

## S.Q. TUBE

Special quality pentode designed for use as wide band amplifier for frequencies up to 250 MHz

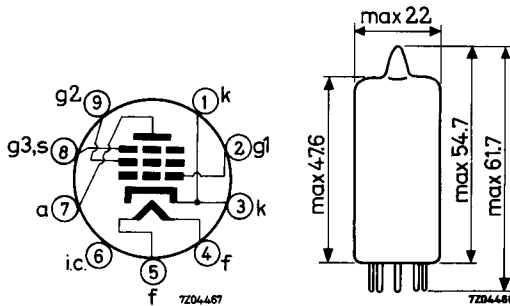
### QUICK REFERENCE DATA

Life test	10 000 hours	
Low interface resistance		
Mechanical quality	Shock and vibration resistant	
Base	Noval. Gold plated pins	
Heating	Indirect A. C. or D. C.; parallel supply	
Heater voltage	$V_f$	6.3 V
Heater current	$I_f$	350 mA
Anode current	$I_a$	35 mA
Mutual conductance	S	26 mA/V
Equivalent noise resistance	$R_{eq}$	200 $\Omega$
Noise factor at 100 MHz	F	7 dB

### DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Noval



## 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	$I_f$	350			mA
Anode supply voltage	$V_{ba}$	125			V
Grid No.2 supply voltage	$V_{bg_2}$	125			V
Grid No.3 voltage	$V_{g_3}$	0			mA/V
Grid No.1 supply voltage	$+V_{bg_1}$	12			V
Cathode resistor	$R_k$	300			$\Omega$
Anode current	$I_a$	35	33 - 37	min. 31	mA
Grid No.2 current	$I_{g_2}$	11	9.9 - 12.1		mA
Mutual conductance	S	26	22 - 30	min. 17.5	mA/V
Amplification factor	$\mu_{g_2g_1}$	27			
Equivalent noise resistance	$R_{eq}$	200			$\Omega$
Noise factor at 100 MHz	F	7			dB
Adapted to minimum noise					
Negative grid current	$-I_{g_1}$		max. 0.3	max. 1.0	$\mu A$
Anode supply voltage	$V_{ba}$	135			V
Grid No.2 supply voltage	$V_{bg_2}$	125			V
Grid No.3 voltage	$V_{g_3}$	0			V
Grid No.1 supply voltage	$+V_{bg_1}$	12			V
Cathode resistor	$R_k$	360			$\Omega$
Anode current	$I_a$	30			mA
Grid No.2 current	$I_{g_2}$	9.5			mA
Mutual conductance	S	25			mA/V
Amplification factor	$\mu_{g_2g_1}$	27			
Equivalent noise resistance	$R_{eq}$	200			$\Omega$

**CHARACTERISTICS** (continued)

As triode (grid No. 2 connected to anode)  
(grid No. 3 connected to cathode)

		I	II	
Anode supply voltage	$V_{ba}$	125		V
Grid No. 3 supply voltage	$V_{bg_3}$	0		V
Grid No. 1 supply voltage	$+V_{bg_1}$	12		V
Cathode resistor	$R_k$	350		$\Omega$
Anode current	$I_a$	40		mA
Mutual conductance	$S$	32		mA/V
Amplification factor	$\mu$	25.5		
Internal resistance	$R_i$	800		$\Omega$
Equivalent noise resistance	$R_{eq}$	100		$\Omega$

Leakage current between cathode  
and heater

Voltage between cathode and heater  
 $V_{kf} = 100$  V

$I_{kf}$  max. 5  $\mu$ A

Insulation resistance

Anode to other electrodes ( $V = 300$ V)	$R$		min. 100	$M\Omega$
Grid No. 1 to other electrodes ( $V = 50$ V)	$R$		min. 100	$M\Omega$

**CAPACITANCES**

		I	II	
Grid No. 1 to grid No. 2, grid No. 3 cathode, heater and screen	$C_{g_1/g_2g_3kfs}$	10		pF
Grid No. 1 to grid No. 2, grid No. 3 cathode, heater and screen	$C_{g_1/g_2g_3kfs}$	16		pF
Cathode current $I_k = 46$ mA				
Anode to grid No. 2, grid No. 3 cathode, heater and screen	$C_{a/g_2g_3kfs}$	2.6		pF
Anode to grid No. 1	$C_{ag_1}$		max. 50	mpF
Anode to cathode	$C_{ak}$		max. 50	mpF
Cathode to heater	$C_{kf}$	4.7		pF
Grid No. 1 to heater	$C_{g_1f}$		max. 50	mpF
Anode to heater	$C_{af}$		max. 100	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) during 10 000 hours.

**LIMITING VALUES** (Absolute max. rating system)

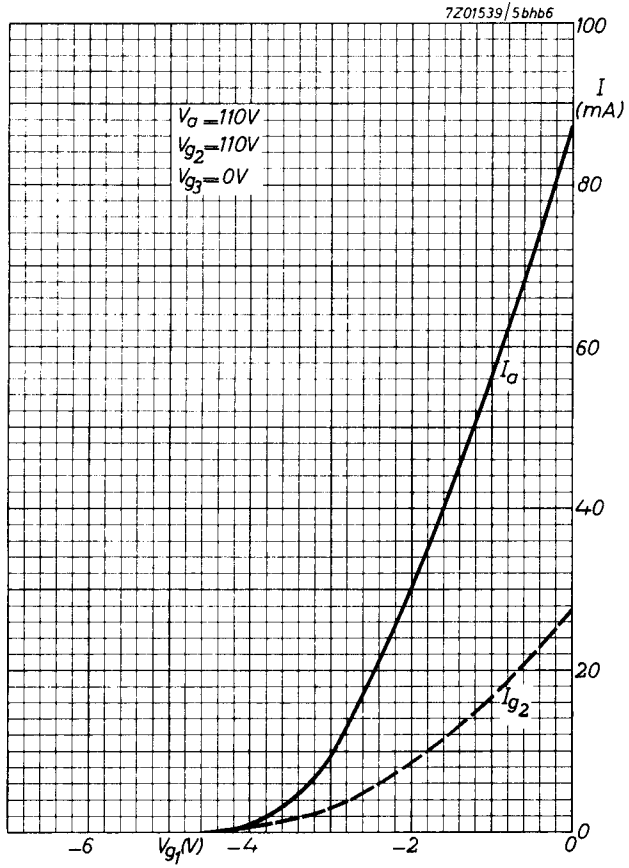
Anode voltage	$V_{a_0}$	max.	400 V
	$V_a$	max.	200 V
Anode dissipation	$W_a$	max.	4.2 W
Grid No. 2 voltage	$V_{g_{20}}$	max.	400 V
	$V_{g_2}$	max.	150 V
Grid No. 2 dissipation <sup>1)</sup>	$W_{g_2}$	max.	1.4 W
Grid voltage	$-V_g$	max.	50 V
Grid resistor, automatic bias	$R_{g_1}$	max.	0.5 MΩ
Cathode current	$I_k$	max.	50 mA
Voltage between cathode and heater	$V_{kf}$	max.	100 V
Bulb temperature	$t_{bulb}$	max.	180 °C

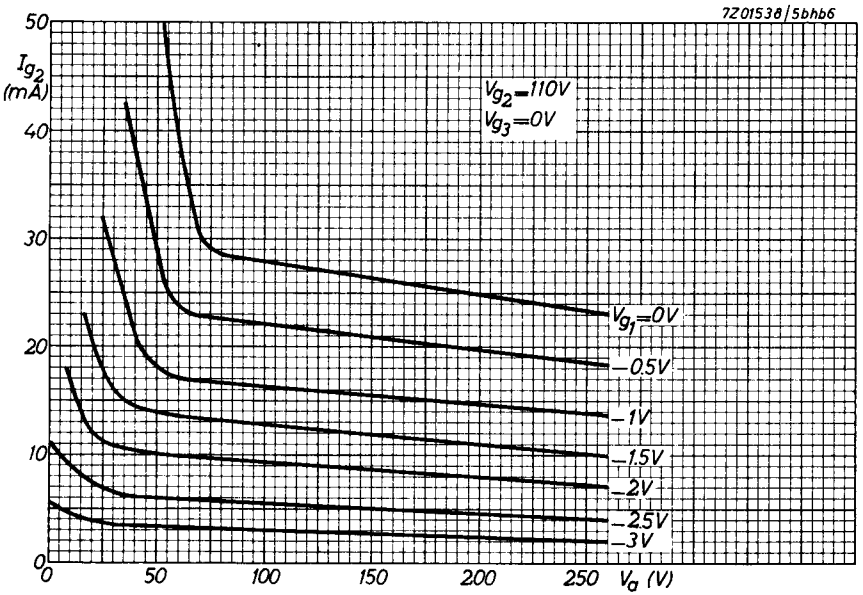
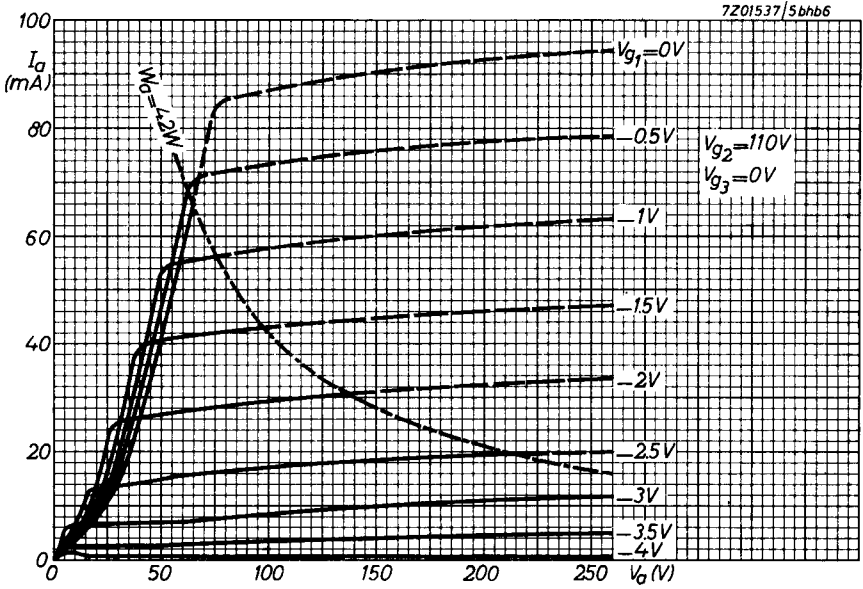
Heater voltage: The average heater voltage should be 6.3 V.

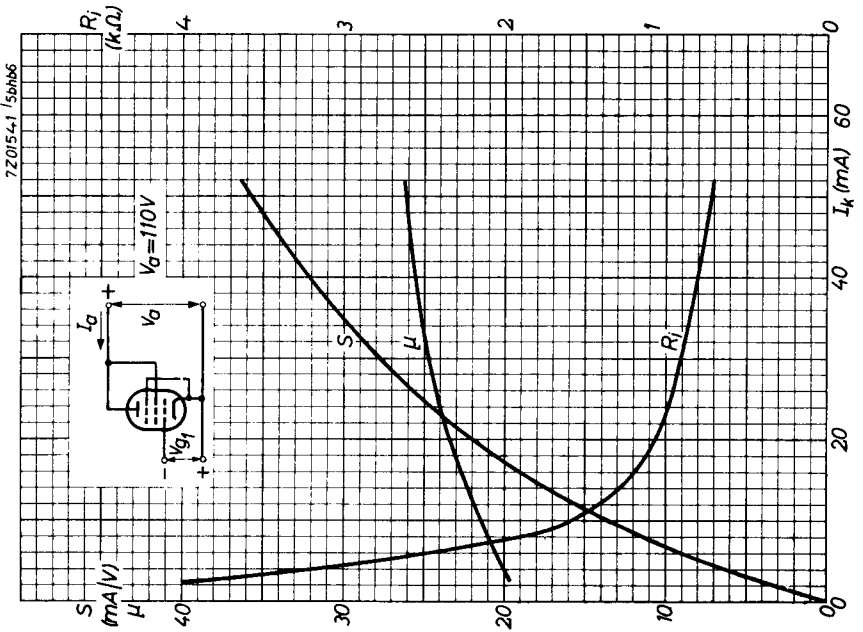
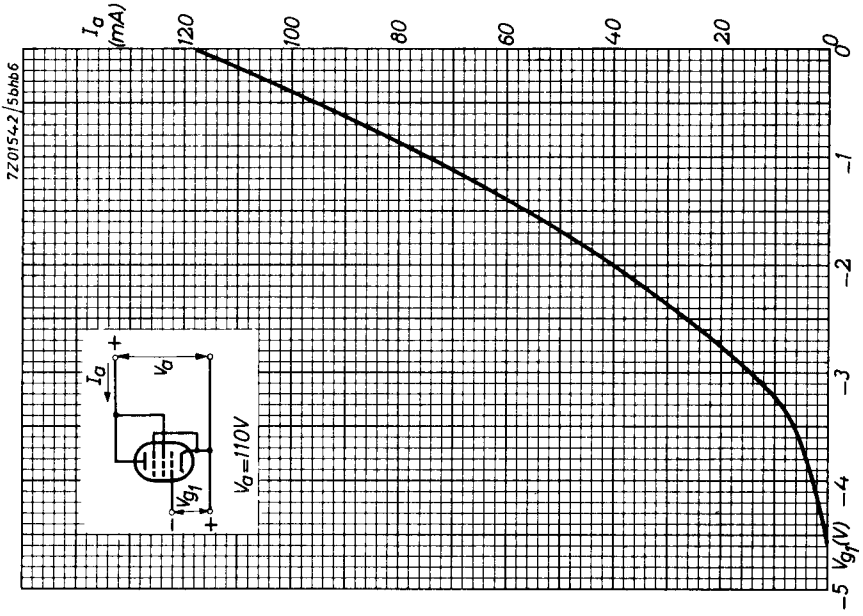
Variations of the heater voltage exceeding the range of 6.0 V to 6.6 V will shorten the tube life.

The tolerance of heater current should be taken into account.

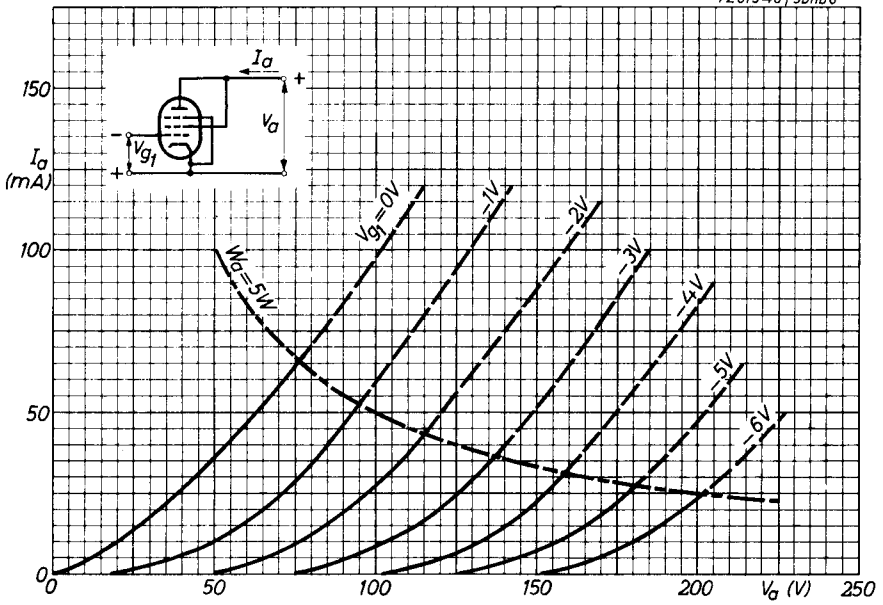
<sup>1)</sup> Grid No. 2 dissipation: Care should be taken not to exceed the limiting value during switching in of positive voltages. If the cathode resistor is shunted by more than 10 μF a grid No. 1 series resistor of minimum 1 kΩ should be applied.







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# PHILIPS

Data handbook



Electronic  
components  
and materials

## E282F

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