



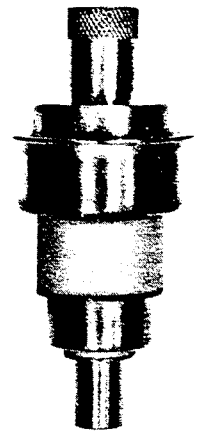
TECHNICAL DATA

8906AL  
Y572AL  
8906ALEM  
PLANAR TRIODE

The EIMAC 8906AL/Y572AL is a ceramic/metal planar triode specially processed and tested to assure high reliability in airborne service. Evaluation of this tube is based upon operating conditions in grid- or plate-pulsed oscillator service (transponder) and in grid- or plate-pulsed amplifier service in distance measuring equipment (DME). The testing emphasizes cathode emission capability at reduced heater voltage and high voltage hold-off, both features which are demanded in airline service.

The 8906AL/Y572AL is derived from the 7815AL/7211/7698 family. This new improved tube also contains the features of the original types, including rugged ceramic/metal construction, low interelectrode capacitance, high transconductance and high mu. The longer grid-anode ceramic insulator of the earlier type is used, making the 8906AL/Y572AL especially suited for high altitude airborne operation. The 8906AL/Y572AL has a 60% larger cathode area than the 7815/7815AL thus lowering cathode current loading per unit area yet maintaining as high or higher current capability.

In addition to these features, this tube also incorporates the arc-resistant cathode which assures stable operation under adverse conditions and which minimizes catastrophic failure due to arc-over during circuit malfunction. The tube is useable from dc to 3 GHz.



GENERAL CHARACTERISTICS<sup>1</sup>

ELECTRICAL

Cathode: Oxide Coated, Unipotential

Heater: Voltage . . . . .	5.7 ( $\pm 2\%$ ) V
Current, at 5.7 volts . . . . .	0.95 A

Transconductance (Average):

$I_b = 100 \text{ mA dc}$ , $E_b = 600 \text{ V dc}$ . . . . .	30 mmhos
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Amplification Factor (Average) . . . . .	80
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Direct Interelectrode Capacitance (grounded cathode)<sup>2</sup>, without heater voltage:

Grid-Cathode . . . . .	8.00 pF
Grid-Plate . . . . .	1.98 pF
Plate-Cathode (maximum) . . . . .	0.060 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.

**MECHANICAL**

## Maximum Overall Dimensions:

Length .....	2.701 in; 68.60 mm
Diameter .....	1.195 in; 30.35 mm
Net Weight .....	1.8 oz; 48 gm
Operating Position .....	Any
Maximum Operating Temperature:	
Ceramic/Metal Seals .....	250°C
Anode Core .....	250°C
Cooling .....	Conduction and Convection
Terminals .....	Special

**RANGE VALUES FOR EQUIPMENT DESIGN**

	<u>Min.</u>	<u>Max.</u>
Heater Current at 5.7 volts .....	0.87	1.02 A
Cut-off Bias <sup>1</sup> .....	---	-25 V
Grid-Plate Capacitance <sup>2</sup> .....	1.85	2.10 pF
Grid-Cathode Capacitance <sup>2</sup> .....	7.00	9.00 pF
Plate-Cathode Capacitance .....	---	0.060 pF

1. Measured with 1 mA plate current and a plate voltage of 1000 Vdc.
2. Capacitance values as measured with a cold tube and in a shielded socket. When the cathode is heated to the proper temperature the grid-cathode capacitance will increase by approximately 1 pF due to thermal expansion of the cathode support.

**RF POWER AMPLIFIER OR OSCILLATOR**Grid- or Plate-Pulsed

## MAXIMUM RATINGS, ABSOLUTE VALUES

DC PLATE VOLTAGE .....	3500	VOLTS
PEAK PULSE PLATE VOLTAGE		
PLATE PULSED .....	4500	VOLTS
DC GRID VOLTAGE .....	-150	VOLTS
INSTANTANEOUS PEAK GRID-		
CATHODE VOLTAGE		
Grid negative to cathode .....	750	VOLTS
Grid positive to cathode .....	250	VOLTS
PULSE PLATE CURRENT .....	5.0	AMPERE
PULSE GRID CURRENT .....	2.5	AMPERE
DC CATHODE CURRENT .....	200	MILLIAMPERES
AVERAGE PLATE DISSIPATION <sup>1</sup>		
Conduction and Convection .....	10	WATTS
GRID DISSIPATION (Average) .....	2	WATTS
DUTY FACTOR <sup>2</sup> .....	0.033	
PULSE DURATION <sup>2</sup> .....	6	μs
FREQUENCY .....	3	GHz

1. Higher plate dissipation is permissible when EIMAC radiator (P/N 014224) is used.
2. For longer pulse duration or higher duty cycle, consult the nearest Varian Electron Tube and Device Group Sales Office, or the Product Manager, EIMAC Division of Varian, Salt Lake City, Utah.

## OPERATING CONDITIONS FOR THE 8906AL/Y572AL in REPRESENTATIVE APPLICATION.

Grid-Pulsed Oscillator

Frequency .....	1.090	GHz
Heater Voltage .....	5.7	V
DC Plate Voltage .....	2000	Vdc
DC Grid Voltage .....	-75	Vdc
Peak Plate Current .....	1.1	a
Peak Grid Current .....	0.8	a
Pulse Duration .....	0.5	μs
Duty .....	0.001	
Useful Power Output (Approx.) .....	850	w

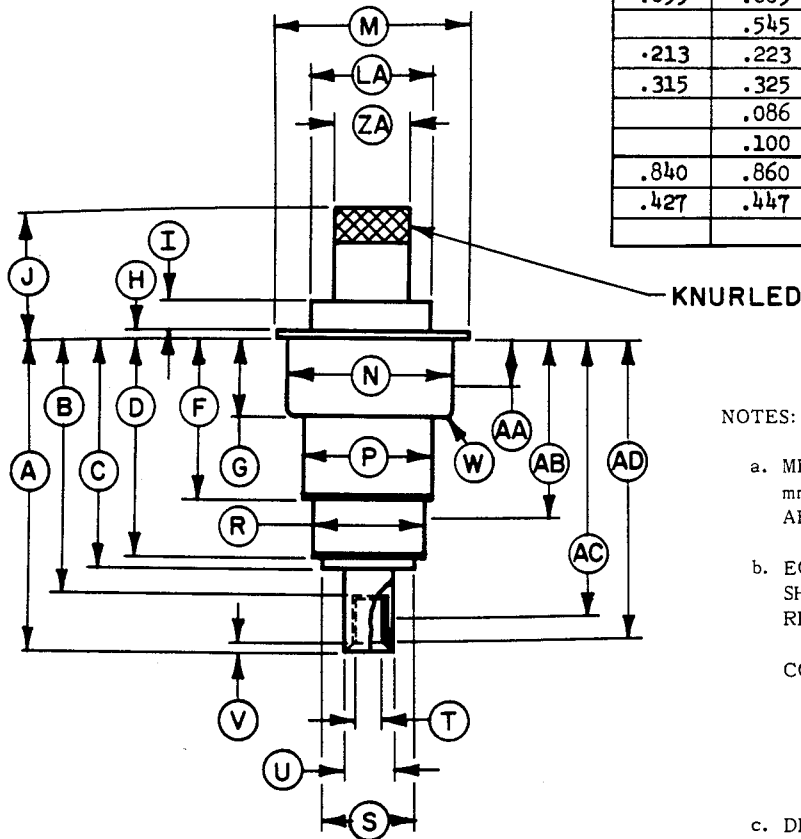
Plate-Pulsed Amplifier

Frequency .....	1.1	GHz
Heater Voltage .....	5.7	V
Peak Plate Pulse Voltage .....	2000	v
DC Grid Voltage .....	-45	Vdc
Peak Plate Current .....	2.0	a
Peak Grid Current .....	1.0	a
Pulse Duration .....	3.5	μs
Duty .....	0.001	
Driving Power .....	300	w
Useful Power Output (Approx.) .....	2000	w
Gain .....	8	db
Plate Efficiency .....	50%	



ELECTRODE CONTACT AREA				
DIM	MIN.	MAX.	MIN.	MAX.
AA	.035	.361	.89	9.17
AB	1.185	1.265	30.10	32.14
AC	1.534	1.728	38.96	43.89
AD	1.475	1.815	37.47	46.10
	DIM. IN INCHES		DIM. IN MILLIMETERS	

DIMENSION DATA					
DIM. IN INCHES			DIM. IN MILLIMETERS		
MIN.	MAX.	DDM	MIN.	MAX.	NOTES
1.185	1.875	A	46.10	47.62	
	1.534	B		38.96	
	1.475	C		37.46	
1.289	1.329	D	32.74	33.76	
.970	1.010	F	24.64	25.65	
.462	.477	G	11.73	12.12	
	.040	H		1.02	
	.185	I		4.70	
.766	.826	J	19.46	20.98	
1.180	1.195	M	29.97	30.35	
1.025	1.035	N	26.04	26.29	c
.752	.792	P	19.10	20.12	d
.655	.665	R	16.64	16.89	c
	.545	S		13.84	
.213	.223	T	5.41	5.66	c
.315	.325	U	8.00	8.26	c
	.086	V		2.18	
	.100	W		2.54	
.840	.860	LA	21.34	21.84	
.427	.447	ZA	10.75	11.35	



NOTES:

a. METRIC EQUIVALENTS, TO THE NEAREST .01 mm, ARE FOR GENERAL INFORMATION ONLY & ARE BASED UPON 1 inch = 25.4 mm.

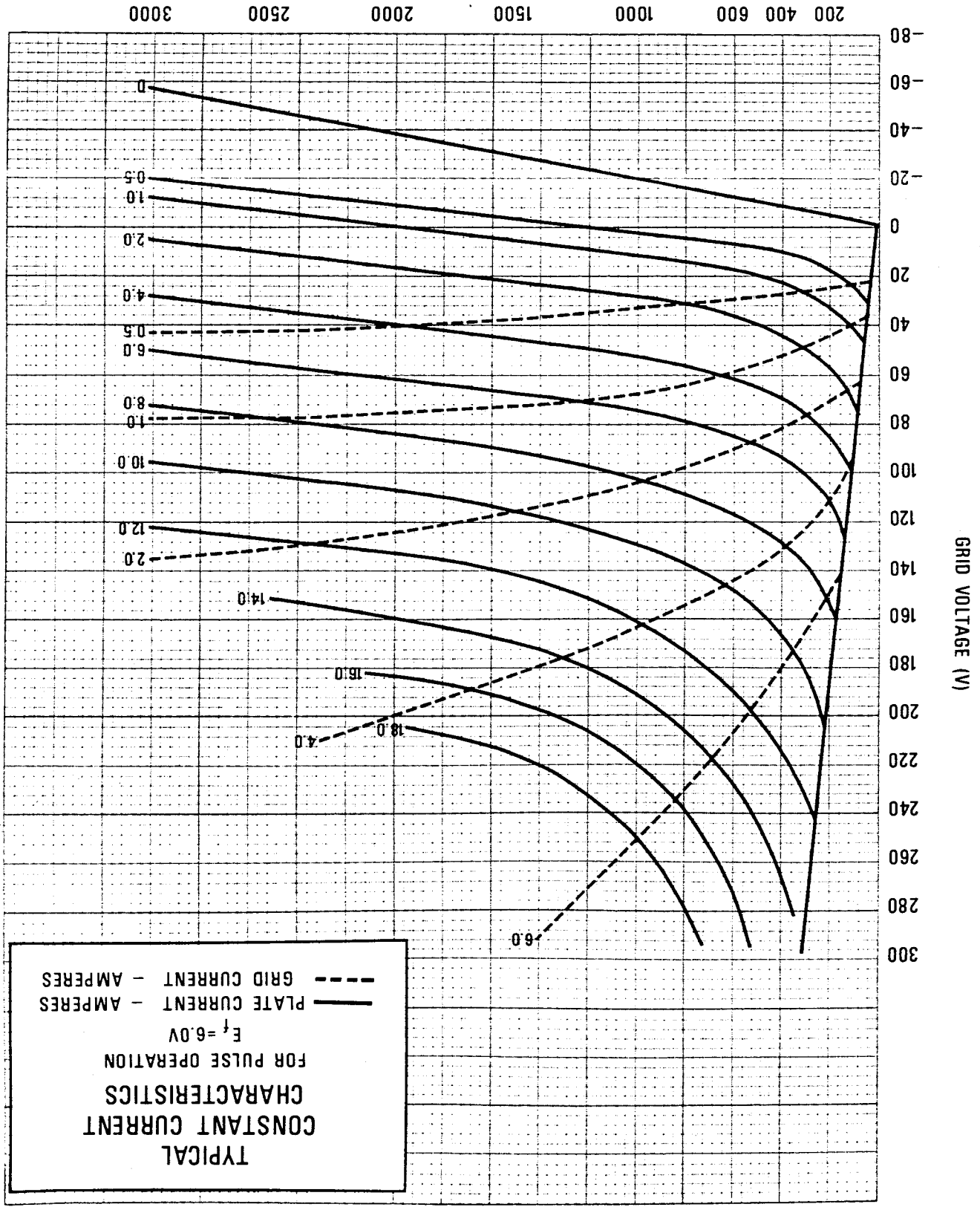
b. ECCENTRICITY OF CONTACT SURFACES SHALL BE GAGED FROM CENTER LINE OR REFERENCE & SHALL BE AS FOLLOWS:

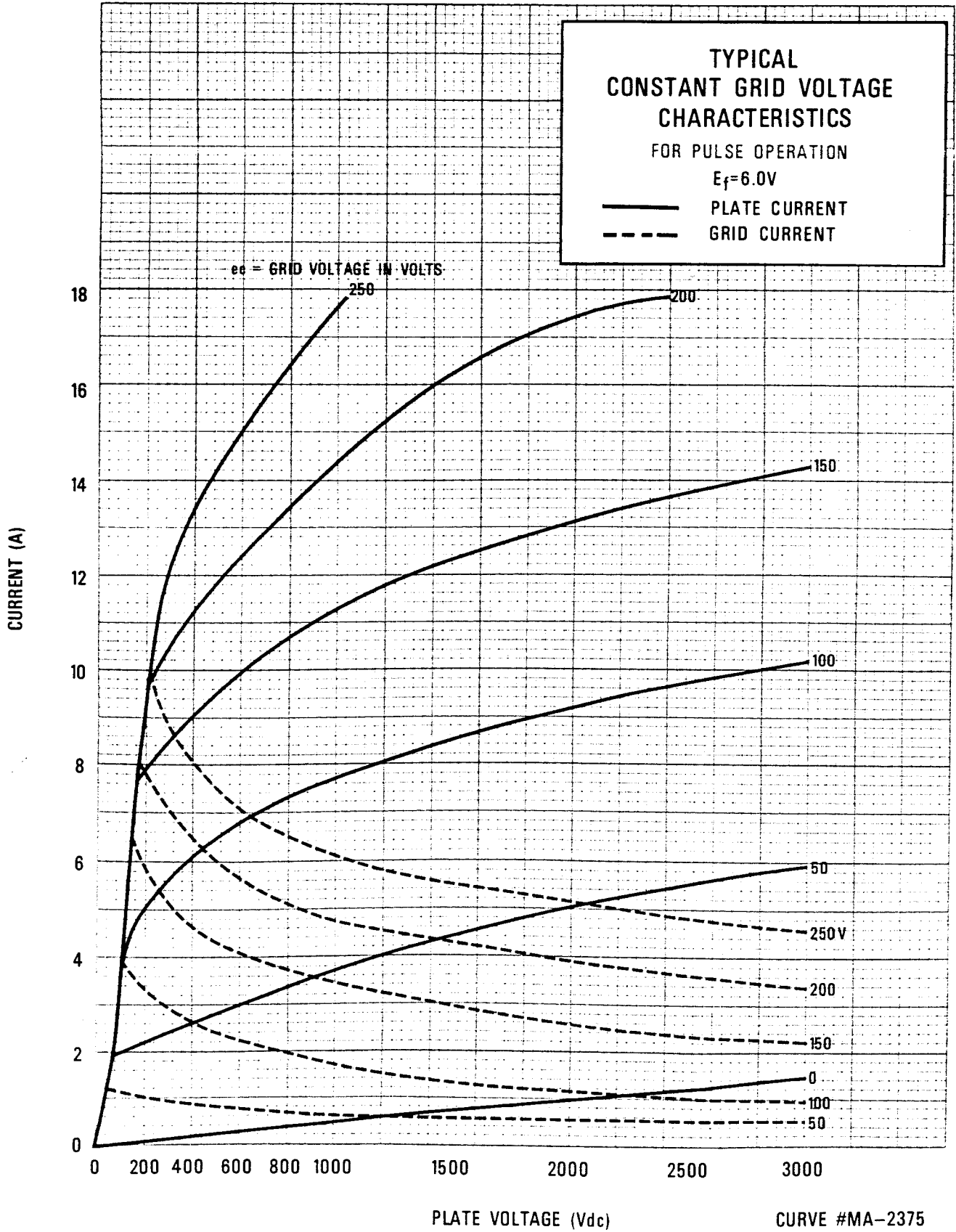
CONTACT SURFACE	TIR(MAX)	REFERENCE
ANODE	.020	CATHODE
GRID	.020	CATHODE
HEATER	.012	CATHODE

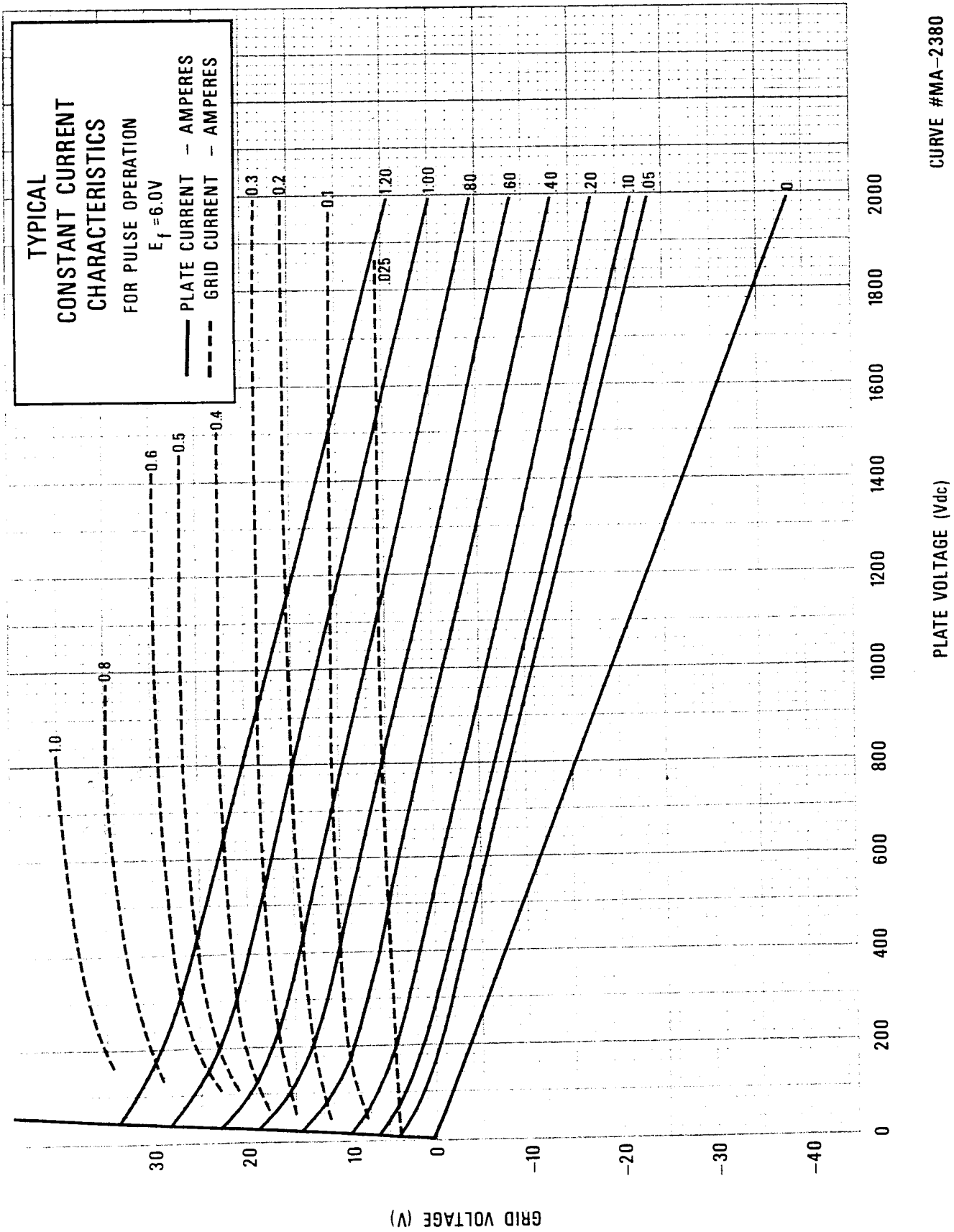
c. DIA'S N, R, T, & U SHALL APPLY THROUGHOUT ENTIRE LENGTH AS DEFINED BY DIM'S AA, AB, AC & AD RESPECTIVELY.

d. THIS SURFACE SHALL NOT BE USED FOR CLAMPING OR LOCATING.

PLATE VOLTAGE (Vdc) CURVE #MA-2374







CURVE #MA-2380

PLATE VOLTAGE (Vdc)

GRID VOLTAGE (V)