ELECTRONIC INNOVATIONS IN ACTION

MICROWAVE DEVICES

# —PRODUCT INFORMATION—

# Planar Triode

**GE16231**

The GE16231 is a planar metal-ceramic triode intended for use as a plate pulsed amplifier. This tube was designed primarily for long life and high gain-bandwidth in the moderate power level stages of broadbanded amplifier chains.

## CHARACTERISTICS AND TYPICAL OPERATION

### AVERAGE CHARACTERISTICS

| | Minimum | Bogey | Maximum | Units | Test Conditions Ef V | Eb V | Ib Ma | Eg V | Rk Ohms |
|---|---|---|---|---|---|---|---|---|---|
| Heater Voltage, AC or DC* | 6.0 | 6.3 | 6.6 | Volts | | | | | |
| Heater Current | 370 | 400 | 430 | Milliamperes | 6.3 | --- | --- | --- | --- |
| Plate Current | 14 | 22 | 30 | Milliamperes | 6.3 | 200 | --- | --- | 22 |
| Amplification Factor | 180 | 225 | 270 | | 6.3 | 200 | --- | +6 | 270 |
| Transconductance | 40000 | 50000 | 60000 | Micromhos | 6.3 | 200 | --- | +6 | 270 |
| Grid Voltage, Cutoff | --- | -2.0 | -5.0 | Volts | 6.3 | 200 | 0.1 | --- | --- |
| Direct Interelectrode Capacitances• | | | | | | | | | |
| Grid to Plate: (g to p) | 1.3 | 1.7 | 2.1 | pf | | | | | |
| Input: g to (h+k) | 4.5 | 6.0 | 7.5 | pf | | | | | |
| Output: p to (h+k) | 0.01 | 0.018 | 0.026 | pf | | | | | |
| Cathode Heating Time | 60 | --- | --- | Seconds | | | | | |

### PLATE-PULSED AMPLIFIER SERVICE

| | | |
|---|---|---|
| Frequency | 1090 | Megahertz |
| Bandwidth (Single-tuned 3 db) | 180 | Megahertz |
| Duty Factor | 0.004 | |
| Pulse Duration | 4 | Microseconds |
| Pulse Repetition Rate | 1000 | Pulses Per Second |
| Peak Positive-Pulse Supply Voltage | 1000 | Volts |
| Plate Current: Average During Pulse | 0.4 | Amperes |
| Power Input: Average During Pulse | 1.0 | Watts |
| Power Output: Average During Pulse | 20 | Watts |

## NOTES

* The equipment designer should design the equipment so that heater voltage is centered at the specified bogey value, with heater supply variations restricted to maintain heater voltage within the specified tolerance.

• Measured at 450 KHz using a grounded adapter that provides shielding between external terminals of tube.

# ABSOLUTE-MAXIMUM RATINGS

## PLATE-PULSED AMPLIFIER SERVICE

| | | |
|---|---|---|
| Peak Positive-Pulse Plate Supply Voltage | | |
| 1 Microsecond Pulse Duration | 1500 | Volts |
| 4 Microsecond Pulse Duration | 1250 | Volts |
| Duty Factor of Plate Pulse § | 0.004 | |
| Plate Current: Average During Pulse ⊕ | 0.5 | Amperes |
| Negative Grid Voltage: Average During Pulse | 50 | Volts |
| Grid Current: Average During Pulse | 0.2 | Amperes |
| Plate Dissipation | 6.5 | Watts |
| Peak Heater-Cathode Voltage | | |
| Heater Positive with Respect to Cathode | 50 | Volts |
| Heater Negative with Respect to Cathode | 50 | Volts |
| Envelope Temperature at Hottest Point ▲ | 250 | °C |
| Temperature Differential Between Two Adjacent Electrodes ♦ | 75 | °C |
| Mechanical Vibration (20-2000 Hz Sinusoidal) | 10 | G.Peak |

Absolute-Maximum ratings are limiting values of operating and environmental conditions applicable to any electron device of a specified type as defined by its published data and should not be exceeded under the worst probable conditions.

The device manufacturer chooses these values to provide acceptable serviceability of the device, making no allowance for equipment variations, environmental variations, and the effects of changes in operating conditions due to variations in the characteristics of the device under consideration and of all other electron devices in the equipment.

The equipment manufacturer should design so that initially and throughout life no absolute-maximum value for the intended service is exceeded with any device under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of the device under consideration and of all other electron devices in the equipment.

# NOTES

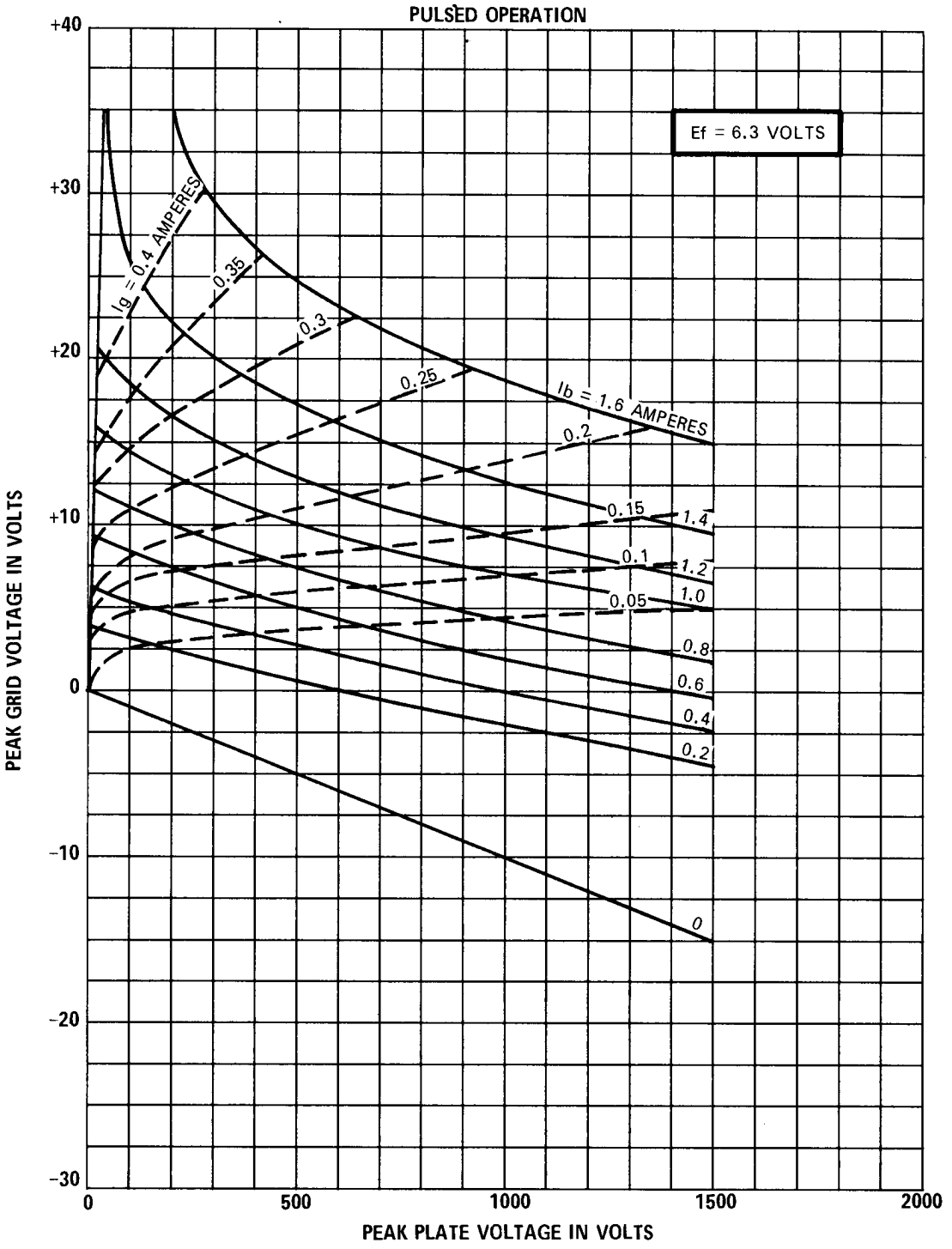
§ In any 5 millisecond interval.

⊕ The regulation and/or series plate supply impedance must be such as to limit the peak current, with the tube considered a short circuit, to a maximum of 10 times the maximum plate current rating.

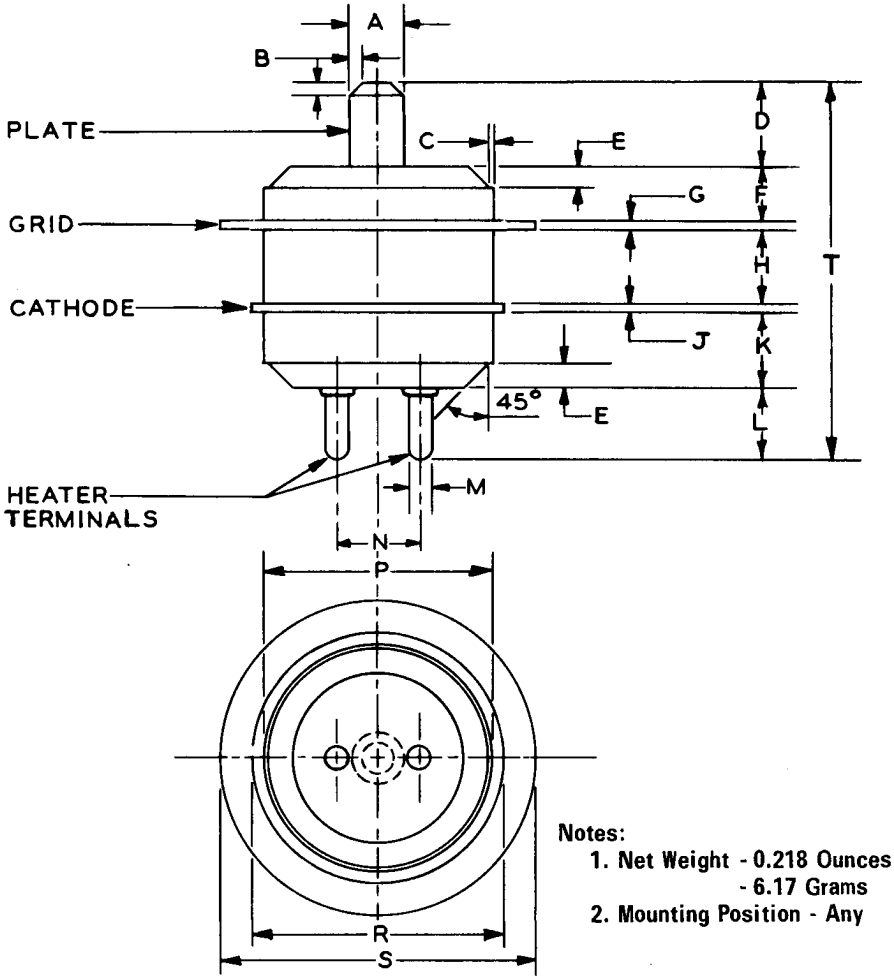
▲ For specific recommendations concerning higher temperature operation, contact your General Electric sales representative.

♦ This assumes no thermal heat sinking to any insulator.

# AVERAGE CONSTANT-CURRENT CHARACTERISTICS



# PHYSICAL DIMENSIONS




Notes:
1. Net Weight - 0.218 Ounces
   - 6.17 Grams
2. Mounting Position - Any

| Ref. | INCHES | | | MILLIMETERS | | |
|---|---|---|---|---|---|---|
| | Min. | Nom. | Max. | Min. | Nom. | Max. |
| A | 0.122 | 0.125 | 0.128 | 3.099 | 3.175 | 3.251 |
| B | --- | 0.030 | --- | --- | 0.762 | --- |
| C | --- | 0.005 | --- | --- | 0.127 | --- |
| D | 0.170 | 0.175 | 0.180 | 4.318 | 4.445 | 4.572 |
| E | 0.040 | 0.050 | 0.060 | 1.016 | 1.270 | 1.524 |
| F | 0.170 | 0.175 | 0.180 | 4.318 | 4.445 | 4.572 |
| G | 0.025 | 0.028 | 0.031 | 0.635 | 0.711 | 0.787 |
| H | 0.167 | 0.172 | 0.177 | 4.242 | 4.369 | 4.496 |
| J | 0.025 | 0.028 | 0.031 | 0.635 | 0.711 | 0.787 |
| K | 0.170 | 0.175 | 0.180 | 4.318 | 4.445 | 4.572 |
| L | 0.170 | 0.175 | 0.180 | 4.318 | 4.445 | 4.572 |
| M | 0.047 | 0.050 | 0.053 | 1.194 | 1.270 | 1.346 |
| N | 0.185 | 0.200 | 0.215 | 4.699 | 5.080 | 5.461 |
| P | 0.535 | 0.550 | 0.565 | 13.59 | 13.97 | 14.35 |
| R | 0.598 | 0.603 | 0.608 | 15.19 | 15.32 | 15.44 |
| S | 0.748 | 0.753 | 0.758 | 19.00 | 19.13 | 19.25 |
| T | 0.897 | 0.928 | 0.959 | 22.78 | 23.57 | 24.36 |

**TUBE PRODUCTS DEPARTMENT**

**GENERAL ELECTRIC**

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