GaAs SPDT Non-Reflective Switch
0.05- 26.5 GHz

MASW-011128-DIE

Rev. V1

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

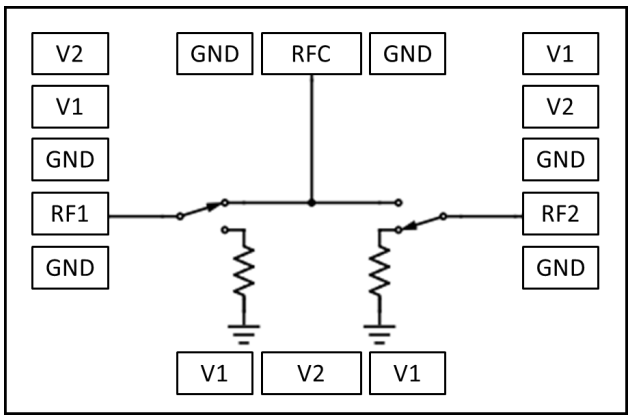
The MASW-011128-DIE is a versatile, broadband, non-reflective SPDT switch offered as bare die part. The switch operates from 0.05 to 26.5 GHz and provides less than 2 dB insertion loss and 50 dB isolation.

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

Part Number	Package
MASW-011028-DIE	Die in Gel Pak

Functional Schematic



Bondpad Configuration[1]

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

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

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

Electrical Specifications: T_A = +25°C, V1, V2 = -5 V / 0 V, Z_0 = 50 Ω

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	0.05 GHz 12 GHz 18 GHz 20 GHz 26.5 GHz	dB	— — — — —	0.9 1.3 1.5 1.7 1.9	— — — 2.0 —
Isolation	0.05 GHz 12 GHz 18 GHz 20 GHz 26.5 GHz	dB	— — — 42 —	64 60 54 48 42	— — — — —
Return Loss	RFC RF1, RF2 “on state” RF1, RF2 “off state”	dB	—	15 15 20	—
Input P1dB	1.0 - 26.5 GHz	dBm	—	27	—
Input IP3	2 Tone, 5 dBm/Tone, 5 MHz spacing, 1 - 26.5 GHz	dBm	—	42	—
T_{RISE}, T_{FALL}	10% to 90% RF and 90% to 10% RF	ns	—	5	—
T_{ON}, T_{OFF}	50% control to 90% RF and 50% control to 10% RF	ns	—	15	—
Control Current (Complementary Logic)	—	µA	—	5	—

Absolute Maximum Ratings[2,3]

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

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

Truth Table[4,5]

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

4. Vlow = -5 V, Vhigh = 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

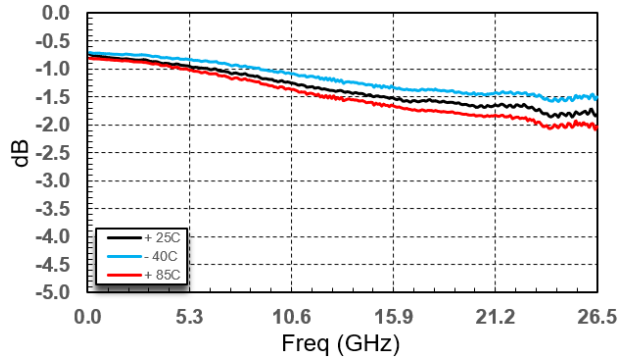
Please observe the following precautions to avoid damage:

Static Sensitivity (ESD)

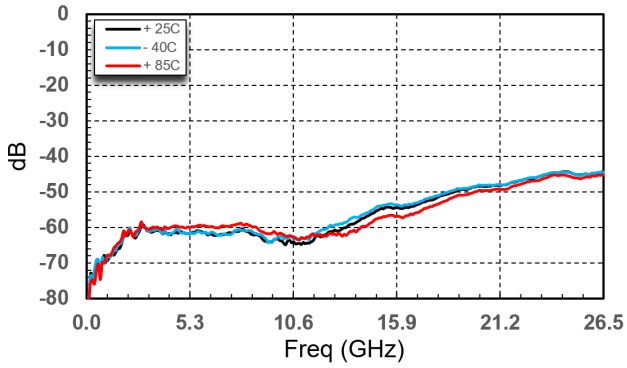
This device is sensitive to electrostatic discharge and can be damaged by static electricity. Proper ESD control techniques should be used when handling these class 1A devices.

Typical RF Performance Curves, (RF Symmetrical)

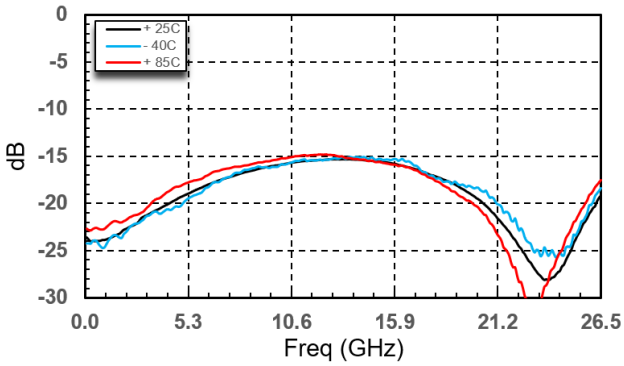
Insertion Loss, (S21)



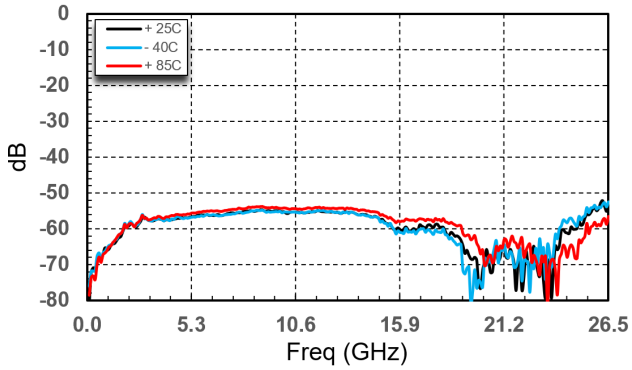
Isolation, (S31)



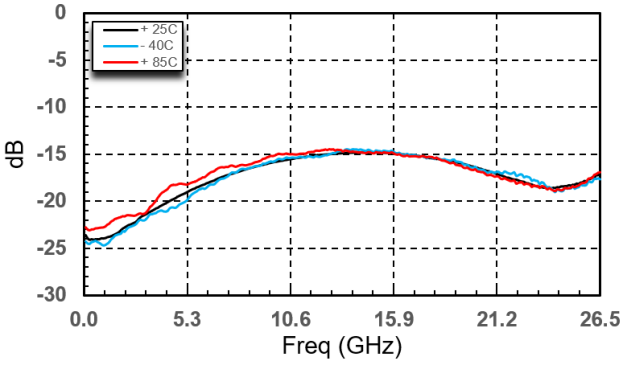
RFc R. Loss, (S11)



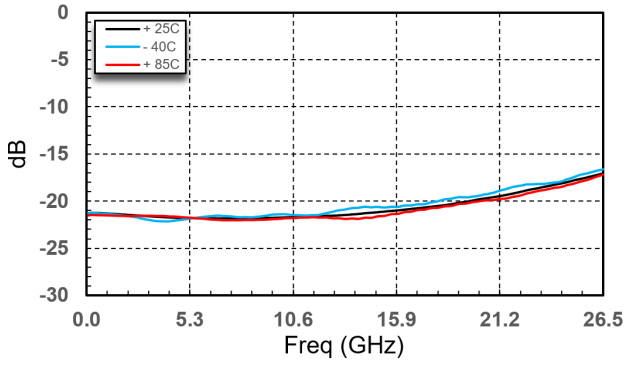
Isolation, (S32)



RF1 or RF2 R. Loss, (S22)

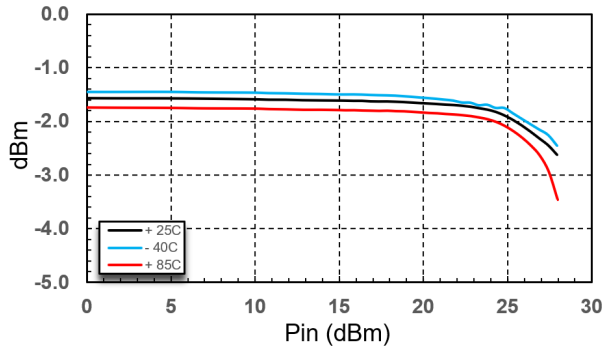


Isolated Port R. Loss, (S22)

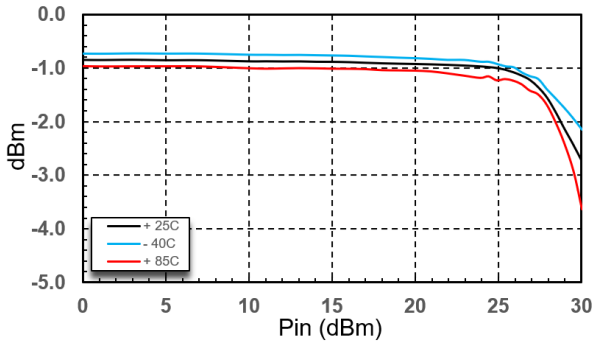


Typical RF Performance Curves

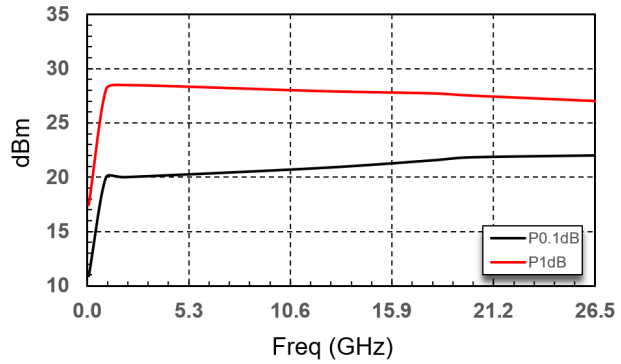
12 GHz Input Compression



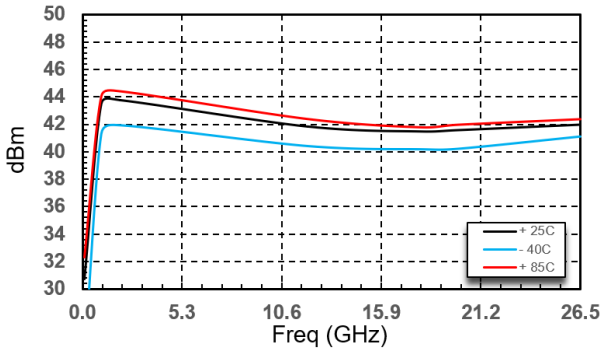
2 GHz Input Compression



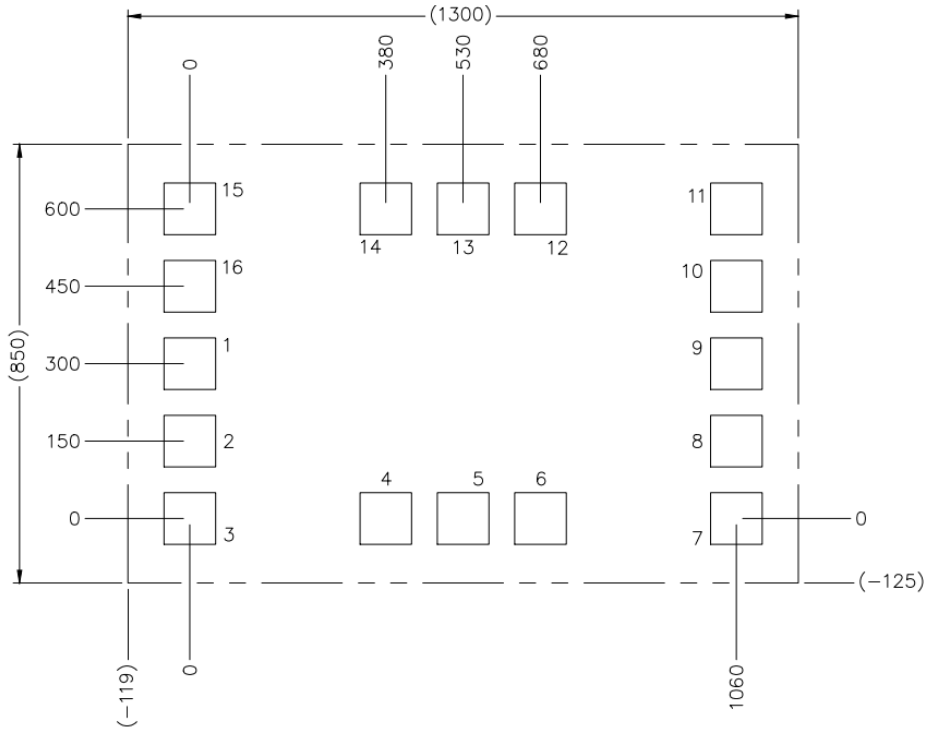
Input Compression (0.1dB & 1dB)



Input IP3



Die Dimensions[6,7,8]



BOND PAD DIM (μm)		
PAD	X	Y
1 – 16	100	100

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

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.