

Frequency Mixer

HJK-ED14378/1

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)			RF (IN) (MHz)	LO (MHz)	IP-3 INPUT (dBm)			RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+16dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+10	+13	+16			+10	+13	+16			+10	+13	+16
10.1	40.1	6.69	6.60	6.50	10.1	40.1	20.78	21.29	23.29	10.1	40.1	0.09	0.00	-0.03
14.1	44.1	6.66	6.54	6.46	14.1	44.1	20.34	21.24	23.82	14.1	44.1	0.08	0.03	-0.03
20.1	50.1	6.68	6.56	6.46	20.1	50.1	19.99	21.59	25.07	20.1	50.1	0.06	0.00	-0.03
26.1	56.1	6.68	6.56	6.46	26.1	56.1	19.62	21.70	25.75	26.1	56.1	0.09	0.03	-0.01
32.1	62.1	6.68	6.56	6.46	32.1	62.1	19.49	22.07	26.21	32.1	62.1	0.14	0.07	0.03
38.1	68.1	6.68	6.56	6.46	38.1	68.1	19.66	22.56	26.77	38.1	68.1	0.16	0.09	0.04
44.1	74.1	6.68	6.54	6.44	44.1	74.1	19.55	22.85	26.92	44.1	74.1	0.17	0.10	0.05
50.1	80.1	6.67	6.53	6.42	50.1	80.1	19.73	23.03	27.35	50.1	80.1	0.17	0.09	0.05
56.1	86.1	6.67	6.54	6.44	56.1	86.1	20.12	23.91	28.29	56.1	86.1	0.17	0.08	0.03
62.1	92.1	6.72	6.58	6.48	62.1	92.1	20.33	24.95	30.28	62.1	92.1	0.16	0.08	0.03
68.1	98.1	6.75	6.61	6.50	68.1	98.1	20.71	25.00	29.30	68.1	98.1	0.16	0.08	0.03
74.1	104.1	6.75	6.61	6.51	74.1	104.1	21.47	26.00	30.80	74.1	104.1	0.16	0.07	0.02
80.1	110.1	6.72	6.58	6.47	80.1	110.1	22.03	26.36	30.91	80.1	110.1	0.15	0.07	0.02
86.1	116.1	6.67	6.53	6.43	86.1	116.1	22.61	26.57	31.43	86.1	116.1	0.16	0.06	0.01
92.1	122.1	6.64	6.51	6.40	92.1	122.1	23.40	29.17	37.42	92.1	122.1	0.14	0.05	0.00
98.1	128.1	6.67	6.53	6.42	98.1	128.1	23.82	28.87	34.96	98.1	128.1	0.12	0.04	0.01
104.1	134.1	6.79	6.65	6.54	104.1	134.1	24.13	29.26	34.42	104.1	134.1	0.09	0.03	0.00
110.1	140.1	6.81	6.68	6.57	110.1	140.1	26.23	32.92	31.69	110.1	140.1	0.10	0.03	0.01
118.1	148.1	6.81	6.66	6.55	118.1	148.1	27.01	32.09	30.08	118.1	148.1	0.11	0.03	0.00
122.1	152.1	6.79	6.65	6.53	122.1	152.1	26.42	32.00	31.53	122.1	152.1	0.12	0.03	0.01
126.1	156.1	6.81	6.66	6.53	126.1	156.1	25.84	31.36	31.61	126.1	156.1	0.11	0.03	0.00
132.1	162.1	6.83	6.68	6.55	132.1	162.1	25.26	30.96	32.86	132.1	162.1	0.12	0.04	0.00
138.1	168.1	6.83	6.68	6.56	138.1	168.1	25.04	29.91	32.18	138.1	168.1	0.13	0.04	0.01
144.1	174.1	6.90	6.74	6.62	144.1	174.1	26.17	30.02	28.89	144.1	174.1	0.13	0.05	0.01
150.1	180.1	7.02	6.87	6.74	150.1	180.1	27.22	30.53	31.48	150.1	180.1	0.11	0.04	0.02
156.1	186.1	7.11	6.95	6.82	156.1	186.1	23.85	25.34	26.71	156.1	186.1	0.10	0.04	0.01
162.1	192.1	7.13	6.95	6.81	162.1	192.1	25.27	29.44	32.32	162.1	192.1	0.09	0.05	0.03
168.1	198.1	7.25	7.08	6.95	168.1	198.1	24.11	27.48	29.42	168.1	198.1	0.09	0.04	0.02
174.1	204.1	7.27	7.10	6.97	174.1	204.1	26.64	28.03	28.68	174.1	204.1	0.08	0.04	0.02
180.1	210.1	7.29	7.12	6.99	180.1	210.1	25.89	26.84	27.94	180.1	210.1	0.06	0.03	0.01
186.1	216.1	7.33	7.17	7.03	186.1	216.1	25.35	26.43	27.96	186.1	216.1	0.06	0.01	0.00
192.1	222.1	7.43	7.26	7.13	192.1	222.1	25.73	26.56	27.95	192.1	222.1	0.04	0.01	0.00
198.1	228.1	7.54	7.37	7.23	198.1	228.1	25.67	26.52	27.65	198.1	228.1	0.04	0.01	-0.01
204.1	234.1	7.64	7.46	7.32	204.1	234.1	25.16	25.88	26.84	204.1	234.1	0.04	0.00	-0.01
210.1	240.1	7.73	7.55	7.41	210.1	240.1	24.57	25.39	26.47	210.1	240.1	0.04	0.01	-0.01
216.1	246.1	7.80	7.61	7.46	216.1	246.1	24.59	25.57	26.25	216.1	246.1	0.04	0.01	0.00
222.1	252.1	7.90	7.71	7.56	222.1	252.1	24.41	25.33	26.64	222.1	252.1	0.04	0.01	-0.01
228.1	258.1	8.01	7.82	7.67	228.1	258.1	24.88	25.86	26.97	228.1	258.1	0.04	0.01	0.00
234.1	264.1	8.18	7.99	7.83	234.1	264.1	26.19	27.86	29.22	234.1	264.1	0.04	0.01	-0.01
240.1	270.1	8.34	8.16	8.01	240.1	270.1	28.70	32.83	37.23	240.1	270.1	0.04	0.00	-0.01

Frequency Mixer

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=127MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=118MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=167MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+13			+13			+13
116.9	10.1	6.83	10.1	128.1	6.80	156.9	10.1	7.19
111.9	15.1	6.79	14.1	132.1	6.73	153.9	13.1	7.12
106.9	20.1	6.84	18.1	136.1	6.72	149.9	17.1	7.10
100.9	26.1	6.86	23.1	141.1	6.71	145.9	21.1	7.13
95.9	31.1	6.91	27.1	145.1	6.67	141.9	25.1	7.10
89.9	37.1	6.94	32.1	150.1	6.65	138.9	28.1	7.11
84.9	42.1	6.96	36.1	154.1	6.60	134.9	32.1	7.12
78.9	48.1	6.96	40.1	158.1	6.57	130.9	36.1	7.14
73.9	53.1	6.98	45.1	163.1	6.53	126.9	40.1	7.15
67.9	59.1	6.95	49.1	167.1	6.50	123.9	43.1	7.15
62.9	64.1	6.93	54.1	172.1	6.26	119.9	47.1	7.17
56.9	70.1	6.72	58.1	176.1	6.20	115.9	51.1	7.19
51.9	75.1	6.92	62.1	180.1	6.30	111.9	55.1	7.20
45.9	81.1	6.90	67.1	185.1	6.26	107.9	59.1	7.22
40.9	86.1	6.89	71.1	189.1	6.31	104.9	62.1	7.24
34.9	92.1	6.87	76.1	194.1	6.48	100.9	66.1	7.26
29.9	97.1	6.89	80.1	198.1	6.59	96.9	70.1	7.31
23.9	103.1	6.88	84.1	202.1	6.61	92.9	74.1	7.34
18.9	108.1	6.89	89.1	207.1	6.60	89.9	77.1	7.34
12.9	114.1	6.89	93.1	211.1	6.59	85.9	81.1	7.32
10.1	137.1	6.86	98.1	216.1	6.60	81.9	85.1	7.31
18.1	145.1	6.73	102.1	220.1	6.60	77.9	89.1	7.32
26.1	153.1	6.68	107.1	225.1	6.62	74.9	92.1	7.32
35.1	162.1	6.56	111.1	229.1	6.62	70.9	96.1	7.30
43.1	170.1	6.54	115.1	233.1	6.61	66.9	100.1	7.32
51.1	178.1	6.37	120.1	238.1	6.60	62.9	104.1	7.30
60.1	187.1	6.29	124.1	242.1	6.60	58.9	108.1	7.28
68.1	195.1	6.53	129.1	247.1	6.59	55.9	111.1	7.28
76.1	203.1	6.66	133.1	251.1	6.59	51.9	115.1	7.27
85.1	212.1	6.66	137.1	255.1	6.56	47.9	119.1	7.29
93.1	220.1	6.62	142.1	260.1	6.53	43.9	123.1	7.29
101.1	228.1	6.64	146.1	264.1	6.48	40.9	126.1	7.28
110.1	237.1	6.64	151.1	269.1	6.43	36.9	130.1	7.22
118.1	245.1	6.59	155.1	273.1	6.39	32.9	134.1	7.14
127.1	254.1	6.61	159.1	277.1	6.38	28.9	138.1	7.11
135.1	262.1	6.59	164.1	282.1	6.38	25.9	141.1	7.10
143.1	270.1	6.54	168.1	286.1	6.41	21.9	145.1	7.12
152.1	279.1	6.49	173.1	291.1	6.45	17.9	149.1	7.13
160.1	287.1	6.50	177.1	295.1	6.49	13.9	153.1	7.15
168.1	295.1	6.53	182.1	300.1	6.52	9.9	157.1	7.15

Frequency Mixer

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+10	+13	+16	+10	+13	+16
40.1	80.54	83.00	83.48	61.17	61.09	61.16
44.1	83.28	83.53	80.80	60.20	60.28	60.33
50.1	79.21	80.11	79.18	59.24	59.26	59.31
56.1	76.12	76.85	76.48	58.35	58.39	58.50
62.1	73.36	74.04	73.58	57.59	57.63	57.70
68.1	71.68	72.83	72.38	56.91	56.97	57.02
74.1	69.43	70.14	69.72	56.51	56.50	56.59
80.1	68.65	69.44	69.23	56.09	56.11	56.24
86.1	67.11	67.82	67.90	55.52	55.51	55.59
92.1	65.40	65.70	65.69	55.08	55.11	55.20
98.1	64.68	65.03	64.80	54.63	54.69	54.89
104.1	63.85	64.58	64.78	53.91	53.94	54.04
110.1	62.05	62.64	62.83	53.34	53.39	53.48
116.1	60.14	60.54	60.73	52.78	52.80	52.84
122.1	58.26	58.36	58.27	52.42	52.47	52.55
128.1	57.33	57.26	56.99	52.35	52.51	52.81
134.1	58.33	58.68	58.80	51.42	51.53	51.82
140.1	58.03	58.53	58.89	50.61	50.67	50.81
148.1	56.71	57.21	57.51	50.01	50.06	50.15
152.1	55.91	56.37	56.64	49.92	50.02	50.09
156.1	55.11	55.45	55.68	49.86	49.99	50.04
162.1	53.98	54.28	54.43	49.73	49.82	49.87
168.1	52.91	53.13	53.18	49.56	49.59	49.63
174.1	51.65	51.72	51.65	49.39	49.38	49.42
180.1	50.28	50.19	50.02	49.45	49.43	49.48
186.1	48.93	48.64	48.33	49.96	50.02	50.16
192.1	49.11	48.69	48.09	50.24	50.66	51.30
198.1	51.52	51.89	51.98	47.83	48.02	48.20
204.1	52.49	53.17	53.57	45.87	45.90	45.88
210.1	51.91	52.60	53.05	44.87	44.86	44.80
216.1	50.89	51.46	51.92	44.27	44.25	44.18
222.1	49.99	50.51	50.89	43.78	43.76	43.70
228.1	49.19	49.65	49.98	43.42	43.42	43.36
234.1	48.44	48.84	49.12	43.24	43.27	43.20
240.1	47.80	48.11	48.38	43.22	43.28	43.19
246.1	47.22	47.44	47.70	43.24	43.34	43.21
252.1	46.62	46.80	47.02	43.12	43.24	43.05
258.1	46.10	46.24	46.44	42.94	43.06	42.85
264.1	45.61	45.77	45.93	42.70	42.77	42.60
270.1	45.06	45.22	45.34	42.48	42.50	42.40

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	54.69	48.92	46.54
14.1	44.1	60.67	48.36	46.86
20.1	50.1	73.80	47.89	48.88
26.1	56.1	62.27	46.96	50.84
32.1	62.1	66.64	44.99	54.99
38.1	68.1	64.33	45.63	53.32
44.1	74.1	62.54	47.46	52.75
50.1	80.1	60.19	48.78	54.33
56.1	86.1	58.73	47.93	57.01
62.1	92.1	56.47	48.09	56.30
68.1	98.1	56.10	48.78	56.33
74.1	104.1	52.66	46.94	52.20
80.1	110.1	50.69	46.43	51.33
86.1	116.1	51.21	48.95	53.95
92.1	122.1	52.97	52.01	53.50
98.1	128.1	52.78	53.51	50.43
104.1	134.1	51.56	50.67	50.50
110.1	140.1	49.72	47.70	48.78
118.1	148.1	48.01	45.20	46.42
122.1	152.1	46.65	44.14	45.02
126.1	156.1	46.45	44.55	45.25
132.1	162.1	46.96	46.44	46.76
138.1	168.1	48.04	48.74	48.70
144.1	174.1	48.82	50.56	49.96
150.1	180.1	49.30	51.76	49.81
156.1	186.1	49.95	52.99	50.55
162.1	192.1	48.78	53.26	49.95
168.1	198.1	46.73	46.51	46.04
174.1	204.1	45.65	44.87	45.00
180.1	210.1	44.56	43.80	44.03
186.1	216.1	43.67	43.00	43.11
192.1	222.1	43.18	42.61	42.45
198.1	228.1	42.77	42.23	41.88
204.1	234.1	42.43	41.94	41.59
210.1	240.1	42.09	41.58	41.38
216.1	246.1	41.53	40.90	40.79
222.1	252.1	40.72	40.04	39.88
228.1	258.1	40.30	39.76	39.25
234.1	264.1	40.75	40.63	39.54
240.1	270.1	41.46	41.91	40.34

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=167MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+10	+13	+16		+10	+13	+16		+10	+13	+16
10.1	40.1	2.06	2.08	2.11	40.1	3.81	3.81	3.79	0.3	2.06	2.07	2.07
14.1	44.1	2.06	2.09	2.12	44.1	3.81	3.81	3.79	0.9	1.43	1.44	1.45
20.1	50.1	2.07	2.09	2.13	50.1	3.82	3.81	3.79	3.1	1.19	1.20	1.21
26.1	56.1	2.07	2.09	2.13	56.1	3.82	3.82	3.80	7.1	1.12	1.13	1.15
32.1	62.1	2.05	2.08	2.11	62.1	3.83	3.83	3.81	10.1	1.11	1.12	1.14
38.1	68.1	2.04	2.07	2.10	68.1	3.85	3.85	3.83	16.1	1.10	1.11	1.12
44.1	74.1	2.02	2.04	2.06	74.1	3.86	3.86	3.85	20.1	1.09	1.10	1.11
50.1	80.1	2.01	2.04	2.07	80.1	3.87	3.88	3.87	24.1	1.09	1.10	1.11
56.1	86.1	2.01	2.03	2.06	86.1	3.89	3.89	3.88	28.1	1.08	1.10	1.11
62.1	92.1	2.04	2.05	2.07	92.1	3.90	3.91	3.90	32.1	1.08	1.09	1.11
68.1	98.1	2.09	2.11	2.14	98.1	3.92	3.92	3.92	38.1	1.09	1.10	1.11
74.1	104.1	2.11	2.14	2.16	104.1	3.93	3.94	3.93	42.1	1.09	1.11	1.12
80.1	110.1	2.11	2.12	2.14	110.1	3.95	3.96	3.95	46.1	1.10	1.11	1.13
86.1	116.1	2.10	2.11	2.12	116.1	3.96	3.97	3.96	50.1	1.11	1.12	1.13
92.1	122.1	2.11	2.12	2.13	122.1	3.98	3.98	3.97	54.1	1.12	1.13	1.14
98.1	128.1	2.17	2.18	2.19	128.1	4.00	4.00	3.98	60.1	1.13	1.14	1.15
104.1	134.1	2.24	2.25	2.26	134.1	4.03	4.03	4.01	64.1	1.14	1.15	1.16
110.1	140.1	2.31	2.32	2.32	140.1	4.07	4.07	4.05	68.1	1.14	1.15	1.16
118.1	148.1	2.36	2.36	2.37	148.1	4.11	4.11	4.10	72.1	1.15	1.15	1.16
122.1	152.1	2.39	2.39	2.39	152.1	4.14	4.14	4.13	76.1	1.15	1.15	1.16
126.1	156.1	2.42	2.42	2.41	156.1	4.17	4.17	4.16	82.1	1.15	1.16	1.16
132.1	162.1	2.47	2.46	2.45	162.1	4.23	4.23	4.22	86.1	1.16	1.16	1.17
138.1	168.1	2.56	2.54	2.53	168.1	4.25	4.25	4.24	90.1	1.16	1.16	1.17
144.1	174.1	2.67	2.66	2.65	174.1	4.30	4.30	4.29	94.1	1.16	1.16	1.17
150.1	180.1	2.80	2.79	2.77	180.1	4.34	4.34	4.33	98.1	1.17	1.17	1.18
156.1	186.1	2.91	2.90	2.88	186.1	4.38	4.38	4.37	104.1	1.18	1.18	1.19
162.1	192.1	2.94	2.93	2.92	192.1	4.40	4.40	4.38	108.1	1.18	1.19	1.19
168.1	198.1	2.91	2.88	2.85	198.1	4.47	4.46	4.44	112.1	1.19	1.20	1.20
174.1	204.1	2.96	2.92	2.89	204.1	4.56	4.55	4.54	116.1	1.20	1.20	1.21
180.1	210.1	3.08	3.04	3.00	210.1	4.65	4.64	4.63	120.1	1.20	1.21	1.21
186.1	216.1	3.21	3.17	3.13	216.1	4.73	4.73	4.71	126.1	1.21	1.21	1.22
192.1	222.1	3.37	3.32	3.28	222.1	4.82	4.81	4.79	130.1	1.21	1.22	1.22
198.1	228.1	3.57	3.52	3.47	228.1	4.93	4.92	4.90	134.1	1.21	1.22	1.22
204.1	234.1	3.75	3.70	3.65	234.1	5.03	5.02	5.00	138.1	1.21	1.22	1.22
210.1	240.1	3.91	3.85	3.80	240.1	5.15	5.14	5.12	142.1	1.21	1.21	1.22
216.1	246.1	4.04	3.98	3.92	246.1	5.25	5.25	5.23	148.1	1.21	1.21	1.22
222.1	252.1	4.21	4.14	4.08	252.1	5.37	5.37	5.35	152.1	1.21	1.22	1.23
228.1	258.1	4.39	4.32	4.26	258.1	5.51	5.50	5.48	156.1	1.22	1.23	1.24
234.1	264.1	4.60	4.54	4.46	264.1	5.64	5.64	5.62	160.1	1.22	1.23	1.24
240.1	270.1	4.85	4.78	4.70	270.1	5.79	5.78	5.76	166.1	1.20	1.21	1.22

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	---	---	15.05	22.79	26.54	23.65	21.43	24.00	30.33	38.51	41.60	23.52
1	---	40.02	---	47.65	11.58	43.23	17.64	44.33	16.95	48.44	24.73	56.54
2	123.81	72.56	71.13	75.68	90.11	74.79	73.21	73.58	70.09	75.59	77.53	78.49
3	127.86	86.62	94.25	94.52	84.90	89.58	82.94	88.48	77.06	91.56	78.35	104.43
4	128.25	103.59	105.68	101.24	102.44	92.64	103.31	102.99	105.50	103.10	102.10	103.91
5	129.70	106.19	103.27	103.65	96.63	100.40	92.21	101.45	103.84	105.08	94.48	102.57
6	129.66	101.27	105.21	102.46	101.69	89.97	100.81	92.38	104.64	102.76	105.85	104.50
7	129.82	104.47	98.60	107.78	102.88	100.67	95.78	102.26	98.88	105.16	103.32	106.04
8	125.79	100.53	105.08	104.55	104.91	103.66	100.63	98.89	100.72	100.11	105.02	105.00
9	129.40	104.89	103.86	105.49	100.50	104.00	103.38	99.77	97.95	101.44	100.27	104.41
10	126.98	102.86	104.93	106.21	103.23	105.65	102.59	105.16	98.42	102.73	99.84	98.81
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 127 MHz; -15.00 dBm

LO IN: 157 MHz; +13 dBm

IF OUT: 30 MHz; -21.56 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	---	---	25.23	32.06	36.40	33.49	31.13	34.25	40.37	48.93	51.99	33.24
1	---	40.07	---	46.91	11.58	42.84	17.86	43.99	17.09	48.48	24.93	57.26
2	108.79	61.22	60.61	65.85	84.87	63.09	63.28	64.59	59.95	67.33	67.10	67.65
3	122.94	72.77	74.46	84.08	70.66	74.78	65.85	75.42	59.52	76.96	60.36	89.88
4	123.84	89.11	96.88	96.15	94.96	87.17	94.72	88.65	106.23	92.28	92.31	91.16
5	122.72	90.53	87.45	88.45	89.33	95.32	89.40	88.71	85.73	90.28	79.48	100.66
6	123.36	99.52	114.79	100.58	107.41	91.29	110.60	94.03	108.84	106.48	115.05	104.14
7	124.67	114.02	97.62	109.11	108.66	104.93	95.11	111.05	103.92	107.90	100.83	106.73
8	122.92	103.13	113.90	104.57	115.72	109.45	110.30	99.66	109.45	100.87	114.53	107.41
9	123.82	116.59	101.44	113.86	102.81	114.21	103.44	110.10	96.26	109.22	97.41	112.58
10	122.29	115.47	113.32	113.99	114.92	111.09	113.21	108.46	107.92	105.73	109.11	107.80
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 127 MHz; -5.00 dBm

LO IN: 157 MHz; +13 dBm

IF OUT: 30 MHz; -11.63 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 represents the Harmonics level of the RF Input Signal to the mixer