Silicon Double Balanced HMIC Mixer
700 - 1200 MHz

Features
- 7.0 dB Typical Conversion Loss
- +13 to +17 dBm LO Drive
- HMIC IC Process
- Silicon High Barrier Schottky Barrier Diodes
- DC - 400 MHz IF Bandwidth
- Low Cost Miniature Plastic Package
- RoHS* Compliant with 260°C Reflow Capability
- 100% Matte Tin Plating

Description
M/A-COM’s MA4EX950H1-1225T is a silicon monolithic 700 - 1200 MHz, high barrier, double balanced mixer in a low cost miniature surface mount SOT25 package. The die uses M/A-COM’s unique HMIC silicon/glass process to realize low loss passive elements while retaining the advantages of high barrier silicon Schottky barrier diodes.

Applications
These mixers are well suited for high volume wireless and cellular applications where small size and repeatability are required. Typical Applications include frequency conversion, modulation, and demodulation in wireless receivers and transmitters.

Electrical Specifications @ 25°C

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Frequency Range</th>
<th>Test Conditions</th>
<th>Units</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
</tr>
</thead>
</table>
| Conversion Loss         | 800 MHz 0.7 - 1.2 GHz | LO Drive = +15 dBm  
RF = -10 dBm, IF = 60 MHz | dB    | 6.6  | 8.1  | 10.5 |
| L - R Isolation         | 800 MHz 0.7 - 1.2 GHz | LO Drive = +15 dBm  
RF Level = -10 dBm | dB    | 27.5 | 23.0 |
| L - I Isolation         | 800 MHz 0.7 - 1.2 GHz | LO Drive = +15 dBm  
RF Level = -10 dBm | dB    | 28.5 | 28.5 |
| R - I Isolation         | 800 MHz 0.7 - 1.2 GHz | LO Drive = +15 dBm  
RF Level = -10 dBm | dB    | 25.0 | —    | 22.5 |
| RF VSWR                 | 800 MHz 0.7 - 1.2 GHz | LO Drive = +15 dBm  
RF Level = -10 dBm | Ratio | 1.20:1 | 1.50:1 |
| IF VSWR                 | DC - 400 MHz          | LO Drive = +15 dBm  
RF Level = -10 dBm | Ratio | 1.55:1 | — |
| Input IP3               | 850 MHz 0.7 - 1.2 GHz | LO Drive = +15 dBm  
RF = -5 dBm, IF = 60 MHz | dBm  | 21.0 | 23.8 | 25.0 |
| Input 1 dB Compression  | 850 MHz 0.7 - 1.2 GHz | LO Drive = +15 dBm  
RF = -5 dBm, IF = 60 MHz | dBm  | 8.3  | 9.1  |
| IF 1 dB Bandwidth       | DC - 400 MHz          | LO = 850 MHz @ +15 dBm | MHz   | 0    | —    | 400  |

For further information and support please visit: https://www.macom.com/support
Silicon Double Balanced HMIC Mixer
700 - 1200 MHz

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Maximum Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>-40°C to +85°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-65°C to +150°C</td>
</tr>
<tr>
<td>Incident LO Power</td>
<td>+20 dBm</td>
</tr>
<tr>
<td>Incident RF Power</td>
<td>+20 dBm</td>
</tr>
</tbody>
</table>

1. Exceeding these limits may cause permanent damage.

Conversion Loss

Isolation

VSWR

Input IP3 & 1 dB Compression

M/A-COM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice. Visit www.macom.com for additional data sheets and product information.

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

SOT-25

<table>
<thead>
<tr>
<th>DIM</th>
<th>INCHES</th>
<th>MILLIMETERS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MIN</td>
<td>MAX</td>
</tr>
<tr>
<td>A</td>
<td>0.106</td>
<td>0.122</td>
</tr>
<tr>
<td>B</td>
<td>0.100</td>
<td>0.118</td>
</tr>
<tr>
<td>C</td>
<td>-</td>
<td>0.051</td>
</tr>
<tr>
<td>D</td>
<td>0.032</td>
<td>0.043</td>
</tr>
<tr>
<td>E</td>
<td>0.014</td>
<td>0.020</td>
</tr>
<tr>
<td>F</td>
<td>0.003</td>
<td>-</td>
</tr>
<tr>
<td>G</td>
<td>0.000</td>
<td>0.006</td>
</tr>
<tr>
<td>H</td>
<td>0.018 REF.</td>
<td>0.45 REF</td>
</tr>
</tbody>
</table>

Mounting Information

The illustration indicates the recommended mounting pad configuration for the SOT-25 package. Solder paste containing flux should be screened onto the pads to a thickness of 0.005-0.007 inches. The plastic package is placed in position, firmly adhering to the solder paste.

Permanent attachment is performed by a reflow soldering procedure during which the tab temperature does not exceed +275 °C and the body temperature does not exceed +260 °C for the RoHS compliant devices.

Please refer to Application Note M538 for surface mounting instructions.
Silicon Double Balanced HMIC Mixer
700 - 1200 MHz

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.