

S Band 7 Bit Digital Attenuator

Features

- ◆ Frequency Range: 2.8- 3.8 GHz
- ◆ Low Insertion Loss 4 dB(Typ.)
- ◆ Max. Attenuation of 31.75 dB
- ◆ RMS Amplitude Error < 0.3 dB
- ◆ Input & Output Return Loss > 12 dB
- ◆ 32 Lead 5.0 X 5.0 X 1.2 mm³ QFN Package

Typical Applications

- ◆ Radar
- ◆ Military & Space
- ◆ Instrumentation

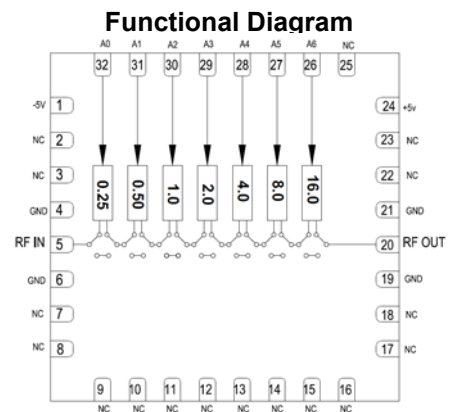
Description

The ASL3011P5 is a high performance MMIC 7-bit Digital Attenuator offering an attenuation range of 31.75dB in steps 0.25dB. The attenuator bit values are 0.25(LSB), 0.5, 1, 2, 4, 8 and 16dB (MSB) for a total attenuation of 31.75dB. The attenuator features an RMS error of less than 0.3dB over all 128 states with a maximum insertion loss of 4.5dB. The attenuator has an integral TTL driver facilitating a 7-bit control. The driver operates on +5/-5V voltages with minimal DC power consumption.

Absolute Maximum Ratings¹

Parameter	Absolute Maximum	Units
RF Input Power	27	dBm
Positive Supply Voltage	+6	V
Negative Supply Voltage	-6	V
Control Voltage	-0.5 to +5.5	V
Operating Temperature	-60 to +80	°C
Storage Temperature	-65 to +150	°C
Junction Temperature(θ_{jc})	106.6	°C /W

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

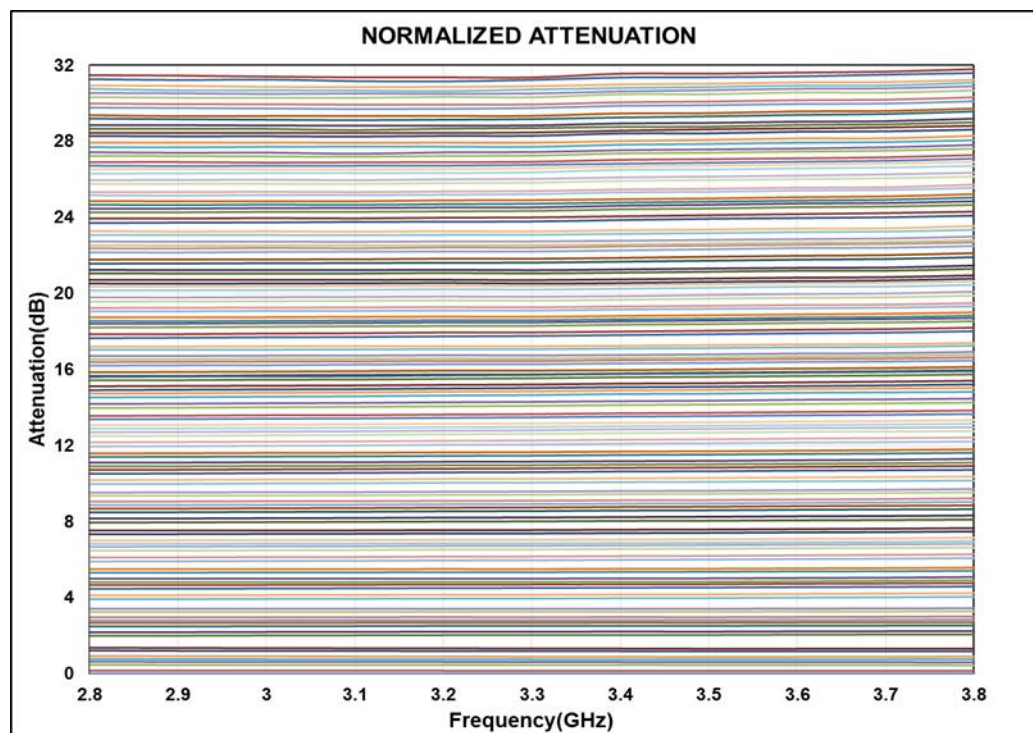
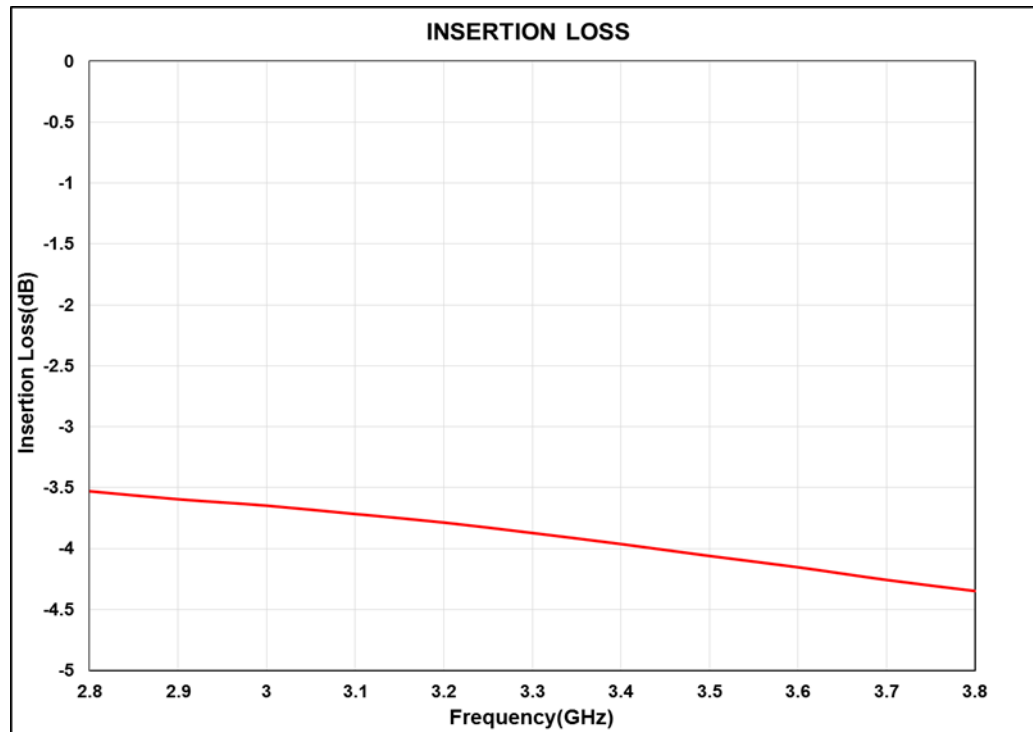


Electrical Specifications @ $T_A = 25^\circ\text{C}$, $Z_o = 50\Omega$,

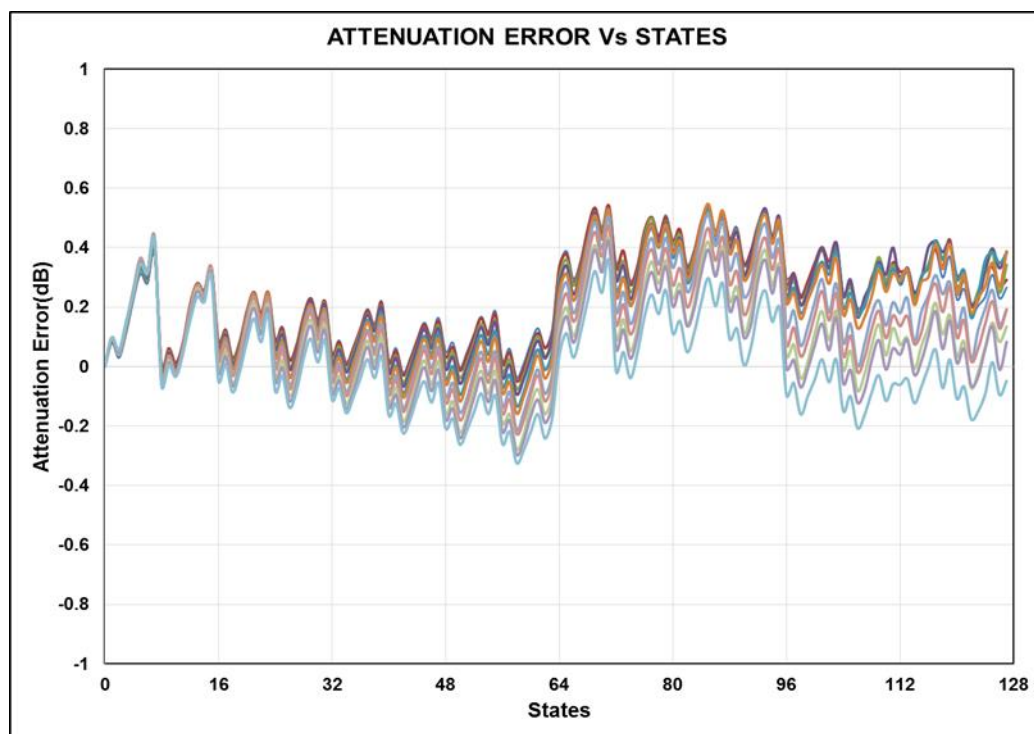
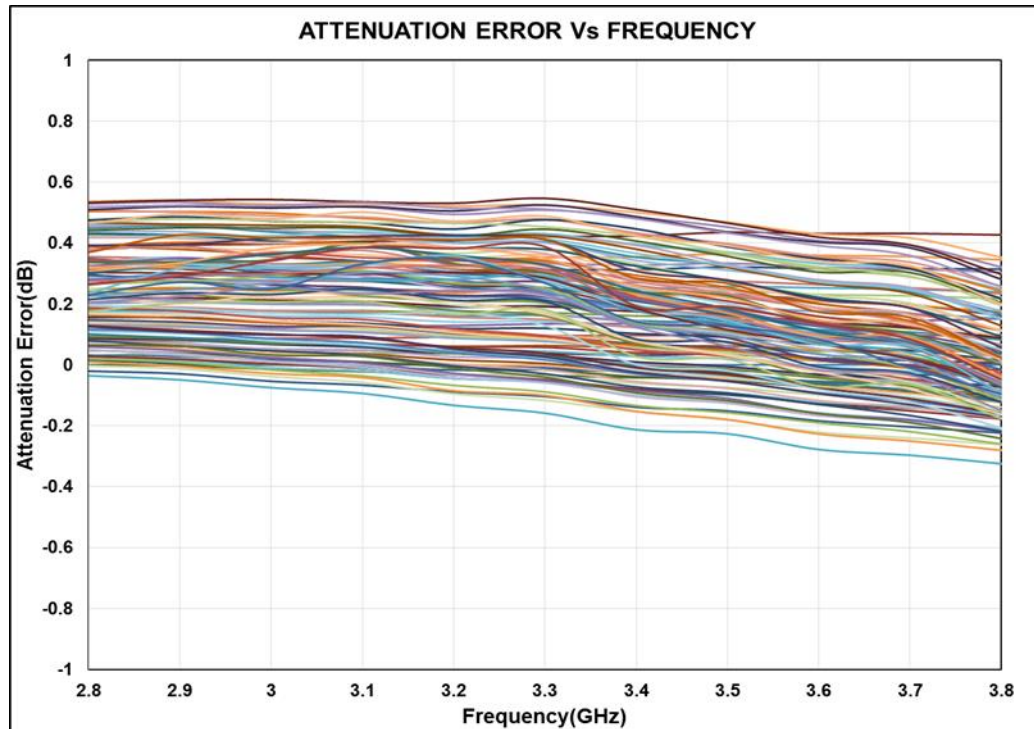
Parameter	Min.	Typ.	Max.	Units
Frequency Range	2.8	-	3.8	GHz
Insertion Loss	3.6	3.9	4.5	dB
Attenuation Range	-	31.75	-	dB
Attenuation Error	-	-0.4 to 0.6	-	dB
RMS Amplitude Error	0.16	0.2	0.3	dB
Input Return Loss	12	18	25	dB
Output Return Loss	12	18	25	dB
Insertion Phase	-	-4 to +6	-	Deg
Input P1dB	-	23	-	dBm
IIP3	-	40	-	dBm
DC Bias Voltages	-	+5 , - 5	-	V
Control Voltages	-	0 / +5	-	V

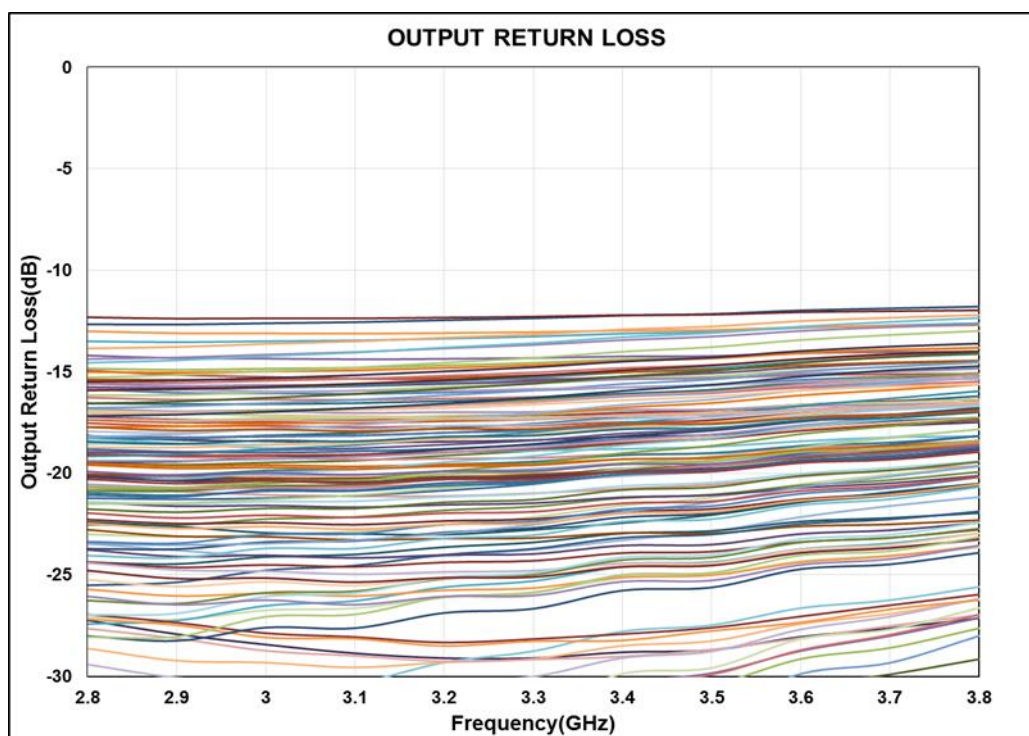
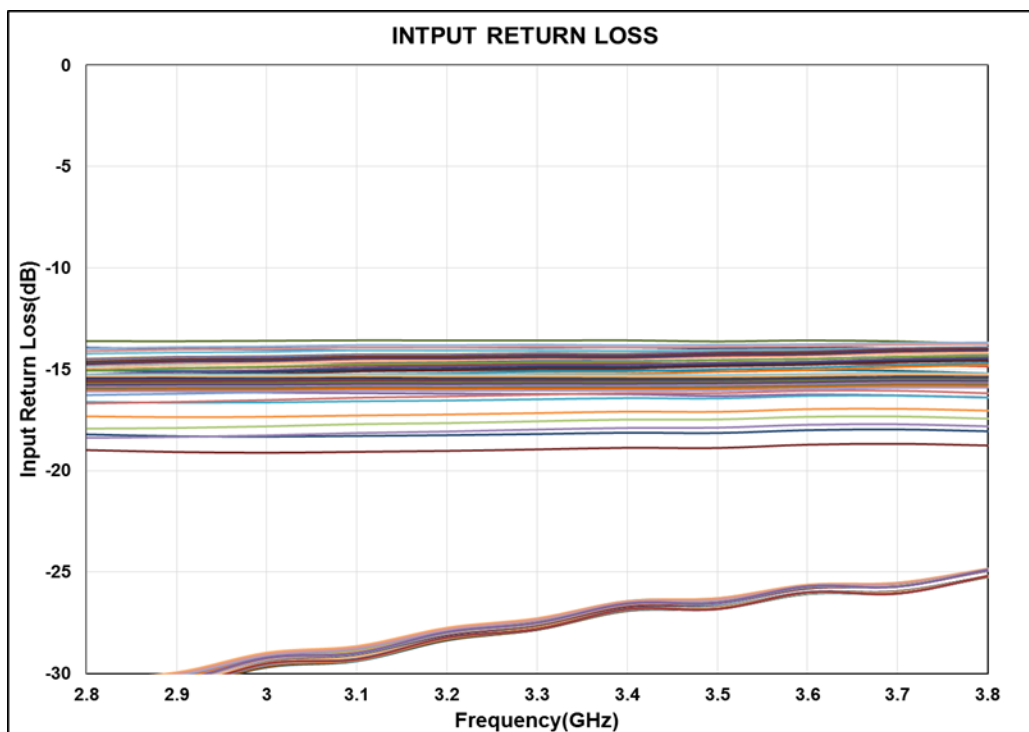
Note:

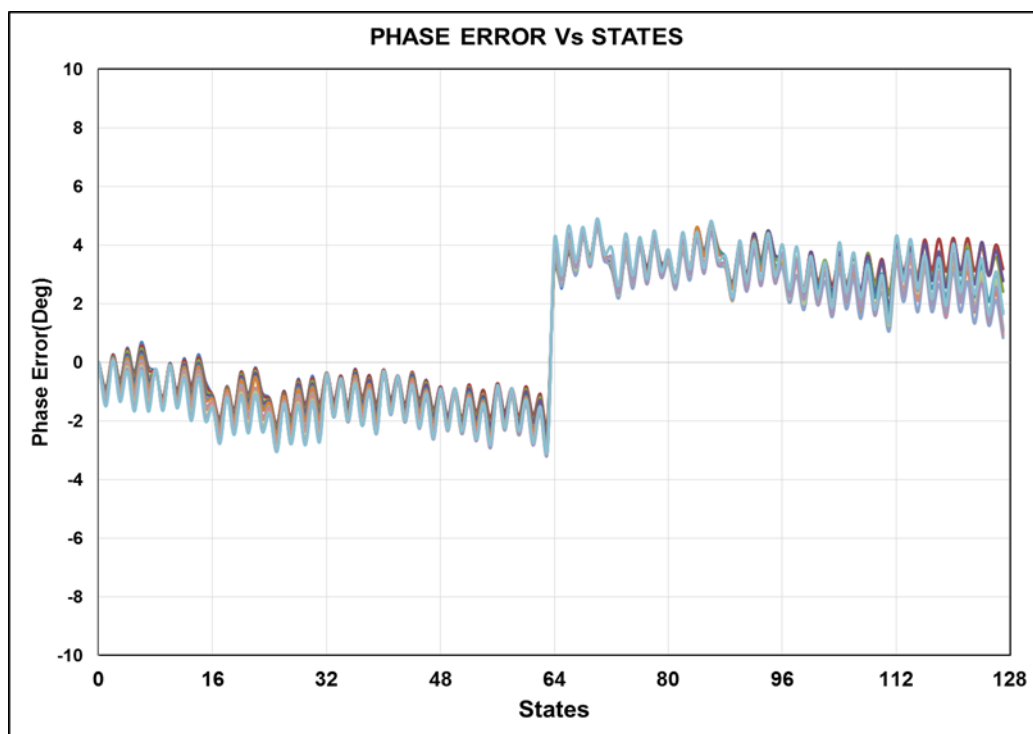
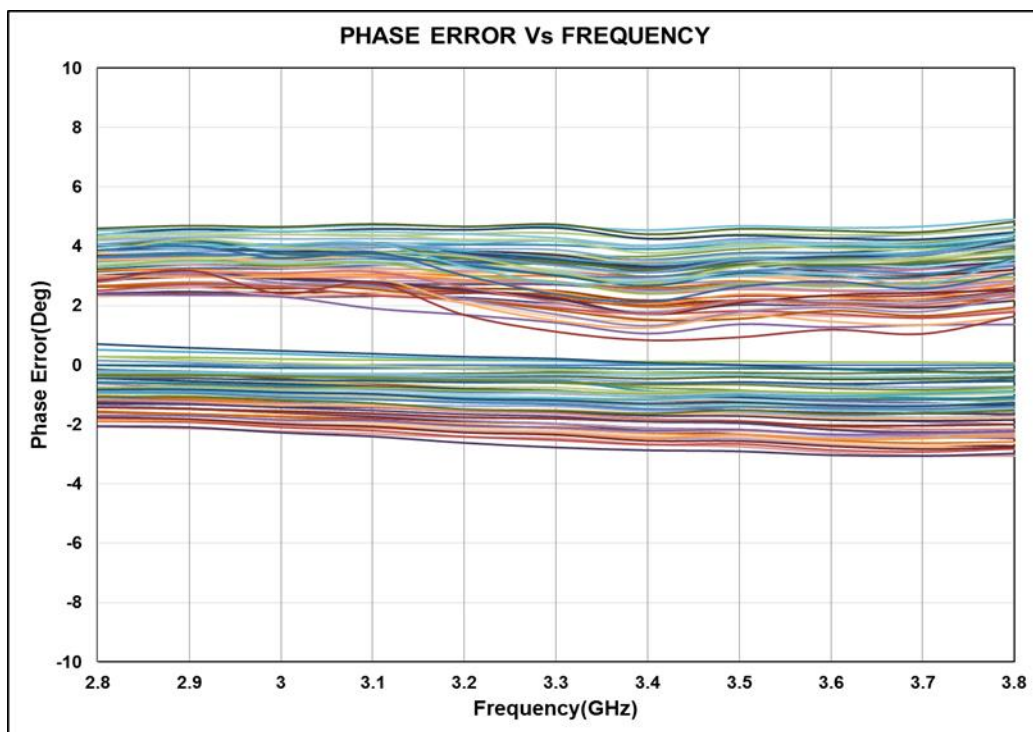
1. The above mentioned electrical specifications are measured on PCB mounted QFN package.
2. Input P1dB and IIP3 are measured for reference state at 3 frequencies points i.e., 3GHz, 3.3GHz & 3.5GHz.

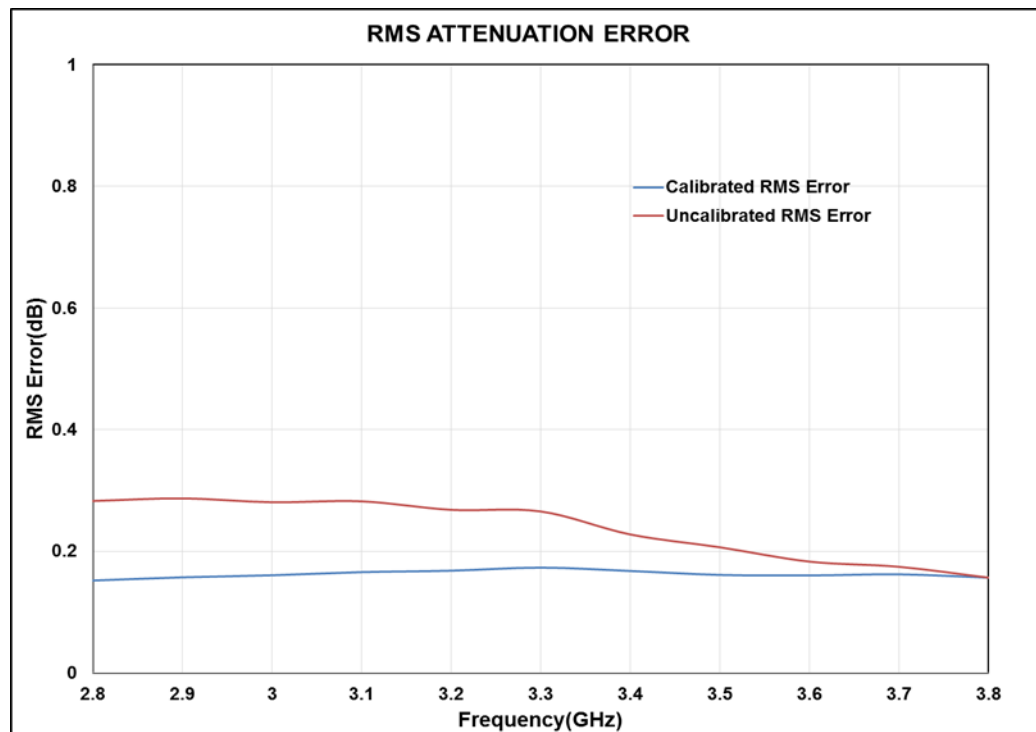
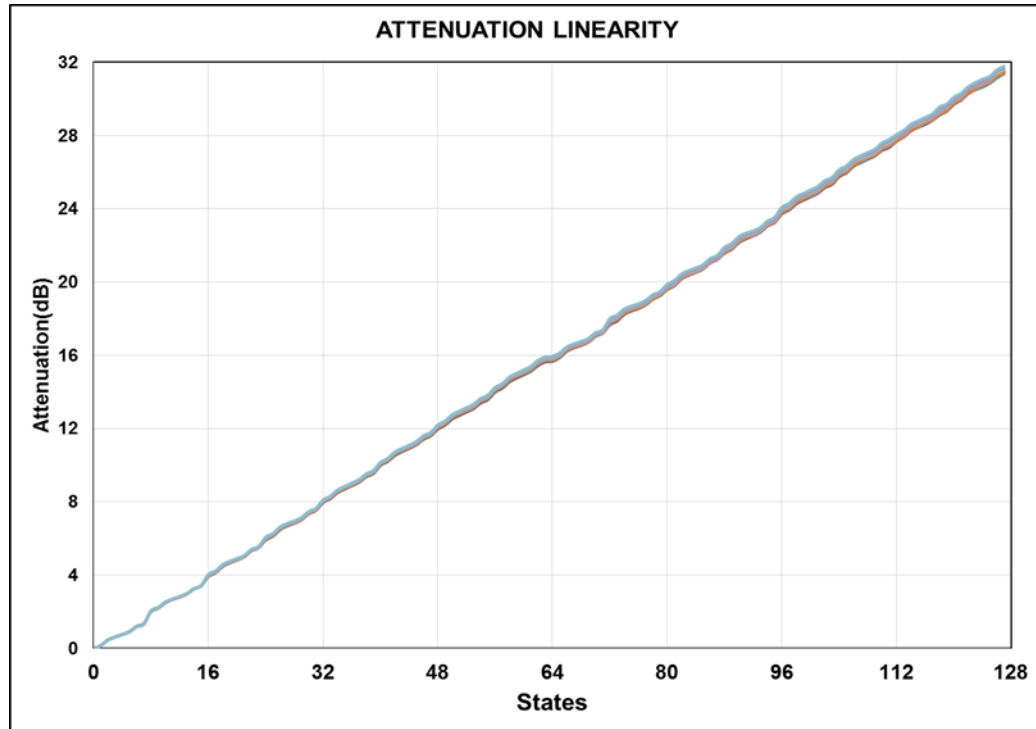
Test Fixture Data
 $T_A = 25^\circ\text{C}$


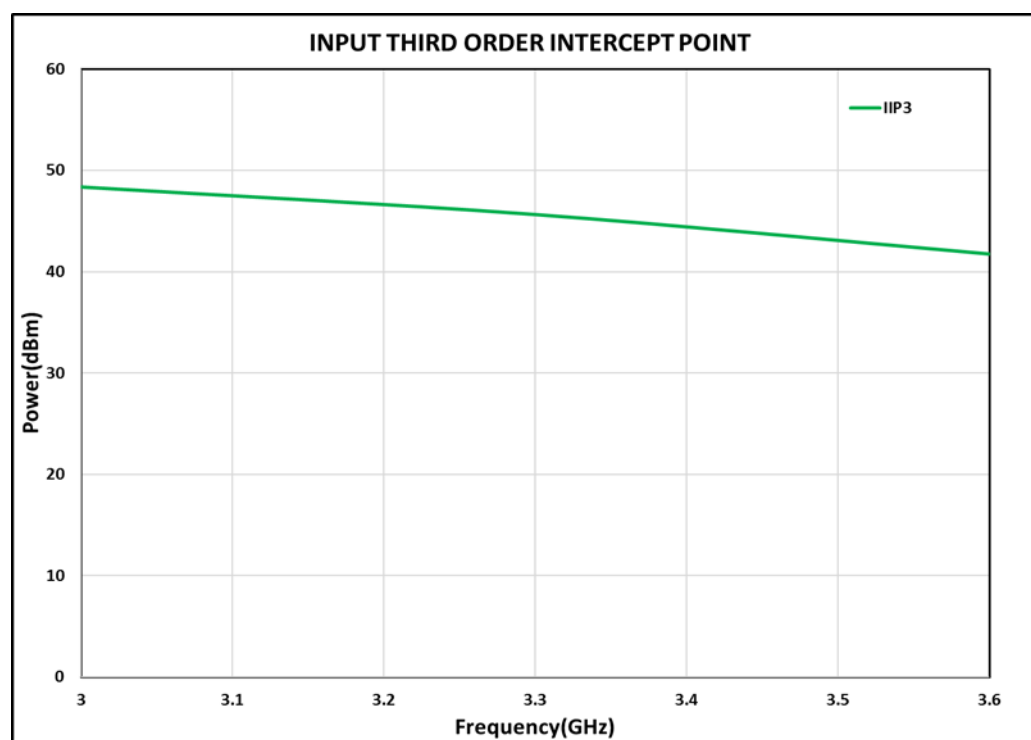
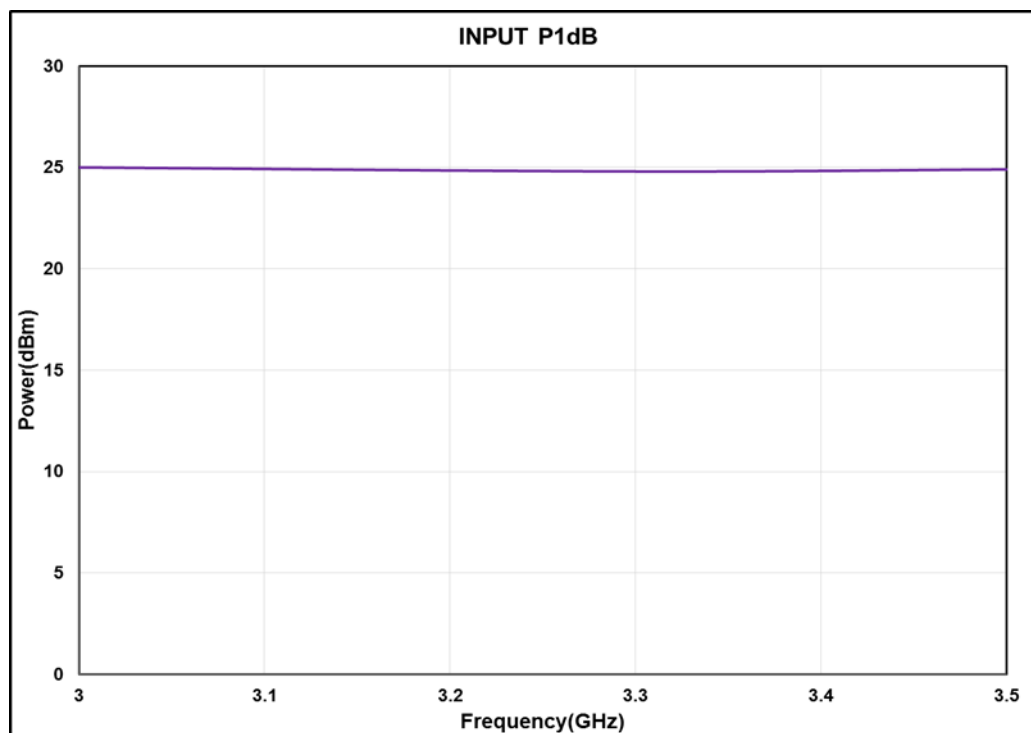
Test Fixture Data

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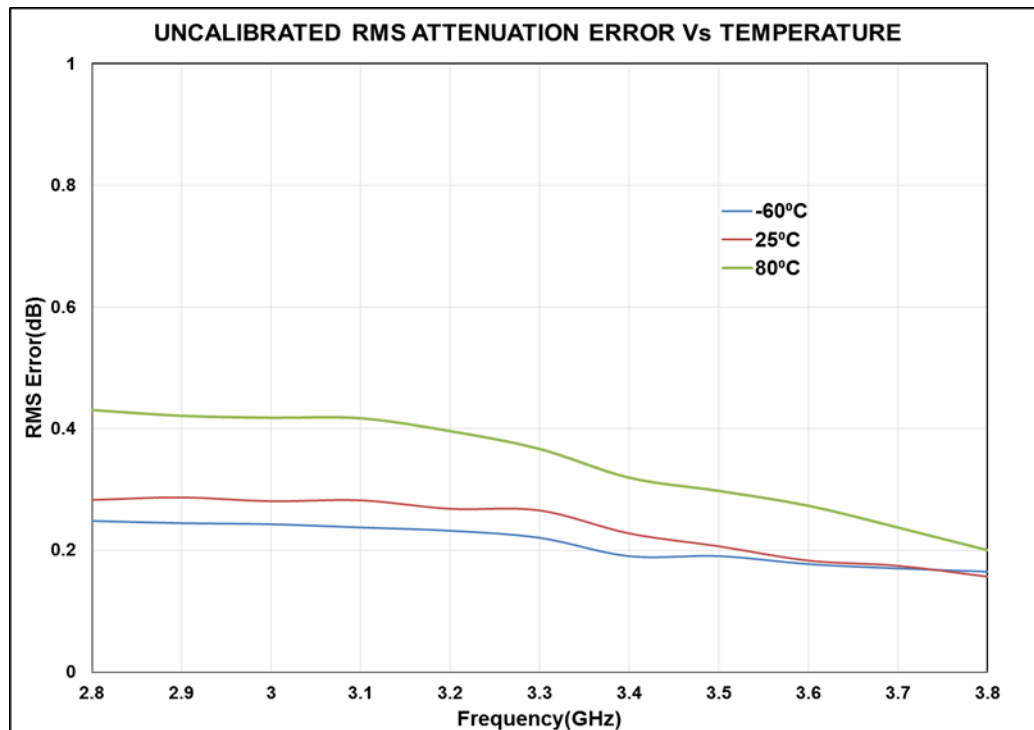
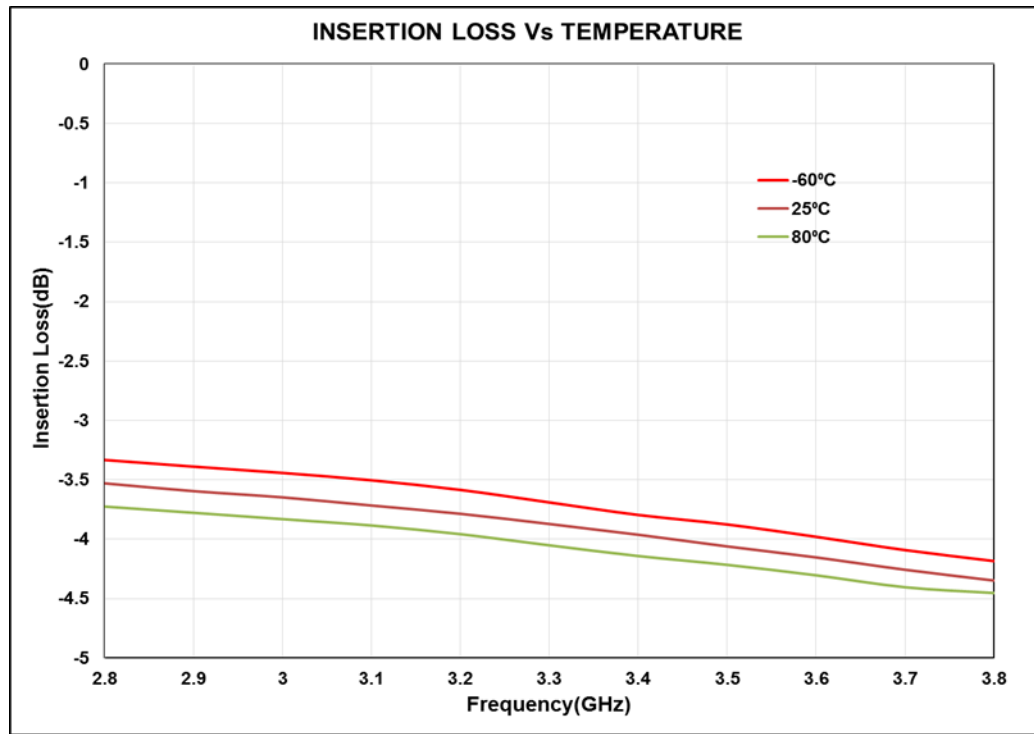
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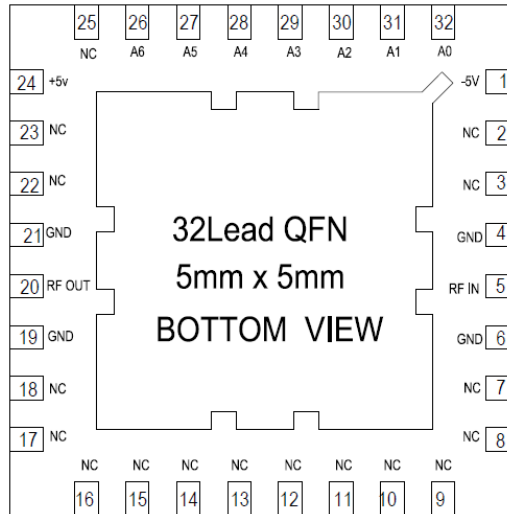
Test Fixture Data
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Test Fixture Data over the Temperature



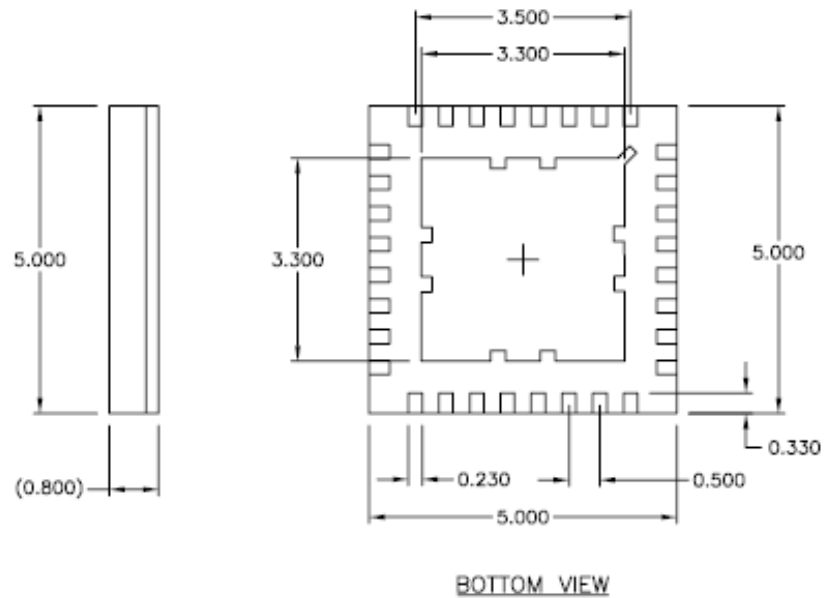
PIN CONFIGURATION



PIN DESCRIPTION

PIN	Function	Description
1	-5V	DC Supply Voltage
2,3,7-18,22,23,25	NC	No Connection
5	RF IN	RF Input
20	RF OUT	RF Output
26-32	A6-A0	Attenuation Controls
24	+5V	DC Supply Voltage
4,6,19,21	GND	Ground

PACKAGE OUTLINE DRAWING



Note: All Dimensions are in mm.

Truth Table for Prime States

State	Attenuation (dB)	TTL Control (1 = 3 to 5 V, 0 = 0 to 0.5 V)						
		A6 (16)	A5 (8)	A4(4)	A3 (2)	A2(1)	A1 (0.5)	A0 (0.25)
0	0	0	0	0	0	0	0	0
1	0.25	0	0	0	0	0	0	1
2	0.5	0	0	0	0	0	1	0
4	1	0	0	0	0	1	0	0
8	2	0	0	0	1	0	0	0
16	4	0	0	1	0	0	0	0
32	8	0	1	0	0	0	0	0
64	16	1	0	0	0	0	0	0
127	31.75	1	1	1	1	1	1	1



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