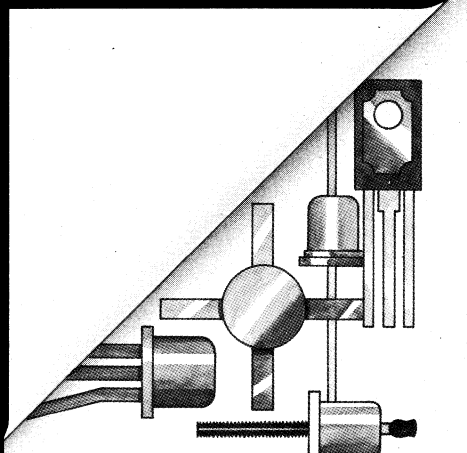
Electronic components and materials

PHILIPS

SEMICONDUCTORS

1981/82



status guide

The status code letters used in this catalogue indicate the status of the products at 1 May 1981

N = New design type. Recommended for new equipment design; production quantities available *after date of publication.*

D = Design type. Recommended for equipment design; production quantities available *at date of publication.*

C = Current type. No longer recommended for equipment design; available for equipment production and for use in existing equipment.

M = Maintenance type. No longer recommended for equipment production; available for maintenance of existing equipment.

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EINDHOVEN — The Netherlands
May 1981

OVERZICHT VOORRAADPROGRAMMA HALFGELEIDERS

Om deze catalogus gemakkelijk hanteerbaar te maken is een overzicht van het voorraadprogramma zoals dat door Philips Nederland B.V. marktgroep Elonco en haar industriële distributeurs gevoerd toegevoegd.
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Natuurlijk kunnen ook alle andere in deze catalogus genoemde produkten worden geleverd. Prijzen en overige leveringscondities worden op aanvraag gaarne verstrekt.

Philips Nederland B.V.

Marktgroep Elonco
Postbus 90050
5600 PB Eindhoven
Telefoon: 040-782754 (documentatie)
040-783749 (programma informatie)
Telex: 51238

Typenummer	Min. afname*
BAS11	500
BAV10	500
BAV18	500
BAV20	500
BAV21	500
BAV45	30
BAW62	500
BAX12A	500
BAX18A	500
BA157	500
BA158	500
BA159	500
BB112	30
BB204B	500
BB205B	500
BB405B	500
BCY56	100
BCY70	100
BCY71	100
BCY87	10
BCY88	10
BCY89	10
BC146/01	500
BC146/02	500
BC146/03	500
BC200/01	500
BC200/02	500
BC200/03	500
BC327	500
BC327/16	500
BC328	500
BC337	500
BC337/16	500
BC338	500
BC368	500
BC369	500
BC546B	500
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BC548C	500
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BC549C	500
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BC550C	500
BC556	500
BC556A	500
BC557	500

Typenummer	Min. afname*
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BC559A	500
BC559B	500
BC560B	500
BC635	500
BC635/636	100
BC636	500
BC637	500
BC638	500
BC639	500
BC640	500
BDT62	30
BDT62A	30
BDT63	30
BDT63A	30
BDT91	30
BDT92	30
BDT93	30
BDT94	30
BDV64	30
BDV64A	30
BDV65	30
BDV65A	30
BDX62A/63A	10
BDX64	30
BDX64A	30
BDX65	30
BDX65A	30
BDX77	50
BDY20	50
BD115	100
BD131	100
BD131/132	50
BD132	100
BD135	100
BD135/136	50
BD136	100
BD137	100
BD137/138	50
BD138	100
BD139	100
BD139/140	50
BD140	100
BD201/202	50
BD202	100
BD203	100
BD203/204	50
BD204	100

Typenummer	Min. afname*
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BD433	100
BD434	100
BD435/436	50
BD437/438	50
BD645	100
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BD647	50
BD648	50
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BD681	100
BD933	100
BD934	100
BD935	100
BD936	100
BD937	100
BD938	100
BD943	100
BD944	100
BD945	100
BD946	100
BD947	100
BD948	100
BD949	100
BD950	100
BD951	100
BD952	100
BD953	100
BD954	100
BFR64	10
BFR90/02	30
BFR91/02	30

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Typenummer	Min. afname*
BFR96/02	10
BFS17	100
BFW10	100
BFW11	100
BFW13	50
BFW16A	30
BFW30	30
BFW92/02	100
BFW93/02	30
BFX89	100
BFY50	100
BFY51	100
BFY55	100
BFY90	100
BF115	100
BF198	500
BF200	100
BF240	500
BF245A	100
BF245C	100
BF324	500
BF336	100
BF337	100
BF338	100
BF458	500
BF459	500
BF494	500
BF495	500
BG1895/641	50
BLX66	10
BLY87C	10
BLY88C	10
BLY89C	10
BLY90	10
BLY91A	10
BLY92A	10
BLY93A	10
BLY94	10
BPW50	50
BPX25	10
BPX70	10
BRY39	100
BR100/03	100
BR101	100
BSS38	500
BSV64	100
BSV78	30
BSV79	30
BSV80	30
BSV81	10
BSW66A	100

Typenummer	Min. afname*
BSW67A	100
BSW68A	100
BSX19	100
BSX20	100
BSX21	100
BSX61	100
BTW30/800RS	1
BTW31/800RW	1
BTW38/1200R	10
BTW38/800R	10
BTW43/1200H	10
BTW43/800H	10
BTW45/1200R	10
BTW45/800R	10
BTW58/1000R	50
BTW58/1300R	50
BTW58/1500R	50
BTW92/1200RM	1
BTW92/1600RM	1
BTW92/800RM	10
BTX94/1200J	1
BTX94/800J	1
BT100A/02	100
BT136/500	100
BT136/600	100
BT137/500	100
BT137/600	100
BT138/500	100
BT138/600	100
BT139/500	100
BT139/600	100
BT151/500R	100
BT151/650R	100
BT152/600R	100
BT152/800R	100
BT153	100
BT154	100
BT155/800RN	10
BUX80	30
BUX82	30
BUX84	30
BUX86	30
BU205	10
BU208A	10
BU326A	30
BU426A	10
BU433	10
BYV21/30	10
BYV21/45	10
BYV27/100	100
BYV27/50	100

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BYV30/300	10
BYV30/400	10
BYV92/300	10
BYV92/400	10
BYV95A	500
BYV95B	500
BYV95C	500
BYV96D	500
BYV96E	500
BYW19/1000	10
BYW19/1000R	10
BYW29/100	10
BYW30/100	10
BYW31/100	10
BYW54	500
BYW55	500
BYW56	500
BYW92/100	10
BYW95A	500
BYW95B	500
BYW95C	500
BYW96D	500
BYW96E	500
BYX10	100
BYX25/1000	10
BYX25/1000R	10
BYX38/1200	100
BYX38/1200R	100
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BYX38/300R	100
BYX38/600	100
BYX38/600R	100
BYX39/1000	50
BYX39/1000R	50
BYX42/1200	50
BYX42/1200R	50
BYX42/600	50
BYX42/600R	50
BYX46/600	10
BYX46/600R	10
BYX49/1200	100
BYX49/1200R	100
BYX49/300	100
BYX49/300R	100
BYX49/600	100
BYX49/600R	100
BYX55/350	100
BYX55/600	100
BYX71/350	100

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Typenummer	Min. afname*
BYX71/350R	100
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BYX71/600R	100
BYX72/500	10
BYX72/500R	10
BYX90	50
BYX96/1200	10
BYX96/1200R	10
BYX96/600	10
BYX96/600R	10
BYX97/1200	10
BYX97/1200R	10
BYX97/300	10
BYX97/300R	10
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BY184	100
BY188A	100
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BY224/600	100
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BY228	100
BY229/400	100
BY229/800	100
BY256	100
BY257	100
BY260/200	100
BY260/400	100
BY261/200	100
BY261/400	100
BY277/750R	100
BY406	100
BY407	100
BY409A	100

Typenummer	Min. afname*
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BY509	100
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BY527	500
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BZV85/C12	500
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BZV85/C16	500
BZV85/C18	500
BZV85/C20	500
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BZV85/C24	500
BZV85/C27	500
BZV85/C30	500
BZV85/C33	500
BZV85/C36	500
BZV85/C39	500
BZV85/C43	500
BZV85/C47	500
BZV85/C5V1	500
BZV85/C5V6	500
BZV85/C51	500
BZV85/C56	500
BZV85/C6V2	500
BZV85/C6V8	500
BZV85/C62	500
BZV85/C68	500
BZV85/C7V5	500
BZV85/C75	500
BZV85/C8V2	500
BZV85/C9V1	500
BZX61/C100	100
BZX61/C110	100
BZX61/C120	100
BZX61/C130	100
BZX61/C150	100
BZX61/C160	100
BZX61/C180	100
BZX61/C200	100
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BZX70/C11	100
BZX70/C12	100
BZX70/C13	100

Typenummer	Min. afname*
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BZX70/C16	100
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BZX70/C22	100
BZX70/C24	100
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BZX70/C39	100
BZX70/C43	100
BZX70/C47	100
BZX70/C51	100
BZX70/C56	100
BZX70/C62	100
BZX70/C68	100
BZX70/C75	100
BZX75/C1V4	100
BZX75/C2V1	100
BZX75/C2V8	100
BZX75/C3V6	100
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BZX79/C30	500
BZX79/C3V0	500
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BZX79/C3V9	500
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BZX79/C39	500
BZX79/C4V3	500
BZX79/C4V7	500
BZX79/C43	500
BZX79/C47	500
BZX79/C5V1	500
BZX79/C5V6	500
BZX79/C51	500
BZX79/C56	500

*) zie pag. I

Typenummer	Min. afname*
BZX79/C6V2	500
BZX79/C6V8	500
BZX79/C62	500
BZX79/C68	500
BZX79/C7V5	500
BZX79/C75	500
BZX79/C8V2	500
BZX79/C9V1	500
BZY93/C10	100
BZY93/C12	100
BZY93/C15	100
BZY93/C18	100
BZY93/C20	100
BZY93/C22	100
BZY93/C24	100
BZY93/C30	100
BZY93/C39	100
BZY93/C7V5	100
BZY93/C75	100
BZY93/C8V2	100
BZY93/C9V1	100
CNX35	75
CNX36	75
CNY48	50
CNY50	10
CNY57	50
CNY57A	50
CNY62	50
CNY63	50
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CQX10/I	100
CQX10/II	100
CQX10/III	100
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CQX11/I	100
CQX11/II	100
CQX11/III	100
CQX12	100
CQX12/I	100
CQX12/II	100
CQX12/III	100
CQX51/I	100
CQX51/II	100
CQX51/III	100
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CQY24B/I	100
CQY24B/II	100
CQY24B/III	100
CQY24B/IV	100

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CQY47	100
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CQY49C	30
CQY50	30
CQY52	30
CQY54	100
CQY54/I	100
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CQY54/III	100
CQY58	100
CQY89	100
CQY94	100
CQY94/I	100
CQY94/II	100
CQY94/III	100
CQY94/IV	100
CQY95/I	100
CQY95/II	100
CQY95/III	100
CQY96	100
CQY96/I	100
CQY96/II	100
CQY96/III	100
CQY96/IV	100
CQY97	100
CQY97/I	100
CQY97/II	100
CQY97/III	100
ON832	1000
ORP60	50
RTC757	500
RTC758	500
IN3879	50
IN3879R	50
IN3880	50
IN3880R	50
IN3881	50
IN3881R	50
IN3882	50
IN3882R	50
IN3889	50
IN3889R	50
IN3890	50
IN3890R	50
IN3891	10
IN3891R	10
IN3892	10
IN3892R	10
IN4001G	500
IN4002G	500
IN4003G	500

Typenummer	Min. afname*
IN4004G	500
IN4005G	500
IN4006G	500
IN4007G	500
IN4148	1000
IN4148S	10000
IN4448	100
IN5060	500
IN5061	500
IN5062	500
IN914	100
2BD181	30
2BD182	30
2BD183	30
2N1131	100
2N1711	100
2N2219A	100
2N2905A	100
2N3055	100
2N3375	10
2N3553	10
2N3632	10
2N3823	1
2N3866	10
2N3924	10
2N3966	1
2N4427	10
2N918	100
55530	1
56200	100
56201	100
56201C	1000
56201D	1000
56230	1000
56233	1
56234	1
56245	100
56246	100
56262A	1000
56263	100
56326	1000
56333	1000
56356	100
56363	1000
56366	1000
56367	1000
56369	1000

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notes

notes

notes

For detailed information
Handbooks S1 to S10

letter symbols

C_d	Diode capacitance
C_{rb}	Feedback capacitance (common base)
C_{rd}	Feedback capacitance (common drain)
C_{re}	Feedback capacitance (common emitter)
C_{rs}	Feedback capacitance (common source)
CMRR	Common mode rejection ratio
D*	Detectivity
d_{im}	Intermodulation distortion
d_{cm}	Cross-modulation distortion
$E_{e\ tr}$	Irradiance to trigger a device
F	Noise figure
f	Frequency
f_{hfe}	Frequency at which h_{fe} is -3 dB
f_T	Transition frequency
$\Delta \frac{1}{gfs}$	Difference in transfer impedance
$\Delta \frac{gos}{gfs}$	Difference in penetration factor
G_p	Power gain
GUM	Maximum unilateral power gain
h_{fe}	Small-signal current gain
h_{FE}	D.C. current gain
$\frac{\Delta I}{\Delta T}$	Equivalent differential current change with temperature
I_A	Anode current
dI_A/dT	Rate of rise of anode current
I_{ARM}	Repetitive peak anode current
I_B	D.C. (or average) base current
I_C	D.C. (or average) collector current
$I_{(CL)SM}$	Non-repetitive peak clamping current
I_{CM}	Peak value of I_C
I_D	Off-state current
I_{DSS}	Drain current (source short-circuited to gate)
I_{DSX}	Drain cut-off current (specified conditions)
I_e	Radiant intensity
I_F	Forward current (d.c. or average)
$I_{F(AV)}$	Total average forward current
I_{FM}	Peak forward current
I_{FRM}	Repetitive peak forward current
I_{FSM}	Non-repetitive peak forward current
I_{FWM}	Working peak forward current
I_{GSS}	Gate cut-off current (source short-circuited to drain)
I_{GT}	Gate-cathode current that will trigger all devices
I_H	Holding current
I_{ISM}	Non-repetitive peak input current
$I_{O(AV)}$	Average output current
I_{opt}	Output current at optimum operation
I_{ORM}	Repetitive peak output current
I_R	Reverse (cut-off) current
$I_{R(D)}$	Dark reverse current
I_{RRM}	Repetitive peak reverse current
I_{SDX}	Source cut-off current (specified conditions)
I_{SGO}	Source current (open drain)
I_T	On-state current
dI_T/dt	Rate of rise of on-state current
$I_{T(AV)}$	Average on-state current
I_{TRM}	Repetitive peak on-state current
$I_{T(RMS)}$	R.M.S. value of the on-state current
I_{TSM}	Non-repetitive peak on-state current
I_{TWM}	Working peak on-state current
I_v	Luminous intensity
I_Z	Working current (d.c. or average)
I_{ZM}	Peak working current
I_{ZRM}	Repetitive peak working current
I^2t	I squared t for fusing
N	Light sensitivity
P_D	Drive power
P.E.P.	Peak envelope power
P_L	Load power
P_o	Output power
P_{opt}	Optimum output power
P_{RRM}	Repetitive peak reverse power dissipation
P_{RSM}	Non-repetitive peak reverse power dissipation
P_S	Source power
P_{tot}	Total power dissipation
P_{ZRM}	Repetitive peak reverse power dissipation
P_{ZSM}	Non-repetitive peak reverse power dissipation
r_D	Diode series resistance
r_{diff}	Differential resistance
r_{do}	Initial dark resistance
r_{DSoff}	Drain-source resistance (off)
$r_{ds\ on}$	Drain-source resistance (on) at specified frequency
R_L	Load resistance
r_{lo}	Initial illumination resistance
SF, SZ	Temperature coefficient of the working voltage
T_{amb}	Ambient temperature
T_c	Colour temperature
t_d	Forward conduction delay
t_f	Fall time
T_h	Heatsink temperature
T_j	Junction temperature
T_{mb}	Mounting base temperature
t_{off}	Turn-off time
t_{on}	Turn-on time
t_q	Circuit commutated turn-off time
t_r	Rise time
t_{rr}	Reverse recovery time
t_{tot}	Total recovery time
V_{AK}	Anode-cathode voltage
V_B	Supply voltage
V_{CBO}	Collector-base voltage (open emitter)
V_{CEO}	Collector-emitter voltage (open base)
V_{CER}	Collector-emitter voltage with a specified resistance between emitter and base
V_{CERM}	Peak value of V_{CER}
V_{CES}	Collector-emitter voltage (emitter to base)
V_{CESM}	Peak value of V_{CES}
V_{CEsat}	Collector-emitter saturation voltage
$V_{(CL)R}$	Output clamping voltage
dV_{com}/dt	Rate of rise of commutating voltage that will not trigger any device
V_D	Continuous off-state voltage
dV_D/dt	Rate of rise of off-state voltage
V_{DB}	Drain-substrate voltage
V_{DRM}	Repetitive peak off-state voltage
V_{DS}	Drain-source voltage
V_{DWM}	Crest working off-state voltage
V_F	Continuous forward voltage
V_{GA}	Anode gate-anode voltage
V_{GK}	Cathode gate-cathode voltage
ΔV_{GS}	Gate-source voltage difference
$\frac{d\Delta V_{GS}}{dT}$	Thermal drift of gate-source voltage difference
V_{GT}	Gate-cathode voltage that will trigger all devices
V_I	Input stand-off voltage (transient suppressors)
V_{IRM}	Repetitive peak input voltage
$V_{I(RMS)}$	R.M.S. value of the input voltage
V_{IWM}	Crest working input voltage
V_n	Equivalent noise voltage
V_O	Output voltage
$V_{(opt)}$	Output voltage at optimum operation
$V_{(P)GS}$	Gate-source cut-off voltage
V_R	Continuous reverse voltage; stand-off voltage
V_{RRM}	Repetitive peak reverse voltage
V_{RWM}	Crest working reverse voltage
V_{SB}	Source-substrate voltage
V_Z	Working voltage
$\frac{\Delta V}{\Delta T}$	Equivalent differential voltage change with temperature
y_{fs}	Transfer admittance (common source)
η	Efficiency
α 50%	Beamwidth between half-intensity directions
λ_{peak}	Wavelength at peak spectral response or emission
ϕ_e	Radiant output power

semiconductor index

In this alphanumeric list we present all semiconductors mentioned in this catalogue.
The second column gives the page on which abridged data can be found.
The third column is a code for the kind of product and the part of the Data Handbook System in which full information is given.

*** = series**

key to product code

D	Displays	S8	PC	Germanium point contact diodes	S1	Th	Thyristors	S2
FET	Field-effect transistors	S5	PDT	Photodiodes or transistors	S8	Tra	Transmitting transistors and modules	SC4a(S6)
GB	Germanium gold-bonded diodes	S1	Ph	Photoconductive devices	S8	Tri	Triacs	S2
I	Infrared devices	S8	PhC	Photocouplers	S8	Vrf	Voltage reference diodes	S1
LCD	Liquid crystal displays	—	R	Rectifier diodes	S1/S2	Vrg	Voltage regulator diodes	S1/S2
LED	Light-emitting diodes	S8	Sm	Small signal transistors	S3	WBM	Wideband hybrid IC modules	S10
Mm	Microminiature semiconductors for hybrid circuits	S7	Sp	Special diodes (low leakage)	S1	WBT	Wideband transistors	S10
P	Low-frequency power transistors and modules	S4	St	Rectifier stacks	S2	WD	Silicon whiskerless diodes	S1
			T	Tuner diodes	S1			

semiconductor index

In this alphanumeric list we present all semiconductors mentioned in this catalogue.
The second column gives the page on which abridged data can be found.
The third column is a code for the kind of product and the part of the Data Handbook System in which full information is given.

* = series

key to product code

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GB	Germanium gold-bonded diodes	S1
I	Infrared devices	S8
LCD	Liquid crystal displays	—
LED	Light-emitting diodes	S8
Mm	Microminiature semiconductors for hybrid circuits	S7
P	Low-frequency power transistors and modules	S4
PC	Germanium point contact diodes	S1
PDT	Photodiodes or transistors	S8
Ph	Photoconductive devices	S8
PhC	Photocouplers	S8
R	Rectifier diodes	S1/S2
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Sp	Special diodes (low leakage)	S1
St	Rectifier stacks	S2
T	Tuner diodes	S1
Th	Thyristors	S2
Tra	Transmitting transistors and modules	SC4a(S6)
Tri	Triacs	S2
Vrf	Voltage reference diodes	S1
Vrg	Voltage regulator diodes	S1/S2
WBM	Wideband hybrid IC modules	S10
WBT	Wideband transistors	S10
WD	Silicon whiskerless diodes	S1

*** = series**

type	page	product code	type	page	product code	type	page	product code	type	page	product code
BDX78	A58	P	**BF579**	A98	Mm	**BFR64**	A89	WBT	**BGY35**	A84	Tra
BDX91	A58	P	**BF622**	A100	Mm	**BFR65**	A89	WBT	**BGY36**	A84	Tra
BDX92	A58	P	**BF623**	A100	Mm	**BFR84**	A72	FET	**BGY38**	A84	Tra
BDX93	A58	P	**BF660**	A98	Mm	**BFR90;A**	A89	WBT	**BGY40A;B**	A84	Tra
BDX94	A58	P	**BF767**	A98	Mm	**BFR91;A**	A89	WBT	**BGY41A;B**	A84	Tra
BDX95	A58	P	**BF819**	A58	P	**BFR92;R***	A99	Mm	**BGY43**	A84	Tra
BDX96	A58	P	**BF857**	A58	P	**BFR93;R***	A99	Mm	**BGY50**	A90	WBM
BDY90;A	A58	P	**BF858**	A58	P	**BFR94**	A89	WBT	**BGY51**	A90	WBM
BDY91	A58	P	**BF859**	A58	P	**BFR95**	A89	WBT	**BGY52**	A90	WBM
BDY92	A58	P	**BF869**	A58	P	**BFR96;S**	A89	WBT	**BGY53**	A90	WBM
BF115	A66	Sm	**BF870**	A59	P	**BFS17;R**	A99	Mm	**BGY54**	A90	WBM
BF180	A66	Sm	**BF871**	A58	P	**BFS18;R**	A98	Mm	**BGY55**	A90	WBM
BF181	A66	Sm	**BF872**	A59	P	**BFS19;R**	A98	Mm	**BGY56**	A90	WBM
BF182	A66	Sm	**BF936**	A66	Sm	**BFS20;R**	A98	Mm	**BGY57**	A90	WBM
BF183	A66	Sm	**BF939**	A66	Sm	**BFS21;A**	A74	FET	**BGY58**	A90	WBM
BF184	A66	Sm	**BF960**	A72	FET	**BFS22A**	A84	Tra	**BGY59**	A91	WBM
BF185	A66	Sm	**BF967**	A66	Sm	**BFS23A**	A84	Tra	**BGY60**	A91	WBM
BF198	A66	Sm	**BF970**	A66	Sm				**BGY70**	A91	WBM
BF199	A66	Sm	**BF979**	A66	Sm	**BFT24**	A89	WBT	**BGY71**	A91	WBM
BF200	A66	Sm	**BF980**	A72	FET	**BFT25;R**	A99	Mm	**BGY74**	A91	WBM
BF240	A66	Sm	**BF981**	A72	FET	**BFT44**	A66	Sm	**BGY75**	A91	WBM
BF241	A66	Sm	**BF982**	A72	FET	**BFT45**	A66	Sm	**BLV10**	A84	Tra
BF245*	A72	FET	**BFQ10**	A74	FET	**BFT46**	A99	Mm	**BLV11**	A84	Tra
BF256*	A72	FET	**BFQ11**	A74	FET	**BFT92;R**	A99	Mm	**BLV20**	A84	Tra
BF324	A66	Sm	**BFQ12**	A74	FET	**BFT93;R**	A99	Mm	**BLV21**	A84	Tra
BF370	A66	Sm	**BFQ13**	A74	FET	**BFW10**	A72	FET	**BLV30**	A84	Tra
BF410*	A72	FET	**BFQ14**	A74	FET	**BFW11**	A72	FET	**BLV31**	A84	Tra
BF419	A58	P	**BFQ15**	A74	FET	**BFW12**	A72	FET	**BLV32F**	A84	Tra
BF422	A66	Sm	**BFQ16**	A74	FET	**BFW13**	A72	FET	**BLV33;F**	A84	Tra
BF423	A66	Sm	**BFQ17**	A99	Mm	**BFW16A**	A89	WBT	**BLV36**	A84	Tra
BF450	A66	Sm	**BFQ18A**	A99	Mm	**BFW17A**	A89	WBT	**BLV57**	A84	Tra
BF451	A66	Sm	**BFQ19**	A99	Mm	**BFW30**	A89	WBT	**BLW29**	A85	Tra
BF457	A58	P	**BFQ22;S**	A89	WBT	**BFW61**	A72	FET	**BLW31**	A85	Tra
BF458	A58	P	**BFQ23**	A89	WBT	**BFW92**	A89	WBT	**BLW32**	A85	Tra
BF459	A58	P	**BFQ24**	A89	WBT	**BFW93**	A89	WBT	**BLW33**	A85	Tra
BF469	A58	P	**BFQ32**	A89	WBT	**BFX34**	A66	Sm	**BLW34**	A85	Tra
BF470	A58	P	**BFQ34**	A89	WBT	**BFX89**	A89	WBT	**BLW50F**	A85	Tra
BF471	A58	P	**BFQ42**	A84	Tra	**BFY50**	A66	Sm	**BLW60;C**	A85	Tra
BF472	A58	P	**BFQ43**	A84	Tra	**BFY51**	A66	Sm	**BLW64**	A85	Tra
BF480	A66	Sm	**BFQ51**	A89	WBT	**BFY52**	A66	Sm	**BLW75**	A85	Tra
BF494	A66	Sm	**BFQ52**	A89	WBT	**BFY55**	A66	Sm	**BLW76**	A85	Tra
BF495	A66	Sm	**BFQ53**	A89	WBT	**BFY90**	A89	WBT	**BLW77**	A85	Tra
BF496	A66	Sm	**BFQ63**	A89	WBT	**BG1895***	A25	R	**BLW78**	A85	Tra
BF510	A99	Mm	**BFQ68**	A89	WBT	**BG1897***	A25	R	**BLW79**	A85	Tra
BF511	A99	Mm	**BFR29**	A72	FET	**BG2000***	A25	R	**BLW80**	A85	Tra
BF512	A99	Mm	**BFR30**	A99	Mm	**BG2097***	A25	R	**BLW81**	A86	Tra
BF513	A99	Mm	**BFR31**	A99	Mm	**BGY22;A**	A84	Tra	**BLW82**	A86	Tra
BF536	A98	Mm	**BFR49**	A89	WBT	**BGY23;A**	A84	Tra	**BLW83**	A86	Tra
BF550;R	A98	Mm	**BFR53;R**	A99	Mm	**BGY32**	A84	Tra	**BLW84**	A86	Tra
BF569	A98	Mm	**BFR54**	A66	Sm	**BGY33**	A84	Tra	**BLW85**	A86	Tra

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type	page	product code	type	page	product code	type	page	product code	type	page	product code
BZX91	A11	Vrf	**CQY96***	A105	LED	**RPY88**	A108	I	**2N2368**	A70	Sm
BZX92	A11	Vrf	**CQY97***	A105	LED	**RPY89**	A108	I	**2N2369;A**	A70	Sm
BZX93	A11	Vrf	**LC1509**	A110	LCD	**RPY93**	A108	I	**2N2483**	A46	Sm
BZX94	A11	Vrf	**LC1612**	A110	LCD	**RPY96**	A108	I	**2N2484**	A46	Sm
BZY91*	A12	Vrg	**LC2011**	A110	LCD	**1N821;A**	A11	Vrf	**2N2894;A**	A70	Sm
BZY93*	A12	Vrg	**LC2213**	A110	LCD	**1N823;A**	A11	Vrf	**2N2904;A**	A70	Sm
BZY95*	A12	Vrg	**LC2411**	A110	LCD	**1N825;A**	A11	Vrf	**2N2905;A**	A70	Sm
BZY96*	A12	Vrg	**LC2418**	A110	LCD	**1N827;A**	A11	Vrf	**2N2906;A**	A70	Sm
CNX21	A112	PhC	**LC3820**	A110	LCD	**1N829;A**	A11	Vrf	**2N2907;A**	A70	Sm
CNX35	A112	PhC	**LC5130**	A110	LCD	**1N3879**	A22	R	**2N3019**	A70	Sm
CNX36	A112	PhC	**LC7020**	A110	LCD	**1N3880**	A22	R	**2N3020**	A70	Sm
CNX38	A112	PhC	**LC7030**	A110	LCD	**1N3881**	A22	R	**2N3375**	A87	Tra
CNY50*	A112	PhC	**LC7038**	A110	LCD	**1N3882**	A22	R	**2N3553**	A87	Tra
CNY62	A112	PhC	**LC8131**	A110	LCD	**1N3889**	A22	R	**2N3632**	A87	Tra
CNY63	A112	PhC	**LC076101**	A110	LCD	**1N3890**	A22	R	**2N3823**	A72	FET
CQ209S	A109	D	**LC114046**	A110	LCD	**1N3891**	A22	R	**2N3866**	A87	Tra
CQ216X;Y	A109	D	**OA47**	A9	GB	**1N3892**	A22	R	**2N3924**	A87	Tra
CQ327;R	A109	D	**OA90**	A9	PC	**1N3899**	A22	R	**2N3926**	A87	Tra
CQ330;R	A109	D	**OA91**	A9	PC	**1N3900**	A22	R	**2N3927**	A87	Tra
CQ331;R	A109	D	**OA95**	A9	PC	**1N3901**	A22	R	**2N3966**	A73	FET
CQ332;R	A109	D	**OM320**	A92	WBM	**1N3902**	A22	R	**2N4030**	A70	Sm
CQ427;R	A109	D	**OM321**	A92	WBM	**1N3903**	A22	R	**2N4031**	A70	Sm
CQ430;R	A109	D	**OM322**	A92	WBM	**1N3909**	A23	R	**2N4032**	A70	Sm
CQ431;R	A109	D	**OM323;A**	A92	WBM	**1N3910**	A23	R	**2N4033**	A70	Sm
CQ432;R	A109	D	**OM335**	A92	WBM	**1N3911**	A23	R	**2N4091**	A73	FET
CQL10	A104	LED	**OM336**	A92	WBM	**1N3912**	A23	R	**2N4092**	A73	FET
CQW10	A104	LED	**OM337;A**	A92	WBM	**1N3913**	A23	R	**2N4093**	A73	FET
CQW11	A105	LED	**OM339**	A92	WBM	**1N4009**	A8	WD	**2N4391**	A73	FET
CQW12	A104	LED	**OM345**	A92	WBM	**1N4148**	A8	WD	**2N4392**	A73	FET
CQX10*	A104	LED	**OM350**	A92	WBM	**1N4150**	A8	WD	**2N4393**	A73	FET
CQX11*	A105	LED	**OM360**	A92	WBM	**1N4151**	A8	WD	**2N4427**	A87	Tra
CQX12*	A105	LED	**OM361**	A92	WBM	**1N4154**	A8	WD	**2N4856**	A73	FET
CQX51*	A104	LED	**OM370**	A92	WBM	**1N4446**	A8	WD	**2N4857**	A73	FET
CQX54	A104	LED	**OM931**	A61	P	**1N4448**	A8	WD	**2N4858**	A73	FET
CQX55 to 58	A104	LED	**OM961**	A61	P	**1N4531**	A9	WD	**2N4859**	A73	FET
CQX60 to 63	A101	LED	**OSB9110***	A25	St	**1N4532**	A9	WD	**2N4860**	A73	FET
CQX64	A105	LED	**OSB9210***	A25	St	**1N5060**	A19	R	**2N4861**	A73	FET
CQX65 to 68	A105	LED	**OSB9410***	A25	St	**1N5061**	A19	R	**2N5415**	A70	Sm
CQY74	A105	LED	**OSM9110***	A25	St	**1N5062**	A19	R	**2N5416**	A70	Sm
CQX75 to 78	A105	LED	**OSM9210***	A25	St	**2N918**	A70	Sm	**3N211**	A72	FET
CQY11B;C	A104	LED	**OSM9410***	A25	St	**2N929**	A46	Sm	**368BPY**	A101	PDT
CQY24B*	A104	LED	**OSS9110***	A25	St	**2N930**	A46	Sm	**375CQY**	A101	—
CQY49B;C	A104	LED	**OSS9210***	A25	St	**2N1613**	A70	Sm			
CQY50	A104	LED	**OSS9410***	A25	St	**2N1711**	A70	Sm			
CQY52	A104	LED	**PH40**	A17	R	**2N1893**	A70	Sm			
CQY54*	A104	LED	**PH70**	A18	R	**2N2218;A**	A70	Sm			
CQY58A*	A104	LED	**PH2369**	A68	Sm	**2N2219;A**	A70	Sm			
CQY89A*	A104	LED	**RPY58A**	A102	Ph	**2N2221;A**	A70	Sm			
CQY94*	A105	LED	**RPY86**	A108	I	**2N2222;A**	A70	Sm			
CQY95*	A105	LED	**RPY87**	A108	I	**2N2297**	A70	Sm			

small-signal diodes

Whiskerless
- high surge immunity
- high resistance to shock
- two-way heat transfer
- low leakage
- simple, sturdy construction
- hermetic capsule
- as good as, or better than MIL-S-19500

We supply
- to any world standardized JEDEC or PRO ELECTRON specification
- to any customer specification
- BS or CECC approved products; further information on request

Whiskerless in SOD-27 (DO-35) max. values

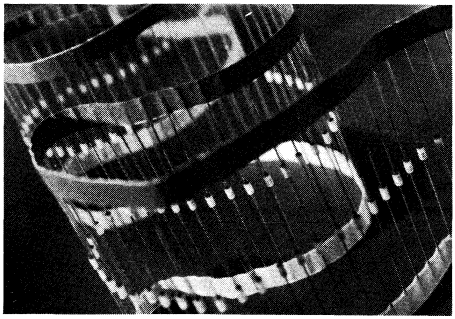
	type	status	V_R (V_{RRM}) V	I_F mA	I_{FRM} mA	t_{rr} * ns	C_d pF	V_F at I_F = mA 10 V	20 V	30 V	50 V	100 V	200 V
general purpose	**BA220**	D	(10)	200	400	4	2,5	0,75	0,8	0,84	0,88	0,95	1,05
	BA316	D	10	100	225	4	2	0,85	0,92	0,97	1,02	1,1	—
	BA317	D	30	100	225	4	2	0,85	0,92	0,97	1,02	1,1	—
	BA318	D	50	100	225	4	2	0,85	0,92	0,97	1,02	1,1	—
	BAX14	D	20	500	2000	300▲	35	—	—	—	—	0,85	0,92
see stabistors	**BA314**	D	—	100	250	—	140	0,83	0,87	0,89	0,92	0,96	—
	BA314A	D	—	100	250	—	110	0,81	0,85	0,88	0,93	1	—
	BA315	D	(5)	100	225	—	3	0,79	0,85	0,89	0,95	1,05	—
high-speed switching	**BAW62**	D	75	100	225	4**	2	0,78	0,8	0,82	0,88	1	1,28
	1N4009	D	25	—	—	2	4	—	—	1	—	—	—
	1N4148	D	75	150	450	4	4	1	—	—	—	—	—
	1N4151	D	50	200	450	2	2	—	—	—	1	—	—
	1N4154	D	25	200	450	2	4	—	—	1	—	—	—
	1N4446	D	75	200	450	4	4	—	1	—	—	—	—
	1N4448	D	75	200	450	4	4	—	—	—	—	1	—
high-speed core gating	**BAV10**	D	60	300	600	6▲▲	2,5	0,75	0,78	0,8	0,85	0,92	1
	1N4150	D	50	300	600	6▲▲	2,5	0,74	—	—	0,86	0,92	1
high-speed, high voltage	**BAV18**	D	50	250	625	50▲	5	0,8	—	—	—	1	1,25
	BAV19	D	100	250	625	50▲	5	0,8	—	—	—	1	1,25
	BAV20	D	150	250	625	50▲	5	0,8	—	—	—	1	1,25
	BAV21	D	200	250	625	50▲	5	0,8	—	—	—	1	1,25
avalanche for telephony	**BAX12**	D	90	400	800	50▲	35	0,75	—	—	0,84	0,90	1
	BAX12A	C									at 400 mA:		1,25
rectifier applications	**BAX18**	D	75	500	2000	—	35	—	—	—	0,80 at 400 mA:	0,86	0,91 1
avalanche	**BAS11**	N	300	350	900	1000▲▲	10	—	—	—	at 300 mA: 1,1 V; at 900 mA: 1,3 V		

* I_F = 10 mA to I_R = 60 mA, R_L = 100 Ω. Measured at I_R = 1 mA.
** I_F = 10 mA to I_R = 10 mA, R_L = 100 Ω. Measured at I_R = 1 mA.
▲ I_F = 30 mA to I_R = 30 mA, R_L = 100 Ω. Measured at I_R = 3 mA.
▲▲ I_F = 400 mA to I_R = 400 mA, R_L = 100 Ω. Measured at I_R = 40 mA.

Whiskerless in hard glass envelopes for demanding service in industry and telephony.

Low leakage (picoampere) diodes for clamping, holding, peak followers, delay, log amps, IGFETS.

Bandolier packed (9000 diodes per reel) for simple mechanical or manual handling.



Whiskerless in DO-34 (miniature axial lead envelope)

max. values

	type	status	V_R	I_F	I_{FRM}	t_{rr} *	C_d	V_F at I_F = mA					
								1	10	20	50	100	400
			V	mA	mA	ns	pF	V	V	V	V	V	V
general purpose	**1N4531** **1N4532**	D	75	150	450	4	4	—	1	—	—	—	—

Low leakage

	type	status	case	V_R	I_F	I_R at V_R and T_j			C_d	V_F at I_F = 10 mA
				V	mA	pA	V	°C		
	BAV45	D	TO-18(3)	20	50	5	5	25	1,3	1
						10	20	25		
						250	5	80		
	BAV45A	N	TO-72(7)	BAV45A = two diodes BAV45 in one envelope						

Point contact

	type	status	case	V_R	I_F	I_{FRM}	t_{rr}	C_d	V_F at I_F = mA		
									0,1	10	30
				V	mA	mA	ns	pF	V	V	V
general purpose	**OA90**			20	8	45				1,5	3,2
	OA91	C	DO-7	90	50	150	—	—	0,25	1,9	3,3
	OA95			90	50	150				1,5	2,6
a.m. and f.m. detection	**AA119** **2-AA119**	C	DO-7	30	35	100	—	—	0,3	2,2	4

Gold bonded

	type	status	case	V_R	I_F	I_{FRM}	t_{rr}**	C_d	V_F at I_F = mA		
									0,1	10	30
				V	mA	mA	ns	pF	V	V	V
general purpose	**AAZ15** **AAZ17**	C	DO-7	75 50	140	250	350	2	0,57	0,9	1,1
general purpose and switching	**AAZ18** **OA47**	C	DO-7	20 25	130 110	300 150	70	2,5 3,5	0,5 0,65	0,75 1,1	—

* I_F = 10 mA to I_R = 60 mA, R_L = 100 Ω. Measured at I_R = 1 mA.
** I_F = 10 mA to I_R = 10 mA, R_L = 100 Ω. Measured at I_R = 1 mA.

tuner diodes

Testing of low-power diodes.

Variable capacitance

	type	status	case	V_R V	C_d at pF	V_R V	C_d ratio at V/V		r_D at Ω	C_d pF
a.f.c. in radio	**BB119**	D	DO-35	15	20 to 25	4	>1,3	4/10	1,5	20-25
and television	**BB417**	D	DO-34	20	2,2 to 4	15	2	4/15	1,2	9
radio a.m.	**BB112**	D	SOD-69	12	440 to 540	1	>15	1/9	1,5	440
	BB130	N	SOD-69	30	450 to 550	1	>23	1/28	2	450
	BB212	D	TO-92(6)	12	500 to 620	0,5	>23	0,5/8	3	500
radio f.m.	**BB204B**	D	TO-29(6)	30	37 to 42	3	2,65	3/30	0,4	38
	BB204G	D		30	34 to 39	3	2,65	3/30	0,4	38
	BB304	N	TO-92(6)	30	42 to 47,5	2	1,65	2/8	0,4	38
television, v.h.f.	**BB105G**	C	SOD-23	28	1,8 to 2,8	25	>4	3/25	1,2	9
	BB109G	C	SOD-23	28	4,3 to 6	25	>5	3/25	0,6	25
	BB405G	D	DO-34	28	1,8 to 2,5	25	>4,3	3/25	1,2	9
	BB809	D	DO-34	28	4,5 to 6	25	>5	3/25	0,6	25
	BB909A	D	DO-34	30	2,6 to 3	28	>12	1/28	1	30
	BB909B				2,8 to 3,2					
bands IV & V to 860 MHz	**BB105B**	C	SOD-23	28	2,0 to 2,3	25	>4,5	3/25	0,8	9
	BB405B	D	DO-34	28	2 to 2,3	25	>4,5	3/25	0,8	9

Band switching

	type	status	case	V_R V	C_d at pF	V_R V	I_F mA	r_D at Ω	I_F mA
tv v.h.f.	**BA243**	C	DO-35	20	2	15	100	1	10
	BA244	C	DO-35	20	2	15	100	0,5	10
	BA482	D	DO-34	35	1,2	3	100	0,7	3
	BA483	D	DO-34	35	1,0	3	100	1,2	3
radio	**BA223**	D	DO-35	20	3,5	6	50	1,5	10
	BA423	N	DO-34	20	2,5	3	50	1,2	10

Various

	type	status	case	V_R V	C_d at pF	V_R V	I_F mA	F dB	r_D at Ω	I_F mA
Schottky barrier u.h.f. mixer	**BA280**	C	SOD-23	4	1	0	30	typ 6,5	15	5
PIN diode	**BA379**	C	SOD-52	30	typ 0,3 (900 MHz)	0	20	—	6,5 (35 MHz)	10

Note
All BB105, BB106, BB109, BB205 and BB405 types will be supplied in matched sets. Over the voltage range 0,5 V to 28 V the diodes in a set are capacitance matched to within 3%, for all mentioned types except 6%, for BB105G.

voltage reference diodes

With very low temperature coefficient;
ideal for top-class voltage reference sources.

type	status	case	reference voltage at I_Z V (nom)	mA	voltage tolerance (±)%	I_{ZM} (I_{ZRM}) mA	$\lvert S_Z \rvert$ at %/°C	I_Z mA	r_{diff} max Ω	at I_Z mA
BZX90	D						<0,01			
BZX91	D						<0,005			
BZX92	D	DO-34	6,5	7,5	5	50	<0,002	7,5	15	7,5
BZX93	D						<0,001			
BZX94	D						<0,0005			
1N821	D						<0,01			
1N823	D						<0,005			
1N825	D	DO-34	6,2	7,5	5	50	<0,002	7,5	15	7,5
1N827	D						<0,001			
1N829	D						<0,0005			
1N821A	N						<0,01			
1N823A	N						<0,005			
1N825A	N	DO-34	6,2	7,5	5	50	<0,002	7,5	10	7,5
1N827A	N						<0,001			
1N829A	N						<0,0005			
BZV10							<0,01			
BZV11		DO-34					<0,005			
BZV12	D	or	6,5	2	5	50	<0,002	2	50	2
BZV13		DO-35					<0,001			
BZV14							<0,0005			

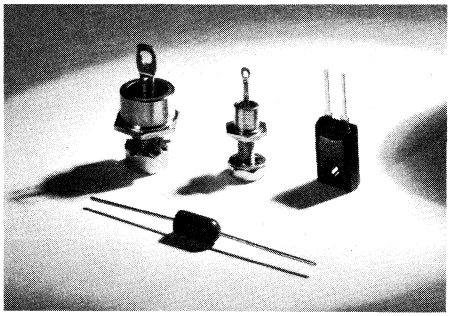
stabistors

Low-voltage regulator diodes — used in forward direction
for all shifting, coupling, clamping, protecting, bias regulating.

type	status	case	V_F at I_F = 1 mA min V	max V	V_F at I_F = 10 mA min V	max V	I_{FRM} mA	V_R = V_{RRM} V	S_F and r_{diff} typ at I_F = 1 mA mV/°C	Ω
BA314	D	DO-35	0,68	0,76	0,75	0,83	250	—	−1,8	30
BA315			0,59	0,66	0,71	0,79	225	—	−2,1	50
BZV46-C1V5	D	DO-35	1,35	1,55	—	—	120	4	−3,7	20
BZV46-C2V0			2,0	2,3			80		−5,6	30
BZX75-C1V4	C	DO-7	1,16	1,34	1,33	1,47	250	10	−4	60
BZX75-C2V1			1,75	2,05	1,99	2,21			−6	90
BZX75-C2V8			2,33	2,70	2,66	2,94			−8	120
BZX75-C3V6			3,02	3,45	3,42	3,78			−10	150

1. For BZY78 S_Z values: +0,006 at T_j = −40 to +25°C.
   −0,004 at T_j = 25 to 100°C.
2. For BA314 to 315 see also small-signal diodes (whiskerless).
3. For BZV46 V_F, S_F and r_{diff} are measured at I_F = 5 mA.

voltage regulator diodes



Medium to high power (Handbook S2)

- smoothing
- limiting
- regulating
- protecting

Normal polarity (cathode to stud) **no end-letter**
Reverse polarity (anode to stud) **R**
Both polarities available **(R)**

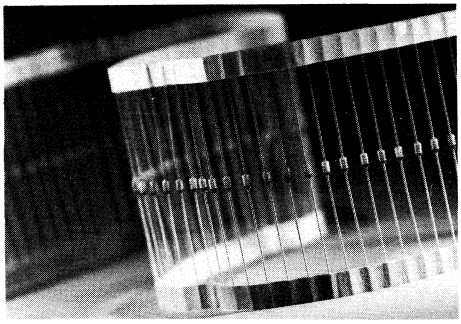
Regulated voltage	Suppression stand-off voltage	$P_{tot\ max}$ for **voltage regulator service** 2,5 W		—	20 W	100 W	—	—
		P_{RSM} max for **transient suppressor service** 190 W	700 W	700 W	700 W	9,5 kW	25 kW	27 kW
4,7 V	3,6 V	**BZY96 series**						
5,1 V	3,9 V							
5,6 V	4,3 V							
6,2 V	4,7 V							
6,8 V	5,1 V							
7,5 V	5,6 V							
8,2 V	6,2 V							**BZW91 series**
9,1 V	6,8 V							
10 V	7,5 V		**BZY95 series**	**BZX70 series**	**BZW70 series**	**BZY93 series**	**BZY91 series**	
11 V	8,2 V							
12 V	9,1 V							
13 V	10 V							
15 V	11 V							
16 V	12 V							
18 V	13 V							
20 V	15 V							
22 V	16 V							
24 V	18 V							
27 V	20 V							
30 V	22 V							
33 V	24 V							
36 V	27 V							
39 V	30 V							
43 V	33 V							
47 V	36 V							
51 V	39 V							
56 V	43 V							
62 V	47 V							
68 V	51 V							
75 V	56 V							
82 V	62 V						**BZW86 series**	
Outline		DO-1	DO-1	SOD-18	SOD-18	DO-4	DO-5	DO-30	DO-5
Polarity		normal	normal	normal	normal	both	both	both	both
Status		D	D	D	C	D	D	D	C

Transient suppressor bridges

type no.	V_I V	$V_{O(CL)}$ V	$I_{(CL)SM}$ A
BZW10-12	12	30	50
BZW10-15	15	34	40

Low power (Handbook S1)

- low leakage current
- low differential resistance
- sharp knee
- high surge immunity
- standard or custom specifications
- standardized envelopes
- types in DO-35 envelopes bandolier packed



Series number	**BZX55—...**	**BZX79—...**	**BZV85—...**	**BZX85—...**	**BZT03—...**	**BZX87—...**
P_{tot} (mW)	**400**	**400**	**1000**	**1100**	**1300**	**1500**
up to Tamb (°C)	50	50	25	25	45	25
Voltage tolerance (%)	5	5 or 2 *	5	5	5	5
I_{FRM} (mA)	250	250	—	400	—	400
I_{ZRM} (mA)	—	—	—	—	—	—
P_{ZSM} (mA)	30	30	—	100	—	100
$T_{j\ max}$ (°C)	200	200	—	200	175	200
Case	DO-35	DO-35	DO-41	DO-41	SOD-57	SOD-51
Status	D	D	D	N	N	D
Nominal voltage range (V)	2,4-75	2,4-75	5,1-75	6,2-75	9,1-270	5,1-75

* 4,7 to 75 V (suffixes B4V7 to B75) available with 2% tolerance.

rectifier diodes
selection guide

General purpose (pages A17 to A19)

$I_{F(AV)max}$		V_{RRMmax} (V)										
A		150	200	300	400	500	600	800	1000	1200	1400	1600
1,4	BYX22						●			●		
1,5	BYX45						●	●	●	●	●	
2	BYW54						●					
2	BYW55							●				
2	BYW56								●			
2	1N5059		●									
2	1N5060				●							
2	1N5061						●					
2	1N5062							●				
6	BYX49			●			●			●		
6	BYX38			●			●			●		
6	BY249			●			●		●			
9,5	BYX39						●	●	●	●	●	
10	BYX98			●			●			●		
10	BYX72	●		●		●						
12	BYX42			●			●			●		
15	BYX99			●			●			●		
20	BYX25						●	●	●	●	●	
30	BYX96			●			●			●		●
40	PH40		●				●		●			
47	BYX97			●			●			●		●
48	BYX52			●			●			●		
48	BYX56						●	●	●	●	●	
70	PH70		●				●		●			
150	BYX32						●	●	●	●		●

Bridges (page A18)

$I_{O(AV)max}$		$V_{I(RMS)}$ (V)						
A		50	60	80	140	220	280	425
1	BY179						●	
1,2	BY164		●					
1,5	BY256			●				
1,5	BY257						●	
4,8	BY224					●	●	
4,8	BY225	●		●				
12	BY260				●		●	●
25	BY261				●		●	●

Efficiency diodes (page A19)

I_{FWMmax}		V_{RRMmax}				
A		50	600	750	1200	1500
1,2*	BY188	●				
4	BY448					●
4	BY458				●	
5	BY223					●
5	BY228					●
5	BY438				●	
10	BY277		●	●		

* $I_{F(AV)max}$

Fast-recovery rectifier diodes

$I_{F(AV)max}$		V_{RRMmax} (V)										
A		50	100	150	200	300	350	400	500	600	800	1000
Super-fast types (page A20)												
7	BYV29				●	●		●				
7	BYX50				●	●						
12	BYV30				●	●		●				
35	BYV92				●	●		●				
Ultra-fast (page A21)												
2	BYV27*	●	●	●	●							
3,5	BYV28*	●	●	●	●							
7	BYW29	●	●	●	●							
2 x 10	BYV32	●	●	●	●							
12	BYW30	●	●	●	●							
25	BYW31	●	●	●	●							
35	BYW92	●	●	●	●							
50	BYW93	●	●	●	●							
70	BYW94	●	●	●	●							
Very-fast types (pages A22/A23)												
1,5	BYV95*				●			●		●		
1,5	BYV96*										●	●
3	BYW95				●			●		●		
3	BYW96										●	●
6	1N3879	●										
6	1N3880		●									
6	1N3881				●							
6	1N3882					●						
12	1N3889	●										
12	1N3890		●									
12	1N3891				●							
12	1N3892					●						
14	BYX30*				●	●		●	●	●		
20	1N3899	●										
20	1N3900		●									
20	1N3901				●							
20	1N3902					●						
20	1N3903							●				
22	BYX46*				●	●		●	●	●		
30	1N3909	●										
30	1N3910		●									
30	1N3911				●							
30	1N3912					●						
30	1N3913							●				
Fast types (page A23)												
7	BY229				●			●		●	●	●
7	BYW19										●	●
7	BYX71						●			●		
14	BYV24										●	●
40	BYW25										●	●

* With avalanche characteristics.

rectifier diodes
selection guide

Schottky barrier (page A20)

$I_{F(AV)}$		V_{RRMmax} (V)			
A		30	35	40	45
10	BYV19	●	●	●	●
2 × 10	BYV33	●	●	●	●
15	BYV20	●	●	●	●
28	BYV21	●	●	●	●
56	BYV22	●	●	●	●
70	BYV23	●	●	●	●

E.H.T. rectifiers (page A24)

$I_{F(AV)max}$		V_{RRMmax} (kV)							
mA		1.8	7,5	12,5	18	23	27,5	37,5	115 to 225
2	BY477					●			
2	BY478						●		
2,5	BY409			●					
2,5	BY476				●				
4	BY509			●					
4	BY510			●					
5	BY184	●							
50	BYX35							●	
200	BYX90		●						
200	BYX91								●

E.H.T. power rectifier stacks: see page A25

Voltage tripler units (page A25)

E.H.T. output: 1,7 mA; 27,5 kV

BG1895 – 541/641
BG1897 – 541/542
BG1897 – 641/642
BG2000 – 641/642
BG2097 – 641/642

abridged data

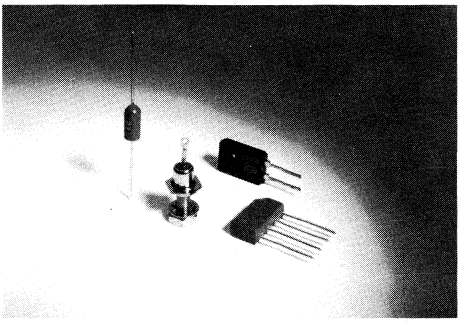
Normal polarity (cathode to stud) **no end-letter**
Reverse polarity (anode to stud) **R**
Both polarities available **(R)**

General purpose

type		status	case	RATINGS $I_{F(AV)}$	V_{RRM}	V_{RWM}	I_{FRM}	I_{FSM} and I^2t T_{jmax}; t = 10 ms	
				A	V	V	A	A	A^2s
BYX10		C	DO-14	**0,36**	1600	800	3	15	—
BY226		C	SOD-18	**1,33**	650	450	10	50	—
BY227					1250	800			
BYX22	– 600	C	DO-1	**1,4**	600	400	15	40	—
	– 1200				1200	800			
BY527*		C	SOD-57	**2**	1250	800	12	50	—
	– 300(R)				300	200			
BYX49	– 600(R)	C	SOD-38	**6**	600	400	20	40	8
	– 1200(R)				1200	800			
	– 300(R)				300	200			
BY249	– 600(R)	N	TO-220AC	**6**	600	400	20	40	8
	– 1000(R)				1000	800			
	– 300(R)				300	200			
BYX38	– 600(R)	D	DO-4(1)	**6**	600	400	50	50	13
	– 1200(R)				1200	800			
	– 300(R)				300	200			
BYX98	– 600(R)	D	DO-4(1)	**10**	600	400	75	75	28
	– 1200(R)				1200	800			
	– 150(R)				150	100			
BYX72	– 300(R)	C	SOD-38	**10**	300	200	50	100	50
	– 500(R)				500	400			
	– 300(R)				300	200			
BYX42	– 600(R)	D	DO-4(1)	**12**	600	400	60	125	75
	– 1200(R)				1200	800			
	– 300(R)				300	200			
BYX99	– 600(R)	D	DO-4(1)	**15**	600	400	180	180	162
	– 1200(R)				1200	800			
	– 300(R)				300	200			
BYX96	– 600(R)	D	DO-4(5)(6)	**30**	600	400	400	400	800
	– 1200(R)				1200	800			
	– 1600(R)				1600	800			
	– 200(R)				200	200			
PH40	– 600(R)	D	DO-5	**40**	600	500	200	400	800
	– 1000(R)				1000	800			

* With avalanche characteristics.

rectifier diodes
abridged data



General purpose

type		status	case	RATINGS $I_{F(AV)}$	V_{RRM}	V_{RWM}	I_{FRM}	I_{FSM} and I^2t T_{jmax}; t = 10 ms I_{FSM}	I^2t
				A	V	V	A	A	A^2s
BYX97	– 300(R) – 600(R) – 1200(R) – 1600(R)	D	DO-5(2)	**47**	300 600 1200 1600	200 400 800 800	550	800	3200
BYX52	– 300(R) – 600(R) – 1200(R)	C	DO-5(1)	**48**	300 600 1200	200 400 800	450	800	3200
PH70	– 200(R) – 600(R) – 1000(R)	D	DO-5	**70**	200 600 1000	200 500 800	350	1000	5000
BYX32	– 600(R) – 800(R) – 1000(R) – 1200(R) – 1600(R)	D	SOD-8	**150**	600 800 1000 1200 1600	600 800 1000 1200 1200	750	1600	12800

Bridges

type		status	case	INPUT $V_{I(RMS)}$	V_{IRM}	V_{IWM}	I_{ISM}	OUTPUT $I_{O(AV)}$ R loaded	I_{ORM}
				V	V	V	A	**A**	A
BY179		D	SOD-28	280	800	400	25	**1**	5
BY164		D	SOD-28	60	120	85	25	**1,2**	5
BY256		D	SOD-28	80	200	112	50	**1,5**	8
BY257		D	SOD-28	280	600	400	50	**1,5**	8
BY224	– 400 – 600	D	SOT-112	220 280	400 600	350 400	100	**4,8**	50
BY225	– 100 – 200	D	SOT112	50 80	100 200	70 112	100	**4,8**	50
BY260	– 200 – 400 – 600	D	—	140 280 425	200 400 600	200 400 600	125	**12**	20
BY261	– 200 – 400 – 600	D	—	140 280 425	200 400 600	200 400 600	320	**25**	75

Normal polarity (cathode to stud) **no end-letter**
Reverse polarity (anode to stud) **R**
Both polarities available **(R)**

Efficiency diodes

type	status	case	RATINGS $I_{F(AV)}$ A	I_{FWM} A	V_{RRM} V	I_{FRM} A	CHARACTERISTICS t_d min µs	t_{tot} max µs	t_{rr} max ns
BY188A	C	SOD-18	**1,2**	—	50	10	0	—	—
BY188B							0,7		
BY188G	N	SOD-57	**1,5**	—	50	10	0,5	—	—
BY223	C	SOD-38	—	**5**	1500	10	—	20	—
BY228	D	SOD-64	—	**5**	1500	10	—	20	—
BY277 – 600R	C	SOD-38	—	**10**	600	20	—	—	400
BY277 – 750R					750				
BY438	D	SOD-64	—	**5**	1200	10	—	20	—
BY448	D	SOD-57	—	**4**	1500	8	—	20	—
BY458	D	SOD-57	—	**4**	1200	8	—	20	—

Avalanche

type	status	case	RATINGS $I_{F(AV)}$ A	V_{RWM} V	I_{FRM} A	I_{FSM} and I^2t T_{jmax}; t = 10 ms A	A^2s	P_{RRM} t = 10 µs kW	P_{RSM} t = 10 µs kW
– 600R				600					
– 800R				800					
BYX45 – 1000R	C	DO-1	**1,5**	1000	15	40	8	0,8	2,5
– 1200R				1200					
– 1400R				1400					
BYW54				600					
BYW55	D	SOD-57	**2**	800	12	50	—	—	1
BYW56				1000					
1N5060				400					
1N5061	D	SOD-57	**2**	600	12	50	—	—	1
1N5062				800					
– 600(R)				600					
– 800(R)				800					
BYX39 – 1000(R)	D	DO-4(1)	**9,5**	1000	100	125	78	2	4
– 1200(R)				1200					
– 1400(R)				1400					
– 600(R)				600					
– 800(R)				800					
BYX25 – 1000(R)	D	DO-4(3)	**20**	1000	440	360	650	3	18
– 1200(R)				1200					
– 1400(R)				1400					
– 600(R)				600					
– 800(R)				800					
BYX56 – 1000(R)	D	DO-5(1)	**48**	1000	450	800	3200	6,5	40
– 1200(R)				1200					
– 1400(R)				1400					

rectifier diodes
abridged data

Schottky barrier				RATINGS						CHARACTERISTICS	
type	status	case	$I_{F(AV)}$	V_{RRM}	V_{RWM}	I_{FRM}	I_{FSM} and I^2t T_{jmax}; t = 10 ms		t_{rr} max	V_{Fmax} at I_F T_j = 100°C	
			A	V	V	A	A	A^2s	ns	V	A
– 30				36	30						
BYV19 – 35	N	TO-220AC	**10**	42	35	—	200	200	180pF	0,55	10
– 40				48	40						
– 45				54	45						
– 30				36	30						
BYV33 – 35	N	TO-220AB	**2×10**	42	35	—	2×200	200	2×220pF	0,55	10
(Double) – 40				48	40						
– 45				54	45						
– 30				36	30						
BYV20 – 35	D	DO-4(1)	**15**	42	35	—	300	450	520pF	0,6	15
– 40				48	40						
– 45				54	45						
– 30				36	30						
BYV21 – 35	D	DO-4(3)	**28**	42	35	—	550	1500	1150pF	0,55	30
– 40				48	40						
– 45				54	45						
– 30				36	30						
BYV22 – 35	D	DO-5	**56**	42	35	—	1000	5000	2100pF	0,55	50
– 40				48	40						
– 45				64	45						
– 30				36	30						
BYV23 – 35	D	DO-5	**70**	42	35	—	1500	11250	2500pF	0,55	70
– 40				48	40						
– 45				54	45						
Super fast types											
– 200				200	200						
BYV29 – 300	N	TO-220AC	**7**	300	300	80	80	32	60	1,2	5
– 400				400	400						
BYX50 – 200(R) – 300(R)	D	DO-4(1)	**7**	200 300	200 300	80	80	32	100	1,95	20
– 200(R)				200	200						
BYV30 – 300(R)	D	DO-4(1)	**12**	300	300	140	150	112	100	1,35	10
– 400(R)				400	400						
– 200(R)				200	200						
BYV92 – 300(R)	D	DO-5	**35**	300	300	500	500	1250	100	1,4	100
– 400(R)				400	400						

Ultra fast types

type		status	case	RATINGS $I_{F(AV)}$	V_{RRM}	V_{RWM}	I_{FRM}	I_{FSM} and I^2t T_{jmax}; t = 10 ms		t_{rr} max	CHARACTERISTICS V_{Fmax} at I_F T_j = 25°C
				A	V	V	A	A	A^2s	ns	V A
BYV27	– 50 – 100 * – 150 – 200	D	SOD-57	**2**	50 100 150 200	50 100 150 200	15	50	—	25	0,88/3
BYV28	– 50 – 100 * – 150 – 200	D	SOD-64	**3,5**	50 100 150 200	50 100 150 200	25	80	—	30	0,75/3
BYW29	– 50 – 100 – 150 – 200	D	TO-220AC	**7**	50 100 150 200	50 100 150 200	80	80	32	35	0,85/5
BYV32 (Double)	– 50 – 100 – 150 – 200	D	TO-220AB	**2 x 10**	50 100 150 200	50 100 150 200	300	2x150	112	35	0,85/5
BYW30	– 50 – 100 – 150 – 200	D	DO-4(1)	**12**	50 100 150 200	50 100 150 200	200	200	200	35	0,85/10
BYW31	– 50 – 100 – 150 – 200	D	DO-4(1)	**25**	50 100 150 200	50 100 150 200	320	320	500	50	0,85/20
BYW92	– 50 – 100 – 150 – 200	D	DO-5	**35**	50 100 150 200	50 100 150 200	500	500	1250	50	0,95/35
BYW93	– 50 – 100 – 150 – 200	D	DO-5	**50**	50 100 150 200	50 100 150 200	800	800	3200	60	0,85/50
BYW94	– 50 – 100 – 150 – 200	D	DO-5	**70**	50 100 150 200	50 100 150 200	1500	1500	11250	60	0,85/70

* With avalanche characteristics.

rectifier diodes
abridged data

Very fast types				RATINGS						CHARACTERISTICS		
type		status	case	$I_{F(AV)}$	V_{RRM}	V_{RWM}	I_{FRM}	I_{FSM} and I^2t T_{jmax}; t = 10 ms		t_{rr} max	V_{Fmax} at I_F T_j = 25°C	
				A	V	V	A	A	A^2s	ns	V	A
	– A				200	200						
BYV95	– B*	D	SOD-57	**1,5**	400	400	10	35	—	250	1,6/3	
	– C				600	600						
BYV96	– D*	D	SOD-57	**1,5**	800	800	10	35	—	300	1,6/3	
	– E*				1000	1000						
	– A				200	200						
BYW95	– B*	D	SOD-64	**3**	400	400	15	70	—	250	1,5/5	
	– C				600	600						
BYW96	– D*	D	SOD-64	**3**	800	800	15	70	—	300	1,5/5	
	– E*				1000	1000						
1N3879(R)					50	50						
1N3880(R)		D	DO-4(1)	**6**	100	100	75	75	28	200	1,4/6	
1N3881(R)					200	200						
1N3882(R)					300	300						
1N3889(R)					50	50						
1N3890(R)		D	DO-4(1)	**12**	100	100	140	140	100	200	1,4/12	
1N3891(R)					200	200						
1N3892(R)					300	300						
	– 200(R)	C			—	200						
	– 300(R)	C			—	300						
BYX30	– 400(R)	D	DO-4(3)	**14**	—	300	310	250	312	200	2,1/14	
	– 500(R)	D			—	500						
	– 600(R)	D			—	600						
1N3899(R)					50	50						
1N3900(R)					100	100						
1N3901(R)		D	DO-5	**20**	200	200	100	225	250	200	1,4/20	
1N3902(R)					300	300						
1N3903(R)					400	400						
	– 200(R)				—	200						
	– 300(R)				—	300						
BYX46	– 400(R)	D	DO-4(3)	**22**	—	400	400	300	450	200	2,0/50	
	– 500(R)				—	500						
	– 600(R)				—	600						

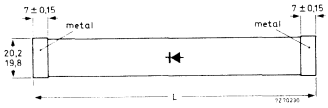
* With avalanche characteristics.

Very fast types (continued)			RATINGS							CHARACTERISTICS	
type	status	case	$I_{F(AV)}$	V_{RRM}	V_{RWM}	I_{FRM}	I_{FSM} and I^2t T_{jmax}; t = 10 ms			t_{rr} max	V_{Fmax} at I_F $T_j = 25°C$
			A	V	V	A	A	A^2s		ns	V A
1N3909(R)				50	50						
1N3910(R)				100	100						
1N3911(R)	D	DO-5	**30**	200	200	125	300	450		200	1,4/30
1N3912(R)				300	300						
1N3913(R)				400	400						
Fast types											
BYX71 – 350(R)	C	SOD-38	**7**	350	300	25	60	—		450	1,25/5
– 600(R)				600	500						
BYW19 – 800(R)	C	SOD-38	**7**	800	800	75	40	—		450	2,3/20
– 1000(R)				1000	800						
– 200(R)				200	150						
– 400(R)				400	300						
BY229 – 600(R)	D	TO-220AC	**7**	600	500	75	60	—		450	1,85/20
– 800(R)				800	600						
– 1000(R)				1000	800						
BYV24 – 800(R)	N	DO-4(1)	**14**	800	650	130	150	112		450	1,7/20
– 1000(R)				1000	800						
BYW25 – 800(R)	D	DO-5	**40**	800	650	600	550	1500		450	2,25/150
– 1000(R)				1000	800						

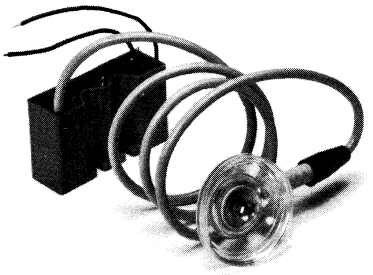
rectifier diodes
abridged data

E.H.T. rectifiers

type	status	case	leads	$I_{F(AV)}$ max mA	V_{RRM} max kV	for use in
BY184 **BY184G**	C N	SOD-34(1)	long	5	1,8	colour tv V_{g2} supply
BY409	C	SOD-34(1)	long	2,5*	12,5	high-voltage multipliers and colour tv
BY476	C	SOD-56	min 22 mm	2,5	18	high-voltage multipliers, tiny vision and black-and-white tv
BY477 **BY478**	C	SOD-56		2	23 27,6	high-voltage rectifiers for black-and-white tv
BY509	D	SOD-61		4	12,5	triplers, diode-split transformers
BY510	D	SOD-61		4	12,5	3-layer split transformer (V_{RSM} = 17 kV)
BYX90	C	SOD-18B		200	7,5	main application in sub-assembly (BYX91) for X-ray equipment
BYX91 – 90K	C	L = max 143 mm		200	115	X-ray apparatus
BYX91 – 120K	C	L = max 171 mm		200	150	X-ray apparatus
BYX91 – 150K	C	L = max 231 mm		200	190	X-ray apparatus
BYX91 – 180K	C	L = max 231 mm		200	225	X-ray apparatus



* 4 mA up to T_{amb} = 77°C, as clamping diode in tripler circuits.



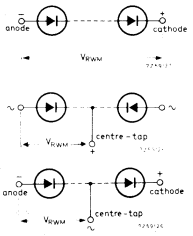
Voltage tripler units.
Non-flammable units for e.h.t. supply in colour tv.

Voltage tripler units

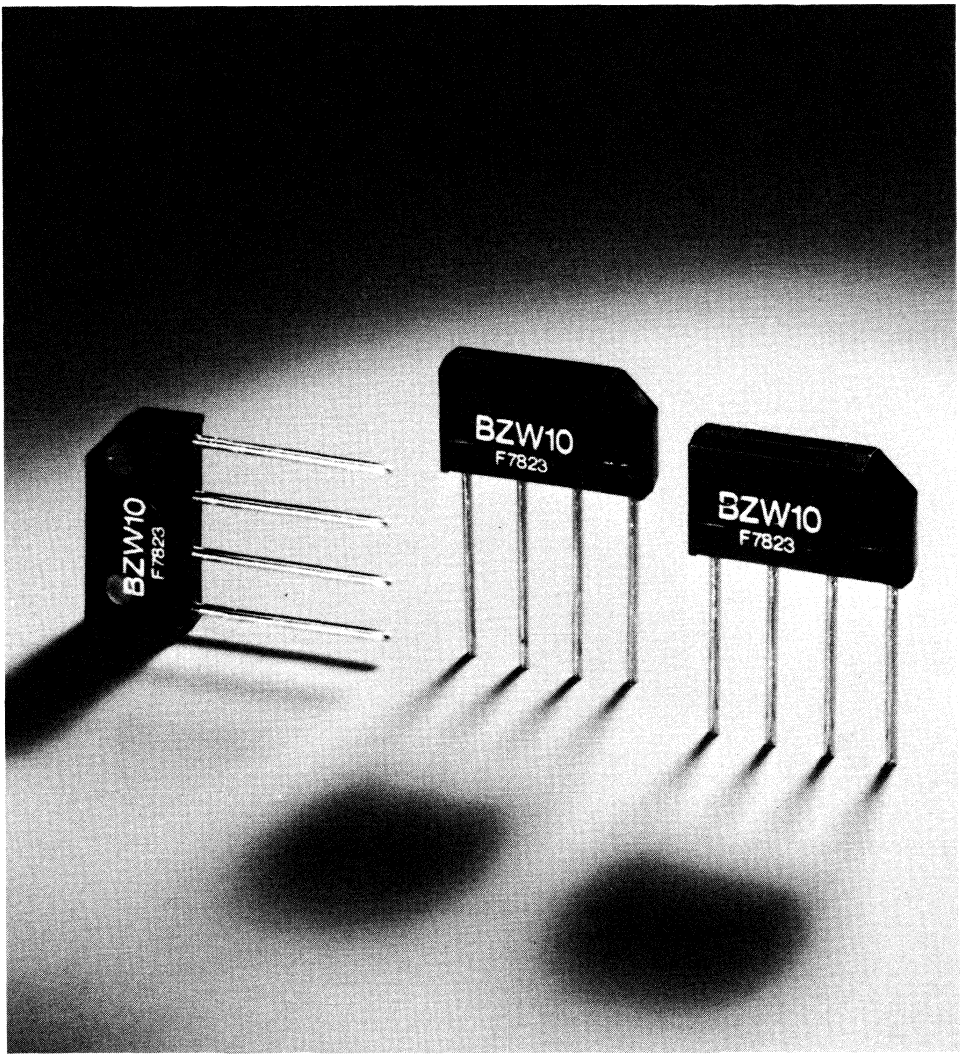
type	status	case sizes in mm	T_{amb} max °C	RATINGS INPUT $V_{i(p-p)}$ kV	OUTPUT $V_{O(EHT)}$ kV	$I_{O(EHT)}$ mA	$I_{O(FOC)}$ mA
BG1895 −541 −641	D	25,5 × 75 × 45	65	10	27,5	1,7	400
BG1897 −541 −542	D	25,5 × 103,5 × 58	65	10	27,5	1,7	85
BG1897 −641 −642	D	25,5 × 103,5 × 58	65	10	27,5	1,7	85
BG2000 −541 −641	N	24 × 52 × 51	65	10	27,5	1,7	400
BG2097 −641 −642	N	24 × 80 × 57	65	10	27,5	1,7	—

E.H.T. power rectifier stacks

type	status	$I_{F(AV)}$	V_{RWM}	for use in
OSS9110-3 to 30 **OSS9210-3 to 30** **OSS9410-3 to 30**	D	3,5 A (6 A in oil) 5 A (20 A in oil) 10 A (30 A in oil)	3 kV to 30 kV	single-phase rectifiers
OSB9110-4 to 30 **OSB9210-4 to 30** **OSB9410-4 to 30**	D	7 A (12 A in oil) 10 A (40 A in oil) 20 A (60 A in oil)	2 kV to 15 kV	two-phase half-wave circuits
OSM9110-4 to 30 **OSM9210-4 to 30** **OSM9410-4 to 30**	D	3,5 A (6 A in oil) 5 A (20 A in oil) 10 A (30 A in oil)	2 kV to 15 kV	bridges and voltage doublers, single or three-phase



BZW10 transient suppression bridge for telephones



thyristors and triacs
selection guide

General purpose thyristors (pages A28, A29)

$I_{T(RMS)}$		V_{RRMmax}(V)												
A		50	100	200	300	400	500	600	650	800	1000	1200	1400	1600
1	BT149	●	●	●		●	●	●						
1,6	BTX18		●	●	●	●	●							
12	BT151						●		●					
16	BTY79					●	●	●		●	●			
16	BTW38							●		●	●	●		
16	BTW42							●		●	●	●		
20	BT152					●		●		●				
25	BTW45					●		●		●	●	●		
25	BTW47									●	●	●	●	●
25	BTY87					●	●	●		●				
25	BTY91					●	●	●		●				
31	BTW92									●	●	●	●	●
32	BTW40					●		●		●				
70	BTV24							●		●		●	●	
140	BTW23							●		●	●	●	●	●

Fast turn-off thyristors (page A30)

$I_{T(RMS)}$			V_{DRMmax}(V)							
A			500	600	750	800	1000	1200	1400	1600
6	BT153		●							
8	BT154	ASCR construction			●					
15	BTW55	ASCR construction				●				
24	BTW30S					●	●	●		
31	BTW31W					●	●	●		
40	BTW63	ASCR construction		●		●				
110	BTW33					●	●	●		

Fast gate turn-off thyristors (page A31)

$I_{T(AV)}$		I_{TCRM}	V_{DRMmax}(V)							
A		A	500	600	750	850	1000	1300	1500	1600
2,2	BT157	10						●	●	
6,5	BTW58	25					●	●	●	
10	BTV58	25		●		●	●			
12	BTW59	50						●	●	
15	BTV59	50		●		●	●			

Triacs (pages A32/A33)

$I_{T(RMS)}$		V_{DRMmax}(V)								
A		400	500	600	650	800	1000	1200	1400	1600
4	BT136		●	●		●				
8	BT137		●	●		●				
12	BT138		●	●		●				
15	BTW43G			●		●	●	●		
15	BTW43H			●		●	●	●		
16	BT139		●	●		●				
25	BTX94H	●		●		●	●	●		
25	BTX94J	●		●		●	●	●		
55	BTV34G			●		●	●	●	●	
55	BTV34H			●		●	●	●	●	

Trigger devices (page A31)

Diac BR100: $V_{(BO)}$ = 28 to 36 V; I_{FRM} < 2 A. Thyristor tetrode BRY39: V_{RRMmax} = 70 V; I_{Tmax} = 250 mA.

thyristors
abridged data

Normal polarity (cathode to stud) **no end-letter**
Reverse polarity (anode to stud) **R**
Both polarities available **(R)**

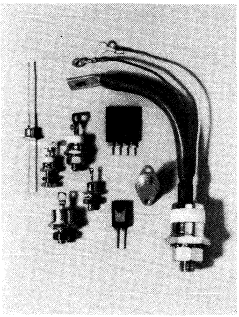
General purpose

type	suffix = V_{RRM} max	status	case	RATINGS $I_{T(RMS)}$ A	$I_{T(AV)}$ A	I_{TRM} A	I_{TSM} and I^2t $T_{j\ max}$; 10 ms A	A^2s	dI_T/dt A/μs	CHARACTERISTICS dV_D/dt max * V/μs	V_{GT}▲ min V	I_{GT}▲ min mA
	F – 50											
	A – 100											
BT149	**B** – 200	D	TO-92	**1**	0,6	15	15	1	30	10	0,8	0,7
	D – 400											
	E – 500											
	M – 600											
	– 100											
	– 200											
BTX18	– 300	D	TO-39(2)	**1,6**	1	10	10	—	—	15	2	5
	– 400											
	– 500											
BT151	– 500(R)	D	TO-220AB(3)	**12**	7,5	65	100	50	50	50	1,5	15
	– 650(R)											
	– 400R											
	– 500R											
BTY79	– 600R	D	TO-64(1)	**16**	10	75	150	112	50	50	1,5	30
	– 800R											
	– 1000R											
	– 600R											
BTW38	– 800R	D	TO-64(1)(2)	**16**	10	75	150	112	50	50	1,5	50
	– 1000R											
	– 1200R											
	– 600R											
BTW42	– 800R	D	TO-64(1)(2)	**16**	10	75	150	112	50	200▲▲	1,5	50
	– 1000R											
	– 1200R											
	– 400R											
BT152	– 600R	D	TO-220AB(3)	**20**	13	200	200	200	200	200	1,5	32
	– 800R											
	– 400R											
	– 600R											
BTW45	– 800R	D	TO-48(1)(2)	**25**	16	200	300	450	100	200▲▲	1,5	75
	– 1000R											
	– 1200R											

* At $T_j = T_{j\ max}$.

▲ $V_D = 6$ V, $T_j = 25°C$.

▲▲ Up to 1000 V/μs on request.



General purpose

type	suffix = V_{RRM} max	status	case	RATINGS $I_{T(RMS)}$ A	$I_{T(AV)}$ A	I_{TRM} A	I_{TSM} and I^2t $T_{j\,max}$; 10 ms A	A^2s	dI_T/dt A/μs	CHARACTERISTICS dV_D/dt max * V/μs	V_{GT}▲ min V	I_{GT}▲ min mA
BTW47	– 800R – 1000R – 1200R – 1400R – 1600R	C	TO-48(1)(2)	**25**	16	150	300	450	200	300▲▲	3,5	100
BTY87	– 400R – 500R – 600R – 800R	C	TO-48(1)	**25**	16	140	140	100	20	20	3,5	65
BTY91	– 400R – 500R – 600R – 800R	C	TO-48(1)	**25**	16	200	200	200	20	20	3	40
BTW92	– 800R – 1000R – 1200R – 1400R – 1600R	D	TO-48(1)(2)	**31**	20	200	400	800	300	300▲▲	3,5	100
BTW40	– 400R – 600R – 800R	D	TO-48(1)(2)	**32**	20	200	400	800	100	100	1,5	75
BTV24	– 600R – 800R – 1200R – 1400R	D	TO-65	**70**	45	500	800	3200	100	200▲▲	2,5	100
BTW23	– 600R – 800R – 1000R – 1200R – 1400R – 1600R	C	TO-94(1)(2)	**140**	90	1250	2000	20000	300	200▲▲	2,5	150

* At $T_j = T_{j\,max}$.

▲ $V_D = 6$ V, $T_j = 25$°C.

▲▲ Up to 1000 V/μs on request.

thyristors
abridged data

Fast turn-off thyristors for motor control and 3-phase inverters. Excellent dI_T/dt and dV_D/dt ratings mean fewer protection components.

For use in high-frequency applications such as
- choppers
- pulse circuits
- frequency converters
- d.c. supplies

Fast turn-off

type	suffix = V_{RRM} max	status	case	RATINGS $I_{T(RMS)}$ A	$I_{T(AV)}$ A	I_{TRM} (I_{TM}) A	I_{TSM} and I^2t $T_{j\,max}$; 10 ms A	A^2s	dI_T/dt A/μs	CHARACTERISTICS t_q max μs	dV_D/dt* max V/μs	V_{GT}▲ min V	I_{GT}▲ min mA
BT153		D	TO-220AB(3)	**6**	4	30	40	—	200	14	200	2,5	40
BT154				**8**	5	240	—	18	60	2,4			
BT155	– 600RK – 600RN – 600RP – 800RK – 800RN – 800RP	D	TO-220AB(3)	**15**	9,5	90	110	60	60	4 6 8 4 6 8	200	2,0	100
BTW30	– 800RS – 1000RS – 1200RS	D	TO-48(2)	**24**	16	150	150	115	100	15	200	2,5	200
BTW31	– 800RW – 1000RW – 1200RW	C	TO-48(2)	**31**	22	240	240	290	100	20	200	2,5	200
BTW63	– 600RK – 600RN – 600RP – 800RK – 800RN – 800RP	D	TO-48	**40**	25	250	370	700		4 6 8 4 6 8		2,0	250
BTW33	– 800R – 1000R – 1200R	C	TO-94(2)	**110**	80	750	1500	11250	100	25	200	2,5	150

* At $T_j = T_{j\,max}$.
▲ $V_D = 6$ V, $T_j = 25$°C.

Fast gate turn-off thyristors

type	suffix = V_{DRM} max	status	case	V_{DW} V	$I_{T(AV)}$ A	I_{TCRM} A	I_{TSM} T_{jmax} A	I^2t 10 ms A^2s	dV_D/dt msx $kV/\mu s$	V_{GT} min V	I_{GT} min mA	t_f max ns	V_{Tmax} at I_T V/A
BT157	– 1300R – 1500R	N	TO-220AB	1200 1300	**2,2**	10	20	2	10	1,5	200	250	3/2,5
BTW58	– 1000R – 1300R – 1500R	D	TO-220AB	650 1200 1300	**6,5**	25	50	12,5	10	1,5	200	250	3/5
BTV58	– 600R – 850R – 1000R	D	TO-220AB	400 600 800	**10**	25	75	28	10	1,5	200	250	1,8/5
BTW59	– 1300R – 1500R	N	TO-238 *	1200 1300	**12**	50	90	40	10	1,5	250	300	3/10
BTV59	– 600R – 850R – 1000R	N	TO-238 *	400 600 800	**15**	50	100	50	10	1,5	250	300	1,8/15

* with isolated base

trigger devices

Diac BR100 — status D

Breakover voltage	$V_{(BO)}$	28 to 36 V
Repetitive peak current	I_{FRM}	max 2 A
Breakback voltage	V_O	min 5 V

Thyristor tetrode BRY39 in TO-72(3) — status D

Ratings		Characteristics at $T_j = 25°C$	
$V_D = V_R$	max 70 V	V_{GKT}	> 0,5 V
I_{TSM} at $T_{j\,max}$		I_{GKT}	> 1 μA
$t = 10\ \mu s$	max 3 A	$-V_{GAT}$	> 1 V
I_T	max 250 mA	$-I_{GAT}$	> 100 μA
dI_T/dt	max 20 $A/\mu s$		

triacs
abridged data

High quality triacs for motor control, furnace control, heating, light dimming, contactor drive, static switching, etc. They have a high surge capability and, due to the high commutating characteristics, are excellent for use with three-phase systems.

Triacs

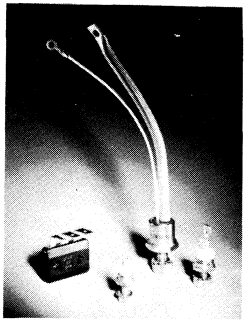
type	suffix = V_{DRM} max	status	case	RATINGS $I_{T(RMS)}$	I_{TRM}	I_{TSM} and I^2t $T_{j\ max}$; 10 ms		dI_T/dt	CHARACTERISTICS dV_D/dt max at $T_{j\ max}$ ** normal commutating at $-dI_T/dt$			V_{GT}▲ min	I_{GT}▲ min
				A	A	A	A^2s	A/μs	V/μs	V/μs	A/ms	V	mA
BT136	– 500 – 600 – 800	D	TO-220AB(2)	**4**	25	25		10	50	10	1,8	1,5	35 *
BT137	– 500 – 600 – 800	D	TO-220AB(2)	**8**	55	55	15	20	50	10	3,6	1,5	35 *
BT138	– 500 – 600 – 800	D	TO-220AB(2)	**12**	90	90	40	30	50	10	5,4	1,5	35 *
BT139	– 500 – 600 – 800	D	TO-220AB(2)	**16**	115	115	65	30	50	10	7,2	1,5	35 *

* Variants with different gate sensitivities are available as follows:

Suffix to type no.	$I_{GT\ min}$
G	50 mA
F	25 mA
E	10 mA
D	5 mA

** It should be noted that a change in gate sensitivity does have effect on the commutation characteristics and dV_D/dt.

▲ $V_D = 12$ V, $T_j = 25°C$.



Letters G, H or J are added to the main type number to indicate the $-dI_T/dt$ value at which the specified dV_{com}/dt max occurs.

Triacs

type	suffix = V_{DRM} max	status	case	RATINGS $I_{T(RMS)}$	I_{TRM}	I_{TSM} and I^2t $T_{j\ max}$; 10 ms		dI_T/dt	CHARACTERISTICS dV_D/dt max at $T_{j\ max}$ normal	commutating at $-dI_T/dt$		V_{GT}▲ min	I_{GT}▲ min
				A	A	A	A^2s	$A/\mu s$	$V/\mu s$	$V/\mu s$	A/ms	V	mA
BTW43G	– 600 – 800 – 1000 – 1200	D	TO-64(2)	**15**	50	120	72	50	200	10	5	2,5	100
BTW43H	– 600 – 800 – 1000 – 1200	D	TO-64(2)	**15**	50	120	72	50	200	10	12	2,5	100
BTX94H	– 400 – 600 – 800 – 1000 – 1200	D	TO-48(1)	**25**	100	250	320	50	100	30	25	3	150
BTX94J	– 400 – 600 – 800 – 1000 – 1200	D	TO-48(1)	**25**	100	250	320	50	100	30	50	3	150
BTV34G	– 600 – 800 – 1000 – 1200 – 1400 – 1600	D	TO-65	**55**	300	350	612	50	200	30	25	2,5	200
BTV34H	– 600 – 800 – 1000 – 1200 – 1400 – 1600	D	TO-65	**55**	300	350	612	50	200	30	50	2,5	200

▲ $V_D = 12$ V, $T_j = 25°C$.

transistor selection guide

P listed by power dissipation
V listed by voltage

N = n-p-n
P = p-n-p
F = FET
M = MOS-FET
PM = power MOS

Excluding r.f. power devices and devices for optoelectronics

P_{tot} max W		V_{CEO} V_{DS} max V	type no.	page
0,03	N	5	BFT24	A66
0,05	N	5	BFT25;R	A99
	N	20	BC146	A44
	P		BC200	A44
0,14	P	20	BF979	A66
0,145	N	20	BF184	A66
	N		BF185	A66
	N	30	BF115	A66
0,15	N	12	BFQ22;S	A89
	P		BFQ24	A89
	P	15	BFQ52	A89
	N		BFQ53	A89
	N	20	BF180	A66
	N		BF181	A66
	N		BF182	A66
	N		BF183	A66
	N		BF200	A66
	P		BF579	A98
	F	30	BFW12	A72
	F		BFW13	A72
	N	32	BCW60	A97
	P		BCW61	A97
	N	40	BCY87	A74
	N		BCY88	A74
	N		BCY89	A74
	N	45	BCX70	A97
	P		BCX71	A97
0,16	P	30	BF967	A66
	P	35	BF970	A66
0,18	P	12	BFQ23	A89
	N		BFR91	A89
	P	15	BFQ51	A89
	N		BFR49	A89
	N		BFR90	A89
	N		BFR90A	A89
0,19	N	10	BFW93	A89
	N	15	BFW92	A89
0,2	N	12	BFR93;R	A99
	P		BFT93;R	A99
	N	15	BF480	A66
	N		BFR92;R	A99
	N		BFR92A;R	A99

P_{tot} max W		V_{CEO} V_{DS} max V	type no.	page
0,2	P	15	BFT92;R	A99
	N		BFX89	A89
	N		BFY90	A89
	N		2N918	A70
	P	20	BF767	A98
	P	25	BF660	A98
	N	30	BC848;R	A96
	N		BC849;R	A96
	P		BC858;R	A96
	P		BC859;R	A97
	P		BF536	A98
	M		BFR29	A72
	M		BSV81	A73
	P	40	BF550;R	A98
	P		BF569	A98
	N	45	BC847;R	A96
	N		BC850;R	A96
	P		BC857;R	A96
	P		BC860;R	A97
	N	65	BC846;R	A96
	P		BC856;R	A96
0,225	M	18	BF980	A72
	M	20	BF960	A72
	M		BF981	A72
	M		BF982	A72
0,25	N	10	BFR53;R	A99
	N		BFW30	A89
	N	12	BFR93A;R	A99
	N		BSV52;R	A100
	N	15	BFQ63	A89
	N		BFS17;R	A99
	P		BSR12;R	A100
	P	20	BF936	A66
	N		BFS18;R	A98
	N		BFS19;R	A98
	N		BFS20;R	A98
	F	25	BFR30	A99
	F		BFR31	A99
	F		BFT46	A99
	P	30	BF324	A66
	F		BFQ10	A74
	F		BFQ11	A74
	F		BFQ12	A74
	F		BFQ13	A74
	F		BFQ14	A74
	F		BFQ15	A74
	F		BFQ16	A74

P_{tot} max W		V_{CEO} V_{DS} max V	type no.	page
0,25	N	40	BF240	A66
	N		BF241	A66
	P		BF450	A66
	P		BF451	A66
	F		BSR56	A99
	F		BSR57	A99
	F		BSR58	A99
0,255	P	25	BF939	A66
0,3	N	12	BFR91A	A89
	N	20	BC108	A44
	N		BC109	A44
	P		BC179	A44
	N		BCY57	A46
	F		BF410	A72
	N		BF494	A66
	N		BF495	A66
	N		BF496	A66
	F		BF510	A99
	F		BF511	A99
	F		BF512	A99
	F		BF513	A99
	P	25	BF178	A44
	F		BFW61	A72
	F	30	BC264	A72
	F		BF245	A72
	F		BF256	A72
	F		BFS21	A74
	F		BFS21A	A74
	F		BFW10	A72
	F		BFW11	A72
	F		2N3823	A72
	F		2N3966	A73
	N	45	BC107	A44
	P		BC177	A44
	N		BCY56	A46
	N		2N929	A46
	N		2N930	A46
0,31	P	25	BC808;R	A96
	N		BC818;R	A96
	P	45	BC807;R	A96
	N		BC817;R	A96
0,35	P	25	BCY72	A46
	P	32	BCF29;R	A98
	P		BCF30;R	A98
	N		BCF32;R	A98
	N		BCF33;R	A98

transistor selection guide

P listed by power dissipation
V listed by voltage

N = n-p-n
P = p-n-p
F = FET
M = MOS-FET
PM = power MOS

Excluding r.f. power devices and devices for optoelectronics

P_{tot} max W		V_{CEO} V_{DS} max V	type no.	page
0,35	P	32	BCW29;R	A97
	P		BCW30;R	A97
	N		BCW31;R	A97
	N		BCW32;R	A97
	N		BCW33;R	A97
	P	40	BCY70	A46
	N		BSR17;R	A100
	P		BSR18;R	A100
	F		BSV78	A73
	F		BSV79	A73
	F		BSV80	A73
	P	45	BCF70;R	A98
	N		BCF81;R	A98
	P		BCW69;R	A97
	P		BCW70;R	A97
	N		BCW71;R	A97
	N		BCW72;R	A97
	N		BCW81;R	A97
	P		BCY71	A46
	N	60	BCV71;R	A97
	N		BCV72;R	A97
	P		BCW89;R	A97
	N	80	BSS64;R	A100
	P	100	BSS63;R	A100
0,36	P	12	2N2894	A70
	P		2N2894A	A70
	N	15	BSX19	A68
	N		BSX20	A68
	N		2N2368	A70
	N		2N2369	A70
	N		2N2369A	A70
	M	27	3N211	A72
	F	30	2N4859	A73
	F		2N4860	A73
	F		2N4861	A73
	F	40	2N4856	A73
	F		2N4857	A73
	F		2N4858	A73
	N	60	2N2483	A46
	N		2N2484	A46
0,4	P	40	2N2906	A70
	P		2N2907	A70
	P	60	2N2906A	A70
	P		2N2907A	A70

P_{tot} max W		V_{CEO} V_{DS} max V	type no.	page
0,425	P	25	BCX18;R	A98
	N		BSX20;R	A98
	N	30	BSR13;R	A100
	N	40	BSR14;R	A100
	P		BSR15;R	A100
	P	45	BCX17;R	A98
	N		BCX19;R	A98
	P	60	BSR16;R	A100
0,5	N	15	BF370	A66
	N		BFQ19	A99
	P		BFQ32	A89
	N		BFR54	A66
	N		BFR96	A89
	N		PH2369	A68
	N	25	BF199	A66
	N	30	BC548	A45
	N		BC549	A45
	P		BC558	A45
	P		BC559	A45
	N		BF198	A66
	N		2N2221	A70
	N		2N2222	A70
	N	40	2N2221A	A70
	N		2N2222A	A70
	N	45	BC547	A45
	N		BC550	A45
	P		BC557	A45
	P		BC560	A45
	N	65	BC546	A45
	P		BC556	A45
	N	100	BSS38	A68
	P		BSS68	A68
0,6	P	32	BCY33A	A46
	P		BCY34A	A46
	P	40	2N2904	A70
	P		2N2905	A70
	P	60	2N2904A	A70
	P		2N2905A	A70
	P	64	BCY30A	A46
	P		BCY31A	A46
	P		BCY32A	A46
0,7	N	15	BFR96S	A89
0,8	N	20	BC375	A45
	P		BC376	A45
	N		BFY52	A66
	P	25	BC328	A44
	N		BC338	A44

P_{tot} max W		V_{CEO} V_{DS} max V	type no.	page
0,8	N	30	BFY51	A66
	N		BSX60	A68
	N		2N2218	A70
	N		2N2219	A70
	N	35	BFY50	A66
	N		BFY55	A66
	N		2N2297	A70
	P	40	BSV15	A68
	N		2N2218A	A70
	N		2N2219A	A70
	P	45	BC327	A44
	N		BC337	A44
	N		BSR50	A68
	P		BSR60	A68
	N		BSS50	A68
	P		BSS60	A68
	N		BSX59	A68
	N		BSX61	A68
	N	50	2N1613	A70
	N		2N1711	A70
	N	60	BSR51	A68
	P		BSR61	A68
	N		BSS51	A68
	P		BSS61	A68
	P		BSV16	A68
	P		2N4030	A70
	P		2N4032	A70
	N	80	BSR52	A68
	P		BSR62	A68
	N		BSS52	A68
	P		BSS62	A68
	P		BSV17	A68
	N		2N1893	A70
	N		2N3019	A70
	N		2N3020	A70
	P		2N4031	A70
	P		2N4033	A70
	N	100	BSW66A	A68
	N	120	BSW67A	A68
	N	150	BSW68A	A68
0,83	N	250	BF422	A66
	P		BF423	A66
0,87	N	60	BFX34	A66
1	N	15	BFQ18A	A99
	N	20	BC368	A45
	P		BC369	A45

transistor selection guide

P listed by power dissipation
V listed by voltage

N = n-p-n
P = p-n-p
F = FET
M = MOS-FET
PM = power MOS

Excluding r.f. power devices and devices for optoelectronics

P_{tot} max W		V_{CEO} V_{DS} max V	type no.	page
1	N	25	BFQ17	A99
	N		BSW41A	A68
	N	32	BCY58	A46
	P		BCY78	A46
	N	45	BC635	A45
	P		BC636	A45
	P		BCX51	A98
	N		BCX54	A98
	N		BCY59	A46
	P		BCY79	A46
	N	60	BC637	A45
	P		BC638	A45
	P		BCX52	A98
	N		BCX55	A98
	P		BSR30	A100
	P		BSR31	A100
	N		BSR40	A100
	N		BSR41	A100
	N	80	BC639	A45
	P		BC640	A45
	P		BCX53	A98
	N		BCX56	A98
	P		BSR32	A100
	P		BSR33	A100
	N		BSR42	A100
	N		BSR43	A100
	P	200	BST15;R	A100
	P		2N5415	A70
	N	250	BF622	A100
	P		BF623	A100
	P	300	BST16;R	A100
	P		2N5416	A70
1,5	N	25	BFR95	A89
	N		BFW16A	A89
	N		BFW17A	A89
1,8	F	40	2N4091	A73
	F		2N4092	A73
	F		2N4093	A73
	F		2N4391	A73
	F		2N4392	A73
	F		2N4393	A73
	N	250	BF469	A58
	P		BF470	A58
	N	300	BF471	A58
	P		BF472	A58
2,25	N	18	BFQ34	A89

P_{tot} max W		V_{CEO} V_{DS} max V	type no.	page
2,5	N	25	BFR94	A89
3,5	N	25	BFR64	A89
3,7	N	40	BC140	A44
	P		BC160	A44
	N	60	BC141	A44
	P		BC161	A44
4,5	N	18	BFQ68	A89
5	N	25	BFR65	A89
	N	40	BSX45	A68
	N	45	BDX42	A57
	P		BDX45	A57
	N	60	BDX43	A57
	P		BDX46	A57
	N		BSV64	A68
	N		BSX46	A68
	N	80	BDX44	A57
	P		BDX47	A57
	N		BSX47	A68
	N	250	BF869	A58
	P		BF870	A59
	P		BFT45	A66
	N	300	BF871	A58
	P		BF872	A59
	P		BFT44	A66
6	N	160	BF457	A58
	N		BF857	A58
	N	250	BF419	A58
	N		BF458	A58
	N		BF819	A58
	N		BF858	A58
	N	300	BF459	A58
	N		BF859	A58
8	N	45	BD135	A51
	P		BD136	A51
	N		BD825	A53
	P		BD826	A53
	N		BDW55	A57
	P		BDW56	A57
	N	60	BD137	A51
	P		BD138	A51
	N		BD827	A53
	P		BD828	A53
	N		BDW57	A57
	P		BDW58	A57

P_{tot} max W		V_{CEO} V_{DS} max V	type no.	page
8	N	80	BD139	A51
	P		BD140	A51
	N		BD829	A53
	P		BD830	A53
	N		BDW59	A57
	P		BDW60	A57
10	N	45	BD839	A53
	P		BD840	A53
	N	60	BD841	A53
	P		BD842	A53
	N	80	BD843	A53
	P		BD844	A53
	N	100	BD845	A53
	P		BD846	A54
	N	120	BD847	A53
	P		BD848	A54
	N	140	BD849	A53
	P		BD850	A54
12,5	N	45	BD226	A51
	P		BD227	A51
	N		BD813	A53
	P		BD814	A53
	N	60	BD228	A51
	P		BD229	A51
	N		BD815	A53
	P		BD816	A53
	N		BD230	A51
	P		BD231	A51
	N		BD817	A53
	P		BD818	A53
15	N	20	BD329	A52
	P		BD330	A52
	N	45	BD131	A51
	P		BD132	A51
	N	60	BDX35	A57
	N		BDX36	A57
	N	80	BDX37	A57
20	N	400	BUX86	A59
	N	450	BUX87	A59
25	N	45	BD233	A51
	P		BD234	A51
	N	60	BD235	A51
	P		BD236	A51

transistor selection guide

P listed by power dissipation
V listed by voltage

N = n-p-n
P = p-n-p
F = FET
M = MOS-FET
PM = power MOS

Excluding r.f. power devices and devices for optoelectronics

P_{tot} max W		V_{CEO} V_{DS} max V	type no.	page
25	N	80	BD237	A51
	P		BD238	A51
30	N	40	BDT29	A55
	P		BDT30	A55
	N	45	BD239	A51
	P		BD240	A51
	N		BD933	A54
	P		BD934	A54
	N	60	BD239A	A51
	P		BD240A	A51
	N		BD935	A54
	P		BD936	A54
	N		BDT29A	A55
	P		BDT30A	A55
	N	80	BD239B	A51
	P		BD240B	A51
	N		BD937	A54
	P		BD938	A54
	N		BDT29B	A55
	P		BDT30B	A55
	N	100	BD239C	A51
	P		BD240C	A51
	N		BD939	A54
	P		BD940	A54
	N		BDT29C	A55
	P		BDT30C	A55
	N	120	BD941	A54
	P		BD942	A54
	N	150	BD941A	A54
	P		BD942A	A54
36	N	22	BD433	A52
	P		BD434	A52
	N	32	BD435	A52
	P		BD436	A52
	N	45	BD437	A52
	P		BD438	A52
40	N	22	BD943	A54
	P		BD944	A54
	N	32	BD945	A54
	P		BD946	A54
	N	40	BDT31	A55
	P		BDT32	A55
	N	45	BD241	A52
	P		BD242	A52
	N		BD675	A53
	P		BD676	A53
	N		BD947	A54
	P		BD948	A54

P_{tot} max W		V_{CEO} V_{DS} max V	type no.	page
40	N	60	BD241A	A52
	P		BD242A	A52
	N		BD677	A53
	P		BD678	A53
	N		BD949	A54
	P		BD950	A54
	N		BDT31A	A55
	P		BDT32A	A55
	N		BDY92	A58
	N	80	BD241B	A52
	P		BD242B	A52
	N		BD679	A53
	P		BD860	A53
	N		BD951	A54
	P		BD952	A54
	N		BDT31B	A55
	P		BDT32B	A55
	N		BDY91	A58
	N	100	BD241C	A52
	P		BD242C	A52
	N		BD681	A53
	P		BD682	A53
	N		BD953	A54
	P		BD954	A54
	N		BDT31C	A55
	P		BDT32C	A55
	N		BDY90	A58
	N	120	BD683	A53
	P		BD684	A53
	N		BD955	A54
	P		BD956	A54
	N	150	BD957	A54
	P		BD958	A54
	N	400	BUX84	A59
	N	450	BUX85	A59
45	PM	50	BUZ10	A60
	PM	100	BUZ20	A60
	PM	200	BUZ30	A60
50	P	60	BDT60	A55
	N		BDT61	A55
	P	80	BDT60A	A55
	N		BDT61A	A55
	P	100	BDT60B	A55
	N		BDT61B	A55
	P	120	BDT60C	A55
	N		BDT61C	A55
	N	400	BUW84	A59
	N	450	BUW85	A59

P_{tot} max W		V_{CEO} V_{DS} max V	type no.	page
60	N	45	BD201	A51
	P		BD202	A51
	N	60	BD203	A51
	P		BD204	A51
	N		BD331	A52
	P		BD332	A52
	N	80	BD333	A52
	P		BD334	A52
	N		BDX77	A58
	P		BDX78	A58
	N	100	BD335	A52
	P		BD336	A52
	N	120	BD337	A52
	P		BD338	A52
	N	150	BU807	A59
	N	200	BU806	A59
62,5	N	60	BD645	A52
	P		BD646	A53
	N	80	BD647	A52
	P		BD648	A53
	N	100	BD649	A52
	P		BD650	A53
	N	120	BD651	A52
	P		BD652	A53
	P	130	BDT20	A54
	N		BDT21	A54
	PM	200	BUZ31	A60
	PM		BUZ33	A60
	PM	500	BUZ40	A60
	PM		BUZ41	A60
	PM	800	BUZ80	A60
	PM		BUZ83	A60
	PM	1000	BUZ50	A60
65	N	40	BDT41	A55
	P		BDT42	A55
	N	45	BD243	A52
	P		BD244	A52
	N	60	BD243A	A52
	P		BD244A	A52
	N		BDT41A	A55
	P		BDT42A	A55
	N	80	BD243B	A52
	P		BD244B	A52
	N		BDT41B	A55
	P		BDT42B	A55
	N	100	BD243C	A52
	P		BD244C	A52
	N		BDT41C	A55
	P		BDT42C	A55

transistor selection guide

P listed by power dissipation
V listed by voltage

N = n-p-n
P = p-n-p
F = FET
M = MOS-FET
PM = power MOS

Excluding r.f. power devices and devices for optoelectronics

P_{tot} max W		V_{CEO} V_{DS} max V	type no.	page
70	N	375	BU426	A59
	N	400	BU426A	A59
	N		BUV82	A59
	N	450	BUV83	A59
78	PM	200	BUZ34	A60
	PM	500	BUZ43	A60
	PM		BUZ44	A60
	PM	1000	BUZ53	A60
80	N	800	BUY89	A59
90	P	60	BDT62	A55
	N		BDT63	A56
	N		BDT91	A56
	P		BDT92	A56
	P		BDX62	A57
	N		BDX63	A57
	N		BDX91	A58
	P		BDX92	A58
	P	80	BDT62A	A55
	N		BDT63A	A56
	N		BDT93	A56
	P		BDT94	A56
	P		BDX62A	A57
	N		BDX63A	A57
	N		BDX93	A58
	P		BDX94	A58
	P	100	BDT62B	A55
	N		BDT63B	A56
	N		BDT95	A56
	P		BDT96	A56
	P		BDX62B	A57
	N		BDX63B	A57
	N		BDX95	A58
	P		BDX96	A58
	P	120	BDT62C	A55
	N		BDT63C	A56
	P		BDX62C	A57
	N		BDX63C	A57
100	N	60	BDV91	A56
	P		BDV92	A57
	N	80	BDV93	A56
	P		BDV94	A57
	N	100	BDV95	A56
	P		BDV96	A57
	N	400	BUS11	A59
	N		BUX46	A59
	N		BUX80	A59

P_{tot} max W		V_{CEO} V_{DS} max V	type no.	page
100	N	450	BUS11A	A59
	N		BUX46A	A59
	N		BUX81	A59
	PM	500	BUZ45	A60
	PM	800	BUZ84	A60
	PM	1000	BUZ54	A60
115	N	375	BU826	A59
	N	400	BU826A	A59
117	P	60	BDX64	A57
	N		BDX65	A57
	P	80	BDX64A	A57
	N		BDX65A	A57
	P	100	BDX64B	A57
	N		BDX65B	A57
	P	120	BDX64C	A57
	N		BDX65C	A57
125	P	60	BDT64	A56
	N		BDT65	A56
	P		BDV64	A56
	N		BDV65	A56
	P	80	BDT64A	A56
	N		BDT65A	A56
	P		BDV64A	A56
	N		BDV65A	A56
	P	100	BDT64B	A56
	N		BDT65B	A56
	P		BDV64B	A56
	N		BDV65B	A56
	P	120	BDT64C	A56
	N		BDT65C	A56
	P		BDV64C	A56
	N		BDV65C	A56
	N	400	BUS12	A59
	N		BUX47	A59
	N		BUX90	A59
	N	450	BUS12A	A59
	N		BUX47A	A59
	N	700	BU508	A59
150	P	60	BDX66	A58
	N		BDX67	A58
	P	80	BDX66A	A58
	N		BDX67A	A58
	P	100	BDX66B	A58
	N		BDX67B	A58
	P	120	BDX66C	A58
	N		BDX67C	A58

P_{tot} max W		V_{CEO} V_{DS} max V	type no.	page
175	N	400	BUS13	A59
	N		BUX48	A59
	N	450	BUS13A	A59
	N		BUX48A	A59
200	P	80	BDV66A	A56
	N		BDV67A	A56
	P	100	BDV66B	A56
	N		BDV67B	A56
	P	120	BDV66C	A56
	N		BDV67C	A56
	P	150	BDV66D	A56
	N		BDV67D	A56
250	N	400	BUS14	A59
	N		BUX98	A59
	N	450	BUS14A	A59
	N		BUX98A	A59

transistor selection guide

P listed by power dissipation
V listed by voltage

N = n-p-n
P = p-n-p
F = FET
M = MOS-FET
PM = power MOS

Excluding r.f. power devices and devices for optoelectronics

V_{CEO} V_{DS} max V		P_{tot} max W	type no.	page
5	N	0,03	BFT24	A66
	N	0,05	BFT25;R	A99
10	N	0,19	BFW93	A89
	N	0,25	BFR53;R	A99
	N		BFW30	A89
12	N	0,15	BFQ22;S	A89
	P		BFQ24	A89
	P	0,18	BFQ23	A89
	N		BFR91	A89
	N	0,2	BFR93;R	A99
	P		BFT93;R	A99
	N	0,25	BFR93A;R	A99
	N		BSV52;R	A100
	N	0,3	BFR91A	A89
	P	0,36	2N2894	A70
	P		2N2894A	A70
15	P	0,15	BFQ52	A89
	N		BFQ53	A89
	P	0,18	BFQ51	A89
	N		BFR49	A89
	N		BFR90	A89
	N		BFR90A	A89
	N	0,19	BFW92	A89
	N	0,2	BF480	A66
	N		BFR92;R	A99
	N		BFR92A;R	A99
	P		BFT92;R	A99
	N		BFX89	A89
	N		BFY90	A89
	N		2N918	A70
	N	0,25	BFQ63	A89
	N		BFS17;R	A99
	P		BSR12;R	A100
	N	0,36	BSX19	A68
	N		BSX20	A68
	N		2N2368	A70
	N		2N2369	A70
	N		2N2369A	A70
	N	0,5	BF370	A66
	N		BFQ19	A99
	P		BFQ32	A89
	N		BFR54	A66
	N		BFR96	A89
	N		PH2369	A68
	N	0,7	BFR96S	A89
	N	1	BFQ18A	A99

V_{CEO} V_{DS} max V		P_{tot} max W	type no.	page
18	M	0,225	BF980	A72
	N	2,25	BFQ34	A89
	N	4,5	BFQ68	A89
20	N	0,05	BC146	A44
	P		BC200	A44
	P	0,14	BF979	A66
	N	0,145	BF184	A66
	N		BF185	A66
	N	0,15	BF180	A66
	N		BF181	A66
	N		BF182	A66
	N		BF183	A66
	N		BF200	A66
	P		BF579	A98
	P	0,2	BF767	A98
	M	0,225	BF960	A72
	M		BF981	A72
	M		BF982	A72
	P	0,25	BF936	A66
	N		BFS18;R	A98
	N		BFS19;R	A98
	N		BFS20;R	A98
	N	0,3	BC108	A44
	N		BC109	A44
	P		BC179	A44
	N		BCY57	A46
	F		BF410	A72
	N		BF494	A66
	N		BF495	A66
	N		BF496	A66
	F		BF510	A99
	F		BF511	A99
	F		BF512	A99
	F		BF513	A99
	N	0,8	BC375	A45
	P		BC376	A45
	N		BFY52	A66
	N	1	BC368	A45
	P		BC369	A45
	N	15	BD329	A52
	P		BD330	A52
22	N	36	BD433	A52
	P		BD434	A52
	N	40	BD943	A54
	P		BD944	A54

V_{CEO} V_{DS} max V		P_{tot} max W	type no.	page
25	P	0,2	BF660	A98
	F	0,25	BFR30	A99
	F		BFR31	A99
	F		BFT46	A99
	P	0,255	BF939	A66
	P	0,3	BF178	A44
	F		BFW61	A72
	P	0,31	BC808;R	A96
	N		BC818;R	A96
	P	0,35	BCY72	A46
	P	0,425	BCX18;R	A98
	N		BCX20;R	A98
	N	0,5	BF199	A66
	P	0,8	BC328	A44
	N		BC338	A44
	N	1	BFQ17	A99
	N		BSW41A	A68
	N	1,5	BFR95	A89
	N		BFW16A	A89
	N		BFW17A	A89
	N	2,5	BFR94	A89
	N	3,5	BFR64	A89
	N	5	BFR65	A89
27	M	0,36	3N211	A72
30	N	0,145	BF115	A66
	F	0,15	BFW12	A72
	F		BFW13	A72
	P	0,16	BF967	A66
	N	0,2	BC848;R	A96
	N		BC849;R	A96
	P		BC858;R	A96
	P		BC859;R	A97
	P		BF536	A98
	M		BFR29	A72
	M		BSV81	A73
	P	0,25	BF324	A66
	F		BFQ10	A74
	F		BFQ11	A74
	F		BFQ12	A74
	F		BFQ13	A74
	F		BFQ14	A74
	F		BFQ15	A74
	F		BFQ16	A74
	F	0,3	BC264	A72
	F		BF245	A72
	F		BF256	A72
	F		BFS21	A74
	F		BFS21A	A74

transistor selection guide

P listed by power dissipation
V listed by voltage

N = n-p-n
P = p-n-p
F = FET
M = MOS-FET
PM = power MOS

Excluding r.f. power devices and devices for optoelectronics

V_{CEO} V_{DS} max V		P_{tot} max W	type no.	page
30	F	0,3	BFW10	A72
	F		BFW11	A72
	F		2N3823	A72
	F		2N3966	A73
	F	0,36	2N4859	A73
	F		2N4860	A73
	F		2N4861	A73
	N	0,425	BSR13;R	A100
	N	0,5	BC548	A45
	N		BC549	A45
	P		BC558	A45
	P		BC559	A45
	N		BF198	A66
	N		2N2221	A70
	N		2N2222	A70
	N	0,8	BFY51	A66
	N		BSX60	A68
	N		2N2218	A70
	N		2N2219	A70
32	N	0,15	BCW60	A97
	P		BCW61	A97
	P	0,35	BCF29;R	A98
	P		BCF30;R	A98
	N		BFC32;R	A98
	N		BCF33;R	A98
	P		BCW29;R	A97
	P		BCW30;R	A97
	N		BCW31;R	A97
	N		BCW32;R	A97
	N		BCW33;R	A97
	P	0,6	BCY33A	A46
	P		BCY34A	A46
	N	1	BCY58	A46
	P		BCY78	A46
	N	36	BD435	A52
	P		BD436	A52
	N	40	BD945	A54
	P		BD946	A54
35	P	0,16	BF970	A66
	N	0,8	BFY50	A66
	N		BFY55	A66
	N		2N2297	A70
40	N	0,15	BCY87	A74
	N		BCY88	A74
	N		BCY89	A74
	P	0,2	BF550;R	A98
	P		BF569	A98

V_{CEO} V_{DS} max V		P_{tot} max W	type no.	page
40	N	0,25	BF240	A66
	N		BF241	A66
	P		BF450	A66
	P		BF451	A66
	F		BSR56	A99
	F		BSR57	A99
	F		BSR58	A99
	P	0,35	BCY70	A46
	N		BSR17;R	A100
	P		BSR18;R	A100
	F		BSV78	A73
	F		BSV79	A73
	F		BSV80	A73
	F	0,36	2N4856	A73
	F		2N4857	A73
	F		2N4858	A73
	P	0,4	2N2906	A70
	P		2N2907	A70
	N	0,425	BSR14;R	A100
	P		BSR15;R	A100
	N	0,5	2N2221A	A70
	N		2N2222A	A70
	P	0,6	2N2904	A70
	P		2N2905	A70
	P	0,8	BSV15	A68
	N		2N2218A	A70
	N		2N2219A	A70
	F	1,8	2N4091	A73
	F		2N4092	A73
	F		2N4093	A73
	F		2N4391	A73
	F		2N4392	A73
	F		2N4393	A73
	N	3,7	BC140	A44
	P		BC160	A44
	N	5	BSX45	A68
	N	30	BDT29	A55
	P		BDT30	A55
	N	40	BDT31	A55
	P		BDT32	A55
	N	65	BDT41	A55
	P		BDT42	A55
45	N	0,15	BCX70	A97
	P		BCX71	A97
	N	0,2	BC847;R	A96
	N		BC850;R	A96
	P		BC857;R	A96
	P		BC860;R	A97

V_{CEO} V_{DS} max V		P_{tot} max W	type no.	page
45	N	0,3	BC107	A44
	P		BC177	A44
	N		BCY56	A46
	N		2N929	A46
	N		2N930	A46
	P	0,31	BC807;R	A96
	N		BC817;R	A96
	P	0,35	BCF70;R	A98
	N		BCF81;R	A98
	P	0,35	BCW69;R	A97
	P		BCW70;R	A97
	N		BCW71;R	A97
	N		BCW72;R	A97
	N		BCW81;R	A97
	P		BCY71	A46
	P	0,425	BCX17;R	A98
	N		BCX19;R	A98
	N	0,5	BC547	A45
	N		BC550	A45
	P		BC557	A45
	P		BC560	A45
	P	0,8	BC327	A44
	N		BC337	A44
	N		BSR50	A68
	P		BSR60	A68
	N		BSS50	A68
	P		BSS60	A68
	N		BSX59	A68
	N		BSX61	A68
	N	1	BC635	A45
	P		BC636	A45
	P		BCX51	A98
	N		BCX54	A98
	N		BCY59	A46
	P		BCY79	A46
	N	5	BDX42	A57
	P		BDX45	A57
	N	8	BD135	A51
	P		BD136	A51
	N		BD825	A53
	P		BD826	A53
	N		BDW55	A57
	P		BDW56	A57
	N	10	BD839	A53
	P		BD840	A53
	N	12,5	BD226	A51
	P		BD227	A51
	N		BD813	A53
	P		BD814	A53

transistor selection guide

P listed by power dissipation
V listed by voltage

N = n-p-n
P = p-n-p
F = FET
M = MOS-FET
PM = power MOS

Excluding r.f. power devices and devices for optoelectronics

V_{CEO} V_{DS} max V		P_{tot} max W	type no.	page
45	N	15	BD131	A51
	P		BD132	A51
	N	25	BD233	A51
	P		BD234	A51
	N	30	BD239	A51
	P		BD240	A51
	N		BD933	A54
	P		BD934	A54
	N	36	BD437	A52
	P		BD438	A52
	N	40	BD241	A52
	P		BD242	A52
	N		BD675	A53
	P		BD676	A53
	N		BD947	A54
	P		BD948	A54
	N	60	BD201	A51
	P		BD202	A51
	N	65	BD243	A52
	P		BD244	A52
50	N	0,8	2N1613	A70
	N		2N1711	A70
	PM	45	BUZ10	A60
60	N	0,35	BCV71;R	A97
	N		BCV72;R	A97
	P		BCW89;R	A97
	N	0,36	2N2483	A46
	N		2N2484	A46
	P	0,4	2N2906A	A70
	P		2N2907A	A70
	P	0,425	BSR16;R	A100
	P	0,6	2N2904A	A70
	P		2N2905A	A70
	N	0,8	BSR51	A68
	P		BSR61	A68
	N		BSS51	A68
	P		BSS61	A68
	P		BSV16	A68
	P		2N4030	A70
	P		2N4032	A70
	N	0,87	BFX34	A66
	N	1	BC637	A45
	P		BC638	A45
	P		BCX52	A98
	N		BCX55	A98
	P		BSR30	A100
	P		BSR31	A100
	N		BSR40	A100
	N		BSR41	A100

V_{CEO} V_{DS} max V		P_{tot} max W	type no.	page
60	N	3,7	BC141	A44
	P		BC161	A44
	N	5	BDX43	A57
	P		BDX46	A57
	N		BSV64	A68
	N		BSX46	A68
	N	8	BD137	A51
	P		BD138	A51
	N		BD827	A53
	P		BD828	A53
	N		BDW57	A57
	P		BDW58	A57
	N	10	BD841	A53
	P		BD842	A53
	N	12,5	BD228	A51
	P		BD229	A51
	N		BD815	A53
	P		BD816	A53
	N	15	BDX35	A57
	N		BDX36	A57
	N	25	BD235	A51
	P		BD236	A51
	N	30	BD239A	A51
	P		BD240A	A51
	N		BD935	A54
	P		BD936	A54
	N		BDT29A	A55
	P		BDT30A	A55
	N	40	BD241A	A52
	P		BD242A	A52
	N		BD677	A53
	P		BD678	A53
	N		BD949	A54
	P		BD950	A54
	N		BDT31A	A55
	P		BDT32A	A55
	N		BDY92	A58
	P	50	BDT60	A55
	N		BDT61	A55
	N	60	BD203	A51
	P		BD204	A51
	N		BD331	A52
	P		BD332	A52
	N	62,5	BD645	A52
	P		BD646	A53
	N	65	BD243A	A52
	P		BD244A	A52
	N		BDT41A	A55
	P		BDT42A	A55

V_{CEO} V_{DS} max V		P_{tot} max W	type no.	page
60	P	90	BDT62	A55
	N		BDT63	A56
	N		BDT91	A56
	P		BDT92	A56
	P		BDX62	A57
	N		BDX63	A57
	N		BDX91	A58
	P		BDX92	A58
	N	100	BDV91	A56
	P		BDV92	A57
	P	117	BDX64	A57
	N		BDX65	A57
	P	125	BDT64	A56
	N		BDT65	A56
	P		BDV64	A56
	N		BDV65	A56
	P	150	BDX66	A58
	N		BDX67	A58
64	P	0,6	BCY30A	A46
	P		BCY31A	A46
	P		BCY32A	A46
65	N	0,2	BC846;R	A96
	P		BC856;R	A96
	N	0,5	BC546	A45
	P		BC556	A45
80	N	0,35	BSS64;R	A100
	N	0,8	BSR52	A68
	P		BSR62	A68
	N		BSS52	A68
	P		BSS62	A68
	P		BSV17	A68
	N		2N1893	A70
	N		2N3019	A70
	N		2N3020	A70
	P		2N4031	A70
	P		2N4033	A70
	N	1	BC639	A45
	P		BC640	A45
	P		BCX53	A98
	N		BCX56	A98
	P		BSR32	A100
	P		BSR33	A100
	N		BSR42	A100
	N		BSR43	A100
	N	5	BDX44	A57
	P		BDX47	A57
	N		BSX47	A68

transistor selection guide

P listed by power dissipation
V listed by voltage

N = n-p-n
P = p-n-p
F = FET
M = MOS-FET
PM = power MOS

Excluding r.f. power devices and devices for optoelectronics

V_{CEO} V_{DS} max V		P_{tot} max W	type no.	page
80	N	8	BD139	A51
	P		BD140	A51
	N		BD829	A53
	P		BD830	A53
	N		BDW59	A57
	P		BDW60	A57
	N	10	BD843	A53
	P		BD844	A53
	N	12,5	BD230	A51
	P		BD231	A51
	N		BD817	A53
	P		BD818	A53
	N	15	BDX37	A57
	N	25	BD237	A51
	P		BD238	A51
	N	30	BD239B	A51
	P		BD240B	A51
	N		BD937	A54
	P		BD938	A54
	N		BDT29B	A55
	P		BDT30B	A55
	N	40	BD241B	A52
	P		BD242B	A52
	N		BD679	A53
	P		BD680	A53
	N		BD951	A54
	P		BD952	A54
	N		BDT31B	A55
	P		BDT32B	A55
	N		BDY91	A58
	P	50	BDT60A	A55
	N		BDT61A	A55
	N	60	BD333	A52
	P		BD334	A52
	N		BDX77	A58
	P		BDX78	A58
	N	62,5	BD647	A52
	P		BD648	A53
	N	65	BD243B	A52
	P		BD244B	A52
	N		BDT41B	A55
	P		BDT42B	A55
	P	90	BDT62A	A55
	N		BDT63A	A56
	N		BDT93	A56
	P		BDT94	A56
	P		BDX62A	A57
	N		BDX63A	A57
	N		BDX93	A58
	P		BDX94	A58

V_{CEO} V_{DS} max V		P_{tot} max W	type no.	page
80	N	100	BDV93	A56
	P		BDV94	A57
	P	117	BDX64A	A57
	N		BDX65A	A57
	P	125	BDT64A	A56
	N		BDT65A	A56
	P		BDV64A	A56
	N		BDV65A	A56
	P	150	BDX66A	A58
	N		BDX67A	A58
	P	200	BDV66A	A56
	N		BDV67A	A56
100	P	0,35	BSS63;R	A100
	N	0,5	BSS38	A68
	P		BSS68	A68
	N	0,8	BSW66A	A68
	N	10	BD845	A53
	P		BD846	A54
	N	30	BD239C	A51
	P		BD240C	A51
	N		BD939	A54
	P		BD940	A54
	N		BDT29C	A55
	P		BDT30C	A55
	N	40	BD241C	A52
	P		BD242C	A52
	N		BD681	A53
	P		BD682	A53
	N		BD953	A54
	P		BD954	A54
	N		BDT31C	A55
	P		BDT32C	A55
	N		BDY90	A58
	PM	45	BUZ20	A60
	P	50	BDT60B	A55
	N		BDT61B	A55
	N	60	BD335	A52
	P		BD336	A52
	N	62,5	BD649	A52
	P		BD650	A53
	N	65	BD243C	A52
	P		BD244C	A52
	N		BDT41C	A55
	P		BDT42C	A55
	P	90	BDT62B	A55
	N		BDT63B	A56
	N		BDT95	A56
	P		BDT96	A56

V_{CEO} V_{DS} max V		P_{tot} max W	type no.	page
100	P	90	BDX62B	A57
	N		BDX63B	A57
	N		BDX95	A58
	P		BDX96	A58
	N	100	BDV95	A56
	P		BDV96	A57
	P	117	BDX64B	A57
	N		BDX65B	A57
	P	125	BDT64B	A56
	N		BDT65B	A56
	P		BDV64B	A56
	N		BDV65B	A56
	P	150	BDX66B	A58
	N		BDX67B	A58
	P	200	BDV66B	A56
	N		BDV67B	A56
120	N	0,8	BSW67A	A68
	N	10	BD847	A53
	P		BD848	A54
	N	30	BD941	A54
	P		BD942	A54
	N	40	BD683	A53
	P		BD684	A53
	N		BD955	A54
	P		BD956	A54
	P	50	BDT60C	A55
	N		BDT61C	A55
	N	60	BD337	A52
	P		BD338	A52
	N	62,5	BD651	A52
	P		BD652	A53
	P	90	BDT62C	A55
	N		BDT63C	A56
	P		BDX62C	A57
	N		BDX63C	A57
	P	117	BDX64C	A57
	N		BDX65C	A57
	P	125	BDT64C	A56
	N		BDT65C	A56
	P		BDV64C	A56
	N		BDV65C	A56
	P	150	BDX66C	A58
	N		BDX67C	A58
	P	200	BDV66C	A56
	N		BDV67C	A56
130	P	62,5	BDT20	A54
	N		BDT21	A54

transistor selection guide

P listed by power dissipation
V listed by voltage

N = n-p-n
P = p-n-p
F = FET
M = MOS-FET
PM = power MOS

Excluding r.f. power devices and devices for optoelectronics

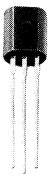
V_{CEO} V_{DS} max V		P_{tot} max W	type no.	page
140	N	10	BD849	A53
	P		BD850	A54
150	N	0,8	BSW68A	A68
	N	30	BD941A	A54
	P		BD942A	A54
	N	40	BD957	A54
	P		BD958	A54
	N	60	BU807	A59
	P	200	BDV66D	A56
	N		BDV67D	A56
160	N	6	BF457	A58
	N		BF857	A58
200	P	1	BST15;R	A100
	P		2N5415	A70
	PM	45	BUZ30	A60
	N	60	BU806	A59
	PM	62,5	BUZ31	A60
	PM		BUZ33	A60
	PM	78	BUZ34	A60
250	N	0,83	BF422	A66
	P		BF423	A66
	N	1	BF622	A100
	P		BF623	A100
	N	1,8	BF469	A58
	P		BF470	A58
	N	5	BF869	A58
	P		BF870	A59
	P		BFT45	A66
	N	6	BF419	A58
	N		BF458	A58
	N		BF819	A58
	N		BF858	A58
300	P	1	BST16;R	A100
	P		2N5416	A70
	N	1,8	BF471	A58
	P		BF472	A58
	N	5	BF871	A58
	P		BF872	A59
	P		BFT44	A66
	N	6	BF459	A58
	N		BF859	A58
375	N	70	BU426	A59
	N	115	BU826	A59
400	N	20	BUX86	A59
	N	40	BUX84	A59
	N	50	BUW84	A59
	N	70	BU426A	A59
	N		BUV82	A59
	N	100	BUS11	A59
	N		BUX46	A59
	N		BUX80	A59
	N	115	BU826A	A59
	N	125	BUS12	A59
	N		BUX47	A59
	N		BUX90	A59
	N	175	BUS13	A59
	N		BUX48	A59
	N	250	BUS14	A59
	N		BUX98	A59
450	N	20	BUX87	A59
	N	40	BUX85	A59
	N	50	BUW85	A59
	N	70	BUV83	A59
	N	100	BUS11A	A59
	N		BUX46A	A59
	N		BUX81	A59
	N	125	BUS12A	A59
	N		BUX47A	A59
	N	175	BUS13A	A59
	N		BUX48A	A59
	N	250	BUS14A	A59
	N		BUX98A	A59
500	PM	62,5	BUZ40	A60
	PM		BUZ41	A60
	PM	78	BUZ43	A60
	PM		BUZ44	A60
	PM	100	BUZ45	A60
700	N	125	BU508	A59
800	PM	62,5	BUZ80	A60
	PM		BUZ83	A60
	N	80	BUY89	A59
	PM	100	BUZ84	A60
1000	PM	62,5	BUZ50	A60
	PM	78	BUZ53	A60
	PM	100	BUZ54	A60

I.f. general purpose transistors
abridged data

Polarity indication P = p-n-p
N = n-p-n

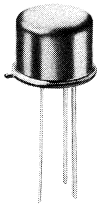
type	polarity	status	case	RATINGS V_{CBO} V	V_{CEO} V	I_C A	P_{tot} W	at T_{amb} (T_{case}) °C	CHARACTERISTICS h_{FE} at I_C min-max	mA	F typ dB	f_T typ MHz	V_{CEsat} typ mV	at I_C/I_B A/mA
BC107				50	45				110-450		2			
BC108				30	20				110-800		2			
BC109	N	D	TO-18(1)	30	20	0,1	0,3	25	200-800	2	1,2	300	200	0,1/5
BC107A,B				50	45			**A**	110-220		2			
BC108A,B,C				30	20			**B**	200-450		2			
BC109B,C				30	20			**C**	420-800		1,2			
BC140-6,10,16	N	C	TO-39(1)	80	40	1	3,7	**6** (45)	40-100	100	—	>50	600	1/100
BC141-6,10,16				100	60			**10**	63-160					
								16	100-250					
BC146/01									80-200		2			
BC146/02	N	C	SOT-42	20	20	0,05	0,05	45	140-350	0,2	1,5	150	—	—
BC146/03									280-550		2			
BC160-6,10,16	P	C	TO-39(1)	40	40	1	3,7	**6** (45)	40-100	100	—	>50	600	1/100
BC161-6,10,16				60	60			**10**	63-160					
								16	100-250					
BC177				50	45				75-260		2			
BC178				30	25				75-500		2			
BC179	P	D	TO-18(1)	25	20	0,1	0,3	25	125-500	2	1	150	250	0,1/5
BC178A,B				30	25			**A**	125-260		2			
BC179A,B				25	20			**B**	240-500		1			
BC200/01									50-105		2			
BC200/02	P	C	SOT-42	20	20	0,05	0,05	45	85-200	0,2	1,5	90	—	—
BC200/03									165-400		2			
BC327				(50)	45				100-600					
BC328	P	D	TO-92(2)	(30)	25	0,5	0,8	25	100-600	100	—	100	700	0,5/50
BC327-16,25,40				(50)	45			**16**	100-250					
BC328-16,25,40				(30)	25			**25**	160-400					
								40	250-600					
BC337	N	D	TO-92(2)	(50)	45	0,5	0,8	25	100-600	100	—	200	700	0,5/50
BC338				(30)	25				100-600					
BC337-16,25,40				(50)	45			**16**	100-250					
BC338-16,25,40				(30)	25			**25**	160-400					
								40	250-600					

SOT-42



TO-92

TO-18



TO-39

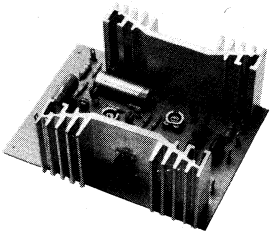
type	polarity	status	case	RATINGS V_{CBO} (V_{CES}) V	V_{CEO} V	I_C A	P_{tot} W	at T_{amb} °C		CHARACTERISTICS h_{FE} at I_C min-max	mA	F typ dB	f_T typ MHz	V_{CEsat} max mV	at I_C/I_B A/mA
BC368	N	D	TO-92(3)	25	20	1	1	25		85-375	500	—	60	500	1/100
BC369	P														
BC375	N	D	TO-92(2)	25	20	1	0,8	25		60-340	150	—	150	500	05/50
BC376	P														
BC546				80	65					110-450					
BC547				50	45					110-800					
BC548	N	D	TO-92(2)	30	30	0,1	0,5	25		110-800	2	2	300	600	0,1/5
BC546A,B				80	65				**A**	110-220					
BC547A,B,C				50	45				**B**	200-450					
BC548A,B,C				30	30				**C**	420-800					
BC549				30	30					200-800					
BC550	N	D	TO-92(2)	50	45	0,1	0,5	25		200-800	2	1,4	300	600	0,1/5
BC549B,C				30	30				**B**	200-450					
BC550B,C				50	45				**C**	420-800					
BC556				80	65					75-250					
BC557				50	45					75-475					
BC558				30	30					75-475					
BC556A	P	D	TO-92(2)	80	65	0,1	0,5	25			2	2	150	650	0,1/5
BC557A,B				50	45				**A**	125-250					
BC558A,B				30	30				**B**	220-475					
BC558C				30	30				**C**	420-800					
BC559				30	30					125-475					
BC560				50	45					125-475					
BC559A,B	P	D	TO-92(2)	30	30	0,1	0,5	25	**A**	125	2	1	150	650	0,1/5
BC559C				30	30				**C**	420-800					
BC560A,B				50	45				**B**	220-475					
BC560C				50	45				**C**	420-800					
BC635				45	45					40-250					
BC637	N	D	TO-92(3)	60	60	1	1	25		40-160	150	—	130	500	0,5/50
BC639				100	80					40-160					
BC636				45	45					40-250					
BC638	P	D	TO-92(3)	60	60	1	1	25		40-160	150	—	50	0,5	0,5/50
BC640				100	80					40-160					

I.f. general purpose transistors
abridged data

Polarity indication **P = p-n-p**
N = n-p-n

type	polarity	status	case	RATINGS					CHARACTERISTICS					
				V_{CBO} (V_{CES}) V	V_{CEO} V	I_C A	P_{tot} W	at T_{amb} (T_{mb}) °C	h_{FE} at I_C min-max	mA	F typ dB	f_T typ MHz	V_{CEsat} at I_C/I_B max V	A/mA
BCY30A				64	64				10- 35					
BCY31A				64	64				15- 60					
BCY32A	P	C	TO-5(1)	64	64	0,05	0,6	25	20- 70	20	8	7	0,55	0,02/3
BCY33A				32	32				10- 35					
BCY34A				32	32				15- 60					
BCY56	N	D	TO-18(1)	45	45	0,1	0,3	25	100-450	2	1,5	85	typ 0,2	0,1/10
BCY57				25	20				200-800			100		
BCY58VII				(32)	32			**VII**	120-220					
VIII,IX,X	N	D	TO-18(1)			0,2	1	45 **VIII**	180-310	2	2	280	0,7	0,1/2,5
BCY59VII								**IX**	250-460					
VIII,IX,X				(45)	45			(T_{case}) **X**	380-630					
BCY70				50	40				100		2			
BCY71	P	D	TO-18(1)	45	45	0,2	0,35	25	100-400	10	0,8	450	0,5	0,05/5
BCY72				30	25				100		2,0			
BCY78VII				(32)	32			**VII**	120-220					
VIII,IX,X	P	D	TO-18(1)			0,2	1	45 **VIII**	180-310	2	2	180	0,8	0,1/2,5
BCY79VII								**IX**	250-460					
VIII,IX				(45)	45			(T_{case}) **X**	380-630					
2N929	N	C	TO-18(1)	(45)	45	0,03	0,3	25	100-350	0,01	—	80	1	0,01/0,5
2N930									150-600					
2N2483	N	C	TO-18(1)	(60)	60	(0,05)	0,36	(25)	40-120	0,01	—	80	0,35	0,001/0,1
2N2484									100-500					

I.f. power transistors
selection guide



25 W, 4 Ω hi-fi audio amplifier using Darlington transistors.

General purpose Darlingtons

polarity NPN	PNP	P_{tot} (W)	I_C (A)	V_{CEO} (V)	page
TO-126 (SOT-32)					
BD675	BD676			45	
BD677	BD678			60	
BD679	BD680	40	4	80	A53
BD681	BD682			100	
BD683	BD684			120	
BDX42	BDX45			45	
BDX43	BDX46	5	1	60	A57
BDX44	BDX47			80	
SOT-82					
BD331	BD332			60	
BD333	BD334	60	6	80	A52
BD335	BD336			100	
BD337	BD338			120	
TO-220 (SOT-78)					
BD645	BD646			60	
BD647	BD648	62,5	8	80	A52
BD649	BD650			100	A53
BD651	BD652			120	
BDT61	BDT60			60	
BDT61A	BDT60A	50	4	80	A55
BDT61B	BDT60B			100	
BDT61C	BDT60C			120	
BDT63	BDT62			60	
BDT63A	BDT62A	90	10	80	A55
BDT63B	BDT62B			100	A56
BDT63C	BDT62C			120	
BDT65	BDT64			60	
BDT65A	BDT64A	125	12	80	A56
BDT65B	BDT64B			100	
BDT65C	BDT64C			120	

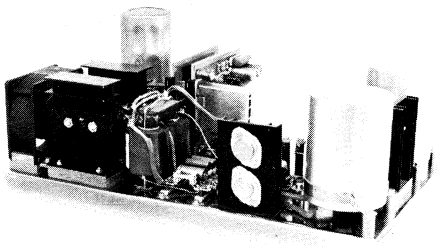
polarity NPN	PNP	P_{tot} (W)	I_C (A)	V_{CEO} (V)	page
SOT-93					
BDV65	BDV64			60	
BDV65A	BDV64A	125	12	80	A56
BDV65B	BDV64B			100	
BDV65C	BDV64C			120	
BDV67A	BDV66A			80	
BDV67B	BDV66B	200	16	100	A56
BDV67C	BDV66C			120	
BDV67D	BDV66D			150	
TO-3 (SOT-3)					
BDX63	BDX62			60	
BDX63A	BDX62A	90	8	80	A57
BDX63B	BDX62B			100	
BDX63C	BDX62C			120	
BDX65	BDX64			60	
BDX65A	BDX64A	117	12	80	A57
BDX65B	BDX64B			100	
BDX65C	BDX64C			120	
BDX67	BDX66			60	
BDX67A	BDX66A	150	16	80	A58
BDX67B	BDX66B			100	
BDX67C	BDX66C			120	

l.f. power transistors
selection guide

General purpose

polarity NPN	PNP	P_{tot} (W)	I_C (A)	V_{CEO} (V)	page
TO-126 (SOT-32)					
BD131	BD132	15	3	45	A51
BD135	BD136			45	
BD137	BD138	8	1	60	A51
BD139	BD140			80	
BD226	BD227			45	
BD228	BD229	12,5	1,5	60	A51
BD230	BD231			80	
BD233	BD234			45	
BD235	BD236	25	2	60	A51
BD237	BD238			80	
BD329	BD330	15	3	20	A52
BD433	BD434			22	
BD435	BD436	36	4	32	A52
BD437	BD438			45	
TO-202 (SOT-128)					
BD813	BD814			45	
BD815	BD816	12,5	2	60	A53
BD817	BD818			80	
BD825	BD826			45	
BD827	BD828	8	1	60	A53
BD829	BD830			80	
BD839	BD840			45	
BD841	BD842	10	1,5	60	A53
BD843	BD844			80	
BD845	BD846			100	A53
BD847	BD848	10	1,5	120	A54
BD849	BD850			140	

polarity NPN	PNP	P_{tot} (W)	I_C (A)	V_{CEO} (V)	page
TO-220 (SOT-78)					
BD201	BD202			45	A51
BD203	BD204	60	8	60	A51
BDX77	BDX78			80	A58
BD239	BD240			45	
BD239A	BD240A	30	3	60	A51
BD239B	BD240B			80	
BD239C	BD240C			100	
BD241	BD242			45	
BD241A	BD242A	40	5	60	A52
BD241B	BD242B			80	
BD241C	BD242C			100	
BD243	BD244			45	
BD243A	BD244A	65	8	60	A52
BD243B	BD244B			80	
BD243C	BD244C			100	
BD933	BD934			45	
BD935	BD936			60	
BD937	BD938	30	3	80	A54
BD939	BD940			100	
BD941	BD942			120	
BD941A	BD942A			150	
BD943	BD944			22	
BD945	BD946			32	
BD947	BD948			45	
BD949	BD950	40	5	60	A54
BD951	BD952			80	
BD953	BD954			100	
BD955	BD956			120	
BD957	BD958			150	
BDT29	BDT30			40	
BDT29A	BDT30A	30	1	60	A55
BDT29B	BDT30B			80	
BDT29C	BDT30C			100	



1000 W, 18 V, mains-fed switched-mode power supply containing forward converter with 2 × BUX80 in parallel; efficiency at full load is 80%.

General purpose

polarity NPN	PNP	P_{tot} (W)	I_C (A)	V_{CEO} (V)	page
TO-220 (SOT-78) (continued)					
BDT31	BDT32	40	3	45	A55
BDT31A	BDT32A			60	
BDT31B	BDT32B			80	
BDT31C	BDT32C			100	
BDT41	BDT42	65	6	40	A55
BDT41A	BDT42A			60	
BDT41B	BDT42B			80	
BDT41C	BDT42C			100	
BDT91	BDT92	90	10	60	A56
BDT93	BDT94			80	
BDT95	BDT96			100	
SOT-93					
BDV91	BDV92	100	10	60	A56
BDV93	BDV94			80	A57
BDV95	BDV96			100	
TO-3 (SOT-3)					
BDX91	BDX92	90	8	60	A58
BDX93	BDX94			80	
BDX95	BDX96			100	

Power MOS transistors - see page A60

Television video signals and driver applications

polarity NPN	PNP	P_{tot} (W)	I_C (A)	V_{CEO} (V)	page
TO-126 (SOT-32)					
BF419		6	0,1	250	A58
BF457		6	0,1	160	A58
BF458				250	
BF459				300	
BF469	BF470	1,8	0,03	250	A58
BF471	BF472			300	
TO-202 (SOT-128)					
BF819		6	0,1	250	A58
BF857		6	0,1	160	A58
BF858			2	250	
BF859			2	300	
BF869	BF870	5	0,05	250	A58
BF871	BF872			300	

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selection guide

Deflection and Industrial

polarity NPN	PNP	P_{tot} (W)	I_C (A)	V_{CEO} (V)	page
TO-126 (SOT-32)					
BDX35				60	
BDX36		15	5	60	A57
BDX37				80	
BDW55	BDW56			45	
BDW57	BDW58	8	1	60	A57
BDW59	BDW60			80	
BUX86		20	0,5	400	A59
BUX87				450	
SOT-82					
BUW84		50	2	400	A59
BUW85				450	
TO-220 (SOT-78)					
BUX84		40	2	450	A59
BUX85				450	
BDT21	BDT20	62,5	8	130	A54
BU806		60	8	200	A59
BU807				150	
SOT-93					
BU426		70	6	375	A59
BU426A				400	
BU508		125	8	700	A59
BU508A				700	
BU826		115	6	375	A59
BU826A				400	
BUV82		70	6	400	A59
BUV83				450	

polarity NPN	PNP	P_{tot} (W)	I_C (A)	V_{CEO} (V)	page
TO-3 (SOT-3)					
BDY90		40	10	100	A58
BDY90A			12		
BDY91		40	10	80	A58
BDY92				60	
BUS11		100	5	400	A59
BUS11A				450	
BUS12		125	8	400	A59
BUS12A				450	
BUS13		175	15	400	A59
BUS13A				450	
BUS14		250	30	400	A59
BUS14A				450	
BUX46		100	5	400	A59
BUX46A				450	
BUX47		125	8	400	A59
BUX47A				450	
BUX48		175	15	400	A59
BUX48A				450	
BUX80		100	10	400	A59
BUX81				450	
BUX90		125	12	400	A59
BUX98		250	30	400	A59
BUX98A				450	
BUY89		80	6	800	A59

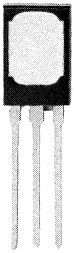
abridged data

Polarity indication P = p-n-p
N = n-p-n

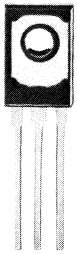
type	polarity	status	case	RATINGS					CHARACTERISTICS					
				V_{CBO} (V_{CERM})	V_{CEO}	I_C	P_{tot} at T_{mb}		h_{FE} at I_C		f_{hfe} typ	f_T typ	V_{CEsat} at I_C/I_B max	
				V	V	A	W	°C	min—max	A	kHz	MHz	V	A/mA
BD131	N	C	TO-126	70	45	3	15	60	40	0,5	—	>60	0,7	2/200
BD132	P			45	45									
BD135				45	45									
BD137	N	D	TO-126	60	60	1	8	70	40—250	0,15	—	250	0,5	0,5/50
BD139				100	80									
BD136				45	45									
BD138	P	D	TO-126	60	60	1	8	70	40—250	0,15	—	75	0,5	0,5/50
BD140				100	80									
BD201	N	D	TO-220	60	45	8	60	25	30	3	25	>3	1	3/300
BD203				60	60					2				
BD202	P	D	TO-220	60	45	8	60	25	30	3	25	>3	1	3/300
BD204				60	60					2				
BD226				45	45				40—250					
BD228	N	D	TO-126	60	60	1,5	12,5	62	40—160	0,15	—	125	0,8	1/100
BD230				100	80				40—160					
BD227				45	45				40—250					
BD229	P	D	TO-126	60	60	1,5	12,5	62	40—160	0,15	—	50	0,8	1/100
BD231				100	80				40—160					
BD233				45	45									
BD235	N	D	TO-126	60	60	2	25	25	40—250	0,15	—	>3	0,6	1/100
BD237				100	80									
BD234				45	45									
BD236	P	D	TO-126	60	60	2	25	25	40—250	0,15	—	>3	0,6	1/100
BD238				100	80									
BD239				45	45									
BD239A	N	N	TO-220AB	60	60	3	30	25	15	1	—	>3	0,6	1/200
BD239B				80	80									
BD239C				100	100									
BD240				45	45									
BD240A	P	N	TO-220AB	60	60	3	30	25	15	1	—	>3	0,6	1/200
BD240B				80	80									
BD240C				100	100									

l.f. power transistors
abridged data

type	polarity	status	case	RATINGS					CHARACTERISTICS					
				V_{CBO} (V_{CERM})	V_{CEO}	I_C	P_{tot} at T_{mb}		h_{FE} at I_C		f_{hfe} typ	f_T typ	V_{CEsat} at I_C/I_B max	
				V	V	A	W	°C	min—max	A	kHz	MHz	V	A/mA
BD241				45	45									
BD241A	N	N	TO-220AB	60	60	5	40	25	25	1	—	>3	1,2	3/600
BD241B				80	80									
BD241C				100	100									
BD242				45	45									
BD242A	P	N	TO-220AB	60	60	5	40	25	25	1	—	>3	1,2	3/600
BD242B				80	80									
BD242C				100	100									
BD243				45	45									
BD243A	N	N	TO-220AB	60	60	8	65	25	15	3	—	>3	1,5	6/1000
BD243B				80	80									
BD243C				100	100									
BD244				45	45									
BD244A	P	N	TO-220AB	60	60	8	65	25	15	3	—	>3	1,5	6/1000
BD244B				80	80									
BD244C				100	100									
BD329	N	C	TO-126	32	20	3	15	45	85—375	0,5	—	130	0,5	2/200
BD330	P											100		
BD331				60	60									
BD333	N	D	SOT-82	80	80	6	60	25	750	3	60	7	2	3/12
BD335				100	100									
BD337				120	120									
BD332				60	60									
BD334	P	D	SOT-82	80	80	6	60	25	750	3	60	7	2	3/12
BD336				100	100									
BD338				120	120									
BD433				22	22				85—475				0,5	2/200
BD435	N	D	TO-126	32	32	4	36	25	85—475	0,5	—	>3	0,5	2/200
BD437				45	45				85—375				0,7	3/300
BD434				22	22				85—475				0,5	2/200
BD436	P	D	TO-126	32	32	4	36	25	85—475	0,5	—	>3	0,5	2/200
BD438				45	45				85—375				0,7	3/300
BD645				80	60									
BD647	N	D	TO-220	100	80	8	62,5	25	750	3	50	—	2	3/12
BD649				120	100									
BD651				140	120									

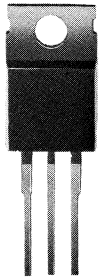


SOT-82



TO-126

TO-202

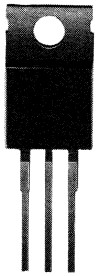


TO-220

type	polarity	status	case	RATINGS						CHARACTERISTICS					
				V_{CBO} (V_{CERM})	V_{CEO}	I_C	P_{tot} at T_{mb}			h_{FE} at I_C		f_{hfe} typ	f_T typ	V_{CEsat} at I_C/I_B max	
				V	V	A	W	°C		min—max	A	kHz	MHz	V	A/mA
BD646				60	60										
BD648	P	D	TO-220	80	80	8	62,5	25		750	3	100	—	2	3/12
BD650				100	100										
BD652				120	120										
BD675				45	45										
BD677				60	60										
BD679	N	D	TO-126	80	80	4	40	25		750	1,5	—	7	2,5	1,5/6
BD681				100	100										
BD683				120	120										
BD676				45	45										
BD678				60	60										
BD680	P	D	TO-126	80	80	4	40	25		750	1,5	—	7	2,5	1,5/6
BD682				100	100										
BD684				120	120										
BD813				45	45										
BD815	N	D	TO-202	60	60	2	12,5	25		25	1	—	>3	0,6	1/100
BD817				100	80										
BD814				45	45										
BD816	P	D	TO-202	60	60	2	12,5	25		25	1	—	>3	0,6	1/100
BD818				100	80										
BD825				45	45										
BD827	N	D	TO-202	60	60	1	8	50		25	0,5	—	250	0,5	0,5/50
BD829				100	80										
BD826				45	45										
BD828	P	D	TO-202	60	60	1	8	50		25	0,5	—	75	0,5	0,5/50
BD830				100	80										
BD839				45	45										
BD841	N	D	TO-202	60	60	1,5	10	62		40—250	0,15	—	125	0,8	1/100
BD843				100	80										
BD840				45	45										
BD842	P	D	TO-202	60	60	1,5	10	62		40—250	0,15	—	50	0,8	1/100
BD844				100	80										
BD845				100	100										
BD847	N	N	TO-202	120	120	1,5	10	25		30	0,5	—	150	1,0	0,5/50
BD849				140	140										

l.f. power transistors
abridged data

type	polarity	status	case	RATINGS					CHARACTERISTICS					
				V_{CBO} (V_{CERM})	V_{CEO}	I_C	P_{tot} at T_{mb}		h_{FE} at I_C		f_{hfe}	f_T	V_{CEsat} at I_C/I_B	
				V	V	A	W	°C	min—max	A	typ kHz	typ MHz	max V	A/mA
BD846				100	100									
BD848	P	N	TO-202	120	120	1,5	10	25	30	0,5	—	75	1,0	0,5/50
BD850				140	140									
BD933		D		45	45									
BD935		D		60	60									
BD937	N	D	TO-220AB	100	80	3	30	25	40—250	0,15	—	3	0,6	1/100
BD939		D		120	100									
BD941		D		140	120									
BD941A		N		160	150									
BD934		D		45	45									
BD936		D		60	60									
BD938	P	D	TO-220AB	100	80	3	30	25	40—250	0,15	—	3	0,6	1/100
BD940		D		120	100									
BD942		D		140	120									
BD942A		N		160	150									
BD943				22	22									
BD945	N	D	TO-220AB	32	32	5	40	25	85—475	0,5	—	3	0,5	2/200
BD947				45	45									
BD944				22	22									
BD946	P	D	TO-220AB	32	32	5	40	25	85—475	0,5	—	3	0,5	2/200
BD948				45	45									
BD949		D		60	60									
BD951		D		80	80									
BD953	N	D	TO-220AB	100	100	5	40	25	40	0,5	—	3	1	2/200
BD955		D		120	120									
BD957		N		150	150									
BD950		D		60	60									
BD952		D		80	80									
BD954	P	D	TO-220AB	100	100	5	40	25	40	0,5	—	3	1	2/200
BD956		D		120	120									
BD958		N		150	150									
BDT20	P	N	TO-220AB	130	130	8	62,5	25	500	3	—	—	1,5	1/2
BDT21	N													

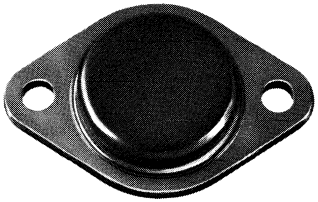


TO-220

type	polarity	status	case	RATINGS					CHARACTERISTICS					
				V_{CBO} (V_{CERM})	V_{CEO}	I_C	P_{tot} at T_{mb}		h_{FE} at I_C		f_{hfe} typ	f_T typ	V_{CEsat} at I_C/I_B max	
				V	V	A	W	°C	min—max	A	kHz	MHz	V	A/mA
BDT29				40	40									
BDT29A	N	N	TO-220AB	60	60	1	30	25	15/75	1	—	>3	0,7	1/125
BDT29B				80	80									
BDT29C				100	100									
BDT30				40	40									
BDT30A	P	N	TO-220AB	60	60	1	30	25	15/75	1	—	>3	0,7	1/125
BDT30B				80	80									
BDT30C				100	100									
BDT31				40	40									
BDT31A	N	N	TO-220AB	60	60	3	40	25	10/50	3	—	—	1,2	3/375
BDT31B				80	80									
BDT31C				100	100									
BDT32				40	40									
BDT32A	P	N	TO-220AB	60	60	3	40	25	10/50	3	—	—	1,2	3/375
BDT32B				80	80									
BDT32C				100	100									
BDT41				40	40									
BDT41A	N	N	TO-220AB	60	60	6	65	25	15/75	3	—	>3	1,5	6/600
BDT41B				80	80									
BDT41C				100	100									
BDT42				40	40									
BDT42A	P	N	TO-220AB	60	60	6	65	25	15/75	3	—	>3	1,5	6/600
BDT42B				80	80									
BDT42C				100	100									
BDT60				60	60									
BDT60A	P	D	TO-220AB	80	80	4	50	25	750	1,5	>25	—	2,5	1,5/6
BDT60B				100	100									
BDT60C				120	120									
BDT61				60	60									
BDT61A	N	D	TO-220AB	80	80	4	50	25	750	1,5	25	—	2,5	1,5/6
BDT61B				100	100									
BDT61C				120	120									
BDT62				60	60									
BDT62A	P	N	TO-220AB	80	80	10	90	25	1000	3	100	—	2	3/12
BDT62B				100	100									
BDT62C				120	120									

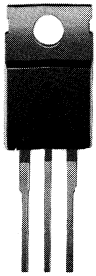
l.f. power transistors
abridged data

type	polarity	status	case	RATINGS V_{CBO} (V_{CERM}) V	V_{CEO} V	I_C A	P_{tot} W	at T_{mb} °C	CHARACTERISTICS h_{FE} min—max	at I_C A	f_{hfe} typ kHz	f_T typ MHz	V_{CEsat} max V	at I_C/I_B A/mA
BDT63				60	60									
BDT63A	N	D	TO-220AB	80	80	10	90	25	1000	3	50	—	2	3/12
BDT63B				100	100									
BDT63C				120	120									
BDT64				60	60									
BDT64A	P	D	TO-220AB	80	80	12	125	25	1000	5	—	—	2	5/20
BDT64B				100	100									
BDT64C				120	120									
BDT65				60	60									
BDT65A	N	D	TO-220AB	80	80	12	125	25	1000	5	—	—	2	5/20
BDT65B				100	100									
BDT65C				120	120									
BDT91				60	60									
BDT93	N	D	TO-220AB	80	80	10	90	25	20—200	4	>20	4	1	4/400
BDT95				100	100									
BDT92				60	60									
BDT94	P	D	TO-220AB	80	80	10	90	25	20—200	4	>20	4	1	4/400
BDT96				100	100									
BDV64				60	60									
BDV64A	P	D	SOT-93	80	80	12	125	25	1000	5	100	—	2	5/20
BDV64B				100	100									
BDV64C				120	120									
BDV65				60	60									
BDV65A	N	D	SOT-93	80	80	12	125	25	1000	5	70	—	2	5/20
BDV65B				100	100									
BDV65C				120	120									
BDV66A				100	80									
BDV66B	P	N	SOT-93	120	100	16	200	25	1000	10	60	—	2	10/40
BDV66C				140	120									
BDV66D				160	150									
BDV67A				100	80									
BDV67B	N	N	SOT-93	120	100	16	200	25	1000	10	60	—	2	10/40
BDV67C				140	120									
BDV67D				160	150									
BDV91				60	60									
BDV93	N	D	SOT-93	80	80	10	100	25	20	4	—	>3	1	4/400
BDV95				100	100									

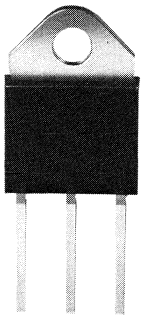


TO-3

TO-126



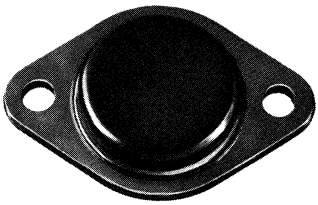
TO-220



SOT-93

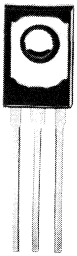
type	polarity	status	case	RATINGS V_{CBO} (V_{CERM}) V	V_{CEO} V	I_C A	P_{tot} W	at T_{mb} °C	CHARACTERISTICS h_{FE} min—max	at I_C A	f_{hfe} typ kHz	f_T typ MHz	V_{CEsat} max V	at I_C/I_B A/mA
BDV92				60	60									
BDV94	P	D	SOT-93	80	80	10	100	25	20	4	—	>4	1	4/400
BDV96				100	100									
BDW55				45	45									
BDW57	N	D	TO-126	60	60	1	8	95	40—250	0,15	—	250	0,5	0,5/50
BDW59				100	80									
BDW56				45	45									
BDW58	P	D	TO-126	60	60	1	8	95	40—250	0,15	—	75	0,5	0,5/50
BDW60				100	80									
BDX35				60	60								0,9	
BDX36	N	C	TO-126	60	60	5	15	75	45—450	0,5	—	100	0,7	5/500
BDX37				80	80								0,9	
BDX42				60	45								1,6	1/4
BDX43	N	C	TO-126	80	60	1	5	100	1500	0,5	—	—	1,6	1/1
BDX44				100	80								1,3	0,5/0,5
BDX45				60	45								1,6	1/4
BDX46	P	C	TO-126	80	60	1	5	100	1500	0,5	—	—	1,6	1/1
BDX47				100	80								1,3	0,5/0,5
BDX62				60	60									
BDX62A	P	C	TO-3	80	80	8	90	25	1000	3	100	—	2	3/12
BDX62B				100	100									
BDX62C				120	120									
BDX63				80	60									
BDX63A	N	C	TO-3	100	80	8	90	25	1000	3	100	—	2	3/12
BDX63B				120	100									
BDX63C				140	120									
BDX64				60	60									
BDX64A	P	C	TO-3	80	80	12	117	25	1000	5	80	—	2	5/20
BDX64B				100	100									
BDX64C				120	120									
BDX65				80	60									
BDX65A	N	C	TO-3	100	80	12	117	25	1000	5	50	—	2	5/20
BDX65B				120	100									
BDX65C				140	120									

l.f. power transistors
abridged data



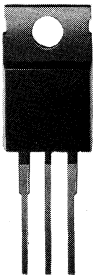
TO-3

type	polarity	status	case	RATINGS					CHARACTERISTICS					
				V_{CBO} (V_{CERM})	V_{CEO}	I_C	P_{tot} at T_{mb}		h_{FE} at I_C		f_{hfe} typ	f_T typ	V_{CEsat} at I_C/I_B max	
				V	V	A	W	°C	min—max	A	kHz	MHz	V	A/mA
BDX66				60	60									
BDX66A	P	C	TO-3	80	80	16	150	25	1000	10	60	—	2	10/40
BDX66B				100	100									
BDX66C				120	120									
BDX67				80	60									
BDX67A	N	C	TO-3	100	80	16	150	25	1000	10	50	—	2	10/40
BDX67B				120	100									
BDX67C				140	120									
BDX77	N	D	TO-220	100	80	8	60	25	30	2	>25	>3	1	3/300
BDX78	P			80	80									
BDX91				60	60									
BDX93	N	C	TO-3	80	80	8	90	25	20	3	—	>4	0,8	3/300
BDX95				100	100									
BDX92				60	60									
BDX94	P	C	TO-3	80	80	8	90	25	20	3	—	>4	0,8	3/300
BDX96				100	100									
BDY90				120	100	10								10/1000
BDY90A	N	D	TO-3	120	100	12	40	70	30—120	5	—	70	1	12/1000
BDY91				100	80	10								10/1000
BDY92				80	60	10								10/1000
BF419	N	D	TO-126	300	250	0,1	6	90	typ 45	0,02		90	11	0,2/20
BF457				160	160									
BF458	N	D	TO-126	250	250	0,1	6	90	26	0,03	—	90	1	0,03/6
BF459				300	300									
BF469	N	D	TO-126	250	250	0,05	1,8	114	50	0,025	—	60	—	—
BF471				300	(300)									
BF470	P	D	TO-126	250	250	0,05	1,8	114	50	0,025	—	60	—	—
BF472				300	(300)									
BF819	N	D	TO-202	300	250	0,1	6	75	typ 45	0,02	—	90	11	0,2/20
BF857				160	160									
BF858	N	D	TO-202	250	250	0,1	6	75	26	0,03	—	90	1	0,03/6
BF859				300	300									
BF869	N	D	TO-202	250	250	0,05	5	25	50	0,025	—	60	—	—
BF871				300	(300)									

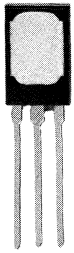


TO-126

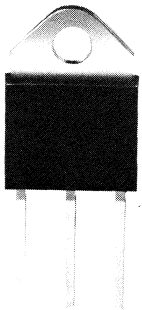
TO-202



TO-220



SOT-82

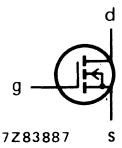


SOT-93

type	polarity	status	case	RATINGS V_{CBO} (V_{CERM}) V	V_{CEO} V	I_C A	P_{tot} W	at T_{mb} °C	CHARACTERISTICS h_{FE} min—max	at I_C A	t_{fmax} at $T_{mb95°C}$ μs	f_T typ MHz	V_{CEsat} max V	at I_C/I_B A/mA
BF870	P	D	TO-202	250	250	0,05	5	25	50	0,025	—	60	—	—
BF872				300	(300)									
BU426	N	D	SOT-93	(800)	375	6	70	73	typ 30	0,6	1	6	1,5	2,5/500
BU426A				(900)	400									
BU508			SOT-93	(1500)	700	8	125				0,7typ		5	4,5/2000
BU508A			SOT-93	(1500)	700	8	125				0,7typ		1	4,5/2000
BU806	N	N	TO-220	400	200	8	60	25			0,2typ	—	1,5	5/50
BU807			TO-220	330	150	8	60				0,2typ		1,5	5/50
BU826			SOT-93	(800)	375	6	115				0,6		2	2,5/55
BU826A			SOT-93	(900)	400	6	115				0,6		2	2,5/55
BUS11				(850)	400	5	100			0,5				3/600
BUS11A				(1000)	450	5	100			0,5				2,5/500
BUS12				(850)	400	8	125			—				6/1200
BUS12A	N	D	TO-3	(1000)	450	8	125	25	typ 30	—	0,8	—	1,5	5/1000
BUS13				(850)	400	15	175			—				10/2000
BUS13A				(1000)	450	15	175			—				8/1600
BUS14				(850)	400	30	250			—				20/4000
BUS14A				(1000)	450	30	250			—				16/3200
BUV82	N	D	SOT-93	(850)	400	6	70	73	typ 30	0,6	1	6	1,5	2,5/500
BUV83				(1000)	450									
BUW84				(800)	400	2	50		typ 50	0,1	1,4	20		0,3/30
BUW85				(1000)	450	2	50		typ 50	0,1	1,4	20		0,3/30
BUX46				(850)	400	5	100		typ 30	0,5	0,8	—		3/600
BUX46A	N	D	SOT-82	(1000)	450	5	100	25	typ 30	0,5	0,8	—	1,5	2,5/500
BUX47				(850)	400	8	125		typ 30	—	0,8	—		6/1200
BUX47A				(1000)	450	8	125		typ 30	—	0,8	—		5/1000
BUX48				(850)	400	15	175		typ 30	—	0,8	—		10/2000
BUX48A				(1000)	450	15	175		typ 30	—	0,8	—		8/1600
BUX80			TO-3	(800)	400	10	100	40	typ 30	1,2	0,8	6	1,5	5/1000
BUX81			TO-3	(1000)	450	10	100	40	typ 30	1,2	0,8	6	1,5	5/1000
BUX84	N	D	TO-220AB	(800)	400	2	40	50	typ 50	0,1	1,4	20	1,0	1/200
BUX85			TO-220	(1000)	450	2	40	50	typ 50	0,1	1,4	20	1,0	1/200
BUX86			TO-126AB	(800)	400	0,5	20	60	typ 50	0,05	1,3	20	3,0	0,2/20
BUX87			TO-126	(1000)	450	0,5	20	60	typ 50	0,05	1,3	20	3,0	0,2/20
BUX90		N		(650)	400	12	125	25			0,8typ	—	1,5	5/50
BUX98	N	D	TO-3	(850)	400	30	250	25			0,8typ	—	1,5	20/4000
BUX98A		D		(1000)	450	30	250	25			0,8typ	—	1,5	16/3200
BUY89		D		(1500)	800	6	80	60			0,5typ	7	1	4,5/2000

l.f. power transistors

power MOS transistors
n-channel enhancement

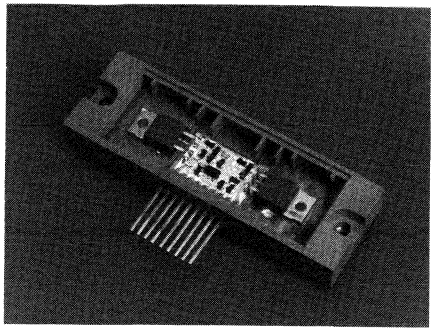


- **very low on-state resistance**
- **drain-source voltages up to 1000 V**
- **drain currents up to 14 A (continuous)**
- **microcomputer and TTL compatibility**

Intended for use in motor control, SMPS, welding, dc/dc and dc/ac converters.

type	status	case	V_{DS}	P_{tot}	I_D	I_{GSS} max	I_{DSS} max	$r_{ds\ on}$ max	C_{rs} typ	$t_{d\ on}$ typ	t_f typ
			V	W	A	nA	mA	Ω	pF	ns	ns
BUZ10	N	TO-220	50	45	12	100	1	0,1	120	20	60
BUZ20	N	TO-220	100	45	8	100	1	0,2	100	20	60
BUZ23	N	TO-3	100	62,5	8	100	1	0,2	100	20	60
BUZ30	N	TO-220	200	45	5,5	100	1	0,75	100	20	60
BUZ31	N	TO-220	200	62,5	12,5	100	1	0,2	100	20	60
BUZ33	N	TO-3	200	62,5	6,4	100	1	0,75	100	20	60
BUZ34	N	TO-3	200	78	14	100	1	0,2	100	20	60
BUZ40	N	TO-220	500	62,5	2	100	1	4,5	30	30	100
BUZ41	N	TO-220	500	62,5	5	100	1	1,1	30	30	100
BUZ43	N	TO-3	500	78	2,5	100	1	4,5	30	30	100
BUZ44	N	TO-3	500	78	5,6	100	1	1,1	30	30	100
BUZ45	N	TO-3	500	100	8,6	100	1	0,6	100	50	100
BUZ80	N	TO-220	800	62,5	2,6	100	1	4	30	40	100
BUZ83	N	TO-3	800	62,5	2,9	100	1	4	30	40	100
BUZ84	N	TO-3	800	100	4,7	100	1	2	100	60	100
BUZ50	N	TO-220	1000	62,5	2,8	100	1	3,5	30	40	100
BUZ53	N	TO-3	1000	78	3	100	1	3,5	30	40	100
BUZ54	N	TO-3	1000	100	4,7	100	1	2	100	60	100

I.f. power modules
hybrid integrated circuits

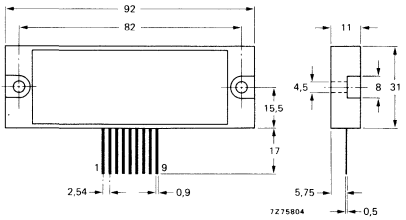


Audio power amplifiers

- thin-film substrate
- output power up to 60 W
- good ripple rejection
- high stability for complex loads
- built-in short-circuit protection (SOAR protected)
- low transient distortion
- low harmonic distortion

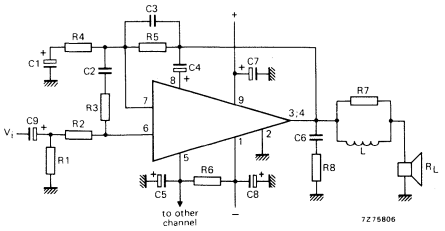
type	status	P_o at d_{tot} < 0,2%		d_{tot}	power	p_o at $R_L = 4\ \Omega$
		$R_L = 4\ \Omega$	$R_L = 8\ \Omega$	at $P_o = 1$ W; f = 1 kHz	bandwidth (−3 dB)	$d_{tot} = 0{,}7\%$
OM931	D	>30 W at ±23 V	>30 W at ±26 V	typ 0,02%	20 Hz to 40 kHz	typ 40 W
OM961	D	>60 W at ±31 V	>60 W at ±35 V			typ 75 W

Dimensions (mm)



Application information

Example of an output amplifier



List of components:

R1 = 10 kΩ (0,25 W)	C1 = 47 μF (10 V)
R2 = 4,7 kΩ (0,25 W)	C2 = 270 pF (10%)
R3 = 300 Ω (0,25 W)	C3 = 120 pF (10%)
R4 = 680 Ω (0,25 W)	C4 = 100 μF
R5 = 10 kΩ (0,25 W)	C5 = 470 μF
R6 = 22 Ω (0,5 W)	C6 = 100 nF
R7 = 2,2 Ω (0,25 W)	C7 = 10 μF (63 V)
R8 = 10 Ω (0,5 W)	C8 = 10 μF (63 V)
	C9 = 1 μF (63 V)

L = 4 μH

R_L = 4 or 8 Ω

h.f. transistors
selection guide

Television — Radio

Polarity indication P = p-n-p
N = n-p-n
J = Junction-FET
M = MOS

		Television								Radio				
				mixer or self-osc. mixer		oscillator		vision amp				mixer or self-osc. mixer		
type	polarity	tuner u.h.f.	preamp v.h.f.	u.h.f.	v.h.f	u.h.f.	v.h.f.	i.f.	video output	r.f. amp a.m.	f.m.	a.m.	f.m.	i.f. amplifier
BF198	N							●						
BF199	N							●						
BF240	N									●		●	●	●
BF241	N									●		●	●	●
BF324	P				●		●				●			
BF370	N							●						
BF410	J										●		●	
BF422	N								●					
BF423	P								●					
BF450	P									●		●	●	●
BF451	P									●		●	●	●
BF480	N	●	●			●								
BF494	N						●				●	●	●	●
BF495	N						●			●	●	●	●	●
BF496	N		●								●			
BF936	P						●							
BF939	P		●		●									
BF960	M*	●												
BF967	P	●		●										
BF970	P			●										
BF979	P	●	●	●										
BF980	M*	●												
BF981	M*		●		●									
BF982	M*		●		●						●		●	

* For abridged data of MOS-FETs, see page A72.

Industrial

Industrial

	type	polarity	f_T min MHz
general purpose; selected by f_T	**BSS68**	P	50
	BSS38	N	60
	2N3020	N	80
	2N3019	N	100
	2N4030	P	100
	2N4031	P	100
	2N4032	P	150
	2N4033	P	150
	BFY50	N	typ 140
	BFY51	N	typ 160
	BFY52	N	typ 185
	2N2904	P	200
	2N2904A	P	200
	2N2905	P	200
	2N2905A	P	200
	2N2906	P	200
	2N2906A	P	200
	2N2907	P	200
	2N2907A	P	200
	2N2218	N	250
	2N2218A	N	250
	2N2219	N	250
	2N2221	N	250
	2N2221A	N	250
	2N2222	N	250
	2N2219A	N	300
	2N2222A	N	300
	BFR54	N	500
line output transistor for wideband oscilloscopes	**BFW45**	N	80
h.f. and v.h.f oscillators and amplifiers, output stages of servo amplifiers	**BFY55**	N	60
	2N2297	N	60
	2N918	N	900
d.c. to h.f. amplifiers; also for switching	**2N1893**	N	50
	2N1613	N	60
	2N1711	N	70
u.h.f. low-power amplifier, e.g. for pocket phones	**BFT24**	N	1200
high-voltage transistors	**BFT44**	P	typ 60
	BFT45	P	typ 60

switching transistors
selection guide

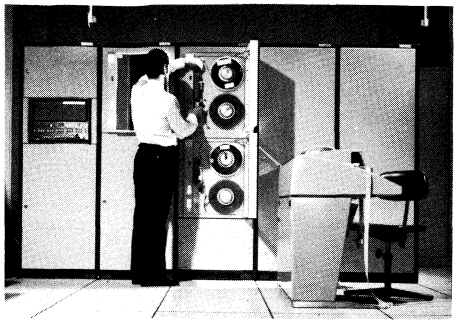
Medium speed
High speed
Trigger devices

Polarity indication P = p-n-p
N = n-p-n

Medium-speed transistors

	type	polarity	V_{CEO} (V_{CER}) V	P_{tot} W	t_{off} max ns
drivers for numerical indicator tubes	**BSS38**	N	100	0,5	1000
	BSS68	P	100	0,5	—
drivers, e.g. for print hammers	**BSR50**	N	(45)	0,8	1500
	BSR51	N	(60)	0,8	1500
	BSR52	N	(80)	0,8	1500
	BSR60	P	(45)	0,8	1500
	BSR61	P	(60)	0,8	1500
	BSR62	P	(80)	0,8	1500
	BSS50	N	(45)	0,8	1500
	BSS51	N	(60)	0,8	1500
	BSS52	N	(80)	0,8	1500
	BSS60	P	(45)	0,8	1500
	BSS61	P	(60)	0,8	1500
	BSS62	P	(80)	0,8	1500
	BSV64	N	60	5	1200
general industrial and switching	**BFT44**	P	300	5	125
	BFT45	P	250	5	125
	BSV15	P	40	0,8	650
	BSV16	P	60	0,8	650
	BSV17	P	80	0,8	650
	BSX45	N	40	5	850
	BSX46	N	60	5	850
	BSX47	N	80	5	850
switching inductive loads	**BSW66A**	N	100	0,8	1000
	BSW67A	N	120	0,8	1000
	BSW68A	N	150	0,8	1000
saturated switching	**2N2894**	P	12	0,36	90
amplifiers and switching circuits	**2N3019**	N	80	0,8	—
	2N3020	N	80	0,8	—
	2N5415	P	200	1	—
	2N5416	P	300	1	—

	type	polarity	V_{CEO} (V_{CER}) V	P_{tot} W	t_{off} max ns
inverting, regulating, etc.	**BFX34**	N	60	0,87	1200
for abridged data see l.f. transistors	**BCY58**	N	32	0,33	800
	BCY59	N	45	0,33	800
	BDY90	N	100	40	1500
	BDY91	N	80	40	1500
	BDY92	N	60	40	1500
general purpose	**BF115**	N	30	0,45	—
	BF180	N	20	0,15	—
	BF181	N	20	0,15	—
	BF182	N	20	0,15	—
	BF183	N	20	0,15	—
	BF184	N	20	0,145	—
	BF185	N	20	0,145	—
	BF200	N	20	0,15	—
	BFR54	N	15	0,5	—
	PH2369	N	15	0,5	21



High-speed transistors

	type	polarity	V_{CEO} V	P_{tot} W	t_{off} max ns		type	polarity	V_{CEO} V	P_{tot} W	t_{off} max ns
core driving	**BSX59**	N	45	0,8	60	saturated switching	**2N2904**	P	40	0,6	100
	BSX60	N	30	0,8	70	and driver	**2N2904A**	P	60	0,6	100
	BSX61	N	45	0,8	100	applications for	**2N2905**	P	40	0,6	100
						industrial service	**2N2905A**	P	60	0,6	100
							2N2906	P	40	0,4	100
							2N2906A	P	60	0,4	100
							2N2907	P	40	0,4	100
							2N2907A	P	60	0,4	100
							2N2218	N	30	0,8	—
							2N2218A	N	40	0,8	285
saturated switching	**BSX19**	N	15	0,36	18		**2N2219**	N	30	0,8	—
	BSX20	N	15	0,36	21		**2N2219A**	N	40	0,8	285
	2N2368	N	15	0,36	15						
							2N2221	N	30	0,5	—
	2N2369	N	15	0,36	18		**2N2221A**	N	40	0,5	285
	2N2369A	N	15	0,36	18		**2N2222**	N	30	0,5	—
	2N2894A	P	12	0,36	35		**2N2222A**	N	40	0,5	285

Trigger devices

BR101
BRY39
BRY56

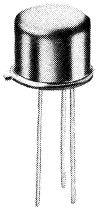
PNPN devices for relay and lamp drivers, sensing networks for temperature control, oscillators, timers, pulse shapers, and as replacements for relays, silicon controlled switches, programmable unijunction transistors.
The BRY39 can also be used for driving numerical indicator tubes.

type	status	case	RATINGS V_{GA} V	V_{EBO} V_{GK} V	I_{ERM} I_{ARM} 10 μs; $\delta = 0{,}01$ A	dI_A/dt A/μs	P_{tot} mW	CHARACTERISTICS V_{AK} max V	I_H max mA	t_r max ns
BR101	D	TO-72(3)	50	5	2,5	—	275	1,4	1	—
BRY39	D	TO-72(3)	70	5	2,5	20	275	1,4	1	80
BRY56	D	TO-92(4)	70	70	2,5	20	300	1,4	—	80

h.f. and switching transistors
abridged data

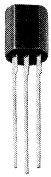
				RATINGS					CHARACTERISTICS		
type	polarity	status	case	V_{CBO}	V_{CEO}	I_C	P_{tot} at	T_{amb} (T_{mb})	h_{FE} at I_C min—max		f_T typ
				V	V	mA	W	°C		mA	MHz
BF115	N	C	TO-72(2)	50	30	30	0,145	45	45—165	1	230
BF180	N	D	TO-72(1)	30	20	20	0,15	25	13	2	675
BF181	N	D	TO-72(1)	30	20	20	0,15	25	13	2	600
BF182	N	D	TO-72(1)	25	20	15	0,15	25	10	2	650
BF183	N	D	TO-72(1)	25	20	15	0,15	25	10	3	800
BF184	N	C	TO-72(2)	30	20	30	0,145	45	75—750	1	300
BF185	N	C	TO-72(2)	30	20	30	0,145	45	34—140	1	220
BF198	N	D	TO-92(1)	40	30	25	0,5	25	27	4	400
BF199	N	D	TO-92(1)	40	25	25	0,5	25	37	7	550
BF200	N	D	TO-72(1)	30	20	20	0,15	25	15	3	650
BF240	N	D	TO-92(1)	40	40	25	0,25	25	65—220	1	380
BF241	N	D	TO-92(1)	40	40	25	0,25	25	35—125	1	350
BF324	P	D	TO-92(2)	30	30	25	0,25	45	25	4	450
BF370	N	N	TO-92(2)	40	15	100	0,5	25	40	10	>490
BF422	N	D	TO-92(3)	250	250	50	0,83	25	50	25	>60
BF423	P	D	TO-92(3)	250	250	50	0,83	25	50	25	>60
BF450	P	D	TO-92(1)	40	40	25	0,25	45	60—200	1	325
BF451	P	D	TO-92(1)	40	40	25	0,25	45	30—90	1	325
BF480	N	D	SOT-37(4)	20	15	20	0,2	60	10	10	2000
BF494	N	D	TO-92(1)	30	20	30	0,3	75	typ 115	1	260
BF495	N	D	TO-92(1)	30	20	30	0,3	75	typ 67	1	200
BF496	N	D	TO-92(1)	30	20	20	0,3	75	—	—	550
BF936	P	D	TO-92(2)	30	20	25	0,25	45	—	—	350
BF939	P	D	TO-92(2)	30	25	20	0,255	55	—	—	675
BF967	P	D	SOT-37(1)	30	30	20	0,16	55	15	3	900
BF970	P	D	SOT-37(1)	40	35	30	0,16	55	25	3	850
BF979	P	D	SOT-37(1)	20	20	20	0,14	55	15	2	1350
BFR54	N	D	TO-92(1)	40	15	350	0,5	25	40	10	600
BFT24	N	D	SOT-37(2)	8	5	2,5	0,03	135	40	1	2300
BFT44	P	D	TO-39(1)	300	300	500	5	(50)	50—150	10	70
BFT45	P	D	TO-39(1)	250	250	500	5	(50)	50—150	10	70
BFX34	N	D	TO-39(1)	120	60	2	0,87	25	40—150	2000	100
BFY50	N	D	TO-39(1)	80	35	1000	0,8	25	112	150	140
BFY51				60	30				123		160
BFY52				40	20				142		185
BFY55				80	35				40—120		>60

SOT-37



TO-39

TO-72



TO-92

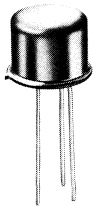
CHARACTERISTICS

V_{CEsat} at I_C/I_B max V	mA/mA	F at typ dB	f MHz	$C_{re}(C_c)$ at f typ pF	MHz	G_{UM} at f typ dB	MHz	t_{off} at I_C max ns	A	type
—	—	4	100	0,65	0,45	—	—	—	—	**BF115**
—	—	7	800	0,28	10,7	12	900	—	—	**BF180**
—	—	6,8	900	0,28	10,7	11	900	—	—	**BF181**
—	—	7,4	800	0,33	10,7	11	900	—	—	**BF182**
—	—	—	—	0,33	10,7	13	900	—	—	**BF183**
—	—	3	0,2	0,65	0,45	—	—	—	—	**BF184**
—	—	4	100	0,65	0,45	—	—	—	—	**BF185**
—	—	3	35	0,2	10,7	42	35	—	—	**BF198**
—	—	—	—	0,3	10,7	43	35	—	—	**BF199**
—	—	2,7	200	0,28	10,7	22	200	—	—	**BF200**
—	—	<3,5	0,2	0,27	1	—	—	—	—	**BF240**
—	—	<3,5	0,2	0,27	1	—	—	—	—	**BF241**
—	—	3	100	0,1	1	—	—	—	—	**BF324**
—	—	—	—	1,6	1	—	—	—	—	**BF370**
—	—	—	—	<1,6	1	—	—	—	—	**BF422**
—	—	—	—	<1,6	1	—	—	—	—	**BF423**
—	—	2	0,1	0,35	1	—	—	—	—	**BF450**
—	—	2	0,1	0,35	1	—	—	—	—	**BF451**
—	—	3,8	800	—	—	—	—	—	—	**BF480**
—	—	4	100	0,85	0,45	—	—	—	—	**BF494**
—	—	4	100	0,85	0,45	—	—	—	—	**BF495**
—	—	2,5	200	0,8	10,7	27	200	—	—	**BF496**
—	—	5	200	0,9	—	—	—	—	—	**BF936**
—	—	25	200	0,7	0,5	—	—	—	—	**BF939**
—	—	4	800	0,45	0,5	—	—	—	—	**BF967**
—	—	4,5	800	0,45	1	—	—	—	—	**BF970**
—	—	4,5	800	0,65	0,5	—	—	—	—	**BF979**
0,25	10/1	—	—	(<4)	1	10	200	—	—	**BFR54**
1,25	1/0,1	3,8	500	<0,4	1	17	500	—	—	**BFT24**
1,4	100/10	—	—	(<15)	1	—	—	125	0,5	**BFT44**
1,4	100/10	—	—	(<15)	1	—	—	125	0,5	**BFT45**
1	5000/500	—	—	36	1	—	—	1200	5	**BFX34**
0,7	500/50									**BFY50**
1	500/50	—	—	12	1	—	—	360	0,15	**BFY51**
1	500/50									**BFY52**
1	1000/100									**BFY55**

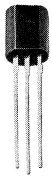
h.f. and switching transistors
abridged data

type	polarity	status	case	RATINGS V_{CBO} V	(V_{CER}) V_{CEO} V	I_C (I_{CM}) mA	P_{tot} at W	T_{amb} (T_{case}) °C	CHARACTERISTICS h_{FE} at I_C min—max	mA	f_T typ MHz
BSR50				60	(45)						
BSR51	N	D	TO-92(3)	80	(60)	1000	0,8	25	2000	500	—
BSR52				100	(80)						
BSR60				60	(45)						
BSR61	P	D	TO-92(3)	80	(60)	1000	0,8	25	2000	500	—
BSR62				100	(80)						
BSS38	N	D	TO-92(2)	120	100	100	0,5	25	20	4	>60
BSS50				60	(45)						
BSS51	N	D	TO-39(1)	80	(60)	1000	0,8	25	2000	500	—
BSS52				100	(80)						
BSS60				60	(45)						
BSS61	P	D	TO-39(1)	80	(60)	1000	0,8	25	2000	500	—
BSS62				100	(80)						
BSS68	P	D	TO-92(2)	110	100	100	0,5	25	30	25	50
BSV15-6,10,16					40				**6** 40—100		
BSV16-6,10,16	P	C	TO-39(1)	—	60	1000	0,8	25	**10** 63—160	100	50
BSV17-6,10					80				**16** 100—250		
BSV64	N	D	TO-39(1)	100	60	2000	5	(50)	40	2000	100
BSW41A	N	M	TO-18(1)	40	25	300	1	(25)	15	500	150
BSW66A				100	100						
BSW67A	N	D	TO-39(1)	120	120	1000	0,8	25	30	500	130
BSW68A				150	150						
BSX19	N	D	TO-18(1)	40	15	(500)	0,36	25	20—60	10	500
BSX20									40—120		600
BSX45-6,10,16					40				**6** 40—100		
BSX46-6,10,16	N	C	TO-39(1)	—	60	1000	5	(25)	**10** 63—160	100	50
BSX47-6,10					80				**16** 100—250		
BSX59					45						450
BSX60	N	D	TO-39(1)	70	30	1000	0,8	25	30—90	500	475
BSX61					45						475
PH2369	N	D	TO-92(1)	40	15	(500)	0,5	25	40—120	10	>500

TO-18



TO-39



TO-92

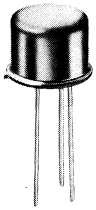
CHARACTERISTICS

V_{CEsat} at I_C/I_B max V	mA/mA	F at f typ dB	MHz	C_c at f typ pF	MHz	G_{UM} at f typ dB	MHz	t_{off} at I_C max ns	A	type
1,3	500/0,5	—	—	—	—	—	—	1500	1	**BSR50** **BSR51** **BSR52**
1,3	500/50	—	—	—	—	—	—	1500	0,5	**BSR60** **BSR61** **BSR62**
0,7	4/0,4	—	—	$C_{re} < 4,5$	1	—	—	1000	0,015	**BSS38**
1,6	1000/4 1000/1 1000/4	—	—	—	—	—	—	1500	0,5	**BSS50** **BSS51** **BSS52**
1,6	1000/4 1000/1 1000/4	—	—	—	—	—	—	1500	0,5	**BSS60** **BSS61** **BSS62**
0,25	25/2,5	—	—	5	1	—	—	—	—	**BSS68**
1	500/25	—	—	20 20 15	1	—	—	650	0,1	**BSV15-6,10,16** **BSV16-6,10,16** **BSV17-6,10**
1	5000/500	—	—	80	1	—	—	1200	5	**BSV64**
0,7	500/35	—	—	8	1	—	—	60	0,5	**BSW41A**
0,4	500/50	—	—	20	1	—	— typ	900	0,5	**BSW66A** **BSW67A** **BSW68A**
1,5	100/10	—	—	4	1	—	—	18 21	0,1 0,1	**BSX19** **BSX20**
1 1 0,9	1000/100 1000/100 500/25	—	—	25 20 15	1	—	—	850	0,1	**BSX45-6,10,16** **BSX46-6,10,16** **BSX47-6,10**
1,2 1,3 1,3	500/50	—	—	6	1	—	—	60 70 100	0,5	**BSX59** **BSX60** **BSX61**
0,6	100/10	—	—	4	1	—	—	21	0,1	**PH2369**

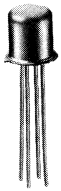
h.f. and switching transistors
abridged data

				RATINGS					CHARACTERISTICS		
type	polarity	status	case	V_{CBO}	V_{CEO} (V_{CER})	I_C (I_{CM})	P_{tot} at T_{amb}		h_{FE} at I_C min—max		f_T typ
				V	V	mA	W	°C		mA	MHz
2N918	N	C	TO-72(1)	30	15	50	0,2	25	20	3	>900
2N1613			TO-39(1)	75	(50)	(1000)	0,8		40—120	150	60
2N1711			TO-39(1)	75	(50)	(1000)	0,8		100—300	150	70
2N1893			TO-39(1)	120	80	500	0,8		40—120	150	50
2N2218	N	D	TO-39(1)	60	30	800	0,8	25	40—120	150	250
2N2219			TO-39(1)				0,8		100—300		
2N2221			TO-18(1)				0,5		40—120		
2N2222			TO-18(1)				0,5		100—300		
2N2218A	N	D	TO-39(1)	75	40	800	0,8	25	40—120	150	250
2N2219A			TO-39(1)				0,8		100—300		
2N2221A			TO-18(1)				0,5		40—120		
2N2222A			TO-18(1)				0,5		100—300		
2N2297	N	C	TO-39(1)	80	35	1000	0,8	25	40—120	150	>60
2N2368	N	C	TO-18(1)	40	15	(500)	0,36	25	20— 60	10	>400
2N2369						(500)			40—120		>500
2N2369A						200			40—120		>500
2N2894	P	C	TO-18(1)	12	12	200	0,36	25	40—150	30	—
2N2894A									40—120		
2N2904	P	D	TO-39(1)	60	40	600	0,6	25	40—120	150	>200
2N2905			TO-39(1)				0,6		100—300		
2N2906			TO-18(1)				0,4		40—120		
2N2907			TO-18(1)				0,4		100—300		
2N2904A	P	D	TO-39(1)	60	60	600	0,6	25	40—120	150	>200
2N2905A			TO-39(1)				0,6		100—300		
2N2906A			TO-18(1)				0,4		40—120		
2N2907A			TO-18(1)				0,4		100—300		
2N3019	N	D	TO-39(1)	140	80	1000	0,8	25	100—300	150	>100
2N3020									40—120		>80
2N4030	P	D	TO-39(1)	60	60	1	0,8	25	25	500	>100
2N4031				80	80				25		>100
2N4032				60	60				70		>150
2N4033				80	80				70		>150
2N5415	P	D	TO-39(1)	200	200	1000	1	50	30—150	50	>15
2N5416				350	300				30—120		

TO-18



TO-39



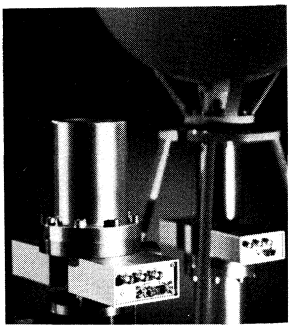
TO-72

CHARACTERISTICS

V_{CEsat} at max V	I_C/I_B mA/mA	F at typ dB	f MHz	C_c at max pF	f MHz	G_{UM} at f typ dB	f MHz	t_{off} at max ns	I_C A	type
0,4	10/1	<6	60	3	0,14	36	200			**2N918**
1,5	150/15	<12	0,001	25	1	—	—	—	—	**2N1613**
1,5	150/15	<8	0,001	25	1	—	—			**2N1711**
5	150/15	—	—	15	—	—	—			**2N1893**
0,4	150/15	—	—	8	0,1	—	—	—	—	**2N2218** **2N2219** **2N2221** **2N2222**
0,3	150/15	— 4 — 4	0,001	8	0,1	—	—	285	0,15	**2N2218A** **2N2219A** **2N2221A** **2N2222A**
1,0	1000/100	—	—	12	0,5	—	—	—	—	**2N2297**
0,25								15		**2N2368**
0,25	10/1	—	—	4	0,14	—	—	18	0,01	**2N2369**
0,2								18		**2N2369A**
0,2				6				90		**2N2894**
0,19	30/3	—	—	4,5	0,14	—	—	35	0,03	**2N2894A**
0,4	150/15	—	—	8	0,1	—	—	100	0,15	**2N2904** **2N2905** **2N2906** **2N2907**
0,4	150/15	—	—	8	0,1	—	—	100	0,15	**2N2904A** **2N2905A** **2N2906A** **2N2907A**
0,2	150/15	—	—	12	1	—	—	—	—	**2N3019** **2N3020**
0,5	500/50	—	—	20	1	—	—	400	0,5	**2N4030** **2N4031** **2N4032** **2N4033**
2,5 2,0	50/5	—	—	15	1	—	—	125	0,5	**2N5415** **2N5416**

field-effect transistors

n-channel



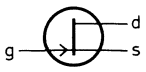
In a charge preamplifier such as this, used with Ge(Li) radiation detector systems, FETs are chosen for their high input resistance and low noise characteristics.

Amplifiers — Junction · FET

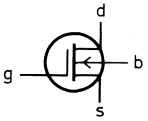
type	status	case	RATINGS ± V_{DS} V	P_{tot} at T_{amb} mW	°C	CHARACTERISTICS − I_{GSS} max nA	I_{DSS} min—max mA	− $V_{(P)GS}$ max V	$\|Y_{fs}\|_{min}$ f = 1 kHz mA/V	C_{rs} typ pF	F typ db	V_n max µV
BC264A							2 — 4,5		2,5			
BC264B	D	TO-92(5)	30	300	25	10	3,5— 6,5	>0,5	3	1,2	<2	—
BC264C							5 — 8		3,5			
BC264D							7 —12		4			
BF245A							2 — 6,5					
BF245B	D	TO-92(5)	30	300	75	5	6 —15	8	3	1,1	1,5	—
BF245C							12 —25					
BF256A							3 — 7					
BF256B	D	TO-92(5)	30	300	75	5	6 —13	—	4,5	0,7	7,5	—
BF256C							11 —18					
BFW10	D	TO-72(4)	30	300	25	0,1	8 —20	8	3,5	0,6	<2,5	—
BFW11							4 —10	6	3			
BFW12	D	TO-72(4)	30	150	110	0,1	1 — 5	2,5	2	<0,8	—	0,5
BFW13							0,2— 1,5	1,2	1			
BFW61	D	TO-72/4)	25	300	25	1,0	2 —20	8	2	<2	—	—
2N3823	D	TO-72(4)	30	300	25	0,5	4 —20	8	3,5	<2	<2,5	—
BF410A							0,7— 3,0	typ 0,8	2,5			
BF410B	D	TO-92(5)	20	300	75	10	2,5— 7,0	typ 1,5	4	<0,4	1,5	—
BF410C							6 —12	typ 2,2	6			
BF410D							10 —18	typ 3	7			

Amplifiers — MOS · FET

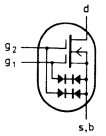
type	status	case	RATINGS V_{DB} V	V_{DS} V	P_{tot} at T_{amb} mW	°C	CHARACTERISTICS ± I_{GSS} max pA	± $I_{G1\text{-}SS}$ ± $I_{G2\text{-}SS}$ max nA	I_{DSS} mA	− $V_{(P)GS}$ − $V_{(P)G1\text{-}S}$ max V	$\|Y_{fs}\|$ f = 1 kHz min mA/V	C_{rs} typ fF	F max dB
BF960	D	SOT-103	—	20	225	75	—	100	4—20	3,5	9	25	typ 1,4
BF980	N	SOT-103	—	18	225	75	—	25	—	1,3	17	25	typ 2,8
BF981	D	SOT-103	—	20	225	75	—	100	4—25	2,5	10	25	2
BF982	N	SOT-103	—	20	225	75	—	25	—	1,3	20	30	typ 1,2
BFR29	D	TO-72(5)	30	—	200	25	10	—	10—40	4	6	<700	5
BFR84	D	TO-72(6)	—	20	300	25	—	10	20—55	3,8	12	30	3
3N211	N	TO-72(6)	—	27	360	25	—	10	6—40	—	17	5-50	4



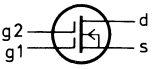
junction FET



single-gate MOS-FET



dual-gate MOS-FET
protected



dual-gate MOS-FET
unprotected

Most of our components are backed by application publications. For this subject, ask for Application Book "Field-effect transistors".

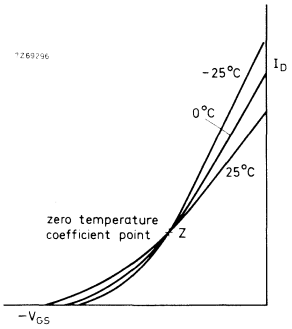
Switching — Junction · FET

type	status	case	RATINGS $\pm V_{DS}$ V	P_{tot} mW	at T_{amb} (T_{case}) °C	CHARACTERISTICS $-I_{GSS}$ max nA	I_{DSS} min mA	$-V_{(P)GS}$ max V	$r_{ds\ on}$ max Ω	C_{rs} max pF	t_{on} max ns	t_{off} max ns
BSV78							50	11	25		10	10
BSV79	D	TO-18(2)	40	350	25	0,25	20	7,0	40	5	15	15
BSV80							10	5,0	60		15	25
2N3966	D	TO-72(4)	30	300	25	0,1	2	6	220	1,5	120	100
2N4091							30	10	30		25	40
2N4092	D	TO-18(2)	40	1800	(25)	0,2	15	7,0	50	5	35	60
2N4093						(I_{SGO})	8	5,0	80		60	80
2N4391							50	10	30			20
2N4392	D	TO-18(2)	40	1800	(25)	0,1	25	5,0	60	3,5	15	35
2N4393							5	3,0	100			50
2N4856							50	10	25		9	25
2N4857	D	TO-18(2)	40	360	25	0,25	20	6	40	8	10	50
2N4858							8	4	60		20	100
2N4859							50	10	25		9	25
2N4860	D	TO-18(2)	30	360	25	0,25	20	6	40	8	10	50
2N4861							8	4	60		20	100

Switching — MOS · FET

type	status	case	RATINGS V_{DB} V_{SB} V	P_{tot} mW	at T_{amb} °C	CHARACTERISTICS $\pm I_{GSS}$ max pA	I_{DSX} I_{SDX} max nA	$r_{ds\ on}$ max Ω	r_{DSoff} min GΩ	C_{rs} max pF	C_{rd} max pF
BSV81	D	TO-72(5)	30	200	25	10	1	50	10	0,5	0,5

field-effect transistors
n-channel



Temperature dependence of the I_D—V_{GS} characteristic of an n-channel FET

Differential amplifiers

Note: BFS..types: matched pairs in SOT-52.
BFQ..types: dual transistors in TO-71(1).

type	status	RATINGS individual transistor		total device	CHARACTERISTICS individual transistor			total device				
		$\pm V_{DS}$	P_{tot} (T_{amb})	P_{tot} (T_{amb})	$-I_{GSS}$	I_{DSS}	$-V_{(P)GS}$	$\lvert\Delta V_{GS}\rvert$	$\lvert\frac{d\Delta V_{GS}}{dT}\rvert$	$\lvert\Delta\frac{1}{g_{fs}}\rvert$	$\lvert\Delta\frac{g_{os}}{g_{fs}}\rvert$	CMRR
		V	mW (°C)	mW (°C)	max nA	. mA	max V	max mV	max μV/°C	max Ω	max μV/V	min dB
BFQ10								5	5	6	10	100
BFQ11								10	5	6	30	90
BFQ12								10	10	12	30	90
BFQ13	D	30	250 (75)	250 (75)	0,1	0,5-10	3,5	10	20	12	30	90
BFQ14								15	20	12	30	90
BFQ15								20	40	20	30	90
BFQ16								50	50	30	100	80
BFS21	C	30	300 (25)	30 (100)	0,5	>1	6	20	75	15	1000	60
BFS21A								10	40	7,5	500	66

dual transistors
differential amplifiers

Dual transistors in TO-71(2) — polarity n-p-n

type	status	RATINGS individual transistor			CHARACTERISTICS individual transistor					total device		
		V_{CEO}	I_C	P_{tot} (T_{amb})	h_{FE} at	I_C	F	f_T	$\frac{I_{1C}}{I_{2C}}$	V_{1BE}-V_{2BE}	$\lvert\frac{\Delta V}{\Delta T}\rvert$	$\lvert\frac{\Delta I}{\Delta T}\rvert$
		V	mA	mW (°C)	min-max	mA	max dB	min MHz		max mV	max μV/°C	max nA/°C
											T_{amb} = −20	to +90°C
BCY87					100—450	0,05	3		0,9 —1,11	3	3	0,5
BCY88	D	40	30	150	120—600	0,5	4	50	0,8 —1,25	6	6	2
BCY89				(25)	100—600	10	4		0,67—1,5	10	10	10

BFQ10 to 16; see above.

r.f. power transistors and modules
recommended types

For complete range see selection guide.

[ ] = MODULE

P_o (W)	H.F. 1,6-30 MHz	V.H.F. band I/II 30-175 MHz	V.H.F. band III transposers 175-225 MHz	U.H.F. communication 225-470 MHz	U.H.F. band IV/V transposers 470-860 MHz
200	BLW 96				
160	BLW 95	BLW 95			
150	BLX 15	BLX 15			
130	BLW 77	BLW 77	BLV 36		
100		BLW 78			
80	BLW 76	BLW 76			
65	BLW 50 F				
50	BLX 14	BLY 90 BLY 94			
45	BLW 86	BLW 60 C BLW 85 BLX 39 BLW 86			
40	BLX 39			BLX 95	
31		BGY 38			
30	BLW 60 C BLW 78 BLW 85			BLW 82	
28		BLW 31			
25	BLX 13 C BLW 83	BLY 89 C BLW 84 BLY 93 C BLW 87		BLX 94 A	
21			BLV 33		
20				BLX 69 A	
18		BGY 32 BGY 35 BGY 33 BGY 36			
17,5			BLV 33 F		
15	BLW 87 BLY 89 C	BLY 88 C BLV 11 BLY 92 C BLV 21			
14		BGY 43	BLW 75	BGY 41 A BGY 41 B	
10	BLY 88 C BLV 11 BLY 92 C BLV 21		BLW 64 BLV 32 F	BLW 81 BLW 91	
8		BLY 87 C BLV 10 BLY 91 C BLV 20		BGY 40 A BGY 40 B	
7,5					BLV 57
7				BLX 68 BLX 93 A BGY 23 BGY 23 A	
6			BLV 31		
5					
4		BFS 22 A BFQ 43 BFS 23 A		BLW 80 BLW 90	
3,5					BLW 98 BLX 98
2,5				BLX 66 BLX 92 A BGY 22 BGY 22 A	
2		BFQ 42		BLW 79 BLX 65 BLW 89	BLW 34
1,7			BLV 30		
1,6			BLX 93 A		
1,3	BLY 91 C BLV 20				
1	BLY 87 C BLV 10			BLX 91 A 2 N 3866	BLW 33 BLX 97
0,7			BLX 92 A		
0,5			BGY 55		BLW 32 BLX 96
0,45			BLX 91 A		

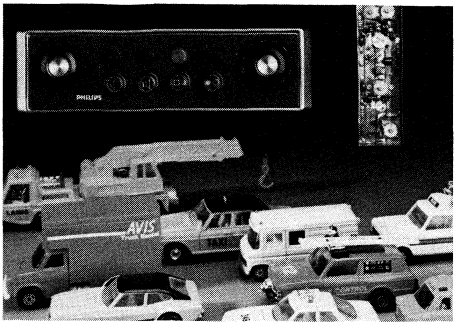
r.f. power transistors and modules

selection guide

Main r.f. power application areas with applicable transistors and modules

For detailed information
Handbook S6

	type number	status	envelope	V_{CE} V	P_L(P.E.P.) W	G_p dB
s.s.b. class-AB	**BLY92A**	C	SOT-48		10	20
f = 28 MHz; d_3; d_5 < − 30 dB	**BLY92C**	D	SOT-120		10	20
	BLV21	D	SOT-123	28	10	20
	BLX13	C	SOT-56		25	18
	BLX13C	D	SOT-120		25	18
	BLW83	D	SOT-123		25	18
	BLX39	D	SOT-120	28	40	17
	BLW86	D	SOT-123		45	17
	BLX14	C	SOT-55		50	13
	BLW76	D	SOT-121	28	80	13
	BLW77	D	SOT-121	28	130	12
	BLW50F	D	SOT-123	50	50	18
	BLX15	D	SOT-55	50	150	14
	BLW95	D	SOT-121	50	160	14
	BLW96	D	SOT-121	50	200	13,5
s.s.b. class-A	**BLY91A**	C	SOT-48		1,3	
f = 28 MHz; d_3; d_5 < − 40 dB	**BLY91C**	D	SOT-120	26	1,3	20
	BLV20	D	SOT-123		1,3	
	BLY92A	C	SOT-48		2,5	
	BLY92C	D	SOT-120		2,5	20
	BLV21	D	SOT-123	26	2,5	20
	BLX13	C	SOT-56		8	18
	BLX13C	D	SOT-120		8	20
	BLW83	D	SOT-123		10	20
	BLX39	D	SOT-120	26	15	18
	BLW86	D	SOT-123		17	20
	BLW78	D	SOT-121		30	18
	BLW50F	D	SOT-123	45	16	19,5
	BLW96	D	SOT-121	40	40	18
s.s.b. class-AB	**BLY88A**	C	SOT-48			
f = 28 MHz; d_3; d_5 < − 30 dB	**BLY88C**	D	SOT-120	13,5	10	18
	BLV11	D	SOT-123			
	BLY89A	C	SOT-56			
	BLY89C	D	SOT-120	13,5	15	18
	BLW87	D	SOT-123			
	BLW60	C	SOT-56			
	BLW60C	D	SOT-120	12,5	30	18
	BLW85	D	SOT-123			
s.s.b. class-A	**BLY87A**	C	SOT-48			
f = 28 MHz; d_3; d_5 < − 40 dB	**BLY87C**	D	SOT-120	12	1	18
	BLV10	D	SOT-123			
	BLY88A	C	SOT-48			
	BLY88C	D	SOT-120	12	2	18
	BLV11	D	SOT-123			
	BLY89A	C	SOT-56			
	BLY89C	D	SOT-120	12	6	18
	BLW87	D	SOT-123			



	type number	status	envelope	f MHz	V_{CE} V	P_L W	G_p dB
v.h.f. base stations	**2N3866**	D	TO-39			1	15
class-B operation	**BFS23A**	D	TO-39			4	10
	BLY91A	C	SOT-48	175	28	8	12
	BLY91C	D	SOT-120			8	12
	BLV20	D	SOT-123			8	12
	BLY92A	C	SOT-48			15	10
	BLY92C	D	SOT-120			15	10
	BLV21	D	SOT-123	175	28	15	10
	BLY93A	C	SOT-56			25	9
	BLY93C	D	SOT-120			25	9
	BLW84		SOT-123	175		25	9
	BLX39		SOT-120	175		45	7,5
	BLW86	D	SOT-123	175	28	45	7,5
	BLY94		SOT-55	175		50	7
	BLW76		SOT-121	108		80	8
	BLW78		SOT-121	150	28	100	6
	BLW77		SOT-121	87,5	28	130	7,5
	BLX15	D	SOT-55	108	50	150	7,5
	BLW95		SOT-121	108	50	160	7,0
	BLW96		SOT-121	108	50	200	6,5
v.h.f. mobile transmitters	**2N4427**	D	TO-39		12	1	10
class-B operation	**BFQ42**	D	TO-39		13,5	2	11
	BFS22A	D	TO-39	175	13,5	4	8
	BFQ43	D	TO-39 ▲		13,5	4	12
	BLY87A	C	SOT-48		13,5	8	9
	BLY87C	D	SOT-120			8	12
	BLV10	D	SOT-123			8	9
	BLW29	D	SOT-120	175	13,5	15	10
	BLY88A	C	SOT-48			15	7,5
	BLY88C	D	SOT-120			15	7,5
	BLV11	D	SOT-123			15	7,5
	BLY89A	C	SOT-56			25	6
	BLY89C	D	SOT-120	175	13,5	25	6
	BLW87	D	SOT-123			25	6
	BLW31	D	SOT-120			28	9
	BLW60	C	SOT-56			45	5,5
	BLW60C	D	SOT-120	175	12,5	45	5,5
	BLW85	D	SOT-123			45	5
	BLY90	D	SOT-55			50	5
v.h.f. modules	**BGY32**	D		68 to 88	12,5	18	22,6
for mobile transmitters	**BGY33**	D		80 to 108	12,5	18	22,6
	BGY43	N	SOT-132	148 to 174	12,5	13	19,4
	BGY35	D		132 to 156	12,5	18	20,8
	BGY36	D		148 to 174	12,5	18	20,8
	BGY38	D		156 to 163	13,5	28	20,5

▲ Emitter connected to case

r.f. power transistors and modules

selection guide

	type number	status	envelope	f MHz	V_{CE} V	P_L W	G_p dB
u.h.f. modules for mobile transmitters	**BGY22**	D	SOT-75A	380 to 512	13,5	2,5	17
	BGY22A	D		420 to 480	12,5	2,5	17
	BGY23	D		380 to 480	13,5	7,0	4,5
	BGY23A	D		420 to 480	12,5	7,0	4,5
	BGY40A	D	SOT-132C	400 to 440	12,5	7,5	18,8
	BGY40B	D	SOT-132C	440 to 470	12,5	7,5	18,8
	BGY41A	D	SOT-132C	400 to 440	12,5	13	19,4
	BGY41B	D	SOT-132C	440 to 470	12,5	13	19,4
u.h.f. base stations class-B operation	**2N3866**	D	TO-39	470	28	1	7
	BLX91A	D	SOT-48	470	28	1	11
	BLW89	D	SOT-122	470	28	2	12
	BLX92A	D	SOT-48	470	28	2,5	11
	BLW90	D	SOT-122	470	28	4	11
	BLX93A	D	SOT-48	470	28	7	8,5
	BLW91	D	SOT-122	470	28	10	9
	BLX94A	D	SOT-48	470	28	25	6
	BLX94C	D	SOT-122	470	28	25	6,5
	BLX95	D	SOT-56	470	28	40	4,5
u.h.f. mobile transmitters class-B operation	**BLX65**	D	TO-39			2	6
	BLW79	D	SOT-122			2	9
	BLX66	D	SOT-48 ▲	470	12,5	2,5	8,5
	BLX67	C	SOT-48			2,5	8,5
	BLW80	D	SOT-122			4	8
	BLX68	C	SOT-48		12,5	7	5
	BLW81	D	SOT-122	470	12,5	10	6
	BLX69A	D	SOT-48		13,5	20	4
	BLW82	D	SOT-119		12,5	30	5

▲ Without stud.

TV transposer types for application in band III, IV and V.

- gold-gold bonding for high reliabilty
- high power gain offering cheaper line-up
- sophisticated ion-implantation technology
- modern encapsulation giving optimum heatsinking
- complete line-up with small-signal driver transistors

TV transposer circuits

	type number	envelope	f MHz	$P_{o\ sync}$ W	d_{im} dB	G_p dB	V_{CE} V	I_C mA
band III; class-A operation	**BGY55** •	SOT-115	225	0,25 0,45	−60 −55	17	24	200
	BLV30	SOT-122	225	1,5	−60	18	25	460
	BLV31	SOT-122	225	5	−58	15	25	800
	BLW64	SOT-56	225	10	−55	10	25	1600
	BLV32F	SOT-160	225	10	−55	16	25	1600
	BLW75	SOT-105	225	14	−55	8	25	2400
	BLV33F	SOT-119	225	16	−55	13,5	25	3200
	BLV33	SOT-147	225	19	−55	9	25	3200
	BLV36	SOT-161	225	35	−55	12	25	2 × 2600
band III; class-AB operation	**BLV33F**	SOT-119	225	85 *		10,5	28	4250
	BLV33	SOT-147	225	90 *		6,5	28	4460
	BLV36	SOT-161	225	125 *		10,5	28	2 × 3430
band IV-V; class-A operation	**BFR965** •	SOT-37	860	0,12	−60	10	10	70
	BFQ34 •	SOT-122	860	0,3	−60	11	15	120
	BLW32	SOT-122	860	0,5	−60	11	25	150
	BFQ68 •	SOT-122	860	0,7	−60	10	15	240
	BLW33	SOT-122	860	1,0	−60	10	25	300
	BLW34	SOT-122	860	1,8	−60	9	25	600
	BLW98	SOT-122	860	3,5	−60	6,5	25	850
	BLV57	SOT-161	860	6	−60	8	25	2 × 850
band IV-V; class-AB operation	**BLV57**	SOT-161	860	30 *		6	25	2 × 1100

* At 1 dB power gain compression.
• See handbook S10.

r.f. power transistors and modules

line-ups

Recommended circuit line-ups in the main r.f. power application areas. A comprehensive range of output power levels is indicated together with our recommended types in the particular line-up configuration. The necessary input power level for each line-up is indicated in the first column. More detailed application information as well as computer aided design parameters are available on request.

S.S.B. transmitters (1,5 to 30 MHz)

input power mW	1st stage		2nd stage	3rd stage	P_L(P.E.P.) W	V_{CE} V	stud S flange F
30	BLY87C	*	2 × BLY89C		**30**		S
30	BLV10	*	2 × BLW87		**30**		F
50	BLY88C	*	2 × BLW60C		**50**	13	S
50	BLV11	*	2 × BLW85		**50**		F
100	BLY89C	*	4 × BLW60C		**100**		S
100	BLW87	*	4 × BLW85		**100**		F
50	BLY91C	*	2 × BLX13C		**50**		S
50	BLV20	*	2 × BLW83		**50**		F
150	BLW83	*	2 × BLW76		**150**	28	F
250	2 × BLW83	*	2 × BLW77		**250**		F
500	2 × BLW86	*	4 × BLW77		**450**		F
300	2 × BLX13C	**	2 × BLX15		**250**		S
300	2 × BLW83	**	2 × BLW96		**350**		F
600	2 × BLX39	**	4 × BLX15		**500**	50	S
600	2 × BLW50F	*	4 × BLW95		**500**		F
40	BLY91C	**	2 × BLW78 **	8 × BLX15	**1000**		S/F
40	BLV20	**	4 × BLW50F	8 × BLW96	**1200**		F

Military communication transmitters (25 to 80 MHz)

input power mW	1st stage		2nd stage	3rd stage	P_L W	V_{CE} V	stud S flange F
5	BFR96 •	*	2 × BFQ42		**2**	7,5	—
15	2N4427	*	2 × BLW80		**6**	13	S
50	BLW79	*	2 × BLW29		**25**	13	S
50	BLW89	*	2 × BLY92C		**25**	28	S
20	2N3866	*	2 × BLY91C	2 × BLX39	**90**	28	S
20	2N3866	*	2 × BLV20	2 × BLW86	**90**	28	F

• See Handbook S10.
* Class-A operation.
** 28 V supply voltage; class-A operation.

Mobile transmitters (68 to 87,5 MHz)

input power mW	1st stage	2nd stage	3rd stage	P_L W	V_{CE} V	stud S flange F
20	2N4427	BLY87C		**8**		S
20	2N4427	BLV10		**8**		F
35	2N4427	BLW29		**14**		S
10	BSX19 •	BGY32		**18**	13	F
70	BFQ42	BLW31		**28**		S
160	BFQ43	BLW60C		**45**		S
160	BFQ43	BLW85		**45**		F

Base stations (68 to 87,5 MHz)

input power mW	1st stage	2nd stage	3rd stage	P_L W	V_{CE} V	stud S flange F
65	BFS23A	BLY93C		**25**	28	S
65	BFS23A	BLW84		**25**	28	F
125	BLX92A	BLX39		**50**	28	S
15	2N3866	BLV21	BLW78	**100**	28	F
50	2N3866 **	BLY93C **	BLX15	**150**	50	S
50	2N3866 **	BLW84 **	BLW95	**150**	50	F

F.M. broadcast transmitters (87,5 to 108 MHz)

input power mW	1st stage	2nd stage	3rd stage	P_L W	V_{CE} V	stud S flange F
100	BLW90	BLX39		**50**	28	S
40	2N3866	BLV21	BLW78	**100**	28	F
60	BLW90 **	BLX39 **	BLX15	**150**	50	S
60	BLW90 **	BLW50F	BLW95	**150**	50	S/F
100	BLW90 **	BLX39 **	2 × BLX15	**250**	50	S
100	BLW90 **	BLW50F	2 × BLW95	**250**	50	SF

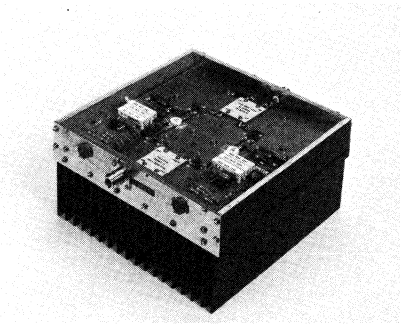
A.M. aircraft transmitters (118 to 136 MHz)

input power mW	1st stage	2nd stage	3rd stage	$P_{L(carr)}$ W	V_{CE} V	stud S flange F
110	BLX92A	BLY93C		**6**		S
240	BLY91C	BLX39		**12**		S
240	BLV20	BLW86		**12**	13/28	F
100	BLX92A	BLY93C	BLW78	**25**		S/F
100	BLX92A	BLW84	BLW78	**25**		S/F

• See Handbook S3.
** 28 V supply voltage.

r.f. power transistors and modules

line-ups



TV band III amplifier with 2 × BLV33

Portable and mobile transmitters (132 to 174 MHz)

input power mW	1st stage	2nd stage	3rd stage	P_L W	V_{CE} V	stud S flange F
40	2N4427	BFQ43		**2**	7,5	—
100	2N4427	BLY87C		**8**	13	S
100	2N4427	BLV10		**8**	13	F
125	BFQ42	BLW29		**14**	13	S
150	BGY36			**18**	13	F
250	BFQ43	BLW31		**28**	13	S
120	BFQ42	BLW29	BLW60C	**45**	13	S
150	BGY36	BLW85		**45**	13	F

Base stations (132 to 174 MHz)

input power mW	1st stage	2nd stage	3rd stage	P_L W	V_{CE} V	stud S flange F
200	BLY91C	BLY93C		**25**		S
200	BLV20	BLW84		**25**		F
25	2N3866	BLY91C	BLX39	**50**	28	S
25	2N3866	BLV20	BLW86	**50**		F
200	BFS23A	BLY93C	2 × BLX39	**100**		S
200	BFS23A	BLW84	2 × BLW86	**100**		F

TV transposers (Band III: 174 to 230 MHz)

input power mW	1st stage	2nd stage	3rd stage	4th stage	$P_{o\ sync}$ W	$P_{o\ sat}$ W	V_{CE} V
6	BGY55 •	2 × BLV31			**10**	**10**	25
7	BLV30	2 × BLV32F			**20**	**20**	25
3	BGY55 •	2 × BLV31	2 × BLV33		**30**	**40**	25
6	BLV30	2 × BLV33F	4 × BLV33		**60**	**75**	25
2	BGY55 •	2 × BLV31	4 × BLV33	8 × BLV33	**100**	**140**	25

TV transmitters (Band III: 174 to 230 MHz)

input power mW	1st stage	2nd stage	3rd stage	$P_{o\ sync}$ W	V_{CE} V
8	BGY55 •	2 × BLV31	2 × BLV33F	**130**	28
10	BLV30	2 × BLV32F	2 × BLV36	**250**	28
35	BLV30	2 × BLV33F	4 × BLV36	**470**	28
75	2 × BLV30	4 × BLV33F	8 × BLV36	**900**	28

• See Handbook S10.

Notes

1. For transposers the input power corresponds with $P_{o\ sync}$.
2. $P_{o\ sync}$ for transposers is the peak sync output power for a three-tone intermodulation distortion of −54 dB (vision carrier −8 dB, sound carrier −7 dB, sideband signal −16 dB) without pre-correction.
3. $P_{o\ sat}$ is the maximum peak sync output power for transposers with pre-correction taking into account that the sound carrier still must be added.
4. In the transmitter line-ups the output stage operates in class-AB, the driver stages in class-A.
5. $P_{o\ sync}$ for transmitters is the peak sync output power at 1 dB power gain compression.

Portable and mobile transmitters (400 to 470 MHz)

input power mW	1st stage	2nd stage	3rd stage	P_L W	V_{CE} V	stud S flange F
15	BFR96 •	BLW79	BLW80	**2**	7,5	S
100	BGY40A BGY40B			**7,5**	12,5	F
50	BLW79	BLW80	BLW81	**10**	13	S
150	BGY41A BGY41B			**13**	12,5	F
220	BLW79	BLW81	BLX69A	**18**	13	S
100	BGY41A BGY41B	BLW82		**30**	13	F

Base stations (400 to 470 MHz)

input power mW	1st stage	2nd stage	3rd stage	4th stage	P_L W	V_{CE} V	stud S flange F
45	BLX91A	BLW91	BLX94C		**25**	28	S
250	BLW90	BLX94C	BLX95		**40**	28	S
45	BLX91A	BLW91	BLX94C	2 × BLX95	**70**	28	S

TV transposers (Band IV/V: 470 to 860 MHz)

input power mW	1st stage	2nd stage	3rd stage	4th stage	$P_{o\ sync}$ W	$P_{o\ sat}$ W	V_{CE} V
5	BFQ34 •	BFQ68 •	2 × BFQ68 •		**1,4**	**1,4**	15
6	BLW32	BLW33	2 × BLW34		**4,4**	**5,7**	25
2	BLW32	BLW33	2 × BLW34	2 × BLW98	**8**	**8**	25
3	BLW32	BLW33	2 × BLW34	2 × BLV57	**13**	**15**	25
10	BFQ68 •	2 × BLW34	2 × BLW98	4 × BLV57	**23**	**30**	25
14	BFQ68 •	2 × BLW34	2 × BLV57	8 × BLV57	**38**	**60**	25

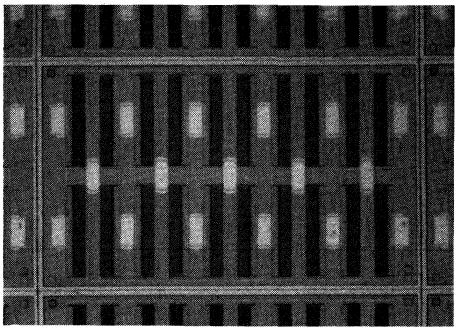
TV transmitters (Band IV/V: 470 to 860 MHz)

input power mW	1st stage	2nd stage	3rd stage	4th stage	$P_{o\ sync}$ W	V_{CE} V
12	BFR96S •	BFQ68 •	2 × BLW34	2 × BLV57	**45**	28
30	BFQ34 •	2 × BLW33	2 × BLV57	4 × BLV57	**85**	28
80	BFQ68•	2 × BLW34	4 × BLV57	8 × BLV57	**165**	28

• See Handbook S10.

r.f. power transistors and modules

abridged data



Crystal of BLV33

For detailed information
Handbook S6

type number	status	envelope	mode of operation	f MHz	V_{CE} V	output power W	G_p dB
BFQ42	D	TO-39	c.w. class-B	175	13,5	2	11
BFQ43		TO-39			13,5	4	12
BFS22A		TO-39			13,5	4	8
BFS23A		TO-39			28	4	10
BGY22	D	SOT-75A	c.w.	380 to 512	13,5	2,5	17
BGY22A				420 to 480	12,5	2,5	17
BGY23				380 to 480	13,5	7	4,5
BGY23A				420 to 480	12,5	7	4,5
BGY32	D	SOT-132	c.w.	68 to 88	12,5	18	22,6
BGY33	D			80 to 108	12,5	18	22,6
BGY35	D			132 to 156	12,5	18	20,8
BGY36	D			148 to 174	12,5	18	20,8
BGY38	D	SOT-132A	c.w.	156 to 163	13,5	28	20,5
BGY40A	D	SOT-132C	c.w.	400 to 440	12,5	7,5	20
BGY40B	D	SOT-132C	c.w.	440 to 470	12,5	13	19,4
BGY41A	D	SOT-132C	c.w.	400 to 440	12,5	7,5	18,8
BGY41B	D	SOT-132C	c.w.	440 to 470	12,5	13	19,4
BGY43	D	SOT-132B	c.w.	148 to 174	12,5	13	19,4
BLV10	D	SOT-123	c.w. class-B	175	13,5	8	9
BLV11	D	SOT-123	c.w. class-B	175	13,5	15	8
BLV20	D	SOT-123	c.w. class-B	175	28	8	12
BLV21	D	SOT-123	c.w. class-B	175	28	15	10
BLV30	D	SOT-122	class-A	224,25	25	1,5 (note 1)	18
BLV31	D	SOT-122	class-A	224,25	25	5 (note 1)	15
BLV32F	D	SOT-160	class-A	224,25	25	11	16,8
BLV33	D	SOT-147	class-A	224,25	25	19 (note 2)	9
			class-AB	224,25	28	90	6,5
BLV33F	D	SOT-119	class-A	224,25	25	16 (note 2)	13,5
			class-AB	224,25	28	85	10,5
BLV36	N	SOT-161	class-A	224,25	25	35 (note 2)	12
			class-AB	224,25	28	125	10,5
BLV57	N	SOT-161	class-A	860	25	6 (note 1)	8
			class-AB	860	25	30	6

Notes: 1. $P_{o\ sync}$ at $d_{im} < -60$ dB. 2. $P_{o\ sync}$ at $d_{im} < -55$ dB.

Our data handbooks are unique in the amount of information they contain. For standard operating conditions:

- read-off curves for power gain, input impedance, output impedance } versus operating frequency
- circuit schematic
- print layout
- component mounting diagram
- VSWR curves
- d.c. SOAR curve
- r.f. SOAR curve

type number	status	envelope	mode of operation	f MHz	V_{CE} V	output power W		G_p dB
BLW29	D	SOT-120	c.w. class-B	175	13,5	15		10
BLW31	D	SOT-120	c.w. class-B	175	13,5	28		9
BLW32	D	SOT-122	class-A	860	25	0,5	(note 1)	11
BLW33	D	SOT-122	class-A	860	25	1,0	(note 1)	10
BLW34	D	SOT-122	class-A	860	25	1,8	(note 1)	9
BLW50F	D	SOT-123	s.s.b. class-A	1,6 to 28	45	0 to 16	(note 3)	19,5
			s.s.b. class-AB	1,6 to 28	50	10 to 65	(note 4)	18
BLW60	C	SOT-56	c.w. class-B	175	12,5	45		5
			s.s.b. class-AB	1,6 to 28	12,5	3 to 30	(note 4)	19,5
BLW60C	D	SOT-120	c.w. class-B	175	12,5	45		5
			s.s.b. class-AB	1,6 to 28	12,5	3 to 30	(note 4)	19,5
BLW64	D	SOT-56	class-A	224,25	25	10	(note 2)	9,5
BLW75		SOT-105				14	(note 2)	8
BLW76	D	SOT-121	s.s.b. class-AB	1,6 to 28	28	8 to 80	(note 4)	13
			c.w. class-B	108		80		7,9
BLW77	D	SOT-121	s.s.b. class-AB	1,6 to 28	28	15 to 130	(note 4)	12
			c.w. class-B	87,5		130		7,5
BLW78	D	SOT-121	c.w. class-B	150	28	100		6
			s.s.b. class-A	28	26	35	(note 3)	19,5
			s.s.b. class-AB					
BLW79	D	SOT-122	c.w. class-B	470	12,5	2		9
				175				13,5
BLW80	D	SOT-122	c.w. class-B	470	12,5	4		8
				175				15

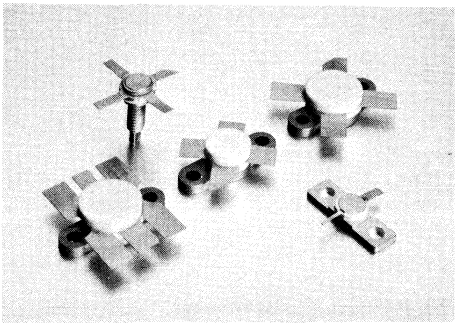
Notes: 1. $P_{o\ sync}$ at $d_{im} < -60$ dB. 2. $P_{o\ sync}$ at $d_{im} < -55$ dB. 3. P.E.P. at $d_3 < -40$ dB. 4. P.E.P. at $d_3 < -30$ dB.

r.f. power transistors and modules

abridged data

type number	status	envelope	mode of operation	f MHz	V_{CE} V	output power W	G_p dB
BLW81	D	SOT-122	c.w. class-B	470 175	12,5	10	6 13,5
BLW82	D	SOT-119	c.w. class-B	470	12,5 13,5	30	5 6,1
BLW83	D	SOT-123	s.s.b. class-A s.s.b. class-AB	1,6 to 28	26 28	0 to 10 3 to 30	20 21
BLW84	D	SOT-123	c.w. class-B	175	28	25	9
BLW85	D	SOT-123	c.w. class-B s.s.b. class-AB	175 1,6 to 28	12,5	45 3 to 30 (note 1)	5 19,5
BLW86	D	SOT-123	c.w. class-B s.s.b. class-AB s.s.b. class-A	175 1,6 to 28 1,6 to 28	28 28 26	45 5 to 47,5 (note 1) 17 (note 2)	7,5 19 22
BLW87	D	SOT-123	c.w. class-B	175	13,5	25	6
BLW89	D	SOT-122	c.w. class-B	470	28	2	12
BLW90	D	SOT-122	c.w. class-B	470	28	4	11
BLW91	D	SOT-122	c.w. class-B	470	28	10	9
BLW95	D	SOT-121	s.s.b. class-AB	1,6 to 28	50	20 to 160 (note 4)	14
BLW96	D	SOT-121	s.s.b. class-AB c.w. class-B	1,6 to 28 108	50 50	25 to 200 (note 4) 200	13,5 6,5
BLW98	D	SOT-122	class-A	860	25	3,5 (note 1)	6,5
BLX13	C	SOT-56	s.s.b. class-A s.s.b. class-AB c.w. class-B	28 28 70	26 28 28	0 to 8 (note 3) 25 (note 4) 25	18 18 17
BLX13C	D	SOT-120	s.s.b. class-A s.s.b. class-AB	1,6 to 28	26 28	0 to 8 (note 3) 3 to 25 (note 4)	20 21
BLX14	C	SOT-55	s.s.b. class-A s.s.b. class-AB c.w. class-B c.w. class-B	1,6 to 28 1,6 to 28 70 30	28	15 (note 3) 7,5 to 50 (note 4) 50 50	13 13 7,5 16
BLX15	D	SOT-55	s.s.b. class-AB s.s.b. class-A c.w. class-B c.w. class-B	1,6 to 28 1,6 to 28 70 108	50 40 50 50	20 to 150 (note 4) 30 (note 3) 150 150	14 14 10 7,5
BLX39	D	SOT-120	c.w. class-B s.s.b. class-AB s.s.b. class-A	175 1,6 to 28 1,6 to 28	28 28 26	45 5 to 42,5 (note 4) 15 (note 3)	7,5 19 20
BLX65	D	TO-39	c.w. class-B	470 175	12,5	2	6 12
BLX66	D	SOT-48	c.w. class-B	470 175	12,5	2,5 3	8,5 20
BLX67	C	SOT-48	c.w. class-B	470 175	12,5	2,5 3	8,5 20

Notes: 1. $P_{o\ sync}$ at $d_{im} < -60$ dB. 2. $P_{o\ sync}$ at $d_{im} < -55$ dB. 3. P.E.P. at $d_3 < -40$ dB. 4. P.E.P. at $d_3 < -30$ dB.



type number	status	envelope	mode of operation	f MHz	V_{CE} V	output power W	G_p dB
BLX68	C	SOT-48	c.w. class-B	470 175	12,5	7 7,2	5 12,6
BLX69A	D	SOT-48	c.w. class-B	470	13,5	20	4
BLX91A		SOT-48				1	11
BLX92A	D	SOT-48	c.w. class-B	470	28	2,5	11
BLX93A		SOT-48				7	8,5
BLX94A		SOT-48				25	6
BLX95	D	SOT-56	c.w. class-B	470	28	40	4,5
BLX96		SOT-48				0,5 (note 1)	6
BLX97	C	SOT-48	class-A	860	25	1,0 (note 1)	5,5
BLX98		SOT-48				3,5 (note 1)	5
BLY87A	C	SOT-48				8	9
BLY87C	D	SOT-120				8	12
BLY88A	C	SOT-48	c.w. class-B	175	13,5	15	7,5
BLY88C	D	SOT-120				15	8
BLY89A	C	SOT-56				25	6
BLY89C	D	SOT-120				25	6
BLY90	D	SOT-55	c.w. class-B	175	12,5	50	5
BLY91A	C	SOT-48				8	12
BLY91C	D	SOT-120	c.w. class-B	175	28	8	12
BLY92A	C	SOT-48				15	10
BLY92C	D	SOT-120				15	10
BLY93A	C	SOT-56				25	9
BLY93C	D	SOT-120	c.w. class-B	175	28	25	9
BLY94	D	SOT-55				50	7
2N3375	C	TO-60	c.w. class-B	100 400	28	7,5 3	8,8 4,8
2N3553	C	TO-39		175		2,5	10
2N3632	C	TO-60	c.w. class-B	175	28	13,5	5,9
2N3866	D	TO-39		400		1	10
2N3924		TO-39				4	6
2N3926	C	TO-60	c.w. class-B	175	13,5	7	5,4
2N3927		TO-60				12	4,8
2N4427	D	TO-39	c.w. class-B	175	12	1	10

Note: 1. $P_{o\ sync}$ at $d_{im} < -60$ dB.

wideband transistors
selection guide

- low noise
- excellent linearity
- high output voltage
- long-term reliability

Wideband transistors for MATV and CATV

BFQ34, BFQ68 and **BFR94** meet all NCTA cross-modulation and DIN intermodulation requirements. We guarantee 12-channel cross-modulation distortion to NCTA standard (better than −105 dB) and three-tone intermodulation to DIN-standard.

Interdigitated emitter and collector prevent "hot spots" and diffused emitter ballast resistors avoid second breakdown.

Ti-Pt-Au metallization:
Gold for conduction;
Titanium for adhesion;
Platinum as migration barrier.

Corresponding types in SOT-23 or SOT-89

	SOT-23	SOT-89
BFQ23	**BFT93**	—
BFQ34	—	**BFQ18A**
BFR90;A	**BFR92;A**	—
BFR91;A	**BFR93;A**	—
BFR96	—	**BFQ19**
BFW16A	—	**BFQ17**
BFW30	**BFR53**	—
BFY90	**BFS17**	—

Application	Recommended types
wideband aerial amplifiers band I to V (40-860 MHz). wideband distribution amplifiers.	BFQ22, 22S, 23, 24, 32, 34, 68 BFR90, 90A, 91, 91A, 95, 96, 96S BFW30, BFW92, 93, BFX89, BFY90
low noise wideband amplifiers in measuring equipment. r.f. amplifiers and mixers for communication systems (microwave link radar i.f. amplifiers).	BFQ22, 22S, 23, 24, 34, 68 BFR49, BFR90, 90A, 91, 91A, BFY90
high output channel and band aerial amplifiers in driver and final stages. channel amplifiers in CATV and MATV.	BFQ34, BFQ68, BFR64, 65, BFR95 BFW16A, 17A
high-voltage output stages in CATV and MATV wideband amplifiers.	BFQ34, BFQ68, BFR94

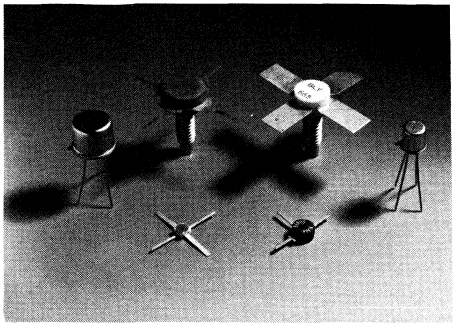
Tetrode MOS-FETS for v.h.f. and u.h.f. applications

- high gain
- extremely low noise
- excellent gain control
- silicon nitride glass barrier passivation for high reliability

Characteristics, measured at $V_{DS} = 10$ V; $I_D = 7$ mA; $V_{G2-S} = 4$ V

BF960 (UHF)	status D	y_{fs} typ 12 mA/V	F typ 2,8 dB at f = 800 MHz	SOT-103
BF980 (UHF)	N	y_{fs} typ 21 mA/V	F typ 2,8 dB at f = 800 MHz	SOT-103
BF981 (VHF)	D	y_{fs} typ 14 mA/V	F typ 0,7 dB at f = 200 MHz	SOT-103
BF982 (VHF)	D	y_{fs} typ 25 mA/V	F typ 1,2 dB at f = 200 MHz	SOT-103

abridged data



* VSWR at output < 2 measured at $f_{(2q-p)}$.
$f_p = 202$ MHz, $f_q = 205$ MHz or
$f_p = 798$ MHz, $f_q = 802$ MHz.
** Intermodulation distortion measured according to DIN three-tone test.

Wideband transistors

type all n-p-n	status	case	CIRCUIT VALUES (typ) f	Po*	Gp (GUM)	VCE	IC	RATINGS VCEO	ICM	Ptot	CHARACTERISTICS hFE	fT typ	F typ
			MHz	mW	dB	V	mA	V	mA	mW		GHz	dB
BFX89	D	TO-72	200 800	6	22 7	10	8	15	50	200	20-150	1,2	3,3 7,0
BFW92	D	SOT-37	200 800	8	23 11	10	10	15	50	190	20-150	1,6	4 at 500 MHz
BFY90	D	TO-72	200 800	12	23 8	10	14	15	50	200	25-150	1,4	2,5 5,5
BFW30	D	TO-72	200 800	15	21 7,5	5	30	10	100	250	> 25	1,6	< 5,0 at 500 MHz
BFW93	D	SOT-37	200 800	15	(22) (10,5)	5	30	10	100	190	> 25	1,7	< 5,0 at 500 MHz
BFW16A	D	TO-39	200 800	150 90	16 6,5	18	70	25	300	1500	> 25	1,2	< 6,0 —
BFW17A	D	TO-39	200	150	16	18	70	25	300	1500	> 25	1,1	—
BFR64	D	SOT-48	200 800	150 90	16 6,5	20	70	25	500	3500	> 25	1,2	6,0 —
BFR65	D	SOT-48	200 800	450 —	19 4,5	20	200	25	1000	5000	> 30	> 1,2	— —

type	polarity	status	case	CHARACTERISTICS (typ) dim** at f(p+q−r) dB	MHz	Vo mV	VCE V	IC mA	GUM typ dB	F at f typ dB	MHz
BFQ22; S	N	D	TO-72	—	—	—	—	—	16,0	1,9	500
BFQ23	P	D	SOT-37	−60	493,25	300	5	30	16,5	2,4	500
BFQ24	P	D	TO-72	—	—	—	—	—		2,4	500
BFQ32	P	D	SOT-37	−60	493,25	500	10	50	14	3,75	500
BFQ34	N	D	SOT-122	−60	793,25	1200	15	120	16	8	500
BFQ51	P	D	SOT-37	—	—	—	—	—	19	2,6	500
BFQ52	P	D	TO-72	—	—	—	—	—	17	2,7	500
BFQ53	N	D	TO-72	—	—	—	—	—	18	2,4	500
BFQ63	P	N	TO-72	—	—	—	—	—	11,5	2,3	500
BFQ68	N	D	SOT-122	−60	793,25	1600	15	240	13	—	800
BFR49	N	D	SOT-100	—	—	—	—	—	17	2,5	1000
BFR90; A	N	D	SOT-37	−60	493,25	150	10	14	19,5	2,4	500
BFR91	N	D	SOT-37	−60	493,25	300	5	30	16,5	1,9	500
BFR91A	N	D	SOT-37	−60	793,25	425	8	30	14	1,6	800
BFR94	N	D	SOT-48	−60	493,25	700	20	90	13,5	5	200
BFR95	N	D	TO-39	−61	194,25	1000	18	80	13,5	9	200
BFR96	N	D	SOT-37	−60	493,25	500	10	50	16	3,3	500
BFR96S	N	D	SOT-37	−60	793,25	700	10	70	11,5	4	800
BFT24	N	D	SOT-37	—	—	—	—	—	17	3,8	500

wideband modules

Wideband amplifier modules for every CATV requirement

We understand reliability. Our CATV modules give you the same high performance and reliability that you have come to expect with our well-known CATV/MATV transistors. A push-pull cascode circuit is used in the modules: cascode to reduce transistor non-linearities and noise, and push-pull to meet the highest requirements for second order distortion.

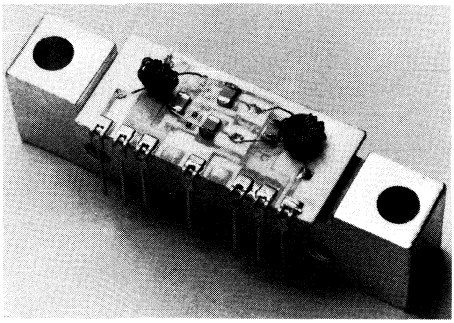
The silicon epitaxial high frequency transistors used in the modules are of proven reliability. Sputter etched titanium-platinum-gold metallization + silicon nitride glass barrier prevent electromigration. And gold-to-gold interconnections from crystal to substrate with 25 μm gold wire ensure freedom from "purple plague". Ballasting resistors are employed to obtain excellent second breakdown performance and a special configuration provides optimal current sharing.

Crystals are eutectically bonded to the substrate which is high quality alumina for good thermal conductivity and high strength. Some of the high stability evaporated NiCr resistors are laser trimmed for optimum d.c. current adjustment. The aluminium heatsink, nickel plated for solderability, is very firmly attached to the substrate for reliable operation. It will withstand extremely wide temperature variations.

All this, coupled with 100% inspection, adds up to very good high frequency performance in terms of high output voltages at low distortion and low noise over a wide operating temperature range with small spreads in power gain and d.c. current.

40 to 300 MHz

Characteristics		Pre-amplifiers				Final amplifiers and line extenders				
		BGY50	BGY52	BGY54	BGY56	BGY51	BGY53	BGY55	BGY57	BGY58
Max. d.c. current at V_B = +24 V	mA	180	180	180	180	220	220	220	220	340
Power gain at f = 50 MHz	dB	12,5 ±0,4	16,4 ±0,4	17 ±0,4	22 ±0,6	12,5 ±0,4	16,4 ±0,4	17 ±0,4	22 ±0,6	33 ±1
Slope cable equivalent 40-300 MHz	dB	+0,2 to +0,8	0 to +1	0 to +1	0 to +1	+0,2 to +0,8	0 to +1	0 to +1	0 to +1	+0,5 to +1,5
Max. flatness of gain 40-300 MHz	dB	±0,2	±0,1	±0,1	±0,2	±0,2	±0,1	±0,1	±0,2	±0,3
Min. return losses $Z_S = Z_L = 75$	dB	18	18	18	20	18	18	18	20	20
Min. output voltage at Intermod. dist. −60 dB to DIN 45004B; f = 300 MHz	dBmV	61	61	61	61,5	63,5	63,5	63,5	64	64
Max. second order dist. at V_O = 50 dBmV; f = 210 MHz	dB	−68	−68	−68	−64	−70	−70	−70	−66	−68
Max. noise figure f = 40 to 300 MHz	dB	7	6	6	6	8	7	7	7	6



Our team of CATV Applications Engineers and our product development team work in close cooperation.
Their technical support and advice are also available to customers.

More data on the devices listed below is available from the addresses listed on the back cover.

Notes
Module BGY60 is a 2 × 17 dB interstage amplifier

Data on the types BGY59, 60, 70, 71, 74 and 75 are preliminary.

40 to 440 MHz

BGY59	BGY60	Characteristics		Pre-amplifiers BGY70	Pre-amplifiers BGY74	Final amplifiers BGY71	Final amplifiers BGY75
340	340	Max. d.c. current at $V_B = +24V$	mA	180	180	220	220
38,5 ± 1	33,3 ± 1	Power gain at f = 50 MHz	dB	12,5 ± 0,4	17 ± 0,4	12,5 ± 0,4	17 ± 0,4
0 to + 1	+ 0,5 to + 1,5	Slope cable equivalent 40-440 MHz	dB	+ 0,2 to + 0,8	+ 0,5 to + 1,5	+ 0,2 to + 0,8	+ 0,5 to + 1,5
± 0,3	± 0,3	Max. flatness of gain 40-440 MHz	dB	± 0,2	± 0,1	± 0,2	± 0,1
20	20	Min. return losses $Z_S = Z_L = 75$	dB	18	18	18	18
64	64	Min. output voltage at Intermod. dist. − 60 dB to DIN 45004B; up to 440 MHz	dBmV	62,5	62,5	65	65
− 68	− 66	Max. second order dist. at $V_O = 50$ dBmV; f = 265 MHz	dB	− 68	− 68	− 70	− 70
6	6	Max. noise figure f = 40 to 440 MHz	dB	7	6	8	7

wideband modules
hybrid i.c. amplifiers

For use in RATV, MATV and CATV systems and for general purposes in v.h.f. and u.h.f. applications.

All amplifiers:

frequency range	f	40 to 860 MHz
source and load (characteristic) imp.	$R_S = R_l + Z_o$	75 Ω
operating ambient temperature	T_{amb}	−20 to +70°C
operating mounting-base temperature (OM323; A and OM337; A)	T_{mb}	−30 to +100°C
pinning (except OM322)	suitable for 0,1-inch grid	
finish	resin coated	

Typical characteristics at $V_B = 24$ V ± 10%

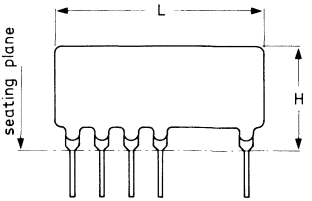
type	status	gain $\lvert sf\rvert^2$ dB	$V_{O(rms)}$* dBμV	supply current mA	noise figure dB	max VSWR typical values input	output	dimensions L mm	H mm
OM320	C	15,5	92	23	5,5	2,2	2,5	30	12
OM321	C	15,5	98	33	6	2,5	2	30	12
OM322	C	15	103	60	7	1,7	1,7	—	—
OM323; A**	C	15	113	100	9	1,9	2,3	30	18
OM335	C	27	98	35	5,5	1,9	3,2	30	18
OM336	C	22	105	65	7	1,4	1,6	30	19
OM337; A**	C	26	112	115	9,8	2,3	1,8	30	18
OM339	C	28	105	67	6	1,5	1,5	30	19

Improved design techniques for h.f. performance resulted in reduced dimensions of the 12 V range.

Typical characteristics at $V_B = 12$ V ± 10%

OM345	D	12	97	11,5	5,5	2,0	1,4	14	8
OM350	D	18	98	18	6	1,5	1,9	19	9
OM360	D	23	105	55	7	1,3	1,5	27	9
OM361	D	28	105	50	6	1,5	1,7	27	9
OM370	D	28	111	105	7	2,3	1,9	27	22

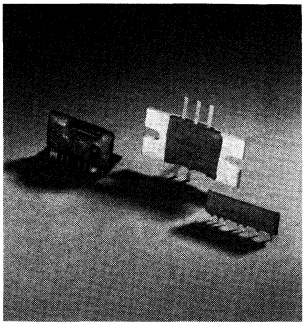
* Minimum output voltage at −60 dB intermodulation distortion (DIN 45004, par. 6.3: 3-tone, f = 470 MHz).
** The OM323A and OM337A need an external collector-coil and output capacitor, the OM323 and OM337 have these built-in.

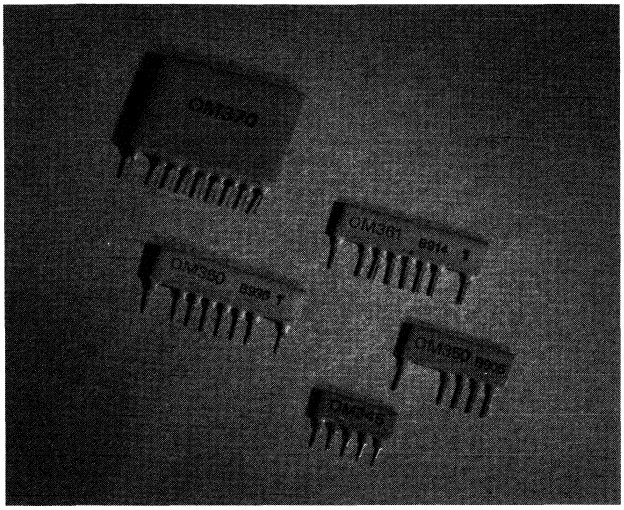


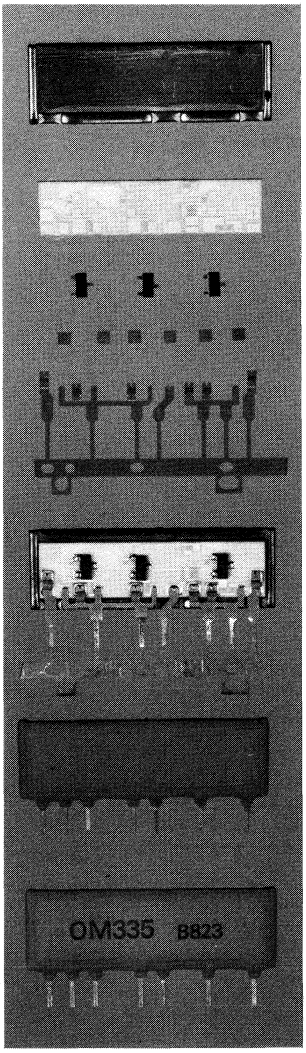
Conversion table for 75 Ω impedance

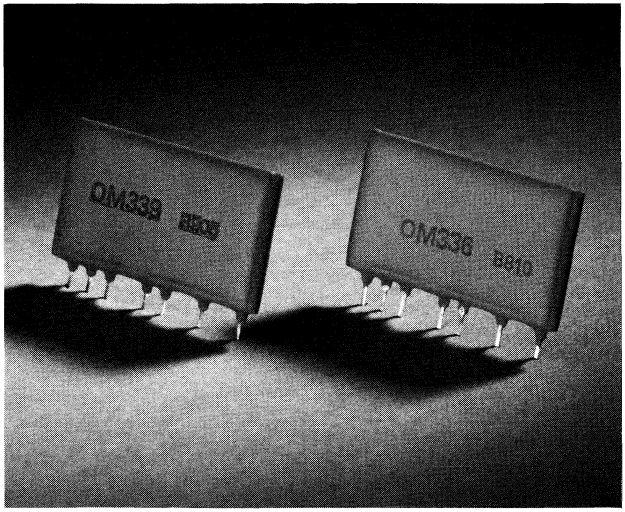
dBμV	mV	dBm
92	39,8	−16,75
98	79,4	−10,75
103	141,3	− 5,75
105	177,8	− 3,75
112	398,1	+ 3,25
113	446,7	+ 4,25

A selection from our range of hybrid IC amplifiers









microminiature semiconductors for hybrid circuits

quoted values are max., unless otherwise specified

High speed switching diodes

type	code on case	status	case	RATINGS V_R V	I_F mA	I_{FRM} mA	CHARACTERISTICS t_{rr}* ns	C_d pF	V_F at 1 mA mV	V_F at 10 mA mV	I_F 50 mA mV	100/ 150 mA mV
BAS16	A6	D	SOT-23	75	250	250	6	2	715	855	1000	—/1250
BAS19	A8			100								
BAS20	A81	D	SOT-23	150	200	625	50	5	—	—	—	1000/—
BAS21	A82			200								
BAV70	A4 ▲							1,5				
BAV99	A7 ▲	D	SOT-23	70	250	250	6	1,5	715	855	1000	—/1250
BAW56	A1 ▲							2				

Stabistor diode

BAS17	A91	D	SOT-23	—	—	250	—	140	760	830	—	960/—

Schottky barrier diode

BAT17	A3	D	SOT-23	4	30	—	—	1	450	600	—	—

Band switch diode

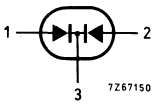
BAT18	A2	D	SOT-23	35	100	—	—	1	—	—	—	1200/—

Variable capacitance diodes

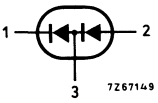
type	code on case	status	case	RATINGS V_R V	CHARACTERISTICS C_d at pF	V_R V	C_d ratio at typ	V/..V	r_D at C_d Ω	pF
BBY31	S1	D	SOT-23	28	1,8-2,8	25	5	3/25	1,2	9
BBY40	S2	D	SOT-23	28	4,3-6	25	5 to 5,6	3/25	0,6	25

▲ Double diodes

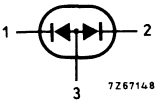
BAV70



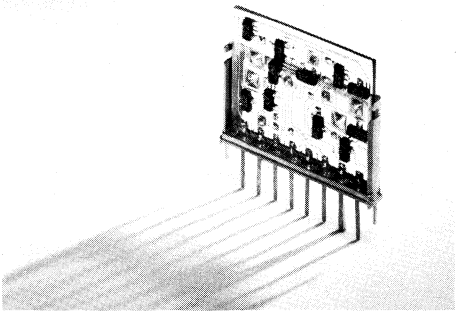
BAV99



BAW56



* I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω. Measured at I_R = 1 mA



Voltage regulator diodes

Series number	**BZX78— . . .**	**BZX84— . . .**	**BZV49— . . .**
P_{tot} (mW)	1000	350	1000
Voltage tolerance (%)	5	5 (2% tolerance on request)	5
I_{FRM} (mA)	400	250	250
I_{ZRM} (mA)	limited by P_{ZRM} max	250	limited by P_{tot} max
Case	SOT-89	SOT-23	SOT-89
Status	N	D	N
Range	5,1 to 75 V	2,4 to 75 V	2,4 to 75 V

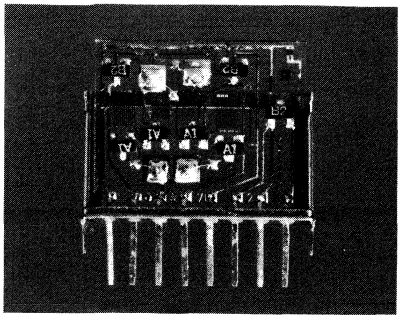
For branding code see Handbook S7

microminiature semiconductors for hybrid circuits

Polarity indication P = p-n-p
N = n-p-n

Low frequency transistors

type	code on case	polarity	status case	RATINGS V_{CBO} (V_{CES}) V	V_{CEO} V	I_C mA	P_{tot} mW	CHARACTERISTICS h_{FE} at I_C min – max	mA	F max dB	f_T typ MHz	V_{CEsat} at I_C max mV	mA
general purpose, low level													
BC807-16;R	5A;5AR		D					100 – 250					
BC807-25;R	5B;5BR	P	SOT-23	(50)	45	500	310(b)	160 – 400	100	—	100	700	500
BC807-40;R	5C;5CR							250 – 600					
BC808-16;R	5E;5ER		D					100 – 250					
BC808-25;R	5F;5FR	P	SOT-23	(30)	25	500	310(b)	160 – 400	100	—	100	700	500
BC808-40;R	5G;5GR							250 – 600					
BC817-16;R	6A;6AR		D					100 – 250					
BC817-25;R	6B;6BR	N	SOT-23	(50)	45	500	310(b)	160 – 400	100	—	200	700	500
BC817-40;R	6C;6CR							250 600					
BC818-16;R	6E;6ER		D					100 – 250					
BC818-25;R	6F;6FR	N	SOT-23	(30)	25	500	310(b)	160 – 400	100	—	200	700	500
BC818-40;R	6G;6GR							250 – 600					
BC846A;R	1A;1AR	N	D	80	65	100	200(a)	110 – 220	2	2	300	600	100
BC846B;R	1B;1BR		SOT-23					200 – 450					
BC847A;R	1E;1ER		D					110 – 220					
BC847B;R	1F;1FR	N	SOT-23	50	45	100	200(a)	200 – 450	2	2	300	600	100
BC847C;R	1G;1GR							420 – 800					
BC848A;R	1J;1JR		D					110 – 220					
BC848B;R	1K;1KR	N	SOT-23	30	30	100	200(a)	200 – 450	2	2	300	600	100
BC848C;R	1L;1LR							420 – 800					
BC849B;R	2B;2BR	N	D	30	30	100	200(a)	200 – 450	2	4	300	600	100
BC849C;R	2C;2CR		SOT-23					420 – 800					
BC850B;R	2F;2FR	N	D	50	45	100	200(a)	200 – 450	2	4	300	600	100
BC850C;R	2G;2GR		SOT-23					420 – 800					
BC856A;R	3A;3AR	P	D	80	65	100	200(a)	125 – 250	2	10	150	650	100
BC856B;R	3B;3BR		SOT-23					220 – 475					
BC857A;R	3E;3ER	P	D	50	45	100	200(a)	125 – 250	2	10	150	650	100
BC857B;R	3F;3FR		SOT-23					220 – 475					
BC858A;R	3J;3JR		D					125 – 250					
BC858B;R	3K;3KR	P	SOT-23	30	30	100	200(a)	220 – 475	2	10	150	650	100
BC858C;R	3L;3LR							420 – 800					



The P_{tot} rating of these microminiature devices depends on the dimensions of the ceramic substrate on which each device is mounted, as well as on T_{amb}. Dimensions of the ceramic substrate are indicated by a code letter between brackets placed after the P_{tot} value.

Code (a): 7 mm × 5 mm × 0,6 mm.
(b): 15 mm × 15 mm × 0,6 mm.
(c): area = 2,5 cm²; thickness = 0,7 mm.

Low frequency transistors

type	code on case	polarity	status	RATINGS V_{CBO} (V_{CES}) V	V_{CEO} V	I_C mA	P_{tot} mW	CHARACTERISTICS h_{FE} at I_C min – max	mA	F max dB	f_T typ MHz	V_{CEsat} at I_C max mV	mA
general purpose, low level													
BC859A;R	4A;4AR		D					125 – 250					
BC859B;R	4B;4BR	P	SOT-23	30	30	100	200(a)	220 – 475	2	4	150	650	100
BC859C;R	4C;4CR							420 – 800					
BC860A;R	4E;4ER		D					125 – 250					
BC860B;R	4F;4FR	P	SOT-23	50	45	100	200(a)	220 – 475	2	4	150	650	100
BC860C;R	4G;4GR							420 – 800					
BCW29;R	C1;C4	P						120 – 260			150	300	
BCW30;R	C2;C5	P						215 – 500			150	300	
BCW31;R	D1;D4	N	D SOT-23	32	32	100	350(a)	110 – 220	2	10	300	250	10
BCW32;R	D2;D5	N						200 – 450			300	250	
BCW33;R	D3;D6	N						420 – 800			300	250	
BCW60A	AA							120 – 220					
BCW60B	AB	N	D	32	32	200	150(a)	180 – 310	2	6	250	350	10
BCW60C	AC		SOT-23					250 – 460					
BCW60D	AD							380 – 630					
BCW61A	BA							120 – 220					
BCW61B	BB	P	D	32	32	200	150(a)	180 – 310	2	6	180	250	10
BCW61C	BC		SOT-23					240 – 460					
BCW61D	BD							380 – 630					
BCW69;R	H1;H4	P						120 – 260			150	300	
BCW70;R	H2;H5	P	D	50	45	100	350(a)	215 – 500	2	10	150	300	10
BCW71;R	K1;K4	N	SOT-23					110 – 220			300	250	
BCW72;R	K2;K5	N						200 – 450			300	250	
BCV71;R	K7;K71	N		80	60			110 – 220			300	250	
BCV72;R	K8;K81	N	D	80	60	100	350(a)	200 – 450	2	10	300	250	10
BCW81;R	K3;K31	N	SOT-23	50	45			420 – 800			300	250	
BCW89;R	H3;H31	P		80	60			120 – 260			150	300	
BCX70G	AG							120 – 220					
BCX70H	AH	N	D	(45)	45	200	150(a)	180 – 310	2	6	250	350	10
BCX70J	AJ		SOT-23					250 – 460					
BCX70K	AK							380 – 630					
BCX71G	BG							120 – 220					
BCX71H	BH	P	D	(45)	45	200	150(a)	180 – 310	2	6	180	250	10
BCX71J	BJ		SOT-23					250 – 460					
BCX71K	BK							380 – 630					

microminiature semiconductors for hybrid circuits

Polarity indication P = p-n-p
N = n-p-n

Low frequency transistors

type	code on case	po-larity	status case	RATINGS V_{CBO} (V_{CES}) V	V_{CEO} V	I_C mA	P_{tot} mW	CHARACTERISTICS h_{FE} at I_C min – max	mA	F max dB	f_T typ MHz	V_{CEsat} at I_C max mV	mA
general purpose — also for switching and driver applications (industrial)													
BCX17;R	T1;T4	P		(50)	45						100		
BCX18;R	T2;T5	P	D	(30)	25	500	425(b)	100 – 600	100		100	620	500
BCX19;R	U1;U4	N	SOT-23	(50)	45						200		
BCX20;R	U2;U5	N		(30)	25						200		
BCX51	—	P	D	45	45			40 – 250					
BCX52	—	P	SOT-89	60	60	1000	1000(c)	40 – 160	150		50	500	500
BCX53	—	P		100	80			40 – 160					
BCX54	—	N	D	45	45			40 – 250					
BCX55	—	N	SOT-89	60	60	1000	1000(c)	40 – 160	150		130	500	500
BCX56	—	N		100	80			40 – 160					
general purpose — low level — low noise													
BCF29;R	C7;C77	P						120 – 160			150	300	
BCF30;R	C8;C9	P	D	32	32	100	350(a)	215 – 500	2	4	150	300	10
BCF32;R	D7;D77	N	SOT-23					200 – 450			300	250	
BCF33;R	D8;D81	N						420 – 800			300	250	
BCF70;R	H7;H71	P	D	50	45	100	350(a)	215 – 500	2	4	150	300	10
BCF81;R	K9;K91	N	SOT-23					420 – 800			300	250	

High frequency transisitors

type	code on case	status case	RATINGS V_{CBO} V	V_{CEO} V	I_C mA	P_{tot} mW	CHARACTERISTICS h_{FE} at I_C min – max	mA	F at f typ dB	MHz	f_T typ MHz	C_{re} at f typ pF	MHz
polarity n-p-n													
BFS18;R	F1;F4	D	30	20	30	250(a)	30/125	1	4	100	200	0,85	
BFS19;R	F2;F5	SOT-23			30		65/225	1	4	100	260	0,85	1
BFS20;R	G1;G4				25		40/—	7	—	—	450	0,35	
polarity p-n-p													
BF536	G3	D SOT-23	30	30	25	200(a)	25/—	1	5	200	350	—	—
BF550;R	G2;G5	D SOT-23	40	40	25	200(a)	50/—	1	2	0,1	325	0,5	1
BF569	G6		40	35	30	200(a)	25/—	3	4,5	800	900	0,33	1
BF579	G7	D	20	20	25	150(a)	20/—	10	4,5	800	1350	0,46	0,5
BF660	G8	SOT-23	40	30	25	200(a)	30/—	3	—	—	650	0,65	1
BF767	G9		30	30	20	200(a)	15/—	3	4	800	900	0,3	0,5

The P_{tot} rating of these microminiature devices depends on the dimensions of the ceramic substrate on which each device is mounted, as well as on T_{amb}. Dimensions of the ceramic substrate are indicated by a code letter between brackets placed after the P_{tot} value.

Code (a): 7 mm × 5 mm × 0,6 mm.
(b): 15 mm × 15 mm × 0,6 mm.
(c): area = 2,5 cm²; thickness = 0,7 mm.

Wideband transistors

type	polarity	code on case	status case	RATINGS V_{CBO} V	V_{CEO} V	I_C mA	P_{tot} mW	CHARACTERISTICS h_{FE} min	f_T typ GHz	G_{UM} at f typ dB	MHz	V_o typ (d_{im} = −60 dB) mV
BFQ17			D	40	25	150	1000(c)	25	1,2	16-6,5	200/800	—
BFQ18A	N	—	SOT-89	25	15	150	1000(c)	25	3,6	—	—	700
BFQ19				20	15	75	500(c)	25	5	18,5-7,5	200/800	—
BFR53;R	N	N1;N4	D SOT-23	18	10	50	250(a)	25	2	22-10,5	200/800	100
BFR92;R	N	P1;P4	D	20	15	25	200(a)	25	5	18	500	150
BFR93;R		R1;R4	SOT-23	15	12	35				16,5		300
BFR92A;R	N	P2;P5	D	20	15	25	200(a)	40	5	16	800	150
BFR93A;R		R2;R5	SOT-23	15	12	35	250(a)			14		425
BFS17;R	N	E1;E4	D SOT-23	25	15	25	250(a)	20/150	1,3	—	—	100
BFT25;R	N	V1;V4	D SOT-23	8	5	2,5	50(a)	20	2,3	25-12	200/800	—
BFT92;R	P	W1;W4	D	20	15	25	200(a)	20	5	18	500	150
BFT93;R		X1;X4	SOT-23	15	12	35				16,5		300

Field-effect transistors

type	code on case	status	case	RATINGS ± V_{DS} V	P_{tot} mW	CHARACTERISTICS $-I_{GSS}$ max nA	I_{DSS} min/max mA	$-V_{(P)GS}$ max V	y_{fs} at 1 kHz min mA/V	C_{rs} max pF	V_n max μV
general purpose – low level amplifiers											
BF510	S6						0,7/3	0,8 (typ)	2,5		
BF511	S7	D	SOT-23	20	300	10	2,5/7	1,5 (typ)	4,0	0,4	—
BF512	S8						6/12	2,2 (typ)	4,0		
BF513	S9						10/18	3 (typ)	3,5		
BFR30	M1	D	SOT-23	25	250(a)	0,2	4/10	5	1	1,5	0,5
BFR31	M2						1/5	2,5	1,5		
BFT46	M3	D	SOT-23	25	250(a)	0,2	0,2/1,5	1,0	1,0	1,5	0,5
BSR56	M4						50/—	10			
BSR57	M5	D	SOT-23	40	250(a)	1	20/100	6	—	5	—
BSR58	M6						8/80	4			

microminiature semiconductors for hybrid circuits

The P_{tot} rating of these microminiature devices depends on the dimensions of the ceramic substrate on which each device is mounted, as well as on T_{amb}.
Dimensions of the ceramic substrate are indicated by a code letter between brackets placed after the P_{tot} value.

Code (a): 7 mm × 5 mm × 0,6 mm.
(b): 15 mm × 15 mm × 0,6 mm.
(c): area = 2,5 cm²; thickness = 0,7 mm.

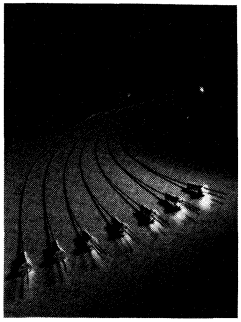
Switching

type	code on case	polarity	status	case	RATINGS V_{CBO} V	V_{CEO} V	I_C mA	P_{tot} mW	CHARACTERISTICS h_{FE} at I_C min/max	mA	V_{CEsat} at I_C max V	mA	t_{off} at I_C max ns	mA
BSV52;R	B2;B4	N	D	SOT-23	20	12	100	250(a)	40/120	10	0,25	10	18	10
BSS63;R	T3;T6	P	D	SOT-23	110	100	100	350(a)	30/—	25	0,25	25	—	—
BSS64;R	U3;U6	N			120	80			20/—	10	0,2	50	1000	15
BSR12;R	B5;B8	P	D	SOT-23	15	15	100	250(a)	30/120	50	0,45	100	30	30
BSR13;R	U7;U71	N	D	SOT-23	60	30	800	425(b)	100/300	150	0,4	150	—	—
BSR14;R	U8;U81	N			75	40	800				0,3	150	285	150
BSR15;R	T7;T71	P			60	40	600				1,6	500	100	150
BSR16;R	T8;T81	P			60	60	600				1,6	500	100	150
BSR17;R	U9;U91	N	D	SOT-23	60	40	200	350(a)	100/300	10	0,3	50	250	10
BSR18;R	T9;T91	P	N	SOT-23	40	40	200	350(b)	50/150	10	0,95	50	260	10
BSR30		P	D	SOT-89	70	60	1000	1000(c)	40/120	100	1,2	500	650	100
BSR31					70	60			100/300					
BSR32					90	80			40/120					
BSR33					90	80			100/300					
BSR40		N	D	SOT-89	70	60	1000	1000(c)	40/120	100	0,5	500	1000	100
BSR41					70	60			100/300					
BSR42					90	80			40/120					
BSR43					90	80			100/300					
BST15;R	—;—	P	D	SOT-89	200	200	1000	1000(c)	30/150	50	2,5	50	125	500
BST16;R	—;—	P	D	SOT-89	350	300	1000	1000(c)	30/120	50	2,0	50	125	500
BRY61		PNPN	D	SOT-23	$V_{GA} < 70$ V		$I_A < 180$ mA		$I_P < 5\,\mu$A $I_V > 30\,\mu$A					

Video black and white and colour tv

type	polarity	status	case	RATINGS V_{CBO} V	V_{CEO} V	I_C mA	P_{tot} at W	T_{amb} °C	CHARACTERISTICS h_{FE} at min	I_C mA	f_T MHz
BF622	N	D	SOT-89	250	250	20	1(c)	25	50	25	>60
BF623	P										

fibre-optic communications
emitters-receivers



Optical fibre technology has matured to the point where it is a serious contender to take over many of the traditional tasks of coaxial cable. Amongst its advantages are

- very large bandwidth, high information capacity
- immunity to electromagnetic interference
- low attenuation, independent of frequency
- electrical isolation of input and output, no earth-loop problems
- wide-range temperature independence

As input and output devices for optical fibres, the emitters and receivers listed here are but the first in a projected range of Philips products for fibre-optic signal transfer in the broadcasting and telecommunication industries.

Emitters

CQX60 GaAlAs LEDs emitting 300 μW/sr at 830 nm.
CQX61 150 μW/sr at 830 nm.
Enlarged TO-18 coupled to a small light guide for use in active connectors.

CQX62 GaAlAs LEDs emitting 300 μW/sr at 830 nm.
CQX63 150 μW/sr at 830 nm.
Enlarged TO-18 with fibre pigtail of 200 μm core diameter.

375CQY AlGaAs double heterostructure diode laser, coupled to a 50 μm graded index silica fibre; radiant output power 3 mW, at 850 nm.
Built-in high speed PIN diode for monitoring.

Receivers

BPW44 Si-PIN diode in enlarged TO-18 with fibre pigtail of 200 μm diameter.

BPW45 Si PIN diode with built-in light guide for use in BNC, TNC and SMA optical connectors.

368BPY Si avalanche photodiode, hermetically sealed in modified TO-18.
Coupled directly to a graded-index quartz fibre of 50 μm core diameter.

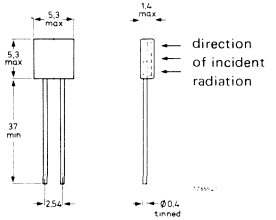
photoconductive devices
photosensitive devices

These devices are mainly used in combination with a light source for go/no-go detection as in card readers, barriers, and industrial safety devices.

Photoconductive devices

CdS cells

type	status	P max mW	V max V	r_{do} min MΩ	r_{lo} * typ kΩ
plastic encapsulated					
RPY58A	D	100	50	0,2	0,6

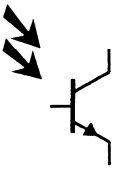


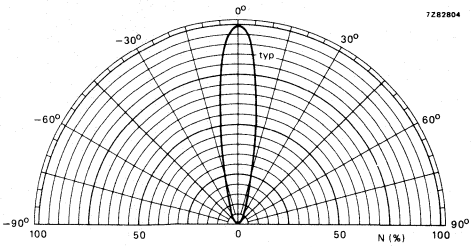
Photosensitive devices

Diodes		RATINGS			CHARACTERISTICS			
type	status	V_R	I_F	P_{tot}	N * typ	$I_{R(D)}$ at V_R max		λ_{pk}
		V	mA	mW	nA/lx	μA	V	nm
BPX40	D	18	5	—	14	0,5	15	800
BPX41	D	18	10	—	40	1	15	800
BPX42	D	12	50	—	150	5	10	800
BPW50	D	32	—	150	—	0,03	10	930

* V_R = 0; T_C = 2700 K.

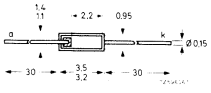
Transistors — n-p-n		RATINGS			CHARACTERISTICS			λ_{peak} typ 800 nm	
type	status	V_{CEO}	I_C	P_{tot}	N	$I_{CEO(L)}$ at E_e min		$I_{CEO(D)}$ at V_{CE} max	
		V	mA	mW	μA/lx	mA	mW/cm²	μA	V
BPW22A-1	D	50	25	100	—	1,5	1	0,1	30
-11						5,0			
BPX25	D	32	100	300	>5	—	7,7	0,5	24
BPX29					>0,25				
BPX71						0,5			
BPX71-203	D	50	20	50	—	4	20	0,025	30
-204						7			
BPX72						0,5			
BPX72D	D	30	25	180	—	0,85	4,75	0,1	20
E						1,4			
F						2,4			
BPX95C-1	D	30	25	100	—	3	1	0,1	20
-2						10			



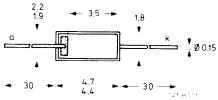


Polar response of relative sensitivity of BPX95C.

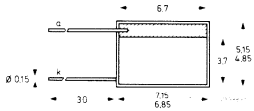
BPX40



BPX41



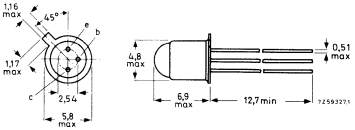
BPX42



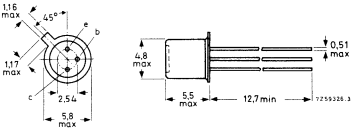
Note: BPX40 to 42 are unencapsulated.

BPX25 in TO-18 (except for lens)
collector to case

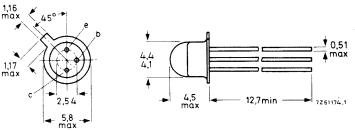
dimensions in mm



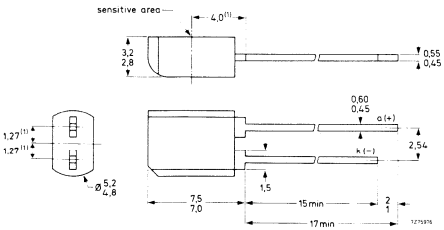
BPX29 in TO-18 (except for window)
collector to case



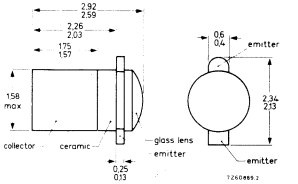
BPX72
in SOT-70



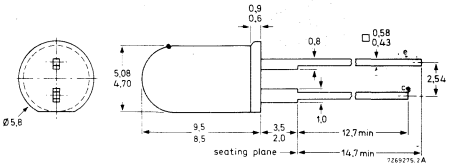
BPW50
in SOD-67



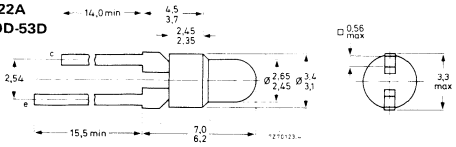
BPX71
in DO-31



BPX95C in SOD-63



BPW22A
in SOD-53D



light emitting diodes

LEDs combine the advantages of semiconductors (long life, reliability, etc.) with the high brightness of incandescent lamps. There is a huge increase in applications of LEDs in the consumer field — in tv channel indicators, bar graph arrays for level indications, etc.

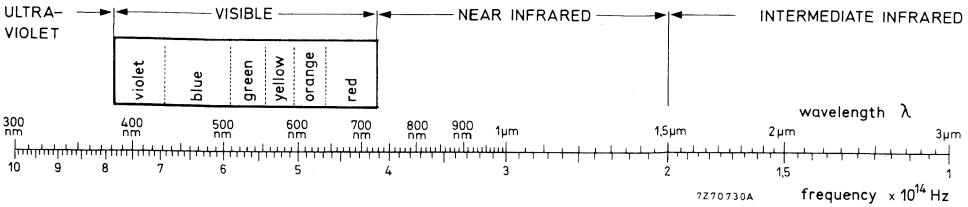
Infrared

type	status	RATINGS I_F	V_R	P_{tot}	CHARACTERISTICS $\varnothing_e$ min	I_e min	measured λ_{pk} typ	at $\alpha_{50\%}$ typ	I_F
		mA	V	mW	μW	μW/sr	nm	deg.	mA
CQL10 (laser)	D	—	—	—	typ 5000	—	780	60 * 34 **	—
CQY11B	D	30	2	50	60	typ 64	880	72	20
CQY11C	D	30	2	50	typ 50	typ 1250	880	7	20
CQY49B	D	100	2	150	—	300	930	80	50
CQY49C	D	100	2	150	—	3000	930	15	50
CQY50	D	100	2	150	160	180	930	35	20
CQY52	D	100	2	150	400	450	930	35	20
CQY58A-I	D	50	5	100	typ 1000	1000	930	20	20
-II						3000			
CQY89A-1	D	130	5	215	7000	9000	930	40	100
-2						15000			

Red

type	status	RATINGS I_F	V_R	P_{tot}	CHARACTERISTICS I_v typ	$\alpha_{50\%}$ typ	measured at I_F
		mA	V	mW	mcd	deg.	mA
CQW10	D	20	5	60	1,5	100	10
CQX10-I	D	30	5	120	> 0,7	50 ***	10
II					1,0 to 2,2		
III					2,6 to 3,5		
IV					> 3		
CQX51-I	D	20	3	60	1,6 to 4,2	55	10
II					3 to 7		
III					5 to 11		
CQX54	N	20	5	60	20	20	10
CQX55 to 58	N	30	5	120	1	—	10
CQY24B-I	D	50	3	100	> 0,7	55	20
II					1,0 to 2,2		
III					1,6 to 3,5		
IV					> 3		
CQY54	D	50	3	100	> 0,3	80	20
CQY54-I					0,7 to 1,6		
II					1,0 to 2,2		
III					> 1,6		

* perpendicular to the junction plane.
** parallel to the junction plane.
*** in plane of connections.



Green

type	status	RATINGS I_F mA	V_R V	P_{tot} mW	CHARACTERISTICS I_v typ mcd	$\alpha_{50\%}$ typ deg.	measured at I_F mA
CQW11	D	20	5	60	1,5	100	10
CQX11-I	D	30	5	120	>0,7	50*	10
II					1,0 to 2,2		
III					1,6 to 3,5		
IV					>3		
CQX64	N	20	5	60	20	20	10
CQX65 to 68	N	30	5	120	1	—	10
CQY94-I	D	20	3	60	>0,7	60	10
II					1,0 to 2,2		
III					1,6 to 3,5		
IV					>3		
CQY95	D	20	3	60	>0,3	60	10
CQY95-I					0,7 to 1,6		
II					1,0 to 2,2		
III					>1,6		

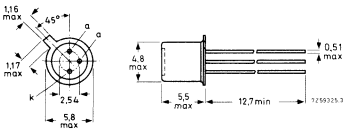
Yellow

CQW12	D	20	5	60	1,5	100	10
CQX12-I	D	30	5	120	>0,7	50*	10
II					1,0 to 2,2		
III					1,6 to 3,5		
IV					>3		
CQX74	N	20	5	60	20	20	10
CQX75 to 78	N	30	5	120	1	—	10
CQY96-I	D	20	3	60	>0,7	60	10
II					1,0 to 2,2		
III					1,6 to 3,5		
IV					>3		
CQY97	D	20	3	60	>0,3	60	10
CQY97-I					0,7 to 1,6		
II					1,0 to 2,2		
III					>1,6		

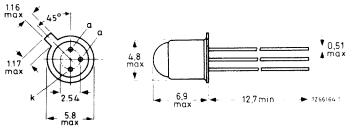
* In plane of connections.

light emitting diodes

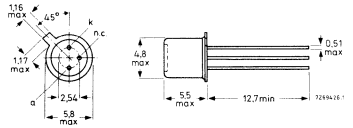
CQY11B in TO-18 (except for window)



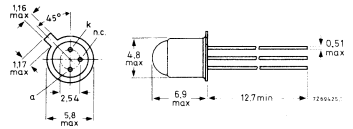
CQY11C in TO-18 (except for lens)



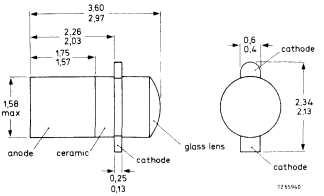
CQY49B in TO-18 (except for window)



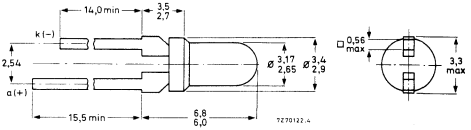
CQY49C in TO-18 (except for lens)



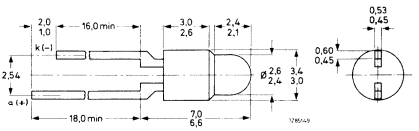
CQY50 and 52 in DO-31 (except for length)



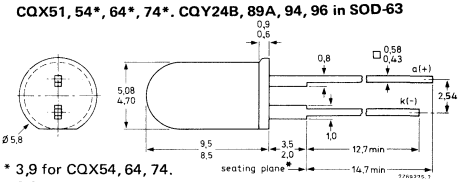
CQY54, 95, 97 in SOD-53C



CQY58A in SOD-53D

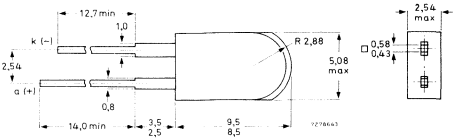


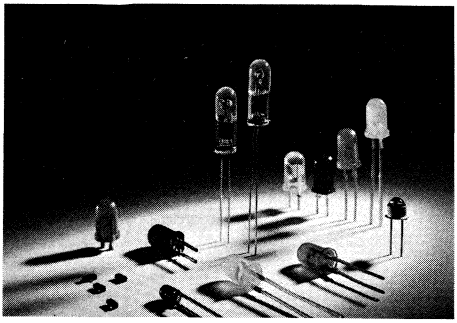
CQX51, 54*, 64*, 74*. CQY24B, 89A, 94, 96 in SOD-63



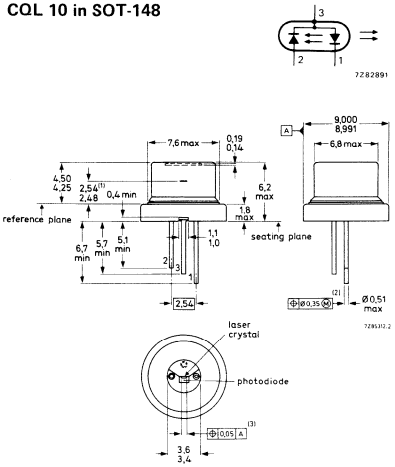
* 3,9 for CQX54, 64, 74.
2,6

CQX10 to 12 in SOD-65

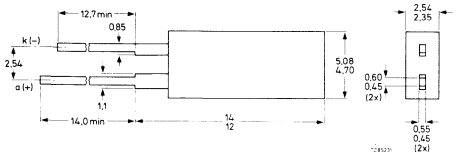




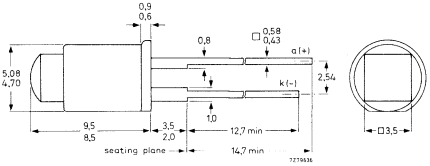
CQL 10 in SOT-148



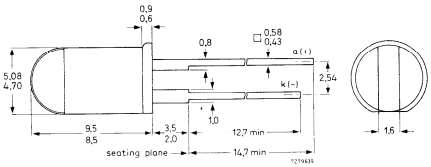
CQW10



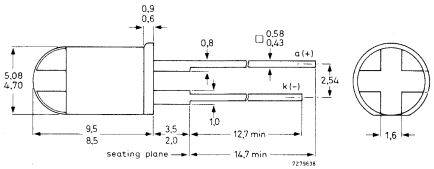
CQX55, 65, 75 in SOD-63C



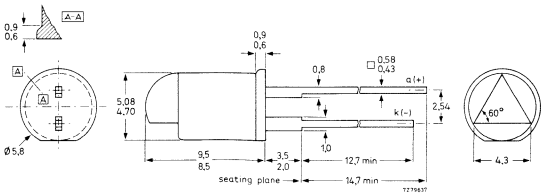
CQX56, 66, 76 in SOD-63T



CQX57, 67, 77 in SOD-63P



CQX58, 68, 78 in SOD-63M



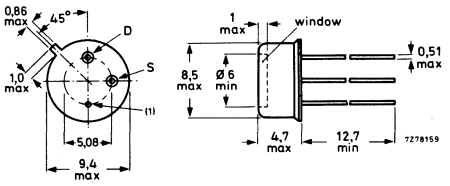
infrared detectors

The detectors shown on this page are our standard range and are not representative of the numerous types we produce for specialist applications and to customer's specifications. The devices shown here are room temperature devices, whereas most of the non-standard types are dewar cooled. For further information contact our local sales engineer.

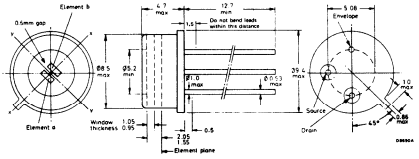
type	status	operating temperature K	spectral response μm	responsivity typ V/W	N.E.P. typ W/Hz$^{1/2}$
RPY86	D	298	6,5 ± 0,5 to > 14	(10 μm, 10) 600	(10 μm, 10, 1) $0,9 \times 10^{-9}$
RPY87	D	298	1,0 to > 15	(6 μm, 10) 500	(6 μm, 10, 1) $1,05 \times 10^{-9}$
RPY88	D	298	6,5 ± 0,5 to > 14	(10 μm, 10) 300	(10 μm, 10, 1) $1,65 \times 10^{-9}$
RPY89	D	298	1,0 to > 15	(6 μm, 10) 250	(6 μm, 10, 1) $2,0 \times 10^{-9}$
RPY93	D	298	6,5 ± 0,5 to > 14	(10 μm, 10) 800*	(10 μm, 10, 1) $1,4 \times 10^{-9}$*
RPY96	D	298	6,5 ± 0,5 to > 14	(10 μm, 10) 130	(10 μm, 10, 1) $3,5 \times 10^{-9}$

* Each element.

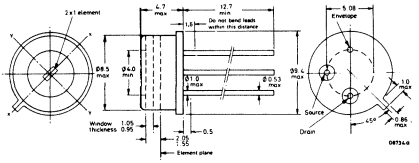
RPY86 to 89 in SOD-49D



RPY93 in SOT-49E (low profile TO-5)



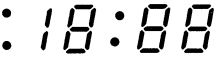
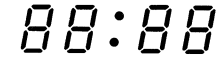
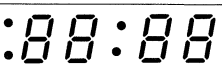
RPY96 in SOT-49F (low profile TO-5)



displays

Segment read-out displays

type		status	height of character mm	RATINGS I_F mA	V_R V	CHARACTERISTICS I_v at μcd	I_F mA	λ_{pk} nm
CQ209S	1½-digit red LEDs	N	12,7	20	3	100	5	700
CQ216X	2-digit super-red LEDs common cathode	N	12,7	20	3	50	5	630
CQ216Y	common anode	N	12,7	20	3	50	5	630
CQ327 CQ330 CQ331 CQ332	compact 4-digit red LED clock displays common cathode	N	15	20	3	200	5	700
CQ327R CQ330R CQ331R CQ332R	common anode	N	15	20	3	200	5	700
CQ427 CQ430 CQ431 CQ432	4-digit red LED clock displays common cathode	N	15	20	3	100	5	700
CQ427R CQ430R CQ431R CQ432R	common anode	N	15	20	3	100	5	700

series connection	common cathode	common anode	fully displayed fonts
CQ209S	—	—	
—	**CQ216X**	**CQ216Y**	
—	**CQ327** **CQ427**	**CQ327R** **CQ427R**	
—	**CQ330** **CQ430**	**CQ330R** **CQ430R**	
—	**CQ331** **CQ431**	**CQ331R** **CQ431R**	
—	**CQ332** **CQ432**	**CQ332R** **CQ432R**	

liquid crystal displays

For detailed information please refer to
VIDELEC Ltd.
Hardstrasse 5
CH - 5600 Lenzburg / Switzerland
Tel : 064/50 11 91
Telex : 68570 videc ch

Liquid Crystal Displays for digital wrist-watches

Standard Sizes

Type	Overall dimensions	Digit height	Standard designs
LC1509	14,8 x 9,0 mm	3,6 mm	3,5 or 4 digits
LC1612	15,7 x 12,4 mm	4,3 mm	3,5 or 6 digits
LC2011	20,5 x 11,5 mm	4,7 mm	3,5 or 4 or 6 digits
LC2213	22,5 x 13,2 mm	4,7 mm	up to 6 digits
LC2411	23,9 x 11,5 mm	5 mm	up to 6 digits
LC2418	23,9 x 18,0 mm	4,6 mm	up to 12 digits

Custom-designed lay-outs and other glass formats available on request.
Connecting mode : Elastomeric
Viewing mode : Transmissive, transflective

Liquid Crystal Displays for industrial applications

Standard Sizes

Type	Overall dimensions	Digit height	Standard designs
LC2011	20,5 x 11,5 mm	4,7 mm	4 or 5 digits
LC2411	23,9 x 11,5 mm	3,8 mm	8 digits
LC3820	38,0 x 20,3 mm	8 mm	4 or 8 digits
LC5130	50,7 x 30,4 mm	12,7 mm	3,5 or 4 digits, bargraph
LC7020	69,8 x 20,3 mm	8 mm	up to 16 digits
LC7030	69,8 x 30,4 mm	12,7 mm	6 digits, bargraph
LC7038	69,8 x 38,0 mm	17,8 mm	3,5 or 4 digits
LC8131	81,1 x 38,0 mm	18,0 mm	5 digits
LC076101	76,2 x 101,6 mm	76,0 mm	1 digit
LC114046	114,0 x 46,0 mm	24 mm	5 digits

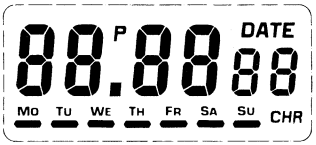
Custom-designed lay-outs and other glass formats available on request.
Connecting mode : Elastomeric or DIL - pin Connectors
Viewing mode : Transmissive, transflective or reflective

- High quality workmanship
- Low power consumption
- Attractive standard designs
- Very high contrast
- Service life > 50.000 hours
- Multiplex possible
- Outdoor/automotive specification

LC 2418112 - 101
12-digit watch display

LC 161260 - 100
digit height 3,3 mm

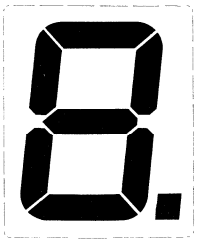
LC 221360 - 003
digit height 4,7 mm



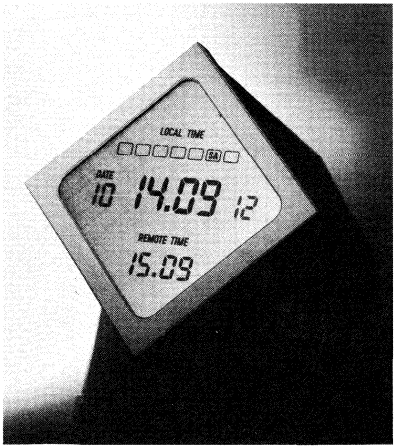
LC 513040 - 301
digit height 12,7 mm

LC 703831 - 300
digit height 17,8 mm

LC 76101 10 - 300
digit height 76,0 mm

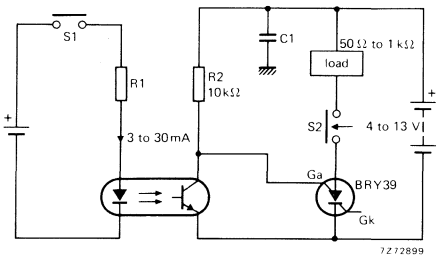


Large area clock display
100 x 100 mm



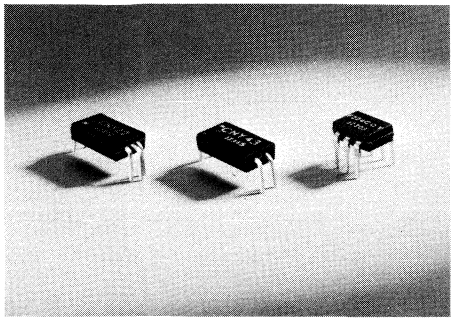
photocouplers

Photocouplers offer the isolator/transfer characteristics previously confined to relays, transformers, etc. but in a completely solid-state form and with all the advantages such as compactness, compatibility, long life and reliability. They are widely used in telephony and for input/output isolation in computer peripherals and subscriber telephones. They are also ideal in over-current sensor circuits, motor control (a.c. and d.c.), analogue circuits for multiplexing, or as isolators between equipments where one chassis is earthed and the other live or floating (tv set and video recorder, for example).



Triggering an SCS via a photocoupler.

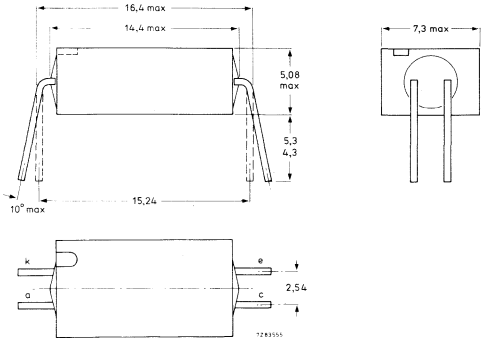
type	status	RATINGS diode I_F	V_R	P_{tot}	transistor V_{CEO}	I_C	P_{tot}	CHARACTERISTICS photocoupler I_C/I_F min	V_{CEsat} max	isolation test voltage (d.c.)
		mA	V	mW	V	mA	mW	%	V	V
CNX21	N	100	5	100	30	25	100	20	0,4	10 000
CNX35	D	100	3	200	30	100	200	40	0,15	4400
CNX36	D	100	3	200	30	100	200	80	0,15	4400
CNX38	D	100	3	150	80	100	200	50	0,4	4300
CNY50-1	D	100	3	150	35	100	150	25	—	1000
-2								40	—	
CNY62	D	100	3	150	50	100	200	25	0,4	5300
CNY63	D	100	3	150	30	100	200	50	0,4	4300



Encapsulations used for our range of photocouplers.

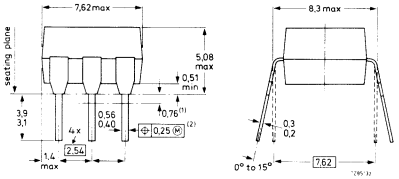
Dimensions in mm

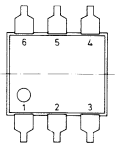
CNX21



CNX35, 36, 38

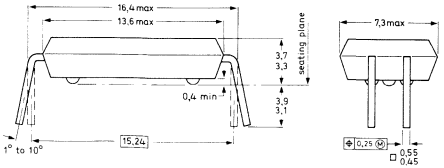
SOT-90



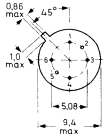


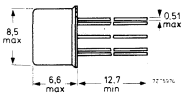
CNY62, 63

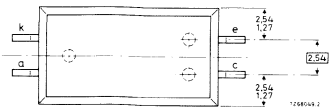
SOT-91B



CNY50 in SOT-104B







successor types

The list of successor types is specially included to guide your future new design or re-design plans. It has little use when seeking direct replacement types. For that purpose use our separate book Replacement guide for Semiconductors.

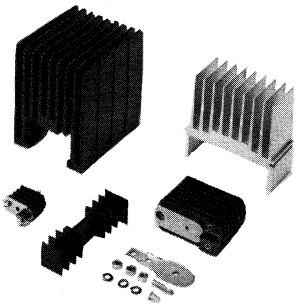
Successors of current types

current type	successor	current type	successor
BAX12A	BAX12	BLY91A	BLY91C; BLV20
BAX14A	BAX14	BLY92A	BLY92C; BLV21
BAX18A	BAX18	BLY93A	BLY93C; BLW84
BB105B/G	BB405B/G	BTW47	BTW45
BB109	BB809	BTW31	BTW63
BC147 to 149	BC547 to 549	BTY87	BTW38; BTW45
BC157 to 159	BC557 to 559	BTY91	BTW45
BDX62	BDT62	BY206	BYV95B
BDX63	BDT63	BY206A	BYV95B
BDX64	BDT64; BDV64	BY207	BYV95C
BDX65	BDT65; BDV65	BY208-600	BYV95C
BDX91 to 96	BDV91 to 96 or	BY208-800	BYV96D
	BDT91 to 96	BY208-1000	BYV96E
BFS21	BFQ15	BY406A	BYV95B
BFS21A	BFQ14	BY407A	BYV95C
BFS28	BFR84	BY226	1N5061/1N5062
BGY23	BGY40	BY227	1N5062/BYW56
BLW60	BLW60C; BLW85	BYX22	BYX49
BLW64	BLV32F	BYX30-200(R)	1N3891(R)
BLW75	BLV33F	BYX30-300(R)	1N3892(R)
BLX15	BLW95	BYX55-350	BYV95B/BYW95B
BLX39	BLW86	BYX55-600	BYV95C/BYW95C
BLX66	BLW79	BZW70	BZX70
BLX67	BLW80	BZW91	BZY91
BLX68	BLW81	BZX75-C1V4	BZV46-C1V5
BLX91A	BLW89	BZX75-C3V6	BZX79-C3V6
BLX92A	BLW90	2N929	BCY58; BCY59
BLX93A	BLW91	2N930	BCY58; BCY59
BLX94A	BLX94C	2N2368	BSX19
BLX96	BLW32	2N2369; 69A	BSX20
BLX97	BLW33		
BLX98	BLW98		
BLY87A	BLY87C; BLV10		
BLY88A	BLY88C; BLV11; BLW29		
BLY89A	BLY89C; BLW87		

Successors of maintenance types

maintenance type	successor
AAY21	AAZ18
AAY30	AAZ17; AAZ18
AAY32	AAZ17; AAZ18
AAZ13	AAZ18
AC127/01	AC187/01; BC368
ASY26	2N2894(A)
ASY27	2N2894(A)
ASY28	BSX19; BSX20
ASY29	BSX19; BSX20
BA182	BA482
BAX13	BAW62
BAX15	BAS11
BAX16	BAV20
BAX17	BAV21
BB106	BB809
BCY55	BCY87
BD291	BD201
BD292	BD202
BD293	BD203
BD294	BD204
BD295	BDX77
BD296	BDX78
BF194	BF494
BF195	BF495
BF196	BF198
BF197	BF199
BFX44	BSX20
BTW41H	BTW41G
BY208	BYV95/96
BZX61	BZT03
BZY88	BZX79
BZZ14 to 29	BZV15

accessories and heatsinks



Accessories

type	description	application
56201j	Insulating bushes (height 5 mm)	TO-3
56201d	Mica washer	TO-3
56234	Mounting strip	Heatsinks
56245	Distance disc of insulating material	TO-5; TO-39
56246	Distance disc of insulating material	TO-18; TO-72
56261a	2 insulating bushes (height 6,5 mm)	TO-3
56262A	Mica washer; insulating ring; plain washer	DO-4; TO-64
56264A	Mica washer; insulating ring; soldering tag	DO-4; DO-5; TO-48
56295	PTFE bush; 2 mica washers; plain washer; soldering tag	DO-4; TO-64
56316	Mica washer	SOD-38
56326	Metal washer	TO-126 (SOT-32)
56333	Metal washer; mica washer; insulating bush	TO-126 (SOT-32)
56339	Mica washer	TO-3
56352	Mounting support	TO-3
56353	Clip	TO-126; SOT-82
56354	Mica insulator	TO-126; SOT-82
56359b	Mica insulator	TO-220
56359c	Insulating bush	TO-220
56359d	Rectangular insulating bush	TO-220
56360a	Rectangular washer	TO-220
56363	Clip (direct mounting)	TO-220
56364	Clip; to be used in conjunction with 56367 or 56369	TO-220
56366	Clip	SOT-112
56367	Alumina insulators, to be used in conjunction with 56364	TO-220
56368a	Mica insulator	SOT-93
56368b	Insulating bush	SOT-93
56369	Mica insulator, to be used with 56364	TO-220
56378	Mica insulator	SOT-93
56379	Clip	SOT-93
56387a	Mica insulator (up to 300 V)	TO-126
56387b	Insulating bush (up to 300 V)	TO-126

Heatsinks

type	
56230	HE
56231	HE
56253	DH
56256	DH
56268	DH
56290	HE
56312	DH
56313	DH
56314	DH
56315	DH
56348	DH
56350	DH

DH = Diecast heatsink
HE = Heatsink extrusion

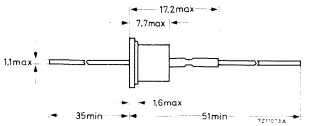
heatsinks
selection guide

Rectifier diodes
Thyristors
Triacs

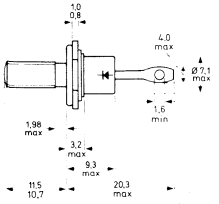
K-code to DIN 41882	K15	K9	K9	K3	K3	K3	K1,1	K1,1	Extrusions		
type	56268	56256	56350	56253	56312	56348	56313	56314	56230	56231	56290
BYX38	●								●		●
BYX39	●	●							●		●
BYX50	●								●		●
1N3879 to 3882	●								●		●
1N3889 to 3892	●	●							●	●	●
BYX98	●	●							●	●	●
BYX42	●	●							●	●	●
BYV20		●							●	●	●
BYV24		●							●	●	●
BYX99		●							●	●	●
BYX30		●							●	●	●
BYX25		●							●	●	●
BYX46		●							●	●	●
BYW30		●	●								
BYV30		●									
BYW31			●			●					
BYV21		●									
BYX96						●			●	●	
BYW92				●	●		●		●	●	
BYV92				●					●	●	
BYV22									●	●	
BYW93				●					●	●	
BYX56				●					●	●	
BYX97					●		●		●	●	
BYX32											
BYX52				●					●	●	
1N3899 to 3902				●							
1N3909 to 3912				●							
BYW25					●		●				
PH40					●		●				
PH70					●		●				
BYW94					●	●	●				
BYV23					●	●	●				
BTY79	●	●									●
BTW38	●	●	●			●					●
BTW42	●	●	●			●					●
BTY87				●					●	●	●
BTY91				●					●	●	●
BTW47				●	●		●		●	●	●
BTW30S					●		●		●	●	●
BTW45				●	●		●		●	●	●
BTW40				●	●		●		●	●	●
BTW92				●	●		●		●	●	●
BTW31W					●		●		●	●	●
BTW63					●		●		●	●	●
BTW24								●	●	●	
BTW33											
BTW23											
BTW43			●								●
BTX94				●					●	●	●
BTW34								●	●	●	

cases

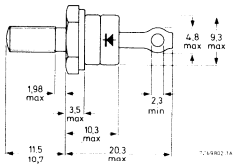
DO-1



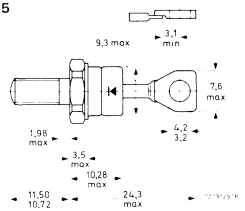
DO-4(1) 10-32 UNF
DO-4(2) M5



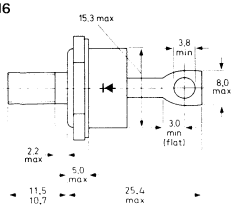
DO-4(3) 10-32 UNF
DO-4(4) M5



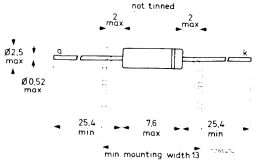
DO-4(5) 10-32 UNF
DO-4(6) M5



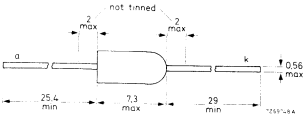
DO-5(1) ¼ " x 28 UNF
DO-5(2) M6



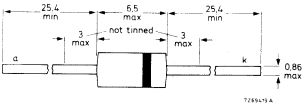
DO-7



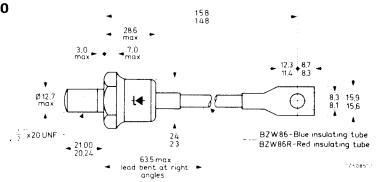
DO-14



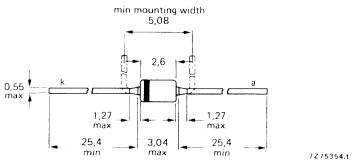
DO-15 (SOD-40)



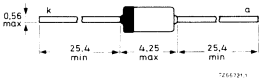
DO-30



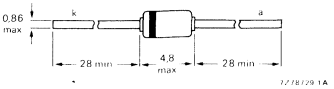
DO-34



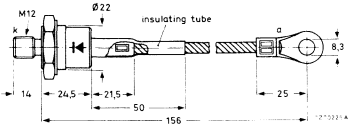
DO-35



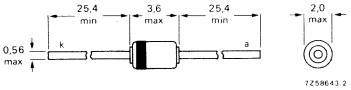
DO-41



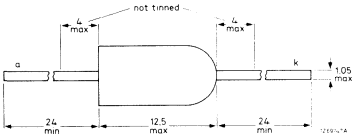
SOD-8



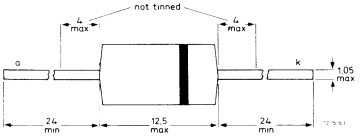
SOD-17 (DO-35)



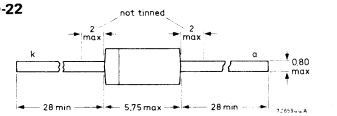
SOD-18



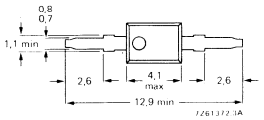
SOD-18B



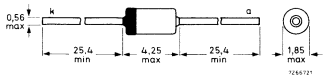
SOD-22



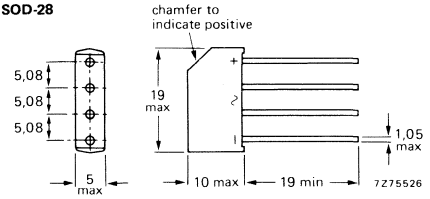
SOD-23



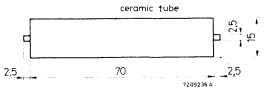
SOD-27 (DO-35)



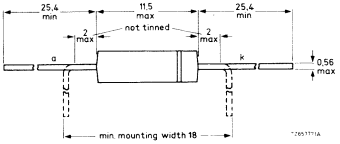
SOD-28



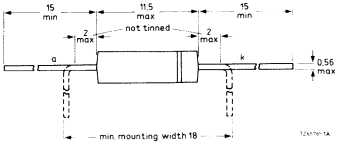
SOD-29



SOD-34(1) long leads

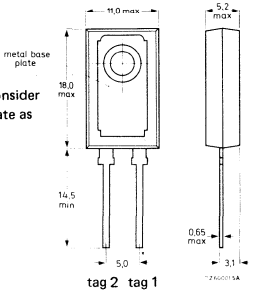


SOD-34(2) medium leads



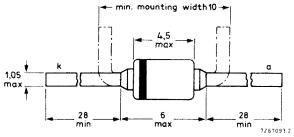
SOD-38

For polarity consider tag 1 = base-plate as mounting base

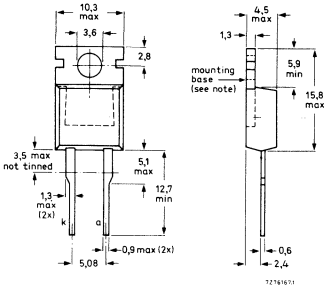


cases

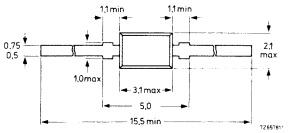
SOD-51



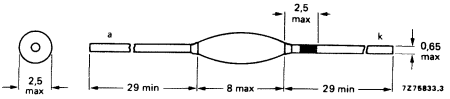
SOD-59



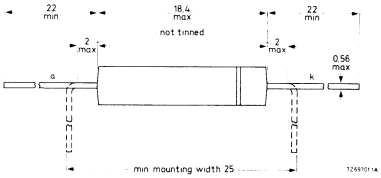
SOD-52



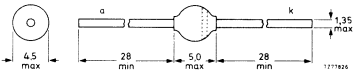
SOD-61



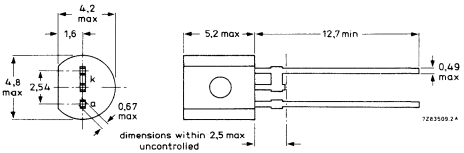
SOD-56



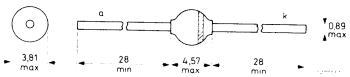
SOD-64



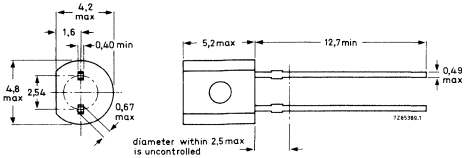
SOD-69



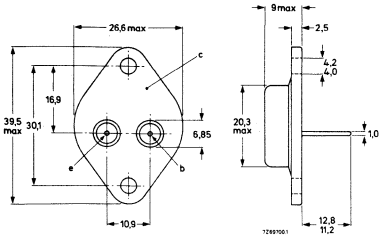
SOD-57



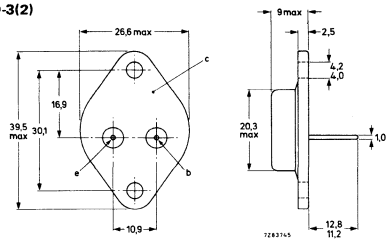
SOD-70



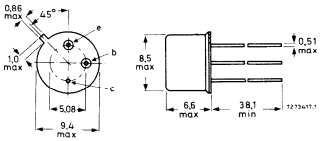
TO-3(1)



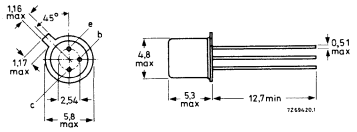
TO-3(2)



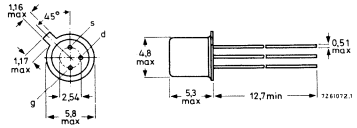
TO-5(1) collector to case



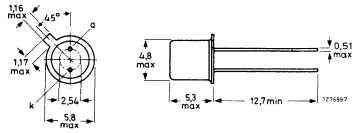
TO-18(1)



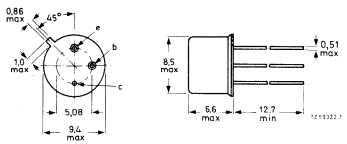
TO-18(2)



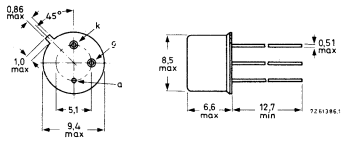
TO-18(3) (2 leads)



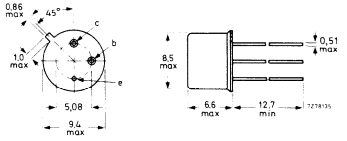
TO-39(1)



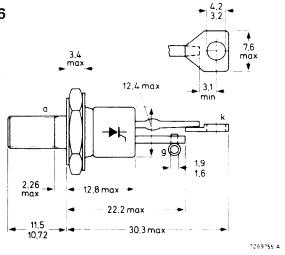
TO-39(2)



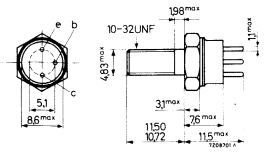
TO-39(3)



TO-48(1) ¼" x 28 UNF
TO-48(2) M6
triac k = T_1
a = T_2

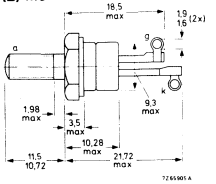


TO-60

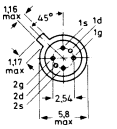


cases

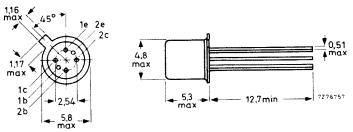
TO-64(1) 10-32 UNF
TO-64(2) M5



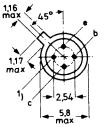
TO-71(1)



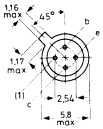
TO-71(2)



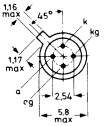
TO-72(1)



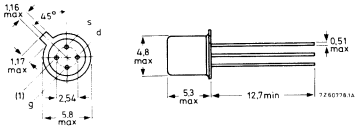
TO-72(2)



TO-72(3)

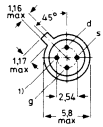


TO-72(4)

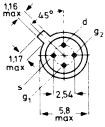


1) = shield lead (connected to case)

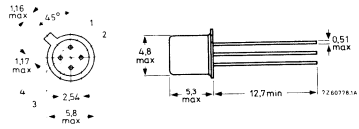
TO-72(5)



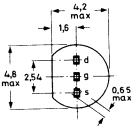
TO-72(6)

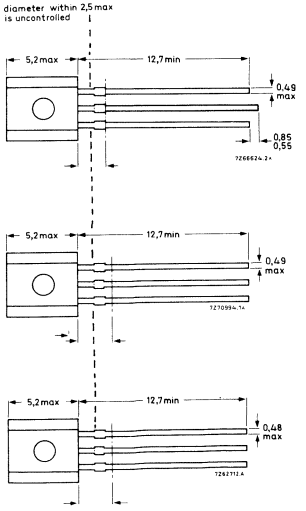


TO-72(7)



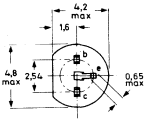
TO-92



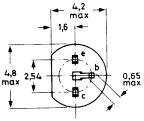


TO-92 variants

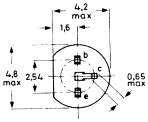
TO-92(1)



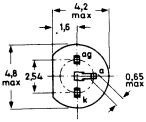
TO-92(2)



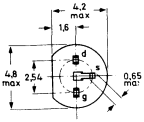
TO-92(3)



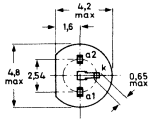
TO-92(4)



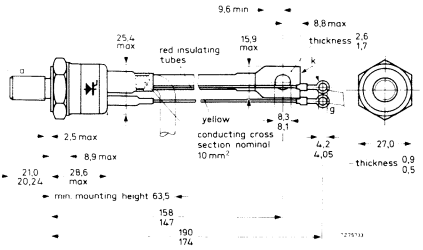
TO-92(5)



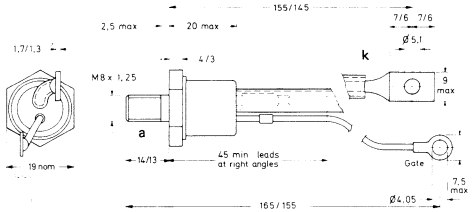
TO-92(6)



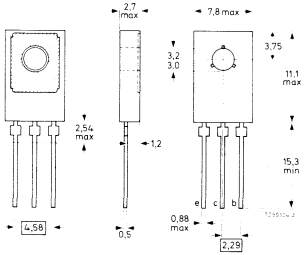
TO-94(1) ½'' x 20 UNF
TO-94(2) M12



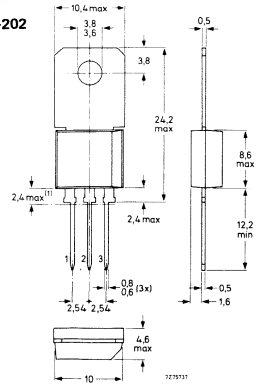
TO-103
triac: k = T_1
a = T_2



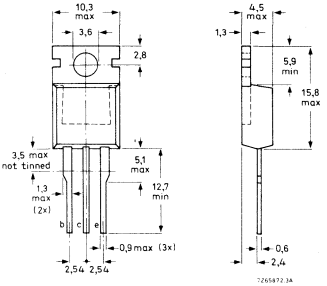
TO-126



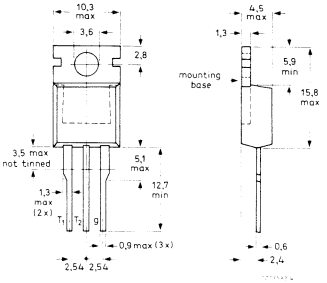
TO-202



TO-220(1)

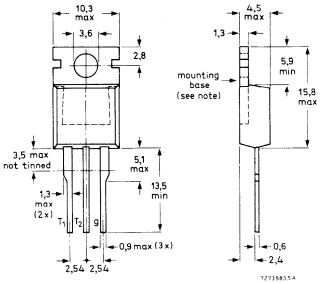


TO-220AB(2)

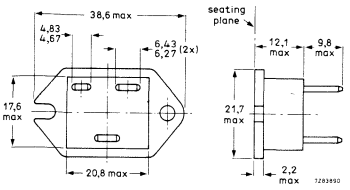


For BYV32: $T_1 = a_1$; $T_2 = k$; $g = a_2$

TO-220AB(3)

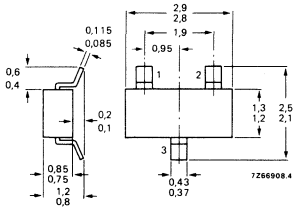


TO-238AA

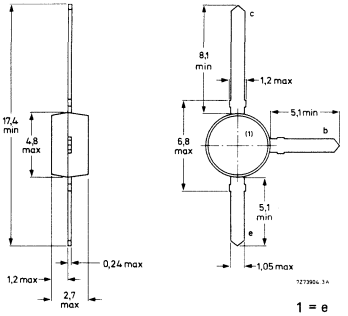


cases

SOT-23

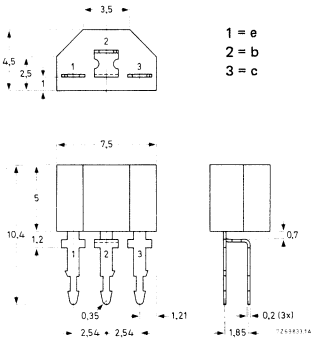


SOT-37(1)



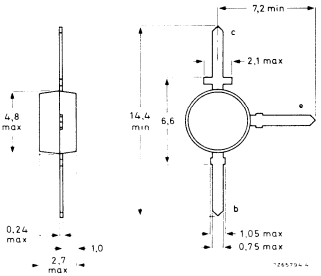
1 = e
2 = b
3 = c

SOT-25(1)

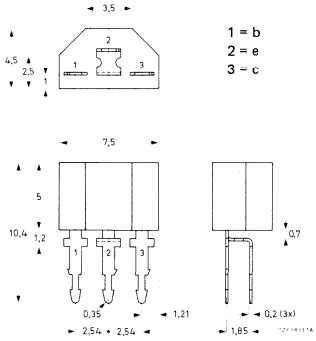


1 = e
2 = b
3 = c

SOT-37(2)

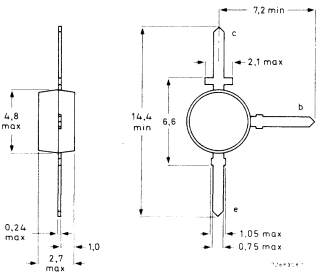


SOT-25(2)

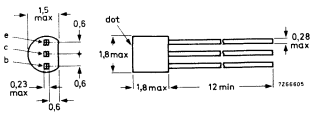


1 = b
2 = e
3 = c

SOT-37(4)



SOT-42



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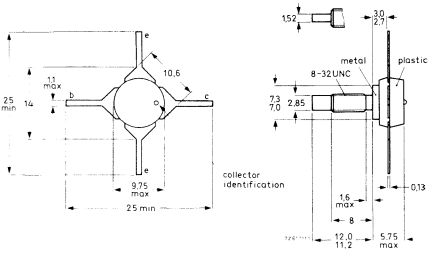

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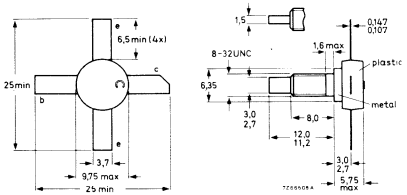
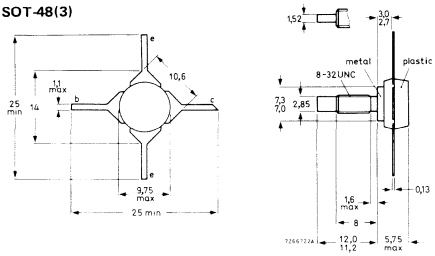
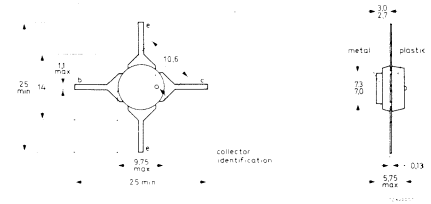


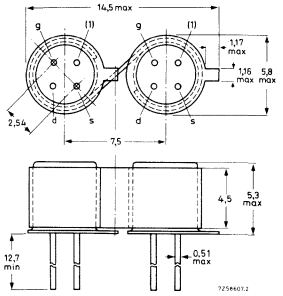
SOT-48(3)



SOT-48(4)

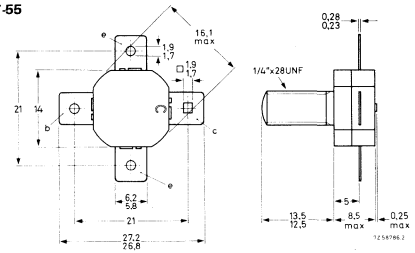


SOT-52

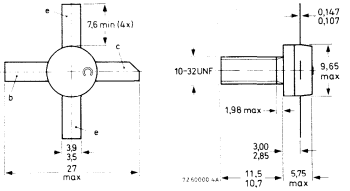


(1) = shield lead (connected to case)

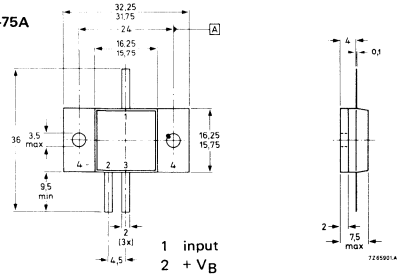
SOT-55



SOT-56



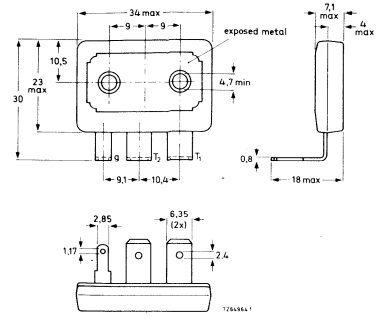
SOT-75A



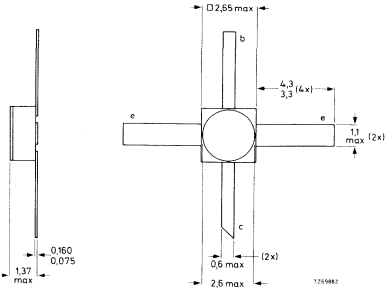
1 input
2 $+V_B$
3 output
4 r.f. and d.c. ground

cases

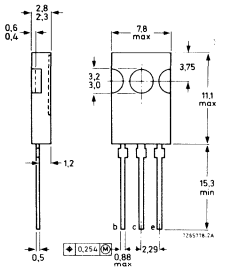
SOT-80



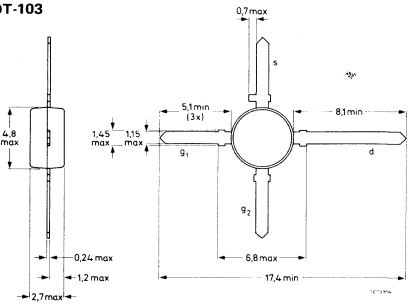
SOT-100



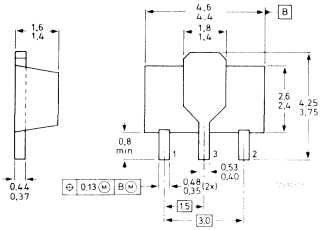
SOT-82



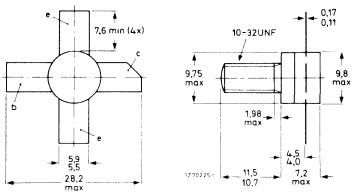
SOT-103



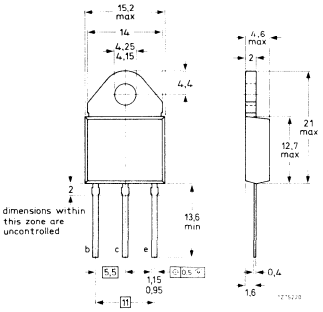
SOT-89



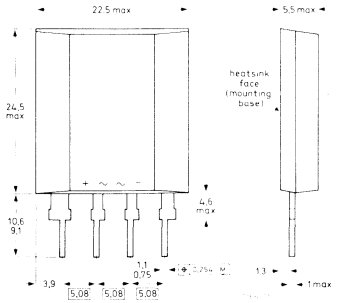
SOT-105



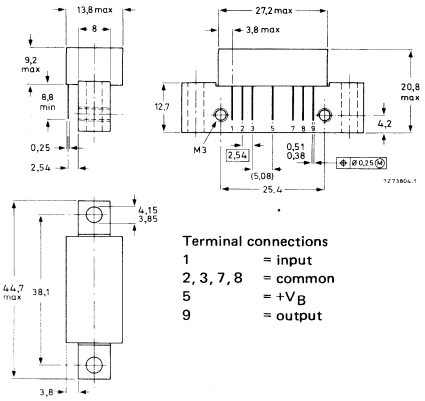
SOT-93



SOT-112



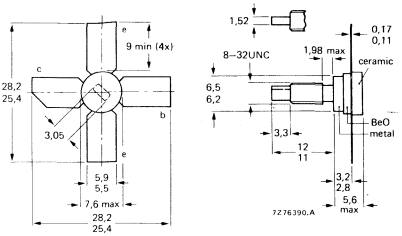
SOT-115



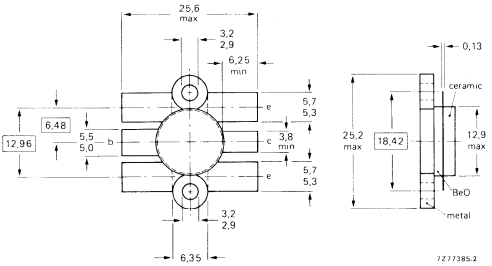
Terminal connections

1	= input
2, 3, 7, 8	= common
5	= $+V_B$
9	= output

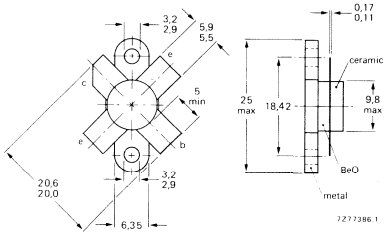
SOT-122



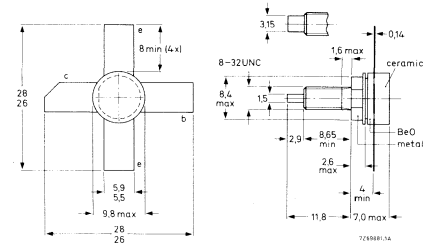
SOT-119



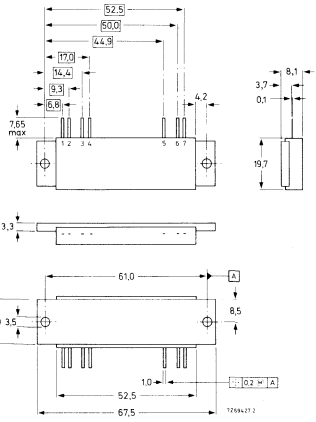
SOT-123



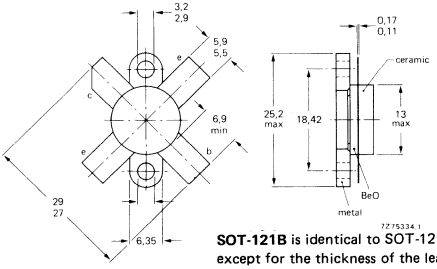
SOT-120



SOT-132



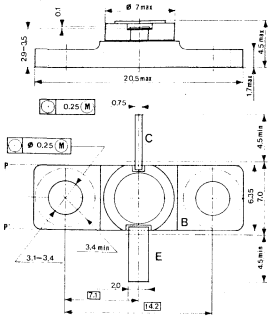
SOT-121A



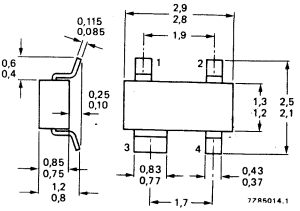
SOT-121B is identical to SOT-121A except for the thickness of the leads which lies between 0,23 and 0,27 mm.

cases

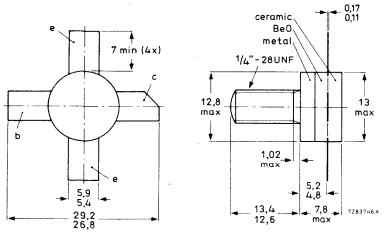
FO-53



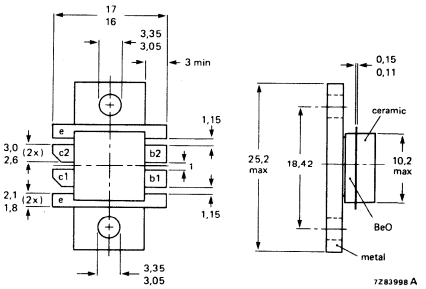
SOT-143



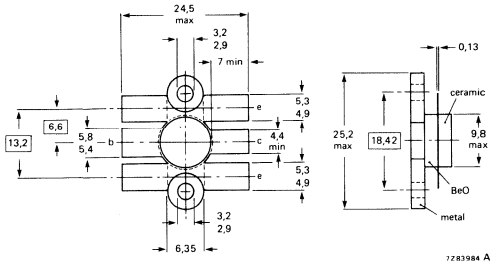
SOT-147

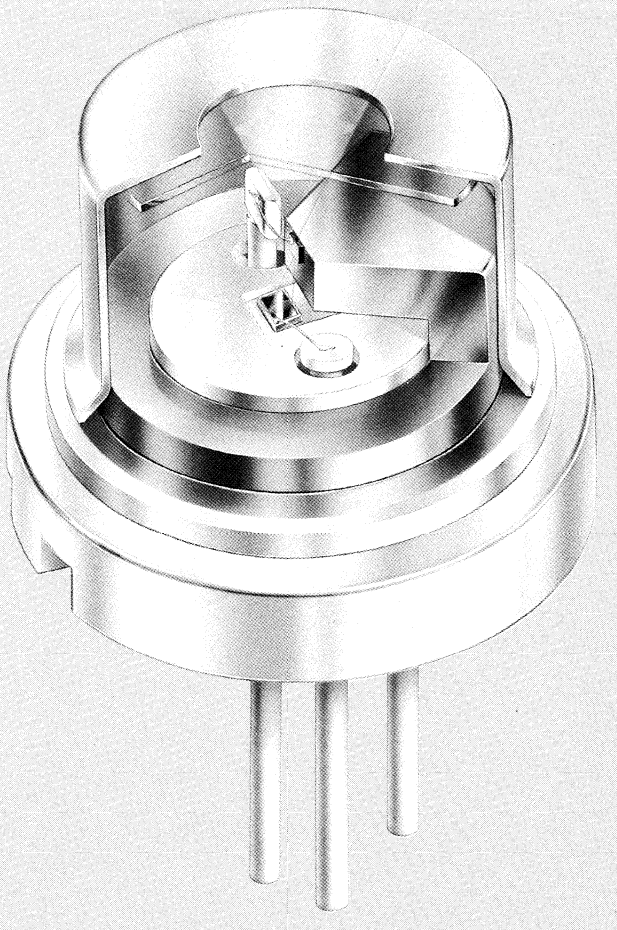


SOT-161



SOT-160



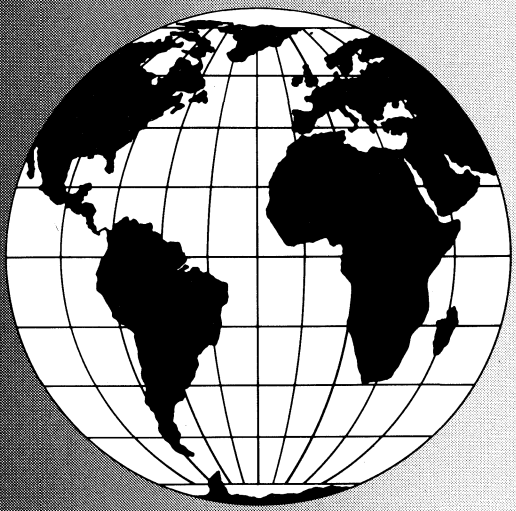


The CQL10 gallium arsenide laser incorporates its own photodiode for feedback stabilization of the radiant power. Requiring a supply of only 2 to 3 V, the laser radiates 5 mW at a wavelength of 780 nm for such applications as reading out digital-optical recording discs.

Electronic components and materials

for professional, industrial and consumer uses

from the world-wide Philips Group of Companies



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