*Ceramic Surface Mount*

# Frequency Mixer WIDE BAND

## Level 17 (LO Power +17 dBm) 7.3 to 19 GHz

# SIM-193H+

*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 |

## Maximum Ratings

| | |
|---|---|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| RF Power | 120mW |

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 |

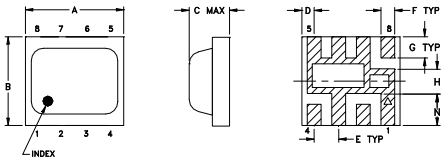
## Features

- wide bandwidth, 7.3 to 19 GHz
- low conversion loss, 6.2 dB typ.
- high L-R isolation, 33 dB typ.
- excellent IF BW, DC to 7.5 GHz
- LTCC double balanced mixer
- tiny size, low profile, 0.08"
- useable as up and down converter
- aqueous washable
- protected under U.S Patent 7,027,795

## Applications

- fixed satellite
- mobile
- radio location

## Outline Drawing




## 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 |

## Electrical Specifications at 25°C

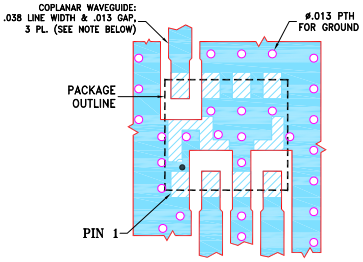
| Parameter | Condition (GHz) | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Frequency Range, LO/RF | | 7.3 | — | 19 | GHz |
| Frequency Range, IF | | DC | — | 7.5 | GHz |
| Conversion Loss[1] | 7.3-10 | — | 8.6 | 10.5 | dB |
| | 10-15 | — | 7.6 | 10.0 | |
| | 15-18 | — | 9.7 | 11.8 | |
| | 18-19 | — | 10.0 | 13.0 | |
| LO to RF Isolation | 7.3-10 | 24 | 32 | — | dB |
| | 10-15 | 20 | 28 | — | |
| | 15-18 | 16 | 21 | — | |
| | 18-19 | 20 | 26 | — | |
| LO to IF Isolation | 7.3-10 | 13 | 18 | — | dB |
| | 10-15 | 13 | 18 | — | |
| | 15-18 | 8 | 11 | — | |
| | 18-19 | 12 | 17 | — | |
| IP3 | 7.3-10 | — | 17 | — | dBm |
| | 10-15 | — | 19 | — | |
| | 15-18 | — | 16 | — | |
| | 18-19 | — | 25 | — | |
| RF Input Power at 1 dB Compression | 7.3-19 | — | +14 | — | dBm |

1. Conversion loss at 30 MHz IF.

## 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 |
| 7300.10 | 7330.00 | 7.07 | 42.48 | 17.69 | 4.20 | 10.62 |
| 8500.10 | 8530.00 | 8.48 | 37.26 | 22.30 | 4.64 | 3.67 |
| 9000.10 | 9030.00 | 8.13 | 41.03 | 21.66 | 4.38 | 3.72 |
| 9500.10 | 9530.00 | 7.44 | 43.94 | 20.41 | 4.15 | 3.39 |
| 10000.10 | 10030.00 | 6.54 | 44.16 | 20.71 | 3.79 | 3.26 |
| 11000.10 | 11030.00 | 6.32 | 40.24 | 19.18 | 2.23 | 2.34 |
| 11500.10 | 11530.00 | 5.89 | 38.41 | 18.90 | 2.17 | 3.62 |
| 12000.10 | 12030.00 | 5.81 | 37.27 | 18.55 | 2.39 | 2.98 |
| 12500.10 | 12530.00 | 5.74 | 34.00 | 20.03 | 2.23 | 2.03 |
| 13000.10 | 13030.00 | 6.00 | 32.41 | 20.42 | 1.39 | 2.90 |
| 14000.10 | 14030.00 | 6.89 | 33.02 | 20.39 | 2.29 | 3.72 |
| 14500.10 | 14530.00 | 7.16 | 32.23 | 22.45 | 3.00 | 2.84 |
| 15000.10 | 15030.00 | 7.02 | 30.11 | 24.95 | 3.34 | 2.77 |
| 15500.10 | 15530.00 | 7.39 | 25.82 | 22.24 | 2.22 | 3.08 |
| 16000.10 | 16030.00 | 8.48 | 21.35 | 16.00 | 2.67 | 3.72 |
| 16500.10 | 16530.00 | 8.95 | 21.99 | 14.20 | 3.74 | 2.73 |
| 17000.10 | 17030.00 | 8.62 | 26.46 | 14.84 | 3.61 | 2.14 |
| 17500.10 | 17530.00 | 8.32 | 29.85 | 19.38 | 4.43 | 2.36 |
| 18000.10 | 18030.00 | 8.47 | 31.75 | 24.25 | 4.67 | 1.44 |
| 19000.10 | 19030.00 | 9.02 | 25.80 | 24.87 | 2.89 | 1.62 |

## *Demo Board MCL P/N: TB-458+*
## *Suggested PCB Layout (PL-284)*

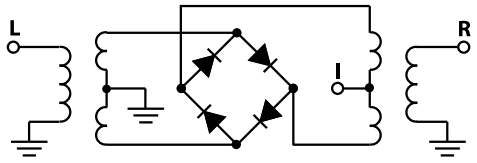



NOTES:
1. TRACE WIDTH AND GAP ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020±.0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

## Electrical Schematic




Notes

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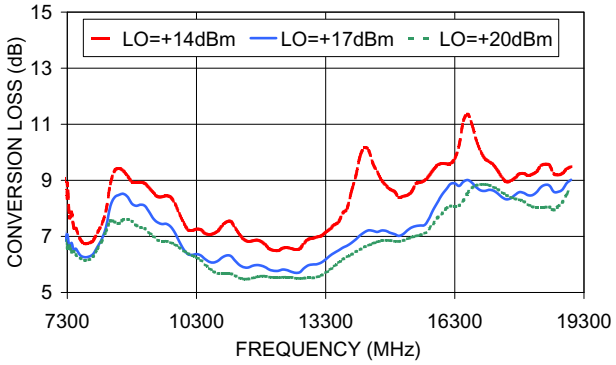
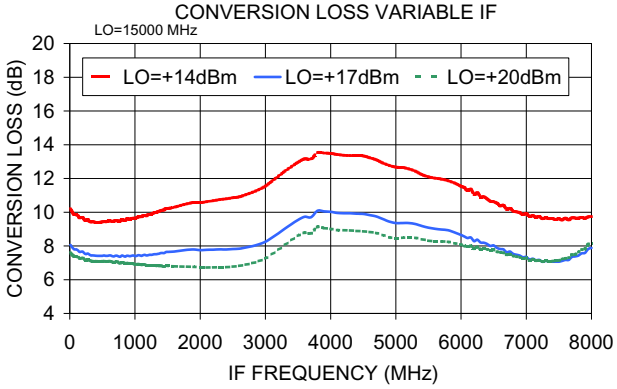
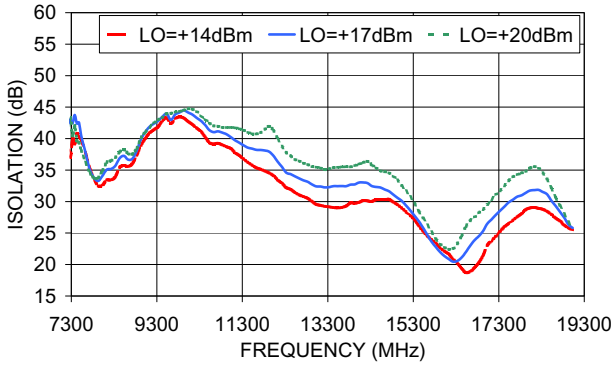
SIM-193H+
CONVERSION LOSS



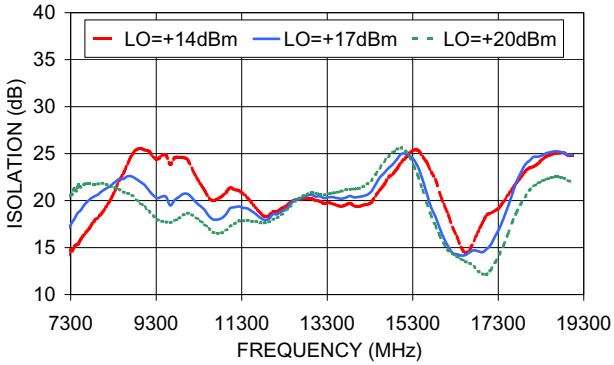

SIM-193H+
CONVERSION LOSS VARIABLE IF



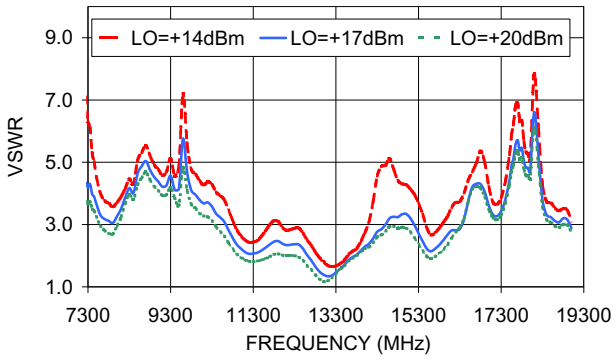

SIM-193H+
L-R ISOLATION



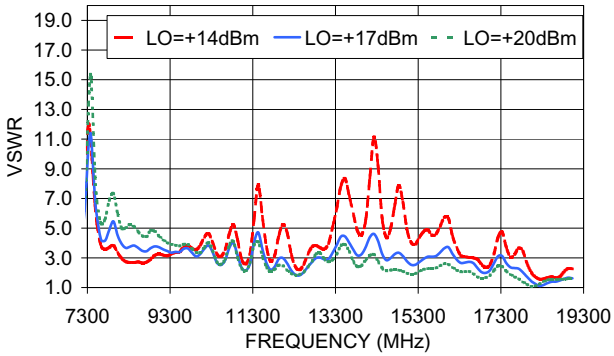

SIM-193H+
L-I ISOLATION



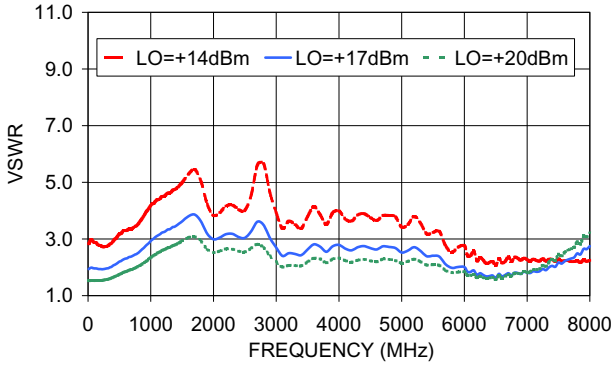

SIM-193H+
RF VSWR



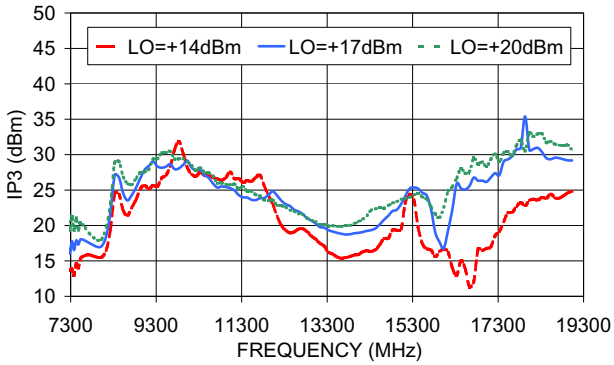

SIM-193H+
LO VSWR




SIM-193H+
IF VSWR




SIM-193H+
IP3

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## *Typical Performance Data*

| RF (IN) (GHz) | LO (GHz) | CONVERSION LOSS IF FIXED @IF(OUT)=0.030GHz (dB) @LO (dBm) | | |
|---|---|---|---|---|
| | | +14 | +17 | +20 |
| 7.22 | 7.25 | 11.41 | 7.31 | 6.72 |
| 7.30 | 7.33 | 8.37 | 6.99 | 6.55 |
| 7.52 | 7.55 | 7.36 | 6.63 | 6.25 |
| 7.86 | 7.89 | 7.09 | 6.50 | 6.11 |
| 8.20 | 8.23 | 8.08 | 7.44 | 6.90 |
| 8.52 | 8.55 | 9.02 | 8.04 | 7.21 |
| 8.86 | 8.89 | 8.94 | 8.11 | 7.51 |
| 9.20 | 9.23 | 8.40 | 7.57 | 7.02 |
| 9.54 | 9.57 | 7.40 | 6.58 | 6.11 |
| 9.86 | 9.89 | 7.76 | 6.78 | 6.30 |
| 10.20 | 10.23 | 7.72 | 6.65 | 6.08 |
| 10.54 | 10.57 | 7.81 | 6.57 | 5.93 |
| 10.88 | 10.91 | 7.21 | 6.03 | 5.47 |
| 11.22 | 11.25 | 7.06 | 6.01 | 5.57 |
| 11.54 | 11.57 | 6.70 | 5.73 | 5.30 |
| 11.88 | 11.91 | 6.88 | 6.01 | 5.59 |
| 12.22 | 12.25 | 6.57 | 5.80 | 5.37 |
| 12.56 | 12.59 | 6.80 | 5.95 | 5.46 |
| 12.88 | 12.91 | 6.65 | 5.76 | 5.29 |
| 13.22 | 13.25 | 7.10 | 6.05 | 5.58 |
| 13.56 | 13.59 | 7.37 | 6.31 | 5.84 |
| 13.90 | 13.93 | 7.48 | 6.48 | 6.03 |
| 14.22 | 14.25 | 7.94 | 6.86 | 6.41 |
| 14.56 | 14.59 | 8.22 | 6.90 | 6.45 |
| 14.90 | 14.93 | 9.93 | 7.57 | 6.96 |
| 15.24 | 15.27 | 9.76 | 7.31 | 6.79 |
| 15.58 | 15.61 | 9.29 | 7.52 | 7.14 |
| 15.90 | 15.93 | 9.25 | 7.97 | 7.57 |
| 16.24 | 16.27 | 9.37 | 8.62 | 8.02 |
| 16.58 | 16.61 | 10.00 | 8.66 | 8.08 |
| 16.92 | 16.95 | 10.61 | 8.83 | 8.60 |
| 17.24 | 17.27 | 9.95 | 8.49 | 8.22 |
| 17.58 | 17.61 | 10.16 | 8.57 | 8.29 |
| 17.92 | 17.95 | 9.61 | 8.66 | 8.38 |
| 18.26 | 18.29 | 9.20 | 8.67 | 8.41 |
| 18.58 | 18.61 | 9.07 | 8.60 | 8.36 |
| 19.00 | 19.03 | 9.20 | 8.78 | 8.58 |
| 19.26 | 19.29 | 9.62 | 9.13 | 8.93 |
| 19.60 | 19.63 | 10.89 | 10.15 | 9.94 |
| 19.94 | 19.97 | 12.12 | 10.84 | 10.62 |

| RF (IN) (GHz) | LO (GHz) | IP-3 INPUT (dBm) @LO (dBm) | | |
|---|---|---|---|---|
| | | +14 | +17 | +20 |
| 7.22 | 7.25 | 15.09 | 17.08 | 20.23 |
| 7.30 | 7.33 | 14.95 | 18.15 | 21.34 |
| 7.52 | 7.55 | 16.39 | 18.96 | 21.06 |
| 7.86 | 7.89 | 16.99 | 18.97 | 21.01 |
| 8.20 | 8.23 | 19.75 | 22.64 | 24.97 |
| 8.52 | 8.55 | 23.22 | 25.07 | 26.81 |
| 8.86 | 8.89 | 24.95 | 26.77 | 27.81 |
| 9.20 | 9.23 | 25.05 | 27.29 | 27.02 |
| 9.54 | 9.57 | 24.69 | 25.96 | 26.46 |
| 9.86 | 9.89 | 24.88 | 24.97 | 25.79 |
| 10.20 | 10.23 | 23.48 | 23.25 | 24.50 |
| 10.54 | 10.57 | 22.20 | 21.89 | 23.12 |
| 10.88 | 10.91 | 21.82 | 21.47 | 22.64 |
| 11.22 | 11.25 | 22.35 | 21.42 | 22.84 |
| 11.54 | 11.57 | 22.14 | 21.25 | 22.62 |
| 11.88 | 11.91 | 23.06 | 21.98 | 22.76 |
| 12.22 | 12.25 | 20.84 | 20.62 | 21.29 |
| 12.56 | 12.59 | 18.53 | 19.70 | 20.24 |
| 12.88 | 12.91 | 16.75 | 18.81 | 19.75 |
| 13.22 | 13.25 | 15.78 | 19.01 | 20.18 |
| 13.56 | 13.59 | 16.04 | 19.55 | 21.20 |
| 13.90 | 13.93 | 16.75 | 19.88 | 21.63 |
| 14.22 | 14.25 | 16.94 | 20.77 | 22.74 |
| 14.56 | 14.59 | 16.77 | 21.70 | 23.21 |
| 14.90 | 14.93 | 19.32 | 22.09 | 23.20 |
| 15.24 | 15.27 | 20.79 | 24.45 | 23.68 |
| 15.58 | 15.61 | 21.10 | 26.38 | 24.01 |
| 15.90 | 15.93 | 21.68 | 23.68 | 22.09 |
| 16.24 | 16.27 | 14.85 | 24.59 | 24.91 |
| 16.58 | 16.61 | 14.87 | 25.98 | 27.97 |
| 16.92 | 16.95 | 17.97 | 24.72 | 28.37 |
| 17.24 | 17.27 | 19.16 | 26.04 | 28.82 |
| 17.58 | 17.61 | 19.01 | 28.08 | 30.04 |
| 17.92 | 17.95 | 20.76 | 29.28 | 30.65 |
| 18.26 | 18.29 | 21.83 | 30.09 | 31.29 |
| 18.58 | 18.61 | 22.57 | 29.43 | 31.79 |
| 19.00 | 19.03 | 23.27 | 27.91 | 31.35 |
| 19.26 | 19.29 | 23.21 | 27.59 | 30.89 |
| 19.60 | 19.63 | 22.15 | 27.87 | 29.93 |
| 19.94 | 19.97 | 19.93 | 28.32 | 29.88 |

| RF (IN) (GHz) | LO (GHz) | COMPRESSION @RF IN=+14dBm (dB) @LO (dBm) | | |
|---|---|---|---|---|
| | | +14 | +17 | +20 |
| 7.22 | 7.25 | 1.89 | 0.79 | 0.44 |
| 7.30 | 7.33 | 2.49 | 1.06 | 0.54 |
| 7.52 | 7.55 | 1.94 | 0.80 | 0.44 |
| 7.86 | 7.89 | 2.02 | 0.94 | 0.57 |
| 8.20 | 8.23 | 1.22 | 0.79 | 0.58 |
| 8.52 | 8.55 | 0.74 | 0.53 | 0.40 |
| 8.86 | 8.89 | 0.42 | 0.34 | 0.22 |
| 9.20 | 9.23 | 0.51 | 0.39 | 0.31 |
| 9.54 | 9.57 | 0.37 | 0.29 | 0.22 |
| 9.86 | 9.89 | 0.37 | 0.29 | 0.23 |
| 10.20 | 10.23 | 0.52 | 0.42 | 0.35 |
| 10.54 | 10.57 | 0.45 | 0.35 | 0.31 |
| 10.88 | 10.91 | 0.48 | 0.40 | 0.34 |
| 11.22 | 11.25 | 0.33 | 0.30 | 0.24 |
| 11.54 | 11.57 | 0.45 | 0.38 | 0.34 |
| 11.88 | 11.91 | 0.18 | 0.19 | 0.15 |
| 12.22 | 12.25 | 0.42 | 0.36 | 0.30 |
| 12.56 | 12.59 | 0.30 | 0.28 | 0.23 |
| 12.88 | 12.91 | 0.39 | 0.32 | 0.25 |
| 13.22 | 13.25 | 0.29 | 0.24 | 0.20 |
| 13.56 | 13.59 | 0.29 | 0.24 | 0.19 |
| 13.90 | 13.93 | 0.16 | 0.19 | 0.17 |
| 14.22 | 14.25 | 0.18 | 0.20 | 0.15 |
| 14.56 | 14.59 | 0.19 | 0.19 | 0.16 |
| 14.90 | 14.93 | 0.22 | 0.18 | 0.14 |
| 15.24 | 15.27 | 0.27 | 0.19 | 0.14 |
| 15.58 | 15.61 | 0.38 | 0.33 | 0.31 |
| 15.90 | 15.93 | 0.58 | 0.64 | 0.54 |
| 16.24 | 16.27 | 0.46 | 0.40 | 0.32 |
| 16.58 | 16.61 | 0.64 | 0.34 | 0.24 |
| 16.92 | 16.95 | 0.68 | 0.31 | 0.21 |
| 17.24 | 17.27 | 0.20 | 0.16 | 0.11 |
| 17.58 | 17.61 | 0.22 | 0.15 | 0.09 |
| 17.92 | 17.95 | 0.55 | 0.26 | 0.15 |
| 18.26 | 18.29 | 0.23 | 0.16 | 0.09 |
| 18.58 | 18.61 | 0.16 | 0.14 | 0.08 |
| 19.00 | 19.03 | 0.22 | 0.16 | 0.09 |
| 19.26 | 19.29 | 0.24 | 0.18 | 0.10 |
| 19.60 | 19.63 | 0.21 | 0.15 | 0.11 |
| 19.94 | 19.97 | 0.19 | 0.13 | 0.06 |

## *Typical Performance Data*

| IF (OUT) (GHz) | LO (GHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=13.150GHz (dB) @LO (dBm) +17 |
|---|---|---|
| 6.050 | 7.100 | 6.17 |
| 5.750 | 7.400 | 6.19 |
| 5.450 | 7.700 | 6.56 |
| 5.130 | 8.020 | 6.51 |
| 4.830 | 8.320 | 6.55 |
| 4.510 | 8.640 | 7.08 |
| 4.210 | 8.940 | 7.59 |
| 3.890 | 9.260 | 7.81 |
| 3.590 | 9.560 | 7.60 |
| 3.270 | 9.880 | 6.88 |
| 2.970 | 10.180 | 6.62 |
| 2.650 | 10.500 | 6.49 |
| 2.350 | 10.800 | 6.31 |
| 2.030 | 11.120 | 6.03 |
| 1.730 | 11.420 | 5.79 |
| 1.410 | 11.740 | 5.73 |
| 1.110 | 12.040 | 5.63 |
| 0.790 | 12.360 | 5.39 |
| 0.490 | 12.660 | 5.33 |
| 0.170 | 12.980 | 5.56 |
| 0.010 | 13.160 | 5.96 |
| 0.350 | 13.500 | 5.85 |
| 0.690 | 13.840 | 5.81 |
| 1.050 | 14.200 | 6.13 |
| 1.390 | 14.540 | 6.42 |
| 1.750 | 14.900 | 6.31 |
| 2.090 | 15.240 | 6.35 |
| 2.450 | 15.600 | 6.48 |
| 2.790 | 15.940 | 6.82 |
| 3.130 | 16.280 | 7.41 |
| 3.490 | 16.640 | 7.07 |
| 3.830 | 16.980 | 6.86 |
| 4.190 | 17.340 | 6.79 |
| 4.530 | 17.680 | 6.78 |
| 4.890 | 18.040 | 6.85 |
| 5.230 | 18.380 | 6.95 |
| 5.570 | 18.720 | 7.19 |
| 5.930 | 19.080 | 7.03 |
| 6.270 | 19.420 | 7.40 |
| 6.630 | 19.780 | 7.27 |

| IF (OUT) (GHz) | LO (GHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=7.300GHz (dB) @LO (dBm) +17 |
|---|---|---|
| 0.050 | 7.350 | 6.58 |
| 0.270 | 7.570 | 6.32 |
| 0.510 | 7.810 | 6.01 |
| 0.730 | 8.030 | 5.73 |
| 0.970 | 8.270 | 5.67 |
| 1.190 | 8.490 | 5.85 |
| 1.430 | 8.730 | 6.40 |
| 1.650 | 8.950 | 7.34 |
| 1.890 | 9.190 | 8.57 |
| 2.110 | 9.410 | 9.35 |
| 2.350 | 9.650 | 9.50 |
| 2.570 | 9.870 | 10.35 |
| 2.810 | 10.110 | 10.77 |
| 3.050 | 10.350 | 10.80 |
| 3.270 | 10.570 | 10.59 |
| 3.510 | 10.810 | 10.45 |
| 3.730 | 11.030 | 10.35 |
| 3.970 | 11.270 | 10.43 |
| 4.190 | 11.490 | 10.40 |
| 4.430 | 11.730 | 10.15 |
| 4.650 | 11.950 | 10.19 |
| 4.890 | 12.190 | 9.83 |
| 5.110 | 12.410 | 9.76 |
| 5.350 | 12.650 | 9.96 |
| 5.570 | 12.870 | 9.63 |
| 5.810 | 13.110 | 9.34 |
| 6.050 | 13.350 | 8.89 |
| 6.270 | 13.570 | 8.62 |
| 6.510 | 13.810 | 8.63 |
| 6.730 | 14.030 | 8.36 |
| 6.970 | 14.270 | 8.23 |
| 7.190 | 14.490 | 8.55 |
| 7.430 | 14.730 | 8.98 |
| 7.650 | 14.950 | 9.55 |
| 7.890 | 15.190 | 10.25 |
| 8.110 | 15.410 | 10.76 |
| 8.350 | 15.650 | 11.56 |
| 8.570 | 15.870 | 12.32 |
| 8.810 | 16.110 | 13.53 |
| 9.050 | 16.350 | 15.18 |

| IF (OUT) (GHz) | LO (GHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=19GHz (dB) @LO (dBm) +17 |
|---|---|---|
| 9.3 | 9.7 | 15.30 |
| 9.1 | 9.9 | 14.89 |
| 8.8 | 10.2 | 14.28 |
| 8.6 | 10.4 | 13.74 |
| 8.3 | 10.7 | 13.13 |
| 8.1 | 10.9 | 12.30 |
| 7.9 | 11.1 | 11.22 |
| 7.6 | 11.4 | 10.28 |
| 7.4 | 11.6 | 9.74 |
| 7.2 | 11.8 | 9.86 |
| 6.9 | 12.1 | 9.87 |
| 6.7 | 12.3 | 9.95 |
| 6.4 | 12.6 | 10.01 |
| 6.2 | 12.8 | 10.00 |
| 6.0 | 13.0 | 10.05 |
| 5.7 | 13.3 | 10.37 |
| 5.5 | 13.5 | 10.78 |
| 5.3 | 13.7 | 11.09 |
| 5.0 | 14.0 | 11.36 |
| 4.8 | 14.2 | 11.66 |
| 4.6 | 14.4 | 11.63 |
| 4.3 | 14.7 | 11.34 |
| 4.1 | 14.9 | 11.03 |
| 3.8 | 15.2 | 11.03 |
| 3.6 | 15.4 | 10.79 |
| 3.4 | 15.6 | 10.93 |
| 3.1 | 15.9 | 11.62 |
| 2.9 | 16.1 | 11.94 |
| 2.7 | 16.3 | 11.26 |
| 2.4 | 16.6 | 11.20 |
| 2.2 | 16.8 | 11.05 |
| 1.9 | 17.1 | 10.94 |
| 1.7 | 17.3 | 10.81 |
| 1.5 | 17.5 | 10.57 |
| 1.2 | 17.8 | 10.29 |
| 1.0 | 18.0 | 9.96 |
| 0.8 | 18.2 | 9.72 |
| 0.5 | 18.5 | 9.64 |
| 0.3 | 18.7 | 9.47 |
| 0.0 | 19.0 | 9.41 |

## *Typical Performance Data*

| LO (GHz) | LO-RF ISOLATION (dB) @LO (dBm) | | | LO-IF ISOLATION (dB) @LO (dBm) | | |
|---|---|---|---|---|---|---|
| | +14 | +17 | +20 | +14 | +17 | +20 |
| 7.25 | 39.93 | 40.01 | 40.26 | 14.58 | 17.39 | 19.15 |
| 7.33 | 39.90 | 41.80 | 41.76 | 14.16 | 17.13 | 19.08 |
| 7.55 | 37.28 | 38.55 | 38.73 | 15.57 | 17.90 | 18.81 |
| 7.89 | 29.65 | 30.72 | 32.02 | 16.95 | 18.26 | 18.44 |
| 8.23 | 32.40 | 34.36 | 36.16 | 17.84 | 18.01 | 17.51 |
| 8.55 | 39.39 | 43.09 | 41.45 | 19.32 | 17.89 | 16.89 |
| 8.89 | 36.92 | 38.18 | 38.18 | 20.18 | 17.74 | 16.33 |
| 9.23 | 37.38 | 38.18 | 38.66 | 17.57 | 15.11 | 13.76 |
| 9.57 | 38.44 | 39.52 | 40.41 | 17.50 | 15.36 | 14.17 |
| 9.89 | 39.78 | 40.93 | 41.08 | 17.75 | 15.43 | 14.23 |
| 10.23 | 39.27 | 40.85 | 40.72 | 16.80 | 14.77 | 13.77 |
| 10.57 | 38.89 | 41.72 | 43.29 | 16.16 | 14.49 | 13.63 |
| 10.91 | 36.36 | 38.67 | 39.57 | 16.19 | 14.65 | 13.78 |
| 11.25 | 35.25 | 37.89 | 38.61 | 15.94 | 14.57 | 13.80 |
| 11.57 | 33.17 | 34.04 | 34.30 | 16.35 | 15.47 | 14.94 |
| 11.91 | 34.78 | 37.07 | 36.34 | 15.38 | 14.69 | 14.32 |
| 12.25 | 32.34 | 35.36 | 37.83 | 16.42 | 16.11 | 15.85 |
| 12.59 | 31.46 | 34.31 | 37.00 | 16.40 | 16.13 | 15.88 |
| 12.91 | 29.34 | 31.73 | 34.04 | 16.71 | 16.70 | 16.63 |
| 13.25 | 29.06 | 31.34 | 33.44 | 17.05 | 17.28 | 17.35 |
| 13.59 | 29.03 | 31.35 | 33.22 | 17.30 | 17.68 | 17.84 |
| 13.93 | 29.56 | 31.75 | 33.39 | 17.47 | 17.97 | 18.22 |
| 14.25 | 29.68 | 32.17 | 33.91 | 17.93 | 18.62 | 19.04 |
| 14.59 | 28.91 | 31.35 | 33.37 | 18.83 | 19.83 | 20.47 |
| 14.93 | 27.70 | 29.60 | 31.17 | 21.23 | 21.80 | 22.15 |
| 15.27 | 25.07 | 26.29 | 27.31 | 21.25 | 20.84 | 20.49 |
| 15.61 | 22.15 | 22.88 | 23.50 | 18.06 | 17.30 | 16.84 |
| 15.93 | 18.33 | 18.97 | 19.62 | 14.14 | 13.38 | 13.15 |
| 16.27 | 16.21 | 17.53 | 18.91 | 10.87 | 10.92 | 11.03 |
| 16.61 | 18.78 | 20.71 | 22.38 | 11.02 | 10.44 | 9.85 |
| 16.95 | 20.96 | 22.59 | 23.98 | 11.81 | 10.25 | 9.09 |
| 17.27 | 24.92 | 26.50 | 27.78 | 12.30 | 10.90 | 9.97 |
| 17.61 | 25.94 | 27.43 | 28.41 | 17.05 | 15.71 | 14.87 |
| 17.95 | 27.03 | 28.83 | 29.81 | 20.70 | 19.90 | 19.09 |
| 18.29 | 31.21 | 33.98 | 36.28 | 21.30 | 19.27 | 17.83 |
| 18.61 | 30.22 | 30.76 | 30.75 | 20.46 | 18.92 | 18.04 |
| 19.03 | 25.17 | 24.89 | 24.66 | 20.49 | 19.81 | 19.31 |
| 19.29 | 22.95 | 21.97 | 21.41 | 20.04 | 19.03 | 18.27 |
| 19.63 | 19.55 | 18.62 | 18.14 | 19.06 | 18.52 | 18.08 |
| 19.97 | 16.25 | 15.48 | 15.06 | 17.79 | 17.69 | 17.47 |

| RF (IN) (GHz) | LO (GHz) | RF-IF ISOLATION (dB) @LO (dBm) | | |
|---|---|---|---|---|
| | | +14 | +17 | +20 |
| 7.22 | 7.25 | 20.17 | 20.18 | 19.98 |
| 7.30 | 7.33 | 20.11 | 20.17 | 20.29 |
| 7.52 | 7.55 | 19.97 | 19.68 | 19.34 |
| 7.86 | 7.89 | 17.94 | 17.75 | 17.48 |
| 8.20 | 8.23 | 17.44 | 17.79 | 17.98 |
| 8.52 | 8.55 | 21.11 | 21.59 | 21.69 |
| 8.86 | 8.89 | 23.54 | 23.96 | 24.11 |
| 9.20 | 9.23 | 25.32 | 25.48 | 25.47 |
| 9.54 | 9.57 | 27.43 | 27.34 | 27.15 |
| 9.86 | 9.89 | 29.82 | 29.43 | 29.12 |
| 10.20 | 10.23 | 30.55 | 30.00 | 29.63 |
| 10.54 | 10.57 | 31.60 | 30.95 | 30.33 |
| 10.88 | 10.91 | 31.60 | 30.77 | 30.00 |
| 11.22 | 11.25 | 31.03 | 30.37 | 29.78 |
| 11.54 | 11.57 | 30.50 | 30.04 | 29.59 |
| 11.88 | 11.91 | 30.07 | 29.41 | 29.07 |
| 12.22 | 12.25 | 30.18 | 29.41 | 28.92 |
| 12.56 | 12.59 | 29.87 | 28.99 | 28.36 |
| 12.88 | 12.91 | 29.51 | 28.57 | 27.88 |
| 13.22 | 13.25 | 28.94 | 27.74 | 26.89 |
| 13.56 | 13.59 | 27.72 | 26.42 | 25.64 |
| 13.90 | 13.93 | 26.22 | 24.83 | 24.09 |
| 14.22 | 14.25 | 24.40 | 23.04 | 22.32 |
| 14.56 | 14.59 | 22.63 | 21.68 | 21.13 |
| 14.90 | 14.93 | 21.48 | 20.64 | 20.12 |
| 15.24 | 15.27 | 20.31 | 19.52 | 19.00 |
| 15.58 | 15.61 | 18.66 | 18.09 | 17.72 |
| 15.90 | 15.93 | 17.78 | 17.19 | 17.07 |
| 16.24 | 16.27 | 18.56 | 19.30 | 19.87 |
| 16.58 | 16.61 | 24.03 | 24.88 | 25.38 |
| 16.92 | 16.95 | 25.97 | 26.30 | 26.51 |
| 17.24 | 17.27 | 24.84 | 24.86 | 24.77 |
| 17.58 | 17.61 | 23.77 | 23.55 | 23.41 |
| 17.92 | 17.95 | 22.58 | 22.28 | 22.14 |
| 18.26 | 18.29 | 20.82 | 20.63 | 20.52 |
| 18.58 | 18.61 | 19.94 | 19.84 | 19.80 |
| 19.00 | 19.03 | 18.28 | 18.25 | 18.25 |
| 19.26 | 19.29 | 16.42 | 16.40 | 16.38 |
| 19.60 | 19.63 | 14.65 | 14.65 | 14.64 |
| 19.94 | 19.97 | 13.44 | 13.51 | 13.53 |

## *Typical Performance Data*

| RF (IN) (GHz) | LO (GHz) | RF VSWR (:1) @LO (dBm) | | |
|---|---|---|---|---|
| | | +14 | +17 | +20 |
| 7.22 | 7.25 | 4.50 | 3.56 | 3.24 |
| 7.30 | 7.33 | 4.99 | 3.50 | 3.12 |
| 7.52 | 7.55 | 3.61 | 3.07 | 2.78 |
| 7.86 | 7.89 | 3.13 | 2.68 | 2.41 |
| 8.20 | 8.23 | 3.93 | 3.63 | 3.43 |
| 8.52 | 8.55 | 5.55 | 5.05 | 4.67 |
| 8.86 | 8.89 | 6.12 | 5.48 | 5.02 |
| 9.20 | 9.23 | 4.91 | 4.35 | 3.97 |
| 9.54 | 9.57 | 4.21 | 3.72 | 3.39 |
| 9.86 | 9.89 | 4.09 | 3.52 | 3.12 |
| 10.20 | 10.23 | 4.20 | 3.54 | 3.12 |
| 10.54 | 10.57 | 3.79 | 3.16 | 2.75 |
| 10.88 | 10.91 | 3.66 | 2.99 | 2.57 |
| 11.22 | 11.25 | 3.26 | 2.66 | 2.26 |
| 11.54 | 11.57 | 3.38 | 2.65 | 2.30 |
| 11.88 | 11.91 | 2.43 | 2.00 | 1.73 |
| 12.22 | 12.25 | 2.26 | 1.90 | 1.62 |
| 12.56 | 12.59 | 2.03 | 1.72 | 1.49 |
| 12.88 | 12.91 | 2.15 | 1.81 | 1.59 |
| 13.22 | 13.25 | 2.04 | 1.66 | 1.50 |
| 13.56 | 13.59 | 2.56 | 1.87 | 1.76 |
| 13.90 | 13.93 | 2.32 | 1.85 | 1.79 |
| 14.22 | 14.25 | 2.57 | 2.18 | 2.18 |
| 14.56 | 14.59 | 3.24 | 3.09 | 3.03 |
| 14.90 | 14.93 | 3.51 | 3.02 | 2.82 |
| 15.24 | 15.27 | 3.58 | 2.80 | 2.63 |
| 15.58 | 15.61 | 3.89 | 2.99 | 2.76 |
| 15.90 | 15.93 | 3.25 | 2.55 | 2.20 |
| 16.24 | 16.27 | 2.08 | 1.69 | 1.68 |
| 16.58 | 16.61 | 2.34 | 2.41 | 2.44 |
| 16.92 | 16.95 | 3.45 | 3.29 | 3.32 |
| 17.24 | 17.27 | 4.20 | 4.15 | 4.11 |
| 17.58 | 17.61 | 5.66 | 5.51 | 5.42 |
| 17.92 | 17.95 | 5.99 | 5.23 | 5.04 |
| 18.26 | 18.29 | 4.26 | 3.98 | 3.84 |
| 18.58 | 18.61 | 3.57 | 3.44 | 3.35 |
| 19.00 | 19.03 | 3.52 | 3.44 | 3.38 |
| 19.26 | 19.29 | 2.85 | 2.78 | 2.75 |
| 19.60 | 19.63 | 3.60 | 3.48 | 3.42 |
| 19.94 | 19.97 | 2.51 | 2.44 | 2.41 |

| LO (GHz) | LO VSWR (:1) @LO (dBm) | | |
|---|---|---|---|
| | +14 | +17 | +20 |
| 7.22 | 7.51 | 6.02 | 6.36 |
| 7.33 | 8.14 | 5.58 | 5.74 |
| 7.55 | 4.46 | 4.61 | 5.31 |
| 7.89 | 3.04 | 3.75 | 4.59 |
| 8.23 | 2.35 | 3.16 | 4.04 |
| 8.55 | 2.27 | 3.04 | 3.85 |
| 8.89 | 2.48 | 2.96 | 3.56 |
| 9.23 | 2.87 | 3.13 | 3.61 |
| 9.57 | 3.19 | 3.08 | 3.28 |
| 9.89 | 3.72 | 3.11 | 3.08 |
| 10.23 | 3.69 | 3.02 | 2.96 |
| 10.57 | 3.91 | 2.97 | 2.75 |
| 10.91 | 4.26 | 2.91 | 2.57 |
| 11.25 | 4.29 | 2.81 | 2.43 |
| 11.57 | 4.78 | 2.79 | 2.38 |
| 11.91 | 3.46 | 2.44 | 2.21 |
| 12.25 | 3.72 | 2.50 | 2.23 |
| 12.59 | 3.42 | 2.50 | 2.34 |
| 12.91 | 4.22 | 2.81 | 2.52 |
| 13.25 | 5.49 | 3.29 | 2.77 |
| 13.59 | 7.48 | 3.89 | 3.00 |
| 13.93 | 7.76 | 3.96 | 2.97 |
| 14.25 | 8.23 | 4.26 | 2.99 |
| 14.59 | 6.29 | 3.53 | 2.68 |
| 14.93 | 5.68 | 3.36 | 2.54 |
| 15.27 | 5.83 | 3.28 | 2.42 |
| 15.61 | 4.54 | 2.76 | 2.17 |
| 15.93 | 4.13 | 2.76 | 2.13 |
| 16.27 | 3.23 | 2.59 | 2.17 |
| 16.61 | 3.24 | 2.87 | 2.48 |
| 16.95 | 3.38 | 2.98 | 2.65 |
| 17.27 | 2.77 | 2.30 | 2.05 |
| 17.61 | 2.49 | 2.07 | 1.81 |
| 17.95 | 2.67 | 2.09 | 1.73 |
| 18.29 | 2.07 | 1.49 | 1.24 |
| 18.61 | 1.58 | 1.31 | 1.25 |
| 19.03 | 1.77 | 1.53 | 1.43 |
| 19.29 | 1.83 | 1.60 | 1.54 |
| 19.63 | 2.09 | 1.87 | 1.78 |
| 19.97 | 2.63 | 2.32 | 2.18 |

| IF (OUT) (GHz) | IF VSWR @LO=19GHz (:1) @LO (dBm) | | |
|---|---|---|---|
| | +14 | +17 | +20 |
| 0.04 | 1.61 | 1.45 | 1.35 |
| 0.24 | 1.68 | 1.49 | 1.40 |
| 0.44 | 1.78 | 1.59 | 1.50 |
| 0.64 | 1.94 | 1.74 | 1.65 |
| 0.88 | 2.14 | 1.93 | 1.83 |
| 1.08 | 2.35 | 2.11 | 2.00 |
| 1.28 | 2.51 | 2.25 | 2.13 |
| 1.48 | 2.63 | 2.36 | 2.23 |
| 1.72 | 2.73 | 2.45 | 2.31 |
| 1.92 | 2.79 | 2.50 | 2.36 |
| 2.12 | 2.84 | 2.54 | 2.39 |
| 2.32 | 2.87 | 2.55 | 2.40 |
| 2.56 | 2.95 | 2.61 | 2.45 |
| 2.76 | 2.97 | 2.62 | 2.45 |
| 2.96 | 2.96 | 2.59 | 2.42 |
| 3.16 | 2.98 | 2.60 | 2.42 |
| 3.40 | 3.09 | 2.70 | 2.51 |
| 3.60 | 3.21 | 2.81 | 2.62 |
| 3.80 | 3.32 | 2.91 | 2.71 |
| 4.00 | 3.46 | 3.03 | 2.82 |
| 4.23 | 3.83 | 3.36 | 3.13 |
| 4.43 | 3.91 | 3.44 | 3.22 |
| 4.63 | 4.11 | 3.63 | 3.40 |
| 4.83 | 4.10 | 3.65 | 3.43 |
| 5.07 | 4.02 | 3.59 | 3.39 |
| 5.27 | 3.74 | 3.38 | 3.21 |
| 5.47 | 3.46 | 3.13 | 2.98 |
| 5.67 | 3.08 | 2.79 | 2.66 |
| 5.91 | 2.61 | 2.37 | 2.26 |
| 6.11 | 2.28 | 2.09 | 2.02 |
| 6.31 | 2.09 | 1.94 | 1.90 |
| 6.51 | 2.14 | 2.04 | 2.01 |
| 6.75 | 2.35 | 2.27 | 2.25 |
| 6.95 | 2.55 | 2.48 | 2.45 |
| 7.15 | 2.47 | 2.38 | 2.34 |
| 7.35 | 2.43 | 2.42 | 2.40 |
| 7.59 | 2.29 | 2.34 | 2.36 |
| 7.79 | 2.24 | 2.36 | 2.41 |
| 7.99 | 2.22 | 2.41 | 2.50 |
| 8.23 | 2.38 | 2.66 | 2.79 |

## *Harmonics Tables*

RF HARMONICS ORDER

| | (-dBm) | (-dBc) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | --- | --- | -15.92 | 32.30 | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | --- | 25.12 | --- | 32.76 | 38.32 | --- | --- | --- | --- | --- | --- | --- |
| 2 | -104.18 | 77.79 | 69.93 | 59.81 | 70.54 | 76.72 | --- | --- | --- | --- | --- | --- |
| 3 | -126.21 | --- | 92.49 | 100.15 | 80.34 | 95.23 | 93.11 | --- | --- | --- | --- | --- |
| 4 | -124.18 | --- | --- | 92.05 | 101.08 | 105.11 | 101.18 | 92.86 | --- | --- | --- | --- |
| 5 | -122.93 | --- | --- | --- | 93.07 | 102.01 | 91.44 | 101.31 | --- | --- | --- | --- |
| 6 | -123.50 | --- | --- | --- | --- | 91.84 | 89.03 | 95.06 | 89.54 | --- | --- | --- |
| 7 | -125.26 | --- | --- | --- | --- | --- | 91.81 | 89.72 | 95.90 | 91.46 | --- | --- |
| 8 | -125.01 | --- | --- | --- | --- | --- | --- | 92.89 | 99.03 | 96.14 | 97.00 | --- |
| 9 | -124.81 | --- | --- | --- | --- | --- | --- | --- | 92.80 | 99.47 | 98.19 | 98.08 |
| 10 | -126.17 | --- | --- | --- | --- | --- | --- | --- | --- | 90.62 | 100.82 | 103.18 |
| | RF CAL | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

**LO HARMONICS ORDER**

**Test conditions:** RF IN: 13150 MHz; -15 dBm.
LO IN: 13180 MHz; +17.00 dBm
IF OUT: 30 MHz; -21.14 dBm

RF HARMONICS ORDER

| | (-dBm) | (-dBc) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | --- | --- | -5.99 | 43.11 | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | --- | 25.69 | --- | 32.80 | 38.06 | --- | --- | --- | --- | --- | --- | --- |
| 2 | -91.45 | 67.62 | 60.04 | 49.89 | 60.78 | 67.58 | --- | --- | --- | --- | --- | --- |
| 3 | -113.83 | --- | 82.64 | 81.07 | 60.37 | 78.67 | 89.18 | --- | --- | --- | --- | --- |
| 4 | -114.17 | --- | --- | 102.36 | 104.36 | 89.73 | 103.71 | 98.09 | --- | --- | --- | --- |
| 5 | -111.38 | --- | --- | --- | 102.59 | 111.69 | 93.95 | 111.21 | --- | --- | --- | --- |
| 6 | -114.65 | --- | --- | --- | --- | 103.17 | 99.67 | 95.69 | 100.33 | --- | --- | --- |
| 7 | -114.09 | --- | --- | --- | --- | --- | 102.30 | 99.78 | 95.63 | 101.48 | --- | --- |
| 8 | -113.95 | --- | --- | --- | --- | --- | --- | 100.31 | 107.72 | 100.28 | 107.42 | --- |
| 9 | -112.34 | --- | --- | --- | --- | --- | --- | --- | 100.85 | 110.44 | 99.48 | 109.14 |
| 10 | -113.17 | --- | --- | --- | --- | --- | --- | --- | --- | 102.69 | 111.37 | 113.77 |
| | RF CAL | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

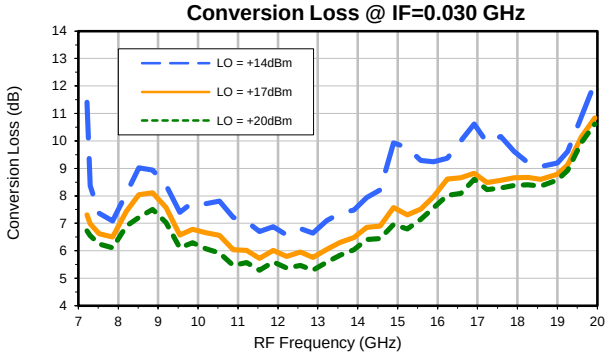
**LO HARMONICS ORDER**

**Test conditions:** RF IN: 13150 MHz; -5 dBm.
LO IN: 13180 MHz; +17.00 dBm
IF OUT: 30 MHz; -10.99 dBm

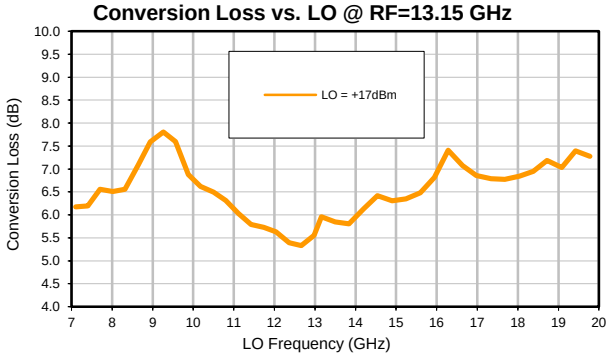
**Notes:** 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

## *Typical Performance Curves*

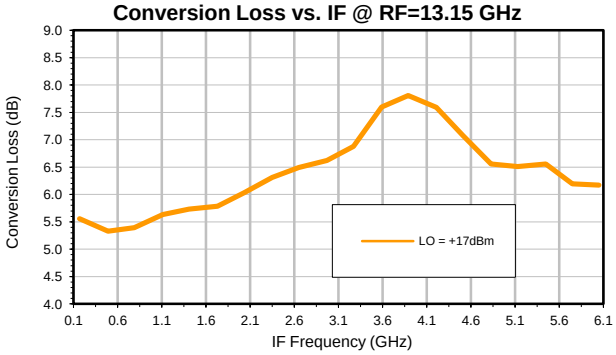
**Conversion Loss @ IF=0.030 GHz**



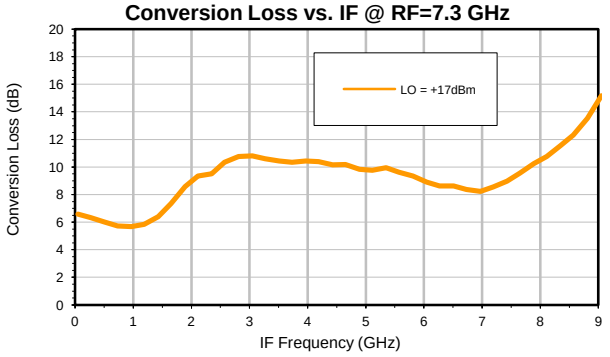

**Conversion Loss vs. LO @ RF=13.15 GHz**



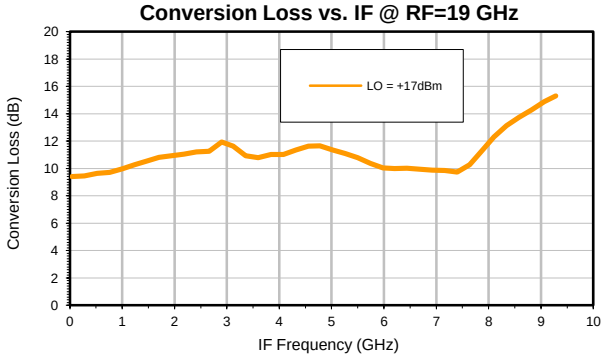

**Conversion Loss vs. IF @ RF=13.15 GHz**



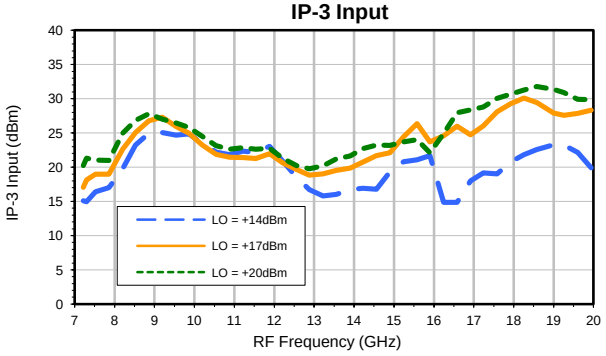

**Conversion Loss vs. IF @ RF=7.3 GHz**



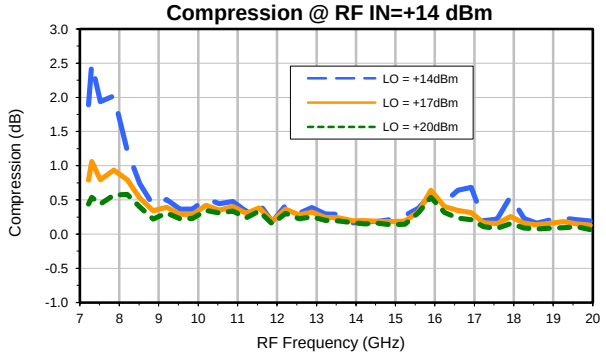

**Conversion Loss vs. IF @ RF=19 GHz**




**IP-3 Input**

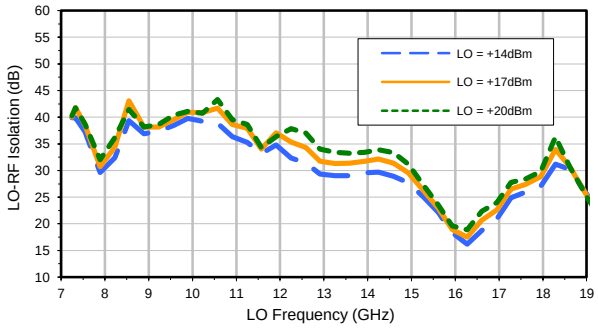



**Compression @ RF IN=+14 dBm**

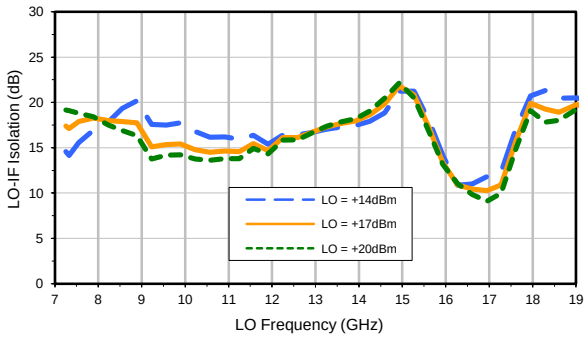


## *Typical Performance Curves*

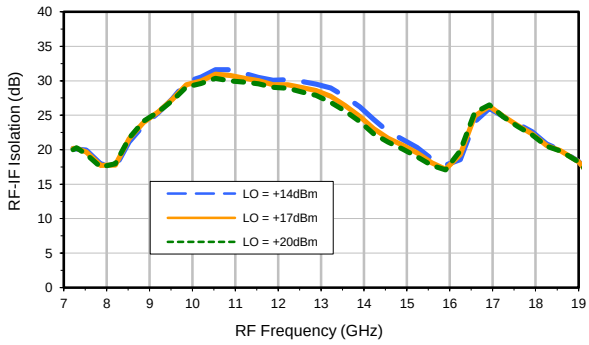
### LO-RF Isolation



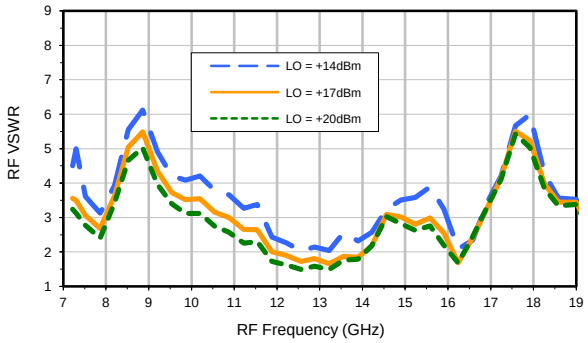

### LO-IF Isolation



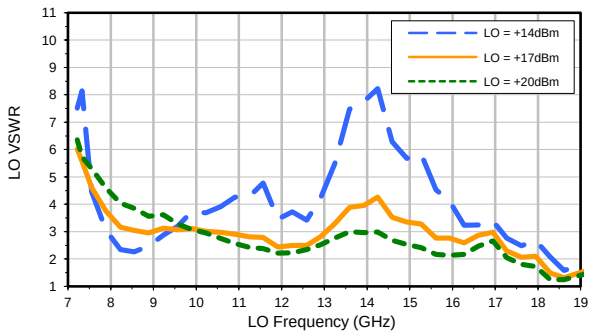

### RF-IF Isolation



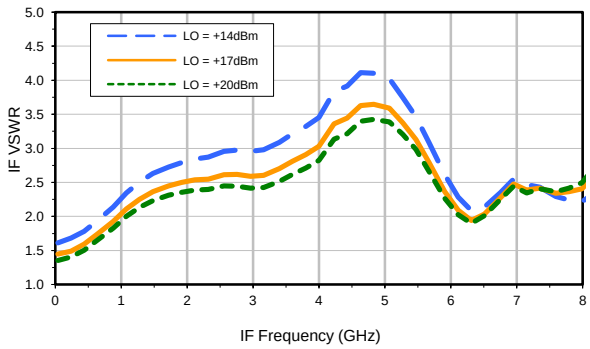

### RF VSWR




### LO VSWR




### IF VSWR



## *Harmonics Tables*

RF HARMONICS ORDER

| | (-dBm) | (-dBc) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | --- | --- | -15.92 | 32.30 | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | --- | 25.12 | --- | 32.76 | 38.32 | --- | --- | --- | --- | --- | --- | --- |
| 2 | -104.18 | 77.79 | 69.93 | 59.81 | 70.54 | 76.72 | --- | --- | --- | --- | --- | --- |
| 3 | -126.21 | --- | 92.49 | 100.15 | 80.34 | 95.23 | 93.11 | --- | --- | --- | --- | --- |
| 4 | -124.18 | --- | --- | 92.05 | 101.08 | 105.11 | 101.18 | 92.86 | --- | --- | --- | --- |
| 5 | -122.93 | --- | --- | --- | 93.07 | 102.01 | 91.44 | 101.31 | --- | --- | --- | --- |
| 6 | -123.50 | --- | --- | --- | --- | 91.84 | 89.03 | 95.06 | 89.54 | --- | --- | --- |
| 7 | -125.26 | --- | --- | --- | --- | --- | 91.81 | 89.72 | 95.90 | 91.46 | --- | --- |
| 8 | -125.01 | --- | --- | --- | --- | --- | --- | 92.89 | 99.03 | 96.14 | 97.00 | --- |
| 9 | -124.81 | --- | --- | --- | --- | --- | --- | --- | 92.80 | 99.47 | 98.19 | 98.08 |
| 10 | -126.17 | --- | --- | --- | --- | --- | --- | --- | --- | 90.62 | 100.82 | 103.18 |
| | RF CAL | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

**LO HARMONICS ORDER**

**Test conditions:** RF IN: 13150 MHz; -15 dBm.
LO IN: 13180 MHz; +17.00 dBm
IF OUT: 30 MHz; -21.14 dBm

RF HARMONICS ORDER

| | (-dBm) | (-dBc) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | --- | --- | -5.99 | 43.11 | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | --- | 25.69 | --- | 32.80 | 38.06 | --- | --- | --- | --- | --- | --- | --- |
| 2 | -91.45 | 67.62 | 60.04 | 49.89 | 60.78 | 67.58 | --- | --- | --- | --- | --- | --- |
| 3 | -113.83 | --- | 82.64 | 81.07 | 60.37 | 78.67 | 89.18 | --- | --- | --- | --- | --- |
| 4 | -114.17 | --- | --- | 102.36 | 104.36 | 89.73 | 103.71 | 98.09 | --- | --- | --- | --- |
| 5 | -111.38 | --- | --- | --- | 102.59 | 111.69 | 93.95 | 111.21 | --- | --- | --- | --- |
| 6 | -114.65 | --- | --- | --- | --- | 103.17 | 99.67 | 95.69 | 100.33 | --- | --- | --- |
| 7 | -114.09 | --- | --- | --- | --- | --- | 102.30 | 99.78 | 95.63 | 101.48 | --- | --- |
| 8 | -113.95 | --- | --- | --- | --- | --- | --- | 100.31 | 107.72 | 100.28 | 107.42 | --- |
| 9 | -112.34 | --- | --- | --- | --- | --- | --- | --- | 100.85 | 110.44 | 99.48 | 109.14 |
| 10 | -113.17 | --- | --- | --- | --- | --- | --- | --- | --- | 102.69 | 111.37 | 113.77 |
| | RF CAL | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

**LO HARMONICS ORDER**

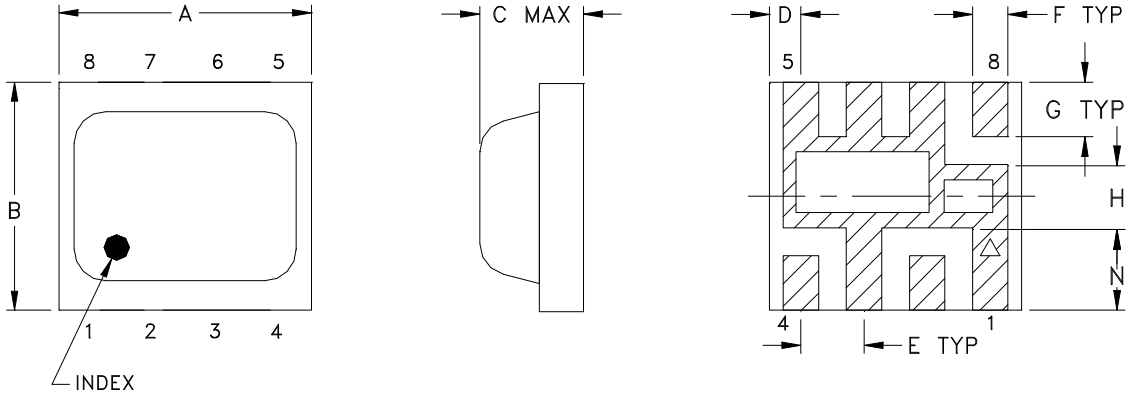
**Test conditions:** RF IN: 13150 MHz; -5 dBm.
LO IN: 13180 MHz; +17.00 dBm
IF OUT: 30 MHz; -10.99 dBm

**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.

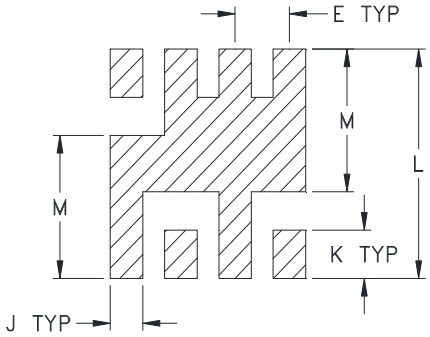
# Case Style HV

## Outline Dimensions

**HV1195**




## PCB Metal Land Pattern




Suggested Layout,
Tolerance to be within ±.002

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

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

**Dimensions are in inches (mm). Tolerances: 2 Pl. ± .01; 3 Pl. ± .005**

**Notes:**

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



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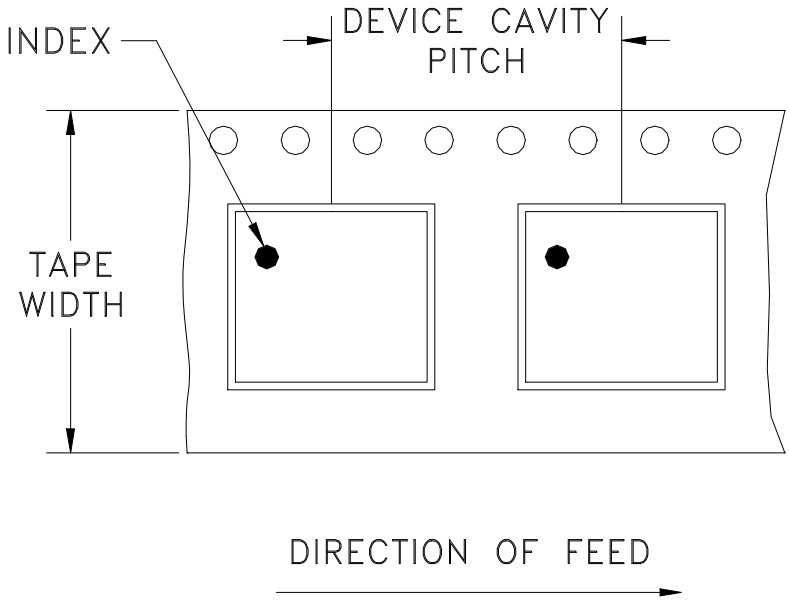
# Tape & Reel Packaging TR-F82

DEVICE ORIENTATION IN T&R




| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, 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

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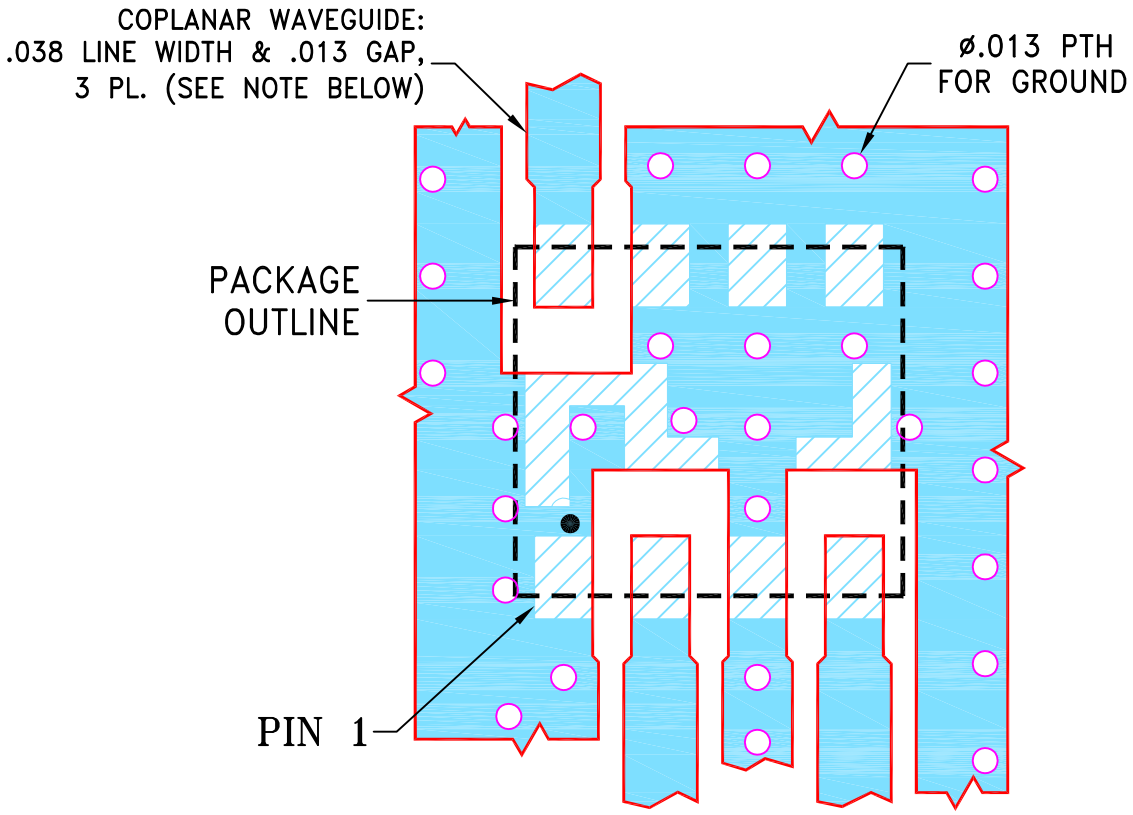
THIRD ANGLE PROJECTION

REVISIONS

| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
|---|---|---|---|---|---|
| OR | M116031 | NEW RELEASE | 02/14/08 | MMG | DJ |
| A | ECO-000060 | MODIFIED CASE STYLE | 10/16/19 | ITG | RB |
| | | | | | |
| | | | | | |

# SUGGESTED MOUNTING CONFIGURATION FOR HV1195 CASE STYLE, "08MX05" PIN CODE




NOTES:

1. 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.
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 | DRAWN | MMG | 02/13/08 |
| TOLERANCES ON: | CHECKED | AV | 02/14/08 |
| 2 PL DECIMALS ± | APPROVED | DJ | 02/14/08 |
| 3 PL DECIMALS ± .005 | | | |
| ANGLES ± | | | |
| FRACTIONS ± | | | |

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

Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

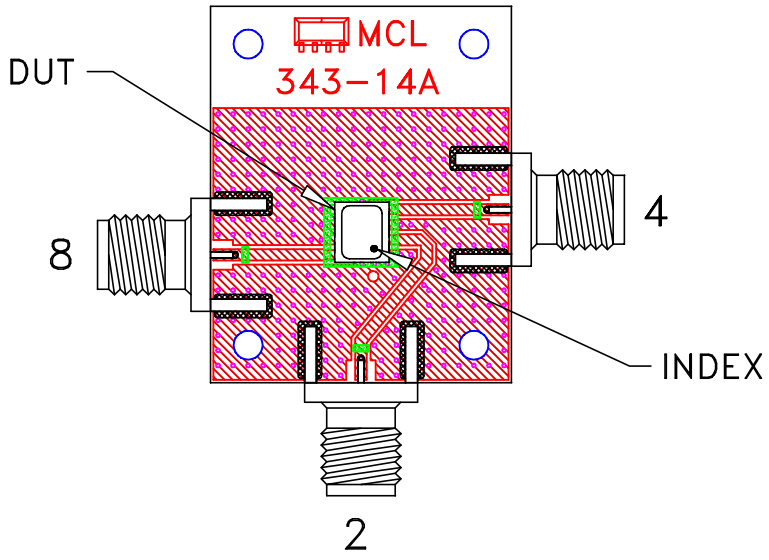
PL, 08MX05, HV1195, SIM, TB-458+

| SIZE | CODE IDENT | DRAWING NO: | REV: |
|---|---|---|---|
| A | 15542 | 98-PL-284 | A |

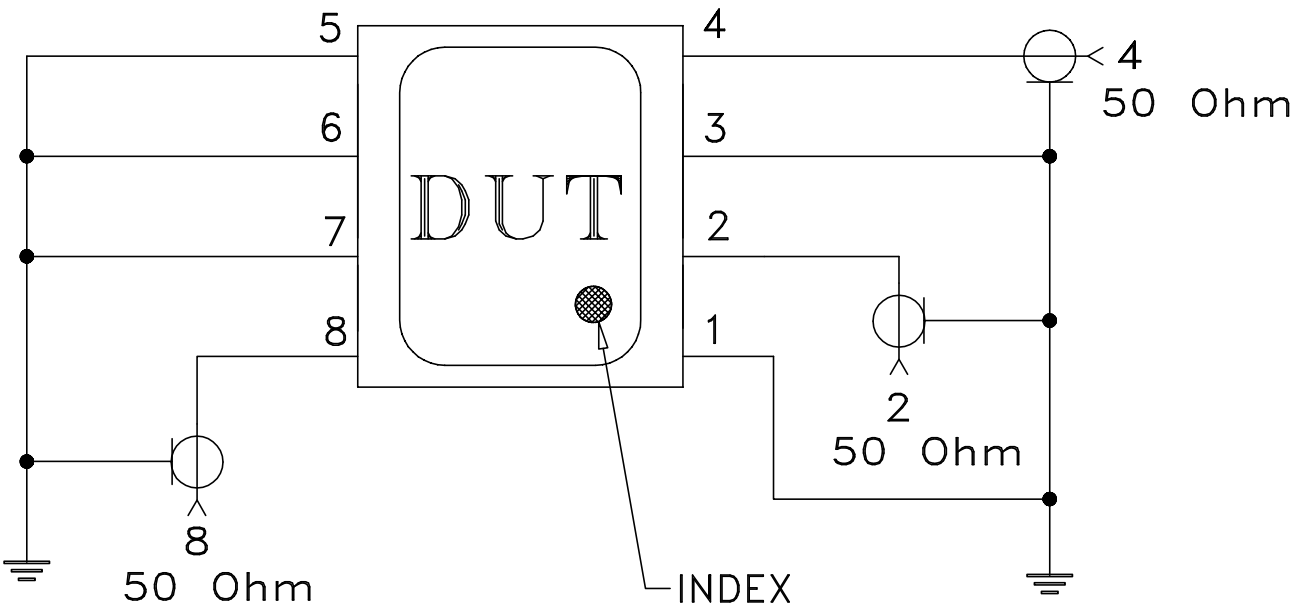
| FILE: | SCALE: | SHEET: |
|---|---|---|
| 98PL284 | 10:1 | 1 OF 1 |

# Evaluation Board and Circuit

For Pin Connections refer to Data Sheet of the DUT




TB-458+




Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.020 inch.

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# Environmental Specifications ENV10T1

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 |


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