

Frequency Mixer

SBL-1-1+

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
0.1	30.1	6.29	5.97	5.79	10.1	40.1	15.98	16.69	18.72	10.1	40.1	1.54	1.22	0.95
0.2	30.2	5.79	5.50	5.33	30.4	60.4	15.65	16.88	19.22	30.4	60.4	1.46	1.20	0.91
0.5	30.5	5.39	5.10	4.97	50.6	80.6	16.34	17.23	19.78	50.6	80.6	1.43	1.10	0.85
1.0	31.0	5.26	5.03	4.88	70.9	100.9	16.22	16.60	25.74	70.9	100.9	1.36	1.06	0.87
2.0	32.0	5.17	4.95	4.83	91.1	121.1	15.60	17.78	20.85	91.1	121.1	1.29	1.00	0.79
5.0	35.0	5.09	4.94	4.79	111.4	141.4	19.77	18.46	15.81	111.4	141.4	1.24	0.93	0.75
10.0	40.0	5.11	4.92	4.82	131.6	161.6	14.85	22.74	21.28	131.6	161.6	1.21	0.98	0.78
30.4	60.4	5.30	5.07	4.94	151.9	181.9	18.00	16.72	13.28	151.9	181.9	1.25	0.95	0.76
50.6	80.6	5.28	5.11	4.99	172.2	202.2	18.33	14.66	14.87	172.2	202.2	1.14	0.86	0.70
91.1	121.1	5.28	5.13	5.00	192.4	222.4	11.40	9.90	10.00	192.4	222.4	1.08	0.84	0.68
111.4	141.4	5.27	5.14	5.02	212.7	242.7	15.97	12.92	12.36	212.7	242.7	1.06	0.80	0.66
131.6	161.6	5.34	5.18	5.06	232.9	262.9	16.54	19.02	22.24	232.9	262.9	1.16	0.88	0.68
151.9	181.9	5.37	5.20	5.08	253.2	283.2	16.80	19.06	26.35	253.2	283.2	1.16	0.93	0.75
172.2	202.2	5.38	5.21	5.08	273.4	303.4	10.84	9.95	11.14	273.4	303.4	1.34	1.06	0.84
212.7	242.7	5.54	5.37	5.21	293.7	323.7	8.84	8.15	8.68	293.7	323.7	1.47	1.15	0.95
232.9	262.9	5.61	5.39	5.21	313.9	343.9	7.32	7.33	7.92	313.9	343.9	1.62	1.29	1.08
253.2	283.2	5.70	5.48	5.30	334.2	364.2	7.29	8.48	10.12	334.2	364.2	1.84	1.42	1.16
273.4	303.4	5.73	5.60	5.47	354.5	384.5	9.58	12.33	15.29	354.5	384.5	2.02	1.51	1.25
293.7	323.7	5.80	5.68	5.59	374.7	404.7	8.78	14.76	19.83	374.7	404.7	2.20	1.70	1.44
334.2	364.2	6.03	5.86	5.74	395.0	425.0	6.71	13.21	21.90	395.0	425.0	2.26	1.94	1.65
354.5	384.5	6.17	5.96	5.84	415.2	445.2	3.99	8.35	17.03	415.2	445.2	2.46	2.23	2.02
374.7	404.7	6.39	6.06	5.87	435.5	465.5	3.29	5.93	10.39	435.5	465.5	2.33	2.19	2.08
395.0	425.0	6.66	6.18	5.88	455.7	485.7	3.18	5.15	7.83	455.7	485.7	2.35	2.16	2.08
415.2	445.2	7.03	6.39	5.86	476.0	506.0	4.00	5.92	8.91	476.0	506.0	2.24	2.08	2.02
455.7	485.7	7.48	6.89	6.28	496.3	526.3	4.15	5.79	8.85	496.3	526.3	2.12	1.91	1.83
476.0	506.0	7.56	7.00	6.45	516.5	546.5	5.09	7.03	11.54	516.5	546.5	2.03	1.75	1.60
496.3	526.3	7.80	7.34	6.82	536.8	566.8	6.28	8.80	15.13	536.8	566.8	2.01	1.71	1.47
516.5	546.5	7.87	7.51	7.13	557.0	587.0	7.42	10.24	15.60	557.0	587.0	1.96	1.61	1.33
536.8	566.8	7.81	7.47	7.19	577.3	607.3	7.47	10.89	14.67	577.3	607.3	1.95	1.50	1.24
577.3	607.3	7.76	7.50	7.32	597.5	627.5	7.35	9.86	11.87	597.5	627.5	1.95	1.44	1.14
597.5	627.5	7.76	7.54	7.39	617.8	647.8	7.31	10.04	10.84	617.8	647.8	1.86	1.31	1.00
617.8	647.8	7.84	7.65	7.54	638.0	668.0	7.82	10.22	11.02	638.0	668.0	1.79	1.23	0.93
638.0	668.0	7.91	7.75	7.66	658.3	688.3	8.03	12.18	12.28	658.3	688.3	1.68	1.15	0.84
658.3	688.3	8.07	7.94	7.91	678.6	708.6	8.59	11.59	12.80	678.6	708.6	1.67	1.11	0.80
698.8	728.8	8.65	8.52	8.51	698.8	728.8	8.96	9.74	10.37	698.8	728.8	1.69	1.15	0.83
719.1	749.1	9.03	8.92	8.88	719.1	749.1	8.41	8.25	8.65	719.1	749.1	1.68	1.14	0.87
739.3	769.3	9.41	9.29	9.24	739.3	769.3	7.97	7.36	7.98	739.3	769.3	1.73	1.20	0.97
759.6	789.6	9.86	9.70	9.61	759.6	789.6	8.05	7.86	7.55	759.6	789.6	1.74	1.29	1.10
779.8	809.8	10.37	10.14	9.99	779.8	809.8	7.95	8.10	8.30	779.8	809.8	1.81	1.32	1.14
800.1	830.1	10.98	10.72	10.54	800.1	830.1	8.24	8.58	8.69	800.1	830.1	1.80	1.30	1.08



Frequency Mixer

SBL-1-1+

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=200.1MHz (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)=400.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+7			+7			+7
190.0	10.1	5.36	10.0	20.1	4.88	390.0	10.1	6.49
185.4	14.7	5.31	19.7	29.8	4.94	380.3	19.8	6.42
180.8	19.3	5.27	29.5	39.6	4.87	370.5	29.6	6.34
176.2	23.9	5.20	39.2	49.3	4.89	360.8	39.3	6.29
171.5	28.6	5.18	49.0	59.1	4.90	351.0	49.1	6.24
166.9	33.2	5.13	58.7	68.8	4.89	341.3	58.8	6.19
162.3	37.8	5.13	68.5	78.6	4.96	331.5	68.6	6.17
157.7	42.4	5.12	78.2	88.3	4.97	321.8	78.3	6.17
153.1	47.0	5.13	87.9	98.0	4.99	312.1	88.0	6.13
148.5	51.6	5.10	97.7	107.8	4.95	302.3	97.8	6.10
143.8	56.3	5.10	107.4	117.5	4.98	292.6	107.5	6.09
139.2	60.9	5.10	117.2	127.3	5.00	282.8	117.3	6.07
134.6	65.5	5.09	126.9	137.0	4.99	273.1	127.0	6.07
130.0	70.1	5.09	136.7	146.8	5.02	263.3	136.8	6.07
125.4	74.7	5.11	146.4	156.5	5.06	253.6	146.5	6.10
120.8	79.3	5.11	156.2	166.3	5.12	243.8	156.3	6.09
116.2	83.9	5.10	165.9	176.0	5.13	234.1	166.0	6.09
111.5	88.6	5.10	175.6	185.7	5.15	224.4	175.7	6.09
106.9	93.2	5.10	185.4	195.5	5.15	214.6	185.5	6.10
102.3	97.8	5.08	195.1	205.2	5.11	204.9	195.2	6.08
97.7	102.4	5.09	204.9	215.0	5.14	195.1	205.0	6.12
93.1	107.0	5.10	214.6	224.7	5.17	185.4	214.7	6.15
88.5	111.6	5.11	224.4	234.5	5.18	175.6	224.5	6.16
83.8	116.3	5.12	234.1	244.2	5.18	165.9	234.2	6.15
79.2	120.9	5.11	243.8	253.9	5.24	156.2	243.9	6.19
74.6	125.5	5.12	253.6	263.7	5.31	146.4	253.7	6.21
70.0	130.1	5.12	263.3	273.4	5.42	136.7	263.4	6.19
65.4	134.7	5.13	273.1	283.2	5.54	126.9	273.2	6.21
60.8	139.3	5.15	282.8	292.9	5.68	117.2	282.9	6.22
56.2	143.9	5.14	292.6	302.7	5.70	107.4	292.7	6.19
51.5	148.6	5.15	302.3	312.4	5.77	97.7	302.4	6.22
46.9	153.2	5.17	312.1	322.2	5.78	87.9	312.2	6.26
42.3	157.8	5.16	321.8	331.9	5.69	78.2	321.9	6.24
37.7	162.4	5.18	331.5	341.6	5.67	68.5	331.6	6.22
33.1	167.0	5.19	341.3	351.4	5.56	58.7	341.4	6.24
28.5	171.6	5.21	351.0	361.1	5.48	49.0	351.1	6.22
23.8	176.3	5.23	360.8	370.9	5.50	39.2	360.9	6.16
19.2	180.9	5.20	370.5	380.6	5.39	29.5	370.6	6.09
14.6	185.5	5.28	380.3	390.4	5.34	19.7	380.4	6.06
10.0	190.1	5.18	390.0	400.1	5.39	10.0	390.1	5.95



Frequency Mixer

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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
0.1	64.00	67.00	70.00	64.00	67.00	70.00
0.2	64.00	67.00	70.00	64.00	67.00	70.00
0.5	64.00	67.00	70.00	64.00	60.77	58.85
1.0	64.00	67.00	70.00	64.00	61.39	59.31
2.0	64.00	67.00	70.00	64.00	61.65	59.31
5.0	64.00	67.00	70.00	64.00	62.29	59.84
10.0	64.00	67.00	60.40	64.00	61.63	57.18
30.4	67.24	68.37	69.58	55.68	55.94	55.89
50.6	63.05	64.91	66.87	52.51	52.69	52.74
91.1	58.68	60.49	62.24	48.63	48.58	49.12
111.4	57.43	59.63	61.36	48.00	48.00	47.69
131.6	56.75	58.34	59.81	47.04	47.44	46.32
151.9	56.14	58.55	60.22	46.51	46.08	45.73
172.2	53.81	55.72	57.57	46.45	45.53	44.93
212.7	56.03	58.99	61.12	45.56	44.33	42.74
232.9	54.54	56.65	57.96	43.81	42.81	41.90
253.2	53.09	55.63	57.73	41.72	40.48	39.42
273.4	50.95	53.69	55.70	38.90	37.69	36.74
293.7	48.76	51.45	54.35	38.51	37.08	35.90
334.2	48.48	51.49	53.92	37.09	35.31	34.47
354.5	51.72	55.40	52.42	36.84	34.04	32.13
374.7	55.35	52.94	49.42	35.33	32.26	30.43
395.0	55.95	49.41	46.31	33.86	31.24	29.72
415.2	54.86	49.76	47.32	33.01	30.48	29.06
455.7	53.30	49.28	45.76	30.62	28.48	26.44
476.0	54.83	48.88	44.71	29.64	28.19	26.04
496.3	51.59	47.78	44.07	28.19	27.12	25.41
516.5	50.72	45.74	42.33	27.60	26.89	25.23
536.8	48.83	43.88	40.48	26.59	26.30	24.84
577.3	46.33	40.68	36.64	24.33	23.85	21.81
597.5	44.58	39.00	35.12	23.18	22.55	20.07
617.8	41.05	36.23	32.66	21.89	21.03	18.68
638.0	39.03	34.64	31.52	20.58	19.47	17.44
658.3	35.73	32.25	29.64	19.17	18.12	16.44
698.8	30.20	28.26	26.57	16.32	15.62	14.46
719.1	28.36	26.72	25.39	15.12	14.64	13.71
739.3	26.88	25.61	24.46	14.49	14.04	13.17
759.6	25.73	24.42	23.41	14.04	13.49	12.60
779.8	25.02	23.71	22.70	13.71	12.92	12.05
800.1	24.36	23.23	22.09	13.37	12.67	11.79

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	41.65	41.80	44.05
30.4	60.4	37.05	36.46	36.37
50.6	80.6	32.69	33.29	32.82
70.9	100.9	30.38	30.49	30.59
91.1	121.1	28.98	29.22	29.53
111.4	141.4	27.89	28.09	28.48
131.6	161.6	27.19	27.53	27.60
151.9	181.9	27.27	27.74	27.89
172.2	202.2	26.71	27.61	28.35
192.4	222.4	26.60	27.21	27.79
212.7	242.7	26.02	26.46	26.81
232.9	262.9	26.24	26.71	27.23
253.2	283.2	26.94	27.77	28.49
273.4	303.4	26.77	27.62	28.24
293.7	323.7	26.43	26.99	27.64
313.9	343.9	24.80	25.36	25.72
334.2	364.2	23.03	23.25	23.36
354.5	384.5	21.45	21.43	21.29
374.7	404.7	20.37	20.19	20.06
395.0	425.0	19.71	19.60	19.57
415.2	445.2	19.45	19.54	19.65
435.5	465.5	19.08	19.33	19.57
455.7	485.7	18.94	19.12	19.28
476.0	506.0	19.03	19.04	19.00
496.3	526.3	18.71	18.61	18.38
516.5	546.5	18.43	18.26	18.09
536.8	566.8	17.75	17.35	16.90
557.0	587.0	17.01	16.60	16.34
577.3	607.3	16.22	15.85	15.51
597.5	627.5	15.77	15.42	15.00
617.8	647.8	15.19	14.72	14.05
638.0	668.0	14.51	13.95	13.18
658.3	688.3	13.55	12.94	12.18
678.6	708.6	12.59	11.91	11.26
698.8	728.8	11.63	11.00	10.46
719.1	749.1	10.78	10.20	9.69
739.3	769.3	10.22	9.64	9.13
759.6	789.6	9.63	9.11	8.69
779.8	809.8	9.29	8.87	8.48
800.1	830.1	8.84	8.43	8.12



Frequency Mixer

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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+4	+7	+10
5.0	35.0	1.38	1.27	1.20
10.0	40.0	1.38	1.27	1.20
30.4	60.4	1.22	1.12	1.06
50.6	80.6	1.21	1.11	1.05
70.9	100.9	1.16	1.08	1.04
91.1	121.1	1.13	1.06	1.04
111.4	141.4	1.10	1.06	1.07
131.6	161.6	1.10	1.07	1.09
151.9	181.9	1.09	1.09	1.12
172.2	202.2	1.11	1.15	1.20
192.4	222.4	1.12	1.15	1.18
212.7	242.7	1.14	1.18	1.22
232.9	262.9	1.16	1.25	1.32
253.2	283.2	1.21	1.30	1.40
273.4	303.4	1.27	1.36	1.43
293.7	323.7	1.34	1.42	1.49
313.9	343.9	1.40	1.49	1.56
334.2	364.2	1.43	1.53	1.59
354.5	384.5	1.45	1.52	1.57
374.7	404.7	1.36	1.42	1.46
395.0	425.0	1.25	1.31	1.34
435.5	465.5	1.06	1.07	1.14
455.7	485.7	1.08	1.04	1.10
476.0	506.0	1.21	1.19	1.21
496.3	526.3	1.34	1.33	1.36
516.5	546.5	1.50	1.53	1.57
536.8	566.8	1.66	1.71	1.77
557.0	587.0	1.86	1.93	2.01
577.3	607.3	2.07	2.17	2.25
597.5	627.5	2.27	2.37	2.45
617.8	647.8	2.49	2.58	2.65
638.0	668.0	2.65	2.72	2.79
658.3	688.3	2.81	2.87	2.93
678.6	708.6	2.95	2.99	3.05
698.8	728.8	3.08	3.11	3.16
719.1	749.1	3.20	3.22	3.25
739.3	769.3	3.29	3.28	3.29
759.6	789.6	3.35	3.30	3.30
779.8	809.8	3.42	3.37	3.35
800.1	830.1	3.54	3.50	3.47

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+4	+7	+10
5.0	1.50	2.30	3.45
10.0	1.42	2.24	3.20
30.4	1.89	2.79	3.95
50.6	1.80	2.61	3.67
70.9	1.71	2.44	3.37
91.1	1.71	2.43	3.34
111.4	1.78	2.56	3.54
131.6	1.83	2.63	3.63
151.9	1.80	2.56	3.48
172.2	1.79	2.51	3.40
192.4	1.84	2.57	3.48
212.7	1.93	2.71	3.67
232.9	1.97	2.75	3.71
253.2	1.96	2.70	3.60
273.4	2.00	2.73	3.63
293.7	2.09	2.87	3.81
313.9	2.18	2.99	3.96
334.2	2.21	3.00	3.95
354.5	2.21	2.96	3.88
374.7	2.27	3.01	3.94
395.0	2.40	3.16	4.11
435.5	2.59	3.37	4.28
455.7	2.64	3.43	4.34
476.0	2.73	3.56	4.50
496.3	2.84	3.69	4.66
516.5	2.90	3.75	4.72
536.8	2.92	3.75	4.69
557.0	2.96	3.78	4.70
577.3	3.04	3.85	4.77
597.5	3.10	3.89	4.75
617.8	3.10	3.84	4.66
638.0	3.09	3.77	4.55
658.3	3.11	3.76	4.52
678.6	3.19	3.82	4.56
698.8	3.27	3.88	4.59
719.1	3.37	3.93	4.59
739.3	3.48	4.00	4.61
759.6	3.57	4.07	4.63
779.8	3.62	4.10	4.64
800.1	3.62	4.10	4.62

IF (OUT) (MHz)	IF VSWR @LO=400.1MHz (:1)		
	@LO (dBm)		
	+4	+7	+10
10.0	1.80	1.55	1.37
20.0	1.86	1.56	1.41
30.0	1.97	1.69	1.52
40.0	2.00	1.72	1.56
50.0	2.03	1.76	1.60
60.0	2.01	1.73	1.59
70.0	2.02	1.73	1.59
80.0	1.99	1.71	1.59
90.0	2.08	1.78	1.63
100.0	2.11	1.82	1.66
110.0	2.12	1.84	1.68
120.0	2.11	1.83	1.69
130.0	2.12	1.85	1.71
140.0	2.13	1.88	1.74
150.0	2.19	1.93	1.80
160.0	2.26	1.99	1.86
170.0	2.29	2.04	1.90
180.0	2.29	2.02	1.89
190.0	2.24	2.00	1.86
200.0	2.23	1.97	1.84
210.0	2.24	1.98	1.86
220.0	2.29	2.03	1.91
230.0	2.33	2.09	1.97
240.0	2.38	2.13	2.01
250.0	2.39	2.15	2.03
260.0	2.37	2.13	2.01
270.0	2.32	2.09	1.97
280.0	2.32	2.09	1.96
290.0	2.36	2.11	1.98
300.0	2.40	2.17	2.04
310.0	2.42	2.19	2.07
320.0	2.42	2.18	2.06
330.0	2.39	2.16	2.05
340.0	2.39	2.16	2.05
350.0	2.40	2.18	2.06
360.0	2.44	2.20	2.08
370.0	2.46	2.23	2.10
380.0	2.48	2.25	2.12
390.0	2.45	2.23	2.11
400.0	2.47	2.29	2.18

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	16	32	15	36	18	39	25	48	35	55
1	-	22	+0	30	12	48	21	44	34	52	41	51
2	>100	71	50	69	50	67	48	66	57	72	62	74
3	>100	65	54	65	57	70	53	67	68	73	66	80
4	>100	>81	>81	>81	>81	>81	>81	>81	78	>81	>81	>81
5	>100	>81	>81	>81	>81	79	>81	>81	>81	>81	>81	>81
6	>100	>81	>81	>81	>81	>81	76	>81	>81	>81	>81	>81
7	>100	>81	>81	>81	>81	>81	>81	68	81	>81	>81	>81
8	>100	>81	>81	>81	>81	>81	>81	>81	57	>81	>81	>81
9	>100	>81	>81	>81	>81	>81	>81	>81	>81	71	>81	>81
10	>100	>81	>81	>81	>81	>81	>81	>81	>81	>81	79	>81
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 200.1 MHz; -14.00 dBm.
 LO IN: 230.01 MHz; +7.00 dBm
 IF OUT: 29.91 MHz; -19.3 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	25	44	27	46	29	51	37	57	49	73
1	-	23	+0	32	12	44	24	52	36	60	46	58
2	99	61	45	65	47	61	50	66	56	65	56	74
3	>100	48	36	48	40	51	35	58	44	57	51	66
4	>100	76	62	84	60	81	59	74	55	75	71	81
5	>100	85	65	74	52	66	50	65	54	63	83	69
6	>100	88	73	86	72	81	81	83	75	87	68	84
7	>100	>91	73	89	66	75	64	78	62	>91	60	76
8	>100	>91	>91	>91	90	>91	90	>91	68	>91	88	>91
9	>100	>91	87	>91	85	90	80	89	83	>91	82	>91
10	>100	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 200.1 MHz; -4.00 dBm.
 LO IN: 230.01 MHz; +7.00 dBm
 IF OUT: 29.91 MHz; -9.42 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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