PRODUCT DATASHEET

Version 1.0

CGY2184UH/C1

0.1 – 6 GHz Active Mixer

DESCRIPTION

The CGY2184UH is a high performance GaAs based Active Double Balanced Mixer MMIC.

The CGY2184UH covers the frequency range of 0.1 GHz to 6 GHz, with a conversion gain of typically 18 dB, and uses an active Gilbert Cell Mixer Structure. It can be used in GPS, Telecommunication, Radar, Instrumentation, and EW applications.

The die is manufactured using OMMIC's 0.18 µm gate length PHEMT Technology. The MMIC uses gold bonding pads and backside metallization and is fully protected with Silicon Nitride passivation to obtain the highest level of reliability.

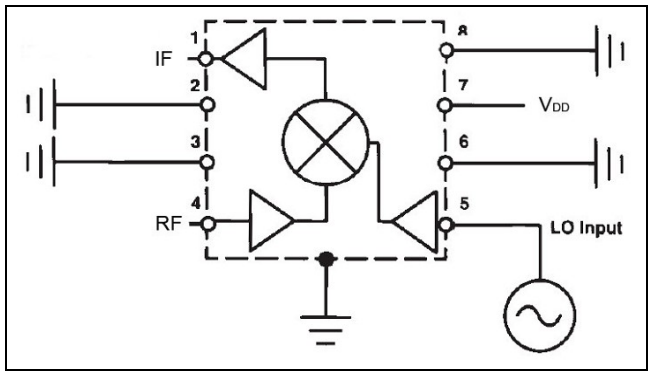
FEATURES

- RF and LO Range : 0.1 GHz to 6 GHz
- IF Range : DC – 3 GHz
- Conversion Gain : 18 dB
- RF to IF Leakage : -40 dBc
- LO to IF Isolation : 40 dB
- Output $P1_{dB}$: 3 dBm
- Small Chip Size 1.1 mm x 1.7 mm
- Tested, Inspected Known Good Die (KGD)
- Samples Available
- Demonstration Boards Available
- Space and MIL-STD Available

APPLICATIONS

- GPS Systems, Radar, Telecommunication & Instrumentation

The CGY2184UH is RoHS compliant.



Functional Diagram of the Mixer

OMMIC

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LIMITING VALUES

T_{amb} = 25 °C unless otherwise noted

Symbol	Parameter	Conditions	MIN.	MAX.	UNIT
V_D	Supply Voltage			10	V
P_{LO}	Local Oscillator Input Power			5	dBm
P_{RF}	RF Input Power			TBD	dBm
T_{amb}	Ambient temperature		-30	+85	° C
T_j	Junction temperature			+150	° C
T_{stg}	Storage temperature		-55	+150	° C

THERMAL CHARACTERISTICS

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

CHARACTERISTICS

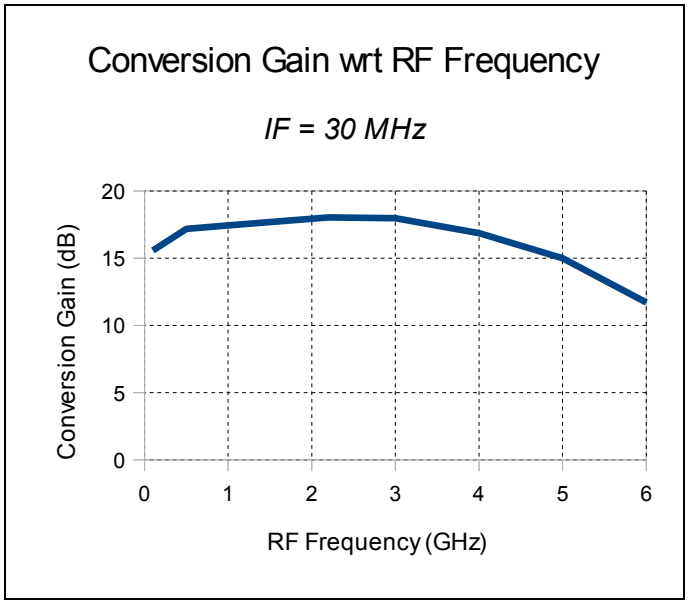
T_{amb} = 25 °C – RF Performance measured on wafer.

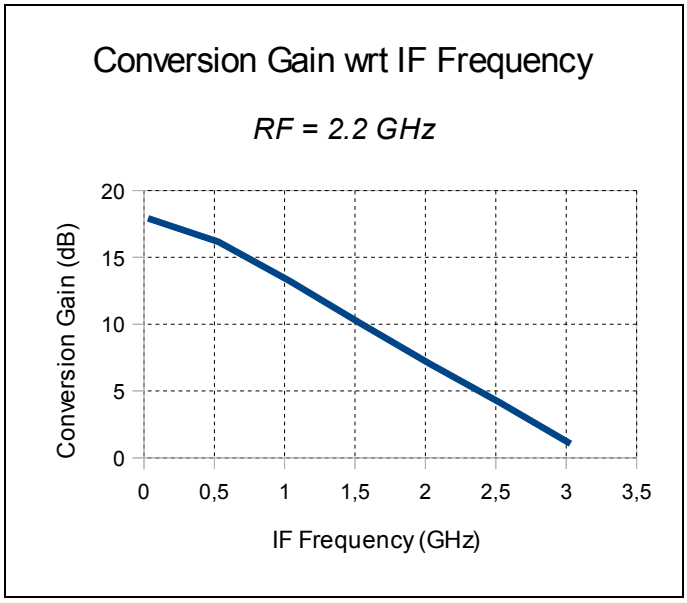
Symbol	Parameter	Conditions	MIN.	TYP.	MAX.	UNIT
Unless otherwise specified LO Power = 0 dBm; IF = 30 MHz; RF = 2.2 GHz; Down Converter Mode						
V_{DD}	Supply Voltage			8		V
I_{DD}	Supply Current		30	38	45	mA
BW_{RF}	RF Bandwidth		0.1		6	GHz
BW_{LO}	LO Bandwidth		0.1		6	GHz
BW_{IF}	IF Bandwidth		DC		3	GHz
G_c	Conversion Gain		15	18	20	dB
NF (SSB)	SSB Noise Figure			10		dB
ISO_{RF-IF}	RF to IF Leakage			-40	-35	dBc
ISO_{LO-IF}	LO to IF Isolation		30	40		dB
P_{1dB}	Output 1dB Compression Point		1	3		dBm

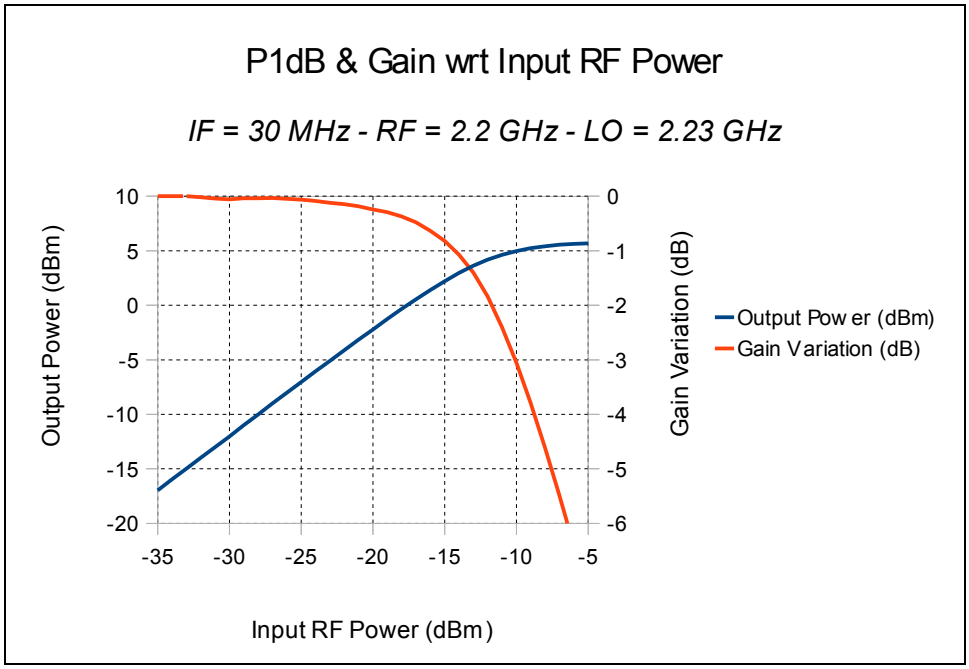
Caution : This device is a high performance RF component and can be damaged by inappropriate handling. Standard ESD precautions should be followed. OMMIC document “OM-CI-MV/ 001/ PG” contains more information on the precautions to take.

ON WAFER MEASUREMENTS – CONVERSION GAIN

T = 25 °C. Calculated with inductance of 0.3 nH to take into account the bonding inductance.

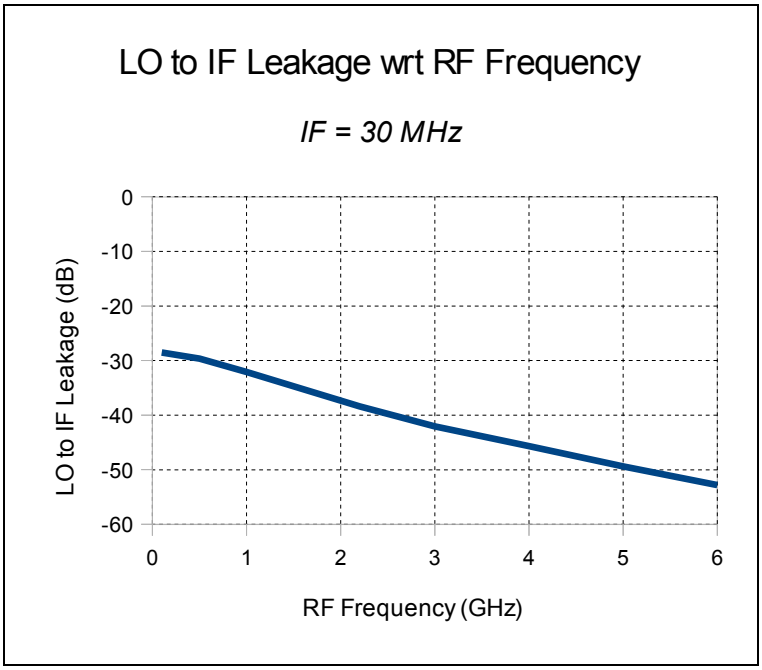


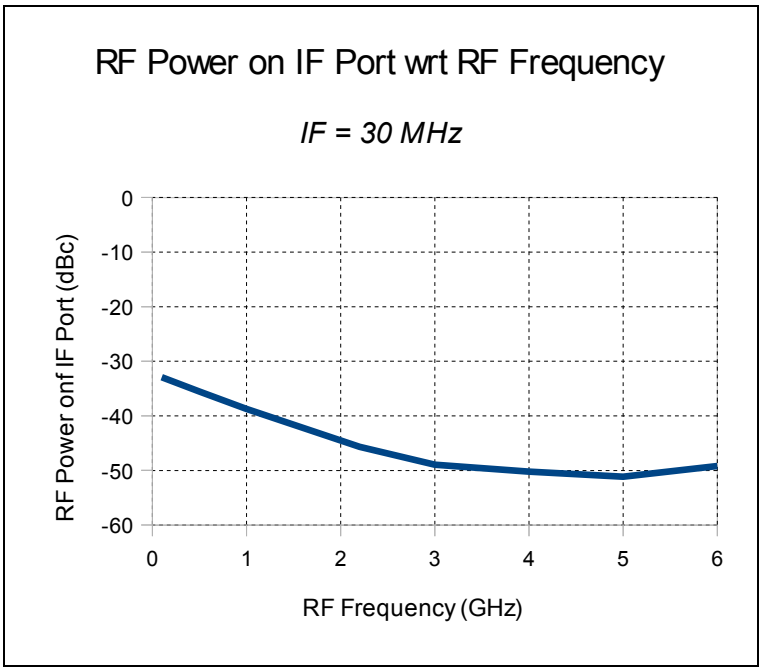




ON WAFER MEASUREMENTS – LEAKAGES & ISOLATIONS

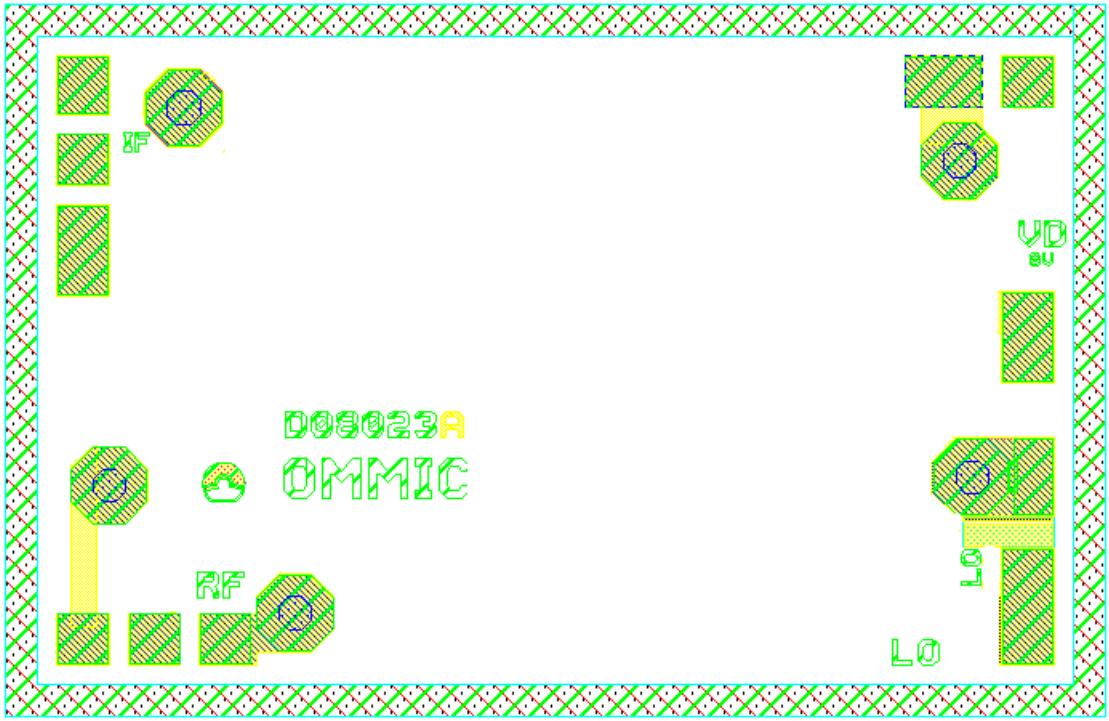
T = 25 °C. Calculated with inductance of 0.3 nH to take into account the bonding inductance.





MECHANICAL INFORMATION

Chip size :	1100 µm x 1700 µm (before wafer sawing)
Substrate thickness :	100 µm
DC, RF & IF Pads Size :	80 x 80 µm
LO Pad Size :	80 x 180 µm



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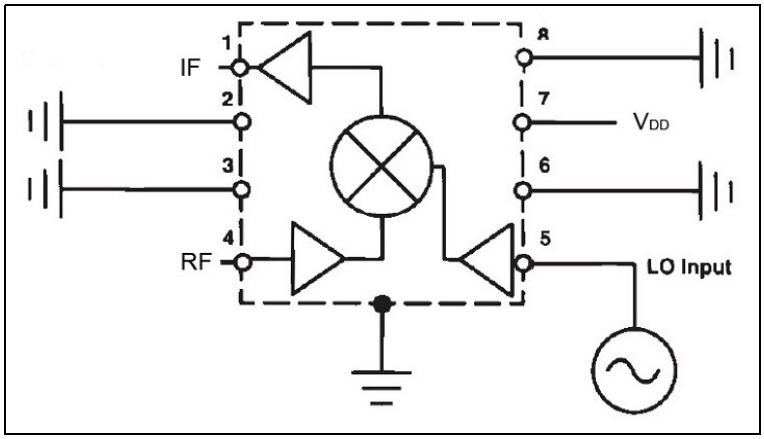
BLOCK DIAGRAM



PAD POSITION

PAD NAME	SYMBOL	COORDINATES		DESCRIPTION
		X	Y	
LO	LO	1575	170	Local Oscillator Input
RF	RF	235	125	RF Input
IF	IF	125	860	IF Output
VD	VD	1575	975	DC Bias

X=0, Y=0 at bottom left corner.
Coordinates correspond to the Centre of the Bonding Pad.
See Mechanical Information for more details.

BONDING DIAGRAM AND ASSEMBLY INFORMATION

THE BONDING WIRES SHOULD BE GOLD AND BE AS SHORT AS POSSIBLE. THE CGY2184UH USES THROUGH SUBSTRATE VIA HOLES TO OBTAIN EXCELLENT RF GROUNDING. THE BACKSIDE OF THE MMIC MUST BE APPROPRIATELY CONNECTED TO THE SYSTEM GROUND.

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.

DISCLAIMERS

Life support applications
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ORDERING INFORMATION

Generic type	Package type	Version	Description
CGY2184UH	Bare Die	C1	Active Double Balanced Quad Mixer

RoHS Compliant

Document History : Version 1.0, Last Update 22/05/2012