

# Frequency Mixer

# LRMS-1MHJ+

## 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=+9dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+10	+13	+16			+10	+13	+16			+10	+13	+16
2.0	32.0	7.33	6.87	6.69	10.1	40.1	22.50	25.50	28.36	10.1	40.1	0.93	0.60	0.37
5.0	35.0	6.39	5.99	5.81	49.8	79.8	23.07	26.62	27.23	49.8	79.8	0.90	0.50	0.35
10.0	40.0	6.66	6.21	6.01	89.5	119.5	23.13	27.55	23.68	89.5	119.5	0.73	0.49	0.28
49.8	79.8	6.48	6.08	5.84	129.2	159.2	23.35	23.67	21.85	129.2	159.2	0.84	0.48	0.28
89.5	119.5	6.47	6.04	5.87	168.9	198.9	28.48	20.58	22.20	168.9	198.9	0.79	0.43	0.27
129.2	159.2	6.36	6.04	5.91	208.6	238.6	22.03	20.04	23.39	208.6	238.6	0.82	0.47	0.31
168.9	198.9	6.37	6.08	5.93	248.3	278.3	19.98	21.37	27.02	248.3	278.3	0.79	0.46	0.32
208.6	238.6	6.33	6.07	5.96	287.9	317.9	18.30	21.28	34.84	287.9	317.9	0.78	0.46	0.36
248.3	278.3	6.42	6.16	6.02	327.6	357.6	18.62	22.68	26.05	327.6	357.6	0.81	0.49	0.38
287.9	317.9	6.43	6.18	6.03	367.3	397.3	20.02	26.42	24.07	367.3	397.3	0.80	0.50	0.44
327.6	357.6	6.49	6.22	6.09	407.0	437.0	20.33	24.64	20.29	407.0	437.0	0.84	0.51	0.46
367.3	397.3	6.52	6.26	6.10	446.7	476.7	18.43	24.52	19.15	446.7	476.7	0.89	0.62	0.50
407.0	437.0	6.53	6.29	6.13	486.4	516.4	20.26	25.88	22.48	486.4	516.4	0.89	0.70	0.59
446.7	476.7	6.62	6.34	6.18	526.1	556.1	23.77	24.68	22.37	526.1	556.1	1.01	0.77	0.68
486.4	516.4	6.70	6.34	6.14	565.8	595.8	25.23	19.32	19.06	565.8	595.8	1.19	0.83	0.75
526.1	556.1	6.75	6.41	6.18	585.6	615.6	22.69	17.72	18.16	585.6	615.6	1.24	0.84	0.76
565.8	595.8	6.78	6.47	6.27	625.3	655.3	19.47	15.78	17.32	625.3	655.3	1.45	0.98	0.87
585.6	615.6	6.82	6.52	6.35	645.2	675.2	18.33	15.36	17.08	645.2	675.2	1.52	1.02	0.88
625.3	655.3	6.95	6.61	6.46	684.9	714.9	17.09	15.67	17.44	684.9	714.9	1.66	1.20	1.03
645.2	675.2	7.05	6.67	6.49	704.7	734.7	16.42	16.00	18.29	704.7	734.7	1.74	1.36	1.12
684.9	714.9	7.24	6.76	6.52	744.4	774.4	14.71	17.04	20.54	744.4	774.4	1.54	1.43	1.23
704.7	734.7	7.40	6.81	6.56	764.3	794.3	13.70	17.31	23.08	764.3	794.3	1.46	1.45	1.31
744.4	774.4	7.83	7.00	6.66	803.9	833.9	12.88	15.70	20.96	803.9	833.9	1.28	1.32	1.40
764.3	794.3	8.04	7.14	6.68	823.8	853.8	13.43	16.20	18.90	823.8	853.8	1.29	1.35	1.42
803.9	833.9	8.37	7.52	6.86	863.5	893.5	16.24	17.76	17.83	863.5	893.5	1.27	1.30	1.28
863.5	893.5	8.56	7.73	7.22	883.3	913.3	20.17	18.10	19.67	883.3	913.3	1.34	1.35	1.25
883.3	913.3	8.52	7.76	7.39	923.0	953.0	28.36	18.26	21.03	923.0	953.0	1.33	1.15	1.10
923.0	953.0	8.62	8.05	7.74	942.9	972.9	20.82	19.30	22.00	942.9	972.9	1.35	1.11	1.06
942.9	972.9	8.63	8.12	7.84	982.6	1012.6	21.59	19.76	21.83	982.6	1012.6	1.36	1.04	0.98
982.6	1012.6	8.72	8.27	8.02	1002.4	1032.4	19.55	20.12	21.79	1002.4	1032.4	1.42	1.05	1.00
1002.4	1032.4	8.71	8.31	8.08	1042.1	1072.1	18.16	20.30	20.64	1042.1	1072.1	1.43	0.97	0.98
1042.1	1072.1	8.73	8.37	8.14	1061.9	1091.9	17.75	19.90	20.83	1061.9	1091.9	1.47	1.03	1.01
1061.9	1091.9	8.74	8.38	8.14	1101.6	1131.6	16.50	18.21	20.60	1101.6	1131.6	1.58	1.03	1.03
1101.6	1131.6	8.75	8.41	8.20	1121.5	1151.5	15.58	17.64	21.09	1121.5	1151.5	1.59	1.03	1.02
1121.5	1151.5	8.77	8.44	8.26	1161.2	1191.2	13.67	17.47	23.55	1161.2	1191.2	1.71	1.00	0.91
1181.0	1211.0	9.01	8.78	8.65	1181.0	1211.0	13.81	18.38	25.04	1181.0	1211.0	1.76	0.97	0.84
1220.7	1250.7	9.35	9.09	8.99	1220.7	1250.7	15.04	19.95	25.14	1220.7	1250.7	1.81	0.90	0.72
1240.6	1270.6	9.62	9.34	9.21	1240.6	1270.6	15.45	19.25	24.13	1240.6	1270.6	1.92	0.93	0.72
1280.3	1310.3	10.19	9.87	9.77	1280.3	1310.3	17.23	18.10	21.41	1280.3	1310.3	2.19	0.93	0.66
1300.1	1330.1	10.48	10.19	10.09	1300.1	1330.1	17.30	18.89	21.95	1300.1	1330.1	2.36	0.99	0.71



# Frequency Mixer

# LRMS-1MHJ+

## Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=250.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=500.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+13			+13			+13
240.0	10.1	6.26	10.0	20.1	5.90	490.0	10.1	6.46
234.1	16.0	6.24	22.3	32.4	5.82	477.7	22.4	6.43
228.2	21.9	6.21	34.6	44.7	5.80	465.4	34.7	6.39
222.3	27.8	6.21	46.9	57.0	5.82	453.1	47.0	6.38
216.4	33.7	6.20	59.2	69.3	5.81	440.8	59.3	6.39
210.5	39.6	6.18	71.5	81.6	5.84	428.5	71.6	6.31
204.6	45.5	6.19	83.8	93.9	5.85	416.2	83.9	6.27
198.7	51.4	6.17	96.2	106.3	5.83	403.8	96.3	6.20
192.8	57.3	6.15	108.5	118.6	5.83	391.5	108.6	6.14
186.9	63.2	6.13	120.8	130.9	5.82	379.2	120.9	6.13
181.0	69.1	6.14	133.1	143.2	5.81	366.9	133.2	6.11
175.1	75.0	6.18	145.4	155.5	5.88	354.6	145.5	6.07
169.2	80.9	6.13	157.7	167.8	5.90	342.3	157.8	6.07
163.3	86.8	6.13	170.0	180.1	5.91	330.0	170.1	6.06
157.4	92.7	6.12	182.3	192.4	5.92	317.7	182.4	6.05
151.5	98.6	6.07	194.6	204.7	5.91	305.4	194.7	6.03
145.6	104.5	6.06	206.9	217.0	5.92	293.1	207.0	6.01
139.7	110.4	6.05	219.2	229.3	5.94	280.8	219.3	6.01
133.8	116.3	6.02	231.5	241.6	5.95	268.5	231.6	6.04
127.9	122.2	5.98	243.8	253.9	5.99	256.2	243.9	6.05
122.1	128.0	5.96	256.2	266.3	6.04	243.8	256.3	6.06
116.2	133.9	6.00	268.5	278.6	6.04	231.5	268.6	6.07
110.3	139.8	6.02	280.8	290.9	6.05	219.2	280.9	6.05
104.4	145.7	6.02	293.1	303.2	6.06	206.9	293.2	6.08
98.5	151.6	6.03	305.4	315.5	6.08	194.6	305.5	6.08
92.6	157.5	6.02	317.7	327.8	6.13	182.3	317.8	6.09
86.7	163.4	6.02	330.0	340.1	6.14	170.0	330.1	6.12
80.8	169.3	6.03	342.3	352.4	6.14	157.7	342.4	6.14
74.9	175.2	6.04	354.6	364.7	6.17	145.4	354.7	6.17
69.0	181.1	6.03	366.9	377.0	6.22	133.1	367.0	6.20
63.1	187.0	6.02	379.2	389.3	6.25	120.8	379.3	6.19
57.2	192.9	6.01	391.5	401.6	6.26	108.5	391.6	6.20
51.3	198.8	6.02	403.8	413.9	6.23	96.2	403.9	6.23
45.4	204.7	6.04	416.2	426.3	6.25	83.8	416.3	6.23
39.5	210.6	6.05	428.5	438.6	6.28	71.5	428.6	6.26
33.6	216.5	6.05	440.8	450.9	6.30	59.2	440.9	6.28
27.7	222.4	6.05	453.1	463.2	6.28	46.9	453.2	6.27
21.8	228.3	6.10	465.4	475.5	6.23	34.6	465.5	6.31
15.9	234.2	6.10	477.7	487.8	6.21	22.3	477.8	6.33
10.0	240.1	6.20	490.0	500.1	6.23	10.0	490.1	6.43

# Frequency Mixer

# LRMS-1MHJ+

## Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+10	+13	+16	+10	+13	+16
2.0	76.01	74.51	74.01	68.31	65.71	64.46
5.0	69.66	68.76	68.46	63.66	61.00	59.73
10.0	64.01	63.07	62.89	58.52	55.80	54.50
49.8	52.79	51.28	50.15	45.48	43.68	42.37
89.5	48.36	47.07	46.51	40.95	38.97	38.00
129.2	46.36	45.67	43.99	38.63	36.92	35.88
168.9	46.21	44.61	42.57	37.07	35.85	34.53
208.6	45.25	42.74	40.74	36.63	34.90	33.59
248.3	44.55	41.76	39.90	36.51	34.26	32.78
287.9	42.35	39.97	38.07	35.78	33.63	31.96
327.6	41.01	38.41	36.65	34.60	32.50	30.88
367.3	39.53	37.35	35.66	33.10	31.10	29.70
407.0	37.26	35.72	34.34	31.93	30.35	28.87
446.7	34.49	33.72	32.72	29.43	28.71	27.83
486.4	32.70	31.76	30.79	27.93	27.02	26.32
526.1	31.29	30.07	29.28	27.51	25.76	24.68
565.8	30.65	29.31	28.21	26.91	25.62	24.09
585.6	30.31	28.90	27.75	26.35	25.36	23.93
625.3	29.69	27.85	26.66	24.50	23.97	23.04
645.2	29.48	27.62	26.48	23.69	23.35	22.49
684.9	28.55	26.84	25.63	22.01	22.00	21.21
704.7	28.09	26.37	25.05	21.12	21.14	20.51
744.4	27.16	25.61	24.34	19.69	19.64	19.13
764.3	26.63	25.12	23.81	19.29	19.14	18.65
803.9	25.61	24.26	22.91	18.68	18.09	17.50
863.5	24.72	23.53	22.64	18.18	17.43	16.47
883.3	24.48	23.25	22.34	18.05	17.33	16.23
923.0	24.13	22.98	22.41	17.23	16.66	15.46
942.9	23.92	22.90	22.40	16.97	16.46	15.18
982.6	23.61	22.88	22.59	16.06	15.82	14.54
1002.4	23.42	23.04	23.00	15.59	15.49	14.32
1042.1	23.11	23.00	23.17	14.57	14.60	13.43
1061.9	23.10	23.06	23.27	14.20	14.24	13.22
1101.6	23.04	23.04	23.34	13.07	13.15	12.18
1121.5	23.06	23.19	23.61	12.55	12.73	11.89
1181.0	23.51	23.70	24.10	11.14	11.54	10.94
1220.7	23.83	23.95	23.97	10.33	10.77	10.27
1240.6	24.36	24.27	23.92	10.06	10.45	10.03
1280.3	24.81	24.16	23.12	9.63	9.89	9.44
1300.1	25.03	24.06	22.82	9.52	9.71	9.33

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	45.50	44.46	44.01
49.8	79.8	31.98	31.67	31.46
89.5	119.5	27.21	27.04	27.07
129.2	159.2	24.60	24.58	24.59
168.9	198.9	23.01	23.03	23.04
208.6	238.6	21.88	21.94	22.02
248.3	278.3	21.26	21.32	21.37
287.9	317.9	20.95	21.06	21.12
327.6	357.6	20.75	20.99	21.15
367.3	397.3	20.77	21.02	21.22
407.0	437.0	21.02	21.24	21.30
446.7	476.7	21.19	21.33	21.58
486.4	516.4	21.23	21.50	21.94
526.1	556.1	20.59	20.52	20.98
565.8	595.8	19.27	19.05	19.29
585.6	615.6	18.23	18.08	18.34
625.3	655.3	16.28	16.33	16.52
645.2	675.2	15.33	15.45	15.60
684.9	714.9	13.83	14.08	14.30
704.7	734.7	13.14	13.38	13.61
744.4	774.4	11.97	12.17	12.44
764.3	794.3	11.57	11.73	12.04
803.9	833.9	10.87	11.00	11.39
823.8	853.8	10.59	10.76	11.32
863.5	893.5	10.08	10.35	11.08
883.3	913.3	9.86	10.20	10.85
923.0	953.0	9.47	9.83	10.41
942.9	972.9	9.27	9.69	10.29
982.6	1012.6	9.01	9.52	10.07
1002.4	1032.4	8.97	9.53	10.08
1042.1	1072.1	9.01	9.63	10.18
1061.9	1091.9	9.03	9.67	10.20
1101.6	1131.6	9.13	9.75	10.37
1121.5	1151.5	9.12	9.76	10.43
1161.2	1191.2	9.01	9.78	10.40
1181.0	1211.0	8.97	9.76	10.26
1220.7	1250.7	8.70	9.34	9.53
1240.6	1270.6	8.38	8.88	8.99
1280.3	1310.3	7.64	7.89	7.91
1300.1	1330.1	7.30	7.43	7.42



# Frequency Mixer

# LRMS-1MHJ+

## Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=500.5MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+10	+13	+16		+10	+13	+16		+10	+13	+16
5.0	35.0	1.38	2.10	3.07	5.0	1.16	1.13	1.15	5.0	1.41	1.24	1.14
10.0	40.0	1.33	2.01	2.91	10.0	1.12	1.06	1.09	10.0	1.42	1.25	1.14
49.8	79.8	1.11	1.02	1.07	49.8	1.30	1.96	2.79	22.3	1.77	1.51	1.29
89.5	119.5	1.09	1.02	1.09	89.5	1.28	1.88	2.65	34.5	1.75	1.50	1.30
129.2	159.2	1.06	1.04	1.10	129.2	1.29	1.92	2.71	46.8	1.87	1.61	1.38
168.9	198.9	1.05	1.05	1.11	168.9	1.28	1.89	2.65	59.0	1.80	1.54	1.32
208.6	238.6	1.04	1.06	1.13	208.6	1.29	1.92	2.68	71.3	1.81	1.54	1.33
248.3	278.3	1.04	1.06	1.12	248.3	1.32	1.96	2.72	83.5	1.79	1.52	1.32
287.9	317.9	1.03	1.07	1.14	287.9	1.33	1.95	2.69	95.8	1.86	1.59	1.37
327.6	357.6	1.03	1.09	1.16	327.6	1.37	2.01	2.76	108.0	1.80	1.53	1.33
367.3	397.3	1.03	1.11	1.18	367.3	1.40	2.02	2.74	120.3	1.87	1.60	1.39
407.0	437.0	1.04	1.12	1.20	407.0	1.44	2.07	2.79	132.5	1.89	1.61	1.39
446.7	476.7	1.04	1.15	1.23	446.7	1.48	2.11	2.82	144.8	1.86	1.58	1.37
486.4	516.4	1.04	1.15	1.25	486.4	1.53	2.13	2.83	157.0	1.83	1.56	1.35
526.1	556.1	1.06	1.16	1.26	526.1	1.58	2.20	2.89	169.3	1.82	1.55	1.34
565.8	595.8	1.10	1.19	1.28	565.8	1.61	2.22	2.90	181.5	1.83	1.56	1.36
585.6	615.6	1.11	1.21	1.30	585.6	1.64	2.25	2.93	193.8	1.88	1.60	1.39
625.3	655.3	1.13	1.23	1.31	625.3	1.69	2.30	2.96	206.0	1.89	1.61	1.40
645.2	675.2	1.14	1.24	1.31	645.2	1.71	2.31	2.96	218.3	1.92	1.63	1.42
684.9	714.9	1.12	1.24	1.30	684.9	1.77	2.34	2.97	230.5	1.92	1.62	1.41
704.7	734.7	1.12	1.23	1.30	704.7	1.81	2.38	3.00	242.8	1.89	1.60	1.39
744.4	774.4	1.11	1.21	1.28	744.4	1.87	2.42	3.02	255.0	1.89	1.60	1.39
764.3	794.3	1.13	1.21	1.29	764.3	1.89	2.45	3.03	267.3	1.88	1.59	1.38
803.9	833.9	1.19	1.22	1.31	803.9	1.95	2.51	3.09	279.5	1.89	1.60	1.39
823.8	853.8	1.22	1.25	1.33	823.8	1.97	2.53	3.10	291.8	1.92	1.62	1.41
863.5	893.5	1.29	1.33	1.39	863.5	2.00	2.55	3.10	304.0	1.89	1.60	1.40
883.3	913.3	1.33	1.38	1.43	883.3	2.02	2.57	3.12	316.3	1.93	1.63	1.42
923.0	953.0	1.41	1.46	1.50	923.0	2.06	2.61	3.15	328.5	1.92	1.62	1.41
942.9	972.9	1.46	1.51	1.55	942.9	2.08	2.61	3.14	340.8	1.93	1.63	1.42
982.6	1012.6	1.54	1.59	1.64	982.6	2.12	2.63	3.13	353.0	1.95	1.64	1.43
1002.4	1032.4	1.57	1.62	1.66	1002.4	2.15	2.66	3.15	365.3	1.91	1.62	1.41
1042.1	1072.1	1.64	1.70	1.74	1042.1	2.18	2.66	3.12	377.5	1.92	1.62	1.42
1061.9	1091.9	1.67	1.73	1.78	1061.9	2.19	2.65	3.10	389.8	1.93	1.63	1.42
1101.6	1131.6	1.77	1.83	1.89	1101.6	2.21	2.65	3.05	402.0	1.97	1.66	1.45
1121.5	1151.5	1.81	1.88	1.96	1121.5	2.23	2.65	3.05	414.3	2.01	1.69	1.48
1161.2	1191.2	1.91	2.01	2.10	1161.2	2.23	2.62	2.98	426.5	1.99	1.68	1.46
1181.0	1211.0	1.98	2.09	2.18	1181.0	2.24	2.61	2.96	438.8	1.97	1.66	1.45
1220.7	1250.7	2.10	2.22	2.30	1220.7	2.25	2.60	2.94	451.0	1.96	1.65	1.44
1240.6	1270.6	2.14	2.26	2.33	1240.6	2.25	2.59	2.91	463.3	1.94	1.64	1.43
1280.3	1310.3	2.18	2.29	2.36	1280.3	2.25	2.54	2.82	487.8	1.99	1.69	1.49
1300.1	1330.1	2.17	2.27	2.35	1300.1	2.28	2.53	2.82	500.0	1.88	1.63	1.49

# Frequency Mixer

# LRMS-1MHJ+

## Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	17	25	22	31	25	45	35	57	41	62
1	-	15	+0	27	12	32	20	35	33	55	41	53
2	79	48	36	50	36	46	36	44	38	55	47	58
3	>100	44	45	49	53	53	46	48	46	52	51	56
4	>100	64	56	57	54	54	54	50	49	54	50	62
5	>100	57	55	57	57	60	52	57	49	60	50	68
6	>100	70	62	75	62	68	65	64	66	60	59	63
7	>100	83	77	73	74	68	72	68	65	67	63	76
8	>100	73	76	66	65	66	64	80	74	81	85	71
9	>100	85	82	89	78	81	74	72	91	72	78	74
10	>100	89	81	85	82	75	81	71	79	77	83	84
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; 4.00 dBm.  
 LO IN: 280.01 MHz; +13.00 dBm  
 IF OUT: 29.91 MHz; -2.24 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	9	16	9	17	11	29	21	36	28	51
1	-	15	+0	26	13	30	20	34	34	46	34	47
2	99	65	40	49	41	47	39	52	42	57	53	60
3	>100	72	57	70	56	63	53	71	56	70	54	68
4	>100	75	65	72	69	67	71	67	65	72	87	77
5	>100	88	86	87	78	83	74	>88	72	86	74	81
6	>100	>88	>88	>88	>88	87	>88	85	83	85	84	85
7	>100	>88	>88	>88	>88	>88	>88	>88	84	>88	>88	>88
8	>100	>88	>88	>88	>88	>88	>88	>88	85	>88	>88	>88
9	>100	>88	>88	>88	>88	>88	>88	>88	>88	66	>88	>88
10	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	78	>88
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; -6.00 dBm.  
 LO IN: 280.01 MHz; +13.00 dBm  
 IF OUT: 29.91 MHz; -12.18 dBm

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

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 LRMS-1MHJ+  
 100817  
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