SDH148
80 – 100 GHz
Switch

Features

♦ Frequency Band: 80-100 GHz
♦ SPDT Switch
♦ Insertion Loss (Average 80-100 GHz):
  ➢ 2.2 dB, typical
♦ Isolation:
  ➢ 35 dB, typical OFF state
  ➢ 35 dB, typical RFIN1 - RFIN2
♦ Die Size: < 2.0 sq. mm

Performance Characteristics \( (T_{\text{OP}} = 25^\circ \text{C}) \)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
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<tbody>
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<td>Frequency</td>
<td>80</td>
<td>2.2</td>
<td>100</td>
<td>GHz</td>
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<tr>
<td>Insertion Loss (Ave.)</td>
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<td>2.2</td>
<td>3</td>
<td>dB</td>
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<tr>
<td>Isolation</td>
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<td>28</td>
<td>35</td>
<td>dB</td>
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<tr>
<td>Input - Output</td>
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<tr>
<td>Input Return Loss 'ON'</td>
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<td>14</td>
<td>14</td>
<td>dB</td>
</tr>
<tr>
<td>'OFF'</td>
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<td>22</td>
<td>22</td>
<td>dB</td>
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<tr>
<td>Output Return Loss</td>
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<td>13</td>
<td>13</td>
<td>dB</td>
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<tr>
<td>RFIN1 - ON</td>
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<tr>
<td>Vg1</td>
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<td>V</td>
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<tr>
<td>Vg2</td>
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<td>V</td>
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<td>RFIN2 - ON</td>
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<tr>
<td>Vg1</td>
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<td>V</td>
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<tr>
<td>Vg2</td>
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<td>V</td>
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</table>

Applications

♦ Wide Bandwidth Millimeter-wave Imaging RX Chains
♦ Sensors
♦ Radar

Product Description

The SDH148 monolithic HEMT MMIC, a broadband, SPDT switch, is designed for use in Wide Bandwidth Millimeter-wave Imaging RX Chains and sensors. To ensure rugged and reliable operation, HEMT devices are fully passivated. Both bond pad and backside metallization are Ti/Au, which is compatible with conventional die attach, thermocompression, and thermosonic wire bonding assembly techniques.
On-Wafer Measured Performance Characteristics ($T_{OP} = 25^\circ C$)

**‘ON’ Insertion Loss vs. Frequency**

Vg1 = 0.3V, Vg2 = -3.3V

**‘OFF’ Insertion Loss vs. Frequency**

Vg1 = -3.3V, Vg2 = -0.3V

**Input Return Loss vs. Frequency**

**‘ON’ Output Return Loss vs. Frequency**

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Die Size and Bond Pad Locations (Not to Scale)

- X Dimension: 1400 ± 25 µm
- Y Dimension: 1400 ± 25 µm

Bond Pad Dimensions:
- RF: 50 x 50 µm ± 0.5 µm
- * DC: 101 x 101 µm ± 0.5 µm
- * VG1 & VG2: 201 x 101 µm ± 0.5 µm

Chip Thickness = 101 ± 5 µm

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Die and Bond Pad Locations (Not to Scale)

- Gnd
- RFIN1
- RFOUT
- VG1
- VG1A
- VG2
- VG2A

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**Recommended Assembly Notes**

1. Bypass caps should be 100 pF ceramic (single-layer) placed no further than 30 mils from the device.
2. Best performance obtained from use of <6 mil (long) by 1.5 by 0.5 mil ribbons on inputs and output.
3. VG1A and VG2A are optional gate bias /control pads and can be used in place of VG1 and/or VG2. Typical use would be NC.