DOUBLE TRIODE for use as R.F. amplifier and self-oscillating mixer in television receivers

PHYSICAL SPECIFICATIONS

Cathode Coated unipotential
Base Small button noval 9-pin
Maximum overall length 2 3/16"
Maximum seated height 1 15/16"
Bulb length excluding tip 1 9/16" ± 3/32"
Maximum diameter 7/8"
Mounting position any
Basing connections—JETEC basing designation 9DE

Pin 1 - Plate
Pin 2 - Grid Triode section 1
Pin 3 - Cathode
Pin 4 - Heater
Pin 5 - Heater
Pin 6 - Plate Triode section 2
Pin 7 - Grid
Pin 8 - Cathode

GENERAL ELECTRICAL DATA

Heater voltage 9.0 volts
Heater current 0.3 ampere

DIRECT INTERELECTRODE CAPACITANCES Triode section 1

Plate to grid 1.5 μF
Plate to cathode 0.18 μF
Grid to cathode + heater + shield 3.0 μF
Plate to cathode + heater + shield 1.2 μF
Plate to cathode + heater + shield

H) With external shielding can with diameter of 0.886"
### Triode section 2

<table>
<thead>
<tr>
<th>Connection</th>
<th>capacitance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate to grid</td>
<td>1.5 μμF</td>
</tr>
<tr>
<td>Plate to cathode</td>
<td>0.18 μμF</td>
</tr>
<tr>
<td>Grid to cathode + heater + shield</td>
<td>3.0 μμF</td>
</tr>
<tr>
<td>Plate to cathode + heater + shield</td>
<td>1.2 μμF</td>
</tr>
<tr>
<td>Plate to cathode + heater + shield&lt;sup&gt;Ⅰ&lt;/sup&gt;)</td>
<td>1.9 μμF</td>
</tr>
</tbody>
</table>

### Between triode section 1 and triode section 2

<table>
<thead>
<tr>
<th>Connection</th>
<th>capacitance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate to plate</td>
<td>max. 0.04 μμF</td>
</tr>
<tr>
<td>Plate to plate&lt;sup&gt;Ⅰ&lt;/sup&gt;)</td>
<td>max. 0.008 μμF</td>
</tr>
<tr>
<td>Grid to grid</td>
<td>max. 0.003 μμF</td>
</tr>
<tr>
<td>Plate section 1 to grid section 2</td>
<td>max. 0.008 μμF</td>
</tr>
<tr>
<td>Plate section 2 to grid section 1</td>
<td>max. 0.008 μμF</td>
</tr>
<tr>
<td>Plate section 1 to cathode section 2</td>
<td>max. 0.008 μμF</td>
</tr>
<tr>
<td>Plate section 2 to cathode section 1</td>
<td>max. 0.008 μμF</td>
</tr>
<tr>
<td>Grid section 1 to cathode section 2</td>
<td>max. 0.003 μμF</td>
</tr>
<tr>
<td>Grid section 2 to cathode section 1</td>
<td>max. 0.003 μμF</td>
</tr>
</tbody>
</table>

MAXIMUM RATINGS (design center values; each section)

- Plate voltage: max. 250 volts
- Plate voltage without current: max. 550 volts
- Plate dissipation: max. 2.5 watts
- Plate dissipation of both sections together: max. 4.5 watts
- Cathode current: max. 15 mamps
- Negative grid bias: max. 100 volts
- External resistance between grid and cathode: max. 1 megohm
- External resistance between cathode and heater: max. 20 000 ohms
- Voltage between cathode and heater: max. 90 volts

### TYPICAL CHARACTERISTICS (each section)

- Plate voltage: 100 170 200 volts
- Negative grid bias: -1.1 -1.5 -2.1 volts
- Plate current: 4.5 10 10 mamps
- Transconductance: 4600 6200 5800 micromhos
- Amplification factor: 50 50 48

<sup>Ⅰ</sup>With external shielding can with diameter of 0.886"
### OPERATING CHARACTERISTICS AS ADDITIVE MIXER

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value 1</th>
<th>Value 2</th>
<th>Value 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>100</td>
<td>170</td>
<td>200 volts</td>
</tr>
<tr>
<td>Plate resistor</td>
<td>4700</td>
<td>4700</td>
<td>8200 ohms</td>
</tr>
<tr>
<td>Grid resistor</td>
<td>1</td>
<td>1</td>
<td>1 megohm</td>
</tr>
<tr>
<td>Oscillator voltage</td>
<td>1.8</td>
<td>2.8</td>
<td>2.8 volts, rms</td>
</tr>
<tr>
<td>Plate current</td>
<td>2.2</td>
<td>4.8</td>
<td>5.2 mamps</td>
</tr>
<tr>
<td>Conversion conductance</td>
<td>1700</td>
<td>2200</td>
<td>2300 micromhos</td>
</tr>
<tr>
<td>Plate resistance</td>
<td>20000</td>
<td>16000</td>
<td>15000 ohms</td>
</tr>
<tr>
<td>Input resistance at 100 Mc</td>
<td>15000</td>
<td></td>
<td>ohms</td>
</tr>
</tbody>
</table>

### OPERATING CHARACTERISTICS AS OSCILLATOR in television receivers

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>180 volts</td>
</tr>
<tr>
<td>Plate resistor</td>
<td>4400 ohms</td>
</tr>
<tr>
<td>Grid resistor</td>
<td>22000 ohms</td>
</tr>
<tr>
<td>Oscillator voltage</td>
<td>9 volts, rms</td>
</tr>
<tr>
<td>Plate current</td>
<td>8 mamps</td>
</tr>
<tr>
<td>Plate dissipation</td>
<td>1.2 watts</td>
</tr>
</tbody>
</table>
One section

Grid bias (volts)

Plate current (milli-amps)

- Plate voltage = 200 volts
- 150 volts
- 100 volts
Plate voltage = 170 volts

Plate resistance (ohms)

Amplification factor

Transconductance (micromhos)

Grid bias (volts)

Plate resistance

Grid bias

Plate current (milli-amps)

4.4.1954
One section
Plate voltage = 200 volts

Plate resistance (ohms)

Amplification factor

Transconductance (milli-ohms)

Grid bias (volts)

Plate current (milli-amps)
One triode section as self-oscillating mixer
Plate resistor = 0 ohm
Grid leak = 1 megohm

Conversion conductance (micromhos)

Oscillator voltage (volts, rms)

Plate voltage = 250 volts
Supply voltage = 170 volts;
Plate resistor = 4700 ohms

10

0 1 2 3 4 5 6
One triode section as self-oscillating mixer

Plate resistor = 0 ohm
Grid leak = 1 megohm

Transconductance (microhm) for an I.F. signal

Oscillator voltage (volts, rms)