Pin Diode Switch Element

Features
- Supports up to 50 W Power
- Low Insertion Loss: 0.1 dB up to 2.5 GHz
- High Isolation: 16 dB @ 1 GHz
- RoHS* Compliant

Description
A broadband medium power switch element in a 2.6 x 1.5 mm DFN package. This device is electrical series with thermal to ground (EST2G). This device is designed for wireless infrastructure applications and test instruments. It is well suited for other applications from 45 MHz up to 1.5 GHz.

Electrical Specifications: $T_C = +25^\circ$C (unless otherwise specified)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Units</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakdown Voltage ($V_{BR}$)</td>
<td>$I_R = 10 \mu A$</td>
<td>V</td>
<td>500</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Lifetime (t)</td>
<td>$I_F = 10 mA$, $I_R = 6 mA$, 10% / 90%</td>
<td>ns</td>
<td>—</td>
<td>2200</td>
<td>—</td>
</tr>
<tr>
<td>I-Region (w)</td>
<td></td>
<td>µm</td>
<td>—</td>
<td>80</td>
<td>—</td>
</tr>
<tr>
<td>Series Resistance ($R_S$)</td>
<td>$I_F = 100 mA$</td>
<td>Ω</td>
<td>—</td>
<td>0.5</td>
<td>0.7</td>
</tr>
<tr>
<td>Junction Capacitance ($C_J$)</td>
<td>$V_R = 50 V$, 1 MHz</td>
<td>pF</td>
<td>—</td>
<td>0.28</td>
<td>0.35</td>
</tr>
<tr>
<td>Insertion Loss ($I_L$)</td>
<td>$I_F = 100 mA$, 1.5 GHz</td>
<td>dB</td>
<td>—</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>Input Return Loss ($I_{RL}$)</td>
<td>$I_F = 100 mA$, 1.5 GHz</td>
<td>dB</td>
<td>20</td>
<td>25</td>
<td>—</td>
</tr>
<tr>
<td>Isolation ($I_{IS}$)</td>
<td>$V_R = -10 V$, 0.5 GHz, $V_R = -10 V$, &lt;1.5 GHz</td>
<td>dB</td>
<td>17</td>
<td>19</td>
<td>11</td>
</tr>
</tbody>
</table>

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Absolute Maximum Ratings\(^1,2\)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakdown Voltage (V(_R))</td>
<td>500 V</td>
</tr>
<tr>
<td>Forward Current (I(_{FDC}))</td>
<td>300 mA</td>
</tr>
<tr>
<td>Thermal Resistance ((\theta_{JC}))</td>
<td>6°C/W</td>
</tr>
<tr>
<td>Junction Temperature (T(_j))</td>
<td>175°C</td>
</tr>
<tr>
<td>Storage Temperature (T(_{STG}))</td>
<td>-65°C to +150°C</td>
</tr>
<tr>
<td>Mounting Temperature (T(_{MTG}))</td>
<td>+260°C per JEDEC STD-J-20C</td>
</tr>
</tbody>
</table>

1. Exceeding any one or combination of these limits may cause permanent damage to this device.
2. MACOM does not recommend sustained operation near these survivability limits.

Handling Procedures
Please observe the following precautions to avoid damage:

Static Sensitivity
These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these Class 0 (HBM) devices.

Typical Performance Curves: \(T_A = 25°C\), \(Z_O = 50 \Omega\), -10 dBm Small Signal

Insertion Loss

Isolation

Input / Output Return Loss

Series Resistance vs. Current , 500 MHz
**Pin Diode Switch Element**

**Junction Temperature vs. P\textsubscript{IN}**
*(20 mil Board Mounted on Heat Sink @ +25°C, 1.3 GHz)*

![Graph showing Junction Temperature vs. P\textsubscript{IN}](image)

**Printed Circuit Board Layout\textsuperscript{3,4,5,6}**

3. Tolerance ±0.10 mm
4. Soldermask to extend 3 mils beyond metal trace
5. Vias under package filled with copper or soldermask
6. Use circles or squares for thermal land stencil such that there is only 50% to 80% solder paste coverage
Outline

Dimensions in inches [mm]
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