M2E / M2EC / SM2E

Double-Balanced Mixer

Features
- LO 10 TO 1000 MHz
- RF 10 TO 1000 MHz
- F DC TO 600 MHz
- LO DRIVE: +20 dBm (nominal)
- HIGH INTERCEPT POINT: +30 dBm (TYP.)
- HERMETICALLY SEALED

Description
The M2E is a double balanced mixer, designed for use in military, commercial, and test equipment applications. The design utilizes Schottky ring quad diodes and broadband 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. Environmental screening is 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>M2E</td>
<td>TO-8</td>
</tr>
<tr>
<td>M2EC</td>
<td>SMA Connectorized</td>
</tr>
<tr>
<td>SM2E</td>
<td>Surface Mount</td>
</tr>
</tbody>
</table>

Electrical Specifications: $Z_0 = 50\Omega$ Lo = +20 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>-54°C to +85°C *</td>
</tr>
<tr>
<td>SSB Conversion Loss (max) &amp; SSB Noise Figure (max)</td>
<td>$f_R = 0.01$ to 0.3 GHz, $f_L = 0.01$ to 0.3 GHz, $f_l = 0.01$ to 0.2 GHz $f_R = 0.01$ to 0.3 GHz, $f_L = 0.01$ to 0.3 GHz, $f_l = 0.01$ to 0.6 GHz $f_R = 0.01$ to 1 GHz, $f_L = 0.01$ to 1 GHz, $f_l = 0.01$ to 0.2 GHz $f_R = 0.01$ to 1 GHz, $f_L = 0.01$ to 1 GHz, $f_l = 0.01$ to 0.6 GHz</td>
<td>dB</td>
<td>7.0</td>
<td>7.5</td>
</tr>
<tr>
<td>Isolation, L to R (min)</td>
<td>$f_l = 0.01$ to 0.1 GHz $f_l = 0.1$ to 0.4 GHz $f_l = 0.4$ to 1 GHz</td>
<td>dB</td>
<td>40</td>
<td>35</td>
</tr>
<tr>
<td>Isolation, L to I (min)</td>
<td>$f_l = 0.01$ to 0.1 GHz $f_l = 0.1$ to 0.4 GHz $f_l = 0.4$ to 1 GHz</td>
<td>dB</td>
<td>45</td>
<td>35</td>
</tr>
<tr>
<td>1 dB Conversion Comp.</td>
<td>$f_l = +25$ dBm</td>
<td>dBm</td>
<td>+20</td>
<td></td>
</tr>
<tr>
<td>Input IP3</td>
<td></td>
<td>dBm</td>
<td>+30</td>
<td></td>
</tr>
</tbody>
</table>

* The M2EC specification limits apply at 0°C to +50°C.

For further information and support please visit:
https://www.macom.com/support
Typical Performance Curves

**Conversion Loss vs. Frequency**

- $f_{LO} = f_{RF}$
- $P_{LO} = +20$ dBm
- $P_{RF} = 20$ dBm
- $f_{RF}$ BETWEEN 3 MHz and 110 MHz

**Isolation**

- $f_{LO} = 100$ MHz @ +10 dBm
- $P_{RF} = -10$ dBm

**Conversion Loss vs. LO Drive**

- $f_{LO} = 400$ MHz
- $P_{RF} = 30$ MHz @ +10 dBm
M2E / M2EC / SM2E

Double-Balanced Mixer

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>OperatingTemperature</td>
<td>-54ºC to +100ºC</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-65ºC to +100ºC</td>
</tr>
<tr>
<td>Peak Input Power</td>
<td>+27 dBm max @ +25ºC dBm max @ +100ºC</td>
</tr>
<tr>
<td>Peak Input Current</td>
<td>100 mA DC</td>
</tr>
</tbody>
</table>

Outline Drawing: TO-8 *

Weight: 2 grams (0.07 oz.) max

Outline Drawing: SMA Connectorized *

Weight: 21 grams (0.74 oz.) max

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

Outline Drawing: Surface Mount *

* Dimensions are inches (millimeters) ±0.015 (0.38) unless otherwise specified.
Double-Balanced Mixer

M/A-COM Technology Solutions Inc. All rights reserved.

Information in this document is provided in connection with M/A-COM Technology Solutions Inc ("MACOM") products. These materials are provided by MACOM as a service to its customers and may be used for informational purposes only. Except as provided in MACOM's Terms and Conditions of Sale for such products or in any separate agreement related to this document, MACOM assumes no liability whatsoever. MACOM assumes no responsibility for errors or omissions in these materials. MACOM may make changes to specifications and product descriptions at any time, without notice. MACOM makes no commitment to update the information and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to its specifications and product descriptions. No license, express or implied, by estoppels or otherwise, to any intellectual property rights is granted by this document.

THESE MATERIALS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, CONSEQUENTIAL OR INCIDENTAL DAMAGES, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. MACOM FURTHER DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. MACOM SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS, WHICH MAY RESULT FROM THE USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.

For further information and support please visit:
https://www.macom.com/support