TECHNICAL DATA

7855
7855K

HIGH-MU
PLANAR TRIODE

The EIMAC 7855 and 7855K are ruggedized high-mu planar triodes of ceramic/metal construction, designed for grid pulsed, plate pulsed and CW operation in amplifiers, oscillators and frequency multipliers from low frequency to 3 GHz. The 7855 is supplied with a radiator for forced air cooling and the 7855K without radiator for conduction and convection cooling. Except for plate dissipation ratings, the characteristics of the two tubes are the same. In addition to the low interelectrode capacitances and high transconductance these tubes exhibit special design features such as a frequency stable anode and an arc resistant cathode to assure stable operation under adverse conditions and to minimize catastrophic failure due to arc over during a circuit malfunction.

7855K 7855

GENERAL CHARACTERISTICS[1]

ELECTRICAL

Cathode: Oxide Coated, Unipotential	
Heater: Voltage	6.0 ± 0.3 V
Current, at 6.0 volts	1.00 A
Transconductance (Average):	
I_b = 70 mA	25 mmhos
Amplification Factor (Average):	80
Direct Interelectrode Capacitances (Grounded Cathode)[2]	
Cin	6.8 pF
Cout	0.04 pF
Cgp	2.50 pF
Cut-off Bias[3]	-30 V max.

1. Characteristics and operating values are based upon performance tests. These figures may change without notice as the result of additional data or product refinement. EIMAC Division of Varian should be consulted before using this information for final equipment design.
2. Capacitance values for a cold tube as measured in a special shielded fixture in accordance with Electronic Industries Association Standard RS-191.
3. Measured with one milliampere plate current and a plate voltage of 1 kVdc.

MECHANICAL

Maximum Overall Dimensions:	
Length	2.39 in; 60.60 mm
Diameter	1.27 in; 32.20 mm
Net Weight (7855)	57 gm
(7855K)	40 gm
Operating Position	Any

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Maximum Operating Temperature:
- Ceramic/Metal Seals . . . . . 250°C
- Anode Core . . . . . 250°C

Cooling (7855) . . . . . Forced air
(7855K) . . . . . Conduction, convection
Terminals . . . . . Coaxial, special

ENVIRONMENTAL

Shock, 11 ms, non-operating	60 G
Vibration, operating, all axes 55 to 500 Hz	10 G
Altitude, max (in a suitably designed circuit)	50,000 ft.

GRID PULSED OR PLATE PULSED AMPLIFIER OR OSCILLATOR

MAXIMUM RATINGS/ABSOLUTE VALUES

DC PLATE VOLTAGE (grid pulsed)	2500	VOLTS
PEAK PULSE PLATE VOLTAGE (plate pulsed)	3500	VOLTS
DC GRID VOLTAGE	-150	VOLTS
INSTANTANEOUS PEAK GRID CATHODE VOLTAGE		
Grid negative to cathode	-700	VOLTS
Grid positive to cathode	250	VOLTS
PULSE PLATE CURRENT	3.0	AMPERES
PULSE GRID CURRENT	1.8	AMPERES
PLATE DISSIPATION (7855)	100	WATTS
(7855K)	10	WATTS
GRID DISSIPATION	2.0	WATTS
FREQUENCY	3.0	GIGAHERTZ
PULSE DURATION[1]	6	μsec
DUTY FACTOR[1]	.0033	

TYPICAL OPERATION Grid Pulsed Oscillator, Representative Application

Plate Voltage	2000	Vdc
Grid Voltage	-75	Vdc
Heater Voltage	5.7	V
Peak Video Plate Current	1.3	a
Peak Video Grid Current	0.8	a
Useful Power Output (approx.)	750	w
Frequency	1.090	GHz
Pulse Duration	0.5	μs
Duty Factor	.001	

PULSE MODULATOR OR PULSE AMPLIFIER SERVICE

MAXIMUM RATINGS/ABSOLUTE VALUES

DC PLATE VOLTAGE	2500	VOLTS
PEAK PLATE VOLTAGE	3500	VOLTS
DC GRID VOLTAGE	-150	VOLTS
INSTANTANEOUS PEAK GRID-CATHODE VOLTAGE		
Grid negative to cathode	-750	VOLTS
Grid positive to cathode	150	VOLTS
PULSE CATHODE CURRENT	4.8	AMPERES
DC PLATE CURRENT	100	MILLIAMPERES
PLATE DISSIPATION (7855)	100	WATTS
(7855K)	10	WATTS
GRID DISSIPATION	1.5	WATTS
PULSE DURATION[1]	6	μs
DUTY FACTOR[1]	.0033	
CUT-OFF MU	60	

1. For application requiring longer pulse duration and/or higher duty cycle consult the nearest Varian Electron Tube and Device Field Office, or the Product Manager Eimac-Division of Varian, Salt Lake City, Utah.

RANGE VALUES FOR EQUIPMENT DESIGN

	Min.	Max.	
Heater: Current at 6.0 volts	0.90	1.05	A
Cathode Heating Time	60	---	sec.
Interelectrode Capacitances [1] (grounded cathode connection)			
Cin	6.00	7.50	pF
Cout	---	0.04	pF
Cgp	2.35	2.65	pF

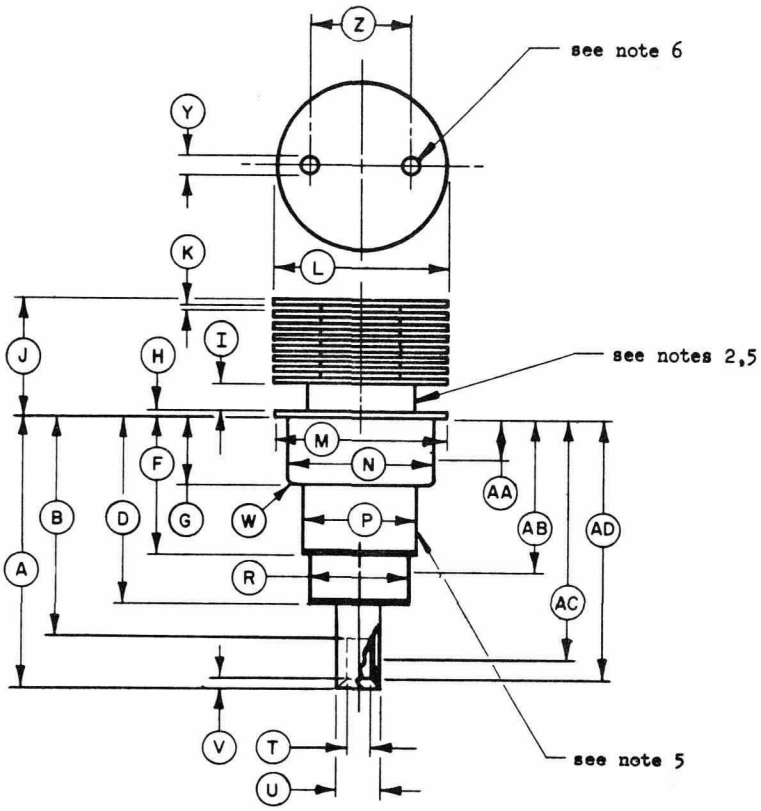
1. Capacitance values for a cold tube as measured in a special shielded fixture. When the cathode is heated to the proper temperature, the grid-cathode capacitance will increase from the cold value by approximately 1 pF due to thermal expansion of the cathode.

APPLICATION

For operating information refer to EIMAC bulletin #15, "Operating Instruction for Planar Triodes."

ELECTRODE CONTACT DIMS. (see note 7)				
Dim. in Inches		Dim.	Dim. in Millim.	
Min.	Max.		Min.	Max.
.035	.361	AA	.89	9.17
1.021	1.101	AB	25.93	27.97
1.219	1.413	AC	30.96	35.89
1.160	1.500	AD	29.46	38.10

DIMENSIONAL DATA					
Dim. in Inches			Dim. in Millimeters		
Min.	Max.	Dim.	MIN.	MAX.	
1.500	1.560	A	38.10	39.62	
	1.214	B		30.84	
1.125	1.165	D	28.58	29.59	
.800	.840	F	20.32	21.34	
.462	.477	G	11.73	12.12	
	.040	H		1.02	
.125	.185	I	3.18	4.70	
.766	.826	J	19.46	20.98	
.025	.046	K	.64	1.17	
1.234	1.264	L	31.34	32.11	
1.180	1.195	M	29.97	30.35	
1.025	1.035	N	26.04	26.29	
.752	.792	P	19.10	20.12	
.655	.665	R	16.64	16.89	
.213	.223	T	5.41	5.66	
.315	.325	U	8.00	8.26	
	.086	V		2.18	
	.100	W		2.54	
.105	.145	Y	2.67	3.68	
.650	.850	Z	16.51	21.59	



7855

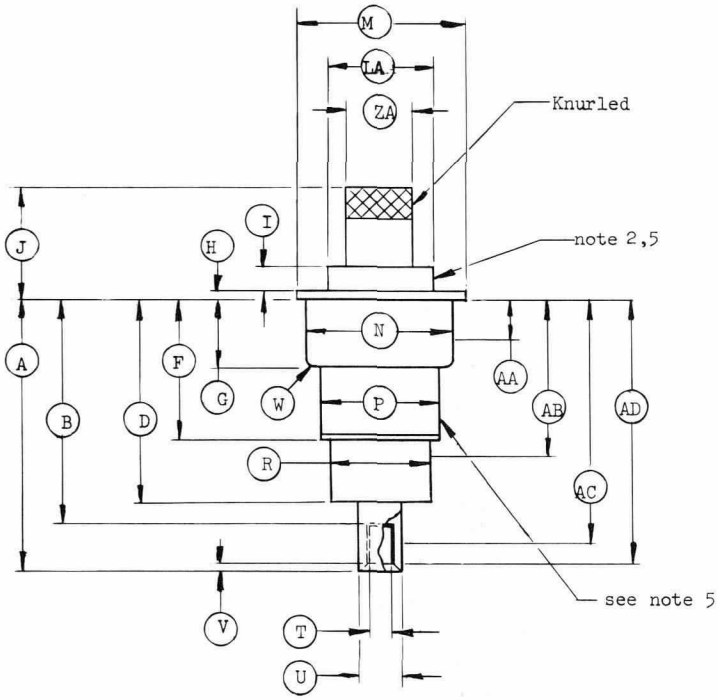
NOTES:
1. Metric equivalents, to the nearest .01 mm, are given for general information only & are based on 1 inch = 25.4 mm.
2. This surface to be used to measure anode shank temperature.
3. Eccentricity of contact surfaces shall be gaged from center line of reference & shall be as follows:

Contact Surface	TIR Max.	Reference
Anode	.020	Cathode
Grid	.020	Cathode
Heater	.012	Cathode

4. Dias. N,R,T & U shall apply throughout entire lenght as defined by dims. AA,AB,AC,AD respectively.
5. This surface shall not be used for clamping or locating.
6. Holes for extractor thru top fin only.
7. Electrode Contact dims. are for socket design purposes & are not intended for inspection purposes.

ELECTRODE CONTACT AREA (see note 6)				
Dim. in Millimeters		Dim.	Dim. in Inches	
Min.	Max.		Min.	Max.
.89	9.17	AA	.035	.361
25.93	27.97	AB	1.021	1.101
30.96	35.89	AC	1.219	1.413
29.46	38.10	AD	1.160	1.500

DIMENSIONAL DATA				
Dim. in Inches		Dim. in Millimetres		
Min.	Max.	Dim.	MIN.	MAX.
1.500	1.560	A	38.10	39.62
	1.215	B		30.84
1.125	1.165	D	28.58	29.59
.800	.840	F	20.32	21.34
.462	.477	G	11.73	12.12
	.040	H		1.02
	.185	I		4.70
.766	.826	J	19.46	20.98
.025	.046	K	.64	1.17
1.234	1.264	L	31.34	32.11
1.180	1.195	M	29.97	30.35
1.025	1.035	N	26.04	26.29
.752	.792	P	19.10	20.12
.655	.665	R	16.64	16.89
.213	.223	T	5.41	5.66
.315	.325	U	8.00	8.26
	.086	V		2.18
	.100	W		2.54
.840	.860	LA	21.34	21.84
.427	.447	ZA	10.85	11.35



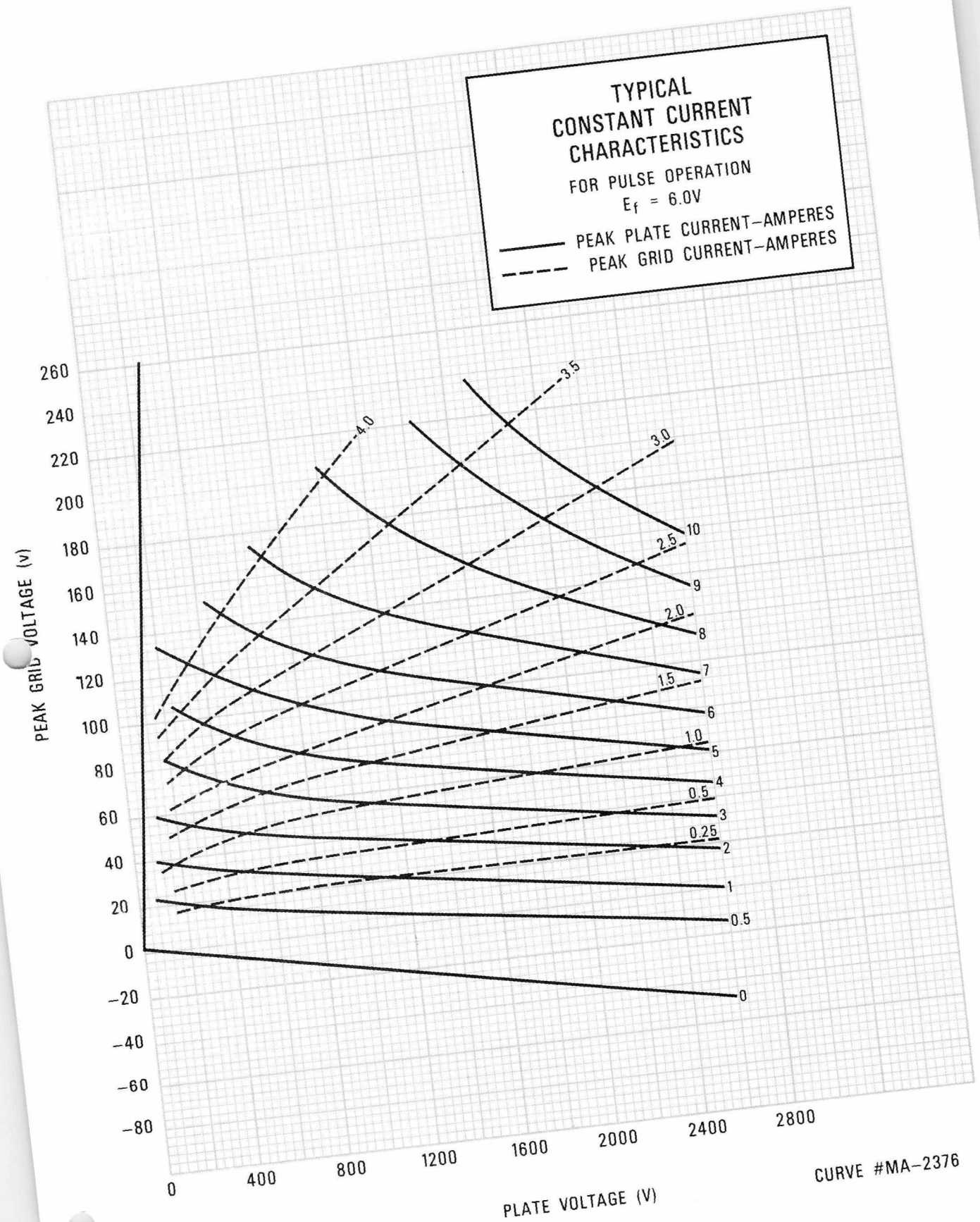
7855K

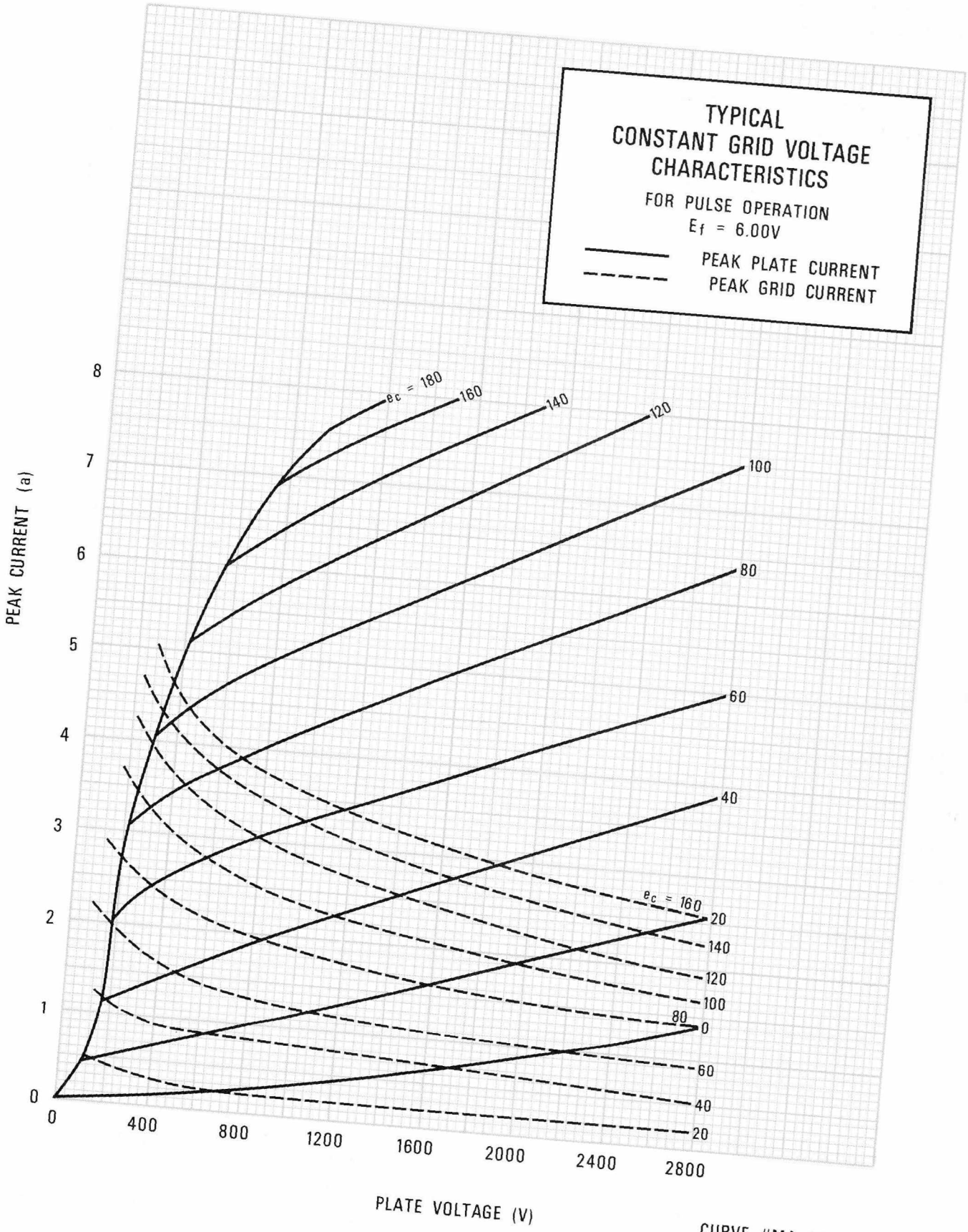
NOTES:

1. Metric equivalents to the nearest .01mm, are given for general information only & are based on 1 inch= 25.4 mm.
2. This surface shall be used to measure Anode shank temperature.
3. Eccentricity of contact surfaces shall be gaged from center line of reference & shall be as follows:

Contact Surface	TIR Max.	Reference
Anode	.020	Cathode
Grid	.020	Cathode
Heater	.012	Cathode

4. Dias. N,R,T,U shall apply throughout entire lenght as defined by dims. AA,AB,AC,AD respectively.
5. This surface shall not be used for clamping or locating.
6. Electrode Contact Dims. are intended for socket design only & are not intended for inspection purposes.


TYPICAL
CONSTANT CURRENT
CHARACTERISTICS
FOR PULSE OPERATION
E_f = 6.0V
PEAK PLATE CURRENT–AMPERES
PEAK GRID CURRENT–AMPERES
PEAK GRID VOLTAGE (V)
260
240
220
200
180
160
140
120
100
80
60
40
20
0
–20
–40
–60
–80
0
400
800
1200
1600
2000
2400
2800
PLATE VOLTAGE (V)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.25
10
9
8
7
6
5
4
3
2
1
0.5
0
CURVE #MA–2376



CURVE #MA-2377