*Surface Mount*

# Frequency Mixer

## RMS-2H+

Level 17 (LO Power +17 dBm) 5 to 1000 MHz

*Generic photo used for illustration purposes only*

CASE STYLE: TT240

***+RoHS Compliant***

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

### Maximum Ratings

| | |
|---|---|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| RF Power | 200mW |
| IF Current | 40mA |

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

### Pin Connections

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

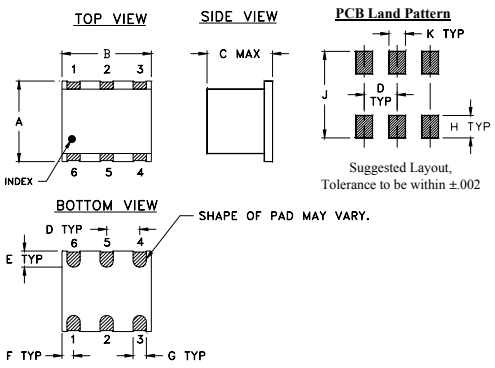
### Features

- excellent L-R isolation, 40 dB typ.
- conversion loss, 6.98 dB typ.
- small size, 0.25”x0.31”x0.2”

### Applications

- UHF
- cellular/ISM/GSM

### Outline Drawing

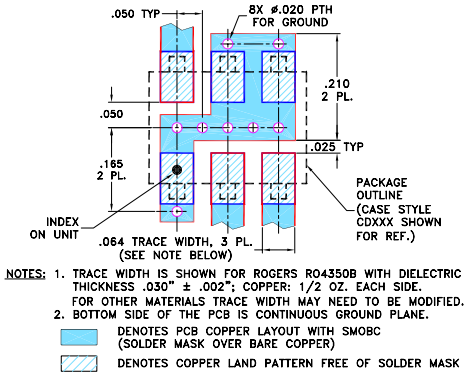



### Outline Dimensions ( inch / mm )

| A | B | C | D | E | F |
|---|---|---|---|---|---|
| .250 | .31 | .20 | .100 | .050 | .055 |
| 6.35 | 7.87 | 5.08 | 2.54 | 1.27 | 1.40 |

| G | H | J | K | wt |
|---|---|---|---|---|
| .040 | .070 | .270 | .050 | grams |
| 1.02 | 1.78 | 6.86 | 1.27 | 0.50 |

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




NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### Electrical Specifications

| FREQUENCY (MHz) | | CONVERSION LOSS (dB) | | | | LO-RF ISOLATION (dB) | | | | | | LO-IF ISOLATION (dB) | | | | | | IP3 at center band (dBm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LO/RF | IF | | | | | L | | M | | U | | L | | M | | U | | |
| $f_L$-$f_U$ | | $\overline{X}$ | σ | Max. | Total Range Max. | Typ. | Min. | Typ. | Min. | Typ. | Min. | Typ. | Min. | Typ. | Min. | Typ. | Min. | Typ. |
| 5-1000 | DC-900 | 6.98 | .054 | 8.5 | 9.3 | 55 | 40 | 39 | 22 | 33 | 20 | 52 | 30 | 45 | 22 | 30 | 17 | 23 |

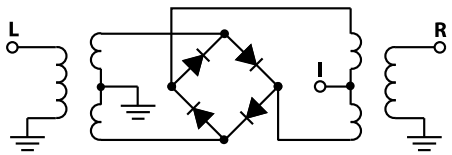
1 dB COMP.: +14 dBm typ.
For phase detection, DC output positive with in-phase RF & LO.

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

### Typical Performance Data

| Frequency (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 |
| 5.00 | 35.00 | 7.85 | 66.33 | 72.89 | 1.54 | 1.95 |
| 10.00 | 40.00 | 7.64 | 63.63 | 68.70 | 1.49 | 1.85 |
| 20.00 | 50.00 | 7.69 | 58.93 | 63.79 | 1.47 | 1.79 |
| 50.00 | 80.00 | 7.55 | 52.00 | 56.89 | 1.45 | 1.91 |
| 95.45 | 65.45 | 7.54 | 46.41 | 50.84 | 1.44 | 1.79 |
| 100.00 | 70.00 | 7.53 | 46.04 | 50.67 | 1.43 | 1.79 |
| 185.91 | 155.91 | 7.51 | 40.70 | 46.79 | 1.43 | 1.69 |
| 200.00 | 170.00 | 7.37 | 40.02 | 46.99 | 1.42 | 1.68 |
| 276.36 | 246.36 | 7.35 | 37.35 | 44.46 | 1.40 | 1.56 |
| 366.82 | 336.82 | 7.22 | 35.28 | 42.69 | 1.34 | 1.47 |
| 457.27 | 427.27 | 7.11 | 33.66 | 39.45 | 1.25 | 1.36 |
| 487.42 | 457.42 | 7.17 | 33.17 | 37.61 | 1.24 | 1.34 |
| 500.00 | 470.00 | 7.07 | 33.04 | 37.36 | 1.21 | 1.34 |
| 547.73 | 517.73 | 7.11 | 32.95 | 35.68 | 1.11 | 1.28 |
| 638.18 | 608.18 | 7.46 | 32.78 | 31.60 | 1.06 | 1.29 |
| 728.64 | 698.64 | 7.45 | 31.90 | 30.61 | 1.27 | 1.46 |
| 819.09 | 789.09 | 7.76 | 30.74 | 28.78 | 1.54 | 1.81 |
| 909.55 | 879.55 | 8.24 | 29.67 | 27.10 | 1.90 | 2.21 |
| 969.85 | 939.85 | 8.54 | 29.46 | 25.48 | 2.06 | 2.34 |
| 1000.00 | 970.00 | 8.75 | 29.31 | 24.84 | 2.10 | 2.40 |

### Electrical Schematic




Notes

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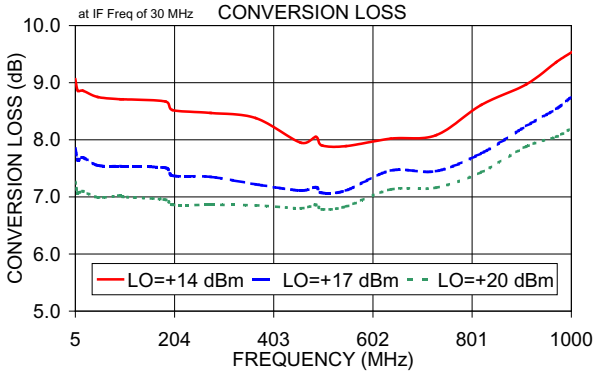
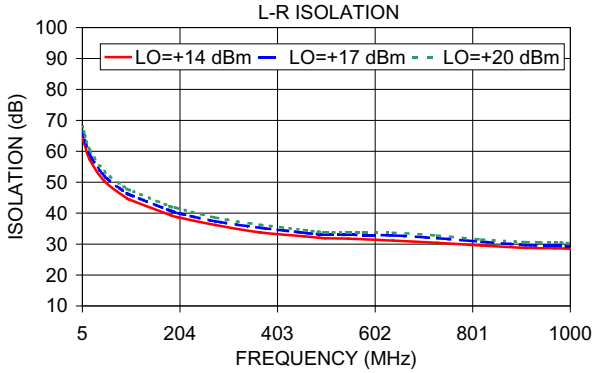
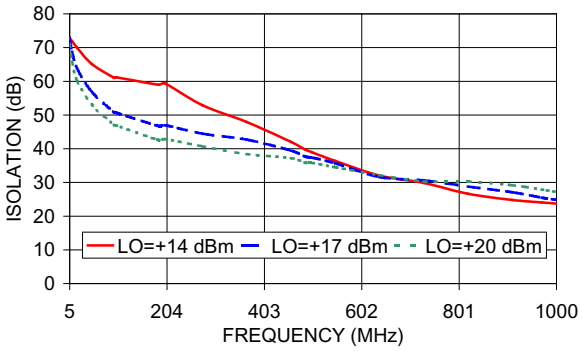
RMS-2H
at IF Freq of 30 MHz CONVERSION LOSS



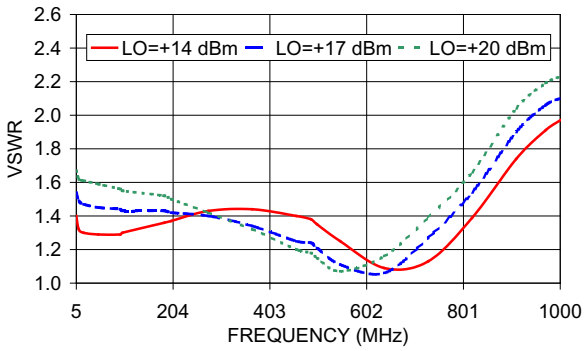

RMS-2H
L-R ISOLATION



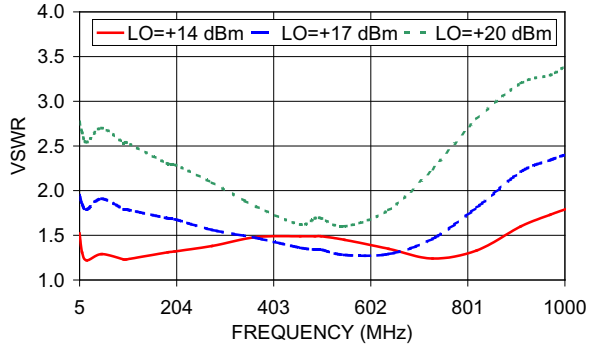

RMS-2H
L-I ISOLATION



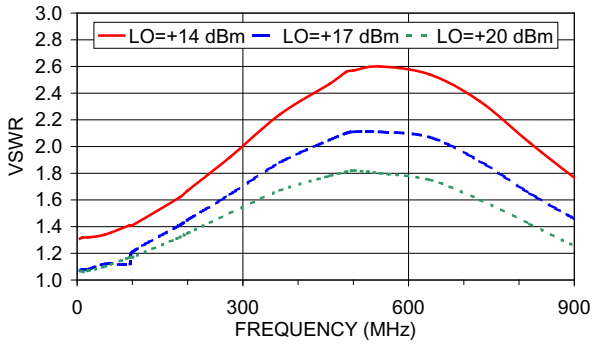

RMS-2H
RF VSWR




RMS-2H
LO VSWR




RMS-2H
IF VSWR

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# Frequency Mixer RMS-2H+

## *Typical Performance Data*

| RF (IN) (MHz) | LO (MHz) | CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) @LO (dBm) | | |
|---|---|---|---|---|
| | | +14 | +17 | +20 |
| 5.0 | 35.0 | 9.06 | 7.85 | 7.26 |
| 10.0 | 40.0 | 8.86 | 7.64 | 7.07 |
| 30.3 | 60.3 | 8.24 | 7.15 | 6.64 |
| 50.5 | 80.5 | 8.18 | 7.24 | 6.77 |
| 70.7 | 100.7 | 8.12 | 7.16 | 6.71 |
| 90.9 | 120.9 | 8.26 | 7.21 | 6.73 |
| 111.1 | 141.1 | 8.24 | 7.19 | 6.71 |
| 131.3 | 161.3 | 8.12 | 7.11 | 6.68 |
| 151.5 | 181.5 | 8.21 | 7.17 | 6.70 |
| 171.7 | 201.7 | 8.21 | 7.15 | 6.72 |
| 191.9 | 221.9 | 8.11 | 7.05 | 6.70 |
| 212.1 | 242.1 | 8.01 | 7.01 | 6.66 |
| 232.3 | 262.3 | 8.10 | 7.05 | 6.71 |
| 252.5 | 282.5 | 7.94 | 7.01 | 6.73 |
| 272.8 | 302.8 | 7.80 | 6.99 | 6.69 |
| 293.0 | 323.0 | 7.84 | 6.96 | 6.69 |
| 313.2 | 343.2 | 7.82 | 7.00 | 6.72 |
| 333.4 | 363.4 | 7.72 | 6.99 | 6.74 |
| 353.6 | 383.6 | 7.73 | 7.00 | 6.72 |
| 373.8 | 403.8 | 7.71 | 7.01 | 6.73 |
| 394.0 | 424.0 | 7.62 | 7.01 | 6.72 |
| 434.4 | 464.4 | 7.65 | 6.99 | 6.71 |
| 454.6 | 484.6 | 7.67 | 7.05 | 6.75 |
| 495.0 | 525.0 | 7.74 | 7.10 | 6.73 |
| 515.2 | 545.2 | 7.74 | 7.18 | 6.83 |
| 555.6 | 585.6 | 7.79 | 7.25 | 6.86 |
| 575.8 | 605.8 | 7.77 | 7.26 | 6.90 |
| 616.2 | 646.2 | 7.83 | 7.24 | 6.88 |
| 636.4 | 666.4 | 7.82 | 7.19 | 6.84 |
| 676.8 | 706.8 | 7.92 | 7.20 | 6.82 |
| 697.0 | 727.0 | 7.91 | 7.18 | 6.80 |
| 737.4 | 767.4 | 8.09 | 7.37 | 6.90 |
| 757.7 | 787.7 | 8.10 | 7.39 | 6.92 |
| 798.1 | 828.1 | 8.32 | 7.68 | 7.14 |
| 818.3 | 848.3 | 8.47 | 7.82 | 7.30 |
| 858.7 | 888.7 | 8.57 | 7.92 | 7.44 |
| 878.9 | 908.9 | 8.72 | 8.04 | 7.51 |
| 919.3 | 949.3 | 8.85 | 8.12 | 7.62 |
| 939.5 | 969.5 | 8.94 | 8.14 | 7.56 |
| 979.9 | 1009.9 | 9.04 | 8.13 | 7.58 |
| 1000.1 | 1030.1 | | | |

| RF (IN) (MHz) | LO (MHz) | IP3 INPUT (dBm) @LO (dBm) | | |
|---|---|---|---|---|
| | | +14 | +17 | +20 |
| 10.1 | 40.1 | 23.00 | 26.76 | 30.85 |
| 30.3 | 60.3 | 21.27 | 25.86 | 29.63 |
| 50.5 | 80.5 | 22.17 | 26.08 | 28.31 |
| 70.7 | 100.7 | 22.99 | 26.36 | 28.91 |
| 90.9 | 120.9 | 22.23 | 25.46 | 28.22 |
| 111.1 | 141.1 | 22.17 | 26.09 | 29.82 |
| 131.3 | 161.3 | 23.75 | 27.45 | 30.28 |
| 151.5 | 181.5 | 22.37 | 25.86 | 29.10 |
| 171.7 | 201.7 | 22.37 | 26.49 | 29.50 |
| 191.9 | 221.9 | 22.91 | 26.66 | 30.85 |
| 212.1 | 242.1 | 22.55 | 26.81 | 32.28 |
| 232.3 | 262.3 | 22.31 | 25.98 | 31.61 |
| 252.5 | 282.5 | 23.08 | 28.04 | 30.69 |
| 272.8 | 302.8 | 23.97 | 28.15 | 28.55 |
| 293.0 | 323.0 | 22.73 | 27.79 | 28.47 |
| 313.2 | 343.2 | 23.37 | 28.50 | 27.39 |
| 333.4 | 363.4 | 24.85 | 27.97 | 27.22 |
| 353.6 | 383.6 | 24.58 | 28.02 | 26.98 |
| 373.8 | 403.8 | 23.94 | 28.49 | 26.31 |
| 394.0 | 424.0 | 26.31 | 27.08 | 25.63 |
| 434.4 | 464.4 | 24.78 | 26.01 | 24.82 |
| 454.6 | 484.6 | 25.29 | 24.98 | 24.48 |
| 495.0 | 525.0 | 24.60 | 23.79 | 23.88 |
| 515.2 | 545.2 | 25.82 | 23.21 | 23.38 |
| 555.6 | 585.6 | 24.41 | 24.07 | 23.71 |
| 575.8 | 605.8 | 25.04 | 24.75 | 24.65 |
| 616.2 | 646.2 | 25.47 | 26.07 | 26.70 |
| 636.4 | 666.4 | 27.41 | 25.66 | 26.53 |
| 676.8 | 706.8 | 24.36 | 24.21 | 26.67 |
| 697.0 | 727.0 | 24.44 | 24.01 | 26.17 |
| 737.4 | 767.4 | 22.16 | 23.17 | 25.83 |
| 757.7 | 787.7 | 20.58 | 22.20 | 25.00 |
| 798.1 | 828.1 | 19.16 | 20.70 | 24.16 |
| 818.3 | 848.3 | 18.60 | 20.17 | 23.13 |
| 858.7 | 888.7 | 17.85 | 19.31 | 22.23 |
| 878.9 | 908.9 | 17.89 | 19.16 | 21.91 |
| 919.3 | 949.3 | 17.33 | 18.65 | 21.31 |
| 939.5 | 969.5 | 17.04 | 18.28 | 21.00 |
| 979.9 | 1009.9 | 17.41 | 18.52 | 21.29 |
| 1000.1 | 1030.1 | 17.46 | 18.56 | 21.97 |

| RF (IN) (MHz) | LO (MHz) | COMPRESSION @RF IN=+14dBm (dB) @LO (dBm) | | |
|---|---|---|---|---|
| | | +14 | +17 | +20 |
| 10.1 | 40.1 | 0.42 | 0.15 | 0.07 |
| 30.3 | 60.3 | 0.19 | 0.03 | 0.03 |
| 50.5 | 80.5 | 0.28 | 0.15 | 0.05 |
| 70.7 | 100.7 | 0.30 | 0.13 | 0.06 |
| 90.9 | 120.9 | 0.09 | 0.01 | 0.04 |
| 111.1 | 141.1 | 0.21 | 0.05 | 0.06 |
| 131.3 | 161.3 | 0.35 | 0.11 | 0.07 |
| 151.5 | 181.5 | 0.35 | 0.12 | 0.07 |
| 171.7 | 201.7 | 0.16 | 0.08 | 0.07 |
| 191.9 | 221.9 | 0.32 | 0.14 | 0.06 |
| 212.1 | 242.1 | 0.25 | 0.15 | 0.07 |
| 232.3 | 262.3 | 0.29 | 0.16 | 0.07 |
| 252.5 | 282.5 | 0.40 | 0.18 | 0.07 |
| 272.8 | 302.8 | 0.41 | 0.15 | 0.05 |
| 293.0 | 323.0 | 0.35 | 0.16 | 0.07 |
| 313.2 | 343.2 | 0.43 | 0.15 | 0.06 |
| 333.4 | 363.4 | 0.56 | 0.14 | 0.06 |
| 353.6 | 383.6 | 0.54 | 0.16 | 0.08 |
| 373.8 | 403.8 | 0.55 | 0.13 | 0.07 |
| 394.0 | 424.0 | 0.54 | 0.14 | 0.07 |
| 434.4 | 464.4 | 0.57 | 0.20 | 0.13 |
| 454.6 | 484.6 | 0.57 | 0.15 | 0.10 |
| 495.0 | 525.0 | 0.47 | 0.16 | 0.14 |
| 515.2 | 545.2 | 0.57 | 0.15 | 0.13 |
| 555.6 | 585.6 | 0.54 | 0.14 | 0.13 |
| 575.8 | 605.8 | 0.56 | 0.15 | 0.15 |
| 616.2 | 646.2 | 0.64 | 0.26 | 0.20 |
| 636.4 | 666.4 | 0.65 | 0.29 | 0.23 |
| 676.8 | 706.8 | 0.58 | 0.33 | 0.26 |
| 697.0 | 727.0 | 0.72 | 0.44 | 0.28 |
| 737.4 | 767.4 | 0.67 | 0.42 | 0.33 |
| 757.7 | 787.7 | 0.74 | 0.48 | 0.39 |
| 798.1 | 828.1 | 0.71 | 0.45 | 0.39 |
| 818.3 | 848.3 | 0.71 | 0.42 | 0.38 |
| 858.7 | 888.7 | 0.67 | 0.45 | 0.40 |
| 878.9 | 908.9 | 0.65 | 0.43 | 0.37 |
| 919.3 | 949.3 | 0.63 | 0.48 | 0.42 |
| 939.5 | 969.5 | 0.58 | 0.46 | 0.41 |
| 979.9 | 1009.9 | 0.62 | 0.54 | 0.49 |
| 1000.1 | 1030.1 | 0.61 | 0.58 | 0.53 |



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## *Typical Performance Data*

| IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=500.1MHz (dB) |
|---|---|---|
| | | @LO (dBm) |
| | | +17 |
| 490.0 | 10.1 | 7.11 |
| 477.7 | 22.4 | 7.05 |
| 465.4 | 34.7 | 7.06 |
| 453.1 | 47.0 | 7.07 |
| 440.8 | 59.3 | 7.09 |
| 428.5 | 71.6 | 7.01 |
| 416.2 | 83.9 | 7.03 |
| 403.8 | 96.3 | 6.98 |
| 391.5 | 108.6 | 6.97 |
| 379.2 | 120.9 | 6.96 |
| 366.9 | 133.2 | 6.82 |
| 354.6 | 145.5 | 6.81 |
| 342.3 | 157.8 | 6.77 |
| 330.0 | 170.1 | 6.79 |
| 317.7 | 182.4 | 6.76 |
| 305.4 | 194.7 | 6.69 |
| 293.1 | 207.0 | 6.63 |
| 280.8 | 219.3 | 6.62 |
| 268.5 | 231.6 | 6.60 |
| 256.2 | 243.9 | 6.63 |
| 243.8 | 256.3 | 6.61 |
| 231.5 | 268.6 | 6.61 |
| 219.2 | 280.9 | 6.62 |
| 206.9 | 293.2 | 6.62 |
| 194.6 | 305.5 | 6.65 |
| 182.3 | 317.8 | 6.65 |
| 170.0 | 330.1 | 6.65 |
| 157.7 | 342.4 | 6.66 |
| 145.4 | 354.7 | 6.70 |
| 133.1 | 367.0 | 6.73 |
| 120.8 | 379.3 | 6.76 |
| 108.5 | 391.6 | 6.77 |
| 96.2 | 403.9 | 6.79 |
| 83.8 | 416.3 | 6.81 |
| 71.5 | 428.6 | 6.82 |
| 59.2 | 440.9 | 6.86 |
| 46.9 | 453.2 | 6.87 |
| 34.6 | 465.5 | 6.91 |
| 22.3 | 477.8 | 6.89 |
| 10.0 | 490.1 | 7.18 |

| IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB) |
|---|---|---|
| | | @LO (dBm) |
| | | +17 |
| 10.0 | 20.1 | 7.18 |
| 29.8 | 39.9 | 6.92 |
| 49.6 | 59.7 | 7.00 |
| 69.3 | 79.4 | 7.02 |
| 89.1 | 99.2 | 6.98 |
| 108.9 | 119.0 | 6.97 |
| 128.7 | 138.8 | 6.93 |
| 148.4 | 158.5 | 6.93 |
| 168.2 | 178.3 | 6.96 |
| 188.0 | 198.1 | 6.97 |
| 207.8 | 217.9 | 6.96 |
| 227.6 | 237.7 | 6.93 |
| 247.3 | 257.4 | 6.96 |
| 267.1 | 277.2 | 7.03 |
| 286.9 | 297.0 | 7.04 |
| 306.7 | 316.8 | 7.04 |
| 326.4 | 336.5 | 7.05 |
| 346.2 | 356.3 | 7.05 |
| 366.0 | 376.1 | 7.10 |
| 385.8 | 395.9 | 7.12 |
| 405.6 | 415.7 | 7.11 |
| 425.3 | 435.4 | 7.11 |
| 445.1 | 455.2 | 7.21 |
| 464.9 | 475.0 | 7.25 |
| 484.7 | 494.8 | 7.23 |
| 504.4 | 514.5 | 7.20 |
| 524.2 | 534.3 | 7.19 |
| 544.0 | 554.1 | 7.30 |
| 583.6 | 593.7 | 7.38 |
| 603.3 | 613.4 | 7.39 |
| 642.9 | 653.0 | 7.51 |
| 662.7 | 672.8 | 7.56 |
| 702.2 | 712.3 | 7.51 |
| 722.0 | 732.1 | 7.55 |
| 761.6 | 771.7 | 7.60 |
| 781.3 | 791.4 | 7.64 |
| 820.9 | 831.0 | 7.60 |
| 840.7 | 850.8 | 7.67 |
| 880.2 | 890.3 | 7.74 |
| 900.0 | 910.1 | 7.76 |

| IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1000.1MHz (dB) |
|---|---|---|
| | | @LO (dBm) |
| | | +17 |
| 900.0 | 100.1 | 7.13 |
| 880.2 | 119.9 | 7.02 |
| 860.4 | 139.7 | 6.98 |
| 840.7 | 159.4 | 6.91 |
| 820.9 | 179.2 | 6.87 |
| 801.1 | 199.0 | 6.80 |
| 781.3 | 218.8 | 6.77 |
| 761.6 | 238.5 | 6.74 |
| 741.8 | 258.3 | 6.74 |
| 722.0 | 278.1 | 6.75 |
| 702.2 | 297.9 | 6.70 |
| 682.4 | 317.7 | 6.69 |
| 662.7 | 337.4 | 6.71 |
| 642.9 | 357.2 | 6.78 |
| 623.1 | 377.0 | 6.76 |
| 603.3 | 396.8 | 6.76 |
| 583.6 | 416.5 | 6.77 |
| 563.8 | 436.3 | 6.81 |
| 544.0 | 456.1 | 6.84 |
| 524.2 | 475.9 | 6.85 |
| 504.4 | 495.7 | 6.86 |
| 484.7 | 515.4 | 6.88 |
| 464.9 | 535.2 | 6.92 |
| 445.1 | 555.0 | 6.96 |
| 425.3 | 574.8 | 6.94 |
| 405.6 | 594.5 | 6.95 |
| 385.8 | 614.3 | 7.02 |
| 366.0 | 634.1 | 7.04 |
| 326.4 | 673.7 | 7.13 |
| 306.7 | 693.4 | 7.13 |
| 267.1 | 733.0 | 7.16 |
| 247.3 | 752.8 | 7.19 |
| 207.8 | 792.3 | 7.24 |
| 188.0 | 812.1 | 7.22 |
| 148.4 | 851.7 | 7.31 |
| 128.7 | 871.4 | 7.30 |
| 89.1 | 911.0 | 7.42 |
| 69.3 | 930.8 | 7.49 |
| 29.8 | 970.3 | 7.68 |
| 10.0 | 990.1 | 7.96 |




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## *Typical Performance Data*

| LO (MHz) | LO-RF ISOLATION (dB) @LO (dBm) | | | LO-IF ISOLATION (dB) @LO (dBm) | | |
|---|---|---|---|---|---|---|
| | +14 | +17 | +20 | +14 | +17 | +20 |
| 5.0 | 64.63 | 66.33 | 68.05 | 72.73 | 72.89 | 71.08 |
| 10.0 | 62.11 | 63.63 | 65.24 | 71.84 | 68.70 | 65.74 |
| 30.3 | 51.79 | 54.16 | 56.61 | 64.04 | 58.06 | 55.01 |
| 50.5 | 46.99 | 49.35 | 51.89 | 62.21 | 54.44 | 50.95 |
| 70.7 | 43.86 | 46.06 | 48.40 | 61.00 | 52.56 | 48.75 |
| 90.9 | 41.76 | 43.92 | 46.27 | 57.96 | 50.41 | 47.09 |
| 111.1 | 40.06 | 42.37 | 44.80 | 56.56 | 48.73 | 44.95 |
| 131.3 | 38.62 | 41.18 | 43.81 | 55.53 | 47.11 | 43.43 |
| 151.5 | 37.56 | 39.99 | 42.55 | 54.95 | 46.17 | 42.30 |
| 171.7 | 36.60 | 38.95 | 41.44 | 53.84 | 45.59 | 41.77 |
| 191.9 | 35.80 | 38.22 | 40.65 | 53.18 | 45.03 | 41.54 |
| 212.1 | 35.21 | 37.65 | 40.11 | 53.00 | 43.94 | 40.79 |
| 232.3 | 34.61 | 37.17 | 39.70 | 52.76 | 43.35 | 40.65 |
| 252.5 | 34.10 | 36.66 | 38.96 | 51.30 | 43.47 | 40.67 |
| 272.8 | 33.72 | 36.15 | 38.38 | 52.43 | 43.91 | 40.59 |
| 293.0 | 33.29 | 35.67 | 37.85 | 51.77 | 44.17 | 40.83 |
| 313.2 | 33.04 | 35.53 | 37.71 | 50.91 | 44.42 | 40.42 |
| 333.4 | 32.82 | 35.23 | 37.35 | 54.14 | 45.58 | 40.57 |
| 353.6 | 32.45 | 34.81 | 36.91 | 53.96 | 45.88 | 40.52 |
| 373.8 | 32.25 | 34.56 | 36.59 | 54.88 | 47.03 | 40.81 |
| 394.0 | 32.19 | 34.47 | 36.47 | 55.25 | 47.93 | 40.94 |
| 434.4 | 31.71 | 33.89 | 35.77 | 51.06 | 47.01 | 40.11 |
| 454.6 | 31.73 | 33.81 | 35.67 | 47.28 | 46.02 | 39.83 |
| 495.0 | 31.47 | 33.44 | 35.25 | 44.11 | 43.79 | 39.28 |
| 515.2 | 31.54 | 33.57 | 35.33 | 41.82 | 41.95 | 38.30 |
| 555.6 | 31.33 | 33.30 | 34.99 | 39.21 | 39.70 | 37.34 |
| 575.8 | 31.40 | 33.31 | 35.04 | 37.55 | 38.24 | 37.04 |
| 616.2 | 31.43 | 33.28 | 34.87 | 35.84 | 36.26 | 35.61 |
| 636.4 | 31.53 | 33.39 | 35.01 | 34.82 | 35.59 | 35.34 |
| 676.8 | 31.72 | 33.47 | 34.88 | 33.43 | 34.32 | 34.27 |
| 697.0 | 31.78 | 33.38 | 34.67 | 32.72 | 33.91 | 33.69 |
| 737.4 | 32.03 | 33.53 | 34.76 | 31.49 | 32.86 | 32.33 |
| 757.7 | 32.00 | 33.36 | 34.62 | 30.82 | 32.56 | 32.33 |
| 818.3 | 32.18 | 33.71 | 35.02 | 29.30 | 31.39 | 31.47 |
| 858.7 | 32.16 | 33.71 | 35.16 | 28.21 | 30.22 | 31.12 |
| 878.9 | 32.20 | 33.77 | 35.15 | 28.02 | 30.18 | 31.20 |
| 919.3 | 32.25 | 33.85 | 35.46 | 27.03 | 29.11 | 30.41 |
| 939.5 | 32.30 | 33.91 | 35.66 | 26.80 | 28.99 | 30.44 |
| 979.9 | 32.50 | 34.24 | 36.19 | 26.03 | 28.29 | 29.88 |
| 1000.1 | 32.79 | 34.67 | 36.84 | 25.81 | 28.15 | 29.75 |

| RF (IN) (MHz) | LO (MHz) | RF-IF ISOLATION (dB) @LO (dBm) | | |
|---|---|---|---|---|
| | | +14 | +17 | +20 |
| 10.1 | 40.1 | 53.66 | 52.46 | 50.21 |
| 30.3 | 60.3 | 43.91 | 43.89 | 42.64 |
| 50.5 | 80.5 | 40.74 | 41.26 | 40.43 |
| 70.7 | 100.7 | 38.93 | 38.55 | 38.40 |
| 90.9 | 120.9 | 37.04 | 36.97 | 36.74 |
| 111.1 | 141.1 | 35.78 | 35.72 | 35.41 |
| 131.3 | 161.3 | 34.63 | 34.84 | 34.96 |
| 151.5 | 181.5 | 33.65 | 34.10 | 34.06 |
| 171.7 | 201.7 | 33.03 | 33.56 | 33.63 |
| 191.9 | 221.9 | 32.56 | 33.07 | 33.15 |
| 212.1 | 242.1 | 32.07 | 32.52 | 32.85 |
| 232.3 | 262.3 | 31.76 | 32.55 | 32.83 |
| 252.5 | 282.5 | 31.59 | 32.20 | 32.56 |
| 272.8 | 302.8 | 31.42 | 31.99 | 32.41 |
| 293.0 | 323.0 | 31.41 | 32.13 | 32.57 |
| 313.2 | 343.2 | 31.07 | 31.98 | 32.44 |
| 333.4 | 363.4 | 31.15 | 32.32 | 33.09 |
| 353.6 | 383.6 | 30.62 | 32.08 | 32.98 |
| 373.8 | 403.8 | 30.50 | 32.19 | 33.50 |
| 394.0 | 424.0 | 30.36 | 32.09 | 33.62 |
| 434.4 | 464.4 | 29.76 | 31.41 | 32.80 |
| 454.6 | 484.6 | 29.51 | 30.84 | 31.81 |
| 495.0 | 525.0 | 29.14 | 30.02 | 30.54 |
| 515.2 | 545.2 | 28.59 | 29.17 | 29.65 |
| 555.6 | 585.6 | 27.05 | 27.42 | 27.74 |
| 575.8 | 605.8 | 26.19 | 26.42 | 26.64 |
| 616.2 | 646.2 | 23.91 | 23.94 | 24.19 |
| 636.4 | 666.4 | 22.95 | 22.94 | 23.13 |
| 676.8 | 706.8 | 21.06 | 20.76 | 20.78 |
| 697.0 | 727.0 | 20.17 | 19.82 | 19.81 |
| 737.4 | 767.4 | 18.84 | 18.36 | 18.13 |
| 757.7 | 787.7 | 18.12 | 17.58 | 17.28 |
| 798.1 | 828.1 | 17.18 | 16.68 | 16.29 |
| 818.3 | 848.3 | 16.81 | 16.32 | 15.96 |
| 858.7 | 888.7 | 16.00 | 15.53 | 15.17 |
| 878.9 | 908.9 | 15.72 | 15.27 | 15.02 |
| 919.3 | 949.3 | 15.09 | 14.66 | 14.42 |
| 939.5 | 969.5 | 14.82 | 14.39 | 14.04 |
| 979.9 | 1009.9 | 14.26 | 13.88 | 13.70 |
| 1000.1 | 1030.1 | 14.00 | 13.68 | 13.45 |




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## *Typical Performance Data*

| RF (IN) (MHz) | LO (MHz) | RF VSWR (:1) @LO (dBm) | | |
|---|---|---|---|---|
| | | +14 | +17 | +20 |
| 5.0 | 35.0 | 1.40 | 1.54 | 1.67 |
| 10.0 | 40.0 | 1.32 | 1.49 | 1.62 |
| 30.3 | 60.3 | 1.04 | 1.10 | 1.21 |
| 50.5 | 80.5 | 1.03 | 1.11 | 1.21 |
| 70.7 | 100.7 | 1.04 | 1.14 | 1.23 |
| 90.9 | 120.9 | 1.06 | 1.13 | 1.23 |
| 111.1 | 141.1 | 1.07 | 1.15 | 1.25 |
| 131.3 | 161.3 | 1.08 | 1.16 | 1.26 |
| 151.5 | 181.5 | 1.09 | 1.15 | 1.25 |
| 171.7 | 201.7 | 1.11 | 1.16 | 1.26 |
| 191.9 | 221.9 | 1.11 | 1.18 | 1.27 |
| 212.1 | 242.1 | 1.12 | 1.19 | 1.29 |
| 232.3 | 262.3 | 1.12 | 1.18 | 1.28 |
| 252.5 | 282.5 | 1.13 | 1.20 | 1.30 |
| 272.8 | 302.8 | 1.14 | 1.22 | 1.31 |
| 293.0 | 323.0 | 1.13 | 1.21 | 1.31 |
| 313.2 | 343.2 | 1.14 | 1.23 | 1.32 |
| 333.4 | 363.4 | 1.14 | 1.24 | 1.33 |
| 353.6 | 383.6 | 1.14 | 1.24 | 1.33 |
| 373.8 | 403.8 | 1.14 | 1.25 | 1.34 |
| 394.0 | 424.0 | 1.15 | 1.27 | 1.35 |
| 434.4 | 464.4 | 1.14 | 1.26 | 1.36 |
| 454.6 | 484.6 | 1.16 | 1.28 | 1.38 |
| 495.0 | 525.0 | 1.15 | 1.27 | 1.37 |
| 515.2 | 545.2 | 1.17 | 1.28 | 1.37 |
| 555.6 | 585.6 | 1.16 | 1.28 | 1.37 |
| 575.8 | 605.8 | 1.17 | 1.29 | 1.38 |
| 616.2 | 646.2 | 1.18 | 1.32 | 1.42 |
| 636.4 | 666.4 | 1.19 | 1.34 | 1.43 |
| 676.8 | 706.8 | 1.20 | 1.36 | 1.47 |
| 697.0 | 727.0 | 1.22 | 1.39 | 1.49 |
| 737.4 | 767.4 | 1.22 | 1.39 | 1.50 |
| 757.7 | 787.7 | 1.23 | 1.39 | 1.50 |
| 798.1 | 828.1 | 1.22 | 1.38 | 1.49 |
| 818.3 | 848.3 | 1.22 | 1.37 | 1.48 |
| 858.7 | 888.7 | 1.22 | 1.35 | 1.46 |
| 878.9 | 908.9 | 1.21 | 1.34 | 1.44 |
| 919.3 | 949.3 | 1.21 | 1.32 | 1.42 |
| 939.5 | 969.5 | 1.21 | 1.31 | 1.41 |
| 979.9 | 1009.9 | 1.23 | 1.32 | 1.42 |
| 1000.1 | 1030.1 | 1.25 | 1.33 | 1.43 |

| LO (MHz) | LO VSWR (:1) @LO (dBm) | | |
|---|---|---|---|
| | +14 | +17 | +20 |
| 5.0 | 1.52 | 1.95 | 2.77 |
| 10.0 | 1.31 | 1.85 | 2.65 |
| 30.3 | 1.07 | 1.71 | 2.64 |
| 50.5 | 1.06 | 1.69 | 2.57 |
| 70.7 | 1.05 | 1.61 | 2.38 |
| 90.9 | 1.06 | 1.59 | 2.34 |
| 111.1 | 1.08 | 1.63 | 2.42 |
| 131.3 | 1.08 | 1.66 | 2.50 |
| 151.5 | 1.08 | 1.64 | 2.45 |
| 171.7 | 1.10 | 1.60 | 2.35 |
| 191.9 | 1.10 | 1.59 | 2.34 |
| 212.1 | 1.10 | 1.63 | 2.43 |
| 232.3 | 1.12 | 1.66 | 2.48 |
| 252.5 | 1.12 | 1.64 | 2.43 |
| 272.8 | 1.10 | 1.61 | 2.37 |
| 293.0 | 1.11 | 1.62 | 2.39 |
| 313.2 | 1.13 | 1.66 | 2.46 |
| 333.4 | 1.10 | 1.67 | 2.49 |
| 353.6 | 1.11 | 1.66 | 2.45 |
| 373.8 | 1.11 | 1.65 | 2.42 |
| 394.0 | 1.09 | 1.66 | 2.45 |
| 434.4 | 1.11 | 1.71 | 2.52 |
| 454.6 | 1.10 | 1.70 | 2.48 |
| 495.0 | 1.12 | 1.73 | 2.52 |
| 515.2 | 1.13 | 1.75 | 2.56 |
| 555.6 | 1.15 | 1.76 | 2.54 |
| 575.8 | 1.16 | 1.77 | 2.55 |
| 616.2 | 1.19 | 1.82 | 2.62 |
| 636.4 | 1.20 | 1.82 | 2.61 |
| 676.8 | 1.24 | 1.84 | 2.61 |
| 697.0 | 1.26 | 1.86 | 2.65 |
| 737.4 | 1.31 | 1.91 | 2.69 |
| 757.7 | 1.32 | 1.91 | 2.68 |
| 798.1 | 1.37 | 1.98 | 2.76 |
| 818.3 | 1.38 | 1.99 | 2.77 |
| 858.7 | 1.43 | 2.03 | 2.79 |
| 878.9 | 1.44 | 2.04 | 2.80 |
| 919.3 | 1.48 | 2.07 | 2.84 |
| 939.5 | 1.49 | 2.07 | 2.83 |
| 979.9 | 1.51 | 2.09 | 2.84 |
| 1000.1 | 1.52 | 2.10 | 2.84 |

| IF (OUT) (MHz) | IF VSWR @LO=1500.1MHz (:1) @LO (dBm) | | |
|---|---|---|---|
| | +14 | +17 | +20 |
| 5.0 | 1.31 | 1.07 | 1.07 |
| 10.0 | 1.32 | 1.08 | 1.06 |
| 29.8 | 2.69 | 2.05 | 1.69 |
| 49.6 | 2.60 | 2.03 | 1.68 |
| 69.3 | 2.57 | 2.02 | 1.68 |
| 89.1 | 2.61 | 2.04 | 1.69 |
| 108.9 | 2.63 | 2.04 | 1.68 |
| 128.7 | 2.64 | 2.05 | 1.69 |
| 148.4 | 2.62 | 2.05 | 1.69 |
| 168.2 | 2.61 | 2.05 | 1.70 |
| 188.0 | 2.62 | 2.05 | 1.69 |
| 207.8 | 2.66 | 2.07 | 1.70 |
| 227.6 | 2.66 | 2.08 | 1.71 |
| 247.3 | 2.61 | 2.04 | 1.68 |
| 267.1 | 2.59 | 2.03 | 1.67 |
| 286.9 | 2.62 | 2.05 | 1.69 |
| 306.7 | 2.61 | 2.04 | 1.68 |
| 326.4 | 2.57 | 2.01 | 1.66 |
| 346.2 | 2.58 | 2.03 | 1.67 |
| 366.0 | 2.58 | 2.04 | 1.68 |
| 385.8 | 2.54 | 2.00 | 1.65 |
| 405.6 | 2.53 | 2.00 | 1.64 |
| 425.3 | 2.56 | 2.04 | 1.68 |
| 445.1 | 2.54 | 2.02 | 1.68 |
| 464.9 | 2.51 | 2.00 | 1.66 |
| 484.7 | 2.52 | 2.01 | 1.67 |
| 504.4 | 2.52 | 2.02 | 1.68 |
| 524.2 | 2.48 | 1.99 | 1.66 |
| 544.0 | 2.47 | 2.00 | 1.66 |
| 583.6 | 2.48 | 2.02 | 1.69 |
| 603.3 | 2.41 | 1.97 | 1.66 |
| 642.9 | 2.44 | 2.01 | 1.71 |
| 662.7 | 2.42 | 2.00 | 1.69 |
| 702.2 | 2.36 | 1.97 | 1.69 |
| 722.0 | 2.31 | 1.94 | 1.67 |
| 761.6 | 2.33 | 1.97 | 1.70 |
| 781.3 | 2.33 | 1.98 | 1.72 |
| 820.9 | 2.18 | 1.88 | 1.64 |
| 840.7 | 2.18 | 1.89 | 1.66 |
| 880.2 | 2.16 | 1.88 | 1.67 |
| 900.0 | 2.12 | 1.85 | 1.65 |




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*Harmonics Tables*

| RF HARMONICS ORDER | (-dBm) | (-dBc) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | - | - | 16 | 21 | 8 | 23 | 16 | 33 | 36 | 51 | 33 | 44 |
| 1 | - | 22 | +0 | 30 | 14 | 33 | 31 | 34 | 34 | 39 | 35 | 46 |
| 2 | 90 | 49 | 41 | 49 | 43 | 52 | 42 | 53 | 54 | 58 | 57 | 59 |
| 3 | >100 | 69 | 56 | 68 | 55 | 68 | 50 | 67 | 52 | 83 | 59 | 77 |
| 4 | >100 | 76 | 74 | 85 | 79 | 77 | 74 | 74 | 69 | 72 | 73 | 81 |
| 5 | >100 | >92 | >92 | 86 | 90 | 91 | 76 | 85 | 77 | 86 | 78 | >92 |
| 6 | >100 | >92 | >92 | >92 | 91 | >92 | 86 | 84 | 85 | >92 | 85 | 91 |
| 7 | >100 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | 91 | >92 | >92 | >92 |
| 8 | >100 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 |
| 9 | >100 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 |
| 10 | >100 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 |
| | RF CAL | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

**LO HARMONICS ORDER**

**Test conditions:** **RF IN: 500.1 MHz; -1.00 dBm.**
**LO IN: 530.01 MHz; +17.00 dBm**
**IF OUT: 29.91 MHz; -8.17 dBm**

| RF HARMONICS ORDER | (-dBm) | (-dBc) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | - | - | 25 | 36 | 22 | 41 | 31 | 45 | 46 | 56 | 45 | 65 |
| 1 | - | 23 | +0 | 30 | 14 | 35 | 27 | 37 | 41 | 45 | 42 | 49 |
| 2 | 78 | 44 | 37 | 43 | 36 | 49 | 35 | 47 | 43 | 71 | 59 | 65 |
| 3 | >100 | 56 | 40 | 59 | 42 | 60 | 36 | 52 | 42 | 55 | 48 | 56 |
| 4 | >100 | 57 | 53 | 59 | 53 | 64 | 54 | 59 | 52 | 70 | 70 | 61 |
| 5 | >100 | 71 | 58 | 66 | 53 | 70 | 52 | 65 | 49 | 74 | 52 | 68 |
| 6 | >100 | 78 | 67 | 73 | 70 | 71 | 68 | 67 | 61 | 65 | 57 | 65 |
| 7 | >100 | 83 | 85 | 91 | 73 | 78 | 72 | 81 | 65 | 76 | 62 | 89 |
| 8 | >100 | 99 | 95 | 92 | >102 | 81 | 80 | 78 | 73 | 74 | 69 | 73 |
| 9 | >100 | 93 | 101 | 97 | 89 | 91 | 76 | 81 | 75 | 85 | 75 | 81 |
| 10 | >100 | 98 | >102 | >102 | >102 | 97 | 87 | 81 | 81 | 82 | 77 | 81 |
| | RF CAL | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

**LO HARMONICS ORDER**

**Test conditions:** **RF IN: 500.1 MHz; 9.00 dBm.**
**LO IN: 530.01 MHz; +17.00 dBm**
**IF OUT: 29.91 MHz; 1.87 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.**



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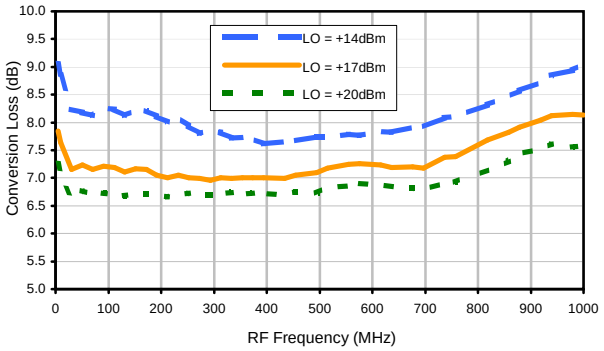
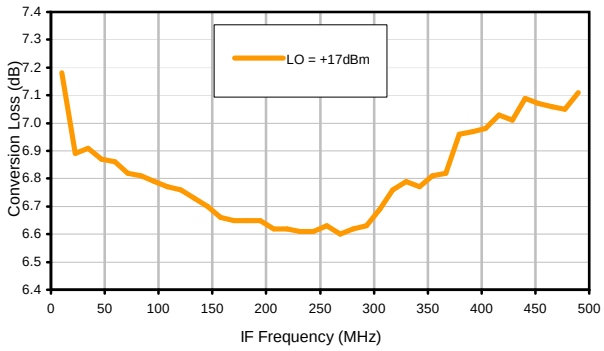
## *Typical Performance Curves*

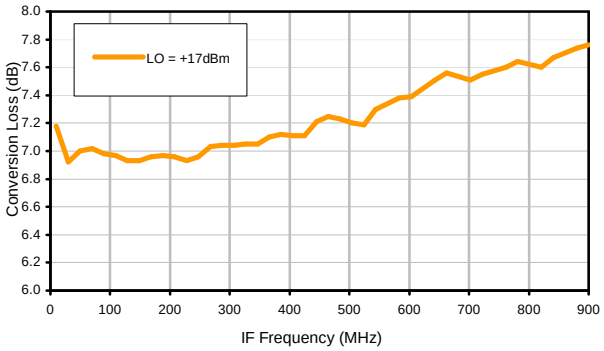
**Conversion Loss @ IF=30MHz**



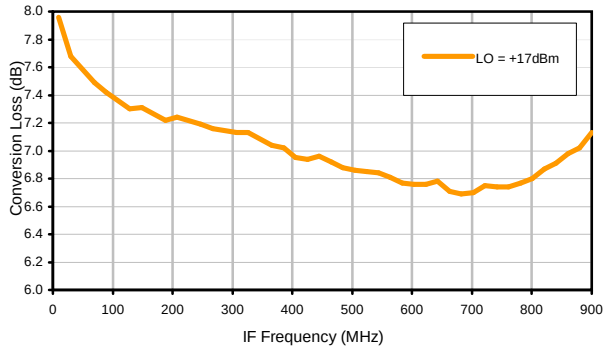

**Conversion Loss vs. IF @ RF=500.1MHz**



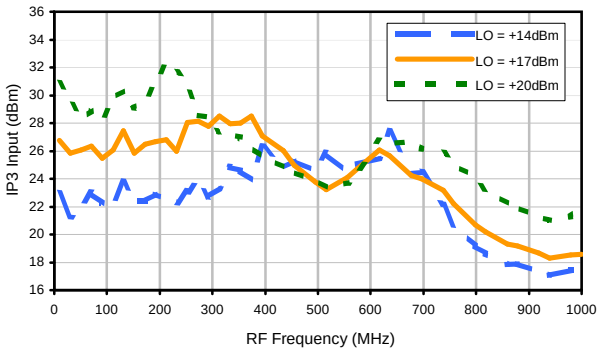

**Conversion Loss vs. IF @ RF=10.1MHz**



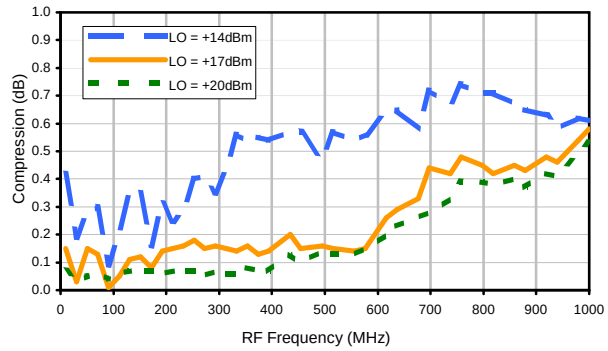

**Conversion Loss vs. IF @ RF=1000.1MHz**




**IP3 Input**




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







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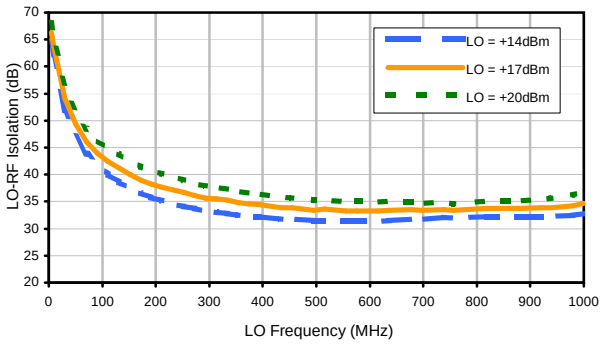
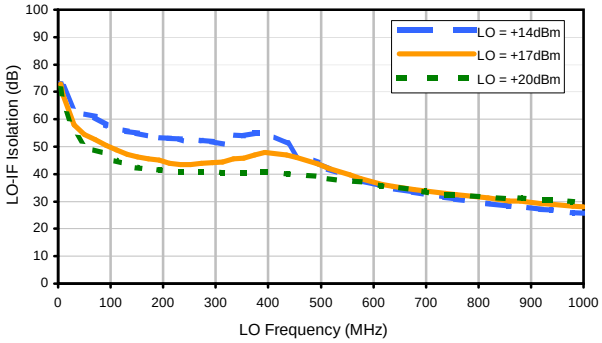
## *Typical Performance Curves*

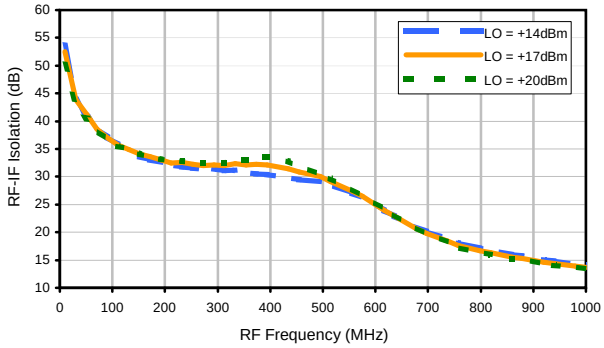
### LO-RF Isolation



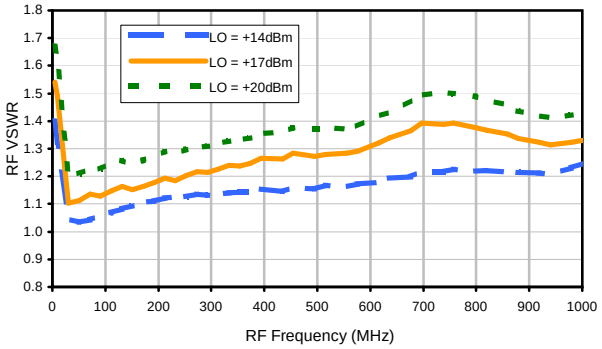

### LO-IF Isolation



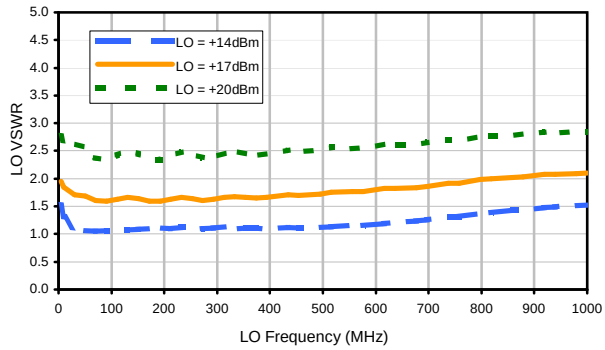

### RF-IF Isolation



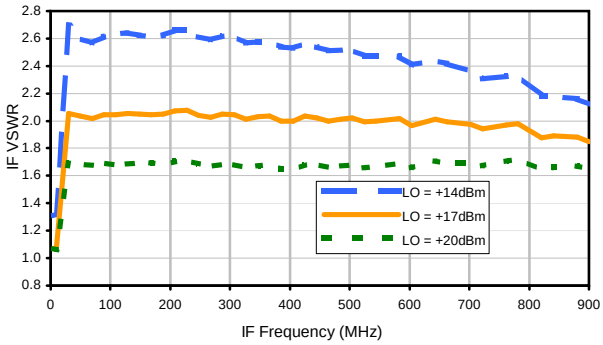

### RF VSWR




### LO VSWR




### IF VSWR







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## *Harmonics Tables*

| RF HARMONICS ORDER | (-dBm) | (-dBc) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | - | - | 16 | 21 | 8 | 23 | 16 | 33 | 36 | 51 | 33 | 44 |
| 1 | - | 22 | +0 | 30 | 14 | 33 | 31 | 34 | 34 | 39 | 35 | 46 |
| 2 | 90 | 49 | 41 | 49 | 43 | 52 | 42 | 53 | 54 | 58 | 57 | 59 |
| 3 | >100 | 69 | 56 | 68 | 55 | 68 | 50 | 67 | 52 | 83 | 59 | 77 |
| 4 | >100 | 76 | 74 | 85 | 79 | 77 | 74 | 74 | 69 | 72 | 73 | 81 |
| 5 | >100 | >92 | >92 | 86 | 90 | 91 | 76 | 85 | 77 | 86 | 78 | >92 |
| 6 | >100 | >92 | >92 | >92 | 91 | >92 | 86 | 84 | 85 | >92 | 85 | 91 |
| 7 | >100 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | 91 | >92 | >92 | >92 |
| 8 | >100 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 |
| 9 | >100 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 |
| 10 | >100 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 | >92 |
| | RF CAL | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

**LO HARMONICS ORDER**

**Test conditions:** **RF IN: 500.1 MHz; -1.00 dBm.**
**LO IN: 530.01 MHz; +17.00 dBm**
**IF OUT: 29.91 MHz; -8.17 dBm**

| RF HARMONICS ORDER | (-dBm) | (-dBc) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | - | - | 25 | 36 | 22 | 41 | 31 | 45 | 46 | 56 | 45 | 65 |
| 1 | - | 23 | +0 | 30 | 14 | 35 | 27 | 37 | 41 | 45 | 42 | 49 |
| 2 | 78 | 44 | 37 | 43 | 36 | 49 | 35 | 47 | 43 | 71 | 59 | 65 |
| 3 | >100 | 56 | 40 | 59 | 42 | 60 | 36 | 52 | 42 | 55 | 48 | 56 |
| 4 | >100 | 57 | 53 | 59 | 53 | 64 | 54 | 59 | 52 | 70 | 70 | 61 |
| 5 | >100 | 71 | 58 | 66 | 53 | 70 | 52 | 65 | 49 | 74 | 52 | 68 |
| 6 | >100 | 78 | 67 | 73 | 70 | 71 | 68 | 67 | 61 | 65 | 57 | 65 |
| 7 | >100 | 83 | 85 | 91 | 73 | 78 | 72 | 81 | 65 | 76 | 62 | 89 |
| 8 | >100 | 99 | 95 | 92 | >102 | 81 | 80 | 78 | 73 | 74 | 69 | 73 |
| 9 | >100 | 93 | 101 | 97 | 89 | 91 | 76 | 81 | 75 | 85 | 75 | 81 |
| 10 | >100 | 98 | >102 | >102 | >102 | 97 | 87 | 81 | 81 | 82 | 77 | 81 |
| | RF CAL | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

**LO HARMONICS ORDER**

**Test conditions:** **RF IN: 500.1 MHz; 9.00 dBm.**
**LO IN: 530.01 MHz; +17.00 dBm**
**IF OUT: 29.91 MHz; 1.87 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.**




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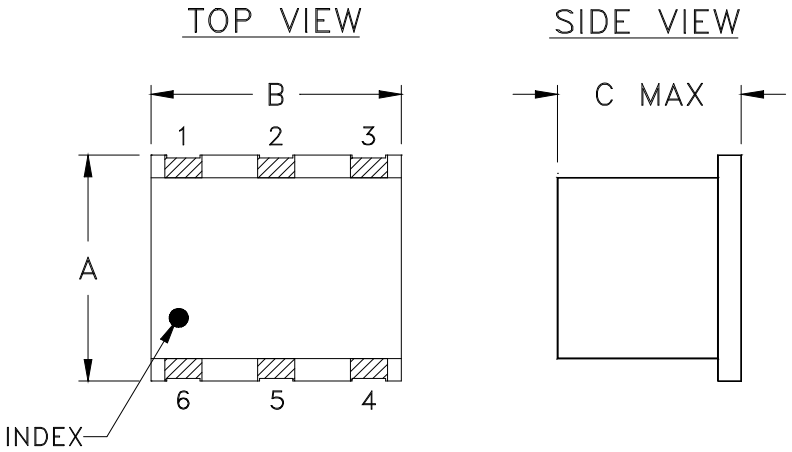
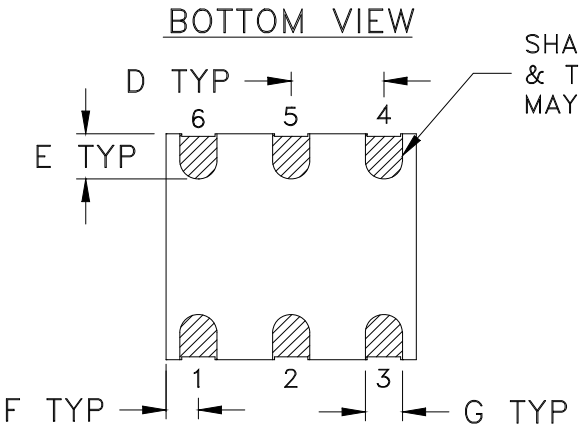
# Case Style TT

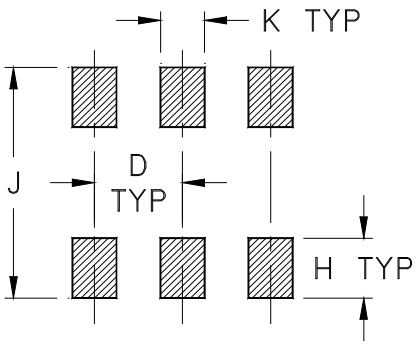
**TT240**

## Outline Dimensions




### PCB Land Pattern




Suggested Layout,
Tolerance to be within ±.002

| CASE # | A | B | C | D | E | F | G | H | J | K | WT. GRAM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TT240 | .250 (6.35) | .31 (7.87) | .20 (5.08) | .100 (2.54) | .050 (1.27) | .055 (1.40) | .040 (1.02) | .070 (1.78) | .270 (6.86) | .050 (1.27) | .50 |

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

### Notes:

1. Case material: Ceramic.
2. Termination finish:
   For RoHS Case Styles: 2-10µ inch (.05-.25 microns) Gold plate over 100-300 µ inch (2.54-7.62 microns) Nickel plate. All models, (+) suffix.
   For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.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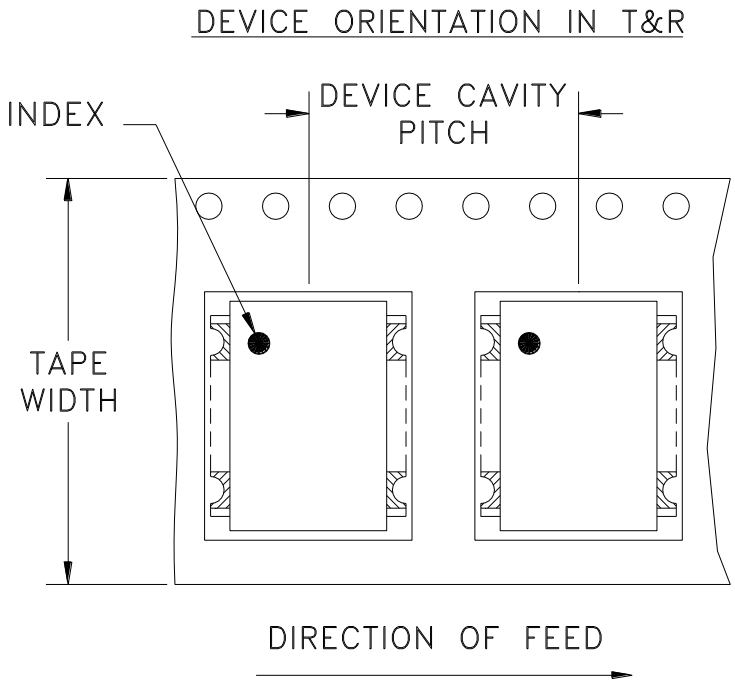
# Tape & Reel Packaging TR-F2




| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel See note |
|---|---|---|---|
| 16 | 12 | 7 | 10 |
| | | | 20 |
| | | | 50 |
| | | | 100 |
| | | | 200 |
| | | 13 | 500 |

Note: Please consult individual model data sheet to determine device per reel availability

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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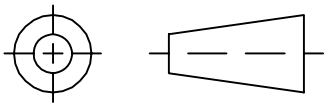
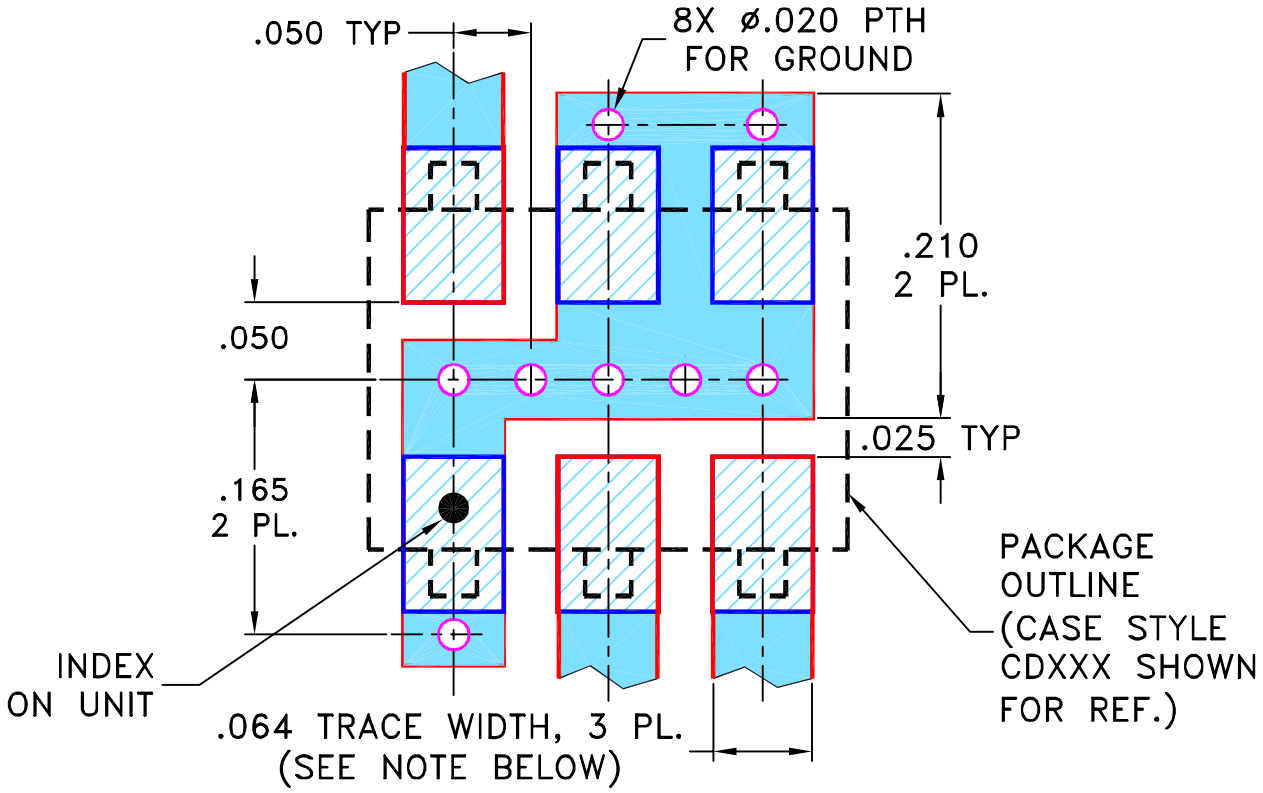
THIRD ANGLE PROJECTION



| REVISIONS | | | | | |
|---|---|---|---|---|---|
| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
| A | M101143 | ADDED "gk" PIN CONNECTION, TT100 CASE STYLE & NOTE 2 | 10/10/05 | MMG | DJ |
| B | M102713 | ADDED "...WITH SMOBC" | 01/17/06 | MMG | IL |
| C | M108637 | REMOVED "PIN 1" , ADDED INDEX ON UNIT | 12/01/06 | MYG | FL |

# SUGGESTED MOUNTING CONFIGURATION FOR BH292, CD541/542/636/637, TT100/240 CASE STYLES, "gk", "ht", "hu", "nd", "w" PIN CONNECTIONS




NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

| UNLESS OTHERWISE SPECIFIED | | INITIALS | DATE |
|---|---|---|---|
| DIMENSIONS ARE IN INCHES | DRAWN | MMG | 07/17/02 |
| TOLERANCES ON: | CHECKED | WL | 08/02/02 |
| 2 PL DECIMALS ± | APPROVED | DJ | 08/05/02 |
| 3 PL DECIMALS ± .005 | | | |
| ANGLES ± | | | |
| FRACTIONS ± | | | |

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

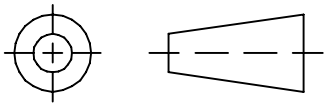
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, gk/ht/hu/nd/w, BH292, CD541/542/636/637, TT100/240, TB-03

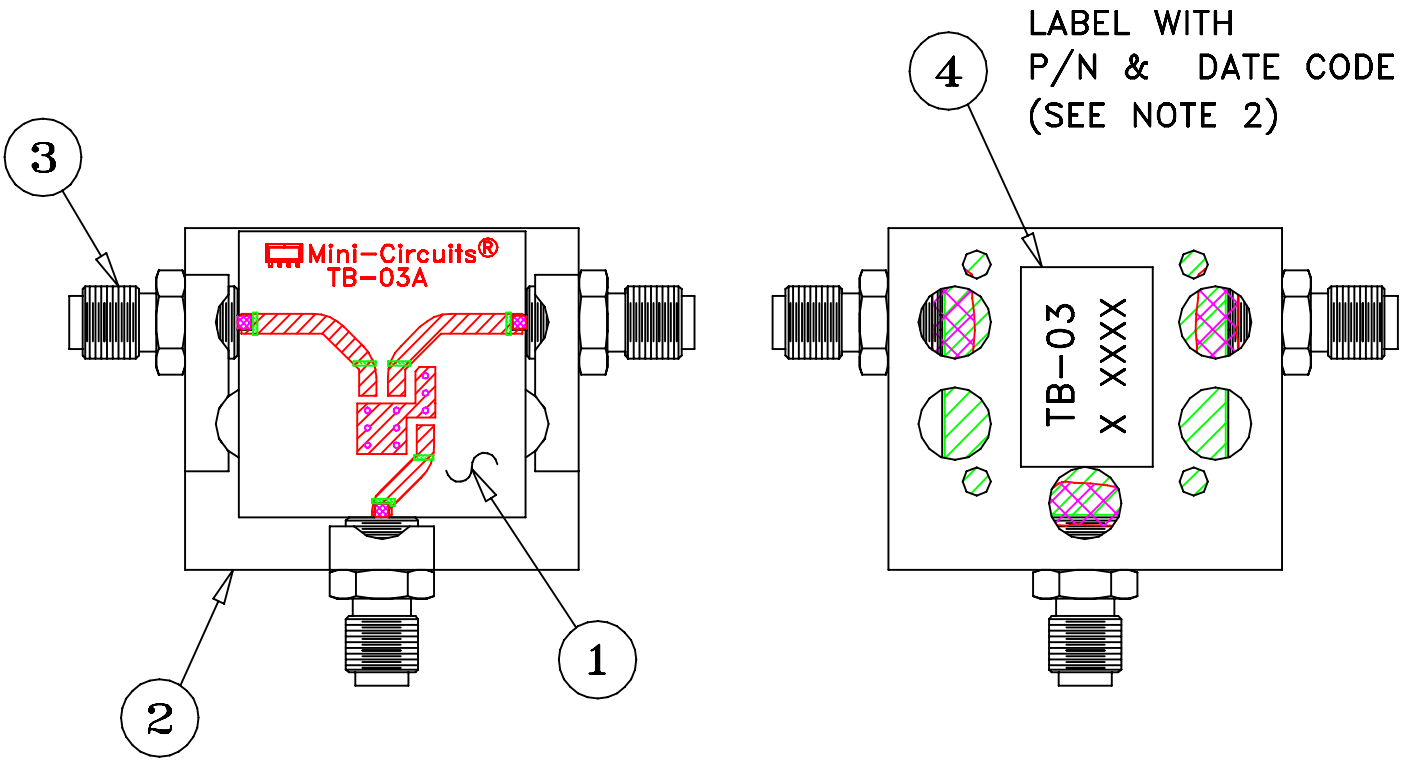
| SIZE | CODE IDENT | DRAWING NO: | REV: |
|---|---|---|---|
| A | 15542 | 98-PL-052 | C |

| FILE: | SCALE: | SHEET: |
|---|---|---|
| 98PL052 | 8:1 | 1 OF 1 |

THIRD ANGLE PROJECTION



| REVISIONS | | | | | |
|---|---|---|---|---|---|
| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
| **E** | **M119737** | **UPDATED PCB** | **10.08** | **MF** | **AD** |
| F | M127659 | UPDATED CARR | 06.10 | SW | SG |
| G | M127846 | UPDATED SCHEMATIC DIAGRAM | 06.10 | SW | SG |
| H | M131840 | UPDATED DWG | 05.11 | MF | AD |




## NOTES:

1. REFER TO -09 PAGE FOR ITEM DESCRIPTIONS. DESIGNATION NUMBERS ON -20 PAGE CORRESPOND TO THE NUMBERS ON -09 PAGE.
2. FOR TEXT HEIGHT & STYLE ON THE LABEL REFER TO: D3-G209.

| UNLESS OTHERWISE SPECIFIED | | INITIALS | DATE |
|---|---|---|---|
| DIMENSIONS ARE IN INCHES | DRAWN | S.WOLYNSKI | 06.29.99 |
| TOLERANCES ON: | CHECKED | SG | 07.06.99 |
| 2 PL DECIMALS ± | APPROVED | MG | 07.10.99 |
| 3 PL DECIMALS ± | | | |
| ANGLES ± | | | |
| FRACTIONS ± | | | |

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

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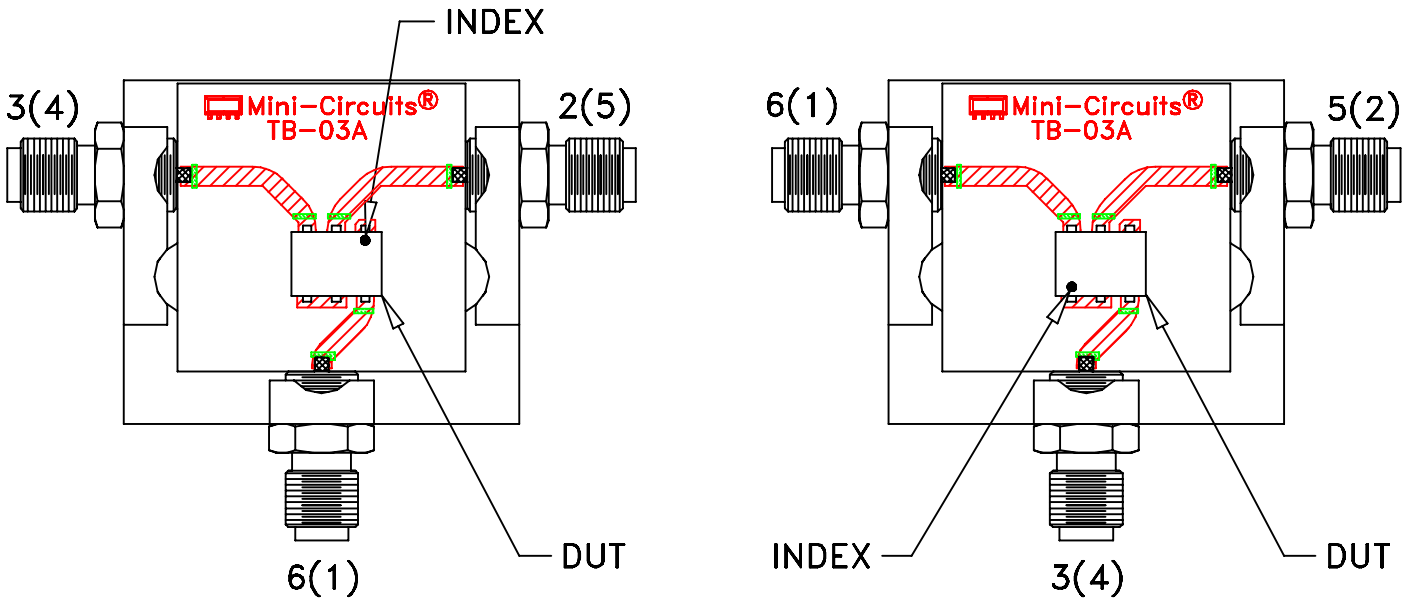
TB,ADE,CD542/636,06MX01,50

| SIZE | CODE IDENT | DRAWING NO: | REV: |
|---|---|---|---|
| A | 15542 | TB-03-20 | H |

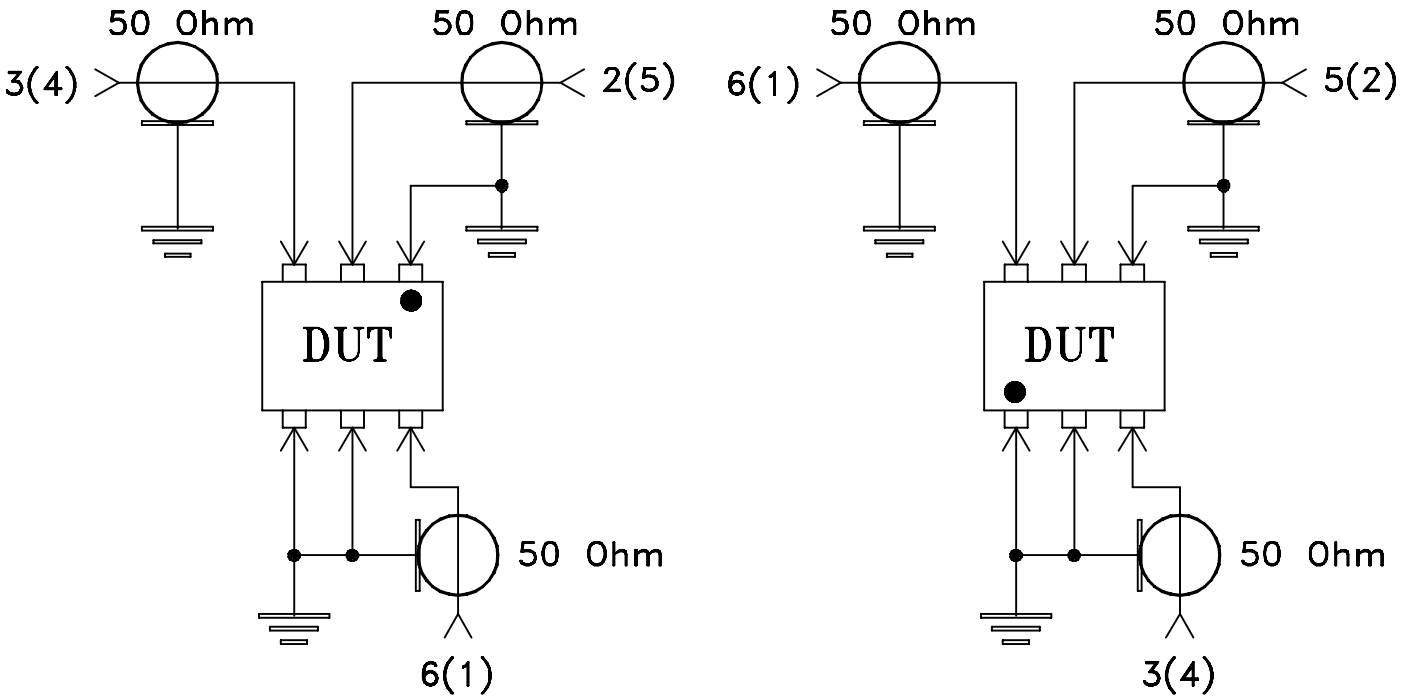
| FILE: | SCALE: | SHEET: |
|---|---|---|
| WTB-03 | 1.5:1 | 1 OF 2 |

# Evaluation Board and Circuit

For Pin Connections and DUT Orientation Refer to Data Sheet of the DUT




TB-03




Schematic Diagram

## Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.030 inch.

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# Environmental Specifications ENV02T1

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>Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C<br>Ambient Environment | Individual Model Data Sheet |
| Humidity | 90 to 95% RH, 240 hours, 50°C | MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours |
| Thermal Shock | -55° to 100°C, 100 cycles | MIL-STD-202, Method 107, Condition A-3, except +100°C |
| Solder Reflow Heat | Sn-Pb Eutetic Process: 225°C peak<br>Pb-Free Process 245° - 250°C peak | J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1 |
| Solderability | 10X Magnification | J-STD-002, 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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