Mullard Data Book 1974/5

Abridged data on consumer electronic components

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MULLARD DATA BOOK
1974-75

Abridged data on consumer electronic components

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FOREWORD

This issue of the Data Book gives abridged data on the extensive range of Mullard valves, picture tubes, semiconductors, integrated circuits, capacitors, resistors, modules and assemblies used in the consumer electronics industry, concisely listed in type number sequence. Each product section has been separated to facilitate quick reference.

May we remind you that in order to make way for new types, it has been necessary to omit some of the earlier devices, and we would therefore recommend you to retain copies of earlier issues for your future reference.

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CONTENTS

	Page No.
Symbols and abbreviations	5
Semiconductors	*Blue section*
Type nomenclature system	9
Data	12
Comparables	74
Integrated Circuits	*Blue section*
Type nomenclature system	98
Data	100
Television Picture Tubes	*Yellow section*
Type nomenclature system	109
Data	110
Replacements	117
Receiving Valves	*Yellow section*
Type nomenclature system	119
List of earlier types	120
Data	121
Equivalents	144
Capacitors and Resistors	*Green section*
Symbols and definitions	149
Data	150
Modules and Assemblies	*Green section*
Data	165
Mullard Technical Handbook	170
Mullard Technical Books	172

LETTER SYMBOLS AND ABBREVIATIONS

1. Base and Connections:

a	Anode
b	Base
c	Collector
d	Drain
e	Emitter
g	Grid, Gate
h	Heater
hct	Heater centre tap
IC	Internal connection (must not be connected externally)
k	Cathode
NC	No connection
NP	No pin
s	Internal shield, Source

NOTE 1 – In valves or tubes having more than one grid or anode, the electrodes are distinguished by numbers: g1, g2, etc., g1 being the grid nearest the cathode.

NOTE 2 – In multiple valves, electrodes of the different sections are distinguished by adding one of the following letters:

Diode	d	Hexode	h
Triode	t	Heptode	
Pentode	p	Octode	

Thus the grid of the triode section of a triode pentode is denoted by gt.

NOTE 3 – Two or more similar electrodes which cannot be distinguished by any of the above means are denoted by adding one or more primes to indicate of which electrode system the electrode forms a part. Thus, the anode of the first diode in a double diode valve is denoted by a. In colour picture tubes the suffixes B, G, R are used to denote blue, green, and red guns.

2. Ratings and Characteristics

Cobs	Output capacitance
Cre	Feedback capacitance
f	Frequency
fT	Transition frequency
gc	Conversion conductance
gm	Mutual conductance
Gs	Source conductance
hfe	Small signal current amplification factor (common emitter)
hFE	Large signal current amplification factor (common emitter)
Ia	Anode current
ia(pk)max.	Maximum peak anode current
Ia(av) max.	Maximum mean anode current
IARM	Repetitive peak anode current
IC	Collector current
ICM	Peak collector current
ICBO	Collector cut-off current (common base)
ID	Drain current
IF	Forward current
IF(AV)	Average forward current
IFRM	Repetitive peak forward current
IFSM	Surge (non-repetitive) forward current
Ig2	Screen-grid current
Ig2+g4	Screen-grid current (frequency changers)
IGT	Gate trigger current
Ih	Heater current
IH	Holding current
IORM	Output repetitive peak current
Iout max.	Maximum output current
IR	Reverse leakage current
IT	On-state current
IT(AV)	Average on-state current
ITSM	Non-repetitive surge on-state current

N	Noise factor
pa max.	Maximum anode dissipation
Ptot max.	Maximum total dissipation
P.I.V. max.	Maximum peak inverse voltage
Pout	Power output
Qs	Stored charge
ra	Anode impedance
Ra	Anode load
Rth(j-amb) } Rth(j-case) }	Thermal resistance
Tamb	Ambient temperature
Tj	Junction temperature
Tmb	Mounting base temperature
tf	Fall time
ts	Storage time
Va	Anode voltage
va(pk)max.	Maximum peak anode voltage
Vb	Supply voltage
VBO	Breakover voltage
VCE	Collector-emitter voltage
VCB	Collector-base voltage
VCS	Collector-substrate voltage
VDS	Drain-source voltage
VF	DC forward voltage
Vg1	Negative grid voltage
Vg2	Screen-grid voltage
Vg2+g4	Screen-grid voltage (frequency changers)
VGA	Gate-anode voltage
VGK	Gate-cathode voltage
VGS	Gate-source voltage
VGT	Gate trigger voltage
Vh	Heater voltage
vh–k(pk)max	Maximum peak voltage between heater and cathode
VIRM	Input repetitive peak voltage

VRWM	Crest (peak) working reverse voltage
VRRM	Repetitive peak reverse voltage
Vz	Zener voltage
μ	Amplification factor

3. Other Abbreviations:

Hz	Unit of frequency (formerly 1c/s)
kHz	Unit of frequency (formerly 1kc/s)
MHz	Unit of frequency (formerly 1Mc/s)
GHz	Unit of frequency (1GHz=1000MHz)
nC	Unit of electrical charge (1nC= 1000pC=10^{-9} coulombs)
nF	Unit of capacitance (1nF=0·001μF =1000pF)

SEMICONDUCTOR DEVICES TYPE NOMENCLATURE SYSTEM

All new Mullard semiconductor devices are registered internationally by Pro-Electron and have type numbers according to the following code. The type nomenclature of a discrete device or, in certain cases, of a range of devices, consists of two letters followed by a serial number. The serial number may consist of three figures or of one letter and two figures depending on the main application of the device.

The first letter indicates the semiconductor material used:

A	germanium
B	silicon
C	compound materials such as gallium arsenide
R	compound materials such as cadmium sulphide

The second letter indicates the general function of the device:

A	detection diode, high speed diode, mixer diode
B	variable capacitance diode
C	transistor for a.f. applications (not power types)
D	power transistor for a.f. applications
E	tunnel diode
F	transistor for r.f. applications (not power types)
G	multiple of dissimilar devices; miscellaneous devices
L	power transistor for r.f. applications
N	photo-coupler
P	radiation sensitive device such as photodiode, phototransistor, photoconductive cell, or radiation detector diode
Q	radiation generating device such as light-emitting diode
R	controlling and switching device (e.g. thyristor) having a specified breakdown characteristic (not power types)

S transistor for switching applications (not power types)
T controlling and switching power device (e.g. thyristor) having a specified breakdown characteristic
U power transistor for switching applications
X multiplier diode such as varactor or step recovery diode
Y rectifier diode, booster diode, efficiency diode
Z voltage reference or voltage regulator diode, transient suppressor diode

The remainder of the type number is a **serial number** indicating a particular design or development and is in one of the following two groups:

(a) Devices intended primarily for use in consumer applications (radio and television receivers, audio amplifiers, tape recorders, domestic appliances, etc).
The serial number consists of three figures:

(b) Devices intended mainly for applications other than (a), e.g. industrial, professional and transmitting equipments.
The serial number consists of one letter (Z, Y, X, W, etc) followed by two figures.

Range Numbers

Where there is a range of variants of a basic type of rectifier diode, thyristor or voltage regulator diode the type number as defined above is often used to identify the range; further letters and figures are added after a hyphen to identify individual types within the range. These additions are as follows:

Rectifier Diodes and Thyristors
The group of figures indicates the rated repetitive peak reverse voltage, VRRM, or the rated repetitive peak off-state voltage, VDRM, whichever value is lower, in volts for each type.
The final letter R is used to denote a reverse polarity

version (stud anode) where applicable. The normal polarity version (stud cathode) has no special final letter.

Voltage Regulator Diodes, Transient Suppression Diodes
The first letter indicates the nominal percentage tolerance in the operating voltage Vz.
A – ±1% B – ±2% C – ±5% D – ±10% E – ±15%
The letter is omitted on transient suppressor diodes.
The group of figures indicates the typical operating voltage Vz for each type at the nominal operating current Iz rating of the range. For transient suppressor diodes the figure indicates the maximum recommended standoff voltage VR.
The letter V is used to denote a decimal sign.
The final letter R is used to denote a reverse polarity version (stud anode) where applicable. The normal polarity version (stud cathode) has no special final letter.

EXAMPLES:

BF362	Silicon r.f. transistor intended primarily for 'consumer' applications.
BZY88–C5V6	Silicon voltage regulator diode for 'industrial' applications. In BZY88 range with 5·6V operating voltage ±5% tolerance.

OLD SYSTEM

Some earlier semiconductor diodes and transistors have type numbers consisting of two or three letters followed by a group of one, two or three figures.
The first letter is always 'O', indicating a semiconductor device.
The second (and third) letter(s) indicate the general class of device:

A – diode or rectifier C – transistor
AP – photodiode CP – phototransistor
AZ – voltage regulator diode

The group of figures is a serial number indicating a particular design or development.

AA119

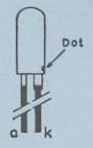
Germanium point-contact diode.

At Tamb	25	60	°C
Max. reverse voltage			
Peak	45	45	V
*Average	30	30	V
Max. forward current			
Peak	100	100	mA
*Average	35	15	mA
Ambient temperature range			
Max.		+60	°C
Min. (Storage)		−65	°C

*Averaged over any 50ms period or d.c. component.

AA129

Germanium junction diode (Bias voltage stabiliser).

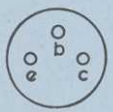


At Tamb=25°C		
*Vf	175 to 230	mV
*Temperature coefficient	−2·3	mV/deg C
IF max.	20	mA
Tj max.		
Continuous operation	75	°C
Intermittent operation	90	°C
Rth (j-amb)	0·5	deg C/mW

*If=5 mA.

AC126

Germanium p-n-p alloy junction transistor. For use in pre-amplifier and driver stages.

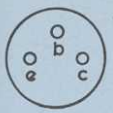


Construction: TO–1		
VCB max.	−32	V
VCE max.	−12	V
IC max.	100	mA
Ptot max. (Tj=75°C)	500	mW
hFE	140	
ICBO (VCB=−10 V; IE=0)	<10	μA
*Noise figure	4	dB

*VCB=−5 V; IE=0·5 mA; f=1 kHz; RS=500 Ω.

AC127

Germanium n-p-n high-gain transistor. For use in complementary symmetrical class 'B' output stages.



Construction: TO–1		
VCB max. (IE=0)	32	V
IC max.	500	mA
Ptot max. (Tamb=25°C)	340	mW
hFE (Typ) IC=500 mA	50	
*Noise figure (Typ.)	4	dB

*VCB=+5 V; IE=500 μA; f=1 kHz.

AC128

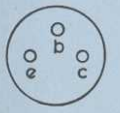
2–AC128

Germanium p-n-p high-gain transistor. For use in class 'A' and 'B' output stages. Matched pair.

Construction: TO–1		
VCB max. (IE=0)	−32	V
ICM max.	2·0	A
Ptot max. (Tamb=25°C)	1·0	W
hFE (IC=300 mA; VCB=0)	60 to 175	
ICBO (VCB=−10 V; IE=0)	<10	μA

AC176

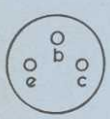
Germanium n-p-n alloy-junction high-gain transistor. For use in mains operated audio amplifiers with class 'B' output stages.



Construction: TO–1		
VCB max.	32	V
ICM max.	1·0	A
Ptot max.	700	mW
hFE (IE=−500 mA; VCB=0)	52 to 180	
ICBO (VCB=10 V; IE=0)	>30	μA

AC187

Germanium n-p-n alloy-junction transistor. With type AC188 it forms a symmetrical complementary pair for use in class 'B' output stages with output power of up to 3 watts.

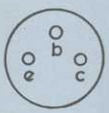


Construction: TO–1		
VCB max.	25	V
VCE max.	15	V
ICM max.	2·0	A
Ptot max. (Tamb ⩽35°C)	1·0	W
*hFE (Typ.)	200	
†fT (Typ.)	5	MHz
ICBO (VCB = 25 V; IE = 0)	15	μA
Tj max.	90	°C

*IC = 300 mA; VCE = 1·0 V.
†IC = 10 mA; VCE = 2·0 V.

AC188

Germanium p-n-p alloy-junction transistor. With type AC187 it forms a symmetrical complementary pair for use in class 'B' output stages with output power of up to 3 watts.



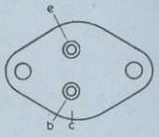
Construction: TO–1		
VCB max.	−25	V
VCE max.	−15	V
ICM max.	2·0	A
Ptot max. (Tamb ⩽35°C)	1·0	W
*hFE (Typ.)	200	
†fT (Typ.)	1·5	MHz
ICBO (VCB = −25 V; IE = 0)	20	μA
Tj max.	90	°C

*IC = −300 mA; VCE = −1·0 V.
†IC = −10 mA; VCE = −2·0 V.

AD149

2–AD149

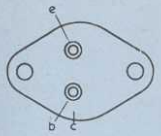
Germanium p-n-p alloy-junction transistor. For use in class 'B' push-pull output stages. Matched pair.



Construction: TO–3		
VCB max.	−50	V
ICM max.	3·5	A
Ptot max. (Tamb = 50°C)	22·5	W
ICBO (VCB = −14 V; IE = 0; Tj = 100°C)	4·5	mA
hFE (IC = 1·0 A)	30 to 100	

AD161

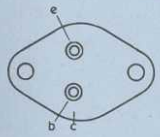
Germanium n-p-n alloy junction transistor. With type AD162 it forms a symmetrical complementary pair for use in mains driven output stages of amplifiers and radio receivers.



Construction: SO–55/SB2–5		
VCBO max.	32	V
ICM max.	3·0	A
Ptot max. (Tmb ⩽72°C)	4·0	W
Tj max. (operating)	90	°C
fT Typ. (VCE = +2 V; IC = 10 mA)	3	MHz
hFE (VCE = +1 V; IC = 500 mA)	80 to 320	
ICBO (VCB = +10 V; IE = 0; Tj = 90°C) max.	2·6	mA

AD162

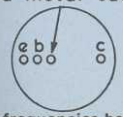
Germanium p-n-p alloy junction transistor. With type AD161 it forms a symmetrical complementary pair for use in mains driven output stages of amplifiers and radio receivers.



Construction: SO–55/SB2–5		
VCBO	−32	V
ICM max.	3·0	A
Ptot max. (Tmb ⩽63°C)	6·0	W
Tj max. (operating)	90	°C
fT Typ. (−VCE = 2·0 V; −IC = 10 mA)	1·5	MHz
hFE (−VCE = 1·0 V); −IC = 500 mA)	80 to 320	
ICBO (−VCB = 32 V; IE = 0; Tj = 90°C) max.	2·0	mA

AF114

Germanium p-n-p alloy-diffused junction transistor. For use as an r.f. amplifier in a.m. and f.m. receivers.



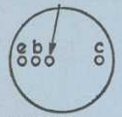
Construction: TO–7		
VCB max. (IE = 0)	−20	V
ICM max.	10	mA
Ptot max. (Tamb ⩽45°C)	50	mW
fT (IE = 1 mA; VCB = −6 V) Typ.	75	MHz
*Cobs (IE = 1 mA; VCB = −6 V) Typ.	2·5	pF

At frequencies below 10·7 MHz the feedback capacitance in common emitter (Coes) is approx. 3·5 pF at IE = 1 mA VCE = −6 V.
*f = 100 MHz.

AF115

Germanium p-n-p alloy-diffused junction transistor. For use as a mixer/oscillator for a.m./f.m. and short wave a.m. receivers.

interlead shield and metal case



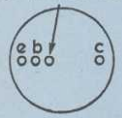
Construction: TO–7		
VCB	−20	V
ICM max.	10	mA
Ptot max. (Tamb=45°C)	50	mW
*Cobs (VCB=−6 V; IE=1 mA) Typ.	2·5	pF
fT (VCB=−6 V; IE=1 mA) Typ.	75	MHz
Power gain (f=100 MHz)	13	dB
hfe	150	

*f=100 MHz

AF116

Germanium p-n-p alloy-diffused junction transistor. For use as an i.f. amplifier in f.m. receivers.

interlead shield and metal case



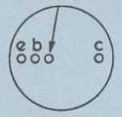
Construction: TO–7		
VCB	−20	V
ICM max.	10	mA
Ptot max. (Tamb=45°C)	50	mW
*Cobs (VCE=−6 V; IE=1 mA)	3·5	pF
fT (VCB=−6 V; IE=1 mA) Typ.	75	MHz
Power gain (f=10·7 MHz)	25	dB
hfe	150	

*f=10·7 MHz.

AF117

Germanium p-n-p alloy-diffused junction transistor. For use as a mixer/oscillator and i.f. amplifier in m.w. and l.w. a.m. receivers.

interlead shield and metal case



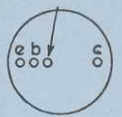
Construction: TO–7		
VCB	−20	V
ICM max.	10	mA
Ptot max. (Tamb=45°C)	50	mW
*Cobs (VCE=−6 V; IE=1 mA)	4·0	pF
fT (VCB=−6 V; IE=1 mA) Typ.	75	MHz
Power gain (f=450 kHz)	42	dB
hfe	150	

*f=450 kHz.

AF118

Germanium p-n-p alloy-diffused transistor. For use as a video amplifier in television receivers.

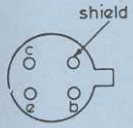
interlead shield and metal case



Construction: TO–7		
VCB max. (IE=0)	−70	V
ICM max.	30	mA
Ptot max. (Tamb=45°C)	250	mW
fT (VCB=−6 V; IE=10 mA) Typ.	175	MHz
ICBO (VCB=−6 V; IE=0) max.	6·0	μA
hFE (Typ.)	180	

AF121

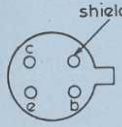
Germanium p-n-p alloy-diffused transistor. Intended for application at frequencies up to 100 MHz.



Construction: TO–72		
VCBO max.	−25	V
ICM max.	15	mA
Ptot max. (Tamb=45°C)	140	mW
fT (VCE=−10 V, IC=−3 mA) typ.	270	MHz
Cre (VCE=−10V, IC=−1 mA) typ.	0·45	pF

AF124

Germanium p-n-p alloy-diffused junction transistor. For use as an r.f. amplifier in a.m. and f.m. receivers.

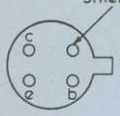


Construction: TO–72		
VCB max. (IE=0)	−20	V
ICM max.	10	mA
Ptot max. (Tamb=30°C)	60	mW
fT (VCB=−6 V; IE=1 mA) Typ.	75	MHz
*Cobs (VCB=−6 V; IE=1 mA)	2·5	pF

At frequencies below 10·7 MHz the feedback capacitance in common emitter (Coes) is approx. 3·5 pF at IE=1 mA; VCE=−6 V.
*f=100 MHz.

AF125

Germanium p-n-p alloy-diffused transistor. For use as a mixer oscillator in a.m./f.m. and shortwave receivers.

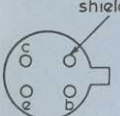


Construction: TO–72		
VCB max. (IE=0)	−20	V
ICM max.	10	mA
Ptot max. (Tamb=30°C)	60	mW
fT (VCB=−6 V; IE=1 mA) Typ.	75	MHz
*Cobs (VCB=−6 V; IE=1 mA) Typ.	2·5	pF

At frequencies below 10·7 MHz the feedback capacitance in common emitter (Coes) is approx. 3·5 pF at IE=1 mA; VCE=−6 V.
*f=100 MHz.

AF126

Germanium p-n-p alloy-diffused transistor. For use as an i.f. amplifier in f.m. receivers.

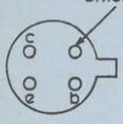


Construction: TO–72		
VCB max. (IE=0)	−20	V
ICM max.	10	mA
Ptot max. (Tamb=30°C)	60	mW
fT (VCB=−6 V; IE=1 mA) Typ.	75	MHz
*Cobs (VCB=−6 V; IE=1 mA) Typ.	2·5	pF

At frequencies below 10·7 MHz the feedback capacitance in common emitter (Coes) is approx. 3·5 pF at IE=1 mA; VCE=−6 V.
*f=100 MHz.

AF127

Germanium p-n-p alloy-diffused transistor. For use as a mixer/oscillator and i.f. amplifier in m.w. and l.w. a.m. receivers.

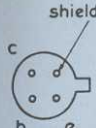


Construction: TO–72		
VCB max. (IE=0)	−20	V
ICM max.	10	mA
Ptot max. (Tamb=30°C)	60	mW
fT (VCB=−6 V; IE=1 MA) Typ.	75	MHz
*Cobs (VCB=−6 V; IE=1 mA) Typ.	2·5	pF

At frequencies below 10·7 MHz the feedback capacitance in common emitter (Coes) is approx. 3·5 pF at IE=1 mA; VCE=−6 V.
*f=100 MHz.

AF139

Germanium p-n-p mesa transistor. For use as a mixer/oscillator at frequencies up to 860 MHz.

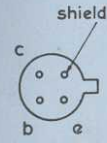


Construction: TO–72		
VCBO max.	−20	V
VCEO max.	−15	V
ICM max.	10	mA
Ptot max. (Tamb ⩽45°C)	60	mW
fT (VCE=−12 V; IC=1·5 mA) Typ.	550	MHz
*Max. unilateralised power gain, Typ.	11·5	dB
*Noise figure (Rs=60 Ω), Typ.	7	dB

*VCB=−12 V; IE=1·5 mA; f=800 MHz.

AF178

Germanium p-n-p alloy-diffused transistor. For use as a mixer/oscillator at frequencies up to 260 MHz.



Construction: TO–12		
VCB max. (IE=0)	−25	V
ICM max.	10	mA
Ptot max. (Tamb ⩽45°C)	75	mW
fT (VCB=−12 V; IE=1 mA) Typ.	180	MHz
*Cobs (VCB=−12 V; IE=1 mA) Typ.	1·8	pF
hfe	>20	
†Noise figure, Typ.	6	dB

*f=200 MHz.
†IC=1 mA; VCE=−12 V; f=200 MHz; RS=30 Ω.

AF239

Germanium p-n-p mesa transistor. For use as a mixer/oscillator at frequencies up to 890 MHz.

Construction: TO–72		
VCBO max.	−20	V
VCEO max.	−15	V
ICM max.	15	mA
Ptot max. (Tamb ⩽45°C)	60	mW
fT (VCE=−10 V; IC=2 mA) typ.	650	MHz
*Max. unilateralised power gain, typ.	17	dB
*Noise figure typ.	5	dB

*VCB=−10 V; IE=2 mA; f=800 MHz.

BA102

Silicon variable capacitance diode.

Construction: DO–7		
VR max.	20	V
IR max.	100	μA
Capacitance Ratio:		
Cd (VR=4 V) / Cd (VR=10 V) min.	1·4	
Tj max.	90	°C

BA145

A high speed double diffused silicon diode intended for use in clamping circuits, line phase detectors and burst phase detectors of colour television receivers.

Plastic construction: DO–14		
VRWM max.	300	V
IF (AV) max.	10	mA
IFRM max.	100	mA
Max. VF at IF of (at Tj=75°C):		
100 mA	1·0	V
Tj max.	125	°C

BA148

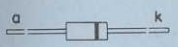
A fast general purpose diode.

Plastic construction: DO–14		
VRRM max.	350	V
VRWM max.	300	V
IF (AV) max. Averaged over any 20 ms period	0·3	A
IFRM	2	A
VF max. at IF of 2 A	1·5	V
*IR max. at VR of 300 V	200	μA
Tj max.	125	°C

*Tj=125°C.

BA154

Silicon whiskerless diode for use in television circuits and general purpose applications; all-glass construction.



VR max.	50	V
IF max.	30	mA
IFRM max.	50	mA
Max. VF at IF of (at Tj=25°C):		
1·0 mA	0·9	V
30 mA	1·5	V
Tj max.	175	°C

BA155

Silicon whiskerless diode for use as video noise limiter and in general purpose applications; all-glass construction.

VR max.	150	V
IF max.	100	mA
IFRM max.	150	mA
Max. VF at IF of (at Tj=25°C):		
10 mA	1·2	V
50 mA	1·5	V
Tj max.	175	°C

BA156

Silicon whiskerless diode intended for use as bias stabiliser in class B output stages; all-glass construction.

IF max.	30	mA
VF (Tj=25°C) at:		
IF=0·2 mA	500 to 590	mV
IF=3·0 mA	585 to 800	mV
Tj max.	175	°C
Rth (j-amb) (in free air)	0·6	deg C/mW

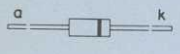
BA182

Silicon planar diode for use as a switching element in v.h.f. tuners.

VR max.	35	V
IF max.	100	mA
Cd (VR = 20 V; f = 1·0 MHz) typ.	0·8	pF
max.	1·0	pF
rd (IF = 5·0 mA; f = 200 MHz) typ.	0·5	Ω
max.	0·7	Ω

BA216

Silicon whiskerless diode for use as a low voltage regulator for bias circuit in class B output stage.



Construction: miniature glass envelope

VRRM max.	10	V
IFRM max.	150	mA
VF at IF = 0·2 mA	500 to 620	mV
IF = 3·0 mA	600 to 800	mV
IF = 15 mA	700–1000	mV
Tj max.	200	°C

BA219

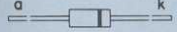
Silicon whiskerless diode for general application.

Construction: miniature glass envelope

VR max.	100	V
IFRM max.	300	mA
VF at IF = 1 mA	<0·65	V
IF = 10 mA	<0·85	V
IF = 100 mA	<1·40	V
Tj max.	200	°C

BA220

Silicon planar epitaxial diode for general purpose and regulator use.

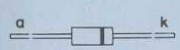


Construction: DO–35

VRRM max.	10	V
IFRM max.	400	mA
VF at IF = 0·1 mA	460 to 520	mV
IF = 10 mA	680–750	mV
IF = 100 mA	825–950	mV
Tj max.	200	°C

BA222

Silicon planar epitaxial diode for general purpose use.



Construction: DO–35

VR max.	50	V
IFRM max.	150	mA
VF at IF = 1 mA	<700	mV
IF = 10 mA	<900	mV
IF = 100 mA	<1100	mV
Tj max.	200	°C

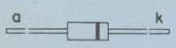
BAX13

Whiskerless diffused diode for high-speed application.

VR max.	50	V
IF max.	75	mA
trr max.	4·0	ns
Qs max. Storage charge	45	pC

BAX16

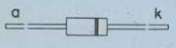
Whiskerless diffused diode for general purpose use.



VR max.	150	V
IF max.	200	mA
VF at IF=100 mA	<1·3	V
Tj max.	200	°C

BAX17

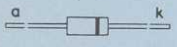
Whiskerless diffused diode for general purpose use.



VR max.	200	V
IF max.	200	mA
VF at IF=200 mA	<1·2	V
Tj max.	200	°C

BAX18

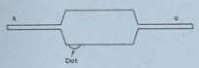
Whiskerless diffused diode for rectifier applications.



VR max.	75	V
IF (AV) max.	350	mA
Tj max.	200	°C

BB105B BB105G (12-BB105B, 12-BB105G)

Variable capacitance silicon diode for u.h.f. tuners.



VR max.		28	V
IR max.		100	nA
Capacitance Ratio:		BB105B	BB105G
Cd (VR= 3 V) (f=1·0 MHz)	min.	4·5	4·0
Cd (VR=25 V)	max.	6	6
Tj max.		60	°C

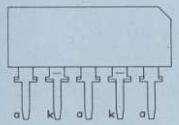
BB110B

Variable capacitance silicon diode for v.h.f. f.m. tuners.

VR max.	30	V
IR max.	20	nA
Capacitance Ratio:		
Cd (VR= 3 V) (f=1·0 MHz)	2·65	
Cd (VR=30V)		
Tj max.	100	°C

BB113

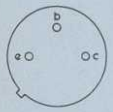
Variable capacitance silicon triple diodes for electronic tuning in LW, MW and SW bands of a.m. receivers.



VR max.	32	V
IR	50	nA
Cd at f=0·5 MHz		
VR=1 V (range)	230 to 280	pF
VR=30 V (max.)	13	pF
Tj max.	80	°C

BC107

Silicon n-p-n planar epitaxial transistor. For use in audio driver stages and television signal processing circuits.



Construction: TO–18		
VCBO max.	50	V
VCEO max.	45	V
IC max.	100	mA
Ptot max. (Tamb ≤25°C)	300	mW
hfe (VCE=5V; IC=2 mA)	125 to 500	
fT (VCE=5 V; IC=10 mA)	300	MHz

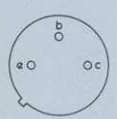
BC108

Silicon n-p-n planar epitaxial transistor. Intended for applications as audio pre-amplifiers, driver stages in amplifiers, radio and television receivers.

Construction: TO–18		
VCBO max.	30	V
VCEO max.	20	V
IC max.	100	mA
Ptot max. (Tamb ≤25°C)	300	mW
hfe (VCE=5 V; IC=2 mA)	125 to 900	
fT (VCE=5 V; IC=10 mA)	300	MHz

BC109

Silicon n-p-n planar epitaxial transistor. For use in low noise input stages in high quality amplifiers and tape recorders.

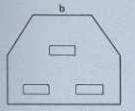


Construction: TO–18		
VCBO max.	30	V
VCEO max.	20	V
IC max.	100	mA
Ptot max. (Tamb ≤25°C)	300	mW
hfe (VCE=5 V; IC=2 mA)	240 to 900	
fT (VCE=5 V; IC=10 mA)	300	MHz
*Noise figure (Typ.)	2·0	dB

*IC=0·2 mA; VCE=5 V; RS=2·0 kΩ; f=30 Hz to 15 KHz.

BC147

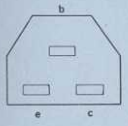
Silicon n-p-n planar epitaxial transistors in plastic encapsulation with three rigid self-locking strips suitable for insertion into printed circuit boards using standard grids. for use in audio driver stages and television signal processing circuits.



VCBO max.	50	V
VCEO max.	45	V
IC max.	100	mA
Ptot max. (Tamb ≤25°C)	350	mW
hfe (VCE=5·0 V; IC=2·0 mA)	125 to 500	
fT Typ. (VCE=5·0 V; IC=10 mA)	300	MHz

BC148

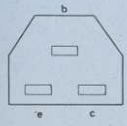
Silicon n-p-n planar epitaxial transistor in plastic encapsulation with three rigid self-locking strips suitable for insertion into printed circuit boards using standard grids. For use in audio preamplifiers, and driver stages in amplifiers, radio and television receivers.



VCBO max.	30	V
VCEO max.	20	V
IC max.	100	mA
Ptot max. (Tamb ≤25°C)	350	mW
hfe (VCE=5 V; IC=2 mA)	125 to 900	
fT Typ. (VCE=5 V; IC=10 mA)	300	MHz

BC149

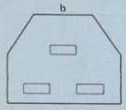
Silicon n-p-n planar epitaxial transistor in plastic encapsulation with three rigid self-locking strips suitable for insertion into printed circuit boards using standard grids. For use in low noise input stages in high quality amplifiers and tape recorders.



VCBO max.	30	V
VCEO max.	20	V
IC max.	100	mA
Ptot max. (Tamb ≤25°C)	350	mW
hfe (VCE=5 V; IC=2 mA)	240 to 900	
fT Typ. (VCE=5 V; IC=10 mA)	300	MHz
*Noise figure (Typ.)	1·4	dB

*IC=0·2 mA; VCE=5 V; RS=2·0 kΩ; f=30 Hz to 15 kHz.

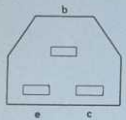
BC157



Silicon p-n-p planar epitaxial transistor in plastic encapsulation with three rigid self-locking strips suitable for insertion into printed circuit boards using standard grids. For use in audio driver stages and television signal processing circuits.

VCBO max.	−50	V
VCEO max.	−45	V
IC max.	100	mA
Ptot max. (Tamb ≤25°C)	350	mW
hfe (VCE=−5 V; IC=−2 mA)	75 to 260	
fT Typ. (VCE=−5 V; IC=−10 mA)	130	MHz

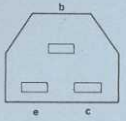
BC158



Silicon p-n-p planar epitaxial transistor in plastic encapsulation with three rigid self-locking strips suitable for insertion into printed circuit boards using standard grids. For use in audio preamplifiers, and driver stages in amplifiers, radio and television receivers.

VCBO max.	−30	V
VCEO max.	−25	V
IC max.	100	mA
Ptot max. (Tamb ≤25°C)	350	mW
hfe (VCE=−5 V; IC=−2 mA)	75 to 260	
fT Typ. (VCE=−5 V; IC=−10 mA)	130	MHz

BC159

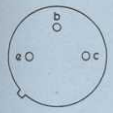


Silicon p-n-p planar epitaxial transistor in plastic encapsulation with three rigid self-locking strips suitable for insertion into printed circuit boards using standard grids. For use in low noise input stages in high quality amplifiers and tape recorders.

VCBO max.	−25	V
VCEO max.	−20	V
IC max.	100	mA
Ptot max. (Tamb ≤25°C)	350	mW
hfe (VCE=−5 V; IC=−2 mA)	125 to 500	
fT Typ. (VCE=−5 V; IC=−10 mA)	130	MHz
*Noise figure (Typ.)	1·2	dB

*IC=−0·2 mA; VCE=−5 V; RS=2·0 kΩ; f=30 Hz to 15 kHz.

BC186

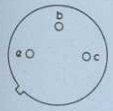


Silicon p-n-p planar epitaxial transistor. For use in television applications and driver stages of audio amplifiers.

Construction: TO–18

VCBO max.	−40	V
VCEO max.	−25	V
ICM max.	200	mA
Ptot max. (Tamb ≤25°C)	300	mW
fT Typ. (VCE=−5 V; IC=−50 mA)	168	MHz
hFE (VCE=−5 V; IC=−50 mA)	35 to 175	

BC187

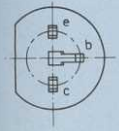


Silicon p-n-p planar epitaxial transistor. For use in television applications and driver stages of audio amplifiers.

Construction: TO–18

VCBO max.	−30	V
VCEO max.	−25	V
ICM max.	200	mA
Ptot max. (Tamb=25°C)	300	mW
fT Typ. (VCE=−5 V; IC=50 mA)	191	MHz
hFE (VCE=−5 V; IC=−50 mA)	65 to 325	

BC327



Silicon p-n-p planar epitaxial transistor in plastic envelope. For use in driver and output stages of audio amplifiers. Complementary to BC337.

VCES max.	−50	V
VCEO max.	−45	V
ICM max.	1·0	A
Ptot max.	625	mW
hFE (VCE=−1 V; IC=−100 mA)	100 to 600	
fT Typ. (VCE=−5 V; IC=−10 mA)	100	MHz

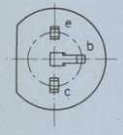
BC328

Silicon p-n-p planar epitaxial transistor in plastic envelope. For use in driver and output stages of audio amplifiers. Complementary to BC338.

VCES max.	−30	V
VCEO max.	−25	V
ICM max.	1·0	A
Ptot max.	625	mW
hFE (VCE=−1 V; IC=−100 mA)	100 to 600	
fT Typ. (VCE=−5V; IC=−10 mA)	100	MHz

BC337

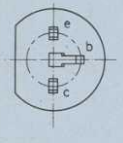
Silicon n-p-n planar epitaxial transistor in plastic envelope. For use in driver and output stages of audio amplifiers. Complementary to BC327.



VCES max.	50	V
VCEO max.	45	V
ICM max.	1·0	A
Ptot max.	625	mW
hFE (VCE=1 V; IC=100 mA)	100 to 600	
fT Typ. (VCE=5 V; IC=10 mA)	200	MHz

BC338

Silicon n-p-n planar epitaxial transistor in plastic envelope. For use in driver and output stages of audio amplifiers. Complementary to BC328.



VCES max.	30	V
VCEO max.	25	V
ICM max.	1·0	A
Ptot max.	625	mW
hFE (VCE=1 V; IC=100 mA)	100 to 600	
fT Typ. (VCE=5 V; IC=10 mA)	200	MHz

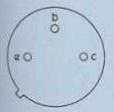
BC548

Silicon n-p-n planar epitaxial transistor in plastic envelope. For use in driver stages of audio amplifiers and in signal processing circuits of TV receivers.

Construction: TO–92		
VCES max.	30	V
VCEO max.	20	V
ICM max.	200	mA
Ptot max.	300	mW
hfe (VCE=5 V; IC=2 mA)	125 to 900	
fT Typ. (VCE=5 V; IC=10 mA)	300	MHz

BCY72

Silicon p-n-p planar epitaxial transistor. For general purpose applications.



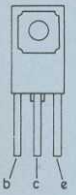
Construction: TO–18		
VCBO max.	−30	V
VCEO max.	−25	V
ICM max.	−200	mA
Ptot max.	350	mW
hFE min. (VCE=−1 V; IC=−10 mA)	100	
fT min. (VCE=−20 V; IC=−10mA)	250	MHz

BD131

Silicon n-p-n planar epitaxial transistor for general purpose and medium power applications.

Construction: TO–126		
VCBO max.	70	V
VCEO max.	45	V
ICM max.	6·0	A
Ptot max. (Tmb ≤60°C)	11	W
hFE min. (VCE=12 V; IC=0·5 A)	40	
fT min. (VCE=5 V; IC=0·25 A)	60	MHz
Tj max	125	°C
Rth (j-mb)	6·0	deg C/W

BD131
BD132



Silicon n-p-n planar epitaxial transistor (BD131) and p-n-p (BD132) output transistors.

Complementary matched pair for push-pull stages.

Construction: TO–126

	BD131	BD132	
VCBO max.	70	−45	V
VCEO max.	45	−45	V
ICM max.	6·0		A
Ptot max. (Tmb ⩽60°C)	11		W
hFE (VCE=±12 V; IC=0·5 A)	78 to 250		
fT min. (VCE=±5 V; IC=0·25 A)	60		MHz
Tj max.	125		°C
Rth (j-mb)	6·0		deg C/W

BD133

Silicon n-p-n planar epitaxial output transistor for high voltage medium power applications.

Construction: TO–126

VCBO max.	90	V
VCEO max.	60	V
ICM max.	6·0	A
Ptot max.	11	W
hFE (VCE=12 V; IC=0·5 A)	>40	
fT (f=35MHz; IC=0·25 A; VCE=5 V)	>60	MHz

BD135

Silicon n-p-n planar epitaxial transistor in plastic encapsulation. Suitable for use in high dissipation single-ended driver circuits, or in complementary driver pairs with type BD136 in high quality audio amplifiers.

Construction: TO–126

VCBO max.	45	V
VCEO max.	45	V
ICM max.	1·5	A
Ptot max. (Tmb ⩽60°C)	6·5	W
hFE (VCE=2 V; IC=150 mA)	40 to 250	
fT Typ. (VCE=5 V; IC=50 mA)	250	MHz
Tj max.	125	°C
Rth (j-mb)	10	deg C/W

BD136

Silicon p-n-p planar epitaxial transistor in plastic encapsulation. Suitable for use in high dissipation single-ended driver circuits, or in complementary driver pairs with type BD135 in high quality audio amplifiers.

Construction: TO–126

VCBO max.	−45	V
VCEO max.	−45	V
ICM max.	1·5	A
Ptot max. (Tmb ⩽60°C)	6·5	W
hFE (VCE=−2 V; IC=150 mA)	40 to 250	
fT Typ. (VCE=−5 V; IC=50 mA)	75	MHz
Tj max.	125	°C
Rth (j-mb)	10	deg C/W

BD137

Silicon n-p-n planar epitaxial transistor in plastic encapsulation. Suitable for use in high dissipation single-ended driver circuits, or in complementary driver pairs with type BD138 in high quality audio amplifiers.

Construction: TO–126

VCBO max.	60	V
VCEO max.	60	V
ICM max.	1·5	A
Ptot max. (Tmb ⩽60°C)	6·5	W
hFE (VCE=2 V; IC=150 mA)	40 to 160	
fT Typ. (VCE=5 V; IC=50 mA)	250	MHz
Tj max.	125	°C
Rth (j-mb)	10	deg C/W

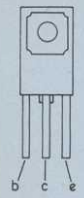
BD138

Silicon p-n-p planar epitaxial transistor in plastic encapsulation. Suitable for use in high dissipation single-ended driver circuits, or in complementary driver pairs with type BD137 in high-quality audio amplifiers.

Construction: TO–126

VCBO max.	−60	V
VCEO max.	−60	V
ICM max.	1·5	A
Ptot max. (Tmb ⩽60°C)	6·5	W
hFE (VCE=−2 V; IC=150 mA)	40 to 160	
fT Typ. (VCE=−5 V; IC=50 mA)	75	MHz
Tj max.	125	°C
Rth (j-mb)	10	deg C/W

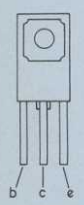
BD139



Silicon n-p-n planar epitaxial transistor in plastic encapsulation. Suitable for use in high dissipation single-ended driver circuits, or in complementary driver pairs with type BD140 in high quality audio amplifiers.

Construction: TO–126		
VCER max.	100	V
VCEO max.	80	V
ICM max.	1·5	A
Ptot max. (Tmb ⩽60°C)	6·5	W
hFE (VCE=2 V; IC=150 mA)	40 to 160	
fT Typ. (VCE=5 V; IC=50 mA)	250	MHz
Tj max.	125	°C
Rth (j-mb)	10	deg C/W

BD140

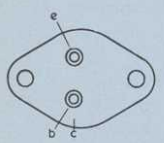


Silicon p-n-p planar epitaxial transistor in plastic encapsulation. Suitable for use in high dissipation single-ended driver circuits, or in complementary driver pairs with type BD139 in high quality audio amplifiers.

Construction: TO–126		
VCER max.	−100	V
VCEO max.	−80	V
ICM max.	1·5	A
Ptot max. (Tmb⩽60°C)	6·5	W
hFE (VCE=−2 V; IC=150 mA)	40 to 160	
fT Typ. (VCE=−5 V; IC=50 mA)	75	MHz
Tj max.	125	°C
Rth (j-mb)	10	deg C/W

BD144

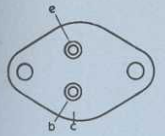
Television line driver n-p-n transistor.



Construction: TO–3		
VCBO	800	V
VCER	800	V
ICM	0·25	A
hFE	20	
fT	12	MHz

BD160

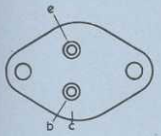
Silicon n-p-n transistor for use in horizontal deflection circuits of TV receivers and E-W correction circuits of colour TV receivers.



Construction: TO–3		
VCBOM max.	250	V
ICM max.	7	A
Ptot (Tmb=125°C) max.	10	W
VCE sat (IC=5 A; IB=1 A)	<1·6	V

BD181

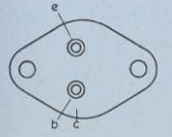
Silicon n-p-n diffused power transistors for use in high-power hi-fi audio equipment.



Construction: TO–3		
VCEO	45	V
VCER	55	V
ICM	15	A
Ptot (Tmb=83°C)	78	W
hFE (IC=3A; VCE=4 V)	20 to 70	

BD182

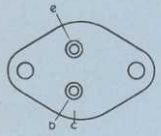
Silicon n-p-n diffused power transistor for use in high-power hi-fi audio equipment.



Construction: TO–3		
VCEO	60	V
VCER	70	V
ICM	15	A
Ptot (Tmb=25°C)	117	W
hFE (IC=4 A; VCE=4 V)	20 to 70	

BD183

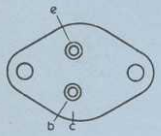
Silicon n-p-n diffused power transistor for use in high-power hi-fi audio equipment.



Construction: TO–3		
VCEO	80	V
VCER	85	V
ICM	15	A
Ptot (Tmb=25°C)	117	W
hFE (IC=4 A; VCE=4 V)	20 to 70	

BD184

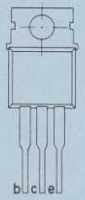
Silicon n-p-n diffused power transistor for use in high-power hi-fi audio equipment.



Construction: TO–3		
VCEO	90	V
VCER	95	V
ICM	15	A
Ptot (Tmb=25°C)	117	W
hFE (IC=4 A; VCE=4 V)	20 to 70	

BD201

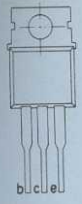
Silicon n-p-n transistor for use in hi-fi audio equipment.
Complementary to BD202.



Construction: TO–220		
VCBO	60	V
VCEO	45	V
ICM	8	A
Ptot (Tmb=25°C)	60	W
hFE	>30	

BD202

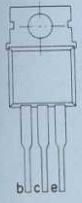
Silicon p-n-p transistor for use in hi-fi audio equipment.
Complementary to BD201.



Construction: TO–220		
VCBO	−60	V
VCEO	−45	V
ICM	8	A
Ptot (Tmb=25°C)	60	W
hFE	>30	

BD203

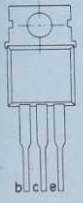
Silicon n-p-n transistor for use in hi-fi audio equipment.
Complementary to BD204.



Construction: TO–220		
VCBO	60	V
VCEO	60	V
ICM	8	A
Ptot (Tmb=25°C)	60	W
hFE	>30	

BD204

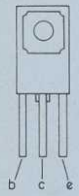
Silicon p-n-p transistor for use in hi-fi audio equipment.
Complementary to BD203.



Construction: TO–220		
VCBO	−60	V
VCEO	−60	V
ICM	8	A
Ptot (Tmb=25°C)	60	W
hFE	>30	

BD232

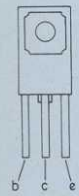
Silicon n-p-n transistor for use as a line driver in television receivers.



Construction: TO–126		
VCBO max.	500	V
VCEO max.	300	V
ICM max.	1·0	A
Ptot max. (Tmb=25°C)	7	W
hFE	25 to 150	
fT typ.	20	MHz

BD233

Silicon n-p-n transistor for use as audio hi-fi driver.



Construction: TO–126		
VCBO max.	45	V
VCEO max.	45	V
ICM max.	6·0	A
Ptot max. (Tmb=25°C)	25	W
hFE	>25	
fT min.	3·0	MHz

BD234

Silicon p-n-p transistor for use as audio hi-fi driver.

Construction: TO–126		
VCBO max.	−45	V
VCEO max.	−45	V
ICM max.	6·0	A
Ptot max. (Tmb=25°C)	25	W
hFE	>25	
fT min.	3·0	MHz

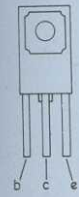
BD235

Silicon n-p-n transistor for use as audio hi-fi driver.

Construction: TO–126		
VCBO max.	60	V
VCEO max.	60	V
ICM max.	6·0	A
Ptot max. (Tmb=25°C)	25	W
hFE	>25	
fT min.	3·0	MHz

BD236

Silicon p-n-p transistor for use as audio hi-fi driver.



Construction: TO–126		
VCBO max.	−60	V
VCEO max.	−60	V
ICM max.	6·0	A
Ptot max. (Tmb=25°C)	25	W
hFE	>25	
fT min.	3·0	MHz

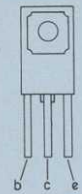
BD237

Silicon n-p-n transistor for use as audio hi-fi driver.

Construction: TO–126		
VCBO max.	100	V
VCEO max.	80	V
ICM max.	6·0	A
Ptot max. (Tmb=25°C)	25	W
hFE	>25	
fT min.	3·0	MHz

BD238

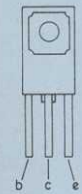
Silicon p-n-p transistor for use as audio hi-fi driver.



Construction: TO–126		
VCBO max.	−100	V
VCEO max.	−80	V
ICM max.	6·0	A
Ptot max. (Tmb=25°C)	25	W
hFE	>25	
fT min.	3·0	MHz

BD435

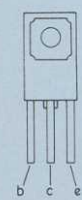
Silicon n-p-n epitaxial base power transistor in plastic envelope. For mains operated amplifiers and radio receivers with output power up to 10 and 15W respectively when used in complementary pair with BD436.



Construction: TO–126		
VCES max.	32	V
VCEO max.	32	V
ICM max.	7	A
Ptot max. (Tmb ⩽25°C)	36	W
hFE min. (VCE=1 V; IC=2 A)	50	
fT min. (VCE=1 V; IC=0·25 A)	3	MHz
Tj max.	150	°C

BD436

Silicon p-n-p epitaxial base power transistor in plastic envelope. For mains operated amplifiers and radio receivers with output power up to 10 and 15W respectively when used in complementary pair with BD435.



Construction: TO–126		
VCES max.	−32	V
VCEO max.	−32	V
ICM max.	−7	A
Ptot max. (Tmb ⩽25°C)	36	W
hFE min. (VCE=−1 V; IC=−2A)	50	
fT min. (VCE=−1 V; IC=0·25 A)	3	MHz
Tj max.	150	°C

BD437

Silicon n-p-n epitaxial base power transistor in plastic envelope. For mains operated amplifiers and radio receivers with output power up to 10 and 15W respectively when used in complementary pair with BD438.

Construction: TO–126		
VCES max.	45	V
VCEO max.	45	V
ICM max.	7	A
Ptot max. (Tmb ⩽25°C)	36	W
hFE min. (VCE=1 V; IC=2 A)	40	
fT min. (VCE=1 V; IC=250 mA)	3	MHz
Tj max.	150	°C

BD438

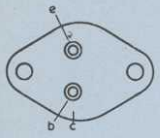
Silicon p-n-p epitaxial base power transistor in plastic envelope. For mains operated amplifiers and radio receivers with output power up to 10 and 15W respectively when used in complementary pair with BD437.

Construction: TO–126		
VCES max.	−45	V
VCEO max.	−45	V
ICM max.	−7	A
Ptot max. (Tmb ⩽25°C)	36	W
hFE min. (VCE=−1 V; IC=−2 A)	40	
fT min. (VCE=−1 V); IC=−250 mA)	3	MHz
Tj max.	150	°C

BDY20

Silicon n-p-n diffused power transistor. For use in high-quality amplifiers and power supplies.

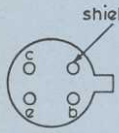
2–BDY20 Matched Pair.



Construction: TO–3		
VCBO max.	100	V
VCEO max.	60	V
ICM max.	15	A
Ptot max. (Tmb ⩽25°C)	115	W
hFE (VCE=4 V; IC=4A)	20 to 70	
fT Typ. (VCE=4 V; IC=1A)	1·0	MHz
Tj max.	200	°C
θj-mb	1·5	deg C/W

BF115

Silicon n-p-n planar epitaxial transistor intended for a.m. and f.m. applications.

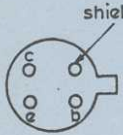


Construction: TO–72		
VCBO max.	50	V
ICM max.	30	mA
Ptot max. (Tamb ⩽45°C)	145	mW
Tj max.	175	°C
fT Typ.	230	MHz
*Noise figure	4·0	dB

*f=100 MHz; gs=10 mmho.

BF167

Silicon n-p-n planar transistor. For use in the control stage of television video i.f. amplifiers with forward gain control.

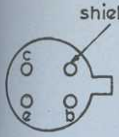


Construction: TO–72		
VCB max.	40	V
VCE max.	30	V
IC max.	25	mA
Ptot max. (Tamb ⩽45°C)	130	mW
fT (VCE=+10 V; IC=4 mA) Typ.	350	MHz
Max. unilateralised gain, Typ.	42	dB
*Noise figure, Typ.	3	dB

*VCE=10 V; IC=4 mA; gs=10 mmho; f=35 MHz.

BF173

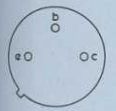
Silicon n-p-n planar epitaxial transistor. For use in the output stages of television video i.f. amplifiers.



Construction: TO–72		
VCB max.	40	V
VCE max.	25	V
IC max.	25	mA
Ptot max. (Tamb ⩽45°C)	260	mW
fT (VCE=+10 V; IC=5 mA)	550	MHz
Max. unilateralised gain, Typ.	42·5	dB

BF177

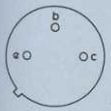
Silicon n-p-n planar transistor. For use in the video output stages of portable television receivers.



Construction: TO–5		
VCBO max.	100	V
VCEO max.	60	V
IC max.	50	mA
Ptot max. (Tamb ⩽65°C)	600	mW
hFE min. (IC=15 mA; VCE=10 V)	20	
fT Typ. (IC=10 mA; VCE=10 V)	120	MHz

BF178

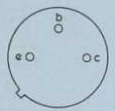
Silicon n-p-n transistor for use in video output stages.



Construction: TO–5 Collector to case		
VCBO max.	185	V
VCEO max.	115	V
ICM max.	50	mA
Ptot max. (Tamb ⩽55°C)	0·6	W
Tj max.	200	°C
fT Typ. (VCE=10 V; IC=10 mA)	120	MHz
hFE min. (VCE=20 V; IC=30 mA)	20	

BF179

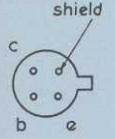
Silicon n-p-n planar transistor. For use in the video output stages of monochrome television receivers.



Construction: TO–5		
VCBO max.	250	V
VCEO max.	115	V
IC max.	50	mA
Ptot max. (Tamb ⩽65°C)	600	mW
hFE min. (IC=20 mA; VCE=15 V)	20	
fT Typ. (IC=10 mA; VCE=10 V)	120	MHz

BF180

Silicon n-p-n planar transistor with forward gain control characteristics. For use in r.f. amplifier stage of television integrated tuners.

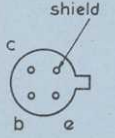


Construction: TO–72		
VCBO max.	30	V
IC max.	20	mA
Ptot max. (Tamb ⩽25°C)	150	mW
*Max. unilateralised power gain	24	dB
fT (IC=2 mA; VCE=10 V) Typ.	675	MHz

*At 200 MHz.

BF181

Silicon n-p-n planar transistor with forward gain control characteristics. For use as a self-oscillating mixer or mixer in television integrated tuners.



Construction: TO–72		
VCBO max.	30	V
IC max.	20	mA
Ptot max. (Tamb ⩽25°C)	150	mW
*Max. unilateralised power gain	11	dB
fT Typ. (IC=2 mA; VCE=10 V)	600	MHz

*At f=900 MHz.

BF182

Silicon n-p-n planar transistor. For use as a separate mixer in television integrated tuners.

Construction: TO–72		
VCBO max.	25	V
VCEO max.	20	V
IC max.	15	mA
Ptot max. (Tamb=25°C)	150	mW
fT Typ. (IC=2 mA; VCE=10 V)	650	MHz
Noise figure (VCB=10 V; IE=2 mA; f=800 MHz) Typ.	7·4	dB
*Max. unilateralised gain Typ.	11	dB

*IE=−2 mA; VCB=10 V; f=900 MHz.

BF183

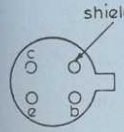
Silicon n-p-n planar transistor. For use as a local oscillator in television integrated tuners.

Construction: TO–72		
VCBO max.	25	V
VCEO max.	20	V
IC max.	15	mA
Ptot max. (Tamb=25°C)	150	mW
fT Typ. (IC=3 mA; VCE=10 V)	800	MHz
*Max. unilateralised gain Typ.	13	dB

*IE=−3 mA;VCB=10 V; f=900 MHz.

BF184

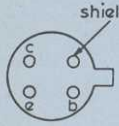
Silicon n-p-n planar epitaxial transistor recommended for use in i.f. amplifiers.



Construction: TO–72		
VCBO max.	30	V
IC max.	30	mA
Ptot max. (Tamb ⩽45°C)	145	mW
Tj max.	175	°C
hFE (IC=1 mA; VCE=10 V)	75 to 750	
fT Typ. (IC=1 mA; VCE=10 V)	300	MHz

BF185

Silicon n-p-n planar epitaxial low noise transistor. Intended for use as input and mixer/oscillator stages.

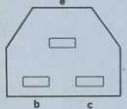


Construction: TO–72		
VCBO max.	30	V
IC max.	30	mA
Ptot max. (Tamb ≤45°C)	145	mW
Tj max.	175	°C
hFE (IC=1 mA; VCE=10 V)	34 to 140	
fT Typ. (IC=1 mA; VCE=10 V)	220	MHz
*Noise figure Typ.	4·0	dB

*IC=1 mA; VCE=10 V; RS=100 Ω; f=100 MHz.

BF194

Silicon n-p-n epitaxial planar transistor in epoxy resin encapulation with three rigid self-locking connections. For use in a.m./f.m. receiver i.f. stages and sound i.f. stages of television receivers.

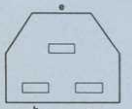


VCB max. (IE=0)	30	V
IC max.	30	mA
Ptot max. (Tamb ≤45°C)	220	mW
hFE (VCE=10 V; IC=1 mA) Typ.	115	
fT Typ.	260	MHz
*Noise figure Typ.	4·0	dB

*IC=1 mA; VCE=10 V; f=100 MHz; gs=10 mmho.

BF195

Silicon n-p-n epitaxial planar transistor. For use in the input and mixer stages of a.m./f.m. receivers.

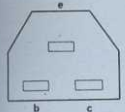


VCB max. (IE=0)	30	V
IC max.	30	mA
Ptot max. (Tamb ≤45°C)	220	mW
hFE (VCE=10 V; IC=1 mA) Typ.	67	
fT Typ.	200	MHz
*Noise figure Typ.	3·5	dB

*IC=1 mA; VCE=10 V; f=1 MHz; gs=20 mmho.

BF196

Silicon n-p-n planar transistor in plastic encapsulation with three rigid self-locking strips suitable for insertion into printed circuit boards using standard grids. For use in the control stage of television video i.f. amplifiers with forward gain control.

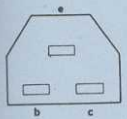


VCBO max.	40	V
VCEO max.	30	V
IC max.	25	mA
Ptot max. (Tamb=25°C)	250	mW
fT Typ. (IC=4 mA; VCE=10 V)	400	MHz
*Noise figure Typ.	3·0	dB

*IC=4 mA; VCE=10 V; gs=10 mmho; f=35 MHz.

BF197

Silicon n-p-n planar epitaxial transistor in plastic encapsulation with three rigid self-locking strips suitable for insertion into printed circuit boards using standard grids. For use in the output stage of television video i.f. amplifiers.



VCBO max.	40	V
VCEO max.	25	V
IC max.	25	mA
Ptot max. (Tamb=25°C)	250	mW
fT Typ. (IC=5 mA; VCE=10 V)	550	MHz

BF200

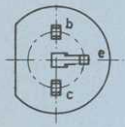
Silicon n-p-n planar transistor with forward gain control characteristics. For use in the r.f. amplifier stage of television v.h.f. tuners.

Construction: TO–72		
VCBO max.	30	V
VCEO max.	20	V
IC max.	20	mA
Ptot max. (Tamb=25°C)	150	mW
fT Typ. (IC=3 mA; VCE=10 V)	550	MHz
*Noise figure Typ.	3·0	dB

*IE=−3 mA; VCB=10 V; gs=10 mmho; f=200 MHz.

BF241

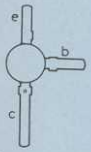
Silicon n-p-n transistor for use as a.m. mixer/i.f. amplifier.



Construction: TO–92		
VCBO max.	40	V
VCEO max.	40	V
ICM max.	25	mA
Ptot max. (Tamb=45°C)	225	mW
Tj max.	150	°C
fT min.	400	MHz

BF262

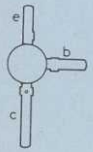
Silicon n-p-n h.f. transistor for use in u.h.f. television tuners.



VCBO max.	30	V
VCEO max.	20	V
ICM max.	20	mA
hFE (IC=3·0 mA)	>20	
fT min.	800	MHz

BF263

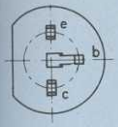
Silicon n-p-n h.f. transistor for use in u.h.f. television tuners.



VCBO max.	30	V
VCEO max.	20	V
ICM max.	20	mA
hFE (IC=3·0 mA)	20	
fT min.	600	MHz

BF324

Silicon p-n-p planar epitaxial transistor in a plastic envelope. For use in f.m. tuners r.f. stages in common base configuration.

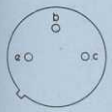


Construction: TO–92		
VCBO max.	−30	V
VCEO max.	−30	V
IC max.	−25	mA
Ptot max. (Tamb=45°C)	250	mW
fT Typ. (IC=−4 mA; VCE=−10 V)	550	MHz
*Noise figure Typ.	3·0	dB

*IC=2 mA; VCE=−10V; Gs=16·7 mA/V; f=100MHz

BF336

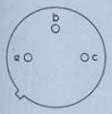
Silicon n-p-n medium power transistor for use as television video amplifier.



Construction: TO–5. Collector to case		
VCBO max.	185	V
VCEO max.	180	V
ICM max.	100	mA
Ptot max. (Tmb=25°C)	3·0	W
hFE (IC=30 mA)	>20	
fT min.	80	MHz

BF337

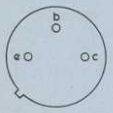
Silicon n-p-n medium power transistor for use as television video amplifier.



Construction: TO–5. Collector to case		
VCBO max.	250	V
VCEO max.	200	V
ICM max.	100	mA
Ptot max. (Tmb=25°C)	3·0	W
hFE (IC=30 mA)	>20	
fT min.	80	MHz

BF338

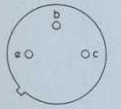
Silicon n-p-n medium power transistor for use as colour television video amplifier.



Construction: TO–5. Collector to case		
VCBO max.	300	V
VCEO max.	225	V
ICM max.	100	mA
Ptot max. (Tmb=25°C)	3·0	W
hFE (IC=30 mA)	>20	
fT min.	80	MHz

BF355

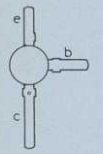
Silicon n-p-n planar transistor for use as a driver in line output stages of TV receivers.



Construction: TO–5. Collector to case		
VCBO max.	300	V
VCEO max.	225	V
IC max.	100	mA
Ptot max. Tmb ⩽140°C)	3	W
ts typ.	0·5	µs
Tj max.	200	°C

BF362

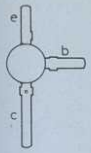
Silicon n-p-n planar high-gain u.h.f. transistor for use in r.f. stages of TV tuners.



Construction: T-pack		
VCBO max.	30	V
VCEO max.	20	V
IC max.	20	mA
Ptot max. (Tamb ⩽55°C)	120	mW
fT typ. (IC=3 mA; VCE=10 V)	800	MHz

BF363

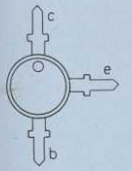
Silicon n-p-n planar high-gain u.h.f. transistor for use in r.f. stages of TV tuners.



Construction: T-pack		
VCBO max.	30	V
VCEO max.	20	V
IC max.	20	mA
Ptot max. (Tamb ⩽55°C)	120	mW
fT min. (IC=3 mA; VCE=10 V)	600	MHz

BFR91

Silicon n-p-n planar epitaxial u.h.f. transistor in plastic T package. For use in u.h.f. and microwave amplifiers.

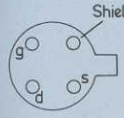


VCBO max.	15	V
VCEO max.	12	V
IC max.	35	mA
Ptot max. (Tamb ⩽60°C)	180	mW
*–Cre typ. (f=1MHz)	0·8	pF
*N typ.	1·9	dB
†fT typ.	5	GHz
†Max. unilateralised power gain typ.	16·5	dB

*IC=2 mA; VCE=5V; f=500 MHz
†IC=30 mA; VCE=5V, f=500 MHz

BFW10

N-channel silicon field-effect transistor, low noise, suitable for use in wide-band amplifiers.



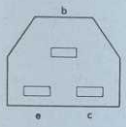
Construction: TO–72. Shield to case		
VDSS max.	±30	V
VGSO max.	−30	V
ID max.	20	mA
IG max.	10	mA
Ptot max. (Tamb ⩽25°C)	300	mW
*N max.	2·5	dB

g—gate
d—drain
s—source

*f=100 MHz; RG=800 Ω; VDS=15 V; VGS=0.

BFW59

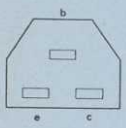
Silicon n-p-n planar epitaxial transistor in plastic encapsulation with three rigid self-locking strips suitable for insertion into printed circuit boards using standard grids. For general purpose applications.



VCBO max.	40	V
VCEO max.	35	V
ICM max.	1·0	A
Ptot max. (Tamb ⩽25°C)	350	mW
hFE (IC=100 mA)	>80	
fT min.	80	MHz

BFW60

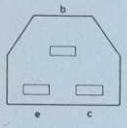
Silicon n-p-n planar epitaxial transistor in plastic encapsulation with three rigid self-locking strips suitable for insertion into printed circuit boards using standard grids. For general purpose applications.



VCBO max.	40	V
VCEO max.	35	V
ICM max.	1·0	A
Ptot max. (Tamb ⩽25°C)	350	mW
hFE (IC=100 mA)	>50	
fT min.	80	MHz

BFW87

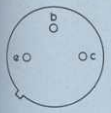
Silicon p-n-p planar epitaxial transistor in plastic encapsulation with three rigid self-locking strips suitable for insertion into printed circuit boards using standard grids.



VCBO max.	−60	V
VCEO max.	−60	V
IC max.	−500	mA
Ptot max. (Tamb ⩽25°C)	300	mW
hFE (IC=150 mA)	80 to 320	
fT min.	100	MHz

BFX29

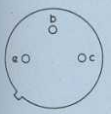
Silicon p-n-p planar epitaxial transistor for general amplifying and switching purposes.



Construction: TO–5. Collector to case		
VCBO max.	−60	V
VCEO max.	−60	V
ICM max.	600	mA
Ptot max. (Tamb ⩽25°C)	600	mW
hFE Typ. (VCE=−10V; IC=10 mA)	125	
fT min. (VCE=−10 V; IC=50 mA)	100	MHz

BFX44

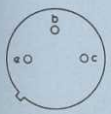
Silicon n-p-n planar epitaxial transistor for use as a low distortion common base linear output amplifier.



Construction: TO–18		
VCBO max.	40	V
VCER max.	23	V
ICM max.	250	mA
Ptot max. (Tamb ⩽25°C)	360	mW
fT min. (IC=10 mA; VCE=10 V)	500	MHz
Tj max.	200	°C

BFX84

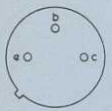
Silicon n-p-n planar epitaxial transistor.



Construction: TO–5. Collector to case		
VCBO max.	100	V
VCEO max.	60	V
ICM max.	1	A
Ptot max. (Tamb. ⩽25°C)	800	mW
hFE Typ. (VCE=10 V; IC=150 mA)	112	
fT min. (VCE=10 V; IC=50 mA)	50	MHz

BFX85

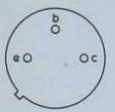
Silicon n-p-n planar epitaxial transistor.



Construction: TO–5. Collector to case		
VCBO max.	100	V
VCEO max.	60	V
ICM max.	1	A
Ptot max. (Tamb. ⩽25°C)	800	mW
hFE Typ. (VCE=10 V; IC=150 mA)	142	
fT min. (VCE=10 V; IC=50 mA)	50	MHz

BFX88

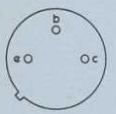
Silicon p-n-p planar epitaxial transistor for general amplifying and switching purposes.



Construction: TO–5. Collector to case		
VCBO max.	−40	V
VCEO max.	−40	V
ICM max.	600	mA
Ptot max. (Tamb ⩽25°C)	600	mW
hFE Typ. (VCE=−10 V; IC=10 mA)	125	
fT min. (VCE=−10 V; IC=50 mA)	100	MHz

BFY50

Silicon n-p-n planar epitaxial transistor for general purpose applications.



Construction: TO–5. Collector to case		
VCBO max.	80	V
VCEO max.	35	V
ICM max.	1·0	A
Ptot max. (Tamb⩽25°C)	800	mW
hFE Typ. (VCE=10 V; IC=150 mA)	112	
fT min (VCE=10 V; IC=50 mA)	50	MHz

BFY51

Silicon n-p-n planar epitaxial transistor for general purpose applications.

Construction: TO–5. Collector to case		
VCBO max.	60	V
VCEO max.	30	V
ICM max.	1·0	A
Ptot max. (Tamb ⩽25°C)	800	mW
hFE Typ. (VCE=10 V; IC=150 mA)	123	
fT min. (VCE=10 V; IC=50 mA)	50	MHz

BFY52

Silicon n-p-n planar epitaxial transistor for general purpose applications.

Construction: TO–5. Collector to case		
VCBO max.	40	V
VCEO max.	20	V
ICM max.	1·0	A
Ptot max. (Tamb ⩽25°C)	800	mW
hFE Typ. (VCE=10 V; IC=150 mA)	142	
fT min. (VCE=10 V; IC=50 mA)	50	MHz

BFY90

Silicon n-p-n transistor for use as a u.h.f. amplifier.

Construction: TO–72		
VCBO max.	30	V
VCEO max.	15	V
ICM max.	50	mA
Ptot max. (Tamb ⩽25°C)	200	mW
hFE (IC=2·0 mA)	25 to 150	
fT min.	1	GHz

BR100

Silicon bi-directional trigger device for use in triac and thyristor trigger circuits.

Construction: DO–14		
VBO	32 ± 4·0	V
ITRM max. ($t \leqslant 20\ \mu s$)	2·0	A
Pav (Tamb ⩽ 70°C)	150	mW

BR101

Silicon planar p-n-p-n controlled switch for television time base and other applications.

Construction: TO–72		
P-N-P Transistor-VEBO (max.)	50	V
N-P-N Transistor VCBO (nom.)	50	V
—IERM (max.)	2·5	A
Ptot max. (Tamb = 25°C)	275	mW
VAK (Forward on State)	<1·4	V
IH (Holding current)	<1·0	mA

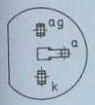
BRY39

Silicon p-n-p-n controlled switch for use as a programmable unijunction transistor.

Construction: TO–72		
VGak max.	70	V
VGaA max.	70	V
IA max.	250	mA
Tj max.	150	°C
IARM (max.)	2·5	A

BRY56

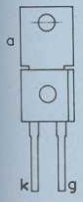
Silicon p-n-p-n controlled switch for use as a programmable unijunction transistor.



Construction: TO–92 (plastic)		
VGK max.	70	V
VGA max.	70	V
IA max.	250	mA
Tj max.	150	°C
IARM max.	2·5	A

BT100A–500R

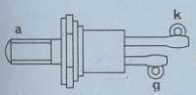
P-gate silicon reverse blocking thyristor in plastic envelope. For use in general domestic applications.



VRRM max.	500	V
IT (AV) max. (Tmb ⩽ 85°C)	2	A
ITSM max.	40	A
IGT min.	10	mA
VGT min.	2·0	V

BT101–500R

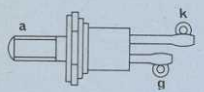
P-gate silicon reverse blocking thyristors. For use in general domestic applications.



Construction: TO–64		
VRWM max.	400	V
VRRM max.	500	V
IT(AV) max.	6·5	A
ITSM max. (t=10 ms)	55	A
IGT (Tj=25°C)	>10	mA
VGT (Tj=25°C)	>2·0	V
Tj max.	125	°C

BT102–500R

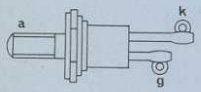
P-gate silicon reverse blocking thyristors. For use in general domestic applications.



Construction: TO–64		
VRWM max.	400	V
VRRM max.	500	V
IT(AV) max.	6·5	A
ITSM max. (t=10 ms)	55	A
IGT (Tj=25°C)	>50	mA
VGT (Tj=25°C)	>2·5	V
Tj max.	125	°C

BT106

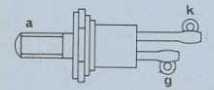
P-gate silicon reverse blocking thyristor. For use in transformerless power supplies, in particular for television applications.



Construction: Similar to TO–64 (Ratings apply to frequencies of 0 to 400 Hz)		
VRWM max.	650	V
VRRM max.	700	V
VBO min. (Tj=100°C)	500	V
IT (RMS) max.	10	A
IT (AV) max. (Tmb=90°C)	1·0	A
VGT (Tj=25°C)	>3·5	V
IGT (Tj=25°C)	>50	mA
Tj max.	100	°C

BT107

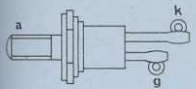
P-gate silicon reverse blocking thyristor for use in domestic and light industrial equipment.



Construction: Similar to TO–64 (Ratings apply to frequencies 0 to 400 Hz)		
VRWM max.	400	V
VRRM max.	500	V
VBO min. (Tj=100°C)	500	V
IT (RMS) max.	15	A
IT (AV) max. (Tmb≤60°C)	6·5	A
VGT (Tj=25°C)	>2·0	V
IGT (Tj=25°C)	>10	mA
Tj max.	100	°C

BT108

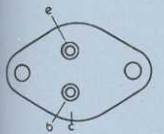
P-gate silicon reverse blocking thyristor for use in domestic and light industrial equipment.



Construction: Similar to TO–64 (Ratings apply to frequencies 0 to 400 Hz)		
VRWM max.	400	V
VRRM max.	500	V
VBO min (Tj=100°C)	500	V
IT (RMS) max.	15	A
IT (AV) max. (Tmb≤60°C)	6·5	A
VGT (Tj=25°C)	>3·5	V
IGT (Tj=25°C)	>50	mA
Tj max.	100	°C

BU105

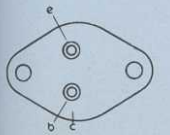
Silicon n-p-n high voltage power transistor in metal envelope, intended for use in line deflection circuits of television receivers.



Construction: TO–3		
VCBO max. (total peak value)	1500	V
VCER max. (total peak value, RBE≤100 Ω)	1500	V
ICM max.	2·5	A
Ptot max. (Tmb ≤90°C)	10	W
VCE (sat) max. (IC=2·5 A, IB=1·5 A)	5·0	V
Tj max.	115	°C
Rth (j-mb)	2·5	deg C/W

BU108

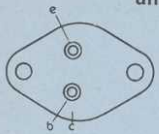
Silicon n-p-n high voltage power transistor in metal envelope, intended for use in line deflection circuits of television receivers.



Construction: TO–3		
VCBO max. (total peak value)	1500	V
VCER max. (total peak value, RBE≤100 Ω)	1500	V
ICM max.	5·0	A
Ptot max. (Tmb ≤95°C)	12·5	W
VCE (sat) max. (IC=4·5 A, IB=2A)	5·0	V
Tj max.	115	°C
Rth (j-mb)	1·6	deg C/W

BU126

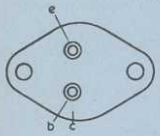
High voltage silicon n-p-n power transistor for use in switched mode power supply units for television.



Construction: TO–3		
VCESM	750	V
ICM	6	A
Ptot max. (Tmb=50°C)	30	W
tf typ.	0·15	µs

BU204

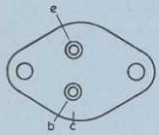
High voltage silicon n-p-n power transistor for use in line deflection circuits for television.



Construction: TO–3		
VCESM	1300	V
IC (dc)	2·5	A
Ptot (Tmb=90°C)	10	W
hFE (IC=2 A)	>2	
tf typ. (IC=2 A; IB=1 A)	0·75	µs

BU205

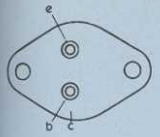
High voltage silicon n-p-n power transistor for use in line deflection circuits for television.
Replacement for BU105, BU105/01 and 02.



Construction: TO–3		
VCESM	1500	V
IC (dc)	2·5	A
Ptot (Tmb=90°C)	10	W
hFE (IC=2 A)	>2	
tf typ. (IC=2 A; IB=1 A)	0·75	µs

BU206

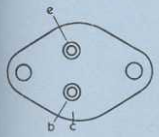
High voltage silicon n-p-n power transistor for use in line deflection circuits for television.
Replacement for BU105, BU105/01 and 02



Construction: TO–3		
VCESM	1700	V
IC (dc)	2·5	A
Ptot (Tmb=90°C)	10	W
hFE (IC=2 A)	>1·8	
tf typ. (IC=2 A; IB=1 A)	0·75	µs

BU208

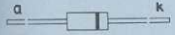
High voltage silicon n-p-n power transistor for use in line deflection circuits for colour television.
Replacement for BU105, BU105/01 and 02



Construction: TO–3		
VCESM	1500	V
IC (dc)	5	A
Ptot (Tmb=90°C)	12·5	W
hFE (IC=4·5 A)	>2·25	
tf typ. (IC=4·5 A; IB=1·8 A)	0·70	µs

BY126

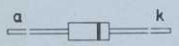
Silicon double-diffused junction rectifier diode.



Plastic construction		
VRRM	650	V
VRWM	450	V
IF (AV) for R and L load:		
at VRWM=max.	1·0	A
at VRWM=60 V	1·2	A
IFSM (t=10 ms)	40	A
Tj max.	150	°C

BY127

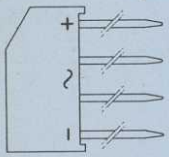
Silicon double-diffused junction rectifier diode.



Plastic construction		
VRRM	1250	V
VRWM	800	V
IF (AV) for L and R loads:		
at VRWM = max.	1·0	A
at VRWM = 60 V	1·2	A
IFSM (t = 10 ms)	40	A
Tj max.	150	°C

BY164

Silicon bridge rectifier consisting of four silicon double diffused junction diodes in a plastic encapsulation. For use in mains powered domestic equipment.

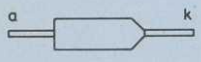


Vin (RMS) max.	42	V
VIRM	120	V
*Vout max.	60	V
†Vout max.	38	V
†Iout max. (Tamb ⩽40°C)	1·4	A
IORM	5·0	A

*Capacitive load.
†Resistive/Inductive load.

BY176

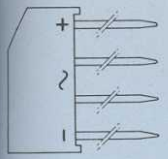
Silicon plastic encapsulated E.H.T. rectifier diode. For television applications, particularly in small-screen receivers.



VRRM max.	15	kV
VRWM max.	15	kV
IF (AV) max.	2·5	mA
IFRM max.	250	mA
Tj max.	95	°C

BY179

Silicon bridge rectifier consisting of four silicon double diffused junction diodes in a plastic encapsulation. For use in mains powered domestic equipment.

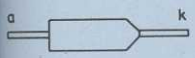


Vin (RMS) max.	280	V
VIRM	800	V
*Vout max.	400	V
†Vout max.	255	V
†Iout max. (Tamb ⩽40°C)	1·0	A
IORM	5·0	A

*Capacitive load
†Resistive/Inductive load

BY182

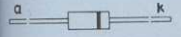
Silicon E.H.T. rectifier diode for use in trebler circuits of colour television receivers.



VRRM max.	12	kV
VRWM max.	12	kV
IF (AV) max.	2·5	mA
IFRM max.	250	mA
Tj max.	95	°C

BY184

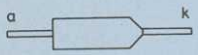
Silicon high voltage, high speed rectifier diode for use in television circuits.



Construction: DO–14		
VRRM max.	1800	V
VRWM max.	1500	V
IF (AV) max.	2·0	mA
IFRM max.	100	mA
Tj max.	75	°C

BY187

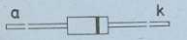
Silicon E.H.T. rectifier diode for use in trebler circuits of colour television receivers.



VRRM max.	12·5	kV
VRWM max.	11·5	kV
IF (AV) max.	2·5	mA
IFRM max.	200	mA
Tj max.	85	°C

BY206

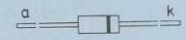
Fast soft-recovery silicon rectifier diode. For use as top level detector, scan rectifier in TV and h.f. power supplies.



VRRM max.	350	V
IF (AV) max.	0·4	A
IFSM max.	15	A
Qs max. (IF=400 mA to VR ⩾50 V)	60	nC
Tj max.	150	°C

BY207

Fast soft-recovery silicon rectifier diode. For use as top level detector, scan rectifier in TV and h.f. power supplies.



VRRM max.	600	V
IF (AV) max.	0·4	A
IFSM max.	15	A
Qs max. (IF=400 mA to VR ⩾50 V)	60	nC
Tj max.	150	°C

BY210–400
BY210–600

High speed soft-recovery silicon rectifier diodes for use in TV scan rectification, switched mode power supplies and converters.

Plastic Construction: DO–15

	BY210–400	600	
VRRM	400	600	V
VRSM	400	600	V
IFRM	5		A
IFSM	30		A
Tj max.	+125		°C

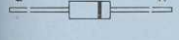
BYX10

Silicon double diffused rectifier diode in plastic encapsulation, intended for use in low current rectifier applications.

VRRM max.	1600	V
VRWM max.	800	V
IF (AV) max. (R and L load):		
at VRWM max.	0·36	A
at VRWM = 60 V	0·5	A
IFRM max.	3·0	A
IFSM max. (t=10 ms)	15	A
Tj max.	150	°C

BYX36–150
BYX36–300
BYX36–600

Silicon diffused rectifier diodes in plastic envelope for general purpose use.



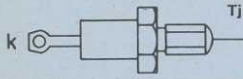
Plastic Construction: DO–15

	BYX36–150	–300	–600	
VRWM max.	100	200	400	V
VRRM max.	150	300	600	V
IF (AV) max. (Tamb ⩽45°C)		1		A
IFSM max.		30		A
Tj max.		125		°C

BYX38–600R

Silicon diffused junction rectifier diode for power applications.

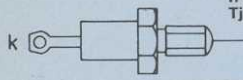
Construction: DO–4		
VRRM	600	V
VRWM	400	V
IF (AV) max.		
(Tmb ⩽75°C)	6	A
IFSM (t=10 ms)	38	A
Tj max.	150	°C



BYX48–600R

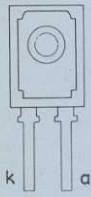
Silicon diffused junction rectifier diode for power applications.

Construction: DO–4		
VRRM	600	V
VRWM	400	V
IF (AV) max.		
(Tmb ⩽125°C)	6	A
IFSM (t=10 ms)	90	A
Tj max.	175	°C



BYX49–600R

Silicon rectifier diode in plastic envelope for power applications.

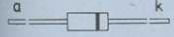


VRRM max.	600	V
VRWM max.	400	V
IF (AV) max.		
(Tmb ⩽120°C)	3	A
IFSM max.	40	A
Tj max.	150	°C

Anode connected to metal base plate

BYX55–600

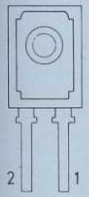
Fast soft-recovery rectifier diode in plastic envelope. For use in inverter and converter applications and in switched mode power supplies, scan rectifiers in TV receivers.



VRRM max.	600	V
VRW max.	500	V
IF (AV) max.	1·2	A
IFSM max.	40	A
Qs max. (IF=1 A to VR >50 V)	120	nC
Tj max.	125	°C

BYX71–350(R) 600(R)

Fast soft-recovery silicon rectifier diodes in plastic envelope. For use in chopper applications, in switched-mode power supplies, as diodes and scan rectifiers in TV receivers.

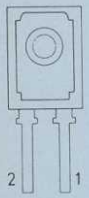


	BYX71–350(R)	–600(R)	
VRRM max.	350	600	V
VRW max.	300	500	V
IF (AV) max. (Tmb <85°C)	7		A
IFSM max.	60		A
Qs max. (IF=2 A to VR=30 V)	700		nC
Tj max.	150		°C

	BYX71-350 -600	BYX71-350R -600R
baseplate	k	a
tag 1	k	a
tag 2	a	k

BZV15

Voltage regulator diodes. Dissipation 2·2W (Tamb=25°C). Voltage tolerance ±5%.



Type No.	Vz (nom.) (V)	Type No.	Vz (nom.) (V)
-C10	10	-C30	30
-C11	11	-C33	33
-C12	12	-C36	36
-C13	13	-C39	39
-C15	15	-C43	43
-C16	16	-C47	47
-C18	18	-C51	51
-C20	20	-C56	56
-C22	22	-C62	62
-C24	24	-C68	68
-C27	27	-C75	75

Normal Polarity		R Version
baseplate	k	a
tag 1	k	a
tag 2	a	k

BZX61

Voltage regulator diodes. Dissipation 1·3W (Tamb=25°C). Voltage tolerance ±5%.

Construction: DO–7

Type No.	Vz (nom.) (V)	Type No.	Vz (nom.) (V)	Type No.	Vz (nom.) (V)
-C3V6	3·6	-C10	10	-C30	30
-C3V9	3·9	-C11	11	-C33	33
-C4V3	4·3	-C12	12	-C36	36
-C4V7	4·7	-C13	13	-C39	39
-C5V1	5·1	-C15	15	-C43	43
-C5V6	5·6	-C16	16	-C47	47
-C6V2	6·2	-C18	18	-C51	51
-C6V8	6·8	-C20	20	-C56	56
-C7V5	7·5	-C22	22	-C62	62
-C8V2	8·2	-C24	24	-C68	68
-C9V1	9·1	-C27	27	-C75	75

BZX70

Voltage regulator diodes. Dissipation 2·5W (Tamb=25°C). Voltage tolerance ±5%.

Construction: SO–15

Type No.	Vz (nom.) (V)	Type No.	Vz (nom.) (V)	Type No.	Vz (nom.) (V)
-C7V5	7·5	-C18	18	-C43	43
-C8V2	8·2	-C20	20	-C47	47
-C9V1	9·1	-C22	22	-C51	51
-C10	10	-C24	24	-C56	56
-C11	11	-C27	27	-C62	62
-C12	12	-C30	30	-C68	68
-C13	13	-C33	33	-C75	75
-C15	15	-C36	36		
-C16	16	-C39	39		

BZY88

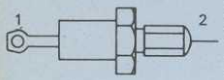
Voltage regulator diodes. Dissipation 400 mW (Tamb=50°C). Voltage tolerance ±5%.

Construction: DO–7

Type No.	Vz (nom.) (V)	Type No.	Vz (nom.) (V)	Type No.	Vz (nom.) (V)
-C1V3	1·3	-C6V2	6·2	-C16	16
-C2V7	2·7	-C6V8	6·8	-C18	18
-C3V0	3·0	-C7V5	7·5	-C20	20
-C3V3	3·3	-C8V2	8·2	-C22	22
-C3V6	3·6	-C9V1	9·1	-C24	24
-C3V9	3·9	-C10	10	-C27	27
-C4V3	4·3	-C11	11	-C30	30
-C4V7	4·7	-C12	12	-C33	33
-C5V1	5·1	-C13	13	-C36	36
-C5V6	5·6	-C15	15		

BZY93

Voltage regulator diodes. Dissipation 20W (Tmb ≤75°C). Voltage tolerance ±5%.



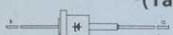
Normal Polarity	R Version
1 a	k
2 k	a

Construction: DO–4

Type No.	Vz (nom.) (V)	Type No.	Vz (nom.) (V)
–C6V8	6·8	–C24	24
–C7V5	7·5	–C27	27
–C8V2	8·2	–C30	30
–C9V1	9·1	–C33	33
–C10	10	–C36	36
–C11	11	–C39	39
–C12	12	–C43	43
–C13	13	–C47	47
–C15	15	–C51	51
–C16	16	–C56	56
–C18	18	–C62	62
–C20	20	–C68	68
–C22	22	–C75	75

BZY95

Voltage regulator diodes. Dissipation 1·5W (Tamb=25°C). Voltage tolerance ±5%.

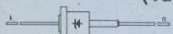


Construction: DO–1

Type No.	Vz (nom.) (V)	Type No.	Vz (nom.) (V)	Type No.	Vz (nom.) (V)
–C10	10	–C22	22	–C47	47
–C11	11	–C24	24	–C51	51
–C12	12	–C27	27	–C56	56
–C13	13	–C30	30	–C62	62
–C15	15	–C33	33	–C68	68
–C16	16	–C36	36	–C75	75
–C18	18	–C39	39		
–C20	20	–C43	43		

BZY96

Voltage regulator diodes. Dissipation 1·5W (Tamb=25°C). Voltage tolerance ±5%.

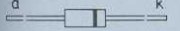


Construction: DO–1

Type No.	Vz (nom.) (V)	Type No.	Vz (nom.) (V)	Type No.	Vz (nom.) (V)
–C4V7	4·7	–C6V2	6·2	–C8V2	8·2
–C5V1	5·1	–C6V8	6·8	–C9V1	9·1
–C5V6	5·6	–C7V5	7·5	–C10	10·0

OA47

Gold bonded germanium diode for switching applications and general use.

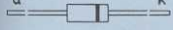


Construction: DO–7

VR max.	25	V
IF max.	110	mA
VF at IF=150 mA	<1·1	V
Qs (when switched from IF=10 mA to VR=10 V)	<600	pC

OA90

Germanium point-contact diode. For use as a detector or f.m. demodulator in a.m. and f.m. receivers.



Construction: DO–7

Max. Reverse voltage peak VRM	30	V
*average VR (AV)	20	V
Max. Forward current peak IFM	45	mA
*average IF (AV)	10	mA
surge (1 sec. max.)	200	mA
Tamb	75	°C

*Averaged over any 50ms period or d.c. component.

OA91

Germanium point-contact diode. For use as a detector in a.m. receivers, and as a general purpose diode.

Construction: DO–7

Max. Reverse voltage peak VRM	115	V
average VR (AV)	90	V
Max. Forward current peak IFM	150	mA
*average IF (AV)	50	mA
Tamb	75	°C

*With zero reverse voltage. Averaged over any 50ms period or d.c. component.

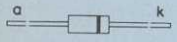
OA95

Germanium point-contact diode for general purpose use.

Construction: DO–7		
Max. Reverse voltage peak		
VRM	115	V
*average (VR (AV)	90	V
Max. Forward current peak		
IFM	150	mA
*average IF (AV)	50	mA
surge (1 sec. max.)	500	mA
Tamb	75	°C

OA202

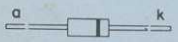
Silicon alloyed diode for general applications.



Construction: DO–7		
VR max.	150	V
IFRM max.	250	mA
VF at IF=30 mA	0·9	V
Tamb (max.)	125	°C

IN914

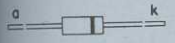
Silicon whiskerless diode for high speed applications.



VR max.	75	V
IFRM max.	225	mA
VF at IF=10 mA	<1	V
trr (when switched from IF=10 mA to VR=6 V)	<4	ns
Tamb (max.)	175	°C

IN4001 IN4002 IN4003 IN4004 IN4005

Range of plastic encapsulated silicon rectifier diodes for general use.



VR max. 1N4001	50	V
1N4002	100	V
1N4003	200	V
1N4004	400	V
1N4005	600	V
IF (AV) max.	1·0	A
Tj max.	175	°C

IN4148 IN4446 IN4448

Whiskerless silicon high speed diodes.

Construction: DO–35		
VR max.	75	V
IFRM, 1N4148 max.	225	mA
1N4446 max.	450	mA
1N4448 max.	450	mA
VF at IF=10 mA, 1N4148	<1	V
IF=20 mA, 1N4446	<1	V
IF=100 mA, 1N4448	<1	V
trr (when switched from IF=10 mA to VR=6 V)	<4	ns

SEMICONDUCTOR COMPARABLES

INTRODUCTION

The comparables section consists of a list of suitable Mullard replacements for semiconductor devices made by other manufacturers. It has been compiled by comparing the published data for individual types. In general, Mullard types are given only if their important electrical characteristics are as good as, or better than, the type to be replaced.

For example, a Mullard AC127 is given as a replacement for a 2SD96. A comparison of the electrical ratings and characteristics which are important for replacement purposes is as follows:

	Ptot max.	VCB max.	VCER max.	IC max.	fT
2SD96	300mW	25V	18V	250mA	2·0MHz
AC127	340mW	32V	32V	500mA	2·5MHz

Thus considering the design tolerance in domestic equipment, the use of the AC127 as a replacement is justified. However, once the Mullard type has been selected from this list, its encapsulation details should be studied to determine whether the Mullard device will fit into the space available.

Semiconductor devices made by different manufacturers seldom have exactly the same nominal characteristics, and, unlike valves, it is not therefore possible to give a list of direct replacements – those types which may confidently be interchanged because all ratings, characteristics and encapsulation details are the same or very similar. The characteristics of some devices made by other manufacturers may be quoted at different d.c. conditions to those used by Mullard, and the measurement methods may also vary; circuit configurations used in various radios, etc. can also differ considerably. On rare occasions even breakdown may result when the Mullard replacement is fitted. In general, however, good results can be obtained by using the following hints.

Replacement hints

The following points are intended as a guide to some of the problems which may be encountered in radio and audio equipment.

1. Polarity

It is essential that the correct polarity transistor (n-p-n or p-n-p) is used. The collector terminal of p-n-p transistors will be negative with respect to the emitter, and the collector terminal of n-p-n transistors will be positive with respect to the emitter.

2. Lead lengths

The leads of all replacement components should be the same length as those of the original devices. If there is a screen lead on the Mullard replacement it should be connected to chassis if possible.

3. Audio-frequency stages in portables

Arrangements with either output and driver transformers, or a driver transformer only,. normally use p-n-p transistors, but if one n-p-n is present every transistor in the arrangement is probably n-p-n. Complementary push-pull arrangements (recognised by the absence of any transformers) usually have at least one n-p-n transistor and frequently more. These can be difficult to service, and it is usually necessary to trace out the circuit if no diagram is available.

4. A.F. driver transistor

The replacement should be selected with care in circuits where the battery voltage is greater than 12V. The

collector voltage rating should be twice the battery voltage, when a driver transformer is used.

5. A.F. output transistors

If an output transistor has failed, and the cause appears to be over-heating, the Mullard replacement may also be in danger of failing. If there is room, cooling clips should be fitted to the output transistors, or the area of the heat-sink should be enlarged if one already exists. Otherwise the value of the emitter resistor can be increased, or thermistors can be fitted across the base bias resistors.

6. Car radio output stages

Arrangements with no driver transformer may use a number of circuit configurations, and the pre-amplifier and driver transistors can be p-n-p or n-p-n. A Mullard AD149 should be used as a p-n-p output transistor replacement in all car radio circuits.

7. A.M. I.F. stages

When transistors in i.f. stages are replaced, a type should be chosen which has a similar value of feedback capacitance. Unfortunately these figures for other manufacturers' types have not always been available. If there is instability after the replacement has been fitted satisfactory operation may be obtained by making some circuit modifications. For example, if there are neutralising components the value of the neutralising capacitor should be altered. If there is no neutralisation, and if the transformer is single-tuned and of the correct phasing, instability may be removed by inserting a neutralising capacitor (value 1 to 10pF). Another method of making the stage stable is to insert a damping resistor across the primary of the i.f. transformer in the collector circuit.

8. A.M. oscillator and mixer stages

An AF117 is a suitable p-n-p replacement. If the circuit does not oscillate after the replacement has been fitted, the emitter current should be increased (but not over 3mA). If there is squegging the value of the emitter decoupling capacitor should be reduced, and if this is unsuccessful a damping resistor should be connected across the oscillator tuned circuit.

9. F.M. I.F. stages

A Mullard AF116 (p-n-p) should be used. If instability occurs the value of the neutralising capacitor should be altered if one is present. Otherwise the emitter current should be reduced (but not to less than half its value) by increasing the value of the upper base bias resistor. A damping resistor connected across the i.f. coil in the collector circuit may cure instability if other methods have failed.

10. F.M. oscillators and mixers

Mullard AF114, AF178 (both p-n-p) should be used. It is important to ensure that the lead lengths of the replacements are the same as those of the original devices. Instability can sometimes be cured by adjusting the value of the emitter current (by altering the value of the upper base bias resistor). It may be necessary to alter the value of the emitter feedback capacitor in oscillators.

11. F.M. R.F. amplifiers

A Mullard AF114 or AF178 (both p-n-p) should be used as a replacement. If there is instability the emitter current should be reduced by increasing the value of the upper base bias resistor across the coil in the collector tuned circuit.

SEMICONDUCTOR COMPARABLES

Type No.	Mullard Comparable	Type No.	Mullard Comparable
A2E5	BY126	AC153	AC128
A2E9	BY126	AC153K	AC128
A2K4	BY127	AC154	AC128
A2K5	BY127	AC155	AC128
A2K9	BY127	AC156	AC128
A7D	BY126	AC157	AC127
A344	BC108, BC109	AC160	AC127
A345	BC108, BC109	AC162	AC126
A346	BC108, BC109	AC163	AC126
AA112	OA90	AC166	AC128
AA116	OA90	AC167	AC128
AA118	OA91	AC168	AC127
AA119	AA119	AC169	AC128
AA120	AA129	AC170	AC126
AA129	AA129	AC171	AC126
AA130	OA90	AC172	AC127
AA131	AA119	AC175	AC127
AA132	OA91	AC176	AC176
AC106	AC128	AC177	AC128
AC110	AC126	AC181	AC127
AC114	AC128	AC185	AC127
AC117	AC128	AC187	AC187
AC120	AC128	AC188	AC188
AC121	AC128	AD139	AD149
AC122	AC126	AD149	AD149
AC123	AC126	AD150	AD149
AC124	AC126	AD152	AD149
AC125	AC126	AD155	AD162
AC126	AC126	AD156	AD162
AC127	AC127	AD157	AD162
AC128	AC128	AD161	AD161
AC131	AC128	AD162	AD162
AC132	AC128	AF102	AF121
AC134	AC126	AF105	AF116
AC138	AC128	AF109	AF178
AC139	AC128	AF110	AF181
AC141	AC176	AF113	AF178
AC150	AC128	AF114	AF114
AC151	AC126	AF115	AF115
AC152	AC128	AF116	AF116

Type No.	Mullard Comparable	Type No.	Mullard Comparable
AF117	AF117	BA116	BA130
AF118	AF118	BA144	BA145
AF121	AF121	BA145	BA145
AF124	AF124	BA148	BA148
AF125	AF125	BA154	BA154
AF126	AF126	BA155	BA155
AF127	AF127	BA156	BA156
AF129	AF178	BA182	BA182
AF130	AF178	BAX13	BAX13
AF134	AF178	BB105	BB105
AF139	AF139	BC107	BC107
AF142	AF178	BC108	BC108
AF143	AF178	BC109	BC109
AF144	AF178	BC113	BC108
AF164	AF178	BC114	BC109
AF165	AF178	BC115	BC107
AF166	AF178	BC118	BC107
AF178	AF178	BC119	BFY51
AF179	AF121	BC125	BC107
AF180	AF178	BC134	BC107
AF181	AF178	BC142	BFX84
AF182	AF178	BC145	BF178
AF186	AF139	BC147	BC147
AF200	AF178	BC148	BC148
AF239	AF239	BC149	BC149
AF201	AF178	BC150	BC109
AFY12	AF178	BC151	BC107
AFY19	BFX88	BC157	BC157
AFZ11	AF178	BC158	BC158
AFZ12	AF178	BC159	BC159
AG150	BA155	BC167	BC107
B2E5	BY126	BC168	BC109
B2E9	BY126	BC169	BC109
B2K5	BY127	BC170	BC109
B2K9	BY127	BC170A	BC108
B1022	AC128	BC170B	BC108
BA100	BA148	BC170C	BC108
BA102	BA102	BC171	BC107
BA114	BA156	BC172	BC109
BA115	BA155	BC186	BC186

Type No.	Mullard Comparable	Type No.	Mullard Comparable
BC187	BC187	BD435	BD435
BC327	BC327	BD436	BD436
BC328	BC328	BD437	BD437
BC337	BC337	BD438	BD438
BC338	BC338	BDY20	BDY20
BC548	BC548	BF109	BF178
BCY42	BC107	BF115	BF115
BCY59	BC107	BF154	BC108
BCY72	BCY72	BF167	BF167
BD115	BD115	BF173	BF173
BD116	BDY20	BF177	BF177
BD121	BDY20	BF178	BF178
BD123	BDY20	BF179	BF179
BD124	BD131	BF180	BF180
BD131	BD131	BF181	BF181
BD132	BD132	BF182	BF182
BD133	BD133	BF183	BF183
BD135	BD135	BF184	BF184
BD136	BD136	BF185	BF185
BD137	BD137	BF194	BF194
BD138	BD138	BF195	BF195
BD139	BD139	BF196	BF196
BD140	BD140	BF197	BF197
BD144	BD144	BF200	BF200
BD160	BD160	BF216	BF115
BD181	BD181	BF241	BF241
BD182	BD182	BF262	BF262
BD183	BD183	BF263	BF263
BD184	BD184	BF324	BF324
BD201	BD201	BF336	BF336
BD202	BD202	BF337	BF337
BD203	BD203	BF338	BF338
BD204	BD204	BF355	BF355
BD232	BD232	BF362	BF362
BD233	BD233	BF363	BF363
BD234	BD234	BFR91	BFR91
BD235	BD235	BFW10	BFW10
BD236	BD236	BFW59	BFW59
BD237	BD237	BFW60	BFW60
BD238	BD238	BFW87	BFW87

Type No.	Mullard Comparable	Type No.	Mullard Comparable
BFX29	BFX29	BY124	BY126
BFX44	BFX44	BY125	BY126
BFX84	BFX84	BY126	BY126
BFX88	BFX88	BY127	BY127
BFY18	BC107	BY130	BY126
BFY19	BC107	BY140	BY182
BFY39	BC107	BY164	BY164
BFY50	BFY50	BY176	BY176
BFY51	BFY51	BY179	BY179
BFY52	BFY52	BY182	BY182
BFY90	BFY90	BY184	BY184
BR100	BR100	BY187	BY187
BR101	BR101	BY206	BY206
BRY39	BRY39	BY207	BY207
BRY56	BRY56	BY210	BY210
BSY20	BC108, BC109	BYX10	BYX10
BSY26	BC108, BC109	BYX36	BYX36
BSY27	BC108, BC109	BYX38	BYX38
BSY72	BC107, BF184	BYX48	BYX48
BSY95A	BC108, BC109	BYX49	BYX49
BT100A	BT100A	BYX55	BYX55
BT101	BT101	BYX71	BYX71
BT102	BT102	BYY34	BY126
BT106	BT106	BYZ13	BYX38
BT107	BT107	BZV15	BZV15
BT108	BT108	BZX61	BZX61
BU105	BU105	BZX70	BZX70
BU108	BU108	BZX88	BZX88
BU126	BU126	BZY93	BZY93
BU204	BU204	BZY95	BZY95
BU205	BU205	BZY96	BZY96
BU206	BU206	CA2DO2	AD149
BU208	BU208	CER72	BY127
BY100	BY127	CER72D	BY127
BY100S	BY127	CER700C	BY126
BY101	BY126	CER720	BY127
BY105	BY127	CG60H	OA90
BY114	BY126	CG61H	OA90
BY118	BY118	CG62H	OA90
BY122	BY164	CG63H	OA90

Type No.	Mullard Comparable	Type No.	Mullard Comparable
CG64H	OA90	D165	BY127
CK721	AC126	DD006	BY126
CK722	AC126	DD056	BY126
CK724	AC126	DD058	BY127
CK725	AC126	DD268	BY127
CK727	AC126	DR365	AA119
CK751	AC128	DR400	BY126
CK870	AC126	DR800	BY127
CK871	AC126	DS26	AC128
CK872	AC128	DS34	AF178
CK878	AC128	DS41	AF178
CK882	AC128	DS44	AC127
CK888	AC128	DS46	AC126
COD1538	BY127	DS501	AD149
COD1618	BY127	EA080	BY127
CSD2310	BA155	ED3	AA119
CSD2317	BA155	ED1800	AA119
CST1773	AD149	ED1892	OA90
CST1773A	AD149	ED1903	OA91
CTP1004	AD149	ED2102	OA90
CTP1005	AD149	ED2848	BY127
CTP1032	AC126	ED2911	BY127
CTP1033	AC126	ED2919	BY126
CTP1034	AC126	ED2923	BY127
CTP1035	AC126	ER41	BY126
CTP1036	AC126	ER81	BY127
CTP1104	AD149	ER308	BY127
CTP1108	AD149	ERD800	BY127
CTP1109	AD149	F8	BY127
CTP1320	AC126	FD212	BA155
CTP1330	AC126	FD213	BA155
CTP1340	AC126	FD227	BA155
CTP1350	AC126	FD260	BA155
CTP1360	AC126	FSP270–1	BF167
CTP1514	AD149	FST1/4	BY127
D45C	BY126	FST2/8	BY127
D58C	BY127	G5/5	AA119
D105C	BY127	G5/103	AA119
D148S	BY127	G5/104	AA119
D158S	BY127	G5/105	AA119

Type No.	Mullard Comparable	Type No.	Mullard Comparable
G1050	BY127	GFT25	AC126
GA52829	AC126	GFT32	AC126
GD1E	AA119	GFT41	AF178
GD2E	OA91	GFT42A	AF178
GD3	OA90	GFT2006/30	AD149
GD4	OA90	GFT3008/20	AD149
GD4E	AA119	GFT3008/40	AD149
GD4S	AA119	GFT3408/20	AD149
GD5	AA119	GFT3408/40	AD149
GD5E	AA119	GFT4012/30	AD149
GD6E	AA119	GFT8024	AD149
GD11	OA90	GSD5/4	AA119
GD12	OA90	GT3	AC126
GD13E	AA119	GT4A	AC128
GD71E	AA119	GT14	AC128
GD72E/3	AA119	GT20	AC128
GD72E/4	AA119	GT31	AC126
GD73E/3	AA119	GT32	AC128
GD73E/4	AA119	GT33	AC128
GD73E/5	AA119	GT34	AC126
GET3	AC126	GT38	AC126
GET4	AC126	GT74	AC126
GET102	AC126	GT81	AC126, AC128
GET103	AC128	GT81HS	AC126
GET104	AC128	GT81R	AC128
GET106	AC126, AC128	GT83	AC126
GET113	AC128	GT87	AC126
GET114	AC128	GT109	AC128
GET116	AC128	GT109R	AC128
GET119	AC128	GT122	AC126
GEX12	OA90	GT222	AC126
GEX23	OA91	GT310	AC128
GEX34	AA119	GT2766	AC127
GEX36	OA90	GT2906	AC127
GEX37	OA90	H2	AD149
GEX39	OA90	H3	AD149
GEX45	OA91	H4	AD149
GEX54	OA91	HA1	AC126
GFT20	AC126	HA2	AC126
GFT21	AC126	HA3	AC126

Type No.	Mullard Comparable
HC1	AC126
HD197	AC128
HJ15	AC126
HJ17	AC128
HJ17D	AC128
HJ34	AC128
HJ34A	AC128
HJ50	AC126
HJ51	AC128
HJ74	AF117
HT400	BC108, BC109
HT401	BC108, BC109
IWP	BY127
JCN4	BY126
JP1	AC128
K5/2	OA90
KGS1000	AC128
M8HZ	BY127
M82	BY127
M720B	BY127
MA215	BY126
ME1001	BC107
ME1002	BC107
ME2001	BC107
ME2002	BC107
ME4101	BC107
ME4102	BC107
MM4	BY126
MT84	BY127
MT101	AC176
NKT72	AF124/5/6/7
NKT128	AC128
NKT131	AF178
NKT132	AF178
NKT133	AF178
NKT141	AF178
NKT142	AF178
NKT143	AF178
NKT144	AF178
NKT202	AC126
NKT203	AC128
NKT204	AC126
NKT205	AC126
NKT206	AC126
NKT208	AC128
NKT211	AC128
NKT212	AC128
NKT213	AC128
NKT214	AC128
NKT215	AC128
NKT216	AC128
NKT218	AC128
NKT222	AC128
NKT223	AC128
NKT224	AC128
NKT225	AC128
NKT231	AC128
NKT232	AC128
NKT251	AC128
NKT251A	AC128
NKT252	AC128
NKT253	AC128
NKT261	AC128
NKT262	AC128
NKT263	AC128
NKT264	AC128
NKT270	AC128
NKT271	AC128
NKT272	AC128
NKT273	AC128
NKT274	AC128
NKT275	AC128
NKT275A	AC128
NKT275E	AC128
NKT275J	AC128
NKT278	AC128
NKT304	AD149
NKT415	AD149
NKT451	AD149
NKT452	AD149

Type No.	Mullard Comparable
NKT453	AD149
NKT676	AF178
NKT713	AC127
NKT773	AC176
OA59	OA90
OA60	OA90
OA70	OA90
OA72	AA119
OA73	OA90
OA79	AA119
OA81	OA91
OA90	OA90
OA91	OA91
OA150	OA91
OA160	OA90
OA179	AA119
OA210	OA210
OA211	BY127
OA214	BY127
OA257	OA90
OA258	OA90
OC13	AC126
OC16	AD149
OC25	AD149
OC30	AD162
OC34	AC126
OC38	AC126
OC71N	AC126
OC79	AC128
OC80	AC128
OC81	AC128
OC81D	AC128
OC81DM	AC128
OC81M	AC128
OC82	AC128
OC85	AC128
OC169	AF126, AF127
OC302	AC126
OC601	AC126
OC602	AC126
OC604	AC126
OC615	AF178
OC615V	AF178
OC702B	AC127
OC810	AC126
OC811	AC126
OC6015	AF178
OD603	AD149
OD603/50	AD149
OD604	AD149
OD605	AD149
OS33	BA100
OX3003	AC126
OX3004	AC128
OY100	BY127
OY101	BY127
P6RP8	BY127
PA340A	BY126
PA380	BY127
PADT24	AF178
PADT25	AF178
PSO25	BY126
PS140	BY126
PS724	BA155
PS2247	BY126
Q6	AC128
Q7	AC128
Q8	AC128
RL31	AA119
RL32	AA119
RL52	AA119
RL246	AA119
RL252	AA119
S16	BY126
S16A	BY126
S16B	BY126
S235	BY126
S243	BY126
SD38	OA91
SD92	BY126

Type No.	Mullard Comparable
SD94	BY126
SEO5A	BY126
SFD107	OA90
SFD108	OA91
SFD112	AA119
SFT124	AC128
SFT125	AC128
SFT125P	AC128
SFT130	AC128
SFT162	AF118
SFT316	AF178
SFT317	AF178
SFT319	AF178
SFT320	AF178
SFT325	AC128
SFT354	AF178
SFT357	AF178
SFT357P	AF178
SFT358	AF178
SG217	BA155
SH1	BY126
SLA604	BY126
SLA604A	BY126
SM105SS	BY126
SR500	BY126
SR500B	BY126
SWO5A	BY126
SX633	BY127
SX635	BY127
SX644	BY126
UT227	BY126
V10/15	AC126
V10/30	AC126
V10/50	AC126
V30/20P	AD149
V30/30P	AD149
V208	AD149
V308	AD149
VD11	OA90
VD12	OA90
VD13	OA90
WR400	BY126
XA131	AF178
XA141	AF178
XA142	AF178
XA143	AF178
XA161	AF178
XB102	AC126
XB104	AC126
XB112	AC126
XB113	AC126
XC101	AC128
XC131	AC128
XC171	AC128
XU604	BY127
Y363	AC126
Y633	AC128
ZDT	BC108, BC109
ZJ13	AC128
ZR12	BY118
ZS12	AC128
ZS15	AC128
ZS34	AC128
ZS38	AC128
ZS56	AC128
ZS91	AC128
ZT40	BC108, BC109
ZT41	BC108, BC109
ZT80	AC127

Numerical

Type No.	Mullard Comparable
1G91	OA90
1G92	OA90
1G95	AA119
1HY100	BY127
1L5TI	AC128

Type No.	Mullard Comparable
1N28A	OA91
1N34	OA90
1N34A	OA90
1N36	AA119
1N38	OA90
1N38A	OA91
1N38B	OA91
1N39A	OA90
1N42	OA91
1N48	OA91
1N52	OA91
1N56A	OA90
1N57A	OA90
1N60	AA119
1N60A	AA119
1N64	OA90, AA119
1N64A	AA119
1N70	OA91
1N70A	OA91
1N74	OA91
1N81	AA119
1N87	OA90
1N87A	OA90
1N88	OA91
1N90	OA91
1N96	OA90
1N97	OA91
1N97A	OA91
1N98	OA91
1N99	OA91
1N99A	OA91
1N100	OA91
1N105	AA119
1N127A	OA91
1N128	AA119
1N128A	AA119
1N142	OA91
1N254	BY126
1N255	BY126
1N256	BY127
1N267	AA119
1N290	AA119
1N295A	OA90
1N310	OA91
1N313	OA91
1N332	BY126
1N338	BY127
1N341	BY126
1N342	BY126
1N343	BY126
1N344	BY126
1N345	BY126
1N346	BY126
1N348	BY126
1N349	BY126
1N441	BY126
1N442	BY126
1N443	BY126
1N444	BY127
1N445	BY127
1N448	OA91
1N462	BA155
1N476	OA91
1N478	OA91
1N479	OA91
1N486A/B	BY126
1N487	BY126
1N488A/B	BY126
1N538	BY126
1N540	BY126
1N541	AA119
1N542	2–AA119
1N547	BY127
1N560	BY127
1N562	BY127
1N599A	BY126
1N600A	BY126
1N602/A	BY126
1N603/A	BY126
1N604/A	BY126

Type No.	Mullard Comparable	Type No.	Mullard Comparable
1N605/A	BY126	1N3769	OA91
1N606/A	BY126	1N4001 to 5	1N4001 to 5
1N616	OA90	1N4148	1N4148
1N617	OA91	1N4250	BY127
1N618	OA91	1N4446,8	1N4446,8
1N646	BY126	1NU40	AC126
1N673	BY126	1NU70	AC126
1N781	AA119	1P541,2	AA119
1N781A	AA119	1S038	BY127
1N801	BA155	1S054	BY127
1N801M	BA155	1S058	BY127
1N802, 2M	BA155	1S32	OA90
1N854	BY127	1S33	OA90
1N914	1N914	1S34	OA90
1N1095	BY127	1S47	BY127
1N1096	BY127	1S83	BY126
1N1103	BY127	1S84	BY126
1N1169	BY127	1S90	BY126
1N1255	BY126	1S91	BY126
1N1255A	BY126	1S92	BY126
1N1259	BY127	1S93	BY126
1N1486	BY127	1S94	BY127
1N1492	BY127	1S95	BY127
1N1693	BY126	1S96	BY127
1N1695	BY126	1S97	BY127
1N2071/A	BY127	1S107	BY127
1N2505	BY127	1S117	BY127
1N2611	BY126	1S119	BY127
1N2613	BY127	1S124	BY126
1N2615	BY127	1S127	OA90
1N2616	BY127	1S149	BY126
1N2773	BY127	1S206	BY126
1N3182	BA102	1S209	BY126
1N3193	BY127	1S426	OA90
1N3194	BY127	1S557	BY127
1N3195,6	BY127	1S686	BY126
1N3221	BY127	1S1692	BY127
1N3242	BY127	1S1693	BY127
1N3547	BY126	1S1694	BY127
1N3625	BA155	1S1695	BY127

Type No.	Mullard Comparable	Type No.	Mullard Comparable
1T23	OA90	2N138A	AC128
1T508	BY127	2N138B	AC128
2G101	AF178	2N156	AD149
2G102	AF117	2N170	AC127
2G108	AC126	2N175	AC107
2G109	AC126	2N180	AC128
2G201	AC128	2N181	AC128
2G202	AC128	2N185	AC128
2G270	AC128	2N186	AC128
2G271	AC128	2N186A	AC128
2G319	AC126	2N187	AC128
2G320	AC128	2N187A	AC128
2G381	AC128	2N188	AC128
2G382	AC128	2N188A	AC128
2G401	AF117	2N191	AC128
2G402	AF117	2N192	AC128
2G416	AF117	2N195	AC128
2G417	AF117	2N196	AC128
2N34	AC128	2N199	AC128
2N34A	AC126, AC128	2N213	AC176
2N35	AC127	2N214	AC127
2N36	AC126, AC128	2N217	AC128
2N37	AC126, AC128	2N218	AF117
2N38	AC126, AC128	2N219	AF117
2N38A	AC126, AC128	2N220	AC107
2N44	AC128	2N224	AC128
2N48	AC126	2N225	AC128
2N54	AC126, AC128	2N226	AC128
2N59A	AC128	2N227	AC128
2N59B/C	AC128	2N228	AC127
2N60	AC128	2N229	AC127
2N61	AC128	2N230	AD149
2N62	AC128	2N234	AD149
2N87	AC128	2N234A	AD149
2N102	AD161	2N235	AD149
2N108	AC128	2N236	AD149
2N109	AC128	2N238	AC128
2N117	AC176	2N241	AC128
2N118	AC176	2N241A	AC128
2N119	AC176	2N249	AC128

Type No.	Mullard Comparable	Type No.	Mullard Comparable
2N252	AF117	2N376	AD149
2N257	AD149	2N385	AC127
2N257A	AD149	2N388	AC127
2N257G	AD149	2N399	AD149
.26257W	AD149	2N407	AC128
2N265	AC128	2N408	AC128
2N266	AC128	2N409	AF117
2N270	AC128	2N410	AF117
2N272	AC128	2N419	AD149
2N285A	AD149	2N431	AC176
2N285B	AD149	2N432	AC176
2N290	AF178	2N433	AC176
2N291	AC128	2N439A	AC127
2N300	AF178	2N447	AC127
2N301	AD149	2N447A	AC127
2N301A	AD149	2N460	AC128
2N302	AC128	2N461	AC128
2N303	AC128	2N464	AC128
2N306	AC127	2N465	AC128
2N306A	AC127	2N466	AC128
2N308	AF117	2N467	AC128
2N309	AF117	2N484	AF178
2N310	AF117	2N486	AF178
2N322	AC128	2N507	AC127
2N323	AC128	2N519	AC128
2N324	AC128	2N563	AC128
2N325	AD149	2N564	AC128
2N331	AC128	2N565	AC128
2N350	AD149	2N566	AC128
2N350A	AD149	2N567	AC128
2N351	AD149	2N568	AC128
2N351A	AD149	2N569	AC128
2N352	AD149	2N570	AC128
2N353	AD149	2N571	AC128
2N358	AC127	2N572	AC128
2N358A	AC127	2N576	AC127
2N362	AC128	2N609	AC128
2N364	AC127	2N610	AC128
2N365	AC127	2N611	AC128
2N366	AC127	2N612	AC128

Type No.	Mullard Comparable	Type No.	Mullard Comparable
2N613	AC128	2N1287	AC128
2N624	AF178	2N1287A	AC128
2N631	AC128	2N1353	AC128
2N632	AC128	2N1370	AC128
2N633	AC128	2N1372	AC128
2N634	AC127	2N1386	BC108, BC109
2N634A	AC127	2N1406	AF178
2N647	AC127	2N1407	AF178
2N649	AC127	2N1431	AC127
2N655	AC128	2N1515	AF178
2N702	BC107	2N1516	AF178
2N703	BC107	2N1517	AF178
2N728	BC107	2N1524	AF178
2N990	AF178	2N1525	AF178
2N991	AF124/5/6/7	2N1586	AC176
2N992	AF126	2N1587	AC176
2N993	AF127	2N1589	AC176
2N1008	AC128	2N1590	AC176
2N1010	AC127	2N1592	AC176
2N1038	AD149	2N1593	AC176
2N1059	AC127	2N1624	AC127
2N1097	AC128	2N1631	AF178
2N1098	AC128	2N1632	AF178
2N1101	AC127	2N1636	AF178
2N1102	AC127	2N1637	AF178
2N1128	AC128	2N1638	AF178
2N1141	AF178	2N1639	AF178
2N1142	AC126	2N2061	AD149
2N1143	AF117	2N2061A	AD149
2N1144	AC128	2N2062	AD149
2N1145	AC128	2N2063	AD149
2N1173	AC127	2N2064	AD149
2N1176	AC128	2N2067	AD149
2N1177	AF178	2N2067B	AD149
2N1178	AF178	2N2067G	AD149
2N1179	AF178	2N2067–0	AD149
2N1195	AF118	2N2067W	AD149
2N1251	AC127	2N2089	AF114, AF178
2N1264	AF117	2N2090	AF115
2N1274	AC128	2N2091	AF116

Type No.	Mullard Comparable	Type No.	Mullard Comparable
2N2092	AF117	2N3391	BC107
2N2207	AF118	2N3391A	BC107
2N2256	BC108, BC109	2N3392	BC107
2N2257	BC108, BC109	2N3393	BC107
2N2271	AC128	2N3394	BC107
2N2429	AC126	2N3443	AC126
2N2430	AC127	2N3493	BF173
2N2431	AC128	2N3565	BC107
2N2495	AF178	2N3588	AF178
2N2496	AF178	2N3662	BF173
2N2512	AF118	2N3663	BF173
2N2626	BC107	2N3691	BC107
2N2654	AF121	2N3692	BC107
2N2671	AF178	2N3693	BC107
2N2672	AF178	2N3694	BC107
2N2672A	AF178	2N3707	BC107
2N2706	AC128	2N3708	BC107
2N2712	BC107	2N3709	BC107
2N2715	BF173	2N3710	BC107
2N2716	BF173	2N3825	BC107
2N2835	AD149	2N4026	BD138
2N2836	AD149	2N4077	AD161
2N2921	BC107	2N4078	AD162
2N2922	BC107	2N4079	AD161/AD162
2N2923	BC107	2N4286	BC107
2N2924	BC107	2N4433	BF115
2N2925	BC107	2N4434	BF184
2N2926	BC107	2N4435	BF185
2N2953	AC128	2S37	AC128
2N3074	AF178	2S38	AC128
2N3075	AF178	2S39	AC128
2N3153	AC126	2S40	AC128
2N3287	BC107	2S41	AD149
2N3288	BC107	2S41A	AD149
2N3289	BC107	2S43	AC128
2N3290	BC107	2S44	AC128
2N3291	BC107	2S54	AC128
2N3292	BC107	2S56	AC128
2N3293	BC107	2S144	AF117
2N3294	BC107	2S163	AC128

Type No.	Mullard Comparable	Type No.	Mullard Comparable
2S179	AC128	2SA175	AF114/5/6
2S433	AF124/5/6/7	2SA213	AF178
2SA24	AF178	2SA216	AF178
2SA25	AF178	2SA220	AF114/5/6
2SA37	AF117	2SA221	AF114/5/6
2SA38	AF117	2SA222	AF114/5/6
2SA39	AF117	2SA223	AF114/5/6
2SA41	AF117	2SA227	AF178
2SA42	AF117	2SA229	AF178
2SA51	AF117	2SA230	AF178
2SA58	AF124/5/6/7	2SA234	AF178
2SA59	AF117	2SA235	AF178
2SA60	AF124/5/6/7	2SA236	AF114/5/6
2SA69	AF178	2SA237	AF114/5/6
2SA70	AF178	2SA240	AF178
2SA71	AF178	2SA242	AF178
2SA72	AF114/5/6/7	2SA250	AF118
2SA73	AF114/5/6/7	2SA255	AF114/5/6
2SA75	AF178	2SA256	AF124/5/6/7
2SA76	AF114/5/6/7	2SA257	AF124/5/6/7
2SA77	AF178	2SA258	AF124/5/6/7
2SA82	AF124, AF125	2SA259	AF124/5/6/7
2SA92	AF124/5/6/7	2SA285	AF114/5/6
2SA93	AF124/5/6/7	2SA286	AF114/5/6
2SA103	AF117	2SA287	AF114/5/6
2SA105	AF178	2SA288	AF178
2SA116	AF178	2SA289	AF178
2SA117	AF178	2SA290	AF178
2SA118	AF178	2SA313	AF114/5/6
2SA124	AF178	2SA314	AF114/5/6
2SA125	AF178	2SA315	AF124/5/6/7
2SA130	AF178	2SA316	AF124/5/6/7
2SA131	AF178	2SA323	AF114/5/6
2SA134	AF178	2SA324	AF114/5/6
2SA135	AF178	2SA340	AF124/5/6/7
2SA148	AF115	2SA341	AF124/5/6/7
2SA153	AF178	2SA342	AF124/5/6/7
2SA155	AF117	2SA343	AF178
2SA159	AF178	2SA345	AF178
2SA161	AF178	2SA346	AF178

Type No.	Mullard Comparable	Type No.	Mullard Comparable
2SA347	AF178	2SB61	AC126
2SA348	AF178	2SB63	AD162
2SA349	AF178	2SB66	AC126
2SA359	AC126, AF118	2SB70	AC126
2SA361	AF178	2SB71	AC126
2SA377	AF121	2SB74	AC126
2SA403	AF178	2SB75	AC126
2SA427	AF178	2SB76	AC126
2SA428	AF178	2SB77	AC128
2SA432	AF178	2SB78	AC128
2SA433	AF114/5/6	2SB79	AC128
2SB19	AD162	2SB80	AD149
2SB20	AD162	2SB83	AD149
2SB26	AD149	2SB89	AC128
2SB27	AD149	2SB90	AC126
2SB28	AD149	2SB91	AC128
2SB29	AD149	2SB92	AC128
2SB30	AD149	2SB94	AC128
2SB31	AD149	2SB95	AC128
2SB32	AC126	2SB96	AC128
2SB33	AC128	2SB98	AC128
2SB34	AC128	2SB99	AC128
2SB37	AC128	2SB100	AC126
2SB38	AC128	2SB101	AC128
2SB44	AC128	2SB102	AC128
2SB46	AC126	2SB103	AC128
2SB48	AC126	2SB104	AC128
2SB49	AC126	2SB105	AD149
2SB50	AC126	2SB106	AD149
2SB51	AC128	2SB107	AD149
2SB52	AC128	2SB108	AD149
2SB53	AC128	2SB109	AD149
2SB54	AC128	2SB110	AC126
2SB55	AC128	2SB111	AC126
2SB56	AC128	2SB112	AC126
2SB57	AC128	2SB113	AC126
2SB58	AC128	2SB114	AC128
2SB59	AC126	2SB115	AC128
2SB60	AC126	2SB116	AC128
2SB60A	AC126	2SB117	AC128

Type No.	Mullard Comparable	Type No.	Mullard Comparable
2SB118	AD149	2SB178	AC128
2SB119	AD149	2SB179	AC128
2SB120	AD149	2SB180	AD149
2SB126	AD149	2SB183	AC126
2SB127	AD149	2SB184	AC128
2SB131	AD149	2SB185	AC126
2SB134	AC126	2SB186	AC126
2SB135	AC126, AC128	2SB187	AC126
2SB136	AC128	2SB188	AC128
2SB137	AD149	2SB189	AC128
2SB140	AD149	2SB190	AC128
2SB142	AD149	2SB192	AC128
2SB143	AD149	2SB193	AC128
2SB144	AD149	2SB194	AC128
2SB145	AD149	2SB195	AC128
2SB146	AD149	2SB196	AC128
2SB154	AC128	2SB197	AC128
2SB155	AC128	2SB198	AC128
2SB156	AC128	2SB199	AC128
2SB157	AC128	2SB200	AC128
2SB158	AC128	2SB201	AC128
2SB159	AC128	2SB202	AC128
2SB160	AC126	2SB219	AC128
2SB161	AC128	2SB220	AC128
2SB162	AC128	2SB221	AC128
2SB163	AC128	2SB222	AC128
2SB164	AC128	2SB223	AC128
2SB165	AC128	2SB254	AC128
2SB166	AC128	2SB255	AC128
2SB167	AC128	2SB261	AC128
2SB168	AC126	2SB262	AC128
2SB169	AC128	2SB263	AC128
2SB170	AC128	2SB264	AC126
2SB171	AC128	2SB293	AC128
2SB172	AC128	2SB294	AC128
2SB173	AC126	2SB345	AC126
2SB174	AC128	2SB346	AC126
2SB175	AC128	2SB347	AC126
2SB176	AC128	2SB348	AC126
2SB177	AC128	2SB415	AC128

Type No.	Mullard Comparable	Type No.	Mullard Comparable
2SB448	AD149	2SD61	AC127
2SB475	AC128	2SD62	AC127
2SC37	BC107	2SD63	AC127
2SC39A	BC107	2SD64	AC127
2SC80	BC107	2SD65	AC127
2SC91	AC127	2SD66	AC127
2SC98	BC108, BC109	2SD75	AC127
2SC99	BC108, BC109	2SD77	AC127
2SC103A	BC107	2SD96	AC127
2SC121	BF173	2SD127	AC127
2SC122	BF173	2SD142	BD124
2SC123	BF173	2SD178	AC127
2SC124	BF173	2SD186	AC127
2SC127	BC108, BC109	2SD187	AC127
2SC155	BF167	2SD193	AC127
2SC156	BF167	2T11	AC128
2SC171	BC107	2T13	AC128
2SC174	BC107	2T14	AC128
2SC183	BF115	2T15	AC128
2SC184	BF115	2T16	AC128
2SC185	BF115	2T20	AC128
2SC186	BF167	2T21	AC128
2SC187	BF167	2T22	AC128
2SC206	BC107	2T23	AC128
2SC271	BF173	2T24	AC128
2SC281	BC107	2T25	AC128
2SC286	BF173	2T26	AC128
2SC287	BF173	2T51	AC127
2SC288	BF173	3N34	BF167
2SC316	BC107	3N35	BF167
2SC360	BC107	3N35A	BF167
2SC368	BC107	3N56	AC176
2SC372	BC107	3N57	AC176
2SC379	BC107	3N71	BF167
2SC429	BF167	3N72	BF167
2SC430	BF167, BF173	3N73	BF167
2SD30	AC127	3N87	BC107
2SD34	AC127	3N88	BC107
2SD37	AC127	4D24	BF167
2SD38	AC127	4D25	BF167

Type No.	Mullard Comparable	Type No.	Mullard Comparable
4D26	BF167	520T1	AC128
33DP1	OA91	521T1	AC128
40AS	BY126	40022	AD149
50D5	BY126	40254	AD149
50E4	BY126		
147T1	AD149		
154T1	AF178		
155T1	AF178		
156T1	AF178		
157T1	AF178		

INTEGRATED CIRCUITS TYPE NOMENCLATURE SYSTEM

Mullard integrated circuits are registered internationally with Pro Electron and have type numbers according to the code below. The type number consists of three letters followed by a serial number.

The first two letters classify the circuit as follows:

FA, FB, – – – – – HY, HZ, etc.
Digital circuits grouped into a 'family' of circuits denoted by the first two letters.

SA, SB, – – – – SZ
'Solitary' digital circuits (not belonging to a 'family').

TA, TB, – – – – TZ
Analogue circuits.

UA, UB. – – – – UZ
Mixed analogue/digital circuits.

The third letter now indicates the operational temperature range or some other significant characteristic:

B	0 to + 70 °C
C	–55 to +125 °C
D	–25 to + 70 °C
E	–25 to + 85 °C
F	–40 to + 85 °C

If no temperature range is indicated the third letter 'A' is used.

On earlier digital circuits the third letter indicated the function of the device as follows:

H	gates and similar circuits
J	bistable or multistable sequential circuit
K	monostable circuit

L	level conversion
N	bi-metastable or multi-metastable sequential circuit
Q	read-write memory circuit
R	read-only memory circuit
S	sense amplifier
Y	miscellaneous

The serial number now consists of four figures or it can be the serial number (figures and letters) of an existing manufacturer's company designation (completed where necessary to four digits by adding zero-in front of the number).

Earlier circuits had a serial number of three figures of which the third figure indicated the operational temperature range as follows:

1	0 to + 70 °C
2	–55 to +125 °C
3	–10 to + 85 °C
4	–15 to + 55 °C
5	–25 to + 70 °C
6	–40 to + 85 °C

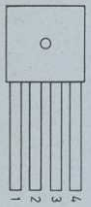
If no temperature range was indicated, the figure '0' was used.

The serial number can be followed by a **version letter** to indicate the type of package or minor variant of a basic type. Generally, the letters C for cylindrical package, D for ceramic DIL, F for flat pack, P for plastic DIL, and Q for QUIL are used.

INTEGRATED CIRCUITS
Full Data Sheets are available on request

OM200/S2

Hearing aid amplifier in plastic envelope.



Construction: miniature plastic envelope		
Supply voltage (nom.)	5	V
Supply current	5	mA
Power gain (min.)	77	dB
Output power (min.)	0·2	mW

1—V supply 2—output
3—earth 4—input

SAJ110

Bipolar frequency dividers in groups of 2, 2, 1, 1 and 1 for use in electronic organs.

Construction: TO–116		
14-lead dual-in-line package		
Supply voltage (nom.)	9	V
Input voltage levels:		
(high)	⩾6	V
(low)	⩽1	V
Output impedance (typ.)	120	Ω
Output voltage levels:		
(high)	⩾7·3	V
(low)	⩽0·1	V

TAA300

Monolithic integrated circuit comprising a complete a.f. amplifier; the voltage range of 4·5 to 9 V and low current drain make the circuit specially suitable for battery operation.

Construction: TO–74		
Supply voltage (nom)	9·0	V
Pout (typ.)	1·0	W
with input signal	8·5	mV
and load impedance	8·0	Ω
Total quiescent current (typ.)	8·0	mA
Operating ambient temperature range	−55 to +150	°C

TAA310A

Monolithic integrated circuit comprising a complete low noise audio pre-amplifier. Suitable for use as a record and playback amplifier for tape.

Construction: TO–74		
Supply voltage (nom.)	7·0	V
Voltage gain (typ.)	100	dB
Noise figure (max.)	4·0	dB
Operating ambient temperature range	−20 to +75	°C

TAA320

Integrated M.O.S. pre-amplifier circuit for use with high-impedance pickups for gramophone applications.

Construction: TO–18		
−VDS (max.)	20	V
−ID (max.)	25	mA
−VGS (typ.)	11	V
rgs min.	100	GΩ

TAA320A

Integrated M.O.S. level detector circuit for use in timing circuits, flame control circuits, etc.

Construction: TO–18		
−VDSS (max.)	20	V
−ID (max.)	60	mA
IGSO (typ.)	1	pA

Coded into groups 1–4 for −VGS voltage between 10·0 and 12·1 typically.

TAA350A

Monolithic integrated circuit for amplification of f.m. i.f. signals. The high gain circuit, employing long-tailed pairs with constant current drive to the emitters, forms a wide band differential limiting amplifier with excellent a.m. rejection.

Construction: TO–74		
Supply voltage (nom.)	6·0	V
Matched power gain at 6 MHz (typ.)	80	dB
A.M. rejection with slope detector	50	dB
Total current drain (typ.)	20	mA
Operating ambient temperature range	−25 to +125	°C

TAA550

Integrated voltage stabiliser circuit for use with varicap tuners in television sets.

Construction: TO–18		
Vstab—	31–32 V red dot	
	32–34 V yellow dot	
	34–36 V green dot	
Istab—	5·0	mA
Diff. resistance	10	Ω

The TAA550 is available in three voltage groups as indicated.

TAA570

Monolithic integrated circuit comprising a four-stage limiter amplifier with symmetrical phase f.m. detector and remote d.c. volume control. Excellent a.m. rejection is obtained by a differential amplifier incorporating long-tailed pairs.

Construction: TO–74		
Supply voltage (nom.)	12·0	V
Frequency	6·0	MHz
A.M. rejection at Vin = 10 mV (typ.)	45	dB
Detected audio output (typ.)		
at 15 kHz frequency deviation	0·3	V
at 50 kHz frequency deviation	1·0	V
Total current drain (typ.)	19	mA
Operating ambient temperature range	−25 to +75	°C

TAA630

Monolithic integrated circuit for colour signal demodulation in colour TV receivers.

Construction: 16-lead dual-in-line package		
Supply voltage (nom.)	12	V
Supply current	23 to 40	mA
Total power dissipation (Tamb = 55°C)	550	mW
Operating ambient temperature range	−20 to +60	°C

TAA840

Integrated A.M. radio circuit comprising r.f. amplifier, mixer/osc. i.f. amplifier, a.g.c., detector, audio, driver stages.

Construction: 14-lead dual-in-line		
Supply voltage (nom.)	6	V
Total supply current (typ.) (Quiescent)	17	mA
Sensitivity for S/N ratio of 26dB	20	μV
A.G.C. range (typ.)	64	dB

TAD100

The TAD100 is a silicon integrated circuit primarily intended for a.m. receivers. The circuit incorporates the mixer, oscillator, i.f. amplifier, a.g.c. and audio preamplifier stages. The audio output transistors are not included so that different output power stages may be added to suit individual receiver requirements. The frequency response of the circuit is such that the front half of the circuit may be used as an i.f. amplifier at 10·7 MHz for f.m. receivers.

Construction: TO–116 (14-lead dual-in-line package)			
Supply voltage (nom)	6	9	V
Performance in a typical receiver:			
Output power (AC187/AC188 output pair) Typ.	0·7	1·5	W
Total receiver quiescent current (no signal) Typ.	15	21	mA
Sensitivity (R.F. at pin 1 to obtain 10 mV from detector) Typ.	4	4	µV
Operating ambient temperature range	–10 to +55		°C

TBA480

Integrated i.f. amplifier circuit for television sound.

Supply voltage (nom)	12	V
Input limiting voltage (6MHz)	40	µV
Output voltage	300	mV
Control range	60	dB
A.M. rejection	50	dB

Construction: 16-lead dual-in-line package.

TBA500/Q
510/Q
520/Q
530/Q
540/Q

Integrated colour processing circuits for colour television.

TBA500—Luminance combination
TBA510—Chrominance combination
TBA520—Colour demodulation
TBA530—R.G.B. Matrix pre-amp
TBA540—Reference combination
Vsupp—(nom) 12V
Devices can be supplied in 16-lead dual-in-line packages or with suffix Q. Zig-Zag Quad-in-line packages.

TBA550
TBA550Q

Monolithic integrated circuit for signal processing in TV receivers; designed for receivers using valves or transistors in the deflection and video output stages, and n-p-n transistors in the tuner and i.f. amplifier stages.
The circuit functions comprise video pre-amplifier, line gated a.g.c. detector, noise protection circuit, sync pulse separator, line flywheel phase detector, field sync pulse separator, and blanking facility for the video amplifier.

Construction: 16-lead plastic dual-in-line or 16-lead zig-zag quad-in-line package suffix Q		
Supply voltage (nom.)	12	V
Supply current		
nom., no a.g.c.	22	mA
max. demand	43	mA
Total power dissipation (Tamb 55°C)	400	mW
Operating ambient temperature range	–25 to +125	°C

TBA560C
TBA560CQ

Integrated Luminance and Chromance control combination for colour television receivers.

Comprises the functions of TBA500 and TBA510
Supply voltage (nom.) 12 V
Construction: 16-lead dual-in-line or 16-lead zig-zag quad-in-line suffix Q.

TBA570
TBA570Q

Integrated a.m./f.m. radio receiver circuit.

Construction: 16-lead dual-in-line or 16-lead zig-zag quad-in-line suffix Q.		
Supply voltage (nom.)	6	V
Itot (quiescent)	10·5	mA
R.F. input voltage for S/N ratio = 26dB	18	μV

TBA673

Monolithic integrated circuit comprising a 4-transistor modulator/demodulator circuit.

Construction: TO–74		
VCEO max.	17·5	V
VEBO max.	6·2	V
VCS max.	65	V
IC max.	20	mA
ICBO max. (VCB=5 V)	100	nA
Ptot max. (Tamb ≤75°C)	250	mW

TBA700

Integrated a.m./f.m. radio receiver circuit with 1W output circuit.

Supply voltage (nom.)	9	V
Output	1·0	W
A.G.C. range	60	dB
Sensitivity	15	μV
Construction: 16-lead dual-in-line package		

TBA720A
TBA720AQ

Integrated line oscillator combination for television receiver applications.

Supply voltage (nom.)	12	V
Supply current (nom.)	10·5	mA
Video input signal (positive sync)	2·4 to 5·3	V
Construction: 16-lead dual-in-line package or 16-lead quad-in-line package suffix Q.		

TBA750
TBA750Q

Integrated limiter amplifier circuit with f.m. detector d.c. volume control and a.f. preamplifier, for use as television sound i.f. circuits.

Supply voltage (nom.)	12	V
Total drain current	23	mA
Limited voltage (Typ.)	100	μV
Construction: 16-lead dual-in-line or 16-lead zig-zag quad-in-line suffix Q.		

TBA920
TBA920Q

Integrated line oscillator combination for television receiver applications.

Supply voltage (nom.)	12	V
Supply current (nom.)	36	mA
Video input signal (positive sync)	3	V
Construction: 16-lead dual-in-line package or 16-lead zig-zag quad-in-line suffix Q		

TBA990
TBA990Q

Integrated circuit colour demodulator for colour television applications.

Supply voltage (nom.)	12	V
Supply current (nom.)	17	mA
Ptot (Tamb = 60°C) Typ.	200	mW

Construction: 16-lead dual-in-line package or 16-lead zig-zag quad-in-line suffix Q.

TCA160

Integrated audio-amplifier circuit for application in battery and mains fed equipment.

Supply voltage range	5 to 16	V
Total quiescent current	5–15	mA
Output power up to (with Heatsink)	2·2	W

Construction: 16-lead power dual-in-line.

TCA270
TCA270Q

Integrated synchronous-demodulator circuit and processing circuit for television applications.

Supply voltage (nom.)	12	V
Total current drain	47	mA
Peak video output	3	V

Construction: 16-lead dual-in-line or 16-lead zig-zag quad-in-line suffix Q.

TELEVISION PICTURE TUBE TYPE NOMENCLATURE SYSTEM

All new Mullard picture tubes are registered internationally with Pro-Electron and have type numbers according to the following code, based on the Pro-Electron type nomenclature system for cathode ray tubes.

The type number consists of a single letter followed by two sets of figures ending with a letter.

The first letter, 'A', indicates that the tube is a television display tube for domestic applications.

The first group of figures indicates the approximate diagonal of the screen in cm.
Thus 47 represents a 47cm (19in) screen
59 represents a 59cm (23in) screen

The second group of figures is a two or three figure serial number indicating a particular design or development.

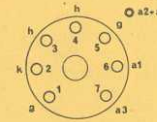
The final letter indicates the properties of the phosphor screen.
Thus W indicates a white fluorescence
X indicates a tri-colour screen

EXAMPLES:

A47–26W Domestic television picture tube with 47cm (19in) 'black-and-white' screen.
A63–120X Domestic television picture tube with 63cm (25in) 'colour' screen.

A28–14W

28cm (11in) television tube. Electrostatic focusing, 90° magnetic deflection angle. Metal-backed screen and reinforced envelope. A separate safety screen is not required.



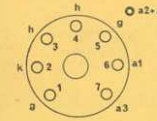
Special 7-pin

Vh	11	V
Ih	75	mA
Va2+a4	11	kV
Va3 (focus electrode)	0 to 350	V
Va1	250	V
Vg for cut-off	−35 to −69	V

Final anode cavity connector type CT8.

A31–120W

31cm (12in) television tube. Electrostatic focusing. 110° magnetic deflection angle. Metal-backed screen and reinforced envelope. A separate safety screen is not required.



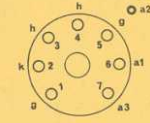
Special 7-pin

Vh	11	V
Ih	75	mA
Va2+a4	11	kV
Va3 (focus electrode)	0 to 350	V
Va1	250	V
Vg for cut-off	−35 to −69	V

Final anode cavity connector type CT8.

A31–410W

31cm (12in) television tube. Electrostatic focusing. 110° magnetic deflection angle. Metal-backed screen and reinforced envelope. A separate safety screen is not required. Short warm-up time.



Special 7-pin

Vh	11	V
Ih	140	mA
Va2+a4	12	kV
Va3 (focus electrode)	0 to 350	V
Va1	250	V
Vg for cut-off	−35 to −69	V

Final anode cavity connector type CT8.

A44 120W/R

44cm (17in) television tube. Electrostatic focusing. 110° magnetic deflection angle. Metal-backed screen and reinforced envelope. A separate safety screen is not required. This tube is fitted with a ring trap base.

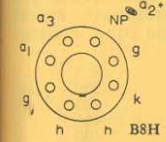
B8H

Vh	6·3	V
Ih	300	mA
Va2+a4	18	kV
Va3 (focus electrode)	0 to 400	V
Va1	400	V
Vg for cut-off	−40 to −77	V

Final anode cavity connector type CT8.

A47–14W

47cm (19in) television tube. Electrostatic focusing. 110° magnetic deflection. Metal-backed screen.



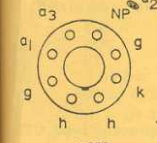
B8H

Vh	6·3	V
Ih	300	mA
Va2+a4	20	kV
Va3 (focus electrode)	0 to 400	V
Va1	400	V
Vg for cut-off	−40 to −77	V

Final anode cavity connector type CT8.

A47–26W
A47–26W/R

47cm (19in) television tube. Electrostatic focusing. 110° magnetic deflection angle. Metal-backed screen and reinforced envelope. A separate safety screen is not required.



B8H

Vh	6·3	V
Ih	300	mA
Va2+a4	20	kV
Va3 (focus electrode)	0 to 400	V
Va1	400	V
Vg for cut-off	−40 to −77	V

Final anode cavity connector type CT8.

The A47–26W/R is fitted with a ring trap connected to pin 5.

A49–120X

49cm (19in) shadow-mask colour television tube.
Electrostatic focusing. 90° magnetic deflection angle. Metal-backed 3-colour phosphor-dot screen. Reinforced envelope. A separate safety screen is not required. Suitable for receivers with push-through presentation.

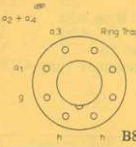
Vh	6·3	V
Ih	900	mA
Va3+a4	25	kV
Va2 (focus electrode)	4·2 to 5	kV
*Va1 (at Vg=−100 V)	210 to 495	V
*Vg (at Va2=300 V)	−65 to −135	V

*For visual extinction of focused raster.

Final anode cavity connector type CT8.

A50–120W/R

50cm (20in) television tube.
Electrostatic focusing. 110° magnetic deflection angle. Metal-backed screen and reinforced envelope. A separate safety screen is not required. This tube is fitted with a ring trap.

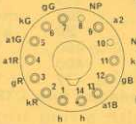


Vh	6·3	V
Ih	300	mA
Va2+a4	20	kV
Va3 (focus electrode)	0 to 400	V
Va1	400	V
Vg for cut-off	−40 to −77	V

Final anode cavity connector type CT8.

A56–120X

56cm (22in) shadow-mask colour television tube.
Electrostatic focusing. 92° magnetic deflection angle. Metal-backed 3-colour phosphor-dot screen. Reinforced envelope. A separate safety screen is not required.



Vh	6·3	V
Ih	900	mA
Va3+a4	25	kV
Va2 (focus electrode)	4·5 to 5	kV
*Va1 (at Vg=−100 V)	210 to 495	V
*Vg (at Va1=300V)	−65 to −135	V

Final anode cavity connector type CT8.

*For visual extinction of raster.

A56–140X

56cm (22in) shadow mask colour television tube.
Electrostatic focusing. 110° magnetic deflection angle. Metal-backed 3-colour phosphor-dot screen. Reinforced envelope. A separate safety screen is not required.

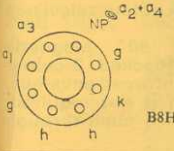
Vh	6·3	V
Ih	900	mA
Va3+a4	25	kV
Va2 (focus electrode)	4·5 to 5	kV
*Va1 (at Vg=−100 V)	210 to 495	V
*Vg (at Va1=300 V)	−65 to −135	V

Final anode cavity connector type CT8.

*For visual extinction of raster.

A59–15W

58cm (23in) television tube.
Electrostatic focusing. 110° magnetic deflection. Metal-backed screen.

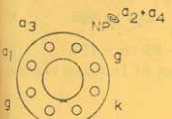


Vh	6·3	V
Ih	300	mA
Va2+a4	20	kV
Va3 (focus electrode)	0 to 400	V
Va1	400	V
Vg for cut-off	−40 to −77	V

Final anode cavity connector type CT8.

A59–23W
A59–23W/R

59cm (23in) television tube.
Electrostatic focusing. 110° magnetic deflection angle. Metal-backed screen and reinforced envelope. A separate safety screen is not required.



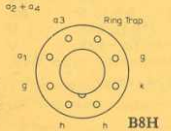
Vh	6·3	V
Ih	300	mA
Va2+a4	20	kV
Va3 (focus electrode)	0 to 400	V
Va1	400	V
Vg for cut-off	−40 to −77	V

Final anode cavity connector type CT8.

The A59–23W/R is fitted with a ring trap connected to pin 5.

A61–120W/R

61cm (24in) television tube.
Electrostatic focusing. 110° magnetic deflection angle. Metal-backed screen and reinforced envelope. A separate safety screen is not required. Suitable for use in receivers with push-through presentation. This tube is fitted with a ring trap base.

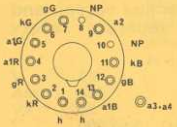


Vh	6·3	V
Ih	300	mA
Va2+a4	20	kV
Va3 (focus electrode)	0 to 400	V
Va1	400	V
Vg for cut-off	−40 to −77	V

Final anode cavity connector type CT8.

A63–120X

63cm (25in) shadow-mask colour television tube.
Electrostatic focusing. 90° magnetic deflection angle. Metal-backed 3-colour phosphor-dot screen. Reinforced envelope. A separate safety screen is not required. Suitable for receivers with push-through presentation.

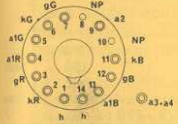


Vh	6·3	V
Ih	900	mA
Va3+a4	25	kV
Va2 (focus electrode)	4·2 to 5	kV
*Va1 (at Vg = −100 V)	210 to 495	V
*Vg (at Va1 = 300 V)	−65 to −135	V

*For visual extinction of focused raster.

A66–120X

66cm (26in) shadow-mask colour television tube.
Electrostatic focusing. 92° magnetic deflection angle. Metal-backed 3-colour phosphor-dot screen. Reinforced envelope. A separate safety screen is not required. Suitable for receivers with push-through presentation.



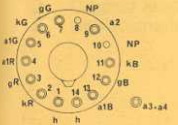
*For visual extinction of focused raster.

Vh	6·3	V
Ih	900	mA
Va3+a4	25	kV
Va2 (focus electrode)	4·2 to 5	kV
*Va1 (at Vg = −100 V)	210 to 495	V
*Vg (at Va1 = 300 V)	−65 to −135	V

Final anode cavity connector type CT8.

A66–140X

66cm (26in) shadow-mask colour television tube.
Electrostatic focusing. 110° magnetic deflection angle. Metal-backed 3-colour phosphor-dot screen. Reinforced envelope. A separate safety screen is not required. Suitable for receivers with push-through presentation.

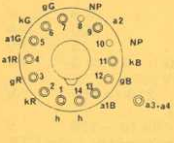


Vh	6·3	V
Ih	900	mA
Va3+a4	25	kV
Va2 (focus electrode)	4·2 to 5	kV
*Va1 (at Vg = −100V)	210 to 495	V
*Vg (at Va1 = 300V)	−65 to −135	V

Final anode cavity connector type CT8.

*For visual extinction of focused raster.

A66–410X **66cm (26in) shadow-mask colour television tube.**
Electrostatic focusing. 110° magnetic deflection angle. Metal-backed 3-colour phosphor-dot screen. Reinforced envelope. A separate safety screen is not required. Suitable for receivers with push-through presentation. A special feature of this tube is its short warm-up time.



Vh	6·3	V
Ih	730	mA
Va3+a4	25	kV
Va2 (focus electrode)	4·2 to 5	kV
*Va1 (at Vg = −100V)	210 to 495	V
*Vg (at Va1 = 300V)	−65 to −135	V

Final anode cavity connector type CT8.

*For visual extinction of focused raster.

TELEVISION PICTURE TUBE REPLACEMENTS

The information supplied in the replacement list is based on similarities of published electrical, mechanical and dimensional specifications. In undertaking any picture tube replacements, please observe all relevant instructions and specifications of the tube maker and/or set manufacturer, in particular, insulation, alignment, mounting and handling of the picture tube.

In case of replacement by a similar type make sure that base pin arrangements are electrically and dimensionally identical. Careful attention must be paid to possible differences in specifications.

If the above mentioned precautions are taken, a Mullard picture tube used as a replacement is covered by its normal guarantee.

Full technical information on Mullard picture tubes used in new receiver designs is published in the Mullard Technical Handbook Book 2 Part 1, May 1973.

Replacement information

1. Original has 12·6V heater. Connect 21Ω, 2W resistor in series with the heater.
2. Original has light screen tint (75%).
3. Replacement is 1 inch shorter.

TELEVISION PICTURE TUBE REPLACEMENTS

Type to be Replaced	Mullard Type	Notes
A28–14W	A28–14W	
A31–120W	A31–120W	
A31–410W	A31–410W	
A44–120W/R	A44–120W/R	
A47–11W	A47–26W	
A47–14W	A47–14W	
A47–15W	A47–14W	
A47–17W	A47–26W	
A47–18W	A47–26W	2
A47–25W	A47–26W	
A47–26W	A47–26W	
A47–26W/R	A47–26W/R	
A47–27W	A47–26W	
A47–28W	A47–26W	
A47–28W/R	A47–26W/R	
A49–11X	A49–120X	
A49–15X	A49–120X	
A49–18X	A49–120X	
A49–191X	A49–120X	
A49–120X	A49–120X	
A49–200X	A49–120X	
A50–120W/R	A50–120W/R	
A56–120X	A56–120X	
A56–140X	A56–140X	
A59–11W	A59–23W	
A59–12W	A59–23W	
A59–15W	A59–15W	
A59–23W	A59–23W	
A59–23W/R	A59–23W/R	
A59–25W	A59–23W	
A61–120W/R	A61–120W/R	
A63–11X	A63–120X	
A63–120X	A63–120X	
A63–200X	A63–120X	
A66–120X	A66–120X	
A66–140X	A66–140X	
A66–410X	A66–410X	
AW47–90	A47–14W	2, 3
AW47–91	A47–14W	2
AW47–97	A47–14W	1, 2, 3
AW59–90	A59–15W	2, 3
AW59–91	A59–15W	2
AW59–95	A59–15W	1, 2, 3
C19/7A	A47–14W	2, 3
C19/10A	A47–14W	2
C19AK	A47–14W	2, 3
C23/7A	A59–15W	2, 3
C23/10A	A59–15W	2
C23AK	A59–15W	2, 3
CME1713R	A44–120W/R	
CME1901	A47–14W	1, 2, 3
CME1902	A47–14W	2, 3
CME1903	A47–14W	2
CME1905	A47–26W	
CME1907	A47–26W	
CME1908	A47–14W	
CME1913	A47–26W	
CME1913R	A47–26W/R	
CME1913S	A47–26W	
CME2013R	A50–120W/R	
CME2301	A59–15W	1, 2, 3
CME2302	A59–15W	2, 3
CME2303	A59–15W	2
CME2305	A59–23W	
CME2308	A59–15W	
CME2312	A59–23W	
CME2313R	A59–23W/R	
CME2313S	A59–23W	
CME2413R	A61–120W/R	
25UP22	A63–120X	
7601A	A47–14W	1, 2, 3
7701A	A59–15W	1, 2, 3

RECEIVING VALVE TYPE NOMENCLATURE SYSTEM

All new Mullard valves are registered internationally with Pro-Electron and have type numbers according to the following code, based on the Pro-Electron type nomenclature system of receiving and amplifying valves.

The type number consists of two or more letters followed by a group of three figures (two figures in earlier types).

The first letter indicates the heater or filament voltage or current:

D	0·5 to 1·5V filament
E	6·3V heater
G	miscellaneous
P	300mA heater
U	100mA heater

The second and subsequent letters indicate the general class of valve:

A	single diode
B	double diode
C	triode
D	power output triode
E	tetrode
F	pentode
L	power output tetrode or pentode
H	hexode or heptode (hexode type)
K	octode or heptode (octode type)
M	tuning indicator
Y	half-wave rectifier
Z	full-wave rectifier

Two or three of these letters may be combined together, e.g. BC – double-diode triode.

The first figure of the serial number indicates the type of base:

2 B10B (10-pin) base (previously used for B8G base)
3 Octal base
4 B8A base
5 B9D (magnoval) base (previously used for miscellaneous bases)
8 B9A (noval) base
9 B7G base

The remaining figure(s) make up the serial number indicating a particular design or development.

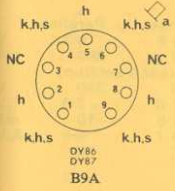
EXAMPLES:

PCF806 Triode pentode with B9A base for use in 300mA series heater chain.
EC90 Triode with B7G base and 6·3V heater.

LIST OF EARLIER TYPES AND TYPES NOT IN COMMON USE

DY51	ECC88	ELL80	PL82
EABC80	ECC189	EM84	PY33
EBC81	ECF82	EM87	PY82
EBF80	ECH83	EY51	UABC80
EBF83	ECL83	EY88	UBC81
EBF89	EF85	PCC88	UBF89
EC86	EL81	PCF82	UCC85
EC88	EL86	PL81A	UF89

DY87 — E.H.T. HALF-WAVE RECTIFIER

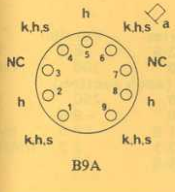


B9A

Vh	1·4	V
Ih	550	mA
Pulsed input		
P.I.V. max.	22	kV
ia(pk) max.	40	mA
Iout max.	500	μA
C max.	2000	pF

Pins 3 and 7 may only be connected to points in the heater circuit and must not be earthed.

DY802 — E.H.T. HALF-WAVE RECTIFIER

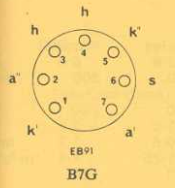


B9A

Vh	1·4	V
Ih	550	mA
Pulsed input		
P.I.V. max.	25	kV
ia(pk) max.	50	mA
Iout max.	500	μA
C max.	2000	pF

Pins 3 and 7 may only be connected to points in the heater circuit and must not be earthed.

EB91 — DOUBLE DIODE (separate cathodes)



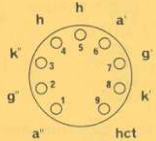
B7G

Vh	6·3	V
Ih	300	mA
*P.I.V. max.	420	V
*Ia max.	9·0	mA
*ia(pk) max.	54	mA
*vh–k(pk) max.	330	V

*Each section

ECC81

R.F. DOUBLE TRIODE (separate cathodes)

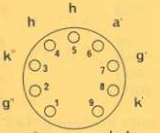


B9A

	Series	Parallel	
Vh	12·6	6·3	V
Ih	150	300	mA
Characteristics (each section)			
Va	200	250	V
Vg	−1·0	−2·0	V
Ia	11·5	10	mA
gm	6·7	5·5	mA/V
μ	70	60	

ECC82

DOUBLE TRIODE (separate cathodes)

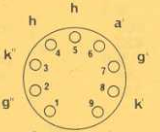


B9A

	Series	Parallel	
Vh	12·6	6·3	V
Ih	150	300	mA
Characteristics (each section)			
Va	100	250	V
Vg	0	−8·5	V
Ia	11·8	10·5	mA
gm	3·1	2·2	mA/V
μ	19·5	17	

ECC83

DOUBLE TRIODE (separate cathodes)

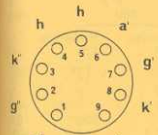


B9A

	Series	Parallel	
Vh	12·6	6·3	V
Ih	150	300	mA
Characteristics (each section)			
Va	100	250	V
Vg	−1·0	−2·0	V
Ia	0·5	1·2	mA
gm	1·25	1·6	mA/V
μ	100	100	

ECC85

R.F. DOUBLE TRIODE (separate cathodes)

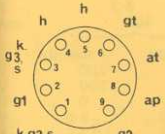


B9A

Vh	6·3	V
Ih	435	mA
Characteristics (each section)		
Va	250	V
Vg	−2·3	V
Ia	10	mA
gm	5·9	mA/V
μ	57	

ECF86

TRIODE FRAME-GRID PENTODE

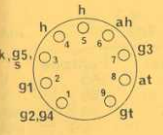


B9A

Vh	6·3		V
Ih	390		mA
	Triode	Pentode	
Va	100	170	V
Vg2	—	150	V
Vg1	−3	−1·2	V
Ia	14	10	mA
Ig2	—	3·3	mA
gm	5·7	12	mA/V
ra	3·0	>350	kΩ

ECH81

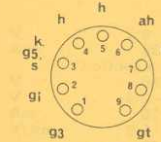
TRIODE HEPTODE FREQUENCY CHANGER



B9A

Vh	6·3	V
Ih	300	mA
Vah = Vb	250	V
Rg2+g4	22	kΩ
Rg3+gt	47	kΩ
Rk	140	Ω
Iah	3·25	mA
Ig2+g4	6·7	mA
Ig3+gt	200	μA
gc	775	μA/V
Vat	100	V
Iat	4·5	mA

ECH84

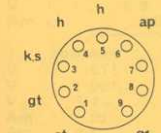


B9A

TRIODE HEPTODE FOR NOISE CANCELLED SYNC. SEPARATOR

Vh	6·3		V
Ih	300		mA
	Triode	Heptode	
Va	50	135	V
Vg3	—	0	V
Vg2+g4	—	14	V
Vg1	0	0	V
Ia	3·0	1·7	mA
Ig2+g4	—	900	μA
gm	3·7	2·2	mA/V
μ	50	—	
Vg3(Ia=20μA)	—	−2·0	V
Vg1(Ia=20μA)	—	−1·9	V
Ia(Va=200V, Vg=−11V)	<100	—	μA

ECL80

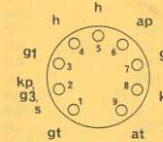


B9A

TRIODE OUTPUT PENTODE (pa max.=3·5W)

Vh	6·3		V
Ih	300		mA
	Triode	Pentode	
Va	100	200	V
Vg2	—	200	V
Vg3	—	0	V
Vg1	−2·3	−8·0	V
Ia	4·0	17·5	mA
Ig2	—	3·3	mA
gm	1·4	3·3	mA/V
μ	17·5	—	
Ra	—	11	kΩ
Pout	—	1·4	W

ECL82

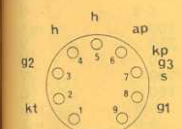


B9A

TRIODE OUTPUT PENTODE (pa max.=5·4W)

Vh	6·3		V
Ih	780		mA
	Triode	Pentode	
Va	100	250	V
Vg2	—	250	V
Ia	3·5	28	mA
Ig2	—	5·7	mA
Vg1	0	−22·5	V
gm	2·5	5·0	mA/V
Ra	—	9·0	kΩ
Pout	—	3·4	W

ECL86

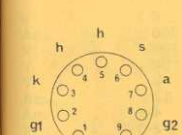


B9A

TRIODE OUTPUT PENTODE (pa max.=9W)

Vh	6·3		V
Ih	700		mA
	Triode	Pentode	
Va	250	250	V
Vg2	—	250	V
Ia	1·2	36	mA
Ig2	—	6·0	mA
Vg1	−1·9	−7·0	V
gm	1·6	10	mA/V
ra	62	48	kΩ
Ra	—	7·0	kΩ
Pout	—	4·0	W

EF80

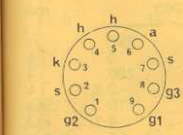


B9A

HIGH SLOPE R.F. PENTODE

Vh	6·3	V
Ih	300	mA
Va	170	V
Vg2	170	V
Vg3	0	V
Rk	160	Ω
Ia	10	mA
Ig2	2·5	mA
gm	7·4	mA/V
μg1–g2	50	

EF86

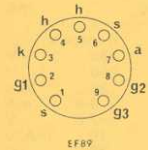


B9A

LOW NOISE A.F. VOLTAGE AMPLIFYING PENTODE

Vh	6·3	V
Ih	200	mA
Va	250	V
Vg3	0	V
Vg2	140	V
Vg1	−2·0	V
Ia	3·0	mA
Ig2	600	μA
gm	2·0	mA/V
μg1–g2	38	

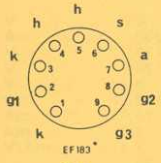
EF89 — VARIABLE-MU R.F. PENTODE



B9A

Vh	6·3	V
Ih	200	mA
Va	250	V
Vg3	0	V
Vg2	100	V
Rk	160	Ω
Ia	9·0	mA
Ig2	3·0	mA
gm	3·6	mA/V

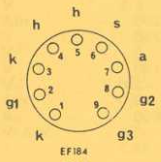
EF183 — FRAME-GRID VARIABLE-MU R.F. PENTODE



B9A

Vh	6·3	V
Ih	300	mA
Va	200	V
Vg2	90	V
Vg3	0	V
Ia	12	mA
Ig2	4·5	mA
Vg1	−2·0	V
gm	12·5	mA/V
ra	500	kΩ

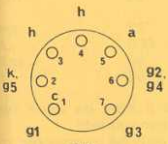
EF184 — FRAME-GRID R.F. PENTODE



B9A

Vh	6·3		V
Ih	300		mA
Va	170	200	V
Vg3	0	0	V
Vg2	170	200	V
Vg1	−2·0	−2·5	V
Ia	10	10	mA
Ig2	4·1	4·1	mA
gm	15·6	15	mA/V
ra	330	380	kΩ
μg1–g2	60	60	

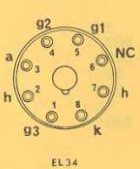
EH90 — DUAL CONTROL HEPTODE



B7G

Vh	6·3	V
Ih	300	mA
Va	100	V
Vg2+g4	30	V
Vg1	−1·0	V
Vg3	0	V
Ia	0·75	mA
Ig2+g4	1·1	mA
gm(g1–a)	1·2	mA/V
ra	900	kΩ

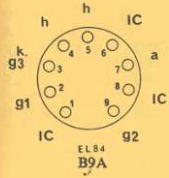
EL34 — OUTPUT PENTODE (pa max. = 25W)



Octal

Vh	6·3	V
Ih	1·5	A
Va	250	V
Vg2	250	V
Vg3	0	V
Rk	106	Ω
Ia	100	mA
Ig2	15	mA
gm	11	mA/V
Ra	2·0	kΩ
Pout	11	W

EL84 — OUTPUT PENTODE (pa max. = 12W)

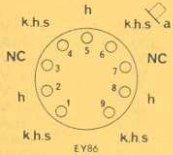


B9A

Vh	6·3	V
Ih	760	mA
Va	250	V
Vg2	250	V
Rk	135	Ω
Ia	48	mA
Ig2	5·5	mA
gm	11·3	mA/V
Ra	4·5	kΩ
Pout	5·7	W

EY87

HIGH VOLTAGE HALF-WAVE RECTIFIER



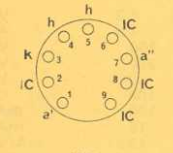
B9A

Vh	6·3	V
Ih	90	mA
Pulsed input		
P.I.V. max.	22	kV
Iout	800	μA
ia(pk) max.	40	mA
C max.	2000	pF

†Pins 1, 4, 6 and 9 may be used for fitting an anti-corona shield
*Pins 3 and 7 may only be connected to points in the heater circuit and must not be earthed

EZ80

FULL-WAVE RECTIFIER

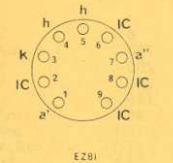


B9A

Vh	6·3	V
Ih	600	mA
Vin (r.m.s.)	2×350	V
Iout max.	90	mA
C max.	50	μF
Rlim min. (per anode)	300	Ω

EZ81

FULL-WAVE RECTIFIER

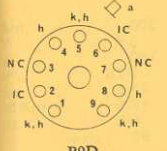


B9A

Vh	6·3	V
Ih	1·0	A
Vin (r.m.s.)	2×350	V
Iout max.	160	mA
C max.	50	μF
Rlim min. (per anode)	230	Ω

GY501

E.H.T. HALF-WAVE RECTIFIER FOR COLOUR TV



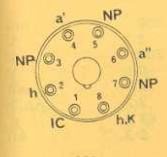
B9D

Vh	3·15	V
Ih	400	mA
P.I.V. max.	31	kV
Vout	25	kV
Iout	1·5	mA

Pins 3 and 7 may only be connected to points with the same potential as the heater, and must not be earthed

GZ34

FULL-WAVE RECTIFIER

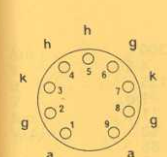


Octal

Vh	5·0	V
Ih	1·9	A
Vin(r.m.s.)	2×450	V
Iout max.	250	mA
C max.	60	μF
Rlim min. (per anode)	150	Ω

PC86

U.H.F. FRAME-GRID MIXER/ OSCILLATOR TRIODE

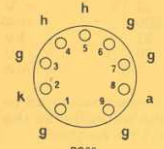


B9A

Ih	300	mA
Vh	3·8	V
Va	175	V
Vg	−1·5	V
Ia	12	mA
gm	14	mA/V
ra	4·85	kΩ
μ	68	

PC88

U.H.F. FRAME-GRID GROUNDED GRID AMPLIFIER TRIODE

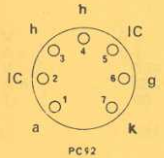


B9A

Ih	300	mA
Vh	3·8	V
Va	160	V
Vg1	−1·25	V
Ia	12·5	mA
gm	13·5	mA/V
ra	4·8	kΩ
μ	65	

PC92

R.F. TRIODE

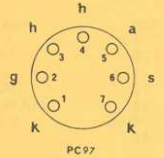


B7G

Ih	300	mA
Vh	3·1	V
Va	200	V
Vg	−0·9	V
Ia	12	mA
gm	7·2	mA/V
μ	67	
ra	9·3	kΩ

PC97

R.F. TRIODE

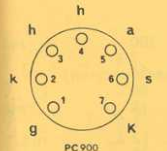


B7G

Ih	300	mA
Vh	4·5	V
Va	135	V
Vg	−1·0	V
Ia	11	mA
gm	13	mA/V
μ	65	
ra	5·0	kΩ

PC900

R.F. TRIODE

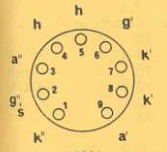


B7G

Ih	300	mA
Vh	4·0	V
Va	135	V
Vg	−1·0	V
Ia	11·5	mA
gm	14·5	mA/V
μ	72	
ra	5·0	kΩ

PCC84

DOUBLE TRIODE (separate cathodes)

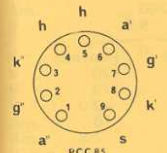


B9A

Ih	300	mA
Vh	7·0	V
Characteristics (each section)		
Va	90	V
Vg	−1·5	V
Ia	12	mA
gm	6·0	mA/V
μ	24	

PCC85

DOUBLE TRIODE (separate cathodes)

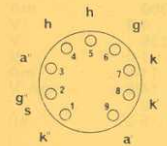


B9A

Ih	300		mA
Vh	9·0		V
Characteristics (each section)			
Va	170	200	V
Vg	−1·5	−2·1	V
Ia	10	10	mA
gm	6·2	5·8	mA/V
μ	50	48	

PCC89

VARIABLE-MU FRAME-GRID DOUBLE TRIODE

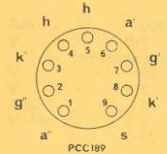


B9A

Ih	300	mA
Vh	7·5	V
Characteristics (each section)		
Va	90	V
Ia	15	mA
Vg	−1·2	V
gm	12·3	mA/V
μ	36	

PCC189

V.H.F. VARIABLE-MU FRAME-GRID CASCODE DOUBLE TRIODE

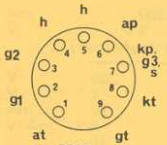


B9A

Ih	300	mA
Vh	7·6	V
Characteristics (each section)		
Va	90	V
Vg	−1·4	V
Ia	15	mA
gm	12·5	mA/V
ra	2·5	kΩ
μ	34	
Vg (for 20:1 reduction in gm)	−5·0	V
Vg (for 100:1 reduction in gm)	−9·0	V

PCF80

TRIODE PENTODE (separate cathodes)

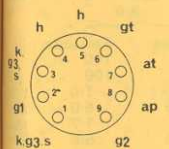


B9A

	Ih 300 mA	Vh 9·0 V	
	Triode	Pentode	
Va	100	170	V
Vg2	—	170	V
Vg1	−2·0	−2·0	V
Ia	14	10	mA
Ig2	—	2·8	mA
gm	5·0	6·2	mA/V
μ	20	—	

PCF86

TRIODE FRAME-GRID PENTODE

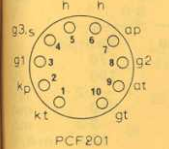


B9A

	Ih 300 mA	Vh 8·0 V	
	Triode	Pentode	
Va	100	170	V
Vg2	—	150	V
Vg1	−3	−1·2	V
Ia	14	10	mA
Ig2	—	3·3	mA
gm	5·7	12	mA/V
ra	3·0	>350	kΩ

PCF201

TRIODE PENTODE

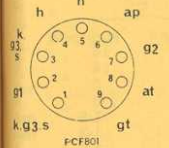


B10B

	Ih 300 mA	Vh 8·0 V	
	Triode	Pentode	
Va	100	160	V
Vg2	—	110	V
Vg1	−2	−1·4	V
Ia	14	13	mA
Ig2	—	5·3	mA
gm	4·8	12·6	mA/V
μ	17·5	—	

PCF801

TRIODE FRAME-GRID VARIABLE-MU PENTODE

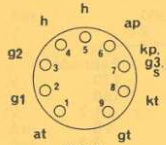


B9A

	Ih 300 mA	Vh 8·5 V	
	Triode	Pentode	
Va	100	170	V
Vg2	—	120	V
Vg1	−3·0	−1·4	V
Ia	15	10	mA
Ig2	—	3·0	mA
gm	9·0	11	mA/V
μ	20	—	
ra	2·2	⩾350	kΩ

PCF802

TRIODE PENTODE

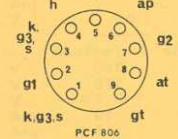


B9A

Ih	300		mA
Vh	9·0		V
	Triode	Pentode	
Va	200	100	V
Vg2	—	100	V
Vg1	−2·0	−1·0	V
Ia	3·5	6·0	mA
Ig2	—	1·7	mA
gm	3·5	5·5	mA/V
μ	70	—	
ra	20	400	kΩ

PCF806

TRIODE FRAME-GRID PENTODE

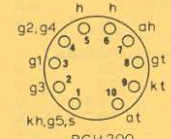


B9A

Ih	300		mA
Vh	8·0		V
	Triode	Pentode	
Va	100	170	V
Vg2	—	150	V
Vg1	−3·0	−1·2	V
Ia	14	10	mA
Ig2	—	3·3	mA
gm	5·5	12	mA/V
μ	17	—	

PCH200

TRIODE HEPTODE FOR NOISE CANCELLED SYNC SEPARATOR

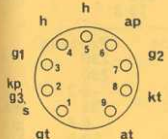


B10B

Ih	300		mA
Vh	8·5		V
	Triode	Heptode	
Va	100	14	V
Vg2+g4	—	14	V
Vg3	—	0	V
Vg1	−1·0	0	V
Ia	9	1·5	mA
Ig2+g4	—	1·3	mA
Ig3	—	1·0	μA
gm	8·8	—	mA/V
μ	50	—	

PCL82

TRIODE OUTPUT PENTODE (pa max.=7W)

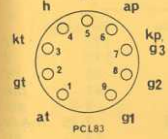


B9A

Ih	300		mA
Vh	16		V
	Triode	Pentode	
Va	100	170	V
Vg2	—	170	V
Vg1	0	−11·5	V
Ia	3·5	41	mA
Ig2	—	9·0	mA
gm	2·2	7·5	mA/V
μ	70	—	
Ra	—	3·9	kΩ
Pout	—	3·3	W

PCL83

TRIODE OUTPUT PENTODE (pa max.=5·4W)

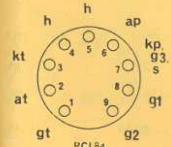


B9A

Ih	300		mA
Vh	12·6		V
	Triode	Pentode	
Va	250	170	V
Vg2	—	170	V
Vg1	−8·5	−9·5	V
Ia	10·5	30	mA
Ig2	—	5·0	mA
gm	2·2	5·5	mA/V
μ	17	—	
Ra	—	5·5	kΩ
Pout	—	2·2	W

PCL84

TRIODE OUTPUT PENTODE (pa max.=4W)

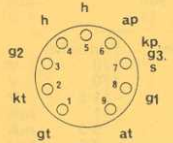


B9A

Ih	300		mA
Vh	15		V
	Triode	Pentode	
Va	200	200	V
Vg2	—	200	V
Vg1	−1·7	−2·9	V
Ia	3·0	18	mA
Ig2	—	3·0	mA
gm	4·0	10·4	mA/V
ra	16·2	130	kΩ
μg1–g2	—	36	

PCL86

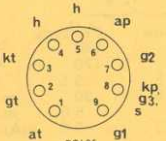
TRIODE OUTPUT PENTODE (pa max. (pentode) = 9W)



Ih	300		mA
Vh	13·3		V
	Triode	Pentode	
Va	230	230	V
Vg2	—	230	V
Vg1	−1·7	−5·7	V
Ia	1·2	39	mA
Ig2	—	6·5	mA
gm	1·6	10·5	mA/V
ra	—	45	kΩ
μg1–g2	—	21	

PCL805/85

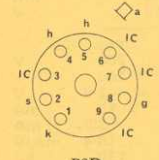
TRIODE OUTPUT PENTODE (pa max. = 7W)



Ih	300		mA
Vh	18		V
	Triode	Pentode	
Va	100	170	V
Vg2	—	170	V
Vg1	0	−15	V
Ia	10	41	mA
Ig2	—	2·7	mA
gm	5·5	7·25	mA/V
ra	9	25	kΩ
μg1–g2	—	7·0	

PD500

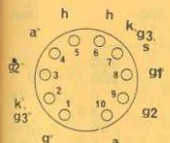
SHUNT STABILISER TRIODE FOR COLOUR TV



Ih	300	mA
Vh	7·3	V
Va	25	kV
Vs	0	V
Vg at Ia = 1·5 mA	−7 to −30	V
Vg max. at Ia = 0·1 mA	−40	V

PFL200

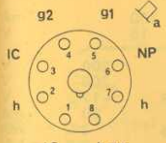
DOUBLE PENTODE (pa max. (output section) = 5W)



Ih	300		mA
Vh	16·5		V
	Amplifier section	Output section	
Va	150	170	V
Vg2	150	170	V
Vg1	−2·3	−2·6	V
Ia	10	30	mA
Ig2	3·0	6·5	mA
gm	8·5	21	mA/V
μg1–g2	35	32	
ra	160	40	kΩ

PL36

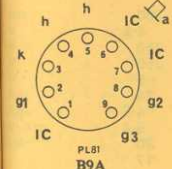
LINE TIMEBASE OUTPUT PENTODE (pa max. = 12W)



Ih	300 mA
Vh	25 V
Va	100 V
Vg2	100 V
Vg1	−8·2 V
Ia	100 mA
Ig2	7·0 mA
gm	14 mA/V
μg1–g2	5·6

PL81

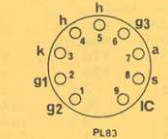
LINE TIMEBASE OUTPUT PENTODE (pa max. = 8W)



Ih	300 mA
Vh	21·5 V
Va	170 V
Vg2	170 V
Vg3	0 V
Vg1	−24 V
Ia	45 mA
Ig2	3·0 mA
gm	6·5 mA/V
μg1–g2	5·5

PL83

VIDEO OUTPUT PENTODE (pa max.=9W)

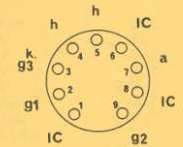


B9A

Ih	300		mA
Vh	15		V
Va	170	200	V
Vg2	170	200	V
Vg3	0	0	V
Vg1	−2·3	−3·5	V
Ia	36	36	mA
Ig2	5·0	5·0	mA
gm	10	10	mA/V
μg1–g2	24	24	

PL84

OUTPUT PENTODE (pa max.=12W)

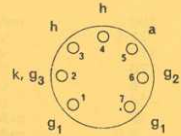


B9A

Ih	300		mA
Vh	15		V
Va	170	200	V
Vg2	170	200	V
Vg1	−12·5	−17·3	V
Ia	70	60	mA
Ig2	3·5	3·0	mA
gm	11	8·8	mA/V
ra	26	28	kΩ
μg1–g2	8·0	8·0	

PL95

OUTPUT PENTODE (pa max.=6W)

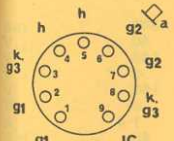


B7G

Ih	300	mA
Vh	4·5	V
Va	250	V
Vg2	250	V
Vg1	−9	V
Ia	24	mA
Ig2	4·5	mA
gm	5·4	mA/V
ra	70	kΩ
μg1–g2	17	

PL504

LINE OUTPUT PENTODE (pa max.=12W) Replaces PL500

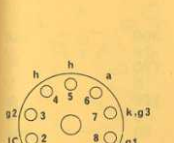


B9D

Ih	300	mA
Vh	27	V
Dynamic characteristics		
Va	75	V
Vg2	200	V
Vg1	−10	V
Ia	440	mA
Ig2	30	mA

PL508

FIELD OUTPUT PENTODE FOR COLOUR TV

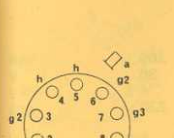


B9D

Ih	300	mA
Vh	17	V
Va	190	V
Vg2	190	V
Ia	60	mA
Ig2	4·5	mA
Vg1	−17	V
gm	9·0	mA/V
μg1–g2	7·0	
ra	10	kΩ

PL509

LINE OUTPUT PENTODE FOR COLOUR TV (pa max.=30W)

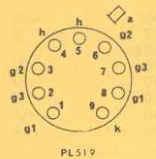


B9D

Ih	300	mA
Vh	40	V
Va	160	V
Vg3	0	V
Vg2	160	V
Vg1	0	V
Ia	1·4	A
Ig2	45	mA

PL519

LINE OUTPUT PENTODE FOR COLOUR TV (pa max. = 35W)

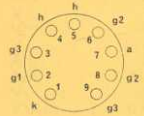


B9D

Ih	300	mA
Vh	40	V
Va	160	V
Vg3	0	V
Vg2	160	V
Vg1	0	V
Ia	1·4	A
Ig2	45	mA

PL802

VIDEO OUTPUT PENTODE FOR COLOUR TV

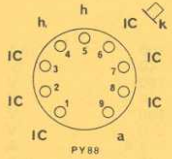


B9A

Ih	300	mA
Vh	16	V
Va	170	V
Vg3	0	V
Vg2	170	V
Vg1	−0·9	V
Ia	30	mA
Ig2	6·5	mA
gm	40	mA/V
ra	45	kΩ
μg1–g2	70	

PY88

BOOSTER DIODE

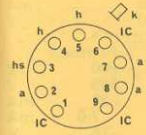


B9A

Ih	300	mA
Vh	30	V
P.I.V. max.	6·6	kV
Ia(av) max.	220	mA
vh–k(pk) max. (cathode positive)	6·6	kV

PY500A

BOOSTER DIODE FOR COLOUR TV

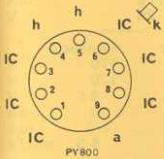


B9D

Ih	300	mA
Vh	42	V
P.I.V. max.	5·6	kV
Ia(av) max.	440	mA
vh–k(pk) max. (cathode positive)	6·3	kV

PY800

BOOSTER DIODE

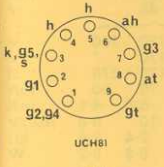


B9A

Ih	300	mA
Vh	19	V
P.I.V. max.	5·75	kV
Ia(av) max.	175	mA
vh–k(pk) max. (cathode positive)	6·0	kV

UCH81

TRIODE HEPTODE FREQUENCY CHANGER

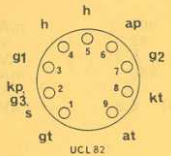


B9A

Ih	100		mA
Vh	19		V
Vah = Vb	170	200	V
Rg+g4	10	10	kΩ
Rg3+gt	47	47	kΩ
Rk	150	150	Ω
Vg2+g4	102	119	V
Iah	3·2	3·7	mA
Ig2+g4	6·8	8·1	mA
Ig3+gt	200	230	μA
gc	750	775	μA/V
Vat	102	102	V
Iat	4·5	5·4	mA

UCL82

TRIODE OUTPUT PENTODE (pa max. = 7W)

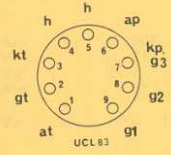


B9A

Ih	100		mA
Vh	50		V
	Triode	Pentode	
Va	100	200	V
Vg2	—	200	V
Ia	3·5	35	mA
Ig2	—	7·0	mA
Vg1	0	−16	V
gm	2·5	6·4	mA/V
Ra	—	5·6	kΩ
Pout	—	3·5	W

UCL83

TRIODE OUTPUT PENTODE (pa max. = 5·4W)

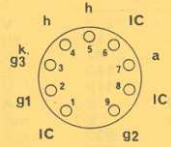


B9A

Ih	100		mA
Vh	38		V
	Triode	Pentode	
Va	170	170	V
Vg2	—	170	V
Vg1	−1·5	−9·5	V
Ia	1·6	30	mA
Ig2	—	5·0	mA
gm	2·1	5·5	mA/V
μ	82	—	
Ra	—	5·5	kΩ
Pout	—	2·2	W

UL84

OUTPUT PENTODE (pa max. = 12W)



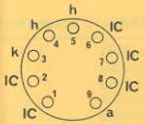
B9A

Ih	100			mA
Vh	45			V
Va	100	170	200	V
Vg2	100	170	*	V
Rk	150	170	270	Ω
Ia	43	70	60	mA
Ig2	3·0	5·0	4·1	mA
gm	9·0	10	8·8	mA/V
Ra	2·4	2·4	2·4	kΩ
Pout	1·9	5·6	5·2	W

*Vg2(b) = 200V. Rg2 = 470Ω

UY85

HALF-WAVE RECTIFIER



B9A

Ih	100	mA
Vh	38	V
Vin(r.m.s.)	250	V
Iout max.	110	mA
C max.	100	μF
Rlim min.	100	Ω

VALVE EQUIVALENTS

† Valves having a different heater current, and therefore not direct replacement in a.c./d.c. receivers.

Type	Mullard Equivalent	Type	Mullard Equivalent
AZ31	AZ31	ECC81	ECC81
B109	UCC85	ECC82	ECC82
B309	ECC81	ECC83	ECC83
B319	PCC84	ECC84	ECC84
B329	ECC82	ECC85	ECC85
B339	ECC83	ECC88	ECC88
B349	30L15/PCC805	ECC189	ECC189
B719	ECC85	ECC804	6/30L2/ECC804
B729	6/30L2/ECC804	ECF80	ECF80
CY30	U301/CY30	ECF82	ECF82
D77	EB91	ECF86	ECF86
DAF96	DAF96	ECH42	ECH42
DF96	DF96	ECH81	ECH81
DH109	UABC80	ECH83	ECH83
DH118	UBC41	ECH84	ECH84
DH119	UBC81	ECL80	ECL80
DH142	UBC41	ECL82	ECL82
DH150	EBC41	ECL83	ECL83
DH718	EBC41	ECL86	ECL86
DH719	EABC80	EF36	EF37A
DK96	DK96	EF37	EF37A
DL96	DL96	EF37A	EF37A
DM70	DM70	EF40	EF40
DM71	DM71	EF41	EF41
DY51	DY51	EF80	EF80
DY86	DY87	EF83	EF83
DY87	DY87	EF85	EF85
DY802	DY802	EF86	EF86
EABC80	EABC80	EF89	EF89
EAF42	EAF42	EF91	EF91
EB91	EB91	EF92	EF92
EBC41	EBC41	EF95	EF95
EBC81	EBC81	EF183	EF183
EBF80	EBF80	EF184	EF184
EBF83	EBF83	EF812	6F23/EF812
EBF89	EBF89	EH90	EH90
EC86	EC86	EL34	EL34
EC88	EC88	EL36	EL36
ECC32	ECC32	EL41	EL41
ECC33	ECC33	EL42	EL42

Type	Mullard Equivalent	Type	Mullard Equivalent
EL81	EL81	N152	PL81
EL84	EL84	N155	EL85
EL85	EL85	N309	PL83
EL86	EL86	N329	PL82
EL91	EL91	N369	30P12/PL801
EL95	EL95	N379	PL84
EL821	EL821	N389	30P19/PL302
ELL80	ELL80	N709	EL84
EM34	EM34	PABC80	PABC80
EM81	EM81	PC86	PC86
EM84	EM84	PC88	PC88
EM87	EM87	PC92	PC92
EM840	EM84†	PC97	PC97
EY51	EY51	PC900	PC900
EY86	EY87	PCC84	PCC84
EY87	EY87	PCC85	PCC85
EY88	EY88	PCC88	PCC88
EZ35	EZ35	PCC89	PCC89
EZ40	EZ40	PCC189	PCC189
EZ41	EZ41	PCC805	3L15/PCC805
EZ80	EZ80	PCE800	30FL1/PCE800
EZ81	EZ81	PCF80	PCF80
GY501	GY501	PCF82	PCF82
GZ32	GZ32	PCF84	PCF84
GZ34	GZ34	PCF86	PCF86
KY50	U25/KY50	PCF200	PCF200
KY80	U26/KY80	PCF201	PCF201
LN119	UCL82	PCF800	30C15/PCF800
LN152	ECL80	PCF801	PCF801
LN319	30PL1/PCL801	PCF802	PCF802
LZ319	PCF80	PCF805	30C18/PCF805
LZ329	PCF80	PCF806	PCF806
LZ339	30C15/PCF800	PCH200	PCH200
N25	DL96	PCL82	PCL82
N77	EL91	PCL83	PCL83
N119	UL84	PCL84	PCL84
N142	UL41	PCL85	PCL805/85
N144	EL91	PCL86	PCL86
N150	EL41	PCL88	30PL14/PCL88
N151	EL42	PCL800	30PL13/PCL800

Type	Mullard Equivalent
PCL801	30PL1/PCL801
PCL805	PCL805/85
PD500	PD500
PF818	30F5/PF818
PFL200	PFL200
PL36	PL36
PL81	PL81
PL81A	PL81A
PL82	PL82
PL83	PL83
PL84	PL84
PL95	PL95
PL302	30P19/PL302
PL500	PL504
PL504	PL504
PL505	PL509
PL508	PL508
PL509	PL509
PL519	PL519
PL801	30P12/PL801
PL802	PL802
PL820	PL820
PY33	PY33
PY81	PY800
PY82	PY82
PY88	PY88
PY301	U191/PY301
PY500	PY500A
PY500A	PY500A
PY800	PY800
R12	EY51
R20	U26/KY80
U25	U25/KY50
U26	U26/KY80
U43	EY51
U47	U25/KY50
U49	U26/KY80
U70	EZ35
U119	UY85
U142	UY41
U143	AZ31
U147	EZ35
U150	EZ40
U151	EY51
U153	PY81
U191	U191/PY301
U192	PY82
U301	U301/CY30
U319	PY82
U339	U191/PY301
U381	UY85
U709	EZ81
UABC80	UABC80
UAF42	UAF42
UBC41	UBC41
UBC81	UBC81
UBF80	UBF80
UBF89	UBF89
UCC85	UCC85
UCH42	UCH42
UCH81	UCH81
UCL82	UCL82
UCL83	UCL83
UF41	UF41
UF89	UF89
UL41	UL41
UL84	UL84
UU12	EZ81
UY41	UY41
UY42	UY41
UY85	UY85
W25	DF96
W77	EF92
W142	UF41
W150	EF41
W719	EF85
WD119	UBF89
WD142	UAF42
WD709	EBF80
X25	DK96

Type	Mullard Equivalent
X119	UCH81
X142	UCH42
X150	ECH42
X719	ECH81
Y25	DM71
Z77	EF91
Z329	30F5/PF818
Z719	EF80
Z729	EF86
Z749	6F23/EF812
ZD25	DAF96
1C3	DK96
1FD1	DAF96
1M1	DM70
1P1	DL96
6AK5	EF95
6AL5	EB91
6AM5	EL91
6AM6	EF91
6C10	ECH42
6C12	ECH81
6CB6	6CB6
6CH6	EL821
6CW5	EL86
6D2	EB91
6F12	EF91
6F19	EF85
6F23	6F23/EF812
6F26	EF85
6F29	EF183
6F30	EF184
6FD12	EBF89
6L12	ECC85
6L13	ECC83
6LD3	EBC41
6LD12	EABC80
6LD13	EBC81
6P15	EL84
6X5GT	EZ35
6/30L2	6/30L2/ECC804
8D3	EF91
9D6	EF92
10C14	UCH81
10FD12	UBF89
10L14	UCC85
10LD3	UBC41
10LD12	UABC80
10LD13	UBC81
10P18	UL84
10PL12	UCL82
12AT7	ECC81
12AU7	ECC82
12AX7	ECC83
30C1	PCF80
30C15	30C15/PCF800
30C18	30C18/PCF805
30F5	30F5/PF818
30FL1	30FL1/PCE800
30L1	PCC84
30L15	30L15/PCC805
30P12	30P12/PL801
30P16	PL82
30P18	PL84
30P19	30P19/PL302
30PL1	30PL1/PCL801
30PL13	30PL13/PCL800
30PL14	30PL14/PCL88

CAPACITORS AND RESISTORS
(Symbols and definitions)

K: The kelvin; unit of thermodynamic temperature. The kelvin is the fraction 1/273·16 of the thermodynamic temperature of the triple point of water. On this scale the temperature of the ice point is 273·15K. The units of kelvin and Celsius temperature interval are identical.

B-value: An index of the temperature sensitivity derived from the following formula:

$$B = 2{\cdot}303 \frac{T_1 \times T_2}{T_2 - T_1} \times \log_{10} \frac{R_1}{R_2} \text{ kelvin}$$

where B is a constant in kelvin
R_1 the resistance in ohms at T_1
R_2 the resistance in ohms at T_2

When calculated from measurements made at $T_1 = 298$ kelvin (25°C) and $T_2 = 358$ kelvin (85°C) the constant is written as $B\frac{25}{85}$

Switch temperature: The higher of two temperatures at which the resistance of the thermistor is twice its minimum value.

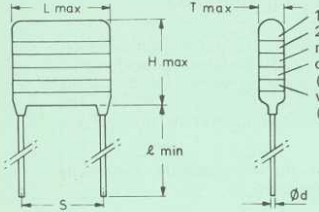
C: Applied voltage for a current of 1A.

ß-value: The index in the voltage/current relationship $V = CI^{\beta}$. It is equal to the slope of the voltage current characteristic when this is plotted using logarithmic scales.

Reference voltage and reference current: The co-ordinates of the voltage/current characteristic. This point is in the working range of the VDR and is used to define the properties and for quality control.

METALLISED FILM CAPACITORS
C280 Series (polyester)

Dimensions and method of marking:



1st fig. of capacitance } standard
2nd fig. of capacitance } colour
multiplier (power of 10) } code
capacitance tolerance
(white = ±10%; black = ±20%)
working voltage
(red = 250V; yellow = 400V)

CAPACITANCE TOLERANCE for C ≤0·22μF ±20%
for C ≥0·33μF ±10%

LOSSES (at 1kHz) $\tan\delta < 75\times10^{-4}$

INSULATION RESISTANCE (at 20°C) for C ≤0·33μF, R >30 000MΩ
for C ≥0·47μF, RC >10 000MΩμF

TEMPERATURE RANGE −40 to +85°C

250V d.c. working

Capacitance (μF)	Type No.	Dimensions (mm)					
		S	L	T	H	d	ℓ
0·01	C280AE/P10K	10·2	12·5	4	9	0·6	16
0·015	C280AE/P15K	10·2	12·5	4	9	0·6	16
0·022	C280AE/P22K	10·2	12·5	4	9	0·6	16
0·033	C280AE/P33K	10·2	12·5	4	9	0·6	16
0·047	C280AE/P47K	10·2	12·5	4	9	0·6	16
0·068	C280AE/P68K	10·2	12·5	5	10	0·6	16
0·1	C280AE/P100K	10·2	12·5	6	11	0·6	16
0·15	C280AE/P150K	15·3	17·5	6	11	0·8	18
0·22	C280AE/P220K	15·3	17·5	7	12	0·8	18
0·33	C280AE/A330K	20·3	22·5	6·5	11·5	0·8	21
0·47	C280AE/A470K	20·3	22·5	7·5	12·5	0·8	21
0·68	C280AE/A680K	20·3	22·5	9·5	14·5	0·8	21
1	C280AE/A1M	27·9	30	9·5	14·5	0·8	21
1·5	C280AE/A1M5	27·9	30	10·5	18	0·8	21
2·2	C280AE/A2M2	27·9	30	12·5	20·5	0·8	21

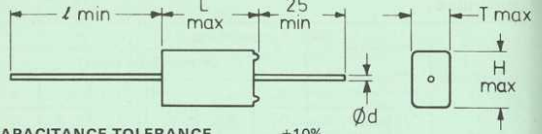
Continued overleaf

METALLISED FILM CAPACITORS
C280 Series (polyester)
(continued)

400V d.c. working

Capacitance (μF)	Type No.	Dimensions (mm)					
		S	L	T	H	d	ℓ
0·01	C280CF/P10K	10·2	12·5	4	9	0·6	16
0·015	C280CF/P15K	10·2	12·5	4	9	0·6	16
0·022	C280CF/P22K	10·2	12·5	4	9	0·6	16
0·033	C280CF/P33K	10·2	12·5	5	10	0·6	16
0·047	C280CF/P47K	10·2	12·5	6	11	0·6	16
0·068	C280CF/P68K	15·3	17·5	6	11	0·8	18
0·1	C280CF/P100K	15·3	17·5	7	12	0·8	18
0·15	C280CF/P150K	20·3	22·5	6·5	11·5	0·8	21
0·22	C280CF/P220K	20·3	22·5	7·5	12·5	0·8	21
0·33	C280CF/A330K	20·3	22·5	9·5	14·5	0·8	21
0·47	C280CF/A470K	27·9	30	9·5	14·5	0·8	21
0·68	C280CF/A680K	27·9	30	10	18	0·8	21
1	C280CF/A1M	27·9	30	12	20	0·8	21

METALLISED FILM CAPACITORS
C281 Series (polyester)



CAPACITANCE TOLERANCE ±10%

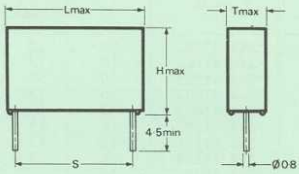
LOSSES (at 1kHz) tanδ for C281AB $<75\times10^{-4}$
for C281CD $<30\times10^{-4}$

INSULATION RESISTANCE (at 20°C) for C ≤0·33μF R >30 000MΩ
for C ≥0·47μF RC >10 000MΩμF

TEMPERATURE RANGE −55 to +85°C

Capacitance (μF)	Type No.	Dimensions (mm)				
		L	T	H	d	ℓ
250V d.c. working						
0·01	C281AB/A10K	14·6	4·8	8·8	0·8	40
0·015	C281AB/A15K	14·6	4·8	8·8	0·8	40
0·022	C281AB/A22K	14·6	4·8	8·8	0·8	40
0·033	C281AB/A33K	14·6	4·8	8·8	0·8	40
0·047	C281AB/A47K	14·6	4·8	8·8	0·8	40
0·068	C281AB/A68K	14·6	5·6	9·5	0·8	40
0·1	C281AB/A100K	14·6	6·6	10·5	0·8	40
0·15	C281AB/A150K	18·1	6·6	10·5	0·8	40
0·22	C281AB/A220K	18·1	7·7	11·6	0·8	40
0·33	C281AB/A330K	23·6	7·5	11·6	0·8	40
0·47	C281AB/A470K	23·6	8·8	12·9	0·8	40
0·68	C281AB/A680K	23·6	10·5	14·5	0·8	40
1	C281AB/A1M	31·1	10·5	14·7	1	49
1·5	C281AB/A1M5	31·1	12·5	19·6	1	49
2·2	C281AB/A2M2	31·1	15·1	22·1	1	49
400V d.c. working						
0·01	C281CD/A10K	14·6	4·8	8·8	0·8	40
0·015	C281CD/A15K	14·6	4·8	8·8	0·8	40
0·022	C281CD/A22K	14·6	4·8	8·8	0·8	40
0·033	C281CD/A33K	14·6	5·6	9·5	0·8	40
0·047	C281CD/A47K	14·6	6·6	10·5	0·8	40
0·068	C281CD/A68K	18·1	6·6	10·5	0·8	40
0·1	C281CD/A100K	18·1	7·7	11·6	0·8	40
0·15	C281CD/A150K	23·6	7·5	11·6	0·8	40
0·22	C281CD/A220K	23·6	8·8	12·9	0·8	40
0·33	C281CD/A330K	23·6	10·5	14·5	0·8	40
0·47	C281CD/A470K	31·1	10·5	14·7	1	49

METALLISED FILM CAPACITORS
344 Series (polyester)



CAPACITANCE TOLERANCE ±10%

LOSSES (at 1kHz) tanδ $<30\times10^{-4}$ (344 21 and 344 51 series)
$<75\times10^{-4}$ (344 25 and 344 41 series)

INSULATION RESISTANCE (at 20°C) for C ≤0·33μF, R >30 000MΩ
for C ≥ 0·47μF, RC >10 000MΩμF

TEMPERATURE RANGE −55 to +85°C

Capacitance (μF)	Type No. (see Note)	Dimensions (mm)			
		S	L max.	T max.	H max.
344 2 Series 100V d.c. working					
0·047	344 2.473	10	13	4·5	10
0·068	344 2.683	10	13	4·5	10
0·1	344 2.104	10	13	4·5	10
0·15	344 2.154	10	13	4·5	10
0·22	344 2.224	10	13	5	11
0·33	344 2.334	15	17·5	5	11
0·47	344 2.474	15	17·5	6	11·5
0·68	344 2.684	15	17·5	7	13
1	344 2.105	15	17·5	8·5	14·5
1·5	344 2.155	22·5	26	7·5	16·5
2·2	344 2.225	22·5	26	8·5	18
3·3	344 2.335	22·5	26	9·5	19
4·7	344 2.475	27·5	30	11	20·5
6·8	344 2.685	27·5	30	13·5	22

Note: • Polyethylene-terephtalate = 5, e.g. 344 25473
Polycarbonate = 1, e.g. 344 21473

344 41 Series 250V d.c. working

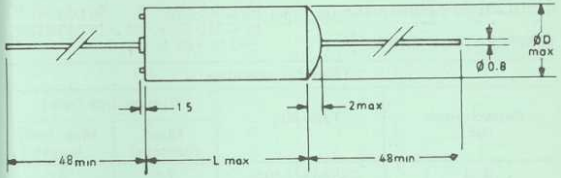
Capacitance (μF)	Type No.	Dimensions (mm)			
		S	L max.	T max.	H max.
0·01	344 41103	10	13	4·5	10
0·015	344 41153	10	13	4·5	10
0·022	344 41223	10	13	4·5	10
0·033	344 41333	10	13	4·5	10
0·047	344 41473	10	13	4·5	10
0·068	344 41683	10	13	5	11
0·1	344 41104	15	17·5	5	11
0·15	344 41154	15	17·5	6	11·5
0·22	344 41224	15	17·5	7	13
0·33	344 41334	15	17·5	8·5	14·5
0·47	344 41474	22·5	26	6·5	15·5
0·68	344 41684	22·5	26	7·5	16·5
1	344 41105	22·5	26	9·5	19
1·5	344 41155	27·5	30	11	20·5
2·2	344 41225	27·5	30	13·5	22

344 51 Series 400V d.c. working

Capacitance (μF)	Type No.	Dimensions (mm)			
		S	L max.	T max.	H max.
0·01	344 51103	10	13	4·5	10
0·015	344 51153	10	13	4·5	10
0·022	344 51223	10	13	4·5	10
0·033	344 51333	10	13	5	11
0·047	344 51473	15	17·5	5	11
0·068	344 51683	15	17·5	6	11·5
0·1	344 51104	15	17·5	7	13
0·15	344 51154	15	17·5	8·5	14·5
0·22	344 51224	22·5	26	6·5	15·5
0·33	344 51334	22·5	26	7·5	16·5
0·47	344 51474	22·5	26	9·5	19
0·68	344 51684	27·5	30	11	20·5
1	344 51105	27·5	30	13·5	22

FILM/FOIL CAPACITORS

278 Series (polypropylene and paper)



CAPACITANCE TOLERANCE ±5%
LOSSES (at 1kHz) $\tan\delta < 30 \times 10^{-4}$
INSULATION RESISTANCE (at 20°C) >50 000MΩ
TEMPERATURE RANGE −25 to +85°C

2kV peak to peak

Capacitance (nF)	Type No.	Dimensions (mm)	
		D max.	L max.
1·5	278 82152	13·5	36
1·8	278 82182	13·5	36
2	278 82202	13·5	36
5·2	278 82522	16·5	41
8·2	278 82822	16·5	41
10	278 82103	16·5	41
11	278 82113	16·5	41

FILM/FOIL CAPACITORS
C296 Series (polyester)

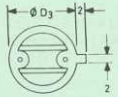
CAPACITANCE TOLERANCE ±10%
LOSSES (at 1kHz) $\tan\delta < 60\times10^{-4}$
INSULATION RESISTANCE (at 20°C) for C ≤0·22μF, R >50 000MΩ
for C ≥0·33μF, RC >16 500MΩμF
TEMPERATURE RANGE −40 to +85°C

Capacitance (μF)	Type No.	Dimensions (mm)	
		Max. diameter	Max. body length
160V d.c. working			
0·01	C296AA/A10K	7·5	21
0·015	C296AA/A15K	7·5	21
0·022	C296AA/A22K	7·5	21
0·033	C296AA/A33K	7·5	21
0·047	C296AA/A47K	8	21
0·068	C296AA/A68K	9	21
0·1	C296AA/A100K	10·5	21
0·15	C296AA/A150K	12	21
0·22	C296AA/A220K	10	35
0·33	C296AA/A330K	12	35
0·47	C296AA/A470K	14	35
0·68	C296AA/A680K	16	35
1	C296AA/A1M	18·5	35
400V d.c. working			
0·001	C296AC/A1K	7·5	21
0·0015	C296AC/A1K5	7·5	21
0·0022	C296AC/A2K2	7·5	21
0·0033	C296AC/A3K3	7·5	21
0·0047	C296AC/A4K7	7·5	21
0·0068	C296AC/A6K8	7·5	21
0·01	C296AC/A10K	7·5	21
0·015	C296AC/A15K	7·5	21
0·022	C296AC/A22K	8·5	21
0·033	C296AC/A33K	10	21
0·047	C296AC/A47K	11·5	21
0·068	C296AC/A68K	9·5	35
0·1	C296AC/A100K	11	35
0·15	C296AC/A150K	12·5	35
0·22	C296AC/A220K	14·5	35
0·33	C296AC/A330K	17	35
0·47	C296AC/A470K	19·5	35

Leads: 0·8 diameter, 28 min. long

ELECTROLYTIC CAPACITORS
015, 016, 017 Series

Dimensions (mm)



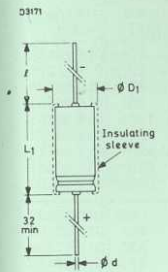


Fig 1

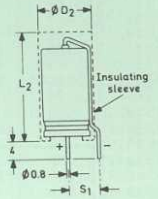


Fig 2

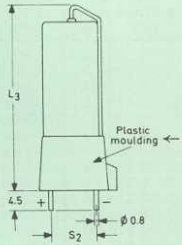


Fig 3

Can size	Axial lead version				Printed-wiring versions					
	Fig. 1				Fig. 2			Fig. 3		
	L_1 max.	D_1 max.	ℓ min.	d nom.	L_2 max.	D_2 max.	S_1 nom.	L_3 max.	D_3 max.	S_2 nom.
2	12·5	4·8	32	0·6	—	—	—	—	—	—
3	12·5	6·1	32	0·6	—	—	—	—	—	—
4	18·5	6·7	32	0·8	23	8·5	5·1	—	—	—
5	18·5	8·3	32	0·8	23	10·2	5·1	—	—	—
6	18·5	10·3	32	0·8	23	12·1	7·6	—	—	—
00	30·5	10·4	54	0·8	—	—	—	40	12·8	10·2
01	30·5	12·9	54	0·8	—	—	—	40	15·2	10·2
02	30·5	15·4	54	0·8	—	—	—	40	17·8	12·7
03	30·5	18·4	54	0·8	—	—	—	40	20·8	15·2

ELECTROLYTIC CAPACITORS
015, 016, 017 Series (Axial version Fig. 1)

CAPACITANCE TOLERANCE −10 to +50%
TEMPERATURE RANGE 015 Series −25 to +85°C
016 and 017 Series −40 to +85°C

Working d.c. voltage (V)	Can size	Capacitance (µF)	Type No.
4	2	47	015 12479
4	3	100	015 12101
4	4	220	016 12221
4	5	330	016 12331
4	00	1000	017 12102
4	03	4700	017 12472
6·3	2	33	015 13339
6·3	3	68	015 13689
6·3	4	150	016 13151
6·3	6	470	016 13471
6·3	00	680	017 13681
6·3	01	1500	017 13152
6·3	02	2200	017 13222
6·3	03	3300	017 13332
10	2	22	015 14229
10	3	47	015 14479
10	4	100	016 14101
10	5	220	016 14221
10	6	330	016 14331
10	00	470	017 14471
10	01	1000	017 14102
10	02	1500	017 14152
10	03	2200	017 14222
16	2	15	015 15159
16	3	33	015 15339
16	4	68	016 15689
16	5	150	016 15151
16	6	220	016 15221
16	00	330	017 15331
16	01	680	017 15681
16	02	1000	017 15102
16	03	1500	017 15152
25	2	10	015 16109
25	3	22	015 16229
25	4	47	016 16479
25	5	100	016 16101
25	6	150	016 16151
25	00	220	017 16221
25	01	470	017 16471
25	02	680	017 16681
25	03	1000	017 16102
40	2	6·8	015 17688
40	3	15	015 17159
40	4	33	016 17339
40	5	47	016 17479
40	6	100	016 17101
40	00	150	017 17151
40	01	220	017 17221
40	02	470	017 17471
40	03	680	017 17681
63	3	1	015 18108
63	3	1·5	015 90001
63	3	2·2	015 18228
63	3	3·3	015 18338
63	3	4·7	015 90003
63	3	6·8	015 18688
63	4	10	016 18109
63	4	15	016 18159
63	5	22	016 18229
63	6	47	016 18479
63	00	68	017 18689
63	01	100	017 18101
63	01	150	017 18151
63	02	220	017 18221
63	03	330	017 18331

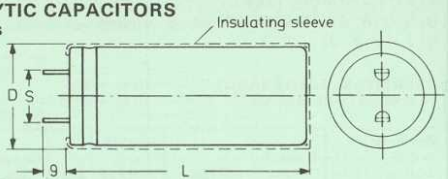
ELECTROLYTIC CAPACITORS
015, 016, 017 Series (Printed wiring versions, 016 – Fig. 2, 017 – Fig. 3)

CAPACITANCE TOLERANCE −10 to +50%
TEMPERATURE RANGE −40 to +85°C

Working d.c. voltage (V)	Can size	Capacitance (µF)	Type No.
4	4	220	016 42221
4	5	330	016 42331
4	00	1000	017 52102
4	03	4700	017 52472
6·3	4	150	016 43151
6·3	6	470	016 43471
6·3	00	680	017 53681
6·3	01	1500	017 53152
6·3	02	2200	017 53222
6·3	03	3300	017 53332
10	4	100	016 44101
10	5	220	016 44221
10	6	330	016 44331
10	00	470	017 54471
10	01	1000	017 54102
10	02	1500	017 54152
10	03	2200	017 54222
16	4	68	016 45689
16	5	150	016 45151
16	6	220	016 45221
16	00	330	017 55331
16	01	680	017 55681
16	02	1000	017 55102
16	03	1500	017 55152
25	4	47	016 46479
25	5	100	016 46101
25	6	150	016 46151
25	00	220	017 56221
25	01	470	017 56471
25	02	680	017 56681
25	03	1000	017 56102
40	4	33	016 47339
40	5	47	016 47479
40	6	100	016 47101
40	00	150	017 57151
40	01	220	017 57221
40	02	470	017 57471
40	03	680	017 57681
63	4	10	016 48109
63	4	15	016 48159
63	5	22	016 48229
63	6	47	016 48479
63	00	68	017 58689
63	01	100	017 58101
63	01	150	017 58151
63	02	220	017 58221
63	03	330	017 58331

ELECTROLYTIC CAPACITORS
C431 Series

Dimensions (mm)



Can size	5	6	7	9	10
D	22	26	26	36	41
L	50·5	50·5	81·5	81·5	81·5
S	11·4	11·4	11·4	18·2	18·2

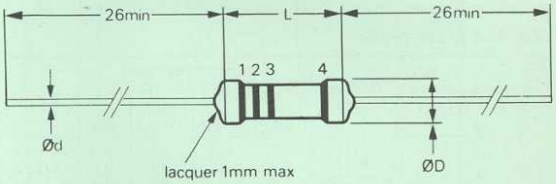
Tags: 4mm wide with hole 1·5 dia. min.

CAPACITANCE TOLERANCE −10 to +50%
TEMPERATURE RANGE −40 to +70°C

Working d.c. voltage (V)	Can size	Capacitance (µF)	Type No.
10	5	2000	C431BR/D2000
10	6	3200	C431BR/D3200
10	7	5000	C431BR/D5000
10	9	10 000	C431BR/D10000
10	10	16 000	C431BR/D16000
16	5	1250	C431BR/E1250
16	6	2000	C431BR/E2000
16	7	3200	C431BR/E3200
16	9	6400	C431BR/E6400
16	10	10 000	C431BR/E10000
25	5	800	C431BR/F800
25	6	1250	C431BR/F1250
25	7	2000	C431BR/F2000
25	9	4000	C431BR/F4000
25	10	6400	C431BR/F6400
40	5	500	C431BR/G500
40	6	800	C431BR/G800
40	7	1250	C431BR/G1250
40	9	2500	C431BR/G2500
40	10	4000	C431BR/G4000
64	5	320	C431BR/H320
64	6	500	C431BR/H500
64	7	800	C431BR/H800
64	9	1600	C431BR/H1600
64	10	2500	C431BR/H2500

LINEAR RESISTORS
CR25, CR37 (carbon film)

Resistance range (Ω)	Resistance tolerance (%)	Max. power dissipation at 70°C (W)	Preferred value series	Max. voltage d.c. or rms (V)	Style
1 to 1M	± 5	0·33	E24	250	CR25
1·2M to 10M	±10	0·33	E12	250	CR25
1 to 1M	± 5	0·5	E24	350	CR37
1·2M to 10M	±10	0·5	E12	350	CR37



Band 1 = 1st significant figure
Band 2 = 2nd significant figure
Band 3 = Multiplier
Band 4 = Tolerance
Standard resistor colour code

Style	Dimensions (mm)		
	D max.	L max.	d
CR25	2·5	7·5	0·6
CR37	3·7	10	0·7

NON-LINEAR RESISTORS
Negative temperature coefficient (n.t.c.) thermistors

Rod types

Resistance at 25°C (Ω)	B value (K)	Colour code	Dimensions (mm)				Type No.
			Body (max.)		Leads		
			dia.	length	length (min.)	dia.	
4·7k	3250	Orange	3·7	12	25	0·4	VA1066S
15 k	3550	Green	3·7	12	25	0·4	VA1055S
47 k	3925	Blue	3·7	12	25	0·4	VA1056S
150 k	4075	White	3·7	12	25	0·4	VA1067S
150 k	4150	White	5·2	22	25	0·8	VA1091

Resistance tolerance ±20%
Max. power dissipation at 25°C 0·6W except VA1091 which is 1·5W

Disc and plate types

Resistance at 25°C (Ω)	B value (K)	Colour code			Dimensions (mm)				Type No.
					Body (max.)		Leads		
					dia.	length	length (min.)	dia.	
1·1	2650	Br	Br	Gd	9×21*	5·2	43	0·6	VA1037
2·2	2675	R	R	Gd	9·4	5	43	0·6	VA1086
4	2800	Y	B	Gd	9·4	5	43	0·6	VA1033
8	2900	Gy	B	Gd	9·4	5	43	0·6	VA1053
15	3000	Br	G	B	9·4	5	43	0·6	VA1100
50	3300	G	B	B	9·4	5	43	0·6	VA1034
130	4600	Br	O	Br	9·4	5	43	0·6	VA1040
470	3520	Y	V	Br	5·5	5·5	44	0·6	VA1097
470	3900	Y	V	Br	16·5	7	45	0·8	VA1103
500	5200	G	B	Br	9·4	5	43	0·6	VA1039
1·3k	5450	Br	O	R	9·4	5	43	0·6	VA1038
1·5k	3775	Br	G	R	5·5	5·5	44	0·6	VA1098

*Rectangular plate
Resistance tolerance ±20%
Maximum power dissipation at 25°C: VA1097/8=0·6W
VA1103=1·5W
Remainder=1W

Resistor code:
B = Black
Br = Brown
R = Red
O = Orange
Y = Yellow
G = Green
V = Violet
Gy = Grey
Gd = Gold

NON-LINEAR RESISTORS
Positive temperature coefficient (p.t.c.) thermistors

Disc type

Resistance at 25°C (Ω)	Switch temp. (°C)	Dissipation factor (mW per °C)	Colour code	Type No.
80 ±20%	75	21	Yellow	VA8650

Dimensions (mm): Diameter 12·6 max.
Thickness over leads: 13
Lead length: 38·4
Lead dia: 0·8

Voltage dependent resistors (VDRs)

Rod types

C approx. (V)	β value	Reference current (mA)	Reference voltage (V)	Colour code	Type No.
1550	0·2 to 0·25	10	470	Green	E298ED/A258
1550	0·2 to 0·25	10	470	Green	E298CD/A258*
1800	0·18 to 0·23	10	560	Blue	E298ED/A260
2200	0·18 to 0·23	10	680	Violet	E298ED/A262
2400	0·17 to 0·22	10	910	White	E298ED/A265
3000	0·17 to 0·22	10	1200	Grey	E298ED/P268
3020	0·16 to 0·21	2	950	Black-blue	E298ZZ/05*
3020	0·16 to 0·21	2	950	Brown	E298ZZ/06

*Tag ended: the remainder have axial leads
Dimensions (mm): **Axial types** – Dia. 5·2 max.
Body length 16
Body length including lacquer 29 max.
Lead length 23
Lead dia. 0·8
Tag ended types – Dia. 7·2 max.
Body length 16·5 max.
Tags to suit 2 holes 1 dia. and 12·7 apart

NON-LINEAR RESISTORS Voltage dependent resistors (VDRs) — Disc types

C approx. (V)	ß value	Reference current (mA)	Reference voltage (V)	Colour code			Thickness over leads (max.)	Type No.
14	0·25 to 0·4	100	8	Br	Br	Bl	12	E299DD/P116
18	0·25 to 0·4	100	10	Br	Br	Gy	12	E299DD/P118
21	0·25 to 0·4	100	12	Br	R	B	12	E299DD/P120
25	0·25 to 0·4	10	8	R	Br	Bl	12	E299DD/P216
32	0·25 to 0·4	10	10	R	Br	Gy	12	E299DD/P218
40	0·25 to 0·4	10	12	R	R	B	12	E299DD/P220
48	0·25 to 0·4	10	15	R	R	R	12	E299DD/P222
57	0·21 to 0·35	10	18	R	R	Y	12	E299DD/P224
60	0·21 to 0·35	10	22	R	R	Bl	12	E299DD/P226
70	0·21 to 0·35	10	27	R	R	Gy	12	E299DD/P228
85	0·18 to 0·25	10	33	R	O	B	12	E299DD/P230
100	0·18 to 0·25	10	39	R	O	R	12	E299DD/P232
130	0·18 to 0·25	10	47	R	O	Y	12	E299DD/P234
150	0·18 to 0·25	10	56	R	O	Bl	12	E299DD/P236
180	0·18 to 0·25	10	68	R	O	Gy	12	E299DD/P238
190	0·14 to 0·23	1	56	O	O	Bl	12	E299DD/P336
230	0·14 to 0·23	1	68	O	O	Gy	12	E299DD/P338
300	0·14 to 0·21	1	82	O	Y	B	12	E299DD/P340
350	0·14 to 0·21	1	100	O	Y	R	12·5	E299DD/P342
400	0·14 to 0·21	1	120	O	Y	Y	13	E299DD/P344
500	0·14 to 0·21	1	150	O	Y	Bl	13·5	E299DD/P346
600	0·14 to 0·21	1	180	O	Y	Gy	14	E299DD/P348
750	0·14 to 0·21	1	220	O	G	B	14·5	E299DD/P350
900	0·14 to 0·21	1	270	O	G	R	15	E299DD/P352
1100	0·14 to 0·21	1	330	O	G	Y	16	E299DD/P354

Dimensions (mm): 14·5 dia. max.; thickness (see above); leads 35 long, 0·8 dia.
Resistor code: B=Black; Br=Brown; R=Red; O=Orange; Y=Yellow; G=Green; Bl=Blue; V=Violet; Gy=Grey

RADIO AND AUDIO MODULES

f.m. tuner modules

Type No.	Description	Tuning	Supply voltage (V)	Tuning range (MHz)	Power gain (dB)
LP1179	a.m./f.m. tuner	mechanical	+6·8	87 to 104·5	28
LP1186	f.m. tuner	diode	+8·0	87 to 104·5	30
LP1402	a.m./f.m. tuner	mechanical	+6·8	87 to 104·5	28

i.f. modules

Type No.	Description	Supply voltage (V)	Supply current (mA)
LP1159	a.m./i.f. L, M and S/wave	−7·6	3·3
LP1164/1	a.m./f.m. i.f. ext. a.m. osc. coil	+9·4	7
LP1170	a.m./f.m. i.f. f.m./M and L/wave use	+9·4	7
LP1171	as LP1170 but low consumption	+7	3·5
LP1181	a.m. i.f. for L, M and S/wave	+7·6	5·0
LP1185	f.m. i.f. for mains or battery operation	+9·0	6·5

Stereo decoder module

Type No.	Description	Supply voltage (V)	Channel separation (dB)
LP1400	frequency multiplex stereo decoder	8–18	40

Stereo preamplifier modules

Type No.	Description	Supply voltage (V)	Supply current (mA)
LP1182/2	dual input for ceramic and crystal p.u.'s 4/5W system	−24	0·6
LP1183/2	as LP 1182/2 for 10W systems	+24	0·6
LP1184	low distortion multi-input for magnetic p.u.'s 10W systems	+24	2·2

Audio amplifier modules

Type No.	Description	Supply voltage (V)	Supply current (mA)
LP1162	4/5W capability into 12 or 8Ω load	−24	280 (12Ω) 340 (8Ω)
LP1173	10W capability into 4Ω load	+24	770

TELEVISION MODULES AND ASSEMBLIES

Voltage multiplying modules

Voltage doublers

Type No.	Vin (kV)	Vout e.h.t. (nom.) (kV)	Vout focus (nom.) (kV)	Iout e.h.t. (max.) (μA)
LP1193	10·6	20	10·6	750

Voltage triplers

Type No's
LP1174/10/11/30/31/34/40/43/44/50
variants of basic LP1174

Vin (p-p)	8·7kV
Vout (e.h.t. supply) (d.c.)	25 kV
Vout (focus supply) (d.c.)	7·7kV
Iout (e.h.t. supply) (av.)	1 mA
Iout (focus supply) (av.)	100μA

Type No.
LP1194/30 – with surge limiter
LP1194/40 – with clipping diode across input
LP1194/60 – with earth return lead for clipping diode

Vin (p-p) (nom.)	8·3–8·9kV
Vin (p-p) (max.)	11kV
Vout (e.h.t. supply) (nom.)	25kV
Vout (focus supply) (nom.)	7–8kV
Iout (e.h.t.) (max.)	1·5mA
Iout (e.h.t.+focus) (max.)	2·5mA

Television tuners

Type No.	Channel coverage	Supply voltage tuner	Supply voltage diodes	Noise factor (dB)	Power gain (dB)
ELC1042	v.h.f.	+12	+0·3 to 28	7	20
ELC1043	u.h.f.	+12	+0·3 to 28	7	20
ELC2000S	v.h.f./u.h.f.	+12	+0·3 to 28	*6–11	*28–32

* dependent on channel

Line linearity control assemblies

Type No.	Adjustment range (V)	Used with deflection assembly
AT4034/01	12–24	AT1030/AT1040 series
AT4042/02	15–26	AT1027/AT1029 series
AT4042/14	Fixed at 17	AT1040/15
AT4042/08	15–25	AT1062/01, AT1063/01

Deflection coil assemblies (Monochrome)

Type No.	Line coil inductance (mH)	Field coil resistance (Ω)
AT1030	2·9 parallel	38 series
AT1040	2·1 parallel	30 series
AT1040/04	2·1 parallel	7·5 parallel
AT1040/05	2·1 parallel	4·7 series

Line output transformers (Monochrome)

Type No.	Driver	Deflection coils	e.h.t. (kV)	h.t. line (V)	Mounting
AT2025/01	PL504	AT1030	18	240	P.C.B.
AT2036/00	PL504	AT1040/00 etc.	18	240	P.C.B.
AT2048/11	BO205	AT1040/15	18	150	P.C.B.

Deflection coil assemblies (90° Colour)

Type No.	Picture tube (cm)	Used with Conv. unit	Used with Lin. control
AT1027/19	66 (26")	AT4046 series	AT4042/02
AT1029/19	49 (19"), 56 (22")	AT4046 series	AT4042/02

Line coil inductance – parallel connected 2·95mH
Field coil resistance – series connected 56Ω
– parallel 14Ω in series with paralleled 6Ω thermistor and 12Ω resistor

Blue lateral units (90° colour)

Type No.	Inductance (mH) parallel	Inductance (mH) series	Resistance (Ω) parallel	Resistance (Ω) series
AT1025/05	0·63	3·2	9	36
AT1025/06	—	0·062	—	0·5
AT1025/08	0·3	—	3·2	—

Deflection coil assemblies (110° colour)

Type No.	Picture tube (cm)	Used with Conv. unit	Used with Lin. control
AT1062/01	66 (26")	AT4046 series	AT4042/08
AT1063/01	56 (22")	AT4046 series	AT4042/08

Line coil inductance	–series	4·7mH
	parallel	1·2mH
Field coil resistance	–series	14·2Ω
	parallel	3·6Ω

Line output transformers

Type No.	Driver	e.h.t. (kV)	e.h.t. generation	h.t. line (V)	Mounting
(90° colour)					
AT2055/02	PL509	25	Tripler	295	P.C.B.
AT2055/00	PL509	25	Tripler	205	Chassis
(110° colour)					
AT2063/00	BU208	25	Tripler	185	P.C.B.

Raster correction transductors

Type No.	Vp-p line	Vp-p field	Defl. coil line	Defl. coil field	N-S phase coil
(90° colour)					
	1400	55	parallel	parallel	AT4040/50
AT4041/37	1400	110	parallel	series	AT4040/55
(110° colour)					
AT4041/40	400	210	parallel	series	AT4040/87

Bridge coil (110° colour)

Type No.	Primary inductance (μH)	Max. current (A p-p)
AT4043/86	285	6

Delay line (chrominance) (P.A.L. colour)

Type No.	Phase delay (μs)	Insertion loss (dB)
DL50	63·943	8

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