

#### 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.

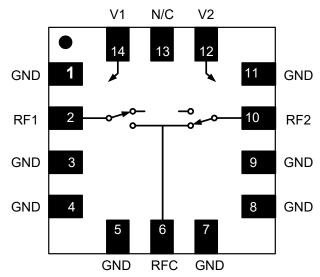
# Ordering Information<sup>1,2</sup>

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.

 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.

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<sup>1</sup> 



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Parameter	Test Conditions	Units	Min.	Тур.	Max.
Insertion Loss	—	dB	_	1.6	2.0
Isolation	_	dB	25	30	
Port Amplitude Imbalance	—	dB	_	0.1	_
Port Phase Imbalance	_	0		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% to10% 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

#### Electrical Specifications: Freq. = 17.7 - 31.0 GHz, $T_A$ = +25°C, V1,2 = 0/+5 V, $Z_0$ = 50 $\Omega$

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

Parameter	neter 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.

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.

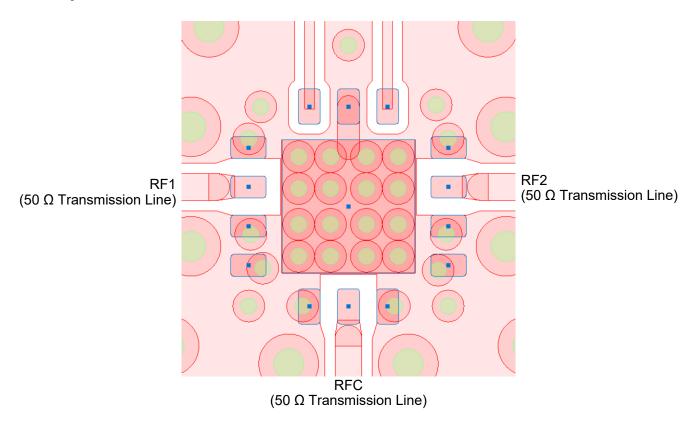
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#### **PCB Layout Recommendation**



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

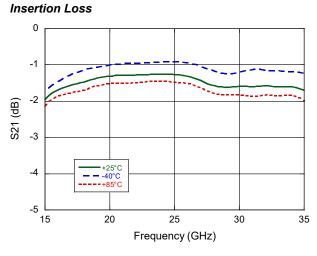
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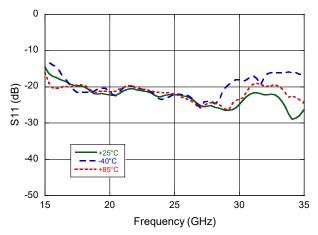
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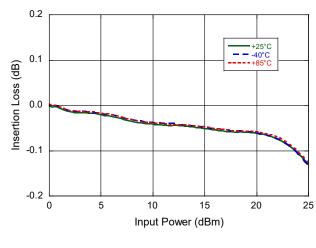
# **Typical Performance Curves**

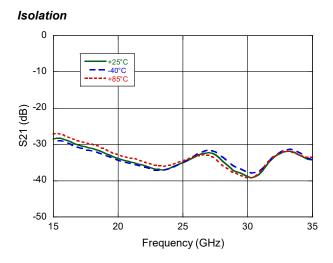


Input Return Loss (RF Common)

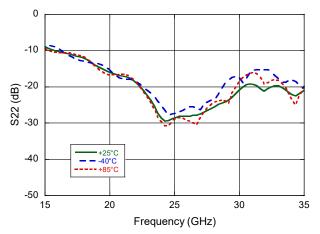


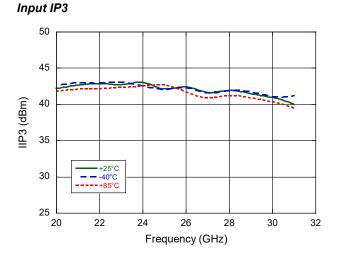






Output Return Loss (On state RF1, RF2)





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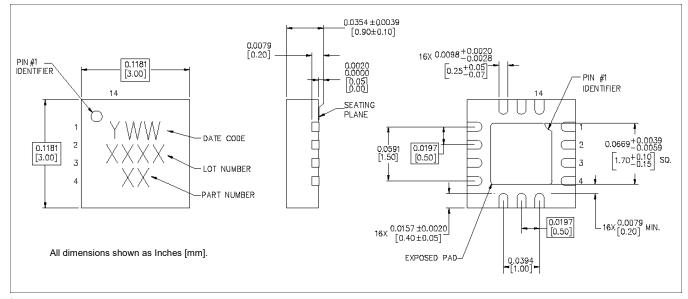
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## Lead-Free 3 mm 14-Lead PQFN<sup>†</sup>



<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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