

Frequency Mixer

HJK-ED12742/1

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=20.4MHz (dB)		
		@LO (dBm)		
		+14	+17	+20
40.0	19.6	12.34	10.46	9.37
51.0	30.6	9.97	9.10	8.57
62.0	41.6	9.31	8.69	8.27
73.0	52.6	9.08	8.56	8.14
84.0	63.6	8.99	8.52	8.20
95.0	74.6	8.84	8.42	8.16
106.0	85.6	8.77	8.39	8.13
117.0	96.6	8.72	8.35	8.10
128.0	107.6	8.70	8.32	8.04
139.0	118.6	8.72	8.31	8.01
150.0	129.6	8.70	8.30	8.01
161.0	140.6	8.77	8.36	8.08
172.0	151.6	8.88	8.46	8.17
183.0	162.6	9.04	8.60	8.28
194.0	173.6	9.24	8.74	8.36
205.0	184.6	9.39	8.80	8.41
216.0	195.6	9.47	8.87	8.42
227.0	206.6	9.54	8.85	8.40
238.0	217.6	9.50	8.84	8.38
249.0	228.6	9.55	8.89	8.44
260.0	239.6	9.64	8.95	8.52
271.0	250.6	9.81	9.11	8.65
281.0	260.6	10.08	9.28	8.75
292.0	271.6	10.28	9.39	8.84
302.0	281.6	10.49	9.50	8.90
313.0	292.6	10.62	9.57	8.90
323.0	302.6	10.60	9.55	8.87
334.0	313.6	10.61	9.55	8.89
344.0	323.6	10.64	9.56	8.91
355.0	334.6	10.73	9.65	8.98
365.0	344.6	10.95	9.81	9.12
376.0	355.6	11.24	9.94	9.21
386.0	365.6	11.55	10.15	9.34
397.0	376.6	11.76	10.31	9.42
407.0	386.6	11.87	10.34	9.44
418.0	397.6	12.04	10.44	9.48
428.0	407.6	11.97	10.45	9.53
439.0	418.6	12.01	10.51	9.59
449.0	428.6	12.09	10.57	9.66
460.0	439.6	12.43	10.75	9.78

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+14	+17	+20
40.0	19.6	16.02	19.31	23.37
51.0	30.6	20.95	23.57	26.74
62.0	41.6	23.43	26.57	29.19
73.0	52.6	24.31	27.23	29.68
84.0	63.6	24.76	27.55	29.89
95.0	74.6	25.89	28.61	30.95
106.0	85.6	25.95	27.06	34.52
117.0	96.6	26.65	29.24	31.76
128.0	107.6	26.56	29.11	31.52
139.0	118.6	26.20	28.84	32.20
150.0	129.6	26.41	28.94	32.77
161.0	140.6	26.23	29.23	32.67
172.0	151.6	25.83	28.63	31.73
183.0	162.6	25.38	28.42	31.96
194.0	173.6	24.65	27.46	31.30
205.0	184.6	23.87	27.20	30.42
216.0	195.6	23.47	26.56	29.62
227.0	206.6	22.92	26.05	29.60
238.0	217.6	23.01	26.09	29.44
249.0	228.6	22.91	26.00	29.51
260.0	239.6	22.52	25.89	29.18
271.0	250.6	22.21	25.55	29.08
281.0	260.6	21.54	24.86	28.32
292.0	271.6	20.95	24.39	27.90
302.0	281.6	20.43	24.01	27.51
313.0	292.6	20.01	23.44	26.78
323.0	302.6	19.94	23.51	26.81
334.0	313.6	19.93	23.25	26.36
344.0	323.6	19.55	23.03	26.08
355.0	334.6	19.58	22.90	26.21
365.0	344.6	19.17	22.48	25.62
376.0	355.6	18.38	21.91	25.22
386.0	365.6	18.07	21.52	24.75
397.0	376.6	17.76	20.86	23.87
407.0	386.6	17.46	20.57	23.47
418.0	397.6	17.60	20.64	23.55
428.0	407.6	17.58	20.58	23.41
439.0	418.6	17.46	20.68	23.65
449.0	428.6	17.58	20.79	23.71
460.0	439.6	16.92	20.45	23.57

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+19dBm (dB)		
		@LO (dBm)		
		+14	+17	+20
40.0	19.6	3.45	3.07	2.15
51.0	30.6	2.57	1.52	0.84
62.0	41.6	1.87	1.08	0.58
73.0	52.6	1.54	0.91	0.47
84.0	63.6	1.34	0.73	0.41
95.0	74.6	1.16	0.61	0.41
106.0	85.6	1.04	0.54	0.30
117.0	96.6	1.02	0.55	0.24
128.0	107.6	1.05	0.55	0.23
139.0	118.6	1.06	0.56	0.33
150.0	129.6	1.06	0.57	0.28
161.0	140.6	1.08	0.55	0.28
172.0	151.6	1.12	0.58	0.27
183.0	162.6	1.22	0.65	0.29
194.0	173.6	1.37	0.77	0.31
205.0	184.6	1.58	0.87	0.35
216.0	195.6	1.66	1.00	0.39
227.0	206.6	1.73	1.02	0.43
238.0	217.6	1.76	1.05	0.42
249.0	228.6	1.75	1.05	0.42
260.0	239.6	1.80	1.08	0.42
271.0	250.6	1.86	1.16	0.47
281.0	260.6	1.94	1.25	0.50
292.0	271.6	2.05	1.37	0.59
302.0	281.6	2.09	1.46	0.67
313.0	292.6	2.08	1.52	0.70
323.0	302.6	2.10	1.56	0.73
334.0	313.6	2.04	1.52	0.75
344.0	323.6	2.04	1.52	0.74
355.0	334.6	2.03	1.57	0.77
365.0	344.6	2.00	1.58	0.81
376.0	355.6	2.00	1.65	0.88
386.0	365.6	1.91	1.66	0.94
397.0	376.6	1.84	1.68	0.98
407.0	386.6	1.81	1.63	0.99
418.0	397.6	1.73	1.58	0.93
428.0	407.6	1.79	1.58	0.92
439.0	418.6	1.85	1.67	0.93
449.0	428.6	1.84	1.67	0.96
460.0	439.6	1.81	1.77	1.01

Frequency Mixer

HJK-ED12742/1

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=113MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=97.9MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=128.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+17			+17			+17
93.0	20.0	10.59	10.1	108.0	8.81	106.1	22.0	10.14
89.0	24.0	9.83	16.1	114.0	8.46	104.1	24.0	9.80
85.1	27.9	9.32	22.1	120.0	8.44	102.1	26.0	9.56
81.1	31.9	9.07	28.1	126.0	8.40	100.1	28.0	9.36
77.2	35.8	8.93	34.1	132.0	8.41	98.1	30.0	9.19
73.2	39.8	8.85	40.1	138.0	8.44	95.1	33.0	9.00
69.3	43.7	8.73	46.1	144.0	8.44	93.1	35.0	8.89
65.3	47.7	8.69	52.1	150.0	8.50	90.1	38.0	8.81
61.4	51.6	8.67	58.1	156.0	8.50	88.1	40.0	8.73
57.4	55.6	8.58	64.1	162.0	8.54	85.1	43.0	8.70
53.5	59.5	8.53	70.1	168.0	8.62	83.1	45.0	8.65
49.5	63.5	8.57	76.1	174.0	8.67	80.1	48.0	8.62
45.6	67.4	8.46	82.1	180.0	8.71	78.1	50.0	8.60
40.6	72.4	8.43	88.1	186.0	8.74	75.1	53.0	8.56
36.7	76.3	8.41	94.1	192.0	8.81	73.1	55.0	8.63
31.7	81.3	8.37	100.1	198.0	8.91	70.1	58.0	8.56
27.8	85.2	8.32	106.1	204.0	8.94	68.1	60.0	8.49
22.8	90.2	8.38	112.1	210.0	8.97	65.1	63.0	8.48
18.9	94.1	8.39	118.1	216.0	8.96	63.1	65.0	8.50
14.0	99.0	8.46	124.1	222.0	8.95	60.1	68.0	8.44
10.0	103.0	8.84	130.1	228.0	8.97	58.1	70.0	8.38
21.2	134.2	8.42	136.1	234.0	9.01	55.1	73.0	8.43
32.3	145.3	8.44	142.1	240.0	9.08	53.1	75.0	8.33
46.2	159.2	8.51	148.1	246.0	9.12	50.1	78.0	8.35
57.4	170.4	8.60	154.1	252.0	9.18	48.1	80.0	8.33
71.3	184.3	8.71	160.1	258.0	9.24	45.1	83.0	8.32
82.5	195.5	8.83	166.1	264.0	9.30	43.1	85.0	8.31
96.4	209.4	8.91	172.1	270.0	9.39	40.1	88.0	8.30
107.6	220.6	8.95	178.1	276.0	9.47	38.1	90.0	8.27
121.5	234.5	8.95	185.1	283.0	9.58	35.1	93.0	8.29
132.7	245.7	9.05	191.1	289.0	9.64	33.1	95.0	8.30
146.6	259.6	9.25	198.1	296.0	9.70	30.1	98.0	8.30
157.8	270.8	9.36	204.1	302.0	9.72	28.1	100.0	8.27
171.7	284.7	9.54	211.1	309.0	9.77	25.1	103.0	8.29
182.9	295.9	9.64	217.1	315.0	9.81	23.1	105.0	8.31
196.8	309.8	9.75	224.1	322.0	9.85	20.1	108.0	8.33
208.0	321.0	9.81	230.1	328.0	9.92	18.1	110.0	8.34
221.9	334.9	9.97	237.1	335.0	9.97	15.1	113.0	8.43
233.1	346.1	10.08	243.1	341.0	10.05	13.1	115.0	8.45
247.0	360.0	10.23	250.1	348.0	10.09	10.1	118.0	8.73

REV. X2

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Frequency Mixer

HJK-ED12742/1

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+20	+14	+17	+20
19.6	42.11	40.50	42.44	37.93	36.48	36.14
30.6	38.48	37.60	38.99	34.62	33.59	32.96
41.6	37.81	37.26	38.24	33.47	32.70	32.96
52.6	37.36	36.95	37.22	33.33	32.74	32.80
63.6	36.89	36.74	36.70	32.81	32.39	32.63
74.6	36.61	36.53	35.76	32.40	32.03	32.63
85.6	35.98	36.03	34.95	32.23	32.08	31.80
96.6	36.67	36.81	35.97	32.55	32.40	32.19
107.6	36.34	36.50	38.49	32.75	32.55	32.56
118.6	36.44	36.54	38.55	33.07	32.76	33.50
129.6	36.76	36.94	39.07	33.68	33.29	34.18
140.6	36.94	36.95	39.30	34.33	33.79	34.93
151.6	37.49	37.57	40.12	34.74	34.13	35.25
162.6	37.74	37.85	40.44	35.42	34.74	35.94
173.6	38.11	38.23	37.97	36.33	35.49	34.57
184.6	38.89	38.93	38.99	37.07	35.97	36.17
195.6	38.71	38.87	38.46	37.60	36.45	35.57
206.6	39.20	39.28	39.20	38.37	36.94	36.55
217.6	39.65	39.86	39.70	39.16	37.76	37.26
228.6	39.61	39.77	40.00	39.73	38.22	38.05
239.6	40.16	40.38	40.67	40.27	38.66	38.49
250.6	40.18	40.43	40.76	40.97	39.30	39.17
260.6	40.60	40.98	41.31	41.69	39.89	39.65
271.6	41.03	41.42	42.07	42.19	40.28	40.28
281.6	41.06	41.44	42.17	42.76	40.70	40.76
292.6	41.49	41.99	42.61	43.44	41.38	41.35
302.6	41.64	42.26	42.91	44.00	41.93	41.92
313.6	41.90	42.39	43.29	44.49	42.37	42.58
323.6	42.22	42.77	43.58	45.05	42.88	43.05
334.6	42.32	42.98	43.89	45.70	43.62	43.86
344.6	42.74	43.48	44.44	46.34	44.23	44.60
355.6	43.29	44.03	45.06	47.07	44.80	45.27
365.6	43.63	44.46	45.50	47.75	45.49	46.06
376.6	44.55	45.63	46.75	48.58	46.40	47.09
386.6	45.24	46.37	47.53	49.32	47.08	47.87
397.6	45.09	46.15	46.98	49.82	47.48	48.27
407.6	45.20	46.45	47.37	49.61	47.46	48.17
418.6	44.89	45.83	46.72	48.90	46.86	47.47
428.6	44.21	45.11	45.90	48.14	46.29	46.85
439.6	43.99	44.84	45.61	47.57	45.80	46.29

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
40.0	19.6	42.43	34.81	33.97
51.0	30.6	46.70	36.65	34.97
62.0	41.6	45.20	39.26	35.05
73.0	52.6	45.28	39.93	34.92
84.0	63.6	43.74	39.00	36.64
95.0	74.6	44.66	41.31	37.33
106.0	85.6	44.57	42.19	38.95
117.0	96.6	43.75	41.89	37.69
128.0	107.6	44.02	42.45	38.77
139.0	118.6	44.01	42.09	38.36
150.0	129.6	44.12	42.70	39.32
161.0	140.6	44.51	43.80	40.71
172.0	151.6	43.99	42.33	39.18
183.0	162.6	44.04	42.18	39.43
194.0	173.6	44.81	43.17	40.11
205.0	184.6	45.02	44.20	40.92
216.0	195.6	45.09	43.38	39.96
227.0	206.6	45.08	43.10	40.20
238.0	217.6	44.89	44.88	43.36
249.0	228.6	44.65	44.36	41.48
260.0	239.6	44.40	44.28	40.82
271.0	250.6	44.49	44.95	43.16
281.0	260.6	44.13	46.48	46.67
292.0	271.6	44.07	45.96	44.50
302.0	281.6	43.65	45.63	44.27
313.0	292.6	43.48	45.86	45.73
323.0	302.6	43.37	45.95	46.59
334.0	313.6	43.06	45.62	45.69
344.0	323.6	42.67	45.13	45.61
355.0	334.6	42.02	44.38	45.41
365.0	344.6	42.10	44.75	46.47
376.0	355.6	41.87	44.67	46.47
386.0	365.6	41.41	44.17	46.04
397.0	376.6	41.15	43.65	44.66
407.0	386.6	41.16	44.04	45.65
418.0	397.6	41.09	43.82	45.38
428.0	407.6	40.80	43.02	43.62
439.0	418.6	40.27	42.53	42.83
449.0	428.6	40.11	42.71	44.10
460.0	439.6	39.83	41.98	43.23

Frequency Mixer

HJK-ED12742/1

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=97.6MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+14	+17	+20		+14	+17	+20		+14	+17	+20
40.0	19.6	1.24	1.11	1.01	19.6	2.73	2.75	2.78	10.0	1.18	1.06	1.01
51.0	30.6	1.05	1.11	1.19	30.6	3.42	3.47	3.57	11.8	1.18	1.06	1.02
62.0	41.6	1.17	1.23	1.29	41.6	6.58	6.81	7.28	13.6	1.17	1.05	1.02
73.0	52.6	1.26	1.30	1.35	52.6	20.70	18.70	16.56	15.3	1.17	1.05	1.02
84.0	63.6	1.30	1.34	1.38	63.6	4.20	4.14	4.24	17.1	1.17	1.06	1.01
95.0	74.6	1.33	1.36	1.39	74.6	2.34	2.38	2.60	18.9	1.17	1.06	1.02
106.0	85.6	1.33	1.36	1.39	85.6	1.55	1.63	1.88	20.7	1.19	1.07	1.00
117.0	96.6	1.32	1.35	1.38	96.6	1.35	1.43	1.69	22.4	1.19	1.08	1.01
128.0	107.6	1.34	1.37	1.41	107.6	1.60	1.65	1.75	24.2	1.21	1.09	1.02
139.0	118.6	1.37	1.41	1.46	118.6	2.04	2.07	2.09	26.0	1.21	1.10	1.03
150.0	129.6	1.42	1.46	1.51	129.6	2.55	2.55	2.54	27.8	1.21	1.10	1.05
161.0	140.6	1.47	1.51	1.56	140.6	3.12	3.08	2.98	29.6	1.22	1.11	1.06
172.0	151.6	1.51	1.54	1.58	151.6	3.97	3.87	3.67	31.3	1.22	1.11	1.07
183.0	162.6	1.53	1.55	1.58	162.6	4.99	4.82	4.50	33.1	1.21	1.11	1.08
194.0	173.6	1.53	1.54	1.58	173.6	5.61	5.36	4.92	34.9	1.21	1.11	1.09
205.0	184.6	1.53	1.54	1.57	184.6	6.46	6.15	5.59	36.7	1.20	1.11	1.09
216.0	195.6	1.55	1.55	1.58	195.6	7.73	7.31	6.49	38.4	1.19	1.10	1.09
227.0	206.6	1.58	1.58	1.62	206.6	8.51	8.05	7.14	41.1	1.18	1.09	1.08
238.0	217.6	1.62	1.63	1.66	217.6	8.86	8.39	7.47	42.9	1.18	1.08	1.08
249.0	228.6	1.68	1.68	1.71	228.6	10.31	9.69	8.60	45.6	1.17	1.08	1.07
260.0	239.6	1.73	1.71	1.74	239.6	12.52	11.69	10.25	47.3	1.18	1.08	1.06
271.0	250.6	1.76	1.74	1.75	250.6	13.29	12.52	10.96	50.0	1.20	1.09	1.06
281.0	260.6	1.79	1.75	1.76	260.6	13.81	12.99	11.46	51.8	1.21	1.10	1.06
292.0	271.6	1.82	1.77	1.76	271.6	15.81	14.74	12.99	54.4	1.23	1.12	1.08
302.0	281.6	1.85	1.78	1.77	281.6	17.05	15.96	14.03	56.2	1.24	1.14	1.10
313.0	292.6	1.88	1.81	1.79	292.6	16.26	15.26	13.70	58.9	1.25	1.15	1.12
323.0	302.6	1.93	1.85	1.83	302.6	16.56	15.67	14.15	60.7	1.25	1.16	1.13
334.0	313.6	1.99	1.90	1.88	313.6	19.32	18.11	16.26	63.3	1.25	1.16	1.14
344.0	323.6	2.05	1.95	1.92	323.6	20.70	19.54	17.57	65.1	1.24	1.15	1.13
355.0	334.6	2.11	2.00	1.96	334.6	19.76	18.90	17.22	67.8	1.23	1.15	1.13
365.0	344.6	2.17	2.04	1.97	344.6	21.20	20.22	18.70	69.6	1.23	1.14	1.13
376.0	355.6	2.22	2.07	1.99	355.6	25.19	24.14	22.29	72.2	1.23	1.14	1.12
386.0	365.6	2.27	2.09	2.00	365.6	25.94	24.83	23.49	74.0	1.23	1.14	1.11
397.0	376.6	2.31	2.12	2.02	376.6	23.49	22.87	21.73	76.7	1.25	1.15	1.11
407.0	386.6	2.36	2.15	2.04	386.6	24.14	23.18	22.29	78.4	1.26	1.16	1.11
418.0	397.6	2.44	2.21	2.09	397.6	26.33	25.56	24.48	81.1	1.29	1.18	1.13
428.0	407.6	2.50	2.27	2.15	407.6	25.94	25.19	24.14	82.9	1.30	1.20	1.15
439.0	418.6	2.60	2.35	2.20	418.6	24.48	23.81	22.87	85.6	1.32	1.22	1.18
449.0	428.6	2.68	2.40	2.25	428.6	25.56	24.83	23.81	87.3	1.33	1.23	1.19
460.0	439.6	2.78	2.46	2.28	439.6	28.49	27.16	25.94	90.0	1.34	1.25	1.21

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	14	11	28	24	33	31	35	36	38	39
1	-	40	+0	37	12	39	18	40	24	39	29	40
2	65	41	51	44	47	47	46	50	46	52	47	55
3	>90	78	65	71	61	67	60	66	60	66	61	65
4	>90	>82	>82	>82	>82	75	>82	77	>82	78	>82	78
5	>90	>82	>82	>82	>82	>82	>82	>82	79	>82	>82	>82
6	>90	>82	>82	>82	>82	>82	>82	>82	>82	81	>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: 113 MHz; 0.00 dBm.
LO IN: 92.6 MHz; +17.00 dBm
IF OUT: 20.4 MHz; -8.4 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	20	24	32	41	31	39	33	43	35	44
1	-	38	+0	35	12	38	19	40	26	39	32	41
2	45	31	40	35	36	39	36	44	37	46	41	50
3	66	56	46	56	43	51	43	50	45	50	48	51
4	>90	69	68	61	66	57	62	56	58	58	55	61
5	>90	71	69	70	64	67	61	64	60	63	60	63
6	>90	77	76	75	75	72	73	70	71	68	71	69
7	>90	77	76	78	77	77	73	75	72	75	71	72
8	>90	85	84	86	84	84	82	83	83	80	81	80
9	>90	85	83	85	83	87	84	86	81	84	81	83
10	>90	90	91	90	>91	91	>91	90	>91	>91	>91	88
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 113 MHz; 10.00 dBm.
LO IN: 92.6 MHz; +17.00 dBm
IF OUT: 20.4 MHz; 1.42 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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