



TECHNICAL DATA

8533

PLANAR TRIODE

The EIMAC Type 8533 is a planar triode designed for use as a grid- or plate-pulsed oscillator, amplifier, frequency multiplier, or switch tube at high plate voltages. The tube will operate from low frequencies up to 3.0 GHz. The extended grid-to-anode insulator and a matrix cathode of the arc resistant extended interface type permit reliable operation up to 8 kVdc in RF applications. Other features of this tube type include high transconductance, high μ , and high current capability coupled with great mechanical strength permitting operation at elevated temperatures. The compact metal and ceramic coaxial construction coupled with low interelectrode capacitances make this tube well suited for operation in line type circuits at lower frequencies as well as in cavity resonators at the higher frequencies. The cathode is an indirectly heated disc requiring only minimal heater power.



GENERAL CHARACTERISTICS¹

ELECTRICAL

Cathode: Oxide Coated, Unipotential

Heater: Voltage	6.3 ± 0.3 V
Current, at 6.3 volts	1.3 A
Transconductance (Average):	
$I_b = 160$ mA (200 mA/cm ²)	30 mmhos
Amplification Factor (Average):	145
Direct Interelectrode Capacitance (grounded cathode) ²	
C _{in}	8.0 pF
C _{out}	0.06 pF
C _{gp}	1.65 pF
Cut-off Bias ³	-30 V max.
Frequency of Maximum Rating:	
CW	3000 MHz
Plate or Grid-Pulsed	3000 MHz

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. 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 milliamperes plate current and a plate voltage of 1 kVdc.

(Effective 12-1-71) © by Varian

Printed in U.S.A.

MECHANICAL

Maximum Overall Dimensions:

Length	2.701 in; 68.60 mm
Diameter	1.264 in; 32.11 mm
Net Weight	63 gm
Operating Position	Any
Maximum Operating Temperature:	
Ceramic/Metal Seals	250°C
Anode Core	250°C
Cooling	Forced Air
Terminals	Coaxial, special

ENVIRONMENTAL

Shock: 11 ms, non-operating	60 G
Vibration: Operating, All Axis	10 G
Altitude: max., in suitably designed circuit	60,000 ft.

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.
Interelectrode Capacitance ¹ (grounded cathode connection)		
C _{in}	7.00	9.00 pF
C _{out}	---	0.06 pF
C _{gp}	1.50	1.80 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.

**GRID PULSED OR PLATE PULSED AMPLIFIER
OR OSCILLATOR**

ABSOLUTE MAXIMUM RATINGS:

DC PLATE VOLTAGE (grid pulsed) ..	8000 VOLTS
PEAK PULSE PLATE VOLTAGE (plate pulsed)	10,000 VOLTS
DC GRID VOLTAGE	-150 VOLTS
INSTANTANEOUS PEAK GRID-CATHODE VOLTAGE	
Grid negative to cathode	-750 VOLTS
Grid positive to cathode	150 VOLTS
PULSE PLATE CURRENT	5.0 AMPERES
PULSE GRID CURRENT	2.5 AMPERES

AVERAGE PLATE DISSIPATION

Forced Air Cooling ¹	100 WATTS
GRID DISSIPATION (Average)	1.5 WATTS
FREQUENCY	3.0 GHz
PULSE DURATION ²	6.0 μ s
DUTY FACTOR ²	.0033

1. Using EIMAC radiator PN 014224.

2. For applications using longer pulse duration and/or higher duty cycle consult the nearest Varian Electron Tube & Device Field Office, or the Product Manager, EIMAC Division of Varian, Salt Lake City, Utah.

PULSE MODULATOR AND PULSE AMPLIFIER SERVICE

ABSOLUTE MAXIMUM RATINGS:

DC PLATE VOLTAGE	8000 VOLTS
PEAK PLATE VOLTAGE	10,000 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

AVERAGE PLATE DISSIPATION

Forced Air Cooling ¹	100 WATTS
GRID DISSIPATION (Average)	1.5 WATTS
PULSE DURATION ²	6.0 μ s
DUTY FACTOR ²	.0033
CUT-OFF MU	90

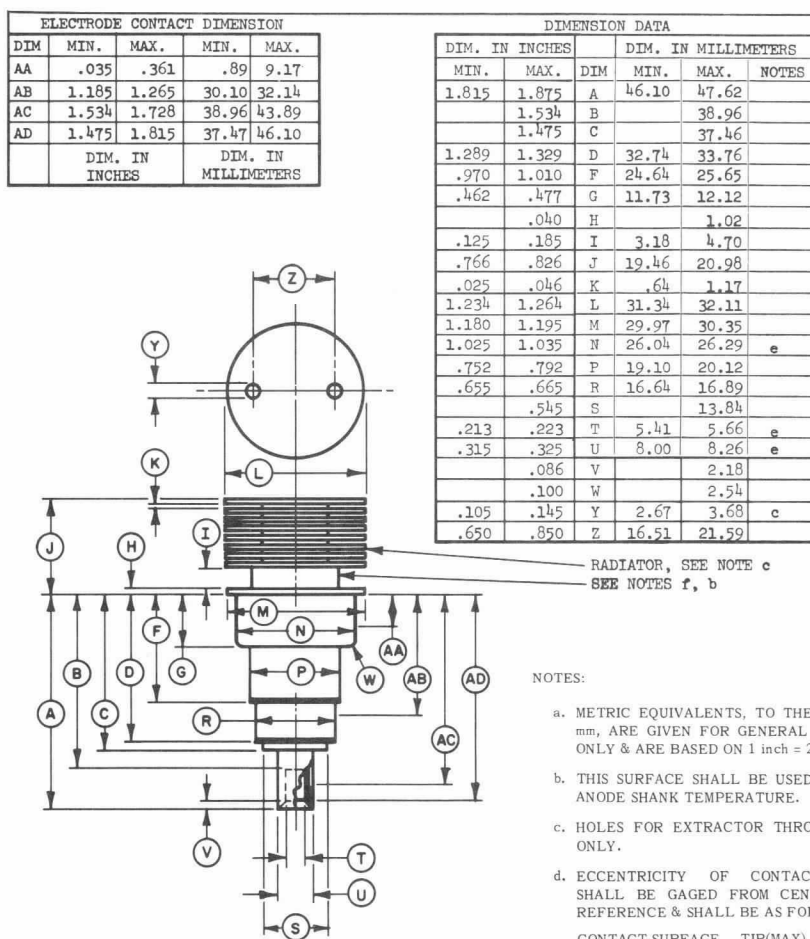
1. Using EIMAC radiator PN 014224.

2. For applications using longer pulse duration and/or higher duty cycle consult the nearest Varian Electron Tube & Device 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:

- METRIC EQUIVALENTS, TO THE NEAREST .01 mm, ARE GIVEN FOR GENERAL INFORMATION ONLY & ARE BASED ON 1 inch = 25.4 mm.
- THIS SURFACE SHALL BE USED TO MEASURE ANODE SHANK TEMPERATURE.
- HOLES FOR EXTRACTOR THROUGH TOP FIN ONLY.
- 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
- DIA'S N, R, T & U SHALL APPLY THROUGHOUT ENTIRE LENGTH AS DEFINED BY DIM'S AA, AB, AC & AD RESPECTIVELY.
- THIS SURFACE SHALL NOT BE USED FOR CLAMPING OR LOCATING.

