

# Frequency Mixer

# LRMS-5MHJ

## 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
10.1	40.1	6.71	6.19	5.96	10.1	40.1	19.09	21.27	23.62	10.1	40.1	0.98	0.77	0.64
70.4	100.4	6.23	5.76	5.52	70.4	100.4	20.70	23.89	21.16	70.4	100.4	1.33	1.09	0.90
130.7	160.7	6.00	5.58	5.41	130.7	160.7	20.55	18.27	20.39	130.7	160.7	1.47	1.16	0.97
191.0	221.0	5.97	5.59	5.41	191.0	221.0	16.93	18.23	20.93	191.0	221.0	1.49	1.18	0.99
231.2	261.2	6.02	5.63	5.45	231.2	261.2	16.28	18.30	21.47	231.2	261.2	1.49	1.18	1.01
291.5	321.5	6.05	5.66	5.47	291.5	321.5	15.93	18.61	22.13	291.5	321.5	1.49	1.19	1.02
331.7	361.7	6.12	5.73	5.53	331.7	361.7	16.16	19.39	22.92	331.7	361.7	1.52	1.24	1.07
392.0	422.0	6.17	5.81	5.58	392.0	422.0	17.03	20.32	25.56	392.0	422.0	1.60	1.30	1.16
432.2	462.2	6.29	5.85	5.61	432.2	462.2	16.43	20.96	26.31	432.2	462.2	1.71	1.44	1.26
492.5	522.5	6.35	5.93	5.66	492.5	522.5	17.19	19.80	24.83	492.5	522.5	1.82	1.55	1.35
532.7	562.7	6.46	6.03	5.77	532.7	562.7	18.04	20.63	23.92	532.7	562.7	1.92	1.61	1.45
593.0	623.0	6.61	6.08	5.80	593.0	623.0	17.54	24.23	25.68	593.0	623.0	2.00	1.78	1.59
633.2	663.2	6.75	6.18	5.81	633.2	663.2	15.91	21.90	24.34	633.2	663.2	2.06	1.89	1.72
693.5	723.5	6.90	6.31	5.92	693.5	723.5	16.23	19.95	25.59	693.5	723.5	2.22	1.97	1.82
733.7	763.7	7.14	6.50	6.08	733.7	763.7	17.00	20.40	21.86	733.7	763.7	2.12	1.90	1.76
794.0	824.0	7.36	6.65	6.20	794.0	824.0	17.73	19.08	18.78	794.0	824.0	2.12	1.88	1.77
834.2	864.2	7.53	6.70	6.24	834.2	864.2	16.65	18.93	21.43	834.2	864.2	2.05	1.92	1.78
894.5	924.5	7.85	6.82	6.30	894.5	924.5	15.88	20.29	25.67	894.5	924.5	1.88	1.98	1.80
934.7	964.7	8.22	7.10	6.48	934.7	964.7	15.19	19.17	24.48	934.7	964.7	1.52	1.78	1.69
995.0	1025.0	8.41	7.57	6.84	995.0	1025.0	15.40	18.86	22.50	995.0	1025.0	1.25	1.37	1.44
1035.3	1065.3	8.43	7.78	7.14	1035.3	1065.3	15.73	17.22	22.81	1035.3	1065.3	1.13	1.10	1.17
1095.6	1125.6	8.43	7.98	7.52	1095.6	1125.6	17.20	15.84	18.72	1095.6	1125.6	1.06	0.89	0.87
1135.8	1165.8	8.38	8.02	7.66	1135.8	1165.8	19.02	16.12	17.21	1135.8	1165.8	0.98	0.76	0.72
1196.1	1226.1	8.37	8.09	7.81	1196.1	1226.1	24.86	18.06	15.74	1196.1	1226.1	0.92	0.63	0.56
1236.3	1266.3	8.39	8.10	7.87	1236.3	1266.3	24.73	19.64	16.06	1236.3	1266.3	0.86	0.54	0.48
1296.6	1326.6	8.49	8.19	7.97	1296.6	1326.6	21.05	19.20	16.96	1296.6	1326.6	0.90	0.51	0.46
1336.8	1366.8	8.53	8.26	8.06	1336.8	1366.8	20.45	18.40	16.60	1336.8	1366.8	0.90	0.53	0.46
1397.1	1427.1	8.70	8.40	8.21	1397.1	1427.1	19.14	18.14	17.89	1397.1	1427.1	1.04	0.59	0.48
1437.3	1467.3	8.78	8.42	8.24	1437.3	1467.3	18.57	19.69	19.12	1437.3	1467.3	1.01	0.58	0.48
1497.6	1527.6	8.89	8.41	8.23	1497.6	1527.6	18.23	20.43	21.42	1497.6	1527.6	1.02	0.63	0.46
1537.8	1567.8	8.96	8.43	8.23	1537.8	1567.8	17.86	19.35	20.06	1537.8	1567.8	1.08	0.65	0.45
1598.1	1628.1	9.16	8.48	8.29	1598.1	1628.1	18.04	20.10	20.84	1598.1	1628.1	1.14	0.62	0.38
1638.3	1668.3	9.30	8.50	8.31	1638.3	1668.3	18.09	20.51	22.98	1638.3	1668.3	1.10	0.57	0.35
1698.6	1728.6	9.51	8.58	8.38	1698.6	1728.6	16.70	20.94	22.67	1698.6	1728.6	1.16	0.56	0.33
1738.8	1768.8	9.73	8.61	8.38	1738.8	1768.8	16.40	20.59	21.73	1738.8	1768.8	1.17	0.58	0.33
1799.1	1829.1	10.34	8.73	8.42	1799.1	1829.1	16.52	19.74	22.45	1799.1	1829.1	0.95	0.61	0.33
1839.3	1869.3	11.02	8.89	8.48	1839.3	1869.3	17.58	19.03	23.20	1839.3	1869.3	0.64	0.66	0.34
1899.6	1929.6	11.84	9.14	8.57	1899.6	1929.6	19.00	19.07	22.34	1899.6	1929.6	0.25	0.63	0.34
1939.8	1969.8	13.17	9.55	8.66	1939.8	1969.8	14.77	20.23	19.31	1939.8	1969.8	-0.55	0.60	0.38
2000.1	2030.1	14.33	10.07	9.03	2000.1	2030.1	12.21	24.07	19.49	2000.1	2030.1	-1.23	0.38	0.27



# Frequency Mixer

# LRMS-5MHJ

## 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)
		+13			+13			+13
730.0	20.1	6.37	10.0	20.1	6.37	900.0	600.1	9.29
711.5	38.6	6.32	29.8	39.9	6.18	879.3	620.8	9.21
693.1	57.0	6.33	49.6	59.7	6.33	858.6	641.5	9.16
674.6	75.5	6.39	69.3	79.4	6.38	837.9	662.2	9.12
656.2	93.9	6.36	89.1	99.2	6.33	817.2	682.9	9.07
637.7	112.4	6.33	108.9	119.0	6.29	796.5	703.6	9.09
619.2	130.9	6.32	128.7	138.8	6.26	775.8	724.3	9.03
600.8	149.3	6.34	148.4	158.5	6.26	755.1	745.0	9.02
582.3	167.8	6.36	168.2	178.3	6.26	734.4	765.7	8.87
563.8	186.3	6.38	188.0	198.1	6.29	713.7	786.4	8.86
545.4	204.7	6.39	207.8	217.9	6.24	693.0	807.1	8.87
526.9	223.2	6.38	227.6	237.7	6.22	672.3	827.8	8.80
508.5	241.6	6.38	247.3	257.4	6.28	651.6	848.5	8.77
490.0	260.1	6.41	267.1	277.2	6.31	630.9	869.2	8.74
471.5	278.6	6.39	286.9	297.0	6.28	610.2	889.9	8.66
453.1	297.0	6.38	306.7	316.8	6.27	589.5	910.6	8.63
434.6	315.5	6.38	326.4	336.5	6.33	568.8	931.3	8.58
416.2	333.9	6.34	346.2	356.3	6.30	548.1	952.0	8.55
397.7	352.4	6.31	366.0	376.1	6.37	527.4	972.7	8.52
379.2	370.9	6.23	385.8	395.9	6.36	506.7	993.4	8.47
360.8	389.3	6.29	405.6	415.7	6.33	486.0	1014.1	8.49
342.3	407.8	6.27	425.3	435.4	6.39	465.3	1034.8	8.45
323.8	426.3	6.29	445.1	455.2	6.39	444.7	1055.4	8.48
305.4	444.7	6.29	464.9	475.0	6.44	424.0	1076.1	8.47
286.9	463.2	6.34	484.7	494.8	6.41	403.3	1096.8	8.46
268.5	481.6	6.33	504.4	514.5	6.42	382.6	1117.5	8.45
250.0	500.1	6.35	524.2	534.3	6.43	361.9	1138.2	8.46
231.5	518.6	6.34	544.0	554.1	6.45	341.2	1158.9	8.48
213.1	537.0	6.38	583.6	593.7	6.41	320.5	1179.6	8.48
194.6	555.5	6.37	603.3	613.4	6.44	299.8	1200.3	8.53
176.2	573.9	6.37	642.9	653.0	6.48	279.1	1221.0	8.53
157.7	592.4	6.37	662.7	672.8	6.50	258.4	1241.7	8.59
139.2	610.9	6.34	702.2	712.3	6.53	217.0	1283.1	8.64
120.8	629.3	6.34	722.0	732.1	6.60	196.3	1303.8	8.64
102.3	647.8	6.36	761.6	771.7	6.65	154.9	1345.2	8.69
83.8	666.3	6.44	781.3	791.4	6.70	134.2	1365.9	8.75
65.4	684.7	6.43	820.9	831.0	6.75	92.8	1407.3	8.76
46.9	703.2	6.48	840.7	850.8	6.81	72.1	1428.0	8.74
28.5	721.6	6.47	880.2	890.3	6.89	30.7	1469.4	8.67
10.0	740.1	6.66	900.0	910.1	6.91	10.0	1490.1	8.69

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# LRMS-5MHJ

## Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+10	+13	+16	+10	+13	+16
10.1	80.50	81.54	80.03	64.42	76.65	71.70
70.4	63.53	68.78	76.05	46.57	55.87	57.29
130.7	56.66	61.62	70.74	42.16	52.68	50.63
191.0	52.05	56.84	63.95	38.42	47.13	49.62
231.2	50.97	56.70	64.77	37.62	47.65	46.00
291.5	48.92	54.04	61.40	35.43	45.04	45.07
331.7	48.66	54.70	63.84	34.98	46.46	42.70
392.0	48.13	54.63	67.51	33.98	46.36	41.28
432.2	48.01	55.37	69.04	34.10	48.70	38.16
492.5	47.88	57.85	62.02	33.79	50.53	36.77
532.7	48.24	59.06	58.77	34.61	49.57	35.01
593.0	48.72	63.95	51.92	35.33	43.82	32.98
633.2	49.22	57.97	48.49	36.41	39.65	30.90
693.5	49.16	55.74	46.71	38.37	36.59	28.93
733.7	49.16	55.18	45.50	41.64	35.14	27.85
794.0	49.01	54.92	45.32	47.08	32.82	26.97
834.2	49.43	55.27	45.46	40.76	30.63	26.08
894.5	48.53	57.01	46.72	33.34	27.09	23.92
934.7	47.20	60.75	47.28	31.36	25.20	22.51
995.0	44.67	64.89	50.73	29.36	23.38	20.81
1035.3	43.62	55.58	54.39	27.98	22.37	19.87
1095.6	42.01	49.05	68.95	25.92	21.43	18.76
1135.8	41.31	47.24	59.03	24.44	20.61	18.23
1196.1	40.20	44.95	51.56	22.84	19.64	17.44
1236.3	39.23	43.48	48.62	22.08	19.11	17.03
1296.6	37.57	41.04	45.51	21.16	18.50	16.52
1336.8	36.50	39.45	43.01	20.57	17.98	16.20
1397.1	35.15	37.63	40.28	19.67	17.51	15.85
1437.3	34.81	37.19	39.59	18.95	16.96	15.42
1497.6	34.00	36.26	38.37	17.97	16.31	14.79
1537.8	33.77	36.15	38.20	17.18	15.74	14.26
1598.1	32.91	35.14	36.90	16.34	15.10	13.82
1638.3	32.21	34.37	35.78	15.80	14.65	13.51
1698.6	30.82	32.92	34.34	15.11	14.31	13.37
1738.8	30.30	32.39	33.79	14.54	14.03	13.19
1799.1	29.07	30.99	32.60	14.01	13.74	13.12
1839.3	28.83	30.68	32.28	13.79	13.59	12.94
1899.6	27.80	29.44	31.03	13.35	13.39	12.90
1939.8	27.45	28.96	30.39	13.27	13.14	12.68
2000.1	26.62	27.96	29.25	13.09	13.12	12.72

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	49.39	49.96	52.62
70.4	100.4	39.78	39.13	38.59
130.7	160.7	35.45	34.74	34.52
191.0	221.0	33.54	32.73	32.19
231.2	261.2	32.52	31.92	31.63
291.5	321.5	31.83	31.18	30.75
331.7	361.7	31.41	30.72	30.26
392.0	422.0	29.87	29.48	29.13
432.2	462.2	28.76	28.54	28.26
492.5	522.5	26.96	26.76	26.48
532.7	562.7	25.50	25.35	25.11
593.0	623.0	23.58	23.39	23.27
633.2	663.2	22.29	22.18	22.00
693.5	723.5	21.00	20.90	20.88
733.7	763.7	20.40	20.29	20.15
794.0	824.0	19.82	19.74	19.68
834.2	864.2	19.71	19.71	19.78
894.5	924.5	19.52	19.96	20.20
934.7	964.7	19.11	19.79	20.21
995.0	1025.0	18.38	19.12	19.87
1035.3	1065.3	17.81	18.56	19.25
1095.6	1125.6	17.14	17.76	18.42
1135.8	1165.8	16.80	17.34	17.86
1196.1	1226.1	16.47	16.89	17.30
1236.3	1266.3	16.26	16.65	17.02
1296.6	1326.6	15.88	16.24	16.57
1336.8	1366.8	15.66	16.00	16.34
1397.1	1427.1	15.29	15.65	16.08
1437.3	1467.3	15.20	15.60	16.00
1497.6	1527.6	15.14	15.63	16.07
1537.8	1567.8	15.19	15.65	16.09
1598.1	1628.1	15.17	15.69	16.09
1638.3	1668.3	15.19	15.74	16.12
1698.6	1728.6	15.03	15.73	16.15
1738.8	1768.8	14.84	15.63	16.04
1799.1	1829.1	14.61	15.45	15.99
1839.3	1869.3	14.40	15.24	15.85
1899.6	1929.6	14.19	15.01	15.61
1939.8	1969.8	14.11	14.90	15.39
2000.1	2030.1	14.14	14.96	15.38

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## Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	1.65	1.62	1.62
70.4	100.4	1.21	1.13	1.14
130.7	160.7	1.16	1.06	1.07
191.0	221.0	1.15	1.04	1.02
231.2	261.2	1.17	1.06	1.02
291.5	321.5	1.17	1.08	1.05
331.7	361.7	1.19	1.11	1.08
392.0	422.0	1.21	1.15	1.13
432.2	462.2	1.26	1.19	1.16
492.5	522.5	1.30	1.24	1.21
532.7	562.7	1.34	1.29	1.26
593.0	623.0	1.44	1.38	1.34
633.2	663.2	1.55	1.47	1.42
693.5	723.5	1.70	1.62	1.56
733.7	763.7	1.84	1.74	1.68
794.0	824.0	2.05	1.95	1.86
834.2	864.2	2.20	2.07	1.98
894.5	924.5	2.43	2.26	2.15
934.7	964.7	2.60	2.42	2.30
995.0	1025.0	2.77	2.66	2.53
1035.3	1065.3	2.83	2.77	2.67
1095.6	1125.6	2.86	2.85	2.80
1135.8	1165.8	2.87	2.87	2.85
1196.1	1226.1	2.87	2.87	2.86
1236.3	1266.3	2.89	2.88	2.86
1296.6	1326.6	2.95	2.93	2.90
1336.8	1366.8	3.00	2.97	2.94
1397.1	1427.1	3.06	3.02	2.98
1437.3	1467.3	3.10	3.04	2.99
1497.6	1527.6	3.14	3.05	3.01
1537.8	1567.8	3.15	3.05	3.00
1598.1	1628.1	3.17	3.05	3.00
1638.3	1668.3	3.20	3.05	2.99
1698.6	1728.6	3.26	3.08	3.01
1738.8	1768.8	3.33	3.11	3.03
1799.1	1829.1	3.48	3.17	3.06
1839.3	1869.3	3.61	3.22	3.09
1899.6	1929.6	3.80	3.32	3.15
1939.8	1969.8	3.99	3.42	3.21
2000.1	2030.1	4.16	3.54	3.34

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+10	+13	+16
10.1	1.56	2.27	3.26
70.4	1.56	2.32	3.33
130.7	1.59	2.41	3.49
191.0	1.53	2.26	3.21
231.2	1.60	2.40	3.43
291.5	1.59	2.33	3.26
331.7	1.66	2.44	3.41
392.0	1.67	2.41	3.31
432.2	1.76	2.51	3.42
492.5	1.80	2.52	3.37
532.7	1.88	2.59	3.44
593.0	1.94	2.62	3.43
633.2	2.02	2.69	3.47
693.5	2.08	2.74	3.50
733.7	2.15	2.78	3.52
794.0	2.23	2.82	3.52
834.2	2.30	2.85	3.51
894.5	2.41	2.91	3.51
934.7	2.49	2.98	3.54
995.0	2.57	3.07	3.60
1035.3	2.63	3.13	3.66
1095.6	2.68	3.14	3.65
1135.8	2.74	3.17	3.67
1196.1	2.78	3.17	3.62
1236.3	2.84	3.20	3.65
1296.6	2.92	3.20	3.62
1336.8	2.99	3.24	3.64
1397.1	3.08	3.25	3.60
1437.3	3.17	3.30	3.62
1497.6	3.27	3.30	3.58
1537.8	3.36	3.34	3.60
1598.1	3.53	3.38	3.59
1638.3	3.68	3.49	3.67
1698.6	4.03	3.66	3.76
1738.8	4.25	3.82	3.88
1799.1	4.78	4.07	4.01
1839.3	5.00	4.25	4.14
1899.6	5.58	4.57	4.29
1939.8	5.74	4.73	4.42
2000.1	6.26	5.10	4.60

IF (OUT) (MHz)	IF VSWR @LO=1500.1MHz (:1)		
	@LO (dBm)		
	+10	+13	+16
10.0	1.55	1.31	1.13
29.8	1.44	1.22	1.05
49.6	1.38	1.17	1.03
69.3	1.38	1.17	1.01
89.1	1.41	1.19	1.03
108.9	1.43	1.22	1.03
128.7	1.44	1.22	1.05
148.4	1.42	1.20	1.03
168.2	1.39	1.17	1.01
188.0	1.39	1.17	1.01
207.8	1.41	1.18	1.00
227.6	1.41	1.18	1.01
247.3	1.41	1.18	1.00
267.1	1.43	1.20	1.02
286.9	1.43	1.20	1.02
306.7	1.40	1.17	1.04
326.4	1.38	1.15	1.05
346.2	1.38	1.15	1.03
366.0	1.40	1.16	1.03
385.8	1.40	1.16	1.03
405.6	1.40	1.16	1.04
425.3	1.37	1.13	1.06
445.1	1.34	1.11	1.09
464.9	1.37	1.13	1.08
484.7	1.41	1.17	1.05
504.4	1.41	1.16	1.04
524.2	1.37	1.13	1.07
544.0	1.35	1.11	1.09
583.6	1.40	1.15	1.09
603.3	1.42	1.16	1.05
642.9	1.37	1.12	1.08
662.7	1.35	1.10	1.11
702.2	1.42	1.15	1.06
722.0	1.42	1.15	1.06
761.6	1.39	1.12	1.08
781.3	1.38	1.12	1.09
820.9	1.40	1.13	1.08
840.7	1.41	1.13	1.08
880.2	1.38	1.11	1.12
900.0	1.37	1.11	1.14

## Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	12	29	23	34	22	53	43	60	42	58
1	-	14	+0	36	19	38	47	51	43	57	52	60
2	82	45	28	45	27	56	44	62	38	54	55	66
3	>100	39	39	43	48	47	52	49	48	61	52	64
4	>100	58	60	53	64	54	48	59	55	52	67	61
5	>100	61	51	54	55	62	48	63	60	81	65	65
6	>100	87	79	64	69	71	50	67	49	66	60	73
7	>100	84	70	77	64	78	63	67	64	75	70	84
8	>100	96	91	87	85	75	81	69	67	67	67	77
9	>100	>97	89	95	79	81	76	81	74	73	77	74
10	>100	93	92	>97	94	94	84	75	89	84	66	77
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; 4.00 dBm.  
 LO IN: 780.01 MHz; +13.00 dBm  
 IF OUT: 29.91 MHz; -2.58 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	7	19	11	21	8	36	36	44	32	39
1	-	13	+0	34	18	32	38	44	34	47	42	51
2	96	53	38	52	36	59	52	52	50	54	57	62
3	>100	64	58	60	53	61	63	70	58	76	64	74
4	>100	82	>87	>87	73	66	69	76	74	82	76	77
5	>100	80	>87	83	87	81	70	80	>87	>87	87	86
6	>100	>87	87	>87	78	>87	80	68	80	>87	82	>87
7	>100	>87	>87	85	85	87	>87	86	78	>87	>87	87
8	>100	>87	86	87	84	>87	>87	>87	79	78	>87	>87
9	>100	78	82	81	83	>87	>87	>87	>87	>87	79	>87
10	>100	84	79	>87	>87	80	>87	82	86	>87	78	77
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; -6.00 dBm.  
 LO IN: 780.01 MHz; +13.00 dBm  
 IF OUT: 29.91 MHz; -12.62 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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