The 6627 is a two electrode inert gas filled cold cathode tube for use in voltage regulator and voltage reference applications where dependable performance under conditions of shock, vibration, high ambient temperatures and absence of external radiation is essential.

**Mechanical Data**

- Cathode: Cold
- Max. overall length: 2 5/8 inches
- Max. seated length: 2 3/8 inches
- Max. diameter: 3/4 inches
- Mounting position: Any
- Envelope: T5 1/2 (6-5)
- Base: Miniature glass button 7 pin E7-1

**Basing Diagram**

- Pin 1: Anode
- Pin 2: Cathode
- Pin 3: Internal Connection (Do not use)
- Pin 4: Cathode
- Pin 5: Anode
- Pin 6: Internal Connection (Do not use)
- Pin 7: Cathode

**580**

**Electrical Data**

For Voltage Regulator Applications:

Maximum ratings, absolute values:

- Average starting current (Note 8): 75 ma
- D.C. cathode current: 30 max. ma
- Ambient temperature, minimum: -55 °C
- Bulb temperature, maximum (Note 9): +150 °C
- Altitude: 120,000 Ft.
- Frequency: 0 C.P.S.

from JETEC release #1433, March 14, 1955, with changes from JETEC release #1433A, Sept. 12, 1955 inserted.
sponsor: CBS-Hytron
CHARACTERISTIC RANGE FOR EQUIPMENT DESIGN

<table>
<thead>
<tr>
<th>Voltage Regulator Service</th>
<th>Min.</th>
<th>Avg.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anode supply voltage (d-c)(^{(3)})</td>
<td>130</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anode breakdown voltage (total darkness)</td>
<td>125</td>
<td>130</td>
<td></td>
</tr>
<tr>
<td>Anode breakdown voltage (normal ambient light)(^{(4)})</td>
<td>120</td>
<td>130</td>
<td></td>
</tr>
<tr>
<td>Anode voltage drop (^{(5)})</td>
<td>105</td>
<td>108</td>
<td>111</td>
</tr>
<tr>
<td>Regulation (5-30 ma)</td>
<td>1.5</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Avg. change anode voltage drop during lifetime</td>
<td>2</td>
<td>4</td>
<td>%</td>
</tr>
</tbody>
</table>

For Voltage Reference Applications:

Maximum ratings, absolute values:

<table>
<thead>
<tr>
<th>F.C. cathode current</th>
<th>10 max. ma</th>
<th>6 min. ma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature limits</td>
<td>-55(^{\circ}) to +150 (^{\circ})C</td>
<td></td>
</tr>
<tr>
<td>Altitude</td>
<td>120,000 Ft.</td>
<td></td>
</tr>
</tbody>
</table>

CHARACTERISTIC RANGE FOR EQUIPMENT DESIGN

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Anode supply voltage (d-c)(^{(3)})</td>
<td>130</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anode breakdown voltage (total darkness)</td>
<td>125</td>
<td>130</td>
<td></td>
</tr>
<tr>
<td>Anode breakdown voltage (normal ambient light)</td>
<td>120</td>
<td>130</td>
<td></td>
</tr>
<tr>
<td>Voltage repeatability(^{(8)})</td>
<td>0.05</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Typical Operating Characteristics:

<table>
<thead>
<tr>
<th>Anode voltage drop (Note 2)</th>
<th>107</th>
<th>volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulation (6-10 ma) (Note 2)</td>
<td>0.2</td>
<td>volts</td>
</tr>
<tr>
<td>Stability (Note 6)</td>
<td>0.2</td>
<td>volts</td>
</tr>
<tr>
<td>Temperature sensitivity, anode voltage drop</td>
<td>0.005 v/(^{\circ})C</td>
<td></td>
</tr>
<tr>
<td>Voltage jumps (Note 7)</td>
<td>0.05</td>
<td>volts</td>
</tr>
</tbody>
</table>
Special Ratings and Performance Data:

Shock rating:

Impact acceleration..................450 max. g

Reference MIL-E-IB specification paragraph 4.9.20.5

Fatigue rating:

Vibrational acceleration..............5.0 max. g

Reference MIL-E-IB specification paragraph 4.9.20.6

Elevated bulb temperature rating

Maximum bulb operation temperature......+150° C

Tubes are tested under intermittent life test conditions at a minimum bulb temperature of 150° C for 1000 hours. Reference MIL-E-IB paragraph 4.11.5.

Shelf stability of electrical characteristics

Tubes are tested for release after undergoing a minimum 1000 hour non-operating holding period.

Notes

Note 1: The D.C. anode supply voltage is the minimum value necessary to assure ionization in the tube throughout life under conditions of either total darkness or normal illumination.

Note 2: Maximum, minimum and average tube values during life.

Note 3: If this value of shunt capacitance is exceeded in the associated circuit the tube may oscillate resulting in unstable performance.

Note 4: Five to fifty foot candles of ambient light.
Note 5: Defined as the maximum shift in tube voltage drop between successive firings of the tube operating at one value of current and temperature within its ratings.

Note 6: Defined as the average shift in tube voltage drop over an 8 hour period when the tube is operated at one value of current and temperature within its ratings.

Note 7: Defined as the instantaneous change in tube anode voltage drop as the tube current is varied slowly within the specified operating current range.

Note 8: When equipment utilizing this tube is placed in operation a starting current in the tube in excess of the average operating current is permissible as indicated under maximum ratings. This current should not be allowed to continue for more than 5 seconds. When the tube is subjected to such high starting currents some time may be required for the tube to stabilize at its normal operating voltage. This "memory characteristic" is typical of glow discharge voltage regulator tubes. Similarly when a tube is operated for extended periods at a given current point within its operating range and then switched to a different operating current some time may be required for the tube to stabilize at the new point.

Note 9: The maximum bulb temperature will vary both with ambient temperature and tube operating current. In an attached appendix sheet is shown the correlation between +150°C maximum bulb temperature, ambient temperature and tube operating current.

Note 10: Regulation is defined as the maximum allowable difference in tube voltage drop measured between any two current points within the specified current rating range (5-30 mA dc). The two current points are to be selected which indicate the largest value of regulation.
CONVERSION CURVE - AMBIENT TEMPERATURE VS TUBE OPERATION CURRENT TO PRODUCE MAXIMUM BULB OPERATING TEMPERATURE OF 150°C.