

## Termination Insensitive Mixer, 1 - 500 MHz

Rev. V3

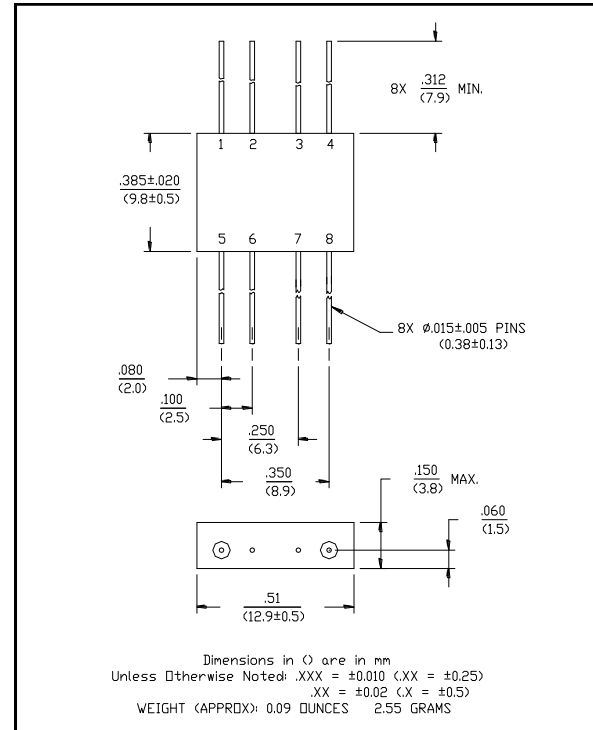
### Features

- Third Order Intermodulation Ratio is Insensitive to Port Mismatches
- Conversion Loss: 6dB Typical Midband
- DC Coupled IF Port
- High Level Phase Detector
- Impedance: 50 Ohms Nominal
- Maximum Input Power: 350 mW Max @ 25°C, Derated to 85°C @ 3.2 mW/°C
- LO Power: +24 dBm Max.
- IF Port Current: 50 mA Max.
- MIL-STD-883 Screening Available

### Description

The unique design of the termination insensitive mixer (TIM) enables it to apply high reverse voltage to diodes during their “off” phase, in the LO cycle. This allows for higher power level performance with minimum distortion. In addition the TIM has internal loads that provide a good match and also absorb mixer generated LO frequency terms. Combined, these features give the mixer its insensitivity to external mismatches, plus superior VSWR.

### FP-2



### Pin Configuration

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

## Termination Insensitive Mixer, 1 - 500 MHz

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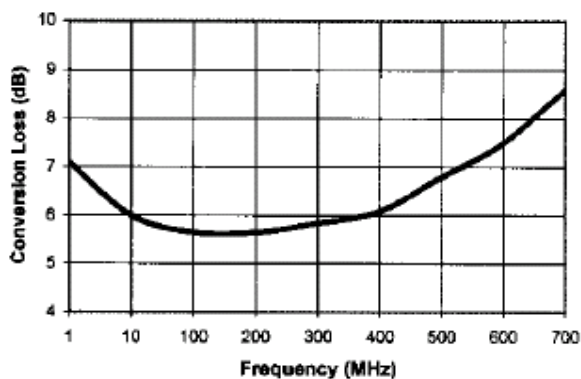
### Electrical Specifications<sup>1</sup>: $T_A = -55^\circ\text{C}$ to $+85^\circ\text{C}$

| Parameter   | Test Conditions                              | Frequency                    | Units      | Min      | Typ    | Max    |
|---|--|------------------------------|------------|----------|--------|--------|
| Frequency Range                                   | RF, LO Ports<br>IF Port                      | 1 - 500<br>DC - 500          | MHz<br>MHz | —<br>—   | —<br>— | —<br>— |
| Conversion Loss                                   |  | 5 - 300 MHz<br>1 - 500 MHz   | dB<br>dB   | —<br>—   | —<br>— | 7<br>8 |
| Isolation   | LO to RF                                     | 1 - 500 MHz                  | dB         | 25       | —      | —      |
|   | LO to IF                                     | 1 - 500 MHz                  | dB         | 30       | —      | —      |
|   | RF to IF                                     | 1 - 300 MHz<br>300 - 500 MHz | dB<br>dB   | 20<br>17 | —<br>— | —<br>— |
| DC Polarity                                       | Positive                                     | —                            | —          | —        | —      | —      |
| DC Offset   | —  | —                            | mV         | —        | ≤5     | —      |
| RF Input  | 1 dB Compression<br>1 dB Desensitization     | —                            | dBm        | —        | +10    | —      |
|   |  | —                            | dBm        | —        | +7     | —      |
| SSB Noise Figure                                  | Within 1 dB of Conversion Loss<br>Max        | —                            | —          | —        | —      | —      |
| Typical Two-Tone IM<br>Ratio                      | with a -10 dBm input, each tone<br>60 MHz IF | 100 MHz                      | dB         | —        | 50     | —      |
|   |  | 500 MHz                      | dB         | —        | 55     | —      |
| 3rd Order<br>Intermodulation Ratio<br>Degradation | @ IF VSWR 3:1                                | —                            | dB         | —        | 3      | —      |

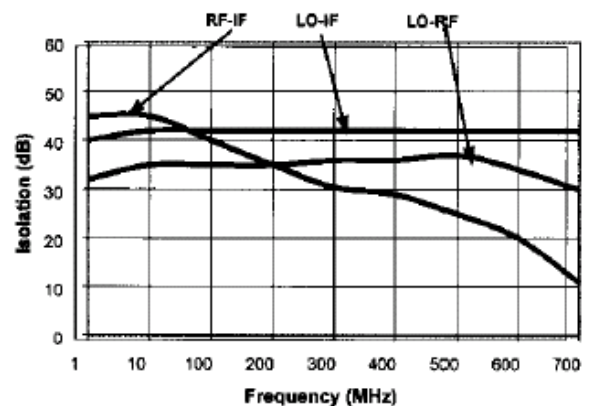
1. All specifications apply when operated at +13 dBm available LO power with 50 Ohm source and load impedance. This product contains elements protected by United States Patent Number 4,224,572.

### Typical Performance Curves

**Conversion Loss (LO @ +13 dBm,  
IF @ 50 MHz)**

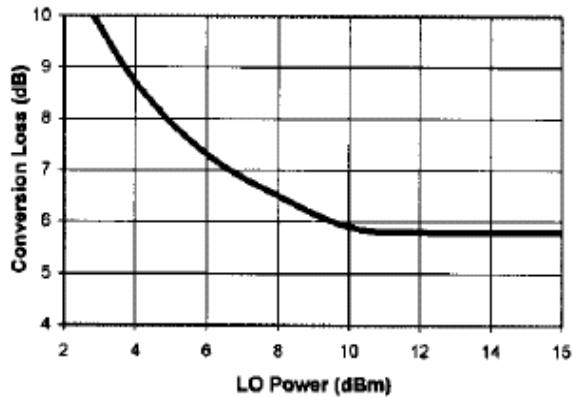


**Isolation**

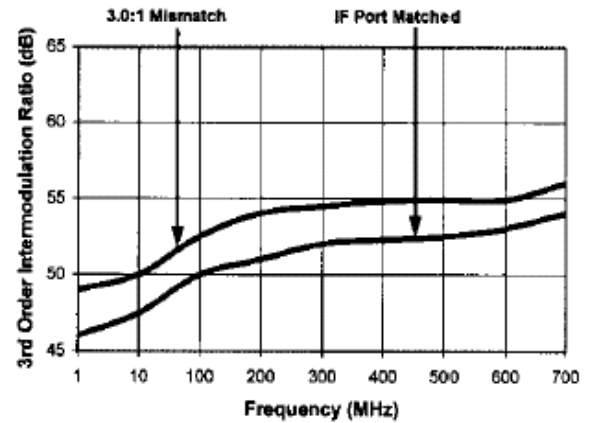


## Typical Performance Curves

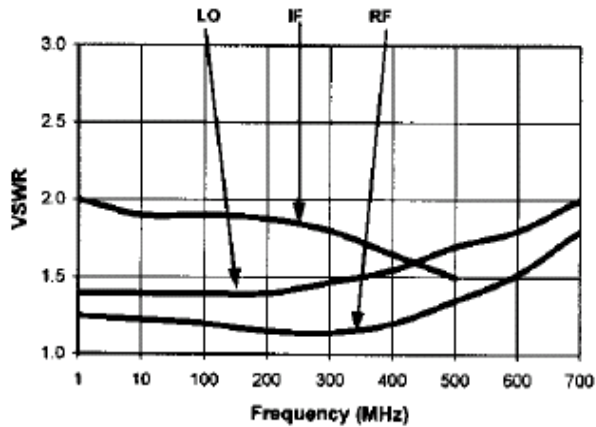
**Conversion Loss vs. LO Power**  
(RF @ 300 MHz, IF @ 50 MHz)



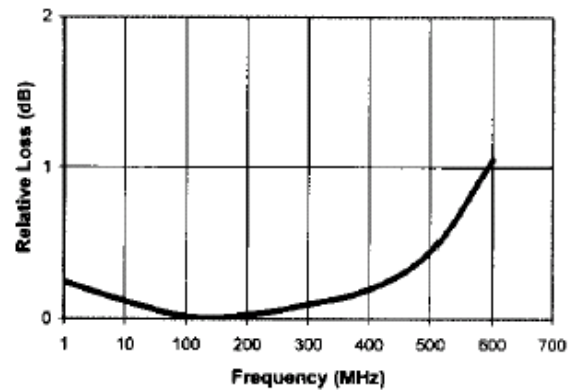
**3rd Order IM Ratio (LO @ +13 dBm, RF @ -10 dBm)**



**VSWR**



**IF Port Response**



## Ordering Information

| Part Number | Package |
|-------------|---------|
| MD-161 PIN  | FP-2    |

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