Power Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:
Heater, for Unipotential Cathode:
Voltage (AC or DC) .................................. 6.3 ± 10% volts
Current at 6.3 volts ................................ 0.76 amp
Direct Inter-electrode Capacitances:
Grid No.1 to plate ................................ 0.14 max. μf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater .................. 10 μf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater .................. 7 μf

Characteristics, Class A1 Amplifier:
Plate Supply Voltage ................................ 250 volts
Grid-No.2 Supply Voltage ........................... 250 volts
Cathode Resistor ..................................... 135 ohms
Mu-Factor, Grid No.2 to Grid No.1 ............... 19
Plate Resistance (Approx.) ......................... 38000 ohms
Transconductance .................................. 11300 μhmhos
Plate Current ........................................ 48 ma
Grid-No.2 Current ................................... 5.5 ma

Mechanical:
Operating Position ..................................... Any
Maximum Overall Length ............................ 3-1/16"
Maximum Seated Length ............................. 2-13/16"
Length, Base Seat to Bulb Top (Excluding tip) 2-7/16" ± 3/32"
Diameter ................................................ 0.750" to 0.875"
Dimensional Outline .................................. See General Section
Bulb ....................................................... T6-1/2
Base ...................................................... Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW ............. 9GK

Pin 1 - Cathode
Pin 2 - Grid No.1
Pin 3 - Grid No.3, Internal Shield
Pin 4 - Heater
Pin 5 - Heater
Pin 6 - No Connection
Pin 7 - Plate
Pin 8 - Grid No.2
Pin 9 - Grid No.3, Internal Shield

AF POWER AMPLIFIER — Class A1

Maximum Ratings, Design-Maximum Values:
PLATE SUPPLY VOLTAGE .......................... 600 max. volts
PLATE VOLTAGE ...................................... 330 max. volts
GRID-No.2 SUPPLY VOLTAGE ...................... 600 max. volts
GRID-No.2 (SCREEN-GRID) VOLTAGE ............ 330 max. volts

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GRID-No.1 (CONTROL-GRID) VOLTAGE:
   Negative-bias value .................. 100 max. volts
   CATHODE CURRENT ................... 65 max. ma
GRID-No.2 INPUT:
   Peak ................................ 4 max. watts
   Average ............................ 2 max. watts
PLATE DISSIPATION .................... 13.2 max. watts
PEAK HEATER-CATHODE VOLTAGE:
   Heater negative with respect to cathode .. 100 max. volts
   Heater positive with respect to cathode .. 100 max. volts

Typical Operation:
   Plate Supply Voltage .................. 250 volts
   Grid-No.2 Supply Voltage ............. 250 volts
   Cathode Resistor ...................... 135 ohms
   Peak AF Grid-No.1 Voltage ............ 7.3 volts
   Zero-Signal Plate Current ............ 48 ma
   Max.-Signal Plate Current ............ 50.6 ma
   Zero-Signal Grid-No.2 Current ........ 5.5 ma
   Max.-Signal Grid-No.2 Current ........ 10 ma
   Effective Load Resistance ............ 5200 ohms
   Total Harmonic Distortion ............ 10 %
   Max.-Signal Power Output ............. 5.7 watts

Maximum Circuit Values:
   Grid-No.1-Circuit Resistance:
      For fixed-bias operation .......... 0.3 max. megohm
      For cathode-bias operation ...... 1 max. megohm

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PUSH-PULL AF POWER AMPLIFIER — Class AB

Maximum Ratings, Design-Maximum Values:
   PLATE SUPPLY VOLTAGE ................. 600 max. volts
   PLATE VOLTAGE ........................ 330 max. volts
   GRID-No.2 SUPPLY VOLTAGE ............. 600 max. volts
   GRID-No.2 (SCREEN-GRID) VOLTAGE ..... 330 max. volts
   GRID-No.1 (CONTROL-GRID) VOLTAGE:
      Negative-bias value ............... 100 max. volts
   CATHODE CURRENT ................... 65 max. ma
GRID-No.2 INPUT:
   Peak ................................ 4 max. watts
   Average ............................ 2 max. watts
PLATE DISSIPATION .................... 13.2 max. watts
PEAK HEATER-CATHODE VOLTAGE:
   Heater negative with respect to cathode .. 100 max. volts
   Heater positive with respect to cathode .. 100 max. volts

Typical Operation:
   Values are for a tubes
   Plate Supply Voltage .................. 250 300 volts
   Grid-No.2 Supply Voltage ............. 250 300 volts
   Cathode Resistor ...................... 130 130 ohms
   Peak AF Grid-No.1-to-Grid-No.1 Voltage .. 22.4 28 volts
   Zero-Signal Plate Current ............. 62 72 ma
Max.-Signal Plate Current.......................... 75 92 ma
Zero-Signal Grid-No.2 Current....................... 7 8 ma
Max.-Signal Grid-No.2 Current........................ 15 22 ma
Effective Load Resistance (Plate to plate). 8000 8000 ohms
Total Harmonic Distortion........................... 3 4 %
Max.-Signal Power Output............................ 11 17 watts

Maximum Circuit Values:
Grid-No.1-Circuit Resistance:
For fixed-bias operation......................... 0.3 max. megohm
For cathode-bias operation....................... 1 max. megohm

**PUSH-PULL AF POWER AMPLIFIER — Class B**

**Maximum Ratings, Design-Maximum Values:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLATE SUPPLY VOLTAGE</td>
<td>600 max. volts</td>
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<tr>
<td>PLATE VOLTAGE</td>
<td>330 max. volts</td>
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<tr>
<td>GRID-No.2 SUPPLY VOLTAGE</td>
<td>600 max. volts</td>
</tr>
<tr>
<td>GRID-No.2 (SCREEN-GRID) VOLTAGE</td>
<td>330 max. volts</td>
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<tr>
<td>GRID-No.1 (CONTROL-GRID) VOLTAGE</td>
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<tr>
<td>Negative-bias value</td>
<td>100 max. volts</td>
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<tr>
<td>CATHODE CURRENT</td>
<td>65 max. ma</td>
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<tr>
<td>GRID-No.2 INPUT</td>
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<tr>
<td>Peak</td>
<td>4 max. watts</td>
</tr>
<tr>
<td>Average</td>
<td>2 max. watts</td>
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<tr>
<td>PLATE DISSIPATION</td>
<td>13.2 max. watts</td>
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<tr>
<td>PEAK HEATER-CATHODE VOLTAGE</td>
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<tr>
<td>Heater negative with respect to cathode</td>
<td>100 max. volts</td>
</tr>
<tr>
<td>Heater positive with respect to cathode</td>
<td>100 max. volts</td>
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**Typical Operation:**

Values are for 2 tubes

<table>
<thead>
<tr>
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<th>Values</th>
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<tbody>
<tr>
<td>Plate Voltage</td>
<td>250 300 volts</td>
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<tr>
<td>Grid-No.2 Voltage</td>
<td>250 300 volts</td>
</tr>
<tr>
<td>Grid-No.1 Voltage</td>
<td>-11.6 -14.7 volts</td>
</tr>
<tr>
<td>Peak AF Grid-No.1-to-Grid-No.1 Voltage</td>
<td>22.4 28 volts</td>
</tr>
<tr>
<td>Zero-Signal Plate Current</td>
<td>20 15 ma</td>
</tr>
<tr>
<td>Max.-Signal Plate Current</td>
<td>75 92 ma</td>
</tr>
<tr>
<td>Zero-Signal Grid-No.2 Current</td>
<td>2.2 1.6 ma</td>
</tr>
<tr>
<td>Max.-Signal Grid-No.2 Current</td>
<td>15 22 ma</td>
</tr>
<tr>
<td>Effective Load Resistance (Plate to plate). 8000 8000 ohms</td>
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</tr>
<tr>
<td>Total Harmonic Distortion</td>
<td>3 4 %</td>
</tr>
<tr>
<td>Max.-Signal Power Output</td>
<td>11 17 watts</td>
</tr>
</tbody>
</table>

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:
For fixed-bias operation......................... 0.3 max. megohm
For cathode-bias operation....................... 1 max. megohm

* Without external shield.*
OPERATION CHARACTERISTICS

E_p = 6.3 VOLTS
PLATE VOLTS = 250
GRID-N2-VOLTS = 250
GRID-N1-VOLTS = -7.3
AF GRID-N21-VOLTS (RMS) = 4.4

POWER OUTPUT

DISTORTION

TOTAL HARMONIC DISTORTION—PER CENT

EFFECTIVE LOAD RESISTANCE—OHMS

POWER OUTPUT—WATTS

2000 4000 6000 8000 10000

0 1 2 3 4 5 10 15 20

92CM-9902

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