

Absorptive SP4T Electro-Mechanical Switch DC-67GHz



Product Description

RFSP4T67EMA-T is an absorptive SP4T electro-mechanical switch with a frequency range of DC to 67GHz.

The typical insertion loss is 0.8dB and the isolation is 70 dB with a switching speed of 20ms. This electromechanical switch works with a +24 VDC power supply.

The working temperature of this product is between - 25°C and + 70°C

Features

- SP4T configuration
- Magnetic latching
- Operating life of 1 million cycles
- Guaranteed repeatability of 0.08dB up to 1 million cycles
- Excellent isolation, typically >70 dB to 18GHz
- Terminated ports
- TTL Drive
- Control Cable Included

Typical Applications

- Wireless Infrastructure
- Military and Aerospace Applications
- Test Instrumentation
- Radar Systems
- 5G Wireless Communications
- Microwave Radio Systems
- TR Modules
- Research and Development
- Cellular Base Stations

Electrical Specifications (T_A=+25°C)

Parameter		Min	Typ	Max	Units
Frequency Range			DC – 67		GHz
Insertion Loss	@DC-10GHz			0.4	dB
	@10-20GHz			0.8	dB
	@20-50GHz			1.8	dB
	@50-67GHz			2.1	dB
VSWR	@DC-10GHz			1.3	:1
	@10-20GHz			1.6	:1
	@20-50GHz			2.3	:1
	@50-67GHz			2.3	:1
Isolation	@DC-10GHz	80			dB
	@10-20GHz	70			dB
	@20-50GHz	70			dB
	@50-67GHz	60			dB
Input Power				1	W
Switching Speed				20	ms
Life Cycles		1			Million
Repeatability				0.08	dB
Supply Current (VCC=+24VDC)			0.2		A
Weight			0.47 Max		lbs.
Impedance			50		Ohms
Connector			1.85mm-Female		
Actuator Type			Latching		
Contact			Break Before Make		
Control			TTL		
Package	Epoxy Sealed (Standard)				
	Hermetically Sealed (Optional)				

Absolute Maximum Ratings

Parameter	Rating
Supply Voltage Range	22 – 28VDC

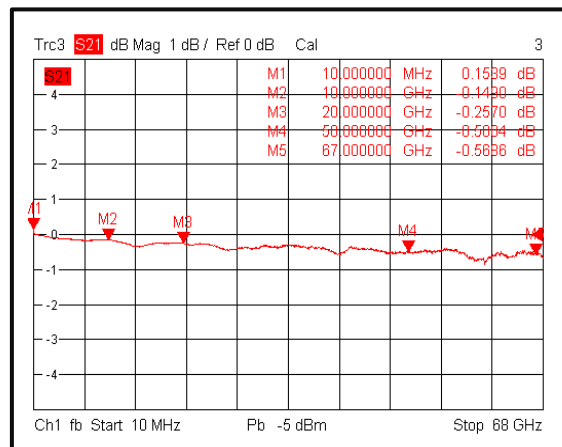
Environmental Specifications and Test Standards

Parameter	Description
Operational Temperature	-25°C to +70°C (Case Temperature)
Storage Temperature	-50°C to +85°C
Thermal Shock	-40°C → +70°C (5 Cycles / 10 hours)
*Random Vibration	MIL-STD-202G Table 214-I, Test Condition Letter C 1.5 Hours Per Axis
High Temperature Burn In	Temperature +70°C for 72 Hours
Shock	1. Weight >20g, 50g half sine wave for 11ms, Speed variation 3.44m/s 2. Weight <=20g, 100g Half sine wave for 6ms, Speed variation 3.75m/s 3. Total 18 times (6 directions, 3 repetitions per direction).
Altitude	Standard: 30,000 Ft (Epoxy Sealed Controlled Environment) Optional: Hermetically Sealed (60,000 ft. 1.0 PSI min)
Hermetically Sealed (Optional)	MIL-STD-883 (For Hermetically Sealed Units)

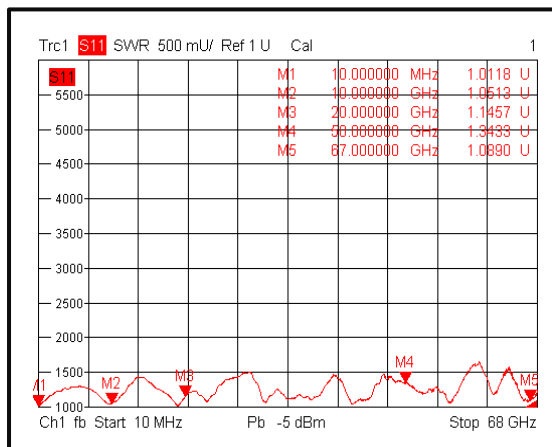
*For vibration testing details please see additional information section.

Typical Performance Plots

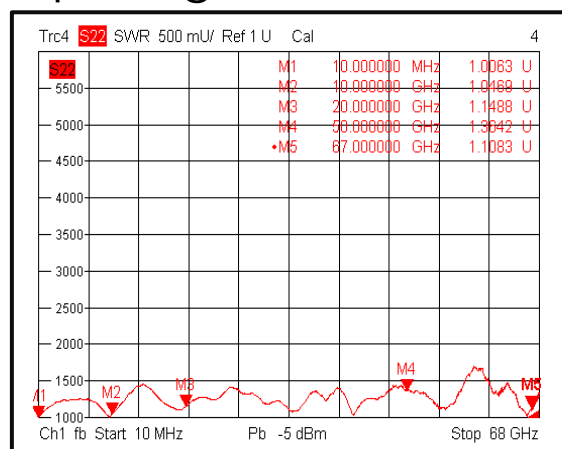
Insertion Loss@+25°C



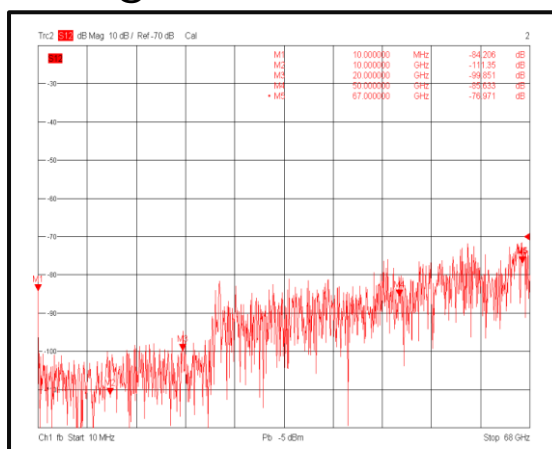
Input VSWR@+25°C



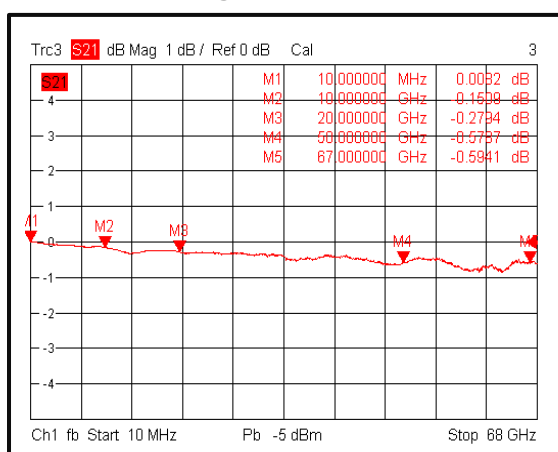
Output VSWR@+25°C



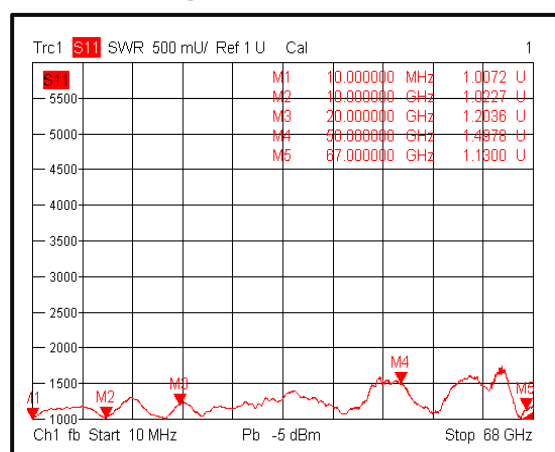
Isolation@+25°C



Insertion Loss @-25°C

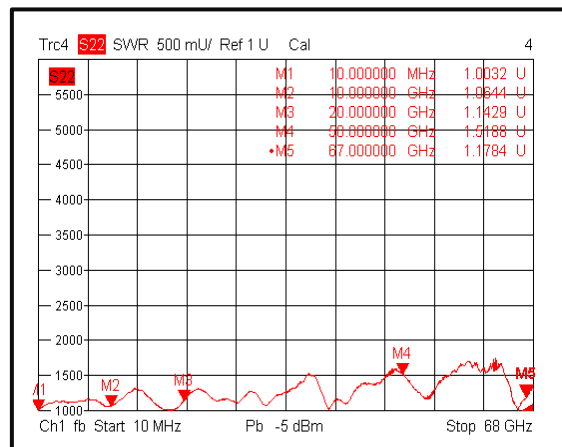


Input VSWR @-25°C

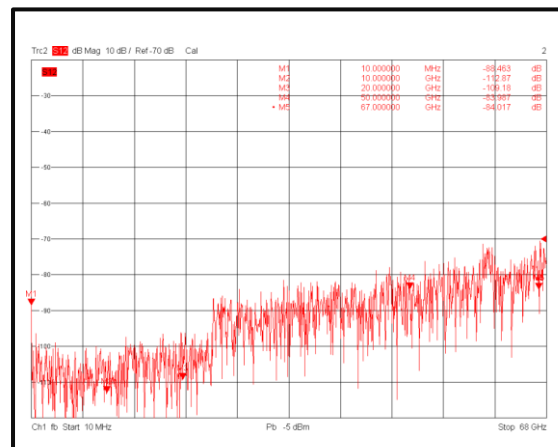


Typical Performance Plots

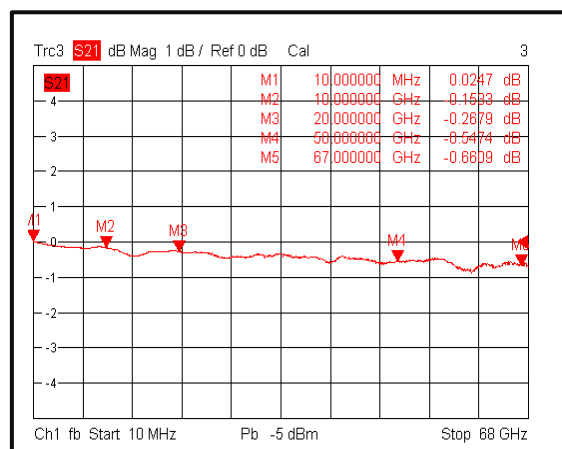
Output VSWR @-25°C



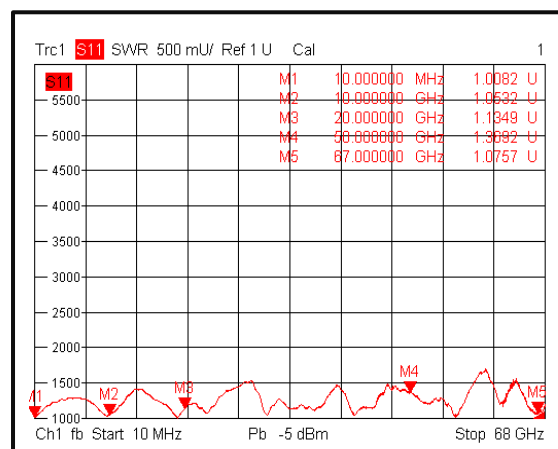
Isolation @-25°C



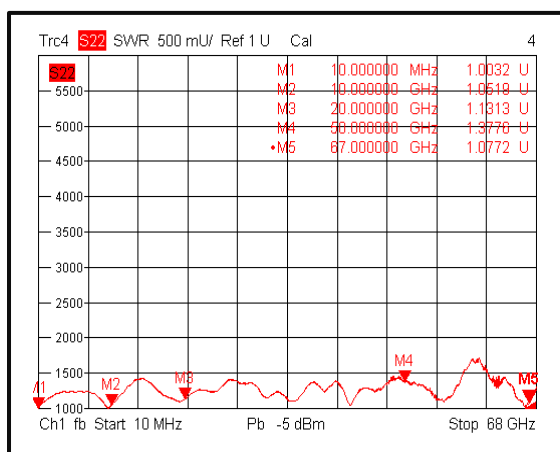
Insertion Loss @+70°C



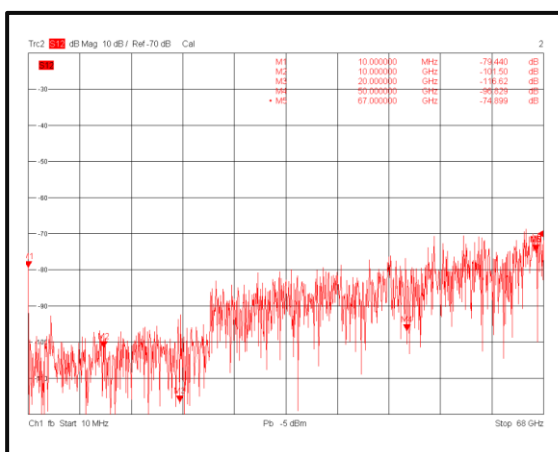
Input VSWR @+70°C



Output VSWR @+70°C

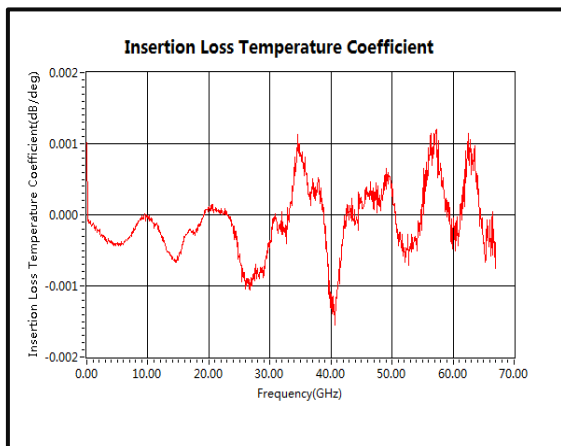


Isolation @+70°C

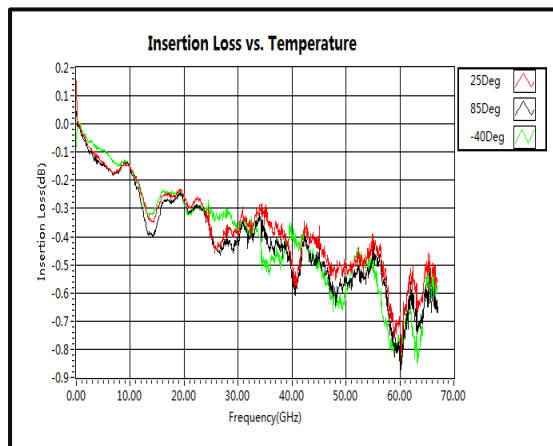


Typical Performance Plots

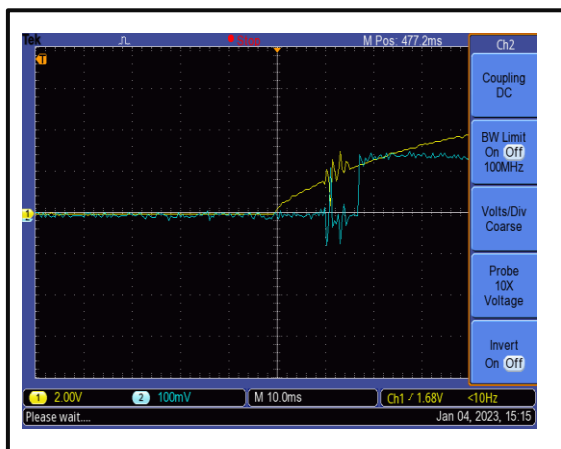
Insertion Loss Temperature Coefficient



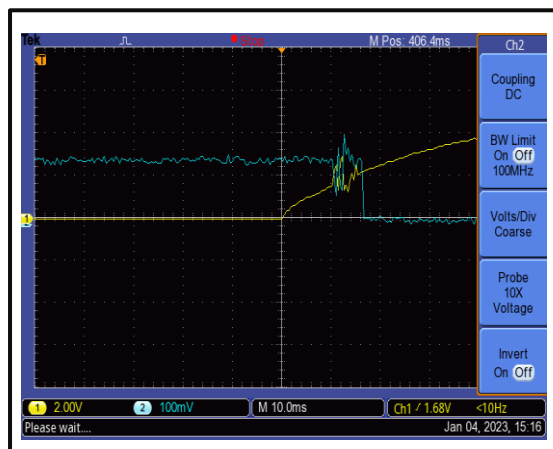
Insertion Loss vs. Temperature



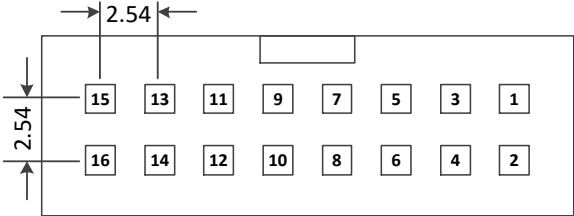
Switching Speed



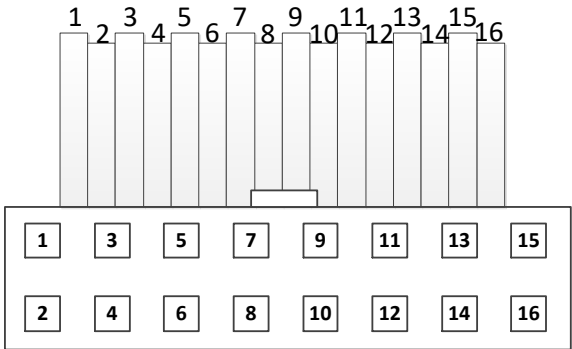
Switching Speed



Control Port



Switch connector pin



External control line and connector matched with the switch

Drive type

TTL Drive Voltage (High = 2.5 to 5.5V, Low = 0 to 0.8V)							
STATUS	Pin1	Pin 5	Pin 7	Pin 11	Pin13	Pin15	Pin16
RF to 1	VCC	High	Low	Low	Low	GND	Low
RF to 2	VCC	Low	High	Low	Low	GND	Low
RF to 3	VCC	Low	Low	High	Low	GND	Low
RF to 4	VCC	Low	Low	Low	High	GND	Low
Reset	VCC	Low	Low	Low	Low	GND	High

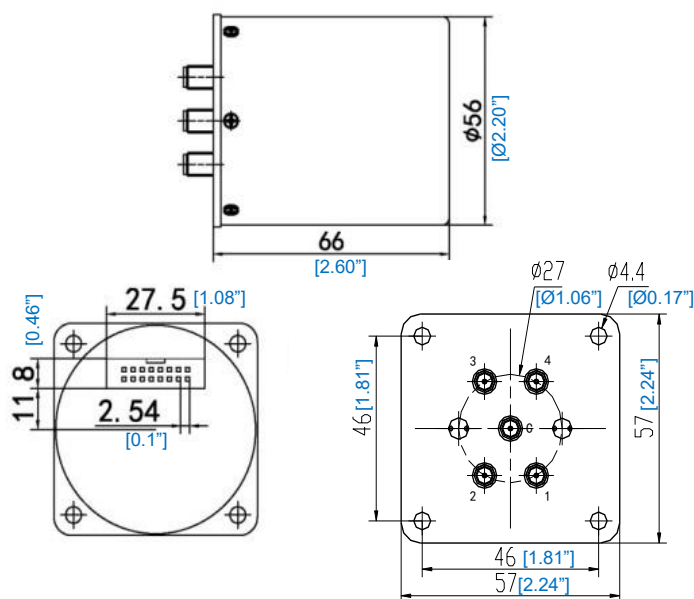
Note:

VCC : +22V~+28V (Rated voltage : +24V)

GND: Ground

Applying "High" to the corresponding pin can control the connection of the corresponding RF channel. At the same time, other RF channels are automatically disconnected and connected to the built-in 50 Ω load. When the High level "High" is applied to the "Reset" pin, all RF channels of the switch are disconnected and connected to the built-in 50 Ω load. Note that applying high to multiple pins at one time is forbidden and can damage the switch.

Outline Drawing



Notes:

1. Package Material: Aluminum
2. Finish: Black Paint
3. All dimensions are in millimeters [inches].



Additional Information

Documentation

ESD Policy

https://rflambda.com/pdf/rflambda_esd_control.pdf

Connector Torque Specifications

https://www.rflambda.com/pdf/Torque_Specifications.pdf

Random Vibration Test Standard

https://www.rflambda.com/pdf/rflambda_random_vibration_MIL-STD-202G.pdf

Ordering Information

Part Number	Modification	Description
RFSP4T67EMA-T	connectors 1.85mm-Female TTL	DC-67GHz SP4T Electromechanical Switch

Important Notice

The information contained herein is believed to be reliable. RF-Lambda makes no warranties regarding the information contained herein. RF-Lambda assumes no responsibility or liability whatsoever for any of the information contained herein. RF-Lambda assumes no responsibility or liability whatsoever for the use of the information contained herein. The information contained herein is provided "AS IS, WHERE IS" and with all faults, and the entire risk associated with such information is entirely with the user. All information contained herein is subject to change without notice. Customers should obtain and verify the latest relevant information before placing orders for RF-Lambda products. The information contained herein or any use of such information does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other intellectual property rights, whether with regard to such information itself or anything described by such information.

RF-Lambda products are not warranted or authorized for use as critical components in medical, life-saving, or life sustaining applications, or other applications where a failure would reasonably be expected to cause severe personal injury or death.