## Surface Mount Double-Balanced Mixer, <br> 10-500 MHZ

## Features

- Fully Hermetic Package
- Low Cost
- Conversion Loss: 7 dB Typical Midband
- Impedance: 50 Ohms Nominal
- Maximum Input Power: 400 mW Max, Derated to $85^{\circ} \mathrm{C} @ 3.2 \mathrm{~mW} /{ }^{\circ} \mathrm{C}$
- X Port Current: 50 mA Max.
- MIL-STD-883 Screening Available


## Description

Transformers convert the LO and RF paths to balanced lines connecting to a medium barrier, Schottky diode ring quad. These transformers help provide excellent isolation between ports. Conversion loss is low. The direct connection of the IF port to the diode quad allows these mixers to be used as phase detectors and bi-phase modulators.

## SF-1



## 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 | $\begin{aligned} & 10-500 \\ & \text { DC }-500 \end{aligned}$ | MHz <br> MHz | - | - | - |
| Conversion Loss |  | $\begin{gathered} 5-150 \mathrm{MHz} \\ 150-500 \mathrm{MHz} \end{gathered}$ | $\begin{aligned} & \mathrm{dB} \\ & \mathrm{~dB} \end{aligned}$ | — | — | $\begin{aligned} & 7.0 \\ & 9.0 \end{aligned}$ |
| Isolation | LO to RF | $\begin{gathered} 5-150 \mathrm{MHz} \\ 150-500 \mathrm{MHz} \end{gathered}$ | $\begin{aligned} & \mathrm{dB} \\ & \mathrm{~dB} \end{aligned}$ | $\begin{aligned} & 40 \\ & 35 \end{aligned}$ | — | - |
|  | LO to IF | $\begin{gathered} 5-150 \mathrm{MHz} \\ 150-500 \mathrm{MHz} \end{gathered}$ | $\begin{aligned} & \mathrm{dB} \\ & \mathrm{~dB} \end{aligned}$ | $\begin{aligned} & 35 \\ & 25 \end{aligned}$ | — | — |
|  | RF to IF | $\begin{gathered} 5-150 \mathrm{MHz} \\ 150-500 \mathrm{MHz} \end{gathered}$ | $\mathrm{dB}$ $\mathrm{dB}$ | $\begin{aligned} & 25 \\ & 20 \end{aligned}$ | — | — |
| DC Polarity | Negative | - | - | - | - | - |
| DC Offset | - | - | mV | - | $\leq 1$ | - |
| RF Input | 1 dB Compression <br> 1 dB Desensitization |  | dBm dBm | — | $\begin{gathered} +2.5 \\ 0 \end{gathered}$ | - |
| SSB Noise Figure | Within 1 dB of Conversion Loss Max | - | - | - | - | - |
| Typical Two-Tone IM Ratio | with a -10 dBm input, each input, 25 MHz and 35 MHz IF | $\begin{aligned} & 100-350 \mathrm{MHz} \\ & 350-500 \mathrm{MHz} \end{aligned}$ | $\begin{aligned} & \mathrm{dB} \\ & \mathrm{~dB} \end{aligned}$ | - | $\begin{aligned} & 55 \\ & 40 \end{aligned}$ | — |

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## Typical Performance Curves

Conversion Loss ( $\mathrm{LO}=\mathbf{+ 7} \mathbf{d B m}$,
$R F=-5 d B m, I F=5 M H z)$


Conversion Loss vs. LO Power ( $R F=200 \mathrm{MHz}, R F=140 \mathrm{MHz}$ @) $-10 \mathrm{dBm}, \mathrm{IF}=60 \mathrm{MHz}$ )


## Ordering Information

| Part Number | Package |
| :---: | :---: |
| MDS-223 PIN | SF-1 |

$$
\text { Isolation (Input }=+7 \mathrm{dBm})
$$



Bottom View of SF-1


## Pin Configuration

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

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[^0]:    1. All specifications apply when operated at +7 dBm available LO power with 50 ohm source and load impedance.
