

Frequency Mixer

LRMS-1+

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=+1dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+4	+7	+10			+4	+7	+10			+4	+7	+10
0.5	30.5	7.81	7.45	7.25	10.1	40.1	22.04	23.14	23.11	10.1	40.1	1.08	0.78	0.61
1.0	31.0	7.02	6.68	6.52	50.4	80.4	22.89	24.56	24.10	50.4	80.4	1.03	0.71	0.57
2.0	32.0	6.45	6.15	6.00	90.8	120.8	17.68	19.77	25.87	90.8	120.8	1.17	0.84	0.59
5.0	35.0	6.12	5.84	5.69	110.9	140.9	17.81	21.22	21.69	110.9	140.9	1.12	0.88	0.63
10.0	40.0	6.09	5.78	5.64	151.3	181.3	19.85	18.88	21.86	151.3	181.3	1.00	0.71	0.56
50.4	80.4	6.22	5.89	5.71	171.5	201.5	18.30	25.30	22.58	171.5	201.5	1.01	0.73	0.51
90.8	120.8	6.29	5.94	5.79	211.8	241.8	18.91	18.88	18.47	211.8	241.8	1.01	0.62	0.48
151.3	181.3	6.32	6.03	5.87	232.0	262.0	25.10	20.55	22.92	232.0	262.0	1.09	0.74	0.57
171.5	201.5	6.35	6.05	5.92	272.3	302.3	19.00	18.35	17.77	272.3	302.3	1.08	0.77	0.48
211.8	241.8	6.33	6.06	5.90	292.5	322.5	20.22	19.05	19.20	292.5	322.5	1.07	0.78	0.55
232.0	262.0	6.37	6.11	5.92	332.8	362.8	17.06	17.04	18.99	332.8	362.8	1.05	0.78	0.67
272.3	302.3	6.39	6.15	5.99	353.0	383.0	18.30	18.35	21.00	353.0	383.0	1.06	0.83	0.59
292.5	322.5	6.39	6.12	5.94	393.3	423.3	19.16	18.53	18.84	393.3	423.3	1.12	0.86	0.67
332.8	362.8	6.42	6.16	6.00	413.5	443.5	19.80	17.26	18.98	413.5	443.5	1.18	0.86	0.71
393.3	423.3	6.52	6.24	6.09	453.8	483.8	15.44	19.13	21.84	453.8	483.8	1.24	0.93	0.75
413.5	443.5	6.51	6.22	6.04	474.0	504.0	14.25	15.93	21.41	474.0	504.0	1.26	0.97	0.77
453.8	483.8	6.65	6.33	6.09	514.3	544.3	14.10	13.74	17.39	514.3	544.3	1.24	0.94	0.74
474.0	504.0	6.68	6.33	6.12	534.5	564.5	13.04	13.58	14.78	534.5	564.5	1.38	0.97	0.84
514.3	544.3	6.70	6.39	6.15	574.8	604.8	12.10	13.07	15.31	574.8	604.8	1.38	1.04	0.89
534.5	564.5	6.75	6.40	6.20	595.0	625.0	12.97	13.89	15.61	595.0	625.0	1.38	1.07	0.86
574.8	604.8	6.84	6.45	6.20	635.4	665.4	13.45	15.50	24.30	635.4	665.4	1.63	1.31	1.12
595.0	625.0	6.86	6.49	6.23	655.5	685.5	13.11	17.86	26.02	655.5	685.5	1.63	1.26	1.10
635.4	665.4	7.04	6.56	6.28	695.9	725.9	12.50	20.81	19.39	695.9	725.9	1.52	1.30	0.98
655.5	685.5	7.07	6.55	6.28	716.0	746.0	12.37	19.69	20.98	716.0	746.0	1.45	1.24	1.06
695.9	725.9	7.26	6.69	6.35	756.4	786.4	12.13	16.16	17.68	756.4	786.4	1.47	1.24	1.01
756.4	786.4	7.60	7.01	6.59	776.5	806.5	11.21	15.68	19.99	776.5	806.5	1.46	1.07	1.02
776.5	806.5	7.76	7.18	6.73	816.9	846.9	13.01	18.47	15.99	816.9	846.9	1.43	1.29	1.13
816.9	846.9	7.92	7.36	6.93	837.0	867.0	12.90	18.62	16.95	837.0	867.0	1.25	1.05	0.89
837.0	867.0	8.02	7.45	7.07	877.4	907.4	17.42	21.78	15.60	877.4	907.4	1.32	1.01	0.85
877.4	907.4	8.11	7.62	7.27	897.6	927.6	15.70	22.81	16.92	897.6	927.6	1.19	0.94	0.79
897.6	927.6	8.15	7.71	7.37	937.9	967.9	18.27	15.66	15.89	937.9	967.9	1.31	1.03	0.86
937.9	967.9	8.28	7.89	7.62	958.1	988.1	14.85	14.77	15.58	958.1	988.1	1.28	0.89	0.75
958.1	988.1	8.35	8.00	7.71	998.4	1028.4	12.35	12.49	14.31	998.4	1028.4	1.27	0.94	0.77
998.4	1028.4	8.47	8.10	7.94	1018.6	1048.6	11.89	13.17	13.74	1018.6	1048.6	1.48	1.01	0.84
1018.6	1048.6	8.53	8.18	8.02	1058.9	1088.9	10.62	12.35	13.10	1058.9	1088.9	1.21	0.82	0.76
1058.9	1088.9	8.79	8.44	8.32	1079.1	1109.1	11.32	12.97	12.87	1079.1	1109.1	1.16	0.79	0.68
1079.1	1109.1	8.85	8.59	8.46	1119.4	1149.4	10.89	11.89	13.19	1119.4	1149.4	1.20	0.84	0.75
1139.6	1169.6	9.43	9.16	9.09	1139.6	1169.6	10.78	11.97	13.11	1139.6	1169.6	1.12	0.77	0.72
1179.9	1209.9	9.88	9.63	9.55	1179.9	1209.9	10.03	11.45	11.97	1179.9	1209.9	1.16	0.70	0.65
1200.1	1230.1	10.15	9.85	9.84	1200.1	1230.1	9.24	10.63	12.38	1200.1	1230.1	1.10	0.73	0.75

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Frequency Mixer

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=250.1MHz (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)=500.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+7			+7			+7
240.0	10.1	6.12	10.0	20.1	5.72	490.0	10.1	6.33
234.1	16.0	6.11	22.3	32.4	5.62	477.7	22.4	6.32
228.2	21.9	6.10	34.6	44.7	5.60	465.4	34.7	6.30
222.3	27.8	6.10	46.9	57.0	5.59	453.1	47.0	6.30
216.4	33.7	6.09	59.2	69.3	5.64	440.8	59.3	6.32
210.5	39.6	6.07	71.5	81.6	5.62	428.5	71.6	6.28
204.6	45.5	6.06	83.8	93.9	5.61	416.2	83.9	6.23
198.7	51.4	6.04	96.2	106.3	5.63	403.8	96.3	6.20
192.8	57.3	6.03	108.5	118.6	5.66	391.5	108.6	6.20
186.9	63.2	6.02	120.8	130.9	5.60	379.2	120.9	6.20
181.1	69.0	6.03	133.1	143.2	5.68	366.9	133.2	6.18
175.2	74.9	6.03	145.4	155.5	5.67	354.6	145.5	6.18
169.3	80.8	6.01	157.7	167.8	5.72	342.3	157.8	6.18
163.4	86.7	6.00	170.0	180.1	5.70	330.0	170.1	6.19
157.5	92.6	6.01	182.3	192.4	5.73	317.7	182.4	6.18
151.6	98.5	6.00	194.6	204.7	5.73	305.4	194.7	6.17
145.7	104.4	6.00	206.9	217.0	5.74	293.1	207.0	6.17
139.8	110.3	5.99	219.2	229.3	5.73	280.8	219.3	6.16
133.9	116.2	5.99	231.5	241.6	5.76	268.5	231.6	6.16
128.0	122.1	5.98	243.8	253.9	5.76	256.2	243.9	6.19
122.1	128.0	5.97	256.2	266.3	5.79	243.8	256.3	6.14
116.2	133.9	5.97	268.5	278.6	5.80	231.5	268.6	6.10
110.3	139.8	5.98	280.8	290.9	5.84	219.2	280.9	6.10
104.4	145.7	5.98	293.1	303.2	5.86	206.9	293.2	6.19
98.5	151.6	5.98	305.4	315.5	5.81	194.6	305.5	6.19
92.6	157.5	5.99	317.7	327.8	5.87	182.3	317.8	6.20
86.7	163.4	5.99	330.0	340.1	5.93	170.0	330.1	6.20
80.8	169.3	5.97	342.3	352.4	5.86	157.7	342.4	6.17
74.9	175.2	5.98	354.6	364.7	5.92	145.4	354.7	6.22
69.0	181.1	5.96	366.9	377.0	5.99	133.1	367.0	6.22
63.2	186.9	5.96	379.2	389.3	5.97	120.8	379.3	6.21
57.3	192.8	5.95	391.5	401.6	5.98	108.5	391.6	6.22
51.4	198.7	5.98	403.8	413.9	5.92	96.2	403.9	6.22
45.5	204.6	6.01	416.2	426.3	5.96	83.8	416.3	6.21
39.6	210.5	6.00	428.5	438.6	6.01	71.5	428.6	6.23
33.7	216.4	5.99	440.8	450.9	6.03	59.2	440.9	6.23
27.8	222.3	6.00	453.1	463.2	6.05	46.9	453.2	6.23
21.9	228.2	5.98	465.4	475.5	6.06	34.6	465.5	6.26
16.0	234.1	5.98	477.7	487.8	6.03	22.3	477.8	6.26
10.1	240.0	6.02	490.0	500.1	6.07	10.0	490.1	6.42

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+4	+7	+10	+4	+7	+10
0.5	77.47	89.00	86.40	58.57	64.40	71.90
1.0	76.77	82.65	81.16	59.07	64.35	70.66
2.0	74.40	76.59	75.41	58.90	63.49	66.01
5.0	68.98	68.78	67.98	57.58	59.68	59.61
10.0	63.87	63.45	62.82	55.47	55.38	54.46
50.4	58.65	57.67	57.75	52.36	53.08	52.92
90.8	52.25	52.72	52.84	48.55	48.57	48.65
151.3	48.16	48.51	48.76	44.55	44.86	44.87
171.5	47.09	47.46	47.78	43.86	44.05	43.90
211.8	45.36	45.81	46.05	42.53	42.44	42.05
232.0	44.64	45.13	45.40	41.93	41.56	41.00
272.3	43.32	43.78	44.09	40.47	39.87	39.21
292.5	42.90	43.35	43.64	39.98	39.24	38.56
332.8	42.21	42.79	43.10	38.31	37.56	36.89
393.3	40.08	40.73	41.12	35.62	34.94	34.45
413.5	39.41	40.12	40.61	34.54	33.85	33.40
453.8	38.33	39.03	39.53	32.91	32.10	31.60
474.0	37.88	38.57	39.11	32.43	31.55	30.96
514.3	37.72	38.32	38.79	31.28	30.41	29.73
534.5	37.55	37.97	38.21	30.70	29.87	29.21
574.8	37.61	37.74	37.65	29.49	28.78	28.16
595.0	37.72	37.77	37.62	28.73	28.04	27.42
635.4	37.32	37.01	36.51	27.08	26.51	25.94
655.5	37.02	36.68	36.11	26.41	25.90	25.35
695.9	36.13	35.79	35.17	24.89	24.49	24.02
756.4	34.70	34.53	33.98	22.81	22.56	22.16
776.5	34.24	34.19	33.80	22.17	21.95	21.54
816.9	33.42	33.43	33.21	20.92	20.79	20.43
837.0	33.13	33.13	32.98	20.36	20.28	19.94
877.4	32.80	32.88	32.90	19.47	19.50	19.22
897.6	32.69	32.78	32.84	18.80	18.88	18.64
937.9	32.75	32.99	33.21	17.89	18.06	17.82
958.1	33.18	33.52	33.76	17.38	17.57	17.32
998.4	34.33	34.84	34.88	16.46	16.69	16.42
1018.6	35.20	35.38	34.84	15.93	16.16	15.87
1058.9	37.64	37.32	35.41	15.17	15.42	15.14
1079.1	40.37	39.11	35.69	14.62	14.91	14.68
1139.6	50.65	36.45	32.12	13.48	13.74	13.50
1179.9	38.27	33.17	29.84	12.79	13.07	12.89
1200.1	34.78	31.01	28.35	12.48	12.73	12.53

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	48.96	47.99	40.63
50.4	80.4	34.53	34.30	34.31
90.8	120.8	29.75	29.89	29.95
110.9	140.9	28.42	28.67	28.74
151.3	181.3	26.30	26.51	26.73
171.5	201.5	25.60	25.91	26.03
211.8	241.8	24.56	24.85	25.03
232.0	262.0	24.13	24.46	24.66
272.3	302.3	23.82	24.20	24.47
292.5	322.5	23.75	24.13	24.48
332.8	362.8	23.56	24.02	24.42
353.0	383.0	23.60	24.07	24.46
393.3	423.3	24.02	24.58	25.05
413.5	443.5	24.18	24.93	25.48
453.8	483.8	24.49	25.38	26.00
474.0	504.0	24.21	24.99	25.58
514.3	544.3	22.70	23.09	23.35
534.5	564.5	21.62	21.82	21.91
574.8	604.8	19.53	19.47	19.35
595.0	625.0	18.64	18.49	18.35
635.4	665.4	17.17	16.94	16.78
655.5	685.5	16.55	16.33	16.17
695.9	725.9	15.61	15.42	15.29
716.0	746.0	15.24	15.07	14.96
756.4	786.4	14.60	14.46	14.38
776.5	806.5	14.35	14.23	14.17
816.9	846.9	13.82	13.76	13.77
837.0	867.0	13.61	13.57	13.60
877.4	907.4	13.20	13.23	13.33
897.6	927.6	13.01	13.06	13.17
937.9	967.9	12.65	12.74	12.83
958.1	988.1	12.42	12.49	12.56
998.4	1028.4	12.00	12.03	12.01
1018.6	1048.6	11.79	11.78	11.71
1058.9	1088.9	11.24	11.16	11.00
1079.1	1109.1	10.91	10.78	10.58
1119.4	1149.4	10.20	10.02	9.77
1139.6	1169.6	9.80	9.61	9.35
1179.9	1209.9	9.02	8.78	8.53
1200.1	1230.1	8.67	8.42	8.19



Frequency Mixer

LRMS-1+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+4	+7	+10
5.0	35.0	1.13	1.11	1.12
10.0	40.0	1.10	1.05	1.07
50.4	80.4	1.04	1.08	1.17
90.8	120.8	1.06	1.06	1.10
151.3	181.3	1.05	1.08	1.12
171.5	201.5	1.02	1.05	1.10
211.8	241.8	1.05	1.11	1.16
232.0	262.0	1.06	1.11	1.16
272.3	302.3	1.04	1.10	1.14
292.5	322.5	1.06	1.12	1.17
332.8	362.8	1.09	1.14	1.19
393.3	423.3	1.14	1.19	1.23
413.5	443.5	1.14	1.19	1.23
453.8	483.8	1.15	1.20	1.25
474.0	504.0	1.18	1.23	1.28
514.3	544.3	1.18	1.22	1.26
534.5	564.5	1.21	1.25	1.30
574.8	604.8	1.25	1.29	1.33
595.0	625.0	1.26	1.29	1.33
635.4	665.4	1.34	1.38	1.42
655.5	685.5	1.39	1.42	1.46
695.9	725.9	1.47	1.49	1.53
756.4	786.4	1.72	1.72	1.74
776.5	806.5	1.76	1.77	1.78
816.9	846.9	2.00	1.99	2.01
837.0	867.0	2.08	2.07	2.08
877.4	907.4	2.20	2.20	2.22
897.6	927.6	2.35	2.36	2.37
937.9	967.9	2.46	2.47	2.48
958.1	988.1	2.51	2.52	2.54
998.4	1028.4	2.78	2.78	2.80
1018.6	1048.6	2.82	2.82	2.82
1058.9	1088.9	2.99	2.99	2.99
1079.1	1109.1	3.14	3.13	3.12
1119.4	1149.4	3.21	3.20	3.18
1139.6	1169.6	3.48	3.44	3.41
1179.9	1209.9	3.42	3.37	3.34
1200.1	1230.1	3.37	3.32	3.29

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+4	+7	+10
5.0	1.58	2.27	3.21
10.0	1.57	2.27	3.08
50.4	1.75	2.50	3.48
90.8	1.73	2.47	3.40
151.3	1.73	2.48	3.40
171.5	1.74	2.49	3.40
211.8	1.74	2.46	3.35
232.0	1.79	2.54	3.46
272.3	1.83	2.57	3.48
292.5	1.81	2.53	3.40
332.8	1.87	2.62	3.51
393.3	1.91	2.64	3.50
413.5	1.98	2.72	3.62
453.8	2.08	2.84	3.76
474.0	2.08	2.81	3.69
514.3	2.12	2.86	3.75
534.5	2.15	2.90	3.79
574.8	2.19	2.91	3.76
595.0	2.26	3.00	3.88
635.4	2.36	3.11	3.99
655.5	2.40	3.12	3.97
695.9	2.50	3.22	4.08
756.4	2.62	3.35	4.19
776.5	2.68	3.43	4.27
816.9	2.79	3.54	4.39
837.0	2.84	3.58	4.42
877.4	2.89	3.61	4.42
897.6	2.89	3.60	4.41
937.9	3.00	3.70	4.48
958.1	3.04	3.73	4.51
998.4	3.10	3.76	4.50
1018.6	3.17	3.81	4.53
1058.9	3.20	3.79	4.47
1079.1	3.19	3.74	4.39
1119.4	3.31	3.83	4.44
1139.6	3.38	3.89	4.47
1179.9	3.37	3.81	4.34
1200.1	3.43	3.85	4.35

IF (OUT) (MHz)	IF VSWR @LO=500.1MHz (:1)		
	@LO (dBm)		
	+4	+7	+10
5.0	1.41	1.24	1.12
10.0	1.41	1.25	1.13
22.1	1.72	1.53	1.36
34.1	1.62	1.45	1.29
46.1	1.54	1.37	1.26
58.1	1.52	1.36	1.21
70.1	1.51	1.35	1.21
82.1	1.56	1.39	1.25
94.1	1.59	1.40	1.26
106.1	1.60	1.42	1.27
130.1	1.63	1.44	1.29
142.1	1.60	1.41	1.27
154.1	1.56	1.38	1.25
166.1	1.54	1.36	1.23
178.1	1.55	1.37	1.24
190.1	1.58	1.41	1.27
202.1	1.63	1.44	1.31
214.1	1.65	1.47	1.32
226.1	1.66	1.47	1.32
238.1	1.64	1.45	1.30
250.1	1.59	1.42	1.28
274.1	1.56	1.39	1.26
286.1	1.59	1.41	1.28
298.1	1.61	1.43	1.30
310.1	1.63	1.45	1.32
322.1	1.63	1.45	1.31
334.1	1.61	1.43	1.30
346.1	1.58	1.41	1.28
358.1	1.55	1.39	1.27
370.1	1.55	1.39	1.27
382.1	1.57	1.41	1.30
394.1	1.61	1.45	1.34
418.1	1.66	1.50	1.37
430.1	1.64	1.47	1.35
442.1	1.60	1.44	1.32
454.1	1.57	1.41	1.30
478.1	1.60	1.45	1.35
490.1	1.65	1.50	1.40

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	13	24	19	34	15	33	21	40	24	48
1	-	18	0	28	12	34	19	37	32	47	41	45
2	114	69	51	69	52	70	52	76	52	68	57	71
3	108	71	74	74	68	74	59	94	63	80	67	79
4	110	95	83	89	83	97	89	100	86	100	89	95
5	115	105	107	108	91	89	87	89	89	111	89	98
6	115	104	100	104	99	103	81	92	92	99	98	104
7	120	106	105	101	100	92	98	77	85	91	99	108
8	110	104	108	114	107	106	95	85	87	94	86	91
9	119	107	98	103	112	102	96	101	105	43	92	94
10	108	104	115	100	98	107	103	99	99	87	68	99
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; -14.00 dBm.
 LO IN: 280.01 MHz; +7.00 dBm
 IF OUT: 29.91 MHz; -20.64 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	22	34	31	45	27	45	32	53	37	58
1	-	18	0	28	12	35	19	39	32	50	41	50
2	102	67	46	70	47	66	47	74	46	59	50	65
3	123	52	53	55	64	64	48	58	51	66	57	67
4	108	75	64	74	63	78	64	76	62	87	63	77
5	120	74	73	66	61	66	58	64	55	73	56	72
6	125	86	81	89	80	97	83	94	86	99	84	96
7	109	91	77	89	74	87	78	88	79	84	81	84
8	111	102	90	102	93	107	96	100	83	104	99	101
9	108	97	97	98	92	97	88	103	106	53	100	95
10	115	118	107	108	105	103	121	102	106	100	83	96
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; -4.00 dBm.
 LO IN: 280.01 MHz; +7.00 dBm
 IF OUT: 29.91 MHz; -11.12 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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