

Frequency Mixer

ML-1+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)			RF (IN) (MHz)	LO (MHz)	IP-3 INPUT (dBm)			RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+1dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+4	+7	+10			+4	+7	+10			+4	+7	+10
0.3	30.3	7.28	6.77	6.49	0.3	30.3	10.75	11.45	11.82	0.3	30.3	0.04	0.00	-0.02
0.5	30.5	6.85	6.37	6.11	0.5	30.5	15.12	16.44	17.20	0.5	30.5	0.09	0.02	0.00
0.7	30.7	6.73	6.25	6.00	0.7	30.7	15.55	18.61	19.87	0.7	30.7	0.07	0.00	-0.03
0.9	30.9	6.65	6.18	5.93	0.9	30.9	15.53	18.48	20.27	0.9	30.9	0.05	-0.02	-0.04
2.1	32.1	6.37	5.91	5.65	2.1	32.1	15.74	18.63	20.28	2.1	32.1	0.08	0.00	-0.02
10.1	40.1	5.90	5.47	5.24	10.1	40.1	16.30	19.75	21.16	10.1	40.1	0.17	0.05	0.01
28.1	58.1	5.92	5.49	5.27	28.1	58.1	17.21	19.97	25.23	28.1	58.1	0.19	0.08	0.03
40.1	70.1	5.92	5.49	5.27	40.1	70.1	17.28	23.21	18.89	40.1	70.1	0.22	0.09	0.04
52.1	82.1	6.00	5.54	5.30	52.1	82.1	18.05	22.20	15.93	52.1	82.1	0.21	0.08	0.03
64.1	94.1	6.12	5.59	5.32	64.1	94.1	19.56	19.61	14.62	64.1	94.1	0.16	0.06	0.03
76.1	106.1	5.95	5.47	5.25	76.1	106.1	22.09	15.98	14.21	76.1	106.1	0.23	0.10	0.04
88.1	118.1	5.91	5.47	5.30	88.1	118.1	20.45	14.53	14.25	88.1	118.1	0.26	0.13	0.05
120.1	150.1	5.92	5.51	5.30	120.1	150.1	15.46	12.60	15.48	120.1	150.1	0.27	0.11	0.04
140.1	170.1	5.91	5.52	5.36	140.1	170.1	13.04	12.70	16.68	140.1	170.1	0.30	0.12	0.04
160.1	190.1	5.98	5.54	5.36	160.1	190.1	12.12	13.08	17.34	160.1	190.1	0.26	0.11	0.05
180.1	210.1	5.85	5.49	5.33	180.1	210.1	11.30	14.50	24.49	180.1	210.1	0.29	0.09	0.03
200.1	230.1	5.90	5.62	5.47	200.1	230.1	11.04	14.09	20.87	200.1	230.1	0.31	0.09	0.03
230.1	260.1	5.84	5.50	5.34	230.1	260.1	11.22	15.05	21.49	230.1	260.1	0.30	0.11	0.06
250.1	280.1	5.90	5.57	5.43	250.1	280.1	12.82	16.10	22.52	250.1	280.1	0.28	0.14	0.09
270.1	300.1	5.90	5.58	5.41	270.1	300.1	15.43	15.92	14.28	270.1	300.1	0.26	0.12	0.09
290.1	320.1	5.96	5.65	5.49	290.1	320.1	17.19	12.91	10.33	290.1	320.1	0.25	0.09	0.06
310.1	340.1	6.13	5.80	5.63	310.1	340.1	15.14	14.32	11.58	310.1	340.1	0.20	0.07	0.03
330.1	360.1	6.06	5.68	5.50	330.1	360.1	12.38	18.53	14.81	330.1	360.1	0.20	0.09	0.05
360.1	390.1	6.11	5.72	5.52	360.1	390.1	13.38	15.78	21.77	360.1	390.1	0.22	0.15	0.09
380.1	410.1	6.15	5.83	5.63	380.1	410.1	15.60	14.33	21.19	380.1	410.1	0.17	0.07	0.02
400.1	430.1	6.11	5.87	5.72	400.1	430.1	15.53	11.19	11.06	400.1	430.1	0.38	0.15	0.12
420.1	450.1	6.16	5.92	5.80	420.1	450.1	17.27	11.33	9.75	420.1	450.1	0.40	0.16	0.14
440.1	470.1	6.12	5.88	5.78	440.1	470.1	20.50	12.00	10.40	440.1	470.1	0.45	0.22	0.17
470.1	500.1	6.41	6.15	6.05	470.1	500.1	15.80	14.24	12.15	470.1	500.1	0.52	0.21	0.10
500.1	530.1	6.54	6.15	5.95	500.1	530.1	16.32	12.51	11.77	500.1	530.1	0.62	0.29	0.10
510.1	540.1	6.66	6.20	5.96	510.1	540.1	16.33	11.95	12.44	510.1	540.1	0.55	0.26	0.08
530.1	560.1	6.79	6.22	5.97	530.1	560.1	13.11	11.69	13.52	530.1	560.1	0.52	0.28	0.07
550.1	580.1	6.94	6.25	5.96	550.1	580.1	8.21	11.33	13.53	550.1	580.1	0.54	0.38	0.12
570.1	600.1	7.21	6.49	6.08	570.1	600.1	4.25	9.56	13.07	570.1	600.1	0.50	0.42	0.20
600.1	630.1	7.66	7.10	6.49	600.1	630.1	1.39	3.64	9.57	600.1	630.1	0.55	0.41	0.33
620.1	650.1	8.10	7.56	6.86	620.1	650.1	0.88	1.57	6.68	620.1	650.1	0.33	0.19	0.20
640.1	670.1	8.58	8.02	7.29	640.1	670.1	0.76	0.61	4.53	640.1	670.1	0.04	-0.09	-0.02
660.1	690.1	9.21	8.57	7.78	660.1	690.1	0.96	0.35	2.87	660.1	690.1	-0.48	-0.53	-0.38
680.1	710.1	9.80	9.16	8.42	680.1	710.1	1.30	0.51	1.59	680.1	710.1	-1.05	-1.06	-0.90
700.1	730.1	10.11	9.49	8.88	700.1	730.1	1.78	1.02	1.17	700.1	730.1	-1.35	-1.36	-1.26

Frequency Mixer

ML-1+

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=250.25MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=0.5MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=500MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+7			+7			+7
240.2	10.1	5.78	9.6	10.1	6.25	489.9	10.1	6.75
228.2	22.1	5.75	29.6	30.1	6.31	482.9	17.1	6.68
216.2	34.1	5.76	49.6	50.1	6.37	468.9	31.1	6.54
204.2	46.1	5.73	69.6	70.1	6.45	454.9	45.1	6.40
192.2	58.1	5.82	89.6	90.1	6.34	440.9	59.1	6.37
180.2	70.1	5.74	109.6	110.1	6.40	433.9	66.1	6.30
168.2	82.1	5.67	129.6	130.1	6.51	419.9	80.1	6.12
156.2	94.1	5.55	149.6	150.1	6.50	405.9	94.1	6.17
144.2	106.1	5.48	169.6	170.1	6.54	391.9	108.1	6.04
132.2	118.1	5.48	189.6	190.1	6.52	384.9	115.1	6.04
120.2	130.1	5.48	209.6	210.1	6.52	370.9	129.1	5.99
108.2	142.1	5.51	229.6	230.1	6.60	356.9	143.1	5.92
96.2	154.1	5.45	249.6	250.1	6.64	342.9	157.1	5.87
84.2	166.1	5.50	269.6	270.1	6.67	328.9	171.1	5.83
72.2	178.1	5.48	289.6	290.1	6.73	321.9	178.1	5.88
60.2	190.1	5.37	309.6	310.1	6.71	307.9	192.1	5.83
48.2	202.1	5.44	329.6	330.1	6.72	293.9	206.1	5.99
36.2	214.1	5.46	349.6	350.1	6.75	279.9	220.1	5.89
24.2	226.1	5.50	369.6	370.1	6.86	272.9	227.1	5.94
12.2	238.1	5.48	389.6	390.1	7.22	258.9	241.1	5.99
1.9	252.1	5.32	409.6	410.1	7.50	244.9	255.1	5.97
26.9	277.1	5.55	429.6	430.1	7.59	230.9	269.1	5.96
51.9	302.1	5.55	449.6	450.1	7.55	223.9	276.1	5.96
76.9	327.1	5.68	469.6	470.1	7.51	209.9	290.1	6.06
101.9	352.1	5.81	489.6	490.1	7.42	195.9	304.1	6.09
126.9	377.1	5.76	509.6	510.1	7.20	181.9	318.1	6.07
151.9	402.1	5.85	529.6	530.1	6.98	167.9	332.1	5.93
176.9	427.1	6.00	549.6	550.1	6.78	160.9	339.1	5.89
206.9	457.1	6.00	569.6	570.1	6.72	146.9	353.1	5.87
231.9	482.1	5.96	589.6	590.1	6.78	132.9	367.1	5.99
256.9	507.1	6.17	609.6	610.1	6.83	118.9	381.1	6.02
281.9	532.1	6.22	629.6	630.1	6.86	111.9	388.1	6.03
306.9	557.1	6.25	649.6	650.1	6.85	97.9	402.1	6.12
331.9	582.1	6.24	669.6	670.1	6.83	83.9	416.1	6.04
356.9	607.1	6.54	689.6	690.1	6.78	69.9	430.1	6.14
381.9	632.1	6.58	709.6	710.1	6.80	62.9	437.1	6.12
411.9	662.1	6.45	729.6	730.1	6.91	48.9	451.1	6.10
436.9	687.1	6.38	749.6	750.1	7.03	34.9	465.1	6.14
461.9	712.1	6.55	769.6	770.1	7.26	20.9	479.1	6.14
486.9	737.1	6.66	799.6	800.1	7.79	6.9	493.1	5.96

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)			RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)					@LO (dBm)		
	+4	+7	+10	+4	+7	+10			+4	+7	+10
30.3	65.99	67.23	68.12	63.13	60.99	59.31	0.3	30.3	74.56	62.82	59.10
30.5	65.73	67.25	68.43	62.48	60.68	59.13	0.5	30.5	77.46	63.85	59.10
30.7	65.34	66.98	68.44	62.49	60.82	59.12	0.7	30.7	67.50	63.37	58.77
30.9	65.36	66.65	68.06	63.21	60.98	59.22	0.9	30.9	71.96	62.81	58.71
32.1	64.96	66.46	67.83	62.71	60.54	58.87	2.1	32.1	64.70	65.17	55.67
40.1	63.36	64.62	65.81	61.90	59.29	57.64	10.1	40.1	53.28	52.90	51.56
58.1	59.93	61.23	62.45	59.57	56.63	54.74	28.1	58.1	42.60	43.36	44.63
70.1	58.27	59.38	60.69	58.88	55.65	53.60	40.1	70.1	40.22	41.17	41.74
82.1	56.62	57.78	59.20	57.64	53.77	51.79	52.1	82.1	38.04	38.87	39.63
94.1	55.39	56.45	57.83	57.24	53.07	50.99	64.1	94.1	36.27	37.24	37.96
106.1	54.13	55.42	56.95	56.18	52.18	50.08	76.1	106.1	35.47	36.51	37.14
118.1	53.06	54.63	56.02	55.39	51.87	49.64	88.1	118.1	34.02	35.04	35.72
150.1	50.78	52.60	54.03	53.91	51.03	48.93	120.1	150.1	32.16	33.10	33.70
170.1	49.71	51.28	52.56	52.74	49.09	47.10	140.1	170.1	30.96	31.82	32.43
190.1	48.38	49.81	50.84	51.44	48.57	46.09	160.1	190.1	30.46	31.39	32.05
210.1	47.95	49.34	50.35	49.23	47.84	46.89	180.1	210.1	30.43	31.52	32.19
230.1	47.03	48.56	49.56	49.74	46.87	44.60	200.1	230.1	29.33	30.38	31.22
260.1	45.94	47.29	48.21	46.74	46.29	45.15	230.1	260.1	28.90	29.99	30.87
280.1	44.99	46.11	46.68	44.12	44.21	43.77	250.1	280.1	28.31	29.54	30.62
300.1	43.72	44.82	45.57	41.03	41.74	42.30	270.1	300.1	28.28	29.30	30.32
320.1	43.23	44.16	45.11	42.13	40.99	40.46	290.1	320.1	28.22	29.18	30.07
340.1	43.26	43.99	44.77	43.08	42.16	41.86	310.1	340.1	27.37	28.52	29.18
360.1	43.06	43.43	43.85	42.13	41.34	41.14	330.1	360.1	27.54	29.12	30.29
390.1	42.50	43.17	43.19	40.56	40.24	39.73	360.1	390.1	26.80	28.36	29.47
410.1	41.81	42.83	43.15	39.72	40.41	40.13	380.1	410.1	26.95	28.10	29.18
430.1	41.21	42.27	42.76	39.10	40.38	40.91	400.1	430.1	25.72	26.49	27.24
450.1	40.52	41.41	41.81	38.20	39.87	40.84	420.1	450.1	24.82	25.52	26.04
470.1	39.54	40.38	40.72	37.38	39.48	41.05	440.1	470.1	24.12	24.68	25.07
500.1	37.35	38.50	39.19	35.63	38.45	41.51	470.1	500.1	23.59	24.11	24.48
530.1	35.66	36.68	37.70	31.62	34.20	36.85	500.1	530.1	23.18	23.79	24.35
540.1	35.73	36.46	37.38	31.98	33.08	35.04	510.1	540.1	22.92	23.77	24.46
560.1	35.62	35.90	36.66	34.36	33.02	34.21	530.1	560.1	22.58	23.64	24.47
580.1	35.42	35.54	36.14	36.80	33.45	34.19	550.1	580.1	22.66	23.74	24.61
600.1	35.58	35.79	36.31	38.76	34.47	34.59	570.1	600.1	23.08	24.11	25.14
630.1	35.36	36.07	36.50	38.79	37.78	36.07	600.1	630.1	23.00	23.83	25.02
650.1	34.77	35.64	36.15	38.78	39.66	37.87	620.1	650.1	22.60	23.40	24.83
670.1	34.22	35.04	35.64	38.92	40.57	39.97	640.1	670.1	22.34	23.14	24.57
690.1	33.44	34.13	34.64	39.20	41.28	42.65	660.1	690.1	22.61	23.43	24.83
710.1	33.12	33.84	34.48	40.09	42.31	44.62	680.1	710.1	23.46	24.11	25.17
730.1	33.13	33.79	34.47	40.73	42.47	44.03	700.1	730.1	24.49	25.16	26.03

Frequency Mixer

ML-1+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=500MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+4	+7	+10		+4	+7	+10		+4	+7	+10
0.3	30.3	2.36	2.23	2.16	30.3	1.02	1.55	2.32	0.3	2.14	1.87	1.65
0.5	30.5	1.74	1.66	1.62	30.5	1.02	1.55	2.32	0.4	2.13	1.86	1.64
0.7	30.7	1.55	1.47	1.44	30.7	1.02	1.55	2.32	0.6	2.13	1.86	1.64
0.9	30.9	1.47	1.39	1.36	30.9	1.02	1.55	2.32	0.7	2.13	1.86	1.64
2.1	32.1	1.41	1.28	1.22	32.1	1.02	1.55	2.31	0.9	2.13	1.86	1.64
10.1	40.1	1.40	1.24	1.14	40.1	1.01	1.52	2.23	2.1	2.15	1.87	1.66
28.1	58.1	1.38	1.22	1.12	58.1	1.03	1.49	2.15	5.1	2.13	1.86	1.64
40.1	70.1	1.34	1.19	1.10	70.1	1.01	1.50	2.17	16.1	2.17	1.89	1.67
52.1	82.1	1.33	1.19	1.09	82.1	1.01	1.52	2.22	28.1	2.22	1.94	1.71
64.1	94.1	1.37	1.21	1.11	94.1	1.02	1.55	2.28	34.1	2.22	1.94	1.71
76.1	106.1	1.31	1.16	1.09	106.1	1.01	1.59	2.36	46.1	2.19	1.91	1.69
88.1	118.1	1.29	1.14	1.07	118.1	1.01	1.54	2.25	58.1	2.16	1.89	1.67
120.1	150.1	1.28	1.15	1.10	150.1	1.01	1.47	2.08	64.1	2.17	1.90	1.68
140.1	170.1	1.26	1.11	1.08	170.1	1.04	1.53	2.19	76.1	2.24	1.96	1.74
160.1	190.1	1.26	1.11	1.07	190.1	1.03	1.62	2.37	82.1	2.26	1.99	1.76
180.1	210.1	1.20	1.09	1.09	210.1	1.05	1.63	2.36	94.1	2.26	1.99	1.77
200.1	230.1	1.18	1.08	1.10	230.1	1.05	1.54	2.19	119.1	2.22	1.96	1.75
230.1	260.1	1.11	1.06	1.15	260.1	1.07	1.61	2.29	129.1	2.30	2.03	1.81
250.1	280.1	1.11	1.06	1.17	280.1	1.10	1.70	2.43	149.1	2.37	2.10	1.88
270.1	300.1	1.11	1.02	1.11	300.1	1.14	1.74	2.49	169.1	2.30	2.04	1.84
290.1	320.1	1.07	1.03	1.10	320.1	1.16	1.72	2.42	179.1	2.36	2.10	1.90
310.1	340.1	1.05	1.07	1.14	340.1	1.18	1.71	2.39	199.1	2.48	2.22	2.01
330.1	360.1	1.07	1.16	1.25	360.1	1.22	1.78	2.49	219.1	2.45	2.20	2.00
360.1	390.1	1.07	1.18	1.31	390.1	1.31	1.97	2.76	229.1	2.46	2.20	2.00
380.1	410.1	1.08	1.20	1.33	410.1	1.33	1.95	2.70	249.1	2.59	2.32	2.10
400.1	430.1	1.09	1.22	1.32	430.1	1.35	1.92	2.61	269.1	2.60	2.35	2.14
420.1	450.1	1.10	1.23	1.33	450.1	1.36	1.94	2.65	279.1	2.58	2.33	2.13
440.1	470.1	1.15	1.29	1.37	470.1	1.43	2.07	2.85	299.1	2.72	2.45	2.23
470.1	500.1	1.16	1.30	1.37	500.1	1.55	2.17	2.93	309.1	2.77	2.51	2.29
500.1	530.1	1.14	1.25	1.30	530.1	1.57	2.11	2.79	329.1	2.71	2.45	2.25
510.1	540.1	1.12	1.24	1.29	540.1	1.60	2.15	2.86	349.1	2.79	2.51	2.29
530.1	560.1	1.08	1.21	1.26	560.1	1.69	2.27	3.00	359.1	2.95	2.66	2.43
550.1	580.1	1.06	1.17	1.22	580.1	1.80	2.43	3.19	379.1	2.95	2.67	2.45
570.1	600.1	1.09	1.11	1.16	600.1	1.87	2.54	3.30	399.1	2.93	2.64	2.41
600.1	630.1	1.19	1.12	1.10	630.1	1.90	2.55	3.28	409.1	3.06	2.75	2.50
620.1	650.1	1.25	1.17	1.10	650.1	1.92	2.57	3.34	429.1	3.09	2.79	2.55
640.1	670.1	1.34	1.26	1.18	670.1	2.03	2.75	3.59	449.1	3.02	2.70	2.47
660.1	690.1	1.48	1.40	1.31	690.1	2.16	2.90	3.78	459.1	3.10	2.75	2.51
680.1	710.1	1.62	1.54	1.46	710.1	2.19	2.88	3.72	479.1	3.28	2.95	2.70
700.1	730.1	1.80	1.72	1.65	730.1	2.21	2.86	3.66	499.1	3.21	2.91	2.69

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	---	---	18.81	32.34	26.35	30.12	22.62	40.04	31.88	44.59	30.83	40.40
1	---	23.87	---	34.92	13.44	41.10	21.11	38.78	37.76	56.66	32.24	50.52
2	117.74	73.58	71.51	71.05	64.23	72.40	61.35	73.89	55.75	72.42	79.12	74.10
3	120.40	69.28	61.84	71.51	68.25	87.51	58.56	72.01	56.33	82.59	63.84	89.10
4	121.36	92.61	84.91	88.86	86.36	87.66	81.00	89.86	82.05	95.23	83.81	91.85
5	121.83	97.49	90.72	93.03	86.09	95.43	80.48	96.69	81.44	95.86	80.02	97.94
6	119.80	97.24	98.67	97.35	98.41	95.75	95.34	94.26	95.15	97.08	96.78	100.48
7	120.94	97.79	96.77	97.80	97.58	97.31	94.12	96.75	92.42	96.71	98.09	98.16
8	120.36	98.75	97.47	98.36	98.63	97.61	98.42	93.95	96.70	91.25	96.60	97.09
9	118.45	96.24	99.00	98.10	100.06	98.84	96.64	95.56	90.60	95.42	91.56	98.14
10	117.97	96.08	99.08	97.56	98.81	97.44	98.16	96.19	96.90	91.76	95.64	93.69
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 250.25 MHz; -15.00 dBm.
 LO IN: 280.25 MHz; +7.00 dBm
 IF OUT: 30.00 MHz; -20.47 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	---	---	27.07	42.47	36.01	40.84	35.22	52.34	42.60	57.32	42.40	53.81
1	---	24.23	---	34.59	13.16	43.17	20.13	38.92	38.23	57.08	38.10	53.60
2	107.75	77.21	67.07	71.35	61.14	72.30	62.58	65.42	52.24	67.51	60.52	73.62
3	110.41	56.82	47.12	59.27	56.13	70.37	51.13	59.99	51.09	81.46	54.10	72.61
4	111.37	91.34	71.12	82.46	87.39	85.12	71.38	82.69	69.77	91.99	68.07	84.56
5	111.84	75.77	65.82	72.29	71.74	73.18	62.10	85.01	57.38	74.63	56.12	77.85
6	109.81	99.54	83.69	94.82	86.53	88.35	86.82	90.78	77.14	92.31	76.42	106.46
7	110.95	92.36	85.37	82.33	84.18	81.94	80.88	83.72	70.36	94.97	68.49	84.69
8	110.37	107.47	94.62	102.84	99.13	98.38	104.66	95.95	88.31	96.24	84.53	97.49
9	108.46	106.26	92.30	100.80	92.38	90.62	97.51	90.95	83.22	92.32	78.76	101.52
10	107.98	106.53	104.77	108.17	103.93	103.89	105.60	106.00	101.61	101.28	95.39	102.05
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 250.25 MHz; -5.00 dBm.
 LO IN: 280.25 MHz; +7.00 dBm
 IF OUT: 30.00 MHz; -10.48 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 represents the Harmonics level of the RF Input Signal to the mixer