

# Reflective Voltage Control Attenuator 0.02GHz-18GHz



## Product Description

RFVAT0000R25 is a reflective voltage control attenuator with a frequency range of 0.02 to 18GHz.

The power input of this attenuator is 25dBm. The insertion loss is 1.5dB with a typical attenuation range of 35dB.

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

## Features

- Reflective Voltage Control Attenuator
- Wide Attenuation Range 35dB
- Insertion Loss 1.5 dB Typical
- RF input power 30dBm Max.
- Reflective Topology

## 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       | Min | Typ    | Max | Units  |
|----------------------------------------|--------------------------------|------------------------------------------|-----------|-----|--------|-----|--------|
| Frequency Range                        |                                | 0.02 – 0.5                               |           |     | 0.5-18 |     | GHz    |
| Attenuation Range                      | 25                             | 30                                       |           | 25  | 35     |     | dB     |
| Insertion Loss                         |                                | 0.5                                      | 1.0       |     | 1.5    | 1.8 | dB     |
| Insertion Loss Temperature Coefficient |                                | 0.003                                    |           |     | 0.003  |     | dB/ °C |
| Input VSWR                             |                                | 1.2                                      | 1.5       |     | 1.5    | 1.8 | : 1    |
| Output VSWR                            |                                | 1.2                                      | 1.5       |     | 1.5    | 1.8 | : 1    |
| 0.1dB Compression Point( P0.1dB )      |                                | 25                                       |           |     | 25     |     | dBm    |
| Input IP3                              |                                | 43                                       |           |     | 43     |     | dBm    |
| Switching Speed                        |                                | 2.5                                      |           |     | 2.5    |     | us     |
| Control Voltage                        | 0                              | 10                                       |           | 0   | 10     |     | V      |
| Current                                |                                | 35                                       |           |     | 35     |     | mA     |
| Weight                                 |                                |                                          | 0.02 Max. |     |        |     | lbs.   |
| Impedance                              |                                |                                          | 50        |     |        |     | Ohms   |
| Input / Output Connectors              |                                | SMA-Female (Input) – SMA-Female (Output) |           |     |        |     |        |
| Package                                | Epoxy Sealed (Standard)        |                                          |           |     |        |     |        |
|                                        | Hermetically Sealed (Optional) |                                          |           |     |        |     |        |

### Absolute Maximum Ratings

| Parameter       | Rating    |
|-----------------|-----------|
| Control Voltage | 0 to +13V |
| RF Input Power  | +30dBm    |

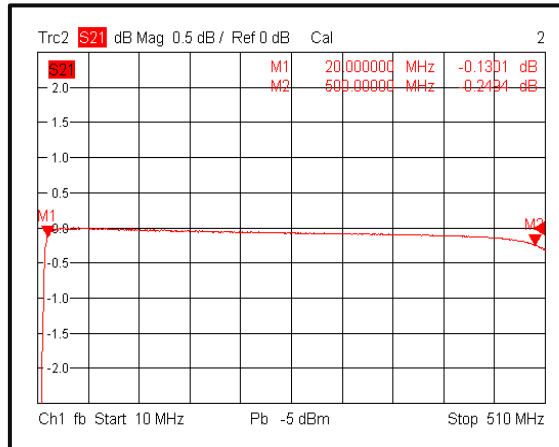
### Environmental Specifications and Test Standards

| 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)                                                                                                                                                                     |

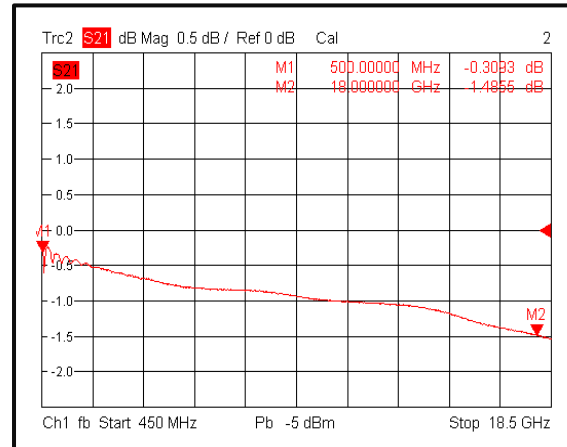
\*\*For vibration testing details please see additional information section.

**Typical Performance Plots**

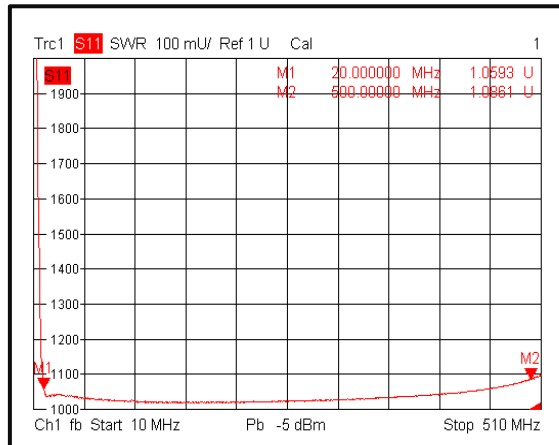
**Insertion Loss (0.02-0.5GHz) @+25°C**



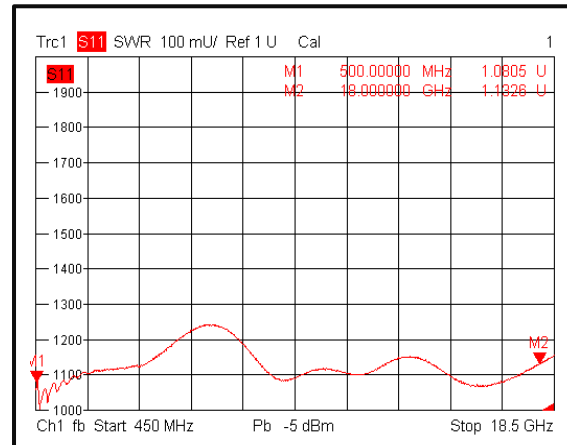
**Insertion Loss (0.5-18GHz) @+25°C**



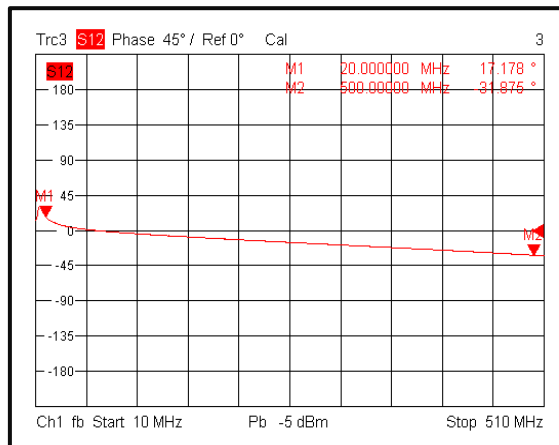
**Input VSWR (0.02-0.5GHz) @+25°C**



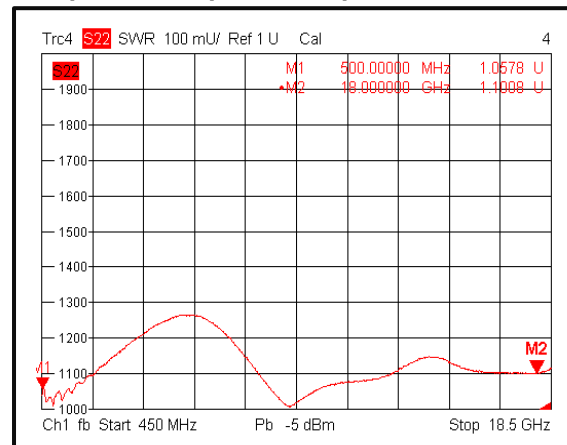
**Input VSWR (0.5-18GHz) @+25°C**



**Output VSWR (0.02-0.5GHz) @+25°C**

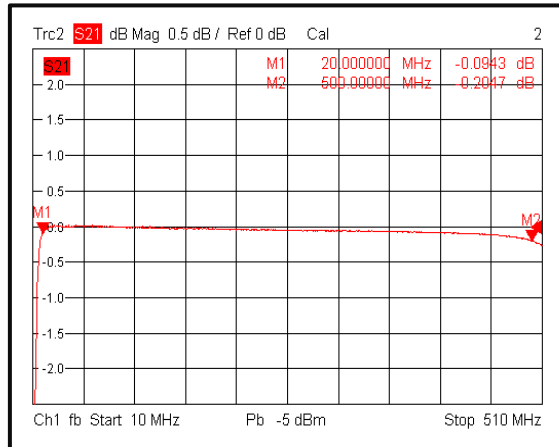


**Output VSWR (0.5-18GHz) @+25°C**

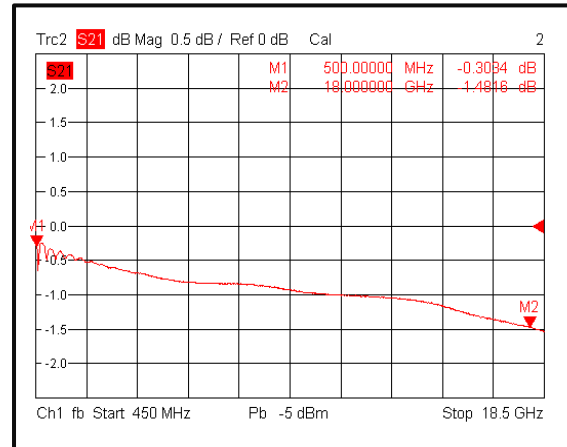


**Typical Performance Plots**

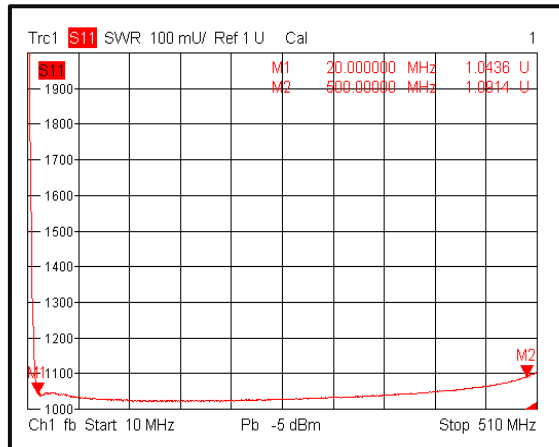
**Insertion Loss (0.02-0.5GHz) @-40°C**



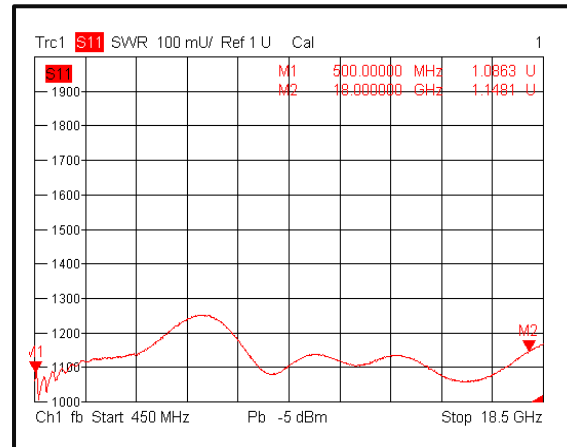
**Insertion Loss (0.5-18GHz) @-40°C**



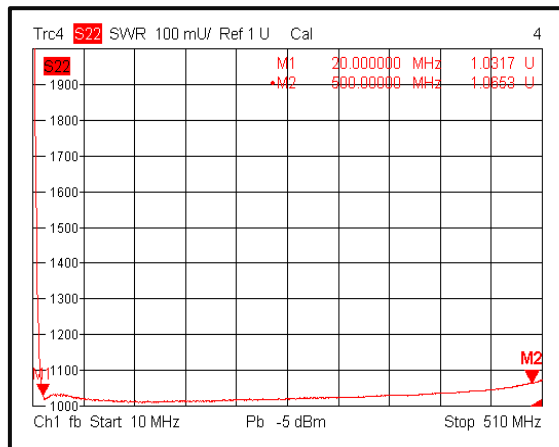
**Input VSWR (0.02-0.5GHz) @-40°C**



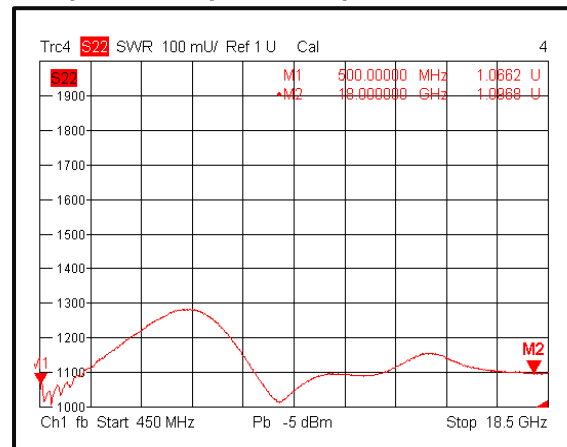
**Input VSWR (0.5-18GHz) @-40°C**



**Output VSWR (0.02-0.5GHz) @-40°C**

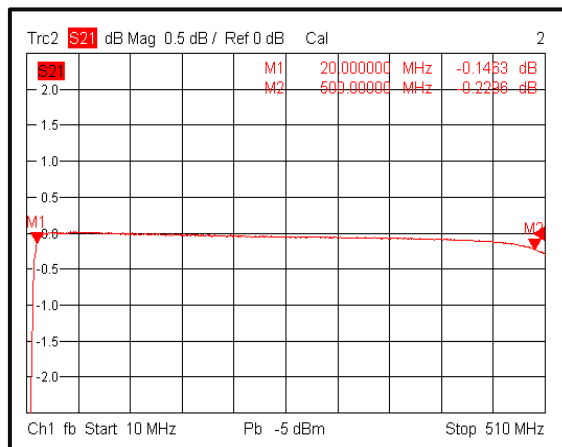


**Output VSWR (0.5-18GHz) @-40°C**

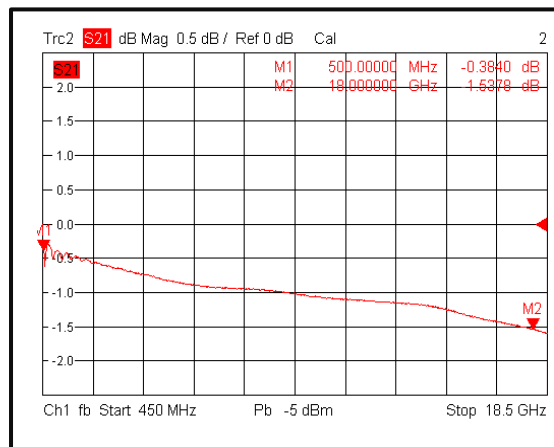


**Typical Performance Plots**

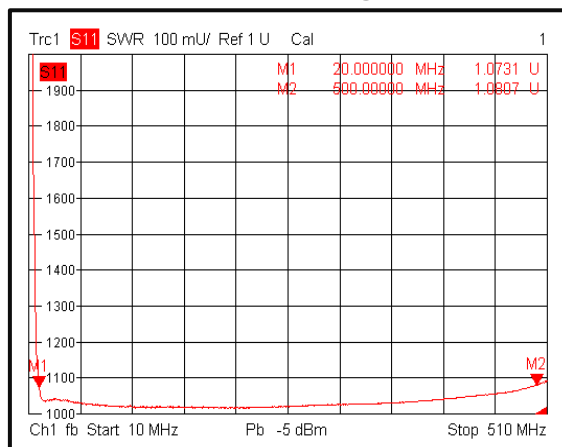
**Insertion Loss (0.02-0.5GHz) @+85°C**



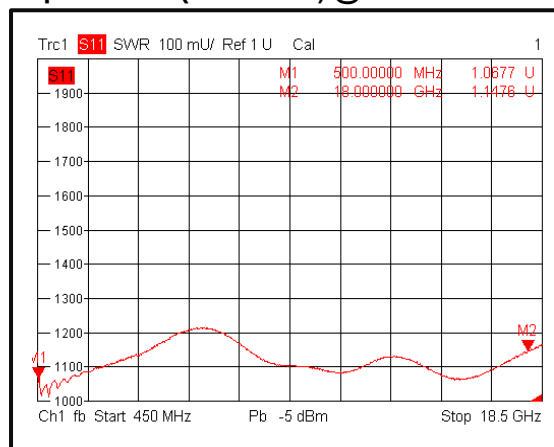
**Insertion Loss (0.5-18GHz) @+85°C**



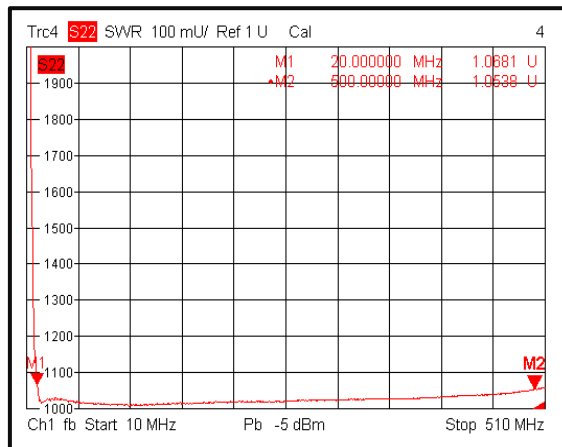
**Input VSWR (0.02-0.5GHz) @+85°C**



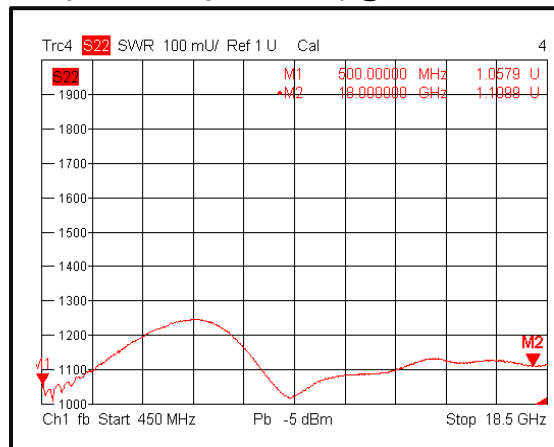
**Input VSWR (0.5-18GHz) @+85°C**



**Output VSWR (0.02-0.5GHz) @+85°C**

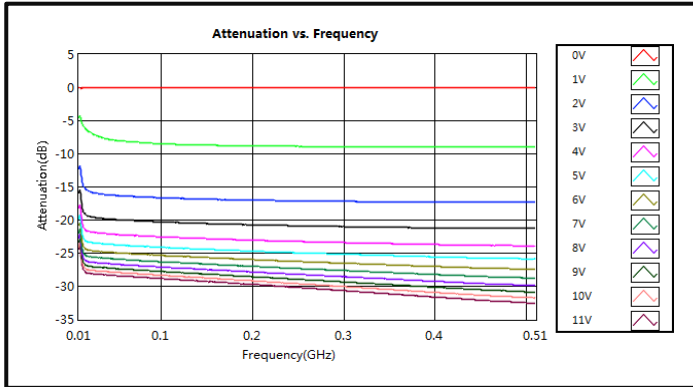


**Output VSWR (0.5-18GHz) @+85°C**

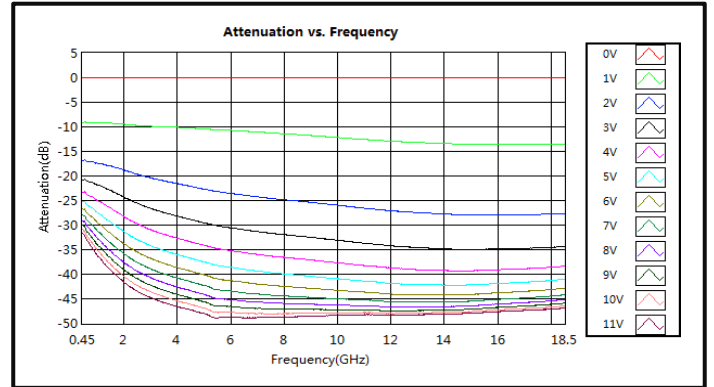


Typical Performance Plots

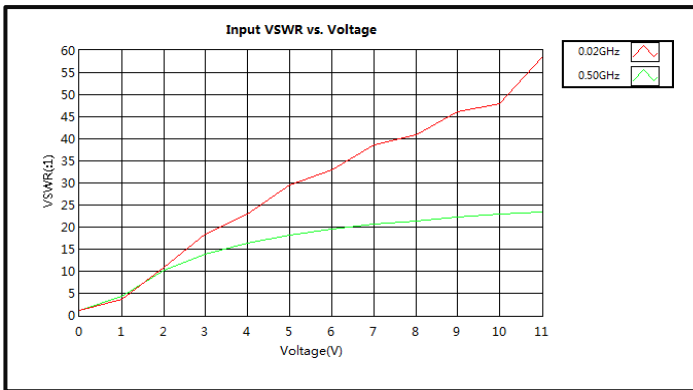
Attenuation vs. Frequency(Normalized loss) (0.02-0.5GHz)



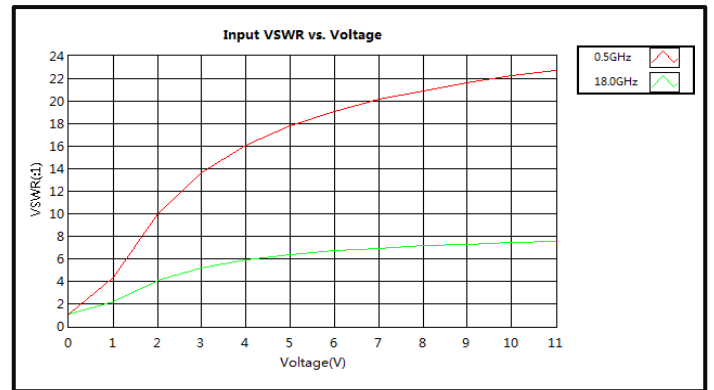
Attenuation vs. Frequency(Normalized loss) (0.5-18GHz)



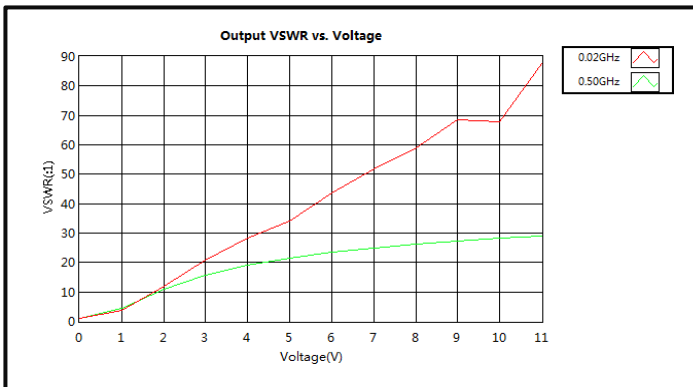
VSWR vs. Voltage (S11) (0.02-0.5GHz)



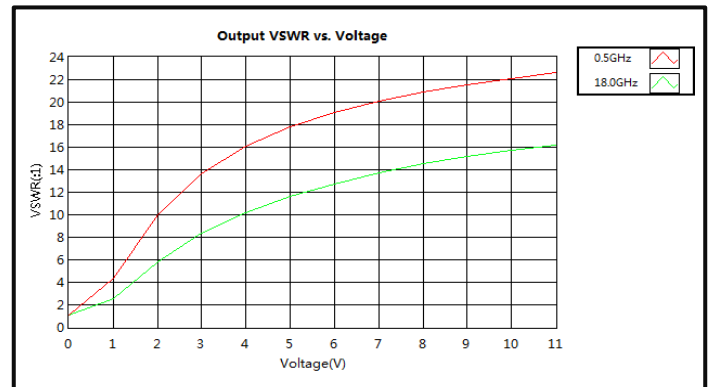
VSWR vs. Voltage (S11) (0.5-18GHz)



VSWR vs. Voltage (S22) (0.02-0.5GHz)

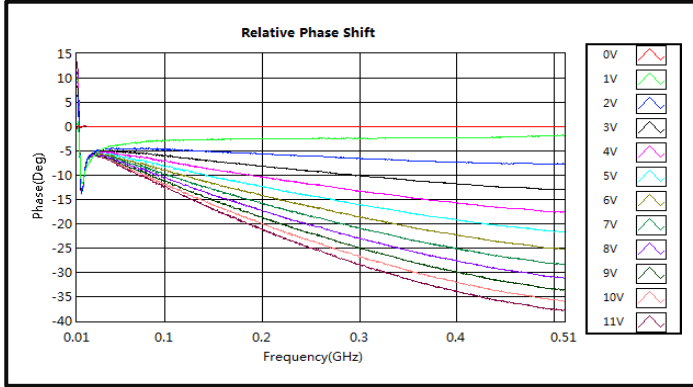


VSWR vs. Voltage (S22) (0.5-18GHz)

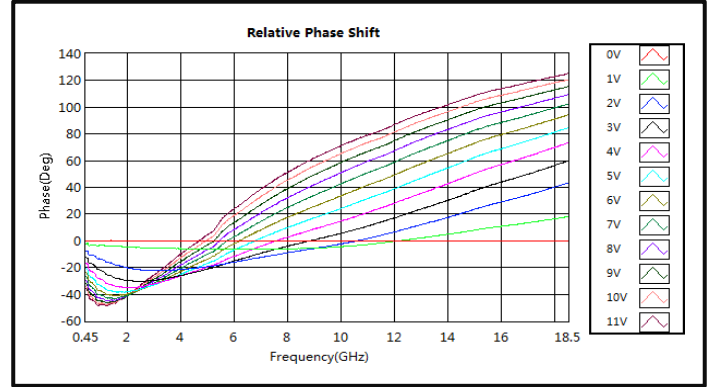


## Typical Performance Plots

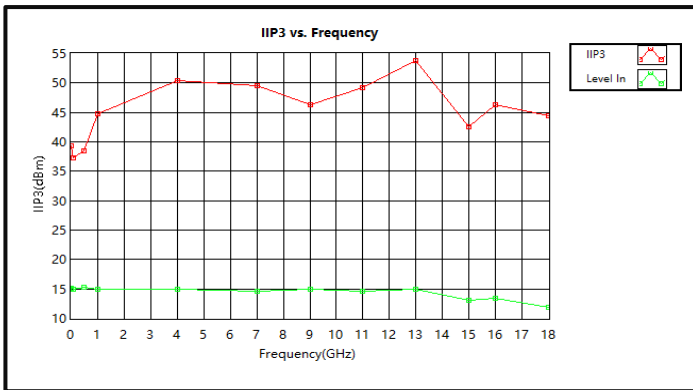
Phase Shift vs. Frequency (0.02-0.5GHz)



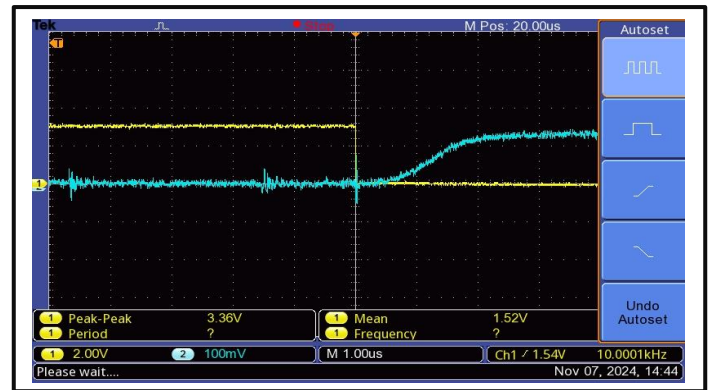
Phase Shift vs. Frequency (0.5-18GHz)



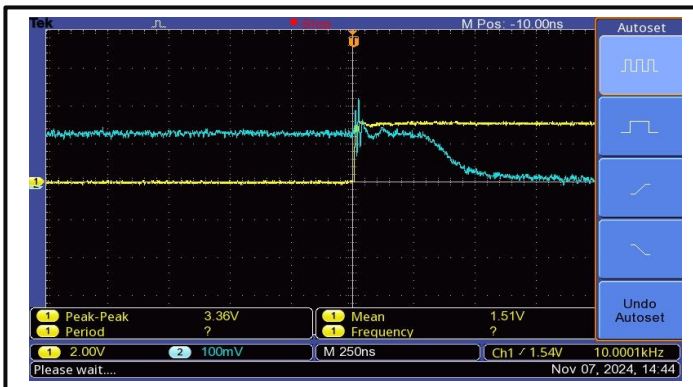
IIP3



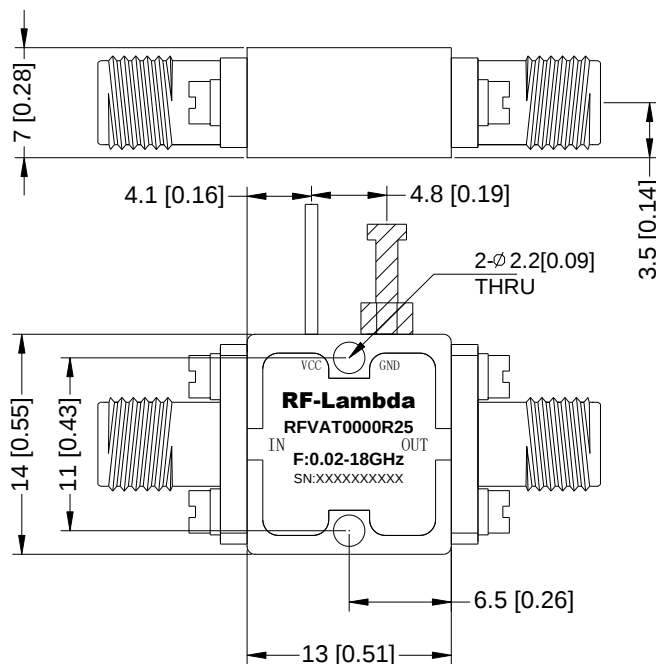
Speed



Speed

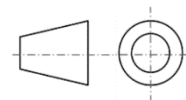


**Outline Drawing**



**Notes:**

1. Package Material: Aluminum
2. Finish: Gold Plated
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                              |
|--------------|--------------|------------------------------------------|
| RFVAT0000R25 | Standard     | 0.02GHz-18GHz Voltage Control Attenuator |

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