Refer to chart at end of section.

**POWER PENTODE 8077/7054**

Miniature type for use as a class C radio-frequency amplifier, oscillator and frequency multiplier up to 40 MHz in mobile communications equipment. Outlines section, 6B; requires miniature 9-contact socket.

**9GK**

Heater Voltage ........................................... 13.5 ± 1.5 volts
Heater Current ........................................... 0.275 ampere
Peak Heater-Cathode Voltage .................................. ±120 max. volts
Direct Interelectrode Capacitances (Approx.):
  Grid No.1 to Plate ................................ 0.063 pF
  Grid No.1 to all other Electrodes except Plate ....... 10.2 pF
  Plate to all other Electrodes except Grid No.1 ....... 3.5 pF

**Class A—AF Power Amplifier**

**MAXIMUM RATINGS (Absolute-Maximum Values)**

<table>
<thead>
<tr>
<th>Component</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>850</td>
</tr>
<tr>
<td>Grid-No.3 (Suppressor Grid)</td>
<td></td>
</tr>
<tr>
<td>Grid-No.2 (Screen-Grid) Voltage</td>
<td>180</td>
</tr>
<tr>
<td>Grid-No.1 (Control-Grid) Voltage</td>
<td></td>
</tr>
<tr>
<td>Negative-bias value</td>
<td></td>
</tr>
<tr>
<td>Positive-bias value</td>
<td>0</td>
</tr>
<tr>
<td>Grid-No.2 Input</td>
<td></td>
</tr>
<tr>
<td>Plate Dissipation</td>
<td>5</td>
</tr>
</tbody>
</table>

**MAXIMUM CIRCUIT VALUES**

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid-No.1-Circuit Resistance:</td>
<td></td>
</tr>
<tr>
<td>For fixed-bias operation</td>
<td>0.1</td>
</tr>
<tr>
<td>For cathode-bias operation</td>
<td>0.25</td>
</tr>
</tbody>
</table>

**CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater Voltage</td>
<td>13.5</td>
</tr>
<tr>
<td>Plate Supply Voltage</td>
<td>350</td>
</tr>
<tr>
<td>Grid No.3</td>
<td></td>
</tr>
<tr>
<td>Grid No.2 Supply Voltage</td>
<td>150</td>
</tr>
<tr>
<td>Cathode Resistor</td>
<td>120</td>
</tr>
<tr>
<td>Plate Resistance (Approx.)</td>
<td>0.1</td>
</tr>
<tr>
<td>Transconductance</td>
<td>11,000</td>
</tr>
<tr>
<td>Plate Current</td>
<td>19</td>
</tr>
<tr>
<td>Grid-No.2 Current</td>
<td>3.5</td>
</tr>
<tr>
<td>Grid-No.1 Voltage (Approx.) for plate $\mu A = 20$</td>
<td>-10</td>
</tr>
</tbody>
</table>

**RF Power Amplifier & Oscillator—Class C Telegraphy**

**RF Power Amplifier—Class C FM Telephony**

**MAXIMUM CCS RatingS (Absolute-Maximum Values)**

<table>
<thead>
<tr>
<th>Component</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Plate Voltage</td>
<td>300</td>
</tr>
<tr>
<td>DC Grid No.3 (Suppressor-Grid)</td>
<td></td>
</tr>
<tr>
<td>DC Grid-No.2 (Screen-Grid) Voltage</td>
<td></td>
</tr>
<tr>
<td>DC Grid-No.1 (Control-Grid) Voltage</td>
<td></td>
</tr>
<tr>
<td>Negative-bias value</td>
<td></td>
</tr>
<tr>
<td>DC Plate Current</td>
<td>33</td>
</tr>
<tr>
<td>DC Grid-No.2 Current</td>
<td>5.5</td>
</tr>
<tr>
<td>DC Grid-No.1 Current</td>
<td>3</td>
</tr>
<tr>
<td>Grid-No.2 Input</td>
<td>1</td>
</tr>
<tr>
<td>Plate Dissipation</td>
<td>5</td>
</tr>
</tbody>
</table>

**TYPICAL OPERATION**

At frequencies up to 40 MHz

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Plate Voltage</td>
<td>200</td>
</tr>
<tr>
<td>Grid No.3</td>
<td>145</td>
</tr>
<tr>
<td>DC Grid-No.2 Voltage</td>
<td>115</td>
</tr>
<tr>
<td>DC Grid-No.1 Voltage</td>
<td>-7</td>
</tr>
</tbody>
</table>
Peak RF Grid-No.1 Voltage ................. 9 11 16 volts
DC Plate Current .................. 14.5 20 26 mA
DC Grid-No.2 Current ............. 3 4.1 5.5 mA
DC Grid-No.1 Current (Approx.) .. 0.5 0.85 1 mA

MAXIMUM CIRCUIT VALUE
Grid-No.1-Circuit Resistance ........... 0.1 megohm

Frequency Multiplier

MAXIMUM CCS\(^a\) RATINGS (Absolute-Maximum Values)
Same as for RF POWER AMPLIFIER & OSCILLATOR

TYPICAL OPERATION
As doubler up to 40 MHz

<table>
<thead>
<tr>
<th>DC Plate Voltage</th>
<th>Grid No.3</th>
<th>DC Grid-No.2 Voltage</th>
<th>DC Grid-No.1 Voltage</th>
<th>Peak RF Grid-No.1 Voltage</th>
<th>DC Plate Current</th>
<th>DC Grid-No.2 Current</th>
<th>DC Grid-No.1 Current (Approx.)</th>
<th>Driving Power (Approx.)</th>
<th>Useful Power Output (Approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200</td>
<td>250</td>
<td>300</td>
<td>115</td>
<td>145 175</td>
<td>16 20 25</td>
<td>19 24 31</td>
<td>0.3 0.45 0.6</td>
<td>1.4 1.9 2.5</td>
</tr>
</tbody>
</table>

As doubler up to 40 MHz

<table>
<thead>
<tr>
<th>DC Plate Voltage</th>
<th>Grid No.3</th>
<th>DC Grid-No.2 Voltage</th>
<th>DC Grid-No.1 Voltage</th>
<th>Peak RF Grid-No.1 Voltage</th>
<th>DC Plate Current</th>
<th>DC Grid-No.2 Current</th>
<th>DC Grid-No.1 Current (Approx.)</th>
<th>Driving Power (Approx.)</th>
<th>Useful Power Output (Approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200</td>
<td>250</td>
<td>300</td>
<td>115</td>
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<td>16 20 25</td>
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<td>0.3 0.45 0.6</td>
<td>1.4 1.9 2.5</td>
</tr>
</tbody>
</table>

\(\text{\textsuperscript{a}}\) Key-down conditions per tube without amplitude modulation. Amplitude modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115 per cent of the carrier conditions.

\(\text{\textsuperscript{b}}\) Continuous Commercial Service.

**8106**

**INDUSTRIAL TYPE**

Miniature type for use as a frequency multiplier and driver in mobile communications equipment. Outlines section, 6B; requires miniature 9-contact socket.

| Heater Voltage | 13.5 ± 1.5 volts
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater Current</td>
<td>0.25 ampere</td>
</tr>
<tr>
<td>Peak Heater-Cathode Voltage</td>
<td>±100 max. volts</td>
</tr>
</tbody>
</table>
Direct Interelectrode Capacitances:

<table>
<thead>
<tr>
<th>Electrode Combination</th>
<th>Capacitance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid No.1 to Plate</td>
<td>0.09 pF</td>
</tr>
<tr>
<td>Grid No.1 to Cathode, Heater, Grid No.2, and Grid No.3</td>
<td>10 pF</td>
</tr>
<tr>
<td>Plate to Cathode, Heater, Grid No.2, and Grid No.3</td>
<td>2.8 pF</td>
</tr>
</tbody>
</table>

**Class A: Amplifier**

**MAXIMUM RATINGS (Absolute-Maximum Values)**

- **Plate Voltage**: 330 volts
- **Grid-No.2 (Screen-Grid) Voltage**: 300 volts
- **Grid-No.1 Voltage**: -125 volts
- **Plate Dissipation**: 6.0 watts
- **Grid-No.1 Current**: 3.0 mA
- **Cathode Current**: 40 mA

**TYPICAL OPERATION AND CHARACTERISTICS**

- **Plate Voltage**: 300 volts
- **Grid-No.2 Voltage**: 150 volts
- **Grid-No.1 (Control-Grid) Voltage**: -3.5 volts
- **Plate Resistance (Approx.)**: 90000 ohms
- **Transconductance**: 9000 $\mu$hos
- **Plate Current**: 16 mA
- **Grid-No.2 Current**: 3.2 mA
- **Grid-No.1 Voltage (Approx.) for plate $\mu$A = 100**: -8 volts

Refer to chart at end of section.

Refer to chart at end of section.

Refer to chart at end of section.

**MEDIUM-MU TRIODE**

**INDUSTRIAL TYPE**

Nuvistor type, medium-mu general purpose triode for use as an amplifier or oscillator at frequencies extending into the UHF region. Outlines section, 1; requires nuvisor socket. The 8393 is the same as the 7586 except for the following items:

- **Heater Voltage (ac/dc)**: 13.5 ± 1.4 volts
- **Heater Current**: 0.060 ampere
- **Peak Heater-Cathode Voltage**: ±100 max. volts

**Direct Interelectrode Capacitance (Approx.)**:

- **Grid to Plate**: 2.4 pF
- **Grid to Cathode, Heater, and Shell**: 4.4 pF
- **Plate to Cathode, Heater, and Shell**: 1.6 pF
- **Plate to Cathode**: 0.25 pF
- **Heater to Cathode**: 1.7 pF

**BEAM POWER TUBE**

Glass octal type used as output amplifier in high-fidelity, high-power sound systems. Outlines section, 19F; requires octal socket. This tube, like other power-handling tubes, should be adequately ventilated. **Heater**: volts (ac/dc), 6.3; amperes, 1.6; maximum heater-cathode volts, ±200 peak, 100 average.
Class A\textsubscript{1} Amplifier

**MAXIMUM RATINGS** (Design-Maximum Values)

- **Plate Voltage** ........................................... 660 volts
- **Grid-No.2 (Screen-Grid) Voltage** ..................... 500 volts
- **Cathode Current** ........................................ 200 mA
- **Plate Dissipation** ....................................... 35 watts
- **Grid-No.2 Input** ........................................ 5* watts

**CHARACTERISTICS**

- **Plate Voltage** ........................................... 300 volts
- **Grid-No.2 Voltage** ..................................... 300 volts
- **Grid-No.1 (Control-Grid) Voltage** ................... -12 volts
- **Grid-No.1 Voltage for plate current of 1 mA** ...... -37 volts
- **Plate Resistance** ....................................... 16000 ohms
- **Transconductance** ..................................... 23000 \(\mu\)hos
- **Plate Current** ........................................... 100 mA
- **Grid-No.2 Current** ..................................... 5.5 mA
- **Triode Amplification Factor** ......................... 18.5

**MAXIMUM CIRCUIT VALUES**

- **Grid-No.1-Circuit Resistance:**
  - For fixed-bias operation ............................... 1 megowhm
  - For cathode-bias operation ......................... 0.25 megowhm

**Push-Pull Class AB\textsubscript{1} Amplifier**

**MAXIMUM RATINGS** (Same as for Class A\textsubscript{1} Amplifier)

**TYPICAL OPERATION** (Values are for two tubes)

- **Plate Supply Voltage** ................................ 400 560 volts
- **Grid-No.2 Supply Voltage** ............................. 275 300 volts
- **Grid-No.1 Voltage** ..................................... -15 15.5 volts
- **Peak AF Grid-to-Grid Voltage** ....................... 24 31 volts
- **Zero-Signal Plate Current** ........................... 150 100 mA
- **Maximum-Signal Plate Current** ....................... 294 270 mA
- **Zero-Signal Grid-No.2 Current** ....................... 4.4 3.4 mA
- **Maximum-Signal Grid-No.2 Current** .................. 34 31 mA
- **Effective Load (Plate-to-Plate)** .................... 2800 4200 ohms
- **Total Harmonic Distortion** ........................... 2.5 2 per cent
- **Maximum Signal Power Output** ....................... 65 100 watts

* A bias resistor or other means is required to protect the tube in absence of excitation.
* Grid-No.2 may reach 8 watts during peak levels of speech and music levels.

8532 Refer to chart at end of section.

8532/6J4WA Refer to chart at end of section.

8532W Refer to chart at end of section.

8627 Refer to chart at end of section.

8627A Refer to chart at end of section.

8628 Refer to chart at end of section.

8808 Refer to chart at end of section.

8950 Refer to chart at end of section.

9001 Refer to chart at end of section.

9002 Refer to chart at end of section.

9003 Refer to chart at end of section.

9005 Refer to chart at end of section.

9006 Refer to chart at end of section.
Refer to type 1S2A/DY87.
Refer to type 6AK8/EABC8.
Refer to type 6DC8/EBF89.
Refer to type 6DL4/EC88.
Refer to type 6FY5/EC97.
Refer to type 12AT7/ECC81.
Refer to type 12AU7A/ECC82.
Refer to type 12AX7A/ECC83.
Refer to type 6AQ8/ECC85.
Refer to type 6ES8/ECC189.
Refer to type 6BL8/ECF80.
Refer to type 6HG8/ECF86.
Refer to type 6X9/ECF200.
Refer to type 6U9/ECF201.
Refer to type 6GJ7/ECF801.
Refer to type 6JW8/ECF802.
Refer to type 6BM8/ECL82.
Refer to type 6DX8/ECL84.
Refer to type 6GV8/ECL85.
Refer to type 6GW8/ECL86.
Refer to type 6AM6/EF91.
Refer to type 6BA6/EF93.
Refer to type 6AK5/EF95.
Refer to type 6EH7/EF183.
Refer to type 6EJ7/EF184.
Refer to type 6X9/EFL200.
Refer to type 6CA7/EL34.
Refer to type 6BQ5/EL84.
Refer to type 6CW5/EL86.
Refer to type 6DL5/EL95.
Refer to type 6GB5/EL500.
<table>
<thead>
<tr>
<th>Tube</th>
<th>Equivalent Type</th>
</tr>
</thead>
</table>
| EL509 | Refer to type 6KG6A/EL509.  
ELL80 | Refer to type 6HU8/ELL80.  
EM84 | Refer to chart at end of section.  
EM84/6GFG6 |  
EM87 | Refer to type 6HU6/EM87.  
EY88 | Refer to type 6AL3/EY88.  
EY500 | Refer to type 6EC4A/EY500.  
GZ34 | Refer to type 5AR4/GZ34.  
HCC85 | Refer to type 17EW8/HCC85.  
LCF80 | Refer to type 6LN8/LCF80.  
LCF86 | Refer to type 5HG8/LCF86.  
LCF201 | Refer to type 5U9/LCF201.  
LCF801 | Refer to type 5GJ7/LCF801.  
LCF802 | Refer to type 6LX8/LCF802.  
LCL84 | Refer to type 10DX8/LCL84.  
LCL85 | Refer to type 10GV8/LCL85.  
LF183 | Refer to type 4EH7/LF183.  
LF184 | Refer to type 4EJ7/LF184.  
LFL200 | Refer to type 11Y9/LFL200.  
LL86 | Refer to type 10CW5/LL86.  
LL500 | Refer to type 18GB5/LL500.  
LY88 | Refer to type 20AQ3/LY88.  
PC900 | Refer to type 4HA5/PC900.  
PCC85 | Refer to type 9AQ8/PCC85.  
PCC88 | Refer to type 7DJ8/PCC88.  
PCF80 | Refer to type 9A8/PCF80.  
PCF86 | Refer to type 7HG8/PCF86.  
PCF801 | Refer to type 8GJ7/PCF801.  
PCF802 | Refer to type 9JW8/PCF802.  
PCL82 | Refer to type 16A8/PCL82.  
PCL84 | Refer to type 15DQ8/PCL84.  

Refer to type 6GV8/PCL85.
Refer to type 25E5/PL36.
Refer to type 15CW5/PL84.
Refer to type 27GB5/PL500.
Refer to type 40KG6A/PL509.
Refer to type 29KQ6/PL521.
Refer to type 17Z3/PY81.
Refer to type 30AE3/PY88.
Refer to type 42EC4A/PY500.
Refer to type 50BM8/UCL82.
Refer to type 4ES8/XCC189.
Refer to type 4BL8/XCF80.
Refer to type 4GJ7/XCF801.
Refer to type 9GV8/XCL85.
Refer to type 3EH7/XF183.
Refer to type 3EJ7/XF184.
Refer to type 8CW5/XL86.
Refer to type 13GB5/XL500.
Refer to type 16AQA3/XY88.
Refer to type 5ES8/YCC189.