Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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ANALOG DEVICES

HMC204

v04.0907

GaAs MMIC PASSIVE FREQUENCY DOUBLER, 4 - 8 GHz INPUT

Typical Applications

The HMC204 is suitable for:

- Wireless Local Loop
- LMDS, VSAT, and Point-to-Point Radios
- Test Equipment

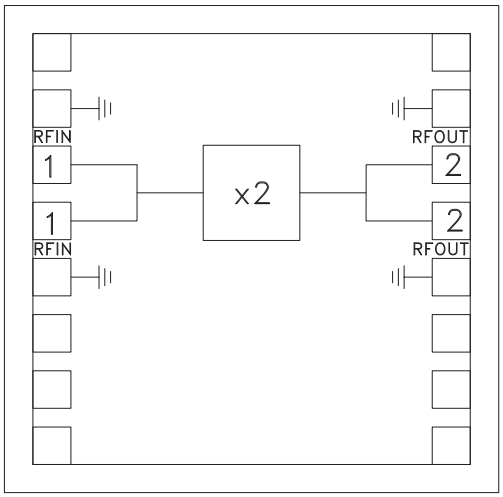
Features

Conversion Loss: 17 dB

Fo, 3Fo, 4Fo Isolation: 38 dB

Passive: No Bias Required

Functional Diagram



General Description

The HMC204 is a passive miniature frequency doubler in a MMIC die. Suppression of undesired fundamental and higher order harmonics is 38 dB typical with respect to input signal level. The doubler utilizes the same GaAs Schottky diode/balun technology found in Hittite MMIC mixers. It features small size, no DC bias, and no measurable additive phase noise onto the multiplied signal.

Electrical Specifications, T_A = +25° C, As a Function of Drive Level

	Input = +10 dBm			Input = +12 dBm			Input = +15 dBm			
Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range, Input	5.5 - 7.5			5.0 - 8.0			4.0 - 8.0			GHz
Frequency Range, Output	11.0 - 15.0			10.0 - 16.0			8.0 - 16.0			GHz
Conversion Loss		17	20		17	20		18	21	dB
FO Isolation (with respect to input level)				41	45					dB
3FO Isolation (with respect to input level)				42	46					dB
4FO Isolation (with respect to input level)				35	38					dB

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HMC204* PRODUCT PAGE QUICK LINKS

Last Content Update: 02/23/2017

COMPARABLE PARTS

View a parametric search of comparable parts.

EVALUATION KITS

- HMC204C8 Evaluation Board.
- HMC204MS8G Evaluation Board

DOCUMENTATION

Data Sheet

- HMC204 Die Data Sheet
- HMC204C8 Data Sheet
- HMC204MS8G Data Sheet

TOOLS AND SIMULATIONS

- HMC204 Die S-Parameters
- HMC204C8 S-Parameters
- HMC204MS8G S-Parameters

REFERENCE MATERIALS

Quality Documentation

- HMC Legacy PCN: MS##, MS##E and MS##G,MS##GE packages - Relocation of pre-existing production equipment to new building
- Package/Assembly Qualification Test Report: MS8G (QTR: 2014-00393)
- PCN: MS, QS, SOT, SOIC packages - Sn/Pb plating vendor change
- Semiconductor Qualification Test Report: MESFET-B (QTR: 2013-00245)

DESIGN RESOURCES

- HMC204 Material Declaration
- PCN-PDN Information
- Quality And Reliability
- Symbols and Footprints

DISCUSSIONS

View all HMC204 EngineerZone Discussions.

SAMPLE AND BUY

Visit the product page to see pricing options.

TECHNICAL SUPPORT

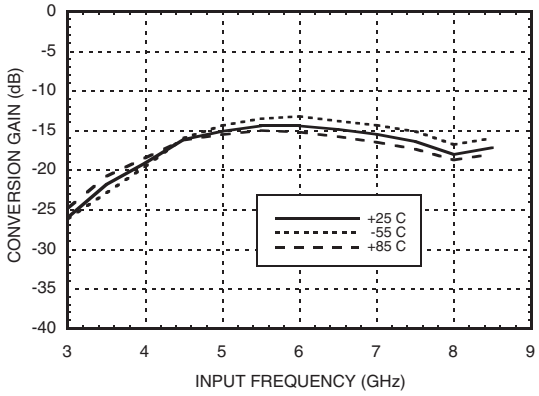
Submit a technical question or find your regional support number.

DOCUMENT FEEDBACK

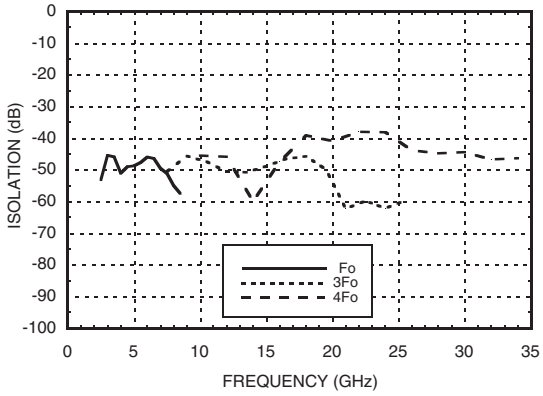
Submit feedback for this data sheet.

GaAs MMIC PASSIVE FREQUENCY DOUBLER, 4 - 8 GHz INPUT

Conversion Gain vs Temperature @ +15 dBm Drive Level

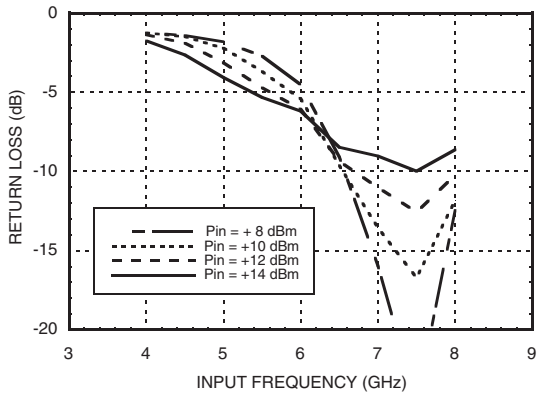


Isolation @ +15 dBm Drive Level*

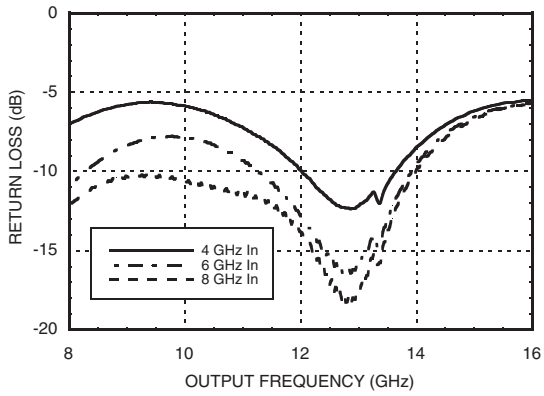


*With respect to input level

Input Return Loss vs. Drive Level



Output Return Loss for Several Input Frequencies



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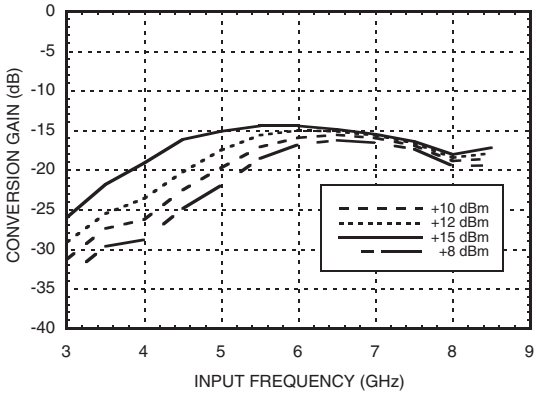
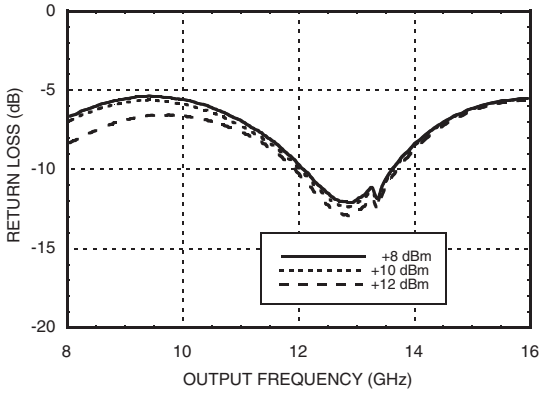
GaAs MMIC PASSIVE FREQUENCY DOUBLER, 4 - 8 GHz INPUT

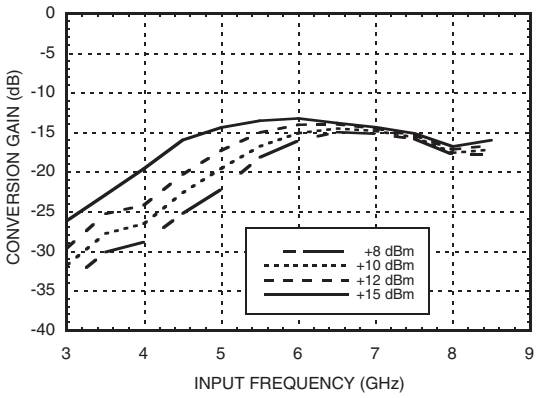
Conversion Gain @ 25°C vs. Drive Level



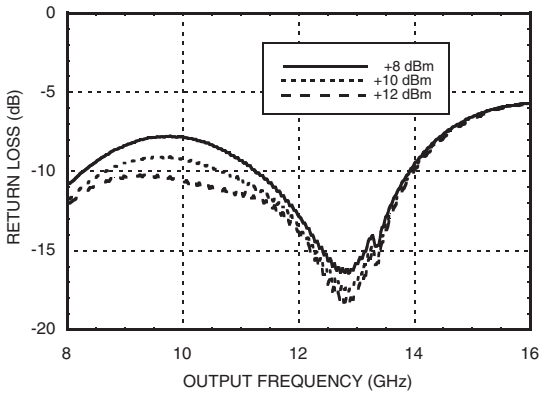
Output Return Loss with 4 GHz Input



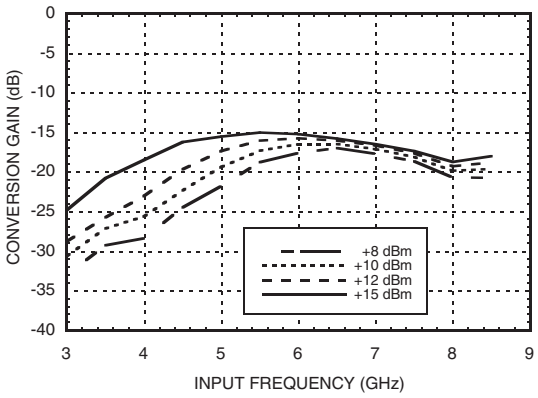
Conversion Gain @ -55°C vs. Drive Level



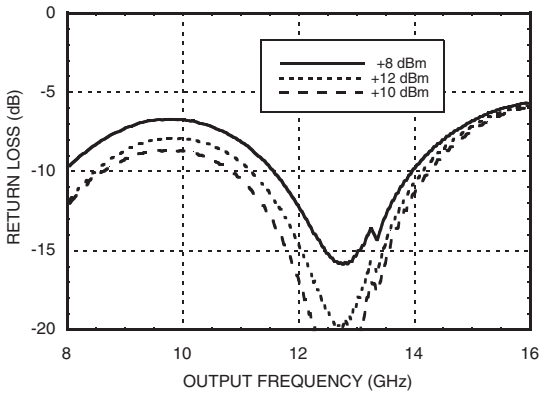
Output Return Loss with 6 GHz Input



Conversion Gain @ +85°C vs. Drive Level



Output Return Loss with 8 GHz Input



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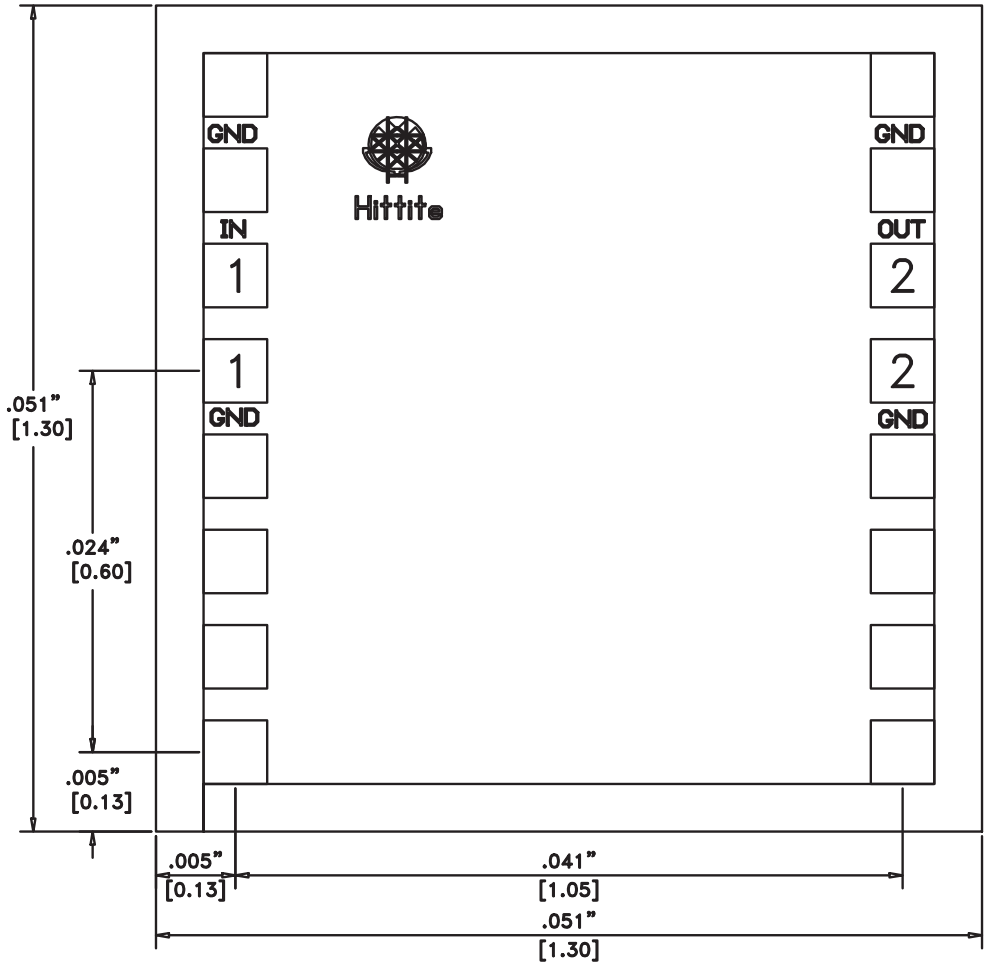
Absolute Maximum Ratings

Input Drive	+27 dBm
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



Die Packaging Information [1]

Standard	Alternate
WP-2 (Waffle Pack)	[2]

[1] Refer to the "Packaging Information" section for die packaging dimensions.
[2] For alternate packaging information contact Hittite Microwave Corporation.

NOTES:
1. DIE THICKNESS IS 0.100 [0.004], BACKSIDE IS GROUND
2. BOND PADS ARE 0.100 [0.004] SQUARE
3. BOND PAD SPACING, CTR-CTR: 0.150 [0.006]
4. ALL DIMENSION IN INCHES [MILLIMETERS]
5. ALL TOLERANCES ARE ±0.025 [±0.001]
6. BOND PAD METALLIZATION: GOLD
7. BACKSIDE METALLIZATION: GOLD

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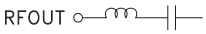
Pad Description

Pad Number	Function	Description	Interface Schematic
1	RFIN	Pad is DC coupled and matched to 50 Ohms.	
2	RFOUT	Pad is AC coupled and matched to 50 Ohms.	
Die Bottom	GND	Die bottom must be connected to RF/DC ground.	

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Handling Precautions

Follow these precautions to avoid permanent damage.

Storage: All bare die are placed in either Waffle or Gel based ESD protective containers, and then sealed in an ESD protective bag for shipment. Once the sealed ESD protective bag has been opened, all die should be stored in a dry nitrogen environment.

Cleanliness: Handle the chips in a clean environment. DO NOT attempt to clean the chip using liquid cleaning systems.

Static Sensitivity: Follow ESD precautions to protect against ESD strikes.

Transients: Suppress instrument and bias supply transients while bias is applied. Use shielded signal and bias cables to minimize inductive pick-up.

General Handling: Handle the chip along the edges with a vacuum collet or with a sharp pair of bent tweezers. The surface of the chip may have fragile air bridges and should not be touched with vacuum collet, tweezers, or fingers.

Mounting

The chip is back-metallized and can be die mounted with AuSn eutectic preforms or with electrically conductive epoxy. The mounting surface should be clean and flat.

Epoxy Die Attach:
Apply a minimum amount of epoxy to the mounting surface so that a thin epoxy fillet is observed around the perimeter of the chip once it is placed into position.

Cure epoxy per the manufacturer's schedule.

Wire Bonding

Ball or wedge bond with 1.0 diameter pure gold wire. Thermosonic wirebonding with a nominal stage temperature of 150 °C and a ball bonding force of 40 to 50 grams or wedge bonding force of 18 to 22 grams is recommended. Use the minimum level of ultrasonic energy to achieve reliable wirebonds. Wirebonds should be started on the chip and terminated on the package. RF bonds should be as short as possible.

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