SUBMINIATURE TYPE 5643 IS A XENON FILLED, FOUR ELECTRODE THYRATRON WITH NEGATIVE CONTROL CHARACTERISTICS. IT IS SIMILAR IN CHARACTERISTICS TO THE MINIATURE TYPE 5696. THE 5643 IS SUITABLE FOR USE AS A SWITCHING TUBE, COUNTER, OR GRID CONTROLLED RECTIFIER. BECAUSE OF ITS SHIELD GRID CONSTRUCTION, THE INPUT WILL WORK DIRECTLY FROM A HIGH IMPEDANCE SOURCE SUCH AS A VACUUM PHOTOTUBE OR A CADMIUM SULPHIDE PHOTO CELL. THE EFFECTIVE DIODE TO CONTROL GRID CAPACITY MAY BE REDUCED BY CONNECTING LEADS 2, 4 AND 8 TO LEAD 5, AND CONNECTING THE GRID RESISTOR DIRECTLY TO THE SOCKET TERMINALS.

THIS TUBE IS PARTICULARLY SUITED FOR USE IN COMPACT AND PORTABLE EQUIPMENT, BECAUSE OF ITS SMALL SIZE AND LIGHT WEIGHT.

**ELECTRICAL DATA**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEATER VOLTAGE</td>
<td>6.3±5% VOLTS</td>
</tr>
<tr>
<td>HEATER CURRENT (E_f=6.3 VOLTS)</td>
<td>0.150 AMP.</td>
</tr>
<tr>
<td>MINIMUM CATHODE HEATING TIME</td>
<td>10. SECONDS</td>
</tr>
<tr>
<td>ANODE TO CONTROL GRID CAPACITANCE</td>
<td>0.084 μF</td>
</tr>
<tr>
<td>CONTROL GRID TO CATHODE (&amp; SHIELD GRID) CAPACITANCE</td>
<td>1.33 μF</td>
</tr>
<tr>
<td>ANODE TO CATHODE (&amp; SHIELD GRID) CAPACITANCE</td>
<td>1.27 μF</td>
</tr>
<tr>
<td>DE-IONIZATION TIME, APPROX. (SHIELD TIED TO CATHODE)</td>
<td></td>
</tr>
<tr>
<td>WITH GRID VOLTS = -400, GRID RES. = 1000Ω</td>
<td>15 μSECONDS</td>
</tr>
<tr>
<td>ANODE VOLTS = 500, ANODE CUR. = .016 AMPS</td>
<td></td>
</tr>
<tr>
<td>WITH GRID VOLTS = -10, GRID RES. = 1000Ω</td>
<td>25 μSECONDS</td>
</tr>
<tr>
<td>ANODE VOLTS = 500, ANODE CUR. = .016 AMPS</td>
<td></td>
</tr>
<tr>
<td>ANODE VOLTAGE DROP, APPROX.</td>
<td>12.5 VOLTS</td>
</tr>
<tr>
<td>CRITICAL GRID CURRENT (AT Ebb = 350V, RMS)</td>
<td>0.5 μAMPS</td>
</tr>
</tbody>
</table>
MECHANICAL DATA

- MAXIMUM SHOCK RATING: 450 G
- MOUNTING POSITION: ANY
- MAXIMUM OVERALL LENGTH: SEE OUTLINE
- MAXIMUM SEATED LENGTH: 1 3/8 INCHES
- MAXIMUM DIAMETER: .40 INCHES
- BULB: T-3
- BASE: SUBMINIATURE BUTTON, 8 PIN LONG LEADS
- WEIGHT (APPROX.): 0.12 OUNCES

RATINGS

ABSOLUTE VALUES

- MAXIMUM PEAK ANODE VOLTAGE:
  - INVERSE: 500 VOLTS
  - FORWARD: 500 VOLTS
- MAXIMUM CATHODE CURRENT:
  - PEAK: 100 MA.
  - AVERAGE: 16 MA.
  - SURGE (MAX. DURATION 0.1 SECOND): 1.0 AMP.
  - MAXIMUM AVERAGE TIME: 15 SECONDS
- MAXIMUM NEGATIVE CONTROL GRID VOLTAGE:
  - BEFORE CONDUCTION: -200 VOLTS
  - DURING CONDUCTION: -10 VOLTS
- MAXIMUM NEGATIVE SHIELD GRID VOLTAGE:
  - BEFORE CONDUCTION: -100 VOLTS
  - DURING CONDUCTION: -10 VOLTS
  (THIS SHIELD GRID SHOULD NOT BE USED FOR CONTROL PURPOSES).
- MAXIMUM HEATER CATHODE VOLTAGE:
  - HEATER NEGATIVE: -100 VOLTS
  - HEATER POSITIVE: 25 VOLTS
- AMBIENT TEMPERATURE LIMITS: -55 to +90 °C
- MAXIMUM CONTROL GRID (G2) CIRCUIT RESISTANCE: 10 MEGOHMS
- ALTITUDE FOR FULL RATINGS: 60 000 FEET
RANGES SHOWN ARE FOR TWO VALUES OF GRID RESISTOR, 0.1 MEGOHM AND 10 MEGOHM, AND TAKE INTO ACCOUNT INITIAL DIFFERENCES BETWEEN INDIVIDUAL TUBES AND SUBSEQUENT DIFFERENCES DURING TUBE LIFE FOR A HEATER VOLTAGE RANGE OF 6.0 TO 6.6 VOLTS.

5643
OPERATIONAL RANGE OF CRITICAL GRID VOLTAGE

AC ANODE VOLTS (RMS - 60 CYCLE)

DC CONTROL GRID VOLTS

5643
AVERAGE GRID CHARACTERISTICS DURING ANODE CONDUCTION

$R_p = 1000$ Ohms
$E_T = 6.3$ Volts
Shield Grid Volts = 0

$I_p = 2$ MA

DC CONTROL GRID MILLIAMPERES

DC CONTROL GRID VOLTS