The EIMAC 8249/4W300B is a ceramic/metal, water cooled, external-anode radial-beam tetrode with a maximum plate dissipation rating of 300 watts and a maximum power input rating of 500 watts. The 8249/4W300B is
designed to operate with a heater voltage of 6.0 volts. Electrically identical to the 4CX250B, it is intended for use where water cooling is preferred or where reserve anode dissipation is desired.

GENERAL CHARACTERISTICS

ELECTRICAL
Cathode: Oxide Coated, Unipotential
Heater: Voltage .................................................. 6.0 ± 0.3 V
Current, at 6.0 volts ........................................... 2.6 A
Cathode - Heater Potential .................................. ±150 V
Transconductance (Average):
I_b = 200 mAd ........................................... 12,000 μmhos
Amplification Factor (Average):
Grid to Screen ........................................... 5.0
Direct Interelectrode Capacitance (grounded cathode)
Input .............................................................. 15.7 pF
Output .............................................................. 4.5 pF
Feedback ........................................................... 0.04 pF
Direct Interelectrode Capacitance (grounded grid)
Input .............................................................. 13.0 pF
Output .............................................................. 4.5 pF
Feedback ........................................................... 0.01 pF
Frequency of Maximum Rating:
CW ................................................................. 500 MHz

1. Characteristics and operating values are based upon performance tests. These figures may change without notice as the result of additional data or product refinement. EIMAC Division of Varian should be consulted before using this information for final equipment design.

2. Capacitance values are for a cold tube as measured in a special shielded fixture.

MECHANICAL
Maximum Overall Dimensions:
Length .......................................................... 3.407 in; 86.54 mm
Diameter ........................................................ 1.562 in; 39.67 mm
Net Weight ................................................ 5.75 oz; 163.0 gm
Operating Position ........................................ Vertical, base up or down
Maximum Operating Temperature:
Ceramic/Metal Seals .............................................. 250°C
Cooling ................................................................. Water and forced air
Base ................................................................. Special 9-pin JEDEC-B8-236
Recommended Air System Socket ....................... SK-600 series

<table>
<thead>
<tr>
<th>MAXIMUM RATINGS:</th>
<th>Class C Plate Mod</th>
<th>Class C CW or FM</th>
<th>Class AB Audio or SSB</th>
<th>TYPICAL OPERATION: DC Plate Voltage (Volts)</th>
<th>Power Input (Watts)</th>
<th>Driving Power (Watts)</th>
<th>Power Output (Watts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC PLATE VOLTAGE</td>
<td>1500</td>
<td>2000</td>
<td>2000 VOLTS</td>
<td>CLASS C AMPLIFIER</td>
<td>2000</td>
<td>500</td>
<td>3</td>
</tr>
<tr>
<td>DC SCREEN VOLTAGE</td>
<td>300</td>
<td>300</td>
<td>400 VOLTS</td>
<td>CW or FM</td>
<td>1500</td>
<td>300</td>
<td>2</td>
</tr>
<tr>
<td>DC GRID VOLTAGE</td>
<td>-250</td>
<td>-250</td>
<td>-250 VOLTS</td>
<td>Plate Modulated</td>
<td>2000</td>
<td>1000</td>
<td>0</td>
</tr>
<tr>
<td>DC PLATE CURRENT</td>
<td>0.20</td>
<td>0.25</td>
<td>0.25 AMPERE</td>
<td>CLASS AB1 AMPLIFIER</td>
<td>2000</td>
<td>500</td>
<td>0</td>
</tr>
<tr>
<td>PLATE DISSIPATION</td>
<td>200</td>
<td>300</td>
<td>300 WATTS</td>
<td>Audio (Two tubes)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCREEN DISSIPATION</td>
<td>12</td>
<td>12</td>
<td>12 WATTS</td>
<td>SSB (One tube)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRID DISSIPATION</td>
<td>2</td>
<td>2</td>
<td>2 WATTS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For full listing of ratings, constant current curves and typical operating conditions, see EIMAC data sheet for 7203/4CX250B.

RANGE VALUES FOR EQUIPMENT DESIGN
Heater: Current at 6.0 volts ..................... 2.3 A
Cathode Warmup Time .................................. 30 sec.

Interelectrode Capacitances\(^1\) (grounded cathode connection)
Input ......................................................... 14.2 \(\text{pF} \)
Output ....................................................... 4.0 \(\text{pF} \)
Feedback .................................................... --- 0.06 \(\text{pF} \)

1. Capacitance values are for a cold tube as measured in a shielded fixture.

APPLICATION

**COOLING** - The water-cooled anode requires a minimum of 1/16 gallon of cooling water per minute for the rated plate dissipation of 300 watts. The outlet-water temperature should not exceed 70°C and the system pressure should not exceed 50 pounds per square inch.

The ceramic/metal seals must be cooled by forced air. At frequencies below 30 MHz and when one of the recommended sockets is used, a flow rate of 1.0 CFM is sufficient. As the operating frequency is increased, the air-flow rate must be increased. At 500 MHz a minimum of 3.8 CFM is required. In all cases, seal temperatures are the criteria which determine cooling effectiveness.
PIN NO. 1: SCREEN GRID
PIN NO. 2: CATHODE
PIN NO. 3: HEATER
PIN NO. 4: CATHODE
PIN NO. 5: LC-DO NOT USE FOR EXTERNAL CONNECTION
PIN NO. 6: CATHODE
PIN NO. 7: HEATER
PIN NO. 8: CATHODE
CENTER PIN—CONTROL GRID

<table>
<thead>
<tr>
<th>DIM</th>
<th>INCHES</th>
<th>MILLIMETERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3.407</td>
<td>86.54</td>
</tr>
<tr>
<td>B</td>
<td>1.490</td>
<td>37.85</td>
</tr>
<tr>
<td>D</td>
<td>0.810</td>
<td>20.60</td>
</tr>
<tr>
<td>E</td>
<td>1.186</td>
<td>29.62</td>
</tr>
<tr>
<td>F</td>
<td>1.406</td>
<td>35.66</td>
</tr>
<tr>
<td>G</td>
<td>0.187</td>
<td>4.75</td>
</tr>
<tr>
<td>H</td>
<td>0.244</td>
<td>6.20</td>
</tr>
<tr>
<td>J</td>
<td>0.797</td>
<td>20.24</td>
</tr>
<tr>
<td>K</td>
<td>0.857</td>
<td>21.77</td>
</tr>
<tr>
<td>L</td>
<td>1.562</td>
<td>39.70</td>
</tr>
<tr>
<td>M</td>
<td>0.670</td>
<td>17.02</td>
</tr>
<tr>
<td>N</td>
<td>10°</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>0.156</td>
<td>3.98</td>
</tr>
<tr>
<td>S</td>
<td>0.250</td>
<td>6.35</td>
</tr>
<tr>
<td>P</td>
<td>1.063</td>
<td>27.00</td>
</tr>
</tbody>
</table>

NOTES:
1. REF: DIMENSIONS ARE FOR INFORMATION ONLY AND ARE NOT READ FOR INSPECTION PURPOSES.
2. (M) CONTACT SURFACE
3. AXIS OF FITTINGS IS ON AXIS OF INDEX OF CENTER PIN AS SHOWN.

SEE NOTE 3