TECHNICAL DATA

8906 / 8907

PLANAR TRIODES

The EIMAC 8906 (formerly Y-572) and 8907 (formerly Y-581) are rugged ceramic/metal planar triodes designed for use as a CW, grid- or plate-pulsed oscillator or frequency multiplier up to 3 GHz, as well as for pulse modulator or voltage regulator service. The 8906 is supplied with a knob intended for conduction-convection cooling and the 8907 is supplied with radiator (P/N 014224) for forced air cooling. Except for the plate dissipation ratings, the characteristics of both tube types are identical.

8906

8907

An outstanding feature of these tubes is the low heater power requirement for such high current capability. Either type can normally be used in place of the 7815, 7815R and 8745 at the same heater voltage where higher current capability and/or longer life is desired. Replacement of the above tube types with either the 8906 or 8907 is possible in most cases. The tubes can also replace the 7211/7698 (or 7698R) when a 25% lower heater power requirement is desired. In addition, the 8906 and 8907 have the preferred features of the 7815 and 7211 type family: high-Mu, high transconductance, great mechanical strength, low interelectrode capacitance, high current capability and increased grid-to-anode insulator length. The cathode is of the arc resistant extended interface type, well proven in airline type applications, assuring reliable, long-life operation under adverse conditions.

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 = 160 mA (200 mA/cm^2)	38	mmhos
Amplification Factor (Average)	80	
Direct Interelectrode Capacitances (grounded cathode)[2]		
Grid-Cathode	8.00	pF
Grid-Plate	1.98	pF
Plate-Cathode	0.06	pF
Cut-off Bias[3]	-30	V max.

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MECHANICAL

Maximum Overall Dimensions:	
Length	2.701 in; 68.60 mm
Diameter (8906)	1.195 in; 30.35 mm
Diameter (8907)	1.264 in; 32.11 mm
Net Weight (8906)	1.8 oz; 48 gm
Net Weight (8907)	2.2 oz; 63 gm
Operating Position	Any
Maximum Operating Temperature:	
Ceramic/Metal Seals	250°C
Anode Core	250°C
Cooling:	
8906	Conduction and Convection
8907	Forced Air
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 suitable designed circuit)	70,000 ft

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. 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.

CW RF POWER AMPLIFIER OR OSCILLATOR

ABSOLUTE MAXIMUM RATINGS

DC PLATE VOLTAGE	2500	VOLTS
DC GRID VOLTAGE	-150	VOLTS
INSTANTANEOUS PEAK GRID-CATHODE VOLTAGE		
GRID NEGATIVE TO CATHODE	-400	VOLTS
GRID POSITIVE TO CATHODE	30	VOLTS
DC PLATE CURRENT	150	MILLIAMPERES
DC GRID CURRENT	45	MILLIAMPERES
PLATE DISSIPATION		
8906	10	WATTS
8907	100	WATTS
GRID DISSIPATION	1.5	WATTS
FREQUENCY	2.5	GIGAHERTZ

REPRESENTATIVE OPERATION

Grounded Grid CW r-f Power Amplifier

DC Plate Voltage	630	Vdc
DC Cathode Current	140	mAdc
DC Grid Voltage (Approx.)	-5	Vdc
DC Grid Current	25	mAdc
Drive Power (Approx.)	4	W
Useful CW Power Output	45	W
Heater Voltage	6.0	V
Frequency	700	MHz

Grounded Grid CW r-f Oscillator

DC Plate Voltage	1000	Vdc
DC Plate Current	140	mAdc
DC Grid Voltage (Approx.)	-20	Vdc
DC Grid Current (Approx.)	30	mAdc
Useful CW Power Output	30	W
Heater Voltage	5.0	V
Frequency	2.5	GHz

RF POWER AMPLIFIER OR OSCILLATOR
Grid- or Plate-Pulsed

ABSOLUTE MAXIMUM RATINGS

DC PLATE VOLTAGE (Grid-Pulsed)	3500	VOLTS
PEAK PULSE PLATE VOLTAGE (Plate-Pulsed)	4500	VOLTS
DC GRID VOLTAGE	-150	VOLTS
INSTANTANEOUS PEAK GRID-CATHODE VOLTAGE		
GRID NEGATIVE TO CATHODE	-700	VOLTS
GRID POSITIVE TO CATHODE	200	VOLTS
PULSE PLATE CURRENT	5.0	AMPERES
PULSE GRID CURRENT	2.5	AMPERES
PLATE DISSIPATION		
8906	10	WATTS
8907	100	WATTS
GRID DISSIPATION	1.5	WATTS
FREQUENCY	3.0	GIGAHERTZ
PULSE DURATION [1]	6	μs
DUTY FACTOR [1]	0033	

REPRESENTATIVE OPERATION
Grid-Pulsed r-f Amplifier

DC Plate Voltage	2200	Vdc
Peak Video Plate Current	2.5	a
DC Grid Voltage	-50	Vdc
Peak Video Grid Current	1.0	a
Pulse Drive Power	400	w
Useful Power Output (Approx.)	2500	w
Duty Factor	.002	
Pulse Width	3	μs
Heater Voltage	6.0	V
Frequency	1.1	GHz

Plate-Pulsed r-f Oscillator

Peak Plate Voltage	3500	v
Peak Video Plate Current	4.8	a
Peak Video Grid Current	1.5	a
Useful Power Output	3000	w
Duty Factor	.0025	
Pulse Width	3	μs
Heater Voltage	5.8	V
Frequency	3.0	GHz

PULSE MODULATOR OR PULSE AMPLIFIER SERVICE

ABSOLUTE MAXIMUM RATINGS

DC PLATE VOLTAGE	3500	VOLTS
PEAK PLATE VOLTAGE	4500	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	7.5	AMPERES
DC PLATE CURRENT	150	MILLIAMPERES
PLATE DISSIPATION		
8906	10	WATTS
8907	100	WATTS
GRID DISSIPATION	1.5	WATTS
PULSE DURATION	6	μs
DUTY FACTOR [1]	0033	
CUT-OFF MU [1]	60	

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

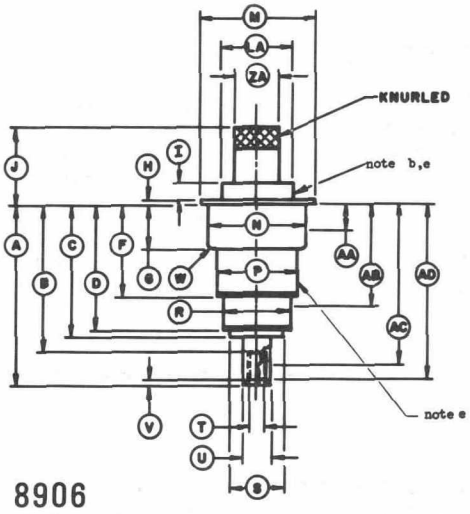
RANGE VALUES FOR EQUIPMENT DESIGN

	Min.	Max.	
Heater: Current at 6.0 volts	0.90	1.05	A
Cathode Heating Time	60	---	sec
Interelectrode Capacitances [1] (grounded cathode connection)			
Grid-Cathode	7.0	9.0	pF
Plate-Cathode	---	0.06	pF
Grid-Plate	1.86	2.10	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 bulletin "Operating Instructions for Planar Triodes". The operating instructions should be consulted prior to the designing of new requirements around the above tube types. Higher plate dissipation of up to 150 watts is possible with the 8906 and 8907 tube type when using radiator P/N 158555. If this is required the tube order should call for the tube type Y-602. For unusual and special application consult the nearest Varian Electron Tube and Device Field Office, or the Product Manager, EIMAC Division of Varian, Salt Lake City, Utah.



8906

DIMENSION DATA (Note a)					
Dim. in Inches		Dim. in Millimeters.			
Min.	Max	Dim.	MIN.	MAX.	Notes
1.815	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	
.125	.185	I	3.18	4.70	
.766	.826	J	19.46	20.98	
.025	.040	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	c,d
.752	.792	P	19.20	20.12	
.655	.665	R	16.64	16.89	c,d
	.545	S		13.84	
.213	.223	T	5.41	5.66	c,d
.315	.325	U	8.00	8.26	c,d
	.086	V		2.18	
	.100	W		2.54	
.105	.145	Y	2.67	3.68	
.650	.850	Z	16.51	21.59	

ELECTRODE CONTACT AREA (Note a,f)				
Dim. in Inches			Dim. in Millimeter	
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

NOTES:

a.. Metric equivalents, to the nearest .01 mm, 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.

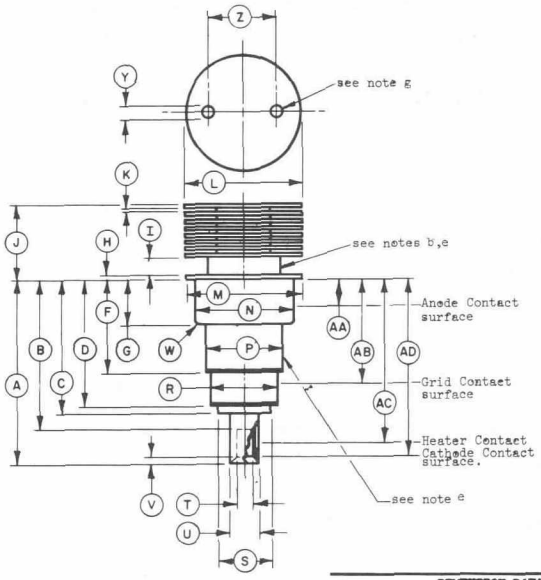
c. Eccentricity of contact surfaces shall be gaged from center line of reference & shall be as follows; note 2 shall apply:

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

d. Diss. N,R,T,U shall apply throughout entire contact area as defined by dims. AA,AB, AC,AD respectively.

e. This surface shall not be used for clamping or locating.

f. . Electrode Contact Dims. are given for socket design purposes & are not intended for inspection purposes.



8907

DIMENSION DATA (Note a)					
DIM. IN INCHES		DIM. IN MILLIMETERS			
MIN.	MAX.	DIM.	MIN.	MAX.	NOTES
1.815	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	d
.752	.792	P	19.10	20.12	
.655	.665	R	16.64	16.89	d
	.545	S		13.84	
.213	.223	T	5.41	5.66	d
.315	.325	U	8.00	8.26	d
	.086	V		2.18	
	.100	W		2.54	
.840	.860	LA	21.34	21.84	
.427	.447	ZA	10.85	11.35	

Notes:

a. Metric equivalents to the nearest .01 mm, are given for general information only & are based on 1 inch= 25.4 mm.

b. This surface shall be used to measure anode shank temp.

c. 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

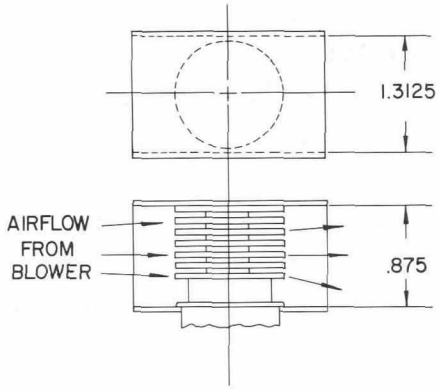
d. Dias. N,R,T & U shall apply throughout entire lenght as defined be dims. AA,AB,AC & AD respectively.

e. This surface shall not be used for clamping or locating.

f. Electrode Contact dims. are given for socket design purposes & are not intended for inspection purposes.

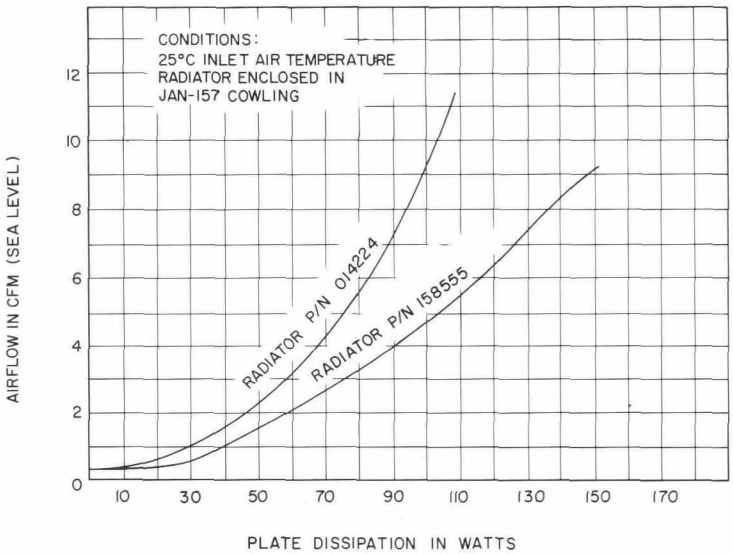
g. Holes for Tube Extractor thru top fin only.

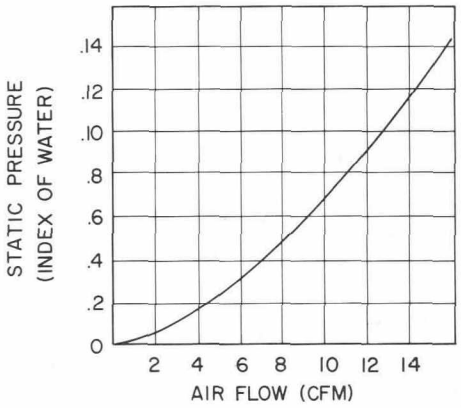
AIRFLOW vs STATIC PRESSURE WITH STANDARD COWLING JAN-157



-STANDARD COWLING-

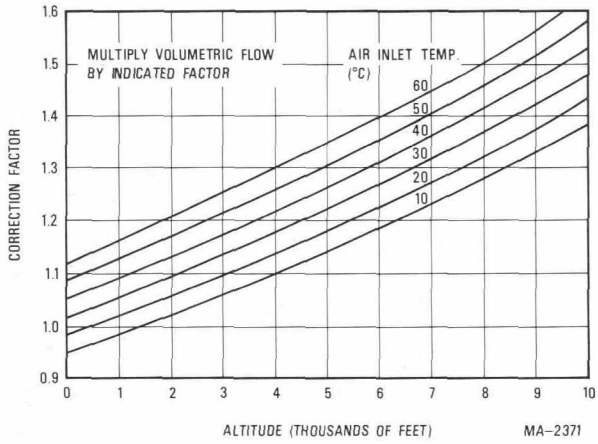
MAXIMUM PLATE DISSIPATION vs COOLING AIRFLOW

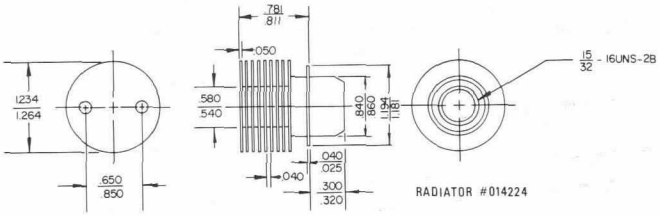




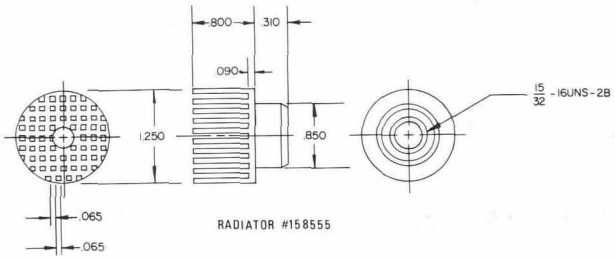
COMBINED CORRECTION FACTORS FOR INLET AIR TEMPERATURE AND ALTITUDE

(RELATIVE TO 25°C AND SEA LEVEL)

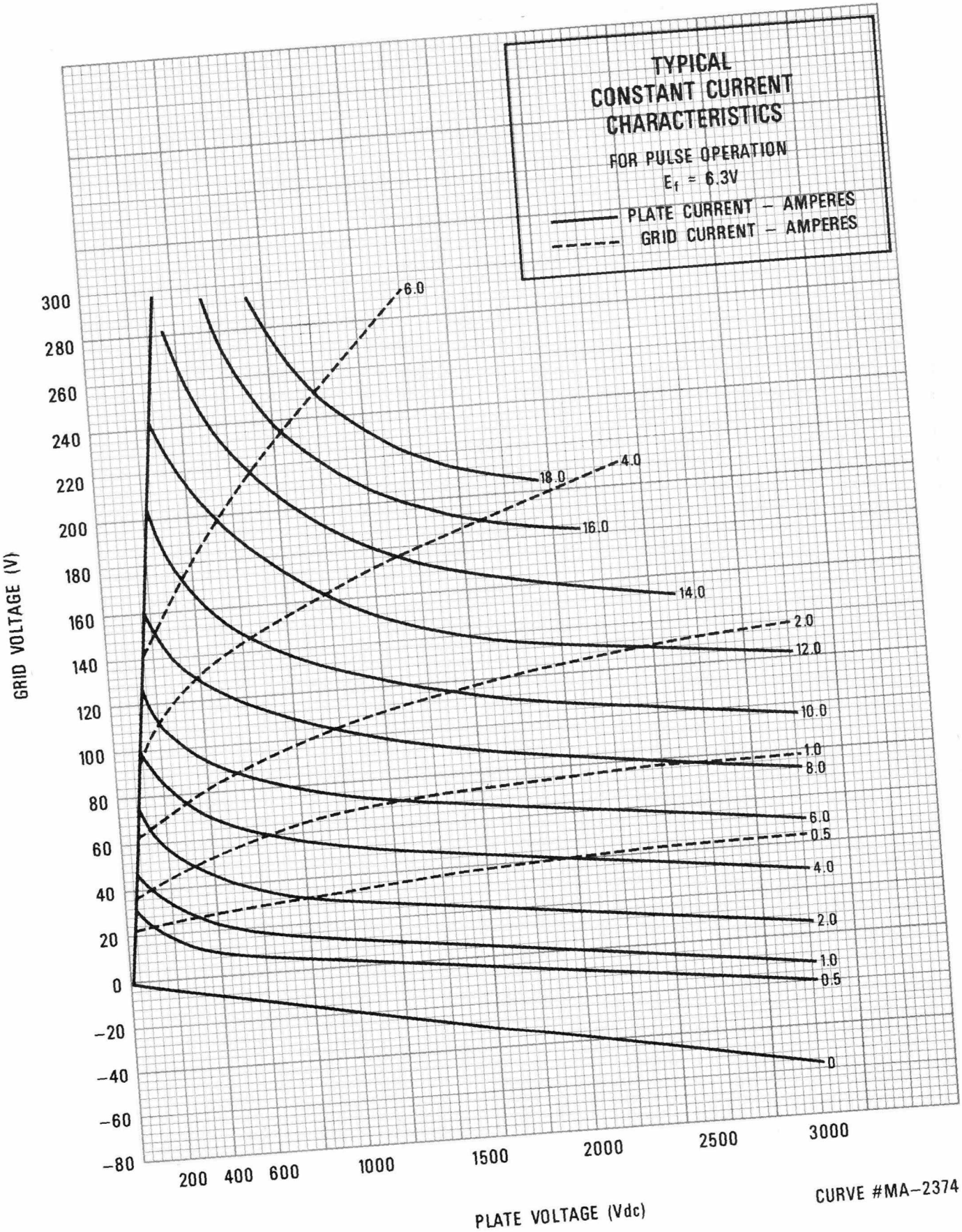


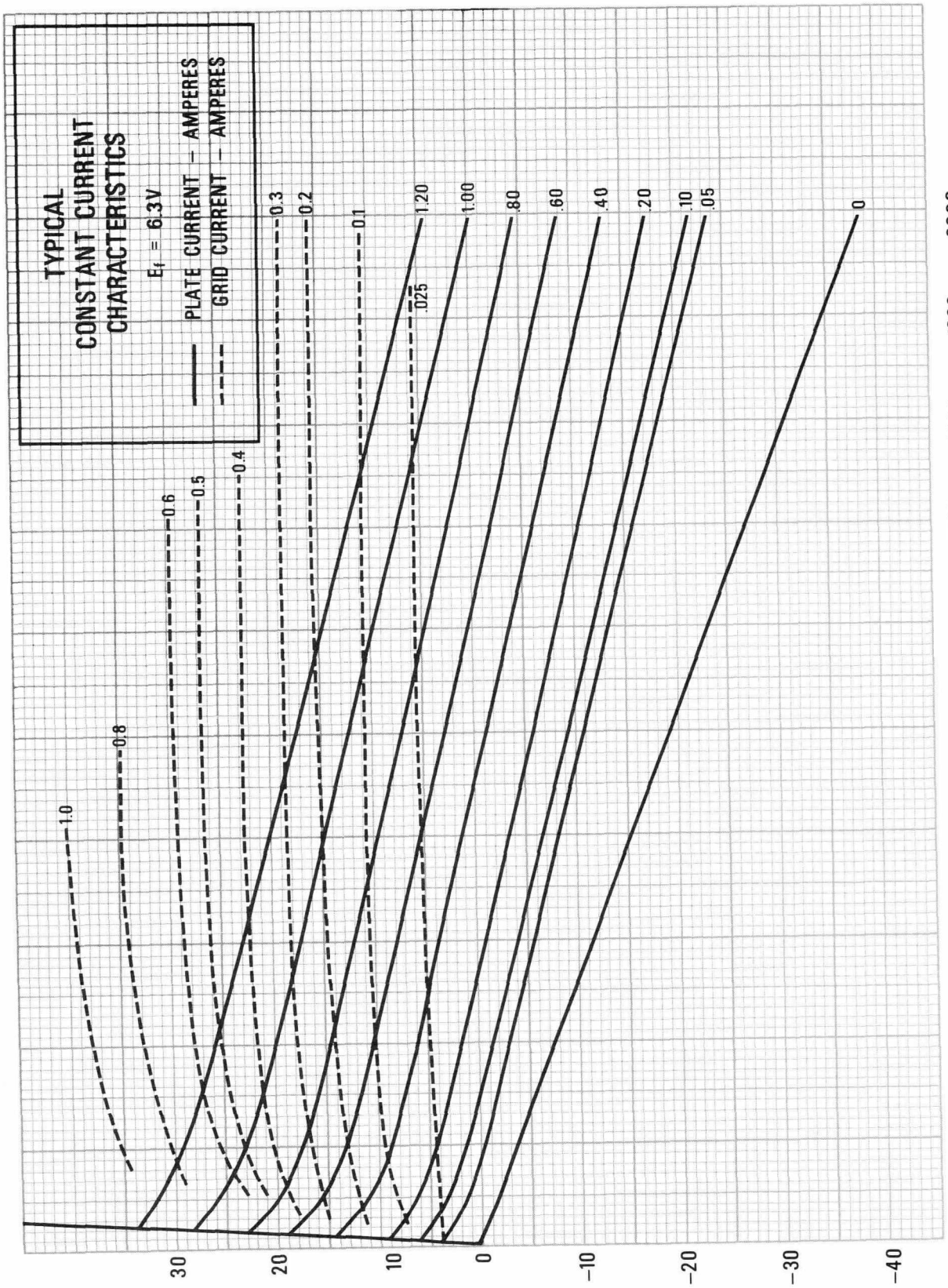


RADIATOR #014224

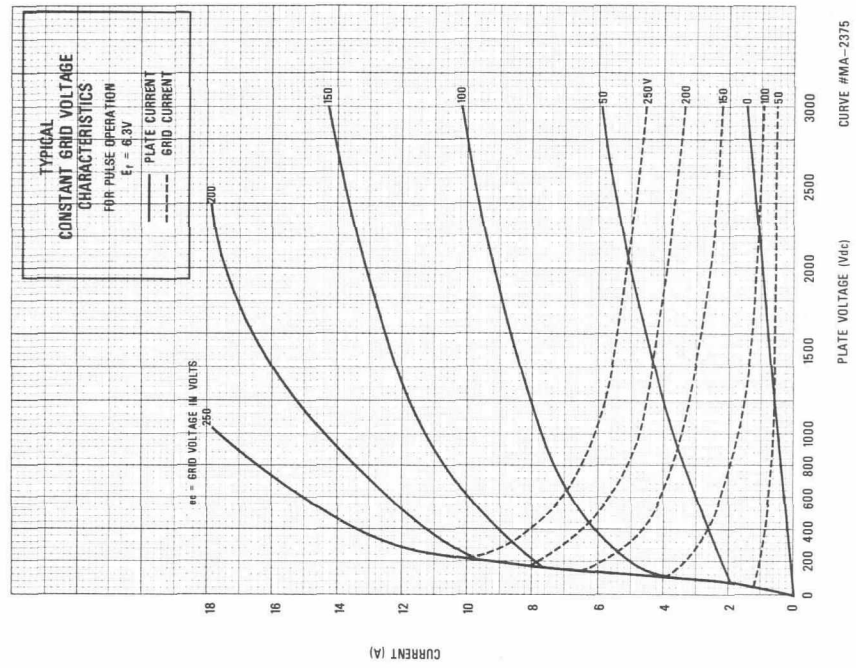


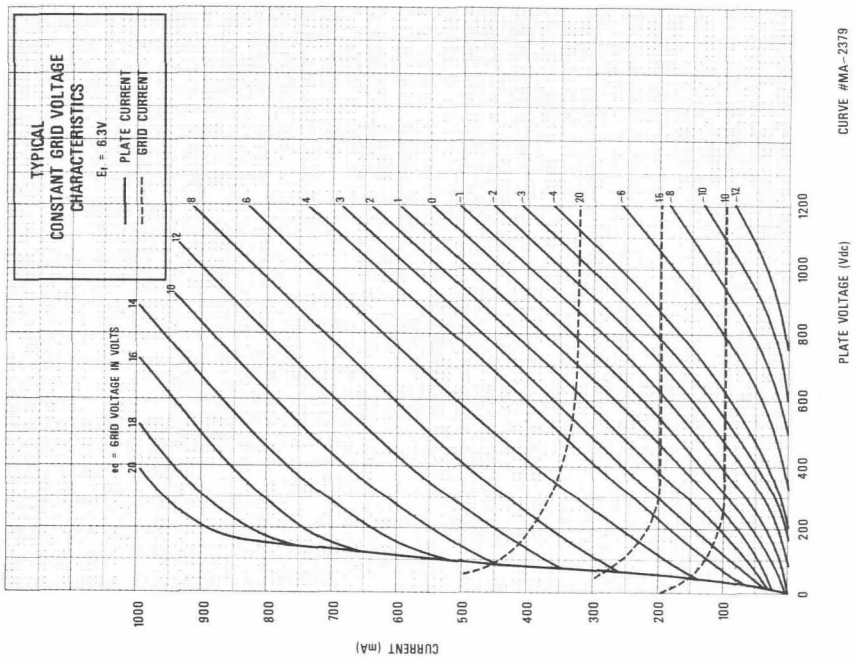
RADIATOR #158555


TYPICAL
CONSTANT CURRENT
CHARACTERISTICS
FOR PULSE OPERATION
E_f = 6.3V
PLATE CURRENT – AMPERES
GRID CURRENT – AMPERES
GRID VOLTAGE (V)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
–20
–40
–60
–80
200
400
600
1000
1500
2000
2500
3000
PLATE VOLTAGE (Vdc)
6.0
4.0
2.0
1.0
0.5
0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
1.0
0.5
0
CURVE #MA–2374



CURVE #MA–2380


TYPICAL
CONSTANT GRID VOLTAGE
CHARACTERISTICS
FOR PULSE OPERATION
Ef = 6.3V
PLATE CURRENT
GRID CURRENT
ec = GRID VOLTAGE IN VOLTS
250
200
150
100
50
250V
200
150
0
100
150
CURRENT (A)
PLATE VOLTAGE (Vdc)
CURVE #MA-2375


TYPICAL
CONSTANT GRID VOLTAGE
CHARACTERISTICS
Ef = 6.3V
PLATE CURRENT
GRID CURRENT
ec = GRID VOLTAGE IN VOLTS
20
18
16
14
10
12
8
6
4
3
2
1
0
-1
-2
-3
-4
20
-6
15
-8
-10
10
-12
CURRENT (mA)
PLATE VOLTAGE (Vdc)
CURVE #MA-2379

TECHNICAL DATA

8906AL
Y572AL

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[1]

ELECTRICAL

Cathode: Oxide Coated, Unipotential		
Heater: Voltage	5.7 (±2%)	V
Current, at 5.7 volts	0.95	A
Transconductance (Average):		
I_b= 100 mAdc, E_b = 600 Vdc	30	mmhos
Amplification Factor (Average)	80	
Direct Interelectrode Capacitance (grounded cathode)[2], 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.

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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

	Min.	Max.	
Heater Current at 5.7 volts	0.87	1.02	A
Cut-off Bias[1]	---	-25	V
Grid-Plate Capacitance[2]	1.85	2.10	pF
Grid-Cathode Capacitance[2]	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[1]		
Conduction and Convection	10	WATTS
GRID DISSIPATION (Average)	2	WATTS
DUTY FACTOR[2]	.0033	
PULSE DURATION[2]	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%	

APPLICATION

MECHANICAL

MOUNTING - The important dimensions of the tube are carefully controlled with respect to the reference surface as shown on the outline drawing. The reference surface is intended to serve as a tube stop and the location of the tube in the circuit should therefore be determined by this surface coming in positive contact with a precisely positioned member of the socket or cavity. Adherence to this practice will assure both mechanical and electrical interchangeability of all tubes of a given type. If a non-designated surface is used as a tube stop, faulty positioning of the tube in the cavity and possible imcomplete electrical contact can result in improper tuning, reduced power output and damage to the cavity, tube or both. Contact surfaces, with reference to the designated tube stop are shown in the outline drawing. Electrical contact to the cathode, grid, anode and also the heater should be restricted to these designated contact areas.

Dimensions should never be taken from sample tubes. Dimensional changes due to normal variations in undimensioned surfaces may occur within the limits specified on the outline drawing. Use of nondesignated electrical contact surfaces might therefore result in incomplete contact or mechanical interference, causing changes in cavity tuning.

Electrical contact should be made by spring finger collets bearing against the previously described contact areas. If connections are employed which do not provide multiple contacts to the designated contact areas, concentration of RF current will result in loss of output power, especially at higher frequencies. The spring contacts used should exert a firm pressure without gouging the plated contact surface. This latter phenomena can result in loose particles of material which can cause arcing or unstable operation of the cavity.

If the tubes are used in applications which call for severe shock or vibration the tube may be clamped in place by the knob or radiator, exerting pressure only on this part of the tube and against the tube stop. No other portion of the tube should be subject to any clamping force. In particular, electrical contacts which utilize setscrews or rigid clamps should be avoided. Such contact schemes can distort the contact surfaces causing undue stress in the metal-to-ceramic seal area which may result in a vacuum leak. Soldered electrical connections can be made, however great care should be taken during the solder operation to avoid fracture of the seal area due to thermal shock. All contact surfaces should be kept clean to minimize losses.

COOLING - The EIMAC planar triodes are designed to operate at envelope and anode temperatures of up to the maximum rated value of 250°C. However, performance and long-term reliability of any component are improved when it is kept as cool as technically feasible. Therefore, it is recommended that sufficient cooling be provided to keep the anode and seal areas well below the specified maximum temperature, where long tube life and high reliability are of great importance.

The maximum plate dissipation of the 8906AL/Y572AL is 10 watts average power. This can be accomplished by conduction, natural convection or forced air convection cooling. The maximum plate dissipation in pulse service is 45 watts average when furnished with EIMAC radiator (P/N 014224) and forced air cooling is employed at that level. When forced air cooling is used, it is recommended that additional airflow, apart from that flowing through the radiator be used to cool the tube envelope and other tube terminals. A certain amount of conduction cooling is usually inherent in the contact finger configuration. It should be noted, however, that spring fingers provide poor heat conduction and measurements have shown a temperature difference as much as 50°C between the contact finger and contact area.

It is suggested that in all new applications the envelope temperature be measured, especially if the tube is used close to the upper temperature limit. The temperature can easily be determined by the use of Tempilaq paint (Tempil Division, Big Three Industrial Gas & Equipment Co. Hamilton Blvd., So. Plainfield, N.J. 07080. or Temp-Plate stickers (Pydrodyne, Inc., 1001 Colorado St., Santa Monica, California 90404.)

ELECTRICAL

HEATER VOLTAGE - The rated heater voltage for the 8906AL/Y572AL is 5.7 volts and should be controlled within ±2% to obtain maximum tube life and to minimize variations in circuit performance. The rated heater voltage is optimum for most existing airborne applications such as DME

and transponder systems. However, there are other applications where a different heater voltage than the nominal should be used to obtain the longest possible tube life. Depending on pulse width, power output and frequency of oscillation used a different heater voltage may be better for long reliable life. Electron transit time is not necessarily small with respect to the period of oscillation and the amount of driving power diverted will contribute to the cathode heating by electron bombardment.

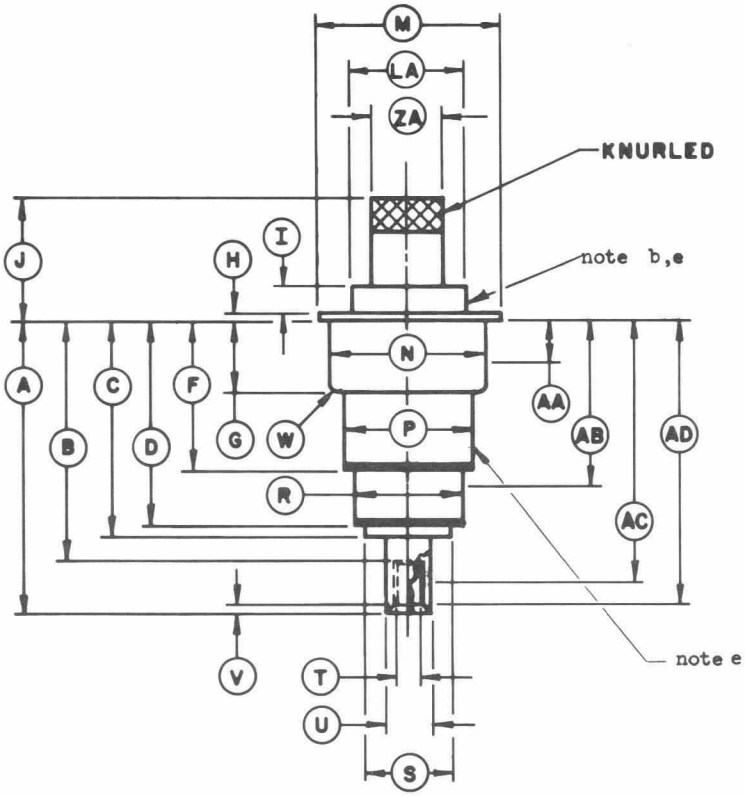
The proper adjustment of the heater voltage must be made to compensate for this additional heating, which depends on operating frequency and duty cycle employed.

INTERELECTRODE CAPACITANCES - As indicated, the capacitance values are shown for measurements made with no heater voltage. The cathode to grid and cathode to plate capacitance will increase with the application of the heater voltage, due to the thermal expansion of the cathode support. Typically, the increase in the grid to cathode capacitance will be 15%, or more, depending on the heater voltage. Since the heater voltage can vary depending on use, data taken without heater voltage is more useful for control of tube-to-tube uniformity. The grid to anode capacitance is not effected by the application of the heater voltage.

CIRCUIT TUNING - Especially under grid pulse conditions, it is important that the tube does not lose bias or momentarily go into a CW mode. Either of these events may result in tube failure. It is suggested that provision be made for initial circuit tune-up at reduced anode voltage and for extra tube protection when the circuit adjustment is critical. The average grid dissipation capability for this tube is 2.0 watts. For many applications the limiting factor is often not anode dissipation or cathode emission capability, but grid dissipation. If pulse width control is lost in pulse applications the grid can exceed safe operating temperatures in 50 ms or less. Appropriate circuit protection during tune up is therefore recommended.

CATHODE OPERATION - The 8906AL/Y572AL contains an arc-resistant cathode. Performance in the field and laboratory indicates this tube is capable of withstanding some abuse due to high voltage arcs, however, poor circuit adjustment in the field may result in shortened tube life. It is, therefore, suggested that wherever feasible, the plate supply be designed such that its impedance limits the short circuit current to within five to ten times the maximum forward current. For pulse service the peak current should be limited to the values listed. Higher pulse width and duty cycles than given can be obtained with proper derating of the current. For this and special applications it is recommended that the user request additional information pertaining to his special application from the nearest Varian Electron Tube and Devices Field Office, or the Product Manager, Eimac Division of Varian, Salt Lake City, Utah.

For general application information please refer to the Planar Triode Operating Instructions.



ELECTRODE CONTACT AREA (see note a,f)				
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 (Note a)					
DIM. IN INCHES		DIM. IN MILLIMETERS			
MIN.	MAX.	DIM.	MIN.	MAX.	NOTES
1.815	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	d
.752	.792	P	19.10	20.12	
.655	.665	R	16.64	16.89	d
	.545	S		13.84	
.213	.223	T	5.41	5.66	d
.315	.325	U	8.00	8.26	d
	.086	V		2.18	
	.100	W		2.54	
.840	.860	LA	21.34	21.84	
.427	.447	ZA	10.85	11.35	

NOTES:

a.. Metric equivalents, to the nearest .01 mm, 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.

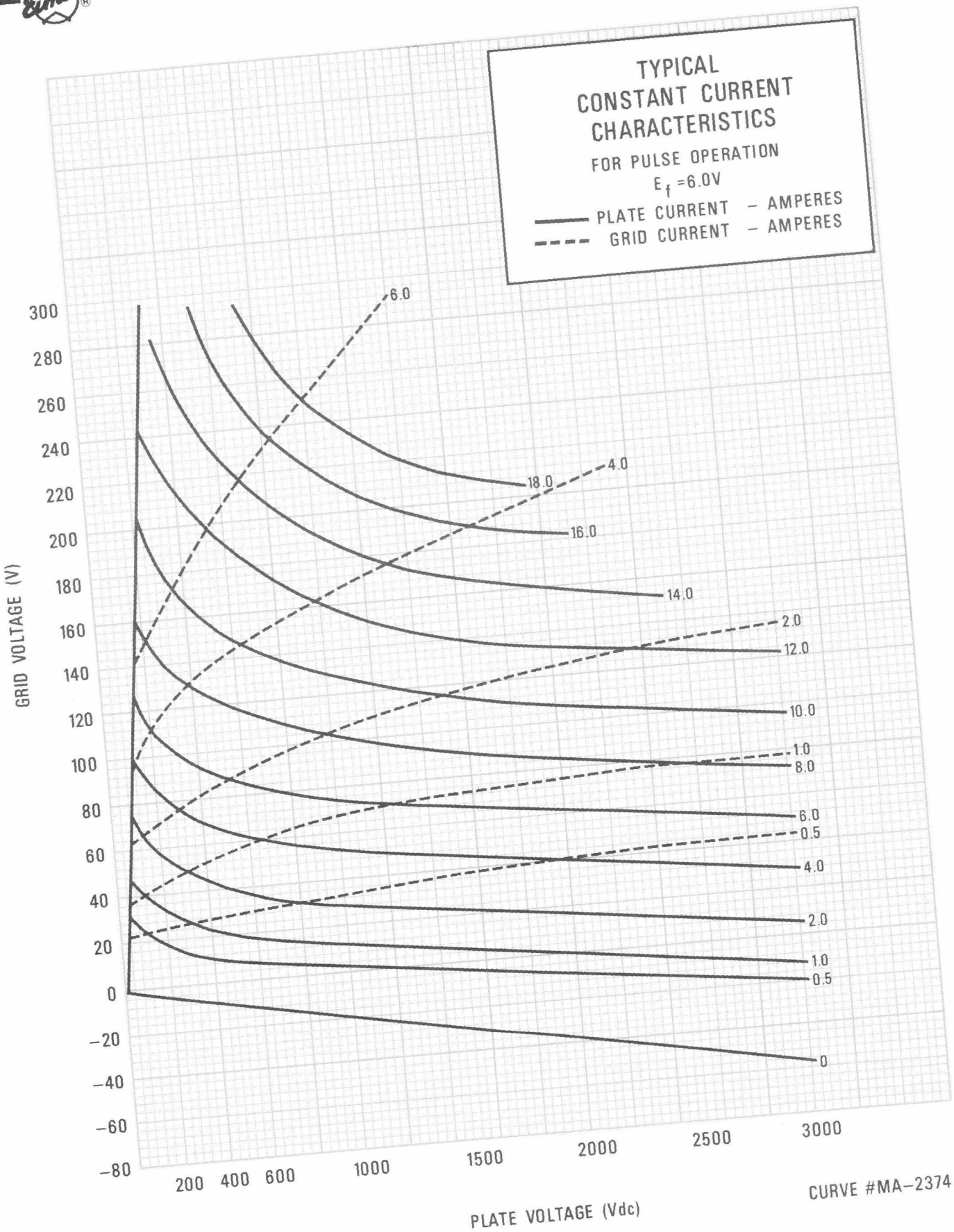
c. Eccentricity of contact surfaces shall be gaged from center line of reference & shall be as follows; note 2 shall apply:

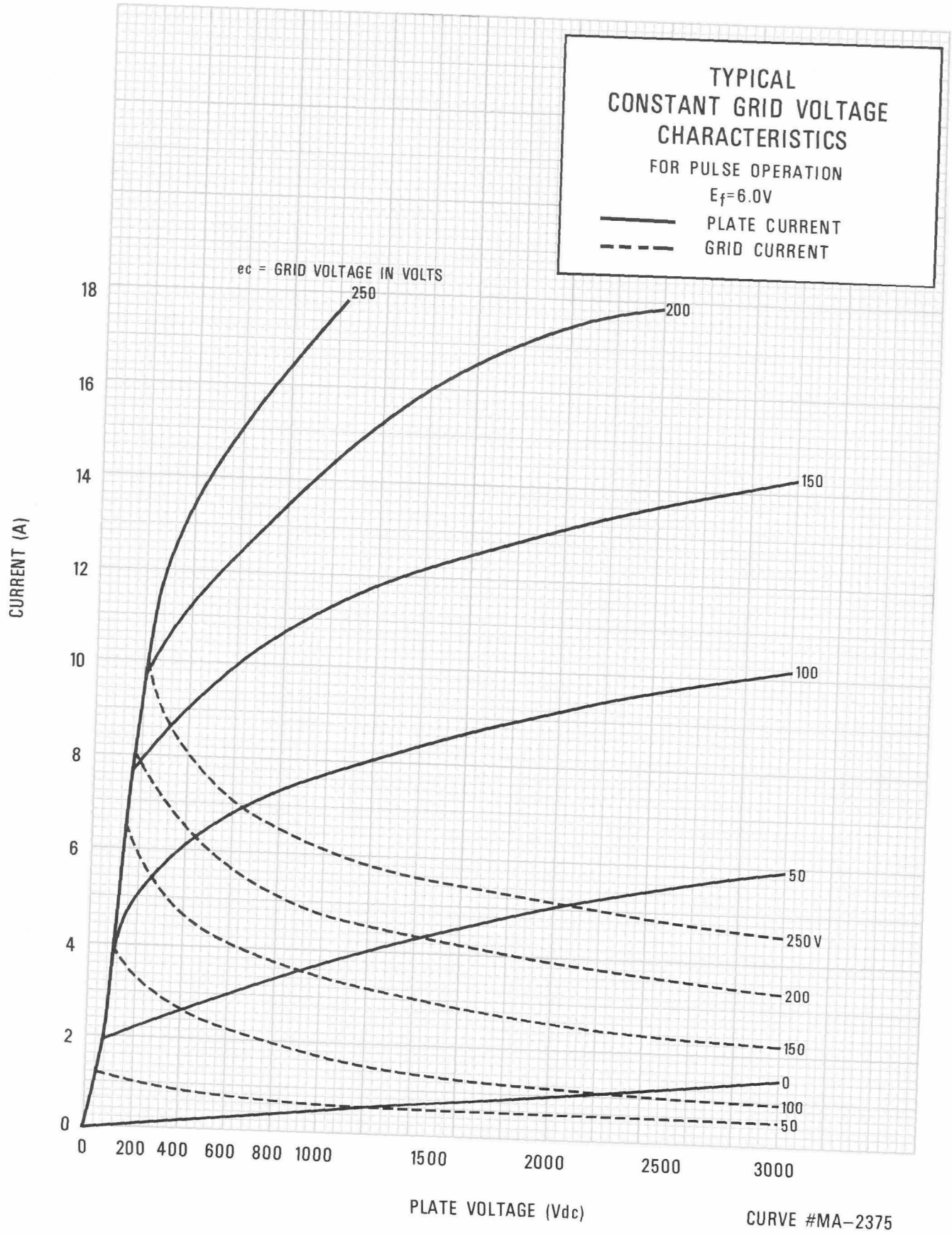
Contact Surface	TIR Max.	Reference
Anode	.020	Cathode
Grid	.020	Cathode
Heater	.012	Cathode

d. Dias. N,R,T,U shall apply throughout entire contact area as defined by dims. AA,AB, AC,AD respectively.

e. This surface shall not be used for clamping or locating.

f. . Electrode Contact Dims. are given for socket design purposes & are not intended for inspection purposes.


TYPICAL
CONSTANT CURRENT
CHARACTERISTICS
FOR PULSE OPERATION
E_f =6.0V
PLATE CURRENT – AMPERES
GRID CURRENT – AMPERES
GRID VOLTAGE (V)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
–20
–40
–60
–80
200
400
600
1000
1500
2000
2500
3000
PLATE VOLTAGE (Vdc)
6.0
4.0
2.0
1.0
0.5
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
1.0
0.5
0
CURVE #MA–2374



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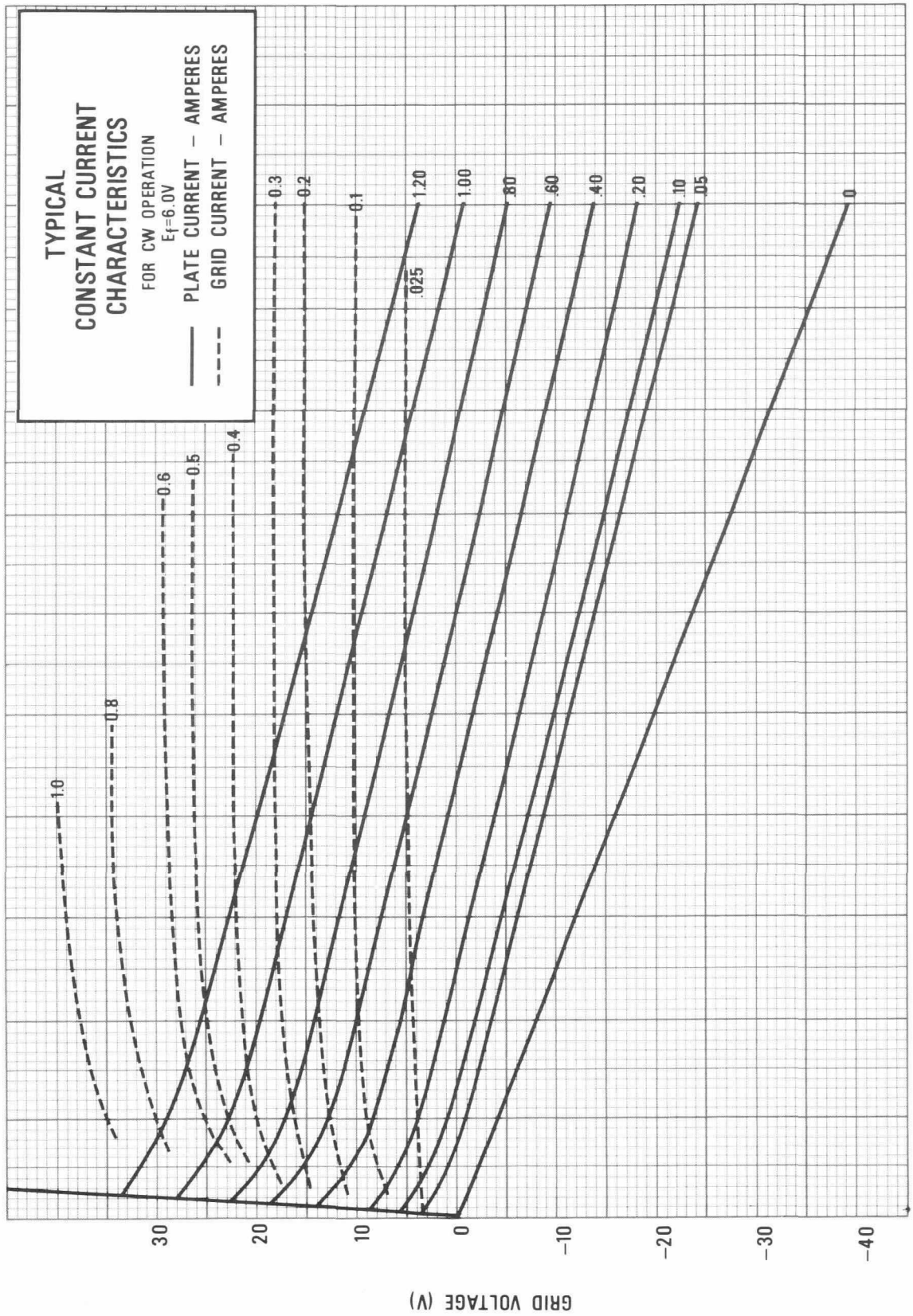

CURVE #MA-2380