Double-Balanced Mixer

Features
- LO 2.5 TO 7.5 GHz
- RF 2.5 TO 6.5 GHz
- IF DC TO 1.5 GHz
- LO DRIVE: +20 dBm (NOMINAL)
- HIGH THIRD-ORDER IP +22 dBm (TYP.)

Description
The M63H 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>M63H</td>
<td>Minpac</td>
</tr>
<tr>
<td>M63HC</td>
<td>SMA Connectorized</td>
</tr>
</tbody>
</table>

Electrical Specifications: \( Z_0 = 50\,\Omega \) \( \text{Lo} = +20 \,\text{dBm} \) (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>-54º to +85ºC</td>
</tr>
<tr>
<td>SSB Conversion Loss (max) &amp; SSB Noise</td>
<td>( f_R = 3 ,\text{to} ,5 ,\text{GHz}, f_L = 3 ,\text{to} ,5.5 ,\text{GHz}, f_I = 0.03 ,\text{to} ,0.5 ,\text{GHz} )</td>
<td>dB</td>
<td>5.8</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td>( f_R = 2.5 ,\text{to} ,6.5 ,\text{GHz}, f_L = 2.5 ,\text{to} ,7.5 ,\text{GHz}, f_I = 0.03 ,\text{to} ,1.5 ,\text{GHz} )</td>
<td>dB</td>
<td>6.0</td>
<td>7.5</td>
</tr>
<tr>
<td>Isolation, L to R (min)</td>
<td>( f_L = 2.5 ,\text{to} ,6.5 ,\text{GHz} )</td>
<td>dB</td>
<td>42</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>( f_L = 6.5 ,\text{to} ,7.5 ,\text{GHz} )</td>
<td>dB</td>
<td>32</td>
<td>26</td>
</tr>
<tr>
<td>Isolation, L to I (min)</td>
<td>( f_L = 3 ,\text{to} ,5.5 ,\text{GHz} )</td>
<td>dB</td>
<td>24</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>( f_L = 5.5 ,\text{to} ,7.5 ,\text{GHz} )</td>
<td>dB</td>
<td>18</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>( f_L = 2.5 ,\text{to} ,3 ,\text{GHz} )</td>
<td>dB</td>
<td>21</td>
<td>17</td>
</tr>
<tr>
<td>1 dB Conversion Comp.</td>
<td>( f_L = +20 ,\text{dBm} )</td>
<td>dBm</td>
<td>+14</td>
<td></td>
</tr>
<tr>
<td>Input IP3</td>
<td>( f_R1=4 ,\text{GHz} ,\text{at} ,0 ,\text{dBm}, f_R2=3.99 ,\text{GHz} ,\text{at} ,0 ,\text{dBm}, f_L = 5 ,\text{GHz} ,\text{at} ,20 ,\text{dBm} )</td>
<td>dBm</td>
<td>+22</td>
<td></td>
</tr>
</tbody>
</table>
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Typical Performance Curves

- **Drive Level**: The maximum recommended drive level is +23 dBm.

- **Conversion Loss**: Graphs showing conversion loss vs. input frequency and RF frequency.

- **Isolation**: Graphs showing isolation vs. LO frequency and IF frequency.

- **Conversion Loss (Upconversion)**: Graph showing conversion loss vs. output frequency.
Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</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>+25 dBm max @ +25ºC &lt;br&gt; +21 dBm max @ +100ºC</td>
</tr>
<tr>
<td>Peak Input Current</td>
<td>100 mA DC</td>
</tr>
</tbody>
</table>

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