*Non-Catalog Model*

# Frequency Mixer MBR-17

## Level 7 (LO Power +7 dBm)

### Important Note

This is a non-catalog model and can be manufactured on specific request.
Pricing and delivery information can be supplied upon request.

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**CASE STYLE : SM26**

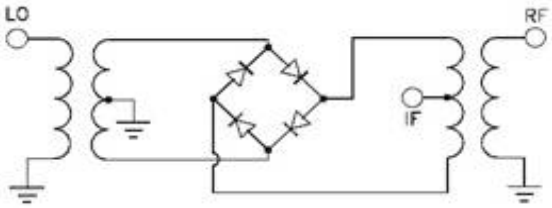
| ELECTRICAL SPECIFICATIONS 50Ω @ +25°C | | | | | |
|---|---|---|---|---|---|
| **Parameter** | | **Min.** | **Typ.** | **Max.** | **Units** |
| **Frequency** | **LO** (fL to fU) | 1200 | | 2000 | MHz |
| | **RF** (fL to fU) | 1200 | | 2000 | MHz |
| | **IF** | 0 | | 750 | MHz |
| **Conversion Loss** | | | 5.3 | 8.5 | dB |
| **LO-RF Isolation** | | 18 | 24 | | dB |
| **LO-IF Isolation** | | 10 | 17 | | dB |
| **1 dB Comp. Input Power** | | | +1 | | dBm |

**Note:** units are non-hermetic.

| MAXIMUM RATINGS | |
|---|---|
| **Operating Temperature** | -40°C to 85°C |
| **Storage Temperature** | -55°C to 100°C |
| **RF Power** | 50mW |
| **IF Current** | 40mA |

| PIN CONNECTIONS | |
|---|---|
| **LO** | 6 |
| **RF** | 3 |
| **IF** | 2 |
| **GROUND** | 1, 4, 5 |

### Electrical Schematics



# Frequency Mixer MBR-17

## *Typical Performance Data*

| RF (IN) (MHz) | LO (MHz) | CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) @LO (dBm) | | |
|---|---|---|---|---|
| | | +4 | +7 | +10 |
| 920.0 | 950.0 | 13.72 | 10.56 | 9.77 |
| 1000.0 | 1030.0 | 10.25 | 8.77 | 8.36 |
| 1080.0 | 1110.0 | 8.48 | 7.78 | 7.54 |
| 1160.0 | 1190.0 | 7.79 | 7.35 | 7.08 |
| 1240.0 | 1270.0 | 7.20 | 6.71 | 6.41 |
| 1320.0 | 1350.0 | 6.60 | 6.19 | 5.99 |
| 1400.0 | 1430.0 | 6.31 | 6.00 | 5.85 |
| 1480.0 | 1510.0 | 6.34 | 6.01 | 5.84 |
| 1560.0 | 1590.0 | 6.24 | 5.93 | 5.77 |
| 1660.0 | 1690.0 | 6.12 | 5.89 | 5.80 |
| 1740.0 | 1770.0 | 6.25 | 6.01 | 5.90 |
| 1840.0 | 1870.0 | 6.38 | 6.15 | 6.05 |
| 1920.0 | 1950.0 | 6.44 | 6.25 | 6.20 |
| 2020.0 | 2050.0 | 6.38 | 6.24 | 6.20 |
| 2100.0 | 2130.0 | 6.38 | 6.25 | 6.22 |
| 2200.0 | 2230.0 | 6.22 | 6.09 | 6.07 |
| 2280.0 | 2310.0 | 6.28 | 6.17 | 6.23 |
| 2380.0 | 2410.0 | 7.89 | 7.56 | 7.32 |
| 2460.0 | 2490.0 | 7.52 | 7.20 | 7.00 |
| 2560.0 | 2590.0 | 7.36 | 7.06 | 6.91 |
| 2640.0 | 2670.0 | 7.17 | 6.88 | 6.74 |
| 2740.0 | 2770.0 | 7.03 | 6.77 | 6.63 |
| 2820.0 | 2850.0 | 6.92 | 6.65 | 6.50 |
| 2920.0 | 2950.0 | 6.76 | 6.47 | 6.38 |
| 3000.0 | 3030.0 | 6.78 | 6.38 | 6.26 |
| 3100.0 | 3130.0 | 6.86 | 6.30 | 6.09 |
| 3180.0 | 3210.0 | 7.09 | 6.42 | 6.12 |
| 3280.0 | 3310.0 | 7.22 | 6.50 | 6.18 |
| 3360.0 | 3390.0 | 7.32 | 6.54 | 6.20 |
| 3460.0 | 3490.0 | 7.28 | 6.43 | 6.09 |
| 3540.0 | 3570.0 | 7.18 | 6.40 | 6.07 |
| 3640.0 | 3670.0 | 7.05 | 6.32 | 6.01 |
| 3720.0 | 3750.0 | 6.88 | 6.27 | 6.01 |
| 3820.0 | 3850.0 | 6.84 | 6.34 | 6.12 |
| 3900.0 | 3930.0 | 6.79 | 6.43 | 6.27 |
| 4000.0 | 4030.0 | 6.97 | 6.69 | 6.59 |
| 4080.0 | 4110.0 | 7.20 | 6.95 | 6.87 |
| 4180.0 | 4210.0 | 7.94 | 7.63 | 7.57 |
| 4260.0 | 4290.0 | 8.61 | 8.34 | 8.31 |
| 4360.0 | 4390.0 | 9.78 | 9.46 | 9.67 |

| RF (IN) (MHz) | LO (MHz) | IP-3 INPUT (dBm) @LO (dBm) | | |
|---|---|---|---|---|
| | | +4 | +7 | +10 |
| 920.0 | 950.0 | 6.29 | 10.78 | 12.24 |
| 1000.0 | 1030.0 | 8.11 | 8.10 | 7.78 |
| 1080.0 | 1110.0 | 7.68 | 8.57 | 7.72 |
| 1160.0 | 1190.0 | 6.69 | 6.12 | 5.16 |
| 1240.0 | 1270.0 | 6.85 | 7.15 | 7.52 |
| 1320.0 | 1350.0 | 7.84 | 8.25 | 8.36 |
| 1400.0 | 1430.0 | 6.32 | 6.52 | 6.55 |
| 1480.0 | 1510.0 | 6.81 | 8.60 | 10.35 |
| 1560.0 | 1590.0 | 6.36 | 8.36 | 10.69 |
| 1660.0 | 1690.0 | 12.76 | 14.19 | 13.89 |
| 1740.0 | 1770.0 | 14.38 | 13.10 | 12.48 |
| 1840.0 | 1870.0 | 14.80 | 13.29 | 11.47 |
| 1920.0 | 1950.0 | 15.28 | 13.23 | 11.73 |
| 2020.0 | 2050.0 | 13.42 | 13.88 | 13.15 |
| 2100.0 | 2130.0 | 11.86 | 14.18 | 15.47 |
| 2200.0 | 2230.0 | 13.96 | 15.53 | 16.34 |
| 2280.0 | 2310.0 | 8.39 | 10.35 | 11.52 |
| 2380.0 | 2410.0 | 13.57 | 10.67 | 6.70 |
| 2460.0 | 2490.0 | 8.49 | 8.27 | 6.67 |
| 2560.0 | 2590.0 | 8.36 | 8.34 | 7.67 |
| 2640.0 | 2670.0 | 8.51 | 8.61 | 8.25 |
| 2740.0 | 2770.0 | 8.34 | 8.58 | 8.83 |
| 2820.0 | 2850.0 | 8.71 | 9.07 | 9.10 |
| 2920.0 | 2950.0 | 8.69 | 9.75 | 10.07 |
| 3000.0 | 3030.0 | 9.02 | 10.07 | 10.71 |
| 3100.0 | 3130.0 | 8.68 | 8.61 | 12.06 |
| 3180.0 | 3210.0 | 9.88 | 11.93 | 13.26 |
| 3280.0 | 3310.0 | 10.02 | 11.51 | 13.14 |
| 3360.0 | 3390.0 | 10.05 | 10.85 | 12.08 |
| 3460.0 | 3490.0 | 9.36 | 10.63 | 11.64 |
| 3540.0 | 3570.0 | 9.35 | 10.92 | 12.82 |
| 3640.0 | 3670.0 | 9.18 | 10.45 | 11.96 |
| 3720.0 | 3750.0 | 9.39 | 10.44 | 12.12 |
| 3820.0 | 3850.0 | 10.58 | 11.08 | 12.37 |
| 3900.0 | 3930.0 | 10.74 | 11.57 | 12.61 |
| 4000.0 | 4030.0 | 11.12 | 11.73 | 13.03 |
| 4080.0 | 4110.0 | 11.05 | 11.72 | 12.48 |
| 4180.0 | 4210.0 | 12.43 | 11.82 | 12.15 |
| 4260.0 | 4290.0 | 13.00 | 12.91 | 11.81 |
| 4360.0 | 4390.0 | 11.07 | 9.95 | 7.47 |

| RF (IN) (MHz) | LO (MHz) | COMPRESSION @RF IN=+1dBm (dB) @LO (dBm) | | |
|---|---|---|---|---|
| | | +4 | +7 | +10 |
| 920.0 | 950.0 | -0.64 | 0.65 | 0.77 |
| 1000.0 | 1030.0 | 0.79 | 1.04 | 1.09 |
| 1080.0 | 1110.0 | 1.37 | 1.28 | 1.29 |
| 1160.0 | 1190.0 | 1.44 | 1.30 | 1.26 |
| 1240.0 | 1270.0 | 1.42 | 1.26 | 1.20 |
| 1320.0 | 1350.0 | 1.45 | 1.27 | 1.19 |
| 1400.0 | 1430.0 | 1.35 | 1.20 | 1.16 |
| 1480.0 | 1510.0 | 1.30 | 1.17 | 1.11 |
| 1560.0 | 1590.0 | 1.25 | 1.05 | 0.95 |
| 1660.0 | 1690.0 | 1.21 | 0.99 | 0.90 |
| 1740.0 | 1770.0 | 1.07 | 0.91 | 0.87 |
| 1840.0 | 1870.0 | 1.00 | 0.85 | 0.85 |
| 1920.0 | 1950.0 | 0.89 | 0.73 | 0.77 |
| 2020.0 | 2050.0 | 0.72 | 0.58 | 0.65 |
| 2100.0 | 2130.0 | 0.74 | 0.52 | 0.55 |
| 2200.0 | 2230.0 | 1.04 | 0.69 | 0.59 |
| 2280.0 | 2310.0 | 1.76 | 1.45 | 1.32 |
| 2380.0 | 2410.0 | 1.50 | 1.31 | 1.31 |
| 2460.0 | 2490.0 | 1.42 | 1.27 | 1.29 |
| 2560.0 | 2590.0 | 1.28 | 1.13 | 1.16 |
| 2640.0 | 2670.0 | 1.26 | 1.06 | 1.06 |
| 2740.0 | 2770.0 | 1.20 | 0.96 | 0.96 |
| 2820.0 | 2850.0 | 1.29 | 0.99 | 0.92 |
| 2920.0 | 2950.0 | 1.37 | 0.91 | 0.79 |
| 3000.0 | 3030.0 | 1.35 | 0.85 | 0.72 |
| 3100.0 | 3130.0 | 1.39 | 0.91 | 0.69 |
| 3180.0 | 3210.0 | 1.35 | 0.92 | 0.72 |
| 3280.0 | 3310.0 | 1.36 | 0.94 | 0.77 |
| 3360.0 | 3390.0 | 1.30 | 0.98 | 0.84 |
| 3460.0 | 3490.0 | 1.40 | 1.11 | 1.00 |
| 3540.0 | 3570.0 | 1.56 | 1.18 | 1.09 |
| 3640.0 | 3670.0 | 1.60 | 1.30 | 1.25 |
| 3720.0 | 3750.0 | 1.67 | 1.38 | 1.37 |
| 3820.0 | 3850.0 | 1.64 | 1.40 | 1.45 |
| 3900.0 | 3930.0 | 1.61 | 1.41 | 1.45 |
| 4000.0 | 4030.0 | 1.49 | 1.32 | 1.36 |
| 4080.0 | 4110.0 | 1.49 | 1.37 | 1.42 |
| 4180.0 | 4210.0 | 1.38 | 1.34 | 1.39 |
| 4260.0 | 4290.0 | 1.35 | 1.33 | 1.47 |
| 4360.0 | 4390.0 | 1.56 | 1.71 | 1.93 |

## *Typical Performance Data*

| IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1589.9MHz (dB) |
|---|---|---|
| | | @LO (dBm) |
| | | +7 |
| 10.1 | 1600.0 | 6.5 |
| 20.1 | 1610.0 | 6.2 |
| 30.1 | 1620.0 | 6.2 |
| 40.1 | 1630.0 | 6.2 |
| 50.1 | 1640.0 | 6.2 |
| 60.1 | 1650.0 | 6.2 |
| 70.1 | 1660.0 | 6.2 |
| 80.1 | 1670.0 | 6.2 |
| 90.1 | 1680.0 | 6.2 |
| 100.1 | 1690.0 | 6.2 |
| 110.1 | 1700.0 | 6.3 |
| 120.1 | 1710.0 | 6.3 |
| 130.1 | 1720.0 | 6.3 |
| 140.1 | 1730.0 | 6.4 |
| 150.1 | 1740.0 | 6.4 |
| 160.1 | 1750.0 | 6.4 |
| 170.1 | 1760.0 | 6.3 |
| 180.1 | 1770.0 | 6.4 |
| 190.1 | 1780.0 | 6.4 |
| 200.1 | 1790.0 | 6.5 |
| 210.1 | 1800.0 | 6.5 |
| 220.1 | 1810.0 | 6.5 |
| 230.1 | 1820.0 | 6.6 |
| 240.1 | 1830.0 | 6.6 |
| 250.1 | 1840.0 | 6.6 |
| 260.1 | 1850.0 | 6.6 |
| 270.1 | 1860.0 | 6.6 |
| 280.1 | 1870.0 | 6.7 |
| 290.1 | 1880.0 | 6.7 |
| 300.1 | 1890.0 | 6.7 |
| 310.1 | 1900.0 | 6.8 |
| 320.1 | 1910.0 | 6.8 |
| 330.1 | 1920.0 | 6.8 |
| 340.1 | 1930.0 | 6.8 |
| 350.1 | 1940.0 | 6.8 |
| 360.1 | 1950.0 | 6.8 |
| 370.1 | 1960.0 | 6.8 |
| 380.1 | 1970.0 | 6.8 |
| 400.1 | 1990.0 | 6.9 |
| 410.1 | 2000.0 | 6.9 |

| IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1189.9MHz (dB) |
|---|---|---|
| | | @LO (dBm) |
| | | +7 |
| 10.1 | 1200.0 | 7.51 |
| 30.1 | 1220.0 | 7.20 |
| 70.1 | 1260.0 | 7.14 |
| 90.1 | 1280.0 | 7.10 |
| 130.1 | 1320.0 | 7.03 |
| 150.1 | 1340.0 | 7.09 |
| 190.1 | 1380.0 | 7.17 |
| 210.1 | 1400.0 | 7.20 |
| 250.1 | 1440.0 | 7.40 |
| 270.1 | 1460.0 | 7.43 |
| 310.1 | 1500.0 | 7.45 |
| 330.1 | 1520.0 | 7.45 |
| 370.1 | 1560.0 | 7.59 |
| 390.1 | 1580.0 | 7.60 |
| 430.1 | 1620.0 | 7.75 |
| 450.1 | 1640.0 | 7.82 |
| 490.1 | 1680.0 | 7.91 |
| 510.1 | 1700.0 | 7.93 |
| 550.1 | 1740.0 | 8.09 |
| 570.1 | 1760.0 | 8.16 |
| 610.1 | 1800.0 | 8.20 |
| 630.1 | 1820.0 | 8.32 |
| 670.1 | 1860.0 | 8.39 |
| 690.1 | 1880.0 | 8.36 |
| 730.1 | 1920.0 | 8.27 |
| 750.1 | 1940.0 | 8.08 |
| 790.1 | 1980.0 | 7.99 |
| 810.1 | 2000.0 | 7.99 |
| 850.1 | 2040.0 | 8.15 |
| 870.1 | 2060.0 | 8.30 |
| 910.1 | 2100.0 | 8.40 |
| 930.1 | 2120.0 | 8.50 |
| 970.1 | 2160.0 | 8.65 |
| 990.1 | 2180.0 | 8.64 |
| 1030.1 | 2220.0 | 8.98 |
| 1050.1 | 2240.0 | 9.16 |
| 1090.1 | 2280.0 | 9.42 |
| 1110.1 | 2300.0 | 9.67 |
| 1150.1 | 2340.0 | 10.16 |
| 1170.1 | 2360.0 | 10.32 |

| IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=2010.1MHz (dB) |
|---|---|---|
| | | @LO (dBm) |
| | | +7 |
| 1110.1 | 900.0 | 10.27 |
| 1090.1 | 920.0 | 9.61 |
| 1070.1 | 940.0 | 9.02 |
| 1050.1 | 960.0 | 8.46 |
| 1030.1 | 980.0 | 7.97 |
| 1010.1 | 1000.0 | 7.45 |
| 990.1 | 1020.0 | 7.18 |
| 970.1 | 1040.0 | 7.00 |
| 930.1 | 1080.0 | 6.89 |
| 910.1 | 1100.0 | 6.84 |
| 870.1 | 1140.0 | 6.64 |
| 850.1 | 1160.0 | 6.56 |
| 810.1 | 1200.0 | 6.54 |
| 790.1 | 1220.0 | 6.42 |
| 750.1 | 1260.0 | 6.35 |
| 730.1 | 1280.0 | 6.37 |
| 690.1 | 1320.0 | 6.21 |
| 670.1 | 1340.0 | 6.10 |
| 630.1 | 1380.0 | 6.40 |
| 610.1 | 1400.0 | 6.61 |
| 570.1 | 1440.0 | 6.88 |
| 550.1 | 1460.0 | 6.99 |
| 510.1 | 1500.0 | 7.05 |
| 490.1 | 1520.0 | 7.08 |
| 450.1 | 1560.0 | 7.07 |
| 430.1 | 1580.0 | 7.04 |
| 390.1 | 1620.0 | 6.69 |
| 370.1 | 1640.0 | 6.60 |
| 330.1 | 1680.0 | 6.43 |
| 310.1 | 1700.0 | 6.35 |
| 270.1 | 1740.0 | 6.25 |
| 250.1 | 1760.0 | 6.24 |
| 210.1 | 1800.0 | 6.12 |
| 190.1 | 1820.0 | 6.12 |
| 150.1 | 1860.0 | 6.14 |
| 130.1 | 1880.0 | 6.14 |
| 90.1 | 1920.0 | 6.14 |
| 70.1 | 1940.0 | 6.15 |
| 30.1 | 1980.0 | 6.21 |
| 10.1 | 2000.0 | 6.49 |

## *Typical Performance Data*

| LO (MHz) | LO-RF ISOLATION (dB) @LO (dBm) | | | LO-IF ISOLATION (dB) @LO (dBm) | | |
|---|---|---|---|---|---|---|
| | +4 | +7 | +10 | +4 | +7 | +10 |
| 950.0 | 32.02 | 32.03 | 36.14 | 13.75 | 14.76 | 16.28 |
| 1030.0 | 30.18 | 31.86 | 35.99 | 14.22 | 15.57 | 16.23 |
| 1110.0 | 28.84 | 31.68 | 36.46 | 15.58 | 16.00 | 15.30 |
| 1190.0 | 27.22 | 30.52 | 35.92 | 17.22 | 16.00 | 14.82 |
| 1270.0 | 25.86 | 30.01 | 37.02 | 17.98 | 15.95 | 14.49 |
| 1350.0 | 25.48 | 30.54 | 39.23 | 18.01 | 15.90 | 14.74 |
| 1430.0 | 24.73 | 29.58 | 37.40 | 17.54 | 16.38 | 15.62 |
| 1510.0 | 23.12 | 27.85 | 35.42 | 17.15 | 16.97 | 16.76 |
| 1590.0 | 23.16 | 28.14 | 33.70 | 16.64 | 17.45 | 18.00 |
| 1690.0 | 23.28 | 27.13 | 30.41 | 15.97 | 17.56 | 19.18 |
| 1770.0 | 23.15 | 26.06 | 28.21 | 15.68 | 17.36 | 18.88 |
| 1870.0 | 23.02 | 24.50 | 25.45 | 15.27 | 16.21 | 16.85 |
| 1950.0 | 22.98 | 23.59 | 23.99 | 14.64 | 14.98 | 15.13 |
| 2050.0 | 23.32 | 23.03 | 22.62 | 14.28 | 13.89 | 13.23 |
| 2130.0 | 23.53 | 22.76 | 22.04 | 13.80 | 12.87 | 12.14 |
| 2230.0 | 22.82 | 21.65 | 20.72 | 12.71 | 11.66 | 10.93 |
| 2310.0 | 21.81 | 20.44 | 19.47 | 11.91 | 10.87 | 10.14 |
| 2410.0 | 22.76 | 21.98 | 21.44 | 10.97 | 10.18 | 9.59 |
| 2490.0 | 23.16 | 22.93 | 22.63 | 9.92 | 9.40 | 9.05 |
| 2590.0 | 23.12 | 23.21 | 23.16 | 9.03 | 8.67 | 8.60 |
| 2670.0 | 22.83 | 23.16 | 22.95 | 8.36 | 8.25 | 8.03 |
| 2770.0 | 22.26 | 22.70 | 22.43 | 7.55 | 7.82 | 7.73 |
| 2850.0 | 21.86 | 22.14 | 21.90 | 7.13 | 7.48 | 7.61 |
| 2950.0 | 21.47 | 21.31 | 20.59 | 6.49 | 7.09 | 7.38 |
| 3030.0 | 22.14 | 21.60 | 20.48 | 6.18 | 6.71 | 7.18 |
| 3130.0 | 22.34 | 21.87 | 20.61 | 5.87 | 6.48 | 7.11 |
| 3210.0 | 21.90 | 21.32 | 20.22 | 5.66 | 6.31 | 7.09 |
| 3310.0 | 21.41 | 20.59 | 19.41 | 5.46 | 6.28 | 7.18 |
| 3390.0 | 21.24 | 20.18 | 18.86 | 5.19 | 6.17 | 7.30 |
| 3490.0 | 21.52 | 20.19 | 18.49 | 5.05 | 6.19 | 7.50 |
| 3570.0 | 21.73 | 20.06 | 17.98 | 5.07 | 6.23 | 7.53 |
| 3670.0 | 21.90 | 19.66 | 17.57 | 5.31 | 6.53 | 7.82 |
| 3750.0 | 21.67 | 19.48 | 17.58 | 5.76 | 7.03 | 8.13 |
| 3850.0 | 21.07 | 19.67 | 18.20 | 6.65 | 7.85 | 8.50 |
| 3930.0 | 20.84 | 19.90 | 19.30 | 7.77 | 8.51 | 8.95 |
| 4030.0 | 20.82 | 21.40 | 21.49 | 9.47 | 9.93 | 9.79 |
| 4110.0 | 21.07 | 22.47 | 23.34 | 11.29 | 11.15 | 10.63 |
| 4210.0 | 21.12 | 22.55 | 23.66 | 13.67 | 13.24 | 12.40 |
| 4290.0 | 21.46 | 21.98 | 22.12 | 14.62 | 14.26 | 13.57 |
| 4390.0 | 20.89 | 20.39 | 20.30 | 14.53 | 14.17 | 13.93 |

| RF (IN) (MHz) | LO (MHz) | RF-IF ISOLATION (dB) @LO (dBm) | | |
|---|---|---|---|---|
| | | +4 | +7 | +10 |
| 920.0 | 950.0 | 25.60 | 25.38 | 22.82 |
| 1000.0 | 1030.0 | 28.93 | 27.92 | 25.10 |
| 1080.0 | 1110.0 | 25.04 | 23.70 | 22.93 |
| 1160.0 | 1190.0 | 22.30 | 21.83 | 22.11 |
| 1240.0 | 1270.0 | 23.71 | 23.56 | 23.89 |
| 1320.0 | 1350.0 | 29.49 | 28.00 | 27.04 |
| 1400.0 | 1430.0 | 36.25 | 32.51 | 30.67 |
| 1480.0 | 1510.0 | 27.12 | 26.51 | 25.62 |
| 1560.0 | 1590.0 | 21.82 | 21.98 | 21.86 |
| 1660.0 | 1690.0 | 18.28 | 18.59 | 18.97 |
| 1740.0 | 1770.0 | 16.27 | 16.82 | 17.16 |
| 1840.0 | 1870.0 | 14.89 | 15.43 | 15.70 |
| 1920.0 | 1950.0 | 14.35 | 14.92 | 15.26 |
| 2020.0 | 2050.0 | 14.20 | 14.57 | 14.97 |
| 2100.0 | 2130.0 | 13.99 | 14.34 | 14.62 |
| 2200.0 | 2230.0 | 13.88 | 14.10 | 14.20 |
| 2280.0 | 2310.0 | 12.87 | 12.93 | 12.86 |
| 2380.0 | 2410.0 | 12.74 | 13.03 | 13.56 |
| 2460.0 | 2490.0 | 14.35 | 14.73 | 15.30 |
| 2560.0 | 2590.0 | 15.96 | 16.40 | 16.79 |
| 2640.0 | 2670.0 | 16.82 | 17.06 | 17.28 |
| 2740.0 | 2770.0 | 17.88 | 17.91 | 17.88 |
| 2820.0 | 2850.0 | 18.16 | 18.18 | 17.99 |
| 2920.0 | 2950.0 | 18.21 | 18.19 | 17.96 |
| 3000.0 | 3030.0 | 18.23 | 17.93 | 17.67 |
| 3100.0 | 3130.0 | 18.76 | 18.17 | 17.75 |
| 3180.0 | 3210.0 | 18.50 | 17.86 | 17.54 |
| 3280.0 | 3310.0 | 18.15 | 17.62 | 17.18 |
| 3360.0 | 3390.0 | 18.52 | 17.96 | 17.74 |
| 3460.0 | 3490.0 | 19.19 | 18.92 | 19.26 |
| 3540.0 | 3570.0 | 20.01 | 20.61 | 21.57 |
| 3640.0 | 3670.0 | 21.69 | 23.79 | 26.48 |
| 3720.0 | 3750.0 | 24.23 | 29.27 | 33.31 |
| 3820.0 | 3850.0 | 28.26 | 37.28 | 32.48 |
| 3900.0 | 3930.0 | 26.88 | 28.72 | 28.10 |
| 4000.0 | 4030.0 | 23.91 | 24.81 | 24.68 |
| 4080.0 | 4110.0 | 22.29 | 23.82 | 24.03 |
| 4180.0 | 4210.0 | 20.08 | 22.77 | 23.92 |
| 4260.0 | 4290.0 | 18.57 | 20.48 | 23.65 |
| 4360.0 | 4390.0 | 18.80 | 20.05 | 23.13 |

## Typical Performance Data

| RF (IN) (MHz) | LO (MHz) | RF VSWR (:1) @LO (dBm) | | |
|---|---|---|---|---|
| | | +4 | +7 | +10 |
| 920.0 | 950.0 | 9.38 | 7.00 | 6.09 |
| 1000.0 | 1030.0 | 6.17 | 4.99 | 4.47 |
| 1080.0 | 1110.0 | 4.32 | 3.73 | 3.39 |
| 1160.0 | 1190.0 | 3.33 | 2.96 | 2.72 |
| 1240.0 | 1270.0 | 2.62 | 2.36 | 2.18 |
| 1320.0 | 1350.0 | 2.10 | 1.95 | 1.84 |
| 1400.0 | 1430.0 | 1.72 | 1.63 | 1.58 |
| 1480.0 | 1510.0 | 1.42 | 1.36 | 1.36 |
| 1560.0 | 1590.0 | 1.18 | 1.22 | 1.27 |
| 1660.0 | 1690.0 | 1.02 | 1.10 | 1.18 |
| 1740.0 | 1770.0 | 1.08 | 1.12 | 1.20 |
| 1840.0 | 1870.0 | 1.24 | 1.23 | 1.29 |
| 1920.0 | 1950.0 | 1.32 | 1.34 | 1.41 |
| 2020.0 | 2050.0 | 1.41 | 1.44 | 1.51 |
| 2100.0 | 2130.0 | 1.44 | 1.46 | 1.53 |
| 2200.0 | 2230.0 | 1.45 | 1.41 | 1.46 |
| 2280.0 | 2310.0 | 1.37 | 1.22 | 1.13 |
| 2380.0 | 2410.0 | 2.21 | 2.12 | 2.02 |
| 2460.0 | 2490.0 | 2.48 | 2.33 | 2.21 |
| 2560.0 | 2590.0 | 2.58 | 2.41 | 2.30 |
| 2640.0 | 2670.0 | 2.63 | 2.45 | 2.31 |
| 2740.0 | 2770.0 | 2.62 | 2.44 | 2.29 |
| 2820.0 | 2850.0 | 2.61 | 2.43 | 2.27 |
| 2920.0 | 2950.0 | 2.48 | 2.26 | 2.12 |
| 3000.0 | 3030.0 | 2.45 | 2.15 | 1.98 |
| 3100.0 | 3130.0 | 2.46 | 2.09 | 1.85 |
| 3180.0 | 3210.0 | 2.40 | 2.03 | 1.79 |
| 3280.0 | 3310.0 | 2.27 | 1.92 | 1.70 |
| 3360.0 | 3390.0 | 2.15 | 1.83 | 1.63 |
| 3460.0 | 3490.0 | 1.98 | 1.68 | 1.49 |
| 3540.0 | 3570.0 | 1.81 | 1.54 | 1.38 |
| 3640.0 | 3670.0 | 1.73 | 1.52 | 1.41 |
| 3720.0 | 3750.0 | 1.71 | 1.56 | 1.50 |
| 3820.0 | 3850.0 | 1.82 | 1.73 | 1.73 |
| 3900.0 | 3930.0 | 1.98 | 1.94 | 1.96 |
| 4000.0 | 4030.0 | 2.28 | 2.25 | 2.28 |
| 4080.0 | 4110.0 | 2.60 | 2.54 | 2.56 |
| 4180.0 | 4210.0 | 3.14 | 2.99 | 2.93 |
| 4260.0 | 4290.0 | 3.71 | 3.54 | 3.38 |
| 4360.0 | 4390.0 | 4.39 | 4.12 | 3.90 |

| LO (MHz) | LO VSWR (:1) @LO (dBm) | | |
|---|---|---|---|
| | +4 | +7 | +10 |
| 950.0 | 12.80 | 8.39 | 6.97 |
| 1030.0 | 8.27 | 5.83 | 5.63 |
| 1110.0 | 5.30 | 4.53 | 4.82 |
| 1190.0 | 3.86 | 3.76 | 4.25 |
| 1270.0 | 3.06 | 3.25 | 3.81 |
| 1350.0 | 2.44 | 2.77 | 3.42 |
| 1430.0 | 1.95 | 2.40 | 3.12 |
| 1510.0 | 1.70 | 2.20 | 2.92 |
| 1590.0 | 1.53 | 2.04 | 2.74 |
| 1690.0 | 1.34 | 1.88 | 2.57 |
| 1770.0 | 1.28 | 1.80 | 2.47 |
| 1870.0 | 1.27 | 1.76 | 2.40 |
| 1950.0 | 1.24 | 1.71 | 2.33 |
| 2050.0 | 1.20 | 1.70 | 2.30 |
| 2130.0 | 1.22 | 1.71 | 2.28 |
| 2230.0 | 1.28 | 1.75 | 2.29 |
| 2310.0 | 1.33 | 1.77 | 2.29 |
| 2410.0 | 1.41 | 1.83 | 2.34 |
| 2490.0 | 1.50 | 1.90 | 2.38 |
| 2590.0 | 1.61 | 1.96 | 2.42 |
| 2670.0 | 1.73 | 2.03 | 2.45 |
| 2770.0 | 1.89 | 2.14 | 2.54 |
| 2850.0 | 1.98 | 2.21 | 2.60 |
| 2950.0 | 2.16 | 2.26 | 2.59 |
| 3030.0 | 2.26 | 2.31 | 2.63 |
| 3130.0 | 2.40 | 2.32 | 2.54 |
| 3210.0 | 2.52 | 2.35 | 2.55 |
| 3310.0 | 2.54 | 2.31 | 2.40 |
| 3390.0 | 2.59 | 2.26 | 2.27 |
| 3490.0 | 2.50 | 2.13 | 2.06 |
| 3570.0 | 2.40 | 1.98 | 1.81 |
| 3670.0 | 2.26 | 1.77 | 1.60 |
| 3750.0 | 2.04 | 1.55 | 1.42 |
| 3850.0 | 1.68 | 1.30 | 1.31 |
| 3930.0 | 1.38 | 1.16 | 1.37 |
| 4030.0 | 1.10 | 1.29 | 1.67 |
| 4110.0 | 1.23 | 1.56 | 1.97 |
| 4210.0 | 1.62 | 2.02 | 2.48 |
| 4290.0 | 2.00 | 2.43 | 2.90 |
| 4390.0 | 2.47 | 2.84 | 3.28 |

| IF (OUT) (MHz) | IF VSWR @LO=2000MHz (:1) @LO (dBm) | | |
|---|---|---|---|
| | +4 | +7 | +10 |
| 10.0 | 1.31 | 1.43 | 1.54 |
| 50.0 | 1.30 | 1.42 | 1.52 |
| 90.0 | 1.31 | 1.42 | 1.52 |
| 130.0 | 1.33 | 1.44 | 1.53 |
| 170.0 | 1.37 | 1.45 | 1.54 |
| 190.0 | 1.40 | 1.48 | 1.56 |
| 230.0 | 1.45 | 1.51 | 1.58 |
| 250.0 | 1.47 | 1.51 | 1.56 |
| 290.0 | 1.54 | 1.57 | 1.61 |
| 310.0 | 1.61 | 1.62 | 1.64 |
| 350.0 | 1.68 | 1.68 | 1.69 |
| 370.0 | 1.74 | 1.73 | 1.73 |
| 410.0 | 1.83 | 1.80 | 1.80 |
| 430.0 | 1.90 | 1.86 | 1.83 |
| 470.0 | 2.07 | 1.99 | 1.94 |
| 490.0 | 2.12 | 2.05 | 2.01 |
| 530.0 | 2.24 | 2.14 | 2.07 |
| 550.0 | 2.33 | 2.20 | 2.12 |
| 590.0 | 2.51 | 2.37 | 2.26 |
| 610.0 | 2.56 | 2.41 | 2.30 |
| 650.0 | 2.79 | 2.61 | 2.49 |
| 670.0 | 2.80 | 2.61 | 2.47 |
| 710.0 | 2.88 | 2.68 | 2.51 |
| 730.0 | 2.98 | 2.77 | 2.60 |
| 770.0 | 3.00 | 2.78 | 2.60 |
| 790.0 | 2.96 | 2.75 | 2.57 |
| 830.0 | 2.88 | 2.66 | 2.50 |
| 850.0 | 2.89 | 2.67 | 2.52 |
| 890.0 | 2.62 | 2.42 | 2.28 |
| 910.0 | 2.46 | 2.28 | 2.16 |
| 950.0 | 2.27 | 2.10 | 2.00 |
| 970.0 | 2.13 | 1.96 | 1.87 |
| 1010.0 | 2.12 | 2.00 | 1.92 |
| 1030.0 | 2.19 | 2.08 | 2.02 |
| 1070.0 | 2.55 | 2.48 | 2.44 |
| 1090.0 | 2.92 | 2.84 | 2.80 |
| 1130.0 | 3.69 | 3.65 | 3.59 |
| 1150.0 | 4.11 | 4.09 | 4.07 |
| 1190.0 | 5.46 | 5.44 | 5.44 |
| 1210.0 | 6.15 | 6.17 | 6.13 |

## *Harmonics Tables*

| RF HARMONICS ORDER | (-dBm) | (-dBc) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | - | - | 10 | 7 | 9 | 12 | 19 | 30 | 33 | 41 | 47 | 34 |
| 1 | - | 15 | 0 | 37 | 15 | 41 | 29 | 51 | 33 | 42 | 42 | 61 |
| 2 | 31 | 49 | 63 | 37 | 47 | 50 | 45 | 52 | 58 | 62 | 52 | 65 |
| 3 | 34 | 73 | 61 | 77 | 55 | 71 | 59 | 68 | 69 | 74 | 62 | 66 |
| 4 | 55 | 81 | 88 | 83 | 86 | 76 | 86 | 84 | 85 | 92 | 81 | 83 |
| 5 | 62 | 96 | 87 | 88 | 87 | 84 | 83 | 87 | 88 | 91 | 93 | 90 |
| 6 | 67 | 95 | 87 | 83 | 83 | 96 | 84 | 87 | 87 | 88 | 85 | 82 |
| 7 | 73 | 94 | 83 | 89 | 86 | 85 | 94 | 85 | 89 | 88 | 91 | 90 |
| 8 | 71 | 87 | 78 | 94 | 80 | 87 | 87 | 102 | 91 | 88 | 94 | 90 |
| 9 | 76 | 77 | 90 | 86 | 85 | 84 | 100 | 90 | 85 | 100 | 98 | 90 |
| 10 | 86 | 89 | 78 | 80 | 91 | 91 | 91 | 87 | 88 | 93 | 85 | 92 |
| | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

**LO HARMONICS ORDER**

**Test conditions:**
**RF IN: 1600 MHz; -14.00 dBm.**
**LO IN: 1630 MHz; +7.00 dBm**
**IF OUT: 30 MHz; -20.14 dBm**

| RF HARMONICS ORDER | (-dBm) | (-dBc) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | - | - | 0 | 18 | 21 | 24 | 30 | 41 | 52 | 61 | 54 | 57 |
| 1 | - | 15 | 0 | 40 | 17 | 41 | 31 | 60 | 39 | 48 | 49 | 67 |
| 2 | 31 | 36 | 58 | 30 | 41 | 39 | 40 | 41 | 52 | 54 | 50 | 56 |
| 3 | 34 | 48 | 40 | 66 | 41 | 49 | 45 | 51 | 54 | 60 | 52 | 58 |
| 4 | 55 | 64 | 55 | 53 | 71 | 45 | 53 | 58 | 56 | 56 | 67 | 58 |
| 5 | 62 | 84 | 78 | 69 | 66 | 71 | 58 | 67 | 61 | 61 | 73 | 66 |
| 6 | 67 | 82 | 96 | 78 | 77 | 73 | 88 | 66 | 71 | 64 | 70 | 72 |
| 7 | 73 | 93 | 93 | 106 | 91 | 85 | 94 | 89 | 73 | 84 | 69 | 74 |
| 8 | 71 | 90 | 91 | 92 | 92 | 93 | 97 | 98 | 88 | 88 | 84 | 75 |
| 9 | 76 | 87 | 106 | 95 | 97 | 96 | 95 | 98 | 104 | 94 | 86 | 94 |
| 10 | 86 | 97 | 95 | 102 | 117 | 95 | 95 | 118 | 101 | 93 | 97 | 94 |
| | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

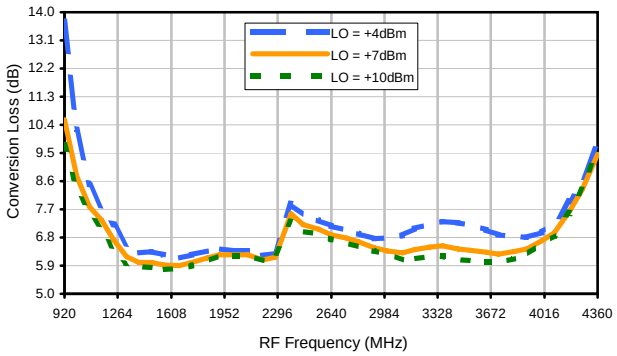
**LO HARMONICS ORDER**

**Test conditions:**
**RF IN: 1600 MHz; -4.00 dBm.**
**LO IN: 1630 MHz; +7.00 dBm**
**IF OUT: 30 MHz; -10.22 dBm**

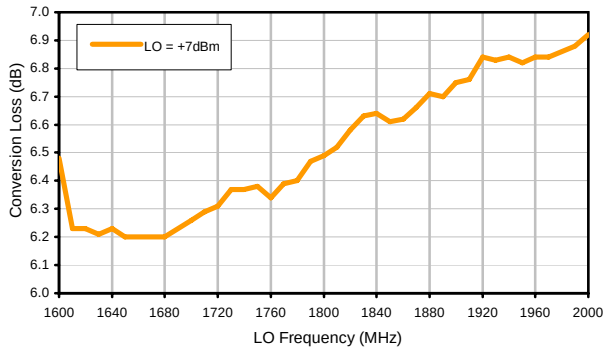
**Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.**
**2. + entry denotes harmonics are in (dBc) above IF OUTPUT.**
**3. RF Cal represent the Harmonics level of the RF input signal to the mixer.**

## *Typical Performance Curves*

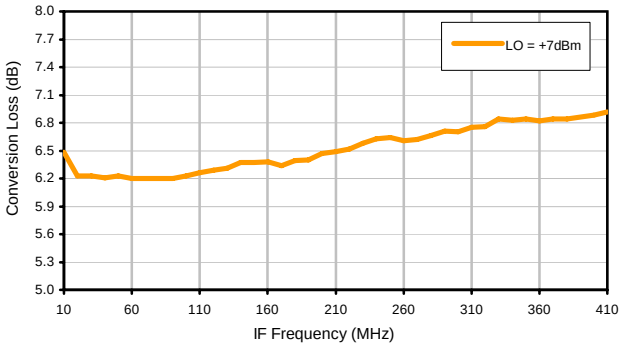
### Conversion Loss @ IF=30MHz



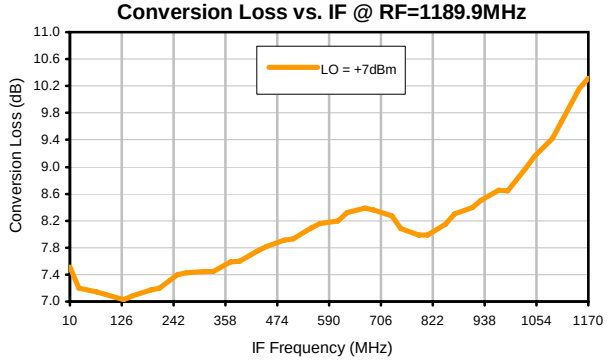

### Conversion Loss vs. LO @ RF=1589.9MHz



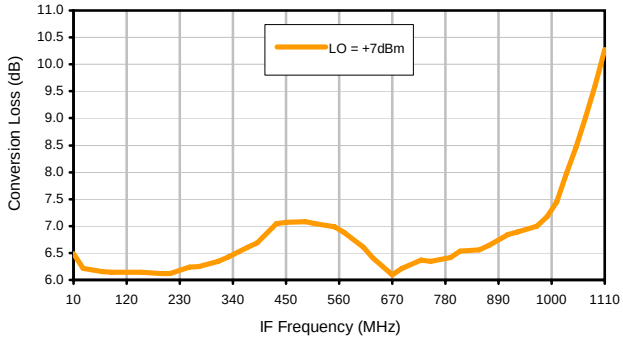

### Conversion Loss vs. IF @ RF=1589.9MHz



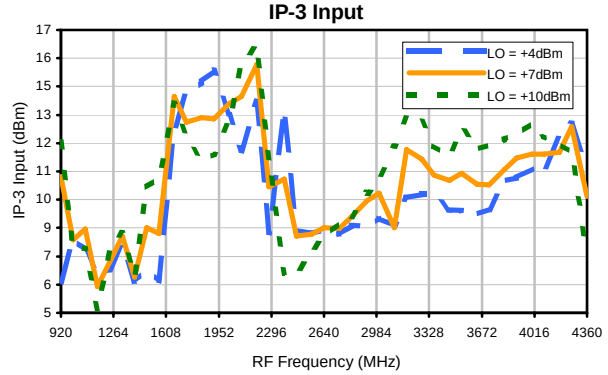

### Conversion Loss vs. IF @ RF=1189.9MHz



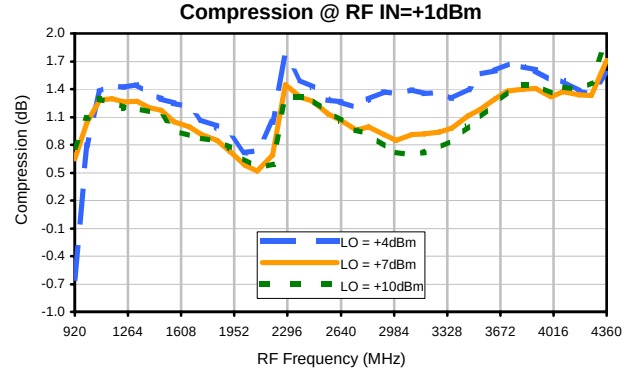

### Conversion Loss vs. IF @ RF=2010.1MHz




### IP-3 Input

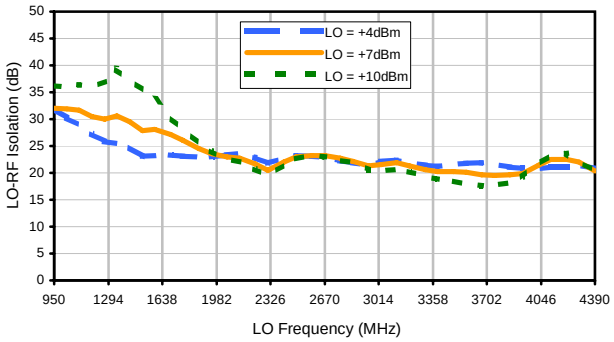



### Compression @ RF IN=+1dBm

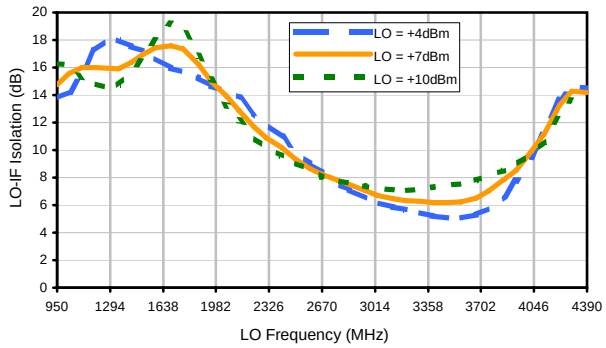


## *Typical Performance Curves*

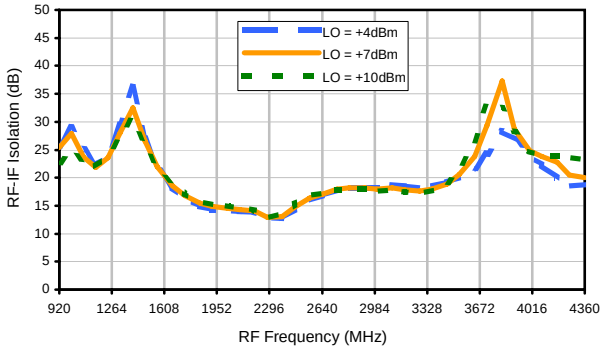
### LO-RF Isolation



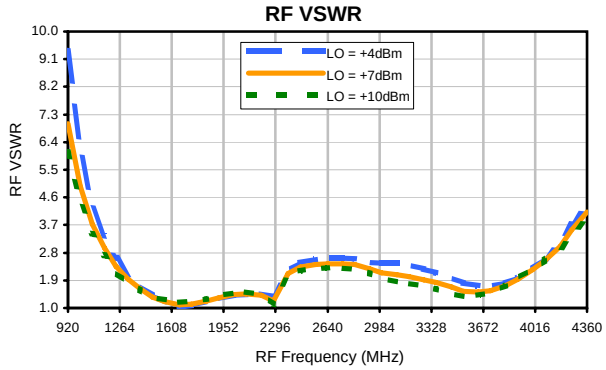

### LO-IF Isolation



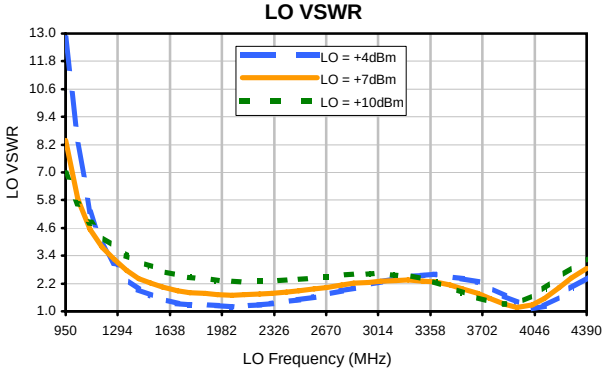

### RF-IF Isolation



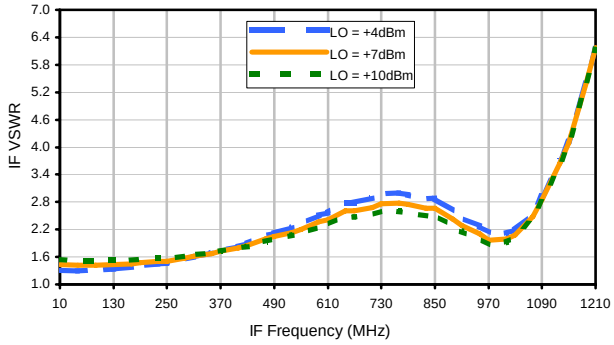

### RF VSWR




### LO VSWR




### IF VSWR



## *Harmonics Tables*

| RF HARMONICS ORDER | (-dBm) | (-dBc) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | - | - | 10 | 7 | 9 | 12 | 19 | 30 | 33 | 41 | 47 | 34 |
| 1 | - | 15 | 0 | 37 | 15 | 41 | 29 | 51 | 33 | 42 | 42 | 61 |
| 2 | 31 | 49 | 63 | 37 | 47 | 50 | 45 | 52 | 58 | 62 | 52 | 65 |
| 3 | 34 | 73 | 61 | 77 | 55 | 71 | 59 | 68 | 69 | 74 | 62 | 66 |
| 4 | 55 | 81 | 88 | 83 | 86 | 76 | 86 | 84 | 85 | 92 | 81 | 83 |
| 5 | 62 | 96 | 87 | 88 | 87 | 84 | 83 | 87 | 88 | 91 | 93 | 90 |
| 6 | 67 | 95 | 87 | 83 | 83 | 96 | 84 | 87 | 87 | 88 | 85 | 82 |
| 7 | 73 | 94 | 83 | 89 | 86 | 85 | 94 | 85 | 89 | 88 | 91 | 90 |
| 8 | 71 | 87 | 78 | 94 | 80 | 87 | 87 | 102 | 91 | 88 | 94 | 90 |
| 9 | 76 | 77 | 90 | 86 | 85 | 84 | 100 | 90 | 85 | 100 | 98 | 90 |
| 10 | 86 | 89 | 78 | 80 | 91 | 91 | 91 | 87 | 88 | 93 | 85 | 92 |
| | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

**LO HARMONICS ORDER**

**Test conditions:**
**RF IN: 1600 MHz; -14.00 dBm.**
**LO IN: 1630 MHz; +7.00 dBm**
**IF OUT: 30 MHz; -20.14 dBm**

| RF HARMONICS ORDER | (-dBm) | (-dBc) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | - | - | 0 | 18 | 21 | 24 | 30 | 41 | 52 | 61 | 54 | 57 |
| 1 | - | 15 | 0 | 40 | 17 | 41 | 31 | 60 | 39 | 48 | 49 | 67 |
| 2 | 31 | 36 | 58 | 30 | 41 | 39 | 40 | 41 | 52 | 54 | 50 | 56 |
| 3 | 34 | 48 | 40 | 66 | 41 | 49 | 45 | 51 | 54 | 60 | 52 | 58 |
| 4 | 55 | 64 | 55 | 53 | 71 | 45 | 53 | 58 | 56 | 56 | 67 | 58 |
| 5 | 62 | 84 | 78 | 69 | 66 | 71 | 58 | 67 | 61 | 61 | 73 | 66 |
| 6 | 67 | 82 | 96 | 78 | 77 | 73 | 88 | 66 | 71 | 64 | 70 | 72 |
| 7 | 73 | 93 | 93 | 106 | 91 | 85 | 94 | 89 | 73 | 84 | 69 | 74 |
| 8 | 71 | 90 | 91 | 92 | 92 | 93 | 97 | 98 | 88 | 88 | 84 | 75 |
| 9 | 76 | 87 | 106 | 95 | 97 | 96 | 95 | 98 | 104 | 94 | 86 | 94 |
| 10 | 86 | 97 | 95 | 102 | 117 | 95 | 95 | 118 | 101 | 93 | 97 | 94 |
| | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

**LO HARMONICS ORDER**

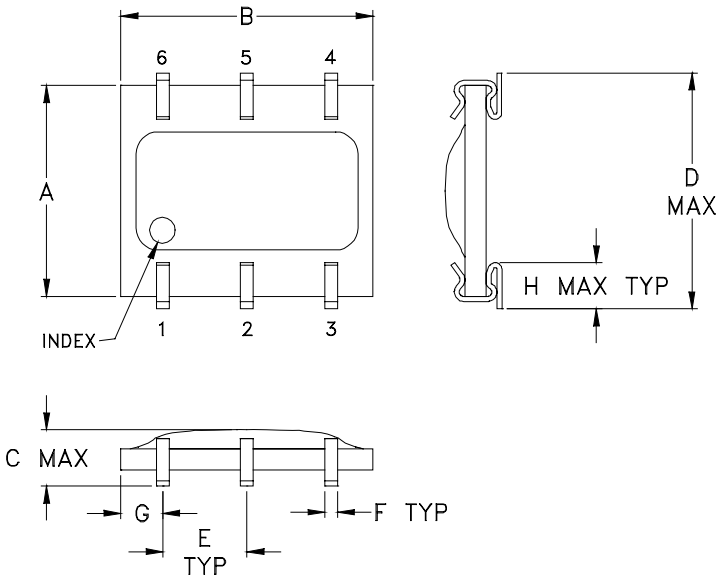
**Test conditions:**
**RF IN: 1600 MHz; -4.00 dBm.**
**LO IN: 1630 MHz; +7.00 dBm**
**IF OUT: 30 MHz; -10.22 dBm**

**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.**

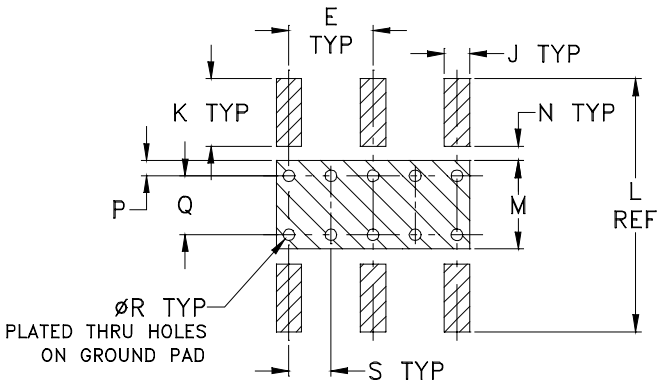
# Case Style SM26

**SM26**

## Outline Dimensions




### PCB Land Pattern




Suggested Layout,
Tolerance to be within ±.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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SM26 | .250 (6.35) | .300 (7.62) | .095 (2.41) | .290 (7.37) | .100 (2.54) | .015 (.38) | .050 (1.27) | .060 (1.52) | .030 (.76) | .080 (2.03) | .300 (7.62) | .100 (2.54) | .020 (.51) |

| CASE# | P | Q | R | S | WT, GRAM |
|---|---|---|---|---|---|
| SM26 | .015 (.38) | .070 (1.78) | .014 (.36) | .050 (1.27) | .3 |

**Dimensions are in inches (mm). Tolerances: 2 Pl. ± .005; 3 Pl. ± .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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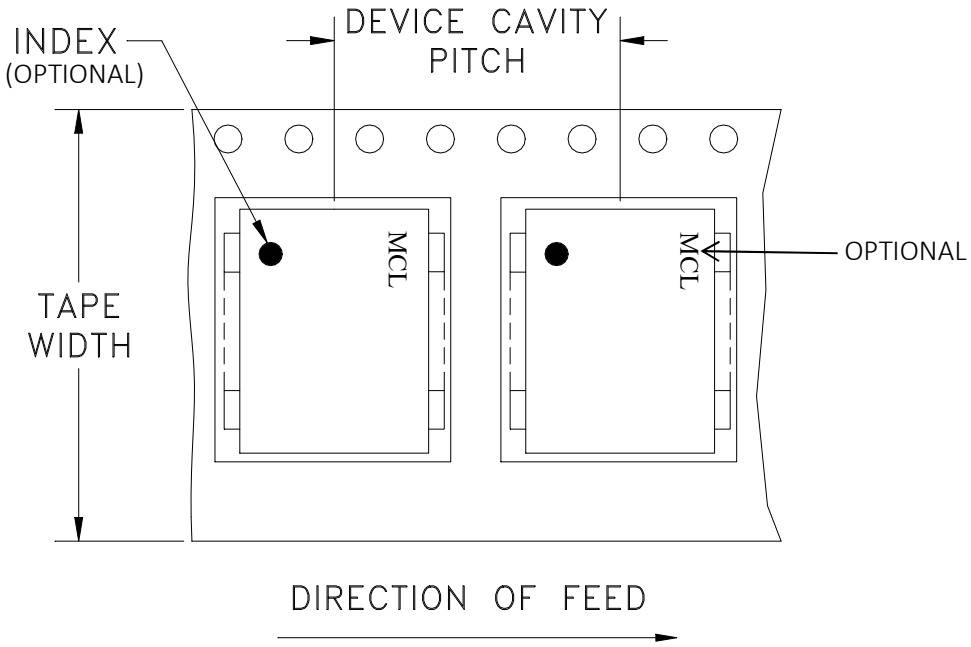
# Tape & Reel Packaging TR-F34

DEVICE ORIENTATION IN T&R




| 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

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Mini-Circuits

# Environmental Specifications ENV02T1

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 |