

S.Q. TUBE

Special quality pentode designed for use as A.F. and R.F. amplifier, output tube, oscillator a.o.

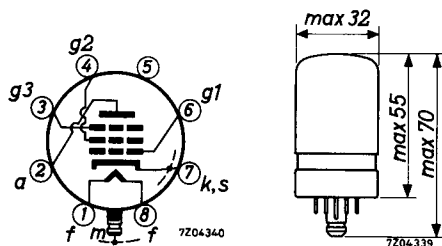
QUICK REFERENCE DATA

Life test	10 000 hours		
Base	Loctal		
Heating	Indirect A.C. or D.C. Series or parallel supply		
Heater voltage	V_f	20	V
Heater current	I_f	125	mA
Anode current	I_a	16	mA
Mutual conductance	S	6.5	mA/V
Equivalent noise resistance	R_{eq}	1200	Ω
Hum voltage	$V_{g_{eq}}$	10	μV_{RMS}

DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Loctal



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	20			V
Heater current	I_f	125	120 - 130		mA
Anode supply voltage	V_{ba}	225			V
Grid No. 2 supply voltage	V_{bg2}	155			V
Grid No. 3 voltage	V_{g3}	0			V
Cathode resistor	R_k	250			Ω
Anode current	I_a	16	13.5 - 19	min. 11.5	mA
Grid No. 2 current	I_{g2}	3	2 - 4		mA
Mutual conductance	S	6.5	5.5 - 7.8	min. 4.5	mA/V
Internal resistance	R_i	250	min. 200		k Ω
Amplification factor	μ_{g2g1}	19			
<u>Negative grid current</u>	$-I_g$		max. 0.5	max. 1.0	μA
<u>Output power</u>	W_o	1.5			W
Anode load resistance $R_{a\sim} = 10\text{ k}\Omega$					
Total distortion $d_{tot} = 10\%$					
<u>Cathode heating time</u>		26	19 - 33		sec
Anode current $I_a = 4\text{ mA}$					
<u>Equivalent noise resistance</u>					
R. F.	R_{eq}	1200	max. 2000		Ω
R. F. connected as triode	R_{eq}	650			Ω
A. F. (500 - 3000 Hz)	R_{eq}	5000			Ω

CHARACTERISTICS (continued)Insulation between cathode and heater

	II	III	
I_{kf}	max. 0.5	max. 1.0	μA

Voltage between cathode and heater $V_{kf} = 50$ V (cathode positive)

Insulation between two electrodes

R_{ins}	min. 1000	min. 300	$M\Omega$
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Voltage between electrodes
 $V = 50$ V

Hum voltage

V_{geq}	max. 10		μV_{RMS}
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Grid No. 1 resistor $R_{g1} = 500$ k Ω

Cathode by-pass capacitor $C_k = 100$ μF

Heater centre earthed

CAPACITANCES

Grid No. 1 to grid No. 2, grid No. 3, cathode, heater and screen

	I	II	
$C_{g1/g2g3kfs}$	8.5	7.5 - 9.5	pF

Grid No. 1 to grid No. 2, grid No. 3, cathode, heater and screen

$C_{g1/g2g3kfs}$	10.5		pF
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Cathode current $I_k = 19$ mA

Anode to grid No. 2, grid No. 3, cathode, heater and screen

$C_{a/g2g3kfs}$	6.0	4.5 - 7.7	pF
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Grid No. 1 and anode to grid No. 3, grid No. 2, cathode, heater and screen

$C_{g1a/g3g2kfs}$		max. 16	pF
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Anode to grid No. 1

C_{ag1}	14	max. 18	mpF
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Grid No. 1 to grid No. 2

C_{g1g2}	3		pF
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Grid No. 2 to grid No. 3

C_{g2g3}	2.2		pF
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Grid No. 1 to cathode and screen

$C_{g1/ks}$	4.5		pF
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Anode to grid No. 3

C_{ag3}	1.2		pF
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Grid No. 1 to heater

C_{g1f}	20	max. 40	mpF
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Anode to heater

C_{af}	120		mpF
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Cathode and screen to heater

$C_{ks/f}$	7		pF
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CAPACITANCES (continued)As triode (Grid No. 2 and grid No. 3 connected to anode)

		I	II	
Grid No. 1 to cathode, heater and screen	C_{g1}/kfs	5	max. 6	pF
Anode, grid No. 2 and grid No. 3 to cathode, heater and screen	C_{ag2g3}/kfs	7.5	max. 9	pF
Anode, grid No. 2 and grid No. 3 to grid No. 1	C_{ag2g3}/g_1	3.2	max. 4	pF

LIFE

Production samples are tested to be within the end of life values (column III) under the following conditions during 10 000 hours.

Heater voltage	V_f	20	V
Anode supply voltage	V_{ba}	225	V
Grid No. 2 supply voltage	V_{bg2}	155	V
Grid No. 3 voltage	V_{g3}	0	V
Cathode resistor	R_k	250	Ω

LIMITING VALUES Design centre rating system.

Anode voltage	V_{a0}	max.	550	V
	V_a	max.	300	V
Anode dissipation	W_a	max.	4	W
Grid No. 3 voltage	V_{g30}	max.	550	V
	V_{g3}	max.	300	V
Grid No. 3 dissipation	W_{g3}	max.	1	W
Grid No. 2 voltage	V_{g20}	max.	550	V
	V_{g2}	max.	300	V
Grid No. 2 dissipation	W_{g2}	max.	1	W
Dissipation of anode, grid No. 2 and grid No. 3 (triode connected)	$W_{a+g2+g3}$	max.	5	W
Grid No. 1 voltage	$-V_{g1}$	max.	100	V
Grid No. 1 dissipation	W_{g1}	max.	50	mW
Cathode current	I_k	max.	30	mA

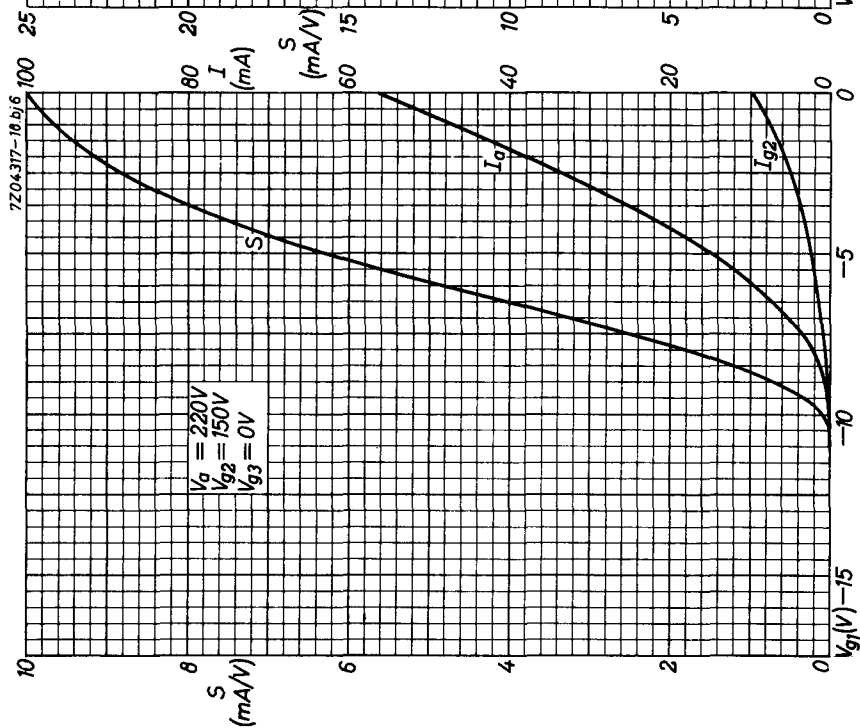
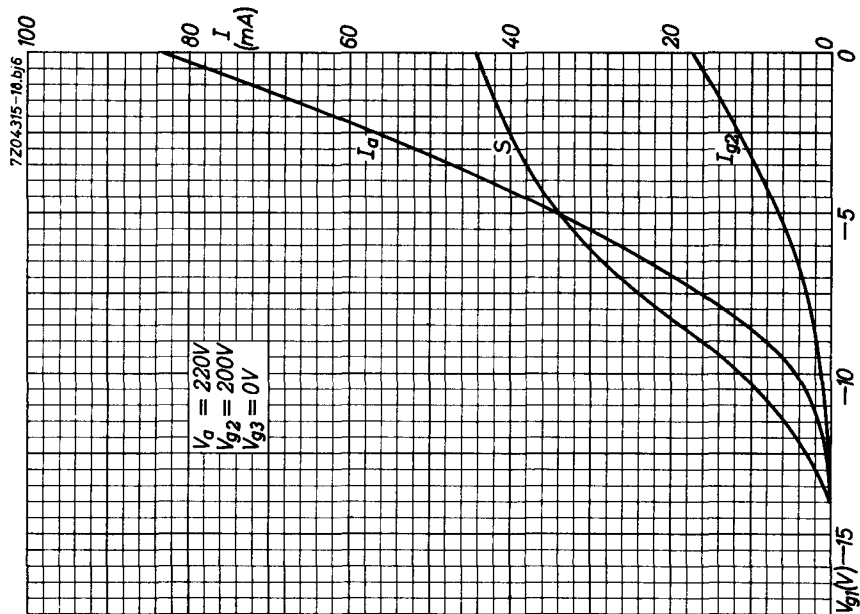
LIMITING VALUES (continued)

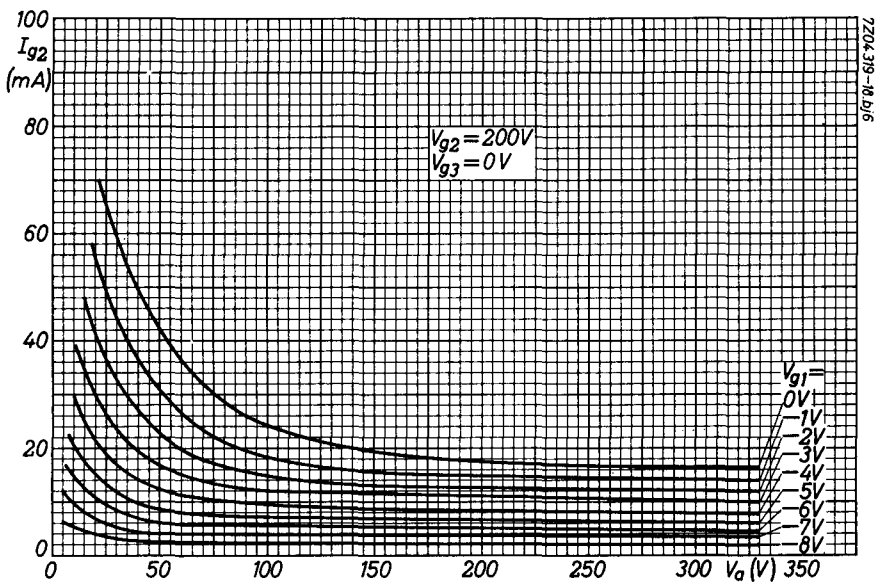
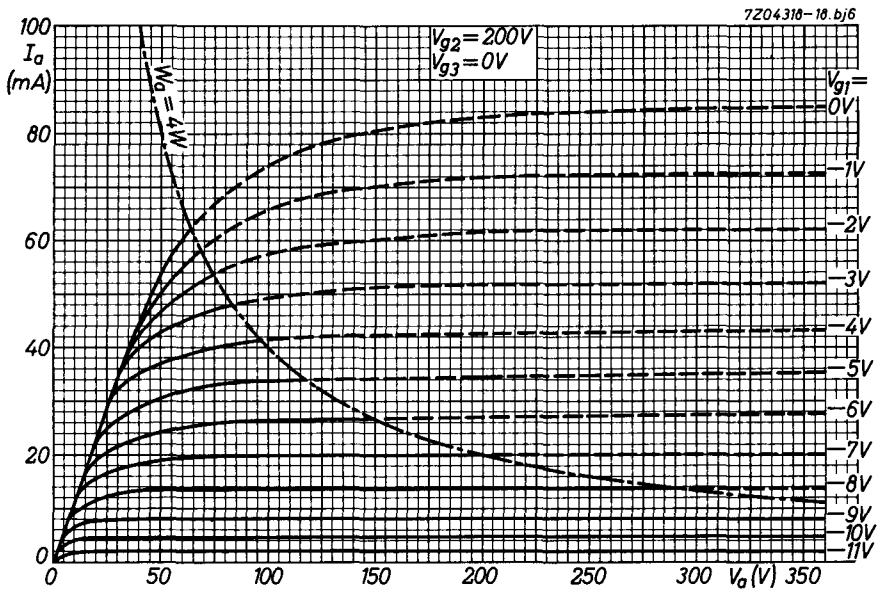
Grid No. 1 resistor	R_{g1}	max.	0.5 $M\Omega$
Anode dissipation > 1.5 W			
Grid No. 1 resistor	R_{g1}	max.	3 $M\Omega$
Anode dissipation < 1.5 W			
Voltage between cathode and heater	V_{kf}	max.	120 V
Bulb temperature (Metal envelope)	t_{bulb}	max.	120 $^{\circ}C$

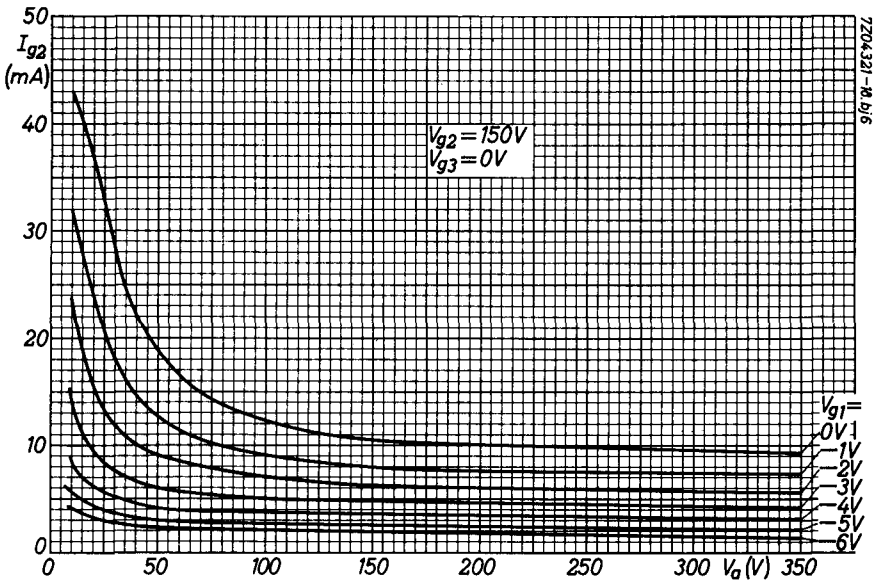
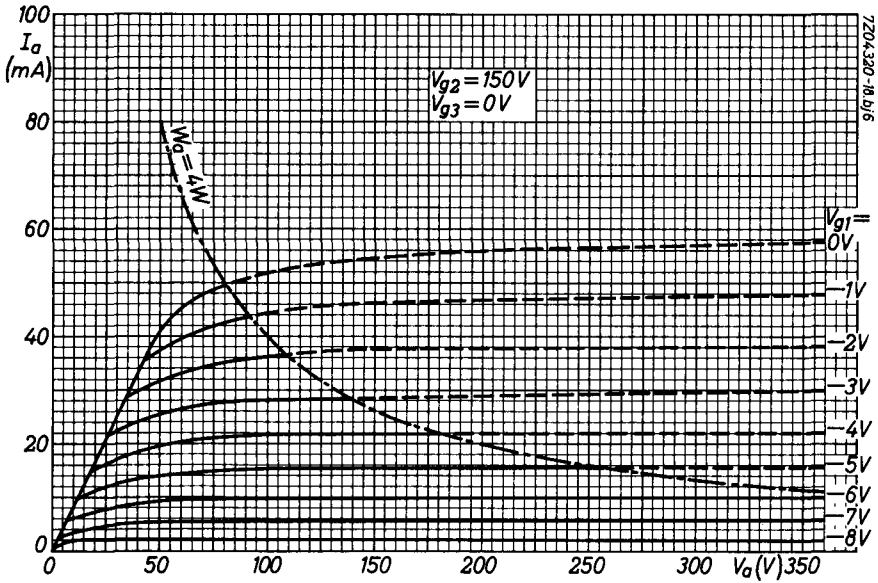
Heater voltage: The average heater voltage should be 20 V.

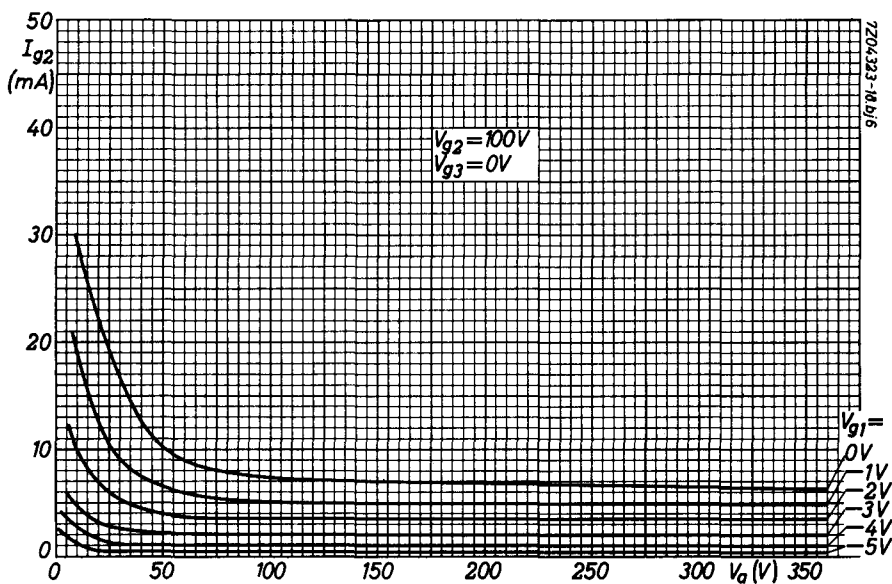
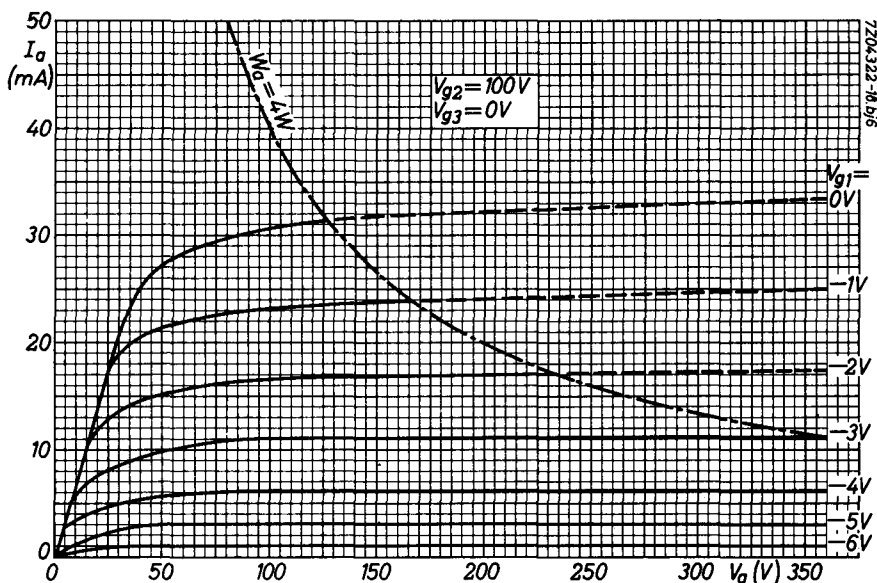
Variations of the heater voltage exceeding the range of 19 V to 21 V will shorten the tube life.

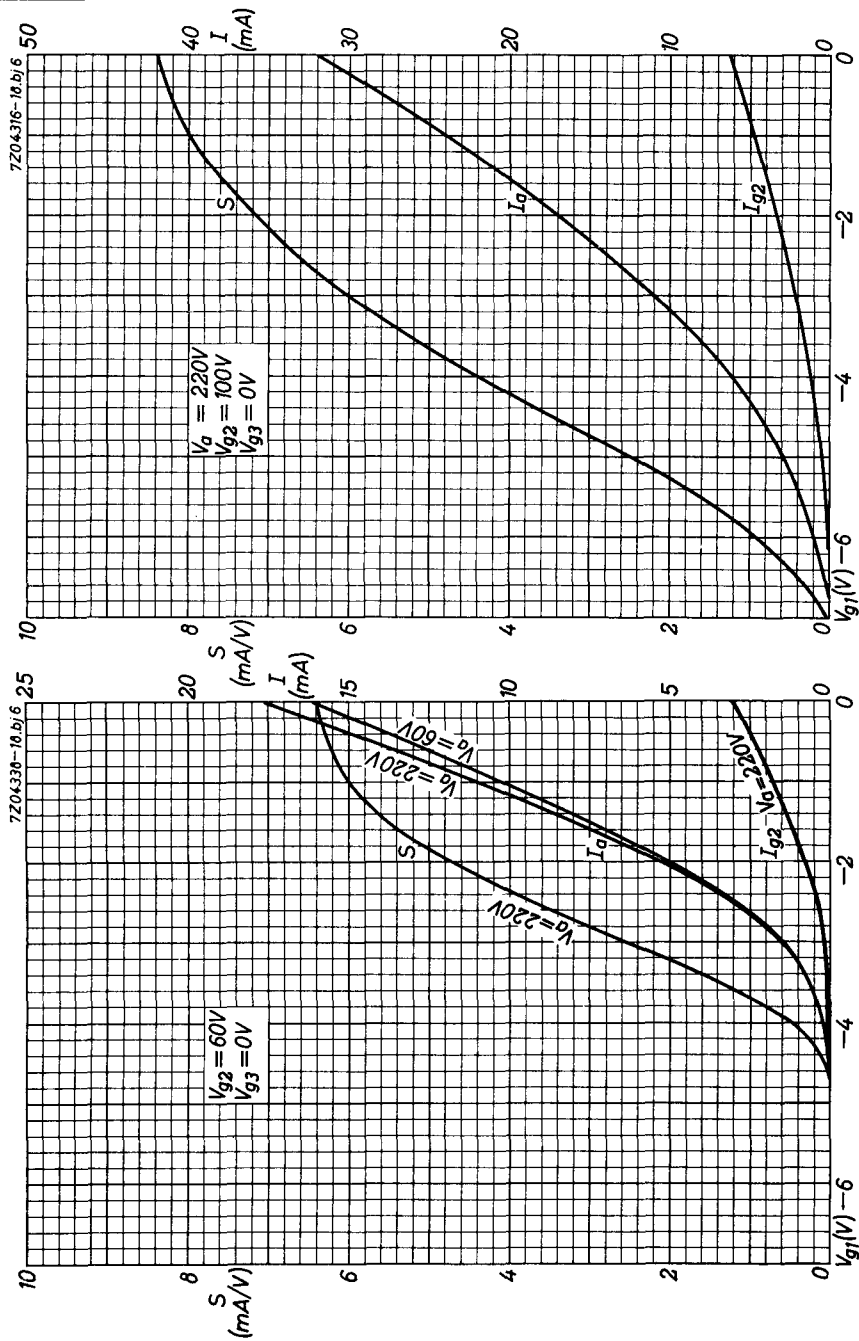
The tolerance of heater current (column II) should be taken into account.

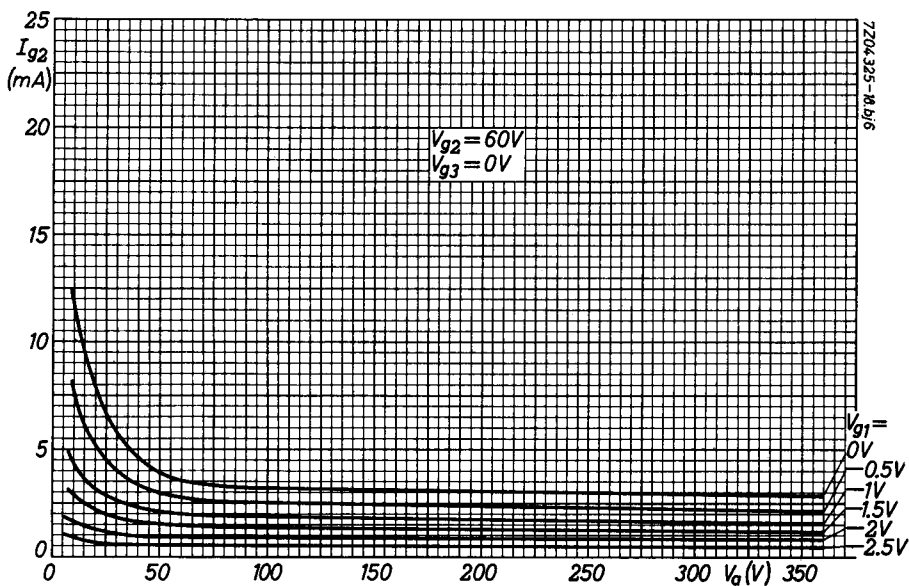
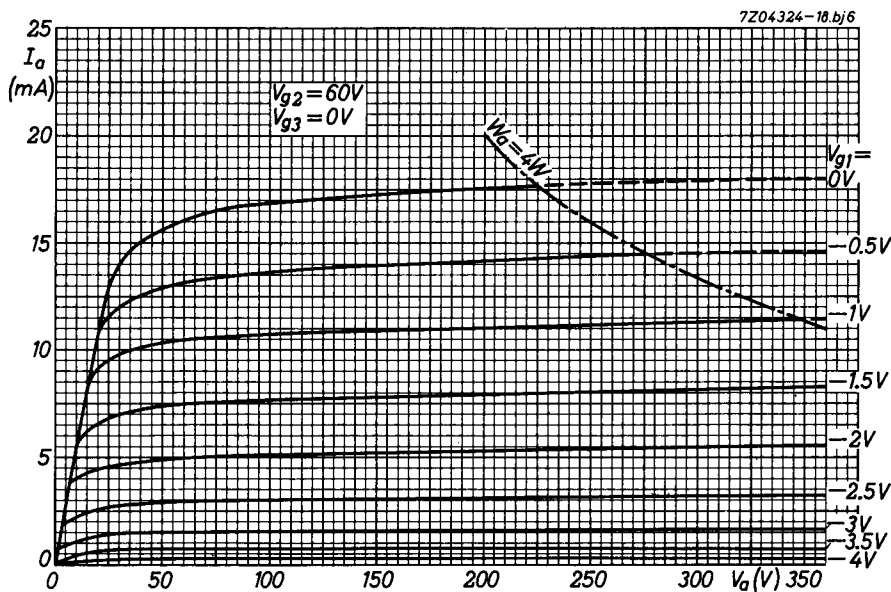


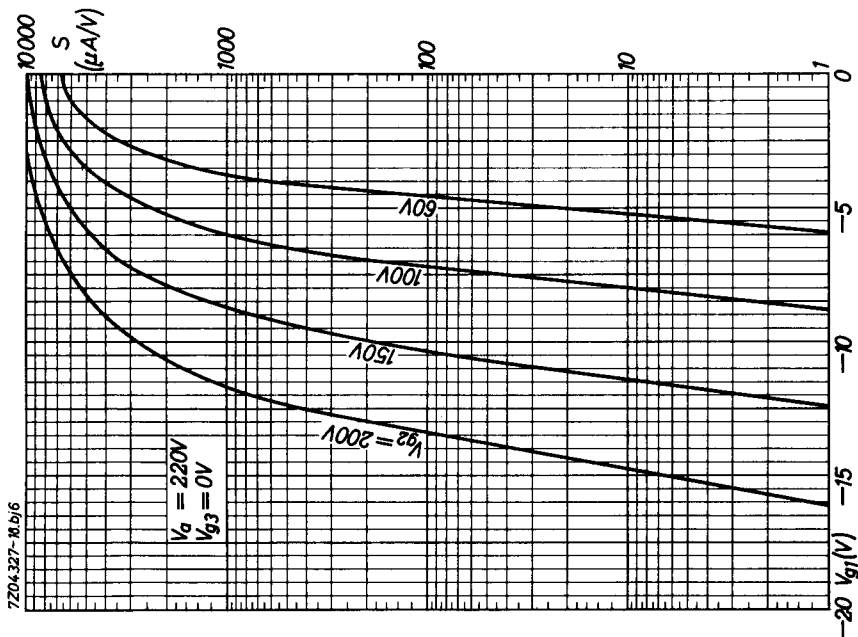
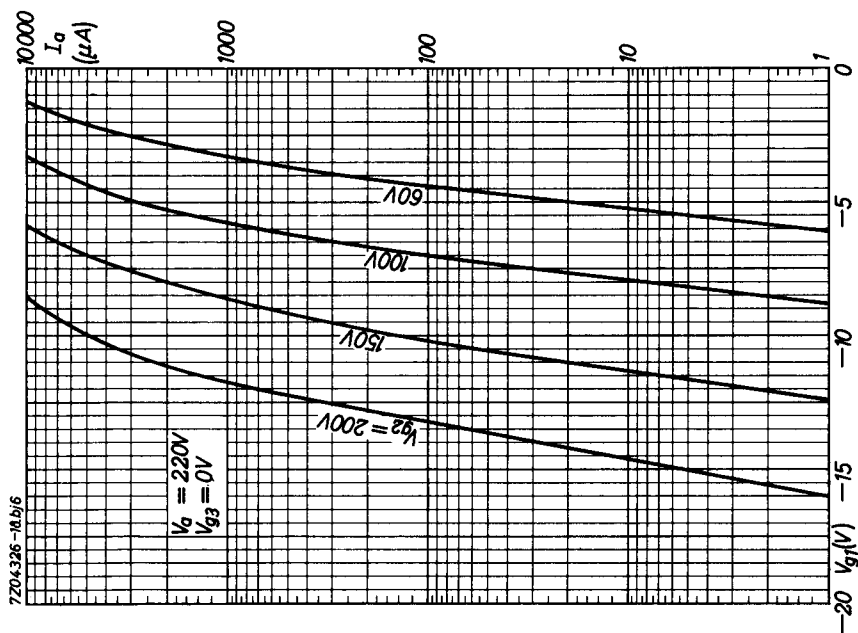


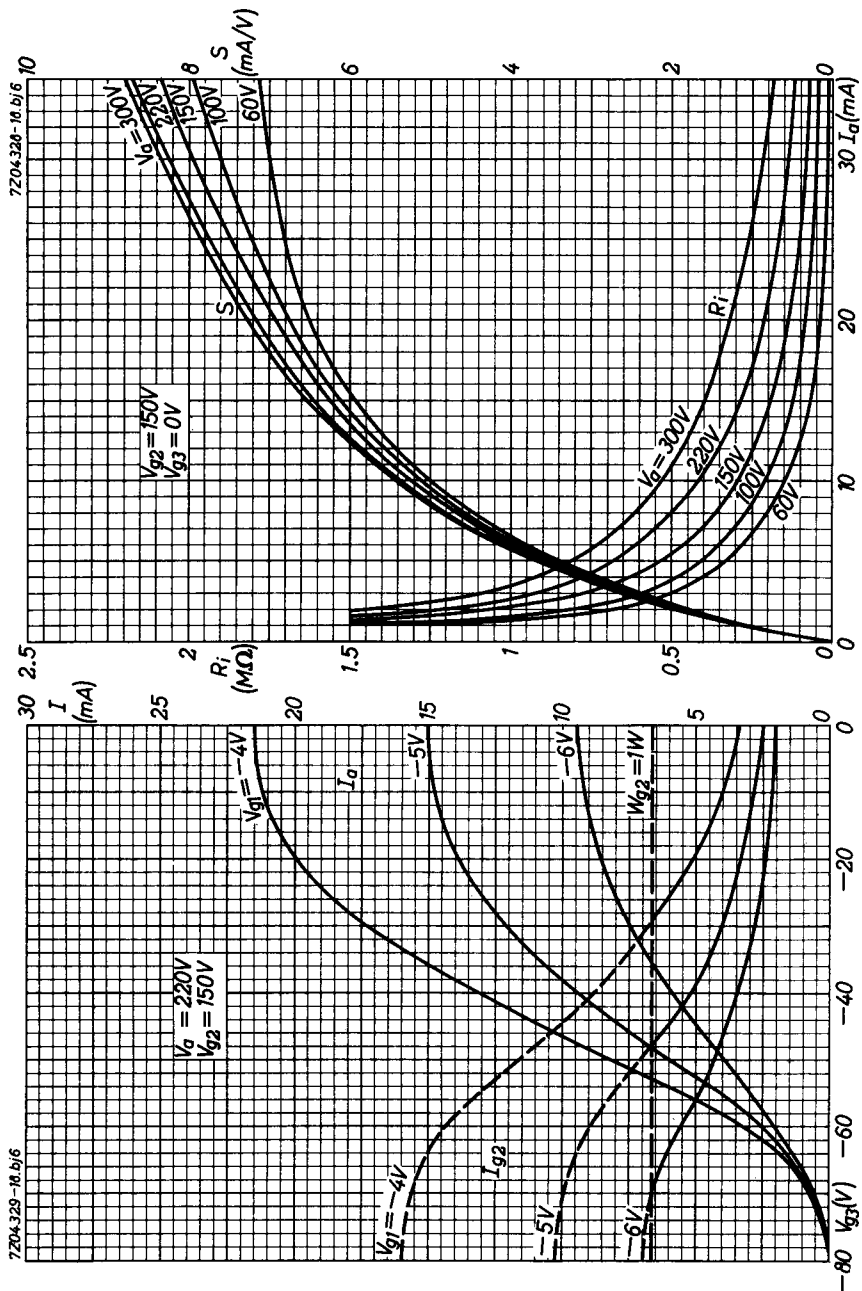


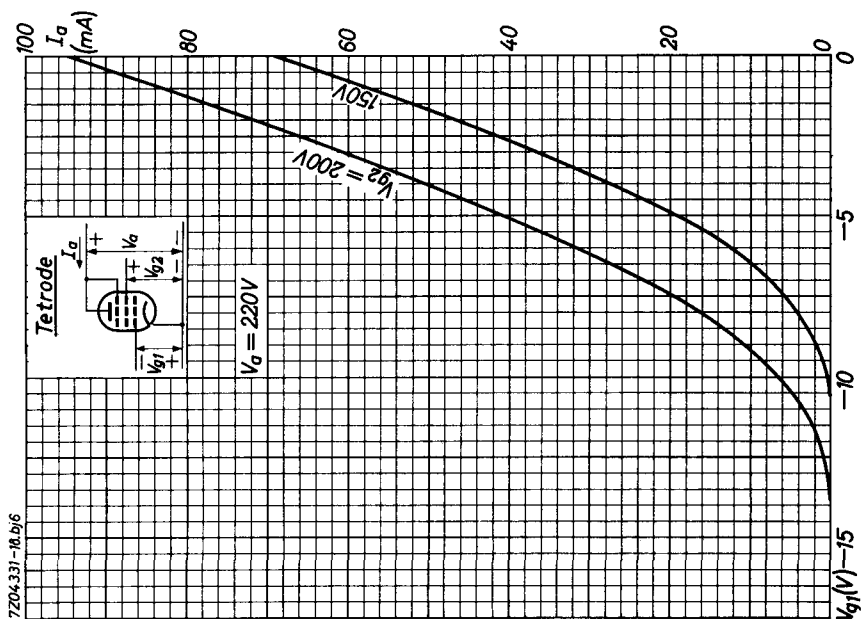
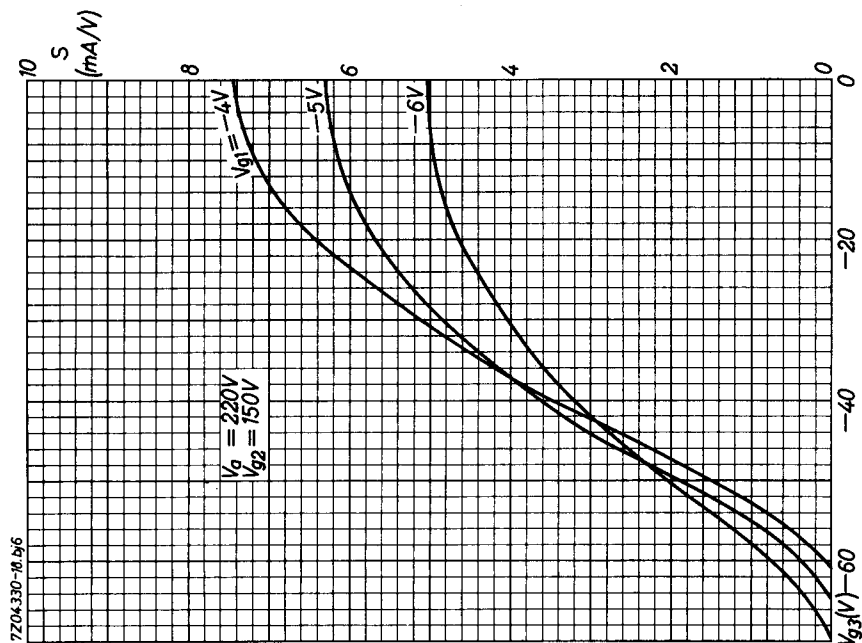


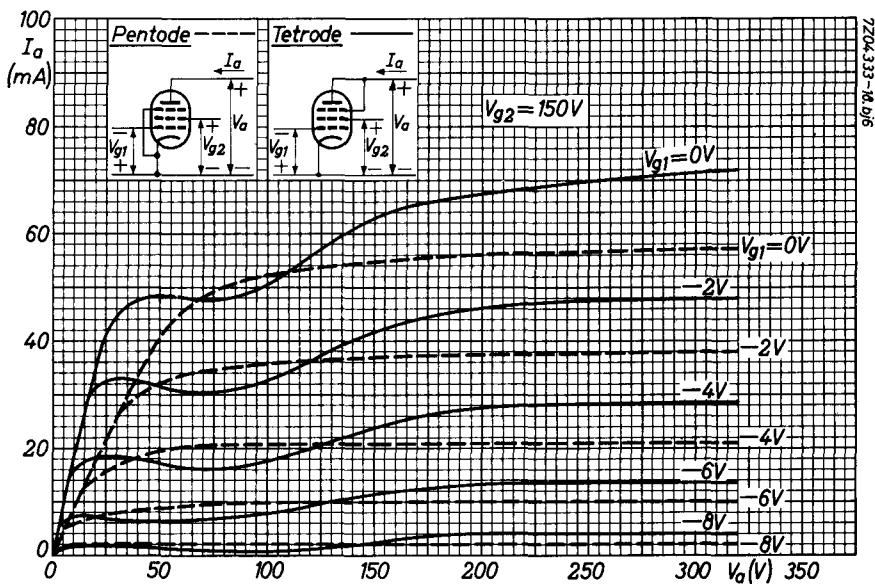
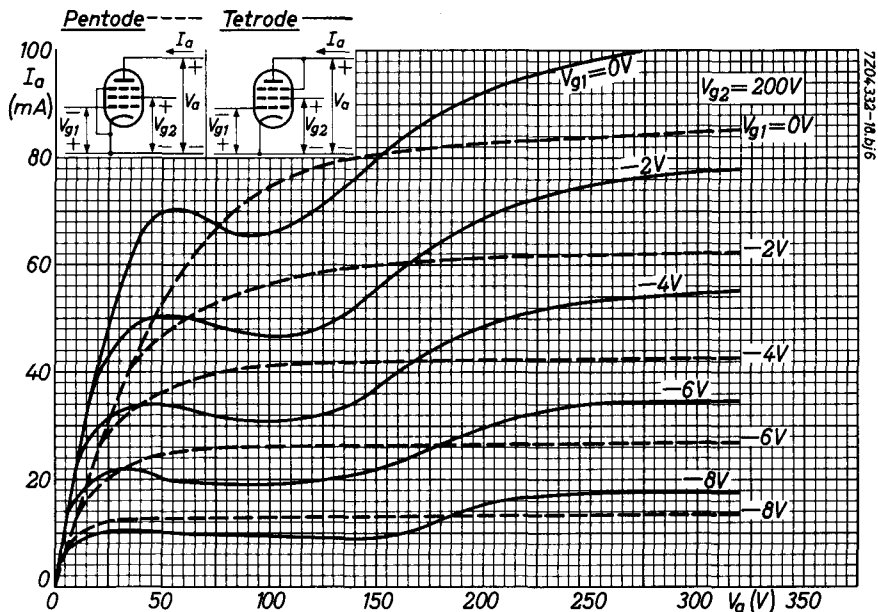




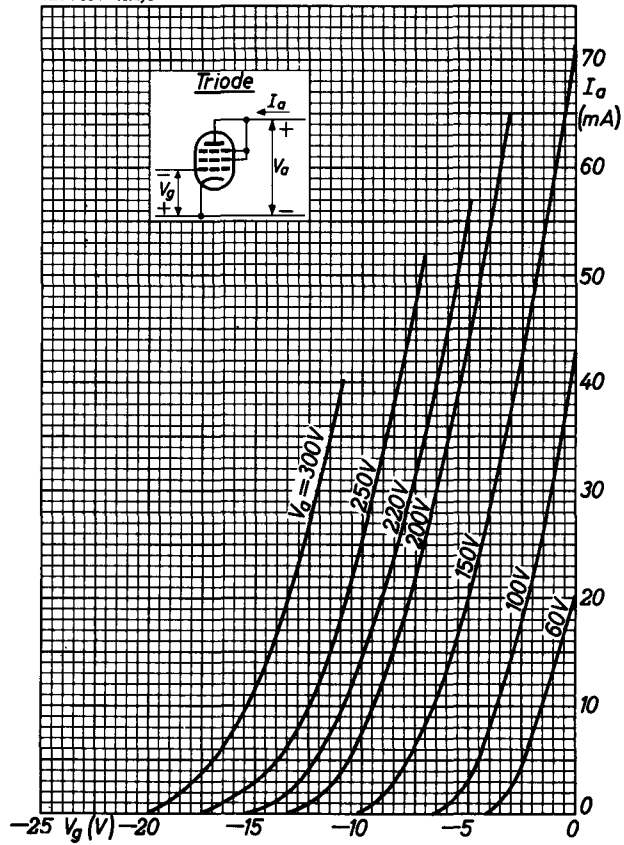




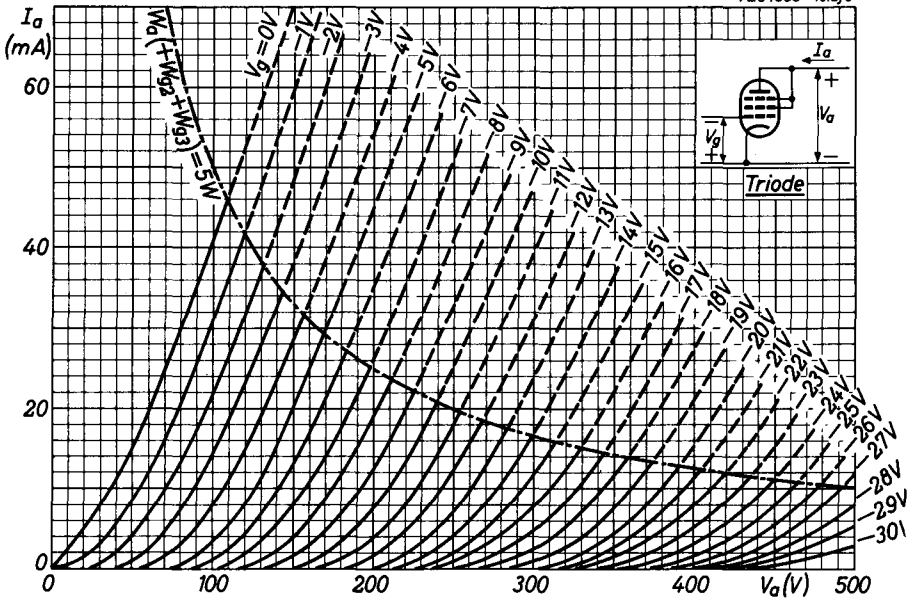




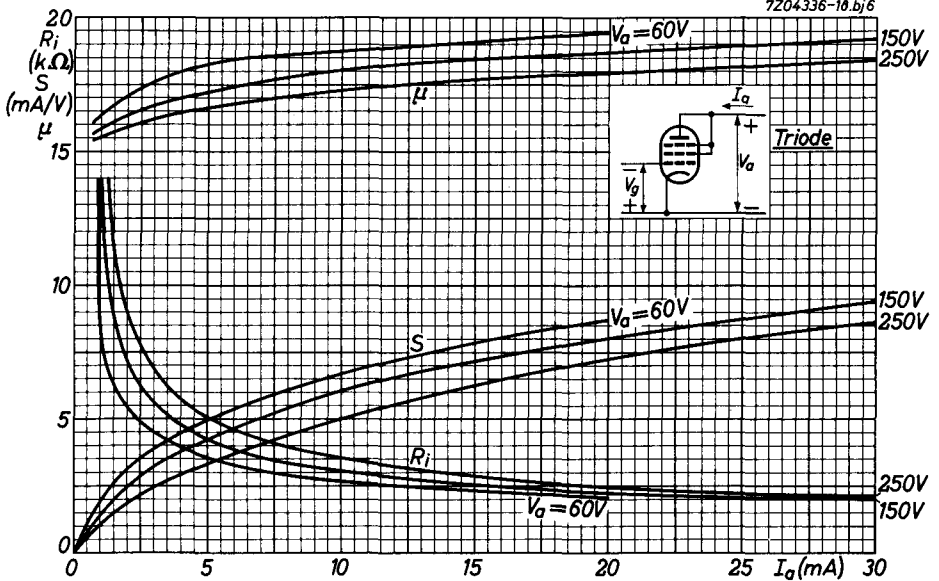
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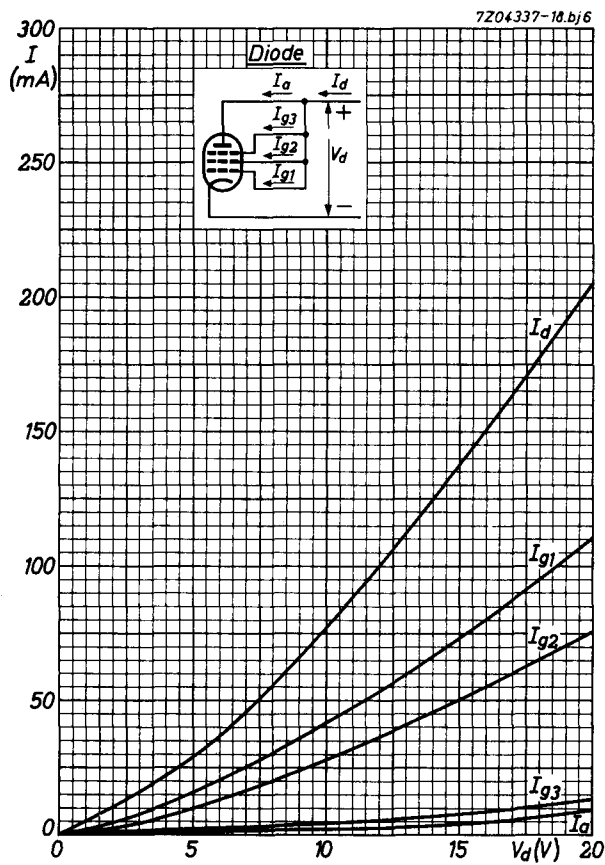


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PHILIPS

Data handbook



**Electronic
components
and materials**

C3m

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