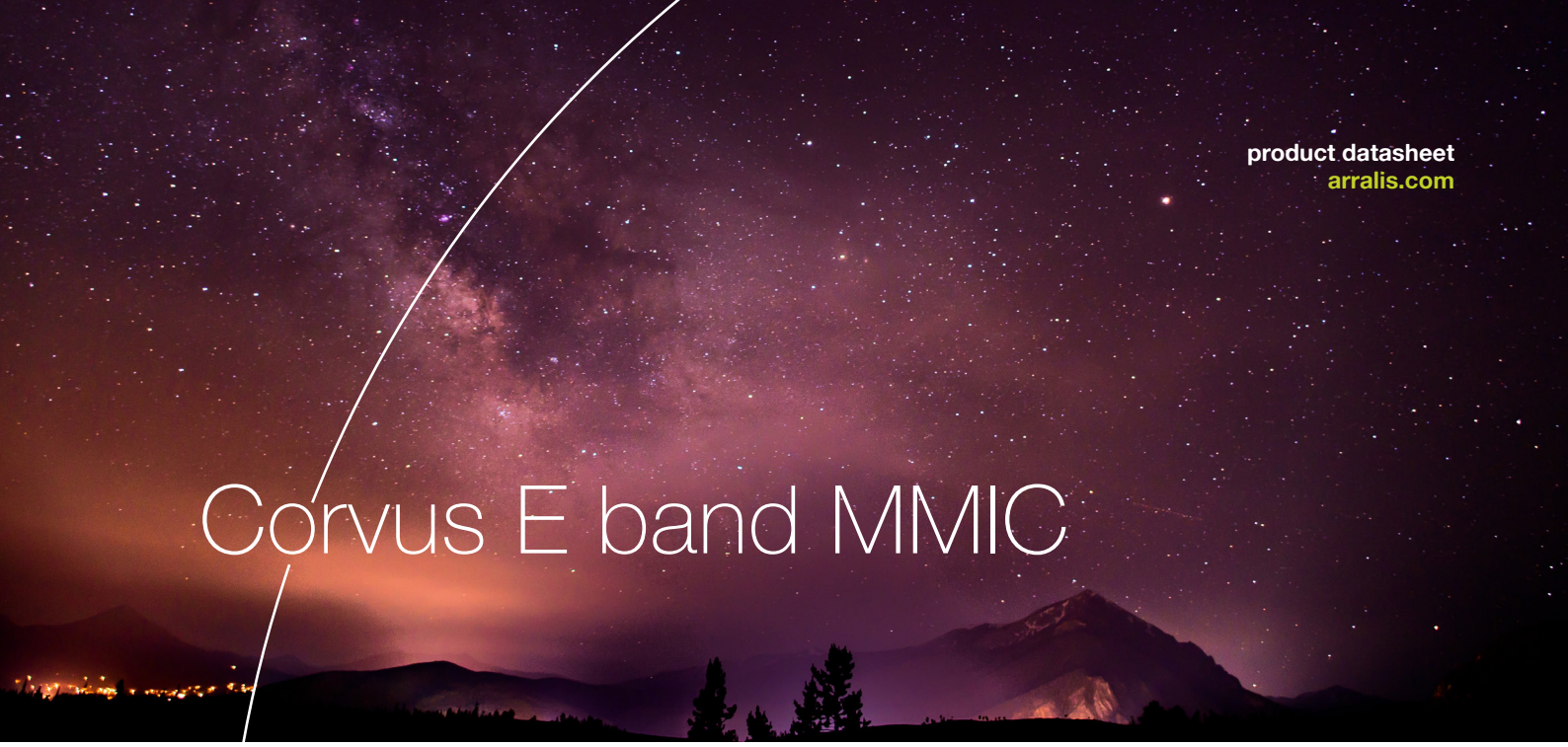


product datasheet
arralis.com

Corvus E band MMIC

CO-E1320305

GaAs PHEMT MMIC LOW NOISE AMPLIFIER 77-82GHz

Overview

CO-E1320305 is a 4-stage MMIC low noise amplifier that covers frequencies from 77GHz to 82GHz and is especially suited for the 77GHz to 82GHz automotive band. The CO-E1320305 provides up to 25dB of stable gain, with a noise figure of 3dB from a 2V supply voltage and 25mA current. With less than ±1dB variation in gain across the band, CO-E1320305 provides a low noise solution for both radar and communication applications.

All bond pads and the backside of the MMIC are gold plated. The CO-E1320305 MMIC is compatible with precision die attach methods, as well as thermo-compression and thermosonic wire bonding, making it ideal for MCM and hybrid microcircuit applications. All data shown is measured with the chip in a 50 Ohm environment, with 100pF decoupling capacitors on all DC connections and is contacted using RF probes.

An option with two CO-E1320305 circuits on a single MMIC die is available as part number CO-E1320306.

Features

- 77 – 82GHz
- 25dB Gain
- 3dB Noise Figure
- Unconditionally Stable
- < ±1dB Gain Variation

Applications

- Millimetre-wave Imaging
- High Resolution Radar
- Sensing
- P2P Communications; short haul / high capacity / low interference links
- Medical
- Automotive

Arralis

Specification Overview

Parameter	Min.	Typ.	Max.	Units
Frequency	77		82	GHz
Gain	23.3	25	25.3	dB
Gain Flatness		±1		dB
Input Return Loss		10		dB
Output Return Loss		12		dB
Noise Figure		3		dB
Voltage		2		V
Current		25		mA

Notes
The tests indicated have all been performed with 100pF de-coupling capacitors on all bias pads.

All tests are carried out at 25°C.

Absolute Maximum Ratings

Parameter	Rating
Voltage	3V
RF Input Power	-5dBm
Storage Temperature	−65°C to +150°C
Channel Temperature	+150°C
Operating Temperature	−40°C to +85°C

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features proprietary protection circuitry, damage may occur on devices subjected to ESD. Proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

Measured Performance Data

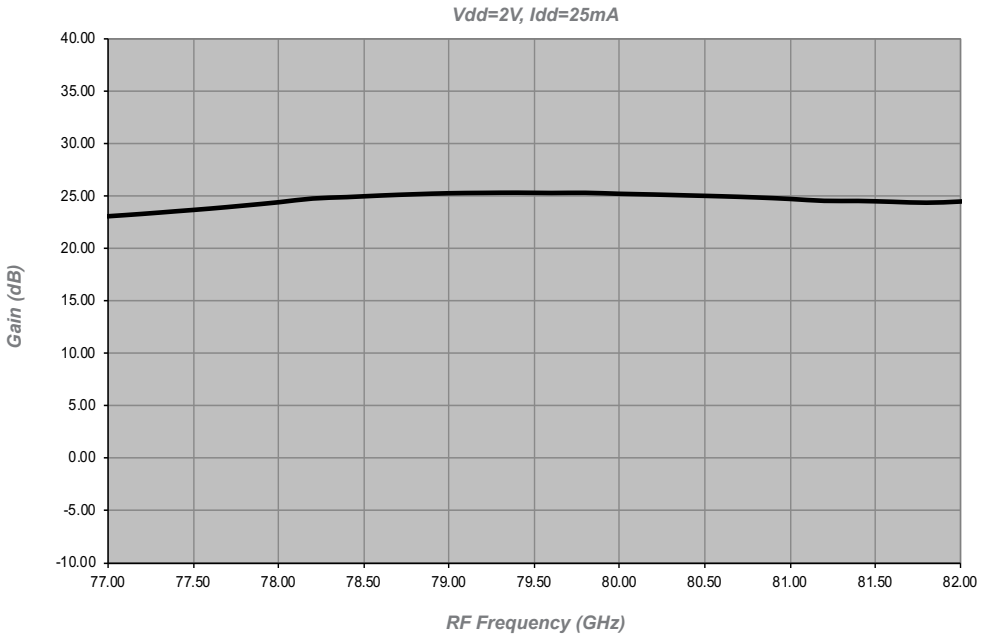


Figure 1
CO-E1320305
Gain

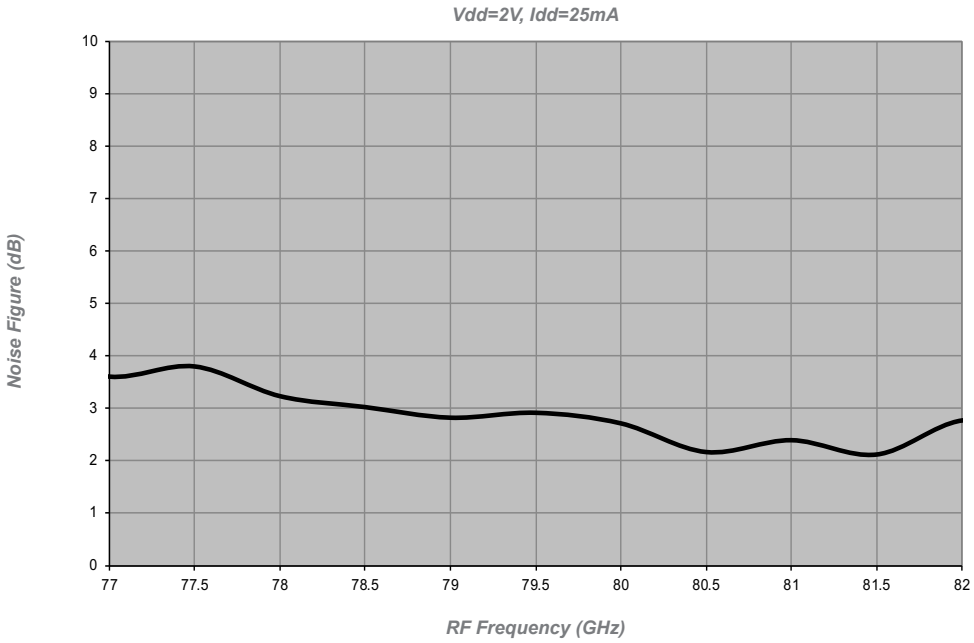


Figure 2
CO-E1320305
Noise Figure

Measured Performance Data

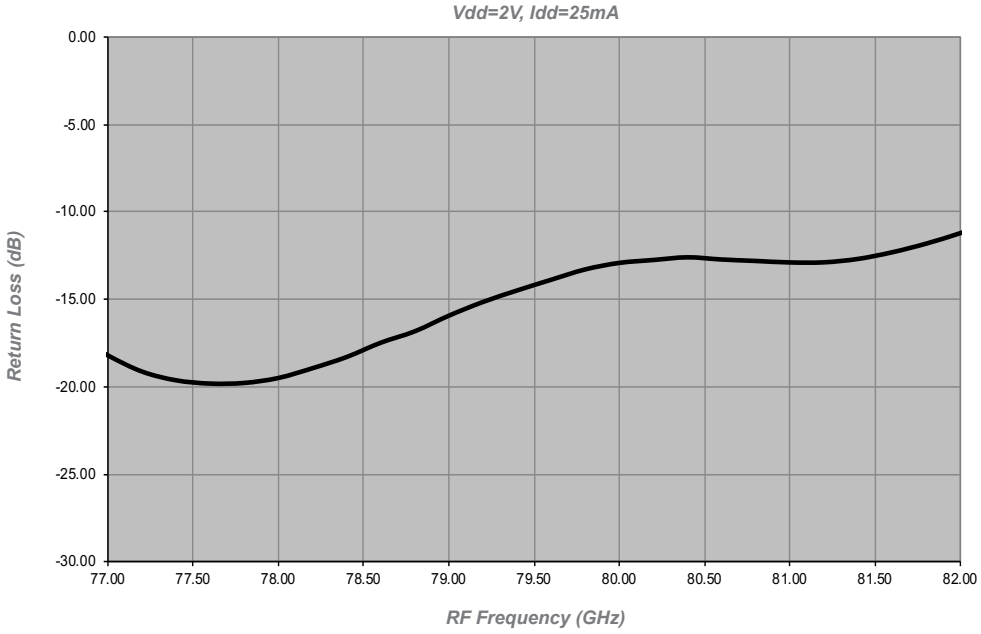


Figure 3
CO-E1320305
Input Return Loss

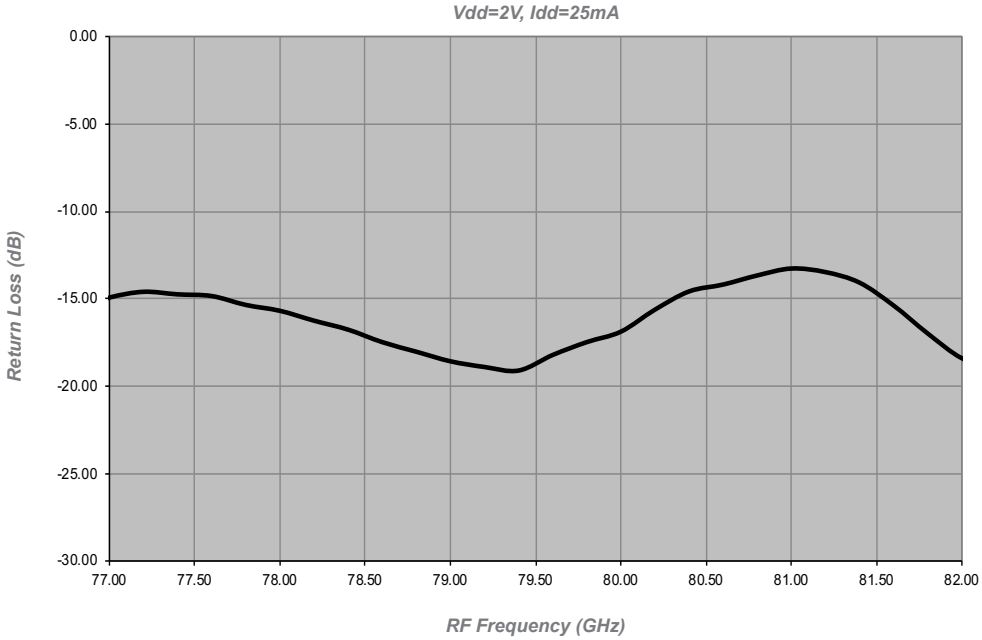
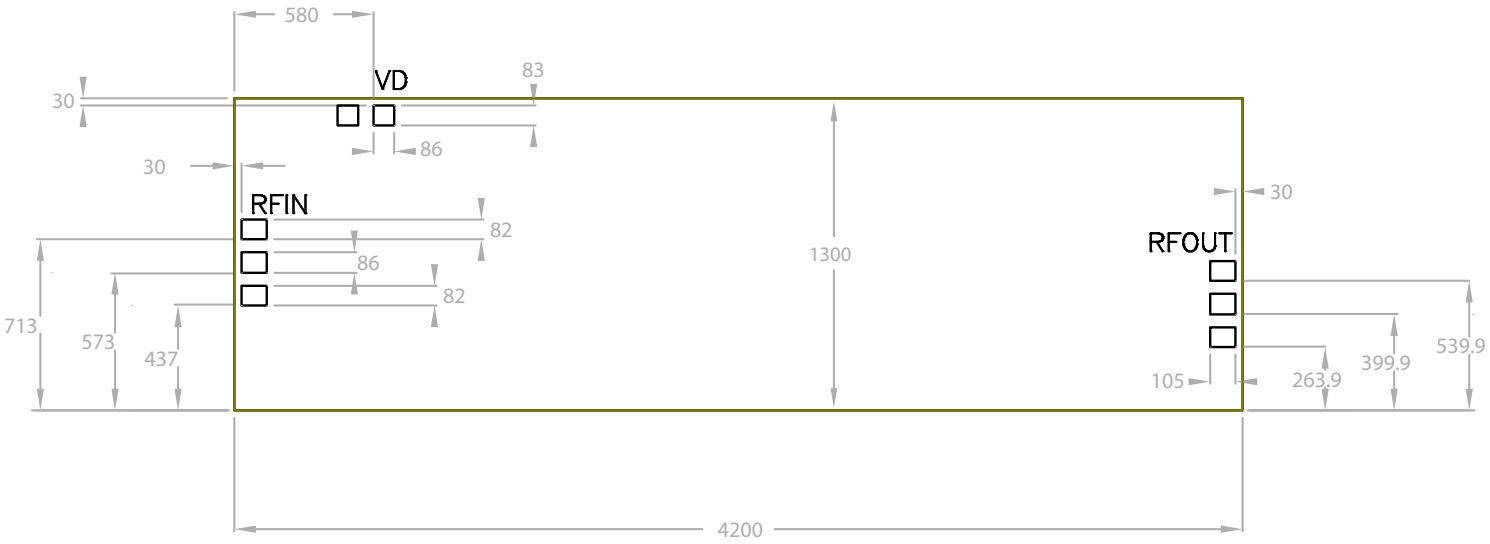


Figure 4
CO-E1320305
Output Return Loss

Outline Drawing

Die Packing Information
All die are delivered using gel-paks unless otherwise requested.



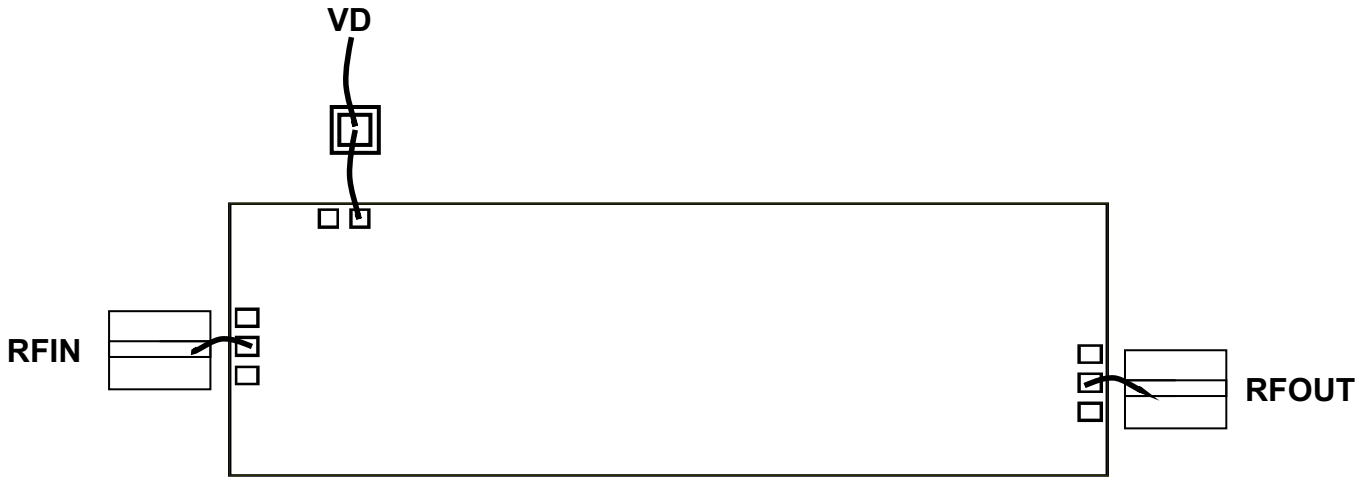
Notes

1. All dimensions are in um.
2. Typical dc bond pads are 86 x 83um.
3. RF bond pads are 86 x 105um.
4. All pads have gold metalisation.
5. Gold backside metalisation.
6. Backside metal is ground.
7. Connections are not required for unlabeled bond pads.
8. Die thickness is 70um.

Pad Descriptions

Name	Description
RFIN	Input RF pad. This pad is ac coupled.
RFOUT	Output RF pad. This pad is ac coupled.
VD	Voltage bias pad.
BOTTOM	The die backside must be connected to RF/dc ground.

Connection Configurations



General Notes on Assembly

Die should be mounted on conductive material such as gold-plated metal to provide a good ground and suitable heat sink, if necessary.

1. Attaching the die using Au/Sn preforms is preferable. The Eutectic melt for Au/Sn occurs at approximately 280°C so the die (plus mount and preform) is initially heated up to 180°C and then it is heated for approximately 10 seconds to 280°C using a nitrogen heat gun. The device will survive 10 seconds at this temperature. The static breakdown for GaAs devices is approximately 330°C.
2. Pure, dry Nitrogen should be used as the heat source.
3. If the devices cannot be lifted/ placed by a vacuum device, then ESD die-lifting tweezers are preferable.
4. Supply lines should be decoupled with 100pF capacitors. Larger planar capacitors could be used if available.
5. Aluminium wire must not be used.

Arralis, Tierney Building UL, Castletroy, Limerick V94NYD3, Ireland (IRL). Tel: +353 61 748 264

Arralis, ECIT, Northern Ireland Science Park, Queen's Road, Queen's Island, Belfast BT3 9DT, United Kingdom (UK). Tel: +44 28 9045 4021

Email: info@arralis.com **Web:** www.arralis.com