

## High Level Termination Insensitive Mixer, 1 - 3500 MHz

Rev. V4

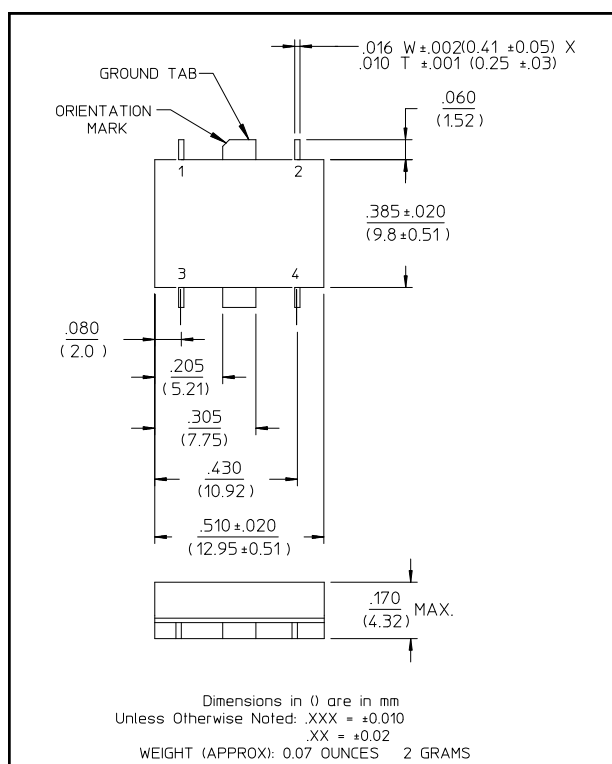
### Features

- 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 IIP<sub>3</sub> (+28 dBm Typical 1-3500 MHz)

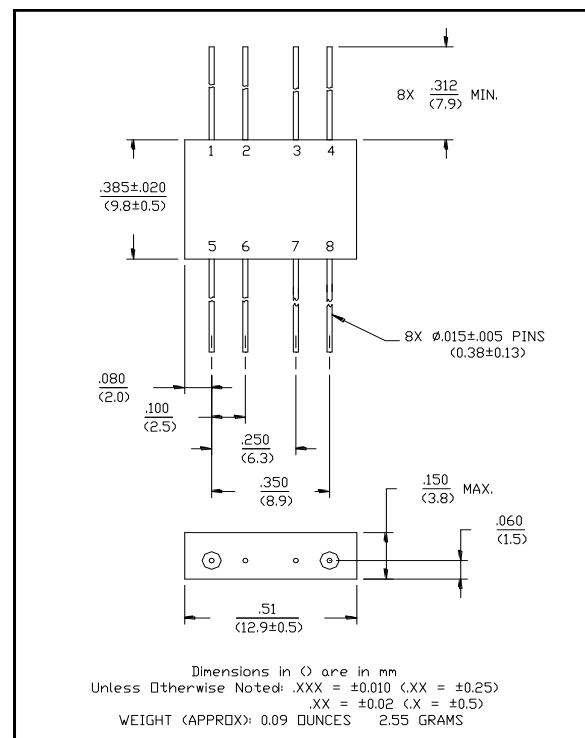
### Description

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 Ratings<sup>1</sup>

| Parameter                                   | Absolute Maximum                    |
|---------------------------------------------|-------------------------------------|
| Max Input Power <sup>2</sup><br>Total Power | 0.5W Derated to 85°C<br>@ 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<sub>A</sub>) = +25°C

## High Level Termination Insensitive Mixer, 1 - 3500 MHz

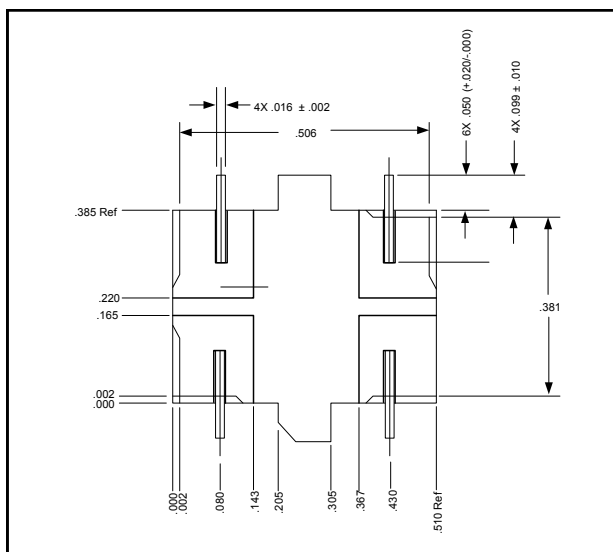
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Electrical Specifications<sup>1</sup>:  $T_A = -55^\circ\text{C}$  to  $+85^\circ\text{C}$

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

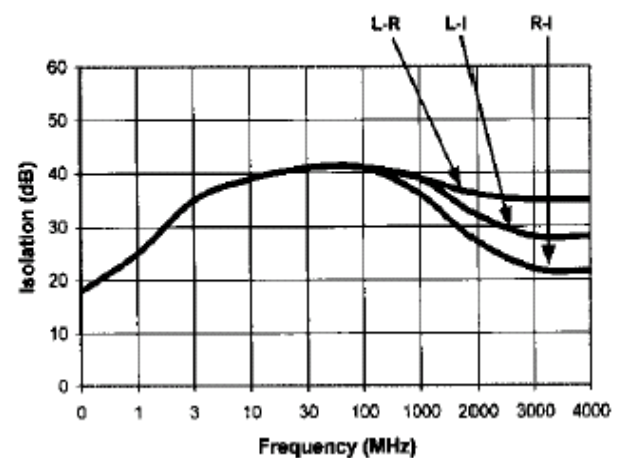
| Parameter                | Test Conditions                                                     | Frequency                       | Units    | Min      | Typ      | Max    |
|--------------------------|---------------------------------------------------------------------|---------------------------------|----------|----------|----------|--------|
| Conversion Loss          | LO @ 23 dBm<br>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<br>2000 - 3500 MHz | dB<br>dB | 30<br>25 | 35<br>30 | —<br>— |
|                          | LO to IF                                                            | 1 - 2000 MHz<br>2000 - 3500 MHz | dB<br>dB | 25<br>20 | 30<br>25 | —<br>— |
|                          | RF to IF                                                            | 10 - 500 MHz<br>1 - 3500 MHz    | dB<br>dB | 30<br>15 | 35<br>20 | —<br>— |
| Input Compression (1 dB) | LO @ 23 dBm<br>IF @ 60 MHz                                          | —                               | —        | —        | +20      | —      |
| IIP <sub>3</sub>         | LO @ 23 dBm<br>IF @ 60 MHz                                          | —                               | dBm      | —        | +28      | —      |
| Desensitivity (1dB)      | LO @ 23 dBm<br>IF @ 60 MHz                                          | —                               | dBm      | —        | +17      | —      |
|                          |                                                                     | —                               | dBm      | —        | —        | —      |
| SSB Noise Figure         | LO @ 23 dBm<br>IF @ 60 MHz<br>Within 1 dB of Conversion Loss<br>Max | —                               | —        | —        | —        | —      |

### Bottom View of SF-1



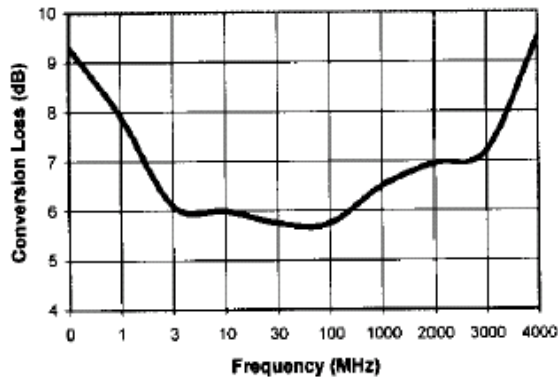
### Typical Performance Curves

#### Isolation - Input +23 dBm

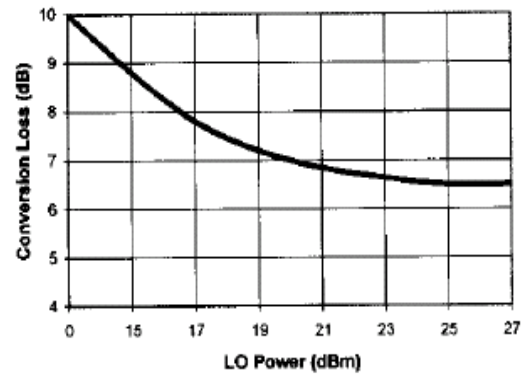


### Typical Performance Curves

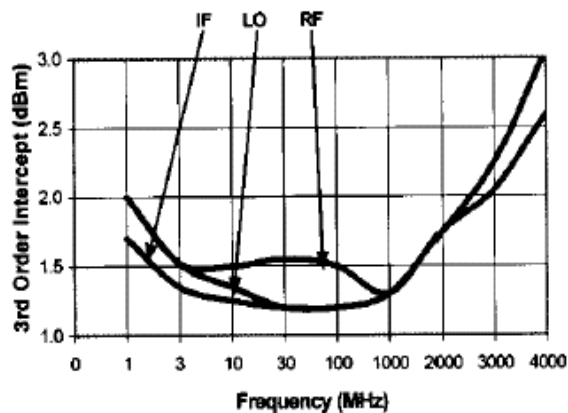
**Conversion Loss - LO @ +23 dBm,  
IF @ 60 MHz**



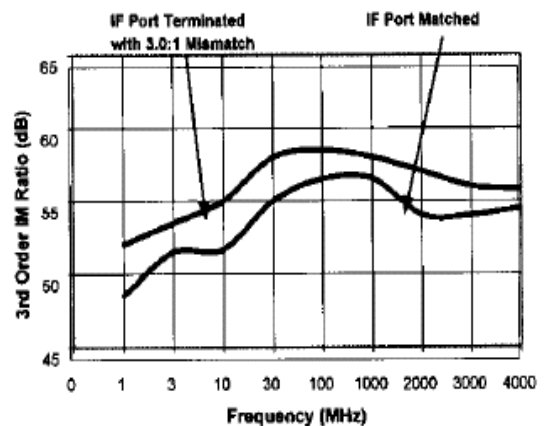
**Conversion Loss vs. LO Power -  
RF @ 2000 MHz 0 dBm, IF @ 60 MHz**



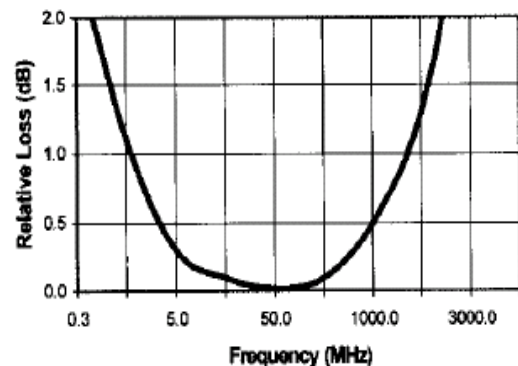
**VSWR**



**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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