

S.Q. TUBE

Special quality pentode designed for use A.F. and R.F. amplifier (max. frequency 400 MHz)

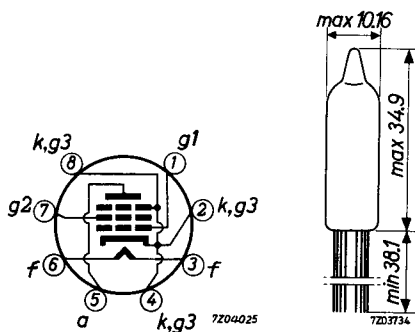
QUICK REFERENCE DATA

Life test	1000 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
Mutual conductance	S	5 mA/V
Anode current	I_a	7.5 mA

DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Subminiature



Leads should not be soldered nearer than 5 mm to the seal

Leads should not be bent nearer than 2 mm to the seal.

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	140 - 160		mA
Anode supply voltage	V_{ba}	100			V
Grid No.2 supply voltage	V_{bg2}	100			V
Cathode resistor	R_k	150			Ω
Anode current	I_a	7.5	5.5 - 9.5		mA
Grid No.2 current	I_{g2}	2.4	1.5 - 3.3		mA
Mutual conductance	S	5	4.2 - 5.8	min. 3.5	mA/V
Internal resistance	R_i	260	min. 175		k Ω
Negative grid No.1 current	$-I_{g1}$		max. 0.3	max. 0.8	μ A
<u>Cut-off voltage</u>	$-V_{g1}$	9			V
Anode voltage	V_a	100			V
Grid No.2 voltage	V_{g2}	100			V
Anode current	I_a	10	max. 50		μ A
<u>Leakage current between cathode and heater</u>	I_{kf}		max. 5	max. 10	μ A
Voltage between cathode and heater $V_{kf} = 100$ V					
<u>Vibrational noise output</u>	V_o		max. 60		mV _{RMS}
Anode supply voltage $V_{ba} = 100$ V					
Grid No.2 supply voltage $V_{bg2} = 100$ V					
Cathode resistor $R_k = 150 \Omega$					
Anode resistor $R_a = 10$ k Ω					
Cathode by-pass capacitor $C_k = 1000 \mu$ F					
Vibration frequency = 50 Hz					
Acceleration = 15 g					
Insulation resistance					
a to all at V = 300 V	R_{ins}		min. 100		M Ω
g_1 to all at V = 100 V	R_{ins}		min. 100		M Ω

CAPACITANCES

		With external screen		Without external shield	
		I	II	I	II
Anode to grid No.2, cathode, heater and screen	C_{a/g_2kfs}	3.4	2.9-3.9	1.9	pF
Grid No.1 to grid No.2, cathode, heater and screen	C_{g_1/g_2kfs}	4.2	3.5-4.9	4.0	pF
Anode to grid No.1	C_{ag_1}		max. 15		max.30 mpF

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 1000 hours.

Anode supply voltage	V_{ba}	100 V
Grid No.2 supply voltage	V_{bg_2}	100 V
Cathode resistor	R_k	150 Ω

LIMITING VALUES (Absolute max. rating system)

Anode voltage	V_{a_0}	max. 330 V
	V_a	max. 165 V
Grid No.2 voltage	$V_{g_{20}}$	max. 330 V
	V_{g_2}	max. 155 V
Anode dissipation	W_a	max. 1.1 W
Grid No.2 dissipation	W_{g_2}	max. 0.55 W

LIMITING VALUES (continued)

Cathode current	I_k	max. 16.5	mA
Grid No.1 voltage	$-V_{g1}$	max. 55	V
Voltage between cathode and heater	V_{kf}	max. 200	V
Grid No.1 resistor	R_{g1}	max. 1.1	M Ω
Bulb temperature	t_{bulb}	max. 220	$^{\circ}\text{C}$

OPERATING CHARACTERISTICS Fig.1

Supply voltage	V	100	150	100	150	100	150	V
Anode resistor	R_a	100	100	270	270	470	470	k Ω
Grid No.2 resistor	R_{g2}	0.22	0.27	0.68	0.82	1.2	1.5	k Ω
Grid No.1 resistor	R_{g1}	0.27	0.27	0.47	0.47	1.0	1.0	M Ω
Total distortion ($V_i = 0.1 \text{ V}_{\text{RMS}}$)	d_{tot}	2.8	1.5	2.5	2.4	2.3	3.0	%
Voltage gain ($V_i = 0.1 \text{ V}_{\text{RMS}}$)	V_o/V_i	82	115	95	132	117	167	
Total distortion ($I_{g1} = 0.3 \mu\text{A}$)	d_{tot}	4.9	4.8	4.7	4.9	5.0	4.8	%
Voltage gain ($I_{g1} = 0.3 \mu\text{A}$)	V_o/V_i	77	109	91	128	114	159	
Input voltage ($I_{g1} = 0.3 \mu\text{A}$)	V_i	0.23	0.2	0.15	0.16	0.14	0.14	V_{RMS}

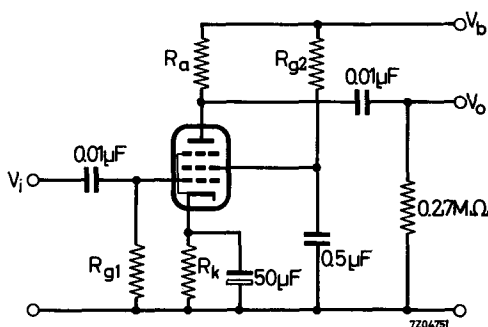
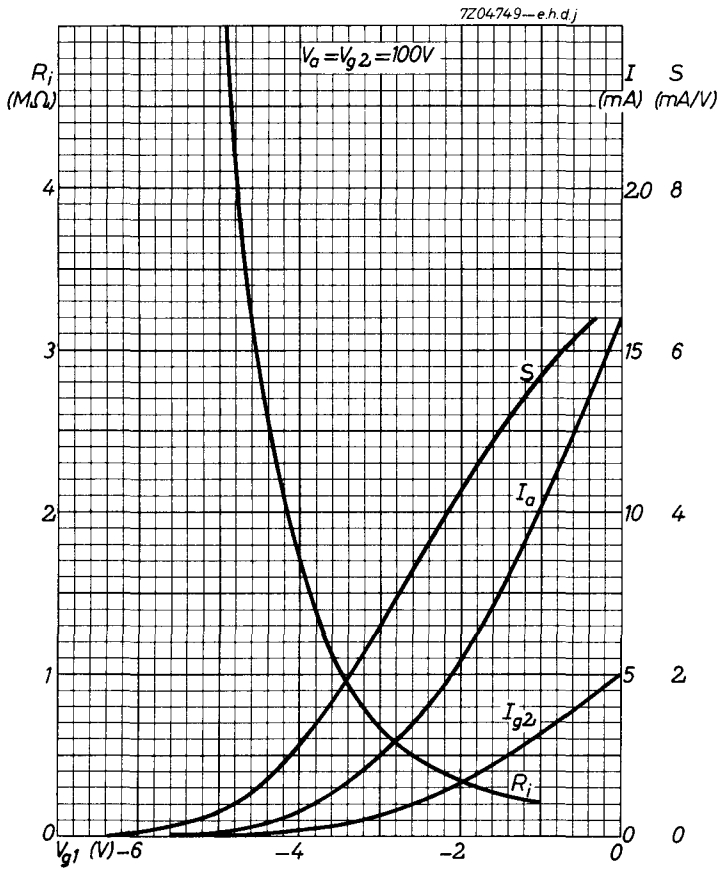
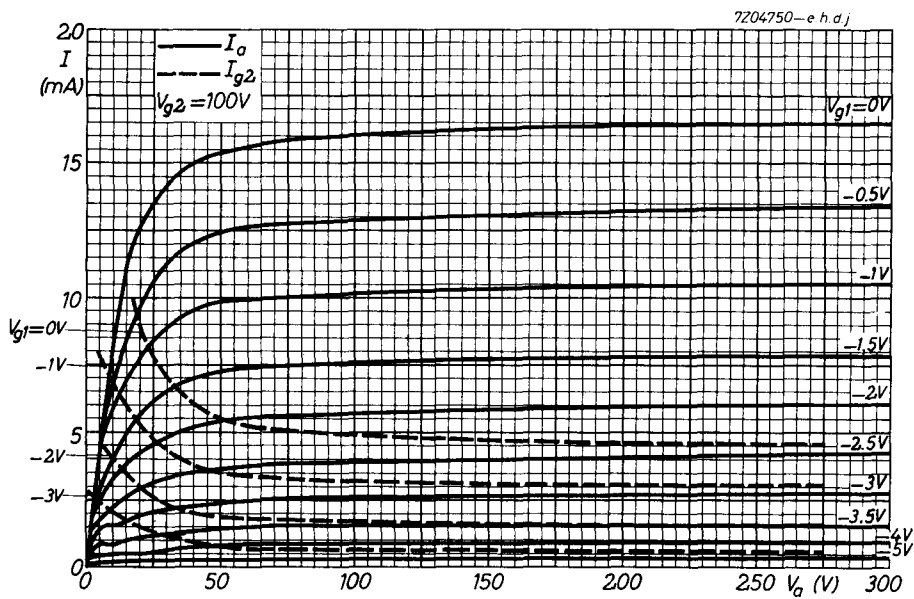


Fig.1





PHILIPS

Data handbook



**Electronic
components
and materials**

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