HMC187AMS8 / 187AMS8E

v00.0410

GaAs MMIC SMT PASSIVE FREQUENCY DOUBLER, 0.85 - 2.0 GHz INPUT

Typical Applications

The HMC187AMS8(E) is ideal for:

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

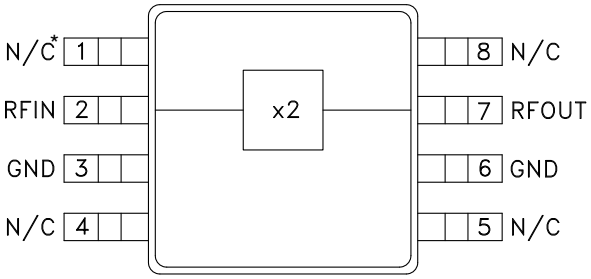
Features

Conversion Loss: 15 dB

Fo, 3Fo, 4Fo Isolation: 40 dB

Input Drive Level: 10 to 20 dBm

Functional Diagram



General Description

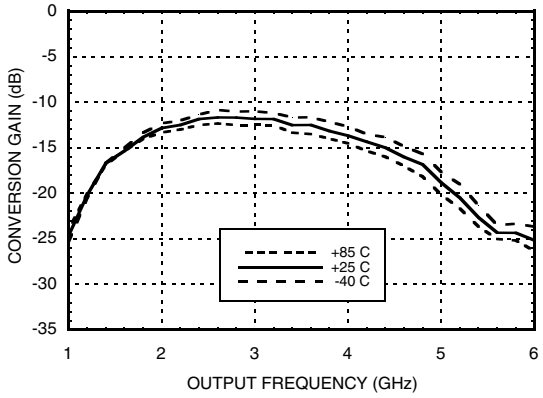
The HMC187AMS8(E) is a miniature frequency doubler MMIC in plastic 8-lead MSOP package. The suppression of undesired fundamental and higher order harmonics is 40 dB typical with respect to input signal levels. The doubler uses the same diode/balun technology used in Hittite MMIC mixers. The doubler is ideal for high volume applications where frequency doubling of a lower frequency is more economical than directly generating a higher frequency. The passive Schottky diode doubler technology contributes no measurable additive phase noise onto the multiplied signal.

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

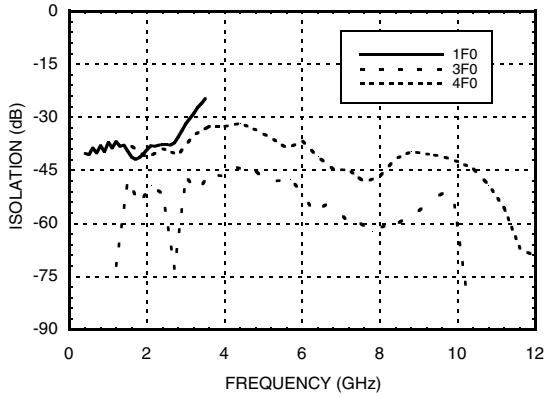
	Input = +10 dBm			Input = +15 dBm			Input = +20 dBm			
Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range, Input	1.25 - 1.75			1.0 - 1.75			0.85 - 2.0			GHz
Frequency Range, Output	2.5 - 3.5			2.0 - 3.5			1.7 - 4.0			GHz
Conversion Loss		18	22		14	17		15	18	dB
FO Isolation (with respect to input level)				35	45					dB
3FO Isolation (with respect to input level)				42	46					dB
4FO Isolation (with respect to input level)				30	40					dB

* N/C denotes no internal connection, however, it is recommended to connect these pins to ground.

Conversion Gain @ +15 dBm Drive Level

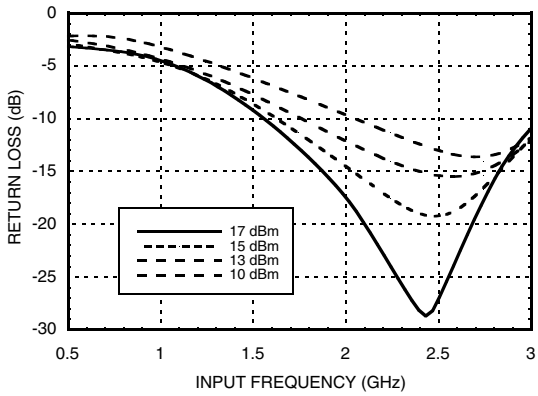


Isolation @ +15 dBm Drive Level*

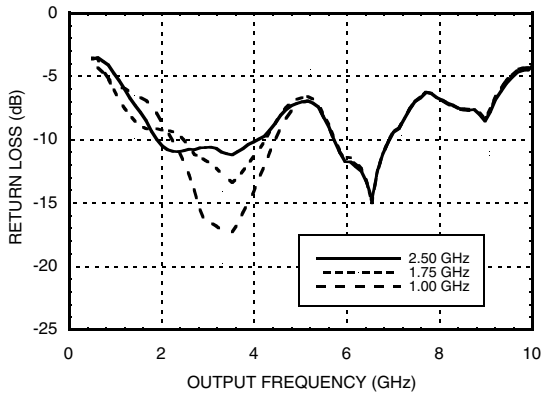


*With respect to input level

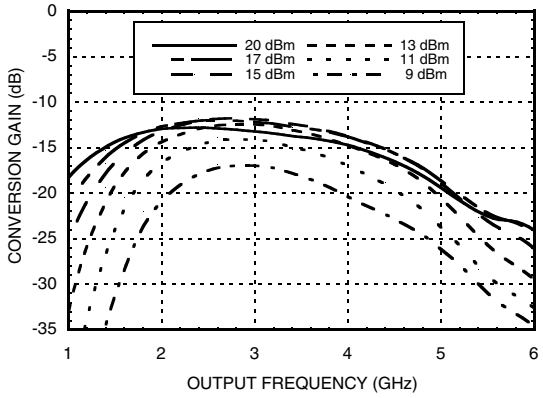
Input Return Loss vs. Drive Level



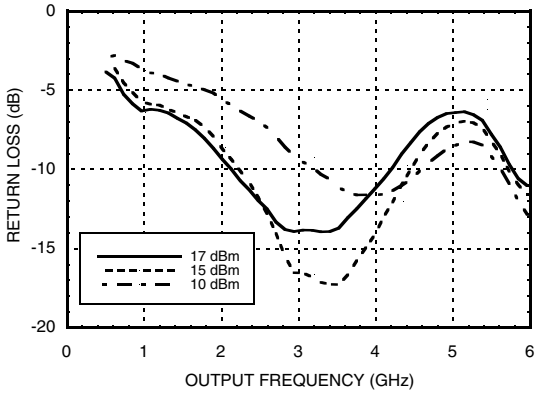
Output Return Loss for Several Input Frequencies



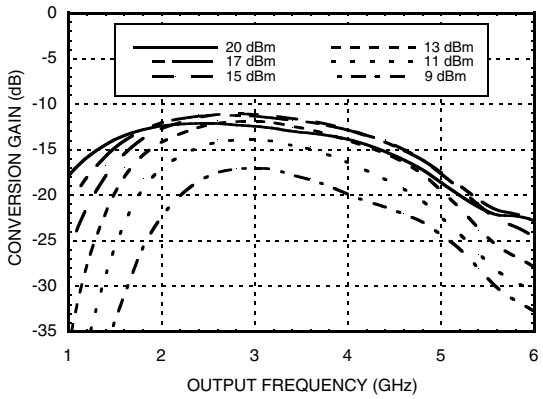
Conversion Gain @ 25°C vs. Drive Level



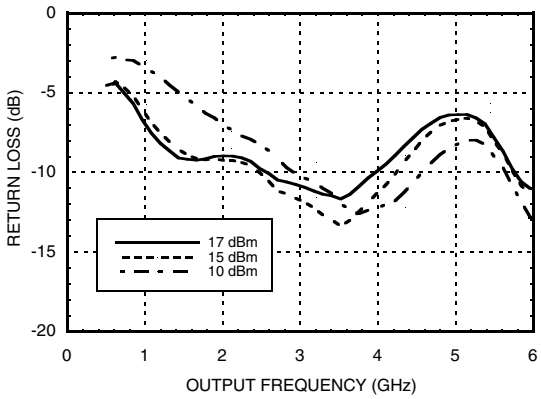
Output Return Loss with 1 GHz Input



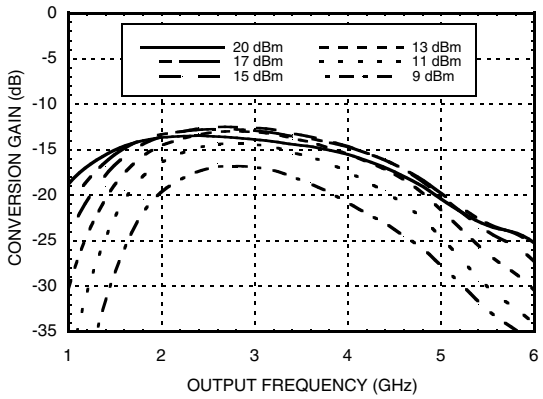
Conversion Gain @ -40°C vs. Drive Level



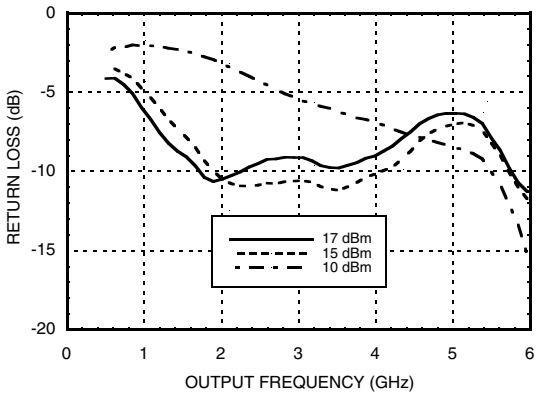
Output Return Loss with 1.75 GHz Input



Conversion Gain @ +85°C vs. Drive Level



Output Return Loss with 2.5 GHz Input



HMC187AMS8 / 187AMS8E

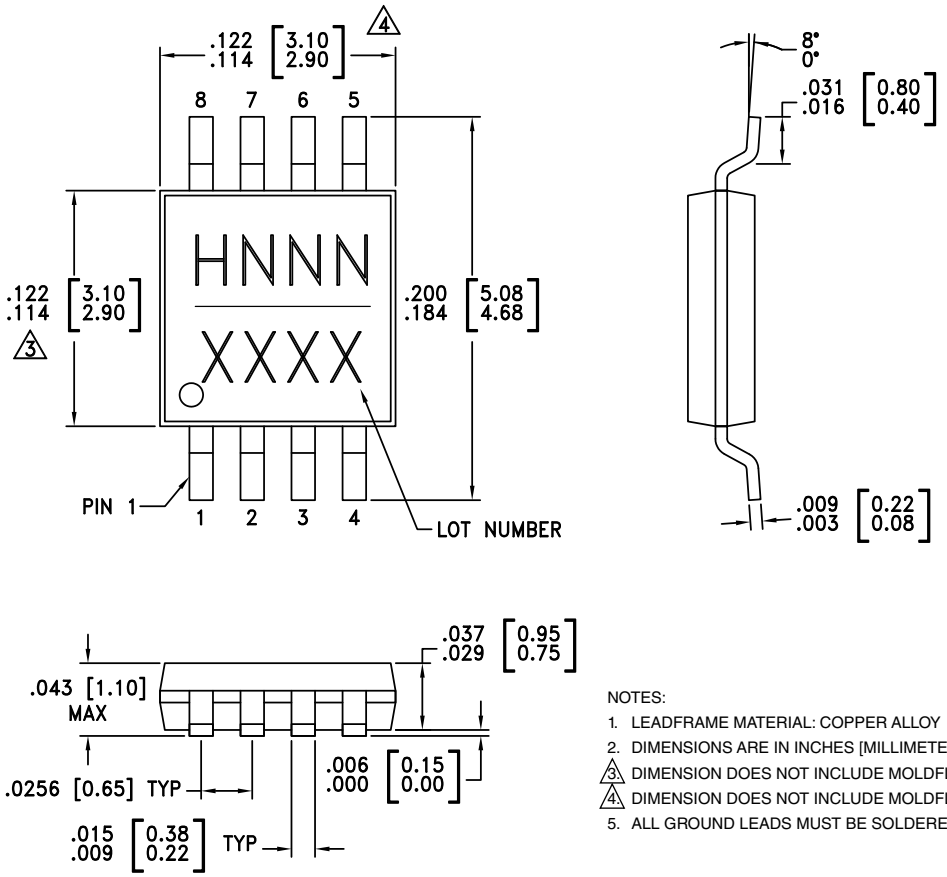
GaAs MMIC SMT PASSIVE FREQUENCY DOUBLER, 0.85 - 2.0 GHz INPUT

Absolute Maximum Ratings

Input Drive	+27 dBm
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



NOTES:

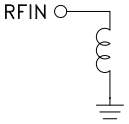
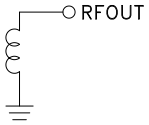
1. LEADFRAME MATERIAL: COPPER ALLOY
2. DIMENSIONS ARE IN INCHES [MILLIMETERS].
3. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15mm PER SIDE.
4. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.25mm PER SIDE.
5. ALL GROUND LEADS MUST BE SOLDERED TO PCB RF GROUND.

Package Information

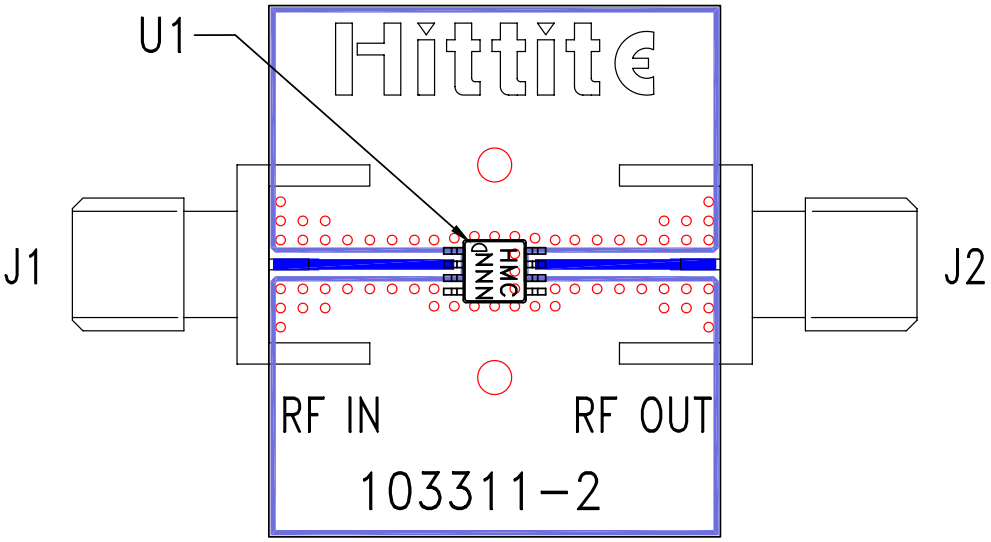
Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking [3]
HMC187AMS8	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 [1]	H187A XXXX
HMC187AMS8E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 [2]	H187A XXXX

[1] Max peak reflow temperature of 235 °C
[2] Max peak reflow temperature of 260 °C
[3] 4-Digit lot number XXXX

Pin Description

Pin Number	Function	Description	Interface Schematic
1, 4, 5, 8	N/C	These pins are not connected internally; however, all data shown herein was measured with these pins connected to RF/DC ground externally.	
3, 6	GND	All ground leads must be soldered to PCB RF/DC ground.	
2	RFIN	Pin is DC coupled and matched to 50 Ohms.	
7	RFOUT	Pin is DC coupled and matched to 50 Ohms.	

Evaluation PCB



List of Materials for Evaluation PCB 103313 [1]

Item	Description
J1, J2	PCB Mount SMA Connector
U1	HMC187AMS8(E) Doubler
PCB [2]	103311 Eval Board

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350

The circuit board used in the application should be generated with proper RF circuit design techniques. Signal lines should have 50 ohm impedance while the package N/C and ground leads should be connected directly to the ground plane similar to that shown. The evaluation circuit board shown is available from Hittite upon request.