The 12B4-A is a miniature low-mu triode designed primarily for service as a vertical-deflection amplifier in television receivers. The tube features high plate current at relatively low plate voltages and is capable of withstanding the high pulse voltages normally encountered in this application.

In addition, the 12B4-A exhibits a controlled heater warm-up characteristic which makes the tube particularly suited for use in television receivers which employ series-connected heaters. When the 12B4-A is used in conjunction with other 600-milliamper e types which exhibit essentially the same heater warm-up characteristic, heater voltage surges across the individual tubes are minimized during the warm-up period.

Except for the controlled heater warm-up time characteristic, the 12B4-A is identical to the 12B4.

**GENERAL**

**ELECTRICAL**
- Cathode—Coated Unipotential
- Heater Voltage, AC or DC: 12.6 Volts
- Heater Current: 0.3 Amperes
- Heater Warm-up Time*: 11 Seconds
- Direct Interelectrode Capacitances, approximate:
  - Grid to Plate: 4.8 μf
  - Input: 5.0 μf
  - Output: 1.5 μf

**MECHANICAL**
- Mounting Position: Any
- Envelope: T-6½, Glass
- Base: E9-1, Small Button 9-Pin

**MAXIMUM RATINGS**

<table>
<thead>
<tr>
<th>Class A, Amplifier</th>
<th>Vertical-Deflection Amplifier†</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Plate Voltage</td>
<td>550 Volts</td>
</tr>
<tr>
<td>Peak Positive Pulse Plate Voltage</td>
<td>1000§ Volts</td>
</tr>
<tr>
<td>Peak Negative Grid Voltage</td>
<td>250 Volts</td>
</tr>
<tr>
<td>Plate Dissipation</td>
<td>5.5 Watts</td>
</tr>
<tr>
<td>DC Cathode Current</td>
<td>30 Milliamperes</td>
</tr>
<tr>
<td>Peak Cathode Current</td>
<td>105 Milliamperes</td>
</tr>
</tbody>
</table>

**Heater-Cathode Voltage**
- Heater Positive with Respect to Cathode
  - DC Component: 100 Volts
  - Total DC and Peak: 200 Volts
- Heater Negative with Respect to Cathode
  - Total DC and Peak: 200 Volts

**Grid Circuit Resistance**
- With Fixed Bias: 0.47 Megohms
- With Cathode Bias: 2.2 Megohms
CHARACTERISTICS AND TYPICAL OPERATION

CLASS A1 AMPLIFIER
Plate Voltage .................................................. 150 150 Volts
Grid Voltage .................................................... -23 -17.5 Volts
Amplification Factor ........................................... 6.5
Plate Resistance, approximate ............................. 1030 Ohms
Transconductance ............................................. 6300 Micromhos
Plate Current ................................................... 9.6 34 Milliamperes
Grid Voltage, approximate
\( I_b = 200 \) Microamperes .................................... -32 Volts

* Heater warm-up time is defined as the time required in the circuit shown at the right for the voltage across the heater terminals to increase from zero to the heater test voltage \( (V_h) \). For this type, \( E = 25 \) volts (RMS or DC), \( V_h = 5.0 \) volts (RMS or DC), and \( R = 31.5 \) ohms.

† Without external shield.
‡ For operation in a 525-line, 30-frame television system as described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission. The duty cycle of the voltage pulse must not exceed 15 percent of one scanning cycle.
§ Value given is to be considered as an Absolute Maximum Rating. In this case, the combined effect of supply voltage variation, manufacturing variation including components in the equipment, and adjustment of equipment controls should not cause the rated value to be exceeded.
π In stages operating with grid-leak bias, an adequate cathode-bias resistor or other suitable means is required to protect the tube in the absence of excitation.