

# Frequency Mixer WIDE BAND

SIM-43H+

Level 17 (LO Power +17 dBm) 1000 to 4000 MHz

## Maximum Ratings

Operating Temperature -40°C to 85°C

Storage Temperature -55°C to 100°C

RF Power 100mW

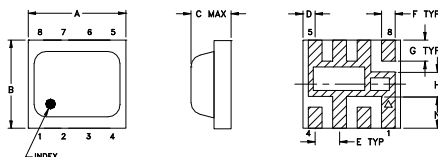
For extended temperature range, consult factory.

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

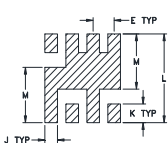
## Pin Connections

|        |           |
|--------|-----------|
| LO     | 8         |
| RF     | 4         |
| IF     | 2         |
| GROUND | 1,3,5,6,7 |

## Outline Drawing



PCB Metal Land Pattern

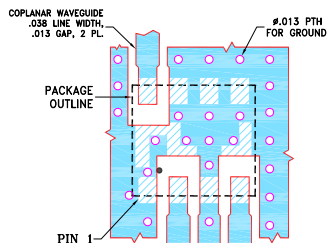


Suggested Layout, Tolerance to be within ±.002

## 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:

- TRACE WIDTH AND GAP ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020" ± .0015". COPPER: 1/2 OZ. EACH SIDE.  
FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
  - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- 

## Features

- wide bandwidth, 1000 to 4000 MHz, useable down to 800 MHz
- low conversion loss, 6.1 dB typ.
- excellent L-R isolation, 35 dB typ.
- 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

- cellular
- defense & weather radar
- defense communications
- PCN
- WCDMA
- WIFI
- blue tooth
- VSAT
- ISM

## Electrical Specifications

| FREQUENCY (MHz)        |         | CONVERSION LOSS* (dB) |          |      | LO-RF ISOLATION (dB) |      | LO-IF ISOLATION (dB) |      | IP3 at center band (dBm) |
|------------------------|---------|-----------------------|----------|------|----------------------|------|----------------------|------|--------------------------|
| LO/RF<br>$f_L$ - $f_U$ | IF      | Typ.                  | $\sigma$ | Max. | Typ.                 | Min. | Typ.                 | Min. | Typ.                     |
| 1000-4000              | DC-1500 |                       |          |      |                      |      |                      |      |                          |
| 1000-2500              |         | 6.5                   | 0.1      | 8.6  | 37                   | 32   | 24                   | 9    | 22                       |
| 2500-4000              |         | 5.7                   | 0.1      | 8.6  | 34                   | 28   | 20                   | 12   | 24                       |

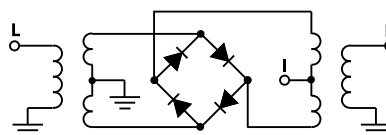
1 dB Compression: +14 dBm typ.

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

## 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 +17dBm            | LO +17dBm          | LO +17dBm          | LO +17dBm         | LO +17dBm         |
| 975.00          | 1005.00 | 7.97                 | 35.59              | 22.55              | 2.35              | 2.23              |
| 1050.00         | 1080.00 | 7.48                 | 39.31              | 23.71              | 2.71              | 1.56              |
| 1200.00         | 1230.00 | 6.87                 | 42.50              | 27.13              | 3.04              | 1.22              |
| 1350.00         | 1380.00 | 6.46                 | 40.87              | 31.37              | 3.16              | 1.61              |
| 1500.00         | 1530.00 | 6.32                 | 38.93              | 35.59              | 3.10              | 1.65              |
| 1650.00         | 1680.00 | 6.49                 | 36.73              | 30.94              | 2.99              | 1.83              |
| 1800.00         | 1830.00 | 6.62                 | 38.21              | 23.39              | 2.59              | 1.74              |
| 2025.00         | 2055.00 | 6.45                 | 36.69              | 14.20              | 2.47              | 1.16              |
| 2100.00         | 2130.00 | 6.56                 | 36.90              | 13.59              | 2.46              | 1.14              |
| 2250.00         | 2280.00 | 6.91                 | 37.09              | 14.23              | 2.57              | 1.48              |
| 2400.00         | 2430.00 | 6.43                 | 36.52              | 16.01              | 2.21              | 1.83              |
| 2550.00         | 2580.00 | 7.46                 | 37.89              | 17.58              | 2.91              | 1.75              |
| 2700.00         | 2730.00 | 6.37                 | 36.23              | 20.10              | 2.43              | 1.82              |
| 2850.00         | 2880.00 | 6.12                 | 32.81              | 21.75              | 1.93              | 1.70              |
| 3000.00         | 3030.00 | 5.65                 | 36.85              | 25.56              | 1.52              | 1.73              |
| 3105.00         | 3135.00 | 5.57                 | 35.17              | 31.30              | 1.40              | 1.85              |
| 3180.00         | 3210.00 | 5.54                 | 35.28              | 37.78              | 1.33              | 1.73              |
| 3540.00         | 3570.00 | 6.45                 | 33.40              | 22.10              | 1.86              | 1.71              |
| 3900.00         | 3930.00 | 7.66                 | 32.59              | 17.74              | 2.54              | 2.44              |
| 4080.00         | 4110.00 | 7.54                 | 34.81              | 18.91              | 2.65              | 3.28              |

## Electrical Schematic



Generic photo used for illustration purposes only

CASE STYLE: HV1195

### +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"        | 10, 20, 50, 100, 200, 500 |

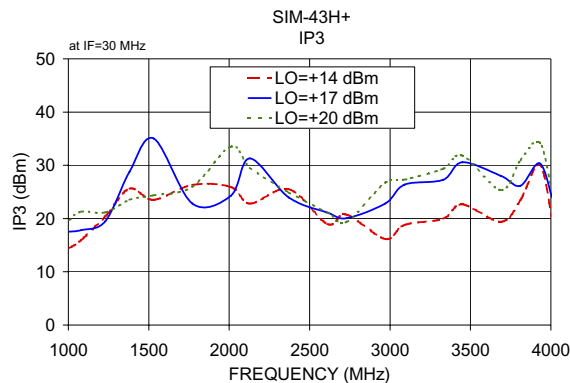
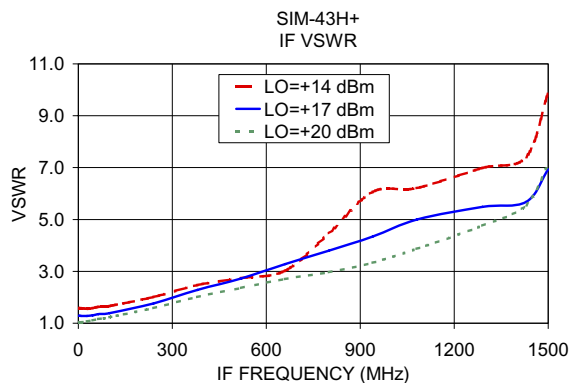
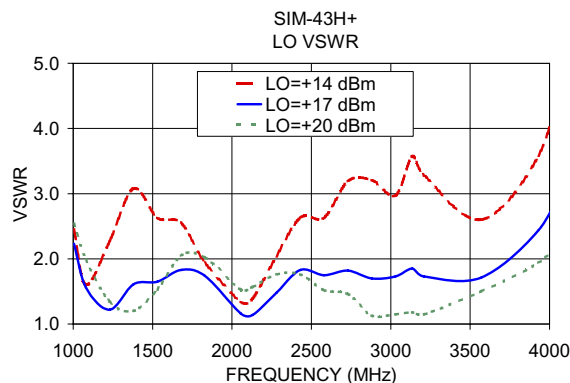
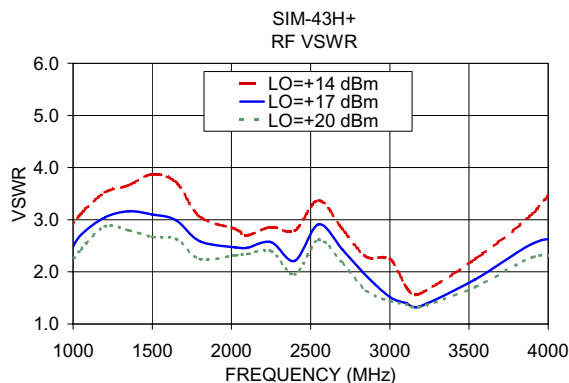
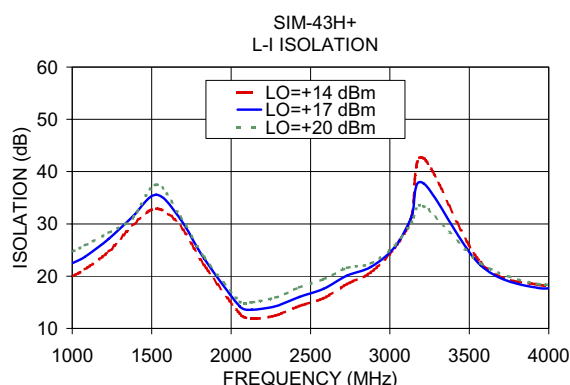
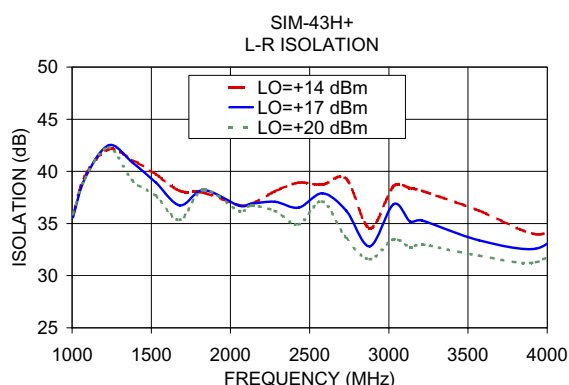
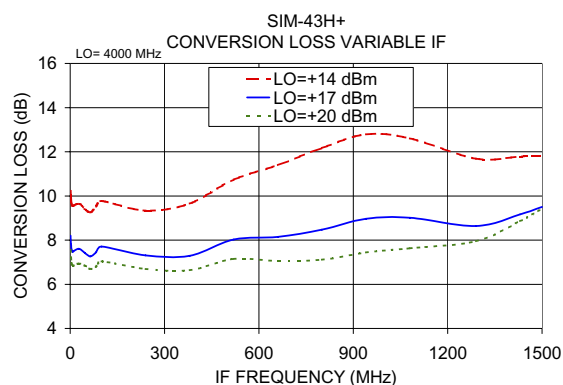
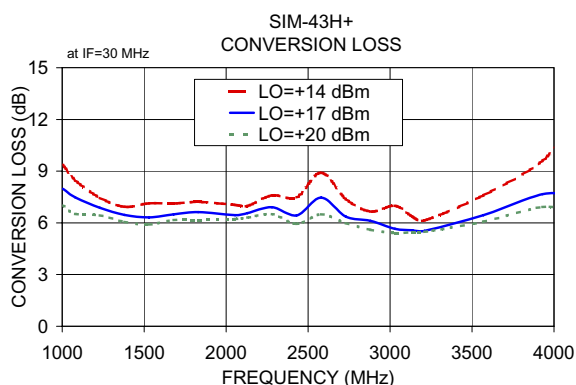
### Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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)



www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

REV. C  
ECO-000060  
SIM-43H+  
ED-12399/4  
DJ/RS/CP/AM  
200821



## Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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)



# Frequency Mixer

**SIM-43H+**

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>IF FIXED<br>@IF(OUT)=30MHz<br>(dB) |       |      | RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IP3 INPUT<br>(dBm) |       |       | RF<br>(IN)<br>(MHz) | LO<br>(MHz) | COMPRESSION<br>@RF IN=+14dBm<br>(dB) |       |      |
|---------------------|-------------|-------------------------------------------------------|-------|------|---------------------|-------------|--------------------|-------|-------|---------------------|-------------|--------------------------------------|-------|------|
|                     |             | @LO (dBm)                                             |       |      |                     |             | @LO (dBm)          |       |       |                     |             | @LO (dBm)                            |       |      |
|                     |             |                                                       |       |      |                     |             |                    |       |       |                     |             |                                      |       |      |
| +14                 | +17         | +20                                                   | +14   | +17  | +20                 | +14         | +17                | +20   |       |                     |             |                                      |       |      |
| 760.0               | 790.0       | 18.73                                                 | 10.42 | 7.29 | 760.0               | 790.0       | 4.00               | 11.79 | 16.03 | 760.0               | 790.0       | -4.48                                | 0.69  | 1.19 |
| 840.0               | 870.0       | 12.33                                                 | 8.41  | 7.01 | 840.0               | 870.0       | 9.64               | 14.20 | 17.15 | 840.0               | 870.0       | 0.11                                 | 1.29  | 1.31 |
| 920.0               | 950.0       | 10.68                                                 | 8.27  | 7.10 | 920.0               | 950.0       | 12.70              | 17.01 | 20.46 | 920.0               | 950.0       | -0.02                                | 0.89  | 1.08 |
| 1000.0              | 1030.0      | 9.36                                                  | 7.95  | 7.05 | 1000.0              | 1030.0      | 16.40              | 18.26 | 19.42 | 1000.0              | 1030.0      | 0.48                                 | 0.72  | 0.81 |
| 1080.0              | 1110.0      | 8.18                                                  | 7.30  | 6.61 | 1080.0              | 1110.0      | 17.96              | 19.05 | 22.90 | 1080.0              | 1110.0      | 0.87                                 | 0.82  | 0.78 |
| 1180.0              | 1210.0      | 7.50                                                  | 6.77  | 6.44 | 1180.0              | 1210.0      | 22.13              | 20.00 | 21.15 | 1180.0              | 1210.0      | 0.79                                 | 0.67  | 0.57 |
| 1260.0              | 1290.0      | 7.16                                                  | 6.73  | 6.41 | 1260.0              | 1290.0      | 24.40              | 20.32 | 24.68 | 1260.0              | 1290.0      | 0.82                                 | 0.40  | 0.41 |
| 1360.0              | 1390.0      | 7.10                                                  | 6.41  | 6.15 | 1360.0              | 1390.0      | 35.33              | 23.40 | 26.57 | 1360.0              | 1390.0      | 0.64                                 | 0.39  | 0.29 |
| 1440.0              | 1470.0      | 7.22                                                  | 6.33  | 6.08 | 1440.0              | 1470.0      | 24.93              | 24.88 | 22.59 | 1440.0              | 1470.0      | 0.46                                 | 0.44  | 0.33 |
| 1540.0              | 1570.0      | 7.33                                                  | 6.48  | 6.06 | 1540.0              | 1570.0      | 21.99              | 23.87 | 26.08 | 1540.0              | 1570.0      | 0.59                                 | 0.38  | 0.36 |
| 1620.0              | 1650.0      | 7.45                                                  | 6.67  | 6.33 | 1620.0              | 1650.0      | 26.01              | 26.42 | 25.47 | 1620.0              | 1650.0      | 0.54                                 | 0.28  | 0.21 |
| 1720.0              | 1750.0      | 7.51                                                  | 6.84  | 6.53 | 1720.0              | 1750.0      | 25.91              | 23.20 | 22.25 | 1720.0              | 1750.0      | 0.50                                 | 0.24  | 0.18 |
| 1800.0              | 1830.0      | 7.56                                                  | 6.86  | 6.45 | 1800.0              | 1830.0      | 21.55              | 25.78 | 29.66 | 1800.0              | 1830.0      | 0.48                                 | 0.31  | 0.22 |
| 1900.0              | 1930.0      | 7.56                                                  | 6.70  | 6.43 | 1900.0              | 1930.0      | 21.06              | 24.58 | 28.06 | 1900.0              | 1930.0      | 0.53                                 | 0.37  | 0.18 |
| 1980.0              | 2010.0      | 7.37                                                  | 6.65  | 6.42 | 1980.0              | 2010.0      | 23.31              | 26.30 | 33.39 | 1980.0              | 2010.0      | 0.72                                 | 0.33  | 0.16 |
| 2080.0              | 2110.0      | 7.17                                                  | 6.60  | 6.40 | 2080.0              | 2110.0      | 23.61              | 30.81 | 30.59 | 2080.0              | 2110.0      | 0.95                                 | 0.34  | 0.17 |
| 2160.0              | 2190.0      | 7.31                                                  | 6.66  | 6.37 | 2160.0              | 2190.0      | 25.69              | 31.79 | 29.22 | 2160.0              | 2190.0      | 0.88                                 | 0.40  | 0.27 |
| 2260.0              | 2290.0      | 7.75                                                  | 6.80  | 6.43 | 2260.0              | 2290.0      | 29.65              | 28.32 | 27.20 | 2260.0              | 2290.0      | 0.59                                 | 0.32  | 0.26 |
| 2340.0              | 2370.0      | 7.86                                                  | 6.77  | 6.33 | 2340.0              | 2370.0      | 24.26              | 23.46 | 24.23 | 2340.0              | 2370.0      | 0.59                                 | 0.36  | 0.28 |
| 2440.0              | 2470.0      | 7.68                                                  | 6.54  | 6.07 | 2440.0              | 2470.0      | 21.12              | 23.48 | 33.48 | 2440.0              | 2470.0      | 0.69                                 | 0.39  | 0.27 |
| 2520.0              | 2550.0      | 9.56                                                  | 7.89  | 6.84 | 2520.0              | 2550.0      | 18.48              | 23.31 | 24.77 | 2520.0              | 2550.0      | -0.04                                | 0.24  | 0.33 |
| 2620.0              | 2650.0      | 8.18                                                  | 7.46  | 6.82 | 2620.0              | 2650.0      | 25.03              | 23.63 | 21.57 | 2620.0              | 2650.0      | 0.91                                 | 0.53  | 0.59 |
| 2700.0              | 2730.0      | 8.00                                                  | 6.84  | 6.35 | 2700.0              | 2730.0      | 19.04              | 20.10 | 20.12 | 2700.0              | 2730.0      | 0.58                                 | 0.50  | 0.59 |
| 2800.0              | 2830.0      | 7.60                                                  | 6.64  | 6.10 | 2800.0              | 2830.0      | 16.93              | 16.26 | 19.43 | 2800.0              | 2830.0      | 0.75                                 | 0.48  | 0.55 |
| 2880.0              | 2910.0      | 7.41                                                  | 6.37  | 5.92 | 2880.0              | 2910.0      | 16.90              | 19.07 | 27.61 | 2880.0              | 2910.0      | 0.77                                 | 0.56  | 0.50 |
| 2980.0              | 3010.0      | 7.16                                                  | 5.95  | 5.79 | 2980.0              | 3010.0      | 16.46              | 25.35 | 30.34 | 2980.0              | 3010.0      | 0.70                                 | 0.58  | 0.31 |
| 3060.0              | 3090.0      | 7.15                                                  | 5.97  | 5.86 | 3060.0              | 3090.0      | 19.04              | 28.12 | 29.72 | 3060.0              | 3090.0      | 0.90                                 | 0.45  | 0.20 |
| 3160.0              | 3190.0      | 6.86                                                  | 5.95  | 5.88 | 3160.0              | 3190.0      | 19.69              | 29.07 | 28.01 | 3160.0              | 3190.0      | 1.21                                 | 0.38  | 0.13 |
| 3240.0              | 3270.0      | 7.20                                                  | 6.09  | 5.96 | 3240.0              | 3270.0      | 19.38              | 28.50 | 29.66 | 3240.0              | 3270.0      | 1.12                                 | 0.43  | 0.18 |
| 3340.0              | 3370.0      | 7.59                                                  | 6.29  | 6.13 | 3340.0              | 3370.0      | 19.03              | 27.58 | 30.65 | 3340.0              | 3370.0      | 0.96                                 | 0.46  | 0.21 |
| 3420.0              | 3450.0      | 8.17                                                  | 6.53  | 6.30 | 3420.0              | 3450.0      | 19.56              | 26.83 | 29.72 | 3420.0              | 3450.0      | 0.73                                 | 0.49  | 0.21 |
| 3520.0              | 3550.0      | 9.03                                                  | 7.07  | 6.60 | 3520.0              | 3550.0      | 18.66              | 24.85 | 27.14 | 3520.0              | 3550.0      | 0.47                                 | 0.40  | 0.22 |
| 3600.0              | 3630.0      | 9.13                                                  | 7.29  | 6.71 | 3600.0              | 3630.0      | 18.76              | 24.11 | 29.75 | 3600.0              | 3630.0      | 0.24                                 | 0.32  | 0.22 |
| 3700.0              | 3730.0      | 9.65                                                  | 7.47  | 6.81 | 3700.0              | 3730.0      | 19.53              | 24.84 | 31.66 | 3700.0              | 3730.0      | -0.15                                | 0.24  | 0.19 |
| 3780.0              | 3810.0      | 9.87                                                  | 7.43  | 6.76 | 3780.0              | 3810.0      | 23.21              | 30.70 | 28.01 | 3780.0              | 3810.0      | -0.16                                | 0.33  | 0.24 |
| 3880.0              | 3910.0      | 11.15                                                 | 8.33  | 7.37 | 3880.0              | 3910.0      | 24.23              | 32.42 | 29.59 | 3880.0              | 3910.0      | -0.48                                | 0.14  | 0.17 |
| 3960.0              | 3990.0      | 11.79                                                 | 8.39  | 7.49 | 3960.0              | 3990.0      | 20.09              | 23.91 | 30.53 | 3960.0              | 3990.0      | -0.79                                | 0.17  | 0.17 |
| 4060.0              | 4090.0      | 14.85                                                 | 8.80  | 7.43 | 4060.0              | 4090.0      | 14.47              | 29.00 | 33.51 | 4060.0              | 4090.0      | -2.99                                | 0.16  | 0.25 |
| 4140.0              | 4170.0      | 17.11                                                 | 9.73  | 8.01 | 4140.0              | 4170.0      | 12.78              | 24.81 | 31.97 | 4140.0              | 4170.0      | -4.48                                | -0.18 | 0.10 |
| 4240.0              | 4270.0      | 21.44                                                 | 10.66 | 8.28 | 4240.0              | 4270.0      | 7.98               | 22.07 | 28.01 | 4240.0              | 4270.0      | -8.23                                | -0.48 | 0.06 |

REV. X3

SIM-43H+

101028

Page 1 of 5



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant  
P.O. Box 350186, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engine Search Engine finds the model you need, instantly • For detailed performance specs & shopping online see



## Typical Performance Data

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=2500MHz<br>(dB) |
|----------------------|-------------|----------------------------------------------------------------|
|                      |             | @LO (dBm)                                                      |
|                      |             | +17                                                            |
| 1400.0               | 1100.0      | 10.76                                                          |
| 1325.9               | 1174.1      | 9.34                                                           |
| 1251.7               | 1248.3      | 7.92                                                           |
| 1177.6               | 1322.4      | 8.22                                                           |
| 1103.5               | 1396.5      | 9.47                                                           |
| 1029.3               | 1470.7      | 9.55                                                           |
| 955.2                | 1544.8      | 9.84                                                           |
| 881.1                | 1618.9      | 10.59                                                          |
| 806.9                | 1693.1      | 10.42                                                          |
| 732.8                | 1767.2      | 9.72                                                           |
| 658.7                | 1841.3      | 8.90                                                           |
| 584.5                | 1915.5      | 8.15                                                           |
| 510.4                | 1989.6      | 7.67                                                           |
| 436.3                | 2063.7      | 7.20                                                           |
| 362.1                | 2137.9      | 6.91                                                           |
| 288.0                | 2212.0      | 6.67                                                           |
| 213.9                | 2286.1      | 6.37                                                           |
| 139.7                | 2360.3      | 6.26                                                           |
| 65.6                 | 2434.4      | 6.98                                                           |
| 10.0                 | 2510.0      | 8.51                                                           |
| 95.9                 | 2595.9      | 8.23                                                           |
| 181.7                | 2681.7      | 8.62                                                           |
| 267.6                | 2767.6      | 8.32                                                           |
| 353.5                | 2853.5      | 8.24                                                           |
| 439.3                | 2939.3      | 7.61                                                           |
| 525.2                | 3025.2      | 7.26                                                           |
| 611.1                | 3111.1      | 7.35                                                           |
| 696.9                | 3196.9      | 7.36                                                           |
| 782.8                | 3282.8      | 7.47                                                           |
| 868.7                | 3368.7      | 7.57                                                           |
| 954.5                | 3454.5      | 7.64                                                           |
| 1018.9               | 3518.9      | 7.67                                                           |
| 1104.8               | 3604.8      | 7.82                                                           |
| 1169.2               | 3669.2      | 7.95                                                           |
| 1255.1               | 3755.1      | 8.20                                                           |
| 1319.5               | 3819.5      | 8.53                                                           |
| 1405.3               | 3905.3      | 9.16                                                           |
| 1469.7               | 3969.7      | 9.57                                                           |
| 1555.6               | 4055.6      | 10.39                                                          |
| 1620.0               | 4120.0      | 11.33                                                          |

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=989.9MHz<br>(dB) |
|----------------------|-------------|-----------------------------------------------------------------|
|                      |             | @LO (dBm)                                                       |
|                      |             | +17                                                             |
| 10.1                 | 1000.0      | 8.99                                                            |
| 50.1                 | 1040.0      | 7.92                                                            |
| 90.1                 | 1080.0      | 7.62                                                            |
| 130.1                | 1120.0      | 7.50                                                            |
| 170.1                | 1160.0      | 7.20                                                            |
| 210.1                | 1200.0      | 7.15                                                            |
| 250.1                | 1240.0      | 7.11                                                            |
| 290.1                | 1280.0      | 6.87                                                            |
| 330.1                | 1320.0      | 6.90                                                            |
| 370.1                | 1360.0      | 6.84                                                            |
| 410.1                | 1400.0      | 6.64                                                            |
| 450.1                | 1440.0      | 6.59                                                            |
| 490.1                | 1480.0      | 6.93                                                            |
| 530.1                | 1520.0      | 7.28                                                            |
| 570.1                | 1560.0      | 7.48                                                            |
| 610.1                | 1600.0      | 7.73                                                            |
| 650.1                | 1640.0      | 7.78                                                            |
| 690.1                | 1680.0      | 7.93                                                            |
| 730.1                | 1720.0      | 8.06                                                            |
| 770.1                | 1760.0      | 8.35                                                            |
| 810.1                | 1800.0      | 8.23                                                            |
| 850.1                | 1840.0      | 7.96                                                            |
| 890.1                | 1880.0      | 7.98                                                            |
| 930.1                | 1920.0      | 7.93                                                            |
| 970.1                | 1960.0      | 8.07                                                            |
| 1010.1               | 2000.0      | 7.88                                                            |
| 1050.1               | 2040.0      | 7.81                                                            |
| 1090.1               | 2080.0      | 7.90                                                            |
| 1130.1               | 2120.0      | 7.97                                                            |
| 1170.1               | 2160.0      | 8.15                                                            |
| 1210.1               | 2200.0      | 8.40                                                            |
| 1250.1               | 2240.0      | 8.77                                                            |
| 1290.1               | 2280.0      | 8.82                                                            |
| 1330.1               | 2320.0      | 8.89                                                            |
| 1370.1               | 2360.0      | 8.99                                                            |
| 1410.1               | 2400.0      | 9.27                                                            |
| 1450.1               | 2440.0      | 9.33                                                            |
| 1490.1               | 2480.0      | 9.67                                                            |
| 1530.1               | 2520.0      | 9.83                                                            |
| 1590.1               | 2580.0      | 10.50                                                           |

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=4010.1MHz<br>(dB) |
|----------------------|-------------|------------------------------------------------------------------|
|                      |             | @LO (dBm)                                                        |
|                      |             | +17                                                              |
| 1150.1               | 2860.0      | 10.91                                                            |
| 1130.1               | 2880.0      | 10.86                                                            |
| 1110.1               | 2900.0      | 10.68                                                            |
| 1090.1               | 2920.0      | 10.36                                                            |
| 1050.1               | 2960.0      | 10.11                                                            |
| 1030.1               | 2980.0      | 10.10                                                            |
| 990.1                | 3020.0      | 9.74                                                             |
| 970.1                | 3040.0      | 9.73                                                             |
| 930.1                | 3080.0      | 9.60                                                             |
| 910.1                | 3100.0      | 9.39                                                             |
| 870.1                | 3140.0      | 9.45                                                             |
| 850.1                | 3160.0      | 9.39                                                             |
| 810.1                | 3200.0      | 9.45                                                             |
| 790.1                | 3220.0      | 9.50                                                             |
| 750.1                | 3260.0      | 9.56                                                             |
| 730.1                | 3280.0      | 9.60                                                             |
| 690.1                | 3320.0      | 9.65                                                             |
| 670.1                | 3340.0      | 9.72                                                             |
| 630.1                | 3380.0      | 9.52                                                             |
| 610.1                | 3400.0      | 9.38                                                             |
| 570.1                | 3440.0      | 9.24                                                             |
| 550.1                | 3460.0      | 9.15                                                             |
| 510.1                | 3500.0      | 9.01                                                             |
| 490.1                | 3520.0      | 9.07                                                             |
| 450.1                | 3560.0      | 8.95                                                             |
| 430.1                | 3580.0      | 8.80                                                             |
| 390.1                | 3620.0      | 8.84                                                             |
| 370.1                | 3640.0      | 8.85                                                             |
| 330.1                | 3680.0      | 8.65                                                             |
| 310.1                | 3700.0      | 8.89                                                             |
| 270.1                | 3740.0      | 9.03                                                             |
| 250.1                | 3760.0      | 8.98                                                             |
| 210.1                | 3800.0      | 9.12                                                             |
| 190.1                | 3820.0      | 8.99                                                             |
| 150.1                | 3860.0      | 8.85                                                             |
| 130.1                | 3880.0      | 8.85                                                             |
| 90.1                 | 3920.0      | 8.77                                                             |
| 70.1                 | 3940.0      | 8.64                                                             |
| 30.1                 | 3980.0      | 8.58                                                             |
| 10.1                 | 4000.0      | 9.24                                                             |

## Typical Performance Data

| LO<br>(MHz) | LO-RF ISOLATION<br>(dB) |       |       | LO-IF ISOLATION<br>(dB) |       |       |
|-------------|-------------------------|-------|-------|-------------------------|-------|-------|
|             | @LO (dBm)               |       |       | @LO (dBm)               |       |       |
|             | +14                     | +17   | +20   | +14                     | +17   | +20   |
| 790.0       | 50.98                   | 50.24 | 40.57 | 21.40                   | 21.49 | 22.61 |
| 870.0       | 46.11                   | 37.83 | 37.06 | 19.40                   | 20.80 | 23.13 |
| 950.0       | 37.96                   | 36.85 | 37.14 | 19.11                   | 21.50 | 23.71 |
| 1030.0      | 40.73                   | 39.88 | 39.63 | 20.25                   | 22.89 | 25.19 |
| 1110.0      | 44.94                   | 44.47 | 43.66 | 21.89                   | 24.62 | 26.84 |
| 1210.0      | 43.83                   | 43.78 | 43.33 | 24.17                   | 26.90 | 28.54 |
| 1290.0      | 43.19                   | 41.31 | 40.43 | 26.68                   | 28.97 | 29.54 |
| 1390.0      | 41.28                   | 39.81 | 38.18 | 30.07                   | 31.59 | 31.33 |
| 1470.0      | 40.47                   | 39.03 | 37.55 | 32.30                   | 33.60 | 33.33 |
| 1570.0      | 38.84                   | 37.93 | 36.77 | 32.06                   | 34.64 | 38.46 |
| 1650.0      | 38.04                   | 36.52 | 35.60 | 30.93                   | 32.58 | 34.26 |
| 1750.0      | 39.22                   | 38.13 | 37.08 | 27.44                   | 28.78 | 29.17 |
| 1830.0      | 39.03                   | 38.37 | 37.99 | 22.68                   | 23.88 | 24.20 |
| 1930.0      | 38.47                   | 37.98 | 36.96 | 17.44                   | 18.71 | 19.22 |
| 2010.0      | 37.95                   | 37.03 | 36.16 | 14.54                   | 15.83 | 16.63 |
| 2110.0      | 36.96                   | 36.22 | 35.50 | 12.91                   | 14.48 | 15.65 |
| 2190.0      | 36.65                   | 35.64 | 35.16 | 12.86                   | 14.45 | 15.95 |
| 2290.0      | 37.25                   | 35.58 | 34.82 | 13.50                   | 15.23 | 16.96 |
| 2370.0      | 37.43                   | 35.30 | 33.70 | 14.39                   | 16.07 | 17.79 |
| 2470.0      | 37.80                   | 36.01 | 34.21 | 15.53                   | 17.33 | 19.13 |
| 2550.0      | 37.91                   | 36.51 | 35.31 | 16.50                   | 18.29 | 20.14 |
| 2650.0      | 36.60                   | 33.14 | 31.68 | 18.10                   | 19.93 | 21.85 |
| 2730.0      | 38.53                   | 35.33 | 32.91 | 19.56                   | 21.19 | 22.78 |
| 2830.0      | 36.41                   | 33.55 | 31.67 | 21.85                   | 23.02 | 23.81 |
| 2910.0      | 36.24                   | 34.06 | 31.71 | 23.81                   | 24.33 | 24.81 |
| 3010.0      | 38.10                   | 34.65 | 31.88 | 27.19                   | 27.52 | 28.01 |
| 3090.0      | 36.88                   | 33.32 | 30.88 | 32.96                   | 33.38 | 32.45 |
| 3190.0      | 35.11                   | 32.37 | 30.69 | 43.81                   | 40.81 | 36.25 |
| 3270.0      | 34.19                   | 31.41 | 29.93 | 31.25                   | 30.47 | 29.90 |
| 3370.0      | 33.77                   | 31.46 | 30.32 | 25.36                   | 24.87 | 25.07 |
| 3450.0      | 34.36                   | 31.68 | 30.57 | 24.68                   | 24.06 | 24.95 |
| 3550.0      | 33.34                   | 31.16 | 29.58 | 22.57                   | 21.70 | 21.78 |
| 3630.0      | 32.56                   | 30.87 | 29.48 | 20.44                   | 19.90 | 20.24 |
| 3730.0      | 31.91                   | 30.41 | 29.15 | 18.61                   | 17.95 | 18.54 |
| 3810.0      | 32.26                   | 30.61 | 29.43 | 18.11                   | 17.43 | 18.14 |
| 3910.0      | 33.71                   | 31.67 | 30.29 | 18.38                   | 17.38 | 17.91 |
| 3990.0      | 35.37                   | 32.93 | 31.32 | 18.85                   | 17.78 | 18.58 |
| 4090.0      | 36.58                   | 35.22 | 33.17 | 18.37                   | 17.72 | 18.19 |
| 4170.0      | 35.36                   | 33.06 | 31.57 | 17.06                   | 16.42 | 17.01 |
| 4270.0      | 35.03                   | 33.57 | 31.91 | 16.06                   | 15.87 | 16.39 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +14                     | +17   | +20   |
| 760.0               | 790.0       | 29.91                   | 24.68 | 16.87 |
| 840.0               | 870.0       | 23.10                   | 15.79 | 14.11 |
| 920.0               | 950.0       | 16.55                   | 14.54 | 13.73 |
| 1000.0              | 1030.0      | 17.16                   | 15.70 | 14.95 |
| 1080.0              | 1110.0      | 20.35                   | 18.61 | 17.57 |
| 1180.0              | 1210.0      | 24.93                   | 23.42 | 22.57 |
| 1260.0              | 1290.0      | 28.59                   | 27.83 | 26.57 |
| 1360.0              | 1390.0      | 34.71                   | 31.95 | 30.03 |
| 1440.0              | 1470.0      | 37.40                   | 32.00 | 29.16 |
| 1540.0              | 1570.0      | 32.88                   | 29.93 | 27.92 |
| 1620.0              | 1650.0      | 31.52                   | 27.86 | 26.64 |
| 1720.0              | 1750.0      | 30.26                   | 28.79 | 27.23 |
| 1800.0              | 1830.0      | 29.98                   | 28.37 | 27.29 |
| 1900.0              | 1930.0      | 31.48                   | 29.87 | 29.18 |
| 1980.0              | 2010.0      | 34.33                   | 33.43 | 33.06 |
| 2080.0              | 2110.0      | 39.14                   | 38.45 | 38.02 |
| 2160.0              | 2190.0      | 38.01                   | 37.36 | 37.01 |
| 2260.0              | 2290.0      | 35.05                   | 34.36 | 33.98 |
| 2340.0              | 2370.0      | 32.21                   | 31.26 | 30.90 |
| 2440.0              | 2470.0      | 30.08                   | 29.25 | 28.87 |
| 2520.0              | 2550.0      | 28.29                   | 27.06 | 26.68 |
| 2620.0              | 2650.0      | 26.88                   | 25.33 | 24.46 |
| 2700.0              | 2730.0      | 27.65                   | 25.62 | 24.32 |
| 2800.0              | 2830.0      | 25.47                   | 23.93 | 22.81 |
| 2880.0              | 2910.0      | 25.04                   | 22.65 | 21.40 |
| 2980.0              | 3010.0      | 26.06                   | 22.61 | 22.20 |
| 3060.0              | 3090.0      | 25.42                   | 22.40 | 21.97 |
| 3160.0              | 3190.0      | 24.34                   | 21.73 | 20.81 |
| 3240.0              | 3270.0      | 24.89                   | 21.81 | 20.74 |
| 3340.0              | 3370.0      | 27.90                   | 24.04 | 23.08 |
| 3420.0              | 3450.0      | 31.00                   | 26.26 | 24.98 |
| 3520.0              | 3550.0      | 29.82                   | 25.31 | 23.68 |
| 3600.0              | 3630.0      | 30.64                   | 25.02 | 23.33 |
| 3700.0              | 3730.0      | 35.65                   | 26.12 | 23.27 |
| 3780.0              | 3810.0      | 40.00                   | 27.58 | 23.82 |
| 3880.0              | 3910.0      | 31.36                   | 28.06 | 25.04 |
| 3960.0              | 3990.0      | 27.11                   | 26.17 | 24.93 |
| 4060.0              | 4090.0      | 23.27                   | 23.22 | 23.74 |
| 4140.0              | 4170.0      | 23.84                   | 25.61 | 25.74 |
| 4240.0              | 4270.0      | 24.69                   | 33.81 | 34.13 |

# Frequency Mixer

**SIM-43H+**

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF VSWR<br>(:1) |      |      | LO<br>(MHz) | LO VSWR<br>(:1) |       |      | IF<br>(OUT)<br>(MHz) | IF VSWR<br>@LO=4000MHz<br>(:1) |      |      |
|---------------------|-------------|-----------------|------|------|-------------|-----------------|-------|------|----------------------|--------------------------------|------|------|
|                     |             | @LO (dBm)       |      |      |             | @LO (dBm)       |       |      |                      | @LO (dBm)                      |      |      |
|                     |             | +14             | +17  | +20  |             | +14             | +17   | +20  |                      | +14                            | +17  | +20  |
| 760.0               | 790.0       | 4.26            | 2.51 | 2.07 | 790.0       | 17.75           | 15.67 | 8.95 | 10.0                 | 2.57                           | 1.26 | 1.09 |
| 840.0               | 870.0       | 2.70            | 1.99 | 1.70 | 870.0       | 11.24           | 6.05  | 4.77 | 50.0                 | 2.47                           | 1.26 | 1.14 |
| 920.0               | 950.0       | 2.59            | 2.09 | 1.85 | 950.0       | 4.11            | 3.09  | 3.25 | 90.0                 | 2.62                           | 1.35 | 1.19 |
| 1000.0              | 1030.0      | 2.89            | 2.53 | 2.29 | 1030.0      | 2.06            | 1.92  | 2.36 | 130.0                | 2.72                           | 1.43 | 1.27 |
| 1080.0              | 1110.0      | 3.18            | 2.89 | 2.66 | 1110.0      | 1.56            | 1.30  | 1.74 | 170.0                | 2.93                           | 1.55 | 1.35 |
| 1180.0              | 1210.0      | 3.36            | 3.07 | 2.93 | 1210.0      | 2.01            | 1.19  | 1.30 | 210.0                | 3.15                           | 1.69 | 1.44 |
| 1260.0              | 1290.0      | 3.38            | 3.09 | 2.95 | 1290.0      | 2.53            | 1.44  | 1.14 | 250.0                | 3.38                           | 1.82 | 1.55 |
| 1360.0              | 1390.0      | 3.50            | 3.11 | 2.80 | 1390.0      | 2.95            | 1.62  | 1.22 | 290.0                | 3.63                           | 1.96 | 1.66 |
| 1440.0              | 1470.0      | 3.55            | 3.03 | 2.74 | 1470.0      | 2.94            | 1.70  | 1.42 | 330.0                | 3.83                           | 2.08 | 1.75 |
| 1540.0              | 1570.0      | 3.54            | 3.00 | 2.65 | 1570.0      | 2.78            | 1.80  | 1.71 | 370.0                | 4.07                           | 2.23 | 1.84 |
| 1620.0              | 1650.0      | 3.53            | 2.96 | 2.66 | 1650.0      | 2.51            | 1.81  | 1.86 | 410.0                | 4.38                           | 2.39 | 1.97 |
| 1720.0              | 1750.0      | 3.46            | 3.01 | 2.65 | 1750.0      | 2.15            | 1.75  | 2.03 | 450.0                | 4.64                           | 2.48 | 2.03 |
| 1800.0              | 1830.0      | 3.35            | 2.80 | 2.44 | 1830.0      | 1.84            | 1.68  | 1.97 | 490.0                | 5.00                           | 2.66 | 2.13 |
| 1900.0              | 1930.0      | 3.16            | 2.56 | 2.34 | 1930.0      | 1.52            | 1.40  | 1.83 | 530.0                | 5.33                           | 2.82 | 2.25 |
| 1980.0              | 2010.0      | 3.01            | 2.59 | 2.42 | 2010.0      | 1.37            | 1.19  | 1.71 | 570.0                | 5.74                           | 2.97 | 2.31 |
| 2080.0              | 2110.0      | 2.77            | 2.50 | 2.36 | 2110.0      | 1.51            | 1.21  | 1.66 | 610.0                | 6.09                           | 3.20 | 2.47 |
| 2160.0              | 2190.0      | 2.84            | 2.57 | 2.43 | 2190.0      | 1.85            | 1.44  | 1.69 | 650.0                | 6.46                           | 3.30 | 2.49 |
| 2260.0              | 2290.0      | 2.93            | 2.58 | 2.39 | 2290.0      | 2.37            | 1.68  | 1.72 | 710.0                | 7.11                           | 3.62 | 2.69 |
| 2340.0              | 2370.0      | 2.78            | 2.35 | 2.13 | 2370.0      | 2.73            | 1.91  | 1.81 | 750.0                | 7.56                           | 3.79 | 2.73 |
| 2440.0              | 2470.0      | 2.38            | 2.04 | 1.82 | 2470.0      | 3.05            | 2.05  | 1.83 | 810.0                | 8.08                           | 4.06 | 2.89 |
| 2520.0              | 2550.0      | 2.82            | 2.45 | 2.21 | 2550.0      | 3.21            | 2.00  | 1.68 | 850.0                | 8.43                           | 4.19 | 2.98 |
| 2620.0              | 2650.0      | 2.46            | 2.22 | 2.01 | 2650.0      | 3.38            | 2.05  | 1.67 | 910.0                | 8.20                           | 4.33 | 3.07 |
| 2700.0              | 2730.0      | 2.38            | 2.08 | 1.88 | 2730.0      | 3.42            | 1.90  | 1.45 | 950.0                | 8.77                           | 4.52 | 3.25 |
| 2800.0              | 2830.0      | 2.18            | 1.90 | 1.66 | 2830.0      | 3.22            | 1.77  | 1.19 | 1010.0               | 8.43                           | 4.56 | 3.31 |
| 2880.0              | 2910.0      | 2.02            | 1.66 | 1.56 | 2910.0      | 3.21            | 1.81  | 1.18 | 1050.0               | 8.55                           | 4.66 | 3.42 |
| 2980.0              | 3010.0      | 1.92            | 1.57 | 1.56 | 3010.0      | 3.18            | 1.82  | 1.19 | 1110.0               | 7.97                           | 4.45 | 3.29 |
| 3060.0              | 3090.0      | 1.80            | 1.57 | 1.58 | 3090.0      | 3.37            | 1.81  | 1.20 | 1150.0               | 8.12                           | 4.60 | 3.52 |
| 3160.0              | 3190.0      | 1.72            | 1.53 | 1.54 | 3190.0      | 3.22            | 1.75  | 1.23 | 1210.0               | 7.60                           | 4.31 | 3.44 |
| 3240.0              | 3270.0      | 1.84            | 1.53 | 1.48 | 3270.0      | 3.21            | 1.73  | 1.25 | 1250.0               | 7.70                           | 4.44 | 3.70 |
| 3340.0              | 3370.0      | 2.00            | 1.58 | 1.48 | 3370.0      | 3.06            | 1.71  | 1.31 | 1310.0               | 7.17                           | 4.29 | 3.82 |
| 3420.0              | 3450.0      | 2.26            | 1.75 | 1.63 | 3450.0      | 3.14            | 1.77  | 1.35 | 1350.0               | 7.22                           | 4.51 | 4.18 |
| 3520.0              | 3550.0      | 2.58            | 2.10 | 1.90 | 3550.0      | 3.13            | 1.92  | 1.54 | 1410.0               | 6.63                           | 4.45 | 4.44 |
| 3600.0              | 3630.0      | 2.82            | 2.35 | 2.11 | 3630.0      | 3.21            | 2.03  | 1.67 | 1450.0               | 6.46                           | 4.61 | 4.74 |
| 3700.0              | 3730.0      | 3.13            | 2.59 | 2.33 | 3730.0      | 3.45            | 2.24  | 1.84 | 1510.0               | 5.89                           | 4.82 | 5.28 |
| 3780.0              | 3810.0      | 3.33            | 2.70 | 2.42 | 3810.0      | 3.73            | 2.40  | 1.92 | 1550.0               | 5.68                           | 5.16 | 5.77 |
| 3880.0              | 3910.0      | 3.77            | 3.05 | 2.74 | 3910.0      | 4.35            | 2.84  | 2.18 | 1610.0               | 5.17                           | 5.65 | 6.46 |
| 3960.0              | 3990.0      | 4.14            | 3.29 | 2.96 | 3990.0      | 4.99            | 3.22  | 2.35 | 1650.0               | 5.04                           | 5.95 | 6.83 |
| 4060.0              | 4090.0      | 4.89            | 3.52 | 3.04 | 4090.0      | 6.07            | 4.05  | 2.75 | 1710.0               | 4.99                           | 6.42 | 7.28 |
| 4140.0              | 4170.0      | 5.28            | 3.82 | 3.27 | 4170.0      | 6.89            | 4.79  | 3.16 | 1750.0               | 5.09                           | 6.61 | 7.41 |
| 4240.0              | 4270.0      | 6.13            | 4.22 | 3.51 | 4270.0      | 7.70            | 5.85  | 3.52 | 1810.0               | 5.19                           | 6.46 | 7.00 |

REV. X3

SIM-43H+

101028

Page 4 of 5



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant  
P.O. Box 350186, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4861



The Design Engineers Search Engine finds the model you need, instantly • For detailed performance specs & shopping online see



## Harmonics Tables

RF HARMONICS ORDER

|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0      | -      | -      | +7  | 17  | 11  | 23  | 26  | 53  | 37  | 47  | 46  | --- |
| 1      | -      | 20     | +0  | 26  | 24  | 38  | 28  | 44  | 38  | 49  | 54  | 55  |
| 2      | 63     | 50     | 51  | 50  | 49  | 57  | 62  | 67  | 64  | 74  | 67  | 71  |
| 3      | >90    | 61     | 59  | 76  | 52  | 72  | 62  | 74  | 70  | 71  | >81 | >81 |
| 4      | >90    | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| 5      | >90    | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| 6      | >90    | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| 7      | >90    | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| 8      | >90    | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| 9      | >90    | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| 10     | ---    | ---    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| RF CAL | 0      | 1      | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |     |

Test conditions:

RF IN: 2500 MHz; -1.00 dBm.  
LO IN: 2530 MHz; +17.00 dBm  
IF OUT: 30 MHz; -9.11 dBm

RF HARMONICS ORDER

|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0      | -      | -      | 3   | 29  | 23  | 38  | 40  | 57  | 50  | 56  | 60  | --- |
| 1      | -      | 20     | +0  | 28  | 24  | 41  | 34  | 47  | 43  | 58  | 62  | 69  |
| 2      | 43     | 40     | 44  | 44  | 39  | 57  | 43  | 59  | 62  | 75  | 64  | 66  |
| 3      | 71     | 41     | 39  | 54  | 34  | 47  | 45  | 56  | 48  | 63  | 64  | 70  |
| 4      | >90    | 75     | 57  | 72  | 62  | 61  | 57  | 65  | 54  | 69  | 63  | 77  |
| 5      | >90    | 65     | 61  | 63  | 62  | 72  | 61  | 57  | 70  | 61  | 64  | 69  |
| 6      | >90    | 89     | 88  | 86  | 85  | 70  | 78  | 60  | 75  | 72  | 72  | 84  |
| 7      | >90    | >91    | 91  | 85  | 78  | 85  | 73  | 91  | 65  | 75  | 80  | 87  |
| 8      | >90    | >91    | >91 | >91 | 90  | >91 | 78  | 83  | >91 | 75  | 75  | >91 |
| 9      | >90    | >91    | >91 | >91 | >91 | >91 | >91 | 81  | 90  | >91 | 83  | 77  |
| 10     | ---    | ---    | >91 | >91 | >91 | >91 | >91 | >91 | >91 | 91  | >91 | 84  |
| RF CAL | 0      | 1      | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |     |

## LO HARMONICS ORDER

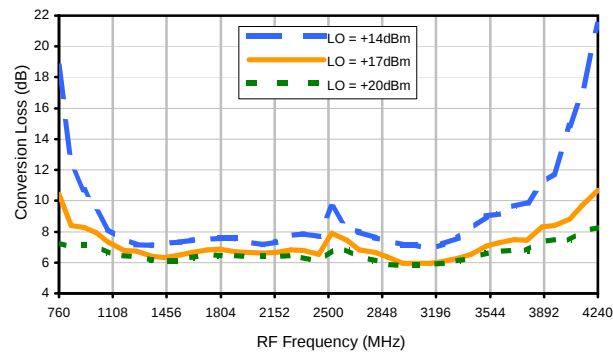
Test conditions:

RF IN: 2500 MHz; 9.00 dBm.  
LO IN: 2530 MHz; +17.00 dBm  
IF OUT: 30 MHz; 1.12 dBm

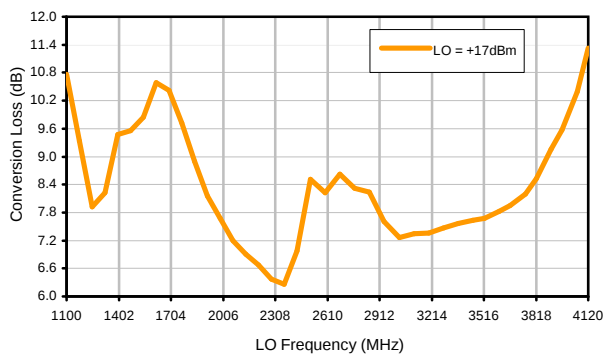
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.  
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.  
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

## Typical Performance Curves

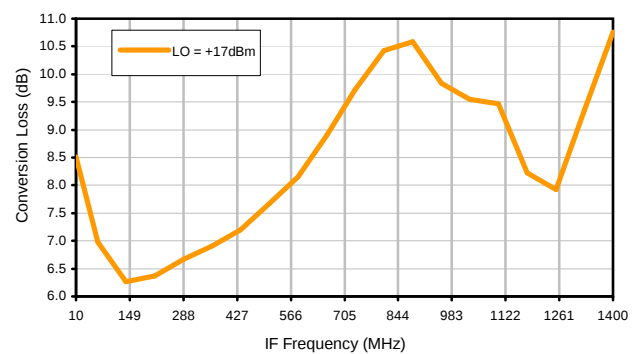
Conversion Loss @ IF=30MHz



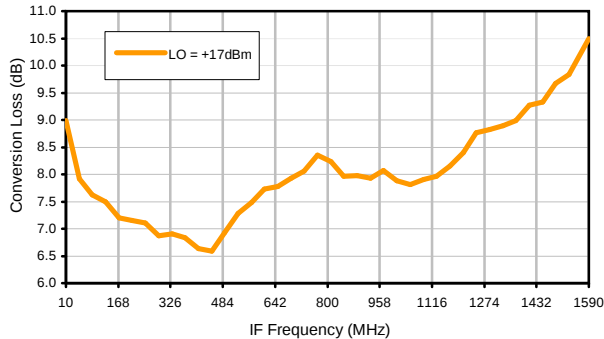
Conversion Loss vs. LO @ RF=2500MHz



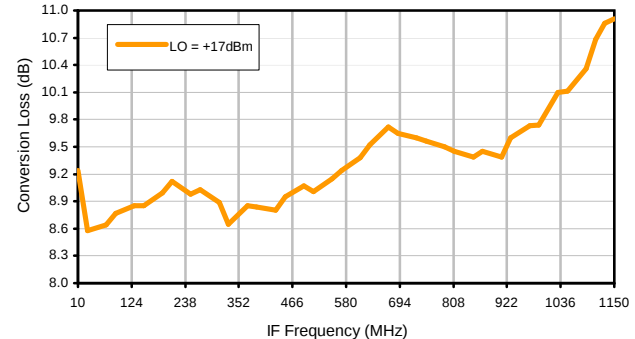
Conversion Loss vs. IF @ RF=2500MHz



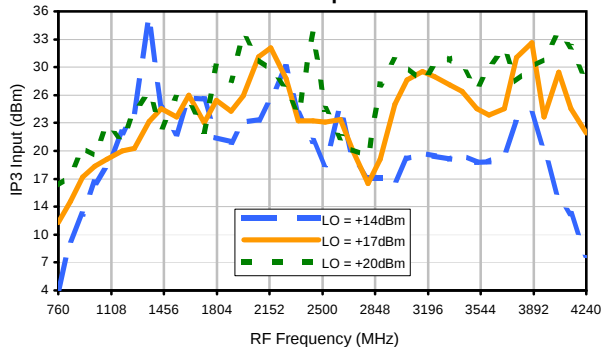
Conversion Loss vs. IF @ RF=989.9MHz



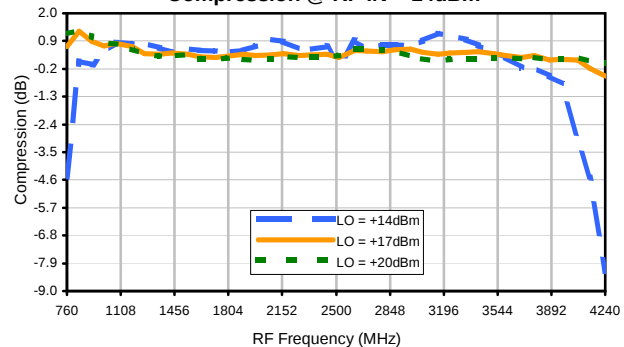
Conversion Loss vs. IF @ RF=4010.1MHz



IP3 Input

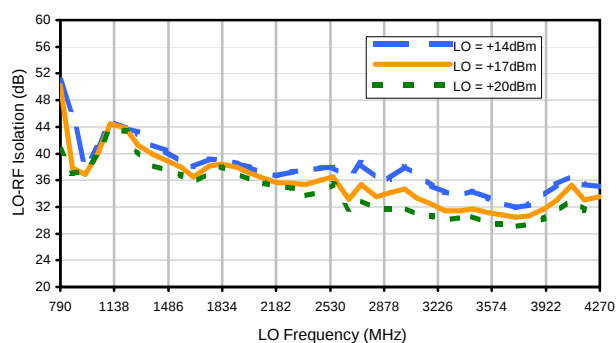


Compression @ RF IN=+14dBm

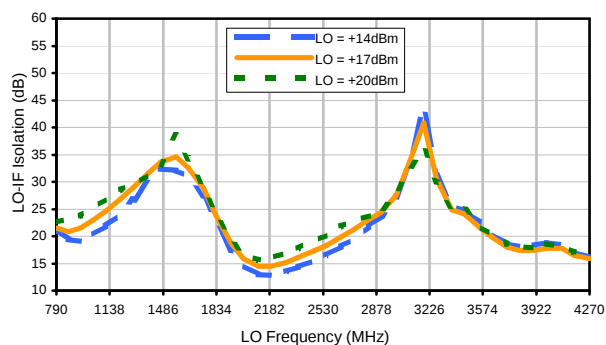


## Typical Performance Curves

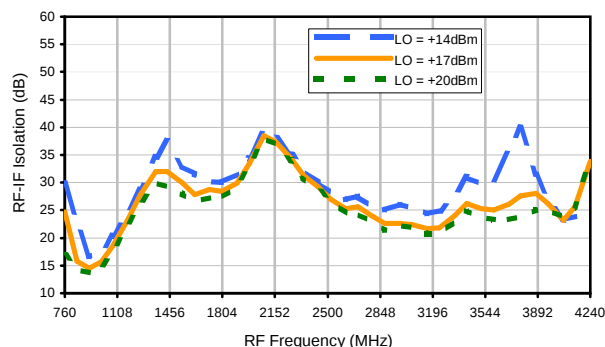
LO-RF Isolation



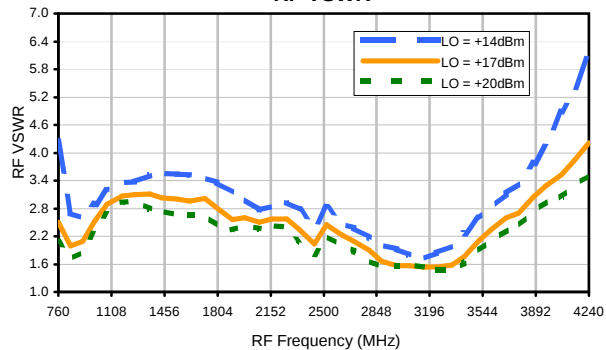
LO-IF Isolation



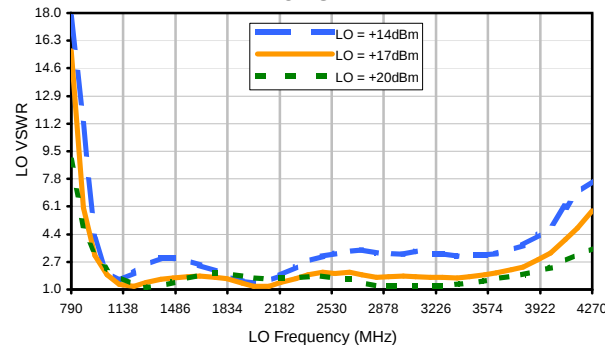
RF-IF Isolation



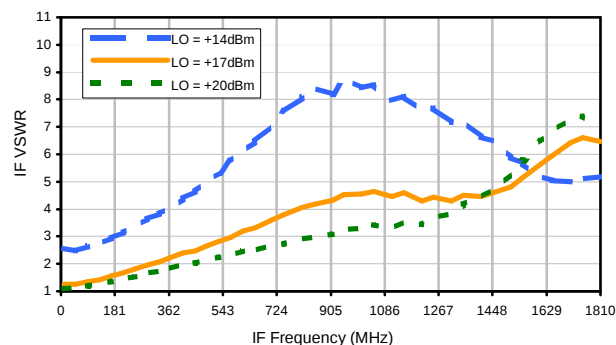
RF VSWR



LO VSWR



IF VSWR



## Harmonics Tables

RF HARMONICS ORDER

|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0      | -      | -      | +7  | 17  | 11  | 23  | 26  | 53  | 37  | 47  | 46  | --- |
| 1      | -      | 20     | +0  | 26  | 24  | 38  | 28  | 44  | 38  | 49  | 54  | 55  |
| 2      | 63     | 50     | 51  | 50  | 49  | 57  | 62  | 67  | 64  | 74  | 67  | 71  |
| 3      | >90    | 61     | 59  | 76  | 52  | 72  | 62  | 74  | 70  | 71  | >81 | >81 |
| 4      | >90    | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| 5      | >90    | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| 6      | >90    | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| 7      | >90    | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| 8      | >90    | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| 9      | >90    | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| 10     | ---    | ---    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| RF CAL | 0      | 1      | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |     |

Test conditions:

RF IN: 2500 MHz; -1.00 dBm.  
LO IN: 2530 MHz; +17.00 dBm  
IF OUT: 30 MHz; -9.11 dBm

RF HARMONICS ORDER

|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0      | -      | -      | 3   | 29  | 23  | 38  | 40  | 57  | 50  | 56  | 60  | --- |
| 1      | -      | 20     | +0  | 28  | 24  | 41  | 34  | 47  | 43  | 58  | 62  | 69  |
| 2      | 43     | 40     | 44  | 44  | 39  | 57  | 43  | 59  | 62  | 75  | 64  | 66  |
| 3      | 71     | 41     | 39  | 54  | 34  | 47  | 45  | 56  | 48  | 63  | 64  | 70  |
| 4      | >90    | 75     | 57  | 72  | 62  | 61  | 57  | 65  | 54  | 69  | 63  | 77  |
| 5      | >90    | 65     | 61  | 63  | 62  | 72  | 61  | 57  | 70  | 61  | 64  | 69  |
| 6      | >90    | 89     | 88  | 86  | 85  | 70  | 78  | 60  | 75  | 72  | 72  | 84  |
| 7      | >90    | >91    | 91  | 85  | 78  | 85  | 73  | 91  | 65  | 75  | 80  | 87  |
| 8      | >90    | >91    | >91 | >91 | 90  | >91 | 78  | 83  | >91 | 75  | 75  | >91 |
| 9      | >90    | >91    | >91 | >91 | >91 | >91 | >91 | 81  | 90  | >91 | 83  | 77  |
| 10     | ---    | ---    | >91 | >91 | >91 | >91 | >91 | >91 | >91 | 91  | >91 | 84  |
| RF CAL | 0      | 1      | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |     |

## LO HARMONICS ORDER

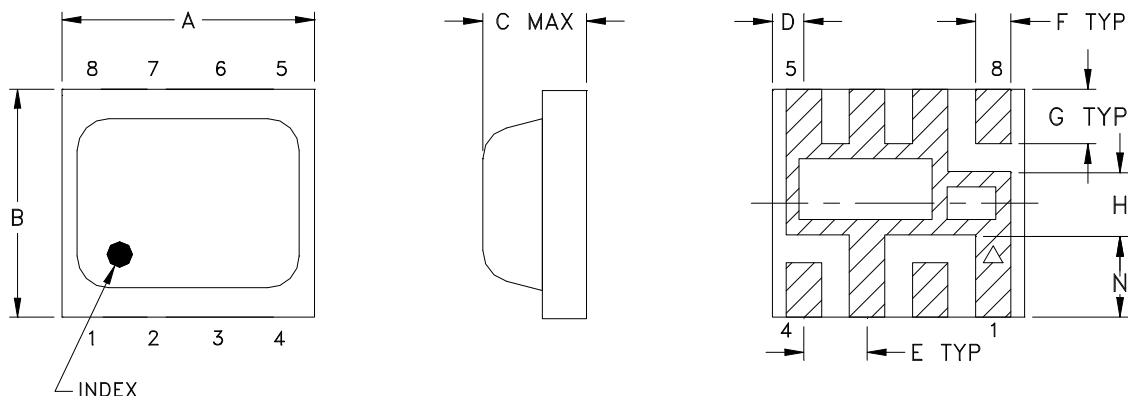
Test conditions:

RF IN: 2500 MHz; 9.00 dBm.  
LO IN: 2530 MHz; +17.00 dBm  
IF OUT: 30 MHz; 1.12 dBm

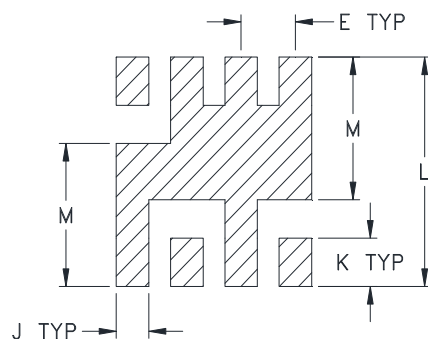
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.  
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.  
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

## Outline Dimensions

HV1195



## PCB Metal Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm.002$

| CASE#  | A               | B               | C               | D               | E               | F               | G               | H               | J               | K               | L               | M               | N               |
|--------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| HV1195 | 0.200<br>(5.08) | 0.180<br>(4.57) | 0.087<br>(2.21) | 0.025<br>(0.64) | 0.050<br>(1.27) | 0.028<br>(0.71) | 0.043<br>(1.09) | 0.050<br>(1.27) | 0.030<br>(0.76) | 0.043<br>(1.09) | 0.204<br>(5.18) | 0.127<br>(3.23) | 0.065<br>(1.65) |

| CASE#  | WT, GRAM |
|--------|----------|
| HV1195 | .08      |

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .01$ ; 3 Pl.  $\pm .005$

### Notes:

1. Case material: Plastic encapsulation on Ceramic base.
2. Termination finish: Palladium Silver.



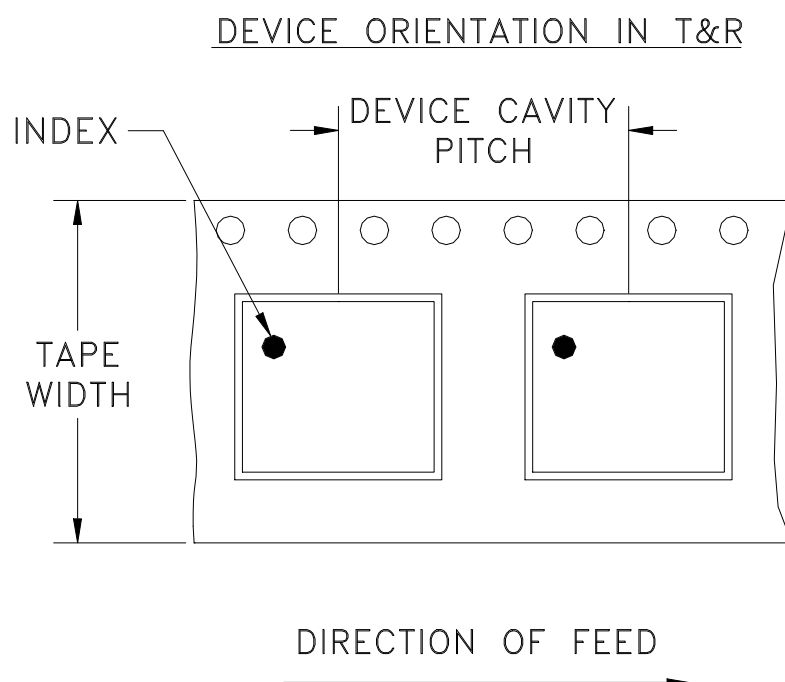
P.O. Box 350186, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F82



| Tape Width,<br>mm | Device Cavity<br>Pitch, mm | Reel Size,<br>inches | Devices per Reel |
|-------------------|----------------------------|----------------------|------------------|
| 12                | 8                          | 7                    | 500              |

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: [www.minicircuits.com/pages/pdfs/tape.pdf](http://www.minicircuits.com/pages/pdfs/tape.pdf)



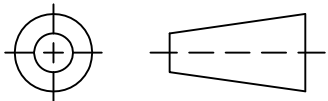
INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

**Distribution Centers** NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

*Mini-Circuits ISO 9001 & ISO 14001 Certified*

## THIRD ANGLE PROJECTION



## REVISIONS

| REV | ECN No. | DESCRIPTION                         | DATE     | DR  | AUTH |
|-----|---------|-------------------------------------|----------|-----|------|
| OR  | M104559 | NEW RELEASE                         | 04/11/06 | MMG | DJ   |
| A   | M109513 | MODIFIED SMOBC AREA, REMOVED NOTE 3 | 01/31/07 | PW  | DJ   |
| B   | M176274 | MODIFIED CASE STYLE                 | 09/23/19 | ITG | RB   |

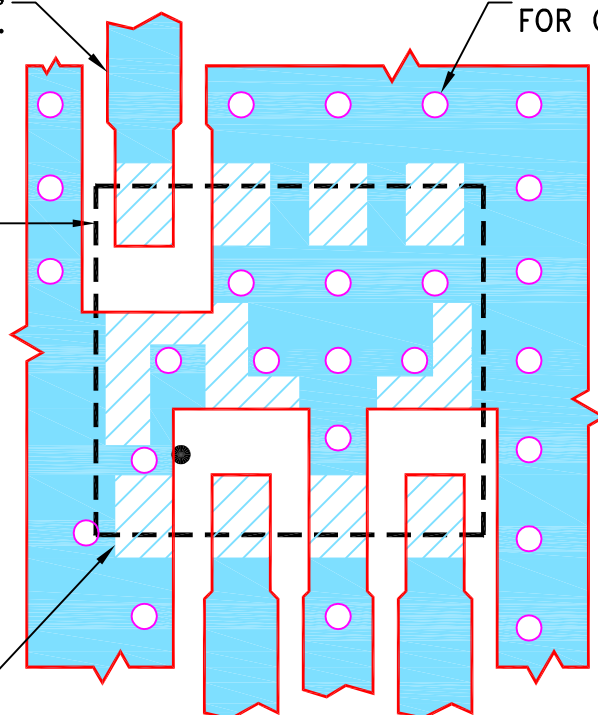
### SUGGESTED MOUNTING CONFIGURATION FOR HV1195 CASE STYLE, "rh" PIN CONNECTION

COPLANAR WAVEGUIDE  
.038 LINE WIDTH,  
.013 GAP, 2 PL.

Ø.013 PTH  
FOR GROUND

PACKAGE  
OUTLINE

PIN 1

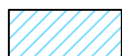


## NOTES:

1. TRACE WIDTH AND GAP ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .020"±.0015"; 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.

UNLESS OTHERWISE SPECIFIED

INITIALS

DATE

DIMENSIONS ARE IN INCHES

TOLERANCES ON:

2 PL DECIMALS ±

3 PL DECIMALS ± .005

ANGLES ±

FRACTIONS ±

DRAWN

MMG

04/10/06

CHECKED

IL

04/11/06

APPROVED

DJ

04/11/06



Mini-Circuits®

13 Neptune Avenue  
Brooklyn NY 11235

PL, rh, HV1195, SIM, TB-382

SIZE

CODE IDENT

DRAWING NO:

REV:

A

15542

98-PL-239

B

FILE:

98PL239

SCALE:

10:1

SHEET:

1 OF 1

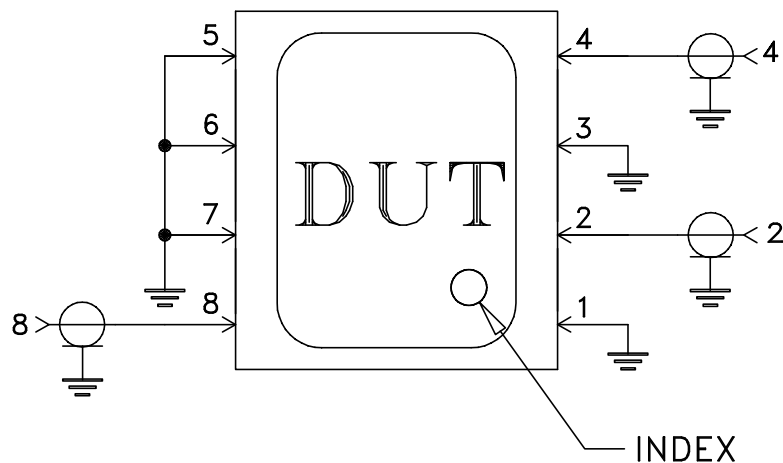
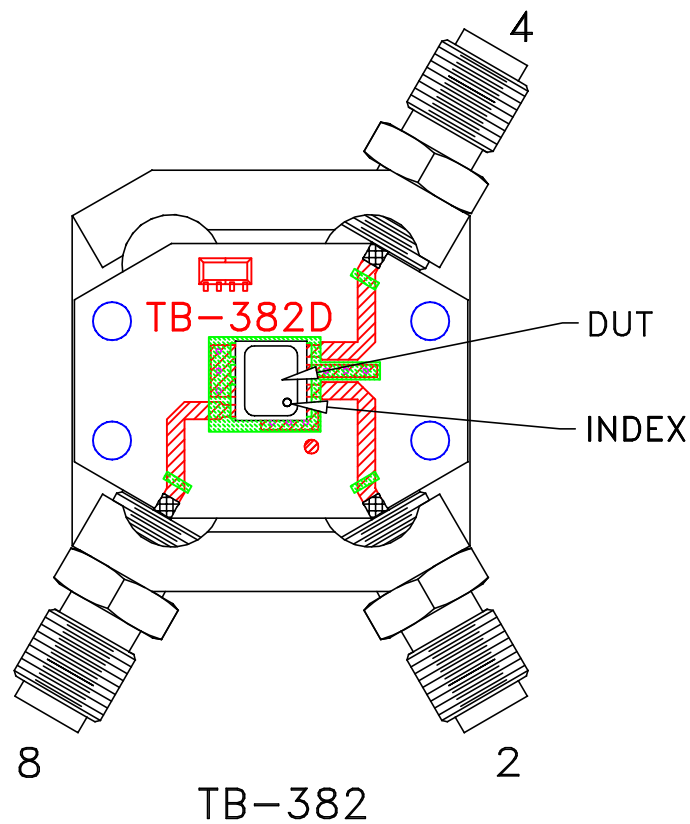
Mini-Circuits®

THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE, MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.

ASHEETA1.DWG REV:A DATE:01/12/95

# Evaluation Board and Circuit

For Pin Connections refer to Data Sheet of the DUT



Schematic Diagram

## Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent, Dielectric Constant=3.5, Thickness=.020 inch.

 **Mini-Circuits®**



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification                  | Test/Inspection Condition                                                                                                                                       | Reference/Spec                                        |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| Operating Temperature          | -40° to 85° C<br>Case Temperature                                                                                                                               | Individual Model Data Sheet                           |
| Storage Temperature            | -55° to 100° C<br>Ambient Environment                                                                                                                           | Individual Model Data Sheet                           |
| Autoclave                      | 15 psig, 100% RH, 121°C, 96 hours                                                                                                                               | JESD22-A102-C, Condition C                            |
| Thermal Shock                  | -55° to 100°C, 100 cycles                                                                                                                                       | MIL-STD-202, Method 107, Condition A-3, except +100°C |
| Solder Reflow Heat             | Sn-Pb Eutectic Process: 225°C peak<br>Pb-Free Process: 250°C peak                                                                                               | J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1         |
| Solderability                  | 10X Magnification                                                                                                                                               | J-STD-002, Para 4.2.5, Test S, 95% Coverage           |
| Vibration (High Frequency)     | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)                                                                             | MIL-STD-202, Method 204, Condition D                  |
| Mechanical Shock               | 50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes                                                                                               | MIL-STD-202, Method 213, Condition A                  |
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C;<br>distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215                               |