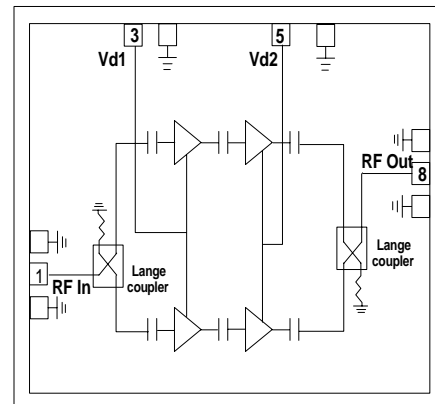


18 - 40 GHz Low Noise Amplifier

Features

- ◆ Frequency Range: 18-40 GHz
- ◆ Better than 4.5 dB Noise Figure
- ◆ Single supply operation
- ◆ DC decoupled Input and Output
- ◆ 10 dB Nominal Gain
- ◆ 6dBm Nominal P1dB
- ◆ Input Return Loss > 12 dB
- ◆ Output Return Loss > 12 dB
- ◆ Nominal Bias : Vd1, Vd2 = 4V@ 45mA
- ◆ 0.15-um InGaAs pHEMT Technology
- ◆ Chip Dimensions: 2.4mm x 2.2mm x 0.1mm

Functional Diagram



Typical Applications

- ◆ Millimetre-wave Point-to-Point Radio
- ◆ LMDS
- ◆ SATCOM
- ◆ VSAT Applications

Description

The AMT2172011 is a two stage balanced 18.0-40.0GHz GaAs MMIC low noise Amplifier with 10dB nominal gain and 4.5 dB noise figure across the band. The LNA has a nominal input/output return loss of 12dB and the P_{1dB} of 6dBm. To amplifier uses a self-bias topology and operates from a single positive supply and consumes 47mA of current. The Amplifier is fully matched to 50Ohms and does not require any external components for reliable operation. The amplifier is fabricated using a reliable 0.15um InGaAs pHEMT process.

This product is 100% DC/RF tested to ensure compliance to performance. This device is well suited for millimetre-wave Point-to-Point Radio, LMDS, SATCOM and VSAT applications.

Absolute Maximum Ratings ⁽¹⁾

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

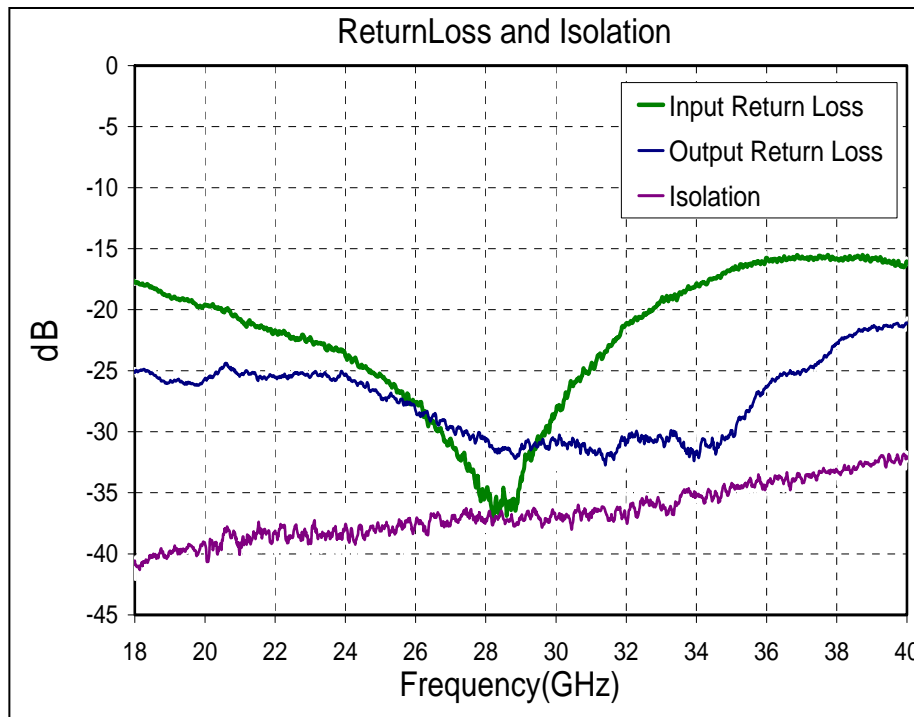
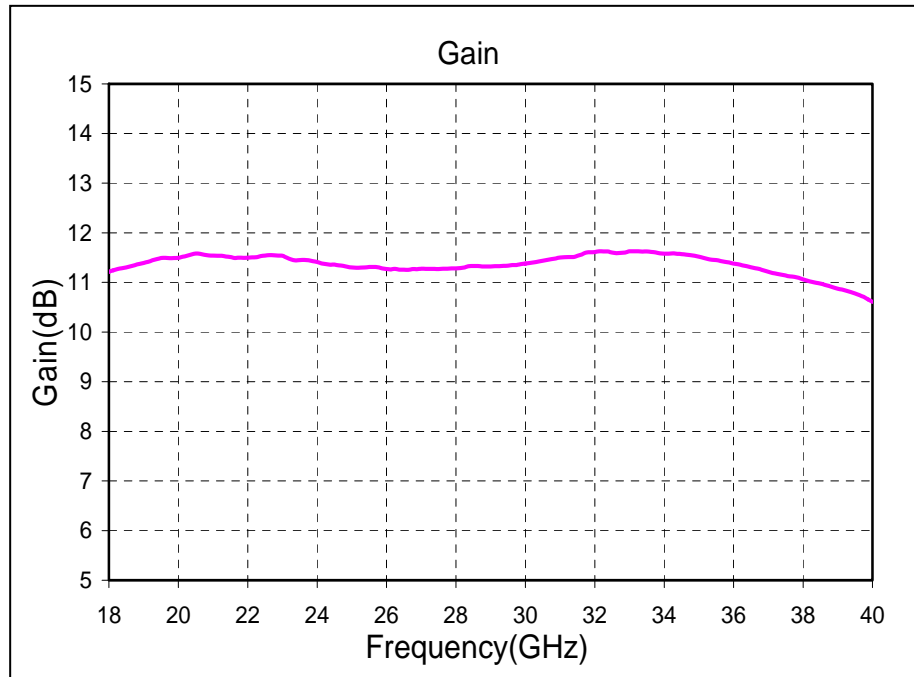
1. Operation beyond these limits may cause permanent damage to the component

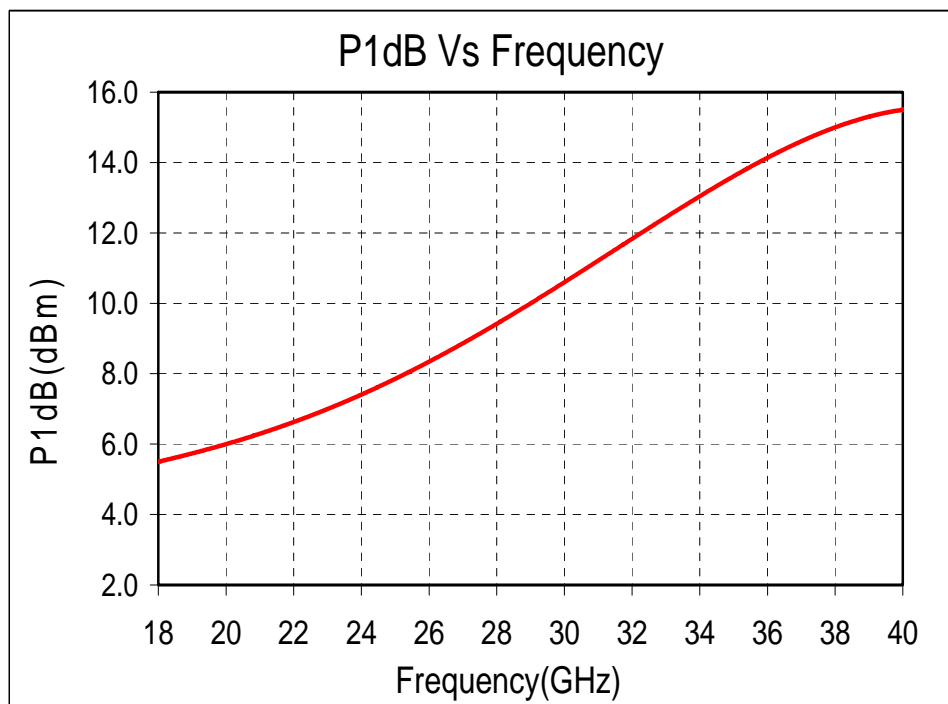
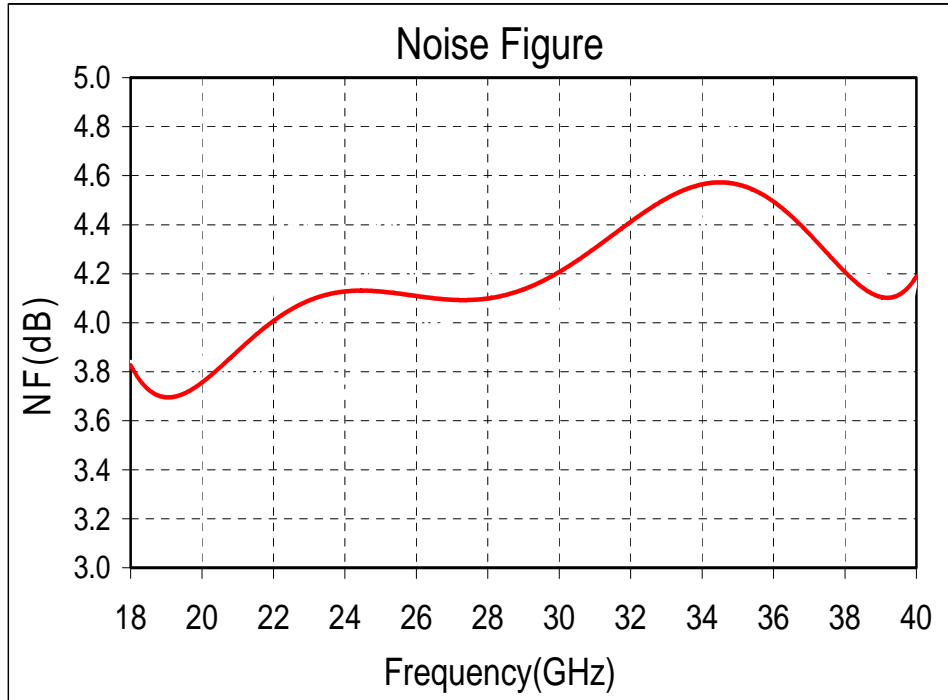
Electrical Specifications ⁽¹⁾ @ T_A = 25 °C, V_d = +4V, Z_o = 50

Parameter	Min.	Typ.	Max.	Units
Frequency	18	-	40	GHz
Gain ⁽¹⁾	-	11	-	dB
Gain Flatness ⁽¹⁾	-	±0.7	-	dB
Noise Figure ⁽²⁾	-	4.5	-	dB
Input Return Loss ⁽¹⁾	-	15	-	dB
Output Return Loss ⁽¹⁾	-	20	-	dB
Output Power (P ₁ dB) ⁽²⁾	-	6	-	dBm
Supply Voltage		4		V
Supply Current	40	45	50	mA

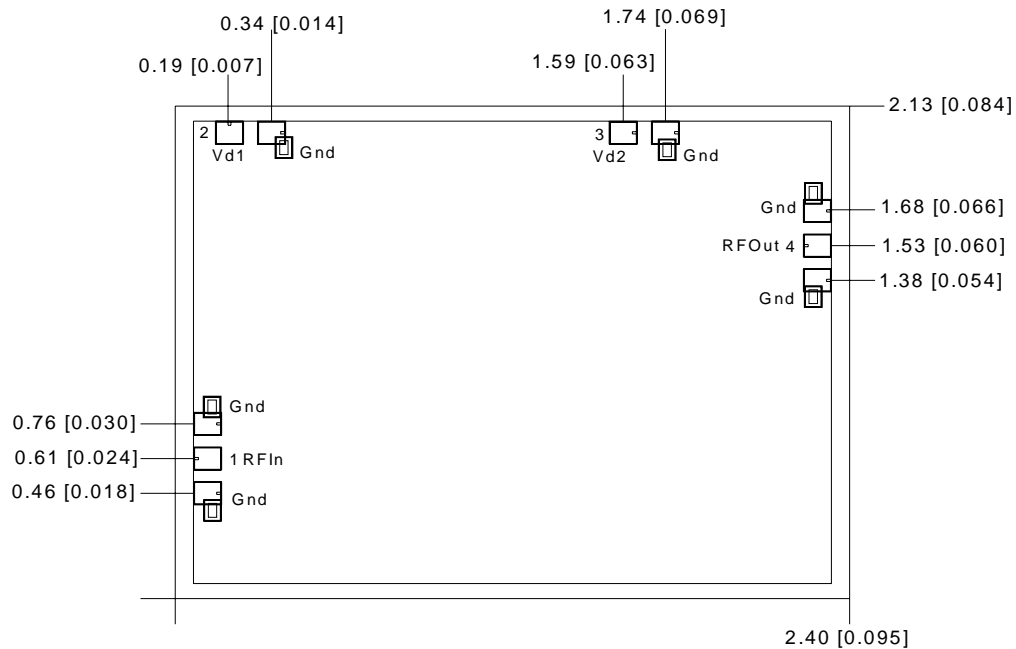
Note:

1. RF On-Wafer Measurement
2. Test Fixture Measurement

On Wafer Measured data
Vd1, Vd2 = 4V, Total Current = 45 mA, T_A = 25 °C


Test fixture data $V_{d1}, V_{d2} = 4V, \text{ Total Current} = 45 \text{ mA}, T_A = 25^\circ\text{C}$ 

Mechanical Characteristics

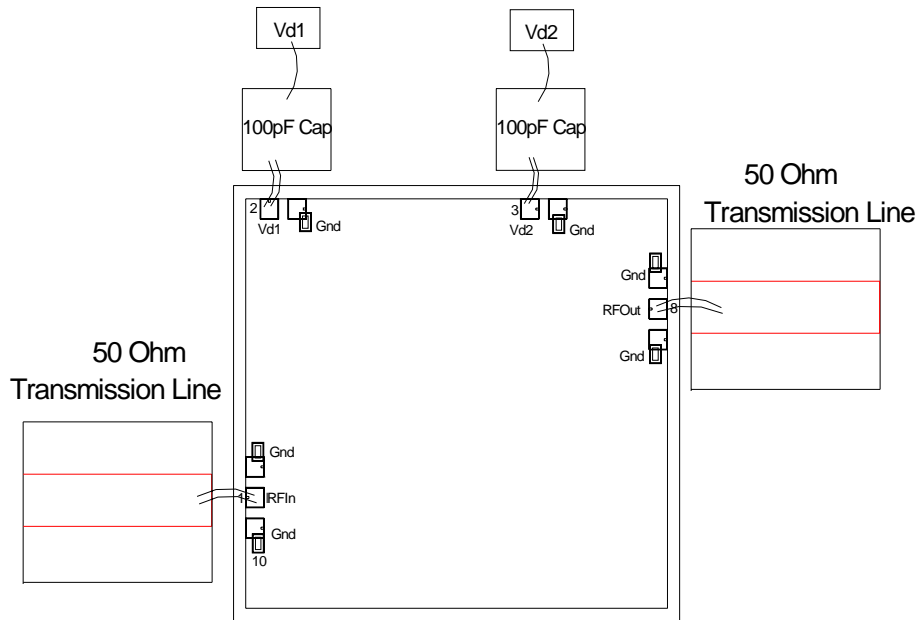


Units: millimetres (inches)

Note:

1. All RF and DC bond pads are 100µm x 100µm
2. Pad no. 1 : RF In
3. Pad no. 2 : Vd1
4. Pad no. 3 : Vd2
5. Pad no. 4 : RF Out

Recommended Assembly Diagram


Note:

1. Two one mil (0.0254mm) bond wires of minimum length should be used for RF input and Output.
2. Two one mil (0.0254mm) bond wires of minimum length should be used from chip bond pad to 100pF drain bypass capacitor.

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