

# GaAs SPDT Switch

## 17.7 - 31.0 GHz



MASW-011105

Rev. V2

### Features

- Broadband Performance
- Low Insertion Loss: 1.6 dB
- High Isolation: 30 dB
- Fast Switching Speed: 12 ns
- Reflective Configuration
- Ultra Low DC Power Consumption
- Lead-Free 3 mm 14-Lead PQFN Package
- RoHS\* Compliant

### Applications

- Test & Measurement

### Description

The MASW-011105 is a versatile, broadband, high isolation SPDT switch offered in a lead-free 3 mm 14-lead PQFN surface mount plastic package. The combination of broadband performance along with fast switching and excellent settling time make this device ideal for many applications, including test & measurement, EW and broadband communication systems.

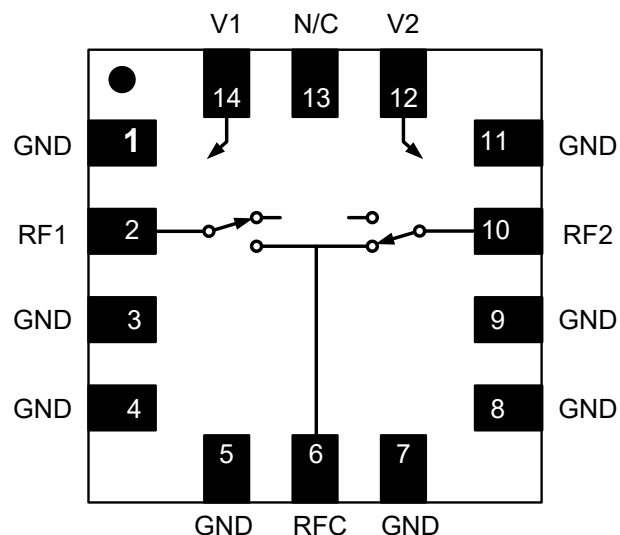
The MASW-011105 is fabricated using MACOM's robust process with full surface passivation for a high performance and high reliability.

### Ordering Information<sup>1,2</sup>

Part Number	Package
MASW-011105-TR0500	500 piece reel
MASW-011105-TR1000	1000 piece reel
MASW-011105-SMB	Sample Board

1. Reference Application Note M513 for reel size information.
2. All sample boards include 2 loose parts.

### Functional Schematic



### Pin Configuration<sup>3</sup>

Pin #	Pin Name	Function
1, 3-5, 7-9, 11	GND	Ground
2	RF1	RF Port 1
6	RFC	RF Common
10	RF2	RF Port 2
12	V2	Control Voltage
13	N/C	No Connection
14	V1	Control Voltage
15	Paddle <sup>4</sup>	Ground

3. MACOM recommends connecting unused package pins to ground.
4. The exposed pad centered on the package bottom must be connected to RF, DC and thermal ground.

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

**Electrical Specifications: Freq. = 17.7 - 31.0 GHz, T<sub>A</sub> = +25°C, V<sub>1,2</sub> = 0/+5 V, Z<sub>0</sub> = 50 Ω**

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	—	dB	—	1.6	2.0
Isolation	—	dB	25	30	—
Port Amplitude Imbalance	—	dB	—	0.1	—
Port Phase Imbalance	—	°	—	5	—
Return Loss	RFC RF1, RF2	dB	—	15 15	—
Input P0.1dB	@ 24 GHz	dBm	—	24	—
Input IP3	Two Tone, +7 dBm/Tone, 5 MHz Spacing, 24 GHz	dBm	—	43	—
T <sub>RISE</sub> , T <sub>FALL</sub>	10% to 90% RF and 90% to 10% RF	ns	—	6	—
T <sub>ON</sub> , T <sub>OFF</sub>	50% control to 90% RF and 50% control to 10% RF	ns	—	12	—
Settling Time	50% Vctl to 0.1 dB of final value	ns	—	60	—
Control Current (Complementary Logic)	V Low (0 V), V High (5 V)	μA	—	1	2

**Absolute Maximum Ratings<sup>5,6</sup>**

Parameter	Absolute Maximum
Control Voltage	8.5 V
Input Power	25 dBm
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

5. Exceeding any one or combination of these limits may cause permanent damage to this device.  
6. MACOM does not recommend sustained operation near these survivability limits.

**Truth Table<sup>7</sup>**

Control Input		Condition of Switch	
V1	V2	RF1	RF2
1	0	On	Off
0	1	Off	On

7. Logic "0" = 0 to 0.2 V, Logic "1" = 5 to 5.2 V.

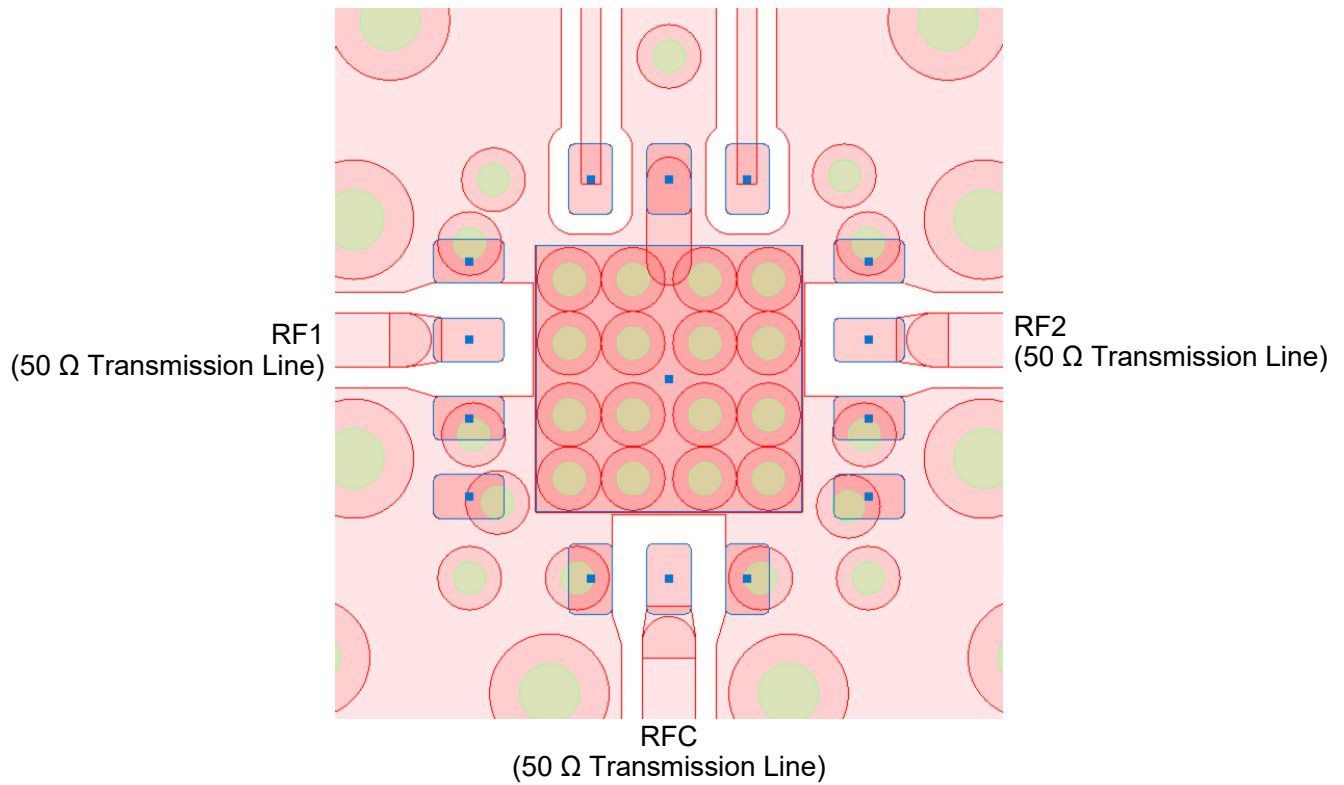
**Handling Procedures**

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.

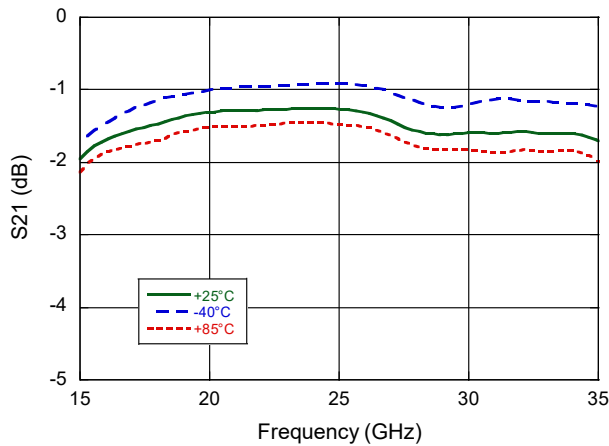
**PCB Layout Recommendation**



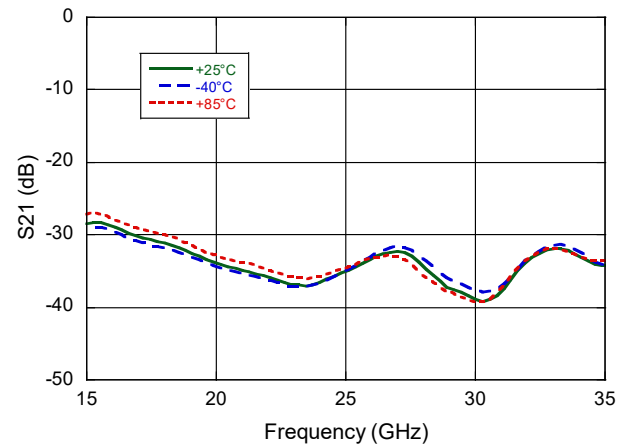
Ground of transmission lines should connect to package paddle in shortest possible way.

**Typical Performance Curves**

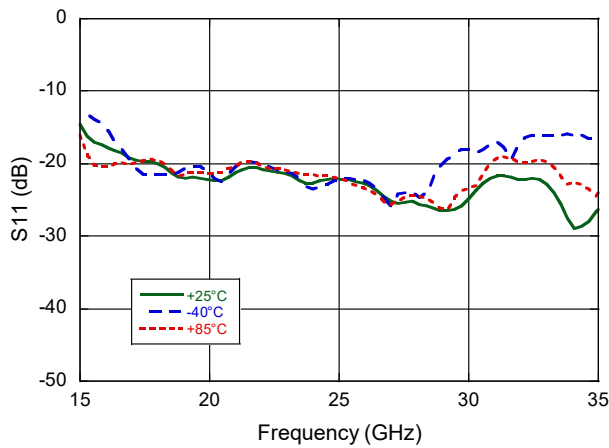
**Insertion Loss**



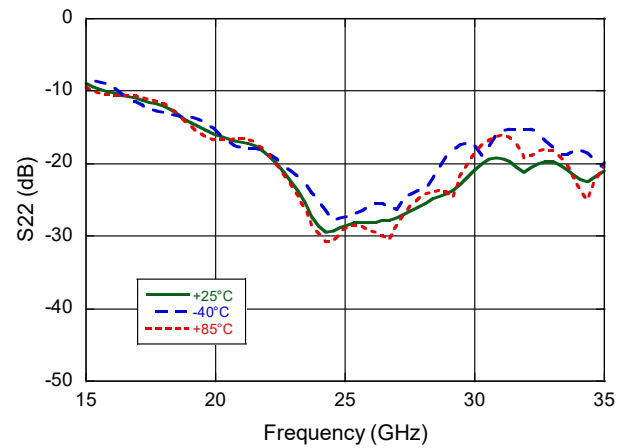
**Isolation**



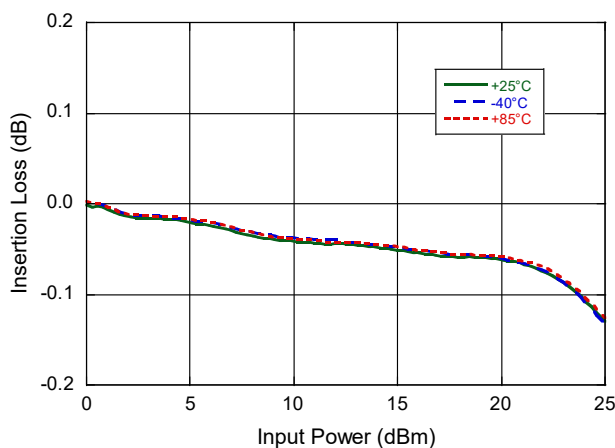
**Input Return Loss (RF Common)**



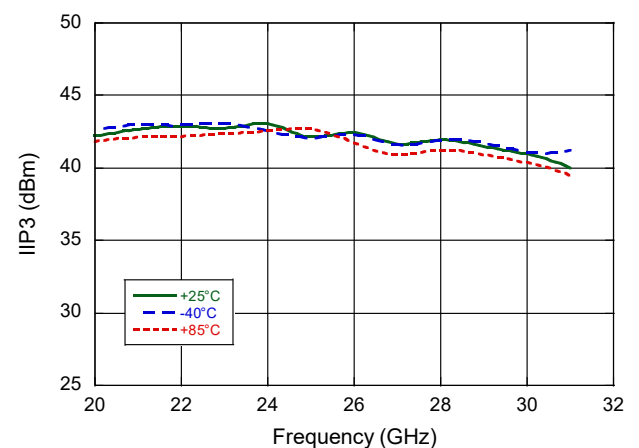
**Output Return Loss (On state RF1, RF2)**



**Gain Compression @ 24 GHz**



**Input IP3**



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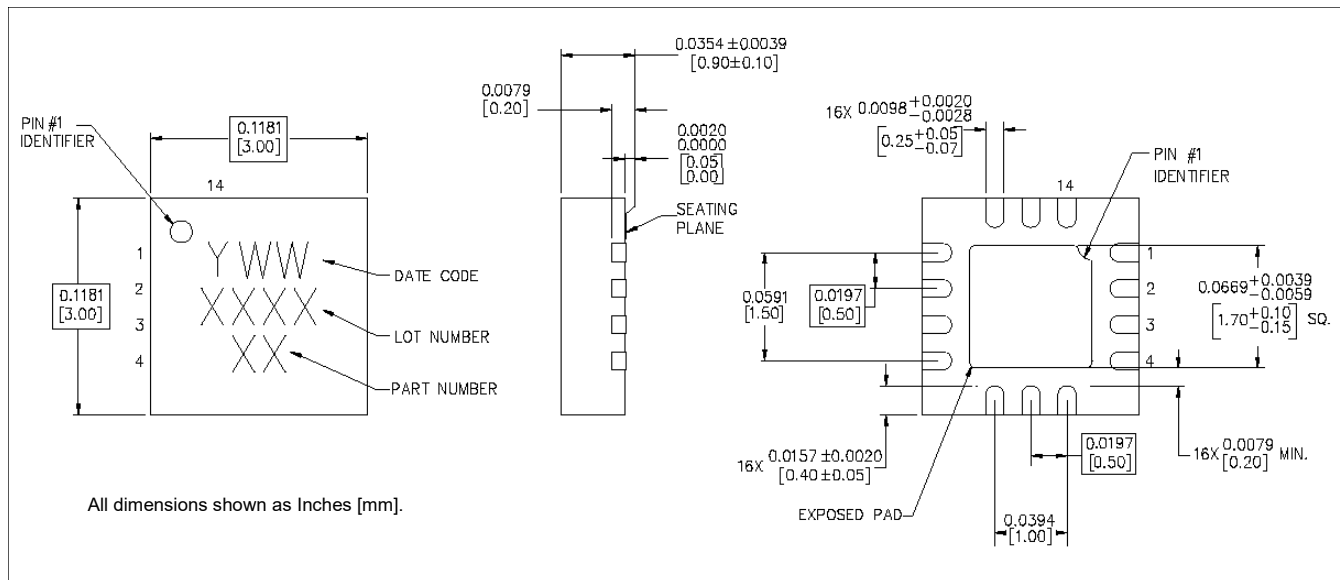
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### Lead-Free 3 mm 14-Lead PQFN<sup>†</sup>



<sup>†</sup> Reference Application Note S2083 for lead-free solder reflow recommendations.  
Meets JEDEC moisture sensitivity level 1 requirements.  
Plating is NiPdAuAg.

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