MECHANICAL DATA

Bulb .................................................. T-6½
Base ..................................................... E9-1 Miniature Button, 9-Pin
Outline .................................................. 6-3
Basing ................................................... 9DJ
Cathode .................................................. Coated Unipotential
Mounting Position ................................. Any

ELECTRICAL DATA

HEATER CHARACTERISTICS

<table>
<thead>
<tr>
<th></th>
<th>6BW4</th>
<th>12BW4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater Voltage AC or DC</td>
<td>6.3</td>
<td>12.6 Volts</td>
</tr>
<tr>
<td>Heater Current</td>
<td>900</td>
<td>450 Ma</td>
</tr>
<tr>
<td>Maximum Heater Cathode Voltage Heaters Negative, DC</td>
<td>450 Volts</td>
<td></td>
</tr>
</tbody>
</table>

RATINGS (Design Center Values)¹

Rectifier Service
Peak Inverse Plate Voltage .................................. 1275 Volts Max.
A.C. Plate Supply Voltage Each Plate, RMS
See Rating Chart I                                     450 Volts Max.
D.C. Output Current
See Rating Chart I                                     See Rating Chart I
Steady State Peak Plate Current Each Plate
(See Rating Chart II)                                 350 Ma Max.
Transient Peak Plate Current Each Plate
(See Rating Chart III)                                2.0 Amperes Max.

AVERAGE CHARACTERISTICS

Tube Voltage Drop
Tube Conducting:
100 Ma Each Plate ...................................... 40 Volts

TYPICAL OPERATION

Full Wave Rectifier — Capacitor Input Filter
A.C. Plate Supply Voltage Each Plate, RMS² . 325 Volts
Filter Input Capacitor .................................. 40 μF
Effective Plate Supply Resistance
Each Plate .............................................. 82 Ohms
D.C. Output Current .................................... 100 Ma
D.C. Output Voltage at Filter Input .................... 330 Volts

Full Wave Rectifier — Choke Input Filter
A.C. Plate Supply Voltage Each Plate, RMS² . 450 Volts
Filter Input Choke ..................................... 10 Henrys
D.C. Output Current .................................... 100 Ma
D.C. Output Voltage at Filter Input .................... 360 Volts

NOTES:

1. See "Interpretation of Rating Charts".
2. A.C. plate voltage is measured without load.
NOTES: (Continued)

3. The 12BW4 is intended to be used in automotive service from a nominal 12 volt battery source. The heater is therefore designed to operate over the 10.0 to 15.9 voltage range encountered in this service. The maximum ratings of the tube provide for an adequate safety factor such that the tube will withstand the wide variation in supply voltages.

INTERPRETATION OF RATING CHARTS

Rating Charts I, II and III represent boundary conditions beyond which operation of the 6BW4 and 12BW4 is not permitted. With the aid of simple laboratory measurements and the use of the three Charts, any application may be analyzed for proper rectifier type operation.

The boundaries of Rating Chart I are based on limits of supply voltage, plate dissipation and output current. These boundaries differ, depending upon the type of filter used. With capacitor input, operation is confined to the area bounded by FAEDG while for choke input, the entire area bounded by FABCDG may be used.

The boundary of Rating Chart II defines the limit of steady-state peak current. Operation within the boundary is permitted.

Rating Chart III defines the minimum value of effective plate supply resistance, per plate, for any given plate voltage supply which will assure that the surge currents are within a safe value.

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

Where: 
\( N \) — Voltage step up ratio of plate transformer.
\( R_{pri} \) — DC resistance of transformer primary.
\( R_{sec} \) — Average DC resistance of transformer secondary per section.
\( R_a \) — Added series resistance.

For any application, each Chart should be consulted. On all Charts the points of operation should fall within the proper boundaries.

Plate supply voltages are measured with the rectifier tube non-conducting, i.e., with the transformer unloaded. This unloaded voltage is used when calculating rectification efficiency.

The rectification efficiency is defined as:

\[ \text{DC Output Voltage} \]
\[ \sqrt{2} \left( \text{RMS Supply Voltage Per Plate} \right) \]

The DC output voltage is measured at the input to the filter.
CAPACITOR INPUT
BASED ON TRANSIENT
PEAK PLATE CURRENT
EACH PLATE OF 2.0
AMPERES

AC PLATE SUPPLY VOLTS (RMS)
EACH PLATE (WITHOUT LOAD)

RESISTANCE EACH PLATE (OHMS)

MINIMUM EFFECTIVE PLATE SUPPLY