### GaAs SPDT Non-Reflective Switch DC - 26.5 GHz

#### Features

- Broadband Performance
- Low Insertion Loss: 1.3 dB @ 20 GHz
- High Isolation: 46 dB @ 20 GHz
- Fast Switching Speed
- Non-Reflective Configuration
- Ultra Low DC Power Consumption
- Size: 1.3 × 0.85 × 0.1 mm
- RoHS\* Compliant

#### Description

The MASW-011107-DIE is a versatile, broadband, non-reflective SPDT switch offered as bare die part. The switch operates from DC to 26.5 GHz and provides <2.0 dB insertion loss and >40 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.

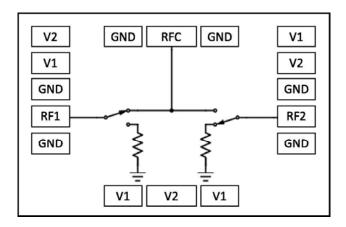
The MASW-011107-DIE is fabricated using MACOMs' mature 0.5  $\mu$ m low gate-lag pHEMT process. This robust process features full surface passivation for a high performance and high reliability.

### **Ordering Information**

Part Number	Package		
MASW-011107-DIE	Die in Gel Pak <sup>1</sup>		

1. Die quantity varies.

#### **Functional Schematic**



### Bondpad Configuration<sup>2</sup>

Pad Name	Function		
GND	Ground		
RF1	RF 1		
V1	Control Voltage 1		
V2	Control Voltage 2		
RFC	RF Common		
RF2	RF 2		

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

\* Restrictions on Hazardous Substances, European Union Directive 2011/65/EU.

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#### Electrical Specifications: $T_A = +25^{\circ}C$ , V1, V2 = -5 V / 0 V, Z<sub>0</sub> = 50 $\Omega$

Parameter	Test Conditions	Units	Min.	Тур.	Max.
Insertion Loss	0.05 GHz 12 GHz 18 GHz 20 GHz 25 GHz	dB	_	0.7 1.0 1.1 1.3 1.5	  2.0
Isolation	0.05 GHz 12 GHz 18 GHz 20 GHz 25 GHz	dB	40	53 44 43 46 41	_
Return Loss	RFC RF1, RF2 "on state" RF1, RF2 "off state"	dB	_	15 17 12	_
Input P1dB	0.5 - 25 GHz	dBm	_	27	_
Input IP3	2 Tone, 5 dBm/Tone, 5 MHz spacing, 0.5 - 25 GHz	dBm	_	45	—
T <sub>RISE</sub> , T <sub>FALL</sub>	10% to 90% RF and 90% to 10% RF	ns	_	10	—
T <sub>on</sub> , T <sub>off</sub>	50% control to 90% RF and 50% control to 10% RF	ns	_	20	_
Control Current (Complementary Logic)	_	μA		1	_

#### Absolute Maximum Ratings<sup>3,4</sup>

Parameter	Absolute Maximum		
Control Voltage	-8.5 V		
Input Power	27 dBm		
Operating Temperature	-40°C to +85°C		
Storage Temperature	-65°C to +150°C		

3. Exceeding any one or combination of these limits may cause permanent damage to this device.

4. MACOM does not recommend sustained operation near these survivability limits.

### Truth Table<sup>5,6</sup>

Control Input		Condition of Switch	
V1	V2	RF1	RF2
Low	High	On	Off
High	Low	Off	On

5. Vlow = -5 V, Vhigh = 0 V.

 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:

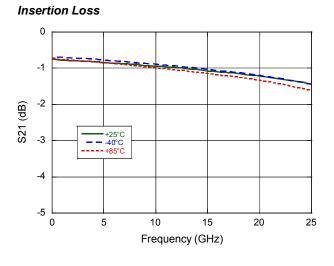
#### Static Sensitivity

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

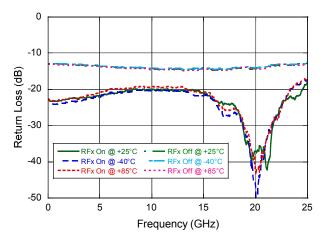
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### **Typical Performance Curves**

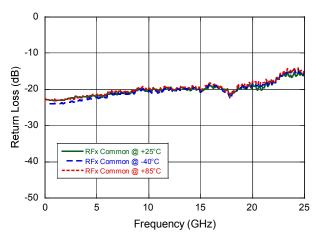


Return Loss, RFx On & RFx OFF



Return Loss, RF Common

Isolation



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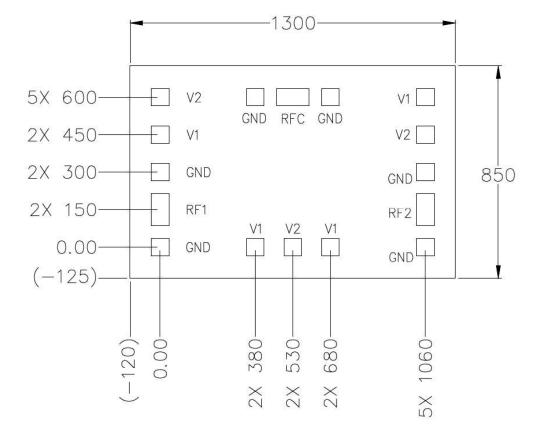
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# For further information and support please visit: <u>https://www.macom.com/support</u>

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## Die Dimensions<sup>7,8</sup>



7. All units are in  $\mu m,$  unless otherwise noted, with a tolerance of ±5  $\mu m.$ 

8. Die thickness is 100±10 μm.

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