RECEIVING TUBES

JEDEC DATA
JOINT ELECTRON DEVICE ENGINEERING COUNCIL
COMMITTEE ON RECEIVING TUBES

JEDEC TYPES: 3BUSA, 6BUSA

TWIN PENTODE

The 3BUSA and 6BUSA are miniature multisection tubes which have separate plates and number three grids for the two sections, but common screen, number one grid and cathode. The tubes are intended for use as a combined sync separator-clipper and AOC tube in television receivers. They have an advantage over similar tubes of this type in that the section one grid three has a high positive current in the region below 50 Volts. Therefore, when section one is used as the sync separator-clipper, the tubes do not block, as is common with tubes of this type, when switching channels, especially from weak to strong, or when aircraft cause flutter, resulting in much faster sync locking action. The 3BUSA and 6BUSA are unilaterally interchangeable with the 3H8 and 6H8 respectively.

The 3BUSA is controlled for heater warm-up time for series string operation.

MECHANICAL DATA

Mounting Position ......................... Any
Envelope ...................................... T-6½ Glass
Base ........................................... E9-1, Small Button 9-Pin
Outline drawing ............................. 6-3
   Maximum Diameter ..................... 7/8"
   Maximum Overall length ............... 2 5/8"
   Maximum Seated Height ............... 2 3/8"

Pin Connections
Pin 1 - Cathode
Pin 2 - Grid #2(Screen) and Internal Shield
Pin 3 - Plate (Section 2)
Pin 4 - Heater
Pin 5 - Heater
Pin 6 - Grid #3(Section 2)
Pin 7 - Grid #1
Pin 8 - Plate (Section 1)
Pin 9 - Grid #3(Section 1)

ELECTRICAL DATA

Cathode ................... Coated Unipotential
Heater Voltage (ac or dc) .............. 3.15 6.3 Volts
Heater Current ......................... 600 300 Ma
Heater Warm-up Time ................... 11 - Seconds
ELECTRICAL DATA -- Cont'd

Direct Inter-electrode Capacitances, approximate (Without external shield)
Grid #3 to Plate (Section 1) .......... 2.0 pf
Grid #3 to Plate (Section 2) .......... 1.9 pf
Grid #1 to All .......................... 6.0 pf
Grid #3 to All (Section 1) .......... 4.0 pf
Grid #3 to All (Section 2) .......... 3.6 pf
Plate to All (Each Section) .......... 3.0 pf
Grid #3 (Section 1) to Grid #3 (Section 2). 0.015 pf Max.

MAXIMUM RATINGS

Design-Maximum Values
Plate Voltage, Each Section .......................... 300 Volts
Screen Voltage .................................................. 150 Volts
Positive DC Grid-Number 3 Voltage, Each Section ........ 3.0 Volts
Negative DC Grid-Number 3 Voltage, Each Section .......... 50 Volts
Peak Positive Grid-Number 3 Voltage, Each Section ........ 50 Volts
Negative DC Grid-Number 1 Voltage .......................... 50 Volts
Plate Dissipation, Each Section ...................... 1.1 Watts
Screen Dissipation .............................................. 0.75 Watts
DC Cathode Current ............................................. 12 Milliampere
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-Number 1 Circuit Resistance ................. 0.5 Megohms
Grid-Number 3 Circuit Resistance, Each Section .... 0.5 Megohms

Design-Maximum Ratings are the limiting values expressed with respect to bogie tubes at which satisfactory tube life can be expected to occur. To obtain satisfactory circuit performance, therefore, the equipment designer must establish the circuit design so that no design-maximum value is exceeded with a bogie tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, and environmental conditions.
CHARACTERISTICS AND TYPICAL OPERATION

**Average Characteristics, Both Sections Operating**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage, Each Section</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Screen Voltage</td>
<td>67.5</td>
<td>67.5</td>
</tr>
<tr>
<td>Grid-Number 3 Voltage, Each Section</td>
<td>-10</td>
<td>0</td>
</tr>
<tr>
<td>Grid-Number 1 Voltage</td>
<td>#</td>
<td>#</td>
</tr>
<tr>
<td>Plate Current, Each Section</td>
<td>2.2</td>
<td>Milliamperes</td>
</tr>
<tr>
<td>Screen Current</td>
<td>6.5</td>
<td>3.3</td>
</tr>
<tr>
<td>Cathode Current</td>
<td>6.6</td>
<td>7.8</td>
</tr>
</tbody>
</table>

**Average Characteristics, Each Section Separately with Plate and Grid Number 3 of Opposite Section Grounded**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Screen Voltage</td>
<td>67.5</td>
<td>67.5</td>
</tr>
<tr>
<td>Grid-Number 3 Voltage</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Grid-Number 1 Voltage</td>
<td>0</td>
<td>#</td>
</tr>
<tr>
<td>Grid-Number 3 Transconductance</td>
<td>180</td>
<td>Micromhos</td>
</tr>
<tr>
<td>Grid-Number 1 Transconductance</td>
<td>1500</td>
<td>#</td>
</tr>
<tr>
<td>Plate Current</td>
<td>2.2</td>
<td>Milliamperes</td>
</tr>
<tr>
<td>Grid-Number 3 Voltage, approximate</td>
<td>-4.5</td>
<td>Volts</td>
</tr>
<tr>
<td>$I_b = 100$ Microamperes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grid-Number 1 Voltage, approximate</td>
<td>-2.3</td>
<td>Volts</td>
</tr>
<tr>
<td>$I_b = 100$ Microamperes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Average Positive Grid Three Characteristics (Section 1)**

- $E_b = E_{g2} = 67.5$ Volts DC
- Grid #1 current adjusted for 100 microamperes d.c.
- Grid #3 Current for $E_{g3} = 45$ Volts ..................... 400 $\mu$A
- Grid #3 Current for $E_{g3} = 450$ Volts ..................... 1000 $\mu$A

# - with grid current adjusted for 100 microamperes d-c.