

Reflective SP4T Electro-Mechanical Switch DC-110GHz



Product Description

RFSP4T110EMB-T is a reflective SP4T electro-mechanical switch with a frequency range of DC to 110GHz.

The typical insertion loss is 1.2dB and the isolation is 70dB with a switching speed of 20ms. This electromechanical switch works with a +24 VDC power supply.

The working temperature of this product is between - 20°C and + 70°C

Features

- SP4T configuration
- Magnetic latching
- Operating life of 500 thousand cycles
- Guaranteed repeatability of 0.05dB up to 500 thousand cycles
- Excellent isolation, typically >60 dB to 90GHz
- 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 – 110		GHz
Insertion Loss	@DC-20GHz			0.6	dB
	@20-67GHz			1.2	dB
	@67-90GHz			1.5	dB
	@90-110GHz			1.8	dB
VSWR	@DC-20GHz			1.4	:1
	@20-67GHz			1.8	:1
	@67-90GHz			2.3	:1
	@90-110GHz			2.5	:1
Isolation	@DC-20GHz	80			dB
	@20-67GHz	70			dB
	@67-90GHz	60			dB
	@90-110GHz	60			dB
Input Power				1	W
Switching Speed				20	ms
Life Cycles		500,000			Times
Repeatability				0.08	dB
Supply Current (VCC=+24VDC)			0.2		A
Weight			0.44		lbs.
Impedance			50		Ohms
Connector			1.0mm-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

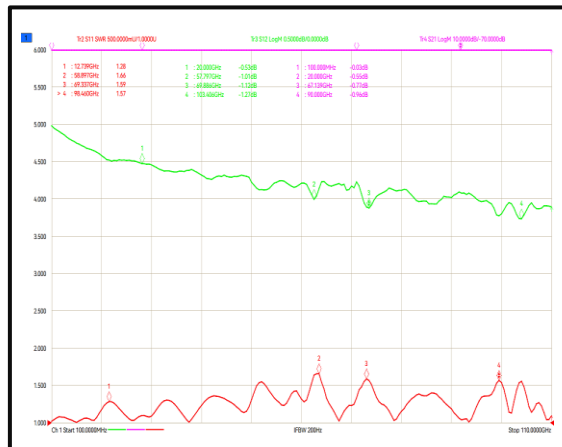
Environmental Specifications and Test Standards

Parameter	Description
Operational Temperature	-20°C to +70°C (Case Temperature)
Storage Temperature	-50°C to +85°C
Thermal Shock	-20°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)

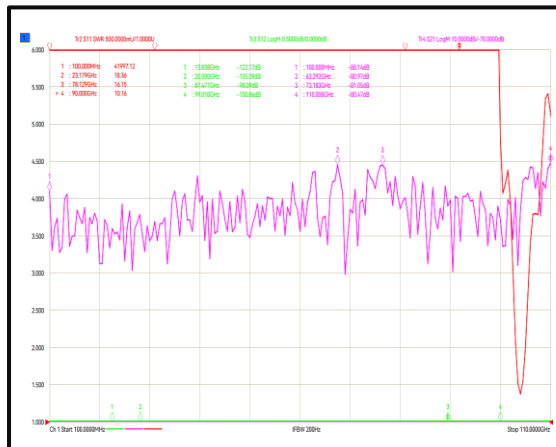
*For vibration testing details please see additional information section.

Typical Performance Plots

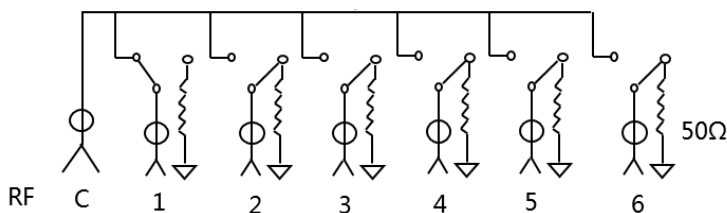
Insertion Loss & VSWR



Isolation

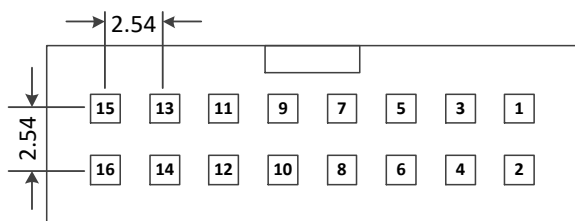


Functional Diagram

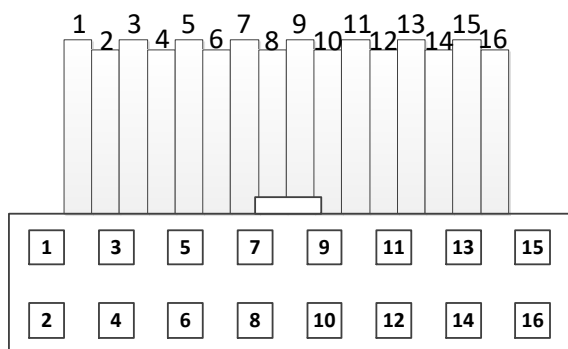


Note: Reflective models do not include 50ohm terminations.

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, Rated voltage: +3V, Low = 0 to 0.8V, Rated voltage: 0V)

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

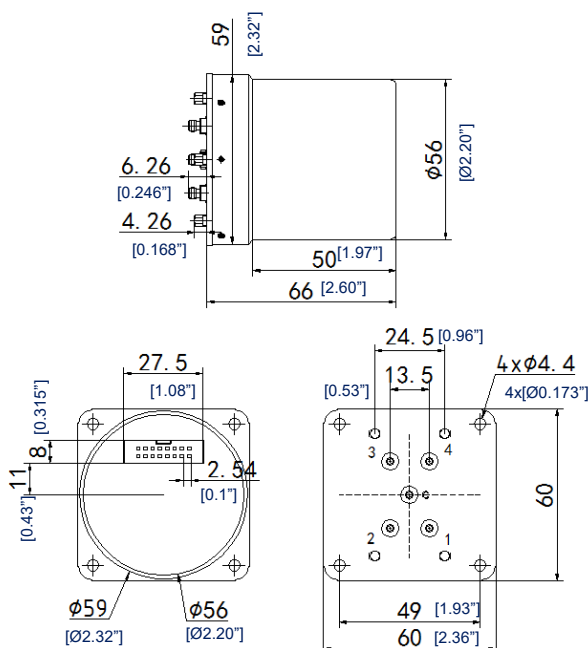
Note:

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

GND: Ground

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

Outline Drawing



Notes:

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



Additional Information

Documentation	Webpage
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
RFSP4T110EMB-T	Connectors 1.0mm-Female TTL	DC-110GHz SP4T Electromechanical Switch

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