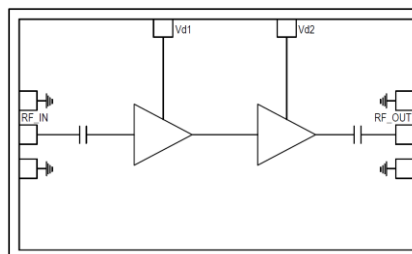


18 – 40 GHz Low Noise Amplifier

Features

- ◆ Frequency Range : 18-40 GHz
- ◆ Nominal Gain : 12.5 dB
- ◆ Noise Figure : 3 dB
- ◆ I/O Return Losses : 15 dB
- ◆ Self-bias operation
- ◆ DC decoupled Input and Output
- ◆ Chip Dimension: 1.95mm x 1.85mm x 0.1mm

Functional Diagram



Typical Applications

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

Description

The ASTRA 2172051 is a Low Noise Amplifier operating in 18.0 – 40.0 GHz frequency range. The LNA uses two stages of amplification and provides 12.5dB of gain with noise figure of less than 3dB having input & output return losses better than 15dB. The LNA operates on +2V, +3V or +4V DC supply with a current consumption of 41mA (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, Z_o = 50Ω,**

Parameter	Min.	Typ.	Max.	Units
Frequency	18		40	GHz
Gain ⁽¹⁾		12.5		dB
Gain Flatness ⁽¹⁾	-	±0.6	-	dB
Noise Figure ⁽¹⁾		3		dB
Input Return Loss ⁽¹⁾	-	15	-	dB
Output Return Loss ⁽¹⁾	-	20	-	dB
Output Power (P _{1dB}) ⁽²⁾		8		dBm
Supply Voltage		2		V
Supply Current		41		mA

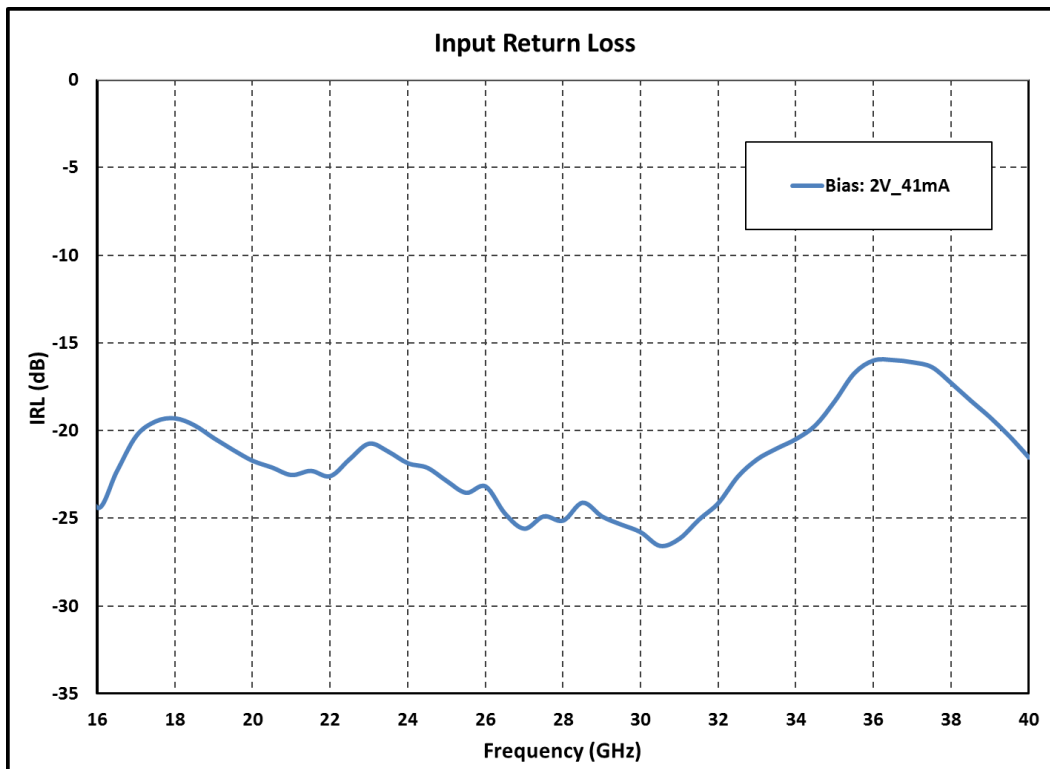
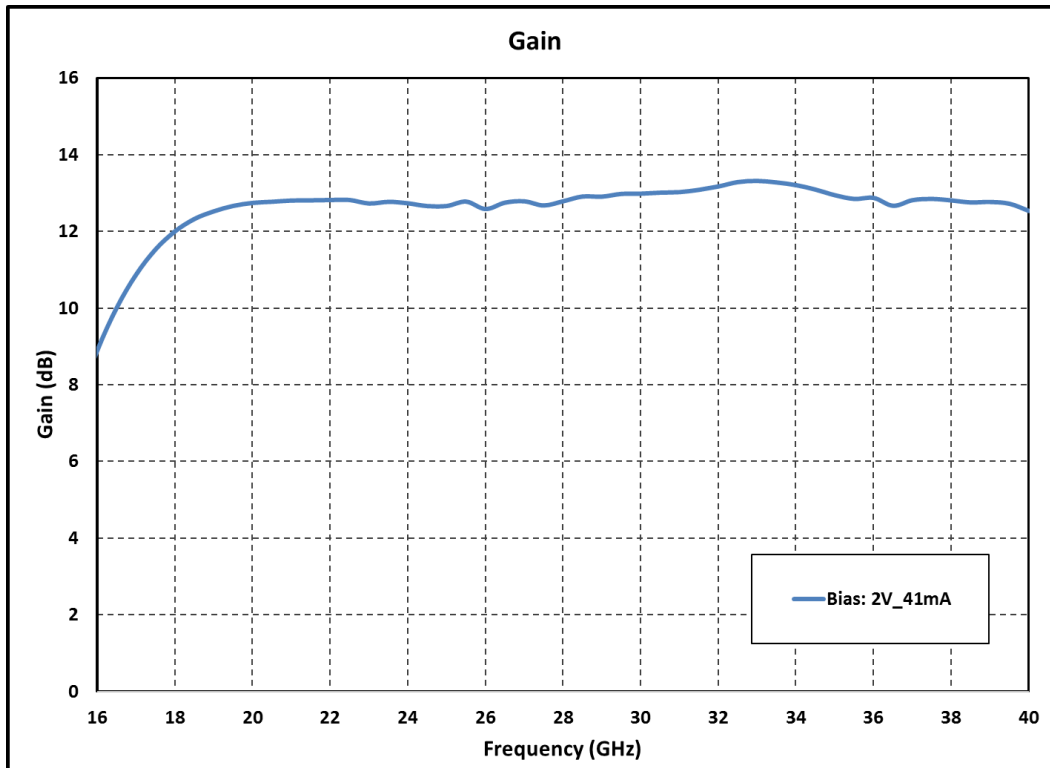
Note:

1. Electrical specifications as measured On-wafer
2. P1dB value shown above is simulated data & is yet to be measured



On-wafer Probed data

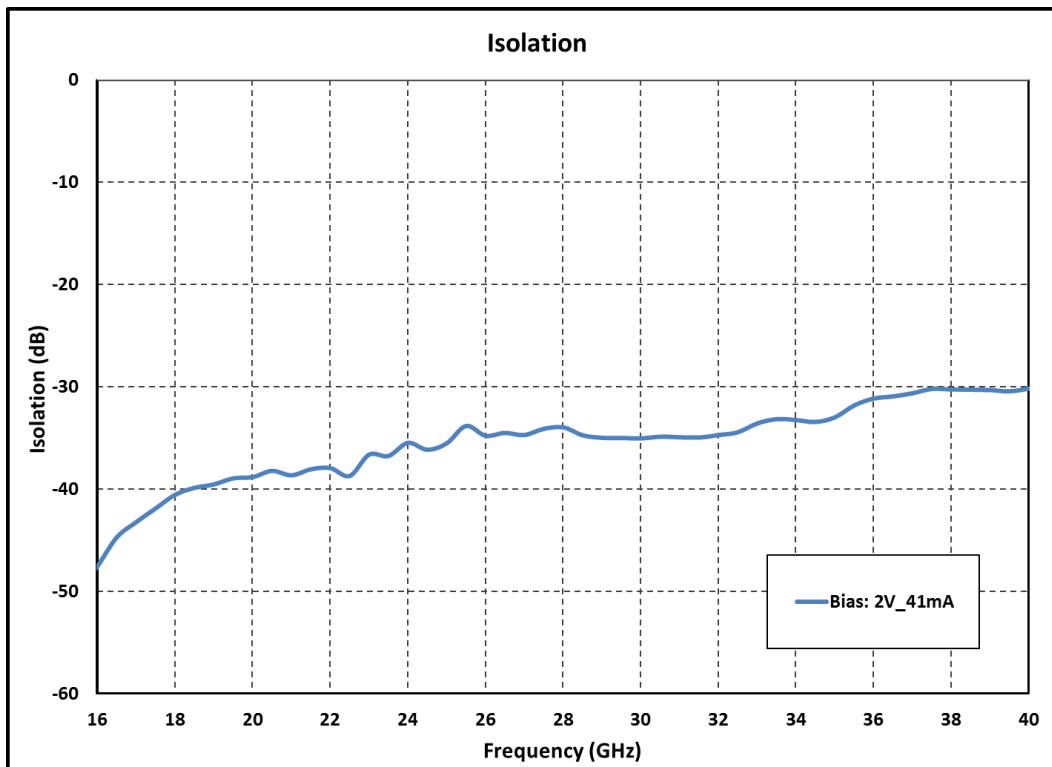
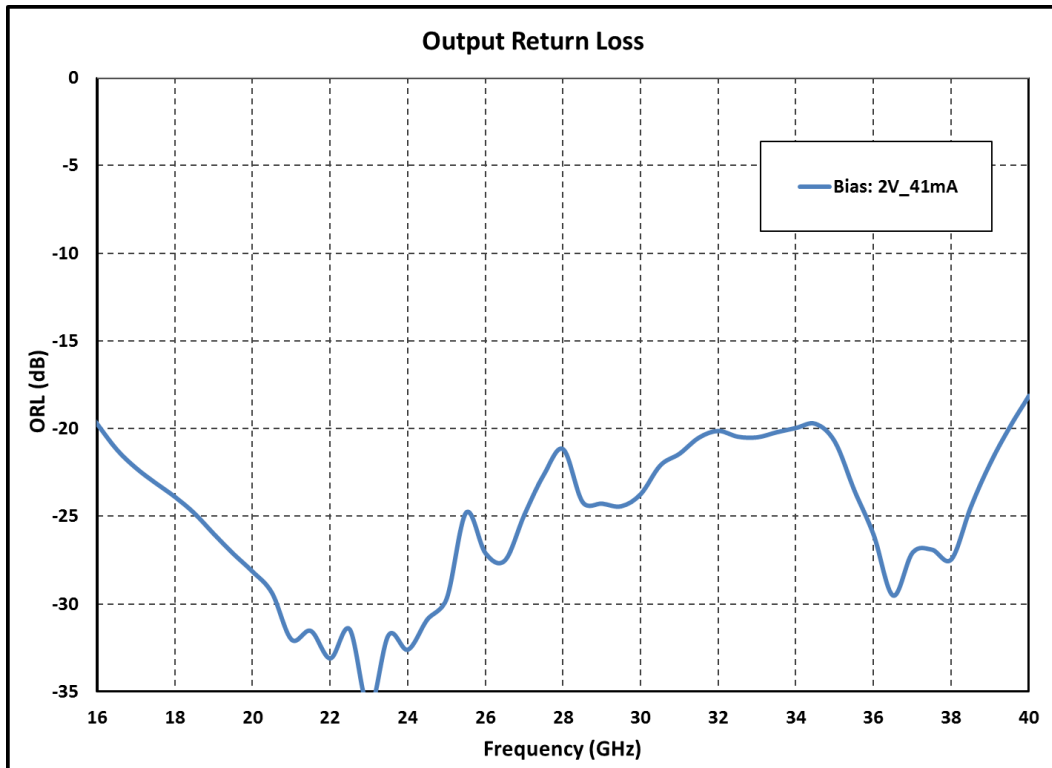
$V_{d1} = V_{d2} = 2V$, Total Current = 41 mA, $T_A = 25^\circ C$





On-wafer Probed data

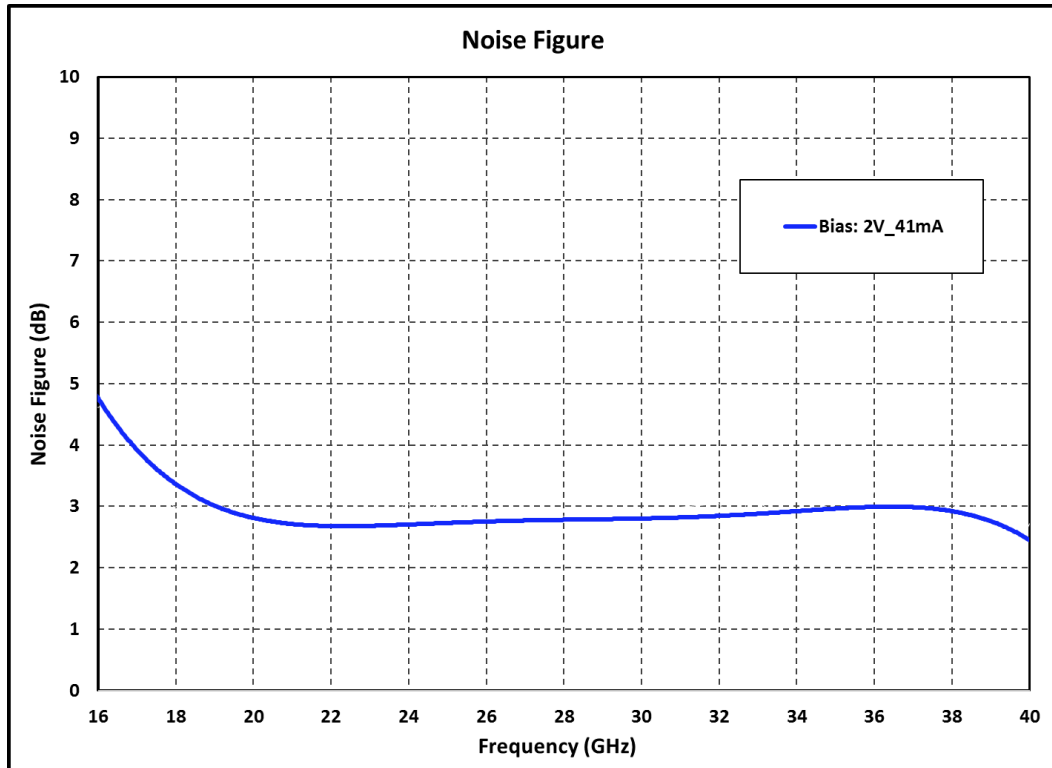
Vd1= Vd2= 2V, Total Current = 41 mA, TA = 25 °C



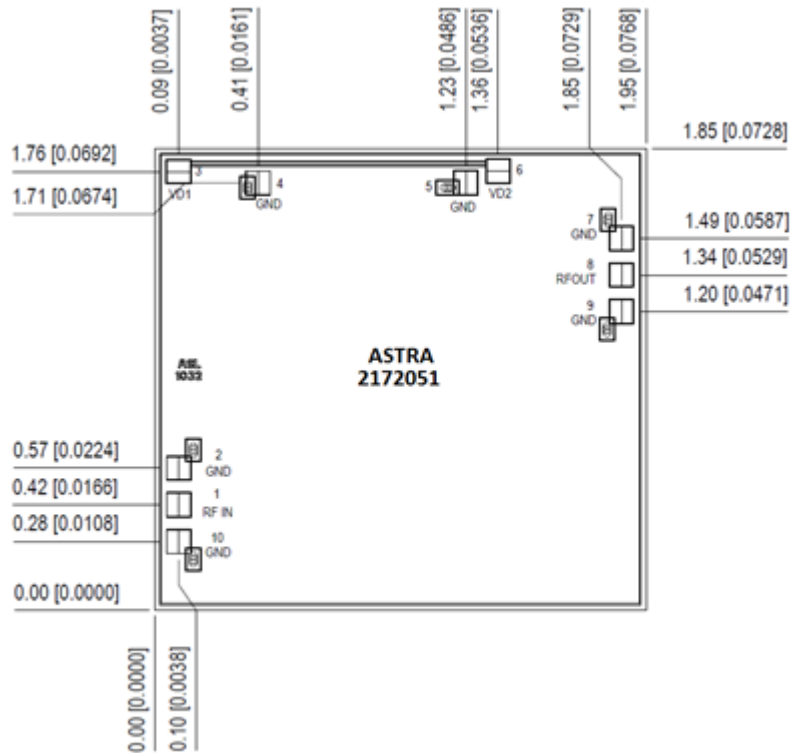


On-wafer Probed data

$V_{d1} = V_{d2} = 2V$, Total Current = 41 mA, $T_A = 25\text{ }^\circ\text{C}$



Mechanical Characteristics



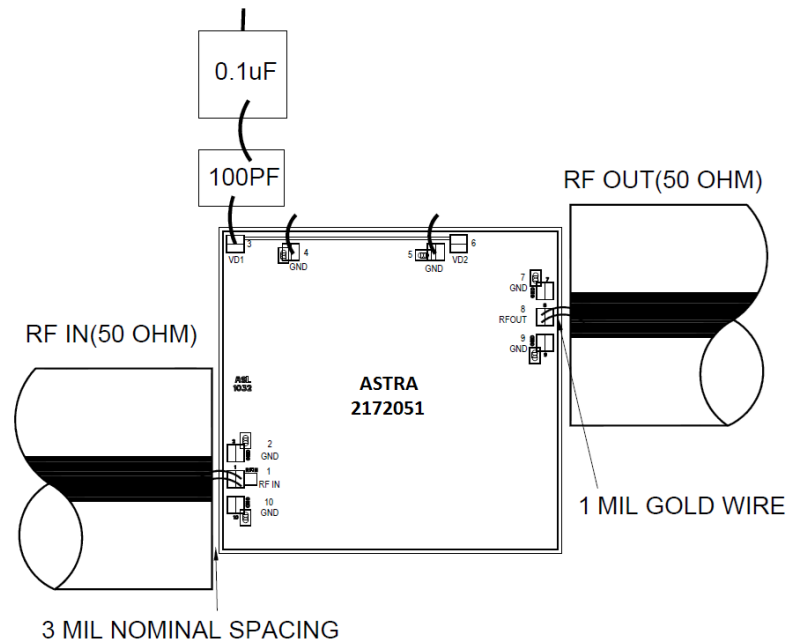
Units: millimeters (inches)

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

Note:

1. Pad no. 1 : RF IN
2. Pad no. 3 : VD1
3. Pad no. 6 : VD2
4. Pad no. 8 : RF OUT
5. Pad no. 2, 4, 5, 7, 9, 10: 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 0.1 μ F 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 - 200 μ m length of wedge bonds is advised. Single Ball bonds of 250-300 μ m 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.