

# Frequency Mixer

# LRMS-5LJ

## 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=-3dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		0	+3	+6			0	+3	+6			0	+3	+6
400.1	430.1	8.23	7.33	6.87	400.1	430.1	10.43	14.44	12.63	400.1	430.1	0.25	0.12	0.11
440.1	470.1	7.73	6.90	6.45	440.1	470.1	10.76	12.80	13.29	440.1	470.1	0.27	0.16	0.16
480.1	510.1	7.55	6.70	6.27	480.1	510.1	9.87	13.20	11.46	480.1	510.1	0.43	0.24	0.18
520.1	550.1	7.22	6.41	5.99	520.1	550.1	11.29	11.98	10.39	520.1	550.1	0.50	0.31	0.27
560.1	590.1	7.07	6.25	5.80	560.1	590.1	12.69	10.08	9.06	560.1	590.1	0.63	0.42	0.33
600.1	630.1	6.87	6.04	5.57	600.1	630.1	13.33	10.34	8.28	600.1	630.1	0.76	0.50	0.47
640.1	670.1	6.81	5.93	5.45	640.1	670.1	12.49	9.96	8.67	640.1	670.1	0.95	0.63	0.54
680.1	710.1	6.70	5.81	5.34	680.1	710.1	12.92	8.91	8.13	680.1	710.1	1.02	0.73	0.57
720.1	750.1	6.64	5.75	5.29	720.1	750.1	13.06	11.03	9.04	720.1	750.1	1.09	0.75	0.67
760.1	790.1	6.71	5.77	5.26	760.1	790.1	14.27	13.50	11.57	760.1	790.1	1.17	0.87	0.70
800.1	830.1	6.75	5.80	5.25	800.1	830.1	17.22	12.92	10.49	800.1	830.1	1.20	0.89	0.73
840.1	870.1	6.91	5.90	5.29	840.1	870.1	12.10	11.45	11.16	840.1	870.1	1.25	1.03	0.90
880.1	910.1	7.09	6.06	5.41	880.1	910.1	10.03	10.79	12.80	880.1	910.1	1.22	1.06	0.93
920.1	950.1	7.31	6.29	5.62	920.1	950.1	8.42	11.20	11.72	920.1	950.1	1.14	1.04	0.95
960.1	990.1	7.59	6.61	5.91	960.1	990.1	6.46	8.53	9.91	960.1	990.1	0.92	0.88	0.87
1000.1	1030.1	7.73	6.85	6.17	1000.1	1030.1	5.49	6.97	10.32	1000.1	1030.1	0.82	0.76	0.75
1040.1	1070.1	7.84	7.08	6.45	1040.1	1070.1	4.82	5.93	9.48	1040.1	1070.1	0.69	0.56	0.58
1080.1	1110.1	7.88	7.18	6.64	1080.1	1110.1	5.24	5.49	8.65	1080.1	1110.1	0.68	0.50	0.49
1120.1	1150.1	7.94	7.32	6.84	1120.1	1150.1	5.55	6.43	8.05	1120.1	1150.1	0.68	0.42	0.41
1160.1	1190.1	8.00	7.36	6.99	1160.1	1190.1	5.26	5.83	7.64	1160.1	1190.1	0.71	0.39	0.35
1200.1	1230.1	8.03	7.41	7.07	1200.1	1230.1	5.90	4.95	6.68	1200.1	1230.1	0.79	0.43	0.34
1240.1	1270.1	8.08	7.40	7.12	1240.1	1270.1	6.24	6.30	6.27	1240.1	1270.1	0.87	0.54	0.44
1280.1	1310.1	8.12	7.41	7.13	1280.1	1310.1	5.94	5.94	6.56	1280.1	1310.1	0.97	0.67	0.50
1320.1	1350.1	8.15	7.40	7.16	1320.1	1350.1	5.41	5.86	6.63	1320.1	1350.1	1.05	0.74	0.57
1360.1	1390.1	8.25	7.42	7.21	1360.1	1390.1	4.94	5.70	5.70	1360.1	1390.1	1.14	0.76	0.61
1400.1	1430.1	8.32	7.45	7.25	1400.1	1430.1	4.95	5.23	5.71	1400.1	1430.1	1.16	0.85	0.69
1440.1	1470.1	8.50	7.54	7.33	1440.1	1470.1	4.63	4.87	5.49	1440.1	1470.1	1.18	0.90	0.73
1480.1	1510.1	8.75	7.70	7.53	1480.1	1510.1	3.85	4.67	4.99	1480.1	1510.1	1.14	0.90	0.68
1520.1	1550.1	9.09	7.91	7.69	1520.1	1550.1	4.12	4.70	4.30	1520.1	1550.1	1.17	0.81	0.65
1560.1	1590.1	9.50	8.16	7.91	1560.1	1590.1	4.00	3.96	4.36	1560.1	1590.1	1.09	0.83	0.60
1600.1	1630.1	9.97	8.48	8.14	1600.1	1630.1	4.27	3.56	4.22	1600.1	1630.1	0.97	0.80	0.55
1640.1	1670.1	10.36	8.66	8.20	1640.1	1670.1	4.37	3.81	5.29	1640.1	1670.1	0.89	0.85	0.55
1680.1	1710.1	10.79	8.89	8.32	1680.1	1710.1	5.66	4.02	5.76	1680.1	1710.1	0.83	0.81	0.60
1720.1	1750.1	11.02	8.97	8.29	1720.1	1750.1	5.05	5.17	6.38	1720.1	1750.1	0.71	0.84	0.66
1760.1	1790.1	11.43	9.17	8.31	1760.1	1790.1	5.76	5.20	6.52	1760.1	1790.1	0.63	0.83	0.68
1780.1	1810.1	11.78	9.35	8.36	1780.1	1810.1	4.70	4.70	5.78	1780.1	1810.1	0.58	0.84	0.74
1820.1	1850.1	12.00	9.44	8.29	1820.1	1850.1	4.51	4.65	6.03	1820.1	1850.1	0.52	0.87	0.71
1840.1	1870.1	12.18	9.57	8.35	1840.1	1870.1	3.53	4.65	5.60	1840.1	1870.1	0.43	0.80	0.73
1880.1	1910.1	12.65	9.78	8.37	1880.1	1910.1	2.49	3.47	4.95	1880.1	1910.1	0.33	0.82	0.76
1900.1	1930.1	12.47	9.69	8.32	1900.1	1930.1	2.50	3.74	5.00	1900.1	1930.1	0.38	0.83	0.73

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# Frequency Mixer

# LRMS-5LJ

## Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=900.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=400.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1400.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+3			+3			+3
500.0	400.1	5.02	10.0	410.1	7.05	800.0	600.1	8.09
479.6	420.5	4.93	30.3	430.4	7.21	779.7	620.4	8.05
459.2	440.9	4.90	50.5	450.6	7.32	759.5	640.6	7.84
438.8	461.4	4.83	70.8	470.9	7.45	739.2	660.9	7.79
418.3	481.8	4.86	91.0	491.1	7.51	719.0	681.1	7.67
397.9	502.2	4.79	111.3	511.4	7.56	698.7	701.4	7.55
377.5	522.6	4.85	131.5	531.6	7.70	678.5	721.6	7.49
357.1	543.0	4.87	151.8	551.9	7.71	658.2	741.9	7.37
336.7	563.4	4.94	172.1	572.2	7.77	637.9	762.2	7.41
316.3	583.9	5.05	192.3	592.4	7.76	617.7	782.4	7.38
295.8	604.3	5.09	212.6	612.7	7.76	597.4	802.7	7.42
275.4	624.7	5.23	232.8	632.9	7.77	577.2	822.9	7.34
255.0	645.1	5.28	253.1	653.2	7.77	556.9	843.2	7.37
234.6	665.5	5.48	273.3	673.4	7.79	536.7	863.4	7.39
214.2	685.9	5.52	293.6	693.7	7.71	516.4	883.7	7.43
193.8	706.4	5.68	313.8	713.9	7.78	496.2	903.9	7.47
173.3	726.8	5.77	334.1	734.2	7.72	475.9	924.2	7.44
152.9	747.2	5.93	354.4	754.5	7.77	455.6	944.5	7.59
132.5	767.6	6.04	374.6	774.7	7.71	435.4	964.7	7.67
112.1	788.0	6.08	394.9	795.0	7.70	415.1	985.0	7.78
71.3	828.9	6.07	415.1	815.2	7.78	394.9	1005.2	7.80
50.8	849.3	6.15	435.4	835.5	7.72	374.6	1025.5	7.83
10.0	890.1	6.13	455.6	855.7	7.83	354.4	1045.7	7.91
10.0	910.1	5.89	475.9	876.0	7.81	334.1	1066.0	7.83
50.8	950.9	6.13	496.2	896.3	8.03	313.8	1086.3	7.87
71.3	971.4	6.07	516.4	916.5	8.01	293.6	1106.5	7.74
112.1	1012.2	6.15	536.7	936.8	8.08	273.3	1126.8	7.70
132.5	1032.6	6.27	556.9	957.0	8.14	253.1	1147.0	7.61
173.3	1073.4	6.38	577.2	977.3	8.14	232.8	1167.3	7.55
193.8	1093.9	6.44	597.4	997.5	8.26	212.6	1187.5	7.52
234.6	1134.7	6.58	617.7	1017.8	8.14	192.3	1207.8	7.46
255.0	1155.1	6.57	637.9	1038.0	8.20	172.1	1228.0	7.47
295.8	1195.9	6.65	658.2	1058.3	8.06	151.8	1248.3	7.37
316.2	1216.4	6.72	678.5	1078.6	8.12	131.5	1268.6	7.39
357.1	1257.2	6.70	698.7	1098.8	8.09	111.3	1288.8	7.34
377.5	1277.6	6.69	719.0	1119.1	8.10	91.0	1309.1	7.35
418.3	1318.4	6.66	739.2	1139.3	8.11	70.8	1329.3	7.32
438.8	1338.9	6.62	759.5	1159.6	8.02	50.5	1349.6	7.29
479.6	1379.7	6.56	779.7	1179.8	8.20	30.3	1369.8	7.32
500.0	1400.1	6.61	800.0	1200.1	8.17	10.0	1390.1	7.30



# Frequency Mixer

# LRMS-5LJ

## Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	0	+3	+6	0	+3	+6
400.1	28.17	27.35	26.60	32.02	36.62	32.62
440.1	27.78	26.91	26.14	32.13	37.14	31.73
480.1	28.13	27.25	26.47	32.74	37.54	30.79
520.1	28.93	27.99	27.17	32.68	37.18	29.43
560.1	29.35	28.43	27.58	33.44	35.72	27.84
600.1	29.95	29.07	28.17	34.52	34.58	26.65
640.1	31.03	30.14	29.17	36.85	32.88	25.45
680.1	32.84	32.00	30.86	39.17	32.16	24.93
720.1	34.52	33.82	32.30	44.90	29.98	23.78
760.1	35.86	36.11	34.35	42.49	27.97	22.89
800.1	37.13	39.63	37.90	35.43	25.37	21.28
840.1	37.04	43.78	44.65	31.44	23.08	19.48
880.1	34.77	41.00	52.52	28.94	21.71	18.32
920.1	32.30	36.63	40.53	26.55	20.25	17.05
960.1	30.24	33.19	35.45	25.11	19.62	16.57
1000.1	28.65	30.88	32.57	23.96	19.09	16.16
1040.1	27.07	28.80	30.10	22.92	18.55	15.72
1080.1	25.82	27.19	28.26	21.84	18.01	15.33
1120.1	25.22	26.38	27.34	20.32	17.03	14.59
1160.1	24.57	25.66	26.58	19.24	16.37	14.11
1200.1	24.03	25.10	26.00	18.07	15.55	13.50
1240.1	23.65	24.78	25.70	17.15	14.96	13.10
1280.1	23.32	24.55	25.53	16.33	14.45	12.73
1320.1	22.91	24.26	25.31	15.58	13.96	12.39
1360.1	22.55	24.06	25.27	15.08	13.74	12.29
1400.1	22.09	23.72	25.06	14.43	13.33	11.98
1440.1	21.72	23.46	24.95	13.82	12.97	11.74
1480.1	21.04	22.83	24.38	13.27	12.65	11.55
1520.1	20.52	22.32	23.89	12.58	12.21	11.23
1560.1	20.07	21.81	23.35	11.66	11.50	10.64
1600.1	19.37	21.07	22.66	10.82	10.84	10.17
1640.1	18.83	20.51	22.18	9.81	9.97	9.48
1680.1	19.02	20.64	22.31	8.79	9.08	8.78
1720.1	18.86	20.46	22.19	8.01	8.36	8.21
1760.1	18.88	20.45	22.20	7.36	7.70	7.65
1780.1	19.31	20.90	22.63	7.03	7.39	7.39
1820.1	19.55	21.17	22.94	6.54	6.89	6.96
1840.1	20.31	21.95	23.73	6.33	6.68	6.76
1880.1	20.61	22.28	24.10	5.94	6.28	6.41
1900.1	21.14	22.80	24.61	5.76	6.09	6.24

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		0	+3	+6
400.1	430.1	16.31	15.49	15.06
440.1	470.1	15.81	15.00	14.61
480.1	510.1	15.41	14.55	14.13
520.1	550.1	15.39	14.52	14.00
560.1	590.1	15.72	14.93	14.40
600.1	630.1	16.33	15.71	15.26
640.1	670.1	17.12	16.66	16.29
680.1	710.1	17.90	17.53	17.22
720.1	750.1	18.92	18.41	18.08
760.1	790.1	20.20	19.10	18.36
800.1	830.1	22.06	20.25	18.85
840.1	870.1	24.20	21.86	19.86
880.1	910.1	24.40	22.42	20.39
920.1	950.1	22.56	21.67	20.40
960.1	990.1	20.27	20.06	19.52
1000.1	1030.1	18.17	18.19	18.05
1040.1	1070.1	16.78	16.84	16.88
1080.1	1110.1	15.67	15.83	15.99
1120.1	1150.1	14.89	15.12	15.35
1160.1	1190.1	14.39	14.64	14.95
1200.1	1230.1	14.13	14.40	14.76
1240.1	1270.1	14.01	14.33	14.73
1280.1	1310.1	14.00	14.37	14.78
1320.1	1350.1	14.05	14.50	14.97
1360.1	1390.1	14.14	14.69	15.24
1400.1	1430.1	14.15	14.86	15.56
1440.1	1470.1	14.06	14.93	15.79
1480.1	1510.1	13.76	14.81	15.78
1520.1	1550.1	13.40	14.59	15.67
1560.1	1590.1	13.08	14.41	15.68
1600.1	1630.1	12.89	14.30	15.82
1640.1	1670.1	12.83	14.32	16.01
1680.1	1710.1	12.97	14.56	16.38
1720.1	1750.1	13.33	14.98	16.86
1760.1	1790.1	13.71	15.36	17.20
1780.1	1810.1	13.89	15.62	17.48
1820.1	1850.1	14.46	16.26	18.09
1840.1	1870.1	14.84	16.68	18.50
1880.1	1910.1	15.43	17.38	19.16
1900.1	1930.1	16.01	18.00	19.80

# Frequency Mixer

# LRMS-5LJ

## Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		0	+3	+6
400.1	430.1	3.90	3.55	3.39
440.1	470.1	3.20	2.92	2.81
480.1	510.1	2.71	2.48	2.39
520.1	550.1	2.33	2.13	2.05
560.1	590.1	2.02	1.85	1.77
600.1	630.1	1.82	1.64	1.56
640.1	670.1	1.62	1.44	1.36
680.1	710.1	1.55	1.33	1.22
720.1	750.1	1.49	1.26	1.11
760.1	790.1	1.64	1.40	1.23
800.1	830.1	1.77	1.52	1.36
840.1	870.1	2.09	1.82	1.63
880.1	910.1	2.32	2.04	1.83
920.1	950.1	2.68	2.38	2.15
960.1	990.1	2.95	2.66	2.41
1000.1	1030.1	3.14	2.89	2.67
1040.1	1070.1	3.33	3.13	2.94
1080.1	1110.1	3.37	3.22	3.10
1120.1	1150.1	3.54	3.42	3.33
1160.1	1190.1	3.59	3.49	3.44
1200.1	1230.1	3.66	3.54	3.52
1240.1	1270.1	3.64	3.50	3.47
1280.1	1310.1	3.65	3.47	3.42
1320.1	1350.1	3.56	3.33	3.24
1360.1	1390.1	3.49	3.20	3.08
1400.1	1430.1	3.40	3.07	2.90
1440.1	1470.1	3.41	3.00	2.78
1480.1	1510.1	3.38	2.92	2.65
1520.1	1550.1	3.58	3.02	2.68
1560.1	1590.1	3.58	3.00	2.62
1600.1	1630.1	3.86	3.20	2.77
1640.1	1670.1	3.93	3.25	2.78
1680.1	1710.1	4.21	3.46	2.95
1720.1	1750.1	4.39	3.57	3.00
1760.1	1790.1	4.48	3.67	3.10
1780.1	1810.1	4.83	3.90	3.25
1820.1	1850.1	4.74	3.86	3.20
1840.1	1870.1	4.74	3.86	3.20
1880.1	1910.1	5.52	4.42	3.62
1900.1	1930.1	5.33	4.26	3.50

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	0	+3	+6
400.1	1.27	1.76	2.44
440.1	1.30	1.80	2.49
480.1	1.33	1.83	2.51
520.1	1.33	1.85	2.54
560.1	1.37	1.89	2.58
600.1	1.40	1.93	2.60
640.1	1.45	1.99	2.67
680.1	1.47	2.00	2.65
720.1	1.51	2.03	2.68
760.1	1.55	2.06	2.68
800.1	1.60	2.10	2.71
840.1	1.66	2.16	2.77
880.1	1.70	2.19	2.76
920.1	1.76	2.27	2.85
960.1	1.81	2.29	2.85
1000.1	1.84	2.32	2.86
1040.1	1.89	2.35	2.88
1080.1	1.92	2.36	2.87
1120.1	2.00	2.44	2.95
1160.1	2.05	2.47	2.95
1200.1	2.10	2.50	2.96
1240.1	2.18	2.57	3.02
1280.1	2.22	2.57	3.00
1320.1	2.27	2.59	3.00
1360.1	2.32	2.61	2.99
1400.1	2.36	2.62	2.97
1440.1	2.43	2.66	2.99
1480.1	2.47	2.68	2.98
1520.1	2.52	2.70	2.99
1560.1	2.55	2.70	2.97
1600.1	2.61	2.74	3.00
1640.1	2.68	2.78	3.00
1680.1	2.77	2.83	3.04
1720.1	2.86	2.92	3.10
1760.1	2.92	2.96	3.09
1780.1	2.94	2.96	3.09
1820.1	3.03	3.00	3.10
1840.1	3.04	3.08	3.18
1880.1	3.06	3.07	3.15
1900.1	3.15	3.12	3.26

IF (OUT) (MHz)	IF VSWR @LO=1400.1MHz (:1)		
	@LO (dBm)		
	0	+3	+6
10.0	1.82	1.33	1.31
29.8	1.57	1.23	1.06
49.5	1.48	1.19	1.15
69.3	1.46	1.11	1.14
89.0	1.51	1.18	1.08
108.8	1.53	1.18	1.07
128.5	1.52	1.18	1.11
148.3	1.52	1.16	1.11
168.0	1.51	1.18	1.11
187.8	1.54	1.20	1.08
207.5	1.58	1.23	1.09
227.3	1.58	1.22	1.11
247.0	1.57	1.23	1.12
266.8	1.55	1.21	1.13
286.5	1.56	1.22	1.11
306.3	1.59	1.22	1.11
326.0	1.57	1.22	1.13
345.8	1.56	1.22	1.14
365.5	1.55	1.21	1.13
385.3	1.55	1.19	1.13
405.0	1.56	1.21	1.12
424.8	1.58	1.21	1.11
444.5	1.57	1.21	1.11
464.3	1.57	1.21	1.12
484.0	1.56	1.20	1.12
503.8	1.54	1.17	1.12
523.5	1.53	1.17	1.12
543.3	1.53	1.17	1.13
563.0	1.52	1.15	1.13
582.8	1.52	1.15	1.13
602.5	1.48	1.13	1.15
622.3	1.47	1.12	1.16
642.0	1.47	1.12	1.16
661.8	1.45	1.12	1.17
681.5	1.44	1.11	1.18
701.3	1.41	1.09	1.20
721.0	1.38	1.09	1.23
740.8	1.38	1.10	1.24
780.3	1.35	1.09	1.24
800.0	1.31	1.08	1.28

## Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+6	5	5	20	21	42	45	53	67	51
1	-	15	+0	26	21	30	34	41	57	54	62	66
2	112	42	36	42	36	49	51	52	76	72	75	73
3	117	67	58	57	74	64	68	69	72	70	92	81
4	116	89	87	93	79	73	79	79	83	96	100	102
5	115	108	91	94	90	94	74	88	93	97	100	98
6	109	101	103	94	103	101	95	83	91	97	100	95
7	108	101	94	100	94	93	88	86	85	91	96	96
8	120	97	96	97	105	104	104	94	95	80	90	93
9	109	105	106	95	99	103	101	101	92	96	80	87
10	124	101	101	96	106	107	105	92	103	91	87	104
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 900.1 MHz; -18.00 dBm.  
 LO IN: 930.01 MHz; +3.00 dBm  
 IF OUT: 29.91 MHz; -24.29 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	2	16	17	36	32	56	58	72	78	73
1	-	15	+0	27	23	33	39	51	62	74	69	84
2	99	32	27	36	26	40	43	47	57	75	75	75
3	116	45	39	38	45	51	50	51	56	59	84	74
4	111	58	61	53	56	48	61	57	63	64	80	91
5	110	72	62	65	56	54	60	58	71	66	86	72
6	107	91	87	73	76	85	63	62	68	69	81	82
7	122	98	120	88	92	85	76	75	71	74	87	78
8	105	99	97	100	97	87	100	82	79	78	82	86
9	113	105	108	106	109	103	97	105	95	83	81	89
10	107	109	113	114	119	117	100	105	99	94	97	91
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 900.1 MHz; -8.00 dBm.  
 LO IN: 930.01 MHz; +3.00 dBm  
 IF OUT: 29.91 MHz; -14.42 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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