## Termination Insensitive Mixer, <br> 1-4000 MHz

## Features

n Intermodulation Ratio is Insensitive to Port Mismatches
n VSWR: <2.0:1 Typical Midband
n Isolation: 35 dB Typical Midband
n Impedance: 50 Ohms Nominal
n Maximum Input Power: 350 mW Max @ $25^{\circ} \mathrm{C}$, Derated to $85^{\circ} \mathrm{C}$ @ $3.2 \mathrm{~mW} /{ }^{\circ} \mathrm{C}$
n LO Power: +24 dBm Max.
n 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.

## C-7 (MDC-179)



FP-2 (MD-179)


Pin Configuration (MD-179)

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

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Electrical Specifications ${ }^{1}$ : $\mathrm{T}_{\mathrm{A}}=-55^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}$

| Parameter | Test Conditions | Frequency | Units | Min | Typ | Max |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Frequency Range | RF, LO Ports IF Port | $\begin{aligned} & 1-4000 \\ & 5-1500 \end{aligned}$ | $\begin{aligned} & \mathrm{MHz} \\ & \mathrm{MHz} \end{aligned}$ | — | — | - |
| Conversion Loss ${ }^{2,3}$ |  | $\begin{aligned} & 5-1000 \mathrm{MHz} \\ & 5-2500 \mathrm{MHz} \\ & 5-3500 \mathrm{MHz} \\ & 1-4000 \mathrm{MHz} \end{aligned}$ | dB <br> dB <br> dB <br> dB | - - - | - — — | $\begin{gathered} 7.5 \\ 8.5 \\ 9.5 \\ 10.5 \end{gathered}$ |
| Isolation | LO to RF | $\begin{aligned} & 5-1000 \mathrm{MHz} \\ & 1-4000 \mathrm{MHz} \end{aligned}$ | dB <br> dB | $\begin{aligned} & 30 \\ & 20 \end{aligned}$ | — | - |
|  | LO to IF | $\begin{aligned} & 5-1000 \mathrm{MHz} \\ & 1-4000 \mathrm{MHz} \end{aligned}$ | $\begin{aligned} & \mathrm{dB} \\ & \mathrm{~dB} \end{aligned}$ | $\begin{aligned} & 30 \\ & 20 \end{aligned}$ | — | - |
|  | RF to IF | $\begin{aligned} & 10-500 \mathrm{MHz} \\ & 1-4000 \mathrm{MHz} \end{aligned}$ | dB <br> dB | $\begin{aligned} & 30 \\ & 16 \end{aligned}$ | — | - |
| RF Input | 1 dB Compression <br> 1 dB Desensitization | — | dBm dBm | — | $\begin{aligned} & +5 \\ & +3 \end{aligned}$ | — |
| SSB Noise Figure | Within 1 dB of Conversion Loss Max | - | - | - | - | - |
| Typical Two-Tone IM Ratio | with a -10 dBm input, each tone 60 MHz IF | $\begin{gathered} 10 \mathrm{MHz} \\ 500 \mathrm{MHz} \\ 3000 \mathrm{MHz} \end{gathered}$ | dB <br> dB <br> dB | — | $\begin{aligned} & 49 \\ & 52 \\ & 50 \end{aligned}$ | — |
| 3rd Order Intermodulation Ratio Degradation | @ IF VSWR 3:1 | - | dB | - | 3 | - |

1. All specifications apply when operated at +7 dBm available LO power with 50 Ohm source and load impedance.
2. For IF Frequencies of $5-300 \mathrm{MHz}$ and RF of -10 dBm or less.
3. For MDC-179, add 1.0 dB to conversion loss.

This product contains elements protected by United States Patent Number 4,224,572.

## Typical Performance Curves

## Conversion Loss - LO @ +7 dBm, IF @ 60 MHz



Isolation - Input +7 dBm


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## Typical Performance Curves

Conversion Loss vs. LO Power - RF @ 2000 MHz -10 dBm, IF @ 60 MHz


VSWR


3rd Order IM Ratio - Input +7 dBm


IF Port Response


## Ordering Information

| Part Number | Package |
| :---: | :---: |
| MD-179 PIN | FP-2 |
| MDC-179 SMA | C-7 |

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