

Features

- 7.6 dB Typical Conversion Loss
- +3 to +7 dBm LO Drive
- HMIC™ Patented Process
- Silicon Low Barrier Schottky Diodes
- DC - 1050 MHz IF Bandwidth
- Low Cost Miniature Plastic Package
- **Lead Free and RoHS Compliant**

Description and Applications

MA4EX580L1-1225T is a silicon monolithic 4.7 to 6.0 GHz double balanced mixer in a low cost miniature surface mount SOT-25 package. The die uses M/A-COM's unique HMIC™ silicon/glass process to achieve low loss passive elements while retaining the advantages of low barrier silicon Schottky diodes.

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

Ordering Information

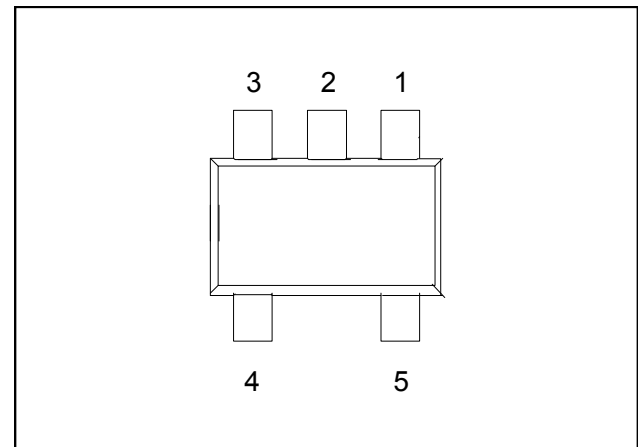
| Standard Part Number | Package |
|----------------------|---------------|
| MA4EX580L1-1225T | Tape and Reel |

Absolute Maximum Ratings¹

| Parameter | Maximum Ratings |
|-----------------------|-------------------|
| Operating Temperature | -40 °C to +85 °C |
| Storage Temperature | -65 °C to +150 °C |
| Incident LO Power | +20 dBm |
| Incident RF Power | +20 dBm |

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

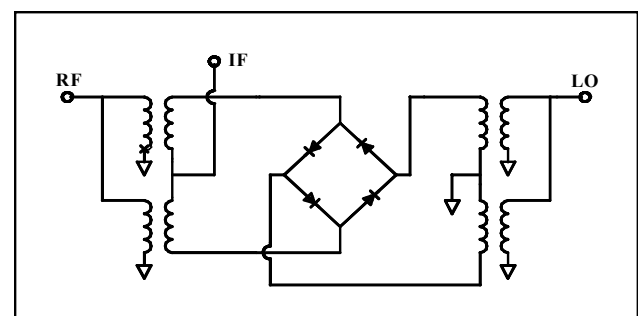
Package Outline (Topview)



PIN Configuration

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

Schematic



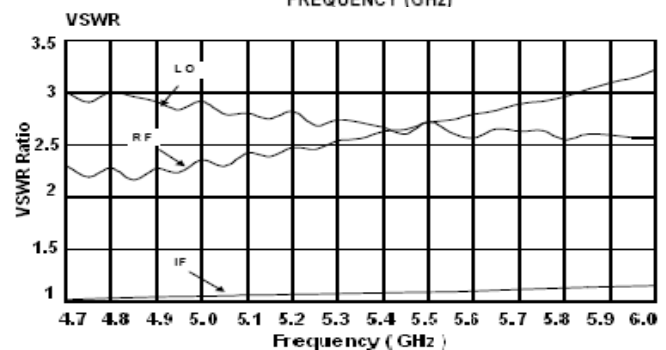
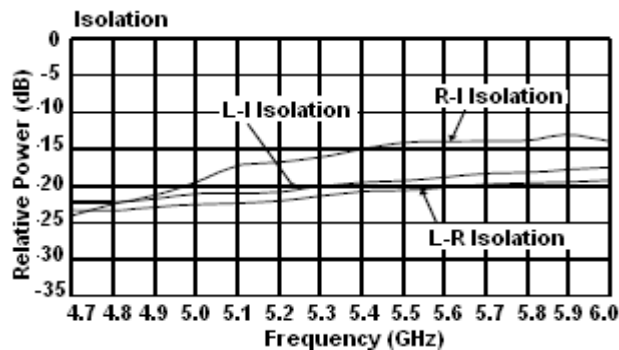
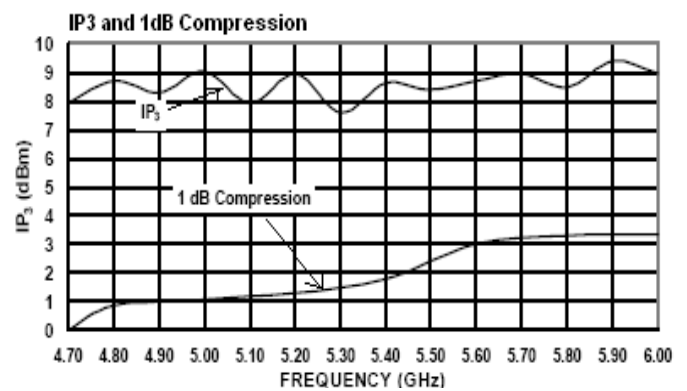
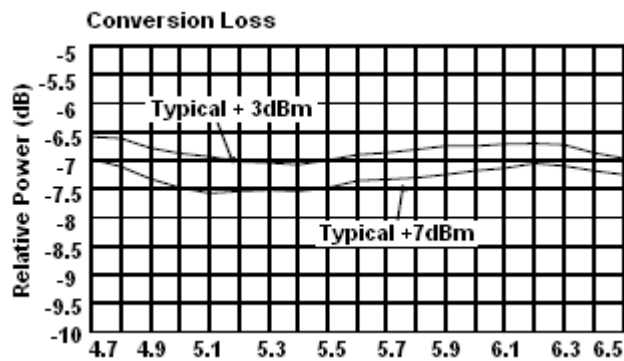
Silicon Double Balanced HMIC Mixer 4.7 - 6.0 GHz

Rev. V2

Electrical Specifications @ +25 °C

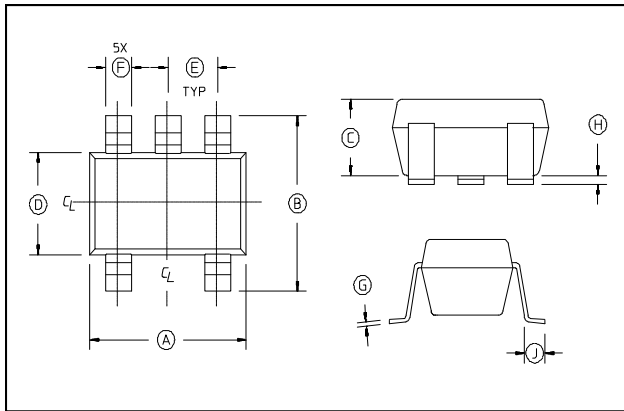
| Parameter | Frequency Range | Test Conditions | Units | Typ. | Max. |
|------------------------|-------------------------|--|-------|------|------|
| Conversion Loss | 4700 MHz 4.7—6.0 GHz | LO Drive = +3 -> +7 dBm RF = -10 dBm, IF = 60 MHz | dB | 7.6 | 8.0 |
| | | | | 8.5 | 9.5 |
| L - R Isolation | 4700 MHz 4.7—6.0 GHz | LO Drive = +5 dBm RF Level = -10 dBm | dB | 23.0 | |
| L - I Isolation | 4700 MHz 4.7—6.0 GHz | LO Drive = +5 dBm RF Level = -10 dBm | dB | 22.0 | |
| R - I Isolation | 4700 MHz 4.7—6.0 GHz | LO Drive = +5 dBm RF Level = -10 dBm | dB | 9.4 | |
| LO VSWR | 4700 MHz 4.7—6.0 GHz | LO Drive = +5 dBm RF Level = -10 dBm | | 2.7 | - |
| | | | | 2.8 | - |
| RF VSWR | 4700 MHz 4.7—6.0 GHz | LO Drive = +5 dBm RF Level = -10 dBm | | 2.3 | - |
| | | | | 3.1 | - |
| IF VSWR | DC - 1050 MHz | LO Drive = +5 dBm RF Level = -10 dBm | | 1.1 | - |
| Input IP3 | 4700 MHz 4.7—6.0 GHz | LO Drive = +3 -> +7 dBm RF = -10 dBm, IF = 60 MHz | dBm | 7.5 | |
| Input 1 dB Compression | 4700 MHz 4.7—6.0 GHz | LO Drive = +3 -> +7 dBm RF = -10 dBm, IF = 60 MHz | dBm | +1.6 | - |
| | | | | +1.5 | - |
| IF 1 dB Bandwidth | DC - 1050 MHz | LO = 4650 MHz @+5dBm | MHz | 1050 | - |

Typical Performance Curves



* Specifications subject to change without notice.

Case Style - SOT-25



SOT-25 Dimensions

| Dim | Inches | | Millimeters | |
|-----|-----------|------|-------------|------|
| | Min. | Max. | Min. | Max. |
| A | .106 | .122 | 2.70 | 3.10 |
| B | .100 | .118 | 2.54 | 3.00 |
| C | — | .051 | — | 1.30 |
| D | .063 REF. | | 1.60 REF. | |
| E | .032 | .043 | .80 | 1.10 |
| F | .014 | .020 | .35 | .50 |
| G | .003 | — | .08 | — |
| H | .000 | .006 | .00 | .15 |
| J | .018 REF. | | .45 REF. | |

2. Leads Coplanarity should be 0.003 (0.08) max.

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