

Frequency Mixer

SBL-1MH+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+10	+13	+16
1.0	31.0	7.80	7.26	6.98
2.0	32.0	6.97	6.48	6.25
10.1	40.1	5.38	5.09	4.96
29.9	59.9	5.63	5.30	5.17
49.7	79.7	5.59	5.32	5.20
69.4	99.4	5.52	5.32	5.21
89.2	119.2	5.55	5.33	5.24
109.0	139.0	5.56	5.34	5.26
148.5	178.5	5.55	5.40	5.32
168.3	198.3	5.57	5.39	5.31
188.1	218.1	5.57	5.38	5.30
207.9	237.9	5.58	5.44	5.36
227.7	257.7	5.76	5.58	5.51
247.4	277.4	5.87	5.61	5.48
267.2	297.2	5.92	5.67	5.50
287.0	317.0	5.90	5.73	5.61
306.8	336.8	5.91	5.78	5.72
326.5	356.5	5.97	5.82	5.77
346.3	376.3	6.00	5.85	5.80
366.1	396.1	6.09	5.91	5.84
385.9	415.9	6.21	6.00	5.95
405.7	435.7	6.53	6.12	6.02
445.2	475.2	7.31	6.84	6.25
465.0	495.0	7.68	7.21	6.46
484.8	514.8	8.18	7.62	6.87
504.5	534.5	8.77	8.17	7.48
524.3	554.3	9.12	8.53	7.92
544.1	574.1	9.21	8.60	8.04
583.7	613.7	9.01	8.38	7.82
603.4	633.4	8.89	8.17	7.60
643.0	673.0	8.66	7.84	7.42
662.8	692.8	8.43	7.74	7.45
702.3	732.3	8.15	7.77	7.63
722.1	752.1	8.18	7.86	7.73
761.7	791.7	8.39	8.11	8.04
781.4	811.4	8.63	8.33	8.26
821.0	851.0	9.32	8.95	8.89
840.8	870.8	9.68	9.29	9.24
880.3	910.3	10.39	9.98	9.89
900.1	930.1	10.93	10.46	10.31

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	23.53	24.49	26.12
29.9	59.9	24.82	25.72	27.77
49.7	79.7	24.31	26.17	28.74
69.4	99.4	23.93	24.17	30.22
89.2	119.2	21.64	24.50	28.22
109.0	139.0	27.90	30.16	24.78
128.8	158.8	23.49	24.77	20.98
148.5	178.5	24.46	24.69	23.54
168.3	198.3	24.25	26.54	21.38
188.1	218.1	19.32	19.47	20.50
207.9	237.9	18.46	16.44	15.98
227.7	257.7	24.47	20.56	20.01
247.4	277.4	21.08	25.03	27.05
267.2	297.2	20.24	25.80	28.13
287.0	317.0	18.12	17.11	18.93
306.8	336.8	17.56	16.30	15.94
326.5	356.5	16.71	15.50	15.48
346.3	376.3	18.86	16.58	16.62
366.1	396.1	20.03	16.84	18.39
385.9	415.9	16.68	18.72	20.27
405.7	435.7	12.78	19.32	21.91
425.4	455.4	8.48	13.47	19.76
445.2	475.2	7.14	9.43	15.45
465.0	495.0	6.46	7.71	11.79
484.8	514.8	6.57	7.29	9.88
504.5	534.5	6.54	7.18	8.68
524.3	554.3	7.50	7.93	8.79
544.1	574.1	9.18	9.80	10.74
583.7	613.7	12.86	14.36	17.17
603.4	633.4	13.89	17.24	21.60
643.0	673.0	20.34	19.01	23.26
662.8	692.8	18.69	19.51	22.21
702.3	732.3	16.89	20.48	23.12
722.1	752.1	17.46	21.27	23.29
761.7	791.7	16.94	20.41	21.68
781.4	811.4	16.29	19.10	20.24
821.0	851.0	15.01	18.58	19.34
840.8	870.8	15.57	19.19	19.78
880.3	910.3	16.35	19.63	20.26
900.1	930.1	16.50	19.70	19.51

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+9dBm (dB)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	1.47	1.15	0.91
29.9	59.9	1.34	1.03	0.79
49.7	79.7	1.41	1.03	0.79
69.4	99.4	1.18	0.91	0.69
89.2	119.2	1.12	0.85	0.63
109.0	139.0	1.11	0.80	0.59
128.8	158.8	1.19	0.78	0.60
148.5	178.5	1.14	0.73	0.57
168.3	198.3	1.05	0.70	0.54
188.1	218.1	0.96	0.71	0.57
207.9	237.9	0.89	0.63	0.52
227.7	257.7	0.86	0.55	0.43
247.4	277.4	0.86	0.64	0.47
267.2	297.2	0.90	0.71	0.56
287.0	317.0	1.06	0.81	0.65
306.8	336.8	1.29	0.94	0.76
326.5	356.5	1.54	1.12	0.90
346.3	376.3	1.74	1.27	1.02
366.1	396.1	2.00	1.44	1.10
385.9	415.9	2.27	1.62	1.24
405.7	435.7	2.41	1.95	1.48
425.4	455.4	2.48	2.20	1.76
445.2	475.2	2.40	2.13	1.96
465.0	495.0	2.39	2.13	2.08
484.8	514.8	2.04	1.86	1.87
504.5	534.5	1.74	1.55	1.58
524.3	554.3	1.37	1.17	1.21
544.1	574.1	1.26	1.09	1.10
583.7	613.7	1.33	1.13	1.18
603.4	633.4	1.46	1.31	1.31
643.0	673.0	1.68	1.51	1.18
662.8	692.8	1.80	1.48	1.10
702.3	732.3	1.91	1.31	1.00
722.1	752.1	1.90	1.23	0.95
761.7	791.7	1.79	1.06	0.87
781.4	811.4	1.83	0.99	0.82
821.0	851.0	1.94	0.89	0.67
840.8	870.8	1.89	0.86	0.58
880.3	910.3	1.98	0.85	0.56
900.1	930.1	2.11	0.85	0.50

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)
		+13			+13			+13
240.0	10.1	5.73	10.0	20.1	5.25	490.0	10.1	7.08
234.1	16.0	5.66	22.3	32.4	5.08	477.7	22.4	6.95
228.2	21.9	5.54	34.6	44.7	5.09	465.4	34.7	6.89
222.3	27.8	5.52	46.9	57.0	5.08	453.1	47.0	6.85
216.4	33.7	5.47	59.2	69.3	5.06	440.8	59.3	6.89
210.5	39.6	5.43	71.5	81.6	5.13	428.5	71.6	6.78
204.6	45.5	5.44	83.8	93.9	5.15	416.2	83.9	6.71
198.7	51.4	5.34	96.2	106.3	5.15	403.8	96.3	6.68
192.8	57.3	5.30	108.5	118.6	5.18	391.5	108.6	6.62
186.9	63.2	5.24	120.8	130.9	5.16	379.2	120.9	6.66
181.0	69.1	5.28	133.1	143.2	5.17	366.9	133.2	6.72
175.1	75.0	5.30	145.4	155.5	5.24	354.6	145.5	6.68
169.2	80.9	5.27	157.7	167.8	5.29	342.3	157.8	6.70
163.3	86.8	5.25	170.0	180.1	5.33	330.0	170.1	6.70
157.4	92.7	5.24	182.3	192.4	5.33	317.7	182.4	6.71
151.5	98.6	5.26	194.6	204.7	5.31	305.4	194.7	6.74
145.6	104.5	5.27	206.9	217.0	5.30	293.1	207.0	6.67
139.7	110.4	5.29	219.2	229.3	5.38	280.8	219.3	6.66
133.8	116.3	5.28	231.5	241.6	5.38	268.5	231.6	6.69
127.9	122.2	5.23	243.8	253.9	5.41	256.2	243.9	6.66
122.1	128.0	5.27	256.2	266.3	5.46	243.8	256.3	6.76
116.2	133.9	5.32	268.5	278.6	5.42	231.5	268.6	6.75
110.3	139.8	5.36	280.8	290.9	5.57	219.2	280.9	6.64
104.4	145.7	5.35	293.1	303.2	5.73	206.9	293.2	6.64
98.5	151.6	5.34	305.4	315.5	5.85	194.6	305.5	6.60
92.6	157.5	5.34	317.7	327.8	5.99	182.3	317.8	6.63
86.7	163.4	5.34	330.0	340.1	5.95	170.0	330.1	6.71
80.8	169.3	5.35	342.3	352.4	5.92	157.7	342.4	6.73
74.9	175.2	5.36	354.6	364.7	5.86	145.4	354.7	6.79
69.0	181.1	5.34	366.9	377.0	5.76	133.1	367.0	6.84
63.1	187.0	5.35	379.2	389.3	5.67	120.8	379.3	6.74
57.2	192.9	5.36	391.5	401.6	5.53	108.5	391.6	6.68
51.3	198.8	5.39	403.8	413.9	5.43	96.2	403.9	6.54
45.4	204.7	5.45	416.2	426.3	5.47	83.8	416.3	6.41
39.5	210.6	5.48	428.5	438.6	5.48	71.5	428.6	6.38
33.6	216.5	5.51	440.8	450.9	5.57	59.2	440.9	6.48
27.7	222.4	5.51	453.1	463.2	5.63	46.9	453.2	6.66
21.8	228.3	5.56	465.4	475.5	5.65	34.6	465.5	7.01
15.9	234.2	5.60	477.7	487.8	5.67	22.3	477.8	7.27
10.0	240.1	5.70	490.0	500.1	5.65	10.0	490.1	7.41

Frequency Mixer

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+10	+13	+16	+10	+13	+16
1.0	65.00	66.63	67.65	60.52	59.30	58.20
2.0	64.11	65.04	67.03	59.98	58.69	58.03
10.1	71.24	72.78	73.53	63.05	61.25	59.38
29.9	63.00	64.76	66.19	61.52	60.51	59.79
49.7	58.48	60.25	62.15	60.16	59.29	58.29
69.4	55.45	57.38	59.27	58.32	57.49	57.13
89.2	53.23	55.51	57.52	56.23	55.81	56.60
109.0	51.93	54.30	56.07	53.50	54.60	56.00
148.5	49.79	52.07	53.84	50.51	53.33	54.87
168.3	48.71	51.00	52.76	49.69	52.85	54.25
188.1	47.70	49.74	51.43	49.99	53.61	55.08
207.9	47.09	49.07	50.63	48.84	52.29	53.20
227.7	47.16	49.46	51.49	47.60	50.72	51.73
247.4	46.61	48.63	50.21	48.95	52.08	52.57
267.2	46.44	48.38	50.21	49.43	51.25	50.88
287.0	45.98	48.42	50.29	48.27	50.06	49.70
306.8	44.30	46.96	49.69	48.55	47.71	45.83
326.5	43.41	45.73	47.94	49.11	47.80	45.71
346.3	42.86	45.41	47.99	49.56	47.45	45.19
366.1	42.04	44.71	47.35	51.63	46.61	43.38
385.9	41.65	44.72	48.94	52.87	47.01	41.22
405.7	43.13	47.66	51.95	54.19	43.14	38.94
445.2	44.09	48.84	53.52	60.09	44.92	38.66
465.0	43.29	46.75	49.76	45.45	43.79	38.76
484.8	43.73	49.37	56.13	41.36	40.09	37.65
504.5	44.55	48.74	52.00	39.43	37.99	36.79
524.3	44.86	51.54	57.33	36.93	35.90	35.25
544.1	44.10	47.31	49.07	35.04	34.37	33.82
583.7	43.38	44.40	43.84	32.19	32.09	32.11
603.4	44.03	46.31	47.04	30.57	30.73	30.79
643.0	45.28	45.47	42.57	27.72	28.78	27.89
662.8	47.88	45.17	39.68	26.23	27.87	25.64
702.3	53.86	44.53	38.82	23.81	24.70	22.55
722.1	57.09	43.55	38.23	22.36	23.49	21.80
761.7	41.48	42.12	36.76	19.48	21.39	20.55
781.4	37.89	40.33	36.15	18.11	20.26	19.71
821.0	32.52	35.76	33.66	16.08	18.56	18.45
840.8	30.33	33.12	32.04	15.28	17.76	18.10
880.3	28.27	30.68	30.20	14.72	16.85	17.11
900.1	27.49	29.83	29.61	14.31	16.41	16.69

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	45.73	48.81	42.27
29.9	59.9	38.95	38.39	38.59
49.7	79.7	34.25	34.76	34.88
69.4	99.4	31.83	32.19	32.23
89.2	119.2	30.25	30.54	30.84
109.0	139.0	28.99	29.40	29.78
128.8	158.8	28.14	28.26	28.58
148.5	178.5	27.69	28.08	28.34
168.3	198.3	27.38	27.94	28.30
188.1	218.1	26.86	27.67	28.49
207.9	237.9	26.49	27.04	27.67
227.7	257.7	26.55	27.09	27.44
247.4	277.4	26.80	27.25	27.49
267.2	297.2	27.15	27.76	28.14
287.0	317.0	27.79	28.47	29.30
306.8	336.8	27.63	28.20	29.07
326.5	356.5	27.17	27.77	28.45
346.3	376.3	26.40	26.94	27.80
366.1	396.1	25.34	25.79	26.33
385.9	415.9	24.49	24.46	24.51
405.7	435.7	23.34	22.90	22.75
425.4	455.4	22.88	22.47	22.20
445.2	475.2	22.10	21.89	21.73
465.0	495.0	21.74	21.65	21.67
484.8	514.8	21.44	21.47	21.56
504.5	534.5	21.35	21.36	21.37
524.3	554.3	21.77	21.84	21.83
544.1	574.1	22.03	22.07	21.84
583.7	613.7	22.31	22.18	21.58
603.4	633.4	21.81	21.56	20.75
643.0	673.0	20.41	19.80	19.39
662.8	692.8	19.69	18.97	18.44
702.3	732.3	17.98	17.29	16.92
722.1	752.1	17.38	16.65	16.21
761.7	791.7	15.91	15.08	14.57
781.4	811.4	15.18	14.36	13.76
821.0	851.0	13.75	12.99	12.37
840.8	870.8	13.14	12.42	11.83
880.3	910.3	11.90	11.27	10.82
900.1	930.1	11.36	10.76	10.40

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Frequency Mixer

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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+10	+13	+16
5.0	35.0	1.30	1.29	1.33
10.1	40.1	1.26	1.16	1.12
29.9	59.9	1.26	1.12	1.05
49.7	79.7	1.23	1.10	1.02
69.4	99.4	1.18	1.07	1.00
89.2	119.2	1.17	1.04	1.02
109.0	139.0	1.13	1.01	1.06
128.8	158.8	1.09	1.01	1.06
148.5	178.5	1.08	1.02	1.09
168.3	198.3	1.05	1.06	1.12
188.1	218.1	1.04	1.08	1.16
207.9	237.9	1.01	1.07	1.13
227.7	257.7	1.00	1.08	1.13
247.4	277.4	1.04	1.14	1.22
267.2	297.2	1.05	1.18	1.29
287.0	317.0	1.09	1.19	1.30
306.8	336.8	1.14	1.23	1.32
326.5	356.5	1.18	1.27	1.34
346.3	376.3	1.24	1.34	1.41
366.1	396.1	1.28	1.40	1.46
385.9	415.9	1.29	1.40	1.43
405.7	435.7	1.22	1.33	1.35
425.4	455.4	1.13	1.21	1.23
445.2	475.2	1.12	1.14	1.14
465.0	495.0	1.19	1.15	1.06
484.8	514.8	1.29	1.24	1.15
504.5	534.5	1.45	1.41	1.32
524.3	554.3	1.61	1.58	1.50
544.1	574.1	1.75	1.72	1.65
583.7	613.7	1.97	1.96	1.89
603.4	633.4	2.11	2.09	2.04
643.0	673.0	2.38	2.40	2.39
662.8	692.8	2.51	2.56	2.55
702.3	732.3	2.74	2.82	2.79
722.1	752.1	2.84	2.93	2.89
761.7	791.7	3.12	3.20	3.16
781.4	811.4	3.29	3.34	3.30
821.0	851.0	3.63	3.69	3.67
840.8	870.8	3.78	3.84	3.86
880.3	910.3	3.98	4.00	4.05
900.1	930.1	4.09	4.08	4.12

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+10	+13	+16
5.0	1.31	1.95	2.96
10.1	1.28	1.94	2.77
29.9	1.37	2.11	3.10
49.7	1.35	2.10	3.04
69.4	1.30	1.97	2.81
89.2	1.29	1.94	2.79
109.0	1.31	1.99	2.84
128.8	1.35	2.08	2.96
148.5	1.37	2.07	2.91
168.3	1.36	2.02	2.81
188.1	1.38	2.03	2.82
207.9	1.43	2.11	2.92
227.7	1.48	2.18	3.01
247.4	1.50	2.17	2.97
267.2	1.53	2.16	2.94
287.0	1.57	2.21	2.96
306.8	1.62	2.30	3.09
326.5	1.67	2.35	3.16
346.3	1.70	2.35	3.12
366.1	1.73	2.37	3.16
385.9	1.77	2.36	3.11
405.7	1.85	2.44	3.20
425.4	1.96	2.54	3.27
445.2	2.03	2.62	3.31
465.0	2.06	2.69	3.38
484.8	2.11	2.77	3.49
504.5	2.18	2.84	3.59
524.3	2.22	2.88	3.63
544.1	2.25	2.89	3.67
583.7	2.34	2.96	3.70
603.4	2.39	3.00	3.73
643.0	2.44	2.98	3.71
662.8	2.42	2.95	3.62
702.3	2.47	2.98	3.69
722.1	2.53	3.02	3.71
761.7	2.82	3.20	3.83
781.4	3.02	3.34	3.94
821.0	3.38	3.62	4.12
840.8	3.47	3.70	4.15
880.3	3.51	3.86	4.30
900.1	3.48	3.90	4.35

IF (OUT) (MHz)	IF VSWR @LO=500.1MHz (:1)		
	@LO (dBm)		
	+10	+13	+16
5.0	1.80	1.67	1.53
10.0	3.36	2.77	2.16
22.6	3.44	2.78	2.19
35.1	3.19	2.59	2.06
47.7	3.11	2.52	2.01
60.3	3.11	2.54	2.03
72.8	3.19	2.62	2.09
85.4	3.24	2.66	2.12
97.9	3.29	2.71	2.16
110.5	3.32	2.75	2.19
123.1	3.38	2.80	2.23
135.6	3.37	2.82	2.26
148.2	3.35	2.80	2.26
160.8	3.30	2.78	2.25
173.3	3.31	2.81	2.27
185.9	3.39	2.89	2.34
198.5	3.49	3.00	2.42
211.0	3.53	3.03	2.46
223.6	3.45	2.96	2.42
236.2	3.35	2.90	2.39
248.7	3.36	2.91	2.40
261.3	3.46	3.00	2.48
273.8	3.49	3.06	2.52
286.4	3.45	3.04	2.51
299.0	3.41	3.00	2.47
311.5	3.40	2.98	2.45
324.1	3.40	3.00	2.48
336.7	3.42	3.02	2.52
349.2	3.42	3.02	2.52
361.8	3.36	2.97	2.50
374.4	3.27	2.91	2.44
386.9	3.30	2.93	2.44
399.5	3.38	2.99	2.48
412.1	3.35	2.98	2.47
424.6	3.29	2.93	2.43
437.2	3.28	2.90	2.40
449.7	3.26	2.89	2.40
462.3	3.27	2.91	2.42
474.9	3.32	2.95	2.44
487.4	3.32	2.94	2.44
500.0	2.73	2.52	2.31

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	35	54	25	44	31	53	40	56	63	74
1	-	23	+0	32	12	37	28	49	40	55	41	61
2	86	56	58	60	64	60	49	59	48	63	50	74
3	>100	49	42	49	51	51	38	62	52	58	50	61
4	>100	75	68	67	74	67	72	68	66	77	61	75
5	>100	76	64	61	48	66	46	61	46	65	59	71
6	>100	89	82	82	78	79	78	79	74	73	87	90
7	>100	85	80	83	68	72	65	73	62	68	58	82
8	>100	96	90	93	>98	86	78	82	81	83	78	85
9	>100	84	85	95	84	88	81	74	72	78	69	75
10	>100	96	98	>98	>98	>98	>98	97	92	92	83	88
	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; +13.00 dBm

IF OUT: 29.91 MHz; -1.53 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	24	40	15	32	19	39	25	46	45	64
1	-	22	+0	30	11	37	27	44	40	46	31	48
2	>100	72	70	65	68	69	55	68	53	67	55	83
3	>100	70	63	75	56	74	57	87	64	79	62	79
4	>100	>88	>88	>88	87	>88	86	>88	83	>88	85	>88
5	>100	>88	82	>88	81	>88	78	>88	77	>88	87	>88
6	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
7	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
8	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
9	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
10	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 250.1 MHz; -6.00 dBm.

LO IN: 280.01 MHz; +13.00 dBm

IF OUT: 29.91 MHz; -11.55 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.

REV. X2

SBL-1MH+

100818

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