High-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE
For Sync-Separator and Noise-Immune
Gated-AGC-Amplifier Applications in
Color and Black-and-White TV Receivers

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage (AC or DC)</td>
<td>6.3 ± 0.6 V</td>
</tr>
<tr>
<td>Current</td>
<td>0.600 ± 0.040 A</td>
</tr>
<tr>
<td>Warm-up time (Average)</td>
<td>11 sec</td>
</tr>
<tr>
<td>Peak heater-cathode voltage</td>
<td></td>
</tr>
<tr>
<td>(Each unit):</td>
<td></td>
</tr>
<tr>
<td>Heater negative with</td>
<td></td>
</tr>
<tr>
<td>respect to cathode</td>
<td>200 max V</td>
</tr>
<tr>
<td>Heater positive with</td>
<td></td>
</tr>
<tr>
<td>respect to cathode</td>
<td>200 max V</td>
</tr>
</tbody>
</table>

Direct Interelectrode

Capacitances:

<table>
<thead>
<tr>
<th>Electrode Combination</th>
<th>Capacitance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid to plate</td>
<td>2.2 pF</td>
</tr>
<tr>
<td>Grid to cathode &amp; pentode</td>
<td></td>
</tr>
<tr>
<td>grid No.3 &amp; internal shield, and heater</td>
<td>2.8 pF</td>
</tr>
<tr>
<td>Plate to cathode &amp; pentode</td>
<td></td>
</tr>
<tr>
<td>grid No.3 &amp; internal shield, and heater</td>
<td>2.2 pF</td>
</tr>
</tbody>
</table>

Pentode Unit:

<table>
<thead>
<tr>
<th>Electrode Combination</th>
<th>Capacitance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid No.1 to plate</td>
<td>0.1 max pF</td>
</tr>
<tr>
<td>Grid No.1 to cathode, triode</td>
<td></td>
</tr>
<tr>
<td>cathode &amp; grid No.3 &amp; internal shield, grid No.2, and heater</td>
<td>10.0 pF</td>
</tr>
<tr>
<td>Grid No.3 &amp; triode cathode &amp;</td>
<td></td>
</tr>
<tr>
<td>internal shield to plate</td>
<td>3.4 pF</td>
</tr>
<tr>
<td>Grid No.1 to grid No.3 &amp;</td>
<td></td>
</tr>
<tr>
<td>triode cathode &amp; internal shield</td>
<td></td>
</tr>
<tr>
<td>. . . . . . . . . . . . . . . . . .</td>
<td>0.36 pF</td>
</tr>
<tr>
<td>Grid No.3 &amp; triode cathode &amp;</td>
<td></td>
</tr>
<tr>
<td>internal shield to plate, cathode, grid No.2, grid No.1, and heater</td>
<td>12.5 pF</td>
</tr>
</tbody>
</table>

Characteristics, Class A1 Amplifier:

<table>
<thead>
<tr>
<th></th>
<th>Triode Unit</th>
<th>Pentode Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Supply Voltage</td>
<td>200 volts</td>
<td>150 volts</td>
</tr>
<tr>
<td>Grid No.3</td>
<td>—</td>
<td>e</td>
</tr>
</tbody>
</table>
**Triode Unit** | **Pentode Unit**
---|---
Grid-No.2 Supply Voltage | 100 volts
Grid-No.1 Voltage | -2 volts
Grid No.1 | e
Cathode Resistor | 180 ohms
Amplification Factor | 70
Plate Resistance (Approx.) | 17500 ohms
**Transconductance,**
Grid No.1 to Plate | 4000 4400 \( \mu \)hos
**Transconductance,**
Grid No.3 to Plate | 600 \( \mu \)hos
Plate Current | 4 ma
Grid-No.2 Current | 2.8 ma
Grid-No.1 Supply Voltage (Approx.) for plate \( \mu a = \)
10 | -5 volts
20 | -4 volts
Grid-No.3 Supply Voltage (Approx.) for plate \( \mu a = 20 \)
| -7 volts

**Mechanical:**

Operating Position | Any
Type of Cathodes | Coated Unipotential
Maximum Overall Length | 2-5/8"
Maximum Seated Length | 2-3/8"
Length, Base Seat to Bulb Top (Excluding tip) | 2" \( \pm 3/32"\)
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 | 9QY

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

**GATED AGC AMPLIFIER & NOISE INVERTER**

**Pentode Unit**

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

For operation in a 525-line, 30-frame system

- DC PLATE VOLTAGE | 300 max. volts
- PEAK POSITIVE-PULSE PLATE VOLTAGE | 600 max. volts

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Electronic Components and Devices

Harrison, N. J.
GRID-No. 3 (CONTROL-GRID) VOLTAGE:
  Negative-bias value ................................ 100 max. volts
  Positive-bias value ................................ 0 max. volts
GRID-No. 2 (SCREEN-GRID) SUPPLY VOLTAGE ...... 300 max. volts
GRID-No. 2 VOLTAGE: ........................... See Grid-No. 2 - Input Rating Chart
                       at front of Receiving Tube Section
GRID-No. 1 (CONTROL-GRID) VOLTAGE:
  Negative-bias value ................................ 50 max. volts
  Positive-bias value ................................ 0 max. volts
GRID-No. 2 INPUT:
  For grid-No. 2 voltages
    up to 150 volts .................................. 1.1 max. watts
  For grid-No. 2 voltages
    between 150 and 300
    volts ........................................... See Grid-No. 2 - Input Rating Chart
                       at front of Receiving Tube Section
PLATE DISSIPATION: .............................. 2 max. watts

Maximum Circuit Values:

Grid-No. 1-Circuit Resistance:
  For fixed-bias operation ................. 0.5 max. megohm
  For cathode-bias operation .............. 1 max. megohm

**AMPLIFIER — Class A**

*Triode Unit*

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE: ................................. 300 max. volts
GRID VOLTAGE:
  Negative-bias value ................................ 50 max. volts
  Positive-bias value ................................ 0 max. volts
PLATE DISSIPATION: .............................. 1.1 max. watts

Maximum Circuit Values:

Grid-Circuit Resistance:
  For fixed-bias operation ................. 0.25 max. megohm
  For cathode-bias operation .............. 1 max. megohm

a  At heater amperes = 0.600.
b  At heater volts = 6.3.
c  The dc component must not exceed 100 volts.
d  Without external shield.
e  Connected to negative end of cathode resistor.
f  With no external connection to triode plate and triode grid.
g  As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.
h  This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.
AVERAGE CHARACTERISTICS
Triode Unit

$E_T = 6.3$ VOLTS
PLATE VOLTS = 200

AMPLIFICATION FACTOR ($\mu$)

PLATE RESISTANCE ($r_p$) — MEGOHMS

TRANSCONDUCTANCE ($g_m$) — MICROMERINS

GRID VOLTS

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Electronic Components and Devices  Harrison, N. J.

DATA 3  9-63
AVERAGE CHARACTERISTICS
Pentode Unit

$E_f = 6.3$ VOLTS
PLATE VOLTS = 0
GRID-No.3 VOLTS = 0
GRID-No.2 VOLTS = 125

GRID-No.1 VOLTS

GRID-No.2 MILLIAMPERES

-4 -3 -2 -1 0

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