

# Frequency Mixer

# LRMS-2HJ

## 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=+14dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+14	+17	+20			+14	+17	+20			+14	+17	+20
5.0	35.0	9.06	7.85	7.26	10.1	40.1	22.84	26.80	30.39	10.1	40.1	0.31	0.12	0.07
10.0	40.0	8.86	7.64	7.07	49.8	79.8	21.92	25.30	28.79	49.8	79.8	0.37	0.12	0.07
49.8	79.8	8.24	7.17	6.71	89.6	119.6	22.36	25.71	28.52	89.6	119.6	0.18	0.05	0.04
89.6	119.6	8.21	7.14	6.69	129.3	159.3	23.01	26.45	29.20	129.3	159.3	0.29	0.08	0.07
129.3	159.3	8.17	7.11	6.65	169.0	199.0	22.30	26.01	30.20	169.0	199.0	0.20	0.10	0.08
169.0	199.0	8.11	7.09	6.64	208.8	238.8	23.45	27.03	29.60	208.8	238.8	0.34	0.16	0.09
208.8	238.8	7.97	6.92	6.60	248.5	278.5	21.25	25.25	29.52	248.5	278.5	0.21	0.14	0.08
248.5	278.5	8.16	7.07	6.68	288.2	318.2	24.07	29.61	26.31	288.2	318.2	0.47	0.21	0.10
288.2	318.2	7.75	6.90	6.61	328.0	358.0	23.85	27.12	26.04	328.0	358.0	0.50	0.15	0.08
328.0	358.0	7.82	6.98	6.69	367.7	397.7	24.88	27.20	26.09	367.7	397.7	0.56	0.15	0.09
367.7	397.7	7.68	6.96	6.67	407.4	437.4	28.61	24.99	25.00	407.4	437.4	0.61	0.20	0.12
407.4	437.4	7.57	6.90	6.63	447.2	477.2	25.62	22.87	24.16	447.2	477.2	0.52	0.20	0.14
447.2	477.2	7.68	6.98	6.66	486.9	516.9	23.05	22.12	23.62	486.9	516.9	0.56	0.19	0.17
486.9	516.9	7.65	6.98	6.65	526.6	556.6	23.16	22.27	23.47	526.6	556.6	0.57	0.15	0.14
526.6	556.6	7.79	7.16	6.77	566.4	596.4	23.94	23.60	25.13	566.4	596.4	0.58	0.18	0.18
566.4	596.4	7.75	7.15	6.78	606.1	636.1	25.57	25.04	27.42	606.1	636.1	0.67	0.26	0.23
606.1	636.1	7.79	7.10	6.76	645.8	675.8	25.93	24.77	26.79	645.8	675.8	0.68	0.35	0.29
645.8	675.8	7.79	7.07	6.70	685.6	715.6	24.57	24.29	26.17	685.6	715.6	0.72	0.39	0.32
685.6	715.6	7.76	7.07	6.69	725.3	755.3	20.87	22.91	24.99	725.3	755.3	0.79	0.45	0.37
725.3	755.3	7.87	7.18	6.80	765.0	795.0	19.17	21.53	25.10	765.0	795.0	0.79	0.51	0.41
765.0	795.0	7.91	7.26	6.87	804.8	834.8	17.87	19.95	23.59	804.8	834.8	0.84	0.48	0.40
804.8	834.8	8.11	7.46	7.04	844.5	874.5	17.12	19.07	21.85	844.5	874.5	0.85	0.56	0.44
844.5	874.5	8.30	7.63	7.17	884.2	914.2	16.62	18.83	22.08	884.2	914.2	0.78	0.55	0.46
884.2	914.2	8.50	7.77	7.29	924.0	954.0	16.54	18.88	22.15	924.0	954.0	0.72	0.55	0.50
924.0	954.0	8.70	7.89	7.37	963.7	993.7	16.34	18.21	21.66	963.7	993.7	0.53	0.54	0.54
1003.4	1033.4	9.11	8.07	7.41	1003.4	1033.4	16.81	19.21	23.82	1003.4	1033.4	0.57	0.61	0.64
1043.2	1073.2	9.09	7.95	7.32	1043.2	1073.2	17.40	20.92	26.28	1043.2	1073.2	0.64	0.71	0.71
1082.9	1112.9	9.37	8.14	7.43	1082.9	1112.9	17.12	20.98	26.79	1082.9	1112.9	0.56	0.69	0.73
1122.6	1152.6	9.40	8.13	7.38	1122.6	1152.6	17.92	22.26	28.84	1122.6	1152.6	0.55	0.75	0.79
1162.4	1192.4	9.57	8.31	7.53	1162.4	1192.4	18.68	23.24	27.34	1162.4	1192.4	0.49	0.69	0.75
1202.1	1232.1	9.72	8.47	7.67	1202.1	1232.1	19.16	23.23	24.94	1202.1	1232.1	0.45	0.65	0.73
1241.8	1271.8	9.86	8.63	7.82	1241.8	1271.8	18.72	21.75	23.84	1241.8	1271.8	0.44	0.63	0.72
1281.6	1311.6	10.15	8.93	8.12	1281.6	1311.6	17.96	20.46	22.00	1281.6	1311.6	0.39	0.57	0.68
1321.3	1351.3	10.25	9.05	8.25	1321.3	1351.3	17.55	19.50	21.71	1321.3	1351.3	0.47	0.62	0.72
1361.0	1391.0	10.49	9.33	8.57	1361.0	1391.0	17.14	19.30	22.02	1361.0	1391.0	0.53	0.66	0.73
1380.9	1410.9	10.55	9.44	8.66	1380.9	1410.9	17.05	19.22	22.35	1380.9	1410.9	0.56	0.67	0.73
1420.6	1450.6	10.71	9.60	8.87	1420.6	1450.6	17.30	20.43	23.91	1420.6	1450.6	0.65	0.71	0.74
1440.5	1470.5	10.73	9.64	8.93	1440.5	1470.5	17.67	21.45	26.72	1440.5	1470.5	0.72	0.79	0.81
1480.2	1510.2	10.89	9.91	9.23	1480.2	1510.2	18.42	22.63	27.75	1480.2	1510.2	0.83	0.84	0.86
1500.1	1530.1	10.98	10.04	9.40	1500.1	1530.1	19.22	25.03	27.28	1500.1	1530.1	0.84	0.85	0.88



# Frequency Mixer

# LRMS-2HJ

## Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=500.1MHz (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)=1000.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+17			+17			+17
490.0	10.1	7.14	10.0	20.1	6.99	900.0	100.1	7.49
477.7	22.4	7.08	29.8	39.9	6.87	880.2	119.9	7.42
465.4	34.7	7.05	49.6	59.7	7.02	860.4	139.7	7.39
453.1	47.0	7.13	69.3	79.4	7.08	840.7	159.4	7.31
440.8	59.3	7.18	89.1	99.2	7.01	820.9	179.2	7.27
428.5	71.6	7.01	108.9	119.0	7.02	801.1	199.0	7.22
416.2	83.9	7.07	128.7	138.8	7.04	781.3	218.8	7.13
403.8	96.3	7.04	148.4	158.5	7.08	761.6	238.5	7.12
391.5	108.6	7.02	168.2	178.3	7.08	741.8	258.3	7.11
379.2	120.9	6.99	188.0	198.1	7.15	722.0	278.1	7.13
366.9	133.2	6.82	207.8	217.9	7.11	702.2	297.9	7.03
354.6	145.5	6.78	227.6	237.7	7.07	682.4	317.7	7.05
342.3	157.8	6.85	247.3	257.4	7.16	662.7	337.4	7.09
330.0	170.1	6.89	267.1	277.2	7.31	642.9	357.2	7.12
317.7	182.4	6.83	286.9	297.0	7.21	623.1	377.0	7.18
305.4	194.7	6.74	306.7	316.8	7.14	603.3	396.8	7.15
293.1	207.0	6.65	326.4	336.5	7.26	583.6	416.5	7.19
280.8	219.3	6.61	346.2	356.3	7.23	563.8	436.3	7.20
268.5	231.6	6.69	366.0	376.1	7.27	544.0	456.1	7.24
256.2	243.9	6.63	385.8	395.9	7.29	524.2	475.9	7.26
243.8	256.3	6.59	405.6	415.7	7.27	504.4	495.7	7.22
231.5	268.6	6.64	425.3	435.4	7.30	484.7	515.4	7.29
219.2	280.9	6.62	445.1	455.2	7.28	464.9	535.2	7.28
206.9	293.2	6.65	464.9	475.0	7.38	445.1	555.0	7.35
194.6	305.5	6.67	484.7	494.8	7.32	425.3	574.8	7.31
182.3	317.8	6.62	504.4	514.5	7.29	405.6	594.5	7.31
170.0	330.1	6.65	524.2	534.3	7.31	385.8	614.3	7.36
157.7	342.4	6.70	544.0	554.1	7.35	366.0	634.1	7.35
145.4	354.7	6.70	583.6	593.7	7.29	326.4	673.7	7.39
133.1	367.0	6.76	603.3	613.4	7.36	306.7	693.4	7.42
120.8	379.3	6.75	642.9	653.0	7.36	267.1	733.0	7.54
108.5	391.6	6.72	662.7	672.8	7.44	247.3	752.8	7.64
96.2	403.9	6.77	702.2	712.3	7.48	207.8	792.3	7.79
83.8	416.3	6.77	722.0	732.1	7.51	188.0	812.1	7.86
71.5	428.6	6.78	761.6	771.7	7.60	148.4	851.7	8.00
59.2	440.9	6.84	781.3	791.4	7.56	128.7	871.4	8.08
46.9	453.2	6.83	820.9	831.0	7.56	89.1	911.0	8.02
34.6	465.5	6.90	840.7	850.8	7.58	69.3	930.8	8.10
22.3	477.8	6.95	880.2	890.3	7.50	29.8	970.3	8.12
10.0	490.1	6.97	900.0	910.1	7.49	10.0	990.1	8.02

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## Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+20	+14	+17	+20
5.0	64.63	66.33	68.05	72.73	72.89	71.08
10.0	62.11	63.63	65.24	71.84	68.70	65.74
49.8	49.30	50.68	51.94	61.86	53.37	49.96
89.6	44.13	45.37	46.65	60.65	51.25	46.58
129.3	40.91	42.33	43.56	58.08	47.67	43.25
169.0	38.83	40.06	41.21	58.54	46.33	41.40
208.8	37.11	38.44	39.68	57.83	44.39	41.02
248.5	35.83	37.11	38.28	55.21	43.73	40.36
288.2	34.72	36.10	37.15	54.32	46.57	41.33
328.0	33.95	35.35	36.34	51.61	48.50	40.86
367.7	33.26	34.61	35.66	49.75	49.98	40.97
407.4	32.71	33.97	34.94	45.04	49.89	40.93
447.2	32.29	33.28	34.10	42.01	46.73	40.41
486.9	31.97	32.79	33.48	38.67	43.23	39.92
526.6	31.77	32.77	33.52	36.78	40.45	38.65
566.4	31.63	32.76	33.47	34.28	36.84	37.44
606.1	31.65	32.88	33.50	32.84	35.21	36.16
645.8	31.57	32.55	32.99	31.35	33.89	34.77
685.6	31.37	32.05	32.37	29.98	33.45	34.05
725.3	30.90	31.54	31.89	28.81	32.95	33.56
765.0	30.27	30.90	31.49	27.64	31.91	34.17
804.8	29.60	30.43	31.18	26.94	31.01	34.22
844.5	29.07	29.98	30.97	26.13	29.77	33.73
884.2	28.88	29.88	31.03	25.59	29.06	32.72
924.0	28.84	30.06	31.49	24.99	28.27	31.41
1003.4	29.59	31.23	32.85	24.23	27.04	29.42
1043.2	30.28	32.06	33.43	23.66	26.15	28.13
1082.9	30.92	32.32	33.09	23.33	25.48	27.24
1122.6	31.56	32.48	32.73	22.82	24.71	26.31
1162.4	31.69	31.91	31.73	22.52	24.32	25.81
1202.1	31.06	30.89	30.62	22.16	24.12	25.63
1241.8	30.36	29.90	29.49	21.96	24.41	26.05
1281.6	29.71	29.08	28.68	21.48	24.36	26.44
1321.3	29.00	28.19	27.81	20.92	24.15	26.71
1361.0	28.25	27.41	26.85	20.51	24.03	27.11
1380.9	27.86	27.08	26.80	20.23	23.75	27.18
1420.6	26.95	26.51	26.32	19.53	23.14	27.06
1440.5	26.43	26.02	25.82	19.32	23.06	27.32
1480.2	25.68	25.59	25.63	19.09	22.96	27.43
1500.1	25.08	25.19	25.31	18.74	22.62	27.23

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	56.55	47.57	49.50
49.8	79.8	38.58	38.61	38.91
89.6	119.6	34.36	34.54	34.57
129.3	159.3	31.81	32.12	32.55
169.0	199.0	30.08	30.67	30.98
208.8	238.8	29.08	29.73	30.07
248.5	278.5	28.39	28.99	29.51
288.2	318.2	28.34	28.89	29.37
328.0	358.0	28.13	29.28	29.81
367.7	397.7	27.83	29.41	30.46
407.4	437.4	27.58	29.45	31.21
447.2	477.2	27.42	29.24	30.84
486.9	516.9	27.77	29.10	29.45
526.6	556.6	27.12	27.94	28.28
566.4	596.4	25.54	26.01	26.64
606.1	636.1	23.51	23.90	24.52
645.8	675.8	21.45	21.57	21.90
685.6	715.6	19.68	19.51	19.53
725.3	755.3	18.19	17.74	17.52
765.0	795.0	16.93	16.39	16.06
804.8	834.8	15.90	15.35	15.03
844.5	874.5	15.07	14.44	14.10
884.2	914.2	14.34	13.65	13.30
924.0	954.0	13.60	13.02	12.68
963.7	993.7	13.04	12.52	12.30
1003.4	1033.4	12.46	12.03	11.79
1043.2	1073.2	11.98	11.72	11.51
1082.9	1112.9	11.71	11.53	11.45
1122.6	1152.6	11.35	11.30	11.33
1162.4	1192.4	11.11	11.13	11.20
1202.1	1232.1	10.91	10.97	11.05
1241.8	1271.8	10.78	10.87	10.88
1281.6	1311.6	10.66	10.78	10.76
1321.3	1351.3	10.48	10.62	10.59
1361.0	1391.0	10.25	10.45	10.42
1380.9	1410.9	10.11	10.34	10.32
1420.6	1450.6	9.87	10.03	9.92
1440.5	1470.5	9.76	9.85	9.77
1480.2	1510.2	9.44	9.43	9.29
1500.1	1530.1	9.26	9.19	9.02

# Frequency Mixer

# LRMS-2HJ

## Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=1000.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+14	+17	+20		+14	+17	+20		+14	+17	+20
5.0	35.0	1.40	1.54	1.67	5.0	1.52	1.95	2.77	5.0	1.31	1.07	1.07
10.0	40.0	1.32	1.49	1.62	10.0	1.31	1.85	2.65	10.0	1.32	1.08	1.06
49.8	79.8	1.03	1.12	1.22	49.7	1.09	1.74	2.66	29.9	3.09	2.25	1.87
89.6	119.6	1.04	1.14	1.24	89.5	1.08	1.62	2.39	49.7	3.00	2.25	1.80
129.3	159.3	1.06	1.15	1.25	129.2	1.10	1.70	2.57	69.4	3.16	2.39	1.90
169.0	199.0	1.07	1.16	1.26	168.9	1.09	1.64	2.43	89.2	3.12	2.33	1.88
208.8	238.8	1.09	1.20	1.30	208.7	1.10	1.65	2.47	109.0	2.95	2.20	1.79
248.5	278.5	1.09	1.17	1.29	248.4	1.12	1.68	2.51	128.8	3.06	2.30	1.88
288.2	318.2	1.10	1.22	1.33	288.2	1.10	1.64	2.43	148.5	3.08	2.32	1.87
328.0	358.0	1.10	1.23	1.33	327.9	1.12	1.70	2.54	168.3	2.94	2.23	1.81
367.7	397.7	1.11	1.24	1.34	367.6	1.10	1.67	2.47	188.1	2.97	2.25	1.84
407.4	437.4	1.13	1.28	1.38	407.4	1.11	1.71	2.53	207.9	3.03	2.32	1.90
447.2	477.2	1.12	1.27	1.38	447.1	1.12	1.73	2.54	227.7	2.95	2.25	1.86
486.9	516.9	1.15	1.28	1.38	486.8	1.12	1.72	2.53	247.4	2.86	2.20	1.82
526.6	556.6	1.14	1.27	1.36	526.6	1.14	1.77	2.60	267.2	2.91	2.25	1.86
566.4	596.4	1.16	1.28	1.37	566.3	1.16	1.77	2.57	287.0	2.91	2.26	1.88
606.1	636.1	1.18	1.32	1.41	606.0	1.18	1.81	2.63	306.8	2.84	2.21	1.85
645.8	675.8	1.19	1.35	1.45	645.8	1.21	1.83	2.63	326.5	2.82	2.21	1.86
685.6	715.6	1.24	1.40	1.50	685.5	1.24	1.85	2.65	346.3	2.85	2.25	1.90
725.3	755.3	1.25	1.41	1.51	725.2	1.27	1.89	2.70	366.1	2.80	2.22	1.88
765.0	795.0	1.26	1.41	1.51	765.0	1.32	1.92	2.71	385.9	2.76	2.17	1.84
804.8	834.8	1.26	1.40	1.49	804.7	1.35	1.97	2.78	405.7	2.74	2.18	1.87
844.5	874.5	1.24	1.36	1.45	844.5	1.38	1.99	2.78	425.4	2.71	2.18	1.88
884.2	914.2	1.22	1.33	1.41	884.2	1.42	2.03	2.81	445.2	2.61	2.10	1.82
924.0	954.0	1.21	1.30	1.38	923.9	1.45	2.04	2.82	465.0	2.64	2.12	1.83
963.7	993.7	1.19	1.27	1.36	963.7	1.49	2.07	2.85	484.8	2.68	2.16	1.87
1003.4	1033.4	1.24	1.31	1.40	1003.4	1.51	2.08	2.85	504.5	2.62	2.12	1.85
1043.2	1073.2	1.31	1.38	1.47	1043.1	1.52	2.07	2.83	524.3	2.52	2.04	1.79
1082.9	1112.9	1.40	1.46	1.53	1082.9	1.57	2.11	2.86	544.1	2.55	2.07	1.82
1122.6	1152.6	1.54	1.58	1.64	1122.6	1.60	2.11	2.84	583.7	2.51	2.05	1.81
1162.4	1192.4	1.68	1.71	1.75	1162.3	1.65	2.15	2.88	603.4	2.49	2.03	1.79
1202.1	1232.1	1.84	1.86	1.89	1202.1	1.73	2.20	2.89	643.0	2.43	1.99	1.78
1241.8	1271.8	2.02	2.01	2.03	1241.8	1.80	2.25	2.93	662.8	2.40	1.96	1.75
1281.6	1311.6	2.21	2.19	2.18	1281.6	1.87	2.29	2.96	702.3	2.46	2.01	1.78
1321.3	1351.3	2.42	2.38	2.35	1321.3	1.92	2.31	2.95	722.1	2.37	1.94	1.72
1361.0	1391.0	2.62	2.58	2.53	1361.0	1.99	2.37	3.01	761.7	2.37	1.93	1.72
1380.9	1410.9	2.71	2.66	2.60	1380.9	2.02	2.37	3.00	781.4	2.34	1.91	1.70
1420.6	1450.6	2.88	2.82	2.73	1420.6	2.07	2.37	2.96	821.0	2.31	1.87	1.65
1440.5	1470.5	2.93	2.87	2.78	1440.5	2.09	2.39	2.99	840.8	2.26	1.84	1.64
1480.2	1510.2	3.04	2.97	2.87	1480.2	2.17	2.42	3.00	880.3	2.23	1.80	1.59
1500.1	1530.1	3.08	3.00	2.90	1500.1	2.20	2.42	2.97	900.1	2.25	1.82	1.61

## Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	15	40	6	20	17	34	32	39	33	39
1	-	22	+0	28	14	30	27	36	40	42	35	48
2	96	47	43	47	43	49	41	48	54	60	63	60
3	>100	69	54	70	54	70	51	65	55	78	64	72
4	>100	78	80	81	>92	79	77	73	72	74	83	82
5	>100	>92	88	86	88	87	83	83	80	83	82	>92
6	>100	>92	>92	>92	>92	>92	>92	89	>92	91	90	>92
7	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
8	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
9	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
10	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; -1.00 dBm.  
 LO IN: 530.01 MHz; +17.00 dBm  
 IF OUT: 29.91 MHz; -8.25 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	25	40	19	38	32	46	48	56	44	57
1	-	22	+0	28	14	32	26	39	47	49	41	51
2	78	44	36	44	35	48	34	44	45	65	55	59
3	>100	54	40	56	41	55	36	50	45	56	52	59
4	>100	54	55	55	54	58	54	57	51	61	74	63
5	>100	76	57	67	52	74	52	64	50	69	54	73
6	>100	81	73	71	77	67	66	66	62	65	57	65
7	>100	82	93	87	74	76	73	78	68	73	64	84
8	>100	94	94	100	86	78	78	74	73	72	70	73
9	>100	>102	101	97	>102	89	80	77	77	79	76	76
10	>100	98	101	>102	98	99	90	82	82	81	79	81
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; 9.00 dBm.  
 LO IN: 530.01 MHz; +17.00 dBm  
 IF OUT: 29.91 MHz; 1.7 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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