Y503

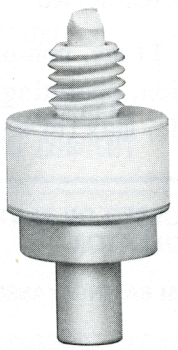
TECHNICAL DATA

HIGH-MU
PLANAR TRIODE

The EIMAC Y503 is a small frequency stable rugged planar triode which has been specially processed and tested to assure the high reliability demanded and required in airborne service. The tube is supplied without radiator for conduction and/or convection or heat sink cooling.

The tube may be used as an amplifier, oscillator, or frequency multiplier in grid or plate pulsed applications. In addition to the low interelectrode capacitances, high transconductance and Mu, the tube exhibits such special design features as a frequency-stable anode and an arc-resistant cathode to assure stable operation under adverse conditions and minimize catastrophic failure due to arcover if it should occur due to circuit malfunction.

The tube is usable from low frequency to 3 GHz.



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	1.810 in; 45.97 mm
Diameter	0.792 in; 20.12 mm

Printed in U.S.A.

Net Weight	18 gm
Operating Position	Any
Maximum Operating Temperature:	
Ceramic/Metal Seals	250°C
Anode Core	250°C
Cooling	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	1.5 AMPERES
PLATE DISSIPATION (Average)	
Conduction & Convection	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

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.

* Plate dissipation of up to 100 Watts is permissable with adequate cooling.

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	2.25	2.60	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.

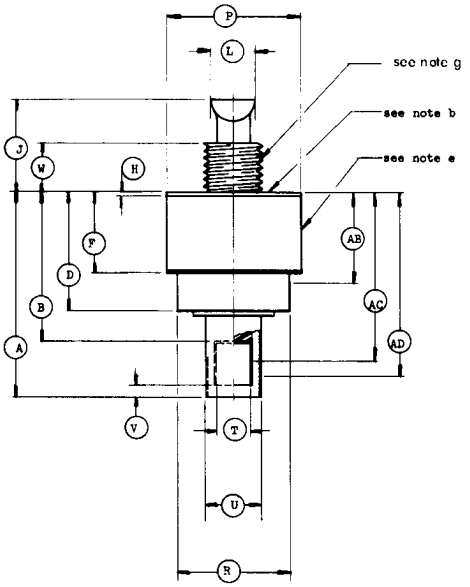
APPLICATION

For general application information please refer to the Planar Triode Operating Instruction Sheet. The operating instructions should be consulted prior to the designing of new requirements around the above tube type. For unusual and special applications consult the nearest Varian Electron Tube Field Office, or Product Manager, EIMAC Division of Varian, Salt Lake City, Utah.

The cathode and grid terminals should not be altered such as by machining or filing, since final seal could be damaged. Maximum torque applied to the tube during installation should not exceed 15 inch pounds.

For optimum performance, the anode line should make good rf contact on the anode area.

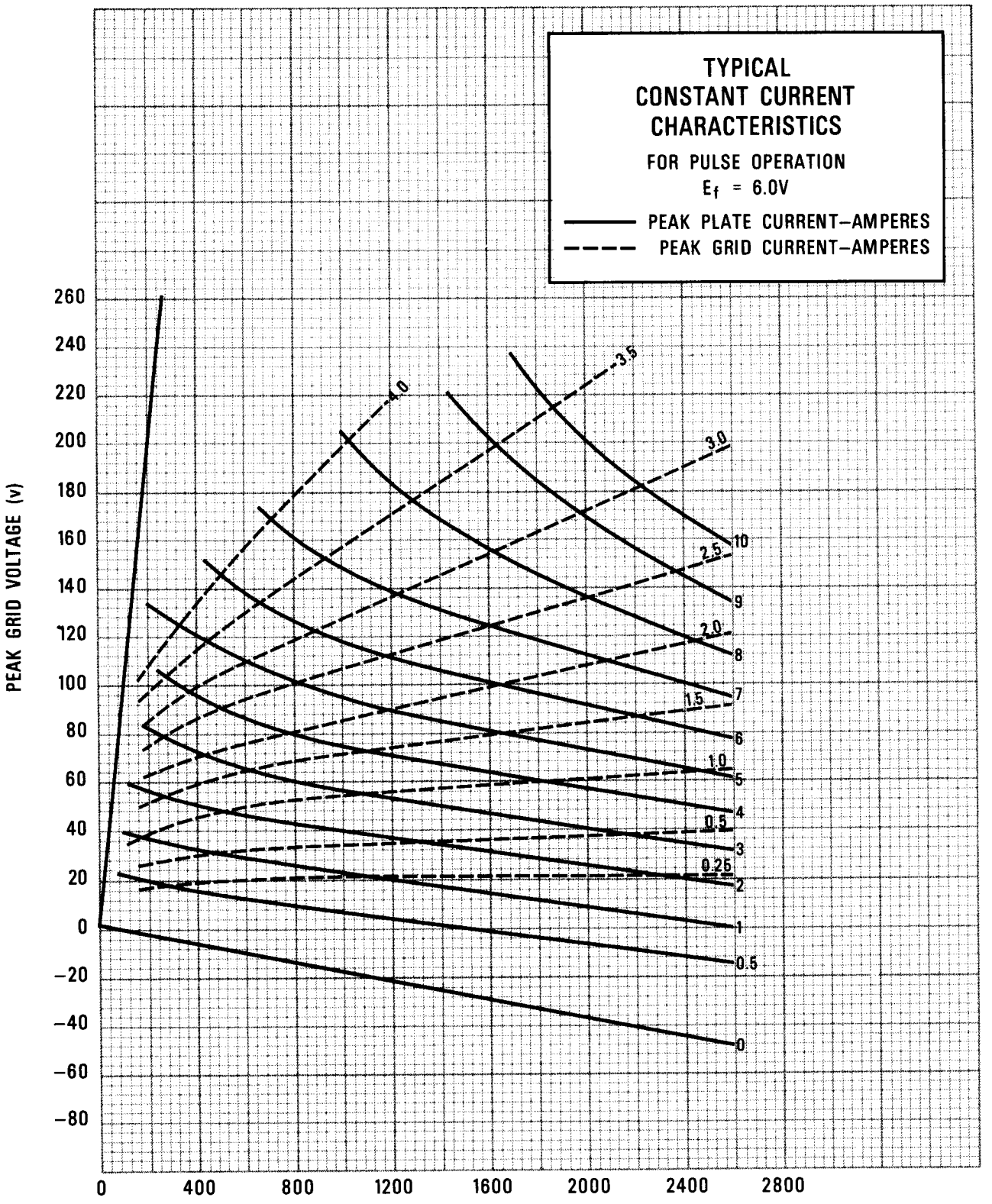
Soldered connections may be made to the anode stud, grid or cathode terminals, and heater contact where adequate heat sinking and good soldering practices are followed to minimize the heat applied to the tube and the thermal gradient across the metal to ceramic brazed areas.



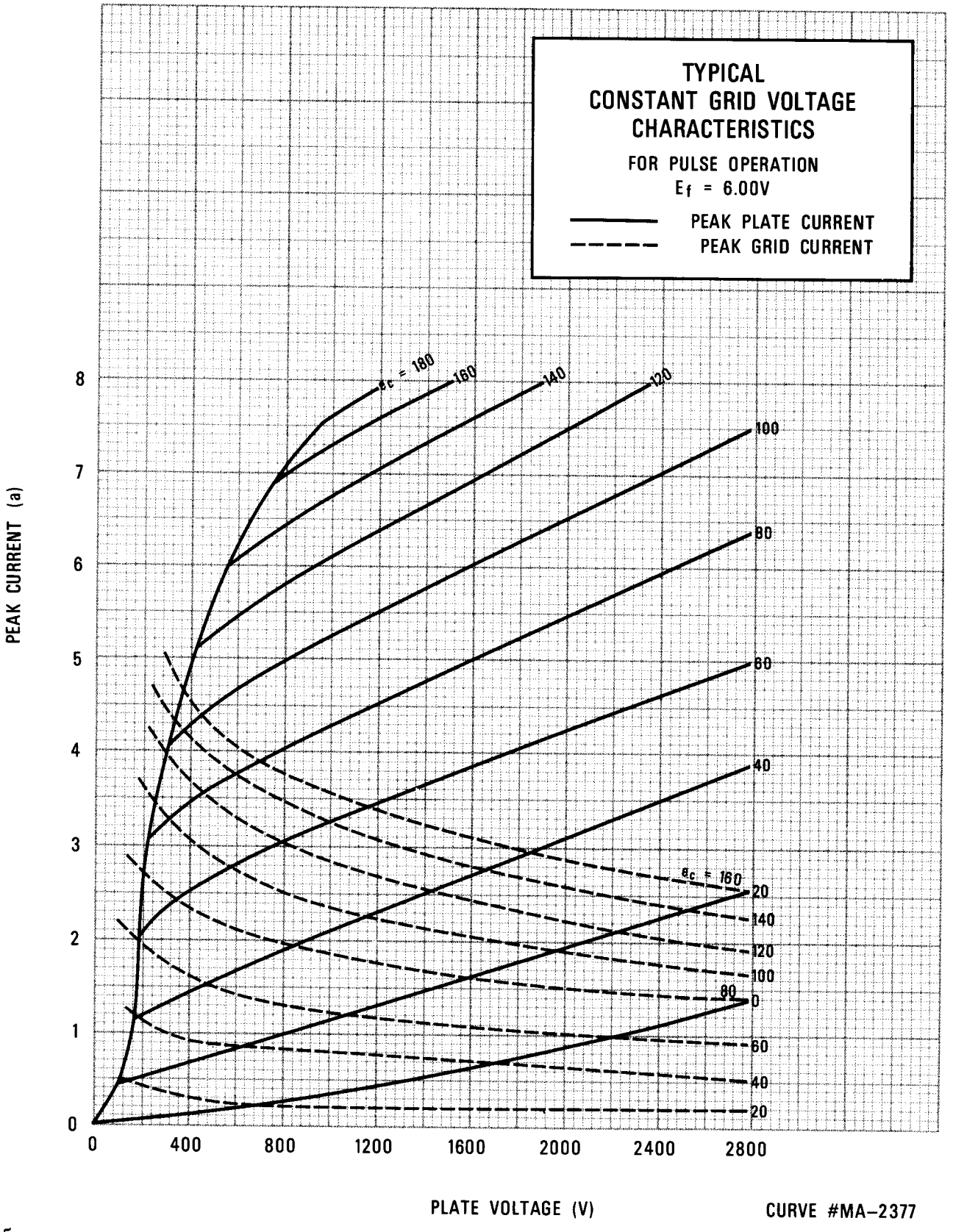
DIMENSIONAL DATA						
DIM	INCHES			MILLIMETERS		
	MIN.	MAX.	REF.	MIN.	MAX.	REF.
A	1.125	1.210	- -	28.58	30.73	- -
B	- -	0.865	- -	- -	21.97	- -
D	0.782	0.822	- -	19.86	20.88	- -
F	- -	0.475	- -	- -	12.07	- -
H	- -	- -	0.030	- -	- -	0.762
I	0.345	0.375	- -	8.76	9.53	- -
J	- -	0.600	- -	- -	15.24	- -
L	- -	0.260	NOTE e	- -	6.60	NOTE e
P	0.752	0.792	NOTE e	19.10	20.12	NOTE e
R	0.655	0.665	NOTE d,b	16.64	16.89	NOTE d,b
T	0.213	0.223	NOTE d,b	5.41	5.66	NOTE d,b
U	0.315	0.325	NOTE d,b	8.00	8.26	NOTE d,b
V	- -	0.086	- -	- -	2.18	- -
ELECTRODE CONTACT AREA DIMENSIONS						
AB	0.695	0.775	NOTE b	17.65	19.68	NOTE b
AC	0.860	1.046	NOTE b	21.84	26.57	NOTE b
AD	0.800	1.090	NOTE b	20.32	27.69	NOTE b

NOTES:

a. Metric equivalents to the nearest .01mm are given for general information only & are based on 1 inch = 25.4 mm.
b. This surface shall be used to measure Anode shank temperature.
c. The total indicated runout of the Grid contact surface (DIMS AB & R) and Cathode contact surface (DIMS AC & U) will not exceed .020. This measurement is made with the gage (J-21685) screwed on the Anode thread so that the face of the gage makes full contact with the Anode contact surface. Runout is then measured by the O.D. of the gage as the reference surface. The total indicated runout of the Cathode contact surface using the Heater contact surface as the reference will not exceed .012.
d. Dias. R, T, U shall apply throughout entire contact area as defined by dims. AB, AC, AD.
e. This surface shall not be used for clamping or locating.
f. Electrode Contact Dims. are given for socket design & are not intended for inspection purposes.
g. Thread 3/8-16 UNC-2A.



CURVE #MA–2376



CURVE #MA-2377