

Silicon Double Balanced HMIC Mixer 700—1400 MHz

Rev. V2

Features

- + 3 to + 7 dBm
- Fully Balanced Passive Mixer
- NO External Matching Required
- Low Cost Surface Mount Package
- RoHS* Compliant with 260 °C Reflow Capability
- 100% Matte Tin Plating

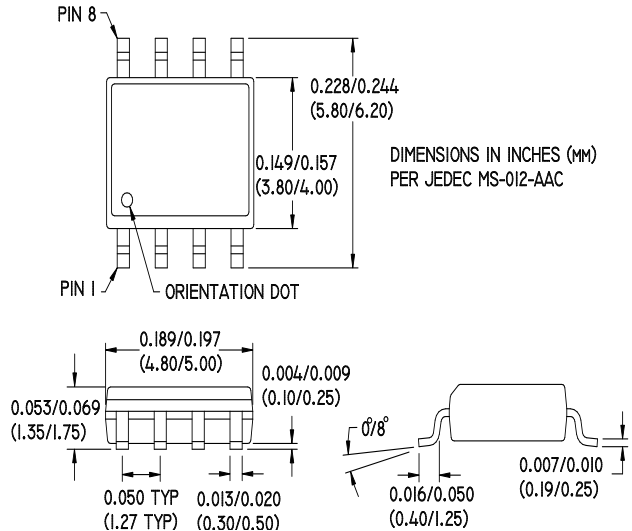
Description

MAMX-000900-1061LT is a silicon monolithic 700-1400 MHz, low barrier, double balanced mixer in a low cost surface mount SOIC-8 package. The die uses M/A-COM's unique HMIC silicon/glass process to realize low loss passive elements while retaining the advantages of low barrier silicon Schottky barrier diodes to produce a compact device.

Applications

These mixers are well suited for applications where small size and repeatability are required. Typical applications include frequency conversion, modulation, and demodulation in wireless receivers and transmitters.

SOIC-8 Package



Pin Configuration

| PIN | Function | PIN | Function |
|-----|----------|-----|----------|
| 1 | GND | 5 | LO |
| 2 | GND | 6 | GND |
| 3 | GND | 7 | GND |
| 4 | IF | 8 | RF |

Ordering Information

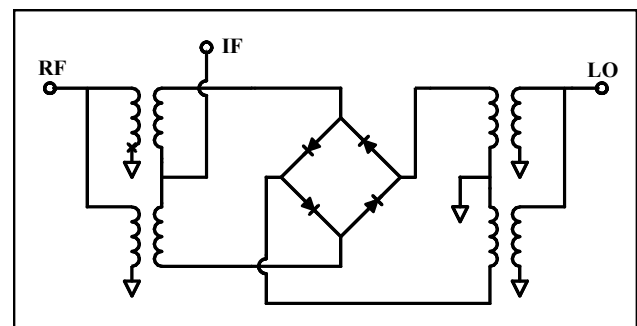
| Model No. | Package |
|--------------------|---------------|
| MAMX-000900-1061LT | Tape and Reel |

Absolute Maximum Ratings ^{1,2}

| Parameter | Maximum Rating |
|-----------------------|----------------|
| Operating Temperature | -40°C to +85°C |
| Storage Temperature | -65°C to 125°C |
| Incident LO Power | +17 dBm |
| Incident RF Power | +17 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

Schematic



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

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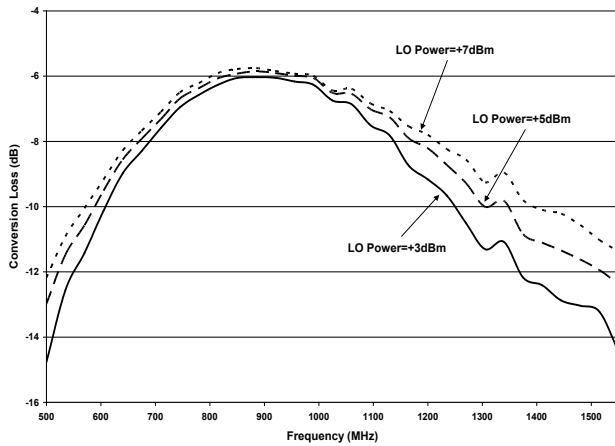
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Electrical Specifications @ 25°C

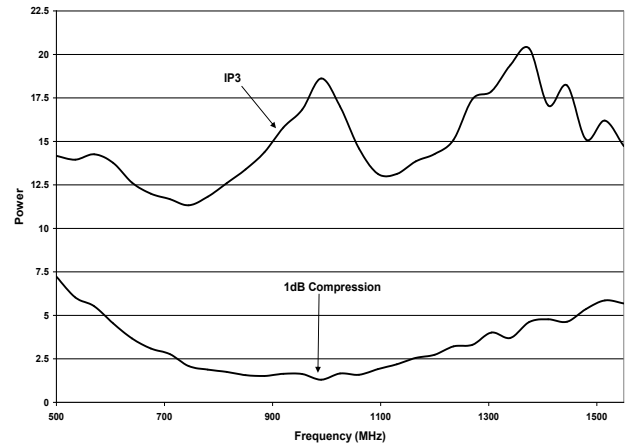
| Parameter | Frequency Range | Test Conditions | Units | Min. | Typ. | Max. |
|------------------------|-----------------|---|-------|------|-------|------|
| Conversion Loss | 700-800 MHz | LO Drive = +7 dBm RF = -10 dBm, IF = 60 MHz | dB | - | 6.7 | 9.5 |
| | 800-1000 MHz | | | - | 6.0 | 8.0 |
| | 1000-1250 MHz | | | | 7.2 | 10.5 |
| | 1250-1400 MHz | | | | 9.2 | 12.0 |
| L - R Isolation | 700-1000 MHz | LO Drive = +7 dBm | dB | 26 | 37.6 | - |
| | 1000-1400 MHz | | | 24 | 32.1 | - |
| L - I Isolation | 700-1000 MHz | LO Drive = +7 dBm | dB | 24 | 36.4 | - |
| | 1000-1400 MHz | | | 21 | 32.1 | - |
| LO VSWR | 700-1000 MHz | LO Drive = +7 dBm RF Level = - 10 dBm | Ratio | - | 1.7:1 | - |
| | 1000-1400 MHz | | | - | 2.3:1 | - |
| RF VSWR | 700-1000 MHz | LO Drive = +7 dBm RF Level = - 10 dBm | Ratio | - | 1.5:1 | - |
| | 1000-1400 MHz | | | - | 2.4:1 | - |
| IF VSWR | DC - 400 MHz | LO Drive = +7 dBm IF Level = - 10 dBm | Ratio | - | 1.5:1 | - |
| Input IP3 | 700-1000 MHz | LO Drive = +7 dBm RF = - 10 dBm, IF = 60 MHz | dBm | 9.0 | 14.1 | - |
| | 1000-1400 MHz | | | 10.5 | 16.1 | - |
| Input 1 dB Compression | 700-1000 MHz | LO Drive = +7 dBm IF = 60 MHz | dBm | - | 1.9 | - |
| | 1000-1400 MHz | | | - | 3.0 | - |

Typical Performance Curves (LO Drive= +5/+7/+9dbm, RF= -10dBm, IF= 60MHz)

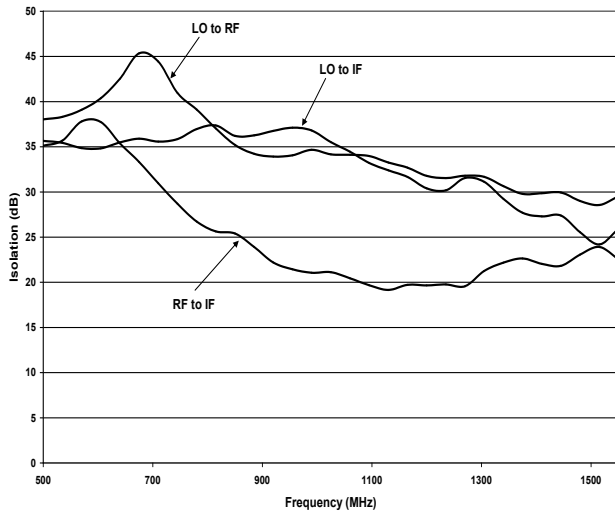
Conversion Loss



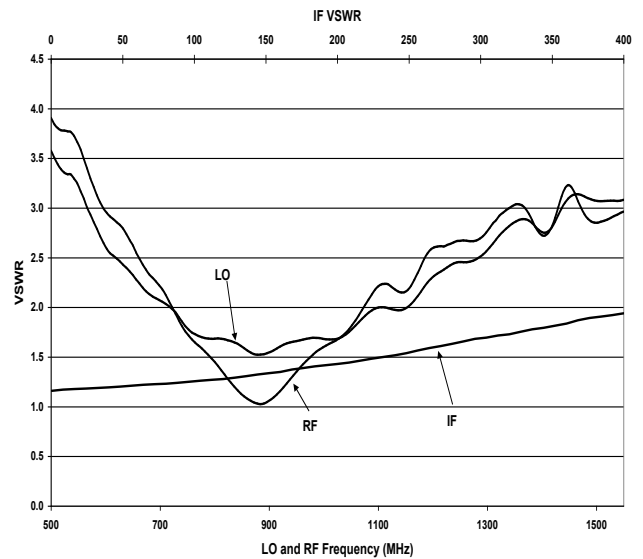
Input IP3



Isolation(LO Drive= +7dbm, RF= -10dBm)



VSWR(LO Drive= +7dbm, RF= -10dBm, IF=-10dBm)



Spurious Table (in dBc below IF)

| | | nf _{LO} +mf _{RF} | | | | | | | | |
|--------|----|------------------------------------|----|----|----|----|----|----|----|----|
| LO (n) | -4 | - | - | - | - | - | - | - | - | - |
| | -3 | - | - | - | - | - | - | - | - | 77 |
| | -2 | - | - | - | - | - | - | - | 60 | 80 |
| | -1 | - | - | - | - | - | - | 44 | 66 | 77 |
| | 0 | - | - | - | - | - | 16 | 61 | 61 | 95 |
| | 1 | - | - | - | 0 | 13 | 2 | 42 | 78 | 89 |
| | 2 | - | - | 55 | 27 | 15 | 27 | 71 | 72 | 87 |
| | 3 | - | 58 | 45 | 13 | 6 | 36 | 51 | 65 | 91 |
| | 4 | 80 | 57 | 61 | 31 | 36 | 39 | 60 | 71 | 94 |
| | | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 |
| | | RF (m) | | | | | | | | |

RF=920MHz
LO=980MHz

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