VARACTOR DIODES
1S2208(B), 1S2209(B)

UHF/VHF TUNER
SILICON EPITAXIAL DIODES
ESVAC®

The 1S2208(B) and 1S2209(B) are a hyper-abrupt junction
type voltage-variable capacitance diodes.
The 1S2208(B) and 1S2209(B) are designed for electronic
tuning circuit application in UHF and VHF.

FEATURES
- Low series resistance. 0.35Ω TYP.
- High capacitance ratio.
- Low leakage current.
- High reliability.

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)
- Peak Reverse Voltage \( V_{RM} \) 30 V
- DC Reverse Voltage \( V_R \) 30 V
- Storage Temperature \( T_{stg} \) -55 to +125 °C

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>SYMBOL</th>
<th>1S2208(B)</th>
<th>1S2209(B)</th>
<th>UNIT</th>
<th>TEST CONDITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse Voltage</td>
<td>( V_R )</td>
<td>30</td>
<td>30</td>
<td>V</td>
<td>( I_R = 1.0\mu A )</td>
</tr>
<tr>
<td>Capacitance</td>
<td>( C_{13} )</td>
<td>11.0</td>
<td>12.65</td>
<td>10.3</td>
<td>12.90 pF</td>
</tr>
<tr>
<td></td>
<td>( C_{25} )</td>
<td>2.0</td>
<td>2.3</td>
<td>2.0</td>
<td>2.5 pF</td>
</tr>
<tr>
<td>Capacitance Ratio</td>
<td>( N )</td>
<td>4.5</td>
<td>4.0</td>
<td></td>
<td>( C_{13}/C_{25} )</td>
</tr>
<tr>
<td>Series Resistance</td>
<td>( r_s )</td>
<td>0.35</td>
<td>0.6</td>
<td>0.35</td>
<td>0.6 Ω</td>
</tr>
</tbody>
</table>

NOTE: Diodes are available in matched sets of 20, 60, 120, 120×n units.
For two diodes of one set the following conditions are relevant:
The variations \( \Delta C \) in capacitance values at \( V_R = 3, 10, 18 \) and 25V are
less than 2% for 1S2208(B), 3% for 1S2209(B).

\[ \Delta C = \frac{C_{\text{max}} - C_{\text{min}}}{C_{\text{min}}} \times 100 \% \]
TYPICAL CHARACTERISTICS (Ta = 25°C)

TERMINAL CAPACITANCE vs. REVERSE VOLTAGE

FIGURE OF MERIT vs. FREQUENCY

Q - Figure of Merit

f - Frequency - MHz

C_t - 9.0pF

f = 10MHz

C_t - Terminal Capacitance - pF

V_R - Reverse Voltage - V

10 20 50 100 200 500 1000

10 20 50 100 200 500 1000

1 2 3 4 5 6 7 8 9 10

1 2 3 4 5 6 7 8 9 10