SHARP-CUTOFF TRIODE 2HMS, 3HMS, 4HMS AND 6HMS

The 2HMS, 3HMS, 4HMS and 6HMS are sharp-cutoff, seven-pin miniature triode types designed particularly for service in V.H.F. television tuners as grounded cathode r-f amplifiers. These types are electrically and mechanically similar to the 2HAS, 3HAS, 4HAS and 6HAS except for bulb length.

The 2HMS, 3HMS and 4HMS have been designed for use in receivers which employ series connected heaters, especially in television receivers where the picture-tube heater is in series with other heaters. When each is employed in this type of circuit with other tubes similarly designed having the same heater current rating, heater voltage surges across individual tubes are minimized inasmuch as heater warm-up characteristic is controlled.

**ELECTRICAL:**

**Heater Characteristics:**

<table>
<thead>
<tr>
<th>Type</th>
<th>2HMS</th>
<th>3HMS</th>
<th>4HMS</th>
<th>6HMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage ac or dc</td>
<td>2.4</td>
<td>2.9</td>
<td>4.0</td>
<td>6.3</td>
</tr>
<tr>
<td>Current</td>
<td>0.60</td>
<td>0.45</td>
<td>0.30</td>
<td>0.185</td>
</tr>
<tr>
<td>Warm-up Time (Note 1)</td>
<td>11</td>
<td>11</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Direct Inter-electrode Capacitance: (Shielded) (Note 2)</td>
<td>0.34 max.</td>
<td>μF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grid to Plate</td>
<td>4.5</td>
<td>μF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>3.0</td>
<td>μF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heater to Cathode</td>
<td>2.5</td>
<td>μF</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MECHANICAL:**

- Cathode: Coated Unipotential
- Bulb: T-5⅓
- Base: Miniature 7-Pin (JEDEC E7-1)
- Outline: S-2
- Basing: 7GM
- Mounting Position: Any

**RATINGS:**

<table>
<thead>
<tr>
<th>Design Maximum Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
</tr>
<tr>
<td>Plate Dissipation</td>
</tr>
<tr>
<td>Grid Voltage:</td>
</tr>
<tr>
<td>Negative Value</td>
</tr>
<tr>
<td>Cathode Current</td>
</tr>
<tr>
<td>Grid Circuit Resistance (Self Bias)</td>
</tr>
</tbody>
</table>

**Heater Ratings:**

- Allowable Heater Voltage: 2HMS, 3HMS, 4HMS, 6HMS
  - Maximum: 6.9 max. Volts
  - Minimum: 5.7 min. Volts
- Allowable Heater Currents:

**Heater-Cathode Voltages:**

- Heater Voltage with Respect to Cathode DC | 100 100 100 max. Volts
- Heater Voltage with Respect to Cathode DC | 100 100 100 max. Volts

**CHARACTERISTICS & TYPICAL OPERATION:**

- Plate Voltage | 120 135 Volts
- Grid Voltage | 0 0 Volt
- Grid Resistance | 0.1 0 Megohm
- Transconductance | 18,000 14,500 μmhos
- Grid Cutoff Bias | See Note 6 See Note 3
- Plate Current | 15.0 12.5 Ma.
- Amplification Factor | 82 78
- Hot Input Resistance (Note 4) | 1000 Ohms
- Hot Input Capacitance (Note 4) | 8.5 μF
- Noise Figure (Note 5) | 4.0 4.2 db

**NOTES:**

1. Heater Warm-up Time is defined as the time required for the voltage across the heater to reach 80% of its rated value after applying four times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to three times rated heater voltage divided by rated heater current.
2. With JEDEC shield No. 316 connected to Blank.
3. Grid Voltages for gm = 150 μmhos: -5.7
   Grid Voltages for gm = 1500 μmhos: -2.7
4. Measured at 200 Mc. with plate at signal ground. Ec = -1.5 Volt.
5. In a 200 Mc. noise-matched, optimised, neutralized, grounded-cathode triode amplifier stage.
6. Grid voltages for gm = 150 μmhos: -5.1

---

WESTINGHOUSE ELECTRIC CORPORATION, ELECTRONIC TUBE DIVISION, ELMIRA, NEW YORK

from JEDEC release #4413, Sept. 16, 1963