Reflective Coaxial SP4T Switch
115MHz-140MHz

Product Description

RFSP4TR0125M is a reflective coaxial single pole four throw switch with a frequency range of 115 to 140MHz.

The power input of this switch is 10dBm Max. The Insertion Loss is 5.1dB max with a minimum isolation of 40dB

The product features fast switching speed, low insertion loss and high isolation.

The working temperature of this product is between - 40 ℃ and + 85 ℃

Features

- TTL compatible driver included
- Fast Switching Speed
- Low Power Cold Switching
- Insertion Loss 5.1dB
- Isolation 40dB
- 50 Ohm Matched

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, TA = +25°C, Vdd = +5V/5V, TTL = 0 / +5V

Parameter	Min	Typ	Max	Units
Frequency Range		0.115-0.14		GHz
Insertion Loss			5.1	dB
Insertion Loss Temperature Coefficient		0.003		dB/ °C
Isolation	40		90	dB
Input VSWR		1.1	1.3	:1
Output VSWR		1.1	1.3	:1
RF Input Power (CW)	7	8	10	dBm
DC Power Dissipation (CW)		0.3		W
IIP3		35		dBm
0.1dB Compression Point(P0.1dB)		23		dBm
Switching Speed			500	ns
Bias Current (+5V / -5V)		300/100 Max.		mA
Weight		0.167 Max.		lbs
Impedance		50		Ω
Input / Output Connectors		SMA-Female		
Package		Epoxy Sealed (Standard)		
		Hermetically Sealed (Optional)		

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RF switch measurements

Serial #		115MHz		120MHz		130MHz		140MHz		Spec
		LOGIC		LOGIC		LOGIC		LOGIC		
Test	Port	0	1	0	1	0	1	0	1	
VSWR	J1	1.2	1.21	1.18	1.2	1.16	1.18	1.14	1.16	<1.3:1
	J2	1.1	1.1	1.11	1.11	1.12	1.12	1.13	1.13	<1.3:1
	J3	1.11	1.12	1.1	1.12	1.08	1.12	1.04	1.12	<1.3:1
	J4	1.04	1.01	1.04	1.01	1.04	1.01	1.04	1.01	<1.3:1
Insertion Loss	J3-J4	51		0.54		0.47		0.5		<1.5dB
	J1-J2	1.1	1.07	1.24	1.17	1.39	1.37	1.58	1.63	<3.6dB
	J1-J3		2.62		2.73		2.96		3.17	<5.1dB
Isolation	J2-J3		44		44		45		45	>40dB
	J1-J3	112		110		106		111		>93dB
	J1-J3				>96					>93dB
	J4-J3		103		108		102		110	>90dB
	J3-J4				>100					>90dB
DC Power	5Vdc				94mA					100mA max
	+15Vdc				92mA					300mA max

RF Switch J1-J2 loss w.r.t. input power

115MHz LOGIC 0 Pin @ J1(dBm)	Pin @J2(dBm)	Loss(dB)	Spec
0	-1.78	1.78	<3.6dB
1	-0.78	1.78	<3.6dB
2	0.21	1.79	<3.6dB
3	1.21	1.79	<3.6dB
4	2.25	1.75	<3.6dB
5	3.24	1.76	<3.6dB
6	4.22	1.78	<3.6dB
7	5.22	1.78	<3.6dB
8	6.2	1.8	<3.6dB
9	7.19	1.81	<3.6dB
10	8.18	1.82	<3.6dB
11	9.12	1.88	<3.6dB
12	9.94	2.06	<3.6dB
13	10.54	2.46	<3.6dB

Absolute Maximum Ratings

Parameter	Rating
Biasing	+5V±10%/+15V±10%

* TTL pins cannot be connected to the negative voltage otherwise the internal driver will be damaged.

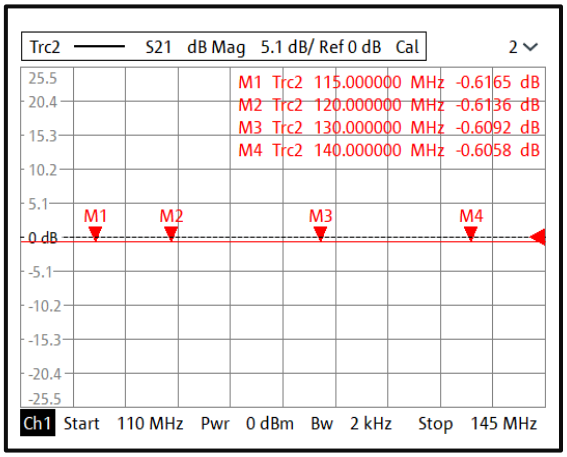
Environmental Specifications and Test Standards

Parameter	Description
Operational Temperature	-40ºC to +85ºC (Case Temperature)
Storage Temperature	-50ºC to +105ºC
Thermal Shock	-40ºC → +85ºC (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 +85ºC 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)

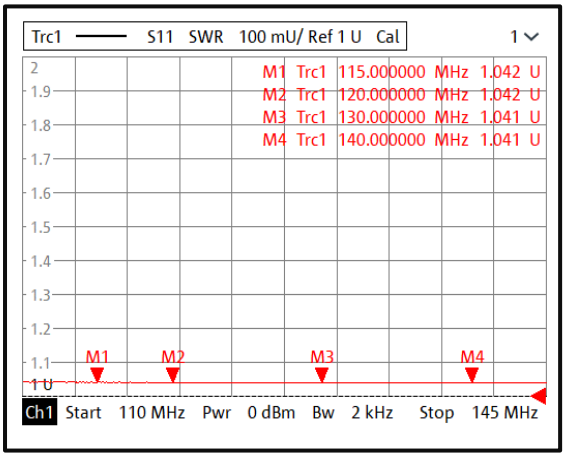
*For vibration testing details please see additional information section.

Typical Performance Plots

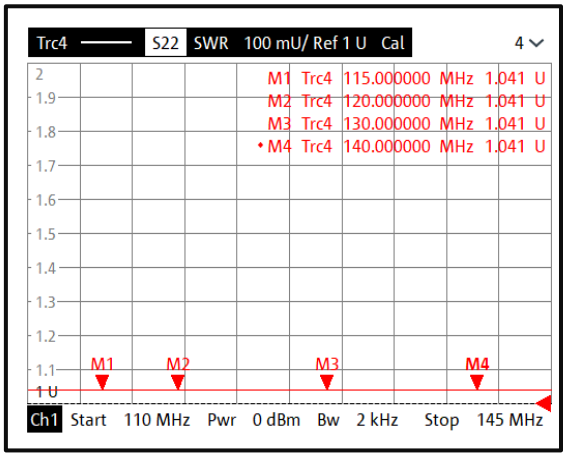
Insertion Loss @+25℃



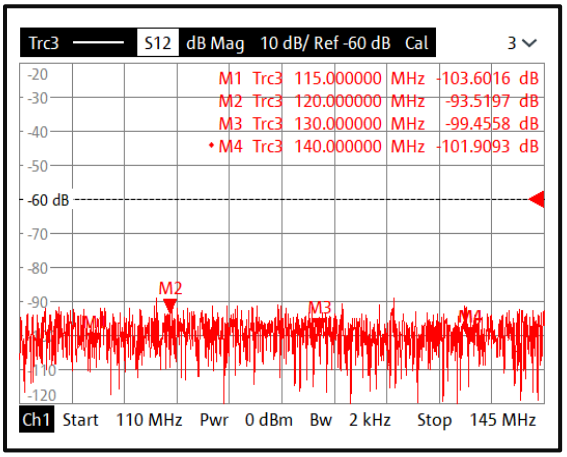
Input VSWR @+25℃



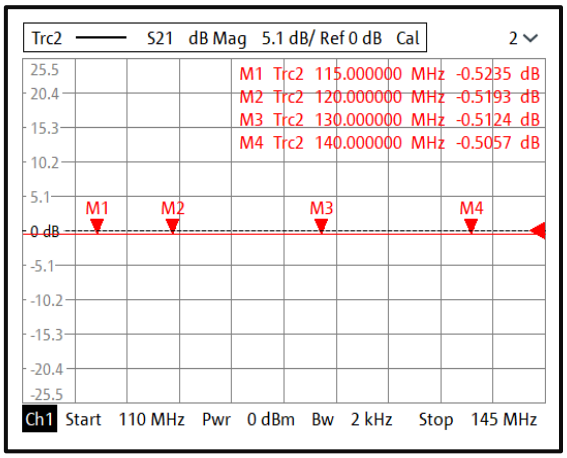
Output VSWR @+25℃



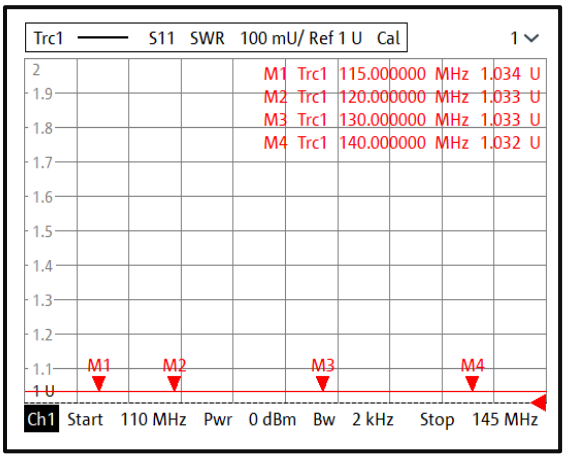
Isolation @+25℃



Insertion Loss @-40℃

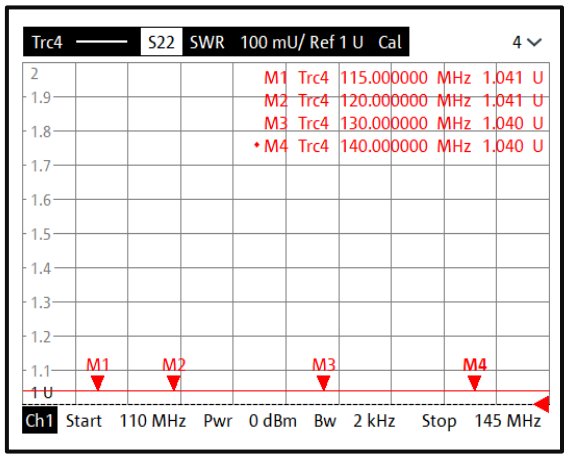


Input VSWR @-40℃

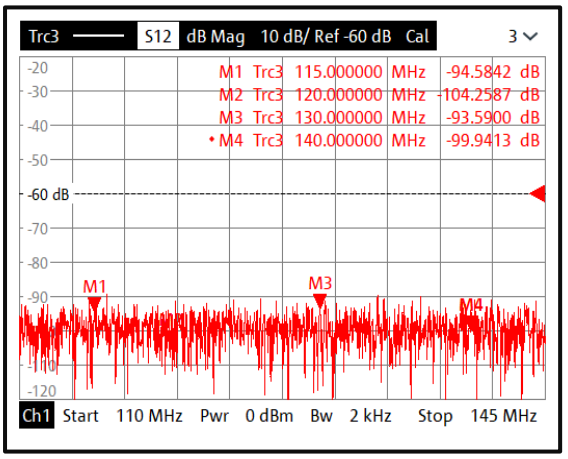


Typical Performance Plots

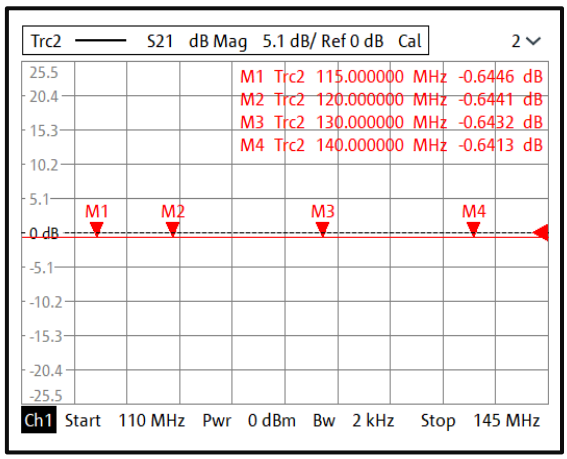
Output VSWR @-40℃



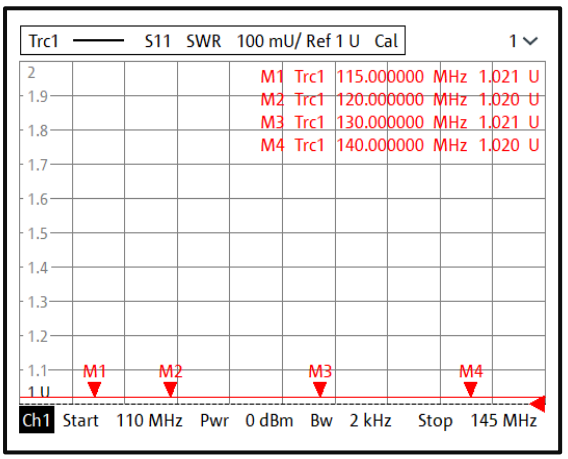
Isolation @-40℃



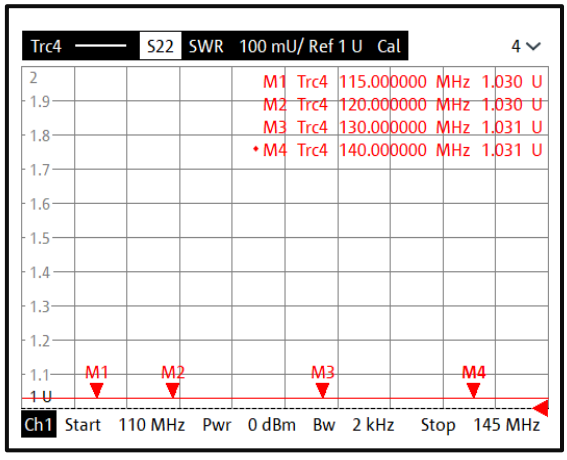
Insertion Loss @+85℃



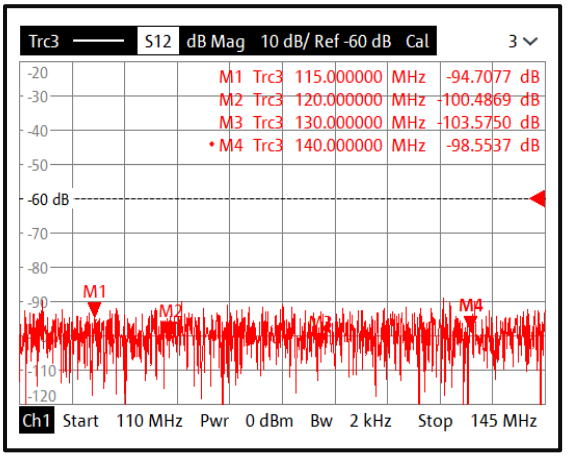
Input VSWR @+85℃



Output VSWR @+85℃

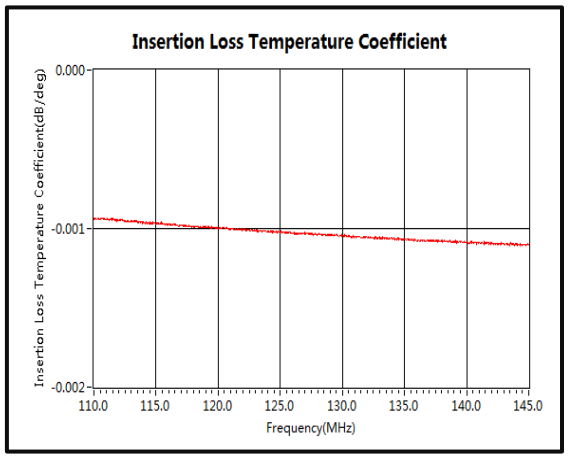


Isolation @+85℃

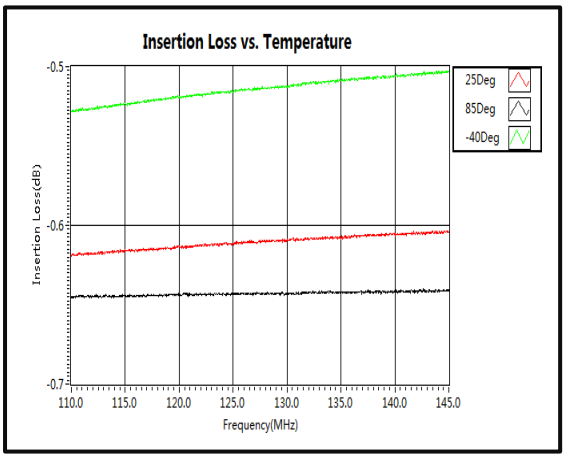


Typical Performance Plots

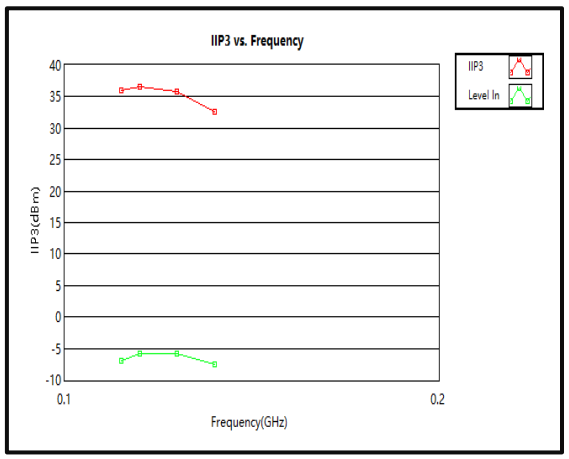
Insertion Loss Temperature Coefficient



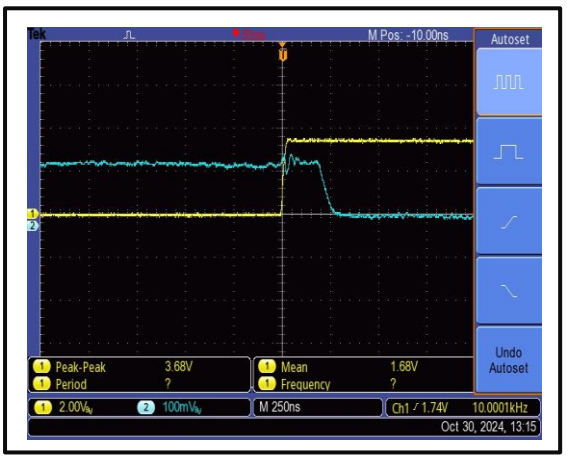
Insertion Loss vs. Temperature



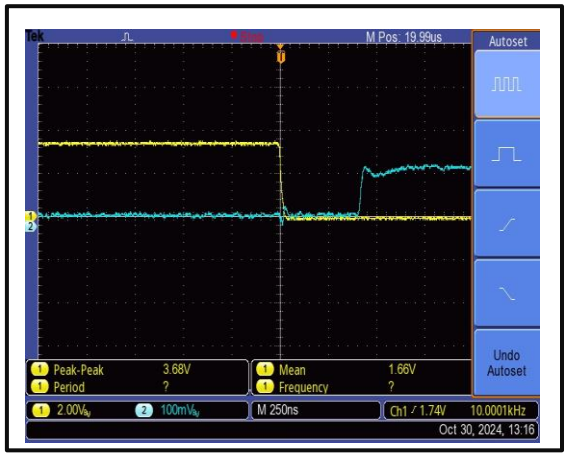
IIP3



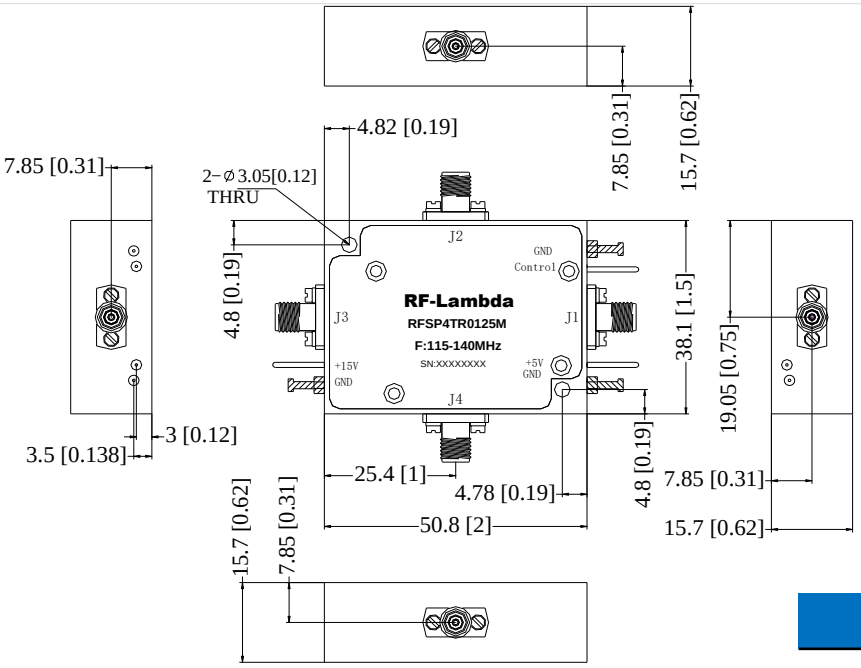
Switching Speed



Switching Speed

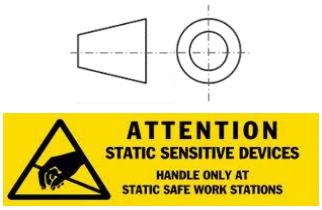


Outline Drawing



Truth Table	
TTL Control Voltage THRESHOLD	Low(0)=0~0.8V
	High(1)=2.8~5V
Control Input TTL	Signal Path State
1	J1-J3 J1-J2
0	J3-J4 J1-J2
Control Pin Customization Available Upon Request	

Notes:
1. Package Material: Aluminum.
2. Finish: Gold Plated.
3. All dimensions are in millimeters [inches].
4. Housing Tolerances±0.1 [0.004]unless otherwise specified.
5. Standard torque wrench must be used to secure RF connectors.



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
RFSP4TR0125M	Standard	115MHz-140MHz SP4T PIN Diode Switch

Important Notice

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