

## Frequency Mixer

## LAVI-ED12813/1

Level 20 (LO Power + 20 dBm)

### Important Note

This model has been designed, built and tested in our engineering department. Performance data represents model capability. At present it is a non-catalog model. On request, we can supply a final specification sheet, part number and price/delivery information.



CASE STYLE : CK605

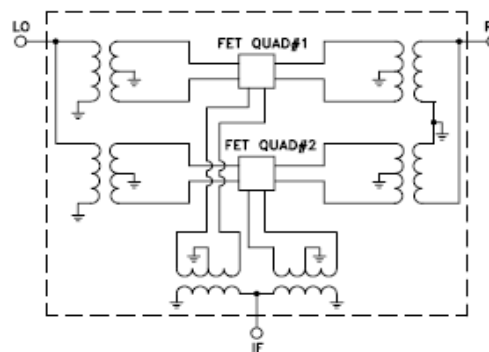
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| ELECTRICAL SPECIFICATIONS 50Ω @ +25°C |                                        |      |      |      |       |
|---------------------------------------|----------------------------------------|------|------|------|-------|
| Parameter                             |                                        | Min. | Typ. | Max. | Units |
| Frequency                             | LO (f <sub>L</sub> to f <sub>U</sub> ) | 700  |      | 2510 | MHz   |
|                                       | RF (f <sub>L</sub> to f <sub>U</sub> ) | 700  |      | 2510 | MHz   |
|                                       | IF                                     | 10   |      | 800  | MHz   |
| Conversion Loss                       | Total Range                            |      | 7.40 |      | dB    |
| LO-RF Isolation                       |                                        |      | 51   |      | dB    |
| LO-IF Isolation                       |                                        |      | 39   |      | dB    |
| Input IP3                             |                                        |      | +27  |      | dBm   |
| 1 dB Compression                      |                                        |      | +20  |      | dBm   |

| MAXIMUM RATINGS       |                 |
|-----------------------|-----------------|
| Operating Temperature | -45°C to 85°C   |
| Storage Temperature   | -55°C to +100°C |

| PIN CONNECTIONS |                                |
|-----------------|--------------------------------|
| LO              | 10                             |
| RF              | 2                              |
| IF              | 14                             |
| GROUND          | 1,3,4,5,6,7,8,9,11,12,13,15,16 |

### Electrical Schematic



# Frequency Mixer

LAVI-ED12813/1

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>IF FIXED<br>@IF(OUT)=100MHz<br>(dB) |       |       |
|---------------------|-------------|--------------------------------------------------------|-------|-------|
|                     |             | @LO (dBm)                                              |       |       |
|                     |             | +17                                                    | +20   | +23   |
| 580.1               | 680.1       | 10.15                                                  | 9.82  | 9.61  |
| 640.6               | 740.6       | 9.87                                                   | 9.53  | 9.32  |
| 701.1               | 801.1       | 8.71                                                   | 8.28  | 8.13  |
| 761.6               | 861.6       | 8.14                                                   | 7.71  | 7.45  |
| 822.1               | 922.1       | 7.89                                                   | 7.51  | 7.27  |
| 882.6               | 982.6       | 7.79                                                   | 7.44  | 7.21  |
| 943.1               | 1043.1      | 7.77                                                   | 7.44  | 7.19  |
| 1003.6              | 1103.6      | 7.79                                                   | 7.48  | 7.32  |
| 1064.1              | 1164.1      | 7.77                                                   | 7.45  | 7.22  |
| 1124.6              | 1224.6      | 7.77                                                   | 7.46  | 7.25  |
| 1185.1              | 1285.1      | 7.76                                                   | 7.45  | 7.25  |
| 1245.6              | 1345.6      | 7.77                                                   | 7.48  | 7.28  |
| 1306.1              | 1406.1      | 8.52                                                   | 8.30  | 8.17  |
| 1366.5              | 1466.5      | 8.16                                                   | 7.80  | 7.55  |
| 1427.0              | 1527.0      | 7.70                                                   | 7.33  | 7.16  |
| 1487.5              | 1587.5      | 7.43                                                   | 7.12  | 6.91  |
| 1548.0              | 1648.0      | 7.39                                                   | 7.10  | 6.90  |
| 1608.5              | 1708.5      | 7.47                                                   | 7.87  | 8.09  |
| 1669.0              | 1769.0      | 7.22                                                   | 6.96  | 6.87  |
| 1729.5              | 1829.5      | 7.19                                                   | 6.92  | 6.82  |
| 1790.0              | 1890.0      | 7.22                                                   | 6.96  | 6.87  |
| 1850.5              | 1950.5      | 7.18                                                   | 6.97  | 6.89  |
| 1911.0              | 2011.0      | 7.17                                                   | 6.95  | 6.87  |
| 1971.5              | 2071.5      | 7.15                                                   | 6.93  | 6.85  |
| 2032.0              | 2132.0      | 7.13                                                   | 6.94  | 6.91  |
| 2092.5              | 2192.5      | 7.12                                                   | 6.92  | 6.90  |
| 2153.0              | 2253.0      | 7.13                                                   | 6.93  | 6.91  |
| 2213.5              | 2313.5      | 7.34                                                   | 7.15  | 7.21  |
| 2274.0              | 2374.0      | 7.41                                                   | 7.22  | 7.29  |
| 2334.5              | 2434.5      | 7.61                                                   | 7.40  | 7.52  |
| 2395.0              | 2495.0      | 7.94                                                   | 7.75  | 7.90  |
| 2455.5              | 2555.5      | 8.09                                                   | 7.89  | 8.04  |
| 2536.1              | 2636.1      | 8.51                                                   | 8.30  | 8.50  |
| 2596.6              | 2696.6      | 9.01                                                   | 8.81  | 9.01  |
| 2677.3              | 2777.3      | 9.48                                                   | 9.30  | 9.50  |
| 2737.8              | 2837.8      | 9.69                                                   | 9.51  | 9.76  |
| 2818.4              | 2918.4      | 10.07                                                  | 9.88  | 10.15 |
| 2878.9              | 2978.9      | 10.45                                                  | 10.27 | 10.54 |
| 2959.6              | 3059.6      | 10.75                                                  | 10.60 | 10.84 |
| 3020.1              | 3120.1      | 10.81                                                  | 10.65 | 10.89 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IP3 INPUT<br>(dBm) |       |       |
|---------------------|-------------|--------------------|-------|-------|
|                     |             | @LO (dBm)          |       |       |
|                     |             | +17                | +20   | +23   |
| 580.1               | 680.1       | 16.73              | 18.95 | 21.41 |
| 640.6               | 740.6       | 19.65              | 22.38 | 24.64 |
| 701.1               | 801.1       | 18.96              | 21.28 | 24.92 |
| 761.6               | 861.6       | 20.29              | 21.36 | 22.76 |
| 822.1               | 922.1       | 21.14              | 24.05 | 27.03 |
| 882.6               | 982.6       | 20.99              | 23.23 | 25.19 |
| 943.1               | 1043.1      | 20.86              | 22.93 | 25.03 |
| 1003.6              | 1103.6      | 20.64              | 22.80 | 25.60 |
| 1064.1              | 1164.1      | 20.89              | 23.10 | 25.66 |
| 1124.6              | 1224.6      | 20.79              | 23.03 | 25.77 |
| 1185.1              | 1285.1      | 20.87              | 23.11 | 26.06 |
| 1245.6              | 1345.6      | 19.46              | 21.51 | 24.13 |
| 1306.1              | 1406.1      | 22.03              | 24.56 | 27.40 |
| 1366.5              | 1466.5      | 23.70              | 26.54 | 28.76 |
| 1427.0              | 1527.0      | 22.32              | 25.27 | 27.45 |
| 1487.5              | 1587.5      | 23.41              | 26.25 | 29.06 |
| 1548.0              | 1648.0      | 23.98              | 26.81 | 29.59 |
| 1608.5              | 1708.5      | 25.12              | 26.90 | 28.65 |
| 1669.0              | 1769.0      | 24.78              | 27.40 | 30.65 |
| 1729.5              | 1829.5      | 25.28              | 28.15 | 31.40 |
| 1790.0              | 1890.0      | 25.65              | 28.66 | 32.43 |
| 1850.5              | 1950.5      | 27.14              | 30.15 | 33.85 |
| 1911.0              | 2011.0      | 27.82              | 31.53 | 35.46 |
| 1971.5              | 2071.5      | 28.13              | 31.02 | 35.81 |
| 2032.0              | 2132.0      | 28.64              | 31.19 | 35.25 |
| 2092.5              | 2192.5      | 28.55              | 31.29 | 35.39 |
| 2153.0              | 2253.0      | 28.16              | 30.70 | 34.45 |
| 2213.5              | 2313.5      | 28.85              | 31.46 | 36.15 |
| 2274.0              | 2374.0      | 28.90              | 31.05 | 34.80 |
| 2334.5              | 2434.5      | 28.60              | 31.32 | 34.29 |
| 2395.0              | 2495.0      | 29.17              | 31.63 | 35.84 |
| 2455.5              | 2555.5      | 29.03              | 31.29 | 35.55 |
| 2536.1              | 2636.1      | 29.24              | 31.74 | 36.11 |
| 2596.6              | 2696.6      | 29.72              | 32.94 | 37.49 |
| 2677.3              | 2777.3      | 30.32              | 33.59 | 39.32 |
| 2737.8              | 2837.8      | 30.09              | 32.98 | 37.67 |
| 2818.4              | 2918.4      | 29.56              | 32.63 | 35.59 |
| 2878.9              | 2978.9      | 29.70              | 32.98 | 35.06 |
| 2959.6              | 3059.6      | 30.26              | 33.58 | 34.81 |
| 3020.1              | 3120.1      | 29.47              | 32.92 | 35.84 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | COMPRESSION<br>@RF IN=+20dBm<br>(dB) |      |      |
|---------------------|-------------|--------------------------------------|------|------|
|                     |             | @LO (dBm)                            |      |      |
|                     |             | +17                                  | +20  | +23  |
| 580.1               | 680.1       | 5.19                                 | 3.21 | 1.93 |
| 640.6               | 740.6       | 3.89                                 | 2.36 | 1.36 |
| 701.1               | 801.1       | 4.02                                 | 2.81 | 1.59 |
| 761.6               | 861.6       | 4.17                                 | 2.95 | 1.84 |
| 822.1               | 922.1       | 4.27                                 | 2.86 | 1.72 |
| 882.6               | 982.6       | 4.25                                 | 2.66 | 1.48 |
| 943.1               | 1043.1      | 4.03                                 | 2.42 | 1.23 |
| 1003.6              | 1103.6      | 3.87                                 | 2.19 | 1.16 |
| 1064.1              | 1164.1      | 3.60                                 | 1.99 | 1.04 |
| 1124.6              | 1224.6      | 3.54                                 | 1.98 | 1.00 |
| 1185.1              | 1285.1      | 3.24                                 | 1.81 | 0.92 |
| 1245.6              | 1345.6      | 3.24                                 | 2.02 | 1.09 |
| 1306.1              | 1406.1      | 1.67                                 | 0.85 | 0.53 |
| 1366.5              | 1466.5      | 3.26                                 | 1.64 | 0.64 |
| 1427.0              | 1527.0      | 3.37                                 | 1.95 | 0.80 |
| 1487.5              | 1587.5      | 2.80                                 | 1.34 | 0.59 |
| 1548.0              | 1648.0      | 2.40                                 | 1.14 | 0.49 |
| 1608.5              | 1708.5      | 2.25                                 | 0.27 | 0.17 |
| 1669.0              | 1769.0      | 2.07                                 | 0.89 | 0.25 |
| 1729.5              | 1829.5      | 1.79                                 | 0.77 | 0.24 |
| 1790.0              | 1890.0      | 1.67                                 | 0.75 | 0.26 |
| 1850.5              | 1950.5      | 1.30                                 | 0.61 | 0.20 |
| 1911.0              | 2011.0      | 1.16                                 | 0.52 | 0.19 |
| 1971.5              | 2071.5      | 1.18                                 | 0.50 | 0.17 |
| 2032.0              | 2132.0      | 0.97                                 | 0.43 | 0.12 |
| 2092.5              | 2192.5      | 0.95                                 | 0.43 | 0.14 |
| 2153.0              | 2253.0      | 1.03                                 | 0.49 | 0.19 |
| 2213.5              | 2313.5      | 0.89                                 | 0.42 | 0.17 |
| 2274.0              | 2374.0      | 0.94                                 | 0.45 | 0.19 |
| 2334.5              | 2434.5      | 1.08                                 | 0.47 | 0.21 |
| 2395.0              | 2495.0      | 0.85                                 | 0.38 | 0.16 |
| 2455.5              | 2555.5      | 0.98                                 | 0.44 | 0.20 |
| 2536.1              | 2636.1      | 0.98                                 | 0.43 | 0.18 |
| 2596.6              | 2696.6      | 0.87                                 | 0.38 | 0.17 |
| 2677.3              | 2777.3      | 0.73                                 | 0.33 | 0.13 |
| 2737.8              | 2837.8      | 0.78                                 | 0.36 | 0.13 |
| 2818.4              | 2918.4      | 0.78                                 | 0.35 | 0.12 |
| 2878.9              | 2978.9      | 0.68                                 | 0.30 | 0.11 |
| 2959.6              | 3059.6      | 0.58                                 | 0.25 | 0.08 |
| 3020.1              | 3120.1      | 0.67                                 | 0.30 | 0.11 |

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# Frequency Mixer

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## Typical Performance Data

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=2050MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=1589.9MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=2510.1MHz<br>(dB) |
|----------------------|-------------|----------------------------------------------------------------|----------------------|-------------|------------------------------------------------------------------|----------------------|-------------|------------------------------------------------------------------|
|                      |             | @LO (dBm)                                                      |                      |             | @LO (dBm)                                                        |                      |             | @LO (dBm)                                                        |
|                      |             | +20                                                            |                      |             | +20                                                              |                      |             | +20                                                              |
| 1350.0               | 700.0       | 11.29                                                          | 10.1                 | 1600.0      | 7.05                                                             | 1030.1               | 1480.0      | 11.01                                                            |
| 1272.3               | 777.7       | 9.98                                                           | 50.6                 | 1640.5      | 7.05                                                             | 1010.1               | 1500.0      | 10.19                                                            |
| 1194.6               | 855.4       | 8.42                                                           | 91.0                 | 1680.9      | 7.99                                                             | 990.1                | 1520.0      | 9.85                                                             |
| 1117.0               | 933.0       | 8.03                                                           | 131.5                | 1721.4      | 7.29                                                             | 970.1                | 1540.0      | 9.69                                                             |
| 1039.3               | 1010.7      | 7.75                                                           | 172.0                | 1761.9      | 6.88                                                             | 950.1                | 1560.0      | 9.61                                                             |
| 961.6                | 1088.4      | 7.70                                                           | 212.5                | 1802.4      | 6.80                                                             | 930.1                | 1580.0      | 9.66                                                             |
| 883.9                | 1166.1      | 7.61                                                           | 252.9                | 1842.8      | 6.71                                                             | 910.1                | 1600.0      | 9.66                                                             |
| 825.7                | 1224.3      | 7.74                                                           | 293.4                | 1883.3      | 6.71                                                             | 890.1                | 1620.0      | 9.73                                                             |
| 748.0                | 1302.0      | 7.91                                                           | 333.9                | 1923.8      | 6.69                                                             | 870.1                | 1640.0      | 9.72                                                             |
| 689.7                | 1360.3      | 7.89                                                           | 374.3                | 1964.2      | 6.71                                                             | 850.1                | 1660.0      | 9.72                                                             |
| 612.0                | 1438.0      | 8.00                                                           | 414.8                | 2004.7      | 6.61                                                             | 830.1                | 1680.0      | 10.30                                                            |
| 553.8                | 1496.2      | 7.34                                                           | 455.3                | 2045.2      | 6.57                                                             | 810.1                | 1700.0      | 10.26                                                            |
| 476.1                | 1573.9      | 7.49                                                           | 495.7                | 2085.6      | 6.54                                                             | 790.1                | 1720.0      | 9.80                                                             |
| 417.8                | 1632.2      | 7.55                                                           | 536.2                | 2126.1      | 6.56                                                             | 770.1                | 1740.0      | 9.54                                                             |
| 340.1                | 1709.9      | 7.86                                                           | 576.7                | 2166.6      | 6.69                                                             | 750.1                | 1760.0      | 9.54                                                             |
| 281.9                | 1768.1      | 7.57                                                           | 617.2                | 2207.1      | 6.79                                                             | 730.1                | 1780.0      | 9.53                                                             |
| 204.2                | 1845.8      | 7.37                                                           | 657.6                | 2247.5      | 6.93                                                             | 690.1                | 1820.0      | 9.50                                                             |
| 145.9                | 1904.1      | 7.32                                                           | 698.1                | 2288.0      | 6.91                                                             | 670.1                | 1840.0      | 9.43                                                             |
| 68.3                 | 1981.7      | 7.20                                                           | 738.6                | 2328.5      | 6.97                                                             | 630.1                | 1880.0      | 9.41                                                             |
| 10.0                 | 2040.0      | 6.97                                                           | 779.0                | 2368.9      | 7.01                                                             | 610.1                | 1900.0      | 9.32                                                             |
| 72.6                 | 2122.6      | 6.88                                                           | 819.5                | 2409.4      | 7.09                                                             | 570.1                | 1940.0      | 9.17                                                             |
| 135.2                | 2185.2      | 6.77                                                           | 860.0                | 2449.9      | 7.20                                                             | 550.1                | 1960.0      | 9.18                                                             |
| 218.7                | 2268.7      | 6.67                                                           | 900.5                | 2490.4      | 7.26                                                             | 510.1                | 2000.0      | 8.99                                                             |
| 281.3                | 2331.3      | 6.79                                                           | 940.9                | 2530.8      | 7.32                                                             | 490.1                | 2020.0      | 8.97                                                             |
| 364.8                | 2414.8      | 6.92                                                           | 981.4                | 2571.3      | 7.39                                                             | 450.1                | 2060.0      | 8.94                                                             |
| 427.4                | 2477.4      | 6.92                                                           | 1021.9               | 2611.8      | 7.50                                                             | 430.1                | 2080.0      | 8.80                                                             |
| 510.9                | 2560.9      | 6.99                                                           | 1062.3               | 2652.2      | 7.71                                                             | 390.1                | 2120.0      | 8.82                                                             |
| 573.5                | 2623.5      | 7.20                                                           | 1123.0               | 2712.9      | 8.01                                                             | 370.1                | 2140.0      | 8.78                                                             |
| 657.0                | 2707.0      | 7.46                                                           | 1163.5               | 2753.4      | 8.21                                                             | 330.1                | 2180.0      | 8.65                                                             |
| 719.6                | 2769.6      | 7.46                                                           | 1224.2               | 2814.1      | 8.43                                                             | 310.1                | 2200.0      | 8.66                                                             |
| 803.0                | 2853.0      | 7.70                                                           | 1264.7               | 2854.6      | 8.67                                                             | 270.1                | 2240.0      | 8.59                                                             |
| 865.7                | 2915.7      | 7.97                                                           | 1325.4               | 2915.3      | 9.08                                                             | 250.1                | 2260.0      | 8.51                                                             |
| 949.1                | 2999.1      | 8.19                                                           | 1365.9               | 2955.8      | 9.30                                                             | 210.1                | 2300.0      | 8.42                                                             |
| 1011.7               | 3061.7      | 8.40                                                           | 1426.6               | 3016.5      | 9.53                                                             | 190.1                | 2320.0      | 8.34                                                             |
| 1095.2               | 3145.2      | 8.85                                                           | 1467.0               | 3056.9      | 9.81                                                             | 150.1                | 2360.0      | 8.26                                                             |
| 1157.8               | 3207.8      | 9.12                                                           | 1527.7               | 3117.6      | 10.12                                                            | 130.1                | 2380.0      | 8.29                                                             |
| 1241.3               | 3291.3      | 9.38                                                           | 1568.2               | 3158.1      | 10.33                                                            | 90.1                 | 2420.0      | 8.18                                                             |
| 1303.9               | 3353.9      | 9.75                                                           | 1628.9               | 3218.8      | 10.53                                                            | 70.1                 | 2440.0      | 8.17                                                             |
| 1387.4               | 3437.4      | 10.15                                                          | 1669.4               | 3259.3      | 10.59                                                            | 30.1                 | 2480.0      | 8.11                                                             |
| 1450.0               | 3500.0      | 10.32                                                          | 1730.1               | 3320.0      | 10.83                                                            | 10.1                 | 2500.0      | 7.99                                                             |

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# Frequency Mixer

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## Typical Performance Data

| LO<br>(MHz) | LO-RF ISOLATION<br>(dB) |       |       | LO-IF ISOLATION<br>(dB) |       |       |
|-------------|-------------------------|-------|-------|-------------------------|-------|-------|
|             | @LO (dBm)               |       |       | @LO (dBm)               |       |       |
|             | +17                     | +20   | +23   | +17                     | +20   | +23   |
| 680.1       | 33.23                   | 33.00 | 32.96 | 30.77                   | 31.20 | 31.27 |
| 740.6       | 33.16                   | 32.42 | 31.97 | 30.70                   | 31.15 | 31.25 |
| 801.1       | 37.64                   | 36.54 | 35.87 | 31.69                   | 31.57 | 31.49 |
| 861.6       | 44.23                   | 43.43 | 42.76 | 35.84                   | 35.71 | 35.76 |
| 922.1       | 50.71                   | 49.65 | 49.06 | 38.97                   | 38.84 | 38.96 |
| 982.6       | 56.97                   | 55.21 | 53.73 | 41.23                   | 41.21 | 41.11 |
| 1043.1      | 62.21                   | 60.26 | 58.38 | 42.73                   | 42.64 | 42.57 |
| 1103.6      | 68.09                   | 71.29 | 62.75 | 43.91                   | 43.79 | 43.74 |
| 1164.1      | 59.76                   | 62.83 | 67.01 | 44.57                   | 44.45 | 44.50 |
| 1224.6      | 55.63                   | 56.62 | 58.00 | 45.39                   | 45.29 | 45.25 |
| 1285.1      | 51.67                   | 52.19 | 52.12 | 47.60                   | 47.62 | 47.84 |
| 1345.6      | 50.72                   | 51.82 | 52.43 | 45.40                   | 44.72 | 44.20 |
| 1406.1      | 50.71                   | 54.15 | 56.44 | 44.46                   | 42.84 | 41.50 |
| 1466.5      | 46.79                   | 48.46 | 49.75 | 39.82                   | 40.94 | 41.78 |
| 1527.0      | 48.62                   | 49.37 | 47.48 | 37.25                   | 37.90 | 38.99 |
| 1587.5      | 52.91                   | 53.59 | 53.72 | 37.17                   | 37.65 | 38.24 |
| 1648.0      | 53.66                   | 53.59 | 53.27 | 37.01                   | 37.40 | 37.83 |
| 1708.5      | 53.55                   | 57.47 | 56.40 | 36.80                   | 37.68 | 38.42 |
| 1769.0      | 50.97                   | 51.07 | 51.07 | 36.43                   | 36.59 | 36.92 |
| 1829.5      | 51.72                   | 52.04 | 52.23 | 36.44                   | 36.62 | 36.89 |
| 1890.0      | 51.30                   | 51.46 | 51.19 | 36.28                   | 36.48 | 36.56 |
| 1950.5      | 49.70                   | 49.63 | 48.93 | 36.29                   | 36.65 | 36.70 |
| 2011.0      | 48.95                   | 48.29 | 47.64 | 36.57                   | 36.75 | 37.05 |
| 2071.5      | 49.59                   | 48.84 | 47.95 | 36.87                   | 37.09 | 37.28 |
| 2132.0      | 49.47                   | 49.66 | 49.68 | 37.39                   | 37.68 | 37.99 |
| 2192.5      | 47.49                   | 48.22 | 48.78 | 37.92                   | 38.19 | 38.35 |
| 2253.0      | 46.39                   | 47.01 | 47.45 | 38.31                   | 38.70 | 38.76 |
| 2313.5      | 46.87                   | 47.34 | 47.53 | 39.24                   | 39.59 | 39.58 |
| 2374.0      | 48.35                   | 48.45 | 48.54 | 40.46                   | 40.86 | 40.79 |
| 2434.5      | 48.98                   | 48.51 | 48.38 | 42.16                   | 42.75 | 42.61 |
| 2495.0      | 49.34                   | 48.47 | 48.28 | 43.50                   | 44.00 | 43.99 |
| 2555.5      | 50.26                   | 49.22 | 48.67 | 42.87                   | 43.30 | 43.46 |
| 2636.1      | 52.40                   | 51.10 | 50.09 | 40.56                   | 40.64 | 41.14 |
| 2696.6      | 56.47                   | 53.98 | 53.20 | 39.51                   | 39.50 | 40.25 |
| 2777.3      | 60.55                   | 63.06 | 59.54 | 37.92                   | 37.97 | 38.54 |
| 2837.8      | 55.67                   | 63.18 | 63.38 | 36.48                   | 36.58 | 37.39 |
| 2918.4      | 52.24                   | 53.90 | 53.55 | 35.84                   | 35.86 | 36.56 |
| 2978.9      | 51.74                   | 53.02 | 52.89 | 36.06                   | 36.01 | 36.53 |
| 3059.6      | 52.16                   | 53.84 | 53.80 | 35.84                   | 35.86 | 36.19 |
| 3120.1      | 52.56                   | 54.28 | 54.60 | 35.26                   | 35.25 | 35.44 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +17                     | +20   | +23   |
| 580.1               | 680.1       | 21.18                   | 21.72 | 21.25 |
| 640.6               | 740.6       | 23.03                   | 23.31 | 23.33 |
| 701.1               | 801.1       | 24.73                   | 24.11 | 23.38 |
| 761.6               | 861.6       | 27.80                   | 30.21 | 30.10 |
| 822.1               | 922.1       | 28.60                   | 33.42 | 34.23 |
| 882.6               | 982.6       | 27.46                   | 31.34 | 29.82 |
| 943.1               | 1043.1      | 28.55                   | 33.89 | 35.51 |
| 1003.6              | 1103.6      | 27.37                   | 29.62 | 22.65 |
| 1064.1              | 1164.1      | 30.06                   | 34.92 | 34.40 |
| 1124.6              | 1224.6      | 31.44                   | 36.64 | 33.47 |
| 1185.1              | 1285.1      | 31.41                   | 35.37 | 31.22 |
| 1245.6              | 1345.6      | 39.81                   | 45.53 | 38.72 |
| 1306.1              | 1406.1      | 45.65                   | 35.83 | 30.23 |
| 1366.5              | 1466.5      | 44.87                   | 41.73 | 40.36 |
| 1427.0              | 1527.0      | 34.43                   | 41.25 | 30.04 |
| 1487.5              | 1587.5      | 38.62                   | 62.36 | 47.23 |
| 1548.0              | 1648.0      | 40.89                   | 59.57 | 43.28 |
| 1608.5              | 1708.5      | 43.87                   | 42.58 | 46.41 |
| 1669.0              | 1769.0      | 59.53                   | 41.13 | 48.00 |
| 1729.5              | 1829.5      | 53.55                   | 40.16 | 45.77 |
| 1790.0              | 1890.0      | 48.35                   | 38.34 | 40.59 |
| 1850.5              | 1950.5      | 44.30                   | 37.60 | 40.78 |
| 1911.0              | 2011.0      | 41.40                   | 35.85 | 37.70 |
| 1971.5              | 2071.5      | 41.26                   | 35.99 | 39.95 |
| 2032.0              | 2132.0      | 39.34                   | 35.07 | 38.64 |
| 2092.5              | 2192.5      | 38.75                   | 34.73 | 38.79 |
| 2153.0              | 2253.0      | 39.16                   | 35.05 | 39.79 |
| 2213.5              | 2313.5      | 39.65                   | 35.67 | 40.84 |
| 2274.0              | 2374.0      | 41.90                   | 37.19 | 45.68 |
| 2334.5              | 2434.5      | 44.40                   | 38.39 | 49.70 |
| 2395.0              | 2495.0      | 44.53                   | 39.02 | 49.33 |
| 2455.5              | 2555.5      | 43.91                   | 39.54 | 45.70 |
| 2536.1              | 2636.1      | 41.12                   | 39.40 | 40.97 |
| 2596.6              | 2696.6      | 39.61                   | 38.38 | 40.10 |
| 2677.3              | 2777.3      | 39.66                   | 38.94 | 39.80 |
| 2737.8              | 2837.8      | 39.52                   | 39.76 | 37.92 |
| 2818.4              | 2918.4      | 38.42                   | 39.60 | 36.35 |
| 2878.9              | 2978.9      | 38.15                   | 39.44 | 37.34 |
| 2959.6              | 3059.6      | 37.86                   | 39.36 | 37.78 |
| 3020.1              | 3120.1      | 36.87                   | 38.60 | 37.00 |

# Frequency Mixer

LAVI-ED12813/1

## 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=2500MHz<br>(:1) |      |      |
|---------------------|-------------|-----------------|------|------|-------------|-----------------|-------|-------|----------------------|--------------------------------|------|------|
|                     |             | @LO (dBm)       |      |      |             | @LO (dBm)       |       |       |                      | @LO (dBm)                      |      |      |
|                     |             | +17             | +20  | +23  |             | +17             | +20   | +23   |                      | +17                            | +20  | +23  |
| 580.1               | 680.1       | 1.83            | 1.83 | 1.76 | 680.1       | 16.41           | 16.56 | 16.11 | 10.0                 | 1.10                           | 1.13 | 1.20 |
| 640.6               | 740.6       | 1.91            | 1.93 | 1.93 | 740.6       | 11.17           | 11.24 | 11.09 | 50.0                 | 1.15                           | 1.18 | 1.24 |
| 701.1               | 801.1       | 2.10            | 2.14 | 2.14 | 801.1       | 12.26           | 12.44 | 12.44 | 90.0                 | 1.18                           | 1.20 | 1.25 |
| 761.6               | 861.6       | 2.30            | 2.34 | 2.34 | 861.6       | 17.05           | 17.22 | 17.22 | 130.0                | 1.27                           | 1.29 | 1.33 |
| 822.1               | 922.1       | 2.45            | 2.49 | 2.48 | 922.1       | 20.95           | 20.70 | 19.54 | 170.0                | 1.29                           | 1.31 | 1.34 |
| 882.6               | 982.6       | 2.60            | 2.64 | 2.62 | 982.6       | 23.18           | 23.18 | 22.58 | 210.0                | 1.35                           | 1.37 | 1.40 |
| 943.1               | 1043.1      | 2.62            | 2.65 | 2.63 | 1043.1      | 24.14           | 23.81 | 22.87 | 250.0                | 1.39                           | 1.41 | 1.41 |
| 1003.6              | 1103.6      | 2.57            | 2.57 | 2.52 | 1103.6      | 23.18           | 22.29 | 19.98 | 290.0                | 1.54                           | 1.56 | 1.57 |
| 1064.1              | 1164.1      | 2.52            | 2.50 | 2.45 | 1164.1      | 23.49           | 23.49 | 22.87 | 330.0                | 1.60                           | 1.62 | 1.63 |
| 1124.6              | 1224.6      | 2.48            | 2.47 | 2.39 | 1224.6      | 22.00           | 20.95 | 18.50 | 370.0                | 1.61                           | 1.63 | 1.63 |
| 1185.1              | 1285.1      | 2.41            | 2.40 | 2.33 | 1285.1      | 20.70           | 20.22 | 18.70 | 410.0                | 1.62                           | 1.64 | 1.64 |
| 1245.6              | 1345.6      | 2.26            | 2.23 | 2.16 | 1345.6      | 18.50           | 18.30 | 17.57 | 450.0                | 1.59                           | 1.60 | 1.60 |
| 1306.1              | 1406.1      | 1.77            | 1.72 | 1.66 | 1406.1      | 13.81           | 13.19 | 11.93 | 490.0                | 1.58                           | 1.60 | 1.58 |
| 1366.5              | 1466.5      | 1.62            | 1.58 | 1.53 | 1466.5      | 14.62           | 14.74 | 14.38 | 530.0                | 1.50                           | 1.51 | 1.50 |
| 1427.0              | 1527.0      | 1.66            | 1.63 | 1.56 | 1527.0      | 15.53           | 15.53 | 14.38 | 570.0                | 1.47                           | 1.47 | 1.45 |
| 1487.5              | 1587.5      | 1.57            | 1.53 | 1.46 | 1587.5      | 14.87           | 14.50 | 13.09 | 610.0                | 1.37                           | 1.38 | 1.35 |
| 1548.0              | 1648.0      | 1.45            | 1.42 | 1.34 | 1648.0      | 14.26           | 14.26 | 13.60 | 650.0                | 1.32                           | 1.31 | 1.28 |
| 1608.5              | 1708.5      | 1.33            | 1.24 | 1.15 | 1708.5      | 12.09           | 10.96 | 9.79  | 690.0                | 1.25                           | 1.24 | 1.20 |
| 1669.0              | 1769.0      | 1.24            | 1.20 | 1.14 | 1769.0      | 11.31           | 11.03 | 10.13 | 730.0                | 1.18                           | 1.16 | 1.12 |
| 1729.5              | 1829.5      | 1.15            | 1.11 | 1.07 | 1829.5      | 9.90            | 9.90  | 9.63  | 770.0                | 1.13                           | 1.11 | 1.06 |
| 1790.0              | 1890.0      | 1.13            | 1.11 | 1.11 | 1890.0      | 8.47            | 8.35  | 7.80  | 810.0                | 1.10                           | 1.06 | 1.03 |
| 1850.5              | 1950.5      | 1.18            | 1.18 | 1.22 | 1950.5      | 7.34            | 7.28  | 6.94  | 850.0                | 1.11                           | 1.08 | 1.09 |
| 1911.0              | 2011.0      | 1.29            | 1.31 | 1.36 | 2011.0      | 6.39            | 6.44  | 6.35  | 890.0                | 1.16                           | 1.15 | 1.18 |
| 1971.5              | 2071.5      | 1.39            | 1.41 | 1.48 | 2071.5      | 5.56            | 5.52  | 5.27  | 930.0                | 1.22                           | 1.22 | 1.27 |
| 2032.0              | 2132.0      | 1.52            | 1.56 | 1.65 | 2132.0      | 4.92            | 4.95  | 4.87  | 970.0                | 1.28                           | 1.29 | 1.35 |
| 2092.5              | 2192.5      | 1.63            | 1.67 | 1.80 | 2192.5      | 4.52            | 4.56  | 4.54  | 1010.0               | 1.38                           | 1.39 | 1.47 |
| 2153.0              | 2253.0      | 1.74            | 1.78 | 1.93 | 2253.0      | 4.16            | 4.16  | 4.04  | 1050.0               | 1.43                           | 1.45 | 1.54 |
| 2213.5              | 2313.5      | 1.90            | 1.96 | 2.13 | 2313.5      | 4.03            | 4.06  | 4.04  | 1090.0               | 1.54                           | 1.57 | 1.67 |
| 2274.0              | 2374.0      | 2.04            | 2.09 | 2.29 | 2374.0      | 4.01            | 4.03  | 4.03  | 1130.0               | 1.62                           | 1.65 | 1.76 |
| 2334.5              | 2434.5      | 2.21            | 2.28 | 2.50 | 2434.5      | 3.97            | 3.96  | 3.86  | 1170.0               | 1.73                           | 1.76 | 1.89 |
| 2395.0              | 2495.0      | 2.37            | 2.44 | 2.66 | 2495.0      | 4.12            | 4.14  | 4.15  | 1210.0               | 1.86                           | 1.90 | 2.04 |
| 2455.5              | 2555.5      | 2.53            | 2.60 | 2.82 | 2555.5      | 4.20            | 4.20  | 4.17  | 1250.0               | 1.96                           | 1.99 | 2.13 |
| 2536.1              | 2636.1      | 2.74            | 2.82 | 3.05 | 2636.1      | 4.31            | 4.25  | 4.16  | 1290.0               | 2.13                           | 2.19 | 2.35 |
| 2596.6              | 2696.6      | 2.85            | 2.93 | 3.14 | 2696.6      | 4.52            | 4.46  | 4.38  | 1330.0               | 2.23                           | 2.29 | 2.45 |
| 2677.3              | 2777.3      | 2.97            | 3.05 | 3.25 | 2777.3      | 4.75            | 4.73  | 4.70  | 1370.0               | 2.40                           | 2.46 | 2.64 |
| 2737.8              | 2837.8      | 3.11            | 3.20 | 3.40 | 2837.8      | 4.79            | 4.75  | 4.80  | 1390.0               | 2.45                           | 2.52 | 2.70 |
| 2818.4              | 2918.4      | 3.10            | 3.18 | 3.37 | 2918.4      | 4.99            | 4.89  | 4.86  | 1430.0               | 2.65                           | 2.71 | 2.91 |
| 2878.9              | 2978.9      | 3.07            | 3.16 | 3.33 | 2978.9      | 5.22            | 5.14  | 5.09  | 1450.0               | 2.71                           | 2.78 | 2.97 |
| 2959.6              | 3059.6      | 3.07            | 3.15 | 3.30 | 3059.6      | 5.44            | 5.41  | 5.39  | 1490.0               | 2.86                           | 2.94 | 3.14 |
| 3020.1              | 3120.1      | 2.93            | 3.01 | 3.14 | 3120.1      | 5.66            | 5.61  | 5.54  | 1510.0               | 2.97                           | 3.05 | 3.25 |

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## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 11  | 17  | 24  | 34  | 33  | 33  | 39  | 61  | 53  | 49  |
| 1  | -      | 25     | +0  | 34  | 25  | 41  | 29  | 45  | 51  | 56  | 66  | 69  |
| 2  | 58     | 57     | 67  | 62  | >83 | 78  | 73  | 74  | >83 | 71  | 78  | >83 |
| 3  | >90    | >83    | 76  | >83 | 70  | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
| 4  | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
| 5  | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
| 6  | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
| 7  | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
| 8  | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
| 9  | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
| 10 | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 2050 MHz; 0.00 dBm.  
LO IN: 2150 MHz; +20.00 dBm  
IF OUT: 100 MHz; -6.9 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 22  | 27  | 34  | 47  | 42  | 43  | 51  | 69  | 65  | 62  |
| 1  | -      | 25     | +0  | 34  | 25  | 41  | 29  | 46  | 52  | 57  | 65  | 70  |
| 2  | 38     | 46     | 54  | 51  | 74  | 68  | 62  | 63  | 74  | 61  | 69  | 89  |
| 3  | 67     | 78     | 55  | 68  | 47  | 69  | 64  | 90  | 64  | 74  | 81  | 84  |
| 4  | >90    | 76     | >93 | 76  | 77  | 75  | 82  | >93 | 83  | 89  | 88  | 91  |
| 5  | >90    | >93    | 89  | 93  | 85  | 76  | 76  | 82  | 89  | 87  | 90  | >93 |
| 6  | >90    | >93    | >93 | >93 | >93 | >93 | >93 | 91  | >93 | >93 | >93 | >93 |
| 7  | >90    | >93    | >93 | >93 | >93 | >93 | >93 | >93 | 87  | >93 | >93 | >93 |
| 8  | >90    | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
| 9  | >90    | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
| 10 | >90    | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 2050 MHz; 10.00 dBm.  
LO IN: 2150 MHz; +20.00 dBm  
IF OUT: 100 MHz; 3.07 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.

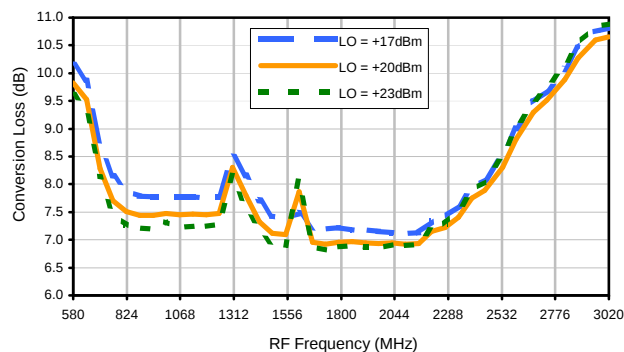
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# Frequency Mixer

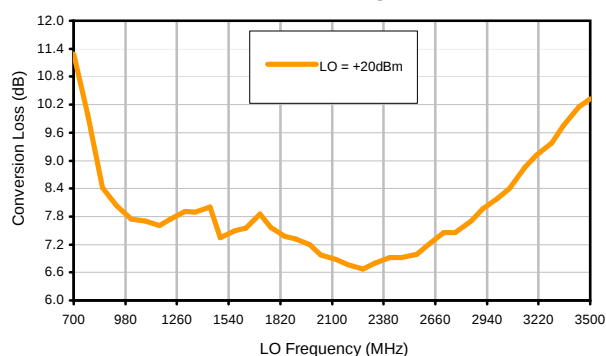
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## Typical Performance Curves

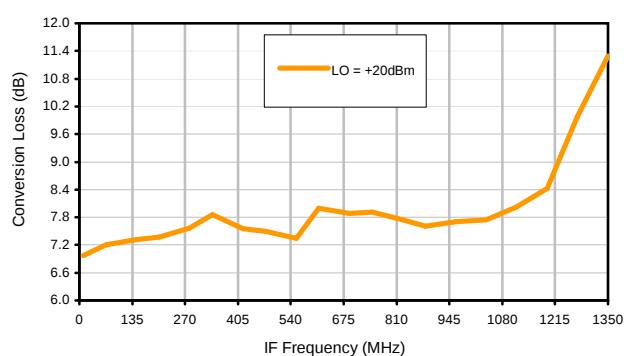
Conversion Loss @ IF=100MHz



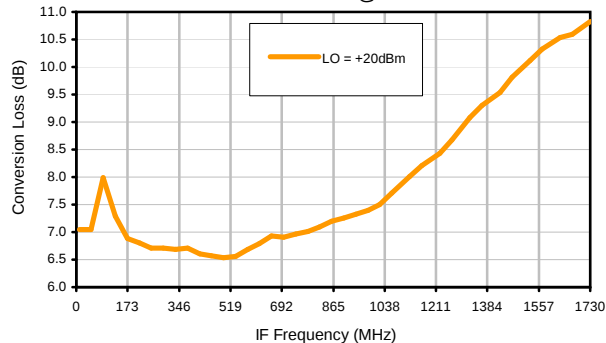
Conversion Loss vs. LO @ RF=2050MHz



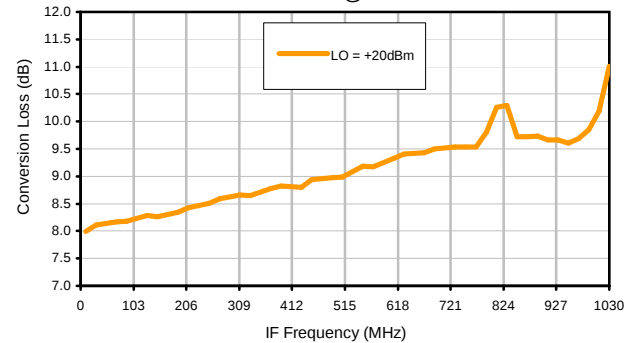
Conversion Loss vs. IF @ RF=2050MHz



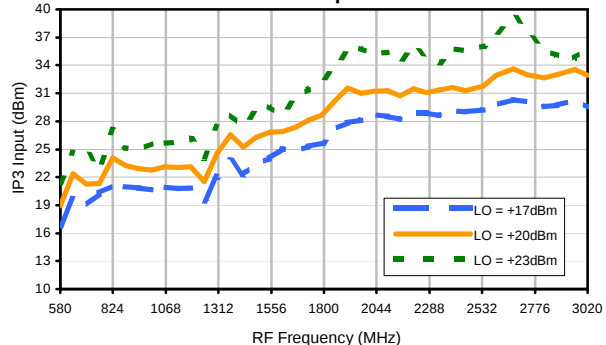
Conversion Loss vs. IF @ RF=1589.9MHz



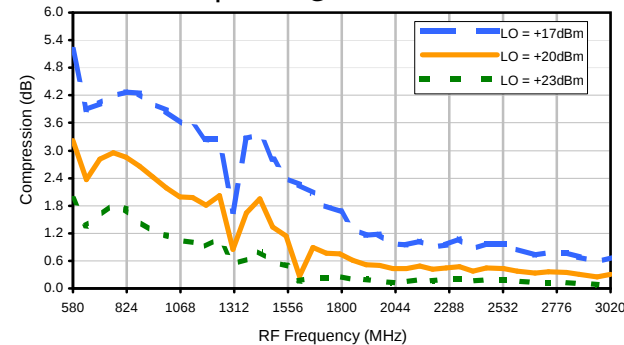
Conversion Loss vs. IF @ RF=2510.1001MHz



IP3 Input

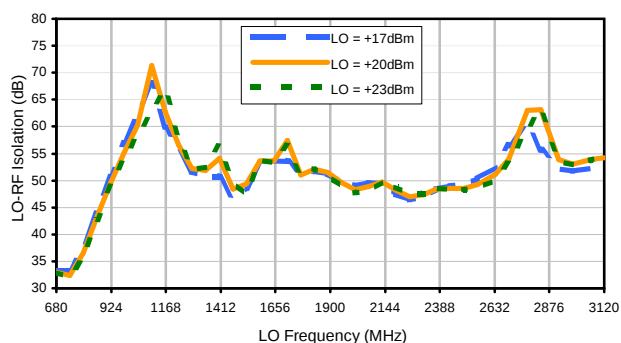


Compression @ RF IN=+20dBm

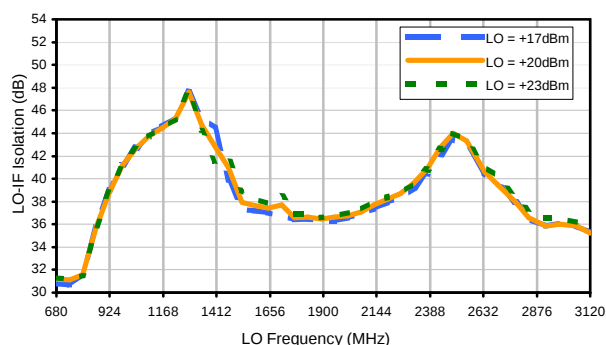


## Typical Performance Curves

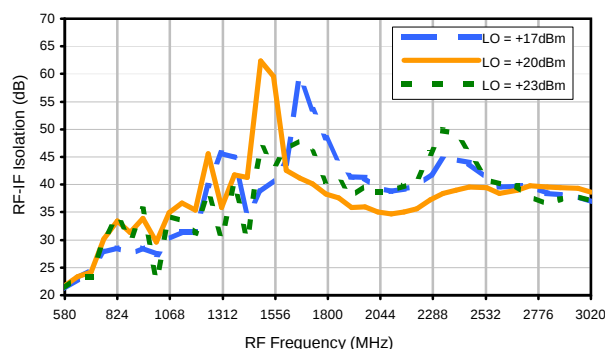
LO-RF Isolation



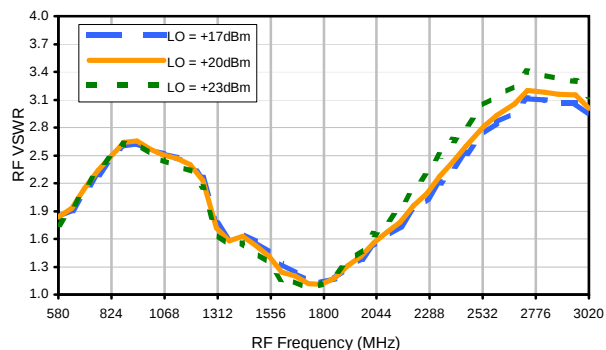
LO-IF Isolation



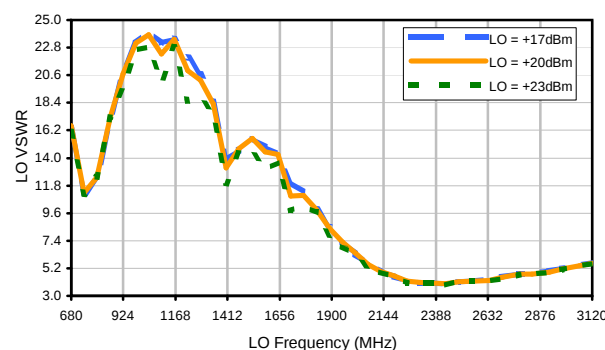
RF-IF Isolation



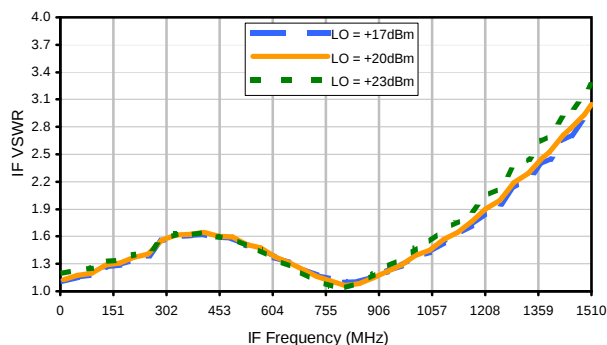
RF VSWR



LO VSWR



IF VSWR



## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 11  | 17  | 24  | 34  | 33  | 33  | 39  | 61  | 53  | 49  |
| 1  | -      | 25     | +0  | 34  | 25  | 41  | 29  | 45  | 51  | 56  | 66  | 69  |
| 2  | 58     | 57     | 67  | 62  | >83 | 78  | 73  | 74  | >83 | 71  | 78  | >83 |
| 3  | >90    | >83    | 76  | >83 | 70  | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
| 4  | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
| 5  | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
| 6  | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
| 7  | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
| 8  | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
| 9  | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
| 10 | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions:

RF IN: 2050 MHz; 0.00 dBm.  
LO IN: 2150 MHz; +20.00 dBm  
IF OUT: 100 MHz; -6.9 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 22  | 27  | 34  | 47  | 42  | 43  | 51  | 69  | 65  | 62  |
| 1  | -      | 25     | +0  | 34  | 25  | 41  | 29  | 46  | 52  | 57  | 65  | 70  |
| 2  | 38     | 46     | 54  | 51  | 74  | 68  | 62  | 63  | 74  | 61  | 69  | 89  |
| 3  | 67     | 78     | 55  | 68  | 47  | 69  | 64  | 90  | 64  | 74  | 81  | 84  |
| 4  | >90    | 76     | >93 | 76  | 77  | 75  | 82  | >93 | 83  | 89  | 88  | 91  |
| 5  | >90    | >93    | 89  | 93  | 85  | 76  | 76  | 82  | 89  | 87  | 90  | >93 |
| 6  | >90    | >93    | >93 | >93 | >93 | >93 | >93 | 91  | >93 | >93 | >93 | >93 |
| 7  | >90    | >93    | >93 | >93 | >93 | >93 | >93 | >93 | 87  | >93 | >93 | >93 |
| 8  | >90    | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
| 9  | >90    | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
| 10 | >90    | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions:

RF IN: 2050 MHz; 10.00 dBm.  
LO IN: 2150 MHz; +20.00 dBm  
IF OUT: 100 MHz; 3.07 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. X3

LAVI-ED12813/1

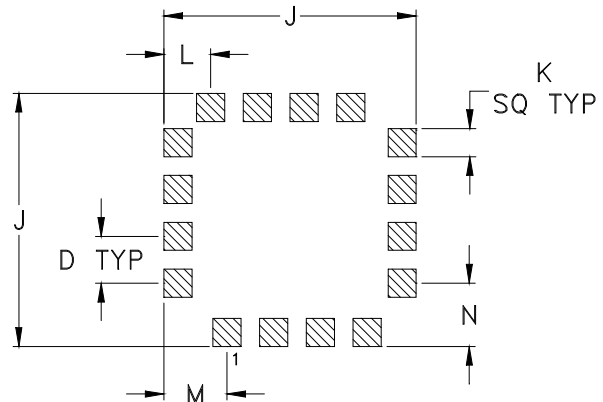
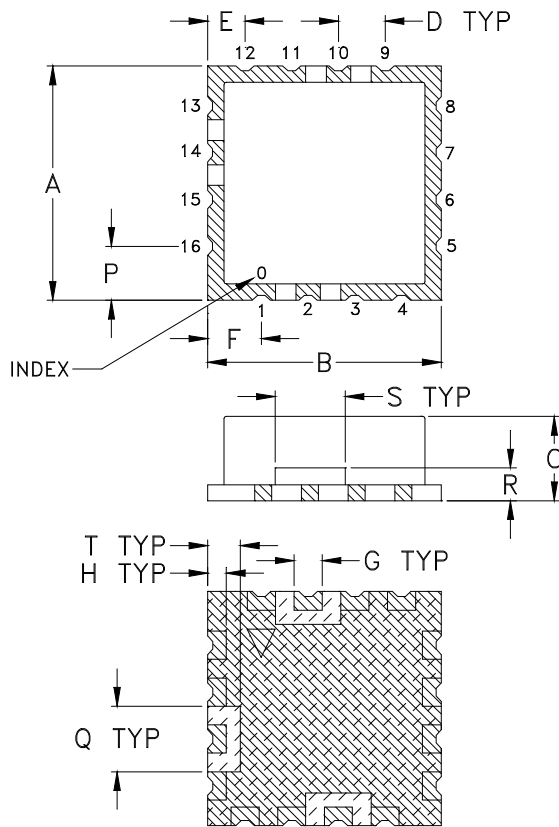
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Page 3 of 3

## Outline Dimensions

CK605

## PCB Land Pattern



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

| CASE # | A               | B               | C              | D              | E              | F              | G              | H              | J               | K              |
|--------|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|----------------|
| CK605  | .500<br>(12.70) | .500<br>(12.70) | .180<br>(4.57) | .100<br>(2.54) | .080<br>(2.03) | .115<br>(2.92) | .060<br>(1.52) | .040<br>(1.02) | .540<br>(13.72) | .060<br>(1.52) |

| CASE # | L              | M              | N              | P              | Q              | R              | S              | T              | WT. GRAM            |
|--------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------------|
| CK605  | .100<br>(2.54) | .135<br>(3.43) | .135<br>(3.43) | .115<br>(2.92) | .140<br>(3.56) | .070<br>(1.78) | .150<br>(3.81) | .070<br>(1.78) | 1.2<br>+0.5<br>-0.0 |

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .03$ ; 3Pl.  $\pm .015$

### Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:  
For RoHS Case Styles: 3-5  $\mu$  inch (.08-.13 microns) Gold over 120-240  $\mu$  inch (3.05-6.10 microns) Nickel plate.  
All models, (+) suffix.



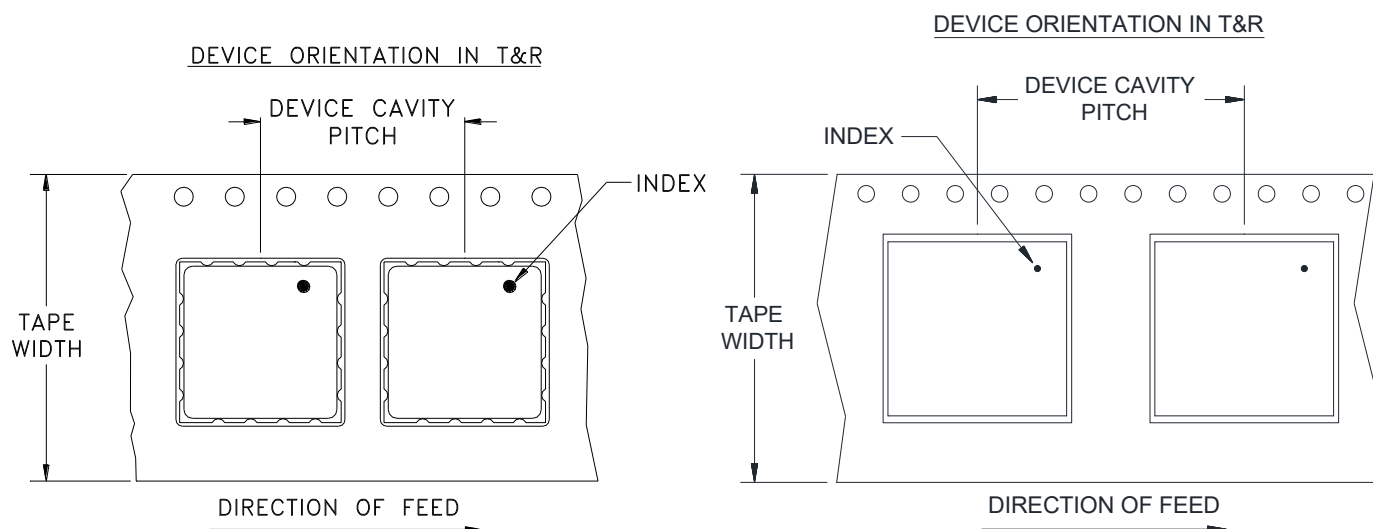
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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

RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F37



| Tape Width,<br>mm | Device Cavity<br>Pitch, mm | Reel Size,<br>inches | Devices per Reel                             |     |
|-------------------|----------------------------|----------------------|----------------------------------------------|-----|
| 24                | 16                         | 7                    | Small<br>quantity<br>standards<br>(see note) | 10  |
|                   |                            |                      |                                              | 20  |
|                   |                            |                      |                                              | 50  |
|                   |                            |                      |                                              | 100 |
|                   |                            | 13                   | Standard                                     | 200 |
|                   |                            |                      |                                              | 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](http://www.minicircuits.com/pages/pdfs/tape.pdf)



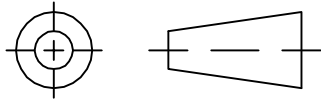
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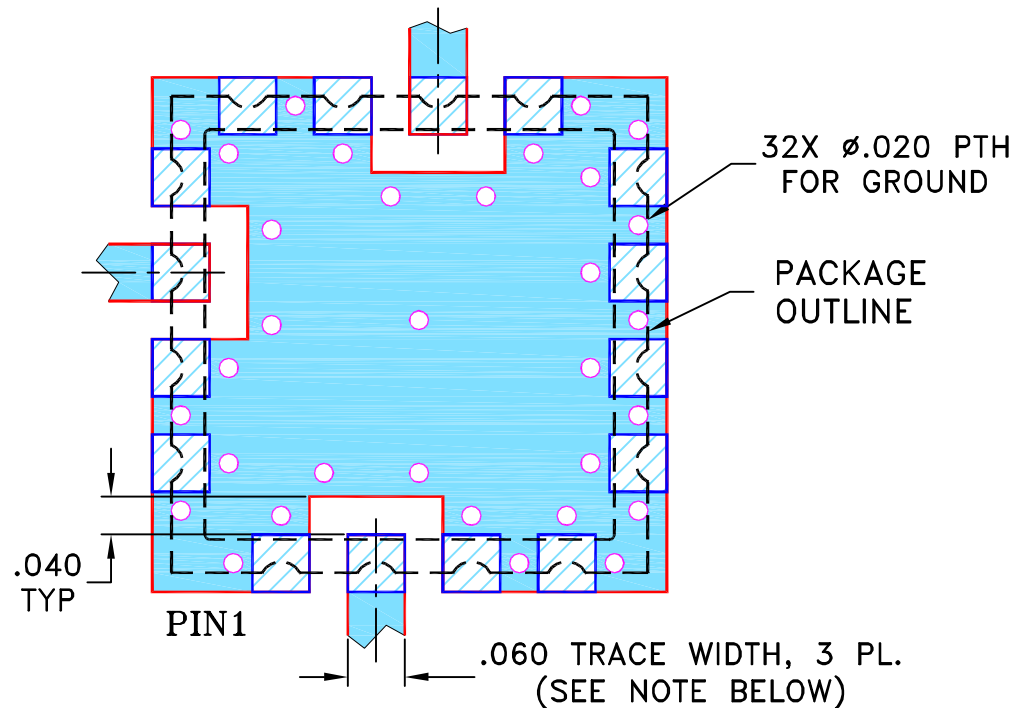
## THIRD ANGLE PROJECTION



## REVISIONS

| REV | ECN No. | DESCRIPTION               | DATE     | DR  | AUTH |
|-----|---------|---------------------------|----------|-----|------|
| E   | M105563 | ADDED "rl" PIN CONNECTION | 06/02/06 | MMG | DJ   |
| F   | M105640 | CORRECTED NOTE 2          | 06/08/06 | MMG | MM   |
| G   | M124395 | ADDED "RAMP"              | 09/09    | EM  | HH   |
| G   | R77589  | ADDED "RAMP"              | 09/09    | EM  | HH   |

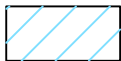
SUGGESTED MOUNTING CONFIGURATION FOR  
CK605 CASE STYLE, "kg/rl/16AM01" PIN CONNECTION

NOTES:

- TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS .030"  $\pm$  .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE BOTTOM 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

AV

08/07/00

CHECKED

SK

08/08/00

APPROVED

DB

08/08/00

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



**Mini-Circuits®** 13 Neptune Avenue  
Brooklyn NY 11235

PL,kg/rl/16AM01,CK605,ROS/LAVI/RAMP

SIZE  
A

CODE IDENT  
15542

DRAWING NO:  
98-PL-012

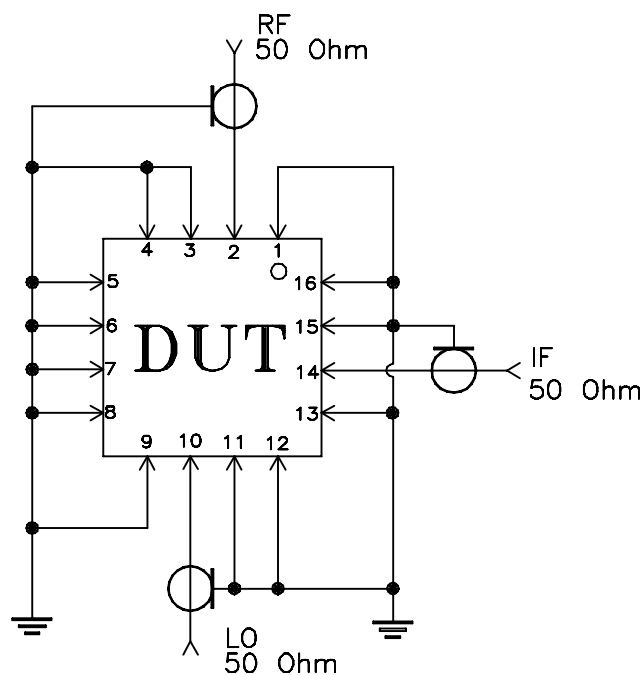
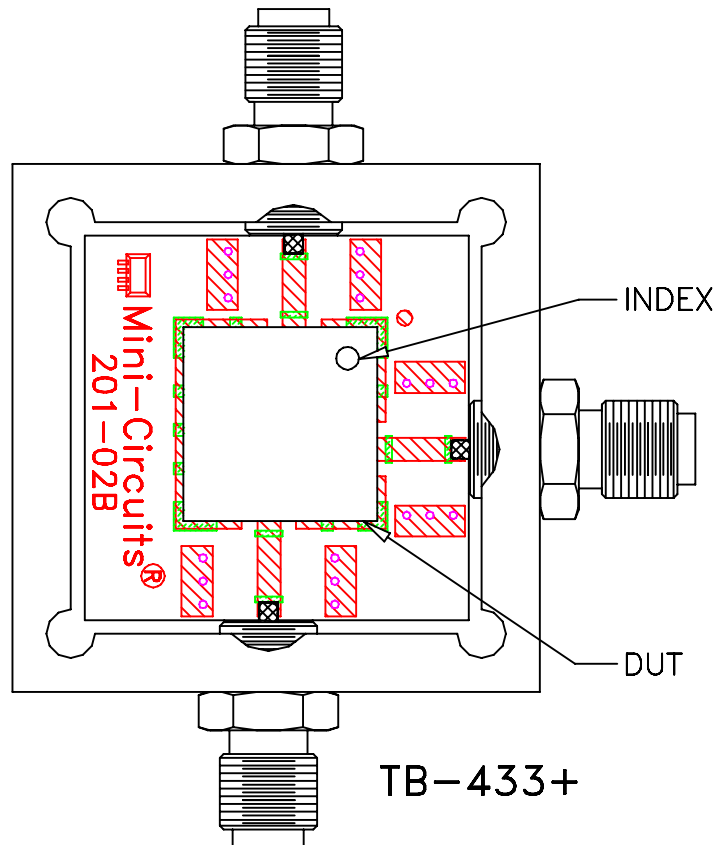
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FILE: 98PL012

SCALE: 5:1

SHEET: 1 OF 1

# Evaluation Board and Circuit



## Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.028 inch.

## Schematic Diagram

 **Mini-Circuits®**



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

| Specification                  | Test/Inspection Condition                                                                                                                                       | Reference/Spec                                                                                       |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Operating Temperature          | -45° 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 Eutectic Process: 225°C peak<br>Pb-Free Process, 245°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                                                                              |