



# TECHNICAL DATA

# Y-540

## PLANAR TRIODE

The Y-540 is a high voltage planar triode especially designed for switch or series regulator service, for general purpose as well as radar applications. Being essentially a UHF triode, the tube capacitances and inductances are small, which enhances operation in the nanosecond region. Other noteworthy features include an extended grid-anode insulator making 10 kV operation at sea level possible, and a matrix cathode of the arc-resistant, extended interface type. The tube exhibits the standard features of a planar triode, such as high transconductance, high  $\mu$ , and high cathode current capability, coupled with great mechanical strength, permitting reliable operation at elevated temperatures.



The compact ceramic/metal construction and solder tabs provided on grid, cathode-heater, and heater terminals make this tube especially suited for ECM and other switch applications. The tube is small in size and light-weight. The cathode is an indirectly heated disc requiring minimal heater power. These are all factors of great importance in airborne applications.

### GENERAL CHARACTERISTICS<sup>1</sup>

#### ELECTRICAL

Cathode: Oxide Coated, Unipotential

Heater: Voltage .....	6.3 ± 5% V
Current, at 6.3 volts .....	1.3 A
Cathode Heating Time .....	60 Sec

Transconductance (Average):

$I_b = 100$ mA .....	30 mmhos
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Amplification Factor (Average):..... 145

(Cut-off)<sup>3</sup> .....

110

Direct Interelectrode Capacitance (grounded cathode)<sup>2</sup>

$C_{in}$  .....

9.5 pF

$C_{out}$  .....

0.06 pF

$C_{gp}$  .....

1.00 pF

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 are for a cold tube as measured in a special shielded fixture (Eimac Dwg. #EC-043-919-0002). 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.

3. Measured with one milliampere plate current and a plate voltage of 1 kVdc.



**MECHANICAL**

**Maximum Overall Dimensions:**

Length .....	1.56 in; 39.62 mm
Diameter .....	0.785 in; 19.94 mm
Net Weight .....	0.56 oz; 16.0 gm
Operating Position .....	Any

**Maximum Operating Temperature:**

Ceramic/Metal Seals .....	250°C
Anode Core .....	250°C
Cooling .....	Conduction, Forced Air with appropriate heat sink adaptor or radiator (Rad. P/N 157254. H.S.P/N SK-3020)

**RANGE VALUES FOR EQUIPMENT DESIGN**

	<u>Min.</u>	<u>Max.</u>
Heater: Current at 6.3 volts .....	1.20	1.40 A
Cathode Warmup Time .....	60	--- sec.
Maximum Inrush Current .....	---	10.0 A
<b>Interelectrode Capacitance<sup>1</sup> (grounded cathode connection)</b>		
Cin .....	---	10.5 pF
Cout .....	---	0.06 pF
Cgp .....	---	1.65 pF

1. Capacitance values are for a cold tube as measured in a special shielded fixture (P/N EC-043-919-0002) in accordance with Electronic Industries Association Standard RS-191.

**PULSE MODULATOR AND PULSE AMPLIFIER SERVICE**

**ABSOLUTE MAXIMUM RATINGS**

DC PLATE VOLTAGE .....	10 KILOVOLTS
PEAK PLATE VOLTAGE .....	12 KILOVOLTS
DC GRID VOLTAGE .....	-150 VOLTS
<b>INSTANTANEOUS PEAK GRID-CATHODE VOLTAGE</b>	
Grid negative to cathode .....	-750 VOLTS
Grid positive to cathode .....	150 VOLTS
PULSE CATHODE CURRENT .....	7.5 AMPERES
DC PLATE CURRENT .....	150 MILLAMPERES
DC GRID CURRENT .....	45 MILLAMPERES

**AVERAGE PLATE DISSIPATION**

Conduction and Convection Cooling ..	10 WATTS
Forced Air Cooling <sup>1</sup> .....	150 WATTS
GRID DISSIPATION .....	1.5 WATTS
PULSE DURATION <sup>2</sup> .....	6.0 μs
CUT-OFF Mu .....	110
DUTY <sup>2</sup> .....	.0033

1. Only with Radiator #157271 attached with heat conducting grease such as Insulgrease S-641 (G.E.).
2. For applications using longer plus duration and/or higher duty cycle consult the nearest Varian Electron Tube & Devices Field Office, or the Product Manager, EIMAC Division of Varian, Salt Lake City, Utah.

**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

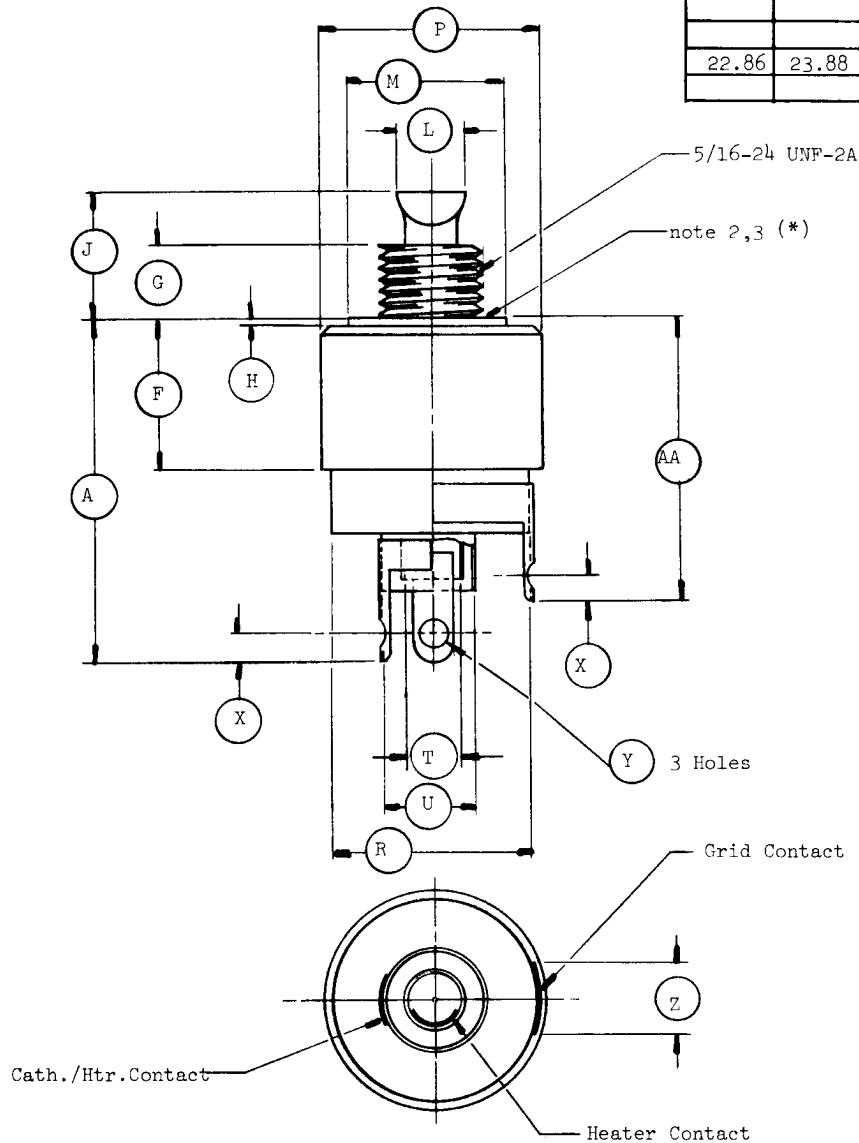
above tube type. For unusual and special applications consult the nearest Varian Electron Tube Field Office, or the Product Manager, EIMAC Division of Varian, Salt Lake City, Utah.



NOTES:

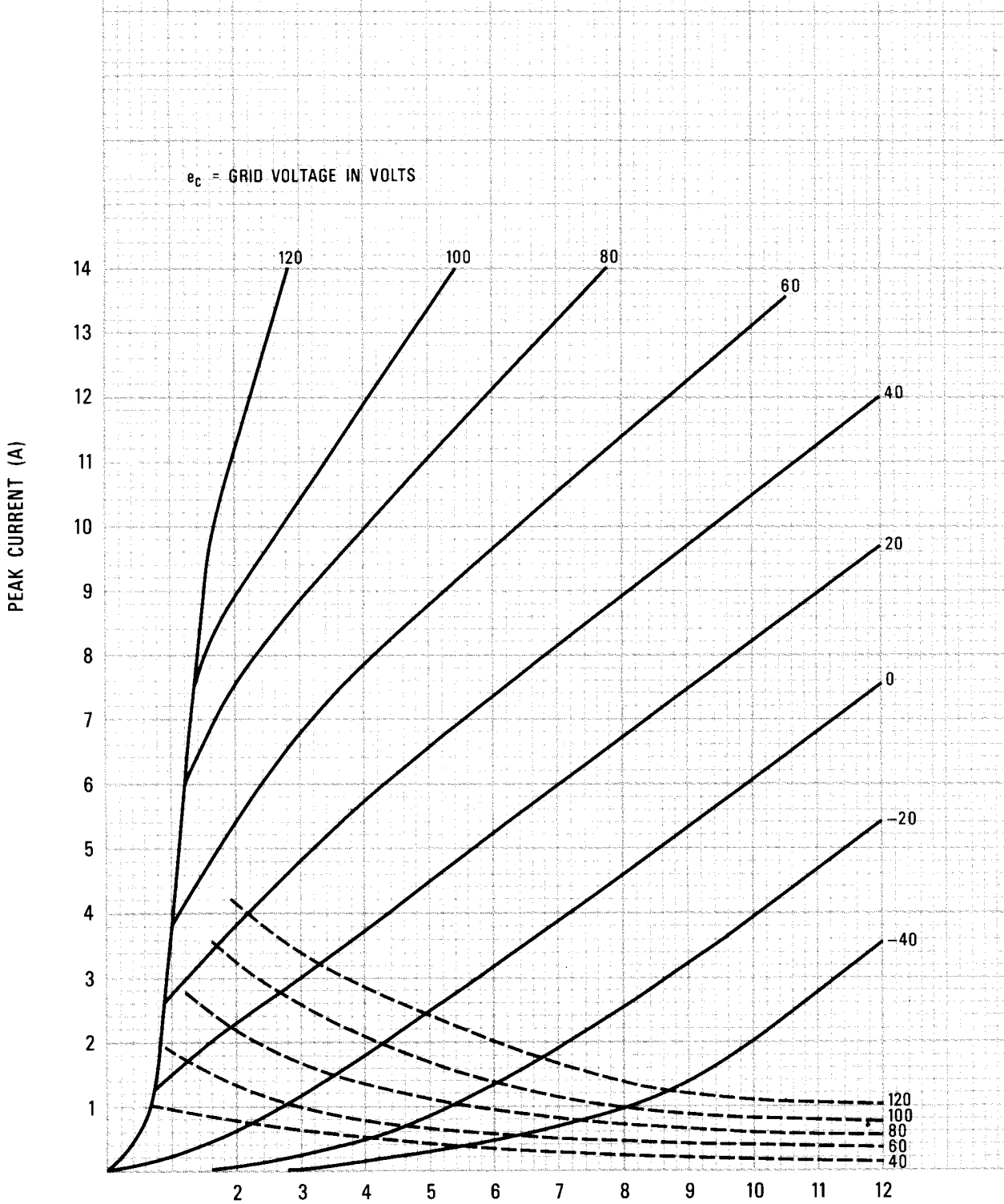
1. Ref. dimensions are for information only & are not req'd for inspection purposes.
2. (\*) contact surface
3. Anode flange is for electrical contact. Stud is for heat transfer.
4. Metric equivalents to the nearest mm. are for information only & are based on 1 inch = 25.4mm.

DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES			
MIN.	MAX.	REF.	DIM.	MIN.	MAX.	REF.
28.45	29.46		A	1.120	1.160	
	14.48		F		.570	
6.10	6.86		G	.240	.270	
	1.02		H		.040	
	10.16		J		.400	
	6.60		L		.260	
13.84	14.48		M	.545	.570	
19.69	19.94		P	.775	.785	
		16.76	R			.660
		5.54	T			.218
		8.13	U			.320
1.78	2.79		X	.070	.110	
		2.29	y			.090
6.10	8.18		Z	.240	.322 (flat)	
22.86	23.88		AA	.900	.940	





**TYPICAL CONSTANT GRID VOLTAGE CHARACTERISTICS**  
FOR PULSE OPERATION  $E_f = 6.3V$   
— PEAK PLATE CURRENT — AMPERES      - - - - PEAK GRID CURRENT — AMPERES



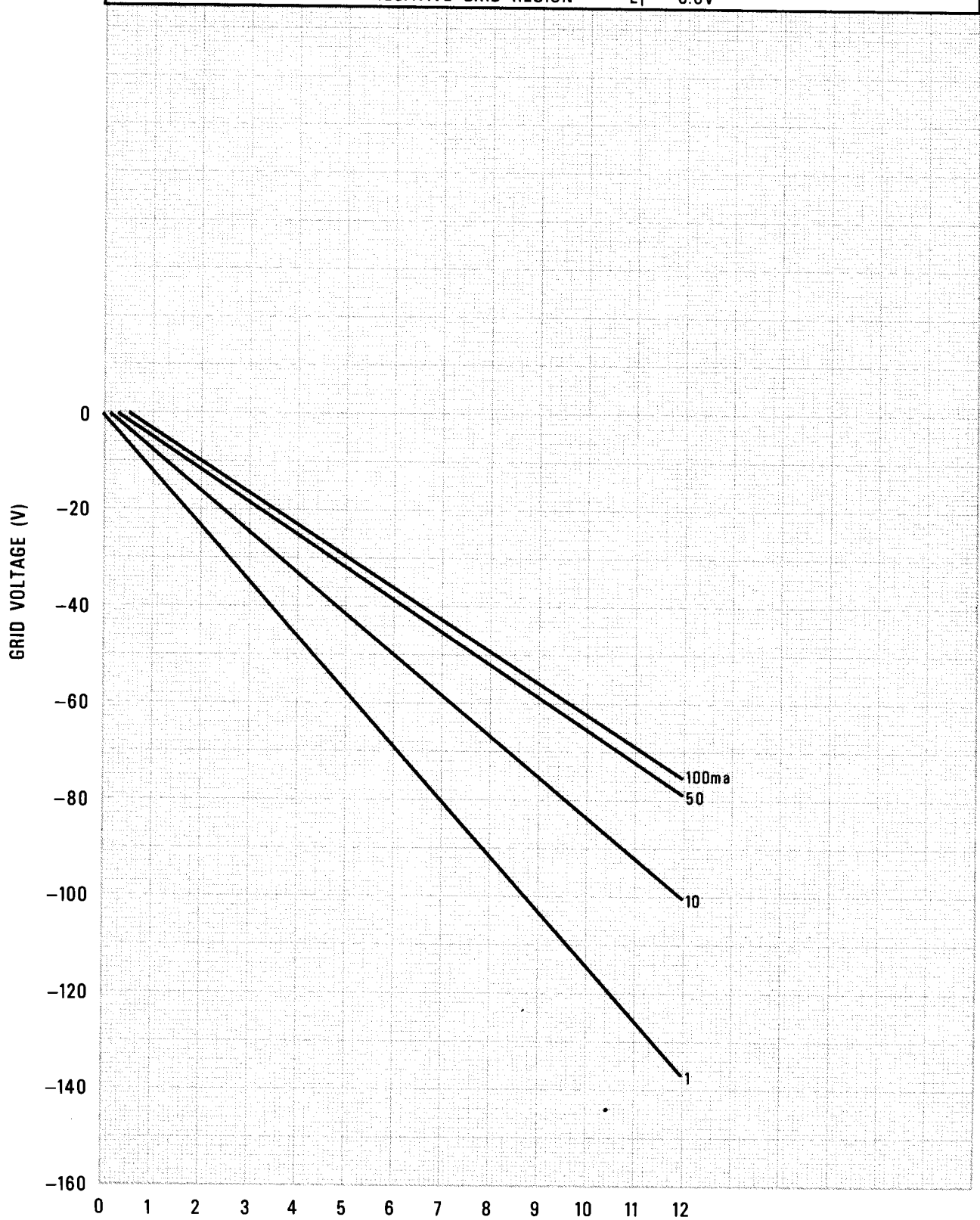


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### TYPICAL CONSTANT PLATE CURRENT CHARACTERISTICS

NEGATIVE GRID REGION

$E_f = 6.3V$





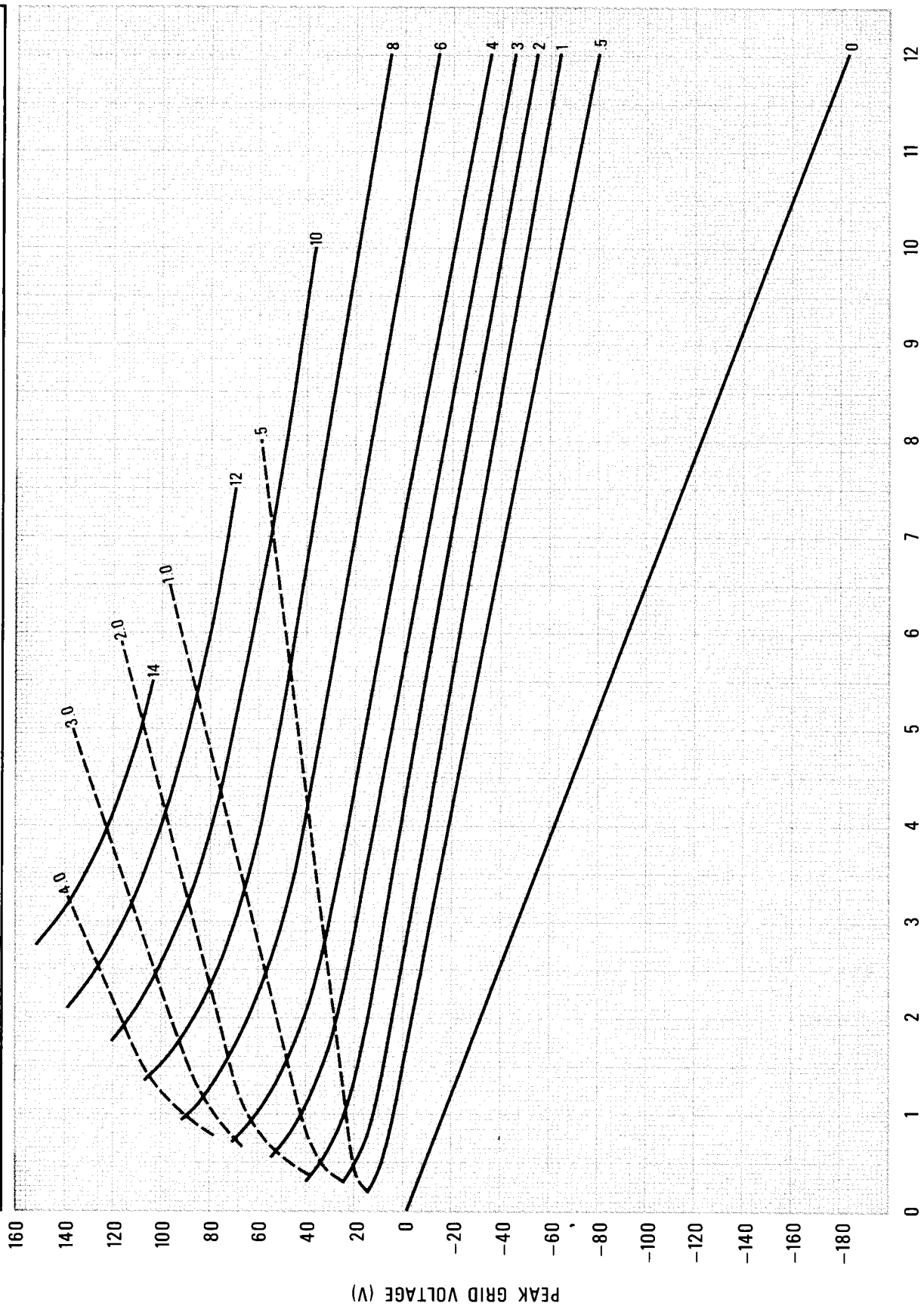
### TYPICAL CONSTANT CURRENT CHARACTERISTICS

FOR PULSE OPERATION

$E_f = 6.3V$

— PEAK PLATE CURRENT — AMPERES

- - - - - PEAK GRID CURRENT — AMPERES



CURVE #MA-2663

PLATE VOLTAGE (kV)