S.Q. TUBE

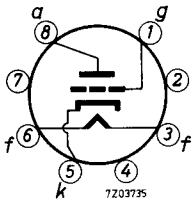
Special quality triode designed for use as A.F. amplifier

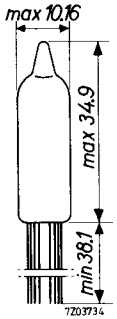
QUICK REFERENCE DATA			
Life test	1000 hours		
Mechanical quality	Shock and vibration resistant		
Base	Subminiature		
Heating	Indirect A.C. or D.C.; parallel supply		
Heater voltage	V_f	6.3	V
Heater current	I_f	150	mA
Mutual conductance	S	2.3	mA/V
Amplification factor	μ	70	

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
Cathode resistor	R_k	1500			Ω
Anode current	I_a	0.73	0.5 - 0.9		mA
Mutual conductance	S	1.7	1.4 - 2.0	min. 1.1	mA/V
Internal resistance	R_i	41			kΩ
Amplification factor	μ	70	60 - 80		
Cut-off voltage	$-V_g$	2.5			V
Anode current	I_a		max. 50		μA
Grid voltage	$-V_g$	1.8			V
Anode current	I_a		min. 5		μA
Negative grid current	$-I_g$		max. 0.3	max. 0.6	μA
Anode supply voltage V_{ba} = 150 V					
Cathode resistor R_k = 2700 Ω					
Anode supply voltage	V_{ba}	150			V
Cathode resistor	R_k	680			Ω
Anode current	I_a	1.85			mA
Mutual conductance	S	2.3			mA/V
Amplification factor	μ	70			
Internal resistance	R_i	30.5			kΩ
Leakage current between cathode and heater	I_{kf}		max. 5		μA
Voltage between cathode and heater V_{kf} = 100 V					

CHARACTERISTICS (continued)

		I	II	III	
Insulation resistance between electrodes	R_{ins}		min. 100	min. 25	MΩ
Voltage between electrodes = 100 V					
Vibrational noise output	V_o		max. 25		mV

Anode supply voltage V_{ba} = 100 V

Anode resistor R_a = 10 kΩ

Cathode by-pass capacitor C_k = 1000 pF

Vibration frequency = 40 Hz

Acceleration = 15 g

CAPACITANCES

		I	II	
Anode to cathode and heater	$C_{a/kf}$	0.6	0.4 - 0.8	pF
Grid to cathode and heater	$C_{g/kf}$	1.7	1.2 - 2.2	pF
Anode to grid	C_{ag}	0.8	0.6 - 1.0	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 1000 hours.

Anode supply voltage	V_{ba}	150	V
Cathode resistor	R_k	680	Ω
Grid resistor	R_g	1	MΩ
Voltage between cathode and heater (k pos)	V_{kf}	200	V

LIMITING VALUES (Absolute max. rating system)

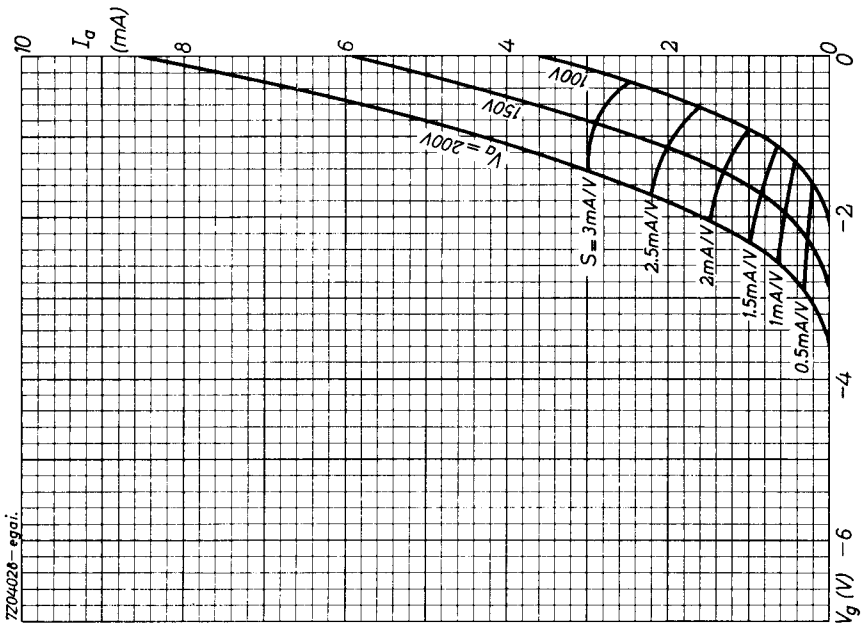
Anode voltage	V_{a_o}	max.	330	V
	V_a	max.	165	V
Grid voltage	$-V_g$	max.	55	V
	$+V_g$	max.	0	V
Anode dissipation	W_a	max.	0.55	W
Anode current	I_a	max.	3.3	mA
Peak voltage between cathode and heater	$V_{kf\,p}$	max.	200	V
Bulb temperature	t_{bulb}	max.	220	°C
Heater voltage	V_f	min.	6.0	V
		max.	6.6	V

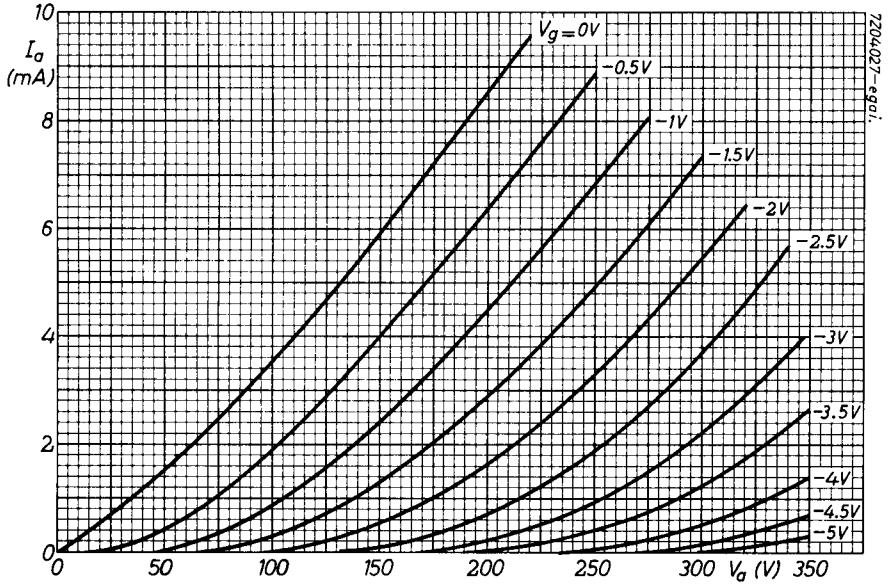
OPERATING CHARACTERISTICS

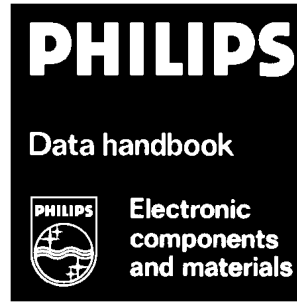
Anode supply voltage	V_{ba}	100	100	100	100	100	100	V
Cathode resistor	R_k	2.7	2.7	5.6	6.8	10	10	kΩ
Anode resistor	R_a	0.1	0.1	0.27	0.27	0.47	0.47	MΩ
Grid resistor	R_g	1.0	1.0	1.0	1.0	1.0	1.0	MΩ
Grid resistor next stage	R_g'	0.27	0.47	0.47	1.0	0.47	1.0	MΩ
Voltage gain	V_o/V_i	37	39	41	42	40	43	
Total distortion	d_{tot}	2.4	2.1	2.1	1.8	2.4	1.7	%

OPERATING CHARACTERISTICS

Anode supply voltage	V_{ba}	200	200	200	200	200	200	V
Cathode resistor	R_k	1.5	1.8	3.3	3.9	5.6	6.8	kΩ
Anode resistor	R_a	0.1	0.1	0.27	0.27	0.47	0.47	MΩ
Grid resistor	R_g	1.0	1.0	1.0	1.0	1.0	1.0	MΩ
Grid resistor next stage	R_g'	0.27	0.47	0.47	1.0	0.47	1.0	MΩ
Voltage gain	V_o/V_i	44	46	49	50	48	50	
Total distortion	d_{tot}	0.7	0.7	0.9	0.7	0.9	0.7	%


I_a (mA)
10
8
6
4
2
0
V_a = 200V
150V
100V
S = 3mA/V
2.5mA/V
2mA/V
1.5mA/V
1mA/V
0.5mA/V
-2
-4
-6
V_g (V)
7Z04028-egai.


I_a (mA)
10
8
6
4
2
0
V_g=0V
-0.5V
-1V
-1.5V
-2V
-2.5V
-3V
-3.5V
-4V
-4.5V
-5V
0
50
100
150
200
250
300
V_a (V)
350
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