

Frequency Mixer

HJK-ED12443

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=80MHz (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	90.1	12.16	11.26	10.71
30.1	110.1	7.63	7.07	6.67
50.1	130.1	7.50	6.93	6.57
70.1	150.1	7.12	6.61	6.32
90.1	170.1	6.73	6.33	6.08
110.1	190.1	6.65	6.24	6.00
130.1	210.1	6.65	6.21	5.96
150.1	230.1	6.61	6.20	5.97
170.1	250.1	6.51	6.13	5.93
200.1	280.1	6.39	6.07	5.90
220.1	300.1	6.40	6.07	5.90
250.1	330.1	6.35	6.06	5.93
270.1	350.1	6.29	6.04	5.92
300.1	380.1	6.27	6.06	5.96
320.1	400.1	6.29	6.14	6.07
350.1	430.1	6.25	6.15	6.11
370.1	450.1	6.22	6.10	6.06
400.1	480.1	6.18	6.04	5.98
420.1	500.1	6.27	6.10	6.01
450.1	530.1	6.48	6.27	6.11
470.1	550.1	6.95	6.78	7.37
500.1	580.1	6.94	6.73	6.66
520.1	600.1	6.85	6.73	6.71
550.1	630.1	6.79	6.58	6.51
570.1	650.1	6.87	6.58	6.46
600.1	680.1	7.25	6.84	6.66
620.1	700.1	7.71	7.20	6.95
650.1	730.1	8.38	7.80	7.44
670.1	750.1	8.62	8.09	7.73
700.1	780.1	8.98	8.57	8.31
720.1	800.1	9.22	8.83	8.64
750.1	830.1	9.43	8.92	8.72
770.1	850.1	9.55	8.96	8.75
800.1	880.1	9.88	9.11	8.84
820.1	900.1	10.26	9.29	8.91
850.1	930.1	10.58	9.50	9.01
870.1	950.1	10.87	9.71	9.16
900.1	980.1	11.50	10.23	9.54
920.1	1000.1	12.10	10.65	9.90
950.1	1030.1	12.95	11.40	10.56

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+14	+17	+20
10.1	90.1	19.75	20.90	22.24
30.1	110.1	20.64	21.85	22.69
50.1	130.1	21.23	22.41	23.24
70.1	150.1	21.18	22.13	22.64
90.1	170.1	22.14	22.81	23.61
110.1	190.1	21.22	21.40	22.57
130.1	210.1	22.60	23.10	24.29
150.1	230.1	23.08	24.16	25.41
170.1	250.1	23.25	24.79	26.13
200.1	280.1	19.32	20.44	21.55
220.1	300.1	21.07	22.80	25.04
250.1	330.1	24.18	25.39	27.58
270.1	350.1	26.05	27.72	30.29
300.1	380.1	27.67	29.76	33.56
320.1	400.1	27.20	29.16	32.76
350.1	430.1	27.70	29.36	32.06
370.1	450.1	29.28	30.60	33.23
400.1	480.1	29.55	31.79	33.61
420.1	500.1	30.96	32.93	36.64
450.1	530.1	30.65	33.56	40.34
470.1	550.1	19.33	18.40	20.10
500.1	580.1	24.88	29.68	32.78
520.1	600.1	25.45	29.32	32.26
550.1	630.1	23.84	27.60	30.98
570.1	650.1	22.86	26.37	29.36
600.1	680.1	21.09	24.42	27.00
620.1	700.1	20.55	23.46	25.86
650.1	730.1	20.10	22.51	24.59
670.1	750.1	19.86	22.47	24.55
700.1	780.1	18.50	21.42	23.85
720.1	800.1	17.57	20.05	22.80
750.1	830.1	16.98	18.95	21.71
770.1	850.1	16.97	18.63	21.26
800.1	880.1	17.78	18.72	20.94
820.1	900.1	18.58	19.19	21.14
850.1	930.1	18.19	19.44	21.56
870.1	950.1	17.78	19.16	21.65
900.1	980.1	17.86	19.01	21.88
920.1	1000.1	17.89	19.11	21.99
950.1	1030.1	17.59	19.14	21.97

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+17dBm (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	90.1	-0.70	-0.45	-0.28
30.1	110.1	0.30	0.01	-0.04
50.1	130.1	0.46	0.07	-0.01
70.1	150.1	0.78	0.29	0.14
90.1	170.1	0.70	0.36	0.27
110.1	190.1	0.41	0.22	0.15
130.1	210.1	0.45	0.27	0.18
150.1	230.1	0.59	0.34	0.23
170.1	250.1	0.59	0.34	0.23
200.1	280.1	0.53	0.29	0.18
220.1	300.1	0.46	0.27	0.18
250.1	330.1	0.57	0.39	0.26
270.1	350.1	0.40	0.33	0.23
300.1	380.1	0.26	0.18	0.12
320.1	400.1	0.27	0.14	0.08
350.1	430.1	0.25	0.13	0.07
370.1	450.1	0.24	0.14	0.07
400.1	480.1	0.27	0.18	0.10
420.1	500.1	0.25	0.16	0.09
450.1	530.1	0.23	0.05	-0.02
470.1	550.1	0.58	0.52	-0.24
500.1	580.1	0.65	0.40	0.10
520.1	600.1	0.82	0.39	0.14
550.1	630.1	1.30	0.58	0.25
570.1	650.1	1.50	0.70	0.32
600.1	680.1	1.39	0.91	0.45
620.1	700.1	1.21	0.95	0.54
650.1	730.1	1.06	0.91	0.63
670.1	750.1	1.08	0.87	0.62
700.1	780.1	1.18	0.86	0.56
720.1	800.1	1.39	1.00	0.67
750.1	830.1	1.66	1.29	0.96
770.1	850.1	1.80	1.45	1.12
800.1	880.1	1.93	1.56	1.23
820.1	900.1	2.08	1.63	1.28
850.1	930.1	2.40	1.78	1.35
870.1	950.1	2.71	1.96	1.45
900.1	980.1	3.22	2.33	1.58
920.1	1000.1	3.56	2.58	1.76
950.1	1030.1	3.87	2.92	1.90

Frequency Mixer

HJK-ED12443

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=325MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=34MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=660.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+17			+17			+17
315.0	10.0	13.06	10.1	44.1	7.80	650.1	10.0	16.05
307.2	17.8	9.27	30.5	64.5	7.52	633.7	26.4	10.39
299.4	25.6	8.30	51.0	85.0	7.11	617.3	42.8	10.18
291.5	33.5	7.93	71.4	105.4	6.94	600.9	59.2	10.10
283.7	41.3	7.88	91.9	125.9	7.10	584.5	75.6	9.77
275.9	49.1	7.74	112.3	146.3	7.10	568.0	92.1	9.62
268.1	56.9	7.67	132.8	166.8	7.10	551.6	108.5	9.52
260.3	64.7	7.49	153.2	187.2	6.91	535.2	124.9	9.58
252.4	72.6	7.29	173.7	207.7	7.07	518.8	141.3	9.60
244.6	80.4	6.96	194.1	228.1	7.08	502.4	157.7	9.34
236.8	88.2	6.90	214.5	248.5	7.17	486.0	174.1	9.25
229.0	96.0	6.85	235.0	269.0	7.17	469.6	190.5	9.13
221.2	103.8	6.73	255.4	289.4	7.14	453.2	206.9	9.07
213.3	111.7	6.77	275.9	309.9	7.31	436.8	223.3	9.03
205.5	119.5	6.65	296.3	330.3	7.32	420.4	239.7	8.86
197.7	127.3	6.66	316.8	350.8	7.45	403.9	256.2	8.66
189.9	135.1	6.56	337.2	371.2	7.42	387.5	272.6	8.51
182.1	142.9	6.44	357.7	391.7	7.68	371.1	289.0	8.27
174.2	150.8	6.26	378.1	412.1	7.64	354.7	305.4	8.08
166.4	158.6	5.78	398.5	432.5	7.65	338.3	321.8	7.40
158.6	166.4	6.02	419.0	453.0	7.33	321.9	338.2	8.25
150.8	174.2	6.41	439.4	473.4	7.35	305.5	354.6	8.18
142.9	182.1	6.42	459.9	493.9	7.21	289.1	371.0	7.96
135.1	189.9	6.35	480.3	514.3	7.47	272.7	387.4	7.73
127.3	197.7	6.36	500.8	534.8	7.87	256.3	403.8	7.56
119.5	205.5	6.31	521.2	555.2	9.12	239.8	420.3	7.42
111.7	213.3	6.32	541.7	575.7	8.25	223.4	436.7	7.27
103.8	221.2	6.30	562.1	596.1	7.99	207.0	453.1	7.23
96.0	229.0	6.27	603.0	637.0	8.03	190.6	469.5	7.33
88.2	236.8	6.28	623.4	657.4	8.12	174.2	485.9	7.45
80.4	244.6	6.25	664.3	698.3	8.32	157.8	502.3	7.64
72.6	252.4	6.25	684.8	718.8	8.40	141.4	518.7	7.98
64.7	260.3	6.21	725.7	759.7	8.43	125.0	535.1	8.16
56.9	268.1	6.21	746.1	780.1	8.56	108.6	551.5	9.01
49.1	275.9	6.14	787.0	821.0	8.89	92.2	567.9	7.75
41.3	283.7	6.19	807.4	841.4	8.98	75.7	584.4	7.28
33.5	291.5	6.25	848.3	882.3	9.32	59.3	600.8	7.12
25.6	299.4	6.29	868.8	902.8	9.63	42.9	617.2	7.17
17.8	307.2	6.33	909.7	943.7	9.96	26.5	633.6	7.33
10.0	315.0	6.50	930.1	964.1	10.11	10.1	650.0	7.60

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+20	+14	+17	+20
90.1	54.24	54.85	55.50	54.95	55.10	55.25
110.1	53.83	54.63	55.26	53.65	54.00	53.99
130.1	53.54	54.63	55.45	52.39	52.80	52.88
150.1	52.49	53.47	54.31	51.26	51.59	51.70
170.1	52.07	53.27	54.10	50.40	50.77	50.74
190.1	51.63	52.69	53.44	49.22	49.31	49.33
210.1	50.74	51.94	52.96	48.46	48.70	48.95
230.1	50.14	51.41	52.59	47.44	47.59	47.70
250.1	49.64	51.29	52.58	46.46	46.41	46.36
280.1	47.72	48.42	48.74	44.95	44.49	44.13
300.1	46.67	47.71	48.52	45.07	45.86	46.40
330.1	46.26	47.71	48.87	43.68	44.04	44.27
350.1	46.14	47.80	49.09	42.47	42.76	42.84
380.1	46.14	48.14	49.56	40.55	40.71	40.85
400.1	46.54	48.67	50.09	38.69	38.73	38.86
430.1	46.70	48.87	50.42	36.11	36.07	36.12
450.1	47.19	49.05	50.17	34.46	34.29	34.22
480.1	47.85	48.57	48.83	32.49	32.25	32.13
500.1	47.10	47.07	47.12	31.72	31.61	31.53
530.1	41.15	40.76	40.48	29.16	29.00	28.85
550.1	37.35	37.33	39.33	27.33	27.04	30.01
580.1	36.85	39.27	42.11	38.83	40.95	42.86
600.1	36.49	38.27	40.07	44.61	46.98	49.42
630.1	37.20	38.41	39.57	48.21	49.76	51.21
650.1	37.65	38.68	39.58	48.54	49.97	51.62
680.1	38.77	39.63	40.36	46.13	46.21	46.96
700.1	39.44	40.17	40.80	46.27	45.36	45.58
730.1	40.44	41.20	41.75	47.41	45.43	44.85
750.1	41.06	42.00	42.57	47.72	45.39	44.51
780.1	41.18	42.06	42.69	49.12	46.75	45.71
800.1	41.49	42.48	43.18	50.55	48.75	47.68
830.1	41.42	42.41	43.23	51.82	50.53	49.66
850.1	41.04	41.87	42.59	52.42	51.55	50.90
880.1	40.95	41.71	42.42	53.31	52.88	52.57
900.1	40.69	41.36	42.19	54.33	53.98	53.85
930.1	39.91	40.56	41.38	55.03	54.85	55.02
950.1	39.66	40.45	41.39	55.68	55.63	55.99
980.1	39.05	39.89	40.90	56.25	56.34	57.10
1000.1	38.66	39.44	40.46	56.60	56.53	57.50
1030.1	37.74	38.36	39.24	56.12	56.06	57.09

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	90.1	46.75	48.58	50.13
30.1	110.1	42.03	43.55	43.18
50.1	130.1	42.51	45.31	47.66
70.1	150.1	39.53	39.70	38.21
90.1	170.1	44.30	51.52	68.90
110.1	190.1	37.87	37.42	35.68
130.1	210.1	42.67	48.46	58.42
150.1	230.1	39.43	39.97	38.94
170.1	250.1	43.68	49.81	53.14
200.1	280.1	44.66	51.33	57.33
220.1	300.1	37.22	39.12	39.51
250.1	330.1	38.81	42.30	44.23
270.1	350.1	39.65	43.20	45.98
300.1	380.1	39.33	42.09	42.58
320.1	400.1	40.70	42.81	42.96
350.1	430.1	39.42	40.98	41.36
370.1	450.1	39.55	40.87	41.42
400.1	480.1	39.93	40.93	41.22
420.1	500.1	40.92	41.84	41.87
450.1	530.1	44.37	47.27	49.72
470.1	550.1	48.67	62.60	36.89
500.1	580.1	47.46	43.14	35.63
520.1	600.1	53.56	42.08	36.77
550.1	630.1	46.37	44.07	38.70
570.1	650.1	41.00	51.99	41.62
600.1	680.1	37.16	44.99	53.16
620.1	700.1	35.32	40.78	44.32
650.1	730.1	31.86	36.16	38.58
670.1	750.1	30.50	34.48	36.80
700.1	780.1	28.56	32.26	34.78
720.1	800.1	27.19	30.17	32.40
750.1	830.1	26.10	28.91	31.54
770.1	850.1	25.64	28.54	31.70
800.1	880.1	25.19	27.96	31.71
820.1	900.1	24.98	27.74	32.75
850.1	930.1	24.95	27.06	32.70
870.1	950.1	25.02	26.59	31.46
900.1	980.1	25.28	26.45	31.84
920.1	1000.1	25.11	25.47	29.48
950.1	1030.1	24.26	23.19	25.24

Frequency Mixer

HJK-ED12443

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)				IF (OUT) (MHz)	IF VSWR @LO=650MHz (:1)			
		@LO (dBm)				@LO (dBm)					@LO (dBm)			
		+14	+17	+20		+14	+17	+20	+14		+17	+20		
10.1	90.1	11.24	9.74	9.13	90.1	12.61	12.61	12.61	10.0	1.28	1.32	1.36		
30.1	110.1	2.57	2.38	2.26	110.1	12.09	12.09	12.01	26.2	1.08	1.20	1.28		
50.1	130.1	1.84	1.68	1.60	130.1	11.69	11.69	11.61	42.3	1.07	1.16	1.23		
70.1	150.1	1.56	1.41	1.34	150.1	11.31	11.31	11.31	58.5	1.15	1.23	1.30		
90.1	170.1	1.38	1.26	1.20	170.1	11.03	10.96	10.96	74.6	1.25	1.29	1.34		
110.1	190.1	1.26	1.14	1.12	190.1	10.62	10.56	10.50	90.8	1.31	1.33	1.38		
130.1	210.1	1.21	1.09	1.08	210.1	10.19	10.13	10.07	106.9	1.47	1.49	1.54		
150.1	230.1	1.19	1.06	1.07	230.1	9.69	9.63	9.58	123.1	1.52	1.53	1.56		
170.1	250.1	1.15	1.04	1.07	250.1	9.08	9.04	8.95	139.2	1.62	1.63	1.67		
200.1	280.1	1.06	1.07	1.14	280.1	8.01	7.94	7.83	155.4	1.71	1.69	1.72		
220.1	300.1	1.03	1.19	1.29	300.1	7.34	7.28	7.22	171.5	1.78	1.76	1.79		
250.1	330.1	1.08	1.23	1.33	330.1	6.24	6.17	6.11	187.7	1.97	1.94	1.95		
270.1	350.1	1.14	1.28	1.38	350.1	5.42	5.36	5.31	203.8	2.00	1.96	1.97		
300.1	380.1	1.22	1.36	1.44	380.1	4.23	4.18	4.14	220.0	2.15	2.10	2.12		
320.1	400.1	1.23	1.36	1.45	400.1	3.49	3.45	3.42	236.2	2.17	2.10	2.09		
350.1	430.1	1.23	1.34	1.42	430.1	2.52	2.49	2.47	252.3	2.28	2.20	2.18		
370.1	450.1	1.18	1.28	1.35	450.1	2.01	2.00	1.99	268.5	2.46	2.35	2.31		
400.1	480.1	1.08	1.15	1.19	480.1	1.64	1.65	1.65	284.6	2.50	2.38	2.35		
420.1	500.1	1.01	1.05	1.09	500.1	1.77	1.80	1.83	300.8	2.63	2.50	2.45		
450.1	530.1	1.16	1.11	1.07	530.1	2.39	2.44	2.50	316.9	2.62	2.46	2.40		
470.1	550.1	1.29	1.20	1.43	550.1	2.79	2.83	2.85	333.1	2.78	2.61	2.54		
500.1	580.1	1.59	1.84	2.06	580.1	3.78	3.93	4.23	349.2	2.87	2.67	2.58		
520.1	600.1	1.59	1.79	1.97	600.1	5.17	5.34	5.58	365.4	2.93	2.73	2.64		
550.1	630.1	1.57	1.68	1.79	630.1	7.90	8.08	8.27	381.5	3.09	2.86	2.75		
570.1	650.1	1.67	1.73	1.80	650.1	10.07	10.31	10.43	397.7	3.03	2.81	2.69		
600.1	680.1	1.92	1.94	1.98	680.1	14.03	14.26	14.38	413.8	3.18	2.94	2.81		
620.1	700.1	2.10	2.11	2.14	700.1	17.05	17.39	17.57	430.0	3.18	2.92	2.77		
650.1	730.1	2.32	2.37	2.40	730.1	21.73	22.00	22.00	446.2	3.27	3.00	2.85		
670.1	750.1	2.42	2.52	2.58	750.1	24.83	25.19	24.83	462.3	3.33	3.06	2.89		
700.1	780.1	2.49	2.68	2.80	780.1	30.49	31.03	30.49	478.5	3.30	3.03	2.86		
720.1	800.1	2.49	2.70	2.87	800.1	34.75	34.75	34.75	494.6	3.37	3.09	2.90		
750.1	830.1	2.51	2.69	2.91	830.1	39.49	39.49	38.61	510.8	3.26	2.97	2.79		
770.1	850.1	2.55	2.68	2.90	850.1	43.44	42.38	40.41	526.9	3.37	3.08	2.89		
800.1	880.1	2.66	2.70	2.89	880.1	49.64	49.64	48.26	543.1	3.30	3.00	2.80		
820.1	900.1	2.81	2.73	2.89	900.1	54.29	52.65	51.10	559.2	3.32	3.03	2.83		
850.1	930.1	3.08	2.87	2.94	930.1	57.91	54.29	51.10	575.4	3.27	2.98	2.77		
870.1	950.1	3.29	3.00	3.00	950.1	57.91	54.29	51.10	591.5	3.14	2.84	2.65		
900.1	980.1	3.60	3.22	3.12	980.1	59.91	57.91	56.04	607.7	3.17	2.88	2.68		
920.1	1000.1	3.84	3.38	3.21	1000.1	62.05	59.91	57.91	623.8	2.96	2.69	2.51		
950.1	1030.1	4.12	3.58	3.33	1030.1	62.05	57.91	51.10	640.0	2.54	2.34	2.22		

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	16	19	27	31	55	49	49	51	51	63
1	-	35	+0	35	11	49	33	71	44	49	42	53
2	64	55	62	64	56	58	77	73	75	72	65	82
3	>90	>84	61	84	61	>84	62	>84	>84	>84	70	80
4	>90	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
5	>90	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
6	>90	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
7	>90	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
8	>90	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
9	>90	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
10	>90	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 342 MHz; 0.00 dBm.
LO IN: 422 MHz; +17.00 dBm
IF OUT: 80 MHz; -6.15 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	28	30	36	42	67	57	56	62	65	66
1	-	34	+0	35	11	48	33	68	53	52	42	56
2	44	45	54	54	48	50	62	64	67	67	60	83
3	66	67	41	66	41	73	43	71	66	71	53	66
4	>90	74	71	69	67	70	65	73	73	86	75	79
5	>90	87	77	76	61	75	65	77	68	86	94	81
6	>90	>94	>94	93	87	87	86	81	88	85	89	>94
7	>90	>94	>94	93	85	84	83	86	79	89	88	>94
8	>90	>94	>94	>94	>94	>94	>94	>94	>94	93	>94	>94
9	>90	>94	>94	>94	>94	>94	>94	>94	>94	>94	>94	>94
10	>90	>94	>94	>94	>94	>94	>94	>94	>94	>94	>94	>94
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 342 MHz; 10.00 dBm.
LO IN: 422 MHz; +17.00 dBm
IF OUT: 80 MHz; 3.81 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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