

# Surface Mount Frequency Mixer

Level 7 (LO Power +7 dBm) 50 to 1600 MHz

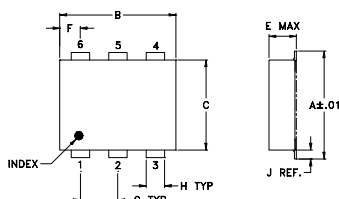
## Maximum Ratings

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

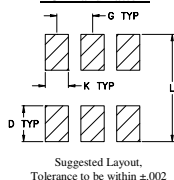
## Pin Connections

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

## Outline Drawing



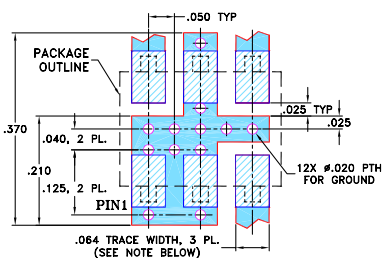
### PCB Land Pattern



## Outline Dimensions (inch/mm)

| A    | B    | C    | D    | E     | F    | G    |
|------|------|------|------|-------|------|------|
| .272 | .310 | .220 | .100 | .082  | .055 | .100 |
| 6.91 | 7.87 | 5.59 | 2.54 | 2.08  | 1.40 | 2.54 |
| H    | J    | K    | L    | wt    |      |      |
| .030 | .026 | .065 | .300 | grams |      |      |
| 0.76 | 0.66 | 1.65 | 7.62 | 0.15  |      |      |

## Demo Board MCL P/N: TB-02 Suggested PCB Layout (PL-051)



- 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

## Features

- low conversion loss, 8.1 dB typ.
- excellent L-R isolation, 40 dB typ.
- low profile package
- aqueous washable
- protected by U.S. Patent 6,133,525

## Applications

- satellite distribution
- GPS

ADE-13+  
ADE-13



CASE STYLE: CD541  
PRICE: \$3.10 ea. QTY (20)

+RoHS Compliant

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



Available Tape and Reel  
at no extra cost

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

## 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><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. | Typ. | Min. |                                   |
|                            |         |                         |          |      |                        |                         |      |      |      |      |      |                         |      |      |      |      |      |                                   |
| 50-1600                    | 50-1000 | 8.1                     | 0.10     | 9.0  | 9.8                    | 50                      | 25   | 40   | 25   | 33   | 20   | 49                      | 30   | 35   | 20   | 32   | 20   | 11                                |

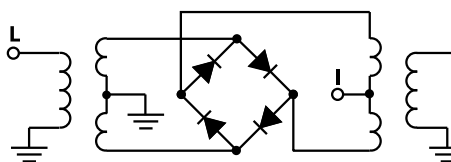
1 dB COMP.: +1 dBm typ.

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>+7dBm                | LO<br>+7dBm              | LO<br>+7dBm              | LO<br>+7dBm             | LO<br>+7dBm             |
| 50.00              | 80.00   | 7.46                       | 55.80                    | 52.20                    | 1.07                    | 2.68                    |
| 100.00             | 130.00  | 7.58                       | 52.00                    | 47.90                    | 1.05                    | 2.72                    |
| 160.71             | 190.71  | 7.51                       | 49.30                    | 44.30                    | 1.01                    | 2.61                    |
| 271.43             | 301.43  | 7.74                       | 45.70                    | 40.50                    | 1.13                    | 2.58                    |
| 300.00             | 330.00  | 7.76                       | 45.00                    | 39.70                    | 1.17                    | 2.72                    |
| 382.14             | 412.14  | 7.69                       | 43.20                    | 38.00                    | 1.31                    | 2.65                    |
| 492.86             | 522.86  | 7.86                       | 40.40                    | 36.20                    | 1.49                    | 2.61                    |
| 500.00             | 530.00  | 7.92                       | 40.40                    | 36.10                    | 1.50                    | 2.61                    |
| 603.57             | 633.57  | 8.06                       | 37.80                    | 35.40                    | 1.71                    | 2.46                    |
| 714.29             | 744.29  | 8.16                       | 36.20                    | 34.40                    | 1.81                    | 2.35                    |
| 825.00             | 855.00  | 7.91                       | 35.30                    | 33.50                    | 1.69                    | 2.52                    |
| 935.71             | 965.71  | 7.87                       | 32.30                    | 33.20                    | 1.64                    | 2.72                    |
| 1000.00            | 1030.00 | 7.75                       | 31.00                    | 33.40                    | 1.63                    | 2.80                    |
| 1046.43            | 1076.43 | 7.87                       | 30.60                    | 33.60                    | 1.61                    | 2.80                    |
| 1157.14            | 1187.14 | 8.02                       | 30.00                    | 33.20                    | 1.48                    | 3.01                    |
| 1267.86            | 1297.86 | 8.09                       | 30.60                    | 32.80                    | 1.30                    | 3.26                    |
| 1300.00            | 1330.00 | 8.17                       | 31.50                    | 32.30                    | 1.27                    | 3.32                    |
| 1378.57            | 1408.57 | 8.24                       | 31.60                    | 31.90                    | 1.27                    | 3.57                    |
| 1489.29            | 1519.29 | 8.30                       | 28.10                    | 31.10                    | 1.42                    | 4.22                    |
| 1600.00            | 1630.00 | 8.40                       | 27.60                    | 30.80                    | 1.56                    | 5.33                    |

## Electrical Schematic



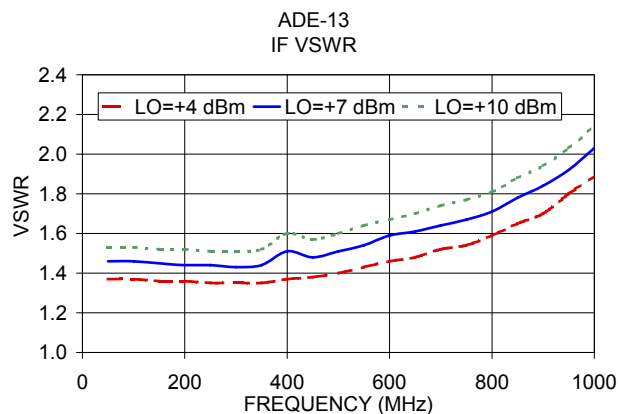
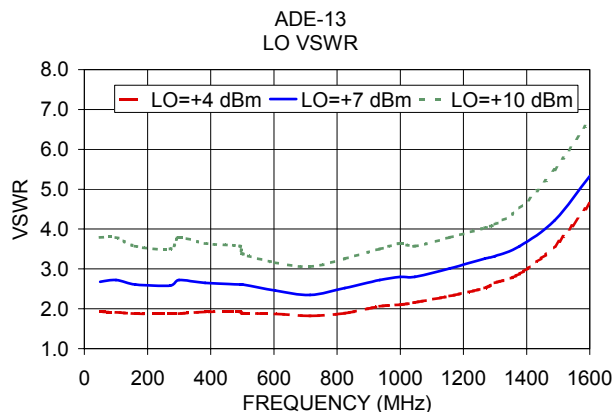
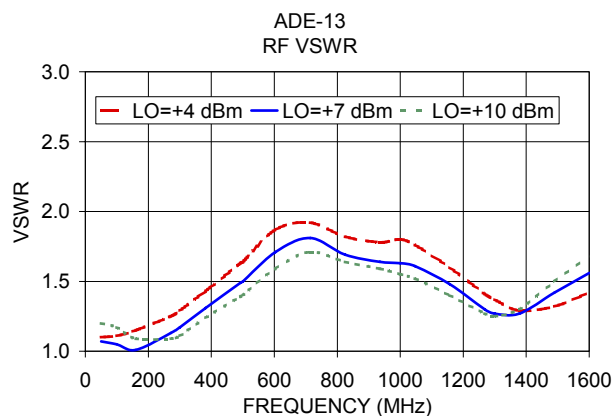
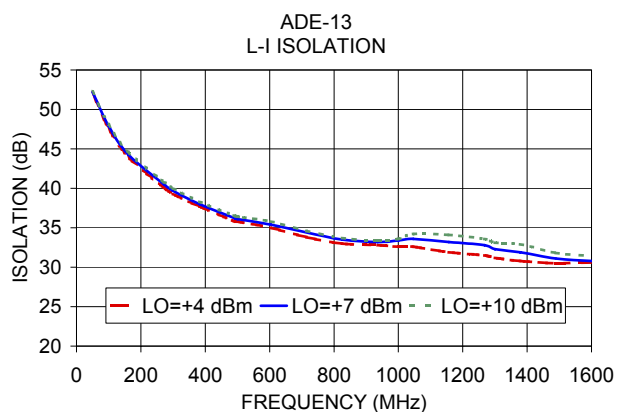
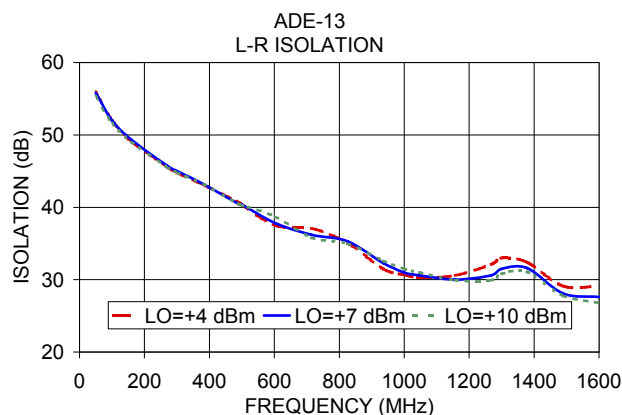
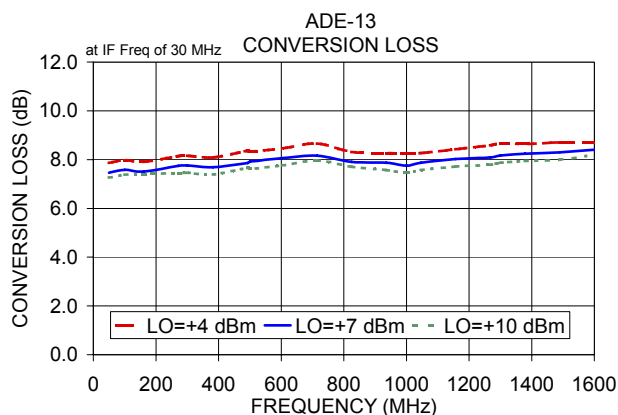
### Notes

- 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.  
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# Performance Charts

**ADE-13+**  
**ADE-13**



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