



**THE DATASHEET OF  
105188-HMC422MS8**





## GaAs MMIC MIXER w/ INTEGRATED LO AMPLIFIER, 1.2 - 2.6 GHz

### Typical Applications

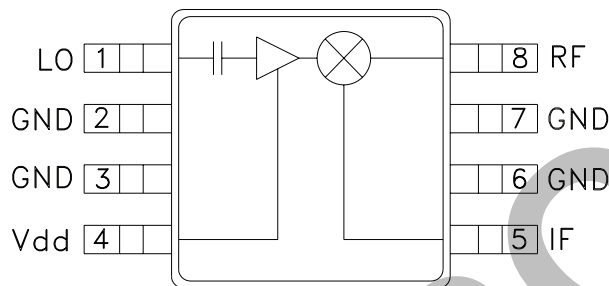
The HMC422MS8 / HMC422MS8E is ideal for:

- MMDS & ISM
- Wireless Local Loop
- WirelessLAN
- Cellular Infrastructure

### Features

- Integrated LO Amplifier w/  $P_{diss} < 100$  mW
- Conversion Loss / Noise Figure: 8 dB
- Low LO Drive: 0 dBm
- Input IP3: +15 dBm
- Single Positive Supply: 3V, 30 mA

### Functional Diagram



### General Description

The HMC422MS8 & HMC422MS8E are double balanced mixer ICs with integrated LO amplifiers. This mixer can operate as an upconverter or downconverter between 1.2 GHz and 2.6 GHz. With the integrated LO amplifier, the mixer requires an LO drive level of only 0 dBm, and requires only 30mA from a single positive +3V rail. The mixer has 8 dB of conversion loss, an input P1dB of +8 dBm and an input third order intercept point of +15 dBm at 2 GHz.

### Electrical Specifications, $T_A = +25^\circ\text{C}$

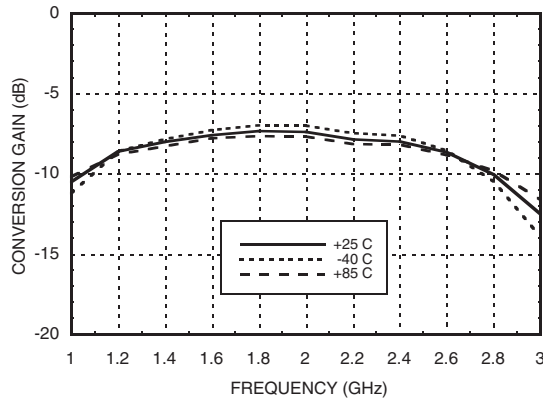
Parameter	IF = 100 MHz LO = 0 dBm & Vdd = 3V			Units
	Min.	Typ.	Max.	
Frequency Range, RF & LO	1.2 - 2.6			GHz
Frequency Range, IF	DC - 1			GHz
Conversion Loss		8	10.5	dB
Noise Figure (SSB)		8	10.5	dB
LO to RF Isolation	23	30		dB
LO to IF Isolation	9	15 - 20		dB
RF to IF Isolation	9	15 - 20		dB
IP3 (Input)	12	15		dBm
1 dB Compression (Input)	5	8		dBm
Supply Current (I <sub>dd</sub> )		37		mA

\* Unless otherwise noted, all measurements performed as downconverter, IF= 100 MHz.

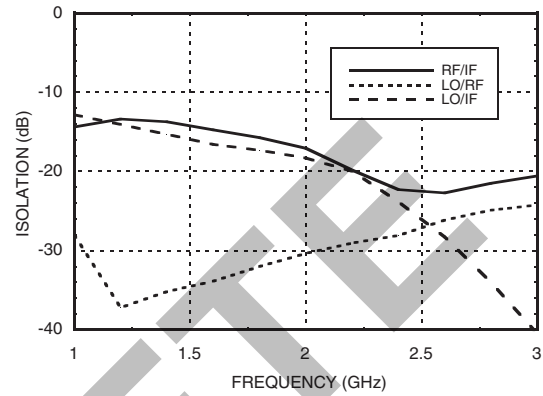
**GaAs MMIC MIXER w/ INTEGRATED  
LO AMPLIFIER, 1.2 - 2.6 GHz**



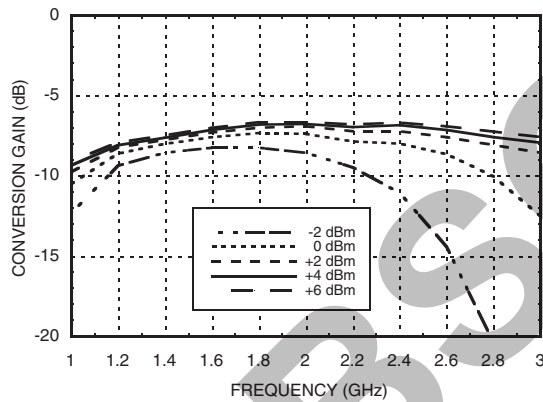
**Conversion Gain  
vs. Temperature @ LO = 0 dBm**



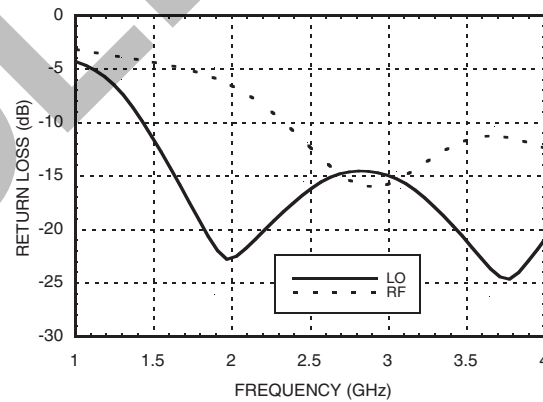
**Isolation @ LO = 0 dBm**



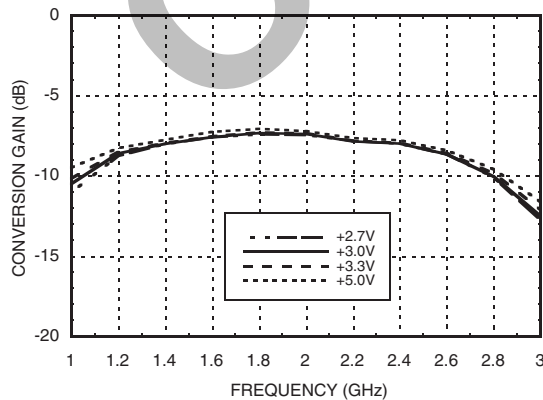
**Conversion Gain vs. LO Drive**



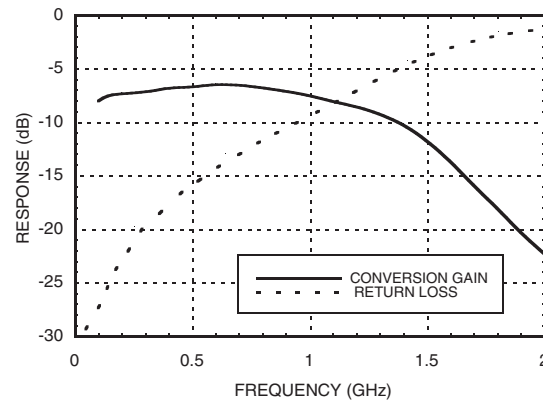
**Return Loss @ LO = 0 dBm**



**Conversion Gain  
vs. Vdd @ LO = 0 dBm**



**IF Bandwidth @ LO = 0 dBm**



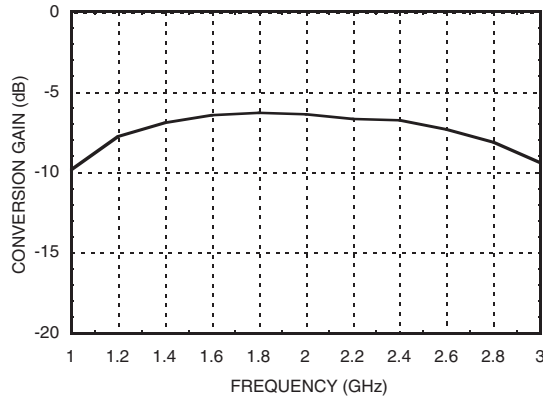
Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Specifications subject to change without notice. No license is granted by implication or otherwise under any patent or patent rights of Analog Devices. Trademarks and registered trademarks are the property of their respective owners.

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106 Phone: 781-329-4700 • Order online at [www.analog.com](http://www.analog.com) Application Support: Phone: 1-800-ANALOG-D

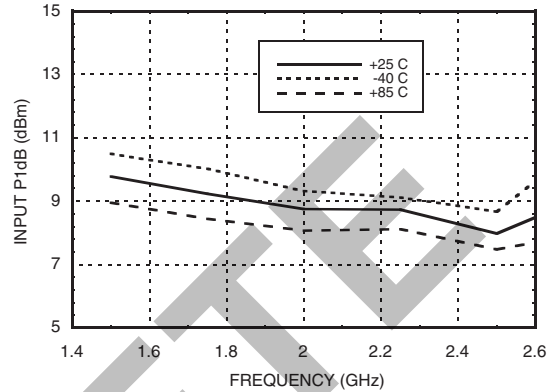
**GaAs MMIC MIXER w/ INTEGRATED LO AMPLIFIER, 1.2 - 2.6 GHz**



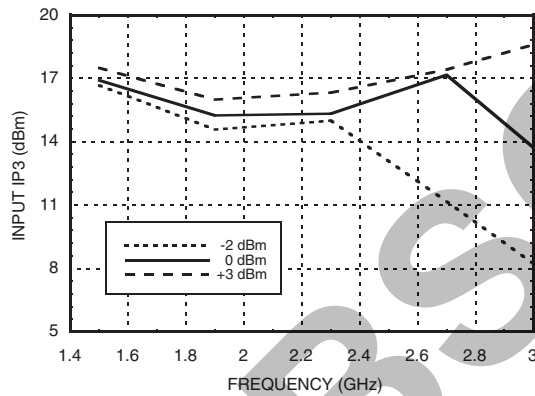
**Upconverter Performance  
Conversion Gain @ LO = 0 dBm**



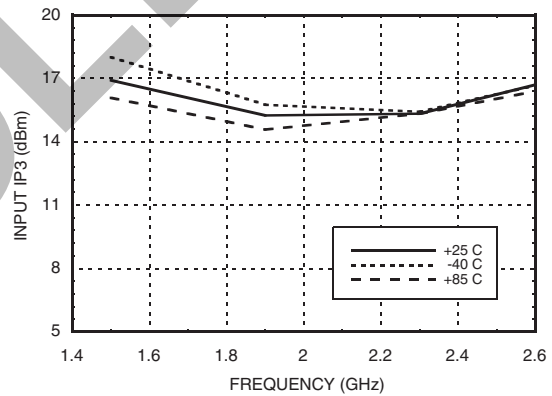
**Input P1dB vs.  
Temperature @ LO = 0 dBm**



**Input IP3 vs. LO Drive\***



**Input IP3 vs.  
Temperature @ LO = 0 dBm\***



**MxN Spurious @ IF Port**

mRF	nLO				
	0	1	2	3	4
0	XX	2	22	26	41
1	10	0	27	48	57
2	66	60	64	53	73
3	>85	>85	83	69	80
4	>85	>85	>85	>85	>85

RF = 2.1 GHz @ -10 dBm  
LO = 2 GHz @ 0 dBm  
All values in dBc relative to the IF power level.

**Harmonics of LO**

LO Freq. (GHz)	nLO Spur @ RF Port			
	1	2	3	4
1.5	33	14	38	35
1.75	30	16	39	44
2	29	17	45	47
2.25	27	20	50	52
2.5	25	26	49	61
3	22	37	69	72

LO = 0 dBm  
All values in dBc below input LO level @ RF port.

\* Two-tone input power = 0 dBm each tone, 1 MHz spacing.

## GaAs MMIC MIXER w/ INTEGRATED LO AMPLIFIER, 1.2 - 2.6 GHz



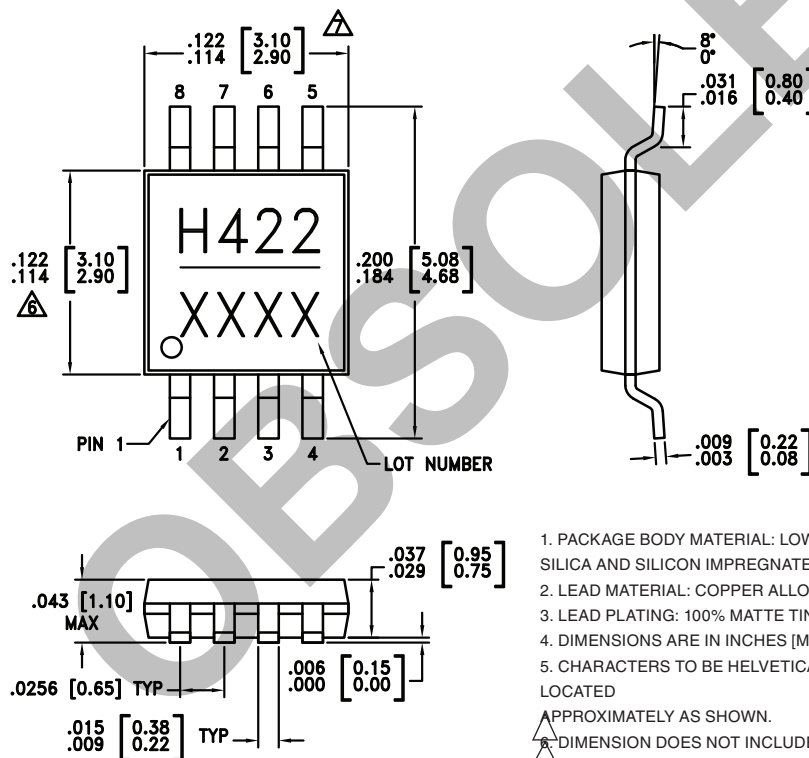
### Absolute Maximum Ratings

RF / IF Input (Vdd = +3V)	+13 dBm
LO Drive (Vdd = +3V)	+13 dBm
Vdd	+7 Vdc
IF DC Current	±10 mA
Channel Temperature (Tc)	150 °C
Continuous Pdiss (T = 85°C) (Derate 5.8 mW/°C above 85 C)	0.38 W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
ESD Sensitivity (HBM)	Class 1A



ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS

### Outline Drawing



1. PACKAGE BODY MATERIAL: LOW STRESS INJECTION MOLDED PLASTIC SILICA AND SILICON IMPREGNATED.
2. LEAD MATERIAL: COPPER ALLOY
3. LEAD PLATING: 100% MATTE TIN.
4. DIMENSIONS ARE IN INCHES [MILLIMETERS]
5. CHARACTERS TO BE HELVETICA MEDIUM, .030 HIGH, LASER OR WHITE INK, LOCATED APPROXIMATELY AS SHOWN.
6. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15mm PER SIDE.
7. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.25mm PER SIDE.
8. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND

### Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking <sup>[3]</sup>
HMC422MS8	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 <sup>[1]</sup>	H422 XXXX
HMC422MS8E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 <sup>[2]</sup>	H422 XXXX

[1] Max peak reflow temperature of 235 °C

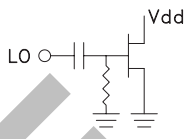

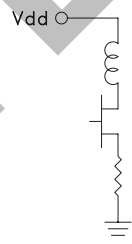
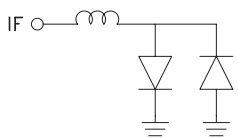
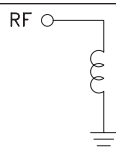
[2] Max peak reflow temperature of 260 °C

[3] 4-Digit lot number XXXX

## GaAs MMIC MIXER w/ INTEGRATED LO AMPLIFIER, 1.2 - 2.6 GHz



### Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1	LO	This pin is AC coupled and matched to 50 Ohms.	
2, 3, 6, 7	GND	Pins must connect to RF ground.	
4	Vdd	Power supply for the LO Amplifier. One external RF bypass capacitor (10,000 pF) is required.	
5	IF	This pin is DC coupled. For applications not requiring operation to DC, this port should be DC blocked externally using a series capacitor whose value has been chosen to pass the necessary IF frequency range. For operation to DC, this pin must not source/sink more than 10 mA of current or die non-function and possible die failure will result.	
8	RF	This pin is DC coupled and matched to 50 Ohms.	



## Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

 [View 105188-HMC422MS8 on WIN SOURCE](#)

 [Analog Devices Inc. Information](#)

## Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management