

# Surface Mount Frequency Mixer

## RMS-5L+

Level 3 (LO Power +3 dBm) 400 to 1400 MHz



CASE STYLE: TT240

### Maximum Ratings

|   |                |
|---|----------------|
| Operating Temperature   | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |
| RF Power  | 50mW           |
| IF Current  | 40mA           |
| Permanent damage may occur if any of these limits are exceeded. |                |

### Pin Connections

|        |       |
|--------|-------|
| LO     | 1     |
| RF     | 4     |
| IF     | 5     |
| GROUND | 2,3,6 |

### Features

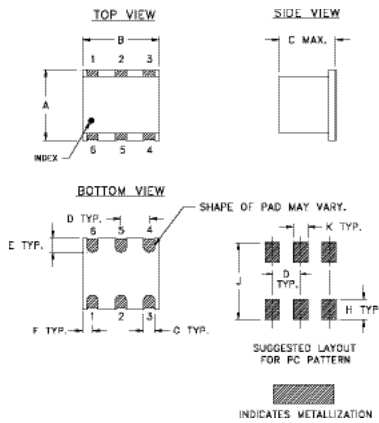
- good conversion loss, 7.0 dB typ.
- small size, 0.25"x0.31"x0.2"
- wide bandwidth, 400-1400 MHz

### Applications

- cellular
- ISM/GSM
- satellite distribution

**+RoHS Compliant**  
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

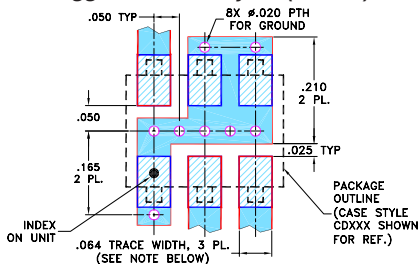
### Outline Drawing



### Outline Dimensions (inch/mm)

| A    | B    | C    | D    | E     | F    |
|------|------|------|------|-------|------|
| .250 | .31  | .20  | .100 | .050  | .055 |
| 6.35 | 7.87 | 5.08 | 2.54 | 1.27  | 1.40 |
| G    | H    | J    | K    | wt    |      |
| .040 | .070 | .270 | .050 | grams |      |
| 1.02 | 1.78 | 6.86 | 1.27 | 0.50  |      |

### Demo Board MCL P/N: TB-03 Suggested PCB Layout (PL-052)



- NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
  2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
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### Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.  
 B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.  
 C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)

### Electrical Specifications

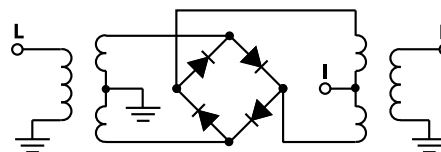
| FREQUENCY (MHz)    | CONVERSION LOSS (dB)    | LO-RF ISOLATION (dB) | LO-IF ISOLATION (dB) | IP3 at center band (dBm) |
|--------------------|-------------------------|----------------------|----------------------|--------------------------|
| $f_L - f_U$        | $\bar{X}$ $\sigma$ Max. | Typ.    Min.         | Typ.    Min.         | Typ.                     |
| 400-1400    DC-800 | 7.0    0.2    9.8       | 22    14             | 22    6              | 9                        |

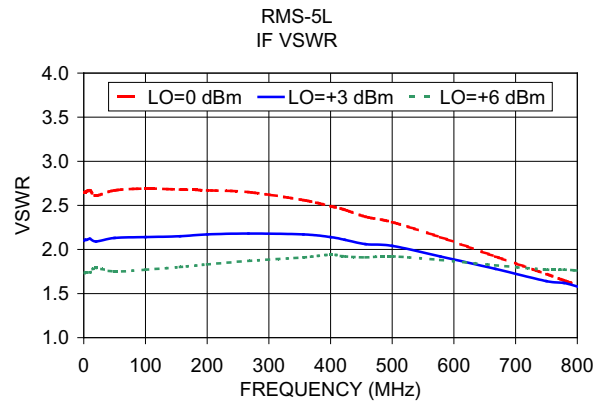
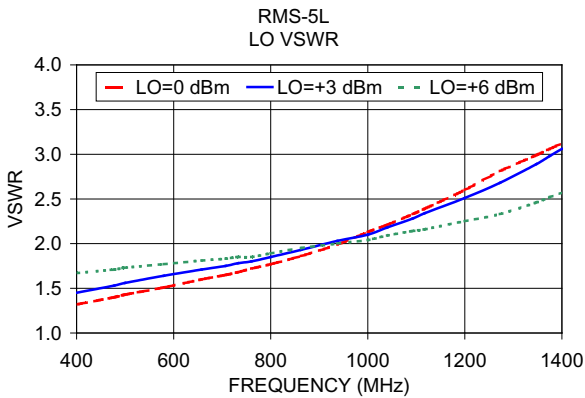
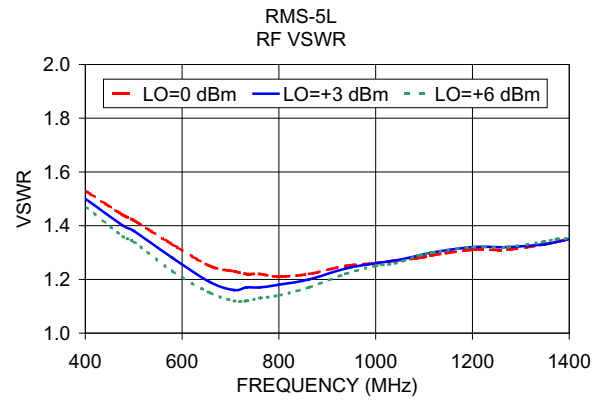
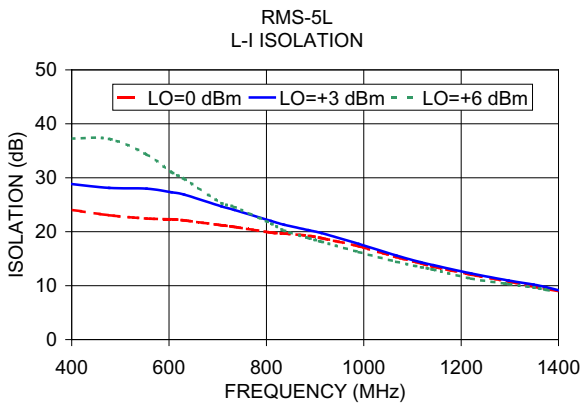
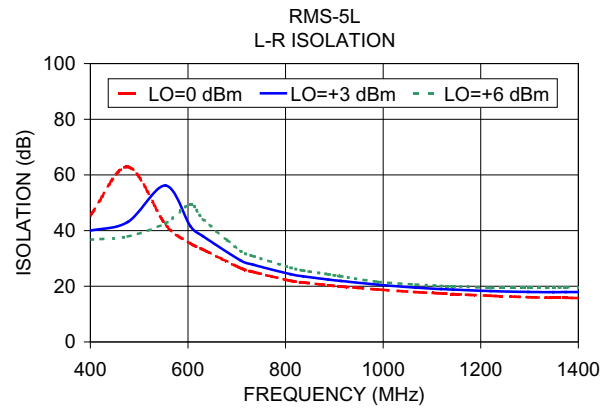
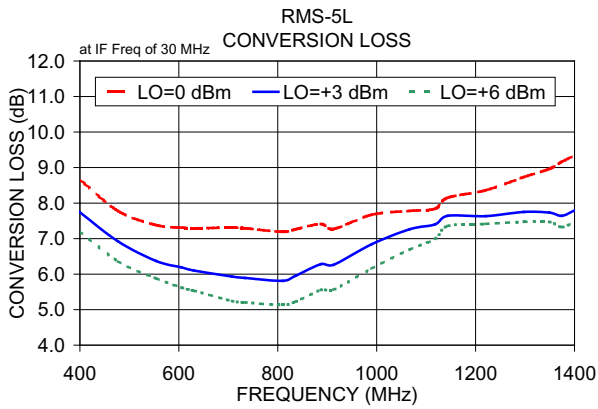
1 dB COMP.: -3 dBm typ.  
 For phase detection, DC output positive with in-phase RF & LO.  
 L = low range [ $f_L$  to  $10 f_L$ ]    M = mid range [ $10 f_L$  to  $f_U/2$ ]    U = upper range [ $f_U/2$  to  $f_U$ ]  
 m = mid band [ $2f_L$  to  $f_U/2$ ]

### Typical Performance Data

| Frequency (MHz) |         | Conversion Loss (dB) | Isolation L-R (dB) | Isolation L-I (dB) | VSWR RF Port (:1) | VSWR LO Port (:1) |
|-----------------|---------|----------------------|--------------------|--------------------|-------------------|-------------------|
| RF              | LO      | LO +3dBm             | LO +3dBm           | LO +3dBm           | LO +3dBm          | LO +3dBm          |
| 400.00          | 430.00  | 7.74                 | 39.94              | 28.82              | 1.50              | 1.45              |
| 476.92          | 506.92  | 6.92                 | 43.12              | 28.11              | 1.40              | 1.53              |
| 553.85          | 583.85  | 6.37                 | 56.16              | 27.98              | 1.38              | 1.56              |
| 605.13          | 635.13  | 6.19                 | 41.52              | 27.30              | 1.28              | 1.64              |
| 630.77          | 660.77  | 6.10                 | 37.96              | 26.89              | 1.19              | 1.71              |
| 707.69          | 737.69  | 5.93                 | 29.29              | 24.68              | 1.16              | 1.75              |
| 733.33          | 763.33  | 5.89                 | 27.74              | 24.04              | 1.17              | 1.78              |
| 810.26          | 840.26  | 5.81                 | 24.32              | 21.96              | 1.17              | 1.80              |
| 835.90          | 865.90  | 5.95                 | 23.55              | 21.29              | 1.18              | 1.85              |
| 887.18          | 917.18  | 6.28                 | 22.39              | 20.26              | 1.20              | 1.93              |
| 912.82          | 942.82  | 6.26                 | 21.89              | 19.74              | 1.24              | 2.03              |
| 989.74          | 959.74  | 6.84                 | 20.56              | 17.73              | 1.26              | 2.10              |
| 1066.67         | 1036.67 | 7.26                 | 19.47              | 15.58              | 1.27              | 2.18              |
| 1117.95         | 1087.95 | 7.40                 | 18.97              | 14.31              | 1.29              | 2.28              |
| 1143.59         | 1113.59 | 7.64                 | 18.77              | 13.78              | 1.30              | 2.34              |
| 1220.51         | 1190.51 | 7.63                 | 18.25              | 12.26              | 1.32              | 2.51              |
| 1297.44         | 1267.44 | 7.75                 | 17.96              | 10.95              | 1.32              | 2.68              |
| 1348.72         | 1318.72 | 7.73                 | 17.87              | 10.20              | 1.33              | 2.89              |
| 1374.36         | 1344.36 | 7.64                 | 17.90              | 9.72               | 1.34              | 2.98              |
| 1400.00         | 1370.00 | 7.79                 | 17.92              | 9.13               | 1.35              | 3.06              |

### Electrical Schematic





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