

## SPDT Absorptive Electro-Mechanical Switch DC-18GHz



### Product Description

RFSPDT18EMC-T is a SPDT absorptive electro-mechanical switch with a frequency range of DC to 18GHz.

The power of this switch is 40W Max. The typical insertion loss is 0.6dB and the Isolation is 60dB with the speed of 20ms. This electromechanical switch works with typically +24 VDC power supply.

The repeatability and reliability of this switch is vital to ATS measurement accuracy and can cut the cost of ownership by reducing calibration cycles.

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

### Features

- SPDT configuration TTL Control
- Magnetic latching
- Operating life of 1 million cycles
- Guaranteed repeatability of 0.05dB up to 1 million cycles
- Excellent isolation, typically >80 dB to 20GHz
- TTL/5V CMOS compatible (Optional).
- 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<sub>A</sub>=+25°C)

| Parameter                   |                                | Min | Typ               | Max  | Units   |
|-----------------------------|--------------------------------|-----|-------------------|------|---------|
| Frequency Range             |                                |     | DC – 18           |      | GHz     |
| Insertion Loss              | @DC-12.4GHz                    |     |                   | 0.3  | dB      |
|                             | @12.4-18GHz                    |     |                   | 0.6  | dB      |
| VSWR                        | @DC-12.4GHz                    |     |                   | 1.3  | :1      |
|                             | @12.4-18GHz                    |     |                   | 1.5  | :1      |
| Isolation                   | @DC-18GHz                      | 60  |                   |      | dB      |
| Input Power                 | @DC-12.4GHz                    |     |                   | 40   | W       |
|                             | @12.4-18GHz                    |     |                   | 25   | W       |
| Switching Speed             |                                |     |                   | 20   | ms      |
| Life Cycles                 |                                | 1   |                   |      | Million |
| Repeatability               |                                |     |                   | 0.05 | dB      |
| Supply Current (VCC=+24VDC) |                                |     | 0.24 Typ.         |      | A       |
| Weight                      |                                |     | 0.18 Typ.         |      | lbs.    |
| Impedance                   |                                |     | 50                |      | Ohms    |
| Connector                   |                                |     | SMA -Female       |      |         |
| Actuator Type               |                                |     | Latching          |      |         |
| Contact                     |                                |     | Break Before Make |      |         |
| Control                     |                                |     | TTL               |      |         |
| Package                     | Epoxy Sealed (Standard)        |     |                   |      |         |
|                             | Hermetically Sealed (Optional) |     |                   |      |         |

### Absolute Maximum Ratings

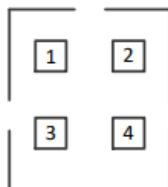
| Parameter            | Rating     |
|----------------------|------------|
| Supply Voltage Range | 20 – 28VDC |

### Environmental Specifications and Test Standards

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

\*For vibration testing details please see additional information section.

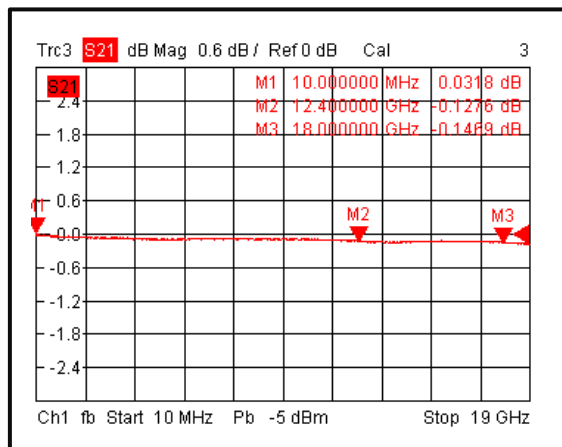
### Pin Descriptions



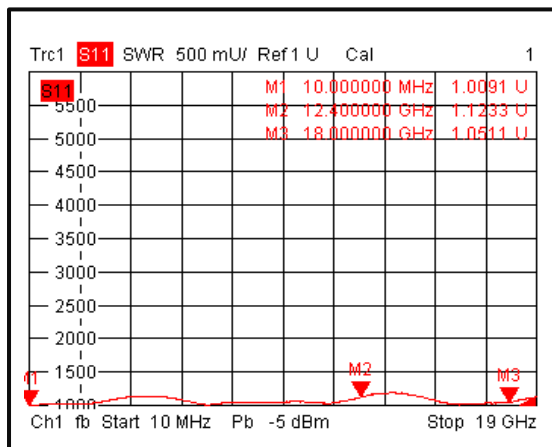
| State   | TTL Drive Voltage |      |      |      |
|---------|-------------------|------|------|------|
|         | PIN1              | PIN2 | PIN3 | PIN4 |
| RF to 1 | GND               | +24V | High | Low  |
| RF to 2 | GND               | +24V | Low  | High |

Typical Performance Plots

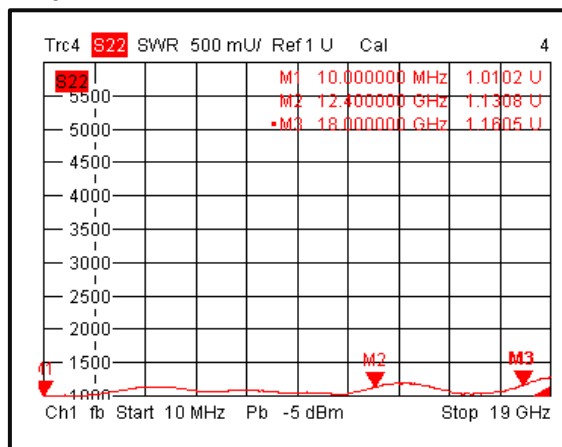
Insertion Loss@+25°C



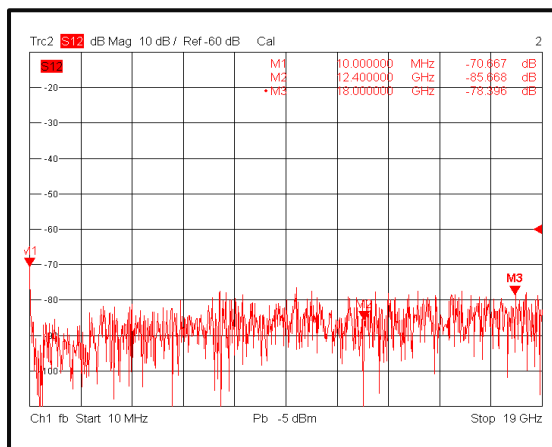
Input VSWR@+25°C



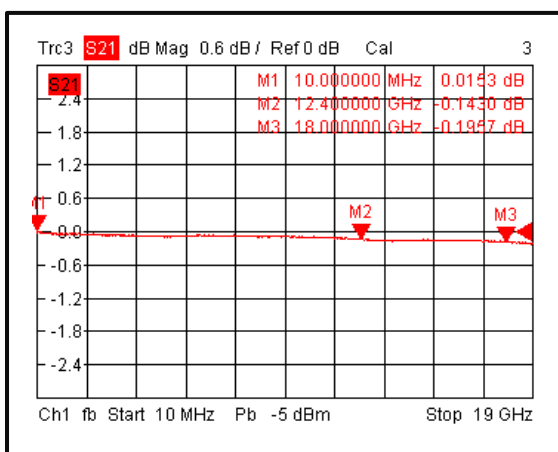
Output VSWR@+25°C



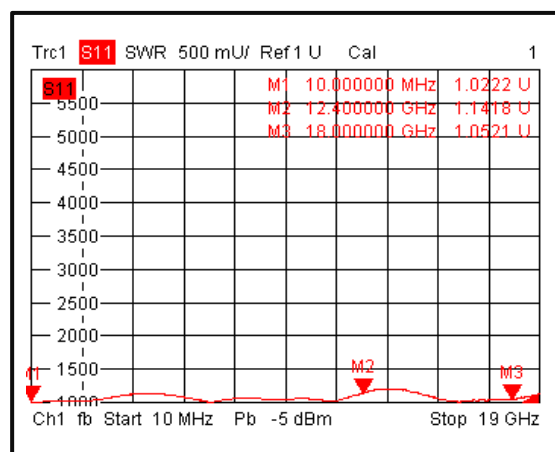
Isolation@+25°C



Insertion Loss @-25°C

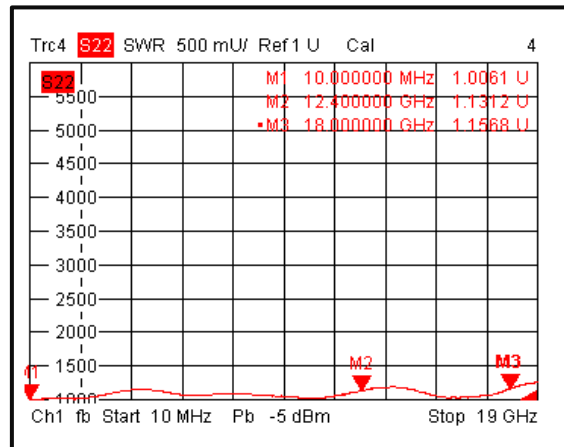


Input VSWR @-25°C

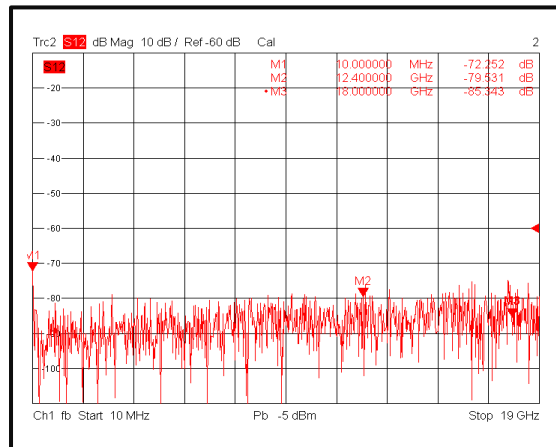


## Typical Performance Plots

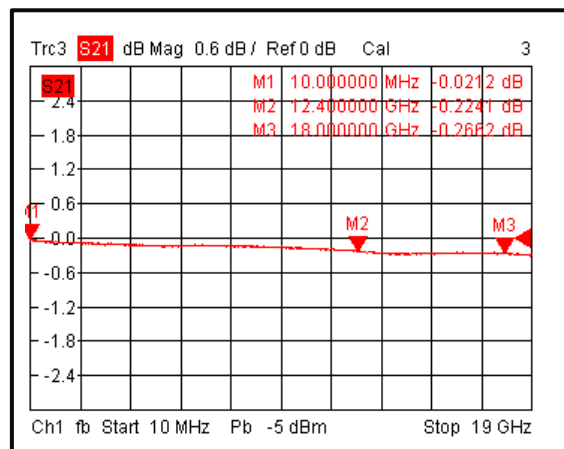
### Output VSWR @-25°C



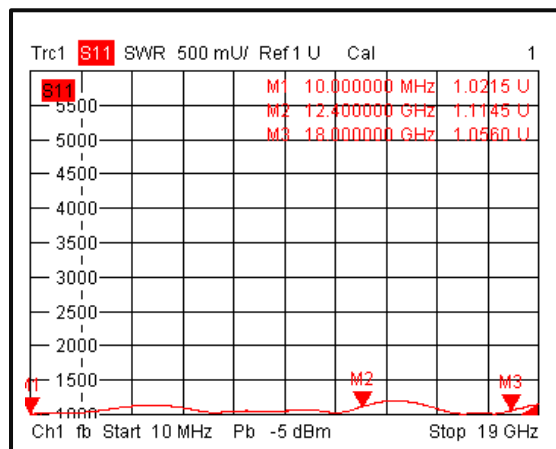
### Isolation @-25°C



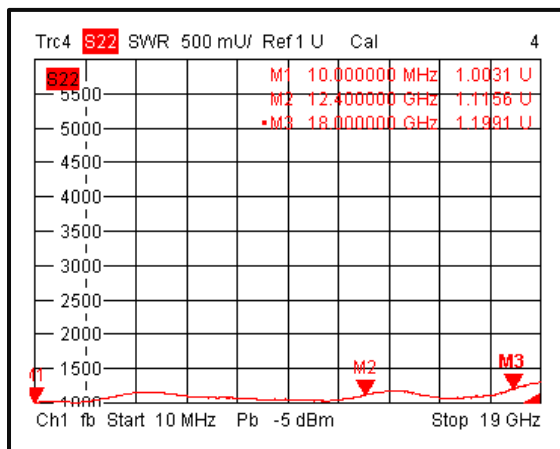
### Insertion Loss @+70°C



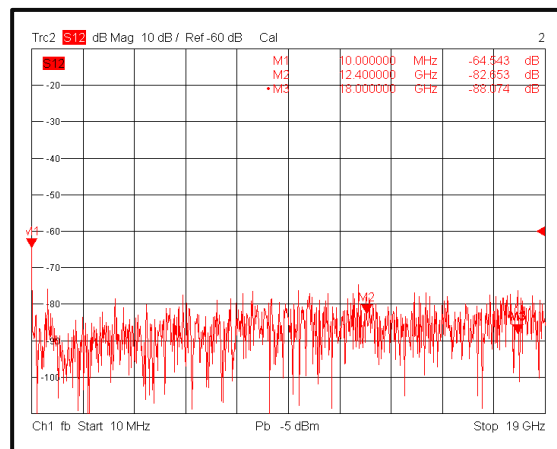
### Input VSWR @+70°C



### Output VSWR @+70°C

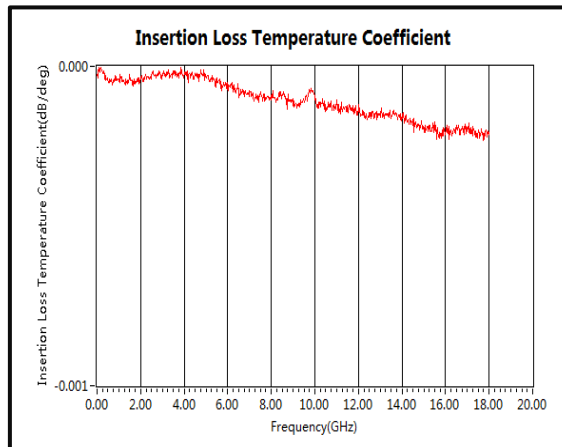


### Isolation @+70°C

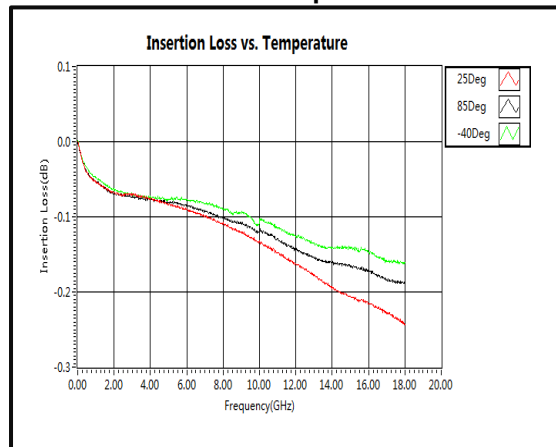


Typical Performance Plots

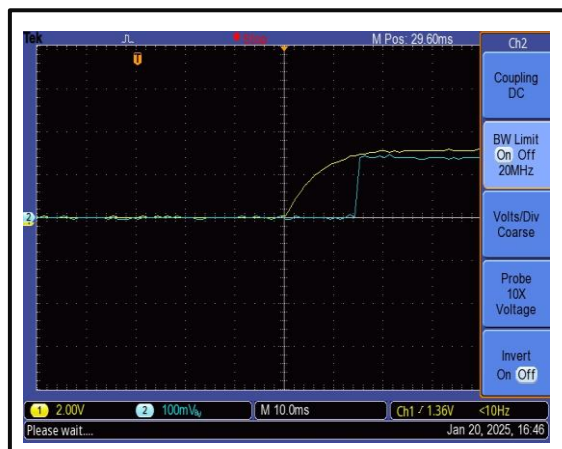
Insertion Loss Temperature Coefficient



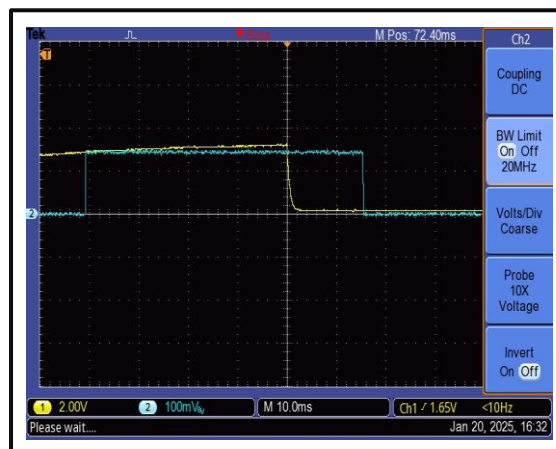
Insertion Loss vs. Temperature



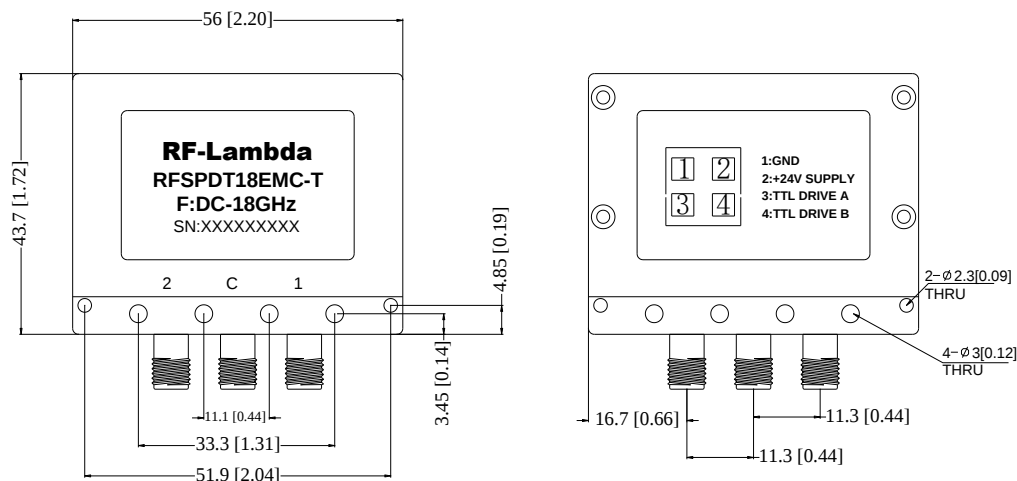
Switching Speed



Switching Speed



**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](https://rflambda.com/pdf/rflambda_esd_control.pdf)

Connector Torque Specifications

[https://www.rflambda.com/pdf/Torque\\_Specifications.pdf](https://www.rflambda.com/pdf/Torque_Specifications.pdf)

Random Vibration Test Standard

[https://www.rflambda.com/pdf/rflambda\\_random\\_vibration\\_MIL-STD-202G.pdf](https://www.rflambda.com/pdf/rflambda_random_vibration_MIL-STD-202G.pdf)

**Ordering Information**

| Part Number   | Modification                      | Description                            |
|---------------|-----------------------------------|----------------------------------------|
| RFSPDT18EMC-T | connectors SMA-Female TTL Control | DC-18GHz SPDT Electromechanical Switch |

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