

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



Note: Photo is for illustration purposes only.  
Please refer to outline drawing.

### Product Description

RFSPDT18EMB-S is a SPDT reflective electro-mechanical switch with a frequency range of DC to 18GHz.

The power of this switch is 2W max. The typical insertion loss is 0.6dB and the Isolation is 60 dB with the speed of 20ms.

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

### Features

- SPDT configuration
- Magnetic latching
- Operating life of 1 million cycles
- Guaranteed repeatability of 0.05dB up to 1 million cycles
- Standard 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<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     |             |                                |                   | 2    | W       |
| Switching Speed |             |                                |                   | 20   | ms      |
| Life Cycles     |             | 1                              |                   |      | Million |
| Repeatability   |             |                                |                   | 0.05 | dB      |
| Supply Current  | VCC=+24VDC  |                                | 200               |      | mA      |
| Weight          |             |                                | -                 |      | lbs.    |
| Impedance       |             |                                | 50                |      | Ohms    |
| Connector       |             |                                | SMA-Female        |      |         |
| Actuator Type   |             |                                | Latching          |      |         |
| Contact         |             |                                | Break Before Make |      |         |
| Control         |             |                                | Standard Ground   |      |         |
| Package         |             | Epoxy Sealed (Standard)        |                   |      |         |
|                 |             | Hermetically Sealed (Optional) |                   |      |         |

### Absolute Maximum Ratings

| Parameter      | Rating      |
|----------------|-------------|
| Supply Voltage | +20 to +28V |

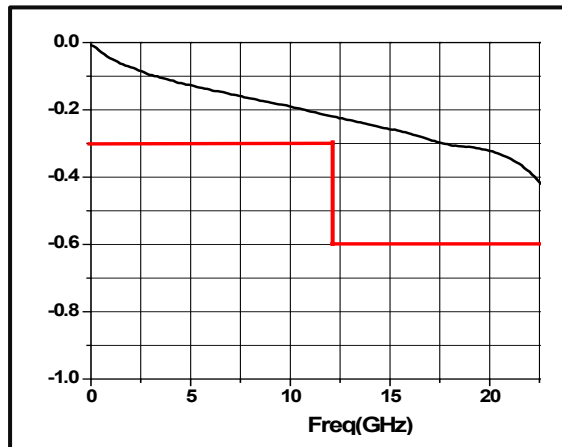
### Environmental Specifications and Test Standards

| Parameter                         | Description                                                                                                                                                                                                     |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operational Temperature           | -20°C to +70°C<br>(Case Temperature)                                                                                                                                                                            |
| Storage Temperature               | -50°C to +85°C                                                                                                                                                                                                  |
| Thermal Shock                     | -40°C → +85°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)                                                                                                                                                                     |

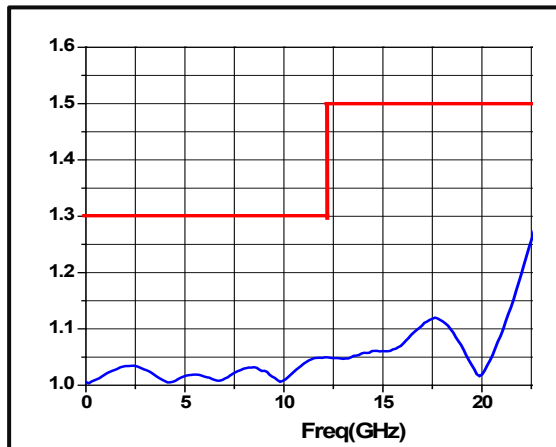
\*For vibration testing details please see additional information section.

Typical Performance Plots

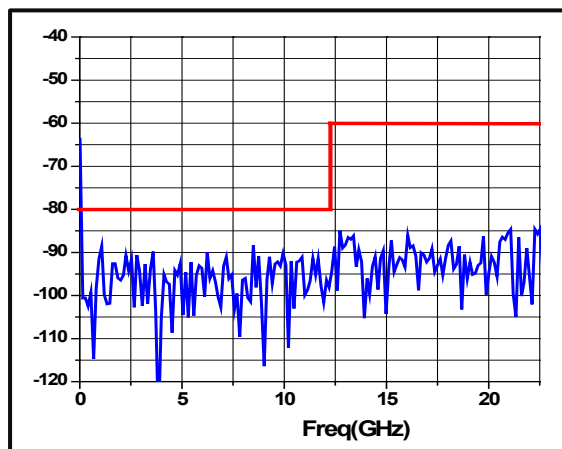
Insertion Loss



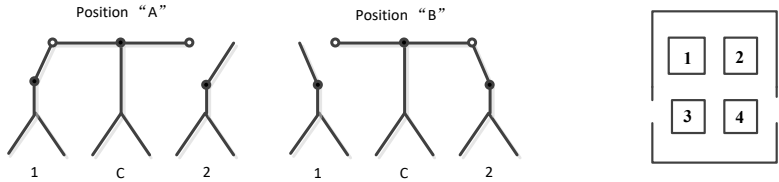
VSWR



Isolation



**Functional Diagram**



PIN 1 connect the ground, PIN 2 connect +24V/+12V/+5V, PIN3 and PIN4 are control PINS.

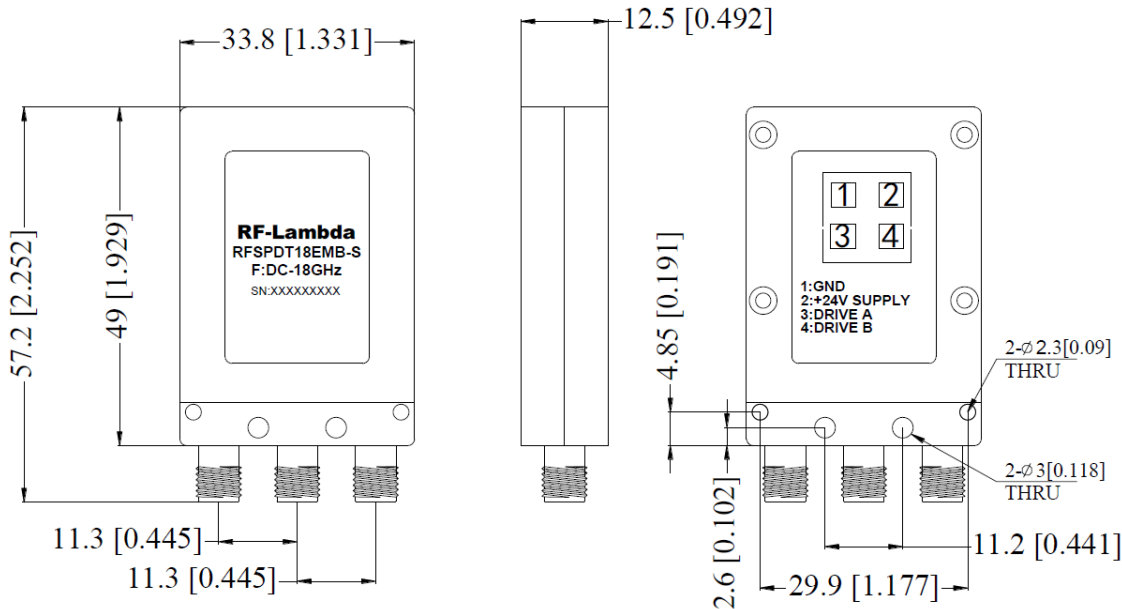
**Control Table**

| PIN1 | PIN2 | PIN3 | PIN4 | Path                   |
|------|------|------|------|------------------------|
| GND  | +24V | GND  | OPEN | PositionA (C↔ 1)       |
| GND  | +24V | OPEN | GND  | PositionB (C↔ 2)       |
| GND  | +24V | OPEN | OPEN | Keep the original path |
| GND  | +24V | GND  | GND  | forbidden              |

**Notes:**

1. When the power path of the switch is in the off state, the switch port is connected to the load sheet, so at this time the max input power of the port is 1W(CW).
2. The negative pole must always be connected to ground. if the negative pole is not connected to power supply ground, catastrophic failure will occur.
3. Before switching, microwave signal sources must be cut off.

**Outline Drawing**



**Notes:**

1. Package Material: Aluminum
2. Finish: Grey Paint
3. All dimensions are in millimeters [inches].
4. Tolerances  $\pm 0.5$  [0.02] unless otherwise specified.



**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

RFSPDT18EMB-S

Connectors SMA-Female Standard Ground

DC-18GHz SPDT Electromechanical Switch

**Important Notice**

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