



**NO CONTENT ON THE ATTACHED DOCUMENT HAS CHANGED**



**THIS PAGE INTENTIONALLY LEFT BLANK**

### Typical Applications

The HMC219AMS8 / HMC219AMS8E is ideal for:

- UNII & HiperLAN
- ISM
- Microwave Radios

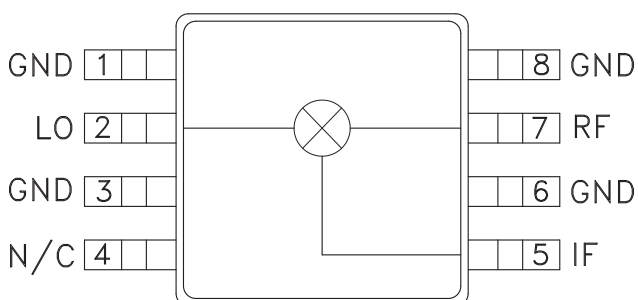
### Features

Ultra Small Package: MSOP8

Conversion Loss: 8.5 dB

LO / RF Isolation: 25 dB

### Functional Diagram



### General Description

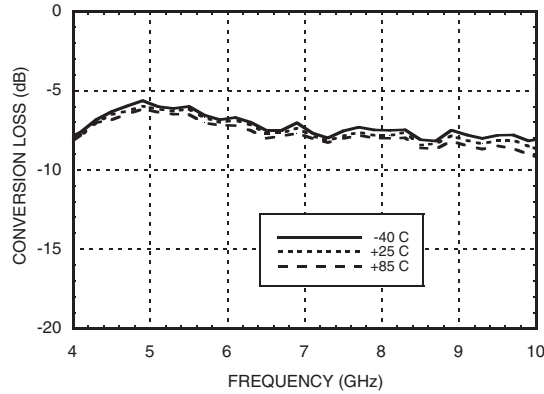
The HMC219AMS8 & HMC219AMS8E are ultra miniature double-balanced mixers in 8 lead plastic surface mount packages (MSOP). This passive MMIC mixer is constructed of GaAs Schottky diodes and novel planar transformer baluns on the chip. The device can be used as an upconverter, downconverter, bi-phase (de)modulator, or phase comparator. The consistent MMIC performance will improve system operation and assure regulatory compliance.

### Electrical Specifications, $T_A = +25^\circ \text{C}$ , As a Function of LO Drive

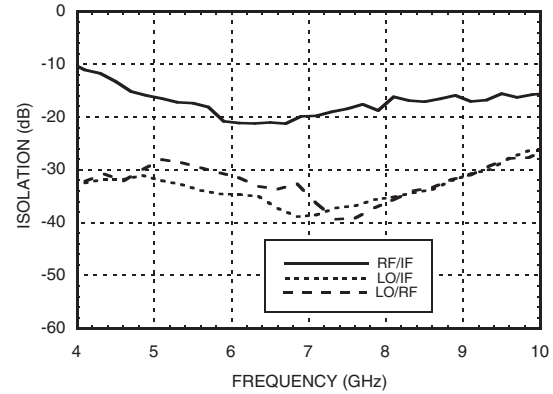
| Parameter                     | LO = +13 dBm<br>IF = 100 MHz |      |      | LO = +11 dBm<br>IF = 100 MHz |      |      | Units |
|-------------------------------|------------------------------|------|------|------------------------------|------|------|-------|
|                               | Min.                         | Typ. | Max. | Min.                         | Typ. | Max. |       |
| Frequency Range, RF & LO      | 4.5 - 9.0                    |      |      | 4.5 - 8.6                    |      |      | GHz   |
| Frequency Range, IF           | DC - 2.5                     |      |      | DC - 2.5                     |      |      | GHz   |
| Conversion Loss               |                              | 8.5  | 10   |                              | 8.5  | 10   | dB    |
| Noise Figure (SSB)            |                              | 8.5  | 10   |                              | 8.5  | 10   | dB    |
| LO to RF Isolation            | 17                           | 25   |      | 20                           | 25   |      | dB    |
| LO to IF Isolation            | 17                           | 25   |      | 20                           | 25   |      | dB    |
| IP3 (Input)                   | 15                           | 21   |      | 15                           | 21   |      | dBm   |
| 1 dB Gain Compression (Input) | 7                            | 10   |      | 5                            | 8    |      | dBm   |

## GaAs MMIC SMT DOUBLE-BALANCED MIXER, 4.5 - 9 GHz

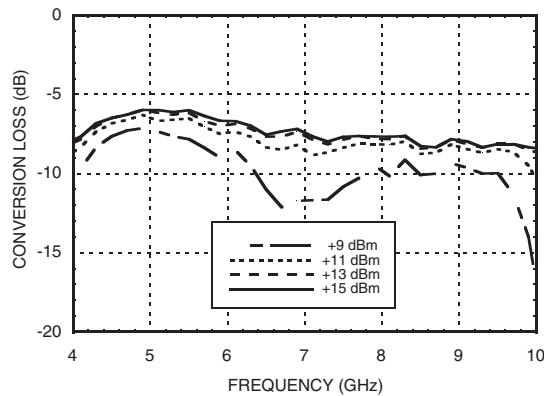
**Conversion Loss vs Temperature @ LO = +13 dBm**



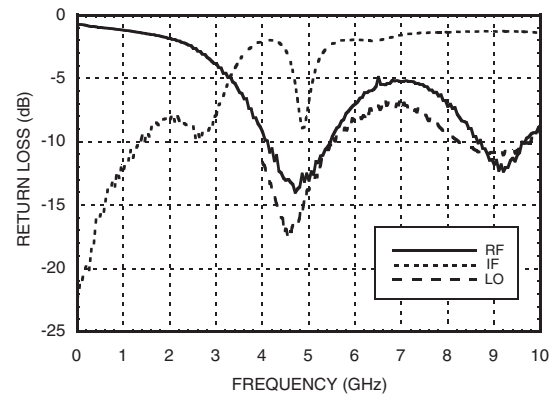
**Isolation @ LO = +13 dBm**



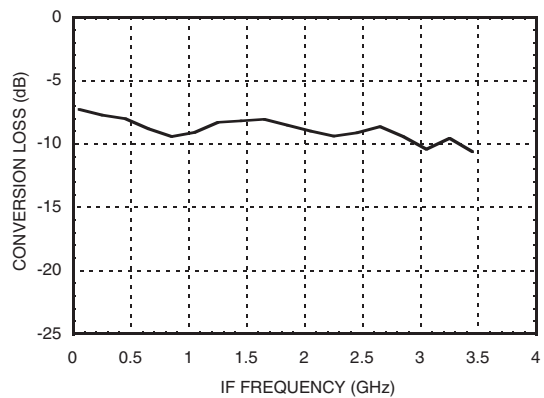
**Conversion Loss vs. LO Drive**



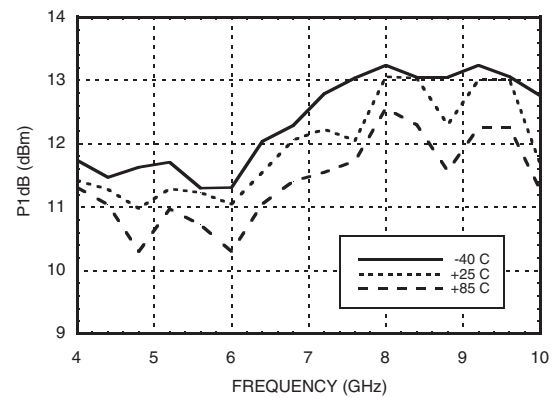
**Return Loss @ LO = +13 dBm**



**IF Bandwidth @ LO = +13 dBm**



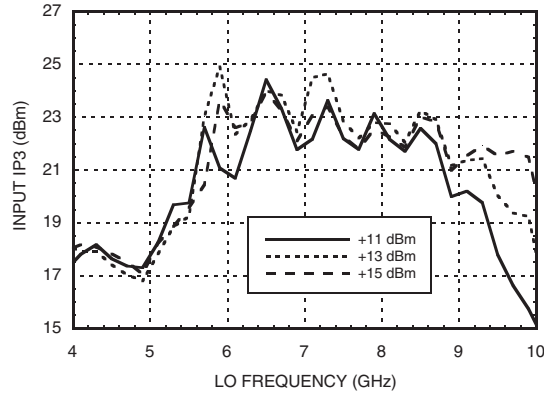
**P1dB vs. Temperature LO = +13 dBm**



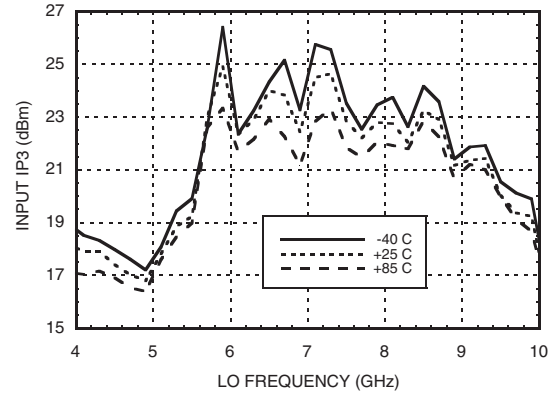
# HMC219AMS8 / 219AMS8E

## GaAs MMIC SMT DOUBLE-BALANCED MIXER, 4.5 - 9 GHz

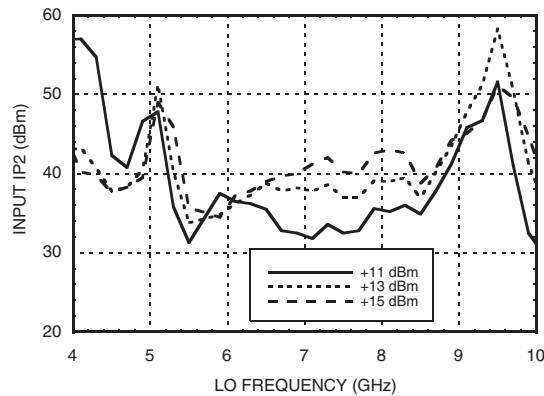
**Input IP3 vs. LO Drive**



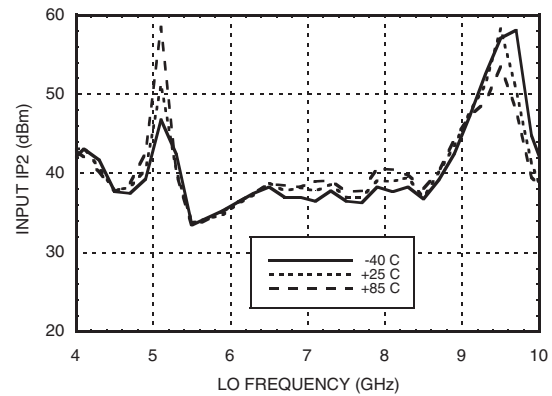
**Input IP3 vs. Temperature @ LO = +13 dBm**



**Input IP2 vs. Drive**



**Input IP2 vs. Temperature @ LO = +13 dBm**





MICROWAVE CORPORATION v00.0810



## HMC219AMS8 / 219AMS8E

### GaAs MMIC SMT DOUBLE-BALANCED MIXER, 4.5 - 9 GHz

#### MxN Spurious Outputs

| mRF | nLO |    |    |    |    |
|-----|-----|----|----|----|----|
|     | 0   | 1  | 2  | 3  | 4  |
| 0   | xx  | 9  | 12 | 16 | 34 |
| 1   | 19  | 0  | 22 | 32 | 49 |
| 2   | 62  | 63 | 59 | 62 | 66 |
| 3   | 80  | 69 | 82 | 69 | 79 |
| 4   | 79  | 81 | 81 | 80 | 83 |

RF = 6 GHz @ -10 dBm  
LO = 6.1 GHz @ +13 dBm  
All values in dBc below the IF power level (-1RF + 1LO).

#### Harmonics of LO

| LO Freq.<br>(GHz) | nLO Spur at RF Port |    |    |    |
|-------------------|---------------------|----|----|----|
|                   | 1                   | 2  | 3  | 4  |
| 4.0               | 31                  | 22 | 32 | 58 |
| 5.0               | 32                  | 21 | 30 | 47 |
| 6.0               | 40                  | 28 | 28 | 49 |
| 7.0               | 32                  | 35 | 53 | 48 |
| 8.0               | 27                  | 40 | 57 | 55 |
| 9.0               | 22                  | 52 | 48 | xx |

LO = +13 dBm  
Values in dBc below input LO level measured at the RF port.

#### Absolute Maximum Ratings

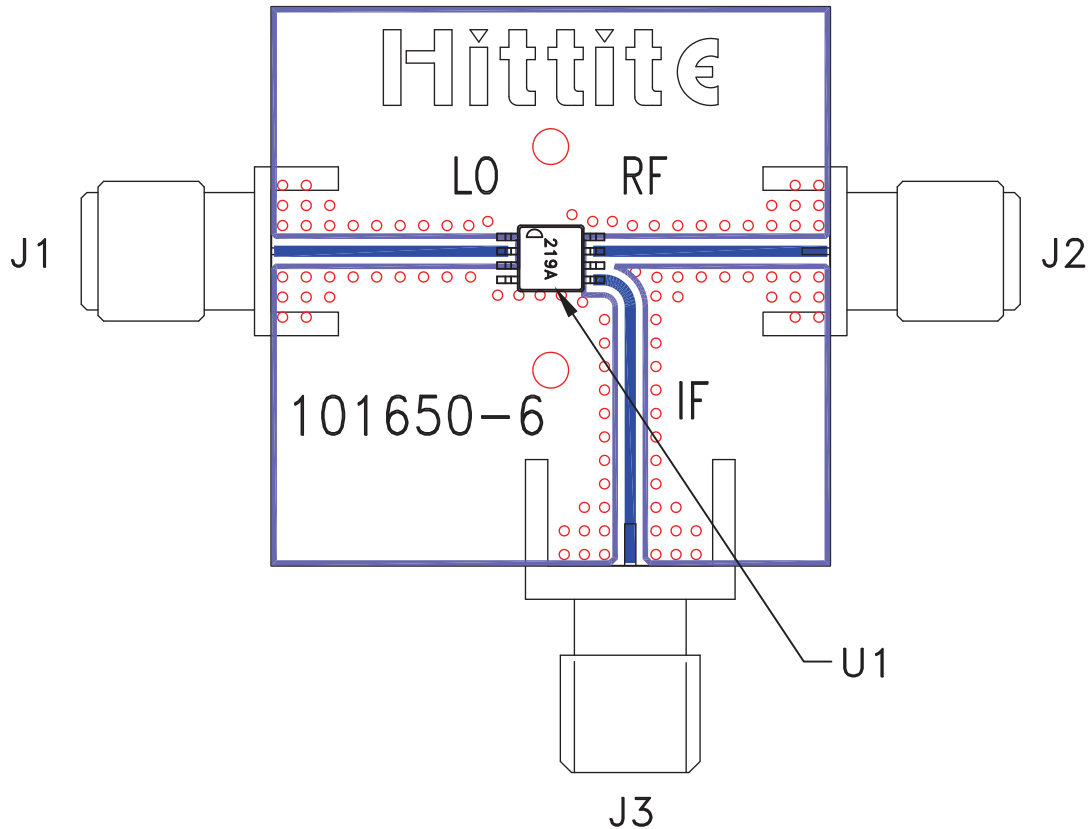
|                       |                |
|-----------------------|----------------|
| RF / IF Input         | +13 dBm        |
| LO Drive              | +27 dBm        |
| Storage Temperature   | -65 to +150 °C |
| Operating Temperature | -40 to +85 °C  |
| ESD Sensitivity (HBM) | Class 1A       |



ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS



### Evaluation Circuit Board



### List of Materials for Evaluation PCB 103350 <sup>[1]</sup>

| Item    | Description                    |
|---------|--------------------------------|
| J1 - J3 | PCB Mount SMA RF Connector     |
| U1      | HMC219AMS8 / HMC219AMS8E Mixer |
| PCB [2] | 101650 Evaluation Board        |

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350

The circuit board used in the application should use RF circuit design techniques. Signal lines should have 50 Ohm impedance while the package ground leads should be connected directly to the ground plane similar to that shown. A sufficient number of via holes should be used to connect the top and bottom ground planes. The evaluation circuit board shown is available from Hittite upon request.