

## Silicon Double Balanced HMIC Mixer 850 - 1050 MHz

Rev. V3

### Features

- +21 dBm Typical Input IP3
- 8.3 dB Typical Conversion Loss
- +5 to +10 dBm LO Drive
- Fully Balanced Passive Mixer
- Low Cost Miniature Plastic MLP Package
- Lead Free (RoHS\* Compliant) with 260°C Re-flow Capability
- 100% Matte Tin Plating

### Description

MAMX-090950-1277LT is a 850 - 1050 MHz silicon monolithic double balanced mixer in a low cost miniature surface mount MLP 3 mm, 16 lead plastic package. The die uses M/A-COM's unique HMIC silicon/glass process to realize low loss passive elements while retaining the advantages of medium barrier silicon Schottky barrier diodes.

### Applications

These mixers are well suited for GSM and CDMA Cellular basestation applications where small size and high performance are required. Typical Applications include frequency conversion, modulation, and demodulation in wireless receivers and transmitters.

### Ordering Information

| Model No.          | Package       |
|--------------------|---------------|
| MAMX-090950-1277LT | Tape and Reel |

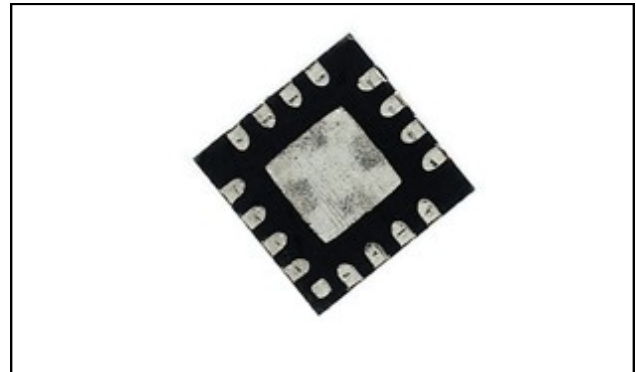
### Absolute Maximum Ratings <sup>1,2</sup>

| Parameter             | Maximum Rating  |
|-----------------------|-----------------|
| Operating Temperature | -65°C to +125°C |
| Storage Temperature   | -65°C to 150°C  |
| Incident LO Power     | +20 dBm         |
| Incident RF Power     | +20 dBm         |
| Soldering Temperature | +260°C max.     |

1. Exceeding these limits may cause permanent damage.
2. Please refer to application note M538 for surface mounting instructions

\* Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

### MLP 3mm Package - Circuit Side

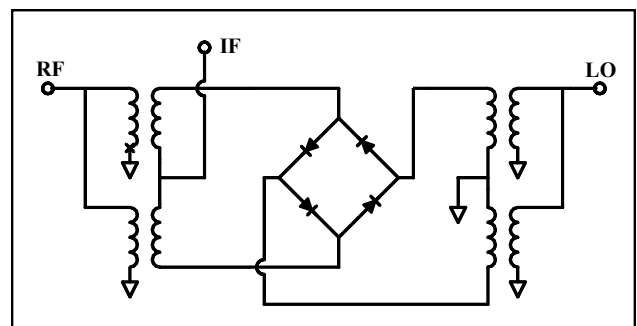


### PIN Configuration <sup>3</sup>

| PIN | Function | PIN | Function |
|-----|----------|-----|----------|
| 1   | N/C      | 9   | N/C      |
| 2   | N/C      | 10  | RF       |
| 3   | LO       | 11  | N/C      |
| 4   | N/C      | 12  | N/C      |
| 5   | N/C      | 13  | N/C      |
| 6   | N/C      | 14  | IF       |
| 7   | N/C      | 15  | N/C      |
| 8   | N/C      | 16  | N/C      |

3. Center area is ground

### Schematic



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### Electrical Specifications @ 25°C

| Parameter              | Frequency Range           | Test Conditions                                | Units          | Min.         | Typ.           | Max.       |
|------------------------|---------------------------|------------------------------------------------|----------------|--------------|----------------|------------|
| Conversion Loss        | 900 MHz<br>850 - 1050 MHz | LO Drive = +7 dBm<br>RF = -10 dBm, IF = 60 MHz | dB<br>dB       | —<br>—       | 8.2<br>8.5     | 8.9<br>9.5 |
| L - R Isolation        | 900 MHz<br>850 - 1050 MHz | LO Drive = +7 dBm<br>RF Level = -10 dBm        | dB<br>dB       | —<br>—       | 65<br>62       | —<br>—     |
| L - I Isolation        | 900 MHz<br>850 - 1050 MHz | LO Drive = +7 dBm<br>RF Level = -10 dBm        | dB<br>dB       | —<br>—       | 46<br>46       | —<br>—     |
| R - I Isolation        | 900 MHz<br>850 - 1050 MHz | LO Drive = +7 dBm<br>RF Level = -10 dBm        | dB<br>dB       | —<br>—       | 23<br>23       | —<br>—     |
| LO VSWR                | 900 MHz<br>850 - 1050 MHz | LO Drive = +7 dBm<br>RF Level = -10 dBm        | Ratio<br>Ratio | —<br>—       | 1.5:1<br>1.5:1 | —<br>—     |
| RF VSWR                | 900 MHz<br>850 - 1050 MHz | LO Drive = +7 dBm<br>RF Level = -10 dBm        | Ratio<br>Ratio | —<br>—       | 1.3:1<br>1.5:1 | —<br>—     |
| IF VSWR                | DC - 400 MHz              | LO Drive = +7 dBm<br>RF Level = -10 dBm        | Ratio<br>Ratio | —<br>—       | 1.5:1<br>1.5:1 | —<br>—     |
| Input IP3              | 900 MHz<br>850 - 1050 MHz | LO Drive = +7 dBm<br>RF = -10 dBm, IF = 60 MHz | dBm<br>dBm     | 17.8<br>16.9 | 21.0<br>20.5   | —<br>—     |
| Input 1 dB Compression | 900 MHz<br>850 - 1050 MHz | LO Drive = +7 dBm<br>IF = 60 MHz               | dBm<br>dBm     | —<br>—       | 4.3<br>4.3     | —<br>—     |
| IF 1 dB Bandwidth      | DC - 400 MHz              | LO = 900 MHz @ +7 dBm                          | MHz            | 0            | —              | 400        |

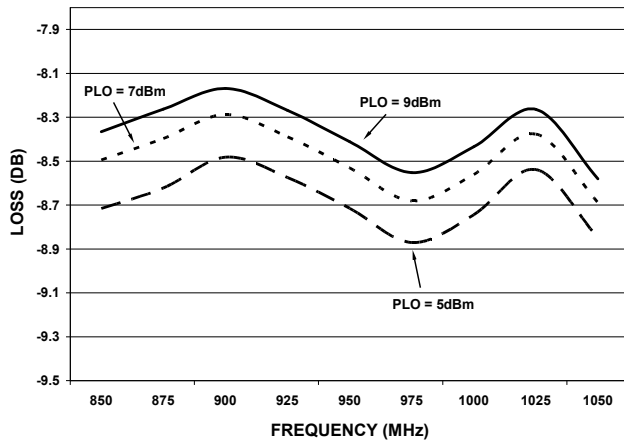
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### Typical Performance Curves

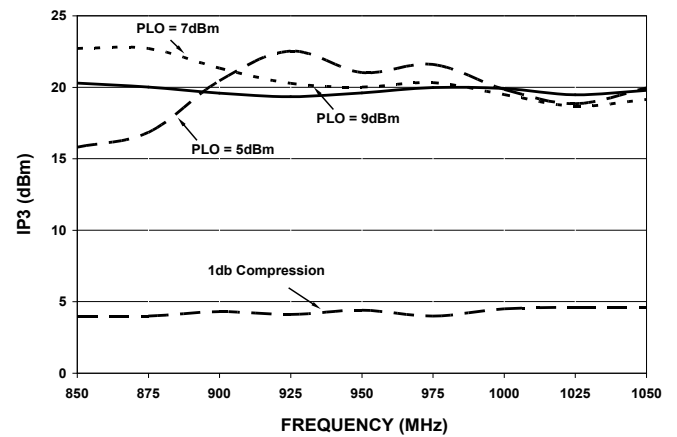
#### Conversion Loss vs. Frequency

LO Drive = +5/+7/+9 dBm, RF = -10 dBm, IF = 60 MHz



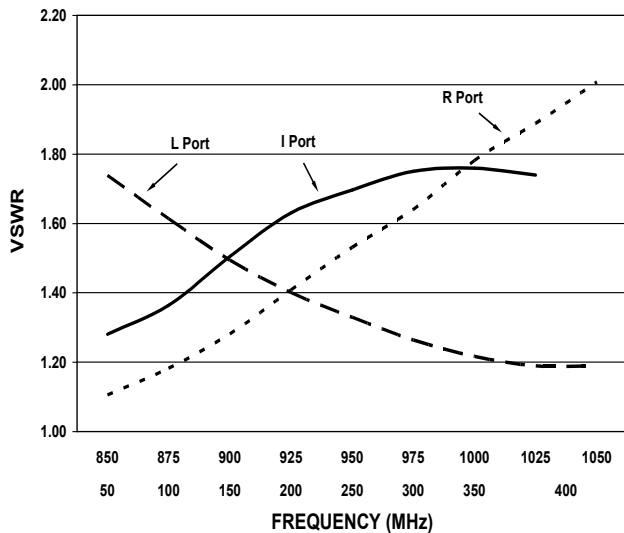
#### Input 1 dB & P1dB vs. Frequency

LO Drive = +5/+7/+9 dBm, RF = -10 dBm, IF = 60 MHz



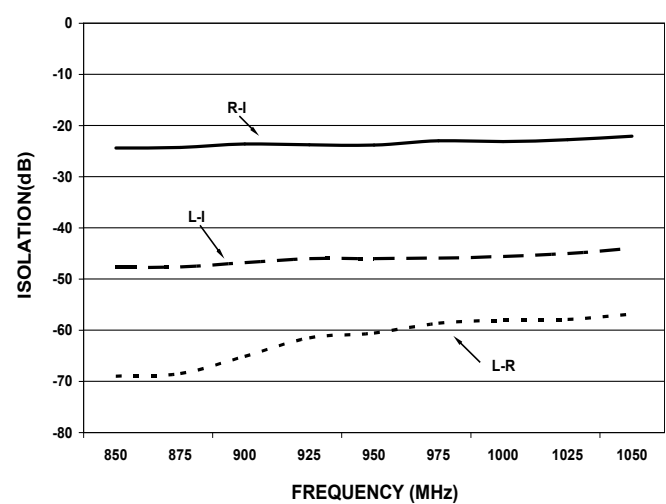
#### VSWR vs. Frequency

LO Drive = +7 dBm, RF = -10 dBm, IF = 60 MHz



#### Isolation vs. Frequency

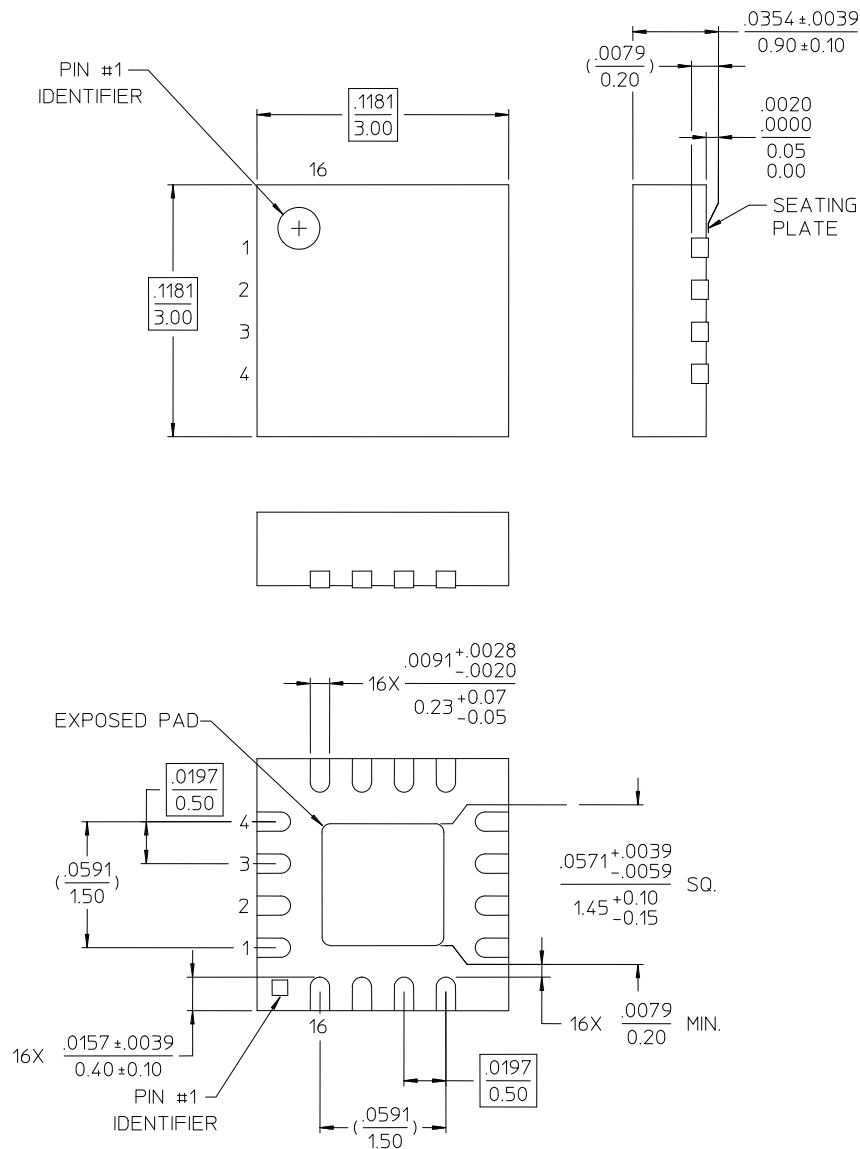
LO Drive = +7 dBm, RF = -10 dBm



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### MAMX-090950-1277LT Outline 3mm FQFP - 16 Lead Saw Singulated



- NOTES: 1. REFERENCE JEDEC MO-220, VAR. VBBD-1 FOR ADDITIONAL DIMENSIONAL AND TOLERANCE INFORMATION.  
2. REFERENCE S2083 APPLICATION NOTE FOR PCB FOOTPRINT INFORMATION.  
3. ALL DIMENSIONS SHOWN AS INCHES/MM.

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