DESCRIPTION AND RATING

FOR GROUNDED-GRID OSCILLATOR, AMPLIFIER, AND FREQUENCY MULTIPLIER SERVICE

Metal and Ceramic  Small Size

The 6771 is a high-mu, metal-and-ceramic triode intended for operation as a grounded-grid oscillator, radio-frequency power amplifier, or frequency multiplier at frequencies as high as 4000 megacycles. The 6771 is also useful as a plate-pulsed, grounded-grid oscillator at frequencies as high as 5000 megacycles.

Features of the 6771 include small size, planar electrode construction with close spacing, inherent rigidity, an envelope structure convenient for coaxial circuit applications, and excellent resistance to vibration and shock.

GENERAL

<table>
<thead>
<tr>
<th>ELECTRICAL</th>
<th>MECHANICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cathode—Coated Unipotential</td>
<td>Mounting Position—Any</td>
</tr>
<tr>
<td>Heater Characteristics and Ratings</td>
<td>Net Weight, approximate</td>
</tr>
<tr>
<td>Heater Voltage, AC or DC..*</td>
<td>.0.9 Ounces</td>
</tr>
<tr>
<td>6.3 volts .0.575†</td>
<td>Cooling—Conduction and Convection</td>
</tr>
<tr>
<td>Heater Current at Ef=.63 volts</td>
<td></td>
</tr>
<tr>
<td>Grid to Plate: (g to p) 2.03 pf</td>
<td></td>
</tr>
<tr>
<td>Grid to Cathode: (g to k) 4.05 pf</td>
<td></td>
</tr>
<tr>
<td>Plate to Cathode: (p to k) 0.018 pf</td>
<td></td>
</tr>
<tr>
<td>Direct Interelectrode Capacitances‡</td>
<td></td>
</tr>
</tbody>
</table>

MAXIMUM RATINGS

**ABSOLUTE-MAXIMUM VALUES**

**RADIO-FREQUENCY AMPLIFIER—CLASS A**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater Voltage*</td>
<td>4.5 to 5.7 Volts</td>
</tr>
<tr>
<td>DC Plate Voltage</td>
<td>300 Volts</td>
</tr>
<tr>
<td>Negative DC Grid Voltage</td>
<td>25 Volts</td>
</tr>
<tr>
<td>DC Plate Current</td>
<td>25 Milliamperes</td>
</tr>
<tr>
<td>Plate Dissipation</td>
<td>6.25 Watts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Heater-Cathode Voltage</td>
<td>90 Volts</td>
</tr>
<tr>
<td>Heater Positive with Respect to</td>
<td>Cathode</td>
</tr>
<tr>
<td>Heater Negative with Respect to</td>
<td>Cathode</td>
</tr>
<tr>
<td>Grid Circuit Resistance</td>
<td>0.5 Megohms</td>
</tr>
<tr>
<td>Envelope Temperature</td>
<td>175° C</td>
</tr>
</tbody>
</table>

Absolute-Maximum ratings are limiting values of operating and environmental conditions applicable to any electron tube of a specified type as defined by its published data and should not be exceeded under the worst probable conditions.

The tube manufacturer chooses these values to provide acceptable serviceability of the tube, making no allowance for equipment variations, environmental variations, and the effects of changes in operating conditions due to variations in the characteristics of the tube under consideration and of all other electron devices in the equipment.

The equipment manufacturer should design so that initially and throughout life no absolute-maximum value for the intended service is exceeded with any tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of the tube under consideration and of all other electron devices in the equipment.
MAXIMUM RATINGS (Continued)

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR—CLASS C TELEGRAPHY
Key-Down Conditions per Tube Without Amplitude Modulation
Heater Voltage* .................................. 4.5 to 5.7 Volts
DC Plate Voltage .................................. 275 Volts
Negative DC Grid Voltage .......................... 25 Volts
DC Plate Current .................................. 25 Milliamperes
DC Grid Current .................................. 8.0 Milliamperes
Plate Dissipation .................................. 6.25 Watts
Peak Heater-Cathode Voltage
  Heater Positive with Respect to Cathode .......... 90 Volts
  Heater Negative with Respect to Cathode .......... 90 Volts
Grid Circuit Resistance ................................ 0.1 Megohms
Envelope Temperature at Hottest Point 175 °C

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR—CLASS C TELEPHONY
Carrier Conditions per Tube for Use With a Maximum Modulation Factor of 1.0
Heater Voltage* .................................. 4.5 to 5.7 Volts
DC Plate Voltage .................................. 250 Volts
Negative DC Grid Voltage .......................... 25 Volts
DC Plate Current .................................. 22 Milliamperes
DC Grid Current .................................. 8.0 Milliamperes
Plate Dissipation .................................. 5.0 Watts
Peak Heater-Cathode Voltage
  Heater Positive with Respect to Cathode .......... 90 Volts
  Heater Negative with Respect to Cathode .......... 90 Volts
Grid Circuit Resistance ................................ 0.1 Megohms
Envelope Temperature at Hottest Point 175 °C

FREQUENCY MULTIPLIER
Heater Voltage* .................................. 4.5 to 5.7 Volts
DC Plate Voltage .................................. 250 Volts
Negative DC Grid Voltage .......................... 50 Volts
DC Plate Current .................................. 20 Milliamperes
DC Grid Current .................................. 5.0 Milliamperes
Plate Dissipation .................................. 5.0 Watts
Peak Heater-Cathode Voltage
  Heater Positive with Respect to Cathode .......... 90 Volts
  Heater Negative with Respect to Cathode .......... 90 Volts
Grid Circuit Resistance ................................ 0.1 Megohms
Envelope Temperature at Hottest Point 175 °C

PLATE-PULSED OSCILLATOR SERVICE
Heater Voltage* .................................. 5.7 to 6.3 Volts
Cathode Heating Time, minimum ..................... 60 Seconds
Frequency ......................................... 5000 Megacycles
Peak Positive-Pulse Plate Supply
  Voltage ......................................... 1750 Volts
  Duty Factor of Plate Pulse* # .................... 0.001
  Pulse Duration .................................. 2.0 Microseconds
Plate Current
  Average # ...................................... 1.25 Milliamperes
  Average During Plate Pulse Δ .................. 1.25 Amperes
Negative Grid Voltage
  Average During Plate Pulse ....................... 75 Volts
Grid Current
  Average # ...................................... 0.7 Milliamperes
  Average During Plate Pulse ...................... 700 Milliamperes
Peak Heater-Cathode Voltage
  Heater Positive with Respect to Cathode .......... 90 Volts
  Heater Negative with Respect to Cathode .......... 90 Volts
Envelope Temperature at Hottest Point 175 °C

CHARACTERISTICS AND TYPICAL OPERATION

AVERAGE CHARACTERISTICS
Heater Voltage .................................. 6.3 Volts
Plate Voltage .................................. 250 Volts
Grid Voltage, approximate ......................... −1.6 Volts
Amplification Factor ................................ 90
Transconductance ................................ 23000 Micromhos
Plate Current .................................. 25 Milliamperes

RADIO-FREQUENCY OSCILLATOR
Frequency ......................................... 4000 Megacycles
Heater Voltage .................................. 4.5 Volts
DC Plate Voltage .................................. 275 Volts

DC Plate Current .................................. 25 Milliamperes
Power Output .................................. 300 Milliwatts

FREQUENCY MULTIPLIER—DOUBLER TO 1000 MEGACYCLES
Heater Voltage .................................. 5.25 Volts
DC Plate Voltage .................................. 250 Volts
DC Plate Current .................................. 20 Milliamperes
DC Grid Voltage .................................. −10 Volts
DC Grid Current .................................. 5.0 Milliamperes
Driving Power .................................. 300 Milliwatts
Power Output .................................. 2.0 Watts
* The equipment designer should design the equipment so that heater voltage is centered at some value within the range of 4.5 to 5.7 volts for CW operation, or 5.7 to 6.3 volts for pulse operation. Heater voltage variations about the center value should be kept as small as practical and should not, in any case, exceed ±5%. The optimum center value of heater voltage depends on the cathode current and on other parameters of circuit design and operation. For specific recommendations, contact your General Electric tube sales representative.

† Heater current of a bogey tube at Ef = 6.3 volts.

‡ Measured in a special shielded socket.

§ Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115 percent of the carrier conditions.

¶ Applications with a duty factor greater than 0.001 should be referred to your General Electric tube sales representative for recommendations.

# In any 5000 microsecond interval.

△The regulation and/or series plate-supply impedance must be such as to limit the peak current, with the tube considered a short circuit, to a maximum of 12.5 amperes.

### INITIAL CHARACTERISTICS LIMITS

<table>
<thead>
<tr>
<th></th>
<th>Min.</th>
<th>Bogey</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater Current</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ef = 6.3 volts</td>
<td>530</td>
<td>575</td>
<td>620</td>
</tr>
<tr>
<td>Grid Voltage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ef = 6.3 volts, Eb = 250 volts, Ib = 25 ma</td>
<td>-0.90</td>
<td>-1.60</td>
<td>-2.65</td>
</tr>
<tr>
<td>Grid Voltage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ef = 6.3 volts, Eb = 250 volts, Ib = 2 ma</td>
<td>-2.00</td>
<td>-3.50</td>
<td>-5.40</td>
</tr>
<tr>
<td>Transconductance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ef = 6.3 volts, Eb = 250 volts, Ec adjusted for Ib = 25 ma</td>
<td>18500</td>
<td>23000</td>
<td>27500</td>
</tr>
<tr>
<td>Amplification Factor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ef = 6.3 volts, Eb = 250 volts, Ec adjusted for Ib = 25 ma</td>
<td>60</td>
<td>90</td>
<td>120</td>
</tr>
<tr>
<td>Negative Grid Current</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ef = 6.3 volts, Eb = 250 volts, Ec adjusted for Ib = 25 ma</td>
<td>0.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interelectrode Leakage Resistance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ef = 6.3 volts, Polarity of applied d-c interelectrode voltage is such that no cathode emission results</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grid to Cathode at 100 volts d-c</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grid to Plate at 500 volts d-c</td>
<td>250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heater-Cathode Leakage Current</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ef = 6.3 volts, Ehk = 100 volts</td>
<td></td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Heater Positive with Respect to Cathode</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heater Negative with Respect to Cathode</td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Interelectrode Capacitances</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grid to Plate: (g to p)</td>
<td>1.75</td>
<td>2.03</td>
<td>2.30</td>
</tr>
<tr>
<td>Grid to Cathode: (g to k)</td>
<td>3.60</td>
<td>4.05</td>
<td>4.55</td>
</tr>
<tr>
<td>Plate to Cathode: (p to k)</td>
<td>0.012</td>
<td>0.018</td>
<td>0.024</td>
</tr>
</tbody>
</table>
SPECIAL PERFORMANCE TESTS

Oscillator Power Output
Tubes are tested for power output as an oscillator under the following conditions: Ef = 4.5 volts; F = 4000 MC, min.; Eb = 275 volts, Ec adjusted for Ib = 25 ma. .......................................................... 200 ... Milliwatts

Low Pressure Voltage Breakdown Test
Statistical sample tested for voltage breakdown at a pressure of 20 mm Hg. Tubes shall not give visual evidence of flashover when 500 volts RMS, 60 cps, is applied between the plate and grid terminals.

DEGRADATION RATE TESTS

Shock
Statistical sample subjected to 5 impact accelerations of approximately 400 G and 1.0 milliseconds duration in each of four positions. The accelerating forces are applied by the Navy-type, High Impact (flyweight) Shock Machine.

1000-Hour Life Test
Statistical sample operated for 1000 hours as an oscillator to evaluate changes in power output with life.

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AVERAGE CONSTANT-CURRENT CHARACTERISTICS

$E_f = 6.3$ VOLTS
CW AMPLIFIER PERFORMANCE

Eb = 275 VOLTS
Ib = 25 MILLIAMPERES
DRIVING POWER = 0.3 WATTS

POWER OUTPUT IN WATTS

FREQUENCY IN KILOMEGACYCLES

EFFICIENCY IN PERCENTAGE

DRIVE LEVEL

HIGH-LEVEL CW-MULTIPLIER PERFORMANCE

Eb = 275 VOLTS
Ib = 20 MILLIAMPERES
DRIVING POWER = 0.3 WATTS

AT LOWER POWER LEVELS THE GAIN MAY BE EXPECTED TO BE APPRECIABLY GREATER.
Note 1. Applies to minimum surface for anode d-c and r-f terminal only. Other surfaces must not be used for these terminal purposes.

Note 2. Applies to minimum surface for grid d-c and r-f terminal only. Other surfaces, except for Notes 3 and 4, must not be used for terminal purposes.

Note 3. Applies to minimum surfaces for grid d-c and r-f terminal only.

Note 4. The cylindrical surface of this diameter may be used for grid d-c and r-f terminal purposes.

Note 5. The surfaces defined by Notes 2, 3, and 4 shall be the only surfaces used for tube stops and clamping purposes.

Note 6. Other surfaces shall not be used for cathode d-c and r-f terminal purposes.

Note 7. Other surfaces shall not be used for anode d-c and r-f terminal purposes.

Note 8. Applies to surface designated for cathode d-c and r-f terminal. Solder at brazed joint will not exceed the maximum diameter.

Note 9. The maximum eccentricity of the anode and cathode with respect to the grid terminal in a prescribed jig is 0.010 (or maximum total runout of 0.020) and is measured by indicators at the points designated.

Note 10. The maximum eccentricity of heater-terminal No. 1 and heater-terminal No. 2 with respect to the grid terminal in a prescribed jig is 0.015 (or maximum total runout of 0.030) and is measured by indicators at the points designated.

Note 11. Exhaust tubulation must not be subjected to any mechanical stress.

Note 12. For reference only. Dimension does not include any possible solder fillet.

Note 13. This area is reserved for tube stamping and coding.