

# Frequency Mixer

MCA-ED12846/1

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>IF FIXED<br>@IF(OUT)=160MHz<br>(dB) |       |       |
|---------------------|-------------|--------------------------------------------------------|-------|-------|
|                     |             | @LO (dBm)                                              |       |       |
|                     |             | +14                                                    | +17   | +20   |
| 510.1               | 350.1       | 13.87                                                  | 11.63 | 9.88  |
| 610.1               | 450.1       | 8.45                                                   | 7.31  | 6.79  |
| 710.1               | 550.1       | 6.42                                                   | 6.25  | 6.17  |
| 810.1               | 650.1       | 8.12                                                   | 8.21  | 7.76  |
| 910.1               | 750.1       | 7.23                                                   | 6.79  | 6.54  |
| 1010.1              | 850.1       | 7.65                                                   | 7.03  | 6.64  |
| 1110.1              | 950.1       | 8.29                                                   | 7.58  | 7.23  |
| 1210.1              | 1050.1      | 8.56                                                   | 7.87  | 7.48  |
| 1310.1              | 1150.1      | 8.73                                                   | 7.90  | 7.40  |
| 1410.1              | 1250.1      | 8.55                                                   | 7.73  | 7.26  |
| 1510.1              | 1350.1      | 8.44                                                   | 7.69  | 7.23  |
| 1610.1              | 1450.1      | 8.32                                                   | 7.68  | 7.29  |
| 1710.1              | 1550.1      | 8.35                                                   | 7.71  | 7.36  |
| 1810.1              | 1650.1      | 8.37                                                   | 7.86  | 7.62  |
| 1910.1              | 1750.1      | 8.72                                                   | 8.39  | 8.24  |
| 2010.1              | 1850.1      | 9.38                                                   | 9.18  | 9.12  |
| 2090.1              | 1930.1      | 8.32                                                   | 7.77  | 7.44  |
| 2190.1              | 2030.1      | 8.01                                                   | 7.78  | 7.72  |
| 2270.1              | 2110.1      | 7.98                                                   | 7.78  | 7.74  |
| 2370.1              | 2210.1      | 7.91                                                   | 7.78  | 7.82  |
| 2450.1              | 2290.1      | 7.95                                                   | 7.85  | 7.91  |
| 2550.1              | 2390.1      | 7.90                                                   | 7.88  | 8.02  |
| 2630.1              | 2470.1      | 7.79                                                   | 7.75  | 7.87  |
| 2730.1              | 2570.1      | 7.73                                                   | 7.70  | 7.81  |
| 2810.1              | 2650.1      | 7.76                                                   | 7.67  | 7.71  |
| 2910.1              | 2750.1      | 7.81                                                   | 7.66  | 7.65  |
| 2990.1              | 2830.1      | 7.89                                                   | 7.65  | 7.57  |
| 3090.1              | 2930.1      | 7.92                                                   | 7.68  | 7.62  |
| 3170.1              | 3010.1      | 7.97                                                   | 7.74  | 7.67  |
| 3270.1              | 3110.1      | 8.14                                                   | 7.85  | 7.73  |
| 3350.1              | 3190.1      | 8.27                                                   | 7.97  | 7.87  |
| 3450.1              | 3290.1      | 8.50                                                   | 8.20  | 8.06  |
| 3530.1              | 3370.1      | 8.89                                                   | 8.52  | 8.30  |
| 3630.1              | 3470.1      | 9.28                                                   | 8.88  | 8.66  |
| 3710.1              | 3550.1      | 9.71                                                   | 9.28  | 9.13  |
| 3810.1              | 3650.1      | 10.24                                                  | 9.66  | 9.41  |
| 3890.1              | 3730.1      | 10.77                                                  | 10.09 | 9.77  |
| 3990.1              | 3830.1      | 11.43                                                  | 10.61 | 10.19 |
| 4070.1              | 3910.1      | 11.98                                                  | 11.08 | 10.59 |
| 4170.1              | 4010.1      | 12.66                                                  | 11.67 | 11.11 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IP3 INPUT<br>(dBm) |       |       |
|---------------------|-------------|--------------------|-------|-------|
|                     |             | @LO (dBm)          |       |       |
|                     |             | +14                | +17   | +20   |
| 510.1               | 350.1       | 15.20              | 15.39 | 16.81 |
| 610.1               | 450.1       | 15.33              | 16.70 | 18.79 |
| 710.1               | 550.1       | 20.69              | 23.09 | 25.48 |
| 810.1               | 650.1       | 21.52              | 30.56 | 23.79 |
| 910.1               | 750.1       | 25.94              | 26.32 | 29.12 |
| 1010.1              | 850.1       | 22.15              | 24.96 | 27.71 |
| 1110.1              | 950.1       | 22.43              | 21.31 | 22.58 |
| 1210.1              | 1050.1      | 21.61              | 21.34 | 20.68 |
| 1310.1              | 1150.1      | 19.12              | 19.94 | 22.90 |
| 1410.1              | 1250.1      | 20.98              | 23.58 | 26.89 |
| 1510.1              | 1350.1      | 20.69              | 23.68 | 28.00 |
| 1610.1              | 1450.1      | 22.27              | 24.93 | 27.75 |
| 1710.1              | 1550.1      | 24.69              | 28.06 | 31.97 |
| 1810.1              | 1650.1      | 26.11              | 29.21 | 40.22 |
| 1910.1              | 1750.1      | 22.75              | 25.79 | 28.44 |
| 2010.1              | 1850.1      | 21.14              | 23.36 | 26.40 |
| 2090.1              | 1930.1      | 23.03              | 25.56 | 28.08 |
| 2190.1              | 2030.1      | 26.59              | 31.35 | 29.53 |
| 2270.1              | 2110.1      | 24.89              | 27.57 | 31.53 |
| 2370.1              | 2210.1      | 25.59              | 30.24 | 34.28 |
| 2450.1              | 2290.1      | 25.88              | 31.11 | 35.80 |
| 2550.1              | 2390.1      | 25.98              | 32.13 | 36.03 |
| 2630.1              | 2470.1      | 25.55              | 32.06 | 36.39 |
| 2730.1              | 2570.1      | 25.37              | 31.57 | 37.95 |
| 2810.1              | 2650.1      | 24.42              | 29.56 | 36.39 |
| 2910.1              | 2750.1      | 23.75              | 27.71 | 33.29 |
| 2990.1              | 2830.1      | 23.33              | 27.47 | 33.50 |
| 3090.1              | 2930.1      | 23.13              | 27.02 | 32.40 |
| 3170.1              | 3010.1      | 22.96              | 26.30 | 32.31 |
| 3270.1              | 3110.1      | 22.87              | 26.18 | 32.20 |
| 3350.1              | 3190.1      | 22.92              | 25.78 | 31.11 |
| 3450.1              | 3290.1      | 22.67              | 25.01 | 29.24 |
| 3530.1              | 3370.1      | 22.70              | 24.87 | 28.48 |
| 3630.1              | 3470.1      | 24.57              | 26.09 | 28.61 |
| 3710.1              | 3550.1      | 23.42              | 26.91 | 33.15 |
| 3810.1              | 3650.1      | 22.33              | 26.72 | 32.26 |
| 3890.1              | 3730.1      | 22.27              | 26.81 | 32.77 |
| 3990.1              | 3830.1      | 22.11              | 27.01 | 32.21 |
| 4070.1              | 3910.1      | 21.76              | 26.32 | 31.58 |
| 4170.1              | 4010.1      | 22.43              | 27.06 | 33.24 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | COMPRESSION<br>@RF IN=+17dBm<br>(dB) |      |      |
|---------------------|-------------|--------------------------------------|------|------|
|                     |             | @LO (dBm)                            |      |      |
|                     |             | +14                                  | +17  | +20  |
| 510.1               | 350.1       | 5.91                                 | 5.34 | 4.44 |
| 610.1               | 450.1       | 7.00                                 | 5.71 | 3.93 |
| 710.1               | 550.1       | 1.80                                 | 1.09 | 0.61 |
| 810.1               | 650.1       | 0.22                                 | 0.07 | 0.43 |
| 910.1               | 750.1       | 1.29                                 | 0.75 | 0.47 |
| 1010.1              | 850.1       | 2.21                                 | 1.46 | 0.81 |
| 1110.1              | 950.1       | 2.41                                 | 1.72 | 1.12 |
| 1210.1              | 1050.1      | 5.26                                 | 4.25 | 3.36 |
| 1310.1              | 1150.1      | 5.21                                 | 3.84 | 2.50 |
| 1410.1              | 1250.1      | 2.66                                 | 1.83 | 1.01 |
| 1510.1              | 1350.1      | 1.96                                 | 1.24 | 0.72 |
| 1610.1              | 1450.1      | 1.06                                 | 0.64 | 0.32 |
| 1710.1              | 1550.1      | 0.99                                 | 0.51 | 0.23 |
| 1810.1              | 1650.1      | 0.99                                 | 0.48 | 0.19 |
| 1910.1              | 1750.1      | 0.71                                 | 0.46 | 0.33 |
| 2010.1              | 1850.1      | 0.62                                 | 0.34 | 0.30 |
| 2090.1              | 1930.1      | 1.20                                 | 0.74 | 0.39 |
| 2190.1              | 2030.1      | 0.81                                 | 0.43 | 0.30 |
| 2270.1              | 2110.1      | 0.77                                 | 0.48 | 0.30 |
| 2370.1              | 2210.1      | 0.75                                 | 0.43 | 0.23 |
| 2450.1              | 2290.1      | 0.79                                 | 0.45 | 0.22 |
| 2550.1              | 2390.1      | 0.78                                 | 0.39 | 0.19 |
| 2630.1              | 2470.1      | 0.74                                 | 0.36 | 0.18 |
| 2730.1              | 2570.1      | 0.66                                 | 0.33 | 0.17 |
| 2810.1              | 2650.1      | 0.69                                 | 0.37 | 0.18 |
| 2910.1              | 2750.1      | 0.75                                 | 0.43 | 0.23 |
| 2990.1              | 2830.1      | 0.78                                 | 0.44 | 0.25 |
| 3090.1              | 2930.1      | 0.81                                 | 0.42 | 0.20 |
| 3170.1              | 3010.1      | 0.83                                 | 0.45 | 0.19 |
| 3270.1              | 3110.1      | 0.77                                 | 0.48 | 0.24 |
| 3350.1              | 3190.1      | 0.70                                 | 0.45 | 0.21 |
| 3450.1              | 3290.1      | 0.65                                 | 0.42 | 0.20 |
| 3530.1              | 3370.1      | 0.54                                 | 0.38 | 0.18 |
| 3630.1              | 3470.1      | 0.51                                 | 0.35 | 0.18 |
| 3710.1              | 3550.1      | 0.58                                 | 0.47 | 0.24 |
| 3810.1              | 3650.1      | 0.48                                 | 0.48 | 0.26 |
| 3890.1              | 3730.1      | 0.36                                 | 0.44 | 0.25 |
| 3990.1              | 3830.1      | 0.22                                 | 0.38 | 0.26 |
| 4070.1              | 3910.1      | 0.11                                 | 0.34 | 0.23 |
| 4170.1              | 4010.1      | 0.06                                 | 0.34 | 0.26 |

REV. X2

MCA-ED12846/1

101028

Page 1 of 5



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## Typical Performance Data

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=2860.1001MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=2230.1001MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=3490.1001MHz<br>(dB) |
|----------------------|-------------|---------------------------------------------------------------------|----------------------|-------------|---------------------------------------------------------------------|----------------------|-------------|---------------------------------------------------------------------|
|                      |             | @LO (dBm)                                                           |                      |             | @LO (dBm)                                                           |                      |             | @LO (dBm)                                                           |
|                      |             | +17                                                                 |                      |             | +17                                                                 |                      |             | +17                                                                 |
| 2190.0               | 670.1       | 11.42                                                               | 10.0                 | 2240.1      | 7.93                                                                | 2070.0               | 1420.1      | 11.43                                                               |
| 2071.5               | 788.6       | 10.65                                                               | 50.0                 | 2280.1      | 7.66                                                                | 2010.0               | 1480.1      | 10.85                                                               |
| 1953.0               | 907.1       | 10.47                                                               | 90.0                 | 2320.1      | 7.67                                                                | 1950.0               | 1540.1      | 10.41                                                               |
| 1834.6               | 1025.5      | 9.99                                                                | 130.0                | 2360.1      | 7.71                                                                | 1890.0               | 1600.1      | 10.14                                                               |
| 1716.1               | 1144.0      | 9.67                                                                | 170.0                | 2400.1      | 7.68                                                                | 1830.0               | 1660.1      | 9.94                                                                |
| 1597.6               | 1262.5      | 8.83                                                                | 210.0                | 2440.1      | 7.71                                                                | 1770.0               | 1720.1      | 10.05                                                               |
| 1479.1               | 1381.0      | 8.60                                                                | 250.0                | 2480.1      | 7.72                                                                | 1710.0               | 1780.1      | 10.38                                                               |
| 1360.7               | 1499.4      | 8.35                                                                | 310.0                | 2540.1      | 7.80                                                                | 1650.0               | 1840.1      | 10.55                                                               |
| 1242.2               | 1617.9      | 8.91                                                                | 350.0                | 2580.1      | 7.82                                                                | 1590.0               | 1900.1      | 9.80                                                                |
| 1123.7               | 1736.4      | 9.52                                                                | 410.0                | 2640.1      | 8.02                                                                | 1530.0               | 1960.1      | 9.59                                                                |
| 1005.2               | 1854.9      | 10.26                                                               | 450.0                | 2680.1      | 8.07                                                                | 1470.0               | 2020.1      | 9.79                                                                |
| 886.7                | 1973.4      | 9.19                                                                | 510.0                | 2740.1      | 8.25                                                                | 1410.0               | 2080.1      | 9.58                                                                |
| 768.3                | 2091.8      | 8.58                                                                | 550.0                | 2780.1      | 8.33                                                                | 1370.0               | 2120.1      | 9.40                                                                |
| 649.8                | 2210.3      | 8.30                                                                | 610.0                | 2840.1      | 8.45                                                                | 1310.0               | 2180.1      | 9.32                                                                |
| 531.3                | 2328.8      | 8.25                                                                | 650.0                | 2880.1      | 8.52                                                                | 1270.0               | 2220.1      | 9.26                                                                |
| 412.8                | 2447.3      | 8.07                                                                | 710.0                | 2940.1      | 8.63                                                                | 1210.0               | 2280.1      | 9.37                                                                |
| 294.3                | 2565.8      | 7.84                                                                | 750.0                | 2980.1      | 8.64                                                                | 1170.0               | 2320.1      | 9.30                                                                |
| 175.9                | 2684.2      | 7.72                                                                | 810.0                | 3040.1      | 8.72                                                                | 1110.0               | 2380.1      | 9.15                                                                |
| 57.4                 | 2802.7      | 7.53                                                                | 850.0                | 3080.1      | 8.72                                                                | 1070.0               | 2420.1      | 9.17                                                                |
| 42.6                 | 2902.7      | 7.49                                                                | 910.0                | 3140.1      | 8.72                                                                | 1010.0               | 2480.1      | 9.23                                                                |
| 107.8                | 2967.9      | 7.49                                                                | 950.0                | 3180.1      | 8.73                                                                | 970.0                | 2520.1      | 9.26                                                                |
| 189.3                | 3049.4      | 7.59                                                                | 1010.0               | 3240.1      | 8.68                                                                | 910.0                | 2580.1      | 9.27                                                                |
| 254.6                | 3114.7      | 7.71                                                                | 1050.0               | 3280.1      | 8.69                                                                | 870.0                | 2620.1      | 9.34                                                                |
| 336.1                | 3196.2      | 8.05                                                                | 1110.0               | 3340.1      | 8.53                                                                | 810.0                | 2680.1      | 9.34                                                                |
| 401.3                | 3261.4      | 8.27                                                                | 1150.0               | 3380.1      | 8.61                                                                | 770.0                | 2720.1      | 9.37                                                                |
| 482.8                | 3342.9      | 8.47                                                                | 1210.0               | 3440.1      | 8.55                                                                | 710.0                | 2780.1      | 9.37                                                                |
| 548.0                | 3408.1      | 8.64                                                                | 1250.0               | 3480.1      | 8.68                                                                | 670.0                | 2820.1      | 9.40                                                                |
| 629.6                | 3489.7      | 8.67                                                                | 1310.0               | 3540.1      | 8.68                                                                | 610.0                | 2880.1      | 9.29                                                                |
| 694.8                | 3554.9      | 8.78                                                                | 1350.0               | 3580.1      | 8.83                                                                | 570.0                | 2920.1      | 9.31                                                                |
| 776.3                | 3636.4      | 8.79                                                                | 1410.0               | 3640.1      | 8.77                                                                | 510.0                | 2980.1      | 9.17                                                                |
| 841.5                | 3701.6      | 8.83                                                                | 1450.0               | 3680.1      | 8.92                                                                | 470.0                | 3020.1      | 9.12                                                                |
| 923.0                | 3783.1      | 8.90                                                                | 1510.0               | 3740.1      | 8.94                                                                | 410.0                | 3080.1      | 8.97                                                                |
| 988.3                | 3848.4      | 8.90                                                                | 1550.0               | 3780.1      | 9.04                                                                | 370.0                | 3120.1      | 8.88                                                                |
| 1069.8               | 3929.9      | 8.93                                                                | 1610.0               | 3840.1      | 9.13                                                                | 310.0                | 3180.1      | 8.69                                                                |
| 1135.0               | 3995.1      | 8.97                                                                | 1650.0               | 3880.1      | 9.29                                                                | 270.0                | 3220.1      | 8.60                                                                |
| 1216.5               | 4076.6      | 9.20                                                                | 1710.0               | 3940.1      | 9.43                                                                | 210.0                | 3280.1      | 8.51                                                                |
| 1281.7               | 4141.8      | 9.22                                                                | 1750.0               | 3980.1      | 9.72                                                                | 170.0                | 3320.1      | 8.41                                                                |
| 1363.3               | 4223.4      | 9.23                                                                | 1810.0               | 4040.1      | 10.04                                                               | 110.0                | 3380.1      | 8.32                                                                |
| 1428.5               | 4288.6      | 9.23                                                                | 1850.0               | 4080.1      | 10.30                                                               | 70.0                 | 3420.1      | 8.29                                                                |
| 1510.0               | 4370.1      | 9.57                                                                | 1910.0               | 4140.1      | 10.71                                                               | 10.0                 | 3480.1      | 8.55                                                                |

## Typical Performance Data

| LO<br>(MHz) | LO-RF ISOLATION<br>(dB) |       |       | LO-IF ISOLATION<br>(dB) |       |       |
|-------------|-------------------------|-------|-------|-------------------------|-------|-------|
|             | @LO (dBm)               |       |       | @LO (dBm)               |       |       |
|             | +14                     | +17   | +20   | +14                     | +17   | +20   |
| 350.1       | 58.94                   | 56.82 | 54.97 | 42.21                   | 42.47 | 42.97 |
| 450.1       | 45.32                   | 45.30 | 46.21 | 34.65                   | 35.07 | 35.56 |
| 550.1       | 34.88                   | 35.55 | 36.03 | 26.89                   | 26.98 | 27.09 |
| 650.1       | 29.65                   | 29.54 | 29.70 | 24.97                   | 25.83 | 26.59 |
| 750.1       | 32.71                   | 32.70 | 32.54 | 28.55                   | 29.40 | 30.21 |
| 850.1       | 34.32                   | 34.68 | 34.71 | 30.84                   | 31.34 | 31.90 |
| 950.1       | 33.96                   | 33.54 | 33.06 | 32.62                   | 33.53 | 34.71 |
| 1050.1      | 34.94                   | 34.36 | 33.62 | 32.40                   | 32.87 | 33.47 |
| 1150.1      | 35.79                   | 34.47 | 33.59 | 32.50                   | 32.82 | 33.43 |
| 1250.1      | 41.95                   | 40.09 | 39.20 | 34.60                   | 35.12 | 35.69 |
| 1350.1      | 53.52                   | 46.90 | 43.30 | 34.22                   | 35.31 | 36.48 |
| 1450.1      | 38.61                   | 37.89 | 36.69 | 32.63                   | 34.14 | 35.56 |
| 1550.1      | 35.26                   | 34.60 | 33.82 | 31.77                   | 33.39 | 34.99 |
| 1650.1      | 32.31                   | 31.54 | 30.79 | 31.18                   | 32.66 | 34.13 |
| 1750.1      | 29.15                   | 27.94 | 27.02 | 30.96                   | 31.58 | 32.03 |
| 1850.1      | 29.56                   | 29.22 | 28.56 | 27.09                   | 27.39 | 27.42 |
| 1930.1      | 32.59                   | 34.13 | 35.32 | 24.40                   | 24.95 | 25.40 |
| 2030.1      | 36.40                   | 37.43 | 37.16 | 26.21                   | 27.39 | 28.55 |
| 2110.1      | 40.10                   | 38.55 | 37.32 | 27.82                   | 29.27 | 30.64 |
| 2210.1      | 42.24                   | 40.41 | 38.77 | 30.53                   | 32.58 | 34.53 |
| 2290.1      | 41.05                   | 40.17 | 39.12 | 33.27                   | 36.32 | 40.07 |
| 2390.1      | 37.37                   | 36.39 | 36.07 | 39.65                   | 41.96 | 41.41 |
| 2470.1      | 35.74                   | 34.83 | 34.61 | 38.07                   | 35.54 | 34.04 |
| 2570.1      | 37.78                   | 37.51 | 37.57 | 30.89                   | 29.76 | 28.84 |
| 2650.1      | 45.97                   | 46.38 | 47.32 | 28.65                   | 27.84 | 27.16 |
| 2750.1      | 42.93                   | 42.73 | 42.56 | 27.47                   | 26.84 | 26.25 |
| 2830.1      | 39.16                   | 38.87 | 38.80 | 27.10                   | 26.37 | 26.18 |
| 2930.1      | 36.63                   | 36.12 | 35.39 | 26.39                   | 25.97 | 25.86 |
| 3010.1      | 35.42                   | 35.37 | 34.64 | 25.23                   | 25.18 | 24.92 |
| 3110.1      | 33.37                   | 33.40 | 32.78 | 24.48                   | 24.60 | 24.51 |
| 3190.1      | 32.34                   | 32.46 | 32.07 | 24.46                   | 24.74 | 24.79 |
| 3290.1      | 32.21                   | 32.58 | 32.41 | 24.88                   | 25.45 | 25.71 |
| 3370.1      | 31.97                   | 32.23 | 32.04 | 25.76                   | 26.41 | 26.75 |
| 3470.1      | 30.92                   | 31.03 | 30.78 | 27.91                   | 29.03 | 29.68 |
| 3550.1      | 29.71                   | 29.64 | 29.81 | 29.84                   | 31.35 | 32.74 |
| 3650.1      | 30.49                   | 30.27 | 30.36 | 31.46                   | 33.48 | 35.60 |
| 3730.1      | 30.96                   | 30.68 | 30.54 | 33.76                   | 36.53 | 39.72 |
| 3830.1      | 31.83                   | 31.47 | 31.40 | 37.34                   | 41.70 | 47.19 |
| 3910.1      | 32.62                   | 32.25 | 31.94 | 39.83                   | 44.01 | 44.82 |
| 4010.1      | 33.52                   | 33.03 | 32.71 | 39.54                   | 40.71 | 40.08 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +14                     | +17   | +20   |
| 510.1               | 350.1       | 26.96                   | 23.34 | 22.41 |
| 610.1               | 450.1       | 20.81                   | 20.80 | 21.28 |
| 710.1               | 550.1       | 20.23                   | 20.70 | 21.32 |
| 810.1               | 650.1       | 20.62                   | 22.37 | 25.90 |
| 910.1               | 750.1       | 21.23                   | 22.17 | 22.96 |
| 1010.1              | 850.1       | 20.34                   | 21.95 | 23.16 |
| 1110.1              | 950.1       | 18.59                   | 20.84 | 22.92 |
| 1210.1              | 1050.1      | 18.39                   | 18.74 | 19.40 |
| 1310.1              | 1150.1      | 19.14                   | 18.43 | 18.02 |
| 1410.1              | 1250.1      | 20.28                   | 20.33 | 20.23 |
| 1510.1              | 1350.1      | 20.05                   | 20.97 | 21.78 |
| 1610.1              | 1450.1      | 20.87                   | 21.11 | 21.36 |
| 1710.1              | 1550.1      | 20.47                   | 20.08 | 19.84 |
| 1810.1              | 1650.1      | 19.10                   | 18.28 | 17.94 |
| 1910.1              | 1750.1      | 17.07                   | 15.82 | 15.10 |
| 2010.1              | 1850.1      | 18.57                   | 17.13 | 16.10 |
| 2090.1              | 1930.1      | 22.84                   | 22.52 | 22.08 |
| 2190.1              | 2030.1      | 23.79                   | 23.75 | 23.42 |
| 2270.1              | 2110.1      | 24.25                   | 24.02 | 23.52 |
| 2370.1              | 2210.1      | 24.11                   | 24.04 | 23.96 |
| 2450.1              | 2290.1      | 25.89                   | 26.02 | 26.24 |
| 2550.1              | 2390.1      | 32.53                   | 33.98 | 35.27 |
| 2630.1              | 2470.1      | 42.08                   | 41.63 | 39.04 |
| 2730.1              | 2570.1      | 37.28                   | 34.69 | 32.75 |
| 2810.1              | 2650.1      | 33.31                   | 31.43 | 30.01 |
| 2910.1              | 2750.1      | 30.40                   | 28.80 | 27.42 |
| 2990.1              | 2830.1      | 32.77                   | 31.53 | 30.35 |
| 3090.1              | 2930.1      | 37.15                   | 41.81 | 46.40 |
| 3170.1              | 3010.1      | 31.51                   | 33.01 | 34.46 |
| 3270.1              | 3110.1      | 30.10                   | 30.71 | 30.67 |
| 3350.1              | 3190.1      | 31.22                   | 31.82 | 31.74 |
| 3450.1              | 3290.1      | 32.12                   | 31.89 | 31.48 |
| 3530.1              | 3370.1      | 32.07                   | 30.55 | 29.65 |
| 3630.1              | 3470.1      | 31.59                   | 29.45 | 27.94 |
| 3710.1              | 3550.1      | 28.67                   | 27.14 | 26.22 |
| 3810.1              | 3650.1      | 27.43                   | 26.72 | 26.01 |
| 3890.1              | 3730.1      | 26.84                   | 26.84 | 26.54 |
| 3990.1              | 3830.1      | 26.17                   | 26.98 | 27.36 |
| 4070.1              | 3910.1      | 25.60                   | 26.61 | 27.20 |
| 4170.1              | 4010.1      | 24.54                   | 25.39 | 25.92 |

# Frequency Mixer

MCA-ED12846/1

## 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=3330MHz<br>(:1) |      |      |
|---------------------|-------------|-----------------|------|------|-------------|-----------------|-------|-------|----------------------|--------------------------------|------|------|
|                     |             | @LO (dBm)       |      |      |             | @LO (dBm)       |       |       |                      | @LO (dBm)                      |      |      |
|                     |             | +14             | +17  | +20  |             | +14             | +17   | +20   |                      | +14                            | +17  | +20  |
| 510.1               | 350.1       | 4.56            | 3.90 | 3.35 | 350.1       | 54.29           | 54.29 | 52.65 | 10.0                 | 1.04                           | 1.18 | 1.33 |
| 610.1               | 450.1       | 2.12            | 1.86 | 1.75 | 450.1       | 20.70           | 20.22 | 19.76 | 90.0                 | 1.27                           | 1.32 | 1.44 |
| 710.1               | 550.1       | 1.24            | 1.27 | 1.32 | 550.1       | 3.48            | 3.40  | 3.33  | 170.0                | 1.55                           | 1.57 | 1.64 |
| 810.1               | 650.1       | 1.19            | 1.51 | 1.83 | 650.1       | 2.73            | 2.78  | 2.88  | 250.0                | 1.84                           | 1.82 | 1.85 |
| 910.1               | 750.1       | 1.37            | 1.42 | 1.54 | 750.1       | 8.08            | 8.35  | 8.51  | 330.0                | 2.13                           | 2.07 | 2.06 |
| 1010.1              | 850.1       | 1.74            | 1.70 | 1.71 | 850.1       | 13.81           | 14.26 | 14.50 | 410.0                | 2.38                           | 2.26 | 2.23 |
| 1110.1              | 950.1       | 2.01            | 1.88 | 1.88 | 950.1       | 19.11           | 19.32 | 19.32 | 490.0                | 2.66                           | 2.49 | 2.41 |
| 1210.1              | 1050.1      | 2.32            | 2.08 | 2.00 | 1050.1      | 23.18           | 23.81 | 23.81 | 570.0                | 2.79                           | 2.57 | 2.46 |
| 1310.1              | 1150.1      | 2.58            | 2.34 | 2.23 | 1150.1      | 26.74           | 27.16 | 26.74 | 650.0                | 2.84                           | 2.59 | 2.45 |
| 1410.1              | 1250.1      | 2.75            | 2.43 | 2.26 | 1250.1      | 29.96           | 29.46 | 28.49 | 730.0                | 2.82                           | 2.54 | 2.38 |
| 1510.1              | 1350.1      | 2.77            | 2.43 | 2.23 | 1350.1      | 31.03           | 30.49 | 29.46 | 810.0                | 2.71                           | 2.42 | 2.23 |
| 1610.1              | 1450.1      | 2.63            | 2.36 | 2.18 | 1450.1      | 27.59           | 27.59 | 27.16 | 890.0                | 2.60                           | 2.29 | 2.09 |
| 1710.1              | 1550.1      | 2.58            | 2.31 | 2.13 | 1550.1      | 22.87           | 22.87 | 22.29 | 970.0                | 2.46                           | 2.12 | 1.89 |
| 1810.1              | 1650.1      | 2.38            | 2.17 | 2.04 | 1650.1      | 16.72           | 16.41 | 16.11 | 1050.0               | 2.30                           | 1.95 | 1.72 |
| 1910.1              | 1750.1      | 2.14            | 1.94 | 1.81 | 1750.1      | 10.62           | 9.96  | 9.38  | 1130.0               | 2.05                           | 1.73 | 1.51 |
| 2010.1              | 1850.1      | 2.02            | 1.76 | 1.60 | 1850.1      | 8.16            | 7.83  | 7.63  | 1210.0               | 1.83                           | 1.54 | 1.34 |
| 2090.1              | 1930.1      | 2.33            | 2.07 | 1.88 | 1930.1      | 9.33            | 9.04  | 8.72  | 1290.0               | 1.65                           | 1.40 | 1.22 |
| 2190.1              | 2030.1      | 2.06            | 1.76 | 1.56 | 2030.1      | 8.01            | 7.70  | 7.41  | 1370.0               | 1.46                           | 1.25 | 1.16 |
| 2270.1              | 2110.1      | 1.76            | 1.53 | 1.42 | 2110.1      | 7.02            | 6.76  | 6.49  | 1450.0               | 1.29                           | 1.17 | 1.20 |
| 2370.1              | 2210.1      | 1.52            | 1.36 | 1.30 | 2210.1      | 5.75            | 5.47  | 5.25  | 1530.0               | 1.11                           | 1.15 | 1.30 |
| 2450.1              | 2290.1      | 1.45            | 1.30 | 1.26 | 2290.1      | 4.74            | 4.51  | 4.29  | 1610.0               | 1.07                           | 1.26 | 1.45 |
| 2550.1              | 2390.1      | 1.38            | 1.22 | 1.19 | 2390.1      | 3.97            | 3.82  | 3.66  | 1690.0               | 1.21                           | 1.39 | 1.58 |
| 2630.1              | 2470.1      | 1.32            | 1.17 | 1.17 | 2470.1      | 3.51            | 3.40  | 3.29  | 1770.0               | 1.41                           | 1.56 | 1.75 |
| 2730.1              | 2570.1      | 1.27            | 1.12 | 1.13 | 2570.1      | 3.25            | 3.17  | 3.10  | 1870.0               | 1.67                           | 1.77 | 1.91 |
| 2810.1              | 2650.1      | 1.26            | 1.11 | 1.11 | 2650.1      | 3.13            | 3.07  | 3.00  | 1950.0               | 1.91                           | 1.96 | 2.08 |
| 2910.1              | 2750.1      | 1.28            | 1.15 | 1.14 | 2750.1      | 3.15            | 3.13  | 3.09  | 2050.0               | 2.29                           | 2.29 | 2.35 |
| 2990.1              | 2830.1      | 1.28            | 1.19 | 1.21 | 2830.1      | 3.20            | 3.19  | 3.16  | 2130.0               | 2.56                           | 2.54 | 2.57 |
| 3090.1              | 2930.1      | 1.32            | 1.29 | 1.34 | 2930.1      | 3.35            | 3.36  | 3.36  | 2230.0               | 2.80                           | 2.70 | 2.66 |
| 3170.1              | 3010.1      | 1.36            | 1.37 | 1.45 | 3010.1      | 3.48            | 3.49  | 3.48  | 2310.0               | 2.86                           | 2.72 | 2.64 |
| 3270.1              | 3110.1      | 1.48            | 1.51 | 1.59 | 3110.1      | 3.71            | 3.73  | 3.74  | 2410.0               | 2.93                           | 2.75 | 2.62 |
| 3350.1              | 3190.1      | 1.56            | 1.60 | 1.69 | 3190.1      | 3.98            | 4.01  | 4.02  | 2490.0               | 3.00                           | 2.81 | 2.66 |
| 3450.1              | 3290.1      | 1.76            | 1.79 | 1.86 | 3290.1      | 4.32            | 4.35  | 4.34  | 2590.0               | 3.22                           | 3.06 | 2.92 |
| 3530.1              | 3370.1      | 1.87            | 1.88 | 1.92 | 3370.1      | 4.72            | 4.75  | 4.78  | 2670.0               | 3.55                           | 3.40 | 3.26 |
| 3630.1              | 3470.1      | 2.14            | 2.14 | 2.18 | 3470.1      | 4.95            | 4.91  | 4.86  | 2770.0               | 3.53                           | 3.38 | 3.25 |
| 3710.1              | 3550.1      | 2.35            | 2.33 | 2.36 | 3550.1      | 5.58            | 5.63  | 5.66  | 2850.0               | 3.28                           | 3.15 | 3.04 |
| 3810.1              | 3650.1      | 2.67            | 2.61 | 2.62 | 3650.1      | 6.51            | 6.51  | 6.49  | 2950.0               | 2.78                           | 2.67 | 2.59 |
| 3890.1              | 3730.1      | 3.05            | 2.95 | 2.91 | 3730.1      | 7.20            | 7.22  | 7.22  | 3030.0               | 2.29                           | 2.18 | 2.13 |
| 3990.1              | 3830.1      | 3.49            | 3.34 | 3.28 | 3830.1      | 8.01            | 8.01  | 7.97  | 3130.0               | 1.80                           | 1.69 | 1.64 |
| 4070.1              | 3910.1      | 4.09            | 3.90 | 3.78 | 3910.1      | 8.43            | 8.35  | 8.16  | 3210.0               | 1.45                           | 1.35 | 1.30 |
| 4170.1              | 4010.1      | 4.69            | 4.43 | 4.28 | 4010.1      | 9.18            | 9.13  | 8.99  | 3310.0               | 1.20                           | 1.11 | 1.10 |

REV. X2

MCA-ED12846/1

101028

Page 4 of 5



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## Harmonics Tables

### RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 5   | 15  | 30  | 25  | 36  | 50  | 39  | 53  | --- | --- |
| 1  | -      | 23     | +0  | 30  | 20  | 43  | 36  | 41  | 43  | 52  | 58  | --- |
| 2  | 60     | 52     | 49  | 68  | 51  | 51  | 62  | 55  | 76  | 66  | 68  | 66  |
| 3  | >90    | 73     | 60  | 77  | 53  | 74  | 59  | 75  | 69  | 77  | 70  | 81  |
| 4  | >90    | >84    | >84 | >84 | 81  | 79  | 78  | >84 | >84 | >84 | >84 | >84 |
| 5  | >90    | >84    | >84 | >84 | >84 | >84 | >84 | >84 | >84 | >84 | >84 | >84 |
| 6  | >90    | >84    | >84 | >84 | >84 | >84 | >84 | >84 | >84 | >84 | >84 | >84 |
| 7  | >90    | >84    | >84 | >84 | >84 | >84 | >84 | >84 | >84 | >84 | >84 | >84 |
| 8  | >90    | >84    | >84 | >84 | >84 | >84 | >84 | >84 | >84 | >84 | >84 | >84 |
| 9  | ---    | ---    | >84 | >84 | >84 | >84 | >84 | >84 | >84 | >84 | >84 | >84 |
| 10 | ---    | ---    | --- | >84 | >84 | >84 | >84 | >84 | >84 | >84 | >84 | >84 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

Test conditions:

RF IN: 2860 MHz; 2.00 dBm.  
LO IN: 2700 MHz; +17.00 dBm  
IF OUT: 160 MHz; -5.69 dBm

### RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |    |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|
| 0  | -      | -      | 16  | 24  | 34  | 42  | 42  | 53  | 52 | 63  | --- | --- |
| 1  | -      | 22     | +0  | 30  | 21  | 47  | 38  | 43  | 48 | 54  | 71  | --- |
| 2  | 40     | 43     | 39  | 54  | 43  | 43  | 54  | 49  | 64 | 58  | 65  | 60  |
| 3  | 62     | 55     | 40  | 70  | 34  | 58  | 42  | 64  | 54 | 71  | 56  | 76  |
| 4  | 86     | 74     | 66  | 67  | 61  | 60  | 58  | 58  | 69 | 63  | 80  | 71  |
| 5  | >90    | 78     | 75  | 70  | 61  | 80  | 57  | 65  | 60 | 72  | 69  | 82  |
| 6  | >90    | >94    | 93  | 88  | 81  | 74  | 71  | 66  | 69 | 82  | 78  | 80  |
| 7  | >90    | >94    | 93  | >94 | 87  | 84  | 80  | 89  | 68 | 76  | 75  | 76  |
| 8  | >90    | >94    | 90  | >94 | 93  | 92  | >94 | 83  | 93 | 77  | 75  | 83  |
| 9  | ---    | ---    | >94 | >94 | >94 | >94 | 90  | 88  | 81 | 94  | 77  | 87  |
| 10 | ---    | ---    | --- | >94 | >94 | >94 | >94 | >94 | 92 | >94 | 91  | 84  |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7  | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions:

RF IN: 2860 MHz; 12.00 dBm.  
LO IN: 2700 MHz; +17.00 dBm  
IF OUT: 160 MHz; 4.14 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.