

# Frequency Mixer

MBA-EE7756/7

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>IF FIXED<br>@IF(OUT)=30MHz<br>(dB) |       |       | RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IP3 INPUT<br>(dBm) |       |       | RF<br>(IN)<br>(MHz) | LO<br>(MHz) | COMPRESSION<br>@RF IN=+1dBm<br>(dB) |       |       |
|---------------------|-------------|-------------------------------------------------------|-------|-------|---------------------|-------------|--------------------|-------|-------|---------------------|-------------|-------------------------------------|-------|-------|
|                     |             | @LO (dBm)                                             |       |       |                     |             | @LO (dBm)          |       |       |                     |             | @LO (dBm)                           |       |       |
|                     |             |                                                       |       |       |                     |             |                    |       |       |                     |             |                                     |       |       |
| +4                  | +7          | +10                                                   | +4    | +7    | +10                 | +4          | +7                 | +10   |       |                     |             |                                     |       |       |
| 550.0               | 580.0       | 16.13                                                 | 11.51 | 10.12 | 550.0               | 580.0       | 1.92               | 6.34  | 7.93  | 550.0               | 580.0       | -2.19                               | 0.10  | 0.35  |
| 650.0               | 680.0       | 11.14                                                 | 9.75  | 9.23  | 650.0               | 680.0       | 2.93               | 5.90  | 10.89 | 650.0               | 680.0       | 0.46                                | 0.33  | 0.18  |
| 750.0               | 780.0       | 9.70                                                  | 8.36  | 7.82  | 750.0               | 780.0       | 5.62               | 13.99 | 14.72 | 750.0               | 780.0       | 0.51                                | 0.51  | 0.54  |
| 850.0               | 880.0       | 8.34                                                  | 7.23  | 6.72  | 850.0               | 880.0       | 9.21               | 13.93 | 14.53 | 850.0               | 880.0       | 1.00                                | 1.00  | 0.96  |
| 950.0               | 980.0       | 8.36                                                  | 7.18  | 6.44  | 950.0               | 980.0       | 6.58               | 9.70  | 12.08 | 950.0               | 980.0       | 0.78                                | 1.02  | 1.12  |
| 1050.0              | 1080.0      | 8.09                                                  | 7.00  | 6.41  | 1050.0              | 1080.0      | 4.48               | 7.43  | 10.73 | 1050.0              | 1080.0      | 0.83                                | 1.02  | 1.01  |
| 1150.0              | 1180.0      | 7.75                                                  | 7.01  | 6.69  | 1150.0              | 1180.0      | 6.80               | 9.77  | 11.63 | 1150.0              | 1180.0      | 1.25                                | 1.04  | 0.87  |
| 1250.0              | 1280.0      | 7.67                                                  | 7.17  | 6.95  | 1250.0              | 1280.0      | 9.44               | 11.12 | 12.64 | 1250.0              | 1280.0      | 1.30                                | 0.96  | 0.80  |
| 1350.0              | 1380.0      | 7.90                                                  | 7.43  | 7.24  | 1350.0              | 1380.0      | 10.19              | 11.48 | 12.98 | 1350.0              | 1380.0      | 1.21                                | 0.81  | 0.60  |
| 1450.0              | 1480.0      | 8.03                                                  | 7.73  | 7.57  | 1450.0              | 1480.0      | 10.41              | 10.59 | 11.79 | 1450.0              | 1480.0      | 1.34                                | 0.91  | 0.62  |
| 1550.0              | 1580.0      | 8.07                                                  | 7.79  | 7.69  | 1550.0              | 1580.0      | 10.78              | 10.96 | 11.70 | 1550.0              | 1580.0      | 1.21                                | 0.79  | 0.51  |
| 1650.0              | 1680.0      | 7.75                                                  | 7.50  | 7.45  | 1650.0              | 1680.0      | 11.64              | 11.90 | 11.89 | 1650.0              | 1680.0      | 1.15                                | 0.80  | 0.60  |
| 1750.0              | 1780.0      | 7.74                                                  | 7.39  | 7.26  | 1750.0              | 1780.0      | 13.03              | 13.17 | 12.91 | 1750.0              | 1780.0      | 0.76                                | 0.56  | 0.45  |
| 1850.0              | 1880.0      | 7.60                                                  | 7.24  | 7.08  | 1850.0              | 1880.0      | 12.88              | 13.96 | 14.19 | 1850.0              | 1880.0      | 0.74                                | 0.46  | 0.35  |
| 1950.0              | 1980.0      | 8.03                                                  | 7.66  | 7.50  | 1950.0              | 1980.0      | 11.52              | 13.23 | 14.12 | 1950.0              | 1980.0      | 1.05                                | 0.77  | 0.62  |
| 2050.0              | 2080.0      | 7.79                                                  | 7.46  | 7.31  | 2050.0              | 2080.0      | 12.13              | 12.77 | 13.49 | 2050.0              | 2080.0      | 0.69                                | 0.50  | 0.42  |
| 2150.0              | 2180.0      | 7.63                                                  | 7.20  | 7.01  | 2150.0              | 2180.0      | 11.70              | 12.69 | 13.37 | 2150.0              | 2180.0      | 0.93                                | 0.75  | 0.64  |
| 2250.0              | 2280.0      | 8.08                                                  | 7.73  | 7.58  | 2250.0              | 2280.0      | 12.07              | 13.71 | 15.49 | 2250.0              | 2280.0      | 0.67                                | 0.52  | 0.42  |
| 2350.0              | 2380.0      | 8.17                                                  | 7.67  | 7.46  | 2350.0              | 2380.0      | 12.84              | 14.03 | 14.96 | 2350.0              | 2380.0      | 0.60                                | 0.47  | 0.38  |
| 2450.0              | 2480.0      | 8.13                                                  | 7.65  | 7.51  | 2450.0              | 2480.0      | 9.99               | 11.63 | 13.28 | 2450.0              | 2480.0      | 0.71                                | 0.53  | 0.41  |
| 2550.0              | 2580.0      | 9.13                                                  | 8.50  | 8.23  | 2550.0              | 2580.0      | 12.72              | 14.21 | 12.33 | 2550.0              | 2580.0      | -0.09                               | -0.23 | -0.24 |
| 2650.0              | 2680.0      | 8.71                                                  | 8.00  | 7.69  | 2650.0              | 2680.0      | 6.70               | 7.33  | 7.89  | 2650.0              | 2680.0      | 0.26                                | 0.08  | 0.01  |
| 2750.0              | 2780.0      | 8.00                                                  | 7.25  | 7.00  | 2750.0              | 2780.0      | 6.96               | 8.04  | 8.97  | 2750.0              | 2780.0      | 0.64                                | 0.31  | 0.19  |
| 2850.0              | 2880.0      | 8.48                                                  | 7.51  | 7.24  | 2850.0              | 2880.0      | 9.19               | 9.48  | 10.04 | 2850.0              | 2880.0      | 0.49                                | 0.27  | 0.16  |
| 2950.0              | 2980.0      | 8.05                                                  | 7.05  | 6.73  | 2950.0              | 2980.0      | 6.87               | 7.98  | 9.10  | 2950.0              | 2980.0      | 0.76                                | 0.54  | 0.39  |
| 3050.0              | 3080.0      | 7.53                                                  | 6.61  | 6.33  | 3050.0              | 3080.0      | 6.87               | 7.83  | 9.10  | 3050.0              | 3080.0      | 0.97                                | 0.72  | 0.51  |
| 3150.0              | 3180.0      | 7.22                                                  | 6.30  | 6.01  | 3150.0              | 3180.0      | 6.01               | 7.77  | 9.22  | 3150.0              | 3180.0      | 0.95                                | 0.71  | 0.53  |
| 3250.0              | 3280.0      | 6.77                                                  | 5.96  | 5.75  | 3250.0              | 3280.0      | 8.09               | 9.16  | 10.40 | 3250.0              | 3280.0      | 1.03                                | 0.71  | 0.57  |
| 3350.0              | 3380.0      | 6.49                                                  | 5.84  | 5.66  | 3350.0              | 3380.0      | 8.83               | 9.58  | 10.74 | 3350.0              | 3380.0      | 1.05                                | 0.72  | 0.60  |
| 3450.0              | 3480.0      | 6.36                                                  | 5.87  | 5.73  | 3450.0              | 3480.0      | 9.52               | 9.94  | 10.87 | 3450.0              | 3480.0      | 0.98                                | 0.70  | 0.62  |
| 3550.0              | 3580.0      | 6.44                                                  | 6.06  | 5.97  | 3550.0              | 3580.0      | 10.02              | 10.49 | 10.99 | 3550.0              | 3580.0      | 0.92                                | 0.70  | 0.73  |
| 3650.0              | 3680.0      | 6.78                                                  | 6.57  | 6.68  | 3650.0              | 3680.0      | 11.52              | 11.46 | 10.31 | 3650.0              | 3680.0      | 0.85                                | 0.70  | 0.83  |
| 3730.0              | 3760.0      | 7.55                                                  | 7.42  | 7.74  | 3730.0              | 3760.0      | 12.93              | 12.89 | 12.55 | 3730.0              | 3760.0      | 0.76                                | 0.62  | 0.76  |
| 3830.0              | 3860.0      | 8.34                                                  | 7.69  | 7.27  | 3830.0              | 3860.0      | 10.74              | 12.76 | 8.32  | 3830.0              | 3860.0      | 0.57                                | 0.78  | 1.39  |
| 3910.0              | 3940.0      | 7.69                                                  | 7.20  | 6.94  | 3910.0              | 3940.0      | 9.84               | 11.45 | 9.96  | 3910.0              | 3940.0      | 0.67                                | 0.76  | 1.15  |
| 4010.0              | 4040.0      | 7.27                                                  | 6.87  | 6.72  | 4010.0              | 4040.0      | 8.85               | 9.93  | 9.69  | 4010.0              | 4040.0      | 0.82                                | 0.82  | 1.03  |
| 4090.0              | 4120.0      | 7.14                                                  | 6.79  | 6.71  | 4090.0              | 4120.0      | 8.87               | 10.26 | 9.83  | 4090.0              | 4120.0      | 0.70                                | 0.67  | 0.81  |
| 4190.0              | 4220.0      | 7.35                                                  | 6.96  | 6.87  | 4190.0              | 4220.0      | 9.05               | 10.30 | 10.71 | 4190.0              | 4220.0      | 0.55                                | 0.48  | 0.54  |
| 4270.0              | 4300.0      | 7.76                                                  | 7.31  | 7.21  | 4270.0              | 4300.0      | 9.43               | 10.47 | 11.54 | 4270.0              | 4300.0      | 0.51                                | 0.41  | 0.44  |
| 4370.0              | 4400.0      | 8.14                                                  | 7.73  | 7.69  | 4370.0              | 4400.0      | 10.49              | 11.20 | 12.31 | 4370.0              | 4400.0      | 0.53                                | 0.42  | 0.41  |

# Frequency Mixer

MBA-EE7756/7

## Typical Performance Data

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=1650MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=789.9MHz<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)                                                        |
|                      |             | +7                                                             |                      |             | +7                                                              |                      |             | +7                                                               |
| 880.0                | 770.0       | 10.82                                                          | 10.1                 | 800.0       | 7.78                                                            | 1010.1               | 1500.0      | 10.66                                                            |
| 842.2                | 807.8       | 9.70                                                           | 30.1                 | 820.0       | 7.85                                                            | 990.1                | 1520.0      | 10.43                                                            |
| 804.3                | 845.7       | 9.09                                                           | 50.1                 | 840.0       | 7.92                                                            | 970.1                | 1540.0      | 10.10                                                            |
| 766.5                | 883.5       | 9.03                                                           | 70.1                 | 860.0       | 7.86                                                            | 950.1                | 1560.0      | 9.85                                                             |
| 728.7                | 921.3       | 9.42                                                           | 90.1                 | 880.0       | 7.88                                                            | 930.1                | 1580.0      | 9.67                                                             |
| 690.9                | 959.1       | 9.46                                                           | 110.1                | 900.0       | 7.90                                                            | 910.1                | 1600.0      | 9.52                                                             |
| 653.0                | 997.0       | 9.52                                                           | 130.1                | 920.0       | 7.97                                                            | 890.1                | 1620.0      | 9.33                                                             |
| 615.2                | 1034.8      | 9.50                                                           | 150.1                | 940.0       | 8.02                                                            | 870.1                | 1640.0      | 9.20                                                             |
| 577.4                | 1072.6      | 9.11                                                           | 170.1                | 960.0       | 8.07                                                            | 850.1                | 1660.0      | 9.13                                                             |
| 520.7                | 1129.3      | 8.88                                                           | 190.1                | 980.0       | 8.12                                                            | 830.1                | 1680.0      | 9.04                                                             |
| 482.8                | 1167.2      | 8.90                                                           | 210.1                | 1000.0      | 8.37                                                            | 810.1                | 1700.0      | 9.02                                                             |
| 426.1                | 1223.9      | 8.74                                                           | 230.1                | 1020.0      | 8.65                                                            | 790.1                | 1720.0      | 8.91                                                             |
| 388.3                | 1261.7      | 8.57                                                           | 250.1                | 1040.0      | 8.51                                                            | 770.1                | 1740.0      | 8.78                                                             |
| 331.5                | 1318.5      | 8.37                                                           | 270.1                | 1060.0      | 8.60                                                            | 750.1                | 1760.0      | 8.57                                                             |
| 293.7                | 1356.3      | 8.19                                                           | 290.1                | 1080.0      | 8.41                                                            | 730.1                | 1780.0      | 8.48                                                             |
| 237.0                | 1413.0      | 8.05                                                           | 310.1                | 1100.0      | 8.16                                                            | 710.1                | 1800.0      | 8.39                                                             |
| 199.1                | 1450.9      | 7.96                                                           | 330.1                | 1120.0      | 8.24                                                            | 690.1                | 1820.0      | 8.23                                                             |
| 142.4                | 1507.6      | 7.82                                                           | 350.1                | 1140.0      | 8.10                                                            | 670.1                | 1840.0      | 8.13                                                             |
| 104.6                | 1545.4      | 7.78                                                           | 390.1                | 1180.0      | 8.15                                                            | 630.1                | 1880.0      | 8.12                                                             |
| 47.8                 | 1602.2      | 7.66                                                           | 410.1                | 1200.0      | 8.07                                                            | 610.1                | 1900.0      | 8.07                                                             |
| 10.0                 | 1640.0      | 7.60                                                           | 450.1                | 1240.0      | 8.17                                                            | 570.1                | 1940.0      | 7.76                                                             |
| 52.1                 | 1702.1      | 7.49                                                           | 470.1                | 1260.0      | 8.16                                                            | 550.1                | 1960.0      | 7.70                                                             |
| 94.3                 | 1744.3      | 7.51                                                           | 510.1                | 1300.0      | 8.26                                                            | 510.1                | 2000.0      | 7.67                                                             |
| 157.4                | 1807.4      | 7.36                                                           | 530.1                | 1320.0      | 8.27                                                            | 490.1                | 2020.0      | 7.63                                                             |
| 199.6                | 1849.6      | 7.04                                                           | 570.1                | 1360.0      | 8.26                                                            | 450.1                | 2060.0      | 7.74                                                             |
| 262.8                | 1912.8      | 7.16                                                           | 590.1                | 1380.0      | 8.26                                                            | 430.1                | 2080.0      | 7.82                                                             |
| 304.9                | 1954.9      | 7.13                                                           | 630.1                | 1420.0      | 8.52                                                            | 390.1                | 2120.0      | 7.76                                                             |
| 368.1                | 2018.1      | 6.95                                                           | 650.1                | 1440.0      | 8.50                                                            | 370.1                | 2140.0      | 7.61                                                             |
| 410.2                | 2060.2      | 6.83                                                           | 690.1                | 1480.0      | 8.57                                                            | 330.1                | 2180.0      | 7.55                                                             |
| 473.4                | 2123.4      | 7.19                                                           | 710.1                | 1500.0      | 8.69                                                            | 310.1                | 2200.0      | 7.60                                                             |
| 515.5                | 2165.5      | 7.64                                                           | 750.1                | 1540.0      | 8.89                                                            | 270.1                | 2240.0      | 7.62                                                             |
| 578.7                | 2228.7      | 8.09                                                           | 770.1                | 1560.0      | 8.90                                                            | 250.1                | 2260.0      | 7.60                                                             |
| 620.9                | 2270.9      | 8.45                                                           | 810.1                | 1600.0      | 8.91                                                            | 210.1                | 2300.0      | 7.53                                                             |
| 684.0                | 2334.0      | 8.99                                                           | 830.1                | 1620.0      | 9.01                                                            | 190.1                | 2320.0      | 7.43                                                             |
| 726.2                | 2376.2      | 9.41                                                           | 870.1                | 1660.0      | 9.18                                                            | 150.1                | 2360.0      | 7.38                                                             |
| 789.4                | 2439.4      | 9.48                                                           | 890.1                | 1680.0      | 9.35                                                            | 130.1                | 2380.0      | 7.49                                                             |
| 831.5                | 2481.5      | 9.56                                                           | 930.1                | 1720.0      | 9.70                                                            | 90.1                 | 2420.0      | 7.63                                                             |
| 894.7                | 2544.7      | 9.81                                                           | 950.1                | 1740.0      | 9.73                                                            | 70.1                 | 2440.0      | 7.67                                                             |
| 936.8                | 2586.8      | 10.09                                                          | 990.1                | 1780.0      | 10.02                                                           | 30.1                 | 2480.0      | 7.84                                                             |
| 1000.0               | 2650.0      | 10.36                                                          | 1010.1               | 1800.0      | 10.27                                                           | 10.1                 | 2500.0      | 7.95                                                             |

REV. X3

MBA-EE7756/7

101012

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IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant

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## Typical Performance Data

| LO<br>(MHz) | LO-RF ISOLATION<br>(dB) |       |       | LO-IF ISOLATION<br>(dB) |       |       |
|-------------|-------------------------|-------|-------|-------------------------|-------|-------|
|             | @LO (dBm)               |       |       | @LO (dBm)               |       |       |
|             | +4                      | +7    | +10   | +4                      | +7    | +10   |
| 580.0       | 32.21                   | 36.00 | 36.16 | 20.29                   | 20.65 | 21.01 |
| 680.0       | 30.70                   | 31.45 | 30.55 | 20.95                   | 19.95 | 20.06 |
| 780.0       | 26.96                   | 27.87 | 27.07 | 20.60                   | 19.10 | 19.05 |
| 880.0       | 25.70                   | 25.70 | 24.76 | 20.29                   | 19.10 | 18.65 |
| 980.0       | 25.65                   | 24.73 | 23.53 | 19.54                   | 19.11 | 18.34 |
| 1080.0      | 26.59                   | 24.98 | 23.83 | 17.72                   | 18.40 | 18.47 |
| 1180.0      | 28.49                   | 26.45 | 24.92 | 15.36                   | 16.77 | 18.02 |
| 1280.0      | 30.06                   | 27.59 | 25.84 | 13.43                   | 15.15 | 16.99 |
| 1380.0      | 31.29                   | 28.76 | 27.34 | 12.15                   | 13.89 | 15.89 |
| 1480.0      | 30.52                   | 29.07 | 28.09 | 11.41                   | 13.15 | 14.89 |
| 1580.0      | 30.34                   | 29.89 | 29.67 | 10.72                   | 12.30 | 13.81 |
| 1680.0      | 28.97                   | 29.07 | 29.56 | 10.40                   | 11.89 | 13.06 |
| 1780.0      | 28.63                   | 29.28 | 29.85 | 10.50                   | 11.78 | 12.68 |
| 1880.0      | 29.50                   | 30.36 | 31.19 | 10.92                   | 11.88 | 12.37 |
| 1980.0      | 30.67                   | 31.62 | 32.52 | 11.43                   | 11.91 | 11.98 |
| 2080.0      | 33.12                   | 33.92 | 34.40 | 12.27                   | 12.26 | 12.01 |
| 2180.0      | 36.01                   | 36.53 | 36.75 | 13.01                   | 12.38 | 11.73 |
| 2280.0      | 46.22                   | 43.76 | 40.84 | 13.86                   | 12.68 | 11.67 |
| 2380.0      | 45.27                   | 53.72 | 45.40 | 14.91                   | 13.10 | 11.83 |
| 2480.0      | 34.75                   | 40.15 | 50.29 | 15.49                   | 13.26 | 11.83 |
| 2580.0      | 30.10                   | 33.42 | 38.47 | 15.86                   | 13.66 | 11.97 |
| 2680.0      | 30.40                   | 33.71 | 38.50 | 15.44                   | 13.80 | 12.33 |
| 2780.0      | 31.73                   | 37.37 | 49.13 | 15.34                   | 13.92 | 12.60 |
| 2880.0      | 29.14                   | 32.97 | 40.43 | 14.79                   | 13.88 | 12.67 |
| 2980.0      | 29.75                   | 34.19 | 48.08 | 14.26                   | 13.96 | 13.25 |
| 3080.0      | 29.96                   | 32.93 | 43.82 | 13.74                   | 14.07 | 13.99 |
| 3180.0      | 33.69                   | 41.14 | 43.91 | 13.37                   | 14.19 | 14.81 |
| 3280.0      | 37.20                   | 49.55 | 34.25 | 12.90                   | 13.94 | 15.23 |
| 3380.0      | 47.51                   | 36.33 | 30.02 | 12.75                   | 14.04 | 15.67 |
| 3480.0      | 40.74                   | 30.75 | 27.04 | 12.73                   | 14.19 | 15.82 |
| 3580.0      | 30.91                   | 26.19 | 23.96 | 12.75                   | 14.06 | 15.35 |
| 3680.0      | 25.09                   | 22.64 | 21.32 | 12.50                   | 13.41 | 14.13 |
| 3760.0      | 22.30                   | 20.95 | 20.96 | 11.96                   | 12.39 | 12.91 |
| 3860.0      | 20.21                   | 19.65 | 19.18 | 11.28                   | 11.90 | 12.49 |
| 3940.0      | 20.34                   | 19.42 | 18.33 | 11.97                   | 12.97 | 13.82 |
| 4040.0      | 23.07                   | 21.60 | 20.16 | 13.75                   | 14.83 | 15.71 |
| 4120.0      | 25.34                   | 23.48 | 21.98 | 15.02                   | 15.96 | 16.75 |
| 4220.0      | 27.47                   | 25.30 | 23.47 | 16.81                   | 17.24 | 17.57 |
| 4300.0      | 28.72                   | 26.76 | 24.66 | 18.21                   | 18.34 | 18.21 |
| 4400.0      | 29.85                   | 28.44 | 26.85 | 19.95                   | 20.06 | 20.24 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +4                      | +7    | +10   |
| 550.0               | 580.0       | 24.26                   | 19.94 | 15.58 |
| 650.0               | 680.0       | 19.68                   | 15.32 | 13.33 |
| 750.0               | 780.0       | 17.24                   | 14.84 | 13.43 |
| 850.0               | 880.0       | 17.75                   | 16.12 | 15.18 |
| 950.0               | 980.0       | 19.83                   | 18.34 | 17.46 |
| 1050.0              | 1080.0      | 22.08                   | 21.52 | 20.99 |
| 1150.0              | 1180.0      | 22.72                   | 23.78 | 24.32 |
| 1250.0              | 1280.0      | 23.32                   | 25.08 | 26.36 |
| 1350.0              | 1380.0      | 23.57                   | 26.07 | 27.60 |
| 1450.0              | 1480.0      | 23.08                   | 25.29 | 26.86 |
| 1550.0              | 1580.0      | 24.66                   | 26.75 | 27.88 |
| 1650.0              | 1680.0      | 26.18                   | 27.81 | 28.72 |
| 1750.0              | 1780.0      | 26.63                   | 27.74 | 28.41 |
| 1850.0              | 1880.0      | 25.97                   | 26.16 | 26.20 |
| 1950.0              | 1980.0      | 25.80                   | 25.81 | 25.73 |
| 2050.0              | 2080.0      | 26.11                   | 26.15 | 26.32 |
| 2150.0              | 2180.0      | 25.84                   | 25.66 | 25.56 |
| 2250.0              | 2280.0      | 25.15                   | 25.02 | 24.97 |
| 2350.0              | 2380.0      | 25.39                   | 25.37 | 25.41 |
| 2450.0              | 2480.0      | 25.11                   | 25.22 | 25.31 |
| 2550.0              | 2580.0      | 24.55                   | 24.81 | 24.82 |
| 2650.0              | 2680.0      | 25.46                   | 25.76 | 25.92 |
| 2750.0              | 2780.0      | 26.49                   | 26.87 | 27.01 |
| 2850.0              | 2880.0      | 26.10                   | 26.28 | 26.38 |
| 2950.0              | 2980.0      | 27.53                   | 27.45 | 27.22 |
| 3050.0              | 3080.0      | 28.14                   | 27.60 | 26.91 |
| 3150.0              | 3180.0      | 28.76                   | 27.97 | 27.01 |
| 3250.0              | 3280.0      | 28.98                   | 27.71 | 26.66 |
| 3350.0              | 3380.0      | 28.56                   | 27.18 | 26.27 |
| 3450.0              | 3480.0      | 27.12                   | 25.93 | 25.20 |
| 3550.0              | 3580.0      | 24.73                   | 23.87 | 23.30 |
| 3650.0              | 3680.0      | 21.64                   | 21.04 | 20.45 |
| 3730.0              | 3760.0      | 19.16                   | 18.84 | 18.48 |
| 3830.0              | 3860.0      | 16.12                   | 16.43 | 16.91 |
| 3910.0              | 3940.0      | 15.45                   | 15.75 | 16.12 |
| 4010.0              | 4040.0      | 16.34                   | 16.25 | 16.28 |
| 4090.0              | 4120.0      | 17.36                   | 16.83 | 16.46 |
| 4190.0              | 4220.0      | 17.30                   | 16.04 | 15.20 |
| 4270.0              | 4300.0      | 17.36                   | 15.53 | 14.32 |
| 4370.0              | 4400.0      | 17.86                   | 15.73 | 14.28 |

# Frequency Mixer

MBA-EE7756/7

## 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)                      |      |      |
|                     |             | +4              | +7   | +10  |             | +4              | +7    | +10  |                      | +4                             | +7   | +10  |
| 550.0               | 580.0       | 6.91            | 5.41 | 4.89 | 580.0       | 15.39           | 12.44 | 8.55 | 10.0                 | 1.77                           | 2.26 | 2.63 |
| 650.0               | 680.0       | 5.07            | 4.68 | 4.38 | 680.0       | 9.33            | 6.09  | 4.92 | 30.0                 | 1.73                           | 2.18 | 2.52 |
| 750.0               | 780.0       | 4.45            | 3.90 | 3.54 | 780.0       | 4.39            | 3.24  | 3.19 | 50.0                 | 1.71                           | 2.14 | 2.46 |
| 850.0               | 880.0       | 3.72            | 3.27 | 2.96 | 880.0       | 2.58            | 2.15  | 2.37 | 70.0                 | 1.71                           | 2.13 | 2.44 |
| 950.0               | 980.0       | 3.59            | 3.23 | 2.95 | 980.0       | 2.14            | 1.77  | 1.97 | 90.0                 | 1.71                           | 2.13 | 2.43 |
| 1050.0              | 1080.0      | 3.54            | 3.18 | 2.92 | 1080.0      | 2.29            | 1.80  | 1.86 | 110.0                | 1.71                           | 2.10 | 2.39 |
| 1150.0              | 1180.0      | 3.54            | 3.28 | 3.13 | 1180.0      | 2.64            | 1.95  | 1.90 | 130.0                | 1.70                           | 2.07 | 2.34 |
| 1250.0              | 1280.0      | 3.70            | 3.52 | 3.38 | 1280.0      | 2.75            | 1.99  | 1.99 | 150.0                | 1.71                           | 2.06 | 2.32 |
| 1350.0              | 1380.0      | 3.92            | 3.76 | 3.64 | 1380.0      | 2.61            | 2.03  | 2.17 | 170.0                | 1.72                           | 2.05 | 2.30 |
| 1450.0              | 1480.0      | 3.91            | 3.82 | 3.76 | 1480.0      | 2.47            | 2.11  | 2.37 | 190.0                | 1.71                           | 2.03 | 2.26 |
| 1550.0              | 1580.0      | 3.79            | 3.65 | 3.60 | 1580.0      | 2.40            | 2.24  | 2.57 | 210.0                | 1.70                           | 1.99 | 2.21 |
| 1650.0              | 1680.0      | 3.53            | 3.25 | 3.11 | 1680.0      | 2.11            | 2.13  | 2.59 | 230.0                | 1.69                           | 1.95 | 2.15 |
| 1750.0              | 1780.0      | 3.67            | 3.30 | 3.06 | 1780.0      | 1.73            | 1.99  | 2.58 | 250.0                | 1.70                           | 1.92 | 2.11 |
| 1850.0              | 1880.0      | 3.31            | 3.02 | 2.78 | 1880.0      | 1.47            | 1.93  | 2.58 | 270.0                | 1.69                           | 1.89 | 2.06 |
| 1950.0              | 1980.0      | 3.34            | 3.13 | 2.98 | 1980.0      | 1.37            | 1.91  | 2.57 | 290.0                | 1.69                           | 1.85 | 2.00 |
| 2050.0              | 2080.0      | 2.95            | 2.73 | 2.56 | 2080.0      | 1.44            | 1.95  | 2.57 | 310.0                | 1.67                           | 1.79 | 1.92 |
| 2150.0              | 2180.0      | 2.72            | 2.50 | 2.33 | 2180.0      | 1.60            | 1.99  | 2.54 | 330.0                | 1.70                           | 1.76 | 1.87 |
| 2250.0              | 2280.0      | 2.72            | 2.59 | 2.49 | 2280.0      | 1.83            | 2.01  | 2.45 | 350.0                | 1.73                           | 1.74 | 1.83 |
| 2350.0              | 2380.0      | 2.71            | 2.54 | 2.41 | 2380.0      | 2.18            | 2.13  | 2.41 | 370.0                | 1.76                           | 1.72 | 1.78 |
| 2450.0              | 2480.0      | 2.42            | 2.24 | 2.14 | 2480.0      | 2.56            | 2.19  | 2.28 | 390.0                | 1.77                           | 1.69 | 1.72 |
| 2550.0              | 2580.0      | 3.14            | 2.83 | 2.65 | 2580.0      | 3.06            | 2.35  | 2.22 | 410.0                | 1.82                           | 1.68 | 1.67 |
| 2650.0              | 2680.0      | 3.90            | 3.39 | 3.10 | 2680.0      | 3.50            | 2.50  | 2.14 | 430.0                | 1.89                           | 1.71 | 1.68 |
| 2750.0              | 2780.0      | 3.67            | 3.07 | 2.77 | 2780.0      | 3.94            | 2.53  | 1.96 | 450.0                | 1.97                           | 1.75 | 1.69 |
| 2850.0              | 2880.0      | 4.01            | 3.31 | 3.01 | 2880.0      | 4.40            | 2.67  | 1.86 | 470.0                | 2.02                           | 1.77 | 1.68 |
| 2950.0              | 2980.0      | 3.78            | 3.13 | 2.80 | 2980.0      | 4.60            | 2.67  | 1.72 | 490.0                | 2.10                           | 1.81 | 1.70 |
| 3050.0              | 3080.0      | 3.06            | 2.52 | 2.25 | 3080.0      | 4.68            | 2.65  | 1.65 | 500.0                | 2.15                           | 1.85 | 1.72 |
| 3150.0              | 3180.0      | 2.46            | 2.06 | 1.83 | 3180.0      | 4.54            | 2.61  | 1.74 | 520.0                | 2.25                           | 1.92 | 1.78 |
| 3250.0              | 3280.0      | 1.91            | 1.59 | 1.43 | 3280.0      | 4.06            | 2.42  | 1.84 | 530.0                | 2.30                           | 1.96 | 1.81 |
| 3350.0              | 3380.0      | 1.60            | 1.34 | 1.21 | 3380.0      | 3.24            | 2.17  | 1.97 | 550.0                | 2.39                           | 2.02 | 1.86 |
| 3450.0              | 3480.0      | 1.49            | 1.31 | 1.22 | 3480.0      | 2.55            | 2.03  | 2.14 | 560.0                | 2.43                           | 2.05 | 1.88 |
| 3550.0              | 3580.0      | 1.59            | 1.45 | 1.40 | 3580.0      | 2.04            | 1.92  | 2.22 | 580.0                | 2.53                           | 2.14 | 1.95 |
| 3650.0              | 3680.0      | 1.67            | 1.56 | 1.52 | 3680.0      | 1.66            | 1.78  | 2.15 | 590.0                | 2.59                           | 2.19 | 2.00 |
| 3730.0              | 3760.0      | 1.63            | 1.48 | 1.43 | 3760.0      | 1.38            | 1.57  | 1.89 | 610.0                | 2.71                           | 2.29 | 2.08 |
| 3830.0              | 3860.0      | 1.83            | 1.74 | 1.67 | 3860.0      | 1.02            | 1.34  | 1.68 | 620.0                | 2.76                           | 2.33 | 2.11 |
| 3910.0              | 3940.0      | 1.87            | 1.76 | 1.65 | 3940.0      | 1.31            | 1.54  | 1.91 | 640.0                | 2.87                           | 2.42 | 2.19 |
| 4010.0              | 4040.0      | 2.22            | 2.03 | 1.89 | 4040.0      | 1.68            | 1.81  | 2.15 | 650.0                | 2.94                           | 2.47 | 2.23 |
| 4090.0              | 4120.0      | 2.30            | 2.10 | 1.96 | 4120.0      | 1.96            | 1.92  | 2.20 | 670.0                | 3.06                           | 2.57 | 2.31 |
| 4190.0              | 4220.0      | 2.36            | 2.11 | 1.96 | 4220.0      | 2.43            | 2.14  | 2.22 | 680.0                | 3.16                           | 2.64 | 2.38 |
| 4270.0              | 4300.0      | 2.47            | 2.20 | 2.04 | 4300.0      | 2.78            | 2.21  | 2.10 | 700.0                | 3.29                           | 2.75 | 2.47 |
| 4370.0              | 4400.0      | 2.58            | 2.34 | 2.20 | 4400.0      | 3.19            | 2.26  | 1.89 | 710.0                | 3.35                           | 2.80 | 2.51 |

## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | +17 | 47  | 18  | 33  | 11  | 36  | 20  | 45  | 33  | 57  |
| 1  | -      | 21     | +0  | 27  | 34  | 20  | 38  | 42  | 49  | 47  | 55  | 57  |
| 2  | 85     | 48     | 46  | 58  | 50  | 68  | 63  | 50  | 57  | 65  | 54  | 60  |
| 3  | >90    | 58     | >69 | 62  | 60  | 65  | >69 | 62  | >69 | >69 | >69 | >69 |
| 4  | >90    | >69    | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 |
| 5  | >90    | >69    | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 |
| 6  | >90    | >69    | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 |
| 7  | >90    | >69    | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 |
| 8  | >90    | >69    | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 |
| 9  | >90    | >69    | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 |
| 10 | >90    | >69    | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 | >69 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 1650 MHz; -14.00 dBm.  
LO IN: 1680 MHz; +7.00 dBm  
IF OUT: 30 MHz; -21.5 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | +7  | 45  | 27  | 33  | 23  | 47  | 34  | 52  | 59  | 67  |
| 1  | -      | 21     | +0  | 27  | 34  | 23  | 40  | 42  | 53  | 60  | 65  | 55  |
| 2  | 65     | 39     | 36  | 47  | 39  | 67  | 51  | 51  | 50  | 63  | 52  | 64  |
| 3  | >90    | 41     | 61  | 46  | 40  | 50  | 64  | 45  | 59  | 63  | 65  | 60  |
| 4  | >90    | 57     | 64  | 61  | 64  | 61  | 64  | 67  | 66  | 54  | >78 | 72  |
| 5  | >90    | 69     | 75  | 54  | >78 | 62  | 65  | 68  | 77  | 75  | 75  | 68  |
| 6  | >90    | >78    | >78 | 71  | 78  | >78 | 75  | 74  | 72  | >78 | 74  | 68  |
| 7  | >90    | >78    | >78 | >78 | >78 | 73  | >78 | >78 | 70  | >78 | >78 | >78 |
| 8  | >90    | >78    | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 |
| 9  | >90    | >78    | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 |
| 10 | >90    | >78    | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 1650 MHz; -4.00 dBm.  
LO IN: 1680 MHz; +7.00 dBm  
IF OUT: 30 MHz; -11.61 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.