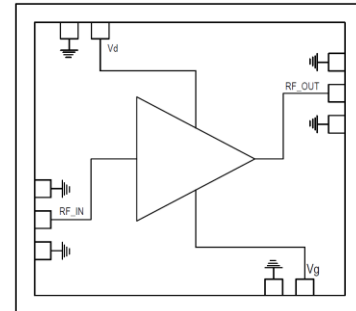


6 – 18GHz 2W Power Amplifier

Features

- ◆ Frequency Range : 6 GHz – 18GHz
- ◆ Output Power : 33dBm Psat
- ◆ PAE : >22%
- ◆ SSG Gain : 22 dB (Typ)
- ◆ Return Losses : ≤10dB
- ◆ Die Size : 3.3 mm x 2.7mm x 0.1mm
- ◆ InGaAs pHEMT Technology
- ◆ Dual Bias Operation with built in ESD Circuit

Functional Diagram



Typical Applications

- ◆ ECCM
- ◆ C-to-Ku Band Point-to-Point
- ◆ Instrumentation

Description

The ASL4044 is 6-18GHz, 2W saturated Power Amplifier with small signal gain of 22dB, and Input/output return losses better than 10dB across bandwidth of 6-18GHz. The PA features 16dB power gain with 22% PAE over the operating frequency band. The PA is fully matched to 50 ohms with integrated DC blocking capacitors at both I/O ports. The chip operates with dual bias supply voltage. The die is fabricated using a reliable InGaAs pHEMT technology. The Circuit grounds are provided through on chip vias to the backside metallization.

Absolute Maximum Ratings¹

Parameter	Absolute Maximum	Units
Drain supply voltage	+9	Volts
Drain current (Id) at Vd=5V	2.5	A
RF input power	25	dBm
Operating temperature	-50 to +85	°C
Storage Temperature	-65 to +150	°C

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

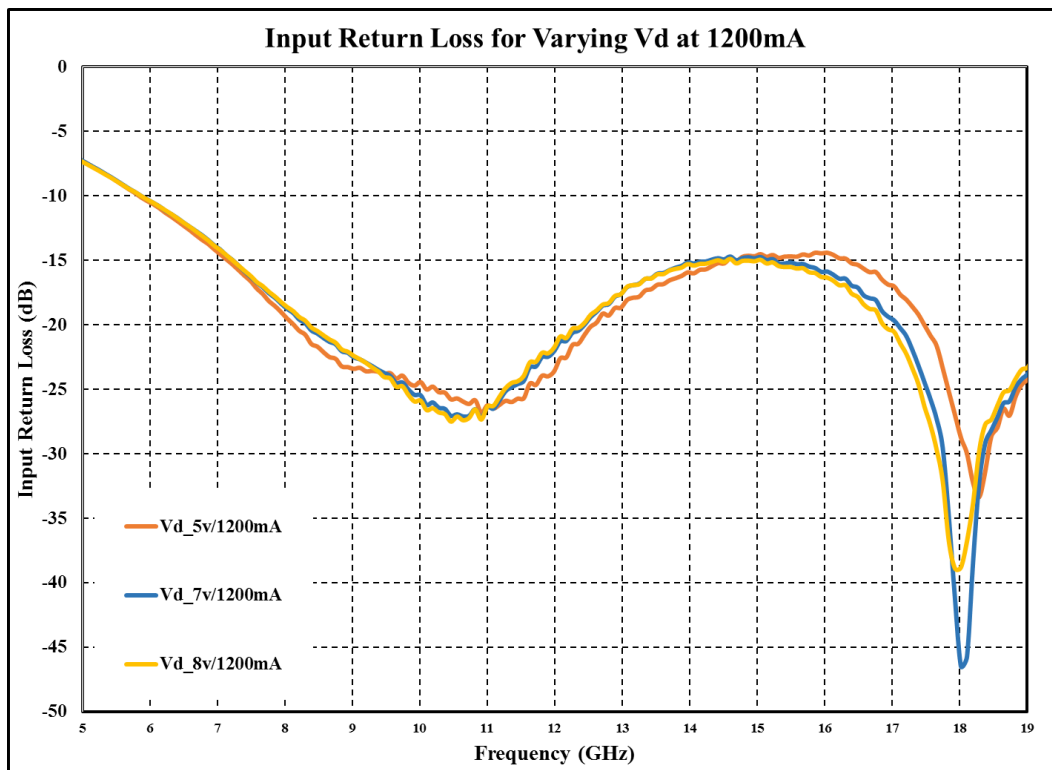
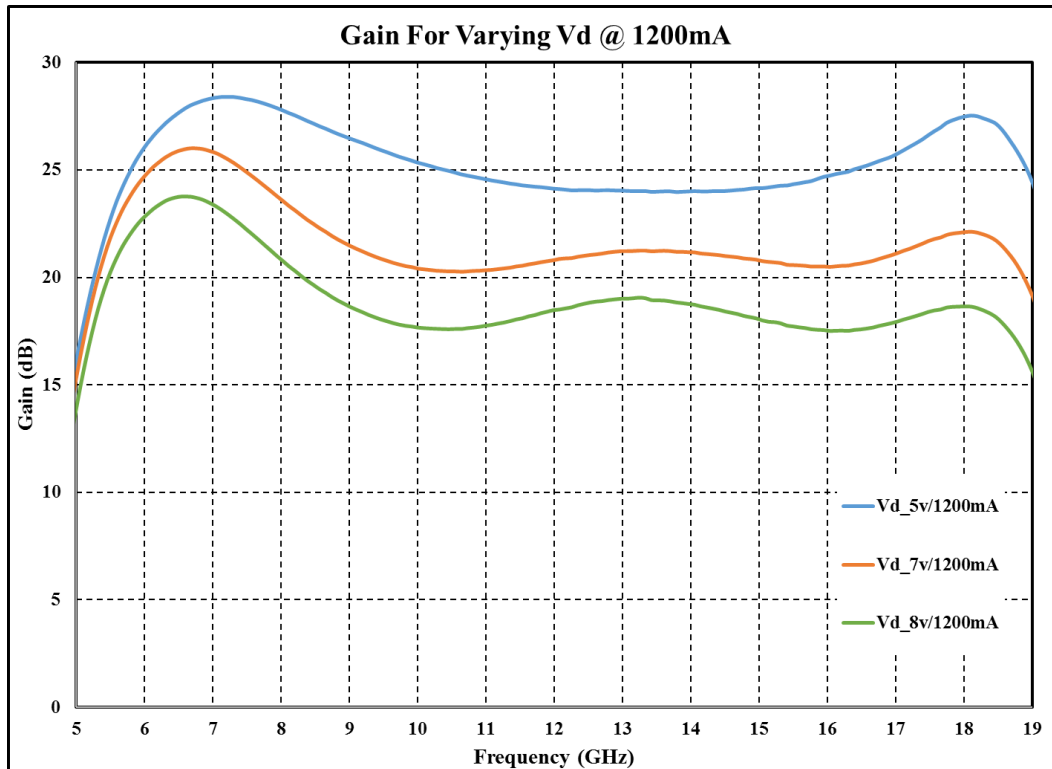
Electrical Specifications @ $T_A = 25\text{ }^{\circ}\text{C}$, $Z_o = 50\Omega$,

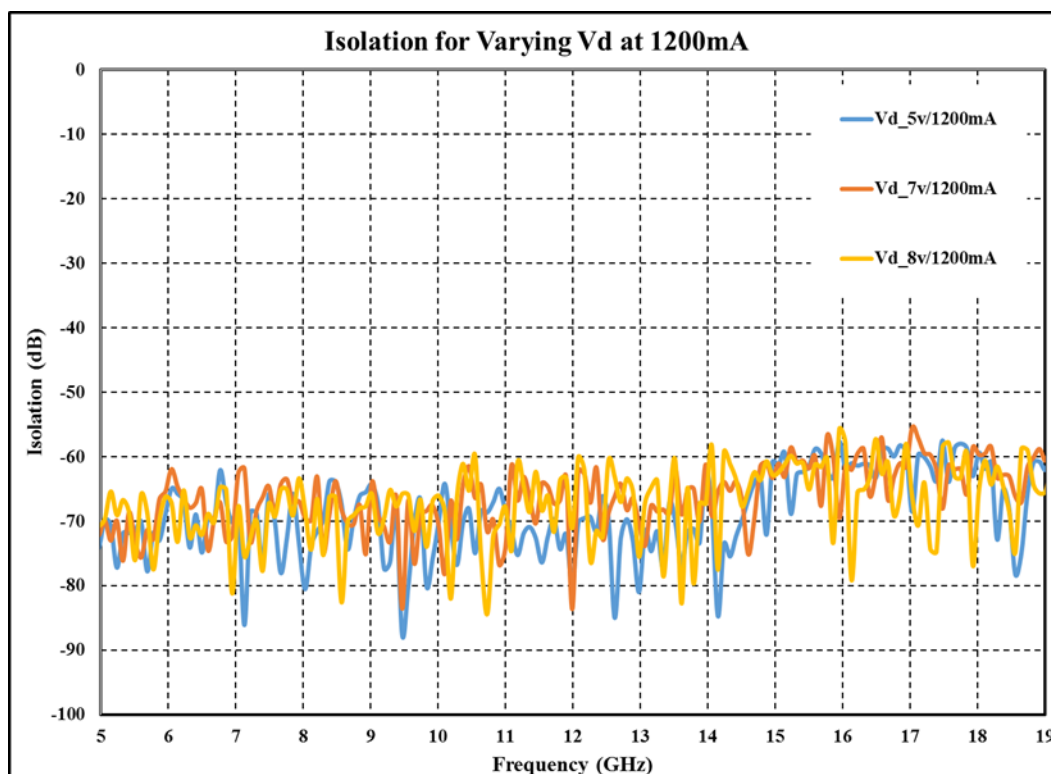
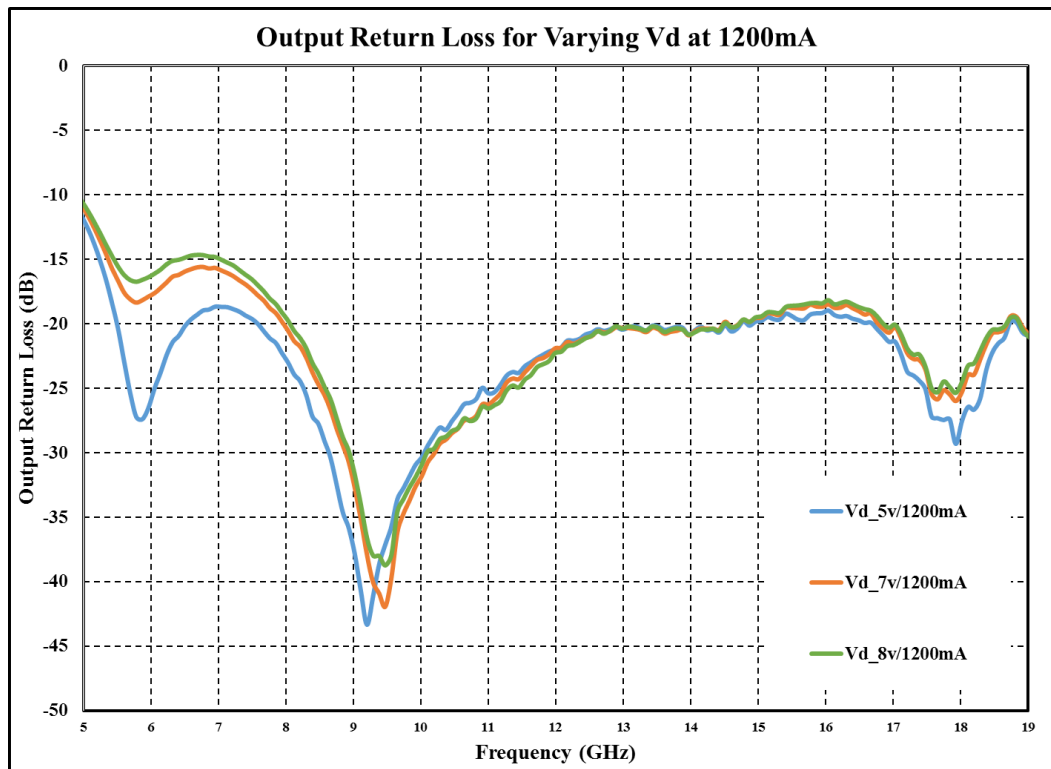
Parameter	Typical Values	Units
Frequency Range	6 - 18	GHz
P_{sat}	33	dBm
P1dB	30	dBm
PAE	22	%
Power gain	15	dB
Small Signal Gain	22	dB
Input Return Loss	12	dB
Output Return Loss	12	dB
Voltage	5 / 7 / 8	V
Current (I_{dq})	950/1200	mA

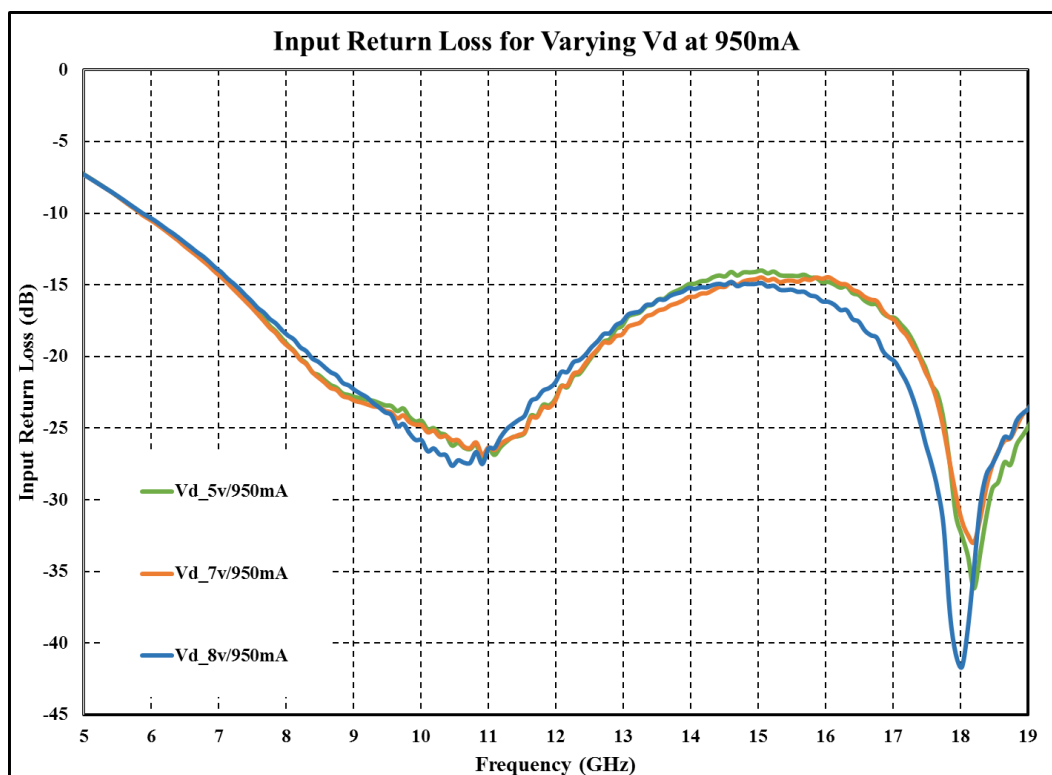
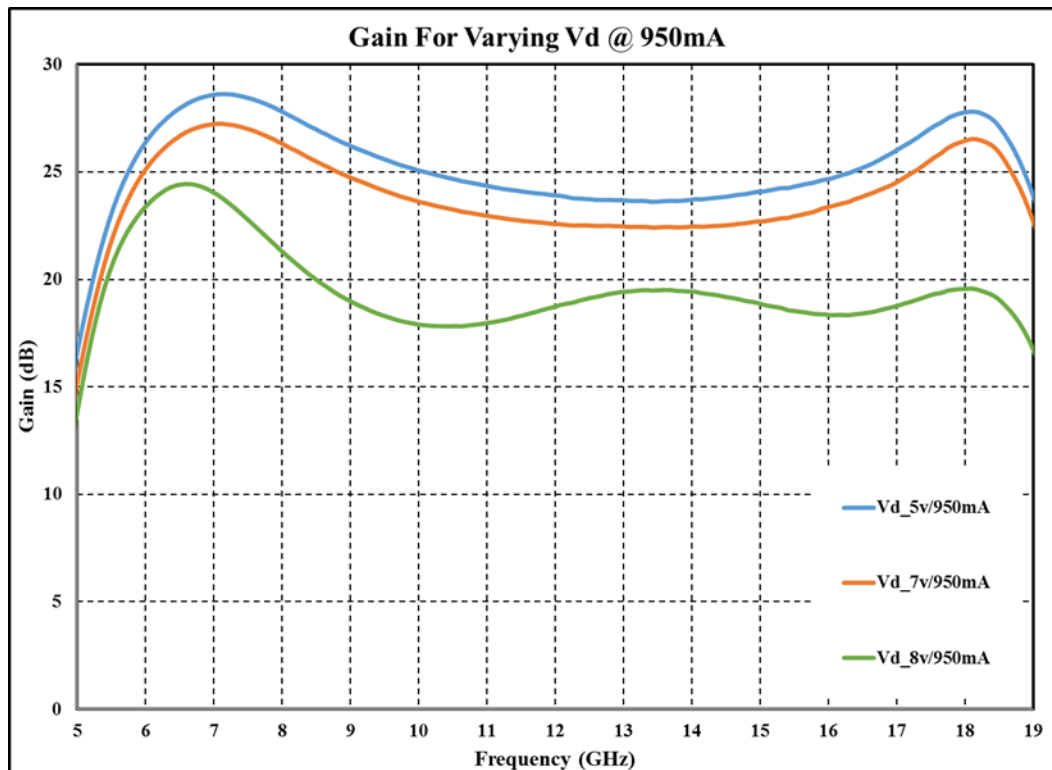
Note:

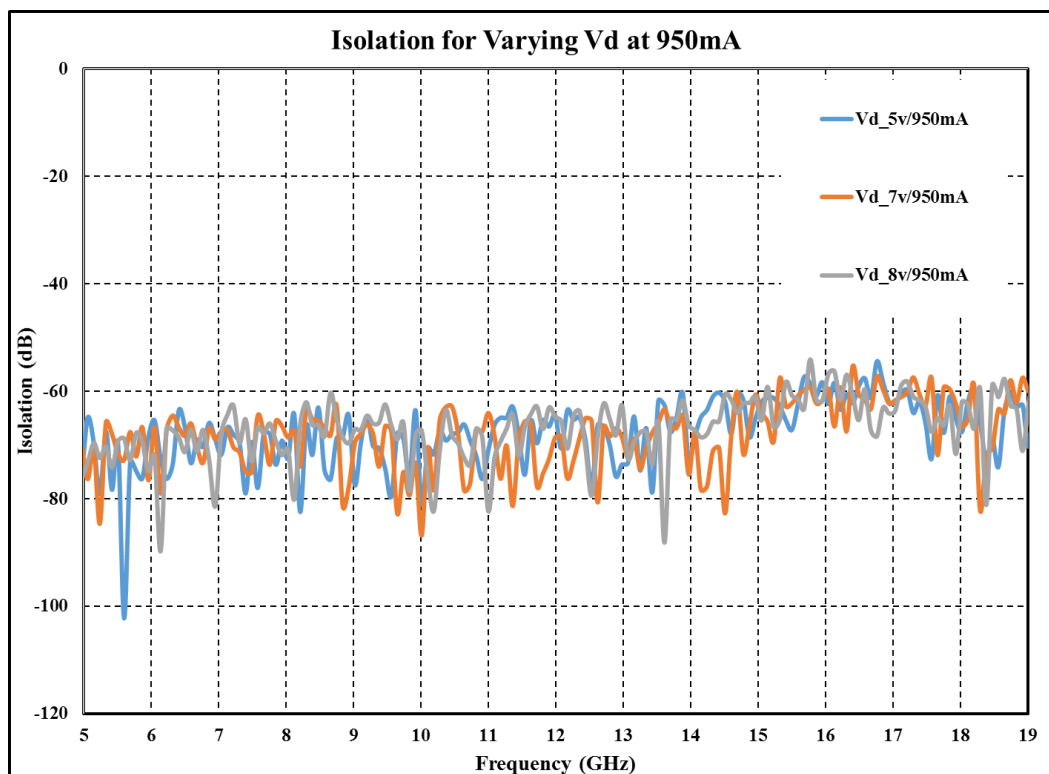
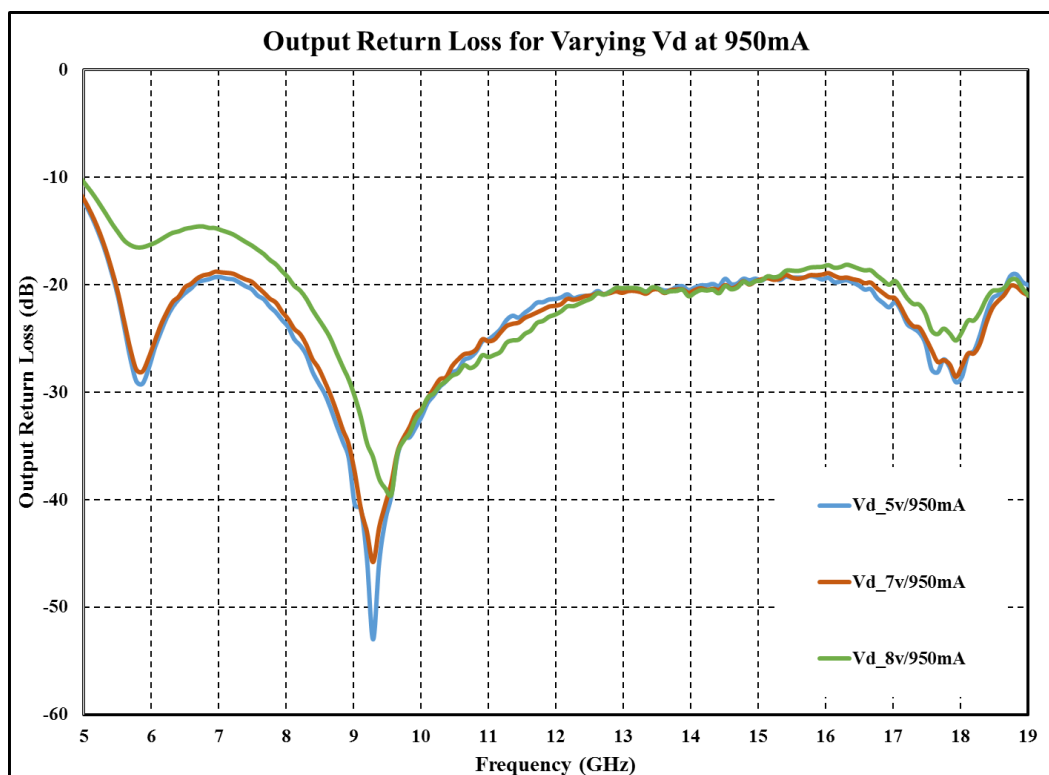
1. The above parameters specified are measured in 50-Ohm test fixture results.
2. Adjust V_g between -1V to -0.4V to achieve corresponding I_{dq}

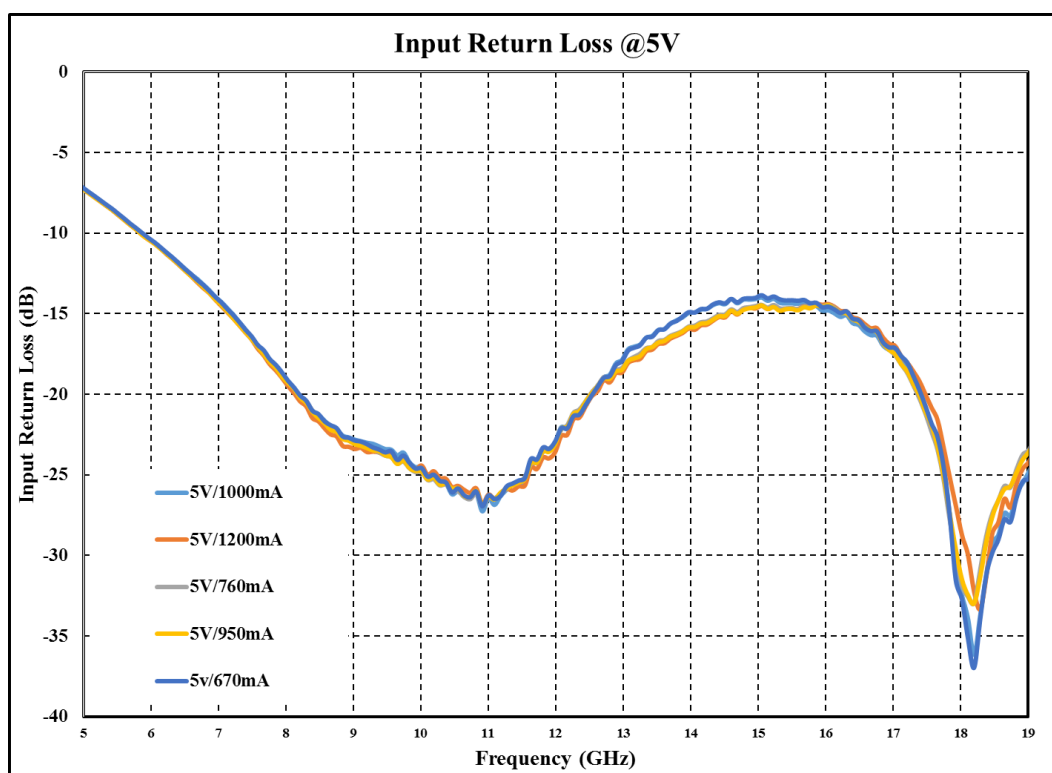
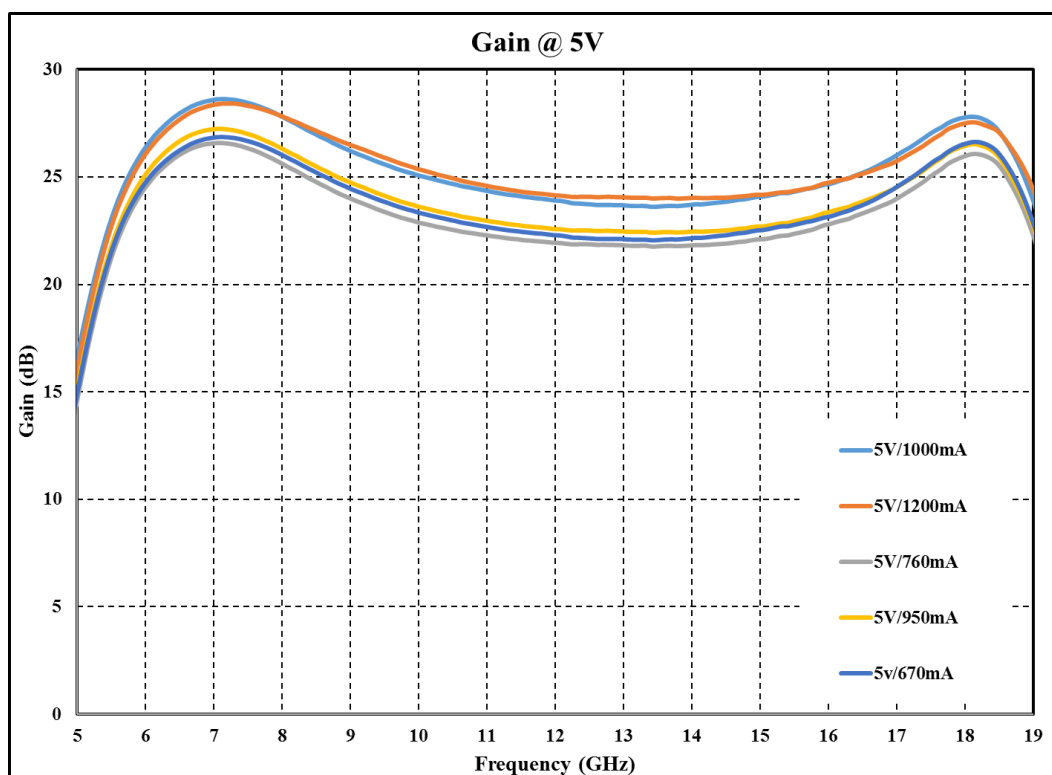
Test Fixture Data for Varying Vd @ 1200mA (Idq)

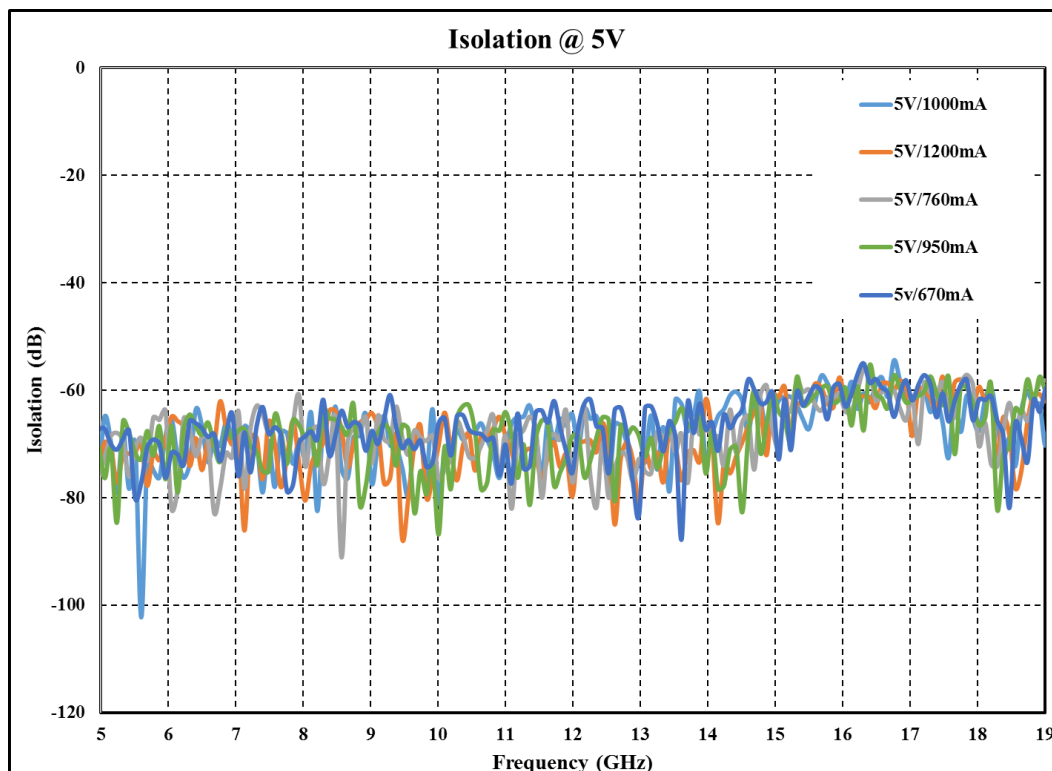
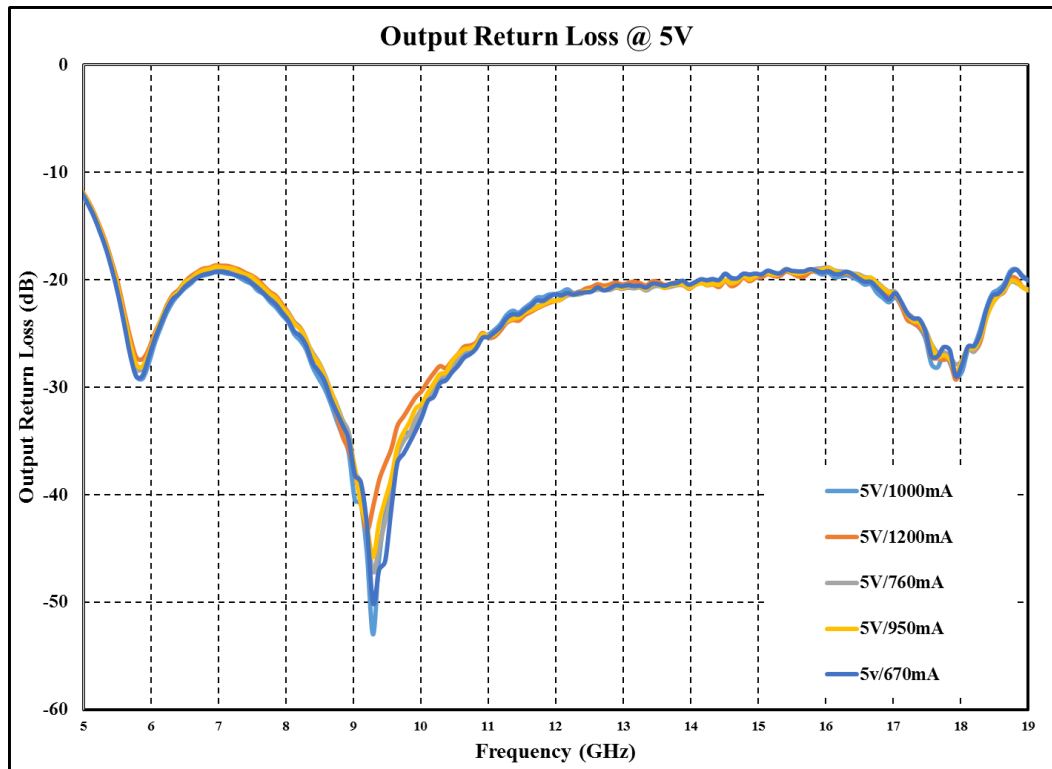
 $T_A = 25^\circ\text{C}$, $Z_o = 50\ \Omega$


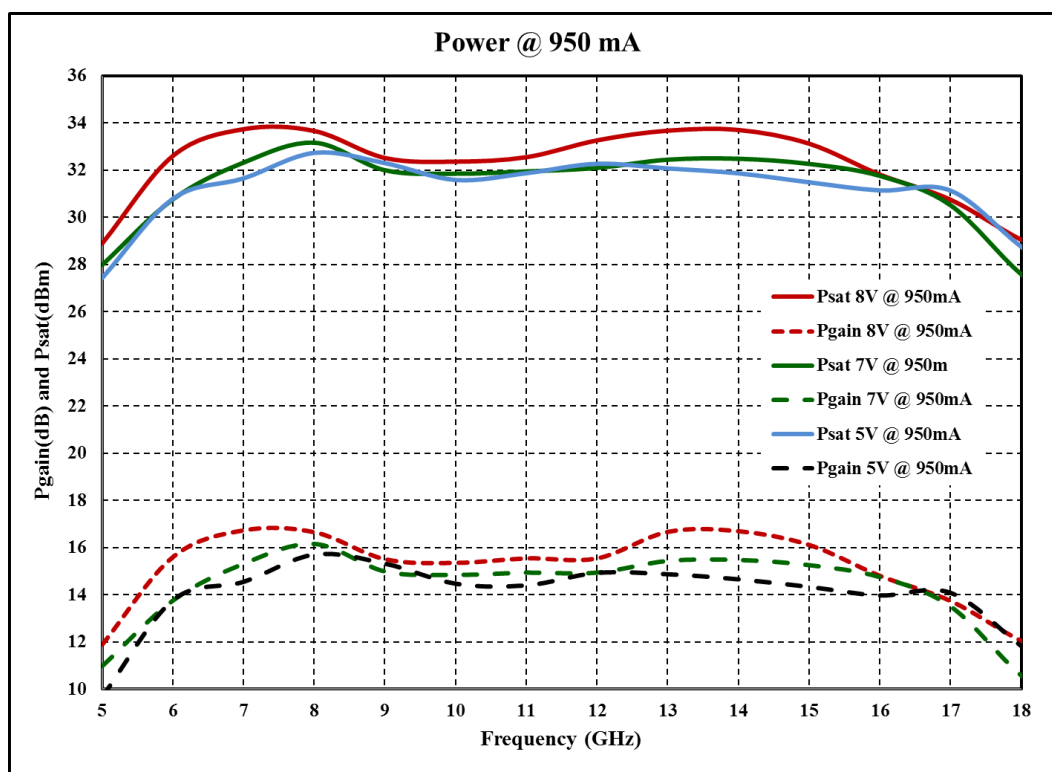
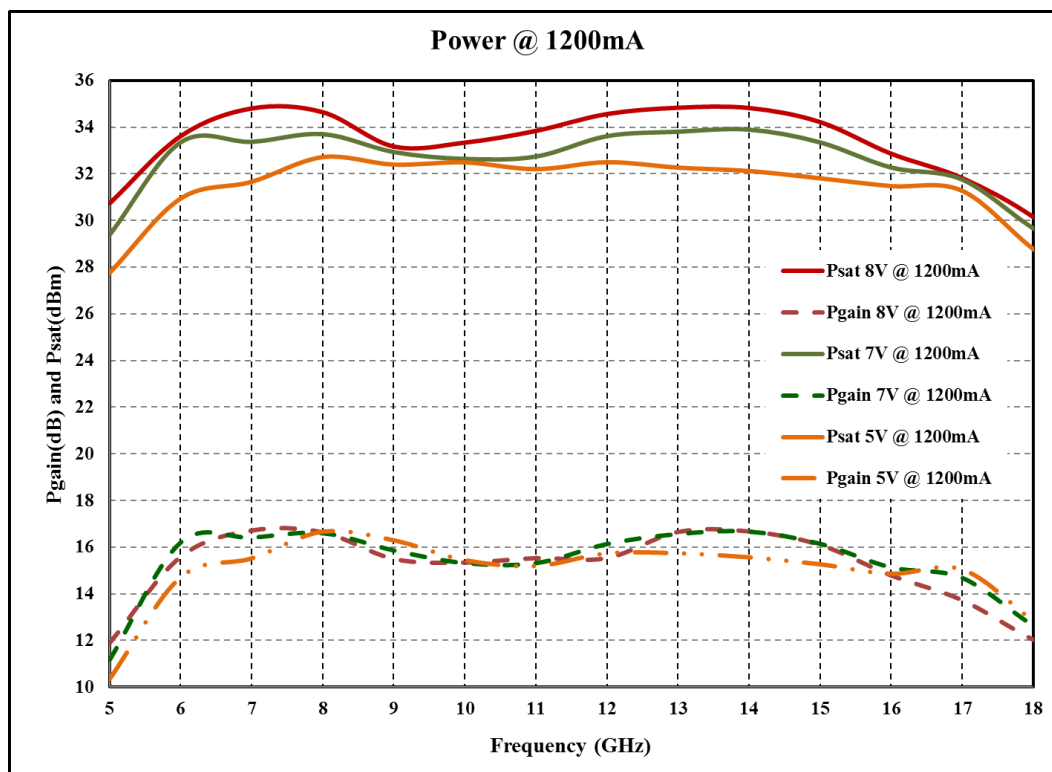
Test Fixture Data for Varying Vd @ 1200mA (Idq)
 $T_A = 25^\circ\text{C}$, $Z_o = 50\ \Omega$


Test Fixture Data for Varying Vd @ 950mA
 $T_A = 25^\circ\text{C}$, $Z_o = 50\ \Omega$


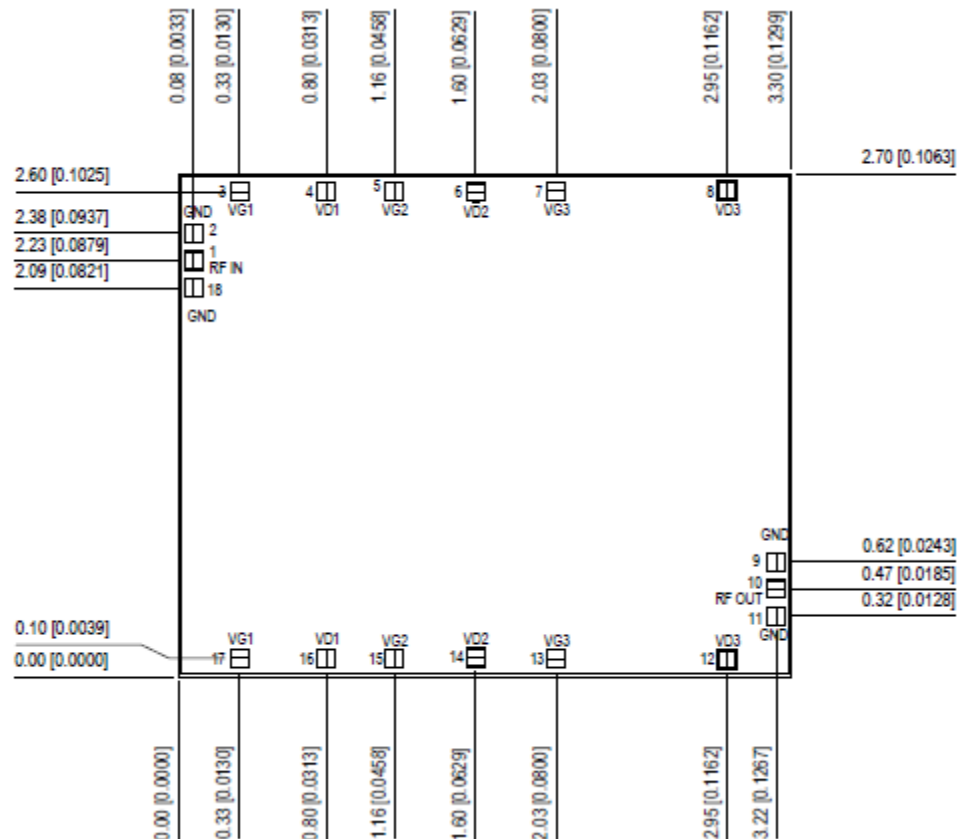
Test Fixture Data for Varying Vd @ 950mA (Idq)
 $T_A = 25^\circ\text{C}$, $Z_o = 50\ \Omega$


Test Fixture Data @ $V_d = 5V$
 $T_A = 25^\circ C$, $Z_o = 50\ \Omega$


Test Fixture Data@ Vd= 5V
 $T_A = 25^\circ\text{C}$, $Z_o = 50\ \Omega$


Test Fixture Data for Varying V_d and Current (I_{dq})
 $T_A = 25^\circ\text{C}$, $Z_o = 50\ \Omega$


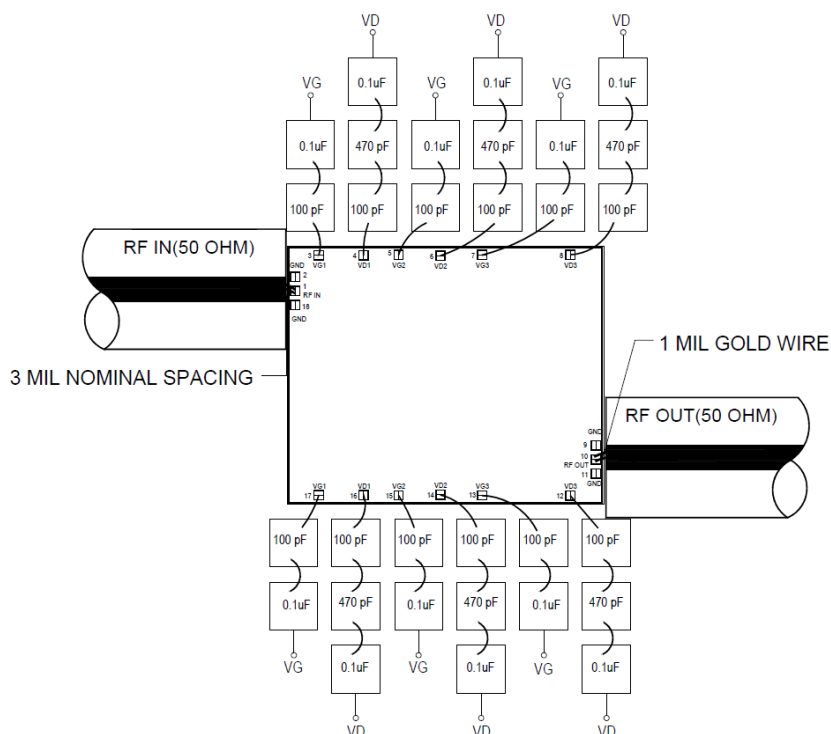
RF and DC Pad Details



Units : millimeters (inches)

1. All RF and DC bond pads are 100µm x 100µm
2. Pad no.1 : RF IN
3. Pad no.10 : RF OUT
4. Pad no. 3, 17 : Vg1
5. Pad no. 5, 15 : Vg2
6. Pad no. 7, 13 : Vg3
7. Pad no. 4, 16 : Vd1
8. Pad no. 6, 14 : Vd2
9. Pad no. 8, 12: Vd3
10. Pad no. 2,9,11,18: GND (Ground)

Recommended Assembly Diagram



Note:

1. Two 1 mil (0.0254mm) bond wires of minimum length should be used for RF input, RF output.
2. Input and output 50 ohm lines are preferably on 5mil or 10mil RT Duroid substrate.
3. Use high thermal conductive material for die mounting/die attachment for long-term reliability.
4. Proper heat sink like Copper tungsten or copper molybdenum carrier plate need to be used for mounting the chip.

Die attach: For Epoxy attachment, use of a two-component conductive epoxy is recommended. An epoxy fillet should be visible around the total die periphery. If Eutectic attachment is preferred, use of flux less AuSn (80/20) 1-2 mil thick preform solder is recommended. Use of AuGe preform should be strictly avoided.

Wire bonding: For DC pad connections use either ball or wedge bonds. For best RF performance, use of 150 - 200µm length of wedge bonds is advised. Single Ball bonds of 250-300µm though acceptable, may cause a deviation in RF performance.



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. Before using the product, please download and refer to latest datasheet from website.