F U L L

L I N E

C O N D E N S E D

C A T A L O G

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This FULL LINE CONDENSED CATALOG has been elaborated **in** I.P.R.S.-Baneasa under the supervision of :

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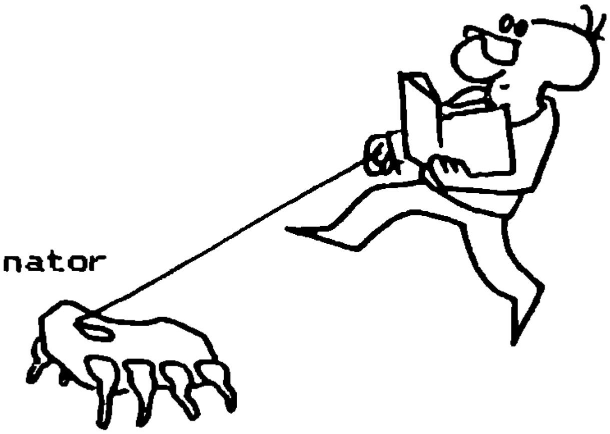

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= PRODUCT = =IDENTIFIER=

This FULL LINE CONDENSED CATALOG contains information concerning the whole product range manufactured by I.P.R.S. - Baneasa at the time of the catalog issue.

The information provided in this catalog has been carefully checked and is believed to be true and reliable. However, no responsability is assumed by the authors for possible omissions or inaccuracies.

In the same time, I.P.R.S.-Baneasa has no responsability in case of wrong interpretation of informations contained in this catalog .

Specifications of electronic components, assemblies, systems and tools produced by I.P.R.S.-Baneasa are subject to change .

On custom request, the manufacturer can deliver components tested under various electrical and mechanical conditions.

SYMBOLS

A		= Anode
B		= Base
C		= Collector or Cathode
Cis	= C_{is}	= Input capacitance (common source)
Cl	= C_{l}	= Reservoir capacitance
Cn	= C_{n}	= Nominal capacitance
Co	= C_{o}	= Output capacitance (of a diode)
Cob	= C_{ob}	= Output capacitance (common base)
Cog	= C_{og}	= Output capacitance (common gate)
Cos	= C_{os}	= Output capacitance (common source)
Crb	= C_{rb}	= Reverse capacitance (common base)
Cre	= C_{re}	= Reverse capacitance (common emitter)
Crs	= C_{rs}	= Reverse capacitance (common source)
Ctot	= C_{tot}	= Diode capacitance
(di/dt)c	= $(di/dt)_{c}$	= Critical rate of rise of on-state current
(dv/dt)c	= $(dv/dt)_{c}$	= Critical rate of rise of off-state voltage
E		= Emitter
EA		= Light source intensity
f		= Frequency
fO	= f_{O}	= Output frequency
fT	= f_{T}	= Transition frequency
f(Yfs)	= $f_{(Yfs)}$	= Cut-off frequency (for FET's)
G		= Gate
GND		= Ground
Gp	= G_{p}	= Power gain
GUM	= G_{UM}	= Unilateralised power gain
hFE	= h_{FE}	= D.C. current gain
hfe	= h_{fe}	= A.C. current gain
IB	= I_{B}	= Base current
IBM	= I_{BM}	= Maximum base current
IBO1	= I_{BO1}	= Breakover current
IBO2	= I_{BO2}	= Breakover current
IC	= I_{C}	= Collector current
ICC	= I_{CC}	= Supply current per package
ICL	= I_{CL}	= Collector light current
ICM	= I_{CM}	= Maximum collector current
ID	= I_{D}	= Off-state current
IDSS	= I_{DSS}	= Drain-source saturation current
Id	= I_{d}	= Output mean current

GENERAL INFORMATIONS

– SYMBOLS –

IE	= I_E	= Emitter current
IEO	= I_{EO}	= Emitter cut-off current (for UJT's)
IEM	= I_{EM}	= Maximum emitter current
IERMS	= I_{ERMS}	= Emitter current - RMS value (for UJT's)
IF	= I_F	= Forward continuous current of a diode
IFAVM	= I_{FAVM}	= Maximum mean forward current
IFM	= I_{FM}	= Maximum forward current
IFRM	= I_{FRM}	= Repetitive peak forward current
IFRMS	= I_{FRMS}	= RMS forward current
IFSM	= I_{FSM}	= Surge forward current
IGSS	= I_{GSS}	= Gate-source cut-off current
IGT	= I_{GT}	= Gate trigger current
IIH	= I_{IH}	= High-level input current
-IIL	=$-I_{IL}$	= Low-level input current
IO	= I_O	= Output current
-IOH	=$-I_{OH}$	= High-level output current
IOL	= I_{OL}	= Low-level output current
IOS	= I_{OS}	= Short-circuit output current
IP	= I_P	= Peak current (for UJT's)
Ipp	= I_{PP}	= Peak-to-peak current
IR	= I_R	= Continuous reverse current
Ir	= I_r	= Ripple current
IT	= I_T	= On-state current
ITAVM	= I_{TAVM}	= Maximum mean on-state current
ITRM	= I_{TRM}	= Repetitive peak on-state current
ITRMS	= I_{TRMS}	= RMS on-state current
ITSM	= I_{TSM}	= Surge on-state current
IZM	= I_{ZM}	= Maximum operating current of a Zener diode
IZT	= I_{ZT}	= Test operating current of a Zener diode
IV	= I_V	= Valley current
i2t	= i^2t	= Current integral
NC		= Non connected terminal
NF		= Noise figure
Pd	= P_d	= Power dissipation
PRSM	= P_{RSM}	= Peak reverse surge power dissipation
Pout	= P_{out}	= Output power
Ptot	= P_{tot}	= Total power dissipation
Qs	= Q	= Stored electrical charge
RBBO	= R_{BBO}	= Interbase resistance
RBE	= R_{BE}	= Base-emitter resistance
RizTC	= R_{izTC}	= Insulation resistance between interconnected terminals and case

RizT	= R_{iZT}	= Insulation resistance between terminals
RthJ-C	= R_{thJ-C}	= Junction to case thermal resistance
rF	= r_F	= Slope resistance of a diode
rf	= r_d	= Dynamic forward resistance
rs	= r_s	= Series resistance
rT	= r_T	= Slope resistance of a thyristor
rZT	= r_{ZT}	= Dynamic series resistance of a Zener diode
SO	= S_O	= Sensitivity
TA	= T_A	= Ambient temperature
TC	= T_C	= Case temperature
TJ	= T_J	= Junction temperature
TJM	= T_{JM}	= Maximum junction temperature
TL	= T_L	= Lead temperature
TVJ	= T_{VJ}	= Junction operating temperature
tf	= t_f	= Fall time
tpHL	= t_{pHL}	= Propagation delay time high-to-low level output
tpLH	= t_{pLH}	= Propagation delay time low-to-high level output
toff	= t_{off}	= Turn-off time
ton	= t_{on}	= Turn-on time
tq	= t_q	= Circuit commutated turn-off time
tr	= t_r	= Rise time
trr	= t_{rr}	= Reverse recovery time
ts	= t_s	= Storage time
VB1E	= V_{B1E}	= Base 1-emitter voltage
VB1B2	= V_{B1E}	= Base 1-base 2 voltage
VB2E	= V_{B2E}	= Base 2-emitter saturation voltage
VBE	= V_{BE}	= Base-emitter voltage
VBEsat	= V_{BEsat}	= Base-emitter saturation voltage
VBO	= V_{BO}	= Breakover voltage simmetry
VBO1	= V_{BO1}	= Breakover voltage
VBO2	= V_{BO2}	= Breakover voltage
VBR	= V_{BR}	= Breakdown voltage
VCB	= V_{CB}	= Collector-base voltage
VCBO	= V_{CBO}	= Collector-base voltage (IE = 0)
VCC	= V_{CC}	= Supply voltage
VCE	= V_{CE}	= Collector-emitter voltage
VCEO	= V_{CEO}	= Collector-emitter voltage (IB = 0)
VCER	= V_{CER}	= Collector-emitter voltage (RBE <> 0)
VCES	= V_{CES}	= Collector-emitter voltage (VBE = 0)
VCEsat	= V_{CEsat}	= Collector-emitter saturation voltage
VCEX	= V_{CEX}	= Collector-emitter voltage (VBE <> 0)

— SYMBOLS —

VCL	= V_{CL}	= Clamp voltage
VCO	= V_{CO}	= Command voltage
VDRM	= V_{DRM}	= Repetitive peak forward off-state voltage
VDS	= V_{DS}	= Drain-source voltage
VEsat	= V_{Esat}	= Emitter saturation voltage (for UJT's)
VF	= V_{F}	= Continuous forward voltage of a diode
VFO	= V_{FO}	= Threshold voltage of a diode
VGS	= V_{GS}	= Gate-source voltage
VGSoff	= V_{GSoff}	= Gate-source cut-off voltage
VGSS	= V_{GSS}	= Gate-source voltage (VDS = 0)
VGT	= V_{GT}	= Gate trigger voltage
VI	= V_{I}	= Input voltage
VIH	= V_{IH}	= High-level input voltage
-VIK	=$-V_{IK}$	= Input clamp voltage
VIL	= V_{IL}	= Low-level input voltage
VIN	= V_{IN}	= Input voltage
VizT	= V_{izT}	= Insulation voltage between terminals
VizTC	= V_{izTC}	= Insulation voltage between interconnected terminals and case
VN	= V_{N}	= Nominal voltage of a capacitor
Vn	= V_{n}	= Noise voltage
VO	= V_{O}	= Output voltage
VOH	= V_{OH}	= High-level output voltage
VOL	= V_{OL}	= Low-level output voltage
VOUT	= V_{OUT}	= Output voltage
Vp	= V_{P}	= Penetration voltage
Vpp	= V_{PP}	= Peak-to-peak voltage
VR	= V_{R}	= Contious reverse voltage of a diode
VRA	= V_{RA}	= Avalanche breakdown voltage
VREF	= V_{REF}	= Reference voltage
VRR	= V_{RR}	= Repetitive reverse voltage
VRRM	= V_{RRM}	= Repetitive peak reverse voltage
VS1	= V_{S1}	= Breakback voltage
VS2	= V_{S2}	= Breakback voltage
VT	= V_{T}	= On-state voltage
VTO	= V_{TO}	= Threshold voltage of a thyristor
VZ	= V_{Z}	= Zener voltage
V+	= V^{+}	= Positive voltage supply
V-	= V^{-}	= Negative voltage supply
Yfs	= Y_{fs}	= Forward transconductance (common source)
Z		= Impedance
λp	= λ_{p}	= Peak wavelength sensitivity
λ0.5	= $\lambda_{0.5}$	= Spectral bandwidth range (50 %)

The catalogue presents the main technical data of the complete product range manufactured by I.P.R.S., as well as the preliminary data for new items to be produced in the next future. The catalogue is structured in 10 sections as follows:

1. Logic integrated circuits
2. Linear integrated circuits
3. Silicon transistors
4. Microwave devices
5. Silicon diodes
6. Thyristors & triacs
7. Power blocks
8. Capacitors
9. Power assemblies
10. Systems, equipments and tools

Sections 1 to 8 refer to components, while the last two ones present industrial and consumer products involving components manufactured by I.P.R.S.

1. PRODUCT DESCRIPTION

1.1. GENERAL DESCRIPTION. Besides the commercial code, other data are also provided : technology type, main applications, use recommendations. The above-mentioned data are more consistent as far as integrated circuits and electronic mountings are concerned.

1.2. CONSTRUCTIVE FEATURES. Outline dimensions are given, together with package type, weight, pin connection, polarity. I.E.C. standardized package drawings are given at the end of each component section.

1.3. ABSOLUTE MAXIMUM RATINGS. The values included in the "absolute maximum ratings" system cannot be exceeded without taking the risk of component degradation. These values should not be exceeded even under the most unfavourable conditions of operation. It is mandatory to observe simultaneously the above-mentioned limits as no mutual compensation is admitted, the first limit exceeded being imperative.

1.4. ELECTRICAL CHARACTERISTICS. Information is given about product performances under specified working conditions. Depending on their importance in application, electrical characteristics can be expressed through:

- limit values (min. and/or max.) guaranteed in the specification ;
- typical values that render the normal fabrication centering.

For each component family, the catalogue indicates a limited number of features that specify briefly and adequately performances essential to the user s orientation.

1.5. CLIMATIC CATEGORY. This quality index is designed as a three-number sequence standing for the minimum storage temperature, the maximum storage temperature and the number of days of moisture resistance testing. The climatic category is given for capacitors, where more severe limitations concerning the minimum operating temperature have to be met. For semiconductor components, temperature range is much larger and robustness to long term moisture action can be controlled through the type and thickness of the protective coatings.

2. CODIFICATION, MARKING

2.1. CODIFICATION. When allocating commercial codes to the I.P.R.S. products, the following solutions were adopted, in order of presidence:

- adopting the Pro-Electron, JEDEC international codification system (which is the case for transistors);
- maintaining (possibly extending) the letter code of reference type, mainly applied to integrated circuits ;
- assigning appropriate I.P.R.S. codes (for the electronic mountings).

2.2. MARKING. Product marking consists of:

- β - manufacturer s identification mark or symbol;
- commercial code;
- polarity;
- quality level code.

```
Example:                      β 2N 3055/3 Q.  5088
                              - ------- - -   ----
manufacturer's logo           !       ! ! !   ! | year 1988
-------------------                   ! ! !   !  ------------------
power transistor JEDEC code           ! ! !   ! week of fabrication
---------------------------             ! !    --------------------
hFE range                               ! !    quality level code
-------------------------------           !    (paragraph 4.3.)
                                           ------------------------
```

3. USE RECOMMENDATIONS

3.1. THERMAL CONSIDERATIONS. As the junction temperature rise over the maximum admitted value during operation and/or storage might cause component damage/destruction, the exhaustion of the heat generated at structure level requires a great deal of attention from the equipment designers. Concrete methods for the thermal stress control are the following:

- locating semiconductor components far enough from heat sources;
- observing catalogue indications in order to maintain at a given temperature certain component subassemblies (connections, packages), which contribute to heat elimination via conduction;
- using cooling accessories (fans, heaters) with known thermal characteristics for high power components as well as the cooling types indicated in the catalogue;
- using compounds which provide an adequate thermal transfer from the mounting base to the heater.

3.2. MECHANICAL INTEGRITY CONSERVATION. Component packages, playing a double role of heat elimination and structure protection against the agressiveness of ambiental environment, should not be submitted to strong shocks capable of affecting their mechanical integrity.

It is therefore recommended to avoid traction and torsion stress of leads. Admitted bending for flexible leads is 90 degrees. Lead bending-torsion should not be applied at less than 2.4 mm distance from the package body.

When mounting a component on the heater, one should observe the indications given by the component supplier:

- heater and mounting base flatness;

- minimum and maximum values of the damping force allowing an accurate thermal transfer without damaging the components/the heater.

These informations specific to the component/package/heater are the object of technical annexes to the contract.

3.3. CONNECTION. Components to be connected on a PCB via soldering should be protected against excessive rise of the junction temperature during soldering. All soldering methods are allowed (soldering iron-dip-wave soldering); anyhow, one should take into account the following indications:

Max.soldering temperature	Max.time	Min.distance from package
260 degrees	5 sec.	5 mm

4. QUALITY

4.1. QUALIFICATION. I.P.R.S. products are qualified by means of a two-step procedure:

- preliminary qualification;
- final qualification.

The qualification procedure implies the following:

- users' agreement with the demonstrated performances of the product, manufacturing process, testing and measurement facilities;
- approval issued by the National Inspectorate for the Quality Control of the Products (I.G.S.C.C.P.);
- approval of the coordinating organism (industrial group and ministery)

The components with the mention "Preliminary data" have the first qualification (prototype) by the time of the catalogue issue .

4.2. QUALITY SPECS. The quality specifications named technical standards (STR) represent the applicable document agreed between I.P.R.S. and its customers.

This document is established prior to the qualification procedure. The main documents used as reference are:

- for the electrical performances of the devices: product catalogues of other manufacturing companies;
- I.E.C. publications for standard packages, methods of measurement for electrical characteristics, as well as methods for quality conformance tests.

At the time of the catalogue issue, the Technical Standards were under an in-depth revision procedure aiming at their alignment to the provisions of I.E.C. quality system, i.e. QC 300,000 and QC 700,000.

4.3. QUALITY LEVELS. We are now establishing a quality level structure for components similar to the one indicated by the I.E.C. system.

Quality levels are coded for active components as follows:

Level	Code	Intended applications
I	X	consumer products
II	Q	industrial applications
III	PI ; PII ; PIII	professional applications

4.4. QUALITY CONFORMANCE INSPECTION. The quality conformance inspection for the delivered products has three main steps:

Lot-by-lot conformance tests	- electrical parameters - external visual and dimensions
Periodical conformance tests (type tests)	- electrical parameters - external visual and mechanical tests - environmental tests - life tests (1,000 hours)
Conformance tests for max. ratings (reliability tests)	- e.g. P_{dmax}, T_{jmax}, V_{Rmax} (time span </= 5000 hours)

The test contents for each inspection step conform the present practice.

4.5. DELIVERY QUALITY. Lot quality conformance tests are performed through a lot acceptance sampling procedure based on AQL or LTPD plans.

The following conservative figures are used in sampling plans:

AQL 0.1 ... 0.25 range for functional defects;
0.4 ... 0.65 range for parametric defects.

The actual average outgoing quality of the inspected lots is more significant than the above-mentioned levels.

5. DELIVERY CONDITIONS

Products described in this catalogue are available with the following remarks:

- the mention "Preliminary data" indicates that the delivery can be made after the final qualification;
- the mention "Limited quantity" indicates bottlenecks in the plant throughput.

Components are packed in containers of the type, size and kind commonly used, which will ensure acceptance by common carriers and safe delivery at the destination.

The following information should appear on the label or should be directly marked on each container:

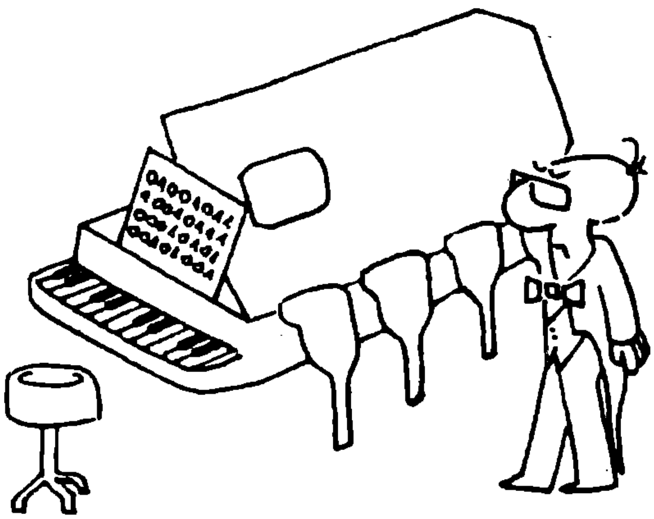
- manufacturer's identification mark;
- type of components;
- quantity;
- technical standard number;
- lot number;
- date code;
- quality control certification stamp and inspector signature.

Quantities to be delivered, delivery time and terms, other additional requirements of the customer (electrical specs, marking, environmental qualification, protective layers, packing) can be established and confirmed at the order issue. For details, please contact:

I.P.R.S.-Baneasa SEICEI, telex number: 11203 IPRS-R
Electronum telex number: 11587 ; 11584 R

DIGITAL
INTEGRATED
CIRCUITS

- T.T.L. FAMILIES
  - T.T.L. STANDARD
  - T.T.L. HIGH SPEED
  - T.T.L. LOW POWER SCHOTTKY
- H.L.L.
- SP 14000 SERIES



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$ Preliminary data

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CDB 4153 EM = DUAL 4 LINE-TO-1 LINE
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CDB 4157 EM = QUAD 2-TO-1 LINE
CDB 4157 E DATA SELECTORS/MULTIPLEXERS
\$ 54 LS 157 (NONINVERTED DATA OUTPUTS) .... 1 - 22
\$ 74 LS 157

\$ 54 LS 158 = QUAD 2-TO-1 LINE
\$ 74 LS 158 DATA SELECTORS/MULTIPLEXERS
(INVERTED DATA OUTPUTS) .... 1 - 22

\$ 54 LS 160 = SYNCHRONOUS 4-BIT COUNTERS
\$ 74 LS 160 (DECADE. DIRECT CLEAR) .... 1 - 22

\$ 54 LS 161 = SYNCHRONOUS 4-BIT COUNTERS
\$ 74 LS 161 (BINARY, DIRECT CLEAR) .... 1 - 23

\$ 54 LS 162 = SYNCHRONOUS 4-BIT COUNTERS
\$ 74 LS 162 (DECADE, SYNCHRONOUS CLEAR) .... 1 - 23

\$ Preliminary data

$ 54 LS 163 $ 74 LS 163	= SYNCHRONOUS 4-BIT COUNTERS (BINARY, SYNCHRONOUS CLEAR)	1 - 23
$ 54 LS 174 $ 74 LS 174	= HEX D-TYPE FLIP-FLOPS (SINGLE RAIL OUTPUTS COMMON DIRECT CLEAR)	1 - 24
$ 54 LS 175 $ 74 LS 175	= QUAD D-TYPE FLIP-FLOPS (COMPLEMENTARY OUTPUTS COMMON DIRECT CLEAR)	1 - 24
CDB 4180 EM CDB 4180 E	= 8-BIT ODD/EVEN PARITY GENERATORS/CHECKERS	1 - 24
CDB 4192 EM CDB 4192 E	= SYNCHRONOUS UP/DOWN DUAL CLOCK COUNTERS (BCD WITH CLEAR)	1 - 25
CDB 4193 EM CDB 4193 E	= SYNCHRONOUS UP/DOWN DUAL CLOCK COUNTERS (BINARY WITH CLEAR)	1 - 25
$ 54 LS 257 $ 74 LS 257	= QUAD DATA SELECTORS/MULTIPLEXERS (NONINVERTED 3-STATE OUTPUTS)	1 - 25
$ 54 LS 258 $ 74 LS 258	= QUAD DATA SELECTORS/MULTIPLEXERS (INVERTED 3-STATE OUTPUTS)	1 - 26
$ 54 LS 266 $ 74 LS 266	= QUAD 2-INPUT EXCLUSIVE-NOR GATES WITH OPEN-COLLECTOR OUTPUTS	1 26
$ 54 LS 386 $ 74 LS 386	= QUAD 2-INPUT EXCLUSIVE-OR GATES	1 - 26
$ CDB 837 EM CDB 837 E CDB 837 EA	= HEX UNIFIED BUS RECEIVERS	1 - 27
$ CDB 838 EM CDB 838 E CDB 838 EA	= QUAD UNIFIED BUS TRANSCEIVERS	1 - 27

$ Preliminary data

CONTENTS

CDB 8136 E = 6-BIT COMPARATORS .... 1 - 27
CDB 8136 C

H.L.L. ..... 1 - 28

FZH 101 = QUADRUPLE 2-INPUT NAND GATES .... 1 - 28
FZH 105

FZH 111 = QUADRUPLE 2-INPUT NAND GATES .... 1 - 28
FZH 115

FZH 121 = DUAL 5-INPUT NAND GATES .... 1 - 28
FZH 125

FZH 131 = DUAL 5-INPUT NAND GATES .... 1 - 29
FZH 135

FZH 141 = DUAL 5-INPUT NAND BUFFERS .... 1 - 29
FZH 145

FZH 171 = DUAL EXPANDABLE
FZH 175 4-INPUT NAND GATES .... 1 - 29

βP 14000 SERIES ..... 1 - 30

βP 14500 = 1-BIT CONTROLLERS .... 1 - 36
βPC 14500

βP 14104 = 4-BIT EXPANDABLE PROGRAM COUNTERS ...... 1 - 39
βPC 14104

βP 14113 = 1-TO-8 LATCHED DEMULTIPLEXERS .... 1 - 42
βPC 14113

βP 14151 = 3-STATE 8-TO-1 MULTIPLEXERS .... 1 - 44
βPC 14151

APPENDIX A - CASE OUTLINES ..... **1A - 01**

TYPE	PAGE
CDB 400 E = QUADRUPLE 2-INPUT NAND GATES	1 - 01
CDB 400 EM = QUADRUPLE 2-INPUT NAND GATES	1 - 01
CDB 400 HE = QUADRUPLE 2-INPUT NAND GATES	1 - 01
CDB 400 HEM = QUADRUPLE 2-INPUT NAND GATES	1 - 01
CDB 402 E = QUADRUPLE 2-INPUT NOR GATES	1 - 01
CDB 402 EM = QUADRUPLE 2-INPUT NOR GATES	1 - 01
CDB 403 E = QUADRUPLE 2-INPUT NAND GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 01
CDB 403 EM = QUADRUPLE 2-INPUT NAND GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 01
CDB 404 E = HEX INVERTERS	1 - 02
CDB 404 EM = HEX INVERTERS	1 - 02
CDB 405 E = HEX INVERTERS WITH OPEN-COLLECTOR OUTPUTS	1 - 02
CDB 405 EM = HEX INVERTERS WITH OPEN-COLLECTOR OUTPUTS	1 - 02
CDB 406 E = HEX INVERTER BUFFERS/DRIVERS WITH OPEN-COLLECTOR HIGH-VOLTAGE OUTPUTS (30 V)	1 - 02
CDB 406 EM = HEX INVERTER BUFFERS/DRIVERS WITH OPEN-COLLECTOR HIGH-VOLTAGE OUTPUTS (30 V)	1 - 02
CDB 407 E = HEX BUFFERS/DRIVERS WITH OPEN-COLLECTOR HIGH-VOLTAGE OUTPUTS (30 V)	1 - 03
CDB 407 EM = HEX BUFFERS/DRIVERS WITH OPEN-COLLECTOR HIGH-VOLTAGE OUTPUTS (30 V)	1 - 03
CDB 408 E = QUADRUPLE 2-INPUT AND GATES	1 - 03
CDB 408 EM = QUADRUPLE 2-INPUT AND GATES	1 - 03
CDB 409 E = QUADRUPLE 2-INPUT AND GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 03
CDB 409 EM = QUADRUPLE 2-INPUT AND GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 03
CDB 410 E = TRIPLE 3-INPUT NAND GATES	1 - 04
CDB 410 EM = TRIPLE 3-INPUT NAND GATES	1 - 04
CDB 410 HE = TRIPLE 3-INPUT NAND GATES	1 - 04
CDB 410 HEM = TRIPLE 3-INPUT NAND GATES	1 - 04
CDB 411 HE = TRIPLE 3-INPUT AND GATES	1 - 04
CDB 411 HEM = TRIPLE 3-INPUT AND GATES	1 - 04

TYPE	PAGE
CDB 413 E = DUAL 4-INPUT NAND SCHMITT TRIGGERS	1 - 05
CDB 413 EM = DUAL 4-INPUT NAND SCHMITT TRIGGERS	1 - 05
CDB 416 E = HEX INVERTER BUFFERS/DRIVERS WITH OPEN-COLLECTOR HIGH-VOLTAGE OUTPUTS (15 V)	1 - 05
CDB 416 EM = HEX INVERTER BUFFERS/DRIVERS WITH OPEN-COLLECTOR HIGH-VOLTAGE OUTPUTS (15 V)	1 - 05
CDB 417 E = HEX BUFFERS/DRIVERS WITH OPEN-COLLECTOR HIGH-VOLTAGE OUTPUTS (15 V)	1 - 06
CDB 417 EM = HEX BUFFERS/DRIVERS WITH OPEN-COLLECTOR HIGH-VOLTAGE OUTPUTS (15 V)	1 - 06
CDB 420 E = DUAL 4-INPUT NAND GATES	1 - 06
CDB 420 EM = DUAL 4-INPUT NAND GATES	1 - 06
CDB 430 E = 8-INPUT NAND GATES	1 - 08
CDB 430 EM = 8-INPUT NAND GATES	1 - 08
CDB 430 HE = 8-INPUT NAND GATES	1 - 08
CDB 430 HEM = 8-INPUT NAND GATES	1 - 08
CDB 432 E = QUADRUPLE 2-INPUT OR GATES	1 - 08
CDB 432 EM = QUADRUPLE 2-INPUT OR GATES	1 - 08
CDB 437 E = QUADRUPLE 2-INPUT NAND BUFFERS	1 - 09
CDB 437 EM = QUADRUPLE 2-INPUT NAND BUFFERS	1 - 09
CDB 438 E = QUADRUPLE 2-INPUT NAND BUFFERS WITH OPEN-COLLECTOR OUTPUTS	1 - 09
CDB 438 EM = QUADRUPLE 2-INPUT NAND BUFFERS WITH OPEN-COLLECTOR OUTPUTS	1 - 09
CDB 440 E = DUAL 4-INPUT NAND BUFFERS	1 - 09
CDB 440 EM = DUAL 4-INPUT NAND BUFFERS	1 - 09
CDB 440 HE = DUAL 4-INPUT NAND BUFFERS	1 - 09
CDB 440 HEM = DUAL 4-INPUT NAND BUFFERS	1 - 09
CDB 442 E = 4 LINE-TO-10 LINE DECODERS (BCD-TO-DECIMAL)	1 - 10
CDB 442 EM = 4 LINE-TO-10 LINE DECODERS (BCD-TO-DECIMAL)	1 - 10
CDB 446 E = BCD-TO-SEVEN-SEGMENT DECODERS/DRIVERS (ACTIVE-LOW, OPEN-COLLECTOR, 30 V OUTPUTS)	1 - 10

TYPE PAGE

CDB 446 EM = BCD-TO-SEVEN-SEGMENT DECODERS/DRIVERS
(ACTIVE-LOW. OPEN-COLLECTOR.
30 V OUTPUTS) .... 1 - 10
CDB 447 E = BCD-TO-SEVEN-SEGMENT DECODERS/DRIVERS
(ACTIVE-LOW. OPEN-COLLECTOR,
15 V OUTPUTS) .... 1 - 10
CDB 447 EM = BCD-TO-SEVEN-SEGMENT DECODERS/DRIVERS
(ACTIVE-LOW. OPEN-COLLECTOR.
15 V OUTPUTS) .... 1 - 10
CDB 450 E = DUAL 2-WIDE 2-INPUT AND-OR-INVERT GATES
(ONE GATE EXPANDABLE) .... 1 - 11
CDB 450 EM = DUAL 2-WIDE 2-INPUT AND-OR-INVERT GATES
(ONE GATE EXPANDABLE) .... 1 - 11
CDB 451 E = DUAL 2-WIDE 2-INPUT AND-OR-INVERT GATES .. 1 - 11
CDB 451 EM = DUAL 2-WIDE 2-INPUT AND-OR-INVERT GATES .. 1 - 11
CDB 451 HE = DUAL 2-WIDE 2-INPUT AND-OR-INVERT GATES . 1 - 11
CDB 451 HEM = DUAL 2-WIDE 2-INPUT AND-OR-INVERT GATES. 1 - 11
CDB 453 E = EXPANDABLE 4-WIDE AND-OR-INVERT GATES .... 1 - 12
CDB 453 EM = EXPANDABLE 4-WIDE AND-OR-INVERT GATES ... 1 - 12
CDB 454 E = 4-WIDE 2-INPUT AND-OR-INVERT GATES .... 1 - 12
CDB 454 EM = 4-WIDE 2-INPUT AND-OR-INVERT GATES ...... 1 - 12
CDB 454 HE = 3-WIDE 2-INPUT + ONE 3-INPUT
AND-OR-INVERT GATES .... 1 - 12
CDB 454 HEM = 3-WIDE 2-INPUT + ONE 3-INPUT
AND-OR-INVERT GATES .... 1 - 12
CDB 460 E = DUAL 4-INPUT EXPANDERS .... 1 - 13
CDB 460 EM = DUAL 4-INPUT EXPANDERS .... 1 - 13
CDB 472 E = AND-GATED J-K MASTER-SLAVE FLIP-FLOPS
WITH PRESET AND CLEAR .... 1 - 14
CDB 472 EM = AND-GATED J-K MASTER-SLAVE FLIP-FLOPS
WITH PRESET AND CLEAR .... 1 - 14
CDB 473 E = DUAL J-K FLIP-FLOPS WITH CLEAR .... 1 - 14
CDB 473 EM = DUAL J-K FLIP-FLOPS WITH CLEAR .... 1 - 14
CDB 474 E = DUAL D-TYPE POSITIVE-EDGE-TRIGGERED
FLIP-FLOPS WITH PRESET AND CLEAR .... 1 - 15
CDB 474 EM = DUAL D-TYPE POSITIVE-EDGE-TRIGGERED
FLIP-FLOPS WITH PRESET AND CLEAR .... 1 - 15
CDB 475 E = 4-BIT BISTABLE LATCHES .... 1 - 15
CDB 475 EM = 4-BIT BISTABLE LATCHES .... 1 - 15

TYPE PAGE

CDB 476 E = DUAL J-K FLIP-FLOPS WITH PRESET AND CLEAR .... 1 - 16
CDB 476 EM = DUAL J-K FLIP-FLOPS WITH PRESET AND CLEAR .... 1 - 16
CDB 481 E = 16-BIT RANDOM-ACCESS MEMORIES .... 1 - 16
CDB 481 EM = 16-BIT RANDOM-ACCESS MEMORIES .... 1 - 16
CDB 483 E = 4-BIT BINARY FULL ADDERS WITH FAST CARRY .... 1 - 17
CDB 483 EM = 4-BIT BINARY FULL ADDERS WITH FAST CARRY .... 1 - 17
CDB 486 E = QUADRUPLE 2-INPUT EXCLUSIVE-OR GATES ..... 1 - 17
CDB 486 EM = QUADRUPLE 2-INPUT EXCLUSIVE-OR GATES .... 1 - 17
CDB 490 E = DECADE COUNTERS (DIVIDE-BY-TWO AND DIVIDE-BY-FIVE) ..... 1 - 18
CDB 490 EM = DECADE COUNTERS (DIVIDE-BY-TWO AND DIVIDE-BY-FIVE .... 1 - 18
CDB 492 E = DIVIDE-BY-TWELVE COUNTERS (DIVIDE-BY-TWO AND DIVIDE-BY-SIX) ...... 1 - 18
CDB 492 EM = DIVIDE-BY-TWELVE COUNTERS (DIVIDE-BY-TWO AND DIVIDE-BY-SIX) ..... 1 - 18
CDB 493 E = 4-BIT BINARY COUNTERS (DIVIDE-BY-TWO AND DIVIDE-BY-EIGHT) .... 1 - 18
CDB 493 EM = 4-BIT BINARY COUNTERS (DIVIDE-BY-TWO AND DIVIDE-BY-EIGHT) ... 1 - 18
CDB 495 E = 4-BIT SHIFT REGISTERS (PARALLEL IN/PARALLEL OUT, SHIFT RIGHT, SHIFT LEFT, SERIAL INPUT) .... 1 - 19
CDB 495 EM = 4-BIT SHIFT REGISTERS (PARALLEL IN/PARALLEL OUT, SHIFT RIGHT, SHIFT LEFT, SERIAL INPUT) .... 1 - 19
CDB 837 E = HEX UNIFIED BUS RECEIVERS .... 1 - 27
CDB 837 EA = HEX UNIFIED BUS RECEIVERS .... 1 - 27
$ CDB 837 EM = HEX UNIFIED BUS RECEIVERS .... 1 - 27
CDB 838 E = QUAD UNIFIED BUS TRANSCEIVERS .... 1 - 27
CDB 838 EA = QUAD UNIFIED BUS TRANSCEIVERS .... 1 - 27
$ CDB 838 EM = QUAD UNIFIED BUS TRANSCEIVERS .... 1 - 27
CDB 4121 E = MONOSTABLE MULTIVIBRATORS .... 1 - 19
CDB 4121 EM = MONOSTABLE MULTIVIBRATORS .... 1 - 19
CDB 4123 E = DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS WITH CLEAR .... 1 - 20

$ Preliminary data

TYPE		PAGE
CDB 4123 EM	DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS WITH CLEAR	1 - 20
CDB 4151 E	1-OF-8 DATA SELECTORS/MULTIPLEXERS	1 - 21
CDB 4151 EM	1-OF-8 DATA SELECTORS/MULTIPLEXERS	1 - 21
CDB 4153 E	DUAL 4 LINE-TO-1 LINE DATA SELECTORS/MULTIPLEXERS	1 - 21
CDB 4153 EM	DUAL 4 LINE-TO-1 LINE DATA SELECTORS/MULTIPLEXERS	1 - 21
CDB 4157 E	QUAD 2-TO-1 LINE DATA SELECTORS/MULTIPLEXERS (NONINVERTED DATA OUTPUTS)	1 - 22
CDB 4157 EM	QUAD 2-TO-1 LINE DATA SELECTORS/MULTIPLEXERS (NONINVERTED DATA OUTPUTS)	1 - 22
CDB 4180 E	8-BIT ODD/EVEN PARITY GENERATORS/CHECKERS	1 - 24
CDB 4180 EM	8-BIT ODD/EVEN PARITY GENERATORS/CHECKERS	1 - 24
CDB 4192 E	SYNCHRONOUS UP/DOWN DUAL CLOCK COUNTERS (BCD WITH CLEAR)	1 - 25
CDB 4192 EM	SYNCHRONOUS UP/DOWN DUAL CLOCK COUNTERS (BCD WITH CLEAR)	1 - 25
CDB 4193 E	SYNCHRONOUS UP/DOWN DUAL CLOCK COUNTERS (BINARY WITH CLEAR)	1 - 25
CDB 4193 EM	SYNCHRONOUS UP/DOWN DUAL CLOCK COUNTERS (BINARY WITH CLEAR)	1 - 25
CDB 8136 C	6-BIT COMPARATORS	1 - 27
CDB 8136 E	6-BIT COMPARATORS	1 - 27
FZH 101	QUADRUPLE 2-INPUT NAND GATES	1 - 28
FZH 105	QUADRUPLE 2-INPUT NAND GATES	1 - 28
FZH 111	QUADRUPLE 2-INPUT NAND GATES	1 - 28
FZH 115	QUADRUPLE 2-INPUT NAND GATES	1 - 28
FZH 121	DUAL 5-INPUT NAND GATES	1 - 28
FZH 125	DUAL 5-INPUT NAND GATES	1 - 28
FZH 131	DUAL 5-INPUT NAND GATES	1 - 29
FZH 135	DUAL 5-INPUT NAND GATES	1 - 29
FZH 141	DUAL 5-INPUT NAND BUFFERS	1 - 29
FZH 145	DUAL 5-INPUT NAND BUFFERS	1 - 29
FZH 171	DUAL EXPANDABLE 4-INPUT NAND GATES	1 - 29
FZH 175	DUAL EXPANDABLE 4-INPUT NAND GATES	1 - 29

TYPE		PAGE
βP 14104	= 4-BIT EXPANDABLE PROGRAM COUNTERS	1 - 39
βP 14113	= 1-TO-8 LATCHED DEMULTIPLEXERS	1 - 42
βP 14151	= 3-STATE 8-TO-1 MULTIPLEXERS	1 - 44
βP 14500	= 1-BIT CONTROLLERS	1 - 36
βPC 14104	= 4-BIT EXPANDABLE PROGRAM COUNTERS	1 - 39
βPC 14113	= 1-TO-8 LATCHED DEMULTIPLEXERS	1 - 42
βPC 14151	= 3-STATE 8-TO-1 MULTIPLEXERS	1 - 44
βPC 14500	= 1-BIT CONTROLLERS	1 - 36
$ 54 LS 00	= QUADRUPLE 2-INPUT NAND GATES	1 - 01
$ 54 LS 02	= QUADRUPLE 2-INPUT NOR GATES	1 - 01
$ 54 LS 03	= QUADRUPLE 2-INPUT NAND GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 01
$ 54 LS 04	= HEX INVERTERS	1 - 02
$ 54 LS 05	= HEX INVERTERS WITH OPEN-COLLECTOR OUTPUTS	1 - 02
$ 54 LS 08	= QUADRUPLE 2-INPUT AND GATES	1 - 03
$ 54 LS 09	= QUADRUPLE 2-INPUT AND GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 03
$ 54 LS 10	= TRIPLE 3-INPUT NAND GATES	1 - 04
$ 54 LS 11	= TRIPLE 3-INPUT AND GATES	1 - 04
$ 54 LS 12	= TRIPLE 3-INPUT NAND GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 04
$ 54 LS 15	= TRIPLE 3-INPUT AND GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 05
$ 54 LS 20	= DUAL 4-INPUT NAND GATES	1 - 06
$ 54 LS 21	= DUAL 4-INPUT AND GATES	1 - 06
$ 54 LS 22	= DUAL 4-INPUT NAND GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 07
$ 54 LS 27	= TRIPLE 3-INPUT NOR GATES	1 - 07
$ 54 LS 28	= QUADRUPLE 2-INPUT NOR BUFFERS	1 - 07
$ 54 LS 30	= 8-INPUT NAND GATES	1 - 08
$ 54 LS 32	= QUADRUPLE 2-INPUT OR GATES	1 - 08
$ 54 LS 33	= QUADRUPLE 2-INPUT NOR BUFFERS WITH OPEN-COLLECTOR OUTPUTS	1 - 08
$ 54 LS 37	= QUADRUPLE 2-INPUT NAND BUFFERS	1 - 09
$ 54 LS 38	= QUADRUPLE 2-INPUT NAND BUFFERS WITH OPEN-COLLECTOR OUTPUTS	1 - 09
$ 54 LS 40	= DUAL 4-INPUT NAND BUFFERS	1 - 09
$ 54 LS 51	= 2-WIDE 3-INPUT. 2-WIDE 2-INPUT AND-OR-INVERT GATES	1 - 11

$ Preliminary data

TYPE		PAGE
$ 54 LS 54	= 2-WIDE 2-INPUT. 2-WIDE 3-INPUT AND-OR-INVERT GATES	1 - 13
$ 54 LS 55	= 2-WIDE 4-INPUT AND-OR-INVERT GATES	1 - 13
$ 54 LS 74	= DUAL D-TYPE POSITIVE-EDGE-TRIGGERED FLIP-FLOPS WITH PRESET AND CLEAR	1 - 15
$ 54 LS 86	= QUADRUPLE 2-INPUT EXCLUSIVE-OR GATES	1 - 17
$ 54 LS 123	= DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS WITH CLEAR	1 - 20
$ 54 LS 136	= QUAD 2-INPUT EXCLUSIVE-OR GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 20
$ 54 LS 138	= 3-TO-8 LINE DECODERS/MULTIPLEXERS	1 - 21
$ 54 LS 157	= QUAD 2-TO-1 LINE DATA SELECTORS/MULTIPLEXERS (NONINVERTED DATA OUTPUTS)	1 - 22
$ 54 LS 158	= QUAD 2-TO-1 LINE DATA SELECTORS/MULTIPLEXERS (INVERTED DATA OUTPUTS)	1 - 22
$ 54 LS 160	= SYNCHRONOUS 4-BIT COUNTERS (DECADE. DIRECT CLEAR)	1 - 22
$ 54 LS 161	= SYNCHRONOUS 4-BIT COUNTERS (BINARY, DIRECT CLEAR)	1 - 23
$ 54 LS 162	= SYNCHRONOUS 4-BIT COUNTERS (DECADE, SYNCHRONOUS CLEAR)	1 - 23
$ 54 LS 163	= SYNCHRONOUS 4-BIT COUNTERS (BINARY, SYNCHRONOUS CLEAR)	1 - 23
$ 54 LS 174	= HEX D-TYPE FLIP-FLOPS (SINGLE RAIL OUTPUTS COMMON DIRECT CLEAR)	1 - 24
$ 54 LS 175	= QUAD D-TYPE FLIP-FLOPS (COMPLEMENTARY OUTPUTS COMMON DIRECT CLEAR)	1 - 24
$ 54 LS 257	= QUAD DATA SELECTORS/MULTIPLEXERS (NONINVERTED 3-STATE OUTPUTS)	1 - 25
$ 54 LS 258	= QUAD DATA SELECTORS/MULTIPLEXERS (INVERTED 3-STATE OUTPUTS)	1 - 26
$ 54 LS 266	= QUAD 2-INPUT EXCLUSIVE-NOR GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 26
$ 54 LS 386	= QUAD 2-INPUT EXCLUSIVE-OR GATES	1 - 26

$ Preliminary data

TYPE		PAGE
74 LS 00	= QUADRUPLE 2-INPUT NAND GATES	1 - 01
74 LS 02	= QUADRUPLE 2-INPUT NOR GATES	1 - 01
74 LS 03	= QUADRUPLE 2-INPUT NAND GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 01
$ 74 LS 04	= HEX INVERTERS	1 - 02
$ 74 LS 05	= HEX INVERTERS WITH OPEN-COLLECTOR OUTPUTS	1 - 02
74 LS 08	= QUADRUPLE 2-INPUT AND GATES	1 - 03
74 LS 09	= QUADRUPLE 2-INPUT AND GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 03
74 LS 10	= TRIPLE 3-INPUT NAND GATES	1 - 04
74 LS 11	= TRIPLE 3-INPUT AND GATES	1 - 04
74 LS 12	= TRIPLE 3-INPUT NAND GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 04
74 LS 15	= TRIPLE 3-INPUT AND GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 05
74 LS 20	= DUAL 4-INPUT NAND GATES	1 - 06
74 LS 21	= DUAL 4-INPUT AND GATES	1 - 06
74 LS 22	= DUAL 4-INPUT NAND GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 07
74 LS 27	= TRIPLE 3-INPUT NOR GATES	1 - 07
$ 74 LS 28	= QUADRUPLE 2-INPUT NOR BUFFERS	1 - 07
74 LS 30	= 8-INPUT NAND GATES	1 - 08
74 LS 32	= QUADRUPLE 2-INPUT OR GATES	1 - 08
$ 74 LS 33	= QUADRUPLE 2-INPUT NOR BUFFERS WITH OPEN-COLLECTOR OUTPUTS	1 - 08
$ 74 LS 37	= QUADRUPLE 2-INPUT NAND BUFFERS	1 - 09
$ 74 LS 38	= QUADRUPLE 2-INPUT NAND BUFFERS WITH OPEN-COLLECTOR OUTPUTS	1 - 09
$ 74 LS 40	= DUAL 4-INPUT NAND BUFFERS	1 - 09
74 LS 51	= 2-WIDE 3-INPUT, 2-WIDE 2-INPUT AND-OR-INVERT GATES	1 - 11
74 LS 54	= 2-WIDE 2-INPUT, 2-WIDE 3-INPUT AND-OR-INVERT GATES	1 - 13
74 LS 55	= 2-WIDE 4-INPUT AND-OR-INVERT GATES	1 - 13
$ 74 LS 74	= DUAL D-TYPE POSITIVE-EDGE-TRIGGERED FLIP-FLOPS WITH PRESET AND CLEAR	1 - 15
$ 74 LS 86	= QUADRUPLE 2-INPUT EXCLUSIVE-OR GATES	1 - 17

$ Preliminary data

TYPE		PAGE
$ 74 LS 123	= DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS WITH CLEAR	1 - 20
$ 74 LS 136	= QUAD 2-INPUT EXCLUSIVE-OR GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 20
$ 74 LS 138	= 3-TO-8 LINE DECODERS/MULTIPLEXERS	1 - 21
$ 74 LS 157	= QUAD 2-TO-1 LINE DATA SELECTORS/MULTIPLEXERS (NONINVERTED DATA OUTPUTS)	1 - 22
$ 74 LS 158	= QUAD 2-TO-1 LINE DATA SELECTORS/MULTIPLEXERS (INVERTED DATA OUTPUTS)	1 - 22
$ 74 LS 160	= SYNCHRONOUS 4-BIT COUNTERS (DECADE, DIRECT CLEAR)	1 - 22
$ 74 LS 161	= SYNCHRONOUS 4-BIT COUNTERS (BINARY, DIRECT CLEAR)	1 - 23
$ 74 LS 162	= SYNCHRONOUS 4-BIT COUNTERS (DECADE, SYNCHRONOUS CLEAR)	1 - 23
$ 74 LS 163	= SYNCHRONOUS 4-BIT COUNTERS (BINARY, SYNCHRONOUS CLEAR)	1 - 23
$ 74 LS 174	= HEX D-TYPE FLIP-FLOPS (SINGLE RAIL OUTPUTS COMMON DIRECT CLEAR)	1 - 24
$ 74 LS 175	= QUAD D-TYPE FLIP-FLOPS (COMPLEMENTARY OUTPUTS COMMON DIRECT CLEAR)	1 - 24
$ 74 LS 257	= QUAD DATA SELECTORS/MULTIPLEXERS (NONINVERTED 3-STATE OUTPUTS)	1 - 25
$ 74 LS 258	= QUAD DATA SELECTORS/MULTIPLEXERS (INVERTED 3-STATE OUTPUTS)	1 - 26
$ 74 LS 266	= QUAD 2-INPUT EXCLUSIVE-NOR GATES WITH OPEN-COLLECTOR OUTPUTS	1 - 26
$ 74 LS 386	= QUAD 2-INPUT EXCLUSIVE-OR GATES	1 - 26

$ Preliminary data

BASIC CHARACTERISTICS

FAMILY	OPERATING TEMPERATURE RANGE	VCC (V) min.	VCC (V) max.
CDB ... E	0 oC ... + 70 oC	4.75	5.25
CDB ... EM	-55 oC ... + 125 oC	4.50	5.50
CDB ... HE	0 oC ... + 70 oC	4.75	5.25
CDB ... HEM	-55 oC ... + 125 oC	4.50	5.50
74 LS ...	0 oC ... + 70 oC	4.75	5.25
54 LS ...	-55 oC ... + 125 oC	4.50	5.50
FZH 101 ... 171	0 oC ... + 70 oC	13.5	17
FZH 105 ... 175	-25 oC ... + 85 oC	13.5	17

BASIC CHARACTÉRISTICS PER NAND GATE

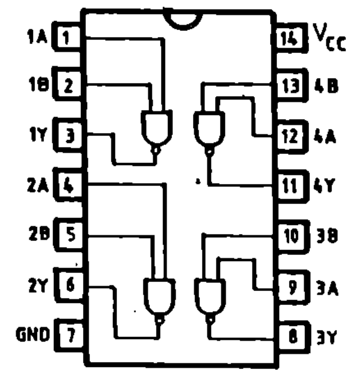
PARAMETER	TTL	TTL-H	TTL-LS	HLL	Unit
FAMILIES	CDB ...	CDB...H	54/74LS..	FZH ...	
VIH min	2	2	2	7.5	V
VIL max	0.8	0.8	0.7/0.8	4.5	V
IIH max	40	50	20	1	uA
- IIL max	1.6	2	0.4	1.8	mA
VOL max	0.4	0.4	0.4/0.5	1.7	V
VOH min	2.4	2.4	2.5/2.7	12	V
IOL min	16	20	4/8	18	mA
- IOH min	0.8	1	0.4	0.1	mA
IOS	18...55	40...100	15...100	15...60	mA
ICC typ @ VOL	3	6.5	0.6	3	mA
ICC typ @ VOH	1	2.5	0.2	1	mA
- VIK max	1.8	1.8	1.5	-	V
Pd medium	10	22	2	30	mW
tpLH typ	12	6	9	175	ns
tpHL typ	8	6.5	10	175	ns

QUADRUPLE 2-INPUT NAND GATES

CDB 400 EM
CDB 400 E

CDB 400 HEM
CDB 400 HE

$ 54 LS 00
74 LS 00



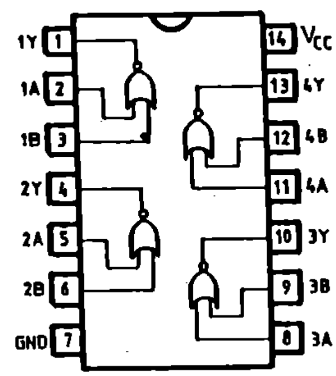
Y = $\overline{A.B}$

PACKAGE TO-116 / TOP VIEW

QUADRUPLE 2-INPUT NOR GATES

CDB 402 EM
CDB 402 E

$ 54 LS 02
74 LS 02



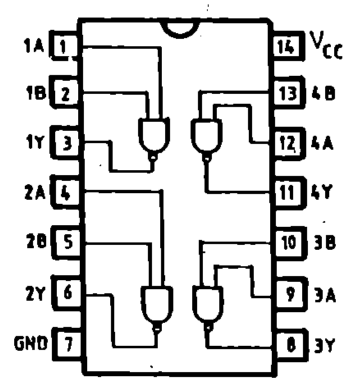
Y = $\overline{A+B}$

PACKAGE TO-116 / TOP VIEW

QUADRUPLE 2-INPUT NAND GATES
WITH OPEN-COLLECTOR OUTPUTS

CDB 403 EM
CDB 403 E

$ 54 LS 03
74 LS 03



Y = $\overline{A.B}$

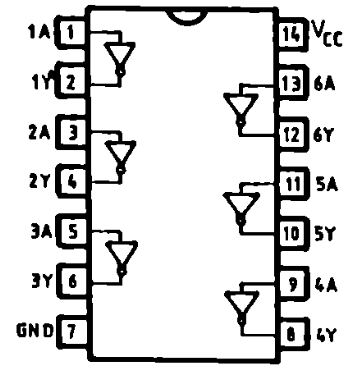
PACKAGE TO-116 / TOP VIEW

$ Preliminary data

HEX INVERTERS

CDB 404 EM
CDB 404 E

$ 54 LS 04
$ 74 LS 04



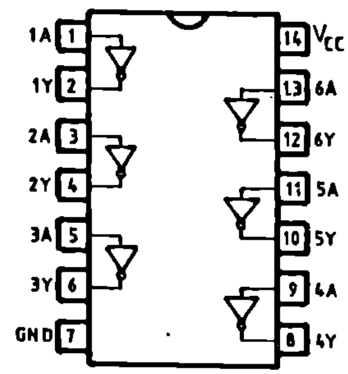
$Y = \overline{A}$

PACKAGE TO-116 / TOP VIEW

HEX INVERTERS
WITH OPEN-COLLECTOR OUTPUTS

CDB 405 EM
CDB 405 E

$ 54 LS 05
$ 74 LS 05

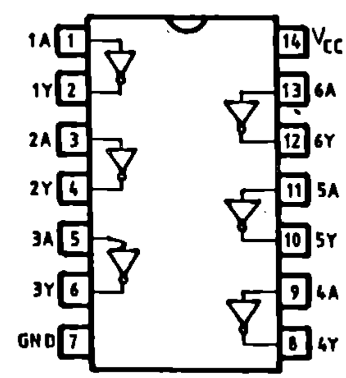


$Y = \overline{A}$

PACKAGE TO-116 / TOP VIEW

HEX INVERTER BUFFERS/DRIVERS
WITH OPEN-COLLECTOR
HIGH-VOLTAGE OUTPUTS (30 V)

CDB 406 EM
CDB 406 E



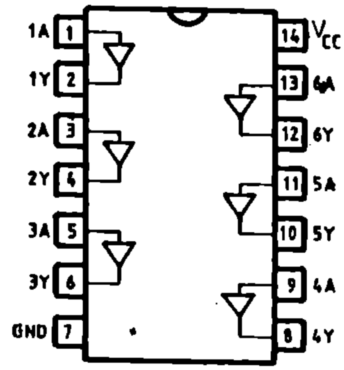
$Y = \overline{A}$

PACKAGE TO-116 / TOP VIEW

$ Preliminary data

HEX BUFFERS/DRIVERS
WITH OPEN-COLLECTOR
HIGH-VOLTAGE OUTPUTS (30 V)

CDB 407 EM
CDB 407 E



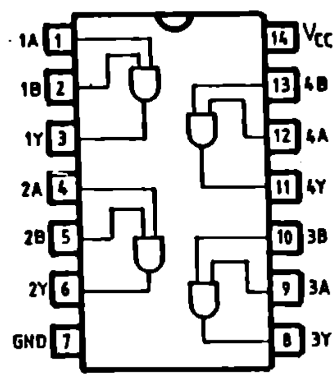
Y = A

PACKAGE TO-116 / TOP VIEW

QUADRUPLE 2-INPUT AND GATES

CDB 408 EM
CDB 408 E

$ **54 LS 08**
74 LS 08



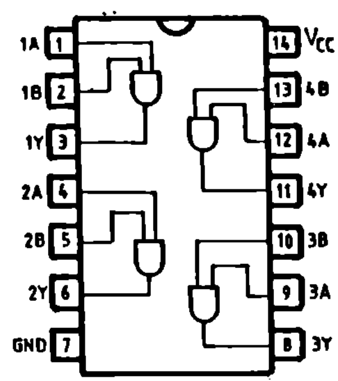
Y = A.B

PACKAGE TO-116 / TOP VIEW

QUADRUPLE 2-INPUT AND GATES
WITH OPEN-COLLECTOR OUTPUTS

CDB 409 EM
CDB 409 E

$ **54 LS 09**
74 LS 09



Y = A.B

PACKAGE TO-116 / TOP VIEW

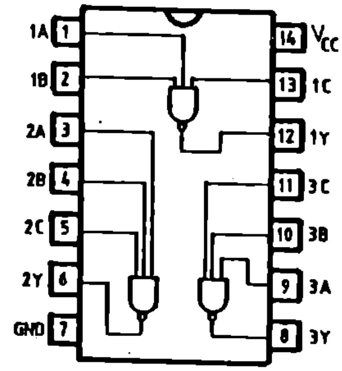
$ Preliminary data

TRIPLE 3-INPUT NAND GATES

CDB 410 EM
CDB 410 E

CDB 410 HEM
CDB 410 HE

$ 54 LS 10
74 LS 10



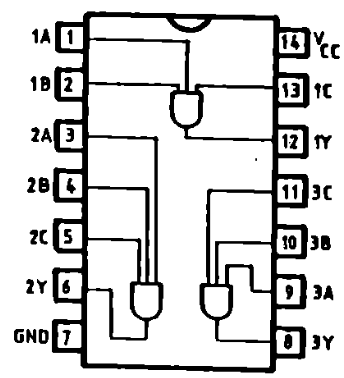
$Y = \overline{A.B.C}$

PACKAGE TO-116 / TOP VIEW

TRIPLE 3-INPUT AND GATES

CDB 411 HEM
CDB 411 HE

$ 54 LS 11
74 LS 11

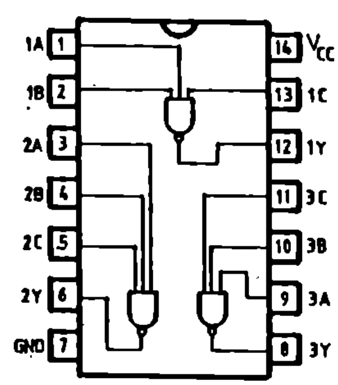


$Y = A.B.C$

PACKAGE TO-116 / TOP VIEW

TRIPLE 3-INPUT NAND GATES WITH OPEN-COLLECTOR OUTPUTS

$ 54 LS 12
74 LS 12



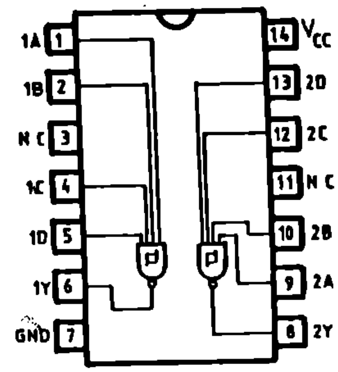
$Y = \overline{A.B.C}$

PACKAGE TO-116 / TOP VIEW

$ Preliminary data

DUAL 4-INPUT NAND
SCHMITT TRIGGERS

CDB 413 EM
CDB 413 E

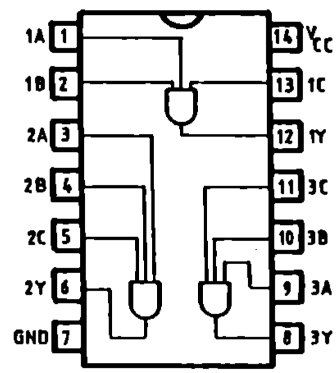


$Y = \overline{A.B.C.D}$

PACKAGE TO-116 / TOP VIEW

TRIPLE 3-INPUT AND GATES
WITH OPEN-COLLECTOR OUTPUTS

$ 54 LS 15
74 LS 15

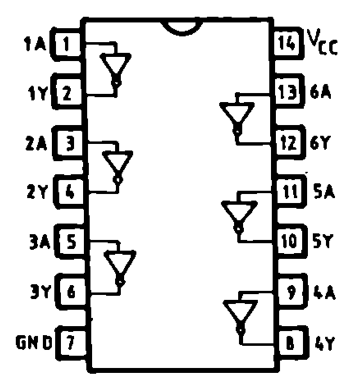


Y = A.B.C

PACKAGE TO-116 / TOP VIEW

HEX INVERTER BUFFERS/DRIVERS
WITH OPEN-COLLECTOR
HIGH-VOLTAGE OUTPUTS (15 V)

CDB 416 EM
CDB 416 E



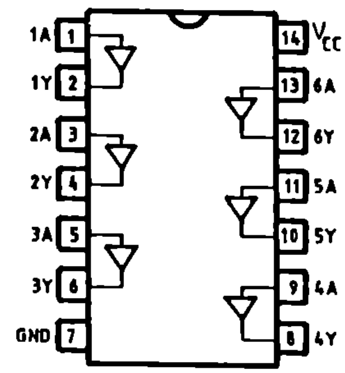
$Y = \overline{A}$

PACKAGE TO-116 / TOP VIEW

$ Preliminary data

HEX BUFFERS/DRIVERS
WITH OPEN-COLLECTOR
HIGH-VOLTAGE OUTPUTS (15 V)

CDB 417 EM
CDB 417 E



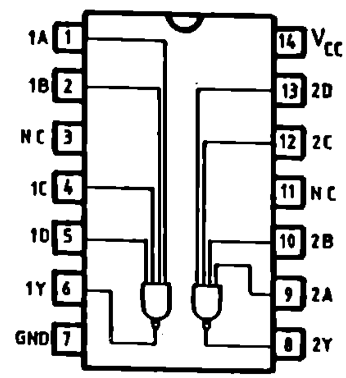
Y = A

PACKAGE TO-116 / TOP VIEW

DUAL 4-INPUT NAND GATES

CDB 420 EM
CDB 420 E

$ 54 LS 20
74 LS 20

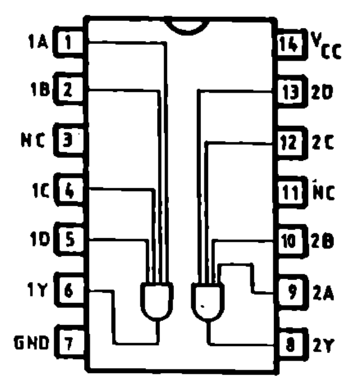


$Y = \overline{A.B.C.D}$

PACKAGE TO-116 / TOP VIEW

DUAL 4-INPUT AND GATES

$ 54 LS 21
74 LS 21



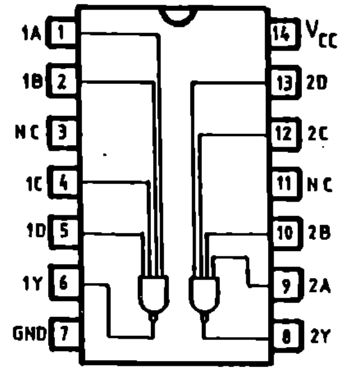
Y = A.B.C.D

PACKAGE TO-116 / TOP VIEW

$ Preliminary data

DUAL 4-INPUT NAND GATES WITH OPEN-COLLECTOR OUTPUTS

$ 54 LS 22
74 LS 22

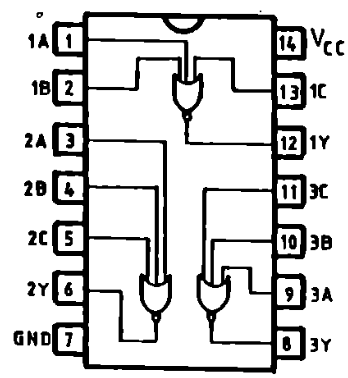


$Y = \overline{A.B.C.D}$

PACKAGE TO-116 / TOP VIEW

TRIPLE 3-INPUT NOR GATES

$ 54 LS 27
74 LS 27

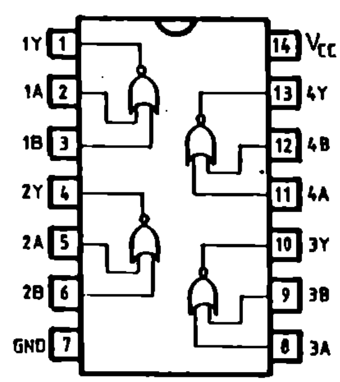


$Y = \overline{A+B+C}$

PACKAGE TO-116 / TOP VIEW

QUADRUPLE 2-INPUT NOR BUFFERS

$ 54 LS 28
$ 74 LS 28



$Y = \overline{A+B}$

PACKAGE TO-116 / TOP VIEW

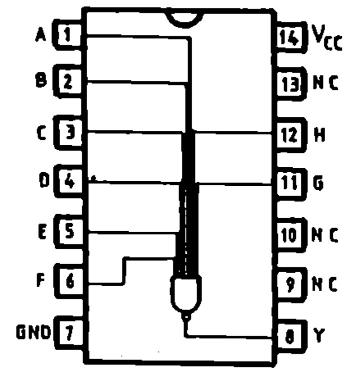
$ Preliminary data

8-INPUT NAND GATES

CDB 430 EM
CDB 430 E

CDB 430 HEM
CDB 430 HE

$ 54 LS 30
74 LS 30



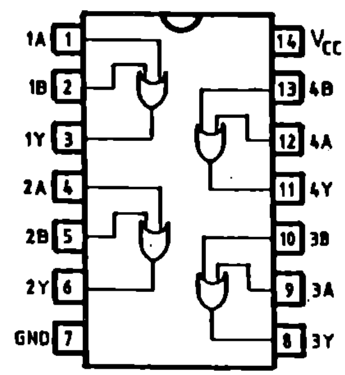
$Y = \overline{A.B.C.D.E.F.G.H}$

PACKAGE TO-116 / TOP VIEW

QUADRUPLE 2-INPUT OR GATES

CDB 432 EM
CDB 432 E

$ 54 LS 32
74 LS 32

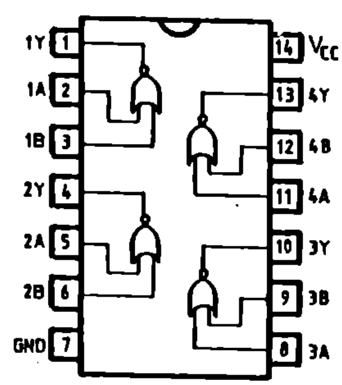


$Y = A+B$

PACKAGE TO-116 / TOP VIEW

QUADRUPLE 2-INPUT NOR BUFFERS WITH OPEN-COLLECTOR OUTPUTS

$ 54 LS 33
$ 74 LS 33



$Y = \overline{A+B}$

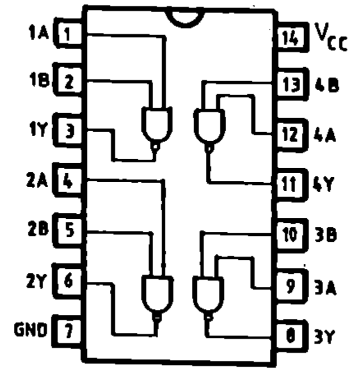
PACKAGE TO-116 / TOP VIEW

$ Preliminary data

QUADRUPLE 2-INPUT NAND BUFFERS

CDB 437 EM
CDB 437 E

$ 54 LS 37
$ 74 LS 37



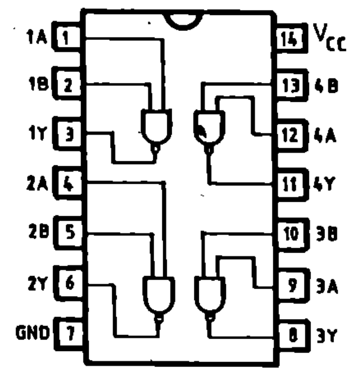
$Y = \overline{A.B}$

PACKAGE TO-116 / TOP VIEW

QUADRUPLE 2-INPUT NAND BUFFERS WITH OPEN-COLLECTOR OUTPUTS

CDB 438 EM
CDB 438 E

$ 54 LS 38
$ 74 LS 38



$Y = \overline{A.B}$

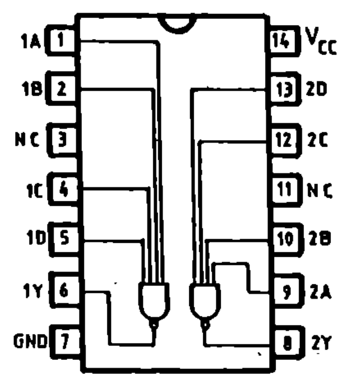
PACKAGE TO-116 / TOP VIEW

DUAL 4-INPUT NAND BUFFERS

CDB 440 EM
CDB 440 E

CDB 440 HEM
CDB 440 HE

$ 54 LS 40
$ 74 LS 40



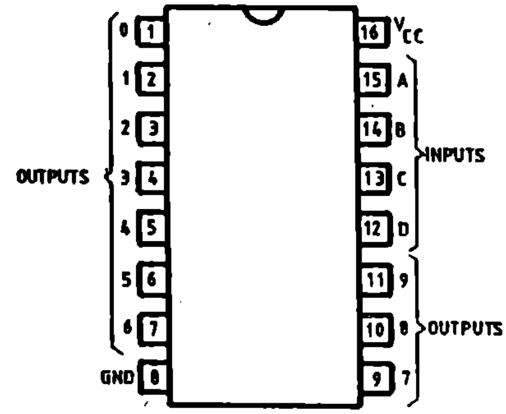
$Y = \overline{A.B.C.D}$

PACKAGE TO-116 / TOP VIEW

$ Preliminary data

4 LINE-TO-10 LINE DECODERS
(BCD-TO-DECIMAL)

CDB 442 EM
CDB 442 E

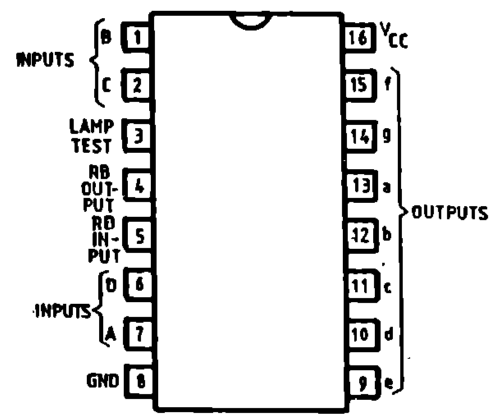


PACKAGE MP-117 / TOP VIEW

BCD-TO-SEVEN-SEGMENT
DECODERS/DRIVERS ACTIVE-LOW,
OPEN-COLLECTOR, 30 V OUTPUTS

CDB 446 EM
CDB 446 E

```
          a
         ---
    f  / g   / b
        ---
  e  /     / c
      ---
       d
```

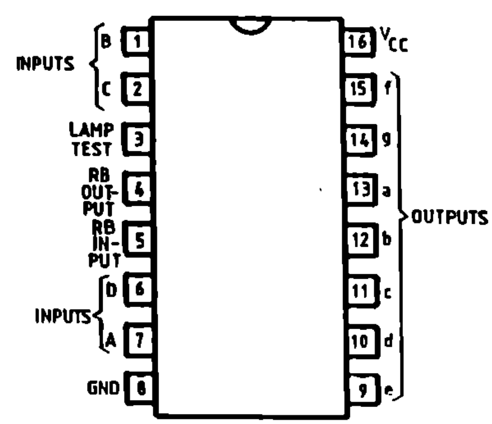


PACKAGE MP-117 / TOP VIEW

BCD-TO-SEVEN-SEGMENT
DECODERS/DRIVERS ACTIVE-LOW,
OPEN-COLLECTOR, 15 V OUTPUTS

CDB 447 EM
CDB 447 E

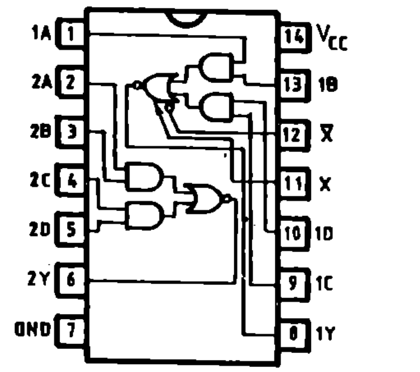
```
          a
         ---
    f  / g   / b
        ---
  e  /     / c
      ---
       d
```



PACKAGE MP-117 / TOP VIEW

DUAL 2-WIDE 2-INPUT
AND-OR-INVERT GATES
(ONE GATE EXPANDABLE)

CDB 450 EM
CDB 450 E



$Y = \overline{A.B+C.D+X}$

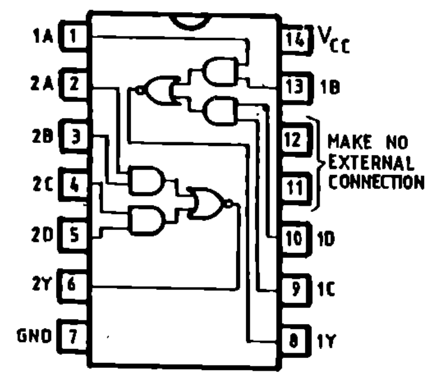
X = output of CDB 460 EM/E

PACKAGE TO-116 / TOP VIEW

DUAL 2-WIDE 2-INPUT
AND-OR-INVERT GATES

CDB 451 EM
CDB 451 E

CDB 451 HEM
CDB 451 HE

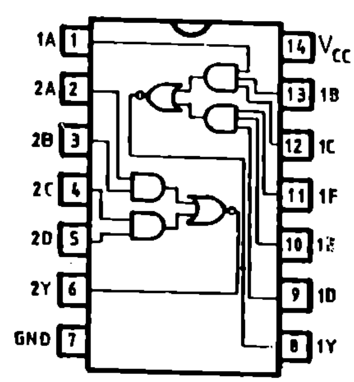


$Y = \overline{A.B+C.D}$

PACKAGE TO-116 / TOP VIEW

2-WIDE 3-INPUT, 2-WIDE 2-INPUT
AND-OR-INVERT GATES

* 54 LS 51
74 LS 51



$1Y = \overline{(1A.11.1C.)+(1D.1E.1F)}$

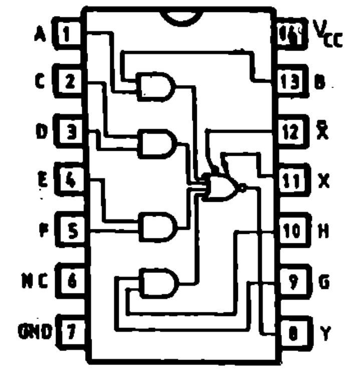
$2Y = \overline{(2A.2B)+(2C.2D)}$

PACKAGE TO-116 / TOP VIEW

* Preliminary data

EXPANDABLE 4-WIDE
AND-OR-INVERT GATES

CDB 453 EM
CDB 453 E

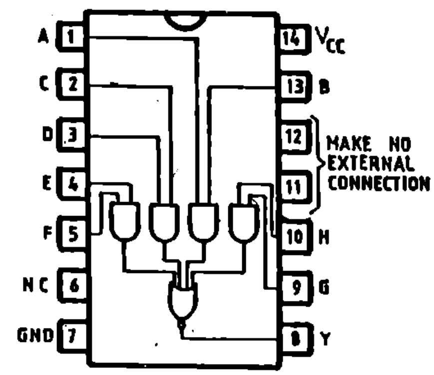


$Y = \overline{A.B+C.D+E.F+G.H+X}$
X = output of CDB 460 EM/E

PACKAGE TO-116 / TOP VIEW

4-WIDE 2-INPUT
AND-OR-INVERT GATES

CDB 454 EM
CDB 454 E

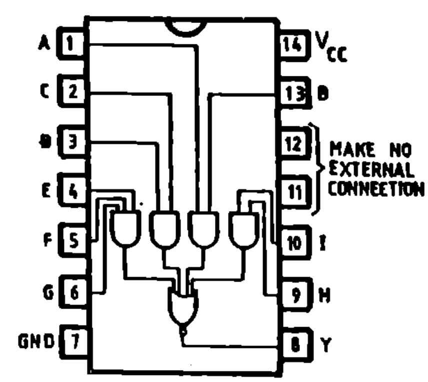


$Y = \overline{A.B+C.D+E.F+G.H}$

PACKAGE TO-116 / TOP VIEW

3-WIDE 2-INPUT + ONE 3-INPUT
AND-OR-INVERT GATES

CDB 454 HEM
CDB 454 HE

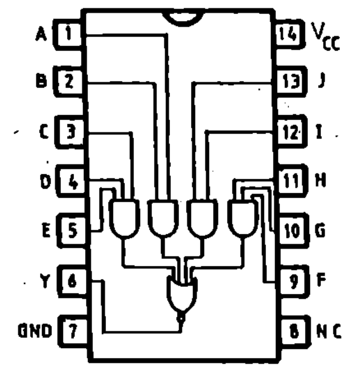


$Y = \overline{A.B+C.D+E.F.G.+H.I}$

PACKAGE TO-116 / TOP VIEW

2-WIDE 2-INPUT, 2-WIDE 3-INPUT AND-OR-INVERT GATES

$ 54 LS 54
74 LS 54

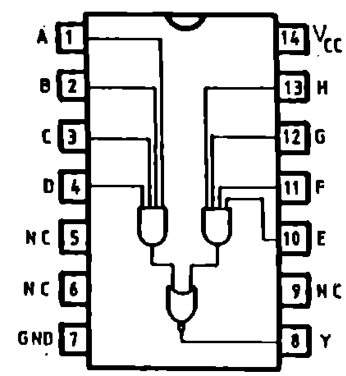


$Y = \overline{A.B+C.D.E+F.G.H+I.J}$

PACKAGE TO-116 / TOP VIEW

2-WIDE 4-INPUT AND-OR-INVERT GATES

$ 54 LS 55
74 LS 55

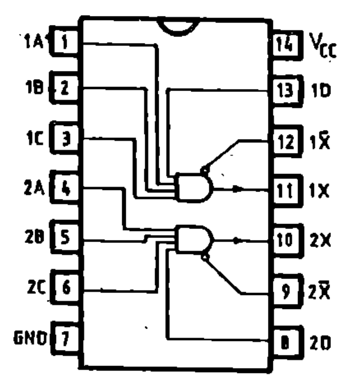


$Y = \overline{A.B.C.D+E.F.G.H}$

PACKAGE TO-116 / TOP VIEW

DUAL 4-INPUT EXPANDERS

CDB 460 EM
CDB 460 E



X = A.B.C.D when connected to X and $\overline{X}$ inputs of CDB 450 or CDB 453 (EM/E)

PACKAGE TO-116 / TOP VIEW

$ Preliminary data

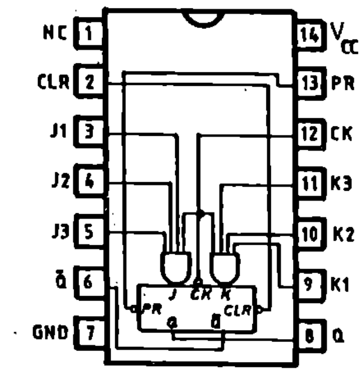
AND-GATED J-K MASTER-SLAVE FLIP-FLOPS WITH PRESET AND CLEAR

CDB 472 EM
CDB 472 E

FUNCTION TABLE

INPUTS					OUTPUTS	
PRESET	CLEAR	CLOCK	J	K	Q	$\bar{Q}$
0	1	X	X	X	1	0
1	0	X	X	X	0	1
0	0	X	X	X	1	1
1	1	⎍	0	0	Q0	$\bar{Q}$0
1	1	⎍	1	0	1	0
1	1	⎍	0	1	0	1
1	1	⎍	1	1	TOGGLE	

J = J1.J2.J3; K = K1.K2.K3



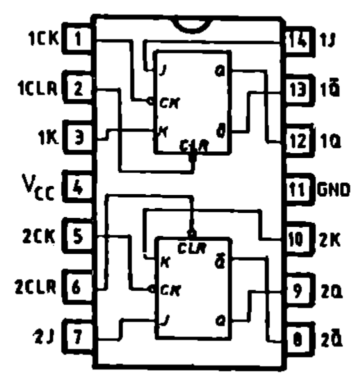
PACKAGE TO-116 / TOP VIEW

DUAL J-K FLIP-FLOPS WITH CLEAR

CDB 473 EM
CDB 473 E

FUNCTION TABLE

INPUTS				OUTPUTS	
CLEAR	CLOCK	J	K	Q	$\bar{Q}$
0	X	X	X	1	0
1	⎍	0	0	Q0	$\bar{Q}$0
1	⎍	1	0	1	0
1	⎍	0	1	0	1
1	⎍	1	1	TOGGLE	



PACKAGE TO-116 / TOP VIEW

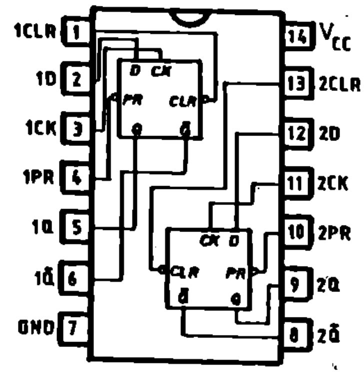
DUAL D-TYPE POSITIVE-EDGE-TRIGGERED FLIP-FLOPS WITH PRESET AND CLEAR

CDB 474 EM
CDB 474 E

$ 54 LS 74
$ 74 LS 74

FUNCTION TABLE

INPUTS				OUTPUTS	
PRESET	CLEAR	CLOCK	D	Q	$\bar{Q}$
0	1	X	X	1	0
1	0	X	X	0	1
0	0	X	X	1	1
1	1	↑	1	1	0
1	1	↑	0	0	1
1	1	0	X	QO	$\bar{Q}$O



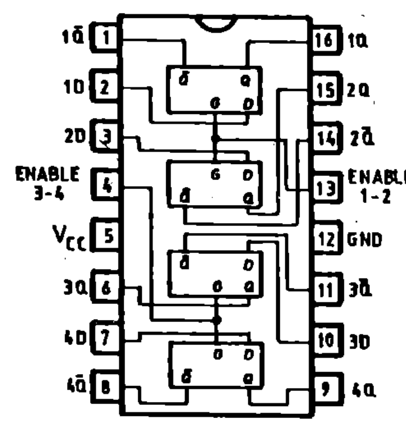
PACKAGE TO-116 / TOP VIEW

4-BIT BISTABLE LATCHES

CDB 475 EM
CDB 475 E

FUNCTION TABLE
(EACH LATCH)

INPUTS		OUTPUTS	
D	G	Q	$\bar{Q}$
0	1	0	1
1	1	1	0
X	0	QO	$\bar{Q}$O



PACKAGE MP-117 / TOP VIEW

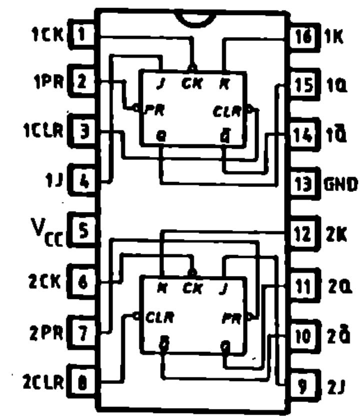
$ Preliminary data

DUAL J-K FLIP-FLOPS WITH PRESET AND CLEAR

CDB 476 EM
CDB 476 E

FUNCTION TABLE

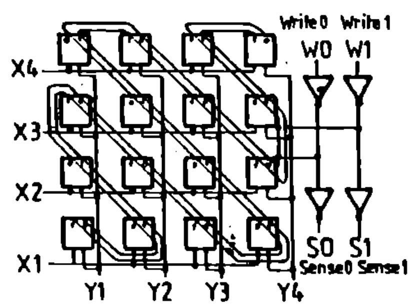
INPUTS					OUTPUTS	
PRESET	CLEAR	CLOCK	J	K	Q	$\bar{Q}$
0	1	X	X	X	1	0
1	0	X	X	X	0	1
0	0	X	X	X	1	1
1	1	⎍	0	0	QO	$\bar{Q}$O
1	1	⎍	1	0	1	0
1	1	⎍	0	1	0	1
1	1	⎍	1	1	TOGGLE	

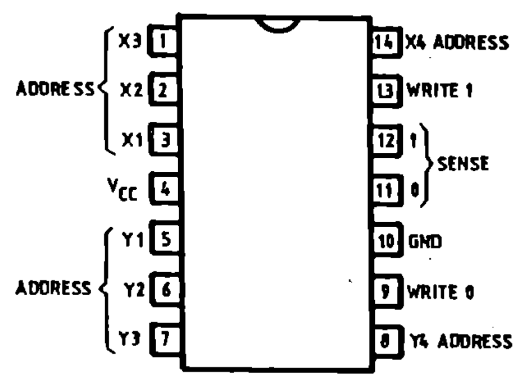


PACKAGE MP-117 / TOP VIEW

16-BIT RANDOM-ACCESS MEMORIES

CDB 481 EM
CDB 481 E

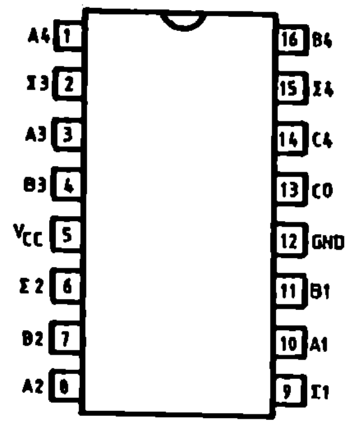




PACKAGE TO-116 / TOP VIEW

4-BIT BINARY FULL ADDERS WITH FAST CARRY

CDB 483 EM
CDB 483 E



PACKAGE MP-117 / TOP VIEW

QUADRUPLE 2-INPUT EXCLUSIVE-OR GATES

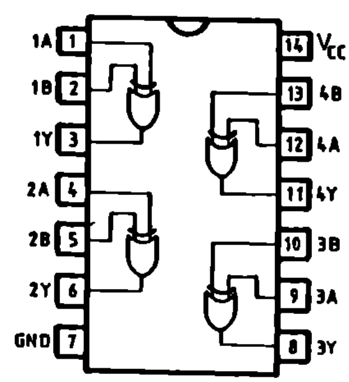
CDB 486 EM
CDB 486 E

\$ 54 LS 86
\$ 74 LS 86

FUNCTION TABLE

INPUTS A	INPUTS B	OUTPUT Y
0	0	0
0	1	1
1	0	1
1	1	0

$Y = A \oplus B = \bar{A}.B + A.\bar{B}$

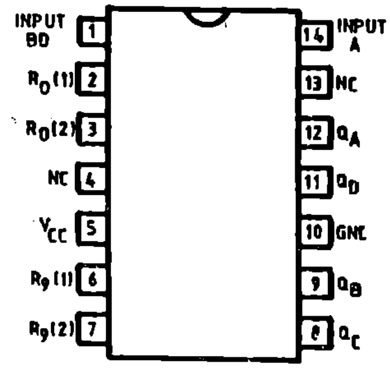


PACKAGE TO-116 / TOP VIEW

\$ Preliminary data

DECADE COUNTERS
(DIVIDE-BY-TWO AND
DIVIDE-BY-FIVE)

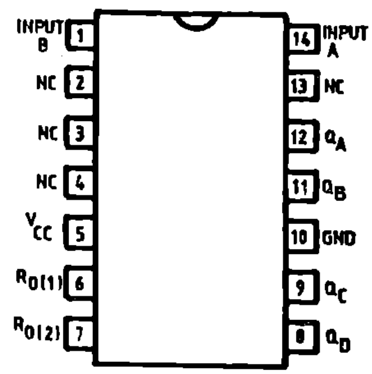
CDB 490 EM
CDB 490 E



PACKAGE TO-116 / TOP VIEW

DIVIDE-BY-TWELVE COUNTERS
(DIVIDE-BY-TWO AND
DIVIDE-BY-SIX)

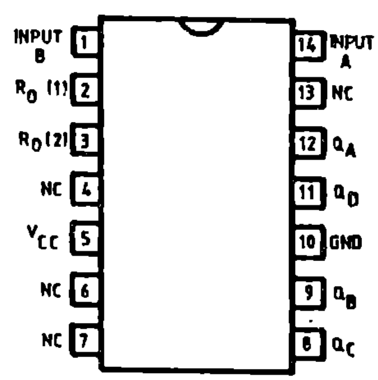
CDB 492 EM
CDB 492 E



PACKAGE TO-116 / TOP VIEW

4-BIT BINARY COUNTERS
(DIVIDE-BY-TWO AND
DIVIDE-BY-EIGHT)

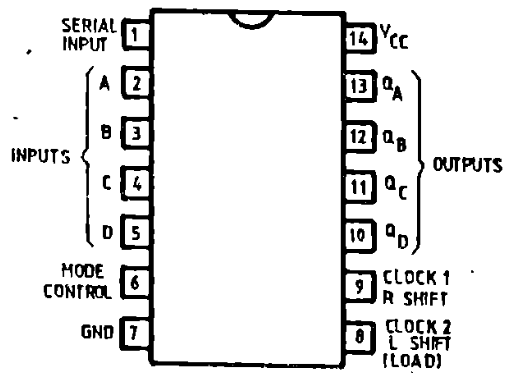
CDB 493 EM
CDB 493 E



PACKAGE TO-116 / TOP VIEW

4-BIT SHIFT REGISTERS
(PARALLEL IN/PARALLEL OUT,
SHIFT RIGHT, SHIFT LEFT, SERIAL INPUT

CDB 495 EM
CDB 495 E



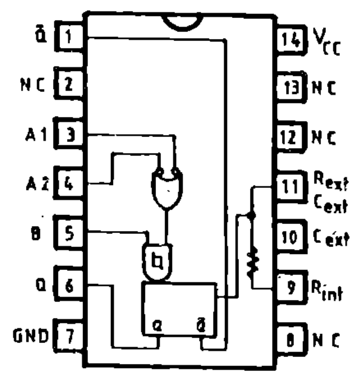
PACKAGE TO-116 / TOP VIEW

MONOSTABLE MULTIVIBRATORS

CDB 4121 EM
CDB 4121 E

FUNCTION TABLE

INPUTS			OUTPUTS	
A1	A2	B	Q	$\bar{Q}$
0	X	1	0	1
X	0	1	0	1
X	X	0	0	1
1	1	X	0	1
1	↓	1	⊓	⊔
↓	1	1	⊓	⊔
↓	↓	1	⊓	⊔
0	X	↑	⊓	⊔
X	0	↑	⊓	⊔



PACKAGE TO-116 / TOP VIEW

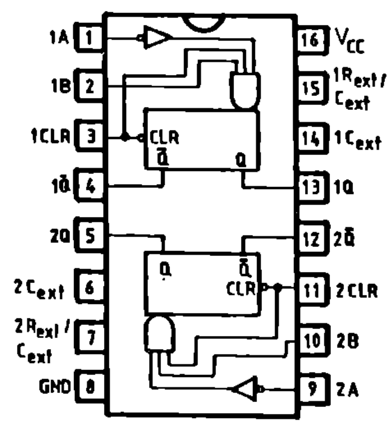
DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS WITH CLEAR

CDB 4123 EM
CDB 4123 E

$ 54 LS 123
$ 74 LS 123

FUNCTION TABLE

INPUTS			OUTPUTS	
CLEAR	A	B	Q	$\bar{Q}$
0	X	X	0	1
X	1	X	0	1
X	X	0	0	1
1	0	↑	⊓	⊔
1	↓	1	⊓	⊔
↑	0	1	⊓	⊔



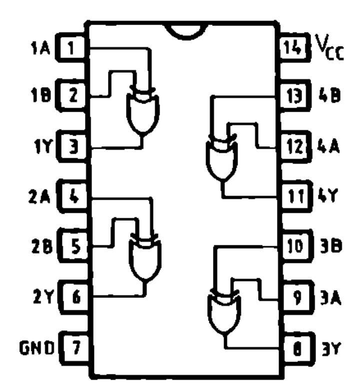
PACKAGE MP-117 / TOP VIEW

QUAD 2-INPUT EXCLUSIVE-OR GATES WITH-OPEN COLLECTOR OUTPUTS

$ 54 LS 136
$ 74 LS 136

FUNCTION TABLE

INPUTS		OUTPUT
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

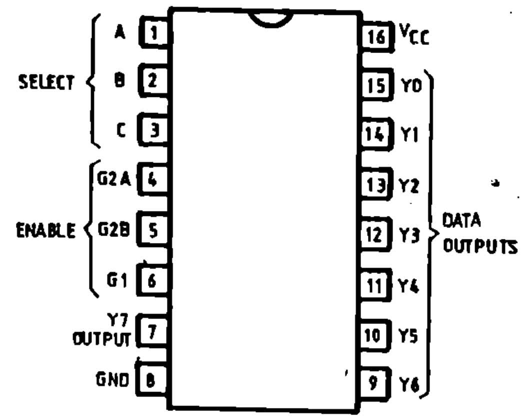


$Y = A \oplus B = \bar{A}.B + A.\bar{B}$

PACKAGE TO-116 / TOP VIEW

3-TO-8 LINE DECODERS/MULTIPLEXERS

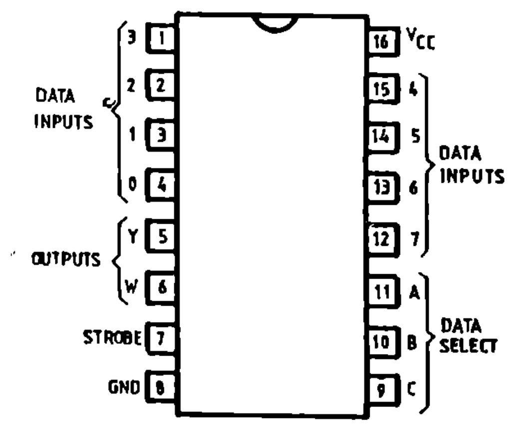
$ 54 LS 138
$ 74 LS 138



PACKAGE MP-117 / TOP VIEW

1-OF-8 DATA SELECTORS/MULTIPLEXERS

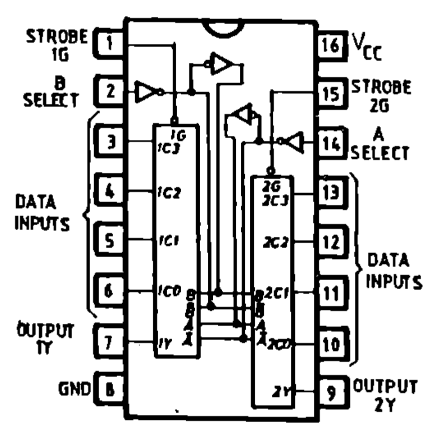
CDB 4151 EM
CDB 4151 E



PACKAGE MP-117 / TOP VIEW

DUAL 4 LINE-TO-1 LINE
DATA SELECTORS/MULTIPLEXERS

CDB 4153 EM
CDB 4153 E



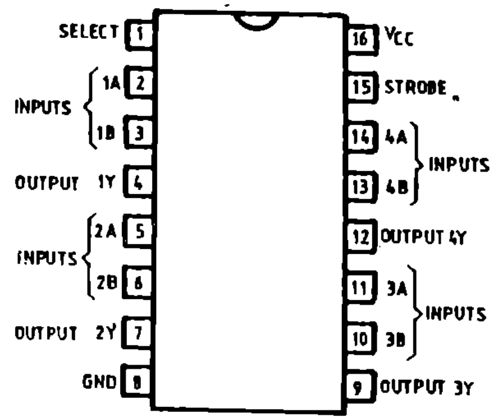
PACKAGE MP-117 / TOP VIEW

$ Preliminary data

QUAD 2-TO-1 LINE DATA SELECTORS/MULTIPLEXERS (NONINVERTED DATA OUTPUTS)

CDB 4157 EM
CDB 4157 E

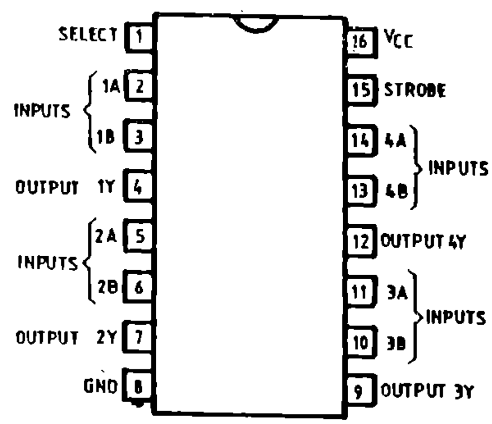
$ 54 LS 157
$ 74 LS 157



PACKAGE MP-117 / TOP VIEW

QUAD 2-TO-1 LINE DATA SELECTORS/MULTIPLEXERS (INVERTED DATA OUTPUTS)

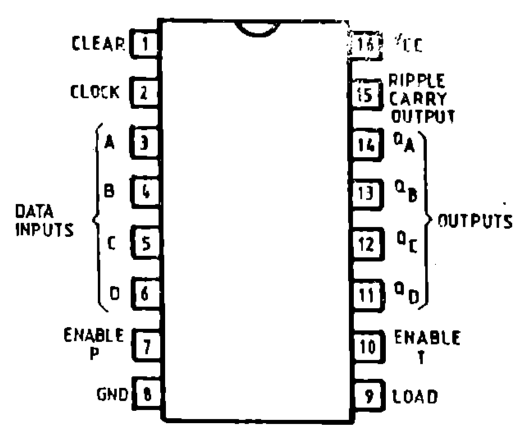
$ 54 LS 158
$ 74 LS 158



PACKAGE MP-117 / TOP VIEW

SYNCHRONOUS 4-BIT COUNTERS (DECADE, DIRECT CLEAR)

$ 54 LS 160
$ 74 LS 160

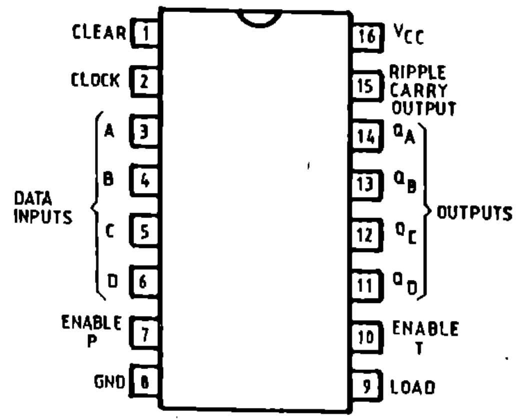


PACKAGE MP-117 / TOP VIEW

$ Preliminary data

SYNCHRONOUS 4-BIT COUNTERS
(BINARY, DIRECT CLEAR)

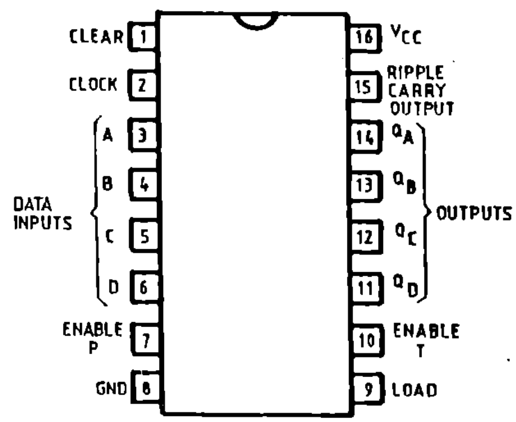
$ 54 LS 161
$ 74 LS 161



PACKAGE MP-117 / TOP VIEW

SYNCHRONOUS 4-BIT COUNTERS
(DECADE, SYNCHRONOUS CLEAR)

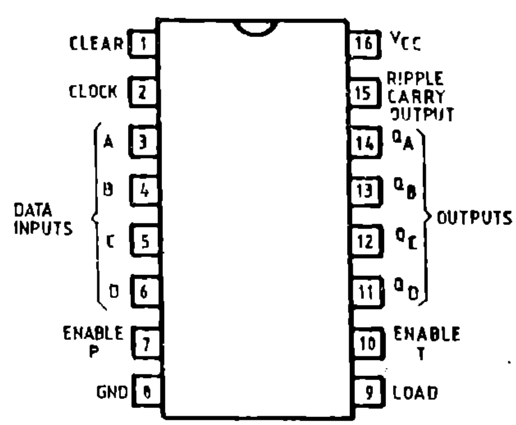
$ 54 LS 162
$ 74 LS 162



PACKAGE MP-117 / TOP VIEW

SYNCHRONOUS 4-BIT COUNTERS
(BINARY, SYNCHRONOUS CLEAR)

$ 54 LS 163
$ 74 LS 163

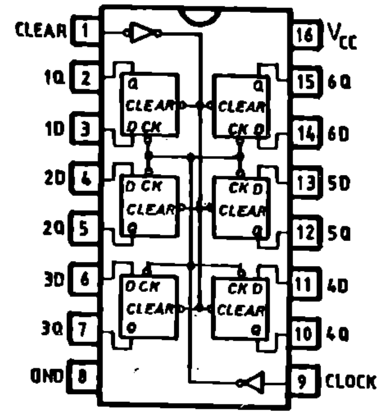


PACKAGE MP-117 / TOP VIEW

$ Preliminary data

HEX D-TYPE FLIP-FLOPS
(SINGLE RAIL OUTPUTS
COMMON DIRECT CLEAR)

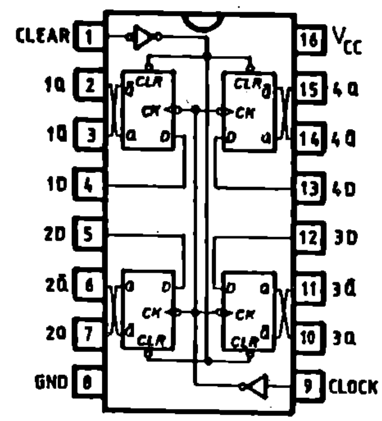
$ 54 LS 174
$ 74 LS 174



PACKAGE MP-117 / TOP VIEW

QUAD D-TYPE FLIP-FLOPS
(COMPLEMENTARY OUTPUTS
COMMON DIRECT CLEAR)

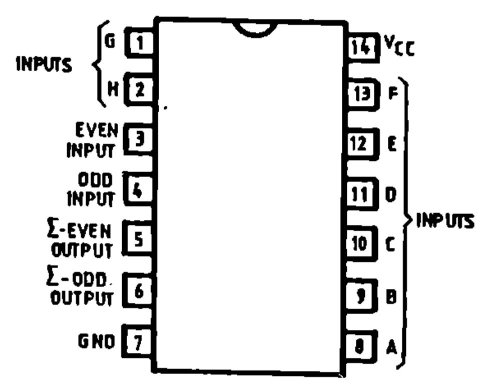
$ 54 LS 175
$ 74 LS 175



PACKAGE MP-117 / TOP VIEW

8-BIT ODD/EVEN PARITY
GENERATORS/CHECKERS

CDB 4180 EM
CDB 4180 E

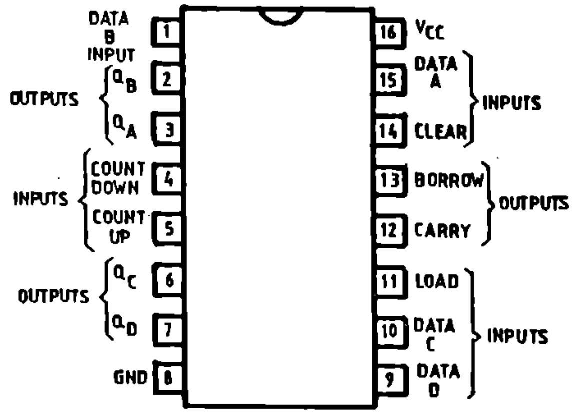


PACKAGE TO-116 / TOP VIEW

$ Preliminary data

SYNCHRONOUS UP/DOWN
DUAL CLOCK COUNTERS
(BCD WITH CLEAR)

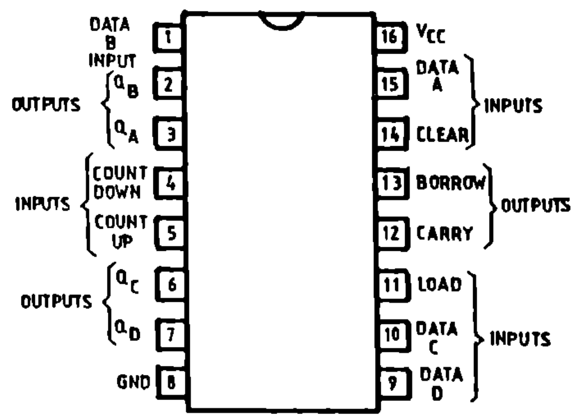
CDB 4192 EM
CDB 4192 E



PACKAGE MP-117 / TOP VIEW

SYNCHRONOUS UP/DOWN
DUAL CLOCK COUNTERS
(BINARY WITH CLEAR)

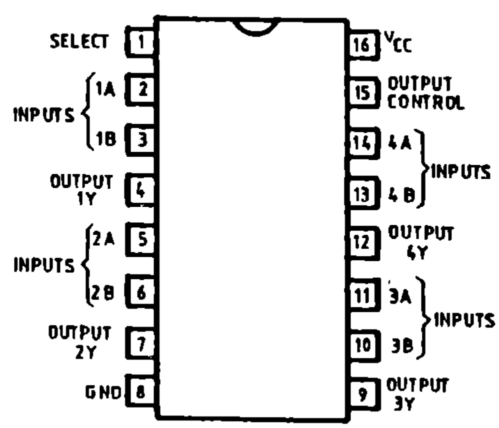
CDB 4193 EM
CDB 4193 E



PACKAGE MP-117 / TOP VIEW

QUAD DATA SELECTORS/MULTIPLEXERS
(NONINVERTED 3-STATE OUTPUTS)

$ 54 LS 257
$ 74 LS 257

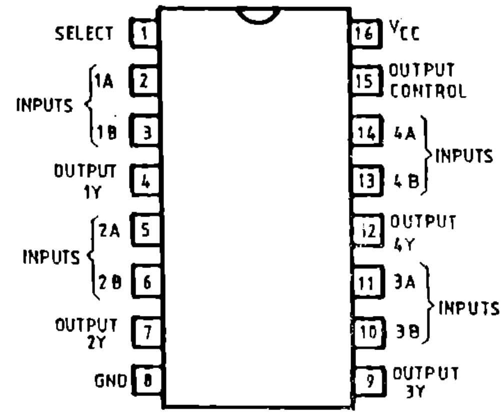


PACKAGE MP-117 / TOP VIEW

$ Preliminary data

QUAD DATA SELECTORS/MULTIPLEXERS
(INVERTED 3-STATE OUTPUTS)

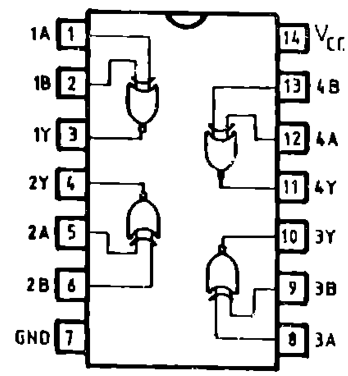
$ 54 LS 258
$ 74 LS 258



PACKAGE MP-117 / TOP VIEW

QUAD 2-INPUT EXCLUSIVE-NOR GATES
WITH OPEN-COLLECTOR OUTPUTS

$ 54 LS 266
$ 74 LS 266

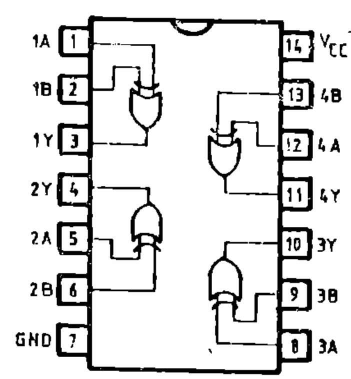


$Y = \overline{A \oplus B} = A.B+\overline{A.B}$

PACKAGE TO-116 / TOP VIEW

QUAD 2-INPUT EXCLUSIVE-OR GATES

$ 54 LS 386
$ 74 LS 386



$Y = A \oplus B = A.B+AB$

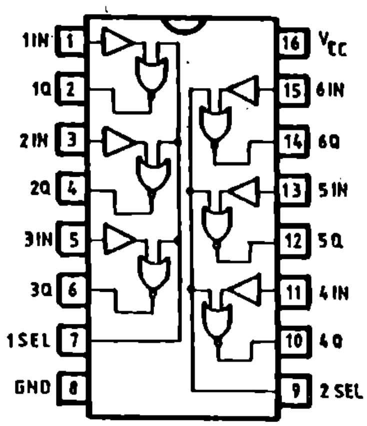
PACKAGE TO-116 / TOP VIEW

$ Preliminary data

HEX UNIFIED BUS RECEIVERS

*** CDB 837 EM**
CDB 837 E
CDB 837 EA

TYPE	/ tPLHmax
CDB 837 EM	30 ns
CDB 837 E	30 ns
CDB 837 EA	50 ns

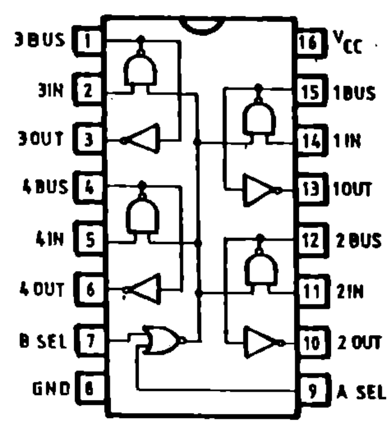


PACKAGE MP-117 / TOP VIEW

QUAD UNIFIED BUS TRANSCEIVERS

*** CDB 838 EM**
CDB 838 E
CDB 838 EA

TYPE	/ tPLHmax
CDB 838 EM	30 ns
CDB 838 E	30 ns
CDB 838 EA	40 ns

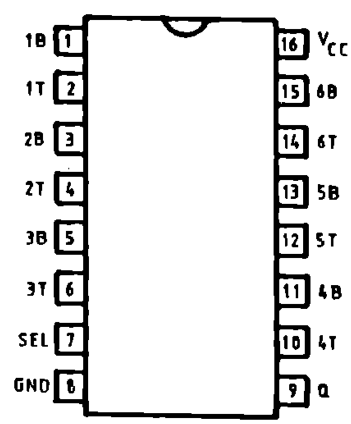


PACKAGE MP-117 / TOP VIEW

6-BIT COMPARATORS

CDB 8136 E
CDB 8136 C

TYPE	/ tPLHmax
CDB 8136 E	45 ns
CDB 8136 C	60 ns

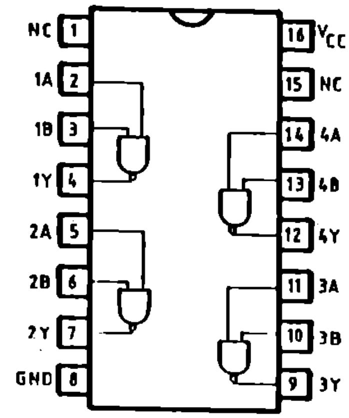


PACKAGE MP-117 / TOP VIEW

* Preliminary data

QUADRUPLE 2-INPUT NAND GATES

FZH 101
FZH 105



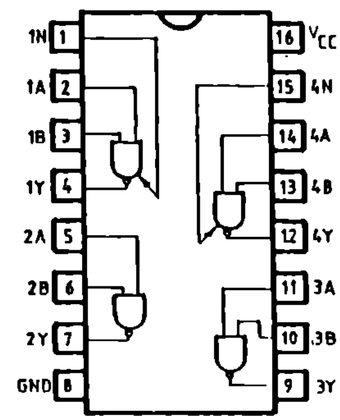
$Y = \overline{A.B}$

PACKAGE MP-117 / TOP VIEW

QUADRUPLE 2-INPUT NAND GATES

FZH 111
FZH 115

Note :
Noise immunity can be increased by connecting an external capacitor between "N" pin and gate output "Y" .

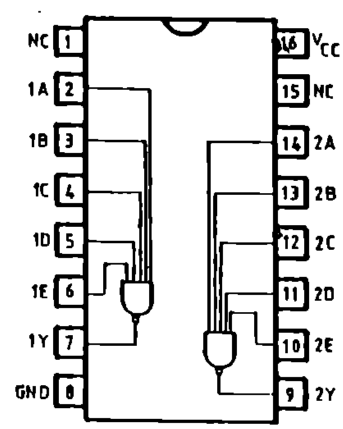


$Y = \overline{A.B}$

PACKAGE MP-117 / TOP VIEW

DUAL 5-INPUT NAND GATES

FZH 121
FZH 125



$Y = \overline{A.B.C.D.E}$

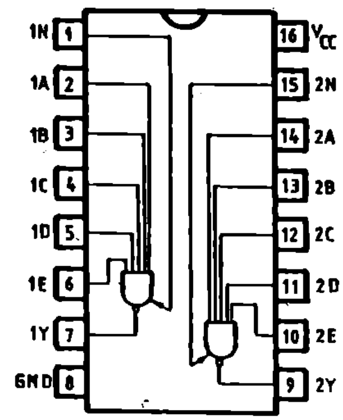
PACKAGE MP-117 / TOP VIEW

DUAL 5-INPUT NAND GATES

FZH 131
FZH 135

Note :
Noise immunity can be increased by connecting an external capacitor between "N" pin and gate output "Y" .

$Y = \overline{A.B.C.D.E}$



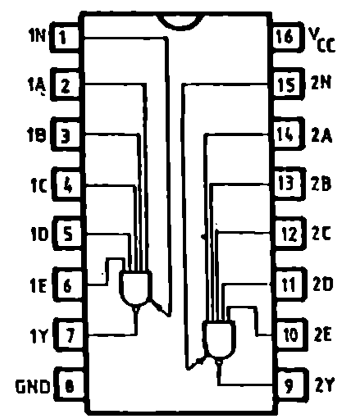
PACKAGE MP-117 / TOP VIEW

DUAL 5-INPUT NAND BUFFERS

FZH 141
FZH 145

Note :
Noise immunity can be increased by connecting an external capacitor between "N" pin and gate output "Y" .

$Y = \overline{A.B.C.D.E}$



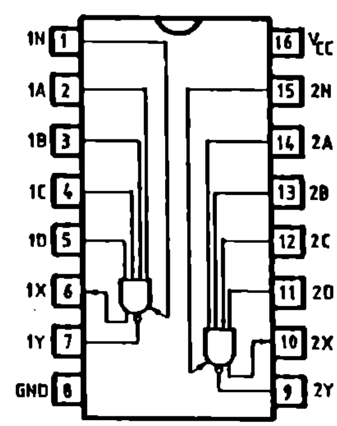
PACKAGE MP-117 / TOP VIEW

DUAL EXPANDABLE 4-INPUT NAND GATES

FZH 171
FZH 175

Note :
"N" pin for external filter is also available .

$Y = \overline{A.B.C.D.X}$



PACKAGE MP-117 / TOP VIEW

IC = FOR INDUSTRY PROGRAMMABLE CONTROLLERS

GENERAL DESCRIPTION

The 14000 IC series, based on the 1-BIT CONTROLLER βP 14500 , is intended to be used in industrial and consumer automation.

It contains the following integrated circuits :
βP 14500, 1-BIT CONTROLLER (central unit);
βP 14104, 4-BIT EXPANDABLE PROGRAM COUNTER;
βP 14113, 1-TO-8 LATCHED DEMULTIPLEXER (output port);
βP 14151, 3-STATE 8-TO-1 MULTIPLEXER (input port).

The first three circuits are processed in IIL technology; βP 14151 is a TTL circuit.

To appropriate the control system to the industrial process, analogue interface IC's are to be added (see the INTERFACE section - LINEAR INTEGRATED CIRCUITS) :
βU 14202, DUAL ANALOGUE OUTPUT INTERFACE ;
βU 14204, QUAD ANALOGUE INPUT INTERFACE .

Depending on the application size, the 14000 series can configurate programmable controllers having tenth, hundreds, even thousands inputs and outputs and an appropriate memory capacity.

These programmable controllers succesfully substitute relay systems and solid state logic, offering advantages like: long term reliability, easy servicing, software possibility of modifying or developing the control logic.

ARCHITECTURE OF A PROGRAMMABLE CONTROLLER BASED ON THE 14000 SERIES

As shown in figure 1, a programmable controller based on the 14000 series uses βP 14500 controller as central unit.

Input data access is made sequentially, by multiplexing, using one or more βP 14151 IC's parallel connected on the 1-bit DATA line.

Output transfer is made sequentially too, by demultiplexing, using one or more βP 14113 IC's .

The control program is written in ROM memory. The memory is addressed by a program counter, made of several βP 14104 IC's E.g., 3 βP 14104 circuits can address 2 raised 12 (= 4096) memory locations.

IC'S FOR INDUSTRY PROGRAMMABLE CONTROLLERS (CONT.)

The program counter function is selected with βP 14500 control flags. It is possible to JUMP into the program, to CALL subroutines and even to use two level nested subroutines .

DATA line may be loaded with many other devices, such as : a 1-bit organised RAM memory, analog timers, programmable counters, A/D or D/A serial access converters etc.

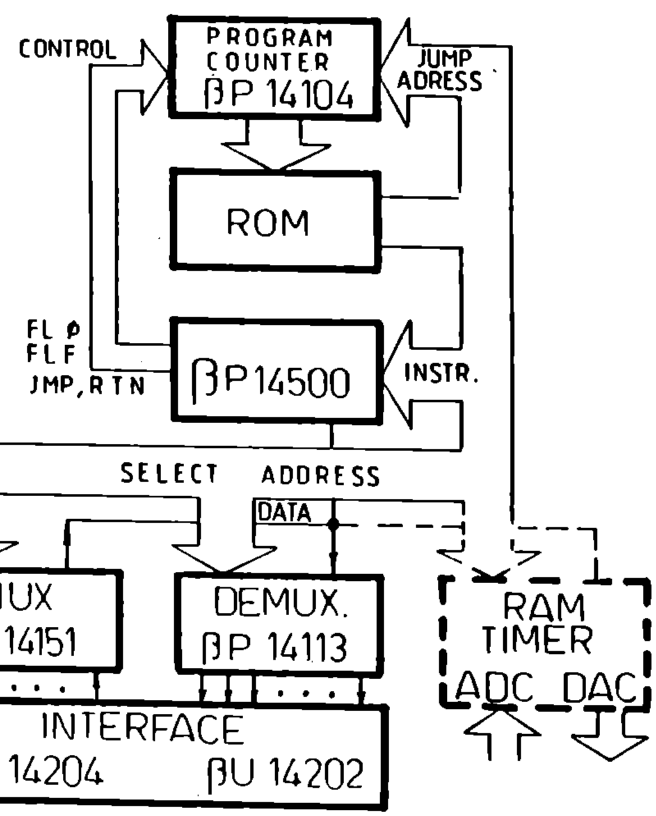


Fig. 1 - ARCHITECTURE OF A PROGRAMMABLE CONTROLLER BASED ON THE 14000 SERIES

IC's FOR INDUSTRY PROGRAMMABLE CONTROLLERS (cont.)

14000 SERIES APPLICATIONS

To easily penetrate the market with the 14000 series IPRS-Baneasa began manufacturing programmable controller modules called PROCESSOR KITs. These modules have standard Eurocard format (10 x 16 cm2) and 3 x 32 pin connector, according to DIN 41612. Their architecture conforms the model presented in figure 1, containing the whole data logic control and the program memory.

To automate a process using an IPRS - PROCESSOR KIT, the user still has to achieve :

HARDWARE = KIT / process interface circuits ;
= + 5 V DC power supply ;
= assembling rack .

SOFTWARE = control program editing and ROM programming .

PROCESSOR KIT 14000A

It is a super-miniaturised programmable controller (the user can "adjust" it to a 10 x 10 cm2 format) designed for small size automation.

Basic features are :

- 16 TTL inputs and 16 TTL latched outputs ;
- 3 analog timers with adjustable timing ;
- Program length : max. 256 instructions ;
- Incorporated clock generator: frequency range 0 ... 500 Hz;
- Easy to program : 16 instructions set ;
- JUMP instruction, 2-level nested subroutines CALL ;
- Power supply connecting AUTORESET and 2 RESET inputs: General Reset and Controller Reset ;
- 512 x 4 wide PROM or (optional) 2k x 8 EPROM program memory;
- Single power supply : +5 V; typical consumption : 370 mA.

IC's FOR INDUSTRY PROGRAMMABLE CONTROLLERS (cont.)

$ PROCESSOR KIT 15000

It is a programmable controller recommended for applications with a large number (tenth, hundreds) of I/O. Such a programmable controller contains one module PROCESSOR KIT 15000 and several (63 maximum) extension modules, i.e. EXTENSION KIT 15000. All these modules are parallel connected on the instruction / address bus.

PROCESSOR KIT 15000 is characterised by :

- 16 TTL inputs and 16 TTL latched outputs ;
- 6 analog timers with variable timing ;
- 1024 I/O and timer address field ;
- Program length : max. 4096 instructions ;
- 1k x 1 DATA RAM with STAND BY supplying mode ;
- Simultaneous store to outputs and RAM instructions ;
- 2k x 8 or (for maximum capacity) 4k x 8 EPROM program memories ;
- 4 jump instructions : JMP, JZ (if RR = 0), CALL, RTN, 2-level nested subroutines ;
- Typical current consumption : 500 mA at +5 V DC ;
- 10 x 16 cm2 Eurocard format.

$ EXTENSION KIT 15000

This module contains additional I/O and timers and is used in a programmable controller built with PROCESSOR KIT 15000.

Basic features :

- 16 TTL inputs and 16 TTL latched outputs ;
- 8 analog timers with variable timing ;
- 6-bit module address selection available on connector ;
- Typical power consumption : 500 mA at +5 V DC.

One can directly connect a maximum of 4 extension modules to one PROCESSOR KIT 15000, to configurate a 80 I/O programmable controller.

More extension modules need a line-buffer.

$ Preliminary data

IC's FOR INDUSTRY PROGRAMMABLE CONTROLLERS (cont.)

* SED 14, DEVELOPPING / EXERCISING KEYBOARD FOR PROCESOR KIT 14000A

The developing / exercising keyboard is used to edit, correct and "live" check control programs written for PROCESSOR KIT 14000A.

Basic characteristics :
- Includes 2 pcs. PROCESOR KIT 14000A, one for exercising and the other for keyboard control ;
- Hexadecimal display for addresses and instructions ;
- RAM / EPROM program storage ;
- Process dialogue simulation using 16 switches and 16 LED's connected to I/O exercised KIT.

Special function keys are used to select one of the following keyboard function :
- Object code program editing and correcting ;
- Step-by-step program execution ;
- Real time program execution ;
- Autorepeat on "INCREM" and "STEP" keys ;
- Programmable Break Point ;
- Program memory CLEAR ;
- RAM from EPROM program copy ;
- EPROM programming ;
- EPROM against RAM verifying .

βP 14500 SOFTWARE SUPPORT

To easy automate with PROCESOR KIT 14000A, IPRS-Baneasa offers on request the next software :

- 14500 language assembling program ;
- 2k x 8 EPROM "burning" program .

The software support is written for CORAL 4000 microcomputer series (PDP 11) under RT 11 operating system. It can be coppied on 8 inches floppy disk or punch tape.

For INTELEC 80 compatible microcomputers (CP/M operating system), IPRS-Baneasa offers assembling programs for both KIT-s (14000A and 15000) : AS 14 and AS 15 , respectively .

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* Preliminary data

IC's FOR INDUSTRY PROGRAMMABLE CONTROLLERS (cont.)

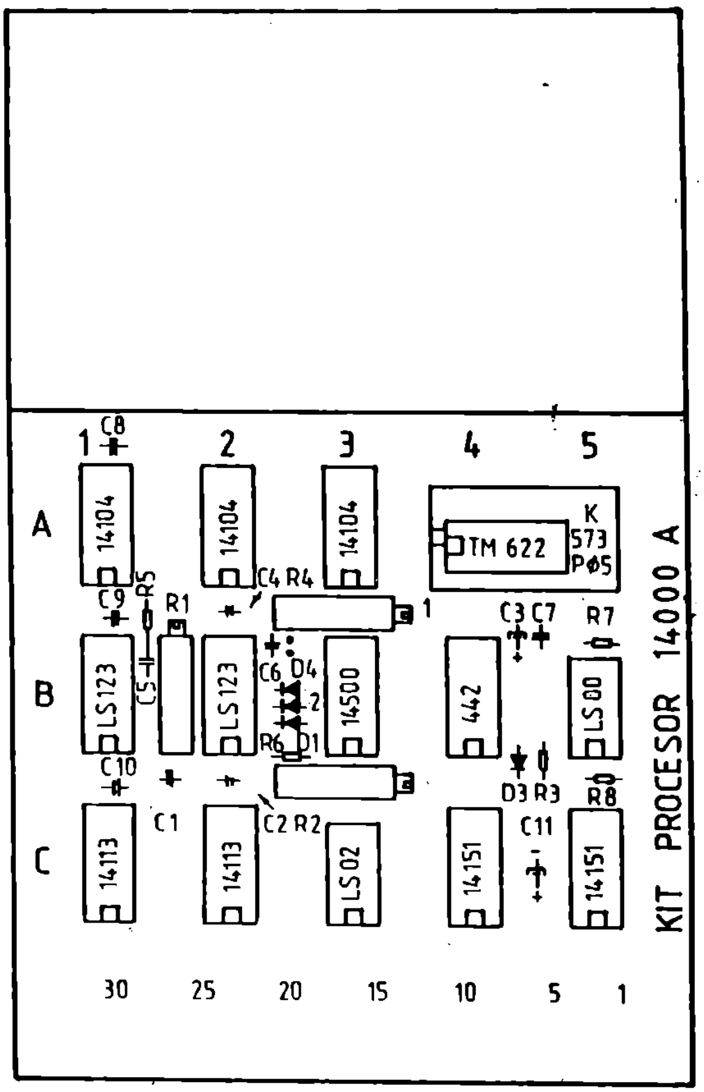


Fig. 2 - HARDWARE PROCESSOR KIT 14000A

βP 14500
βPC 14500
1 - BIT CONTROLLERS

GENERAL DESCRIPTION

The integrated circuits βP 14500 and βPC 14500 are used as central unit in the programmable logic controllers, built with the 14000 series. They have a 16 program instructions set and execute one instruction per clock period.

The sequence of operation is :

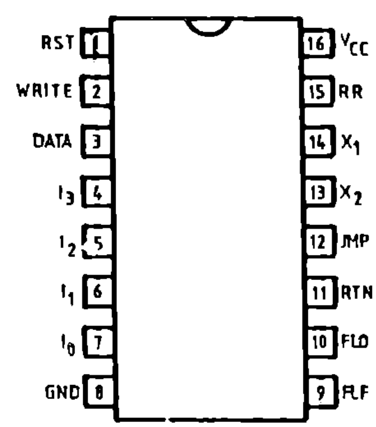
The clock period begins with the falling edge of the clock pulse , when the instruction in binary code (I3,I2,I1,I0) is memorised in the INSTRUCTION REGISTER (see block diagram)

The LOGIC UNIT decodes the instructions and creates the load functions for the RESULT REGISTER (RR), a 1-bit accumulator. RR is loaded on the leading edge of the clock pulse. The LOGIC UNIT also transfers the information from accumulator (RR or RR) to the DATA line .

In the WRITE (emitting) mode, DATA works as an output and is active a full clock period. WRITE output is also active (high state) during the first half clock period (when X1=0).

The integrated circuits βP 14500 and βPC 14500 contain a clock generator (OSC) whose frequency value is determined by an external RC circuit.

1. RST
2. WRITE
3. DATA
4. I3
5. I2
6. I1
7. I0
8. GND
9. FLF
10. FLO
11. RTN
12. JMP
13. X2
14. X1
15. RR
16. VCC



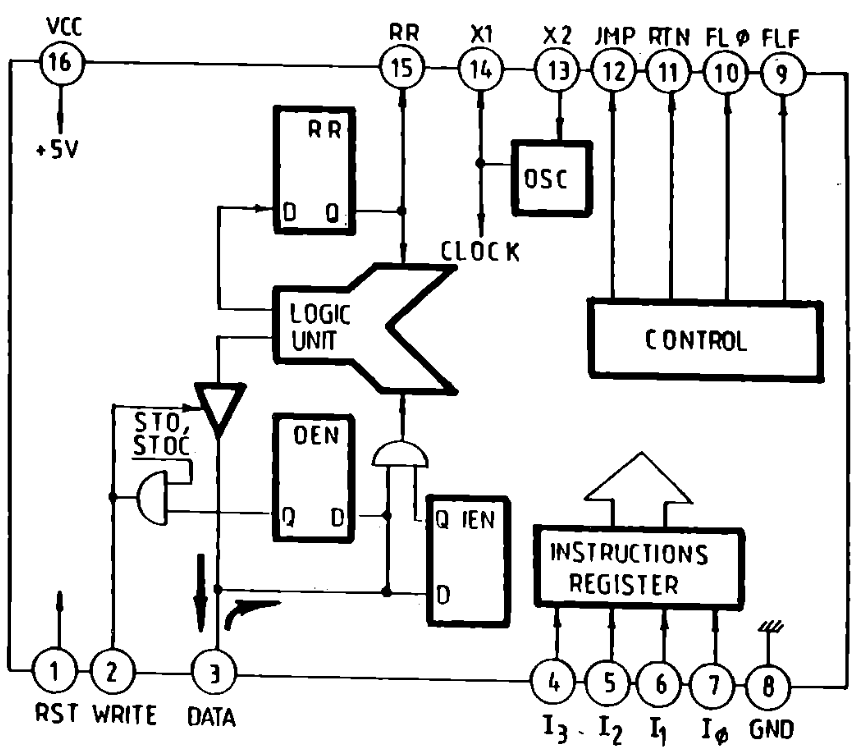
PACKAGE MP-117 / TOP VIEW

βP 14500 ; βPC 14500 (cont).

BASIC CHARACTERISTICS

TYPE	CLOCK FREQUENCY	OPERATING TEMPERATURE RANGE	VCC (V) MIN.	MAX.
βP 14500	1.0 MHz	-40 oC ... + 85 oC	4.5	5.5
βPC 14500	200 kHz	0 oC ... + 70 oC	4.75	5.25

BLOCK DIAGRAM



βP 14500 ; βPC 14500 (cont).

INSTRUCTION SET

CODE HEXA	STATE I3	I2	I1	I0	MNEMO-NICA	FUNCTION
0	0	0	0	0	NOPO	Activate FLO output ⎍ -> FLO
1	0	0	0	1	LD	Load Result Register DATA -> RR
2	0	0	1	0	LDC	Load Complement $\overline{DATA}$ -> RR
3	0	0	1	1	AND	Logical AND DATA • RR-> RR
4	0	1	0	0	ANDC	Logical AND Complement $\overline{DATA}$ • RR-> RR
5	0	1	0	1	OR	Logical OR DATA + RR-> RR
6	0	1	1	0	ORC	Logical OR Complement $\overline{DATA}$ + RR-> RR
7	0	1	1	1	XNOR	Exclusive OR Negated $\overline{DATA \oplus RR}$-> RR
8	1	0	0	0	STO	Store RR RR-> DATA: ⎍ -> WRITE
9	1	0	0	1	STOC	Store Complement $\overline{RR}$-> DATA: ⎍ -> WRITE
A	1	0	1	0	IEN	Load IEN Register DATA -> IEN
B	1	0	1	1	OEN	Load OEN Register DATA -> OEN
C	1	1	0	0	JMP	Activate JMP output ⎍ -> JMP
D	1	1	0	1	RTN	Activate RTN output and skip next instruction ⎍ -> RTN
E	1	1	1	0	SKZ	If RR = 0, skip next instruction
F	1	1	1	1	NOPF	Activate FLF output ⎍ -> FLF

βP 14104
βPC 14104
4 - BIT EXPANDABLE PROGRAM COUNTERS

GENERAL DESCRIPTION

The integrated circuits βP 14104 and βPC 14104 have the function of program counter in the programmable controllers built with the 14000 series.

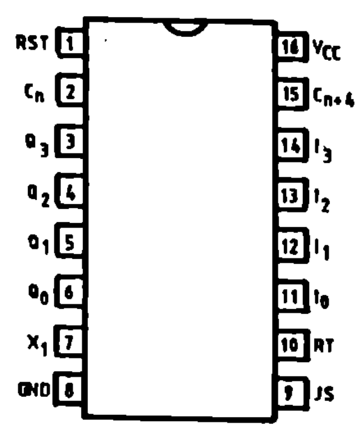
They have a 4-bit word length and can be connected in a serial mode, to obtain an extended 8, 12, 16 ... bit program counter.

As shown in the function table , the program counter has many functions, selected with JS and RT control inputs :

- 4-bit synchronous counter, with carry (Cn, Cn+4) ;
- JUMP function, to a specified address ;
- SUBROUTINE CALL function (CALL / RTN, βP 14104 only).

It is possible to call two level nested subroutines.

1. RST
2. Cn
3. Q3
4. Q2
5. Q1
6. Q0
7. X1
8. GND
9. JS
10. RT
11. I0
12. I1
13. I2
14. I3
15. Cn+4
16. VCC



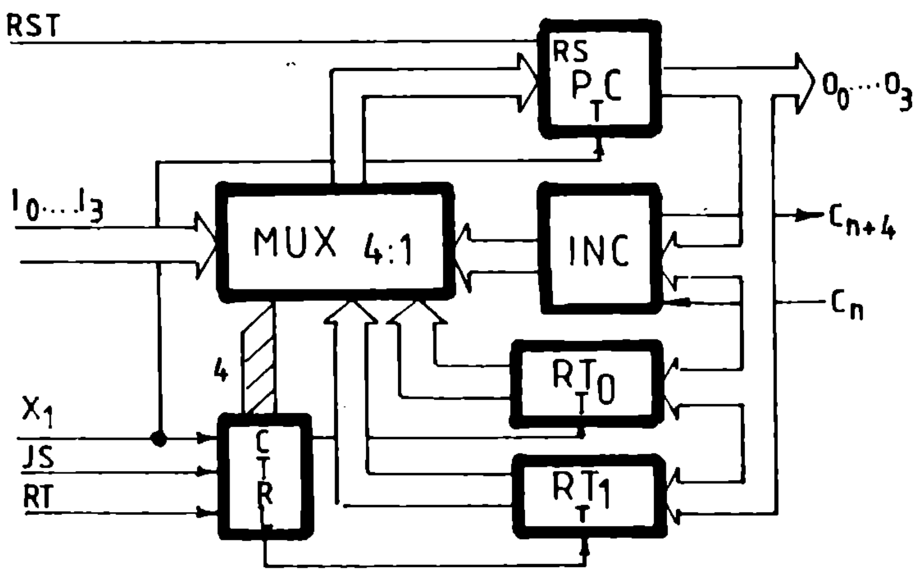
PACKAGE MP-117 / TOP VIEW

βP 14104 ; βPC 14104 (cont).

BASIC CHARACTERISTICS

TYPE	CLOCK FREQUENCY	OPERATING TEMPERATURE RANGE	VCC (V) MIN.	MAX.
βP 14104	1.0 MHz	-40 oC .... + 85 oC	4.5	5.5
βPC 14104	200 kHz	0 oC ... + 70 oC	4.75	5.25

BLOCK DIAGRAM



βP 14104 ; βPC 14104 (cont).

FUNCTION TABLE

RST	Cn	RT	JS	F U N C T I O N	SYMBOL
0	0	0	0	NO OPERATION	NOP
0	1	0	0	INCREMENT	INC
0	X	0	1	SUBROUTINE CALL	CALL *)
0	X	1	0	RETURN FROM SUBROUTINE	RTN *)
0	X	1	1	JUMP	JMP
1	X	X	X	RESET	RST

Note : X = Low or High level
*) = βP 14104 only

βP 14113
βPC 14130
1-TO-8 LATCHED DEMULTIPLEXERS

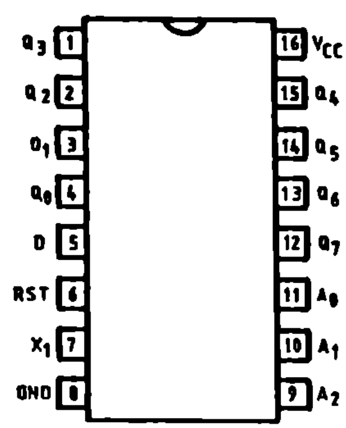
GENERAL DESCRIPTION

The integrated circuits βP 14113 and βPC 14113 have the function of output interface in the programmable controllers built with the 14000 series .

As it can be seen in the functional block diagram, they contain an " 1 from 8 " decoder, which enables, depending on A2 , A1 , A0 adress inputs, one of the 8 " D " flip-flops to be loaded with the logic state of D input. Data is loaded after the select adress setting-up, on the leading edge of X1 clock.

The RST input, active in High-state, clears all the eight " D " flip-flops : Q0 = Q1 = ... = Q7 = 0 .

1. Q3
2. Q2
3. Q1
4. Q0
5. D
6. RST
7. X1
8. GND
9. A2
10. A1
11. A0
12. Q7
13. Q6
14. Q5
15. Q4
16. VCC



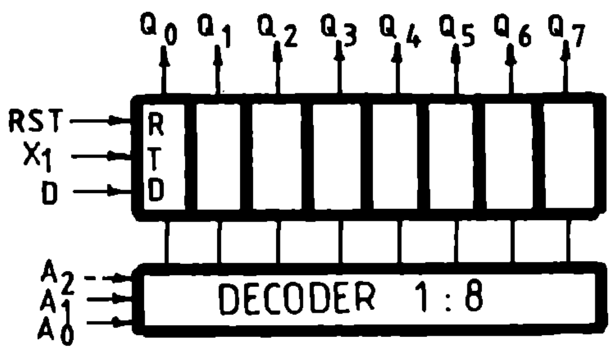
PACKAGE MP-117 / TOP VIEW

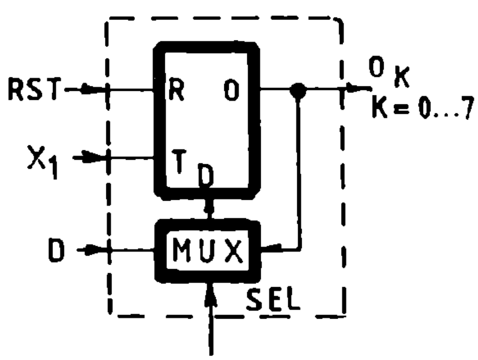
βP 14113 ; βPC 14113 (cont).

BASIC CHARACTERISTICS

TYPE	CLOCK FREQUENCY	OPERATING TEMPERATURE RANGE	VCC (V) MIN.	MAX.
βP 14113	1.0 MHz	-40 oC ... + 85 oC	4.5	5.5
βPC 14113	200 kHz	0 oC ... + 70 oC	4.75	5.25

BLOCK DIAGRAM





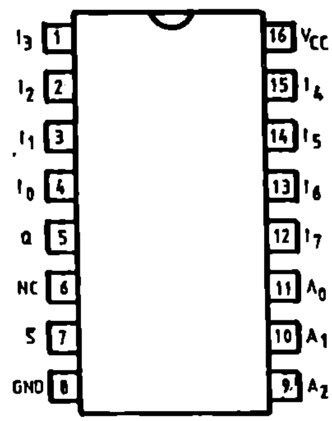
RST	X1	ADRESSED OUTPUT	OTHER OUTPUTS
1	X	O	O
O	O	N	N
O	↑	D	N
O	↑	N	N

X = Low or High level
N = Unchanged
↑ = Positive transition

βP 14151
βPC 14151

3 - STATE 8-TO-1 MULTIPLEXERS

1. I3
2. I2
3. I1
4. I0
5. Q
6. NC
7. S
8. GND
9. A2
10. A1
11. A0
12. I7
13. I6
14. I5
15. I4
16. VCC



PACKAGE MP-117 / TOP VIEW

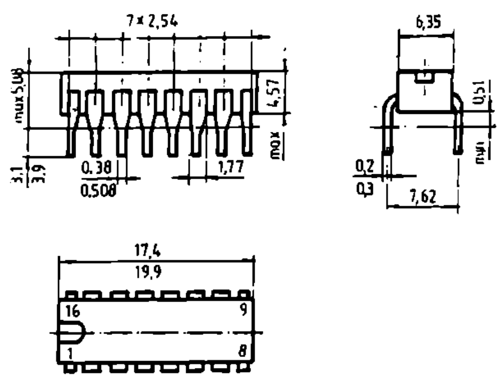
FUNCTION TABLE

S	A2	A1	A0	I0	I1	I2	I3	I4	I5	I6	I7	Q
0	0	0	0	0	X	X	X	X	X	X	X	0
0	0	0	0	1	X	X	X	X	X	X	X	1
0	0	0	1	X	0	X	X	X	X	X	X	0
0	0	0	1	X	1	X	X	X	X	X	X	1
0	0	1	0	X	X	0	X	X	X	X	X	0
0	0	1	0	X	X	1	X	X	X	X	X	1
0	0	1	1	X	X	X	0	X	X	X	X	0
0	0	1	1	X	X	X	1	X	X	X	X	1
0	1	0	0	X	X	X	X	0	X	X	X	0
0	1	0	0	X	X	X	X	1	X	X	X	1
0	1	0	1	X	X	X	X	X	0	X	X	0
0	1	0	1	X	X	X	X	X	1	X	X	1
0	1	1	0	X	X	X	X	X	X	0	X	0
0	1	1	0	X	X	X	X	X	X	1	X	1
0	1	1	1	X	X	X	X	X	X	X	0	0
0	1	1	1	X	X	X	X	X	X	X	1	1
1	X	X	X	X	X	X	X	X	X	X	X	Z

Note : X = Low or High level
Z = High impedance state

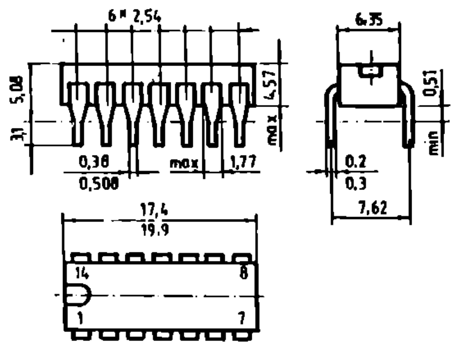
CASE OUTLINES - All dimensions in mm.

MP-117



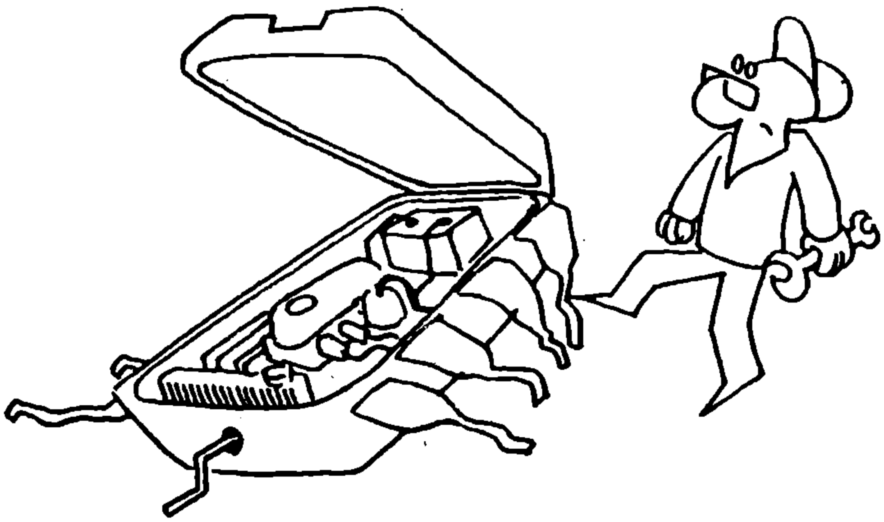
CASE OUTLINES - All dimensions in mm.

TO-116



LINEAR INTEGRATED CIRCUITS

- VOLTAGE REGULATORS
- VOLTAGE COMPARATORS
- OPERATIONAL AMPLIFIERS
- INDUSTRIAL
- RADIO - TV
- TRANSISTORS ARRAYS
- ARRAYS
- INTERFACE



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$ Preliminary data

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$ Preliminary data   # Not recommended for new design

LINEAR INTEGRATED CIRCUITS
—ALPHANUMERIC— INDEX

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$ Preliminary data # Not recommended for new design

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$ Preliminary data

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$ Preliminary data

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$ Preliminary data   # Not recommended for new design

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$ Preliminary data

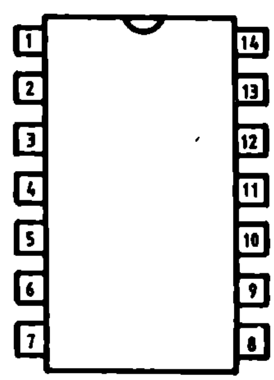
βA 723C
β 723
VOLTAGE REGULATORS

The βA 723C, β723 are voltage regulators designed primarily for series regulator applications. By itself. it will supply output currents up to 150 mA, but external transistors can be added to provide any desired load current. All can be used as a shunt regulator, a switching regulator, a current regulator or a temperature controller.

Features

- Operating temperature		0 ...	+70 oC
- Storage temperature		-25 ...	+125 oC
- Power dissipation		max.	500 mW
- Input voltage	βA 723C ...	max.	40 V
	β 723	max.	30 V
- Input-output voltage differential	βA 723C ...	max.	40 V
	β 723	max.	30 V
- Amplifier input voltage (differential)		max.	5 V
- Line regulation (VI = 12 ... 15 V)		max.	0.1 %/VOUT
- Load regulation		max.	0.2 %/VOUT
- Temperature coefficient of output voltage		max.	0.015 %/oC
- Standby current drain		max.	4 mA
- Reference voltage		6.8 ...	7.6 V
- Output voltage range	βA 723C ...	2 ...	37 V
	β 723	2 ...	27 V

1. NC
2. Current limit
3. Current sense
4. Input -
5. Input +
6. V REF
7. V-
8. NC
9. Vz
10. VO
11. Vc
12. V+
13. Frequency compensation
14. NC



PACKAGE TO-116 / TOP VIEW

$ βA 7800 series
3-TERMINAL POSITIVE VOLTAGE REGULATORS

The βA 7800 series is available with several fixed output voltages making them useful in a wide range of applications including, on-card regulation used in logic systems, instrumentation and other solid state electronic equipments.

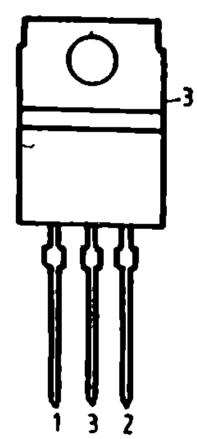
These regulators employ internal current limiting, thermal shutdown and safe area compensation. If adequate heat sinking is provided, they can deliver over 1 A output current.

In addition to use as fixed regulators, these devices can be used with external components to obtain adjustable output voltages and currents and also as the power pass element in precision regulators.

Features

- Storage temperature .... −25 ... +125 oC
- Operating junction temperature range .... max. +125 oC
- Thermal resistance of the TO-220 package
  (without a heat sink) : junction to case ... max. 4 oC/W
  junction to ambient max. 50 oC/W
- Output voltages : 5; 6; 8; 9; 12; 15; 18 and 24 V
- Input voltage (5 ... 18 V) .... max. 35 V
  (24 V) .... max. 40 V
- Output current in excess of 1 A
- Internal thermal overload protection

1. Input
2. Output
3. GND



PACKAGE TO-220 / FRONT VIEW

$ Preliminary data

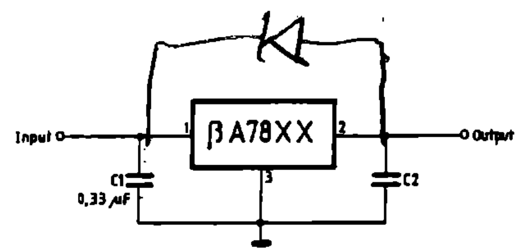
βA 7800 series (cont.)

Typical applications

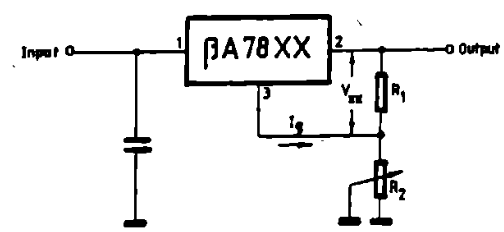
NOTES : to specify an output voltage, substitute voltage value for XX

C2 : although no output capacitor is needed for stability, it does improve transient response.

C1 : required if regulator is located an appreciable distance from power supply filter.

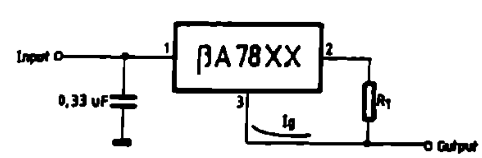


FIXED OUTPUT REGULATOR



VO = VXX(1+R2/R1)+IgR2

ADJUSTABLE OUTPUT REGULATOR



IO = VO/R1+Ig

CURRENT REGULATOR

$ βM 317H
$ βM 317AH

3-TERMINAL ADJUSTABLE POSITIVE VOLTAGE REGULATORS

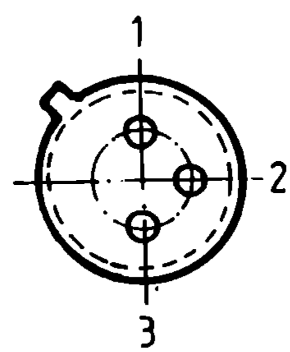
The βM 317H is an adjustable 3-terminal positive regulator capable of supplying in excess of 0.5 A over a 1.2 V to 37 V output range. It requires only two external resistors to set the output voltage. The circuit offers full overload protection including current limit, thermal protection and safe area protection. Rated power dissipation is about 2 W.

The βM 317 series is useful in applications including local on-card regulation, programmable-output voltage regulation or precision current regulation. It also makes a simple adjustable switching regulator. Since the regulator is "floating", supplies of voltages higher than 37 V are possible as long as the maximum input to output differential voltage is not exceeded.

Features

- Operating junction temperature range .... 0 ... +125 oC
- Thermal resistance of the TO-39 package (without a heat sink) : junction to case ... max. 15 oC/W
- Line regulation .... typ. 0.01 %/V
- Load regulation .... typ. 0.1 %
- Input-output voltage differential βM 317H .... max. 40 V; βM 317AH ... max. 25 V

1. Input
2. Adjustement
3. Output



Note : Case is output

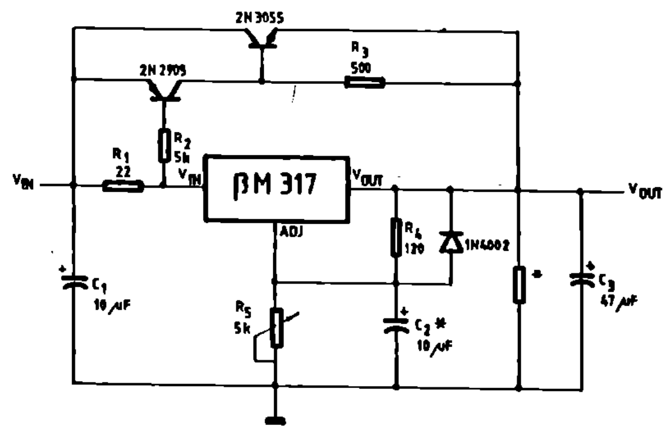
PACKAGE TO-39 / BOTTOM VIEW

$ Preliminary data

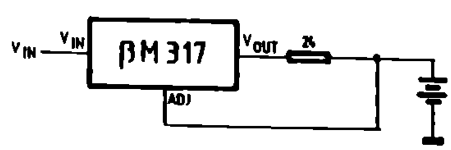
βM 317H ; βM 317AH (cont.)

Typical applications

+ = Solid tantalum
* = Minimum load current 30 mA
# = Optional-improves ripple
rejection



HIGH CURRENT ADJUSTABLE REGULATOR



50 mA CONSTANT CURRENT BATTERY CHARGER

\$ βM 317K
\$ βM 317AK
3-TERMINAL ADJUSTABLE POSITIVE VOLTAGE REGULATORS

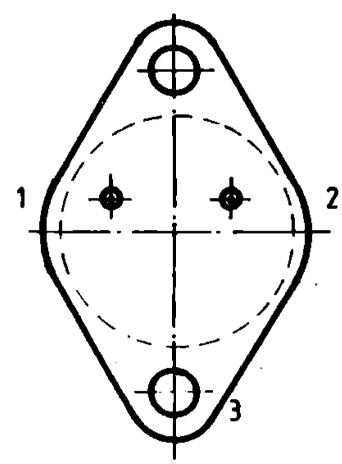
The βM 317K is an adjustable 3-terminal positive regulator capable of supplying in excess of 1.5 A over a 1.2 V to 37 V output range. It requires only two external resistors to set the output voltage. The circuit offers full overload protection including current limit, thermal protection and safe area protection. Rated power dissipation is about 20 W.

● The βM 317 series is useful in applications including local on-card regulation, programmable-output voltage regulation or precision current regulation. It also makes a simple adjustable switching regulator. Since the regulator is "floating", supplies of voltages higher than 37 V are possible as long as the maximum input to output differential voltage is not exceeded.

Features

- Operating junction temperature range	0 ...	+125 oC
- Thermal resistance of the TO-3 package (without a heat sink) : junction to case ...	max.	3 oC/W
- Line regulation	typ.	0.01 %/V
- Load regulation	typ.	0.1 %
- Input-output voltage differential βM 317K	max.	40 V
βM 317AK ...	max.	25 V

1. Adjustement
2. Input
3. Output



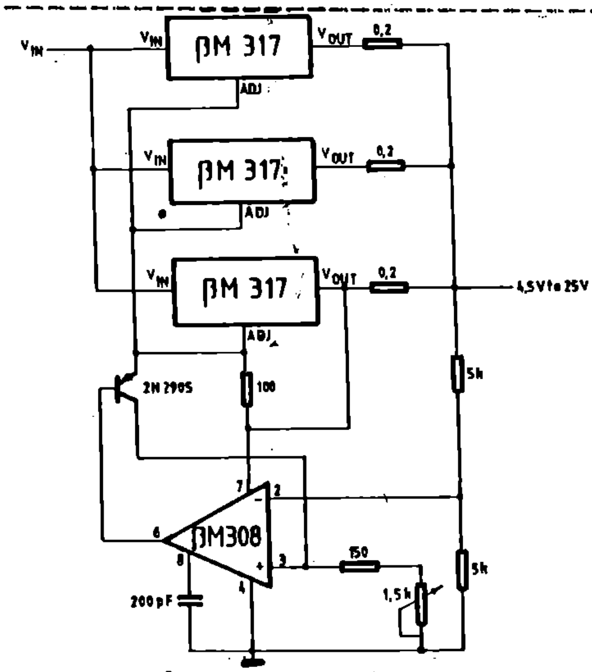
Note : Case is output

PACKAGE TO-3 / BOTTOM VIEW

\$ Preliminary data

βM 317K ; βM 317AK (cont.)

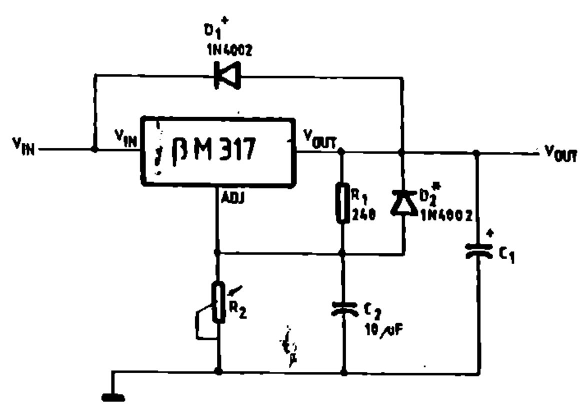
Typical applications



ADJUSTABLE 4 A REGULATOR

\+ = When C1 is larger than 20 uF, D1 protects the βM 317 in case that the input supply is shorted.

* = When C2 is larger than 10 uF and VOUT is larger than 25 V, D2 protects the βM 317 in case that the output is shorted.



ADJUSTABLE POSITIVE REGULATOR WITH PROTECTION DIODES

\$ βM 317T
\$ βM 317AT

3-TERMINAL ADJUSTABLE POSITIVE VOLTAGE REGULATORS

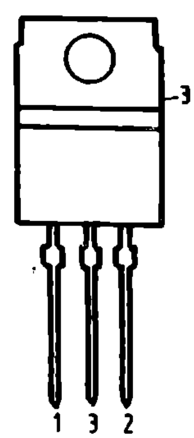
The βM 317T is an adjustable 3-terminal positive regulator capable of supplying in excess of 1.5 A over a 1.2 V to 37 V output range. It requires only two external resistors to set the output voltage. The circuit offers full overload protection including current limit, thermal protection and safe area protection. Rated power dissipation is about 15 W.

The βM 317 series is useful in applications including local on-card regulation, programmable-output voltage regulation or precision current regulation. Also it makes a simple adjustable switching regulator. Since the regulator is "floating", supplies of voltages higher than 37 V are possible as long as the maximum input to output differential voltage is not exceeded.

Features

- Operating junction temperature range	0 ...	+125 oC
- Thermal resistance of the TO-220 package (without a heat sink) : junction to case ...	max.	4 oC/W
- Line regulation	typ.	0.01 %/V
- Load regulation	typ.	0.1 %
- Input-output voltage differential βM 317T	max.	40 V
βM 317AT ...	max.	25 V

1. Adjustement
2. Input
3. Output



Note : Case is output

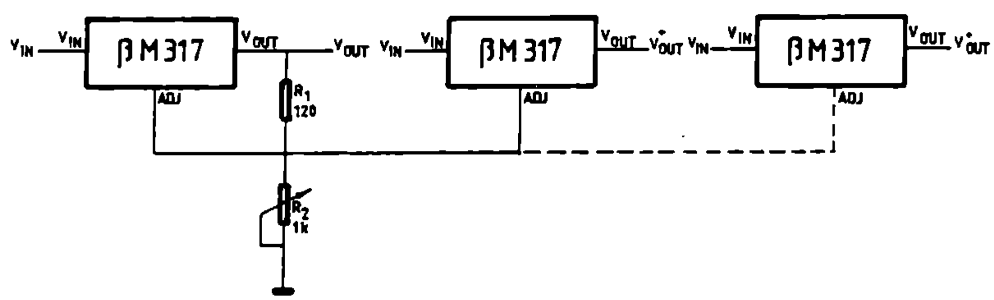
PACKAGE TO-220 / FRONT VIEW

\$ Preliminary data

βM 317T ; βM 317AT (cont.)

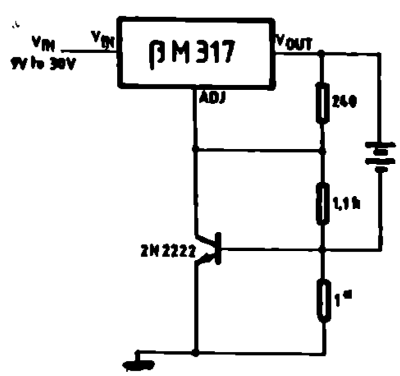
Typical applications

* = All outputs within +/- 100 mV
\+ = Minimum load 10 mA



ADJUSTING MULTIPLE ON-CARD REGULATORS
WITH SINGLE CONTROL *

* = Sets peak current
(0.6 A for 1 ohm).



CURRENT LIMITED 6 V CHARGER

βM 323
βM 323J

3-TERMINAL 5 V / 3 A POSITIVE VOLTAGE REGULATORS

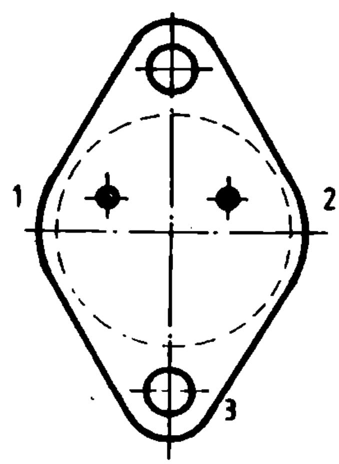
The βM 323 series is a 3-terminal positive voltage regulator with preset 5 V output and a load driving capability of 3 A . Current limiting, power limiting, thermal shutdown and hermetic TO-3 package provide high reliability.

No external components are required for standard operation of the βM 323 series.

Features

- Storage temperature		-55 ...	+125 oC
- Operating junction temperature		0 ...	+125 oC
- Junction to case thermal resistance		max.	2 oC/W
- Input voltage		max.	20 V
- Power dissipation (internally limited)		min.	30 W
- Output voltage (7.5 V < VI < 15 V ; IO < 3 A)			
	βM 323 ...	4.75 ...	5.25 V
	βM 323J ...	4.60 ...	5.40 V
- Line regulation (7.5 V < VI < 15 V)			
	βM 323 ...	max.	25 mV
	βM 323J ...	max.	40 mV
- Load regulation (0 < IO < 3 A)	βM 323 ...	max.	100 mV
	βM 323J ...	max.	150 mV
- Quiescent current	βM 323 ...	max.	20 mA
	βM 323J ...	max.	30 mA

1. Input
2. Output
3. GND

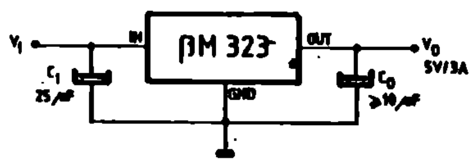


PACKAGE TO-3 / BOTTOM VIEW

βM 323J ; βM 323 (cont.)

Typical applications

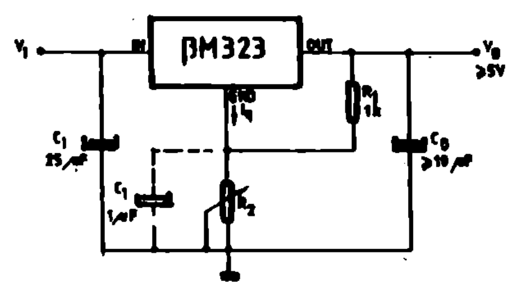
CI = Required if βM 323 is more than 2 inches from filter capacitor.
CO = Improves transient response



BASIC 3 A REGULATOR

VO(V) = 5(1+R2/R1)+ IqR2
R2 in kohms

Io = 10 mA



ADJUSTABLE REGULATOR

$ βM 337H
$ βM 337AH

3-TERMINAL ADJUSTABLE NEGATIVE VOLTAGE REGULATORS

The βM 337H is an adjustable 3-terminal negative regulator capable of supplying in excess of −1.5 A over a −1.2 V to −37 V output range. It requires only two external resistors to set the output voltage and one output capacitor for frequency compensation. The circuit features full overload protection including current limit, thermal protection and safe operating area protection. Rated power dissipation is about 2 W.

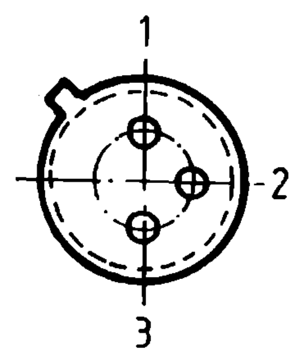
The βM 337 series is useful in applications including local on-card regulation, programmable-output voltage regulation or precision current regulation.

The βM 337 series is ideal complement to the βM 317 series adjustable positive regulator.

Features

− Operating junction temperature range	0 ...	+125 oC
− Thermal resistance of the TO-39 package (without a heat sink) : junction to case ...	max.	15 oC/W
− Line regulation	typ.	0.01 %/V
− Load regulation	typ.	0.3 %
− Input-output voltage differential βM 337H ...	max.	−40 V
βM 337AH ...	max.	−25 V

1. Adjustement
2. Output
3. Input



Note : Case is input

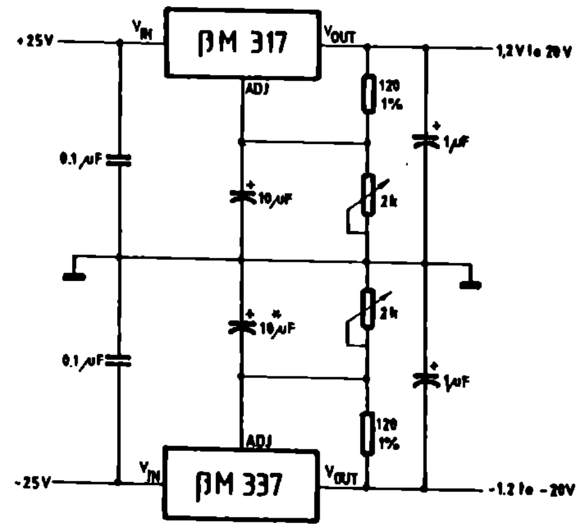
PACKAGE TO-39 / BOTTOM VIEW

$ Preliminary data

βM 337H ; βM 337AH (cont.)

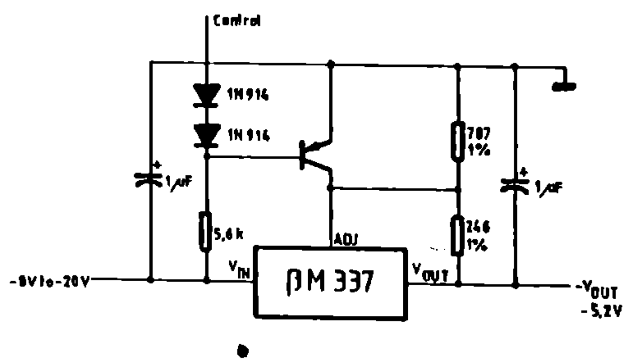
Typical applications

* = The 10 uF capacitors are optional to improve ripple rejection.



ADJUSTABLE LAB VOLTAGE REGULATOR

* = Minimum output = -1.3 V when control input is low.



-5.2 V REGULATOR WITH ELECTRONIC SHUTDOWN *

$ βM 337K
$ βM 337AK

3-TERMINAL ADJUSTABLE NEGATIVE VOLTAGE REGULATORS

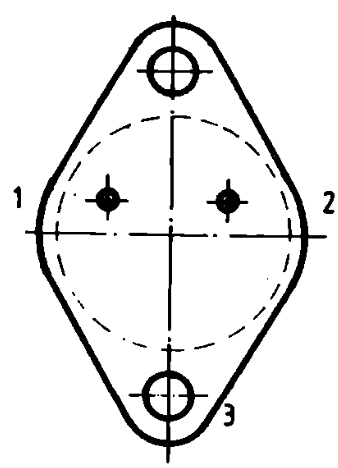
The βM 337K is an adjustable 3-terminal negative regulator capable of supplying in excess of -1.5 A over a -1.2 V to -37 V output range. It requires only two external resistors to set the output voltage and one output capacitor for frequency compensation. The circuit features full overload protection including current limit, thermal protection and safe operating area protection. Rated power dissipation is about 20 W.

The βM 337 series is useful in applications including local on-card regulation, programmable-output voltage regulation or precision current regulation.

The βM 337 series is ideal complement to the βM 317 series adjustable positive regulator.

Features

- Operating junction temperature range	0 ...	+125 oC
- Thermal resistance of the TO-3 package (without a heat sink) : junction to case ...	max.	3 oC/W
- Line regulation	typ.	0.01 %/V
- Load regulation	typ.	0.1 %
- Input-output voltage differential βM 337K ...	max.	-40 V
βM 337AK ...	max.	-25 V



1. Adjustement
2. Output
3. Input

Note : Case is input

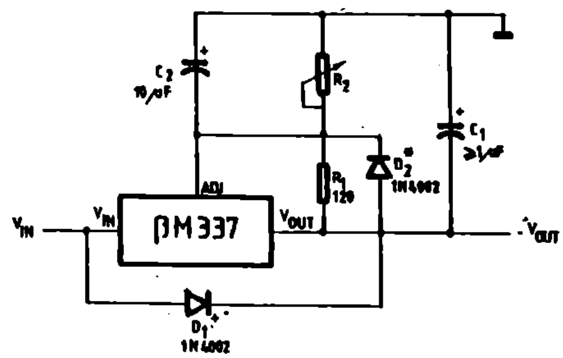
PACKAGE TO-3 / BOTTOM VIEW

$ Preliminary data

βM 337K ; βM 337AK (cont.)

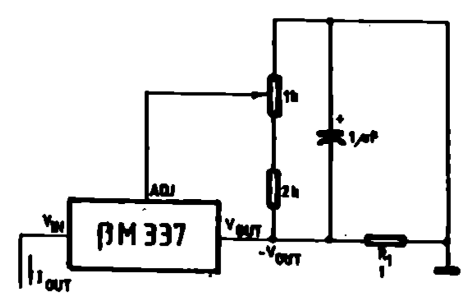
Typical applications

+○ = When C1 is larger than 20 uF, D1 protects the βM 337 in case that the input supply is shorted.
* = When C2 is larger than 10 uF and -VOUT is larger than -25 V, D2 protects the βM 317 in case that the output is shorted.
-VOUT = -1.25V(1+R2/R1)-R2Iadj;
(Iadj typ. 65 uA)



ADJUSTABLE NEGATIVE REGULATOR
WITH PROTECTION DIODES

IOUT = 1.5V/R1 +/-15% adjustable



ADJUSTABLE CURRENT REGULATOR

\$ βM 337T
\$ βM 337AT

3-TERMINAL ADJUSTABLE NEGATIVE VOLTAGE REGULATORS

The βM 337H is an adjustable 3-terminal negative regulator capable of supplying in excess of -1.5 A over a -1.2 V to -37 V output range. It requires only two external resistors to set the output voltage and one output capacitor for frequency compensation. The circuit features full overload protection including current limit, thermal protection and safe area protection. Rated power dissipation is at about 15 W.

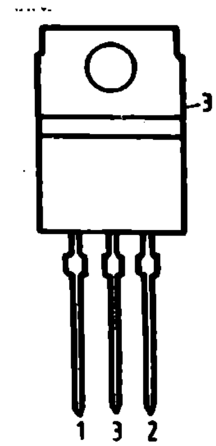
The βM 337 series is useful in applications including local on-card regulation, programmable-output voltage regulation or precision current regulation.

The βM 337 series is ideal complement to the βM 317 series adjustable positive regulator.

Features

- Operating junction temperature range .... 0 ... +125 oC
- Thermal resistance of the TO-220 package (without a heat sink) : junction to case ... max. 4 oC/W
- Line regulation .... typ. 0.01 %/V
- Load regulation .... typ. 0.3 %
- Input-output voltage differential βM 337T ... max. -40 V
  βM 337AT ... max. -25 V

1. Adjustement
2. Output
3. Input



Note : Case is input

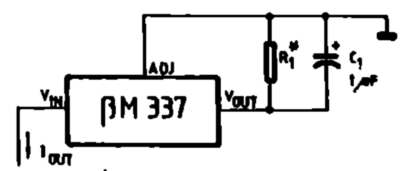
PACKAGE TO-220 / FRONT VIEW

\$ Preliminary data

βM 337T ; βM 337AT (cont.)

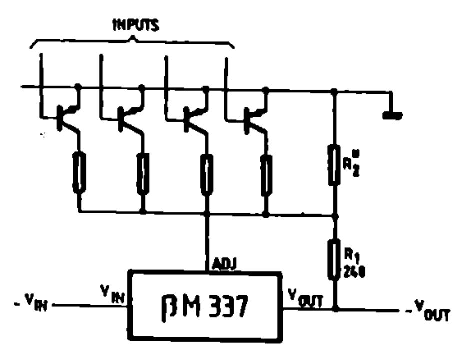
Typical applications

IOUT = 1.25V/R1
* = o.8 ohms < R1 < 120 ohms



CURRENT REGULATOR

* = Sets minimum -VOUT



DIGITALLY SELECTED OUTPUTS

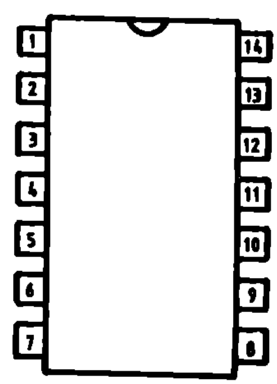
CLB 2711EC
DUAL COMPARATOR

The integrated circuit CLB 2711EC contains two voltage comparators with separate differential inputs. a common output and provision for strobing each side independently. With the addition of an external resistor network, can bê used as a sense amplifier for core memories. The CLB 2711EC is also useful as a double ended limit detector, providing high, speed with lower power dissipation than two single comparators.

Features

- Operating temperature	0 ...	+70	oC
- Storage temperature	-55	+125	oC
- Positive supply voltage	max.	+14	V
- Negative supply voltage	min.	-7	V
- Peak output current	max.	25	mA
- Differential input voltage	max.	+/- 5	V
- Input voltage	max.	+/- 7	V
- Strobe voltage	0 ...	6	V
- Input offset voltage	max.	5	mV
- Input offset current	max.	15	uA
- Input bias current	max.	75	uA
- Voltage gain	min.	700	-
- Response time	typ.	40	ns
- Output sink current	min.	0.5	mA

1. NC
2. Input 1-
3. Input 1+
4. V-
5. Input 2+
6. Input 2-
7. NC
8. NC
9. Strobe 2
10. Output
11. V+
12. GND
13. Strobe 1
14. NC



PACKAGE TO-116 / TOP VIEW

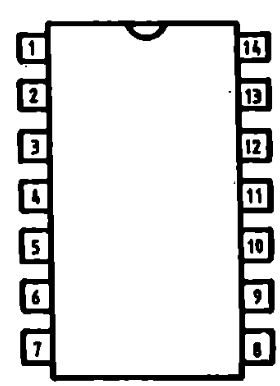
βM 339
βM 2901
βM 3302
QUAD COMPARATORS

The integrated circuits βM 339, βM 2901, βM 3302 consist of four independent precision voltage comparators wich were designed specifically to operate from a single power supply. The βM 339 series was designed to directly interface with TTL and CMOS. Applications areas include limit comparators, simple analog to digital converters, pulse generators, time delay generators, wide range VCO.

Features

- Operating temperature		0 ... +70	oC
- Storage temperature		-25 ... +125	oC
- Supply voltage	βM 339, βM 2901	2 ... 36	V
	βM 3302	2 ... 28	V
- Differential input voltage	βM 339, βM 2901	max. 36	V
	βM 3302	max. 28	V
- Input voltage	βM 339, βM 2901	-0.3 ... 36	V
	βM 3302	-0.3 ... 28	V
- Supply current		max. 2	mA
- Input offset voltage	βM 339	max. +/- 5	mV
	βM 2901	max. +/- 7	mV
	βM 3302	max. +/- 20	mV

1. Output 2
2. Output 1
3. V+
4. Input 1-
5. Input 1+
6. Input 2-
7. Input 2+
8. Input 3-
9. Input 3+
10. Input 4-
11. Input 4+
12. V-
13. Output 4
14. Output 3



PACKAGE TO-116 / TOP VIEW

βM 393N
βM 2903N
DUAL COMPARATORS

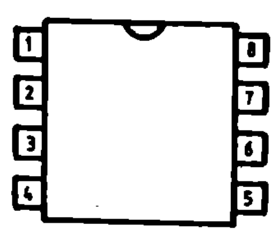
The integrated circuits βM 393N, βM 2903N consist of two independent precision voltage comparators which were designed specifically to operate from a single power supply.

Their electrical characteristics and applications areae are identically to precision voltage comparators βM 339, respectively βM 2901, mounted in the dual-in-line packages MP-48 with 8 leads.

Features

Operating temperature		0 ...	+75	oC
- Storage temperature		-25 ...	+125	oC
- Supply voltage	βM 393N ...	2 ...	36	V
	βM 2903N ...	2 ...	28	V
- Differential input voltage	βM 393N ...	max.	36	V
	βM 2903N ...	max.	28	V
- Input voltage	βM 393N ...	-0.3 ...	36	V
	βM 2903N ...	-0.3 ...	28	V
- Input current		max.	50	mA
- Input offset voltage	βM 393N ...	max.	+/- 5	mV
	βM 2903N ...	max.	+/- 7	mV
- Input bias current		max.	250	nA
- Input offset current		max.	50	nA

1. Output 1
2. Input 1-
3. Input 1+
4. V-
5. Input 2+
6. Input 2-
7. Output 2
8. V+



PACKAGE MP-48 TOP VIEW

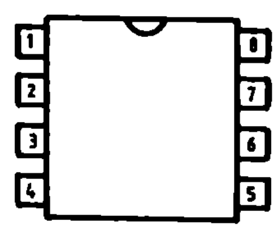
TCA 520N
HIGH SPEED OPERATIONAL AMPLIFIER

The integrated circuit TCA 520N is an operational amplifier intended for use in low power, low voltage applications and as comparator in digital systems. This circuit can be frequency compensated by one external capacitor.

Features

- Operating temperature	0 ...	+70 oC
- Storage temperature	-55 ...	+125 oC
- Power dissipation	max.	300 mW
- Supply voltage	max.	22 V
- Differential input voltage	max.	6 V
- Input offset voltage	max.	6 mV
- Input offset voltage drift	typ.	3 uV/oC
- Input bias current	max.	150 nA
- Input offset current	max.	30 nA
- Common mode rejection ratio	min.	70 dB
- DC voltage gain	typ.	50000 -
- AC voltage gain	600 ..	1800 -
- Output current source	typ.	0.2 mA
- Output current sink	min.	8 mA
- Supply current	max.	1.6 mA
- Slew rate	typ.	50 V/us

1. Null
2. Input -
3. Input +
4. V-
5. Compensation
6. Output
7. V+
8. Null



PACKAGE MP-48 / TOP VIEW

βA 741M
βA 741J
βA 741
OPERATIONAL AMPLIFIERS

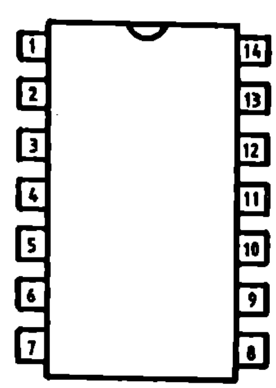
βA 741 series are general purpose operational amplifiers wich feature improved performances over industry standards. The amplifiers offer many features : overload protection on the input, no latch-up when the common mode range is exceeded, as well as freedom from oscillations.

Features

- Operating temperature .... βA 741M ... -55 ... +125 oC
  βA 741J ... 0 ... +70 oC
  βA 741 ... 0 ... +70 oC
- Storage temperature ...... βA 741, βA 741J ... -25 ... +125 oC
  βA 741M ... -55 ... +125 oC
- Supply voltage .... max. +/- 22 V
- Differential input voltage (Note 1) .... max. +/- 30 V
- Input offset voltage ....(βA 741J)... max. +/- 3 mV
- Input bias current ....(βA 741J)... max. 200 nA
- Large signal voltage gain .... typ. 200 V/mV
- Cut-off frequency .... typ. 1 MHz
- Slew rate .... typ. 0.5 V/us
- Supply voltage rejection ratio .... typ. 30 uV/V
- Common mode rejection ratio .... typ. 90 dB

(1) For V+/- less than 15 V, is equal with the supply voltage.

1. NC
2. NC
3. Offset null
4. Inverting input
5. Non-inverting input
6. V-
7. NC
8. NC
9. Offset null
10. Output
11. V+
12. NC
13. NC
14. NC



PACKAGE TO-116 / TOP VIEW

βA 741MN
βA 741JN
βA 741N
OPERATIONAL AMPLIFIERS

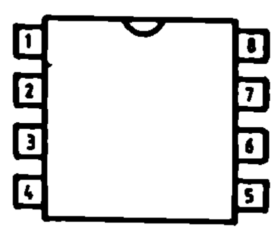
βA 741N series are general purpose operational amplifiers wich feature improved performances over industry standards. The amplifiers offer many features : overload protection on the input, no latch-up when the common mode range is exceeded, as well as freedom from oscillations.

Features

- Operating temperature .... βA 741MN ... -55 ... +125 oC
  βA 741JN ... 0 ... +70 oC
  βA 741N ... 0 ... +70 oC
- Storage temperature .... βA 741N, βA 741JN ... -25 ... +125 oC
  βA 741MN ... -55 ... +125 oC
- Supply voltage .... max. +/- 22 V
- Differential input voltage (Note 1) .... max. +/- 30 V
- Input offset voltage ....(βA 741JN)... max. +/- 3 mV
- Input bias current ....(βA 741JN)... max. 200 nA
- Large signal voltage gain .... typ. 200 V/mV
- Cut-off frequency .... typ. 1 MHz
- Slew rate .... typ. 0.5 V/us
- Supply voltage rejection ratio .... typ. 30 uV/V
- Common mode rejection ratio .... typ. 90 dB

(1) For V+/- less than 15 V, is equal with the supply voltage.

1. Offset null
2. Inverting input
3. Non-inverting input
4. V-
5. Offset null
6. Output
7. V+
8. NC



PACKAGE MP-48 / TOP VIEW

βLF 356N

MONOLITHIC JFET INPUT OPERATIONAL AMPLIFIER

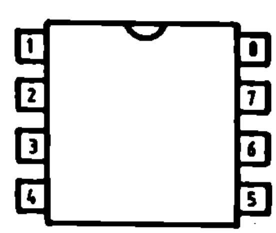
The βLF 356N series are high performance monolithic JFET input operational amplifiers which combine precision characteristics with high speed. These operational amplifiers use a new process which allows fabrication of matched, high voltage JFET transistors (BIFET technology). The βLF 356N series features low input bias and offset currents, low offset voltage and offset voltage drift, coupled with offset adjust which does not degrade drift or common-mode rejection. The devices are also designed for high slew rate, wide bandwidth, extremely fast settling time, low voltage and current noise and a low 1/f noise corner. A unique output stage allows use of large capacitive loads (10 nF) without stability problems. βLF 356N operational amplifier is internally frequency compensated for closed loop gains down to unity.

Applications include precision high speed integrators, fast D/A and A/D converters, high impedance buffers, wideband / low noise / low drift / logarithmic / photocell amplifiers, sample and hold circuits, coaxial cable drivers, etc.

Features

- Input offset voltage .... max. 10 mV
- Input bias current .... max. 200 pA
- Slew rate .... typ. 12 V/us

1. Offset null
2. Inverting input
3. Non-inverting input
4. V-
5. Offset null
6. Output
7. V+
8. NC



PACKAGE MP-48 / TOP VIEW

$ βM 101A
$ βM 301A
OPERATIONAL AMPLIFIERS

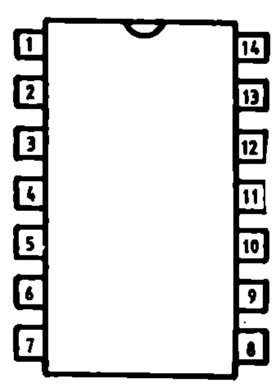
The βM 101A series are general purpose operational amplifiers wich feature improved performances over industry standards. The amplifiers offer many features : overload protection on the input and output, no latch-up when the common mode range is exceeded, freedom from oscillation and compensation with a single 30 pF capacitor .

Features

- Operating temperature	βM 101A ...	-55 ... +125 oC	
	βM 301A ...	0 ... +70 oC	
- Storage temperature	βM 101A ...	-55 ... +125 oC	
	βM 301A ...	-25 ... +125 oC	
- Supply voltage	βM 101A ...	max.	+/- 22 V
	βM 301A ...	max.	+/- 18 V
- Differential input voltage (Note 1)		max.	+/- 15 V
- Input offset voltage	(βM 101A)...	typ.	0.7 mV
- Input bias current	(βM 101A)...	typ.	30 nA
- Large signal voltage gain		typ.	160 V/mV
- Supply voltage rejection ratio		typ.	96 uV/V
- Common mode rejection ratio		min.	70 dB

(1) For V+/- less than 15 V, is equal with the supply voltage.

1. NC
2. NC
3. Balance/compensation
4. Inverting input
5. Non-inverting input
6. V-
7. NC
8. NC
9. Balance
10. Output
11. V+
12. Compensation
13. NC
14. NC



PACKAGE TO-116 / TOP VIEW

$ Preliminary data

* βM 101AN
* βM 301AN
OPERATIONAL AMPLIFIERS

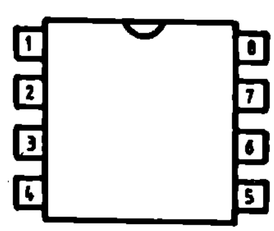
The βM 101AN series are general purpose operational amplifiers wich feature improved performances over industry standards. The amplifiers offer many features : overload protection on the input and output, no latch-up when the common mode range is exceeded, freedom from oscillation and compensation with a single 30 pF capacitor .

Features

- Operating temperature	βM 101AN ...	-55 ...	+125 oC
	βM 301AN ...	0 ...	+70 oC
- Storage temperature	βM 101AN ...	-55 ...	+125 oC
	βM 301AN ...	-25 ...	+125 oC
- Supply voltage	βM 101AN ...	max.	+/- 22 V
	βM 301AN ...	max.	+/- 18 V
- Differential input voltage (Note 1)		max.	+/- 15 V
- Input offset voltage	(βM 101AN)...	typ.	0.7 mV
- Input bias current	(βM 101AN)...	typ.	30 nA
- Large signal voltage gain		typ.	160 V/mV
- Supply voltage rejection ratio		typ.	96 uV/V
- Common mode rejection ratio		min.	70 dB

(1) For V+/- less than 15 V, is equal with the supply voltage.

1. Balance/compensation
2. Inverting input
3. Non-inverting input
4. V-
5. Balance
6. Output
7. V+
8. Compensation



PACKAGE MP-48 / TOP VIEW

* Preliminary data

βM 108
βM 308
PRECISION OPERATIONAL AMPLIFIERS

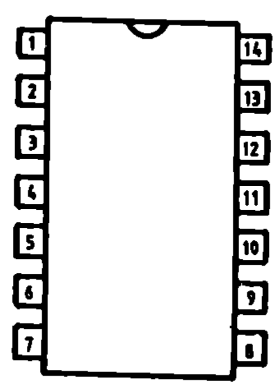
The βM 108 series are precision operational amplifiers having specifications about a factor of ten better than FET amplifiers over their operating temperature range. In addition to low input currents, selected units are available, having extremely low offset voltage (refer to βM 108A series) making posible to eliminate offset voltage adjustments in most cases.

Excellent performance is achieved by applying an advanced ion-implantated super-beta process and providing on chip zener-zapping offset voltage trimming capabilities. The devices operate with supply voltages from +/-2 to +/-20V(+/-2 to +/-18V for βM 308) and have typ. 110 dB supply rejection to use unregulated supplies. Low supply current drain (typ. 300uA) makes the βM 108 attractive in battery operated/low power applications.Low offset current and low bias current provide excellent performance in high impedance circuits such as long period integrators, sample-and-holds and with piezoelectric and capacitive transducers.

Features

- Operating temperature	βM 108	-55 ...	+125 oC
	βM 308	0 ...	+70 oC
- Input bias current	βM 108	max.	2 nA
	βM 308	max.	5 nA
- Input bias current over temperature	βM 108	max.	3 nA

1. NC
2. Compensation 1
3. Guard
4. Inverting input
5. Non-inverting input
6. Guard
7. V-
8. NC
9. NC
10. Output
11. V+
12. Compensation 2
13. NC
14. NC



PACKAGE TO-116 / TOP VIEW

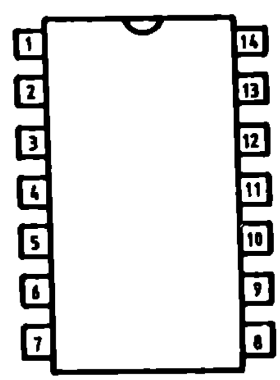
βM 108A
βM 308A
PRECISION OPERATIONAL AMPLIFIERS

The βM 108A series are precision operational amplifiers having specifications about a factor of ten better than FET amplifiers over their operating temperature range. In addition to low input currents, these circuits have extremely low offset voltage, making possible to eliminate offset adjustments in most cases. Excellent performance is achieved by applying an advanced ion-implantated super-beta process and providing on chip zener-zapping offset voltage trimming capabilities. The devices operate with supply voltages from +/-2 to +/-20V(+/-2 to +/-18V for βM 308A) and have typ 110 dB supply rejection to use unregulated supplies. Low supply current drain (typ 300uA) makes the βM 108A attractive in battery operated/low power applications.Low offset current and low bias current provide excellent performance in high impedance circuits such as long period integrators, sample-and-holds and with piezoelectric and capacitive transducers.

Features

- Operating temperature	βM 108A ...	-55 ...	+125 oC
	βM 308A ...	0 ...	+70 oC
- Input offset voltage		max.	0.5 mV
- Input offset voltage drift		max.	5 uV/oC
- Input bias current over temperature	βM 108A ..	max.	3 nA

1. NC
2. Compensation 1
3. Guard
4. Inverting input
5. Non-inverting input
6. Guard
7. V-
8. NC
9. NC
10. Output
11. V+
12. Compensation 2
13. NC
14. NC



PACKAGE TO-116 / TOP VIEW

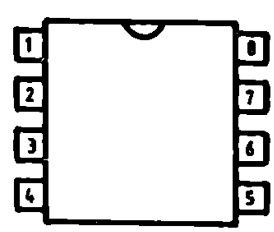
βM 108AN
βM 308AN
PRECISION OPERATIONAL AMPLIFIERS

The βM 108AN series are precision operational amplifiers having specifications about a factor of ten better than FET amplifiers over their operating temperature range. In addition to low input currents, these circuits have extremely low offset voltage, making possible to eliminate offset adjustments in most cases. Excellent performance is achieved by applying an advanced ion-implantated super-beta process and providing on chip zener-zapping offset voltage trimming capabilities. The devices operate with supply voltages from +/-2 to +/-20V(+/-2 to +/-18V for βM 308AN)and have typ 110 dB supply rejection to use unregulated supplies.Low supply current drain (typ.300uA) makes the βM 108AN attractive in battery operated/low power applications.Low offset current and low bias current provide excellent performance in high impedance circuits such as long period integrators, sample-and-holds and with piezoelectric and capacitive transducers.

Features

- Operating temperature .... βM 108AN ... -55 ... +125 oC
  βM 308AN ... 0 ... +70 oC
- Input offset voltage .... max. 0.5 mV
- Input offset voltage drift .... max. 5 uV/oC
- Input bias current over tempertaure βM 108AN . max. 3 nA

1. Compensation 1
2. Inverting input
3. Non-inverting input
4. V-
5. NC
6. Output
7. V+
8. Compensation 2



PACKAGE MP-48 / TOP VIEW

βM 108N
βM 308N
PRECISION OPERATIONAL AMPLIFIERS

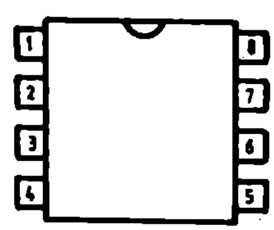
The βM 108N series are precision operational amplifiers having specifications about a factor of ten better than FET amplifiers over their operating temperature range. In addition to low input currents, selected units are available, having extremely low offset voltage (refer to βM 108AN series) making posible to eliminate offset voltage adjustment in most cases.

Excellent performance is achieved by applying an advanced ion-implantated super-beta process and providing on chip zener-zapping offset voltage trimming capabilities. The devices operate with supply voltages from +/-2 to +/-20V(+/-2 to +/-18V for βM 308N) and have typ 110 dB supply rejection to use unregulated supplies.Low supply current drain (typ.300uA) makes the βM 108AN attractive in battery operated/low power applications.Low offset current and low bias current provide excellent performance in high impedance circuits such as long period integrators, sample-and-holds and with piezoelectric and capacitive transducers.

Features

- Operating temperature	βM 108N ...	-55 ...	+125 oC	
	βM 308N ...	0 ...	+70 oC	
- Input bias current	βM 108N ...	max.	2 nA	
	βM 308N ...	max.	5 nA	
- Input bias current over temperature	βM 108N ..	max.	3 nA	

1. Compensation 1
2. Inverting input
3. Non-inverting input
4. V-
5. NC
6. Output
7. V+
8. Compensation 2



PACKAGE MP-48 / TOP VIEW

βM 324
βM 2902
QUAD OPERATIONAL AMPLIFIERS

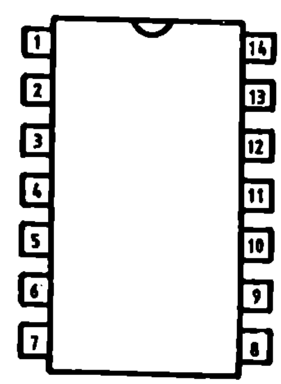
The integrated circuits βM 324, βM 2902 consist of four independent, internally frequency compensated operational amplifiers, which were designed specifically to operate from a single power supply.

Applications areas include transducer amplifiers, DC gain block and all the conventional operational amplifier circuits which needn't offset voltage compensation.

Features

- Operating temperature		0 ... +125	oC
- Storage temperature		-55 ... +125	oC
- Supply voltage (+/-)	βM 324 ..	1.5 ... 16	V
	βM 2902 ..	1.5 ... 13	V
- Differential input voltage	βM 324 ..	max. 32	V
	βM 2902 ..	max. 26	V
- Input voltage	βM 324 ..	-0.3 ... 32	V
	βM 2902 ..	-0.3 ... 26	V
- Input current (VIN < - 0.3 V)		max. 50	mA
- Input offset voltage		max. +/- 7	mV
- Input bias current		max. 250	nA
- Input offset current		max. 50	nA
- Supply current		max. 3	mA
- Large signal voltage gain		typ. 100	V/mV

1. Output 1
2. Input 1-
3. Input 1+
4. V+
5. Input 2+
6. Input 2-
7. Output 2
8. Ootput 3
9. Input 3-
10. Input 3+
11. V-
12. Input 4+
13. Input 4-
14. Output 4



PACKAGE TO-116 / TOP VIEW

βM 358N
βM 2904N
DUAL OPERATIONAL AMPLIFIERS

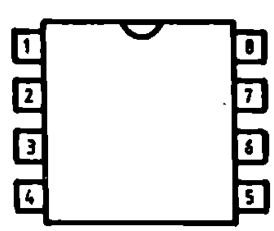
The integrated circuits βM 358N, βM 2904N consist of two independent, internally frequency compensated operational amplifiers, which were designed specifically to operate from a single power supply.

Their electrical characteristics and application areas are identical to operational amplifier βM 324, respectively βM 2902, mounted in the dual-in-line packages MP-48 with 8 leads.

Features

- Operating temperature		0 ... +125	oC
- Storage temperature		-55 ... +125	oC
- Supply voltage (+/-)	βM 358N	1.5 ... 16	V
	βM 2904N	1.5 ... 13	V
- Differential input voltage	βM 358N	max. 32	V
	βM 2904N	max. 26	V
- Input voltage	βM 358N	-0.3 ... 32	V
	βM 2904N	-0.3 ... 26	V
- Input current (VIN < - 0.3 V)		max. 50	mA
- Input offset voltage		max. +/- 7	mV
- Input bias current		max. 250	nA
- Input offset current		max. 50	nA
- Supply current		max. 2	mA
- Large signal voltage gain		typ. 100	V/mV

1. Output 1
2. Input 1+
3. Input 1-
4. V-
5. Input 2+
6. Input 2-
7. Output 2
8. V+



PACKAGE MP-48 / TOP VIEW

\$ βM 747E
\$ βM 747C

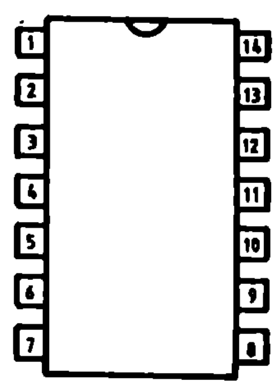
DUAL OPERATIONAL AMPLIFIERS

The βM 747 series are general purpose dual βA 741 type operational amplifiers. They feature internal frequency compensation, short-circuit protection, wide common-mode and differential voltage ranges, no latch-up, balanced offset null, independent networks and V+ supply leads for improved isolation between amplifiers and application flexibility. In addition to industry standard types, the I.P.R.S. series uses a thermally balanced input stage design employing cross-coupled transistor quads which provides low VOS, TCVos, TCIos, insensivity to output load conditions and improved channel separation . The βM 747 can be used anywhere multiple βA 741 type amplifiers are being used and in applications where amplifier matching is required.

Features

- Input offset voltage	βM 747E ...	max.	3 mV
	βM 747C ...	max.	6 mV
- Input bias current	βM 747E ...	max.	80 nA
	βM 747C ...	max.	500 nA
- Large signal voltage gain		typ.	400 V/mV
- Common-mode rejection ratio	βM 747E ...	min.	80 dB
	βM 747C ...	min.	70 dB
- Supply voltage rejection ratio ...	βM 747E ...	min.	86 dB
	βM 747C ...	min.	77 dB

1. Inverting input A
2. Non-inverting input A
3. Offset null A
4. V-
5. Offset nul B
6. Non-inverting input B
7. Inverting input B
8. Offset null B
9. V+ B
10. Output B
11. NC
12. Output A
13. V+ A
14. Offset null A



PACKAGE TO-116 / TOP VIEW

\$ Preliminary data

βM 3900AE
βM 3900BE
QUAD NORTON OPERATIONAL AMPLIFIERS

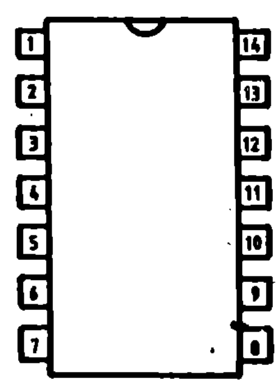
The integrated circuits βM 3900AE , βM 3900BE consist of four independent dual input, internally compensated amplifiers, which were designed specifically to operate from a single power supply and to provide a large output voltage swing.

These amplifiers make use of a current mirror to achieve the non-inverting input function. Application areas include: AC amplifiers, RC active filters, waveform generator circuits.

Features

- Operating temperature		0 ...	+70 oC
- Storage temperature		-55 ...	+125 oC
- Supply voltage	βM 3900AE ..	+4 ...	+36 V
	βM 3900BE ..	+4 ...	+18 V
- Input current		max.	20 mA
- Supply current		max.	10 mA
- Voltage gain		min.	1.2 V/mV
- Input bias current		max.	200 nA
- Output voltage swing		min.	13.5 V
- Output current source		min.	6 mA
- Output current sink		min.	0.5 mA
- Cut-off frequency		typ.	2.5 MHz
- Slew rate		typ.	2.5 V/us
- Supply voltage rejection ratio		typ.	70 dB

1. Input 1+
2. Input 2+
3. Input 2-
4. Output 2
5. Output 1
6. Input 1-
7. V-
8. Input 3-
9. Output 3
10. Output 4
11. Input 4-
12. Input 4+
13. Input 3+
14. V+



PACKAGE TO-116 / TOP VIEW

DAC 08H
DAC 08E
DAC 08C

8-BIT DIGITAL-TO-ANALOG CONVERTORS

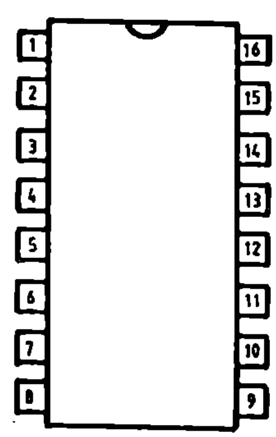
The DAC 08 is a monolithic 8-bit high-speed current outout digital-to-analog convertor (DAC) featuring typical settling time of 100 ns When using as a multiplying DAC, monotonic performance over a 40:1 reference current range is possible. The circuit also features high compliance complementarv current outputs to allow differential output voltages of 20 Vpp with simple resistor loads.

The noise immune inputs of the circuit will accept TTL levels with the logic threshold pin VLC - pin 1 grounded. The performance and characteristics of the device are essentially unchanged over the full power supply range (+/-4.5V to +/-18V).

Features

- Operating temperature .... 0 ... +70 oC
- Storage temperature .... -25 ... +70 oC
- Power dissipation .... max. 500 mW
- Supply voltage .... max. 36 V
- Differential input voltage .... V- ... V+ V
- Common mode input voltage .... V- ... V+ V
- Nonlinearity .... DAC 08H ... max.+/- 0.1%/FS
  DAC 08E ... max.+/-0.19%/FS
  DAC 08C ... max.+/-0.39%/FS

1. VLC
2. I OUT
3. V-
4. I OUT
5. B1 (MSB)
6. B2
7. B3
8. B4
9. B5
10. B6
11. B7
12. B8 (LSB)
13. V+
14. VREF (+)
15. VREF (-)
16. Compensation



PACKAGE MP-117 / TOP VIEW

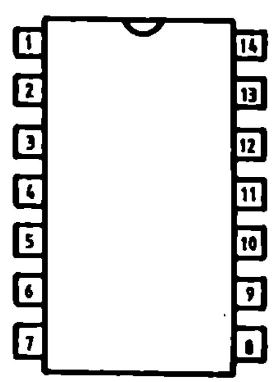
TBA 315E
POWER TIMER

The TBA 315E is an integrated circuit designed to provide rectangular pulses with adjustable frequency and duty cycle, by an external group RC. The circuit contains a voltage regulator, a comparator oscillator and an output power stage. It allows cyclical excitation of a relay. Therefore it is specially suitable in such application as car winking-lights, windscreen-wipper motor and power multivibrators. For V+ = 12 V, pin 11 (12/24) is connected to V+, and for V+ = 24 V, the same pin is not connected.

Features

- Operating temperature	0 ... +70	oC
- Storage temperature	-55 ... +125	oC
- Power dissipation	max. 500	mW
- Supply voltage	10 ... 32	V
- Supply current	3.5 ... 18	mA
- Output current	max. 200	mA
- Voltage on control pin	max. V+	V
- Oscillator input leakage current	min. -1	uA
- Oscillator input current for VOL	min. 10	uA
- Saturation voltage at the output power stage	max. 1.5	V
- Frequency of oscillation	max. 2.1fo	Hz
- Duty cycle	0.4 ...0.65	-

1. NC
2. NC
3. Oscillator output
4. Control
5. NC
6. GND
7. NC
8. NC
9. Output
10. V+
11. 12/24
12. Oscillator input
13. NC
14. NC



PACKAGE TO-116 / TOP VIEW

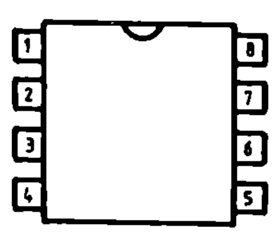
TBA 315N
POWER TIMER

The TBA 315N is an integrated circuit designed to provide rectangular pulses with adjustable frequency and duty cycle, by an external group RC. The circuit contains a voltage regulator, a comparator oscillator and an output power stage. It allows cyclical excitation of a relay. Therefore it is specially suitable in such application as car winking-lights, windscreen-wipper motor and power multivibrators. For V+ = 12 V, pin 11 (12/24) is connected to V+, and for V+ = 24 V, the same pin is not connected.

Features

- Operating temperature .... 0 ... +70 oC
- Storage temperature .... -55 ... +125 oC
- Power dissipation .... max. 500 mW
- Supply voltage .... 10 ... 32 V
- Supply current .... 3.5 ... 18 mA
- Output current .... max. 200 mA
- Voltage on control pin .... max. V+ V
- Oscillator input leakage current .... min. -1 uA
- Oscillator input current for VOL .... min. 10 uA
- Saturation voltage at the output power stage .. max. 1.5 V
- Frequency of oscillation .... max. 2.1fo Hz
- Duty cycle .... 0.4 ...0.65 -

1. Oscillator output
2. Control
3. NCD
4. GND
5. Output
6. V+
7. 12/24
8. Oscillator input



PACKAGE MP-48 / TOP VIEW

TCA 105N

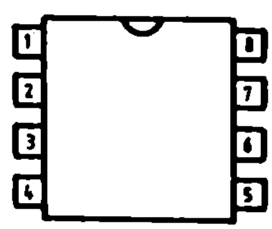
INDUCTIVE PROXIMITY SENSOR

The TCA 105N usually uses a simple external LC circuit wich oscilating amplitude may be altered by the presence of a fero-magnetical metal. The integrated sensor signals this event by switching two complementary open collector outputs. .

Features

- Operating temperature	0 ... +70	oC
- Storage temperature	-25 ... +125	oC
- Supply voltage	4.5 ... 20	V
- Supply current	max. 5	mA
- Low level output voltage at 50 mA	typ. 0.7	V
- Residual output current at 20 V	max. 60	uA
- Switching time	typ. 3	us

1. GND
2. Base input
3. Emitter input
4. Collector input
5. Filter
6. Output 1
7. Output 2
8. V+



PACKAGE MP-48 / TOP VIEW

βAA 145
PHASE - CONTROL REGULATOR

The βAA 145 is an integrated circuit in planar-epitaxial technology suitable for phase-control in high precision regulators using triacs and/or thyristors. It is synchronised on the industrial supply (220 V, 50 Hz) provided separated pulse outputs for the positive and negative half-cycle of the synchronisation signal.

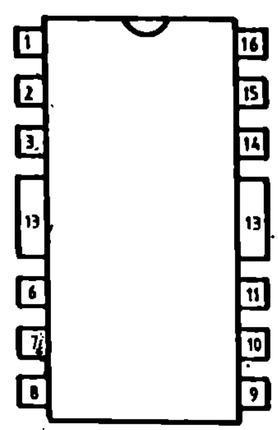
Features

- Operating temperature	-10 ...	+70	oC
- Storage temperature	-20 ...	+125	oC
- Power dissipation	max.	550	mW
- Supply voltage	max.	18	V
- Shift voltage	-5 ...	+18	V
- Synchronisation current	max.	10	mA
- Negative supply current (pin 13)	max.	-25	mA
- Negative supply current (pin 15)	max.	-5	mA
- Control input pulse current	max.	3	mA
- Output current	max.	20	mA
- Supply current	12 ...	30	mA
- Current at phase control input	max.	10	uA
- Ct charging current	-40 ...	-10	mA
- Ct discharging current	min.	5	mA
- Cs charging current	-60 ...	-20	mA

1. V+
2. Monostable output
3. GND

6. Pulse blocking
7. Voltage ramp
8. Phase control
9. Synchronisation input
10. Output
11. Pulse width control

13. I- supply
14. Output
15. -8V reference
16. Paralel synchro



PACKAGE CB-109B / TOP VIEW

βE 555M
βE 555E
TIMERS

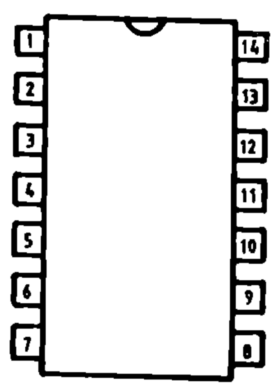
The βE 555 are highly stable devices for generating accurate time delay or waveforms. Additional terminals are provided for triggering or resetting if desired. In the time delay mode of operation, the time is precisely controlled by one external resistor and capacitor. For astable operation as an oscillator, the free running trequency and duty cycle are accurately controlled with two external resistors and one capacitor.

The output can drive TTL circuits and can source or sink up to 200 mA.

Features

- Operating temperature	βE 555M	-55 ... +125 oC
	βE 555E	0 ... + 70 oC
- Storage temperature		-55 ... +125 oC
- Power dissipation		max. 500 mW
- Supply voltage		4.5 ... 18 V
- Supply current		max. 15 mA
- Threshold voltage		typ. 2/3V+ V
- Reset voltage		0.4 ... 1 V
- Threshold current		max. 250 nA
- Trigger current		max. 900 nA
- Reset current		max. 400 uA
- Control voltage level		9 ... 11 V

1. NC
2. NC
3. NC
4. GND
5. Low threshold
6. Output
7. Reset
8. Control
9. High threshold
10. Discharge
11. V+
12. NC
13. NC.
14. NC



PACKAGE TO-116 / TOP VIEW

βE 555MN
βE 555N
TIMERS

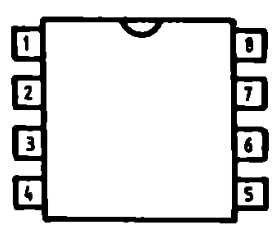
The βE 555N are highly stable devices for generating accurate time delay or waveforms. Additional terminals are provided for triggering or resetting if desired. In the time delay mode of operation, the time is precisely controlled by one external resistor and capacitor. For astable operation as an oscillator, the free running trequency and duty cycle are accurately controlled with two external resistors and one capacitor.

The output can drive TTL circuits and can source or sink up to 200 mA.

Features

- Operating temperature	βE 555MN ...	-55 ... +125	oC
	βE 555N ...	0 ... + 70	oC
- Storage temperature		-55 ... +125	oC
- Power dissipation		max. 500	mW
- Supply voltage		4.5 ... 18	V
- Supply current		max. 15	mA
- Threshold voltage		typ. 2/3V+	V
- Reset voltage		0.4 ... 1	V
- Threshold current		max. 250	nA
- Trigger current		max. 900	nA
- Reset current		max. 400	uA
- Control voltage level		9 ... 11	V

1. GND
2. Low threshold
3. Output
4. Reset
5. Control
6. High threshold
7. Discharge
8. V+



PACKAGE MP-48 / TOP VIEW

* βE 5517A
* βE 5517
DUAL TRANSCONDUCTANCE OPERATIONAL AMPLIFIERS

The βE 5517 contains two current controlled transconductance amplifiers, each with a differential input and push-pull output. The βE 5517 offers significant design and performance advantages over similar devices for all types of programmable gain applications. Constant impedance buffers are provided wich effectively eliminate changes in output offset voltage as the amplifier bias current is varied.

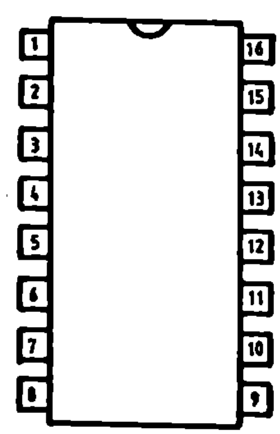
Features

- Constant impedance buffers
- VBE of buffers is constant with amplifier I bias change
- Pin compàtible with βM 13600
- Excellent matching between amplifiers V
- Linearizing diodes

Applications

- Multiplexers
- Timers
- Electronic music synthesizers
- Dolby HX (Headroom extension) systems
- Current controlled amplifiers, filters
- Current controlled oscillators, impedances

1. Amp 1 bias input
2. Diode 1 bias
3. Input 1+
4. Input 1−
5. Output 1
6. V−
7. Buffer 1 input
8. Buffer 1 output
9. Buffer 2 output
10. Buffer 2 input
11. V+
12. Output 2
13. Input 2−
14. Input 2+
15. Diode 2 bias
16. Amp 2 bias input



PACKAGE MP-117 / TOP VIEW

* Preliminary data

$ βH 1
$ βH 2
HALL MAGNETIC TRANSDUCERS

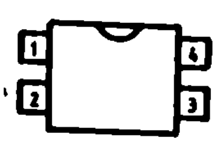
The βH 1 and βH 2 are linear integrated circuits consisting of an built-in transducer processed on a silicon chip. In the presence of a magnetic field, the circuit differential output is proportional to the value of the magnetic field induction vector.

The circuit is intended for use in all applications where the measuring of a magnetic field is necessary.

Features

- Operating temperature		0 ...	+70 oC
- Storage temperature		-25 ...	+125 oC
- Supply voltage		0 ...	+18 V
- Supply current (V+ = 5 V)		max.	3 mA
- Output offset voltage (V+ = 5 V)	βH 1	- 2 ...	+12 mV
	βH 2	-12 ...	+ 2 mV
- Output voltage (V+ = 5 V, B = 40 mT)		min.	+/- 8 mV

1. GND
2. Differential output 1
3. Differential output 2
4. V+



PACKAGE MP-24 / TOP VIEW

$ Preliminary data

βL 105
βL 106
βL 107
βL 108
BAR - GRAPH DISPLAYS

The ICs are driving circuits for a 5 or 10 LED bar display having an integrated current generator. whose current is adjustable between 0 and 20 mA. Light emitting diodes are connected in series in order to reduce power dissipation and to have the same current flow to the supply, under any operating conditions. For red LEDs the supply voltage is 12 V, whereas in case of green or yellow LEDs the voltage is 16 V.

The input thresholds are :

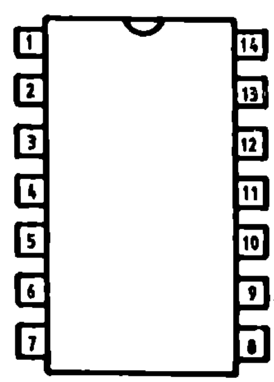
βL 105 0.1V; 0.3V; 0.5V; 0.7V; 0.9V
βL 106 0.2V; 0.4V; 0.6V; 0.8V; 1 V
βL 107 0.1V/-20dB; 0.31V/-10dB; 0.71V/-3dB; 1V/0dB; 1.41V/+3dB
βL 108 0.18V/-15dB; 0.5V/-6dB; 0.84V/-1.5dB; 1.19V/+1.5dB; 2V/+6dB

An externally compensated operational amplifier is included in the IC, whitch provides facilities for scaling, peak detection and/or chaining. The internal reference may be used for biasing.

By choosing a parallel connection of the inputs of a βL 105 and a βL 106, it is possible to get a 10 LED bar display with thresholds : 0.1 V ; 0.2 V ; 0.3 V ... 1 V.

By choosing a parallel connection of the inputs of a βL 107 and a βL 108, it is possible to get a 10 LED bar display with thresholds : -20 dB ; -15 dB ; -10 dB ... +6 dB.

1. Non-inverting Op Amp s input
2. Frequency compensation
3. Op Amp output
4. GND
5. LED 5
6. LED 4
7. LED 3
8. LED 2
9. LED 1
10. Bar display input
11. V+
12. LED current control
13. Internal reference
14. Inverting Op Amp input



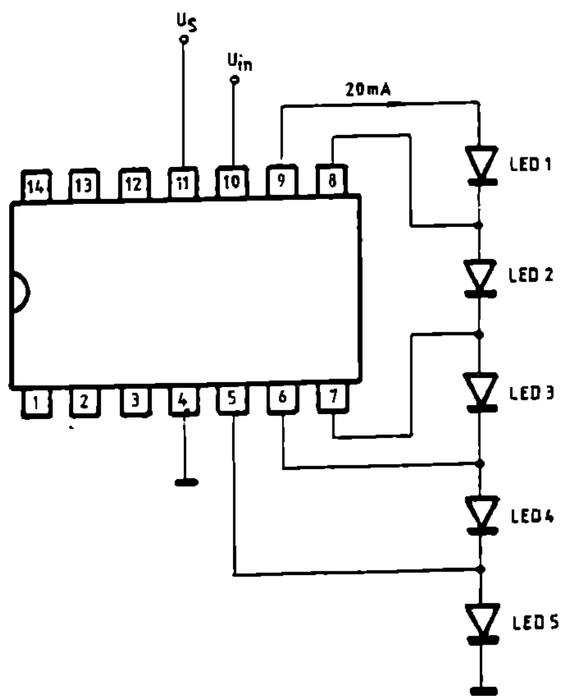
PACKAGE TO-116 / TOP VIEW

βL 105 ; βL 106 ; βL 107 ; βL 108 (cont.)

Features

- Operating temperature .... -25 ... +70 oC
- Supply voltage range .... 12 ... 18 V
- Power dissipation .... max. 680 mW
- Programmable LED current .... 0 ... 20 mA
- Linear dependence between LED current and command current .... I LED = 20 mA - 40 I COM
- Biasing current .... max. 1 uA
- Operational amplifier open loop gain .... min. 10000 -
- Different colour LED's can be connected arbitrary

Typical application



* βLF 11331
* βLF 13331

4-NORMALLY OPEN SWITCHES WITH DISABLE

These devices are monolithic combination of bipolar and JFET technology producing the one chip quad JFET switch. A circuit technique is employed to maintain a constant resistance over the analog voltage range of +/- 10 V. The input is designed to operate from minimum TTL levels, and switch operation also ensures a break before make action. These devices operate from +/- 15 V supplies and swing a +/- 10 V analog signal.

The JFET switches are designed for aplications where a DC to medium frequency analog signal requires control.

Features

- Operating temperature	βLF 11331 ...	-55 ... +125	oC
	βLF 13331 ...	0 ... +70	oC
- Storage temperature		-55 ... +125	oC
- Positive supply - negative supply (VCC-VEE).	max.	36	V
- Reference voltage		VEE ... VCC	V
- Logic input voltage		VR-4...VR+6	V
- Analog current	max.	20	mA

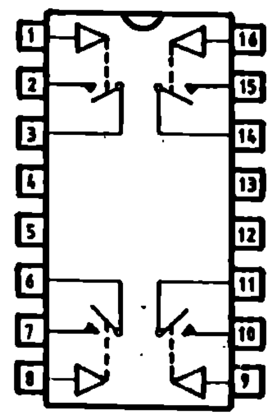
The following parameters are supposed to be guaranted for : VCC = +15 V; VEE = -15 V; VR = 0 V; TA = 25 oC

- " ON " resistance (VA = 0 V; ID = 1 mA)	max.	200	ohms
- " ON " resistance matching	max.	50	ohms
- Analog range		-10 ... +10	V
- Leakage current in " ON " condition	max.	10	nA
- Source and drain current in " OFF " condition.	max.	10	nA
- Logical " 1 " input voltage	min.	2	V
- Logical " 0 " input voltage	max.	0.8	V
- Logical " 1 " input current (VI = 5 V)	max.	40	uA
- Logical " 0 " input current	max.	0.1	uA
- Disable current	max.	1.5	mA
- Negative supply current all switches "OFF")	max.	7	mA
- Reference supply current	max.	5	mA
- Positive supply current	max.	9	mA

* Preliminary data

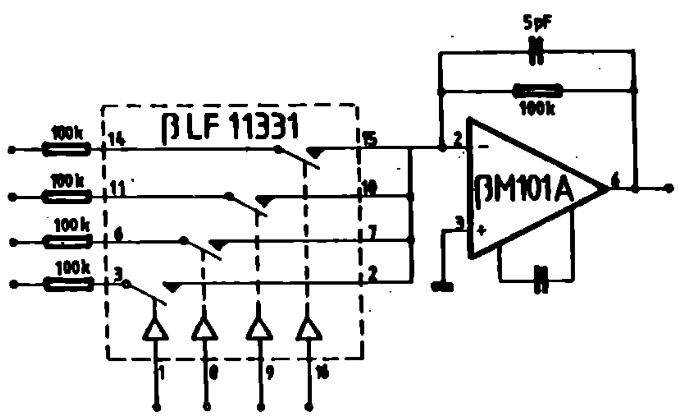
βLF 11331 ; βLF 13331 (cont.)

1. IN1
2. D1
3. S1
4. VR
5. -VEE
6. S2
7. D2
8. IN2
9. IN3
10. D3
11. S3
12. +VCC
13. Disable
14. S4
15. D4
16. IN4



PACKAGE MP-117 / TOP VIEW

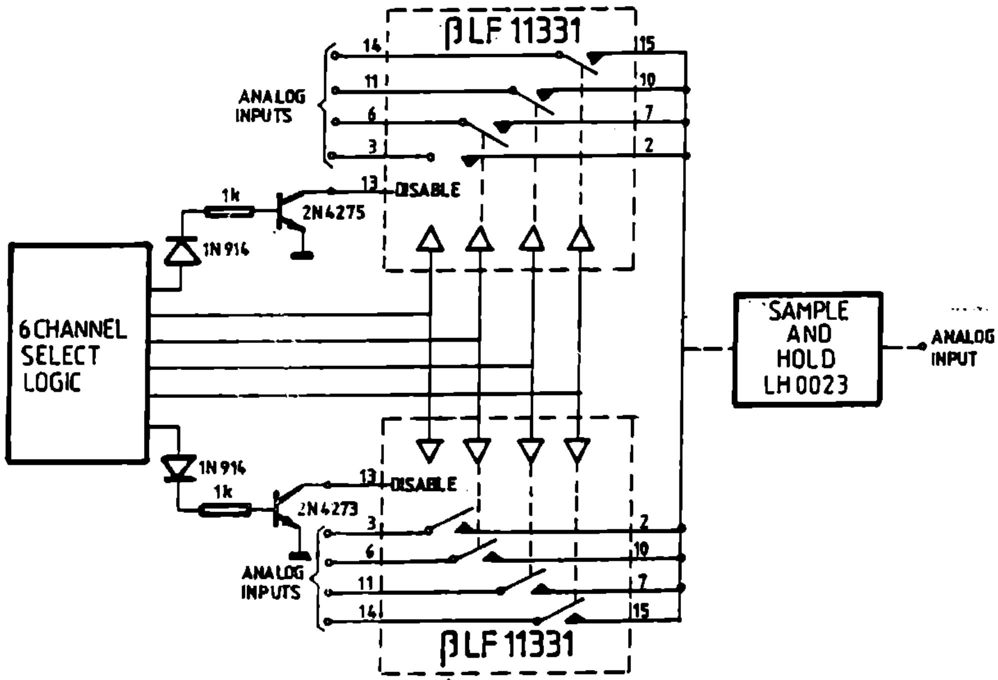
Typical applications



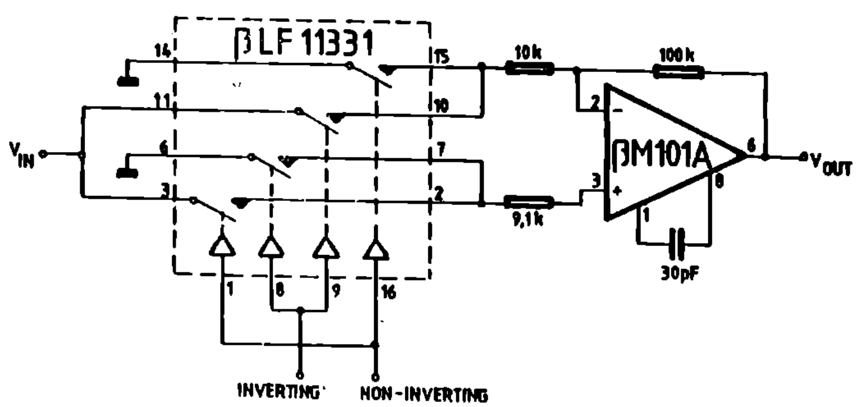
MULTIPLEXER / MIXER

βLF 11331 ; βLF 13331 (cont.)

Typical applications



8 CHANNEL ANALOG COMMUTATOR
WITH 6 CHANNEL SELECT LOGIC



PROGRAMMABLE INVERTING NON-INVERTING
OPERATIONAL AMPLIFIER

βM 121N
βM 221N
βM 321N
PRECISION PREAMPLIFIERS

The βM 121 series are precision preamplifiers designed to operate with general purpose operational amplifiers to drastically decrease DC errors. Drift, bias current, common-mode and supply rejection are more than a factor of 50 better than standard op amps alone. Further, the added DC gain of the βM 121 decreases the closed loop gain error. The operating current is programmable from 5 uA to 200 ua so bias current, offset current, gain and noise can be optimized for the particular application while still realizing very low drift. Super-gain transistors are used for the input stage so input error currents are much lower than conventional amplifiers at the same operating current. Further, the initial offset voltage is easily nulled to zero.

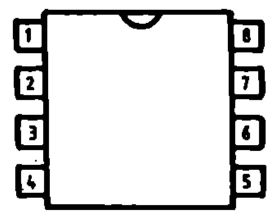
The extremely low drift of the βM 121 will improve accuracy on almost any precision DC circuit. For example, instrumentation amplifiers, strain gauge amplifiers and thermocouple amplifiers using chopper amplifiers can be made with the βM 121. Low noise, full differential input, high common-mode rejection ratio, low power drain and small size offer substantial advantages over choppers. The devices are directly interchangeable with LM 121, LM 221, LM 321 types.

Features

- Operating temperature	βM 121N ...	-55 ...	+125 oC
	βM 221N ...	-25 ...	+ 85 oC
	βM 321N ...	0 ...	+ 70 oC
- Input stage op. current, Iset		5 ...	200 uA
(Iset = programmable, Iset = 600 mV/ Rset)			
- Input offset voltage .... βM 121N,	βM 221N ...	max.	0.7 mV
(externally adj. to zero)	βM 321N ...	max.	1.5 mV
- Input bias current		typ	Iset/2000
- Common-mode rejection ratio		min.	120 dB
- Supply voltage rejection ratio		min.	120 dB
- Supply current		typ.	400 uA
- Input offset voltage drift		max.	1uV/oC
(VOS nulled externally)			

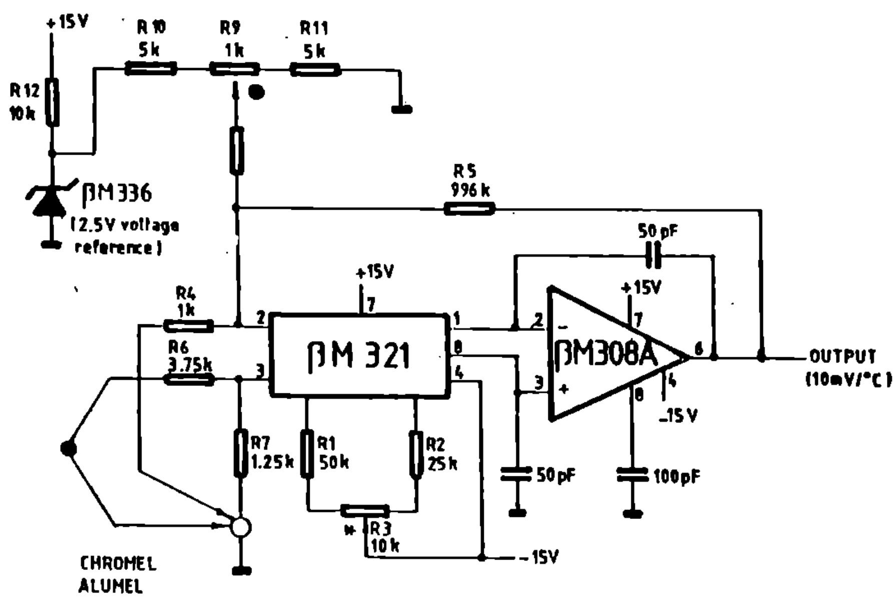
βM 121N ; βM 221N ; βM 321N (cont.)

1. Output 2
2. Input 1
3. Input 2
4. V-
5. R SET/Balance
6. R SET/Balance
7. V+
8. Output 1



PACKAGE MP-48 / TOP VIEN

Typical application



THERMOCOUPLE AMPLIFIER WITH
COLD JUNCTION COMPENSATION

βM 121N ; βM 221N ; βM 321N (cont.)

Calibration procedure :

* Set for T amb [oK] x 10 mV/oK at output with voltage reference (ßM 336) shorted (for example, at 25 oC ambient temperature, output should equal 2.98 V).

Adjust for output reading in oC.

Remarks :

1. This is a minimum part count application in which βM 321 performs both signal amplification and cold junction compensation. This is possible due to the theoretical relationship between the offset voltage and drift. when the offset is not nulled to zero. The drift of the amplifier is then used to compensate the thermocouple for ambient variations.

2. The βM 336 provides a temperature stable voltage reference for ofsseting the output to read directly in degrees centigrade. It can be replaced by any voltage reference device provided that appropriate changes are made in the resistor voltage divider string R9, R10, R11.

3. Calibration is independent of thermocouple type; however, circuit values are for chromel alumel. R6 and R7 must be changed for different thermocouples.

\$ βM 135A
\$ βM 335A
\$ βM 335
TEMPERATURE SENSORS

The βM 335 series are precision, calibrated chips. Operating as a two terminal zener diode , the βM 335 has a breakdown voltage directly proportional to absolute temperature of the jonctions. Coefficient of this proportionality is 10 mV / oK.

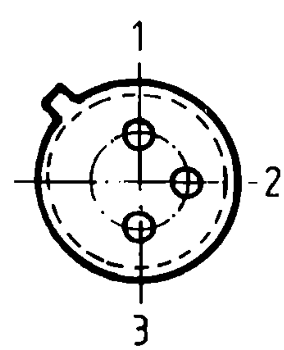
Within range of currents injected of 0.5 ... 5 mA the devices operate properly.

The βM 335 series has typically less than 1 oK nonlinearity errors over a 100 oC temperature range.

Features

- Operating temperature .... βM 135A ... -55 ... +125 oC
  βM 335; βM 335A ... -10 ... +100 oC
- Reverse current .... max. 10 mA
- Forward current .... max. 10 mA
- Uncalibrated error (I=1mA)........ βM 135A ... max. +/- 1 oC
  βM 335A ... max. +/- 3 oC
  βM 335 ... max. +/- 6 oC
- Nonlinearity (I=1mA) at T min < T amb < T max :
  βM 135A ... typ. +/-0.5 oC
  βM 335; βM 335A ... typ. +/-1.5 oC

1. External adjustement
2. Anode (V+ or Vout)
3. Catode (electricallV connected at the metal can)



PACKAGE TO-39 / BOTTOM VIEW

\$ Preliminary data

$ βM 136
$ βM 336

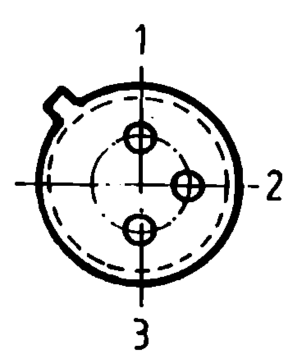
VOLTAGE REFERENCES

The βM 136 and βM 336 integrated circuits are precision 2.5 V shunt regulator. These monolithic IC voltage references operate as a low temperature coefficient 2.5 V zener diode with 0.5 ohms dynamic impedance.

Features

- Operating temperature .... βM 136 ... -55 ... +125 oC
  βM 336 ... 0 ... +70 oC
- Reverse current .... max. 10 mA
- Forward current .... max. 10 mA
- Reverse breakdown voltage (I=1mA).. βM 136 ... 2.490+/- 50 mV
  βM 336 ... 2.490+/-100 mV
- Temperature stability at Vout = 2.490 V adjusted :
  βM 136 .... -55oC < Tamb < +125 oC ... typ. 12 mV
  βM 336 .... 0oC < Tamb < +70 oC ... typ. 1.8 mV
- Easy external calibration
- +/- 1 % initial tolerance available
- Metal can

1. External adjustement
2. Anode (V+ or Vout)
3. Catode (electrically connected at the metal can)



PACKAGE TO-39 / BOTTOM VIEW

$ Preliminary data

* βM 13600
* βM 13700
DUAL TRANSCONDUCTANCE OPERATIONAL AMPLIFIERS

The βM 13600 and βM 13700 IC's consist of two curent controlled transconductance amplifiers each with differencial inputs and a push-pull output. The two amplifiers have common supplies but otherwise operate independently. Lineariting diodes are provided at the inputs to reduce distorsion and allow higher input levels. The βM 13600 has a controlled impedance buffer when βM 13700 has a high impedance buffer.

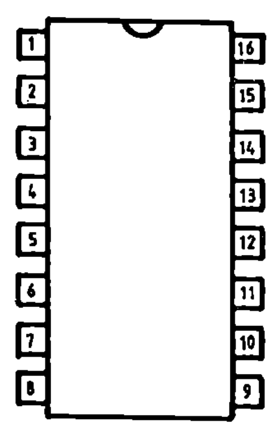
Features

- Transconductance adjustable over 6 decades
- Excellent transconductance linearity
- Excellent matching between amplifiers
- Wide supply range +/- 2 V ... +/- 18 V

Applications

- Current controlled amplifiers
- Current controlled impedances
- Current controlled filters
- Current controlled oscilators
- Multiplexers
- Timers
- Sample-and-hold circuits

1. Amp 1 bias input
2. Diode 1 bias
3. Input 1+
4. Input 1-
5. Output 1
6. V-
7. Buffer 1 input
8. Buffer 1 output
9. Buffer 2 output
10. Buffer 2 input
11. V+
12. Output
13. Input 2-
14. Input 2+
15. Diode 2 bias
16. Amp 2 bias input



PACKAGE MP-117 / TOP VIEW

* Preliminary data

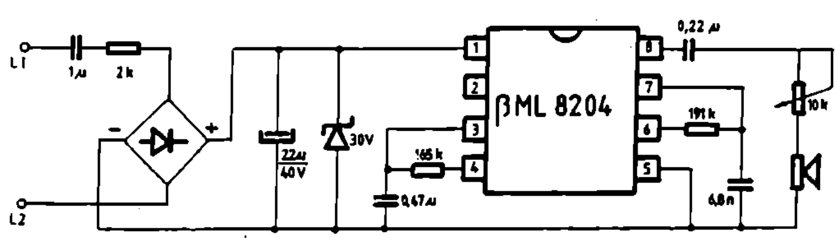
βML 8204
βML 8205
TONE RINGERS

The βML 8204 and βML 8205 are monolithic integrated circuits designed for telephone bell replacement. Each of them incorporates two oscillators, an output amplifier and a power supply control circuit. The oscillator frequency can be adjusted over a wide range, choosing the appropriate external componente. One oscillator, normally operated at low frequency (fL), causes the second oscillator to alternate between its nominal frequency (fH1) and a related higher frequency (fH2). The resulting output is a distinctive "warbling" tone. The output amplifier can drive either a transformer or serial capacitor coupled loudspeaker, or a piezoceramic transducer. The device can be powered from a telephone line or a fixed DC supply. The power supply control circuit has built-in hysteresis to prevent false triggering and rotary dial "chirps". The βML 8204 can be triggered externally under logic control. The βML 8205 has provision for adjustment of the power supply initiation current.

Features

- Operating temperature .... -25 ... +70 oC
- Storage temperature .... -25 ... +125 oC
- Supply voltage .... max. 30 V
- Supply initiation voltage .... 17 ... 21 V
- Sustaining voltage .... 9.7 ... 12 V
- Sustaining current .... min. 0.7 mA
- Supply initiation current .... 1.4 ... 4.2 mA
- Trigger voltage (only βML 8204) .... min. 10.5 V
- Disable voltage (only βML 8204) .... max. 0.8 V
- Output voltage (no load) .... (V+)-2...V+ V

Typical application



βML 8204 , βML 8205 (cont.)

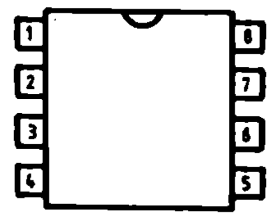
βML 8204

1. V+
2. Trigger-in 1)
3. RL, CL
4. RL
5. GND
6. RH
7. RH, CH
8. Tone output

Note 1) Must be connected through a current limiting resistor, when used .

Pins 3 , 4 low frequency time constant adjustment .

Pins 6 , 7 high frequency time constant adjustment .



PACKAGE MP-48 / TOP VIEW

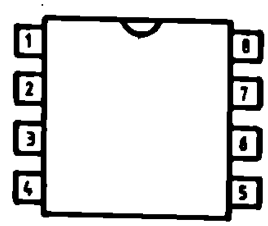
βML 8205

1. V+ •
2. Initiation current 1)
3. RL, CL
4. RL
5. GND
6. RH
7. RH, CH
8. Tone output

Note 1) Must be connected to GND through an initiation current adjustment resistor .

Pins 3 , 4 low frequency time constant adjustment .

Pins 6 , 7 high frequency time constant adjustment .



PACKAGE MP-48 / TOP VIEW

βMTX series
βMTY series
ULTRALOW OFFSET VOLTAGE PRECISION PREAMPLIFIERS

The BMTX/BMTY series :
βMTX 121AN, βMTX 121N, βMTX 321AN, βMTX 321N, βMTX 321CN;
βMTY 121AN, βMTY 121N, βMTY 321AN, βMTY 321N, βMTY 321CN;
are improved, easy-to-use versions of the popular LM 121 precision preamplifier (refer to the βM 121N data sheet). These devices feature fixed input stage operating current and internally trimmed offset voltage. The difference over the standard series is that the need for external components (two resistors and a potentiometer of low TC) is eliminated since :

1. current setting resistors are integrated on the chip;
2. offset voltage is adjusted on the chip, at the wafer test, down to typically +/- 15 uV, using the well proved zener-zap trimming technique.

The βMTX series is primarily intended for low noise with low source resistance, while the βMTY series is intended for low input bias current with high source resistance applications.

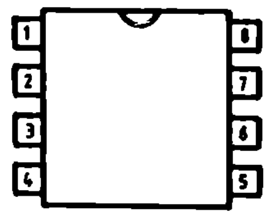
The devices are manufacturated with a low noise bipolar process including ion-implanted super-beta transistors so input bias current related errors are more than an order of magnitude lower than conventional bipolar amplifiers at the same operating current of the input stage. The βMTX / βMTY series provides high performance for low noise, high-accuracy amplification of very low-level signals in transducer applications.

Features

- Operating temperature	121AN, 121N ...	-55 ...	+125 oC
	321AN, 321N, 321CN ...	0 ...	+ 70 oC
- Input offset voltage	121AN, 321AN ..	max.	75 uV
	121N , 321N ...	max.	150 uV
	321CN ..	max.	250 uV
- Input offset voltage drift ..	βMTX 121AN,321AN	max.	1 uV/oC
- Input bias current	βMTY 121AN ...	max.	10 nA
	βMTX 121AN ...	max.	75 nA
- Common-mode rejection ratio		min.	120 dB
- Supply voltage rejection ratio		min.	120 dB
- Input noise voltage	βMTX series ..	typ.	7 nV/√Hz
- Supply current		typ.	400 uA

BMTX / βMTY **series** (cont.)

1. Output 2
2. Input 1
3. Input 2
4. V–
5. Balance
6. Balance
7. V+
8. Output 1



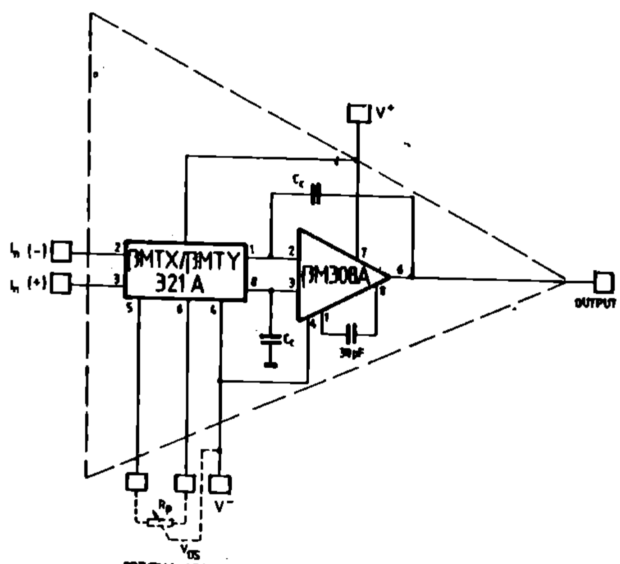
PACKAGE MP-48 / TOP VIEW

Typical application

Recomended Rp values:
- 10 kohms for βMTX 321
- 25 kohms for βMTY 321

Frequency compensation:
- Cc (pF) = 680 / ACL (for βMTX 121)
- Cc (pF) = 100 / ACL (for βMTY 121)

ACL = Closed loop gain



HIGH PRECISION ULTRA-LOW DRIFT OPERATIONAL AMPLIFIER

βS 053
βS 255
βS 057
MAGNETIC SENSORS.

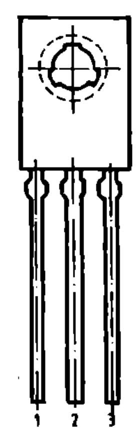
The βS 053, βS 255, βS 057 are three pin magnetic sensors, special designed for computer keyboards. The sensor has a TTL compatible open collector output, that switches in low state in the presence of a magnetic field. This IC series use the same chip, but have some different electro - magnetical performances.

These magnetic sensors are not recommended for extended temperature range.

Features

- Operating temperature		0 ...	+ 70	oC
- Storage temperature		-25 ...	+125	oC
- Supply voltage		4 ...	6	V
- Supply current		max.	6.5	mA
- Output current		max.	40	mA
- "ON STATE" magnetic field	βS 053	min.	30	mT
	βS 255	min.	50	mT
	βS 057	min.	70	mT
- "OFF STATE" magnetic field	βS 053	max.	5	mT
	βS 057	max.	5	mT
	βS 255	min.	25	mT

1. Supply voltage
2. GND
3. Output



PACKAGE SOT-32 / FRONT VIEW

$ βSAK 215MN
$ βSAK 215VN
$ βSAK 215N

PULSE SHAPER CIRCUITS FOR REVOLUTION COUNTERS

The βSAK 215N monolithic integrated circuit, consists of an input trigger, a monostable and an output circuit.

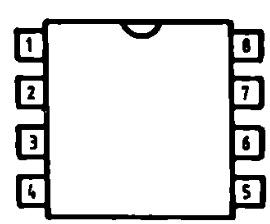
The built-in voltage regulator enables the circuit to operate over a large supply voltage range. The circuit converts the input pulses to a standard (amplitude and pulse duration) current or voltage output pulses.

The βSAK is designed for use in revolution counters of cars and other applications like frequency to current converters. By use of suitable external circuitry the revolution counter can be adapted to engines with two to eight cylinders. It is designed for a nominal DC 12 V supply.

Features

- Operating temperature	βSAK 215MN ...	-55 ...		+125	oC
	βSAK 215VN ...	-25 ...		+85	oC
	βSAK 215N ...	0 ...		+70	oC
- Storage temperature	βSAK 215MN ...	-55 ...		+125	oC
	βSAK 215VN ...	-40 ...		+125	oC
	βSAK 215N ...	-25 ...		+125	oC
- Internal regulator voltage		7.4 ...		8.2	V
- Supply current		max.		12	mA
- Output voltage pulse amplitude		2 ...		2.5	V

1. GND
2. Input
3. Monostable capacitor
4. Monostable capacitor and resistor
5. Current output pulses
6. Voltage output pulses
7. Internal regulator voltage
8. Internal regulator current output

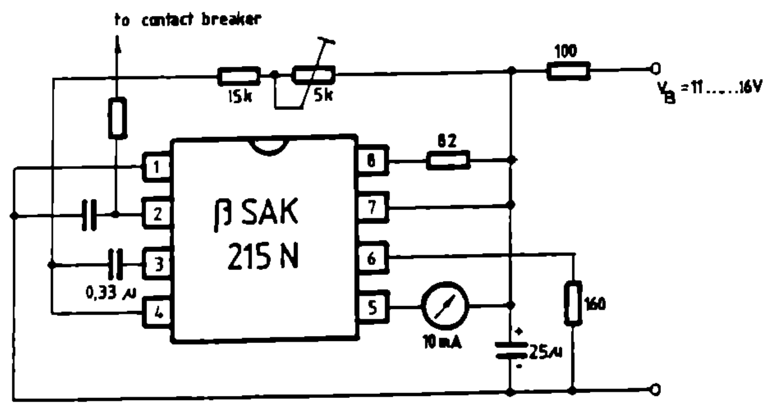


PACKAGE MP-48 / TOP VIEW

$ Preliminary data

βSAK 215MN ; βSAK 215V ; βSAK 215N (cont.)

Typical application



OPERATING CIRCUIT OF A REVOLUTION COUNTER WITH FSD = 6000 RPM (TWO IGNITION PULSES PER TURN OF THE CRANK-SHIFT) AT A NOMINAL BATTERY VOLTAGE OF 12 V.

βSM 231
βSM 232
βSM 233
βSM 234

MAGNETIC HALL - EFFECT SENSORS

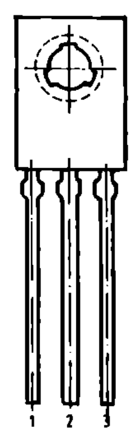
The βSM 231, βSM 232, βSM 233 and βSM 234 are three pins magnetic Hall - effect sensors, special designed for computer keyboards. The sensor has a TTL compatible open collector output, that switches in Low state in the presence of a magnetic field. The βSM 230 IC series use the same chip, but have some different electro - magnetical performances.

The βSM 230 series is not recomanded for extended temperature range.

Features

- Operating temperature .... 0 ... +70 oC
- Supply voltage .... βSM 231, βSM 232 ... 4.5 ... 25 V
  βSM 233, βSM 234 ... 4.5 ... 10 V
- Supply current .... βSM 231, βSM 232 ... max. 6.5 mA
  βSM 233, βSM 234 ... max. 10 mA
- Low level output voltage :
  βSM 231, βSM 232 at 40 mA ... max. 500 mV
  βSM 233, βSM 234 at 16 mA ... max. 500 mV
- "ON STATE" magnetic field :
  βSM 231, βSM 233 ... min. 30 mT
  βSM 232 ... min. 30 mT
  βSM 234 ... min. 70 mT

1. Supply voltage
2. GND
3. Output



PACKAGE SOT-32 / FRONT VIEW

Not recommended for new design

βTDA 1085A

UNIVERSAL MOTOR SPEED CONTROLLER

The βTDA 1085A is a monolithic integrated circuit that provides all the necessary functions for the speed control of universal (AC series) motors in an open or closed loop configuration; additionally it has the facility for defining the initial speed/time characteristics. The circuit provides a phase angle varied trigger pulse to the motor control triac.

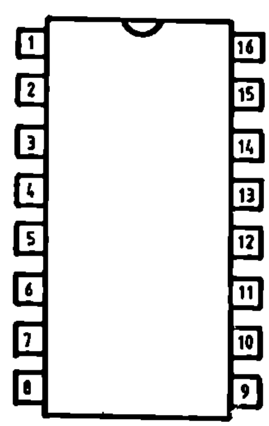
The functions of this circuit include :

- guaranteed full wave triac drive
- soft start from power-up
- on-chip frequency/voltage convertor and ramp generator
- current limiting incorporated
- direct drive from AC line

Features

- Operating temperature	0 ...	+70 oC
- Storage temperature	-25 ...	+125 oC
- Regulated voltage		15.5 V
- Control amplifier transconductance	max.	300 uA/V
- Trigger pulse repetition period	max.	215 us
- Trigger pulse width	max.	100 us
- Output leakage current	min.	30 uA

1. Current synchronisation
2. Voltage synchronisation
3. Motor current limit
4. Actual speed
5. Set speed
6. Ramp current generator control
7. Ramp generator timing
8. V-
9. V+
10. Ballast resistor
11. F/VC pump capacitor
12. Digital speed sense
13. Trigger pulse output
14. Sawtooth capacitor
15. Sawtooth set current
16. Closed loop stability



PACKAGE MP-117 / TOP VIEW

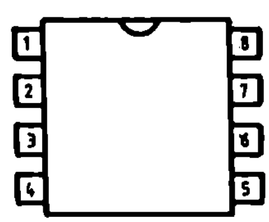
* βU 1010N
VOLTAGE LEVEL INDICATOR

The βU 1010N drives 3 external LED's (RED, YELLOW and GREEN) to indicate the voltage level of 12 V accumulators. The voltage typical threshold are : 11.3 V, 13 V and 15.2 V. The 4 voltage intervals are signalised according to the following colours diagram : RED, YELLOW, GREEN, RED & GREEN. The βU 1010N contains a BAND - GAP voltage reference, external adjustable to 3.25 V by simply (dis)connecting 3 of the IC pins.

Features

- Operating temperature	-40 ...	+85 oC
- Storage temperature	-55 ...	+125 oC
- Supply voltage	8 ...	18 V
- Supply current (IC unloaded)	typ.	3.4 mA
- Output LED current	max.	25 mA
- Reference voltage drift	typ.	0.2 mV/oC

1. Yellow LED output
2. Green LED output
3. Power supply
4. GND
5. VREF adj.
6. VREF adj.
7. VREF
8. Red LED output



PACKAGE MP-48 / TOP VIEW

* Preliminary data

βU 1011
ALARM GENERATOR

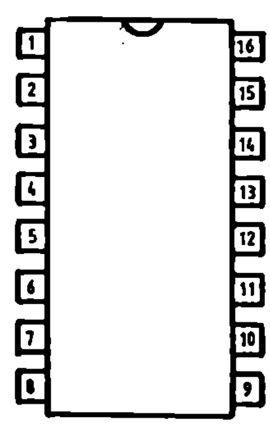
The βU 1011 is a general purpose alarm generator, used to detect and signalise dangerous events like : fire, smoke, liquid presence (absence), robberies.

This IC has a modular structure, containing : 2 voltage comparators connected through an AND-OR logic circuitry, 2 buffers with 100 mA output sink (source) capability, a 7.3 V ZENER reference and an operational amplifier.

Features

- Operating temperature	-25 ... +85	oC
- Storage temperature	-55 ... +125	oC
- Supply voltage	8 ... 20	V
- Low level output voltage at 100 mA	max. 2	V
- Op. amp. offset voltage	max. 10	mV
- Op. amp. open loop gain	typ. 100000	-

1. RC input
2. IP, programmable bias current
3. Oscillator output
4. 1-st treshold input
5. O.A. non-inverting input
6. O.A. inverting input
7. Alarm output
8. O.A. output
9. O.A. frequency compensation
10. V+ power supply
11. Buffer output
12. Buffer input
13. OR input
14. GND
15. 2-nd treshold input
16. ZENER reference



PACKAGE MP-117 / TOP VIEW

\$ βUTB 0010
\$ βUTB 0011
MONOLITHIC INTEGRATED SUBSCRIBER LINE INTERFACE CIRCUITS (SLIC)

The βUTB 0010 and βUTB 0011 are monolithic integrated circuits designed for use in telephone electronic central offices. The difference between βUTB 0010 and βUTB 0011 consists of a minor change in pin assignment. The linear section comprises a 2-to-4 wire converter, a receive buffer and emission booster. Gain is externally controlled by a semipot; loop current is limited and longitudinal induction is supressed. The digital section comprises a subscriber line sensoring pin that controls the bias circuitry reducing standby power when subscriber line is on hook or short-circuited; power down state is output TTL compatible. The Chip Select and Read / Write pins are TTL/CMOS compatible inputs, while Data is a three-state input/output pin, TTL/CMOS compatible, allowing direct interfacing on the control system data bus. There are two open collector outputs, B1 and B2, used to command two external high-voltage transistors driving the phone ring bell. B1 and B2 are controlled by the CS, RTW and D pins.

Features

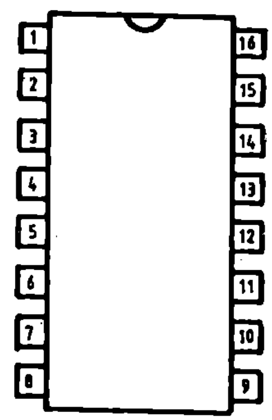
- Operating temperature .... -25 ... +70 oC
- Storage temperature .... -25 ... +125 oC
- Supply voltage .... max. +/-12 V
- Frequency response (200 Hz ... 4 kHz) ...... max. +/-0.5 dB
- Transhybrid rejection (f = 1 kHz) .... min. 30 dB
- Longitudinal rejection .... min. 45 dB
- Output capability B1, B2 .... min. 40 mA

\$ Preliminary data

βUTB 0010 ; βUTB 0011 (cont.)

βUTB 0010

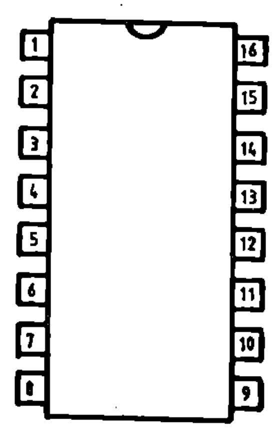
1. Open collector B2
2. GND-linear+digital
3. Receive input
4. L1-telephone line
5. L2-telephone line
6. CF-frequency compensation
7. Emission output
8. VA- negative power supply (linear)
9. PD-power down TTL output
10. VA+ positive power supply (linear)
11. VD-positive power supply (digital)
12. S-subscriber line sensor
13. CS-chip select
14. R/W-Read/Write
15. D-Data
16. Open collector B1



PACKAGE MP-117 / TOP VIEW

βUTB 0011

1. GND-digital
2. GND-linear
3. Receive input
4. L1-telephone line
5. L2-telephone line
6. CF-frequency compensation
7. Emission output
8. VA- negative power supply (linear)
9. PD-power down TTL output
10. VA+ positive power supply (linear)
11. VD-positive power supply (digital)
12. S-subscriber line sensor
13. CS-chip select
14. R/W-Read/Write
15. D-Data
16. Open collector B1



PACKAGE MP-117 / TOP VIEW

SAS 560S
SAS 570S
4-CHANNELS TOUCH SELECTORS

The SAS 560S and SAS 570S are integrated circuits used for channel touch - selectors in radio or TV receivers. Each channel has a high impedance input (100 nA sensitivity) and two outputs : a 12 V / 30 mA LAMP driver and a 33 V / 1 mA VARICAP diode driver.

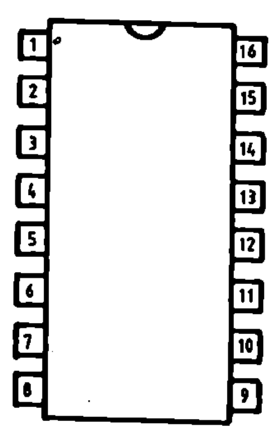
The integrated circuit SAS 560S includes a " POWER ON " preset function on the first channel.

Extended selectors, with 8, 12, 16 ... channels can be performed , using one SAS 560S and respectively 1, 2, 3 ... SAS 570S IC's.

Features

- Operating temperature	-25 ...	+70	oC
- Storage temperature	-25 ...	+125	oC
- Supply voltage (V7)	max.	35	V
- Supply current (I7)	typ.	4.5	mA
- Input sensitivity ("touch" current)	max.	300	nA
- LAMP output current	max.	55	mA
- VARICAP output current	max.	1.5	mA

1. GND
2. Extension line
3. VARICAP 4 output
4. VARICAP 3 output
5. VARICAP 2 output
6. VARICAP 1 output
7. VARICAP power supply
8. LAMP power supply
9. LAMP 1 output
10. Input 1
11. LAMP 2 output
12. Input 2
13. LAMP 3 output
14. Input 3
15. LAMP 4 output
16. Input 4



PACKAGE MP-117 / TOP VIEW

SAS 6804

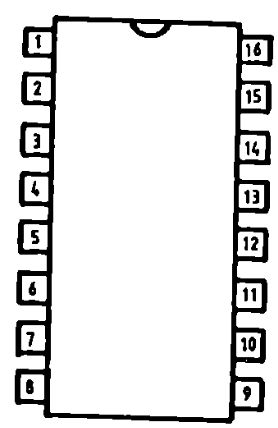
4-INDEPENDENT CHANNELS TOUCH SELECTOR

The SAS 6804 contains 4 independent " T " flip-flops, with " POWER ON " preset function. Each channel has a high impedance " touch " input (200 nA sensitivity) and two complementary 30 V / 30 mA outputs. The integrated circuit also contains two power supply pins : a " STAND - BY " V+ and an output stage V+ .

Features

- Operating temperature	-25 ...	+70 oC
- Storage temperature	-25 ...	+125 oC
- Supply voltage	max.	33 V
- Stand-by supply current	typ.	10 mA
- Input sensitivity	max.	100 nA
- Output current	max.	35 mA

1. GND
2. Input 1
3. Input 2
4. Input 3
5. Input 4
6. NC
7. Stand-by V+
8. Output stage V+
9. Q4 output
10. Q4N output
11. Q3 output
12. Q3N output
13. Q2 output
14. Q2N output
15. Q1 output
16. Q1N output



PACKAGE MP-117 / TOP VIEW

TAA 661

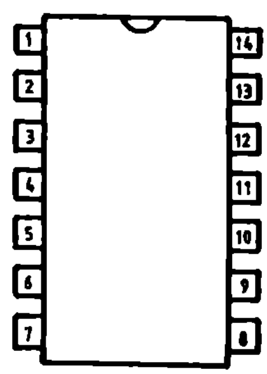
IF AMPLIFIER - LIMITER AND FM DETECTOR

The TAA 661 integrated circuit comprises a four stage IF amplifier-limiter, a balanced coincidence FM detector and a voltage regulator wich enables the circuit to work over a large supply voltage range. Demodulator twing requires just a simple single winding coil. This circuit is intended for use in TV receiver AFC stages.

Features

- Operating temperature		0 ... +70 oC
- Storage temperature		-25 ... +125 oC
- Supply voltage		6 ... 15 V
- Supply current (V+ = 12 V)	max.	30 mA
- AF output voltage (vi=10 mV ; V+=12V)	min.	700 mV
- Input limiting (threshold) voltage (-3 dB)	max.	250 uVrms
- AM rejection (vi=10 mV ; m=0.3)	min.	40 dB
- Total harmonic distorsion (vi=10 mV)	max.	2 %
- Input resistance	typ.	2.5 kohms
- Input capacitance	typ.	9 pF
- Output resistance	typ.	100 ohms

1. Deemphasis
2. Decoupling
3. NC
4. NC
5. Decoupling
6. Input
7. Decoupling
8. IF output
9. GND
10. NC
11. NC
12. Demodulator input
13. V+
14. AF output



PACKAGE TO-116 / TOP VIEW

Not recommended for new design

TBA 120T
TAA 120U
IF AMPLIFIER AND FM DETECTOR

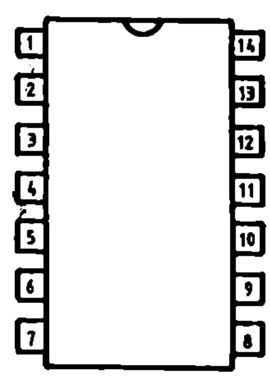
The TBA 120T and TBA 120U integrated circuits are intended for use into the sound stage of TV and FM radio receivers. They incorporate a limiting IF amplifier, balanced FM detector with coincidence, a voltage reference, AF preamplifier, DC operated volume control, constant level audio output for video recording/ playback and an auxiliary AF input for multistandard reception or video playback.

The TBA 120T uses ceramic filters, while TBA 120U is optimized for inductive tuning.

Features

- Operating temperature	-25 ...	+ 70 oC
- Storage temperature	-25 ...	+125 oC
- Supply voltage	max.	18 V
- Supply current	9 ...	18 mA
- Voltage applied to pin 5	max.	6 V
- Current (pin 4)	max.	5 mA
- Operating frequency range	0 ...	12 MHz
- Regulator voltage (i4 < 5 mA)	4 ...	6 V
- Volume control	min.	70 dB
- Sensitivity (-3 dB)	max.	60 uVeff
- AM rejection	min.	50 dB

1. GND
2. Bias decoupling
3. Recorder audio input
4. Volume control bias
5. Volume control
6. IF amplifier output
7. Phase shift network
8. Volume controlled audio output
9. Phase shift network
10. IF amplifier output
11. V+
12. Constant level audio output
13. IF input bias
14. IF input



PACKAGE TO-116 / TOP VIEW

TBA 530

RGB MATRIX PREAMPLIFIER

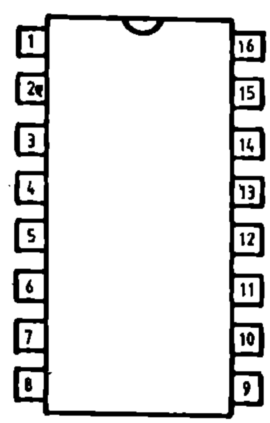
The TBA 530 is an integrated circuit for color TV receivers, incorporating a matrix preamplifier for RGB cathode or grid drive of the picture tube.

Due to its internal configuration, the integrated circuit has a close thermal matching between channels.

Features

- Operating temperature	-25 ...	+70 oC
- Storage temperature	-25 ...	+125 oC
- Supply voltage	max.	13.2 V
- Supply current	typ.	30 mA
- Current throw load resistances	max.	10 mA
- Output current	max.	50 mA
- Bias current	typ.	2.5 MA
- Ratio of gain of luminance amplifier to color amplifier (f = 0.5 MHz)	0.3 ...	1.1 -
- Input resistance of color difference amplifiers (f = 1 kHZ)	typ.	60 kohms
- Input capacitance of color difference amplifiers (f = 1 MHz)	typ.	3 pF
- Input resistance of luminance amplifier (f = 1 kHz)	typ.	20 kohms
- Input capacitance of luminance amplifier (f = 1 MHz)	typ.	10 pF

1. Load resistance R
2. Input - (R-Y)
3. Input - (G-Y)
4. Input - (B-Y)
5. Input Y
6. GND
7. Bias current
8. V+
9. Feedback B
10. Output B
11. Load resistance B
12. Feedback G
13. Output G
14. Load resistance G
15. Feedback R
16. Output R



PACKAGE MP-117 / TOP VIEW

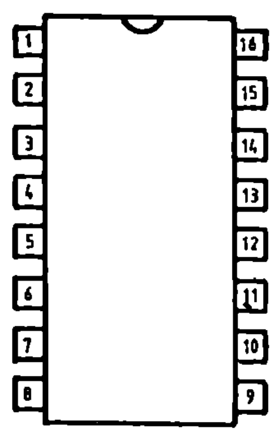
TBA 540
PAL REFERENCE COMBINATION

The TBA 540 is an integrated reference oscillator circuit for PAL TV receivers. The oscillator employs a quartz crystal and incorporates automatic phase and amplitude control. A synchronous demodulator is used to compare the phase and amplitude of the swinging burst ripple with the PAL flip-flop waveform and generates appropriate ACC (automatic color control) and identification signals. A high standard of noise immunity has been obtained by using synchronous demodulation.

Features

- Operating temperature	-25 ... +70	oC
- Storage temperature	-25 ... +125	oC
- Supply voltage	max. 13.2	V
- Supply current	typ. 33	mA
- R-Y reference signal output	typ. 1.5	Vpp
- Color killer output (color ON)	typ. 12	V
- Color killer output (color OFF)	max. 0.25	V
- ACC output signal range :		
- correct phase of PAL switch	0.2 ... 4	V
- incorrect phase of PAL switch	4 ... 11	V
- Voltage gain (G15-1)	typ. 4.7	-
- Voltage gain (G15-2 ; pins 13/14 shorted)	typ. 1.3	-
- Input resistance	typ. 3.4	kohms

1. Oscillator feedback output
2. Control stage output
3. V+
4. Reference signal output
5. Burst input
6. Reference signal input
7. Color killer output
8. H/2 input
9. ACC output
10. ACC level setting
11. ACC gain control
12. ACC level setting
13. \ Oscillator phase
14. / DC control
15. Oscillator feedback input
16. GND



PACKAGE MP-117 / TOP VIEW

TBA 570A
AM - FM RECEIVER

The 570A is an AM - FM receiver circuit for use in portable radios, radio recorders and car radios.

For AM receivers (long, medium and short waves), the integrated circuit includes : oscillator, mixer, 60 dB AGC controller, IF amplifier, AM detector, audio preamplifier and a driver for the output stage.

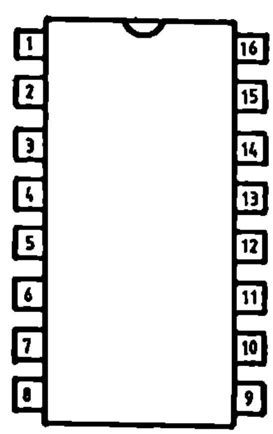
For FM receiver (ultrashort wave) the integrated circuit includes : limiter-amplifier IF, voltage regulator, audio preamplifier and an output stage.

The internal output stage can drive a final class B power amplifier up to 6 W, built with only two power transistors.

Features

- Operating temperature	-25 ...	+70	oC
- Storage temperature	-25 ...	+125	oC
- Power dissipation at 25 oC	max.	500	mW
- Supply voltage	3 ...	18	V
- Supply current without external components	max.	15	mA
- Signal to noise ratio (AM operation) at 26 dB	min.	36	uV
- AGC range (AM operation)	min.	60	dB
- FM-IF sensitivity	min.	140	uV
- Distorsions on the volume control potentiometer (AM operation)	max.	3	%

1. IF filter input
2. Mixer signal input
3. Mixer oscillator input
4. Oscillator external tank
5. AM detector output
6. Decoupling
7. FM limiter output
8. V+
9. Output GND
10. Compensation
11. Output
12. Preamplifier input
13. Feedback
14. AGC decoupling
15. IF amplifier input
16. GND



PACKAGE MP-117 / TOP VIEW

TBA 790T
β 790AT
β 790T
AF AMPLIFIERS

The TBA 790T is an AF power amplifier intended for use in radio receivers, car-radios, TV sets, tape recorders and in many other industrial applications up to 2.5 W output power.

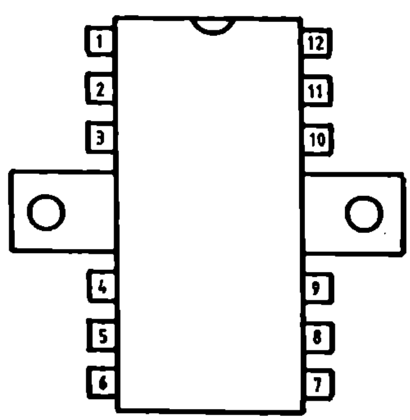
Due to a suitable configuration of internal circuit, the following advantages can be provided :

- open-loop gain is high enough to allow a great amount of feedback (low distortions) and keep a sufficient closed loop gain (high sensitivity) ;
- the differential preamplifier, fed from a controlled constant-current source, provides good immunity against power-supply ripple .

Features

- Operating temperature	-25 ...	+70	oC
- Storage temperature	-25 ...	+125	oC
- Supply voltage	6 ...	14	V
- Input voltage	-0.5 ...	9	V
- Repetitive peak output current	max.	1.5	A
- Voltage gain	43 ...	49	dB
- Minimum output power (THD=10%) - TBA 790T	min.	2.5	W
- β 790AT	min.	1.7	W
- β 790T	min.	1.3	W

1. V+
2. NC
3. NC
4. Bootstrap
5. Frequency compensation
6. Feedback
7. Preamplifier decoupling
8. Input
9. Preamplifier GND
10. Amplifier GND
11. NC
12. Output



(TABS must be grounded)

PACKAGE CB-155 / TOP VIEW

$ TBA 810AS
$ TBA 810S
AF AMPLIFIERS

The TBA 810 are monolithic integrated power amplifiers, designed for class B audio amplification with up to 7 W output power, in 12-lead quad in-line plastic package.

For TBA 810S is possible to use a part of the printed circuit board as heatsink. The cooling tabs of the TBA 810AS are flat and pierced so that an external heatsink can be easily attached.

Few external components are required for its main application as an power amplifier.

Features

- Operating temperature	0 ...	+ 70 oC
- Storage temperature	-25 ...	+125 oC
- Junction temperature	max.	+150 oC
- Supply voltage	4 ...	20 V
- Repetitive peak output current	max.	2.5 A
- Non-repetitive output current	max.	3.5 A
- Voltage gain (open loop)	typ.	80 dB
- Output power (@ 16 V/ 4 ohms)	typ.	7 W

- Internally thermal protection (TJ = 150 oC)

Electrical characteristics

(Vcc = 14.4 V, RL = 4 ohms, Rf = 56 ohms, TA = +25 OC)

- Quiescent output voltage	typ.	7.2 V
- Quiescent current	typ.	12 mA
- Output power (THD = 10 %)	typ.	6 W
- Voltage gain (closed loop)	34 ...	40 dB
- THD (Po = 50 mW ... 3 W)	typ.	0.3 %
- Input noise	typ.	2 uV
- Supply voltage rejection	typ.	38 dB

Thermal data

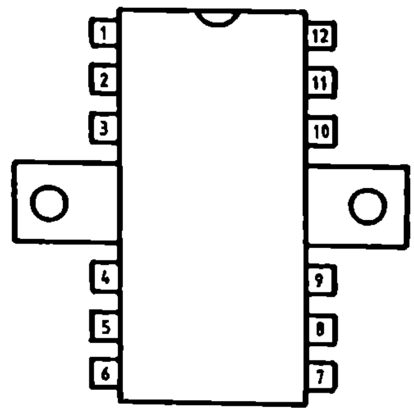
- Junction-tab thermal resistance	TBA 810S	max.	12 oC/W
	TBA 810AS	max.	10 oC/W
- Junction-ambient thermal resistance	TBA 810S	max.(*)	70 oC/W
	TBA 810AS	max.	80 oC/W

(*) With TABS soldered to printed circuit board with minimized copper area.

TBA 810AS ; TBA 810S (cont.)

TBA 810AS

1. V+
2. NC
3. NC
4. Bootstrap
5. Compensation
6. Feedback
7. Ripple rejection
8. Input
9. GND (substrate)
10. GND (output stage)
11. NC
12. Output

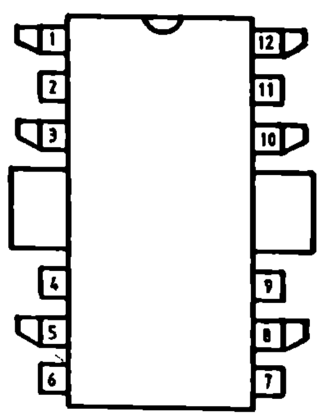


(TABS must be grounded)

PACKAGE CB-155 / TOP VIEW

TBA 810S

1. V+
2. NC
3. NC
4. Bootstrap
5. Compensation
6. Feedback
7. Ripple rejection
8. Input
9. GND (substrate)
10. GND (output stage)
11. NC
12. Output



(TABS must be grounded)

PACKAGE CB-109 / TOP VIEW

TBA 950/1
TBA 950/2

TELEVISION SIGNAL PROCESSING CIRCUITS

The TBA 950/1 and TBA 950/2 are monolithic integrated circuits for sync separation and line synchronization in black and white TV receivers with transistor output stages.

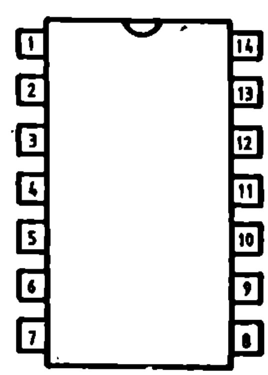
The circuit comprises the sync separator, the frame pulse integrator, the phase comparator of noise immunity, the line oscillator with frequency range limiter, a phase control circuit and the output stage.

The difference between these two versions is the output pulse duration.

Features

- Operating temperature	0 ... + 60 oC
- Storage temperature	-25 ... +125 oC
- Supply voltage	max. 18 V
- Supply current (pin 3)	max. 50 mA
- Input current (pin 5)	max. 2 mA
- Stabilized voltage	8.9 ...10.5 V
- Composite video input signal	1 ... 6 Vpp
- Output pulse duration ... TBA 950/1	22 ... 26 us
TBA 950/2	24 ... 28.5 us
- Free frequency oscillation	typ. 15,625 Hz
- Frequency pull-in range	min.+/- 500 Hz

1. GND
2. Lines output
3. V+ (stabilized voltage)
4. CP1 filter
5. Video input
6. Separator output
7. Frames output
8. Detector capacitor
9. Detector output
10. Flyback input
11. Phase control
12. CP2 filter
13. Internal oscillator
14. Oscillator control



PACKAGE TO-116 / TOP VIEW

TCA 150T
5 W - AF AMPLIFIER

The TCA 150T is an AF power amplifier intended for use in radio receivers, car-radios, TV sets, tape recorders and in many other industrial applications up to 5 W output power.

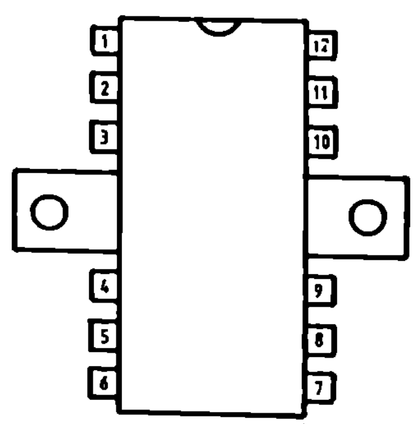
This integrated circuit is internally protected against overheating. Due to a suitable configuration of internal circuit, the following advantages can be provided :

- open-loop gain is high enough to allow a great amount of feedback (low distortions) and keep a sufficient closed loop gain (high sensitivity) ;
- the differential preamplifier, fed from a controlled constant-current source, provides good immunity against power-supply ripple .

Features

- Operating temperature	-25 ... +70	oC
- Storage temperature	-25 ... +125	oC
- Supply voltage	6 ... 18	V
- Input voltage	-0.5 ... 15	V
- Repetitive peak output current	max. 2.3	A
- Voltage gain	43 ... 49	dB
- Input equivalent noise voltage	max. 10	uV
- Distorsion coefficient	max. 1	%
- Minimum output power (THD </= 10 %)	typ. 5	W

1. V+
2. NC
3. NC
4. Bootstrap
5. Frequency compensation
6. Feedback
7. Preamplifier decoupling
8. Input
9. Preamplifier GND
10. Amplifier GND
11. NC
12. Output



(TABS must be grounded) PACKAGE CB-155 / TOP VIEW

TCA 640

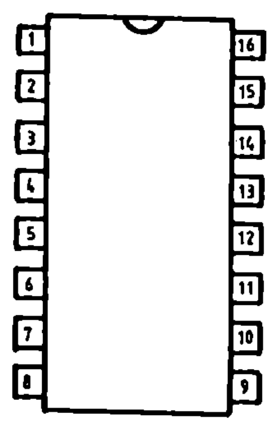
CHROMINANCE AMPLIFIER FOR PAL/SECAM DECODER

The TCA 640 is an integrated chrominance amplifier for either a SECAM decoder or a double standard PAL/SECAM decoder. Switching of the standard is performed internally and is controlled by an external applied DC signal. In addition to the chrominance amplifier, the circuit also incorporates a 7.8 kHz flip-flop, an identification circuit for SECAM, a blanking circuit,a burst gating circuit and a color killer detector. For PAL identification, the TBA 540 integrated circuit should be used.

Features

- Operating temperature	-25 ...	+70 oC
- Storage temperature	-25 ...	+125 oC
- Supply voltage	max.	13.2 V
- Supply current	typ.	37 mA
- Chrominance output signal (SECAM)	1.8 ...	2.3 Vpp
- Chrominance output signal (PAL)	425 ...	575mVpp
- Burst output PAl	typ.	1 Vpp
- Out ut resistance (SECAM identification) ...	typ.2.45	kohms
- Output current (SECAM identification)	typ.	2 mApp
- Square-wave output	2.5 ...	3.5Vpp
- Output color killer voltage (v16=4V-PAL)	max.	0.5 V
- Output color killer voltage (v16=1V-PAL)	min.	11.5 V
- Burst rejection	min.	40 dB

1. Chrominance output
2. GND
3. Chrominance input
4. PAL/SECAM selector
5. Chrominance input
6. Line identification input
7. Frame identification input
8. Color killer output
9. SECAM integrator
10. SECAM integrator
11. LC circuit SECAM (identifier)
12. H/2 output (7.5 kHz)
13. PAL burst output
14. V+
15. Chrominance output
16. ACC input



PACKAGE MP-117 / TOP VIEW

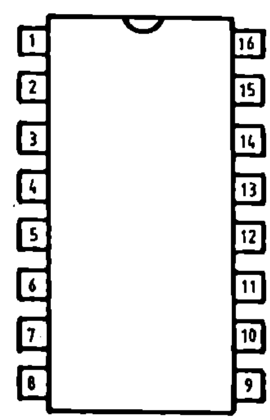
TCA 650
CHROMINANCE DEMODULATOR FOR PAL/SECAM DECODER

The TCA 650 is an integrated synchronous demodulator for both PAL and SECAM chrominance signals. Switching of the standard is performed internally, controlled by an external applied DC signal. In addition to the synchronous demodulator, which delivers color difference signals, the circuit also incorporates : a PAL matrix, to obtain separately the (R-Y) and (B-Y) components of the chrominance signal, a PAL switch which reverses the phase of the (R-Y) component of the chrominance signal, a SECAM switch which performs the separation of DR and DB chrominance signals and the SECAM limiter.

Features

- Operating temperature		-25 ...	+70 oC
- Supply voltage		max.	13.2 V
- Supply current		typ.	36 mA
- Gain from both inputs to pin 13 (PAL)		typ.	2.8 -
- Gain from both inputs to pin 15 (PAL)		typ.	3.1 -
- Gain difference from line to line (PAL)		max.	5 %
- Output signals DR, DB (SECAM)		1.6 ...	2.2 Vpp
- Color difference output signal (R-Y)		0.99 -	1.21 Vpp
- Color difference output signal (B-Y)		1.32 -	1.62 Vpp
- Square wave input signal		2.55 -	3.55 Vpp
- System switch input	PAL	min.	7 V
	SECAM	max.	1 V

1. Chrominance input
2. GND
3. Chrominance input
4. PAL/SECAM selector
5. (R-Y) reference input (SECAM)
6. (R-Y) reference input (PAL)
7. (B-Y) reference input (PAL)
8. (B-Y) reference input (SECAM)
9. (B-Y), DB input
10. Demodulated (B-Y) output
11. (R-Y), DR input
12. Demodulated (R-Y) output
13. (R-Y), DR output
14. V+
15. (B-Y), DB output
16. H/2 input (7.5 kHZ)



PACKAGE MP-117 / TOP VIEW

TCA 660

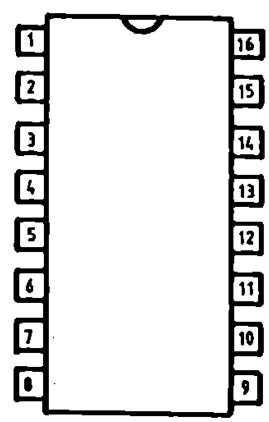
CONTRAST, SATURATION AND BRIGHTNESS CONTROL CIRCUIT FOR COLOR DIFFERENCE AND LUMINANCE SIGNALS

The TCA 660 is an integrated circuit performing the control functions of contrast, saturation and brightness in color TV sets. The contrast is controlled by three tracking electronic potentiometers, one for the luminance signal (Y), and the two others for the (R-Y) and (B-Y) color difference signals. In addition, two tracking electronic potentiometers provide the saturation control of the color difference signals (R-Y) and (B-Y). The brightness is controlled by varying the black level of the luminance signal at the output. An inverting amplifier is also included for external matrixing of the (G-Y) signal.

Features

- Operating temperature .... -25 ... +70 oC
- Storage temperature .... -25 ... +125 oC
- Supply voltage .... max. 13.2 V
- Supply current .... typ. 25 mA
- Black level variation with brightness setting 2.2 ... 5.2 V
- Bandwidth of luminance signal at 6 MHz .... min. -3 dB
- (R-Y) output signal .... typ. 1.25 Vpp
- (B-Y) output signal .... typ. 1.60 Vpp
- Luminance (Y) output signal .... typ. 3 Vpp
- Gain of the (G-Y) amplifier .... -1 ... 0.5 dB

1. Luminance output
2. Clamping pulse input
3. Blanking pulse input
4. GND
5. Contrast control
6. Saturation control
7. -(B-Y) output
8. -(B-Y) input
9. -(R-Y) input
10. -(R-Y) output
11. -(G-Y) input
12. -(G-Y) output
13. V+
14. Brightness control
15. Storage capacitor
16. Luminance input



PACKAGE MP-117 / TOP VIEW

TDA 440P

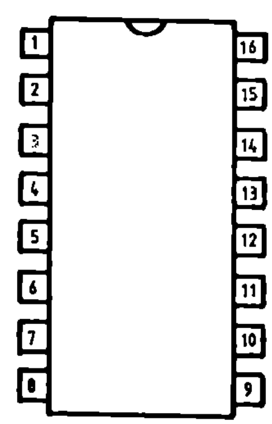
VIDEO IF AMPLIFIER

TDA 440 is a video IF amplifier for B/W TV sets. This integrated circuit has the following functions incorporated : Gain controlled video IF amplifier, sinchronous demodulator, preamplifier with negative and positive video outputs, gated AGC section, internal voltage regulator.

Features

- Operating temperature	-25 ... +70 oC
- Storage temperature	-25 ... +125 oC
- Supply voltage	10 ... 15 V
- Supply current (I14 = 40 mA)	15 ... 25 mA
- White level control voltage	-1 ... 3
- DC video output current	max. 5 mA
- Regulated voltage (I14 = 40 mA)	5.5 ... 6.5 V
- Negative video DC output voltage (I14 = 40 mA / R10 = 0 ... 2.5 kohms)	4.8 ... 6.4 V
- Negative video output current	typ. 3.2 mA
- Positive video DC output voltage (I14 = 40 mA / V11 = 5.5 V)	typ. 5.6 V
- Video bandwith at - 3 dB (I14 = 40 ma / V7 = 0 V / V11 = 5.5 V / V16 = 9 mV fo = 38 MHz)	min. 6.5 MHz

1. IF input
2. DC feedback
3. GND
4. AGC internal filter
5. Tuner AGC output
6. Tuner AGC threshold control
7. Gate pulse
8. Tank circuit
9. Tank circuit
10. White level control
11. Negative video output
12. Positive video output
13. V+
14. Polarisation
15. DC feedback
16. IF input



PACKAGE MP-117 / TOP VIEW

TDA 655

SPEED REGULATOR FOR SMALL DC MOTORS

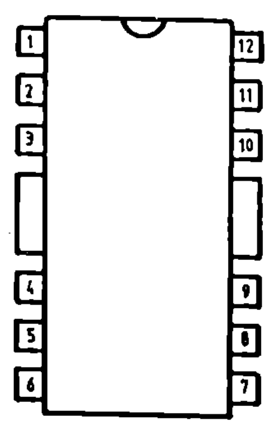
The TDA 655 is an integrated circuit intended to be used for speed regulation of permanent magnet DC motors in phonographs and tape recorders. This integrated circuit contents following stages : a voltage reference, an error amplifier, an output power stage and therm il protection.

Due to the internal cc ifiguration for such applications is required only three external components namelly : one capacitor for frequency compensation, one resistor and one potentiometer for speed adjustment. Pin TABS is internal connected to the supply voltage ground.

Features

- Operating temperature	0 ...		+70	oC
- Storage temperature	-25 ...		+125	oC
- Supply voltage	+3.8 ...		+18	V
- Output peak current (non-repetitive)	max.		1.8	A
- Voltage on pins	max.		< V+	V
- Internal reference voltage	1.2 ...		1.8	V
- Regulator supply current	4 ...		12	mA
- Amplifier inut current	typ.		4	uA
- Sped regulation versus load	typ.		0.6	%
- Speed regulation coefficient versus supply voltage	max.		+/-0.6	%

1. Non-inverting input
2. Refference
3. Refference (R6)
4. Refference (R5)
5. Refference
6. Compensation
7. Output (R2)
8. Output (R1)
9. Output
10. GND
11. V+
12. Inverting input



PACKAGE CB-109B / TOP VIEW

TDA 1028
4 CHANNELS - 2 INPUTS SIGNAL - SOURCES SWITCH

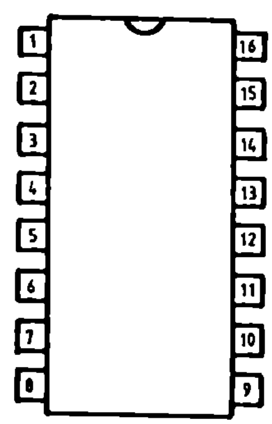
The TDA 1028 is a quadruple operational amplifier connected as an impedance converter. Each amplifier has 2 switchable inputs which are protected by clamping diodes. The input currents are independent of the switch position and the outputs are short-circuit protected.

The device is intended as an electronic 4 - channel signal - source in AF amplifiers.

Features

Operating temperature	-25 ...	+70 oC
- Storage temperature	-25 ...	+125 oC
- Supply voltage	max.	23 V
- Supply current	typ.	2.5 mA
- Input signal handling	max.	6 Vrms
- Input current	max.	20 mA
- Switch control current	max.	50 mA
- Input offset voltage of switched-on input	max.	10 mV
- DC input voltage	3 ...	19 V
- Supply voltage rejection ratio (Ri<10kohms) ..	typ.	100 uV/V
- Voltage gain of a switched-on amplifier	typ.	1.0 -
- Output current	min.	5 mA
- Frequency limit of the output voltage	typ.	1.3 MHz
- Slew rate	typ.	2 V/us

1. Control 1 ; 2
2. Input 1B
3. Input 1A
4. Output 1
5. Output 3
6. Input 3A
7. Input 3B
8. Control 3 ; 4
9. V+
10. Input 4B
11. Input 4A
12. Output 4
13. Output 2
14. Input 2A
15. Input 2B
16. GND



PACKAGE MP-117 / TOP VIEW

TDA 1029

2 CHANNELS - 4 INPUTS SIGNAL - SOURCES SWITCH

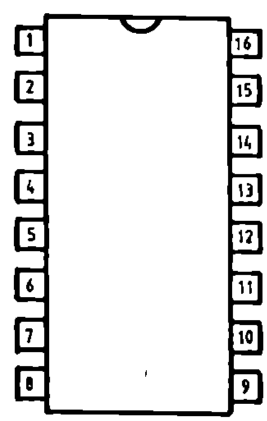
The TDA 1029 is a dual operational amplifier connected as an impedance converter. Each amplifier has 4 switchable inputs which are protected by clamping diodes. The input currents are independent of the switch position and the outputs are short-circuit protected.

The device is intended as an electronic 2 - channel signal - source in AF amplifiers.

Features

- Operating temperature	-25 ...	+70 oC
- Storage temperature	-25 ...	+125 oC
- Supply voltage	max.	23 V
- Supply current	typ.	4.0 mA
- Input signal handling	max.	6 Vrms
- Input current	max.	20 mA
- Switch control current	max.	50 mA
- Input offset voltage of switched-on input	max.	10 mV
DC input voltage	3 ...	19 V
- Supply voltage rejection ratio (Ri<10kohms)	typ.	100 uV/V
- Voltage gain of a switched-on amplifier	typ.	1.0 -
- Output current	min.	5 mA
- Frequency limit of the output voltage	typ.	1.3 MHz
- Slew rate	typ.	2 V/us

1. Input 1A
2. Input 1B
3. Input 1C
4. Input 1D
5. Input 2A
6. Input 2B
7. Input 2C
8. Input 2D
9. Output 2
10. Reference voltage
11. Control 4
12. Control 3
13. Control 2
14. V+
15. Output 1
16. GND



PACKAGE MP-117 / TOP VIEW

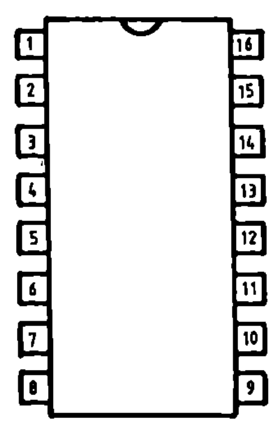
TDA 1046
AM DEMODULATOR AMPLIFIER

The TDA 1046 is an AM demodulator-amplifier operating at a carrier frequency up to 30 MHz. The integrated circuit is intended to be used in HI-FI radio receivers and incorporates the following stages : gain controlled RF and IF amplifiers, oscillator, mixer, symetrical AM demodulator, active filter, low frequency amplifier.

Features

- Operating temperature	-25 ...	+70 oC
- Storage temperature	-25 ...	+125 oC
- Supply voltage	max.	18 V
- Supply current	15 ...	25 mA
- Reference voltage (I16 =< 3 mA)	3 ...	3.8 V
- Oscillator frequency	0.5 ...	31 MHz
- Oscillator output signal	max.	350 mVrms
- HF signal frequency	0 ...	30 MHz
- IF signal frequency	0.2 ...	9 MHz
- RF amplifier AGC range	min.	40 dB
- IF amplifier AGC range	min.	45 dB
- Output harmonic distorsion (m = 80 %)	max.	1 %
- Output harmonic distorsion (m = 30 %)	max.	0.6 %
- Noise to signal ratio (m = 30 % / m = 0 %)	typ.	53 dB
- Available field indicator current	1 ...	1.5 mA

1. GND
2. IF input
3. IF input
4. IF ouput
5. AGC / IF
6. UDIO output
7. V+
8. Mixer output
9. RF input
10. RF input
11. Field indicator
12. RF output
13. Mixer input
14. AGC / RF
15. LC oscillator circuit
16. 3.3 V stabilized voltage



PACKAGE MP-117 / TOP VIEW

TDA 1170S
VERTICAL DEFLECTION SYSTEM

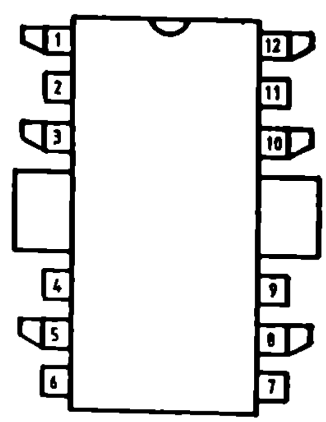
The TDA 1170S is a monolithic integrated circuit intended to be used for vertical deflection in black and white and color TV sets.

The circuit incorporates the following stages : synchronization circuit, oscillator and ramp generator, high power gain amplifier, flyback generator and a voltage regulator.

Features :

- Operating temperature	-25 ...	+70	oC
- Storage temperature	-25 ...	+125	oC
- Supply voltage	10 ...	35	V
- Flyback peak voltage	max.	60	V
- Synchronization current	max.	+/- 20	mA
- Non-repetitive output peak current	max.	2	A
- Stabilized voltage	typ.	6.5	V
- Voltage drift with supply voltage	typ.	1.5	mV/V
- Voltage drift with temperature	typ.	0.25	mV/oC
- Oscillator bias current	max.	1	uA
- Oscillator sawtooth voltage	typ.	2.4	Vpp
- Synchronization input current	min.	500	uA
- Oscillator free running frequency	43 ...	52	Hz
- Amplifier input bias curent	max.	1	uA
- Flyback time	max.	0.8	ms

1. Ramp output
2. V+
3. Flyback generator
4. Power output
5. Power amplifier DC supply
6. Regulated voltage
7. Amplitude control
8. Synchronization input
9. RC oscillator
10. Power amplifier input
11. Frequency compensation
12. Ramp generator



(TABS must be grounded)

PACKAGE CB-109 / TOP VIEW

TDA 1170SH
VERTICAL DEFLECTION SYSTEM

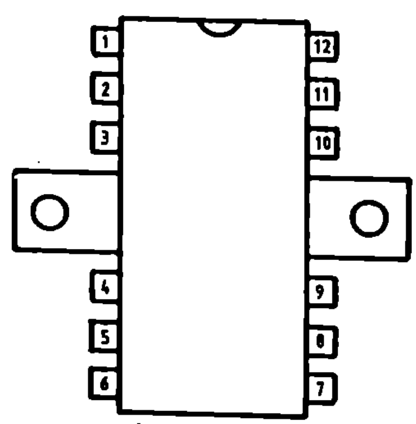
The TDA 1170SH is a monolithic integrated circuit intended to be used for vertical deflection in black and white and color TV sets.

The circuit incorporates the following stages : synchronization circuit, oscillator and ramp generator, high power gain amplifier, flyback generator and a voltage regulator.

Features

- Operating temperature	-25 ...	+70 oC
- Storage temperature	-25 ...	+125 oC
- Supply voltage	10 ...	35 V
- Flyback peak voltage	max.	60 V
- Synchronization current	max. +/-	20 MA
- Non-repetitive output peak current	max.	2 A
- Stabilized voltage	typ.	6.5 V
- Voltage drift with supply voltage	typ.	1.5 mV/V
- Voltage drift with temperature	typ.	0.25 mV/oC
- Oscillator bias current	max.	1 uA
- Oscillator sawtooth voltage	typ.	2.4 Vpp
- Synchronization input current	min.	500 uA
- Oscillator free running frequency	43 ...	52 Hz
- Amplifier input bias curent	max.	1 uA
- Flyback time	max.	0.8 ms

1. Ramp output
2. V+
3. Flyback generator
4. Power output
5. Power amplifier DC supply
6. Regulated voltage
7. Amplitude control
8. Synchronization input
9. RC oscillator
10. Power amplifier input
11. Frequency compensation
12. Ramp generator



(TABS must be grounded)

PACKAGE CB-155 / TOP VIEW

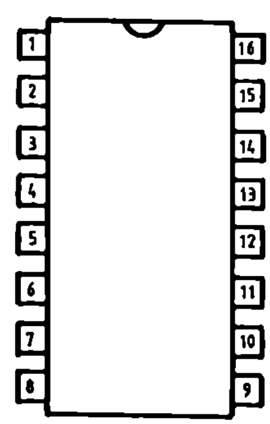
βA 758
βA 758C
PHASE LOCKED LOOP FM STEREO MULTIPLEX DECODERS

The βA 758 and βA 758C are monolithic Phase Locked Loop stereo multiplex decoders. Internal functions include automatic mono- stereo switching and drive for an external lamp to indicate stereo mode operation. These circuits use a low number of external components (no external coils are required). There is only one control to adjust : a potentiometer to set the oscillator frequncy.

Features

- Operating temperature	0 ...	+70 oC
- Storage temperature	-25 ...	+125 oC
- Supply voltage	max.	16 V
- Supply current (Lamp OFF)	max.	35 mA
- Voltage at lamp driver pin (Lamp OFF)	max.	16 V
- Available lamp current	max.	100 mA
- Voltage supply ripple rejection	typ.	45 dB
- Channel separation	min.	30 dB
- Channel balance	max.	1.5 dB
- Voltage gain	0.5 ...	1.5 -
- Total harmonic distorsion	typ.	0.4 %
- Capture range	2 ...	6 %fo
- 38 kHz rejection	min.	20 dB
- 19 kHz rejection	min.	20 dB

1. Composite signal input
2. Amplifier output
3. Left deemphasis
4. Left output
5. Right output
6. Right deemphasis
7. Lamp indicator
8. GND
9. Stereo switch filter
10. Stereo switch filter
11. Pilot signal 19 kHz
12. Detector input
13. PLL filter
14. PLL filter
15. RC oscillator
16. V+



PACKAGE MP-117 / TOP VIEW

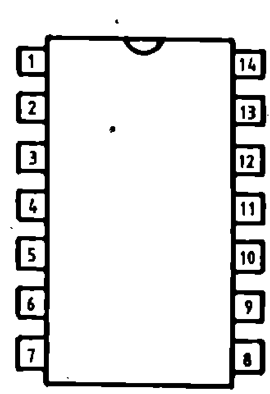
βE 565
PHASE LOCKED LOOP CIRCUIT

The βE 565 is a general purpose phase locked loop integrated circuit, containing a stable, voltage controlled oscillator (VCO) for low distorsion FM demodulation, and a double balanced phase detector (FD) with good carrier suppression. The VCO frequency is set with an external resistor and capacitor, and a tuning range of 10 : 1 can be obtained with the same capacitor. The characteristics of the closed loop system (bandwidth , response speed, capture and pull in range) can be adjusted with an external resistor and capacitor.

Features

- Operating temperature	0 ...	+70 oC
- Storage temperature	-55 ...	+125 oC
Supply voltage	max.	+/- 16 V
- Supply current	max.	12.5 mA
Output offset voltage	max.	200 mV
- Triangle wave output voltage .(fo=10 kHz)...	min.	2 Vpp
Square wave output voltage ...(fo=10 kHz)...	min.	4.7 Vpp
- VCO maximum operating frequency (Co=2.7 pF)...	typ.	500 kHz
- Demodulated output voltage (fo = 10 +/-1 kHz)	min.	200 mVpp
VCO output impedance	typ.	5 kohms
- Square wave rise time	typ.	20 ns
Square wave fall time	typ.	50 ns

1. V-
2. Input
3. Input
4. VCO output
5. Phase detector ref. input
6. Vref
7. VCO control voltage
8. fo resistance
9. fo capacitor
10. V+
11. NC
12. NC
13. NC
14. NC



PACKAGE TO-116 / TOP VIEW

βM 381A
βM 381

LOW NOISE DUAL PREAMPLIFIERS

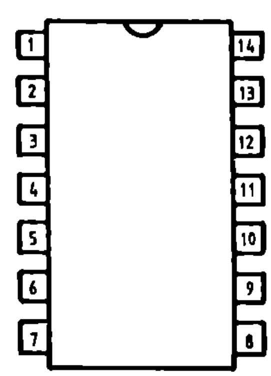
The integrated circuits βM 381A, βM 381 are low noise dual preamplifiers. Each amplifier is completely independent, with individual internal power supply decoupler-regulator, providing 120 dB supply rejection ratio and 60 dB channel separation.

Either differential input or single ended input configurations can be selected. Each amplifier is internally compensated with the provision of additional external compensation for narrow band applications.

Features

- Operating temperature		-25 ...	+70 oC
- Storage temperature		-25 ...	+125 oC
- Supply voltage		max.	40 V
- Supply current (V+ = 9 ... 40 V)		typ.	10 mA
- Voltage gain (differential input)		typ.	160000 -
- Voltage gain (single ended)		typ.	320000 -
- Input current (negative input)		typ.	0.5 uA
- Output source current		typ.	8 mA
- Output sink current		typ.	2 mA
- Unity gain bandwidth		typ.	15 MHz
- Total equivalent input noise	βM 381A	max.	0.7 uVrms
	βM 381	max.	1.0 uVrms

1. Input 1+
2. Input 1-
3. Input single ended 1-
4. GND
5. Compensation A1
6. Compensation B1
7. Output 1
8. Output 2
9. V+
10. Compensation B2
11. Compensation A2
12. Input single ended 2-
13. Input 2-
14. Input 2+



PACKAGE TO-116 / TOP VIEW

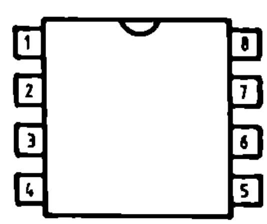
βM 387AN
βM 387N
LOW NOISE DUAL PREAMPLIFIERS

The integrated circuits βM 387AN, βM 387N are low noise dual preamplifiers. Each amplifier is completely independent, with individual internal power supply decoupler-regulator, providing 110 dB supply rejection ratio and 60 dB channel separation. The amplifiers are internaly compensated for voltage gain exceeding 10.

Features

– Operating temperature		–25 ...	+70	oC
– Storage temperature		–25 ...	+125	oC
– Supply voltage	βM 387AN ...	max.	40	V
	βM 387N ...	max.	30	V
– Voltage gain (open loop)		typ.	160000	–
– Supply current		typ.	10	mA
– Input current (negative input)		typ.	0.5	uA
– Output source current		typ.	8	mA
– Output sink current		typ.	2	mA
– Unity gain bandwidth		typ.	15	MHz
– Input voltage (linear operation)		max.	300	mVrms
– Channel separation (f = 1 kHz)		typ.	40	dB
– Supply rejection ratio (f = 1 kHz)		typ.	110	dB
– Total equivalent input noise	βM 387AN ...	max.	0.9	uVrms
	βM 387N ...	max.	1.2	uVrms

1. Input 1+
2. Input 1–
3. GND
4. Output 1
5. Output 2
6. V+
7. Input 2–
8. Input 2+



PACKAGE MP-48 / TOP VIEW

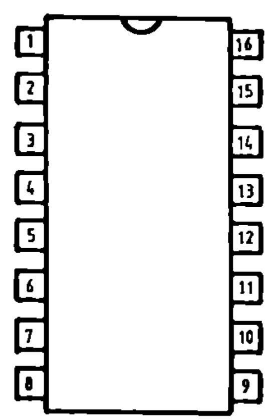
βM 3189
FM-IF HIGH FIDELITY SYSTEM

The βM 3189 is a monolithic integrated circuit that provides all the functions of a comprehensive FM-IF system. The block diagram of this circuit includes a three stage FM-IF amplifier-limiter configuration with level detectors for each stage, a double balanced quadrature FM detector and an audio amplifier that features the optional use of a muting (squelch) circuit. The advanced circuit design of the IF system includes desirable features such as programmable delayed AGC for the RF tuner, an AFC drive circuit and an output signal to drive a tuning meter and/or provide stereo switching logic. This IC is ideal for HI-FI operation.

Features

- Operating temperature	-25 ...	+70 oC
- Storage temperature	-25 ...	+125 oC
- Supply voltage	9 ...	16 V
- Supply current	20 ...	44 mA
- Input limiting voltage (-3 dB point)	max.	25 uV
- Recovered AF voltage (rms)	325 ...	625 mV
- Single tuned total harmonic distorsions	max.	1 %
- Double tuned total harmonic distorsions	typ.	0.1 %
- Signal plus noise-to-noise ratio	min.	65 dB
- AM rejection	min.	45 dB

1. IF input
2. Decoupling
3. Decoupling
4. RF GND
5. MUTING input
6. AUDIO output
7. AFC output
8. IF output
9. Detector input
10. Reference voltage
11. V+
12. MUTING output
13. Field indicator
14. GND
15. AGC output
16. AGC input



PACKAGE MP-117 / TOP VIEW

$ βMC 1309A
$ βMC 1309

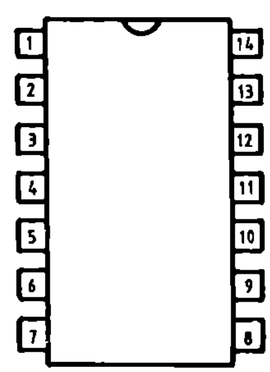
PHASE LOCK LOOP STEREO DECODERS

The βMC 1309A and βMC 1309 are monolithic integrated circuits using IIL and linear bipolar technology. They perform the function of a stereo signal demodulator - decoder. Internal functions include automatic mono - stereo mode swiching and drive for an external lamp to indicate stereo mode operation. The decoder uses a low number of external components. It has only one control to adjust : a potentiometer to set oscillator frequency. No external coils are required.

Features

- Operating temperature		-25 ...	170 oC
- Storage temperature		-25 ...	+125 oC
- Supply voltage	βMC 1309A ...	4.5 ...	16 V
	βMC 1309 ...	6.0 ...	16 V
- Channel balance		max.	1 dB
- Monaural gain		typ.	0.9 dB
- Channel separation		typ.	40 dB
- Capture range		min.	+/- 7 %

1. V+
2. Input
3. Amplifier output
4. Left channel output
5. Right channel output
6. Lamp indicator
7. GND
8. Swich filter
9. Swich filter
10. 19 kHz output
11. Phase & amplitude detector input
12. Loop filter
13. Loop filter
14. Oscillator RC network



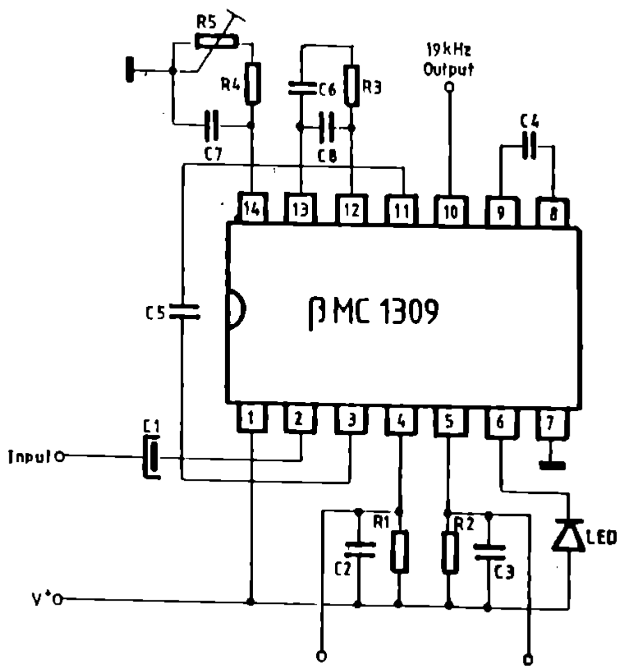
PACKAGE TO-116 / TOP VIEW

$ Preliminary data

βMC 1309A ; βMC 1309 (cont)

Typical application and test circuit

C1 = 2 uF	R1 = 3.3 kohms
C2 = 22 nF	R2 = 3.3 kohms
C3 = 22 nF	R3 = 1 kohms
C4 = 0.22 uF	R4 = 16 kohms
C5 = 47 nF	R5 = 5 kohms
C6 = 0.47 uF	
C7 = 470 pF	
C8 = 0.22 uF	



$ βTDA 1083

AM - FM RADIO SYSTEM

The βTDA 1083 integrated circuit, performing all radio functions except for the VHF tunning, is well-suited for low-cost applications requiring a minimum parts count and high performance standards.

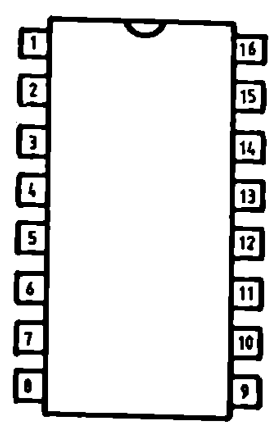
In the AM mode of operation, the device is a complete, single conversion, superheterodyne broadcast or shortwave receiver including AGC and envelope peak detection.

In the FM mode of operation, the βTDA 1083 operates as a high-gain IF amplifier / limiter and phase shift detector. Switching between modes is accomplished with a simple DC switch.

Features

- Operating temperature	-25 ...	+70 oC
- Storage temperature	-25 ...	+125 oC
- Supply voltage	2 ...	12 V
Input limiting threshold	max.	40 uV
- Sensitivity	typ.	10 uV
- output distorsion	max.	2 %p
- AM rejection	min.	40 dB

1. IF decoupling
2. IF input
3. GND
4. Mixer output
5. Oscillator circuit
6. Input
7. AM-decoupling
8. Demodulator output
9. Audio input
10. Audio feedback
11. Audio GND
12. Audio output
13. Vcc
14. Demodulator circuit
15. Demodulator circuit
16. AGC / AFC voltage



PACKAGE MP-117 / TOP VIEW

$ Preliminary data

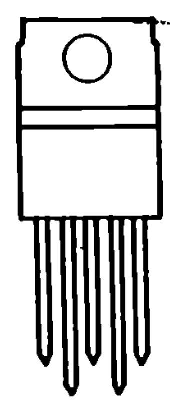
$ βTDA 2030
14 W HI - FI AUDIO POWER AMPLIFIER

The βTDA 2030 is a monolithic integrated circuit in pentawatt package, intended for use as a low frequency class AB amplifier. Typically is provides 14 W output power (d = 0.5 %) at +/- 14 V / 4 ohms ; at 14 V the guaranted output power is 12 W on a 4 ohms load and 8 W on a 8 ohms. The βTDA 2030 provides high output current and has very low harmonic and cross-over distorsions. Further the device incorporates a short circuit protection system comprising an arrangement for automatically limiting the dissipated power so as to keep the working poit of the output transistors within their safe operating area. A conventional thermal shut-down system is also included.

Features

- Operating temperature	-25 ...	+70 oC
- Storage temperature	-25 ...	+125 oC
- Supply voltage	max.	+/-18 V
- Quiescent drain current	max.	40 mA
- Input voltage	max.	+/-18 V
- Differential input voltage	max.	+/-15 V
- Output peak current (internally limited) ...	max.	3.5 A
- Distorsion	max.	0.5 %

1. Non-inverting input
2. Inverting input
3. V-
4. Output
5. V+



PACKAGE PENTAWATT / FRONT VIEW

$ Preliminary data

\$ βTDA 2581
\$ βTDA 2582

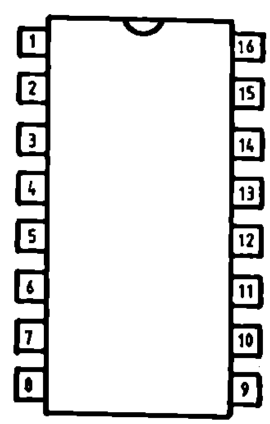
CONTROL CIRCUITS FOR SPMS

The βTDA 2581 and βTDA 2582 are monolithic integrated circuits for controlling switched-mode power supplies (SMPS) which are provided with the drive for the horizontal deflection stage.

Features

- Operating temperature	-25 ...	+70 oC
Storage temperature	-55 ...	+125 oC
Supply voltage	typ.	12 V
- Supply current	typ.	15 mA
Input horizontal drive pulse	typ.	11 Vpp
- Input flyback pulse	typ.	5 Vpp
- External reference voltage	typ.	6.1 V
- Duty factor of output pulse	0...	98+/-0.8 %
Output voltage at IO < 20 mA (peak value)	typ.	11.8 V
- Output current (peak value)	max.	40 mA

1. Phase detector output
2. Flyback pulse position input
3. Reference frequency input
4. Re-start count capacitor
   remote control input
5. Slow start and transfer
   characteristic for low feedback
6. Over current protection input
7. Over-voltage protection input
8. Feedback voltage input
9. Positive supply
10. Reference input
11. Output
12. Maximum duty factor
    adjustment / smoothing
13. Oscillator timing network
14. Reactance stage
    reference voltage
15. Reactance stage input
16. Negative supply (GND)



PACKAGE MP-117 / TOP VIEW

\$ Preliminary data

βU 1014N

LOW VOLTAGE AM RECEIVER

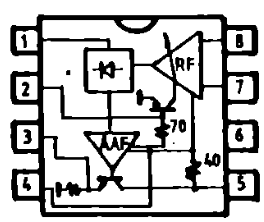
The βU 1014N is a dedicated circuit for use in AM portable radio receivers with typical voltage supply 1.5 V. The circuit consists of :

- RF (IF) amplifier with AGC
- AM demodulator
- Audio frequency amplifier with internal fixed gain (at 30 dB)

Features

- Supply voltage	1 ...	2 V
- Supply current (RL = 100 ohms)	max.	10 mA
- Operating frequency	max.	2 MHz
- RF input impedance	min.	300 kohms
- Sensibility (see Note 1)	max.	1 mV
- AGC efficiency (see Note 2)	typ.	30 dB
- RF input amplitude	max.	30 mV

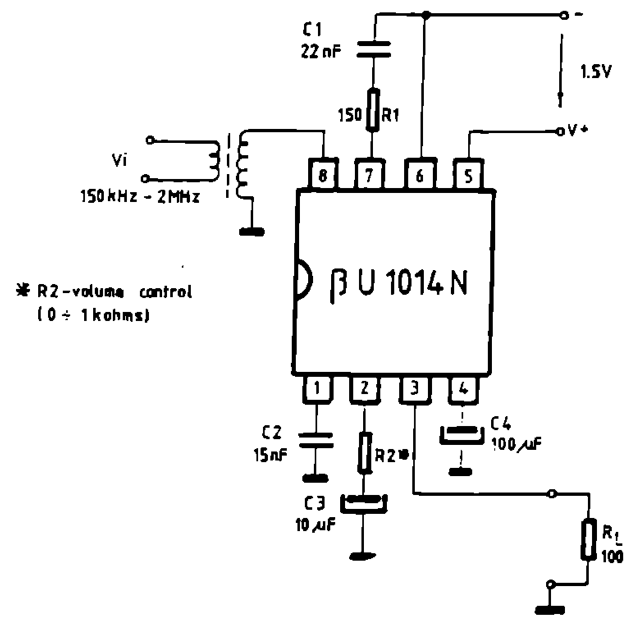
1. AAF input
2. AAF decoupling / AGC
3. Output AF
4. V+ decoupling
5. V+
6. GND
7. RF (IF) amplifier decoupling
8. RF (IF) input



PACKAGE MP-48 / TOP VIEW

βU 1014N (cont.)

Typical application



Note 1 : fi = 1 MHZ; fm = 1 kHz; m = 30 %; vo3 > 60 mV
Note 2 : for 6 dB nonuniformity at AF output

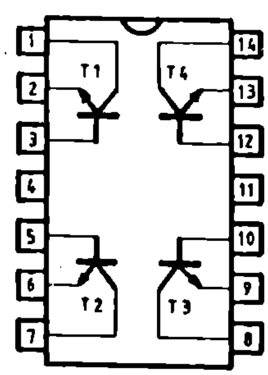
β 340D
β 342D
TRANSISTOR ARRAYS

The β 340D and β 342D each consist of four general purpose silicon n-p-n transistors on a common monolithic substrate. The transistors are well suited to a wide variety of low power applicatons in the DC through VHF range. They may be used as discrete transistors in conventional circuits, however, in adition, they provide the very significant inherent integrated circuit advantages of close electrichal and thermal matching.

Features

– Operating temperature	-25 ...	+70	oC
– Storage temperature	-25 ...	+125	oC
– Collector-emitter breakdown voltage (VCEO) ...	min.	15	V
– Collector-base breakdown voltage (VCBO)	min.	20	V
– Collector-substrate breakdown voltage (VCSS) .	min.	30	V
– hFE (transistor T1) ..... β 340Dc, β 342Dc ...	56 ...	140	–
β 340Dd, β 342Dd ...	112 ...	280	–
β 340De, β 342De ...	224 ...	560	–
– hFE matching	0.8 ...	1.25	–
– Base-emitter voltage matching ... β 340D	max.	5	mV
– Base current	max.	5	mA
– Collector current	max.	10	mA

1. C1
2. E1
3. B1
4. Substrate
5. B2
6. E2
7. C2
8. C3
9. E3
10. B3
11. Substrate
12. B4
13. E4
14. C4



PACKAGE TO-116 / TOP VIEW

βA 726

TEMPERATURE CONTROLLED TRANSISTOR ARRAY

The βA 726 is an integrated circuit which consists of a transistor array and a circuit built to control the temperature of the common monolithic substrate. The internal circuit for thermal control mentains the temperature of the chip independently from the variations of ambient temperature. Two n-p-n independent transistors and a mirror of current are well suited to a wide variety of applications, providing the very significant inherent integrated circuit advantages of close electrichal and thermal matching.

Features

For the integrated circuit

- Operating temperature	0 ...	+70	oC
- Storage temperature	-55 ...	+125	oC
- Power dissipation	max.	500	mW

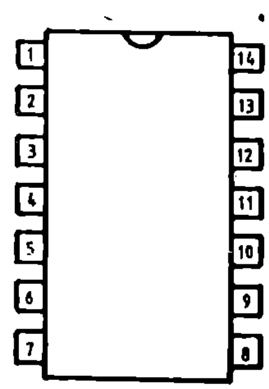
For each transistor

- Collector-emitter voltage	max.	40	V
- Collector-base voltage	max.	40	V
- Emitter-base voltage	max.	5	V
- Collector current	max.	5	mA
- Base current	max.	2	mA
- Current gain of one trasnsistor	50 ...	600	-

For the thermostat

- Supply current	10 ...	20	mA

1. B1
2. NC
3. B2
4. E2
5. C2
6. V-
7. NC
8. R adj.
9. V+
10. C1
11. E1
12. E3,E4
13. B3,B4,C4
14. C3



PACKAGE TO-116 / TOP VIEW

Not recommended for new design

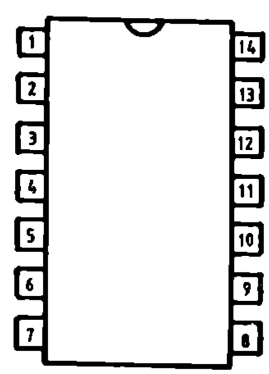
βA 726X
TEMPERATURE CONTROLLED TRANSISTOR ARRAY

The βA 726X is an integrated circuit which consists of a transistor array and a circuit built to control the temperature of the common monolithic substrate. The internal circuit for thermal control mentains the temperature of the chip independently from the variations of ambient temperature. Two n-p-n independent transistors are well suited to a wide variety of applications, providing the very significant inherent integrated circuit advantages of close electrichal and thermal matching.

Features

For the integrated circuit		
- Operating temperature	0 ... +70	oC
- Storage temperature	-55 ... +125	oC
- Power dissipation	max. 500	mW
For each transistor		
- Collector-emitter voltage	max. 40	V
- Collector-base voltage	max. 40	V
- Emitter-base voltage	max. 5	V
- Collector current	max. 5	mA
- Base current	max. 2	mA
- Current gain of one trasnsistor	50 ... 600	-
For the thermostat		
- Supply current	10 ... 20	mA

1. B1
2. NC
3. B2
4. E2
5. C2
6. V-
7. NC
8. R adj.
9. V+
10. C1
11. E1
12. NC
13. NC
14. NC



PACKAGE TO-116 / TOP VIEW

βA 3054

DUAL INDEPENDENT DIFFERENTIAL AMPLIFIER

The integrated circuit βA 3054 consists of two independent differential amplifiers with associated constant current transistors. The six n-p-n transistors which comprise the amplifiers are general purpose devices useful from DC to 120 MHz. Bias and load resistances have been omitted to feature maximum application flexibility.

The monolithic construction provides close electrical and thermal matching of the amplifiers.

Features

For the integrated circuit

– Operating temperature	0 ...	+70 oC
– Storage temperature	-55 ...	+125 oC
– Power dissipation	max.	500 mW

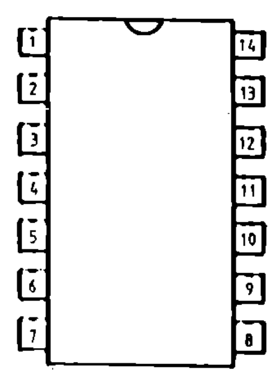
For each transistor

– Collector-emitter voltage	max.	15 V
– Collector-base voltage	max.	20 V
– Emitter-base voltage	max.	5 V
– Collector current	max.	50 mA
– Base current	max.	10 mA
– DC current gain	typ.	150 –

For each differential amplifier

– Input offset voltage	max.	5 mV
– Input offset current	max.	2 uA

1. C2
2. B2
3. B3
4. E3
5. Substrate
6. B5
7. C5
8. C6
9. B6
10. NC
11. B4
12. E4
13. B1
14. C1



PACKAGE TO-116 / TOP VIEW

UNICIP 1000
20 V CUSTOM DESIGN ARRAY

UNICIP 1000 is an IC standard array dedicated to customer original (or model based) projects . IC's like TCA 520N , FZH 100 series , TCA 105N , βU 1010N , BB 342 or βU 1014N were processed using UNICIP 1000 .

The customer can design by his own the interconnection mask of a new IC, using a 250 times enlarged layout sheet. This step is similar to a P.C. board layout. The basic component set of UNICIP 1000 (transistors, diodes, resistors) is packaged in 5 IC's (βU 1001 to βU 1005) , being dedicated to IC's function simulation .

UNICIP 1000 component list :

- 10 mA NPN transistors .... 28 pcs.
- 150 mA NPN transistors .... 2 pcs.
- Lateral PNP transistors .... 7 pcs.
- Vertical PNP transistors .... 3 pcs.
- 7.3 Zener diode .... 1 pc.
- Base-diffusion resistors :
  - 0.25 kohms .... 2 pcs.
  - 0.5 kohms .... 21 pcs.
  - 1 kohm .... 20 pcs.
  - 2 kohms .... 36 pcs.
  - 4 kohms .... 12 pcs.
- 35 kohms Pinch resistors .... 2 pcs.
- Pads for pin connection .... 14 pcs.

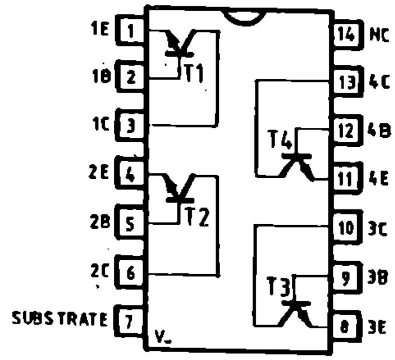
Features

- Supply voltage .... max. 20 V
- NPN transistor current gain (IC = 2 mA) .... typ. 150 -
- Lateral PNP transistor current gain (IC=0.2mA) typ. 10 -
- Base-diffusion resistor tolerance .... max. 25 %
- Pinch resistor tolerance .... -50 ... +100 %
- Zener diode voltage drift .... typ. 0.01 %/oC
- Chip temperature .... max. 125 oC
- Power dissipation (depending on package type). 0.3 ... 1.3 W
- Operating temperature .... depending on customer project

UNICIP 1000 - design kit

4 NPN 10 mA transistors

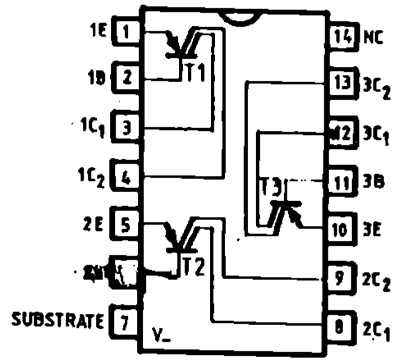
βU 1001



PACKAGE TO-116 / TOP VIEW

3 lateral PNP transistors

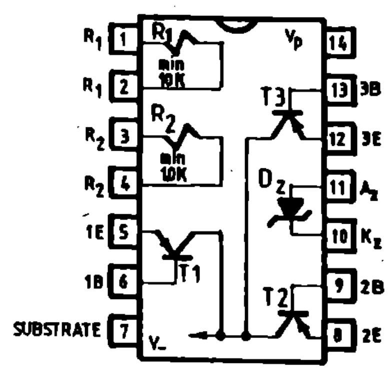
βU 1002



PACKAGE TO-116 / TOP VIEW

3 vertical PNP transistors
2 Pinch resistors
1 Zener diode

βU 1003

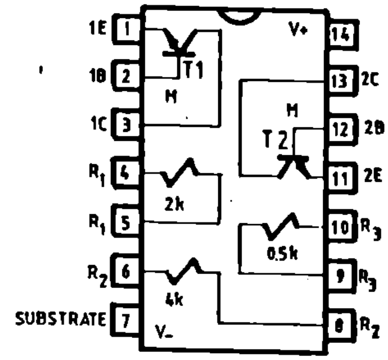


PACKAGE TO-116 / TOP VIEW

UNICIP 1000 - design kit

2 NPN 150 mA transistors
3 base-diffusion resistors

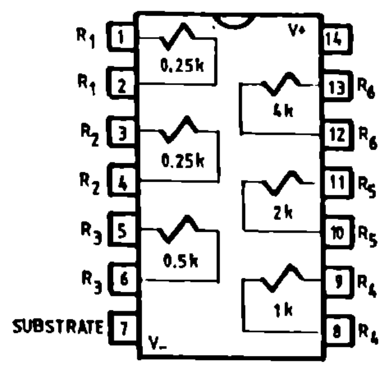
βU 1004



PACKAGE TO-116 / TOP VIEW

6 base-difusion resistors

βU 1005



PACKAGE TO-116 / TOP VIEW

UNICIP 2000
40 V CUSTOM DESIGN ARRAY

UNICIP 2000 is a MSI linear standard array recommended for custom designed industrial applications. Processed in a 40 volts supply technology, UNICIP 2000 contains over 170 electronic components : 104 resistors with over 350 kohms total value, 61 transistors (including 4 NPN 300 mA power drivers), 6 volts Zener diodes, etc.

Same as the UNICIP 1000 array, the interconnection mask of the UNICIP 2000 can be designed by the customer on a 250 times enlarged sheet. The basic component set of the UNICIP 2000 array is packaged in 3 IC's (βU 2001, βU 2002, βU 2003) and is dedicated to model developping.

UNICIP 1000 component list :

- 10 mA NPN transistors .... 38 pcs.
- 300 mA NPN transistors .... 4 pcs.
- 2-collector PNP-lateral transistors .... 12 pcs.
  3-collector PNP-lateral transistors .... 1 pc.
- Vertical PNP transistors .... 6 pcs.
- J-FET current generator .... 1 pc.
- 7 Zener diodes .... 2 pcs.
- Base-diffusion resistors :
  - 0.5 kohms .... 16 pcs.
  - 1 kohm .... 16 pcs.
  - 2 kohms .... 18 pcs.
  - 4 kohms .... 28 pcs.
  - 8 kohms .... 22 pcs.
- 35 kohms Pinch resistors .... 4 pcs.
- 30 pF capacitors .... 2 pcs.
- Pads for pin connection .... 16 pcs.

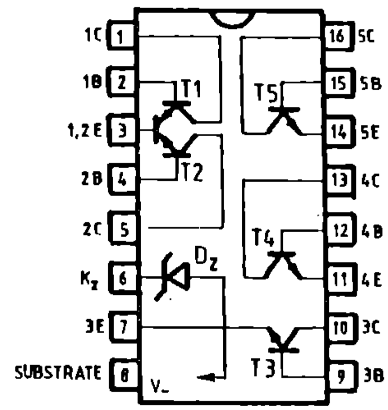
Features

- Supply voltage	max.	40 V
- NPN power transistor collector resistance (IC = 200 mA)	typ.	5 ohms
- NPN transistor current gain (IC = 2 mA)	typ.	100 -
- Lateral PNP transistor current gain (IC=0.2mA)	typ.	10
- Base-diffusion resistor tolerance	max.	25 %
- Pinch resistor tolerance	-50 ...	+100 %
- Zener voltage	5.7 ...	6.3 V
- Chip temperature	max.	125 oC
- Power dissipation (depending on package type) and external heatsink)	0.3 ...	1.3 W
- Operating temperature .... depending on customer project		

UNICIP 2000 – design kit

5 NPN 10 mA transistors
1 Zener diode

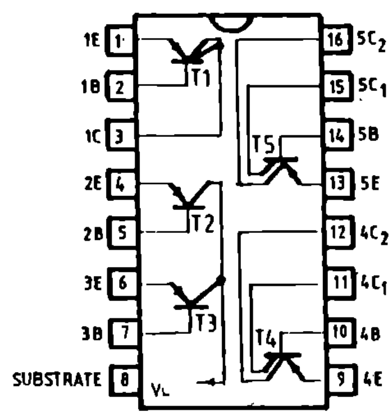
βU 2001



PACKAGE MP-117 / TOP VIEW

3 lateral PNP transistors
2 vertical PNP transistors

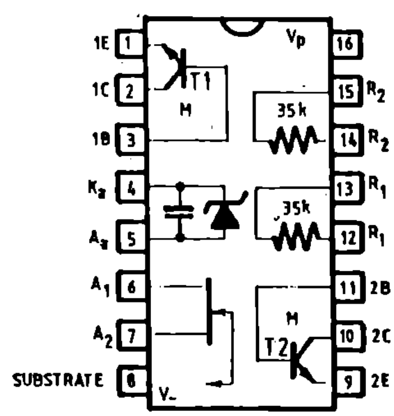
βU 2002



PACKAGE MP-117 / TOP VIEW

2 NPN 300 mA transistors
1 J-FET current generator
2 Pinch resistors
1 capacitor

βU 2003



PACKAGE MP-117 / TOP VIEW

$ βU 14202

DUAL ANALOGUE OUTPUT INTERFACE

The βU 14202 is a monolithic integrated circuit intended to be used as analogue output interface in programmable controllers (see for example the βF 14000 series).

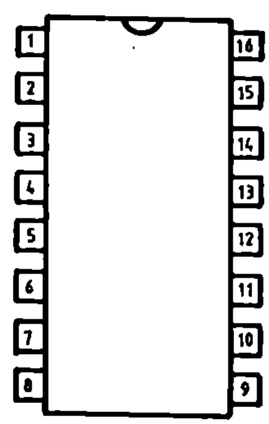
The circuit containes two identically channels which can drive AC or DC loads, performing :

- memorised commands by a status LATCH ;
- short-circuit protection, which resets the status LATCH;
- full-wave drive of triacs ;
- zero-cross voltage detector incorporated ;
- open collector Darlington output ;
- output enable pin ;
- test input for load breakdown detection ;
- open collector output (NXOR) for load breakdown signalling .

Features

- Supply voltage	5 ...	40	V
- Supply current	typ.	4	mA
- Output current (ON-state)	typ.	200	mA
- Output voltage (OFF-state)	max.	44	V

1. OE input
2. NXOR 1 output
3. VLOAD 1 input
4. SYNC 1 output
5. DATA 1 input
6. PROTECTION 1 input
7. OUTPUT 1
8. GND
9. STROBE
10. OUTPUT 2
11. PROTECTION 2 input
12. DATA 2 input
13. SYNC 2 output
14. VLOAD 2 input
15. NXOR 2 output
16. V+

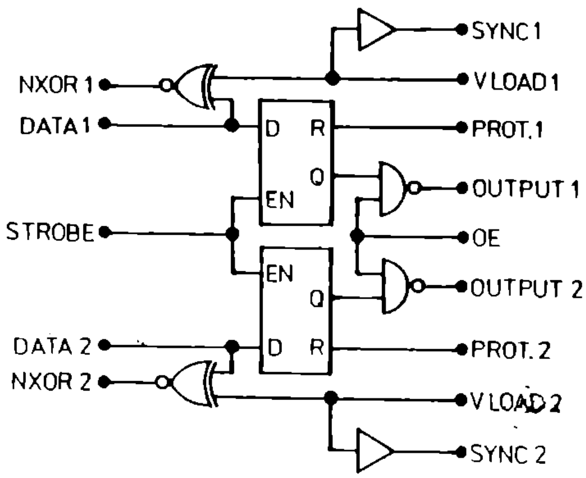


PACKAGE MP-117 / TOP VIEW

$ Preliminary data

βU 14202 (cont.)

Block diagram and FUNCTION TABLE

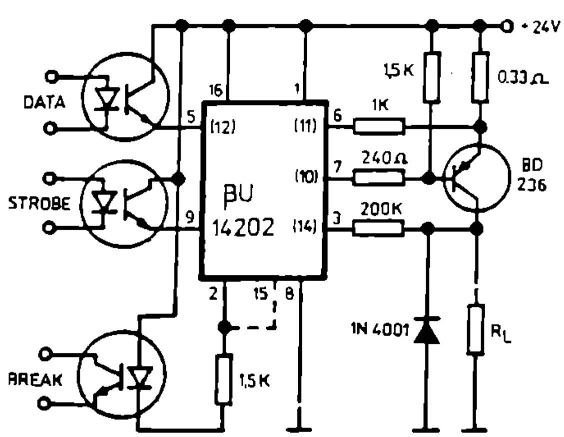


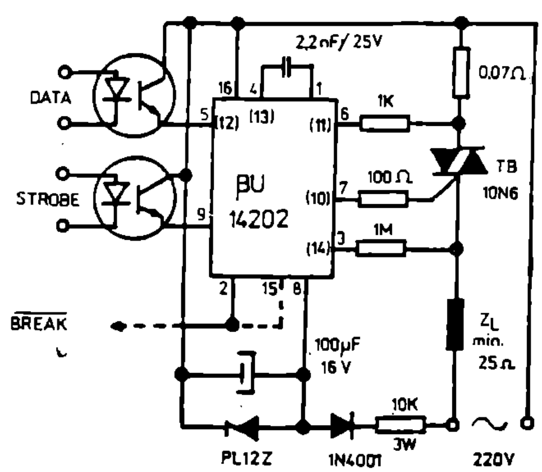
OE	PROT.	STR.	OUT.
ON	OFF	H	$\overline{DATA}$
ON	OFF	L	LATCH
X	ON	X	H
OFF	X	X	H

X : DON'T CARE

NXOR	
H	LOAD CIRCUIT OK
L	BREAK DOWN

Applications





$ βU 14204
QUAD ANALOGUE INPUT INTERFACE

The βU 14204 is a monolithic integrated circuit intended to be used as analogue input (even output) interface in programmable controllers (see for example the βP 14000 series).

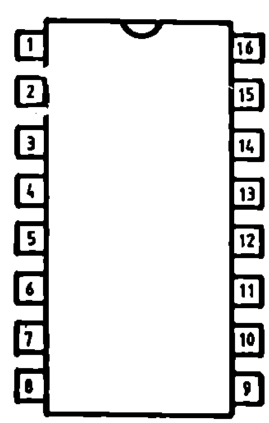
The circuit containes four identically channels which can process AC or DC input signals, performing :

- transconductance threshold comparator in two quadrants ;
- single serial external resistor, needed to appropriate the IC input signal ;
- Low-pass filter, with pin for external capacitor ;
- open-collector output ;
- 3-STATE common input to test the interfaces during operation : all the 4 channels can be forced ON or OFF simultaneously .

Features

- Supply voltage		8 ... 40 V
- Supply current	typ.	7 mA
- Output current (ON-state)	typ.	50 mA
- Output voltage (OFF-state)	max.	44 V
- Zener refference voltage	typ.	6 V
- Input threshold current	typ.	145 uA
- Input hysteresis	typ.	35 uA

1. Output 1
2. GND
3. Input 1
4. Comp. 1
5. VREF
6. Comp. 2
7. Output 2
8. Input 2
9. Output 3
10. Input 3
11. Comp. 3
12. V+
13. Comp. 4
14. Input 4
15. TEST input
16. Output 4

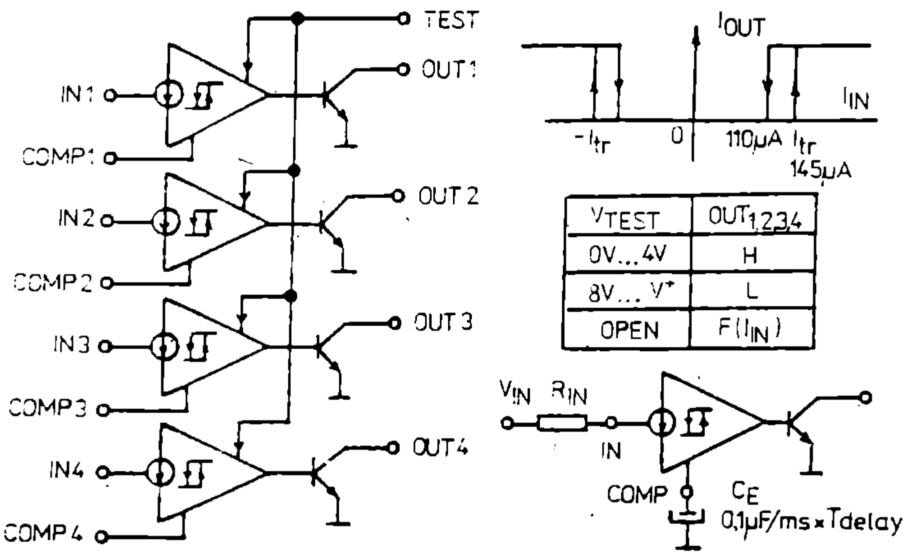


PACKAGE MP-117 / TOP VIEW

$ Preliminary data

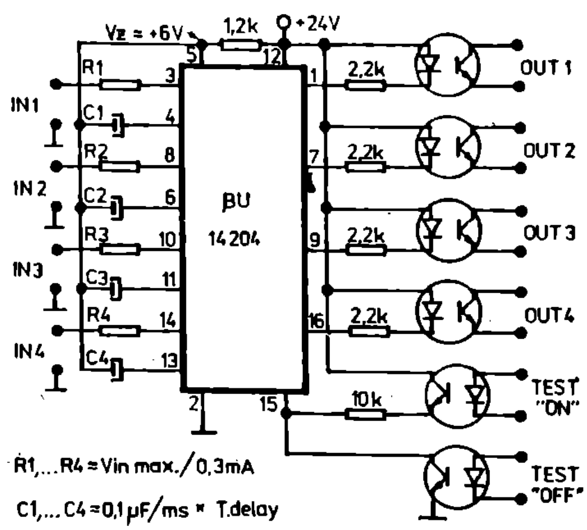
βU 14204 (cont.)

Block diagram and FUNCTION TABLE



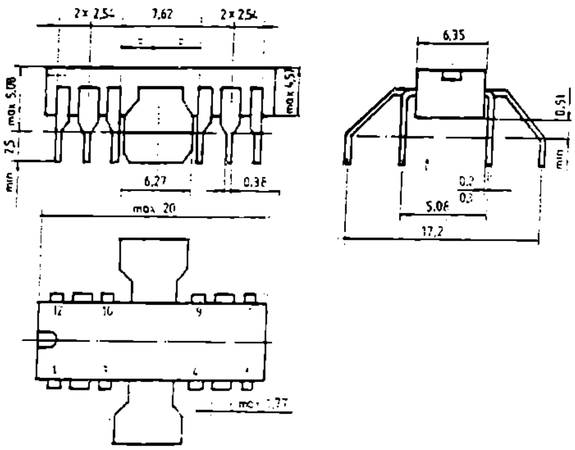
VTEST	OUT1,2,3,4
0V...4V	H
8V... V+	L
OPEN	F(IIN)

Application

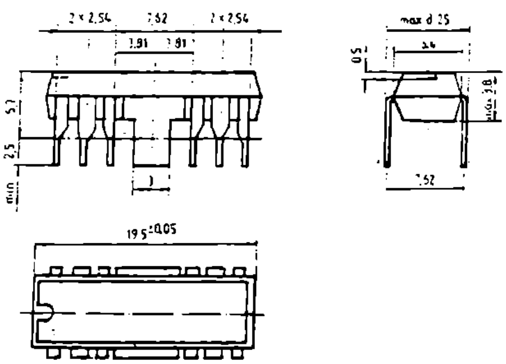


CASE OUTLINES - All dimensions in mm.

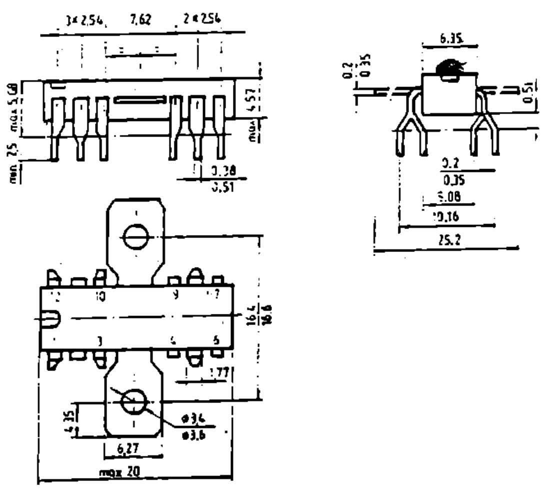
CB-109 (TABS A)



CB-109B (TABS B)

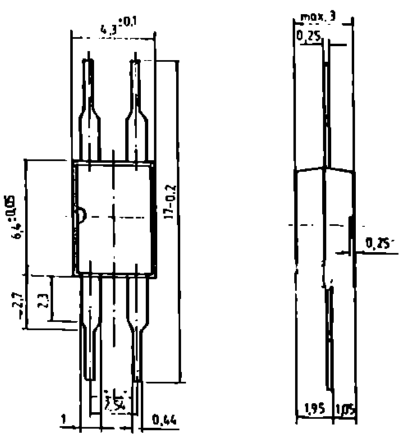


CB-155 (TABS C)

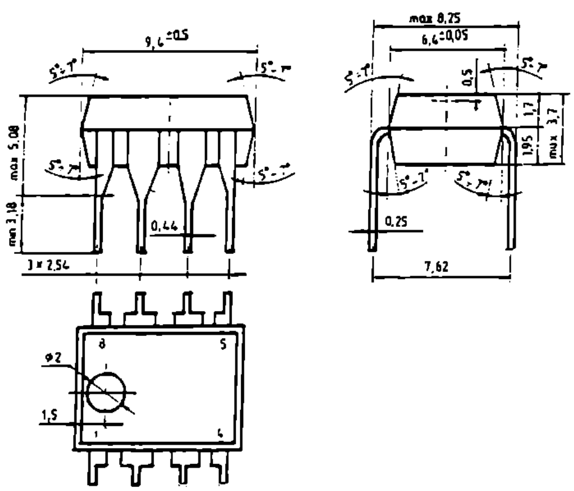


CASE OUTLINES - All dimensions in mm.

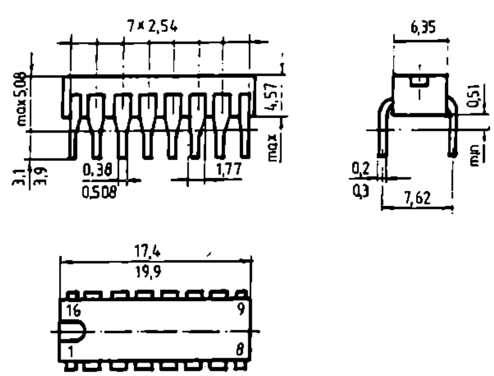
MP-24



MP-48

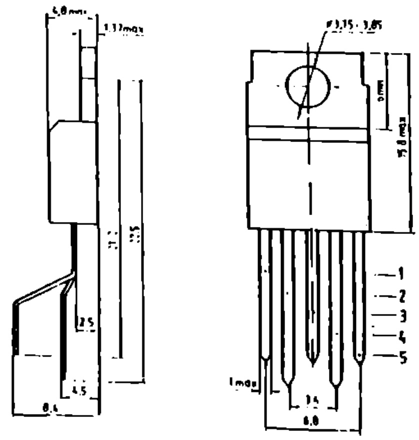


MP-117

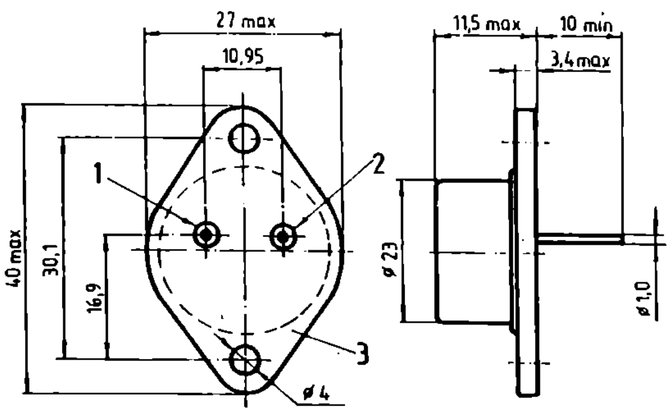


CASE OUTLINES - All dimensions in mm.

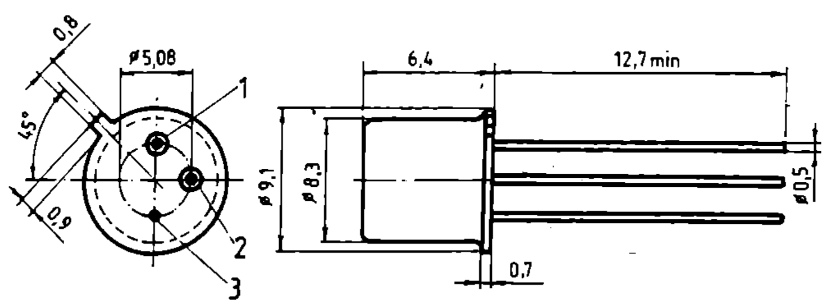
PENTAWATT



TO-3

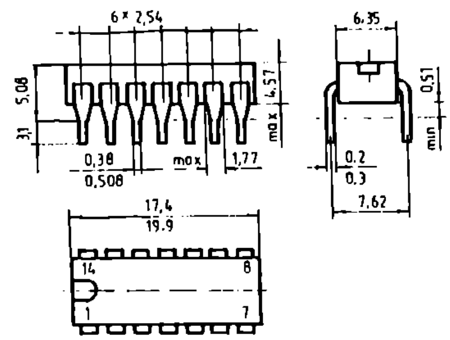


TO-39

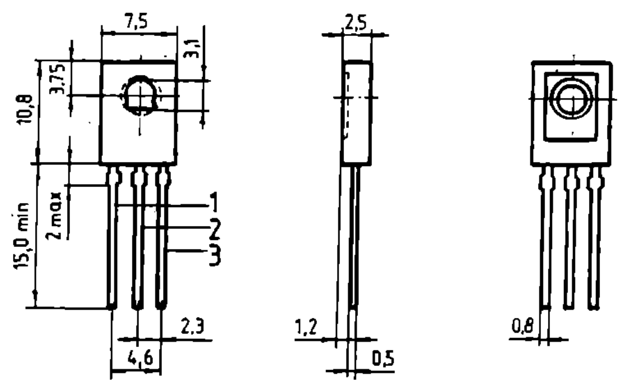


CASE OUTLINES - All dimensions in mm.

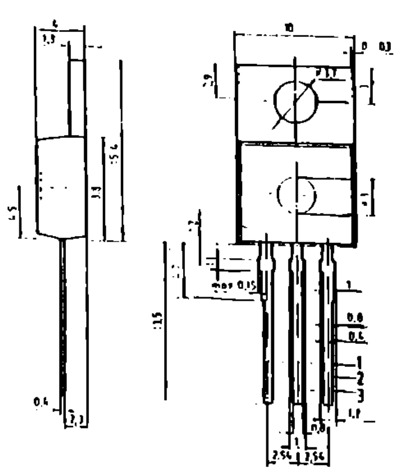
TO-116



TO-126 (SOT-32)



TO-220



SILICON TRANSISTORS

HIGH POWER

- GENERAL PURPOSE TRANSISTORS
- GENERAL PURPOSE EPIBASE TRANSISTORS
- GENERAL PURPOSE DARLINGTONS
- GENERAL PURPOSE EPIBASE DARLINGTONS
- HIGH SPEED & GENERAL PURPOSE TRANSISTORS
- HIGH SPEED SWITCHING TRANSISTORS
- HIGH VOLTAGE TRANSISTORS - TV APPLICATIONS
- HIGH VOLTAGE DARLINGTONS
- HIGH VOLTAGE SWITCHING TRANSISTORS
- HIGH VOLTAGE SWITCHING DARLINGTONS
- SWITCHING TRANSISTORS

SUPER POWER

- HIGH VOLTAGE SWITCHING GIANT DARLINGTONS

LOW POWER

- GENERAL PURPOSE TRANSISTORS
- LOW CURRENT FAST SWITCHING TRANSISTORS
- HIGH VOLTAGE & VIDEO AMPLIFIER TRANSISTORS

HIGH FREQUENCY

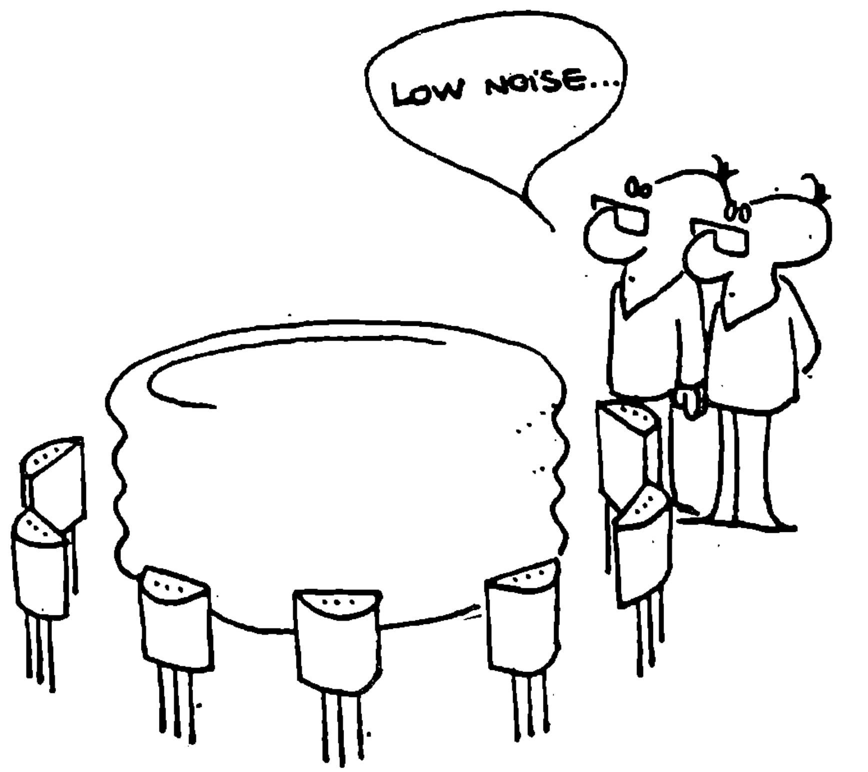
- RF TRANSISTORS FOR RADIO - TV
- RF TRANSISTORS FOR PROFESSIONAL APPLICATIONS

FIELD-EFFECT

- N-CHANNEL FIELD-EFFECT TRANSISTORS
- P-CHANNEL FIELD-EFFECT TRANSISTORS

MISCELLANEOUS

- UNIJUNCTION TRANSISTORS
- PHOTOTRANSISTORS


LOW NOISE...

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HIGH SPEED & GENERAL PURPOSE TRANSISTORS - PLASTIC CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCEX* (V)	VCEO (V)	IC ICM+ (A)	VCEsat max (V)	@ IC (A)
BD 135		12.5	150	45	45	1.5	0.6	0.5
BD 137		12.5	150	60	60	1.5	0.6	0.5
BD 139		12.5	150	80	80	1.5	0.6	0.5
	BD 136	12.5	150	45	45	1.5	0.6	0.5
	BD 138	12.5	150	60	60	1.5	0.6	0.5
	BD 140	12.5	150	80	80	1.5	0.6	0.5
BD 233		25	150	45	45	2	0.6	1
BD 235		25	150	60	60	2	0.6	1
BD 237		25	150	80	80	2	0.6	1
	BD 234	25	150	45	45	2	0.6	1
	BD 236	25	150	60	60	2	0.6	1
	BD 238	25	150	80	80	2	0.6	1

On request, the following transistor pairs can be delivered :

BD 135 / BD 136
BD 137 / BD 138
BD 139 / BD 140

BD 233 / BD 234
BD 235 / BD 236
BD 237 / BD 238

When ordering, use as well symbols for the **hFE** groups .

HIGH SPEED & GENERAL PURPOSE TRANSISTORS - PLASTIC CASE

hFE min-max	@	IC & (A)	VCE (V)	ton max (us)	ts toff+ max (us)	tf max (us)	fT min (MHz)	CASE
33.5-300	(1)	0.15	2				50	TO-126
33.5-300	(1)	0.15	2				50	TO-126
33.5-300	(1)	0.15	2				50	TO-126
33.5-300	(1)	0.15	2				50	TO-126
33.5-300	(1)	0.15	2				50	TO-126
33.5-300	(1)	0.15	2				50	TO-126
40-375	(2)	0.15	2				3	TO-126
40-375	(2)	0.15	2				3	TO-126
40-375	(2)	0.15	2				3	TO-126
40-375	(2)	0.15	2				3	TO-126
40-375	(2)	0.15	2				3	TO-126
40-375	(2)	0.15	2				3	TO-126

(1) Different hFE groups :

gr. E : 33.5 - 47.5
gr. F : 42.5 - 60
gr. G : 53 - 75
gr. H : 67 - 95
gr. I : 85 - 118
gr. K : 196 - 150
gr. L : 132 - 190
gr. M : 170 - 236
gr. N : 212 - 300

gr.- 4 : 33.5 - 60
gr.- 6 : 42.5 - 95
gr.-10 : 67 - 150
gr.-16 : 106 - 236
gr.-25 : 170 - 300

(2) Different hFE groups :

gr.- 6 : 40 - 95
gr.-10 : 67 - 150
gr.-16 : 106 - 250
gr.-25 : 170 - 375

HIGH SPEED & GENERAL PURPOSE TRANSISTORS - PLASTIC CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCEX* (V)	VCEO (V)	IC ICM+ (A)	VCEsat @ max (V)	IC (A)
BD 433		36	150	22	22	4	0.5	2
BD 435		36	150	32	32	4	0.5	2
BD 437		36	150	45	45	4	0.6	2
BD 439		36	150	60	60	4	0.8	2
BD 441		36	150	80	80	4	0.8	2
	BD 434	36	150	22	22	4	0.5	2
	BD 436	36	150	32	32	4	0.5	2
	BD 438	36	150	45	45	4	0.6	2
	BD 440	36	150	60	60	4	0.8	2
	BD 442	36	150	80	80	4	0.8	2
2N 5294		36	150	80	70	4	1	0.5
2N 5296		36	150	60	40	4	1	1
2N 5298		36	150	80	60	4	1	1.5
2N 5490		50	150	60	40	7	1	2
2N 5492		50	150	75	55	7	1	2.5
2N 5494		50	150	60	40	7	1	3
2N 5496		50	150	90	70	7	1	3.5

On request, the following transistor pairs can be delivered :

BD 433 / BD 434
BD 435 / BD 436
BD 437 / BD 438
BD 439 / BD 440
BD 441 / BD 442

When ordering, use as well symbols for the **hFE** groups .

HIGH SPEED & GENERAL PURPOSE TRANSISTORS - PLASTIC CASE

hFE min-max	@	IC & (A)	VCE (V)	ton max (us)	ts toff+ max (us)	tf max (us)	fT min (MHz)	CASE
85-375	(1)	0.5	1				3	TO-126
85-375	(1)	0.5	1				3	TO-126
85-375	(1)	0.5	1				3	TO-126
40-375	(2)	0.5	1				3	TO-126
40-375	(2)	0.5	1				3	TO-126
85-375	(1)	0.5	1				3	TO-126
85-375	(1)	0.5	1				3	TO-126
85-375	(1)	0.5	1				3	TO-126
40-375	(2)	0.5	1				3	TO-126
40-375	(2)	0.5	1				3	TO-126
30-120		0.5	4	5	15		0.8	TO-220
30-120		1	4	5	15		0.8	TO-220
20- 80		1.5	4	5	15		0.8	TO-220
20-100		2	4	5	15		0.8	TO-220
20-100		2.5	4	5	15		0.8	TO-220
20-100		3	4	5	15		0.8	TO-220
20-100		3.5	4	5	15		0.8	TO-220

(1) Different hFE groups :

gr.-10 : 85 - 150
gr.-16 : 106 - 250
gr.-25 : 170 - 375

(2) Different hFE groups :

gr.- 6 : 40 - 95
gr.-10 : 67 - 150
gr.-16 : 106 - 250
gr.-25 : 170 - 375

GENERAL PURPOSE DARLINGTONS - PLASTIC CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCEX* (V)	VCEO (V)	IC ICM+ (A)	VCEsat @ max (V)	IC (A)
BD 675		40	150	45	45	4	2.5	1.5
BD 675A		40	150	45	45	4	2.8	2
BD 677		40	150	60	60	4	2.5	1.5
BD 677A		40	150	60	60	4	2.8	2
BD 679		40	150	80	80	4	2.5	1.5
BD 679A		40	150	80	80	4	2.8	2
BD 681		40	150	100	100	4	2.5	1.5
BD 681A		40	150	100	100	4	2.8	2
	BD 676	40	150	45	45	4	2.5	1.5
	BD 676A	40	150	45	45	4	2.8	2
	BD 678	40	150	60	60	4	2.5	1.5
	BD 678A	40	150	60	60	4	2.8	2
	BD 680	40	150	80	80	4	2.5	1.5
	BD 680A	40	150	80	80	4	2.8	2
	BD 682	40	150	100	100	4	2.5	1.5
	BD 682A	40	150	100	100	4	2.8	2
$ BD 643		62.5	150	45	45	8	2	3
$ BD 645		62.5	150	60	60	8	2	3
$ BD 647		62.5	150	80	80	8	2	3
$ BD 649		62.5	150	100	100	8	2	3
$ BD 651		62.5	150	120	120	8	2	3
$	BD 644	62.5	150	45	45	8	2	3
$	BD 646	62.5	150	60	60	8	2	3
$	BD 648	62.5	150	80	80	8	2	3
$	BD 650	62.5	150	100	100	8	2	3
$	BD 652	62.5	150	120	120	8	2	3

$ Preliminary data

GENERAL PURPOSE DARLINGTONS - PLASTIC CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts toff+ max (us)	tf max (us)	hfe @ f= 1 MHz min	CASE
750	1.5	3				18	TO-126
750	2	3				18	TO-126
750	1.5	3				18	TO-126
750	2	3				18	TO-126
750	1.5	3				18	TO-126
750	2	3				18	TO-126
750	1.5	3				18	TO-126
750	2	3				18	TO-126
750	1.5	3				18	TO-126
750	2	3				18	TO-126
750	1.5	3				18	TO-126
750	2	3				18	TO-126
750	1.5	3				18	TO-126
750	2	3				18	TO-126
750	1.5	3				18	TO-126
750	2	3				18	TO-126
750	3	3				10	TO-220
750	3	3				10	TO-220
750	3	3				10	TO-220
750	3	3				10	TO-220
750	3	3				10	TO-220
750	3	3				10	TO-220
750	3	3				10	TO-220
750	3	3				10	TO-220
750	3	3				10	TO-220
750	3	3				10	TO-220

HIGH VOLTAGE SWITCHING TRANSISTORS - PLASTIC CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCEX* (V)	VCEO (V)	IC ICM+ (A)	VCEsat @ max (V)	IC (A)
$ BUX 86		20	150	800*	400	1+	1.5	0.1
$ BUX 86/4		20	150	400*	300	1+	1.5	0.1
$ BUX 86/5		20	150	500*	350	1+	1.5	0.1
$ BUX 86/6		20	150	600*	375	1+	1.5	0.1
$ BUX 86/7		20	150	700*	400	1+	1.5	0.1
$ BUX 87		20	150	1000*	450	1+	1.5	0.1
$ BUX 87/9		20	150	900*	400	1+	1.5	0.1
$ BUX 84		40	150	800*	400	2	3	1
$ BUX 84/5		40	150	500*	350	2	3	1
$ BUX 84/6		40	150	600*	375	2	3	1
$ BUX 84/7		40	150	700*	400	2	3	1
$ BUX 85		40	150	900*	450	2	3	1

HIGH VOLTAGE DARLINGTONS - TV APPLICATIONS - PLASTIC CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCEX* (V)	VCEO (V)	IC ICM+ (A)	VCEsat @ max (V)	IC (A)
$ BU 806		60	150	400	200	8	1.5	5
$ BU 807		60	150	330	150	8	1.5	5

$ Preliminary data

HIGH VOLTAGE SWITCHING TRANSISTORS - PLASTIC CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts toff+ max (us)	tf max (us)	fT min (MHz)	CASE
typ.50	0.05	5	0.5	3.5	0.5		TO-126
typ.50	0.05	5	0.5	3.5	0.5		TO-126
typ.50	0.05	5	0.5	3.5	0.5		TO-126
typ.50	0.05	5	0.5	3.5	0.5		TO-126
typ.50	0.05	5	0.5	3.5	0.5		TO-126
typ.50	0.05	5	0.5	3.5	0.5		TO-126
typ.50	0.05	5	0.5	3.5	0.5		TO-126
25	0.05	5	0.5	3.5	1.4		TO-220
20	0.05	5			1		TO-220
20	0.05	5			1		TP-220
20	0.05	5			1		TO-220
20	0.05	5			1		TO-220

HIGH VOLTAGE DARLINGTONS - TV APPLICATIONS - PLASTIC CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	toff max (us)	fT min (MHz)	CASE
				1	1		TO-220
				1	1		TO-220

SWITCHING TRANSISTORS - METAL CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCEX* (V)	VCEO (V)	IC ICM+ (A)	VCEsat max (V)	@ IC (A)
2N 2890		5	200	100	80	2	0.75	2
2N 2891		5	200	100	80	2	0.75	2
$ 2N 3439		10	200	450	350	1	0.5	0.05
$ 2N 3440		10	200	300	250	1	0.5	0.05
$	2N 5415	10	200	200	200	1	2.5	0.05
$	2N 5416	10	200	350	300	1	2.5	0.05
BSX 12		3	200	25	12	1+	0.33	0.3
BSX 12A		3	200	25	15	1+	0.33	0.3
BSX 12S		3	200	25	12	1+	0.33	0.3

GENERAL PURPOSE TRANSISTORS - METAL CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCEX* (V)	VCEO (V)	IC ICM+ (A)	VCEsat max (V)	@ IC (A)
2N 3054		25	175	90	55	4	1	0.5
BDY 71		29	175	90	55	4	1	0.5
2N 6260		29	175	50	40	3	1.5	1.5
2N 6261		50	175	90	80	4	0.5	1.5
2N 6263		20	175	140	120	3	1.2	2.7
2N 3441		25	175	160	140	3	1	0.5
2N 6264		50	175	170	150	3	0.5	1

$ Preliminary data

SWITCHING TRANSISTORS - METAL CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf toff+ max (us)	fT min (MHz)	CASE
30- 90	1	2	0.3		1.5+	30	TO-39
50-150	1	2	0.3		1.5+	30	TO-39
40-160	0.02	10				15	TO-39
30	0.02	10				15	TO-39
30-150	0.05	10				15	TO-39
30-120	0.05	10				15	TO-39
20	0.01	0.5	0.015	0.015	0.025+	450	TO-100
30-120	0.3	0.5	0.015	0.015	0.025+	450	TO-100
22	0.8	1	0.015		0.025+	450	TO-100

GENERAL PURPOSE TRANSISTORS - METAL CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf toff+ max (us)	fT min (MHz)	CASE
25-150	0.5	4				0.8	F-22
80-200	0.5	4				0.8	F-22
20-100	1.5	4				0.8	F-22
25-100	1.5	2				0.8	F-22
20.100	0.5	4				0.8	F-22
25-100	0.5	4				0.8	F-22
20-100	1	2				0.8	F-22

Case F-22 is similar to TO-66

GENERAL PURPOSE DARLINGTONS - METAL CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCEX* (V)	VCEO (V)	IC ICM+ (A)	VCEsat max (V)	@ IC (A)
TD 643		62.5	175	45	45	8	2	3
TD 645		62.5	175	60	60	8	2	3
TD 647		62.5	175	80	80	8	2	3
TD 649		62.5	175	100	100	8	2	3
	TD 644	62.5	175	45	45	8	2	3
	TD 646	62.5	175	60	60	8	2	3
	TD 648	62.5	175	80	80	8	2	3
	TD 650	62.5	175	100	100	8	2	3

HIGH VOLTAGE TRANSISTORS - TV APPLICATIONS - METAL CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCEX* (V)	VCEO (V)	IC ICM+ (A)	VCEsat max (V)	@ IC (A)
BUR 606		60	175	400	200	15+	1	5
BUR 607		60	175	330	200	15+	1	5
BUR 608		60	175	400	200	15+	1	6
* BUR 606D		60	175	400		15+	1	5
* BUR 607D		60	175	330		15+	1	5
* BUR 608D		60	175	400		15+	1	6
+ BU 806R		60	150	400	200	8	1.5	5
+ BU 807R		60	150	330	150	8	1.5	5

* With integrated diode
\+ Darlington transistors

GENERAL PURPOSE DARLINGTONS - METAL CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf toff+ max (us)	hfe @ f= 1 MHz min	CASE
750	3	3				10	F-22
750	3	3				10	F-22
750	3	3				10	F-22
750	3	3				10	F-22
750	3	3				10	F-22
750	3	3				10	F-22
750	3	3				10	F-22
750	3	3				10	F-22

HIGH VOLTAGE TRANSISTORS - TV APPLICATIONS - METAL CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf toff+ max (us)	fT min (MHz)	CASE
					1.25+	10	F-22
					1.25+	10	F-22
					0.8	10	F-22
					1.20+	10	F-22
10	5	1			1.20+	10	F-22
					0.8	10	F-22
				1	1		F-22
				1	1		F-22

Case F-22 is similar to TO-66

GENERAL PURPOSE TRANSISTORS - METAL CASE

TYPE NPN	PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCEX* (V)	VCEO (V)	IC ICM+ (A)	VCEsat max (V)	@ IC (A)
2N 1487		75	175	60	40	6		
2N 1488		75	175	100	55	6		
2N 1489		75	175	60	40	6		
2N 1490		75	175	100	55	6		
SDT 9301		87.5	175	40	40	10+	1	1
SDT 9302		87.5	175	60	60	10+	1	1
SDT 9303		87.5	175	80	80	10+	1	1
SDT 9304		87.5	175	40	40	10+	1	2
SDT 9305		87.5	175	60	60	10+	1	2
SDT 9306		87.5	175	80	80	10+	1	2
SDT 9307		87.5	175	40	40	10+	1	3
SDT 9308		87.5	175	60	60	10+	1	3
SDT 9309		87.5	175	80	80	10+	1	3
2N 4347		100	175	140*	120	10+	2	5
2N 6253		117	175	55*	45	15	3.5	10
BD 142		117	175	50*	45	15	1.1	4
BD 181		117	175	55	45	15	1.5	3
BD 182		117	175	70	60	15	1.5	4
BD 183		117	175	85	80	15	1.5	3
SDT 9201		117	175	55*	45	15	1.1	4
SDT 9202		117	175	100*	80	15	1.1	4
SDT 9203		117	175	120*	100	15	1.1	4
SDT 9204		117	175	140*	120	15	1.1	4
SDT 9205		117	175	55*	45	15	1.1	4
SDT 9206		117	175	80*	60	15	1.1	4
SDT 9207		117	175	100*	80	15	1.1	4
SDT 9208		117	175	120*	100	15	1.1	4
SDT 9209		117	175	140*	120	15	1.1	4
SDT 9210		117	175	40*	30	15	1.1	2

GENERAL PURPOSE TRANSISTORS - METAL CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf toff+ max (us)	fT min (MHz)	CASE
15- 45	1.5	4				0.8	TO-3
15- 45	1.5	4				0.8	TO-3
25- 75	1.5	4				0.8	TO-3
25- 75	1.5	4				0.8	TO-3
15	1	4				0.8	TO-3
15	1	4				0.8	TO-3
15	1	4				0.8	TO-3
15	2	4				0.8	TO-3
15	2	4				0.8	TO-3
15	2	4				0.8	TO-3
15	3	4				0.8	TO-3
15	3	4				0.8	TO-3
15	3	4				0.8	TO-3
15- 70	2	4				0.8	TO-3
20- 70	3	4				0.8	TO-3
12.5-160	4	4				0.8	TO-3
20- 70	3	4				0.8	TO-3
20- 70	4	4				0.8	TO-3
20- 70	3	4				0.8	TO-3
20- 70	4	4				0.8	TO-3
20- 70	4	4				0.8	TO-3
20- 70	4	4				0.8	TO-3
20- 70	4	4				0.8	TO-3
15- 70	4	4				0.8	TO-3
15- 70	4	4				0.8	TO-3
15- 70	4	4				0.8	TO-3
15- 70	4	4				0.8	TO-3
15- 70	2	4				0.8	TO-3
15	2	2				0.8	TO-3

GENERAL PURPOSE TRANSISTORS - METAL CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCEX* (V)	VCEO (V)	IC ICM+ (A)	VCEsat max (V)	@ IC (A)
2N 3055		117	175	90*	60	15	1	4
2N 3055H		117	175	90*	60	15	1	4
2N 3055W		117	175	70*	60	15	1	4
2N 3055/1		117	175	40*	30	15	1.5	3
2N 3055/2		117	175	40*	30	15	1.5	3
2N 3055/3		117	175	90*	60	15	1.5	4
2N 3055/4		117	175	30	20	15	1.5	3
2N 3055/5		117	175	30	20	15	1.5	3
2N 3055/6		117	175	90*	60	15	1.1	4
2N 3055/7		117	175	90*	60	15	1.1	4
2N 3055/8		117	175	90*	60	15	1.1	4
2N 3055/9		117	175	55*	45	15	1.1	4
2N 3055/10		117	175	55*	45	15	1.1	4
2N 6371		117	175	50	40	15	3.5	10
2N 3442		117	175	160	140	10	5	10
2N 4348		120	200	140	120	10	2	10
2N 6254		150	175	100	80	15	3.5	10
2N 6262		150	175	170	150	10	0.5	3
2N 3771		150	200	50	40	30	4	30
2N 3772		150	200	100	60	20	4	20
2N 3773		150	200	160	140	16	4	16
2N 6257		150	200	50	40	20	4	20
BDY 37		150	200	160	140	16	1.4	8

GENERAL PURPOSE TRANSISTORS - METAL CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf toff+ max (us)	fT min (MHz)	CASE
20- 70	4	4				0.8	TO-3
20- 70	4	4				0.8	TO-3
20- 70	4	4				0.8	TO-3
20- 70	3	4				0.8	TO-3
10- 70	3	4				0.8	TO-3
20- 70	3	4				0.8	TO-3
30- 70	3	4				0.8	TO-3
14	4	4				0.8	TO-3
15- 70	4	4				0.8	TO-3
14- 70	3	4				0.8	TO-3
65	4	4				0.8	TO-3
14- 70	3	4				0.8	TO-3
70	4	4				0.8	TO-3
15- 70	3	4				0.8	TO-3
20- 70	8	4				0.8	TO-3
15- 60	5	4				0.8	TO-3
20- 70	5	4				0.8	TO-3
20- 70	3	2				0.8	TO-3
15- 60	15	4				0.8	TO-3
15- 60	10	4				0.8	TO-3
15- 60	8	4				0.8	TO-3
15- 75	8	4				0.8	TO-3
15- 60	8	4				0.8	TO-3

GENERAL PURPOSE TRANSISTORS - METAL CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCEX* (V)	VCEO (V)	IC ICM+ (A)	VCEsat @ max (V)	IC (A)
BDY 29		220	175	100	75	30	1.2	15
2N 6258		250	175	100	80	30	3	30
2N 6259		250	175	170	150	30	2.5	16
$ 2N 5575		300	175	70	50	80	2	60
$ 2N 5576		300	175	70	50	100+	2	55
$ 2N 5577		300	175	70	50	80	2	50
$ 2N 5578		300	175	90	70	60	1.5	40
$ 2N 5579		300	175	90	70	80+	1.5	35
$ 2N 5580		300	175	90	70	60	1.5	30

$ Preliminary data

GENERAL PURPOSE TRANSISTORS - METAL CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf toff+ max (us)	fT min (MHz)	CASE
15- 60	15	2				0.8	TO-3
20- 60	15	2				0.8	TO-3
15- 60	8	2				0.8	TO-3
10- 40	60	4				0.8	TO-3
10- 40	55	4				0.8	TO-3
10- 40	50	4				0.8	TO-3
10- 40	40	3				0.8	TO-3
10- 40	35	3				0.8	TO-3
10- 40	30	3				0.8	TO-3

GENERAL PURPOSE EPIBASE TRANSISTORS - METAL CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCEX* (V)	VCEO (V)	IC ICM+ (A)	VCEsat max (V)	@ IC (A)
	2N 5871	115	200	60	60	7	1	4
	2N 5871/1	115	200	45	45	7	1	4
	2N 5871/2	90	200	45	45	7	1	2
	2N 5872	115	200	80	80	7	1	4
	2N 5872A	115	200	100	100	7	1.1	3
	2N 5872B	115	200	120	120	7	1.1	3
2N 5873		115	200	60	60	7	1	4
2N 5873/1		115	200	45	45	7	1	4
2N 5873/2		90	200	45	45	7	1	2
2N 5874		115	200	80	80	7	1	4
2N 5874A		115	200	100	100	7	1.1	3
2N 5874B		115	200	120	120	7	1.1	3
2N 6338A		200	200	120	100	25	1.8	25
2N 6339A		200	200	140	120	25	1.8	25
2N 6340A		200	200	160	140	25	1.8	25
2N 6341A		200	200	180	150	25	1.8	25
	2N 6436A	200	200	100	80	25	1.8	25
	2N 6437A	200	200	120	100	25	1.8	25
	2N 6438A	200	200	140	120	25	1.8	25

GENERAL PURPOSE EPIBASE TRANSISTORS - METAL CASE

hFE min-max	@ IC (A)	& VCE (V)	ton tr* max (us)	ts max (us)	tf toff+ max (us)	fT min (MHz)	CASE
20-100	2.5	4				4	TO-3
20	2.5	4				4	TO-3
20	2.5	4				2.5	TO-3
20-100	2.5	4				4	TO-3
15	4	4				4	TO-3
10	4	4				4	TO-3
20-100	2.5	4				4	TO-3
20	2.5	4				4	TO-3
20	2.5	4				2.5	TO-3
20-100	2.5	4				4	TO-3
15	4	4				4	TO-3
10	4	4				4	TO-3
30-120	10	2	0.3*	1	0.25	40	TO-3
30-120	10	2	0.3*	1	0.25	40	TO-3
30-120	10	2	0.3*	1	0.25	40	TO-3
30-120	10	2	0.3*	1	0.25	40	TO-3
20- 80	10	2	0.3*	1	0.25	40	TO-3
20- 80	10	2	0.3*	1	0.25	40	TO-3
20- 80	10	2	0.3*	1	0.25	40	TO-3

GENERAL PURPOSE DARLINGTONS - METAL CASE

TYPE NPN	PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCEX* (V)	VCEO (V)	IC ICM+ (A)	VCEsat @ max (V)	IC (A)
SDM 4001		117	175	40	40	15	1.1	4
SDM 4002		117	175	60	60	15	1.1	4
SDM 4003		117	175	80	80	15	1.1	4
SDM 4004		117	175	40	40	15	1.5	10
SDM 4005		117	175	60	60	15	1.5	10
SDM 4006		117	175	80	80	15	1.5	10
SDM 4010		117	175	100	100	10	1	2
SDM 4011		117	175	120	120	10	1	2
SDM 4012		117	175	140	140	10	1	2
SDM 4013		117	175	160	160	10	1	2
SDM 4014		117	175	100	100	10	1.4	5
SDM 4015		117	175	120	120	10	1.4	5
SDM 4016		117	175	140	140	10	1.4	5
SDM 4017		117	175	160	160	10	1.4	5

GENERAL PURPOSE DARLINGTONS - METAL CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf toff+ max (us)	fT min (MHz)	CASE
500	10	4				1	TO-3
500	10	4				1	TO-3
500	10	4				1	TO-3
350	10	4				1	TO-3
350	10	4				1	TO-3
350	10	4				1	TO-3
1000	2	4				1	TO-3
1000	2	4				1	TO-3
1000	2	4				1	TO-3
1000	2	4				1	TO-3
750	2	4				1	TO-3
750	2	4				1	TO-3
750	2	4				1	TO-3
750	2	4				1	TO-3

GENERAL PURPOSE EPIBASE DARLINGTONS - METAL CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCEX* (V)	VCEO (V)	IC ICM+ (A)	VCEsat @ max (V)	IC (A)
	TD 162/1	90	200	30	30	8	2.2	3
	TD 162	90	200	60	60	8	2	3
	TD 162A	90	200	80	80	8	2	3
	TD 162B	90	200	100	100	8	2	3
	TD 162C	90	200	120	120	8	2	3
TD 163/1		90	200	30	30	8	2.2	3
TD 163		90	200	60	60	8	2	3
TD 163A		90	200	80	80	8	2	3
TD 163B		90	200	100	100	8	2	3
TD 163C		90	200	120	120	8	2	3
	TD 264/1	117	200	30	30	12	2.2	5
	TD 264	117	200	60	60	12	2	5
	TD 264A	117	200	80	80	12	2	5
	TD 264B	117	200	100	100	12	2	5
	TD 264C	117	200	120	120	12	2	5
TD 265/1		117	200	30	30	12	2.2	5
TD 265		117	200	60	60	12	2	5
TD 265A		117	200	80	80	12	2	5
TD 265B		117	200	100	100	12	2	5
TD 265C		117	200	120	120	12	2	5
	TD 366	150	200	60	60	16	2	10
	TD 366A	150	200	80	80	16	2	10
	TD 366B	150	200	100	100	16	2	10
	TD 366C	150	200	120	120	16	2	10
TD 367		150	200	60	60	16	2	10
TD 367A		150	200	80	80	16	2	10
TD 367B		150	200	100	100	16	2	10
TD 367C		150	200	120	120	16	2	10

GENERAL PURPOSE EPIBASE DARLINGTONS - METAL CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf toff+ max (us)	hfe @ f= 1 MHz min	CASE
1000	3	3	0.7		2.5+	4	TO-3
1000	3	3	0.7		2.5+	4	TO-3
1000	3	3	0.7		2.5+	4	TO-3
1000	3	3	0.7		2.5+	4	TO-3
1000	3	3	0.7		2.5+	4	TO-3
1000	3	3	0.7		2.5+	4	TO-3
1000	3	3	0.7		2.5+	4	TO-3
1000	3	3	0.7		2.5+	4	TO-3
1000	3	3	0.7		2.5+	4	TO-3
1000	3	3	0.7		2.5+	4	TO-3
750	5	3	1		2.5+	4	TO-3
1000	5	3	1		2.5+	4	TO-3
1000	5	3	1		2.5+	4	TO-3
1000	5	3	1		2.5+	4	TO-3
1000	5	3	1		2.5+	4	TO-3
750	5	3	1		2.5+	4	TO-3
1000	5	3	1		2.5+	4	TO-3
1000	5	3	1		2.5+	4	TO-3
1000	5	3	1		2.5+	4	TO-3
1000	5	3	1		2.5+	4	TO-3
1000	10	3	2		6 +	4	TO-3
1000	10	3	2		6 +	4	TO-3
1000	10	3	2		6 +	4	TO-3
1000	10	3	2		6 +	4	TO-3
1000	10	3	2		6 +	4	TO-3
1000	10	3	2		6 +	4	TO-3
1000	10	3	2		6 +	4	TO-3
1000	10	3	2		6 +	4	TO-3

HIGH VOLTAGE SWITCHING TRANSISTORS - METAL CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCES* (V)	VCEO (V)	IC ICM+ (A)	VCEsat @ max (V)	IC (A)
BU 326A		62.5	175	900*	400	6	3	4
BU 326A/4		62.5	175	400*	300	6	3	4
BU 326A/5		62.5	175	500*	350	6	3	4
BU 326A/6		62.5	175	600*	350	6	3	4
BU 326A/7		62.5	175	700*	375	6	3	4
BU 326A/8		62.5	175	800*	400	6	3	4
BU 526		86	175	900*	400	8	5	8
BU 526/4		86	175	400*	300	8	5	8
BU 526/5		86	175	500*	350	8	5	8
BU 526/6		86	175	600*	350	8	5	8
BU 526/7		86	175	700*	375	8	5	8
BU 526/8		86	175	800*	400	8	5	8
BUX 80		100	150	800*	400	10	3	8
BUX 80/4		100	150	400*	300	10	3	8
BUX 80/5		100	150	500*	350	10	3	8
BUX 80/6		100	150	600*	375	10	3	8
BUX 80/7		100	150	700*	400	10	3	8
BUX 81		100	150	1000*	450	10	3	8
BUX 81/9		100	150	900*	400	10	3	8
BUX 82		60	150	800*	400	6	3	4
BUX 82/4		60	150	400*	300	6	3	4
BUX 82/5		60	150	500*	350	6	3	4
BUX 82/6		60	150	600*	375	6	3	4
BUX 82/7		60	150	700*	400	6	3	4
BUX 83		60	150	1000*	450	6	3	4
BUX 83/9		60	150	900*	400	6	3	4

HIGH VOLTAGE SWITCHING TRANSISTORS - METAL CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf toff+ max (us)	fT min (MHz)	CASE
3.5	4	5		3.5	0.5	4	TO-3d
3.5	4	5		3.5	0.5	4	TO-3d
3.5	4	5		3.5	0.5	4	TO-3d
3.5	4	5		3.5	0.5	4	TO-3d
3.5	4	5		3.5	0.5	4	TO-3d
3.5	4	5		3.5	0.5	4	TO-3d
15	1	5		3.5	1	6	TO-3d
15	1	5		3.5	1	6	TO-3d
15	1	5		3.5	1	6	TO-3d
15	1	5		3.5	1	6	TO-3d
15	1	5		3.5	1	6	TO-3d
15	1	5		3.5	1	6	TO-3d
10	1.2	5	0.5	3.5	0.5		TO-3d
10	1.2	5	0.5	3.5	0.5		TO-3d
10	1.2	5	0.5	3.5	0.5		TO-3d
10	1.2	5	0.5	3.5	0.5		TO-3d
10	1.2	5	0.5	3.5	0.5		TO-3d
10	1.2	5	0.5	3.5	0.5		TO-3d
10	1.2	5	0.5	3.5	0.5		TO-3d
10	0.6	5	0.5	3.5	0.5		TO-3d
10	0.6	5	0.5	3.5	0.5		TO-3d
10	0.6	5	0.5	3.5	0.5		TO-3d
10	0.6	5	0.5	3.5	0.5		TO-3d
10	0.6	5	0.5	3.5	0.5		TO-3d
10	0.6	5	0.5	3.5	0.5		TO-3d
10	0.6	5	0.5	3.5	0.5		TO-3d

HIGH VOLTAGE SWITCHING TRANSISTORS - METAL CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCES* (V)	VCEO (V)	IC ICM+ (A)	VCEsat @ max (V)	IC (A)
$ BUS 11		100	175	850*	400	5	1.5	3
$ BUS 11A		100	175	1000*	450	10+	1.5	2.5
$ BUS 11B		100	175	1000*	600	5	1.5	2.5
$ BUS 11/4		100	175	400*	300	5	1.5	2.5
$ BUS 11/6		100	175	600*	350	10+	1.5	2.5
$ BUT 11		100	175	850*	400	5	1.5	3
$ BUT 11A		100	175	1000*	450	10+	1.5	2.5
$ BUT 11/5		100	175	500*	350	5	1.5	3
$ BUT 11/6		100	175	600*	375	10+	1.5	3
$ BUT 11/7		100	175	700*	400	5	1.5	3
$ BUS 12		125	175	850*	400	8	1.5	6
$ BUS 12A		125	175	1000*	450	20+	1.5	5
$ BUS 12B		125	175	1000*	600	8	1.5	5
$ BUS 12/4		125	175	400*	300	8	1.5	5
$ BUS 12/6		125	175	600*	350	20+	1.5	5
$ BUS 13		150	175	850*	400	15	1.5	10
$ BUS 13A		150	175	1000*	450	30+	1.5	8
$ BUS 13/5		150	175	500*	350	15	1.5	10
$ BUS 13/6		150	175	600*	375	30+	1.5	10
$ BUS 13/7		150	175	700*	400	15	1.5	10
$ BUS 14		214	175	850*	400	30	1.5	20
$ BUS 14A		214	175	1000*	450	50+	1.5	16
$ BUS 14/4		214	175	400*	300	30	1.5	20
$ BUS 14/5		214	175	500*	350	50+	1.5	20
$ BUS 14/6		214	175	600*	375	30	1.5	20
$ BUS 14/7		214	175	700*	400	50+	1.5	20

$ Preliminary data

HIGH VOLTAGE SWITCHING TRANSISTORS - METAL CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf toff+ max (us)	fT min (MHz)	CASE
30	0.5	5	1	4	0.8		TO-3d
30	0.5	5	1	4	0.8		TO-3d
30	0.5	5	1	4	0.8		TO-3d
30	0.5	5	1	4	0.8		TO-3d
30	0.5	5	1	4	0.8		TO-3d
30	0.5	5	1	4	0.8		TO-3d
30	0.5	5	1	4	0.8		TO-3d
30	0.5	5	1	4	0.8		TO-3d
30	0.5	5	1	4	0.8		TO-3d
30	0.5	5	1	4	0.8		TO-3d
30	1.5	5	1	4	0.8		TO-3d
30	1.5	5	1	4	0.8		TO-3d
30	1.5	5	1	4	0.8		TO-3d
30	1.5	5	1	4	0.8		TO-3d
30	1.5	5	1	4	0.8		TO-3d
30	1.2	5	1	4	0.8		TO-3d
30	1.2	5	1	4	0.8		TO-3d
30	1.2	5	1	4	0.8		TO-3d
30	1.2	5	1	4	0.8		TO-3d
30	1.2	5	1	4	0.8		TO-3d
30	2	5	1	4	0.8		TO-3d
30	2	5	1	4	0.8		TO-3d
30	2	5	1	4	0.8		TO-3d
30	2	5	1	4	0.8		TO-3d
30	2	5	1	4	0.8		TO-3d
30	2	5	1	4	0.8		TO-3d

HIGH VOLTAGE SWITCHING TRANSISTORS - METAL CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCES* (V)	VCEO (V)	IC ICM+ (A)	VCEsat @ max (V)	IC (A)
$	BUW 22	100	150	400*	350	10	1.5	2.5
$	BUW 23	125	150	450*	400	10	1.5	4
$ BUW 24		100	150	450*	350	10	1.5	2.5
$ BUW 25		125	150	600*	400	10	1.5	4
$ BUW 25/5		125	150	500*	400	10	1.5	4
$ BUW 26		125	200	800*	450	10	1.5	4
BUX 10A		150	175	160	125	25	1.2	20
BUX 11A		150	175	250	200	20	1.5	12
BUX 12A		150	175	300	250	20	1.5	10
BUX 40A		120	175	160	125	20	1.6	15
BUX 41A		120	175	250	200	15	1.6	8
BUX 42A		120	175	300	250	12	1.6	6
2N 6653		150	175	350	300	20	0.6	15
2N 6653A		188	175	350	300	16	0.8	12
2N 6653B		188	175	350	300	12	0.8	8
2N 6653/1		150	175	350	300	20	0.8	15
2N 6653/2		150	175	350	300	15	0.8	10
2N 6653/3		125	175	350	300	10	0.8	7
2N 6653/4		125	175	350	300	7	0.8	5

$ Preliminary data

HIGH VOLTAGE SWITCHING TRANSISTORS - METAL CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf toff+ max (us)	fT min (MHz)	CASE
10	1	5	0.5	2	0.8		TO-3d
15	1	5	0.5	2	0.8		TO-3d
10	1	5	0.5	2	0.5		TO-3d
15	1	5	0.5	2	0.5		TO-3d
15	1	5	0.5	2	0.5		TO-3d
15	1	5	0.5	2	0.5		TO-3d
10	20	4	1.5	1.2	0.3	8	TO-3
10	12	4	1	1.8	0.4	8	TO-3
10	10	4	1	2	0.5	8	TO-3
8	15	4	1.2	1	0.4	8	TO-3
8	8	4	1	1.7	0.8	8	TO-3
8	6	4	1	2	1.2	8	TO-3
10	15	2	0.25	1.5	0.35	25	TO-3
10	12	5	0.25	1.8	0.5	25	TO-3
10	8	5	0.4	2.5	0.5	25	TO-3
10	15	5	0.25	1.5	0.35	25	TO-3
10	10	5	0.25	1.5	0.35	25	TO-3
10	7	5	0.25	2.5	0.5	25	TO-3
10	5	5	0.4	2.5	0.5	25	TO-3

HIGH VOLTAGE SWITCHING TRANSISTORS - METAL CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCES* (V)	VCEO (V)	IC ICM+ (A)	VCEsat max (V)	@ IC (A)
2N 6654		150	175	400	350	20	0.6	15
2N 6654A		188	175	400	350	16	0.8	12
2N 6654B		188	175	400	350	12	0.8	8
2N 6654/1		150	175	400	350	20	0.8	15
2N 6654/2		150	175	400	350	15	0.8	10
2N 6654/3		125	175	400	350	10	0.8	7
2N 6654/4		125	175	400	350	7	0.8	5
2N 6655		150	175	450	400	20	0.6	15
2N 6655A		188	175	450	400	16	0.8	12
2N 6655B		188	175	450	400	12	0.8	8
2N 6655/1		150	175	450	400	20	0.8	15
2N 6655/2		150	175	450	400	15	0.8	10
2N 6655/3		125	175	450	400	10	0.8	7
2N 6655/4		125	175	450	400	7	0.8	5

HIGH VOLTAGE SWITCHING DARLINGTONS - METAL CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCES* (V)	VCEO (V)	IC ICM+ (A)	VCEsat max (V)	@ IC (A)
BU 930		150	175	400*	350	15	1.8	10
BU 931		150	175	450*	400	15	1.8	10
BU 932		150	175	500*	450	15	1.8	8

HIGH VOLTAGE SWITCHING TRANSISTORS - METAL CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf toff+ max (us)	fT min (MHz)	CASE
10	15	2	0.25	1.5	0.35	25	TO-3
10	12	5	0.25	1.8	0.5	25	TO-3
10	8	5	0.4	2.5	0.5	25	TO-3
10	15	5	0.25	1.5	0.35	25	TO-3
10	10	5	0.25	1.5	0.35	25	TO-3
10	7	5	0.25	2.5	0.5	25	TO-3
10	5	5	0.4	2.5	0.5	25	TO-3
10	15	2	0.25	1.5	0.35	25	TO-3
10	12	5	0.25	1.8	0.5	25	TO-3
10	8	5	0.4	2.5	0.5	25	TO-3
10	15	5	0.25	1.5	0.35	25	TO-3
10	10	5	0.25	1.5	0.35	25	TO-3
10	7	5	0.25	2.5	0.5	25	TO-3
10	5	5	0.4	2.5	0.5	25	TO-3

HIGH VOLTAGE SWITCHING DARLINGTONS - METAL CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf toff+ max (us)	fT min (MHz)	CASE
80	8						TO-3d
80	8						TO-3d
50	8						TO-3d

HIGH VOLTAGE TRANSISTORS - TV APPLICATIONS - METAL CASE

TYPE NPN	PNP	Ptot @ TC (1) (W)	TJM (oC)	VCEX VCES* (V)	VCEO (V)	IC ICM+ (A)	VBEsat @ VCEsat* max (V)	IC (A)
BU 204		10	115	1300*	600	3+	1.5	2
BU 205		10	115	1500*	700	3+	1.5	2
BU 205A		10	115	1500*	700	3+	5*	2
BU 206		10	115	1700*	800	3+	1.5	2
BU 207		12.5	115	1300*	600	7.5+	5*	4.5
BU 208		12.5	115	1500*	700	7.5+	5*	4.5
BU 208A		12.5	115	1500*	700	7.5+	1*	4.5
BU 208B		12.5	115	1500*	700	7.5+	5*	4.5
BU 209		12.5	115	1700*	800	7.5+	5*	3
BU 606		90	175	400	200	7	1*	5
BU 607		90	175	330	200	7	1*	5
BU 608		90	175	400	200	7	1*	6
* BU 606D		90	175	400		7	1*	5
* BU 607D		90	175	330		7	1*	5
* BU 608D		90	175	400		7	1*	6

(1) Ptot @ TC = 90 oC for : BU 204 , BU 205 , BU 206
BU 205A
(1) Ptot @ TC = 90 oC for : BU 207 , BU 208 , BU 209
BU 208A
BU 208B
(1) Ptot @ TC = 25 oC for : BU 606 , BU 607 , BU 608
BU 606D, BU 607D, BU 608D

* With integrated diode

HIGH VOLTAGE TRANSISTORS - TV APPLICATIONS - METAL CASE

hFE min-max	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf toff+ max (us)	fT min (MHz)	CASE
				10	1.5	3	TO-3d
				10	1.5	3	TO-3d
						3	TO-3d
				10	1.5	3	TO-3d
2.25	4.5	5		10	1.5	3	TO-3d
2.25	4.5	5		10	1.5	3	TO-3d
2.25	4.5	5		10	1.5	3	TO-3d
2.25	4.5	5		10	1.5	3	TO-3d
2.25	3	5		10	1.5	3	TO-3d
					1.25+	10	TO-3
					1.25+	10	TO-3
					0.8 +	10	TO-3
					1.25+	10	TO-3
					1.25+	10	TO-3
					0.8 +	10	TO-3

HIGH VOLTAGE SWITCHING GIANT DARLINGTONS

TYPE NPN	Ptot @ TC = 25 oC (W)	TJM (oC)	VCEX (V)	VCEO (V)	IC (A)	ICM (A)	IB IBM+ (A)
GT 100A/4	300	125	400	300	60	100	10
GT 100A/6	300	125	600	400	60	100	10
GT 100A/8	300	125	800	400	60	100	10
GT 100A/9	300	125	900	450	60	100	10
GT 100A/10	300	125	1000	500	60	100	10
GT 100B/4	250	125	400	300	40	80	10
GT 100B/6	250	125	600	400	40	80	10
GT 100B/8	250	125	800	400	40	80	10
GT 100B/9	250	125	900	450	40	80	10
GT 100B/10	250	125	1000	500	40	80	10
GT 150A/3	500	125	300	300	150	240	8
GT 150A/4	500	125	400	400	150	240	16+
GT 150A/5	500	125	500	500	150	240	8
GT 150A/6	500	125	600	600	150	240	16+
GT 150A/7	500	125	700	700	150	240	8
GT 150A/8	500	125	800	800	150	240	16+
GT 150A/9	500	125	900	900	150	240	8
GT 150A/10	500	125	1000	1000	150	240	16+
GT 150B/3	350	125	300	300	100	125	8
GT 150B/4	350	125	400	400	100	125	8
GT 150B/5	350	125	500	500	100	125	8
GT 150B/6	350	125	600	600	100	125	8
GT 150B/7	350	125	700	700	100	125	8
GT 150B/8	350	125	800	800	100	125	8
GT 150B/9	350	125	900	900	100	125	8
GT 150B/10	350	125	1000	1000	100	125	8

HIGH VOLTAGE SWITCHING GIANT DARLINGTONS

VCEsat @ max (V)	IC (A)	hFE @ min-max	IC (A)	& VCE (V)	ts max (us)	tf max (us)	CASE
2.5	60	20	60	5	20	4	T-20
2.5	60	20	60	5	20	4	T-20
2.5	60	20	60	5	20	4	T-20
2.5	60	20	60	5	20	4	T-20
2.5	60	20	60	5	20	4	T-20
2.5	40	20	60	5	20	4	T-20
2.5	40	20	60	5	20	4	T-20
2.5	40	20	60	5	20	4	T-20
2.5	40	20	60	5	20	4	T-20
2.5	40	20	60	5	20	4	T-20
2.5	100	50	100	5	20	4	T-28
2.5	100	50	100	5	20	4	T-28
2.5	100	50	100	5	20	4	T-28
2.5	100	50	100	5	20	4	T-28
2.5	100	50	100	5	20	4	T-28
2.5	100	50	100	5	20	4	T-28
2.5	100	50	100	5	20	4	T-28
2.5	100	50	100	5	20	4	T-28
2.5	70	50	70	5	20	4	T-28
2.5	70	50	70	5	20	4	T-28
2.5	70	50	70	5	20	4	T-28
2.5	70	50	70	5	20	4	T-28
2.5	70	50	70	5	20	4	T-28
2.5	70	50	70	5	20	4	T-28
2.5	70	50	70	5	20	4	T-28
2.5	70	50	70	5	20	4	T-28

HIGH VOLTAGE SWITCHING GIANT DARLINGTONS

TYPE NPN	Ptot @ TC = 25 oC (W)	TJM (oC)	VCES (V)	VCEO (V)	IC (A)	ICM (A)	IB IBM+ (A)
GT 250A/3	1330	125	300	300	250	400	20
GT 250A/4	1330	125	400	400	250	400	20
GT 250A/5	1330	125	500	500	250	400	20
GT 250A/6	1330	125	600	600	250	400	20
GT 250A/7	1330	125	700	700	250	400	20
GT 250A/8	1330	125	800	800	250	400	20
GT 250A/9	1330	125	900	900	250	400	20
GT 250A/10	1330	125	1000	1000	250	400	20
GT 250B/3	1330	125	300	300	160	250	16
GT 250B/4	1330	125	400	400	160	250	16
GT 250B/5	1330	125	500	500	160	250	16
GT 250B/6	1330	125	600	600	160	250	16
GT 250B/7	1330	125	700	700	160	250	16
GT 250B/8	1330	125	800	800	160	250	16
GT 250B/9	1330	125	900	900	160	250	16
GT 250B/10	1330	125	1000	1000	160	250	16
GT 250C/3	900	125	300	300	100	160	10
GT 250C/4	900	125	400	400	100	160	10
GT 250C/5	900	125	500	500	100	160	10
GT 250C/6	900	125	600	600	100	160	10
GT 250C/7	900	125	700	700	100	160	10
GT 250C/8	900	125	800	800	100	160	10
GT 250C/9	900	125	900	900	100	160	10
GT 250C/10	900	125	1000	1000	100	160	10
GT 250D/3	770	125	300	300	70	125	10
GT 250D/4	770	125	400	400	70	125	10
GT 250D/5	770	125	500	500	70	125	10
GT 250D/6	770	125	600	600	70	125	10
GT 250D/7	770	125	700	700	70	125	10
GT 250D/8	770	125	800	800	70	125	10
GT 250D/9	770	125	900	900	70	125	10
GT 250D/10	770	125	1000	1000	70	125	10

HIGH VOLTAGE SWITCHING GIANT DARLINGTONS

VCEsat @ max (V)	IC (A)	hFE @ & min-max	IC (A)	VCE (V)	ts max (us)	tf max (us)	CASE
2.5	200	50	200	5	20	4	T-30
2.5	200	50	200	5	20	4	T-30
2.5	200	50	200	5	20	4	T-30
2.5	200	50	200	5	20	4	T-30
2.5	200	50	200	5	20	4	T-30
2.5	200	50	200	5	20	4	T-30
2.5	200	50	200	5	20	4	T-30
2.5	200	50	200	5	20	4	T-30
2.5	160	50	160	5	20	4	T-30
2.5	160	50	160	5	20	4	T-30
2.5	160	50	160	5	20	4	T-30
2.5	160	50	160	5	20	4	T-30
2.5	160	50	160	5	20	4	T-30
2.5	160	50	160	5	20	4	T-30
2.5	160	50	160	5	20	4	T-30
2.5	160	50	160	5	20	4	T-30
2.5	100	50	100	5	20	4	T-30
2.5	100	50	100	5	20	4	T-30
2.5	100	50	100	5	20	4	T-30
2.5	100	50	100	5	20	4	T-30
2.5	100	50	100	5	20	4	T-30
2.5	100	50	100	5	20	4	T-30
2.5	100	50	100	5	20	4	T-30
2.5	100	50	100	5	20	4	T-30
2.5	60	50	60	5	20	4	T-30
2.5	60	50	60	5	20	4	T-30
2.5	60	50	60	5	20	4	T-30
2.5	60	50	60	5	20	4	T-30
2.5	60	50	60	5	20	4	T-30
2.5	60	50	60	5	20	4	T-30
2.5	60	50	60	5	20	4	T-30
2.5	60	50	60	5	20	4	T-30

HIGH VOLTAGE SWITCHING GIANT DARLINGTONS

TYPE NPN	Ptot @ TC = 25 oC (W)	TJM (oC)	VCES (V)	VCEO (V)	IC (A)	ICM (A)	IB IBM+ (A)
GT 400A/3	2500	125	300	300	400	600	30
GT 400A/4	2500	125	400	400	400	600	30
GT 400A/5	2500	125	500	500	400	600	30
GT 400A/6	2500	125	600	600	400	600	30
GT 400A/7	2500	125	700	700	400	600	30
GT 400A/8	2500	125	800	800	400	600	30
GT 400A/9	2500	125	900	900	400	600	30
GT 400A/10	2500	125	1000	1000	400	600	30
GT 400B/3	2000	125	300	300	350	525	30
GT 400B/4	2000	125	400	400	350	525	30
GT 400B/5	2000	125	500	500	350	525	30
GT 400B/6	2000	125	600	600	350	525	30
GT 400B/7	2000	125	700	700	350	525	30
GT 400B/8	2000	125	800	800	350	525	30
GT 400B/9	2000	125	900	900	350	525	30
GT 400B/10	2000	125	1000	1000	350	525	30
GT 400C/3	1660	125	300	300	300	450	30
GT 400C/4	1660	125	400	400	300	450	30
GT 400C/5	1660	125	500	500	300	450	30
GT 400C/6	1660	125	600	600	300	450	30
GT 400C/7	1660	125	700	700	300	450	30
GT 400C/8	1660	125	800	800	300	450	30
GT 400C/9	1660	125	900	900	300	450	30
GT 400C/10	1660	125	1000	1000	300	450	30

HIGH VOLTAGE SWITCHING GIANT DARLINGTONS

VCEsat max (V)	@ IC (A)	hFE min-max	@ IC (A)	& VCE (V)	ts max (us)	tf max (us)	CASE
2.5	300	50	300	5	20	4	T-50
2.5	300	50	300	5	20	4	T-50
2.5	300	50	300	5	20	4	T-50
2.5	300	50	300	5	20	4	T-50
2.5	300	50	300	5	20	4	T-50
2.5	300	50	300	5	20	4	T-50
2.5	300	50	300	5	20	4	T-50
2.5	300	50	300	5	20	4	T-50
2.5	240	50	240	5	20	4	T-50
2.5	240	50	240	5	20	4	T-50
2.5	240	50	240	5	20	4	T-50
2.5	240	50	240	5	20	4	T-50
2.5	240	50	240	5	20	4	T-50
2.5	240	50	240	5	20	4	T-50
2.5	240	50	240	5	20	4	T-50
2.5	240	50	240	5	20	4	T-50
2.5	200	50	200	5	20	4	T-50
2.5	200	50	200	5	20	4	T-50
2.5	200	50	200	5	20	4	T-50
2.5	200	50	200	5	20	4	T-50
2.5	200	50	200	5	20	4	T-50
2.5	200	50	200	5	20	4	T-50
2.5	200	50	200	5	20	4	T-50
2.5	200	50	200	5	20	4	T-50

HIGH VOLTAGE SWITCHING GIANT DARLINGTONS

TYPE NPN	Ptot @ TC = 25 oC (W)	TJM (oC)	VCES (V)	VCEO (V)	IC (A)	ICM (A)	IB IBM+ (A)
GT 400D/3	1540	125	300	300	250	375	30
GT 400D/4	1540	125	400	400	250	375	30
GT 400D/5	1540	125	500	500	250	375	30
GT 400D/6	1540	125	600	600	250	375	30
GT 400D/7	1540	125	700	700	250	375	30
GT 400D/8	1540	125	800	800	250	375	30
GT 400D/9	1540	125	900	900	250	375	30
GT 400D/10	1540	125	1000	1000	250	375	30
GT 400E/3	1540	125	300	300	200	300	30
GT 400E/4	1540	125	400	400	200	300	30
GT 400E/5	1540	125	500	500	200	300	30
GT 400E/6	1540	125	600	600	200	300	30
GT 400E/7	1540	125	700	700	200	300	30
GT 400E/8	1540	125	800	800	200	300	30
GT 400E/9	1540	125	900	900	200	300	30
GT 400E/10	1540	125	1000	1000	200	300	30

HIGH VOLTAGE SWITCHING GIANT DARLINGTONS

VCEsat max (V)	@ IC (A)	hFE min-max	@ IC (A)	& VCE (V)	ts max (us)	tf max (us)	CASE
2.5	160	50	160	5	20	4	T-50
2.5	160	50	160	5	20	4	T-50
2.5	160	50	160	5	20	4	T-50
2.5	160	50	160	5	20	4	T-50
2.5	160	50	160	5	20	4	T-50
2.5	160	50	160	5	20	4	T-50
2.5	160	50	160	5	20	4	T-50
2.5	160	50	160	5	20	4	T-50
2.5	125	50	125	5	20	4	T-50
2.5	125	50	125	5	20	4	T-50
2.5	125	50	125	5	20	4	T-50
2.5	125	50	125	5	20	4	T-50
2.5	125	50	125	5	20	4	T-50
2.5	125	50	125	5	20	4	T-50
2.5	125	50	125	5	20	4	T-50
2.5	125	50	125	5	20	4	T-50

GENERAL PURPOSE TRANSISTORS - METAL CASE

TYPE NPN	TYPE PNP	Ptot @ TA= 25 oC (mW)	TJM (oC)	VCBO VCES* (V)	VCEO (V)	IC ICM+ (mA)	VCEsat @ max (mV)	IC (mA)
BC 107		300	175	50*	45	100	600	100
BC 108		300	175	30*	20	100	600	100
BC 109		300	175	30*	20	100	600	100
	BC 177	300	175	50*	45	100	600	100
	BC 178	300	175	30	25	100	600	100
	BC 179	300	175	25	20	100	600	100
BC 190		300	175	70*	64	100	600	100
	BC 261	300	175	50*	45	100	500	100
	BC 262	300	175	30*	25	100	500	100
	BC 263	300	175	25	25	100	500	100
	BC 266	300	175	64*	64	100	500	100
BCY 58		390	200	32*	32	200	350	10
BCY 59		390	200	45*	45	200	350	10
BCY 69		300	175	20	20	100	250	10
	BCY 78	300	175	32*	32	200	250	10
	BCY 79	300	175	45*	45	200	250	10
	BSW 19A	300	175	35	30	100	200	50
	BSW 19VI	300	175	35	30	100	200	50

GENERAL PURPOSE TRANSISTORS - METAL CASE

hFE hfe* min-max	@	IC & (mA)	VCE (V)	fT min (MHz)	NF max (dB)	Cob max (pF)	toff max (ns)	CASE
125-900*	(1)	2	5	250	10	6		TO-18
125-900*	(1)	2	5	250	10	6		TO-18
125-900*	(1)	2	5	250	3	6		TO-18
75-900*	(1)	2	5	150	10	7		TO-18
75-900*	(1)	2	5	150	10	7		TO-18
125-900*	(1)	2	5	150	4	7		TO-18
125-500*	(1)	2	5	250	10	6		TO-18
125-900*	(1)	2	5	130	10	6		TO-18
125-900*	(1)	2	5	130	10	6		TO-18
125-900*	(1)	2	5	130	4	6		TO-18
125-500*	(1)	2	5	130	10	6		TO-18
125-700*	(2)	2	5	130	6	6	480	TO-18
125-700*	(2)	2	5	130	6	6	480	TO-18
450-650		2	5	180	6	8		TO-18
125-700*	(2)	2	5	180		7	480	TO-18
125-700*	(2)	2	5	180		7	480	TO-18
40-120		10	1	150		8	800	TO-18
100-300		10	1	150		8	800	TO-18

(1) Different hfe groups :

gr. VI: 75 - 150
gr. A : 125 - 260
gr. B : 240 - 500
gr. C : 450 - 900

(2) Different hfe groups :

gr. VII : 125 - 250
gr. VIII : 175 - 350
gr. IX : 250 - 500
gr. X : 350 - 700

GENERAL PURPOSE TRANSISTORS - METAL CASE

TYPE NPN	TYPE PNP	Ptot @ TA= 25 oC (mW)	TJM (oC)	VCBO VCES* (V)	VCEO (V)	IC ICM+ (mA)	VCEsat @ max (mV)	IC (mA)
	BSW 21	300	175	25	25	200	500	50
	BSW 21A	300	175	50	50	200	500	50
	BSW 22	300	175	25	25	200	500	50
	BSW 22A	300	175	50	50	200	500	50
BSX 51		300	175	25	25	200	300	50
BSX 51A		300	175	50	50	200	300	50
BSX 51B		300	175	60	60	200	300	50
BSX 52		300	175	25	25	200	300	50
BSX 52A		300	175	50	50	200	300	50
BSX 52B		300	175	60	60	200	300	50
2N 929		300	175	15	15	30	1000	10
2N 930		300	175	45	45	30	1000	10
2N 2220		500	175	60	30	800	400	150
2N 2221		500	175	60	30	800	400	150
2N 2221A		500	175	75	40	800	300	150
2N 2222		500	175	60	30	800	400	150
2N 2222A		500	175	75	30	800	300	150
	2N 2906	400	175	60	40	600	400	150
	2N 2906A	400	175	60	60	600	400	150
	2N 2907	400	175	60	40	600	400	150
	2N 2907A	400	175	60	60	600	400	150

GENERAL PURPOSE TRANSISTORS - METAL CASE

hFE hfe* min-max	@ IC (mA)	& VCE (V)	fT min (MHz)	NF max (dB)	Cob max (pF)	toff max (ns)	CASE
75-225	2	4.5	300		8		TO-18
75-225	2	4.5	300		8		TO-18
180-540	2	4.5	300		8		TO-18
180-540	2	4.5	300		8		TO-18
75-225	2	4.5	300		8		TO-18
75-225	2	4.5	300		8		TO-18
75-225	2	4.5	300		8		TO-18
180-540	2	4.5	300		8		TO-18
180-540	2	4.5	300		8		TO-18
180-540	2	4.5	300		8		TO-18
40-120	0.01	5	180	4	8		TO-18
100-300	0.01	5	180	4	8		TO-18
20- 60	150	10	200		8	285	TO-18
40-120	150	10	250		8	285	TO-18
40-120	150	10	250		8	285	TO-18
100-300	150	10	250		8	285	TO-18
100-300	150	10	300		8	285	TO-18
40-120	150	10	200		8	285	TO-18
40-120	150	10	200		8	285	TO-18
100-300	150	10	200		8	285	TO-18
100-300	150	10	200		8	285	TO-18

GENERAL PURPOSE TRANSISTORS - METAL CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (W)	TJM (oC)	VCBO VCES* (V)	VCEO (V)	IC ICM+ (mA)	VCEsat max (V)	@ IC (mA)
	BSV 15	5	200	40*	40	1000	1	500
	BSV 16	5	200	60*	60	1000	1	500
	BSV 17	5	200	80*	80	1000	1	500
BSX 45		5	200	80*	40	1000	1	1000
BSX 46		5	200	100*	60	1000	1	1000
BSX 47		5	200	120*	80	1000	1	1000
2N 1613		3	200	75	50	500	1.3	150
2N 1613A		3	200	100	60	500	1.3	150
2N 1711		3	200	75	50	500	1.3	150
2N 1711A		3	200	100	60	500	1.3	150
2N 2217		3	200	60	30	800	1.6	500
2N 2218		3	200	60	30	800	1.6	500
2N 2218A		3	200	75	40	800	1	500
2N 2219		3	200	60	30	800	1.6	500
2N 2219A		3	200	75	40	800	1	500
	2N 2904	3	200	60	40	800	1.6	500
	2N 2904A	3	200	75	60	800	1	500
	2N 2905	3	200	60	40	800	1.6	500
	2N 2905A	3	200	75	60	800	1	500

GENERAL PURPOSE TRANSISTORS - METAL CASE

hFE hfe* min-max	@	IC & (mA)	VCE (V)	fT min (MHz)	NF max (dB)	Cob Cre+ max (pF)	toff max (ns)	CASE
40-250	(1)	100	1	50		30+		TO-39
40-250	(1)	100	1	50		30+		TO-39
40-250	(1)	100	1	50		30+		TO-39
40-250	(1)	100	1	50		25+		TO-39
40-250	(1)	100	1	50		25+		TO-39
40-250	(1)	100	1	50		25+		TO-39
40-120		150	10	60	10			TO-39
40-120		150	10	60				TO-39
100-300		150	10	60	10			TO-39
100-300		150	10	60				TO-39
20- 60		150	10	200		8	285	TO-39
40-120		150	10	250		8	285	TO-39
40-120		150	10	250		8	285	TO-39
100-300		150	10	250		8	285	TO-39
100-300		150	10	300		8	285	TO-39
40-120		150	10	200		8	285	TO-39
40-120		150	10	200		8	285	TO-39
100-300		150	10	200		8	285	TO-39
100-300		150	10	200		8	285	TO-39

(1) Different hFE groups :

gr. 6 : 40 - 100
gr. 10 : 63 - 160
gr. 16 : 100 - 250

LOW CURRENT FAST SWITCHING TRANSISTORS - METAL CASE

TYPE NPN	TYPE PNP	Ptot @ TC= 25 oC (mW)	TJM (oC)	VCBO VCES* (V)	VCEO (V)	IC ICM+ (mA)	VCEsat max (mV)	@ IC (mA)
BSV 89		360	200	25*	10	100	250	30
BSV 90		360	200	30*	13.5	100	250	30
BSV 91		360	200	40*	15	100	250	30
2N 706		300	200	25	15	200	600	10
2N 708		360	200	40	15	200	400	10
2N 2368		360	200	20	15	200	250	30
2N 2368S		360	200	15	6	100	400	20
2N 2369		360	200	40	15	200	250	10
2N 2369A		360	200	40	15	200	250	10

LOW CURRENT FAST SWITCHING TRANSISTORS - METAL CASE

hFE min-max	@ IC (mA)	& VCE (v)	Cob max (pF)	ton max (ns)	toff ts * max (ns)	fT min (MHz)	CASE
40	10	1	2	12	18	400	TO-18
40-120	10	1	2	12	18	400	TO-18
40-270	10	1	2	12	18	400	TO-18
20	10	1	6		35*	200	TO-18
30-120	10	1	6	40	70	300	TO-18
20- 60	10	1	4	12	15	400	TO-18
30-150	20	0.4	4	12	15	400	TO-18
40-120	10	1	4	12	18	500	TO-18
40-120	10	1	4	12	18	500	TO-18

GENERAL PURPOSE TRANSISTORS - PLASTIC CASE

TYPE NPN	TYPE PNP	Ptot (1) (mW)	TJM (oC)	VCBO VCES* (V)	VCEO (V)	IC ICM+ (mA)	VCEsat max (mV)	@ IC (mA)
BC 170		300	150	20	20	100	400	30
BC 171		300	150	50*	45	100	600	100
BC 172		300	150	30*	25	100	600	100
BC 173		300	150	30*	25	100	200	10
BC 174		300	150	70*	64	100	600	100
BC 237		300	150	50*	45	100	600	100
BC 238		300	150	30*	25	100	600	100
BC 239		300	150	30*	25	100	200	10
	BC 250	300	150	20	20	100	400	30
	BC 251	300	150	50*	45	100	500	100
	BC 252	300	150	30*	25	100	500	100
	BC 253	300	150	30*	25	100	300	10
	BC 256	300	150	64*	64	100	500	100
	BC 307	300	150	50*	45	100	500	100
	BC 308	300	150	30*	25	100	500	100
	BC 309	300	150	30*	25	100	300	10
	BC 327	625	150	50*	45	1000+	700	500
	BC 328	625	150	30*	20	1000+	700	500
BC 337		625	150	50*	45	1000+	700	500
BC 338		625	150	30*	20	1000+	700	500

(1) With the leads kept at 25 oC at 2 mm from case .

GENERAL PURPOSE TRANSISTORS - PLASTIC CASE

hFE hfe* min-max	@	IC & (mA)	VCE (V)	fT min (MHz)	NF max (dB)	Cob max (pF)	toff max (ns)	CASE
35- 600	(2)	1	1	250	10	6		TO-92a
125-1000*	(1)	2	5	250	10	6		TO-92a
125-1000*	(1)	2	5	250	10	6		TO-92a
125- 900*	(1)	2	5	250	4	6		TO-92a
125- 500*	(1)	2	5	250	10	6		TO-92a
125-1000*	(1)	2	5	250	10	6		TO-92a
125- 900*	(1)	2	5	250	10	6		TO-92a
125- 900*	(1)	2	5	250	4	6		TO-92a
35- 600	(2)	2	4.5	250	10	6		TO-92a
125- 900*	(1)	2	5	250	10	6		TO-92a
125- 900*	(1)	2	5	250	10	6		TO-92a
125- 900*	(1)	2	5	250	4	6		TO-92a
125- 500*	(1)	2	5	250	10	6		TO-92a
125- 900*	(1)	2	5	250	10	6		TO-92a
125- 900*	(1)	2	5	250	10	6		TO-92a
125- 900*	(1)	2	5	250	3	6		TO-92a
100- 630	(3)	100	1	100		12		TO-92a
100- 630	(3)	100	1	100		12		TO-92a
100- 630	(3)	100	1	100		12		TO-92a
100- 630	(3)	100	1	100		12		TO-92a

(1) Different hfe groups :
- gr. A : 125 - 260
- gr. B : 240 - 500
- gr. C : 450 - 900/1000

(2) Different hFE groups :
- gr. A : 35 - 100
- gr. B : 80 - 250
- gr. C : 200 - 600

(3) Different hFE groups :
- gr. 16 : 100 - 250
- gr. 25 : 160 - 400
- gr. 40 : 250 - 630

GENERAL PURPOSE TRANSISTORS - PLASTIC CASE

TYPE NPN	TYPE PNP	Ptot (1) (mW)	TJM (oC)	VCBO VCES* (V)	VCEO (V)	IC ICM+ (mA)	VCEsat max (mV)	@ IC (mA)
BC 413		300	150	45	30	100	600	100
BC 414		300	150	50	45	100	600	100
	BC 415	300	150	45	30	100	600	100
	BC 416	300	150	50	45	100	600	100
+	BC 516	625	150	40	30	400	1000	100
+ BC 517		625	150	40	30	400	1000	100
BC 546		300	150	80	65	200+	600	100
BC 547		300	150	50	45	200+	600	100
BC 548		300	150	30	30	200+	600	100
BC 549		300	150	30	30	100	250	10
BC 550		300	150	50	45	100	250	10
	BC 556	300	150	80	65	200+	650	100
	BC 557	300	150	50	45	200+	650	100
	BC 558	300	150	30	30	200+	650	100
	BC 559	300	150	30	30	100	300	10
	BC 560	300	150	50	45	100	300	10

(1) With the leads kept at 25 oC at 2 mm from case
\+ Darlington transistor

GENERAL PURPOSE TRANSISTORS - PLASTIC CASE

hFE hfe* min-max	@	IC & (mA)	VCE (V)	fT min (MHz)	NF max (dB)	Cob max (pF)	toff max (ns)	CASE
240-900*	(1)	2	5	250	3	6		TO-92a
240-900*	(1)	2	5	250	3	6		TO-92a
240-900*	(1)	2	5	250	3	6		TO-92a
240-900*	(1)	2	5	250	3	6		TO-92a
min 30000		2	2	220				TO-92a
min 30000		2	2	220				TO-92a
125-500*	(1)	2	5	150	10	6		TO-92a
125-500*	(1)	2	5	150	10	6		TO-92a
125-900*	(1)	2	5	150	10	6		TO-92a
240-900*	(1)	2	5	150	4	6		TO-92a
240-900*	(1)	2	5	150	3	6		TO-92a
125-500*	(1)	2	5	150	10	6		TO-92a
125-500*	(1)	2	5	150	10	6		TO-92a
125-900*	(1)	2	5	150	10	6		TO-92a
240-900*	(1)	2	5	150	4	6		TO-92a
240-900*	(1)	2	5	150	2	6		TO-92a

(1) Different **hfe** groups :

gr. A : 125 - 260
gr. B : 240 - 500
gr. C : 450 - 900

HIGH VOLTAGE & VIDEO AMPLIFIER TRANSISTORS

TYPE NPN	TYPE PNP	Ptot @ TA= 25 oC (mW)	TJM (oC)	VCBO (V)	VCEO VCER# (V)	IC ICM$ (mA)	VCEsat max (mV)	@ IC (mA)
BSX 21		300	175	120	80	100	0.7	4
BF 257		800	175	160	160	100	1	30
BF 257E		800	175	200	200	100	1	30
BF 258		800	175	250	250	100	1	30
BF 259		800	175	300	300	100	1	30
BF 297		625+	150	160	160	100	1	30
BF 298		625+	150	250	250	100	1	30
BF 299		625+	150	300	300	100	1	30
BF 420A		830*	150	300	300	100$		
BF 422A		830*	150	250	250	100$		
	BF 421A	830*	150	300	300	100$		
	BF 423A	830*	150	250	250	100$		
BF 457		1200	150	160	160	100	1	30
BF 457E		1200	150	200	200	100	1	30
BF 458		1200	150	250	250	100	1	30
BF 459		1200	150	300	300	100	1	30
BF 469		2000^	150	250	250	30		
BF 471		2000^	150	300	300#	30		
	BF 470	2000^	150	250	250	30		
	BF 472	2000^	150	300	300#	30		

Total power dissipation (**Ptot**) as follows :

+ With the leads kept at 25 oC at 2 mm from case .

* This value applies if the collector lead (whose length will be less than 3 mm) is soldered on a copper cooling area of at least 10 mm x 10 mm and with minimum thickness 35 um .

^ **TC** </= 110 oC

HIGH VOLTAGE & VIDEO AMPLIFIER TRANSISTORS

hFE @ hfe* min-max	IC (mA)	& VCE (V)	fT min (MHz)	NF max (dB)	Cob Cre+ max (pF)	toff max (ns)	CASE
20	4	3	60		4.7		TO-18
25	30	10	50		4.7+		TO-39
25	30	10	50		4.7+		TO-39
25	30	10	50		4.7+		TO-39
25	30	10	50		4.7+		TO-39
25	30	10	50		5.5+		TO-92a
25	30	10	50		5.5+		TO-92a
25	30	10	50		5.5+		TO-92a
40	25	20	60		1.6		TO-92a
50	25	20	60		1.6		TO-92a
40	25	20	60		1.6		TO-92a
50	25	20	60		1.6		TO-92a
25	30	10	50		5.5+		TO-126
25	30	10	50		5.5+		TO-126
25	30	10	50		5.5+		TO-126
25	30	10	50		5.5+		TO-126
50	25	20	60		1.8+		TO-126
40	25	20	60		1.8+		TO-126
50	25	20	60		1.8+		TO-126
40	25	20	60		1.8+		TO-126

SILICON
TRANSISTORS
= HIGH =
=FREQUENCY=--

RF TRANSISTORS FOR RADIO-TV - METAL CASE

TYPE NPN	TYPE PNP	APPLICATIONS	Ptot @ TA= 25 oC (mW)	TJM (oC)	VCEO (V)
BF 115		RF amplif.,mixer,oscillator	165	175	30
BF 167		AGC IF TV amplifier	130	175	30
BF 173		TV IF amplifier	200	175	25
BF 173S		TV IF amplifier	200	175	25
BF 180		UHF AGC amplifier	200	175	20
BF 181		UHF oscillator & mixer	200	175	20
BF 184		AM-FM amplifier	165	175	30
BF 185		Front-end FM tuners	165	175	30
BF 200		VHF AGC amplifier	200	175	20
BF 214		AM-FM amplifier	165	175	30
BF 215		AM-FM amplifier	165	175	30
	BF 272A	UHF AGC amplifier	200	200	35
	BF 272B	UHF AGC amplifier	200	200	35
	BF 316A	UHF oscillator & mixer	200	200	35

RF TRANSISTORS FOR RADIO-TV - METAL CASE

Gp GUM+ min (dB)	NF @ max (dB)	IC & (mA)	f (MHz)	fT @ typ* min (MHz)	IC (mA)	Cre @ max (pF)	VCB (V)	CASE
	1.2	1	1	150	1	0.8	10	TO-72b
26	3	4	35	350	4	0.25	10	TO-72b
26		7.2	36.4	550	5	0.3	10	TO-72b
				900	7			TO-72b
12	7	2	800	700	2	0.4	10	TO-72a
12	5	3	200	600	2	0.4	10	TO-72a
	6	1	100	250	1	0.8	10	TO-72b
	6	1	100	250	1	0.8	10	TO-72b
22+	8	3	200	500*	2	0.5	10	TO-72a
				250	1	0.7	10	TO-72b
	6	1	100	250	1	0.7	10	TO-72b
15	5	3	800	600	3	0.35	10	TO-72a
15	5	3	800	600	3	0.35	10	TO-72a
12	5	3	800	600	3	0.35	10	TO-72a

+ Typical value

RF TRANSISTORS FOR RADIO-TV - PLASTIC CASE

TYPE NPN	TYPE PNP	APPLICATIONS	Ptot (1) (mW)	TJM (oC)	VCEO (V)
BF 198		AGC IF TV amplifier	300	150	32
BF 199		TV IF amplifier	300	150	32
BF 240		FM IF amplifier	300	150	42
BF 241		FM IF amplifier	300	150	42
BF 254		AM IF amplifier	220	150	20
BF 255		FM amplifier & mixer	220	150	20
	BF 450	VHF oscillator & mixer	300	150	35
	BF 451	VHF oscillator & mixer	300	150	35
	BF 506	VHF oscillator & mixer	300	150	35
	BF 509	AGC VHF amplifier	300	150	35
	BF 914	UHF-VHF front-end amplifier	300	150	35

(1) With the leads kept at 25 oC at 2 mm from case .

RF TRANSISTORS FOR RADIO-TV - PLASTIC CASE

Gp typ* min (dB)	NF @ typ+ max (dB)	IC & (mA)	f (MHz)	fT @ typ* min (MHz)	IC (mA)	Cre @ Crb+ max (pF)	VCB (V)	CASE
		4	35	265	4	0.35	10	TO-92b
				365	5	0.42	10	TO-92b
				265	1	0.42	10	TO-92b
				265	1	0.42	10	TO-92b
				150	1	1.2	10	TO-92b
				150	1	1.2	10	TO-92b
	2.5	1.3	200	375	1	0.32	10	TO-92b
	2.5	1.3	200	375	1	0.32	10	TO-92b
17*	3+	3	200	400*	3	1	10	TO-92a
17*	2.5+	3	200	700*	3	1	10	TO-92a
15	3.5	2	200	850*	2	0.8	10	TO-92a

RF TRANSISTORS FOR PROFESSIONAL APPLICATIONS

TYPE NPN	TYPE PNP	APPLICATIONS	Ptot @ TA= 25 oC (mW)	TJM (oC)	VCEO (V)
$	BF 479	UHF-VHF amplifier & mixer	170	150	25
$ BFW 94		Power UHF amplifier	700	150	20
BFX 89		UHF-VHF amplifier	200	200	15
BFY 90		UHF-VHF amplifier	200	200	15
2N 918		VHF low noise amplifier	200	200	15
	2N 4957	UHF low noise amplifier	200	150	20
	2N 4958	UHF low noise amplifier	200	150	20
	2N 4959	UHF low noise amplifier	200	150	20
2N 5109		Power UHF amplifier	1000	200	20
2N 5109A		Power UHF amplifier	1000	200	20
2N 5109B		Power UHF amplifier	1000	200	20
	2N 5829	UHF low noise amplifier	200	200	20
2N 5835		UHF amplifier	200	175	10
2N 5836		Power UHF amplifier	360	175	10
$ 2N 5837		Power UHF amplifier	750	175	5

$ Preliminary data

RF TRANSISTORS FOR PROFESSIONAL APPLICATIONS

Gp typ* min (dB)	NF @ typ+ max (dB)	IC (mA)	& f (MHz)	fT @ typ* min (MHz)	IC (mA)	Cre @ Crb+ max (pF)	VCB (V)	CASE
	3.5	3	800	2000*	10	0.7 +	10	TO-50
9.5*			870	3000*	100	1.5	10	TO-50
17.5	6.5	2	500	1000	25			TO-72a
19.5	5	2	500	1300	25			TO-72a
13.5	5	1.5	200	600	4			TO-72a
	2.6	2	450	1600*	10			TO-72a
	2.9	2	450	1500*	10			TO-72a
	3.2	2	450	1500*	10			TO-72a
	3+	70	200	1200	50			TO-39
	3+	70	200	1000	50			TO-39
	3+	70	200	800	50			TO-39
	2.5	2	450	1200	2	0.8+	10	TO-72a
				2500	10	0.8+	10	TO-72a
				2000	50	3.5+	10	TO-18
				1700	100			TO-39

N-CHANNEL FIELD-EFFECT TRANSISTORS

TYPE	Ptot (mW)	TJM (oC)	+/- VDS (V)	-VGSS (V)	-VGSoff min-max (V)	-IGSS max (nA)	IDSS min-max (mA)
BF 245	200	150	30	30	0.5-8.0	5	2-25
BF 245A	200	150	30	30	0.5-8.0	5	2-6.5
BF 245B	200	150	30	30	1.6-3.8	5	6-15
BF 245C	200	150	30	30	3.2-7.5	5	12-25
BF 247	200	125	25	30	0.5-14	5	10-300
BF 247A	200	125	25	30	1.5- 4	5	30- 80
BF 247B	200	125	25	30	3 - 7	5	60-140
BF 247C	200	125	25	30	5.5-12	5	110-250
BF 256	200	125	30	30	0.5-7.5	5	3-18
BF 256A	200	125	30	30	0.5-7.5	5	3- 7
BF 256B	200	125	30	30	0.5-7.5	5	6-13
BF 256C	200	125	30	30	0.5-7.5	5	11-18

P-CHANNEL FIELD-EFFECT TRANSISTORS

TYPE	Ptot (mW)	TJM (oC)	-/+ VDS (V)	VGSS (V)	VGSoff min-max (V)	IGSS max (nA)	-IDSS min-max (mA)
2N 5020	250	150	25	25	0.3- 5	1	0.3-1.2
2N 5021	250	150	25	25	0.3- 5	1	1 -10

N-CHANNEL FIELD-EFFECT TRANSISTORS

Yfs min-max (mS)	@ VGS (V)	& VDS (V)	f(Yfs) (MHz)	Cog Cis* (pF)	Crs (pF)	NF (dB)	@ f (MHz)	CASE
3 -6.5	0	15	500	2	1.4			TO-92d
3 -6.5	0	15	500	2	1.4			TO-92d
3 -6.5	0	15	500	2	1.4			TO-92d
3 -6.5	0	15	500	2	1.4			TO-92d
8	0	15	450	15*	5			TO-92d
8	0	15	450	15*	5			TO-92d
8	0	15	450	15*	5			TO-92d
8	0	15	450	15*	5			TO-92d
4.5	0	15	700	1.55	1	7.5	800	TO-92d
4.5	0	15	700	1.55	1	7.5	800	TO-92d
4.5	0	15	700	1.55	1	7.5	800	TO-92d
4.5	0	15	700	1.55	1	7.5	800	TO-92d

P-CHANNEL FIELD-EFFECT TRANSISTORS

Yfs min-max (mS)	@ VGS (V)	& VDS (V)	f(Yfs) (MHz)	Cis Cos* (pF)	Crs (pF)	NF (dB)	@ f (kHz)	CASE
0.3	0	15		15		6.5	1	TO-18d
0.3	0	15		15		6.5	1	TO-18d

UNIJUNCTION TRANSISTORS

TYPE	Ptot @ TA= 25 oC (mW)	TJM (oC)	VB1E (V)	VB2E (V)	IERMS IEM+ (mA)	VEsat max (V)	@ IE (mA)
2N 2646	300	175	30	30	50	2.5	50
2N 2646A	300	175	30	30	50	2.5	50
2N 2647	300	175	30	30	2000+	2.5	50

PHOTOTRANSISTORS

TYPE NPN	TYPE PNP	Ptot @ TA= 25 oC (mW)	TJM (oC)	VCBO (*) (V)	VCEO (V)	IC ICM+ (mA)	VCEsat (1) max (V)	@ IC (mA)
FT 201A		300	70		20	50	1	1
FT 201B		300	70		20	100+	1	5
FT 201C		300	70		20	50	1	10
FT 201D		300	70		20	100+	1	20
FT 201E		300	70		20	50	1	40
FT 202A		300	70		30	50	1	1
FT 202B		300	70		30	100+	1	5
FT 202C		300	70		30	50	1	10
FT 202D		300	70		30	100+	1	20
FT 202E		300	70		30	50	1	40

(1) EA = 1 klx
(*) Base terminal connected on request

UNIJUNCTION TRANSISTORS

INTRINSIC STAND OFF RATIO min-max	@ VB1B2 (V)	RBBO min-max (kohms)	@ VB1B2 (V)	IEO max (uA)	IV min (mA)	IP max (uA)	CASE
0.56-0.75	10	4.7-9.1	3	12	4	5	TO-18e
0.56-0.75	10	4.7-9.1	3	12	6	5	TO-18e
0.68-0.82	10	4.7-9.1	3	12	8	2	TO-18e

PHOTOTRANSISTORS

ICL min-max (mA)	SENSITI-VITY min-max (uA/lx)	@ EA (klx)	λp (nm)	λ0.5 (nm)	ton max (us)	toff max (us)	CASE
1- 6	1- 6	1	800	520-950	230	180	TO-18f
4-12	4-12	1	800	520-950	230	180	TO-18f
8-24	8-24	1	800	520-950	230	180	TO-18f
16-56	16-56	1	800	520-950	230	180	TO-18f
44	44	1	800	520-950	230	180	TO-18f
1- 6	1- 6	1	800	520-950	230	180	TO-18f
4-12	4-12	1	800	520-950	230	180	TO-18f
8-24	8-24	1	800	520-950	230	180	TO-18f
16-56	16-56	1	800	520-950	230	180	TO-18f
44	44	1	800	520-950	230	180	TO-18f

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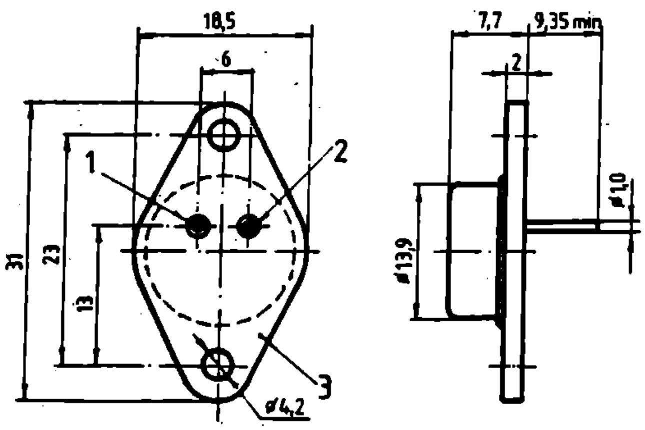
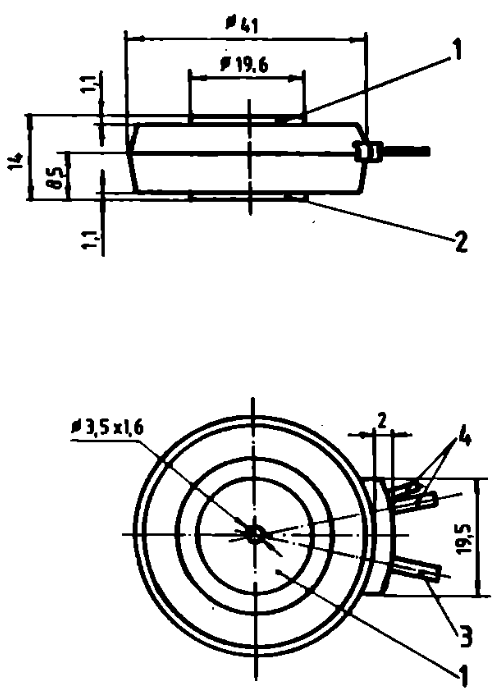
CASE OUTLINES - All dimensions in mm.

F-22



1. Base
2. Emitter
3. Collector connected to case

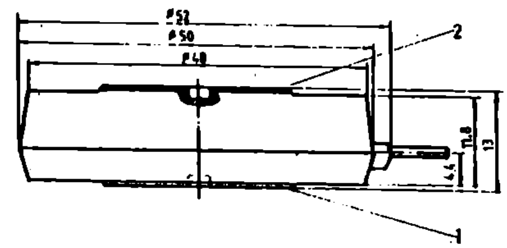
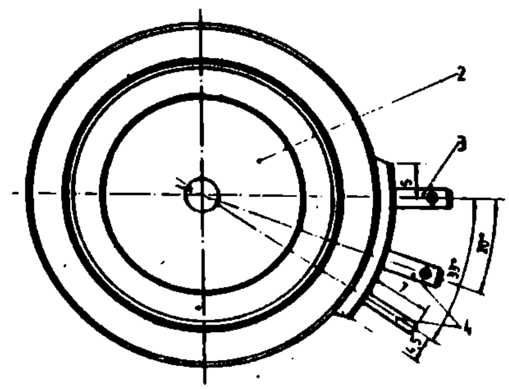
T-20



1. Emitter
2. Collector
3. Base
4. Emitter (auxiliary)

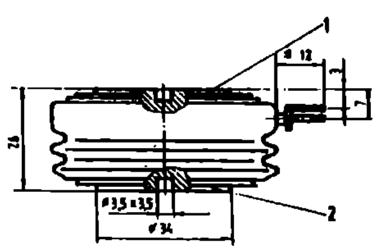
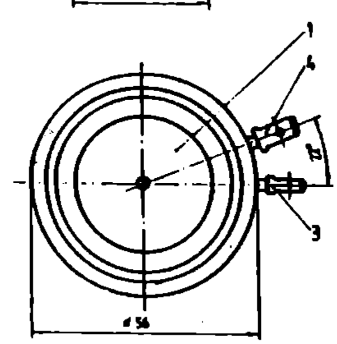
CASE OUTLINES - All dimensions in mm.

T-28

1. Emitter
2. Collector
3. Base
4. Emitter (auxiliary)

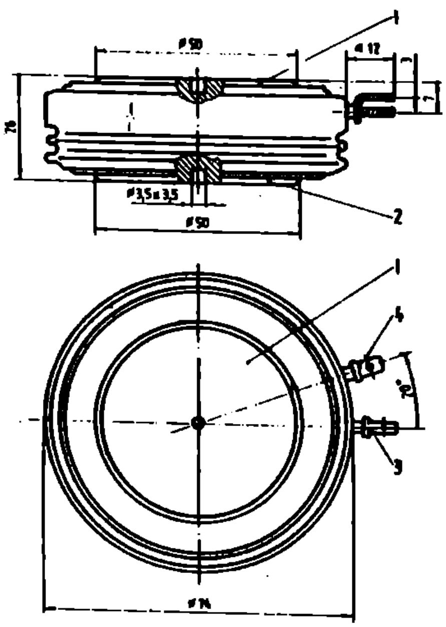
T-30

1. Emitter
2. Base
3. Collector
4. Emitter (auxiliary)

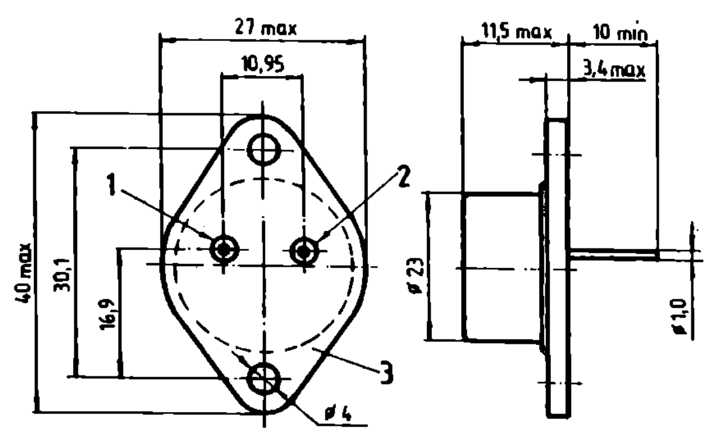
CASE OUTLINES - All dimensions in mm.

T-50



1. Emitter
2. Collector
3. Base
4. Emitter (auxiliary)

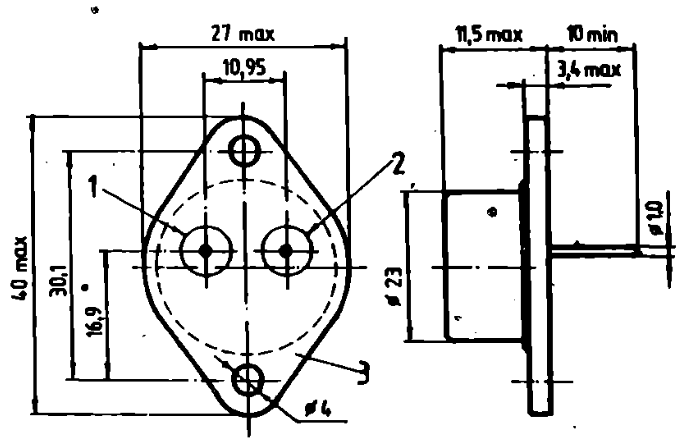
TO-3



1. Base
2. Emitter
3. Collector connected to case

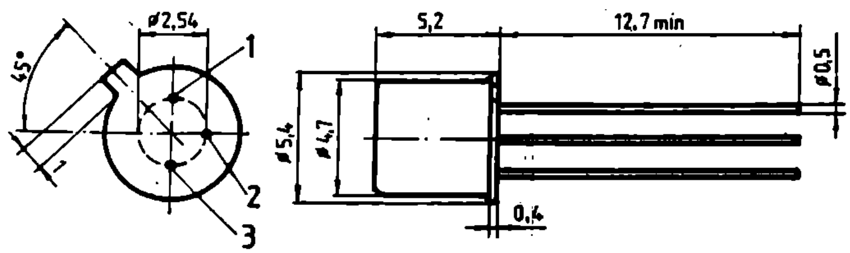
CASE OUTLINES - All dimensions in mm.

TO-3d



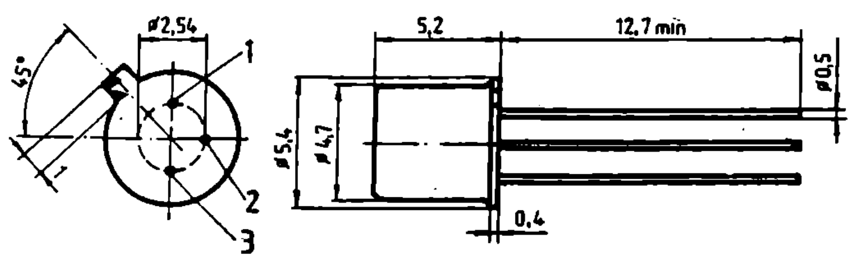
1. Base
2. Emitter
3. Collector connected to case

TO-18



1. Emitter
2. Base
3. Collector

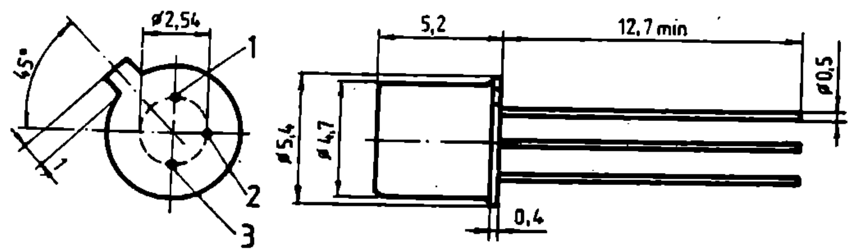
TO-18d



1. Source
2. Gate
3. Drain

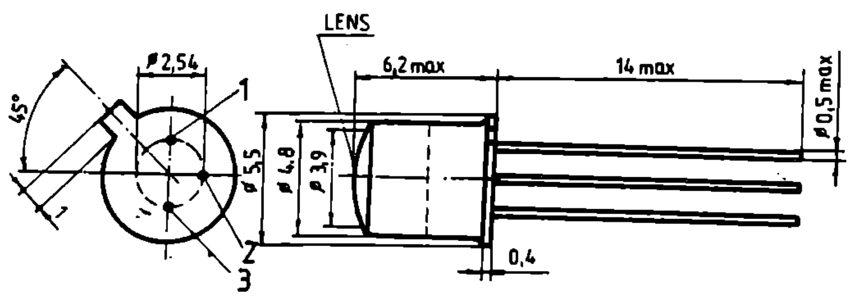
CASE OUTLINES - All dimensions in mm.

TO-18e



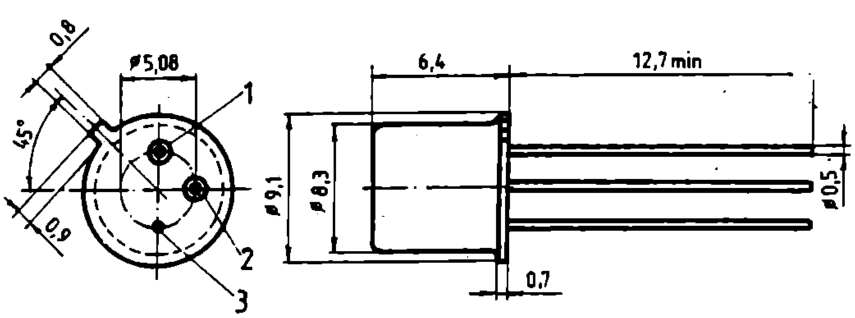
1. Base 1
2. Emitter
3. Base 2

TO-18f



1. Emitter
2. Base
3. Collector

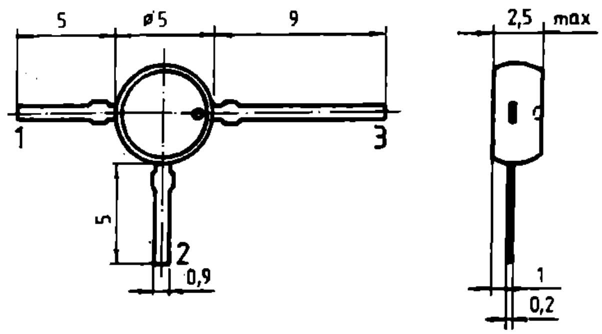
TO-39



1. Emitter
2. Base
3. Collector connected to case

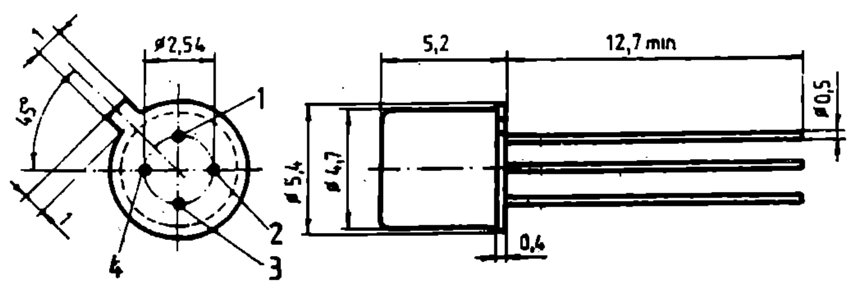
CASE OUTLINES - All dimensions in mm.

TO-50/3



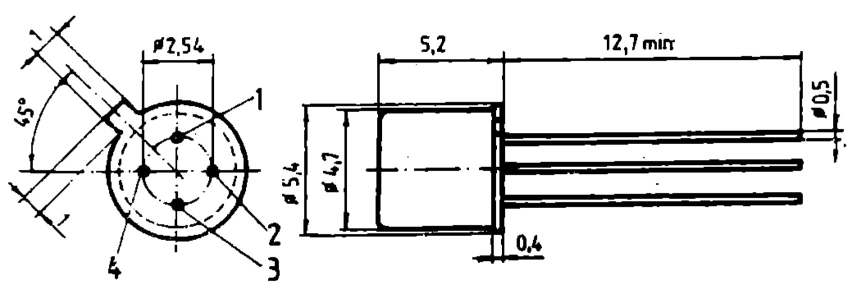
1. Emitter
2. Base
3. Collector

TO-72a



1. Emitter
2. Base
3. Collector
4. Lead connected to case

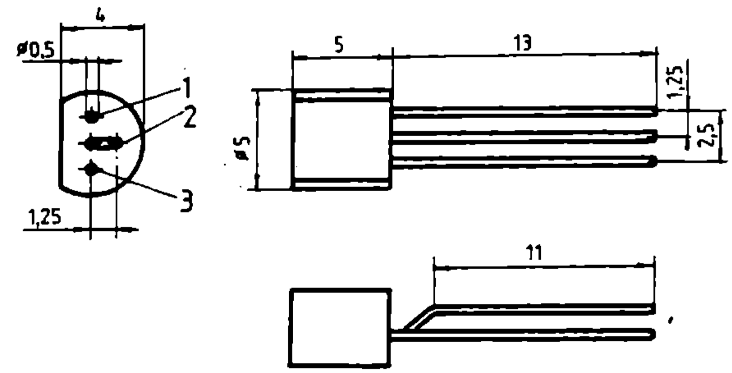
TO-72b



1. Base
2. Emitter
3. Collector
4. Lead connected to case

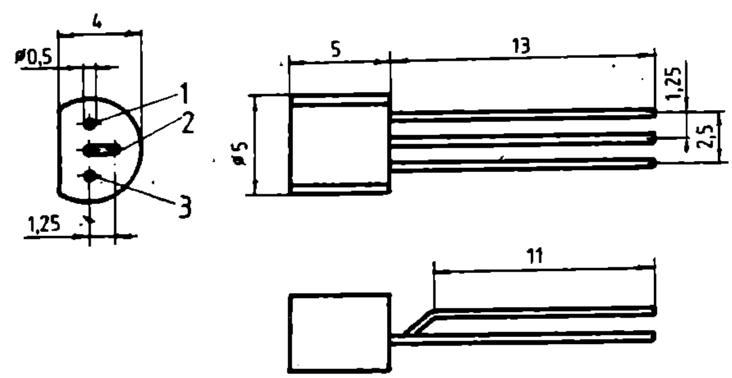
CASE OUTLINES - All dimensions in mm.

TO-92a



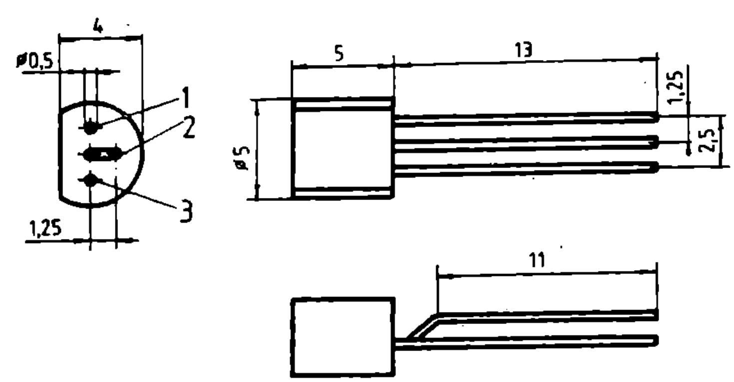
1. Emitter
2. Base
3. Collector

TO-92b



1. Base
2. Emitter
3. Collector

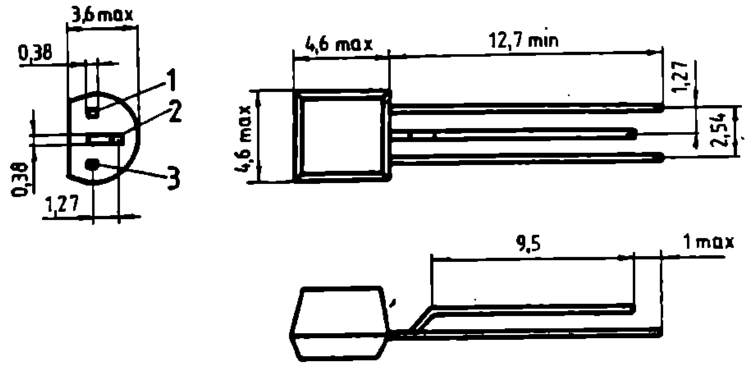
TO-92d



1. Drain
2. Source
3. Gate

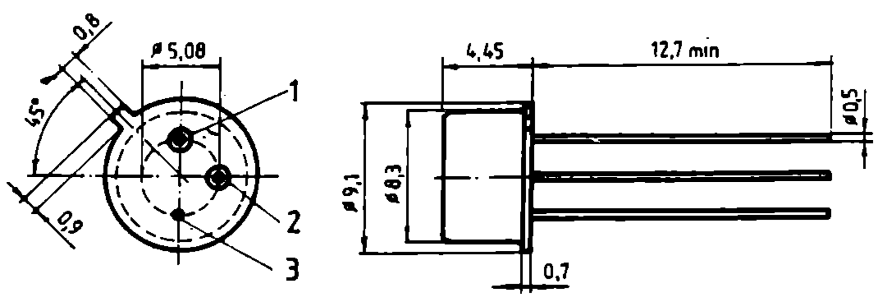
CASE OUTLINES - All dimensions in mm.

TO-92g



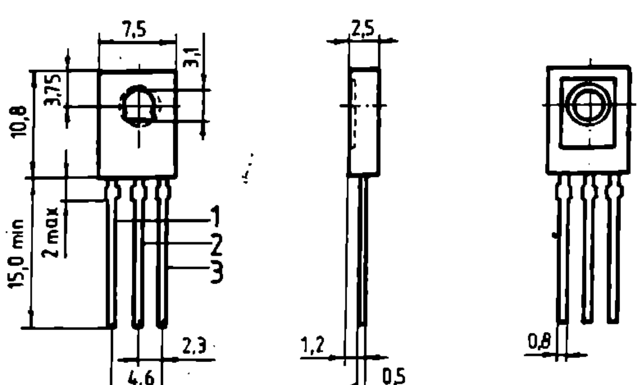
1. Emitter
2. Base
3. Collector

TO-100



1. Emitter
2. Base
3. Collector connected to case

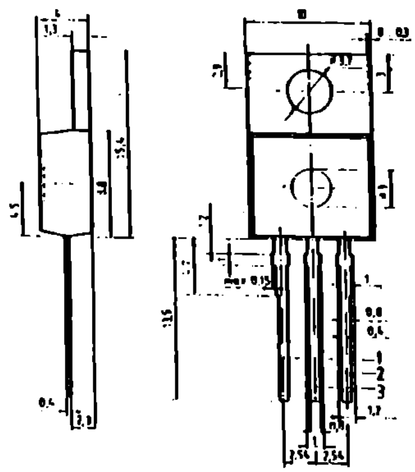
TO-126 (SOT-32)



1. Emitter
2. Collector connected to tab
3. Base

CASE OUTLINES - All dimensions in mm.

TO-220



1. Base
2. Emitter
3. Collector connected to tab

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MICROWAVE

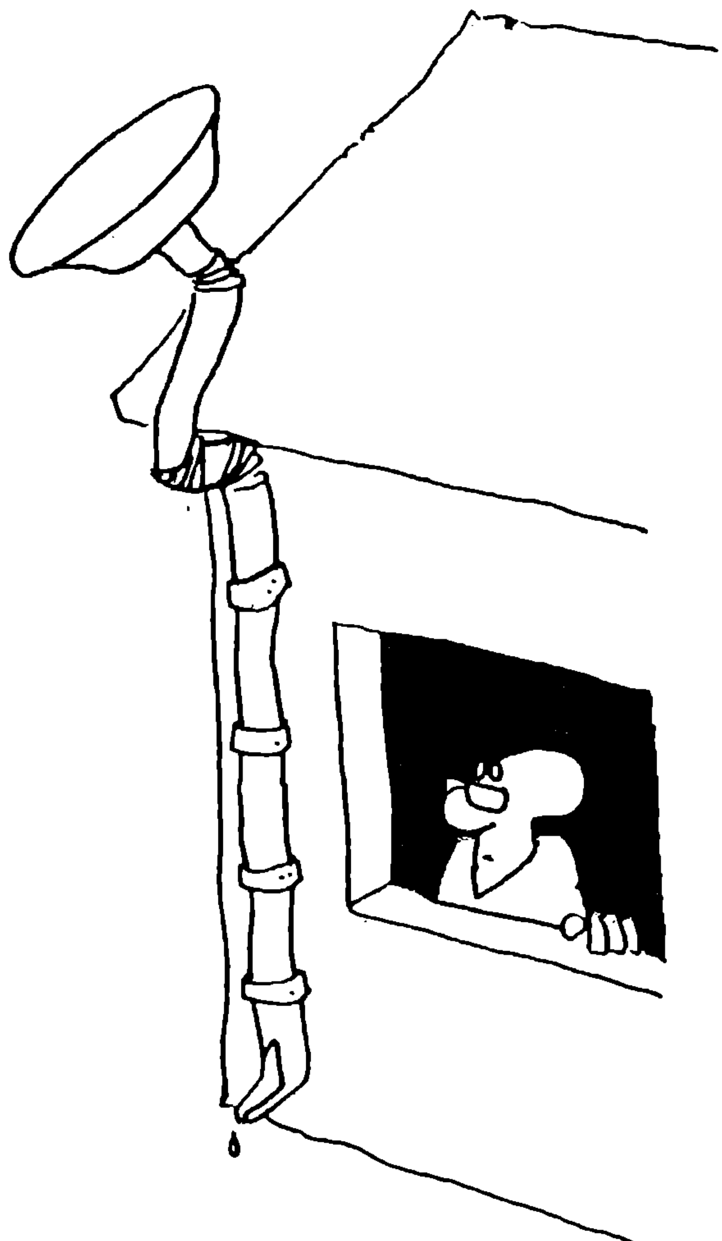
DEVICES

BARITT DIODES

IMPATT DIODES

SCHOTTKY DIODES

SCHOTTKY DIODE RINGS



CONTENTS

ALPHANUMERIC INDEX ..... 4 - IV

BARITT DIODES .... 4 - 01

BX 011YA
BX 011YB
BX 011YC
BX 011YD
BX 012YA
BX 012YB
BX 012YC
BX 012YD
BX 051YA
BX 051YB
BX 051YC
BX 051YD
BX 052YA
BX 052YB
BX 052YC
BX 052YD
BX 101YA
BX 101YB
BX 101YC
BX 101YD
BX 102YA
BX 102YB
BX 102YC
BX 102YD

IMPATT DIODES .... 4 - 02

BX 0181Y
BX 0182Y
BX 0301Y
BX 0302Y
BX 0381Y
BX 0382Y
BX 0391Y
BX 0392Y
BX 0501Y
BX 5002Y
BX 0581Y
BX 0582Y
BX 0591Y
BX 0592Y

SCHOTTKY DIODES .... 4 - 03

BS 05155Y
BS 10155Y
BS 10106Y
BS 15106Y
BS 20107Y

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BS 20106Q
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BARITT DIODES

TYPE	Vp (1) max (V)	IO min-max (mA)	VO max (V)	f0 (2) min-max (GHz)	Pout (2) (mW)	EFFI-CI-ENCY (%)	CASE
BX 011YA	40	5-25	40	8- 9	1	0.05	Fd 27d1
BX 011YB	40	5-25	40	9-10	1	0.05	Fd 27d1
BX 011YC	40	5-25	40	10-11	1	0.05	Fd 27d1
BX 011YD	40	5-25	40	11-12	1	0.05	Fd 27d1
BX 012YA	40	5-25	40	8- 9	1	0.05	Fd 27d2
BX 012YB	40	5-25	40	9-10	1	0.05	Fd 27d2
BX 012YC	40	5-25	40	10-11	1	0.05	Fd 27d2
BX 012YD	40	5-25	40	11-12	1	0.05	Fd 27d2
BX 051YA	55	10-35	55	8- 9	5	0.2	Fd 27d1
BX 051YB	55	10-35	55	9-10	5	0.2	Fd 27d1
BX 051YC	55	10-35	55	10-11	5	0.2	Fd 27d1
BX 051YD	55	10-35	55	11-12	5	0.2	Fd 27d1
BX 052YA	55	10-35	55	8- 9	5	0.2	Fd 27d2
BX 052YB	55	10-35	55	9-10	5	0.2	Fd 27d2
BX 052YC	55	10-35	55	10-11	5	0.2	Fd 27d2
BX 052YD	55	10-35	55	11-12	5	0.2	Fd 27d2
BX 101YA	70	10-45	70	8- 9	10	0.5	Fd 27d1
BX 101YB	70	10-45	70	9-10	10	0.5	Fd 27d1
BX 101YC	70	10-45	70	10-11	10	0.5	Fd 27d1
BX 101YD	70	10-45	70	11-12	10	0.5	Fd 27d1
BX 102YA	70	10-45	70	8- 9	10	0.5	Fd 27d2
BX 102YB	70	10-45	70	9-10	10	0.5	Fd 27d2
BX 102YC	70	10-45	70	10-11	10	0.5	Fd 27d2
BX 102YD	70	10-45	70	11-12	10	0.5	Fd 27d2

(1) Vpt @ IR = 0.1 mA
(2) EFFICIENCY, f0 and Pout @ IO
(3) Typical value for EFFICIENCY

IMPATT DIODES

TYPE	VBR (1) min-max (V)	IO typ (mA)	VO max (V)	f0 (2) min-max (GHz)	Pout (2) min (mW)	EFFI-CI-ENCY (%)	CASE
BX 0181Y	70- 90	40	95	8-12	100	3	Fd 27d1
BX 0182Y	70- 90	40	95	8-12	100	3	Fd 27d2
BX 0381Y	60-100	80	100	8-10	350	5	Fd 27d1
BX 0382Y	60-100	80	100	8-10	350	5	Fd 27d2
BX 0391Y	60-100	80	100	9-11	350	5	Fd 27d1
BX 0392Y	60-100	80	100	9-11	350	5	Fd 27d2
BX 0301Y	60-100	80	100	10-12	350	5	Fd 27d1
BX 0302Y	60-100	80	100	10-12	350	5	Fd 27d2
BX 0581Y	60-100	100	100	8-10	500	6	Fd 27d1
BX 0582Y	60-100	100	100	8-10	500	6	Fd 27d2
BX 0591Y	60-100	100	100	9-11	500	6	Fd 27d1
BX 0592Y	60-100	100	100	9-11	500	6	Fd 27d2
BX 0501Y	60-100	100	100	10-12	500	6	Fd 27d1
BX 0502Y	60-100	100	100	10-12	500	6	Fd 27d2

(1) VBR @ IR = 1 mA
(2) EFFICIENCY, f0 and Pout @ IO
(3) Typical value for EFFICIENCY

SCHOTTKY DIODES

TYPE	VR (1) min (V)	IR (2) min (nA)	VF @ max (V)	IF (mA)	VF @ max (V)	IF (mA)	Co (3) max (pF)	@ f (MHz)	CASE
BS 05155Y	5	100	0.4	1	0.5	10	1.5	1	TO-92s
BS 10155Y	10	100	0.4	1	0.5	10	1.5	1	TO-92s
BS 10106Y	10	100	0.4	1	0.6	10	1	1	TO-92s
BS 15106Y	15	100	0.4	1	0.6	10	1	1	TO-92s
BS 20107Y	20	100	0.4	1	0.7	10	1	1	TO-92s

(1) VR @ IR = 10 uA
(2) IR @ VR
(3) Co @ VR = 0

SCHOTTKY DIODE RINGS

TYPE	/\VF -- max (mV)	@ IF (mA)	/\Co -- max (pF)	@ f (MHz)	& VR' (V)	CASE
BS 20106Q	20	10	0.2	1	0	TO-50s
BS 30016Q	30	10	0.1	1	0	TO-50s

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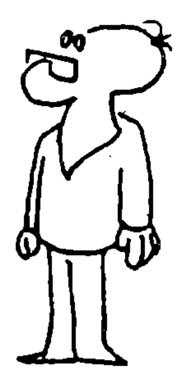
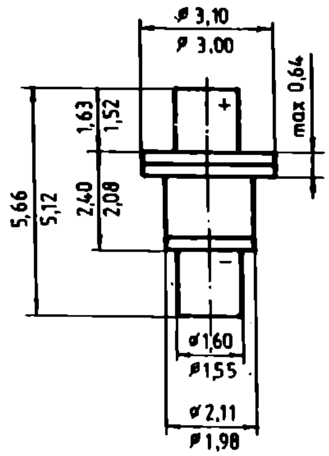
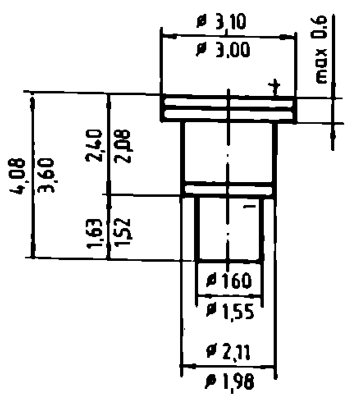


CASE OUTLINES - All dimensions in mm.

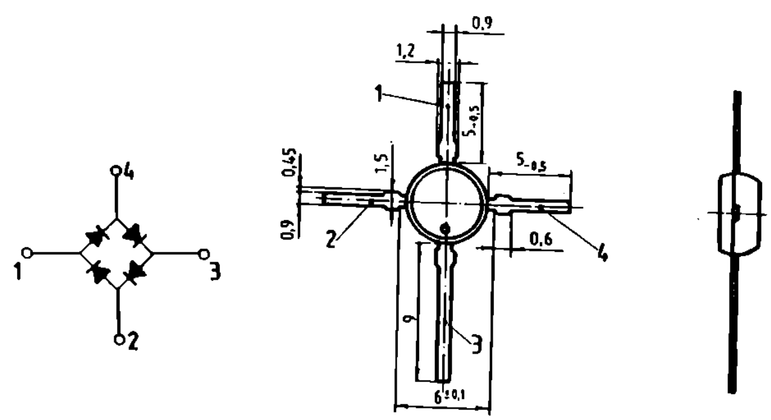
Fd 27d1



Fd 27d2

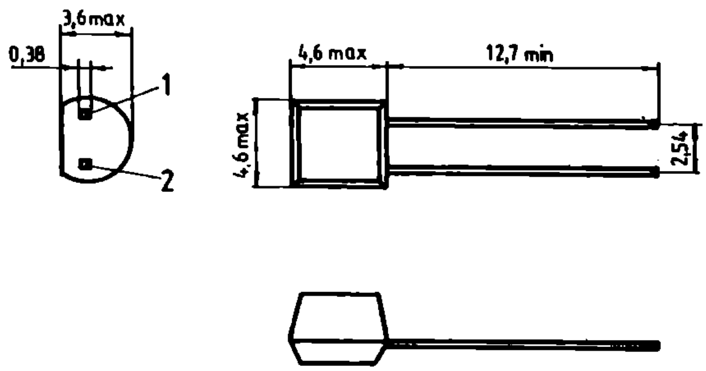


TO-50s



CASE OUTLINES - All dimensions in mm.

TO-92



1. Anode
2. Cathode

SILICON DIODES

SMALL SIGNAL

- HIGH SPEED SWITCHING DIODES
- AVALANCHE DIODES FOR TELEPHONY
- ULTRA-LOW LEAKAGE DIODES
- BAND SWITCHING DIODES
- GENERAL APPLICATION DIODES
- VARIABLE CAPACITANCE DIODES
- TRIPLE VARIABLE CAPACITANCE DIODES
- PIN ATTENUATOR
- DIODES FOR THERMAL COMPENSATION

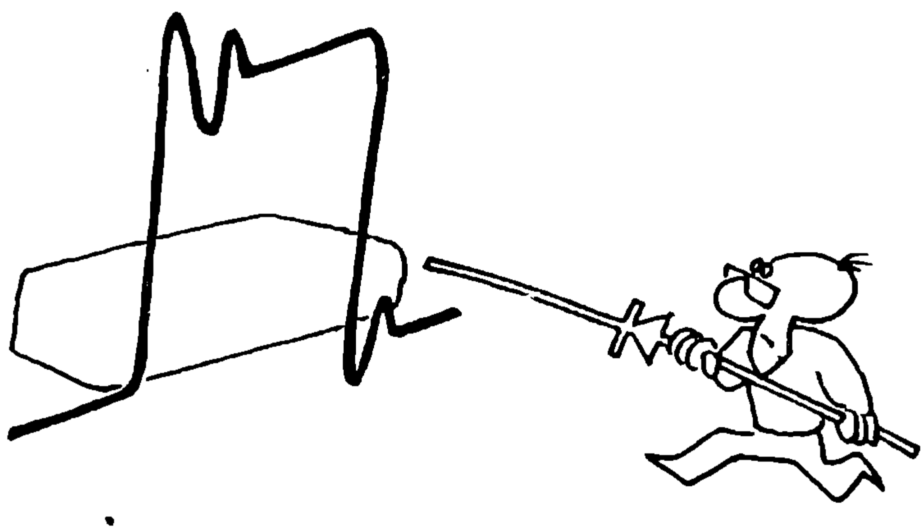
ZENER

- TEMPERATURE COMPENSATED REFERENCE DIODES
- REFERENCE DIODES
- VOLTAGE REGULATOR DIODES

RECTIFIERS

- STANDARD RECTIFIERS
- FAST RECOVERY RECTIFIERS
- ULTRA-FAST RECOVERY RECTIFIERS
- CONTROLLED AVALANCHE RECTIFIERS
- SCHOTTKY RECTIFIERS

VOLTAGE TRANSIENT SUPPRESSORS



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Preliminary data
(R) Suffix R for reverse polarity types

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$ Preliminary data
(R) Suffix R for reverse polarity types

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$ Preliminary data
(R) Suffix R for reverse polarity types

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$ Preliminary data
(R) Suffix R for reverse polarity types

HIGH SPEED SWITCHING DIODES

TYPE	VR min (V)	IF max (mA)	TVJ max (oC)	IFSM (mA)	VF max (V)	@ IF (mA)	Ctot max (pF)	trr max (ns)	CASE
1N 4148	75	200	200	2000	1	10	4	4	DO-35
1N 4149	75	200	200	2000	1	10	2	4	DO-35
1N 4151	50	200	200	2000	1	50	2	2	DO-35
1N 4154	25	200	200	2000	1	30	4	2	DO-35
1N 4446	75	200	200	2000	1	20	4	4	DO-35
1N 4447	75	200	200	2000	1	20	2	4	DO-35
1N 4448	75	200	200	2000	1	100	4	4	DO-35
1N 4449	75	200	200	2000	1	30	2	4	DO-35
1N 4454	50	200	200	2000	1	10	2	2	DO-35

AVALANCHE DIODES FOR TELEPHONY

TYPE	VR (1) min (V)	IF (2) max (mA)	TVJ max (oC)	IFSM (mA)	VF max (V)	@ IF (mA)	Ctot max (pF)	trr max (ns)	CASE
BAW 21	70	400	175	6000	1	200	35	50	DO-35
BAX 12	90	400	175	6000	1	200	35	50	DO-35

(1) VR can be exceeded if IRM is observed :
a) at TJ = 25 oC energy (E) must be </= 5mWs ;
at TJ > 25 oC E must be reduced by 0.015 mWs/oC.
b) at square wave pulses with T >/= 50 ms, duty cycle must be tp/T </= 0.01 .

(2) IF value is valid if leads are kept at TA = 25 oC at 8 mm from case .

ULTRA-LOW LEAKAGE DIODES - PICOAMPERE RANGE

TYPE	VR min (V)	IF max (mA)	TVJ max (oC)	VF max (V)	@ IF (mA)	IR max (pA)	@ VR (V)	Ctot max (pF)	CASE
DP 450	20	50	125	1	10	5	5	1.5	DO-35
DP 451	20	50	125	1	10	10	5	1.5	DO-35

BAND SWITCHING DIODES

TYPE	VR min (V)	IF max (mA)	TVJ max (oC)	VF max (V)	@ IF (mA)	rf max (ohms)	Ctot max (pF)	@ VR (V)	CASE
BA 243	20	100	150	1	100	1	2	15	DO-35
BA 244	20	100	150	1	100	0.7	2	15	DO-35

GENERAL APPLICATION DIODES

TYPE	VR min (V)	IF max (mA)	TVJ max (oC)	VF max (V)	@ IF (mA)	IR max (nA)	rf max (ohms)	trr max (ns)	CASE
BA 170	20	150	150	1	80	100	0.5	100	DO-35
BA 171	30	150	150	1	80	100	0.5	100	DO-35
BA 172	50	150	150	1	80	100	0.5	100	DO-35

VARIABLE CAPACITANCE DIODES

TYPE	VR min (V)	Ctot f=1 MHZ min-max (pF)	@ VR (V)	Ctot RATIO min-max	@ V/V (V/V)	rs max (ohms)	@ Ctot (pF)	CASE
BB 125	30	2 -3.2	25	4 - 6	3/25	0.8	9	DO-35
BB 125A	30	2 -2.35	25	4 - 6	3/25	0.8	9	DO-35
BB 125B	30	2.25-2.65	25	4 - 6	3/25	0.8	9	DO-35
BB 125C	30	2.5-3.2	25	4 - 6	3/25	0.8	9	DO-35
BB 126	30	2 - 3	25	4 - 6	3/25	1.2	9	DO-35
β 410	12	7.5-11.5	4	1.6	4/ 9			DO-35
BB 139	30	26-32	3	5 -6.5	3/25	0.5	9	DO-35
β 310	12	16-28	4	1.6-2.25	4/9			DO-35

TRIPLE VARIABLE CAPACITANCE DIODES

TYPE	VR min (V)	Ctot f=1 MHZ min-max (pF)	@ VR (V)	Ctot RATIO min-max	@ V/V (V/V)	rs max (ohms)	@ Ctot (pF)	CASE
βB 313N	12	440-530	1	20	1/8.5	2.5	440	MP-48
βB 313AN	12	440	1	20	1/8.5	2.5	440	MP-48
βB 313BN	12	440	1	15	1/8.5	3	440	MP-48
βB 413N	32	345-410	1	14	1/20	2	345	MP-48
βB 413AN	32	345-410	1	17	1/20	2	345	MP-48
βB 413BN	32	345-410	1	17	1/20	2	345	MP-48
* βB 113AN	32	230-280	1	17.7	1/30	4	200	MP-48
* βB 113BN	32	230-280	1	15.3	1/30	5	200	MP-48

* Preliminary data

PIN ATTENUATOR

TYPE	DESCRIPTION	CASE
β 1053	The β 1053 attenuator contains in one package three silicon diodes connected in order to form a PI network. The diodes are suitable for electronic control of tuners and antenna amplifiers in the 50-500 MHz range . VR = 30 V ; IF = 50 mA ; TJM = 125 oC ; VF = 1.2 V @ IF = 50 mA ; rf > 5 ohms ; Vcr for 1 % intermodulation = (typ) 1 V ; Attenuation : > 35 dB @ VCO = 1 V ; f = 100 MHz >2.3 dB @ VCO = 5 V ; f = 100 MHz > 30 dB @ VCO = 1 V ; f = 500 MHz Reflexion atenuation : > 16 dB @ VCO = 1-5 V : f = 100 MHz	TO-72g

DIODES FOR THERMAL COMPENSATION

TYPE	IF (mA)	Ptot @ TA= 25 oC (mW)	TJM (oC)	THERMAL COEFF. (mV/oC)	VF min-max (mV)	@ IF (mA)	VF min-max (mV)	@ IF (mA)	CASE
DC 2	50	500	175	2	650-850	5	700-1200	30	TO-18h
DC 4	50	300	150	2	650-850	5	700-1200	30	TO-92h

TEMPERATURE COMPENSATED REFERENCE DIODES

TYPE	VZ typ (V)	@ IZ (mA)	rZT max (ohms)	TEST TEMPERATURE (oC)	/\VZ max (V)	MAX TEMP. COEFF. (x0.0001) (1/oC)	CASE
BZV 43	6.2	5	20	0/25/100	0.062	1	DO-35
BZV 44	6.2	5	20	0/25/100	0.031	0.5	DO-35
$ BZV 45	6.2	5	20	0/25/100	0.012	0.2	DO-35
* ZTC 33	33	5	25			-1 /+0.5	DO-35

$ Preliminary data
* Linear integrated circuit for TV tuners

REFERENCE DIODES

TYPE	IR (uA)	@ VR (V)	IFM (mA)	VF min-max (V)	@ IF (mA)	rd max (ohms)	TJM (oC)	CASE
DRD 1	10	10	250	0.40-0.50	0.1	680	125	F-126
				0.52-0.63	1	65		DO-13
				0.56-0.66	2	34		
				0.61-0.71	5	13		
				0.65-0.74	10	6.7		
				0.75-0.85	100	0.7		
				0.80-0.91	250	0.43		
DRD 2	10	10	250	0.80-1.00	0.1	1300	125	F-126
				1.05-1.25	1	135		DO-13
				1.11-1.33	2	68		
				1.19-1.42	5	26		
				1.25-1.50	10	13		
				1.50-1.75	100	2		
				1.60-1.90	250	1.1		
DRD 3	10	10	250	1.22-1.42	0.1	2250	125	F-126
				1.62-1.83	1	205		DO-13
				1.74-1.94	2	100		
				1.87-2.08	5	42		
				1.98-2.18	10	21		
				2.30-2.60	100	3.5		
				2.50-2.80	250	2.5		
DRD 4	10	10	250	1.50-1.90	0.1	3100	125	F-126
				2.07-2.37	1	275		DO-13
				2.23-2.50	2	180		
				2.45-2.67	5	55		
				2.60-2.80	10	27		
				3.00-3.30	100	4.5		
				3.20-3.50	250	3.5		

0.5 W @ TA = 25 oC VOLTAGE REGULATOR DIODES

TYPE	VZ min-max (V)	@ IZT (mA)	rZT max (ohms)	IZM (mA)	TEMP. COEFF. (x0.0001) (1 /oC)	TJM (oC)	CASE
DZ 2V7	2.5- 2.9	5	83	160	- 9/- 4	175	DO-35
DZ 3	2.8- 3.2	5	95	140	- 9/- 3	175	DO-35
DZ 3V3	3.1- 3.5	5	95	130	- 8/- 3	175	DO-35
DZ 3V6	3.4- 3.8	5	95	120	- 8/- 3	175	DO-35
DZ 3V9	3.7- 4.1	5	95	110	- 7/- 3	175	DO-35
DZ 4V3	4.0- 4.6	5	95	100	- 6/- 1	175	DO-35
DZ 4V7	4.4- 5.0	5	78	90	- 5/+ 2	175	DO-35
DZ 5V1	4.8- 5.4	5	60	80	- 3/+ 4	175	DO-35
DZ 5V6	5.2- 6.0	5	40	70	- 2/+ 6	175	DO-35
DZ 6V2	5.8- 6.6	5	10	64	- 1/+ 7	175	DO-35
DZ 6V8	6.4- 7.2	5	8	58	2/ 7	175	DO-35
DZ 7V5	7.0- 7.9	5	7	53	3/ 7	175	DO-35
DZ 8V2	7.7- 8.7	5	7	47	4/ 7	175	DO-35
DZ 9V1	8.5- 9.6	5	10	43	5/ 8	175	DO-35
DZ 10	9.4-10.6	5	15	40	5/ 8	175	DO-35
DZ 11	10.4-11.6	5	20	36	5/ 9	175	DO-35
DZ 12	11.4-12.7	5	20	32	6/ 9	175	DO-35
DZ 13	12.4-14.1	5	25	29	7/ 9	175	DO-35
DZ 15	13.8-15.6	5	30	27	7/ 9	175	DO-35
DZ 16	15.3-17.1	5	40	24	8/9.5	175	DO-35
DZ 18	16.8-19.1	5	50	21	8/9.5	175	DO-35
DZ 20	18.8-21.2	5	50	20	8/ 10	175	DO-35
DZ 22	20.8-23.3	5	55	18	8/ 10	175	DO-35
DZ 24	22.8-25.6	5	80	16	8/ 10	175	DO-35
DZ 27	25.1-28.9	5	80	14	8/ 10	175	DO-35
DZ 30	28 - 32	5	80	13	8/ 10	175	DO-35
DZ 33	31 - 35	5	80	12	8/ 10	175	DO-35
DZ 36	34 - 38	5	90	11	8/ 10	175	DO-35
DZ 39	37 - 41	5	90	10	10/ 12	175	DO-35
DZ 43	40 - 46	5	100	9	10/ 12	175	DO-35
DZ 47	44 - 50	5	100	8	10/ 12	175	DO-35
DZ 51	48 - 54	5	100	8	10/ 12	175	DO-35

= ZENER =

1.0 W @ TA = 25 oC VOLTAGE REGULATOR DIODES

TYPE	VZ min-max (V)	@ IZT (mA)	rZT max (ohms)	IZM (*) (mA)	TEMP. COEFF. (x0.0001) (1 /oC)	TJM (oC)	CASE
PL 3V3Z	3.1- 3.5	100	10	285	- 6.0	150	F-126
PL 3V6Z	3.4- 3.8	100	10	260	- 5.5	150	F-126
PL 3V9Z	3.7- 4.1	100	7	240	- 5.0	150	F-126
PL 4V3Z	4.0- 4.6	100	7	215	- 4.0	150	F-126
PL 4V7Z	4.4- 5.0	100	7	200	- 2.0	150	F-126
PL 5V1Z	4.8- 5.4	100	5	185	1	150	F-126
PL 5V6Z	5.2- 6.0	100	2	165	2.5	150	F-126
PL 6V2Z	5.8- 6.6	100	2	150	3.2	150	F-126
PL 6V8Z	6.4- 7.2	100	2	140	4	150	F-126
PL 7V5Z	7.0- 7.9	100	2	130	4.5	150	F-126
PL 8V2Z	7.7- 8.7	100	2	110	4.8	150	F-126
PL 9V1Z	8.5- 9.6	50	4	100	5.1	150	F-126
PL 10Z	9.4-10.6	50	4	94	5.5	150	F-126
PL 11Z	10.4-11.6	50	7	86	6	150	F-126
PL 12Z	11.4-12.7	50	7	79	6.5	150	F-126
PL 13Z	12.4-14.1	50	10	71	6.5	150	F-126
PL 15Z	13.8-15.6	50	10	64	7	150	F-126
PL 16Z	15.3-17.1	25	15	59	7	150	F-126
PL 18Z	16.8-19.1	25	15	52	7.5	150	F-126
PL 20Z	18.8-21.2	25	15	47	7.5	150	F-126
PL 22Z	20.8-23.3	25	15	43	8	150	F-126
PL 24Z	22.8-25.6	25	15	39	8	150	F-126
PL 27Z	25.1-28.9	25	15	35	8.5	150	F-126
PL 30Z	28 - 32	25	15	31	8.5	150	F-126

(*) TL = 85 oC ; 1 = 10 mm

1.0 W @ TA = 25 oC VOLTAGE REGULATOR DIODES

TYPE	VZ min-max (V)	@ IZT (mA)	rZT max (ohms)	IZM (*) (mA)	TEMP. COEFF. (x0.0001) (1 /oC)	TJM (oC)	CASE
PL 33Z	31 - 35	25	15	29	8.5	150	F-126
PL 36Z	34 - 38	10	40	26	8.5	150	F-126
PL 39Z	37 - 41	10	40	24	9	150	F-126
PL 43Z	40 - 46	10	45	22	9	150	F-126
PL 47Z	44 - 50	10	45	20	9	150	F-126
PL 51Z	44 - 54	10	60	19	9	150	F-126
PL 56Z	52 - 60	10	60	17	9	150	F-126
PL 62Z	58 - 66	10	80	15	9	150	F-126
PL 68Z	64 - 72	10	80	14	9	150	F-126
PL 75Z	70 - 79	10	100	13	9	150	F-126
PL 82Z	77 - 87	10	100	12	9	150	F-126
PL 91Z	85 - 96	5	200	10	9	150	F-126
PL 100Z	94 -106	5	200	9.4	9	150	F-126
PL 110Z	104 -116	5	250	8.6	9.5	150	F-126
PL 120Z	114 -127	5	250	7.8	9.5	150	F-126
PL 130Z	124 -141	5	300	7	9.5	150	F-126
PL 150Z	138 -156	5	300	6.4	9.5	150	F-126
PL 160Z	153 -171	5	350	5.8	9.5	150	F-126
PL 180Z	168 -191	5	350	5.3	9.5	150	F-126
PL 200Z	188 -212	5	350	5	10	150	F-126

(*) TL = 85 oC : 1 = 10 mm

1.0 W @ TA = 25 oC VOLTAGE REGULATOR DIODES

TYPE	VZ min-max (V)	@ IZT (mA)	rZT max (ohms)	IZM (mA)	TEMP. COEFF. (x0.0001) (1 /oC)	TJM (oC)	CASE
1N 3016B	6.4- 7.2	37	3.5	140	2 / 6	175	DO-13
1N 3017B	7.0- 7.9	34	4	130	3 / 7	175	DO-13
1N 3018B	7.7- 8.7	31	4.5	110	3.5/7.5	175	DO-13
1N 3019B	8.5- 9.6	28	5	100	4 / 8	175	DO-13
1N 3020B	9.4-10.6	25	7	94	4 / 8	175	DO-13
1N 3021B	10.4-11.6	23	8	86	4 / 9	175	DO-13
1N 3022B	11.4-12.7	21	9	79	4 / 9	175	DO-13
1N 3023B	12.4-14.1	19	10	71	4 / 9	175	DO-13
1N 3024B	13.8-15.6	17	14	64	5 / 9	175	DO-13
1N 3025B	15.3-17.1	15.5	16	59	5 / 9	175	DO-13
1N 3026B	16.8-19.1	14	20	52	5 / 9	175	DO-13
1N 3027B	18.8-21.2	12.5	22	47	5 / 9	175	DO-13
1N 3028B	20.8-23.3	11.5	23	43	5 / 9	175	DO-13
1N 3029B	22.8-25.6	10.5	25	39	5 / 9	175	DO-13
1N 3030B	25.1-28.9	9.5	35	35	5 / 9	175	DO-13
1N 3031B	28 - 32	8.5	40	31	5 / 9	175	DO-13
1N 3032B	31 - 35	7.5	45	29	5 / 9	175	DO-13
1N 3033B	34 - 38	7	50	26	6 /10	175	DO-13
1N 3034B	37 - 41	6.5	60	24	6 /10	175	DO-13
1N 3035B	40 - 46	6	70	22	6 /10	175	DO-13
1N 3036B	44 - 50	5.5	80	20	8 /10	175	DO-13
1N 3037B	48 - 54	5	95	19	8 /10	175	DO-13
1N 3038B	52 - 60	4.5	110	17	9 /10	175	DO-13
1N 3039B	58 - 66	4	125	15	9 /10	175	DO-13

1.0 W @ TA = 25 oC VOLTAGE REGULATOR DIODES

TYPE	VZ min-max (V)	@ IZT (mA)	rZT max (ohms)	IZM (mA)	TEMP. COEFF. (x0.0001) (1 /oC)	TJM (oC)	CASE
1N 3040B	64 - 72	3.7	150	14	9 /10	175	DO-13
1N 3041B	70 - 79	3.3	175	13	9 /10	175	DO-13
1N 3042B	77 - 87	3	200	12	9 /10	175	DO-13
1N 3043B	85 - 96	2.8	250	10	9 /10	175	DO-13
1N 3044B	94 -106	2.5	350	9.4	9 /10	175	DO-13
1N 3045B	104 -116	2.3	450	8.6	9 /11	175	DO-13
1N 3046B	114 -127	2	550	7.8	9 /11	175	DO-13
1N 3047B	124 -141	1.9	700	7	9 /11	175	DO-13
1N 3048B	138 -156	1.7	1 k	6.4	9 /11	175	DO-13
1N 3049B	153 -171	1.6	1.1k	5.8	9 /11	175	DO-13
1N 3050B	168 -191	1.4	1.2k	5.2	10/11	175	DO-13
1N 3051B	188 -212	1.2	1.5k	5	10/11	175	DO-13

1.3 W @ TA = 25 oC VOLTAGE REGULATOR DIODES

TYPE	VZ min-max (V)	@ IZT (mA)	rZT max (ohms)	IZM (*) (mA)	TEMP. COEFF. (x0.0001) (1 /oC)	TJM (oC)	CASE
ZP 3V9	3.7- 4.1	100	7	290	- 7/+ 2	175	DO-41
ZP 4V3	4.0- 4.6	100	7	260	- 7/+ 3	175	DO-41
ZP 4V7	4.4- 5.0	100	7	235	- 7/+ 4	175	DO-41
ZP 5V1	4.8- 5.4	100	5	215	- 6/+ 5	175	DO-41
ZP 5V6	5.2- 6.0	100	2	193	- 3/+ 5	175	DO-41
ZP 6V2	5.8- 6.6	100	2	183	- 1/+ 6	175	DO-41
ZP 6V8	6.4- 7.2	100	2	157	0 / 7	175	DO-41
ZP 7V5	7.0- 7.9	100	2	143	0 / 7	175	DO-41
ZP 8V2	7.7- 8.7	100	2	127	3 / 8	175	DO-41
ZP 9V1	8.5- 9.6	50	4	117	3 / 8	175	DO-41
ZP 10	9.4-10.6	50	4	105	5 / 9	175	DO-41
ZP 11	10.4-11.6	50	7	94	5 /10	175	DO-41
ZP 12	11.4-12.7	50	7	85	5 /10	175	DO-41
ZP 13	12.4-14.1	50	9	78	5 /10	175	DO-41
ZP 15	13.8-15.8	50	9	70	5 /10	175	DO-41
ZP 16	15.3-17.1	25	10	63	7 /11	175	DO-41
ZP 18	16.8-19.1	25	11	57	7 /11	175	DO-41
ZP 20	18.8-21.2	25	12	52	7 /11	175	DO-41
ZP 22	20.8-23.3	25	13	48	7 /11	175	DO-41
ZP 24	22.8-25.6	25	14	42	7 /12	175	DO-41
ZP 27	25.1-28.9	25	15	38	7 /12	175	DO-41
ZP 30	28 - 32	25	20	35	7 /12	175	DO-41
ZP 33	31 - 35	25	20	31	7 /12	175	DO-41
ZP 36	34 - 38	10	60	29	7 /12	175	DO-41

(*) TA = 45 oC

1.3 W @ TA = 25 oC VOLTAGE REGULATOR DIODES

TYPE	VZ min-max (V)	@ IZT (mA)	rZT max (ohms)	IZM (*) (mA)	TEMP. COEFF. (x0.0001) (1 /oC)	TJM (oC)	CASE
ZP 39	37 - 41	10	60	26	8 /12	175	DO-41
ZP 43	40 - 46	10	80	24	8 /13	175	DO-41
ZP 47	44 - 50	10	80	22	8 /13	175	DO-41
ZP 51	48 - 54	10	100	20	8 /13	175	DO-41
ZP 56	52 - 60	10	100	18	8 /13	175	DO-41
ZP 62	58 - 66	10	130	16	8 /13	175	DO-41
ZP 68	64 - 72	10	130	14	8 /13	175	DO-41
ZP 75	70 - 79	10	160	13	8 /13	175	DO-41
ZP 82	77 - 88	10	160	12	8 /13	175	DO-41
ZP 91	85 - 96	5	250	11	9 /13	175	DO-41
ZP 100	94 -106	5	250	10	9 /13	175	DO-41

(*) TA = 45 oC

= ZENER =

5.0 W @ TA = 25 oC VOLTAGE REGULATOR DIODES

TYPE	VZ min-max (V)	@ IZT (mA)	rZT max (ohms)	IZM (mA)	TEMP. COEFF. (x0.0001) (1 /oC)	TJM (oC)	CASE
$ 5DZ 3	2.8- 3.2	410	3.5	1670	- 6.5	175	DO-27A
$ 5DZ 3V3	3.1- 3.5	380	3	1430	- 6.0	175	DO-27A
$ 5DZ 3V6	3.4- 3.8	350	2.5	1310	- 5.5	175	DO-27A
$ 5DZ 3V9	3.7- 4.1	320	2	1220	- 5.0	175	DO-27A
$ 5DZ 4V3	4.0- 4.6	290	2	1090	- 4.0	175	DO-27A
$ 5DZ 4V7	4.4- 5.0	260	2	1000	- 2.0	175	DO-27A
$ 5DZ 5V1	4.8- 5.4	240	1.5	925	1	175	DO-27A
$ 5DZ 5V6	5.2- 6.0	220	1	830	2.5	175	DO-27A
$ 5DZ 6V2	4.8- 6.6	200	1	750	3.2	175	DO-27A
$ 5DZ 6V8	6.4- 7.2	175	1	690	4	175	DO-27A
$ 5DZ 7V5	7.0- 7.9	175	1.5	630	4.5	175	DO-27A
$ 5DZ 8V2	7.7- 8.7	150	1.5	570	4.8	175	DO-27A
$ 5DZ 9V1	8.5- 9.6	150	2	520	5.1	175	DO-27A
$ 5DZ 10	9.4-10.6	125	2	470	5.5	175	DO-27A
$ 5DZ 11	10.4-11.6	125	2.5	430	6	175	DO-27A
$ 5DZ 12	11.4-12.7	100	2.5	390	6.5	175	DO-27A
$ 5DZ 13	12.4-14.1	100	2.5	350	6.5	175	DO-27A
$ 5DZ 15	13.8-15.6	75	2.5	320	7	175	DO-27A
$ 5DZ 16	15.3-17.1	75	2.5	290	7	175	DO-27A
$ 5DZ 18	16.8-19.1	65	2.5	260	7.5	175	DO-27A
$ 5DZ 20	18.8-21.2	65	3	235	7.5	175	DO-27A
$ 5DZ 22	20.8-23.3	50	3.5	215	8	175	DO-27A
$ 5DZ 24	22.8-25.6	50	3.5	195	8	175	DO-27A
$ 5DZ 27	25.1-28.9	50	5	170	8.5	175	DO-27A

$ Preliminary data

5.0 W @ TA = 25 oC VOLTAGE REGULATOR DIODES

TYPE	VZ min-max (V)	@ IZT (mA)	rZT max (ohms)	IZM (mA)	TEMP. COEFF. (x0.0001) (1 /oC)	TJM (oC)	CASE
$ 5DZ 30	28 - 32	40	8	155	8.5	175	DO-27A
$ 5DZ 33	31 - 35	40	10	140	8.5	175	DO-27A
$ 5DZ 36	34 - 38	30	11	130	8.5	175	DO-27A
$ 5DZ 39	37 - 41	30	14	120	9	175	DO-27A
$ 5DZ 43	40 - 46	30	20	110	9	175	DO-27A
$ 5DZ 47	44 - 50	25	25	100	9	175	DO-27A
$ 5DZ 51	44 - 54	25	27	92	9	175	DO-27A
$ 5DZ 56	52 - 60	20	35	83	9	175	DO-27A
$ 5DZ 62	58 - 66	20	42	75	9	175	DO-27A
$ 5DZ 68	64 - 72	20	44	69	9	175	DO-27A
$ 5DZ 75	70 - 79	20	45	63	9	175	DO-27A
$ 5DZ 82	77 - 87	15	65	57	9	175	DO-27A
$ 5DZ 91	85 - 96	15	75	52	9	175	DO-27A
$ 5DZ 100	94 -106	12	90	47	9	175	DO-27A
$ 5DZ 110	104 -116	12	125	43	9.5	175	DO-27A
$ 5DZ 120	114 -127	10	170	38	9.5	175	DO-27A
$ 5DZ 130	124 -141	10	190	35	9.5	175	DO-27A
$ 5DZ 150	38 -156	8	330	32	9.5	175	DO-27A
$ 5DZ 160	153 -171	8	350	29	9.5	175	DO-27A
$ 5DZ 180	168 -191	5	430	26	9.5	175	DO-27A
$ 5DZ 200	188 -212	5	480	23	10	175	DO-27A

$ Preliminary data

10 W @ TC = 25 oC VOLTAGE REGULATOR DIODES

TYPE	VZ min-max (V)	@ IZT (mA)	rZT max (ohms)	IZM (mA)	TEMP. COEFF. (x0.0001) (1 /oC)	TJM (oC)	CASE
10DZ 6V8	6.1- 7.5	370	1.2	1300	3	150	DO-4
10DZ 8	7.4- 9.1	305	1.8	1100	4	150	DO-4
10DZ 10	9 - 11	250	2.4	925	5	150	DO-4
10DZ 12	10.5-13.5	210	3.2	770	5.7	150	DO-4
10DZ 15	13 -16.5	170	4.5	625	6.3	150	DO-4
10DZ 18	16 -20.5	140	6	500	6.8	150	DO-4
10DZ 22	20 -24.5	115	8.5	415	7.3	150	DO-4
10DZ 27	24 - 30	95	11	335	7.7	150	DO-4
10DZ 33	29 - 36	75	17	275	8	150	DO-4
10DZ 39	35 - 43	65	21	230	8.5	150	DO-4
10DZ 47	42 - 52	55	28	195	8.5	150	DO-4
10DZ 56	50 - 62	45	38	160	8.8	150	DO-4
10DZ 68	61 - 75	37	52	135	9	150	DO-4
10DZ 82	74 - 91	30	72	110	9.2	150	DO-4
10DZ 100	90 -110	25	96	90	9.3	150	DO-4
10DZ 120	105 -135	20	135	77	9.4	150	DO-4
10DZ 150	130 -165	17	190	62	9.6	150	DO-4
10DZ 180	160 -205	14	260	50	9.6	150	DO-4

10 W @ TC = 25 oC VOLTAGE REGULATOR DIODES

TYPE	VZ min-max (V)	@ IZT (mA)	rZT max (ohms)	IZM (mA)	TEMP. COEFF. (x0.0001) (1 /oC)	TJM (oC)	CASE
10DZ 12P	10.5-13.5	210	3.2	730	6.5	125	TO-220
10DZ 15P	13 -16.5	170	4.5	590	7	125	TO-220
10DZ 18P	16 -20.5	140	6	490	7.5	125	TO-220
10DZ 22P	20 -24.5	115	8.5	410	8	125	TO-220
10DZ 27P	24 - 30	95	11	330	8.5	125	TO-220
10DZ 33P	29 - 36	75	17	300	8.5	125	TO-220
10DZ 39P	35 - 43	65	21	230	9	125	TO-220
10DZ 47P	42 - 52	55	28	190	9	125	TO-220
10DZ 56P	50 - 62	45	38	160	9	125	TO-220
10DZ 68P	61 - 75	37	52	140	9	125	TO-220
10DZ 82P	74 - 91	30	72	110	9	125	TO-220
10DZ 100P	90 -110	25	96	90	9	125	TO-220
10DZ 120P	105 -135	20	135	70	9.5	125	TO-220
10DZ 150P	130 -165	17	190	60	9.5	125	TO-220
10DZ 180P	160 -205	14	260	50	9.5	125	TO-220

= ZENER =

20 W @ TC = 25 oC VOLTAGE REGULATOR DIODES

TYPE	VZ min-max (V)	@ IZT (mA)	rZT max (ohms)	IZM (mA)	TEMP. COEFF. (x0.0001) (1 /oC)	TJM (oC)	CASE
20DZ 6V8	6.1- 7.5	730	1	2700	3	150	DO-5
20DZ 8V2	7.4- 9.1	610	1.2	2200	4	150	DO-5
20DZ 10	9 - 11	500	1.8	1800	5	150	DO-5
20DZ 12	10.5-13.5	420	2.4	1540	5.7	150	DO-5
20DZ 15	13 -16.5	330	3.9	1250	6.3	150	DO-5
20DZ 18	16 -20.5	280	5.7	1000	6.8	150	DO-5
20DZ 22	20 -24.5	230	6.9	830	7.3	150	DO-5
20DZ 27	24 - 30	180	9	665	7.7	150	DO-5
20DZ 33	29 - 36	150	11	555	8	150	DO-5
20DZ 39	35 - 43	120	13	465	8.3	150	DO-5
20DZ 47	42 - 52	100	16	390	8.6	150	DO-5
20DZ 56	50 - 62	90	18	320	8.8	150	DO-5
20DZ 68	61 - 75	73	24	265	9	150	DO-5
20DZ 82	74 - 91	60	33	220	9.2	150	DO-5
20DZ 100	90 -110	50	56	180	9.3	150	DO-5
20DZ 120	105 -135	42	76	154	9.4	150	DO-5
20DZ 150	130 -165	33	150	125	9.6	150	DO-5
20DZ 180	160 -205	28	280	100	9.8	150	DO-5

50 W @ TC = 25 oC VOLTAGE REGULATOR DIODES

TYPE	VZ min-max (V)	@ IZT (mA)	rZT max (ohms)	IZM (mA)	TEMP. COEFF. (x0.0001) (1 /oC)	TJM (oC)	CASE
50DZ 10	9 - 11	1200	0.8	3900	6	150	DO-5
50DZ 12	10.5-13.5	1000	1.2	3000	6.5	150	DO-5
50DZ 15	13 -16.5	830	1.8	2500	7	150	DO-5
50DZ 18	16 -20.5	700	2.4	2200	7.5	150	DO-5
50DZ 22	20 -24.5	570	2.7	1900	8	150	DO-5
50DZ 27	24 - 30	460	3	1500	8.5	150	DO-5
50DZ 33	29 - 36	380	3.5	1300	8.5	150	DO-5
50DZ 39	35 - 43	320	4.5	1050	9	150	DO-5
50DZ 47	42 - 52	270	5.5	880	9	150	DO-5
50DZ 56	50 - 62	220	7	740	9	150	DO-5
50DZ 68	61 - 75	180	9	600	9	150	DO-5
50DZ 82	74 - 91	150	15	490	9	150	DO-5
50DZ 100	90 -110	120	30	400	9	150	DO-5
50DZ 120	105 -135	100	60	336	9.5	150	DO-5
50DZ 150	130 -165	85	85	270	9.5	150	DO-5
50DZ 180	160 -205	68	100	200	9.5	150	DO-5

STANDARD RECTIFIERS (IFAVM < 100 A)

TYPE	IFAVM (A)	@ TC TA+ TL* (oC)	VRRM = VR min (V)	IFRM (A)	IFSM (10ms) max (A)	i2t (kA2s)
F 057	0.75	110*	50	4	30	0.0045
F 087	0.75	110*	80	4	30	0.0045
F 107	0.75	110*	100	4	30	0.0045
F 207	0.75	110*	400	4	30	0.0045
F 307	0.75	110*	600	4	30	0.0045
F 407	0.75	110*	800	4	30	0.0045
1N 4001	1	85*	50	10	20	0.0045
1N 4002	1	85*	100	10	20	0.0045
1N 4003	1	85*	200	10	20	0.0045
1N 4004	1	85*	400	10	20	0.0045
1N 4005	1	85*	600	10	20	0.0045
1N 4006	1	85*	800	10	20	0.0045
1N 4007	1	85*	1000	10	20	0.0045
F 102	2	50*	100	6.5	70	0.0245
F 202	2	50*	200	6.5	70	0.0245
F 402	2	50*	400	6.5	70	0.0245
F 602	2	50*	600	6.5	70	0.0245
F 802	2	50*	800	6.5	70	0.0245
F 112	2	50*	1000	6.5	70	0.0245
$ D3N 1	3	45+	100	20	160	0.128
$ D3N 2	3	45+	200	20	160	0.128
$ D3N 3	3	45+	300	20	160	0.128
$ D3N 4	3	45+	400	20	160	0.128
$ D3N 5	3	45+	500	20	160	0.128
$ D3N 6	3	45+	600	20	160	0.128
$ D3N 8	3	45+	800	20	160	0.128
$ D3N 10	3	45+	1000	20	160	0.128

(R) Reverse polarity
$ Preliminary data

STANDARD RECTIFIERS (IFAVM < 100 A)

VF max (V)	@ IF (A)	IR max (uA)	@ TJ (oC)	VFO max (V)	rF (x0.001) (ohms)	trr max (us)	TJM (oC)	CASE
1	0.75	5	25	0.87	100		150	DO-13
1	0.75	5	25	0.87	100		150	DO-13
1	0.75	5	25	0.87	100		150	DO-13
1	0.75	5	25	0.87	100		150	DO-13
1	0.75	5	25	0.87	100		150	DO-13
1	0.75	5	25	0.87	100		150	DO-13
1.1	1	5	25	0.95	75		150	F-126
1.1	1	5	25	0.95	75		150	F-126
1.1	1	5	25	0.95	75		150	F-126
1.1	1	5	25	0.95	75		150	F-126
1.1	1	5	25	0.95	75		150	F-126
1.1	1	5	25	0.95	75		150	F-126
1.1	1	5	25	0.95	75		150	F-126
1.2	2	10	25	1.06	54		150	DO-13
1.2	2	10	25	1.06	54		150	DO-13
1.2	2	10	25	1.06	54		150	DO-13
1.2	2	10	25	1.06	54		150	DO-13
1.2	2	10	25	1.06	54		150	DO-13
1.2	2	10	25	1.06	54		150	DO-13
1.24	9.5	3000	155	0.64	30		150	DO-27A
1.24	9.5	3000	155	0.64	30		150	DO-27A
1.24	9.5	3000	155	0.64	30		150	DO-27A
1.24	9.5	3000	155	0.64	30		150	DO-27A
1.24	9.5	3000	155	0.64	30		150	DO-27A
1.24	9.5	3000	155	0.64	30		150	DO-27A
1.24	9.5	3000	155	0.64	30		150	DO-27A
1.24	9.5	3000	155	0.64	30		150	DO-27A

STANDARD RECTIFIERS (IFAVM < 100 A)

TYPE		IFAVM (A)	@ TC (oC)	VRRM = VR min (V)	IFRM (A)	IFSM (10ms) max (A)	i2t (kA2s)
6SI 1P		6	100	100	25	60	0.028
6SI 2P		6	100	200	25	60	0.028
6SI 3P		6	100	300	25	60	0.028
6SI 4P		6	100	400	25	60	0.028
6SI 5P		6	100	500	25	60	0.028
D10N 05	(R)	10	125	50	30	210	0.220
D10N 1	(R)	10	125	100	30	210	0.220
D10N 2	(R)	10	125	200	30	210	0.220
D10N 3	(R)	10	125	300	30	210	0.220
D10N 4	(R)	10	125	400	30	210	0.220
D10N 5	(R)	10	125	500	30	210	0.220
D10N 6	(R)	10	125	600	30	210	0.220
D10N 8	(R)	10	125	800	30	210	0.220
D10N 10	(R)	10	125	1000	30	210	0.220
D10N 12	(R)	10	125	1200	30	210	0.220
D10N 14	(R)	10	125	1400	30	210	0.220
D10N 16	(R)	10	125	1600	30	210	0.220
RAG 115		15	100	100	50	250	0.312
RAG 215		15	100	200	50	250	0.312
RAG 415		15	100	400	50	250	0.312
RAG 615		15	100	600	50	250	0.312
D16N 05	(R)	16	95	50	155	250	0.3125
D16N 1	(R)	16	95	100	155	250	0.3125
D16N 2	(R)	16	95	200	155	250	0.3125
D16N 3	(R)	16	95	300	155	250	0.3125
D16N 4	(R)	16	95	400	155	250	0.3125
D16N 5	(R)	16	95	500	155	250	0.3125
D16N 6	(R)	16	95	600	155	250	0.3125
D16N 8	(R)	16	95	800	155	250	0.3125
D16N 10	(R)	16	95	1000	155	250	0.3125
D16N 12	(R)	16	95	1200	155	250	0.3125
D16N 14	(R)	16	95	1400	155	250	0.3125
D16N 16	(R)	16	95	1600	155	250	0.3125

(R) Reverse polarity

STANDARD RECTIFIERS (IFAVM < 100 A)

VF max (V)	@ IF (A)	IR max (mA)	@ TJ (oC)	VFO max (V)	rF (x0.001) (ohms)	trr max (us)	TJM (oC)	CASE
1.25	6	1	125	0.8	40		150	TO-220
1.25	6	1	125	0.8	40		150	TO-220
1.25	6	1	125	0.8	40		150	TO-220
1.25	6	1	125	0.8	40		150	TO-220
1.25	6	1	125	0.8	40		150	TO-220
1.4	35	3	150	0.85	15		150	DO-4
1.4	35	3	150	0.85	15		150	DO-4
1.4	35	3	150	0.85	15		150	DO-4
1.4	35	3	150	0.85	15		150	DO-4
1.4	35	3	150	0.85	15		150	DO-4
1.4	35	3	150	0.85	15		150	DO-4
1.4	35	3	150	0.85	15		150	DO-4
1.4	35	3	150	0.85	15		150	DO-4
1.4	35	3	150	0.85	15		150	DO-4
1.4	35	3	150	0.85	15		150	DO-4
1.4	35	3	150	0.85	15		150	DO-4
1.4	35	3	150	0.85	15		150	DO-4
1.2	50	3	150	0.95	3.75		150	RAG
1.2	50	3	150	0.95	3.75		150	RAG
1.2	50	3	150	0.95	3.75		150	RAG
1.2	50	3	150	0.95	3.75		150	RAG
1.4	50	3	150	0.9	8.75		150	DO-4
1.4	50	3	150	0.9	8.75		150	DO-4
1.4	50	3	150	0.9	8.75		150	DO-4
1.4	50	3	150	0.9	8.75		150	DO-4
1.4	50	3	150	0.9	8.75		150	DO-4
1.4	50	3	150	0.9	8.75		150	DO-4
1.4	50	3	150	0.9	8.75		150	DO-4
1.4	50	3	150	0.9	8.75		150	DO-4
1.4	50	3	150	0.9	8.75		150	DO-4
1.4	50	3	150	0.9	8.75		150	DO-4
1.4	50	3	150	0.9	8.75		150	DO-4
1.4	50	3	150	0.9	8.75		150	DO-4

STANDARD RECTIFIERS (IFAVM < 100 A)

TYPE		IFAVM (A)	@ TC (oC)	VRRM = VR min (V)	IFRM (A)	IFSM (10ms) max (A)	i2t (kA2s)
RA 120	(R)	20	90	100	70	250	0.312
RA 220	(R)	20	90	200	70	250	0.312
RA 125	(R)	25	100	100	230	400	0.800
RA 225	(R)	25	100	200	230	400	0.800
D25N 05	(R)	25	125	50	80	400	0.800
D25N 1	(R)	25	125	100	80	400	0.800
D25N 2	(R)	25	125	200	80	400	0.800
D25N 3	(R)	25	125	300	80	400	0.800
D25N 4	(R)	25	125	400	80	400	0.800
D25N 5	(R)	25	125	500	80	400	0.800
D25N 6	(R)	25	125	600	80	400	0.800
D25N 8	(R)	25	125	800	80	400	0.800
D25N 10	(R)	25	125	1000	80	400	0.800
D25N 12	(R)	25	125	1200	80	400	0.800
D25N 14	(R)	25	125	1400	80	400	0.800
D25N 16	(R)	25	125	1600	80	400	0.800
D32N 05	(R)	32	100	50	100	450	1.010
D32N 1	(R)	32	100	100	100	450	1.010
D32N 2	(R)	32	100	200	100	450	1.010
D32N 3	(R)	32	100	300	100	450	1.010
D32N 4	(R)	32	100	400	100	450	1.010
D32N 5	(R)	32	100	500	100	450	1.010
D32N 6	(R)	32	100	600	100	450	1.010
D32N 8	(R)	32	100	800	100	450	1.010
D32N 10	(R)	32	100	1000	100	450	1.010
D32N 12	(R)	32	100	1200	100	450	1.010
D32N 14	(R)	32	100	1400	100	450	1.010
D32N 16	(R)	32	100	1600	100	450	1.010

(R) Reverse polarity

STANDARD RECTIFIERS (IFAVM < 100 A)

VF max (V)	@ IF (A)	IR max (mA)	@ TJ (oC)	VFO max (V)	rF (x0.001) (ohms)	trr max (us)	TJM (oC)	CASE
1.4	60	3	150	1.25	2.5		150	DO-21
1.4	60	3	150	1.25	2.5		150	DO-21
1.4	80	3	150	1	4.58		150	DO-21
1.4	80	3	150	1	4.58		150	DO-21
1.4	80	5	150	0.9	5.6		150	DO-5
1.4	80	5	150	0.9	5.6		150	DO-5
1.4	80	5	150	0.9	5.6		150	DO-5
1.4	80	5	150	0.9	5.6		150	DO-5
1.4	80	5	150	0.9	5.6		150	DO-5
1.4	80	5	150	0.9	5.6		150	DO-5
1.4	80	5	150	0.9	5.6		150	DO-5
1.4	80	5	150	0.9	5.6		150	DO-5
1.4	80	5	150	0.9	5.6		150	DO-5
1.4	80	5	150	0.9	5.6		150	DO-5
1.4	80	5	150	0.9	5.6		150	DO-5
1.4	80	5	150	0.9	5.6		150	DO-5
1.7	100	5	150	0.9	7.85		150	DO-5
1.7	100	5	150	0.9	7.85		150	DO-5
1.7	100	5	150	0.9	7.85		150	DO-5
1.7	100	5	150	0.9	7.85		150	DO-5
1.7	100	5	150	0.9	7.85		150	DO-5
1.7	100	5	150	0.9	7.85		150	DO-5
1.7	100	5	150	0.9	7.85		150	DO-5
1.7	100	5	150	0.9	7.85		150	DO-5
1.7	100	5	150	0.9	7.85		150	DO-5
1.7	100	5	150	0.9	7.85		150	DO-5
1.7	100	5	150	0.9	7.85		150	DO-5
1.7	100	5	150	0.9	7.85		150	DO-5

STANDARD RECTIFIERS (IFAVM < 100 A)

TYPE		IFAVM @ TC (A)	(oC)	VRRM = VR min (V)	IFRM (A)	IFSM (10ms) max (A)	i2t (kA2s)
D40N 05	(R)	40	100	50	125	500	1.250
D40N 1	(R)	40	100	100	125	500	1.250
D40N 2	(R)	40	100	200	125	500	1.250
D40N 3	(R)	40	100	300	125	500	1.250
D40N 4	(R)	40	100	400	125	500	1.250
D40N 5	(R)	40	100	500	125	500	1.250
D40N 6	(R)	40	100	600	125	500	1.250
D40N 8	(R)	40	100	800	125	500	1.250
D40N 10	(R)	40	100	1000	125	500	1.250
D40N 12	(R)	40	100	1200	125	500	1.250
D40N 14	(R)	40	100	1400	125	500	1.250
D40N 16	(R)	40	100	1600	125	500	1.250
K 1040	(R)	40	90	100	180	800	5.000
K 4040	(R)	40	90	400	180	800	5.000
K 6040	(R)	40	90	600	180	800	5.000
K 1140	(R)	40	90	1000	180	800	5.000
K 1040-S	(R)	40	90	100	180	800	5.000
K 4040-S	(R)	40	90	400	180	800	5.000
K 6040-S	(R)	40	90	600	180	800	5.000
K 1140-S	(R)	40	90	1000	180	800	5.000

(R) Reverse polarity
-S Metal-glass case

STANDARD RECTIFIERS (IFAVM < 100 A)

VF max (V)	@ IF (A)	IR max (mA)	@ TJ (oC)	VFO max (V)	rF (x0.001) (ohms)	trr max (us)	TJM (oC)	CASE
1.35	125	10	150	1.15	6.5		150	DO-5
1.35	125	10	150	1.15	6.5		150	DO-5
1.35	125	10	150	1.15	6.5		150	DO-5
1.35	125	10	150	1.15	6.5		150	DO-5
1.35	125	10	150	1.15	6.5		150	DO-5
1.35	125	10	150	1.15	6.5		150	DO-5
1.35	125	10	150	1.15	6.5		150	DO-5
1.35	125	10	150	1.15	6.5		150	DO-5
1.35	125	10	150	1.15	6.5		150	DO-5
1.35	125	10	150	1.15	6.5		150	DO-5
1.35	125	10	150	1.15	6.5		150	DO-5
1.35	125	10	150	1.15	6.5		150	DO-5
1.2	125	4	125	0.95	1.33		150	F-62
1.2	125	4	125	0.95	1.33		150	F-62
1.2	125	4	125	0.95	1.33		150	F-62
1.2	125	4	125	0.95	1.33		150	F-62
1.2	125	4	125	0.95	1.33		150	B-27
1.2	125	4	125	0.95	1.33		150	B-27
1.2	125	4	125	0.95	1.33		150	B-27
1.2	125	4	125	0.95	1.33		150	B-27

STANDARD RECTIFIERS (IFAVM < 100 A)

TYPE	IFAVM @ TC (A)	(oC)	VRRM = VR min (V)	IFRM (A)	IFSM (10ms) max (A)	i2t (kA2s)
D50N 05 (R)	50	90	50	450	550	1.510
D50N 1 (R)	50	90	100	450	550	1.510
D50N 2 (R)	50	90	200	450	550	1.510
D50N 3 (R)	50	90	300	450	550	1.510
D50N 4 (R)	50	90	405	450	550	1.510
D50N 5 (R)	50	90	500	450	550	1.510
D50N 6 (R)	50	90	600	450	550	1.510
D50N 8 (R)	50	90	800	450	550	1.510
D50N 10 (R)	50	90	1000	450	550	1.510
D50N 12 (R)	50	90	1200	450	550	1.510
D50N 14 (R)	50	90	1400	450	550	1.510
D50N 16 (R)	50	90	1600	450	550	1.510
KS 1060 (R)	60	110	100	200	1500	11.250
KS 4060 (R)	60	110	400	200	1500	11.250
KS 6060 (R)	60	110	600	200	1500	11.250
KS 1160 (R)	60	110	1000	200	1500	11.250
KS 1060-S(R)	60	110	100	200	1500	11.250
KS 4060-S(R)	60	110	400	200	1500	11.250
KS 6060-S(R)	60	110	600	200	1500	11.250
KS 1160-S(R)	60	110	1000	200	1500	11.250

(R) Reverse polarity
-S Metal-glass case

STANDARD RECTIFIERS (IFAVM < 100 A)

VF max (V)	@ IF (A)	IR max (mA)	@ TJ (oC)	VFO max (V)	rF (x0.001) (ohms)	trr max (us)	TJM (oC)	CASE
1.55	150	10	150	1.1	4		150	DO-5
1.55	150	10	150	1.1	4		150	DO-5
1.55	150	10	150	1.1	4		150	DO-5
1.55	150	10	150	1.1	4		150	DO-5
1.55	150	10	150	1.1	4		150	DO-5
1.55	150	10	150	1.1	4		150	DO-5
1.55	150	10	150	1.1	4		150	DO-5
1.55	150	10	150	1.1	4		150	DO-5
1.55	150	10	150	1.1	4		150	DO-5
1.55	150	10	150	1.1	4		150	DO-5
1.55	150	10	150	1.1	4		150	DO-5
1.55	150	10	150	1.1	4		150	DO-5
1.2	190	5	125	1	0.8		150	F-62
1.2	190	5	125	1	0.8		150	F-62
1.2	190	5	125	1	0.8		150	F-62
1.2	190	5	125	1	0.8		150	F-62
1.2	190	5	125	1	0.8		150	B-27
1.2	190	5	125	1	0.8		150	B-27
1.2	190	5	125	1	0.8		150	B-27
1.2	190	5	125	1	0.8		150	B-27

STANDARD RECTIFIERS (IFAVM < 100 A)

TYPE	IFAVM (A)	@ TC (oC)	VRRM = VR min (V)	IF RMS max (A)	IFSM (10ms) max (A)	i2t (kA2s)
KU 290 (R)	90	90	200	275	1800	12
KU 490 (R)	90	90	400	275	1800	12
KU 690 (R)	90	90	600	275	1800	12
KU 1090 (R)	90	90	1000	275	1800	12
KU 1290 (R)	90	90	1200	275	1800	12
KU 1490 (R)	90	90	1400	275	1800	12
KU 290-S (R)	90	90	200	275	1800	12
KU 490-S (R)	90	90	400	275	1800	12
KU 690-S (R)	90	90	600	275	1800	12
KU 1090-S(R)	90	90	1000	275	1800	12
KU 1290-S(R)	90	90	1200	275	1800	12
KU 1490-S(R)	90	90	1400	275	1800	12

(R) Inverse polarity
-S Metal-glass case
$ Preliminary data

STANDARD RECTIFIERS (IFAVM < 100 A)

VF @ max (V)	IF (A)	IR @ max (mA)	TJ (oC)	VFO max (V)	rF (x0.001) (ohms)	trr max (us)	TJM (oC)	CASE
1.33	275	20	150	1	0.75		150	F-62
1.33	275	20	150	1	0.75		150	F-62
1.33	275	20	150	1	0.75		150	F-62
1.33	275	20	150	1	0.75		150	F-62
1.33	275	20	150	1	0.75		150	F-62
1.33	275	20	150	1	0.75		150	F-62
1.33	275	20	150	1	0.75		150	B-27
1.33	275	20	150	1	0.75		150	B-27
1.33	275	20	150	1	0.75		150	B-27
1.33	275	20	150	1	0.75		150	B-27
1.33	275	20	150	1	0.75		150	B-27
1.33	275	20	150	1	0.75		150	B-27

STANDARD RECTIFIERS (IFAVM > 100 A)

TYPE	IFAVM (A)	@ TC (oC)	VRRM = VR min (V)	IFRM (A)	IFSM (10ms) max (A)	i2t (kA2s)
D325N 200	325	100	200	550	7200	259
D325N 400	325	100	400	550	7200	259
D325N 600	325	100	600	550	7200	259
D325N 800	325	100	800	550	7200	259
D325N 1000	325	100	1000	550	7200	259
D325N 1200	325	100	1200	550	7200	259
D325N 1400	325	100	1400	550	7200	259
D325N 1600	325	100	1600	550	7200	259
D325N 1800	325	10C	1800	550	7200	259
D325N 2000	325	100	2000	550	7200	259
D325R 200 =	D325N 200					
...	... with reverse polarity					
D325R 2000	D325N 2000					
D355N 200	355	100	200	550	8500	361
D355N 400	355	100	400	550	8500	361
D355N 600	355	100	600	550	8500	361
D355N 800	355	100	800	550	8500	361
D355N 1000	355	100	1000	550	8500	361
D355N 1200	355	100	1200	560	8500	361
D355N 1400	355	100	1400	550	8500	361
D355N 1600	355	100	1600	550	8500	361
D355N 1800	355	100	1800	550	8500	361
D355N 2000	355	100	2000	550	8500	361
D355R 200 =	D355N 200					
...	... with reverse polarity					
D355R 2000	D355N 2000					

STANDARD RECTIFIERS (IFAVM > 100 A)

VF max (V)	@ IF (A)	IR max (mA)	@ TJ (oC)	VFO max (V)	rF (x0.001) (ohms)	trr max (us)	TJM (oC)	CASE
1.7	1000	20	150	0.78	0.82		150	B-42
1.7	1000	20	150	0.78	0.82		150	B-42
1.7	1000	20	150	0.78	0.82		150	B-42
1.7	1000	20	150	0.78	0.82		150	B-42
1.7	1000	20	150	0.78	0.82		150	B-42
1.7	1000	20	150	0.78	0.82		150	B-42
1.7	1000	20	150	0.78	0.82		150	B-42
1.7	1000	20	150	0.78	0.82		150	B-42
1.7	1000	20	150	0.78	0.82		150	B-42
1.7	1000	20	150	0.78	0.82		150	B-42
1.55	1000	20	150	0.72	0.72		150	B-42
1.55	1000	20	150	0.72	0.72		150	B-42
1.55	1000	20	150	0.72	0.72		150	B-42
1.55	1000	20	150	0.72	0.72		150	B-42
1.55	1000	20	150	0.72	0.72		150	B-42
1.55	1000	20	150	0.72	0.72		150	B-42
1.55	1000	20	150	0.72	0.72		150	B-42
1.55	1000	20	150	0.72	0.72		150	B-42
1.55	1000	20	150	0.72	0.72		150	B-42
1.55	1000	20	150	0.72	0.72		150	B-42

STANDARD RECTIFIERS (IFAVM > 100 A)

TYPE	IFAVM @ TC (A)	(oC)	VRRM = VR min (V)	IFRM (A)	IFSM (10ms) max (A)	i2t (kA2s)
D358N 200	360	100	200	650	4800	115
D358N 400	360	100	400	650	4800	115
D358N 600	360	100	600	650	4800	115
D358N 700	360	100	700	650	4800	115
D358N 800	360	100	800	650	4800	115
D358N 1000	360	100	1000	650	4800	115
D358N 1200	360	100	1200	650	4800	115
D358N 1400	360	100	1400	650	4800	115
D358N 1600	360	100	1600	650	4800	115
D358N 1800	360	100	1800	650	4800	115
D400N 200	400	100	200	700	8500	361
D400N 400	400	100	400	700	8500	361
D400N 600	400	100	600	700	8500	361
D400N 800	400	100	800	700	8500	361
D400N 1000	400	100	1000	700	8500	361
D400N 1200	400	100	1200	700	8500	361
D400N 1400	400	100	1400	700	8500	361
D400N 1600	400	100	1600	700	8500	361
D400N 1800	400	100	1800	700	8500	361
D400N 2000	400	100	2000	700	8500	361
D400R 200	= D400N 200					
...	... with reverse polarity					
D400R 2000	D400N 2000					
D408N 200	410	150	200	700	5500	150
D408N 400	410	150	400	700	5500	150
D408N 600	410	150	600	700	5500	150
D408N 700	410	150	700	700	5500	150
D408N 800	410	150	800	700	5500	150
D408N 1000	410	150	1000	700	5500	150
D408N 1200	410	150	1200	700	5500	150
D408N 1400	410	150	1400	700	5500	150
D408N 1600	410	150	1600	700	5500	150
D408N 1800	410	150	1800	700	5500	150

STANDARD RECTIFIERS (IFAVM > 100 A)

VF @ max (V)	IF (A)	IR @ max (mA)	TJ (oC)	VFO max (V)	rF (x0.001) (ohms)	trr max (us)	TJM (oC)	CASE
1.65	1000	20	150	0.72	0.9		150	T-20
1.65	1000	20	150	0.72	0.9		150	T-20
1.65	1000	20	150	0.72	0.9		150	T-20
1.65	1000	20	150	0.72	0.9		150	T-20
1.65	1000	20	150	0.72	0.9		150	T-20
1.65	1000	20	150	0.72	0.9		150	T-20
1.65	1000	20	150	0.72	0.9		150	T-20
1.65	1000	20	150	0.72	0.9		150	T-20
1.65	1000	20	150	0.72	0.9		150	T-20
1.65	1000	20	150	0.72	0.9		150	T-20
1.5	1000	40	150	0.8	0.6		150	E-50
1.5	1000	40	150	0.8	0.6		150	E-50
1.5	1000	40	150	0.8	0.6		150	E-50
1.5	1000	40	150	0.8	0.6		150	E-50
1.5	1000	40	150	0.8	0.6		150	E-50
1.5	1000	40	150	0.8	0.6		150	E-50
1.5	1000	40	150	0.8	0.6		150	E-50
1.5	1000	40	150	0.8	0.6		150	E-50
1.5	1000	40	150	0.8	0.6		150	E-50
1.5	1000	40	150	0.8	0.6		150	E-50
1.45	1000	20	150	0.72	0.6		150	T-20
1.45	1000	20	150	0.72	0.6		150	T-20
1.45	1000	20	150	0.72	0.6		150	T-20
1.45	1000	20	150	0.72	0.6		150	T-20
1.45	1000	20	150	0.72	0.6		150	T-20
1.45	1000	20	150	0.72	0.6		150	T-20
1.45	1000	20	150	0.72	0.6		150	T-20
1.45	1000	20	150	0.72	0.6		150	T-20
1.45	1000	20	150	0.72	0.6		150	T-20
1.45	1000	20	150	0.72	0.6		150	T-20

STANDARD RECTIFIERS (IFAVM > 100 A)

TYPE	IFAVM (A)	@ TC (oC)	VRRM = VR min (V)	IFRM (A)	IFSM (10ms) max (A)	i2t (kA2s)
$ D448N 200	450	120	200	700	4900	120
$ D448N 400	450	120	400	700	4900	120
$ D448N 600	450	120	600	700	4900	120
$ D448N 700	450	120	700	700	4900	120
$ D448N 800	450	120	800	700	4900	120
D450N 200	450	100	200	700	10200	520
D450N 400	450	100	400	700	10200	520
D450N 600	450	100	600	700	10200	520
D450N 800	450	100	800	700	10200	520
D450N 1000	450	100	1000	700	10200	520
D450N 1200	450	100	1200	700	10200	520
D450N 1400	450	100	1400	700	10200	520
D450N 1600	450	100	1600	700	10200	520
D450N 1800	450	100	1800	700	10200	520
D450N 2000	450	100	2000	700	10200	520
D450R 200	=	D450N 200				
...		... with reverse polarity				
D450R 2000		D450N 2000				
$ D508N 1400	650	83	1400	1020	7300	266
$ D508N 1600	650	83	1600	1020	7300	266
$ D508N 1800	650	83	1800	1020	7300	266
$ D508N 2000	650	83	2000	1020	7300	266
$ D508N 2200	650	83	2200	1020	7300	266
$ D508N 2400	650	83	2400	1020	7300	266
$ D508N 2600	650	83	2600	1020	7300	266

$ Preliminary data

STANDARD RECTIFIERS (IFAVM > 100 A)

VF max (V)	@ IF (A)	IR max (mA)	@ TJ (oC)	VFO max (V)	rF (x0.001) (ohms)	trr max (us)	TJM (oC)	CASE
		20	150	0.70	0.45		150	T-20
		20	150	0.70	0.45		150	T-20
		20	150	0.70	0.45		150	T-20
		20	150	0.70	0.45		150	T-20
		20	150	0.70	0.45		150	T-20
1.3	1000	40	150	0.8	0.4		150	E-50
1.3	1000	40	150	0.8	0.4		150	E-50
1.3	1000	40	150	0.8	0.4		150	E-50
1.3	1000	40	150	0.8	0.4		150	E-50
1.3	1000	40	150	0.8	0.4		150	E-50
1.3	1000	40	150	0.8	0.4		150	E-50
1.3	1000	40	150	0.8	0.4		150	E-50
1.3	1000	40	150	0.8	0.4		150	E-50
1.3	1000	40	150	0.8	0.4		150	E-50
1.3	1000	40	150	0.8	0.4		150	E-50
		50	150	0.85	0.45		150	T-36A
		50	150	0.85	0.45		150	T-36A
		50	150	0.85	0.45		150	T-36A
		50	150	0.85	0.45		150	T-36A
		50	150	0.85	0.45		150	T-36A
		50	150	0.85	0.45		150	T-36A
		50	150	0.85	0.45		150	T-36A

STANDARD RECTIFIERS (IFAVM > 100 A)

TYPE	IFAVM (A)	@ TC (oC)	VRRM = VR min (V)	IF RMS max (A)	IFSM (10ms) max (A)	i2t (kA2s)
D668N 2000	670	100	2000	1260	9000	405
D668N 2200	670	100	2200	1260	9000	405
D668N 2400	670	100	1800	1260	9000	405
D668N 2600	670	100	2000	1260	9000	405
D668N 2800	670	100	2200	1260	9000	405
D798N 200	800	100	200	1780	14700	1080
D798N 400	800	100	400	1780	14700	1080
D798N 600	800	100	600	1780	14700	1080
D798N 800	800	100	800	1780	14700	1080
D798N 1000	800	100	1000	1780	14700	1080
D798N 1200	800	100	1200	1780	14700	1080
D798N 1400	800	100	1400	1780	14700	1080
D798N 1600	800	100	1600	1780	14700	1080
D798N 1800	800	100	1800	1780	14700	1080
D800N 1400	800	100	1400	1500	12000	720
D800N 1600	800	100	1600	1500	12000	720
D800N 1800	800	100	1800	1500	12000	720
D800N 2000	800	100	2000	1500	12000	720
D800N 2200	800	100	2200	1500	12000	720
D800N 2400	800	100	2400	1500	12000	720
D800N 2600	800	100	2600	1500	12000	720
D800N 2800	800	100	2800	1500	12000	720

STANDARD RECTIFIERS (IFAVM > 100 A)

VF @ max (V)	IF (A)	IR @ max (mA)	TJ (oC)	VFO max (V)	rF (x0.001) (ohms)	trr max (us)	TJM (oC)	CASE
1.96	2400	40	150	0.8	0.55		150	T-28
1.96	2400	40	150	0.8	0.55		150	T-28
1.96	2400	40	150	0.8	0.55		150	T-28
1.96	2400	40	150	0.8	0.55		150	T-28
1.96	2400	40	150	0.8	0.55		150	T-28
1.85	3400	30	150	0.75	0.33		150	T-28
1.85	3400	30	150	0.75	0.33		150	T-28
1.85	3400	30	150	0.75	0.33		150	T-28
1.85	3400	30	150	0.75	0.33		150	T-28
1.85	3400	30	150	0.75	0.33		150	T-28
1.85	3400	30	150	0.75	0.33		150	T-28
1.85	3400	30	150	0.75	0.33		150	T-28
1.85	3400	30	150	0.75	0.33		150	T-28
1.85	3400	30	150	0.75	0.33		150	T-28
2.1	3000	50	150	0.85	0.4		150	T-30
2.1	3000	50	150	0.85	0.4		150	T-30
2.1	3000	50	150	0.85	0.4		150	T-30
2.1	3000	50	150	0.85	0.4		150	T-30
2.1	3000	50	150	0.85	0.4		150	T-30
2.1	3000	50	150	0.85	0.4		150	T-30
2.1	3000	50	150	0.85	0.4		150	T-30
2.1	3000	50	150	0.85	0.4		150	T-30

STANDARD RECTIFIERS (IFAVM > 100 A)

TYPE	IFAVM @ TC (A)	(oC)	VRRM = VR min (V)	IF RMS max (A)	IFSM (10ms) max (A)	i2t (kA2s)
D1000N 1400	1000	90	1400	2000	14200	1000
D1000N 1600	1000	90	1600	2000	14200	1000
D1000N 1800	1000	90	1800	2000	14200	1000
D1000N 2000	1000	90	2000	2000	14200	1000
D1000N 2200	1000	90	2200	2000	14200	1000
D1000N 2400	1000	90	2400	2000	14200	1000
D1000N 2600	1000	90	2600	2000	14200	1000
D1000N 2800	1000	90	2800	2000	14200	1000
D1300N 200	1300	100	200	2800	20000	2000
D1300N 400	1300	100	400	2800	20000	2000
D1300N 600	1300	100	600	2800	20000	2000
D1300N 800	1300	100	800	2800	20000	2000
D1300N 1000	1300	100	1000	2800	20000	2000
D1300N 1200	1300	100	1200	2800	20000	2000
D1300N 1400	1300	100	1400	2800	20000	2000
D1300N 1600	1300	100	1600	2800	20000	2000
D1300N 1800	1300	100	1800	2800	20000	2000
D1300N 2000	1300	100	2000	2800	20000	2000
D1600N 200	1600	100	200	3600	26000	3380
D1600N 400	1600	100	400	3600	26000	3380
D1600N 600	1600	100	600	3600	26000	3380
D1600N 800	1600	100	800	3600	26000	3380
D1600N 1000	1600	100	1000	3600	26000	3380
D1600N 1200	1600	100	1200	3600	26000	3380
D1600N 1400	1600	100	1400	3600	26000	3380
D1600N 1600	1600	100	1600	3600	26000	3380
D1600N 1800	1600	100	1800	3600	26000	3380
D1600N 2000	1600	100	2000	3600	26000	3380

STANDARD RECTIFIERS (IFAVM > 100 A)

VF @ max (V)	IF (A)	IR @ max (mA)	TJ (oC)	VFO max (V)	rF (x0.001) (ohms)	trr max (us)	TJM (oC)	CASE
1.9	3000	50	150	0.8	0.35		150	T-30
1.9	3000	50	150	0.8	0.35		150	T-30
1.9	3000	50	150	0.8	0.35		150	T-30
1.9	3000	50	150	0.8	0.35		150	T-30
1.9	3000	50	150	0.8	0.35		150	T-30
1.9	3000	50	150	0.8	0.35		150	T-30
1.9	3000	50	150	0.8	0.35		150	T-30
1.9	3000	50	150	0.8	0.35		150	T-30
1.9	3000	50	150	0.95	0.32		150	T-50
1.9	3000	50	150	0.95	0.32		150	T-50
1.9	3000	50	150	0.95	0.32		150	T-50
1.9	3000	50	150	0.95	0.32		150	T-50
1.9	3000	50	150	0.95	0.32		150	T-50
1.9	3000	50	150	0.95	0.32		150	T-50
1.9	3000	50	150	0.95	0.32		150	T-50
1.9	3000	50	150	0.95	0.32		150	T-50
1.9	3000	50	150	0.95	0.32		150	T-50
1.9	3000	50	150	0.95	0.32		150	T-50
1.5	3000	50	150	0.78	0.21		150	T-50
1.5	3000	50	150	0.78	0.21		150	T-50
1.5	3000	50	150	0.78	0.21		150	T-50
1.5	3000	50	150	0.78	0.21		150	T-50
1.5	3000	50	150	0.78	0.21		150	T-50
1.5	3000	50	150	0.78	0.21		150	T-50
1.5	3000	50	150	0.78	0.21		150	T-50
1.5	3000	50	150	0.78	0.21		150	T-50
1.5	3000	50	150	0.78	0.21		150	T-50
1.5	3000	50	150	0.78	0.21		150	T-50

STANDARD RECTIFIERS (IFAVM > 100 A)

TYPE	IFAVM (A)	@ TC (oC)	VRRM = VR min (V)	IF RMS max (A)	IFSM (10ms) max (A)	i2t (kA2s)
D1800N 2000	2550	63	2000	3600	31500	4961
D1800N 2200	2550	63	2200	3600	31500	4961
D1800N 2400	2550	63	2400	3600	31500	4961
D1800N 2600	2550	63	2600	3600	31500	4961
D1800N 2800	2550	63	2800	3600	31500	4961
D1800N 3000	2550	63	3000	3600	31500	4961
D1800N 3200	2550	63	3200	3600	31500	4961
D1800N 3400	2550	63	3400	3600	31500	4961
D1800N 3600	2550	63	3600	3600	31500	4961
$ D2228N 200	2230	109	200	3500	25000	3125
$ D2228N 400	2230	109	400	3500	25000	3125
$ D2228N 600	2230	109	600	3500	25000	3125
$ D2228N 800	2230	109	800	3500	25000	3125
$ D4000N 200	4000	80	200		40000	8000
$ D4000N 400	4000	80	400		40000	8000
$ D4000N 600	4000	80	600		40000	8000

$ Preliminary data

STANDARD RECTIFIERS (IFAVM > 100 A)

VF max (V)	@ IF (A)	IR max (mA)	@ TJ (oC)	VFO max (V)	rF (x0.001) (ohms)	trr max (us)	TJM (oC)	CASE
1.8	3000	100	150	0.9	0.3		150	T-50
1.8	3000	100	150	0.9	0.3		150	T-50
1.8	3000	100	150	0.9	0.3		150	T-50
1.8	3000	100	150	0.9	0.3		150	T-50
1.8	3000	100	150	0.9	0.3		150	T-50
1.8	3000	100	150	0.9	0.3		150	T-50
1.8	3000	100	150	0.9	0.3		150	T-50
1.8	3000	100	150	0.9	0.3		150	T-50
1.8	3000	100	150	0.9	0.3		150	T-50
1.45	7000	50	150	0.7	0.1		180	T-36A
1.45	7000	50	150	0.7	0.1		180	T-36A
1.45	7000	50	150	0.7	0.1		180	T-36A
1.45	7000	50	150	0.7	0.1		180	T-36A
1.45	15000	100	180	0.7	0.037		180	T-50
1.45	15000	100	180	0.7	0.037		180	T-50
1.45	15000	100	180	0.7	0.037		180	T-50

FAST RECOVERY RECTIFIERS (IFAVM < 10 A)

TYPE	IFAVM (A)	@ TL (oC)	VRRM = VR min (V)	IFRM (A)	IFSM (10ms) max (A)	i2t (kA2s)
BA 157	0.4	100	400	2.5	15	0.0012
BA 158	0.4	100	600	2.5	15	0.0012
BA 159	0.4	100	1000	2.5	15	0.0012
DRR 104	0.4	100	100	2.5	15	0.0012
DRR 204	0.4	100	200	2.5	15	0.0012
DRR 404	0.4	100	400	2.5	15	0.0012
DRR 604	0.4	100	600	2.5	15	0.0012
DRR 114	0.4	100	1000	2.5	15	0.0012
BAX 157	0.4	100	400	2.5	15	0.0012
BY 228-1	2	45	100	10	50	0.008
BY 228-4	2	45	400	10	50	0.008
BY 228-6	2	45	600	10	50	0.008
BY 228-8	2	45	800	10	50	0.008
BY 228-10	2	45	1000	10	50	0.008
BY 228-12	2	45	1200	10	50	0.008
BY 228	2	45	1500	10	50	0.008

FAST RECOVERY RECTIFIERS (IFAVM < 10 A)

VF max (V)	@ IF (A)	IR max (uA)	@ TJ (oC)	VFO max+ typ (V)	rF (x0.001) (ohms)	trr max (us)	TJM (oC)	CASE
1.5	0.4	5	25	1.2	450	0.3	150	F-126
1.5	0.4	5	25	1.2	450	0.3	150	F-126
1.5	0.4	5	25	1.2	450	0.3	150	F-126
1.5	0.4	5	25	1.2	450	1	150	F-126
1.5	0.4	5	25	1.2	450	1	150	F-126
1.5	0.4	5	25	1.2	450	1	150	F-126
1.5	0.4	5	25	1.2	450	1	150	F-126
1.5	0.4	5	25	1.2	450	1	150	F-126
0.97	0.4	5	25	0.87+	143	0.4	150	F-126
15	5	10	150			1.2	150	DO-27A
15	5	10	150			1.2	150	DO-27A
15	5	10	150			1.2	150	DO-27A
15	5	10	150			1.2	150	DO-27A
15	5	10	150			1.2	150	DO-27A
15	5	10	150			1.2	150	DO-27A
15	5	10	150			1.2	150	DO-27A

=RECTIFIERS=

FAST RECOVERY RECTIFIERS (IFAVM < 100 A)

TYPE		IFAVM @ TC (A)	(oC)	VRRM = VR min (V)	IFRM (A)	IFSM (10ms) max (A)	i2t (kA2s)
6DRR 1P	(R)	6	85	100	25	60	0.018
6DRR 2P	(R)	6	85	200	25	60	0.018
6DRR 3P	(R)	6	85	300	25	60	0.018
6DRR 4P	(R)	6	85	400	25	60	0.018
6DRR 5P	(R)	6	85	500	25	60	0.018
D10F 05	(R)	10	115	50	35	210	0.220
D10F 1	(R)	10	115	100	35	210	0.220
D10F 2	(R)	10	115	200	35	210	0.220
D10F 3	(R)	10	115	300	35	210	0.220
D10F 4	(R)	10	115	400	35	210	0.220
D10F 5	(R)	10	115	500	35	210	0.220
D10F 6	(R)	10	115	600	35	210	0.220
D10F 8	(R)	10	115	800	35	210	0.220
D10F 10	(R)	10	115	1000	35	210	0.220
D16F 05	(R)	16	100	50	50	250	0.315
D16F 1	(R)	16	100	100	50	250	0.315
D16F 2	(R)	16	100	200	50	250	0.315
D16F 3	(R)	16	100	300	50	250	0.315
D16F 4	(R)	16	100	400	50	250	0.315
D16F 5	(R)	16	100	500	50	250	0.315
D16F 6	(R)	16	100	600	50	250	0.315
D16F 8	(R)	16	100	800	50	250	0.315
D16F 10	(R)	16	100	1000	50	250	0.315
* D16AF 10	(R)	16	100	1000	147	250	0.315

* Fast Recovery Controlled Avalanche Diode
(R) Reverse polarity

FAST RECOVERY RECTIFIERS (IFAVM < 100 A)

VF @ max (V)	IF (A)	IR @ max (mA)	TJ (oC)	VFO max+ typ (V)	rF (x0.001) (ohms)	trr max (us)	TJM (oC)	CASE
1.25	5	1000	125	0.9	45	0.6	125	TO-220
1.25	5	1000	125	0.9	45	0.6	125	TO-220
1.25	5	1000	125	0.9	45	0.6	125	TO-220
1.25	5	1000	125	0.9	45	0.6	125	TO-220
1.25	5	1000	125	0.9	45	0.6	125	TO-220
1.3	10	3	115	1	19	0.6	150	DO-4
1.3	10	3	115	1	19	0.6	150	DO-4
1.3	10	3	115	1	19	0.6	150	DO-4
1.3	10	3	115	1	19	0.6	150	DO-4
1.3	10	3	115	1	19	0.6	150	DO-4
1.3	10	3	115	1	19	0.6	150	DO-4
1.3	10	3	115	1	19	0.6	150	DO-4
1.3	10	3	115	1	19	0.6	150	DO-4
1.3	10	3	115	1	19	0.6	150	DO-4
1.4	16	3	100	1.1	13.75	0.6	150	DO-4
1.4	16	3	100	1.1	13.75	0.6	150	DO-4
1.4	16	3	100	1.1	13.75	0.6	150	DO-4
1.4	16	3	100	1.1	13.75	0.6	150	DO-4
1.4	16	3	100	1.1	13.75	0.6	150	DO-4
1.4	16	3	100	1.1	13.75	0.6	150	DO-4
1.4	16	3	100	1.1	13.75	0.6	150	DO-4
1.4	16	3	100	1.1	13.75	0.6	150	DO-4
1.4	16	3	100	1.1	13.75	0.6	150	DO-4
1.4	16	3	100			0.6	150	DO-4

Avalanche ratings for **D16AF 10** :

VRA = 1200-1700 V

PRSM = 10 kW

FAST RECOVERY RECTIFIERS (IFAVM < 100 A)

TYPE		IFAVM @ TC (A)	(oC)	VRRM = VR min (V)	IFRM (A)	IFSM (10ms) max (A)	i2t (kA2s)
D25F 05	(R)	25	100	50	80	350	0.610
D25F 1	(R)	25	100	100	80	350	0.610
D25F 2	(R)	25	100	200	80	350	0.610
D25F 3	(R)	25	100	300	80	350	0.610
D25F 4	(R)	25	100	400	80	350	0.610
D25F 5	(R)	25	100	500	80	350	0.610
D25F 6	(R)	25	100	600	80	350	0.610
D25F 8	(R)	25	100	800	80	350	0.610
D25F 10	(R)	25	100	1000	80	350	0.610
* D25AF 10	(R)	25	100	1000	260	400	0.800
D32F 05	(R)	32	90	50	100	400	0.800
D32F 1	(R)	32	90	100	100	400	0.800
D32F 2	(R)	32	90	200	100	400	0.800
D32F 3	(R)	32	90	300	100	400	0.800
D32F 4	(R)	32	90	400	100	400	0.800
D32F 5	(R)	32	90	500	100	400	0.800
D32F 6	(R)	32	90	600	100	400	0.800
D32F 8	(R)	32	90	800	100	400	0.800
D32F 10	(R)	32	90	1000	100	400	0.800
D40F 05	(R)	40	90	50	340	500	1.250
D40F 1	(R)	40	90	100	340	500	1.250
D40F 2	(R)	40	90	200	340	500	1.250
D40F 3	(R)	40	90	300	340	500	1.250
D40F 4	(R)	40	90	400	340	500	1.250
D40F 5	(R)	40	90	500	340	500	1.250
D40F 6	(R)	40	90	600	340	500	1.250
D40F 8	(R)	40	90	800	340	500	1.250
D40F 10	(R)	40	90	1000	340	500	1.250

* Fast Recovery Controlled Avalanche Diode
(R) Reverse polarity

FAST RECOVERY RECTIFIERS (IFAVM < 100 A)

VF max (V)	@ IF (A)	IR max (mA)	@ TJ (oC)	VFO max+ typ (V)	rF (x0.001) (ohms)	trr max (us)	TJM (oC)	CASE
1.5	25	5	100	1.05	11.25	0.6	150	DO-5
1.5	25	5	100	1.05	11.25	0.6	150	DO-5
1.5	25	5	100	1.05	11.25	0.6	150	DO-5
1.5	25	5	100	1.05	11.25	0.6	150	DO-5
1.5	25	5	100	1.05	11.25	0.6	150	DO-5
1.5	25	5	100	1.05	11.25	0.6	150	DO-5
1.5	25	5	100	1.05	11.25	0.6	150	DO-5
1.5	25	5	100	1.05	11.25	0.6	150	DO-5
1.5	25	5	100	1.05	11.25	0.6	150	DO-5
1.5	25	5	100			0.6	150	DO-5
1.5	30	5	100	1.1+	9	0.8	150	DO-5
1.5	30	5	100	1.1+	9	0.8	150	DO-5
1.5	30	5	100	1.1+	9	0.8	150	DO-5
1.5	30	5	100	1.1+	9	0.8	150	DO-5
1.5	30	5	100	1.1+	9	0.8	150	DO-5
1.5	30	5	100	1.1+	9	0.8	150	DO-5
1.5	30	5	100	1.1+	9	0.8	150	DO-5
1.5	30	5	100	1.1+	9	0.8	150	DO-5
1.5	30	5	100	1.1+	9	0.8	150	DO-5
1.5	40	5	150	1.1	5.8	0.8	150	DO-5
1.5	40	5	150	1.1	5.8	0.8	150	DO-5
1.5	40	5	150	1.1	5.8	0.8	150	DO-5
1.5	40	5	150	1.1	5.8	0.8	150	DO-5
1.5	40	5	150	1.1	5.8	0.8	150	DO-5
1.5	40	5	150	1.1	5.8	0.8	150	DO-5
1.5	40	5	150	1.1	5.8	0.8	150	DO-5
1.5	40	5	150	1.1	5.8	0.8	150	DO-5
1.5	40	5	150	1.1	5.8	0.8	150	DO-5

Avalanche ratings for **D25AF 10** :

VRA = 1200-1700 V

PRSM = 13 kW

FAST RECOVERY RECTIFIERS (IFAVM > 100 A)

TYPE	IFAVM @ TC (A)	(oC)	VRRM = VR min (V)	IF RMS max (A)	IFSM (10ms) max (A)	i2t (kA2s)
$ D178S 200	180	100	200	280	2500	31.250
$ D178S 400	180	100	400	280	2500	31.250
$ D178S 600	180	100	600	280	2500	31.250
$ D178S 800	180	100	800	280	2500	31.250
$ D178S 900	180	100	900	280	2500	31.250
$ D178S 1000	180	100	1000	280	2500	31.250
$ D178S 1100	180	100	1100	280	2500	31.250
$ D178S 1200	180	100	1200	280	2500	31.250
$ D178S 1400	180	100	1400	280	2500	31.250
$ D208S 200	210	100	200	400	4000	80
$ D208S 400	210	100	400	400	4000	80
$ D208S 600	210	100	600	400	4000	80
$ D208S 800	210	100	800	400	4000	80
$ D208S 900	210	100	900	400	4000	80
$ D208S 1000	210	100	1000	400	4000	80
$ D208S 1200	210	100	1200	400	4000	80
$ D208S 1400	210	100	1400	400	4000	80
D400S 1200	400	100	1200	900	7750	300
D400S 1400	400	100	1400	900	7750	300
D400S 1600	400	100	1600	900	7750	300
D400S 1800	400	100	1800	900	7750	300
D400S 2000	400	100	2000	900	7750	300
D400S 2200	400	100	2200	900	7750	300
D400S 2400	400	100	2400	900	7750	300
D400S 2600	400	100	2600	900	7750	300

$ Preliminary data

FAST RECOVERY RECTIFIERS (IFAVM > 100 A)

VF @ max (V)	IF (A)	IR @ max (mA)	TJ (oC)	VFO max+ typ (V)	rF (x0.001) (ohms)	trr Qs * max (us)	TJM (oC)	CASE
1.9	500	40	150	1.1	2	2	150	T-28
1.9	500	40	150	1.1	2	2	150	T-28
1.9	500	40	150	1.1	2	2	150	T-28
1.9	500	40	150	1.1	2	2	150	T-28
1.9	500	40	150	1.1	2	2	150	T-28
1.9	500	40	150	1.1	2	2	150	T-28
1.9	500	40	150	1.1	2	2	150	T-28
1.9	500	40	150	1.1	2	2	150	T-28
1.9	500	40	150	1.1	2	2	150	T-28
1.6	500	40	150	1.1	2	2.5	150	T-28
1.6	500	40	150	1.1	2	2.5	150	T-28
1.6	500	40	150	1.1	2	2.5	150	T-28
1.6	500	40	150	1.1	2	2.5	150	T-28
1.6	500	40	150	1.1	2	2.5	150	T-28
1.6	500	40	150	1.1	2	2.5	150	T-28
1.6	500	40	150	1.1	2	2.5	150	T-28
1.6	500	40	150	1.1	2	2.5	150	T-28
2.4	1200	80	150	1.2+	0.89	360*	150	T-30
2.4	1200	80	150	1.2+	0.89	360*	150	T-30
2.4	1200	80	150	1.2+	0.89	360*	150	T-30
2.4	1200	80	150	1.2+	0.89	360*	150	T-30
2.4	1200	80	150	1.2+	0.89	360*	150	T-30
2.4	1200	80	150	1.2+	0.89	360*	150	T-30
2.4	1200	80	150	1.2+	0.89	360*	150	T-30
2.4	1200	80	150	1.2+	0.89	360*	150	T-30

Qs unit : uAs

FAST RECOVERY RECTIFIERS (IFAVM > 100 A)

TYPE	IFAVM @ TC (A)	(oC)	VRRM = VR min (V)	IF RMS max (A)	IFSM (10ms) max (A)	i2t (kA2s)
D495S 1200	495	90	1200	1160	10000	500
D495S 1400	495	90	1400	1160	10000	500
D495S 1600	495	90	1600	1160	10000	500
D495S 1800	495	90	1800	1160	10000	500
D495S 2000	495	90	2000	1160	10000	500
D495S 2200	495	90	2200	1160	10000	500
D495S 2400	495	90	2400	1160	10000	500
D495S 2600	495	90	2600	1160	10000	500
$ D648S 400	650	100	400	1220	10800	
$ D648S 600	650	100	600	1220	10800	
$ D648S 800	650	100	800	1220	10800	
$ D648S 1000	650	100	1000	1220	10800	
$ D658S 1000	660	100	1000	1430	12500	
$ D658S 1200	660	100	1200	1430	12500	
$ D658S 1400	660	100	1400	1430	12500	
$ D690S 1800	690	100	1800	1600	13500	
$ D690S 2000	690	100	2000	1600	13500	
$ D690S 2200	690	100	2200	1600	13500	
$ D690S 2400	690	100	2400	1600	13500	
$ D690S 2600	690	100	2600	1600	13500	
$ D800S 1800	800	100	1800	1800	15500	
$ D800S 2000	800	100	2000	1800	15500	
$ D800S 2200	800	100	2200	1800	15500	
$ D800S 2400	800	100	2400	1800	15500	
$ D800S 2600	800	100	2600	1800	15500	

$ Preliminary data

FAST RECOVERY RECTIFIERS (IFAVM > 100 A)

VF max (V)	@ IF (A)	IR max (mA)	@ TJ (oC)	VFO max+ typ (V)	rF (x0.001) (ohms)	Qs max (uAs)	TJM (oC)	CASE
2.1	1200	80	150	1.06+	0.65	360	150	T-30
2.1	1200	80	150	1.06+	0.65	360	150	T-30
2.1	1200	80	150	1.06+	0.65	360	150	T-30
2.1	1200	80	150	1.06+	0.65	360	150	T-30
2.1	1200	80	150	1.06+	0.65	360	150	T-30
2.1	1200	80	150	1.06+	0.65	360	150	T-30
2.1	1200	80	150	1.06+	0.65	360	150	T-30
2.1	1200	80	150	1.06+	0.65	360	150	T-30
2.1	2440	200	150	1.05+	0.4	55	150	T-36A
2.1	2440	200	150	1.05+	0.4	55	150	T-36A
2.1	2440	200	150	1.05+	0.4	55	150	T-36A
2.1	2440	200	150	1.05+	0.4	55	150	T-36A
3.6	2860	200	150	1	0.45	110	150	T-36A
3.6	2860	200	150	1	0.45	110	150	T-36A
3.6	2860	200	150	1	0.45	110	150	T-36A
4.2	3200	150	150	1.2	0.46	380	150	T-30
4.2	3200	150	150	1.2	0.46	380	150	T-30
4.2	3200	150	150	1.2	0.46	380	150	T-30
4.2	3200	150	150	1.2	0.46	380	150	T-30
4.2	3200	150	150	1.2	0.46	380	150	T-30
4	3600	150	150	1.07	0.325	660	150	T-30
4	3600	150	150	1.07	0.325	660	150	T-30
4	3600	150	150	1.07	0.325	660	150	T-30
4	3600	150	150	1.07	0.325	660	150	T-30
4	3600	150	150	1.07	0.325	660	150	T-30

ULTRA-FAST RECOVERY RECTIFIERS

TYPE	IFAVM (A)	@ TC T1* (oC)	VRRM = VR min (V)	IFRM (A)	IFSM (10ms) max (A)	i2t (kA2s)
$ D12X 50 (R)	12	100	50	75	200	0.200
$ D12X 100 (R)	12	100	100	75	200	0.200
$ D12X 150 (R)	12	100	150	75	200	0.200
$ D12X 200 (R)	12	100	200	75	200	0.200
$ D12X 300 (R)	12	100	300	75	200	0.200
$ D12X 400 (R)	12	100	400	75	200	0.200
$ D32X 50 (R)	32	90	50	75	500	1.250
$ D32X 100 (R)	32	90	100	75	500	1.250
$ D32X 150 (R)	32	90	150	75	500	1.250
$ D32X 200 (R)	32	90	200	75	500	1.250
$ D32X 300 (R)	32	90	300	75	500	1.250
$ D32X 400 (R)	32	90	400	75	500	1.250

(R) Reverse polarity
$ Preliminary data

ULTRA-FAST RECOVERY RECTIFIERS

VF max (V)	@ IF (A)	IR max (mA)	@ TJ (oC)	VFO max+ typ (V)	rF (x0.001) (ohms)	trr max (ns)	TJM (oC)	CASE
1.5	12	2.5	100			50	150	DO-4
1.5	12	2.5	100			50	150	DO-4
1.5	12	2.5	100			50	150	DO-4
1.5	12	2.5	100			50	150	DO-4
1.5	12	2.5	100			50	150	DO-4
1.5	12	2.5	100			50	150	DO-4
1.5	30	6	100			50	150	DO-5
1.5	30	6	100			50	150	DO-5
1.5	30	6	100			50	150	DO-5
1.5	30	6	100			50	150	DO-5
1.5	30	6	100			50	150	DO-5
1.5	30	6	100			50	150	DO-5

CONTROLLED AVALANCHE RECTIFIERS

TYPE		IFAVM (A)	@ TC TL* (oC)	VRRM = VR min (V)	IFRM (A)	IFSM (10ms) max (A)	i2t (kA2s)
D1A 4		1	75*	400	3	50	0.0125
D1A 6		1	75*	600	3	50	0.0125
D1A 8		1	75*	800	3	50	0.0125
D1A 10		1	75*	1000	3	50	0.0125
D1A 12		1	75*	1200	3	50	0.0125
F 4AC		1	75*	400	6.5	30	0.0045
F 6AC		1	75*	600	6.5	30	0.0045
F 8AC		1	75*	800	6.5	30	0.0045
F 10AC		1	75*	1000	6.5	30	0.0045
D10A 4	(R)	10	125	400	35	210	0.220
D10A 6	(R)	10	125	600	35	210	0.220
D10A 8	(R)	10	125	800	35	210	0.220
D10A 10	(R)	10	125	1000	35	210	0.220
D16A 4	(R)	16	125	400	50	250	0.315
D16A 6	(R)	16	125	600	50	250	0.315
D16A 8	(R)	16	125	800	50	250	0.315
D16A 10	(R)	16	125	1000	50	250	0.315
D16A 12	(R)	16	125	1200	50	250	0.315
D16A 14	(R)	16	125	1400	50	250	0.315
D25A 4	(R)	25	125	400	260	400	0.800
D25A 6	(R)	25	125	600	260	400	0.800
D25A 8	(R)	25	125	800	260	400	0.800
D25A 10	(R)	25	125	1000	260	400	0.800
D25A 12	(R)	25	125	1200	260	400	0.800
D25A 14	(R)	25	125	1400	260	400	0.800

(R) Reverse polarity

CONTROLLED AVALANCHE RECTIFIERS

VF @ max (V)	IF (A)	IR @ max (uA)	TJ max (oC)	VFO typ (V)	rF (x0.001) (ohms)	VRA min-max (V)	PRSM (kW)	CASE
1.1	1	50	150	1	66	450- 750	5	F-126
1.1	1	50	150	1	66	720-1000	3	F-126
1.1	1	50	150	1	66	950-1400	2	F-126
1.1	1	50	150	1	66	1200-1700	1	F-126
1.1	1	50	150	1	66	1400-2000	0.5	F-126
1.1	1	500	150	1	66	450- 750	5	DO-13
1.1	1	500	150	1	66	720-1000	3	DO-13
1.1	1	500	150	1	66	950-1400	2	DO-13
1.1	1	500	150	1	66	1200-1700	1	DO-13
1.4	35	3000	150	0.85	15	450- 750	30	DO-4
1.4	35	3000	150	0.85	15	720-1000	18	DO-4
1.4	35	3000	150	0.85	15	950-1400	12	DO-4
1.4	35	3000	150	0.85	15	1200-1700	6	DO-4
1.4	50	3000	150	0.82	9.8	450- 750	40	DO-4
1.4	50	3000	150	0.82	9.8	720-1000	25	DO-4
1.4	50	3000	150	0.82	9.8	950-1400	16	DO-4
1.4	50	3000	150	0.82	9.8	1200-1700	10	DO-4
1.4	50	3000	150	0.82	9.8	1400-2000	6	DO-4
1.4	50	3000	150	0.82	9.8	1600-2400	4	DO-4
1.4	80	5000	150	0.9	5.6	450- 750	60	DO-5
1.4	80	5000	150	0.9	5.6	720-1000	35	DO-5
1.4	80	5000	150	0.9	5.6	950-1400	25	DO-5
1.4	80	5000	150	0.9	5.6	1200-1700	13	DO-5
1.4	80	5000	150	0.9	5.6	1400-2000	10	DO-5
1.4	80	5000	150	0.9	5.6	1600-2400	7	DO-5

SCHOTTKY RECTIFIERS

TYPE	IFAVM (A)	@ TC (oC)	VRRM = VR min (V)	IFRM (A)	IFSM (10ms) max (A)	i2t (kA2s)
DS20S 20	20	90	20		400	0.800
DS20S 30	20	90	30		400	0.800
DS20S 35	20	90	35		400	0.800
DS20S 40	20	90	40		400	0.800
DS20S 45	20	90	45		400	0.800
DS30S 20	30	90	20		600	1.800
DS30S 30	30	90	30		600	1.800
DS30S 35	30	90	35		600	1.800
DS30S 40	30	90	40		600	1.800
DS30S 45	30	90	45		600	1.800
DS50S 20	50	82	20		700	2.450
DS50S 30	50	82	30		700	2.450
DS50S 35	50	82	35		700	2.450
DS50S 40	50	82	40		700	2.450
DS50S 45	50	82	45		700	2.450
DS60S 20	60	82	20		800	3.200
DS60S 30	60	82	30		800	3.200
DS60S 35	60	82	35		800	3.200
DS60S 40	60	82	40		800	3.200
DS60S 45	60	82	45		800	3.200

SCHOTTKY RECTIFIERS

VF @ max (V)	IF (A)	IR @ max (uA)	TJ (oC)	VFO max+ typ (V)	rF (x0.001) (ohms)	trr max (us)	TJM (oC)	CASE
0.65	20	20	25	0.38	6.2	1.5	125	DO-4
0.65	20	20	25	0.38	6.2	1.5	125	DO-4
0.65	20	20	25	0.38	6.2	1.5	125	DO-4
0.65	20	20	25	0.38	6.2	1.5	125	DO-4
0.65	20	20	25	0.38	6.2	1.5	125	DO-4
0.65	30	20	25	0.38	6.2	1.5	125	DO-4
0.65	30	20	25	0.38	6.2	1.5	125	DO-4
0.65	30	20	25	0.38	6.2	1.5	125	DO-4
0.65	30	20	25	0.38	6.2	1.5	125	DO-4
0.65	30	20	25	0.38	6.2	1.5	125	DO-4
0.65	50	25	25	0.38	2.75	0.9	125	DO-5
0.65	50	25	25	0.38	2.75	0.9	125	DO-5
0.65	50	25	25	0.38	2.75	0.9	125	DO-5
0.65	50	25	25	0.38	2.75	0.9	125	DO-5
0.65	50	25	25	0.38	2.75	0.9	125	DO-5
0.65	60	25	25	0.38	2.75	0.9	125	DO-5
0.65	60	25	25	0.38	2.75	0.9	125	DO-5
0.65	60	25	25	0.38	2.75	0.9	125	DO-5
0.65	60	25	25	0.38	2.75	0.9	125	DO-5
0.65	60	25	25	0.38	2.75	0.9	125	DO-5

TRANSIENT VOLTAGE SUPPRESSOR DIODES

TYPE	IR max (uA)	VR max (V)	VBR min-max (V)	@ IR (mA)	VCL (1ms) max (V)	@ Ipp (A)	CASE
D3VS 12	5	12	13.5-16.5	1	21.9	47.1	DO-27
D3VS 24	5	24	27 - 33	1	43.8	24	DO-27
D3VS 47	5	47	54 - 66	1	81.9	12.9	DO-27
D3VS 120	5	120	135 -165	1	219	4.8	DO-27
D10VS 12	5	12	13.5-16.5	1	21.9	114	DO-27
D10VS 24	5	24	27 - 33	1	43.8	57	DO-27
D10VS 47	5	47	54 - 66	1	81.9	30.5	DO-27
D10VS 120	5	120	135 -165	1	219	11	DO-27

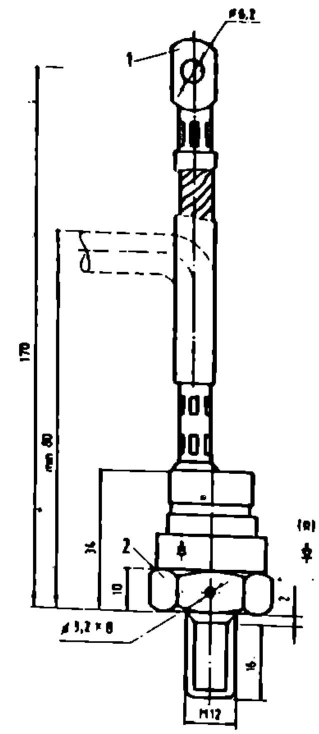
HIGH POWER TRANSIENT VOLTAGE SUPPRESSOR DIODES

TYPE	VRRM (V)	IRRM (A)	PRSM (kW)	CASE
$ DSAS 5U	600	70	350	B-27
$ DSAS 6U	700	70	350	B-27
$ DSAS 7U	800	60	350	B-27
$ DSAS 8U	900	60	350	B-27
$ DSAS 9U	1000	50	350	B-27
$ DSAS 10U	1100	50	350	B-27
$ DSAS 11U	1200	41	350	B-27
$ DSAS 12U	1300	41	350	B-27
$ DSAS 13U	1400	35	350	B-27
$ DSAS 14U	1500	35	350	B-27
$ DSAS 15U	1600	30	350	B-27
$ DSAS 16U	1700	30	350	B-27

$ Preliminary data

CASE OUTLINES - All dimensions in mm.

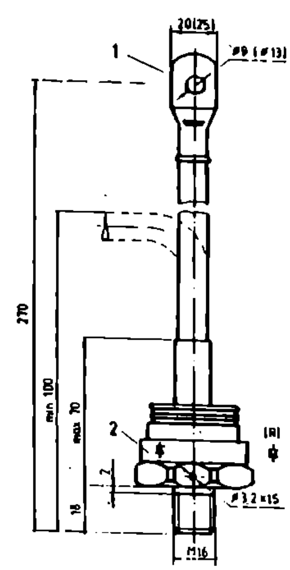
B-27



1 = Anode
2 = Cathode

For reverse polarity diodes :
1 = Cathode
2 = Anode

B-42



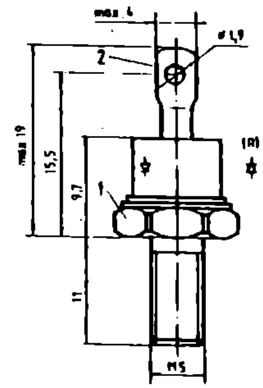
1 = Anode
2 = Cathode

For reverse polarity diodes :
1 = Cathode
2 = Anode

= APPENDIX A =

CASE OUTLINES - All dimensions in mm.

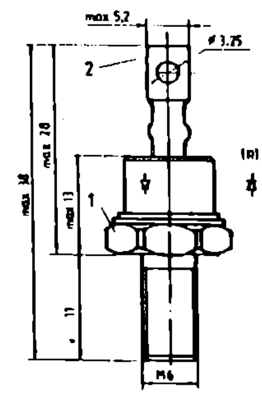
DO-4



1 = Anode
2 = Cathode

For reverse pólarity diodes :
1 = Cathode
2 = Anode

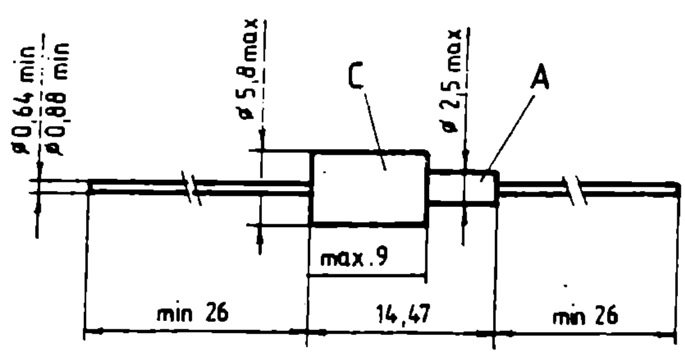
DO-5



1 = Anode
2 = Cathode

For reverse polarity diodes :
1 = Cathode
2 = Anode

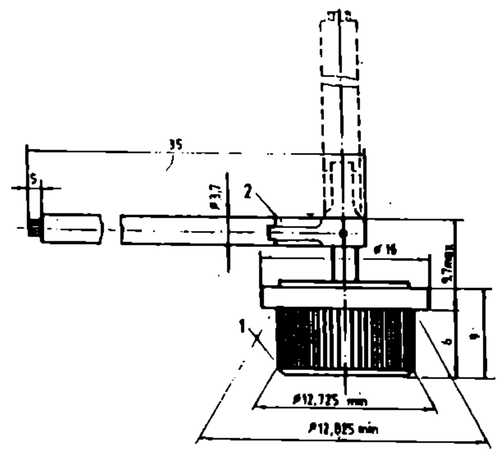
DO-13



APPENDIX A

CASE OUTLINES - All dimensions in mm.

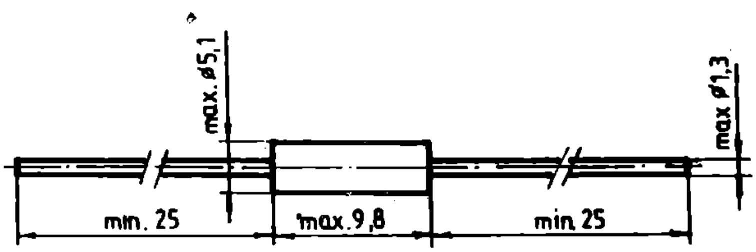
DO-21



1 = Anode
2 = Cathode

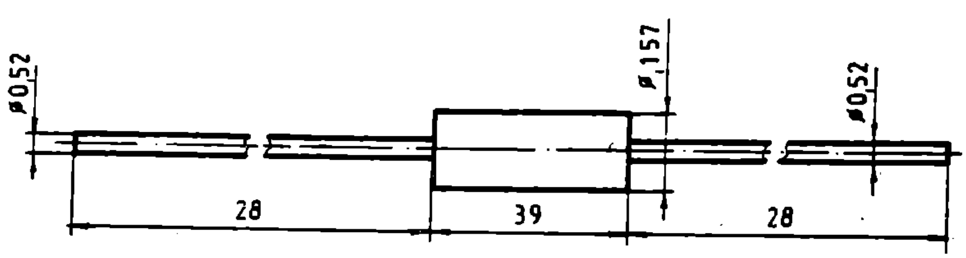
For reverse polarity diodes :
1 = Cathode
2 = Anode

DO-27A



White band at cathode terminal.

DO-35

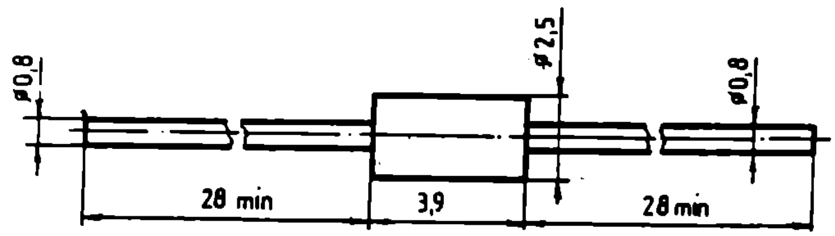


White band at cathode terminal,

APPENDIX A

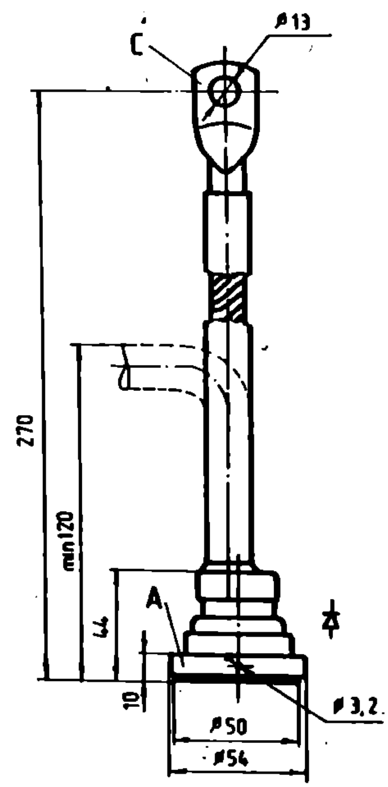
CASE OUTLINES - All dimensions in mm.

DO-41



White band at cathode terminal.

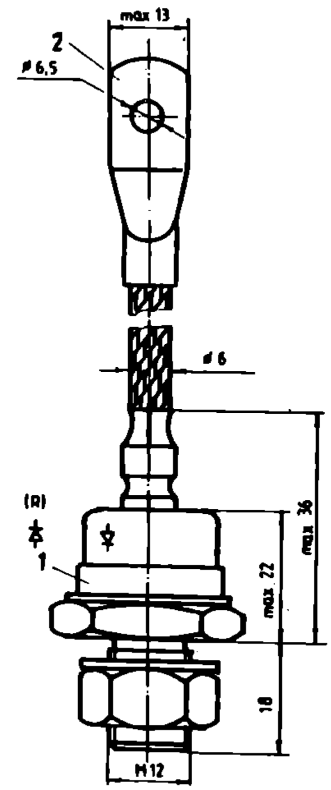
E-50



APPENDIX A

CASE OUTLINES - All dimensions in mm.

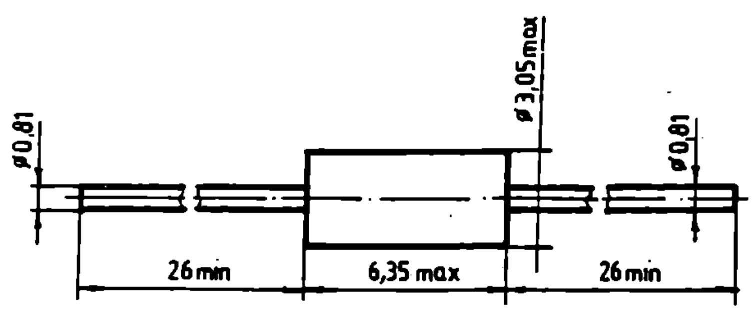
F-62



1 = Anode
2 = Cathode

For reverse polarity diodes :
1 = Cathode
2 = Anode

F-126

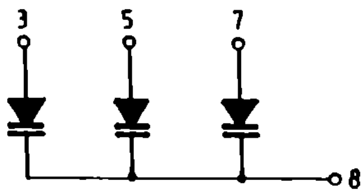


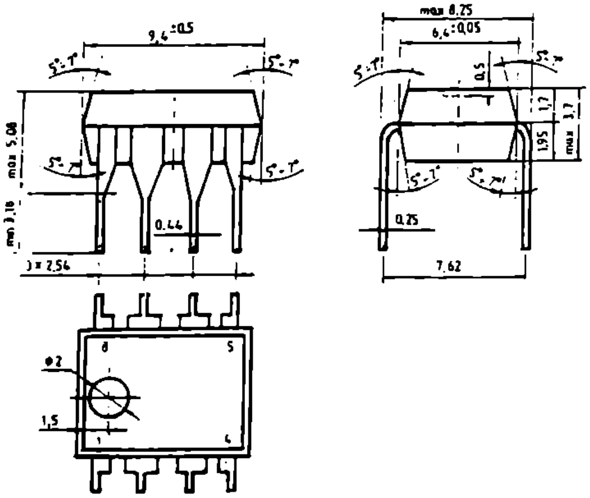
White band at cathode terminal.

= APPENDIX A =

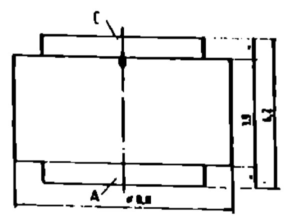
CASE OUTLINES - All dimensions in mm.

MP-48

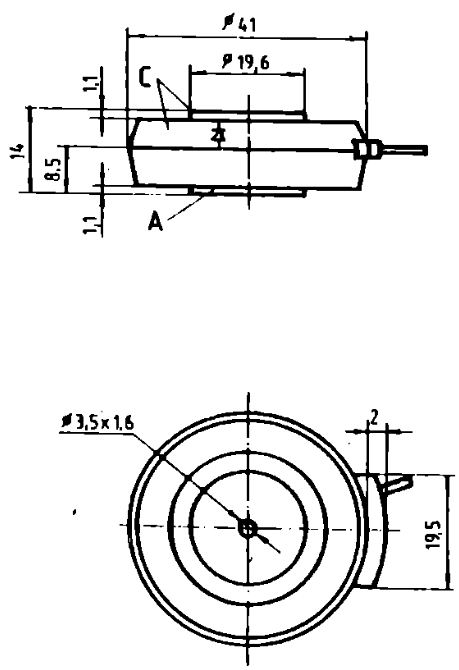




RAG

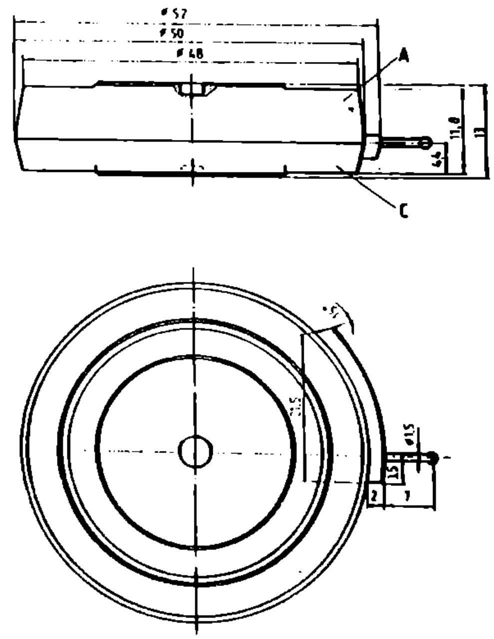


T-20

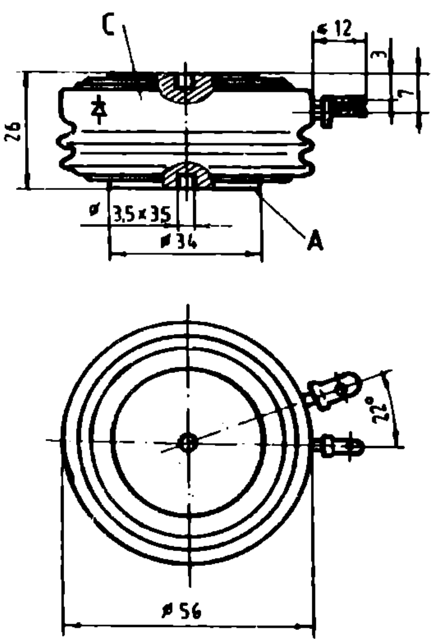


CASE OUTLINES - All dimensions in mm.

T-28



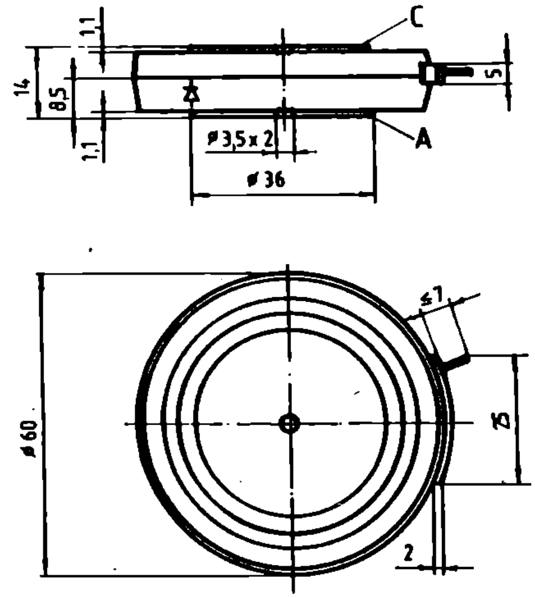
T-30



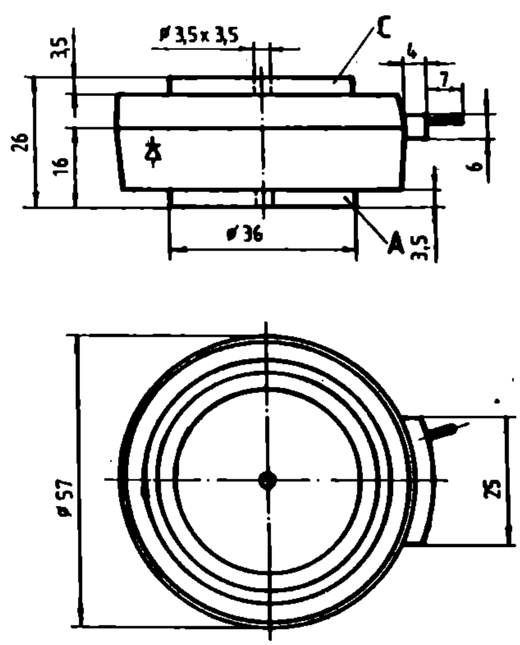
— APPENDIX A —

CASE OUTLINES - All dimensions in mm.

T-36A



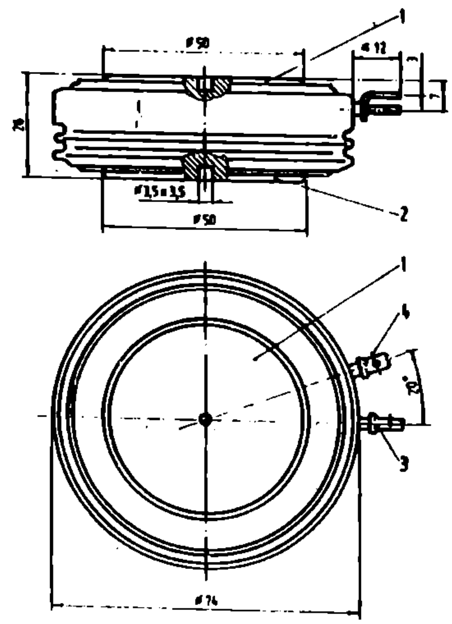
T-36B



— APPENDIX A —

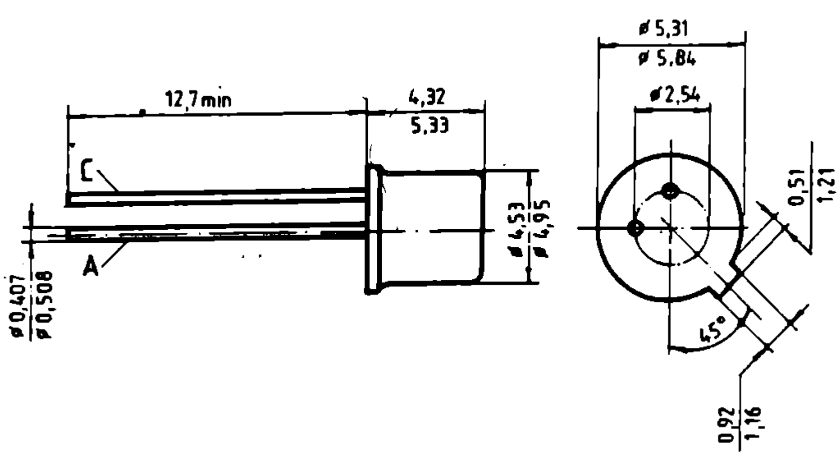
CASE OUTLINES - All dimensions in mm.

T-50



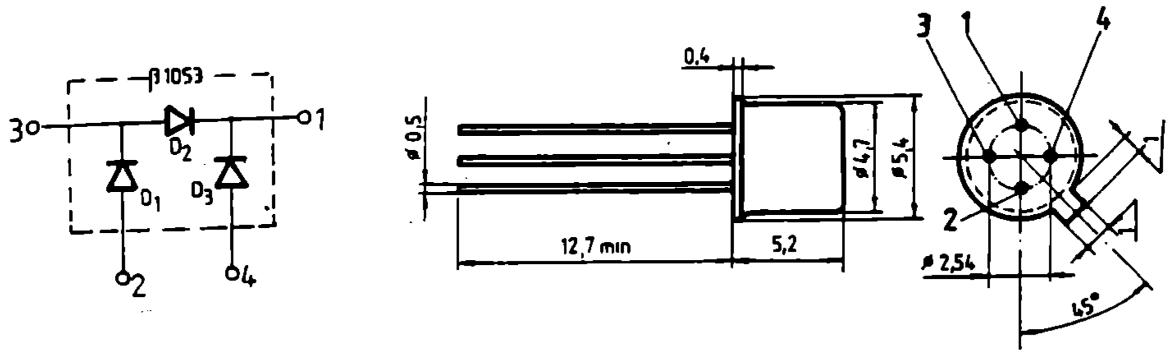
1 = Cathode
2 = Anode
3 = Not connected
4 = Not connected

TO-18h

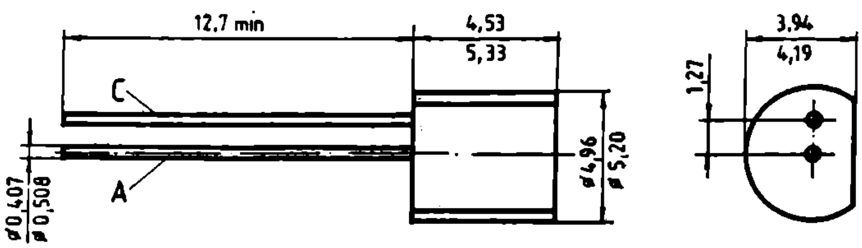


CASE OUTLINES - All dimensions in mm.

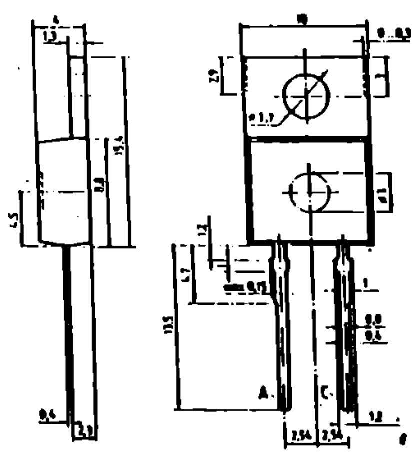
TO-72g



TO-92h



TO-220



THYRISTORS

& TRIACS

THYRISTORS

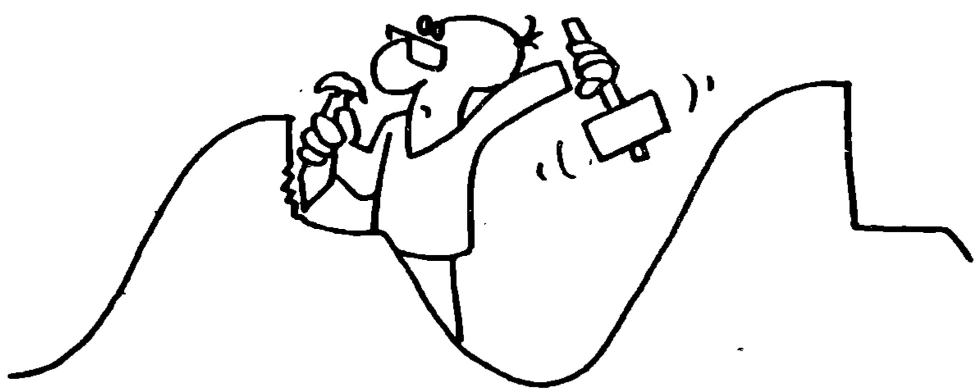
- MAINS FREQUENCY THYRISTORS (ITAVM < 100 A)
- MAINS FREQUENCY THYRISTORS (ITAVM > 100 A)
- FAST SWITCHING THYRISTORS (ITAVM < 100 A)
- FAST SWITCHING THYRISTORS (ITAVM > 100 A)

TRIACS

- BIDIRECTIONAL THYRISTORS (TRIACS)

DIACS

TRIGGER DIODES (DIACS)



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$ Preliminary data

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$ Preliminary data

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$ Preliminary data

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THYRIS               RISTORS*TR
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ORS*TR      HYRISTO      IACS*TH
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TRIACS      STO          *THYRIS
TORS*T      TH          TRIACS*T
HYRIST      IA        STORS*TRI
ACS*TH      RS       *THYRISTOR
S*TRIA      RI      TRIACS*THYR
ISTORS      S*     STORS*TRIACS
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ORS*TR      HYRISTORS*TRIACS*TH
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CS*THY      S*TRIACS*THYRISTORS
*TRIAC      ISTORS*TRIACS*THYRI
STORS*      *THIRISTORS*TRIACS*
THYRIST     RIACS*THYRISTORS*TR
IACS*THYR   ORS*TRIACS*THYRISTO
RS*TRIACS*THYRISTORS*TRIACS*THY
S*THYRISTORS*TRIACS*THYRISTORS*
TRIACS*THYRISTORS*TRIACS*THYRIS
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=THYRISTORS=

MAINS FREQUENCY THYRISTORS (ITAVM < 100 A)

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	ITRM (A)	ITSM (10ms) max (A)	i2t (A2s)
T1N 05	1	100	50	9	15	1.12
T1N 1	1	100	100	9	15	1.12
T1N 2	1	100	200	9	15	1.12
T1N 4	1	100	400	9	15	1.12
T1N 6	1	100	600	9	15	1.12
$ T1N 8	1	100	800	9	15	1.12
T3N 05	3	100	50	27	50	12.5
T3N 1	3	100	100	27	50	12.5
T3N 2	3	100	200	27	50	12.5
T3N 4	3	100	400	27	50	12.5
T3N 6	3	100	600	27	50	12.5
T3N 8	3	100	800	27	50	12.5
T3N 05P	3	70	50	24	35	6.13
T3N 1P	3	70	100	24	35	6.13
T3N 2P	3	70	200	24	35	6.13
T3N 3P	3	70	300	24	35	6.13
T3N 4P	3	70	400	24	35	6.13
T3N 5P	3	70	500	24	35	6.13
T3N 6P	3	70	600	24	35	6.13
$ T3N 7P	3	70	700	24	35	6.13
$ T3N 8P	3	70	800	24	35	6.13

RthJ-C : 30 oC/W for T1N...
4 oC/W for T3N...
4 oC/W for T3N...P

$ Preliminary data

MAINS FREQUENCY THYRISTORS (ITAVM < 100 A)

VT max (V)	@ IT (A)	(di/dt)c (A/us)	(dv/dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq typ+ max (us)	TJM (oC)	CASE
2	3		50 (1)	1	10	2	40	125	TO-126
2	3		50 (1)	1	10	2	40	125	TO-126
2	3		50 (1)	1	10	2	40	125	TO-126
2	3		50 (1)	1	10	2	40	125	TO-126
2	3		50 (1)	1	10	2	40	125	TO-126
2	3		50 (1)	1	10	2	40	125	TO-126
2	10	50	50 (1)	1.5	30	3	80	125	F-22
2	10	50	50 (1)	1.5	30	3	80	125	F-22
2	10	50	50 (1)	1.5	30	3	80	125	F-22
2	10	50	50 (1)	1.5	30	3	80	125	F-22
2	10	50	50 (1)	1.5	30	3	80	125	F-22
2	10	50	50 (1)	1.5	30	3	80	125	F-22
2.7	10		50 (1)	0.5	30	2	50+	100	TO-220
2.7	10		50 (1)	0.5	30	2	50+	100	TO-220
2.7	10		50 (1)	0.5	30	2	50+	100	TO-220
2.7	10		50 (1)	0.5	30	2	50+	100	TO-220
2.7	10		50 (1)	0.5	30	2	50+	100	TO-220
2.7	10		50 (1)	0.5	30	2	50+	100	TO-220
2.7	10		50 (1)	0.5	30	2	50+	100	TO-220
2.7	10		50 (1)	0.5	30	2	50+	100	TO-220
2.7	10		50 (1)	0.5	30	2	50+	100	TO-220

(1) Different **dv/dt** groups :

C = 100 V/us
D = 200 V/us
G = 500 V/us
K = 1000 V/us

MAINS FREQUENCY THYRISTORS (ITAVM < 100 A)

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	ITRM (A)	ITSM (10ms) max (A)	i2t (kA2s)
T6N 05P	6	70	50	48	70	0.0245
T6N 1P	6	70	100	48	70	0.0245
T6N 2P	6	70	200	48	70	0.0245
T6N 3P	6	70	300	48	70	0.0245
T6N 4P	6	70	400	48	70	0.0245
T6N 5P	6	70	500	48	70	0.0245
T6N 6P	6	70	600	48	70	0.0245
$ T6N 7P	6	70	700	48	70	0.0245
$ T6N 8P	6	70	800	48	70	0.0245
T10N 05	10	45	50	90	150	0.112
T10N 1	10	45	100	90	150	0.112
T10N 2	10	45	200	90	150	0.112
T10N 3	10	45	300	90	150	0.112
T10N 4	10	45	400	90	150	0.112
T10N 5	10	45	500	90	150	0.112
T10N 6	10	45	600	90	150	0.112
T10N 7	10	45	700	90	150	0.112
T10N 8	10	45	800	90	150	0.112
T10N 9	10	45	900	90	150	0.112
T10N 10	10	45	1000	90	150	0.112
T10N 11	10	45	1100	90	150	0.112
T10N 12	10	45	1200	90	150	0.112

RthJ-C : 2.6 oC/W for T6N...P
4 oC/W for T10N...

$ Preliminary data

MAINS FREQUENCY THYRISTORS (ITAVM < 100 A)

VT max (V)	@ IT (A)	(di/dt)c (A/us)	(dv/dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq typ+ max* (us)	TJM (oC)	CASE
2	18		50 (1)	0.5	30	2	50+	100	TO-220
2	18		50 (1)	0.5	30	2	50+	100	TO-220
2	18		50 (1)	0.5	30	2	50+	100	TO-220
2	18		50 (1)	0.5	30	2	50+	100	TO-220
2	18		50 (1)	0.5	30	2	50+	100	TO-220
2	18		50 (1)	0.5	30	2	50+	100	TO-220
2	18		50 (1)	0.5	30	2	50+	100	TO-220
2	18		50 (1)	0.5	30	2	50+	100	TO-220
2	18		50 (1)	0.5	30	2	50+	100	TO-220
2.2	30	50	50 (1)	15	50	3	200	125	TO-48
2.2	30	50	50 (1)	15	50	3	200	125	TO-48
2.2	30	50	50 (1)	15	50	3	200	125	TO-48
2.2	30	50	50 (1)	15	50	3	200	125	TO-48
2.2	30	50	50 (1)	15	50	3	200	125	TO-48
2.2	30	50	50 (1)	15	50	3	200	125	TO-48
2.2	30	50	50 (1)	15	50	3	200	125	TO-48
2.2	30	50	50 (1)	15	50	3	200	125	TO-48
2.2	30	50	50 (1)	15	50	3	200	125	TO-48
2.2	30	50	50 (1)	15	50	3	200	125	TO-48
2.2	30	50	50 (1)	15	50	3	200	125	TO-48
2.2	30	50	50 (1)	15	50	3	200	125	TO-48
2.2	30	50	50 (1)	15	50	3	200	125	TO-48

(1) Different dv/dt groups :

C = 100 V/us
D = 200 V/us
G = 500 V/us
K = 1000 V/us

MAINS FREQUENCY THYRISTORS (ITAVM < 100 A)

TYPE	ITAVM @ TC (A)	(oC)	VDRM VRRM min (V)	ITRM (A)	ITSM (10ms) max (A)	i2t (kA2s)
T16N 05	16	75	50	140	200	0.200
T16N 1	16	75	100	140	200	0.200
T16N 2	16	75	200	140	200	0.200
T16N 3	16	75	300	140	200	0.200
T16N 4	16	75	400	140	200	0.200
T16N 5	16	75	500	140	200	0.200
T16N 6	16	75	600	140	200	0.200
T16N 7	16	75	700	140	200	0.200
T16N 8	16	75	800	140	200	0.200
T16N 9	16	75	900	140	200	0.200
T16N 10	16	75	1000	140	200	0.200
T16N 11	16	75	1100	140	200	0.200
T16N 12	16	75	1200	140	200	0.200
T22N 05	22	85	50	190	300	0.450
T22N 1	22	85	100	190	300	0.450
T22N 2	22	85	200	190	300	0.450
T22N 3	22	85	300	190	300	0.450
T22N 4	22	85	400	190	300	0.450
T22N 5	22	85	500	190	300	0.450
T22N 6	22	85	600	190	300	0.450
T22N 7	22	85	700	190	300	0.450
T22N 8	22	85	800	190	300	0.450
T22N 9	22	85	900	190	300	0.450
T22N 10	22	85	1000	190	300	0.450
T22N 11	22	85	1100	190	300	0.450
T22N 12	22	85	1200	190	300	0.450

RthJ-C : 1.5 oC/W for T16N...
1.1 oC/W for T22N...

MAINS FREQUENCY THYRISTORS (ITAVM < 100 A)

VT max (V)	@ IT (A)	(di/dt)c (A/us)	(dv/dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
2.2	50	50	50 (1)	15	50	3	200	125	TO-48
2.2	50	50	50 (1)	15	50	3	200	125	TO-48
2.2	50	50	50 (1)	15	50	3	200	125	TO-48
2.2	50	50	50 (1)	15	50	3	200	125	TO-48
2.2	50	50	50 (1)	15	50	3	200	125	TO-48
2.2	50	50	50 (1)	15	50	3	200	125	TO-48
2.2	50	50	50 (1)	15	50	3	200	125	TO-48
2.2	50	50	50 (1)	15	50	3	200	125	TO-48
2.2	50	50	50 (1)	15	50	3	200	125	TO-48
2.2	50	50	50 (1)	15	50	3	200	125	TO-48
2.2	50	50	50 (1)	15	50	3	200	125	TO-48
2.2	50	50	50 (1)	15	50	3	200	125	TO-48
2.2	50	50	50 (1)	15	50	3	200	125	TO-48
2	70	50	50 (1)	15	100	3	200	125	TO-48
2	70	50	50 (1)	15	100	3	200	125	TO-48
2	70	50	50 (1)	15	100	3	200	125	TO-48
2	70	50	50 (1)	15	100	3	200	125	TO-48
2	70	50	50 (1)	15	100	3	200	125	TO-48
2	70	50	50 (1)	15	100	3	200	125	TO-48
2	70	50	50 (1)	15	100	3	200	125	TO-48
2	70	50	50 (1)	15	100	3	200	125	TO-48
2	70	50	50 (1)	15	100	3	200	125	TO-48
2	70	50	50 (1)	15	100	3	200	125	TO-48
2	70	50	50 (1)	15	100	3	200	125	TO-48
2	70	50	50 (1)	15	100	3	200	125	TO-48
2	70	50	50 (1)	15	100	3	200	125	TO-48

(1) Different **dv/dt** groups :

C = 100 V/us
D = 200 V/us
G = 500 V/us
K = 1000 V/us

=THYRISTORS=

MAINS FREQUENCY THYRISTORS (ITAVM < 100 A).

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	ITRMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
T25N 05	25	85	50	37	375	0.700
T25N 1	25	85	100	37	375	0.700
T25N 2	25	85	200	37	375	0.700
T25N 3	25	85	300	37	375	0.700
T25N 4	25	85	400	37	375	0.700
T25N 5	25	85	500	37	375	0.700
T25N 6	25	85	600	37	375	0.700
T25N 7	25	85	700	37	375	0.700
T25N 8	25	85	800	37	375	0.700
T25N 9	25	85	900	37	375	0.700
T25N 10	25	85	1000	37	375	0.700
T25N 11	25	85	1100	37	375	0.700
T25N 12	25	85	1200	37	375	0.700
T30N 05	30	85	50	45	450	1
T30N 1	30	85	100	45	450	1
T30N 2	30	85	200	45	450	1
T30N 3	30	85	300	45	450	1
T30N 4	30	85	400	45	450	1
T30N 5	30	85	500	45	450	1
T30N 6	30	85	600	45	450	1
T30N 7	30	85	700	45	450	1
T30N 8	30	85	800	45	450	1
T30N 9	30	85	900	45	450	1
T30N 10	30	85	1000	45	450	1
T30N 11	30	85	1100	45	450	1
T30N 12	30	85	1200	45	450	1

RthJ-C : 0.84 oC/W for T25N...
0.84 oC/W for T30N...

MAINS FREQUENCY THYRISTORS (ITAVM < 100 A)

VT max (V)	@ IT (A)	(di/dt)c (A/us)	(dv/dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
2.1	75	50	50 (1)	10	150	1.5	80	125	DO-5Ty
2.1	75	50	50 (1)	10	150	1.5	80	125	DO-5Ty
2.1	75	50	50 (1)	10	150	1.5	80	125	DO-5Ty
2.1	75	50	50 (1)	10	150	1.5	80	125	DO-5Ty
2.1	75	50	50 (1)	10	150	1.5	80	125	DO-5Ty
2.1	75	50	50 (1)	10	150	1.5	80	125	DO-5Ty
2.1	75	50	50 (1)	10	150	1.5	80	125	DO-5Ty
2.1	75	50	50 (1)	10	150	1.5	80	125	DO-5Ty
2.1	75	50	50 (1)	10	150	1.5	80	125	DO-5Ty
2.1	75	50	50 (1)	10	150	1.5	80	125	DO-5Ty
2.1	75	50	50 (1)	10	150	1.5	80	125	DO-5Ty
2.1	75	50	50 (1)	10	150	1.5	80	125	DO-5Ty
2.1	75	50	50 (1)	10	150	1.5	80	125	DO-5Ty
1.8	90	50	50 (1)	10	150	1.5	80	125	DO-5Ty
1.8	90	50	50 (1)	10	150	1.5	80	125	DO-5Ty
1.8	90	50	50 (1)	10	150	1.5	80	125	DO-5Ty
1.8	90	50	50 (1)	10	150	1.5	80	125	DO-5Ty
1.8	90	50	50 (1)	10	150	1.5	80	125	DO-5Ty
1.8	90	50	50 (1)	10	150	1.5	80	125	DO-5Ty
1.8	90	50	50 (1)	10	150	1.5	80	125	DO-5Ty
1.8	90	50	50 (1)	10	150	1.5	80	125	DO-5Ty
1.8	90	50	50 (1)	10	150	1.5	80	125	DO-5Ty
1.8	90	50	50 (1)	10	150	1.5	80	125	DO-5Ty
1.8	90	50	50 (1)	10	150	1.5	80	125	DO-5Ty
1.8	90	50	50 (1)	10	150	1.5	80	125	DO-5Ty
1.8	90	50	50 (1)	10	150	1.5	80	125	DO-5Ty

(1) Different dv/dt groups :

C = 100 V/us
D = 200 V/us
G = 500 V/us
K = 1000 V/us

=THYRISTORS=

MAINS FREQUENCY THYRISTORS (ITAVM < 100 A)

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	ITRMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
T32N 400	32	85	400	60	900	4
T32N 600	32	85	600	60	900	4
T32N 800	32	85	800	60	900	4
T32N 1000	32	85	1000	60	900	4
T32N 1100	32	85	1100	60	900	4
T32N 1200	32	85	1200	60	900	4
T32N 1400	32	85	1400	60	900	4
T32N 1600	32	85	1600	60	900	4
T32N 1800	32	85	1800	60	900	4
T40N 400	40	85	400	80	1100	6
T40N 600	40	85	600	80	1100	6
T40N 800	40	85	800	80	1100	6
T40N 1000	40	85	1000	80	1100	6
T40N 1100	40	85	1100	80	1100	6
T40N 1200	40	85	1200	80	1100	6
T40N 1400	40	85	1400	80	1100	6
T40N 1600	40	85	1600	80	1100	6
T40N 1800	40	85	1800	80	1100	6
T50N 400	50	85	400	80	1200	7.2
T50N 600	50	85	600	80	1200	7.2
T50N 800	50	85	800	80	1200	7.2
T50N 1000	50	85	1000	80	1200	7.2
T50N 1100	50	85	1100	80	1200	7.2
T50N 1200	50	85	1200	80	1200	7.2
T50N 1400	50	85	1400	80	1200	7.2
T50N 1600	50	85	1600	80	1200	7.2
T50N 1800	50	85	1800	80	1200	7.2

RthJ-C : 0.72 oC/W for T32N...
0.60 oC/W for T40N...
0.44 oC/W for T50N...

MAINS FREQUENCY THYRISTORS (ITAVM < 100 A)

VT max (V)	@ IT (A)	(di/dt)c (A/us)	(dv/dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
2.8	200	120	400 (2)	20	200	2	400	125	B-22
2.8	200	120	400 (2)	20	200	2	400	125	B-22
2.8	200	120	400 (2)	20	200	2	400	125	B-22
2.8	200	120	400 (2)	20	200	2	400	125	B-22
2.8	200	120	400 (2)	20	200	2	400	125	B-22
2.8	200	120	400 (2)	20	200	2	400	125	B-22
2.8	200	120	400 (2)	20	200	2	400	125	B-22
2.8	200	120	400 (2)	20	200	2	400	125	B-22
2.8	200	120	400 (2)	20	200	2	400	125	B-22
2.5	200	120	400 (2)	20	200	2	400	125	B-22
2.5	200	120	400 (2)	20	200	2	400	125	B-22
2.5	200	120	400 (2)	20	200	2	400	125	B-22
2.5	200	120	400 (2)	20	200	2	400	125	B-22
2.5	200	120	400 (2)	20	200	2	400	125	B-22
2.5	200	120	400 (2)	20	200	2	400	125	B-22
2.5	200	120	400 (2)	20	200	2	400	125	B-22
2.5	200	120	400 (2)	20	200	2	400	125	B-22
2.5	200	120	400 (2)	20	200	2	400	125	B-22
2.4	200	120	400 (2)	20	200	2	400	125	B-22
2.4	200	120	400 (2)	20	200	2	400	125	B-22
2.4	200	120	400 (2)	20	200	2	400	125	B-22
2.4	200	120	400 (2)	20	200	2	400	125	B-22
2.4	200	120	400 (2)	20	200	2	400	125	B-22
2.4	200	120	400 (2)	20	200	2	400	125	B-22
2.4	200	120	400 (2)	20	200	2	400	125	B-22
2.4	200	120	400 (2)	20	200	2	400	125	B-22
2.4	200	120	400 (2)	20	200	2	400	125	B-22

(2) Different **dv/dt** groups :

C = 400 V/us
F = 1000 V/us

=THYRISTORS=

MAINS FREQUENCY THYRISTORS (ITAVM < 100 A)

TYPE	ITAVM @ (A)	TC (oC)	VDRM VRRM min (V)	ITRMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
T63N 400	63	85	400	160	2100	22.05
T63N 600	63	85	600	160	2100	22.05
T63N 800	63	85	800	160	2100	22.05
T63N 1000	63	85	1000	160	2100	22.05
T63N 1100	63	85	1100	160	2100	22.05
T63N 1200	63	85	1200	160	2100	22.05
T63N 1400	63	85	1400	160	2100	22.05
T63N 1600	63	85	1600	160	2100	22.05
T63N 1800	63	85	1800	160	2100	22.05
T80N 400	80	85	400	180	2400	28.80
T80N 600	80	85	600	180	2400	28.80
T80N 800	80	85	800	180	2400	28.80
T80N 1000	80	85	1000	180	2400	28.80
T80N 1100	80	85	1100	180	2400	28.80
T80N 1200	80	85	1200	180	2400	28.80
T80N 1400	80	85	1400	180	2400	28.80
T80N 1600	80	85	1600	180	2400	28.80
T80N 1800	80	85	1800	180	2400	28.80

RthJ-C : 0.417 oC/W for T63N...
0.344 oC/W for T80N...

MAINS FREQUENCY THYRISTORS (ITAVM < 100 A)

VT max (V)	@ IT (A)	(di/dt)c (A/us)	(dv/dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
1.85	320	150	400 (2)	25	200	2	180	125	B-27
1.85	320	150	400 (2)	25	200	2	180	125	B-27
1.85	320	150	400 (2)	25	200	2	180	125	B-27
1.85	320	150	400 (2)	25	200	2	180	125	B-27
1.85	320	150	400 (2)	25	200	2	180	125	B-27
1.85	320	150	400 (2)	25	200	2	180	125	B-27
1.85	320	150	400 (2)	25	200	2	180	125	B-27
1.85	320	150	400 (2)	25	200	2	180	125	B-27
1.85	320	150	400 (2)	25	200	2	180	125	B-27
1.75	360	150	400 (2)	25	200	2	180	125	B-27
1.75	360	150	400 (2)	25	200	2	180	125	B-27
1.75	360	150	400 (2)	25	200	2	180	125	B-27
1.75	360	150	400 (2)	25	200	2	180	125	B-27
1.75	360	150	400 (2)	25	200	2	180	125	B-27
1.75	360	150	400 (2)	25	200	2	180	125	B-27
1.75	360	150	400 (2)	25	200	2	180	125	B-27
1.75	360	150	400 (2)	25	200	2	180	125	B-27
1.75	360	150	400)2)	25	200	2	180	125	B-27

(2) Different dv/dt groups :

C = 400 V/us
F = 1000 V/us

MAINS FREQUENCY THYRISTORS (ITAVM > 100 A)

TYPE	ITAVM @	TC	VDRM VRRM min	ITRMS max	ITSM (10ms) max	i2t
	(A)	(oC)	(V)	(A)	(A)	(kA2s)
T100N 400	100	85	400	200	2700	36.45
T100N 600	100	85	600	200	2700	36.45
T100N 800	100	85	800	200	2700	36.45
T100N 1000	100	85	1000	200	2700	36.45
T100N 1100	100	85	1100	200	2700	36.45
T100N 1200	100	85	1200	200	2700	36.45
T100N 1400	100	85	1400	200	2700	36.45
T100N 1600	100	85	1600	200	2700	36.45
T100N 1800	100	85	1800	200	2700	36.45
T158N 400	160	85	400	280	2400	28.80
T158N 600	160	85	600	280	2400	28.80
T158N 800	160	85	800	280	2400	28.80
T158N 1000	160	85	1000	280	2400	28.80
T158N 1100	160	85	1100	280	2400	28.80
T158N 1200	160	85	1200	280	2400	28.80
T158N 1400	160	85	1400	280	2400	28.80
T158N 1600	160	85	1600	280	2400	28.80
T158N 1800	160	85	1800	280	2400	28.80
T198N 400	200	85	400	320	2700	36.45
T198N 600	200	85	600	320	2700	36.45
T198N 800	200	85	800	320	2700	26.45
T198N 1000	200	85	1000	320	2700	36.45
T198N 1100	200	85	1100	320	2700	36.45
T198N 1200	200	85	1200	320	2700	26.45
T198N 1400	200	85	1400	320	2700	36.45
T198N 1600	200	85	1600	320	2700	36.45
T198N 1800	200	85	1800	320	2700	26.45

RthJ-C : 0.270 oC/W for T100N...
0.141 oC/W for T158N...
0.111 oC/W for T198N...

MAINS FREQUENCY THYRISTORS (ITAVM > 100 A)

VT max (V)	@ IT (A)	(di/dt)c (A/us)	(dv/dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
1.65	400	150	400 (2)	25	200	2	180	125	B-27
1.65	400	150	400 (2)	25	200	2	180	125	B-27
1.65	400	150	400 (2)	25	200	2	180	125	B-27
1.65	400	150	400 (2)	25	200	2	180	125	B-27
1.65	400	150	400 (2)	25	200	2	180	125	B-27
1.65	400	150	400 (2)	25	200	2	180	125	B-27
1.65	400	150	400 (2)	25	200	2	180	125	B-27
1.65	400	150	400 (2)	25	200	2	180	125	B-27
1.65	400	150	400 (2)	25	200	2	180	125	B-27
1.75	400	150	400 (2)	25	250	2	180	125	T-20
1.75	400	150	400 (2)	25	250	2	180	125	T-20
1.75	400	150	400 (2)	25	250	2	180	125	T-20
1.75	400	150	400 (2)	25	250	2	180	125	T-20
1.75	400	150	400 (2)	25	250	2	180	125	T-20
1.75	400	150	400 (2)	25	250	2	180	125	T-20
1.75	400	150	400 (2)	25	250	2	180	125	T-20
1.75	400	150	400 (2)	25	250	2	180	125	T-20
1.75	400	150	400 (2)	25	250	2	180	125	T-20
1.75	500	150	400 (2)	25	250	2	180	125	T-20
1.75	500	150	400 (2)	25	250	2	180	125	T-20
1.75	500	150	400 (2)	25	250	2	180	125	T-20
1.75	500	150	400 (2)	25	250	2	180	125	T-20
1.75	500	150	400 (2)	25	250	2	180	125	T-20
1.75	500	150	400 (2)	25	250	2	180	125	T-20
1.75	500	150	400 (2)	25	250	2	180	125	T-20
1.75	500	150	400 (2)	25	250	2	180	125	T-20
1.75	500	150	400 (2)	25	250	2	180	125	T-20

(2) Different **dv/dt** groups :

C = 400 V/us
F = 1000 V/us

=THYRISTORS=

MAINS FREQUENCY THYRISTORS (ITAVM > 100 A)

	TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	ITRMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
	T200N 400	200	85	400	400	6000	180
	T200N 600	200	85	600	400	6000	180
	T200N 800	200	85	800	400	6000	180
	T200N 1000	200	85	1000	400	6000	180
	T200N 1100	200	85	1100	400	6000	180
	T200N 1200	200	85	1200	400	6000	180
	T200N 1400	200	85	1400	400	6000	180
	T200N 1600	200	85	1600	400	6000	180
	T200N 1800	200	85	1800	400	6000	180
	T250N 400	250	85	400	450	6500	212
	T250N 600	250	85	600	450	6500	212
	T250N 800	250	85	800	450	6500	212
	T250N 1000	250	85	1000	450	6500	212
	T250N 1100	250	85	1100	450	6500	212
	T250N 1200	250	85	1200	450	6500	212
	T250N 1400	250	85	1400	450	6500	212
	T250N 1600	250	85	1600	450	6500	212
	T250N 1800	250	85	1800	450	6500	212
$	T298N 400	382	68	400	600	4250	90
$	T298N 600	382	68	600	600	4250	90
$	T298N 800	382	68	800	600	4250	90
$	T298N 1000	382	68	1000	600	4250	90
$	T298N 1100	382	68	1100	600	4250	90
$	T298N 1200	382	68	1200	600	4250	90
$	T298N 1400	382	68	1400	600	4250	90

RthJ-C : 0.127 oC/W for T200N...
0.127 oC/W for T250N...
0.088 oC/W for T298N...

$ Preliminary data

MAINS FREQUENCY THYRISTORS (ITAVM > 100 A)

VT max (V)	@ IT (A)	(di/dt)c (A/us)	(dv/dt)c (V/us)		ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
1.95	800	150	400	(2)	50	200	2	250	125	E-50
1.95	800	150	400	(2)	50	200	2	250	125	E-50
1.95	800	150	400	(2)	50	200	2	250	125	E-50
1.95	800	150	400	(2)	50	200	2	250	125	E-50
1.95	800	150	400	(2)	50	200	2	250	125	E-50
1.95	800	150	400	(2)	50	200	2	250	125	E-50
1.95	800	150	400	(2)	50	200	2	250	125	E-50
1.95	800	150	400	(2)	50	200	2	250	125	E-50
1.95	800	150	400	(2)	50	200	2	250	125	E-50
1.75	800	150	400	(2)	50	200	2	250	125	E-50
1.75	800	150	400	(2)	50	200	2	250	125	E-50
1.75	800	150	400	(2)	50	200	2	250	125	E-50
1.75	800	150	400	(2)	50	200	2	250	125	E-50
1.75	800	150	400	(2)	50	200	2	250	125	E-50
1.75	800	150	400	(2)	50	200	2	250	125	E-50
1.75	800	150	400	(2)	50	200	2	250	125	E-50
1.75	800	150	400	(2)	50	200	2	250	125	E-50
1.75	800	150	400	(2)	50	200	2	250	125	E-50
1.95	1200	150	400	(2)	30	150	1.4	200	125	T-20
1.95	1200	150	400	(2)	30	150	1.4	200	125	T-20
1.95	1200	150	400	(2)	30	150	1.4	200	125	T-20
1.95	1200	150	400	(2)	30	150	1.4	200	125	T-20
1.95	1200	150	400	(2)	30	150	1.4	200	125	T-20
1.95	1200	150	400	(2)	30	150	1.4	200	125	T-20
1.95	1200	150	400	(2)	30	150	1.4	200	125	T-20

(2) Different **dv/dt** groups :

C = 400 V/us
F = 1000 V/us

MAINS FREQUENCY THYRISTORS (ITAVM > 100 A)

TYPE	ITAVM @ (A)	TC (oC)	VDRM VRRM min (V)	ITRMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
$ T308N 1400	350	76	1400	550	4500	100
$ T308N 1600	350	76	1600	550	4500	100
$ T308N 1800	350	76	1800	550	4500	100
$ T308N 2000	350	76	2000	550	4500	100
$ T308N 2200	350	76	2200	550	4500	100
$ T308N 2400	350	76	2400	550	4500	100
$ T308N 2600	350	76	2600	550	4500	100
T320N 400	320	85	400	500	7200	260
T320N 600	320	85	600	500	7200	260
T320N 800	320	85	800	500	7200	260
T320N 1000	320	85	1000	500	7200	260
T320N 1100	320	85	1100	500	7200	260
T320N 1200	320	85	1200	500	7200	260
T320N 1400	320	85	1400	500	7200	260
T320N 1600	320	85	1600	500	7200	260
T320N 1800	320	85	1800	500	7200	260
$ T348N 200	348	85	200	600	4000	80
$ T348N 400	348	85	400	600	4000	80
$ T348N 600	348	85	600	600	4000	80
T350N 400	350	85	400	550	8000	320
T350N 600	350	85	600	550	8000	320
T350N 800	350	85	800	550	8000	320
T350N 1000	350	85	1000	550	8000	320
T350N 1100	350	85	1100	550	8000	320
T350N 1200	350	85	1200	550	8000	320
T350N 1400	350	85	1400	550	8000	320
T350N 1600	350	85	1600	550	8000	320
T350N 1800	350	85	1800	550	8000	320

RthJ-C : 0.056 oC/W for T308N...
0.08 oC/W for T320N...
0.1 oC/W for T348N...
0.08 oC/W for T350N...

$ Preliminary data

MAINS FREQUENCY THYRISTORS (ITAVM > 100 A)

VT max (V)	@ IT (kA)	(di/dt)c (A/us)	(dv/dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
2.9	1.1	60	400 (2)	50	200	2	350	125	T-28
2.9	1.1	60	400 (2)	50	200	2	350	125	T-28
2.9	1.1	60	400 (2)	50	200	2	350	125	T-28
2.9	1.1	60	400 (2)	50	200	2	350	125	T-28
2.9	1.1	60	400 (2)	50	200	2	350	125	T-28
2.9	1.1	60	400 (2)	50	200	2	350	125	T-28
2.9	1.1	60	400 (2)	50	200	2	350	125	T-28
1.7	1	150	400 (2)	50	200	2	250	125	E-50
1.7	1	150	400 (2)	50	200	2	250	125	E-50
1.7	1	150	400 (2)	50	200	2	250	125	E-50
1.7	1	150	400 (2)	50	200	2	250	125	E-50
1.7	1	150	400 (2)	50	200	2	250	125	E-50
1.7	1	150	400 (2)	50	200	2	250	125	E-50
1.7	1	150	400 (2)	50	200	2	250	125	E-50
1.7	1	150	400 (2)	50	200	2	250	125	E-50
1.7	1	150	400 (2)	50	200	2	250	125	E-50
1.9	1.2	200	400 (2)	20	150	2	200	140	T-20
1.9	1.2	200	400 (2)	20	150	2	200	140	T-20
1.9	1.2	200	400 (2)	20	150	2	200	140	T-20
1.53	1	150	400 (2)	50	200	2	250	125	E-50
1.53	1	150	400 (2)	50	200	2	250	125	E-50
1.53	1	150	400 (2)	50	200	2	250	125	E-50
1.53	1	150	400 (2)	50	200	2	250	125	E-50
1.53	1	150	400 (2)	50	200	2	250	125	E-50
1.53	1	150	400 (2)	50	200	2	250	125	E-50
1.53	1	150	400 (2)	50	200	2	250	125	E-50
1.53	1	150	400 (2)	50	200	2	250	125	E-50
1.53	1	150	400 (2)	50	200	2	250	125	E-50

(2) Different **dv/dt** groups :

C = 400 V/us
F = 1000 V/us

=THYRISTORS=

MAINS FREQUENCY THYRISTORS (ITAVM > 100 A)

TYPE	ITAVM @ (A)	TC (oC)	VDRM VRRM min (V)	ITRMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
$ T388N 400	465	72	400	730	6400	205
$ T388N 600	465	72	600	730	6400	205
$ T388N 800	465	72	800	730	6400	205
$ T388N 1000	465	72	1000	730	6400	205
$ T388N 1100	465	72	1100	730	6400	205
$ T388N 1200	465	72	1200	730	6400	205
$ T388N 1400	465	72	1400	730	6400	205
$ T388N 1600	465	72	1600	730	6400	205
T455N 1600	455	85	1600	1000	7500	281
T455N 1800	455	85	1800	1000	7500	281
T455N 2000	455	85	2000	1000	7500	281
T455N 2200	455	85	2200	1000	7500	281
T455N 2400	455	85	2400	1000	7500	281
T455N 2600	455	85	2600	1000	7500	281
T501N 1600	500	85	1600	1100	9000	405
T501N 1800	500	85	1800	1100	9000	405
T501N 2000	500	85	2000	1100	9000	405
T501N 2200	500	85	2200	1100	9000	405
T501N 2400	500	85	2400	1100	9000	405
T501N 2600	500	85	2600	1100	9000	405
T508N 400	510	85	400	800	6900	238
T508N 600	510	85	600	800	6900	238
T508N 800	510	85	800	800	6900	238
T508N 1000	510	85	1000	800	6900	238
T508N 1100	510	85	1100	800	6900	238
T508N 1200	510	85	1200	800	6900	238
T508N 1400	510	85	1400	800	6900	238
T508N 1600	510	85	1600	800	6900	238
T508N 1800	510	85	1800	800	6900	238

RthJ-C : 0.08 oC/W for T388N...
0.0455 oC/W for T455N...
0.0455 oC/W for T501N...
0.053 oC/W for T508N...

$ Preliminary data

MAINS FREQUENCY THYRISTORS (ITAVM > 100 A)

VT max (V)	@ IT (kA)	(di) (--) (dt)c (A/us)	(dv) (--) (dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
2	1.5	120	400 (2)	50	200	2	220	125	T-28
2	1.5	120	400 (2)	50	200	2	220	125	T-28
2	1.5	120	400 (2)	50	200	2	220	125	T-28
2	1.5	120	400 (2)	50	200	2	220	125	T-28
2	1.5	120	400 (2)	50	200	2	220	125	T-28
2	1.5	120	400 (2)	50	200	2	220	125	T-28
2	1.5	120	400 (2)	50	200	2	220	125	T-28
2	1.5	120	400 (2)	50	200	2	220	125	T-28
2.6	2	120	400 (2)	80	250	1.5	350	125	T-30
2.6	2	120	400 (2)	80	250	1.5	350	125	T-30
2.6	2	120	400 (2)	80	250	1.5	350	125	T-30
2.6	2	120	400 (2)	80	250	1.5	350	125	T-30
2.6	2	120	400 (2)	80	250	1.5	350	125	T-30
2.6	2	120	400 (2)	80	250	1.5	350	125	T-30
2.25	2	120	400 (2)	80	250	1.5	350	125	T-30
2.25	2	120	400 (2)	80	250	1.5	350	125	T-30
2.25	2	120	400 (2)	80	250	1.5	350	125	T-30
2.25	2	120	400 (2)	80	250	1.5	350	125	T-30
2.25	2	120	400 (2)	80	250	1.5	350	125	T-30
2.25	2	120	400 (2)	80	250	1.5	350	125	T-30
1.8	1.6	120	400 (2)	50	200	2	250	125	T-28
1.8	1.6	120	400 (2)	50	200	2	250	125	T-28
1.8	1.6	120	400 (2)	50	200	2	250	125	T-28
1.8	1.6	120	400 (2)	50	200	2	250	125	T-28
1.8	1.6	120	400 (2)	50	200	2	250	125	T-28
1.8	1.6	120	400 (2)	50	200	2	250	125	T-28
1.8	1.6	120	400 (2)	50	200	2	250	125	T-28
1.8	1.6	120	400 (2)	50	200	2	250	125	T-28
1.8	1.6	120	400 (2)	50	200	2	250	125	T-28

(2) Different **dv/dt** groups :

C = 400 V/us
F = 1000 V/us

MAINS FREQUENCY THYRISTORS (ITAVM > 100 A)

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	ITRMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
$ T529N 400	800	50	400	1250	9000	405
$ T529N 600	800	50	600	1250	9000	405
$ T529N 800	800	50	800	1250	9000	405
$ T529N 1000	800	50	1000	1250	9000	405
$ T529N 1100	800	50	1100	1250	9000	405
$ T529N 1200	800	50	1200	1250	9000	405
$ T529N 1400	800	50	1400	1250	9000	405
$ T529N 1600	800	50	1600	1250	9000	405
$ T529N 1800	800	50	1800	1250	9000	405
$ T649N 400	649	85	400	1300	11000	605
$ T649N 600	649	85	600	1300	11000	605
$ T649N 800	649	85	800	1300	11000	605
$ T649N 1000	649	85	1000	1300	11000	605
$ T649N 1100	649	85	1100	1300	11000	605
$ T649N 1200	649	85	1200	1300	11000	605
$ T649N 1400	649	85	1400	1300	11000	605
T700N 1600	700	85	1600	1500	14500	1050
T700N 1800	700	85	1800	1500	14500	1050
T700N 2000	700	85	2000	1500	14500	1050
T700N 2200	700	85	2200	1500	14500	1050
T700N 2400	700	85	2400	1500	14500	1050
T700N 2600	700	85	2600	1500	14500	1050
$ T718N 400	875	63	400	1500	12500	781
$ T718N 600	875	63	600	1500	12500	781
$ T718N 800	875	63	800	1500	12500	781
$ T718N 1000	875	63	1000	1500	12500	781
$ T718N 1100	875	63	1100	1500	12500	781
$ T718N 1200	875	63	1200	1500	12500	781
$ T718N 1400	875	63	1400	1500	12500	781

RthJ-C : 0.0456 oC/W for **T529N...**
0.038 oC/W for **T649N...**
0.029 oC/W for **T700N...**
0.038 oC/W for **T718N...**

$ Preliminary data

MAINS FREQUENCY THYRISTORS (ITAVM > 100 A)

VT max (V)	@ IT (kA)	(di) (--) (dt)c (A/us)	(dv) (--) (dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
2.3	2.5	100	400 (2)	80	300	1.5	280	125	T-36B
2.3	2.5	100	400 (2)	80	300	1.5	280	125	T-36B
2.3	2.5	100	400 (2)	80	300	1.5	280	125	T-36B
2.3	2.5	100	400 (2)	80	300	1.5	280	125	T-36B
2.3	2.5	100	400 (2)	80	300	1.5	280	125	T-36B
2.3	2.5	100	400 (2)	80	300	1.5	280	125	T-36B
2.3	2.5	100	400 (2)	80	300	1.5	280	125	T-36B
2.3	2.5	100	400 (2)	80	300	1.5	280	125	T-36B
2.3	2.5	100	400 (2)	80	300	1.5	280	125	T-36B
2	2.6	120	400 (2)	80	250	1.5	250	125	T-36B
2	2.6	120	400 (2)	80	250	1.5	250	125	T-36B
2	2.6	120	400 (2)	80	250	1.5	250	125	T-36B
2	2.6	120	400 (2)	80	250	1.5	250	125	T-36B
2	2.6	120	400 (2)	80	250	1.5	250	125	T-36B
2	2.6	120	400 (2)	80	250	1.5	250	125	T-36B
2	2.6	120	400 (2)	80	250	1.5	250	125	T-36B
2.6	3	50	400 (2)	100	300	1.5	350	125	T-50
2.6	3	50	400 (2)	100	300	1.5	350	125	T-50
2.6	3	50	400 (2)	100	300	1.5	350	125	T-50
2.6	3	50	400 (2)	100	300	1.5	350	125	T-50
2.6	3	50	400 (2)	100	300	1.5	350	125	T-50
2.6	3	50	400 (2)	100	300	1.5	350	125	T-50
2	3	120	400 (2)	80	250	1.5	250	125	T-36A
2	3	120	400 (2)	80	250	1.5	250	125	T-36A
2	3	120	400 (2)	80	250	1.5	250	125	T-36A
2	3	120	400 (2)	80	250	1.5	250	125	T-36A
2	3	120	400 (2)	80	250	1.5	250	125	T-36A
2	3	120	400 (2)	80	250	1.5	250	125	T-36A
2	3	120	400 (2)	80	250	1.5	250	125	T-36A

(2) Different **dv/dt** groups :

C = 400 V/us
F = 1000 V/us

THYRISTORS

MAINS FREQUENCY THYRISTORS (ITAVM > 100 A)

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	ITRMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
$ T719N 400	875	63	400	1500	12500	781
$ T719N 600	875	63	600	1500	12500	781
$ T719N 800	875	63	800	1500	12500	781
$ T719N 1000	875	63	1000	1500	12500	781
$ T719N 1100	875	63	1100	1500	12500	781
$ T719N 1200	875	63	1200	1500	12500	781
$ T719N 1400	875	63	1400	1500	12500	781
$ T860N 2600	1275	53	2600	2000	17000	1445
$ T860N 2800	1275	53	2800	2000	17000	1445
$ T860N 3000	1275	53	3000	2000	17000	1445
$ T860N 3200	1275	53	3200	2000	17000	1445
$ T860N 3400	1275	53	3400	2000	17000	1445
$ T860N 3600	1275	53	3600	2000	17000	1445
T1000N 200	1000	85	200	2000	17000	1445
T1000N 400	1000	85	400	2000	17000	1445
T1000N 600	1000	85	600	2000	17000	1445
T1000N 800	1000	85	800	2000	17000	1445
T1000N 1000	1000	85	1000	2000	17000	1445
T1000N 1100	1000	85	1100	2000	17000	1445
T1000N 1200	1000	85	1200	2000	19000	1445
T1000N 1400	1000	85	1400	2000	17000	1445
T1000N 1600	1000	85	1600	2000	17000	1445
$ T1050N 1600	1400	64	1600	2200	19000	1805
$ T1050N 1800	1400	64	1800	2200	19000	1805
$ T1050N 2000	1400	64	2000	2200	19000	1805
$ T1050N 2200	1400	64	2200	2200	19000	1805
$ T1050N 2400	1400	64	2400	2200	19000	1805
$ T1050N 2600	1400	64	2600	2200	19000	1805

RthJ-C : 0.038 oC/W for T719N...
0.021 oC/W for T860N...
0.025 oC/W for T1000N...
0.021 oC/W for T1050N...

$ Preliminary data

MAINS FREQUENCY THYRISTORS (ITAVM > 100 A)

VT max (V)	@ IT (kA)	(di)/(dt)c (A/us)	(dv)/(dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
2	3	120	400 (2)	80	250	1.5	250	125	T-36B
2	3	120	400 (2)	80	250	1.5	250	125	T-36B
2	3	120	400 (2)	80	250	1.5	250	125	T-36B
2	3	120	400 (2)	80	250	1.5	250	125	T-36B
2	3	120	400 (2)	80	250	1.5	250	125	T-36B
2	3	120	400 (2)	80	250	1.5	250	125	T-36B
2	3	120	400 (2)	80	250	1.5	250	125	T-36B
2.58	3	80	400 (2)	250	250	2	400	125	T-50
2.58	3	80	400 (2)	250	250	2	400	125	T-50
2.58	3	80	400 (2)	250	250	2	400	125	T-50
2.58	3	80	400 (2)	250	250	2	400	125	T-50
2.58	3	80	400 (2)	250	250	2	400	125	T-50
2.58	3	80	400 (2)	250	250	2	400	125	T-50
1.3	1.2	50	400 (2)	80	250	2	300	125	T-50
1.3	1.2	50	400 (2)	80	250	2	300	125	T-50
1.3	1.2	50	400 (2)	80	250	2	300	125	T-50
1.3	1.2	50	400 (2)	80	250	2	300	125	T-50
1.3	1.2	50	400 (2)	80	250	2	300	125	T-50
1.3	1.2	50	400 (2)	80	250	2	300	125	T-50
1.3	1.2	50	400 (2)	80	250	2	300	125	T-50
1.3	1.2	50	400 (2)	80	250	2	300	125	T-50
1.3	1.2	50	400 (2)	80	250	2	300	125	T-50
2.5	4.4	150	400 (2)	200	250	2	300	125	T-50
2.5	4.4	150	400 (2)	200	250	2	300	125	T-50
2.5	4.4	150	400 (2)	200	250	2	300	125	T-50
2.5	4.4	150	400 (2)	200	250	2	300	125	T-50
2.5	4.4	150	400 (2)	200	250	2	300	125	T-50
2.5	4.4	150	400 (2)	200	250	2	300	125	T-50

(2) Different **dv/dt** groups :

C = 400 V/us
F = 1000 V/us

=THYRISTORS=

MAINS FREQUENCY THYRISTORS (ITAVM > 100 A)

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	ITRMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
$ T1200N 400	1800	54	400	2800	24000	2880
$ T1200N 600	1800	54	600	2800	24000	2880
$ T1200N 800	1800	54	800	2800	24000	2880
$ T1200N 1000	1800	54	1000	2800	24000	2880
$ T1200N 1100	1800	54	1100	2800	24000	2880
$ T1200N 1200	1800	54	1200	2800	24000	2880
$ T1200N 1400	1800	54	1400	2800	24000	2880
$ T1200N 1600	1800	54	1600	2800	24000	2880
$ T1200N 1800	1800	54	1800	2800	24000	2880
$ T1258N 200	1590	67	200	2500	20000	2000
$ T1258N 400	1590	67	400	2500	20000	2000
$ T1258N 600	1590	67	600	2500	20000	2000

RthJ-C : 0.021 oC/W for T1200N...
0.033 oC/W for T1258N...

$ Preliminary data

MAINS FREQUENCY THYRISTORS (ITAVM > 100 A)

VT max (V)	@ IT (kA)	(di/dt)c (A/us)	(dv/dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
2.1	5.6	200	400 (2)	150	250	2	280	125	T-50
2.1	5.6	200	400 (2)	150	250	2	280	125	T-50
2.1	5.6	200	400 (2)	150	250	2	280	125	T-50
2.1	5.6	200	400 (2)	150	250	2	280	125	T-50
2.1	5.6	200	400 (2)	150	250	2	280	125	T-50
2.1	5.6	200	400 (2)	150	250	2	280	125	T-50
2.1	5.6	200	400 (2)	150	250	2	280	125	T-50
2.1	5.6	200	400 (2)	150	250	2	280	125	T-50
2.1	5.6	200	400 (2)	150	250	2	280	125	T-50
1.6	5	120	400 (2)	80	150	1.4	200	140	T-36A
1.6	5	120	400 (2)	80	150	1.4	200	140	T-36A
1.6	5	120	400 (2)	80	150	1.4	200	140	T-36A

(2) Different **dv/dt** groups :

C = 400 V/us
F = 1000 V/us

FAST SWITCHING THYRISTORS (ITAVM < 100 A)

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	ITRM (A)	ITSM (10ms) max (A)	i2t (A2s)
T1R 05	1	100	50	9	15	1.12
T1R 1	1	100	100	9	15	1.12
T1R 2	1	100	200	9	15	1.12
T1R 4	1	100	400	9	15	1.12
T1R 6	1	100	600	9	15	1.12
$ T1R 8	1	100	800	9	15	1.12
T3R 05	3	100	50	27	50	12.5
T3R 1	3	100	100	27	50	12.5
T3R 2	3	100	200	27	50	12.5
T3R 4	3	100	400	27	50	12.5
T3R 6	3	100	600	27	50	12.5
T3R 8	3	100	800	27	50	12.5
T3F 05P	3	70	50	24	35	6.13
T3F 1P	3	70	100	24	35	6.13
T3F 2P	3	70	200	24	35	6.13
T3F 3P	3	70	300	24	35	6.13
T3F 4P	3	70	400	24	35	6.13
T3F 5P	3	70	500	24	35	6.13
T3F 6P	3	70	600	24	35	6.13
$ T3F 7P	3	70	700	24	35	6.13
$ T3F 8P	3	70	800	24	35	6.13

RthJ-C : 30 oC/W for T1R...
4 oC/W for T3R...
4 oC/W for T3F...P

$ Preliminary data

FAST SWITCHING THYRISTORS (ITAVM < 100 A)

VT @ max (V)	IT (A)	(di/dt)c (A/us)	(dv/dt)c (V/us)	ID=IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
2	3		50 (1)	1	10	2	10	125	TO-126
2	3		50 (1)	1	10	2	10	125	TO-126
2	3		50 (1)	1	10	2	10	125	TO-126
2	3		50 (1)	1	10	2	10	125	TO-126
2	3		50 (1)	1	10	2	10	125	TO-126
2	3		50 (1)	1	10	2	10	125	TO-126
2.5	10	50	50 (1)	1.5	50	3	10	125	F-22
2.5	10	50	50 (1)	1.5	50	3	10	125	F-22
2.5	10	50	50 (1)	1.5	50	3	10	125	F-22
2.5	10	50	50 (1)	1.5	50	3	10	125	F-22
2.5	10	50	50 (1)	1.5	50	3	10	125	F-22
2.5	10	50	50 (1)	1.5	50	3	10	125	F-22
2.7	10		50 (1)	0.5	30	2	20	100	TO-220
2.7	10		50 (1)	0.5	30	2	20	100	TO-220
2.7	10		50 (1)	0.5	30	2	20	100	TO-220
2.7	10		50 (1)	0.5	30	2	20	100	TO-220
2.7	10		50 (1)	0.5	30	2	20	100	TO-220
2.7	10		50 (1)	0.5	30	2	20	100	TO-220
2.7	10		50 (1)	0.5	30	2	20	100	TO-220
2.7	10		50 (1)	0.5	30	2	20	100	TO-220
2.7	10		50 (1)	0.5	30	2	20	100	TO-220

(1) Different dv/dt groups :

C = 100 V/us
D = 200 V/us
G = 500 V/us
K = 1000 V/us

FAST SWITCHING THYRISTORS (ITAVM < 100 A)

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	ITRM (A)	ITSM (10ms) max (A)	i2t (kA2s)
T6F 05P	6	70	50	48	70	24.5
T6F 1P	6	70	100	48	70	24.5
T6F 2P	6	70	200	48	70	24.5
T6F 3P	6	70	300	48	70	24.5
T6F 4P	6	70	400	48	70	24.5
T6F 5P	6	70	500	48	70	24.5
T6F 6P	6	70	600	48	70	24.5
$ T6F 7P	6	70	700	48	70	24.5
$ T6F 8P	6	70	800	48	70	24.5
T10F 05	10	45	50	90	150	0.112
T10F 1	10	45	100	90	150	0.112
T10F 2	10	45	200	90	150	0.112
T10F 3	10	45	300	90	150	0.112
T10F 4	10	45	400	90	150	0.112
T10F 5	10	45	500	90	150	0.112
T10F 6	10	45	600	90	150	0.112
T10F 7	10	45	700	90	150	0.112
T10F 8	10	45	800	90	150	0.112
T10F 9	10	45	900	90	150	0.112
T10F 10	10	45	1000	90	150	0.112
T10F 11	10	45	1100	90	150	0.112
T10F 12	10	45	1200	90	150	0.112

RthJ-C : 2.6 oC/W for T6F...P
2 oC/W for T10F...

$ Preliminary data

FAST SWITCHING THYRISTORS (ITAVM < 100 A)

VT max (V)	@ IT (A)	(di) (—) (dt)c (A/us)	(dv) (—) (dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
2	18		50 (1)	0.5	30	2	20	100	TO-220
2	18		50 (1)	0.5	30	2	20	100	TO-220
2	18		50 (1)	0.5	30	2	20	100	TO-220
2	18		50 (1)	0.5	30	2	20	100	TO-220
2	18		50 (1)	0.5	30	2	20	100	TO-220
2	18		50 (1)	0.5	30	2	20	100	TO-220
2	18		50 (1)	0.5	30	2	20	100	TO-220
2	18		50 (1)	0.5	30	2	20	100	TO-220
2	18		50 (1)	0.5	30	2	20	100	TO-220
2.5	30	50	50 (1)	15	100	3	20	125	TO-48
2.5	30	50	50 (1)	15	100	3	20	125	TO-48
2.5	30	50	50 (1)	15	100	3	20	125	TO-48
2.4	30	50	50 (1)	15	100	3	20	125	TO-48
2.5	30	50	50 (1)	15	100	3	20	125	TO-48
2.5	30	50	50 (1)	15	100	3	20	125	TO-48
2.5	30	50	50 (1)	15	100	3	20	125	TO-48
2.5	30	50	50 (1)	15	100	3	20	125	TO-48
2.5	30	50	50 (1)	15	100	3	20	125	TO-48
2.5	30	50	50 (1)	15	100	3	20	125	TO-48
2.5	30	50	50 (1)	15	100	3	20	125	TO-48
2.5	30	50	50 (1)	15	100	3	20	125	TO-48
2.5	30	50	50 (1)	15	100	3	20	125	TO-48

(1) Different dv/dt groups :

C = 100 V/us
D = 200 V/us
G = 500 V/us
K = 1000 V/us

FAST SWITCHING THYRISTORS (ITAVM < 100 A)

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	ITRM (A)	ITSM (10ms) max (A)	i2t (kA2s)
T16F 05	16	75	50	140	200	0.200
T16F 1	16	75	100	140	200	0.200
T16F 2	16	75	200	140	200	0.200
T16F 3	16	75	300	140	200	0.200
T16F 4	16	75	400	140	200	0.200
T16F 5	16	75	500	140	200	0.200
T16F 6	16	75	600	140	200	0.200
T16F 7	16	75	700	140	200	0.200
T16F 8	16	75	800	140	200	0.200
T16F 9	16	75	900	140	200	0.200
T16F 10	16	75	1000	140	200	0.200
T16F 11	16	75	1100	140	200	0.200
T16F 12	16	75	1200	140	200	0.200
T22F 05	22	85	50	190	300	0.450
T22F 1	22	85	100	190	300	0.450
T22F 2	22	85	200	190	300	0.450
T22F 3	22	85	300	190	300	0.450
T22F 4	22	85	400	190	300	0.450
T22F 5	22	85	500	190	300	0.450
T22F 6	22	85	600	190	300	0.450
T22F 7	22	85	700	190	300	0.450
T22F 8	22	85	800	190	300	0.450
T22F 9	22	85	900	190	300	0.450
T22F 10	22	85	1000	190	300	0.450
T22F 11	22	85	1100	190	300	0.450
T22F 12	22	85	1200	190	300	0.450

RthJ-C : 1.5 oC/W for T16F...
1.1 oC/W for T22F...

FAST SWITCHING THYRISTORS (ITAVM < 100 A)

VT max (V)	@ IT (A)	(di/dt)c (A/us)	(dv/dt)c (V/us)	ID=IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
2.5	50	50	50 (1)	15	100	3	20	125	TO-48
2.5	50	50	50 (1)	15	100	3	20	125	TO-48
2.5	50	50	50 (1)	15	100	3	20	125	TO-48
2.5	50	50	50 (1)	15	100	3	20	125	TO-48
2.5	50	50	50 (1)	15	100	3	20	125	TO-48
2.5	50	50	50 (1)	15	100	3	20	125	TO-48
2.5	50	50	50 (1)	15	100	3	20	125	TO-48
2.5	50	50	50 (1)	15	100	3	20	125	TO-48
2.5	50	50	50 (1)	15	100	3	20	125	TO-48
2.5	50	50	50 (1)	15	100	3	20	125	TO-48
2.5	50	50	50 (1)	15	100	3	20	125	TO-48
2.5	50	50	50 (1)	15	100	3	20	125	TO-48
2.5	50	50	50 (1)	15	100	3	20	125	TO-48
2.2	70	50	50 (1)	15	200	3	20	125	TO-48
2.2	70	50	50 (1)	15	200	3	20	125	TO-48
2.2	70	50	50 (1)	15	200	3	20	125	TO-48
2.2	70	50	50 (1)	15	200	3	20	125	TO-48
2.2	70	50	50 (1)	15	200	3	20	125	TO-48
2.2	70	50	50 (1)	15	200	3	20	125	TO-48
2.2	70	50	50 (1)	15	200	3	20	125	TO-48
2.2	70	50	50 (1)	15	200	3	20	125	TO-48
2.2	70	50	50 (1)	15	200	3	20	125	TO-48
2.2	70	50	50 (1)	15	200	3	20	125	TO-48
2.2	70	50	50 (1)	15	200	3	20	125	TO-48
2.2	70	50	50 (1)	15	200	3	20	125	TO-48
2.2	70	50	50 (1)	15	200	3	20	125	TO-48

(1) Different dv/dt groups :

C = 100 V/us
D = 200 V/us
G = 500 V/us
K = 1000 V/us

FAST SWITCHING THYRISTORS (ITAVM < 100 A)

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	ITRMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
T25F 1	25	85	100	37	375	0.700
T25F 2	25	85	200	37	375	0.700
T25F 3	25	85	300	37	375	0.700
T25F 4	25	85	400	37	375	0.700
T25F 5	25	85	500	37	375	0.700
T25F 6	25	85	600	37	375	0.700
T25F 7	25	85	700	37	375	0.700
T25F 8	25	85	800	37	375	0.700
T25F 9	25	85	900	37	375	0.700
T25F 10	25	85	1000	37	375	0.700
T25F 11	25	85	1100	37	375	0.700
T25F 12	25	85	1200	37	375	0.700
T30F 1	30	85	100	45	450	1
T30F 2	30	85	200	45	450	1
T30F 3	30	85	300	45	450	1
T30F 4	30	85	400	45	450	1
T30F 5	30	85	500	45	450	1
T30F 6	30	85	600	45	450	1
T30F 7	30	85	700	45	450	1
T30F 8	30	85	800	45	450	1
T30F 9	30	85	900	45	450	1
T30F 10	30	85	1000	45	450	1
T30F 11	30	85	1100	45	450	1
T30F 12	30	85	1200	45	450	1

RthJ-C : 0.84 oC/W for T25F...
0.84 oC/W for T30F...

$ Preliminary data

FAST SWITCHING THYRISTORS (ITAVM < 100 A)

VT max (V)	@ IT (A)	(di)/(dt)c (A/us)	(dv)/(dt)c (V/us)	ID=IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
2.1	25	50	50 (1)	10	150	1.5	20	125	DO-5Ty
2.1	25	50	50 (1)	10	150	1.5	20	125	DO-5Ty
2.1	25	50	50 (1)	10	150	1.5	20	125	DO-5Ty
2.1	25	50	50 (1)	10	150	1.5	20	125	DO-5Ty
2.1	25	50	50 (1)	10	150	1.5	20	125	DO-5Ty
2.1	25	50	50 (1)	10	150	1.5	20	125	DO-5Ty
2.1	25	50	50 (1)	10	150	1.5	20	125	DO-5Ty
2.1	25	50	50 (1)	10	150	1.5	20	125	DO-5Ty
2.1	25	50	50 (1)	10	150	1.5	20	125	DO-5Ty
2.1	25	50	50 (1)	10	150	1.5	20	125	DO-5Ty
2.1	25	50	50 (1)	10	150	1.5	20	125	DO-5Ty
2.1	25	50	50 (1)	10	150	1.5	20	125	DO-5Ty
1.8	30	50	50 (1)	10	150	1.5	20	125	DO-5Ty
1.8	30	50	50 (1)	10	150	1.5	20	125	DO-5Ty
1.8	30	50	50 (1)	10	150	1.5	20	125	DO-5Ty
1.8	30	50	50 (1)	10	150	1.5	20	125	DO-5Ty
1.8	30	50	50 (1)	10	150	1.5	20	125	DO-5Ty
1.8	30	50	50 (1)	10	150	1.5	20	125	DO-5Ty
1.8	30	50	50 (1)	10	150	1.5	20	125	DO-5Ty
1.8	30	50	50 (1)	10	150	1.5	20	125	DO-5Ty
1.8	30	50	50 (1)	10	150	1.5	20	125	DO-5Ty
1.8	30	50	50 (1)	10	150	1.5	20	125	DO-5Ty
1.8	30	50	50 (1)	10	150	1.5	20	125	DO-5Ty
1.8	30	50	50 (1)	10	150	1.5	20	125	DO-5Ty

(1) Different dv/dt groups :

C = 100 V/us
D = 200 V/us
G = 500 V/us
K = 1000 V/us

THYRISTORS

FAST SWITCHING THYRISTORS (ITAVM < 100 A)

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	ITRMS max (A)	ITSM (10ms) max (A)	I2t (kA2s)
* T31F 200	38	75	200	60	1000	5
* T31F 400	38	75	400	60	1000	5
* T31F 600	38	75	600	60	1000	5
* T31F 800	38	75	800	60	1000	5
* T31F 900	38	75	900	60	1000	5
* T31F 1000	38	75	1000	60	1000	5
* T31F 1100	38	75	1100	60	1000	5
* T31F 1200	38	75	1200	60	1000	5
* T40F 200	40	85	200	80	1100	6
* T40F 400	40	85	400	80	1100	6
* T40F 600	40	85	600	80	1100	6
* T40F 800	40	85	800	80	1100	6
* T40F 900	40	85	900	80	1100	6
* T40F 1000	40	85	1000	80	1100	6
* T40F 1100	40	85	1100	80	1100	6
* T40F 1200	40	85	1200	80	1100	6
* T40F 1300	40	85	1300	80	1100	6

RthJ-C : 0.72 oC/W for T31F...
0.45 oC/W for T40F...

* Preliminary data

FAST SWITCHING THYRISTORS (ITAVM < 100 A)

VT max (V)	@ IT (A)	(di/dt)c (A/us)	(dv/dt)c (V/us)	ID=IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
2.1	120	120	50 (1)	20	150	1.4	25*	125	B-22
2.1	120	120	50 (1)	20	150	1.4	25*	125	B-22
2.1	120	120	50 (1)	20	150	1.4	25*	125	B-22
2.1	120	120	50 (1)	20	150	1.4	25*	125	B-22
2.1	120	120	50 (1)	20	150	1.4	25*	125	B-22
2.1	120	120	50 (1)	20	150	1.4	25*	125	B-22
2.1	120	120	50 (1)	20	150	1.4	25*	125	B-22
2.1	120	120	50 (1)	20	150	1.4	25*	125	B-22
2.2	160	120	50 (2)	20	200	2	20	125	B-27
2.2	160	120	50 (2)	20	200	2	20	125	B-27
2.2	160	120	50 (2)	20	200	2	20	125	B-27
2.2	160	120	50 (2)	20	200	2	20	125	B-27
2.2	160	120	50 (2)	20	200	2	20	125	B-27
2.2	160	120	50 (2)	20	200	2	20	125	B-27
2.2	160	120	50 (2)	20	200	2	20	125	B-27
2.2	160	120	50 (2)	20	200	2	20	125	B-27
2.2	160	120	50 (2)	20	200	2	20	125	B-27

(1) Different dv/dt groups :

C = 100 V/us
D = 200 V/us
B = 500 V/us
K = 1000 V/us

(2) Different dv/dt groups :

B = 50 V/us
C = 400 V/us
F = 1000 V/us

* Different tq groups :

F = 25 us
E = 20 us
D = 15 us

THYRISTORS

FAST SWITCHING THYRISTORS (ITAVM < 100 A)

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	ITRMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
T50F 200	50	85	200	140	1400	9.8
T50F 400	50	85	400	140	1400	9.8
T50F 600	50	85	600	140	1400	9.8
T50F 800	50	85	800	140	1400	9.8
T50F 1000	50	85	1000	140	1400	9.8
T50F 1100	50	85	1100	140	1400	9.8
T50F 1200	50	85	1200	140	1400	9.8
T50F 1300	50	85	1300	140	1400	9.8
T63F 200	63	85	200	160	1600	12.8
T63F 400	63	85	400	160	1600	12.8
T63F 600	63	85	600	160	1600	12.8
T63F 800	63	85	800	160	1600	12.8
T63F 1000	63	85	1000	160	1600	12.8
T63F 1100	63	85	1100	160	1600	12.8
T63F 1200	63	85	1200	160	1600	12.8
T63F 1300	63	85	1300	160	1600	12.8
T80F 200	80	85	200	180	2100	22.1
T80F 400	80	85	400	180	2100	22.1
T80F 600	80	85	600	180	2100	22.1
T80F 800	80	85	800	180	2100	22.1
T80F 1000	80	85	1000	180	2100	22.1
T80F 1100	80	85	1100	180	2100	22.1
T80F 1200	80	85	1200	180	2100	22.1
T80F 1300	80	85	1300	180	2100	22.1

RthJ-C : 0.417 oC/W for T50F...
0.344 oC/W for T63F...
0.271 oC/W for T80F...

FAST SWITCHING THYRISTORS (ITAVM < 100 A)

VT max (V)	@ IT (A)	(di/dt)c (A/us)	(dv/dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
3	300	150	50 (3)	30	200	2	30+	125	B-27
3	300	150	50 (3)	30	200	2	30+	125	B-27
3	300	150	50 (3)	30	200	2	30+	125	B-27
3	300	150	50 (3)	30	200	2	30+	125	B-27
3	300	150	50 (3)	30	200	2	30+	125	B-27
3	300	150	50 (3)	30	200	2	30+	125	B-27
3	300	150	50 (3)	30	200	2	30+	125	B-27
3	300	150	50 (3)	30	200	2	30+	125	B-27
3	400	150	50 (3)	30	200	2	30+	125	B-27
3	400	150	50 (3)	30	200	2	30+	125	B-27
3	400	150	50 (3)	30	200	2	30+	125	B-27
3	400	150	50 (3)	30	200	2	30+	125	B-27
3	400	150	50 (3)	30	200	2	30+	125	B-27
3	400	150	50 (3)	30	200	2	30+	125	B-27
3	400	150	50 (3)	30	200	2	30+	125	B-27
3	400	150	50 (3)	30	200	2	30+	125	B-27
2.5	400	150	50 (3)	30	200	2	30+	125	B-27
2.5	400	150	50 (3)	30	200	2	30+	125	B-27
2.5	400	150	50 (3)	30	200	2	30+	125	B-27
2.5	400	150	50 (3)	30	200	2	30+	125	B-27
2.5	400	150	50 (3)	30	200	2	30+	125	B-27
2.5	400	150	50 (3)	30	200	2	30+	125	B-27
2.5	400	150	50 (3)	30	200	2	30+	125	B-27
2.5	400	150	50 (3)	30	200	2	30+	125	B-27

(3) Different dv/dt groups :

B = 50 V/us
C = 400 V/us
L = 400 V/us
M = 1000 V/us

+ Different tq groups :

G = 30 us
F = 25 us
E = 20 us
S = 18 us

=THYRISTORS=----

FAST SWITCHING THYRISTORS (ITAVM > 100 A)

TYPE	ITAVM @ TC (A)	(oC)	VDRM VRRM min (V)	ITRMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
$ T128F 200	191	54	200	300	2450	30
$ T128F 400	191	54	400	300	2450	30
$ T128F 600	191	54	600	300	2450	30
$ T128F 800	191	54	800	300	2450	30
$ T128F 1000	191	54	1000	300	2450	30
$ T128F 1100	191	54	1100	300	2450	30
$ T128F 1200	191	54	1200	300	2450	30
$ T128F 1300	191	54	1300	300	2450	30
$ T158S 200	160	85	200	300	1000	5
$ T158S 400	160	85	400	300	1000	5
$ T158S 600	160	85	600	300	1000	5
$ T158S 800	160	85	800	300	1000	5
$ T158S 1000	160	85	1000	300	1000	5
$ T158S 1100	160	85	1100	300	1000	5
$ T158S 1200	160	85	1200	300	1000	5
$ T158S 1300	160	85	1300	300	1000	5
$ T178F 200	190	79	200	300	1900	18
$ T178F 400	190	79	400	300	1900	18
$ T178F 500	190	79	500	300	1900	18
$ T178F 600	190	79	600	300	1900	18

RthJ-C : 0.163 oC/W for T128F...
0.18 oC/W for T158S...
0.18 oC/W for T178F...

$ Preliminary data

FAST SWITCHING THYRISTORS (ITAVM > 100 A)

VT max (V)	@ IT (kA)	(di/dt)c (A/us)	(dv/dt)c (V/us)	ID=IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
2.6	0.6	160	50 (3)	30	150	2	30+	125	T-20
2.6	0.6	160	50 (3)	30	150	2	30+	125	T-20
2.6	0.6	160	50 (3)	30	150	2	30+	125	T-20
2.6	0.6	160	50 (3)	30	150	2	30+	125	T-20
2.6	0.6	160	50 (3)	30	150	2	30+	125	T-20
2.6	0.6	160	50 (3)	30	150	2	30+	125	T-20
2.6	0.6	160	50 (3)	30	150	2	30+	125	T-20
2.6	0.6	160	50 (3)	30	150	2	30+	125	T-20
2.5	0.5	500	50 (3)	10	250	2.2	60#	125	T-20
2.5	0.5	500	50 (3)	10	250	2.2	60#	125	T-20
2.5	0.5	500	50 (3)	10	250	2.2	60#	125	T-20
2.5	0.5	500	50 (3)	10	250	2.2	60#	125	T-20
2.5	0.5	500	50 (3)	10	250	2.2	60#	125	T-20
2.5	0.5	500	50 (3)	10	250	2.2	60#	125	T-20
2.5	0.5	500	50 (3)	10	250	2.2	60#	125	T-20
2.5	0.5	500	50 (3)	10	250	2.2	60#	125	T-20
2	0.6	300	50 (3)	20	200	2	20*	140	T-20
2	0.6	300	50 (3)	20	200	2	20*	140	T-20
2	0.6	300	50 (3)	20	200	2	20*	140	T-20
2	0.6	300	50 (3)	20	200	2	20*	140	T-20

(3) Different dv/dt groups :
- B = 50 V/us
- C = 400 V/us
- L = 400 V/us
- M = 1000 V/us

+ Different tq groups :
- G = 30 us
- F = 25 us
- E = 20 us
- S = 18 us

Different tq groups :
- N = 60 us
- K = 40 us

* Different tq groups :
- E = 20 us
- D = 15 us
- C = 12 us

=THYRISTORS=

FAST SWITCHING THYRISTORS (ITAVM > 100 A)

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	ITRMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
$ T188F 200	254	64	200	400	2900	42
$ T188F 400	254	64	400	400	2900	42
$ T188F 600	254	64	600	400	2900	42
$ T188F 800	254	64	800	400	2900	42
$ T188F 900	254	64	900	400	2900	42
$ T188F 1000	254	64	1000	400	2900	42
$ T188F 1100	254	64	1100	400	2900	42
$ T188F 1200	254	64	1200	400	2900	42
$ T188F 1300	254	64	1300	400	2900	42
T195F 200	195	85	200	450	6700	224
T195F 400	195	85	400	450	6700	224
T195F 600	195	85	600	450	6700	224
T195F 800	195	85	800	450	6700	224
T195F 1000	195	85	1000	450	6700	224
T195F 1100	195	85	1100	450	6700	224
T195F 1200	195	85	1200	450	6700	224
T195F 1300	195	85	1300	450	6700	224
T290F 200	290	85	200	550	7200	260
T290F 400	290	85	400	550	7200	260
T290F 600	290	85	600	550	7200	260
T290F 800	290	85	800	550	7200	260
T290F 1000	290	85	1000	550	7200	260
T290F 1100	290	85	1100	550	7200	260
T290F 1200	290	85	1200	550	7200	260
T290F 1300	290	85	1300	550	7200	260

RthJ-C : 0.18 oC/W for T188F...
0.127 oC/W for T195F...
0.08 oC/W for T290F...

$ Preliminary data

FAST SWITCHING THYRISTORS (ITAVM > 100 A)

VT max (V)	@ IT (kA)	(di/dt)c (A/us)	(dv/dt)c (V/us)		ID=IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
2.3	0.8	160	50	(3)	30	150	2	25+	125	T-20
2.3	0.8	160	50	(3)	30	150	2	25+	125	T-20
2.3	0.8	160	50	(3)	30	150	2	25+	125	T-20
2.3	0.8	160	50	(3)	30	150	2	25+	125	T-20
2.3	0.8	160	50	(3)	30	150	2	25+	125	T-20
2.3	0.8	160	50	(3)	30	150	2	25+	125	T-20
2.3	0.8	160	50	(3)	30	150	2	25+	125	T-20
2.3	0.8	160	50	(3)	30	150	2	25+	125	T-20
2.3	0.8	160	50	(3)	30	150	2	25+	125	T-20
2.17	0.8	200	50	(3)	50	250	2.2	25+	125	E-50
2.17	0.8	200	50	(3)	50	250	2.2	25+	125	E-50
2.17	0.8	200	50	(3)	50	250	2.2	25+	125	E-50
2.17	0.8	200	50	(3)	50	250	2.2	25+	125	E-50
2.17	0.8	200	50	(3)	50	250	2.2	25+	125	E-50
2.17	0.8	200	50	(3)	50	250	2.2	25+	125	E-50
2.17	0.8	200	50	(3)	50	250	2.2	25+	125	E-50
2.17	0.8	200	50	(3)	50	250	2.2	25+	125	E-50
2.13	1	200	50	(3)	50	250	2.2	30#	125	E-50
2.13	1	200	50	(3)	50	250	2.2	30#	125	E-50
2.13	1	200	50	(3)	50	250	2.2	30#	125	E-50
2.13	1	200	50	(3)	50	250	2.2	30#	125	E-50
2.13	1	200	50	(3)	50	250	2.2	30#	125	E-50
2.13	1	200	50	(3)	50	250	2.2	30#	125	E-50
2.13	1	200	50	(3)	50	250	2.2	30#	125	E-50
2.13	1	200	50	(3)	50	250	2.2	30#	125	E-50

(3) Different dv/dt groups :
B = 50 V/us
C = 400 V/us
L = 400 V/us
M = 1000 V/us

+ Different tq groups :
F = 25 us
E = 20 us
S = 18 us

# Different tq groups :
S = 30 us
F = 25 us
E = 20 us
S = 18 us

FAST SWITCHINS THYRISTORS (ITAVM > 100 A)

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	ITRMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
$ T308F 200	382	56	200	600	4000	80
$ T308F 400	382	56	400	600	4000	80
$ T308F 500	382	56	500	600	4000	80
$ T308F 600	382	56	600	600	4000	80
$ T318F 200	446	62	200	700	6000	180
$ T318F 400	446	62	400	700	6000	180
$ T318F 600	446	62	600	700	6000	180
$ T318F 800	446	62	800	700	6000	180
$ T318F 900	446	62	900	700	6000	180
$ T318F 1000	446	62	1000	700	6000	180
$ T318F 1100	446	62	1100	700	6000	180
$ T318F 1200	446	62	1200	700	6000	180
$ T318F 1300	446	62	1300	700	6000	180
$ T408F 200	477	76	200	750	6400	205
$ T408F 400	477	76	400	750	6400	205
$ T408F 600	477	76	600	750	6400	205
$ T408F 800	477	76	800	750	6400	205
$ T408F 900	477	76	900	750	6400	205
$ T408F 1000	477	76	1000	750	6400	205
$ T408F 1100	477	76	1100	750	6400	205
$ T408F 1200	477	76	1200	750	6400	205

RthJ-C : 0.108 oC/W for T308F...
0.068 oC/W for T318F...
0.053 oC/W for T408F...

$ Preliminary data

FAST SWITCHING THYRISTORS (ITAVM > 100 A)

VT max (V)	@ IT (kA)	(di/dt)c (A/us)	(dv/dt)c (V/us)	ID==IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
1.9	1.2	300	50 (3)	30	200	2	20*	140	T-20
1.9	1.2	300	50 (3)	30	200	2	20*	140	T-20
1.9	1.2	300	50 (3)	30	200	2	20*	140	T-20
1.9	1.2	300	50 (3)	30	200	2	20*	140	T-20
2.3	1.4	200	50 (3)	50	250	2.2	25+	125	T-28
2.3	1.4	200	50 (3)	50	250	2.2	25+	125	T-28
2.3	1.4	200	50 (3)	50	250	2.2	25+	125	T-28
2.3	1.4	200	50 (3)	50	250	2.2	25+	125	T-28
2.3	1.4	200	50 (3)	50	250	2.2	25+	125	T-28
2.3	1.4	200	50 (3)	50	250	2.2	25+	125	T-28
2.3	1.4	200	50 (3)	50	250	2.2	25+	125	T-28
2.3	1.4	200	50 (3)	50	250	2.2	25+	125	T-28
2.3	1.4	200	50 (3)	50	250	2.2	25+	125	T-28
2.2	1.5	200	50 (3)	50	250	2.2	25+	125	T-28
2.2	1.5	200	50 (3)	50	250	2.2	25+	125	T-28
2.2	1.5	200	50 (3)	50	250	2.2	25+	125	T-28
2.2	1.5	200	50 (3)	50	250	2.2	25+	125	T-28
2.2	1.5	200	50 (3)	50	250	2.2	25+	125	T-28
2.2	1.5	200	50 (3)	50	250	2.2	25+	125	T-28
2.2	1.5	200	50 (3)	50	250	2.2	25+	125	T-28
2.2	1.5	200	50 (3)	50	250	2.2	25+	125	T-28

(3) Different dv/dt groups :

B = 50 V/us
C = 400 V/us
L = 400 V/us
M = 1000 V/us

* Different tq groups :

E = 20 us
D = 18 us
C = 12 us

\+ Different tq groups :

F = 25 us
E = 20 us
S = 18 us

THYRISTORS

FAST SWITCHING THYRISTORS (ITAVM > 100 A)

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	ITRMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
* T468S 1200	830	33	1200	1300	8300	345
* T468S 1400	830	33	1400	1300	8300	345
* T468S 1600	830	33	1600	1300	8300	345
* T468S 1800	830	33	1800	1300	8300	345
T600F 400	600	85	400	1500	11300	638
T600F 600	600	85	600	1500	11300	638
T600F 800	600	85	800	1500	11300	638
T600F 1000	600	85	1000	1500	11300	638
T600F 1100	600	85	1100	1500	11300	638
T600F 1200	600	85	1200	1500	11300	638
T600F 1300	600	85	1300	1500	11300	638
T630S 1200	968	50	1200	1500	9600	461
T630S 1400	968	50	1400	1500	9600	461
T630S 1600	968	50	1600	1500	9600	461
T630S 1800	968	50	1800	1500	9600	461
T630S 2000	968	50	2000	1500	9600	461
* T698F 200	698	85	200	1100	11000	605
* T698F 400	698	85	400	1100	11000	605
* T698F 500	698	85	500	1100	11000	605
* T698F 600	698	85	600	1100	11000	605

RthJ-C : 0.04 oC/W for T468S...
0.038 oC/W for T600F...
0.029 oC/W for T630S...
0.05 oC/W for T698F...

* Preliminary data

FAST SWITCHING THYRISTORS (ITAVM > 100 A)

VT max (V)	@ IT (kA)	(di/dt)c (A/us)	(dv/dt)c (V/us)	ID=IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
3.2	2.6	300	50 (3)	100	250	2.2	60#	125	T-36A
3.2	2.6	300	50 (3)	100	250	2.2	60#	125	T-36A
3.2	2.6	300	50 (3)	100	250	2.2	60#	125	T-36A
3.2	2.6	300	50 (3)	100	250	2.2	60#	125	T-36A
2.33	2.5	200	50 (3)	100	250	2.2	40+	125	T-30
2.33	2.5	200	50 (3)	100	250	2.2	40+	125	T-30
2.33	2.5	200	50 (3)	100	250	2.2	40+	125	T-30
2.33	2.5	200	50 (3)	100	250	2.2	40+	125	T-30
2.33	2.5	200	50 (3)	100	250	2.2	40+	125	T-30
2.33	2.5	200	50 (3)	100	250	2.2	40+	125	T-30
2.33	2,5	200	50 (3)	100	250	2.2	40+	125	T-30
3.1	3	300	50 (3)	30	250	2.2	60	125	T-50
3.1	3	300	50 (3)	30	250	2.2	60	125	T-50
3.1	3	300	50 (3)	30	250	2.2	60	125	T-50
3.1	3	300	50 (3)	30	250	2.2	60	125	T-50
3.1	3	300	50 (3)	30	250	2.2	60	125	T-50
1.8	2.2	300	50 (3)	50	200	2	20*	140	T-28
1.8	2.2	300	50 (3)	50	200	2	20*	140	T-28
1.8	2.2	300	50 (3)	50	200	2	20*	140	T-28
1.8	2.2	300	50 (3)	50	200	2	20*	140	T-28

(3) Different dv/dt groups :
B = 50 V/us
C = 400 V/us
L = 400 V/us
M = 1000 V/us.

# Different tq groups :
N = 60 us
M = 50 us
K = 40 us

+ Different tq groups :
K = 40 us
G = 30 us
F = 25 us
E = 20 us

+ Different tq groups :
E = 20 us
D = 15 us
C = 12 us

BIDIRECTIONAL THYRISTORS (TRIACS)

TYPE	ITRMS max (A)	@ TC (oC)	VDRM VRRM min (V)	ITRM (A)	ITSM (10ms) max (A)	i2t (A2s)
TB6N 2	6	80	200	35	48	11.5
TB6N 3	6	80	300	35	48	11.5
TB6N 4	6	80	400	35	48	11.5
TB6N 5	6	80	500	35	48	11.5
TB6N 6	6	80	600	35	48	11.5
TB10N 2	10	80	200	55	80	32
TB10N 3	10	80	300	55	80	32
TB10N 4	10	80	400	55	80	32
TB10N 5	10	80	500	55	80	32
TB10N 6	10	80	600	55	80	32
$ TB16N 05	16	80	50		90	40
$ TB16N 1	16	80	100		90	40
$ TB16N 2	16	80	200		90	40
$ TB16N 3	16	80	300		90	40
$ TB16N 4	16	80	400		90	40
$ TB16N 5	16	80	500		90	40
$ TB16N 6	16	80	600		90	40
$ TB25N 05	25	80	50		140	315
$ TB25N 1	25	80	100		140	315
$ TB25N 2	25	80	200		140	315
$ TB25N 3	25	80	300		140	315
$ TB25N 4	25	80	400		140	315
$ TB25N 5	25	80	500		140	315
$ TB25N 6	25	80	600		140	315
$ TB25N 7	25	80	700		140	315
$ TB25N 8	25	80	800		140	315
$ TB25N 9	25	80	900		140	315
$ TB25N 10	25	80	1000		140	315
$ TB25N 11	25	80	1100		140	315
$ TB25N 12	25	80	1200		140	315

RthJ-C : 3 oC/W for TB6N... ; 2 oC/W for TB16N...
2.4 oC/W for TB10N... ; 2 oC/W for TB25N...

$ Preliminary data

BIDIRECTIONAL THYRISTORS (TRIACS)

VT @ +/- max (V)	IT +/- (A)	(di) (—) (dt)c (A/us)	(dv) (—) (dt)c (V/us)	ID +/- max (mA)	IGT +/- max (mA)	VGT +/- max (V)	TJM (oC)	CASE
2.3	8.5	50	5	0.5	100	2.5	115	TO-220
2.3	8.5	50	5	0.5	100	2.5	115	TO-220
2.3	8.5	50	5	0.5	100	2.5	115	TO-220
2.3	8.5	50	5	0.5	100	2.5	115	TO-220
2.3	8.5	50	5	0.5	100	2.5	115	TO-220
1.9	14	50	5	0.5	100	2.5	115	TO-220
1.9	14	50	5	0.5	100	2.5	115	TO-220
1.9	14	50	5	0.5	100	2.5	115	TO-220
1.9	14	50	5	0.5	100	2.5	115	TO-220
1.9	14	50	5	0.5	100	2.5	115	TO-220
2	23		3	3	100	3	125	TO-48
2	23		3	3	100	3	125	TO-48
2	23		3	3	100	3	125	TO-48
2	23		3	3	100	3	125	TO-48
2	23		3	3	100	3	125	TO-48
2	23		3	3	100	3	125	TO-48
2	23		3	3	100	3	125	TO-48
2	40		5	3	100	3	125	DO-5Ty
2	40		5	3	100	3	125	DO-5Ty
2	40		5	3	100	3	125	DO-5Ty
2	40		5	3	100	3	125	DO-5Ty
2	40		5	3	100	3	125	DO-5Ty
2	40		5	3	100	3	125	DO-5Ty
2	40		5	3	100	3	125	DO-5Ty
2	40		5	3	100	3	125	DO-5Ty
2	40		5	3	100	3	125	DO-5Ty
2	40		5	3	100	3	125	DO-5Ty
2	40		5	3	100	3	125	DO-5Ty
2	40		5	3	100	3	125	DO-5Ty
2	40		5	3	100	3	125	DO-5Ty

- DIACS -

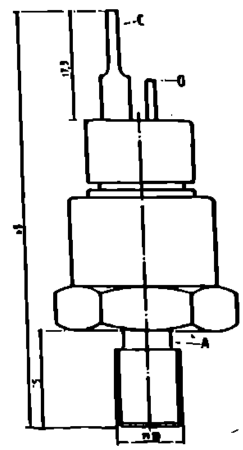
TRIGGER DIODES (DIACS)

TYPE	VBO 1-2 min-max (V)	IBO1 IBO2 max (uA)	VBO max (V)	VS1 VS2 min (V)	ITRM max (A)	Pd max (W)	TJ max (oC)	CASE
DC 32	28 - 36	300	4	5	1.5	0.3	125	F-126
DC 32A	28 - 36	50	2	5	1.5	0.3	125	F-126
DC 38	34 - 42	300	4	5	1.5	0.3	125	F-126
DC 38A	34 - 42	50	2	5	1.5	0.3	125	F-126
DC 44	40 - 48	300	4	7	1.5	0.3	125	F-126
DC 44A	40 - 48	50	2	7	1.5	0.3	125	F-126
DC 50	46 - 54	300	4	7	1.5	0.3	125	F-126
DC 50A	46 - 54	50	2	7	1.5	0.3	125	F-126

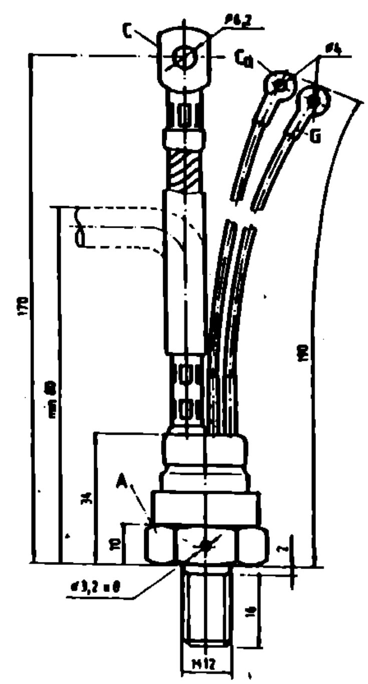
NOTE : RthJ-L = 65 oC/W (l = 12.5 mm) for all types.

CASE OUTLINES - All dimensions in mm.

B-22

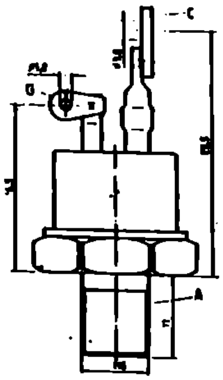


B-27

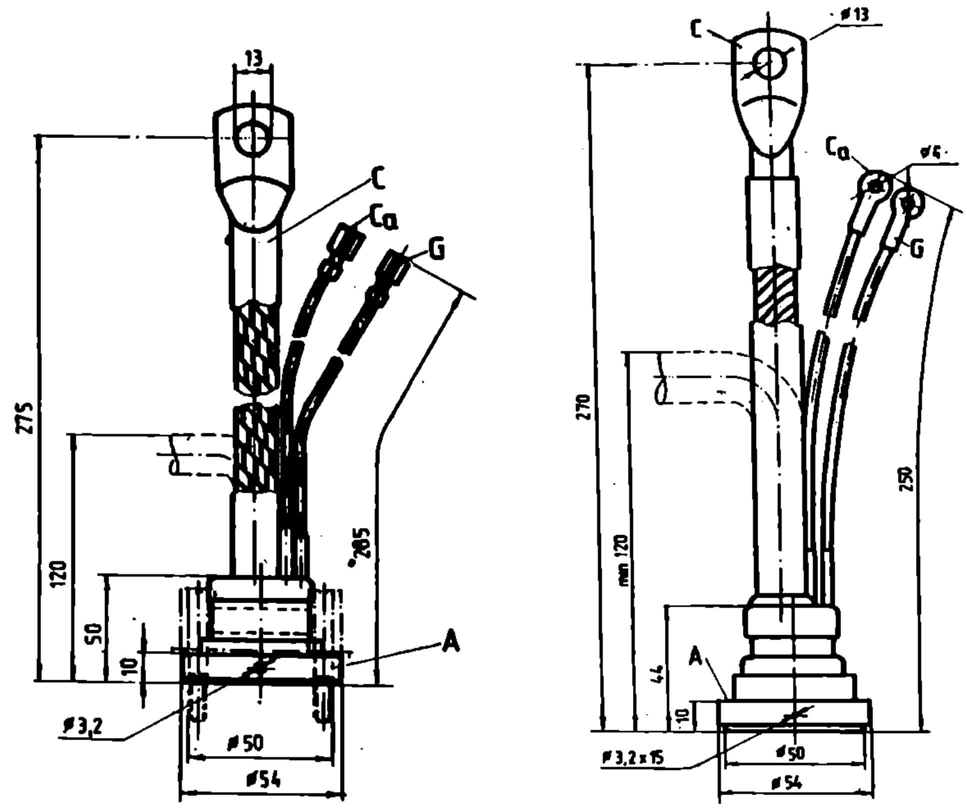


CASE OUTLINES – All dimensions in mm.

DO-5Ty

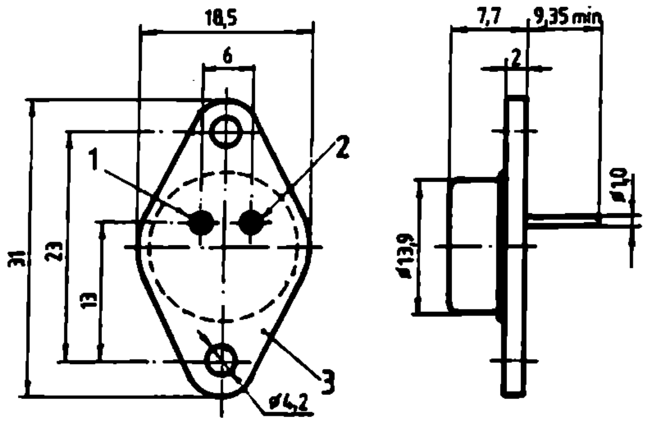


E-50



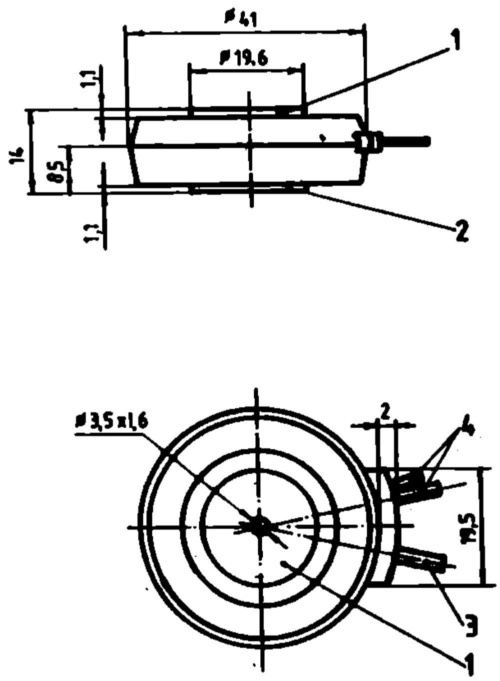
CASE OUTLINES - All dimensions in mm.

F-22



1 = Gate
2 = Cathode
3 = Anode connected to case

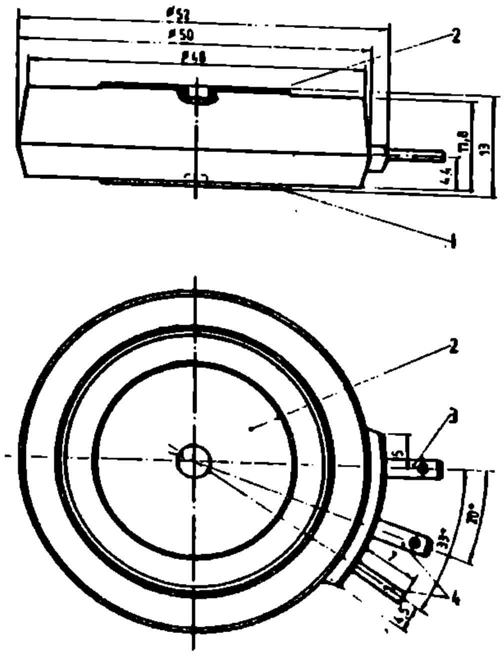
T-20



1 = Cathode
2 = Anode
3 = Gate
4 = Cathode (auxiliary)

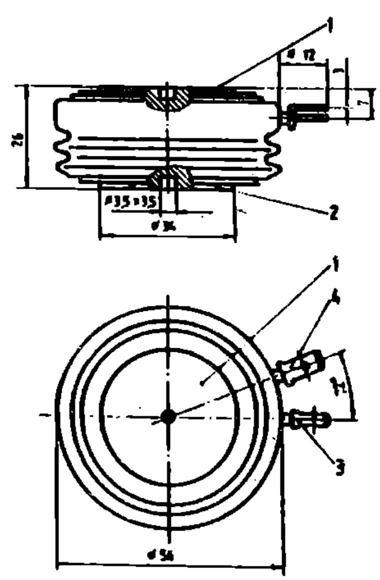
CASE OUTLINES - All dimensions in mm.

T-28



1 = Cathode
2 = Anode
3 = Gate
4 = Cathode (auxiliary)

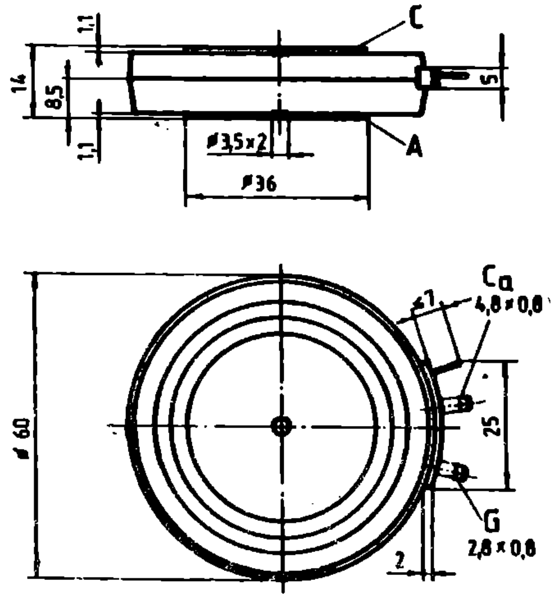
T-30



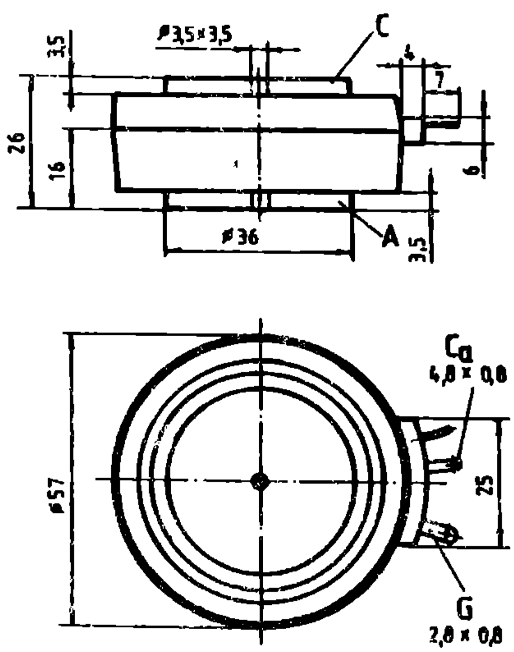
1 = Cathode
2 = Anode
3 = Gate
4 = Cathode (auxiliary)

CASE OUTLINES - All dimensions in mm.

T-36A



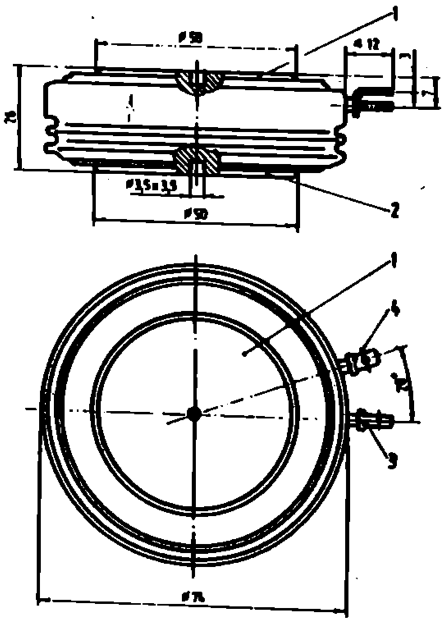
T-36B



— APPENDIX A —

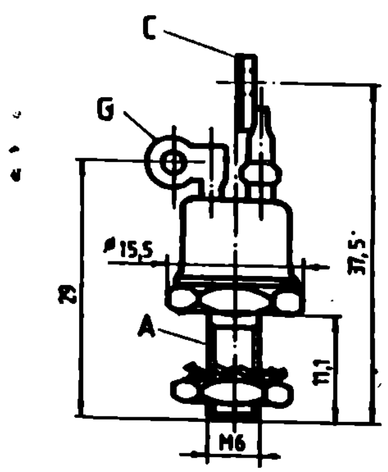
CASE OUTLINES - All dimensions in mm.

T-50



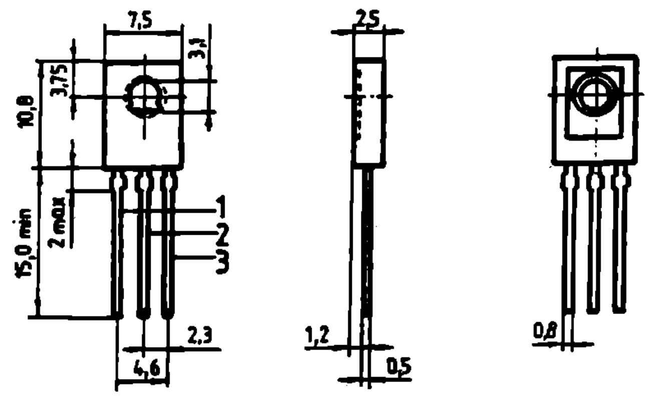
1 = Cathode
2 = Anode
3 = Gate
4 = Cathode (auxiliary)

TO-48



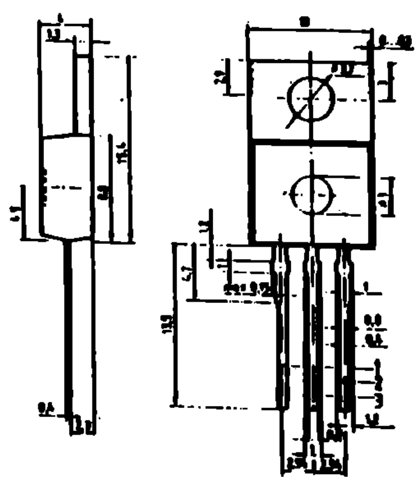
CASE OUTLINES - All dimensions in mm.

TO-126 (SOT-32)



1 = Cathode
2 = Anode
3 = Gate

TO-220



1 = Cathode connected to tab
2 = Gate
3 = Anode

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POWER

BLOCKS

SINGLE-PHASE RECTIFIER BRIDGES

THREE-PHASE CAR ENGINE RECTIFIER BRIDGES

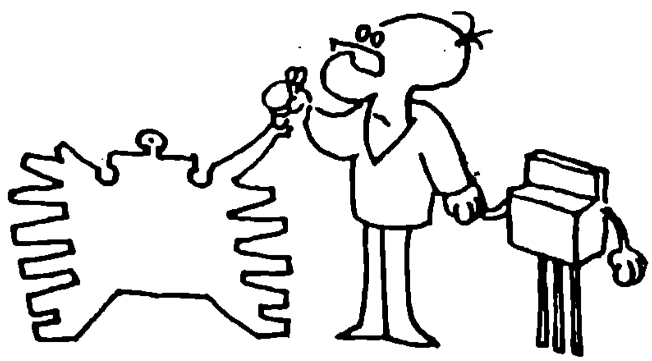
MAINS FREQUENCY POWER BLOCKS

- DIODE POWER BLOCKS
- THYRISTOR POWER BLOCKS

FAST SWITCHING POWER BLOCKS

- DIODE POWER BLOCKS
- THYRISTOR POWER BLOCKS

TRANSISTOR POWER BLOCKS



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R*MODULES*POWER*MODULES*POWER*M
ODULES*POWER*MODULES*POWER*MODU
LES*POWER*MODULES*POWER*MODULES
*POWER*MODULES*POWER*MODULES*PO
WER*MODULES*POWER*MODULES*POWER
*MODULES*PO     ODULES*POWER*MO
DULES*POW         S*POWER*MODUL
ES*POWER           WER*MODULES*
POWER*M             MODULES*POW
ER*MODU             ULES*POWER*
MODULE               *POWER*MOD
ULES*P               WER*MODULE
S*POWE      LES       MODULES*P
OWER*M      *POW      ULES*POWE
R*MODU      WER*      S*POWER*M
ODULES      *MO      POWER*MODU
LES*PO      DU      WER*MODULES
*POWER      ES      *MODULES*PO
WER*MO      PO       ULES*POWER
*MODUL      ER*      S*POWER*MO
DULES*      MODU      WER*MODUL
ES*POW      ULES*      MODULES*
POWER*      S*POWE      LES*POW
ER*MOD      OWER*MO     *POWER*
MODULE      R*MODULE     ER*MOD
ULES*P      ODULES*P     MODULE
S*POWE      LES*POWE      LES*P
OWER*M      *POWER*M      *POWE
R*MODU      WER*MODU      WER*M
ODULES      *MODULE      R*MODU
LES*PO      DULES*P      ODULES
*POWER      ES*POW      ULES*PO
WER*MO      POWER       S*POWER
*MODUL      ER*         OWER*MO
DULES*      MO         ER*MODUL
ES*POW      UL        *MODULES*
POWER*      S*       ODULES*POW
ER*MOD      OW      ULES*POWER*
MODULE      R*     ES*POWER*MOD
ULES*P      OD   S*POWER*MODULE
S*POWE      LES*POWER*MODULES*P
OWER*M      *POWER*MODULES*POWE
R*MODU      WER*MODULES*POWER*M
ODULES      *MODULES*POWER*MODU
LES*PO      DULES*POWER*MODULES
*POWER      ES*POWER*MODULES*PO
WER*MOD     POWER*MODULES*POWER
*MODULES*   ER*MODULES*POWER*MO
DULES*POWER*MODULES*POWER*MODUL
ES*POWER*MODULES*POWER*MODULES*
POWER*MODULES*POWER*MODULES*POW
ER*MODULES*POWER*MODULES*POWER*
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SINGLE-PHASE RECTIFIER BRIDGES

TYPE	Id (A)	@ TA TC* (oC)	VRRM (V)	IFS max (A)	i2t @ TJM (A2s)	rs max (ohm)	C1 max (mF)	TJ max (oC)	CASE
1PM 05	1.2	45	50	30	3	1	3.5	150	1PM
1PM 1	1.2	45	100	30	3	1.3	1.8	150	1PM
1PM 2	1.2	45	200	30	3	3.3	1	150	1PM
1PM 4	1.2	45	400	30	3	6.8	0.5	150	1PM
1PM 6	1.2	45	600	30	3	11	0.3	150	1PM
1PM 8	1.2	45	800	30	3	15	0.2	150	1PM
B 40C 1500	1.5	45	80	50	8	0.5	5	150	BC1500
B 80C 1500	1.5	45	160	50	8	1	2.5	150	BC1200
B125C 1500	1.5	45	250	50	8	1.5	1.5	150	BC1500
B250C 1500	1.5	45	500	50	8	2.5	0.8	150	BC1200
B500C 1500	1.5	45	1000	50	8	5	0.4	150	BC1200
3PM 05	3.2	45	50	70	+24	0.3	5	150	3PM
3PM 1	3.2	45	100	70	+24	0.5	5	150	3PM
3PM 2	3.2	45	200	70	+24	1	2.5	150	3PM
3PM 4	3.2	45	400	70	+24	3	1	150	3PM
3PM 6	3.2	45	600	70	+24	3	1	150	3PM
3PM 8	3.2	45	800	70	+24	5	0.5	150	3PM
$ 4PM 05	4	45	50	100	100	0.3	5	180	4PM
$ 4PM 1	4	45	100	100	100	0.5	5	180	4PM
$ 4PM 2	4	45	200	100	100	1	2.5	180	4PM
$ 4PM 4	4	45	400	100	100	3	1	180	4PM
$ 4PM 6	4	45	600	100	100	3	1	180	4PM
$ 4PM 8	4	45	800	100	100	5	0.5	180	4PM
10PM 05	10	80*	50	180		0.3	10	125	10PM
10PM 1	10	80*	100	180		0.5	5	125	10PM
10PM 2	10	80*	200	180		1.1	2.5	125	10PM
10PM 4	10	80*	400	180		2.2	1.5	125	10PM

+ Value at 25 oC .
$ Preliminary data

SINGLE-PHASE RECTIFIER BRIDGES

TYPE	Id (A)	@ TA TC* (oC)	VRRM (V)	IFS max (A)	i2t @ TJM (A2s)	rs max (ohm)	C1 max (mF)	TJ max (oC)	CASE
20PM 03	20	70*	30	250	313			150	20PM
20PM 05	20	70*	50	250	313			150	20PM
20PM 1	20	70*	100	250	313			150	20PM
20PM 2	20	70*	200	250	313			150	20PM
20PM 4	20	70*	400	250	313			150	20PM

THREE-PHASE CAR ENGINE RECTIFIER BRIDGES

TYPE	Id1 (A)	Id2 (A)	@ TJ (oC)	VRR max (V)	VFM (V)	@ IF (A)	IR max (uA)	TJM (oC)	CASE
4 PTM 2	4	3	80	200	1.2	4.5	10	175	4PTM2
1C 1202	40	30	80	100	1.2	80	100	150	1C1202
1C 1203	40	30	80	100	1.2	80	100	150	1C1203
40 PT 2	45	35	80	200	1.2	50	50	175	40PT2
45 PT 2	45	35	80	200	1.4	50	100	150	45PT2
60 PT 2	60	45	80	200	1.2	60	50	175	60PT2

NOTES : Id1 @ 6000 RPM ;
Id2 @ 3000 RPM .

DIODE POWER BLOCKS

TYPE	IFAVM @ TC (A)	(oC)	VRRM min (V)	IF RMS max (A)	IFSM (10ms) max (A)	i2t (kA2s)
$ MDD31N 400	31	100	400	60	480	1.15
$ MDD31N 600	31	100	600	60	480	1.15
$ MDD31N 800	31	100	800	60	480	1.15
$ MDD31N 1000	31	100	1000	60	480	1.15
$ MDD31N 1200	31	100	1200	60	480	1.15
$ MDD31N 1400	31	100	1400	60	480	1.15
$ MDD50N 400	50	75	400	75	420	0.882
$ MDD50N 600	50	75	600	75	420	0.882
$ MDD50N 800	50	75	800	75	420	0.882
$ MDD50N 1000	50	75	1000	75	420	0.882
$ MDD50N 1200	50	75	1200	75	420	0.882
$ MDD50N 1400	50	75	1400	75	420	0.882
$ MDD50N 1600	50	75	1600	75	420	0.882
$ MDD61N 400	61	100	400	120	1200	7.2
$ MDD61N 600	61	100	600	120	1200	7.2
$ MDD61N 800	61	100	800	120	1200	7.2
$ MDD61N 1000	61	100	1000	120	1200	7.2
$ MDD61N 1200	61	100	1200	120	1200	7.2
$ MDD61N 1400	61	100	1400	120	1200	7.2
$ MDD86N 400	86	100	400	160	2400	28.8
$ MDD86N 600	86	100	600	160	2400	28.8
$ MDD86N 800	86	100	800	160	2400	28.8
$ MDD86N 1000	86	100	1000	160	2400	28.8
$ MDD86N 1200	86	100	1200	160	2400	28.8
$ MDD86N 1400	86	100	1400	160	2400	28.8
$ MDD86N 1600	86	100	1600	160	2400	28.8

$ Preliminary data

DIODE POWER BLOCKS

VFO max (V)	rF (x0.001) (ohms)	IR max (mA)	RthJ-C per branch (oC/W)	TVJ max (oC)	CASE
0.8	7	15	1.2	160	K-20
0.8	7	15	1.2	160	K-20
0.8	7	15	1.2	160	K-20
0.8	7	15	1.2	160	K-20
0.8	7	15	1.2	160	K-20
0.8	7	15	1.2	160	K-20
1.1	4	10	1.2	150	K-20
1.1	4	10	1.2	150	K-20
1.1	4	10	1.2	150	K-20
1.1	4	10	1.2	150	K-20
1.1	4	10	1.2	150	K-20
1.1	4	10	1.2	150	K-20
1.1	4	10	1.2	150	K-20
0.75	3	10	0.68	150	K-20
0.75	3	10	0.68	150	K-20
0.75	3	10	0.68	150	K-20
0.75	3	10	0.68	150	K-20
0.75	3	10	0.68	150	K-20
0.75	3	10	0.68	150	K-20
0.75	2.5	20	0.45	150	K-25
0.75	2.5	20	0.45	150	K-25
0.75	2.5	20	0.45	150	K-25
0.75	2.5	20	0.45	150	K-25
0.75	2.5	20	0.45	150	K-25
0.75	2.5	20	0.45	150	K-25
0.75	2.5	20	0.45	150	K-25

DIODE POWER BLOCKS

TYPE	IFAVM (A)	@ TC (oC)	VRRM min (V)	IF RMS max (A)	IFSM (10ms) max (A)	i2t (kA2s)
$ MDD100N 400	100	100	400	160	2500	40
$ MDD100N 600	100	100	600	160	2500	40
$ MDD100N 800	100	100	800	160	2500	40
$ MDD100N 1000	100	100	1000	160	2500	40
$ MDD100N 1200	100	100	1200	160	2500	40
$ MDD100N 1400	100	100	1400	160	2500	40
$ MDD100N 1600	100	100	1600	160	2500	40
$ MDD151N 400	151	100	400	240	4600	105.8
$ MDD151N 600	151	100	600	240	4600	105.8
$ MDD151N 800	151	100	800	240	4600	105.8
$ MDD151N 1000	151	100	1000	240	4600	105.8
$ MDD151N 1200	151	100	1200	240	4600	105.8
$ MDD151N 1400	151	100	1400	240	4600	105.8
$ MDD151N 1600	151	100	1600	240	4600	105.8
$ MDD151N 1800	151	100	1800	240	4600	105.8
MDD165N 400	160	100	400	300	6800	290
MDD165N 600	160	100	600	300	6800	290
MDD165N 800	160	100	800	300	6800	290
MDD165N 1000	160	100	1000	300	6800	290
MDD165N 1200	160	100	1200	300	6800	290
MDD165N 1400	160	100	1400	300	6800	290
MDD165N 1600	160	100	1600	300	6800	290
MDD165N 1800	160	100	1800	300	6800	290
MDD220N 400	220	100	400	400	7300	361
MDD220N 600	220	100	600	400	7300	361
MDD220N 800	220	100	800	400	7300	361
MDD220N 1000	220	100	1000	400	7300	361
MDD220N 1200	220	100	1200	400	7300	361
MDD220N 1400	220	100	1400	400	7300	361
MDD220N 1600	220	100	1600	400	7300	361
MDD220N 1800	220	100	1800	400	7300	361

$ Preliminary data

DIODE POWER BLOCKS

VFO max (V)	rF (x0.001) (ohms)	IR max (mA)	RthJ-C per branch (oC/W)	TVJ max (oC)	CASE
0.85	1.7	20	0.42	150	K-25
0.85	1.7	20	0.42	150	K-25
0.85	1.7	20	0.42	150	K-25
0.85	1.7	20	0.42	150	K-25
0.85	1.7	20	0.42	150	K-25
0.85	1.7	20	0.42	150	K-25
0.85	1.7	20	0.42	150	K-25
0.75	0.9	20	0.29	150	K-30
0.75	0.9	20	0.29	150	K-30
0.75	0.9	20	0.29	150	K-30
0.75	0.9	20	0.29	150	K-30
0.75	0.9	20	0.29	150	K-30
0.75	0.9	20	0.29	150	K-30
0.75	0.9	20	0.29	150	K-30
0.75	0.9	20	0.29	150	K-30
1.15	1	10	0.22	150	K-50
1.15	1	10	0.22	150	K-50
1.15	1	10	0.22	150	K-50
1.15	1	10	0.22	150	K-50
1.15	1	10	0.22	150	K-50
1.15	1	10	0.22	150	K-50
1.15	1	10	0.22	150	K-50
1.15	1	10	0.22	150	K-50
1	0.78	10	0.17	150	K-50
1	0.78	10	0.17	150	K-50
1	0.78	10	0.17	150	K-50
1	0.78	10	0.17	150	K-50
1	0.78	10	0.17	150	K-50
1	0.78	10	0.17	150	K-50
1	0.78	10	0.17	150	K-50
1	0.78	10	0.17	150	K-50

THYRISTOR POWER BLOCKS

TYPE	ITAVM @ TC (A)	(oC)	VDRM VRRM min (V)	IT RMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
$ MTT32N 400	50	85	400	60	1200	7.2
$ MTT32N 600	50	85	600	60	1200	7.2
$ MTT32N 800	50	85	800	60	1200	7.2
$ MTT32N 1000	50	85	1000	60	1200	7.2
$ MTT32N 1200	50	85	1200	60	1200	7.2
$ MTT32N 1400	50	85	1400	60	1200	7.2
$ MTT32N 1600	50	85	1600	60	1200	7.2
$ MTT40N 400	40	85	400	80	1100	6
$ MTT40N 600	40	85	600	80	1100	6
$ MTT40N 800	40	85	800	80	1100	6
$ MTT40N 1000	40	85	1000	80	1100	6
$ MTT40N 1200	40	85	1200	80	1100	6
$ MTT40N 1400	40	85	1400	80	1100	6
$ MTT40N 1600	40	85	1600	80	1100	6
$ MTT50N 400	50	85	400	80	1300	8.5
$ MTT50N 600	50	85	600	80	1300	8.5
$ MTT50N 800	50	85	400	80	1300	8.5
$ MTT50N 1000	50	85	600	80	1300	8.5
$ MTT50N 1200	50	85	400	80	1300	8.5
$ MTT50N 1400	50	85	600	80	1300	8.5
$ MTT50N 1600	50	85	400	80	1300	8.5

IMPORTANT NOTE :

MDT...N... / MTD...N... power blocks have the same thyristor characteristics.

RthJ-C :	0.86 oC/W	for	MTT32N...
per	0.75 oC/W	for	MTT40N...
branch	0.69 oC/W	for	MTT50N...

$ Preliminary data

THYRISTOR POWER BLOCKS

VTO max (V)	rT (x0.001) (ohms)	(di/dt)c (A/us)	(du/dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
1	7.2	120	400 (2)	20	200	2	120	125	K-20
1	7.2	120	400 (2)	20	200	2	120	125	K-20
1	7.2	120	400 (2)	20	200	2	120	125	K-20
1	7.2	120	400 (2)	20	200	2	120	125	K-20
1	7.2	120	400 (2)	20	200	2	120	125	K-20
1	7.2	120	400 (2)	20	200	2	120	125	K-20
1	7.2	120	400 (2)	20	200	2	120	125	K-20
1.15	6.5	120	400 (2)	20	200	2	120	125	K-20
1.15	6.5	120	400 (2)	20	200	2	120	125	K-20
1.15	6.5	120	400 (2)	20	200	2	120	125	K-20
1.15	6.5	120	400 (2)	20	200	2	120	125	K-20
1.15	6.5	120	400 (2)	20	200	2	120	125	K-20
1.15	6.5	120	400 (2)	20	200	2	120	125	K-20
1.15	6.5	120	400 (2)	20	200	2	120	125	K-20
1.15	3.2	150	400 (2)	20	200	2	180	125	K-20a
1.15	3.2	150	400 (2)	20	200	2	180	125	K-20a
1.15	3.2	150	400 (2)	20	200	2	180	125	K-20a
1.15	3.2	150	400 (2)	20	200	2	180	125	K-20a
1.15	3.2	150	400 (2)	20	200	2	180	125	K-20a
1.15	3.2	150	400 (2)	20	200	2	180	125	K-20a
1.15	3.2	150	400 (2)	20	200	2	180	125	K-20a

(2) Different dv/dt groups :

C = 400 V/us
F = 1000 V/us

THYRISTOR POWER BLOCKS

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	IT RMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
$ MTT63N 400	63	85	400	120	1800	11.3
$ MTT63N 600	63	85	600	120	1800	11.3
$ MTT63N 800	63	85	400	120	1800	11.3
$ MTT63N 1000	63	85	600	120	1800	11.3
$ MTT63N 1200	63	85	400	120	1800	11.3
$ MTT63N 1400	63	85	600	120	1800	11.3
$ MTT63N 1600	63	85	400	120	1800	11.3
MTT80N 400	80	85	400	150	1800	16.2
MTT80N 600	80	85	600	150	1800	16.2
MTT80N 800	80	85	800	150	1800	16.2
MTT80N 1000	80	85	1000	150	1800	16.2
MTT80N 1200	80	85	1200	150	1800	16.2
MTT80N 1400	80	85	1400	150	1800	16.2
MTT80N 1600	80	85	1400	150	1800	16.2
MTT80N 1800	80	85	1600	150	1800	16.2
$ MTT100N 400	100	85	400	200	2300	26.45
$ MTT100N 600	100	85	600	200	2300	26.45
$ MTT100N 800	100	85	800	200	2300	26.45
$ MTT100N 1000	100	85	1000	200	2300	26.45
$ MTT100N 1200	100	85	1200	200	2300	26.45
$ MTT100N 1400	100	85	1400	200	2300	26.45
$ MTT100N 1600	100	85	1600	200	2300	26.45
$ MTT100N 1800	100	85	1800	200	2300	26.45

IMPORTANT NOTE :

MDT...N... / MTD...N... power blocks have the same thyristor characteristics.

RthJ-C :	0.52 oC/W	for	MTT63N...
per	0.34 oC/W	for	MTT80N...
branch	0.38 oC/W	for	MTT100N...

$ Preliminary data

THYRISTOR POWER BLOCKS

VTO max (V)	rT (x0.001) (ohms)	(di) (--) (dt)c (A/us)	(du) (--) (dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
1.9	1.1	150	400 (2)	20	200	2	180	125	K-20a
1.9	1.1	150	400 (2)	20	200	2	180	125	K-20a
1.9	1.1	150	400 (2)	20	200	2	180	125	K-20a
1.9	1.1	150	400 (2)	20	200	2	180	125	K-20a
1.9	1.1	150	400 (2)	20	200	2	180	125	K-20a
1.9	1.1	150	400 (2)	20	200	2	180	125	K-20a
1.9	1.1	150	400 (2)	20	200	2	180	125	K-20a
1	2.6	150	400 (2)	20	200	2	180	125	K-20a
1	2.6	150	400 (2)	20	200	2	180	125	K-20a
1	2.6	150	400 (2)	20	200	2	180	125	K-20a
1	2.6	150	400 (2)	20	200	2	180	125	K-20a
1	2.6	150	400 (2)	20	200	2	180	125	K-20a
1	2.6	150	400 (2)	20	200	2	180	125	K-20a
1	2.6	150	400 (2)	20	200	2	180	125	K-20a
1	2.6	150	400 (2)	20	200	2	180	125	K-20a
0.95	1.9	150	400 (2)	25	200	2	180	125	K-25
0.95	1.9	150	400 (2)	25	200	2	180	125	K-25
0.95	1.9	150	400 (2)	25	200	2	180	125	K-25
0.95	1.9	150	400 (2)	25	200	2	180	125	K-25
0.95	1.9	150	400 (2)	25	200	2	180	125	K-25
0.95	1.9	150	400 (2)	25	200	2	180	125	K-25
0.95	1.9	150	400 (2)	25	200	2	180	125	K-25
0.95	1.9	150	400 (2)	25	200	2	180	125	K-25

(2) Different dv/dt groups :

C = 400 V/us
F = 1000 V/us

THYRISTOR POWER BLOCKS

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	IT RMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
$ MTT121N 400	121	85	400	200	2350	27.6
$ MTT121N 600	121	85	600	200	2350	27.6
$ MTT121N 800	121	85	800	200	2350	27.6
$ MTT121N 1000	121	85	1000	200	2350	27.6
$ MTT121N 1200	121	85	1200	200	2350	27.6
$ MTT121N 1400	121	85	1400	200	2350	27.6
$ MTT121N 1600	121	85	1600	200	2350	27.6
$ MTT121N 1800	121	85	1800	200	2350	27.6
$ MTT131N 400	131	85	400	200	3200	51.2
$ MTT131N 600	131	85	600	200	3200	51.2
$ MTT131N 800	131	85	600	200	3200	51.2
$ MTT131N 1000	131	85	1000	200	3200	51.2
$ MTT131N 1200	131	85	1200	200	3200	51.2
$ MTT131N 1400	131	85	1400	200	3200	51.2
MTT170N 400	170	85	400	350	4600	106
MTT170N 600	170	85	600	350	4600	106
MTT170N 800	170	85	800	350	4600	106
MTT170N 1000	170	85	1000	350	4600	106
MTT170N 1200	170	85	1200	350	4600	106
MTT170N 1400	170	85	1400	350	4600	106
MTT170N 1600	170	85	1600	350	4600	106
MTT170N 1800	170	85	1800	350	4600	106

IMPORTANT NOTE :

MDT...N... / MTD...N... power blocks have the same thyristor characteristics.

RthJ-C :	0.23 oC/W	for	MTT121N...
per	0.25 oC/W	for	MTT131N...
branch	0.19 oC/W	for	MTT170N...

$ Preliminary data

THYRISTOR POWER BLOCKS

VTO max (V)	rT (x0.001) (ohms)	(di) (--) (dt)c (A/us)	(du) (--) (dt)c (V/us)		ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
0.85	2	150	400	(2)	25	150	1.4	200	125	K-30
0.85	2	150	400	(2)	25	150	1.4	200	125	K-30
0.85	2	150	400	(2)	25	150	1.4	200	125	K-30
0.85	2	150	400	(2)	25	150	1.4	200	125	K-30
0.85	2	150	400	(2)	25	150	1.4	200	125	K-30
0.85	2	150	400	(2)	25	150	1.4	200	125	K-30
0.85	2	150	400	(2)	25	150	1.4	200	125	K-30
0.85	2	150	400	(2)	25	150	1.4	200	125	K-30
0.85	1.5	150	400	(2)	25	150	1.4	200	125	K-30
0.85	1.5	150	400	(2)	25	150	1.4	200	125	K-30
0.85	1.5	150	400	(2)	25	150	1.4	200	125	K-30
0.85	1.5	150	400	(2)	25	150	1.4	200	125	K-30
0.85	1.5	150	400	(2)	25	150	1.4	200	125	K-30
0.85	1.5	150	400	(2)	25	150	1.4	200	125	K-30
0.95	1	150	400	(2)	50	200	2	250	125	K-50
0.95	1	150	400	(2)	50	200	2	250	125	K-50
0.95	1	150	400	(2)	50	200	2	250	125	K-50
0.95	1	150	400	(2)	50	200	2	250	125	K-50
0.95	1	150	400	(2)	50	200	2	250	125	K-50
0.95	1	150	400	(2)	50	200	2	250	125	K-50
0.95	1	150	400	(2)	50	200	2	250	125	K-50
0.95	1	150	400	(2)	50	200	2	250	125	K-50

(2) Different dv/dt groups :

C = 400 V/us
F = 1000 V/us

THYRISTOR POWER BLOCKS

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	IT RMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
MTT210N 400	210	85	400	410	5800	168
MTT210N 600	210	85	600	410	5800	168
MTT210N 800	210	85	800	410	5800	168
MTT210N 1000	210	85	1000	410	5800	168
MTT210N 1200	210	85	1200	410	5800	168
MTT210N 1400	210	85	1400	410	5800	168
MTT210N 1600	210	85	1600	410	5800	168
MTT210N 1800	210	85	1800	410	5800	168

IMPORTANT NOTE :

MDT...N... / MTD...N... power blocks have the same thyristor characteristics.

RthJ-C : 0.19 oC/W for MTT210N...
per
branch

THYRISTOR POWER BLOCKS

VTO max (V)	rT (x0.001) (ohms)	(di) (--) (dt)c (A/us)	(du) (--) (dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
1	0.85	150	400 (2)	50	200	2	250	125	K-50
1	0.85	150	400 (2)	50	200	2	250	125	K-50
1	0.85	150	400 (2)	50	200	2	250	125	K-50
1	0.85	150	400 (2)	50	200	2	250	125	K-50
1	0.85	150	400 (2)	50	200	2	250	125	K-50
1	0.85	150	400 (2)	50	200	2	250	125	K-50
1	0.85	150	400 (2)	50	200	2	250	125	K-50
1	0.85	150	400 (2)	50	200	2	250	125	K-50

(2) Different dv/dt groups :

C = 400 V/us
F = 1000 V/us

DIODE POWER BLOCKS

TYPE	IFAVM (A)	@ TC (oC)	VRRM min (V)	IF RMS max (A)	IFSM (10ms) max (A)	i2t (kA2s)
$ MDD31S 800	38	82	800	60	400	0.8
$ MDD31S 1000	38	82	1000	60	400	0.8
$ MDD31S 1200	38	82	1200	60	400	0.8
$ MDD31S 1400	38	82	1400	60	400	0.8
$ MDD45S 400	45	100	400	100	850	3.6
$ MDD45S 600	45	100	600	100	850	3.6
$ MDD45S 800	45	100	800	100	850	3.6
$ MDD45S 1000	45	100	1000	100	850	3.6
$ MDD45S 1200	45	100	1200	100	850	3.6
$ MDD61S 400	61	100	400	120	1600	12.8
$ MDD61S 600	61	100	600	120	1600	12.8
$ MDD61S 800	61	100	800	120	1600	12.8
$ MDD61S 1000	61	100	1000	120	1600	12.8
$ MDD61S 1200	61	100	1200	120	1600	12.8
$ MDD61S 1400	61	100	1400	120	1600	12.8
$ MDD81S 400	81	100	400	150	1900	18.05
$ MDD81S 600	81	100	600	150	1900	18.05
$ MDD81S 800	81	100	800	150	1900	18.05
$ MDD81S 1000	81	100	1000	150	1900	18.05
$ MDD81S 1200	81	100	1200	150	1900	18.05
$ MDD81S 1400	81	100	1400	150	1900	18.05
$ MDD122S 400	121	100	400	200	2000	20
$ MDD122S 600	121	100	600	200	2000	20
$ MDD122S 800	121	100	800	200	2000	20
$ MDD122S 1000	121	100	1000	200	2000	20
$ MDD122S 1200	121	100	1200	200	2000	20
$ MDD122S 1400	121	100	1400	200	2000	20

$ Preliminary data

DIODE POWER BLOCKS

VFO max (V)	rF (x0.001) (ohms)	IR max (mA)	Qs min (uA*s)	RthJ-C per branch (oC/W)	TVJ max (oC)	CASE
0.8	7.5	10	24	0.59	150	K-20
0.8	7.5	10	24	0.59	150	K-20
0.8	7.5	10	24	0.59	150	K-20
0.8	7.5	10	24	0.59	150	K-20
0.9	3.9	20	10	0.68	125	K-20
0.9	3.9	20	10	0.68	125	K-20
0.9	3.9	20	10	0.68	125	K-20
0.9	3.9	20	10	0.68	125	K-20
0.9	3.9	20	10	0.68	125	K-20
1	2.2	40	34	0.62	150	K-20
1	2.2	40	34	0.62	150	K-20
1	2.2	40	34	0.62	150	K-20
1	2.2	40	34	0.62	150	K-20
1	2.2	40	34	0.62	150	K-20
1	2.2	40	34	0.62	150	K-20
0.95	1.7	40	38	0.5	150	K-25
0.95	1.7	40	38	0.5	150	K-25
0.95	1.7	40	38	0.5	150	K-25
0.95	1.7	40	38	0.5	150	K-25
0.95	1.7	40	38	0.5	150	K-25
0.95	1.7	40	38	0.5	150	K-25
0.95	1.7	40	25	0.28	150	K-30
0.95	1.7	40	25	0.28	150	K-30
0.95	1.7	40	25	0.28	150	K-30
0.95	1.7	40	25	0.28	150	K-30
0.95	1.7	40	25	0.28	150	K-30
0.95	1.7	40	25	0.28	150	K-30

THYRISTOR POWER BLOCKS

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	IT RMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
$ MTT32F 200	51	52	200	80	850	3.6
$ MTT32F 400	51	52	400	80	850	3.6
$ MTT32F 600	51	52	600	80	850	3.6
$ MTT32F 800	51	52	800	80	850	3.6
$ MTT32F 1000	51	52	1000	80	850	3.6
$ MTT32F 1200	51	52	1200	80	850	3.6
$ MTT45F 200	76	48	200	120	1100	6.6
$ MTT45F 400	76	48	400	120	1100	6.6
$ MTT45F 600	76	48	600	120	1100	6.6
$ MTT45F 800	76	48	800	120	1100	6.6
$ MTT45F 1000	76	48	1000	120	1100	6.6
$ MTT45F 1200	76	48	1200	120	1100	6.6
$ MTT63F 200	63	85	200	160	1800	9.8
$ MTT63F 400	63	85	400	160	1800	9.8
$ MTT63F 600	63	85	600	160	1800	9.8
$ MTT63F 800	63	85	400	160	1800	9.8
$ MTT63F 1000	63	85	600	160	1800	9.8
$ MTT63F 1200	63	85	400	160	1800	9.8

IMPORTANT NOTE :

MDT...F... / MTD...F... power blocks have the same thyristor characteristics.

RthJ-C :	0.72 oC/W	for	MTT32F...
per	0.52 oC/W	for	MTT45F...
branch	0.40 oC/W	for	MTT63F...

$ Preliminary data

THYRISTOR POWER BLOCKS

VTO max (V)	rT (x0.001) (ohms)	(di/dt)c (A/us)	(du/dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
1.3	5.5	120	50 (3)	10	150	2.5	25	125	K-20
1.3	5.5	120	50 (3)	10	150	2.5	25	125	K-20
1.3	5.5	120	50 (3)	10	150	2.5	25	125	K-20
1.3	5.5	120	50 (3)	10	150	2.5	25	125	K-20
1.3	5.5	120	50 (3)	10	150	2.5	25	125	K-20
1.3	5.5	120	50 (3)	10	150	2.5	25	125	K-20
1.3	3.4	120	50 (3)	20	150	1.4	25	125	K-20
1.3	3.4	120	50 (3)	20	150	1.4	25	125	K-20
1.3	3.4	120	50 (3)	20	150	1.4	25	125	K-20
1.3	3.4	120	50 (3)	20	150	1.4	25	125	K-20
1.3	3.4	120	50 (3)	20	150	1.4	25	125	K-20
1.3	3.4	120	50 (3)	20	150	1.4	25	125	K-20
1.25	3.8	150	50 (3)	30	200	2	20	125	K-25
1.25	3.8	150	50 (3)	30	200	2	20	125	K-25
1.25	3.8	150	50 (3)	30	200	2	20	125	K-25
1.25	3.8	150	50 (3)	30	200	2	20	125	K-25
1.25	3.8	150	50 (3)	30	200	2	20	125	K-25
1.25	3.8	150	50 (3)	30	200	2	20	125	K-25

(3) Different **dv/dt** groups :

B = 50 V/us
C = 400 V/us
L = 400 V/us
M = 1000 V/us

THYRISTOR POWER BLOCKS

TYPE	ITAVM (A)	@ TC (oC)	VDRM VRRM min (V)	IT RMS max (A)	ITSM (10ms) max (A)	i2t (kA2s)
$ MTT80F 200	80	85	200	180	1800	16.2
$ MTT80F 400	80	85	400	180	1800	16.2
$ MTT80F 600	80	85	600	180	1800	16.2
$ MTT80F 800	80	85	800	180	1800	16.2
$ MTT80F 1000	80	85	1000	180	1800	16.2
$ MTT80F 1200	80	85	1200	180	1800	16.2
$ MTT80F 1300	80	85	1300	180	1800	16.2
$ MTT101F 200	128	70	200	200	2050	21
$ MTT101F 400	128	70	400	200	2050	21
$ MTT101F 600	128	70	600	200	2050	21
$ MTT101F 800	128	70	800	200	2050	21
$ MTT101F 1000	128	70	1000	200	2050	21
$ MTT101F 1200	128	70	1200	200	2050	21
$ MTT101F 1300	128	70	1300	200	2050	21
$ MTT130F 200	191	54	200	300	2450	30
$ MTT130F 400	191	54	400	300	2450	30
$ MTT130F 600	191	54	600	300	2450	30
$ MTT130F 800	191	54	600	300	2450	30
$ MTT130F 1000	191	54	1000	300	2450	30
$ MTT130F 1200	191	54	1200	300	2450	30
$ MTT130F 1300	191	54	1300	300	2450	30

IMPORTANT NOTE :

MDT...F... / MTD...F... power blocks have the same thyristor characteristics.

RthJ-C :	0.40 oC/W	for	MTT80F...
per	0.30 oC/W	for	MTT101F...
branch	0.30 oC/W	for	MTT130F...

$ Preliminary data

THYRISTOR POWER BLOCKS

VTO max (V)	rT (x0.001) (ohms)	(di) (--) (dt)c (A/us)	(du) (--) (dt)c (V/us)	ID= =IR max (mA)	IGT max (mA)	VGT max (V)	tq max (us)	TJM (oC)	CASE
1.2	3.2	150	50 (3)	30	200	2	30	125	K-25
1.2	3.2	150	50 (3)	30	200	2	30	125	K-25
1.2	3.2	150	50 (3)	30	200	2	30	125	K-25
1.2	3.2	150	50 (3)	30	200	2	30	125	K-25
1.2	3.2	150	50 (3)	30	200	2	30	125	K-25
1.2	3.2	150	50 (3)	30	200	2	30	125	K-25
1.2	3.2	150	50 (3)	30	200	2	30	125	K-25
1.2	2.1	160	50 (3)	30	150	2	20	125	K-30
1.2	2.1	160	50 (3)	30	150	2	20	125	K-30
1.2	2.1	160	50 (3)	30	150	2	20	125	K-30
1.2	2.1	160	50 (3)	30	150	2	20	125	K-30
1.2	2.1	160	50 (3)	30	150	2	20	125	K-30
1.2	2.1	160	50 (3)	30	150	2	20	125	K-30
1.2	2.1	160	50 (3)	30	150	2	20	125	K-30
1.28	2.15	160	50 (3)	30	150	2	25	125	K-30
1.28	2.15	160	50 (3)	30	150	2	25	125	K-30
1.28	2.15	160	50 (3)	30	150	2	25	125	K-30
1.28	2.15	160	50 (3)	30	150	2	25	125	K-30
1.28	2.15	160	50 (3)	30	150	2	25	125	K-30
1.28	2.15	160	50 (3)	30	150	2	25	125	K-30
1.28	2.15	160	50 (3)	30	150	2	25	125	K-30

(3) Different **dv/dt** groups :

B = 50 V/us
C = 400 V/us
L = 400 V/us
M = 1000 V/us

TRANSISTOR POWER BLOCKS

TYPE	Ptot @ TC= 25 oC (W)	TJM (oC)	VCEX min (V)	VCEO (*) min (V)	IC (A)	VCEsat max (V)	@ IC / IB (A / A)
$ MTR30 04X	250	125	400	400	30	2.5	30/ 1.5
$ MTR30 06X	250	125	600	400	30	2.5	30/ 1.5
$ MTR30 08X	250	125	800	800	30	2.5	30/ 1.5
$ MTR30 10X	250	125	1000	880	30	2.5	30/ 1.5
$ MTR30 12X	250	125	1200	880	30	2.5	30/ 1.5
$ MTR30 04Y	250	125	400	400	30	2.5	30/ 1.5
$ MTR30 06Y	250	125	600	400	30	2.5	30/ 1.5
$ MTR30 08Y	250	125	800	800	30	2.5	30/ 1.5
$ MTR30 10Y	250	125	1000	880	30	2.5	30/ 1.5
$ MTR30 12Y	250	125	1200	880	30	2.5	30/ 1.5
$ MTR50 04X	250	125	400	400	50	2.5	50/ 2.5
$ MTR50 06X	250	125	600	400	50	2.5	50/ 2.5
$ MTR50 08X	250	125	800	800	50	2.5	50/ 2.5
$ MTR50 10X	250	125	1000	880	50	2.5	50/ 2.5
$ MTR50 12X	250	125	1200	880	50	2.5	50/ 2.5
$ MTR50 04Y	250	125	400	400	50	2.5	50/ 2.5
$ MTR50 06Y	250	125	600	400	50	2.5	50/ 2.5
$ MTR50 08Y	250	125	800	800	50	2.5	50/ 2.5
$ MTR50 10Y	250	125	1000	880	50	2.5	50/ 2.5
$ MTR50 12Y	250	125	1200	880	50	2.5	50/ 2.5

IMPORTANT NOTE :

MTR...X = Diode anode connected to the emitter of the transistor.
MTR...Y = Diode cathode connected to the emitter of the transistor.

* VCEO @ IC = 0.2 A ; L = 25 mH
$ Preliminary data

TRANSISTOR POWER BLOCKS

ICEX @ VCEX max (mA)	hFE min	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf max (us)	trr max (us)	CASE
				----<	IC =	30 A	>----	
20	50	30	5	2	15	5	2.5	K-25
20	50	30	5	2	15	5	2.5	K-25
20	50	30	5	2	15	5	2.5	K-25
20	50	30	5	2	15	5	2.5	K-25
20	50	30	5	2	15	5	2.5	K-25
20	50	30	5	2	15	5	2.5	K-25
20	50	30	5	2	15	5	2.5	K-25
20	50	30	5	2	15	5	2.5	K-25
20	50	30	5	2	15	5	2.5	K-25
20	50	30	5	2	15	5	2.5	K-25
20	50	50	5	2	15	5	2.5	K-25
20	50	50	5	2	15	5	2.5	K-25
20	50	50	5	2	15	5	2.5	K-25
20	50	50	5	2	15	5	2.5	K-25
20	50	50	5	2	15	5	2.5	K-25
20	50	50	5	2	15	5	2.5	K-25
20	50	50	5	2	15	5	2.5	K-25
20	50	50	5	2	15	5	2.5	K-25
20	50	50	5	2	15	5	2.5	K-25
20	50	50	5	2	15	5	2.5	K-25

TRANSISTOR POWER BLOCKS

TYPE	Ptot @ TC= 25 oC (W)	TJM (oC)	VCEX min (V)	VCEO (*) min (V)	IC (A)	VCEsat max (V)	@ IC / IB (A / A)
MTR100 04X	500	125	400	400	100	2.5	100/ 5
MTR100 06X	500	125	600	400	100	2.5	100/ 5
MTR100 08X	500	125	800	800	100	2.5	100/ 5
MTR100 10X	500	125	1000	880	100	2.5	100/ 5
MTR100 12X	500	125	1200	880	100	2.5	100/ 5
MTR100 04Y	500	125	400	400	100	2.5	100/ 5
MTR100 06Y	500	125	600	400	100	2.5	100/ 5
MTR100 08Y	500	125	800	800	100	2.5	100/ 5
MTR100 10Y	500	125	1000	880	100	2.5	100/ 5
MTR100 12Y	500	125	1200	880	100	2.5	100/ 5
MTR125 04X	500	125	400	400	125	2.5	125/6.25
MTR125 06X	500	125	600	400	125	2.5	125/6.25
MTR125 08X	500	125	800	800	125	2.5	125/6.25
MTR125 10X	500	125	1000	880	125	2.5	125/6.25
MTR125 12X	500	125	1200	880	125	2.5	125/6.25
MTR125 04Y	500	125	400	400	125	2.5	125/6.25
MTR125 06Y	500	125	600	400	125	2.5	125/6.25
MTR125 08Y	500	125	800	800	125	2.5	125/6.25
MTR125 10Y	500	125	1000	880	125	2.5	125/6.25
MTR125 12Y	500	125	1200	880	125	2.5	125/6.25

IMPORTANT NOTE :

MTR...X = Diode anode connected to the emitter of the transistor.

MTR...Y = Diode cathode connected to the emitter of the transistor.

* VCEO @ IC = 0.2 A ; L = 25 mH

TRANSISTOR POWER BLOCKS

ICEX @ VCEX max (mA)	hFE min	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf max (us)	trr max (us)	CASE
				-----<	IC = 100 A		>-----	
20	50	100	5	2	15	5	2.5	K-50
20	50	100	5	2	15	5	2.5	K-50
20	50	100	5	2	15	5	2.5	K-50
20	50	100	5	2	15	5	2.5	K-50
20	50	100	5	2	15	5	2.5	K-50
20	50	100	5	2	15	5	2.5	K-50
20	50	100	5	2	15	5	2.5	K-50
20	50	100	5	2	15	5	2.5	K-50
20	50	100	5	2	15	5	2.5	K-50
20	50	100	5	2	15	5	2.5	K-50
20	50	125	5	2	15	5	2.5	K-50
20	50	125	5	2	15	5	2.5	K-50
20	50	125	5	2	15	5	2.5	K-50
20	50	125	5	2	15	5	2.5	K-50
20	50	125	5	2	15	5	2.5	K-50
20	50	125	5	2	15	5	2.5	K-50
20	50	125	5	2	15	5	2.5	K-50
20	50	125	5	2	15	5	2.5	K-50
20	50	125	5	2	15	5	2.5	K-50
20	50	125	5	2	15	5	2.5	K-50

TRANSISTOR POWER BLOCKS

TYPE	Ptot @ TC= 25 oC (W)	TJM (oC)	VCEX min (V)	VCEO (*) min (V)	IC (A)	VCEsat max (V)	@ IC / IB (A / A)
MTR150 04X	500	125	400	400	150	2.5	150/ 7.5
MTR150 06X	500	125	600	400	150	2.5	150/ 7.5
MTR150 08X	500	125	800	800	150	2.5	150/ 7.5
MTR150 10X	500	125	1000	880	150	2.5	150/ 7.5
MTR150 12X	500	125	1200	880	150	2.5	150/ 7.5
MTR150 04Y	500	125	400	400	150	2.5	150/ 7.5
MTR150 06Y	500	125	600	400	150	2.5	150/ 7.5
MTR150 08Y	500	125	800	800	150	2.5	150/ 7.5
MTR150 10Y	500	125	1000	880	150	2.5	150/ 7.5
MTR150 12Y	500	125	1200	880	150	2.5	150/ 7.5

IMPORTANT NOTE :

MTR...X = Diode anode connected to the emitter of the transistor.

MTR...Y = Diode cathode connected to the emitter of the transistor.

* VCEO @ IC = 0.2 A ; L = 25 mH

TRANSISTOR POWER BLOCKS

ICEX @ VCEX max (mA)	hFE min	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf max (us)	trr max (us)	CASE
				——<	IC = 100 A	>——		
20	50	150	5	2	15	5	2.5	K-50
20	50	150	5	2	15	5	2.5	K-50
20	50	150	5	2	15	5	2.5	K-50
20	50	150	5	2	15	5	2.5	K-50
20	50	150	5	2	15	5	2.5	K-50
20	50	150	5	2	15	5	2.5	K-50
20	50	150	5	2	15	5	2.5	K-50
20	50	150	5	2	15	5	2.5	K-50
20	50	150	5	2	15	5	2.5	K-50
20	50	150	5	2	15	5	2.5	K-50

TRANSISTOR POWER BLOCKS

TYPE	Ptot @ TC= 25 oC (W)	TJM (oC)	VCEX min (V)	VCEO (*) min (V)	IC (A)	VCEsat max (V)	@ IC / IB (A / A)
$ MTR200 04	1000	125	400	400	200	2.5	200/ 10
$ MTR200 06	1000	125	600	400	200	2.5	200/ 10
$ MTR200 08	1000	125	800	800	200	2.5	200/ 10
$ MTR200 10	1000	125	1000	880	200	2.5	200/ 10
$ MTR200 12	1000	125	1200	880	200	2.5	200/ 10
$ MTR250 04	1000	125	400	400	250	2.5	250/12.5
$ MTR250 06	1000	125	600	400	250	2.5	250/12.5
$ MTR250 08	1000	125	800	800	250	2.5	250/12.5
$ MTR250 10	1000	125	1000	880	250	2.5	250/12.5
$ MTR250 12	1000	125	1200	880	250	2.5	250/12.5
$ MTR300 04	1000	125	400	400	300	2.5	300/ 15
$ MTR300 06	1000	125	600	400	300	2.5	300/ 15
$ MTR300 08	1000	125	800	800	300	2.5	300/ 15
$ MTR300 10	1000	125	1000	880	300	2.5	300/ 15
$ MTR300 12	1000	125	1200	880	300	2.5	300/ 15

* VCEO @ IC = 0.2 A ; L = 25 mH

$ Preliminary data

TRANSISTOR POWER BLOCKS

ICEX @ VCEX max (mA)	hFE min	@ IC (A)	& VCE (V)	ton max (us)	ts max (us)	tf max (us)	trr max (us)	CASE
				----<	IC = 200 A		>----	
20	50	200	5	4	30	10	3.0	K-85
20	50	200	5	4	30	10	3.0	K-85
20	50	200	5	4	30	10	3.0	K-85
20	50	200	5	4	30	10	3.0	K-85
20	50	200	5	4	30	10	3.0	K-85
20	50	250	5	4	30	10	3.0	K-85
20	50	250	5	4	30	10	3.0	K-85
20	50	250	5	4	30	10	3.0	K-85
20	50	250	5	4	30	10	3.0	K-85
20	50	250	5	4	30	10	3.0	K-85
20	50	300	5	4	30	10	3.0	K-85
20	50	300	5	4	30	10	3.0	K-85
20	50	300	5	4	30	10	3.0	K-85
20	50	300	5	4	30	10	3.0	K-85
20	50	300	5	4	30	10	3.0	K-85

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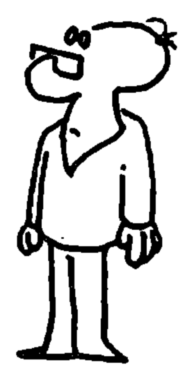
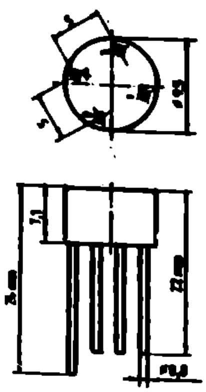


CASE OUTLINES - All dimensions in mm.

1PM



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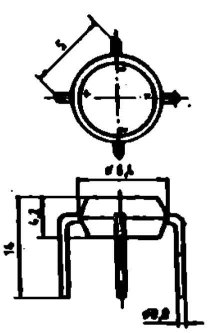

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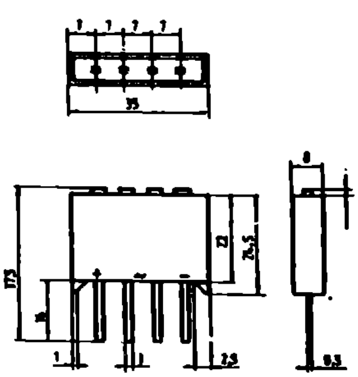
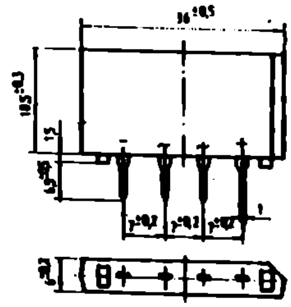
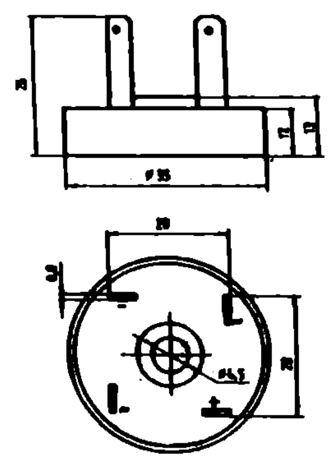


CASE OUTLINES - All dimensions in mm.

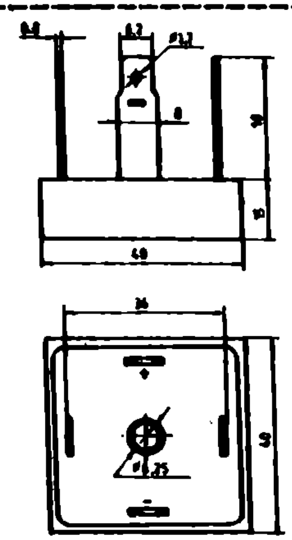
4PM



10PM

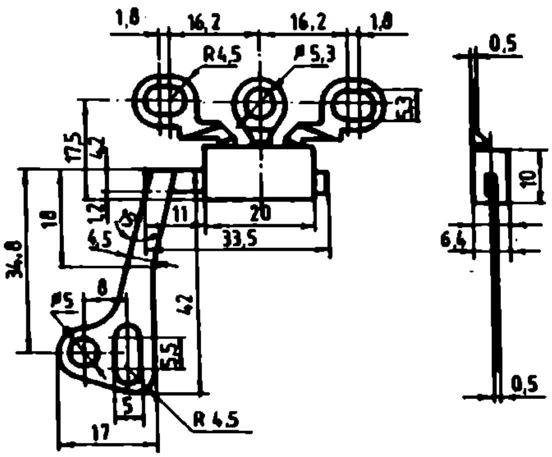


20PM

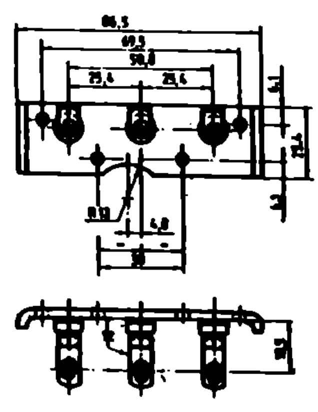


CASE OUTLINES - All dimensions in mm.

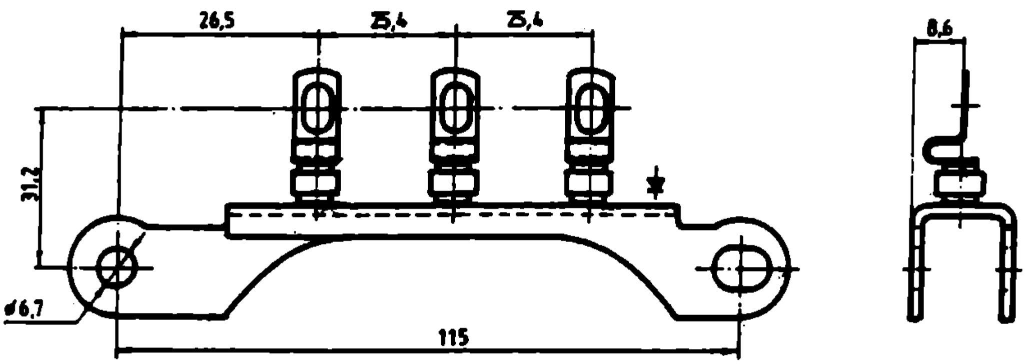
4 PTM 2



1C 1202



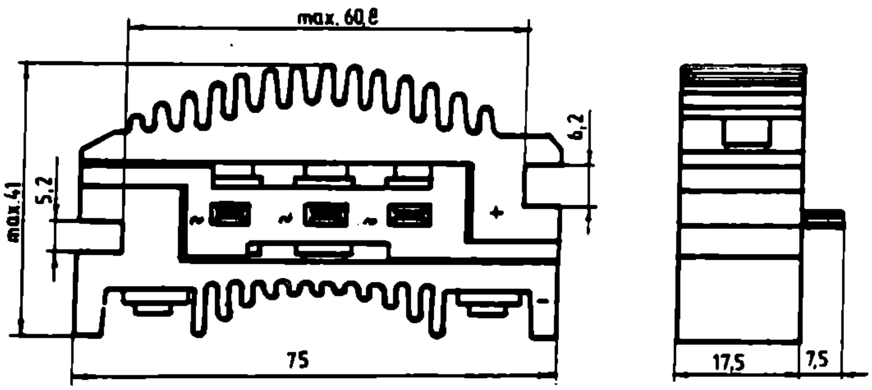
1C 1203



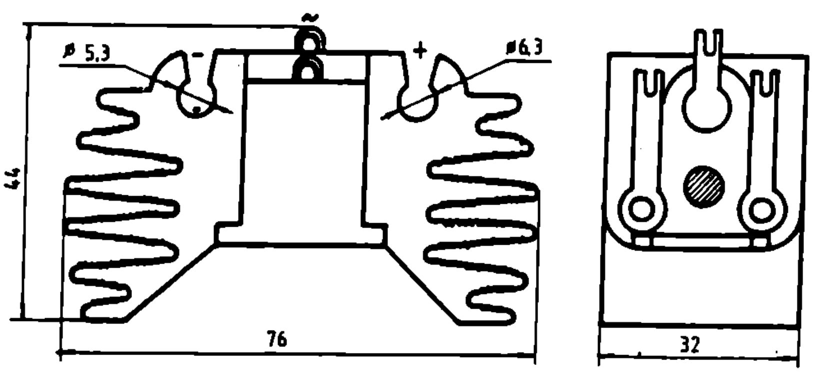
= APPENDIX A =

CASE OUTLINES - All dimensions in mm.

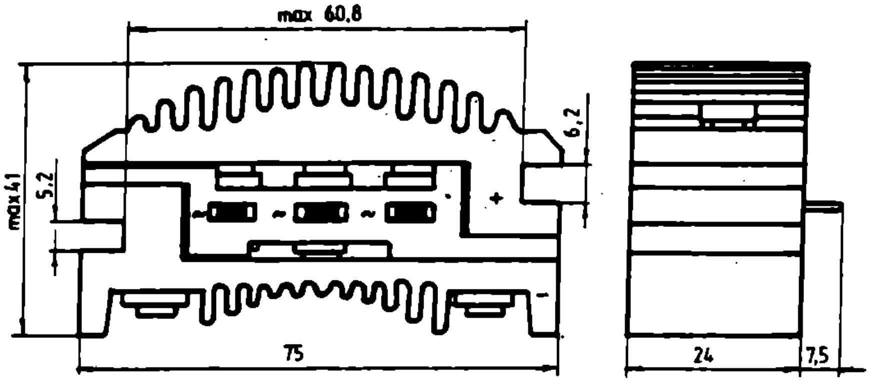
40 PT 2



45 PT 2

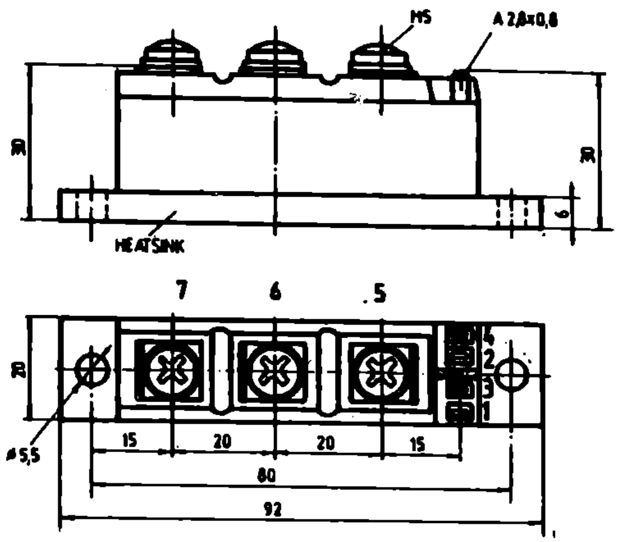


60 PT 2



CASE OUTLINES - All dimensions in mm.

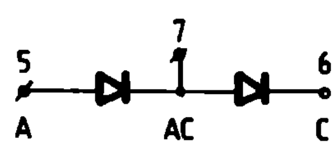
K-20



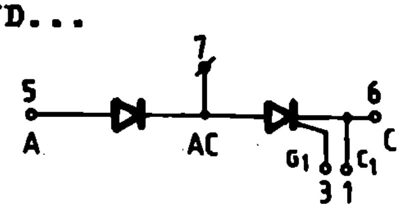
The heatsink is electrically isolated .

CONNECTIONS

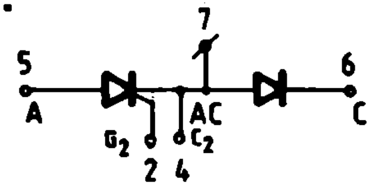
MDD...



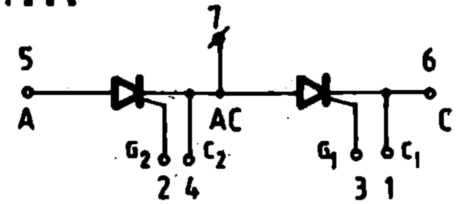
MTD...



MDT...

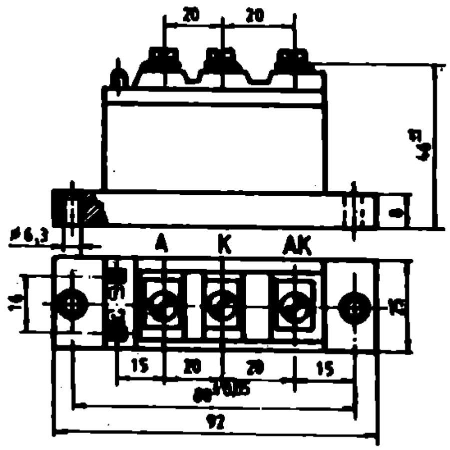


MTT...



CASE OUTLINES - All dimensions in mm.

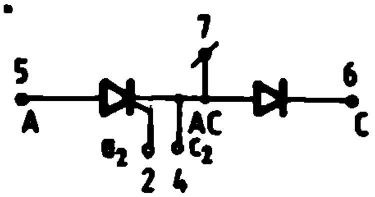
K-20a



The heatsink is electrically isolated .

CONNECTIONS

MDT...



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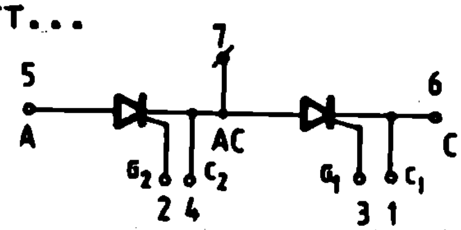
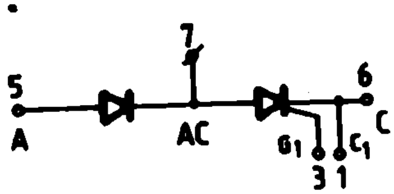
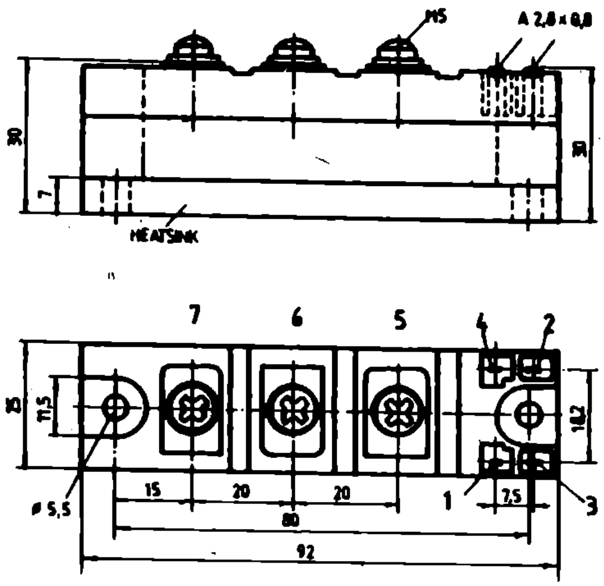


MTD...



CASE OUTLINES - All dimensions in mm.

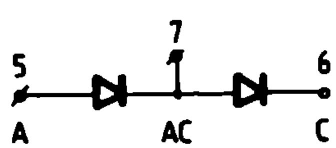
K-25



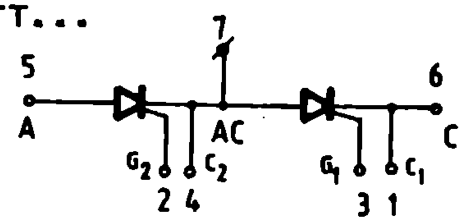
The heatsink is electrically isolated .

CONNECTIONS

MDD...



MTT...



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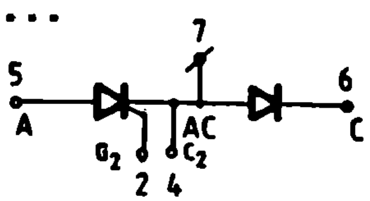

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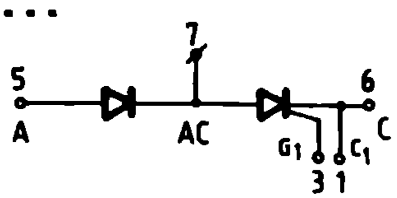
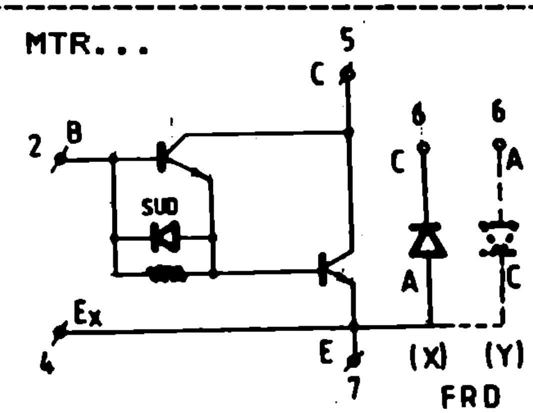


MTR...

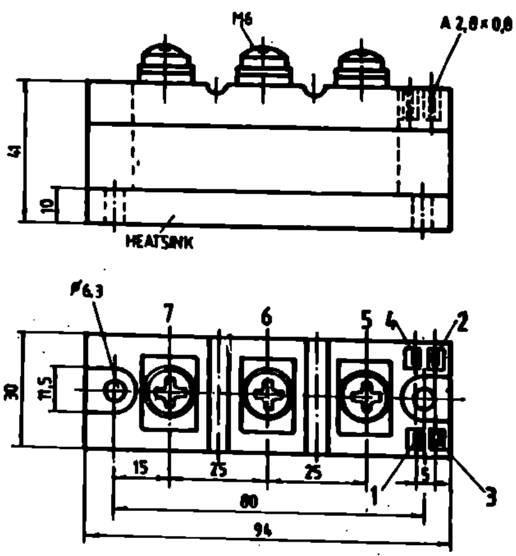


SUD = Speed Up Diode
FRD = Fast Recovery Diode

— APPENDIX A —

CASE OUTLINES - All dimensions in mm.

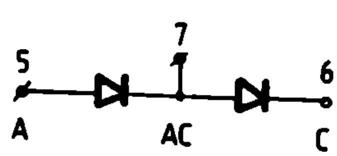
K-30



The heatsink is electrically isolated .

CONNECTIONS

MDD...



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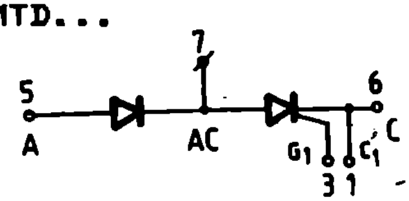
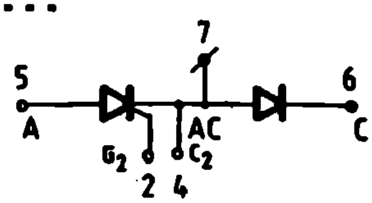


MDT...



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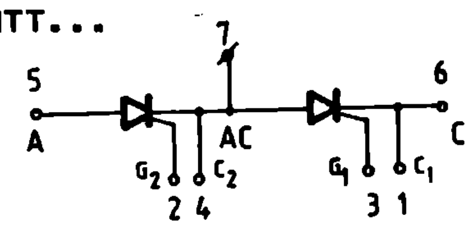
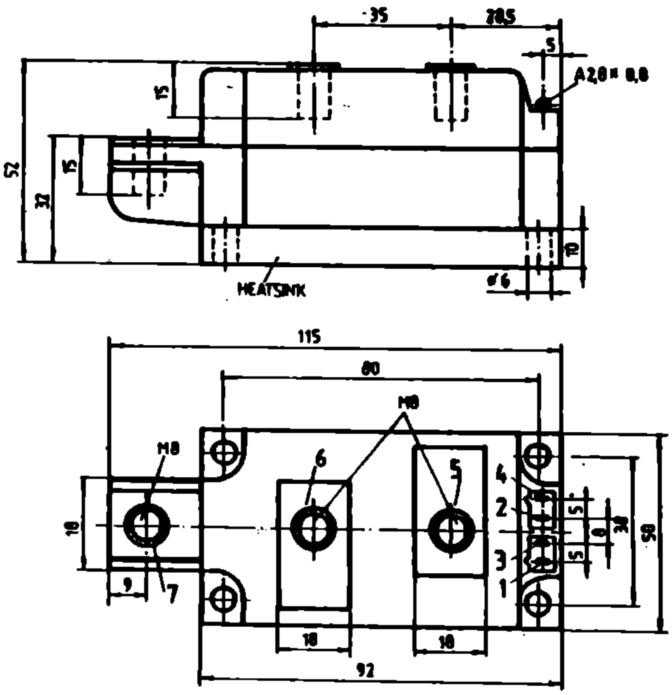


CASE OUTLINES - All dimensions in mm.

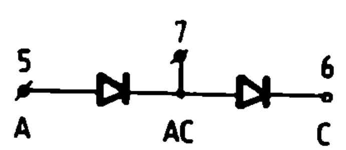
K-50



The heatsink is electrically isolated .

CONNECTIONS

MDD...



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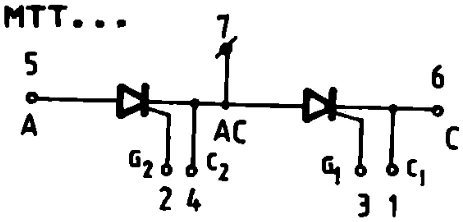

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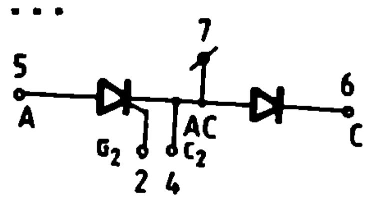

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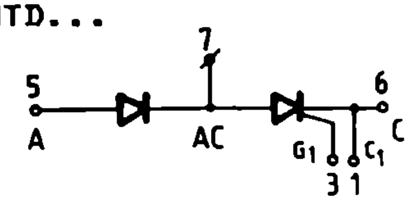
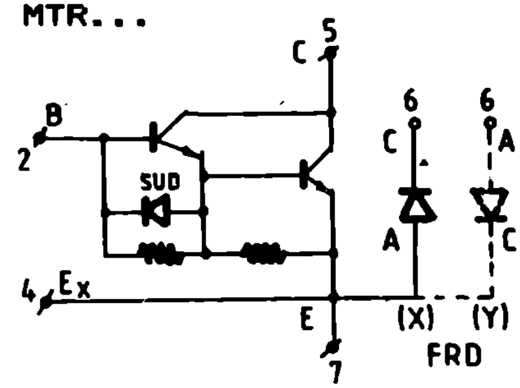


MTR...

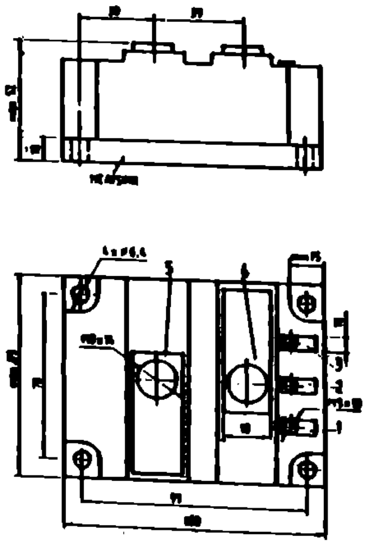


SUD = Speed Up Diode
FRD = Fast Recovery Diode

= APPENDIX A =

CASE OUTLINES - All dimensions in mm.

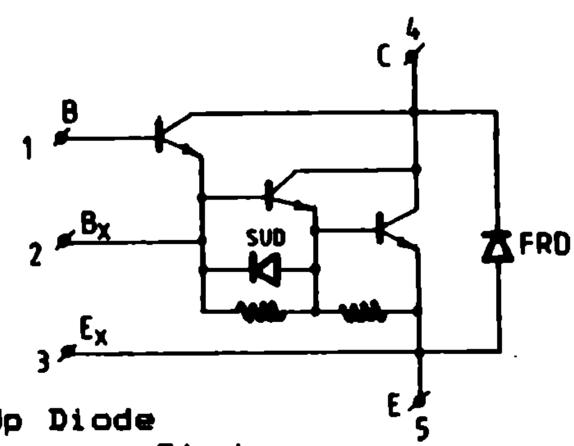
K-85



The heatsink is electrically isolated .

CONNECTIONS

MTR...



SUD = Speed Up Diode
FRD = Fast Recovery Diode

CAPACITORS

OIL IMPREGNATED PAPER CAPACITORS

MIXT DIELECTRIC CAPACITORS

METALLISED PAPER CAPACITORS OF "MKV" CONSTRUCTION

BY-PASS CAPACITORS

SUPPRESSION MULTIPLE CAPACITORS

ELECTROLYTIC CAPACITORS

MINIATURE ELECTROLYTIC CAPACITORS

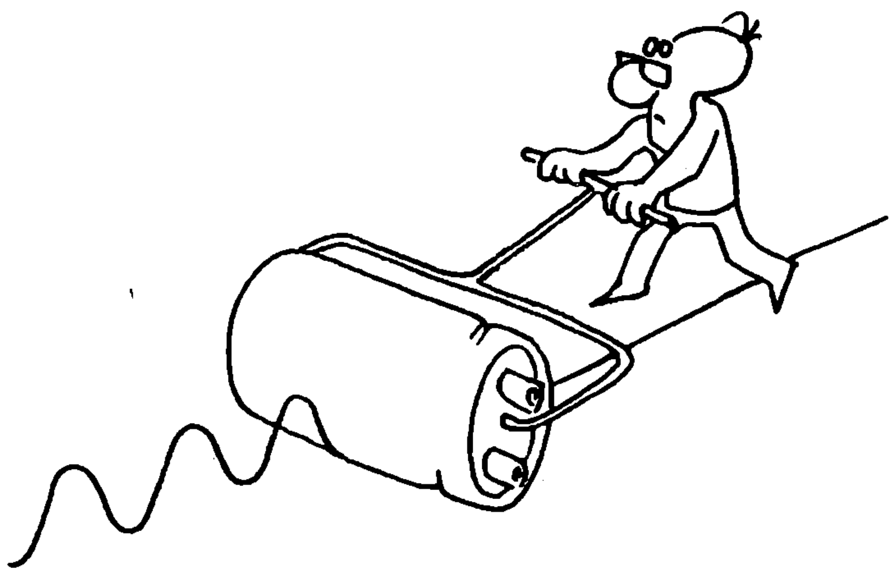
HIGH CAPACITANCE ELECTROLYTIC CAPACITORS

SINGLE / MULTIPLE ELECTROLYTIC CAPACITORS

HIGH VOLTAGE ELECTROLYTIC CAPACITORS

UNPOLARISED ELECTROLYTIC CAPACITORS

MOTOR CAR EQUIPMENT CAPACITORS



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DC OIL IMPREGNATED PAPER CAPACITORS

TYPE	Cn (uF)	VN (Vcc)	DIMENSIONS D (mm)	L (mm)	LOSS ANGLE TANG. max	RizT (Mohms)	CASE
HC 2416	0.010	630	10	26	0.010	6000	C 1
HC 2421	0.015	630	12	26	0.010	6000	C 1
HC 2421	0.022	630	12	26	0.010	6000	C 1
HC 2423	0.033	630	12	34	0.010	6000	C 1
HC 2423	0.047	630	12	34	0.010	6000	C 1
HC 2428	0.068	630	14	34	0.010	6000	C 1
HC 2430	0.100	630	14	39	0.010	6000	C 1
HC 2435	0.150	630	16	39	0.010	6000	C 1
HC 2447	0.180	630	18	39	0.010	6000	C 1
HC 2447	0.220	630	18	39	0.010	6000	C 1
HC 2448	0.330	630	18	53	0.010	6000	C 1
HC 2455	0.470	630	20	53	0.010	(*)	C 1
HC 2416	0.010	1000	10	26	0.010	6000	C 1
HC 2421	0.015	1000	12	26	0.010	6000	C 1
HC 2423	0.022	1000	12	34	0.010	6000	C 1
HC 2428	0.033	1000	14	34	0.010	6000	C 1
HC 2428	0.047	1000	14	34	0.010	6000	C 1
HC 2435	0.068	1000	16	39	0.010	6000	C 1
HC 2447	0.100	1000	18	39	0.010	6000	C 1
HC 2448	0.150	1000	18	53	0.010	6000	C 1
HC 2455	0.220	1000	20	53	0.010	6000	C 1
HC 2435	0.047	1300	16	39	0.010	6000	C 1
HC 2435	0.056	1300	16	39	0.010	6000	C 1

Climatic category : 25/085/21
Capacitance tolerance : +/- 20 %
Capacitance tolerance (on request) : +/- 10 % or +/- 5 %
Proof voltage between terminals : min 2 Vn / 1 min.
Proof voltage between interconnected terminals and case : min 2 Vn / 1 min.
Loss angle tangent @ TA = 20 oC ; f = 1 kHz
RizT @ V = 500 Vcc ; TA = 20 oC after 1 min.

(*) RC > 2000 sec.

MIXT DIELECTRIC CAPACITORS FOR PULSE GENERATORS

TYPE	Cn (nF)	VN (Vvv)	DIMENSIONS D (mm)	L (mm)	LOSS ANGLE TANG. max	RizT (Mohms)	CASE
HPI 1233	22	400	12	33	0.003	50000	C 1
HPI 1233	27	400	12	33	0.003	50000	C 1
HPI 1433	68	400	14	33	0.003	50000	C 1
HPI 1433	82	400	14	33	0.003	50000	C 1
HPI 1433	100	400	14	33	0.003	50000	C 1
HPI 1640	150	400	16	40	0.003	50000	C 1
HPI 2053	150	800	20	53	0.003	50000	C 1
HPI 2053	180	800	20	53	0.003	50000	C 1
HPI 1233	1	1500	12	33	0.003	50000	C 1
HPI 1233	2.4	1500	12	33	0.003	50000	C 1
HPI 1233	7.5	1500	14	33	0.003	50000	C 1
HPI 1853	68	1500	18	53	0.003	50000	C 1

Climatic category : 25/085/21
Capacitance tolerance : +/- 10 %
Proof voltage between terminals : min 2 Vn / 1 min.
Proof voltage between interconnected terminals and case :
min 2 Vn / 1 min
Loss angle tangent @ TA = 20 oC ; f = 1 kHz ,
RizT @ V = 500 Vcc ; TA = 20 oC after 1 min.

MIXT DIELECTRIC CAPACITORS FOR RECTIFIER PROTECTION

TYPE	Cn (uF)	VN (Vcc)	DIMENSIONS D (mm)	DIMENSIONS L (mm)	LOSS ANGLE TANG. max	RizT (Mohms)	CASE
HPR 3056	0.8	400	30	56	0.010	6000	C 2
HPR 3056	1	400	30	56	0.010	6000	C 2
HPR 3056	0.47	800	30	56	0.010	6000	C 2

Climatic category : 40/070/21
Capacitance tolerance : +/- 10 %
Proof voltage between terminals : min 4.3 Vn / 1 min.
Proof voltage between interconnected terminals and case :
min 4 Vn +/- 1000 V / 1 min
Loss angle tangent @ TA = 20 oC ; f = 1 kHz
RizT @ V = 500 Vcc ; TA = 20 oC after 1 min.

SUPPRESSION PAPER CAPACITORS

TYPE	Cn (uF)	VN (Vcc)	DIMENSIONS D (mm)	DIMENSIONS L (mm)	LOSS ANGLE TANG. max	RizT (Mohms)	CASE
HT 50130	2	1600	50	120	0.010	1000	C 2

Climatic category : 25/085/21
Capacitance tolerance : +/- 10 %
Proof voltage between terminals : min 4200 Vcc / 2 s
Proof voltage between interconnected terminals and case :
min 3500 Vcc / 2 s
Loss angle tangent @ TA = 20 oC ; f = 50 Hz
RizT @ V = 500 Vcc ; TA = 20 oC after 1 min.
RizTC = min 1000 Mohms , under the same conditions .

AC OIL IMPREGNATED PAPER CAPACITORS

TYPE	Cn (uF)	VN (Vac)	DIMENSIONS D (mm)	L (mm)	LOSS ANGLE TANG. max	VizT min (Vac)	VizTC min (Vac)	CASE
HPA 3506	4	220	35	68	0.008	2.15Vn	6Vn	C 2
# HPA 3024	4.2	220	30	84	0.008	2.15Vn	6Vn	C 2
# HPA 3506	4.5	220	35	68	0.008	2.15Vn	6Vn	C 2
HPA 3524	5	220	35	84	0.008	2.15Vn	6Vn	C 2
# HPA 3530	7	220	35	92	0.008	2.15Vn	6Vn	C 2
HPA 4058	10	220	40	120	0.008	2.15Vn	6Vn	C 2
HSA 4024	3.7	380	40	84	0.008	2.15Vn	6Vn	C 2
HSA 3530	3.75	380	35	92	0.008	2.15Vn	6Vn	C 2
HSA 4024	4.2	380	40	84	0.008	2.15Vn	6Vn	C 2
HSA 4030	5	380	40	92	0.008	2.15Vn	6Vn	C 2
HSA 4056	5.9	380	40	120	0.008	2.15Vn	6Vn	C 2

Climatic category : 25/085/21
Capacitance tolerance (for HPA...) : +/- 10 %
Capacitance tolerance (for HSA...) : +/- 10 % or +/- 4 %
Loss angle tangent @ TA = 20 oC ; f = 1 kHz
Proof voltage test condition : t = 1 min.

Limited quantity

PAPER CAPACITORS FOR MOTORS

TYPE	Cn (uF)	VN (Vac)	DIMENSIONS D (mm)	DIMENSIONS L (mm)	LOSS ANGLE TANG. max	RizTC min (Mohms)	CASE
HAM 2706-240	4	250	35	68	0.006	200	C 2
HAM 2706-240	3.5	380	40	68	0.006	200	C 2
HAM 2806-240	3.5	380	40	68	0.010	200	C 2
HAM 2730-240	3.75	380	35	92	0.006	200	C 2
# HAM 2704-240	2.5	400	40	56	0.006	200	C 2
# HAM 2804-240	2.5	400	40	56	0.010	200	C 2
HAM 2722-240	3	400	35	84	0.006	200	C 2
HAM 2730-240	4	400	35	92	0.006	200	C 2

Climatic category : 25/070/21
Capacitance tolerance : +/- 10 %
Proof voltage between terminals :
(t=10 sec.) 2.15 Vn (Vac) or 2.15 $\sqrt{2}$ Vn (Vcc)
Proof voltage between interconnected terminals and case :
(t= 2 min.) 2 Vn + 1000 (Vac) but not less then 2000 Vac
Loss angle tangent @ TA = 25 oC ; f = 50 Hz
RizT @ V = 100 Vcc ; TC = 20 oC after 1 min.

On special request only .

METALLISED PAPER CAPACITORS OF "MKV" CONSTRUCTION FOR MOTORS

TYPE	Cn (uF)	VN (Vac)	DIMENSIONS D (mm)	L (mm)	LOSS ANGLE TANG. max	RizT min (Mohms)	CASE
HMPM 4090-240	7.5	400	40	92	0.006	200	C 2
HMPM 4086-240	10	400	40	86	0.01	200	C 2
HMPM50138-260	15	450	50	138	0.01	200	C 11
HMPM50138-260	20	400	50	138	0.01	200	C 11
HMPM50152-260	25	400	50	152	0.01	200	C 11

Climatic category : 25/070/21
Capacitance tolerance : +/- 10 %
Proof voltage between terminals :
(t=10 sec.) 2.15 Vn (Vac)
Proof voltage between interconnected terminals and case :
(t=10 sec.) 2 Vn + 1000 (Vac) but not less than 2000 Vac
Loss angle tangent @ TA = 25 oC ; f = 50 Hz
RizT @ V = 100 Vcc ; TC = 20 oC after 2 min.
Same value for RizTC ; test conditions :
V = 100 Vcc ; TC = 20 oC after 1 min.
Same value for RizTC ; test conditions (for 15 uF / 450 V) :
V = 500 Vcc ; TC = 20 oC after 1 min.

PAPER CAPACITORS FOR STARTERS

TYPE	Cn (uF)	VN (Vac)	DIMENSIONS D (mm)	H (mm)	l (mm)	LOSS ANGLE TANG. max	RizT min (Mohms)	CASE
HS 7101	0.01	220	28.6	13	4.7	0.01	50000	C 3

Climatic category : 10/070/-
Capacitance tolerance : +/- 20 %
Proof voltage between terminals : 3600 Vcc

SUPPRESSION BY-PASS CAPACITORS

TYPE	Cn (uF)	VN (Vac)	DIMENSIONS D (mm)	L (mm)	LOSS ANGLE TANG. max	RizT min (Mohms)	CASE
PMZ 6401	1	110	18	40	0.02	2000	C 4
PMZ 6411	8.2	40	45	70	0.02	244	C 5
PMZ 6412	8.2	40	45	70	0.02	100	C 5

	PMZ 6401	PMZ 6411	PMZ 6412
Climatic category :	40/070/21	40/085/21	65/070/21
Capacitance tolerance :	+/- 10 %	(all types)	
Proof voltage at :	330 Vcc (1 min.)	250 Vcc (1 sec.)	100 Vcc (1 sec.)
Loss angle tangent at : TA = 20 +/- 5 oC &	f = 1 kHz	f = 50 Hz	f = 50 Hz
Insulation resistance at TA = 20 oC & t = 1 min.	Vt= 100 Vcc +/- 15 Vcc	Vt = 25 Vcc +/- 5 Vcc	Vt= 100 Vcc +/- 15 Vcc

SUPPRESSION MULTIPLE CAPACITORS

TYPE	CnAA (uF)	CnAC CnA'C 2 x (pF)	VN (V)	DIMENSIONS D (mm)	L (mm)	RizT min (Mohms)	CASE
HZ 9401	0.10	2500	250	18	39	6000	C 1
HZ 9402	0.22	2500	250	18	39	6000	C 1
HZ 9403	0.22	22000	250	20	48	6000	C 6
HZ 9404	0.47	27000	250	30	43	6000	C 7

Capacitor CnAA' = class X
Capacitors CnAC & CnA'C = class Y

Climatic category : 25/085/21
Capacitance tolerance (CnAA') : +/- 20 %
Capacitance tolerance (CnAC / CnA'C) : +/- 30 % (..01,02)
Capacitance tolerance (CnAC / CnA'C) : +/- 20 % (..03,04)
Proof voltage (t = 60 sec.) :
- for CnAA' = 1075 Vcc ;
- for CnAC & CnA'C = 1500 Vca
Proof voltage between interconnected terminals and case :
(t = 60 sec.) = 2000 Vcc

MOTOR CAR EQUIPMENT PAPER CAPACITORS

TYPE	CN (uF)	DIMENSIONS D (mm)	L (mm)	l (mm)	CONSTRUCTION	LOSS ANGLE TANG. max	RizT min (Mohms)	CASE
HS 6510	0.22	17.5	39.5	45	(01)	0.010	6000	C 8
HS 6511	0.22	17.5	39.5	45	(02)	0.010	6000	C 8
HS 6513	0.22	17.5	39.5	45	(03)	0.010	6000	C 8
HS 6520	0.22	17.5	39.5	75	(01)	0.010	6000	C 8
HS 6521	0.22	17.5	39.5	75	(02)	0.010	6000	C 8
HS 6522	0.22	17.5	39.5	75	(04)	0.010	6000	C 8
HS 6524	0.22	17.5	39.5	75	(05)	0.010	6000	C 8
HS 6530	0.22	17.5	39.5	110	(01)	0.010	6000	C 8
HS 6541	0.22	17.5	39.5	275	(02)	0.010	6000	C 8
HS 6543	0.22	17.5	39.5	275	(03)	0.010	6000	C 8
HS 6550	0.22	17.5	30.5	90	(06)	0.010	6000	C 8
* HS 6722	0.27	17.5	48.5	75	(04)	0.005	6000	C 9
HS 6860	0.26	17.5	30.5		(07)	0.005	6000	C 10

Climatic category : 40/085/21 (40/100/21 for HS 6722)
Capacitance tolerance : +/- 15 % (+/- 5 % for HS 6722)
(+/- 10 % for HS 6860)
(+/- 20 % for HS 6550)
Proof voltage at 20 oC : 1200 Vcc ; t = 2 sec.
1000 Vac ; t = 5 sec.
330 Vac ; t = 1 hr.
Proof voltage at 85 oC : 220 Vac ; t = 1 hr.
100 oC : 220 Vac ; t = 1 hr. (HS 6722 only)
Loss angle tangent @ TA = 25 oC ; f = 1 kHz
RizT @ 500 +/- 50 Vcc ; TA 20 oC after 1 min.

(01) with slipper only
(02) with collar "A" & slipper
(03) with collar "A" only
(04) with collar "B" & slipper
(05) with collar "B" only
(06) without collar or slipper
(07) with slipper "C"

* For OLTCIT motor car

METALLISED PAPER CAPACITORS OF "MKV" CONSTRUCTION FOR THYRISTOR PROTECTION

TYPE	CN (uF)	Vn (Vac)	DIMENSIONS D (mm)	L (mm)	LOSS ANGLE TANG. max	RizTC min (Mohms)	CASE
HMPT 4092	0.47	1400	40	92	0.0003	3000	C 2
HMPT 4092	0.56	1400	40	92	0.0003	3000	C 2
HMPT 40138	1	1400	40	138	0.0003	3000	C 2

Climatic category : 40/070/21
Capacitance tolerance : +/- 10 %
Proof voltage between terminals :
(t=10 sec.) 2.15 Vn (Vac)
Proof voltage between interconnected terminals and case :
(t= 1 min.) 2 Vn + 1000 (Vac)
Loss angle tangent @ TA = 25 oC ; f = 50 Hz
RizTC @ V = 500 Vcc ; TA = 20 oC after 1 min.

AXIAL LEAD ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	l (mm)	Ir max (mA)	LOSS ANGLE TANG. max	Z (ohms)	CASE
EG 5248	100	4	8	20	38	40	.5	2.4	C 14
EG 5249	150	4	8	23	38	70	.5	1.6	C 14
EG 5252	220	4	9.5	23	38	70	.5	1.1	C 14
EG 5252	330	4	9.5	23	38	125	.5	0.8	C 14
EG 5256	470	4	12	23	50	150	.5	0.51	C 14
EG 5256	680	4	12	23	50	200	.5	0.4	C 14
EG 5260	1000	4	14	26	50	325	.5	0.24	C 14
EG 5260	1500	4	14	26	50	380	.5	0.17	C 14
EG 5262	2200	4	14	39	60	420	.5	0.11	C 14
EG 5262	3300	4	14	39	60	490	.5	0.08	C 14
EG 5245	47	6.3	6.5	23	38	25	.5	5.1	C 14
EG 5245	68	6.3	6.5	23	38	40	.5	3.52	C 14
EG 5249	100	6.3	8	23	38	60	.5	2.4	C 14
EG 5249	150	6.3	8	23	38	70	.5	1.6	C 14
EG 5252	220	6.3	9.5	23	38	90	.5	1.1	C 14
EG 5252	330	6.3	9.5	23	38	120	.5	0.73	C 14
EG 5257	470	6.3	12	26	50	190	.5	0.51	C 14
EG 5257	680	6.3	12	26	50	270	.5	0.35	C 14
EG 5261	1000	6.3	14	32	60	350	.5	0.24	C 14
EG 5261	1500	6.3	14	32	60	470	.5	0.16	C 14
EG 5263	2200	6.3	14	42.5	60	600	.5	0.11	C 14
EG 5263	3300	6.3	14	42.5	60	720	.5	0.08	C 14

Climatic category : 25/070/21
Capacitance tolerance : -10/+100 % (on request -10/+50 %)
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

AXIAL LEAD ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	l (mm)	Ir max (mA)	LOSS ANGLE TANG. max	Z (ohms)	CASE
EG 5243	22	10	6.5	17	38	25	.5	8.2	C 14
EG 5243	33	10	6.5	17	38	30	.5	5.5	C 14
EG 5251	47	10	9.5	20	38	40	.5	3.9	C 14
EG 5251	68	10	9.5	20	38	55	.5	2.65	C 14
EG 5251	100	10	9.5	20	38	70	.5	1.8	C 14
EG 5252	150	10	9.5	23	38	110	.5	1.2	C 14
EG 5253	220	10	9.5	26	50	125	.5	0.82	C 14
EG 5257	330	10	12	26	50	190	.5	0.55	C 14
EG 5258	470	10	12	32	50	300	.5	0.39	C 14
EG 5258	680	10	12	32	50	350	.5	0.27	C 14
EG 5262	1000	10	14	39	60	450	.5	0.18	C 14
EG 5262	1500	10	14	39	60	600	.5	0.12	C 14
EG 5247	22	16	8	17	38	25	.35	6.81	C 14
EG 5247	33	16	8	17	38	40	.35	4.6	C 14
EG 5249	47	16	8	23	38	55	.35	3.2	C 14
EG 5249	68	16	8	23	38	70	.35	2.3	C 14
EG 5252	100	16	9.5	23	38	90	.35	1.5	C 14
EG 5252	150	16	9.5	23	38	120	.35	1	C 14
EG 5257	220	16	12	26	50	190	.35	0.7	C 14
EG 5257	330	16	12	26	50	280	.35	0.46	C 14
EG 5260	470	16	14	26	50	350	.35	0.32	C 14
EG 5261	680	16	14	32	60	470	.35	0.23	C 14
EG 5263	1000	16	14	42.5	60	600	.35	0.15	C 14
EG 5263	1500	16	14	42.5	60	700	.35	0.1	C 14

Climatic category : 25/070/21
Capacitance tolerance : -10/+100 % (on request -10/+50 %)
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

AXIAL LEAD ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	l (mm)	Ir max (mA)	LOSS ANGLE TANG. max	Z (ohms)	CASE
EG 5244	10	25	6.5	20	38	20	.35	12	C 14
EG 5244	15	25	6.5	20	38	28	.35	8	C 14
EG 5248	22	25	8	20	38	35	.35	5.46	C 14
EG 5248	33	25	8	20	38	50	.35	3.63	C 14
EG 5250	47	25	8	26	38	60	.35	2.56	C 14
EG 5250	68	25	8	26	38	75	.35	1.8	C 14
EG 5253	100	25	9.5	26	50	100	.35	1.2	C 14
EG 5253	150	25	9.5	26	50	150	.35	0.8	C 14
EG 5258	220	25	12	32	50	230	.35	0.55	C 14
EG 5258	330	25	12	32	50	300	.35	0.36	C 14
EG 5262	470	25	14	39	60	360	.35	0.26	C 14
EG 5263	680	25	14	42.5	60	490	.35	0.18	C 14
EG 5263	1000	25	14	42.5	60	600	.35	0.12	C 14
EG 5243	4.7	40	6.5	17	38	10	.25	21.3	C 14
EG 5243	6.8	40	6.5	17	38	20	.25	14.7	C 14
EG 5247	10	40	8	17	38	25	.25	10	C 14
EG 5247	15	40	8	17	38	35	.25	6.67	C 14
EG 5249	22	40	8	23	38	50	.25	4.6	C 14
EG 5249	33	40	8	23	38	60	.25	3	C 14
EG 5253	47	40	9.5	26	50	90	.25	2.13	C 14
EG 5253	68	40	9.5	26	50	125	.25	1.5	C 14
EG 5257	100	40	12	26	50	150	.25	1	C 14
EG 5257	150	40	12	26	50	200	.25	0.67	C 14
EG 5261	220	40	14	32	60	300	.25	0.46	C 14
EG 5263	330	40	14	42.5	60	430	.25	0.3	C 14
EG 5263	470	40	14	42.5	60	500	.25	0.21	C 14

Same notes as per page 8 - 12 ; same notes for next page .

AXIAL LEAD ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	l (mm)	Ir max (mA)	LOSS ANGLE TANG. max	Z (ohms)	CASE
EG 5243	2.2	63	6.5	17	38	10	.25	36.4	C 14
EG 5243	3.3	63	6.5	17	38	15	.25	24.2	C 14
EG 5247	4.7	63	8	17	38	18	.25	17	C 14
EG 5247	6.8	63	8	17	38	25	.25	11.8	C 14
EG 5249	10	63	8	23	38	30	.25	8	C 14
EG 5249	15	63	8	23	38	40	.25	5.3	C 14
EG 5252	22	63	9.5	23	38	60	.25	3.65	C 14
EG 5252	33	63	9.5	23	38	85	.25	2.4	C 14
EG 5257	47	63	12	26	50	115	.25	1.7	C 14
EG 5257	68	63	12	26	50	140	.25	1.18	C 14
EG 5261	100	63	14	32	60	210	.25	0.8	C 14
EG 5262	150	63	14	39	60	280	.25	0.54	C 14
EG 5263	220	63	14	42.5	60	360	.25	0.37	C 14
EG 5263	330	63	14	42.5	60	420	.25	0.24	C 14
EG 5243	1.5	100	6.5	17	38	11	.2	46.6	C 14
EG 5247	2.2	100	8	17	38	19	.2	31.8	C 14
EG 5247	3.3	100	8	17	38	23	.2	21.2	C 14
EG 5249	4.7	100	8	23	38	30	.2	14.9	C 14
EG 5249	6.8	100	8	23	38	40	.2	10.3	C 14
EG 5252	10	100	9.5	23	38	50	.2	7	C 14
EG 5252	15	100	9.5	23	38	60	.2	4.67	C 14
EG 5257	22	100	12	26	50	80	.2	3.18	C 14
EG 5257	33	100	12	26	50	100	.2	2.12	C 14
EG 5261	47	100	14	32	60	115	.2	1.5	C 14
EG 5261	68	100	14	32	60	130	.2	1.03	C 14
EG 5263	100	100	14	42.5	60	180	.2	0.7	C 14
EG 5263	150	100	14	42.5	60	240	.2	0.47	C 14

AXIAL LEAD ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	l (mm)	Ir max (mA)	LOSS ANGLE TANG. max	Z (ohms)	CASE
$ EG 5249	2.2	160	8	23	50	23	.2	45.5	C 14
$ EG 5250	3.3	160	8	26	50	29	.2	30.3	C 14
$ EG 5253	4.7	160	9.5	26	50	39	.2	21.3	C 14
$ EG 5256	6.8	160	12	23	50	52	.2	14.7	C 14
$ EG 5257	10	160	12	26	50	67	.2	10	C 14
$ EG 5258	15	160	12	32	50	90	.2	6.6	C 14
EG 5261	22	160	14	32	60	120	.2	4.55	C 14
$ EG 5263	33	160	14	42.5	60	160	.2	3.03	C 14
$ EG 5252	2.2	250	9.5	23	38	22	.2	68.2	C 14
$ EG 5253	3.3	250	9.5	26	50	29	.2	45.5	C 14
$ EG 5256	4.7	250	12	23	50	38	.2	32	C 14
$ EG 5257	6.8	250	12	26	50	49	.2	22.1	C 14
$ EG 5258	10	250	12	32	50	65	.2	15	C 14
$ EG 5259	15	250	12	39	60	88	.2	10	C 14
$ EG 5262	22	250	14	39	60	116	.2	6.82	C 14

Climatic category : 25/070/21
Capacitance tolerance : -10/+50 %
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

Same notes for page 8 - 14 .
$ Preliminary data

AXIAL LEAD ELECTROLYTIC CAPACITORS

	TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	l (mm)	Ir max (mA)	LOSS ANGLE TANG. max	Z (ohms)	CASE
$	EG 5249	1	350	8	23	38	13	.2	170	C 14
$	EG 5250	1.5	350	8	26	38	18	.2	113.3	C 14
$	EG 5253	2.2	350	9.5	26	50	24	.2	77.3	C 14
$	EG 5256	3.3	350	12	23	50	32	.2	51.5	C 14
$	EG 5257	4.7	350	12	26	50	41	.2	36.2	C 14
	EG 5258	6.8	350	12	32	50	54	.2	25	C 14
	EG 5261	10	350	14	32	60	72	.2	17	C 14
	EG 5263	15	350	14	42.5	60	100	.2	11.33	C 14
$	EG 5249	0.68	450	8	23	50	11	.2	397.1	C 14
$	EG 5250	1	450	8	26	50	14	.2	270	C 14
$	EG 5253	1.5	450	9.5	26	50	19	.2	180	C 14
$	EG 5256	2.2	450	12	23	50	26	.2	128.8	C 14
$	EG 5257	3.3	450	12	26	50	34	.2	81.81	C 14
$	EG 5258	4.7	450	12	32	50	45	.2	57.45	C 14
$	EG 5261	6.8	450	14	32	60	58	.2	39.71	C 14
$	EG 5263	10	450	14	42.5	60	81	.2	27	C 14

Climatic category : 25/070/21
Capacitance tolerance : -10/+50 %
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

$ Preliminary data

RADIAL LEAD ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	d (mm)	Ir max (mA)	LOSS ANGLE TANG. max	Z (ohms)	CASE
EG 6111	100	4	9.5	12.7	5	9	.5	2.5	C 15
EG 6111	150	4	9.5	12.7	5	16	.5	1.7	C 15
EG 6121	220	4	12.7	12.7	5	25	.5	1.2	C 15
EG 6121	330	4	12.7	12.7	5	36	.5	0.8	C 15
EG 6123	470	4	12.7	25.4	5	50	.5	0.6	C 15
EG 6123	680	4	12.7	25.4	5	64	.5	0.4	C 15
EG 6111	68	6.3	9.5	12.7	5	9	.5	3.54	C 15
EG 6111	100	6.3	9.5	12.7	5	9	.5	2.4	C 15
EG 6121	150	6.3	12.7	12.7	5	28	.5	1.6	C 15
EG 6121	220	6.3	12.7	12.7	5	37	.5	1.1	C 15
EG 6123	330	6.3	12.7	25.4	5	64	.5	0.8	C 15
EG 6123	470	6.3	12.7	25.4	5	64	.5	0.52	C 15
EG 6111	47	10	9.5	12.7	5	9	.5	3.83	C 15
EG 6111	68	10	9.5	12.7	5	12	.5	2.65	C 15
EG 6121	100	10	12.7	12.7	5	35	.5	1.8	C 15
EG 6121	150	10	12.7	12.7	5	40	.5	1.2	C 15
EG 6123	220	10	12.7	25.4	5	50	.5	0.81	C 15
EG 6123	330	10	12.7	25.4	5	64	.5	0.6	C 15
EG 6144	680	10	18	32	10	220	.5	0.26	C 15
EG 6144	1000	10	18	32	10	300	.5	0.18	C 15
EG 6144	1500	10	18	32	10	300	.5	0.12	C 15

Climatic category : 25/070/21
Capacitance tolerance : -10/+100 % (on request -10/+50 %)
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

RADIAL LEAD ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	d (mm)	Ir max (mA)	LOSS ANGLE TANG. max	Z (ohms)	CASE
EG 6111	47	16	9.5	12.7	5	9	.35	3.4	C 15
EG 6111	68	16	9.5	12.7	5	20	.35	2.2	C 15
EG 6121	100	16	12.7	12.7	5	37	.35	1.5	C 15
EG 6121	150	16	12.7	12.7	5	45	.35	1	C 15
EG 6123	220	16	12.7	25.4	5	64	.35	0.68	C 15
EG 6123	330	16	12.7	25.4	5	64	.35	0.46	C 15
EG 6142	470	16	18	18	10	80	.35	0.32	C 15
EG 6144	680	16	18	32	10	300	.35	0.22	C 15
EG 6144	1000	16	18	32	10	360	.35	0.15	C 15
EG 6144	1500	16	18	32	10	360	.35	0.1	C 15
EG 6111	22	25	9.5	12.7	5	9	.35	5.5	C 15
EG 6111	33	25	9.5	12.7	5	15	.35	3.6	C 15
EG 6121	47	25	12.7	12.7	5	40	.25	2.6	C 15
EG 6121	68	25	12.7	12.7	5	45	.35	1.76	C 15
EG 6123	100	25	12.7	25.4	5	64	.35	1.2	C 15
EG 6123	150	25	12.7	25.4	5	64	.35	0.8	C 15
EG 6123	220	25	12.7	25.4	5	70	.35	0.55	C 15
EG 6144	470	25	18	32	10	300	.35	0.26	C 15
EG 6144	680	25	18	32	10	300	.35	0.18	C 15

Climatic category : 25/070/21
Capacitance tolerance : -10/+100 % (on request -10/+50 %)
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

RADIAL LEAD ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	d (mm)	Ir max (mA)	LOSS ANGLE TANG. max	Z (ohms)	CASE
EG 6111	4.7	40	9.5	12.7	5	7	.25	21.3	C 15
EG 6111	6.8	40	9.5	12.7	5	7	.25	14.7	C 15
EG 6111	10	40	9.5	12.7	5	9	.25	10	C 15
EG 6111	15	40	9.5	12.7	5	9	.25	6.67	C 15
EG 6123	100	40	12.7	25.4	5	70	.25	1	C 15
EG 6111	4.7	63	9.5	12.7	5	9	.25	17	C 15
EG 6111	6.8	63	9.5	12.7	5	9	.25	17.7	C 15
EG 6121	22	63	12.7	12.7	5	40	.25	3.7	C 15
EG 6121	33	63	12.7	12.7	5	40	.25	2.4	C 15
EG 6123	47	63	12.7	25.4	5	64	.25	1.8	C 15
EG 6123	68	63	12.7	25.4	5	64	.25	1.78	C 15

Climatic category : 25/070/21
Capacitance tolerance : -10/+100 % (on request -10/+50 %)
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

MINIATURE ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	d (mm)	Ir max (mA)	LOSS ANGLE TANG. max	Z (ohms)	CASE
EG 6318	100	6.3	8	12.5	3.5	70	.5	2.4	C 16
EG 6315	10	16	5	11	2.2	30	.35	15	C 16
EG 6316	22	16	6	11	2.5	50	.35	7	C 16
EG 6315	4.7	25	5	11	2.2	20	.35	17	C 16
EG 6315	6.8	25	5	11	2.2	20	.35	17	C 16
EG 6316	10	25	6	11	2.5	25	.35	10	C 16
EG 6316	15	25	6	11	2.5	25	.35	8	C 16
EG 6318	22	25	8	12.5	3.5	45	.35	5	C 16
EG 6318	33	25	8	12.5	3.5	52	.35	4	C 16
EG 6316	4.7	40	6	11	2.5	15	.35	20	C 16
EG 6316	10	40	6	11	2.5	40	.35	10	C 16

Climatic category : 40/070/21
Capacitance tolerance : -10/+100 % (on request -10/+50 %)
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	d (mm)	Ir max (mA)	LOSS ANGLE TANG. max	Z (ohms)	CASE
EG 7330	1500	25	30	31	15	1100	.35	0.12	C 17
EG 7330	2200	25	30	31	15	1400	.35	0.1	C 17
EG 7365	4700	25	30	65	15	2500	.35	0.1	C 17
EG 7335	1000	40	30	35	15	1100	.25	0.15	C 17
EG 7335	1500	40	30	35	15	1370	.25	0.1	C 17

Climatic category : 25/070/21
Capacitance tolerance : -10/+50
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	l (mm)	Ir max (A)	LOSS ANGLE TANG. max	Z (ohms)	CASE
EG 7475	2200	16	25	38	38	1.2	.35	0.1	C 18
EG 7477	3300	16	25	50	38	1.8	.35	0.1	C 18
EG 7478	4700	16	30	50	38	2.5	.35	0.1	C 18
EG 7480	6800	16	30	65	38	3	.45	0.1	C 18
EG 7480	10000	16	30	65	38	3.5	.45	0.1	C 18
EG 7473	680	25	20	38	38	0.68	.35	0.26	C 18
EG 7474	1000	25	20	50	38	0.95	.35	0.18	C 18
EG 7476	1500	25	20	65	38	1.3	.35	0.12	C 18
EG 7477	2200	25	25	50	38	1.6	.35	0.1	C 18
EG 7480	3300	25	30	65	38	2.2	.35	0.1	C 18
EG 7480	4700	25	30	65	38	2.5	.45	0.1	C 18
EG 7480	6800	25	30	65	38	3	.45	0.1	C 18
EG 7473	470	40	20	38	38	0.68	.25	0.32	C 18
EG 7474	680	40	20	50	38	0.93	.25	0.22	C 18
EG 7476	1000	40	20	65	38	1.26	.25	0.15	C 18
EG 7478	1500	40	30	50	38	1.7	.25	0.1	C 18
EG 7480	2200	40	30	65	38	2.13	.25	0.1	C 18
EG 7480	3300	40	30	65	38	2.3	.35	0.1	C 18

Climatic category : 25/070/21
Capacitance tolerance : -10/+50 %
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	l (mm)	Ir max (A)	LOSS ANGLE TANG. max	Z (ohms)	CASE
EG 7473	220	63	20	38	38	0.45	.25	0.54	C 18
EG 7474	330	63	20	50	38	0.65	.25	0.36	C 18
EG 7475	470	63	25	38	38	0.77	.25	0.25	C 18
EG 7478	680	63	30	50	38	1.05	.25	0.17	C 18
EG 7478	1000	63	30	50	38	1.4	.25	0.12	C 18
EG 7478	1500	63	30	50	38	1.95	.25	0.1	C 18
EG 7480	2200	63	30	65	38	1.95	.35	0.1	C 18
EG 7473	100	100	20	38	38	0.35	.2	1	C 18
EG 7474	150	100	20	50	38	0.47	.2	0.66	C 18
EG 7476	220	100	20	65	38	0.56	.2	0.45	C 18
EG 7478	330	100	30	50	38	0.8	.2	0.33	C 18
EG 7480	470	100	30	65	38	1.2	.2	0.21	C 18
EG 7480	680	100	30	65	38	1.4	.2	0.14	C 18
EG 7480	1000	100	30	65	38	1.7	.2	0.1	C 18
$ EG 7473	33	160	20	38	38	0.2	.2	3	C 18
$ EG 7474	47	160	20	50	38	0.27	.2	2.1	C 18
$ EG 7476	68	160	20	65	38	0.36	.2	1.5	C 18
$ EG 7479	100	160	25	65	38	0.49	.2	1	C 18
$ EG 7478	150	160	30	50	38	0.59	.2	0.7	C 18
$ EG 7480	220	160	30	65	38	0.81	.2	0.5	C 18

Climatic category : 25/070/21
Capacitance tolerance : -10/+50 %
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

$ Preliminary data

ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	l (mm)	Ir max (A)	LOSS ANGLE TANG. max	Z (ohms)	CASE
EG 7473	22	250	20	38	38	0.14	.2	6.8	C 18
EG 7474	33	250	20	50	38	0.2	.2	4.5	C 18
EG 7476	47	250	20	65	38	0.26	.2	3.2	C 18
EG 7477	68	250	25	50	38	0.32	.2	2.2	C 18
EG 7478	100	250	30	50	38	0.43	.2	1.5	C 18
EG 7480	150	250	30	65	38	0.59	.2	1	C 18
EG 7473	15	350	20	38	38	0.12	.2	11.3	C 18
EG 7474	22	350	20	50	38	0.16	.2	7.7	C 18
EG 7476	33	350	20	65	38	0.22	.2	5.2	C 18
EG 7477	47	350	25	50	38	0.26	.2	3.6	C 18
EG 7478	68	350	30	50	38	0.35	.2	2.5	C 18
EG 7480	100	350	30	65	38	0.48	.2	1.7	C 18
EG 7473	10	450	20	38	38	.098	.2	27	C 18
EG 7474	15	450	20	50	38	0.13	.2	18	C 18
EG 7476	22	450	20	65	38	0.18	.2	12.2	C 18
EG 7479	33	450	25	65	38	0.25	.2	8.2	C 18
EG 7478	47	450	30	50	38	0.29	.2	5.7	C 18
EG 7480	68	450	30	65	38	0.4	.2	3.9	C 18

Climatic category : 25/070/21
Capacitance tolerance : -10/+50 %
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

HIGH CAPACITANCE ELECTROLYTIC CAPACITORS.

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	(mm)	Ir max (A)	LOSS ANGLE TANG. max	Z (ohms)	CASE
EG 7691	10000	16	35	70	10	3.1	.85	0.22	C 19
EG 7692	15000	16	40	70	15	4.2	.85	0.15	C 19
EG 7693	22000	16	35	115	10	5.6	.85	0.1	C 19
EG 7694	33000	16	40	115	15	7.8	.85	0.1	C 19
EG 7695	47000	16	50	115	15	9.8	.85	0.1	C 19
EG 7691	6800	25	35	70	10	2.8	.75	0.26	C 19
EG 7692	10000	25	40	70	15	4	.75	0.18	C 19
EG 7693	15000	25	35	115	10	4.8	.75	0.12	C 19
EG 7694	22000	25	40	115	15	6.5	.75	0.1	C 19
EG 7695	33000	25	50	115	15	9.8	.75	0.1	C 19
EG 7691	3300	40	35	70	10	1.8	.75	0.46	C 19
EG 7691	4700	40	35	70	10	2.3	.75	0.32	C 19
EG 7692	6800	40	40	70	15	3.2	.75	0.22	C 19
EG 7694	10000	40	40	115	15	4.2	.75	0.15	C 19
EG 7695	15000	40	50	115	15	5.9	.75	0.1	C 19
EG 7695	22000	40	50	115	15	7.4	.75	0.1	C 19

Climatic category : 25/070/21
Capacitance tolerance : -10/+50 %
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

HIGH CAPACITANCE ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	d (mm)	Ir max (A)	LOSS ANGLE TANG. max	Z (ohms)	CASE
EG 7691	2200	63	35	70	10	1.8	.6	0.55	C 19
EG 7692	3300	63	40	70	15	2.5	.6	0.36	C 19
EG 7693	4700	63	35	115	10	3.2	.6	0.26	C 19
EG 7694	6800	63	40	115	15	3.9	.6	0.18	C 19
EG 7695	10000	63	50	115	15	5.4	.6	0.12	C 19
EG 7695	15000	63	50	115	15	6.6	.6	0.1	C 19
EG 7692	1000	100	40	70	15	1.3	.5	1	C 19
EG 7693	1500	100	35	115	10	1.9	.5	0.67	C 19
EG 7694	2200	100	40	115	15	2.4	.5	0.46	C 19
EG 7695	3300	100	50	115	15	3.5	.5	0.3	C 19
EG 7695	4700	100	50	115	15	4	.5	0.21	C 19
EG 7695	680	350	50	115	15	1.8	.2	0.5	C 19
EG 7695	1000	350	50	115	15	1.8	.2	0.5	C 19

Climatic category : 25/070/21
Capacitance tolerance : -10/+50 %
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

SINGLE / MULTIPLE ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	d (mm)	Ir max (mA)	LOSS ANGLE TANG. max	Z (ohms)	CASE
EG 2470	100	250	35	56	*	350	.2	1.5	C 20
EG 2470	100	250	35	56	*	350	.2	1.5	C 20
EG 2466	100	350	30	60	*	468	.2	1.7	C 20
EG 2471	220	350	35	73	*	860	.2	0.77	C 20
EG 2472	390+	160	35	73	*	1200	.2	0.25	C 20
	220	160				800	.2	0.45	
EG 2470	100+	250	35	56	*	350	.2	1.5	C 20
	100	250				350	.2	1.5	
EG 2466	47+	350	30	60	*	468	.2	1.7	C 20
	47	350				468	.2	1.7	
EG 2471	100+	350	35	73	*	410	.2	1.7	C 20
	100	350				410	.2	1.7	
EG 2471	47+	350	35	80	*	198	.2	3.62	C 20
	47+	350				198	.2	3.62	
	100	350				420	.2	1.7	
EG 2471	100+	350	35	80	*	400	.2	1.7	C 20
	100+	350				400	.2	1.7	
	10	350				40	.2	17	

Climatic category : 25/070/21
Capacitance tolerance : -10/+50 %
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC
* See case outline

SINGLE / MULTIPLE ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	d (mm)	Ir max (mA)	LOSS ANGLE TANG. max	Z (ohms)	CASE
EG 1162	33	350	29	46	*	235	.2	5.15	C 21
EG 1162	47	350	29	46	*	280	.2	3.62	C 21
EG 1164	100	350	29	73	*	502	.2	1.7	C 21
EG 1162	22	450	29	46	*	192	.2	12.2	C 21
EG 1162	33	450	29	46	*	235	.2	8.18	C 21
EG 1163	47	450	29	63	*	322	.2	5.25	C 21
EG 1170	100	450	35	73	*	556	.2	2.9	C 21
EG 1162	15+	350	29	46	*	112	.2	11.3	C 21
	15	350				112	.2	11.3	
EG 1163	33+	350	29	63	*	191	.2	5.15	C 21
	33	350				191	.2	5.15	
EG 1164	47+	350	29	73	*	244	.2	3.62	C 21
	47	350				244	.2	3.62	
EG 1162	15+	450	29	46	*	112	.2	18	C 21
	15	450				112	.2	18	
EG 1170	33+	450	35	73	*	227	.2	8.18	C 21
	33	450				227	.2	8.18	
EG 1170	47+	450	35	73	*	270	.2	5.25	C 21
	47	450				270	.2	5.25	

Climatic category : 25/070/21
Capacitance tolerance : -10/+50 %
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC
$ See case outline

HIGH VOLTAGE ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	d (mm)	Ir max (A)	LOSS ANGLE TANG. max	Z (ohms)	CASE
# EF 7217IT	120	200	26	94	*	0.9	.20	0.8	C 22

Climatic category : 25/070/56
Capacitance tolerance : -10/+50 % ; +/-20 %
Ripple current (Ir) @ f = 20 kHz ; TA = 70 oC
Ir = max. 0.4 A @ f = 50 Hz = TA = 70 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC
Equivalent series resistance = max. 2 ohms @ f = 120 Hz

HIGH VOLTAGE ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	d (mm)	Ir max (A)	LOSS ANGLE TANG. max	Z (ohms)	CASE
# EP 7738IT	680	200	35	118	*	4.2	.20	0.26	C 23
# EP 7738IT	820	200	35	118	*	4.2	.20	0.26	C 23

Climatic category : 25/070/56
Capacitance tolerance : -10/+50 % ; +/-20 %
Ripple current (Ir) @ f = 20 kHz ; TA = 70 oC
Ir = max. 2.4 A @ f = 50 Hz = TA = 70 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC
Equivalent series resistance = max. 0.5 ohms @ f = 120 Hz

Limited quantity

HIGH CAPACITANCE ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	d (mm)	Ir max (A)	LOSS ANGLE TANG. max	Z (ohms)	CASE
# EP 7738	33000	10	35	118	*	7	.6	0.04	C 21
# EP 7735	6800	25	35	75	*	5.6	.3	0.055	C 21
# EP 7737	10000	25	35	100	*	6.1	.4	0.05	C 21
# EP 7738	6800	40	35	118	*	7	.25	0.055	C 21
# EP 7738	8200	40	35	118	*	7	.25	0.055	C 21
# EP 7738	10000	40	35	118	*	7	.3	0.05	C 21
# EP 7758	15000	40	51	118	*	10	.3	0.06	C 21
# EP 7738	4700	63	35	118	*	7	.2	0.065	C 21
# EP 7738	5600	63	35	118	*	7	.2	0.065	C 21
# EP 7738	6800	63	35	118	*	7	.2	0.065	C 21
# EP 7758	10000	63	51	118	*	14	.25	0.055	C 21

Climatic category : 25/070/56
Capacitance tolerance : -10/+50 % ; +/-20 %
Ripple current (Ir) @ f = 20 kHz ; TA = 70 oC
Ir = max. 3.2 A @ f = 50 Hz ; TA = 70 oC (6800uF/25V)
to
Ir = max. 8.0 A @ f = 50 Hz ; TA = 70 oC (10000uF/63V)
Impedance (Z) @ f = 10 kHz ; TA = 20 oC
Equivalent series resistance @ f = 120 Hz
max. 55 mohms (15000uF/40V)
to
max. 80 mohms (6800uF/63V)

Limited quantity

HIGH CAPACITANCE ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VnN (V)	DIMENSIONS D (mm)	L (mm)	d (mm)	Ir max (A)	LOSS ANGLE TANG. max	Z (ohms)	CASE
# EF 7738	33000	7.5	35	117	*	12	.25	0.015	C 22

Climatic category : 25/070/56
Capacitance tolerance : -10/+50 % ; +/-20 %
Ripple current (Ir) @ f = 20 kHz ; TA = 70 oC
Ir = max. 5.0 A @ f = 50 Hz = TA = 70 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC
Equivalent series resistance = max. 10 mohms @ f = 120 Hz

SUPPRESSION ELECTROLYTIC CAPACITORS FOR OLTCIT MOTOR CAR

TYPE	Cn (uF)	VN (V)	DIMENSIONS H (mm)	L (mm)	l (mm)	LOSS ANGLE TANG. max	Z (ohms)	CASE
EA 9050	50	12	20.5	53	258	0.14	2.5	C 24

Climatic category : 25/085/56
Capacitance tolerance : -10/+50 %
Ripple current (Ir) @ f = 10 kHz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

Limited quantity

UNPOLARISED ELECTROLYTIC CAPACITORS

	TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	l (mm)	Ir max (mA)	LOSS ANGLE TANG. max	Z (ohms)	CASE
$	EN 5244	22	6.3	6.5	20	38	40	.5	11	C 14
$	EN 5247	33	6.3	8	17	38	52	.5	8	C 14
$	EN 5248	47	6.3	8	20	38	65	.5	5.1	C 14
$	EN 5251	68	6.3	9.5	20	38	85	.5	4	C 14
$	EN 5250	100	6.3	8	26	38	110	.5	2.4	C 14
$	EN 5250	150	6.3	8	26	38	135	.5	1.6	C 14
$	EN 5256	220	6.3	12	23	38	190	.5	1.1	C 14
	EN 5257	330	6.3	12	26	38	250	.5	0.8	C 14
	EN 5260	470	6.3	14	26	60	325	.5	0.51	C 14
	EN 5259	680	6.3	12	39	60	420	.5	0.4	C 14
	EN 5262	1000	6.3	14	39	60	560	.5	0.24	C 14
$	EN 5244	15	10	6.5	20	38	33	.5	12	C 14
$	EN 5247	22	10	8	17	38	40	.5	8.2	C 14
$	EN 5245	33	10	6.5	23	38	50	.5	5.5	C 14
$	EN 5251	47	10	9.5	20	38	78	.5	4	C 14
$	EN 5250	68	10	8	26	38	90	.5	3	C 14
$	EN 5250	100	10	8	26	38	110	.5	1.8	C 14
$	EN 5256	150	10	12	23	38	150	.5	1.2	C 14
$	EN 5257	220	10	12	26	38	200	.5	0.28	C 14
$	EN 5260	330	10	14	26	60	270	.5	0.55	C 14
$	EN 5259	470	10	12	39	60	340	.5	0.4	C 14
$	EN 5262	680	10	14	39	60	465	.5	0.3	C 14

Climatic category : 25/070/21
Capacitance tolerance : -10/+50 %
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

$ Preliminary data

UNPOLARISED ELECTROLYTIC CAPACITORS

	TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	l (mm)	Ir max (mA)	LOSS ANGLE TANG. max	Z (ohms)	CASE
$	EN 5243	10	16	6.5	17	38	28	.35	15	C 14
$	EN 5244	15	16	6.5	17	38	38	.35	10	C 14
$	EN 5247	22	16	8	17	38	48	.35	7	C 14
$	EN 5248	33	16	8	20	38	64	.35	5	C 14
$	EN 5251	47	16	9.5	20	38	85	.35	4	C 14
$	EN 5252	68	16	9.5	23	38	105	.35	3	C 14
$	EN 5253	100	16	9.5	26	38	140	.35	1.5	C 14
$	EN 5256	150	16	12	23	38	180	.35	1	C 14
$	EN 5257	220	16	12	26	38	235	.35	0.7	C 14
$	EN 5258	330	16	12	32	38	325	.35	0.5	C 14
$	EN 5261	470	16	14	32	60	420	.35	0.4	C 14
$	EN 5263	680	16	14	42.5	60	570	.35	0.3	C 14
$	EN 5243	4.7	25	6.5	17	38	18	.35	26	C 14
$	EN 5244	6.8	25	6.5	20	38	24	.35	18	C 14
$	EN 5247	10	25	8	17	38	30	.35	12	C 14
$	EN 5248	15	25	8	20	38	40	.35	8	C 14
$	EN 5249	22	25	8	23	38	55	.35	6	C 14
	EN 5250	33	25	8	26	38	70	.35	4	C 14
$	EN 5253	47	25	9.5	26	38	90	.35	2.6	C 14
	EN 5256	68	25	12	23	38	120	.35	1.8	C 14
$	EN 5257	100	25	12	26	38	155	.35	1.2	C 14
$	EN 5260	150	25	14	26	50	210	.35	0.8	C 14
$	EN 5261	220	25	14	32	60	285	.35	0.6	C 14
$	EN 5262	330	25	14	42.5	60	390	.35	0.4	C 14

Climatic category : 25/070/21
Capacitance tolerance : -10/+50 %
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

$ Preliminary data

UNPOLARISED ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	l (mm)	Ir max (mA)	LOSS ANGLE TANG. max	Z (ohms)	CASE
$ EN 5243	3.3	40	6.5	17	38	18	.25	31	C 14
$ EN 5244	4.7	40	6.5	20	38	20	.25	22	C 14
$ EN 5245	6.8	40	6.5	23	38	30	.25	15	C 14
$ EN 5251	10	40	9.5	20	38	43	.25	10	C 14
$ EN 5249	15	40	8	23	38	50	.25	7	C 14
$ EN 5250	22	40	8	26	38	68	.25	5	C 14
$ EN 5253	33	40	9.5	26	38	87	.25	3.1	C 14
$ EN 5257	47	40	12	26	38	125	.25	2.2	C 14
$ EN 5260	68	40	14	26	50	165	.25	1.5	C 14
$ EN 5259	100	40	12	39	50	230	.25	1	C 14
$ EN 5262	150	40	14	39	60	300	.25	0.7	C 14
$ EN 5263	220	40	14	42.5	60	380	.25	0.5	C 14
$ EN 5243	1.5	63	6.5	17	38	12	.25	54	C 14
$ EN 5244	2.2	63	6.5	20	38	15	.25	36	C 14
$ EN 5247	3.3	63	8	17	38	18	.25	24	C 14
$ EN 5248	4.7	63	8	20	38	25	.25	16	C 14
$ EN 5251	6.8	63	9.5	20	38	35	.25	12	C 14
$ EN 5252	10	63	9.5	23	38	43	.25	8	C 14
$ EN 5253	15	63	9.5	26	38	58	.25	5.4	C 14
EN 5256	22	63	12	23	38	80	.25	3.6	C 14
EN 5257	33	63	12	26	38	100	.25	2.4	C 14
EN 5260	47	63	14	26	50	135	.25	1.5	C 14
$ EN 5259	68	63	12	39	50	185	.25	1.2	C 14
$ EN 5263	100	63	14	42.5	60	260	.25	0.8	C 14

Climatic category : 25/070/21
Capacitance tolerance : -10/+50 %
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

$ Preliminary data

UNPOLARISED ELECTROLYTIC CAPACITORS

TYPE	Cn (uF)	VN (V)	DIMENSIONS D (mm)	L (mm)	l (mm)	Ir max (mA)	LOSS ANGLE TANG. max	Z (ohms)	CASE
$ EN 5248	1.5	100	8	20	38	15	.2	47	C 14
$ EN 5251	2.2	100	9.5	20	38	20	.2	32	C 14
$ EN 5249	3.3	100	8	23	38	25	.2	22	C 14
$ EN 5252	4.7	100	9.5	23	38	34	.2	15	C 14
$ EN 5253	6.8	100	9.5	26	38	44	.2	11	C 14
$ EN 5257	10	100	12	26	38	60	.2	7	C 14
EN 5260	15	100	14	26	50	84	.2	4.7	C 14
$ EN 5259	22	100	12	39	50	110	.2	3.2	C 14
$ EN 5262	33	100	14	39	60	150	.2	2.2	C 14
$ EN 5263	47	100	14	42.5	60	190	.2	1.5	C 14

Climatic category : 25/070/21
Capacitance tolerance : -10/+50 %
Ripple current (Ir) @ f = 100 Hz ; TA = 50 oC
Impedance (Z) @ f = 10 kHz ; TA = 20 oC

$ Preliminary data

UNPOLARISED ELECTROLYTIC CAPACITORS FOR MOTORS

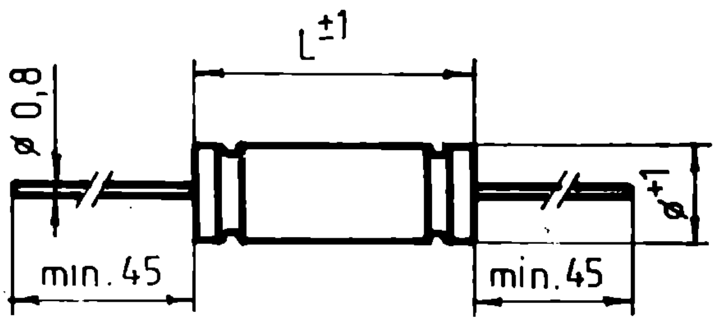
TYPE	Cn (uF)	VN (Vac)	DIMENSIONS D (mm)	L (mm)	d (mm)	In max (A)	LOSS ANGLE TANG. max	V max (V)	CASE
EM 4892	80	220	35	75	6	*	.15	250	C 25
EM 4893	100	220	35	88	6	*	.15	250	C 25
EM 4894	125	220	35	102	6	*	.15	250	C 25
EM 4895	160	220	35	118	6	*	.15	250	C 25

Climatic category : 10/055/21
Capacitance tolerance : 0 / +30 % ; -10/ +50 %
* Current computing formulae : In = 2 * PI * f * Cn * Vn
f = frequency (Hz) ; Cn = capacitance
PI = 3.1416..... ; Vn = rated voltage
Loss angle tangent @ f = 80...120 Hz ; TA = 25+/-5 oC

CASE OUTLINES - All dimensions in mm.

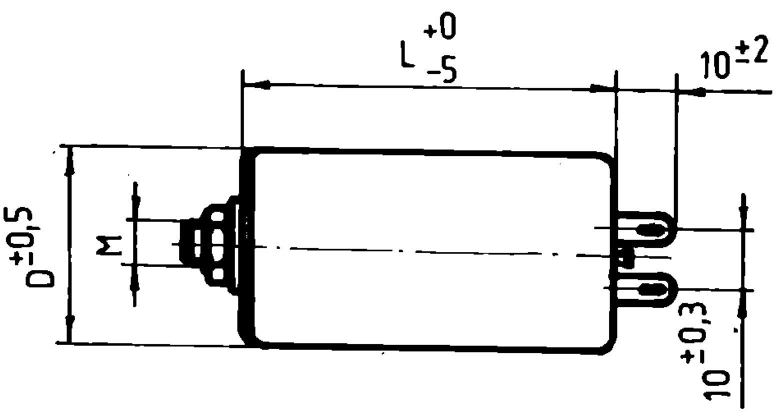
C 1

HC...
HPI...
HZ 9401
HZ 9402



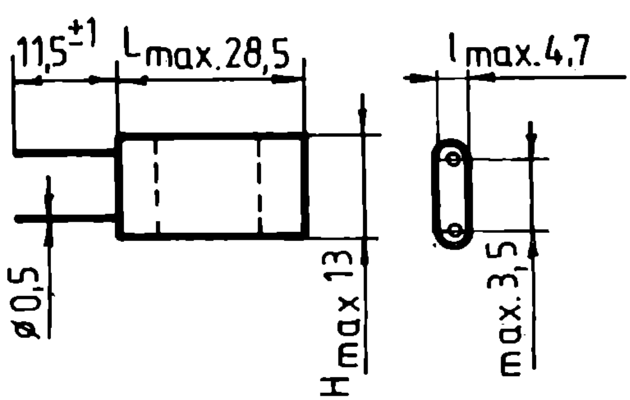
C 2

HAM...
HMPM 4000
HMPT...
HPA...
HPR...
HSA...
HT 50130



C 3

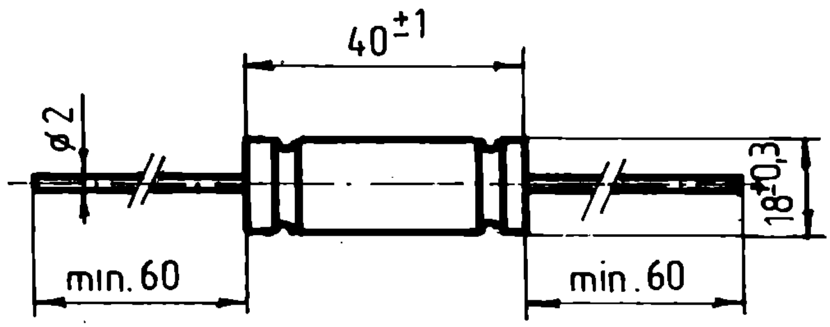
HS 7101



CASE OUTLINES - All dimensions in mm.

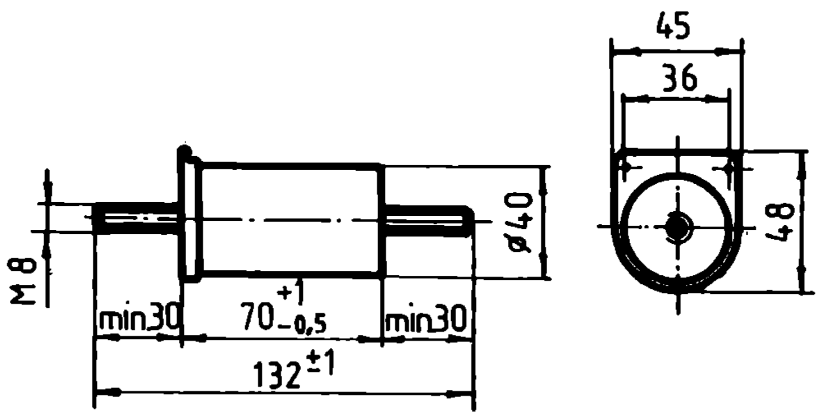
C 4

PMZ 6401



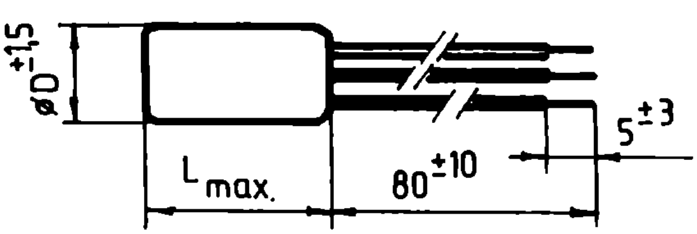
C 5

PMZ 6411
PMZ 6412



C 6

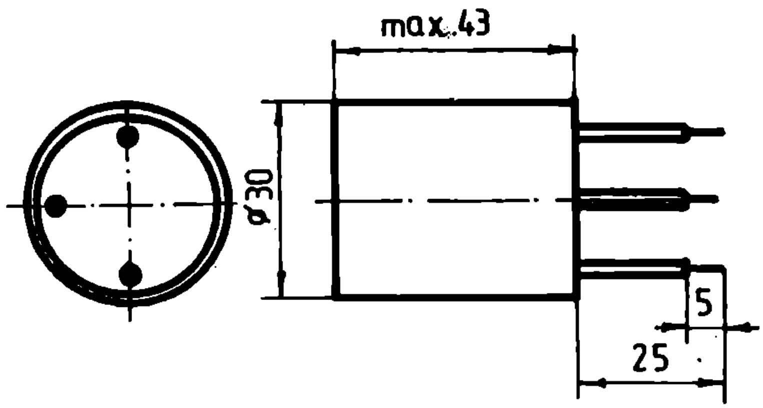
HZ 9403



CASE OUTLINES - All dimensions in mm.

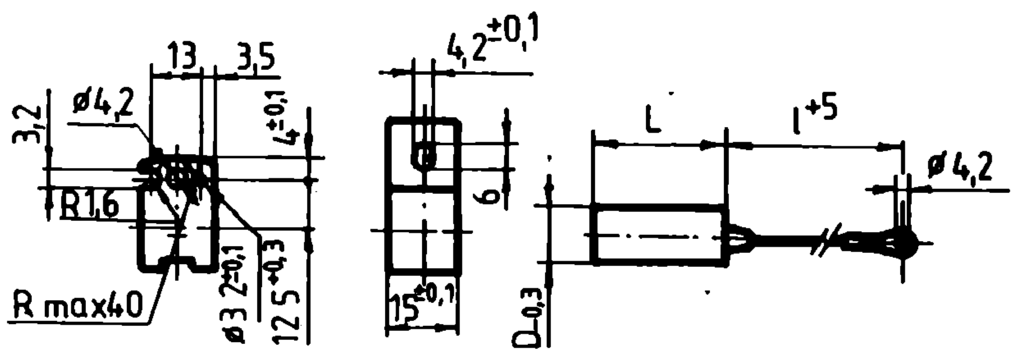
C 7

HZ 9404



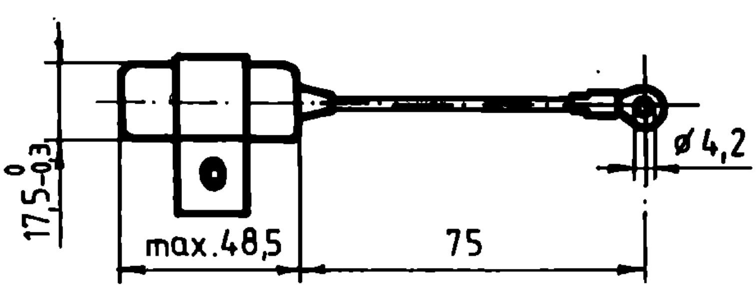
C 8

HS 65..



C 9

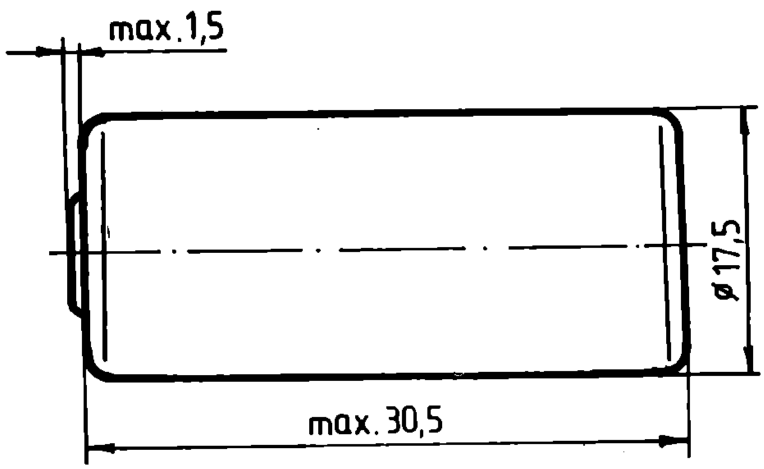
HS 6722



CASE OUTLINES - All dimensions in mm.

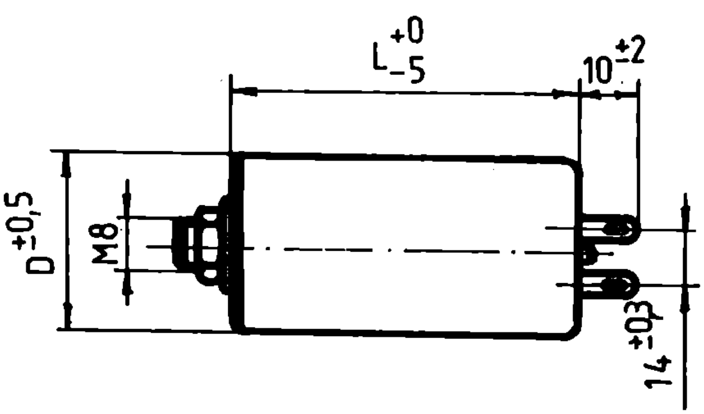
C 10

HS 6860



C 11

HMPM 50000



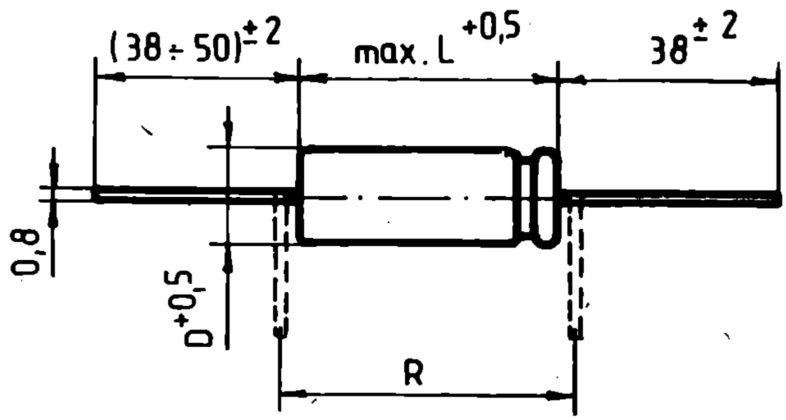
C 12

CASE OUTLINES - All dimensions in mm.

C 13

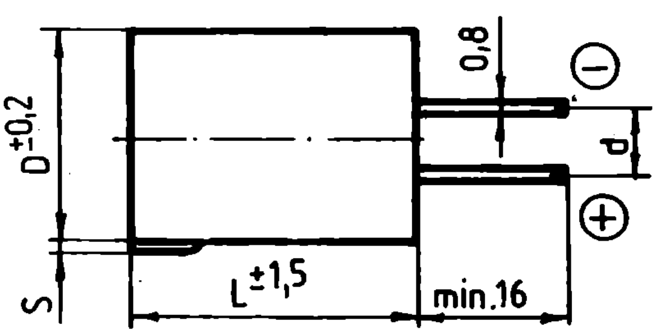
C 14

EG 52..
EN 52..



C 15

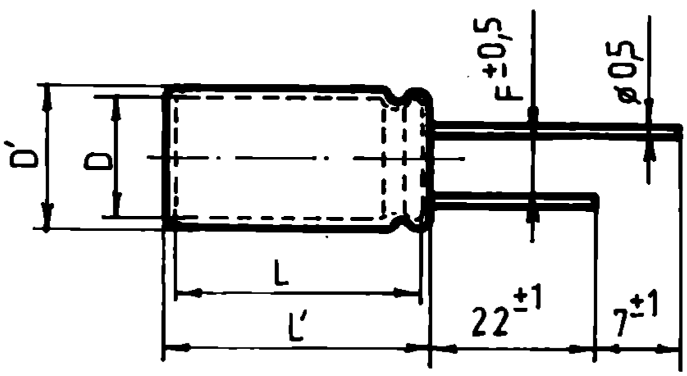
EG 61..



CASE OUTLINES - All dimensions in mm.

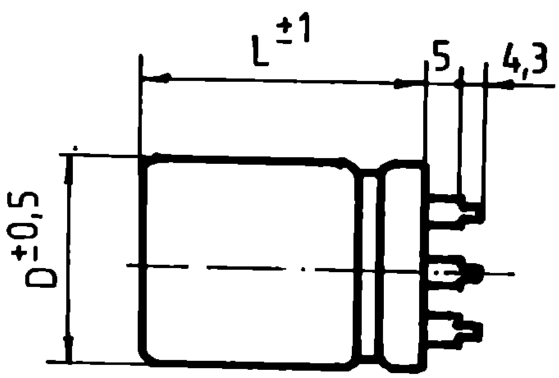
C 16

EG 63..



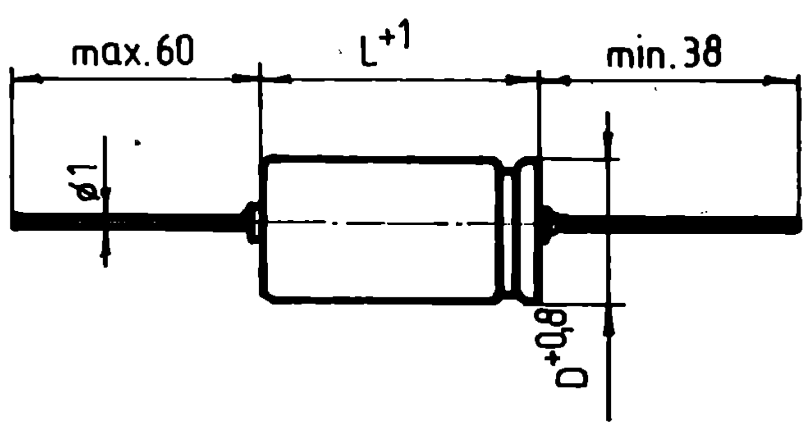
C 17

EG 73..



C 18

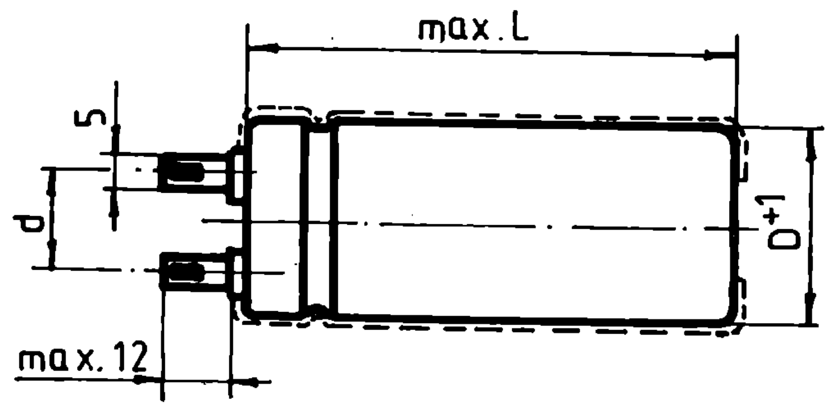
EG 74..



CASE OUTLINES - All dimensions in mm.

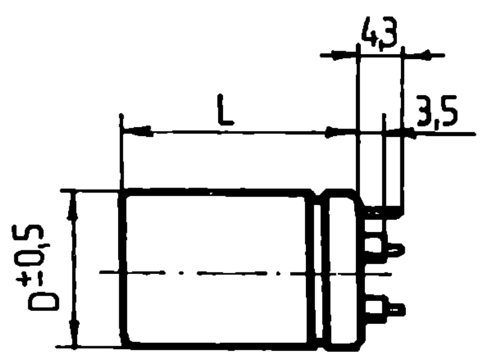
C 19

EG 76..
EM 48..



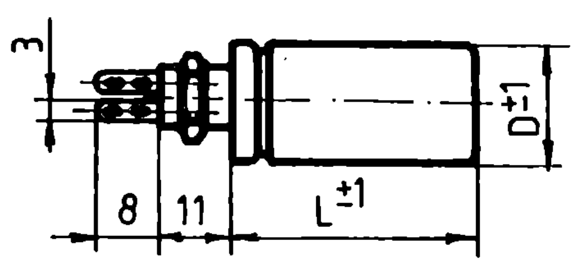
C 20

EG 24..



C 21

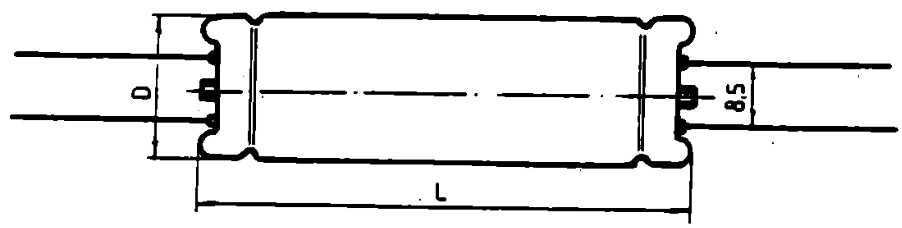
EG 11..



CASE OUTLINES - All dimensions in mm.

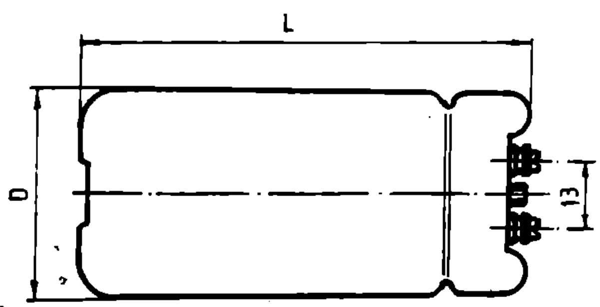
C 22

EF 72..IT
EF 77..



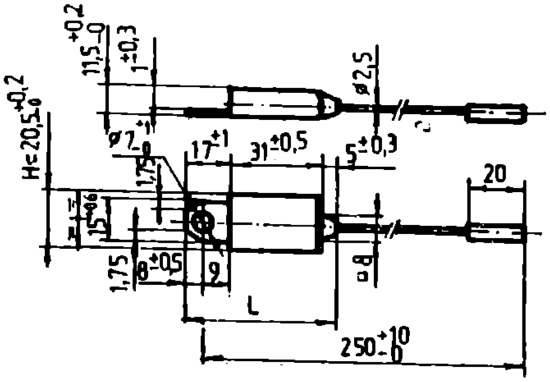
C 23

EP 77..
EP 7738IT



C 24

EA 9050



POWER

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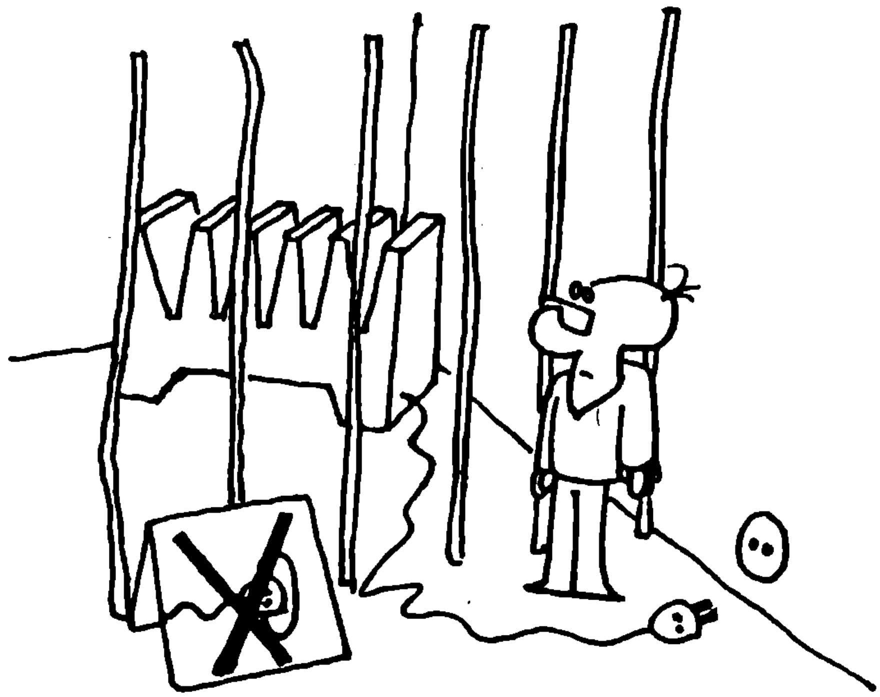

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$ Preliminary data

NON CONTROLLED BRIDGES

TYPE (WORKING VOLTAGE &) (CURRENT INCLUDED)		AIR COOLING (NOTE 2)	PROTECTION TYPE (NOTE 3)	DIMENSIONS (mm/mm/mm)	WEIGHT (Kg)
PM	220V/ 200A	N	2, 3	190x200x210	6
PMB	380V/ 250A	N	1, 2, 3	215x370x250	17
PMB	380V/ 320A	N	1, 2, 3	215x370x250	17
MPM-M	220V/ 320A	N	1, 2, 3, 4	220x580x375	35
MPM-M	220V/ 350A	N	1, 2, 3, 4	220x580x375	35
MPM-M	660V/ 250A	N	1, 2, 3, 4	220x580x375	35
MPM-M	660V/ 350A	N	1, 2, 3, 4	220x580x375	35
MPM-MV	24V/1000A	F	1, 2, 3, 4	220x650x375	40
MPM-MV	24V/1100A	F	1, 2, 3, 4	220x650x375	40
MPM-MV	220V/ 400A	F	1, 2, 3, 4	220x650x375	40
MPM-MV	220V/ 680A	F	1, 2, 3, 4	220x650x375	40
MPM-MV	660V/ 520A	F	1, 2, 3, 4	220x650x375	40
MPM-MV	660V/ 630A	F	1, 2, 3, 4	220x650x375	40
MPM-MV	660V/ 850A	F	1, 2, 3, 4	220x650x375	40
MPM	660V/ 820A	N	1, 2, 3, 4	415x780x350	60
MPM	900V/ 650A	N	1, 2, 3, 4	415x780x350	60
MPM	900V/ 700A	N	1, 2, 3, 4	415x780x350	60

NOTE 1 : Working temperature : -25 ... +40 oC
Storage temperature : -33 ... +55 oC

NOTE 2 : N (natural) , F (forced) air cooling

NOTE 3 : 1 = short-circuit
2 = over-voltage
3 = du/dt
4 = thermal (with PTC thermistors)

NOTE 4 : These bridges are intended to be used for MAINS FREQUENCY only .

NOTE 5 : Mains transformers and / or inductances are NOT SUPPLIED by the manufacturer .

HALF CONTROLLED BRIDGES

TYPE (WORKING VOLTAGE &) (CURRENT INCLUDED)		AIR COOLING (NOTE 2)	PROTECTION TYPE (NOTE 3)	DIMENSIONS (mm/mm/mm)	WEIGHT (Kg)
PMS	220V/ 100A	N	2, 3	190x200x210	6
PMSB	380V/ 100A	N	1, 2, 3	215x370x250	17
PMSB	380V/ 160A	N	1, 2, 3	215x370x250	17
MPMS-M	220V/ 200A	N	1, 2, 3, 4	220x580x375	35
MPMS-M	220V/ 250A	N	1, 2, 3, 4	220x580x375	35
MPMS-M	525V/ 160A	N	1, 2, 3, 4	220x580x375	35
MPMS-MV	220V/ 250A	F	1, 2, 3, 4	220x650x375	40
MPMS-MV	220V/ 350A	F	1, 2, 3, 4	220x650x375	40
MPMS-MV	220V/ 400A	F	1, 2, 3, 4	220x650x375	40
MPMS-MV	220V/ 680A	F	1, 2, 3, 4	220x650x375	40
MPMS	900V/ 400A	N	1, 2, 3, 4	415x780x350	60
MPMS	900V/ 450A	N	1, 2, 3, 4	415x780x350	60

NOTE 1 : Working temperature : -25 ... +40 oC
Storage temperature : -33 ... +55 oC

NOTE 2 : N (natural) , F (forced) air cooling

NOTE 3 : 1 = short-circuit
2 = over-voltage
3 = du/dt
4 = thermal (with PTC thermistors)

NOTE 4 : These bridges are intended to be used for MAINS FREQUENCY only .

NOTE 5 : Mains transformers and / or inductances are NOT SUPPLIED by the manufacturer .

FULLY CONTROLLED BRIDGES

TYPE (WORKING VOLTAGE &) (CURRENT INCLUDED)		AIR COOLING (NOTE 2)	PROTECTION TYPE (NOTE 3)	DIMENSIONS (mm/mm/mm)	WEIGHT (Kg)
PMC	380V/ 100A	N	2, 3	190x200x210	6
PMCB	380V/ 100A	N	1, 2, 3	215x370x250	17
PMCB	380V/ 160A	N	1, 2, 3	215x370x250	17
MPMC-M	525V/ 160A	N	1, 2, 3, 4	220x580x375	35
MPMC-M	525V/ 200A	N	1, 2, 3, 4	220x580x375	35
MPMC-M	660V/ 200A	N	1, 2, 3, 4	220x580x375	35
MPMC-M	660V/ 250A	N	1, 2, 3, 4	220x580x375	35
MPMC-MV	220V/ 350A	F	1, 2, 3, 4	220x650x375	40
MPMC-MV	525V/ 250A	F	1, 2, 3, 4	220x650x375	40
MPMC-MV	660V/ 520A	F	1, 2, 3, 4	220x650x375	40
MPMC-MV	660V/ 630A	F	1, 2, 3, 4	220x650x375	40
MPMC-MV	660V/ 680A	F	1, 2, 3, 4	220x650x375	40
MPMC	900V/ 400A	N	1, 2, 3, 4	415x780x350	60
MPMC	900V/ 450A	N	1, 2, 3, 4	415x780x350	60

NOTE 1 : Working temperature : -25 ... +40 oC
Storage temperature : -33 ... +55 oC

NOTE 2 : N (natural) , F (forced) air cooling

NOTE 3 : 1 = short-circuit
2 = over-voltage
3 = du/dt
4 = thermal (with PTC thermistors)

NOTE 4 : These bridges are intended to be used for MAINS FREQUENCY only .

NOTE 5 : Mains transformers and / or inductances are NOT SUPPLIED by the manufacturer .

REVERSIBLE POWER BRIDGES

TYPE (WORKING VOLTAGE &) (CURRENT INCLUDED)		AIR COOLING (NOTE 2)	PROTECTION TYPE (NOTE 3)	DIMENSIONS (mm/mm/mm)	WEIGHT (Kg)
MPMCR-M	525V/160A	N	1, 2, 3, 4	220x850x375	65
MPMCR-M	525V/200A	N	1, 2, 3, 4	220x850x375	65
MPMCR-M	660V/200A	N	1, 2, 3, 4	220x850x375	65
MPMCR-M	660V/250A	N	1, 2, 3, 4	220x850x375	65
MPMCR-MV	220V/350A	F	1, 2, 3, 4	220x920x375	70
MPMCR-MV	525V/250A	F	1, 2, 3, 4	220x920x375	70
MPMCR-MV	660V/520A	F	1, 2, 3, 4	220x920x375	70
MPMCR-MV	660V/630A	F	1, 2, 3, 4	220x920x375	70
MPMCR-MV	660V/680A	F	1, 2, 3, 4	220x920x375	70
MPMCR	900V/400A	N	1, 2, 3, 4	415x980x350	80
MPMCR	900V/450A	N	1, 2, 3, 4	415x980x350	80

NOTE 1 : Working temperature : -25 ... +40 oC
Storage temperature : -33 ... +55 oC

NOTE 2 : N (natural) , F (forced) air cooling

NOTE 3 : 1 = short-circuit
2 = over-voltage
3 = du/dt
4 = thermal (with PTC thermistors .

NOTE 4 : These bridges are intended to be used for MAINS FREQUENCY only .

NOTE 5 : Mains transformers and / or inductances are NOT SUPPLIED by the manufacturer .

A.C. SWITCHES / CONTROLLERS

TYPE (WORKING VOLTAGE &) (CURRENT INCLUDED)	COOLING AGENT (NOTE 2)	PROTECTION TYPE (NOTE 3)	DIMENSIONS (mm/mm/mm)	WEIGHT (Kg)
$ CSA 10-220 (220V/ 5A)	A		88x 23x 80	0.25
$ CSA 10-220R (220V/10A)	A		88x 23x 80	0.25
$ CSA 10-380 (380V/ 5A)	A		88x 23x 80	0.25
$ CSA 10-380R (380V/10A)	A		88x 23x 80	0.25
CSMA 220V(380V)/ 63A	A	1, 2, 3	286x260x180	12
CSMA 220V(380V)/ 80A	A	1, 2, 3	286x260x180	12
CSMA 220V(380V)/ 100A	A	1, 2, 3	286x260x180	12
CSMA 220V(380V)/ 160A	A	1, 2, 3	372x353x250	16
CSMA 220V(380V)/ 200A	A	1, 2, 3	372x353x250	16
CSMA 220V(380V)/ 250A	A	1, 2, 3	372x353x250	16
CSMA 220V(380V)/ 320A	A	1, 2, 3	372x353x250	16
CSA 220V(380V)/1170A	L	1, 2, 3	260x350x300	15
CSA 220V(380V)/1900A	L	1, 2, 3	260x350x300	17
CSMLD 380V / 2 x 4000A	L	1, 2, 3, 4	1200x870x650	225

$ Preliminary data

WARNING :

- A.C. switches / controllers MUST be manually trimmed at Load Power Factor (cos Ø) for inductive loads.

A.C. SWITCHES / CONTROLLERS (cont.)

CONTROL SIGNAL :

- Switch off = 0 V ;
- Switch on = +10 V .

- The analog signal 0...10 V is used to control the load power (177...0 electric degrees).

Types **CSA 10-220 / CSA 10-380** are intended to be used for inductive loads ; types **CSA 10-220R / CSA 10-380R** for resistive - inductive loads.

NOTE 1 : Working temperature -25 ... +40 oC (air cooled)
+ 5 ... +40 oC (liquid cooled)
Storage temperature : -33 ... +55 oC

NOTE 2 : Cooling agent : A = air ;
L = liquid , minimum 6 l/min.

NOTE 3 : PROTECTION TYPE :
1 = over-voltage
2 = du/dt
3 = thermal
4 = over-current

NOTE 4 : These switches / controllers are intended to be used for MAINS FREQUENCY only.

NOTE 5 : Mains transformers and / or inductances are NOT SUPPLIED by the manufacturer .

NON CONTROLLED BRIDGES

T Y P E (WORKING VOLTAGE &) (CURRENT INCLUDED)		AIR COOLING (NOTE 2)	PROTECTION TYPE (NOTE 3)	DIMENSIONS (mm/mm/mm)	WEIGHT (Kg)
PT	220V/ 350A	N	2, 3	280x200x220	9
PTB	380V/ 350A	N	1, 2, 3	290x370x250	25
PTB	380V/ 500A	N	1, 2, 3	290x370x250	25
MPT-M	220V/ 400A	N	1, 2, 3, 4	300x580x375	50
MPT-M	220V/ 500A	N	1, 2, 3, 4	300x580x375	50
MPT-M	660V/ 500A	N	1, 2, 3, 4	300x580x375	50
MPT-M	660V/ 520A	N	1, 2, 3, 4	300x580x375	50
MPT-MV	24V/1350A	F	1, 2, 3, 4	300x650x375	55
MPT-MV	24V/1500A	F	1, 2, 3, 4	300x650x375	55
MPT-MV	220V/ 520A	F	1, 2, 3, 4	300x650x375	55
MPT-MV	220V/ 680A	F	1, 2, 3, 4	300x650x375	55
MPT-MV	220V/ 850A	F	1, 2, 3, 4	300x650x375	55
MPT-MV	660V/ 850A	F	1, 2, 3, 4	300x650x375	55
MPT-MV	660V/1050A	F	1, 2, 3, 4	300x650x375	55
MPT	660V/1150A	N	1, 2, 3, 4	536x780x350	90
MPT	900V/ 900A	N	1, 2, 3, 4	536x780x350	90
MPT	900V/ 950A	N	1, 2, 3, 4	536x780x350	90
MPT-V	48V/1900A	F	2, 3, 4	536x780x350	90
MPT-V	48V/2050A	F	2, 3, 4	536x780x350	90
$ MPT-V	48V/2700A	F	2, 3, 4	536x780x350	90
$ MPT-V	48V/3500A	F	2, 3, 4	536x980x350	120
$ MPT-V	48V/4050A	F	2, 3, 4	536x980x350	120
MPT-V	525V/1350A	F	1, 2, 3, 4	536x780x350	90
MPT-V	525V/1700A	F	1, 2, 3, 4	536x780x350	90
MPT-V	660V/2150A	F	2, 3, 4	536x780x350	90
MPT-V	900V/1050A	F	2, 3, 4	536x780x350	90
MPT-V	900V/1200A	F	1, 2, 3, 4	536x780x350	90

IMPORTANT : See page 9 - 08 for NOTES .

$ Preliminary data

HALF CONTROLLED BRIDGES

TYPE (WORKING VOLTAGE &) (CURRENT INCLUDED)		AIR COOLING (NOTE 2)	PROTECTION TYPE (NOTE 3)	DIMENSIONS (mm/mm/mm)	WEIGHT (Kg)
PTS	220V/ 160A	N	2, 3	280x200x220	9
PTSB	380V/ 160A	N	1, 2, 3	290x370x250	25
PTSB	380V/ 250A	N	1, 2, 3	290x370x250	25
MPTS-M	220V/ 250A	N	1, 2, 3, 4	300x580x375	50
MPTS-M	220V/ 320A	N	1, 2, 3, 4	300x580x375	50
MPTS-M	660V/ 350A	N	1, 2, 3, 4	300x580x375	50
MPTS-MV	220V/ 320A	F	1, 2, 3, 4	300x650x375	55
MPTS-MV	220V/ 400A	F	1, 2, 3, 4	300x650x375	55
MPTS-MV	220V/ 680A	F	1, 2, 3, 4	300x650x375	55
MPTS	525V/ 750A	N	1, 2, 3, 4	536x780x350	90
MPTS	900V/ 560A	N	1, 2, 3, 4	536x780x350	90
MPTS	900V/ 600A	N	1, 2, 3, 4	536x780x350	90
MPTS	900V/ 620A	N	1, 2, 3, 4	536x780x350	90
MPTS-V	380V/1050A	F	1, 2, 3, 4	536x780x350	90
MPTS-V	525V/1350A	F	1, 2, 3, 4	536x780x350	90
MPTS-V	525V/2000A	F	1, 2, 3, 4	536x780x350	90
MPTS-V	825V/ 850A	F	1, 2, 3, 4	536x780x350	90
MPTS-V	900V/ 680A	F	1, 2, 3, 4	536x780x350	90
MPTS-V	900V/1200A	F	1, 2, 3, 4	536x780x350	90

NOTE 1 : Working temperature : -25 ... +40 oC
Storage temperature : -33 ... +55 oC

NOTE 2 : N (natural) , F (forced) air cooling

NOTE 3 : 1 = short-circuit
2 = over-voltage
3 = du/dt
4 = thermal (with PTC thermistors)

NOTE 4 : These switches / controllers are intended to be used for MAINS FREQUENCY only.

NOTE 5 : Mains transformers and / or inductances are NOT SUPPLIED by the manufacturer .

FULLY CONTROLLED BRIDGES

TYPE (WORKING VOLTAGE &) (CURRENT INCLUDED)		AIR COOLING (NOTE 2)	PROTECTION TYPE (NOTE 3)	DIMENSIONS (mm/mm/mm)	WEIGHT (Kg)
PTC	380V/ 160A	N	2, 3	280x200x220	9
PTCB	380V/ 160A	N	1, 2, 3	290x370x250	25
PTCB	380V/ 250A	N	1, 2, 3	290x370x250	25
MPTC-M	525V/ 250A	N	1, 2, 3, 4	300x580x375	50
MPTC-M	660V/ 320A	N	1, 2, 3, 4	300x580x375	50
MPTC-M	660V/ 350A	N	1, 2, 3, 4	300x580x375	50
MPTC-MV	220V/ 400A	F	1, 2, 3, 4	300x650x375	55
MPTC-MV	525V/ 320A	F	1, 2, 3, 4	300x650x375	55
MPTC-MV	660V/ 680A	F	1, 2, 3, 4	300x650x375	55
MPTC-MV	660V/ 800A	F	1, 2, 3, 4	300x650x375	55
MPTC-MV	660V/ 850A	F	1, 2, 3, 4	300x650x375	55
MPTC	525V/ 750A	N	1, 2, 3, 4	536x780x350	90
MPTC	900V/ 560A	N	1, 2, 3, 4	536x780x350	90
MPTC	900V/ 600A	N	1, 2, 3, 4	536x780x350	90
MPTC	900V/ 620A	N	1, 2, 3, 4	536x780x350	90
MPTC-V	220V/1050A	F	1, 2, 3, 4	536x780x350	90
MPTC-V	380V/1050A	F	1, 2, 3, 4	536x780x350	90
MPTC-V	525V/1700A	F	1, 2, 3, 4	536x780x350	90
MPTC-V	525V/2000A	F	1, 2, 3, 4	536x780x350	90
MPTC-V	825V/ 850A	F	1, 2, 3, 4	536x780x350	90
MPTC-V	825V/1350A	F	1, 2, 3, 4	536x780x350	90
MPTC-V	900V/ 680A	F	1, 2, 3, 4	536x780x350	90
MPTC-V	900V/1200A	F	1, 2, 3, 4	536x780x350	90

IMPORTANT : See page 9 - 10 for NOTES .

REVERSIBLE BRIDGES

TYPE (WORKING VOLTAGE &) (CURRENT INCLUDED)		AIR COOLING (NOTE 2)	PROTECTION TYPE (NOTE 3)	DIMENSIONS (mm/mm/mm)	WEIGHT (Kg)
MPTCR-M	525V/ 250A	N	1, 2, 3, 4	300x850x375	90
MPTCR-M	660V/ 320A	N	1, 2, 3, 4	300x850x375	90
MPTCD-M	660V/ 350A	N	1, 2, 3, 4	300x850x375	90
MPTCR-MV	220V/ 400A	F	1, 2, 3, 4	300x920x375	95
MPTCR-MV	525V/ 320A	F	1, 2, 3, 4	300x920x375	95
MPTCR-MV	660V/ 680A	F	1, 2, 3, 4	300x920x375	95
MPTCR-MV	660V/ 800A	F	1, 2, 3, 4	300x920x375	95
MPTCR-MV	660V/ 850A	F	1, 2, 3, 4	300x920x375	95
MPTCR	525V/ 750A	N	1, 2, 3, 4	536x980x350	120
MPTCR	900V/ 560A	N	1, 2, 3, 4	536x980x350	120
MPTCR	900V/ 600A	N	1, 2, 3, 4	536x980x350	120
MPTCR	900V/ 620A	N	1, 2, 3, 4	536x980x350	120
MPTCR-V	220V/1050A	F	1, 2, 3, 4	536x980x350	120
MPTCR-V	380V/1050A	F	1, 2, 3, 4	536x980x350	120
MPTCR-V	525V/1700A	F	1, 2, 3, 4	536x980x350	120
MPTCR-V	525V/2000A	F	1, 2, 3, 4	536x980x350	120
MPTCR-V	825V/ 850A	F	1, 2, 3, 4	536x980x360	120
MPTCR-V	825V/1350A	F	1, 2, 3, 4	536x980x350	120
MPTCR-V	900V/ 680A	F	1, 2, 3, 4	536x980x350	120
MPTCR-V	900V/1200A	F	1, 2, 3, 4	536x980x350	120

NOTE 1 : Working temperature : -25 ... +40 oC
Storage temperature : -33 ... +55 oC

NOTE 2 : N (natural) , F (forced) air cooling

NOTE 3 : 1 = short-circuit
2 = over-voltage
3 = du/dt
4 = thermal (with PTC thermistors)

NOTE 4 : These switches / controllers are intended to be used for MAINS FREQUENCY only.

NOTE 5 : Mains transformers and / or inductances are NOT SUPPLIED by the manufacturer .

A.C. SWITCHES

TYPE (WORKING VOLTAGE &) (CURRENT INCLUDED)		AIR COOLING (NOTE 2)	PROTECTION TYPE (NOTE 3)	DIMENSIONS (mm/mm/mm)	WEIGHT (Kg)
CSTA	380V/ 63A	N	1,2,3,4,5	445x310x250	20
CSTA	380V/ 80A	N	1,2,3,4,5	445x310x250	20
CSTA	380V/100A	N	1,2,3,4,5	445x310x250	20
CSTA	380V/160A	N	1,2,3,4,5	630x335x250	30
CSTA	380V/200A	N	1,2,3,4,5	630x335x250	30
CSTA	380V/250A	N	1,2,3,4,5	630x335x250	30
CSTA	380V/320A	N	1,2,3,4,5	630x335x250	30
$ CST2	380V/350A	N	1,2,3,4,5,6	380x650x350	42
$ CST2	380V/400A	N	1,2,3,4,5,6	380x650x350	42
$ CST2	380V/500A	N	1,2,3,4,5,6	380x650x350	42
$ CST2-V	380V/500A	F	1,2,3,4,5,6	380x746x350	45
$ CST2-V	380V/630A	F	1,2,3,4,5,6	380x746x350	45
$ CST2-V	380V/800A	F	1,2,3,4,5,6	380x746x350	45

$ Preliminary data

WARNING :

- **A.C. switches / controllers MUST be manually trimmed at Load Power Factor (cos Ø) for inductive loads.**

CONTROL SIGNAL : Switch off = 0 V ; Switch on = +10 V .

NOTE 1 : Working temperature : -25 ... +40 oC
Storage temperature : -33 ... +55 oC

NOTE 2 : N (natural) , F (forced) air cooling

NOTE 3 : 1 = over-voltage ; 4 = over-current ;
2 = du/dt ; 5 = phase / thyristor open ;
3 = thermal ; 6 = short-circuit .

NOTE 4 : These switches are intended to be used for MAINS FREQUENCY only .

NOTE 5 : Mains transformers and / or inductances are NOT SUPPLIED by the manufacturer .

PHASE-CONTROL A.C. CONTROLLERS

TYPE (WORKING VOLTAGE &) (CURRENT INCLUDED)		AIR COOLING (NOTE 2)	PROTECTION TYPE (NOTE 3)	DIMENSIONS (mm/mm/mm)	WEIGHT (Kg)
$ CSTP2	380V/350A	N	1,2,3,4,5,6	380x650x350	42
$ CSTP2	380V/400A	N	1,2,3,4,5,6	380x650x350	42
$ CSTP2	380V/500A	N	1,2,3,4,5,6	380x650x350	42
$ CSTP2-V	380V/500A	F	1,2,3,4,5,6	380x746x350	45
$ CSTP2-V	380V/630A	F	1,2,3,4,5,6	380x746x350	45
$ CSTP2-V	380V/800A	F	1,2,3,4,5,6	380x746x350	45

$ Preliminary data

PULSE-TRAIN A.C. CONTROLLERS

TYPE (WORKING VOLTAGE &) (CURRENT INCLUDED)		AIR COOLING (NOTE 2)	PROTECTION TYPE (NOTE 3)	DIMENSIONS (mm/mm/mm)	WEIGHT (Kg)
CSTRF	380V/400A	N	1,2,3,6	350x550x540	70
CSTRF	380V/700A	F	1,2,3,6	350x650x540	76

WARNING :

- **A.C. switches / controllers MUST be manually trimmed at Load Power Factor (cos Ø) for inductive loads.**

CONTROL SIGNAL :

- Power control is achieved with an unified voltage signal 0...10 V or an unified current signal 2...10/4...20 mA.

IMPORTANT : See page 9 - 11 for NOTES .

THREE-PHASE RECTIFIER ASSEMBLIES FOR DIESEL-ELECTRICAL LOCOMOTIVES

TYPE (WORKING VOLTAGE &) (CURRENT INCLUDED)	COOLING AGENT	PROTECTION TYPE (NOTE 2)	DIMENSIONS (mm/mm/mm)	WEIGHT (Kg)
MRT-LDE 900V/3000A	AIR	1, 2, 3	790x690x840	250
110V/1500A		1, 3, 4		
$ MRT-LDE 900V/4500A	AIR	1, 2, 3	1170x880x630	325
110V/1500A		1, 3, 4		

$ Preliminary data

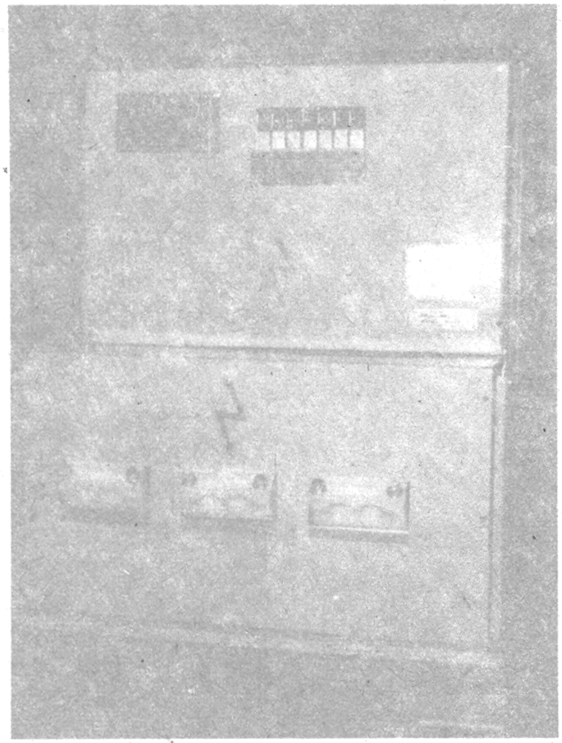
NOTE 1 : Working temperature : -25 ... +55 oC
Storage temperature : -35 ... +55 oC

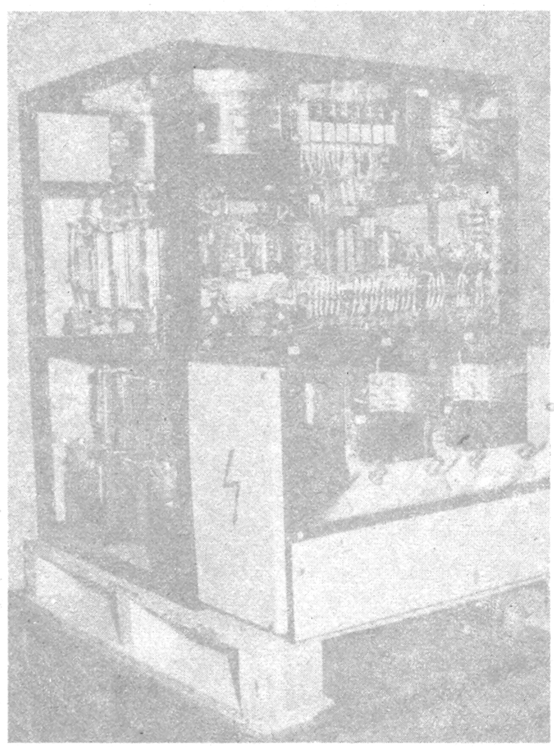
NOTE 2 : 1 = over-voltage
2 = over-current
3 = over-temperature
4 = short-circuit

NOTE 3 : Working frequency : 30 ... 150 Hz .

NOTE 4 : Cooling type : Forced air .

THREE-PHASE RECTIFIER ASSEMBLIES FOR DIESEL-ELECTRICAL LOCOMOTIVES





MRT-LDE 900V/3000A , 110V/1500A

SYSTEMS, EQUIPMENTS & TOOLS

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- STELA 85 - LINEAR I.C. TESTING EQUIPMENT. . 10 - 02
- HANDLER FOR ELECTRONIC COMPONENTS . . . . . 10 - 03
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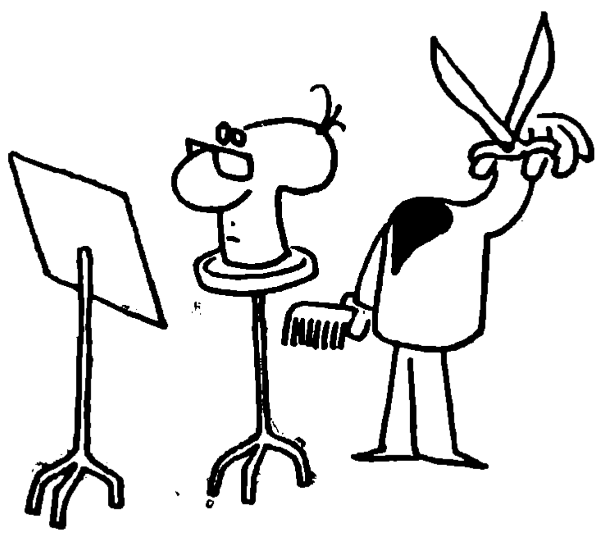


STELA - I.C. TESTING EQUIPMENT

Stela - I.C. testing equipment provides the possibility of I.C. automatic sorting with one or two workplaces, manually and / or mechanically operated for either final or wafer tests (mechanical system available for final testing only).

General user facilities provided :

- Computer controlled testing, using a CORAL 4030 minicomputer (DEC's soft compatible) connected to each workplace via one connector having 18 output lines, 14 input lines plus logical ground.

- Interactive software support, ensuring sorting, debugging and development programs for new I.C types.

Workplace facilities :

- The basic test equipment consists of : the interface to the fixed voltage supplies and the programmable data acquisition system, and a dedicated measure-head. With the available measure-heads the following parameters were obtained under real working conditions : minimal current 50 pA, maximal slew-rate 50 V/us, maximal voltage offset 0.5 mV, maximal gain 100 dB etc. The "one-test time" and the measuring accuracy are given by the measure-head. Typical "one-test time" is about 50 ms.

I.C. handler:

- The final sorting mechanical system ensures automatic loading of the test socket with circuits from a ten-sleeve input and also the I.C. repartition into five electric classes. The output is provided with five tracks by ten sleeves each plus one track for mechanic-rejected circuits. Handling time per circuit: 0.6s. With a typical sorting time of 1 s the machine yields 2000 circuits per hour.

NOTE : The HP 9825 computer in conjunction with HP 98032A interface is fully compatible with the basic test equipment and the final sorting mechanical system.

STELA 85 - LINEAR I.C. TESTING EQUIPMENT

STELA 85 is a new version of the I.C. testing equipment. It is dedicated for linear I.C. testing and sorting : operational amplifiers, 8 bit D/A converters, comparators, voltage regulators. Other I.C. types can be tested ; the measure-head can be hard programmed to control external power supplies, frequency generators, digital multimeters etc.

The system has three main parts :

- The HC 85 computer (Sinclair - Spectrum compatible) with the digital interface INTERDIG 85 ;
- The STELA analog interface ;
- The measure-head dedicated for one or more I.C.

The computer

The HC 85 home computer with 64 kB of memory is provided with a 5"1/4 floppy-disk drive and a ROBOTRON miniprinter. It controls the STELA analog interface via the INTERDIG 85 digital interface (fully compatible with the HP 98032A interface).

The software support consists of :

- I.C. test programs ;
- System autotest program (the autotest measure-head must be used) ;
- Computer controlled PCB test programs .

The I.C. test programs are offered in BASIC ("one-test time" of about 0.5 sec, or up to 300 pcs/hr for a 741 IC type) or in PASCAL (up to 10 times time saving).

The STELA interface

This interface contains fixed power supplies for all the STELA and the measure-head PCB's, INTERDIG 85 connection buffers, an analog buffered PCB and all computer controlled PCB's.

A final sorting mechanism can be connected at the STELA interface.

The measure-head

The measure-head is dedicated for one or more I.C. s. It contains the final test configurations, relays and a "zero insertion force" socket. The measure-head can be hard programmed for many other I.C. types.

HANDLER FOR ELECTRONIC COMPONENTS

APPLICATION : These equipments carry out diode and transistor handling in specific mechanical configurations.

OPERATION : Electronic components are put into a vibrator. A singulator mechanism feeds the measuring system with components. The measured components are sent to the distribution system which separates them into classes, according to their electrical parameters.

FACILITIES :

Built-in electronic counter for each bin.

Testing equipment : computer controlled multiprogrammer and test heads , supplied on request.

Depending on the type and dimensions of components to be tested, special design is available on request.

Technical characteristics :

- Dimensions .... 900 x 500 x 1200 mm
- Weight .... 175 kg
- Power supply .... 0.5 kVA
- Test stations 1
- Kelvin contacts .... yes

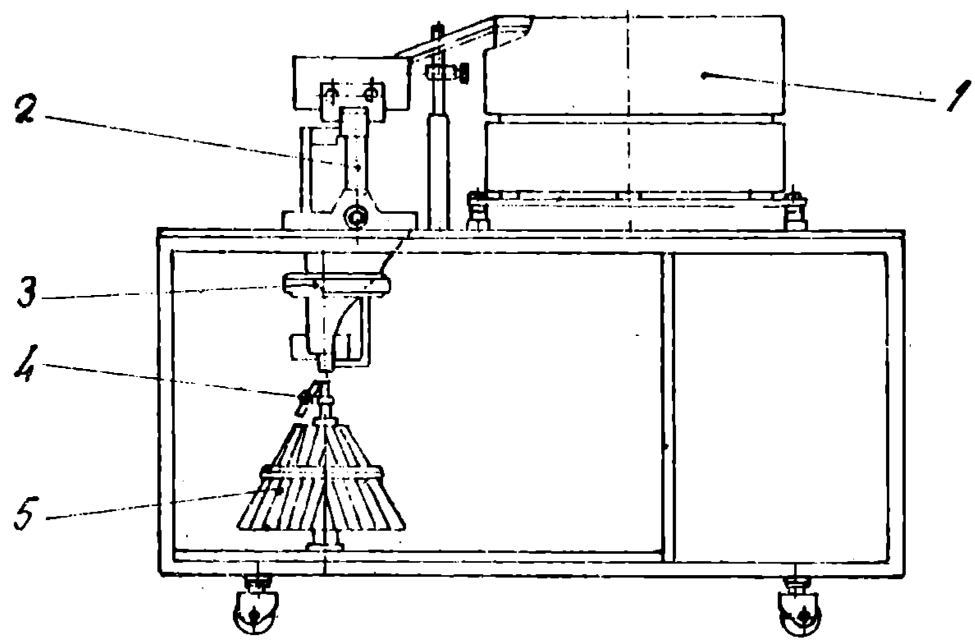
- Singulator mechanism actuated by :
  - (diodes) .... Air cylinder 70 psi, 3 l/min
  - (transistors) .... Step-by-step motor

- Throughput (zero testing time) :
  - (diodes) .... 4000 pcs / hr.
  - (transistors) .... 5000 pcs / hr.

- Bins (diodes) .... max. 25
  (transistors) .... max. 20

- Packages (diodes) .... DO-35 , DO-41
  (transistors) .... TO-39 , TO-92

HANDLER FOR ELECTRONIC COMPONENTS (' cont.)



1. Vibrator
2. Conveyer
3. Measuring system (head)
4. Classifying system
5. Boxes

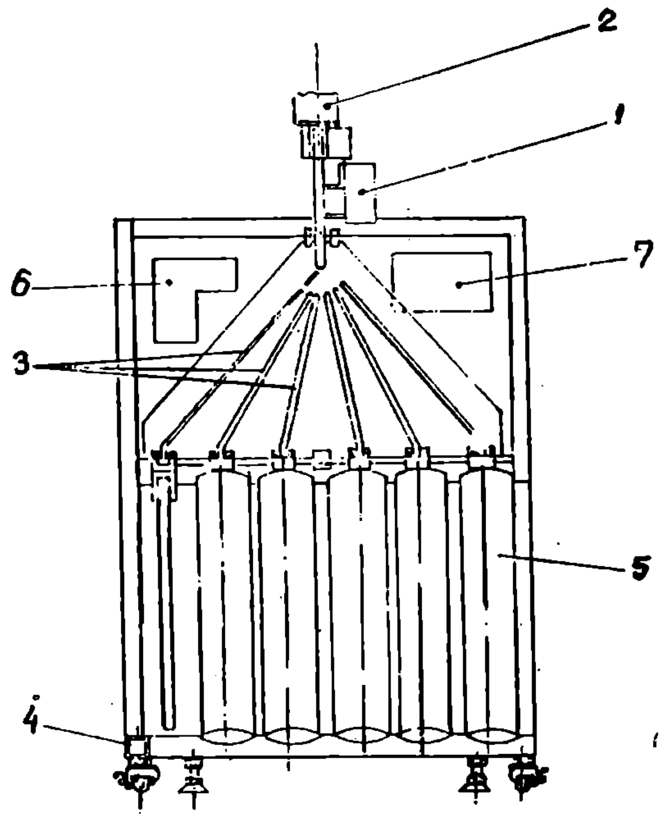
AUTOMATIC AMBIENTAL I.C. HANDLER

APPLICATION : This equipment is suitable for IC manufacturers as well as for IC user incoming inspection

Technical characteristics :

- Dimensions .... 900 x 500 x 1200 mm
- Weight .... 175 kg
- Power supply (220 V / 50 - 60 Hz) ...... 250 VA
- Test stations 1
- Test socket - ZIF (zero insertion force)
- Throughput (zero testing time) .... 7200 pcs / hr.
- Bins .... max. 5 + 1
  (1 bin for geometric faults)
- Packages .... 8, 14, 16 pins DIP / 0.3 in. wide
- Input feeding .... 1 turret with 10 sleeves
- Output .... 5 turrets (1 / bin), 10 sleeves each
- Sorting mode .... 16 programmable classes for the first 4 bins The fifth bin is hard programmed for classes zero and 8 to OF (hex).
- Actuating .... step-by-step motors
- Interfacing ..... According to user requirements , positive or negative logic (8 wire bus) : 4 data bits plus 2 control bits plus power supply.

AUTOMATIC AMBIENTAL I.C. HANDLER (cont.)



1. Test clip (contactor)
2. Sleeve feeder
3. Carrier and sorter chute
4. Metallic frame
5. Output sleeve holder
6. Command panel
7. Programming panel

HYDROGEN BELT FURNACE

APPLICATION : This equipment is designed for brazing, curing or annealing operations in controlled atmosphere.

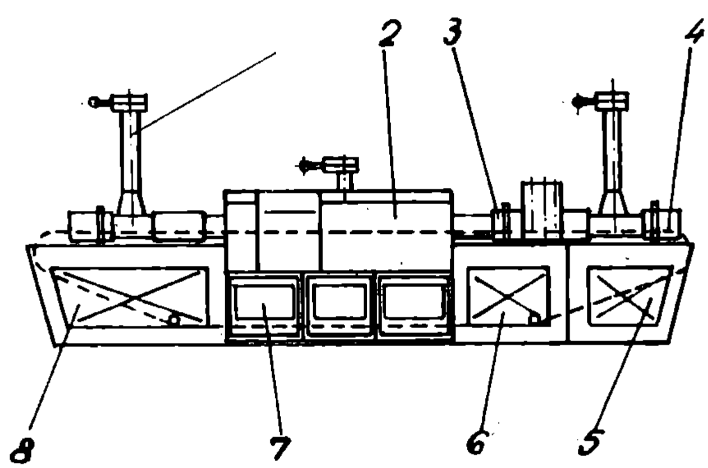
DESCRIPTION : The furnace consists of 4 units or more , the number of units depending on the requirements of the technological process. It includes the belt, temperature regulators and all facilities for hydrogen and nitrogen.

A belt made of refractory steel wire conveys the items through a stainless steel tube where the required treatment is applied.

Technical characteristics

- Dimensions ....max.	7100 x 1300 x 750 mm
- Weight ....max.	3500 kg
- Power supply	380 V / 50 Hz
- Input power	22.5 kW
- Adjustable hydrogen supply	0 ... 90 l / min.
- Adjustable nitrogen supply	0 ... 90 l / min.
- Maximum temperature	700 oC
- Belt speed	10 ... 12 cm /min.
- Passage way	140 x 110 mm
- Belt width	120 mm
- Maximum loading (per linear meter) ...	8 kg

1. Burning hydrogen pipe
2. Furnace body
3. Passage tube
4. Drive belt
5. Belt drive gear
6. Side cover
7. Furnace frame
8. Belt stretch system



EXHAUST GAS CLEANER

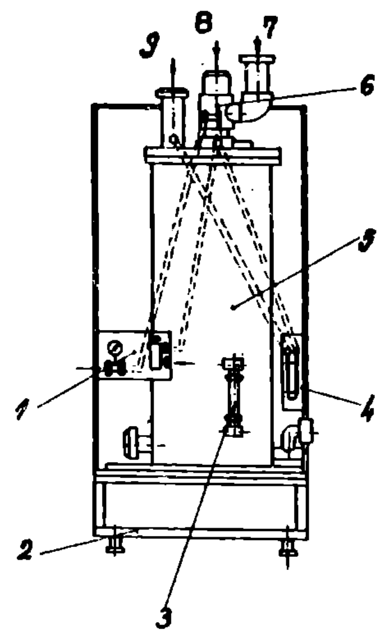
APPLICATION : The equipment is intended to purge the exhaust gas from the epitaxial growth reactors. The exhaust is a highly explosive mixture of hydrocloric acid , hydrogen and silicon tetrachloride. The process consists of hydrogen neutralisation and of silicon tetrachloride hydrolysation .

DESCRIPTION : The equipment configuration is :
- metal frame with protection covers ;
- cleaning chamber with PVC pellets ;
- water and clean gas outlets ;
- nitrogen and exhaust gas inlets, nozzles for water admission into the chamber ;
- differential pressure regulator and flowmeter for nitrogen ;
- visiting window .

Technical characteristics

- Dimensions .... 600 x 600 x 2100 mm
- Weight .... 210 kg
- Water pressure range .... 0.7 ... 2 atm
- Nitrogen supply .... 0 ... 0.25 c.m.h.

1. Nitrogen inlet
2. Metal frame
3. Level indicator
4. Differential pressure indicator
5. Cleaning chamber
6. Collector chamber
7. Gas inlet
8. Visiting window
9. Exit



SILICON WAFER AUTOMATIC LOADING SYSTEM

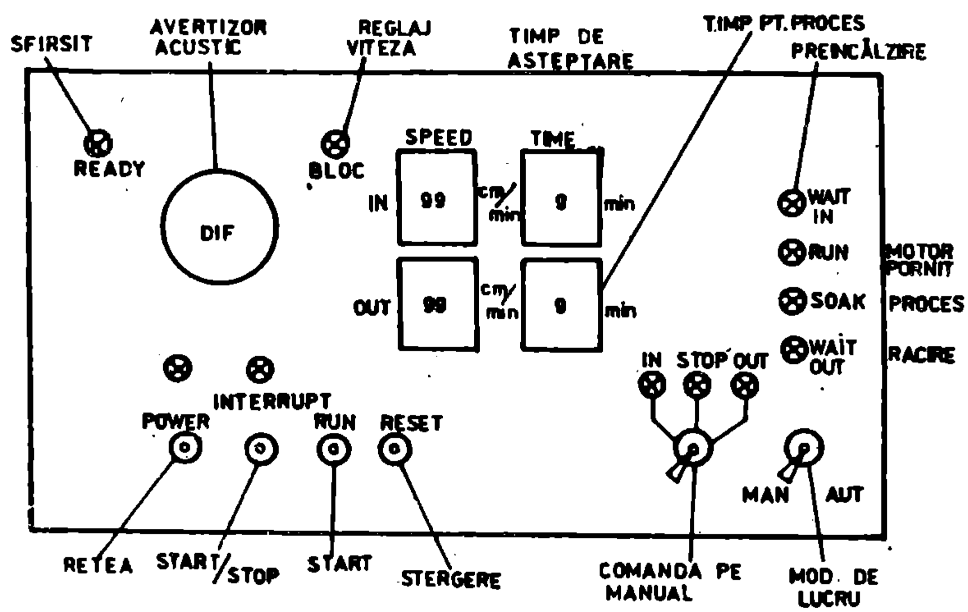
DESTINATION : The system ensures silicon wafer carrier automatic loadind and unloading into/out of the oven (diffusion, oxidation etc.) at a regulated and constant speed.

OPERATION : Switch on the start button (RUN) on the "Automat" mode and the carrier is maintained at the oven entrance for a period (ranging from 0 to 9 min.) preset by a " pre-heating " clock. Another clock is started (1 - 99 min. or 10 - 990 min.) immediately after the carrier enters the oven. After the heating time elapsed, the carrier is maintained at the oven entrance for a period of time equal to the " pre-heating ".

The end of the above-mentioned sequence of operations is acoustically and optically signalled (the READY signal).

Technical characteristics :

- Dimensions .... 1500 x 300 x 120 mm
- Weight .... 20 kg
- Power supply .... 0.1 kW



125 L TEMPERATURE CHAMBER

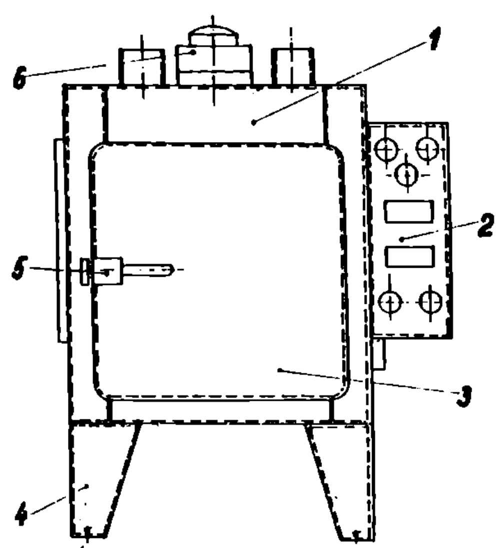
APPLICATION : The chamber is designed for drying, reliability tests, storage, polymerisation and for other processes requiring temperature conditions.

DESCRIPTION : The chamber body is made out of plate outside and of stainless steel inside, with a 90 mm thick insulating layer of glass wadding between. The chamber door is provided with a joint. At the top of the chamber an electric motor is located with a fan mounted on its axis. The ventilation system is equipped with adjustment valves. An external electronic control board is provided too.

The electric diagram ensures that temperature is maintained in the chamber within the range going from 20 oC to 250 oC. Temperature value is given by a temperature regulator.

Technical characteristics :

- Dimensions	970 x 910 x 1350 mm
- Weight	240 kg
- Inner volume	500 x 500 x 500 mm
- Input power	5.0 kW
- Operating temperature	0 ... 250 oC
- Accuracy (of full range)	1.5 %



1. Chamber body
2. Electric board
3. Door
4. Supporting feet
5. Locking system
6. Ventilation unit

FIXING TEMPERATURE CHAMBER

APPLICATION : The chamber is designed for drying, reliability tests, storage, polymerisation and for other processes requiring temperature conditions.

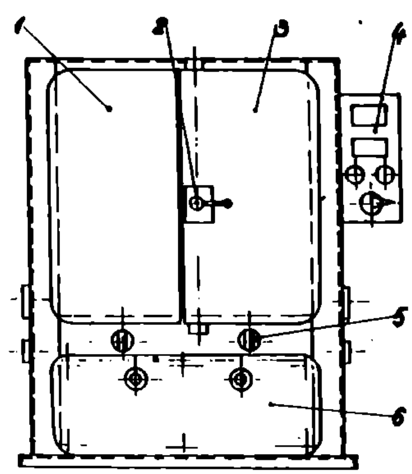
DESCRIPTION : The chamber body is made out of plate outside and of stainless steel inside, with insulating layer of glass wadding between . The chamber is provided with two doors equipped with joints and locking systems. The position can be fixed due to its screwing supports. The ventilation system, composed of an electric motor (0.37 kW / 1450 rpm), ball bearing and ventilator fan, is located in the lower inside part.

The electronic temperature regulator ensures constant or timer controlled (0 - 6 hrs.) temperature values. Optionally, an electronic safety system can be added to lock the doors if temperature exceeds the prescribed value inside the chamber.

Technical characteristics :.

- Dimensions	1300 x 1340 x 2000 mm
- Weight	890 kg
- Input power	11 kW
- Operating temperature	0 ... 200 oC
- Accuracy (of full range)	1.5 %
- Ventilator air flow	(2 x) 1890 m3/hrs
- Dynamic air pressure	(2 x) 10 mm H2O

1. Chamber body
2. Locker
3. Door
4. Electric pannel
5. Air valve control
6. Motor protection



SCREEN PRINTING MARKING MACHINE

APPLICATION : The machine is designed for marking the plastic sleeve of aluminium can capacitors using screen printing method.

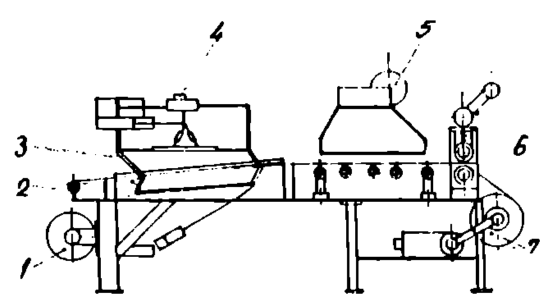
DESCRIPTION : The screen printing machine consists of a frame on which the following modules are mounted :
- unwinding system for plastic sleeve coil ;
- sleeve positioning system ;
- screen printing system consisting of screen holder and squeegee marker ;
- dryer and winding system .

This screen printing marking machine can be operated both manually and automatically and it performs the following sequence of operations :
1. lowering the screen holder ;
2. screen printing ;
3. setting up the screen holder ;
4. shifting the plastic sleeve simultaneously with the winding system .

Technical characteristics

- Dimensions	1700 x 800 x 1300 mm
- Weight	87 kg
- Power supply	0.3 kW
- Air supply	22 l/min.
- Output	10 s /cycle
- Marking lenght	325 mm./cycle

1. Unwinding system
2. Positioning system
3. Screen holder
4. Marker
5. Dryer
6. Sleeve drive system
7. Winding system



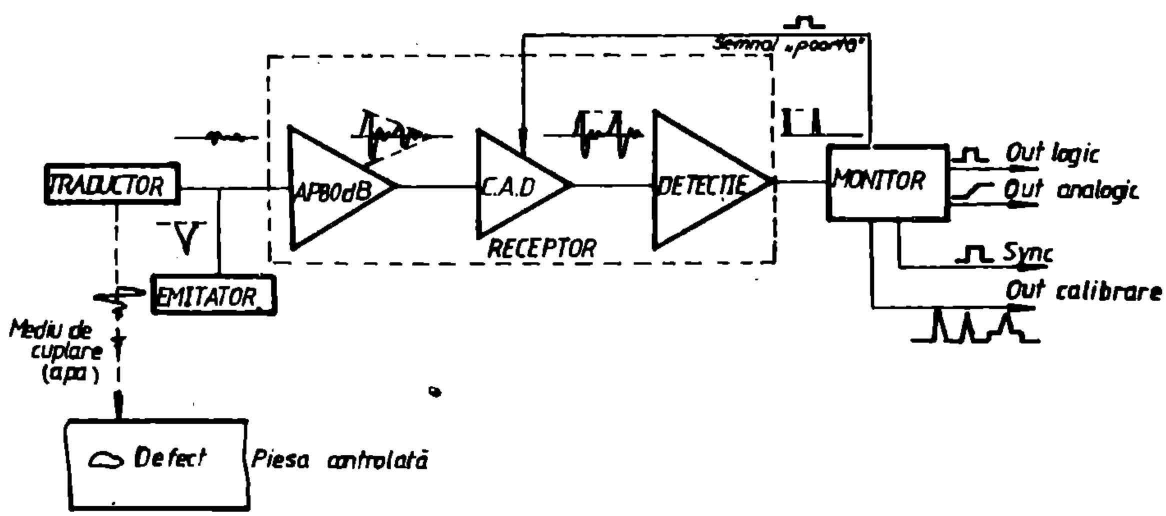
S.E.C.U. - ULTRASONIC ELECTRONIC CONTROL SYSTEM

The S.E.C.U. (Sistem Electronic de Control cu Ultrasunete) system was designed to be part of a nondestructive ultrasonic control equipment for laminated profiles (bars, tubes, files etc.) manufactured by the metal-working industry. Its main parts are the defectoscopy-control system (SC-DEF) and the dimensional control system (SC-DIM) . Due to the system modular design, the available configuration can be easily modified by the user, if necessary.

IMPORTANT : Modules can be ordered separately.

DEFECTOSCOPY-CONTROL SYSTEM (SC-DEF)

The system is made of test channel combinations, its configuration being determined by the user's control technology. The block diagram of a test channel is shown in Figure 1.



BLOCK DIAGRAM OF A TEST CHANNEL

1. Pulser - receiver module (M-ER)

1.1. Pulser features :

- Supply voltages +/- 6.0 V, +/- 12 V, 117 V / 50 Hz ;
- Internal and external triggering, TTL levels, pulse width 4.0 us. When operating on external triggering, a pulser can drive 8 identical units.

Parameters of the transducer drive pulse are adjustable through front panel controls :

- Repetition frequency - 500 Hz ... 10 kHz ;
- Rise time - 30 ns ... 80 ns ;
- Width - 50 ns ... 500 ns ;
- Amplitude - 100 V ... 300 V..

1.2. Receiver features :

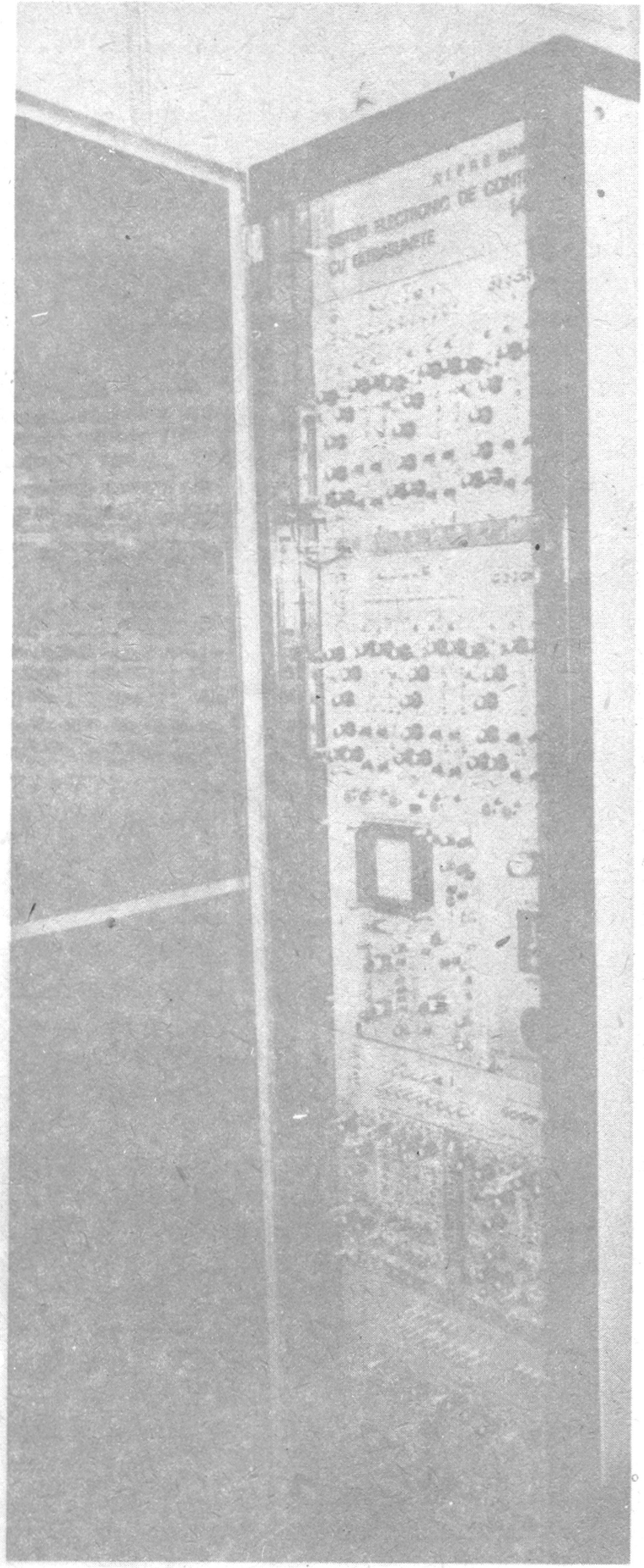
- Supply voltages +/- 6.0 V, +/- 12 V ;
- Sensitivity : min. 1.6 mV ;
- Amplification : min. 80 dB (adjustable) ;
  - coarse = 0 ... 70 dB , in 10 dB steps
  - fine = 0 ... 10 dB , in 1.0 dB steps
- Frequency range : 0.5 ... 6 MHz or 6 ... 12 MHz ;
- Noise rejection up to 50 % of maximum output signal ;
- Signal filtering switchable in two steps ;
- Signal filtering cancel available .

2. Monitor module (M-M)

Features :

- Operating modes : direct and echo pulse triggering ;
- Gate triggering pulse width (adjustable) :
  - coarse = 55 us ... 4 ms
  - fine = 5 us ... 65 us
- Gate pulse width (adjustable) :
  - coarse = 20 us ... 2.2 ms
  - fine = 0.8 us ... 25 us
- Two adjustable defect signalling levels, in steps, in the 0 ... 100 % range ;
- Optical signalling (by LED) ;
- Analog output (defect signalling) : 0 ... 5 V ;
- Logic output (defect signalling) : max. 10 mA with signal insulation via opto-coupler ;
- Recorder output : 0 ... 8 V .

The M-ER and M-M modules, together with a power supply, are mounted in a metallic frame insuring the mechanical fixture as well as the module interconnections for the required test channel configuration.



ULTRASONIC CONTROL SYSTEM (S.E.C.U.)

DIMENSIONAL CONTROL SYSTEM (SC-DIM)

This system was designed to measure the wall thickness and the diameter of various profiles and to signal the deviations from the nominal values,thus permitting to obtain a considerable material saving .

The dimensional control system modules are compatible with SC-DEF modules and frame .

The whole dimensional control system contains 6 modules for thickness control , diameter control , synchronisation , defect-evaluation, signal convertion and storage / comparison.

For further signal processing, value storage, implementation of a profile measurement data base, a computer can be added to the system (optionally) .

IMPORTANT : Modules can be ordered separately.

3. Thickness control module (M-CG)

Measuring principle : immersion or rotating method.

3.1. Pulser features :
- Drive pulse amplitude (no load) : min. 250 V ;
- Pulse width : 50 ns ... 200 ns (adjustable) ;
- Pulse rise time : 10 ns ... 80 ns (adjustable) ;
- Output impedance : min. 15 ohms ;
- Trigger pulse amplitude : 5 V ... 15 V ;
- Output SYNCHRO pulse : TTL level .

3.2. Receiver features :
- Gain : min. 60 dB (adjustable) ;
- Frequency range : 500 kHz ... 20 MHz ;
- Input impedance : 15 ... 250 ohms (adjustable) ;
- Adjustment range conforming to the propagation speed through the object : 1 ... 7 km/s ;
- Controlled thickness range (and accuracy) :

1 ... 19 mm (+/- 10 um)
4 ... 40 mm (+/- 0.1 mm)
10 ... 150 mm (+/- 0.5 mm)

3.3. Interface features :
- Logic outputs of exceeding wall thickness min./max. values ;
- 3 + 3/4 digital display ;
- Output impedance : 50 ohms .

4. Diameter control module (M-CD)

Measuring principle : 3 transducer method .

4.1. Pulser features :
- Drive pulse amplitude (no load) : min. 250 V ;
- Pulse rise time : 30 ns ;
- Output impedance : 47 ... 500 ohms (adjustable) ;
- Pulse frequency : 1 ... 5 kHz (adjustable)
- External synchro ;
- Negative going edge triggering : 5 V ... 15 V .

4.2. Receiver features :
- Frequency range : 4 MHz ... 10 MHz ;
- Input impedance : 47 ... 500 ohms (adjustable) ;
- Output voltage function of deviation from set-point ;

Sensitivity	Measuring range	Null adjustment	Distance measuring sensitivity
20 mV/um	+/-0.4 mm	+/-0.25 mm	2 mV/um
10 mV/um	+/- 1 mm	+/-0.5 mm	1 mV/um
4 mV/um	+/- 2 mm	+/- 1 mm	0.5 mV/um

- Accuracy : +/- 3 um ;
- Maximum eccentricity range : 2 / 4 / 8 mm ;
- Digital display (in um) ;
- Interferences rejection stage ;
- Operating temperature : 0 ... 45 oC .

5. Synchro module (M-S)

This module assures the synchro pulses for all SC-DEF and SC-DIM modules .

The M-S module has two operating modes :
- external triggering : the SC-DEF / SC-DIM modules are synchronised by the rotating head (when using the rotating method) ;
- internal triggering : SC-DEF synchro pulses generate trigger pulses for the SC-DIM modules ;

In both modes, the synchro frequency for all the other modules is limited at a preset value of 1 or 5 kHz .

Operating temperature range is 0 ... 45 oC .

6. Defect-evaluation module (M-ED).

The M-ED module contains several comparators for the measured signal. It has 4 independent channels (with signal summing facility) and can drive different storage / computing units .

6.1. Technical features :

- 4 independent channels with min./max. thresholds ;
- Tolerance adjust : continuous for each channel, self-contained for min./max. values, in the 0 ... 100 % range ;
- Indicators for the exceeding of the min./max. values for each channel ;
- Open collector outputs ;
- Operating temperature range : 0 ... 45 oC .

7.Signal converter module (M-CS)

The M-CS module is used as interface between the M-CG/M-CD modules and a computer and/or graphic recorder. It contains 4 identical channels, each with 2 sample / hold circuits , for minimum and maximum signal values.

7.1. Module features :

- 4 identical channels, with 2 S/H circuits each ;
- Input voltage swing : +/- 8 V ;
- Minimum input pulse width : 20 us ;
- Input impedance : 100 kohms ;
- Chopper frequency : 100 Hz ;
- Unity voltage gain ;
- Output impedance : 1 kohms ;
- Operating temperature range : 0 ... 45 oC .

8. Storage / comparator module (M-AD)

The M-AD module was designed to count the total number of defects and to compare the obtained value with a preset one . It has 6 circuits on 3 boards, with summing signal facility.

All inputs and outputs are buffered with opto-couplers.

SCR-CCR-01 CONTROL AND REGULATION SYSTEM

The system represents a control assembly to be used in single-phase or three-phase thyristor converters at mains frequency .

Due to the system modular design, the available configuration can be easily modified by the user, if necessary .

The modules were achieved in EUROCARD type PCBs (100 x 160 mm) .

Operating temperature range is of -25 to +40 oC .

Storage temperature ranges from -40 to + 55 oC .

The following modules are available at present :

1. Phase-sequence signalling module (P1-SCR-SSF-01)

The module was designed to check if the control and regulation unit supply voltages are in normal or reverse sequence and if a phase is missing .

- Supply voltages : +/-15 V (+/- 5 %) / 20 mA ;
  + 24 V (+/- 30 %) / 30 mA ;
- Normal sequence of phases : relay contact closed ;
- Reverse sequence of phases: relay contact open ;
- Phase missing : relay contact open ;
- Dimensions : 188.5 x 132.5 x 45 mm .

2. Supply voltage module (P2-SCR-SA-01)

The unit is intended to supply the whole system with regulated and unregulated voltages as well as synchro voltages .

- Supply voltages : 3 x 380 Vac (+10 % / -15 %) ;
- Output voltages : + 15 V (+/-5 %) / 400 mA ;
  - 15 V (+/-5 %) / 400 mA ;
  + 24 V (+/-30%) / 600 mA ;
  3 x 60 Vac (synchro voltages);
- Regulated voltages are short-circuit protected ;
- Dimensions : 192 x 132.5 x 105 mm .

3. Pulse amplifier module (P 345-AI-01)

This module was designed to amplify the trigger pulses generated by the gate-control module when using parallel-connected thyristors (pulse transformers SCR-TI-01 are required) .

- Supply voltages : + 24 V (+/-30%) / 100 mA ;
  22 Vac / 50 Hz / 1.5A ;
  43 Vac / 50 Hz / 1 A ;
  (AC voltages with 6 SCR-TI-01)
- Control voltage : + 24 V / 25 mA ;
- Pulse voltage : 24 Vcc / 1 ms (48 V / 100 us peak) ;
- Maximum load : 6 transformers type SCR-TI-01 ;
- Dimensions : 188.5 x 132.5 x 40 mm .

4. Gate-control module (P6-SCR-DCG-01)

The unit is intended to deliver 6 double-pulses to be used for the control of thyristor converters such as : fully-controlled three-phase bridges, commanded rectifiers with absorbtion choke and static three-phase contactors .

Pulse width is 1 ms and can be enlarged , on request , up to 10 ms for strong inductive loads .

- Supply voltages : +/- 15 V (+/- 5 %) ;
  + 24 V (+/- 30 %) ;
  3 x 60 Vac (+/- 20 %) ;
- Frequency : 50 Hz (+/- 2 %) ; for other frequency values in the range going from 54 to 60 Hz , extra-adjustments are needed ;
- Control voltage : 0 ... +10 V / < 100 uA ;
- Control range : 170 electric degrees ;
- Pulse location (rectifier range) : adjustable from 5 to at least 60 electric degrees ;
- Pulse location (inverter range) : adjustable from 100 to 175 electric degrees ;
- Output pulses : the regulation domain of the pulses is shifted 30 electric degrees with respect to the respective phase ;
- Output pulses : 6 pulses / full cycle (the auxiliary pulse is 60 electric degrees shifted with respect to the main pulse .
- Pulse interval : 60 +/- 3 electric degrees ;
- Pulse width : 1 ms (+/- 50 % for a control voltage of +5 volts) ;
- Pulse voltage : 24 V (+/- 30 %) / 0.6 A (for one SCR-TI-01 transformer) ;
- Pulse blocking : through grounding .
- Dimensions : 188.5 x 132.5 x 30 mm .

5. Regulation module (P7-SCR-R-01)

The P7-SCR-R-01 module was designed for voltage control of the thyristor converters with current monitoring loop . Due to its circuitry , no thyristor trigger pulses appear at power switch-on .

- Supply voltages : +/- 15 V (+/- 5 %) ;
  + 24 V (+/- 30 %) ;
- Input signal : < 1 mA (at the voltage regulator) ;
  < 0.2 mA (at the current regulator) ;
- Output voltage (typical) : 0 ... + 5 V (2 kohms load);
- Start delay : < 300 ms (adjustable) ;
- Integration time : < 6 s (adjustable) ;
- Dimensions : 188.5 x 132.5 x 30 mm .

6. Adaptive regulator module (P7-SCR-RA-01)

The adaptive regulator module achieves the command and control of thyristor converters output voltages with current monitoring loop .

- Supply voltages : +/- 15 V (+/- 5 %) ;
  + 24 V (+/- 30 %) ;
- Input signal : < 1 mA (at the voltage regulator) ;
  < 0.1 mA (at the current regulator) ;
- Output voltage (typical) : 0 ... + 5 V (2 kohms load);
- Start delay : < 600 ms (adjustable) ;
- Integration time : < 2 s (adjustable) ;
- Dimensions : 188.5 x 132.5 x 30 mm .

7. Current balancing module (P8-SCR-EL-01)

The module is intended to current balancing and power limiting for thyristor converters driving two D.C. motors coupled on the same axis.

- Supply voltages : +/- 15 V (+/- 5 %) / 25 mA ;
- Input signal : 0 ... 10 V ;
- Output signals : 0 ... + 10 V ;
  - 10 ... + 10 V ;
- Comparation error : < +/- 5 % ;
- Dimensions : 188.5 x 132.5 x 30 mm .

8. Relay board module (P9-SCR-PR-01)

The board achieves the control of various electrical circuits requiring galvanic insulation . The module is provided with 5 relays , 4 of them commanded by a logic signal (0 ...+5V or 0 ... +15 V) and one having a programmable voltage level ranging from - 12 to + 12 volts .

- Supply voltages : +/- 15 V (+/- 5 %) ;
- Control voltage : + 5 V or + 15 V ;
  grounding / programmable signal from - 12 V to + 12 V ;
- Control current : 0.25 mA (+ 5 V) ;
  0.75 mA (+15 V) ;
  0.25 mA (programmable level signal) ;
- Relay contact voltage : max. 220 Vac ;
- Relay contact power : max. 50 W ;
- Dimensions : 188.5 x 132.5 x 55 mm .

9. Current transducer module (P10-SCR-2TC-01)

To obtain current information (single polarity only) , the current transducer having galvanic insulation requires a current shunt . There are two current transducers on a module .

- Supply voltages : +/- 15 V (+/- 5 %) / 20 mA ;
  + 24 V (+/- 30 %) / 10 mA ;
- Shunt : 75 mV type ;
- Transfer ratio : 0.02 V / mV ;
- Transfer ratio error : +/- 4 % (20 ... 100 mV) ;
  +/-10 % (10 ... 20 mV) ;
  +/-10 % (100 ... 150 mV) ;
- Linear range : max. 20 ... 100 mV ;
- Voltage to be compared : 0.75 ... 15 V ;
- Dimensions : 188.5 x 132.5 x 45 mm .

10. Voltage transducer module (P11-SCR-2TT-01)

This double polarity voltage transducer with galvani insulation is required for the control and regulation system There are two transducers on a module .

- Supply voltage : + 24 V (+/- 30 %) / 40 mA ;
- Input voltage : 0 ... +/- 10 V ;

- Transfer ratio : 0.85 V/V ;
- Transfer ratio error : max. +/- 10 % ;
- Linearity error : max. +/- 5 % ;
- Zero error : max. +/- 20 % ;
- Maximum linearity range : 150 % ;
- Dimensions : 188.5 x 132.5 x 50 mm .

11. Power supply module (SCR-SA-02)

The unit is intended to supply the whole system with regulated and unregulated voltages .

- Supply voltages : 2 x (3 x 9.5 Vac (+10 % / -15 %));
  3 x 11 Vac (+10 % / - 15 %) ;
- Mains frequency : 50 Hz (+/- 2 %) ;
- Output voltages : + 15 V (+/-2 %) / 400 mA ;
  - 15 V (+/-2 %) / 400 mA ;
  + 24 V (+/-30%) / 600 mA ;
- Dimensions : 190 x 132.5 x 30 mm .

12. Gate-control module (SCR-DCG-02)

The unit is intended to deliver 6 double-pulses to be used for the control of thyristor converters such as : fully-controlled three-phase bridges, commanded rectifiers with absorbtion choke and static three-phase contactors .

- Supply voltages : +/- 15 V (+/- 5 %) ;
  + 24 V (+/- 30 %) ;
  3 x 60 Vac (+/- 20 %) ;
- Control voltage : 0 ... +10 V / < 100 uA ;
- Control range : 170 electric degrees ;
- Pulse location (rectifier range) : adjustable from 5 to at least 60 electric degrees ;
- Pulse location (inverter range) : adjustable from 100 to 175 electric degrees ;
- Output pulses : 6 pulses / full cycle (the auxiliary pulse is 60 electric degrees shifted with respect to the main pulse) .
- Pulse interval : 60 +/- 3 electric degrees ;
- Pulse width : 1 ms (+/- 15 % for +5 V control voltage);
- Pulse voltage : 24 V (+/- 30 %) / 1.2 A (for two SCR-TI-01 transformers connected in parallel) ;
- Dimensions : 190 x 132.5 x 30 mm .

13. Regulation module (SCR-R-02)

The SCR-R-02 module, as a part of the SCR-F-01 control and regulation system, was designed for voltage control of thyristor converters with current monitoring loop .

- Supply voltages : +/- 15 V (+/- 2 %) ;
  + 24 V (+/- 30 %) ;
- Input signal : < 1 mA (at the voltage regulator) ;
  < 0.1 mA (at the current regulator) ;
- Output voltage (typical) : 0 ... + 5 V (2 kohms load);
- Start delay : typ. 900 ms (adjustable) ;
- Integration time : typ. 1 s (adjustable) ;
- Dimensions : 190 x 132.5 x 35 mm .

14. Checking module (SCR-TEST-01)

This module was designed to check the proper operation of voltage supplies and of the gate control device within the SCR-F-01 control and regulation system . The module contains an analog measuring device indicating the input voltage level for 12 signals selected via a front pannel switch .

- Supply voltages : + 24 V (+/- 30 %) / 20 mA ;
- Input voltages : D.C. voltages : 0 ... +/- 15 V ;
  A.C. voltages : max. 60 Veff / 50 Hz ;
  pulses with max. amplitudes of 24 V , width 1 ms., frequency 50 Hz. ;
- Maximum input current (each input) : 1 mA ;
- Dimensions : 200 x 132.5 x 50 mm .

15. Checking module (SCR-TEST-02)

The SCR-TEST-02 module is intended to check the proper operation of some of the electronic circuits mounted in the SCR-F-01 control and regulation system . It contains an electronic voltmeter equipped with an analog measuring device indicating the input voltage value for 12 electrical signals selected via a front pannel switch .

- Supply voltages : +/- 15 V (+/- 2 %) / 25 mA ;
- Input voltages : 0 ... +/- 12 V ;
- Input current (for each input) : typ. 3 uA ;
- Dimensions : 200 x 132.5 x 50 mm .

16. Signal conversion and balancing module (SCR-ASE-01)

The module is intended to achieve the translation of electrical signals in the 0 ... 10 V range , as well as to ensure temporized current limiting in case of overload .

- Supply voltages : +/- 15 V (+/- 5 %) ;
- Input voltages : 0 ... - 10 V ;
  0 ... + 10 V ;
  - 5 ... 0 ... + 5 V (differential) ;
- Dimensions : 190 x 132.5 x 30 mm .

17. Current limiting and protection module (SCR-PLC-01)

The module ensures : adjustable voltage steps for rotor current limiting, rotor overcurrent protection with instant pulse shift at 180 electric degrees and comparison between the real voltage value , two prescribed voltages and the assigned voltage value.

- Supply voltages : +/- 15 V (+/- 2 %) ;
  + 24 V (+/- 30 %) ;
- Input voltages : -15 V ... 0 ... +15 V ;
- Current limiting threshold : + 8.4 V for 1.25 I_N ;
  + 6.6 V for 1.0 I_N ;
  + 5.1 V for 0.75 I_N ;
  + 3.4 V for 0.5 I_N ;
- Rotor overcurrent threshold: +13.3 V for 2.0 I_N ;
- Dimensions : 190 x 132.5 x 35 mm .

18. Gate-control module (SCR-DCG-03)

The unit is intended to deliver drive pulses for the thyristors of a single-phase converter as well as to provide the D.C. voltages necessary to the system modules .

- Supply voltages : 2 x 18 Veff / 50 Hz ;
  22 Veff ;
  60 Veff (synchro voltage) ;
- Output voltages : +/- 15 V (+/- 2 %) / 200 mA ;
  + 24 V (+/- 30 %) / 600 mA ;
- Control voltage : 0 ... +10 V / < 100 uA ;
- Control range : 175 electric degrees ;

- Pulse location (rectifier range) : adjustable from 18 to 75 electric degrees ;
- Pulse location (inverter range) : adjustable from 115 to 193 electric degrees ;
- Output pulses : 2 pulses / full cycle ;
- Pulse interval : 180 +/- 3 electric degrees ;
- Pulse width : 1 ms (adjustable) ;
- Pulse voltage : 24 V / 1.2 A (for two SCR-TI-01 transformers) ;
- Dimensions : 190 x 132.5 x 40 mm .

19. Regulation module (SCR-R-03)

The SCR-R-03 module, as a part of the SCR-F-01 control and regulation system, was designed for voltage control of thyristor converters . The regulator commands a single current loop .

- Supply voltages : +/- 15 V (+/- 2 %) ;
  + 24 V (+/- 30 %) ;
- Input signal : < 0.1 mA (at the current regulator) ;
- Output voltage (typical) : 0 ... + 5 V (·2 kohms load);
- Start delay : typ. 900 ms ;
- Dimensions : 190 x 132.5 x 40 mm .

20. Checking module (SCR-TEST-03)

This module was designed to check the proper operation of voltage supplies and of the gate control pulses as well as to test the proper operation of the SCR-F-01 system electronic circuits . The module contains an electronic voltmeter equipped with an analog measuring device indicating the input voltage level for 12 signals selected via a front pannel switch .

- Supply voltages : +/- 15 V (+/- 2 %) ;
  + 24 V (+/- 30 %) ;
- Input voltages : 0 ... +/- 12 V ;
  max. 60 Veff / 50 Hz ;
- Maximum input current (each input) : 1 mA ;
- Dimensions : 200 x 132.5 x 70 mm .

21. Pulse transformer (SCR-TI-01)

The SCR-TI-01 transformer achieves the transmission of gate drive pulses to converter thyristors ; it provides, at the same time, galvanic insulation between the regulation and control system and the thyristor converter .

- Primary pulse voltage : + 24 V ;
- Pulse frequency : 50 Hz ;
- Pulse width : 1 ms ;
- Secondary pulse voltage (no load) : 10 volts ;
- Secondary pulse rise slope : 1 A / 4 us ;
- Short-circuit current : 1.2 A ;
- Dimensions : 59.5 x 50 x 50 mm .

22. Power transformer (SCR-TAI-01)

The SCR-TAI-01 is a single phase power transformer for the P 345-SCR-AI-01 pulse amplifier .

- Primary : 220 V / 110 VA ;
- Secondary 1 : 22.5 V / 100 VA ;
- Secondary 2 : 43 V / 10 VA ;
- Dimensions : 126 x 99 x 96.5

23. Modular frames

The modular frames provide connections between modules for the output slots and transformers .

SCR-SM-03 = 4 module frame for :
- P2-SCR-SA-01 - 1 pc.
- P6-SCR-DCG-01 - 1 pc.
- P7-SCR-R(RA)-01 - 1 pc.
- P10-SCR-2TC-01 - 1 pc.

Dimensions : 285 x 221 x 132.5 mm.

SCR-SM-04 = 3 module frame for P345-SCR-AI-01 .
Dimensions : 221 x 186 x 132.5 mm.

SCR-SM-05 = 6 module frame for :
- P2-SCR-SA-01 - 1 pc.
- P6-SCR-DCG-01 - 1 pc.
- P7-SCR-R(RA)-01 - 1 pc.
- P9-SCR-PR-01 - 1 pc.
- P10-SCR-2TC-01 - 1 pc.
- P11-SCR-2TT-01 - 1 pc.

Dimensions : 395 x 221 x 132.5 mm.

SCR-SM-06 = 8 module frame for :

- P1-SCR-SSF-01	-	1	pc.
- P2-SCR-SA-01	-	1	pc.
- P6-SCR-DCG-01	-	1	pc.
- P7-SCR-R(RA)-01	-	1	pc.
- P8-SCR-EL-01	-	1	pc.
- P9-SCR-PR-01	-	1	pc.
- P10-SCR-2TC-01	-	1	pc.
- P11-SCR-2TT-01	-	1	pc.

Dimensions : 495 x 219 x 132.5 mm.

SCR-SM-07 = 7 module frame for :

- SCR-SA-02	-	1	pc.
- SCR-DCG-02	-	1	pc.
- SCR-R-02	-	1	pc.
- SCR-TEST-01	-	1	pc.
- SCR-TEST-02	-	1	pc.
- SCR-ASE-01	-	1	pc.
- SCR-PLC-01	-	1	pc.

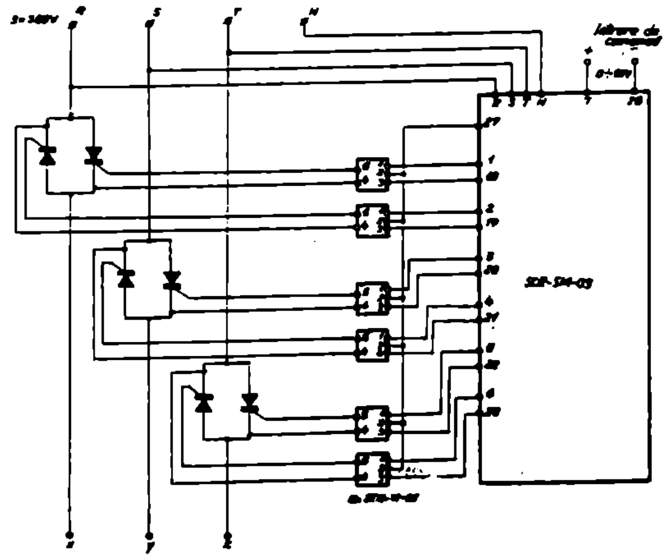
Dimensions : 269 x 260 x 196 mm.

SCR-SM-08 = 3 module frame for :

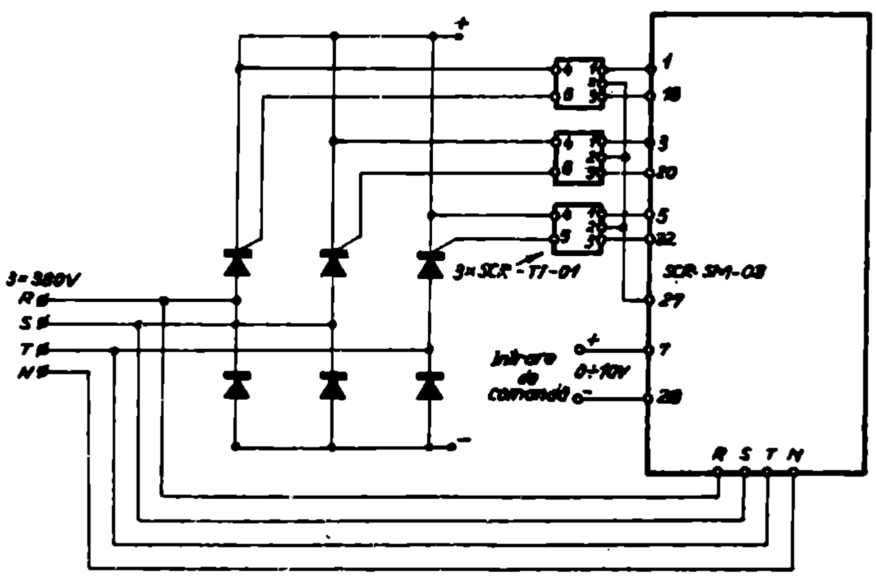
- SCR-DCG-03	-	1	pc.
- SCR-R-03	-	1	pc.
- SCR-TEST-03	-	1	pc.

Dimensions : 260 x 235 x 134.5 mm.

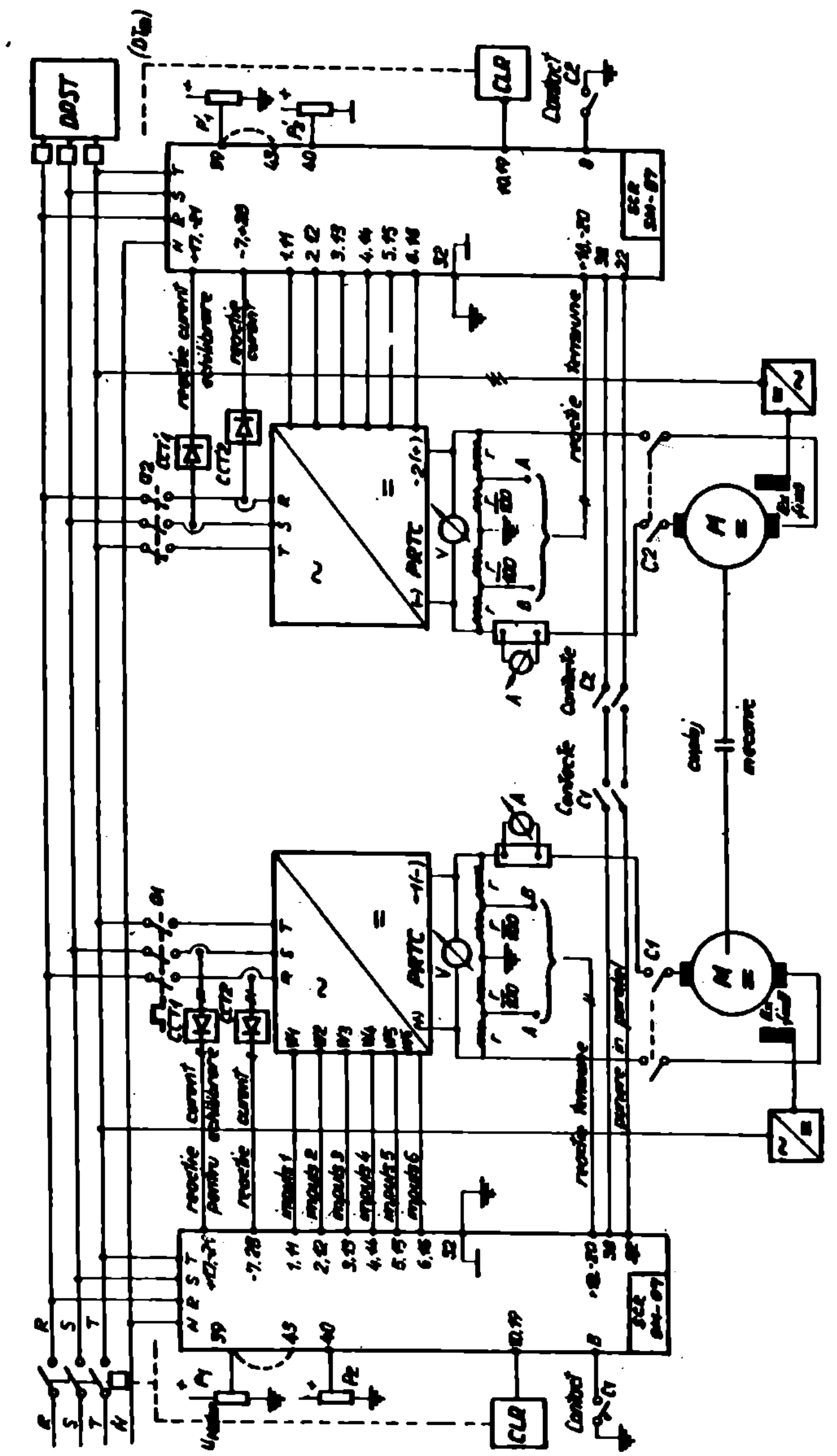
OTHER FRAME TYPES ARE AVAILABLE ON REQUEST .



SCR-CCR-01 SYSTEM : THREE-PHASE A.C. CONVERTER



SCR-CCR-01 SYSTEM : THREE-PHASE CONVERTER



SCR-CCR-01 SYSTEM : POWER CONTROLLER

MADS-STAR-ST - POWER CONSUMPTION MONITORING SYSTEM

The MADS-STAR-ST system was designed for mains power consumption monitoring at plant transformer level or next higher (up to county / district level) .

It was built around MADS computer modules (developped by MICROELECTRONICA) .

The equipment performs the following operations :

- Data processing from pulse-generator meters and / or pulse-generator adders ;
- For every measuring point as well as for groups of measuring points, computing of :
  - => the momentary power (i.e. the average power for a very short time interval) ;
  - => the average power / 15 min.
- On request, the transmission of the following informations to the hierarchic level for every measuring point or group of measuring points :
  - => index ;
  - => average power / 15 min.;
  - => momentary power ;
  - => mains frequency ;
  - => local time ;
  - => measuring point identifier .
- Programming , by the higher level, for every measuring point or group of measuring points, of the index and the exact time .
- Console operating of the system computer.

Features :

- power supply : 220 Vdc, 110 Vdc, 48 Vdc, 220 Vac ;
- Protection grade : IP 41 ;
- Operating temperature range : 0 ... +45 oC ;
- Transport temperature range : -25 ... +55 oC ;
- Storage temperature range : +5 ... +35 oC ;
- Relative humidity (in operation) : 40 ... 80 % ;
  WARNING : NO CONDENSATION !
- Relative humidity (during transport) : max. 95 % at +30 oC ;
- Relative humidity (during storage) : max. 85 % at 20 oC;
- Weight : 200 kg ;
- Dimensions : 550 x 1010 x 1680 mm

SCA-MPP-02 - STEP-BY-STEP MOTOR DRIVE SYSTEM

- Preliminary data

This system was designed in two versions : SCA-MPP-02-A which has linear final stages and SCA-MPP-02-B with switching final stages .

It permits the control and drive of step-by-step motors with the following features :

	SCA-MPP-02-A	SCA-MPP-02-B
- Motor phases	4 (2)	
- Maximum couple	3 Nm	
- Max. current / phase	3 A	6 A
- Phase resistance	0.1 ... 10 ohms	
- Phase inductance	0.1 ... 10 mH	
- Step-angle	0.72 ... 72 degrees	
- Connection wires	8	

The SCA-MPP-02 system has the following features :

	SCA-MPP-02-A	SCA-MPP-02-B
- Min. revolution increment	step-angle / 4	(step-angle / 15)
- Max. rotational speed	3 rev/s	3 rev/s
- Min. rotational speed	0.003 rev/s	0.01 rev/s
- Phase supply voltage	max. +/-24 V	max. +/-70 V
- Logic PCB supply voltage	+/-15 V / 300 mA	
- Phase current	max. 3 A	max.6 A
- Protection current	max. 3 A	max.6 A
- Control frequency ratio	kf (max)= 2000	

- Manual command for step-by-step motor angular acceleration ;
- External command in frequency and sense (0 ... 10 kHz , 0 ... 15V) for step-by-step-motor acceleration ;
- External command in current and sense (0 ... 2 mA) for step-by-step-motor speed ;
- External movement inhibition ;
- Auto-stop at extreme positions (sensed by limitators) ;
- Phase current adjustment depending on motor type .

The SCA-MPP-02 system has a modular structure and improves the NIM standard . Four SCA-MPP-02 systems can be inserted in a NIM type frame .

Dimensions do not exceed 105 x 225 x 270 mm .

DST-02 - DANGEROUS VOLTAGE ALARM DEVICE

The device is intended to be mounted on trolley-buses designed for negative-to-ground electrical networks . It ensures monitoring of the body voltage versus ground and signalling of the preset value excess for passenger safety .

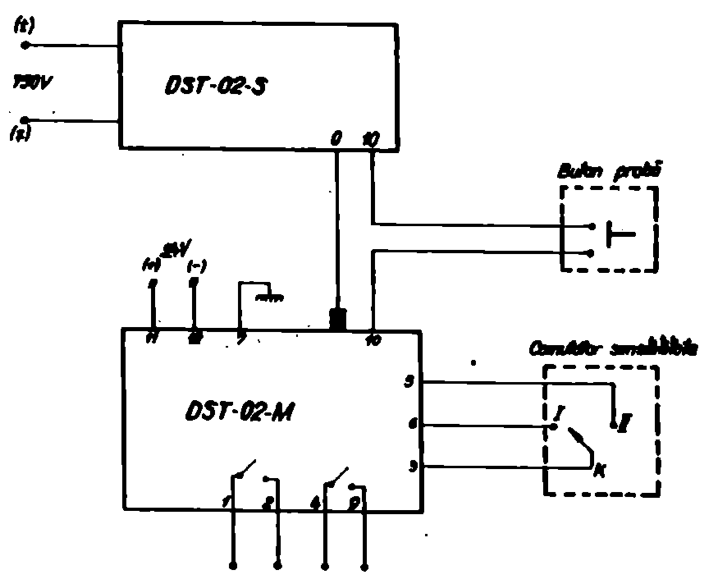
The system is divided in two parts :

- DST-02 M : electronic block ;
- DST-02 S : high voltage sensor .

At the same time , the DST-02 device is ideal for signalling the lower-limit of insulation resistance , in equipments supplied with a negative-to-ground D.C. voltage .

Features :

- Supply voltage : 24 Vdc (+/- 20 %) ;
- Dangerous voltage signalling : Normal-Open 50 W type relay contacts ;
- Sensitivity levels : I : 40 V (+/- 10 %) ;
  II : 100 V (+/- 10 %) ;
- Dimensions : 233 x 178 x 72 mm (DST-02 M) ;
  116 x 114 x 85 mm (DST-01 S) .



Connection diagram of DST-02 M and DST-02 S

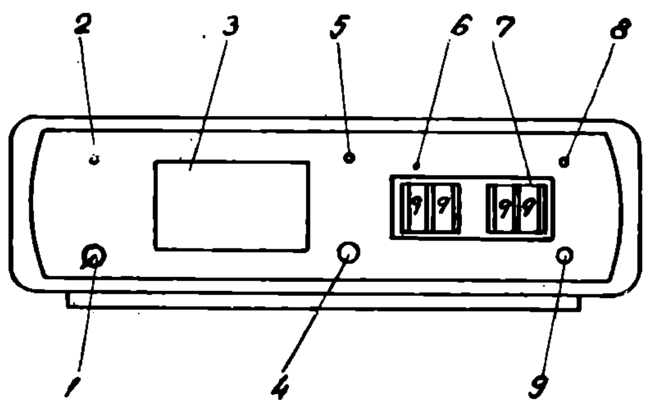
INDUSTRIAL TIMER

APPLICATION : The industrial timer is intended for all applications requiring time adjustments.

DESCRIPTION : The device capability is up to 99 minutes and 59 seconds in one second steps. The timer is set to the desired value in this range. It displays the count-down in steps of one minute, then lights on the flash-lamp and starts the acoustic allarm at the end of the sequence. The timer is provided with an output connection for the remote control of other equipments.

Technical characteristics :

- Dimensions .... 270 x 75 x 150 mm
- Weight .... 1.0 kg
- Power supply .... 220 V / 50 Hz
- Input power .... 2.5 VA



1. Power switch
2. Supply lamp
3. Count-down display
4. Reset
5. Allarm flash lamp
6. Tumbler switch for minutes
7. Tumbler switch for seconds
8. Timer control lamp
9. Start push-button

ANGULAR SPEED REGULATOR

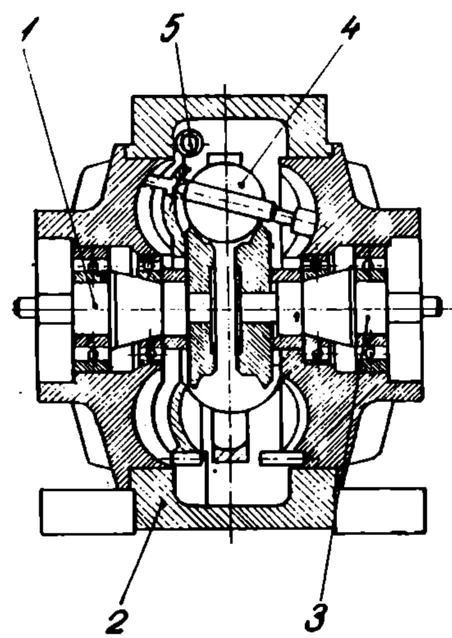
APPLICATION : The regulator is intended for all mechanical drives requiring a continuous regulation of the angular speed.

DESCRIPTION : Built up with steel balls, this angular speed regulator operates due to the friction resulting from the pressure exerted by the balls against the drive cones placed on the input and output spindles. In order to continuously vary the input angular speed, the position of the ball shafts is regulated via a snail drive gear.

Depending on the position of the ball shafts relative to the main shaft , a continuous regulation ratio up to 3:27 can be achieved.

Technical characteristics :

- Dimensions .... 270 x 200 x 210 mm
- Continuous regulation ratio .... max. 3:27 -
- Output power at 1400 r.p.m. .... 0.3 kW
- Minimal input speed .... 630 r.p.m.
- Maximal input speed .... 1500 r.p.m.
- Output angular speed range (1500 r.p.m. at input) 430...4320 r.p.m.



1. Input spindle
2. Body
3. Output spindle
4. Ball 1 5/8"
5. Regulation set screw

X-Y-Z MICROMETRIC TOOL

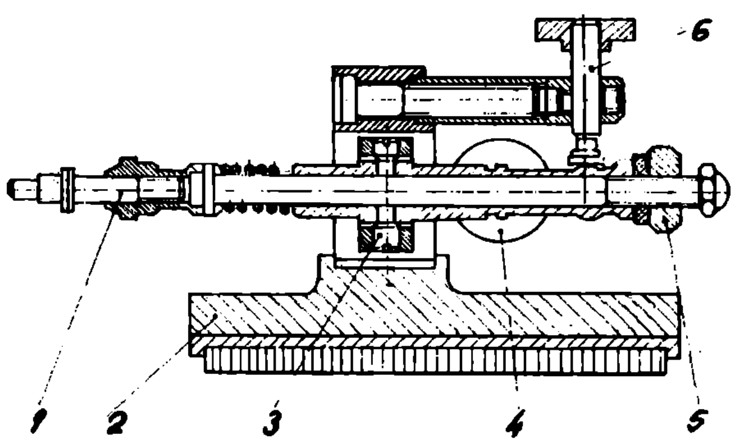
APPLICATION : The X-Y-Z micrometric tool is designed for precision positioning of current / voltage measuring heads .

DESCRIPTION : The measuring head is mounted on an insulated body and can be independently moved up to 30 mm along the three axes (X, Y, Z).

X, Y and Z motions are achieved by a mechanical system located inside the body. The tool can be fixed magnetically on the metal plate of any measuring system.

Technical characteristics

- Dimensions .... 175 x 80 x 55 mm
- Weight .... 0.15 kg
- Settling precision per turn of the micrometer screw .... 0.25 mm



1. Mechanical head
2. Base plate
3. Positioning system
4. X set screw
5. Y set screw
6. Z set screw