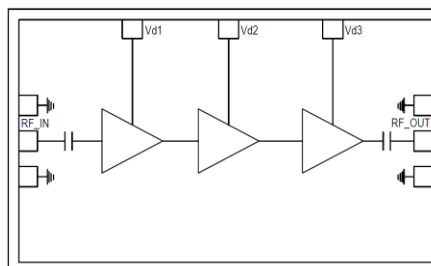


18 – 40 GHz Low Noise Amplifier

Features

- ◆ Frequency Range : 18-40 GHz
- ◆ Nominal Gain : 19 dB
- ◆ Noise Figure : 3.5 dB
- ◆ I/O Return Losses : 15 dB
- ◆ Output P1dB : 8 dBm
- ◆ Self-bias operation
- ◆ DC decoupled Input and Output
- ◆ Chip Dimension: 2.20mm x 2.35mm x 0.1mm

Functional diagram



Typical Applications

- ◆ Radar
- ◆ Military
- ◆ Test Equipment and Sensors.

Description

The ASTRA 2172041 is a Low Noise Amplifier operating in 18.0 – 40.0 GHz frequency range. The LNA uses 3 stages of amplification and provides 19dB of gain with noise figure of less than 3.5dB having input & output return losses better than 15dB. The LNA has P1dB of 8dBm over the entire operating frequency band and operates on +2V, +3V or +4V DC supply with a current consumption of 100mA (typ). The circuit grounds on the die are provided through vias to the backside metallization.

Absolute Maximum Ratings¹

Parameter	Absolute Maximum	Units
Positive DC voltage	+6	V
RF input power	+20	dBm
Supply Current	100	mA
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 °C, V_d = +3V, Z_o = 50Ω,**

Parameter	Min.	Typ.	Max.	Units
Frequency	18		40	GHz
Gain ⁽¹⁾	-	19	-	dB
Gain Flatness ⁽¹⁾	-	±1.5	-	dB
Noise Figure ⁽¹⁾	2.8	3.5	4.0	dB
Input Return Loss ⁽¹⁾		15	-	dB
Output Return Loss ⁽¹⁾	-	15	-	dB
Output Power (P ₁ dB) ⁽¹⁾		8		dBm
Supply Voltage		3		V
Supply Current		100		mA

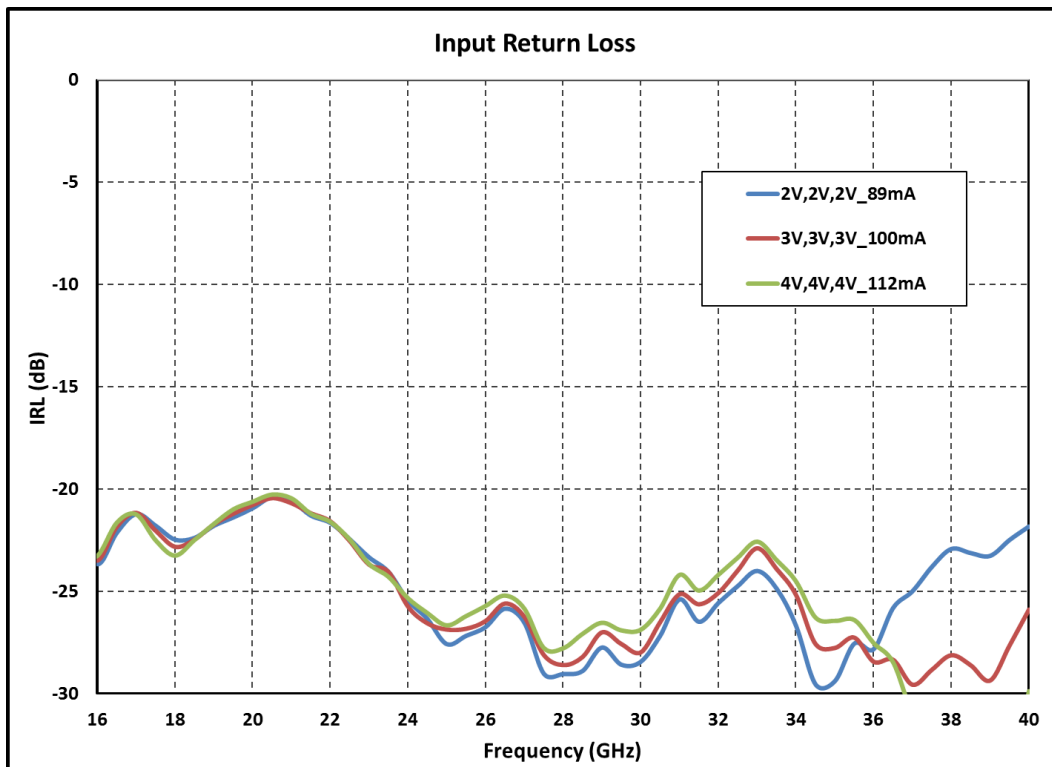
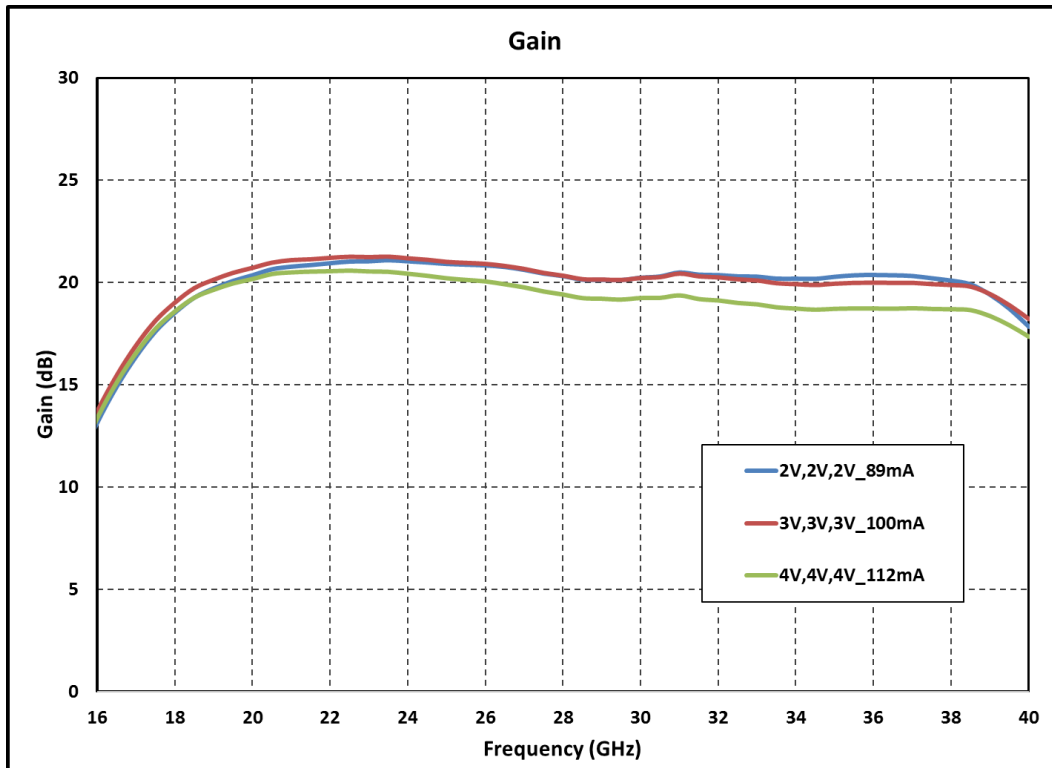
Note:

1. Electrical specifications as measured On-wafer.



On-wafer Probed data

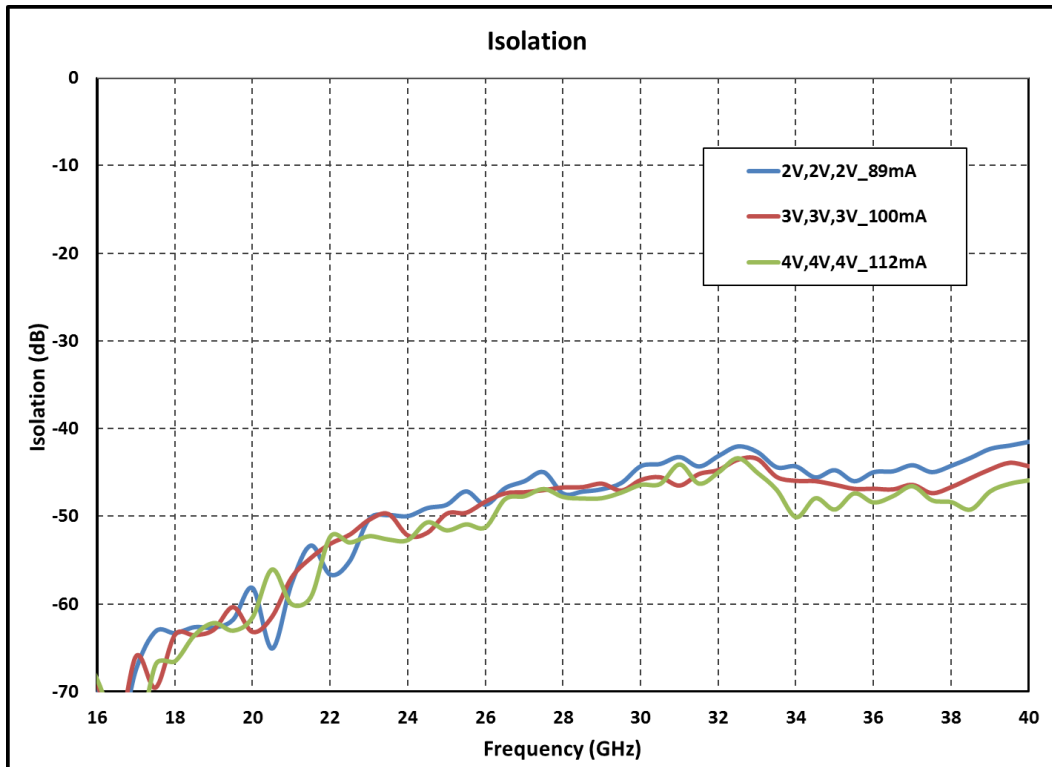
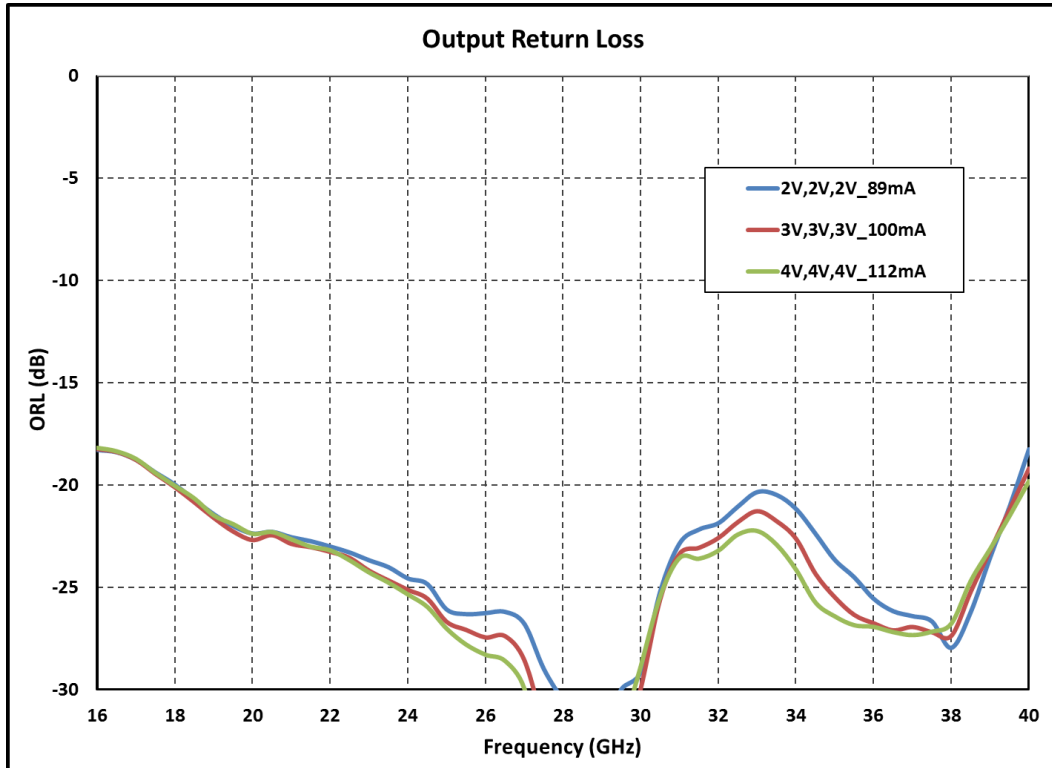
Vd1= Vd2= Vd3= 3V, Total Current = 100 mA, T_A = 25 °C





On-wafer Probed data

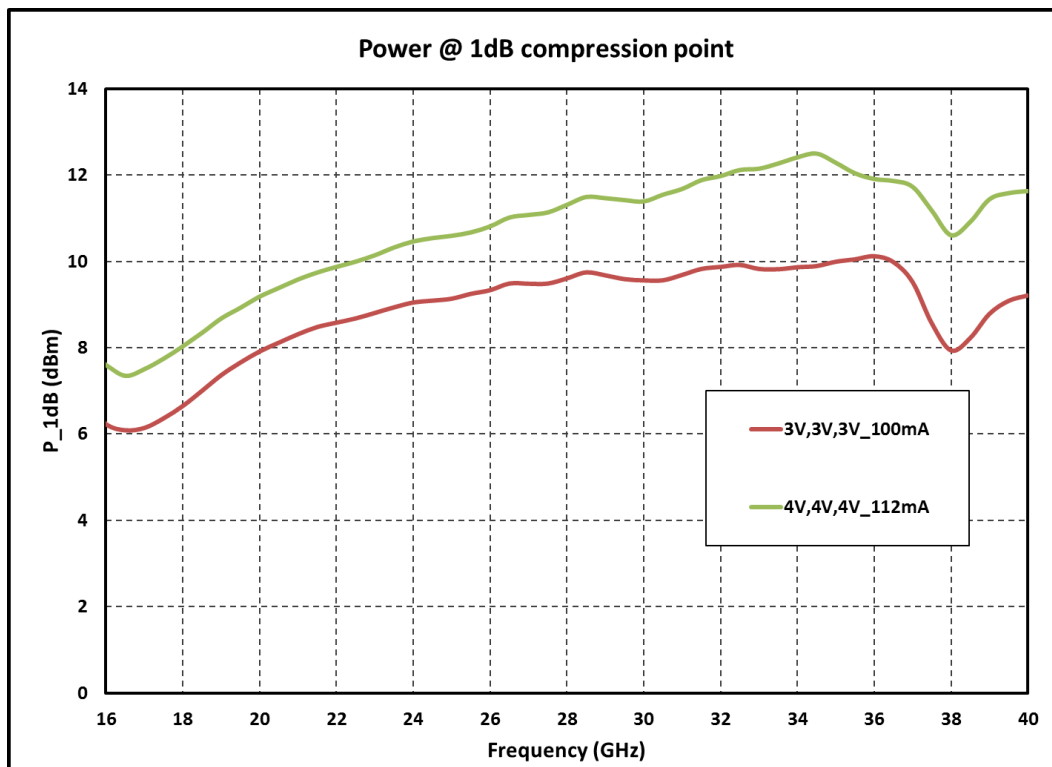
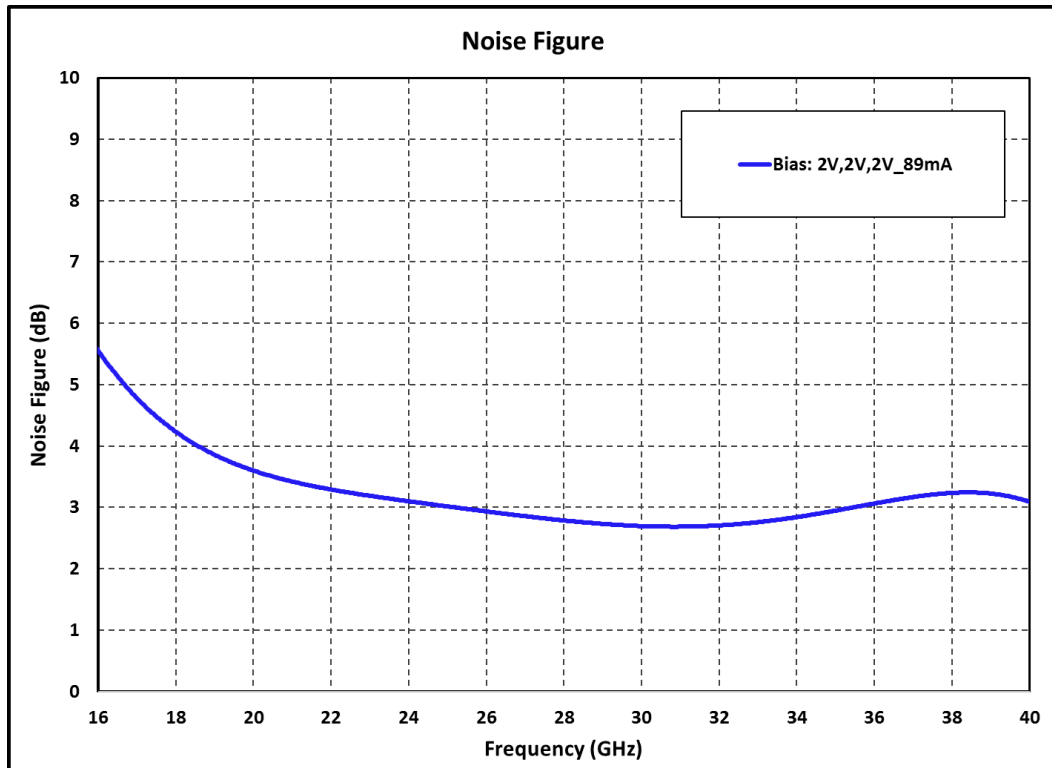
$Vd1= Vd2= Vd3= 3V$, Total Current = 100 mA, $T_A = 25\text{ }^\circ\text{C}$



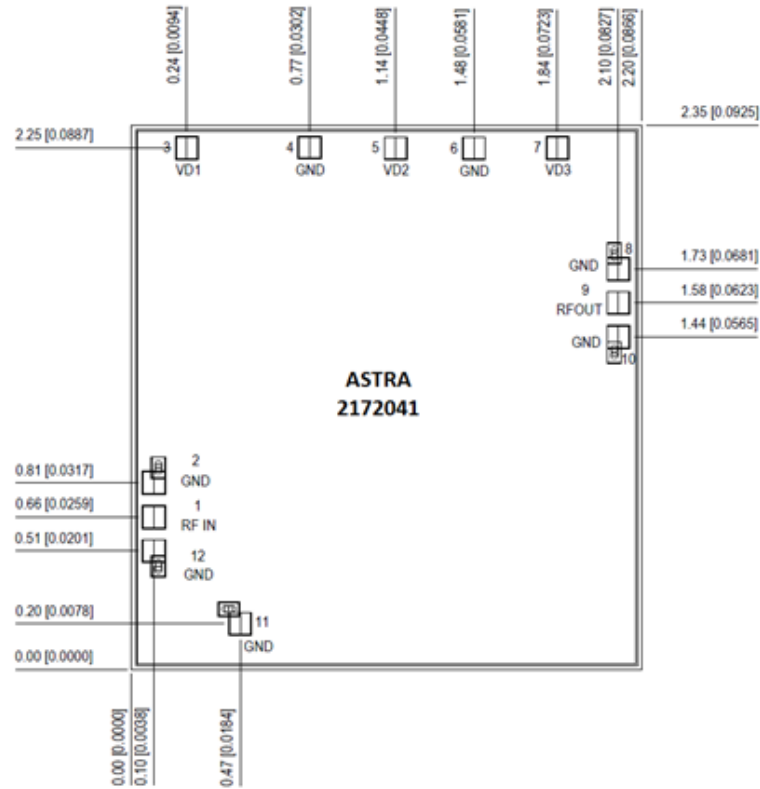


On-wafer Probed data

Vd1= Vd2= Vd3= 3V, Total Current = 100 mA, T_A = 25 °C



Mechanical Characteristics



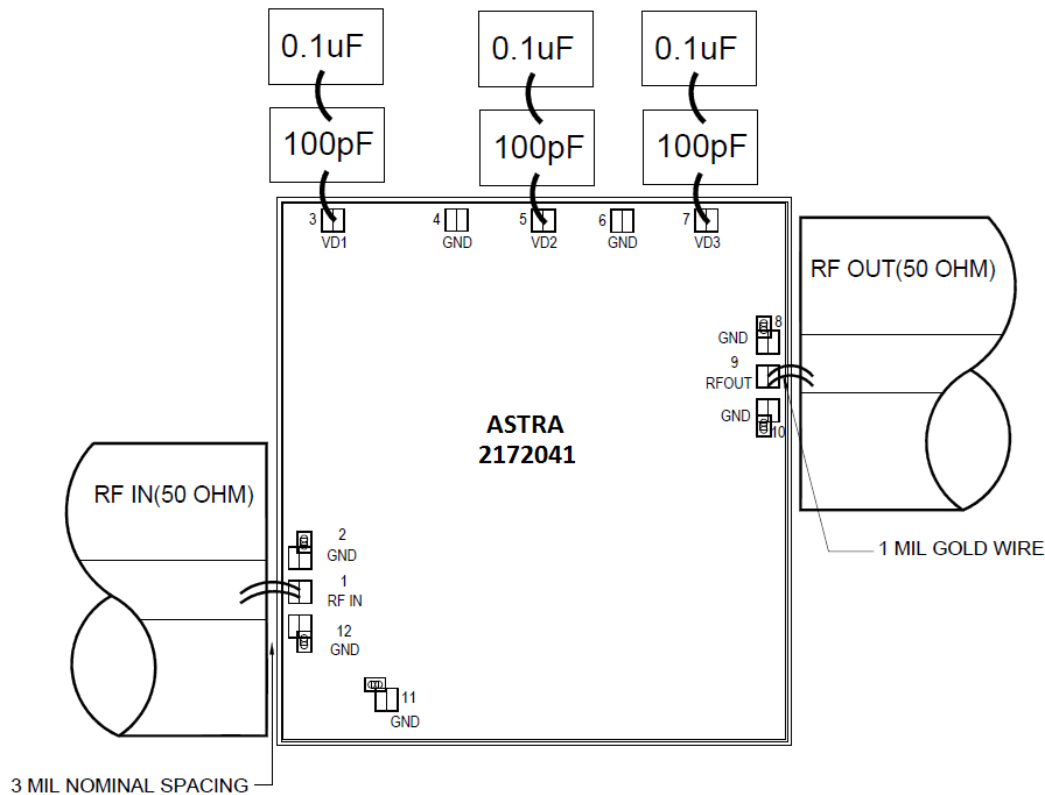
Units: millimeters (inches)

All RF and DC bond pads are 100µm x 100µm

Note:

1. Pad no. 1 : RFIN
2. Pad no. 3 : VD1
3. Pad no. 5 : VD2
4. Pad no. 7 : VD3
5. Pad no. 9 : RF OUT
6. Pad no. 2, 4, 6, 8, 10, 11, 12 : GND

Recommended Assembly Diagram



Note:

1. Two 1 mil (0.0254mm) bond wires of minimum length should be used for RF input and output.
2. 100pF and 0.1μF capacitors may be additionally used as a second level of bypass at the power supplies for reliable operation.

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 fluxless 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.