

Frequency Mixer

ZP-10514

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			
10.1	40.1	5.42	5.00	4.63	10.1	40.1	17.37	19.06	21.15	10.1	40.1	0.56	0.14	0.12
30.1	60.1	5.78	5.24	5.03	30.1	60.1	17.44	20.69	21.48	30.1	60.1	0.19	0.10	0.04
50.1	80.1	5.90	5.39	5.12	50.1	80.1	14.48	16.70	17.72	50.1	80.1	0.13	0.03	0.02
70.1	100.1	5.64	5.24	5.05	70.1	100.1	20.26	20.27	21.48	70.1	100.1	0.28	0.15	0.07
90.1	120.1	5.73	5.33	5.10	90.1	120.1	15.70	16.93	19.77	90.1	120.1	0.29	0.08	0.06
110.1	140.1	5.94	5.44	5.20	110.1	140.1	15.24	18.80	19.09	110.1	140.1	0.17	0.06	0.02
130.1	160.1	5.98	5.50	5.29	130.1	160.1	15.11	18.74	18.86	130.1	160.1	0.19	0.07	0.03
150.1	180.1	5.95	5.53	5.33	150.1	180.1	15.39	17.92	17.70	150.1	180.1	0.20	0.05	0.02
170.1	200.1	5.79	5.46	5.27	170.1	200.1	17.83	16.73	16.38	170.1	200.1	0.29	0.14	0.07
190.1	220.1	6.02	5.63	5.42	190.1	220.1	14.63	17.81	17.17	190.1	220.1	0.22	0.08	0.05
210.1	240.1	6.01	5.61	5.39	210.1	240.1	17.17	16.73	18.34	210.1	240.1	0.22	0.08	0.05
230.1	260.1	6.05	5.67	5.48	230.1	260.1	16.09	15.21	15.40	230.1	260.1	0.24	0.09	0.04
250.1	280.1	6.02	5.65	5.46	250.1	280.1	15.49	14.63	15.14	250.1	280.1	0.27	0.12	0.07
270.1	300.1	6.10	5.72	5.52	270.1	300.1	14.74	15.20	15.79	270.1	300.1	0.26	0.13	0.09
290.1	320.1	6.27	5.83	5.55	290.1	320.1	14.63	15.04	16.99	290.1	320.1	0.19	0.10	0.06
310.1	340.1	6.29	5.86	5.55	310.1	340.1	13.25	14.63	18.25	310.1	340.1	0.15	0.07	0.05
330.1	360.1	6.40	6.03	5.73	330.1	360.1	13.53	13.67	15.91	330.1	360.1	0.18	0.06	0.05
350.1	380.1	6.34	6.01	5.76	350.1	380.1	14.27	14.09	15.63	350.1	380.1	0.32	0.16	0.09
370.1	400.1	6.44	6.09	5.87	370.1	400.1	15.94	15.29	16.15	370.1	400.1	0.32	0.13	0.08
390.1	420.1	6.47	6.07	5.81	390.1	420.1	17.19	16.17	17.42	390.1	420.1	0.31	0.12	0.08
410.1	440.1	6.44	6.05	5.81	410.1	440.1	17.11	16.38	17.90	410.1	440.1	0.35	0.16	0.11
440.1	470.1	6.46	6.02	5.79	440.1	470.1	14.95	18.39	20.83	440.1	470.1	0.48	0.24	0.12
460.1	490.1	6.71	6.24	5.99	460.1	490.1	11.06	17.36	21.00	460.1	490.1	0.42	0.24	0.12
490.1	520.1	6.91	6.39	6.08	490.1	520.1	7.10	12.11	19.04	490.1	520.1	0.46	0.28	0.13
510.1	540.1	7.16	6.65	6.28	510.1	540.1	5.01	7.95	13.89	510.1	540.1	0.41	0.25	0.14
540.1	570.1	7.34	6.84	6.42	540.1	570.1	4.31	5.57	9.48	540.1	570.1	0.51	0.33	0.20
560.1	590.1	7.67	7.12	6.65	560.1	590.1	4.10	4.99	7.83	560.1	590.1	0.36	0.21	0.15
590.1	620.1	7.98	7.39	6.88	590.1	620.1	4.49	5.17	6.80	590.1	620.1	0.32	0.19	0.15
610.1	640.1	8.28	7.66	7.13	610.1	640.1	5.01	5.82	7.24	610.1	640.1	0.19	0.11	0.10
640.1	670.1	8.74	7.98	7.32	640.1	670.1	6.12	7.90	10.15	640.1	670.1	-0.03	-0.02	0.06
660.1	690.1	9.00	8.14	7.40	660.1	690.1	6.90	9.07	12.22	660.1	690.1	-0.19	-0.10	0.04
690.1	720.1	9.20	8.12	7.28	690.1	720.1	7.16	9.45	13.75	690.1	720.1	-0.20	0.01	0.18
710.1	740.1	9.25	8.05	7.25	710.1	740.1	7.47	10.38	15.31	710.1	740.1	-0.14	0.10	0.25
740.1	770.1	9.45	8.15	7.42	740.1	770.1	8.09	12.07	16.12	740.1	770.1	-0.12	0.15	0.22
760.1	790.1	9.39	8.16	7.52	760.1	790.1	9.27	13.17	16.85	760.1	790.1	0.04	0.23	0.26
790.1	820.1	9.54	8.46	7.87	790.1	820.1	10.67	13.65	15.59	790.1	820.1	0.18	0.23	0.21
810.1	840.1	9.71	8.69	8.15	810.1	840.1	11.76	14.21	15.37	810.1	840.1	0.24	0.23	0.20
840.1	870.1	10.20	9.29	8.79	840.1	870.1	11.95	14.16	15.14	840.1	870.1	0.19	0.18	0.16
860.1	890.1	10.43	9.60	9.10	860.1	890.1	12.01	14.12	15.81	860.1	890.1	0.23	0.20	0.18
890.1	920.1	10.99	10.31	9.86	890.1	920.1	12.00	13.99	16.58	890.1	920.1	0.13	0.14	0.15

REV. X2

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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)
		+7			+7			+7
240.0	10.1	5.58	10.0	20.1	5.23	490.0	10.1	6.31
234.1	16.0	5.66	50.0	60.1	4.91	477.7	22.4	6.21
228.2	21.9	5.64	90.0	100.1	5.12	465.4	34.7	6.16
222.3	27.8	5.60	130.0	140.1	5.03	453.1	47.0	6.19
216.4	33.7	5.55	170.0	180.1	5.24	440.8	59.3	6.18
210.5	39.6	5.50	210.0	220.1	5.24	428.5	71.6	6.12
204.6	45.5	5.55	250.0	260.1	5.11	416.2	83.9	6.06
198.7	51.4	5.42	290.0	300.1	5.25	403.8	96.3	6.07
192.8	57.3	5.39	330.0	340.1	5.31	391.5	108.6	6.03
186.9	63.2	5.47	370.0	380.1	5.36	379.2	120.9	6.05
181.0	69.1	5.46	410.0	420.1	5.17	366.9	133.2	5.97
175.1	75.0	5.41	430.0	440.1	5.13	354.6	145.5	6.06
169.2	80.9	5.41	470.0	480.1	5.12	342.3	157.8	6.01
163.3	86.8	5.40	490.0	500.1	5.35	330.0	170.1	6.06
157.4	92.7	5.39	530.0	540.1	5.40	317.7	182.4	5.98
151.5	98.6	5.31	550.0	560.1	5.09	305.4	194.7	6.06
145.6	104.5	5.31	590.0	600.1	5.40	293.1	207.0	6.02
139.7	110.4	5.38	610.0	620.1	5.27	280.8	219.3	6.08
133.8	116.3	5.41	650.0	660.1	5.31	268.5	231.6	6.05
127.9	122.2	5.36	670.0	680.1	5.14	256.2	243.9	6.12
122.1	128.0	5.35	710.0	720.1	5.25	243.8	256.3	6.09
116.2	133.9	5.38	730.0	740.1	5.19	231.5	268.6	6.02
110.3	139.8	5.35	770.0	780.1	5.14	219.2	280.9	6.07
104.4	145.7	5.30	790.0	800.1	5.19	206.9	293.2	6.17
98.5	151.6	5.33	830.0	840.1	5.08	194.6	305.5	6.26
92.6	157.5	5.42	850.0	860.1	4.95	182.3	317.8	6.17
86.7	163.4	5.42	890.0	900.1	5.13	170.0	330.1	6.22
80.8	169.3	5.38	910.0	920.1	5.05	157.7	342.4	6.08
74.9	175.2	5.43	950.0	960.1	5.34	145.4	354.7	6.28
69.0	181.1	5.47	970.0	980.1	5.66	133.1	367.0	6.22
63.1	187.0	5.42	1010.0	1020.1	5.81	120.8	379.3	6.27
57.2	192.9	5.41	1030.0	1040.1	5.92	108.5	391.6	6.23
51.3	198.8	5.45	1070.0	1080.1	6.30	96.2	403.9	6.32
45.4	204.7	5.52	1090.0	1100.1	6.94	83.8	416.3	6.31
39.5	210.6	5.50	1130.0	1140.1	7.28	71.5	428.6	6.28
33.6	216.5	5.50	1150.0	1160.1	7.78	59.2	440.9	6.32
27.7	222.4	5.53	1190.0	1200.1	8.56	46.9	453.2	6.26
21.8	228.3	5.58	1210.0	1220.1	8.65	34.6	465.5	6.30
15.9	234.2	5.51	1250.0	1260.1	9.96	22.3	477.8	6.27
10.0	240.1	5.49	1270.0	1280.1	10.43	10.0	490.1	6.31

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+4	+7	+10	+4	+7	+10
40.1	59.59	59.52	60.41	64.26	62.48	59.91
60.1	57.77	57.46	57.40	61.57	60.15	57.81
80.1	55.41	55.62	55.52	60.51	59.44	56.91
100.1	53.86	54.16	54.06	57.72	57.58	55.41
120.1	52.44	52.83	52.83	54.57	55.16	53.94
140.1	51.55	51.78	51.51	51.73	52.34	51.36
160.1	50.76	51.03	50.92	49.24	50.32	50.27
180.1	49.86	50.01	49.80	47.04	48.67	49.29
200.1	49.39	49.26	48.89	44.89	46.68	47.30
220.1	48.72	48.88	48.59	43.20	45.22	46.71
240.1	48.20	48.62	48.34	42.07	44.42	46.00
260.1	47.16	47.41	47.41	41.04	42.90	43.97
280.1	46.13	46.04	45.89	39.82	41.65	42.73
300.1	45.38	44.95	44.80	38.80	40.34	41.72
320.1	45.17	44.50	44.20	38.07	39.63	41.08
340.1	45.51	44.99	44.61	37.71	39.40	40.62
360.1	45.51	45.16	44.78	36.84	38.88	40.04
380.1	45.57	45.10	44.67	35.75	38.35	40.06
400.1	47.12	46.04	45.22	35.33	37.99	40.05
420.1	46.97	45.45	44.24	34.60	37.15	39.21
440.1	46.35	45.05	44.06	33.85	36.14	38.39
470.1	44.46	44.00	43.15	32.80	34.75	36.57
490.1	43.10	43.20	42.79	32.38	34.09	35.69
520.1	40.74	41.06	41.01	32.12	33.05	34.53
540.1	39.75	40.06	40.30	32.21	32.70	34.02
570.1	38.98	39.11	39.39	32.58	32.83	33.57
590.1	38.37	38.35	38.56	32.74	32.88	33.26
620.1	38.18	38.10	38.25	32.91	33.62	33.71
640.1	38.06	37.98	37.94	32.82	33.99	34.21
670.1	37.94	38.08	38.27	32.20	33.77	34.57
690.1	37.66	37.71	37.64	31.43	32.85	33.82
720.1	37.06	37.26	37.44	30.10	30.79	31.32
740.1	36.38	36.38	36.37	29.23	29.31	29.46
770.1	35.72	35.63	35.69	28.18	27.60	27.58
790.1	34.94	34.70	34.60	27.72	26.99	26.91
820.1	34.44	34.08	33.85	27.18	26.41	26.17
840.1	34.02	33.55	33.23	27.06	26.21	25.78
870.1	33.82	33.02	32.60	26.96	25.79	25.17
890.1	33.50	32.69	32.11	26.91	25.69	24.84
920.1	32.85	31.85	31.01	26.63	25.24	24.13

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	42.61	42.49	42.14
30.1	60.1	34.60	34.60	34.62
50.1	80.1	30.65	30.78	30.87
70.1	100.1	28.18	28.36	28.46
90.1	120.1	26.34	26.58	26.67
110.1	140.1	25.29	25.54	25.72
130.1	160.1	24.33	24.68	24.89
150.1	180.1	23.66	23.97	24.19
170.1	200.1	23.27	23.53	23.66
190.1	220.1	22.93	23.37	23.58
210.1	240.1	22.46	23.13	23.54
230.1	260.1	22.17	22.82	23.33
250.1	280.1	22.22	22.90	23.49
270.1	300.1	22.58	23.05	23.52
290.1	320.1	23.50	23.92	24.29
310.1	340.1	24.33	24.71	24.99
330.1	360.1	25.41	25.90	26.23
350.1	380.1	25.53	26.26	26.78
370.1	400.1	24.72	25.63	26.47
390.1	420.1	22.90	23.73	24.55
410.1	440.1	21.35	21.90	22.45
440.1	470.1	19.16	19.20	19.30
460.1	490.1	18.23	18.01	17.91
490.1	520.1	17.17	16.74	16.50
510.1	540.1	16.59	16.22	15.98
540.1	570.1	16.01	15.45	15.21
560.1	590.1	15.56	15.23	14.80
590.1	620.1	15.08	14.81	14.47
610.1	640.1	14.98	14.66	14.45
640.1	670.1	14.81	14.48	14.27
660.1	690.1	14.66	14.48	14.14
690.1	720.1	14.38	14.20	14.07
710.1	740.1	14.18	14.08	14.00
740.1	770.1	13.90	13.88	13.98
760.1	790.1	13.65	13.65	13.65
790.1	820.1	13.03	13.11	13.07
810.1	840.1	12.76	12.79	12.81
840.1	870.1	12.22	12.11	12.09
860.1	890.1	11.82	11.72	11.64
890.1	920.1	11.26	11.05	10.88

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)		
		+4	+7	+10		+4	+7	+10		+4	+7	+10
10.1	40.1	1.33	1.27	1.08	40.1	1.07	1.82	2.86	10.1	2.27	1.83	1.56
30.1	60.1	1.41	1.24	1.15	60.1	1.08	1.74	2.63	20.1	2.39	1.91	1.63
50.1	80.1	1.42	1.25	1.12	80.1	1.08	1.69	2.48	30.1	2.39	1.92	1.64
70.1	100.1	1.35	1.19	1.08	100.1	1.08	1.75	2.62	40.1	2.33	1.88	1.60
90.1	120.1	1.37	1.20	1.11	120.1	1.08	1.66	2.40	50.1	2.33	1.87	1.60
110.1	140.1	1.37	1.17	1.08	140.1	1.13	1.81	2.72	60.1	2.37	1.90	1.63
130.1	160.1	1.32	1.16	1.07	160.1	1.12	1.71	2.48	70.1	2.37	1.91	1.64
150.1	180.1	1.30	1.14	1.06	180.1	1.11	1.73	2.53	80.1	2.29	1.86	1.60
170.1	200.1	1.29	1.14	1.05	200.1	1.16	1.76	2.56	90.1	2.20	1.79	1.54
190.1	220.1	1.29	1.13	1.05	220.1	1.17	1.72	2.46	100.1	2.23	1.81	1.55
210.1	240.1	1.22	1.07	1.01	240.1	1.20	1.86	2.72	110.1	2.33	1.88	1.61
230.1	260.1	1.20	1.07	1.02	260.1	1.21	1.75	2.48	120.1	2.35	1.92	1.65
250.1	280.1	1.18	1.06	1.03	280.1	1.25	1.84	2.64	130.1	2.29	1.87	1.62
270.1	300.1	1.18	1.05	1.03	300.1	1.29	1.83	2.56	140.1	2.22	1.81	1.58
290.1	320.1	1.16	1.04	1.06	320.1	1.30	1.85	2.60	150.1	2.23	1.82	1.58
310.1	340.1	1.13	1.06	1.10	340.1	1.35	1.95	2.75	160.1	2.27	1.86	1.61
330.1	360.1	1.14	1.09	1.12	360.1	1.36	1.89	2.62	170.1	2.22	1.83	1.60
350.1	380.1	1.14	1.11	1.14	380.1	1.40	1.96	2.73	180.1	2.14	1.77	1.55
370.1	400.1	1.14	1.13	1.17	400.1	1.41	1.91	2.61	190.1	2.15	1.77	1.55
390.1	420.1	1.14	1.17	1.23	420.1	1.44	1.97	2.74	200.1	2.22	1.83	1.60
410.1	440.1	1.17	1.23	1.29	440.1	1.53	2.05	2.80	210.1	2.24	1.86	1.63
440.1	470.1	1.18	1.26	1.32	470.1	1.56	2.02	2.73	220.1	2.17	1.82	1.61
460.1	490.1	1.17	1.25	1.31	490.1	1.64	2.10	2.79	240.1	2.14	1.78	1.58
490.1	520.1	1.19	1.23	1.29	520.1	1.70	2.20	2.92	250.1	2.18	1.83	1.63
510.1	540.1	1.21	1.21	1.26	540.1	1.72	2.21	2.92	270.1	2.04	1.73	1.56
540.1	570.1	1.26	1.22	1.24	570.1	1.76	2.27	3.00	280.1	2.02	1.70	1.53
560.1	590.1	1.32	1.27	1.27	590.1	1.78	2.30	3.05	300.1	2.12	1.81	1.63
590.1	620.1	1.48	1.41	1.39	620.1	1.80	2.29	3.01	310.1	2.08	1.78	1.63
610.1	640.1	1.61	1.54	1.50	640.1	1.81	2.26	2.97	330.1	2.03	1.74	1.59
640.1	670.1	1.82	1.73	1.69	670.1	1.82	2.26	2.96	340.1	2.07	1.78	1.63
660.1	690.1	1.97	1.87	1.81	690.1	1.82	2.24	2.92	360.1	1.97	1.72	1.60
690.1	720.1	2.22	2.10	2.03	720.1	1.82	2.17	2.82	370.1	1.92	1.66	1.54
710.1	740.1	2.34	2.21	2.13	740.1	1.82	2.15	2.80	390.1	2.02	1.75	1.62
740.1	770.1	2.49	2.35	2.27	770.1	1.84	2.16	2.82	400.1	2.00	1.75	1.64
760.1	790.1	2.57	2.44	2.36	790.1	1.87	2.17	2.82	420.1	1.92	1.67	1.58
790.1	820.1	2.72	2.60	2.52	820.1	1.95	2.21	2.82	430.1	1.97	1.71	1.61
810.1	840.1	2.75	2.65	2.57	840.1	2.03	2.26	2.84	450.1	1.91	1.70	1.63
840.1	870.1	2.82	2.72	2.65	870.1	2.16	2.34	2.89	460.1	1.85	1.63	1.56
860.1	890.1	2.86	2.77	2.70	890.1	2.26	2.40	2.91	480.1	1.95	1.70	1.61
890.1	920.1	2.90	2.82	2.75	920.1	2.42	2.47	2.93	490.1	1.96	1.73	1.66

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	14	24	19	31	18	46	25	43	46	44
1	-	17	+0	25	13	36	25	39	36	41	39	41
2	82	>69	67	>69	62	>69	66	69	57	>69	60	>69
3	>90	>69	66	>69	63	>69	59	>69	58	>69	68	>69
4	>90	>69	>69	>69	>69	>69	>69	>69	>69	>69	>69	>69
5	>90	>69	>69	>69	>69	>69	>69	>69	>69	>69	>69	>69
6	>90	>69	>69	>69	>69	>69	>69	>69	>69	>69	>69	>69
7	>90	>69	>69	>69	>69	>69	>69	>69	>69	>69	>69	>69
8	>90	>69	>69	>69	>69	>69	>69	>69	>69	>69	>69	>69
9	>90	>69	>69	>69	>69	>69	>69	>69	>69	>69	>69	>69
10	>90	>69	>69	>69	>69	>69	>69	>69	>69	>69	>69	>69
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; -14.00 dBm.
LO IN: 280.1 MHz; +7.00 dBm
IF OUT: 30 MHz; -19.69 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	25	34	30	44	31	59	41	61	57	60
1	-	17	+0	26	13	35	23	41	41	44	44	43
2	62	68	57	66	53	66	58	63	50	66	52	>79
3	>90	52	44	50	46	57	42	52	46	60	53	61
4	>90	>79	77	>79	78	78	72	75	78	>79	71	77
5	>90	73	68	75	62	75	58	71	56	74	58	77
6	>90	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
7	>90	>79	>79	>79	79	>79	75	>79	74	>79	72	>79
8	>90	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
9	>90	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
10	>90	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
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: 280.1 MHz; +7.00 dBm
IF OUT: 30 MHz; -9.62 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.