GaAs SPDT Non-Reflective Switch
0.05-26.5 GHz

Features
- Broadband Performance
- Low Insertion Loss: 1.7 dB @ 20 GHz
- High Isolation: 48 dB @ 20 GHz
- Fast Switching Speed
- Non-Reflective Configuration
- Ultra Low DC Power Consumption
- Size: 1.3 × 0.85 × 0.1 mm
- RoHS* Compliant

Applications
- Test & Measurement
- EW
- Broadband Communications Systems

Description
The MASW-011128-DIE is a versatile, broadband, non-reflective SPDT switch offered as bare die part. The switch operates from 0.05 to 26.5 GHz and provides less than 2 dB insertion loss and 50 dB isolation.

The combination of broadband performance along with very fast switching and excellent settling time make this device ideal for many applications, including Test & Measurement, EW and broadband communication systems.

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MASW-011028-DIE</td>
<td>Die in Gel Pak</td>
</tr>
</tbody>
</table>

* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

1. Backside of die must be connected to RF, DC and thermal ground.

MACOM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.
Visit www.macom.com for additional data sheets and product information.
GaAs SPDT Non-Reflective Switch
0.05- 26.5 GHz

Electrical Specifications: $T_A = +25^\circ$C, $V1, V2 = -5$ V / 0 V, $Z_0 = 50$ Ω

<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>Insertion Loss</td>
<td>0.05 GHz, 12 GHz, 18 GHz, 20 GHz, 26.5 GHz</td>
<td>dB</td>
<td>0.9</td>
<td>1.3</td>
<td>2.0</td>
</tr>
<tr>
<td>Isolation</td>
<td>0.05 GHz, 12 GHz, 18 GHz, 20 GHz, 26.5 GHz</td>
<td>dB</td>
<td>64</td>
<td>60</td>
<td>54</td>
</tr>
<tr>
<td>Return Loss</td>
<td>RFC, RF1, RF2 &quot;on state&quot;</td>
<td>dB</td>
<td>42</td>
<td>48</td>
<td>42</td>
</tr>
<tr>
<td>Input P1dB</td>
<td>1.0 - 26.5 GHz</td>
<td>dBm</td>
<td>27</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Input IP3</td>
<td>2 Tone, 5 dBm/Tone, 5 MHz spacing, 1 - 26.5 GHz</td>
<td>dBm</td>
<td>42</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>$T_{RISE}, T_{FALL}$</td>
<td>10% to 90% RF and 90% to 10% RF</td>
<td>ns</td>
<td>5</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>$T_{ON, T_{OFF}}$</td>
<td>50% control to 90% RF and 50% control to 10% RF</td>
<td>ns</td>
<td>15</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Control Current (Complementary Logic)</td>
<td>—</td>
<td>µA</td>
<td>5</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Absolute Maximum Ratings$^{2,3}$

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Voltage</td>
<td>-8.5 V</td>
</tr>
<tr>
<td>Input Power</td>
<td>27 dBm</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40°C to +85°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-65°C to +150°C</td>
</tr>
</tbody>
</table>

Truth Table$^{4,5}$

<table>
<thead>
<tr>
<th>Control Input</th>
<th>Condition of Switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>V2</td>
</tr>
<tr>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

4. $V_{low} = -5$ V, $V_{high} = 0$ V.
5. All V1 bondpads and V2 bondpads are connected on die, respectively. Bias voltages can be supplied to any combination of V1 and V2 bondpads.

Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity (ESD)

This device is sensitive to electrostatic discharge and can be damaged by static electricity. Proper ESD control techniques should be used when handling these class 1A devices.

MACOM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice. Visit www.macom.com for additional data sheets and product information.

For further information and support please visit: https://www.macom.com/support

DC-0022176
GaAs SPDT Non-Reflective Switch
0.05- 26.5 GHz

Typical RF Performance Curves, (RF Symmetrical)

**Insertion Loss, (S21)**

**Isolation, (S31)**

**RFc R. Loss, (S11)**

**Isolation, (S32)**

**RF1 or RF2 R. Loss, (S22)**

**Isolated Port R. Loss, (S22)**
GaAs SPDT Non-Reflective Switch
0.05- 26.5 GHz

Typical RF Performance Curves

12 GHz Input Compression

2 GHz Input Compression

Input Compression (0.1dB & 1dB)

Input IP3

For further information and support please visit:
https://www.macom.com/support
Die Dimensions

6. All units are in µm, unless otherwise noted, with a tolerance of ±5 µm.
7. Die thickness is 100±10 µm.
8. All square bond pads are 100 µm by 100 µm.

<table>
<thead>
<tr>
<th>BOND PAD</th>
<th>X (µm)</th>
<th>Y (µm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAD 1</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>PAD 16</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

NOTES:
1. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS SHOWN ARE µm WITH A TOLERANCE OF ±5 µm.
2. DIE THICKNESS IS 100±10 µm
3. BOND PAD/BACKSIDE METALIZATION: GOLD
4. DIE SIZE REFLECTS UN-CUT DIMENSIONS. SAW OR LASER KERF REDUCES DIE SIZE BY ~25 µm EACH DIMENSION.
GaAs SPDT Non-Reflective Switch
0.05 - 26.5 GHz

MACOM Technology Solutions Inc. ("MACOM"). All rights reserved.
These materials are provided in connection with MACOM’s products as a service to its customers and may be used for informational purposes only. Except as provided in its Terms and Conditions of Sale or any separate agreement, MACOM assumes no liability or responsibility whatsoever, including for (i) errors or omissions in these materials; (ii) failure to update these materials; or (iii) conflicts or incompatibilities arising from future changes to specifications and product descriptions, which MACOM may make at any time, without notice. These materials grant no license, express or implied, to any intellectual property rights.

THESE MATERIALS ARE PROVIDED "AS IS" WITH NO WARRANTY OR LIABILITY, EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHT, ACCURACY OR COMPLETENESS, OR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.