

# Frequency Mixer

# LRMS-5HJ+

## 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
10.1	40.1	7.84	6.81	6.39	10.1	40.1	22.29	25.79	28.92	10.1	40.1	0.43	0.26	0.20
50.3	80.3	7.34	6.46	6.03	50.3	80.3	21.76	25.51	27.11	49.9	79.9	0.71	0.43	0.28
90.5	120.5	7.15	6.29	5.84	90.5	120.5	21.95	24.29	29.19	89.7	119.7	0.91	0.46	0.32
130.7	160.7	7.06	6.14	5.77	130.7	160.7	23.21	28.01	23.40	129.5	159.5	0.90	0.51	0.34
171.0	201.0	7.07	6.18	5.83	171.0	201.0	22.59	23.61	22.99	169.3	199.3	0.81	0.50	0.34
211.2	241.2	6.85	6.10	5.78	211.2	241.2	24.00	21.42	24.45	209.0	239.0	1.09	0.59	0.38
251.4	281.4	6.90	6.22	5.88	251.4	281.4	21.87	21.31	25.09	248.8	278.8	1.09	0.56	0.41
291.6	321.6	6.89	6.20	5.88	291.6	321.6	20.13	21.73	26.11	308.5	338.5	1.02	0.56	0.45
331.8	361.8	6.97	6.31	5.97	331.8	361.8	19.60	22.21	26.42	348.3	378.3	1.22	0.59	0.51
392.1	422.1	7.04	6.37	5.99	392.1	422.1	19.68	24.49	36.98	408.0	438.0	1.17	0.71	0.64
432.3	462.3	7.16	6.42	6.01	432.3	462.3	19.61	23.61	34.83	447.8	477.8	1.14	0.77	0.72
492.7	522.7	7.22	6.54	6.06	492.7	522.7	20.70	24.91	35.08	507.5	537.5	1.45	1.00	0.89
532.9	562.9	7.29	6.64	6.22	532.9	562.9	21.06	26.46	32.24	547.3	577.3	1.57	1.16	0.97
593.2	623.2	7.43	6.56	6.20	593.2	623.2	22.70	27.31	27.44	606.9	636.9	1.73	1.44	1.15
633.4	663.4	7.59	6.56	6.08	633.4	663.4	21.69	23.01	24.02	646.7	676.7	1.66	1.47	1.29
693.7	723.7	7.77	6.65	6.01	693.7	723.7	19.37	23.68	21.64	706.4	736.4	1.81	1.57	1.50
733.9	763.9	7.99	6.92	6.18	733.9	763.9	19.59	26.37	22.67	746.2	776.2	1.73	1.51	1.44
794.2	824.2	8.22	7.14	6.49	794.2	824.2	21.87	23.13	24.59	805.9	835.9	1.63	1.45	1.27
834.5	864.5	8.36	7.23	6.62	834.5	864.5	29.21	24.32	23.47	845.7	875.7	1.52	1.49	1.34
894.8	924.8	8.56	7.37	6.72	894.8	924.8	23.60	33.32	28.64	905.4	935.4	1.31	1.50	1.33
935.0	965.0	8.68	7.55	6.89	935.0	965.0	20.75	25.13	29.74	945.2	975.2	1.18	1.37	1.29
995.3	1025.3	8.74	7.75	7.12	995.3	1025.3	18.28	22.87	25.62	1004.8	1034.8	1.09	1.18	1.12
1035.5	1065.5	8.69	7.79	7.25	1035.5	1065.5	17.66	21.35	24.21	1044.6	1074.6	1.09	1.09	1.04
1095.8	1125.8	8.62	7.88	7.40	1095.8	1125.8	17.41	19.96	23.80	1104.3	1134.3	1.09	1.00	0.95
1136.1	1166.1	8.60	7.91	7.48	1136.1	1166.1	17.20	19.70	23.74	1144.1	1174.1	0.98	0.89	0.84
1196.4	1226.4	8.73	8.12	7.75	1196.4	1226.4	17.11	19.54	25.56	1203.8	1233.8	1.13	0.76	0.69
1236.6	1266.6	8.83	8.35	8.06	1236.6	1266.6	17.14	19.65	27.55	1243.6	1273.6	1.10	0.55	0.46
1296.9	1326.9	8.98	8.77	8.57	1296.9	1326.9	17.49	18.22	24.85	1303.3	1333.3	1.30	0.43	0.31
1337.1	1367.1	8.94	8.87	8.77	1337.1	1367.1	17.63	17.86	23.83	1343.0	1373.0	1.47	0.47	0.28
1397.4	1427.4	8.85	8.79	8.91	1397.4	1427.4	17.29	17.39	21.38	1402.7	1432.7	1.94	0.79	0.41
1437.7	1467.7	8.77	8.70	8.93	1437.7	1467.7	16.88	17.11	20.11	1442.5	1472.5	2.19	0.98	0.54
1498.0	1528.0	8.84	8.74	9.07	1498.0	1528.0	16.10	16.27	17.96	1502.2	1532.2	2.43	1.12	0.55
1538.2	1568.2	8.94	8.84	9.15	1538.2	1568.2	15.61	16.18	17.27	1542.0	1572.0	2.54	1.16	0.56
1598.5	1628.5	9.32	8.99	9.13	1598.5	1628.5	15.10	16.13	16.12	1601.7	1631.7	2.64	1.25	0.64
1638.7	1668.7	9.72	9.15	9.05	1638.7	1668.7	15.17	16.95	16.88	1641.5	1671.5	2.54	1.27	0.68
1699.0	1729.0	10.71	9.32	8.95	1699.0	1729.0	15.20	19.02	20.66	1701.2	1731.2	2.30	1.42	0.80
1739.2	1769.2	11.35	9.29	8.80	1739.2	1769.2	15.48	18.48	23.28	1740.9	1770.9	1.91	1.60	0.89
1799.6	1829.6	12.74	9.52	8.77	1799.6	1829.6	15.18	18.22	23.61	1800.6	1830.6	1.16	1.72	0.95
1839.8	1869.8	13.61	9.82	8.77	1839.8	1869.8	14.74	18.67	23.73	1840.4	1870.4	0.57	1.58	0.95
1900.1	1930.1	15.21	10.59	8.93	1900.1	1930.1	14.93	18.85	23.64	1900.1	1930.1	-0.36	1.30	0.92



# Frequency Mixer

# LRMS-5HJ+

## Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=750.1MHz (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)=1500.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+17			+17			+17
730.0	20.1	6.85	10.0	20.1	6.90	900.0	600.1	9.76
711.5	38.6	6.76	29.6	39.7	6.79	880.2	619.9	9.73
693.1	57.0	6.74	49.1	59.2	6.97	860.4	639.7	9.69
674.6	75.5	6.84	68.7	78.8	6.97	840.7	659.4	9.67
656.2	93.9	6.78	88.2	98.3	6.90	820.9	679.2	9.51
637.7	112.4	6.71	107.8	117.9	6.87	801.1	699.0	9.42
619.2	130.9	6.61	127.3	137.4	6.86	781.3	718.8	9.27
600.8	149.3	6.63	146.9	157.0	6.92	761.6	738.5	9.20
582.3	167.8	6.64	166.4	176.5	6.86	741.8	758.3	8.87
563.8	186.3	6.69	186.0	196.1	6.85	722.0	778.1	8.93
545.4	204.7	6.66	205.6	215.7	6.82	702.2	797.9	8.81
526.9	223.2	6.68	225.1	235.2	6.73	682.4	817.7	8.70
508.5	241.6	6.67	244.7	254.8	6.73	662.7	837.4	8.68
490.0	260.1	6.72	264.2	274.3	6.83	642.9	857.2	8.59
471.5	278.6	6.72	283.8	293.9	6.81	623.1	877.0	8.57
453.1	297.0	6.69	303.3	313.4	6.72	603.3	896.8	8.52
434.6	315.5	6.66	322.9	333.0	6.82	583.6	916.5	8.54
416.2	333.9	6.60	342.4	352.5	6.78	563.8	936.3	8.56
397.7	352.4	6.61	362.0	372.1	6.88	544.0	956.1	8.55
379.2	370.9	6.49	381.6	391.7	6.86	524.2	975.9	8.60
360.8	389.3	6.59	401.1	411.2	6.83	504.4	995.7	8.56
342.3	407.8	6.52	420.7	430.8	6.89	484.7	1015.4	8.56
323.8	426.3	6.56	440.2	450.3	6.93	464.9	1035.2	8.49
305.4	444.7	6.55	459.8	469.9	7.02	445.1	1055.0	8.56
286.9	463.2	6.63	479.3	489.4	6.95	425.3	1074.8	8.54
268.5	481.6	6.59	498.9	509.0	7.01	405.6	1094.5	8.53
250.0	500.1	6.62	518.4	528.5	6.99	385.8	1114.3	8.57
231.5	518.6	6.58	538.0	548.1	6.98	366.0	1134.1	8.54
213.1	537.0	6.64	577.1	587.2	6.96	326.4	1173.7	8.62
194.6	555.5	6.61	596.7	606.8	7.01	306.7	1193.4	8.70
176.2	573.9	6.57	635.8	645.9	7.10	267.1	1233.0	8.70
157.7	592.4	6.57	655.3	665.4	7.19	247.3	1252.8	8.72
139.2	610.9	6.54	694.4	704.5	7.30	207.8	1292.3	8.68
120.8	629.3	6.56	714.0	724.1	7.28	188.0	1312.1	8.62
102.3	647.8	6.51	753.1	763.2	7.40	148.4	1351.7	8.62
83.8	666.3	6.62	772.7	782.8	7.42	128.7	1371.4	8.69
65.4	684.7	6.59	811.8	821.9	7.42	89.1	1411.0	8.68
46.9	703.2	6.70	831.3	841.4	7.60	69.3	1430.8	8.71
28.5	721.6	6.72	870.4	880.5	7.71	29.8	1470.3	8.84
10.0	740.1	6.89	890.0	900.1	7.80	10.0	1490.1	8.84

## Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+20	+14	+17	+20
10.1	73.39	71.28	68.50	56.51	62.81	58.61
49.9	69.35	60.85	56.67	44.15	54.39	56.33
89.7	74.54	59.26	53.79	38.74	46.96	59.07
129.5	70.53	57.40	50.74	35.58	45.17	48.48
169.3	61.80	57.74	49.93	33.32	41.76	49.05
209.0	55.67	53.65	47.35	31.68	39.96	48.67
248.8	51.31	52.45	46.48	30.32	38.17	46.20
308.5	46.95	47.04	43.06	28.58	36.85	45.58
348.3	44.20	44.08	41.43	27.35	36.05	44.32
408.0	41.16	40.92	39.02	26.15	35.83	39.79
447.8	39.46	39.55	37.70	25.75	35.84	37.84
507.5	37.07	36.98	35.84	25.20	36.53	34.42
547.3	35.58	35.57	34.51	25.20	38.18	32.04
606.9	33.76	33.99	33.17	25.06	39.85	28.99
646.7	32.46	32.86	32.40	24.81	38.77	27.35
706.4	30.58	31.23	30.96	25.47	37.78	25.40
746.2	29.64	30.26	30.15	26.21	34.34	25.01
805.9	28.29	29.07	28.98	27.84	28.31	22.68
845.7	27.47	28.41	28.61	27.99	25.39	20.90
905.4	26.29	27.50	27.89	28.17	21.89	18.35
945.2	25.59	26.97	27.60	28.08	20.65	17.19
1004.8	24.78	26.17	26.99	27.37	19.13	15.57
1044.6	24.24	25.60	26.49	26.42	18.52	15.03
1104.3	23.55	25.02	25.91	23.91	17.74	14.38
1144.1	23.05	24.55	25.57	22.74	17.31	14.12
1203.8	22.24	23.73	24.85	20.42	16.36	13.49
1243.6	21.75	23.20	24.38	19.05	15.70	13.02
1303.3	21.41	22.77	24.01	17.21	14.75	12.43
1343.0	21.42	22.75	23.95	16.19	14.06	11.99
1402.7	21.15	22.43	23.54	14.85	13.17	11.44
1442.5	20.88	22.25	23.32	14.06	12.81	11.21
1502.2	20.37	21.77	22.85	13.08	12.22	10.92
1542.0	20.14	21.65	22.81	12.47	11.82	10.62
1601.7	19.29	20.83	21.97	11.41	11.27	10.26
1641.5	18.87	20.39	21.55	10.63	10.64	9.78
1701.2	18.43	19.93	21.15	9.42	9.72	9.23
1740.9	18.52	20.02	21.11	8.81	9.17	8.78
1800.6	18.54	20.00	21.05	7.96	8.36	8.20
1840.4	18.88	20.29	21.40	7.57	7.91	7.93
1900.1	19.19	20.43	21.64	7.04	7.31	7.44

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	58.43	48.39	42.80
49.9	79.9	47.90	43.81	42.62
89.7	119.7	43.11	40.08	38.73
129.5	159.5	40.58	38.27	36.80
169.3	199.3	39.52	37.03	35.63
209.0	239.0	38.44	35.93	34.60
248.8	278.8	37.36	35.19	33.93
308.5	338.5	36.36	34.46	33.18
348.3	378.3	34.31	33.21	32.29
408.0	438.0	31.68	30.99	30.54
447.8	477.8	30.28	30.19	29.67
507.5	537.5	27.41	27.87	28.02
547.3	577.3	25.69	26.25	26.25
606.9	636.9	23.57	23.85	23.50
646.7	676.7	22.38	22.56	22.37
706.4	736.4	20.42	20.45	20.49
746.2	776.2	19.74	19.70	19.75
805.9	835.9	18.65	18.52	18.35
845.7	875.7	18.35	18.23	18.08
905.4	935.4	17.94	18.02	17.81
945.2	975.2	17.61	18.04	17.86
1004.8	1034.8	16.96	17.79	18.02
1044.6	1074.6	16.63	17.44	17.78
1104.3	1134.3	16.12	17.07	17.74
1144.1	1174.1	15.91	16.97	17.78
1203.8	1233.8	15.61	17.03	18.09
1243.6	1273.6	15.70	17.17	18.34
1303.3	1333.3	16.07	17.39	18.52
1343.0	1373.0	16.55	17.64	18.75
1402.7	1432.7	16.97	17.74	18.73
1442.5	1472.5	17.20	17.89	18.79
1502.2	1532.2	16.99	17.65	18.51
1542.0	1572.0	16.88	17.59	18.61
1601.7	1631.7	16.41	17.41	18.43
1641.5	1671.5	16.35	17.33	18.40
1701.2	1731.2	16.52	17.33	18.45
1740.9	1770.9	16.76	17.42	18.29
1800.6	1830.6	17.92	18.52	19.15
1840.4	1870.4	18.67	19.27	19.87
1900.1	1930.1	20.04	20.60	21.23

# Frequency Mixer

# LRMS-5HJ+

## Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	1.81	1.69	1.65
49.9	79.9	1.44	1.25	1.18
89.7	119.7	1.43	1.23	1.13
129.5	159.5	1.42	1.19	1.10
169.3	199.3	1.41	1.18	1.09
209.0	239.0	1.36	1.15	1.08
248.8	278.8	1.38	1.17	1.08
308.5	338.5	1.34	1.16	1.08
348.3	378.3	1.30	1.15	1.08
408.0	438.0	1.30	1.16	1.09
447.8	477.8	1.33	1.19	1.11
507.5	537.5	1.34	1.21	1.14
547.3	577.3	1.37	1.25	1.19
606.9	636.9	1.46	1.32	1.25
646.7	676.7	1.53	1.37	1.29
706.4	736.4	1.66	1.50	1.37
746.2	776.2	1.78	1.61	1.46
805.9	835.9	1.93	1.76	1.62
845.7	875.7	2.05	1.88	1.76
905.4	935.4	2.22	2.05	1.94
945.2	975.2	2.31	2.16	2.06
1004.8	1034.8	2.40	2.28	2.21
1044.6	1074.6	2.44	2.34	2.27
1104.3	1134.3	2.48	2.38	2.31
1144.1	1174.1	2.50	2.41	2.32
1203.8	1233.8	2.55	2.47	2.39
1243.6	1273.6	2.57	2.53	2.45
1303.3	1333.3	2.59	2.61	2.57
1343.0	1373.0	2.59	2.63	2.61
1402.7	1432.7	2.55	2.59	2.60
1442.5	1472.5	2.51	2.54	2.56
1502.2	1532.2	2.49	2.46	2.47
1542.0	1572.0	2.48	2.43	2.43
1601.7	1631.7	2.49	2.37	2.35
1641.5	1671.5	2.51	2.37	2.34
1701.2	1731.2	2.63	2.44	2.39
1740.9	1770.9	2.75	2.48	2.40
1800.6	1830.6	2.98	2.58	2.45
1840.4	1870.4	3.14	2.68	2.51
1900.1	1930.1	3.40	2.89	2.63

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+14	+17	+20
10.1	1.11	1.60	2.32
49.9	1.09	1.72	2.61
89.7	1.06	1.61	2.35
129.5	1.08	1.68	2.52
169.3	1.07	1.62	2.40
209.0	1.07	1.64	2.44
248.8	1.08	1.67	2.49
308.5	1.08	1.68	2.48
348.3	1.10	1.72	2.52
408.0	1.14	1.75	2.55
447.8	1.18	1.79	2.57
507.5	1.24	1.85	2.63
547.3	1.29	1.89	2.65
606.9	1.36	1.96	2.71
646.7	1.42	2.00	2.71
706.4	1.50	2.09	2.80
746.2	1.55	2.13	2.82
805.9	1.64	2.21	2.89
845.7	1.70	2.24	2.89
905.4	1.80	2.32	2.92
945.2	1.85	2.36	2.94
1004.8	1.93	2.42	2.97
1044.6	1.99	2.46	2.99
1104.3	2.05	2.50	3.00
1144.1	2.12	2.55	3.03
1203.8	2.19	2.58	3.02
1243.6	2.28	2.63	3.07
1303.3	2.37	2.67	3.06
1343.0	2.47	2.73	3.09
1402.7	2.57	2.77	3.08
1442.5	2.66	2.82	3.11
1502.2	2.77	2.85	3.08
1542.0	2.86	2.91	3.11
1601.7	3.01	2.94	3.10
1641.5	3.10	3.00	3.10
1701.2	3.33	3.09	3.11
1740.9	3.47	3.18	3.16
1800.6	3.67	3.38	3.26
1840.4	3.86	3.54	3.38
1900.1	4.04	3.76	3.50

IF (OUT) (MHz)	IF VSWR @LO=1500.1MHz (:1)		
	@LO (dBm)		
	+14	+17	+20
10.1	1.35	1.17	1.37
29.9	1.40	1.18	1.21
49.7	1.30	1.10	1.29
69.4	1.32	1.12	1.26
89.2	1.34	1.12	1.25
109.0	1.31	1.09	1.27
128.8	1.36	1.14	1.25
148.5	1.34	1.11	1.26
168.3	1.33	1.10	1.28
188.1	1.36	1.12	1.27
207.9	1.41	1.14	1.25
227.7	1.40	1.14	1.28
247.4	1.37	1.12	1.31
267.2	1.37	1.11	1.32
287.0	1.40	1.13	1.30
306.8	1.40	1.13	1.31
326.5	1.41	1.14	1.35
346.3	1.40	1.13	1.37
366.1	1.38	1.11	1.36
385.9	1.40	1.13	1.35
405.7	1.43	1.15	1.36
425.4	1.45	1.17	1.38
445.2	1.40	1.14	1.41
465.0	1.40	1.14	1.41
484.8	1.42	1.15	1.40
504.5	1.44	1.16	1.40
524.3	1.43	1.18	1.44
544.1	1.42	1.19	1.47
583.7	1.38	1.16	1.46
603.4	1.41	1.18	1.47
643.0	1.40	1.22	1.52
662.8	1.37	1.22	1.55
702.3	1.40	1.23	1.53
722.1	1.41	1.26	1.57
761.7	1.42	1.32	1.64
781.4	1.40	1.31	1.63
821.0	1.43	1.36	1.67
840.8	1.44	1.38	1.68
880.3	1.45	1.43	1.75
900.1	1.45	1.45	1.77

## Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	5	10	7	26	12	26	19	30	32	36
1	-	12	+0	39	19	36	48	37	27	40	40	49
2	79	41	31	42	29	57	50	47	52	46	68	54
3	100	75	53	55	50	58	61	64	59	60	55	60
4	>100	79	84	69	57	66	56	68	78	71	71	73
5	>100	81	79	84	70	73	64	79	71	85	73	85
6	>100	>92	>92	>92	>92	89	76	85	74	>92	>92	90
7	>100	>92	>92	>92	>92	>92	85	85	79	88	87	>92
8	>100	>92	>92	>92	>92	>92	>92	>92	90	>92	88	>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: 750.1 MHz; -1.00 dBm.  
 LO IN: 780.01 MHz; +17.00 dBm  
 IF OUT: 29.91 MHz; -7.96 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	10	21	18	46	26	44	33	48	44	59
1	-	13	+0	38	22	40	42	48	34	48	50	57
2	70	35	24	40	22	44	41	45	47	61	48	60
3	>100	47	43	40	47	47	44	53	53	54	47	62
4	>100	52	72	47	45	44	46	54	56	50	63	59
5	>100	65	61	64	59	49	53	50	60	60	70	56
6	>100	67	64	70	75	64	50	57	51	57	67	61
7	>100	83	78	72	72	73	68	64	55	64	62	70
8	>100	83	78	82	76	92	81	68	68	70	64	67
9	>100	89	83	91	85	71	75	75	69	61	64	67
10	>100	94	95	92	81	91	86	77	85	68	70	62
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; 9.00 dBm.  
 LO IN: 780.01 MHz; +17.00 dBm  
 IF OUT: 29.91 MHz; 2.03 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-5HJ+  
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