

# Engineering Development Model

## Frequency Mixer

## MBA-EE7756/28

Level 13 (LO Power +13 dBm)

### Important Note

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



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**CASE STYLE : SM2**

| ELECTRICAL SPECIFICATIONS 50Ω @ +25°C |               |      |      |      |       |
|---------------------------------------|---------------|------|------|------|-------|
| Parameter                             |               | Min. | Typ. | Max. | Units |
| Frequency                             | LO (fL to fU) | 780  |      | 1990 | MHz   |
|                                       | RF (fL to fU) | 780  |      | 1990 | MHz   |
|                                       | IF            | 0.1  |      | 300  | MHz   |
| Conversion Loss                       |               |      | 6.8  |      | dB    |
| LO-RF Isolation                       |               |      | 26   |      | dB    |
| LO-IF Isolation                       |               |      | 16   |      | dB    |

| MAXIMUM RATINGS       |                |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |

| PIN CONNECTIONS |               |
|-----------------|---------------|
| LO              | 10            |
| RF              | 5             |
| IF              | 3             |
| GROUND          | 1, 4, 7, 8, 9 |
| ISOLATE         | 2, 6          |

# Frequency Mixer

# MBA-EE7756/28

## Typical Performance Data

| RF (IN) (MHz) | LO (MHz) | CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) |       |       |
|---------------|----------|----------------------------------------------|-------|-------|
|               |          | @LO (dBm)                                    |       |       |
|               |          | +10                                          | +13   | +16   |
| 530.0         | 560.0    | 12.28                                        | 10.20 | 10.24 |
| 630.0         | 660.0    | 9.95                                         | 9.61  | 9.48  |
| 730.0         | 760.0    | 9.20                                         | 8.50  | 8.23  |
| 830.0         | 860.0    | 8.12                                         | 7.49  | 7.21  |
| 930.0         | 960.0    | 7.96                                         | 7.06  | 6.64  |
| 1030.0        | 1060.0   | 7.57                                         | 6.72  | 6.45  |
| 1130.0        | 1160.0   | 7.57                                         | 7.09  | 6.89  |
| 1230.0        | 1260.0   | 7.72                                         | 7.41  | 7.27  |
| 1330.0        | 1360.0   | 7.88                                         | 7.66  | 7.58  |
| 1430.0        | 1460.0   | 8.20                                         | 7.98  | 7.89  |
| 1530.0        | 1560.0   | 8.30                                         | 8.18  | 8.11  |
| 1630.0        | 1660.0   | 8.33                                         | 8.36  | 8.35  |
| 1730.0        | 1760.0   | 7.60                                         | 7.57  | 7.60  |
| 1830.0        | 1860.0   | 7.50                                         | 7.39  | 7.37  |
| 1930.0        | 1960.0   | 7.92                                         | 7.79  | 7.76  |
| 2030.0        | 2060.0   | 7.68                                         | 7.61  | 7.60  |
| 2130.0        | 2160.0   | 7.30                                         | 7.15  | 7.12  |
| 2230.0        | 2260.0   | 7.39                                         | 7.33  | 7.35  |
| 2330.0        | 2360.0   | 7.83                                         | 7.70  | 7.68  |
| 2430.0        | 2460.0   | 7.40                                         | 7.35  | 7.40  |
| 2530.0        | 2560.0   | 7.79                                         | 7.79  | 7.87  |
| 2630.0        | 2660.0   | 8.63                                         | 8.37  | 8.26  |
| 2730.0        | 2760.0   | 8.03                                         | 7.82  | 7.74  |
| 2830.0        | 2860.0   | 7.72                                         | 7.57  | 7.55  |
| 2930.0        | 2960.0   | 7.75                                         | 7.56  | 7.53  |
| 3030.0        | 3060.0   | 7.29                                         | 7.04  | 7.00  |
| 3130.0        | 3160.0   | 6.90                                         | 6.71  | 6.69  |
| 3230.0        | 3260.0   | 6.40                                         | 6.29  | 6.30  |
| 3330.0        | 3360.0   | 6.19                                         | 6.08  | 6.09  |
| 3430.0        | 3460.0   | 6.11                                         | 6.02  | 6.03  |
| 3530.0        | 3560.0   | 6.25                                         | 6.18  | 6.27  |
| 3630.0        | 3660.0   | 6.69                                         | 6.95  | 8.03  |
| 3730.0        | 3760.0   | 7.68                                         | 8.14  | 9.71  |
| 3830.0        | 3860.0   | 7.68                                         | 7.38  | 8.37  |
| 3910.0        | 3940.0   | 7.16                                         | 6.95  | 7.04  |
| 4010.0        | 4040.0   | 7.16                                         | 6.98  | 6.98  |
| 4090.0        | 4120.0   | 6.99                                         | 6.89  | 6.94  |
| 4190.0        | 4220.0   | 7.23                                         | 7.13  | 7.17  |
| 4270.0        | 4300.0   | 7.67                                         | 7.59  | 7.65  |
| 4370.0        | 4400.0   | 8.23                                         | 8.17  | 8.28  |

| RF (IN) (MHz) | LO (MHz) | IP3 INPUT (dBm) |       |       |
|---------------|----------|-----------------|-------|-------|
|               |          | @LO (dBm)       |       |       |
|               |          | +10             | +13   | +16   |
| 530.0         | 560.0    | 11.99           | 9.54  | 15.52 |
| 630.0         | 660.0    | 7.72            | 11.65 | 14.46 |
| 730.0         | 760.0    | 12.17           | 20.53 | 18.32 |
| 830.0         | 860.0    | 15.65           | 19.74 | 19.70 |
| 930.0         | 960.0    | 13.25           | 19.07 | 26.01 |
| 1030.0        | 1060.0   | 10.92           | 13.75 | 15.55 |
| 1130.0        | 1160.0   | 14.15           | 17.18 | 19.23 |
| 1230.0        | 1260.0   | 14.24           | 16.25 | 18.14 |
| 1330.0        | 1360.0   | 13.49           | 15.41 | 16.44 |
| 1430.0        | 1460.0   | 12.78           | 14.76 | 16.32 |
| 1530.0        | 1560.0   | 12.94           | 14.70 | 15.81 |
| 1630.0        | 1660.0   | 14.96           | 16.28 | 17.56 |
| 1730.0        | 1760.0   | 14.87           | 15.16 | 15.76 |
| 1830.0        | 1860.0   | 17.45           | 17.22 | 17.35 |
| 1930.0        | 1960.0   | 16.68           | 17.28 | 17.58 |
| 2030.0        | 2060.0   | 15.90           | 16.45 | 16.88 |
| 2130.0        | 2160.0   | 15.85           | 16.36 | 16.70 |
| 2230.0        | 2260.0   | 16.61           | 17.49 | 18.03 |
| 2330.0        | 2360.0   | 17.12           | 17.95 | 18.51 |
| 2430.0        | 2460.0   | 16.70           | 18.11 | 18.76 |
| 2530.0        | 2560.0   | 12.01           | 14.26 | 16.24 |
| 2630.0        | 2660.0   | 17.41           | 15.67 | 14.08 |
| 2730.0        | 2760.0   | 12.06           | 12.66 | 12.69 |
| 2830.0        | 2860.0   | 13.44           | 13.71 | 13.85 |
| 2930.0        | 2960.0   | 11.92           | 12.57 | 12.98 |
| 3030.0        | 3060.0   | 11.34           | 12.11 | 12.67 |
| 3130.0        | 3160.0   | 11.19           | 12.06 | 12.58 |
| 3230.0        | 3260.0   | 12.68           | 13.38 | 13.57 |
| 3330.0        | 3360.0   | 13.14           | 13.88 | 14.28 |
| 3430.0        | 3460.0   | 13.57           | 14.14 | 14.11 |
| 3530.0        | 3560.0   | 12.76           | 12.44 | 10.43 |
| 3630.0        | 3660.0   | 12.23           | 11.83 | 14.31 |
| 3730.0        | 3760.0   | 15.01           | 15.67 | 11.40 |
| 3830.0        | 3860.0   | 15.80           | 12.73 | 12.26 |
| 3910.0        | 3940.0   | 14.62           | 15.09 | 10.83 |
| 4010.0        | 4040.0   | 13.08           | 13.37 | 10.45 |
| 4090.0        | 4120.0   | 14.27           | 14.68 | 12.57 |
| 4190.0        | 4220.0   | 13.83           | 15.21 | 15.08 |
| 4270.0        | 4300.0   | 14.49           | 16.29 | 16.64 |
| 4370.0        | 4400.0   | 15.41           | 16.84 | 16.95 |

| RF (IN) (MHz) | LO (MHz) | COMPRESSION @RF IN=+8dBm (dB) |      |      |
|---------------|----------|-------------------------------|------|------|
|               |          | @LO (dBm)                     |      |      |
|               |          | +10                           | +13  | +16  |
| 530.0         | 560.0    | 0.90                          | 1.12 | 0.54 |
| 630.0         | 660.0    | 1.97                          | 1.15 | 0.86 |
| 730.0         | 760.0    | 2.02                          | 1.74 | 1.50 |
| 830.0         | 860.0    | 2.68                          | 2.49 | 2.19 |
| 930.0         | 960.0    | 2.59                          | 2.70 | 2.55 |
| 1030.0        | 1060.0   | 2.78                          | 2.83 | 2.56 |
| 1130.0        | 1160.0   | 2.80                          | 2.51 | 2.23 |
| 1230.0        | 1260.0   | 2.69                          | 2.32 | 2.02 |
| 1330.0        | 1360.0   | 2.64                          | 2.20 | 1.83 |
| 1430.0        | 1460.0   | 2.51                          | 2.08 | 1.71 |
| 1530.0        | 1560.0   | 2.21                          | 1.72 | 1.37 |
| 1630.0        | 1660.0   | 1.95                          | 1.45 | 1.19 |
| 1730.0        | 1760.0   | 2.08                          | 1.78 | 1.54 |
| 1830.0        | 1860.0   | 1.45                          | 1.22 | 1.08 |
| 1930.0        | 1960.0   | 1.91                          | 1.63 | 1.45 |
| 2030.0        | 2060.0   | 1.66                          | 1.49 | 1.34 |
| 2130.0        | 2160.0   | 1.79                          | 1.61 | 1.48 |
| 2230.0        | 2260.0   | 1.80                          | 1.61 | 1.49 |
| 2330.0        | 2360.0   | 1.57                          | 1.39 | 1.24 |
| 2430.0        | 2460.0   | 1.80                          | 1.57 | 1.40 |
| 2530.0        | 2560.0   | 1.39                          | 1.11 | 0.94 |
| 2630.0        | 2660.0   | 0.62                          | 0.53 | 0.48 |
| 2730.0        | 2760.0   | 1.10                          | 0.92 | 0.78 |
| 2830.0        | 2860.0   | 1.28                          | 0.95 | 0.75 |
| 2930.0        | 2960.0   | 1.75                          | 1.40 | 1.12 |
| 3030.0        | 3060.0   | 2.49                          | 2.08 | 1.75 |
| 3130.0        | 3160.0   | 2.69                          | 2.23 | 1.89 |
| 3230.0        | 3260.0   | 2.77                          | 2.38 | 2.08 |
| 3330.0        | 3360.0   | 2.86                          | 2.51 | 2.25 |
| 3430.0        | 3460.0   | 2.84                          | 2.57 | 2.34 |
| 3530.0        | 3560.0   | 2.95                          | 2.74 | 2.57 |
| 3630.0        | 3660.0   | 2.64                          | 2.36 | 1.70 |
| 3730.0        | 3760.0   | 1.99                          | 1.73 | 1.32 |
| 3830.0        | 3860.0   | 2.01                          | 2.23 | 1.70 |
| 3910.0        | 3940.0   | 2.06                          | 2.09 | 2.19 |
| 4010.0        | 4040.0   | 2.53                          | 2.43 | 2.42 |
| 4090.0        | 4120.0   | 2.30                          | 2.14 | 2.06 |
| 4190.0        | 4220.0   | 1.96                          | 1.70 | 1.59 |
| 4270.0        | 4300.0   | 1.73                          | 1.38 | 1.25 |
| 4370.0        | 4400.0   | 1.70                          | 1.30 | 1.22 |



# Frequency Mixer

# MBA-EE7756/28

## Typical Performance Data

| IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=900MHz (dB) | IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=789.9MHz (dB) | IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1010.1MHz (dB) |
|----------------|----------|------------------------------------------------------|----------------|----------|--------------------------------------------------------|----------------|----------|---------------------------------------------------------|
|                |          | @LO (dBm)                                            |                |          | @LO (dBm)                                              |                |          | @LO (dBm)                                               |
|                |          | <b>+13</b>                                           |                |          | <b>+13</b>                                             |                |          | <b>+13</b>                                              |
| 430.0          | 470.0    | 10.22                                                | 10.1           | 800.0    | 7.95                                                   | 510.1          | 500.0    | 10.38                                                   |
| 406.0          | 494.0    | 9.40                                                 | 30.1           | 820.0    | 7.81                                                   | 500.1          | 510.0    | 9.91                                                    |
| 382.0          | 518.0    | 8.94                                                 | 50.1           | 840.0    | 7.85                                                   | 490.1          | 520.0    | 9.50                                                    |
| 358.0          | 542.0    | 9.14                                                 | 70.1           | 860.0    | 7.79                                                   | 480.1          | 530.0    | 9.39                                                    |
| 334.0          | 566.0    | 9.13                                                 | 90.1           | 880.0    | 7.79                                                   | 470.1          | 540.0    | 9.31                                                    |
| 310.0          | 590.0    | 9.20                                                 | 110.1          | 900.0    | 7.74                                                   | 460.1          | 550.0    | 9.09                                                    |
| 286.0          | 614.0    | 9.16                                                 | 130.1          | 920.0    | 7.74                                                   | 450.1          | 560.0    | 8.98                                                    |
| 262.0          | 638.0    | 8.84                                                 | 150.1          | 940.0    | 7.69                                                   | 440.1          | 570.0    | 8.81                                                    |
| 238.0          | 662.0    | 8.36                                                 | 170.1          | 960.0    | 7.65                                                   | 430.1          | 580.0    | 8.62                                                    |
| 214.0          | 686.0    | 7.88                                                 | 190.1          | 980.0    | 7.68                                                   | 420.1          | 590.0    | 8.52                                                    |
| 190.0          | 710.0    | 7.41                                                 | 210.1          | 1000.0   | 7.88                                                   | 410.1          | 600.0    | 8.45                                                    |
| 166.0          | 734.0    | 7.12                                                 | 230.1          | 1020.0   | 8.05                                                   | 400.1          | 610.0    | 8.47                                                    |
| 142.0          | 758.0    | 6.83                                                 | 250.1          | 1040.0   | 7.91                                                   | 390.1          | 620.0    | 8.54                                                    |
| 118.0          | 782.0    | 6.80                                                 | 270.1          | 1060.0   | 7.84                                                   | 380.1          | 630.0    | 8.57                                                    |
| 94.0           | 806.0    | 6.76                                                 | 290.1          | 1080.0   | 7.69                                                   | 370.1          | 640.0    | 8.47                                                    |
| 70.0           | 830.0    | 6.78                                                 | 310.1          | 1100.0   | 7.62                                                   | 360.1          | 650.0    | 8.43                                                    |
| 46.0           | 854.0    | 6.89                                                 | 330.1          | 1120.0   | 7.69                                                   | 350.1          | 660.0    | 8.28                                                    |
| 22.0           | 878.0    | 7.02                                                 | 350.1          | 1140.0   | 7.69                                                   | 340.1          | 670.0    | 8.15                                                    |
| 10.0           | 910.0    | 7.29                                                 | 390.1          | 1180.0   | 7.78                                                   | 320.1          | 690.0    | 7.94                                                    |
| 65.6           | 965.6    | 7.12                                                 | 410.1          | 1200.0   | 7.75                                                   | 310.1          | 700.0    | 7.60                                                    |
| 121.1          | 1021.1   | 7.10                                                 | 450.1          | 1240.0   | 7.91                                                   | 290.1          | 720.0    | 7.33                                                    |
| 176.7          | 1076.7   | 6.78                                                 | 470.1          | 1260.0   | 8.06                                                   | 280.1          | 730.0    | 7.13                                                    |
| 232.2          | 1132.2   | 6.82                                                 | 510.1          | 1300.0   | 8.25                                                   | 260.1          | 750.0    | 6.86                                                    |
| 287.8          | 1187.8   | 7.05                                                 | 530.1          | 1320.0   | 8.19                                                   | 250.1          | 760.0    | 6.73                                                    |
| 343.3          | 1243.3   | 7.25                                                 | 570.1          | 1360.0   | 8.14                                                   | 230.1          | 780.0    | 6.60                                                    |
| 398.9          | 1298.9   | 7.41                                                 | 590.1          | 1380.0   | 8.13                                                   | 220.1          | 790.0    | 6.57                                                    |
| 454.4          | 1354.4   | 7.39                                                 | 630.1          | 1420.0   | 8.56                                                   | 200.1          | 810.0    | 6.54                                                    |
| 510.0          | 1410.0   | 7.61                                                 | 650.1          | 1440.0   | 8.57                                                   | 190.1          | 820.0    | 6.56                                                    |
| 565.6          | 1465.6   | 7.70                                                 | 690.1          | 1480.0   | 8.65                                                   | 170.1          | 840.0    | 6.55                                                    |
| 593.3          | 1493.3   | 7.76                                                 | 710.1          | 1500.0   | 8.68                                                   | 160.1          | 850.0    | 6.56                                                    |
| 648.9          | 1548.9   | 7.69                                                 | 750.1          | 1540.0   | 8.86                                                   | 140.1          | 870.0    | 6.68                                                    |
| 676.7          | 1576.7   | 7.86                                                 | 770.1          | 1560.0   | 8.88                                                   | 130.1          | 880.0    | 6.73                                                    |
| 732.2          | 1632.2   | 8.06                                                 | 810.1          | 1600.0   | 9.03                                                   | 110.1          | 900.0    | 6.88                                                    |
| 760.0          | 1660.0   | 8.04                                                 | 830.1          | 1620.0   | 9.22                                                   | 100.1          | 910.0    | 6.96                                                    |
| 815.6          | 1715.6   | 8.57                                                 | 870.1          | 1660.0   | 9.58                                                   | 80.1           | 930.0    | 7.08                                                    |
| 843.3          | 1743.3   | 8.74                                                 | 890.1          | 1680.0   | 9.85                                                   | 70.1           | 940.0    | 7.13                                                    |
| 898.9          | 1798.9   | 9.30                                                 | 930.1          | 1720.0   | 10.32                                                  | 50.1           | 960.0    | 7.19                                                    |
| 926.7          | 1826.7   | 9.58                                                 | 950.1          | 1740.0   | 10.43                                                  | 40.1           | 970.0    | 7.08                                                    |
| 982.2          | 1882.2   | 10.18                                                | 990.1          | 1780.0   | 10.74                                                  | 20.1           | 990.0    | 7.09                                                    |
| 1010.0         | 1910.0   | 10.63                                                | 1010.1         | 1800.0   | 11.02                                                  | 10.1           | 1000.0   | 7.08                                                    |

REV. X3

MBA-EE7756/28

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IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED RoHS compliant

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# Frequency Mixer

MBA-EE7756/28

## Typical Performance Data

| LO<br>(MHz) | LO-RF ISOLATION<br>(dB) |       |       | LO-IF ISOLATION<br>(dB) |       |       |
|-------------|-------------------------|-------|-------|-------------------------|-------|-------|
|             | @LO (dBm)               |       |       | @LO (dBm)               |       |       |
|             | +10                     | +13   | +16   | +10                     | +13   | +16   |
| 560.0       | 32.00                   | 33.66 | 34.06 | 20.32                   | 20.28 | 20.86 |
| 660.0       | 29.39                   | 29.85 | 29.46 | 19.52                   | 19.22 | 19.61 |
| 760.0       | 27.33                   | 27.50 | 26.82 | 18.42                   | 18.15 | 18.32 |
| 860.0       | 26.32                   | 25.81 | 24.89 | 18.29                   | 17.77 | 17.34 |
| 960.0       | 25.79                   | 24.94 | 24.16 | 18.29                   | 17.82 | 17.17 |
| 1060.0      | 25.98                   | 24.73 | 23.86 | 18.04                   | 17.96 | 17.63 |
| 1160.0      | 26.87                   | 25.40 | 24.37 | 16.59                   | 17.55 | 18.14 |
| 1260.0      | 28.09                   | 26.34 | 25.23 | 14.82                   | 16.41 | 17.90 |
| 1360.0      | 28.98                   | 27.54 | 26.44 | 13.66                   | 15.50 | 17.23 |
| 1460.0      | 29.11                   | 28.08 | 27.53 | 12.83                   | 14.55 | 16.18 |
| 1560.0      | 29.96                   | 29.36 | 28.91 | 12.06                   | 13.58 | 14.89 |
| 1660.0      | 30.51                   | 30.32 | 30.21 | 11.50                   | 12.87 | 13.86 |
| 1760.0      | 28.88                   | 29.29 | 29.74 | 11.42                   | 12.55 | 13.18 |
| 1860.0      | 30.58                   | 31.31 | 31.61 | 11.51                   | 12.34 | 12.73 |
| 1960.0      | 30.29                   | 31.16 | 31.95 | 11.58                   | 12.03 | 12.21 |
| 2060.0      | 32.19                   | 32.75 | 33.25 | 12.17                   | 12.08 | 11.86 |
| 2160.0      | 33.38                   | 33.88 | 34.12 | 12.18                   | 11.98 | 11.59 |
| 2260.0      | 38.07                   | 38.12 | 37.76 | 12.77                   | 11.94 | 11.50 |
| 2360.0      | 38.44                   | 38.73 | 38.38 | 13.50                   | 12.21 | 11.32 |
| 2460.0      | 38.24                   | 39.42 | 39.39 | 13.85                   | 12.47 | 11.37 |
| 2560.0      | 34.05                   | 36.31 | 37.61 | 14.41                   | 12.58 | 11.60 |
| 2660.0      | 32.27                   | 35.17 | 37.63 | 14.85                   | 13.03 | 11.98 |
| 2760.0      | 35.00                   | 36.88 | 36.70 | 15.30                   | 13.54 | 12.43 |
| 2860.0      | 33.09                   | 34.95 | 34.47 | 15.27                   | 14.07 | 12.88 |
| 2960.0      | 36.83                   | 38.87 | 35.55 | 15.34                   | 14.64 | 13.71 |
| 3060.0      | 37.09                   | 38.84 | 34.32 | 15.68                   | 15.22 | 15.00 |
| 3160.0      | 39.51                   | 43.23 | 37.44 | 16.12                   | 16.43 | 16.75 |
| 3260.0      | 43.64                   | 35.06 | 31.60 | 15.83                   | 16.98 | 18.00 |
| 3360.0      | 35.53                   | 30.78 | 28.59 | 15.83                   | 17.37 | 18.93 |
| 3460.0      | 29.93                   | 27.17 | 25.37 | 15.93                   | 17.62 | 19.04 |
| 3560.0      | 25.91                   | 23.97 | 22.65 | 15.77                   | 17.12 | 17.99 |
| 3660.0      | 22.77                   | 21.50 | 20.64 | 14.78                   | 15.43 | 15.68 |
| 3760.0      | 20.06                   | 20.07 | 20.53 | 13.04                   | 13.43 | 13.50 |
| 3860.0      | 19.93                   | 19.47 | 18.36 | 12.57                   | 13.34 | 13.95 |
| 3940.0      | 20.27                   | 19.50 | 18.32 | 13.68                   | 14.76 | 15.53 |
| 4040.0      | 23.23                   | 22.16 | 20.83 | 15.54                   | 16.76 | 17.66 |
| 4120.0      | 25.46                   | 24.36 | 23.18 | 16.78                   | 18.24 | 19.43 |
| 4220.0      | 27.95                   | 26.55 | 25.29 | 18.38                   | 19.74 | 20.94 |
| 4300.0      | 28.64                   | 27.64 | 26.49 | 19.42                   | 21.05 | 22.45 |
| 4400.0      | 30.48                   | 28.86 | 27.23 | 21.51                   | 23.89 | 26.48 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +10                     | +13   | +16   |
| 530.0               | 560.0       | 26.36                   | 19.64 | 16.56 |
| 630.0               | 660.0       | 18.70                   | 15.86 | 14.55 |
| 730.0               | 760.0       | 16.81                   | 15.04 | 14.09 |
| 830.0               | 860.0       | 17.35                   | 15.91 | 15.10 |
| 930.0               | 960.0       | 18.18                   | 17.32 | 16.96 |
| 1030.0              | 1060.0      | 19.86                   | 19.57 | 19.38 |
| 1130.0              | 1160.0      | 20.93                   | 21.09 | 21.15 |
| 1230.0              | 1260.0      | 22.15                   | 22.67 | 22.97 |
| 1330.0              | 1360.0      | 23.19                   | 24.04 | 24.59 |
| 1430.0              | 1460.0      | 23.16                   | 24.06 | 24.55 |
| 1530.0              | 1560.0      | 23.73                   | 24.30 | 24.58 |
| 1630.0              | 1660.0      | 24.61                   | 24.74 | 24.78 |
| 1730.0              | 1760.0      | 24.64                   | 24.98 | 25.19 |
| 1830.0              | 1860.0      | 24.09                   | 24.28 | 24.39 |
| 1930.0              | 1960.0      | 24.08                   | 24.08 | 24.02 |
| 2030.0              | 2060.0      | 24.65                   | 24.71 | 24.68 |
| 2130.0              | 2160.0      | 24.63                   | 24.70 | 24.82 |
| 2230.0              | 2260.0      | 24.14                   | 24.14 | 24.17 |
| 2330.0              | 2360.0      | 24.29                   | 24.30 | 24.35 |
| 2430.0              | 2460.0      | 24.71                   | 24.78 | 24.81 |
| 2530.0              | 2560.0      | 24.21                   | 24.28 | 24.32 |
| 2630.0              | 2660.0      | 24.07                   | 24.16 | 24.25 |
| 2730.0              | 2760.0      | 25.42                   | 25.43 | 25.36 |
| 2830.0              | 2860.0      | 25.25                   | 25.29 | 25.28 |
| 2930.0              | 2960.0      | 26.59                   | 26.42 | 26.19 |
| 3030.0              | 3060.0      | 27.64                   | 27.13 | 26.91 |
| 3130.0              | 3160.0      | 28.22                   | 27.58 | 27.13 |
| 3230.0              | 3260.0      | 29.08                   | 28.23 | 27.69 |
| 3330.0              | 3360.0      | 29.57                   | 28.52 | 27.89 |
| 3430.0              | 3460.0      | 28.51                   | 27.71 | 27.13 |
| 3530.0              | 3560.0      | 25.81                   | 25.22 | 24.68 |
| 3630.0              | 3660.0      | 21.88                   | 21.15 | 20.63 |
| 3730.0              | 3760.0      | 18.29                   | 18.04 | 18.20 |
| 3830.0              | 3860.0      | 16.10                   | 16.53 | 16.62 |
| 3910.0              | 3940.0      | 16.09                   | 16.46 | 16.88 |
| 4010.0              | 4040.0      | 16.78                   | 16.81 | 16.95 |
| 4090.0              | 4120.0      | 17.65                   | 17.37 | 17.17 |
| 4190.0              | 4220.0      | 17.42                   | 16.70 | 16.16 |
| 4270.0              | 4300.0      | 16.76                   | 15.60 | 14.87 |
| 4370.0              | 4400.0      | 18.08                   | 16.31 | 15.29 |



# Frequency Mixer

# MBA-EE7756/28

## Typical Performance Data

| RF (IN) (MHz) | LO (MHz) | RF VSWR (:1) |      |      |
|---------------|----------|--------------|------|------|
|               |          | @LO (dBm)    |      |      |
|               |          | +10          | +13  | +16  |
| 530.0         | 560.0    | 5.52         | 4.79 | 4.72 |
| 630.0         | 660.0    | 4.48         | 4.32 | 4.15 |
| 730.0         | 760.0    | 3.93         | 3.62 | 3.41 |
| 830.0         | 860.0    | 3.38         | 3.07 | 2.84 |
| 930.0         | 960.0    | 3.38         | 3.11 | 2.89 |
| 1030.0        | 1060.0   | 3.54         | 3.19 | 2.98 |
| 1130.0        | 1160.0   | 3.82         | 3.61 | 3.47 |
| 1230.0        | 1260.0   | 4.26         | 4.08 | 3.95 |
| 1330.0        | 1360.0   | 4.56         | 4.38 | 4.26 |
| 1430.0        | 1460.0   | 4.82         | 4.67 | 4.54 |
| 1530.0        | 1560.0   | 4.57         | 4.54 | 4.51 |
| 1630.0        | 1660.0   | 3.92         | 3.92 | 3.96 |
| 1730.0        | 1760.0   | 3.70         | 3.45 | 3.31 |
| 1830.0        | 1860.0   | 3.71         | 3.37 | 3.10 |
| 1930.0        | 1960.0   | 3.79         | 3.60 | 3.48 |
| 2030.0        | 2060.0   | 3.15         | 2.97 | 2.85 |
| 2130.0        | 2160.0   | 2.83         | 2.57 | 2.37 |
| 2230.0        | 2260.0   | 2.67         | 2.54 | 2.44 |
| 2330.0        | 2360.0   | 2.97         | 2.84 | 2.73 |
| 2430.0        | 2460.0   | 2.68         | 2.57 | 2.48 |
| 2530.0        | 2560.0   | 2.63         | 2.55 | 2.50 |
| 2630.0        | 2660.0   | 3.65         | 3.40 | 3.21 |
| 2730.0        | 2760.0   | 3.86         | 3.59 | 3.39 |
| 2830.0        | 2860.0   | 3.62         | 3.33 | 3.12 |
| 2930.0        | 2960.0   | 3.94         | 3.65 | 3.45 |
| 3030.0        | 3060.0   | 3.26         | 2.97 | 2.84 |
| 3130.0        | 3160.0   | 2.67         | 2.39 | 2.27 |
| 3230.0        | 3260.0   | 2.02         | 1.85 | 1.76 |
| 3330.0        | 3360.0   | 1.71         | 1.54 | 1.46 |
| 3430.0        | 3460.0   | 1.55         | 1.41 | 1.31 |
| 3530.0        | 3560.0   | 1.54         | 1.43 | 1.33 |
| 3630.0        | 3660.0   | 1.50         | 1.40 | 1.42 |
| 3730.0        | 3760.0   | 1.47         | 1.34 | 1.39 |
| 3830.0        | 3860.0   | 1.70         | 1.55 | 1.32 |
| 3910.0        | 3940.0   | 1.92         | 1.74 | 1.52 |
| 4010.0        | 4040.0   | 2.46         | 2.26 | 2.04 |
| 4090.0        | 4120.0   | 2.46         | 2.28 | 2.12 |
| 4190.0        | 4220.0   | 2.47         | 2.26 | 2.12 |
| 4270.0        | 4300.0   | 2.67         | 2.46 | 2.31 |
| 4370.0        | 4400.0   | 2.89         | 2.68 | 2.56 |

| LO (MHz) | LO VSWR (:1) |      |      |
|----------|--------------|------|------|
|          | @LO (dBm)    |      |      |
|          | +10          | +13  | +16  |
| 580.0    | 12.52        | 8.01 | 6.30 |
| 680.0    | 5.79         | 4.45 | 4.36 |
| 780.0    | 3.07         | 2.83 | 3.14 |
| 880.0    | 2.10         | 2.11 | 2.47 |
| 980.0    | 1.86         | 1.81 | 2.10 |
| 1080.0   | 1.99         | 1.78 | 1.97 |
| 1180.0   | 2.18         | 1.87 | 2.02 |
| 1280.0   | 2.20         | 1.95 | 2.17 |
| 1380.0   | 2.16         | 2.06 | 2.39 |
| 1480.0   | 2.18         | 2.21 | 2.60 |
| 1580.0   | 2.25         | 2.36 | 2.78 |
| 1680.0   | 2.07         | 2.30 | 2.80 |
| 1780.0   | 1.81         | 2.20 | 2.78 |
| 1880.0   | 1.66         | 2.14 | 2.74 |
| 1980.0   | 1.54         | 2.06 | 2.65 |
| 2080.0   | 1.50         | 2.01 | 2.57 |
| 2180.0   | 1.44         | 1.91 | 2.42 |
| 2280.0   | 1.52         | 1.85 | 2.28 |
| 2380.0   | 1.56         | 1.75 | 2.10 |
| 2480.0   | 1.65         | 1.64 | 1.90 |
| 2580.0   | 1.83         | 1.61 | 1.73 |
| 2680.0   | 1.94         | 1.54 | 1.55 |
| 2780.0   | 2.02         | 1.45 | 1.32 |
| 2880.0   | 2.15         | 1.42 | 1.14 |
| 2980.0   | 2.18         | 1.42 | 1.06 |
| 3080.0   | 2.14         | 1.47 | 1.30 |
| 3180.0   | 2.31         | 1.74 | 1.68 |
| 3280.0   | 2.10         | 1.79 | 1.93 |
| 3380.0   | 1.89         | 1.88 | 2.20 |
| 3480.0   | 1.77         | 2.00 | 2.42 |
| 3580.0   | 1.70         | 2.06 | 2.52 |
| 3680.0   | 1.59         | 1.95 | 2.32 |
| 3760.0   | 1.36         | 1.67 | 1.91 |
| 3860.0   | 1.33         | 1.63 | 1.96 |
| 3940.0   | 1.61         | 1.88 | 2.24 |
| 4040.0   | 1.87         | 2.06 | 2.39 |
| 4120.0   | 2.03         | 2.08 | 2.36 |
| 4220.0   | 2.38         | 2.14 | 2.23 |
| 4300.0   | 2.62         | 2.11 | 2.03 |
| 4400.0   | 2.84         | 2.04 | 1.74 |

| IF (OUT) (MHz) | IF VSWR @LO=1000MHz (:1) |      |      |
|----------------|--------------------------|------|------|
|                | @LO (dBm)                |      |      |
|                | +10                      | +13  | +16  |
| 10.0           | 1.29                     | 1.64 | 1.88 |
| 30.0           | 1.31                     | 1.64 | 1.89 |
| 50.0           | 1.36                     | 1.68 | 1.93 |
| 70.0           | 1.38                     | 1.69 | 1.92 |
| 90.0           | 1.46                     | 1.75 | 1.99 |
| 110.0          | 1.51                     | 1.76 | 1.98 |
| 130.0          | 1.61                     | 1.86 | 2.08 |
| 150.0          | 1.69                     | 1.90 | 2.10 |
| 170.0          | 1.78                     | 1.97 | 2.17 |
| 190.0          | 1.88                     | 2.03 | 2.21 |
| 210.0          | 1.97                     | 2.09 | 2.27 |
| 230.0          | 2.09                     | 2.19 | 2.36 |
| 250.0          | 2.16                     | 2.22 | 2.36 |
| 270.0          | 2.27                     | 2.32 | 2.46 |
| 290.0          | 2.33                     | 2.34 | 2.46 |
| 310.0          | 2.44                     | 2.43 | 2.55 |
| 330.0          | 2.49                     | 2.44 | 2.54 |
| 350.0          | 2.57                     | 2.49 | 2.59 |
| 370.0          | 2.64                     | 2.50 | 2.57 |
| 390.0          | 2.69                     | 2.52 | 2.58 |
| 410.0          | 2.75                     | 2.52 | 2.57 |
| 430.0          | 2.79                     | 2.53 | 2.55 |
| 450.0          | 2.86                     | 2.53 | 2.52 |
| 470.0          | 2.91                     | 2.52 | 2.49 |
| 490.0          | 2.98                     | 2.55 | 2.48 |
| 510.0          | 3.00                     | 2.51 | 2.41 |
| 530.0          | 3.07                     | 2.53 | 2.39 |
| 550.0          | 3.09                     | 2.50 | 2.32 |
| 590.0          | 3.18                     | 2.51 | 2.25 |
| 610.0          | 3.21                     | 2.51 | 2.22 |
| 650.0          | 3.26                     | 2.50 | 2.15 |
| 670.0          | 3.28                     | 2.51 | 2.14 |
| 710.0          | 3.28                     | 2.50 | 2.11 |
| 730.0          | 3.27                     | 2.50 | 2.10 |
| 770.0          | 3.26                     | 2.54 | 2.18 |
| 790.0          | 3.26                     | 2.57 | 2.24 |
| 830.0          | 3.18                     | 2.63 | 2.38 |
| 850.0          | 3.15                     | 2.69 | 2.50 |
| 890.0          | 3.15                     | 2.88 | 2.80 |
| 910.0          | 3.18                     | 3.03 | 3.01 |



## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | +10 | 34  | 1   | 41  | 19  | 40  | 16  | 44  | 37  | 46  |
| 1  | -      | 10     | +0  | 19  | 34  | 40  | 37  | 24  | 33  | 44  | 40  | 44  |
| 2  | 76     | 47     | 45  | 51  | 49  | 63  | 48  | 59  | 50  | 45  | 47  | 52  |
| 3  | >90    | 67     | 69  | 50  | 51  | 57  | 69  | >76 | 58  | 54  | 55  | 59  |
| 4  | >90    | >76    | >76 | >76 | 73  | 73  | >76 | >76 | >76 | >76 | 68  | 74  |
| 5  | >90    | >76    | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 |
| 6  | >90    | >76    | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 |
| 7  | >90    | >76    | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 |
| 8  | >90    | >76    | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 |
| 9  | >90    | >76    | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 |
| 10 | >90    | >76    | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 900 MHz; -7.00 dBm.  
 LO IN: 930 MHz; +13.00 dBm  
 IF OUT: 30 MHz; -14.28 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |    |    |    |    |    |     |     |    |     |    |
|----|--------|--------|----|----|----|----|----|-----|-----|----|-----|----|
| 0  | -      | -      | +0 | 39 | 11 | 51 | 29 | 48  | 31  | 66 | 41  | 53 |
| 1  | -      | 9      | +0 | 25 | 35 | 54 | 36 | 36  | 54  | 47 | 44  | 50 |
| 2  | 56     | 36     | 35 | 46 | 37 | 57 | 43 | 63  | 65  | 49 | 45  | 53 |
| 3  | 88     | 43     | 48 | 37 | 39 | 36 | 55 | 57  | 60  | 44 | 54  | 54 |
| 4  | >90    | 57     | 53 | 72 | 45 | 49 | 58 | 65  | 56  | 67 | 60  | 60 |
| 5  | >90    | 47     | 68 | 66 | 61 | 48 | 44 | 56  | 64  | 74 | 53  | 59 |
| 6  | >90    | 63     | 53 | 71 | 73 | 64 | 51 | 58  | 63  | 69 | 77  | 66 |
| 7  | >90    | 72     | 60 | 54 | 81 | 74 | 67 | 61  | 54  | 63 | >86 | 78 |
| 8  | >90    | 83     | 78 | 69 | 63 | 74 | 78 | 69  | 59  | 63 | 72  | 84 |
| 9  | >90    | 78     | 83 | 75 | 71 | 72 | 78 | 79  | 76  | 70 | 71  | 68 |
| 10 | >90    | 77     | 77 | 82 | 82 | 75 | 79 | >86 | >86 | 80 | 69  | 68 |
|    | RF CAL | 0      | 1  | 2  | 3  | 4  | 5  | 6   | 7   | 8  | 9   | 10 |

### LO HARMONICS ORDER

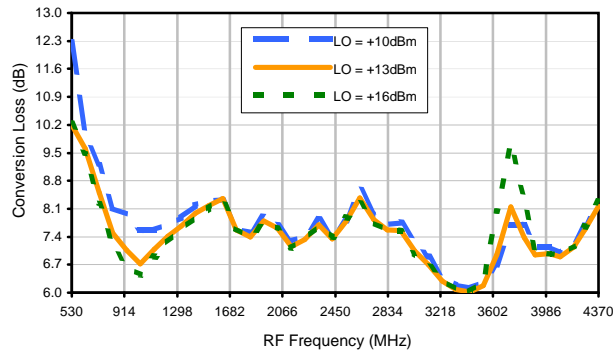
Test conditions: RF IN: 900 MHz; 3.00 dBm.  
 LO IN: 930 MHz; +13.00 dBm  
 IF OUT: 30 MHz; -4.38 dBm

- 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.

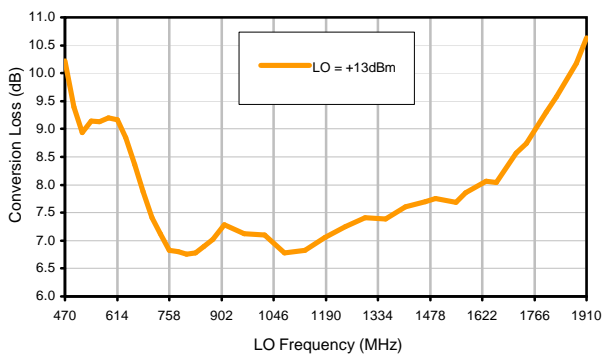


## Typical Performance Curves

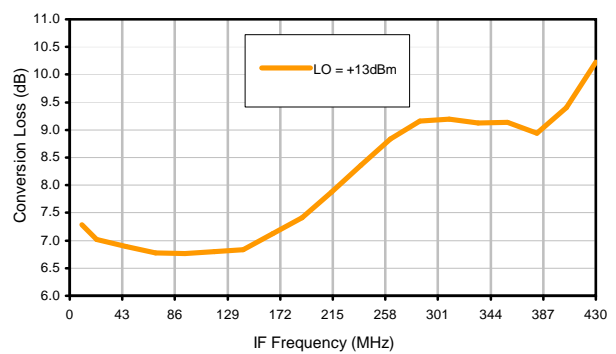
Conversion Loss @ IF=30MHz



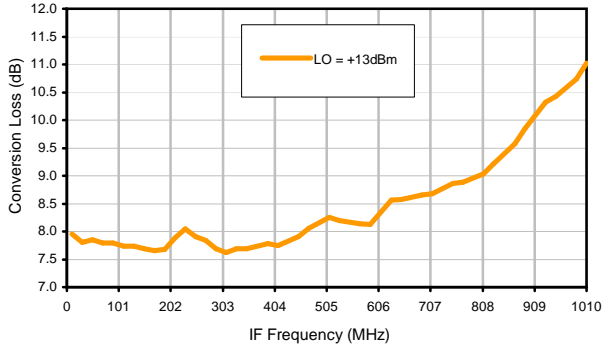
Conversion Loss vs. LO @ RF=900MHz



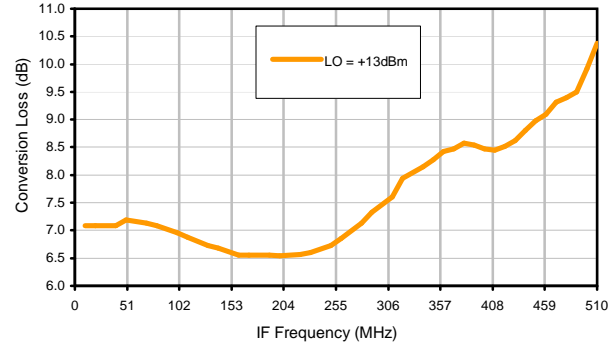
Conversion Loss vs. IF @ RF=900MHz



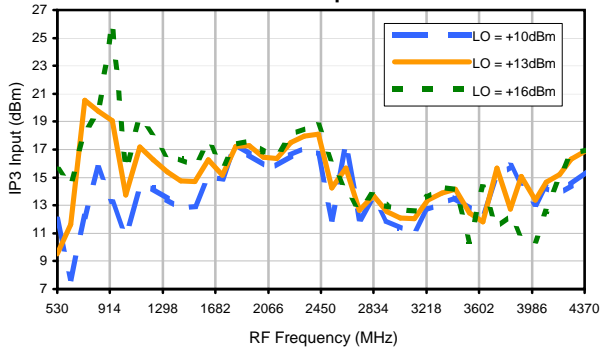
Conversion Loss vs. IF @ RF=789.9MHz



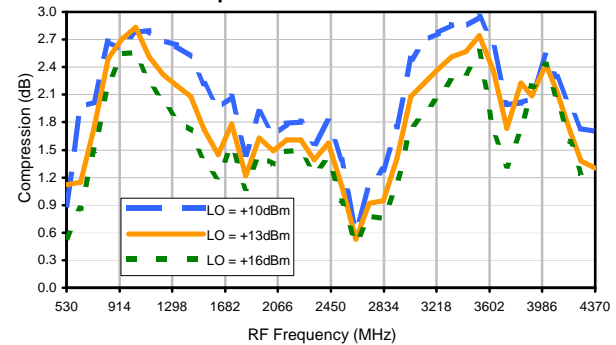
Conversion Loss vs. IF @ RF=1010.1MHz



IP3 Input

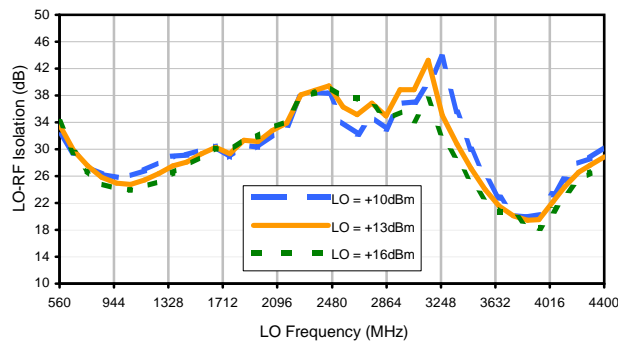


Compression @ RF IN=+8dBm

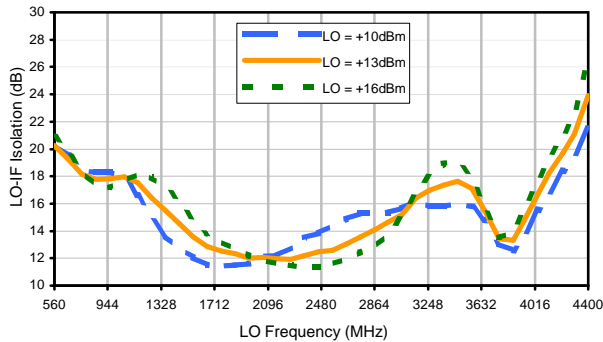


## Typical Performance Curves

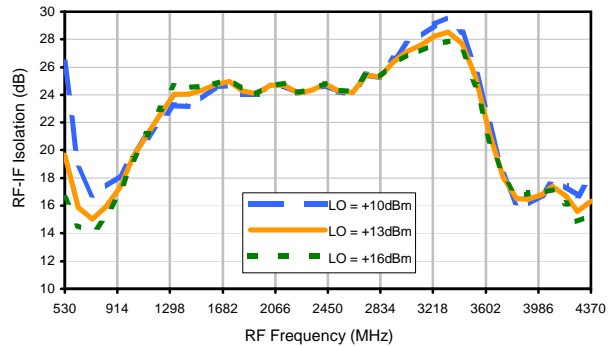
LO-RF Isolation



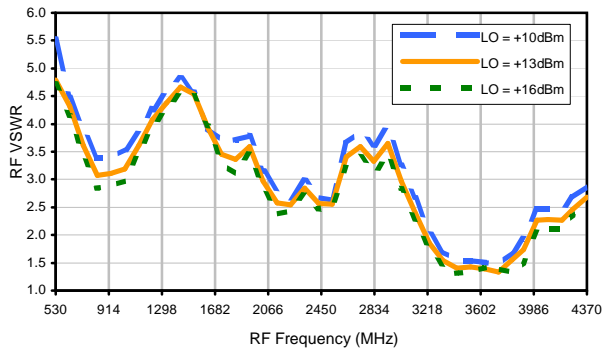
LO-IF Isolation



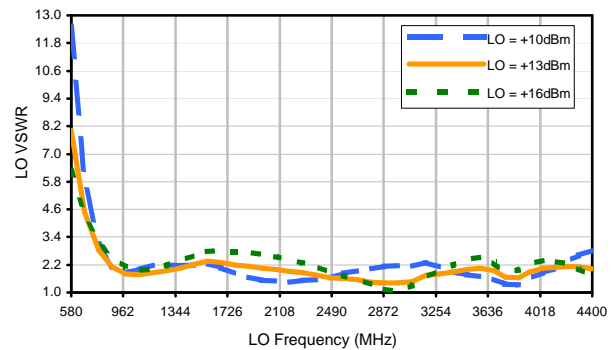
RF-IF Isolation



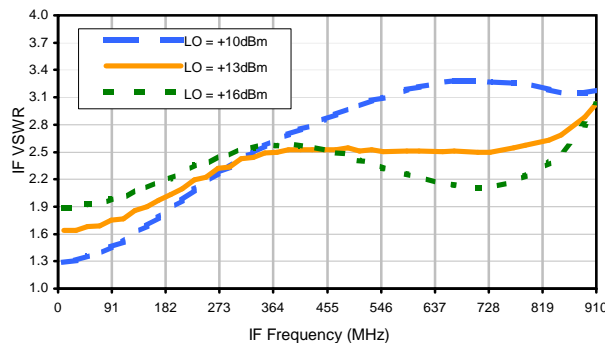
RF VSWR



LO VSWR



IF VSWR



## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | +10 | 34  | 1   | 41  | 19  | 40  | 16  | 44  | 37  | 46  |
| 1  | -      | 10     | +0  | 19  | 34  | 40  | 37  | 24  | 33  | 44  | 40  | 44  |
| 2  | 76     | 47     | 45  | 51  | 49  | 63  | 48  | 59  | 50  | 45  | 47  | 52  |
| 3  | >90    | 67     | 69  | 50  | 51  | 57  | 69  | >76 | 58  | 54  | 55  | 59  |
| 4  | >90    | >76    | >76 | >76 | 73  | 73  | >76 | >76 | >76 | >76 | 68  | 74  |
| 5  | >90    | >76    | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 |
| 6  | >90    | >76    | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 |
| 7  | >90    | >76    | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 |
| 8  | >90    | >76    | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 |
| 9  | >90    | >76    | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 |
| 10 | >90    | >76    | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 | >76 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 900 MHz; -7.00 dBm.  
 LO IN: 930 MHz; +13.00 dBm  
 IF OUT: 30 MHz; -14.28 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |    |    |    |    |    |     |     |    |     |    |
|----|--------|--------|----|----|----|----|----|-----|-----|----|-----|----|
| 0  | -      | -      | +0 | 39 | 11 | 51 | 29 | 48  | 31  | 66 | 41  | 53 |
| 1  | -      | 9      | +0 | 25 | 35 | 54 | 36 | 36  | 54  | 47 | 44  | 50 |
| 2  | 56     | 36     | 35 | 46 | 37 | 57 | 43 | 63  | 65  | 49 | 45  | 53 |
| 3  | 88     | 43     | 48 | 37 | 39 | 36 | 55 | 57  | 60  | 44 | 54  | 54 |
| 4  | >90    | 57     | 53 | 72 | 45 | 49 | 58 | 65  | 56  | 67 | 60  | 60 |
| 5  | >90    | 47     | 68 | 66 | 61 | 48 | 44 | 56  | 64  | 74 | 53  | 59 |
| 6  | >90    | 63     | 53 | 71 | 73 | 64 | 51 | 58  | 63  | 69 | 77  | 66 |
| 7  | >90    | 72     | 60 | 54 | 81 | 74 | 67 | 61  | 54  | 63 | >86 | 78 |
| 8  | >90    | 83     | 78 | 69 | 63 | 74 | 78 | 69  | 59  | 63 | 72  | 84 |
| 9  | >90    | 78     | 83 | 75 | 71 | 72 | 78 | 79  | 76  | 70 | 71  | 68 |
| 10 | >90    | 77     | 77 | 82 | 82 | 75 | 79 | >86 | >86 | 80 | 69  | 68 |
|    | RF CAL | 0      | 1  | 2  | 3  | 4  | 5  | 6   | 7   | 8  | 9   | 10 |

### LO HARMONICS ORDER

Test conditions: RF IN: 900 MHz; 3.00 dBm.  
 LO IN: 930 MHz; +13.00 dBm  
 IF OUT: 30 MHz; -4.38 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.



# Case Style

# SM2

SM2

## Outline Dimensions



## PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm 0.002$

ADJACENT GROUND PINS SHALL BE CONNECTED  
TO EACH OTHER AND TO GROUND PAD

| CASE # | A              | B              | C              | D              | E              | F              | G              | H              | J              | K              | L              | M              | N              | P              |
|--------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| SM2    | .250<br>(6.35) | .300<br>(7.62) | .095<br>(2.41) | .290<br>(7.37) | .050<br>(1.27) | .015<br>(0.38) | .050<br>(1.27) | .060<br>(1.52) | .030<br>(0.76) | .080<br>(2.03) | .300<br>(7.62) | .100<br>(2.54) | .020<br>(0.51) | .015<br>(0.38) |

| CASE # | Q              | R              | WT. GRAM |
|--------|----------------|----------------|----------|
| SM2    | .070<br>(1.78) | .014<br>(0.36) | .3       |

Dimensions are in inches (mm). Tolerances:  $\pm .005$

### Notes:

1. Case material: Plastic encapsulation on Ceramic base.
2. Termination finish:  
For RoHS Case Styles: Tin plate over Nickel plate.  
For RoHS-5 Case Styles: Tin-Lead plate.



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# Tape & Reel Packaging TR-F34



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

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

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: [www.minicircuits.com/pages/pdfs/tape.pdf](http://www.minicircuits.com/pages/pdfs/tape.pdf)



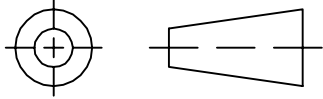
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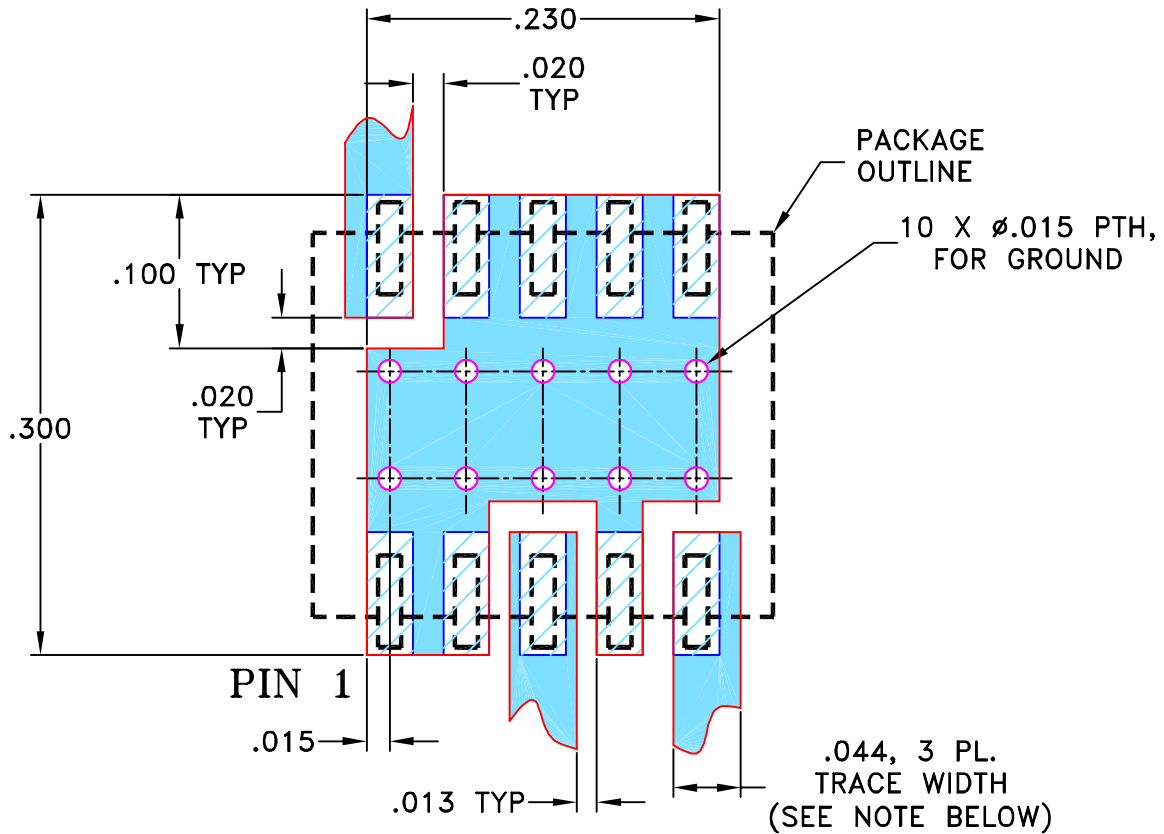
THIRD ANGLE PROJECTION



REVISIONS

| REV | ECN No. | DESCRIPTION                          | DATE     | DR | AUTH |
|-----|---------|--------------------------------------|----------|----|------|
| OR  | M82272  | NEW RELEASE                          | 08/02/02 | GF | DJ   |
| A   | M102713 | UPDATED NOTES, ADDED "...WITH SMOBC" | 01/16/06 | GT | IL   |
|     |         |                                      |          |    |      |

SUGGESTED MOUNTING CONFIGURATION FOR SM2 CASE STYLE, "Id" PIN CONNECTION



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.020" ± 0.0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

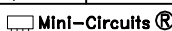
 DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

| UNLESS OTHERWISE SPECIFIED | INITIALS | DATE     |
|----------------------------|----------|----------|
| DRAWN                      | GF       | 07/18/02 |
| CHECKED                    | WL       | 08/02/02 |
| APPROVED                   | DJ       | 08/02/02 |

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PL, Id, SM2, MBA, TB-99

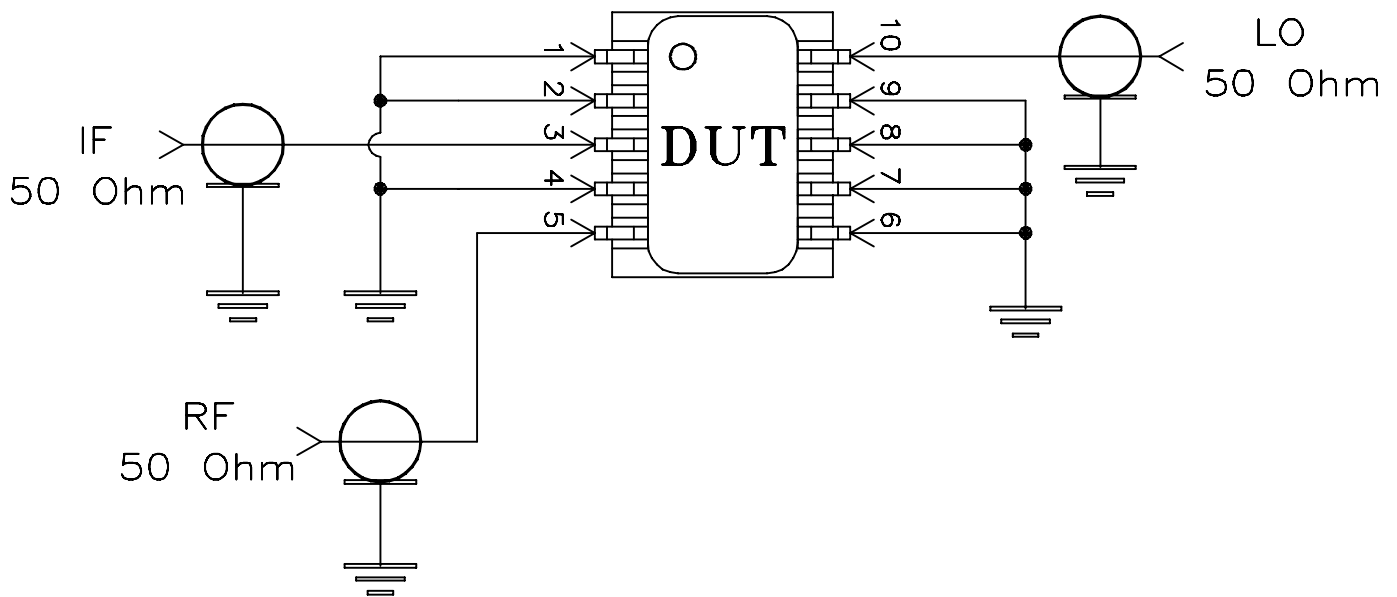
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| SIZE  | CODE IDENT | DRAWING NO: | REV:          |
|-------|------------|-------------|---------------|
| A     | 15542      | 98-PL-066   | A             |
| FILE: | 98PL066    | SCALE: 8:1  | SHEET: 1 OF 1 |

# Evaluation Board and Circuit



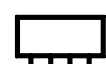
TB-99



Schematic Diagram

## Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.020 inch.

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

| Specification                  | Test/Inspection Condition                                                                                                                                       | Reference/Spec                                                                                       |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Operating Temperature          | -40° to 85°C<br>Ambient Environment                                                                                                                             | Individual Model Data Sheet                                                                          |
| Storage Temperature            | -55° to 100° C<br>Ambient Environment                                                                                                                           | Individual Model Data Sheet                                                                          |
| Humidity                       | 90 to 95% RH, 240 hours, 50°C                                                                                                                                   | MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours |
| Thermal Shock                  | -55° to 100°C, 100 cycles                                                                                                                                       | MIL-STD-202, Method 107, Condition A-3, except +100°C                                                |
| Solder Reflow Heat             | Sn-Pb Eutetic Process: 225°C peak<br>Pb-Free Process 245° - 250°C peak                                                                                          | J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1                                                        |
| Solderability                  | 10X Magnification                                                                                                                                               | J-STD-002, 95% Coverage                                                                              |
| Vibration (High Frequency)     | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)                                                                             | MIL-STD-202, Method 204, Condition D                                                                 |
| Mechanical Shock               | 50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes                                                                                               | MIL-STD-202, Method 213, Condition A                                                                 |
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C;<br>distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215                                                                              |