

# Surface Mount Frequency Mixer

Level 17 (LO Power +17dBm) 2 to 500 MHz

## LRMS-1HJ+



Generic photo used for illustration purposes only

CASE STYLE: QQQ569

**+RoHS Compliant**

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

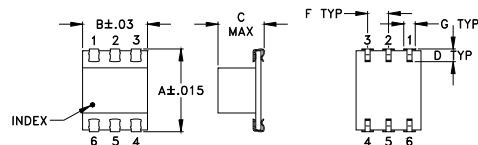
### Maximum Ratings

|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| Operating Temperature                                           | -40°C to 85°C  |
| Storage Temperature                                             | -55°C to 100°C |
| RF Power                                                        | 200mW          |
| IF Current                                                      | 40mA           |
| Permanent damage may occur if any of these limits are exceeded. |                |

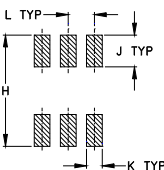
### Pin Connections

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

### Outline Drawing



#### PCB Land Pattern

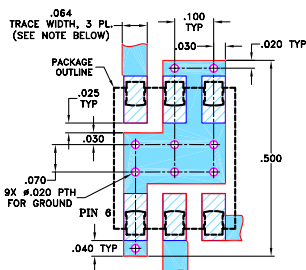


Suggested Layout,  
Tolerance to be within ±.002

### Outline Dimensions ( inch )

| A     | B    | C    | D    | E  | F     | G    |
|-------|------|------|------|----|-------|------|
| .390  | .31  | .225 | .060 | -- | .100  | .045 |
| 9.91  | 7.87 | 5.72 | 1.52 | -- | 2.54  | 1.14 |
| H     | J    | K    | L    | M  | wt    |      |
| .420  | .120 | .060 | .100 | -- | grams |      |
| 10.67 | 3.05 | 1.52 | 2.54 | -- | 0.50  |      |

### Demo Board MCL P/N: TB-44+ Suggested PCB Layout (PL-083)



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; 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.
3. DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
4. DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### Features

- low conversion loss, 6.25 dB typ.
- excellent L-R isolation, 44 dB typ.
- aqueous washable
- J-leads for strain relief

### Applications

- HF/VHF/UHF
- instrumentation

### Electrical Specifications

| FREQUENCY<br>(MHz)     |        | CONVERSION LOSS<br>(dB) |          |      |                        | LO-RF ISOLATION<br>(dB) |      |      |      |      |      | LO-IF ISOLATION<br>(dB) |      |      |      |    |    | IP3<br>at center<br>band<br>(dBm) |
|------------------------|--------|-------------------------|----------|------|------------------------|-------------------------|------|------|------|------|------|-------------------------|------|------|------|----|----|-----------------------------------|
| LO/RF<br>$f_L$ - $f_U$ | IF     | Mid-Band<br>m           |          |      | Total<br>Range<br>Max. | L                       |      | M    |      | U    |      | L                       |      | M    |      | U  |    |                                   |
|                        |        | $\overline{X}$          | $\sigma$ | Max. |                        | Typ.                    | Min. | Typ. | Min. | Typ. | Min. | Typ.                    | Min. | Typ. | Min. |    |    |                                   |
|                        |        |                         |          |      |                        |                         |      |      |      |      |      |                         |      |      |      |    |    |                                   |
| 2-500                  | DC-500 | 6.25                    | .034     | 7.0  | 8.5                    | 55                      | 44   | 44   | 25   | 33   | 20   | 50                      | 34   | 45   | 25   | 37 | 22 | 25                                |

1 dB COMP.: +14 dBm typ.

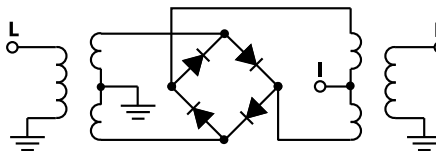
L = low range [ $f_L$  to 10  $f_L$ ]  
m= mid band [ $2f_L$  to  $f_U/2$ ]

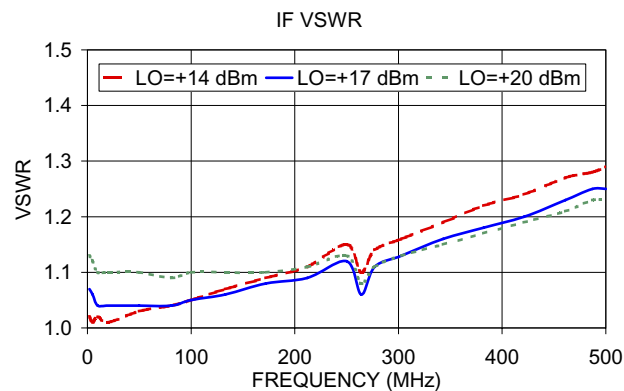
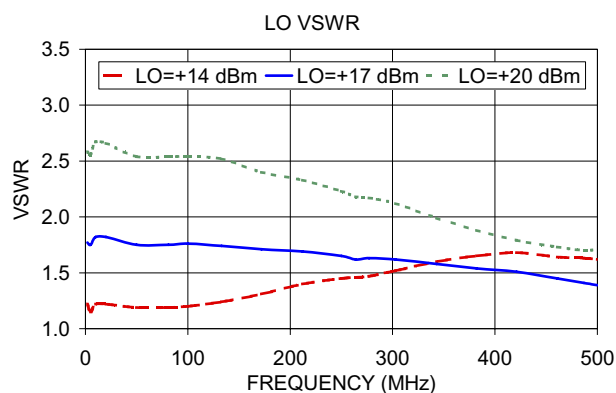
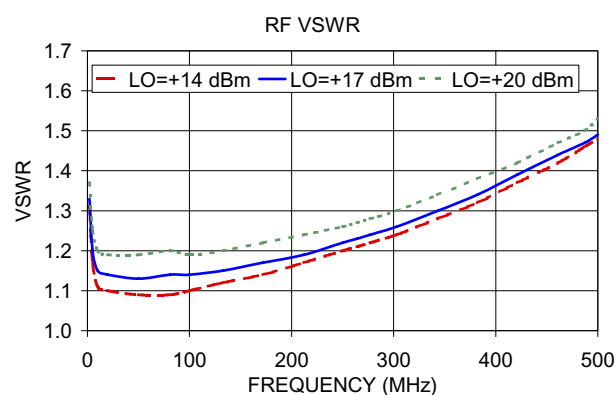
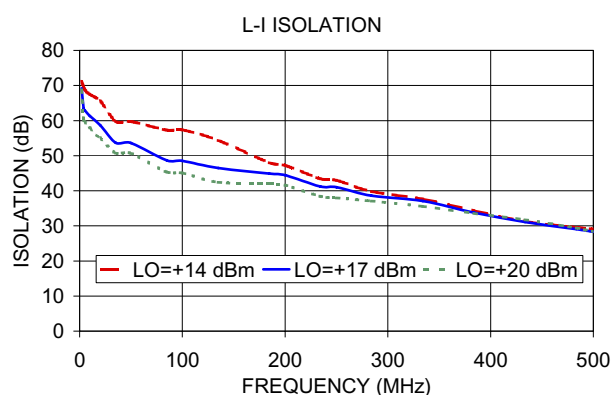
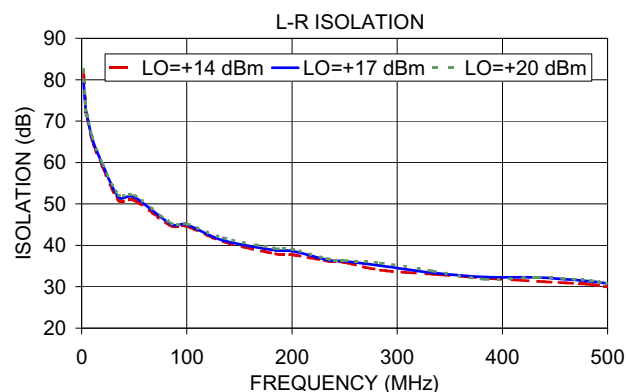
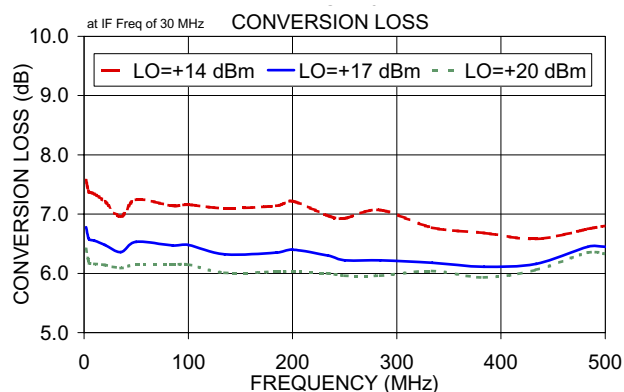
M = mid range [10  $f_L$  to  $f_U/2$ ]  
U = upper range [ $f_U/2$  to  $f_U$ ]

### Typical Performance Data

| Frequency<br>(MHz) |        | Conversion<br>Loss<br>(dB) | Isolation<br>L-R<br>(dB) | Isolation<br>L-I<br>(dB) | VSWR<br>RF Port<br>(:1) | VSWR<br>LO Port<br>(:1) |
|--------------------|--------|----------------------------|--------------------------|--------------------------|-------------------------|-------------------------|
| RF                 | LO     | LO<br>+17dBm               | LO<br>+17dBm             | LO<br>+17dBm             | LO<br>+17dBm            | LO<br>+17dBm            |
| 2.00               | 32.00  | 6.78                       | 79.29                    | 69.19                    | 1.33                    | 1.77                    |
| 4.00               | 34.00  | 6.60                       | 72.35                    | 63.39                    | 1.20                    | 1.75                    |
| 5.00               | 35.00  | 6.57                       | 71.51                    | 62.98                    | 1.15                    | 1.82                    |
| 10.00              | 40.00  | 6.55                       | 65.84                    | 61.30                    | 1.14                    | 1.82                    |
| 20.00              | 50.00  | 6.48                       | 59.50                    | 58.68                    | 1.13                    | 1.75                    |
| 35.20              | 65.20  | 6.36                       | 51.64                    | 53.67                    | 1.14                    | 1.75                    |
| 50.00              | 80.00  | 6.53                       | 51.61                    | 53.63                    | 1.14                    | 1.76                    |
| 85.00              | 55.00  | 6.47                       | 45.13                    | 48.67                    | 1.15                    | 1.74                    |
| 100.00             | 70.00  | 6.48                       | 44.98                    | 48.52                    | 1.17                    | 1.71                    |
| 134.80             | 104.80 | 6.32                       | 41.19                    | 46.50                    | 1.19                    | 1.69                    |
| 184.60             | 154.60 | 6.35                       | 38.78                    | 44.90                    | 1.22                    | 1.65                    |
| 200.00             | 170.00 | 6.40                       | 38.62                    | 44.42                    | 1.23                    | 1.62                    |
| 234.40             | 204.40 | 6.30                       | 36.44                    | 41.20                    | 1.24                    | 1.63                    |
| 250.00             | 220.00 | 6.22                       | 36.14                    | 41.01                    | 1.26                    | 1.62                    |
| 284.20             | 254.20 | 6.22                       | 35.11                    | 38.57                    | 1.30                    | 1.58                    |
| 334.00             | 304.00 | 6.18                       | 33.38                    | 37.07                    | 1.34                    | 1.54                    |
| 383.80             | 353.80 | 6.11                       | 32.33                    | 33.77                    | 1.39                    | 1.51                    |
| 433.60             | 403.60 | 6.16                       | 32.22                    | 31.10                    | 1.44                    | 1.45                    |
| 483.40             | 453.40 | 6.45                       | 31.29                    | 29.09                    | 1.47                    | 1.41                    |
| 500.00             | 470.00 | 6.45                       | 30.80                    | 28.30                    | 1.49                    | 1.39                    |

### Electrical Schematic





## Notes

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