TRIODE-PENTODE

Triode-pentode intended for use in television receivers; triode section as limiter, noise detector, A.G.C. amplifier, sync. separator and pulse-amplifier; pentode section as sound I.F. amplifier and video I.F. amplifier.

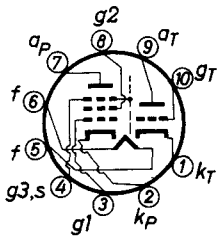
QUICK REFERENCE DATA			
Pentode section			
Anode current	I_a	13	mA
Transconductance	S	14	mA/V
Amplification factor	$\mu_{g_2g_1}$	53	-
Triode section			
Anode current	I_a	8.5	mA
Transconductance	S	5.2	mA/V
Amplification factor	μ	57	-

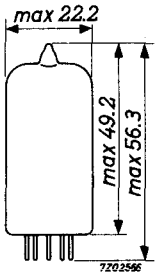
HEATING: Indirect by A.C. or D.C.; series supply

Heater current	I_f	300	mA
Heater voltage	V_f	8.5	V

DIMENSIONS AND CONNECTIONS Dimensions in mm

Base: Decal





CAPACITANCES

Triode section				
Grid to all except anode	$C_{g(a)}$		2.1	pF
Anode to all except grid	$C_{a(g)}$		3.0	pF
Anode to grid	C_{ag}		2.2	pF
Pentode section				
Grid No.1 to all except anode	$C_{g_1(a)}$		6.0	pF
Anode to all except grid No.1	$C_{a(g_1)}$		3.3	pF
Anode to grid No.1	C_{ag_1}		0.0056	pF
	C_{ag_1}	max.	0.008	pF
Grid No.1 to grid No.2	$C_{g_1g_2}$		1.7	pF
Grid No.1 to cathode	C_{g_1k}		3.7	pF
Between triode and pentode sections				
Pentode anode to triode anode	$C_{aP\text{-}aT}$	max.	0.015	pF
Pentode grid No.1 to triode anode	$C_{g_1P\text{-}aT}$	max.	0.0012	pF
Pentode grid No.1 to triode grid	$C_{g_1P\text{-}gT}$	max.	0.0015	pF

TYPICAL CHARACTERISTICS

Pentode section			
Anode voltage	V_a	160	V
Grid No.3 voltage	V_{g_3}	0	V
Grid No.2 voltage	V_{g_2}	135	V
Grid No.1 voltage	V_{g_1}	-1.7	V
Anode current	I_a	13	mA
Grid No.2 current	I_{g_2}	5.3	mA
Transconductance	S	14	mA/V
Amplification factor	$\mu_{g_2g_1}$	53	-
Triode section			
Anode voltage	V_a	170	V
Grid voltage	V_g	-1.0	V
Anode current	I_a	8.5	mA
Transconductance	S	5.2	mA/V
Amplification factor	μ	57	-

OPERATING CHARACTERISTICS

Pentode section as sound or video I.F. amplifier (g_3 connected to earth)

Supply voltage	V_b	210	230	V
Anode resistor	R_a	3.9	5.6	kΩ
Grid No.2 resistor	R_{g_2}	15	22	kΩ
Cathode resistor	R_k	91	83	Ω
Anode current	I_a	13.0	12.5	mA
Grid No.2 current	I_{g_2}	5.3	5.1	mA
Transconductance	S	14	14	mA/V
Input resistance at 40 MHz	r_{g_1}	6.6	6.6	kΩ

Triode section as sync separator

Anode supply voltage	V_b	130 to 150		V
Anode resistor	R_a	33		kΩ
Grid current	I_g	1		μA
Anode current	I_a	min. 2		mA

LIMITING VALUES (Design centre rating system)

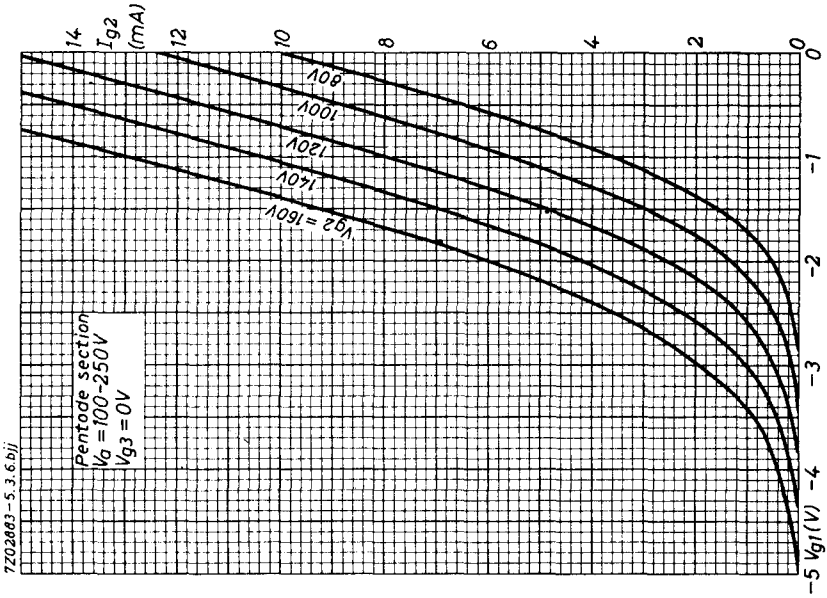
Pentode section

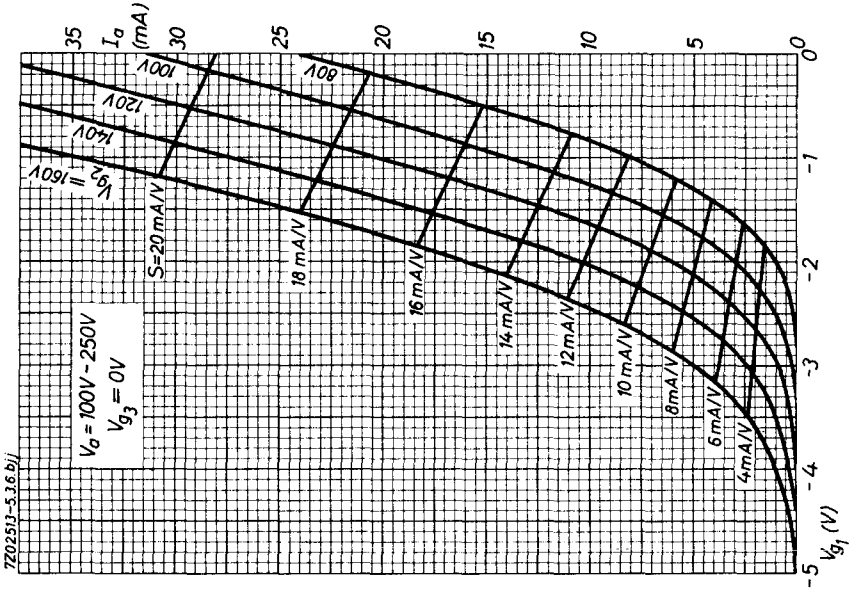
Anode voltage	V_{a_o}	max.	550	V
	V_a	max.	250	V
Anode dissipation	W_a	max.	2.1	W
Cathode current	I_k	max.	20	mA
Grid No.2 voltage	V_{g2_o}	max.	550	V
	V_{g_2}	max.	250	V
Grid No.2 dissipation	W_{g_2}	max.	0.75	W
Cathode to heater voltage	V_{kf}	max.	150	V
Grid No.1 resistor	R_{g_1}	max.	1	MΩ

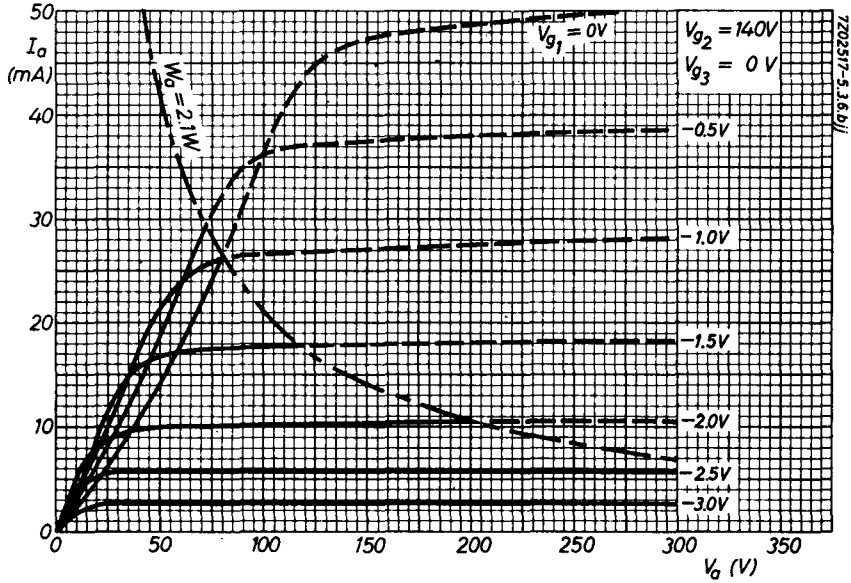
Triode section

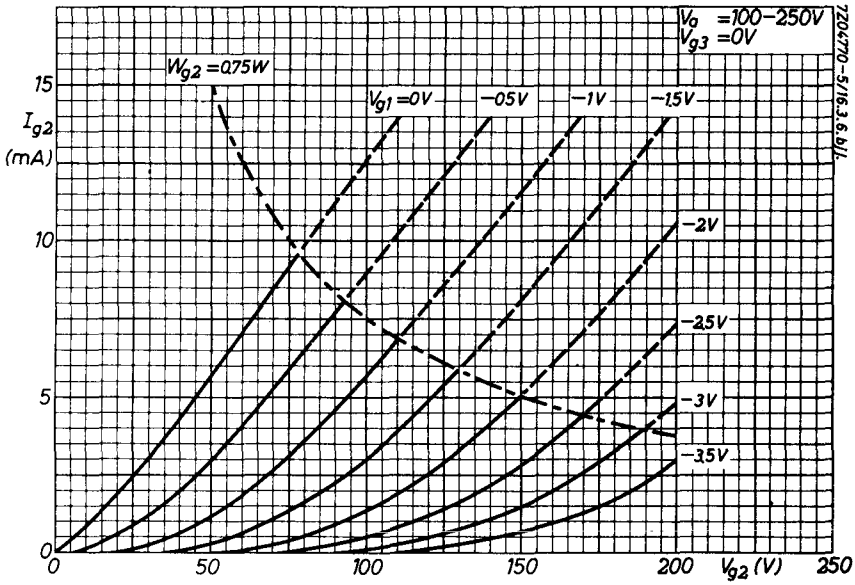
Peak anode voltage ($I_a < 0.1$ mA)	V_{a_p}	max.	600	V [1])
Anode voltage	V_{a_o}	max.	550	V
	V_a	max.	250	V
Anode dissipation	W_a	max.	1.5	W
Cathode current	I_k	max.	18	mA
Grid resistor	R_g	max.	1	MΩ
Cathode to heater voltage:				
cathode negative with respect to heater	V_{kf}	max.	150	V
cathode positive with respect to heater	V_{kf}	max.	200	V
		+ max.	150	V_{RMS}

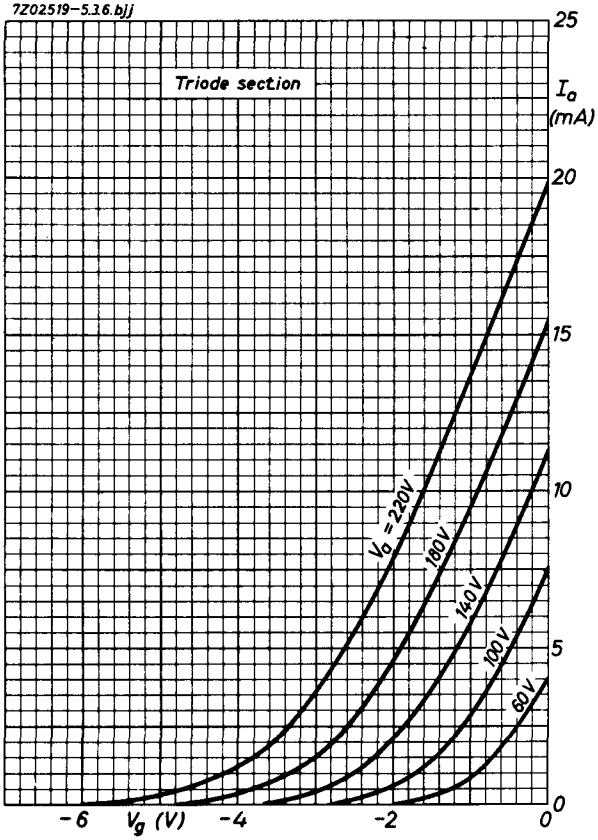
[1]) Max. pulse duration is 18 % of a cycle but max. 18 μsec.

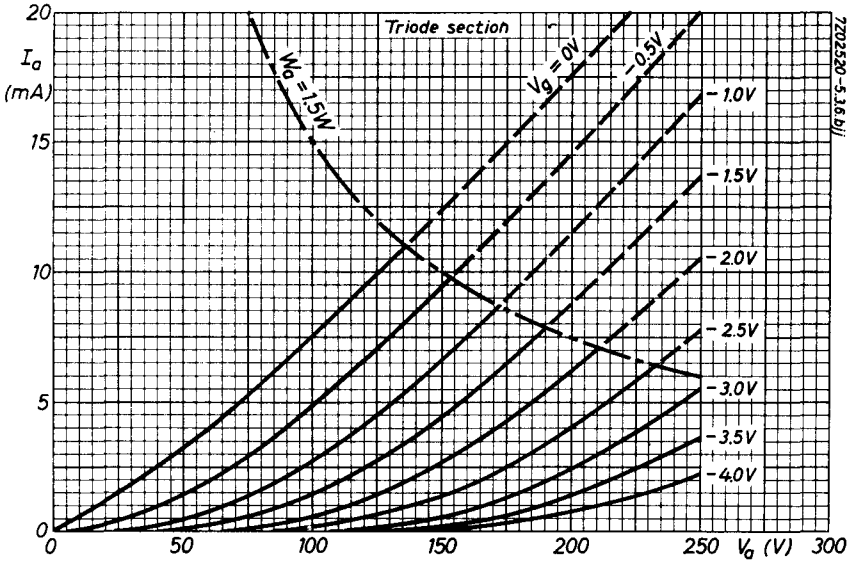

7Z02883-5.3.6.bij
Pentode section
V_a = 100-250V
V_{g3} = 0V
I_{g2} (mA)
14
12
10
8
6
4
2
0
V_{g2} = 160V
140V
120V
100V
80V
0
-1
-2
-3
-4
-5
V_{g1} (V)


7Z02513-5.3.6.bij
V_a = 100V-250V
V_{g3} = 0V
I_a (mA)
35
30
25
20
15
10
5
0
V_{g2} = 160V
140V
120V
100V
80V
S=20mA/V
18mA/V
16mA/V
14mA/V
12mA/V
10mA/V
8mA/V
6mA/V
4mA/V
0
-1
-2
-3
-4
-5
V_{g1} (V)


50
I_a
(mA)
40
30
20
10
0
0
50
100
150
200
250
300
350
V_a (V)
$W_a = 2.1W$
$V_{g1} = 0V$
$V_{g2} = 140V$
$V_{g3} = 0V$
−0.5V
−1.0V
−1.5V
−2.0V
−2.5V
−3.0V
7Z02517-5.3.6.b)j


15
I_{g2}
(mA)
10
5
0
0
50
100
150
200
250
V_{g2} (V)
$W_{g2} = 0.75W$
$V_{g1} = 0V$
−0.5V
−1V
−1.5V
−2V
−2.5V
−3V
−3.5V
V_a = 100−250V
V_{g3} = 0V
7Z04770-5.16.3.6.b)j


7Z02519-5.3.6.bjj
Triode section
I_a
(mA)
25
20
15
10
5
0
V_a = 220V
180V
140V
100V
60V
-6
V_g (V)
-4
-2
0


Triode section
I_a
(mA)
20
15
10
5
0
0
50
100
150
200
250
V_a (V)
300
W_a = 1.5W
V_g = 0V
−0.5V
−1.0V
−1.5V
−2.0V
−2.5V
−3.0V
−3.5V
−4.0V
7Z02520-S.16b/

PHILIPS

Data handbook

Electronic components and materials

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