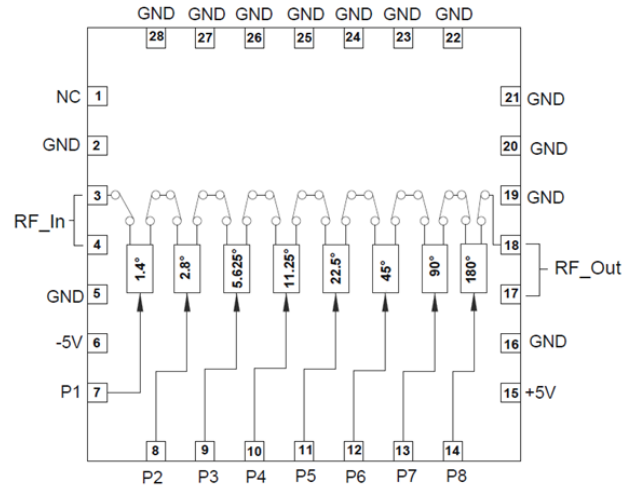


2.8 – 3.8 GHz 8-Bit Digital Phase Shifter

Features

- ◆ Frequency Range: 2.8 to 3.8 GHz
- ◆ Low RMS Error: 2.5 Deg (Max.)
- ◆ Low RMS Amplitude Error < 0.2 dB
- ◆ Peak Phase Error -5 to +5 Deg (Typ.)
- ◆ 7 dB Typ. Insertion Loss
- ◆ TTL Control Inputs
- ◆ 28 Lead 7.0 X 7.0 X 1.2 mm3 QFN Package



Typical Applications

- ◆ Radar
- ◆ Military & Space
- ◆ Instrumentation

Description

The ASL 2018P7 is an 8-bit digital phase shifter MMIC packaged in a QFN package. It is designed to operate over a frequency band of 2.8 – 3.8 GHz. The phase shifter features a low RMS phase error of 2.5 Deg (Max.). The insertion loss is 7 dB typical and varies within ± 0.2 dB over the band and the 256 phase states. The input /output ports are well matched to 50 Ohms. The integrated TTL compatible drivers provide convenient digital interface for 8-bit control. The package operates with +5V and -5V DC supply at a very low current.

Absolute Maximum Ratings¹

Parameter	Absolute Maximum	Units
RF Input Power	25	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})	108.57	°C/W

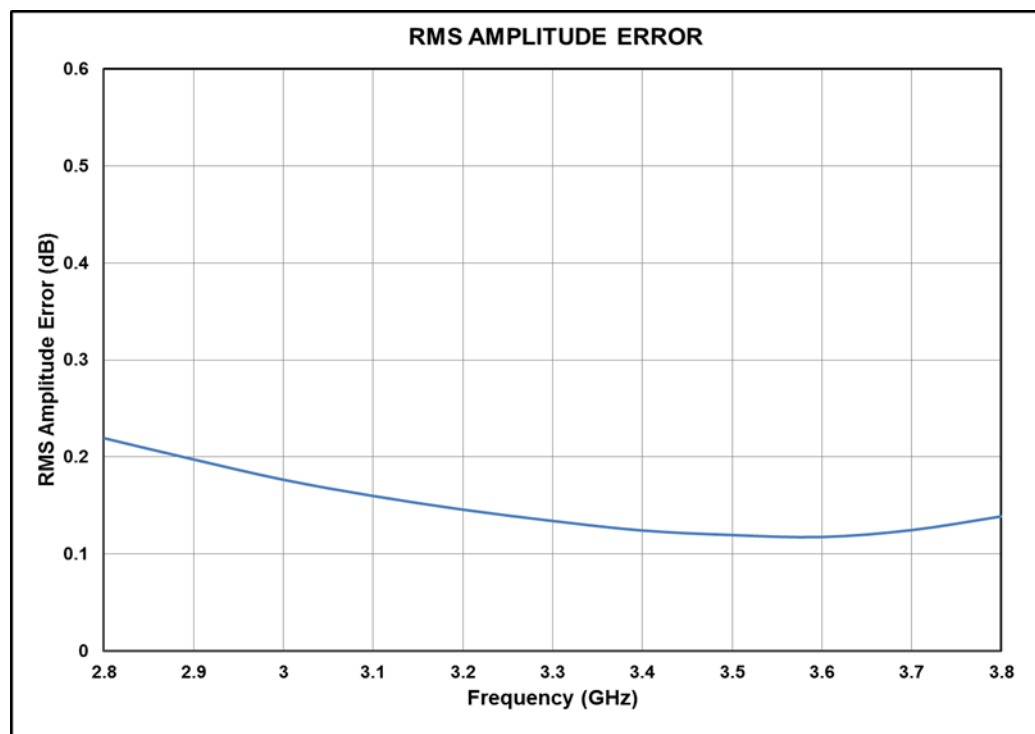
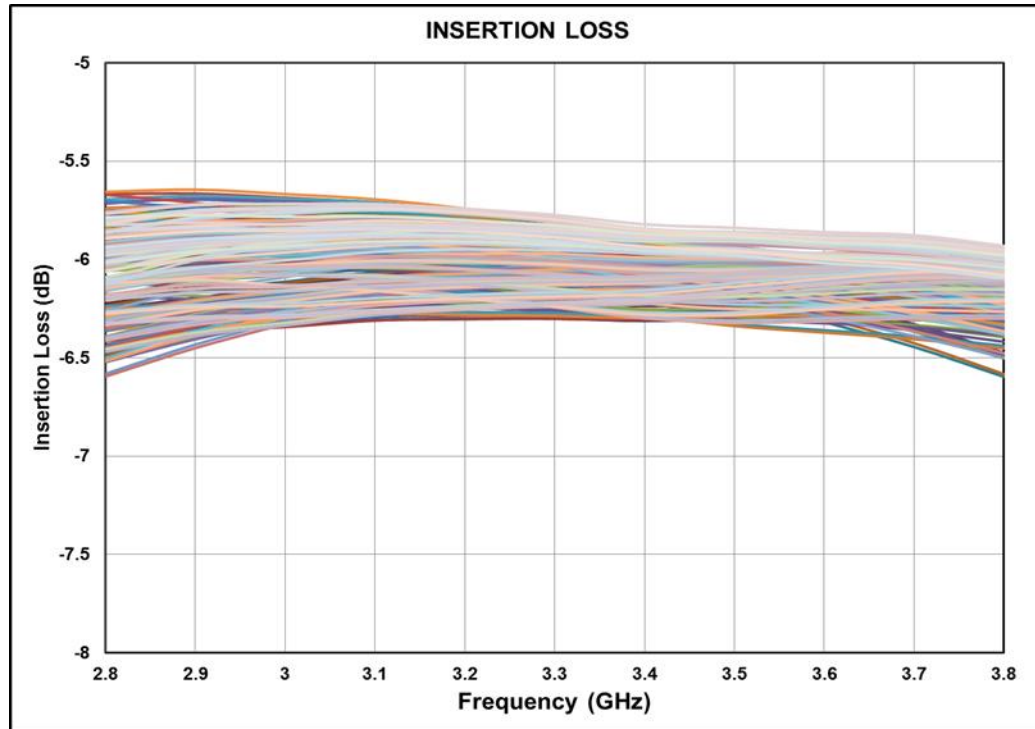
1. Operation beyond these limits may cause permanent damage to the component

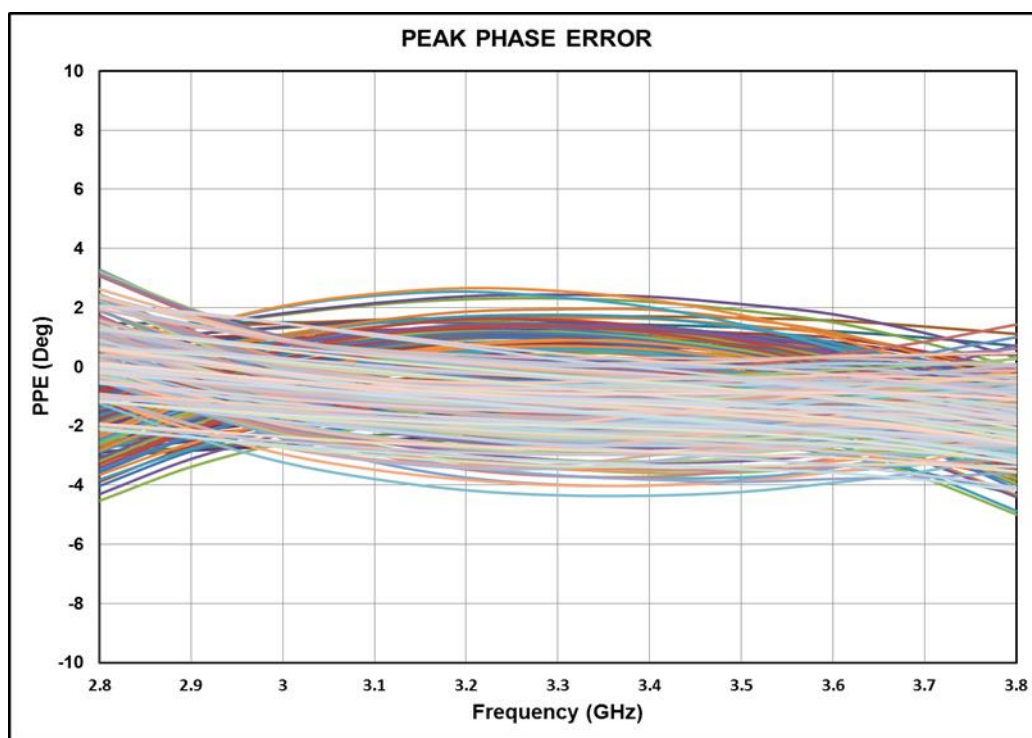
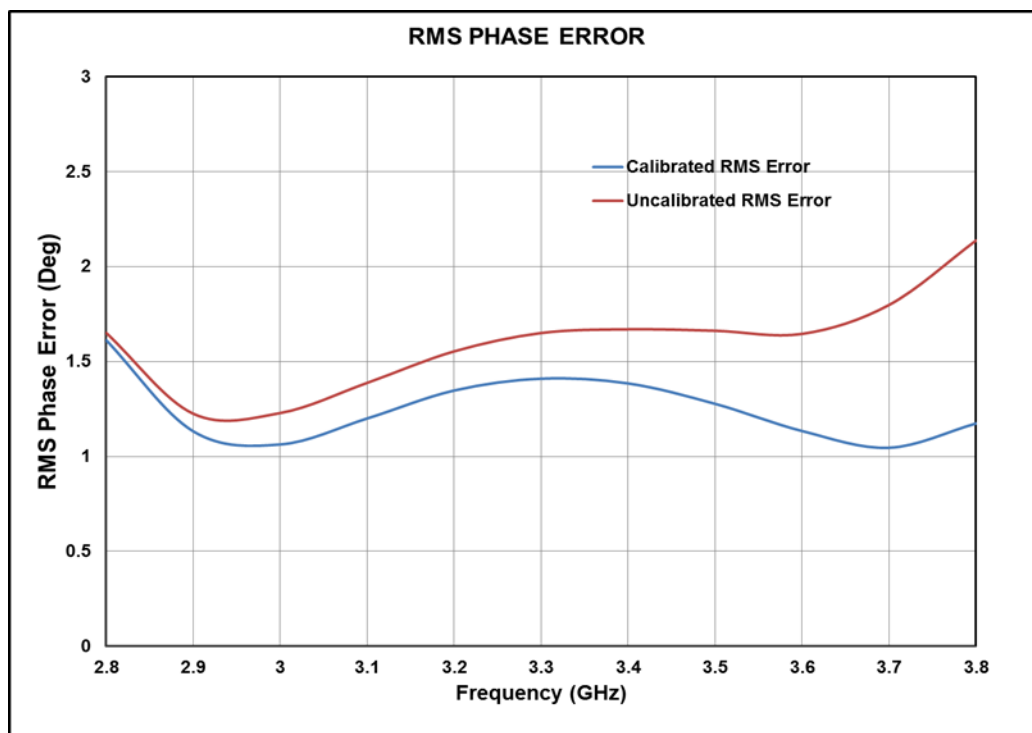
Electrical Specifications² @ T_A = 25 °C , Z_o = 50 Ω

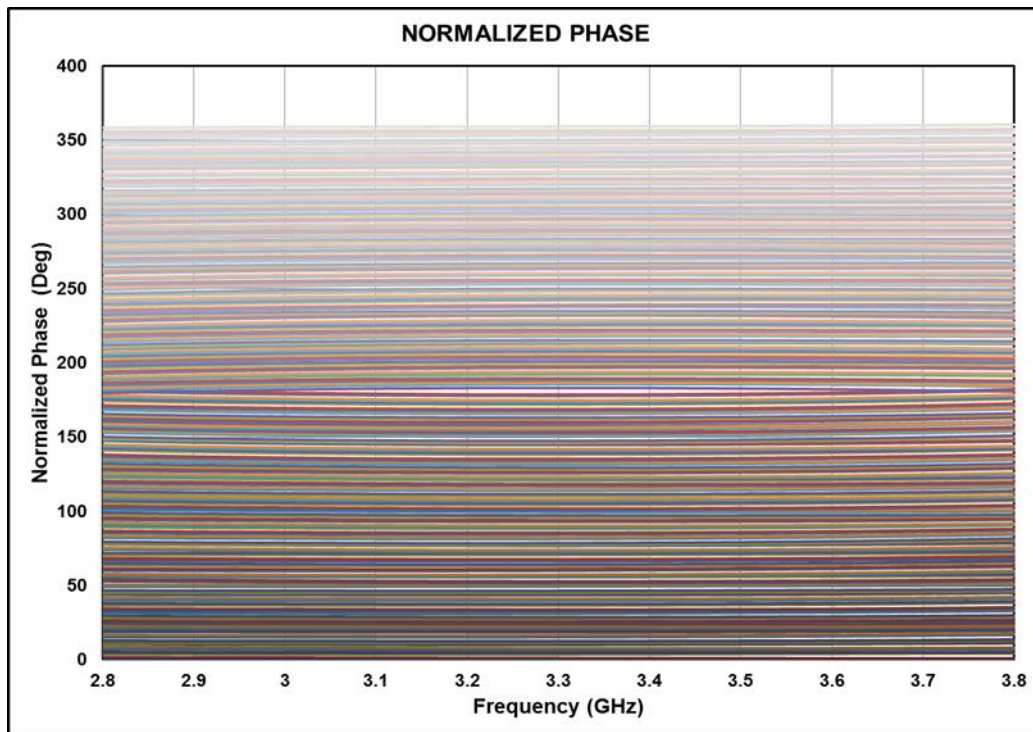
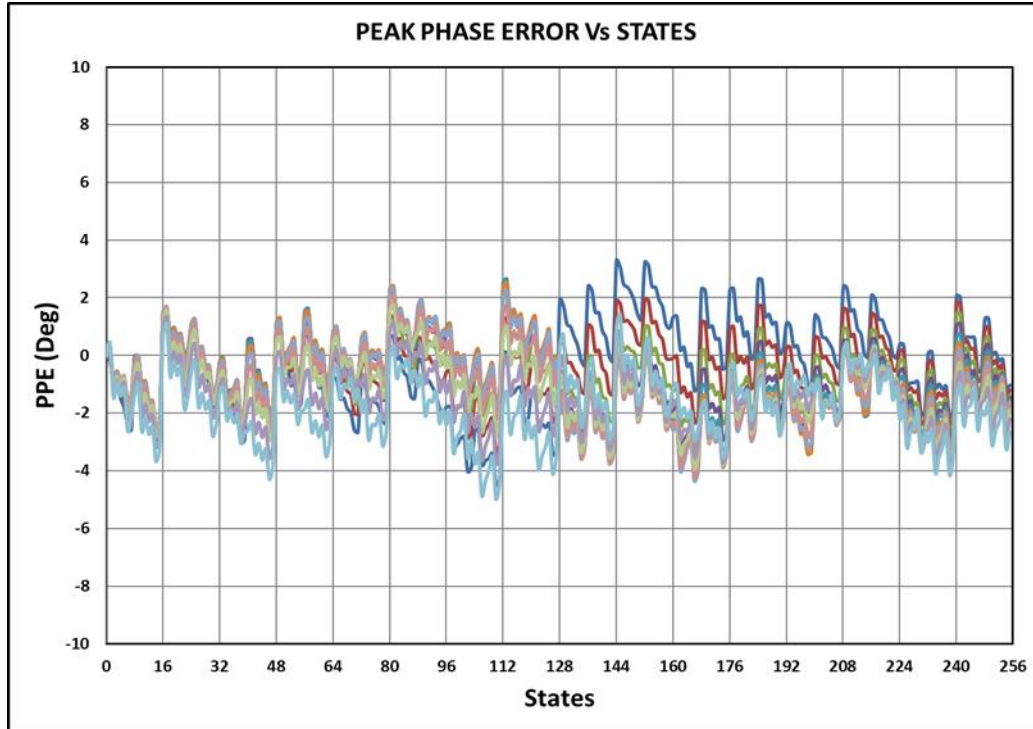
Parameter	Min.	Typ.	Max.	Units
Frequency Range	2.8	-	3.8	GHz
Phase Shift	-	0-360 in 256 steps	-	Deg
Insertion Loss	6.0	6.5	7	dB
Insertion Loss Variation	-	± 0.4	-	dB
Peak Phase Error	-	-5 to +5	--	Deg
RMS phase Error	1.5	2	2.5	Deg
RMS Amplitude Error	-	<0.2	-	dB
Input Return Loss	10	12	25	dB
Output Return Loss	10	10	25	dB
P1dB	-	22	-	dBm
IIP3	-	39	-	dBm
DC Bias Voltages	-	+5, -5	-	V
DC Supply Current	-	14	-	mA
TTL Control Voltage	-	0 / +3.3	-	V

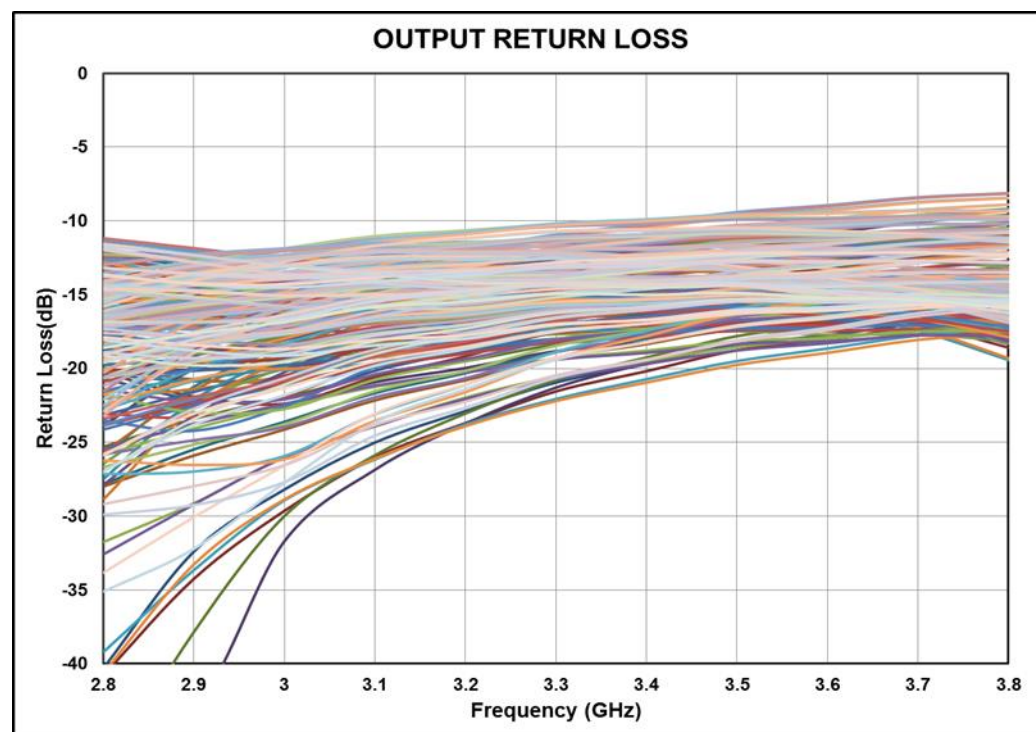
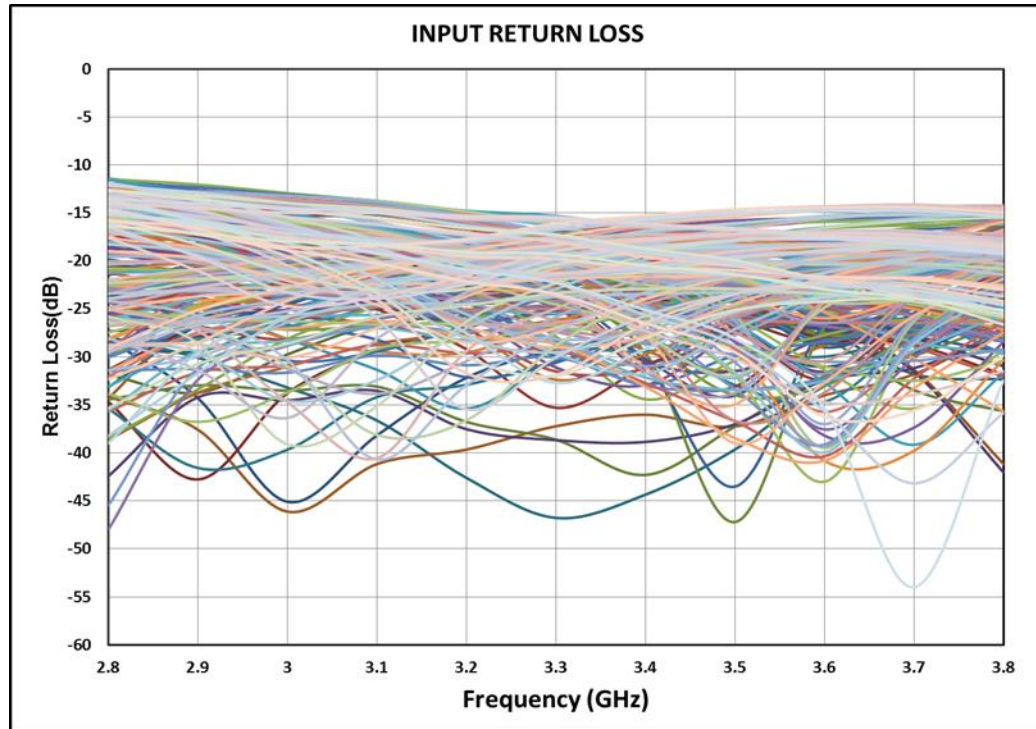
Note:

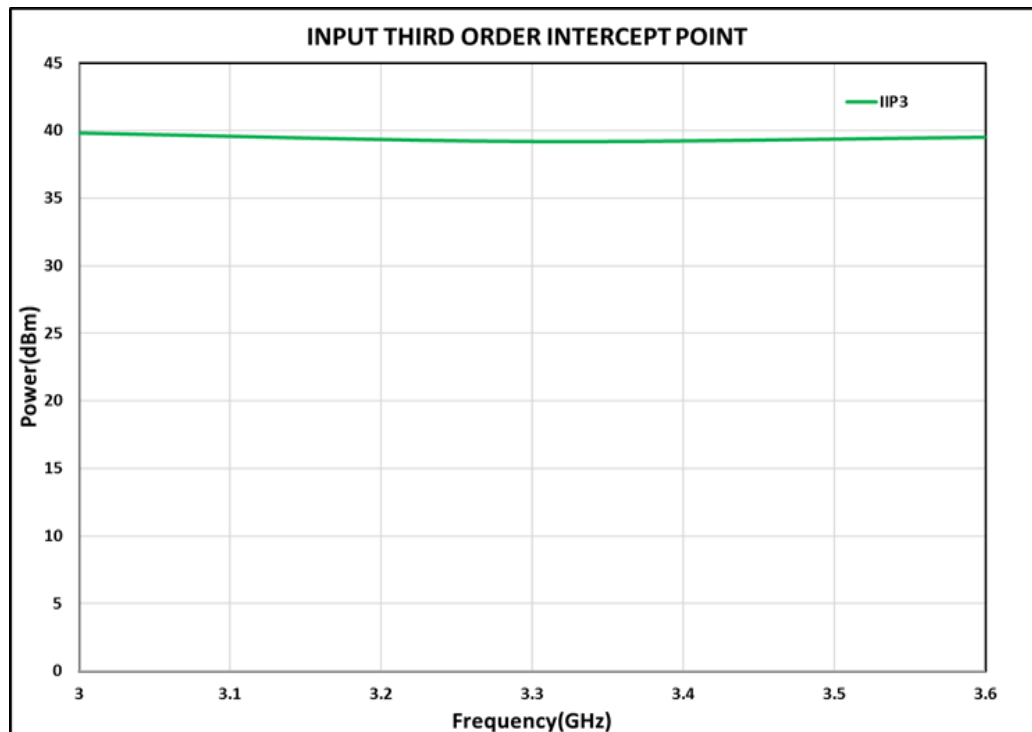
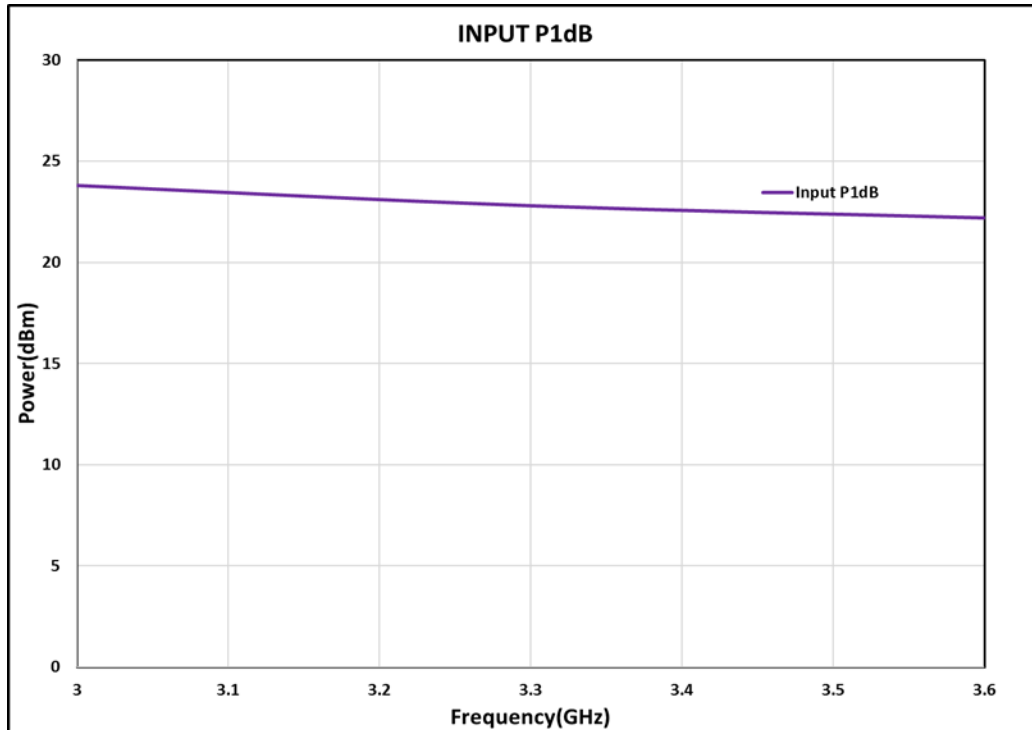
1. The above mentioned electrical specifications are measured on PCB mounted QFN package.
2. P1dB & IIP3 are measured only for ref state at 3 frequencies 3GHz, 3.3GHz & 3.5GHz.

Test Fixture Data
 $T_A = 25\text{ }^{\circ}\text{C}$, $Z_0 = 50\text{ }\Omega$


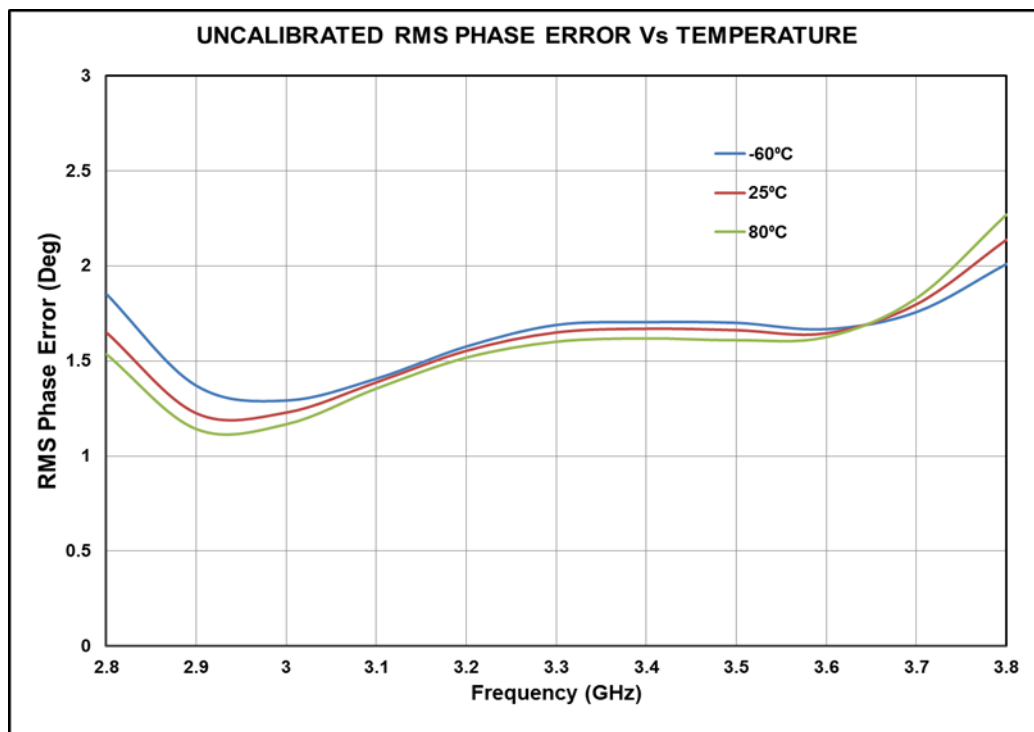
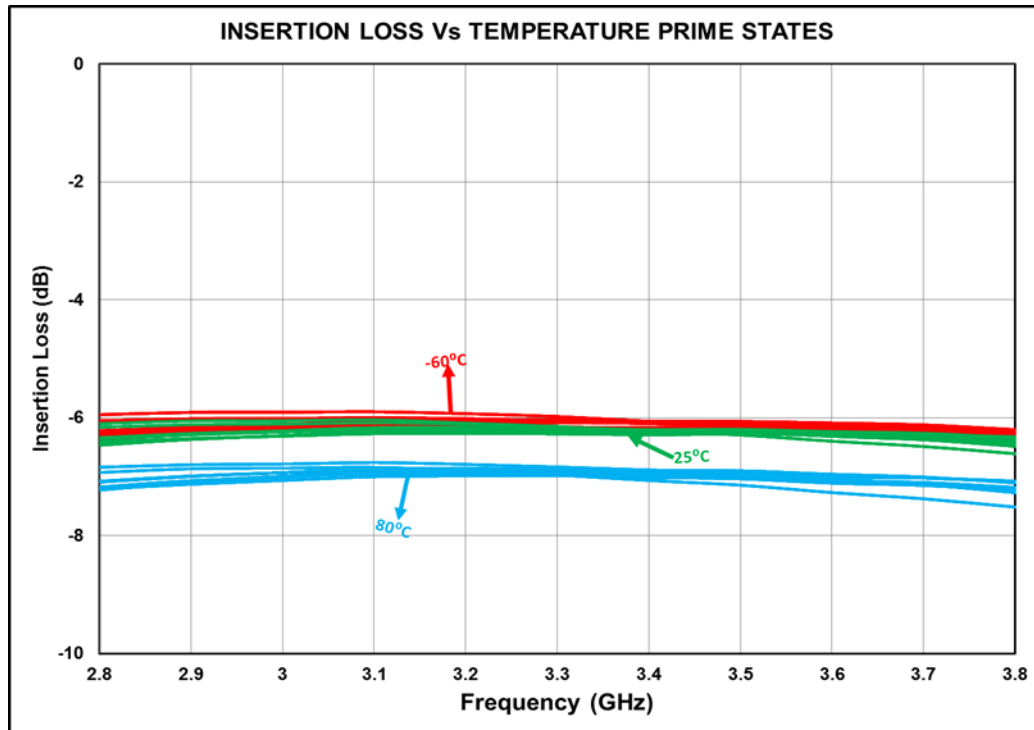
Test Fixture Data
 $T_A = 25\text{ }^{\circ}\text{C}$, $Z_0 = 50\text{ }\Omega$


Test Fixture Data
 $T_A = 25\text{ }^{\circ}\text{C}$, $Z_o = 50\text{ }\Omega$


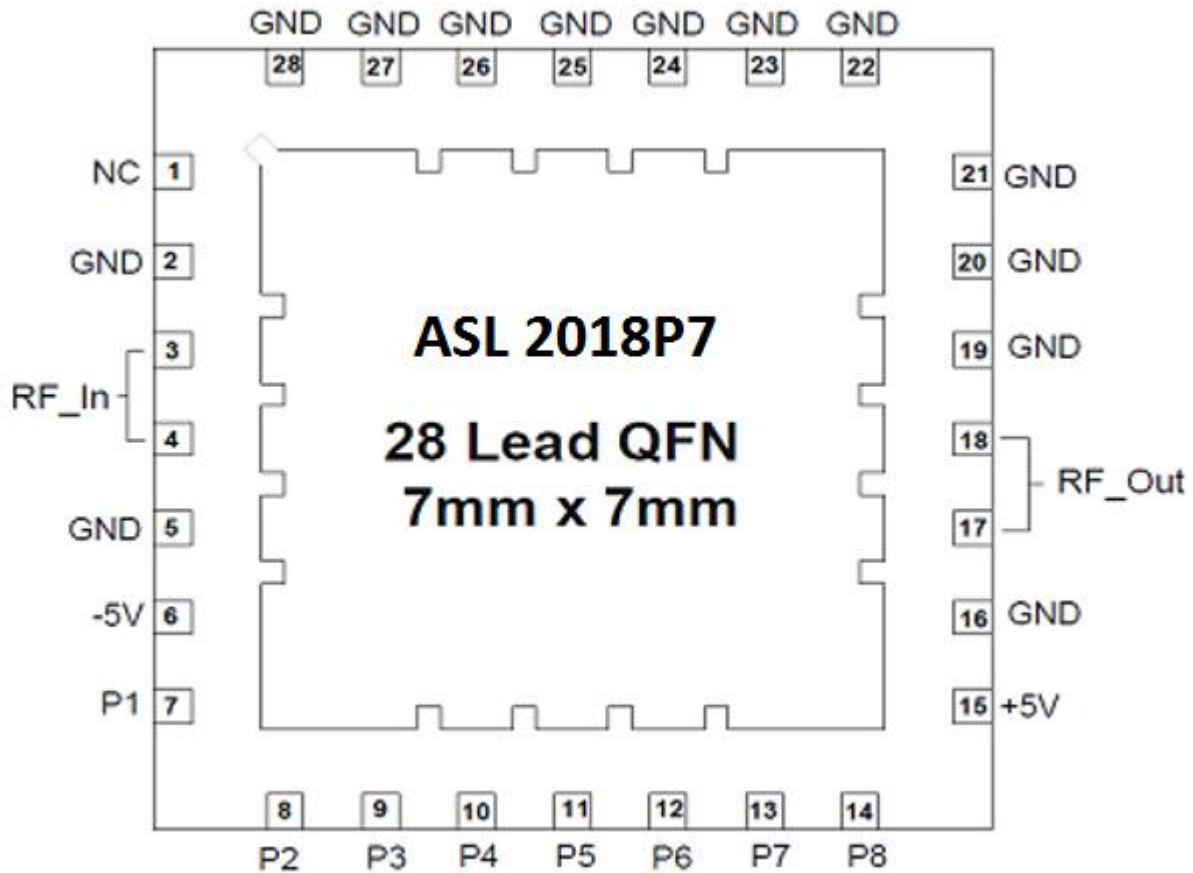
Test Fixture Data
 $T_A = 25\text{ }^{\circ}\text{C}$, $Z_o = 50\text{ }\Omega$


Test Fixture Data
 $T_A = 25\text{ }^{\circ}\text{C}$, $Z_o = 50\text{ }\Omega$


Test Fixture Data over the Temperature



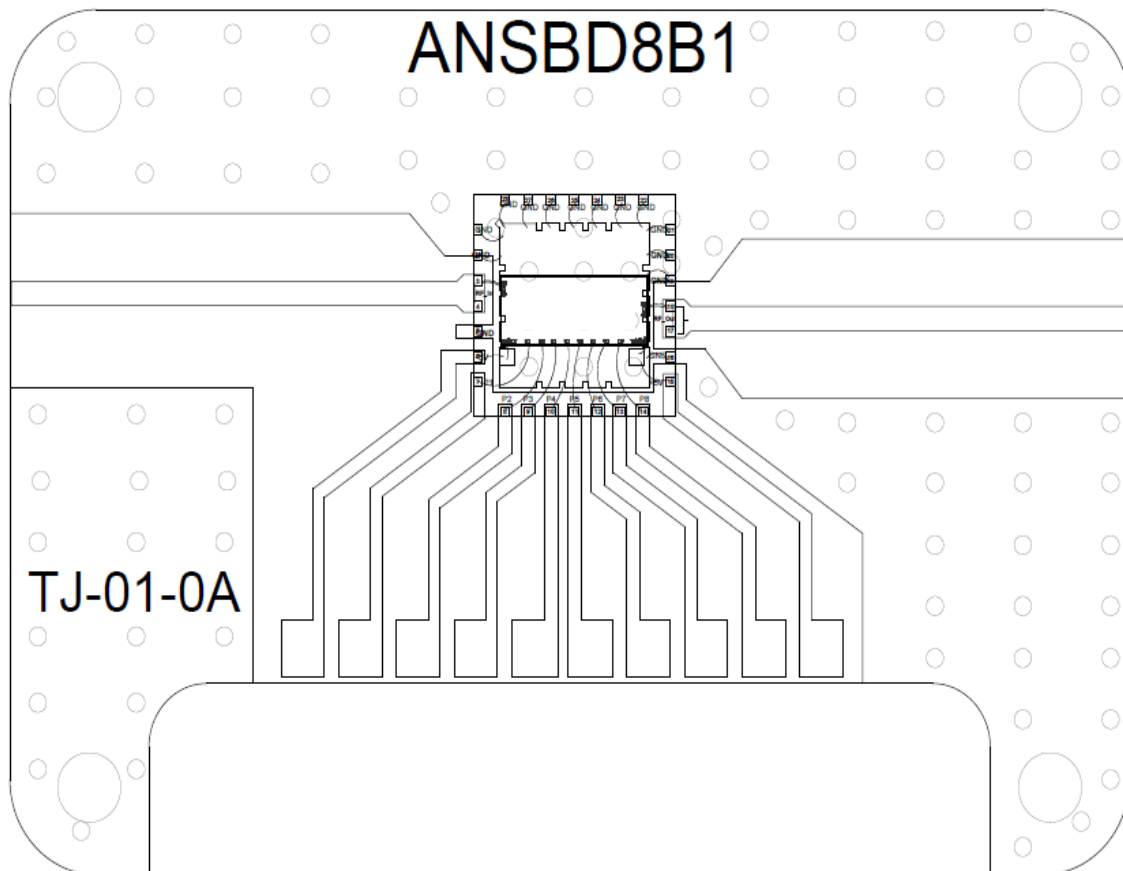
PIN CONFIGURATION



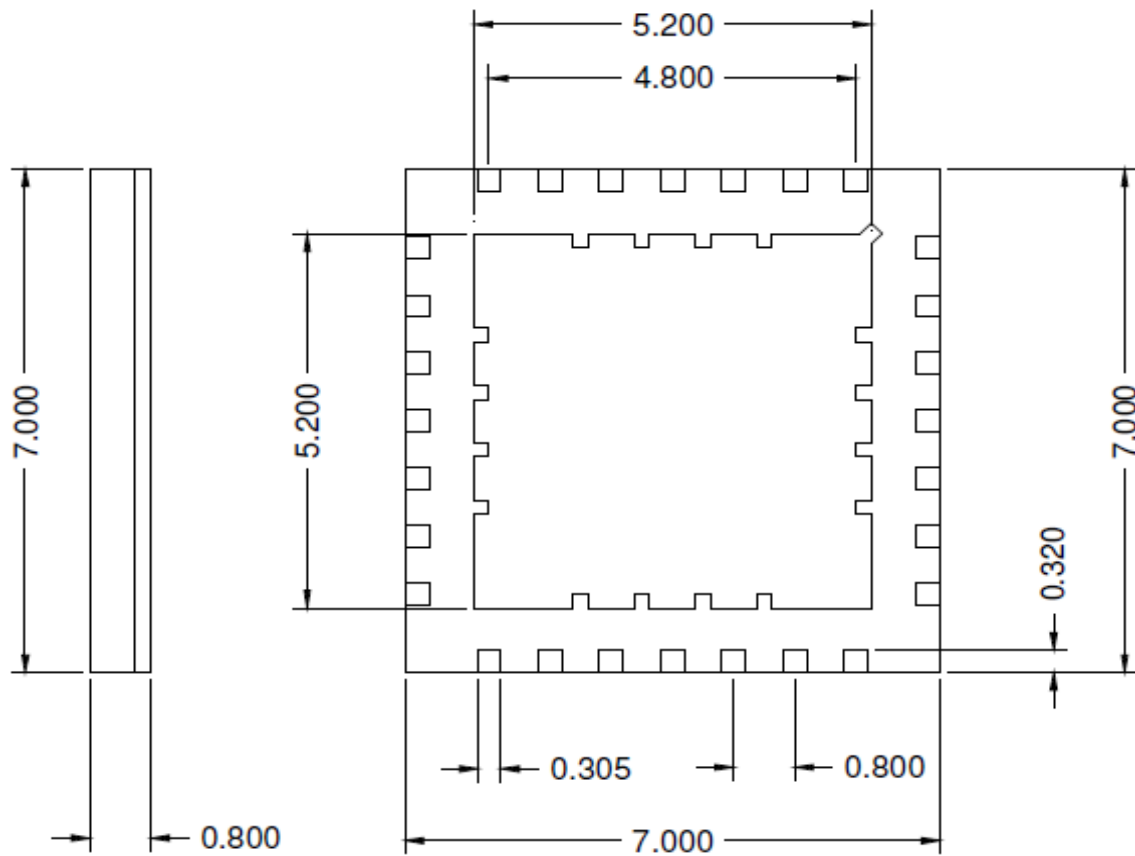
TOP VIEW

PIN DESCRIPTION

PIN	Function	Description
3,4	RF IN	RF Input
17,18	RF OUT	RF Output
15	+5V	DC Supply Voltage
6	-5V	DC Supply Voltage
7-14	P1-P8	8 Bit Phase Controls
1	NC	No Connection
2, 5, 16,19-28	Gnd	Ground

TEST BOARD PATTERN**Note:**

1. Circuit board material: Rogers 4350B, 20mil, 1 Ounce Copper.
2. RF Input/Output signal lines have 50 Ω impedance

PACKAGE OUTLINE DRAWING**BOTTOM VIEW**

Note: All Dimensions are in mm.

TRUTH TABLE [TTL Control (1= 3.3 V to 5 V & 0 = 0 to 0.5 V)]

State	Phase Shift	180 deg	90 deg	45 deg	22.5 deg	11.25 deg	5.625 deg	2.8125 deg	1.40625 deg
		P8	P7	P6	P5	P4	P3	P2	P1
1	1.40625	0	0	0	0	0	0	0	1
2	2.8125	0	0	0	0	0	0	1	0
4	5.625	0	0	0	0	0	1	0	0
8	11.25	0	0	0	0	1	0	0	0
16	22.5	0	0	0	1	0	0	0	0
32	45	0	0	1	0	0	0	0	0
64	90	0	1	0	0	0	0	0	0
128	180	1	0	0	0	0	0	0	0
256	358.59375	1	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