

Level 7 (LO Power +7 dBm) 5 to 1500 MHz

## Maximum Ratings

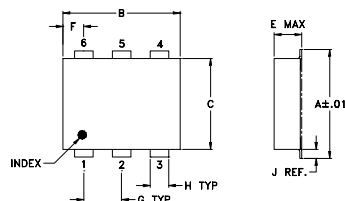
|                       |                |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |
| RF Power              | 50mW           |
| IF Current            | 40mA           |

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

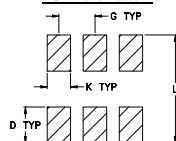
## Pin Connections

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

## Outline Drawing



## PCB Land Pattern

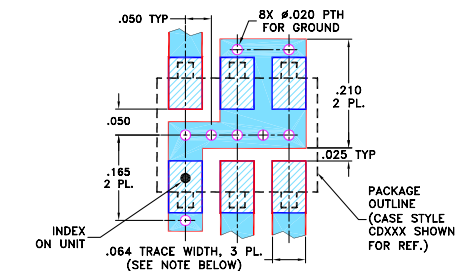
Suggested Layout,  
Tolerance to be within ±.002

## Outline Dimensions (inch)

| A    | B    | C    | D    | E    | F    | G    |
|------|------|------|------|------|------|------|
| .272 | .310 | .220 | .100 | .112 | .055 | .100 |
| 6.91 | 7.87 | 5.59 | 2.54 | 2.84 | 1.40 | 2.54 |

| H    | J    | K    | L    | wt    |
|------|------|------|------|-------|
| .030 | .026 | .065 | .300 | grams |
| 0.76 | 0.66 | 1.65 | 7.62 | 0.20  |

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

## Features

- low conversion loss, 6.6 dB typ.
- excellent L-R isolation, 40 dB typ.
- excellent IP3, 15 dBm
- aqueous washable
- protected by U.S. Patent 6,133,525

## Applications

- cellular
- PCS

Generic photo used for illustration purposes only

CASE STYLE: CD542



## Electrical Specifications

| FREQUENCY<br>(MHz) |         | CONVERSION LOSS<br>(dB) |                        |      |                        | LO-RF ISOLATION<br>(dB) |           |           | LO-IF ISOLATION<br>(dB) |           |           | IP3<br>at center<br>band<br>(dBm) |
|--------------------|---------|-------------------------|------------------------|------|------------------------|-------------------------|-----------|-----------|-------------------------|-----------|-----------|-----------------------------------|
|                    |         | Mid-Band<br>m           | Total<br>Range<br>Max. |      |                        | L                       | M         | U         | L                       | M         | U         |                                   |
| LO/RF              | IF      |                         |                        |      |                        |                         |           |           |                         |           |           |                                   |
| $f_L$ - $f_U$      |         | $\bar{X}$               | $\sigma$               | Max. | Total<br>Range<br>Max. | Typ. Min.               | Typ. Min. | Typ. Min. | Typ. Min.               | Typ. Min. | Typ. Min. | Typ.                              |
| 5-1500             | DC-1000 | 6.6                     | 0.10                   | 7.5  | 9.3                    | 50 40                   | 40 25     | 33 23     | 50 40                   | 30 20     | 20 10     | 15                                |

1 dB COMP.: +1 dBm typ.

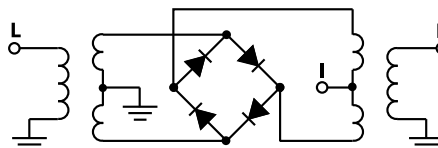
Phase detection, positive polarity

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

## Typical Performance Data

| Frequency<br>(MHz) |        | Conversion<br>Loss<br>(dB) | Isolation<br>L-R<br>(dB) | Isolation<br>L-I<br>(dB) | VSWR<br>RF Port<br>(:1) | VSWR<br>LO Port<br>(:1) |
|--------------------|--------|----------------------------|--------------------------|--------------------------|-------------------------|-------------------------|
| RF                 | LO     | LO<br>+7dBm                | LO<br>+7dBm              | LO<br>+7dBm              | LO<br>+7dBm             | LO<br>+7dBm             |
| 5.0                | 35.0   | 7.0                        | 63.9                     | 53.6                     | 1.59                    | 1.91                    |
| 10.0               | 40.0   | 6.6                        | 63.2                     | 52.2                     | 1.51                    | 1.94                    |
| 50.0               | 80.0   | 6.5                        | 56.7                     | 46.6                     | 1.39                    | 1.91                    |
| 100.0              | 130.0  | 6.6                        | 52.7                     | 41.7                     | 1.38                    | 1.91                    |
| 197.1              | 227.1  | 6.7                        | 49.0                     | 36.3                     | 1.41                    | 1.94                    |
| 295.6              | 325.6  | 6.6                        | 47.3                     | 33.5                     | 1.40                    | 2.01                    |
| 394.1              | 424.1  | 6.7                        | 43.7                     | 32.0                     | 1.39                    | 2.20                    |
| 492.6              | 522.6  | 6.5                        | 42.4                     | 30.7                     | 1.35                    | 2.40                    |
| 500.0              | 530.0  | 6.6                        | 41.9                     | 30.5                     | 1.34                    | 2.37                    |
| 591.1              | 621.1  | 6.6                        | 39.7                     | 29.9                     | 1.35                    | 2.40                    |
| 689.6              | 719.6  | 6.6                        | 36.8                     | 28.5                     | 1.28                    | 2.32                    |
| 788.1              | 818.1  | 6.6                        | 35.2                     | 26.0                     | 1.23                    | 2.30                    |
| 886.6              | 916.6  | 6.5                        | 33.4                     | 23.5                     | 1.14                    | 2.32                    |
| 985.1              | 1015.1 | 6.4                        | 33.2                     | 21.8                     | 1.09                    | 2.49                    |
| 1000.0             | 1030.0 | 6.5                        | 33.5                     | 21.5                     | 1.11                    | 2.58                    |
| 1182.0             | 1212.0 | 6.6                        | 35.6                     | 20.4                     | 1.50                    | 2.88                    |
| 1280.5             | 1310.5 | 7.1                        | 36.3                     | 19.2                     | 1.81                    | 2.92                    |
| 1379.0             | 1409.0 | 7.6                        | 34.3                     | 17.9                     | 2.10                    | 2.92                    |
| 1477.5             | 1507.5 | 8.2                        | 31.2                     | 17.1                     | 2.37                    | 2.88                    |
| 1500.0             | 1530.0 | 8.2                        | 30.5                     | 16.8                     | 2.46                    | 2.96                    |

## Electrical Schematic

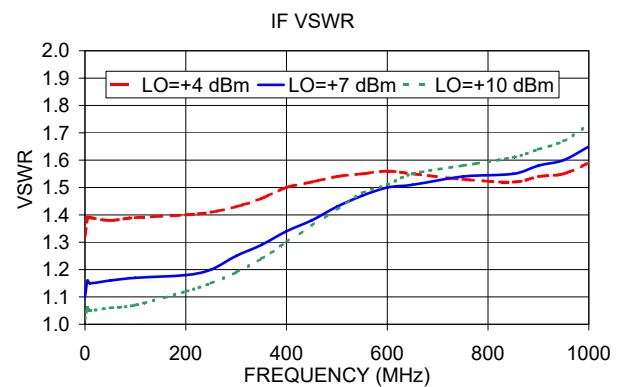
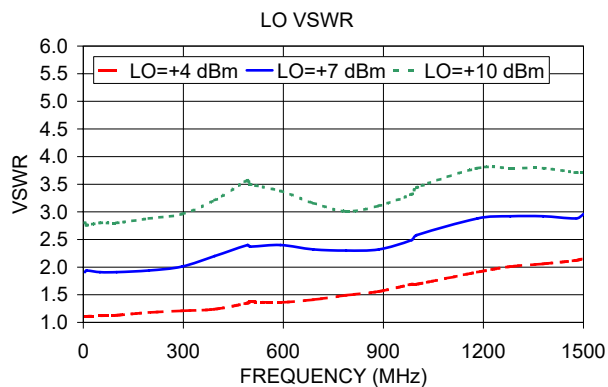
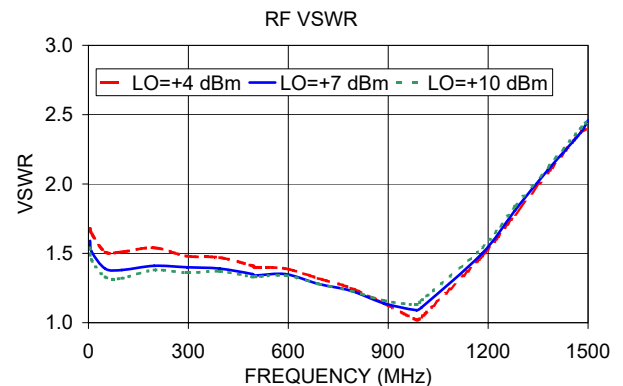
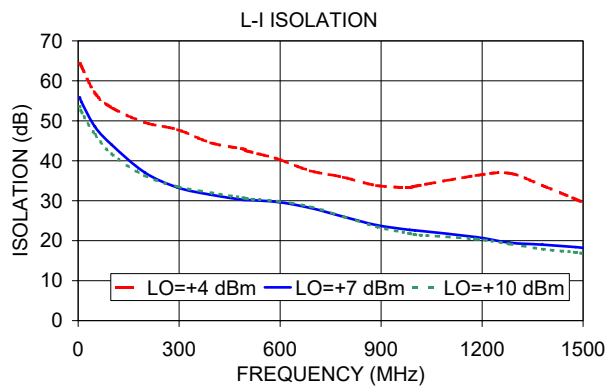
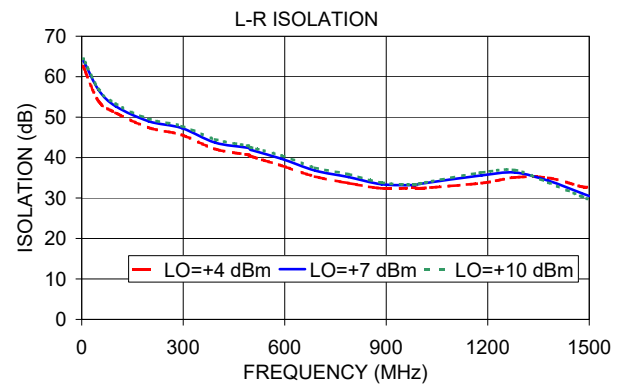
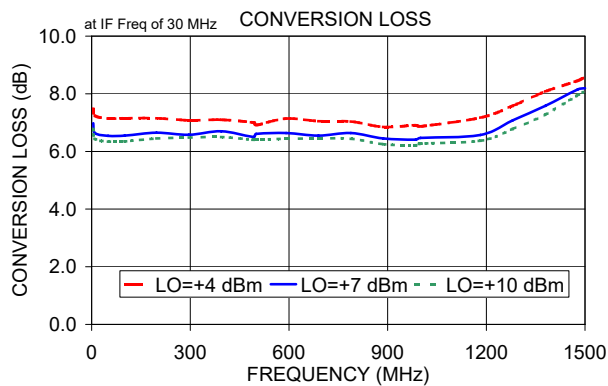


## Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.  
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## Performance Charts

## ADE-5



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## 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=+1dBm<br>(dB) |      |      |
|---------------------|-------------|-------------------------------------------------------|------|------|---------------------|-------------|--------------------|-------|-------|---------------------|-------------|-------------------------------------|------|------|
|                     |             | @LO (dBm)                                             |      |      |                     |             | @LO (dBm)          |       |       |                     |             | @LO (dBm)                           |      |      |
|                     |             |                                                       |      |      |                     |             |                    |       |       |                     |             |                                     |      |      |
| +4                  | +7          | +10                                                   | +4   | +7   | +10                 | +4          | +7                 | +10   | +4    | +7                  | +10         |                                     |      |      |
| 5.0                 | 35.0        | 7.48                                                  | 6.98 | 6.78 | 10.1                | 40.1        | 15.58              | 20.51 | 23.05 | 10.1                | 40.1        | 0.45                                | 0.31 | 0.25 |
| 10.0                | 40.0        | 7.24                                                  | 6.64 | 6.44 | 49.9                | 79.9        | 15.26              | 20.08 | 20.07 | 49.9                | 79.9        | 0.53                                | 0.33 | 0.28 |
| 49.9                | 79.9        | 7.37                                                  | 6.84 | 6.60 | 89.7                | 119.7       | 14.88              | 18.96 | 20.00 | 89.7                | 119.7       | 0.50                                | 0.41 | 0.28 |
| 89.7                | 119.7       | 7.41                                                  | 6.89 | 6.65 | 129.5               | 159.5       | 15.49              | 15.95 | 20.95 | 129.5               | 159.5       | 0.49                                | 0.40 | 0.23 |
| 129.5               | 159.5       | 7.42                                                  | 6.87 | 6.66 | 169.3               | 199.3       | 14.96              | 17.56 | 20.45 | 169.3               | 199.3       | 0.49                                | 0.41 | 0.26 |
| 169.3               | 199.3       | 7.36                                                  | 6.88 | 6.66 | 209.0               | 239.0       | 14.80              | 17.96 | 19.47 | 209.0               | 239.0       | 0.57                                | 0.38 | 0.24 |
| 209.0               | 239.0       | 7.33                                                  | 6.87 | 6.69 | 248.8               | 278.8       | 14.87              | 18.74 | 23.99 | 248.8               | 278.8       | 0.55                                | 0.34 | 0.32 |
| 248.8               | 278.8       | 7.31                                                  | 6.89 | 6.69 | 308.5               | 338.5       | 14.65              | 18.93 | 17.31 | 308.5               | 338.5       | 0.47                                | 0.39 | 0.23 |
| 308.5               | 338.5       | 7.34                                                  | 6.94 | 6.75 | 348.3               | 378.3       | 17.66              | 18.72 | 17.98 | 348.3               | 378.3       | 0.60                                | 0.37 | 0.28 |
| 348.3               | 378.3       | 7.33                                                  | 6.95 | 6.74 | 408.0               | 438.0       | 15.65              | 17.13 | 18.08 | 408.0               | 438.0       | 0.62                                | 0.36 | 0.27 |
| 408.0               | 438.0       | 7.37                                                  | 6.98 | 6.78 | 447.8               | 477.8       | 16.68              | 20.38 | 17.17 | 447.8               | 477.8       | 0.50                                | 0.39 | 0.28 |
| 447.8               | 477.8       | 7.40                                                  | 7.00 | 6.80 | 507.5               | 537.5       | 17.82              | 17.23 | 17.43 | 507.5               | 537.5       | 0.49                                | 0.38 | 0.29 |
| 507.5               | 537.5       | 7.44                                                  | 7.04 | 6.87 | 547.3               | 577.3       | 16.90              | 17.00 | 16.06 | 547.3               | 577.3       | 0.46                                | 0.50 | 0.29 |
| 547.3               | 577.3       | 7.49                                                  | 7.08 | 6.89 | 606.9               | 636.9       | 15.01              | 15.88 | 15.85 | 606.9               | 636.9       | 0.52                                | 0.51 | 0.34 |
| 606.9               | 636.9       | 7.55                                                  | 7.10 | 6.83 | 646.7               | 676.7       | 15.61              | 15.91 | 15.01 | 646.7               | 676.7       | 0.70                                | 0.65 | 0.55 |
| 646.7               | 676.7       | 7.58                                                  | 7.17 | 6.89 | 706.4               | 736.4       | 16.16              | 16.86 | 17.45 | 706.4               | 736.4       | 0.63                                | 0.54 | 0.46 |
| 706.4               | 736.4       | 7.66                                                  | 7.24 | 6.99 | 746.2               | 776.2       | 16.41              | 17.01 | 16.57 | 746.2               | 776.2       | 0.70                                | 0.57 | 0.52 |
| 805.9               | 835.9       | 7.68                                                  | 7.24 | 6.94 | 805.9               | 835.9       | 15.03              | 15.52 | 14.82 | 805.9               | 835.9       | 0.83                                | 0.73 | 0.58 |
| 845.7               | 875.7       | 7.67                                                  | 7.17 | 6.89 | 845.7               | 875.7       | 13.72              | 14.23 | 14.92 | 845.7               | 875.7       | 1.08                                | 0.93 | 0.76 |
| 905.4               | 935.4       | 7.73                                                  | 7.18 | 6.86 | 905.4               | 935.4       | 12.88              | 12.10 | 13.20 | 905.4               | 935.4       | 1.15                                | 1.07 | 0.93 |
| 945.2               | 975.2       | 7.80                                                  | 7.19 | 6.85 | 945.2               | 975.2       | 12.26              | 11.50 | 12.30 | 945.2               | 975.2       | 1.17                                | 1.16 | 0.96 |
| 1004.8              | 1034.8      | 7.88                                                  | 7.26 | 6.89 | 1004.8              | 1034.8      | 11.09              | 11.31 | 11.03 | 1004.8              | 1034.8      | 1.27                                | 1.16 | 0.97 |
| 1044.6              | 1074.6      | 7.91                                                  | 7.28 | 6.89 | 1044.6              | 1074.6      | 10.10              | 10.80 | 12.00 | 1044.6              | 1074.6      | 1.10                                | 1.01 | 0.97 |
| 1104.3              | 1134.3      | 7.96                                                  | 7.36 | 6.94 | 1104.3              | 1134.3      | 8.96               | 9.96  | 11.18 | 1104.3              | 1134.3      | 1.18                                | 1.08 | 0.96 |
| 1144.1              | 1174.1      | 8.00                                                  | 7.42 | 7.00 | 1144.1              | 1174.1      | 8.35               | 9.98  | 10.73 | 1144.1              | 1174.1      | 1.19                                | 1.09 | 1.04 |
| 1203.8              | 1233.8      | 8.02                                                  | 7.51 | 7.12 | 1203.8              | 1233.8      | 7.74               | 9.22  | 9.32  | 1203.8              | 1233.8      | 1.30                                | 1.07 | 0.99 |
| 1243.6              | 1273.6      | 8.04                                                  | 7.54 | 7.22 | 1243.6              | 1273.6      | 7.33               | 8.33  | 10.20 | 1243.6              | 1273.6      | 1.33                                | 1.05 | 0.96 |
| 1303.3              | 1333.3      | 7.97                                                  | 7.50 | 7.16 | 1303.3              | 1333.3      | 8.15               | 10.60 | 12.48 | 1303.3              | 1333.3      | 1.48                                | 1.16 | 1.00 |
| 1343.0              | 1373.0      | 7.97                                                  | 7.52 | 7.21 | 1343.0              | 1373.0      | 8.92               | 11.15 | 12.65 | 1343.0              | 1373.0      | 1.47                                | 1.22 | 1.01 |
| 1402.7              | 1432.7      | 8.00                                                  | 7.56 | 7.29 | 1402.7              | 1432.7      | 9.92               | 12.80 | 13.65 | 1402.7              | 1432.7      | 1.38                                | 1.11 | 0.88 |
| 1442.5              | 1472.5      | 8.03                                                  | 7.63 | 7.37 | 1442.5              | 1472.5      | 10.21              | 13.09 | 14.38 | 1442.5              | 1472.5      | 1.32                                | 1.08 | 0.91 |
| 1502.2              | 1532.2      | 8.21                                                  | 7.84 | 7.66 | 1502.2              | 1532.2      | 10.87              | 12.83 | 14.40 | 1502.2              | 1532.2      | 1.28                                | 0.94 | 0.90 |
| 1542.0              | 1572.0      | 8.36                                                  | 8.07 | 7.88 | 1542.0              | 1572.0      | 11.83              | 14.09 | 15.96 | 1542.0              | 1572.0      | 1.19                                | 0.89 | 0.74 |
| 1601.7              | 1631.7      | 8.69                                                  | 8.43 | 8.29 | 1601.7              | 1631.7      | 11.25              | 13.16 | 16.08 | 1601.7              | 1631.7      | 0.95                                | 0.71 | 0.81 |
| 1641.5              | 1671.5      | 8.84                                                  | 8.68 | 8.59 | 1641.5              | 1671.5      | 11.08              | 13.06 | 15.88 | 1641.5              | 1671.5      | 0.74                                | 0.70 | 0.66 |
| 1701.2              | 1731.2      | 9.06                                                  | 8.89 | 8.82 | 1701.2              | 1731.2      | 11.38              | 13.94 | 15.06 | 1701.2              | 1731.2      | 0.72                                | 0.58 | 0.45 |
| 1740.9              | 1770.9      | 9.19                                                  | 9.03 | 8.97 | 1740.9              | 1770.9      | 12.51              | 13.39 | 15.86 | 1740.9              | 1770.9      | 0.87                                | 0.55 | 0.46 |
| 1800.6              | 1830.6      | 9.49                                                  | 9.31 | 9.24 | 1800.6              | 1830.6      | 13.91              | 16.85 | 18.66 | 1800.6              | 1830.6      | 0.69                                | 0.44 | 0.31 |
| 1840.4              | 1870.4      | 9.78                                                  | 9.54 | 9.44 | 1840.4              | 1870.4      | 15.41              | 16.40 | 18.41 | 1840.4              | 1870.4      | 0.51                                | 0.40 | 0.42 |
| 1900.1              | 1930.1      | 10.18                                                 | 9.93 | 9.87 | 1900.1              | 1930.1      | 14.49              | 18.96 | 17.05 | 1900.1              | 1930.1      | 0.61                                | 0.37 | 0.29 |

## Typical Performance Data

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=750.1MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=10.1MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=1500.1MHz<br>(dB) |
|----------------------|-------------|-----------------------------------------------------------------|----------------------|-------------|----------------------------------------------------------------|----------------------|-------------|------------------------------------------------------------------|
|                      |             | @LO (dBm)                                                       |                      |             | @LO (dBm)                                                      |                      |             | @LO (dBm)                                                        |
|                      |             | +7                                                              |                      |             | +7                                                             |                      |             | +7                                                               |
| 740.0                | 10.1        | 7.47                                                            | 10.0                 | 20.1        | 6.66                                                           | 1000.0               | 500.1       | 8.51                                                             |
| 721.3                | 28.8        | 7.48                                                            | 30.0                 | 40.1        | 6.24                                                           | 979.8                | 520.3       | 8.33                                                             |
| 702.6                | 47.5        | 7.46                                                            | 50.0                 | 60.1        | 6.16                                                           | 959.6                | 540.5       | 8.26                                                             |
| 683.8                | 66.3        | 7.47                                                            | 70.0                 | 80.1        | 6.24                                                           | 939.4                | 560.7       | 8.20                                                             |
| 665.1                | 85.0        | 7.40                                                            | 90.0                 | 100.1       | 6.22                                                           | 919.2                | 580.9       | 8.15                                                             |
| 646.4                | 103.7       | 7.37                                                            | 110.0                | 120.1       | 6.12                                                           | 899.0                | 601.1       | 8.06                                                             |
| 627.7                | 122.4       | 7.32                                                            | 130.0                | 140.1       | 6.16                                                           | 878.8                | 621.3       | 8.03                                                             |
| 609.0                | 141.1       | 7.25                                                            | 150.0                | 160.1       | 6.20                                                           | 858.6                | 641.5       | 7.97                                                             |
| 590.3                | 159.8       | 7.23                                                            | 170.0                | 180.1       | 6.18                                                           | 838.4                | 661.7       | 7.95                                                             |
| 571.5                | 178.6       | 7.19                                                            | 190.0                | 200.1       | 6.21                                                           | 818.2                | 681.9       | 7.95                                                             |
| 552.8                | 197.3       | 7.18                                                            | 210.0                | 220.1       | 6.20                                                           | 798.0                | 702.1       | 7.92                                                             |
| 534.1                | 216.0       | 7.14                                                            | 230.0                | 240.1       | 6.28                                                           | 777.8                | 722.3       | 7.90                                                             |
| 515.4                | 234.7       | 7.12                                                            | 250.0                | 260.1       | 6.22                                                           | 757.6                | 742.5       | 7.87                                                             |
| 496.7                | 253.4       | 7.10                                                            | 270.0                | 280.1       | 6.27                                                           | 737.3                | 762.8       | 7.88                                                             |
| 477.9                | 272.2       | 7.09                                                            | 290.0                | 300.1       | 6.36                                                           | 717.1                | 783.0       | 7.84                                                             |
| 459.2                | 290.9       | 7.08                                                            | 310.0                | 320.1       | 6.35                                                           | 696.9                | 803.2       | 7.79                                                             |
| 440.5                | 309.6       | 7.11                                                            | 330.0                | 340.1       | 6.37                                                           | 676.7                | 823.4       | 7.73                                                             |
| 421.8                | 328.3       | 7.09                                                            | 350.0                | 360.1       | 6.44                                                           | 656.5                | 843.6       | 7.72                                                             |
| 403.1                | 347.0       | 7.05                                                            | 370.0                | 380.1       | 6.41                                                           | 636.3                | 863.8       | 7.66                                                             |
| 384.4                | 365.7       | 7.04                                                            | 390.0                | 400.1       | 6.46                                                           | 616.1                | 884.0       | 7.63                                                             |
| 365.6                | 384.5       | 7.01                                                            | 430.0                | 440.1       | 6.86                                                           | 575.7                | 924.4       | 7.53                                                             |
| 346.9                | 403.2       | 7.04                                                            | 450.0                | 460.1       | 6.63                                                           | 555.5                | 944.6       | 7.54                                                             |
| 328.2                | 421.9       | 7.04                                                            | 490.0                | 500.1       | 6.59                                                           | 515.1                | 985.0       | 7.50                                                             |
| 309.5                | 440.6       | 7.02                                                            | 510.0                | 520.1       | 6.64                                                           | 494.9                | 1005.2      | 7.50                                                             |
| 290.8                | 459.3       | 7.01                                                            | 550.0                | 560.1       | 6.73                                                           | 454.5                | 1045.6      | 7.52                                                             |
| 272.1                | 478.0       | 7.03                                                            | 570.0                | 580.1       | 6.79                                                           | 434.3                | 1065.8      | 7.59                                                             |
| 253.3                | 496.8       | 7.04                                                            | 610.0                | 620.1       | 6.77                                                           | 393.9                | 1106.2      | 7.55                                                             |
| 234.6                | 515.5       | 6.98                                                            | 630.0                | 640.1       | 6.97                                                           | 373.7                | 1126.4      | 7.63                                                             |
| 215.9                | 534.2       | 7.06                                                            | 670.0                | 680.1       | 6.98                                                           | 333.3                | 1166.8      | 7.69                                                             |
| 197.2                | 552.9       | 7.04                                                            | 690.0                | 700.1       | 7.05                                                           | 313.1                | 1187.0      | 7.74                                                             |
| 178.5                | 571.6       | 7.04                                                            | 730.0                | 740.1       | 7.19                                                           | 272.7                | 1227.4      | 7.84                                                             |
| 159.7                | 590.4       | 7.03                                                            | 750.0                | 760.1       | 7.28                                                           | 252.4                | 1247.7      | 7.89                                                             |
| 141.0                | 609.1       | 7.04                                                            | 790.0                | 800.1       | 7.24                                                           | 212.0                | 1288.1      | 7.96                                                             |
| 122.3                | 627.8       | 7.06                                                            | 810.0                | 820.1       | 7.24                                                           | 191.8                | 1308.3      | 8.01                                                             |
| 103.6                | 646.5       | 7.10                                                            | 850.0                | 860.1       | 7.23                                                           | 151.4                | 1348.7      | 7.99                                                             |
| 84.9                 | 665.2       | 7.12                                                            | 870.0                | 880.1       | 7.13                                                           | 131.2                | 1368.9      | 7.96                                                             |
| 66.2                 | 683.9       | 7.14                                                            | 910.0                | 920.1       | 7.17                                                           | 90.8                 | 1409.3      | 7.94                                                             |
| 47.4                 | 702.7       | 7.15                                                            | 930.0                | 940.1       | 7.24                                                           | 70.6                 | 1429.5      | 7.91                                                             |
| 28.7                 | 721.4       | 7.26                                                            | 970.0                | 980.1       | 7.30                                                           | 30.2                 | 1469.9      | 7.81                                                             |
| 10.0                 | 740.1       | 7.14                                                            | 990.0                | 1000.1      | 7.30                                                           | 10.0                 | 1490.1      | 7.77                                                             |

## Typical Performance Data

| LO<br>(MHz) | LO-RF ISOLATION<br>(dB) |       |       | LO-IF ISOLATION<br>(dB) |       |       |
|-------------|-------------------------|-------|-------|-------------------------|-------|-------|
|             | @LO (dBm)               |       |       | @LO (dBm)               |       |       |
|             | +4                      | +7    | +10   | +4                      | +7    | +10   |
| 5.0         | 62.6                    | 63.9  | 64.4  | 55.9                    | 53.6  | 52.4  |
| 10.0        | 61.4                    | 63.2  | 63.6  | 54.7                    | 52.2  | 51.4  |
| 49.9        | 61.08                   | 60.98 | 60.65 | 55.75                   | 54.61 | 55.38 |
| 89.7        | 55.41                   | 55.60 | 55.58 | 49.88                   | 49.37 | 48.68 |
| 129.5       | 52.30                   | 52.23 | 52.56 | 45.64                   | 44.95 | 44.63 |
| 169.3       | 50.10                   | 50.23 | 50.70 | 42.62                   | 41.75 | 42.08 |
| 209.0       | 48.36                   | 48.80 | 49.12 | 39.72                   | 39.51 | 40.26 |
| 248.8       | 46.94                   | 47.56 | 47.90 | 37.50                   | 37.92 | 38.88 |
| 308.5       | 45.40                   | 45.98 | 46.35 | 35.25                   | 36.14 | 37.21 |
| 348.3       | 44.61                   | 45.30 | 45.71 | 34.05                   | 35.20 | 36.31 |
| 408.0       | 43.15                   | 43.93 | 44.43 | 32.74                   | 34.07 | 35.15 |
| 447.8       | 42.36                   | 43.14 | 43.68 | 31.86                   | 33.18 | 34.18 |
| 507.5       | 41.41                   | 42.42 | 43.10 | 31.08                   | 32.51 | 33.50 |
| 547.3       | 40.59                   | 41.65 | 42.39 | 30.48                   | 31.87 | 32.81 |
| 606.9       | 39.04                   | 40.18 | 41.02 | 29.97                   | 31.20 | 31.87 |
| 646.7       | 37.90                   | 39.08 | 39.97 | 29.70                   | 30.95 | 31.53 |
| 706.4       | 36.33                   | 37.46 | 38.35 | 29.10                   | 30.30 | 30.82 |
| 805.9       | 34.21                   | 35.20 | 35.96 | 27.33                   | 28.08 | 28.44 |
| 845.7       | 33.70                   | 34.62 | 35.33 | 26.53                   | 27.07 | 27.37 |
| 905.4       | 32.94                   | 33.74 | 34.36 | 25.59                   | 25.92 | 26.07 |
| 945.2       | 32.65                   | 33.39 | 33.90 | 25.15                   | 25.36 | 25.35 |
| 1004.8      | 32.39                   | 33.13 | 33.57 | 24.57                   | 24.64 | 24.35 |
| 1044.6      | 32.16                   | 32.91 | 33.36 | 24.12                   | 24.17 | 23.78 |
| 1104.3      | 31.89                   | 32.59 | 33.03 | 23.70                   | 23.66 | 23.09 |
| 1144.1      | 31.75                   | 32.41 | 32.84 | 23.44                   | 23.43 | 22.85 |
| 1203.8      | 31.60                   | 32.15 | 32.52 | 23.00                   | 23.05 | 22.62 |
| 1243.6      | 31.58                   | 32.03 | 32.35 | 22.53                   | 22.58 | 22.33 |
| 1303.3      | 31.59                   | 31.90 | 32.06 | 21.45                   | 21.18 | 20.92 |
| 1343.0      | 31.54                   | 31.72 | 31.81 | 20.63                   | 20.08 | 19.65 |
| 1402.7      | 31.40                   | 31.41 | 31.44 | 19.80                   | 19.00 | 18.49 |
| 1442.5      | 31.29                   | 31.16 | 31.14 | 19.40                   | 18.56 | 18.04 |
| 1502.2      | 31.18                   | 30.82 | 30.62 | 19.01                   | 18.10 | 17.49 |
| 1542.0      | 31.23                   | 30.67 | 30.33 | 18.96                   | 17.97 | 17.30 |
| 1601.7      | 30.92                   | 29.97 | 29.37 | 18.78                   | 17.63 | 16.91 |
| 1641.5      | 30.61                   | 29.34 | 28.56 | 18.67                   | 17.39 | 16.57 |
| 1701.2      | 30.08                   | 28.40 | 27.40 | 18.55                   | 17.18 | 16.28 |
| 1740.9      | 29.78                   | 27.83 | 26.70 | 18.45                   | 17.03 | 16.09 |
| 1800.6      | 29.22                   | 26.97 | 25.70 | 18.31                   | 16.86 | 15.89 |
| 1840.4      | 28.86                   | 26.56 | 25.26 | 18.20                   | 16.76 | 15.78 |
| 1900.1      | 28.30                   | 25.88 | 24.49 | 18.09                   | 16.67 | 15.65 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +4                      | +7    | +10   |
| 10.1                | 40.1        | 42.19                   | 49.31 | 48.33 |
| 49.9                | 79.9        | 34.91                   | 34.84 | 34.69 |
| 89.7                | 119.7       | 29.97                   | 30.08 | 30.18 |
| 129.5               | 159.5       | 27.31                   | 27.39 | 27.37 |
| 169.3               | 199.3       | 25.29                   | 25.46 | 25.52 |
| 209.0               | 239.0       | 23.91                   | 24.05 | 24.11 |
| 248.8               | 278.8       | 22.84                   | 23.01 | 23.11 |
| 308.5               | 338.5       | 21.72                   | 21.97 | 22.10 |
| 348.3               | 378.3       | 21.20                   | 21.49 | 21.67 |
| 408.0               | 438.0       | 20.59                   | 20.97 | 21.21 |
| 447.8               | 477.8       | 20.20                   | 20.60 | 20.87 |
| 507.5               | 537.5       | 19.52                   | 19.96 | 20.26 |
| 547.3               | 577.3       | 19.12                   | 19.65 | 20.03 |
| 606.9               | 636.9       | 18.85                   | 19.54 | 20.02 |
| 646.7               | 676.7       | 18.66                   | 19.33 | 19.84 |
| 706.4               | 736.4       | 18.13                   | 18.63 | 18.98 |
| 746.2               | 776.2       | 17.48                   | 17.80 | 18.00 |
| 805.9               | 835.9       | 16.34                   | 16.43 | 16.46 |
| 845.7               | 875.7       | 15.62                   | 15.64 | 15.63 |
| 905.4               | 935.4       | 14.66                   | 14.61 | 14.58 |
| 945.2               | 975.2       | 14.18                   | 14.11 | 14.07 |
| 1004.8              | 1034.8      | 13.67                   | 13.60 | 13.54 |
| 1044.6              | 1074.6      | 13.44                   | 13.37 | 13.33 |
| 1104.3              | 1134.3      | 13.21                   | 13.16 | 13.14 |
| 1144.1              | 1174.1      | 13.06                   | 13.02 | 12.98 |
| 1203.8              | 1233.8      | 12.89                   | 12.84 | 12.81 |
| 1243.6              | 1273.6      | 12.75                   | 12.69 | 12.67 |
| 1303.3              | 1333.3      | 12.56                   | 12.43 | 12.33 |
| 1343.0              | 1373.0      | 12.35                   | 12.16 | 12.02 |
| 1402.7              | 1432.7      | 11.86                   | 11.63 | 11.47 |
| 1442.5              | 1472.5      | 11.46                   | 11.21 | 11.03 |
| 1502.2              | 1532.2      | 10.86                   | 10.57 | 10.36 |
| 1542.0              | 1572.0      | 10.38                   | 10.08 | 9.86  |
| 1601.7              | 1631.7      | 9.70                    | 9.37  | 9.14  |
| 1641.5              | 1671.5      | 9.22                    | 8.87  | 8.65  |
| 1701.2              | 1731.2      | 8.54                    | 8.15  | 7.87  |
| 1740.9              | 1770.9      | 8.13                    | 7.73  | 7.48  |
| 1800.6              | 1830.6      | 7.51                    | 7.11  | 6.86  |
| 1840.4              | 1870.4      | 7.17                    | 6.78  | 6.53  |
| 1900.1              | 1930.1      | 6.56                    | 6.20  | 5.98  |

## 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=1500.1MHz<br>(:1) |      |      |
|---------------------|-------------|-----------------|------|------|-------------|-----------------|------|------|----------------------|----------------------------------|------|------|
|                     |             | @LO (dBm)       |      |      |             | @LO (dBm)       |      |      |                      | @LO (dBm)                        |      |      |
|                     |             | +4              | +7   | +10  |             | +4              | +7   | +10  |                      | +4                               | +7   | +10  |
| 5.0                 | 35.0        | 1.68            | 1.59 | 1.54 | 5.0         | 1.11            | 1.91 | 2.80 | 0.1                  | 1.32                             | 1.10 | 1.02 |
| 10.0                | 40.0        | 1.64            | 1.51 | 1.45 | 10.0        | 1.11            | 1.94 | 2.76 | 5.0                  | 1.39                             | 1.16 | 1.06 |
| 49.9                | 79.9        | 1.41            | 1.30 | 1.24 | 49.9        | 1.12            | 1.69 | 2.45 | 10.0                 | 1.39                             | 1.15 | 1.05 |
| 89.7                | 119.7       | 1.49            | 1.38 | 1.32 | 89.7        | 1.12            | 1.69 | 2.42 | 30.3                 | 1.80                             | 1.54 | 1.43 |
| 129.5               | 159.5       | 1.42            | 1.33 | 1.28 | 129.5       | 1.14            | 1.68 | 2.39 | 50.5                 | 1.64                             | 1.44 | 1.24 |
| 169.3               | 199.3       | 1.47            | 1.38 | 1.32 | 169.3       | 1.17            | 1.71 | 2.43 | 70.7                 | 1.59                             | 1.38 | 1.25 |
| 209.0               | 239.0       | 1.44            | 1.35 | 1.32 | 209.0       | 1.17            | 1.69 | 2.37 | 90.9                 | 1.69                             | 1.47 | 1.32 |
| 248.8               | 278.8       | 1.41            | 1.34 | 1.30 | 248.8       | 1.21            | 1.73 | 2.44 | 111.1                | 1.74                             | 1.50 | 1.37 |
| 308.5               | 338.5       | 1.43            | 1.37 | 1.34 | 308.5       | 1.22            | 1.75 | 2.46 | 131.3                | 1.68                             | 1.46 | 1.33 |
| 348.3               | 378.3       | 1.41            | 1.35 | 1.32 | 348.3       | 1.25            | 1.82 | 2.55 | 151.5                | 1.63                             | 1.42 | 1.30 |
| 408.0               | 438.0       | 1.40            | 1.35 | 1.33 | 408.0       | 1.26            | 1.83 | 2.55 | 171.7                | 1.66                             | 1.43 | 1.31 |
| 447.8               | 477.8       | 1.45            | 1.40 | 1.37 | 447.8       | 1.30            | 1.88 | 2.63 | 191.9                | 1.71                             | 1.48 | 1.36 |
| 507.5               | 537.5       | 1.48            | 1.43 | 1.40 | 507.5       | 1.32            | 1.92 | 2.67 | 212.1                | 1.70                             | 1.48 | 1.35 |
| 547.3               | 577.3       | 1.47            | 1.43 | 1.41 | 547.3       | 1.36            | 1.99 | 2.75 | 232.3                | 1.65                             | 1.43 | 1.31 |
| 606.9               | 636.9       | 1.49            | 1.45 | 1.43 | 606.9       | 1.39            | 2.01 | 2.76 | 252.5                | 1.61                             | 1.41 | 1.29 |
| 646.7               | 676.7       | 1.43            | 1.40 | 1.39 | 646.7       | 1.45            | 2.09 | 2.87 | 272.8                | 1.61                             | 1.42 | 1.30 |
| 706.4               | 736.4       | 1.42            | 1.40 | 1.39 | 706.4       | 1.49            | 2.12 | 2.88 | 293.0                | 1.64                             | 1.44 | 1.32 |
| 746.2               | 776.2       | 1.33            | 1.31 | 1.30 | 746.2       | 1.54            | 2.20 | 2.99 | 313.2                | 1.63                             | 1.43 | 1.31 |
| 805.9               | 835.9       | 1.30            | 1.28 | 1.28 | 805.9       | 1.58            | 2.22 | 2.98 | 333.4                | 1.58                             | 1.39 | 1.29 |
| 845.7               | 875.7       | 1.27            | 1.23 | 1.22 | 845.7       | 1.64            | 2.29 | 3.06 | 353.6                | 1.56                             | 1.38 | 1.29 |
| 905.4               | 935.4       | 1.24            | 1.20 | 1.19 | 905.4       | 1.71            | 2.37 | 3.14 | 394.0                | 1.59                             | 1.42 | 1.33 |
| 945.2               | 975.2       | 1.26            | 1.21 | 1.19 | 945.2       | 1.79            | 2.46 | 3.23 | 434.4                | 1.55                             | 1.39 | 1.31 |
| 1004.8              | 1034.8      | 1.16            | 1.12 | 1.12 | 1004.8      | 1.88            | 2.57 | 3.35 | 454.6                | 1.55                             | 1.40 | 1.33 |
| 1044.6              | 1074.6      | 1.15            | 1.11 | 1.11 | 1044.6      | 1.95            | 2.64 | 3.43 | 495.0                | 1.57                             | 1.43 | 1.36 |
| 1104.3              | 1134.3      | 1.06            | 1.05 | 1.10 | 1104.3      | 2.03            | 2.73 | 3.52 | 515.2                | 1.55                             | 1.42 | 1.36 |
| 1144.1              | 1174.1      | 1.08            | 1.09 | 1.13 | 1144.1      | 2.10            | 2.81 | 3.61 | 555.6                | 1.56                             | 1.44 | 1.39 |
| 1203.8              | 1233.8      | 1.25            | 1.25 | 1.26 | 1203.8      | 2.15            | 2.84 | 3.62 | 575.8                | 1.57                             | 1.46 | 1.41 |
| 1243.6              | 1273.6      | 1.29            | 1.30 | 1.32 | 1243.6      | 2.23            | 2.93 | 3.73 | 616.2                | 1.56                             | 1.47 | 1.43 |
| 1303.3              | 1333.3      | 1.37            | 1.37 | 1.38 | 1303.3      | 2.22            | 2.86 | 3.62 | 636.4                | 1.57                             | 1.48 | 1.45 |
| 1343.0              | 1373.0      | 1.44            | 1.45 | 1.47 | 1343.0      | 2.29            | 2.94 | 3.70 | 676.8                | 1.59                             | 1.51 | 1.48 |
| 1402.7              | 1432.7      | 1.50            | 1.52 | 1.54 | 1402.7      | 2.29            | 2.90 | 3.63 | 697.0                | 1.57                             | 1.50 | 1.47 |
| 1442.5              | 1472.5      | 1.60            | 1.63 | 1.64 | 1442.5      | 2.36            | 2.97 | 3.71 | 737.4                | 1.58                             | 1.53 | 1.52 |
| 1502.2              | 1532.2      | 1.80            | 1.83 | 1.84 | 1502.2      | 2.44            | 3.03 | 3.76 | 757.7                | 1.60                             | 1.55 | 1.53 |
| 1542.0              | 1572.0      | 1.90            | 1.93 | 1.94 | 1542.0      | 2.55            | 3.12 | 3.83 | 798.1                | 1.56                             | 1.51 | 1.50 |
| 1601.7              | 1631.7      | 2.08            | 2.11 | 2.12 | 1601.7      | 2.71            | 3.26 | 3.94 | 818.3                | 1.55                             | 1.52 | 1.52 |
| 1641.5              | 1671.5      | 1.99            | 2.03 | 2.04 | 1641.5      | 2.84            | 3.35 | 4.01 | 858.7                | 1.58                             | 1.56 | 1.55 |
| 1701.2              | 1731.2      | 2.02            | 2.05 | 2.06 | 1701.2      | 3.03            | 3.48 | 4.10 | 878.9                | 1.56                             | 1.53 | 1.53 |
| 1740.9              | 1770.9      | 1.88            | 1.91 | 1.93 | 1740.9      | 3.20            | 3.62 | 4.21 | 919.3                | 1.51                             | 1.50 | 1.51 |
| 1800.6              | 1830.6      | 1.92            | 1.93 | 1.94 | 1800.6      | 3.36            | 3.70 | 4.21 | 939.5                | 1.52                             | 1.51 | 1.53 |
| 1840.4              | 1870.4      | 2.03            | 2.04 | 2.07 | 1840.4      | 3.56            | 3.84 | 4.33 | 979.9                | 1.49                             | 1.47 | 1.48 |
| 1900.1              | 1930.1      | 2.09            | 2.09 | 2.10 | 1900.1      | 3.69            | 3.88 | 4.29 | 1000.1               | 1.44                             | 1.44 | 1.45 |

REV. X2

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## Harmonics Tables

RF HARMONICS ORDER

|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0      | -      | -      | +0  | 20  | 8   | 36  | 18  | 27  | 34  | 38  | 58  | 44  |
| 1      | -      | 10     | +0  | 27  | 14  | 39  | 33  | 41  | 47  | 38  | 59  | 48  |
| 2      | 124    | 63     | 48  | 59  | 50  | 59  | 51  | 62  | 63  | 61  | 69  | 64  |
| 3      | 117    | 68     | 79  | 67  | 67  | 68  | 65  | 86  | 79  | 77  | 81  | 82  |
| 4      | 118    | 96     | 90  | 91  | 83  | 81  | 83  | 91  | 90  | 92  | 92  | 94  |
| 5      | 116    | 107    | 103 | 130 | 110 | 95  | 86  | 104 | 100 | 99  | 102 | 105 |
| 6      | 119    | 102    | 109 | 100 | 99  | 119 | 104 | 83  | 119 | 102 | 114 | 112 |
| 7      | 114    | 101    | 103 | 114 | 115 | 125 | 100 | 95  | 102 | 109 | 109 | 109 |
| 8      | 109    | 99     | 103 | 114 | 110 | 97  | 110 | 101 | 97  | 91  | 101 | 106 |
| 9      | 117    | 95     | 106 | 112 | 107 | 106 | 102 | 109 | 108 | 95  | 97  | 98  |
| 10     | 114    | 99     | 98  | 102 | 122 | 111 | 107 | 102 | 104 | 110 | 104 | 96  |
| RF CAL | 0      | 1      | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |     |

### LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; -14.00 dBm.  
LO IN: 780.01 MHz; +7.00 dBm  
IF OUT: 29.91 MHz; -21.11 dBm

RF HARMONICS ORDER

|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |    |    |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|----|----|
| 0      | -      | -      | 10  | 31  | 18  | 42  | 28  | 39  | 48  | 53  | 63 | 66 |
| 1      | -      | 10     | +0  | 28  | 14  | 42  | 33  | 46  | 56  | 43  | 67 | 54 |
| 2      | 89     | 51     | 37  | 47  | 39  | 48  | 42  | 57  | 71  | 54  | 67 | 60 |
| 3      | 116    | 47     | 60  | 49  | 50  | 50  | 47  | 65  | 61  | 60  | 63 | 59 |
| 4      | 115    | 78     | 71  | 69  | 58  | 61  | 58  | 77  | 61  | 70  | 64 | 64 |
| 5      | 114    | 73     | 76  | 73  | 66  | 66  | 62  | 72  | 64  | 73  | 71 | 75 |
| 6      | 111    | 91     | 87  | 91  | 88  | 78  | 70  | 71  | 70  | 72  | 72 | 78 |
| 7      | 122    | 92     | 97  | 94  | 107 | 87  | 78  | 78  | 78  | 79  | 85 | 89 |
| 8      | 106    | 110    | 104 | 99  | 102 | 116 | 92  | 91  | 83  | 82  | 82 | 93 |
| 9      | 113    | 121    | 111 | 116 | 109 | 104 | 105 | 103 | 107 | 105 | 94 | 97 |
| 10     | 105    | 111    | 113 | 111 | 130 | 111 | 114 | 116 | 106 | 99  | 99 | 98 |
| RF CAL | 0      | 1      | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10 |    |

### LO HARMONICS ORDER

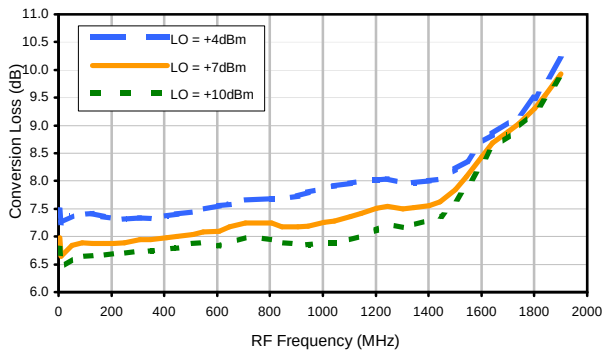
Test conditions: RF IN: 750.1 MHz; -4.00 dBm.  
LO IN: 780.01 MHz; +7.00 dBm  
IF OUT: 29.91 MHz; -11.16 dBm

- 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.

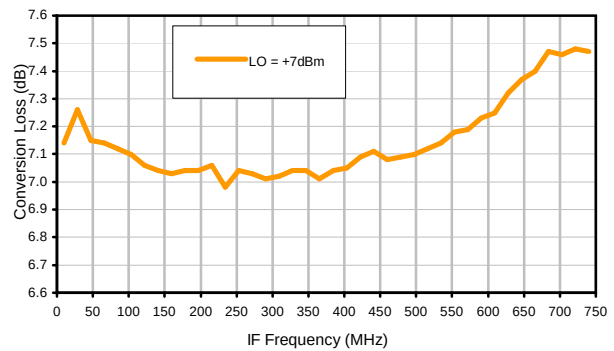
REV. X2  
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## Typical Performance Curves

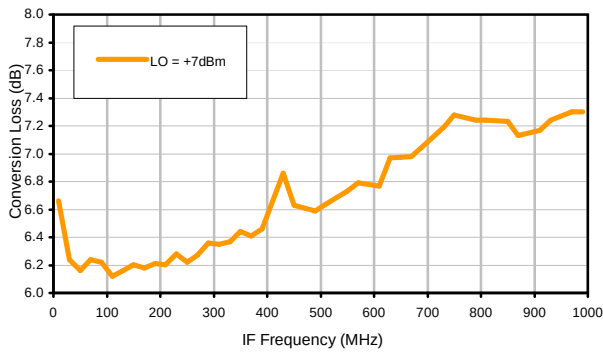
Conversion Loss @ IF=30MHz



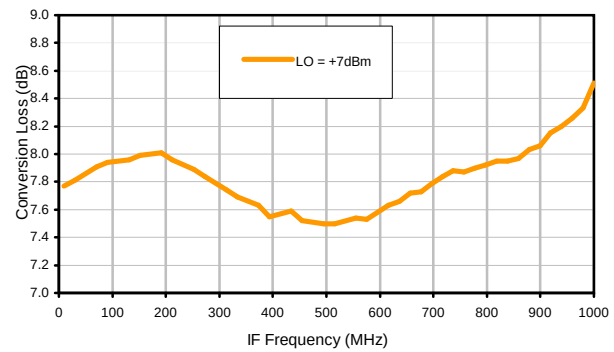
Conversion Loss vs. IF @ RF=750.1MHz



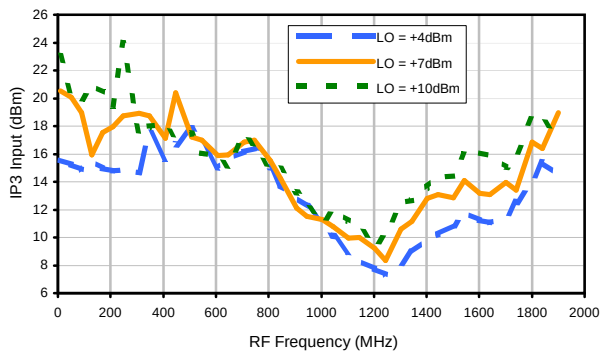
Conversion Loss vs. IF @ RF=10.1MHz



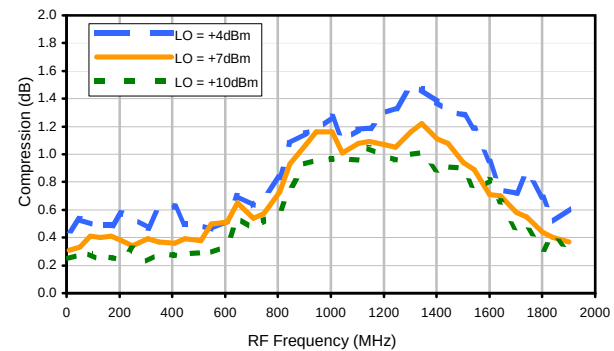
Conversion Loss vs. IF @ RF=1500.1MHz



IP3 Input



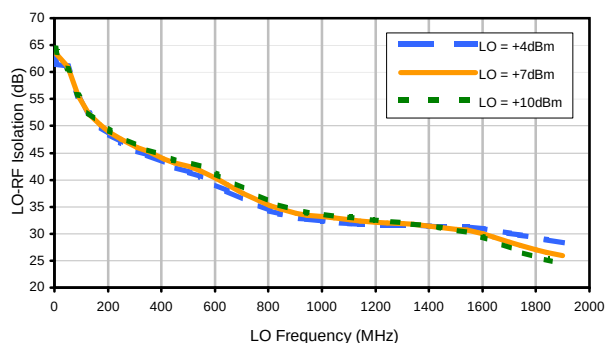
Compression @ RF IN=+1dBm



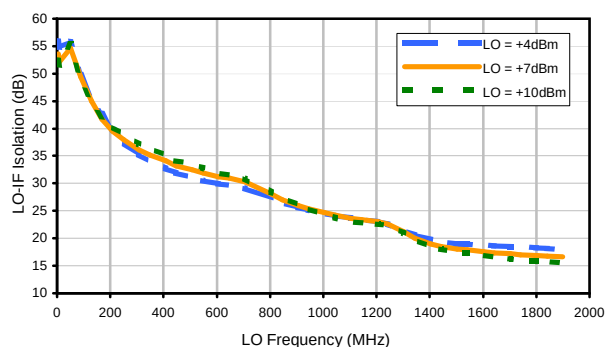


## Typical Performance Curves

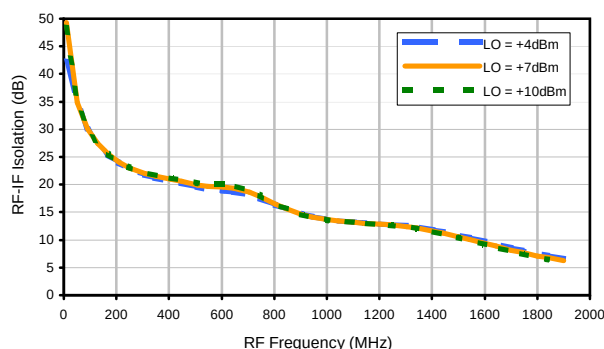
LO-RF Isolation



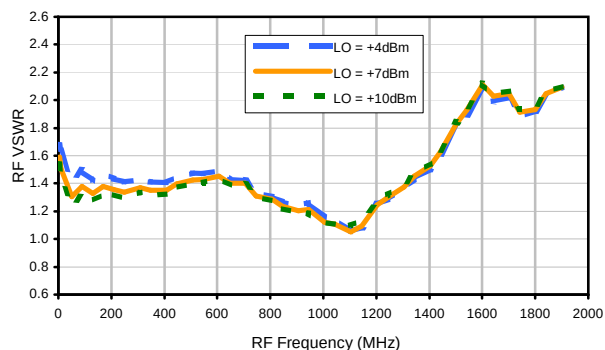
LO-IF Isolation



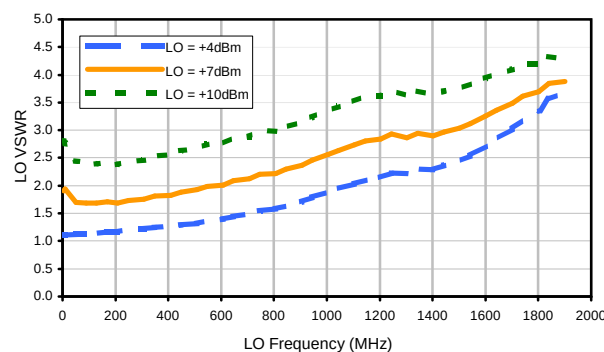
RF-IF Isolation



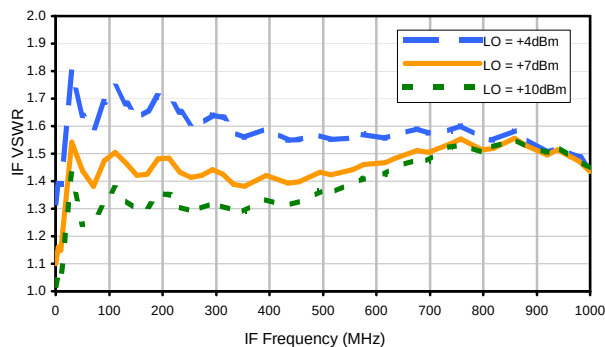
RF VSWR



LO VSWR



IF VSWR



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## Harmonics Tables

RF HARMONICS ORDER

|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0      | -      | -      | +0  | 20  | 8   | 36  | 18  | 27  | 34  | 38  | 58  | 44  |
| 1      | -      | 10     | +0  | 27  | 14  | 39  | 33  | 41  | 47  | 38  | 59  | 48  |
| 2      | 124    | 63     | 48  | 59  | 50  | 59  | 51  | 62  | 63  | 61  | 69  | 64  |
| 3      | 117    | 68     | 79  | 67  | 67  | 68  | 65  | 86  | 79  | 77  | 81  | 82  |
| 4      | 118    | 96     | 90  | 91  | 83  | 81  | 83  | 91  | 90  | 92  | 92  | 94  |
| 5      | 116    | 107    | 103 | 130 | 110 | 95  | 86  | 104 | 100 | 99  | 102 | 105 |
| 6      | 119    | 102    | 109 | 100 | 99  | 119 | 104 | 83  | 119 | 102 | 114 | 112 |
| 7      | 114    | 101    | 103 | 114 | 115 | 125 | 100 | 95  | 102 | 109 | 109 | 109 |
| 8      | 109    | 99     | 103 | 114 | 110 | 97  | 110 | 101 | 97  | 91  | 101 | 106 |
| 9      | 117    | 95     | 106 | 112 | 107 | 106 | 102 | 109 | 108 | 95  | 97  | 98  |
| 10     | 114    | 99     | 98  | 102 | 122 | 111 | 107 | 102 | 104 | 110 | 104 | 96  |
| RF CAL | 0      | 1      | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |     |

### LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; -14.00 dBm.  
LO IN: 780.01 MHz; +7.00 dBm  
IF OUT: 29.91 MHz; -21.11 dBm

RF HARMONICS ORDER

|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |    |    |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|----|----|
| 0      | -      | -      | 10  | 31  | 18  | 42  | 28  | 39  | 48  | 53  | 63 | 66 |
| 1      | -      | 10     | +0  | 28  | 14  | 42  | 33  | 46  | 56  | 43  | 67 | 54 |
| 2      | 89     | 51     | 37  | 47  | 39  | 48  | 42  | 57  | 71  | 54  | 67 | 60 |
| 3      | 116    | 47     | 60  | 49  | 50  | 50  | 47  | 65  | 61  | 60  | 63 | 59 |
| 4      | 115    | 78     | 71  | 69  | 58  | 61  | 58  | 77  | 61  | 70  | 64 | 64 |
| 5      | 114    | 73     | 76  | 73  | 66  | 66  | 62  | 72  | 64  | 73  | 71 | 75 |
| 6      | 111    | 91     | 87  | 91  | 88  | 78  | 70  | 71  | 70  | 72  | 72 | 78 |
| 7      | 122    | 92     | 97  | 94  | 107 | 87  | 78  | 78  | 78  | 79  | 85 | 89 |
| 8      | 106    | 110    | 104 | 99  | 102 | 116 | 92  | 91  | 83  | 82  | 82 | 93 |
| 9      | 113    | 121    | 111 | 116 | 109 | 104 | 105 | 103 | 107 | 105 | 94 | 97 |
| 10     | 105    | 111    | 113 | 111 | 130 | 111 | 114 | 116 | 106 | 99  | 99 | 98 |
| RF CAL | 0      | 1      | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10 |    |

### LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; -4.00 dBm.  
LO IN: 780.01 MHz; +7.00 dBm  
IF OUT: 29.91 MHz; -11.16 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.

REV. X2  
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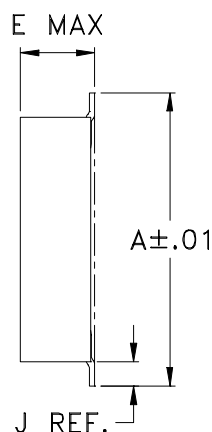
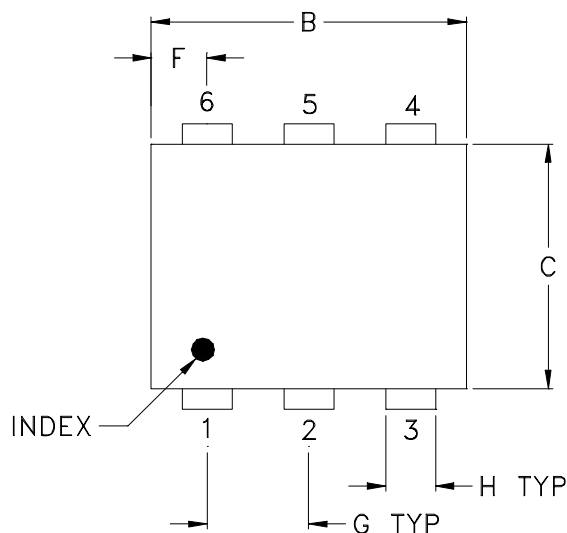
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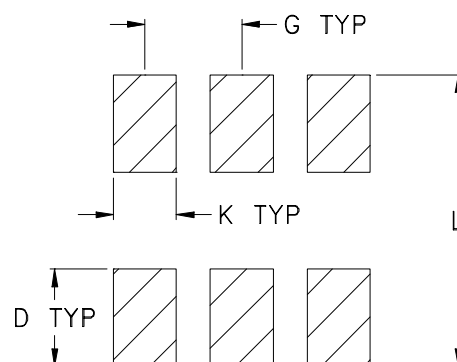


CD541  
CD542  
CD636  
CD637

## Outline Dimensions



## PCB Land Pattern



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

| CASE# | A              | B              | C              | D              | E              | F              | G              | H              | J              | K              | L              | WT,<br>GRAM |
|-------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------|
| CD541 |                |                |                |                | .082<br>(2.08) |                |                |                |                |                |                | .15         |
| CD542 | .272<br>(6.91) | .310<br>(7.87) | .220<br>(5.58) | .100<br>(2.54) | .112<br>(2.84) | .055<br>(1.40) | .100<br>(2.54) | .030<br>(0.76) | .026<br>(0.66) | .065<br>(1.65) | .300<br>(7.62) | .20         |
| CD636 |                |                |                |                | .162<br>(4.11) |                |                |                |                |                |                | .25         |
| CD637 |                |                |                |                | .206<br>(5.23) |                |                |                |                |                |                | .40         |

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

### Notes:

- Case material: Plastic.
- Termination finish:  
For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.  
For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.



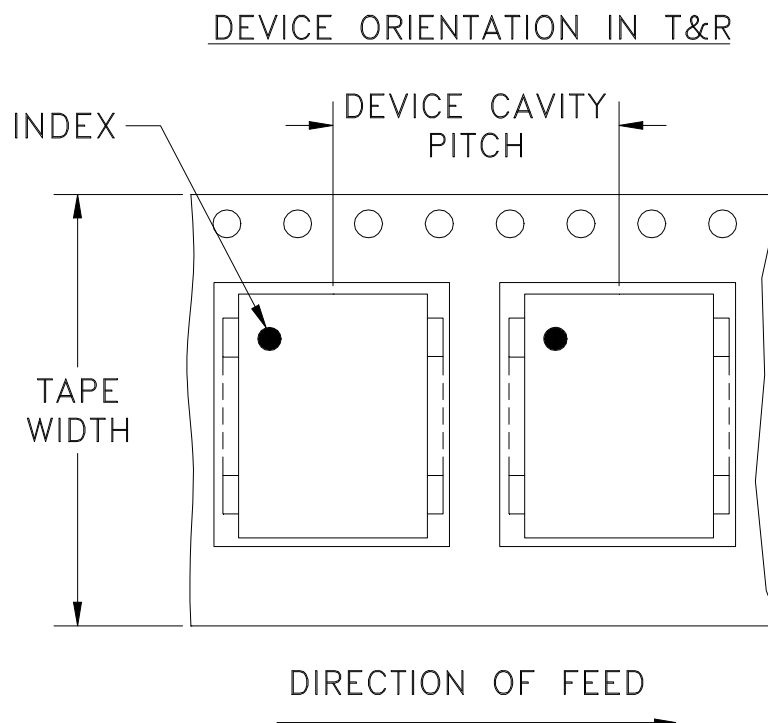
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# Tape & Reel Packaging TR-F34



| Tape Width,<br>mm | Device Cavity<br>Pitch, mm | Reel Size,<br>inches | Devices per Reel<br>see note                |      |
|-------------------|----------------------------|----------------------|---------------------------------------------|------|
| 16                | 12                         | 7                    | Small<br>quantity<br>standard<br>(see note) | 20   |
|                   |                            |                      |                                             | 50   |
|                   |                            |                      |                                             | 100  |
|                   |                            |                      |                                             | 200  |
|                   |                            | 13                   | Standard                                    | 500  |
|                   |                            |                      |                                             | 1000 |

Note: Availability of small reel quantity varies by model.  
Refer to pricing and availability on individual model dashboard.

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)



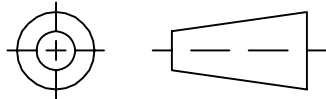
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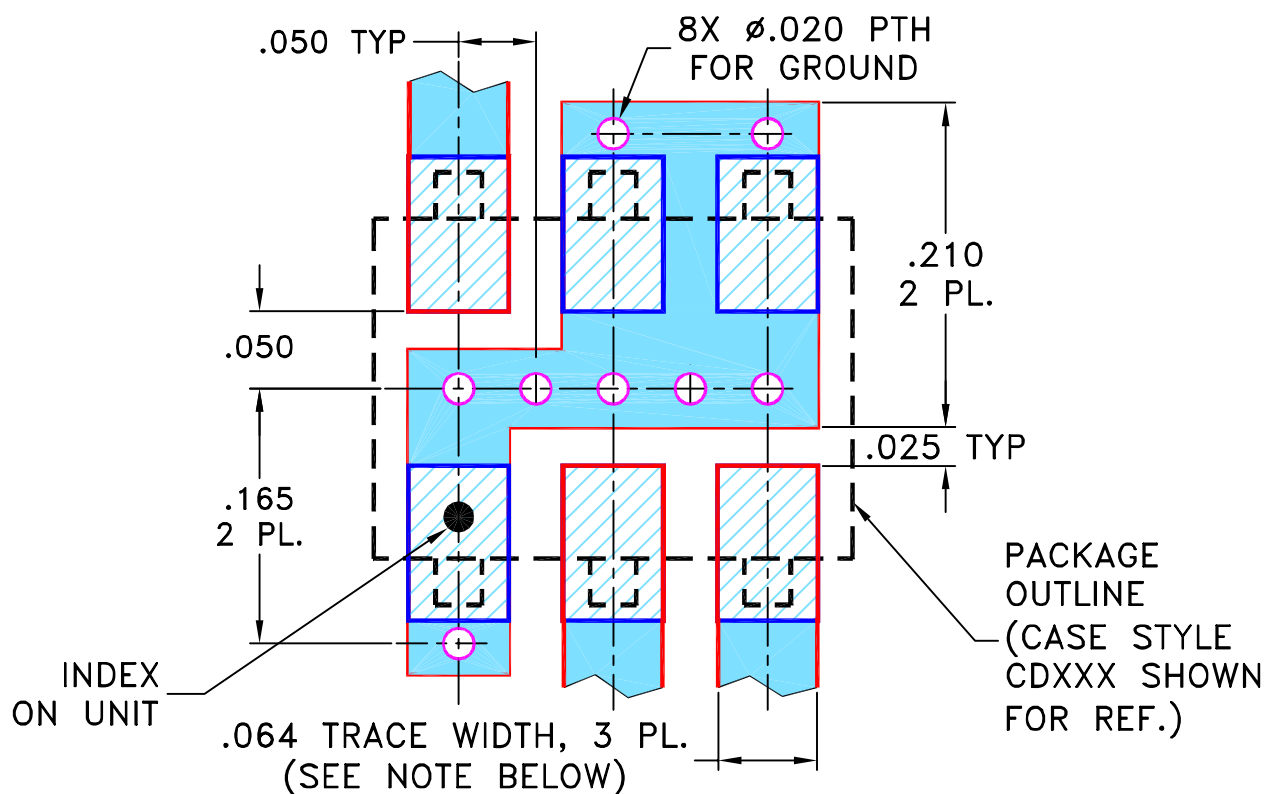
## THIRD ANGLE PROJECTION



## 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   |

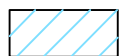
**SUGGESTED MOUNTING CONFIGURATION**  
**FOR BH292, CD541/542/636/637, TT100/240 CASE**  
**STYLES, "gk", "ht", "hu", "nd", "w" PIN CONNECTIONS**



- NOTES:** 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030"  $\pm$  .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

TOLERANCES ON:

2 PL DECIMALS  $\pm$ 3 PL DECIMALS  $\pm$  .005ANGLES  $\pm$ FRACTIONS  $\pm$ 

DRAWN

MMG

07/17/02

CHECKED

WL

08/02/02

APPROVED

DJ

08/05/02



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Brooklyn NY 11235

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

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-052

REV:

C

FILE:

98PL052

SCALE:

8:1

SHEET:

1 OF 1

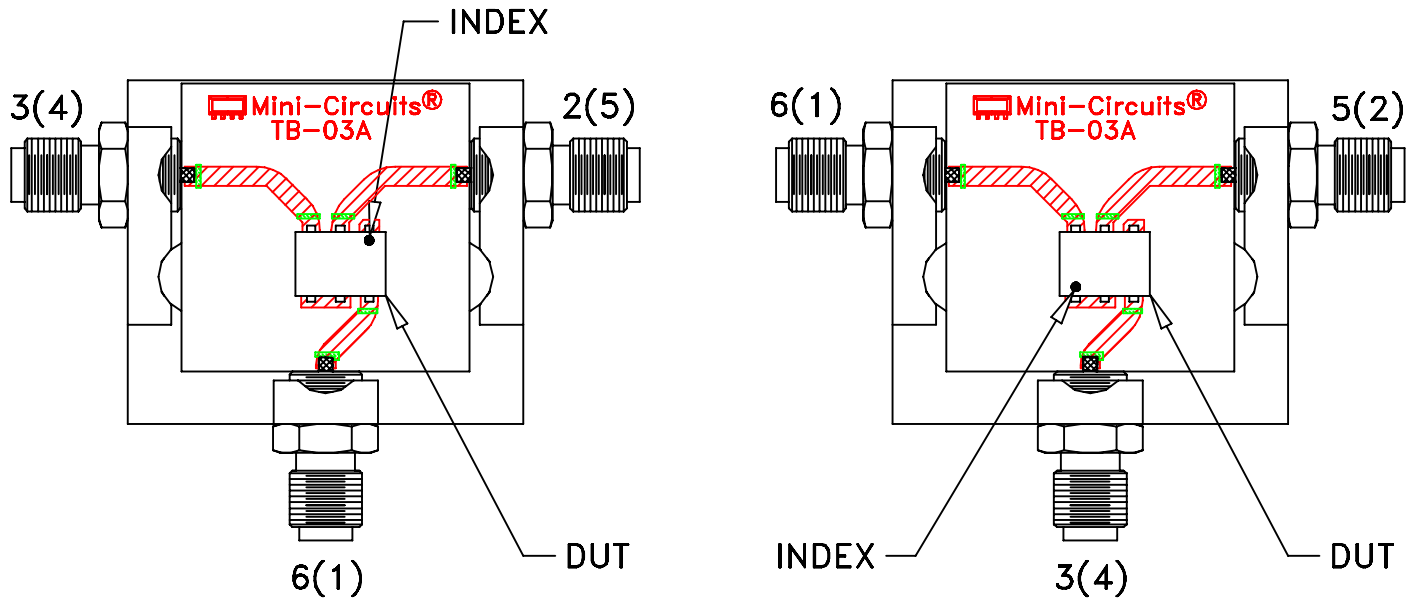
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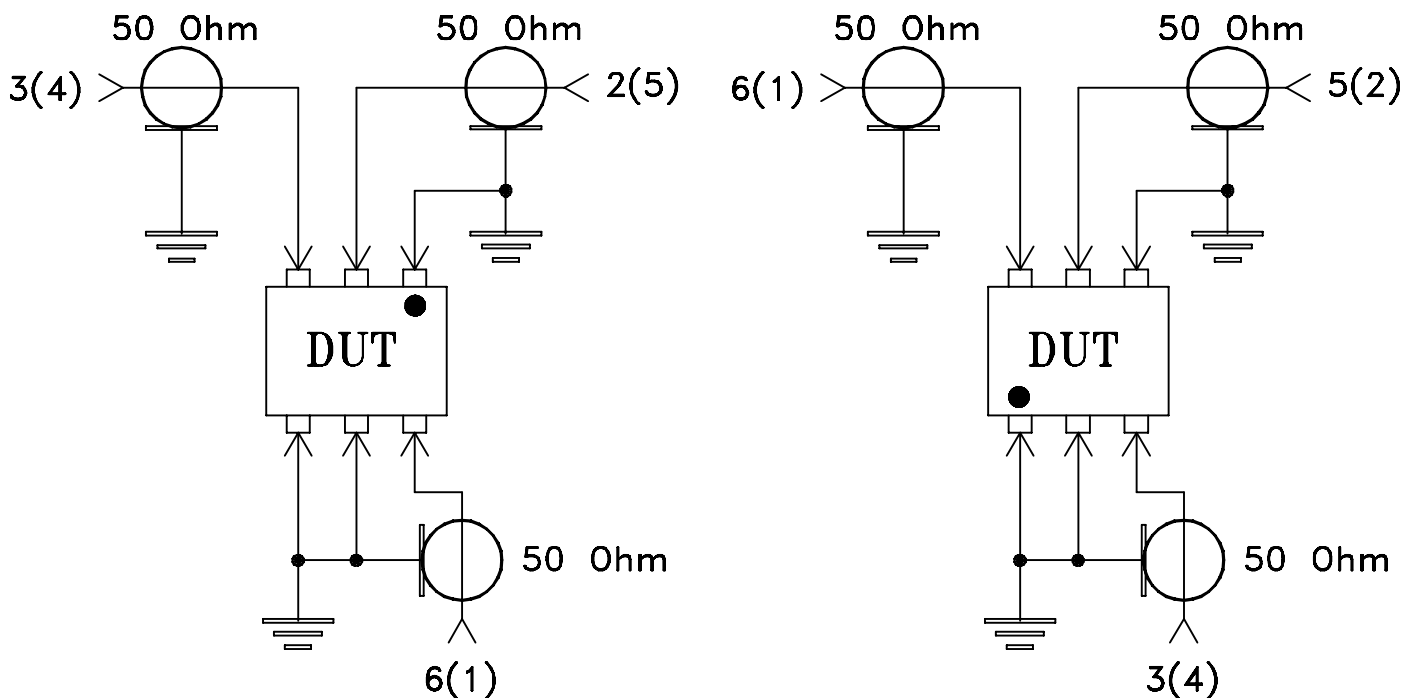
ASHEETA1.DWG REV:A DATE:01/12/95

# 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 R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.030 inch.

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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                                                                              |