**MMP20224**  
**COUGAR MIXERPAK**  
**DOUBLE-BALANCED MIXER**  

**Typical Values**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>LO &amp; RF</th>
<th>IF</th>
<th>Third Order I.P.</th>
<th>Conversion Loss</th>
<th>LO Drive (nominal)</th>
<th>High Isolation (LO to RF)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.0 - 20.0 GHz</td>
<td>DC - 1.0 GHz</td>
<td>+20.0 dBm</td>
<td>+16.0 dBm</td>
<td></td>
<td>35.0 dB</td>
</tr>
</tbody>
</table>

**SPECIFICATIONS**

- **Guaranteed**
  - Temperature range: -55 to +85 °C

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Port</th>
<th>Frequency</th>
<th>Typ. (dB)</th>
<th>Max. (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSB Conversion Loss and</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>f_L</td>
<td>2.0 to 12.0</td>
<td>6.0</td>
<td>7.0</td>
</tr>
<tr>
<td></td>
<td>f_R</td>
<td>2.0 to 12.0</td>
<td>6.0</td>
<td>7.0</td>
</tr>
<tr>
<td>SSB Noise Figure</td>
<td>f_I</td>
<td>DC to 0.5</td>
<td>6.0</td>
<td>7.0</td>
</tr>
<tr>
<td></td>
<td>f_L</td>
<td>2.0 to 20.0</td>
<td>7.0</td>
<td>8.5</td>
</tr>
<tr>
<td></td>
<td>f_R</td>
<td>2.0 to 20.0</td>
<td>7.0</td>
<td>8.5</td>
</tr>
<tr>
<td></td>
<td>f_I</td>
<td>DC to 0.5</td>
<td>7.0</td>
<td>8.5</td>
</tr>
<tr>
<td></td>
<td>f_I</td>
<td>0.5 to 1.0</td>
<td>8.0</td>
<td>9.5</td>
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<tr>
<td>Conversion Comp.</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>f_R</td>
<td>Level = 10 dBm</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>f_R</td>
<td>Level = 8 dBm</td>
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<td>1.0</td>
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<tr>
<td>Isolation</td>
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<tr>
<td></td>
<td>f_L</td>
<td>2.0 to 10.0</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>f_L</td>
<td>2.0 to 20.0</td>
<td>25</td>
<td>18</td>
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<tr>
<td></td>
<td>f_R</td>
<td>2.0 to 4.0</td>
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<td>18</td>
</tr>
<tr>
<td></td>
<td>f_R</td>
<td>10.0 to 20.0</td>
<td>30</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>f_R</td>
<td>2.0 to 20.0</td>
<td>25</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>f_R</td>
<td>4.0 to 20.0</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>Third Order Intercept</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>LO</td>
<td>-16 dBm</td>
<td></td>
<td>+20 dBm</td>
</tr>
</tbody>
</table>

* Measured in a 50-ohm system with nominal LO drive of +16 dBm as a downconverter.

**ABSOLUTE MAXIMUM RATINGS**

- **Storage Temperature**: -65 to +150 °C
- **Peak RF Input Power All Ports**: +22 dBm @ 25 °C  
  derate to +17 dBm @ 100 °C

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**Typical Performance**

1. **Isolation (L to I) vs Frequency**
   - Isolation (L to I) vs Frequency
   - \( F_L \) at +16 dBm
   - \( F_L \) at +16 dBm

2. **Isolation (L to R) vs Frequency**
   - Isolation (L to R) vs Frequency
   - \( F_L \) at +16 dBm

3. **Isolation (R to I) vs Frequency**
   - Isolation (R to I) vs Frequency
   - \( F_L = 12 \text{ GHz} @ +16 \text{ dBm} \)

4. **L-Port VSWR vs Frequency**
   - L-Port VSWR vs Frequency
   - \( F_L \) at +16 dBm

5. **R-Port VSWR vs Frequency**
   - R-Port VSWR vs Frequency
   - \( F_L = 12.0 \text{ GHz at } +16 \text{ dBm} \)

6. **I-Port VSWR vs Frequency**
   - I-Port VSWR vs Frequency
   - \( F_L = 12.0 \text{ GHz at } +16 \text{ dBm} \)

7. **Conversion Loss vs LO Drive Level**
   - Conversion Loss vs LO Drive Level
   - \( F_L = 10.03 \text{ GHz, Hi-Side LO, } F_I = 30 \text{ MHz} \)

8. **Conversion Loss vs RF Frequency**
   - Conversion Loss vs RF Frequency
   - \( F_L = 12.0 \text{ GHz, Low-Side LO} \)

9. **Power Input at 1 dB Compression**
   - Power Input at 1 dB Compression
   - IF = 30 MHz, Hi-Side LO
   - IF = 30 MHz    RF = –10 dBm  Hi-Side LO

10. **Relative IF Response**
    - Relative IF Response
    - \( F_L = 12.0 \text{ GHz, Hi-Side LO} \)
    - \( F_L = 12.0 \text{ GHz, Low-Side LO} \)

11. **Intercept Point**
    - Intercept Point
    - IP2
    - IP3

12. **VSWR**
    - VSWR
    - 1-Level of the \( f_I \) signal fed through to the R- and I-ports with respect to the level of the \( f_L \) signal at the L-port.

13. **VSWR of the I- and R-ports in a 50-ohm system. Some variation in the R-port VSWR will occur as a function of the L-port frequency as shown above.**

14. **Conversion loss of the mixer when used in an SSB system. The frequency ordinate refers to the R-port \( f_R \) with \( f_I \) at 30 MHz.**

15. **The minimum recommended drive level is +7 dBm.**

16. **The maximum recommended drive level is +22 dBm.**