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High Level Termination Insensitive Mixer, 1 - 3500 MHz

Rev. V4

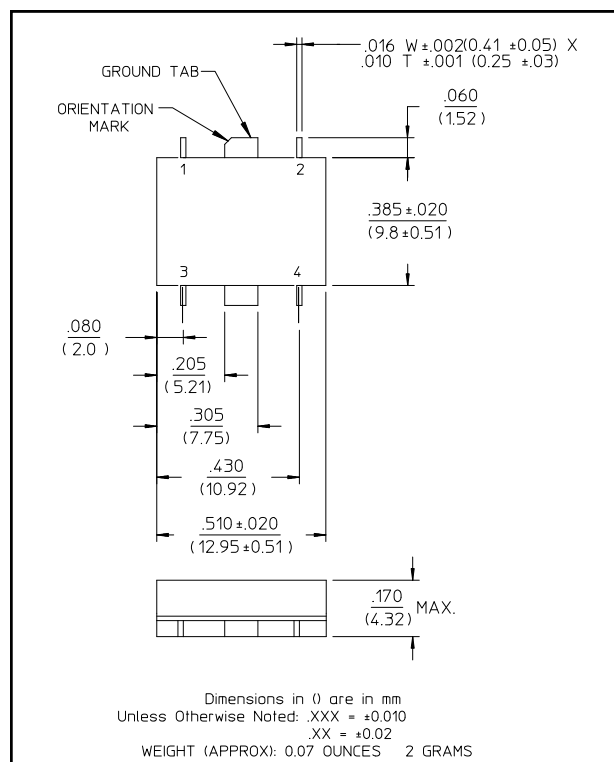
Features

- Operates Over Full PCN/PCS/PHS/MSS Bands
- Low Conversion Loss
- Fully Hermetic Package
- Intermodulation Ratio Insensitive to System Mismatches
- VSWR: <2.0:1 Typical Midband
- Isolation: 35 dB Typical Midband
- High IIP₃ (+28 dBm Typical 1-3500 MHz)

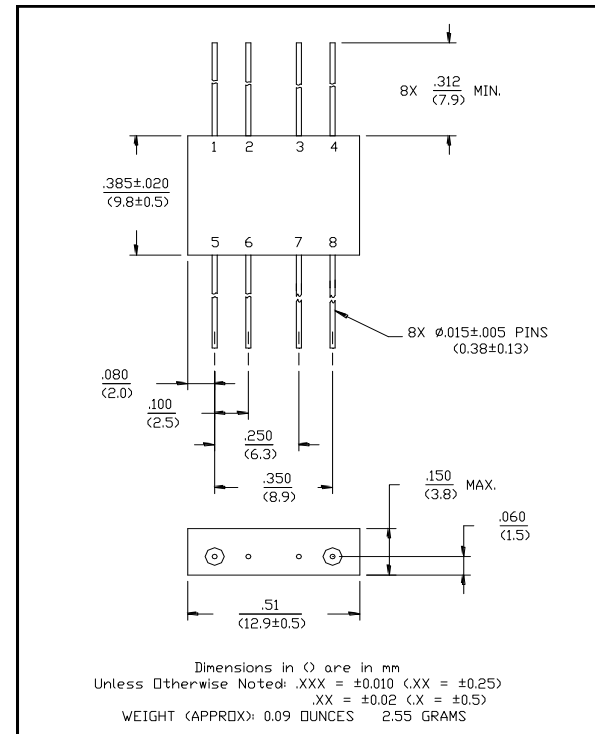
Description

M/A-COM's MD-189 and MDS-189 are high level termination insensitive mixers. These devices are packaged in 8-lead flatpack and SMT packages. These mixers offer consistent and repeatable flat intermodulation performance and flat conversion loss with low spurious signal generation independent of system mismatch from 1 to 3500 MHz. The MD-189 and MDS-189 are ideally suited for RF/IF communications applications requiring high intercept point performance.

SF-1 (MDS-189)



FP-2 (MD-189)



Pin Configuration (MD-189)

| Pin No. | Function | Pin No. | Function |
|---------|----------|---------|----------|
| 1 | GND | 5 | LO |
| 2 | GND | 6 | GND |
| 3 | GND | 7 | GND |
| 4 | IF | 8 | RF |

Pin Configuration (MDS-189)

| Pin No. | Function | Pin No. | Function |
|---------|----------|---------|----------|
| 1 | GND | 3 | LO |
| 2 | IF | 4 | RF |

Absolute Maximum Ratings¹

| Parameter | Absolute Maximum |
|---|-------------------------------------|
| Max Input Power ² Total Power | 0.5W Derated to 85°C @ 3.2 mW/°C |
| LO Power | +27 dBm |

1. Operation of this device above any one of these parameters may cause permanent damage.
2. Ambient Temperature (T_A) = +25°C

High Level Termination Insensitive Mixer, 1 - 3500 MHz

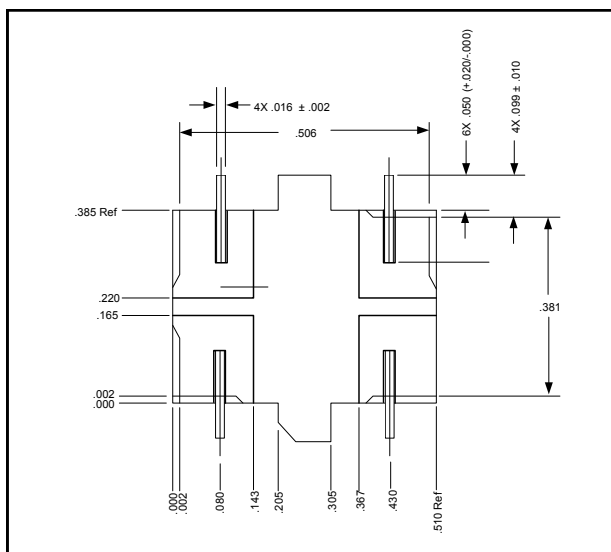
Rev. V4

Electrical Specifications¹: $T_A = -55^{\circ}\text{C}$ to $+85^{\circ}\text{C}$

Frequency: RF, LO Ports = 1-3500 MHz, IF Port = 5-1500 MHz

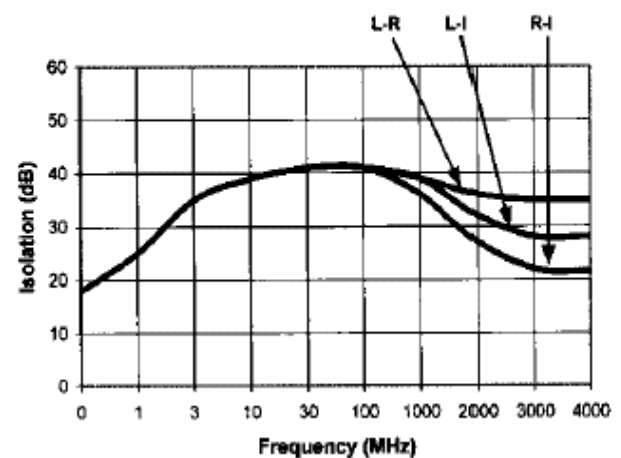
| Parameter | Test Conditions | Frequency | Units | Min | Typ | Max |
|--------------------------|---|---------------------------------|----------|----------|----------|--------|
| Conversion Loss | LO @ 23 dBm IF @ 60 MHz | 5 - 1000 MHz | dB | — | 6.5 | 7.0 |
| | | 1000 - 3000 MHz | dB | — | 7.5 | 8.5 |
| | | 1 - 3500 MHz | dB | — | 8.0 | 9.5 |
| Isolation | LO to RF | 1 - 2000 MHz 2000 - 3500 MHz | dB dB | 30 25 | 35 30 | — — |
| | LO to IF | 1 - 2000 MHz 2000 - 3500 MHz | dB dB | 25 20 | 30 25 | — — |
| | RF to IF | 10 - 500 MHz 1 - 3500 MHz | dB dB | 30 15 | 35 20 | — — |
| Input Compression (1 dB) | LO @ 23 dBm IF @ 60 MHz | — | — | — | +20 | — |
| IIP ₃ | LO @ 23 dBm IF @ 60 MHz | — | dBm | — | +28 | — |
| Desensitivity (1dB) | LO @ 23 dBm IF @ 60 MHz | — | dBm | — | +17 | — |
| | | — | dBm | — | — | — |
| SSB Noise Figure | LO @ 23 dBm IF @ 60 MHz Within 1 dB of Conversion Loss Max | — | — | — | — | — |

Bottom View of SF-1



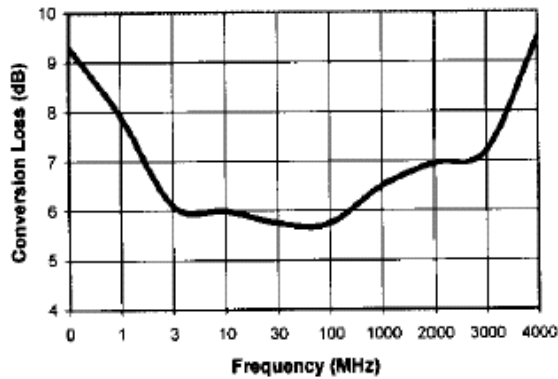
Typical Performance Curves

Isolation - Input +23 dBm

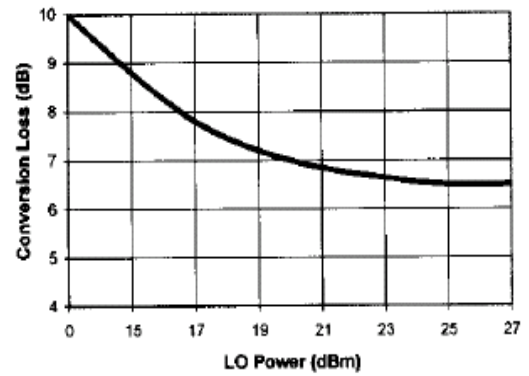


Typical Performance Curves

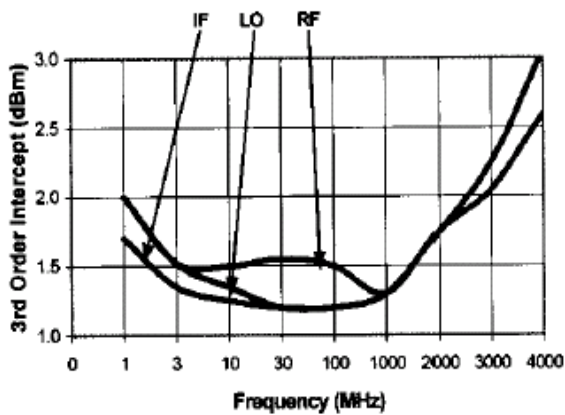
**Conversion Loss - LO @ +23 dBm,
IF @ 60 MHz**



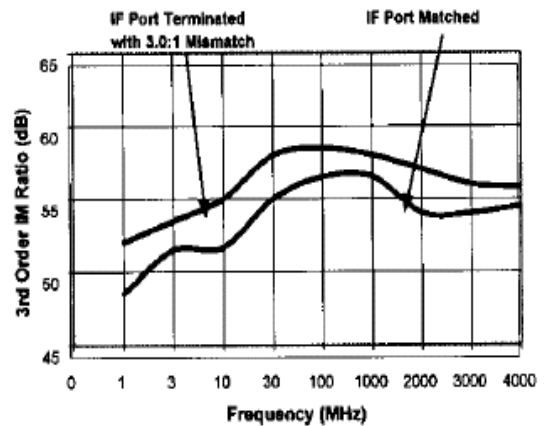
**Conversion Loss vs. LO Power -
RF @ 2000 MHz 0 dBm, IF @ 60 MHz**



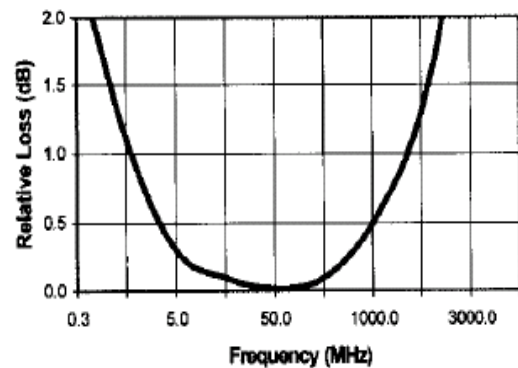
VSWR



3rd Order IM Ratio - LO @ +23 dBm,



IF Port Response



Ordering Information

| Part Number | Package |
|-------------|---------|
| MD-189 PIN | FP-2 |
| MDS-189 PIN | SF-1 |

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