



# HMC-SDD112

## GaAs PIN MMIC SPDT SWITCH 55 - 86 GHz

### Typical Applications

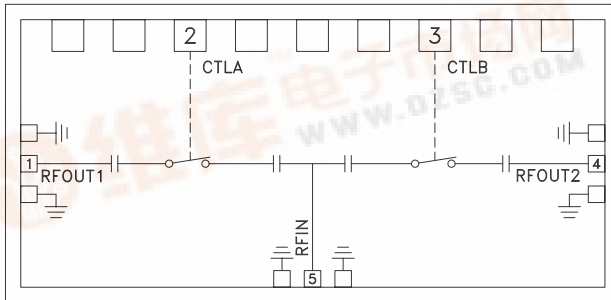
This HMC-SDD112 is ideal for:

- FCC E-Band Communication Systems
- Short-Haul / High Capacity Radios
- Automotive Radar
- Test & Measurement Equipment
- SATCOM
- Sensors

### Features

- Low Insertion Loss: 2 dB
- High Isolation: 30 dB
- DC Blocked RF I/Os
- Integrated DC Bias Circuitry
- Die Size: 2.01 x 0.975 x 0.1 mm

### Functional Diagram



### General Description

The HMC-SDD112 is a monolithic, GaAs PIN diode based Single Pole Double Throw (SPDT) MMIC Switch which exhibits low insertion loss and high isolation. This all-shunt MMIC SPDT features on-chip DC blocks and DC bias voltage decoupling circuitry. All bond pads and the die backside are Ti/Au metallized and the PIN diode devices are fully passivated for reliable operation. The HMC-SDD112 GaAs PIN SPDT is compatible with conventional die attach methods, as well as thermocompression and thermosonic wirebonding, making it ideal for MCM and hybrid microcircuit applications. All data shown herein is measured with the chip in a 50 Ohm environment and contacted with RF probes.

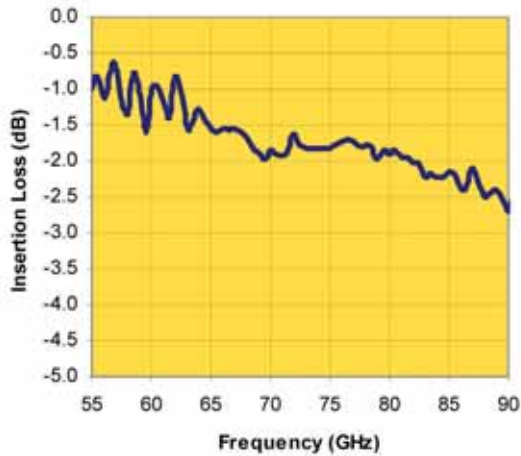
### Electrical Specifications\*, $T_A = +25^\circ\text{C}$ , with -5/+5V Control, 50 Ohm System

Parameter	Min.	Typ.	Max.	Units
Frequency Range		55 - 86		GHz
Insertion Loss		2	3	dB
Isolation	25	30		dB
Return Loss ON State		12		dB
Current (+5 V) ON State		22		mA
Current (-5 V) OFF State		-63		nA

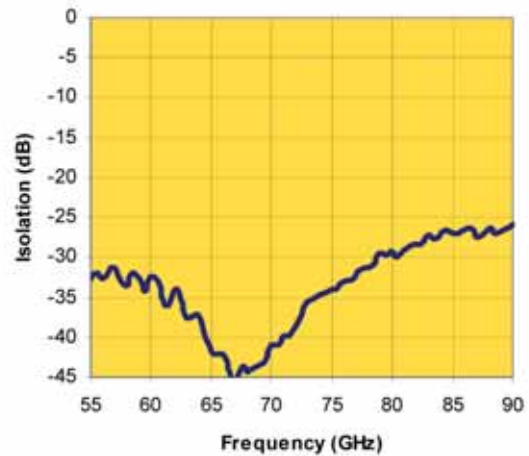
\* Unless otherwise indicated, all measurements are from probed die

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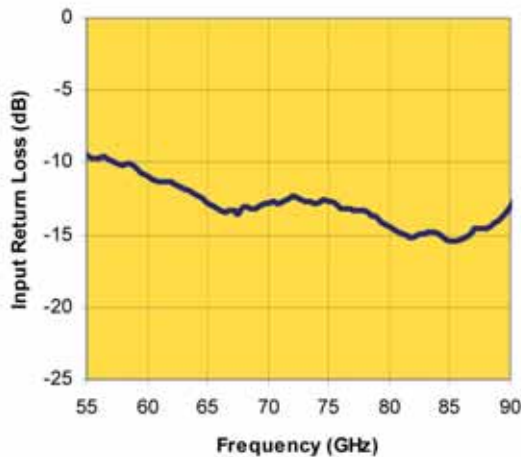
**“On” Insertion Loss vs. Freq. CTLA= -5V,  
CTLB= 5V for RFOUT1 to be ON**



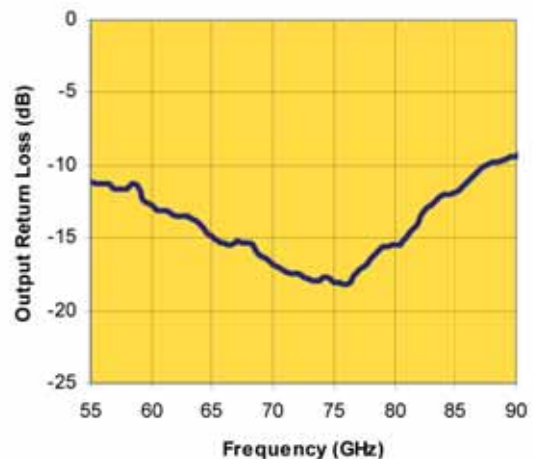
**“Off” Isolation vs. Freq. CTLA= +5V,  
CTLB= -5V for RFOUT1 to be OFF**



**“On” Input Return Loss vs. Freq. CTLA= -5V,  
CTLB= 5V for RFOUT1 to be ON**



**“On” Output Return Loss vs. Freq.  
CTLA= -5V, CTLB= 5V for RFOUT1 to be ON**



Note 1: Measured Performance Characteristics (Typical Performance at 25°C) Test data is taken with probes on RFIN and RFOUT1 with RFOUT2 left open.

### Absolute Maximum Ratings

Bias Voltage Range	-5.5 to 5.5 Vdc
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C
Bias Current (ON State)	30 mA



ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS

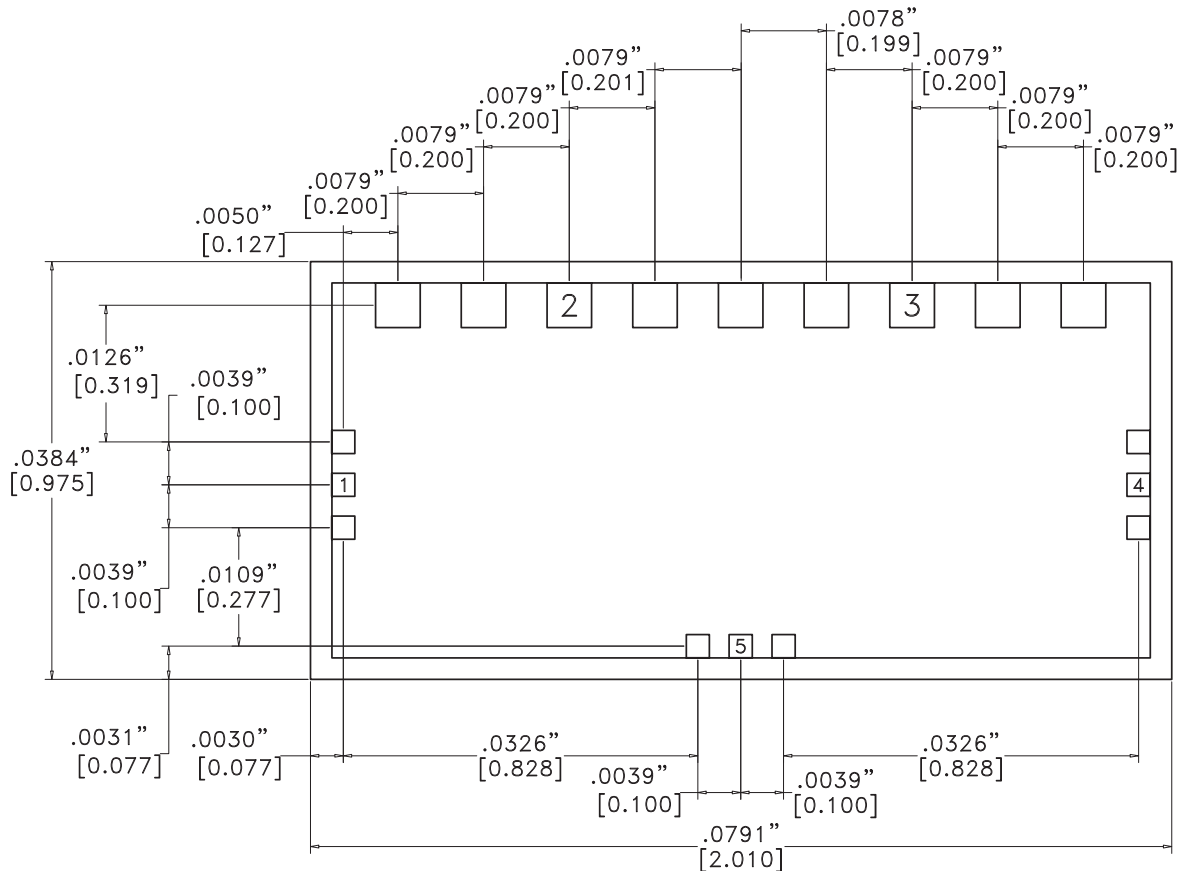
### Control Voltages

State	Bias Condition
Low	-5 V @ 63 nA typical
High	+5 V @ 22 mA typical

### Truth Table

Control Input		Signal Path State	
CTLA	CTLB	RFIN to RFOUT1	RFIN to RFOUT2
Low (-5V)	High (+5V)	On	Off
High (+5V)	Low (-5V)	Off	On

### Outline Drawing



#### NOTES:

1. ALL DIMENSIONS ARE IN INCHES [MM].
2. TYPICAL BOND PAD IS .004" SQUARE.
3. BACKSIDE METALLIZATION: GOLD.
4. BACKSIDE METAL IS GROUND.
5. BOND PAD METALLIZATION: GOLD.
6. CONNECTION NOT REQUIRED FOR UNLABELED BOND PADS.
7. OVERALL DIE SIZE ±.002"