

## S.Q. TUBE

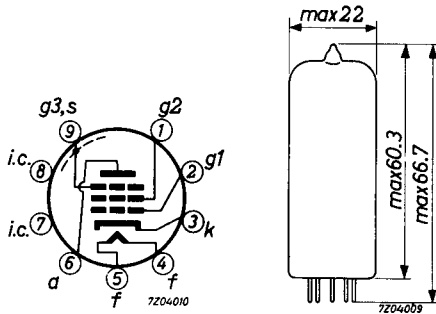
Special quality pentode designed for use in telephone equipment.

QUICK REFERENCE DATA	
Life expectancy	10 000 hours
Low interface resistance	
Base	Noval. Gold plated pins
Heating	Indirect A.C. or D.C. Series or parallel supply
Heater voltage	$V_f$ 6.3 V
Heater current	$I_f$ 0.3 A
Anode current	$I_a$ 10 mA
Mutual conductance	$S$ 9 mA/V

### 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	$I_f$	300	285 - 315		mA
Anode voltage	$V_a$	210			V
Grid No.3 voltage	$V_{g3}$	0			V
Grid No.2 voltage	$V_{g2}$	120			V
Cathode resistor	$R_k$	165			$\Omega$
Anode current	$I_a$	10	8.7 - 11.3	7	mA
Grid No.2 current	$I_{g2}$	2.1	1.7 - 2.5	1.25	mA
Mutual conductance	S	9	7.8 - 10.2	6.4	mA/V
Internal resistance	$R_i$	0.5	min. 0.3		M $\Omega$
Amplification factor grid No.2 to grid No.1	$\mu_{g2g1}$	38			
Equivalent noise resistance (R.F.)	$R_{eq}$	750	max. 1000		$\Omega$
Equivalent noise resistance (A.F.)	$R_{eq}$		max. 36		k $\Omega$
<u>Negative grid No.1 current</u>	$-I_{g1}$		max. 0.5	max. 1.0	$\mu A$
<u>Hum voltage</u>	$V_{g1}$		max. 0.5		mVRMS
Grid resistor $R_{g1} = 0.5 M\Omega$ Cathode resistor by passed					
<u>Cut off voltage</u>	$-V_{g1}$	5	max. 5.25		V
Anode voltage	$V_a$	210			V
Grid No.3 voltage	$V_{g3}$	0			V
Grid No.2 voltage	$V_{g2}$	120			V
Anode current	$I_a$	0.5			mA

**CHARACTERISTICS** (continued)

Leakage current between  
cathode and heater

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

	I	II	III	
$I_{kf}$		max. 15		$\mu A$

Insulation resistance between  
two arbitrary electrodes

Voltage between electrodes  $V = 250$  V

	I	II	III	
R		min. 100		$M\Omega$

**CAPACITANCES**

Radiation capacitances measured to a surrounding cylinder, internal diameter 52 mm, height 98 mm.

	I	II	
Grid No.1 to grid No.2, grid No.3, cathode, heater and screen	$C_{g_1/g_2g_3kfs}$	8	8.7 pF
Grid No.1 to grid No.2, grid No.3, cathode, heater and screen Cathode current = 12.1 mA	$C_{g_1/g_2g_3kfs}$	10.8	pF
Anode to grid No.2, grid No.3, cathode, heater and screen	$C_{a/g_2g_3kfs}$	3.5	max. 4.1 pF
Anode to grid No.1	$C_{ag_1}$		max. 15 mpF
Grid No.1 to heater	$C_{g_1f}$		max. 0.15 pF
Cathode to heater	$C_{kf}$	4	pF
Grid No.1 radiation capacitance	$C_{rg_1}$	max. 25	mpF
Anode radiation capacitance	$C_{ra}$	max. 25	mpF

**LIFE EXPECTANCY**

When the tube is operated under the following conditions the range values of the characteristics in column III may be expected not to be exceeded during an operation period of 10 000 hours.

Anode voltage	$V_a$	210 V
Grid No.3 voltage	$V_{g_3}$	0 V
Grid No.2 voltage	$V_{g_2}$	120 V
Cathode resistor	$R_k$	165 $\Omega$

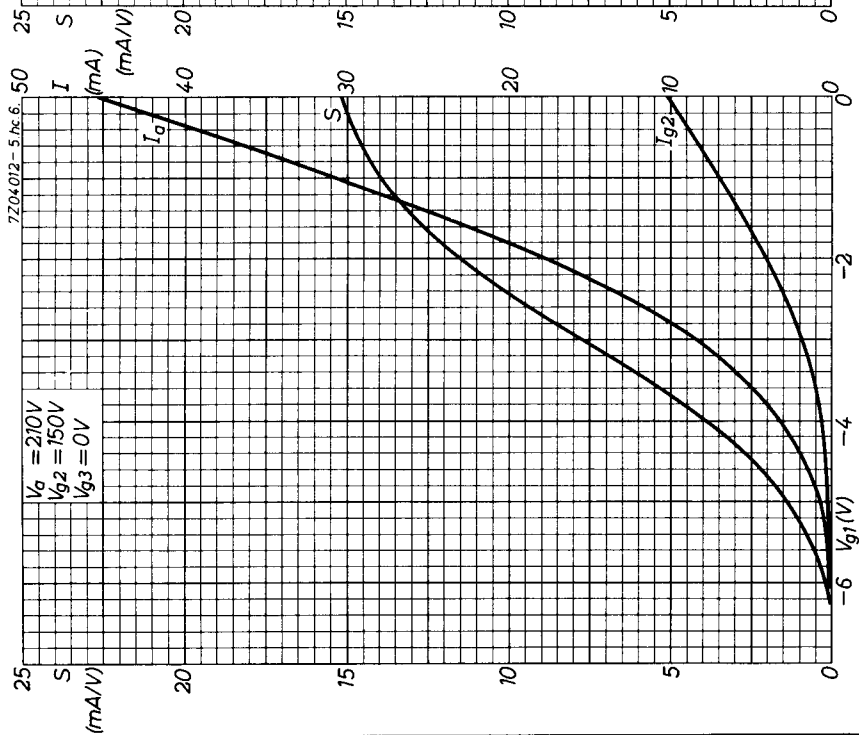
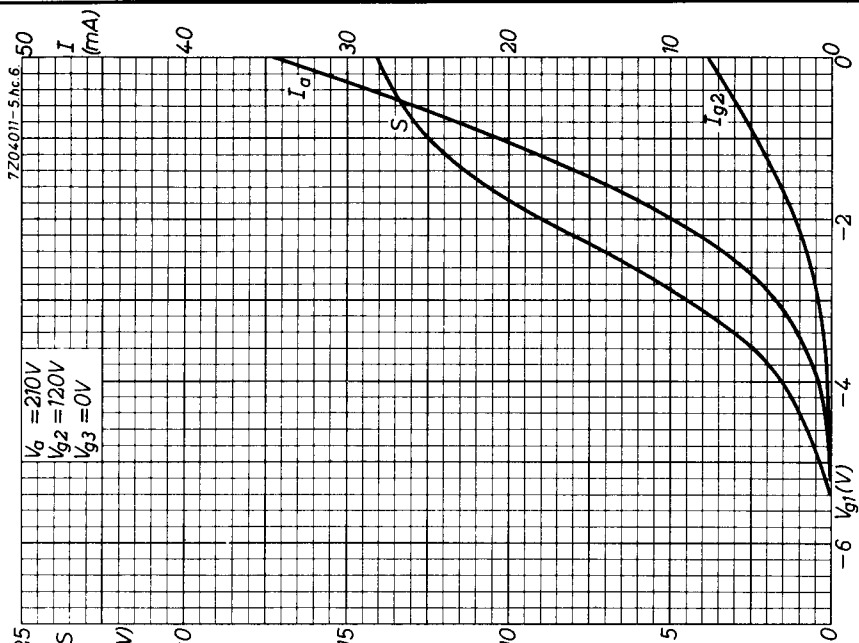
## LIMITING VALUES (Design centre rating system)

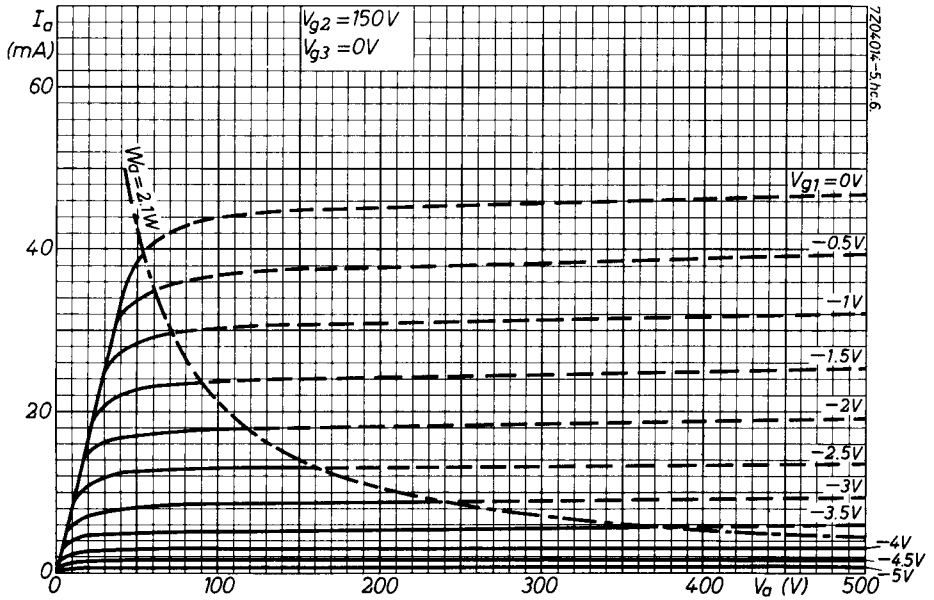
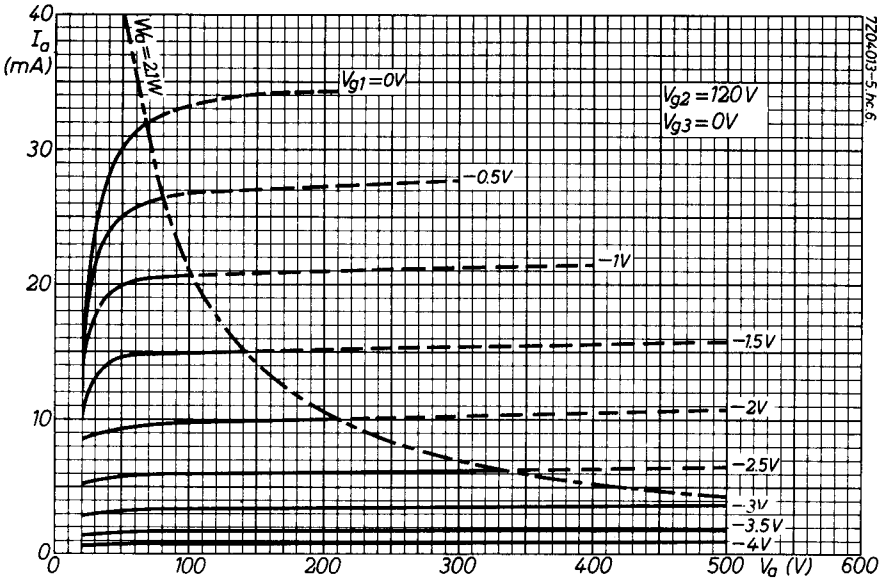
Anode voltage	$V_{a0}$	max.	550 V
	$V_a$	max.	210 V
Anode dissipation	$W_a$	max.	2.1 W
Grid No.2 voltage	$V_{g20}$	max.	550 V
	$V_{g2}$	max.	210 V
Grid No.2 dissipation	$W_{g2}$	max.	0.35 W
Grid No.1 voltage	$-V_{g1}$	max.	100 V
Grid No.1 voltage, peak	$-V_{g1p}$	max.	200 V
Duty factor max. 0.1			
Pulse duration max. 200 $\mu$ s			
Grid No.1 dissipation	$W_{g1}$	max.	50 mW
Grid No.1 resistor (automatic bias)	$R_{g1}$	max.	1 M $\Omega$
Cathode current	$I_k$	max.	16 mA
Cathode current peak value	$I_{kp}$	max.	80 mA
Duty factor max. 0.1			
Pulse duration max. 200 $\mu$ s			
Voltage between heater and cathode	$V_{kf}$	max.	100 V
Bulb temperature (absolute maximum)	$t_{bulb}$	max.	170 $^{\circ}$ C

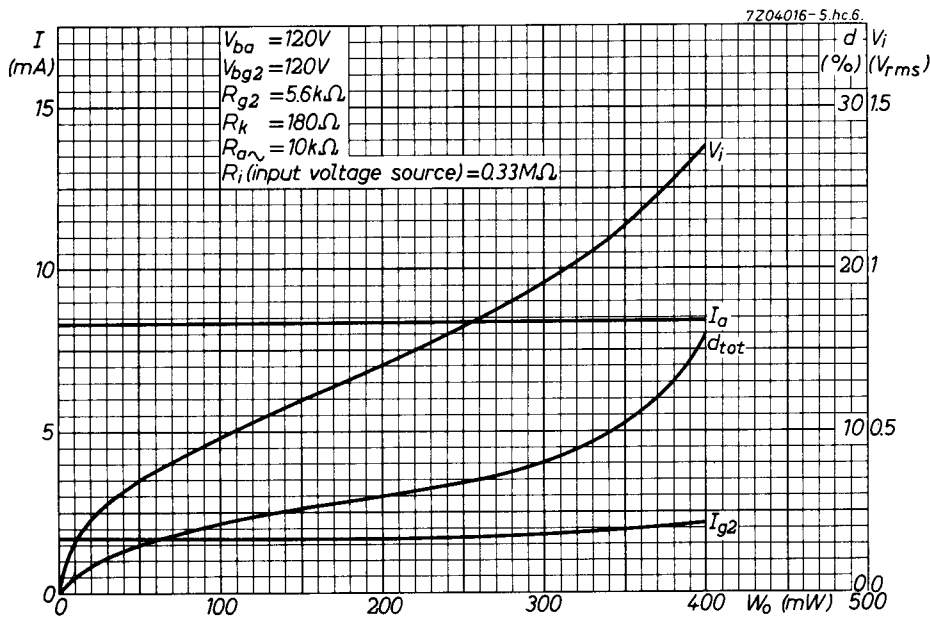
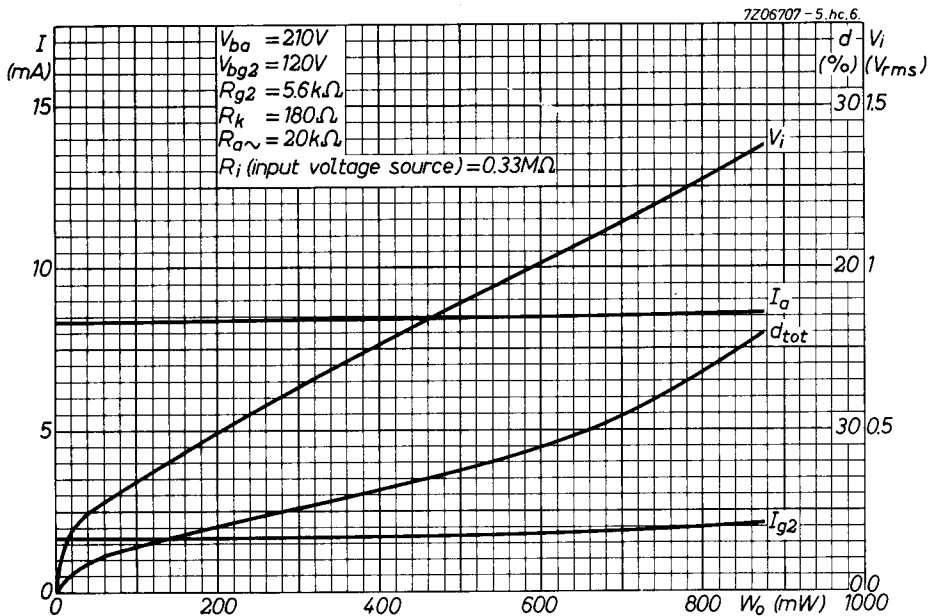
## OPERATING CHARACTERISTICS

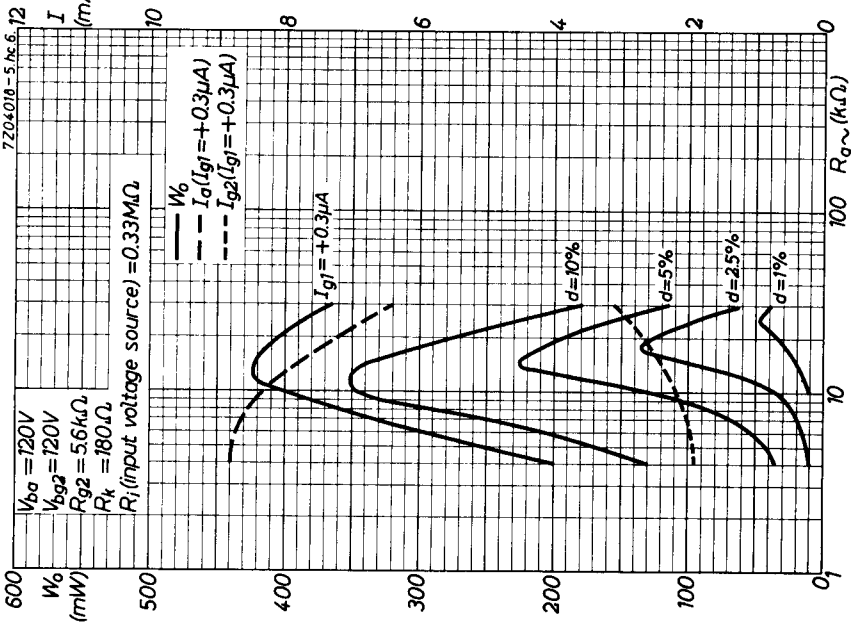
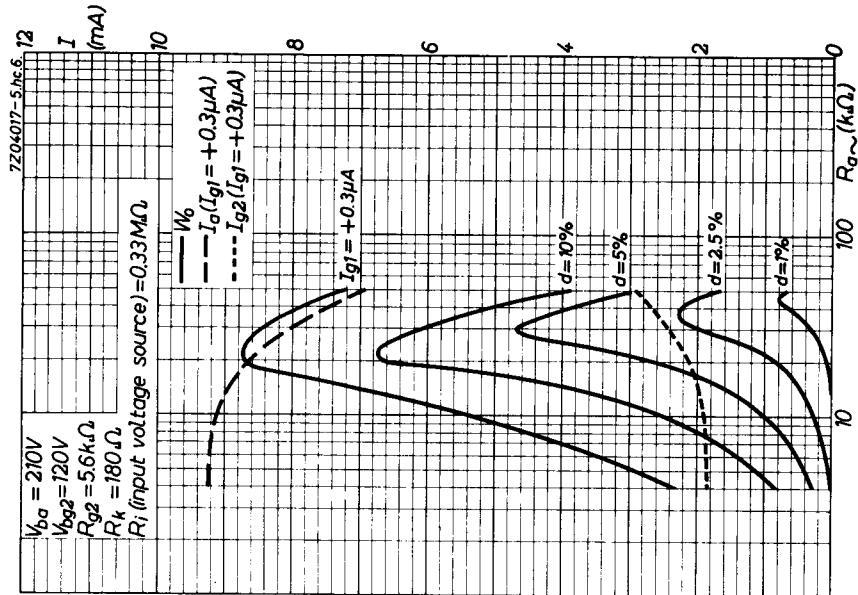
### Output tube. Class A

Anode voltage	$V_a$	120	210	V
Grid No.3 voltage	$V_{g3}$	0	0	V
Grid No.2 supply voltage	$V_{bg2}$	120	120	V
Grid No.2 resistor	$R_{g2}$	5.6	5.6	k $\Omega$
Cathode resistor	$R_k$	180	180	$\Omega$
Anode current	$I_a$	8.3	8.3	mA
Grid No.2 current	$I_{g2}$	1.7	1.7	mA
Mutual conductance	$S$	8.2	8.2	mA/V
Internal resistance	$R_i$	0.42	0.44	M $\Omega$
Load resistance	$R_{a\sim}$	10	20	k $\Omega$
Input voltage	$V_i$	0.35   1.1   -	0.25   1.1   -	$V_{RMS}$
Grid No.1 current	$+I_{g1}$	-   -   0.3	-   -   0.3	$\mu$ A
Grid No.1 resistor	$R_{g1}$	-   -   0.33	-   -   0.33	M $\Omega$
Total distortion	$dt_{tot}$	-   10   -	-   10   -	%
Output power	$W_o$	50   340   400	50   660   870	mW

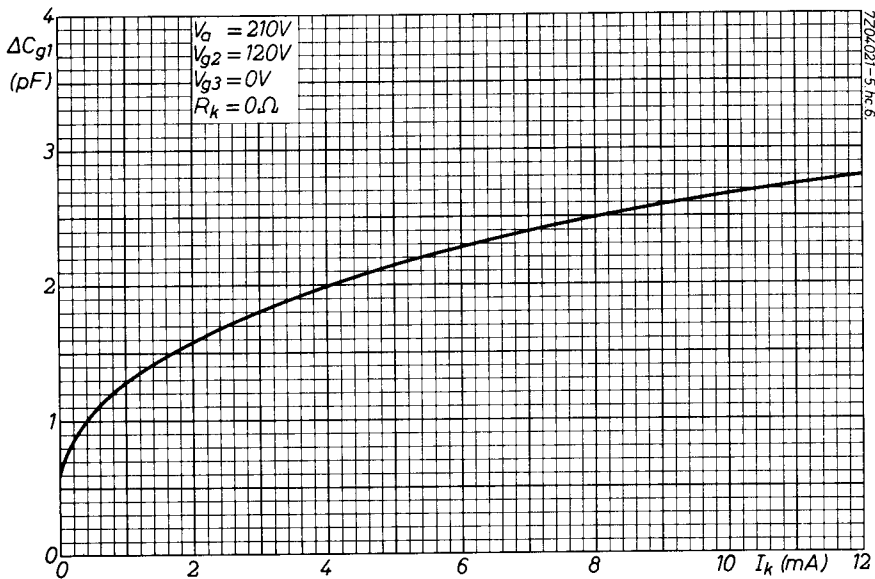
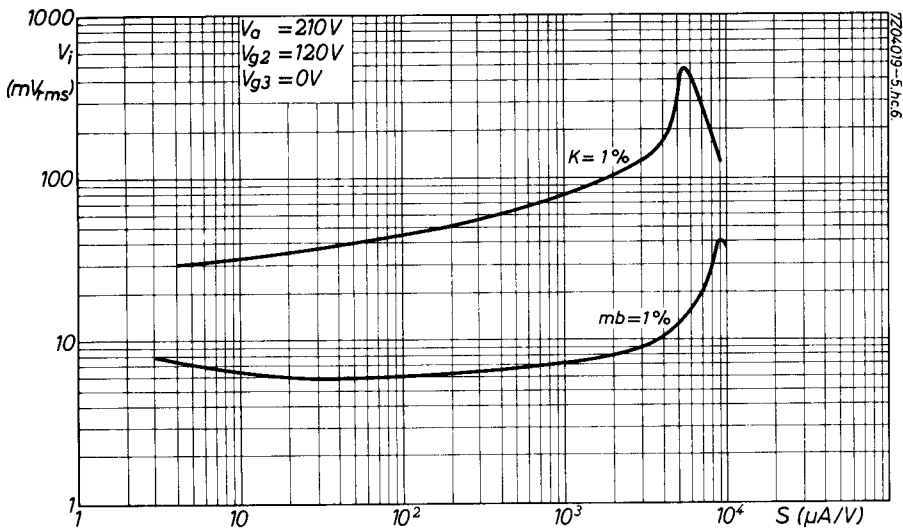


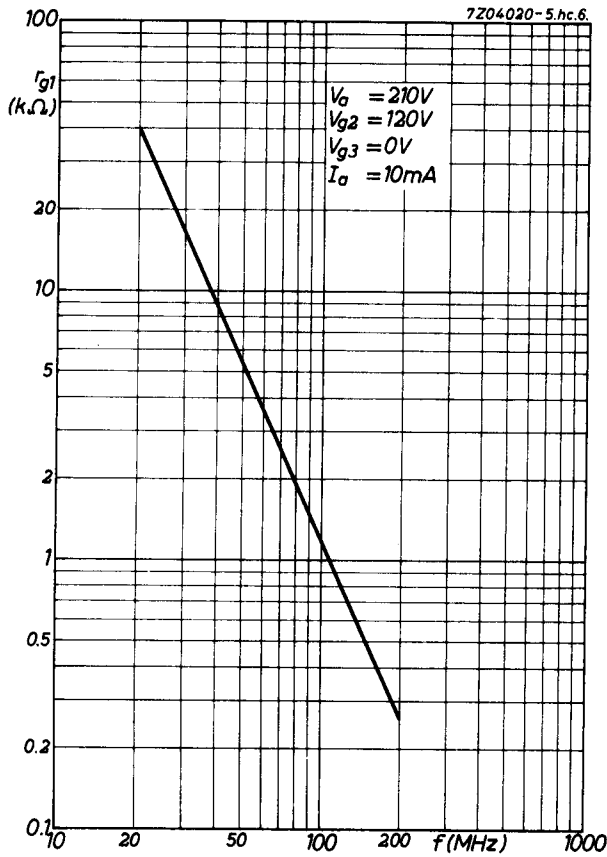












# PHILIPS

Data handbook



Electronic  
components  
and materials

## E83F

<b>page</b>	<b>sheet</b>	<b>date</b>
1	1	1968.12
2	2	1968.12
3	3	1968.12
4	4	1968.12
5	5	1968.12
6	6	1968.12
7	7	1968.12
8	8	1968.12
9	9	1968.12
10	10	1968.12
11	FP	2000.11.19