

BRIMAR

RADIO VALVE and TELETUBE MANUAL

6

RADIO VALVES
TELETUBES
BRIMISTORS
METAL RECTIFIERS
GERMANIUM DIODES
TRANSISTORS

Standard Telephones and Cables Limited

RADIO RECEIVER VALVE DIVISION
FOOTSCRAY, SIDCUP, KENT

Telephone : FOotscray 3333



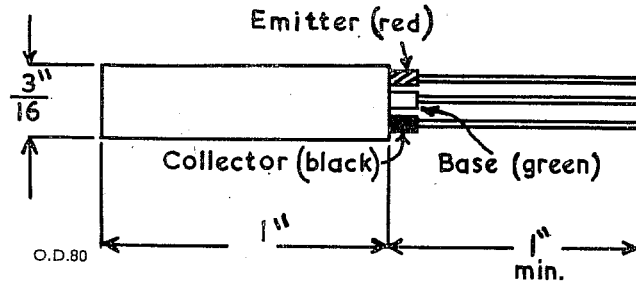
PRICE 5/-

1953

TRANSISTORS

TYPES TJ1, TJ2, TJ3

(Germanium Crystal Triodes)



The BRIMAR TJ1, TJ2 and TJ3 are pnp alloyed junction transistors intended for use in audio frequency applications. The small size and low power consumption of these transistors permits the design of light, compact equipment. Since the cases are of metal there is little danger of accidental fracture, and the transistors are also thereby rendered lightproof.

MECHANICAL DATA

Leads	...	Tinned
Lead Lengths	...	1 inch minimum
Colour Coding	...	Emitter —Red Base —Green Collector—Black
Mounting position	...	Any

MAXIMUM RATINGS

Maximum Total Dissipation	...	200 mW at 20°C. 100 mW at 50°C.
Maximum Ambient Temperature	...	60°C.

OPERATING NOTES

1. Correct polarity of the power supplies must be observed.
2. To avoid damage to the transistor by surges, connections should not be made or broken with the power supplies on.
3. Improved operation may be obtained by mounting in a heat sink.
4. When soldering into the circuit the joints should be made as rapidly as possible and preferably in conjunction with a thermal shunt on the wires between the crystal and the joints.

CHARACTERISTICS

Typical noise figure at $V_{ce} = -1.5$ volts, $I_c = -0.2$ mA with source resistance of 500Ω at 1 Kc/s.	...	25dB
Typical common base cut-off frequency (a_{∞} 3dB down)	...	500 Kc/s.
Typical transducer gain at 1Kc/s between a source of $2K\Omega$ and a load of $20K$ with $V_{ce} = -1.5$ volts, $I_c = -0.2$ mA	...	27dB

CHARACTERISTICS—continued

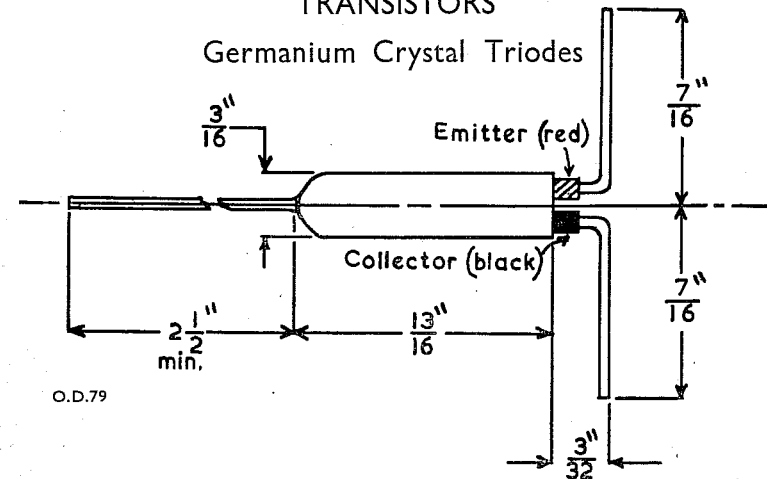
I_{c0} in common base connections with $V_{cb} = -10$ volts and $I_e = 0$ $-10 \mu A$ max.
 Emitter floating potential with $V_{cb} = -10.5$ volts 150 mV max.
 Collector turnover voltage in common emitter connection with $I_b = 0$ -20 volts min.
 Parameters measured at 1 Kc/s in common emitter connection with $V_{ce} = -1.5$ volts and $I_e = -2.0$ mA

	TJ1	TJ2	TJ3
Current gain α_{cb} min.	10	30	50
Typical characteristics:			
Emitter Resistance r_e	15Ω	15Ω	15Ω
Base Resistance r_b	350Ω	650Ω	850Ω
Collector Resistance r_c	$30 K\Omega$	$25 K\Omega$	$17.5 K\Omega$

TYPES TP1, TP2

TRANSISTORS

Germanium Crystal Triodes



The BRIMAR TP1 and TP2 are point contact, n type, germanium transistors. Type TP1 may be used in control and switching circuits at frequencies up to 100 Kc/s and will work consistently and reliably within this range. Type TP2 may be used as an amplifier or oscillator at frequencies up to 2 Mc/s. The small size and the power consumption of these transistors permit the design of light, compact equipment. Since the cases are of metal there is little danger of accidental fracture, and the transistors are also thereby rendered lightproof.

MECHANICAL DATA

Lead Lengths	...	Emitter and collector— $\frac{7}{16}$ " nom. from axis of transistor Base— $2\frac{1}{2}$ " min.
Colour Coding	...	Emitter— Red Base— Plain Collector— Black
Mounting Position	...	Any

MAXIMUM RATINGS

Negative Emitter Voltage ...	Max. 30 volts	Collector Current	Max. 30 mA
Emitter Current ...	30 mA	Total Dissipation ...	150 mW at 20°C.
Negative Collector Voltage...	50 volts	Storage Temperature	75°C.

OPERATING NOTES

1. Correct polarity of power supplies must be observed.
2. To avoid damage to the transistor by surges, connections should not be made or broken with the power supplies on.
3. Improved operation may be obtained by mounting in a heat sink.
4. When soldering into the circuit the joints should be made as rapidly as possible and preferably in conjunction with a thermal shunt on the wires between the crystal and the joints.
5. It is recommended that the case temperature should not exceed 40°C.

CHARACTERISTICS

Ambient Temperature 15°C.—25°C.

	TP1	TP2
Current Gain with $V_c = -20$ V ...	2 min. (with $I_e = 0.05$ mA)	2 min. (with $I_e = 0.75$ mA) 5 max. (with $I_e = 0.75$ mA)
Emitter Resistance with $V_e = -10$ V and Collector open circuited ...	1 M Ω min.	
Base to Collector Current with $V_c = -12$ V and Emitter open circuited	1 mA max.	
Base to Collector Current with $V_c = -20$ V and Emitter open circuited		2 mA max.
Base to Collector Current with $V_c = -20$ V and $I_e = 1$ mA ...		2 mA min. 7 mA max.
Negative Collector Voltage with $I_e = 1$ mA and $I_c = -2$ mA ...	3 V max.	
Negative Collector Voltage with $I_e = 3$ mA and $I_c = -5$ mA ...	3 V max.	4 V max.
Open Circuit Input Resistance (R11) with $I_e = 0.75$ mA and $V_c = -20$ V	250 Ω	
Open Circuit Output Resistance (R22) with $I_e = 0.75$ mA and $V_c = -20$ V	25 K Ω	
Feedback Resistance (R12) with $I_e = 0.75$ mA and $V_c = -20$ V	110 Ω	
Frequency Response for TP2 :		
With $V_c = -20$ V and $I_e = 0.75$ mA current gain at 500 Kc/s is not less than 0.7 of that at 10 Kc/s.		
The typical frequency at which the current gain drops to 0.7 of that at 10 Kc/s is 2 Mc/s.		
Stability of type TP2 :		
With $V_c = -20$ V, $I_e = 0.75$ mA, collector short circuited to base for A.C. and 150 Ω in series with the emitter, the input impedance is positive.		