

# Frequency Mixer WIDE BAND

## Level 10 (LO Power +10 dBm) 3700 to 10000 MHz

SIM-14LH+



Generic photo used for illustration purposes only

CASE STYLE: HV1195

### Maximum Ratings

Operating Temperature -40°C to 85°C

Storage Temperature -55°C to 100°C

RF Power 50mW

For extended temperature range, consult factory.

Permanent damage may occur if any of these limits are exceeded.

### Pin Connections

LO 8

RF 4

IF 2

GROUND 1,3,5,6,7

### Features

- wide bandwidth, 3700 to 10000 MHz
- low conversion loss, 6.7 dB typ.
- high L-R isolation, 38 dB typ.
- excellent IF BW, DC to 4000 MHz
- LTCC double balanced mixer
- tiny size, low profile, 0.08"
- useable as up and down converter
- aqueous washable
- protected by US patent 7,027,795

### Applications

- satellite up and down converters
- defense radar and communications
- line of sight links
- federal fixed service
- WIFI
- blue tooth
- VSAT
- ISM

### 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) |
|---------------------------|--------------------------|----------|------|-------------------------|------|-------------------------|------|-----------------------------------|
|                           | Typ.                     | $\sigma$ | Max. | Typ.                    | Min. | Typ.                    | Min. |                                   |
| LO/RF<br>$f_L - f_U$      |                          |          |      |                         |      |                         |      |                                   |
| IF                        |                          |          |      |                         |      |                         |      |                                   |
| <b>3700-10000 DC-4000</b> |                          |          |      |                         |      |                         |      |                                   |
| 3700-6200                 | 6.7                      | 0.3      | 8.3  | 38                      | 29   | 17                      | 11   | 19                                |
| 6200-10000                | 6.7                      | 0.2      | 8.9  | 35                      | 21   | 17                      | 10   | 12                                |

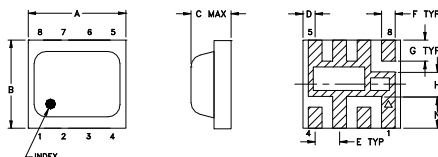
1 dB Compression: +5 dBm typ.

\* Conversion loss at 30 MHz IF.  $\sigma$  is a measure of repeatability from unit to unit.

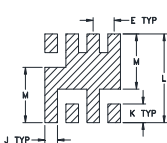
### Typical Performance Data

| 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>+10dBm               | LO<br>+10dBm             | LO<br>+10dBm             | LO<br>+10dBm            | LO<br>+10dBm            |
| 3560.00            | 3590.00  | 7.30                       | 40.15                    | 18.87                    | 2.43                    | 10.16                   |
| 3740.00            | 3770.00  | 6.82                       | 41.27                    | 19.21                    | 2.66                    | 5.72                    |
| 4100.00            | 4130.00  | 6.97                       | 39.63                    | 19.14                    | 3.31                    | 3.88                    |
| 4280.00            | 4310.00  | 6.98                       | 37.73                    | 18.69                    | 3.39                    | 3.74                    |
| 4460.00            | 4490.00  | 7.07                       | 37.45                    | 17.41                    | 3.38                    | 3.17                    |
| 4640.00            | 4670.00  | 6.93                       | 37.50                    | 16.34                    | 2.95                    | 2.36                    |
| 4820.00            | 4850.00  | 6.65                       | 38.46                    | 16.08                    | 3.15                    | 2.02                    |
| 5000.00            | 5030.00  | 6.74                       | 40.39                    | 15.55                    | 3.53                    | 1.54                    |
| 5600.00            | 5630.00  | 7.57                       | 39.12                    | 14.89                    | 4.40                    | 1.40                    |
| 6280.00            | 6310.00  | 7.02                       | 34.27                    | 15.14                    | 4.33                    | 2.83                    |
| 6620.00            | 6650.00  | 6.74                       | 29.98                    | 14.24                    | 3.08                    | 2.69                    |
| 6960.00            | 6990.00  | 6.30                       | 31.24                    | 14.80                    | 2.44                    | 2.91                    |
| 7300.00            | 7330.00  | 5.77                       | 32.63                    | 15.10                    | 1.77                    | 3.59                    |
| 7640.00            | 7670.00  | 5.56                       | 31.66                    | 14.68                    | 1.19                    | 3.25                    |
| 7980.00            | 8010.00  | 5.92                       | 29.76                    | 13.75                    | 1.42                    | 3.04                    |
| 8320.00            | 8350.00  | 6.27                       | 28.44                    | 14.18                    | 1.74                    | 2.43                    |
| 9000.00            | 9030.00  | 7.08                       | 40.25                    | 19.61                    | 3.19                    | 1.31                    |
| 9500.00            | 9530.00  | 7.74                       | 40.11                    | 23.53                    | 3.81                    | 1.49                    |
| 9810.00            | 9840.00  | 7.99                       | 37.87                    | 21.82                    | 4.39                    | 1.80                    |
| 10120.00           | 10150.00 | 8.04                       | 35.70                    | 21.02                    | 4.73                    | 2.05                    |

### Outline Drawing



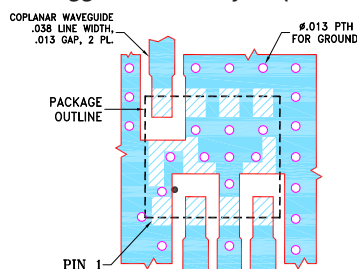
PCB Metal Land Pattern

Suggested Layout,  
Tolerance to be within ±0.02

### Outline Dimensions (inch mm)

| A    | B    | C      | D    | E    | F     | G     |
|------|------|--------|------|------|-------|-------|
| .200 | .180 | .087   | .025 | .050 | .028  | .043  |
| 5.08 | 4.57 | 2.2098 | 0.64 | 1.27 | 0.71  | 1.09  |
| H    | J    | K      | L    | M    | N     | wt    |
| .050 | .030 | .043   | .204 | .127 | 0.065 | grams |
| 1.27 | 0.76 | 1.09   | 5.18 | 3.23 | 1.65  | 0.08  |

### Demo Board MCL P/N: TB-382 Suggested PCB Layout (PL-239)



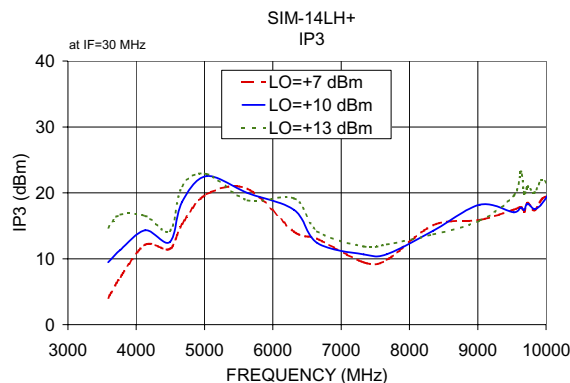
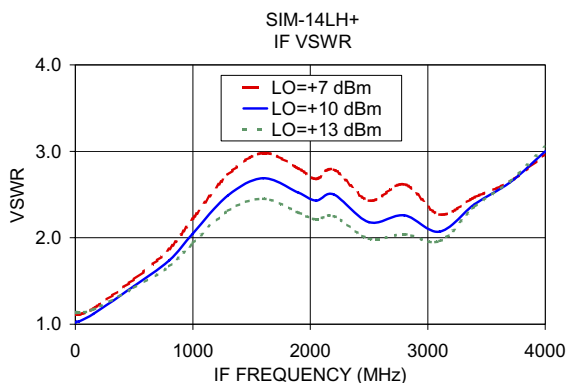
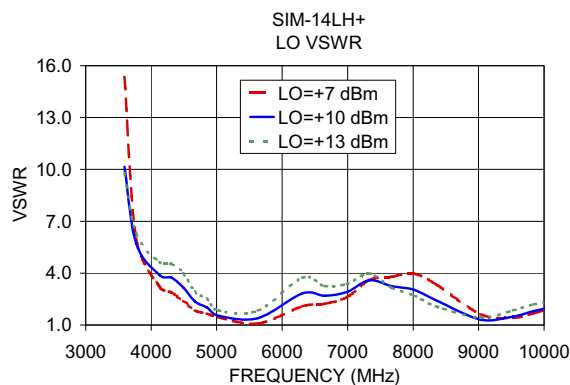
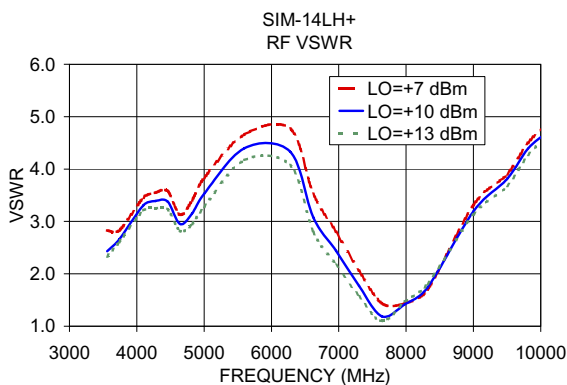
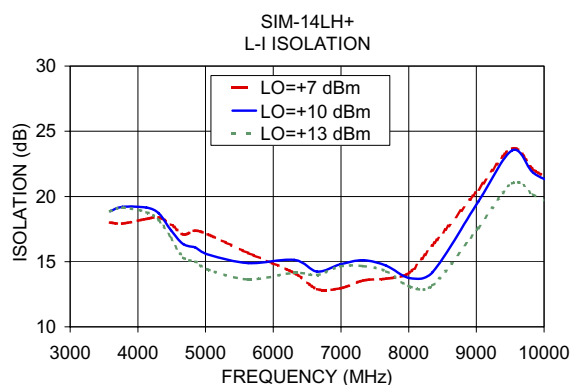
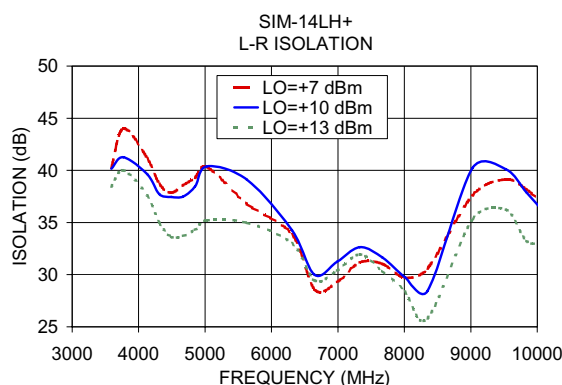
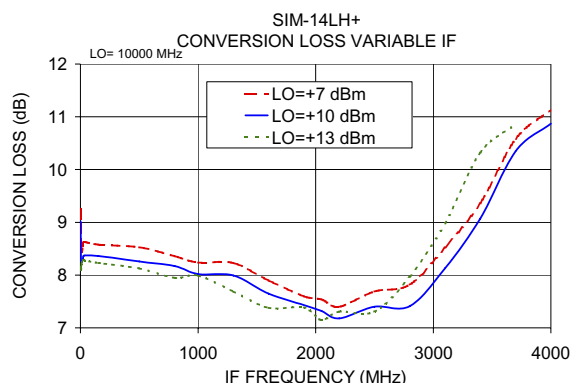
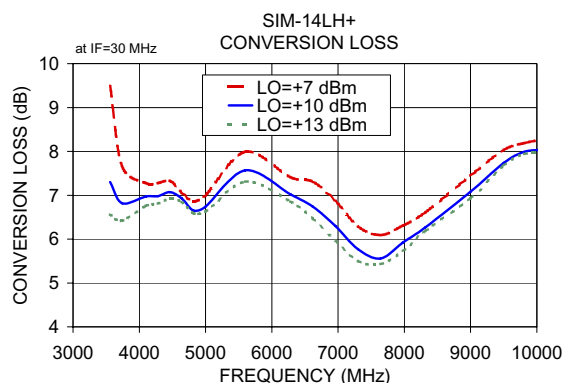
- NOTES:
1. TRACE WIDTH AND GAP ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020 ± 0.015; COPPER: 1/2 OZ. EACH SIDE.  
FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
  2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK 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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