Type 6N8

Double Diode-Pentode for R.F., I.F. and A.F. Amplification

Physical Specifications

Cathode
Base
Bulb
Maximum overall length
Maximum seated height
Bulb length excluding tip
Maximum diameter
Mounting position
Basing connections - JETEC basing designation

Coated unipotential
Small button noval 9-pin
T 6\frac{1}{2}
2-5/8 inches
2-3/8 inches
2+3/32 inches
7/8 inches
any
9T-0-0

Pin 1 - Pentode screen grid
Pin 2 - Pentode control grid
Pin 3 - Cathode and internal shield
Pin 4 - Heater
Pin 5 - Heater
Pin 6 - Pentode plate
Pin 7 - Diode No. 1 plate
Pin 8 - Diode No. 2 plate
Pin 9 - Pentode grid No. 3

General Electrical Data

Heater voltage
Heater current

6.3 volts
0.3 amperes

Direct interelectrode capacitances

Pentode grid No.1 to all other electrodes
Pentode plate to all other electrodes
Between pentode plate and pentode grid No.1 max.
Between pentode grid No.1 and heater max.
Between diode No.1 plate and cathode
Between diode No.2 plate and cathode
Between diode plates max.
Between diode No.1 plate and heater max.
Between diode No.2 plate and heater max.

4.0 \mu F
4.6 \mu F
0.002 \mu F
0.06 \mu F
2.15 \mu F
2.35 \mu F
0.3 \mu F
0.02 \mu F
0.01 \mu F
Type 6N8
(Continued)

Direct interelectrode capacitances (continued)
Between diode No.1 plate and grid No.1 max. 0.0008 \( \mu \text{F} \)
Between diode No.2 plate and grid No.1 max. 0.001 \( \mu \text{F} \)
Between diode No.1 plate and pentode plate max. 0.2 \( \mu \text{F} \)
Between diode No.2 plate and pentode plate max. 0.1 \( \mu \text{F} \)

Maximum ratings

Pentode section
Plate voltage (without current) 550 volts
Plate voltage 250 volts
Plate dissipation 2 watts
Screen grid voltage (without current) 550 volts
Screen grid voltage (plate current less than 2.5 ma) 250 volts
Screen grid voltage (plate current = 5 ma) 125 volts
Screen grid dissipation 0.3 watts
Cathode current 10 ma
Grid No.1 voltage at grid No.1 current = +0.3 \( \mu \text{a} \) -1.3 volts
External resistance between grid No.1 and cathode 3 megohms
External resistance between heater and cathode 20,000 ohms
Voltage between heater and cathode 50 volts

Diode sections
Plate voltage (peak value) 200 volts
Plate current 0.8 ma
Plate voltage at plate current = +0.3 \( \mu \text{a} \) -1.3 volts
External resistance between heater and cathode 20,000 ohms
Voltage between heater and cathode 50 volts

1: The maximum value of this resistor is 22 megohms if the grid bias is only obtained by the voltage drop across the grid leak.

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Type 6N8
(Continued)

Operating characteristics of the pentode section as R.F. or I.F. amplifier

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate and supply voltage</td>
<td>250</td>
<td>volts</td>
</tr>
<tr>
<td>Grid No.3 voltage</td>
<td>0</td>
<td>volts</td>
</tr>
<tr>
<td>Screen grid series resistor</td>
<td>95,000</td>
<td>ohms</td>
</tr>
<tr>
<td>Cathode resistor</td>
<td>295</td>
<td>ohms</td>
</tr>
<tr>
<td>Grid No.1 voltage</td>
<td>-2</td>
<td>-41.5</td>
</tr>
<tr>
<td>Screen grid voltage</td>
<td>85</td>
<td>250</td>
</tr>
<tr>
<td>Plate current</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Screen grid current</td>
<td>1.75</td>
<td></td>
</tr>
<tr>
<td>Transconductance</td>
<td>2200</td>
<td>22</td>
</tr>
<tr>
<td>Plate resistance</td>
<td>1.6</td>
<td>&gt;10</td>
</tr>
</tbody>
</table>

Amplification factor of grid No.2 with respect to grid No.1

<table>
<thead>
<tr>
<th>Factor</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19</td>
<td>19</td>
</tr>
</tbody>
</table>

Equivalent noise resistance

<table>
<thead>
<tr>
<th>Resistance</th>
<th>Value 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>ohms</td>
<td>6,200</td>
</tr>
</tbody>
</table>

Operating characteristics of the pentode section as A.F. amplifier

In circuits with a loudspeaker with an acoustical efficiency of 5% this valve can be used without special precautions against microphony if the input voltage for an output of 50 milli-watts is more than 10 milli-volts

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N.V.PHILIPS'GLOEILAMPENFABRIEKEN, EINDHOVEN, HOLLAND
Type 6N8  
(Continued)

<table>
<thead>
<tr>
<th>$R_p$ (MΩ)</th>
<th>$R_{g2}$ (MΩ)</th>
<th>$R_{g1}$ (MΩ)</th>
<th>$R_k$ (Ω)</th>
<th>$R'_{g1}$ (MΩ)</th>
<th>$I_p$ (ma)</th>
<th>$I_{g2}$ (ma)</th>
<th>$\frac{E_0}{E_i}$</th>
<th>Distortion (%) at $E_0$(r.m.s.) =</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.22</td>
<td>0.68</td>
<td>1</td>
<td>1200</td>
<td>0.68</td>
<td>0.88</td>
<td>0.33</td>
<td>150</td>
<td>0.5 0.8 1.2</td>
</tr>
<tr>
<td>0.10</td>
<td>0.27</td>
<td>1</td>
<td>560</td>
<td>0.33</td>
<td>1.93</td>
<td>0.75</td>
<td>100</td>
<td>0.45 0.75 1.15</td>
</tr>
<tr>
<td>0.22</td>
<td>0.68</td>
<td>10</td>
<td>0</td>
<td>0.68</td>
<td>0.94</td>
<td>0.35</td>
<td>185</td>
<td>0.7 0.9 1.2</td>
</tr>
<tr>
<td>0.10</td>
<td>0.27</td>
<td>10</td>
<td>0</td>
<td>0.33</td>
<td>2.04</td>
<td>0.80</td>
<td>125</td>
<td>0.6 0.75 0.9</td>
</tr>
</tbody>
</table>

Operating characteristics of the pentode section as A.F. amplifier in triode connection (screen grid connected to plate)

<table>
<thead>
<tr>
<th>$R_p$ (MΩ)</th>
<th>$R_{g1}$ (MΩ)</th>
<th>$R_k$ (Ω)</th>
<th>$R'_{g1}$ (MΩ)</th>
<th>$I_p$ (ma)</th>
<th>$\frac{E_0}{E_i}$</th>
<th>Distortion (%) at $E_0$(r.m.s.) =</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>1</td>
<td>820</td>
<td>0.33</td>
<td>2.08</td>
<td>14.5</td>
<td>1.6 2.5 4.3</td>
</tr>
<tr>
<td>0.047</td>
<td>1</td>
<td>560</td>
<td>0.15</td>
<td>4.1</td>
<td>13</td>
<td>1.3 2.0 2.9</td>
</tr>
<tr>
<td>0.1</td>
<td>10</td>
<td>0</td>
<td>0.33</td>
<td>2.16</td>
<td>15</td>
<td>2.0 3.1 4.8</td>
</tr>
<tr>
<td>0.047</td>
<td>10</td>
<td>0</td>
<td>0.15</td>
<td>4.5</td>
<td>15</td>
<td>1.7 2.7 4.1</td>
</tr>
</tbody>
</table>

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N.V.PHILIPS' GLOEI LAMPE NPABRIEKEN, EINDHOVEN, HOLLAND
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Plate voltage = 250 volts
Grid No. 3 voltage = 0 volts

Supply voltage = 250 volts
Screen grid resistor = 95,000 ohms

Grid No. 1 voltage (volts)

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Anode voltage = 250 volts
Grid No. 3 voltage = 0 volts
Supply voltage = 250 volts
Screen grid resistor = 95,000 ohms

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Type 6N8

Plate and supply voltage = 250 volts
Screen grid resistor = 95,000 ohms
Grid No. 3 voltage = 0 volts

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C.
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Type 6N8

Supply voltage
= 250 volts

Screen grid resistor
= 95,000 ohms

Grid No. 3 voltage
= 0 volts

Cross modulation = 1%

Interfering input voltage
(milli-volts r.m.s.)

Transconductance (micro-mhos)

Modulation hum = 1%

Interfering input voltage
(milli-volts r.m.s.)

Transconductance (micro-mhos)

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