

# Frequency Mixer

# MBA-10L

## 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=0dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		0	+3	+6			0	+3	+6			0	+3	+6
680.0	710.0	13.26	10.37	9.34	680.0	710.0	8.08	11.40	11.23	680.0	710.0	-0.83	-0.01	-0.06
700.0	730.0	12.02	9.80	8.82	700.0	730.0	10.22	10.84	11.29	700.0	730.0	-0.31	0.07	0.05
720.0	750.0	11.13	9.49	8.56	720.0	750.0	10.81	9.88	10.69	720.0	750.0	-0.11	0.08	0.12
740.0	770.0	10.39	9.19	8.38	740.0	770.0	13.61	10.68	10.09	740.0	770.0	0.10	0.08	0.13
760.0	790.0	9.98	8.97	8.28	760.0	790.0	12.77	12.35	10.02	760.0	790.0	0.11	0.01	0.05
780.0	810.0	9.65	8.73	8.13	780.0	810.0	12.84	12.13	9.99	780.0	810.0	0.12	-0.05	-0.03
800.0	830.0	9.45	8.65	8.17	800.0	830.0	11.38	10.72	9.87	800.0	830.0	0.15	-0.03	-0.06
820.0	850.0	9.21	8.46	7.99	820.0	850.0	13.03	10.74	9.89	820.0	850.0	0.18	-0.02	-0.05
840.0	870.0	9.29	8.56	8.12	840.0	870.0	10.70	9.88	9.47	840.0	870.0	0.06	-0.14	-0.13
860.0	890.0	9.25	8.52	8.08	860.0	890.0	8.69	8.09	8.54	860.0	890.0	0.01	-0.12	-0.12
880.0	910.0	9.20	8.44	8.03	880.0	910.0	7.00	7.72	8.85	880.0	910.0	0.11	-0.04	-0.07
900.0	930.0	9.23	8.43	8.01	900.0	930.0	6.09	7.36	9.59	900.0	930.0	0.03	-0.08	-0.10
920.0	950.0	9.48	8.55	8.11	920.0	950.0	4.78	7.15	9.68	920.0	950.0	-0.04	-0.07	-0.06
940.0	970.0	9.51	8.45	7.97	940.0	970.0	3.99	7.46	11.61	940.0	970.0	-0.01	0.03	0.08
960.0	990.0	9.46	8.36	7.87	960.0	990.0	3.96	10.23	14.23	960.0	990.0	0.12	0.16	0.22
980.0	1010.0	9.55	8.56	8.07	980.0	1010.0	4.40	12.14	11.15	980.0	1010.0	0.09	0.08	0.15
1000.0	1030.0	9.75	8.73	8.21	1000.0	1030.0	4.06	11.23	11.65	1000.0	1030.0	0.19	0.09	0.15
1020.0	1050.0	9.63	8.71	8.22	1020.0	1050.0	5.49	9.48	9.91	1020.0	1050.0	0.28	0.11	0.15
1040.0	1070.0	9.81	8.91	8.38	1040.0	1070.0	6.05	9.65	10.52	1040.0	1070.0	0.42	0.12	0.17
1060.0	1090.0	9.61	8.84	8.38	1060.0	1090.0	7.01	9.44	12.73	1060.0	1090.0	0.63	0.19	0.20
1080.0	1110.0	9.76	8.91	8.50	1080.0	1110.0	7.43	8.82	17.58	1080.0	1110.0	0.86	0.29	0.23
1100.0	1130.0	9.59	8.72	8.39	1100.0	1130.0	11.64	6.79	10.00	1100.0	1130.0	0.92	0.42	0.34
1120.0	1150.0	9.70	8.74	8.42	1120.0	1150.0	8.18	5.43	6.96	1120.0	1150.0	1.04	0.55	0.47
1140.0	1170.0	9.65	8.63	8.37	1140.0	1170.0	6.85	5.50	6.94	1140.0	1170.0	1.00	0.58	0.45
1160.0	1190.0	9.54	8.50	8.25	1160.0	1190.0	4.77	5.07	6.56	1160.0	1190.0	1.26	0.72	0.52
1180.0	1210.0	9.59	8.47	8.17	1180.0	1210.0	3.88	4.82	6.27	1180.0	1210.0	1.26	0.73	0.49
1200.0	1230.0	9.66	8.56	8.24	1200.0	1230.0	3.25	4.58	6.39	1200.0	1230.0	1.29	0.72	0.45
1220.0	1250.0	9.72	8.59	8.19	1220.0	1250.0	3.54	4.92	7.06	1220.0	1250.0	1.16	0.69	0.43
1240.0	1270.0	9.85	8.64	8.22	1240.0	1270.0	3.49	4.78	7.17	1240.0	1270.0	1.12	0.71	0.43
1260.0	1290.0	10.15	8.73	8.15	1260.0	1290.0	4.70	5.56	8.00	1260.0	1290.0	0.97	0.65	0.40
1280.0	1310.0	10.45	8.91	8.24	1280.0	1310.0	5.19	6.46	9.41	1280.0	1310.0	0.86	0.62	0.37
1300.0	1330.0	10.53	8.98	8.25	1300.0	1330.0	6.77	7.34	10.01	1300.0	1330.0	0.70	0.54	0.37
1320.0	1350.0	10.73	9.21	8.45	1320.0	1350.0	8.76	8.40	11.88	1320.0	1350.0	0.60	0.46	0.30
1330.0	1360.0	10.72	9.22	8.53	1330.0	1360.0	9.45	9.39	12.76	1330.0	1360.0	0.51	0.40	0.27
1350.0	1380.0	11.03	9.32	8.63	1350.0	1380.0	10.52	11.19	14.29	1350.0	1380.0	0.46	0.39	0.26
1360.0	1390.0	11.18	9.38	8.70	1360.0	1390.0	10.22	11.92	14.84	1360.0	1390.0	0.38	0.37	0.23
1380.0	1410.0	11.72	9.66	9.01	1380.0	1410.0	7.12	10.35	14.89	1380.0	1410.0	0.01	0.25	0.22
1390.0	1420.0	11.81	9.72	9.15	1390.0	1420.0	7.48	10.52	14.73	1390.0	1420.0	-0.07	0.21	0.18
1410.0	1440.0	12.01	9.97	9.43	1410.0	1440.0	7.58	10.46	14.50	1410.0	1440.0	-0.12	0.10	0.15
1420.0	1450.0	12.12	10.12	9.63	1420.0	1450.0	8.63	10.64	14.32	1420.0	1450.0	-0.14	0.09	0.13

REV. X3

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# Frequency Mixer

# MBA-10L

## 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)
		+3			+3			+3
320.0	580.0	10.80	10.1	800.0	9.00	430.1	580.0	10.41
306.2	593.8	9.51	20.1	810.0	8.53	420.1	590.0	9.50
292.4	607.6	8.92	30.1	820.0	8.45	410.1	600.0	8.88
278.7	621.3	8.44	40.1	830.0	8.80	400.1	610.0	8.63
264.9	635.1	8.32	50.1	840.0	8.97	390.1	620.0	8.39
251.1	648.9	8.00	55.1	845.0	8.81	380.1	630.0	8.16
237.3	662.7	7.67	65.1	855.0	8.83	370.1	640.0	8.04
223.6	676.4	7.41	70.1	860.0	8.80	360.1	650.0	7.99
209.8	690.2	7.22	80.1	870.0	9.02	350.1	660.0	7.85
196.0	704.0	6.95	85.1	875.0	8.97	340.1	670.0	7.67
182.2	717.8	7.03	95.1	885.0	9.00	330.1	680.0	7.71
168.4	731.6	6.94	100.1	890.0	8.88	320.1	690.0	7.74
154.7	745.3	6.87	110.1	900.0	9.12	310.1	700.0	7.64
134.0	766.0	6.99	115.1	905.0	9.07	300.1	710.0	7.52
120.2	779.8	6.92	125.1	915.0	9.32	290.1	720.0	7.58
99.6	800.4	7.32	130.1	920.0	9.23	280.1	730.0	7.53
85.8	814.2	7.33	140.1	930.0	9.27	270.1	740.0	7.36
65.1	834.9	7.68	145.1	935.0	9.24	260.1	750.0	7.26
51.3	848.7	7.76	155.1	945.0	9.41	250.1	760.0	7.28
30.7	869.3	8.07	160.1	950.0	9.40	240.1	770.0	7.24
16.9	883.1	8.33	170.1	960.0	9.31	230.1	780.0	7.14
22.8	922.8	8.62	175.1	965.0	9.30	220.1	790.0	7.05
48.5	948.5	8.55	185.1	975.0	9.31	210.1	800.0	7.13
87.0	987.0	8.50	190.1	980.0	9.42	200.1	810.0	7.21
112.6	1012.6	8.58	200.1	990.0	9.47	190.1	820.0	7.10
151.1	1051.1	8.86	205.1	995.0	9.53	180.1	830.0	7.14
176.7	1076.7	8.98	215.1	1005.0	9.39	170.1	840.0	7.34
215.2	1115.2	9.05	220.1	1010.0	9.46	160.1	850.0	7.46
240.9	1140.9	8.96	230.1	1020.0	9.57	150.1	860.0	7.50
279.3	1179.3	8.83	235.1	1025.0	9.70	140.1	870.0	7.70
305.0	1205.0	8.77	245.1	1035.0	9.68	130.1	880.0	7.82
343.5	1243.5	8.70	250.1	1040.0	9.74	120.1	890.0	7.85
369.1	1269.1	8.82	260.1	1050.0	9.68	110.1	900.0	7.93
407.6	1307.6	9.04	265.1	1055.0	9.79	100.1	910.0	8.09
433.3	1333.3	8.95	275.1	1065.0	9.84	80.1	930.0	8.08
471.7	1371.7	9.22	280.1	1070.0	9.93	70.1	940.0	8.22
497.4	1397.4	9.42	290.1	1080.0	9.94	50.1	960.0	8.44
535.9	1435.9	9.32	295.1	1085.0	9.90	40.1	970.0	8.42
561.5	1461.5	9.52	305.1	1095.0	9.91	20.1	990.0	8.76
600.0	1500.0	10.28	310.1	1100.0	10.02	10.1	1000.0	9.16

# Frequency Mixer

# MBA-10L

## Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	0	+3	+6	0	+3	+6
710.0	26.37	26.99	26.34	21.16	21.14	21.68
730.0	27.16	27.27	26.10	19.89	20.26	20.85
750.0	27.98	27.09	25.60	18.71	19.40	20.14
770.0	27.71	26.41	25.08	17.77	18.68	19.65
790.0	26.60	25.38	24.47	16.68	17.67	18.94
810.0	24.97	24.04	23.75	15.63	16.67	18.12
830.0	23.22	22.55	22.64	14.80	15.90	17.40
850.0	21.51	21.20	21.54	13.98	15.07	16.57
870.0	20.04	20.07	20.62	13.30	14.42	15.96
890.0	18.90	19.12	19.78	12.82	13.89	15.42
910.0	18.09	18.38	19.14	12.32	13.31	14.78
930.0	17.46	17.93	18.73	11.87	12.84	14.24
950.0	16.64	17.13	17.99	11.61	12.45	13.77
970.0	16.31	16.70	17.54	11.20	11.95	13.21
990.0	15.99	16.39	17.19	10.86	11.60	12.85
1010.0	15.82	16.14	16.86	10.76	11.40	12.58
1030.0	15.87	16.09	16.69	10.51	11.06	12.12
1050.0	16.06	16.25	16.70	10.27	10.80	11.78
1070.0	16.16	16.37	16.65	10.26	10.64	11.49
1090.0	16.36	16.58	16.71	10.18	10.46	11.19
1110.0	17.01	17.20	17.22	10.16	10.41	10.96
1130.0	17.30	17.43	17.32	10.26	10.45	10.84
1150.0	17.64	17.83	17.55	10.46	10.67	10.80
1170.0	18.15	18.11	17.72	10.65	10.79	10.81
1190.0	18.76	18.58	17.94	10.97	11.12	10.97
1210.0	19.22	18.83	18.05	11.38	11.46	11.12
1230.0	19.85	19.21	18.17	11.77	11.65	11.13
1250.0	20.46	19.53	18.26	12.39	12.03	11.36
1270.0	20.86	19.68	18.27	13.00	12.40	11.61
1290.0	21.44	20.02	18.46	13.75	12.87	11.86
1310.0	22.06	20.18	18.40	14.49	13.30	12.05
1330.0	22.36	20.33	18.46	15.35	13.79	12.24
1350.0	22.56	20.32	18.35	16.11	14.23	12.39
1360.0	22.70	20.32	18.21	16.59	14.54	12.55
1380.0	23.23	20.52	18.08	17.66	15.06	12.71
1390.0	23.62	20.64	18.09	18.21	15.38	12.85
1410.0	23.64	20.64	17.65	19.10	15.83	12.87
1420.0	23.72	20.55	17.56	19.35	16.05	12.93
1440.0	22.83	19.90	16.84	19.20	15.87	12.70
1450.0	22.41	19.67	16.65	19.11	16.00	12.77

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		0	+3	+6
680.0	710.0	12.36	14.34	15.55
700.0	730.0	12.16	13.97	15.07
720.0	750.0	12.31	13.96	15.03
740.0	770.0	12.27	13.72	14.59
760.0	790.0	12.48	13.69	14.33
780.0	810.0	12.53	13.70	14.16
800.0	830.0	12.48	13.57	13.66
820.0	850.0	12.44	13.53	13.66
840.0	870.0	12.41	13.37	13.06
860.0	890.0	12.13	13.06	12.78
880.0	910.0	11.80	12.56	12.30
900.0	930.0	11.59	12.20	12.00
920.0	950.0	11.04	11.68	11.49
940.0	970.0	10.94	11.40	11.12
960.0	990.0	10.63	10.89	10.68
980.0	1010.0	10.48	10.54	10.11
1000.0	1030.0	10.42	10.25	9.90
1020.0	1050.0	10.48	10.31	9.81
1040.0	1070.0	10.28	9.97	9.59
1060.0	1090.0	10.83	10.25	9.75
1080.0	1110.0	10.95	10.38	10.02
1100.0	1130.0	11.73	10.90	10.50
1120.0	1150.0	11.88	11.04	10.79
1140.0	1170.0	12.96	11.65	11.44
1160.0	1190.0	13.43	11.97	11.72
1180.0	1210.0	14.20	12.61	12.16
1200.0	1230.0	14.51	12.90	12.34
1220.0	1250.0	15.04	13.41	12.77
1240.0	1270.0	15.39	13.58	12.70
1260.0	1290.0	16.21	14.06	12.92
1280.0	1310.0	16.59	14.29	12.86
1300.0	1330.0	16.98	14.36	12.93
1320.0	1350.0	16.81	13.99	12.80
1330.0	1360.0	16.92	14.00	13.00
1350.0	1380.0	16.76	13.59	12.63
1360.0	1390.0	16.84	13.76	12.83
1380.0	1410.0	16.51	13.57	12.91
1390.0	1420.0	16.02	13.35	12.60
1410.0	1440.0	15.28	13.27	12.81
1420.0	1450.0	14.97	13.07	12.62

# Frequency Mixer

# MBA-10L

## Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=1000MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		0	+3	+6		0	+3	+6		0	+3	+6
680.0	710.0	6.91	5.44	4.70	710.0	5.70	3.07	2.85	10.0	2.93	2.36	2.04
700.0	730.0	5.89	4.79	4.13	730.0	4.56	2.66	2.62	30.0	2.90	2.36	2.05
720.0	750.0	5.02	4.20	3.64	750.0	3.56	2.33	2.43	50.0	2.95	2.39	2.08
740.0	770.0	4.28	3.71	3.25	770.0	2.83	2.09	2.32	70.0	3.02	2.43	2.12
760.0	790.0	3.74	3.31	2.95	790.0	2.36	1.91	2.26	90.0	3.06	2.49	2.19
780.0	810.0	3.34	2.99	2.72	810.0	2.03	1.77	2.21	110.0	3.14	2.57	2.27
800.0	830.0	2.99	2.71	2.51	830.0	1.75	1.63	2.15	130.0	3.11	2.57	2.28
820.0	850.0	2.67	2.47	2.31	850.0	1.51	1.52	2.09	150.0	3.19	2.64	2.35
840.0	870.0	2.45	2.27	2.16	870.0	1.33	1.44	2.05	170.0	3.26	2.71	2.42
860.0	890.0	2.21	2.06	1.97	890.0	1.21	1.39	2.04	190.0	3.38	2.83	2.54
880.0	910.0	2.03	1.89	1.83	910.0	1.15	1.37	2.02	210.0	3.39	2.86	2.58
900.0	930.0	1.87	1.73	1.69	930.0	1.19	1.38	1.99	230.0	3.40	2.87	2.60
920.0	950.0	1.70	1.60	1.58	950.0	1.30	1.40	1.97	250.0	3.43	2.91	2.64
940.0	970.0	1.55	1.46	1.48	970.0	1.43	1.45	1.97	270.0	3.56	3.02	2.75
960.0	990.0	1.40	1.35	1.38	990.0	1.56	1.51	1.97	290.0	3.58	3.03	2.76
980.0	1010.0	1.29	1.25	1.30	1010.0	1.69	1.58	1.97	310.0	3.54	3.02	2.77
1000.0	1030.0	1.15	1.15	1.24	1030.0	1.84	1.66	1.99	330.0	3.56	3.01	2.76
1020.0	1050.0	1.07	1.13	1.23	1050.0	2.01	1.75	2.00	350.0	3.52	3.01	2.76
1040.0	1070.0	1.10	1.20	1.30	1070.0	2.15	1.83	2.01	370.0	3.56	3.02	2.75
1060.0	1090.0	1.20	1.30	1.38	1090.0	2.29	1.91	2.03	390.0	3.48	3.00	2.76
1080.0	1110.0	1.34	1.41	1.47	1110.0	2.45	1.99	2.04	410.0	3.48	2.95	2.71
1100.0	1130.0	1.47	1.53	1.59	1130.0	2.63	2.07	2.05	430.0	3.40	2.90	2.68
1120.0	1150.0	1.62	1.68	1.73	1150.0	2.81	2.16	2.06	450.0	3.40	2.88	2.63
1140.0	1170.0	1.79	1.84	1.88	1170.0	3.02	2.25	2.05	470.0	3.34	2.84	2.63
1160.0	1190.0	1.94	1.97	2.01	1190.0	3.27	2.35	2.04	490.0	3.35	2.82	2.58
1180.0	1210.0	2.10	2.10	2.13	1210.0	3.54	2.45	2.04	510.0	3.28	2.78	2.57
1200.0	1230.0	2.27	2.25	2.29	1230.0	3.76	2.53	2.03	530.0	3.27	2.78	2.55
1220.0	1250.0	2.46	2.39	2.41	1250.0	3.93	2.57	2.00	550.0	3.30	2.81	2.58
1240.0	1270.0	2.69	2.59	2.61	1270.0	4.11	2.62	1.99	590.0	3.37	2.86	2.60
1260.0	1290.0	2.89	2.72	2.68	1290.0	4.39	2.71	2.00	610.0	3.35	2.89	2.63
1280.0	1310.0	3.11	2.89	2.85	1310.0	4.62	2.78	2.02	650.0	3.52	3.01	2.71
1300.0	1330.0	3.24	3.00	2.95	1330.0	4.70	2.82	2.04	670.0	3.71	3.16	2.80
1320.0	1350.0	3.46	3.20	3.16	1350.0	4.78	2.87	2.08	710.0	3.96	3.33	2.91
1330.0	1360.0	3.52	3.28	3.24	1360.0	4.86	2.92	2.10	730.0	3.90	3.33	2.94
1350.0	1380.0	3.76	3.45	3.38	1380.0	5.20	3.09	2.15	770.0	4.08	3.44	3.00
1360.0	1390.0	3.90	3.54	3.47	1390.0	5.46	3.19	2.17	790.0	4.11	3.44	2.98
1380.0	1410.0	4.12	3.67	3.57	1410.0	5.89	3.38	2.21	830.0	4.02	3.32	2.89
1390.0	1420.0	4.22	3.73	3.62	1420.0	5.99	3.42	2.20	850.0	3.94	3.23	2.80
1410.0	1440.0	4.30	3.82	3.70	1440.0	6.03	3.41	2.19	890.0	3.80	3.02	2.61
1420.0	1450.0	4.41	3.90	3.79	1450.0	6.01	3.41	2.19	910.0	3.64	2.83	2.43

## Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+14	8	15	30	17	21	19	30	24	32
1	-	3	+0	12	20	32	39	36	35	33	35	37
2	>90	36	30	43	44	47	49	55	49	45	50	51
3	>90	57	53	44	48	49	50	65	>66	59	62	60
4	>90	>66	>66	>66	60	65	60	66	>66	>66	>66	>66
5	>90	>66	>66	>66	>66	>66	>66	>66	>66	>66	>66	>66
6	>90	>66	>66	>66	>66	>66	>66	>66	>66	>66	>66	>66
7	>90	>66	>66	>66	>66	>66	>66	>66	>66	>66	>66	>66
8	>90	>66	>66	>66	>66	>66	>66	>66	>66	>66	>66	>66
9	>90	>66	>66	>66	>66	>66	>66	>66	>66	>66	>66	>66
10	>90	>66	>66	>66	>66	>66	>66	>66	>66	>66	>66	>66
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 900 MHz; -15.00 dBm.  
 LO IN: 930 MHz; +3.00 dBm  
 IF OUT: 30 MHz; -23.67 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+3	22	29	38	29	34	35	46	45	53
1	-	2	+0	17	21	39	44	42	42	42	43	52
2	70	31	23	29	39	51	42	52	50	45	45	54
3	>90	44	53	31	40	35	42	57	61	56	55	49
4	>90	63	57	54	46	45	52	50	65	62	71	58
5	>90	56	76	73	60	50	50	55	56	64	>77	66
6	>90	75	67	>77	71	67	53	61	61	64	72	>77
7	>90	73	75	75	>77	>77	66	73	65	66	72	>77
8	>90	>77	>77	>77	76	>77	>77	>77	63	65	69	>77
9	>90	>77	>77	>77	>77	>77	>77	>77	>77	71	>77	>77
10	>90	>77	>77	>77	>77	>77	>77	>77	>77	>77	>77	>77
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 900 MHz; -5.00 dBm.  
 LO IN: 930 MHz; +3.00 dBm  
 IF OUT: 30 MHz; -13.33 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.