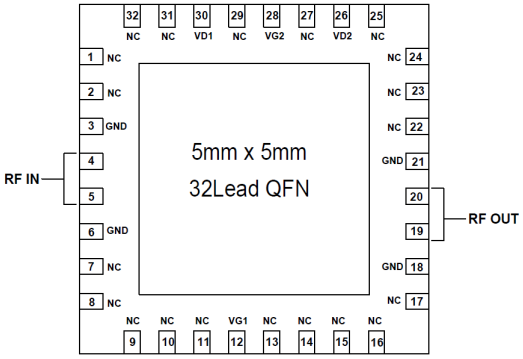
5.0 – 6.0 GHz 1 Watt Power Amplifier

Features

- **Frequency Range : 5.0 – 6.0 GHz**
- **31 dBm Psat**
- **24 dB Small Signal Gain**
- **Input Return Loss ≥ 8 dB**
- **Output Return Loss ≥ 8 dB**
- **Dual bias operation**
- **No external matching required**
- **DC decoupled input and output**
- **32 Lead 5X5mm QFN Package**

Functional Diagram



Typical Applications

- **RADAR**
- **Military & space**
- **LMDS, VSAT**

Description

The ASL4003P is a C-band Power amplifier with 31dBm power output. The PA uses two stages of amplification and operates in 5.0 – 6.0GHz frequency range. It features 24dB of gain with input and output return losses of 8dB respectively over the band. It has a high P1dB of 27dBm and 31dBm of PSAT. This feature enables it to be used in the applications requiring efficiency along with linearity. The phase shifter operates with dual bias supply voltage.

Absolute Maximum Ratings (1)

Parameter	Absolute Maximum	Units
Drain bias voltage (Vd)	+9	volts
Drain current (Id)	0.6	A
RF input power (RFin at Vd=9V)	30	dBm
Operating temperature	-50 to +85	^{o}C
Storage Temperature	-65 to +150	^{o}C

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

Electrical Specifications (1) @ T_A = 25 °C, Z_o =50 Ω
V_{d1} = V_{d2} = 5V, V_{g1} = V_{g2} = -1V

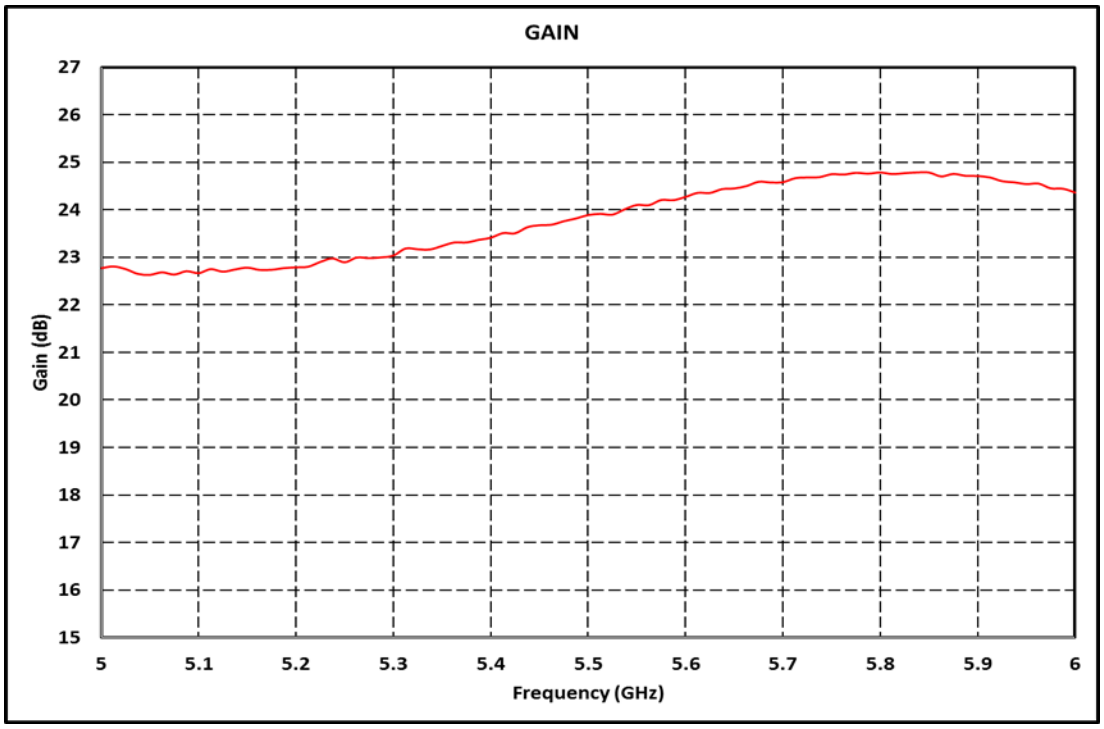
Parameter	Typ.	Units
Frequency Range	5 - 6	GHz
Gain	24	dB
Gain Flatness	+/-1	dB
Output Power (P1 dB)	27	dBm
Saturated output power (Psat)	31	dBm
Input/output Return Loss	8	dB
Gate Voltage (V_g)	-1	V
Drain voltage (Vd)	+5	V
Supply Current(I_{dq})	240	mA
Supply Current(I_{dsat}[2])	600	mA

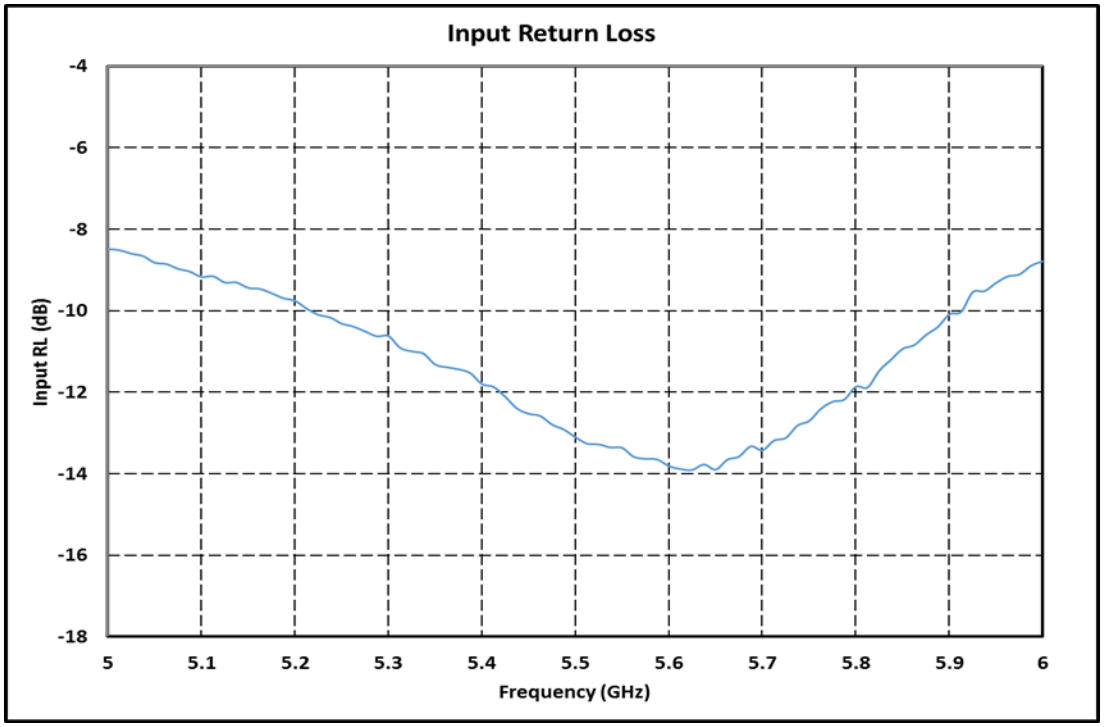
Note:

1. Electrical specifications as measured in test fixture.
2. I_{dsat} is the current drawn over input RF drive condition.

Test fixture data

V_{d1} = V_{d2} = 5V, V_{g1} = V_{g2} = -1V, Total Current (I_{dq}) =240mA, T_A = 25 ^oC





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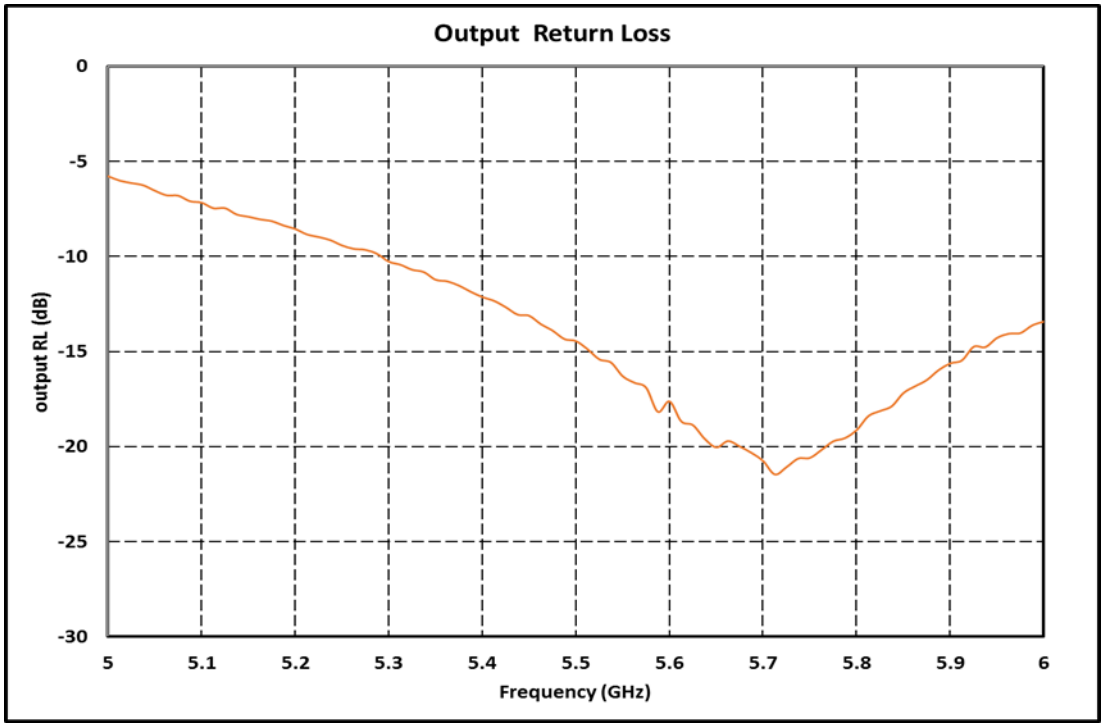

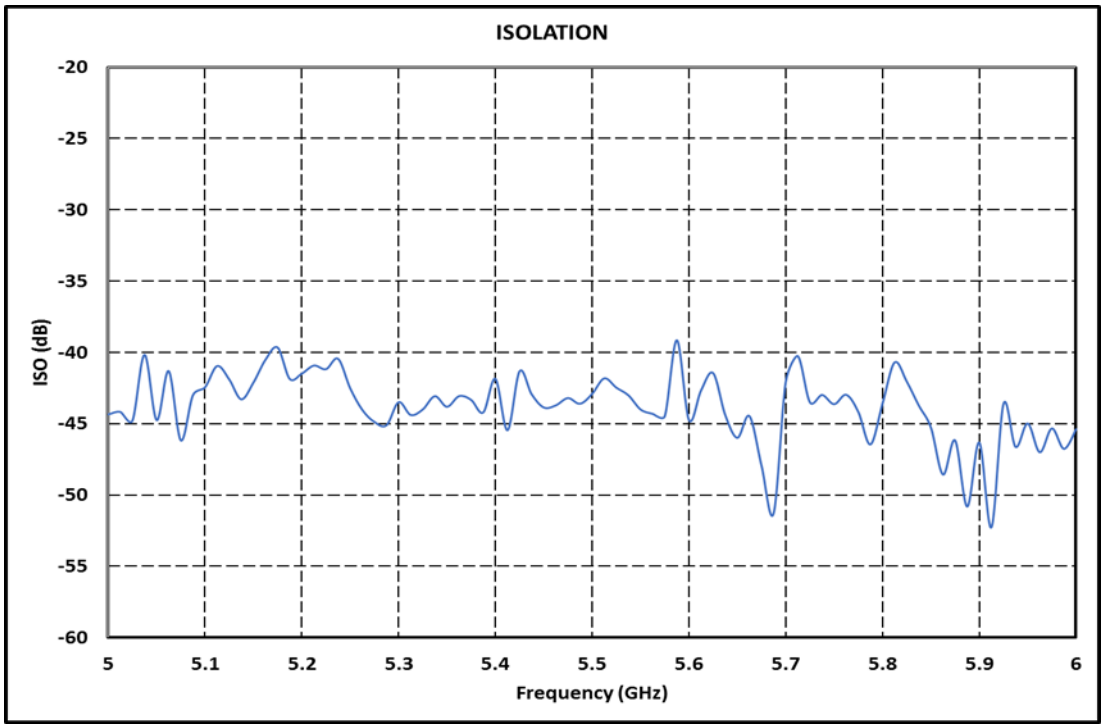

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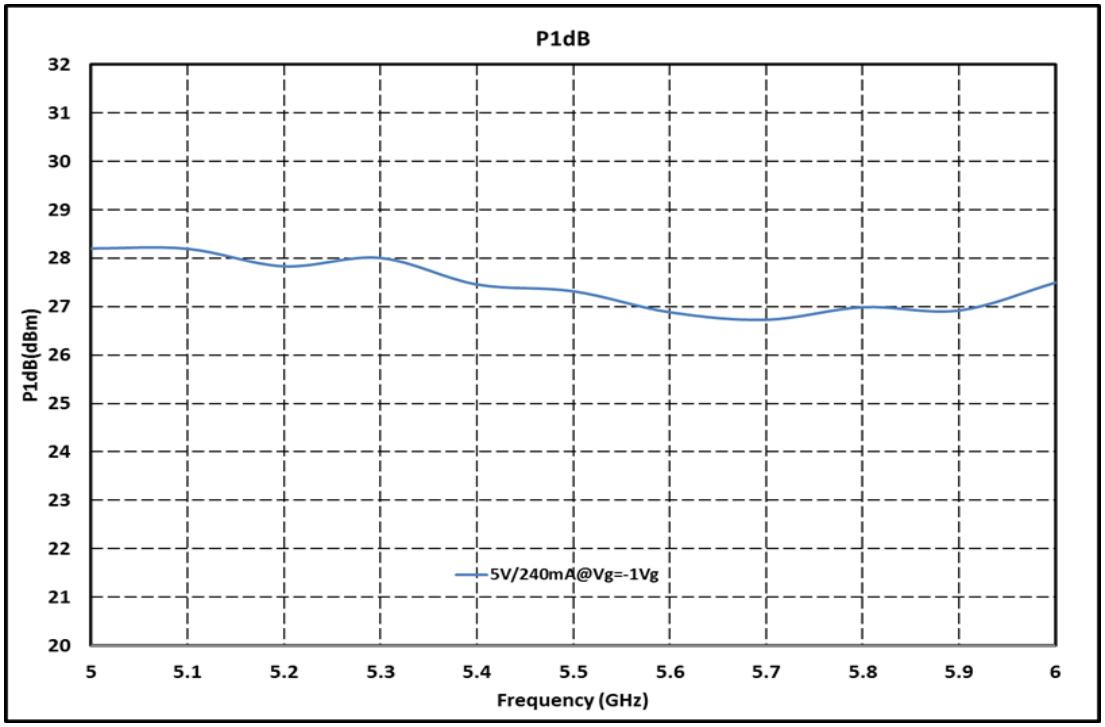
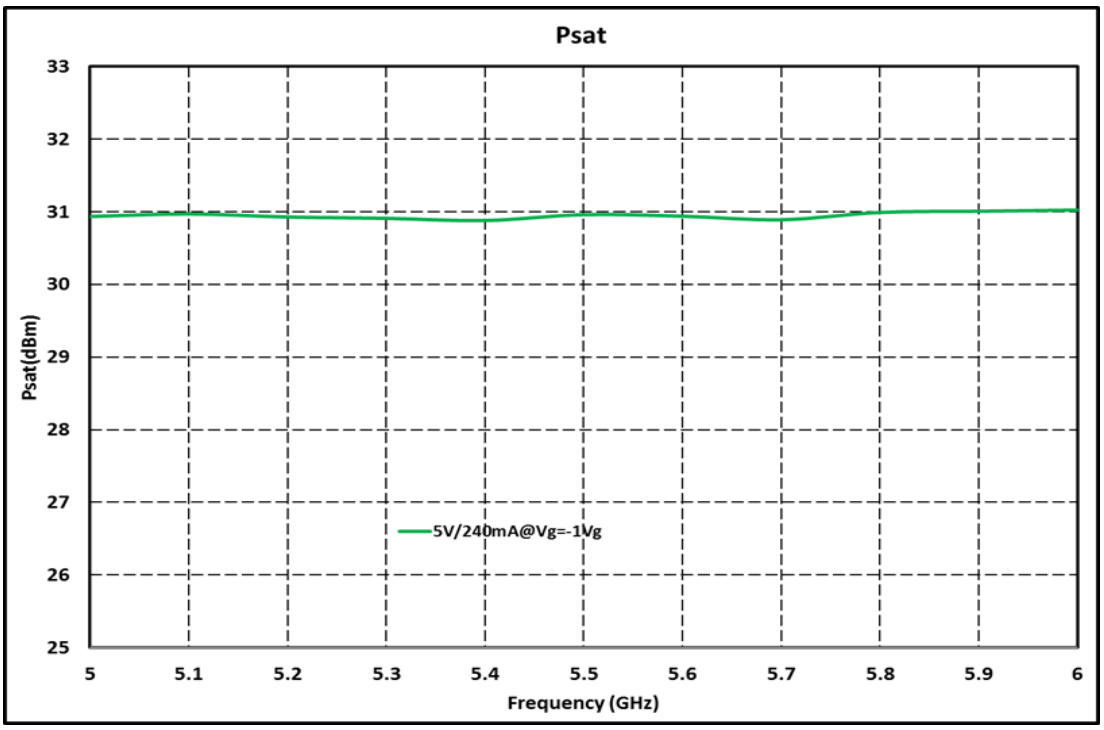
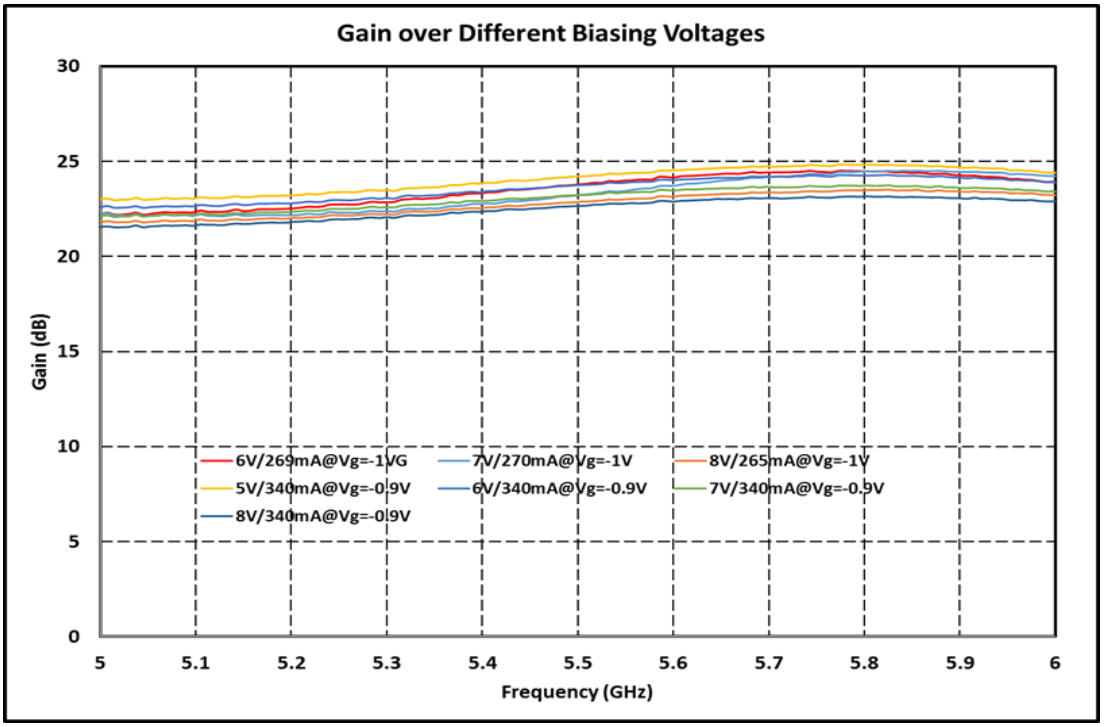
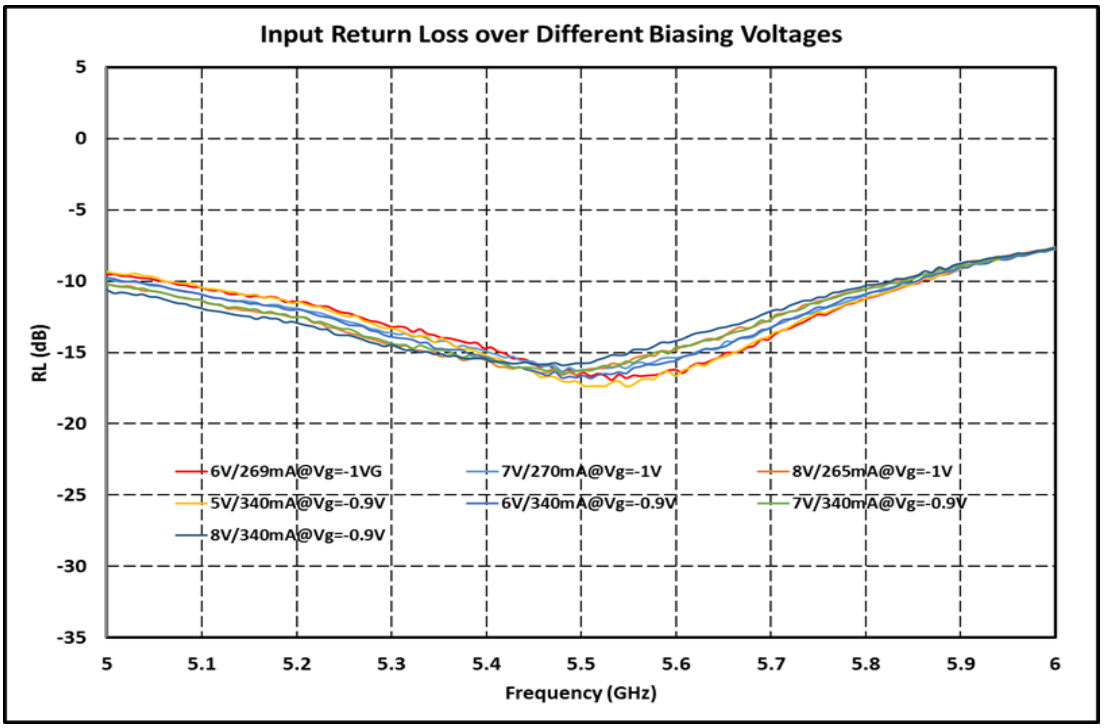




Test fixture data, T_A = 25 °C

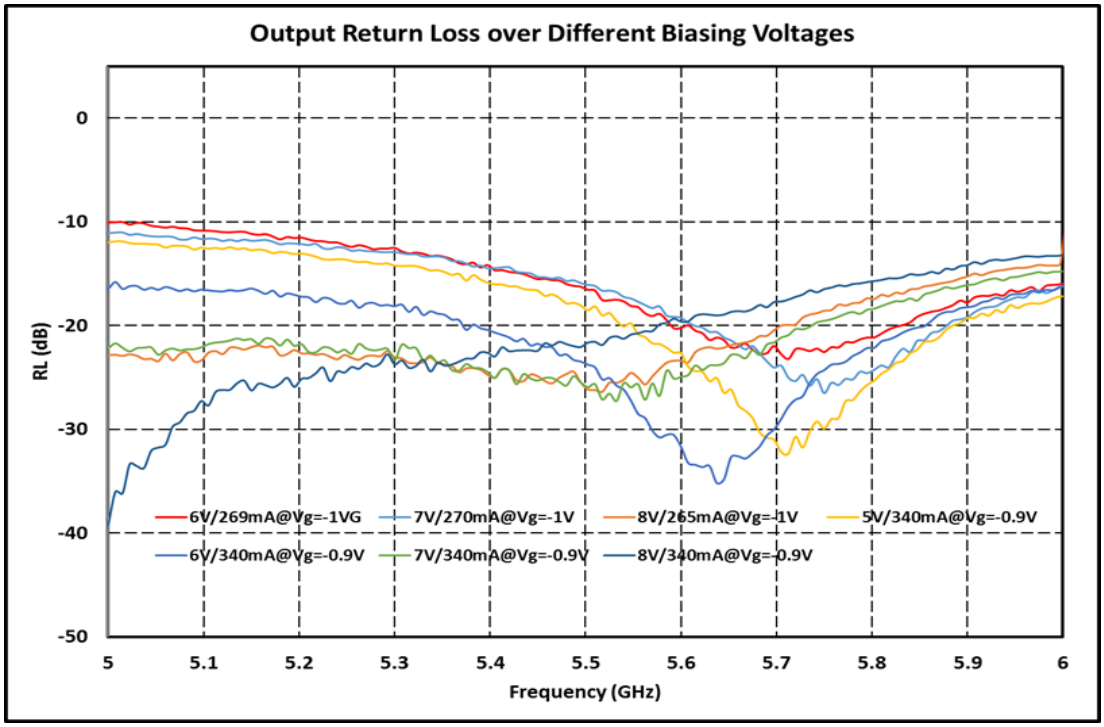
At different biasing conditions

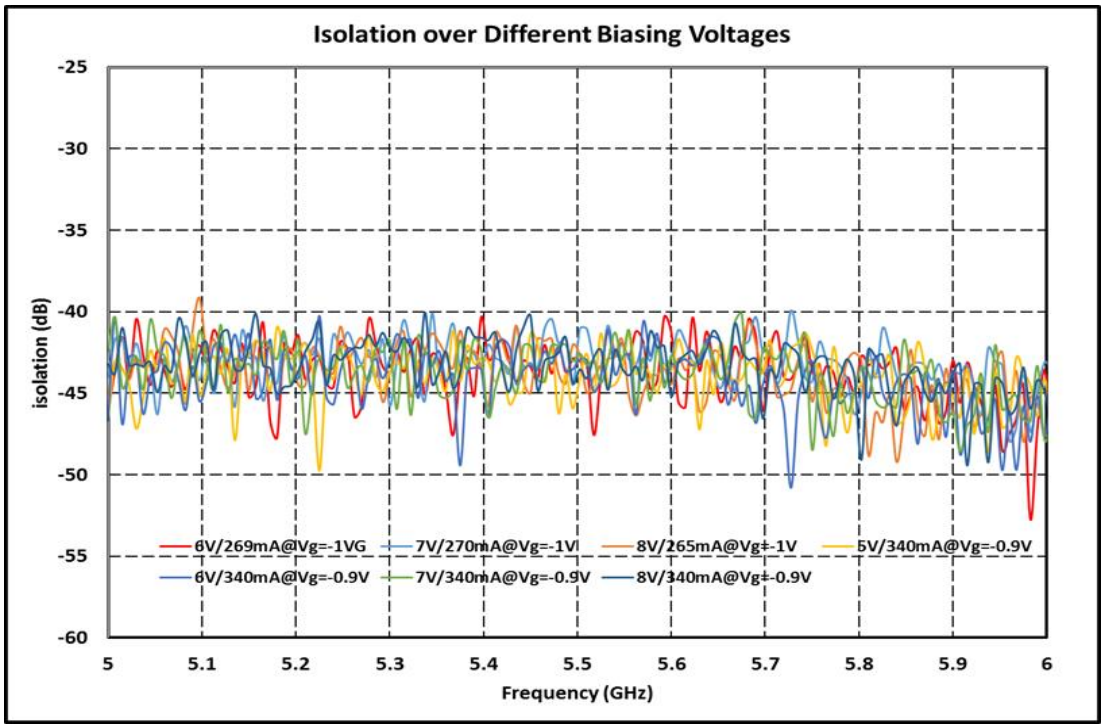




Test fixture data, T_A = 25 °C

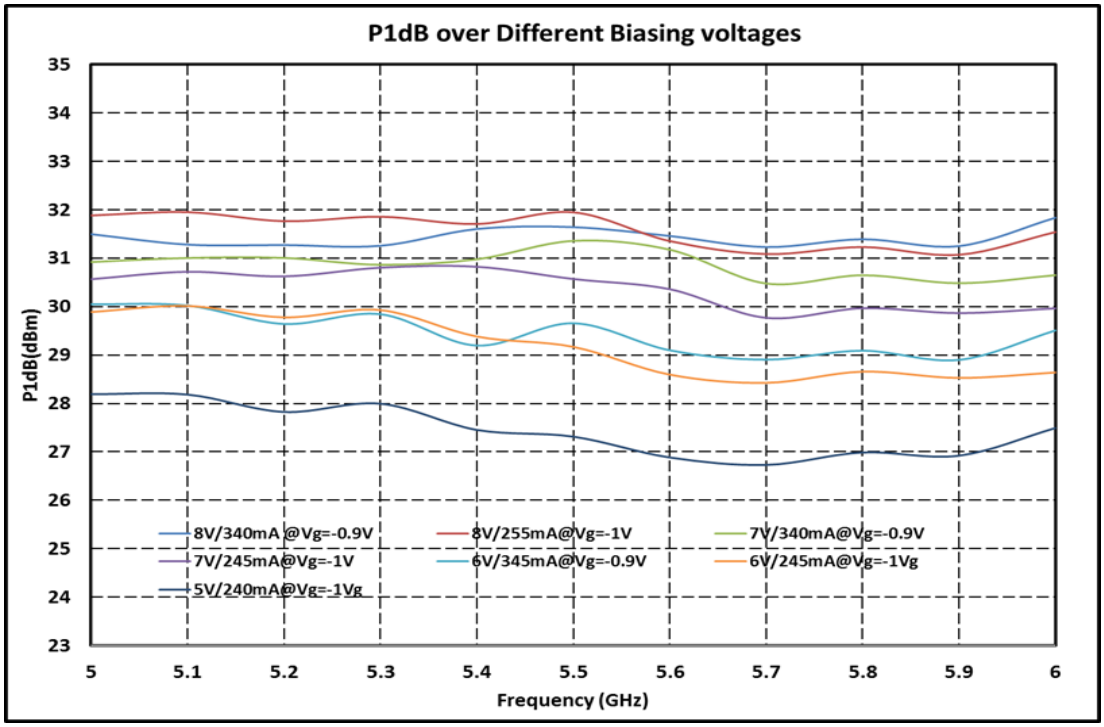
At different biasing conditions

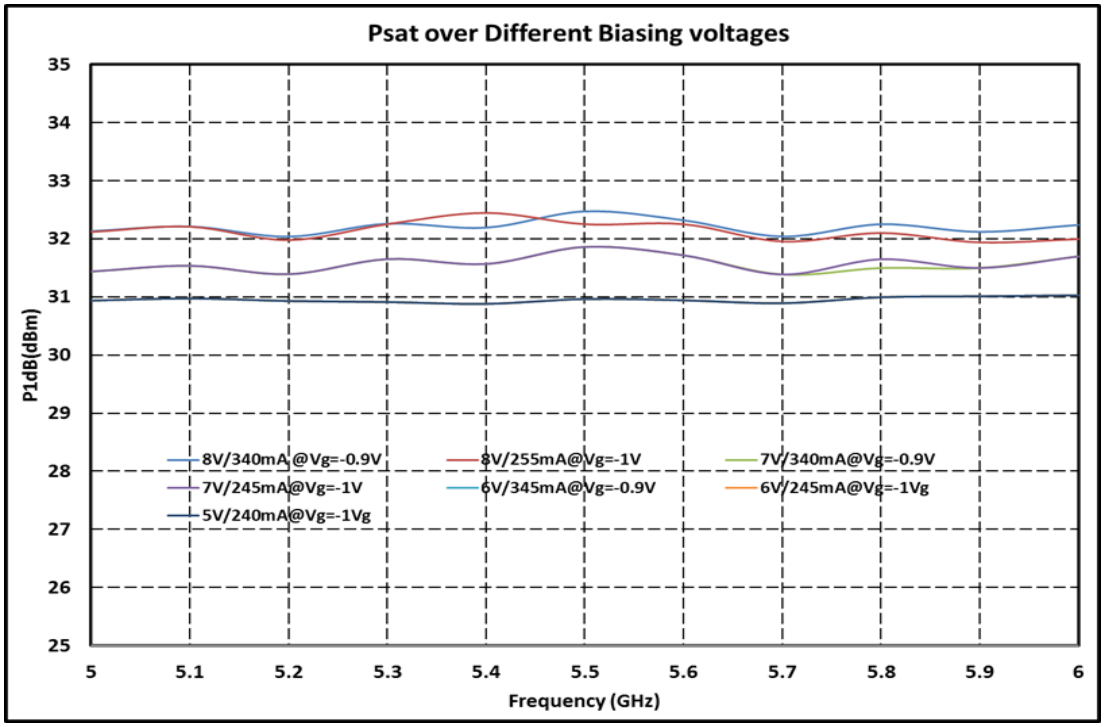




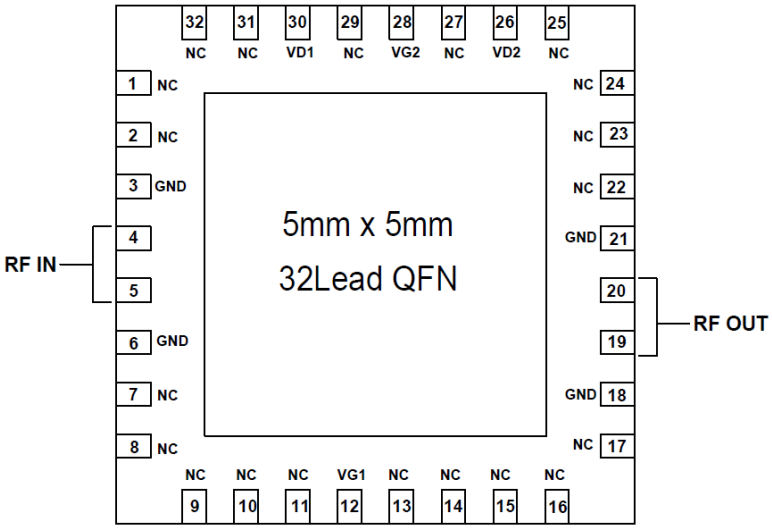
Test fixture data, T_A = 25 °C

At different biasing conditions





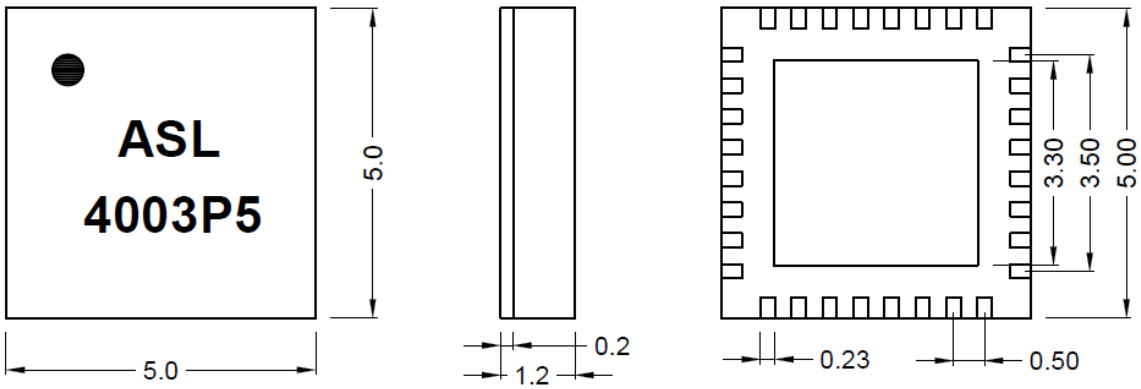
Pin Configuration



Pin Descriptions

PIN	Function	Description
4,5	RF IN	RF Input
19,20	RF OUT	RF Output
12	VG1	DC SUPPLY Voltage
26	VD2	DC SUPPLY Voltage
28	VG2	DC SUPPLY Voltage
30	VD1	DC SUPPLY Voltage
1,2,3,6,7,8,9,10,11,13,14,15,16,17,1821,22,23,24,25,27,29,31,32	NC	No Connection

Package Outline Drawing

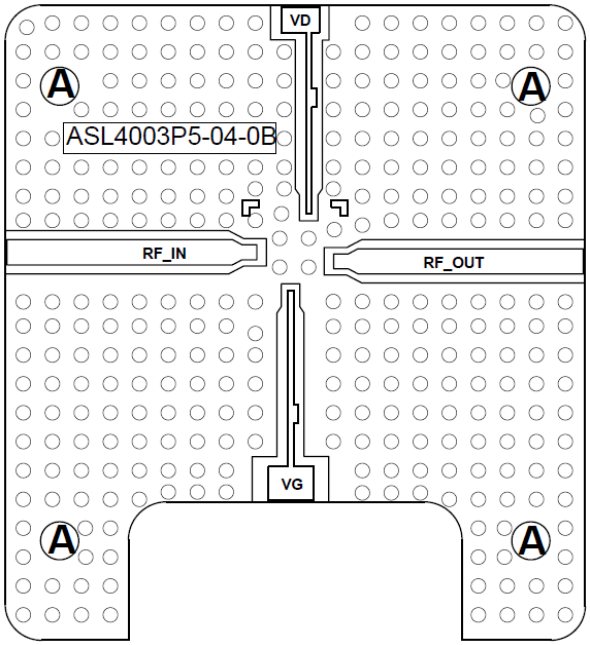


TOP VIEW

BOTTOM VIEW

Note: All dimensions are in Millimeters

Recommended Assembly Diagram



Note:

1. Circuit board material: RT Duroid 5880
2. 0.1 µF capacitors additionally used as a second level of bypass for reliable operation as shown above
3. The RF input & output ports are DC decoupled ports.
4. During testing device need to be mounted on proper heat sink made of either aluminum or copper base for better thermal reliability of package

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