

# Engineering Development Model

## Frequency Mixer

# MBR-EE7756/19

Level 7 (LO Power +7 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 : SM26**

ELECTRICAL SPECIFICATIONS 50Ω @ +25°C					
Parameter		Min.	Typ.	Max.	Units
Frequency	LO (fL to fU)	1200		4100	MHz
	RF (fL to fU)	1200		4100	MHz
	IF	0.1		863	MHz
Conversion Loss			5.8		dB
LO-RF Isolation			24		dB
LO-IF Isolation			14		dB

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

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

# Frequency Mixer

# MBR-EE7756/19

## Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)			RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)			RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+1dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+4	+7	+10			+4	+7	+10			+4	+7	+10
920.0	950.0	13.72	10.56	9.77	920.0	950.0	6.29	10.78	12.24	920.0	950.0	-0.64	0.65	0.77
1000.0	1030.0	10.25	8.77	8.36	1000.0	1030.0	8.11	8.10	7.78	1000.0	1030.0	0.79	1.04	1.09
1080.0	1110.0	8.48	7.78	7.54	1080.0	1110.0	7.68	8.57	7.72	1080.0	1110.0	1.37	1.28	1.29
1160.0	1190.0	7.79	7.35	7.08	1160.0	1190.0	6.69	6.12	5.16	1160.0	1190.0	1.44	1.30	1.26
1240.0	1270.0	7.20	6.71	6.41	1240.0	1270.0	6.85	7.15	7.52	1240.0	1270.0	1.42	1.26	1.20
1320.0	1350.0	6.60	6.19	5.99	1320.0	1350.0	7.84	8.25	8.36	1320.0	1350.0	1.45	1.27	1.19
1400.0	1430.0	6.31	6.00	5.85	1400.0	1430.0	6.32	6.52	6.55	1400.0	1430.0	1.35	1.20	1.16
1480.0	1510.0	6.34	6.01	5.84	1480.0	1510.0	6.81	8.60	10.35	1480.0	1510.0	1.30	1.17	1.11
1560.0	1590.0	6.24	5.93	5.77	1560.0	1590.0	6.36	8.36	10.69	1560.0	1590.0	1.25	1.05	0.95
1660.0	1690.0	6.12	5.89	5.80	1660.0	1690.0	12.76	14.19	13.89	1660.0	1690.0	1.21	0.99	0.90
1740.0	1770.0	6.25	6.01	5.90	1740.0	1770.0	14.38	13.10	12.48	1740.0	1770.0	1.07	0.91	0.87
1840.0	1870.0	6.38	6.15	6.05	1840.0	1870.0	14.80	13.29	11.47	1840.0	1870.0	1.00	0.85	0.85
1920.0	1950.0	6.44	6.25	6.20	1920.0	1950.0	15.28	13.23	11.73	1920.0	1950.0	0.89	0.73	0.77
2020.0	2050.0	6.38	6.24	6.20	2020.0	2050.0	13.42	13.88	13.15	2020.0	2050.0	0.72	0.58	0.65
2100.0	2130.0	6.38	6.25	6.22	2100.0	2130.0	11.86	14.18	15.47	2100.0	2130.0	0.74	0.52	0.55
2200.0	2230.0	6.22	6.09	6.07	2200.0	2230.0	13.96	15.53	16.34	2200.0	2230.0	1.04	0.69	0.59
2280.0	2310.0	6.28	6.17	6.23	2280.0	2310.0	8.39	10.35	11.52	2280.0	2310.0	1.76	1.45	1.32
2380.0	2410.0	7.89	7.56	7.32	2380.0	2410.0	13.57	10.67	6.70	2380.0	2410.0	1.50	1.31	1.31
2460.0	2490.0	7.52	7.20	7.00	2460.0	2490.0	8.49	8.27	6.67	2460.0	2490.0	1.42	1.27	1.29
2560.0	2590.0	7.36	7.06	6.91	2560.0	2590.0	8.36	8.34	7.67	2560.0	2590.0	1.28	1.13	1.16
2640.0	2670.0	7.17	6.88	6.74	2640.0	2670.0	8.51	8.61	8.25	2640.0	2670.0	1.26	1.06	1.06
2740.0	2770.0	7.03	6.77	6.63	2740.0	2770.0	8.34	8.58	8.83	2740.0	2770.0	1.20	0.96	0.96
2820.0	2850.0	6.92	6.65	6.50	2820.0	2850.0	8.71	9.07	9.10	2820.0	2850.0	1.29	0.99	0.92
2920.0	2950.0	6.76	6.47	6.38	2920.0	2950.0	8.69	9.75	10.07	2920.0	2950.0	1.37	0.91	0.79
3000.0	3030.0	6.78	6.38	6.26	3000.0	3030.0	9.02	10.07	10.71	3000.0	3030.0	1.35	0.85	0.72
3100.0	3130.0	6.86	6.30	6.09	3100.0	3130.0	8.68	8.61	12.06	3100.0	3130.0	1.39	0.91	0.69
3180.0	3210.0	7.09	6.42	6.12	3180.0	3210.0	9.88	11.93	13.26	3180.0	3210.0	1.35	0.92	0.72
3280.0	3310.0	7.22	6.50	6.18	3280.0	3310.0	10.02	11.51	13.14	3280.0	3310.0	1.36	0.94	0.77
3360.0	3390.0	7.32	6.54	6.20	3360.0	3390.0	10.05	10.85	12.08	3360.0	3390.0	1.30	0.98	0.84
3460.0	3490.0	7.28	6.43	6.09	3460.0	3490.0	9.36	10.63	11.64	3460.0	3490.0	1.40	1.11	1.00
3540.0	3570.0	7.18	6.40	6.07	3540.0	3570.0	9.35	10.92	12.82	3540.0	3570.0	1.56	1.18	1.09
3640.0	3670.0	7.05	6.32	6.01	3640.0	3670.0	9.18	10.45	11.96	3640.0	3670.0	1.60	1.30	1.25
3720.0	3750.0	6.88	6.27	6.01	3720.0	3750.0	9.39	10.44	12.12	3720.0	3750.0	1.67	1.38	1.37
3820.0	3850.0	6.84	6.34	6.12	3820.0	3850.0	10.58	11.08	12.37	3820.0	3850.0	1.64	1.40	1.45
3900.0	3930.0	6.79	6.43	6.27	3900.0	3930.0	10.74	11.57	12.61	3900.0	3930.0	1.61	1.41	1.45
4000.0	4030.0	6.97	6.69	6.59	4000.0	4030.0	11.12	11.73	13.03	4000.0	4030.0	1.49	1.32	1.36
4080.0	4110.0	7.20	6.95	6.87	4080.0	4110.0	11.05	11.72	12.48	4080.0	4110.0	1.49	1.37	1.42
4180.0	4210.0	7.94	7.63	7.57	4180.0	4210.0	12.43	11.82	12.15	4180.0	4210.0	1.38	1.34	1.39
4260.0	4290.0	8.61	8.34	8.31	4260.0	4290.0	13.00	12.91	11.81	4260.0	4290.0	1.35	1.33	1.47
4360.0	4390.0	9.78	9.46	9.67	4360.0	4390.0	11.07	9.95	7.47	4360.0	4390.0	1.56	1.71	1.93



# Frequency Mixer

# MBR-EE7756/19

## Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1610.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1189.9MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=2010.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+7			+7			+7
410.1	1200.0	6.47	10.1	1200.0	7.51	1110.1	900.0	10.27
400.1	1210.0	6.52	30.1	1220.0	7.20	1090.1	920.0	9.61
390.1	1220.0	6.51	70.1	1260.0	7.14	1070.1	940.0	9.02
380.1	1230.0	6.53	90.1	1280.0	7.10	1050.1	960.0	8.46
370.1	1240.0	6.42	130.1	1320.0	7.03	1030.1	980.0	7.97
360.1	1250.0	6.45	150.1	1340.0	7.09	1010.1	1000.0	7.45
350.1	1260.0	6.36	190.1	1380.0	7.17	990.1	1020.0	7.18
340.1	1270.0	6.33	210.1	1400.0	7.20	970.1	1040.0	7.00
330.1	1280.0	6.26	250.1	1440.0	7.40	930.1	1080.0	6.89
320.1	1290.0	6.25	270.1	1460.0	7.43	910.1	1100.0	6.84
310.1	1300.0	6.15	310.1	1500.0	7.45	870.1	1140.0	6.64
300.1	1310.0	6.12	330.1	1520.0	7.45	850.1	1160.0	6.56
290.1	1320.0	6.02	370.1	1560.0	7.59	810.1	1200.0	6.54
280.1	1330.0	5.97	390.1	1580.0	7.60	790.1	1220.0	6.42
270.1	1340.0	5.89	430.1	1620.0	7.75	750.1	1260.0	6.35
260.1	1350.0	5.82	450.1	1640.0	7.82	730.1	1280.0	6.37
250.1	1360.0	5.72	490.1	1680.0	7.91	690.1	1320.0	6.21
240.1	1370.0	5.65	510.1	1700.0	7.93	670.1	1340.0	6.10
230.1	1380.0	5.64	550.1	1740.0	8.09	630.1	1380.0	6.40
220.1	1390.0	5.56	570.1	1760.0	8.16	610.1	1400.0	6.61
210.1	1400.0	5.53	610.1	1800.0	8.20	570.1	1440.0	6.88
200.1	1410.0	5.47	630.1	1820.0	8.32	550.1	1460.0	6.99
190.1	1420.0	5.48	670.1	1860.0	8.39	510.1	1500.0	7.05
180.1	1430.0	5.47	690.1	1880.0	8.36	490.1	1520.0	7.08
170.1	1440.0	5.48	730.1	1920.0	8.27	450.1	1560.0	7.07
160.1	1450.0	5.42	750.1	1940.0	8.08	430.1	1580.0	7.04
150.1	1460.0	5.51	790.1	1980.0	7.99	390.1	1620.0	6.69
140.1	1470.0	5.53	810.1	2000.0	7.99	370.1	1640.0	6.60
130.1	1480.0	5.56	850.1	2040.0	8.15	330.1	1680.0	6.43
120.1	1490.0	5.58	870.1	2060.0	8.30	310.1	1700.0	6.35
110.1	1500.0	5.70	910.1	2100.0	8.40	270.1	1740.0	6.25
100.1	1510.0	5.74	930.1	2120.0	8.50	250.1	1760.0	6.24
90.1	1520.0	5.84	970.1	2160.0	8.65	210.1	1800.0	6.12
80.1	1530.0	5.87	990.1	2180.0	8.64	190.1	1820.0	6.12
70.1	1540.0	5.94	1030.1	2220.0	8.98	150.1	1860.0	6.14
60.1	1550.0	5.97	1050.1	2240.0	9.16	130.1	1880.0	6.14
50.1	1560.0	6.02	1090.1	2280.0	9.42	90.1	1920.0	6.14
40.1	1570.0	5.95	1110.1	2300.0	9.67	70.1	1940.0	6.15
20.1	1590.0	5.99	1150.1	2340.0	10.16	30.1	1980.0	6.21
10.1	1600.0	6.25	1170.1	2360.0	10.32	10.1	2000.0	6.49

REV. X3  
 MBR-EE7756/19  
 101012  
 Page 2 of 5



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# Frequency Mixer

# MBR-EE7756/19

## Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@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



# Frequency Mixer

# MBR-EE7756/19

## 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
	RF CAL	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
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

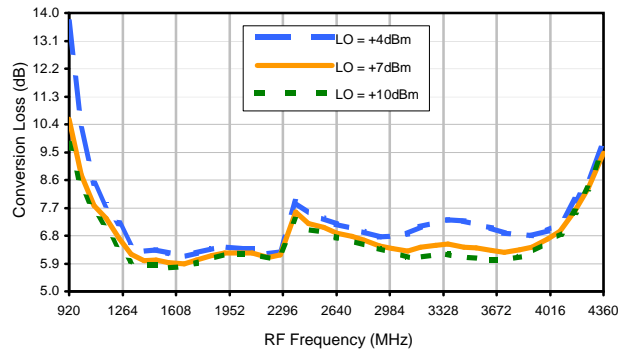
### LO HARMONICS ORDER

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

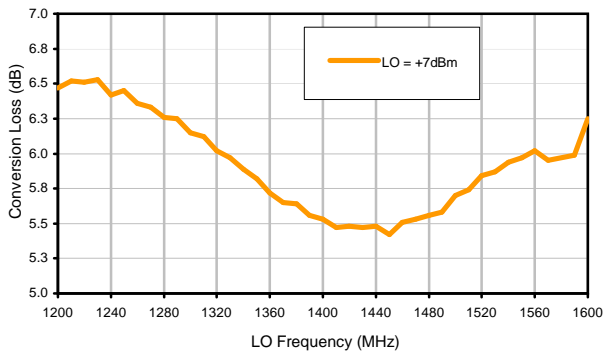
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.  
 2. + entry denotes harmonics are in (dBc) above IF OUTPUT.  
 3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

## Typical Performance Curves

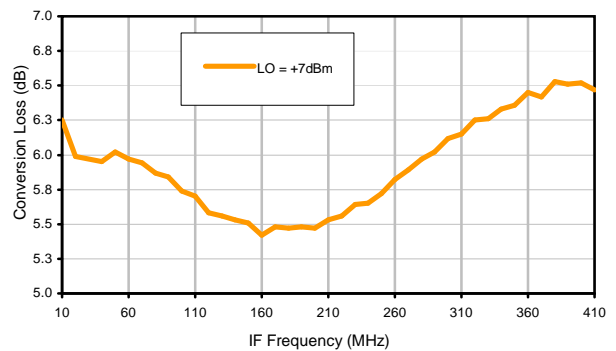
Conversion Loss @ IF=30MHz



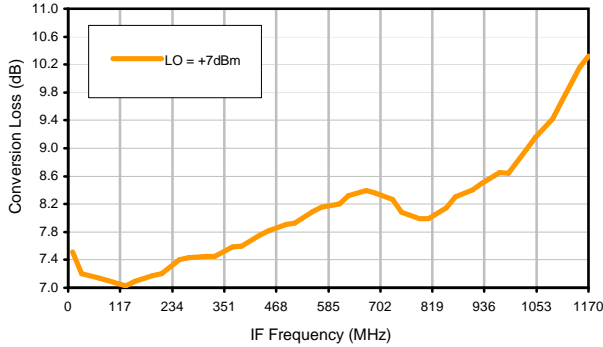
Conversion Loss vs. LO @ RF=1610.1MHz



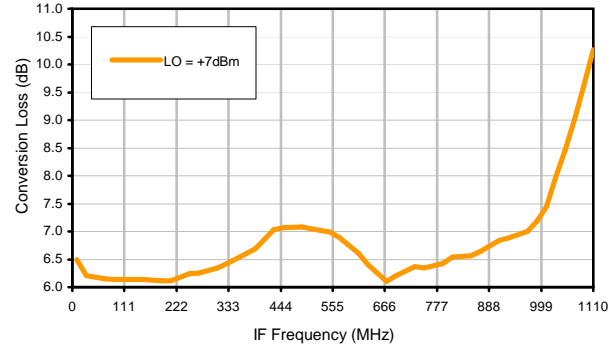
Conversion Loss vs. IF @ RF=1610.1MHz



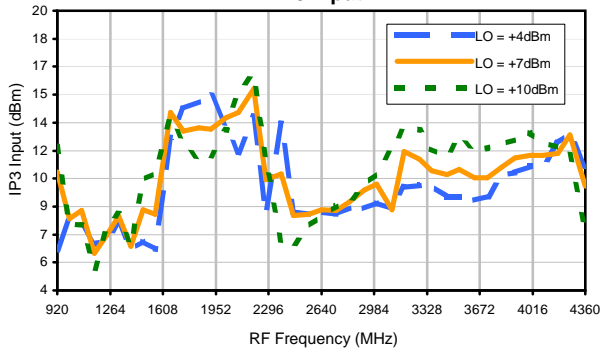
Conversion Loss vs. IF @ RF=1189.9MHz



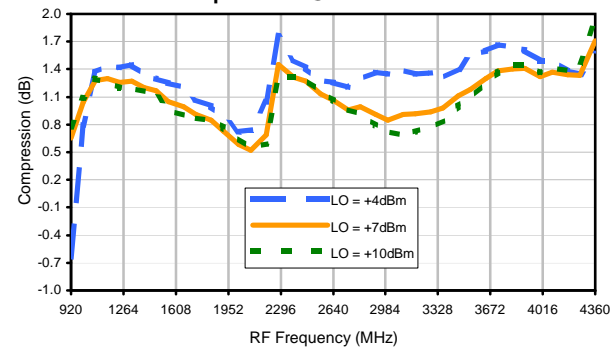
Conversion Loss vs. IF @ RF=2010.1MHz



IP3 Input

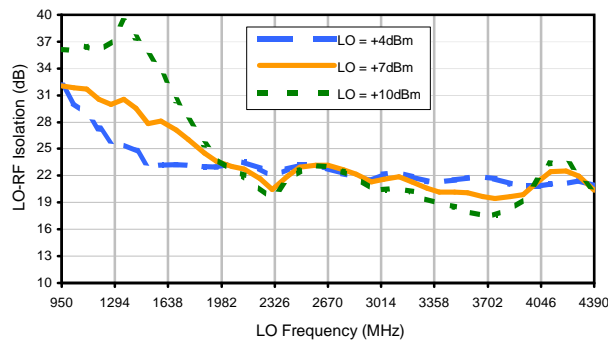


Compression @ RF IN=+1dBm

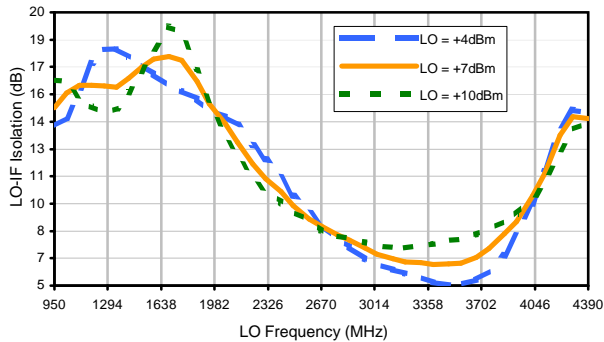


## Typical Performance Curves

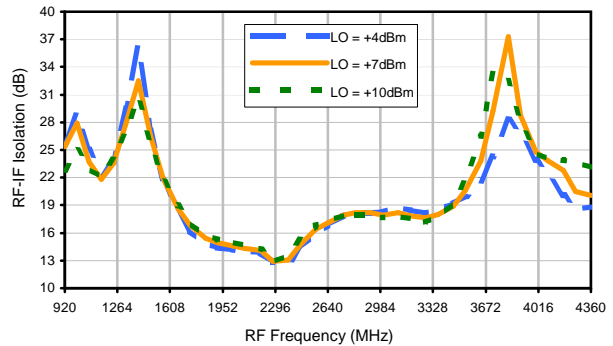
LO-RF Isolation



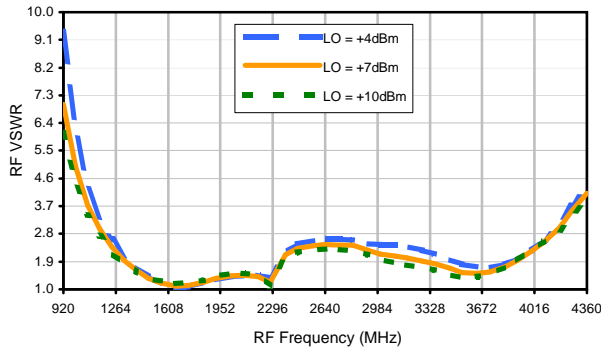
LO-IF Isolation



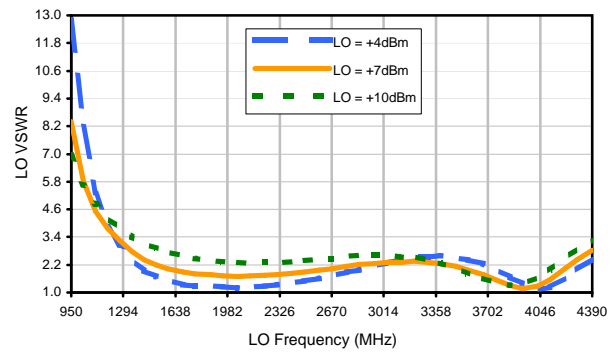
RF-IF Isolation



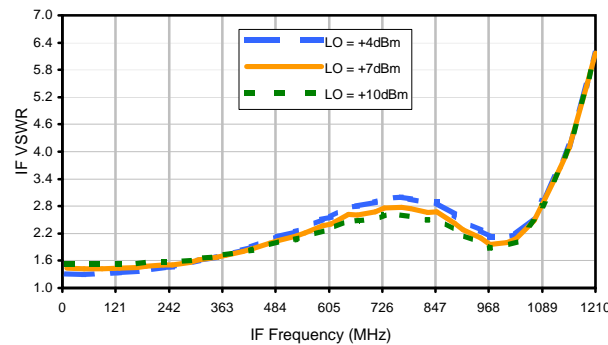
RF VSWR



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
	RF CAL	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

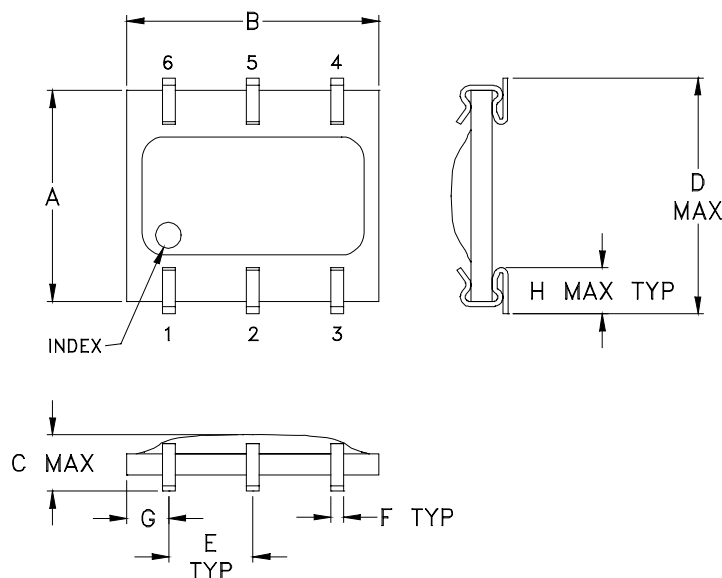
	(-dBm)	(-dBc)										
0	-	-	0	18	21	24	30	41	52	61	54	57
1	-	15	0	40	17	41	31	60	39	48	49	67
2	31	36	58	30	41	39	40	41	52	54	50	56
3	34	48	40	66	41	49	45	51	54	60	52	58
4	55	64	55	53	71	45	53	58	56	56	67	58
5	62	84	78	69	66	71	58	67	61	61	73	66
6	67	82	96	78	77	73	88	66	71	64	70	72
7	73	93	93	106	91	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
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

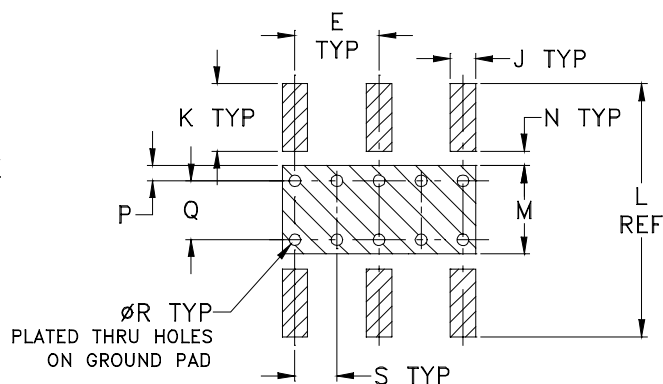
Test conditions: RF IN: 1600 MHz; -4.00 dBm.  
 LO IN: 1630 MHz; +7.00 dBm  
 IF OUT: 30 MHz; -10.22 dBm

- 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.

### 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
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.  $\pm .005$ ; 3 Pl.  $\pm .005$

### Notes:

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

# 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
			Standard	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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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 Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C 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 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; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215