MSWSH-020-24

PIN Diode Shunt Switch Element

Rev. V1

Features
- Supports up to 25 W Power @ 5 GHz
- Low Insertion Loss:
  0.2 dB to 2.7 GHz
  0.4 dB to 10.0 GHz
- High Isolation:
  25 dB to 10.0 GHz
- RoHS* Compliant

Description
A broadband, high linearity, medium power shunt switch element in a 2 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 ~ 17 GHz broad band and 24 GHz narrow band with tuning.

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSWSH-020-24</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>200</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Insertion Loss ($I_{IL}$)</td>
<td>$V_R = 10 V$ 2.7 GHz 10.0 GHz</td>
<td>dB</td>
<td>—</td>
<td>0.20</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td>$I_F = 100 mA$ 2.7 GHz 10.0 GHz</td>
<td>dB</td>
<td>27</td>
<td>30</td>
<td>—</td>
</tr>
<tr>
<td>Isolation ($I_{ISO}$)</td>
<td>$V_R = 10 V$ 2.7 GHz 10.0 GHz</td>
<td>dB</td>
<td>20</td>
<td>25</td>
<td>—</td>
</tr>
<tr>
<td>Input Return Loss ($I_{RL}$)</td>
<td>$I_R = 10 mA, I_F = 6 mA, @ 50%$</td>
<td>ns</td>
<td>15</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>I-Region (W)</td>
<td>I-Layer</td>
<td>µm</td>
<td>—</td>
<td>600</td>
<td>—</td>
</tr>
</tbody>
</table>


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Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
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</thead>
<tbody>
<tr>
<td>Breakdown Voltage</td>
<td>200 V</td>
</tr>
<tr>
<td>Forward Current</td>
<td>150 mA</td>
</tr>
<tr>
<td>Thermal Resistance</td>
<td>30°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, Per JEDEC STD-J-20C</td>
</tr>
</tbody>
</table>

Typical Performance Curves

**Insertion Loss**

![Insertion Loss Graph]

**Isolation**

![Isolation Graph]

**Input Return Loss**

![Input Return Loss Graph]

**Diode Resistance vs. Current**

![Diode Resistance vs. Current Graph]

1. Input return loss can be reduced to less than -15 dB with the use of stub tuner printed on the circuit board. Insertion loss is also improve by 0.25 dB at 15 GHz with this tuner.
Junction Temperature vs. Power,
1.3 GHz, $T_A = +25^\circ$C, 20 mil PCB Mounted on Heatsink

Printed Circuit Board Layout
MSWSH-020-24

PIN Diode Shunt Switch Element

Outline (2020)

0.0310 ±0.0040 [0.79 ±0.10]

0.0800 ±0.0050 [2.03 ±0.13]

0.0070 [0.018]

0.0150 [0.38]

0.0010 [0.03]

0.0800 ±0.0050 [2.03 ±0.13]

0.0010 [0.03]

0.0150 ±0.0040 [0.38 ±0.10]

0.0230 ±0.0050 [0.51 ±0.13]

0.0160 ±0.0040 [0.41 ±0.10]

0.0660 ±0.0050 [1.68 ±0.13]

0.0140 ±0.0040 [0.35 ±0.10]

0.0325 [0.82]

0.0150 ±0.0040 [0.38 ±0.10]

0.0310 ±0.0040 [0.79 ±0.10]