

# Frequency Mixer

# MACA-ED10457/10

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>IF FIXED<br>@IF(OUT)=30MHz<br>(dB) |       |      |
|---------------------|-------------|-------------------------------------------------------|-------|------|
|                     |             | @LO (dBm)                                             |       |      |
|                     |             | -3                                                    | 0     | +3   |
| 1540.1              | 1510.1      | 8.10                                                  | 6.93  | 6.44 |
| 1660.1              | 1630.1      | 7.87                                                  | 7.28  | 7.00 |
| 1780.1              | 1750.1      | 7.66                                                  | 7.00  | 6.61 |
| 1900.1              | 1870.1      | 7.12                                                  | 6.43  | 6.07 |
| 2020.1              | 1990.1      | 6.99                                                  | 6.28  | 5.98 |
| 2140.1              | 2110.1      | 7.36                                                  | 6.56  | 6.13 |
| 2260.1              | 2230.1      | 6.86                                                  | 6.19  | 5.88 |
| 2380.1              | 2350.1      | 6.25                                                  | 5.80  | 5.64 |
| 2500.1              | 2470.1      | 6.10                                                  | 5.73  | 5.65 |
| 2620.1              | 2590.1      | 6.18                                                  | 5.92  | 5.83 |
| 2740.1              | 2710.1      | 7.20                                                  | 6.78  | 6.58 |
| 2860.1              | 2830.1      | 7.59                                                  | 7.10  | 6.86 |
| 2980.1              | 2950.1      | 6.93                                                  | 6.60  | 6.44 |
| 3100.1              | 3070.1      | 6.74                                                  | 6.43  | 6.32 |
| 3220.1              | 3190.1      | 7.66                                                  | 7.17  | 6.95 |
| 3340.1              | 3310.1      | 7.43                                                  | 6.99  | 6.80 |
| 3460.1              | 3430.1      | 8.16                                                  | 7.38  | 7.07 |
| 3580.1              | 3550.1      | 8.83                                                  | 8.05  | 7.67 |
| 3700.1              | 3670.1      | 8.70                                                  | 8.08  | 7.78 |
| 3820.1              | 3790.1      | 8.26                                                  | 7.78  | 7.52 |
| 3940.1              | 3910.1      | 7.64                                                  | 7.29  | 7.10 |
| 4060.1              | 4030.1      | 7.04                                                  | 6.71  | 6.58 |
| 4180.1              | 4150.1      | 6.51                                                  | 6.33  | 6.28 |
| 4300.1              | 4270.1      | 6.07                                                  | 5.94  | 5.90 |
| 4420.1              | 4390.1      | 5.95                                                  | 5.83  | 5.81 |
| 4540.1              | 4510.1      | 6.05                                                  | 6.00  | 6.01 |
| 4660.1              | 4630.1      | 7.07                                                  | 6.90  | 6.88 |
| 4780.1              | 4750.1      | 7.59                                                  | 6.99  | 6.85 |
| 4900.1              | 4870.1      | 7.12                                                  | 6.62  | 6.51 |
| 5040.1              | 5010.1      | 7.08                                                  | 6.48  | 6.28 |
| 5160.1              | 5130.1      | 6.97                                                  | 6.33  | 6.06 |
| 5300.1              | 5270.1      | 7.07                                                  | 6.38  | 6.09 |
| 5420.1              | 5390.1      | 7.33                                                  | 6.44  | 6.03 |
| 5560.1              | 5530.1      | 7.49                                                  | 6.60  | 6.17 |
| 5680.1              | 5650.1      | 7.89                                                  | 6.99  | 6.48 |
| 5820.1              | 5790.1      | 8.06                                                  | 7.03  | 6.53 |
| 5940.1              | 5910.1      | 8.54                                                  | 7.18  | 6.64 |
| 6080.1              | 6050.1      | 9.36                                                  | 7.43  | 6.82 |
| 6200.1              | 6170.1      | 11.46                                                 | 7.98  | 7.02 |
| 6340.1              | 6310.1      | 19.54                                                 | 12.58 | 8.82 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IP3 INPUT<br>(dBm) |       |       |
|---------------------|-------------|--------------------|-------|-------|
|                     |             | @LO (dBm)          |       |       |
|                     |             | -3                 | 0     | +3    |
| 1540.1              | 1510.1      | 17.30              | 17.74 | 17.53 |
| 1660.1              | 1630.1      | 15.35              | 17.28 | 18.11 |
| 1780.1              | 1750.1      | 17.57              | 18.29 | 20.20 |
| 1900.1              | 1870.1      | 19.34              | 24.15 | 20.96 |
| 2020.1              | 1990.1      | 15.31              | 19.93 | 22.33 |
| 2140.1              | 2110.1      | 15.81              | 17.65 | 17.90 |
| 2260.1              | 2230.1      | 17.88              | 20.84 | 23.09 |
| 2380.1              | 2350.1      | 18.67              | 18.01 | 18.00 |
| 2500.1              | 2470.1      | 16.07              | 16.65 | 19.01 |
| 2620.1              | 2590.1      | 18.00              | 23.63 | 27.44 |
| 2740.1              | 2710.1      | 21.33              | 21.06 | 21.66 |
| 2860.1              | 2830.1      | 24.53              | 24.03 | 23.29 |
| 2980.1              | 2950.1      | 20.84              | 21.37 | 21.29 |
| 3100.1              | 3070.1      | 20.04              | 20.77 | 21.22 |
| 3220.1              | 3190.1      | 20.84              | 21.76 | 23.11 |
| 3340.1              | 3310.1      | 21.55              | 23.44 | 23.32 |
| 3460.1              | 3430.1      | 24.19              | 22.70 | 20.89 |
| 3580.1              | 3550.1      | 19.22              | 22.39 | 23.62 |
| 3700.1              | 3670.1      | 17.69              | 19.45 | 20.28 |
| 3820.1              | 3790.1      | 16.78              | 18.08 | 18.79 |
| 3940.1              | 3910.1      | 15.78              | 15.98 | 16.33 |
| 4060.1              | 4030.1      | 16.06              | 17.52 | 17.80 |
| 4180.1              | 4150.1      | 17.47              | 17.86 | 17.64 |
| 4300.1              | 4270.1      | 16.22              | 17.14 | 17.23 |
| 4420.1              | 4390.1      | 15.67              | 17.50 | 18.21 |
| 4540.1              | 4510.1      | 17.09              | 18.90 | 20.00 |
| 4660.1              | 4630.1      | 17.07              | 28.06 | 26.02 |
| 4780.1              | 4750.1      | 18.35              | 20.49 | 20.05 |
| 4900.1              | 4870.1      | 15.22              | 15.92 | 16.43 |
| 5040.1              | 5010.1      | 15.95              | 16.32 | 16.60 |
| 5160.1              | 5130.1      | 17.84              | 17.83 | 17.98 |
| 5300.1              | 5270.1      | 21.82              | 19.89 | 18.62 |
| 5420.1              | 5390.1      | 20.20              | 20.97 | 19.88 |
| 5560.1              | 5530.1      | 21.53              | 21.35 | 22.32 |
| 5680.1              | 5650.1      | 23.88              | 22.65 | 21.08 |
| 5820.1              | 5790.1      | 21.20              | 21.66 | 21.50 |
| 5940.1              | 5910.1      | 20.32              | 20.26 | 20.66 |
| 6080.1              | 6050.1      | 16.83              | 18.58 | 19.94 |
| 6200.1              | 6170.1      | 11.32              | 16.69 | 18.71 |
| 6340.1              | 6310.1      | 3.92               | 10.52 | 18.64 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | COMPRESSION<br>@RF IN=+10dBm<br>(dB) |       |      |
|---------------------|-------------|--------------------------------------|-------|------|
|                     |             | @LO (dBm)                            |       |      |
|                     |             | -3                                   | 0     | +3   |
| 1540.1              | 1510.1      | 2.36                                 | 2.20  | 2.06 |
| 1660.1              | 1630.1      | 1.77                                 | 1.51  | 1.34 |
| 1780.1              | 1750.1      | 1.31                                 | 1.10  | 1.01 |
| 1900.1              | 1870.1      | 1.54                                 | 1.26  | 1.12 |
| 2020.1              | 1990.1      | 1.91                                 | 1.53  | 1.29 |
| 2140.1              | 2110.1      | 2.39                                 | 1.74  | 1.51 |
| 2260.1              | 2230.1      | 2.09                                 | 1.36  | 0.99 |
| 2380.1              | 2350.1      | 1.41                                 | 0.99  | 0.77 |
| 2500.1              | 2470.1      | 1.17                                 | 0.77  | 0.56 |
| 2620.1              | 2590.1      | 1.14                                 | 0.74  | 0.62 |
| 2740.1              | 2710.1      | 1.33                                 | 1.06  | 0.86 |
| 2860.1              | 2830.1      | 0.94                                 | 0.71  | 0.59 |
| 2980.1              | 2950.1      | 0.89                                 | 0.66  | 0.57 |
| 3100.1              | 3070.1      | 0.64                                 | 0.36  | 0.25 |
| 3220.1              | 3190.1      | 0.67                                 | 0.41  | 0.29 |
| 3340.1              | 3310.1      | 0.84                                 | 0.49  | 0.35 |
| 3460.1              | 3430.1      | 0.64                                 | 0.60  | 0.54 |
| 3580.1              | 3550.1      | 0.35                                 | 0.43  | 0.46 |
| 3700.1              | 3670.1      | 0.29                                 | 0.36  | 0.39 |
| 3820.1              | 3790.1      | 0.44                                 | 0.43  | 0.46 |
| 3940.1              | 3910.1      | 0.79                                 | 0.70  | 0.68 |
| 4060.1              | 4030.1      | 0.98                                 | 0.80  | 0.70 |
| 4180.1              | 4150.1      | 0.94                                 | 0.72  | 0.65 |
| 4300.1              | 4270.1      | 0.97                                 | 0.71  | 0.65 |
| 4420.1              | 4390.1      | 0.78                                 | 0.47  | 0.39 |
| 4540.1              | 4510.1      | 0.65                                 | 0.31  | 0.21 |
| 4660.1              | 4630.1      | 0.82                                 | 0.63  | 0.52 |
| 4780.1              | 4750.1      | 1.05                                 | 1.11  | 1.03 |
| 4900.1              | 4870.1      | 1.30                                 | 1.25  | 1.12 |
| 5040.1              | 5010.1      | 1.23                                 | 1.08  | 0.96 |
| 5160.1              | 5130.1      | 1.25                                 | 1.04  | 0.91 |
| 5300.1              | 5270.1      | 1.04                                 | 0.86  | 0.71 |
| 5420.1              | 5390.1      | 0.93                                 | 0.76  | 0.64 |
| 5560.1              | 5530.1      | 1.12                                 | 0.83  | 0.72 |
| 5680.1              | 5650.1      | 1.07                                 | 0.73  | 0.65 |
| 5820.1              | 5790.1      | 1.28                                 | 0.77  | 0.64 |
| 5940.1              | 5910.1      | 1.17                                 | 0.79  | 0.63 |
| 6080.1              | 6050.1      | 0.96                                 | 0.90  | 0.71 |
| 6200.1              | 6170.1      | 0.04                                 | 1.38  | 1.09 |
| 6340.1              | 6310.1      | -5.15                                | -0.90 | 0.86 |

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# Frequency Mixer

MACA-ED10457/10

## Typical Performance Data

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=4000.1001MHz<br>(dB) |
|----------------------|-------------|---------------------------------------------------------------------|
|                      |             | @LO (dBm)<br><br>0                                                  |
| 1090.0               | 2910.1      | 11.51                                                               |
| 1038.6               | 2961.5      | 11.31                                                               |
| 987.1                | 3013.0      | 11.11                                                               |
| 935.7                | 3064.4      | 11.05                                                               |
| 884.3                | 3115.8      | 10.84                                                               |
| 832.9                | 3167.2      | 10.33                                                               |
| 781.4                | 3218.7      | 10.30                                                               |
| 730.0                | 3270.1      | 9.67                                                                |
| 678.6                | 3321.5      | 9.27                                                                |
| 627.1                | 3373.0      | 8.61                                                                |
| 575.7                | 3424.4      | 8.28                                                                |
| 524.3                | 3475.8      | 8.00                                                                |
| 472.9                | 3527.2      | 7.85                                                                |
| 421.4                | 3578.7      | 7.81                                                                |
| 370.0                | 3630.1      | 7.85                                                                |
| 318.6                | 3681.5      | 7.35                                                                |
| 267.1                | 3733.0      | 7.21                                                                |
| 215.7                | 3784.4      | 7.11                                                                |
| 164.3                | 3835.8      | 7.07                                                                |
| 112.9                | 3887.2      | 7.00                                                                |
| 44.3                 | 3955.8      | 7.02                                                                |
| 10.0                 | 4010.1      | 7.48                                                                |
| 101.4                | 4101.5      | 6.80                                                                |
| 170.0                | 4170.1      | 6.95                                                                |
| 261.4                | 4261.5      | 7.12                                                                |
| 330.0                | 4330.1      | 7.05                                                                |
| 421.4                | 4421.5      | 6.86                                                                |
| 490.0                | 4490.1      | 7.08                                                                |
| 581.4                | 4581.5      | 7.40                                                                |
| 650.0                | 4650.1      | 7.46                                                                |
| 741.4                | 4741.5      | 7.44                                                                |
| 810.0                | 4810.1      | 7.58                                                                |
| 901.4                | 4901.5      | 7.94                                                                |
| 970.0                | 4970.1      | 8.16                                                                |
| 1061.4               | 5061.5      | 8.44                                                                |
| 1130.0               | 5130.1      | 8.63                                                                |
| 1221.4               | 5221.5      | 8.66                                                                |
| 1290.0               | 5290.1      | 9.16                                                                |
| 1381.4               | 5381.5      | 10.52                                                               |
| 1450.0               | 5450.1      | 11.69                                                               |

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=2000.1MHz<br>(dB) |
|----------------------|-------------|------------------------------------------------------------------|
|                      |             | @LO (dBm)<br><br>0                                               |
| 10.0                 | 2010.1      | 6.78                                                             |
| 50.0                 | 2050.1      | 6.56                                                             |
| 90.0                 | 2090.1      | 6.48                                                             |
| 130.0                | 2130.1      | 6.80                                                             |
| 170.0                | 2170.1      | 6.59                                                             |
| 210.0                | 2210.1      | 6.29                                                             |
| 250.0                | 2250.1      | 6.11                                                             |
| 290.0                | 2290.1      | 6.00                                                             |
| 330.0                | 2330.1      | 6.07                                                             |
| 370.0                | 2370.1      | 6.10                                                             |
| 410.0                | 2410.1      | 6.17                                                             |
| 450.0                | 2450.1      | 6.24                                                             |
| 490.0                | 2490.1      | 6.17                                                             |
| 530.0                | 2530.1      | 6.17                                                             |
| 570.0                | 2570.1      | 6.22                                                             |
| 610.0                | 2610.1      | 6.35                                                             |
| 650.0                | 2650.1      | 6.50                                                             |
| 690.0                | 2690.1      | 6.84                                                             |
| 730.0                | 2730.1      | 7.04                                                             |
| 770.0                | 2770.1      | 7.13                                                             |
| 810.0                | 2810.1      | 7.36                                                             |
| 850.0                | 2850.1      | 7.51                                                             |
| 890.0                | 2890.1      | 7.75                                                             |
| 930.0                | 2930.1      | 7.59                                                             |
| 970.0                | 2970.1      | 7.66                                                             |
| 1010.0               | 3010.1      | 7.72                                                             |
| 1050.0               | 3050.1      | 7.92                                                             |
| 1090.0               | 3090.1      | 8.14                                                             |
| 1130.0               | 3130.1      | 8.11                                                             |
| 1170.0               | 3170.1      | 8.37                                                             |
| 1210.0               | 3210.1      | 8.63                                                             |
| 1250.0               | 3250.1      | 9.06                                                             |
| 1290.0               | 3290.1      | 9.29                                                             |
| 1330.0               | 3330.1      | 9.44                                                             |
| 1370.0               | 3370.1      | 9.56                                                             |
| 1390.0               | 3390.1      | 9.71                                                             |
| 1430.0               | 3430.1      | 10.08                                                            |
| 1450.0               | 3450.1      | 10.36                                                            |
| 1490.0               | 3490.1      | 11.51                                                            |
| 1510.0               | 3510.1      | 12.39                                                            |

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=6000.1001MHz<br>(dB) |
|----------------------|-------------|---------------------------------------------------------------------|
|                      |             | @LO (dBm)<br><br>0                                                  |
| 1530.0               | 4470.1      | 12.61                                                               |
| 1490.0               | 4510.1      | 10.32                                                               |
| 1450.0               | 4550.1      | 9.48                                                                |
| 1410.0               | 4590.1      | 9.27                                                                |
| 1370.0               | 4630.1      | 9.34                                                                |
| 1330.0               | 4670.1      | 9.29                                                                |
| 1290.0               | 4710.1      | 9.33                                                                |
| 1250.0               | 4750.1      | 9.22                                                                |
| 1210.0               | 4790.1      | 9.21                                                                |
| 1170.0               | 4830.1      | 9.29                                                                |
| 1130.0               | 4870.1      | 9.06                                                                |
| 1090.0               | 4910.1      | 9.07                                                                |
| 1050.0               | 4950.1      | 8.91                                                                |
| 1010.0               | 4990.1      | 8.91                                                                |
| 970.0                | 5030.1      | 8.93                                                                |
| 930.0                | 5070.1      | 8.85                                                                |
| 890.0                | 5110.1      | 8.95                                                                |
| 850.0                | 5150.1      | 8.69                                                                |
| 810.0                | 5190.1      | 8.63                                                                |
| 770.0                | 5230.1      | 8.69                                                                |
| 730.0                | 5270.1      | 8.74                                                                |
| 690.0                | 5310.1      | 8.93                                                                |
| 650.0                | 5350.1      | 8.80                                                                |
| 610.0                | 5390.1      | 8.81                                                                |
| 570.0                | 5430.1      | 8.77                                                                |
| 530.0                | 5470.1      | 8.69                                                                |
| 490.0                | 5510.1      | 8.64                                                                |
| 450.0                | 5550.1      | 8.54                                                                |
| 410.0                | 5590.1      | 8.47                                                                |
| 370.0                | 5630.1      | 8.37                                                                |
| 330.0                | 5670.1      | 8.18                                                                |
| 290.0                | 5710.1      | 8.01                                                                |
| 250.0                | 5750.1      | 7.76                                                                |
| 210.0                | 5790.1      | 7.67                                                                |
| 170.0                | 5830.1      | 7.52                                                                |
| 130.0                | 5870.1      | 7.44                                                                |
| 90.0                 | 5910.1      | 7.33                                                                |
| 70.0                 | 5930.1      | 7.28                                                                |
| 30.0                 | 5970.1      | 7.33                                                                |
| 10.0                 | 5990.1      | 7.57                                                                |

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# Frequency Mixer

MACA-ED10457/10

## Typical Performance Data

| LO<br>(MHz) | LO-RF ISOLATION<br>(dB) |       |       | LO-IF ISOLATION<br>(dB) |       |       |
|-------------|-------------------------|-------|-------|-------------------------|-------|-------|
|             | @LO (dBm)               |       |       | @LO (dBm)               |       |       |
|             | -3                      | 0     | +3    | -3                      | 0     | +3    |
| 1510.1      | 9.30                    | 8.53  | 9.33  | 1.24                    | 1.26  | 4.02  |
| 1630.1      | 11.06                   | 12.21 | 13.55 | 13.09                   | 14.32 | 15.85 |
| 1750.1      | 17.69                   | 18.69 | 21.10 | 12.93                   | 14.25 | 15.68 |
| 1870.1      | 21.28                   | 22.64 | 26.61 | 21.96                   | 23.34 | 24.95 |
| 1990.1      | 21.41                   | 21.98 | 23.94 | 37.31                   | 38.49 | 39.74 |
| 2110.1      | 21.33                   | 21.19 | 21.54 | 47.48                   | 47.78 | 48.44 |
| 2230.1      | 21.56                   | 23.08 | 23.38 | 39.72                   | 39.81 | 40.25 |
| 2350.1      | 20.17                   | 20.78 | 20.53 | 34.65                   | 34.50 | 34.99 |
| 2470.1      | 21.55                   | 22.65 | 22.60 | 33.74                   | 33.48 | 33.92 |
| 2590.1      | 18.22                   | 18.16 | 18.75 | 34.78                   | 34.17 | 34.61 |
| 2710.1      | 17.39                   | 18.36 | 19.69 | 36.28                   | 35.58 | 35.94 |
| 2830.1      | 16.17                   | 17.18 | 18.77 | 37.70                   | 37.11 | 37.46 |
| 2950.1      | 14.99                   | 15.38 | 16.30 | 38.32                   | 38.02 | 38.38 |
| 3070.1      | 14.46                   | 14.13 | 13.84 | 38.26                   | 38.29 | 38.81 |
| 3190.1      | 13.61                   | 13.75 | 13.82 | 37.44                   | 37.97 | 39.04 |
| 3310.1      | 13.49                   | 15.05 | 17.68 | 36.35                   | 37.32 | 38.77 |
| 3430.1      | 13.06                   | 15.26 | 18.30 | 35.38                   | 36.83 | 38.85 |
| 3550.1      | 12.59                   | 15.24 | 18.21 | 34.70                   | 36.60 | 38.99 |
| 3670.1      | 13.06                   | 16.20 | 19.21 | 33.20                   | 35.40 | 38.01 |
| 3790.1      | 16.65                   | 21.05 | 24.75 | 31.65                   | 33.88 | 36.48 |
| 3910.1      | 20.49                   | 24.47 | 26.57 | 32.10                   | 34.00 | 36.31 |
| 4030.1      | 13.90                   | 15.90 | 18.12 | 33.42                   | 34.92 | 36.95 |
| 4150.1      | 10.91                   | 12.44 | 14.38 | 35.63                   | 36.91 | 38.56 |
| 4270.1      | 9.66                    | 10.75 | 12.47 | 37.37                   | 38.04 | 39.34 |
| 4390.1      | 9.15                    | 9.87  | 11.53 | 38.60                   | 38.66 | 39.82 |
| 4510.1      | 9.20                    | 9.47  | 10.75 | 38.91                   | 38.47 | 39.40 |
| 4630.1      | 9.91                    | 10.59 | 12.03 | 39.23                   | 38.49 | 39.19 |
| 4750.1      | 8.96                    | 9.64  | 11.28 | 38.83                   | 38.03 | 38.64 |
| 4870.1      | 8.38                    | 8.88  | 10.44 | 38.15                   | 37.35 | 37.89 |
| 5010.1      | 7.91                    | 7.90  | 8.97  | 37.56                   | 36.79 | 37.15 |
| 5130.1      | 7.59                    | 7.55  | 8.13  | 36.79                   | 36.47 | 36.70 |
| 5270.1      | 7.24                    | 7.14  | 7.38  | 35.65                   | 35.51 | 35.78 |
| 5390.1      | 7.60                    | 7.20  | 7.35  | 33.43                   | 34.01 | 34.95 |
| 5530.1      | 9.13                    | 8.43  | 8.24  | 32.40                   | 33.37 | 34.50 |
| 5650.1      | 9.17                    | 8.71  | 8.48  | 33.67                   | 34.17 | 34.76 |
| 5790.1      | 8.95                    | 8.79  | 8.70  | 35.21                   | 34.96 | 34.80 |
| 5910.1      | 9.09                    | 9.11  | 9.08  | 35.52                   | 34.88 | 34.29 |
| 6050.1      | 9.75                    | 9.89  | 9.79  | 34.72                   | 33.96 | 32.98 |
| 6170.1      | 11.45                   | 11.74 | 12.30 | 32.90                   | 32.62 | 31.91 |
| 6310.1      | 13.47                   | 13.77 | 13.51 | 29.51                   | 29.56 | 29.41 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | -3                      | 0     | +3    |
| 1540.1              | 1510.1      | 19.31                   | 18.56 | 18.22 |
| 1660.1              | 1630.1      | 29.56                   | 26.93 | 25.57 |
| 1780.1              | 1750.1      | 34.55                   | 32.45 | 31.11 |
| 1900.1              | 1870.1      | 46.45                   | 45.43 | 44.45 |
| 2020.1              | 1990.1      | 53.33                   | 54.01 | 54.63 |
| 2140.1              | 2110.1      | 53.90                   | 54.67 | 55.29 |
| 2260.1              | 2230.1      | 54.69                   | 54.58 | 54.25 |
| 2380.1              | 2350.1      | 54.15                   | 52.80 | 51.72 |
| 2500.1              | 2470.1      | 53.03                   | 51.80 | 50.99 |
| 2620.1              | 2590.1      | 52.72                   | 52.21 | 51.83 |
| 2740.1              | 2710.1      | 55.85                   | 55.64 | 55.26 |
| 2860.1              | 2830.1      | 61.50                   | 60.72 | 60.13 |
| 2980.1              | 2950.1      | 59.42                   | 58.85 | 58.78 |
| 3100.1              | 3070.1      | 57.81                   | 57.31 | 57.21 |
| 3220.1              | 3190.1      | 60.33                   | 60.14 | 60.67 |
| 3340.1              | 3310.1      | 60.46                   | 60.72 | 60.45 |
| 3460.1              | 3430.1      | 56.17                   | 56.33 | 56.23 |
| 3580.1              | 3550.1      | 52.70                   | 52.87 | 53.08 |
| 3700.1              | 3670.1      | 51.06                   | 51.46 | 51.68 |
| 3820.1              | 3790.1      | 52.52                   | 53.06 | 53.22 |
| 3940.1              | 3910.1      | 57.35                   | 58.13 | 58.61 |
| 4060.1              | 4030.1      | 56.60                   | 57.05 | 57.19 |
| 4180.1              | 4150.1      | 53.60                   | 53.62 | 53.63 |
| 4300.1              | 4270.1      | 52.63                   | 52.52 | 52.58 |
| 4420.1              | 4390.1      | 50.86                   | 50.61 | 50.48 |
| 4540.1              | 4510.1      | 48.99                   | 48.40 | 48.14 |
| 4660.1              | 4630.1      | 47.23                   | 46.57 | 46.40 |
| 4780.1              | 4750.1      | 48.47                   | 47.41 | 46.96 |
| 4900.1              | 4870.1      | 47.51                   | 46.23 | 45.71 |
| 5040.1              | 5010.1      | 45.49                   | 44.28 | 43.74 |
| 5160.1              | 5130.1      | 43.70                   | 42.92 | 42.56 |
| 5300.1              | 5270.1      | 41.96                   | 41.36 | 40.98 |
| 5420.1              | 5390.1      | 44.15                   | 44.03 | 43.73 |
| 5560.1              | 5530.1      | 43.27                   | 43.56 | 43.62 |
| 5680.1              | 5650.1      | 40.64                   | 41.10 | 41.47 |
| 5820.1              | 5790.1      | 38.93                   | 39.31 | 39.63 |
| 5940.1              | 5910.1      | 37.39                   | 37.80 | 38.08 |
| 6080.1              | 6050.1      | 35.85                   | 36.47 | 36.81 |
| 6200.1              | 6170.1      | 34.49                   | 35.94 | 36.79 |
| 6340.1              | 6310.1      | 33.08                   | 34.94 | 37.96 |

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# Frequency Mixer

MACA-ED10457/10

## 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=6000MHz<br>(:1) |       |       |
|---------------------|-------------|-----------------|------|------|-------------|-----------------|------|------|----------------------|--------------------------------|-------|-------|
|                     |             | @LO (dBm)       |      |      |             | @LO (dBm)       |      |      |                      | @LO (dBm)                      |       |       |
|                     |             | -3              | 0    | +3   |             | -3              | 0    | +3   |                      | -3                             | 0     | +3    |
| 1540.1              | 1510.1      | 2.20            | 1.85 | 1.69 | 1510.1      | 3.54            | 3.65 | 3.82 | 10.0                 | 2.12                           | 1.43  | 1.17  |
| 1660.1              | 1630.1      | 2.53            | 2.19 | 2.04 | 1630.1      | 3.56            | 3.55 | 3.60 | 50.0                 | 2.15                           | 1.46  | 1.22  |
| 1780.1              | 1750.1      | 2.83            | 2.53 | 2.36 | 1750.1      | 4.00            | 3.91 | 3.93 | 90.0                 | 2.22                           | 1.53  | 1.30  |
| 1900.1              | 1870.1      | 2.85            | 2.53 | 2.37 | 1870.1      | 4.47            | 4.44 | 4.48 | 130.0                | 2.31                           | 1.62  | 1.38  |
| 2020.1              | 1990.1      | 2.90            | 2.49 | 2.31 | 1990.1      | 4.92            | 5.02 | 5.17 | 170.0                | 2.49                           | 1.76  | 1.52  |
| 2140.1              | 2110.1      | 3.15            | 2.72 | 2.44 | 2110.1      | 5.27            | 5.51 | 5.72 | 210.0                | 2.63                           | 1.88  | 1.62  |
| 2260.1              | 2230.1      | 2.67            | 2.31 | 2.14 | 2230.1      | 4.60            | 4.83 | 4.98 | 250.0                | 2.84                           | 2.04  | 1.76  |
| 2380.1              | 2350.1      | 2.58            | 2.27 | 2.13 | 2350.1      | 3.73            | 3.65 | 3.61 | 290.0                | 3.00                           | 2.16  | 1.86  |
| 2500.1              | 2470.1      | 2.33            | 2.00 | 1.89 | 2470.1      | 3.31            | 3.17 | 3.10 | 330.0                | 3.22                           | 2.33  | 2.01  |
| 2620.1              | 2590.1      | 2.13            | 1.93 | 1.86 | 2590.1      | 3.11            | 2.99 | 2.93 | 370.0                | 3.45                           | 2.50  | 2.14  |
| 2740.1              | 2710.1      | 3.13            | 2.93 | 2.83 | 2710.1      | 2.90            | 2.88 | 2.86 | 410.0                | 3.58                           | 2.60  | 2.22  |
| 2860.1              | 2830.1      | 4.03            | 3.81 | 3.67 | 2830.1      | 2.75            | 2.81 | 2.82 | 470.0                | 3.89                           | 2.84  | 2.43  |
| 2980.1              | 2950.1      | 3.48            | 3.30 | 3.19 | 2950.1      | 2.69            | 2.78 | 2.82 | 510.0                | 3.98                           | 2.93  | 2.50  |
| 3100.1              | 3070.1      | 2.92            | 2.68 | 2.52 | 3070.1      | 2.70            | 2.77 | 2.78 | 570.0                | 4.26                           | 3.16  | 2.69  |
| 3220.1              | 3190.1      | 3.52            | 3.26 | 3.13 | 3190.1      | 2.79            | 2.78 | 2.71 | 610.0                | 4.40                           | 3.28  | 2.80  |
| 3340.1              | 3310.1      | 3.27            | 2.98 | 2.78 | 3310.1      | 2.83            | 2.72 | 2.61 | 670.0                | 4.68                           | 3.47  | 2.98  |
| 3460.1              | 3430.1      | 3.95            | 3.67 | 3.50 | 3430.1      | 2.66            | 2.46 | 2.33 | 710.0                | 4.88                           | 3.65  | 3.14  |
| 3580.1              | 3550.1      | 4.03            | 3.72 | 3.57 | 3550.1      | 2.35            | 2.17 | 2.08 | 770.0                | 5.14                           | 3.86  | 3.31  |
| 3700.1              | 3670.1      | 3.95            | 3.63 | 3.48 | 3670.1      | 2.03            | 1.91 | 1.92 | 810.0                | 5.39                           | 4.05  | 3.50  |
| 3820.1              | 3790.1      | 3.71            | 3.47 | 3.33 | 3790.1      | 1.67            | 1.64 | 1.75 | 870.0                | 5.58                           | 4.22  | 3.63  |
| 3940.1              | 3910.1      | 3.46            | 3.25 | 3.13 | 3910.1      | 1.39            | 1.44 | 1.59 | 910.0                | 5.79                           | 4.42  | 3.82  |
| 4060.1              | 4030.1      | 2.72            | 2.48 | 2.37 | 4030.1      | 1.34            | 1.41 | 1.60 | 970.0                | 5.93                           | 4.51  | 3.89  |
| 4180.1              | 4150.1      | 2.26            | 2.11 | 2.04 | 4150.1      | 1.36            | 1.45 | 1.64 | 1010.0               | 6.07                           | 4.67  | 4.03  |
| 4300.1              | 4270.1      | 1.84            | 1.70 | 1.63 | 4270.1      | 1.37            | 1.47 | 1.67 | 1070.0               | 5.93                           | 4.53  | 3.90  |
| 4420.1              | 4390.1      | 1.52            | 1.38 | 1.34 | 4390.1      | 1.38            | 1.51 | 1.74 | 1110.0               | 5.87                           | 4.53  | 3.91  |
| 4540.1              | 4510.1      | 1.44            | 1.42 | 1.44 | 4510.1      | 1.45            | 1.58 | 1.81 | 1170.0               | 5.34                           | 4.13  | 3.60  |
| 4660.1              | 4630.1      | 1.93            | 1.94 | 1.95 | 4630.1      | 1.52            | 1.64 | 1.86 | 1210.0               | 4.84                           | 3.78  | 3.31  |
| 4780.1              | 4750.1      | 1.89            | 1.73 | 1.69 | 4750.1      | 1.59            | 1.68 | 1.88 | 1270.0               | 3.92                           | 3.14  | 2.83  |
| 4900.1              | 4870.1      | 1.51            | 1.33 | 1.25 | 4870.1      | 1.67            | 1.73 | 1.90 | 1310.0               | 3.13                           | 2.57  | 2.38  |
| 5040.1              | 5010.1      | 1.43            | 1.28 | 1.23 | 5010.1      | 1.73            | 1.78 | 1.93 | 1370.0               | 2.01                           | 1.87  | 1.90  |
| 5160.1              | 5130.1      | 1.56            | 1.47 | 1.46 | 5130.1      | 1.72            | 1.74 | 1.85 | 1410.0               | 1.42                           | 1.60  | 1.77  |
| 5300.1              | 5270.1      | 1.73            | 1.62 | 1.59 | 5270.1      | 1.64            | 1.63 | 1.69 | 1470.0               | 1.70                           | 2.00  | 2.20  |
| 5420.1              | 5390.1      | 1.92            | 1.74 | 1.65 | 5390.1      | 1.56            | 1.55 | 1.59 | 1510.0               | 2.33                           | 2.53  | 2.66  |
| 5560.1              | 5530.1      | 2.27            | 2.07 | 1.95 | 5530.1      | 1.41            | 1.42 | 1.48 | 1570.0               | 2.90                           | 2.96  | 3.00  |
| 5680.1              | 5650.1      | 2.54            | 2.33 | 2.19 | 5650.1      | 1.32            | 1.36 | 1.40 | 1610.0               | 3.91                           | 3.91  | 3.91  |
| 5820.1              | 5790.1      | 2.78            | 2.54 | 2.38 | 5790.1      | 1.33            | 1.36 | 1.40 | 1670.0               | 6.56                           | 6.46  | 6.42  |
| 5940.1              | 5910.1      | 3.08            | 2.72 | 2.54 | 5910.1      | 1.40            | 1.42 | 1.44 | 1710.0               | 8.47                           | 8.31  | 8.23  |
| 6080.1              | 6050.1      | 3.26            | 2.77 | 2.57 | 6050.1      | 1.48            | 1.49 | 1.50 | 1770.0               | 11.61                          | 11.46 | 11.46 |
| 6200.1              | 6170.1      | 3.53            | 2.75 | 2.46 | 6170.1      | 1.51            | 1.50 | 1.52 | 1810.0               | 13.60                          | 13.49 | 13.49 |
| 6340.1              | 6310.1      | 3.82            | 3.10 | 2.61 | 6310.1      | 1.55            | 1.50 | 1.43 | 1870.0               | 16.56                          | 16.56 | 16.56 |

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## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 23  | 43  | 25  | 47  | 60  | 52  | --- | --- | --- | --- |
| 1  | -      | 51     | +0  | 58  | 52  | 50  | 70  | 70  | 58  | --- | --- | --- |
| 2  | 76     | 72     | 77  | 46  | 76  | >78 | 64  | >78 | >78 | 71  | --- | --- |
| 3  | >90    | 74     | >78 | >78 | 53  | >78 | >78 | >78 | >78 | >78 | >78 | --- |
| 4  | >90    | >78    | >78 | >78 | >78 | 71  | >78 | >78 | >78 | >78 | >78 | >78 |
| 5  | >90    | >78    | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 |
| 6  | ---    | ---    | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 |
| 7  | ---    | ---    | --- | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 |
| 8  | ---    | ---    | --- | --- | >78 | >78 | >78 | >78 | >78 | >78 | >78 | >78 |
| 9  | ---    | ---    | --- | --- | --- | >78 | >78 | >78 | >78 | >78 | >78 | >78 |
| 10 | ---    | ---    | --- | --- | --- | --- | >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: 4000.1 MHz; -5.00 dBm.

LO IN: 3970.1 MHz; +0.00 dBm

IF OUT: 30 MHz; -12.15 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 33  | 54  | 37  | 58  | 75  | 60  | --- | --- | --- | --- |
| 1  | -      | 52     | +0  | 60  | 49  | 57  | 69  | 68  | 70  | --- | --- | --- |
| 2  | 57     | 65     | 70  | 53  | 71  | 72  | 59  | 79  | >88 | 74  | --- | --- |
| 3  | 80     | 54     | 64  | 77  | 36  | 81  | 75  | 68  | 84  | >88 | 77  | --- |
| 4  | >90    | >88    | 77  | 83  | >88 | 67  | >88 | >88 | 76  | >88 | >88 | 88  |
| 5  | >90    | >88    | >88 | 79  | 80  | >88 | 49  | >88 | 85  | 78  | >88 | >88 |
| 6  | ---    | ---    | >88 | >88 | >88 | >88 | >88 | 66  | >88 | >88 | 85  | >88 |
| 7  | ---    | ---    | --- | >88 | >88 | >88 | >88 | >88 | 61  | >88 | >88 | 87  |
| 8  | ---    | ---    | --- | --- | >88 | >88 | >88 | >88 | >88 | 71  | >88 | >88 |
| 9  | ---    | ---    | --- | --- | --- | >88 | >88 | >88 | >88 | >88 | 72  | >88 |
| 10 | ---    | ---    | --- | --- | --- | --- | >88 | >88 | >88 | >88 | >88 | 77  |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

## LO HARMONICS ORDER

Test conditions:

RF IN: 4000.1 MHz; 5.00 dBm.

LO IN: 3970.1 MHz; +0.00 dBm

IF OUT: 30 MHz; -2.24 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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