MC2413

Open Carrier Double-Balanced Mixer
For Microwave Telecommunications
Rev. V2

Features

- LO 4.5 TO 7.0 GHz
- RF 4.5 TO 7.0 GHz
- IF DC TO 2.0 GHz
- LO DRIVE +13 dBm (NOMINAL)
- MICROSTRIP INTERFACE

Description

The MC2413 is a double balanced mixer, designed for use in military, commercial and test equipment applications. The design utilizes Schottky ring quad diodes and broadband soft dielectric and ferrite baluns to attain excellent performance. This mixer can also be used as a phase detector and/or bi-phase modulator since the IF port is DC coupled to the diodes. The use of high temperature solder and welded assembly processes used internally makes it ideal for use in manual, semi-automated assembly. Environmental screening available to MIL-STD-883, MIL-STD-202, or MIL-DTL-28837, consult factory.

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC2413</td>
<td>Open Carrier</td>
</tr>
<tr>
<td>MC2413-2</td>
<td>Open Carrier</td>
</tr>
</tbody>
</table>

Electrical Specifications:  $Z_0 = 50\,\Omega$  Lo = +13 dBm (Downconverter application only)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Units</th>
<th>Typical</th>
<th>Guaranteed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>+25°C</td>
<td>-55° to +85°C</td>
</tr>
<tr>
<td>SSB Conversion Loss (max) &amp; SSB Noise</td>
<td>$f_R = 4.5$ to 7 GHz, $f_L = 4.5$ to 7 GHz, $f_I = 0.01$ to 1 GHz</td>
<td>dB</td>
<td>5.2</td>
<td>6.5</td>
</tr>
<tr>
<td>Figure (max)</td>
<td>$f_R = 4.5$ to 7 GHz, $f_L = 4.5$ to 7 GHz, $f_I = 0.01$ to 2 GHz</td>
<td>dB</td>
<td>5.5</td>
<td>7.0</td>
</tr>
<tr>
<td>Isolation, L to R (min)</td>
<td>$f_L = 4.5$ to 7 GHz</td>
<td>dB</td>
<td>27</td>
<td>20</td>
</tr>
<tr>
<td>Isolation, L to I (min)</td>
<td>$f_L = 4.5$ to 7 GHz</td>
<td>dB</td>
<td>40</td>
<td>25</td>
</tr>
<tr>
<td>Isolation, R to I (min)</td>
<td>$f_L = 4.5$ to 7 GHz</td>
<td>dB</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>1 dB Conversion Comp.</td>
<td>$f_L = 13$ dBm</td>
<td>dBm</td>
<td></td>
<td>+6</td>
</tr>
<tr>
<td>Input IP3</td>
<td>$f_R = 6$ GHz at $-10$ dBm, $f_R = 6.01$ GHz at $-10$ dBm, $f_L = 5$ GHz at $+13$ dBm</td>
<td>dBm</td>
<td></td>
<td>+16</td>
</tr>
</tbody>
</table>

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Typical Performance Curves

Conversion Loss vs. RF Frequency

- IF=300MHz (L=R)
- IF=900MHz (L>R)

ISOlation vs. Frequency

- L=R
- L=I
- R=I

Conversion Loss vs. RF Frequency

- IF=1400MHz (L>R)
- IF=1499MHz (L>R)

LO-Port VSWR vs. Frequency

RF-Port VSWR vs. Frequency

IF-Port VSWR vs. Frequency

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Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>-54°C to +85°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-65°C to +100°C</td>
</tr>
<tr>
<td>Peak Input Power</td>
<td>+23 dBm max @ +25°C, +20 dBm max @ +85°C</td>
</tr>
<tr>
<td>Peak Input Current</td>
<td>50 mA DC</td>
</tr>
</tbody>
</table>

*For the base model, only the IF1 port is connected.
For the “-2” model, only the IF2 port is connected.

* Dimensions are inches (millimeters) ±0.015 (0.38) unless otherwise specified.
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