DESCRIPTION AND RATING

TWIN DIODE GL-6202
FIVE-STAR TUBE
★★★★★

The GL-6202 is a miniature full-wave high-vacuum rectifier intended for use in power supplies in which the d-c current requirements do not exceed 50 milliamperes. Within the limitations of its maximum ratings, the GL-6202 is a replacement for the 6X4.

The GL-6202 is specially designed to assure dependable life and reliable service under the exacting conditions encountered in mobile and aircraft applications. Features include a high degree of mechanical strength and a heater-cathode construction designed to withstand many-thousand cycles of intermittent operation. This tube may be used in applications which are subjected to altitudes as high as 60,000 feet.

TECHNICAL INFORMATION

GENERAL

Electrical

Cathode - Coated Unipotential
Heater Voltage (A-c or D-c) 6.3 Volts
Heater Current 0.6 Ampere

Mechanical

Mounting Position - Any
Envelope - T-5 1/2, Glass
Base - Miniature Button 7-pin, E7-1

MAXIMUM RATINGS

Electrical*, Design-center Values
Rectifier Service - Sinusoidal Supply Voltages, Frequency Range 25 to 1000 Cycles per Second

Peak Inverse Plate Voltage
Altitudes up to 40,000 Feet† 1250 Volts
Altitudes from 40,000 to 60,000 Feet‡ 850 Volts
A-c Plate-supply Voltage, per Plate, RMS - See Rating Chart I‡
Steady-state Peak Plate Current per Plate 200 Milliamperes
Transient Peak Plate Current per Plate,
Maximum Duration 0.2 Second 1.45 Amperes
D-c Output Current - See Rating Chart I‡
Heater-cathode Voltage
Heater Positive with Respect to Cathode 100 Volts
Heater Negative with Respect to Cathode 450 Volts

Mechanical

Peak Impact Acceleration§ 700 G
Bulb Temperature at Hottest Point (Absolute Maximum) +165 °C

CHARACTERISTICS AND TYPICAL OPERATION

Full-wave Rectifier, Altitudes up to 40,000 Feet

<table>
<thead>
<tr>
<th>Capacitor Input Filter</th>
<th>Choke Input Filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-c Plate-supply Voltage per plate, RMS</td>
<td>325</td>
</tr>
<tr>
<td>Filter Input Capacitor</td>
<td>4</td>
</tr>
<tr>
<td>Filter Input Choke</td>
<td>---</td>
</tr>
<tr>
<td>Total Plate-supply Resistance per plate</td>
<td>175</td>
</tr>
</tbody>
</table>
CHARACTERISTICS AND TYPICAL OPERATION (CONT'D)

Full-wave Rectifier, Altitudes up to 40,000 Feet

<table>
<thead>
<tr>
<th>Capacitor Input Filter</th>
<th>Choke Input Filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-c Output Current</td>
<td>50</td>
</tr>
<tr>
<td>D-c Output Voltage at Filter Input</td>
<td>365</td>
</tr>
<tr>
<td></td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>375</td>
</tr>
<tr>
<td>Tube Voltage Drop</td>
<td>22</td>
</tr>
<tr>
<td>Measured with Applied D-c at 50 Milliamperes per Plate</td>
<td>22</td>
</tr>
<tr>
<td>Volts</td>
<td>Volts</td>
</tr>
</tbody>
</table>

* To simplify the application of the maximum ratings to circuit design, the electrical design-center maximum ratings are also presented in chart form as Rating Charts I, II, and III. Rating Chart I presents the maximum ratings for a-c plate-supply voltage and d-c output current. Rating Chart II provides a convenient method for checking conformance with the maximum steady-state peak plate current rating. Rating Chart III offers a convenient method for checking conformance with the maximum transient peak plate current rating.

With a capacitor-input filter, the conditions of each of Rating Charts I, II, and III must be satisfied in order to obtain performance within all of the appropriate electrical maximum ratings. With a choke-input filter, operation within the indicated boundary of Rating Chart I will assure performance within all of the appropriate electrical maximum ratings.

† The altitude ratings as presented refer to the limitations of the tube itself. Because the socket employed can become the limiting factor in high-altitude operation, consideration must be given to the voltage-breakdown capabilities of the tube and socket combination employed.

‡ The maximum ratings for a-c plate supply voltage and d-c output current are interrelated and are also dependent on whether a choke or capacitor-input filter is employed. This relationship is shown in Rating Chart I. With a capacitor-input filter, the operating point of d-c output current and a-c supply voltage must fall within the curve FAEDO. With a choke-input filter, the operating point must fall within the curve FABCDG.

§ Forces in any direction as applied by the Navy-type, High Impact (flyweight) Shock Machine for Electronic Devices or its equivalent.

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K69087-72A583

March 27, 1953

Outline

GL-6202
RATING CHART I

ALITUDE LIMITATION:
OPERATION TO THE RIGHT OF LINE JK IS PERMISSIBLE ONLY WHEN THE ALTITUDE DOES NOT EXCEED 40000 FEET. TO THE LEFT OF LINE JK, OPERATION MAY BE EXTENDED TO 60000 FEET.

RATING CHART II

FOR CAPACITOR INPUT FILTER (BASED ON MAXIMUM STEADY-STATE PEAK PLATE CURRENT OF 200 MILLIAMPERES PER PLATE)
RECTIFICATION EFFICIENCY = \( \frac{E}{I_{sl} E_s} \)
WHERE \( E \) = D-C OUTPUT VOLTAGE AT FILTER INPUT IN VOLTS
\( E_s \) = RMS SUPPLY VOLTAGE PER PLATE IN VOLTS

February 12, 1953
RATING CHART III

FOR CAPACITOR INPUT FILTER
(BASED ON MAXIMUM TRANSIENT PEAK PLATE CURRENT
OF 1.5 AS AMPERES PER PLATE)

\[ R_s = R_{sec} \times N^2 R_{pim} + R_a \]

WHERE

- \( R_s \) = PLATE SUPPLY RESISTANCE PER PLATE
- \( R_{sec} \) = D-C RESISTANCE OF TRANSFORMER SECONDARY PER SECTION
- \( N \) = TRANSFORMER VOLTAGE STEP-UP RATIO PER SECTION
- \( R_{pim} \) = D-C RESISTANCE OF TRANSFORMER PRIMARY
- \( R_a \) = D-C RESISTANCE OF ADDED SERIES RESISTANCE PER PLATE

ALTITUDE LIMITATION:
OPERATION TO THE RIGHT OR LINE JR IS PERMISSIBLE ONLY WHEN THE ALTITUDE DOES NOT EXCEED 4000 FEET. TO THE LEFT OF LINE JR, OPERATION MAY BE EXTENDED TO 6000 FEET.

IF SERIES INDUCTION IS PRESENT IN THE PLATE SUPPLY, IT IS PERMISSIBLE TO USE A SMALLER-THAN-INDICATED VALUE OF PLATE SUPPLY RESISTANCE PROVIDING THE HIGHEST MAXIMUM VALUE OF TRANSIENT PEAK PLATE CURRENT IS NEVER EXCEEDED.

February 12, 1953

AVERAGE PLATE CHARACTERISTICS

\[ V_p = 0.3 \text{ VOLTS} \]

February 12, 1953
TUBE DEPARTMENT

GENERAL ELECTRIC

Schenectady 5, N. Y.