MECGaNWBSPDT
DC-20 GHz GaN HEMT SPDT

Main Features

- 0.25µm GaN HEMT Technology
- DC – 20 GHz full performance Frequency Range
- Insertion Loss @ 12 GHz = 1.4 dB
- Insertion Loss @ 20 GHz = 1.7 dB
- Isolation @ 12 GHz > 50 dB
- Isolation @ 20 GHz > 45 dB
- P1dB > 33 dBm
- Input Power Handling = 40 dBm
- Reflective

- Bias: Vc = 0/ -30V
- Chip Size: 1.50 x 2.00 x 0.10 mm³

Product Description

MECGaNWBSPDT is a 0.25µm GaN HEMT Wide Band GHz SPDT Switch designed and tested by MEC for DC - 20 GHz Band applications.

In the frequency range from DC to 12 GHz MECGaNWBSPDT provides less than 1.4 dB of small signal insertion loss and more than 50 dB of isolation. In the frequency range from 12 to 20 GHz provides less than 1.7 dB of small signal insertion loss and more than 45 dB of isolation.

The maximum input power handling of the MECGaNWBSPDT is 40 dBm.

Typical Applications

- Commercial and Military Radar
- Communications
- Test Instrumentation

Measured Data

T = 25 degC - CW
Main Characteristics

Test Conditions: $T_{\text{base_plate}} = 25^\circ \text{C}$, Reception ($V_{c1} = -30 \text{ V}, V_{c2} = -0 \text{ V})$ - CW

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating frequency</td>
<td>DC</td>
<td></td>
<td>22</td>
<td>GHz</td>
</tr>
<tr>
<td>Insertion Loss - On State</td>
<td>1.4</td>
<td></td>
<td>2</td>
<td>dB</td>
</tr>
<tr>
<td>Isolation - Off State</td>
<td></td>
<td></td>
<td>45</td>
<td>dB</td>
</tr>
<tr>
<td>Input Return Loss</td>
<td></td>
<td></td>
<td>15</td>
<td>dB</td>
</tr>
<tr>
<td>Output Return Loss</td>
<td></td>
<td></td>
<td>15</td>
<td>dB</td>
</tr>
<tr>
<td>Return Loss @ Off State Port (Reflective)</td>
<td>-2</td>
<td></td>
<td>-1</td>
<td>dB</td>
</tr>
<tr>
<td>$P_{1\text{dB}}$</td>
<td>33</td>
<td></td>
<td></td>
<td>dBm</td>
</tr>
<tr>
<td>Input Power Handling</td>
<td>40</td>
<td></td>
<td></td>
<td>dBm</td>
</tr>
<tr>
<td>Gate Control Voltage $V_{c1}$</td>
<td>-30 (0)</td>
<td></td>
<td>-25 (1)</td>
<td>V</td>
</tr>
<tr>
<td>Gate Control Voltage $V_{c2}$</td>
<td>0 (-30)</td>
<td></td>
<td>1 (-25)</td>
<td>V</td>
</tr>
<tr>
<td>Control Current</td>
<td></td>
<td></td>
<td>0.5</td>
<td>mA</td>
</tr>
</tbody>
</table>
Insertion Loss, Isolation and Return Loss

Test Conditions: $T_{\text{base\_plate}} = 25^\circ\text{C}$, $Vc1 = 0\ \text{V}$, $Vc2 = -30\ \text{V}$ - CW

<table>
<thead>
<tr>
<th>Function Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF path Selected</td>
</tr>
<tr>
<td>Out1</td>
</tr>
<tr>
<td>Out2</td>
</tr>
</tbody>
</table>
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**Bond Pad Configuration & Assembly Recommendations**

### Bond Pad Configuration

![Bond Pad Layout](image)

<table>
<thead>
<tr>
<th>Bond Pad #</th>
<th>Connection</th>
<th>External Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN, Out1 and Out2</td>
<td>2 Bonding Wires L_bond = 0.3nH</td>
<td>No external components required (Internal Series Resistance: Rs=4kΩ)</td>
</tr>
<tr>
<td>Vc1, Vc2</td>
<td>L_bond ≤ 1 nH</td>
<td></td>
</tr>
</tbody>
</table>

Eutectic Die bond using AuSn (80/20) solder is recommended.

The backside of the die is the Source (ground) contact.

Thermosonic ball or wedge bonding are the preferred connection methods.

Gold wire must be used for connections.

### Bias Procedure

**Bias-Up**

1. Vc1 and Vc2 sets to Control Voltage.
2. Apply RF signal.

**Bias-Down**

1. Turn off RF signal.
2. Turn off Vc1, Vc2.
Contact Information

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Notice

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