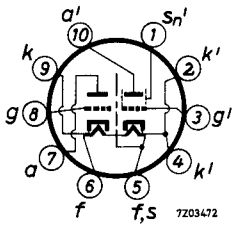
S.Q. TUBE

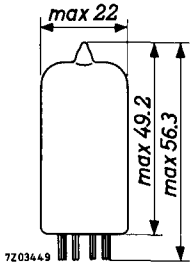
Special quality double triode with neutralisation screen, designed for use as V.H.F. amplifier (max. freq. 300 MHz) in a cascode circuit without external neutralisation, e.g. aerial amplifier for band III and frequency multiplier.

QUICK REFERENCE DATA					
Life test	10 000 hours				
Low interface resistance					
Mechanical quality	Shock and vibration resistant				
Base	10 pin miniature with gold plated pins				
Heating	Indirect A.C. or D.C.; parallel supply				
Heater voltage	V_f	6.3	V		
Heater current	I_f	335	mA		
	Input section		Output section		
Anode voltage	90	90	90	90	V
Anode current	15	27	15	27	mA
Mutual conductance	13	17.5	17	22	mA/V

DIMENSIONS AND CONNECTIONS Dimensions in mm

Base: 10 pin miniature





CHARACTERISTICS

Heater voltage	V_f	6.3		V
Heater current	I_f	335		mA
Input section (unit a', g', k')				
Anode voltage	$V_{a'}$	90	90	V
Neutralization screen voltage	$V_{Sn'}$	0	0	V
Grid voltage	$-V_{g'}$	2.1	1.4	V
Anode current	$I_{a'}$	15	27	mA
Mutual conductance	S	13	17.5	mA/V
Amplification factor	μ	27	27	
Equivalent noise resistance	R_{eq}	250	200	Ω
Output section (unit a, g, k)				
Anode voltage	V_a	90	90	V
Grid voltage	$-V_g$	2.0	1.4	V
Anode current	I_a	15	27	mA
Mutual conductance	S	17	22	mA/V
Amplification factor	μ	28	28	
Equivalent noise resistance	R_{eq}	200	150	Ω

Insulation resistance between electrodes	R_{ins}	Initial	min.	100	MΩ
		End of life	min.	20	MΩ
Leakage current between cathode and heater					
Voltage between cathode and heater V = 150 V					
Cathode positive	I_{kf}	Initial	max.	15	μA
		End of life	max.	20	μA
Voltage between cathode and heater V = 50 V					
Cathode negative	I_{kf}	Initial	max.	15	μA
		End of life	max.	20	μA

CAPACITANCES

Input system (unit a', g', k')

Grid to cathode, filament and neutralisation screen	$C_{g'/k'fsn'}$	5.1	pF
Anode to cathode, filament and neutralisation screen	$C_{a'/k'fsn'}$	5.0	pF
Grid to neutralisation screen	$C_{g'sn'}$	1.4	pF
Anode to grid	$C_{a'g'}$	0.45	pF
Anode to neutralisation screen	$C_{a'sn'}$	3.4	pF

Output system (unit a, g, k)

Cathode to grid and filament	$C_{k/gf}$	6.5	pF
Anode to grid and filament	$C_{a/gf}$	3.2	pF
Anode to cathode	C_{ak}	180	mpF
Anode to grid	C_{ag}	1.5	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 under the following conditions during 10 000 hours: (each unit)

Heater voltage	V_f	6.3	V
Anode supply voltage	V_{ba}	110	V
Grid supply voltage	V_{bg}	17	V
Cathode resistor	R_k	680	Ω

LIMITING VALUES (Absolute max. rating system)

(Each unit)

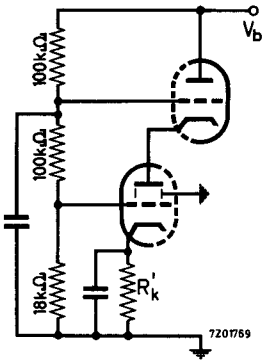
Anode voltage	V_{a_o}	max. 450	V
	V_a	max. 250	V
Anode dissipation	W_a	max. 2.7	W
Grid voltage	$-V_g$	max. 50	V
Grid peak voltage	$-V_{g_p}$	max. 150	V
Duty factor max. 1%			
Pulse duration max. 10 μs			
Cathode current	I_k	max. 40	mA
Cathode peak current	I_{k_p}	max. 400	mA
Duty factor max. 10%			
Pulse duration max. 200 μs			
Grid resistor	R_g	max. 1	MΩ
Automatic bias			
Voltage between cathode and heater			
Cathode positive	$V_{kf\ (k+)}$	max. 150	V
Cathode negative	$V_{kf\ (k-)}$	max. 50	V
Bulb temperature		max. 225	°C

OPERATING CHARACTERISTICS

Cascode circuit, Frequency 200 MHz

Supply voltage	V_b	200	200	V
Cathode resistor	R_k'	1200	680	Ω
Anode current	I_a	15.5	26.5	mA
Input resistance	r_g'	910	670	Ω
Input capacitance	C_i	11	12	pF
Noise figure	F	2.5	2.5	kT_o

Adapted to minimum noise



PHILIPS

Data handbook

Electronic components and materials

ECC2000

page	sheet	date
1	1	1968.12
2	2	1968.12
3	3	1968.12
4	4	1968.12
5	5	1968.12
6	FP	2001.04.12