**METAL-CERAMIC TRIODE**

**DESCRIPTION AND RATING**

The 7462 is a high-mu triode of ceramic-and-metal planar construction primarily intended for radio-frequency amplifier service from low frequencies into the ultra-high-frequency range. It is similar to the 7077 in characteristics but differs in having terminal lugs for use in print-board circuits.

**GENERAL**

**ELECTRICAL**

Cathode—Coated Unipotential
Heater Characteristics and Ratings
Heater Voltage, AC or DC* .................. 6.3 ± 0.3 Volts
Heater Current† .......................... 0.24 Amperes
Direct Interelectode Capacitances†
  Grid to Plate: (g to p) .................. 1.25 pf
  Input: g to (h + k) .................. 1.8 pf
  Output: p to (h + k) .................. 0.032 pf
  Heater to Cathode (h to k) .............. 1.5 pf

**MECHANICAL**

Mounting Position—Any
See Outline Drawing on page 2 for dimensions and electrical connections.

**MAXIMUM RATINGS**

**ABSOLUTE-MAXIMUM VALUES**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>250 Volts</td>
</tr>
<tr>
<td>Positive Peak and DC Grid Voltage</td>
<td>0 Volts</td>
</tr>
<tr>
<td>Negative Peak and DC Grid Voltage</td>
<td>50 Volts</td>
</tr>
<tr>
<td>Plate Dissipation</td>
<td>1.1 Watts</td>
</tr>
<tr>
<td>DC Cathode Current</td>
<td>11 Milliamperes</td>
</tr>
</tbody>
</table>

*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.

Heater-Cathode Voltage
Heater Positive with Respect to
  Cathode ................................ 50 Volts
Heater Negative with Respect to
  Cathode ................................ 50 Volts
Grid-Circuit Resistance, with Fixed
  Bias‡ ................................... 0.01 Megohms
Bulb Temperature at Hottest Point‡ 250°C

**CHARACTERISTICS AND TYPICAL OPERATION**

**AVERAGE CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>150 Volts</td>
</tr>
<tr>
<td>Grid Voltage</td>
<td>+6.0 Volts</td>
</tr>
<tr>
<td>Cathode-Bias Resistor</td>
<td>910 Ohms</td>
</tr>
<tr>
<td>Amplification Factor</td>
<td>94</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Resistance, approximate</td>
<td>9000 Ohms</td>
</tr>
<tr>
<td>Transconductance</td>
<td>10500 Micromhos</td>
</tr>
<tr>
<td>Plate Current</td>
<td>7.2 Milliamperes</td>
</tr>
<tr>
<td>Grid Voltage, approximate</td>
<td>Ib = 100 Microamperes</td>
</tr>
<tr>
<td></td>
<td>−2.4 Volts</td>
</tr>
</tbody>
</table>
FOOTNOTES

* 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.
§ If a cathode bias resistor is used, the grid-circuit resistance may be as high as (10,000 + 100 Rk + Rf) ohms, where Rk is the value of the cathode-bias resistor in ohms and Rf is the value of the plate-load resistor in ohms.
¶ For applications where long life is a primary consideration, it is recommended that the envelope temperature be maintained below 175 °C.

NOTE: Maximum eccentricity of insulators 0.010 in. from center line.

The tubes and arrangements disclosed herein may be covered by patents of General Electric Company or others. Neither the disclosure of any information herein nor the sale of tubes by General Electric Company conveys any license under patent claims covering combinations of tubes with other devices or elements. In the absence of an express written agreement to the contrary, General Electric Company assumes no liability for patent infringement arising out of any use of the tubes with other devices or elements by any purchaser of tubes or others.

INITIAL CHARACTERISTICS LIMITS

<table>
<thead>
<tr>
<th></th>
<th>Min.</th>
<th>Bogey</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater Current</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ef = 6.3 volts</td>
<td>222</td>
<td>240</td>
<td>258</td>
</tr>
<tr>
<td>Plate Current</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ef = 6.3 volts, Eb = 150 volts, Rk = 82 ohms (bypassed)</td>
<td>4.5</td>
<td>7.5</td>
<td>11</td>
</tr>
<tr>
<td>Transconductance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ef = 6.3 volts, Eb = 150 volts, Ec = +6 volts, Rk = 910 ohms (bypassed)</td>
<td>8000</td>
<td>10500</td>
<td>13000</td>
</tr>
<tr>
<td>Amplification Factor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ef = 6.3 volts, Eb = 150 volts, Ec = +6 volts, Rk = 910 ohms (bypassed)</td>
<td>65</td>
<td>94</td>
<td>115</td>
</tr>
</tbody>
</table>
INITIAL CHARACTERISTICS LIMITS (Continued)

Transconductance Change with Heater Voltage
Difference between transconductance at \( E_f = 6.3 \) volts and trans-
conductance at \( E_f = 6.0 \) volts (other conditions the same) ex-
pressed as a percentage of transconductance at \( E_f = 6.3 \) volts. .......... 15 Percent

Grid Voltage Cutoff
\( E_f = 6.3 \) volts, \( E_b = 150 \) volts, \( I_b = 100 \) \( \mu A \) .......... \(-2.4\) \(-4.5\) Volts

Inter electrode Capacitances
Grid to Plate: (g to p) ........................................ 1.05 1.25 1.45 pf
Input: g to \( (h+k) \) ............................................. 1.25 1.8 2.25 pf
Output: p to \( (h+k) \) ............................................. 0.013 0.032 0.045 pf
Heater to Cathode: (h to k) .................................... 1.1 1.5 1.9 pf

Heater-Cathode Leakage Current
\( E_f = 6.3 \) volts, \( E_{hk} = 100 \) volts
Heater Positive with Respect to Cathode ........................................ 20 Microamperes
Heater Negative with Respect to Cathode ........................................ 20 Microamperes

Inter electrode Leakage Resistance
\( E_f = 6.3 \) volts. Polarity of applied d-c inter electrode voltage
is such that no cathode emission results.
Grid to All of 100 volts d-c .................................... 100 Megohms
Plate to All at 300 volts d-c .................................... 100 Megohms

Grid Emission Current
\( E_f = 7.0 \) volts, \( E_b = 100 \) volts, \( E_{cc} = -10 \) volts, \( R_g = 0.1 \) meg .......................... 2.0 Microamperes

SPECIAL PERFORMANCE TESTS

Low Frequency Vibrational Output
Statistical sample is subjected to vibration in each of two planes
at 40 cps, with peak acceleration 15 G. Tube is operated with
\( E_f = 6.3 \) volts, \( E_{bb} = 150 \) volts, \( R_k = 82 \) ohms (bypassed), \( R_L = 10000 \) ohms .......................... 10 Millivolts RMS

Variable Frequency Vibrational Output
Statistical sample is subjected to vibration according to the pro-
cedure given below. Tube is operated with \( E_f = 6.3 \) volts, \( E_{bb} = 150 \) volts, \( R_k = 82 \) ohms (bypassed) \( R_L = 10000 \) ohms .......................... 15 Millivolts RMS

The variable-frequency vibration test shall be performed as follows:
1. The frequency shall be increased from 100 to 2000 cps with approximately logarithmic progression in 3 x 1 minutes.
The return sweep (2000 to 100 cps) is not required.
2. The tube shall be vibrated with simple harmonic motion in each of two planes: first, parallel to the cylindrical
axis; second, perpendicular to the cylindrical axis and parallel to a line through the major axis of a terminal lug.
At all frequencies from 100 to 2000 cps, the total harmonic distortion of the acceleration waveform shall be less
than 5%.
3. The peak acceleration shall be maintained at 10 = 1.0 G throughout the test.
4. The value of the alternating voltage produced across the load resistor \( R_L \), as a result of the vibration, shall be measured with a suitable device having a response to the RMS value of the voltage to within \( \pm 0.5 \) db of the re-
sponse at 400 cps for the frequency range of 100 to 3000 cps, and having a band-pass filter with an attenuation rate
of 24 db per octave below the low frequency cutoff point of 50 cps and above the high frequency cutoff point of
5000 cps. The meter shall have a dynamic response characteristic equivalent to or faster than a VU meter (op-
erated in accordance with ASA Standard No. C16.5-1954).

Low Pressure Voltage Breakdown Test
Statistical sample tested for voltage breakdown at a pressure of
8 mm Hg, to simulate an altitude of 100,000 feet. Tubes shall not
give visual evidence of flashover or corona when 300 volts RMS,
60 cps, is applied between the plate and grid terminals.
DEGRADATION RATE TESTS

Fatigue
Statistical sample vibrated for a total of six hours, three hours in each of two planes, at a peak acceleration of 10 G. Frequency is continuously varied from 30 cps to 2000 cps and back to 30 cps, with a period of ten minutes. Tubes are operated during the test with \( E_f = 6.3 \) volts, \( E_b = 150 \) volts, and \( R_k = 82 \) ohms. Following the test, tubes are evaluated for low frequency vibrational output, heater-cathode leakage, heater current, and transconductance.

Shock
Statistical sample subjected to 5 impact accelerations of approximately 450 G in each of four positions. The accelerating forces are applied by the Navy-type, High Impact (flyweight) Shock Machine using a 30° hammer angle. Tubes are operated during the test with \( E_f = 6.3 \) volts, \( E_b = 150 \) volts, \( E_{hk} = +100 \) volts, \( R_g = 0.1 \) meg, and \( R_k = 82 \) ohms. Following the test, tubes are evaluated for low frequency vibrational output, heater-cathode leakage, heater current, and transconductance.

Stability Life Test
The statistical sample subjected to the Intermittent Life Test is evaluated for percent change in transconductance of individual tubes, from the initial reading to readings following 2 hours and 20 hours of the life test.

Survival Rate Life Test
The statistical sample subjected to the Intermittent Life Test is evaluated for shorted and open elements, and transconductance, following approximately 100 hours of life test.

Intermittent Life Test
Statistical sample operated 1000 hours under the following conditions: \( E_f = 6.3 \) volts, \( E_b = 150 \) volts, \( E_{cc} = +6 \) volts, \( E_{hk} = -70 \) volts, \( R_k = 910 \) ohms, \( R_g = 0.1 \) meg. Heater voltage is cycled (on \( 1\frac{3}{4} \) hours, off \( 3\frac{1}{4} \) hour). Tubes are evaluated, following 500 and 1000 hours of life test, for shorted or open elements, heater current, transconductance, heater-cathode leakage, and interelectrode leakage resistance.

Interface Life Test
Statistical sample operated for 500 hours with \( E_f = 6.6 \) volts, no other voltages applied, and evaluated for cathode interface resistance following the life test.

Heater-Cycling Life Test
Statistical sample operated for 2000 cycles minimum to evaluate and control heater-cathode defects. Conditions of test include \( E_f = 7.0 \) volts cycled for one minute on and one minute off, \( E_b = E_{cc} = 0 \) volts, and \( E_{hk} = 70 \) volts with heater positive with respect to cathode. Following the test, tubes are evaluated for open heaters, heater-cathode shorts, and heater-cathode leakage.