



R.F. POWER TETRODE

Service Type CV5959

The data should be read in conjunction with the Power Tetrode Preamble.

ABRIDGED DATA

V.H.F. radial beam tetrode for amplifier, oscillator or modulator applications.

Anode dissipation	400	W max
Anode voltage	4.0	kV max
Frequency for full ratings	110	MHz max
Output power (class C unmodulated conditions)	1.1	kW

GENERAL

Electrical

Filament	thoriated tungsten
Filament voltage	5.0 V
Filament current	14.5 A
Peak usable cathode current	2.2 A
Perveance	0.65 mA/V ^{3/2}
Grid-screen amplification factor ($V_a = 2.5\text{kV}$, $V_{g2} = 500\text{V}$, $I_a = 100\text{mA}$)	5.1
Mutual conductance ($V_a = 2.5\text{kV}$, $V_{g2} = 500\text{V}$, $I_a = 100\text{mA}$)	4.0 mA/V
Inter-electrode capacitances:	
input	12.7 pF
output	4.9 pF
grid to anode	0.12 pF

Mechanical

Overall length	151mm (5.944 inches) max
Overall diameter	87mm (3.425 inches) max
Net weight	230g (8 ounces) approx
Mounting position	vertical, base up or down
Base	B.S.448-B5F

COOLING

An adequate flow of air must be provided to maintain the temperatures of the glass to metal seals and the envelope below the maximum values given below.

Where the anode dissipation is less than 250W, an air flow of at least 5ft³/min (0.14m³/min) should be directed at the valve base. Up to 14ft³/min (0.4m³/min) will be required when the anode dissipation exceeds 150W and a glass chimney should be used in order to assist circulation.

Anode seal temperature	220	°C max
Base pin seal temperature	180	°C max
Bulb temperature	350	°C max

A heat dissipating anode connector of large surface area is necessary.

AUDIO FREQUENCY POWER AMPLIFIER OR MODULATOR (Class AB)

MAXIMUM RATINGS (Absolute values)

Anode voltage	4.0	kV max
Anode dissipation	400	W max
Screen voltage	800	V max
Screen dissipation	35	W max
Grid voltage (negative value)	500	V max
Grid dissipation	10	W max
Grid to filament resistance	250	kΩ max
Cathode current (mean)	400	mA max

TYPICAL OPERATING CONDITIONS

(Class AB without grid current, 2 valves)

Anode voltage	3.0	3.5	4.0	kV
Screen voltage	750	750	750	V
Grid voltage	-137	-145	-150	V
Peak a.f. input voltage (grid to grid)	275	290	300	V
Maximum-signal anode current	2 x 318	2 x 305	2 x 292	mA
Zero-signal anode current	2 x 80	2 x 70	2 x 60	mA
Maximum-signal screen current	2 x 13	2 x 16	2 x 20	mA
Effective load (anode to anode)	8.9	11.5	14.5	kΩ
Anode dissipation	2 x 400	2 x 400	2 x 400	W
Output power	1.11	1.33	1.54	kW
Efficiency	58	62	66	%

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TYPICAL OPERATING CONDITIONS (Class AB with grid current, 2 valves)

Anode voltage	3.0	3.5	4.0	kV
Screen voltage	500	500	500	V
Grid voltage	-80	-85	-90	V
Peak a.f. input voltage (grid to grid)	290	304	304	V
Maximum-signal anode current	2 x 350	2 x 350	2 x 319	mA
Zero-signal anode current	2 x 90	2 x 80	2 x 80	mA
Maximum-signal screen current	2 x 20	2 x 19	2 x 16	mA
Grid current	2 x 3.0	2 x 3.0	2 x 3.0	mA
Effective load (anode to anode)	10	11.3	15	k Ω
Anode dissipation	2 x 362	2 x 400	2 x 400	W
Nominal driving power	2 x 4.5	2 x 5.0	2 x 3.5	W
Output power	1.375	1.65	1.75	kW
Efficiency	65	67	69	%

ANODE AND SCREEN MODULATED R.F. POWER AMPLIFIER

(Class C telephony, carrier conditions per valve for use with a maximum modulation factor of 1.0)

MAXIMUM RATINGS (Absolute values)

Anode voltage	3.2	kV max
Anode dissipation	270	W max
Screen voltage	600	V max
Screen dissipation	35	W max
Grid voltage (negative value)	500	V max
Grid dissipation	10	W max
Grid to filament resistance	50	k Ω max
Cathode current (mean)	330	mA max
Frequency for above ratings	75	MHz max

TYPICAL OPERATING CONDITIONS (for frequencies up to 75MHz)

Anode voltage	2.0	2.5	3.0	kV
Screen voltage	500	500	500	V
Grid voltage	-220	-220	-220	V
Peak r.f. grid voltage	305	305	305	V
Peak screen modulating voltage (modulation factor 1.0)	400	400	400	V
Anode current	275	275	275	mA
Screen current	30	28	26	mA
Grid current	6.0	6.0	6.0	mA
Anode dissipation	170	178	195	W
Screen dissipation	15	14	13	W
Nominal driving power	3.5	3.5	3.5	W
Output power	380	510	630	W
Efficiency	69	74	76	%

R.F. POWER AMPLIFIER OR OSCILLATOR**(Class C telegraphy, key-down conditions, one valve)****MAXIMUM RATINGS (Absolute values)**

Anode voltage	4.0	kV max
Anode dissipation	400	W max
Screen voltage	600	V max
Screen dissipation	35	W max
Grid voltage (negative value)	500	V max
Grid dissipation	10	W max
Grid to filament resistance	50	k Ω max
Cathode current (mean)	420	mA max
Frequency for above ratings	110	MHz max

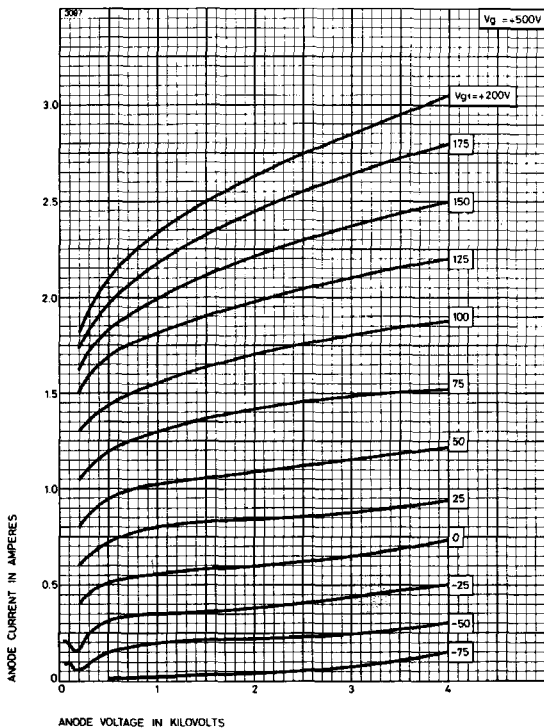
TYPICAL OPERATING CONDITIONS

Frequency	<75	<75	<75	MHz
Anode voltage	2.5	3.0	4.0	kV
Screen voltage	500	500	500	V
Grid voltage	-200	-220	-220	V
Peak r.f. grid voltage	290	305	305	V
Anode current	350	350	350	mA
Screen current	46	46	40	mA
Grid current	6.5	6.0	6.0	mA
Anode dissipation	235	250	300	W
Screen dissipation	17.5	15	12.5	W
Nominal driving power	12	12	12	W
Output power	640	800	1100	W
Efficiency	73	76	79	%

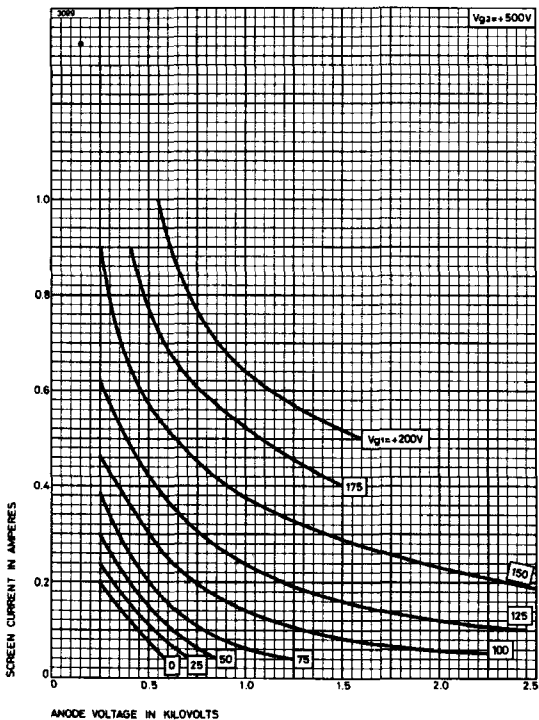
TYPICAL OPERATING CONDITIONS

Frequency	100	100	MHz
Anode voltage	3.5	4.0	kV
Screen voltage	500	500	V
Grid voltage	-170	-170	V
Peak r.f. grid voltage	235	240	V
Anode current	250	270	mA
Screen current	17	15.5	mA
Grid current	9.0	10	mA
Anode dissipation	225	280	W
Screen dissipation	30	30	W
Nominal driving power	20	20	W
Output power	650	800	W
Efficiency	74	74	%

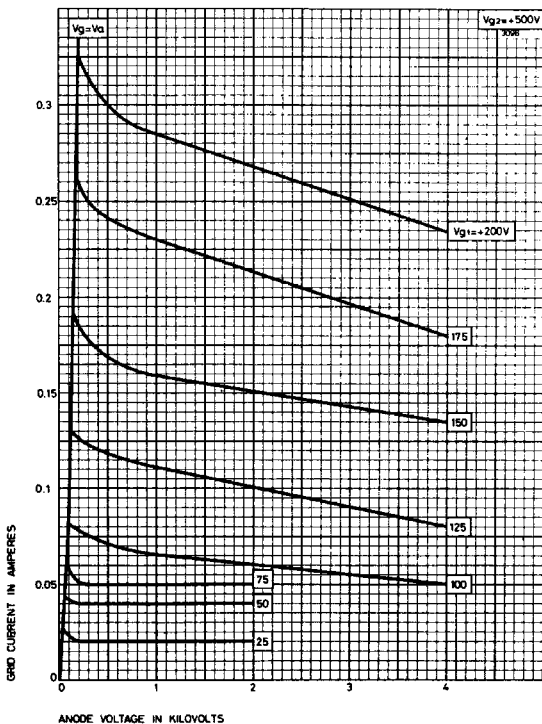
TYPICAL ANODE CHARACTERISTICS



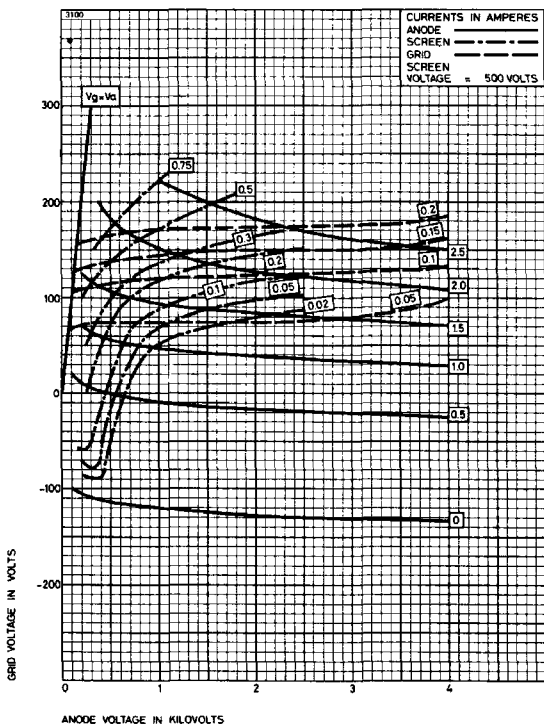
TYPICAL SCREEN CHARACTERISTICS



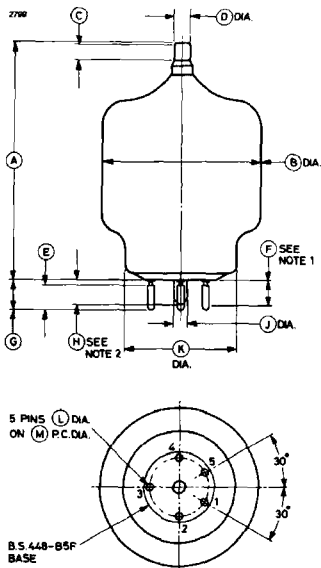
TYPICAL GRID CHARACTERISTICS



TYPICAL CONSTANT CURRENT CHARACTERISTICS



OUTLINE



Outline Notes

1. Limit of parallel portion of pins.
2. Seal-off length.

Pin	Element
1	Filament
2	Screen
3	Grid
4	Screen
5	Filament
Cap	Anode

Ref	Millimetres	Inches	Ref	Millimetres	Inches
A	127.0 $\pm$ 6.0	5.000 $\pm$ 0.236	G	18.00 max	0.708 max
B	87.00 max	3.425 max	H	15.00 max	0.590 max
C	9.00 min	0.354 min	J	7.50 max	0.295 max
D	9.00 $\pm$ 0.13	0.354 $\pm$ 0.005	K	62.00 max	2.440 max
E	14.94 $\pm$ 0.25	0.588 $\pm$ 0.010	L	4.750 $\pm$ 0.076	0.187 $\pm$ 0.003
F	15.00 min	0.590 min	M	31.75	1.250 —

Inch dimensions have been derived from millimetres.