Termination Insensitive Mixer,
1 - 1500 MHz

Features
- Third Order Intermodulation Ratio is Insensitive to Port Mismatches
- Conversion Loss: 7 dB Typical Midband
- VSWR: Typically Less than 1.5:1 @ Midband
- Impedance: 50 Ohms Nominal
- Maximum Input Power: 350 mW Max @ 25°C, Derated to 85°C @ 3.5 mW/°C
- 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.

Pin Configuration

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Function</th>
<th>Pin No.</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LO</td>
<td>5</td>
<td>GND</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
<td>6</td>
<td>GND</td>
</tr>
<tr>
<td>3*</td>
<td>IF</td>
<td>7*</td>
<td>IF</td>
</tr>
<tr>
<td>4</td>
<td>GND</td>
<td>8</td>
<td>RF</td>
</tr>
</tbody>
</table>

* P3 and P7 are connected together to make IF Port.

Dimensions in 0. are in mm

Unless Otherwise Noted: XXX = +0.010 (XX = +0.25)

WEIGHT (APPROX): 0.23 OUNCES 6.5 GRAMS
**Termination Insensitive Mixer, 1 - 1500 MHz**

Electrical Specifications\(^1\): \(T_A = -55^\circ C \text{ to } +85^\circ C\)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Frequency</th>
<th>Units</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
</tr>
</thead>
</table>
| Frequency Range | RF, LO Ports  
IF Port (3 dB BW) | 1 - 1500 MHz  
1 - 1000 MHz | MHz  
MHz | – | – | – |
| Conversion Loss \(^2\) | 5 - 1000 MHz  
1 - 1500 MHz | dB | – | – | 7.5  
9.0 |
| Isolation | LO to RF | 1 - 5 MHz  
5 - 500 MHz  
500 - 1500 MHz | dB | 20 | – | – |
| | | 5 - 500 MHz  
500 - 1500 MHz | dB | – | – | – |
| | LO to IF | 1 - 5 MHz  
5 - 500 MHz  
500 - 1500 MHz | dB | 20 | – | – |
| | | 5 - 500 MHz  
500 - 1500 MHz | dB | 25 | – | – |
| | RF to IF | 1 - 5 MHz  
5 - 500 MHz  
500 - 1500 MHz | dB | 20 | – | – |
| | RF Input | 1 dB Compression\(^3\)  
1 dB Desensitization\(^3\) | dBm | – | – | +15  
+13 | – |
| SSB Noise Figure | Within 1 dB of Conversion Loss  
Max | – | – | – | – | – |
| 3rd Order Input Interception | \(P_{LO} +13 \text{ dBm}\)  
\(P_{LO} +20 \text{ dBm}\) | 15 MHz  
500 MHz  
1000 MHz  
15 MHz  
500 MHz  
1000 MHz | dBm | – | +18  
+20  
+19  
+23  
+25  
+25 | – |
| 3rd Order Intercept Degradation | @ IF VSWR 3.0:1 | – | dB | – | 3 | – |

1. All specifications apply when operated at +13 dBm available LO power with 50 Ohm source and load impedance.
2. For IF Frequencies of 5 - 1000 MHz and RF of –10 dBm or less.
3. These characteristics apply @ 25 dBm LO power.

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

**Typical Performance Curves**

![Conversion Loss](image1)

![Isolation](image2)
Typical Performance Curves

3rd Order intercept vs. IF Port Termination

VSWR

IF Port Response

3rd Order intercept

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD-160 PIN</td>
<td>RH-3</td>
</tr>
</tbody>
</table>
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