

AIR COOLED R.F. POWER TRIODE

QUICK REFERENCE DATA								
Frequency (MHz)	C telegraphy		C anode mod.		C television Two tubes		AF class B Two tubes	
	V _a (kV)	W _o (kW)	V _a (kV)	W _o (kW)	V _a (kV)	W _o (kW)	V _a (kV)	W _o (kW)
30	4	4.0					6	13.3
	5	5.6						
	6	6.9						
75			5	4.7				
110	5	4.8	4	2.8				
220	3	2.65						
48 to 75					5	9.5		

HEATING: direct; filament thoriated tungsten

Filament voltage $V_f = 12.6 \text{ V}$

Filament current $I_f = 33 \text{ A}$

The connection f_c is intended for use as cathode return. It is not an electrical centre tap and must not be used for filament current supply. At frequencies above 30 MHz the three filament leads should be interconnected by suitable capacitors.

CAPACITANCES

Anode to filament $C_{af} = 0.3 \text{ pF}$

Grid to filament $C_{gf} = 16 \text{ pF}$

Anode to grid $C_{ag} = 11 \text{ pF}$

TYPICAL CHARACTERISTICS

Anode voltage $V_a = 4.0 \text{ kV}$

Anode current $I_a = 1.0 \text{ A}$

Amplification factor $\mu = 32$

Mutual conductance $S = 17 \text{ mA/V}$

TEMPERATURE LIMITS (Absolute limits)

Temperature of anode and grid seals t = max. 180 °C
 Temperature of pin seals t = max. 220 °C
 Air inlet temperature t_i = max. 45 °C

AIR COOLING CHARACTERISTICS

W _a (kW)	h (m)	t _i (°C)	q _{min} (m ³ /min)	P _i (mm H ₂ O)
1	0	35	3.0	8
	0	45	3.1	8
	1500	35	3.7	9
	3000	25	4.1	10
3	0	35	5.2	23
	0	45	6.1	29
	1500	35	6.2	26
	3000	25	6.6	26
5	0	35	9.2	68
	0	45	10.7	90
	1500	35	11.2	81
	3000	25	11.6	79

It may be necessary to direct an air flow to the seals to keep them within the temperature limits.

R.F. CLASS C TELEGRAPHY or F.M. TELEPHONY

LIMITING VALUES (Absolute limits)

Frequency	f	up to	75	110	220	MHz
Anode voltage	V_a	= max.	6.2	5.5	4.0	kV
Anode current	I_a	= max.	1.5	1.5	1.5	A
Anode input power	W_{ia}	= max.	9.3	8.2	6.0	kW
Anode dissipation	W_a	= max.	5.0	5.0	5.0	kW
Negative grid voltage	$-V_g$	= max.	1000	1000	1000	V
Grid current	I_g	= max.	350	350	350	mA

OPERATING CONDITIONS

Frequency	f	=	30	30	30	110	220 ¹⁾	MHz
Anode voltage	V_a	=	6.0	5.0	4.0	5.0	3.0	kV
Grid voltage	V_g	=	-400	-300	-200	-300	-160	V
Anode current	I_a	=	1.5	1.5	1.37	1.25	1.25	A
Grid current	I_g	=	310	330	300	300	250	mA
Driver output power	W_{dr}	=	275	240	190	250	510	W
Anode input power	W_{ia}	=	9.0	7.5	5.5	6.25	3.75	kW
Anode dissipation	W_a	=	2.1	1.9	1.5	1.45	1.6	kW
Output power	W_o	=	6.9	5.6	4.0	4.8	2.65	kW
Tube efficiency	η	=	76.5	75	73	77	70	%
Output power in the load	W_l	=	5.5	4.5	3.2	3.9	2.15	kW

¹⁾ In grounded grid circuit

R.F. CLASS C ANODE MODULATION

LIMITING VALUES (Absolute limits)

Frequency	f	up to	75	110	220	MHz
Anode voltage	V_a	= max.	5.0	4.5	3.2	kV
Anode current	I_a	= max.	1.3	1.3	1.3	A
Anode input power	W_{i_a}	= max.	6.5	5.8	4.0	kW
Anode dissipation	W_a	= max.	3.4	3.4	3.4	kW
Negative grid voltage	$-V_g$	= max.	1000	1000	1000	V
Grid current	I_g	= max.	350	350	350	mA

OPERATING CONDITIONS

Frequency	f	=	75	110	MHz
Anode voltage	V_a	=	5.0	4.0	kV
Grid voltage	V_g	=	-400	-350	V
Anode current	I_a	=	1.2	0.93	A
Grid current	I_g	=	300	240	mA
Driver output power	W_{dr}	=	205	130	W
Anode input power	W_{i_a}	=	6.0	3.72	kW
Anode dissipation	W_a	=	1.3	0.92	kW
Output power	W_o	=	4.7	2.8	kW
Tube efficiency	η	=	78.5	75	%
Output power in the load	W_ℓ	=	3.75	2.25	kW
Modulation depth	m	=	100	100	%
Modulation power	W_{mod}	=	2.4	1.4	kW

R.F. CLASS C AMPLIFIER FOR TELEVISION SERVICE ; negative modulation, positive synchronisation

LIMITING VALUES (Absolute limits)

Frequency	f	up to 75	up to 220 MHz
Anode voltage	V_a	= max. 5.0	max. 4.0 kV
Anode current	I_a sync	= max. 2.0	max. 1.6 A
Anode input power	W_{i_a}	= max. 10	max. 6.4 kW
Anode dissipation	W_a sync	= max. 4.0	max. 4.0 kW
Negative grid voltage	$-V_g$ sync	= max. 1000	max. 1000 V
Grid dissipation	W_g sync	= max. 120	max. 120 W

OPERATING CONDITIONS (Two tubes in push-pull, common cathode bias modulated)

Frequency	f	= 48 to 75 MHz
Bandwidth (- 3 dB)	B	= 8.0 MHz
Anode voltage	V_a	= 5.0 kV
Grid voltage	V_g sync	= -200 V
	V_g black	= -300 V
	V_g white	= -550 V
Anode current	I_a sync	= 2x1.9 A
	I_a black	= 2x1.3 A
Grid current	I_g sync	= 2x250 mA
	I_g black	= 2x175 mA
Driver output power	W_{dr} sync	= 250 W
Output power	W_o sync	= 9.5 kW
Output power in the load	W_l sync	= 6.3 kW

A.F. CLASS B AMPLIFIER AND MODULATOR

LIMITING VALUES (Absolute limits)

Anode voltage	V_a	=	max.	6.0	kV
Anode current	I_a	=	max.	1.8	A
Anode input power	W_{i_a}	=	max.	10.5	kW
Anode dissipation	W_a	=	max.	5.0	kW

OPERATING CONDITIONS (Two tubes in push-pull)

Anode voltage	V_a	=	6.0	kV	
Grid voltage	V_g	=	-165	V ¹⁾	
Load resistance	$R_{aa\sim}$	=	4.9	k Ω	
Grid driving voltage	V_{gg}	=	0	645	V(RMS)
Anode current	I_a	=	2x125	2x1500	mA
Grid current	I_g	=	0	2x280	mA
Driving power	W_{dr}	=	0	2x115	W
Anode input power	W_{i_a}	=	2x0.75	2x9.0	kW
Anode dissipation	W_a	=	2x0.75	2x2.35	kW
Output power	W_o	=	0	13.3	kW
Efficiency	η	=	-	74	%
Total harmonic distortion	d_{tot}	=	-	4.3	%

¹⁾ To be adjusted for zero signal anode current of 125 mA.





