C1134

BEAM POWER DOUBLE TETRODE

Service Type CV2799

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

ABRIDGED DATA

V.H.F. double tetrode, with centre-tapped heater for series or parallel operation.

Anode dissipation	2 x 10	W max
Anode voltage	600	V max
Frequency for full ratings	150	MHz max
Frequency at reduced ratings	600	MHz max
Output power (class C telegraphy, 2 sections in push-pull)	48	W

GENERAL

Electrical

Cathode . . . . . indirectly heated, oxide coated

	Series	Parallel	
Heater voltage	12.6	6.3	V
Heater current	0.65	1.3	A
Grid-screen amplification factor (each unit) (I_a = 20mA)		8.0	
Mutual conductance (each unit) (I_a = 20mA)		2.5	mA/V
Inter-electrode capacitances (see note 1):			
grid to anode*		0.04	pF
input		7.5	pF
output		2.6	pF
input (two sections in push-pull)		4.4	pF
output (two sections in push-pull)		1.6	pF

* Internally neutralized for push-pull operation.

Mechanical

Overall length	86mm (3.38 inches) max
Overall diameter	46mm (1.81 inches) max
Net weight	2 ounces (60g) approx
Mounting position	vertical, base up or down

Horizontal operation is permitted with fixed station operation when the anode pins are in a horizontal plane.

Base . . . . . B.S.448-B7A (JEDEC no. E7-2)

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COOLING

The temperature of the seals must not exceed the values given below:

Anode seal or bulb temperature	200	°C max
Base pin seal temperature	180	°C max

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

Natural cooling is normally sufficient at maximum ratings for frequencies up to 150MHz. At higher frequencies it may be necessary to direct an air flow of up to $5ft^3$/min ($0.14m^3$/min) on to the anode and base seals.

AUDIO FREQUENCY POWER AMPLIFIER AND MODULATOR (Class B)

MAXIMUM RATINGS (Absolute values)

Anode voltage	600	V max
Anode dissipation	2 x 10	W max
Screen voltage	300	V max
Screen input power	2 x 1.5	W max
Grid voltage (negative value)	75	V max
Grid dissipation	2 x 0.5	W max
Grid resistor (fixed bias)	50	kΩ max
Grid resistor (cathode bias)	100	kΩ max
Cathode current (peak)	2 x 120	mA max
Cathode current (mean)	2 x 55	mA max
Peak heater to cathode voltage	100	V max

TYPICAL OPERATING CONDITIONS (Class B, 2 valves)

Anode voltage	300	500	V
Screen voltage	250	250	V
Grid voltage	−25	−26	V
Peak a.f. input voltage (grid to grid)	49	52	V
Effective load (anode to anode)	11	20	kΩ
Maximum-signal anode current	2 x 35	2 x 36.5	mA
Zero-signal anode current	2 x 12.5	2 x 12.5	mA
Maximum-signal screen current	2 x 9.5	2 x 8.1	mA
Zero-signal screen current	2 x 0.6	2 x 0.35	mA
Anode dissipation	2 x 3.9	2 x 6.5	W
Output power	13.2	23.5	W
Efficiency	63	64.5	%
Total distortion	3.5	3.5	%

PUSH-PULL R.F. POWER AMPLIFIER AND OSCILLATOR
(Class C telegraphy, key-down conditions, one valve)

MAXIMUM RATINGS (Absolute values)

Anode voltage	600	V max
Anode dissipation	2 x 10	W max
Screen voltage	300	V max
Screen input power	2 x 1.5	W max
Grid voltage (negative value)	75	V max
Grid current	2 x 2.5	mA max
Grid resistor (fixed bias)	50	kΩ max
Grid resistor (cathode bias)	100	kΩ max
Cathode current (mean)	2 x 55	mA max
Cathode current (peak)	2 x 260	mA max
Peak heater to cathode voltage	100	V max

TYPICAL OPERATING CONDITIONS

Frequency	**200**	**200**	**200**	**200**	**MHz**
Anode voltage	200	300	400	600	V
Screen voltage (see note 2)	200	250	250	250	V
Grid voltage	−30	−40	−50	−60	V
Anode current	2 x 50	2 x 50	2 x 50	2 x 50	mA
Screen current	2 x 4.0	2 x 4.5	2 x 4.0	2 x 4.0	mA
Grid current (approx)	2 x 1.0	2 x 0.7	2 x 0.7	2 x 0.7	mA
Driving power (approx)	<1.0	<1.0	1.0	1.5	W
Output power	13	21	30	48	W

Frequency	**400**	**400**	**400**	**600**	**MHz**
Anode voltage	200	300	400	400	V
Screen voltage (see note 2)	200	250	250	250	V
Grid voltage	−30	−40	−50	−50	V
Anode current	2 x 50	2 x 50	2 x 50	2 x 50	mA
Screen current	2 x 3.0	2 x 2.5	2 x 2.5	2 x 2.5	mA
Grid current (approx)	2 x 0.5	2 x 0.6	2 x 0.7	2 x 0.7	mA
Driving power (approx)	1.0	1.5	2.0	6.0	W
Output power	11	17	25	20	W

FREQUENCY TREBLER

TYPICAL OPERATING CONDITIONS

Output frequency	**200**	**400**	**MHz**
Anode voltage	300	300	V
Screen voltage	250	250	V
Grid voltage	−175	−175	V
Anode current	2 x 45	2 x 45	mA
Screen current	2 x 3.0	2 x 2.8	mA
Grid current (approx)	2 x 1.5	2 x 1.2	mA
Driving power (approx)	4.0	5.0	W
Output power	10	8.0	W

R.F. POWER AMPLIFIER – ANODE AND SCREEN MODULATED

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

MAXIMUM RATINGS (Absolute values)

Anode voltage	600	V max
Anode dissipation	2 x 6.7	W max
Screen voltage	300	V max
Screen input power	2 x 1.2	W max
Grid voltage (negative value)	100	V max
Grid current	2 x 2.5	mA max
Grid dissipation	2 x 0.5	W max
Cathode current (peak)	2 x 400	mA max
Cathode current (mean)	2 x 50	mA max
Peak heater to cathode voltage	100	V max

TYPICAL OPERATING CONDITIONS

Frequency	**200**	**200**	**200**	**400**	**MHz**
Anode voltage	300	500	600	300	V
Screen voltage	250	250	250	250	V
Grid voltage	−50	−80	−80	−50	V
Anode current	2 x 40	2 x 40	2 x 40	2 x 40	mA
Screen current	2 x 4.0	2 x 4.0	2 x 4.0	2 x 3.0	mA
Grid current (approx)	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	mA
Driving power (approx)	1.5	3.0	3.0	2.5	W
Anode dissipation	2 x 3.5	2 x 4.0	2 x 5.0	2 x 4.5	W
Output power	17	31	38	15	W
Efficiency	71	78	79	63	%

MAXIMUM ANODE VOLTAGE AGAINST FREQUENCY

Natural Cooling

Operating frequency (MHz)	Max. anode voltage c.w. (V)	Max. anode voltage with anode modulation (V)
150	600	600
200	500	500
450	300	300
600	250	250

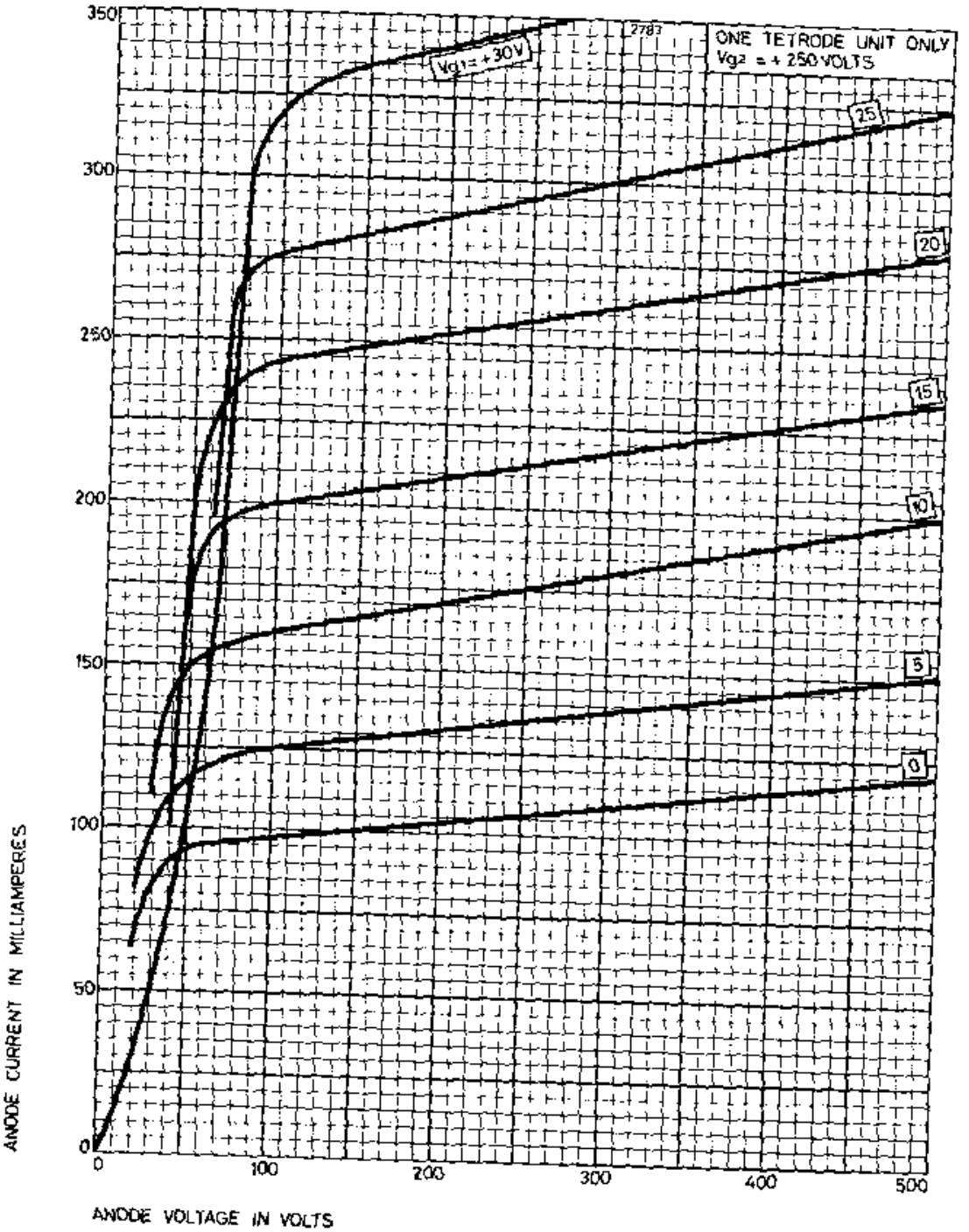
Forced-air Cooling

Operating frequency (MHz)	Max. anode voltage c.w. (V)	Max. anode voltage with anode modulation (V)
250		600
300	600	
600	400	400

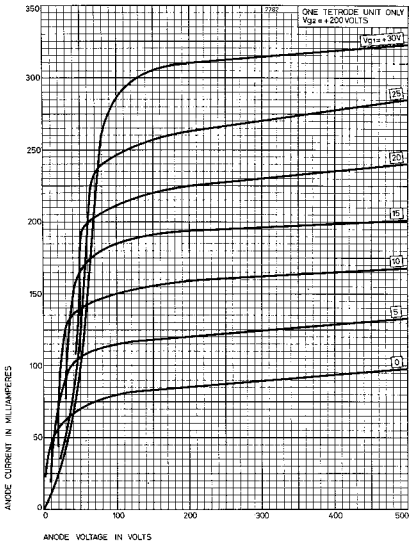
NOTES

1. Inter-electrode capacitances are for each unit except where otherwise indicated.
2. The screen voltage may be obtained from a separate source, or from the anode supply with a potential divider or through a series resistor. The screen voltage must not exceed 600V under key-up conditions.

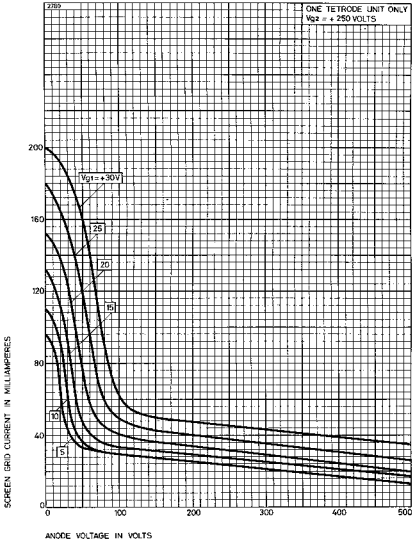
TYPICAL ANODE CHARACTERISTICS



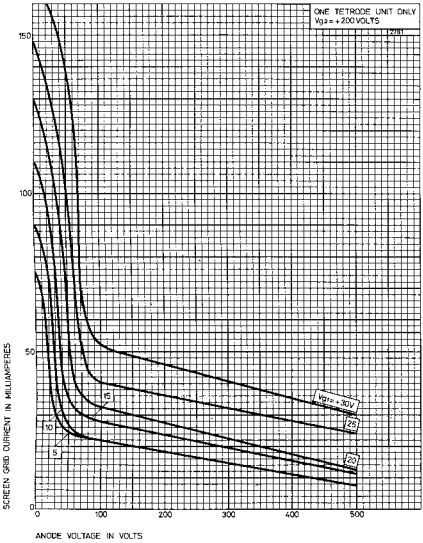
TYPICAL ANODE CHARACTERISTICS



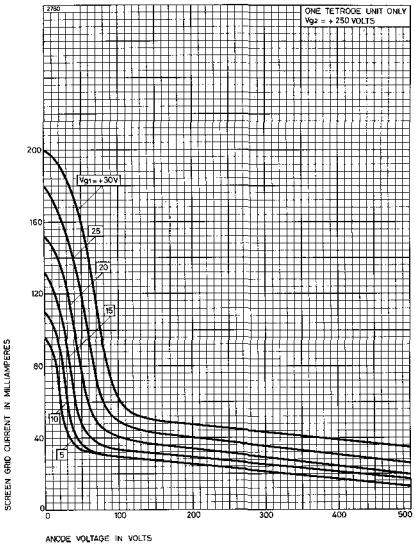
TYPICAL SCREEN CHARACTERISTICS



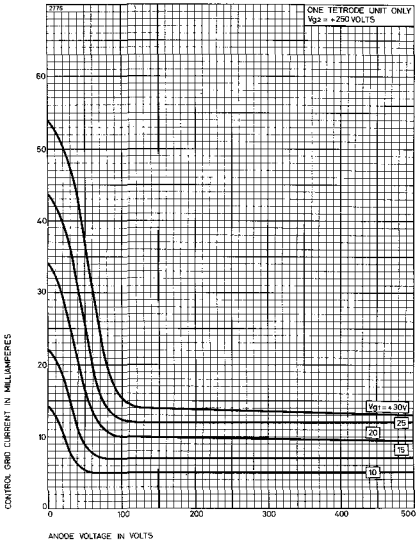
TYPICAL SCREEN CHARACTERISTICS



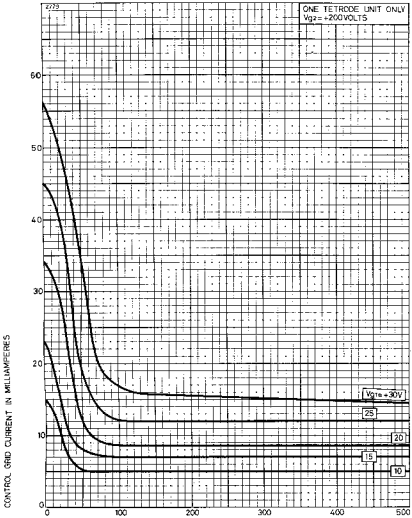
TYPICAL SCREEN CHARACTERISTICS



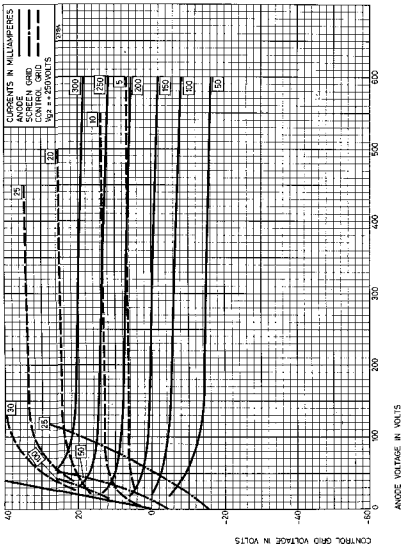
TYPICAL GRID CHARACTERISTICS



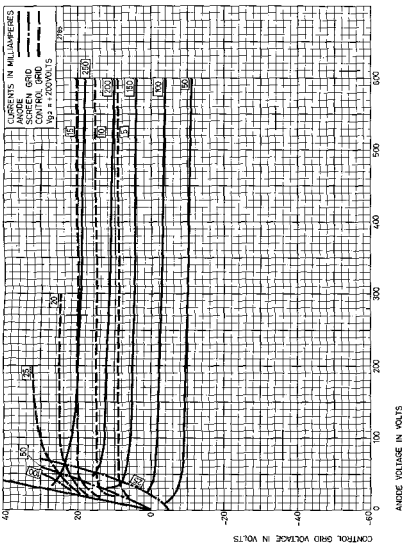
TYPICAL GRID CHARACTERISTICS



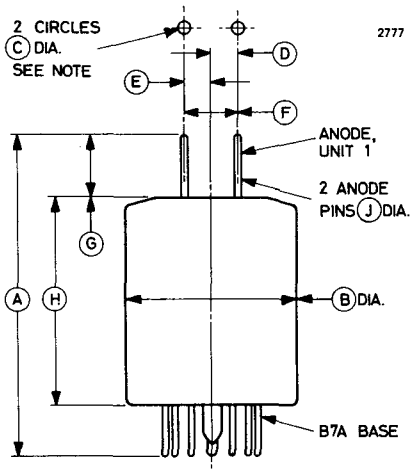
TYPICAL CONSTANT CURRENT CHARACTERISTICS

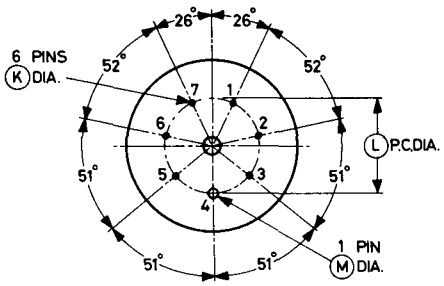


TYPICAL CONSTANT CURRENT CHARACTERISTICS



OUTLINE (All dimensions without limits are nominal)





Pin	Element
1	Heater
2	Grid, unit 1
3	Screen, common
4	Cathode, beam plates, shield
5	Heater centre tap
6	Grid, unit 2
7	Heater

Note The location of the anode pins will be within the two circles.

Ref	Millimetres	Inches	Ref	Millimetres	Inches
A	85.5 *max*	3.366 *max*	H	55.0 *max*	2.165 *max*
B	46.0 max	1.811 max	J	2.0	0.079
C	3.6	0.142	K*	$1.473^{+0.051}_{-0.152}$	$0.058^{+0.002}_{-0.006}$
D	7.0	0.276			
E	7.0	0.276	L*	25.4	1.000
F	14.0 ± 1.0	0.550 ± 0.040	M*	3.175 ± 0.076	0.125 ± 0.003
G	16.5 ± 1.5	0.650 ± 0.059			

Inch dimensions have been derived from millimetres except where marked *.