TUNG-SOL

TRIODE PENTODE
MINIATURE TYPE

FOR
CONVERTER SERVICE

COATED UNIPOTENTIAL CATHODE
ANY MOUNTING POSITION

GLASS BULB
MINIATURE BUTTON
9 PIN BASE E9-1
OUTLINE DRAWING
JEDEC 6-2

6AT8A IS A MULTI-UNIT TUBE USING THE 9 PIN MINIATURE CONSTRUCTION. IT CONTAINS A MEDIUM-MU TRIODE AND A SHARP CUT-OFF PENTODE WITH A COMMON CATHODE IN ONE ENVELOPE. IT IS DESIGNED PRIMARILY FOR USE IN 600 MA SERIES HEATER OPERATED TELEVISION RECEIVERS UTILIZING AN INTERMEDIATE FREQUENCY IN THE ORDER OF 40 MC. THERMAL CHARACTERISTICS OF THE HEATER ARE CONTROLLED SUCH THAT HEATER VOLTAGE SURGES DURING THE WARM-UP CYCLE ARE MINIMIZED PROVIDED IT IS USED WITH OTHER TYPES WHICH ARE SIMILARLY CONTROLLED.

DIRECT INTERELECTRODE CAPACITANCES
WITH SHIELD WITHOUT SHIELD

<table>
<thead>
<tr>
<th>Component Description</th>
<th>With Shield</th>
<th>Without Shield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentode Grid 1 to Pentode Plate (PG1 to PP)</td>
<td>0.03</td>
<td>0.06</td>
</tr>
<tr>
<td>Pentode Input: PG1 to (H + K + PG2 + PG3)</td>
<td>4.8</td>
<td>4.6</td>
</tr>
<tr>
<td>Pentode Output: PP to (H + K + PG3 + PG2)</td>
<td>1.6</td>
<td>0.9</td>
</tr>
<tr>
<td>Cathode to Heater (K to H)</td>
<td>6.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Triode Grid to Triode Plate (TG to TP)</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Triode Input: TG to (H + K)</td>
<td>2.4</td>
<td>2.0</td>
</tr>
<tr>
<td>Triode Output: TP to (H + K)</td>
<td>1.0</td>
<td>0.5</td>
</tr>
<tr>
<td>Pentode Grid 1 to Triode Plate (PG1 to TP)</td>
<td>0.04</td>
<td>0.05</td>
</tr>
<tr>
<td>Pentode Plate to Triode Plate (PP to TP)</td>
<td>0.008</td>
<td>0.05</td>
</tr>
</tbody>
</table>

HEATER CHARACTERISTICS AND RATINGS
DESIGN MAXIMUM VALUES - SEE EIA STANDARD RS-239

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Volts</td>
<td>6.3</td>
</tr>
<tr>
<td>Heater Warm-Up Time (A)</td>
<td>450 MA, 11 SECONDS</td>
</tr>
<tr>
<td>Limits of Supplied Current</td>
<td>450 ± 30 MA</td>
</tr>
</tbody>
</table>

A HEATER WARM-UP TIME IS DEFINED AS THE TIME REQUIRED FOR THE VOLTAGE ACROSS THE HEATER TO REACH 80% OF ITS RATED VOLTAGE AFTER APPLYING 4 TIMES RATED HEATER VOLTAGE TO A CIRCUIT CONSISTING OF THE TUBE HEATER IN SERIES WITH A RESISTANCE OF VALUE THREE TIMES THE NOMINAL HEATER OPERATING RESISTANCE.
HEATER CHARACTERISTICS AND RATINGS - CONT'D.

MAXIMUM HEATER-CATHODE VOLTAGE:
HEATER NEGATIVE WITH RESPECT TO CATHODE
TOTAL DC AND PEAK → 200 VOLTS
HEATER POSITIVE WITH RESPECT TO CATHODE
DC 100 VOLTS
TOTAL DC AND PEAK → 200 VOLTS

→ MAXIMUM RATINGS

PENTODE PLATE VOLTAGE 275 VOLTS
TRIODE PLATE VOLTAGE 275 VOLTS
GRID 2 SUPPLY VOLTAGE 275 VOLTS
GRID 2 VOLTAGE See Rating Chart
PENTODE PLATE DISSIPATION 2.3 WATTS
GRID 2 DISSIPATION 0.45 WATTS
POSITIVE DC GRID 1 VOLTAGE 0 VOLTS
POSITIVE DC TRIODE GRID VOLTAGE 0 VOLTS
TRIODE PLATE DISSIPATION 1.7 VOLTS

TYPICAL OPERATING CHARACTERISTICS

CLASS A1 AMPLIFIER

<table>
<thead>
<tr>
<th></th>
<th>PENTODE</th>
<th>TRIODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLATE VOLTAGE</td>
<td>125</td>
<td>125</td>
</tr>
<tr>
<td>GRID 3 VOLTAGE</td>
<td>Connected to pin 3 at socket</td>
<td></td>
</tr>
<tr>
<td>GRID 2 VOLTAGE</td>
<td>125</td>
<td>-----</td>
</tr>
<tr>
<td>GRID 1 VOLTAGE</td>
<td>-1.0</td>
<td>-1.0</td>
</tr>
<tr>
<td>PLATE CURRENT</td>
<td>9.0</td>
<td>12.0</td>
</tr>
<tr>
<td>GRID 2 CURRENT</td>
<td>2.2</td>
<td>-----</td>
</tr>
<tr>
<td>TRANSCONDUCTANCE</td>
<td>5,500</td>
<td>6,500</td>
</tr>
<tr>
<td>PLATE RESISTANCE</td>
<td>(APPROX.) 300,000</td>
<td>6,000</td>
</tr>
<tr>
<td>AMPLIFICATION FACTOR</td>
<td>-----</td>
<td>40</td>
</tr>
<tr>
<td>GRID 1 VOLTAGE (APPROX.,) FOR Ib = 20 µA</td>
<td>-6.5</td>
<td>-7</td>
</tr>
<tr>
<td>ZERO BIAS TRANSCONDUCTANCE (WITH Eb = 100 V; Ec2 = 70 V)</td>
<td>5,700</td>
<td>-----</td>
</tr>
</tbody>
</table>

→ INDICATES A CHANGE
PENTODE UNIT
CONNECTED AS TRIODE

Grid #3 Connected to Cathode
Grid #2 Connected to Plate

PENTODE UNIT
SEPARATE OSCILLATOR EXCITATION

\[ E_b = 150 \text{ Volts} \]
\[ E_{c3} = 0 \text{ Volts} \]
\[ E_{c2} = 150 \text{ Volts} \]
\[ R_{c4} = 120000 \text{ Ohms} \]
Oscillator Volts at
Grid #1 = 2.6 rms

\[ I_b \]
\[ I_{c2} \]
\[ g_c \]

CONVERTER TRANSCONDUCTANCE (g_c) - MICROHMS

GRID #1 SUPPLY VOLTS

PLATE VOLTAGE

TUNG-SOL ELECTRIC INC. ELECTRON TUBE DIVISION BLOOMFIELD, NEW JERSEY, U.S.A. AUGUST 3, 1963 PLATE #6767
PENTODE UNIT SEPARATE OSCILLATOR EXCITATION

E_b = 150 Volts
E_c3 = 0 Volts
E_c2 = 150 Volts
E_cc1 = 3.5 Volts
R_c1 = 120000 Ohms

PENTODE UNIT CONNECTED AS TRIODE

E_b = 150 Volts
Grid #3 Connected to Cathode
Grid #2 Connected to Plate
6AT8-6AT8A

PENTODE UNIT
SEPARATE OSCILLATOR EXCITATION

$E_f = 6.3$ Volts
$E_b = 150$ Volts
$E_{c1} = 0$ Volts
$E_{c2} = 150$ Volts
$E_{c3} = 3.5$ Volts
$R_{c1} = 120000$ Ohms

CONVERSION TRANSCONDUCTANCE ($g_{ce}$) - MICROMOSIS

PEAK OSCILLATOR VOLTS

6AT8-6AT8A
PENTODE UNIT CONNECTED AS TRIODE

$E_f = 6.3$ Volts
$E_b = 150$ Volts
Grid #3 Connected to Cathode
Grid #2 Connected to Plate

TRANSCECTANCE ($g_{ce}$) - MICROMOSIS

GRID VOLTS