

# Surface Mount Frequency Mixer

Level 7 (LO Power +7 dBm) 0.5 to 500 MHz

## ADE-1



CASE STYLE: CD636

### Maximum Ratings

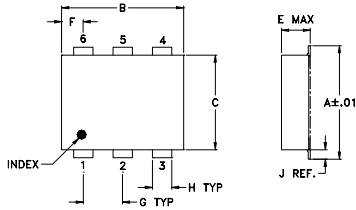
|                       |                |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |
| RF Power              | 50mW           |
| IF Current            | 40mA           |

Permanent damage may occur if any of these limits are exceeded. These electrical ratings are not intended for continuous normal operation.

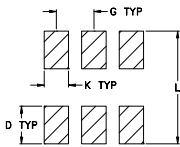
### Pin Connections

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

### Outline Drawing



### PCB Land Pattern

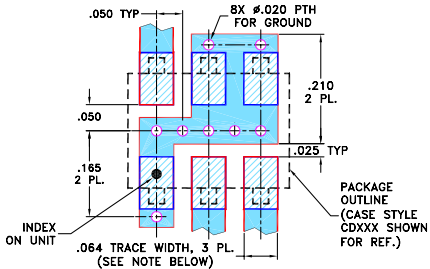


Suggested Layout,  
Tolerance to be within ±.002

### Outline Dimensions (inch/mm)

| A    | B    | C    | D    | E     | F    | G    |
|------|------|------|------|-------|------|------|
| .272 | .310 | .220 | .100 | .162  | .055 | .100 |
| 6.91 | 7.87 | 5.59 | 2.54 | 4.11  | 1.40 | 2.54 |
| H    | J    | K    | L    | wt    |      |      |
| .030 | .026 | .065 | .300 | grams |      |      |
| 0.76 | 0.66 | 1.65 | 7.62 | 0.25  |      |      |

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



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B 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.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### 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.  
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### Features

- low conversion loss, 5.0 dB typ.
- excellent L-R isolation, 55 dB typ.
- excellent IP3, 15 dBm typ.
- low profile package
- aqueous washable
- protected by US patent 6,133,525

### Applications

- VHF/UHF

Available Tape and Reel at no extra cost

| Reel Size | Devices/Reel          |
|-----------|-----------------------|
| 7"        | 20, 50, 100, 200, 500 |
| 13"       | 500, 1000             |

### Electrical Specifications

| FREQUENCY (MHz)      | CONVERSION LOSS (dB)                   | LO-RF ISOLATION (dB) |      |      | LO-IF ISOLATION (dB) |      |      | IP3 at center band (dBm) |    |    |    |    |    |    |    |    |    |    |
|----------------------|--|----------------------|------|------|----------------------|------|------|--------------------------|----|----|----|----|----|----|----|----|----|----|
|                      |  | L                    | M    | U    | L                    | M    | U    |                          |    |    |    |    |    |    |    |    |    |    |
| LO/RF<br>$f_L - f_U$ | Mid-Band<br>$m$<br>Total Range<br>Max. | Typ.                 | Min. | Typ. | Min.                 | Typ. | Min. | Typ.                     |    |    |    |    |    |    |    |    |    |    |
| 0.5-500              | DC-500                                 | 5.0                  | 0.10 | 6.5  | 7.8                  | 70   | 50   | 55                       | 35 | 45 | 30 | 65 | 45 | 40 | 25 | 30 | 20 | 15 |

1 dB COMP.: +1 dBm typ.

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

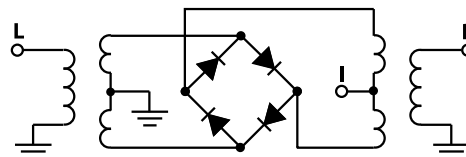
M = mid range [ $10 f_L$  to  $f_U/2$ ]

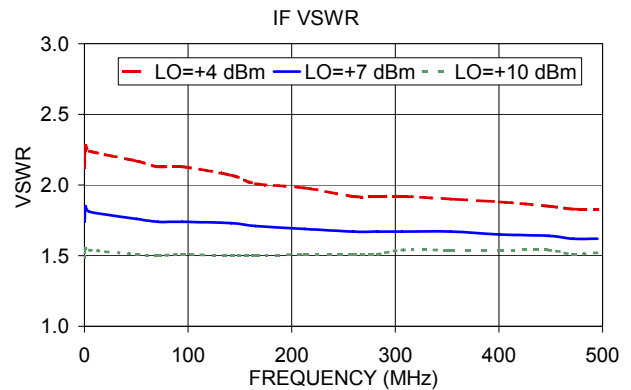
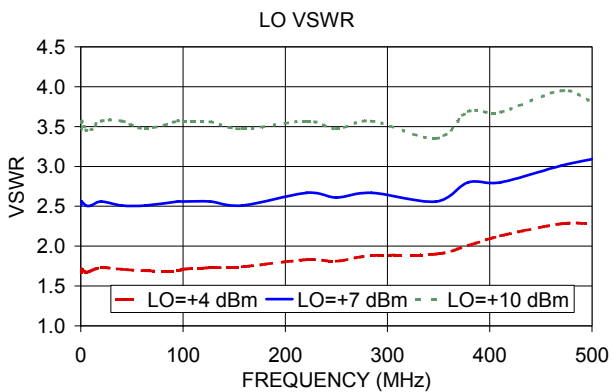
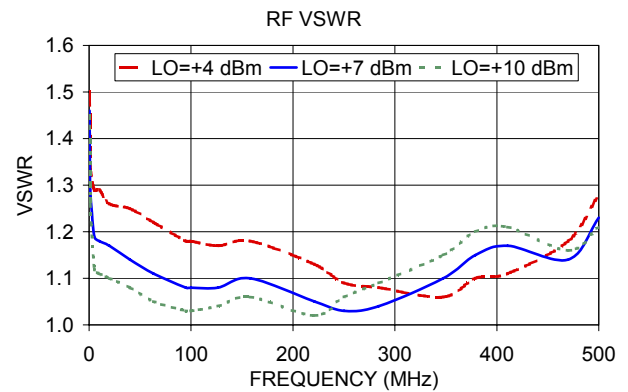
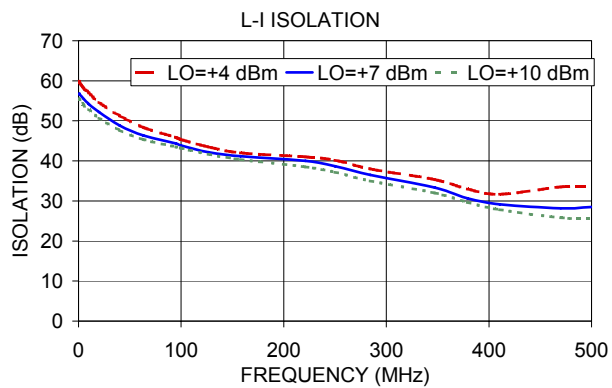
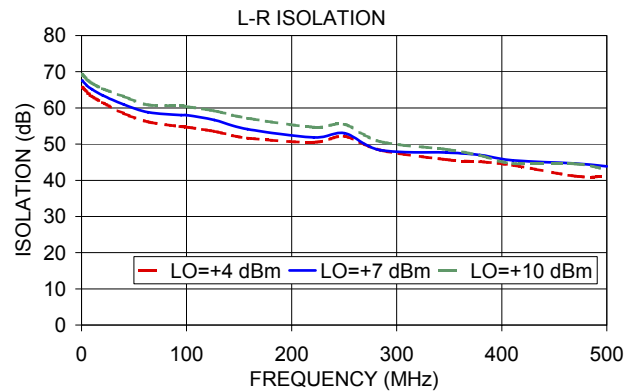
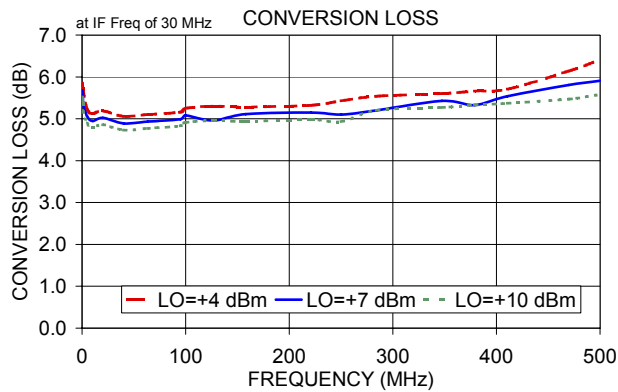
U = upper range [ $f_U/2$  to  $f_U$ ]

### Typical Performance Data

| Frequency (MHz) |        | Conversion Loss (dB) | Isolation L-R (dB) | Isolation L-I (dB) | VSWR RF Port (:1) | VSWR LO Port (:1) |
|-----------------|--------|----------------------|--------------------|--------------------|-------------------|-------------------|
| RF              | LO     | LO +7dBm             | LO +7dBm           | LO +7dBm           | LO +7dBm          | LO +7dBm          |
| 0.50            | 30.50  | 5.68                 | 67.49              | 56.67              | 1.46              | 2.51              |
| 0.80            | 30.80  | 5.55                 | 67.50              | 56.83              | 1.32              | 2.56              |
| 1.00            | 31.00  | 5.35                 | 67.51              | 56.67              | 1.29              | 2.56              |
| 5.00            | 35.00  | 5.06                 | 66.17              | 55.50              | 1.19              | 2.51              |
| 10.00           | 40.00  | 4.95                 | 65.17              | 54.17              | 1.18              | 2.51              |
| 20.00           | 50.00  | 5.02                 | 63.50              | 52.17              | 1.17              | 2.56              |
| 40.00           | 70.00  | 4.89                 | 61.00              | 48.83              | 1.14              | 2.51              |
| 63.25           | 93.25  | 4.93                 | 58.84              | 46.33              | 1.11              | 2.51              |
| 94.82           | 124.82 | 4.99                 | 58.00              | 44.34              | 1.08              | 2.56              |
| 100.00          | 130.00 | 5.08                 | 58.00              | 43.84              | 1.08              | 2.56              |
| 126.39          | 156.39 | 4.96                 | 56.67              | 42.17              | 1.08              | 2.56              |
| 157.97          | 187.97 | 5.11                 | 54.16              | 41.16              | 1.10              | 2.51              |
| 221.12          | 251.12 | 5.15                 | 51.84              | 40.00              | 1.05              | 2.67              |
| 250.00          | 280.00 | 5.10                 | 53.00              | 38.67              | 1.03              | 2.61              |
| 284.26          | 314.26 | 5.20                 | 48.33              | 36.50              | 1.04              | 2.67              |
| 347.41          | 377.41 | 5.43                 | 47.66              | 33.34              | 1.10              | 2.56              |
| 378.98          | 408.98 | 5.33                 | 47.00              | 30.67              | 1.15              | 2.80              |
| 410.56          | 440.56 | 5.54                 | 45.50              | 29.17              | 1.17              | 2.80              |
| 470.00          | 500.00 | 5.81                 | 44.67              | 28.16              | 1.14              | 3.01              |
| 500.00          | 530.00 | 5.91                 | 43.82              | 28.50              | 1.23              | 3.09              |

### Electrical Schematic





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