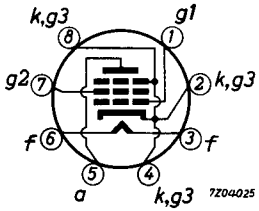
S.Q. TUBE

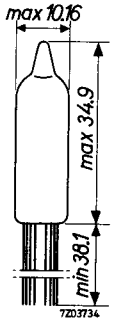
Special quality pentode designed for use A.F. and R.F. amplifier (max. frequency 400 MHz)

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_{bg_2}	100			V
Cathode resistor	R_k	150			Ω
Anode current	I_a	7.5	5.5 - 9.5		mA
Grid No.2 current	I_{g_2}	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		kΩ
Negative grid No.1 current	$-I_{g_1}$		max. 0.3	max. 0.8	μA
Cut-off voltage	$-V_{g_1}$	9			V
Anode voltage	V_a	100			V
Grid No.2 voltage	V_{g_2}	100			V
Anode current	I_a	10	max. 50		μA
Leakage current between cathode and heater	I_{kf}		max. 5	max. 10	μA
Voltage between cathode and heater V_{kf} = 100 V					
Vibrational noise output	V_o		max. 60		mV_{RMS}
Anode supply voltage V_{ba} = 100 V					
Grid No.2 supply voltage V_{bg_2} = 100 V					
Cathode resistor R_k = 150 Ω					
Anode resistor R_a = 10 kΩ					
Cathode by-pass capacitor C_k = 1000 μF					
Vibration frequency = 50 Hz					
Acceleration = 15 g					
Insulation resistance					
a to all at V = 300 V	R_{ins}		min. 100		MΩ
g_1 to all at V = 100 V	R_{ins}		min. 100		MΩ

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_o}	max. 330	V
	V_a	max. 165	V
Grid No.2 voltage	$V_{g_{2o}}$	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	$-V_{g_1}$	max.	55	V
Voltage between cathode and heater	V_{kf}	max.	200	V
Grid No.1 resistor	R_{g_1}	max.	1.1	MΩ
Bulb temperature	t_{bulb}	max.	220	°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	kΩ
Grid No.2 resistor	R_{g_2}	0.22	0.27	0.68	0.82	1.2	1.5	kΩ
Grid No.1 resistor	R_{g_1},	0.27	0.27	0.47	0.47	1.0	1.0	MΩ
Total distortion (V_i = 0.1 V_{RMS})	d_{tot}	2.8	1.5	2.5	2.4	2.3	3.0	%
Voltage gain (V_i = 0.1 V_{RMS})	V_o/V_i	82	115	95	132	117	167	
Total distortion ($+I_{g_1}$ = 0.3 μA)	d_{tot}	4.9	4.8	4.7	4.9	5.0	4.8	%
Voltage gain ($+I_{g_1}$ = 0.3 μA)	V_o/V_i	77	109	91	128	114	159	
Input voltage ($+I_{g_1}$ = 0.3 μA)	V_i	0.23	0.2	0.15	0.16	0.14	0.14	V_{RMS}

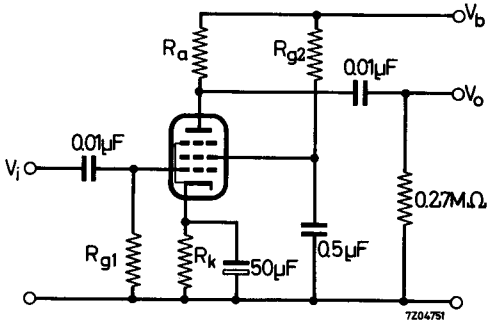
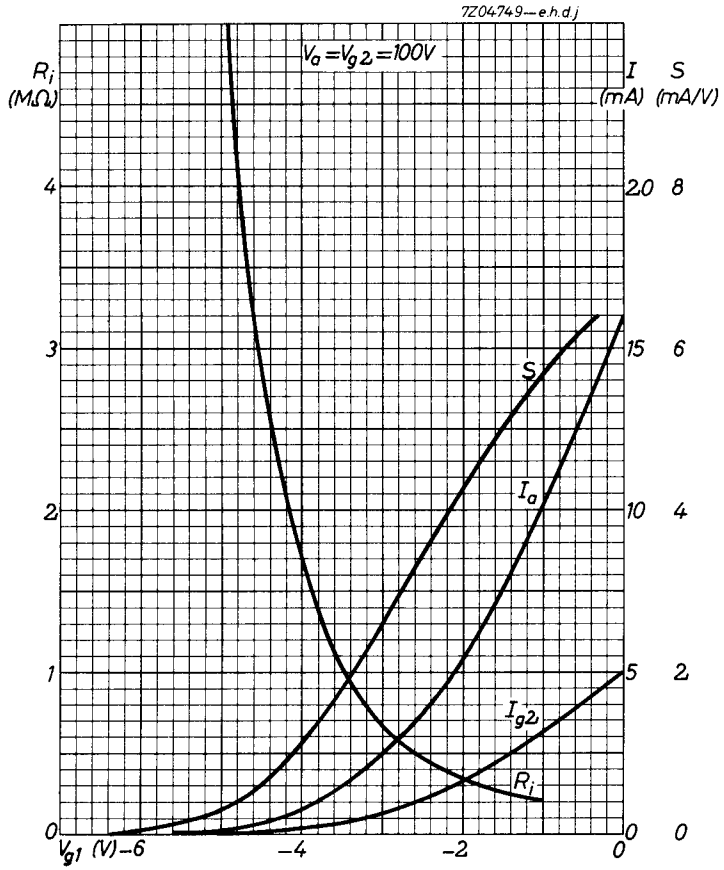
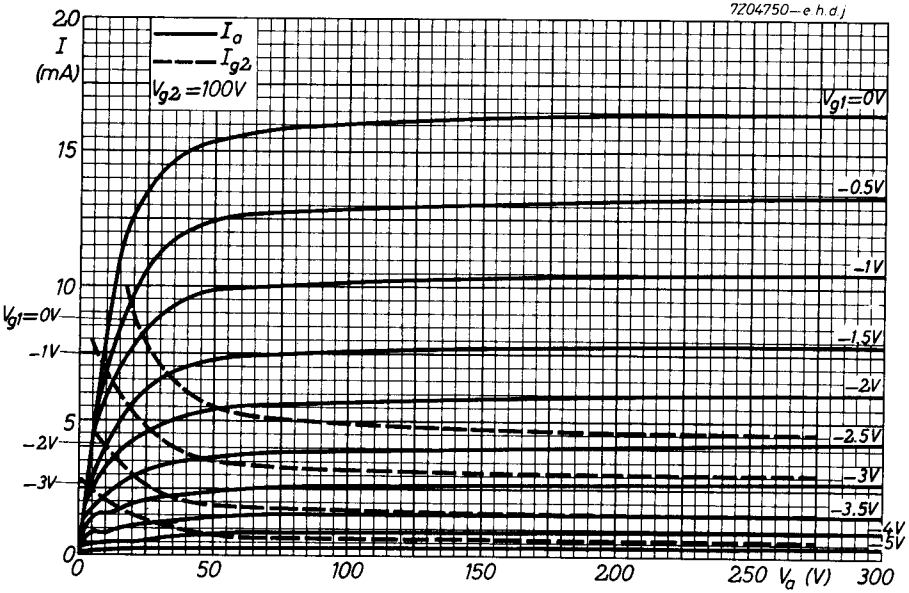
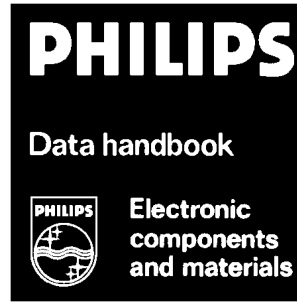


Fig.1


7Z04749—e.h.d.j
$V_a = V_{g2} = 100V$
R_i (MΩ)
I (mA)
S (mA/V)
4
3
2
1
0
2.0
15
10
5
0
8
6
4
2
0
S
I_a
I_{g2}
R_i
V_{g1} (V) −6
−4
−2
0


7Z04750-e h.d.j
20
I
(mA)
I_a
I_{g2}
V_{g2}=100V
15
10
5
0
V_{g1}=0V
-1V
-2V
-3V
V_{g1}=0V
-0.5V
-1V
-1.5V
-2V
-2.5V
-3V
-3.5V
4V
5V
0
50
100
150
200
250
300
V_a (V)



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