

Frequency Mixer

HJK-ED11877

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=48MHz (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	58.1	8.01	7.55	7.36
40.1	88.1	6.99	6.76	6.63
80.1	128.1	7.16	7.03	6.93
110.1	158.1	7.00	6.87	6.81
150.1	198.1	6.81	6.70	6.65
180.1	228.1	7.01	6.93	6.87
220.1	268.1	6.84	6.76	6.68
250.1	298.1	6.85	6.77	6.71
290.1	338.1	6.80	6.71	6.65
320.1	368.1	6.57	6.48	6.43
360.1	408.1	6.73	6.63	6.59
390.1	438.1	7.00	6.94	6.92
430.1	478.1	7.46	7.30	7.18
460.1	508.1	7.15	7.01	6.90
500.1	548.1	6.99	6.85	6.75
530.1	578.1	7.02	6.87	6.76
570.1	618.1	7.19	7.03	6.92
600.1	648.1	7.19	7.03	6.91
640.1	688.1	7.31	7.14	7.02
670.1	718.1	7.30	7.12	7.00
710.1	758.1	7.26	7.07	6.94
740.1	788.1	7.29	7.09	6.95
780.1	828.1	7.37	7.15	7.02
810.1	858.1	7.57	7.36	7.25
850.1	898.1	8.03	7.85	7.75
880.1	928.1	8.06	7.82	7.68
920.1	968.1	7.72	7.44	7.27
950.1	998.1	7.54	7.28	7.11
990.1	1038.1	7.46	7.21	7.04
1020.1	1068.1	7.51	7.26	7.10
1060.1	1108.1	7.63	7.39	7.23
1090.1	1138.1	7.76	7.52	7.36
1130.1	1178.1	8.01	7.78	7.62
1160.1	1208.1	8.25	8.02	7.86
1200.1	1248.1	8.69	8.48	8.32
1230.1	1278.1	9.04	8.84	8.68
1270.1	1318.1	9.49	9.29	9.13
1300.1	1348.1	9.98	9.79	9.64
1340.1	1388.1	10.49	10.31	10.15
1370.1	1418.1	11.03	10.87	10.72

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+14	+17	+20
10.1	58.1	16.59	20.35	23.81
40.1	88.1	20.35	23.52	26.88
80.1	128.1	24.64	26.91	28.82
110.1	158.1	25.35	26.91	30.66
150.1	198.1	25.39	29.37	32.30
180.1	228.1	27.11	26.50	27.37
220.1	268.1	28.42	32.31	34.62
250.1	298.1	29.81	31.94	30.97
290.1	338.1	29.25	30.92	30.44
320.1	368.1	28.47	28.89	33.09
360.1	408.1	30.03	27.64	27.20
390.1	438.1	20.40	22.27	25.32
430.1	478.1	23.42	26.31	28.74
460.1	508.1	25.09	27.43	29.92
500.1	548.1	26.11	28.32	30.73
530.1	578.1	25.45	27.60	29.48
570.1	618.1	24.75	26.59	27.92
600.1	648.1	23.43	25.12	26.46
640.1	688.1	22.94	24.71	26.38
670.1	718.1	23.64	25.53	27.35
710.1	758.1	23.70	25.71	27.63
740.1	788.1	24.30	26.48	28.23
780.1	828.1	23.62	25.19	26.57
810.1	858.1	23.48	25.16	27.32
850.1	898.1	23.46	26.52	28.66
880.1	928.1	21.56	24.05	26.18
920.1	968.1	20.30	22.35	24.08
950.1	998.1	19.91	21.91	23.80
990.1	1038.1	19.75	21.94	23.99
1020.1	1068.1	19.75	22.01	24.17
1060.1	1108.1	19.82	22.11	24.35
1090.1	1138.1	20.05	22.38	24.66
1130.1	1178.1	20.55	22.92	25.19
1160.1	1208.1	20.76	23.14	25.32
1200.1	1248.1	21.23	23.62	25.70
1230.1	1278.1	21.33	23.64	25.69
1270.1	1318.1	21.67	23.90	25.98
1300.1	1348.1	22.05	24.30	26.35
1340.1	1388.1	22.51	24.83	26.90
1370.1	1418.1	23.40	25.88	28.05

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+15dBm (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	58.1	4.59	2.68	1.07
40.1	88.1	2.76	1.20	0.47
80.1	128.1	1.00	0.57	0.34
110.1	158.1	0.80	0.45	0.31
150.1	198.1	0.55	0.36	0.25
180.1	228.1	0.44	0.29	0.21
220.1	268.1	0.42	0.32	0.24
250.1	298.1	0.24	0.12	0.06
290.1	338.1	0.25	0.13	0.09
320.1	368.1	0.26	0.14	0.09
360.1	408.1	0.25	0.12	0.06
390.1	438.1	0.38	0.06	-0.09
430.1	478.1	0.86	0.54	0.26
460.1	508.1	0.72	0.31	0.14
500.1	548.1	0.59	0.25	0.12
530.1	578.1	0.63	0.27	0.14
570.1	618.1	0.56	0.24	0.13
600.1	648.1	0.59	0.26	0.13
640.1	688.1	0.61	0.28	0.15
670.1	718.1	0.59	0.27	0.15
710.1	758.1	0.67	0.31	0.16
740.1	788.1	0.74	0.32	0.16
780.1	828.1	0.93	0.38	0.19
810.1	858.1	1.10	0.40	0.22
850.1	898.1	1.33	0.57	0.27
880.1	928.1	1.70	0.84	0.36
920.1	968.1	2.24	1.13	0.43
950.1	998.1	2.03	0.92	0.36
990.1	1038.1	1.75	0.77	0.33
1020.1	1068.1	1.67	0.72	0.32
1060.1	1108.1	1.58	0.70	0.32
1090.1	1138.1	1.53	0.70	0.33
1130.1	1178.1	1.45	0.67	0.33
1160.1	1208.1	1.42	0.66	0.32
1200.1	1248.1	1.25	0.58	0.29
1230.1	1278.1	1.20	0.56	0.29
1270.1	1318.1	1.10	0.53	0.28
1300.1	1348.1	0.97	0.48	0.26
1340.1	1388.1	0.92	0.47	0.25
1370.1	1418.1	0.78	0.40	0.21

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=238.5MHz (dB)
		@LO (dBm)
		+17
220.0	18.5	10.58
205.5	33.0	7.97
191.0	47.5	7.54
183.8	54.7	7.41
169.3	69.2	7.27
162.1	76.4	7.21
147.6	90.9	7.05
140.3	98.2	7.01
125.9	112.6	6.94
118.6	119.9	6.89
104.1	134.4	6.87
96.9	141.6	6.87
82.4	156.1	6.85
75.2	163.3	6.78
60.7	177.8	6.78
53.4	185.1	6.71
39.0	199.5	6.71
31.7	206.8	6.68
17.2	221.3	6.59
10.0	228.5	6.33
43.4	281.9	6.70
76.9	315.4	6.70
143.8	382.3	6.38
177.2	415.7	6.20
244.1	482.6	8.52
277.6	516.1	8.06
344.5	583.0	7.36
377.9	616.4	7.10
444.8	683.3	6.74
478.3	716.8	6.59
545.2	783.7	6.44
578.6	817.1	6.45
645.5	884.0	7.26
679.0	917.5	7.83
745.9	984.4	7.61
779.3	1017.8	7.75
846.2	1084.7	8.55
879.7	1118.2	9.02
946.6	1185.1	10.50
980.0	1218.5	11.12

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=233.5MHz (dB)
		@LO (dBm)
		+17
10.0	243.5	6.37
30.0	263.5	6.72
50.0	283.5	6.69
70.0	303.5	6.53
90.0	323.5	6.57
110.0	343.5	6.64
130.0	363.5	6.51
150.0	383.5	6.40
170.0	403.5	6.26
190.0	423.5	6.22
210.0	443.5	6.41
230.0	463.5	9.05
250.0	483.5	8.59
270.0	503.5	8.34
290.0	523.5	8.07
310.0	543.5	7.76
330.0	563.5	7.56
350.0	583.5	7.34
370.0	603.5	7.17
390.0	623.5	7.02
410.0	643.5	6.93
430.0	663.5	6.78
450.0	683.5	6.72
470.0	703.5	6.62
510.0	743.5	6.56
530.0	763.5	6.50
570.0	803.5	6.42
590.0	823.5	6.47
630.0	863.5	6.81
650.0	883.5	7.24
690.0	923.5	7.88
710.0	943.5	7.76
750.0	983.5	7.63
770.0	1003.5	7.74
810.0	1043.5	8.02
830.0	1063.5	8.27
870.0	1103.5	8.83
890.0	1123.5	9.17
930.0	1163.5	10.08
950.0	1183.5	10.53

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=243.5MHz (dB)
		@LO (dBm)
		+17
230.0	13.5	13.27
225.0	18.5	10.61
220.0	23.5	9.09
215.0	28.5	8.36
210.0	33.5	7.97
205.0	38.5	7.76
200.0	43.5	7.64
195.0	48.5	7.58
190.0	53.5	7.47
185.0	58.5	7.39
180.0	63.5	7.37
175.0	68.5	7.31
170.0	73.5	7.24
165.0	78.5	7.21
160.0	83.5	7.16
155.0	88.5	7.11
150.0	93.5	7.05
145.0	98.5	7.02
140.0	103.5	7.00
135.0	108.5	6.97
130.0	113.5	6.92
125.0	118.5	6.95
120.0	123.5	6.88
115.0	128.5	6.90
110.0	133.5	6.88
105.0	138.5	6.91
100.0	143.5	6.86
95.0	148.5	6.83
90.0	153.5	6.80
85.0	158.5	6.83
75.0	168.5	6.80
70.0	173.5	6.74
60.0	183.5	6.79
55.0	188.5	6.86
45.0	198.5	6.73
40.0	203.5	6.73
30.0	213.5	6.70
25.0	218.5	6.70
15.0	228.5	6.56
10.0	233.5	6.35

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+20	+14	+17	+20
58.1	62.61	62.63	62.52	67.77	67.34	66.04
88.1	61.24	61.31	61.11	59.30	59.01	58.53
128.1	59.64	59.71	59.71	52.80	52.78	52.59
158.1	58.99	59.12	58.99	49.22	49.23	49.05
198.1	58.80	59.08	58.80	45.59	45.56	45.41
228.1	57.88	57.99	56.98	43.17	43.10	42.93
268.1	60.35	61.17	61.21	42.02	42.06	42.04
298.1	61.50	62.43	62.33	40.44	40.45	40.39
338.1	58.37	58.67	58.01	38.46	38.40	38.23
368.1	56.60	56.61	55.66	37.32	37.22	37.04
408.1	52.27	52.06	51.21	36.05	35.90	35.75
438.1	48.52	48.38	48.19	35.14	35.02	34.92
478.1	54.52	55.05	55.22	41.90	41.83	41.73
508.1	55.14	55.58	55.71	41.08	40.94	40.88
548.1	55.35	55.34	55.25	40.53	40.46	40.42
578.1	55.58	54.84	54.63	40.55	40.53	40.49
618.1	57.95	59.12	59.49	41.00	41.02	40.97
648.1	56.51	57.37	57.67	41.52	41.53	41.51
688.1	56.85	57.88	58.10	42.30	42.34	42.30
718.1	58.57	60.03	60.43	43.24	43.32	43.24
758.1	59.14	61.82	62.31	44.09	44.20	44.15
788.1	61.90	67.39	70.86	44.29	44.41	44.32
828.1	56.26	55.87	55.61	43.24	43.31	43.21
858.1	48.93	48.34	47.85	40.60	40.42	40.13
898.1	41.54	40.95	40.54	37.70	37.57	37.46
928.1	39.30	38.94	38.64	37.20	37.22	37.26
968.1	39.23	39.14	38.96	37.85	37.94	38.04
998.1	39.71	39.67	39.57	38.52	38.63	38.76
1038.1	39.90	39.81	39.74	38.93	38.97	39.11
1068.1	39.95	39.85	39.73	38.99	39.01	39.05
1108.1	40.02	39.95	39.87	39.03	39.02	39.06
1138.1	39.89	39.81	39.68	38.99	38.98	39.00
1178.1	39.57	39.52	39.43	38.81	38.81	38.80
1208.1	39.46	39.46	39.44	38.59	38.59	38.57
1248.1	39.48	39.50	39.49	38.06	38.06	38.02
1278.1	40.59	40.69	40.72	37.53	37.54	37.49
1318.1	41.48	41.51	41.46	37.04	37.02	36.94
1348.1	41.50	41.51	41.47	36.75	36.74	36.62
1388.1	41.13	41.14	41.11	36.47	36.46	36.34
1418.1	41.14	41.10	41.09	36.46	36.46	36.41

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	58.1	36.70	37.12	35.84
40.1	88.1	41.39	41.91	41.04
80.1	128.1	48.23	48.21	45.62
110.1	158.1	50.99	48.53	46.60
150.1	198.1	43.51	42.24	41.53
180.1	228.1	44.06	43.39	44.84
220.1	268.1	44.28	43.95	43.54
250.1	298.1	43.59	43.75	44.00
290.1	338.1	42.14	41.63	42.11
320.1	368.1	39.97	39.43	39.43
360.1	408.1	39.89	39.26	39.25
390.1	438.1	41.48	41.06	41.40
430.1	478.1	43.69	43.23	42.78
460.1	508.1	42.58	42.31	42.10
500.1	548.1	41.33	40.78	40.66
530.1	578.1	40.60	40.07	39.99
570.1	618.1	40.15	39.43	39.50
600.1	648.1	41.72	41.41	42.49
640.1	688.1	41.95	41.88	42.91
670.1	718.1	39.74	39.35	40.24
710.1	758.1	38.59	38.21	39.03
740.1	788.1	37.12	36.88	37.40
780.1	828.1	31.96	31.55	31.48
810.1	858.1	26.81	26.27	26.06
850.1	898.1	22.10	21.62	21.50
880.1	928.1	22.01	21.80	21.73
920.1	968.1	25.88	26.15	26.14
950.1	998.1	28.85	29.09	29.18
990.1	1038.1	30.50	30.58	30.55
1020.1	1068.1	30.78	30.70	30.50
1060.1	1108.1	31.14	30.96	30.66
1090.1	1138.1	31.23	31.00	30.68
1130.1	1178.1	31.20	30.98	30.74
1160.1	1208.1	31.11	30.89	30.71
1200.1	1248.1	30.99	30.82	30.63
1230.1	1278.1	30.92	30.74	30.57
1270.1	1318.1	30.80	30.73	30.62
1300.1	1348.1	30.69	30.67	30.61
1340.1	1388.1	30.57	30.60	30.63
1370.1	1418.1	30.47	30.52	30.57

Frequency Mixer

HJK-ED11877

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=286.5MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+14	+17	+20		+14	+17	+20		+14	+17	+20
10.1	58.1	3.14	2.99	2.61	58.1	10.02	10.02	9.96	10.0	1.16	1.17	1.17
40.1	88.1	2.18	2.18	2.04	88.1	6.30	6.32	6.32	15.0	1.13	1.15	1.15
80.1	128.1	2.00	2.01	1.95	128.1	5.00	5.02	5.02	20.0	1.13	1.15	1.15
110.1	158.1	2.05	2.08	2.03	158.1	4.53	4.54	4.54	25.0	1.14	1.15	1.15
150.1	198.1	1.94	1.96	1.94	198.1	4.32	4.32	4.33	30.0	1.15	1.16	1.16
180.1	228.1	1.92	1.93	1.90	228.1	4.11	4.11	4.11	35.0	1.15	1.17	1.17
220.1	268.1	2.05	2.09	2.09	268.1	4.03	4.04	4.04	40.0	1.16	1.17	1.17
250.1	298.1	1.86	1.89	1.88	298.1	3.92	3.92	3.93	45.0	1.16	1.17	1.17
290.1	338.1	1.69	1.69	1.68	338.1	3.79	3.80	3.80	50.0	1.15	1.17	1.17
320.1	368.1	1.62	1.62	1.61	368.1	3.68	3.69	3.69	55.0	1.16	1.18	1.18
360.1	408.1	1.64	1.63	1.64	408.1	3.43	3.43	3.43	60.0	1.17	1.18	1.18
390.1	438.1	1.84	1.85	1.85	438.1	3.12	3.12	3.11	65.0	1.17	1.19	1.19
430.1	478.1	1.81	1.83	1.84	478.1	3.10	3.10	3.10	70.0	1.17	1.19	1.19
460.1	508.1	1.79	1.80	1.80	508.1	3.43	3.42	3.42	75.0	1.17	1.18	1.18
500.1	548.1	1.94	1.93	1.93	548.1	3.60	3.60	3.60	85.0	1.17	1.18	1.18
530.1	578.1	2.06	2.05	2.06	578.1	3.65	3.65	3.65	90.0	1.19	1.20	1.20
570.1	618.1	2.20	2.19	2.20	618.1	3.70	3.70	3.70	100.0	1.22	1.23	1.23
600.1	648.1	2.25	2.23	2.25	648.1	3.68	3.68	3.69	105.0	1.23	1.24	1.24
640.1	688.1	2.21	2.18	2.20	688.1	3.69	3.69	3.69	115.0	1.25	1.26	1.26
670.1	718.1	2.16	2.13	2.14	718.1	3.72	3.72	3.72	120.0	1.26	1.27	1.27
710.1	758.1	2.06	2.02	2.03	758.1	3.73	3.73	3.74	130.0	1.27	1.28	1.28
740.1	788.1	2.03	1.98	2.00	788.1	3.72	3.72	3.72	135.0	1.27	1.28	1.28
780.1	828.1	2.05	2.00	2.03	828.1	3.69	3.69	3.69	145.0	1.27	1.28	1.28
810.1	858.1	2.01	1.97	2.00	858.1	3.65	3.65	3.65	150.0	1.26	1.27	1.27
850.1	898.1	1.87	1.85	1.88	898.1	3.58	3.58	3.57	160.0	1.26	1.27	1.27
880.1	928.1	1.70	1.67	1.68	928.1	3.56	3.56	3.57	165.0	1.27	1.27	1.27
920.1	968.1	1.41	1.37	1.38	968.1	3.60	3.61	3.62	175.0	1.29	1.30	1.30
950.1	998.1	1.27	1.23	1.23	998.1	3.61	3.62	3.61	180.0	1.30	1.31	1.31
990.1	1038.1	1.18	1.15	1.14	1038.1	3.60	3.60	3.61	190.0	1.32	1.33	1.33
1020.1	1068.1	1.23	1.22	1.21	1068.1	3.59	3.60	3.59	195.0	1.33	1.33	1.33
1060.1	1108.1	1.41	1.43	1.41	1108.1	3.55	3.56	3.55	205.0	1.35	1.36	1.36
1090.1	1138.1	1.59	1.61	1.60	1138.1	3.52	3.52	3.52	210.0	1.36	1.37	1.37
1130.1	1178.1	1.82	1.86	1.83	1178.1	3.50	3.49	3.48	220.0	1.37	1.38	1.38
1160.1	1208.1	2.04	2.09	2.07	1208.1	3.45	3.46	3.45	225.0	1.36	1.37	1.37
1200.1	1248.1	2.41	2.47	2.46	1248.1	3.41	3.41	3.41	235.0	1.36	1.37	1.37
1230.1	1278.1	2.67	2.75	2.73	1278.1	3.38	3.38	3.36	240.0	1.36	1.37	1.37
1270.1	1318.1	3.13	3.21	3.20	1318.1	3.31	3.31	3.30	250.0	1.36	1.37	1.37
1300.1	1348.1	3.44	3.54	3.52	1348.1	3.27	3.27	3.26	255.0	1.36	1.36	1.36
1340.1	1388.1	3.92	4.03	4.02	1388.1	3.22	3.21	3.20	265.0	1.37	1.37	1.37
1370.1	1418.1	4.41	4.55	4.55	1418.1	3.17	3.17	3.16	270.0	1.39	1.39	1.39

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(dBc)										
0	-	-	17	23	41	27	61	56	58	63	55	57
1	-	38	+0	40	11	50	20	49	40	57	48	53
2	66	62	65	73	75	>83	>83	74	75	73	>83	>83
3	>90	79	67	80	64	77	64	75	66	>83	>83	>83
4	>90	>83	>83	82	>83	>83	>83	>83	>83	>83	>83	>83
5	>90	>83	>83	>83	80	>83	83	>83	>83	>83	>83	>83
6	>90	>83	>83	>83	>83	82	71	80	>83	>83	>83	>83
7	>90	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
8	>90	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
9	>90	>83	>83	>83	>83	>83	>83	83	>83	>83	78	>83
10	>90	>83	>83	>83	>83	>83	>83	>83	82	>83	82	>83
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 238.5 MHz; 0.00 dBm.

LO IN: 286.5 MHz; +17.00 dBm

IF OUT: 48 MHz; -6.71 dBm

RF HARMONICS ORDER

	(-dBm)	(dBc)										
0	-	-	26	32	52	36	58	60	66	69	63	64
1	-	38	+0	41	11	52	21	50	42	58	51	53
2	46	55	54	62	59	68	68	61	69	67	81	86
3	66	80	51	70	46	66	44	62	48	71	65	81
4	>90	78	81	73	76	76	84	73	>93	91	92	86
5	>90	84	68	73	66	79	66	75	>93	76	76	91
6	86	92	90	89	86	85	84	87	84	82	90	91
7	>90	>93	83	90	78	91	75	87	73	91	79	87
8	>90	>93	>93	>93	>93	>93	91	>93	>93	>93	>93	>93
9	>90	>93	>93	>93	91	>93	88	>93	82	91	83	>93
10	85	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 238.5 MHz; 10.00 dBm.

LO IN: 286.5 MHz; +17.00 dBm

IF OUT: 48 MHz; 2.96 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.

REV. X2

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