S.Q. TRIODE

Special quality triode designed for use as R.F. amplifier, oscillator (max. frequency 1000 MHz), and AF amplifier.

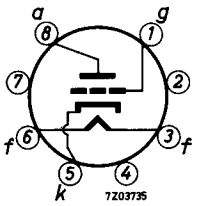
QUICK REFERENCE DATA			
Life test	500 hours		
Mechanical quality	Shock and vibration resistant		
Base	Subminiature		
Heating	Indirect		
	A.C. or D.C., Parallel supply		
Heater voltage	V_f	6.3	V
Heater current	I_f	150	mA
Anode current	I_a	13	mA
Mutual conductance	S	6.5	mA/V

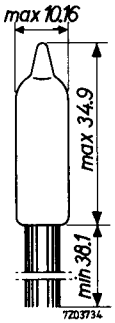
DIMENSIONS AND CONNECTIONS

Base : Subminiature

Dimensions in mm

Socket: B1 506 81





Connections should not be soldered nearer than 5 mm to the seal.
Leads should not be bent nearer than 1.5 mm to the seal.
On request the tube can also be delivered with shortened leads of 4.7-5.4 mm.

CHARACTERISTICS

Column I Nominal value or setting of the tube
II Range values for equipment design: Initial spread
III Range values for equipment design: End of life

		I	II	III	
Heater voltage	V_f	6.3			V
Heater current	I_f	150	138 - 162		mA
Anode voltage	V_a	100			V
Cathode resistor	R_k	150			Ω
Anode current	I_a	8.5	6 - 11		mA
Mutual conductance	S	5.8	4.8 - 6.8	ΔS:max. 20%	mA/V
Internal resistance	R_i	4.65			kΩ
Amplification factor	μ	27	23 - 31		–
Anode voltage	V_a	100			V
Negative grid voltage	$-V_g$		max. 7		V
Anode current	I_a	100			μA
Cut off voltage	$-V_g$	7			V
Anode voltage	V_a	100			V
Anode current	I_a	10			μA
Anode voltage	V_a	150			V
Cathode resistor	R_k	180			Ω
Anode current	I_a	13			mA
Mutual conductance	S	6.5			mA/V
Internal resistance	R_i	4.15			kΩ
Amplification factor	μ	27			–
Negative grid current (R_k = 380 Ω)	$-I_g$		max.0.4	max.0.6	μA
Cut off voltage	$-V_g$	11			V
Anode voltage	V_a	150			V
Anode current	I_a	10			μA

CHARACTERISTICS (continued)

		I	II	III	
Leakage current between cathode and heater Voltage between cathode and heater = 100 V	I_{kf}			max. 10	μA
Insulation between two electrodes	R_{ins}			min. 50	MΩ

CAPACITANCES

		With external shield	Without shield		
		I	I	II	
Anode to cathode and heater	$C_{a/kf}$	2.4	0.7	0.5 - 0.9	pF
Grid to cathode and heater	$C_{g/kf}$	2.4	2.2	1.6 - 2.8	pF
Anode to grid	C_{ag}	1.3	1.45	1.1 - 1.8	pF

SHOCK AND VIBRATION RESISTANCE

The following test conditions are applied to assess the mechanical quality of the tube. These conditions are not intended to be used as normal operating conditions.

Shock

The tube is subjected 5 times in each of 4 positions to an acceleration of 500 g supplied by an NRL shock machine with the hammer lifted over an angle of 30°.

Vibration

The tube is subjected during 32 hours in each of 3 positions to a vibration frequency of 50 Hz with an acceleration of 2.5 g.

LIFE

Production samples are tested to be within the end of life values (column III) under the following conditions during 500 hours:

Anode voltage	V_a	=	100	V
Cathode resistor	R_k	=	150	Ω
Grid resistor	R_g	=	1	MΩ
Voltage between cathode and heater (cath.neg.)	V_{kf}	=	200	V

LIMITING VALUES (Absolute max. rating system)

Anode voltage	V_a	max.	165	V
Grid voltage	$-V_g$	max.	55	V
Anode dissipation	W_a	max.	3.3	W
Anode current	I_a	max.	22	mA
Grid current	I_g	max.	5.5	mA
Grid resistor	R_g	max.	1.2	MΩ
Voltage between cathode and heater	V_{kf}	max.	200	V
Bulb temperature [1])	t_{bulb}	max.	250	°C

Heater voltage: The average heater voltage should be 6.3 V.
Variations of the heater voltage exceeding the range of 6.0 V to 6.6 V will shorten the tube life.
The tolerance of heater current (column II) should be taken into account.

OPERATING CHARACTERISTICS

As R.F. amplifier

Anode voltage	V_a	100	150	V
Cathode resistor	R_k	150	180	Ω
Anode current	I_a	8.5	13	mA
Mutual conductance	S	5.8	6.5	mA/V

As oscillator

Anode voltage	V_a	150	V
Anode current	I_a	20	mA
Output power	W_o	0.9	W
Frequency	f	500	MHz

[1]) In the interest of optimum life performance it is recommended to reduce the bulb temperature by fixing the bulb directly to the chassis with a metal clamp. (ZE1100)

OPERATING CHARACTERISTICS (continued)

As A.F. amplifier Fig.1

Anode supply voltage	V_b	100	200	100	200	100	200	V
Anode resistor	R_a	47	47	100	100	270	270	kΩ
Grid resistor	R_g	270	270	270	270	270	270	kΩ
Grid resistor next stage	R_g	100	100	270	270	470	470	kΩ
Cathode resistor	R_k	1.0	0.82	2.2	1.8	8.2	5.6	kΩ
Input voltage	V_i	0.5	1.0	0.5	1.0	0.5	1.0	V_{RMS}
Voltage gain	V_o/V_i	16.4	19.0	16.4	18.6	14.8	16.2	-
Total distortion	d_{tot}	3.9	4.0	3.0	3.2	2.8	3.2	%

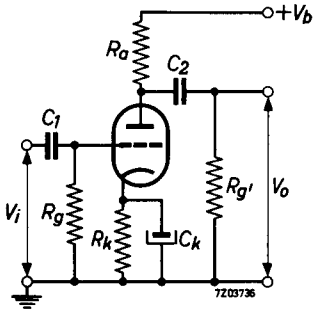
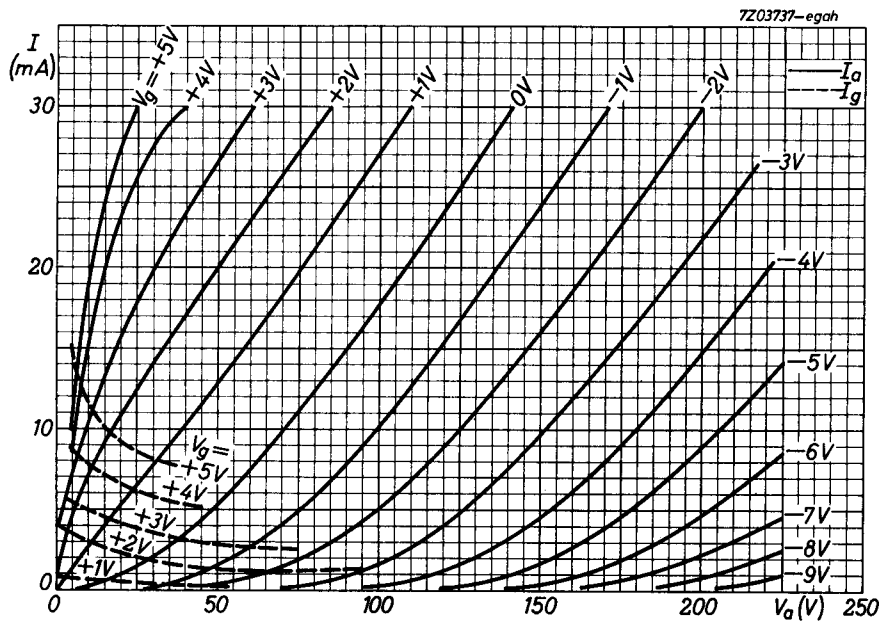


Fig.1


7Z03737-egah
I (mA)
30
20
10
0
0
50
100
150
200
Va (V)
250
Ia
Ig
Vg = +5V
+4V
+3V
+2V
+1V
0V
-1V
-2V
-3V
-4V
-5V
-6V
-7V
-8V
-9V

PHILIPS

Data handbook

Electronic components and materials

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