PIN Diode Shunt Switch Element

Features
- Supports up to 40 W Power
- Low Insertion Loss:
  - 0.10 dB to 2.7 GHz
  - 0.25 dB to 6.0 GHz
- High Isolation:
  - 25 dB to 6.0 GHz
- RoHS* Compliant

Description
A broadband, high linearity, medium power shunt switch element in a 1.9 x 1.1 mm DFN package.

This device is designed for wireless telecommunications infrastructure and test instrument applications. It is also suited for other applications in 0.05 ~ 6 GHz.

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSWSH-040-30</td>
<td>3000 piece reel</td>
</tr>
</tbody>
</table>

Electrical Specifications: \( T_A = +25^\circ C \)

<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_B ))</td>
<td>( I_R = 10 \mu A )</td>
<td>V</td>
<td>500</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Total Capacitance (( C_T ))</td>
<td>( V_R = -50 \text{ V}, 1 \text{ MHz} )</td>
<td>pF</td>
<td>—</td>
<td>0.42</td>
<td>—</td>
</tr>
<tr>
<td>Series Resistance (( R_S ))</td>
<td>( I_F = 100 \text{ mA}, 500 \text{ MHz} )</td>
<td>( \Omega )</td>
<td>—</td>
<td>0.36</td>
<td>—</td>
</tr>
<tr>
<td>I-Region (( W ))</td>
<td>I-Layer</td>
<td>mm</td>
<td>—</td>
<td>40</td>
<td>—</td>
</tr>
</tbody>
</table>
| Insertion Loss (\( I_L \)) | \( V_R = 10 \text{ V} \)  
2.7 GHz  
<6.0 GHz | dB | —    | 0.10 | 0.30 | 0.50 |
| Isolation (\( I_{SO} \)) | \( I_F = 100 \text{ mA} \)  
2.7 GHz  
<6.0 GHz | dB | 29   | 24   | 32   | 36   | —    |
| Input / Output Return Loss (\( R_L \)) | \( V_R = 10 \text{ V} \)  
2.7 GHz  
<6.0 GHz | dB | 18   | 13   | 22   | 15   | —    |
| Minority Carrier Lifetime (\( T_L \)) | \( I_F = 10 \text{ mA}, I_R = 6 \text{ mA}, @ 50\% \) | ns | —    | 600  | —    |


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Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakdown Voltage</td>
<td>500 V</td>
</tr>
<tr>
<td>Forward Current</td>
<td>500 mA</td>
</tr>
<tr>
<td>Thermal Resistance</td>
<td>10°C/W</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>+175°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-65°C to +150°C</td>
</tr>
<tr>
<td>Assembly Temperature</td>
<td>+260°C</td>
</tr>
</tbody>
</table>

Per JEDEC STD-J-20C

Junction Temperature vs. Power Mounted on Heatsink, +25°C, 1.3 GHz

Insertion Loss

Isolation

Input Return Loss

Series Resistance vs. Bias, 500 MHz

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NOTE: If possible, use copper filled vias underneath pin 3 for better thermals; otherwise, use vias that are plated through, filled and plated over.

Solder mask should provide a 60 um clearance between copper pad and soldermask. Rounded pkg pads should have matching rounded solder mask openings.

Use circles or squares for the thermal land stencil such that only get 50% to 80% solder paste coverage.
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