NuPhotonics

Part Number: S001T67
Product State: Production Build

Rev. 0.9 – Feb. 2024

9 KHz – 67 GHz Absorptive SPDT Switch

Description

S001T67 is an ultrawide band (UWB) absorptive single pole double through (SPDT) RF switch. The outputs are terminated to 50 Ω load in the isolated path. It offers 24 dBm of power handling. The device offers Low voltage logic levels which make this device compatible with CMOS logic. The RF outputs are DC-coupled.

Features

- Coaxial package
- Low insertion loss
  - 1.5 dB @ 10 GHz
  - 2 dB @ 30 GHz
  - 3 dB @ 40 GHz
  - 4 dB @ 60 GHz
- 15 dB return loss
- Broad temperature operating range
- No low Frequency Spurious emissions
- 40 dB Reverse isolation
- 1.85 mm connectors
- 24 dBm switching power handling

Applications

- Communication systems
- Datacenters
- Test and Measurement

Electrical Specifications (T_{op} 23 ± 3°c, unless otherwise specified)

Parameter	Min.	Typ.	Max.	Unit	Test Conditions
Insertion Loss		1.5 2 3 4		dB	9 KHz – 18 GHz 18 – 30 GHz 30– 45 GHz 45 – 67 GHz
Isolation RF1 to RF2		60 50 40		dB	9KHz - 20 GHz 20 – 40 GHz 40 – 67 GHz
Isolation RFC to RF1/RF2	50 35 30	55 40 38		dB	9 KHz -20 GHz 20 – 40 GHz 40 – 67 GHz
RFin Return loss		25 18 15		dB	9 KHz -20 GHz 20 – 40 GHz 40 – 67 GHz
RF1/RF2 Return loss		20 18 15		dB	9 KHz – 20 GHz 20 – 40 GHz 40 – 67 GHz
T_{ON}		0.9		µs	50% control to 90%
T_{OFF}		0.2		µs	50% control to 10%
T_{RISE}		0.4		µs	10% to 90%
T_{FALL}		0.06		µs	90% to 10%
Input P1dB		28		dBm	10 MHz – 27 GHz
Input IP3		50		dBm	10 MHz – 27 GHz / Two tone, 1 MHz tone separation

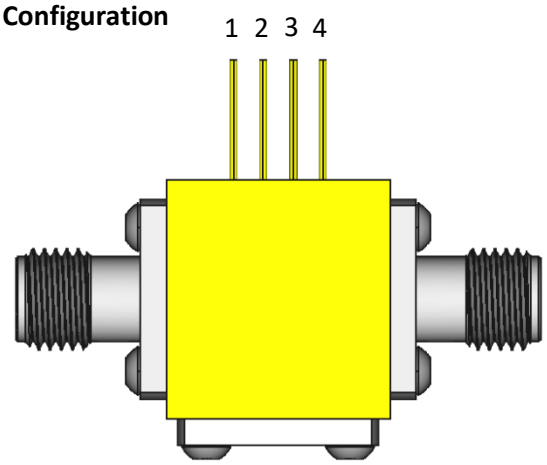
Absolute Maximum Ratings

Parameter	Symbol	Condition	Min.	Max.	Unit
VSS	V_{SS}		-3.5	0	V
VCC/VC1/VC2			0	3.5	V
Storage Temperature	T_{stg}		-65	120	°C
Storage Humidity	H_{stg}			85	% r.H.
Operating Temperature	T_{op}		-40	85	°C
ESD Susceptibility[1]		HBM		1000	V
Input Power	P_{in}	CW		24	dBm

Operating at maximum ratings for a prolonged period will cause damage to the device.

[1] ESD sensitive device, proper ESD protection procedures must be followed.

Pin Configuration



Pin Number	Function
1	VSS
2	Control Voltage 1 (V_{C1})
3	Control Voltage 2 (V_{C2})
4	VCC

Truth Table

VC1	VC2	RF_{out1}	RF_{out2}
Low	Low	Off	On
Low	High	On	Off
High	Low	Off	Off
High	High	Off	Off

Off signifies that the RF output is connected to the device 50Ω load

On signifies RF out is connected to RF in

Recommended Bias Sequence

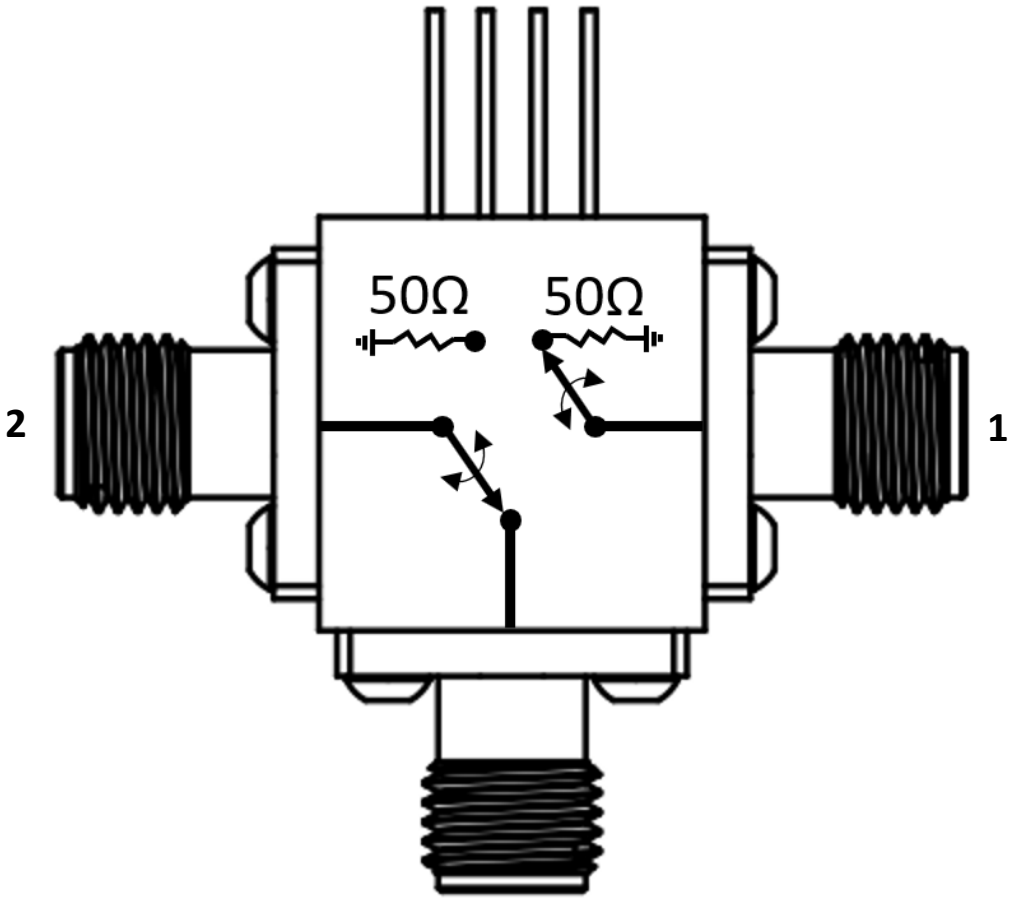
Power on:

1.) Apply VCC Bias
2.) Apply VSS Bias
3.) Apply Control Bias

Power off:

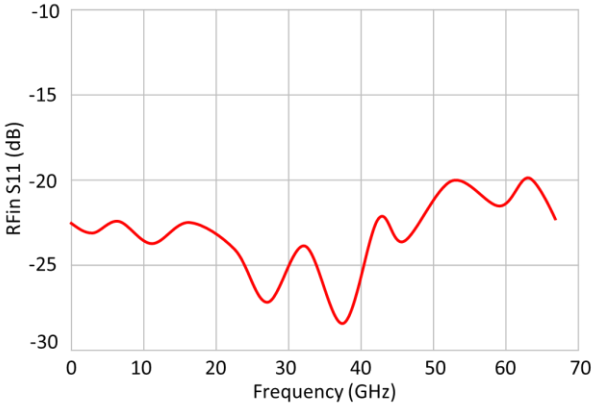
1.) Remove Control Bias
2.) Remove VSS Bias
3.) Remove VCC Bias

Functional Diagram

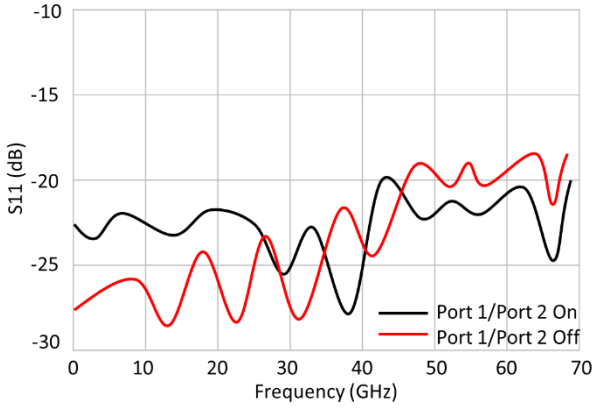


Typical performnace curves (T_{op} 23 ± 3°c)

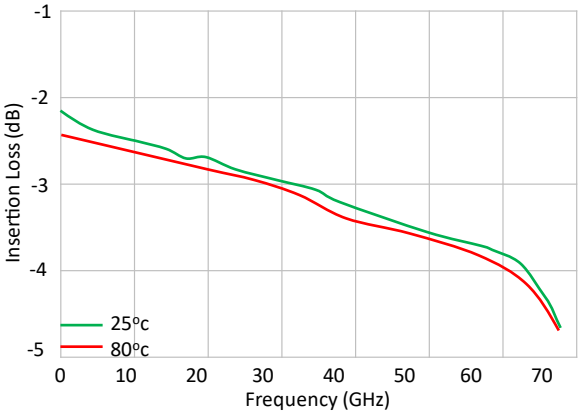
RFin S11



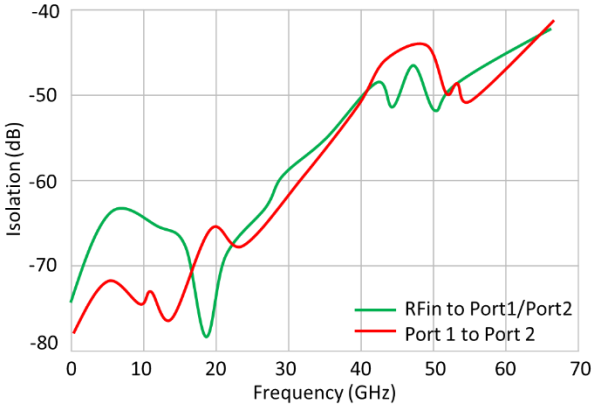
Port 1 and Port 2 S11 in ON/OFF state



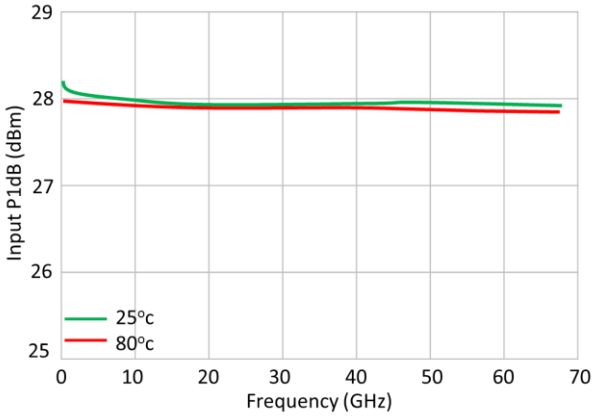
Insertion Loss



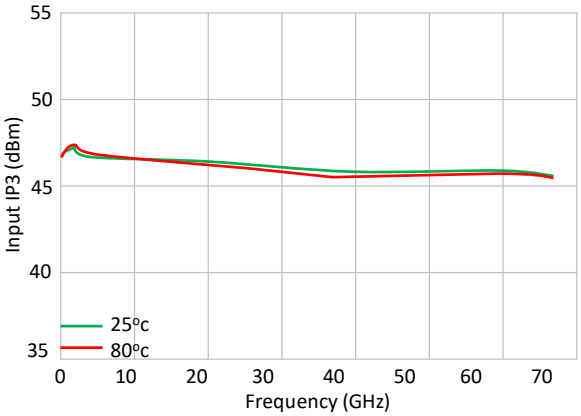
Isolation



Input P1dB



Input IP3



Device Dimensions (all units in mm)

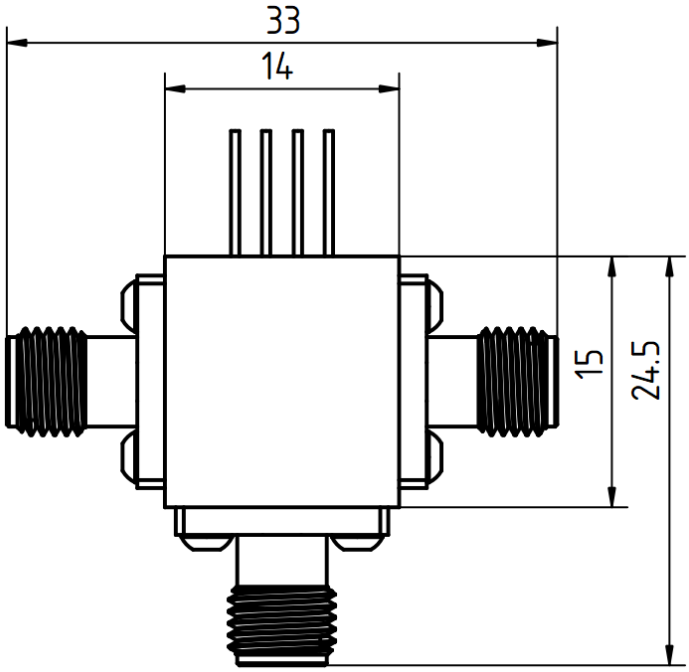
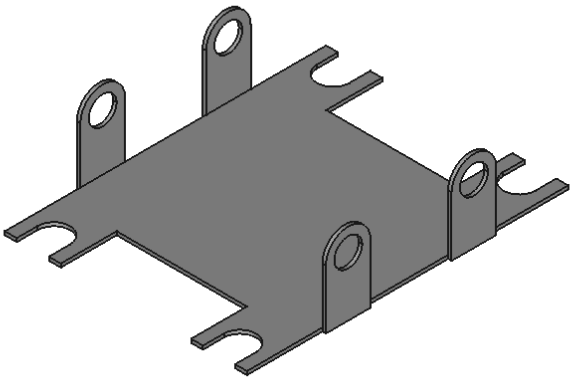
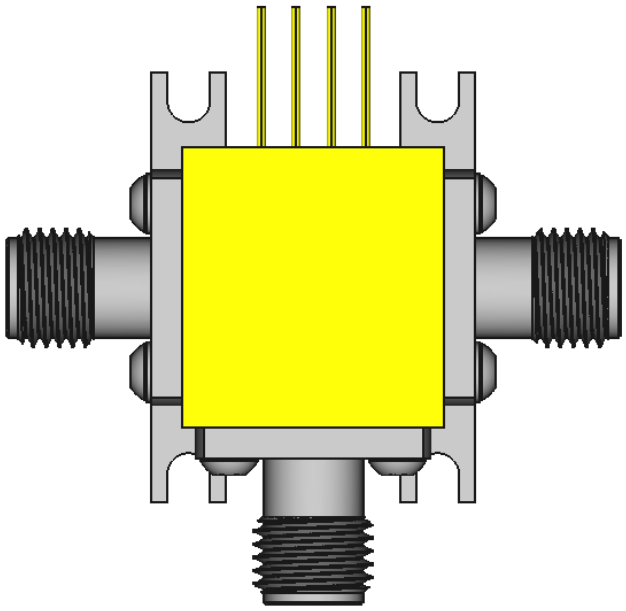


Figure 1. All units in mm. Manufactured device sizes may differ.

Optional Mount: If is desirable to mechanically fix the device in place. An optional Mount can be added to the device.



(a) Mount



(b) Mount on the device

Inquiry Information

Sales: All inquiries regarding sales please contact Sales@NuPhotonics.com

General: If you are interested in a custom solution, general information, or engineering related information please contact Inquiry@NuPhotonics.com

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Definitions: Product State

Alpha Build: Devices in Alpha build are in internal engineering build and testing stages. Major changes may happen for production build.

Beta Build: Devices in Beta build are for external customer and engineering sample testing stages. Minor changes may happen for production build.

Production Build: Customer ready devices. Small appearance changes may occur between devices.

Obsolete: Currently not supported.