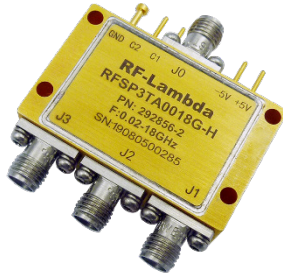


## Hermetically Sealed Absorptive Coaxial SP3T Switch 0.02GHz-18GHz



### Features

- TTL compatible driver included
- Fast Switching Speed
- Low Power Cold Switching
- Insertion Loss 3.0dB
- Isolation 75dB Typical
- 50 Ohm Matched

### Product Description

RFSP3TA0018G-H is a hermetically sealed absorptive coaxial single pole three throw switch with a frequency range of 0.02 to 18GHz.

The maximum power input of this switch is 30dBm. The insertion loss is 3.0dB with a typical isolation of 75dB.

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

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

### 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 | Min | Typ                                    | Max | Min | Typ   | Max | Units  |
|--|-----|--------|-----|-----|--|-----|-----|-------|-----|--------|
| Frequency Range                        |     | 0.02~6 |     |     | 6~12                                   |     |     | 12~18 |     | GHz    |
| Insertion Loss                         |     | 2.0    | 2.2 |     | 4.2                                    | 4.5 |     | 4.4   | 4.8 | dB     |
| Insertion Loss Temperature Coefficient |     | 0.003  |     |     | 0.003                                  |     |     | 0.003 |     | dB/ °C |
| Isolation                              | 60  | 80     |     | 60  | 75                                     |     | 60  | 68    |     | dB     |
| Input VSWR                             |     | 1.8    | 2.0 |     | 1.5                                    | 1.8 |     | 1.5   | 1.8 | : 1    |
| Output VSWR                            |     | 1.5    | 1.8 |     | 1.5                                    | 1.8 |     | 1.5   | 1.8 | : 1    |
| RF Input Power                         |     |        | 30  |     |  | 30  |     |       | 30  | dBm    |
| Power Dissipation                      |     | 0.85   |     |     | 0.85                                   |     |     | 0.85  |     | W      |
| 0.1dB Compression Point (P0.1dB )      |     | 30     |     |     | 30                                     |     |     | 30    |     | dBm    |
| IIP3                                   |     | 37     |     |     | 38                                     |     |     | 35    |     | dBm    |
| Switching Speed                        |     |        |     |     | 250 Max.                               |     |     |       |     | ns     |
| Bias Current (+5V/-5V)                 |     |        |     |     | 120/50 Max.                            |     |     |       |     | mA     |
| Weight                                 |     |        |     |     | 0.07 Max.                              |     |     |       |     | lbs    |
| Impedance                              |     |        |     |     | 50                                     |     |     |       |     | Ω      |
| Input / Output Connectors              |     |        |     |     | SMA-Female(Input) – SMA-Female(Output) |     |     |       |     |        |
| Package                                |     |        |     |     | Hermetically Sealed (Laser Welded)     |     |     |       |     |        |

**Absolute Maximum Ratings**

| Parameter | Rating          |
|-----------|-----------------|
| Biasing   | +5V±10%/-5V±10% |

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

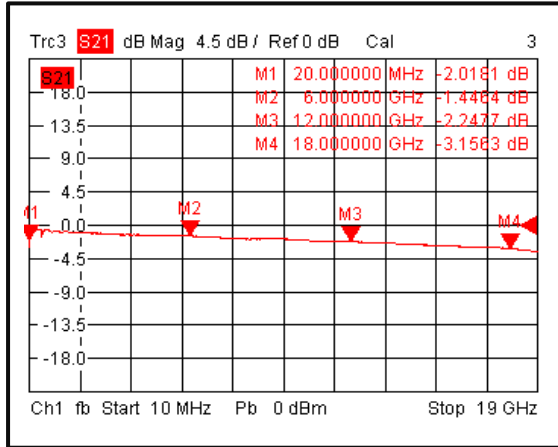
**Environmental Specifications and Test Standards**

| Parameter                      | Description   |
|--------------------------------|---|
| Operational Temperature        | -40°C to +85°C<br>(Case Temperature)  |
| Storage Temperature            | -50°C to +105°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 +85°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 (Optional) | MIL-STD-883 (For Hermetically Sealed Units)   |

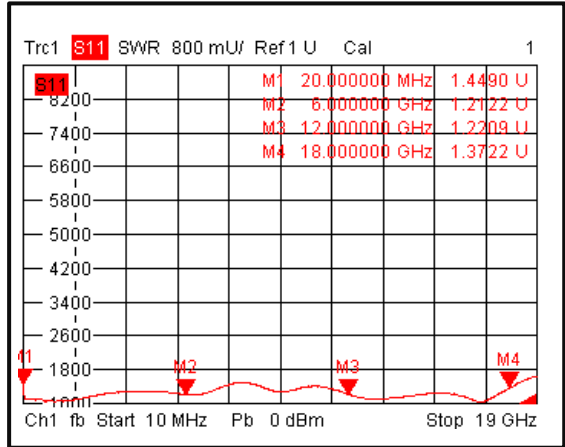
\*For vibration testing details please see additional information section.

Typical Performance Plots

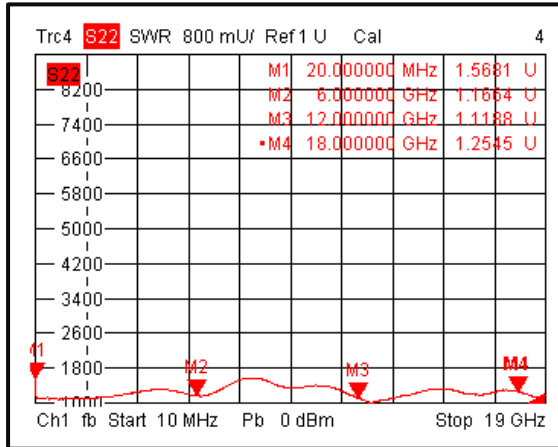
Insertion Loss @+25°C



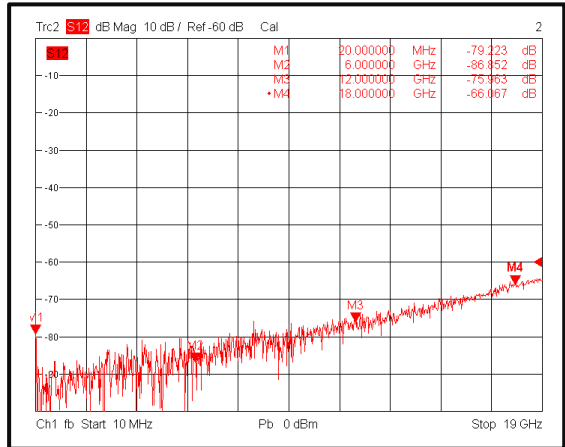
Input VSWR @+25°C



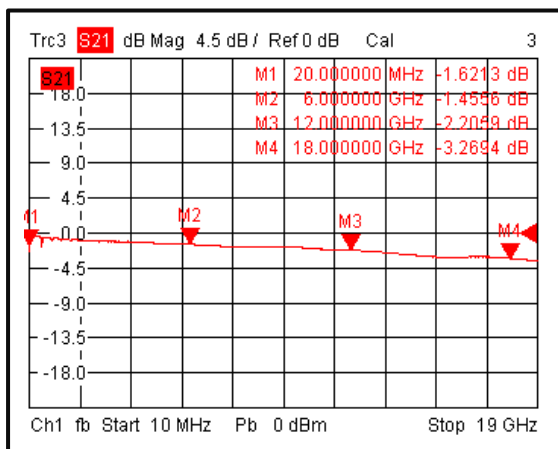
Output VSWR @+25°C



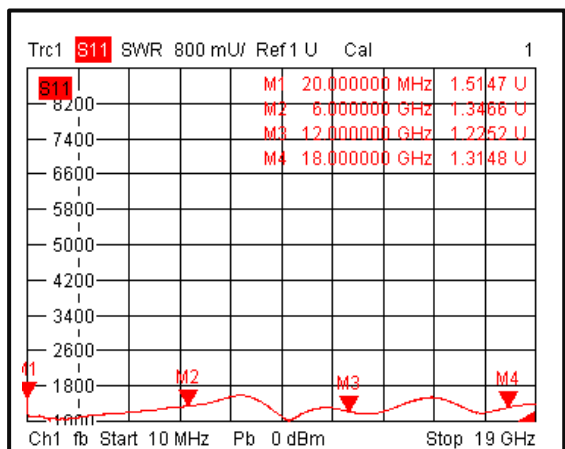
Isolation @+25°C



Insertion Loss @-40°C

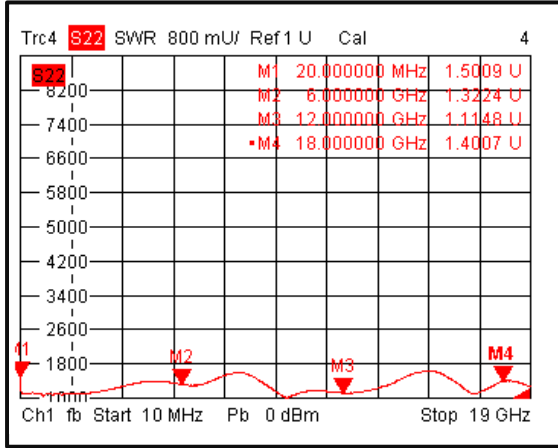


Input VSWR @-40°C

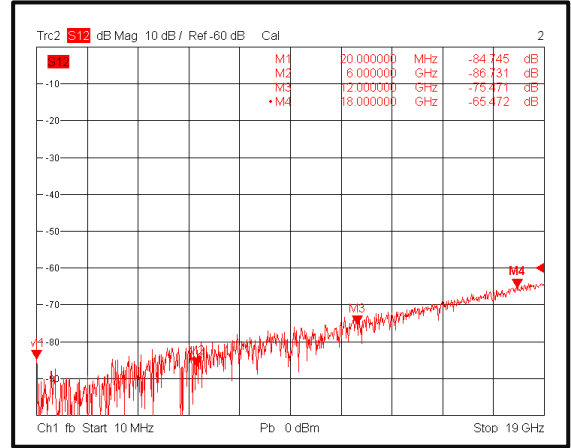


Typical Performance Plots

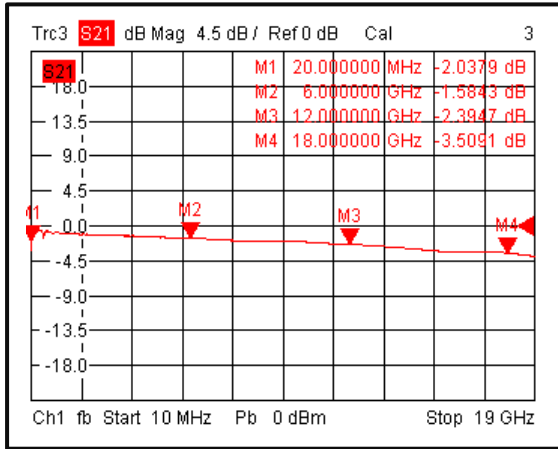
Output VSWR @-40°C



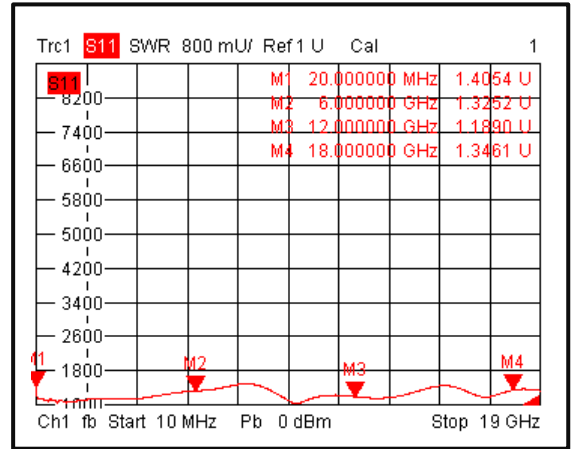
Isolation @-40°C



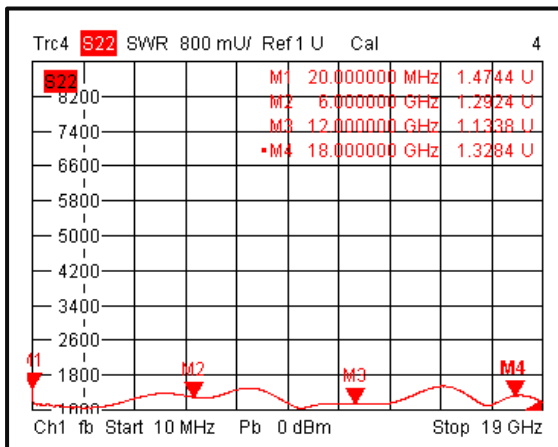
Insertion Loss @+85°C



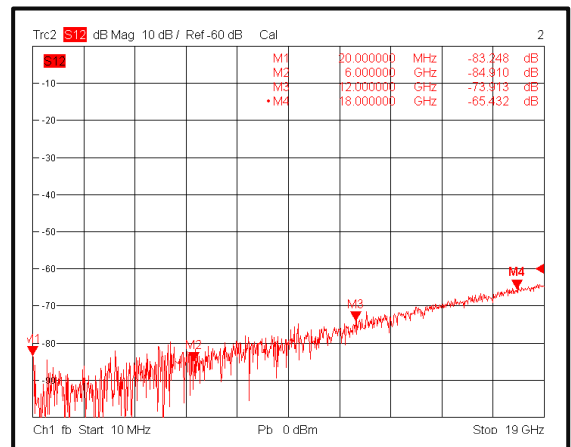
Input VSWR @+85°C



Output VSWR @+85°C

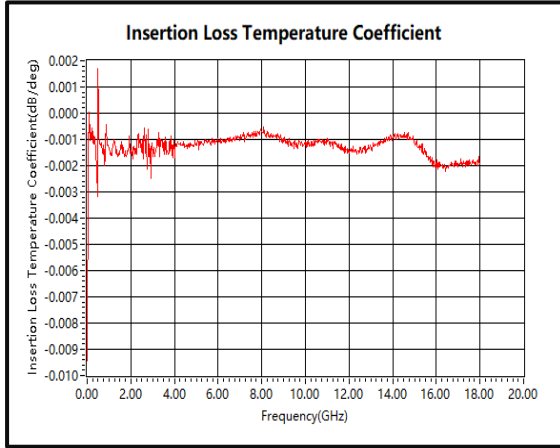


Isolation @+85°C

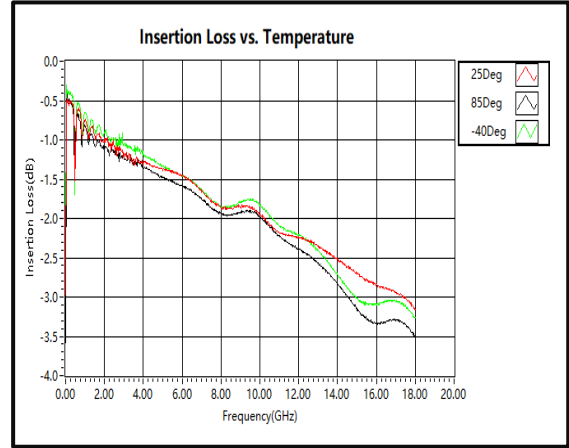


**Typical Performance Plots**

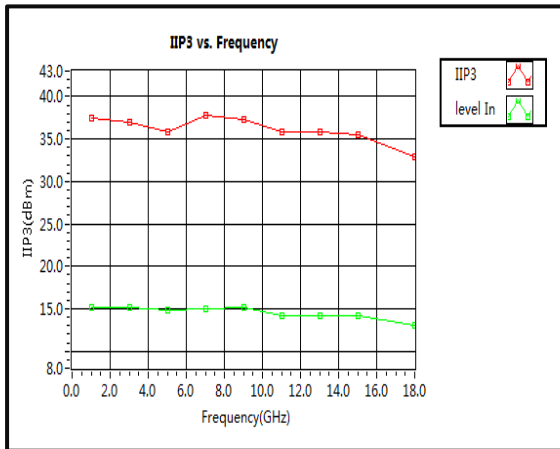
**Insertion Loss Temperature Coefficient**



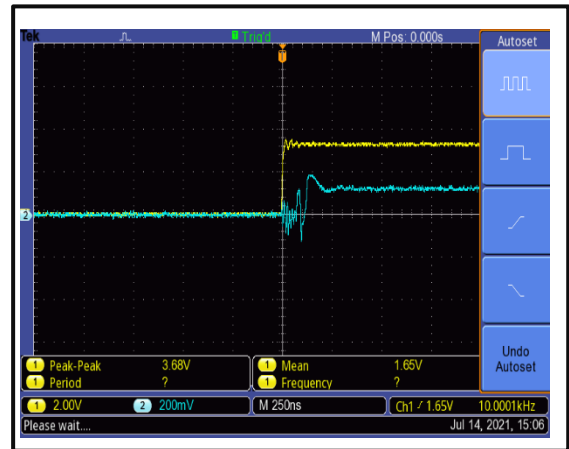
**Insertion Loss vs. Temperature**



**IIP3**



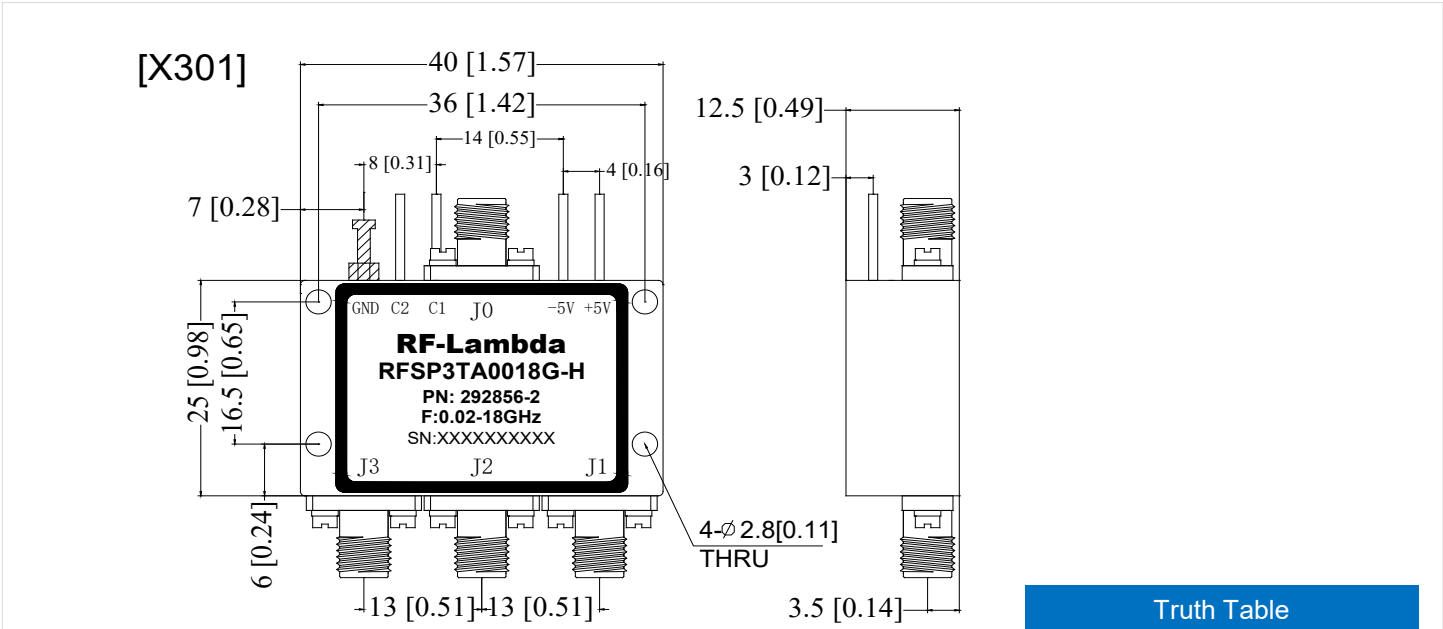
**Switching Speed**



**Switching Speed**



**Outline Drawing**

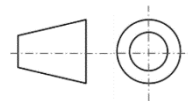


**Truth Table**

|  |                   |       |
|--|-------------------|-------|
| TTL Control Voltage                              | Low(0)=0~0.8V     |       |
| THRESHOLD  | High(1)=2.8~5V    |       |
| Control Input TTL                                | Signal Path State |       |
| C1   | C2                |       |
| 0  | 0                 | J0-J1 |
| 0  | 1                 | J0-J2 |
| 1  | 0                 | J0-J3 |
| 1  | 1                 | OFF   |
| Control Pin Customization available upon request |                   |       |

Notes:

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



Additional Information

| Documentation                   | Webpage   |
|---------------------------------|---|
| ESD Policy                      | <a href="https://rflambda.com/pdf/rflambda_esd_control.pdf">https://rflambda.com/pdf/rflambda_esd_control.pdf</a>   |
| Connector Torque Specifications | <a href="https://www.rflambda.com/pdf/Torque_Specifications.pdf">https://www.rflambda.com/pdf/Torque_Specifications.pdf</a>                                   |
| Random Vibration Test Standard  | <a href="https://www.rflambda.com/pdf/rflambda_random_vibration_MIL-STD-202G.pdf">https://www.rflambda.com/pdf/rflambda_random_vibration_MIL-STD-202G.pdf</a> |

**Ordering Information**

| Part Number    | Modification | Description   |
|----------------|--------------|---|
| RFSP3TA0018G-H | Standard     | 0.02-18GHz Hermetically Sealed<br>SP3T PIN Diode Switch |

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