

## Reflective Coaxial SP4T Switch 0.001GHz - 60GHz



### Product Description

RFSP4TR0060G is a reflective coaxial single pole four throw switch with a frequency range of 0.001 to 60GHz.

The max power input of this switch is 15dBm Max. The insertion loss is 8.5dB with a typical isolation of 35dB.

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

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

### Features

- TTL compatible driver included
- Fast Switching Speed
- High Power Cold Switching
- Insertion Loss 8.5dB Typical
- Isolation 35dB Typical
- 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 , TTL = 0 / +5V

| Parameter                              | Min   | Typ                            | Max | Units  |
|----------------------------------------|-------|--------------------------------|-----|--------|
| Frequency Range                        | 0.001 |                                | 60  | GHz    |
| Insertion Loss                         |       | 8.5                            | 9.2 | dB     |
| Insertion Loss Temperature Coefficient |       | 0.003                          |     | dB/ °C |
| Isolation (Between any ports)          | 29    | 35                             |     | dB     |
| Input VSWR                             |       | 2.0                            |     | : 1    |
| Output VSWR                            |       | 2.2                            |     | : 1    |
| RF Input Power (CW)                    |       |                                | 15  | dBm    |
| DC Power Dissipation                   |       | 0.8                            |     | W      |
| 0.1dB Compression Point (P0.1dB )      |       | 15                             |     | dBm    |
| IIP3                                   |       | 30                             |     | dBm    |
| Switching Speed                        |       | 250 Max.                       |     | ns     |
| Bias Current ( +5V )                   |       | 50 Max.                        |     | mA     |
| Weight                                 |       | 0.106 Max.                     |     | lbs    |
| Impedance                              |       | 50                             |     | Ω      |
| Input / Output Connectors              |       | 1.85mm-Female                  |     |        |
| Package                                |       | Epoxy Sealed (Standard)        |     |        |
|                                        |       | Hermetically Sealed (Optional) |     |        |

Absolute Maximum Ratings

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

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

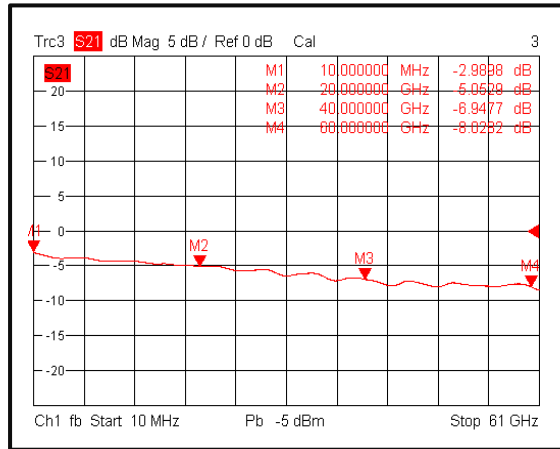
Environmental Specifications and Test Standards

| 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)                                                                                                                                                                     |

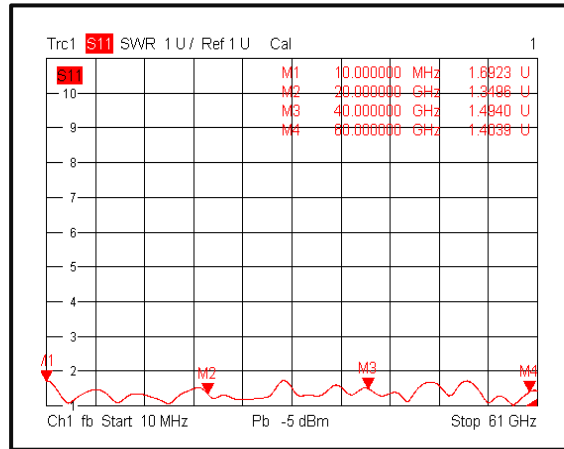
\*For vibration testing details please see additional information section.

Typical Performance Plots

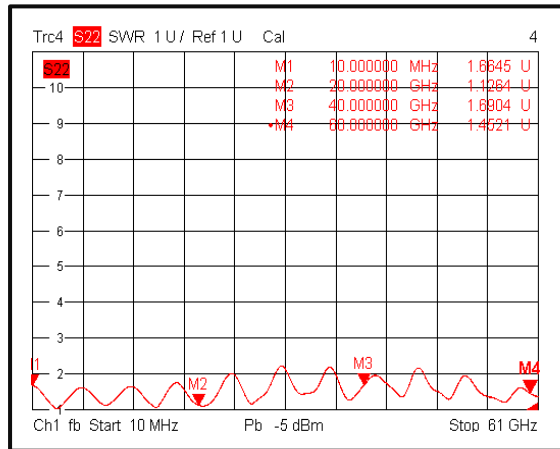
Insertion Loss @+25°C



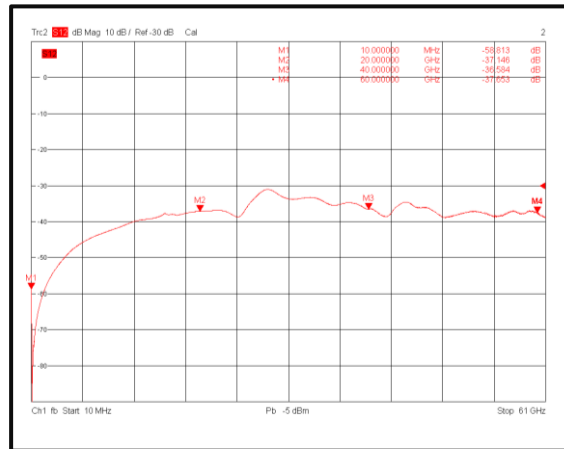
Input VSWR @+25°C



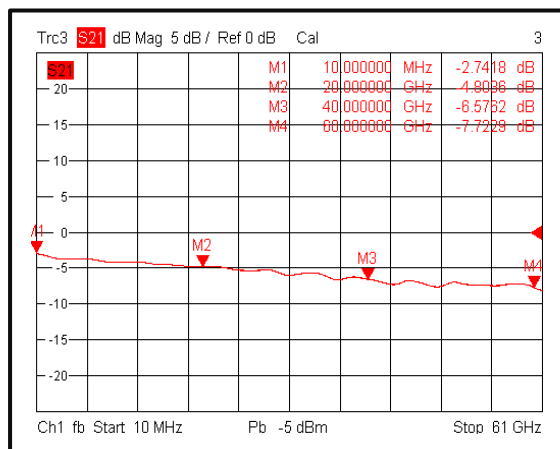
Output VSWR @+25°C



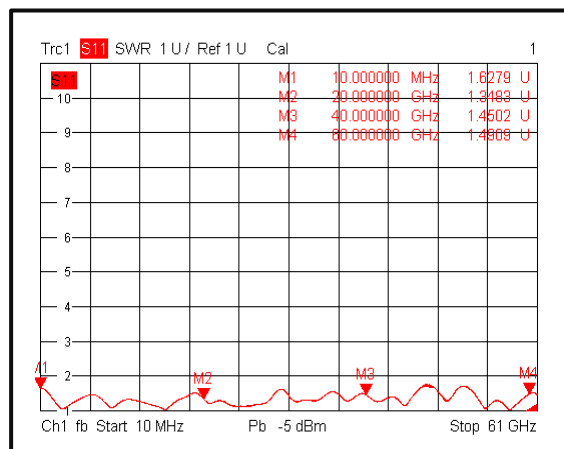
Isolation @+25°C



Insertion Loss @-40°C

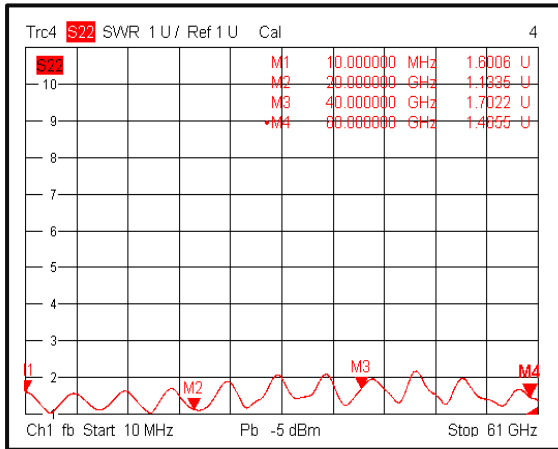


Input VSWR @-40°C

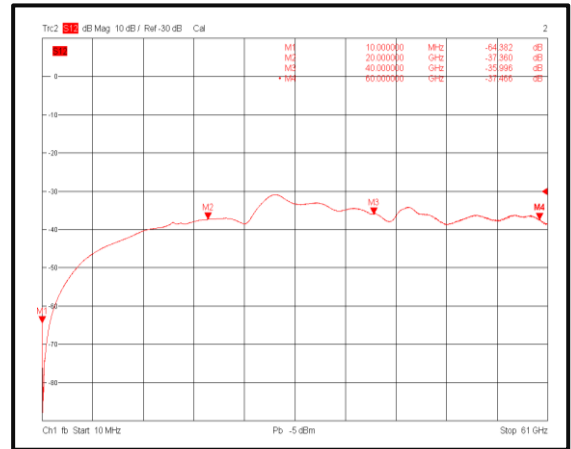


Typical Performance Plots

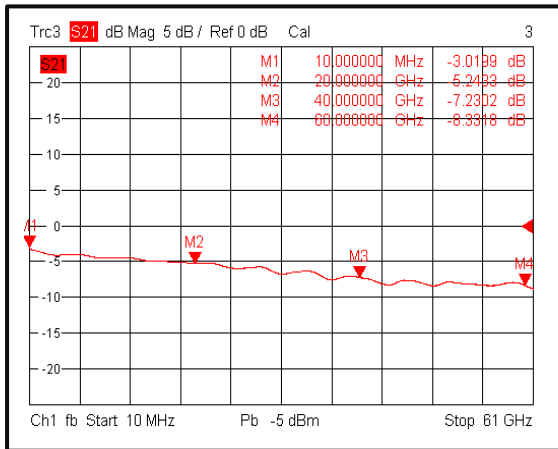
Output VSWR @-40°C



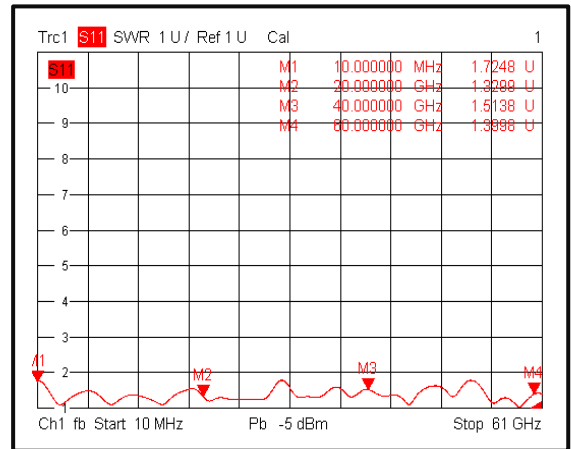
Isolation @-40°C



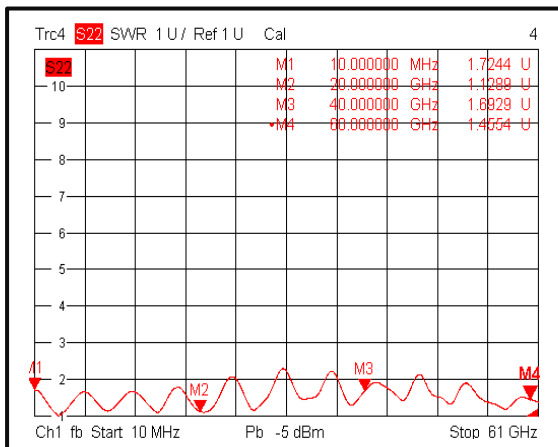
Insertion Loss @+85°C



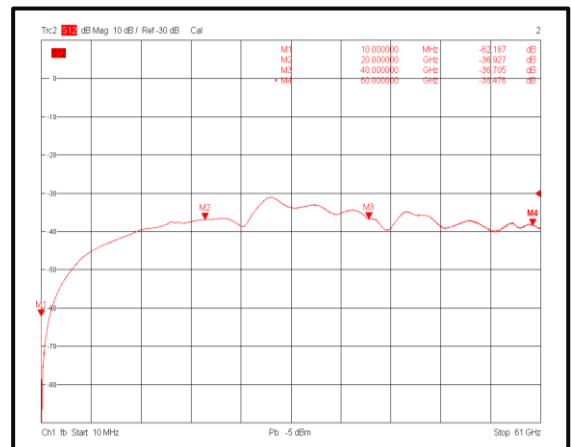
Input VSWR @+85°C



Output VSWR @+85°C

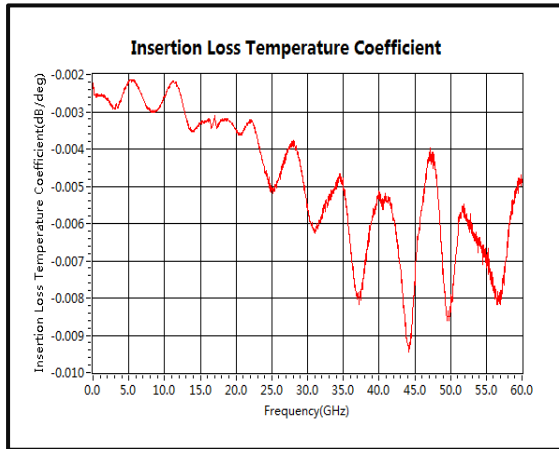


Isolation @+85°C

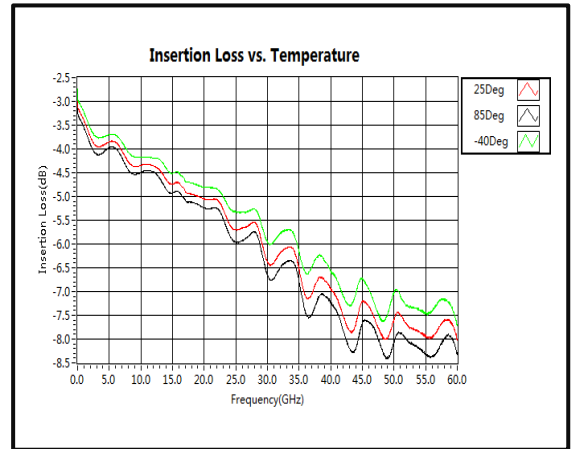


Typical Performance Plots

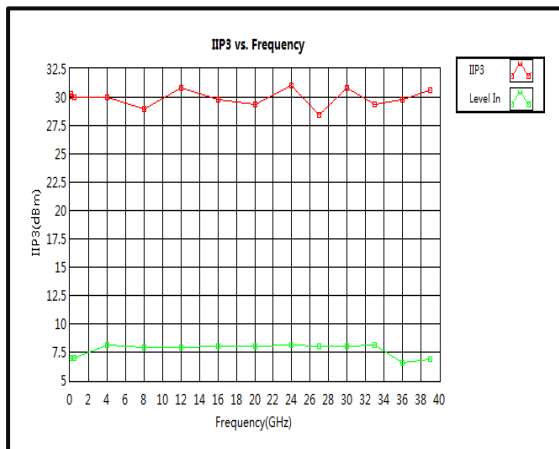
Insertion Loss Temperature Coefficient



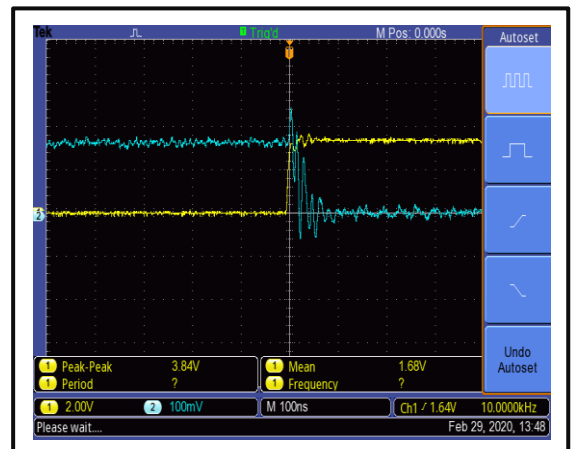
Insertion Loss vs. Temperature



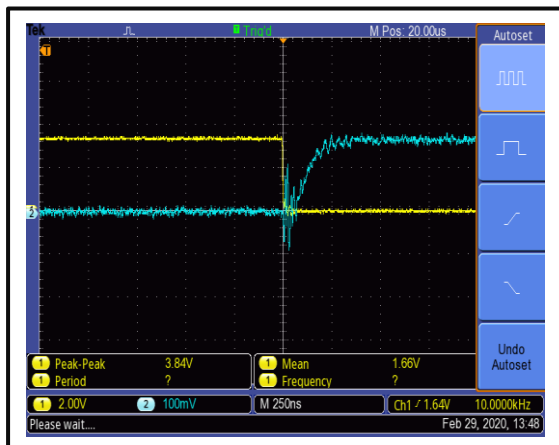
IIP3



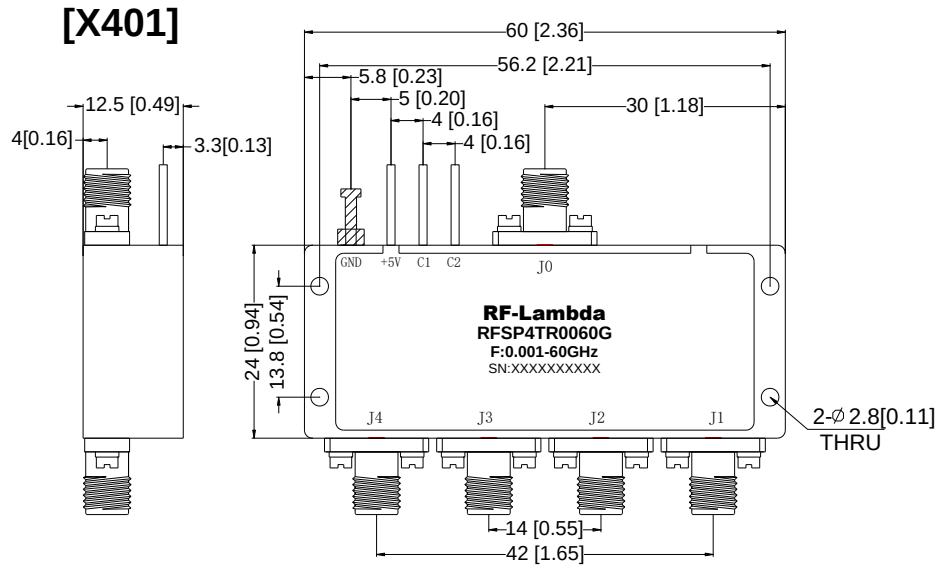
Switching Speed



Switching Speed



**Outline Drawing**

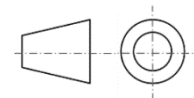


**Truth Table**

|                                                  |                   |       |
|--------------------------------------------------|-------------------|-------|
| TTL Control Voltage                              | Low(0)=0~0.8V     |       |
| THRESHOLD                                        | High(1)=2.8~5V    |       |
| Control Input TTL                                | Signal Path State |       |
| C2                                               | C1                |       |
| 0                                                | 0                 | J0-J1 |
| 0                                                | 1                 | J0-J2 |
| 1                                                | 0                 | J0-J3 |
| 1                                                | 1                 | J0-J4 |
| 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  $\pm 0.3$  [0.012] unless otherwise specified.
5. Heatsink Required - Mandatory for High Power Operation .Matching heatsink is listed on our website. If customer would like to use their own cooling method, please make sure the amplifier will operate under the specs that listed in page 2 of this datasheet.
6. Standard torque wrench must be used to secure RF connectors.



**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)

**Webpage**

Ordering Information

| Part Number  | Modification             | Description                          |
|--------------|--------------------------|--------------------------------------|
| RFSP4TR0060G | Connectors 1.85mm-Female | 0.001GHz-60GHz SP4T PIN Diode Switch |

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