

Frequency Mixer

ZLW-1SH+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	6.89	6.14	5.85
30.1	60.1	7.23	6.47	6.08
50.1	80.1	7.39	6.61	6.19
70.1	100.1	7.18	6.45	6.11
90.1	120.1	7.12	6.43	6.16
110.1	140.1	7.31	6.48	6.21
130.1	160.1	7.17	6.42	6.17
150.1	180.1	7.07	6.44	6.21
170.1	200.1	6.85	6.36	6.20
190.1	220.1	6.88	6.43	6.25
210.1	240.1	6.91	6.41	6.22
230.1	260.1	6.80	6.38	6.22
250.1	280.1	6.85	6.43	6.23
270.1	300.1	6.75	6.42	6.26
290.1	320.1	6.83	6.48	6.33
310.1	340.1	6.89	6.49	6.33
330.1	360.1	7.07	6.60	6.36
350.1	380.1	7.17	6.69	6.35
370.1	400.1	7.09	6.79	6.49
390.1	420.1	7.18	6.87	6.65
410.1	440.1	7.11	6.82	6.65
430.1	460.1	7.13	6.85	6.68
450.1	480.1	7.16	6.87	6.71
470.1	500.1	7.23	6.92	6.74
490.1	520.1	7.29	6.90	6.67
510.1	540.1	7.47	6.94	6.73
530.1	560.1	7.78	7.07	6.84
550.1	580.1	7.93	7.21	6.87
570.1	600.1	8.34	7.63	7.04
590.1	620.1	8.48	7.93	7.15
610.1	640.1	8.84	8.37	7.57
630.1	660.1	9.09	8.65	7.98
650.1	680.1	9.38	8.93	8.33
670.1	700.1	9.85	9.35	8.79
690.1	720.1	10.22	9.68	9.12
710.1	740.1	10.80	10.22	9.60
730.1	760.1	11.09	10.44	9.75
740.1	770.1	11.15	10.50	9.80
760.1	790.1	11.53	10.80	10.00
770.1	800.1	11.62	10.82	9.98

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	28.15	30.20	30.22
30.1	60.1	25.07	29.21	28.82
50.1	80.1	24.95	27.21	27.56
70.1	100.1	31.14	28.85	29.71
90.1	120.1	25.50	28.33	30.65
110.1	140.1	26.61	31.20	33.94
130.1	160.1	27.89	28.42	29.82
150.1	180.1	26.59	27.91	30.09
170.1	200.1	24.48	27.54	27.26
190.1	220.1	26.45	34.87	30.99
210.1	240.1	25.62	26.24	25.13
230.1	260.1	24.43	31.16	27.41
250.1	280.1	25.13	29.62	28.36
270.1	300.1	23.68	22.92	22.94
290.1	320.1	25.89	22.35	20.87
310.1	340.1	23.19	21.80	20.95
330.1	360.1	27.87	26.21	23.42
350.1	380.1	24.73	27.72	27.24
370.1	400.1	25.46	23.59	26.94
390.1	420.1	26.59	22.89	22.31
410.1	440.1	23.13	21.68	21.11
430.1	460.1	26.18	21.71	20.61
450.1	480.1	22.86	21.17	20.79
470.1	500.1	25.37	21.67	21.17
490.1	520.1	23.03	21.68	21.53
510.1	540.1	20.87	21.65	23.37
530.1	560.1	19.20	23.34	25.04
550.1	580.1	15.90	20.46	24.90
570.1	600.1	14.71	17.73	24.56
590.1	620.1	13.22	14.74	20.07
610.1	640.1	12.73	13.39	16.91
630.1	660.1	12.20	12.47	14.54
650.1	680.1	11.59	11.67	12.98
670.1	700.1	11.36	11.28	12.07
690.1	720.1	10.96	10.94	11.44
710.1	740.1	10.77	10.85	11.31
730.1	760.1	10.80	11.23	11.96
740.1	770.1	10.93	11.50	12.36
760.1	790.1	11.37	12.27	13.56
770.1	800.1	11.41	12.42	13.68

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+14dBm (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	0.62	0.24	0.17
30.1	60.1	0.32	0.16	0.08
50.1	80.1	0.45	0.15	0.09
70.1	100.1	0.54	0.25	0.14
90.1	120.1	0.69	0.34	0.18
110.1	140.1	0.50	0.25	0.10
130.1	160.1	0.53	0.28	0.13
150.1	180.1	0.65	0.23	0.08
170.1	200.1	0.77	0.30	0.14
190.1	220.1	0.84	0.29	0.13
210.1	240.1	0.69	0.21	0.10
230.1	260.1	0.80	0.26	0.10
250.1	280.1	0.75	0.21	0.12
270.1	300.1	0.83	0.29	0.19
290.1	320.1	0.79	0.27	0.17
310.1	340.1	0.71	0.24	0.13
330.1	360.1	0.63	0.20	0.10
350.1	380.1	0.61	0.24	0.20
370.1	400.1	0.74	0.24	0.21
390.1	420.1	0.73	0.21	0.14
410.1	440.1	0.81	0.28	0.16
430.1	460.1	0.90	0.34	0.19
450.1	480.1	0.94	0.43	0.26
470.1	500.1	0.90	0.44	0.26
490.1	520.1	1.00	0.54	0.28
510.1	540.1	1.35	0.93	0.48
530.1	560.1	1.32	0.99	0.50
550.1	580.1	1.43	1.13	0.67
570.1	600.1	1.27	0.96	0.72
590.1	620.1	1.47	1.04	0.95
610.1	640.1	1.29	0.91	0.87
630.1	660.1	1.23	0.84	0.71
650.1	680.1	1.15	0.77	0.56
670.1	700.1	0.86	0.45	0.23
690.1	720.1	0.50	0.16	-0.02
710.1	740.1	-0.02	-0.28	-0.39
730.1	760.1	-0.28	-0.48	-0.52
740.1	770.1	-0.35	-0.54	-0.56
760.1	790.1	-0.66	-0.79	-0.73
770.1	800.1	-0.71	-0.83	-0.73

Frequency Mixer

ZLW-1SH+

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)
		+17			+17			+17
240.0	10.1	6.59	10.0	20.1	6.63	490.0	10.1	6.94
234.9	15.2	6.70	50.0	60.1	6.18	479.8	20.3	6.83
229.8	20.3	6.66	90.0	100.1	5.97	469.6	30.5	6.80
224.7	25.4	6.53	130.0	140.1	6.17	459.4	40.7	6.63
219.6	30.5	6.56	170.0	180.1	6.14	449.1	51.0	6.75
214.4	35.7	6.49	210.0	220.1	6.18	438.9	61.2	6.63
209.3	40.8	6.46	250.0	260.1	6.20	428.7	71.4	6.53
204.2	45.9	6.50	290.0	300.1	6.52	418.5	81.6	6.51
199.1	51.0	6.40	330.0	340.1	6.45	408.3	91.8	6.34
194.0	56.1	6.35	370.0	380.1	6.46	398.1	102.0	6.28
188.9	61.2	6.42	410.0	420.1	6.88	387.9	112.2	6.26
183.8	66.3	6.48	450.0	460.1	7.15	377.7	122.4	6.22
178.7	71.4	6.36	490.0	500.1	6.90	367.4	132.7	6.06
173.6	76.5	6.37	510.0	520.1	6.80	357.2	142.9	6.15
168.4	81.7	6.38	550.0	560.1	6.42	347.0	153.1	6.05
163.3	86.8	6.35	570.0	580.1	6.53	336.8	163.3	6.08
158.2	91.9	6.31	610.0	620.1	6.78	326.6	173.5	6.06
153.1	97.0	6.28	630.0	640.1	6.85	316.4	183.7	6.04
148.0	102.1	6.15	670.0	680.1	6.81	306.2	193.9	6.10
142.9	107.2	6.22	690.0	700.1	6.73	296.0	204.1	6.05
137.8	112.3	6.31	730.0	740.1	6.74	285.7	214.4	6.15
132.7	117.4	6.22	750.0	760.1	6.67	275.5	224.6	6.09
127.6	122.5	6.09	790.0	800.1	6.69	265.3	234.8	6.19
122.4	127.7	6.09	810.0	820.1	6.73	255.1	245.0	6.21
117.3	132.8	6.08	850.0	860.1	6.61	234.7	265.4	6.17
112.2	137.9	6.08	870.0	880.1	6.47	224.5	275.6	6.14
107.1	143.0	6.09	910.0	920.1	6.13	204.0	296.1	6.38
102.0	148.1	6.00	930.0	940.1	5.94	193.8	306.3	6.49
91.8	158.3	6.10	970.0	980.1	5.81	173.4	326.7	6.54
86.7	163.4	6.11	990.0	1000.1	5.79	163.2	336.9	6.50
76.4	173.7	6.09	1030.0	1040.1	6.02	142.8	357.3	6.62
71.3	178.8	6.13	1050.0	1060.1	6.10	132.6	367.5	6.52
61.1	189.0	6.09	1090.0	1100.1	6.40	112.1	388.0	6.57
56.0	194.1	6.06	1110.0	1120.1	6.73	101.9	398.2	6.63
45.8	204.3	6.16	1150.0	1160.1	7.58	81.5	418.6	6.67
40.7	209.4	6.20	1170.0	1180.1	8.09	71.3	428.8	6.72
30.4	219.7	6.19	1210.0	1220.1	9.33	50.9	449.2	6.85
25.3	224.8	6.22	1230.0	1240.1	9.76	40.6	459.5	6.81
15.1	235.0	6.33	1270.0	1280.1	10.51	20.2	479.9	6.90
10.0	240.1	6.55	1290.0	1300.1	10.76	10.0	490.1	7.24

REV. X2

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IF/RF MICROWAVE COMPONENTS



Frequency Mixer

ZLW-1SH+

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+20	+14	+17	+20
40.1	73.26	72.32	71.94	74.54	64.09	60.01
60.1	70.24	70.71	70.06	70.82	61.74	57.53
80.1	67.74	67.78	68.73	68.16	59.92	55.86
100.1	65.81	66.65	67.26	66.05	58.17	54.16
120.1	65.09	65.85	66.06	62.10	56.81	52.72
140.1	64.70	65.14	65.86	58.72	54.63	50.97
160.1	63.85	64.64	65.05	56.33	53.85	50.59
180.1	63.32	64.21	65.03	54.27	52.68	49.81
200.1	62.47	63.08	64.23	51.47	50.82	48.94
220.1	62.76	62.82	62.83	49.83	49.75	48.08
240.1	61.94	63.46	64.05	47.87	48.91	47.73
260.1	61.92	63.66	65.04	46.50	46.95	46.63
280.1	61.19	62.65	63.48	45.61	45.40	44.85
300.1	59.61	60.93	61.43	43.97	44.64	43.89
320.1	58.23	58.85	59.47	42.96	43.68	43.80
340.1	58.88	59.52	60.29	42.75	43.34	43.63
360.1	60.52	59.45	59.45	42.55	42.31	42.56
380.1	62.38	60.19	59.05	42.24	41.69	41.28
400.1	63.34	62.54	61.37	41.13	42.01	41.29
420.1	62.13	60.30	59.19	40.36	41.92	41.82
440.1	58.43	56.86	56.83	39.43	40.86	41.14
460.1	55.56	54.55	54.48	38.82	40.21	40.82
480.1	53.24	53.19	53.81	38.14	39.73	40.45
500.1	50.69	51.22	52.16	37.76	39.51	40.18
520.1	48.81	50.24	52.76	36.91	38.09	38.22
540.1	49.31	51.09	52.95	36.14	36.17	36.53
560.1	49.50	51.27	51.96	36.19	34.90	35.54
580.1	50.64	51.42	52.85	37.46	34.41	34.94
600.1	51.45	49.46	50.23	38.01	34.36	34.56
620.1	55.04	51.23	50.90	37.35	35.54	34.37
640.1	56.59	53.59	51.31	36.70	36.83	35.15
660.1	55.00	54.19	51.21	36.45	37.37	36.39
680.1	53.63	53.77	52.85	36.18	37.54	37.53
700.1	50.64	50.19	48.52	35.96	37.27	38.04
720.1	52.08	53.23	53.95	35.74	36.79	37.62
740.1	50.49	49.94	48.97	35.98	36.98	37.58
760.1	52.81	53.74	53.05	36.35	37.44	38.12
770.1	52.17	53.00	53.35	36.23	37.17	37.77
790.1	49.47	48.44	46.50	36.06	37.00	37.51
800.1	49.69	48.88	46.81	35.68	36.42	37.06

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	49.43	49.05	48.76
30.1	60.1	40.86	40.67	40.65
50.1	80.1	36.73	36.75	36.62
70.1	100.1	34.10	34.29	34.22
90.1	120.1	32.29	32.37	32.38
110.1	140.1	31.16	31.33	31.47
130.1	160.1	30.21	30.32	30.24
150.1	180.1	29.18	29.41	29.49
170.1	200.1	28.60	28.68	28.79
190.1	220.1	28.28	28.28	28.27
210.1	240.1	28.05	28.14	28.14
230.1	260.1	27.84	28.16	28.13
250.1	280.1	27.71	28.25	28.51
270.1	300.1	27.49	28.06	28.52
290.1	320.1	27.51	28.08	28.49
310.1	340.1	27.56	27.93	28.16
330.1	360.1	27.90	27.72	27.64
350.1	380.1	28.07	27.57	27.09
370.1	400.1	28.00	27.83	27.47
390.1	420.1	27.84	27.82	27.76
410.1	440.1	27.68	27.84	28.14
430.1	460.1	27.29	27.51	27.75
450.1	480.1	26.55	26.76	27.09
470.1	500.1	25.39	25.63	26.18
490.1	520.1	24.46	24.64	24.96
510.1	540.1	23.72	23.57	23.52
530.1	560.1	23.21	22.65	22.37
550.1	580.1	22.59	21.78	21.28
570.1	600.1	22.13	21.41	20.63
590.1	620.1	21.38	20.85	19.94
610.1	640.1	20.61	20.20	19.52
630.1	660.1	20.05	19.56	18.94
650.1	680.1	19.45	19.06	18.64
670.1	700.1	18.92	18.48	18.03
690.1	720.1	18.57	18.25	17.97
710.1	740.1	18.40	18.09	17.83
730.1	760.1	18.21	17.92	17.70
740.1	770.1	18.20	17.95	17.71
760.1	790.1	18.16	17.94	17.75
770.1	800.1	18.18	17.96	17.79

Frequency Mixer

ZLW-1SH+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=500.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+14	+17	+20		+14	+17	+20		+14	+17	+20
10.1	40.1	1.27	1.14	1.18	40.1	1.18	1.43	2.25	10.1	2.29	2.04	1.82
30.1	60.1	1.17	1.04	1.06	60.1	1.15	1.39	2.12	20.1	2.29	2.03	1.81
50.1	80.1	1.18	1.04	1.06	80.1	1.12	1.37	2.02	30.1	2.29	2.04	1.82
70.1	100.1	1.15	1.01	1.10	100.1	1.15	1.40	2.11	40.1	2.33	2.07	1.85
90.1	120.1	1.13	1.02	1.10	120.1	1.13	1.34	1.96	50.1	2.35	2.09	1.87
110.1	140.1	1.14	1.02	1.12	140.1	1.15	1.41	2.13	60.1	2.31	2.05	1.83
130.1	160.1	1.11	1.04	1.13	160.1	1.13	1.37	2.02	70.1	2.28	2.03	1.81
150.1	180.1	1.11	1.07	1.14	180.1	1.14	1.37	2.02	80.1	2.33	2.07	1.85
170.1	200.1	1.10	1.06	1.14	200.1	1.14	1.39	2.05	90.1	2.38	2.11	1.88
190.1	220.1	1.09	1.05	1.14	220.1	1.15	1.36	1.95	100.1	2.38	2.12	1.89
210.1	240.1	1.08	1.08	1.16	240.1	1.15	1.42	2.11	110.1	2.34	2.08	1.86
230.1	260.1	1.05	1.11	1.18	260.1	1.13	1.38	1.97	120.1	2.33	2.07	1.85
250.1	280.1	1.06	1.11	1.21	280.1	1.15	1.42	2.03	130.1	2.36	2.10	1.87
270.1	300.1	1.06	1.08	1.17	300.1	1.14	1.43	2.03	140.1	2.38	2.12	1.89
290.1	320.1	1.04	1.09	1.16	320.1	1.15	1.42	2.01	150.1	2.39	2.12	1.89
310.1	340.1	1.03	1.12	1.18	340.1	1.16	1.47	2.09	160.1	2.37	2.11	1.88
330.1	360.1	1.06	1.13	1.20	360.1	1.17	1.45	2.00	170.1	2.39	2.11	1.88
350.1	380.1	1.07	1.13	1.23	380.1	1.16	1.50	2.06	180.1	2.44	2.16	1.93
370.1	400.1	1.06	1.12	1.22	400.1	1.15	1.50	2.06	190.1	2.49	2.21	1.97
390.1	420.1	1.05	1.13	1.22	420.1	1.15	1.51	2.09	200.1	2.46	2.19	1.96
410.1	440.1	1.08	1.17	1.25	440.1	1.16	1.58	2.19	210.1	2.43	2.15	1.93
430.1	460.1	1.08	1.17	1.23	460.1	1.18	1.52	2.05	220.1	2.44	2.16	1.93
450.1	480.1	1.09	1.20	1.26	480.1	1.20	1.59	2.17	240.1	2.53	2.24	2.01
470.1	500.1	1.12	1.23	1.31	500.1	1.24	1.68	2.28	250.1	2.51	2.23	1.99
490.1	520.1	1.14	1.29	1.38	520.1	1.28	1.69	2.27	270.1	2.55	2.25	2.01
510.1	540.1	1.14	1.32	1.38	540.1	1.32	1.71	2.29	280.1	2.61	2.31	2.07
530.1	560.1	1.08	1.28	1.32	560.1	1.36	1.78	2.35	300.1	2.59	2.30	2.06
550.1	580.1	1.04	1.22	1.27	580.1	1.39	1.87	2.44	310.1	2.59	2.29	2.05
570.1	600.1	1.04	1.15	1.21	600.1	1.42	1.96	2.53	330.1	2.69	2.38	2.14
590.1	620.1	1.05	1.11	1.17	620.1	1.45	2.00	2.59	340.1	2.71	2.40	2.15
610.1	640.1	1.07	1.06	1.10	640.1	1.48	2.03	2.64	360.1	2.72	2.41	2.16
630.1	660.1	1.12	1.07	1.04	660.1	1.52	2.08	2.71	370.1	2.76	2.44	2.20
650.1	680.1	1.16	1.11	1.05	680.1	1.57	2.14	2.78	390.1	2.76	2.45	2.20
670.1	700.1	1.22	1.17	1.11	700.1	1.62	2.19	2.84	400.1	2.76	2.44	2.19
690.1	720.1	1.29	1.23	1.18	720.1	1.67	2.23	2.87	420.1	2.85	2.53	2.27
710.1	740.1	1.42	1.36	1.31	740.1	1.71	2.27	2.91	430.1	2.88	2.56	2.30
730.1	760.1	1.55	1.49	1.44	760.1	1.77	2.33	2.98	450.1	2.85	2.52	2.26
740.1	770.1	1.60	1.53	1.48	770.1	1.81	2.37	3.02	460.1	2.86	2.53	2.27
760.1	790.1	1.75	1.68	1.63	790.1	1.87	2.43	3.08	480.1	2.93	2.59	2.32
770.1	800.1	1.81	1.74	1.69	800.1	1.90	2.45	3.10	490.1	2.92	2.58	2.31

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(dBc)										
0	-	-	22	45	27	49	21	48	23	38	35	45
1	-	21	+0	33	16	36	24	44	32	41	25	45
2	56	66	57	78	58	80	58	74	47	71	51	61
3	89	68	53	72	52	65	45	71	43	66	56	71
4	>90	>82	78	>82	>82	>82	75	>82	74	>82	75	>82
5	>90	>82	79	>82	>82	>82	69	>82	67	>82	64	>82
6	>90	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82
7	>90	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82
8	>90	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82
9	>90	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82
10	>90	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; -1.00 dBm.
LO IN: 280.1 MHz; +17.00 dBm
IF OUT: 30 MHz; -7.43 dBm

RF HARMONICS ORDER

	(-dBm)	(dBc)										
0	-	-	31	56	38	60	36	63	42	55	54	80
1	-	21	+0	32	15	37	22	42	40	49	35	50
2	37	57	46	68	58	70	60	74	46	64	45	59
3	59	52	42	62	51	61	39	61	42	69	49	56
4	89	81	80	81	74	84	75	81	71	82	61	75
5	>90	71	57	76	59	66	50	61	47	74	45	65
6	>90	85	86	85	86	89	80	89	76	>91	76	86
7	>90	81	75	76	62	86	65	73	59	72	58	78
8	>90	>91	86	91	86	>91	85	>91	86	>91	81	>91
9	>90	>91	81	>91	81	78	71	81	69	80	67	79
10	>90	>91	87	>91	>91	>91	87	>91	89	>91	>91	>91
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; 9.00 dBm.
LO IN: 280.1 MHz; +17.00 dBm
IF OUT: 30 MHz; 2.3 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.