

Frequency Mixer

SBL-3+

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	+4	+7	+10			
0.03	30.0	9.03	8.41	8.05	10.1	40.1	15.62	15.45	14.85	10.1	40.1	0.37	0.18	0.08
0.04	30.0	7.34	6.80	6.48	21.4	51.4	16.02	15.63	14.40	21.4	51.4	0.22	0.10	0.03
0.05	30.1	6.79	6.31	6.01	32.7	62.7	14.19	13.84	13.14	32.7	62.7	0.33	0.18	0.05
0.10	30.1	5.94	5.51	5.27	43.9	73.9	13.81	13.16	13.28	43.9	73.9	0.28	0.07	0.06
0.2	30.2	5.67	5.27	5.02	55.2	85.2	13.65	12.41	14.31	55.2	85.2	0.33	0.16	0.08
0.5	30.5	5.53	5.15	4.92	66.5	96.5	11.89	12.21	15.62	66.5	96.5	0.22	0.14	0.08
1.0	31.0	5.38	4.98	4.80	77.8	107.8	11.05	11.54	14.61	77.8	107.8	0.37	0.15	0.07
2.0	32.0	5.27	4.89	4.71	89.1	119.1	10.86	14.36	24.33	89.1	119.1	0.35	0.15	0.08
5.0	35.0	5.26	4.86	4.70	100.4	130.4	11.76	19.58	14.84	100.4	130.4	0.44	0.19	0.11
10.0	40.0	5.34	4.93	4.75	111.6	141.6	11.56	18.95	15.74	111.6	141.6	0.31	0.22	0.14
21.4	51.4	5.31	4.86	4.71	122.9	152.9	10.47	14.54	18.95	122.9	152.9	0.35	0.19	0.16
43.9	73.9	5.44	5.03	4.86	134.2	164.2	10.03	13.88	15.00	134.2	164.2	0.29	0.15	0.13
55.2	85.2	5.33	4.98	4.80	145.5	175.5	10.09	15.41	15.30	145.5	175.5	0.42	0.16	0.11
66.5	96.5	5.30	4.99	4.85	156.8	186.8	10.51	20.30	18.59	156.8	186.8	0.46	0.19	0.13
77.8	107.8	5.30	5.02	4.87	168.0	198.0	10.04	21.93	16.03	168.0	198.0	0.48	0.23	0.14
100.4	130.4	5.32	4.93	4.80	179.3	209.3	12.44	16.45	12.13	179.3	209.3	0.49	0.28	0.14
111.6	141.6	5.39	4.98	4.81	190.6	220.6	14.92	12.45	11.22	190.6	220.6	0.53	0.38	0.14
122.9	152.9	5.47	5.10	4.91	201.9	231.9	8.95	10.61	11.41	201.9	231.9	0.53	0.48	0.21
134.2	164.2	5.52	5.21	5.03	213.2	243.2	6.52	7.32	10.99	213.2	243.2	0.49	0.45	0.31
156.8	186.8	5.64	5.32	5.17	224.5	254.5	4.93	4.41	6.50	224.5	254.5	0.52	0.43	0.31
168.0	198.0	5.73	5.32	5.17	235.7	265.7	4.38	3.62	3.90	235.7	265.7	0.63	0.54	0.39
179.3	209.3	5.82	5.39	5.27	247.0	277.0	4.40	3.74	3.87	247.0	277.0	0.66	0.53	0.39
190.6	220.6	5.94	5.47	5.36	258.3	288.3	4.80	4.26	4.60	258.3	288.3	0.76	0.59	0.44
213.2	243.2	6.28	5.91	5.61	269.6	299.6	5.30	4.73	5.48	269.6	299.6	0.68	0.46	0.32
224.5	254.5	6.53	6.15	5.90	280.9	310.9	5.11	4.64	5.15	280.9	310.9	0.75	0.53	0.41
235.7	265.7	6.52	6.15	5.95	292.2	322.2	5.68	5.28	5.56	292.2	322.2	0.61	0.43	0.33
247.0	277.0	6.60	6.29	6.13	303.4	333.4	5.91	5.10	5.93	303.4	333.4	0.67	0.54	0.41
269.6	299.6	6.80	6.53	6.31	314.7	344.7	7.21	6.06	7.00	314.7	344.7	0.67	0.52	0.38
280.9	310.9	6.79	6.46	6.28	326.0	356.0	6.89	5.79	8.03	326.0	356.0	0.77	0.68	0.46
292.2	322.2	7.05	6.73	6.53	337.3	367.3	7.61	6.57	9.62	337.3	367.3	0.72	0.64	0.38
303.4	333.4	7.05	6.67	6.50	348.6	378.6	7.41	7.54	11.31	348.6	378.6	0.81	0.77	0.46
326.0	356.0	7.34	6.73	6.65	359.8	389.8	8.20	9.14	12.75	359.8	389.8	0.80	0.77	0.42
337.3	367.3	7.55	7.02	6.94	371.1	401.1	8.09	9.44	11.07	371.1	401.1	1.01	0.85	0.50
348.6	378.6	7.62	6.99	6.98	382.4	412.4	8.25	9.11	11.13	382.4	412.4	0.97	0.78	0.45
359.8	389.8	7.93	7.37	7.39	393.7	423.7	7.39	9.20	11.01	393.7	423.7	0.99	0.78	0.43
382.4	412.4	8.64	7.93	8.12	405.0	435.0	6.89	10.37	10.80	405.0	435.0	0.99	0.66	0.36
393.7	423.7	9.06	8.30	8.53	416.3	446.3	5.97	9.56	8.23	416.3	446.3	1.07	0.66	0.38
405.0	435.0	9.70	8.94	9.23	427.5	457.5	5.28	9.70	7.90	427.5	457.5	1.32	0.71	0.47
438.8	468.8	11.51	10.21	10.43	438.8	468.8	4.62	10.83	8.51	438.8	468.8	1.47	0.86	0.66
450.1	480.1	12.29	10.75	10.86	450.1	480.1	4.50	10.32	10.01	450.1	480.1	1.81	1.10	0.82

REV. X2

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=100.1MHz (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)=200.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+7			+7			+7
90.0	10.1	5.36	10.0	20.1	4.78	190.0	10.1	6.45
87.9	12.2	5.32	14.6	24.7	4.68	185.4	14.7	6.42
85.9	14.2	5.34	19.2	29.3	4.62	180.8	19.3	6.30
83.8	16.3	5.30	23.8	33.9	4.61	176.2	23.9	6.19
81.8	18.3	5.26	28.5	38.6	4.60	171.5	28.6	6.11
79.7	20.4	5.22	33.1	43.2	4.69	166.9	33.2	5.99
77.7	22.4	5.17	37.7	47.8	4.67	162.3	37.8	5.92
75.6	24.5	5.17	42.3	52.4	4.73	157.7	42.4	5.92
73.6	26.5	5.18	46.9	57.0	4.77	153.1	47.0	5.89
71.5	28.6	5.17	51.5	61.6	4.76	148.5	51.6	5.86
69.5	30.6	5.16	56.2	66.3	4.74	143.8	56.3	5.85
67.4	32.7	5.14	60.8	70.9	4.80	139.2	60.9	5.77
65.4	34.7	5.09	65.4	75.5	4.84	134.6	65.5	5.73
63.3	36.8	5.07	70.0	80.1	4.81	130.0	70.1	5.74
61.3	38.8	5.06	74.6	84.7	4.90	125.4	74.7	5.73
59.2	40.9	5.04	79.2	89.3	4.96	120.8	79.3	5.71
57.2	42.9	5.06	83.8	93.9	4.95	116.2	83.9	5.68
55.1	45.0	5.05	88.5	98.6	4.92	111.5	88.6	5.66
53.1	47.0	5.02	93.1	103.2	5.00	106.9	93.2	5.60
51.0	49.1	4.91	97.7	107.8	5.01	102.3	97.8	5.51
49.0	51.1	4.93	102.3	112.4	5.03	97.7	102.4	5.53
46.9	53.2	4.98	106.9	117.0	5.08	93.1	107.0	5.55
44.9	55.2	4.99	111.5	121.6	5.05	88.5	111.6	5.58
42.8	57.3	4.98	116.2	126.3	5.03	83.8	116.3	5.58
40.8	59.3	5.00	120.8	130.9	5.03	79.2	120.9	5.58
38.7	61.4	5.01	125.4	135.5	5.05	74.6	125.5	5.54
36.7	63.4	5.01	130.0	140.1	5.06	70.0	130.1	5.55
34.6	65.5	5.00	134.6	144.7	5.18	65.4	134.7	5.58
32.6	67.5	4.99	139.2	149.3	5.32	60.8	139.3	5.61
30.5	69.6	4.98	143.8	153.9	5.41	56.2	143.9	5.60
28.5	71.6	4.99	148.5	158.6	5.55	51.5	148.6	5.63
26.4	73.7	4.98	153.1	163.2	5.61	46.9	153.2	5.58
24.4	75.7	4.97	157.7	167.8	5.67	42.3	157.8	5.54
22.3	77.8	4.97	162.3	172.4	5.75	37.7	162.4	5.52
20.3	79.8	5.00	166.9	177.0	5.81	33.1	167.0	5.50
18.2	81.9	4.96	171.5	181.6	5.88	28.5	171.6	5.53
16.2	83.9	5.00	176.2	186.3	5.95	23.8	176.3	5.53
14.1	86.0	5.02	180.8	190.9	5.90	19.2	180.9	5.46
12.1	88.0	5.05	185.4	195.5	5.93	14.6	185.5	5.55
10.0	90.1	5.09	190.0	200.1	5.95	10.0	190.1	5.64

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+4	+7	+10	+4	+7	+10
0.03	68.38	70.32	73.64	71.48	73.42	79.24
0.04	64.91	68.24	72.87	70.01	73.04	81.87
0.05	64.32	68.06	72.79	69.72	73.56	83.69
0.10	63.53	67.57	72.70	69.83	74.37	88.60
0.2	63.80	67.72	72.52	69.80	74.82	91.52
0.5	63.65	67.66	72.44	70.15	75.16	95.14
1.0	63.35	67.06	71.74	69.95	74.46	89.64
2.0	63.09	66.83	71.61	69.19	74.03	87.01
5.0	63.12	66.56	70.96	68.22	72.56	82.86
10.0	62.81	66.04	69.84	66.21	69.54	77.34
21.4	70.33	70.26	69.93	63.20	61.01	59.47
43.9	65.22	67.52	68.78	56.46	56.34	56.12
55.2	62.59	65.88	67.90	52.23	53.47	54.32
66.5	60.87	63.72	66.70	49.88	51.64	52.92
77.8	61.24	66.65	69.26	47.99	49.31	51.01
100.4	57.53	58.52	60.47	44.74	46.80	49.13
111.6	61.33	66.90	67.76	44.01	45.41	47.21
122.9	58.58	74.47	66.94	43.55	45.12	46.53
134.2	53.95	60.99	59.32	43.47	45.30	46.27
156.8	48.86	52.03	56.43	42.89	45.25	46.86
168.0	46.83	49.86	53.54	41.12	43.21	44.36
179.3	46.39	49.62	53.88	39.66	41.86	42.75
190.6	46.23	49.28	53.13	38.75	41.06	41.69
213.2	47.20	51.64	60.08	37.75	40.49	39.17
224.5	49.28	55.83	52.36	40.02	41.26	37.83
235.7	51.37	57.79	51.66	43.24	42.40	37.84
247.0	53.10	61.20	54.82	44.47	43.13	38.72
269.6	51.42	52.16	49.83	38.96	37.16	35.33
280.9	52.59	51.93	49.31	38.14	36.11	34.22
292.2	54.14	50.67	46.54	38.19	35.91	34.04
303.4	57.11	49.88	44.62	38.04	35.14	32.94
326.0	54.30	48.30	40.56	37.26	34.86	30.04
337.3	46.74	44.00	36.98	35.52	34.71	27.96
348.6	42.24	41.24	33.67	32.76	32.60	25.24
359.8	38.65	38.50	31.63	29.98	30.30	23.52
382.4	32.50	32.94	28.02	25.75	26.55	21.65
393.7	29.94	30.76	26.42	23.99	25.35	20.77
405.0	27.47	28.52	25.06	22.22	23.67	19.91
438.8	22.86	22.82	21.55	19.57	19.69	17.85
450.1	22.66	21.96	20.91	19.94	19.39	17.66

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	32.15	34.55	34.02
21.4	51.4	29.36	29.37	28.91
32.7	62.7	26.03	26.55	26.88
43.9	73.9	24.32	24.82	25.27
55.2	85.2	23.36	23.78	24.16
66.5	96.5	22.62	23.15	23.46
77.8	107.8	22.23	22.96	23.68
89.1	119.1	21.64	22.81	23.67
100.4	130.4	21.34	22.34	23.17
111.6	141.6	21.53	22.46	23.16
122.9	152.9	21.85	22.61	23.24
134.2	164.2	22.45	23.19	23.64
145.5	175.5	23.15	24.08	24.49
156.8	186.8	21.74	22.68	23.08
168.0	198.0	19.97	20.62	21.07
179.3	209.3	18.33	18.82	19.15
190.6	220.6	16.83	17.17	17.34
201.9	231.9	15.73	15.96	16.19
213.2	243.2	15.02	15.15	15.35
224.5	254.5	14.41	14.48	14.69
235.7	265.7	14.25	14.13	14.34
247.0	277.0	13.97	13.85	13.91
258.3	288.3	13.67	13.52	13.58
269.6	299.6	13.68	13.52	13.73
280.9	310.9	13.44	13.28	13.52
292.2	322.2	13.58	13.49	13.71
303.4	333.4	13.41	13.34	13.55
314.7	344.7	13.37	13.27	13.34
326.0	356.0	12.94	12.84	12.74
337.3	367.3	12.63	12.38	12.02
348.6	378.6	12.18	11.70	11.28
359.8	389.8	11.43	10.96	10.50
371.1	401.1	10.92	10.35	9.73
382.4	412.4	10.21	9.56	8.91
393.7	423.7	9.59	8.73	8.24
405.0	435.0	8.76	7.83	7.44
416.3	446.3	8.03	7.08	6.67
427.5	457.5	7.41	6.51	6.17
438.8	468.8	6.98	6.21	5.95
450.1	480.1	6.51	5.98	5.73

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=200.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+4	+7	+10		+4	+7	+10		+4	+7	+10
5.0	35.0	1.67	1.44	1.28	5.0	1.25	1.33	2.01	5.0	1.78	1.61	1.51
10.0	40.0	1.68	1.45	1.29	10.0	1.25	1.32	1.99	10.0	1.79	1.63	1.52
21.4	51.4	1.54	1.31	1.19	21.4	1.04	1.55	2.28	14.9	1.99	1.81	1.65
32.7	62.7	1.52	1.33	1.21	32.7	1.06	1.57	2.38	19.7	2.04	1.85	1.68
43.9	73.9	1.49	1.30	1.19	43.9	1.06	1.58	2.34	24.6	2.07	1.85	1.70
55.2	85.2	1.43	1.26	1.15	55.2	1.08	1.55	2.25	29.5	2.06	1.87	1.70
66.5	96.5	1.41	1.23	1.13	66.5	1.09	1.51	2.18	34.4	2.09	1.88	1.74
77.8	107.8	1.38	1.20	1.10	77.8	1.08	1.49	2.13	39.2	2.06	1.87	1.71
89.1	119.1	1.37	1.18	1.08	89.1	1.10	1.51	2.20	44.1	2.08	1.87	1.75
100.4	130.4	1.32	1.13	1.05	100.4	1.15	1.53	2.17	49.0	2.09	1.90	1.75
111.6	141.6	1.31	1.11	1.02	111.6	1.15	1.56	2.24	53.8	2.10	1.88	1.74
122.9	152.9	1.30	1.13	1.02	122.9	1.16	1.59	2.28	58.7	2.12	1.91	1.76
134.2	164.2	1.27	1.12	1.05	134.2	1.18	1.60	2.28	63.6	2.17	1.94	1.78
145.5	175.5	1.21	1.08	1.06	145.5	1.21	1.62	2.25	68.5	2.17	1.96	1.81
156.8	186.8	1.15	1.05	1.09	156.8	1.22	1.62	2.24	73.3	2.22	1.98	1.82
168.0	198.0	1.11	1.07	1.17	168.0	1.22	1.60	2.21	78.2	2.27	2.05	1.89
179.3	209.3	1.12	1.10	1.21	179.3	1.25	1.61	2.27	83.1	2.33	2.08	1.92
190.6	220.6	1.16	1.10	1.23	190.6	1.28	1.63	2.23	87.9	2.38	2.14	1.98
201.9	231.9	1.24	1.09	1.22	201.9	1.31	1.67	2.28	92.8	2.45	2.20	2.03
213.2	243.2	1.28	1.11	1.18	213.2	1.34	1.72	2.31	97.7	2.48	2.26	2.08
224.5	254.5	1.36	1.19	1.12	224.5	1.36	1.76	2.34	102.6	2.53	2.30	2.12
235.7	265.7	1.36	1.20	1.12	235.7	1.36	1.80	2.35	107.4	2.55	2.34	2.17
247.0	277.0	1.38	1.25	1.16	247.0	1.35	1.80	2.37	112.3	2.54	2.36	2.19
258.3	288.3	1.36	1.23	1.16	258.3	1.33	1.80	2.38	117.2	2.60	2.37	2.22
269.6	299.6	1.40	1.27	1.19	269.6	1.33	1.83	2.46	122.1	2.60	2.40	2.23
280.9	310.9	1.37	1.25	1.16	280.9	1.34	1.82	2.43	126.9	2.62	2.42	2.25
292.2	322.2	1.43	1.30	1.19	292.2	1.35	1.86	2.48	131.8	2.65	2.44	2.28
303.4	333.4	1.41	1.28	1.19	303.4	1.37	1.88	2.50	136.7	2.68	2.46	2.30
314.7	344.7	1.49	1.35	1.28	314.7	1.40	1.89	2.49	141.5	2.69	2.49	2.36
326.0	356.0	1.48	1.34	1.28	326.0	1.41	1.89	2.48	146.4	2.72	2.54	2.40
337.3	367.3	1.56	1.42	1.38	337.3	1.44	1.89	2.45	151.3	2.80	2.61	2.46
348.6	378.6	1.57	1.45	1.42	348.6	1.46	1.91	2.46	156.2	2.86	2.67	2.53
359.8	389.8	1.67	1.55	1.53	359.8	1.48	1.92	2.44	161.0	2.93	2.74	2.59
371.1	401.1	1.68	1.57	1.56	371.1	1.52	1.94	2.44	165.9	2.97	2.78	2.64
382.4	412.4	1.75	1.64	1.64	382.4	1.56	1.97	2.45	170.8	2.99	2.82	2.68
393.7	423.7	1.82	1.67	1.67	393.7	1.61	1.99	2.45	175.6	3.02	2.87	2.73
405.0	435.0	1.91	1.72	1.71	405.0	1.66	2.01	2.46	180.5	3.06	2.91	2.76
416.3	446.3	1.94	1.74	1.71	416.3	1.71	2.01	2.42	185.4	3.06	2.91	2.77
427.5	457.5	2.04	1.80	1.74	427.5	1.77	2.04	2.41	190.3	3.07	2.93	2.79
438.8	468.8	2.11	1.82	1.73	438.8	1.86	2.09	2.45	195.1	3.07	2.93	2.80
450.1	480.1	2.16	1.86	1.73	450.1	1.95	2.13	2.45	200.0	3.06	2.91	2.78

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	18	31	16	30	19	38	38	49	58	58
1	-	17	+0	25	15	29	23	34	30	45	33	56
2	>100	60	57	67	57	58	61	69	55	63	73	70
3	>100	58	52	61	58	61	63	58	54	74	55	>81
4	>100	>81	80	>81	61	>81	>81	>81	>81	>81	>81	>81
5	>100	>81	74	80	77	68	75	>81	76	>81	74	>81
6	>100	>81	>81	>81	>81	>81	81	>81	>81	>81	>81	>81
7	>100	>81	>81	>81	>81	>81	>81	>81	>81	>81	>81	>81
8	>100	>81	>81	>81	>81	>81	>81	66	80	>81	>81	>81
9	>100	>81	>81	>81	>81	>81	>81	>81	57	>81	>81	>81
10	>100	>81	>81	>81	>81	>81	>81	>81	75	74	>81	>81
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 100.1 MHz; -14.00 dBm.
LO IN: 130.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -18.73 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	27	40	26	40	31	52	52	65	65	73
1	-	18	+0	27	14	33	23	37	38	49	41	64
2	>100	61	51	64	54	56	55	69	50	62	69	74
3	>100	46	41	48	47	48	48	46	49	55	48	62
4	>100	74	65	69	64	75	68	69	70	86	69	76
5	>100	68	60	59	62	61	63	62	60	61	56	77
6	>100	82	85	81	79	80	>91	80	79	85	76	83
7	>100	>91	67	76	87	68	69	75	68	70	67	76
8	>100	89	88	90	86	>91	>91	82	84	89	>91	89
9	>100	>91	79	>91	76	79	85	78	70	86	77	81
10	>100	>91	>91	>91	>91	>91	>91	>91	89	80	91	>91
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 100.1 MHz; -4.00 dBm.
LO IN: 130.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -9.07 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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