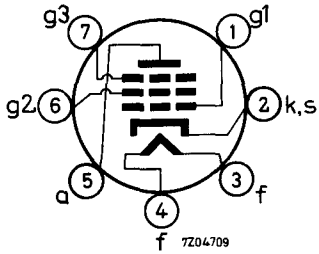
S.Q. TUBE

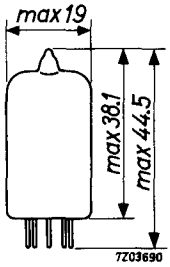
Special quality pentode designed for use as R.F. amplifier.

QUICK REFERENCE DATA			
Life test	1000 hours		
Mechanical quality	Shock and vibration resistant		
Base	Miniature 7 pin		
Heating	Indirect A.C. or D.C.; parallel supply		
Heater voltage	V_f	6.3	V
Heater current	I_f	175	mA
Sharp cut-off			
Double control			

DIMENSIONS AND CONNECTIONS Dimensions in mm

Base: Miniature 7 pin





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	175	160 - 190		mA
Anode voltage	V_a	120			V
Grid No.2 voltage	V_{g_2}	120			V
Grid No.3 voltage	V_{g_3}	0			V
Grid No.1 voltage	$-V_{g_1}$	2			V
Anode current	I_a	5.2	2.5 - 9.0		mA
Grid No.2 current	I_{g_2}	3.5	max.5.5		mA
Mutual conductance, grid No.1	S_{g_1}	3.2	2.5 - 4.5	ΔS max.20%	mA/V
Mutual conductance, grid No.3	S_{g_3}	0.47			mA/V
Internal resistance	R_i	150			kΩ
Negative grid No.1 current	$-I_{g_1}$		max.0.1	max. 0.2	μA
Anode voltage	V_a	120			V
Grid No.2 voltage	V_{g_2}	120			V
Grid No.3 voltage	$-V_{g_3}$	3			V
Grid No.1 voltage	$-V_{g_1}$	2			V
Anode current	I_a	3.6			mA
Grid No.2 current	I_{g_2}	4.8			mA
Mutual conductance, grid No.1	S_{g_1}	1.85			mA/V
Mutual conductance, grid No.3	S_{g_3}	0.7			mA/V
Anode voltage	V_a	120			V
Grid No.2 voltage	V_{g_2}	120			V
Grid No.3 voltage	$-V_{g_3}$	5			V
Grid No.1 voltage	$-V_{g_1}$	2			V
Mutual conductance, grid No.3	S_{g_3}	1.2	0.7 - 1.7		mA/V

CHARACTERISTICS (continued)

		I	II	III	
Cut-off voltage	$-V_{g_1}$	8			V
Anode voltage	V_a	120			V
Grid No.2 voltage	V_{g_2}	120			V
Grid No.3 voltage	V_{g_3}	0			V
Anode current	I_a		max. 50		μA
Cut-off voltage	$-V_{g_1}$	6			V
Anode voltage	V_a	120			V
Grid No.2 voltage	V_{g_2}	120			V
Grid No.3 voltage	V_{g_3}	0			V
Anode current	I_a		min. 5		μA
Cut-off voltage	$-V_{g_1}$	3			V
	$-V_{g_3}$	5.5			V
Anode voltage	V_a	120			V
Grid No.2 voltage	V_{g_2}	120			V
Anode current	I_a		min. 5		μA
Cut-off voltage	$-V_{g_1}$	3			V
	$-V_{g_3}$	10			V
Anode voltage	V_a	120			V
Grid No.2 voltage	V_{g_2}	120			V
Anode current	I_a		max. 50		μA
Cut-off voltage	$-V_{g_1}$	2			V
	$-V_{g_2}$	15			V
Anode voltage	V_a	120			V
Grid No.2 voltage	V_{g_2}	120			V
Anode current	I_a	10			μA
Leakage current between cathode and heater	I_{kf}		max. 10	max. 10	μA
Voltage between cathode and heater V_{kf} = 100 V Cathode negative					

CHARACTERISTICS (continued)		I	II	
Vibrational noise	V_o		max.150	mV
Anode voltage V_a = 120 V				
Grid No.2 voltage V_{g_2} = 120 V				
Grid No.1 voltage $-V_{g_1}$ = 2 V				
Grid No.3 voltage V_{g_3} = 0 V				
Anode resistor R_a = 10 kΩ				
Vibration frequency = 50 Hz				
Acceleration = 10 g				
CAPACITANCES With external screen				
Anode to grid No.3, grid No.2, cathode, heater and screen	C_{a/g_3g_2kfs}	3.0	2.6 - 3.4	pF
Grid No.1 to grid No.3, grid No.2, cathode, heater and screen	C_{g_1/g_3g_2kfs}	4.0	3.5 - 4.5	pF
Grid No.1 to grid No.3	$C_{g_1g_3}$		max.150	mpF
Anode to grid No.1	C_{ag_1}		max. 20	mpF
Grid No.1 to grid No.3, grid No.2, cathode, heater and screen	C_{g_1/g_3g_2kfs}	5.5		pF
Cathode current I_k = 12 mA				
Frequency = 100 MHz				

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

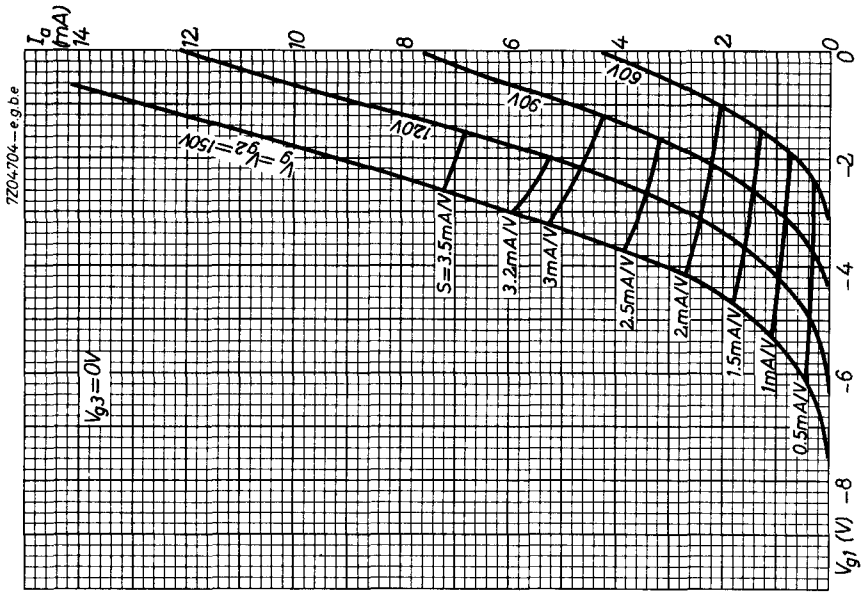
The tube is subjected during 32 hours in each of 3 positions to a vibration frequency of 50 Hz with an acceleration of 2.5 g.

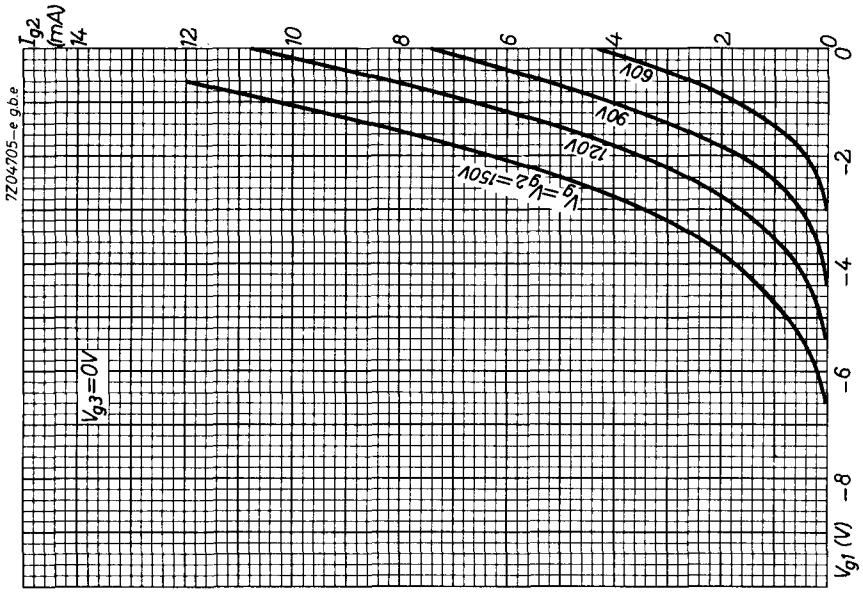
LIFE

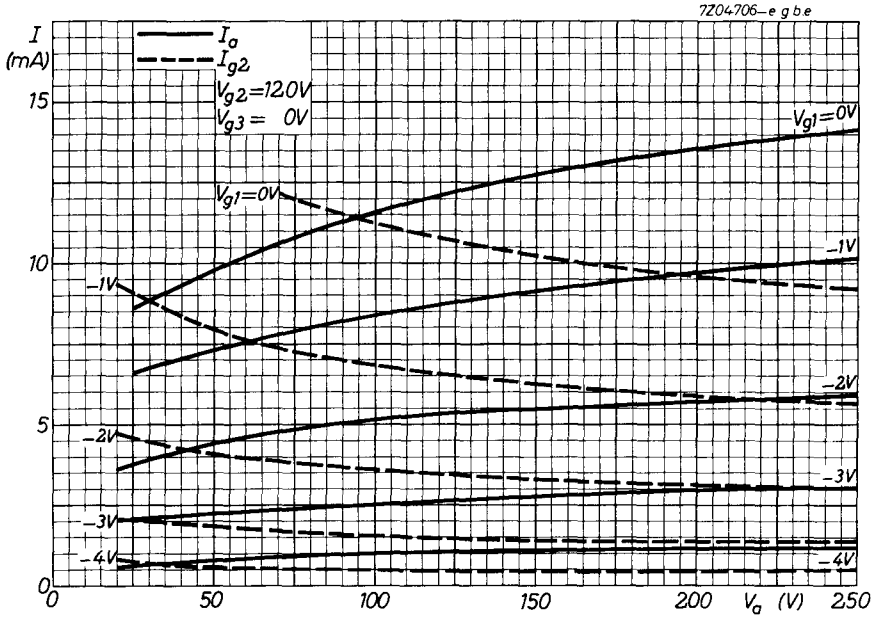
Production samples are tested to be within the end of life values (column III) during 1000 hours.

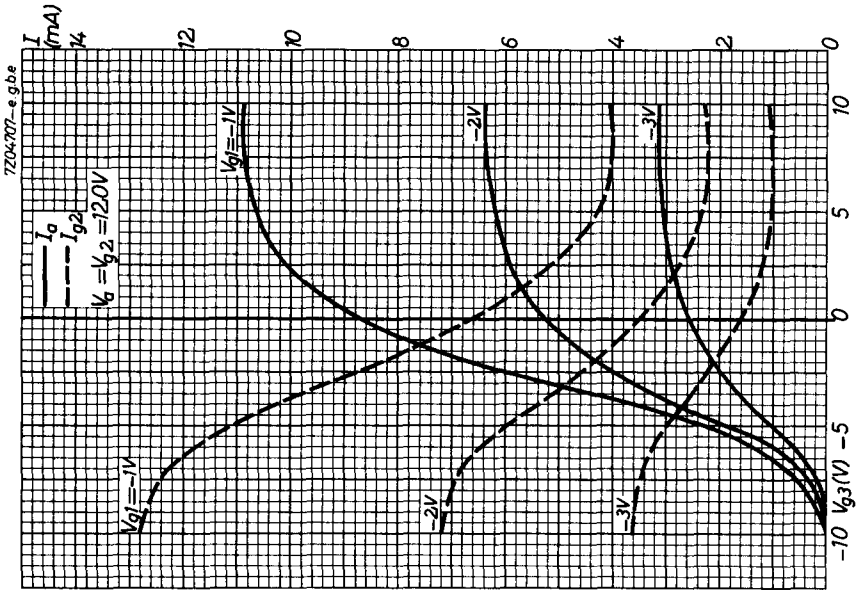
LIMITING VALUES (Absolute max. rating system)

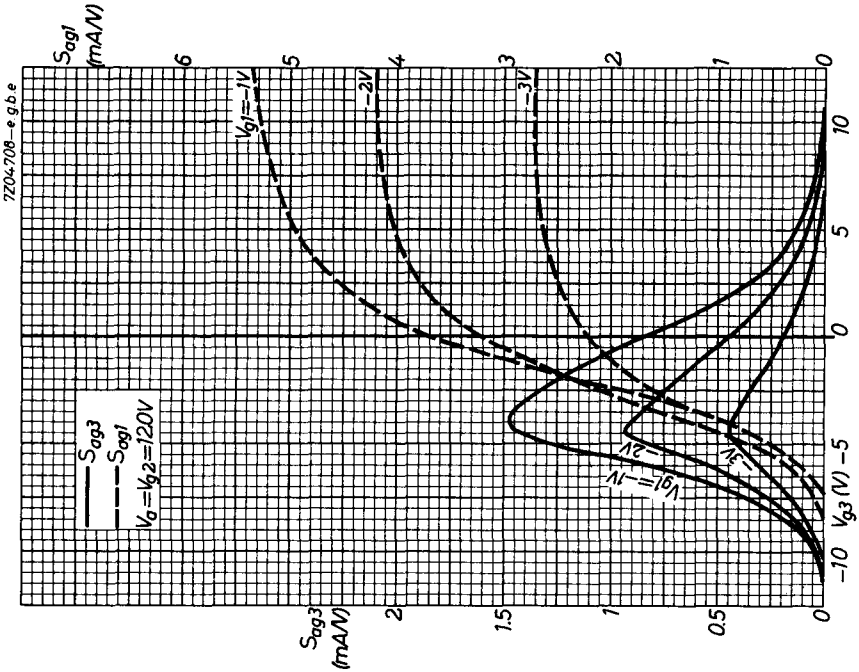
Anode voltage	V_a	max.	200	V
Grid No.2 voltage	V_{g_2}	max.	155	V
Grid No.3 voltage	V_{g_3}	max.	30	V
Anode dissipation	W_a	max.	1.85	W
Grid No.2 dissipation	W_{g_2}	max.	0.85	W
Cathode current	I_k	max.	20	mA
Voltage between cathode and heater	V_{kf}	max.	100	V
Grid resistor with fixed bias	R_{g_1}	max.	1	MΩ
Bulb temperature	t_{bulb}	max.	165	°C


7Z04704—e.g.b.e
I_a (mA)
14
12
10
8
6
4
2
0
$V_{g3}=0V$
$V_g=V_{g2}=150V$
120V
90V
60V
S=3.5mA/V
3.2mA/V
3mA/V
2.5mA/V
2mA/V
1.5mA/V
1mA/V
0.5mA/V
0
−2
−4
−6
−8
V_{g1} (V)


7Z04705—e.g.b.e
I_{g2} (mA)
14
12
10
8
6
4
2
0
$V_{g3}=0V$
$V_g=V_{g2}=150V$
120V
90V
60V
0
−2
−4
−6
−8
V_{g1} (V)


7Z04706–e g b.e
I
(mA)
I_a
I_{g2}
V_{g2}=120V
V_{g3} = 0V
15
10
5
0
0
50
100
150
200
V_a (V)
250
V_{g1}=0V
V_{g1}=0V
–1V
–1V
–2V
–2V
–3V
–3V
–4V
–4V


7Z04707—egbe
I (mA)
14
12
10
8
6
4
2
0
10
5
0
−5
−10
Vg3 (V)
Ia
Ig2
Va = Vg2 = 120V
Vg1 = −1V
−2V
−3V


7Z04708—egbe
Sag1 (mA/V)
6
5
4
3
2
1
0
Sag3 (mA/V)
2
1.5
1
0.5
0
10
5
0
−5
−10
Vg3 (V)
Sag3
Sag1
Va = Vg2 = 120V
Vg1 = −1V
−2V
−3V

PHILIPS

Data handbook

Electronic components and materials

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