# Planar Triode

## 7391

### FOR GROUNDED-GRID CLASS C OSCILLATOR APPLICATIONS

The 7391 is a high-mu, metal-and-ceramic triode intended for operation as a grounded-grid, Class C oscillator at frequencies as high as 6000 megacycles.

Features of the tube include small size, planar electrode construction with close spacing, inherent rigidity, and an envelope structure convenient for coaxial circuit applications.

The physical appearance and dimensions of the 7391 are identical to those of the 6299.

## GENERAL

### ELECTRICAL

Cathode - Coated Unipotential

Heater Characteristics and Ratings

| | | |
|---|---|---|
| Heater Voltage, AC or DC* | 6.3±0.3 | Volts |
| Heater Current‡ | 0.38 | Amperes |
| Cathode Heating Time, minimum | 60 | Seconds |
| Direct Interelectrode Capacitances§ | | |
| Grid to Plate: (g to p) | 1.58 | pf |
| Grid to Cathode and Heater: | | |
| g to (h + k) | 3.25 | pf |
| Plate to Cathode and Heater: | | |
| p to (h + k) | 0.0158 | pf |

### MECHANICAL

Operating Position - Any

| | | |
|---|---|---|
| Net Weight, approximate | 1/6 | Ounce |

Cooling - Conduction¶

## MAXIMUM RATINGS

### ABSOLUTE-MAXIMUM VALUES

| | | |
|---|---|---|
| Plate Voltage | 200 | Volts |
| Negative DC Grid Voltage | 15 | Volts |
| Plate Dissipation | 2.25 | Watts |
| DC Plate Current | 15 | Milliamperes |
| DC Grid Current | 3.0 | Milliamperes |
| DC Cathode Current | 15 | Milliamperes |
| Envelope Temperature at Hottest Point | 150 | C |

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

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

# CHARACTERISTICS AND TYPICAL OPERATION

## AVERAGE CHARACTERISTICS

| | | |
|---|---|---|
| Plate Voltage | 175 | Volts |
| Grid Voltage | -1.5 | Volts |
| Amplification Factor | 62 | |
| Transconductance | 11000 | Micromhos |
| Plate Current | 10 | Milliamperes |

## CLASS C CW OSCILLATOR—GROUNDED-GRID COAXIAL-TYPE CIRCUIT

| | | | | |
|---|---|---|---|---|
| Frequency | 500 | 1000 | 5400 | Megacycles |
| Plate Voltage | 150 | 150 | 150 | Volts |
| Plate Current | 12 | 12 | 12 | Milliamperes |
| Grid Current | 3.0 | 3.0 | 3.0 | Milliamperes |
| Power Output | 500 | 250 | 65 | Milliwatts |

## 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.

‡ Heater current of a bogey tube at Ef = 6.3 volts.

§ Without external shield.

¶ The electrical connections to the plate and cathode must provide good thermal conductivity from these electrodes. The plate contact must be sufficiently flexible to keep the lateral force on the plate terminal at a minimum.

## INITIAL CHARACTERISTICS LIMITS

| | Minimum | Bogey | Maximum | |
|---|---|---|---|---|
| Heater Current | | | | |
| Ef = 6.3 volts | 360 | 380 | 400 | Milliamperes |
| Grid Voltage | | | | |
| Ef = 6.3 volts, Eb = 175 volts, Ib = 10 ma | -0.7 | -1.5 | -2.55 | Volts |
| Transconductance | | | | |
| Ef = 6.3 volts, Eb = 175 volts, Ec adjusted for Ib = 10 ma. | 8000 | 11000 | 13500 | Micromhos |
| Amplification Factor | | | | |
| Ef = 6.3 volts, Eb = 175 volts, Ec adjusted for Ib = 10 ma. | 46 | 62 | 80 | |
| Grid Voltage Cutoff | | | | |
| Ef = 6.3 volts, Eb = 175 volts, Ib = 100 μa. | -2.4 | -4.2 | -7.0 | Volts |
| Interelectrode Leakage Resistance | | | | |
| Ef = 6.3 volts, Polarity of applied d-c interelectrode voltage is such that no cathode emission results. | | | | |
| Grid to Cathode and Heater at 45 volts d-c | 0.25 | --- | --- | Megohms |
| Grid to Plate at 500 volts d-c | 5.0 | --- | --- | Megohms |
| Interelectrode Capacitances | | | | |
| Grid to Plate: (g to p) | 1.40 | 1.58 | 1.80 | pf |
| Grid to Cathode and Heater: g to (h + k) | 2.60 | 3.25 | 3.95 | pf |
| Plate to Cathode and Heater: p to (h + k) | 0.010 | 0.0158 | 0.023 | pf |

## SPECIAL PERFORMANCE TESTS

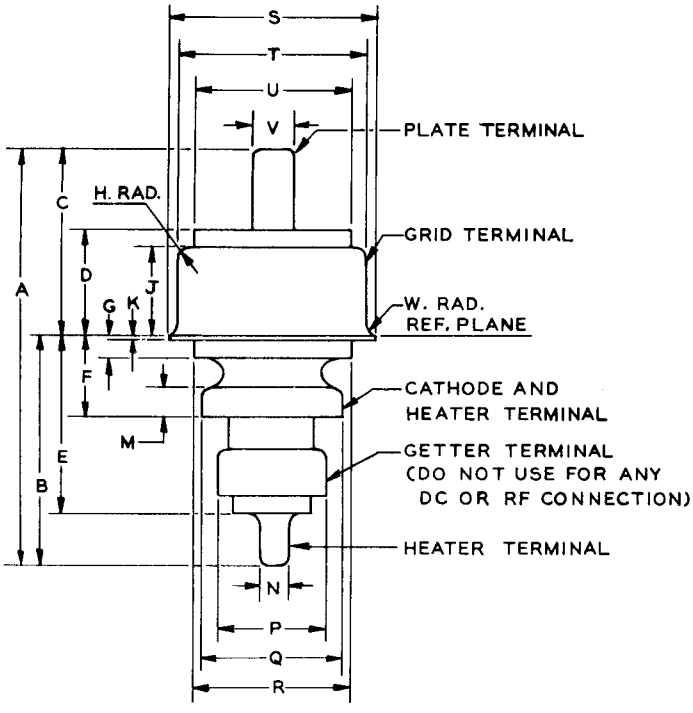
| | | | | |
|---|---|---|---|---|
| 5400 Megacycle Oscillator Power Output | | | | |
| Ef = 6.3 volts, Eb = 150 volts, Rg = 2000 ohms, Ib = 15±0.5 ma, F = 5400 MC, min. | 30 | 65 | --- | Milliwatts |

## DEGRADATION RATE TESTS

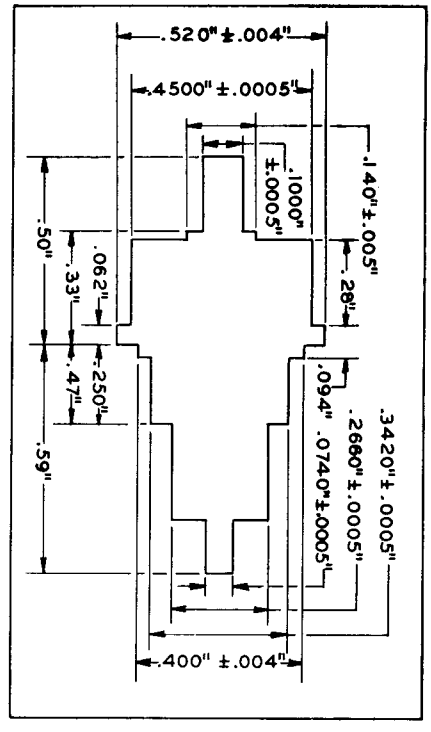
500-Hour Life

Statistical sample operated for 500 hours to evaluate changes in power output and transconductance with life.

## PHYSICAL DIMENSIONS

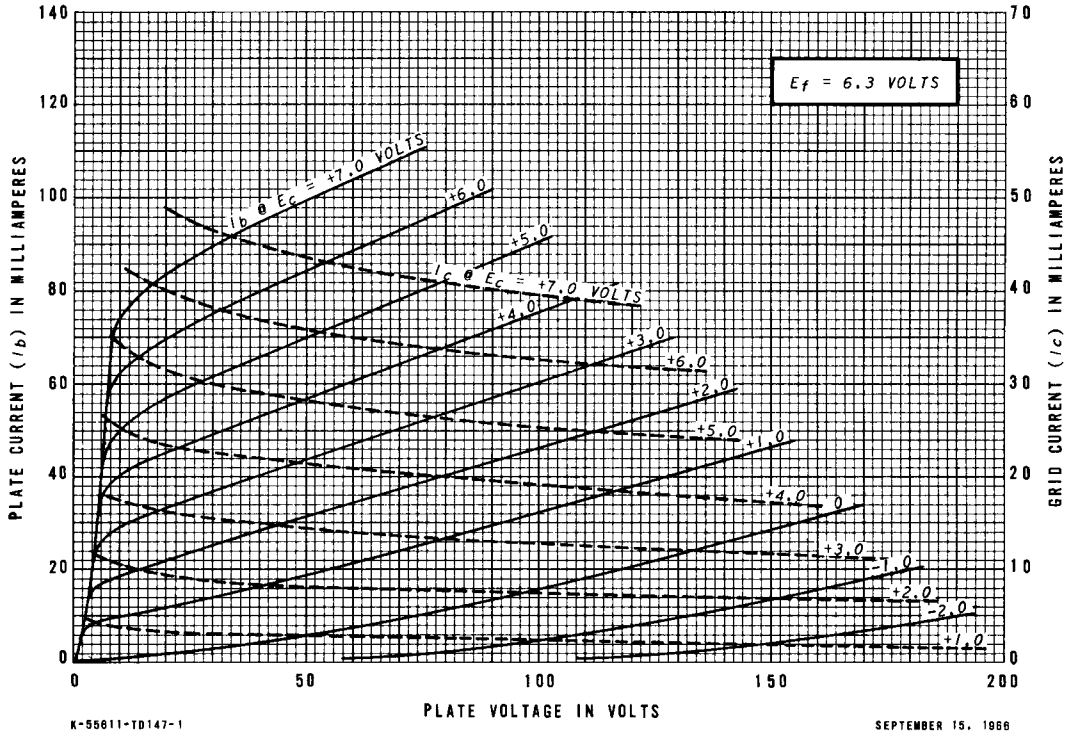



## ALIGNMENT GAUGE




| Ref. | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| | Minimum | Maximum | Minimum | Maximum |
| A | 0.960 | 1.040 | 24.38 | 26.42 |
| B | 0.530 | 0.590 | 13.46 | 14.99 |
| C | 0.410 | 0.470 | 10.41 | 11.94 |
| D | --- | 0.272 | --- | 6.91 |
| E | --- | 0.475 | --- | 12.07 |
| F | 0.163 | 0.193 | 4.14 | 4.90 |
| G | --- | 0.060 | --- | 1.52 |
| H | --- | 0.030 | --- | 0.76 |
| J | 0.190 | 0.210 | 4.83 | 5.33 |
| K | 0.009 | 0.015 | 0.23 | 0.38 |
| M | 0.040 | 0.070 | 1.02 | 1.78 |
| N | 0.059 | 0.065 | 1.50 | 1.65 |
| P | --- | 0.257 | --- | 6.53 |
| Q | 0.326 | 0.334 | 8.28 | 8.48 |
| R | --- | 0.385 | --- | 9.78 |
| S | 0.483 | 0.497 | 12.27 | 12.62 |
| T | 0.435 | 0.445 | 11.05 | 11.30 |
| U | --- | 0.385 | --- | 9.78 |
| V | 0.088 | 0.094 | 2.24 | 2.39 |
| W | --- | 0.008 | --- | 0.20 |

## AVERAGE PLATE CHARACTERISTICS

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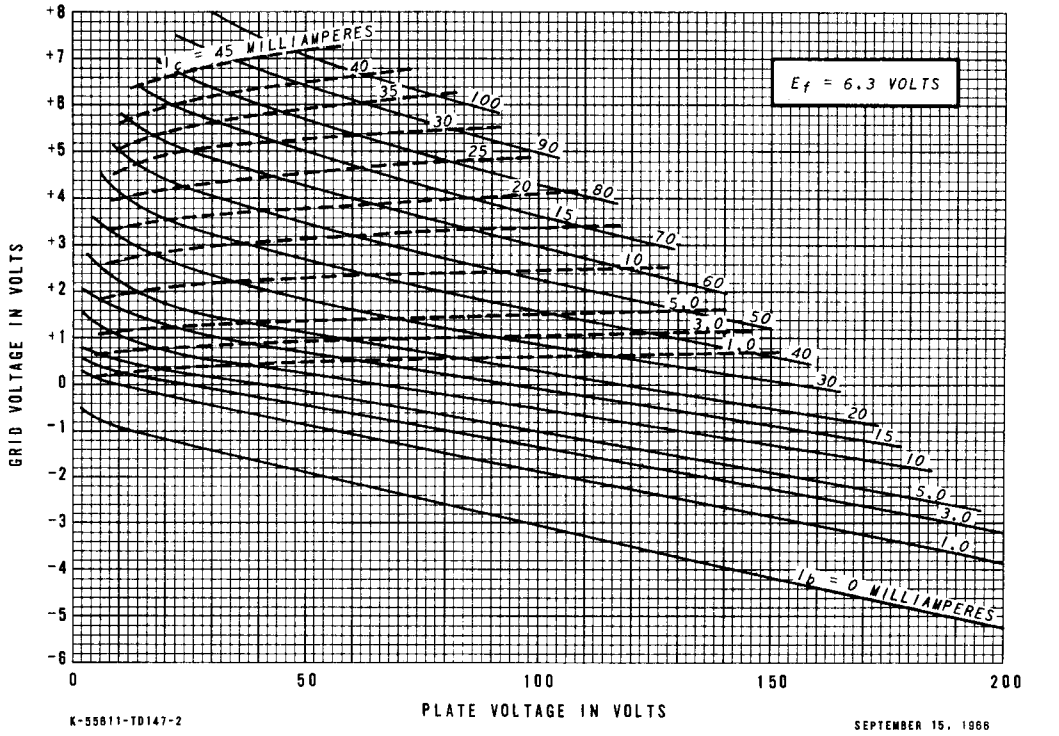
## AVERAGE CONSTANT-CURRENT CHARACTERISTICS

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SEPTEMBER 15, 1966

TUBE DEPARTMENT

GENERAL ELECTRIC

Owensboro, Kentucky