MA4EXP240L-1277

Silicon Double Balanced HMIC Mixer
2300 - 2800 MHz

Features

- + 18 dBm Typical Input IP3
- 8.3 dB Typical Conversion Loss
- +5 to +9 dBm LO Drive
- Fully Balanced Passive Mixer
- NO External Matching Required
- Low Cost Miniature Plastic MLP Package
- RoHS* Compliant with 260 °C Reflow Capability
- 100 % MATTE Tin Plating

Description and Applications

The MA4EXP240L-1277 is a silicon monolithic 2300 - 2800 MHz, low barrier, double balanced mixer in a low cost, miniature surface mount FQFP-N 3mm Square, 16 lead plastic package. The die uses M/A-COM’s unique HMIC silicon/glass process to realize low loss passive elements while retaining the advantages of low barrier silicon schottky barrier diodes to produce a compact device.

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

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA4EXP240L-1277T</td>
<td>Tape and Reel</td>
</tr>
</tbody>
</table>

MLP 3mm Package
(Circuit Side View)

PIN Configuration

<table>
<thead>
<tr>
<th>PIN</th>
<th>Function</th>
<th>PIN</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N/C</td>
<td>9</td>
<td>N/C</td>
</tr>
<tr>
<td>2</td>
<td>N/C</td>
<td>10</td>
<td>RF</td>
</tr>
<tr>
<td>3</td>
<td>LO</td>
<td>11</td>
<td>N/C</td>
</tr>
<tr>
<td>4</td>
<td>N/C</td>
<td>12</td>
<td>N/C</td>
</tr>
<tr>
<td>5</td>
<td>N/C</td>
<td>13</td>
<td>N/C</td>
</tr>
<tr>
<td>6</td>
<td>N/C</td>
<td>14</td>
<td>IF</td>
</tr>
<tr>
<td>7</td>
<td>N/C</td>
<td>15</td>
<td>N/C</td>
</tr>
<tr>
<td>8</td>
<td>N/C</td>
<td>16</td>
<td>N/C</td>
</tr>
</tbody>
</table>

1. Package bottom is electrical ground

## 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>Avg.</th>
<th>Max.</th>
</tr>
</thead>
</table>
| Conversion Loss         | 2500 MHz  
2300-2800 MHz          | LO Drive = +7 dBm  
RF = -10 dBm, IF = 60 MHz   | dB    | -    | 8.3  | 9.8  |
|                         |                           |                                  |       | 8.5  |      | 10.5 |
| L - R Isolation         | 2500 MHz  
2300-2800 MHz          | LO Drive = +7 dBm  
RF Level = -10 dBm       | dB    | -    | 51.0 | -    |
|                         |                           |                                  |       |      | 51.0 |      |
| L - I Isolation         | 2500 MHz  
2300-2800 MHz          | LO Drive = +7 dBm  
RF Level = -10 dBm       | dB    | -    | 42.0 | -    |
|                         |                           |                                  |       |      | 39.0 |      |
| R - I Isolation         | 2500 MHz  
2300-2800 MHz          | LO Drive = +7 dBm  
RF Level = -10 dBm       | dB    | -    | 23.0 | -    |
|                         |                           |                                  |       |      | 23.0 |      |
| LO VSWR                 | 2500 MHz  
2300-2800 MHz          | LO Drive = +7 dBm  
RF Level = -10 dBm       | Ratio | 2.0:1|      | 1.9:1|
| RF VSWR                 | 2500 MHz  
2300-2800 MHz          | LO Drive = +7 dBm  
RF Level = -10 dBm       | Ratio | 1.6:1|      | 1.7:1|
| IF VSWR                 | DC - 200 MHz              | LO Drive = +7 dBm  
RF Level = -10 dBm       | Ratio | 1.5:1|      |      |
| Input IP3               | 2500 MHz  
2300-2800 MHz          | LO Drive = +7 dBm  
RF = -10 dBm, IF = 60 MHz | dBm   | 15   | 18.4 | 20.3 |
| Input 1 dB Compression  | 2500 MHz  
2300-2800 MHz          | LO Drive = +7 dBm  
IF = 60 MHz               | dBm   | 4.8  |      |      |
Silicon Double Balanced HMIC Mixer
2300 - 2800 MHz

Typical Performance Curves (LO Drive = +5/+7/+9 dBm, RF = -10 dBm, IF = 60 MHz)

Conversion Loss

Input IP3
Silicon Double Balanced HMIC Mixer
2300 - 2800 MHz

Typical Performance Curves (LO Drive = +5/7/9 dBm, RF = -10 dBm, IF = 60 MHz)

Isolation (LO Drive= +7dbm, RF= -10dBm)

VSWR (LO Drive= +7dbm, RF= -10dBm, IF=-10dBm)
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2300 - 2800 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 C.W.</td>
</tr>
<tr>
<td>Incident RF Power</td>
<td>+20 dBm C.W.</td>
</tr>
<tr>
<td>Soldering Temperature</td>
<td>+260 °C max</td>
</tr>
</tbody>
</table>

1. Exceeding these limits may cause permanent damage.
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MA4EXP240L-1277 Outline – 3mm FQFP-N 16 Lead Saw Singulated

NOTES:
1. REFER TO MSOD-295O FOR ADDITIONAL DIMENSIONAL AND TOLERANCE INFORMATION.
2. REFER TO MSOD-32283 APPLICATION NOTE FOR PCB FOOTPRINT INFORMATION.
3. ALL DIMENSIONS SHOWN AS INCHES/MM.
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