



E I M A C

Division of Varian

SAN CARLOS

CALIFORNIA

592/3-200A3
MEDIUM-MU TRIODE

**MODULATOR
OSCILLATOR
AMPLIFIER**

The EIMAC 592/3-200A3 is a medium-mu power triode having a maximum plate dissipation rating of 200 watts, and it is intended for use as a power amplifier, oscillator, or modulator. It can be used at its maximum ratings at frequencies as high as 150 MHz.

Cooling of the 592/3-200A3 is accomplished by radiation from the plate, which operates at a visible red color at maximum plate dissipation, and by means of forced-air circulation around the envelope.

ELECTRICAL GENERAL CHARACTERISTICS

Filament: Thoriated Tungsten

Voltage - - - - - 10.0 volts

Current - - - - - 5.0 amperes

Amplification Factor (Average) - - - - - 25

Direct Interelectrode Capacitances (Average)

Grid-Plate - - - - - 3.3 μmf

Grid-Filament - - - - - 3.6 μmf

Plate-Filament - - - - - 0.29 μmf

Transconductance ($I_b=200$ ma., $E_b=3000$ v.) - - - - - 3600 μmhos

Frequency for Maximum Ratings - - - - - 150 MHz

MECHANICAL

Mounting - - - - - Vertical

Maximum Over-all Dimensions:

Length - - - - - 6.0 inches

Diameter - - - - - 3 $\frac{1}{2}$ inches

Net Weight (approx.) - - - - - 6 ounces

Shipping Weight (approx.) - - - - - 1 $\frac{1}{2}$ pounds

Cooling - - - - - Radiation and Forced-Air

Recommended Heat Dissipating Connectors:

Plate - - - - - EIMAC HR-10

Grid - - - - - EIMAC HR-5

Maximum Bulb Temperature - - - - - 225°C

Maximum Seal Temperature - - - - - 175°C

AUDIO FREQUENCY POWER AMPLIFIER AND MODULATOR

Class B

MAXIMUM RATINGS

DC PLATE VOLTAGE - - - 3500 VOLTS

MAX-SIGNAL DC
PLATE CURRENT - - - 250 MA.

DC PLATE CURRENT - - - 200 WATTS

GRID DISSIPATION - - - 25 WATTS

PLATE MODULATED RADIO FREQUENCY AMPLIFIER

Class-C Telephony (Carrier conditions, per tube)

MAXIMUM RATINGS

DC PLATE VOLTAGE - - - 2600 VOLTS

PLATE DISSIPATION - - - 200 MA.

PLATE DISSIPATION - - - 130 WATTS

GRID DISSIPATION - - - 25 WATTS

TYPICAL OPERATION

Sinusoidal wave, two tubes unless otherwise specified.

DC Plate Voltage - - - 2000 2500 3000 Volts

DC Grid Voltage (approx.)* - - -50 -70 -90 Volts

Zero-Signal DC Plate Current - 120 100 80 Ma.

Max-Signal DC Plate Current - 500 450 400 Ma.

Effective Load, Plate-to-Plate - 8500 12,600 18,000 Ohms

Peak AF Grid Input
Voltage (per tube) - - - 260 270 270 Volts

Max-Signal Peak Driving Power - 50 52 40 Watts

Max-Signal Nominal
Driving Power (approx.) - - - 25 26 20 Watts

Max-Signal Plate Power Output - 600 725 820 Watts

*Adjust to give stated zero-signal plate current.

TYPICAL OPERATION

DC Plate Voltage - - - 2000 2500 Volts

DC Plate Current - - - 200 200 Ma.

DC Grid Voltage - - - -250 -300 Volts

DC Grid Current - - - 35 35 Ma.

Peak RF Grid Input Voltage - - - 480 535 Volts

Driving Power - - - 17 19 Watts

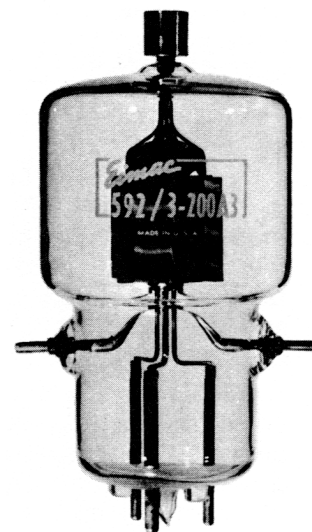
Grid Dissipation - - - 8 9 Watts

Plate Power Input - - - 400 500 Watts

Plate Dissipation - - - 115 125 Watts

Plate Power Output - - - 285 375 Watts

The output figures do not allow for circuit losses.



RADIO FREQUENCY POWER AMPLIFIER AND OSCILLATOR

Class-C Telephony or FM Telephony
(Key-down conditions, per tube)

MAXIMUM RATINGS

DC PLATE VOLTAGE	-	-	-	3500 VOLTS
DC PLATE CURRENT	-	-	-	250 MA.
PLATE DISSIPATION	-	-	-	200 WATTS
GRID DISSIPATION	-	-	-	25 WATTS

TYPICAL OPERATION

DC Plate Voltage	-	-	2000	2500	3000	3500 Volts
DC Plate Current	-	-	250	228	222	228 Ma.
DC Grid Voltage	-	-	-150	-180	-220	-270 Volts
DC Grid Current	-	-	32	28	25	30 Ma.
Peak RF Grid Input Voltage	-	-	380	400	440	505 Volts
Driving Power	-	-	12	11	11	15 Watts
Grid Dissipation	-	-	7	6	5.5	7 Watts
Plate Power Input	-	-	500	570	666	800 Watts
Plate Dissipation	-	-	200	200	200	200 Watts
Plate Power Output	-	-	300	370	466	600 Watts

The output figures do not allow for circuit losses.

APPLICATION

MECHANICAL

Mounting — The 592/3-200A3 must be mounted vertically, base down or base up. Flexible connecting straps should be provided from the grid and plate terminals to the external grid and plate circuits. The tube must be protected from severe vibration and shock.

Cooling — An air-flow of approximately 15 cubic feet per minute should be directed at the bulb from a 2 inch diameter nozzle located about three inches from the center line of the tube. The center line of the nozzle should be located about two inches down from the top of the plate terminal. The incoming air temperature should not exceed 50°C. Other methods of cooling may be used provided the maximum bulb and seal temperatures are not exceeded. An 8 inch, house-hold-type fan located about 10 inches from the tube is one alternate method. Special heat-dissipating connectors EIMAC HR-5 and HR-10, or equivalent, for grid and plate terminals respectively) should be used with this tube. These connectors help to prolong tube life by reducing the temperature of the metal-glass seals.

ELECTRICAL

Filament Voltage — For maximum tube life, the filament voltage, as measured directly at the filament pins, should be the rated value of 10.0 volts. Unavoidable variations in filament voltage must be kept within the range of 9.5 to 10.5 volts.

Bias Voltage — There is little advantage in using bias voltages in excess of those given under "Typical Operation" except in certain very specialized applications. Where bias is obtained by a grid leak, suitable protective means must be provided to prevent excessive plate dissipation in the event of loss of excitation.

Grid Dissipation — The power dissipated by the grid of the 592/3-200A3 must not exceed 25 watts. Grid dissipation may be calculated from the following expression:

$$P_g = e_{\text{cmp}} I_c$$

where P_g = grid dissipation,

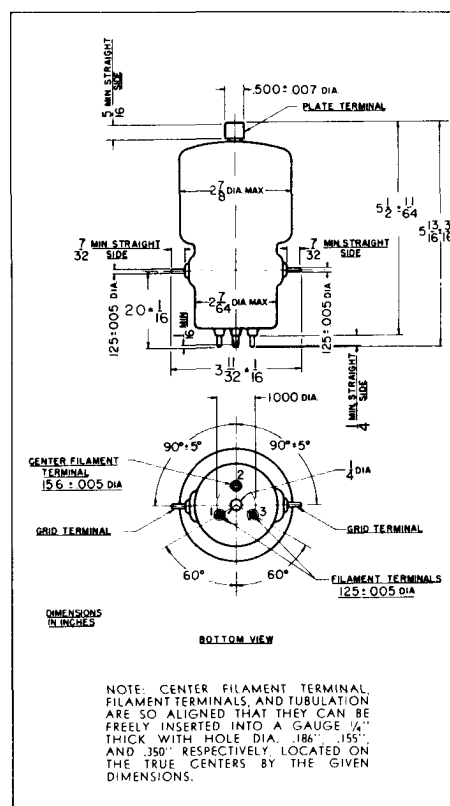
e_{cmp} = peak positive grid voltage, and

I_c = dc grid current.

e_{cmp} may be measured by means of a suitable peak-reading voltmeter connected between filament and grid.

Plate Voltage — Except for special applications, the plate supply voltage for the 592/3-200A3 should not exceed 3500 volts. In most cases there is little advantage in using plate-supply voltages in excess of those given under "Typical Operation" for the power output desired.

Plate Dissipation — Under normal operating conditions, the power dissipated by the plate of the 592/3-200A3 should not exceed 200 watts. At this dissipation the brightness temperature of the plate will appear a red-orange in color. The value of this color is somewhat affected by light from the filament, as well as from external sources. Plate dissipation in excess of the maximum rating is permissible for short periods of time, such as during tuning procedures.





DRIVING POWER vs. POWER OUTPUT

The four charts on this page show the relationship of plate efficiency, power output and grid driving power at plate voltages of 2000, 2500, 3000 and 3500 volts. These charts show combined grid and bias losses only. The driving power and power output figures do not include circuit losses. The plate dissipation in watts is indicated by P_p .

Points A, B, C, and D are identical to the typical Class C operating conditions shown on the first page under 2000, 2500, 3000, and 3500 volts respectively.

