TUNG-SOL

TWIN TRIODE
MINIATURE TYPE

FOR
MOBILE COMMUNICATIONS
EQUIPMENT

COATED UNIPOTENTIAL CATHODE
ANY MOUNTING POSITION

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

THE 6681 IS A HIGH-MU TWIN TRIODE IN THE 9 PIN MINIATURE CONSTRUCTION. IT IS ESPECIALLY SUITED FOR USE IN RESISTANCE-COUPLED VOLTAGE AMPLIFIERS, PHASE INVERTERS, MULTI-VIBRATORS, AND OTHER APPLICATIONS IN WHICH HIGH VOLTAGE GAIN IS DESIRED. THE 6681 MAY BE OPERATED WITHOUT SERIOUS DEGRADATION UNDER NORMAL VARIATIONS IN SUPPLY VOLTAGE AS ENCOUNTERED WITH AUTOMOTIVE ELECTRICAL SYSTEMS. ALSO, THE TUBE WILL TOLERATE LARGE HEATER VOLTAGE VARIATIONS FOR SHORT PERIODS, BUT HIGHER EQUIPMENT RELIABILITY CAN BE ACHIEVED WITH IMPROVED SUPPLY-VOLTAGE REGULATION. THE ELECTRICAL CHARACTERISTICS OF THE 6681 ARE EQUIVALENT TO THE 12AX7.

DIRECT INTERELECTRODE CAPACITANCES

WITH SHIELD
WITH SHIELD
WITHOUT
WITHOUT
SHIELD
SHIELD

GRID TO PLATE, EACH SECTION
1.7
1.7
pf

INPUT, EACH SECTION
1.8
1.6
pf

OUTPUT, SECTION 1
1.9
0.46
pf

OUTPUT, SECTION 2
1.9
0.34
pf

A WITH EXTERNAL SHIELD (RETMA 315) CONNECTED TO CATHODE OF SECTION UNDER TEST.

HEATER CHARACTERISTICS AND RATINGS

DESIGN MAXIMUM VALUES - SEE EIA STANDARD RS-239

SUPPLY CONNECTED TO PINS
4 AND 5
9 AND 4 + 5
VOLTS

AVERAGE VALUES - VOLTAGE
12.6
6.3
VOLTS

- CURRENT
150
300
MA.

HEATER SUPPLY LIMITS:
VOLTAGE OPERATION
12.6±2.5
6.3±1.3
VOLTS

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

TUNG-SOL ELECTRIC INC., ELECTRON TUBE DIVISION, BLOOMFIELD, NEW JERSEY, U.S.A., MARCH 1, 1963 PLATE #6681
CONTINUED FROM PRECEDING PAGE

MAXIMUM RATINGS
DESIGN MAXIMUM VALUES - SEE EIA STANDARD RS-239

EACH SECTION

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>330 V</td>
</tr>
<tr>
<td>Positive DC Grid Voltage</td>
<td>0 V</td>
</tr>
<tr>
<td>Negative DC Grid Voltage</td>
<td>55 V</td>
</tr>
<tr>
<td>Plate Dissipation</td>
<td>1.1 W</td>
</tr>
</tbody>
</table>

TYPICAL OPERATING CHARACTERISTICS
CLASS A1 AMPLIFIER - EACH SECTION

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>100 V</td>
</tr>
<tr>
<td>Grid Voltage</td>
<td>-1 V</td>
</tr>
<tr>
<td>Plate Current</td>
<td>0.5 A</td>
</tr>
<tr>
<td>Transconductance</td>
<td>1250 mS</td>
</tr>
<tr>
<td>Amplification Factor</td>
<td>100</td>
</tr>
<tr>
<td>Plate Resistance, Approx.</td>
<td>80,000 Ohms</td>
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</tbody>
</table>

CLASS A RESISTANCE - COUPLED AMPLIFIER

EACH SECTION

<table>
<thead>
<tr>
<th>RL</th>
<th>Rgf</th>
<th>Ebb = 90 Volts</th>
<th>Ebb = 180 Volts</th>
<th>Ebb = 300 Volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10</td>
<td>0.10</td>
<td>Rk</td>
<td>Ek</td>
<td>Gain</td>
</tr>
<tr>
<td>0.10</td>
<td>0.24</td>
<td>2500</td>
<td>4.3</td>
<td>32</td>
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<tr>
<td>0.24</td>
<td>0.24</td>
<td>2600</td>
<td>6.5</td>
<td>40</td>
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<tr>
<td>0.24</td>
<td>0.51</td>
<td>4400</td>
<td>6.3</td>
<td>45</td>
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<tr>
<td>0.51</td>
<td>0.51</td>
<td>4800</td>
<td>8.5</td>
<td>50</td>
</tr>
<tr>
<td>0.51</td>
<td>1.0</td>
<td>8500</td>
<td>7.3</td>
<td>50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RL</th>
<th>Rgf</th>
<th>Ebb = 90 Volts</th>
<th>Ebb = 180 Volts</th>
<th>Ebb = 300 Volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10</td>
<td>0.10</td>
<td>Rk</td>
<td>Ek</td>
<td>Gain</td>
</tr>
<tr>
<td>0.10</td>
<td>0.24</td>
<td>3400</td>
<td>7.1</td>
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<td>0.24</td>
<td>0.24</td>
<td>3700</td>
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<td>0.24</td>
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<td>6100</td>
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<tr>
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<td>0.51</td>
<td>6800</td>
<td>12</td>
<td>47</td>
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<tr>
<td>0.51</td>
<td>1.0</td>
<td>11000</td>
<td>11</td>
<td>47</td>
</tr>
</tbody>
</table>

1. $E_o$ is maximum RMS voltage output for approximately 5% total harmonic distortion.
2. Gain is measured for an output voltage of two volts RMS.
3. $R_k$ is in ohms; $R_L$ and $R_{gf}$ are in megohms.
COUPLING CAPACITORS (C) SHOULD BE SELECTED TO GIVE DESIRED FREQUENCY RESPONSE. $R_k$ SHOULD BE ADEQUATELY BY-PASSED.

SPECIAL TESTS AND RATINGS

HEATER-CYLING LIFE TEST

![Graph showing plate current vs. plate voltage for each triode unit](image-url)