

Frequency Mixer

LRMS-1WHJ

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	8.68	7.75	7.20	10.1	40.1	23.14	26.98	30.82	10.1	40.1	0.36	0.19	0.11
10.0	40.0	8.40	7.52	7.00	49.6	79.6	22.12	25.41	28.70	49.6	79.6	0.25	0.15	0.07
49.6	79.6	8.24	7.19	6.81	89.0	119.0	22.93	26.25	29.08	89.0	119.0	0.30	0.10	0.06
89.0	119.0	8.14	7.16	6.76	128.5	158.5	23.19	26.06	28.63	128.5	158.5	0.37	0.12	0.09
128.5	158.5	8.13	7.10	6.74	167.9	197.9	23.15	26.25	30.44	167.9	197.9	0.29	0.16	0.09
167.9	197.9	7.99	7.04	6.71	207.4	237.4	23.71	27.23	29.52	207.4	237.4	0.41	0.20	0.10
207.4	237.4	7.83	6.88	6.65	246.8	276.8	21.82	25.79	31.60	246.8	276.8	0.33	0.16	0.09
246.8	276.8	7.95	7.01	6.75	286.3	316.3	23.97	29.07	27.34	286.3	316.3	0.58	0.21	0.10
286.3	316.3	7.62	6.85	6.65	325.7	355.7	23.22	28.35	27.98	325.7	355.7	0.51	0.17	0.07
325.7	355.7	7.66	6.95	6.74	365.2	395.2	26.93	27.04	27.73	365.2	395.2	0.65	0.18	0.11
365.2	395.2	7.47	6.88	6.70	404.6	434.6	26.67	26.20	25.55	404.6	434.6	0.61	0.21	0.14
404.6	434.6	7.46	6.86	6.67	444.1	474.1	24.73	25.15	25.17	444.1	474.1	0.60	0.22	0.14
444.1	474.1	7.49	6.90	6.66	483.5	513.5	23.95	23.37	24.80	483.5	513.5	0.59	0.21	0.17
483.5	513.5	7.54	6.95	6.70	523.0	553.0	23.98	23.83	25.09	523.0	553.0	0.60	0.19	0.17
523.0	553.0	7.62	7.10	6.76	562.4	592.4	26.04	24.76	26.31	562.4	592.4	0.68	0.25	0.21
562.4	592.4	7.55	7.03	6.76	601.9	631.9	26.00	25.14	26.46	601.9	631.9	0.71	0.29	0.24
601.9	631.9	7.63	7.09	6.81	641.3	671.3	27.48	25.51	27.35	641.3	671.3	0.79	0.40	0.30
641.3	671.3	7.59	7.02	6.74	680.8	710.8	25.13	24.93	26.22	680.8	710.8	0.79	0.45	0.33
680.8	710.8	7.63	7.03	6.74	720.2	750.2	21.34	23.67	25.57	720.2	750.2	0.92	0.57	0.43
720.2	750.2	7.76	7.11	6.81	759.7	789.7	19.09	22.46	25.79	759.7	789.7	0.97	0.66	0.50
759.7	789.7	7.88	7.21	6.89	799.1	829.1	17.54	20.26	24.80	799.1	829.1	0.90	0.67	0.54
799.1	829.1	8.07	7.43	7.04	838.6	868.6	16.64	18.66	22.75	838.6	868.6	0.89	0.69	0.55
838.6	868.6	8.26	7.55	7.16	878.0	908.0	16.49	17.79	21.34	878.0	908.0	0.80	0.66	0.56
878.0	908.0	8.53	7.77	7.36	917.5	947.5	16.23	16.95	19.87	917.5	947.5	0.67	0.63	0.59
917.5	947.5	9.12	8.21	7.57	956.9	986.9	15.85	16.83	19.32	956.9	986.9	0.47	0.51	0.57
956.9	986.9	9.45	8.50	7.71	996.4	1026.4	16.28	17.44	20.39	996.4	1026.4	0.35	0.43	0.59
996.4	1026.4	9.57	8.52	7.69	1035.9	1065.9	16.69	18.72	22.07	1035.9	1065.9	0.33	0.48	0.65
1035.9	1065.9	9.62	8.46	7.66	1075.3	1105.3	17.56	20.79	25.61	1075.3	1105.3	0.36	0.53	0.69
1075.3	1105.3	9.71	8.49	7.70	1114.8	1144.8	17.86	21.54	26.52	1114.8	1144.8	0.39	0.60	0.77
1114.8	1144.8	9.65	8.48	7.76	1154.2	1184.2	18.78	22.00	25.50	1154.2	1184.2	0.50	0.65	0.73
1154.2	1184.2	9.62	8.51	7.81	1193.7	1223.7	19.09	21.64	23.79	1193.7	1223.7	0.63	0.71	0.70
1193.7	1223.7	9.73	8.57	7.92	1213.4	1243.4	18.93	21.55	23.27	1213.4	1243.4	0.66	0.71	0.70
1213.4	1243.4	9.72	8.61	8.05	1252.8	1282.8	18.81	21.20	22.83	1252.8	1282.8	0.74	0.78	0.69
1252.8	1282.8	9.86	8.77	8.22	1272.6	1302.6	18.57	20.77	22.92	1272.6	1302.6	0.72	0.73	0.69
1272.6	1302.6	10.02	8.93	8.41	1312.0	1342.0	18.76	20.88	22.83	1312.0	1342.0	0.80	0.77	0.72
1312.0	1342.0	10.17	9.08	8.52	1331.7	1361.7	18.93	20.78	22.73	1331.7	1361.7	0.72	0.75	0.71
1331.7	1361.7	10.46	9.44	8.88	1371.2	1401.2	19.29	21.27	23.03	1371.2	1401.2	0.79	0.78	0.77
1371.2	1401.2	10.56	9.58	9.03	1390.9	1420.9	19.18	21.55	23.13	1390.9	1420.9	0.85	0.81	0.79
1390.9	1420.9	10.87	9.97	9.43	1430.4	1460.4	19.29	21.92	23.83	1430.4	1460.4	0.68	0.75	0.78
1430.4	1460.4	10.99	10.18	9.65	1450.1	1480.1	19.61	21.82	23.48	1450.1	1480.1	0.64	0.72	0.76
1450.1	1480.1													



Frequency Mixer

LRMS-1WHJ

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=375.1MHz (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)=750.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+17			+17			+17
355.0	20.1	7.06	10.0	20.1	7.04	740.0	10.1	7.22
346.2	28.9	7.10	28.7	38.8	6.84	721.3	28.8	7.15
337.3	37.8	6.98	47.4	57.5	6.99	702.6	47.5	7.09
328.5	46.6	7.06	66.2	76.3	7.06	683.8	66.3	6.93
319.6	55.5	6.98	84.9	95.0	7.09	665.1	85.0	6.92
310.8	64.3	7.02	103.6	113.7	6.97	646.4	103.7	6.87
301.9	73.2	7.02	122.3	132.4	6.92	627.7	122.4	6.84
293.1	82.0	6.99	141.0	151.1	7.03	609.0	141.1	6.72
284.2	90.9	7.06	159.7	169.8	7.13	590.3	159.8	6.57
275.4	99.7	6.98	178.5	188.6	7.08	571.5	178.6	6.60
266.5	108.6	6.98	197.2	207.3	7.03	552.8	197.3	6.53
257.7	117.4	6.89	215.9	226.0	7.03	534.1	216.0	6.53
248.8	126.3	6.86	234.6	244.7	7.11	515.4	234.7	6.43
240.0	135.1	6.81	253.3	263.4	7.20	496.7	253.4	6.46
231.2	143.9	6.78	272.1	282.2	7.16	477.9	272.2	6.42
222.3	152.8	6.85	290.8	300.9	7.12	459.2	290.9	6.48
213.5	161.6	6.73	309.5	319.6	7.11	440.5	309.6	6.53
204.6	170.5	6.85	328.2	338.3	7.26	421.8	328.3	6.50
195.8	179.3	6.77	346.9	357.0	7.19	403.1	347.0	6.48
186.9	188.2	6.52	365.6	375.7	7.25	384.4	365.7	6.56
178.1	197.0	6.73	384.4	394.5	7.25	365.6	384.5	6.62
169.2	205.9	6.71	403.1	413.2	7.26	346.9	403.2	6.63
160.4	214.7	6.73	421.8	431.9	7.29	328.2	421.9	6.69
151.5	223.6	6.62	440.5	450.6	7.34	309.5	440.6	6.71
142.7	232.4	6.68	459.2	469.3	7.34	290.8	459.3	6.77
133.8	241.3	6.64	477.9	488.0	7.26	272.1	478.0	6.81
125.0	250.1	6.63	496.7	506.8	7.33	253.3	496.8	6.88
116.2	258.9	6.63	515.4	525.5	7.30	234.6	515.5	6.83
107.3	267.8	6.66	534.1	544.2	7.33	215.9	534.2	6.88
98.5	276.6	6.74	552.8	562.9	7.34	197.2	552.9	6.88
89.6	285.5	6.66	571.5	581.6	7.39	178.5	571.6	6.90
80.8	294.3	6.71	590.3	600.4	7.36	159.7	590.4	6.90
71.9	303.2	6.72	609.0	619.1	7.36	141.0	609.1	6.93
63.1	312.0	6.74	627.7	637.8	7.37	122.3	627.8	6.93
54.2	320.9	6.72	646.4	656.5	7.36	103.6	646.5	6.95
45.4	329.7	6.74	665.1	675.2	7.43	84.9	665.2	7.03
36.5	338.6	6.80	683.8	693.9	7.33	66.2	683.9	7.03
27.7	347.4	6.80	702.6	712.7	7.36	47.4	702.7	7.10
18.8	356.3	6.80	721.3	731.4	7.35	28.7	721.4	7.11
10.0	365.1	6.88	740.0	750.1	7.40	10.0	740.1	7.22



Frequency Mixer

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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	64.86	66.55	68.27	73.06	73.50	71.89
10.0	62.27	63.83	65.42	72.36	69.50	66.38
49.6	48.22	49.77	51.26	72.06	62.16	56.33
89.0	43.04	44.44	45.81	62.59	60.80	53.32
128.5	39.90	41.46	42.88	58.35	58.96	49.97
167.9	37.77	39.17	40.54	54.06	59.78	49.34
207.4	36.09	37.53	38.97	50.83	60.78	49.53
246.8	34.87	36.38	37.68	48.75	64.84	48.54
286.3	33.76	35.29	36.49	46.02	54.28	49.85
325.7	33.00	34.54	35.82	43.94	50.63	48.59
365.2	32.35	33.81	34.95	41.07	45.71	46.67
404.6	31.78	33.16	34.25	39.18	43.74	46.35
444.1	31.42	32.67	33.65	37.37	41.60	44.12
483.5	31.05	32.12	33.06	35.79	39.81	42.98
523.0	30.93	32.14	33.01	34.60	38.03	41.32
562.4	30.61	31.85	32.67	33.31	36.53	39.67
601.9	30.41	31.63	32.32	32.26	35.95	38.90
641.3	30.14	31.14	31.86	30.86	34.79	38.04
680.8	29.78	30.72	31.40	29.83	34.07	38.12
720.2	29.40	30.32	31.05	28.75	32.81	37.81
759.7	29.00	29.80	30.56	28.00	31.62	37.02
799.1	28.72	29.59	30.39	27.66	30.98	35.63
838.6	28.65	29.57	30.37	27.23	30.30	34.07
878.0	28.67	29.82	30.63	27.17	30.27	33.60
956.9	28.90	30.13	31.08	26.61	29.46	32.00
996.4	28.86	30.09	30.88	26.36	29.27	31.79
1035.9	28.93	30.01	30.55	26.07	28.98	31.26
1075.3	29.06	29.91	30.14	26.25	29.13	31.07
1114.8	28.85	29.34	29.49	25.47	29.08	32.50
1154.2	28.52	28.82	28.76	25.04	29.39	34.32
1193.7	28.41	28.54	28.38	24.48	29.08	34.91
1213.4	28.26	28.25	28.02	23.76	28.14	34.00
1252.8	28.35	28.15	27.83	23.18	27.21	32.34
1272.6	28.34	27.98	27.69	22.80	26.65	31.35
1312.0	28.18	27.60	27.26	22.36	26.07	30.63
1331.7	28.15	27.57	27.25	22.11	25.81	30.35
1371.2	27.83	27.04	26.61	22.22	26.02	30.81
1390.9	27.67	26.80	26.36	22.12	25.94	30.77
1430.4	27.40	26.51	26.05	22.12	26.17	31.23
1450.1	26.95	26.20	25.71	22.39	26.63	31.86

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	48.36	48.74	56.64
49.6	79.6	38.18	38.05	37.95
89.0	119.0	33.60	33.68	33.54
128.5	158.5	31.09	31.35	31.20
167.9	197.9	29.46	29.63	29.58
207.4	237.4	28.37	28.59	28.62
246.8	276.8	27.73	27.89	28.04
286.3	316.3	27.52	27.66	27.75
325.7	355.7	27.27	27.96	28.08
365.2	395.2	27.10	28.00	28.65
404.6	434.6	27.19	28.37	29.29
444.1	474.1	27.55	28.71	29.50
483.5	513.5	27.85	28.56	28.89
523.0	553.0	27.27	27.81	28.14
562.4	592.4	25.53	25.99	26.64
601.9	631.9	23.19	23.56	24.18
641.3	671.3	21.09	21.27	21.65
680.8	710.8	19.32	19.21	19.31
720.2	750.2	17.86	17.53	17.38
759.7	789.7	16.63	16.20	15.94
799.1	829.1	15.85	15.33	14.99
838.6	868.6	15.20	14.71	14.33
878.0	908.0	14.56	14.10	13.79
917.5	947.5	13.87	13.55	13.25
956.9	986.9	13.25	12.97	12.79
996.4	1026.4	12.65	12.48	12.40
1035.9	1065.9	12.08	12.09	12.04
1075.3	1105.3	11.70	11.82	11.92
1114.8	1144.8	11.34	11.45	11.64
1154.2	1184.2	11.04	11.25	11.35
1193.7	1223.7	10.96	11.12	11.17
1213.4	1243.4	10.93	11.13	11.18
1252.8	1282.8	10.88	11.12	11.15
1272.6	1302.6	10.86	11.09	11.15
1312.0	1342.0	10.73	11.04	11.08
1331.7	1361.7	10.65	10.98	11.01
1371.2	1401.2	10.46	10.76	10.83
1390.9	1420.9	10.37	10.66	10.72
1430.4	1460.4	10.15	10.37	10.40
1450.1	1480.1	10.01	10.17	10.18

Frequency Mixer

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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+14	+17	+20
5.0	35.0	1.94	2.02	2.07
10.0	40.0	1.58	1.71	1.83
49.6	79.6	1.03	1.14	1.25
89.0	119.0	1.04	1.16	1.26
128.5	158.5	1.05	1.17	1.27
167.9	197.9	1.06	1.18	1.28
207.4	237.4	1.07	1.21	1.31
246.8	276.8	1.06	1.17	1.29
286.3	316.3	1.08	1.23	1.32
325.7	355.7	1.08	1.22	1.33
365.2	395.2	1.10	1.25	1.35
404.6	434.6	1.11	1.27	1.37
444.1	474.1	1.12	1.28	1.38
483.5	513.5	1.13	1.27	1.37
523.0	553.0	1.14	1.27	1.37
562.4	592.4	1.18	1.30	1.39
601.9	631.9	1.20	1.33	1.42
641.3	671.3	1.23	1.37	1.47
680.8	710.8	1.27	1.42	1.52
720.2	750.2	1.27	1.44	1.54
759.7	789.7	1.28	1.44	1.53
799.1	829.1	1.27	1.40	1.51
838.6	868.6	1.25	1.37	1.47
878.0	908.0	1.24	1.33	1.42
917.5	947.5	1.26	1.32	1.40
956.9	986.9	1.31	1.34	1.42
996.4	1026.4	1.40	1.42	1.49
1035.9	1065.9	1.53	1.55	1.60
1075.3	1105.3	1.68	1.69	1.74
1114.8	1144.8	1.86	1.86	1.89
1154.2	1184.2	2.06	2.05	2.07
1193.7	1223.7	2.28	2.25	2.25
1213.4	1243.4	2.39	2.36	2.34
1252.8	1282.8	2.60	2.55	2.52
1272.6	1302.6	2.72	2.67	2.63
1312.0	1342.0	2.93	2.87	2.82
1331.7	1361.7	3.06	2.99	2.92
1371.2	1401.2	3.24	3.17	3.10
1390.9	1420.9	3.34	3.26	3.19
1430.4	1460.4	3.50	3.43	3.35
1450.1	1480.1	3.56	3.49	3.42

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+14	+17	+20
5.0	1.52	1.97	2.71
10.0	1.32	1.87	2.69
49.6	1.11	1.79	2.71
89.0	1.09	1.66	2.44
128.5	1.10	1.74	2.62
167.9	1.09	1.68	2.48
207.4	1.10	1.68	2.51
246.8	1.11	1.72	2.57
286.3	1.09	1.68	2.48
325.7	1.11	1.74	2.60
365.2	1.10	1.72	2.53
404.6	1.12	1.75	2.58
444.1	1.14	1.78	2.62
483.5	1.15	1.77	2.58
523.0	1.19	1.83	2.68
562.4	1.21	1.83	2.63
601.9	1.24	1.87	2.69
641.3	1.29	1.89	2.70
680.8	1.31	1.90	2.69
720.2	1.37	1.96	2.77
759.7	1.41	1.98	2.76
799.1	1.46	2.05	2.84
838.6	1.51	2.09	2.87
878.0	1.53	2.11	2.88
917.5	1.57	2.15	2.92
956.9	1.61	2.17	2.93
996.4	1.62	2.17	2.92
1035.9	1.64	2.17	2.91
1075.3	1.66	2.16	2.89
1114.8	1.68	2.15	2.86
1154.2	1.71	2.17	2.88
1193.7	1.76	2.18	2.87
1213.4	1.79	2.20	2.87
1252.8	1.86	2.25	2.92
1272.6	1.90	2.27	2.94
1312.0	1.98	2.29	2.92
1331.7	2.03	2.33	2.95
1371.2	2.13	2.40	3.00
1390.9	2.19	2.42	2.99
1430.4	2.32	2.48	3.02
1450.1	2.38	2.53	3.06

IF (OUT) (MHz)	IF VSWR @LO=750.1MHz (:1)		
	@LO (dBm)		
	+14	+17	+20
5.0	1.30	1.07	1.07
10.0	1.31	1.07	1.06
29.0	2.53	1.98	1.61
47.9	2.42	1.86	1.55
66.9	2.49	1.91	1.60
85.9	2.43	1.89	1.56
104.9	2.48	1.95	1.60
123.8	2.42	1.88	1.55
142.8	2.46	1.89	1.57
161.8	2.48	1.90	1.58
180.8	2.47	1.90	1.58
199.7	2.46	1.90	1.56
218.7	2.43	1.89	1.54
237.7	2.42	1.87	1.54
256.7	2.42	1.86	1.55
275.6	2.39	1.84	1.53
294.6	2.41	1.87	1.54
313.6	2.41	1.89	1.55
332.6	2.40	1.87	1.55
351.5	2.38	1.85	1.54
370.5	2.42	1.87	1.56
389.5	2.41	1.88	1.57
408.5	2.37	1.86	1.55
427.4	2.38	1.86	1.55
446.4	2.39	1.88	1.58
465.4	2.39	1.88	1.59
484.4	2.35	1.85	1.57
503.3	2.37	1.88	1.58
522.3	2.36	1.87	1.58
541.3	2.31	1.85	1.58
560.3	2.29	1.83	1.57
579.2	2.35	1.87	1.61
598.2	2.35	1.89	1.63
617.2	2.28	1.84	1.59
636.2	2.28	1.83	1.58
655.1	2.27	1.84	1.61
674.1	2.27	1.85	1.63
693.1	2.25	1.81	1.60
712.1	2.25	1.80	1.59
731.0	2.26	1.83	1.62
750.0	1.98	1.83	1.80

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	20	34	11	23	19	35	32	52	46	54
1	-	21	+0	31	15	30	26	45	30	44	35	45
2	98	56	45	56	46	69	45	54	50	68	76	62
3	>100	73	63	65	55	64	50	73	49	62	53	79
4	>100	83	77	84	75	89	77	80	75	77	70	80
5	>100	87	82	87	79	88	75	>92	77	90	75	86
6	>100	>92	>92	>92	>92	>92	88	>92	88	>92	86	>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	91	>92
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 370.1 MHz; -1.00 dBm.
 LO IN: 400.01 MHz; +17.00 dBm
 IF OUT: 29.91 MHz; -8.06 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	31	43	23	38	35	47	48	59	50	62
1	-	21	+0	29	15	32	24	40	37	50	44	51
2	85	50	42	50	40	56	38	51	42	73	58	72
3	>100	53	44	64	47	56	38	55	41	55	43	60
4	>100	64	57	66	56	70	60	78	55	67	63	69
5	>100	66	62	63	56	61	52	61	50	85	48	60
6	>100	75	67	90	70	73	78	72	71	68	64	66
7	>100	90	80	72	79	76	70	75	65	77	65	86
8	>100	91	89	86	84	83	92	87	80	79	74	77
9	>100	97	88	90	78	78	75	81	73	83	73	86
10	>100	>102	101	>102	97	92	93	86	87	86	81	83
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 370.1 MHz; 9.00 dBm.
 LO IN: 400.01 MHz; +17.00 dBm
 IF OUT: 29.91 MHz; 1.94 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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