**TUNGSOL**

**TWIN DIODE**

**COATED FILAMENT**

3.3±0.3 VOLTS 3.8 AMP.

AC OR DC

ANY MOUNTING POSITION

*OPPOSITE ENDS OF THE DIRECTLY HEATED CATHODE ARE CONNECTED TO PINS 1 AND 3, CATHODE-HEATING VOLTAGE SHOULD BE CONNECTED BETWEEN THESE PINS, OUTPUT CURRENT MAY BE TAKEN FROM EITHER PIN 1 OR PIN 3.*

**BOTTOM VIEW**

**JEDC 508**

**THE 3DG4 IS A TWIN DIODE WITH A DIRECTLY HEATED FILAMENT DESIGNED FOR USE AS A FULL-WAVE RECTIFIER IN THE POWER SUPPLY OF TELEVISION RECEIVERS.**

**RATINGS**

INTERPRETED ACCORDING TO DESIGN MAXIMUM SYSTEM RECTIFIER SERVICE

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum peak inverse plate voltage</td>
<td>1050 VOLTS</td>
</tr>
<tr>
<td>Maximum AC plate-supply voltage per plate</td>
<td>SEE RATING CHART</td>
</tr>
<tr>
<td>Maximum steady-state peak plate current per plate</td>
<td>1200 MA.</td>
</tr>
<tr>
<td>Maximum transient peak plate current per plate, maximum duration 0.2 second</td>
<td>SEE RATING CHART 6.5 AMP.</td>
</tr>
<tr>
<td>Maximum DC output current</td>
<td></td>
</tr>
<tr>
<td>Bulb temperature at hottest point</td>
<td>200 °C</td>
</tr>
</tbody>
</table>

**TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS**

FULL-WAVE RECTIFIER

**CAPACITOR-INPUT FILTER**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC plate-supply voltage per plate, RMS</td>
<td>275 VOLTS</td>
</tr>
<tr>
<td>Filter input capacitor</td>
<td>40 μF</td>
</tr>
<tr>
<td>Total plate-supply resistance per plate</td>
<td>32 OHMS</td>
</tr>
<tr>
<td>DC output current</td>
<td>350 MA.</td>
</tr>
<tr>
<td>DC output voltage at filter input</td>
<td>300 VOLTS</td>
</tr>
<tr>
<td>Tube voltage drop</td>
<td>350 MA. DC PER PLATE 25 VOLTS</td>
</tr>
</tbody>
</table>

**DESIGN-MAXIMUM RATINGS ARE LIMITING VALUES OF OPERATING AND ENVIRONMENTAL CONDITIONS APPLICABLE TO A ROGUE ELECTRON DEVICE OF A SPECIFIED TYPE AS DEFINED BY ITS PUBLISHED DATA, AND SHOULD NOT BE EXCEEDED UNDER THE MOST PROBABLE CONDITIONS. THE DEVICE MANUFACTURER CHOOSES THESE VALUES TO PROVIDE ACCEPTABLE SERVICEABILITY OF THE DEVICE, TAKING RESPONSIBILITY FOR THE EFFECTS OF CHANGES IN OPERATING CONDITIONS DUE TO VARIATIONS IN DEVICE CHARACTERISTICS. THE EQUIPMENT MANUFACTURER SHOULD DESIGN SO THAT INITIALLY AND THROUGHOUT LIFE NO DESIGN-MAXIMUM VALUE FOR THE INTENDED SERVICE IS EXCEEDED WITH A ROGUE DEVICE UNDER THE WORST PROBABLE OPERATING CONDITIONS WITH RESPECT TO SUPPLY-VOLTAGE VARIATION, EQUIPMENT COMPONENT VARIATION, EQUIPMENT CONTROL ADJUSTMENT, LOAD VARIATION, SIGNAL VARIATION, AND ENVIRONMENTAL CONDITIONS.**

TUNG-SOL ELECTRIC INC., ELECTRON TUBE DIVISION, BLOOMFIELD, NEW JERSEY, U.S.A., JANUARY 1, 1967 PLATE 4552
RATING CHART 1

3DG4

$E_f = 3.3$ Volts

DESIGN-MAXIMUM RATING

CHoke INPUT

CAPACITOR OR CHoke INPUT

MAXIMUM PROBABLE DC OUTPUT CURRENT PER PLATE-MILLIAMPERES

MAXIMUM PROBABLE AC PLATE SUPPLY VOLTAGE PER PLATE (RMS)-VOLTS

RATING CHART 2

3DG4

FOR CAPACITOR-INPUT FILTER

THE BOUNDARY CURVE IS BASED ON A STEADY-STATE PEAK PLATE CURRENT OF 1.2 AMPERES MAXIMUM PER PLATE.

RECTIFICATION EFFICIENCY $= \frac{E}{1.41 E_S}$

WHERE $E$ = DC OUTPUT VOLTAGE AT FILTER INPUT

$E_S$ = RMS SUPPLY VOLTAGE PER PLATE

MAXIMUM PROBABLE DC OUTPUT CURRENT PER PLATE - MILLIAMPERES

RECTIFICATION EFFICIENCY

AREA OF PERMISSIBLE OPERATION
\[ P_s = R_{sec} + N^2 R_{pri} + R_A \]

**WHERE**

\[ R_s = \text{PLATE SUPPLY RESISTANCE PER PLATE} \]
\[ R_{sec} = \text{DC RESISTANCE OF Transformer SECONDARY PER SECTION} \]
\[ R_{pri} = \text{DC RESISTANCE OF Transformer PRIMARY} \]
\[ R_A = \text{DC RESISTANCE OF ADDED SERIES RESISTANCE PER PLATE} \]
\[ N = \text{TRANSFORMER VOLTAGE STEP-UP RATIO PER SECTION} \]

**RATING CHART 3**

**3DG4**

FOR CAPACITOR-INPUT FILTER

THE VALUES OF \( R_A \) ARE BASED ON A TRANSIENT (HOT SWITCHING) PEAK PLATE CURRENT OF 6.5 AMPERES MAXIMUM PER PLATE.

**3DG4**

EACH SECTION

\[ E_f = 3.3 \text{ Volts} \]
3DG4

FULL-WAVE RECTIFIER
WITH CAPACITOR-INPUT FILTER

$E_f = 3.3$ Volts
$C = 40 \mu F$

<table>
<thead>
<tr>
<th>Curve</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rs in Ohms</td>
<td>16</td>
<td>26</td>
<td>37</td>
<td>48</td>
<td>53</td>
</tr>
</tbody>
</table>

(Boundary Line DEA is same as shown on Rating Chart 1)

DC OUTPUT VOLTAGE AT INPUT TO FILTER-VOLTS
DC OUTPUT CURRENT - MILLIAMPERES

---

3DG4

FULL-WAVE RECTIFIER
WITH CHOKE-INPUT FILTER

$E_f = 3.3$ Volts

(Boundary Line OBA is same as shown on Rating Chart 1)

DC OUTPUT VOLTAGE AT INPUT TO FILTER - VOLTS
DC OUTPUT CURRENT - MILLIAMPERES