TWIN TRIODE
FOR COMPUTER APPLICATIONS

DESCRIPTION AND RATING

MEDIUM MU
9-PIN MINIATURE

HIGH PERVEANCE
HEATER-CYCLING RATING

The 7044 is a miniature, medium-mu, twin triode designed especially for service in computer applications. The tube features high zero-bias plate current and exceptional freedom from cathode interface development. Incorporated in the 7044 is a heater-cathode construction capable of withstanding many-thousand cycles of intermittent operation.

GENERAL

ELECTRICAL

Cathode—Coated L Dipotential

<table>
<thead>
<tr>
<th>Series</th>
<th>Parallel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater Voltage, AC or DC</td>
<td>12.6 = 10% 6.3 = 10% Volts</td>
</tr>
<tr>
<td>Heater Current</td>
<td>0.45 0.9 Amperes</td>
</tr>
<tr>
<td>Direct Interelectrode Capacitance* Section 1 Section 2</td>
<td></td>
</tr>
<tr>
<td>Grid to Plate (g to p)</td>
<td>6.0 6.0 μF</td>
</tr>
<tr>
<td>Input: g to (h + k)</td>
<td>4.8 4.8 μF</td>
</tr>
<tr>
<td>Output: p to (h + k)</td>
<td>0.65 0.55 μF</td>
</tr>
<tr>
<td>Heater to Cathode: (h to k)</td>
<td>6.0 6.0 μF</td>
</tr>
<tr>
<td>Grid to Grid: (1g to 2g)</td>
<td>0.1 μF</td>
</tr>
<tr>
<td>Plate to Plate: (p to 2p)</td>
<td>1.4 μF</td>
</tr>
</tbody>
</table>

MECHANICAL

Mounting Position—
Preferred Orientation—Upright or with Plate Majors in Vertical Position
Permissible Orientation—Any
Envelope—T-6½, Glass
Base—E9-1, Small Burron 9-Pin
Outline Drawing—EIA 6-3

| Maximum Diameter | 7/8 Inches |
| Maximum Over-all Length | 2 7/8 Inches |
| Maximum Seated Height | 2 3/8 Inches |

MAXIMUM RATINGS

ABSOLUTE MAXIMUM VALUES, EACH SECTION†

| Plate Voltage, Average† | 300 Volts |
| Peak Plate Voltage† | 600 Volts |
| Positive DC Grid Voltage | 1.0 Volts |
| Negative DC Grid Voltage | 100 Volts |
| Peak Positive Grid Voltage‡ | 30 Volts |
| Peak Negative Grid Voltage‡ | 300 Volts |
| Plate Dissipation, Each Plate, Average‡ | 4.5 Watts |
| Total Plate Dissipation, Both Plates, Average‡ | 9.0 Watts |
| DC Grid Current, Average‡ | 5.0 Milliamperes |
| Peak Grid Current‡ | 200 Milliamperes |

DC Cathode Current, Average‡ | 50 Milliamperes |
Peak Cathode Current‡ | 400 Milliamperes |
Heater-Cathode Voltage
Heater Positive with Respect to Cathode
DC Component | 100 Volts |
Total DC and Peak | 200 Volts |
Heater Negative with Respect to Cathode
Total DC and Peak | 200 Volts |
Grid Circuit Resistance
With Fixed Bias | 0.1 Megohms |
With Cathode Bias | 0.47 Megohms |
Bulb Temperature at Hottest Point | 160 °C |

PHYSICAL DIMENSIONS

TERMINAL CONNECTIONS

Pin 1—Plate (Section 2)
Pin 2—Grid (Section 2)
Pin 3—Cathode (Section 2)
Pin 4—Heater
Pin 5—Heater
Pin 6—Cathode (Section 1)
Pin 7—Grid (Section 1)
Pin 8—Heater Center-Tap
Pin 9—Plate (Section 1)

BASE DIAGRAM

EIA 9-3
CHARACTERISTICS AND TYPICAL OPERATION

Average Characteristics, Each Section
Plate Voltage .................................................. 90 150 120 Volts
Grid Voltage .................................................. ** -2 0 Volts
Amplification Factor ........................................ 21
Plate Resistance, approxim. te ................................ 1750 Ohms
Transconductance ........................................... 12000 Microhoms
Plate Current ................................................ 47 56 Milliamperes
Grid Voltage, approximate
Id = 200 Microamperes ..................................... -11 11 Volts

INITIAL CHARACTERISTICS LIMITS

Heater Current
Eh = 12.6 volts .................................. 410 490 Milliamperes

Zero-Bias Plate Current, Each Section
Eh = 12.6 volts, Eb = 90 volts, Isc = 250 µA .................................. 41 62 Milliamperes

Plate Current, Each Section
Eh = 12.6 volts, Eb = 120 volts, Ec = -2 volts .................................. 26 45 Milliamperes

Plate Current Cutoff, Each Section
Eh = 12.6 volts, Eb = 150 volts, Ec = -14 volts .................................. 200 Microamperes

Negative Grid Current, Each Section
Eh = 12.6 volts, Eb = 120 volts, Ec = -2 volts .................................. 1.5 Microamperes

Heater-Cathode Leakage Current
Eh = 12.6 volts, Ebk = 100 volts (parallel sections)
Heater Positive with Respect to Cathode .................................. 30 Microamperes
Heater Negative with Respect to Cathode .................................. 30 Microamperes

Interelectrode Leakage Resistance
Eh = 12.6 volts. Polarity of applied d-c interelectrode voltage is such
that no cathode emission results
Grid (Each Section) to All at 300 volts d-c .................................. 50 Megohms
Plate (Each Section) to All at 500 volts d-c .................................. 50 Megohms

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 electronic 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 electronic devices in the equipment.

The tube and arrangements disclosed herewith may be covered by patents of General Electric Company or others. Notice the Suffixes of all information herein are the Suffixes of the tube by General Electric Company. Patent claims covering combinations of the tube with other devices or elements in the absence of an express written agreement to the contrary.

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SPECIAL TESTS AND RATINGS

Heater-Cycling
2000-Cycle Life-Test Endpoint, Maximum
Heater-Cathode Leakage
Cathode-Grid Impedance
1000-Hour Life-Test Endpoint, Maximum
Intermittent Shorts

* Without external shield.
† Pulse terms in accordance with "Standards on Pulses: Definitions of Terms—Parts I and II—1951, 1952": IRE.
‡ Averaging time 1 millisecond unless otherwise specified.
§ Measured between plate and a cathode.
¶ Rating based on a rectangular pulse of 10 μsec width, 1% duty factor (= 0.1%), and 1 KC repetition rate.
The rise time shall be less than 1 μsec and the fall time shall be less than 2 μsec. Overshoot shall be less than 5% and droop shall be less than 10%.
∥ Not recommended for reliable operation.
++ With grid current adjusted for approximately 250 microamperes.
++ Statistic sample operated for 2000 cycles. Conditions of test include E = 7.5 volts (parallel heater connection), cycled for one minute on and one minute off, Eb = Ec = 0 volts, and Ehk = 135 volts with heater positive with respect to cathode.
+++ Statistic sample operated for 1000 hours under the following conditions for each section: E = 6.3 volts, Eb = -10 volts, E = -100 volts, and E0g = -0.1 megohms.
§§ Intermittent shorts are measured with equipment capable of detecting resistances as follows:
  less than 100,000 ohms for 15 microseconds
  less than 2.5 megohms for 1 millisecond

The acceleration applied to the tube is an approximate half-sine pulse of 50 to 100 G for a base duration of approximately 500 microseconds.

AVERAGE PLATE CHARACTERISTICS

Each Section

[Graph showing average plate characteristics with various lines indicating plate current in milliamperes and plate voltage in volts.]