

PRELIMINARY DATASHEET

CGY2290SUH/C1 6-18GHz Low Noise Amplifier

DESCRIPTION

The CGY2290SUH/C1 is a high performance GaAs MMIC Low Noise Amplifier operating from 6 GHz up to 18 GHz.

The CGY2290SUH/C1 has a low noise figure of under 3.3 dB, with 8.5 dB of gain across the operating frequency range. The on-chip matching provides better than 14 dB of Input / Output Return Losses. It is part of Ommic's new 6 - 18 GHz chipset that is dedicated to Radar, Telecommunication and Instrumentation applications.

The die is manufactured using ED02AH OMMIC's 0.18 μm gate length PHEMT process. The MMIC uses gold bonding pads, backside metallization and is fully protected with Silicon Nitride passivation to obtain the highest level of reliability. This technology has been evaluated for Space applications and is on the European Preferred Parts List of the European Space Agency.

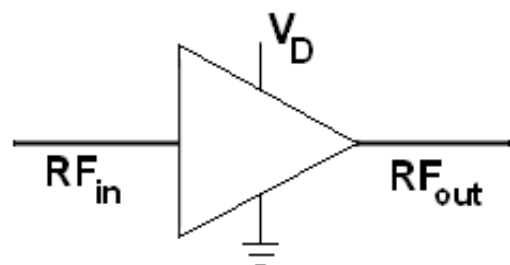
APPLICATIONS

- ▶ Radar
- ▶ Telecommunication
- ▶ Instrumentation



FEATURES

- ▶ Operating Range : 6 GHz to 18 GHz
- ▶ Gain = 8.5 dB
- ▶ NF = 3.3 dB
- ▶ Gain Flatness = +/- 0.5 dB
- ▶ Input P1dB > +12 dBm
- ▶ $S_{11} < -14$ dB
- ▶ $S_{22} < -14$ dB
- ▶ Total Drain Current = 33 mA
- ▶ Chip size = 1400 x 1200 μm
- ▶ Tested, Inspected Known Good Die (KGD)
- ▶ Space and MIL-STD Available



6-18 GHz LNA Block Diagram

ABSOLUTE MAXIMUM RATINGS
 $T_{amb} = + 25 \text{ }^{\circ}\text{C}$, at Die backside; unless otherwise specified

Symbol	Parameter	Conditions	MIN.	MAX.	UNIT
V_D	Positive Voltage Supply		0	+6	V
P_{IN}	Input power	P_{RF} at RFIN		TBD	dBm
T_{amb}	Ambient temperature		-40	+85	$^{\circ}\text{C}$
T_j	Junction temperature			+150	$^{\circ}\text{C}$
T_{stg}	Storage temperature		-55	+150	$^{\circ}\text{C}$

THERMAL CHARACTERISTICS

Symbol	Parameter	Value	UNIT
$R_{th(j-a)}$	Thermal resistance from junction to ambient ($T_a = 25 \text{ }^{\circ}\text{C}$)	TBD	$^{\circ}\text{C/W}$

CHARACTERISTICS
 $T_{amb} = 25 \text{ }^{\circ}\text{C}$ – RF Performance measured on wafer.

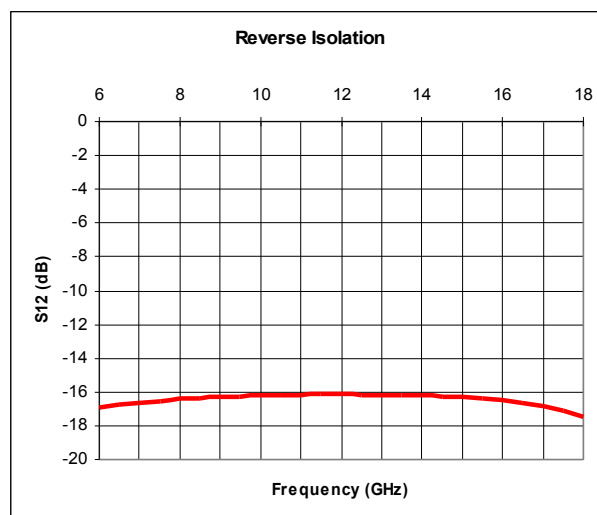
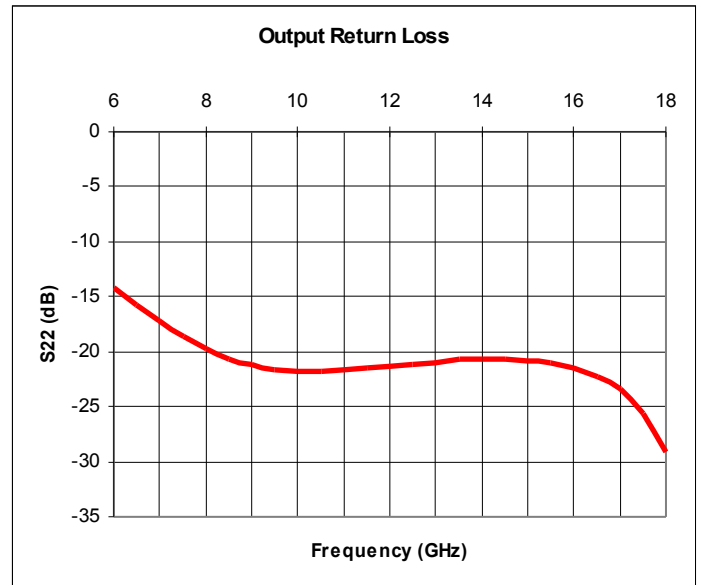
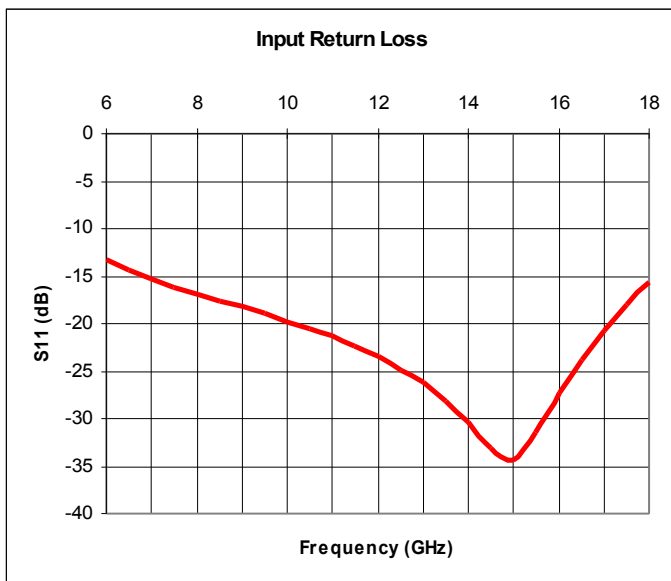
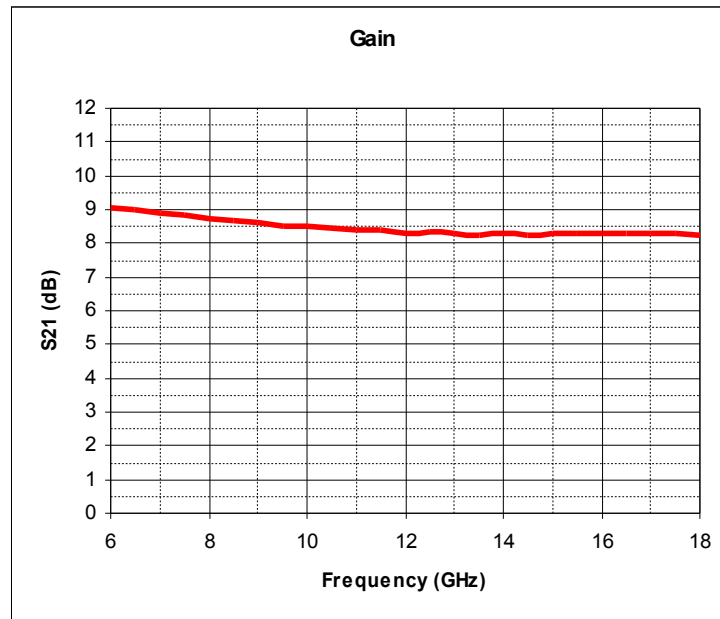
Symbol	Parameter	Conditions	MIN.	TYP.	MAX.	UNIT
BW	Bandwidth		6		18	GHz
<i>RF Performance at 12 GHz unless specified</i>						
V_D	Positive Voltage Supply		0	+5		V
I_D	Positive supply current			30		mA
G	Gain			8.5		dB
NF	Noise Figure			3		dB
S_{12}	Reverse Isolation			-16		dB
S_{11}	Input reflection coefficient				-15	dB
S_{22}	Output reflection coefficient				-15	dB
P_{1dB}	Output 1dB compression point			13		dBm



Caution : This device is a high performance RF component and can be damaged by inappropriate handling. Standard ESD precautions should be followed. OMMIC document “OM-CI-MV/ 001/ PG” contains more information on the precautions to take.

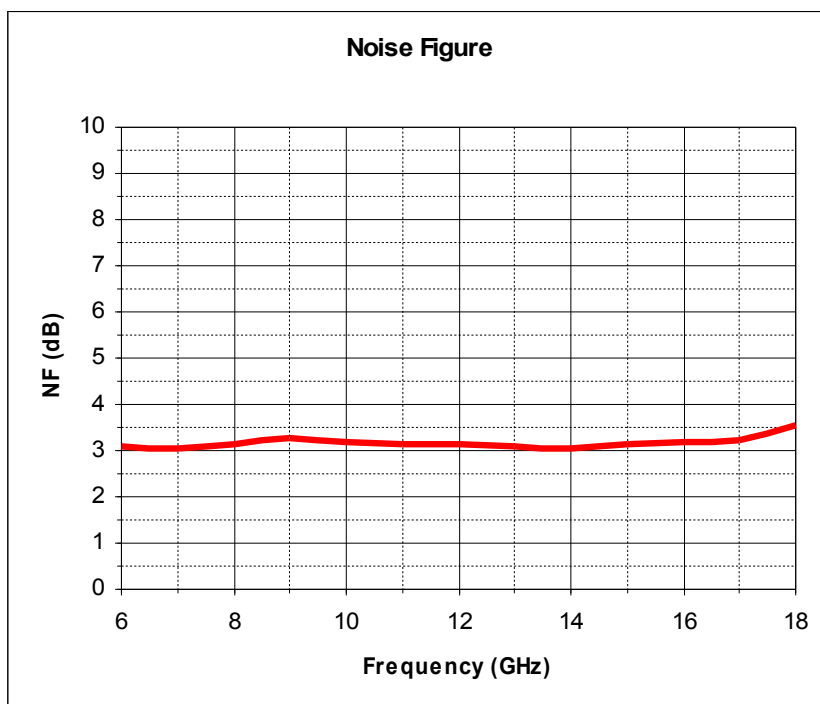
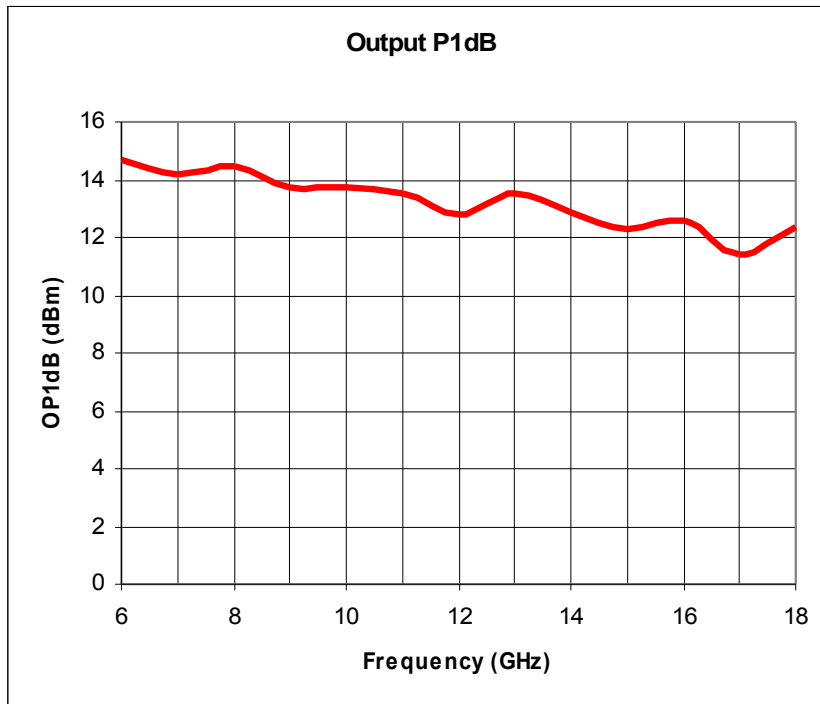
ON WAFER MEASUREMENTS – S PARAMETERS

Measured on wafer @ T = 25 °C



ON WAFER MEASUREMENTS – OUTPUT P1DB AND NOISE FIGURE

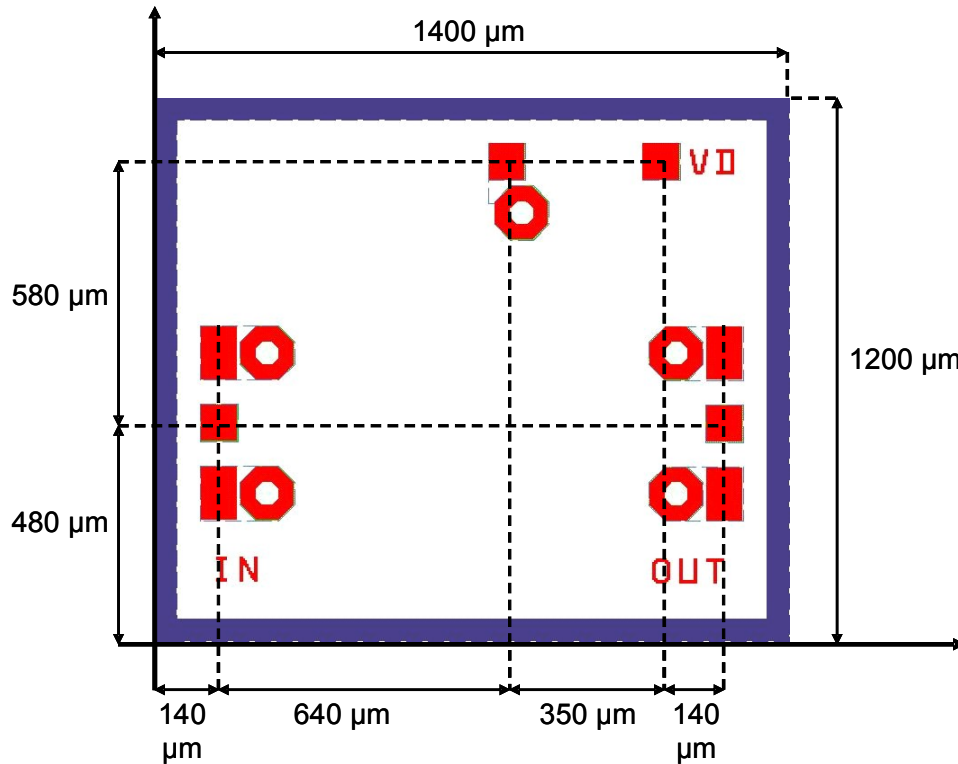
Measured on wafer @ T = 25 °C



MECHANICAL INFORMATION

Chip size = 1400 x 1200 μm

- DC and RF Pads = 80 x 80 μm , top metal = Au
- Chip Thickness 100 μm



PAD POSITION

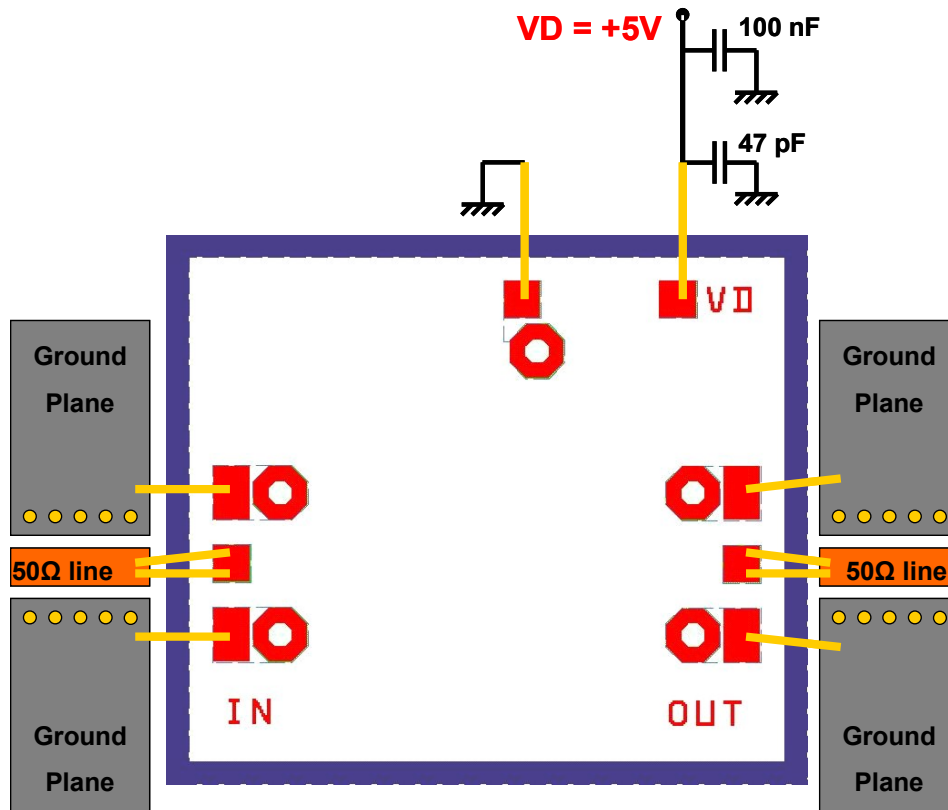
PAD NAME	SYMBOL	COORDINATES		DESCRIPTION
		X	Y	
GND	GND	140	330	Ground
RFin	RF in	140	480	RF Input Port
GND	GND	140	630	Ground
GND	GND	1260	630	Ground
RFout	RF out	1260	480	RF Output Port
GND	GND	1260	330	Ground
VDD	VDD	1120	1060	Positive supply voltage
GND	GND	780	1060	Ground

X=0, Y=0 at bottom left corner.



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BONDING DIAGRAM AND ASSEMBLY INFORMATION



The RF interfacing bond wires or ribbon should be kept as short as possible. The RF lines should be 300um wide or less to minimize discontinuities associated with the connection to the MMIC bond pads.

DEFINITIONS
Limiting values definition

Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

Application information

Applications that are described herein for any of these products are for illustrative purposes only. OMMIC makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

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Life support applications

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ORDERING INFORMATION

Generic type	Package type	Version	Sort type	Description
CGY2290S	UH	C1	-	6-18 GHz Low Noise Amplifier


Document History : Version 1.0, Last Update 13/06/2013