

## Absorptive Coaxial SP8T Switch 0.02GHz-18GHz



### Product Description

RFSP8TA0018G-RS422 is an absorptive coaxial single pole eight throw switch with a frequency range of 0.02 to 18GHz.

The power input of this switch is 30dBm Max. The insertion loss is 3.8dB with a typical isolation of 80dB.

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

### Features

- RS-422 compatible driver included
- Fast Switching Speed
- Low Power Cold Switching
- Insertion Loss 3.8dB
- Isolation 80dB
- 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 | Min | Typ                                    | Max | Min | Typ   | Max | Units  |
|----------------------------------------|-----|--------|-----|-----|----------------------------------------|-----|-----|-------|-----|--------|
| Frequency Range                        |     | 0.02-6 |     |     | 6-12                                   |     |     | 12-18 |     | GHz    |
| Insertion Loss                         |     | 2.5    | 4.5 |     | 3.8                                    | 5.5 |     | 5.5   | 6.0 | dB     |
| Insertion Loss Temperature Coefficient |     | 0.003  |     |     | 0.003                                  |     |     | 0.003 |     | dB/ °C |
| Port to Port Phase Matching            |     |        |     |     | +/-15                                  |     |     |       |     | deg    |
| Isolation                              | 60  | 85     |     | 75  | 80                                     |     | 60  | 70    |     | dB     |
| Input VSWR                             |     | 1.5    | 1.8 |     | 1.5                                    | 1.8 |     | 1.5   | 2.0 | : 1    |
| Output VSWR                            |     | 1.5    | 1.8 |     | 1.5                                    | 1.8 |     | 1.5   | 2.0 | : 1    |
| RF Input Power                         |     |        | 30  |     |                                        | 30  |     |       | 30  | dBm    |
| DC Power Dissipation                   |     | 1.5    |     |     | 1.5                                    |     |     | 1.5   |     | W      |
| 0.1dB Compression Point (P0.1dB )      |     | 30     |     |     | 30                                     |     |     | 30    |     | dBm    |
| IIP3                                   |     | 45     |     |     | 43                                     |     |     | 39    |     | dBm    |
| Switching Speed                        |     |        |     |     | 250 Typ.                               |     |     |       |     | ns     |
| Bias Current (+5V/-5V )                |     |        |     |     | 400/80 Max.                            |     |     |       |     | mA     |
| Weight                                 |     |        |     |     | 0.13 Max.                              |     |     |       |     | lbs    |
| Impedance                              |     |        |     |     | 50                                     |     |     |       |     | Ω      |
| Input / Output Connectors              |     |        |     |     | SMA-Female(Input) – SMA-Female(Output) |     |     |       |     |        |
| Interface and Control Connector        |     |        |     |     | Micro-D9 (Female )                     |     |     |       |     |        |
| Package                                |     |        |     |     | Epoxy Sealed (Standard)                |     |     |       |     |        |
|                                        |     |        |     |     | Hermetically Sealed (Optional)         |     |     |       |     |        |

### 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.

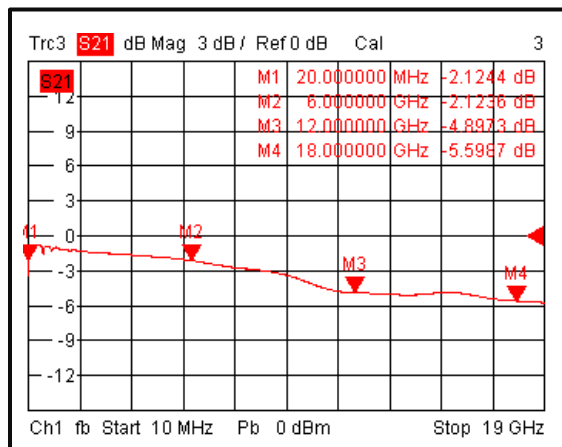
### Environmental Specifications and Test Standards

| 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<br>(Optional) | MIL-STD-883 (For Hermetically Sealed Units)                                                                                                                                                                     |

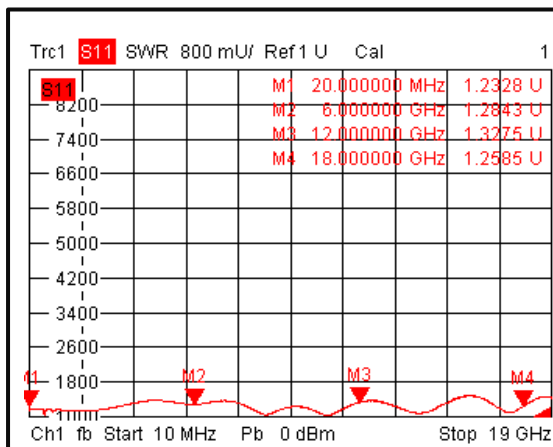
\*\*For vibration testing details please see additional information section.

Typical Performance Plots

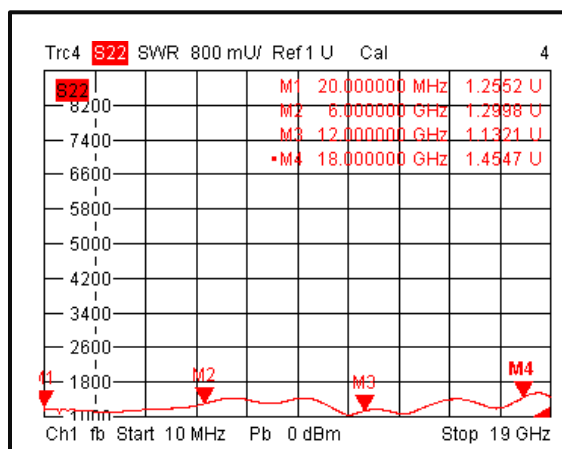
Insertion Loss @+25°C



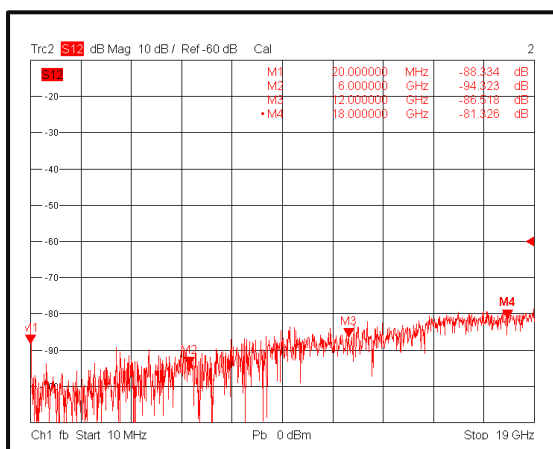
Input VSWR @+25°C



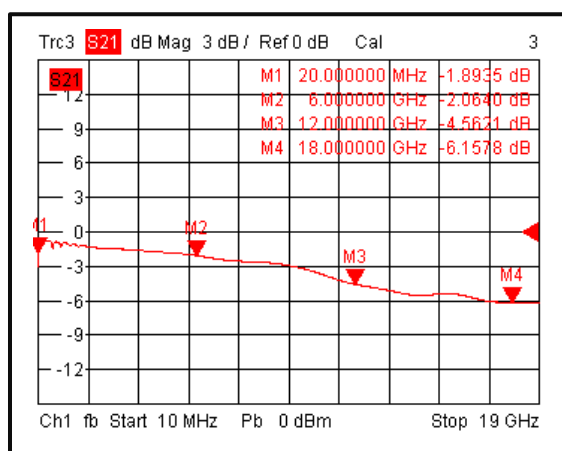
Output VSWR @+25°C



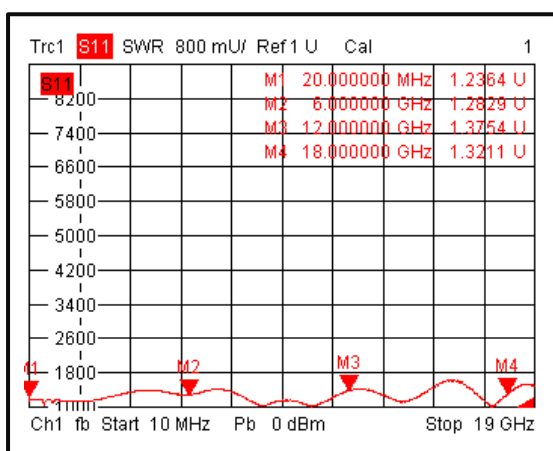
Isolation @+25°C



Insertion Loss @-40°C

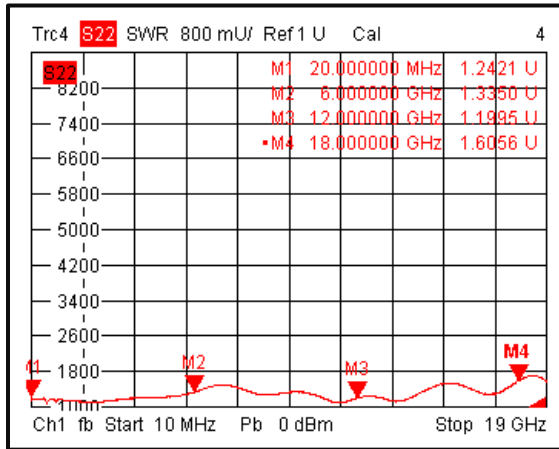


Input VSWR @-40°C

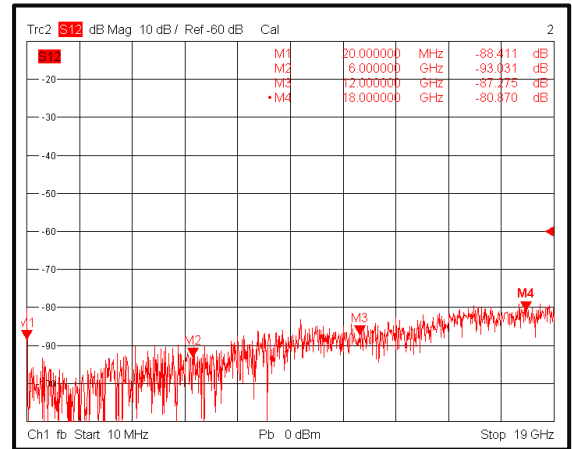


Typical Performance Plots

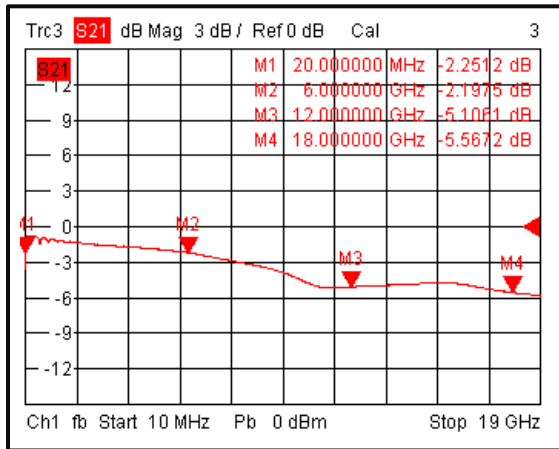
Output VSWR @-40°C



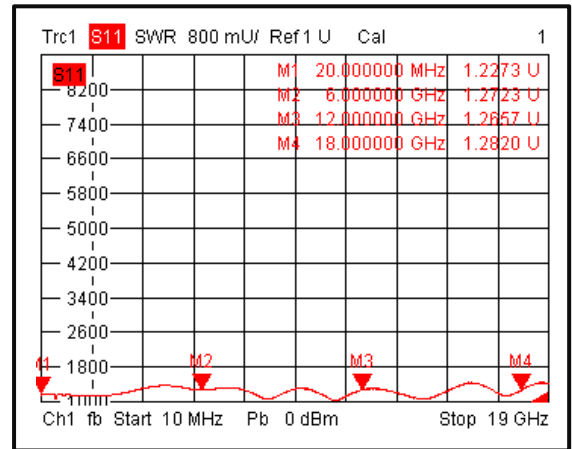
Isolation @-40°C



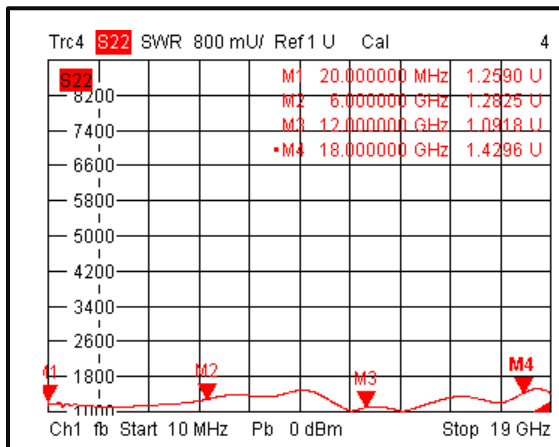
Insertion Loss @+85°C



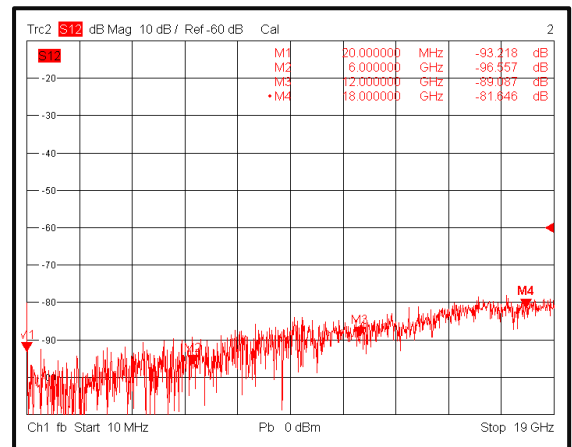
Input VSWR @+85°C



Output VSWR @+85°C

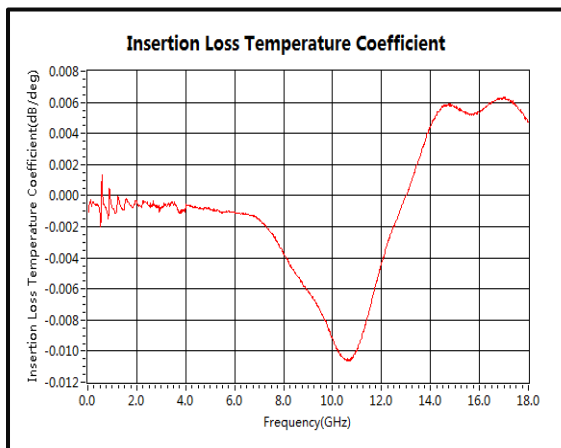


Isolation @+85°C

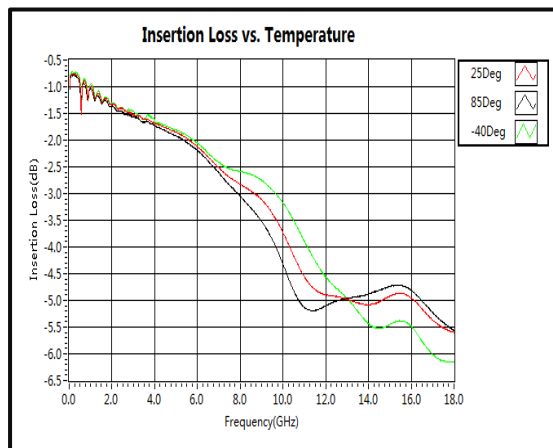


Typical Performance Plots

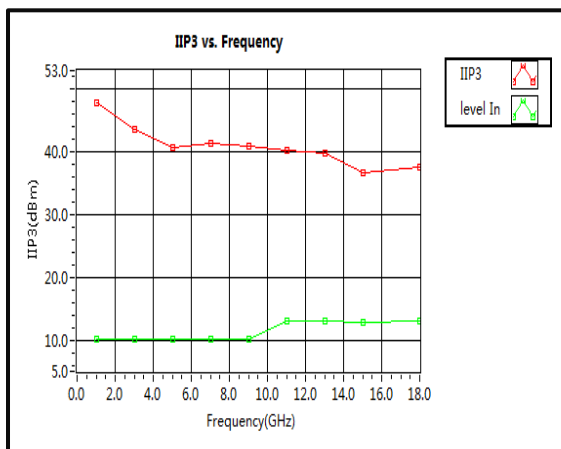
Insertion Loss Temperature Coefficient



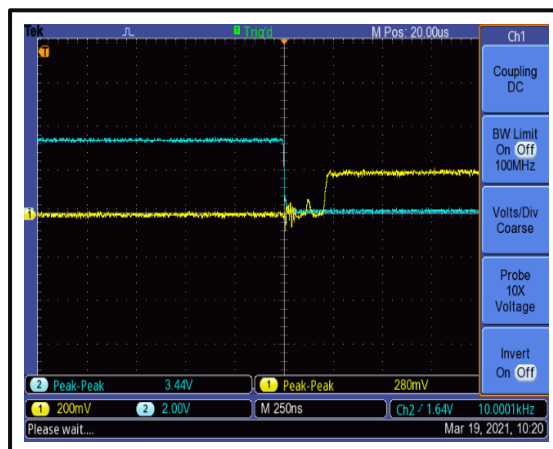
Insertion Loss vs. Temperature



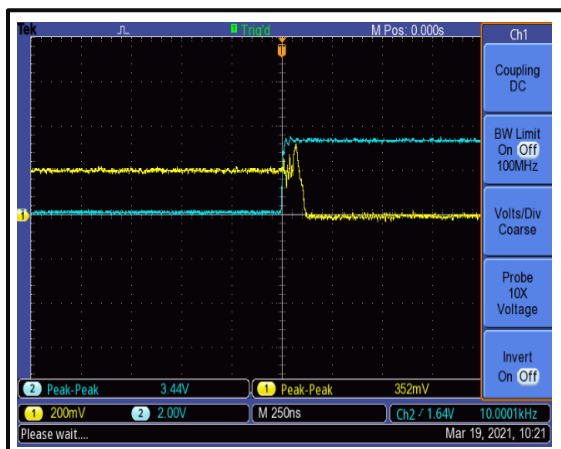
IIP3



Switching Speed

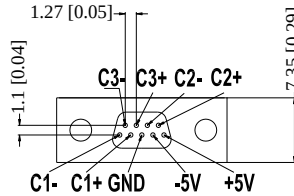
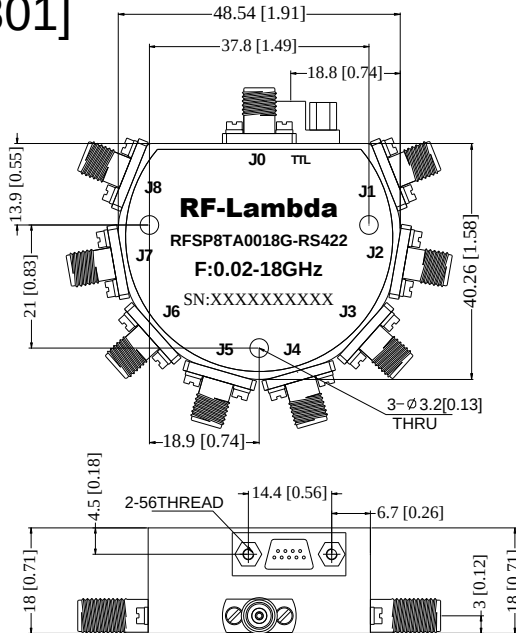


Switching Speed



Outline Drawing

[X801]



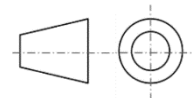
**MICRO-D9(Female)**

**Truth Table**

|                                                          |                         |                   |
|----------------------------------------------------------|-------------------------|-------------------|
| Common-Mode Input Voltage                                |                         | ±7V (MAX)         |
| High(1)                                                  |                         | 2V (MIN)          |
| Low(0)                                                   |                         | 0.8V (MAX)        |
| Control Voltage THRESHOLD                                | Low(0)=(C+)-(C-) ≤0.2V  |                   |
|                                                          | High(1)=(C+)-(C-) ≥0.2V |                   |
| Control Input                                            | RS-422                  | Signal Path State |
| C1+ C1- C2+ C2- C3+ C3-                                  |                         | ALL OFF           |
| 0 1 0 1 0 1                                              |                         | J0-J1             |
| 1 0 0 1 0 1                                              |                         | J0-J2             |
| 0 1 1 0 0 1                                              |                         | J0-J3             |
| 1 0 1 0 0 1                                              |                         | J0-J4             |
| 0 1 0 1 1 0                                              |                         | J0-J5             |
| 1 0 0 1 1 0                                              |                         | J0-J6             |
| 0 1 1 0 1 0                                              |                         | J0-J7             |
| 1 0 1 0 1 0                                              |                         | J0-J8             |
| Control instruction 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](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                         |
|--------------------|--------------|-------------------------------------|
| RFSP8TA0018G-RS422 | Standard     | 0.02GHz-18GHz SP8T PIN Diode Switch |

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