

Frequency Mixer

SRA-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
0.03	30.03	7.21	6.94	6.77	10.1	40.1	13.26	14.64	14.97	10.1	40.1	1.72	1.43	1.18
0.04	30.04	6.05	5.80	5.65	23.9	53.9	13.67	13.82	16.93	23.9	53.9	1.52	1.21	1.00
0.05	30.05	5.74	5.52	5.37	37.8	67.8	12.68	13.98	17.56	37.8	67.8	1.47	1.14	0.97
0.1	30.1	5.32	5.16	4.95	51.6	81.6	13.35	14.11	20.20	51.6	81.6	1.40	1.10	0.89
0.2	30.2	5.21	4.98	4.86	65.5	95.5	13.89	15.90	18.80	65.5	95.5	1.40	1.06	0.87
0.5	30.5	5.14	4.92	4.82	79.3	109.3	12.46	19.72	16.39	79.3	109.3	1.28	1.00	0.82
1.0	31.0	5.00	4.82	4.72	93.2	123.2	13.56	23.54	17.90	93.2	123.2	1.28	0.96	0.78
2.0	32.0	4.95	4.77	4.67	107.0	137.0	15.00	12.18	10.77	107.0	137.0	1.20	0.94	0.77
5.0	35.0	4.94	4.76	4.66	120.9	150.9	18.35	12.49	11.81	120.9	150.9	1.15	0.88	0.74
10.0	40.0	5.00	4.81	4.69	134.7	164.7	14.59	24.15	16.71	134.7	164.7	1.13	0.86	0.68
23.9	53.9	4.93	4.69	4.58	148.6	178.6	18.35	13.88	13.99	148.6	178.6	1.11	0.86	0.69
51.6	81.6	4.95	4.76	4.65	162.4	192.4	13.03	10.60	10.03	162.4	192.4	1.14	0.86	0.71
65.5	95.5	4.93	4.76	4.68	176.3	206.3	12.93	11.19	11.71	176.3	206.3	1.20	0.94	0.76
79.3	109.3	4.98	4.80	4.70	190.1	220.1	11.68	10.83	10.87	190.1	220.1	1.32	0.96	0.77
93.2	123.2	4.99	4.81	4.70	203.9	233.9	11.10	9.96	11.38	203.9	233.9	1.55	1.10	0.83
120.9	150.9	5.04	4.85	4.75	217.8	247.8	9.89	9.98	12.05	217.8	247.8	1.82	1.32	0.99
134.7	164.7	5.15	4.93	4.80	231.6	261.6	6.17	8.44	10.52	231.6	261.6	2.14	1.62	1.21
148.6	178.6	5.19	5.02	4.89	245.5	275.5	3.26	4.91	8.41	245.5	275.5	2.37	1.95	1.53
162.4	192.4	5.21	5.06	4.95	259.3	289.3	2.03	2.73	4.99	259.3	289.3	2.47	2.12	1.74
176.3	206.3	5.24	5.08	4.97	273.2	303.2	1.63	2.28	3.84	273.2	303.2	2.47	2.14	1.90
190.1	220.1	5.26	5.10	5.04	287.0	317.0	1.88	2.74	4.18	287.0	317.0	2.44	2.15	1.99
217.8	247.8	5.49	5.28	5.22	300.9	330.9	2.58	3.64	4.71	300.9	330.9	2.28	2.06	1.95
245.5	275.5	5.89	5.67	5.45	314.7	344.7	3.20	4.21	5.66	314.7	344.7	2.20	1.96	1.80
259.3	289.3	6.02	5.84	5.63	328.6	358.6	3.90	4.93	7.14	328.6	358.6	2.12	1.83	1.59
273.2	303.2	6.26	6.04	5.77	342.4	372.4	4.74	6.55	9.67	342.4	372.4	1.99	1.62	1.34
287.0	317.0	6.39	6.12	5.80	356.3	386.3	5.13	7.50	13.55	356.3	386.3	1.96	1.55	1.30
300.9	330.9	6.52	6.22	5.87	370.1	400.1	5.15	8.20	16.72	370.1	400.1	1.97	1.50	1.29
328.6	358.6	6.67	6.31	6.06	383.9	413.9	5.67	8.55	14.96	383.9	413.9	1.95	1.46	1.23
356.3	386.3	6.72	6.40	6.16	397.8	427.8	5.26	7.81	12.07	397.8	427.8	2.03	1.58	1.27
370.1	400.1	6.59	6.29	6.13	411.6	441.6	5.26	7.15	10.26	411.6	441.6	1.97	1.49	1.18
383.9	413.9	6.64	6.37	6.24	425.5	455.5	5.30	6.95	9.42	425.5	455.5	1.99	1.49	1.18
397.8	427.8	6.65	6.35	6.26	439.3	469.3	5.24	6.59	9.07	439.3	469.3	2.02	1.51	1.16
425.5	455.5	6.91	6.67	6.67	453.2	483.2	5.80	7.31	10.95	453.2	483.2	1.90	1.37	1.06
439.3	469.3	7.03	6.85	6.89	467.0	497.0	6.15	8.02	9.84	467.0	497.0	1.93	1.42	1.18
453.2	483.2	7.36	7.26	7.35	480.9	510.9	7.08	9.48	10.50	480.9	510.9	1.88	1.37	1.18
467.0	497.0	7.69	7.58	7.64	494.7	524.7	8.28	10.19	11.45	494.7	524.7	1.82	1.33	1.17
480.9	510.9	8.06	7.92	7.94	508.6	538.6	8.35	9.74	10.26	508.6	538.6	1.88	1.44	1.24
494.7	524.7	8.56	8.37	8.34	522.4	552.4	9.12	10.25	10.85	522.4	552.4	1.79	1.29	1.08
508.6	538.6	8.96	8.72	8.62	536.3	566.3	9.65	10.36	11.72	536.3	566.3	1.76	1.18	0.96
550.1	580.1	10.69	10.40	10.31	550.1	580.1	10.55	10.55	11.81	550.1	580.1	1.68	1.06	0.86



Frequency Mixer

SRA-3+

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	4.95	10.0	20.1	4.53	190.0	10.1	5.60
87.9	12.2	4.93	14.6	24.7	4.38	185.4	14.7	5.54
85.9	14.2	4.93	19.2	29.3	4.35	180.8	19.3	5.49
83.8	16.3	4.90	23.8	33.9	4.33	176.2	23.9	5.43
81.8	18.3	4.89	28.5	38.6	4.34	171.5	28.6	5.39
79.7	20.4	4.87	33.1	43.2	4.36	166.9	33.2	5.34
77.7	22.4	4.85	37.7	47.8	4.37	162.3	37.8	5.33
75.6	24.5	4.83	42.3	52.4	4.40	157.7	42.4	5.31
73.6	26.5	4.83	46.9	57.0	4.41	153.1	47.0	5.30
71.5	28.6	4.82	51.5	61.6	4.43	148.5	51.6	5.28
69.5	30.6	4.81	56.2	66.3	4.43	143.8	56.3	5.28
67.4	32.7	4.81	60.8	70.9	4.46	139.2	60.9	5.26
65.4	34.7	4.78	65.4	75.5	4.47	134.6	65.5	5.24
63.3	36.8	4.78	70.0	80.1	4.50	130.0	70.1	5.23
61.3	38.8	4.77	74.6	84.7	4.49	125.4	74.7	5.23
59.2	40.9	4.77	79.2	89.3	4.52	120.8	79.3	5.22
57.2	42.9	4.77	83.8	93.9	4.52	116.2	83.9	5.20
55.1	45.0	4.77	88.5	98.6	4.55	111.5	88.6	5.19
53.1	47.0	4.75	93.1	103.2	4.56	106.9	93.2	5.17
51.0	49.1	4.72	97.7	107.8	4.57	102.3	97.8	5.13
49.0	51.1	4.72	102.3	112.4	4.57	97.7	102.4	5.14
46.9	53.2	4.75	106.9	117.0	4.59	93.1	107.0	5.14
44.9	55.2	4.75	111.5	121.6	4.63	88.5	111.6	5.13
42.8	57.3	4.76	116.2	126.3	4.63	83.8	116.3	5.12
40.8	59.3	4.75	120.8	130.9	4.65	79.2	120.9	5.13
38.7	61.4	4.74	125.4	135.5	4.66	74.6	125.5	5.15
36.7	63.4	4.76	130.0	140.1	4.66	70.0	130.1	5.14
34.6	65.5	4.77	134.6	144.7	4.70	65.4	134.7	5.16
32.6	67.5	4.76	139.2	149.3	4.69	60.8	139.3	5.16
30.5	69.6	4.77	143.8	153.9	4.73	56.2	143.9	5.16
28.5	71.6	4.77	148.5	158.6	4.75	51.5	148.6	5.16
26.4	73.7	4.76	153.1	163.2	4.80	46.9	153.2	5.16
24.4	75.7	4.75	157.7	167.8	4.82	42.3	157.8	5.13
22.3	77.8	4.78	162.3	172.4	4.89	37.7	162.4	5.12
20.3	79.8	4.78	166.9	177.0	4.96	33.1	167.0	5.15
18.2	81.9	4.79	171.5	181.6	5.00	28.5	171.6	5.13
16.2	83.9	4.80	176.2	186.3	5.07	23.8	176.3	5.15
14.1	86.0	4.83	180.8	190.9	5.11	19.2	180.9	5.16
12.1	88.0	4.87	185.4	195.5	5.10	14.6	185.5	5.19
10.0	90.1	4.97	190.0	200.1	5.12	10.0	190.1	5.32

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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
0.03	61.68	58.72	56.56	57.08	53.27	51.07
0.04	57.71	55.35	53.96	54.31	51.43	49.68
0.05	56.72	54.61	53.34	53.56	51.09	49.47
0.1	55.43	53.51	52.62	52.38	50.41	49.13
0.2	55.00	53.27	52.45	51.97	50.18	49.00
0.5	54.58	53.12	52.30	51.86	50.13	48.94
1.0	53.86	53.18	52.24	51.81	50.48	49.14
2.0	53.82	53.13	52.17	51.42	50.55	49.22
5.0	54.18	53.42	52.39	52.01	50.99	49.53
10.0	54.39	53.68	52.71	52.35	51.27	49.73
23.9	68.12	70.14	71.75	53.94	53.37	53.01
51.6	61.74	64.18	66.77	49.84	49.40	49.62
65.5	59.65	62.16	64.67	46.80	47.56	48.13
79.3	57.92	60.81	63.65	44.97	45.50	46.38
93.2	57.85	60.62	63.12	43.28	43.85	44.99
120.9	53.84	56.61	59.94	40.22	41.74	43.10
134.7	54.81	56.69	58.99	38.39	39.56	41.08
148.6	60.57	63.84	67.15	37.35	38.29	39.42
162.4	64.21	65.31	62.57	36.70	37.75	39.05
176.3	56.04	57.65	57.43	36.09	37.46	39.01
190.1	51.78	53.93	55.23	35.43	36.90	38.21
217.8	46.63	49.42	51.50	34.97	36.03	36.57
245.5	44.52	47.02	48.98	33.44	33.78	33.69
259.3	44.56	47.56	49.63	32.52	33.04	32.88
273.2	44.19	47.05	48.88	31.41	32.18	31.96
287.0	43.76	46.78	49.18	30.46	31.14	30.82
300.9	43.70	46.21	47.08	29.46	30.24	30.18
328.6	45.38	47.02	46.20	28.47	28.64	28.20
356.3	44.50	42.27	39.19	27.82	26.44	24.17
370.1	44.07	40.76	37.47	27.19	24.83	22.13
383.9	42.27	38.09	35.03	26.60	23.42	20.71
397.8	41.05	36.21	33.52	26.24	22.24	19.64
425.5	40.01	34.16	31.43	25.12	20.57	18.16
439.3	38.69	33.07	30.15	24.56	20.02	17.50
453.2	36.76	31.59	28.92	23.51	19.35	16.86
467.0	33.59	29.67	27.20	22.34	18.49	16.20
480.9	31.07	27.79	25.64	20.71	17.67	15.32
494.7	28.70	26.48	24.50	19.28	16.79	14.57
508.6	26.85	25.16	23.38	18.27	16.14	14.13
550.1	23.36	22.27	20.96	16.26	14.79	13.14

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	34.85	36.74	37.13
23.9	53.9	30.39	30.70	30.95
37.8	67.8	27.84	27.43	27.84
51.6	81.6	25.94	26.13	26.31
65.5	95.5	24.44	24.41	24.93
79.3	109.3	23.63	24.01	24.19
93.2	123.2	23.26	23.65	23.99
107.0	137.0	22.67	23.09	23.64
120.9	150.9	22.47	22.95	23.47
134.7	164.7	22.41	22.87	23.63
148.6	178.6	22.86	23.30	23.75
162.4	192.4	23.72	24.15	24.43
176.3	206.3	24.47	25.08	25.75
190.1	220.1	24.57	25.66	27.06
203.9	233.9	23.06	24.36	25.17
217.8	247.8	21.39	22.38	23.04
231.6	261.6	19.63	20.18	20.34
245.5	275.5	18.33	18.62	18.72
259.3	289.3	17.35	17.60	17.79
273.2	303.2	16.87	17.15	17.61
287.0	317.0	16.55	16.84	17.51
300.9	330.9	16.62	16.93	17.56
314.7	344.7	17.03	17.38	17.83
328.6	358.6	16.98	17.12	17.24
342.4	372.4	16.94	16.91	16.92
356.3	386.3	16.83	16.54	16.50
370.1	400.1	16.32	16.06	16.01
383.9	413.9	16.04	15.64	15.48
397.8	427.8	15.87	15.44	14.99
411.6	441.6	15.39	14.89	14.17
425.5	455.5	14.99	14.25	13.33
439.3	469.3	14.24	13.39	12.43
453.2	483.2	13.20	12.33	11.58
467.0	497.0	12.14	11.50	10.93
480.9	510.9	11.27	10.84	10.43
494.7	524.7	10.57	10.29	10.01
508.6	538.6	9.99	9.73	9.61
522.4	552.4	9.48	9.25	9.12
536.3	566.3	8.94	8.74	8.61
550.1	580.1	8.51	8.20	8.06

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+4	+7	+10
5.0	35.0	1.28	1.16	1.09
10.0	40.0	1.29	1.17	1.09
23.9	53.9	1.29	1.18	1.11
37.8	67.8	1.28	1.17	1.11
51.6	81.6	1.24	1.14	1.08
65.5	95.5	1.21	1.11	1.05
79.3	109.3	1.19	1.09	1.05
93.2	123.2	1.16	1.06	1.05
107.0	137.0	1.12	1.04	1.04
120.9	150.9	1.10	1.01	1.05
134.7	164.7	1.09	1.03	1.10
148.6	178.6	1.06	1.04	1.11
162.4	192.4	1.03	1.08	1.13
176.3	206.3	1.07	1.15	1.21
190.1	220.1	1.13	1.24	1.32
203.9	233.9	1.18	1.31	1.40
217.8	247.8	1.15	1.31	1.39
231.6	261.6	1.12	1.25	1.33
245.5	275.5	1.13	1.18	1.26
259.3	289.3	1.15	1.15	1.18
273.2	303.2	1.19	1.14	1.11
287.0	317.0	1.21	1.15	1.10
300.9	330.9	1.24	1.17	1.10
314.7	344.7	1.33	1.25	1.20
328.6	358.6	1.35	1.28	1.26
342.4	372.4	1.41	1.39	1.39
356.3	386.3	1.50	1.49	1.50
370.1	400.1	1.54	1.54	1.57
383.9	413.9	1.65	1.67	1.70
397.8	427.8	1.74	1.76	1.80
411.6	441.6	1.84	1.85	1.91
425.5	455.5	1.99	2.00	2.04
439.3	469.3	2.09	2.09	2.13
453.2	483.2	2.20	2.19	2.22
467.0	497.0	2.29	2.24	2.24
480.9	510.9	2.34	2.27	2.24
494.7	524.7	2.43	2.34	2.30
508.6	538.6	2.50	2.38	2.34
522.4	552.4	2.61	2.48	2.45
536.3	566.3	2.73	2.61	2.57
550.1	580.1	2.82	2.69	2.65

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+4	+7	+10
5.0	1.39	2.06	2.93
10.0	1.38	2.04	2.90
23.9	1.68	2.45	3.35
37.8	1.71	2.50	3.48
51.6	1.71	2.49	3.45
65.5	1.69	2.42	3.34
79.3	1.68	2.38	3.27
93.2	1.68	2.38	3.25
107.0	1.71	2.42	3.29
120.9	1.74	2.47	3.34
134.7	1.78	2.51	3.38
148.6	1.80	2.50	3.35
162.4	1.82	2.50	3.32
176.3	1.83	2.52	3.34
190.1	1.86	2.54	3.37
203.9	1.90	2.58	3.42
217.8	1.95	2.62	3.46
231.6	2.01	2.66	3.48
245.5	2.09	2.72	3.50
259.3	2.15	2.79	3.55
273.2	2.18	2.85	3.62
287.0	2.22	2.91	3.71
300.9	2.25	2.96	3.78
314.7	2.29	3.00	3.82
328.6	2.31	3.01	3.84
342.4	2.33	3.01	3.82
356.3	2.34	3.00	3.78
370.1	2.35	2.99	3.75
383.9	2.37	3.00	3.74
397.8	2.41	3.01	3.73
411.6	2.45	3.03	3.75
425.5	2.49	3.03	3.72
439.3	2.54	3.04	3.70
453.2	2.62	3.08	3.70
467.0	2.72	3.14	3.72
480.9	2.86	3.22	3.76
494.7	2.99	3.31	3.80
508.6	3.09	3.38	3.83
522.4	3.11	3.40	3.82
536.3	3.07	3.37	3.79
550.1	2.97	3.30	3.71

IF (OUT) (MHz)	IF VSWR @LO=200.1MHz (:1)		
	@LO (dBm)		
	+4	+7	+10
5.0	1.53	1.42	1.33
10.0	1.54	1.43	1.33
14.9	1.92	1.91	1.75
19.7	1.91	1.78	1.69
24.6	1.89	1.78	1.70
29.5	1.84	1.76	1.65
34.4	1.80	1.72	1.64
39.2	1.81	1.71	1.58
44.1	1.78	1.69	1.58
49.0	1.76	1.68	1.56
53.8	1.76	1.66	1.57
58.7	1.75	1.66	1.57
63.6	1.79	1.69	1.60
68.5	1.83	1.72	1.62
73.3	1.84	1.73	1.64
78.2	1.88	1.78	1.69
83.1	1.94	1.83	1.74
87.9	1.99	1.89	1.79
92.8	2.04	1.93	1.83
97.7	2.07	1.96	1.87
102.6	2.10	1.99	1.90
107.4	2.13	2.02	1.92
112.3	2.16	2.05	1.95
117.2	2.17	2.06	1.97
122.1	2.17	2.06	1.96
126.9	2.16	2.06	1.97
131.8	2.17	2.05	1.97
136.7	2.18	2.08	1.98
141.5	2.20	2.11	2.01
146.4	2.26	2.13	2.03
151.3	2.28	2.16	2.07
156.2	2.31	2.22	2.11
161.0	2.37	2.26	2.16
165.9	2.40	2.30	2.19
170.8	2.46	2.35	2.26
175.6	2.49	2.38	2.29
180.5	2.52	2.42	2.32
185.4	2.57	2.46	2.36
190.3	2.59	2.48	2.39
195.1	2.61	2.51	2.41
200.0	2.72	2.61	2.53

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	15	41	18	32	21	44	29	44	32	60
1	-	19	+0	29	13	46	18	35	35	47	37	66
2	>100	67	59	68	68	72	62	79	>81	>81	61	79
3	>100	61	54	65	64	65	58	64	65	67	57	77
4	>100	81	78	>81	66	>81	78	>81	72	>81	77	>81
5	>100	>81	>81	>81	80	70	>81	>81	>81	>81	81	>81
6	>100	>81	>81	>81	>81	>81	77	>81	>81	>81	>81	>81
7	>100	>81	>81	>81	>81	>81	77	>81	>81	>81	>81	>81
8	>100	>81	>81	>81	>81	>81	>81	74	>81	>81	>81	>81
9	>100	>81	>81	>81	>81	>81	>81	>81	76	>81	>81	>81
10	>100	>81	>81	>81	>81	>81	>81	>81	>81	68	>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; -18.74 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	25	50	29	43	32	57	43	57	44	71
1	-	19	+0	29	12	42	20	40	36	52	44	70
2	>100	66	59	65	60	76	51	61	58	69	56	70
3	>100	45	40	51	40	49	39	50	43	51	53	61
4	>100	75	63	78	63	72	63	76	72	84	81	85
5	>100	71	73	73	67	72	59	67	65	63	69	67
6	>100	90	76	82	76	88	79	81	79	80	84	84
7	>100	86	69	81	74	81	76	88	71	83	71	77
8	>100	>91	>91	>91	85	>91	86	80	>91	>91	89	88
9	>100	>91	>91	89	84	89	87	81	67	90	87	>91
10	>100	>91	>91	>91	>91	>91	>91	>91	>91	75	>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; -8.95 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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