

31P5dB Single Bit Digital Attenuator

Features

- ◆ Frequency Range: 2.0 – 5.0GHz
- ◆ Low Insertion Loss ~ 1.5 dB (Typ)
- ◆ Max. Attenuation of 31.5dB
- ◆ Input & Output Return Loss > 18 dB
- ◆ Integral TTL Driver
- ◆ 20 Lead 4mm x 4mm QFN Package

Functional Diagram



Typical Applications

- ◆ Radar
- ◆ Military & Space
- ◆ Instrumentation

Description

The ASL3012 is a single bit Digital Controlled Fixed 31P5dB Attenuator operates over the frequency range of 2.0-5.0GHz. The single bit attenuator features very low insertion loss of 1.5dB (typ), maximum attenuation of 31dB with input & output return loss better than 18dB over the operating frequency band. The attenuator provides on-chip integral TTL driver, facilitating a single bit control. The driver operates on +5/-5V voltages with minimal DC power consumption. The Single bit attenuator is packaged in a 20 lead 4mm x 4mm QFN Package.

Absolute Maximum Ratings¹

| Parameter | Absolute Maximum | Units |
|-------------------------|------------------|-------|
| RF Input Power | 33 | dBm |
| Positive Supply Voltage | +6 | V |
| Negative Supply Voltage | -6 | V |
| Control Voltage | -0.5 to +5.5 | V |
| Operating Temperature | -55 to +85 | °C |
| Storage Temperature | -65 to +150 | °C |

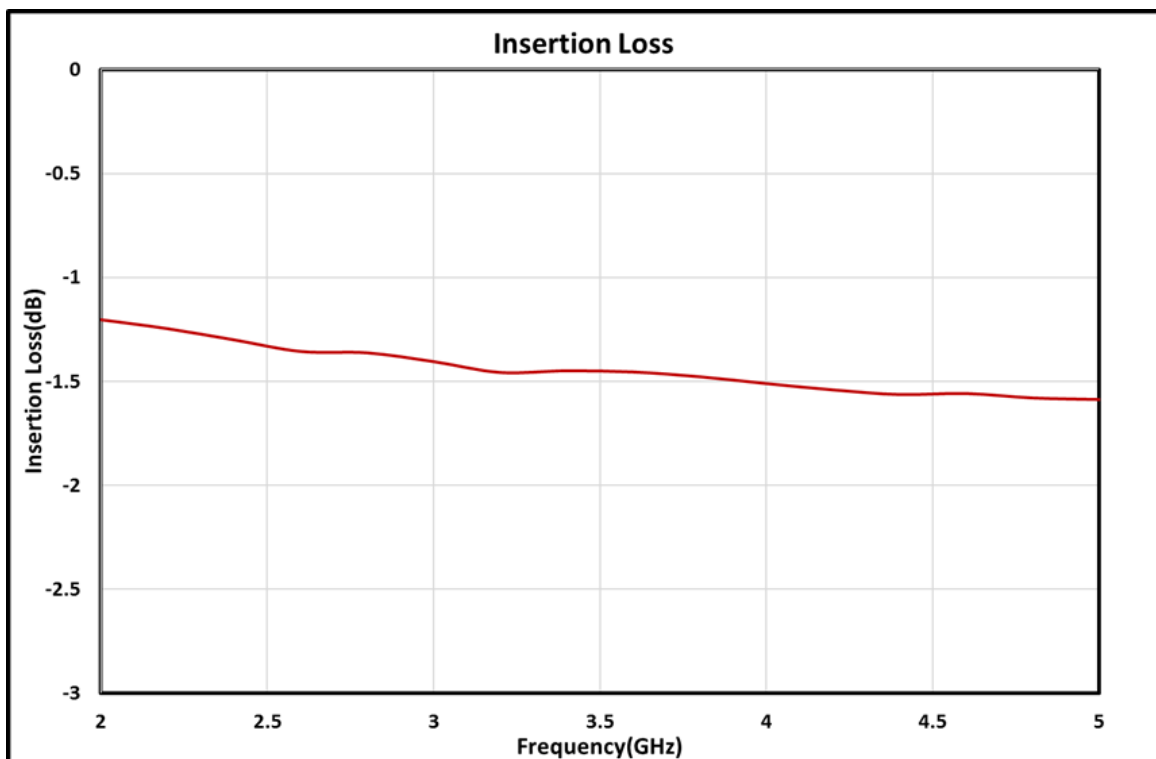
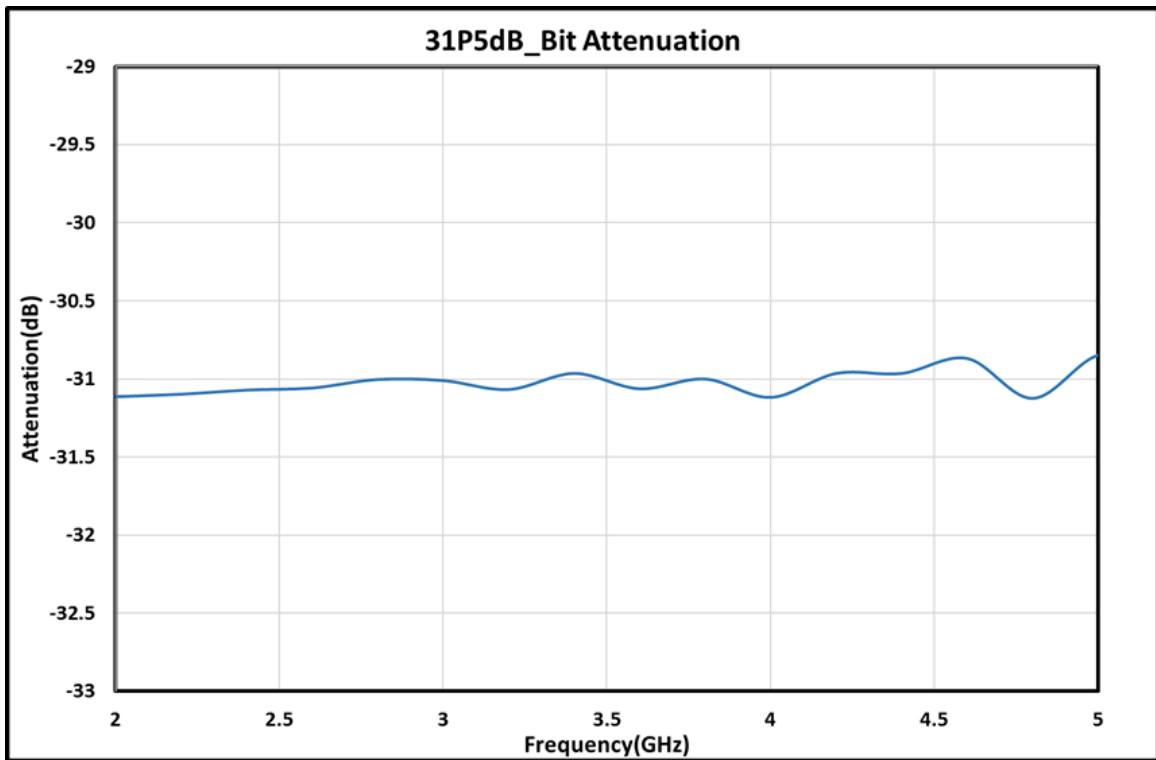
1. Operation beyond these limits may cause permanent damage to the component

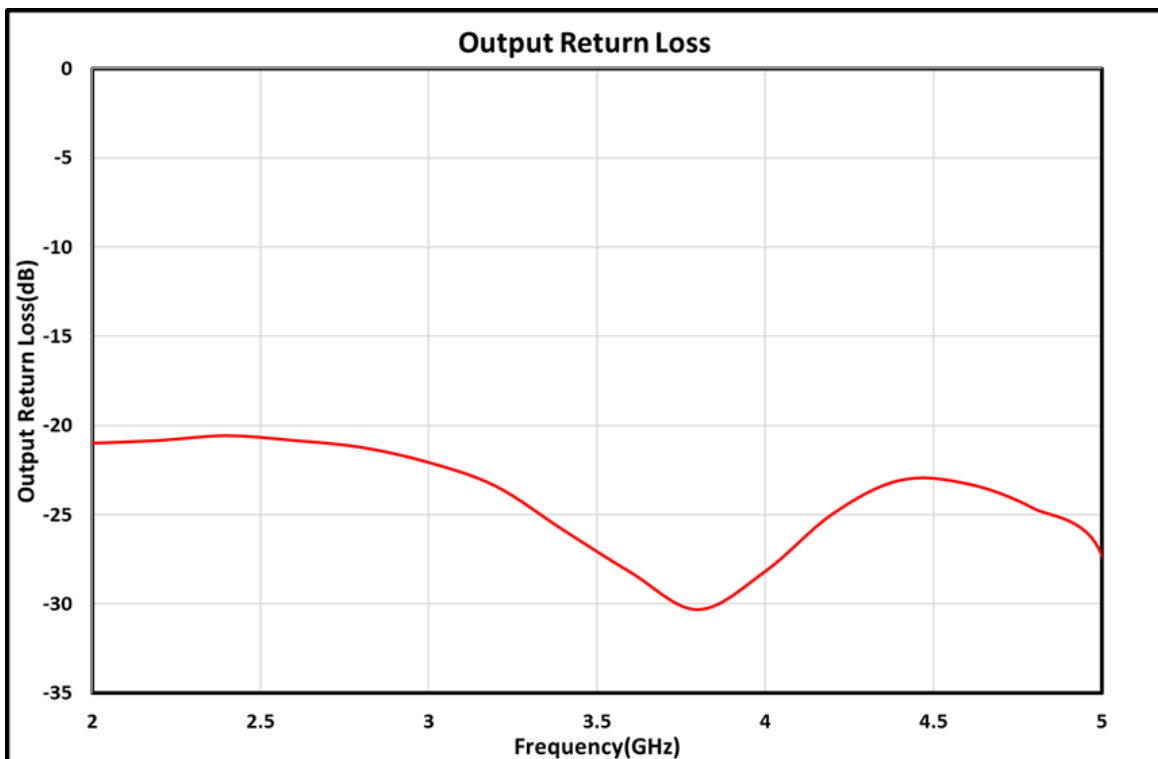
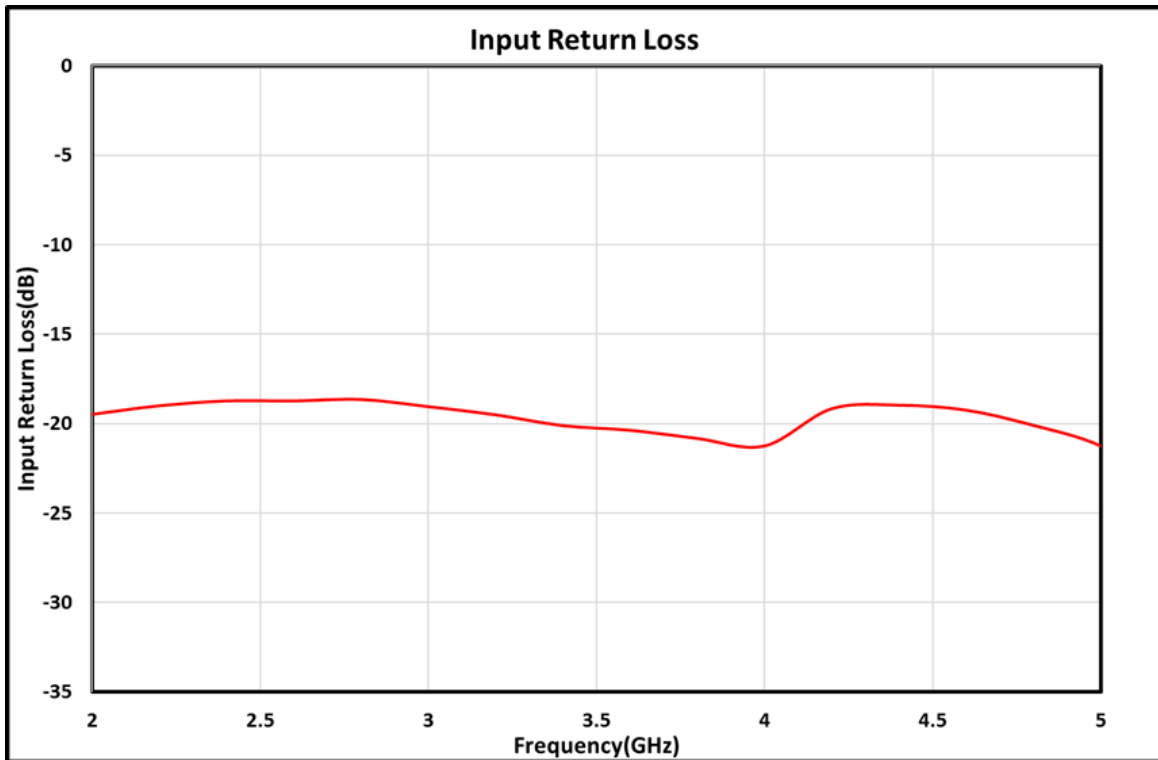
Electrical Specifications @ $T_A = 25\text{ }^\circ\text{C}$, $Z_o = 50\Omega$,

| Parameter | Min. | Typ. | Max. | Units |
|---------------------------------------|------|-----------|------|-------|
| Frequency Range | 2.0 | - | 5.0 | GHz |
| Insertion Loss | 1.4 | 1.5 | - | dB |
| Attenuation Range | 0 | - | 31.2 | dB |
| Attenuation Flatness | - | ± 0.3 | - | dB |
| Input Return Loss | - | 18 | - | dB |
| Output Return Loss | - | 20 | - | dB |
| Input power for 1dB compression Point | 22 | - | 24 | dBm |
| DC Bias Voltages | - | +5 , - 5 | - | V |
| Current | - | 3 | - | mA |
| Control Voltages | - | 0 / +5 | - | V |

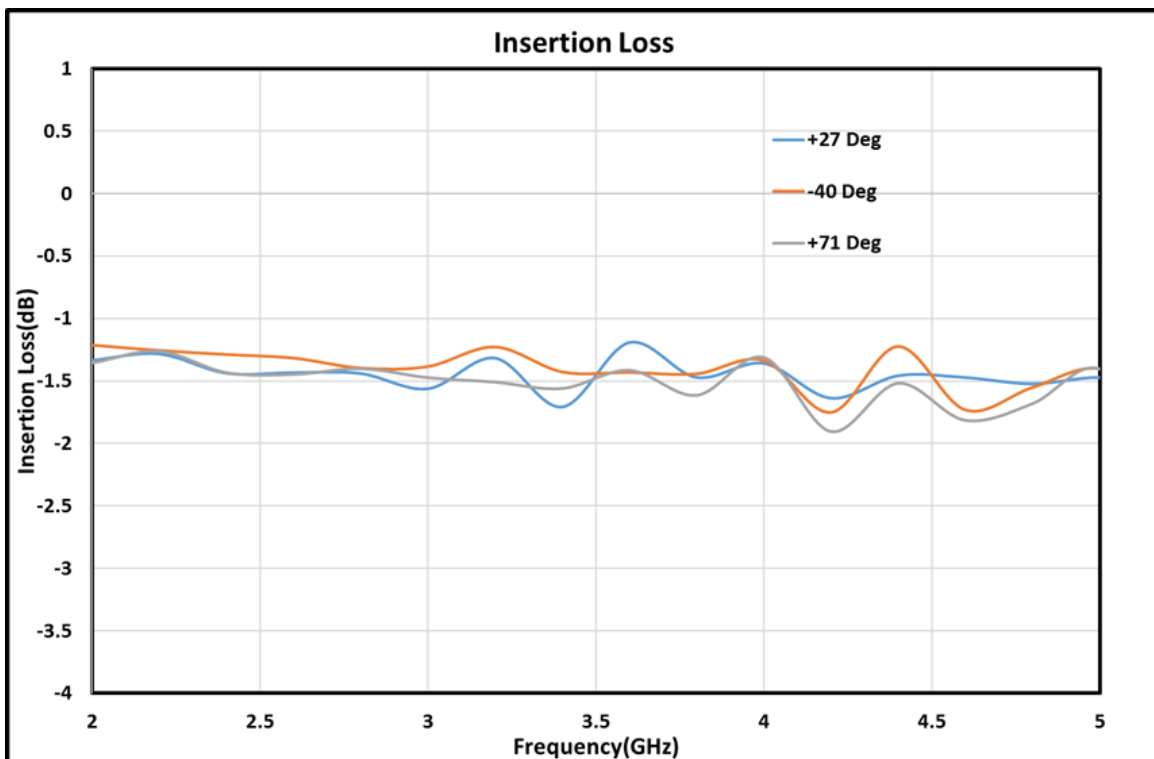
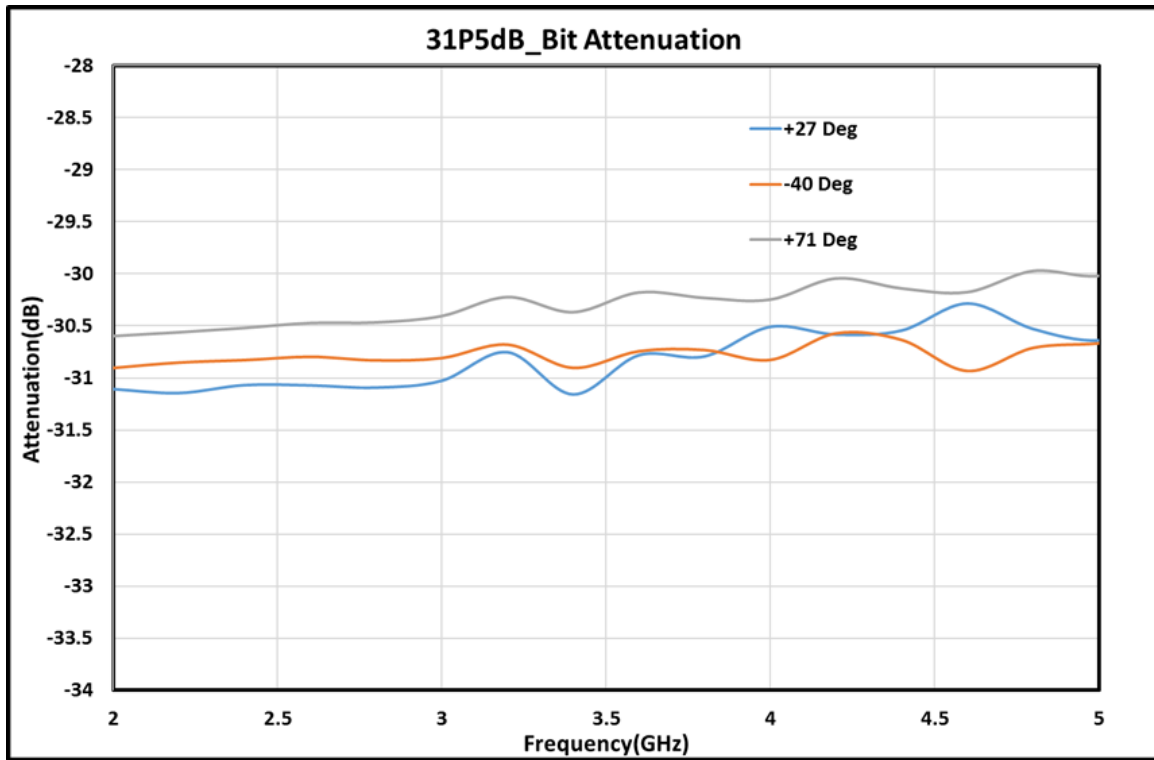
Note:

1. The above mentioned electrical specifications are measured in 50ohm line test fixture.

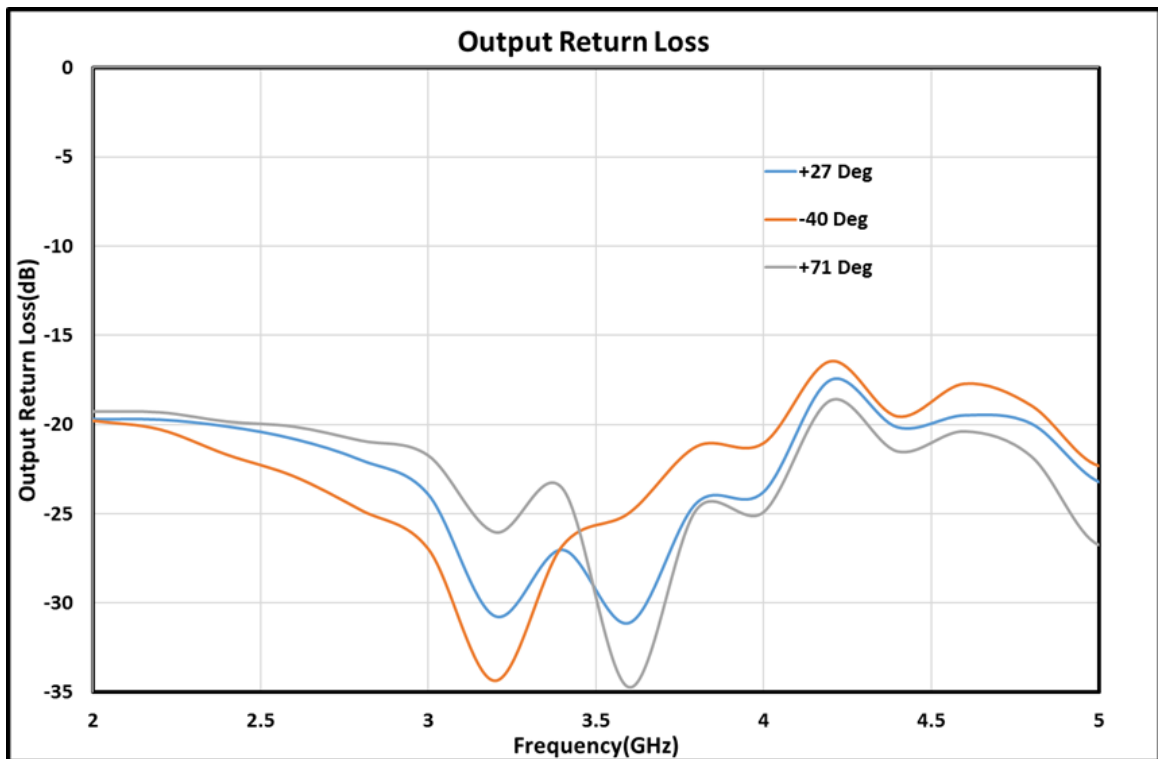
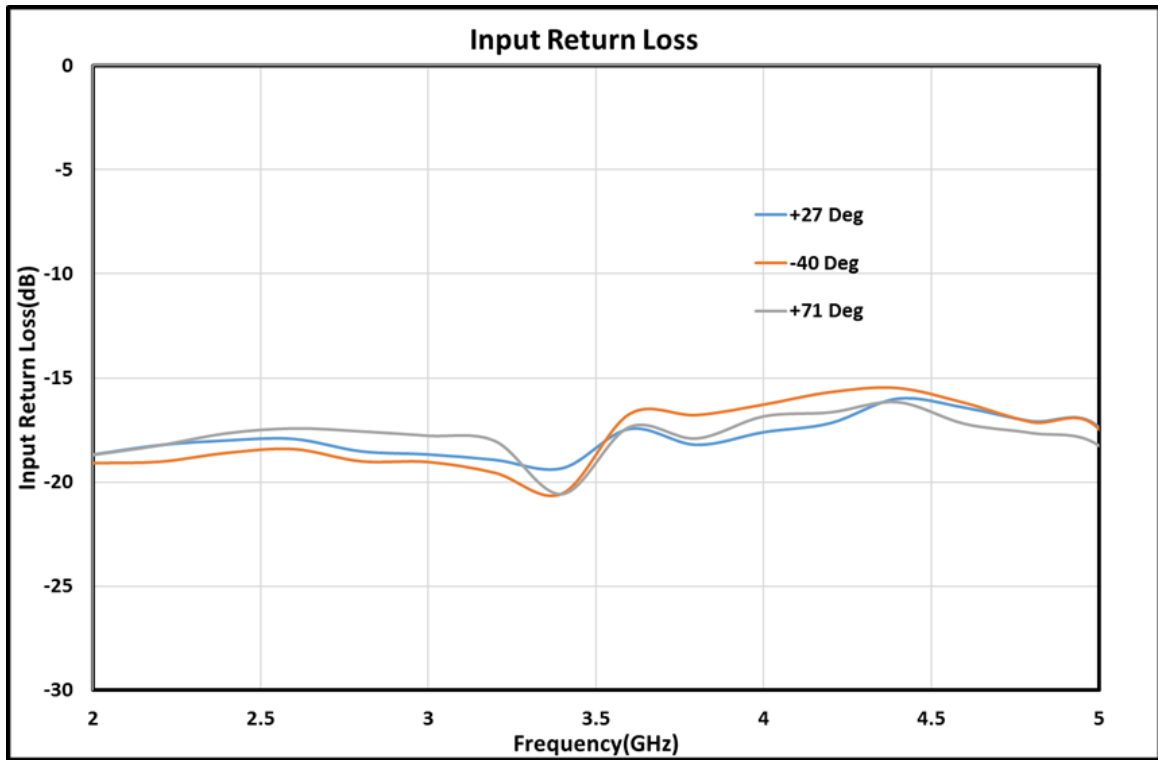
Text Fixture Data; $T_A = 25^\circ\text{C}$ 

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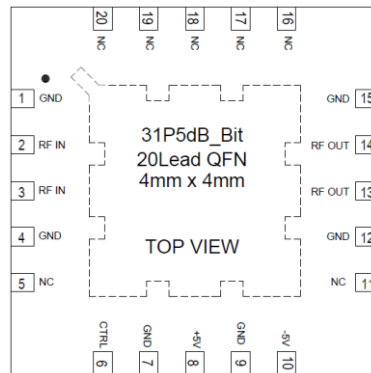
Attenuation & Insertion Loss over Temperature



Input & Output Return Loss over Temperature

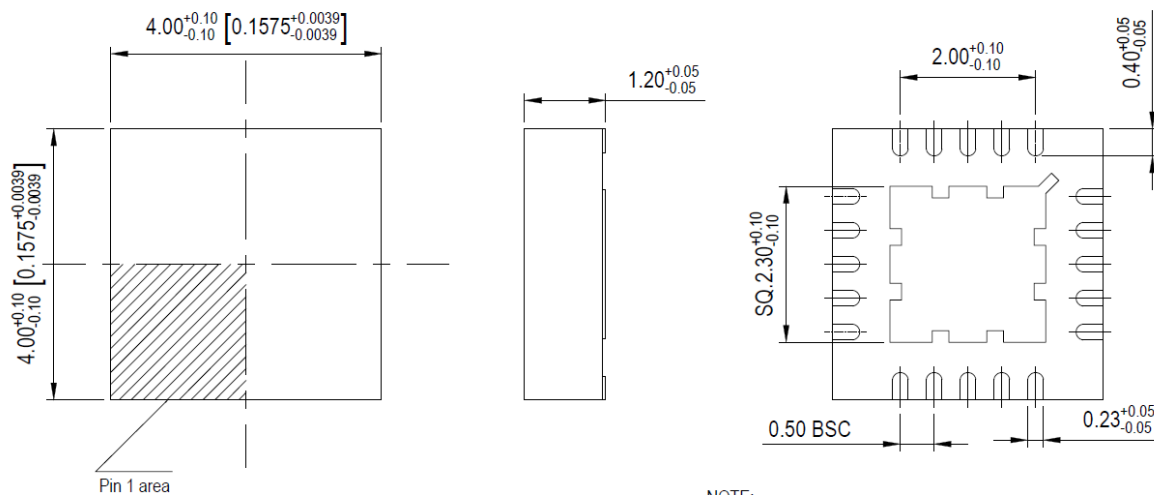


PIN Configuration Details



| Pin Number | Function | Description |
|------------------------|----------|-------------------|
| 2,3 | RFIN | RF Input |
| 13,14 | RF OUT | RF Output |
| 6 | CTRL | Control Bit |
| 8 | +5V | DC Supply Voltage |
| 10 | -5V | DC Supply Voltage |
| 5,11, 16,17,18,19 & 20 | NC | No Connection |
| 1,4,7,9,11,12 & 15 | GND | Ground |

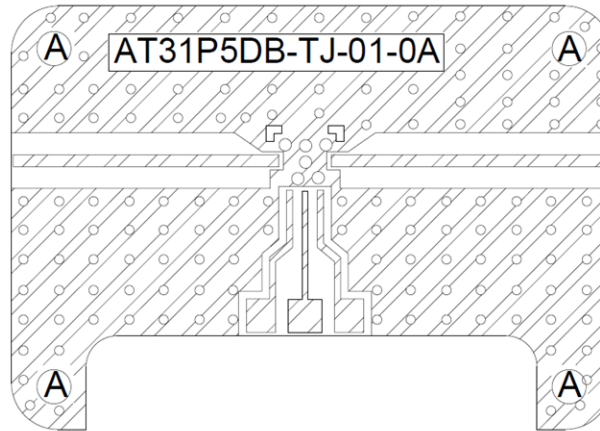
Package Outline



NOTE:
JEDEC REFERENCE MO220

ALL UNITS ARE IN MILLIMETERS

Test Board Pattern


Note:

1. Circuit board material: RT Duroid 5880, 10mil
2. Input and Output lines have 50Ω impedance.
3. No external matching components are required.

Truth Table

| State | Ctrl Voltage | Bias Conditions | Attenuation(dB) |
|---------|--------------|-----------------|-----------------|
| State 0 | 0(Low) | 0 to 0.5V | 0 |
| State 1 | 1(High) | 3 to 5V | 31.5 |



GaAs MMIC devices are susceptible to Electrostatic discharge. Proper precautions should be observed during handling, assembly & testing

All information and Specifications are subject to change without prior notice. Please download and refer to datasheet from website before using the product.