

Frequency Mixer

HJK-ED9978

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=70MHz (dB)			RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)			RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+15dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+14	+17	+20			+14	+17	+20			+14	+17	+20
380.1	310.1	11.99	10.01	9.19	380.1	310.1	12.08	15.94	20.25	380.1	310.1	1.85	1.61	0.45
460.1	390.1	9.76	8.28	7.95	460.1	390.1	15.96	19.72	21.93	460.1	390.1	3.41	2.22	0.31
540.1	470.1	8.34	7.43	7.25	540.1	470.1	15.70	18.19	20.85	540.1	470.1	2.17	1.38	0.38
620.1	550.1	7.94	7.51	7.52	620.1	550.1	19.23	23.89	27.38	620.1	550.1	1.08	0.93	0.36
700.1	630.1	7.02	6.94	6.94	700.1	630.1	27.77	30.99	34.69	700.1	630.1	0.43	0.18	0.10
780.1	710.1	6.80	6.78	7.11	780.1	710.1	32.07	36.69	27.81	780.1	710.1	0.15	0.08	0.02
860.1	790.1	6.86	6.77	6.77	860.1	790.1	30.72	34.10	39.00	860.1	790.1	0.19	0.10	0.06
940.1	870.1	7.25	7.02	6.95	940.1	870.1	25.71	31.36	35.14	940.1	870.1	0.41	0.20	0.10
1020.1	950.1	8.76	8.39	8.33	1020.1	950.1	22.66	28.87	33.95	1020.1	950.1	0.11	0.02	0.00
1100.1	1030.1	9.11	8.55	8.34	1100.1	1030.1	26.48	26.95	29.74	1100.1	1030.1	0.68	0.47	0.19
1180.1	1110.1	8.93	8.20	8.01	1180.1	1110.1	22.20	24.90	29.60	1180.1	1110.1	0.69	0.55	0.09
1260.1	1190.1	9.26	8.38	8.18	1260.1	1190.1	23.42	24.41	29.34	1260.1	1190.1	0.78	0.68	0.18
1340.1	1270.1	9.44	8.49	8.28	1340.1	1270.1	23.56	25.01	32.09	1340.1	1270.1	0.80	0.66	0.17
1420.1	1350.1	9.65	8.60	8.36	1420.1	1350.1	24.45	25.36	34.08	1420.1	1350.1	0.76	0.67	0.17
1500.1	1430.1	10.06	8.84	8.53	1500.1	1430.1	25.14	24.64	32.91	1500.1	1430.1	0.55	0.67	0.20
1580.1	1510.1	10.53	9.16	8.76	1580.1	1510.1	23.18	24.10	32.00	1580.1	1510.1	0.15	0.56	0.22
1660.1	1590.1	10.79	9.42	8.98	1660.1	1590.1	20.97	23.06	31.30	1660.1	1590.1	-0.09	0.42	0.15
1740.1	1670.1	10.64	9.33	9.00	1740.1	1670.1	20.66	21.85	26.39	1740.1	1670.1	-0.03	0.46	0.10
1820.1	1750.1	10.41	9.21	8.96	1820.1	1750.1	20.47	21.86	25.62	1820.1	1750.1	0.08	0.52	0.09
1900.1	1830.1	10.29	9.15	8.93	1900.1	1830.1	20.38	21.91	25.52	1900.1	1830.1	0.08	0.49	0.07
1980.1	1910.1	10.32	9.17	8.94	1980.1	1910.1	20.42	22.01	25.44	1980.1	1910.1	0.00	0.45	0.05
2060.1	1990.1	10.41	9.25	9.02	2060.1	1990.1	20.69	22.19	25.59	2060.1	1990.1	-0.10	0.37	0.00
2140.1	2070.1	10.36	9.26	9.02	2140.1	2070.1	21.32	22.94	26.79	2140.1	2070.1	-0.06	0.34	-0.01
2220.1	2150.1	10.14	9.22	9.03	2220.1	2150.1	22.24	24.38	28.54	2220.1	2150.1	0.10	0.33	0.00
2300.1	2230.1	9.78	9.05	8.90	2300.1	2230.1	23.49	25.61	29.98	2300.1	2230.1	0.32	0.34	0.04
2380.1	2310.1	9.52	8.90	8.80	2380.1	2310.1	24.01	26.18	32.70	2380.1	2310.1	0.44	0.34	0.08
2480.1	2410.1	9.29	8.83	8.78	2480.1	2410.1	24.63	27.26	39.42	2480.1	2410.1	0.53	0.30	0.08
2560.1	2490.1	9.16	8.84	8.82	2560.1	2490.1	24.82	28.20	40.59	2560.1	2490.1	0.56	0.27	0.07
2660.1	2590.1	9.10	8.92	8.93	2660.1	2590.1	25.46	28.97	33.08	2660.1	2590.1	0.46	0.18	0.04
2740.1	2670.1	9.08	8.97	9.00	2740.1	2670.1	25.76	29.04	30.17	2740.1	2670.1	0.43	0.14	0.02
2840.1	2770.1	9.16	9.06	9.11	2840.1	2770.1	26.12	29.22	28.92	2840.1	2770.1	0.38	0.12	0.02
2920.1	2850.1	9.30	9.18	9.23	2920.1	2850.1	26.16	29.22	29.01	2920.1	2850.1	0.43	0.17	0.04
3020.1	2950.1	9.66	9.47	9.51	3020.1	2950.1	26.43	28.74	29.31	3020.1	2950.1	0.44	0.21	0.06
3100.1	3030.1	9.93	9.71	9.76	3100.1	3030.1	27.28	30.18	31.29	3100.1	3030.1	0.48	0.25	0.09
3200.1	3130.1	10.16	9.87	9.92	3200.1	3130.1	25.95	29.51	33.16	3200.1	3130.1	0.55	0.36	0.14
3280.1	3210.1	10.42	9.97	10.02	3280.1	3210.1	24.75	27.96	32.12	3280.1	3210.1	0.52	0.42	0.14
3380.1	3310.1	11.01	10.28	10.26	3380.1	3310.1	27.25	25.78	32.48	3380.1	3310.1	0.38	0.46	0.14
3460.1	3390.1	11.76	10.73	10.57	3460.1	3390.1	22.69	25.49	34.70	3460.1	3390.1	0.18	0.40	0.15
3560.1	3490.1	12.61	11.31	11.03	3560.1	3490.1	18.73	26.22	30.59	3560.1	3490.1	-0.11	0.32	0.16

REV. X2

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=795.1MHz (dB)
		@LO (dBm)
		+17
495.0	300.1	12.18
467.7	327.4	10.93
440.4	354.7	10.22
413.0	382.1	9.54
385.7	409.4	8.73
358.4	436.7	8.38
331.1	464.0	8.15
303.7	491.4	7.78
276.4	518.7	8.87
249.1	546.0	7.76
221.8	573.3	7.38
194.4	600.7	7.15
167.1	628.0	6.93
139.8	655.3	6.89
112.5	682.6	6.73
92.0	703.1	6.72
64.6	730.5	6.67
44.2	750.9	6.70
16.8	778.3	6.67
43.2	838.3	6.73
175.8	970.9	8.60
275.4	1070.5	7.67
408.0	1203.1	8.10
507.5	1302.6	8.55
640.2	1435.3	9.02
739.7	1534.8	9.35
872.4	1667.5	9.50
971.9	1767.0	9.54
1104.6	1899.7	9.70
1204.1	1999.2	9.62
1336.8	2131.9	9.24
1436.3	2231.4	9.00
1568.9	2364.0	8.71
1668.5	2463.6	8.55
1801.1	2596.2	8.48
1900.6	2695.7	8.72
2033.3	2828.4	9.11
2132.8	2927.9	9.70
2265.5	3060.6	10.60
2365.0	3160.1	11.07

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=595.1MHz (dB)
		@LO (dBm)
		+17
10.0	605.1	7.31
70.0	665.1	6.82
130.0	725.1	6.79
190.0	785.1	6.82
250.0	845.1	6.88
310.0	905.1	7.19
370.0	965.1	8.64
430.0	1025.1	8.26
490.0	1085.1	7.89
550.0	1145.1	8.03
610.0	1205.1	8.40
670.0	1265.1	8.54
730.0	1325.1	8.89
790.0	1385.1	9.16
850.0	1445.1	9.24
910.0	1505.1	9.69
970.0	1565.1	9.62
1030.0	1625.1	9.80
1090.0	1685.1	9.81
1150.0	1745.1	9.52
1210.0	1805.1	9.83
1270.0	1865.1	9.67
1330.0	1925.1	9.45
1390.0	1985.1	9.58
1450.0	2045.1	9.25
1510.0	2105.1	9.17
1570.0	2165.1	9.05
1630.0	2225.1	8.64
1690.0	2285.1	8.59
1750.0	2345.1	8.40
1810.0	2405.1	8.36
1870.0	2465.1	8.51
1930.0	2525.1	8.56
1990.0	2585.1	8.74
2050.0	2645.1	8.92
2110.0	2705.1	9.06
2190.0	2785.1	9.48
2250.0	2845.1	9.87
2330.0	2925.1	10.48
2390.0	2985.1	10.94

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=995.1MHz (dB)
		@LO (dBm)
		+17
630.0	365.1	11.09
610.0	385.1	10.54
590.0	405.1	9.96
570.0	425.1	9.52
550.0	445.1	9.33
530.0	465.1	9.08
510.0	485.1	8.80
490.0	505.1	9.34
470.0	525.1	8.97
460.0	535.1	8.58
440.0	555.1	8.11
430.0	565.1	7.88
410.0	585.1	7.70
400.0	595.1	7.64
380.0	615.1	7.45
370.0	625.1	7.38
350.0	645.1	7.25
340.0	655.1	7.13
320.0	675.1	7.02
310.0	685.1	7.06
290.0	705.1	7.01
280.0	715.1	6.93
260.0	735.1	6.86
250.0	745.1	6.88
230.0	765.1	6.82
220.0	775.1	6.94
200.0	795.1	6.97
190.0	805.1	6.91
170.0	825.1	6.89
160.0	835.1	6.96
140.0	855.1	7.03
130.0	865.1	7.06
110.0	885.1	7.15
100.0	895.1	7.19
80.0	915.1	7.43
70.0	925.1	7.68
50.0	945.1	8.07
40.0	955.1	8.42
20.0	975.1	8.80
10.0	985.1	9.12

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+20	+14	+17	+20
310.1	56.30	53.49	52.53	56.56	55.61	54.65
390.1	51.95	50.28	50.04	58.03	57.11	55.98
470.1	48.51	47.61	47.75	70.03	61.46	58.76
550.1	43.26	42.73	42.96	50.04	50.73	50.57
630.1	38.75	38.66	38.70	39.27	39.62	39.86
710.1	34.63	34.89	35.04	32.14	32.43	32.76
790.1	35.26	35.88	36.25	32.11	32.63	33.06
870.1	35.05	35.62	36.01	32.84	33.52	33.93
950.1	35.49	35.97	36.44	33.85	34.12	34.02
1030.1	37.31	37.76	38.29	30.83	30.99	31.08
1110.1	39.06	39.32	39.98	30.42	31.16	31.52
1190.1	38.58	39.73	40.78	30.42	30.86	31.21
1270.1	36.45	37.19	37.91	30.95	31.27	31.57
1350.1	35.65	36.39	37.18	31.99	32.21	32.54
1430.1	35.34	36.29	37.21	33.66	33.80	34.20
1510.1	35.85	37.35	38.62	36.11	36.50	36.99
1590.1	37.17	38.55	39.38	35.62	34.59	34.32
1670.1	37.15	37.51	37.81	33.79	32.49	32.21
1750.1	36.17	36.47	36.79	33.10	31.97	31.80
1830.1	35.32	35.87	36.26	32.97	31.98	31.81
1910.1	34.72	35.45	35.92	33.02	32.07	31.92
1990.1	34.30	35.16	35.68	33.36	32.39	32.23
2070.1	34.29	35.31	35.85	34.13	33.35	32.99
2150.1	34.57	35.96	36.62	35.77	34.94	34.46
2230.1	36.24	38.59	39.65	38.44	36.83	36.00
2310.1	38.47	41.09	42.45	40.74	36.99	36.39
2410.1	37.08	37.86	38.66	42.61	38.45	38.29
2490.1	34.92	35.58	36.27	45.55	44.27	45.47
2590.1	32.83	33.61	34.24	35.44	36.68	36.90
2670.1	31.71	32.52	33.07	30.11	30.63	30.58
2770.1	30.37	31.00	31.62	26.16	26.37	26.50
2850.1	29.56	30.17	30.76	24.64	24.79	25.09
2950.1	28.82	29.22	29.67	24.09	24.49	24.72
3030.1	28.88	29.00	29.33	24.80	25.38	25.67
3130.1	28.60	28.40	28.80	26.53	27.63	27.94
3210.1	28.58	28.34	28.69	27.95	29.44	29.77
3310.1	28.51	28.05	28.48	29.21	30.58	31.13
3390.1	28.47	28.14	28.42	29.72	30.62	31.18
3490.1	27.98	27.63	27.94	30.33	30.45	30.95

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
380.1	310.1	39.93	41.06	28.22
460.1	390.1	42.70	40.27	27.45
540.1	470.1	39.58	39.06	28.81
620.1	550.1	36.31	34.56	24.91
700.1	630.1	35.09	35.57	32.58
780.1	710.1	37.71	38.86	38.05
860.1	790.1	40.62	41.25	43.45
940.1	870.1	33.38	35.34	37.29
1020.1	950.1	22.36	23.94	27.00
1100.1	1030.1	28.03	26.97	23.33
1180.1	1110.1	23.30	24.05	21.34
1260.1	1190.1	23.22	24.71	21.63
1340.1	1270.1	23.69	25.37	22.11
1420.1	1350.1	23.93	25.93	22.68
1500.1	1430.1	23.44	26.13	23.21
1580.1	1510.1	22.24	24.83	22.60
1660.1	1590.1	22.29	24.41	22.15
1740.1	1670.1	24.43	26.49	23.12
1820.1	1750.1	26.41	28.06	23.78
1900.1	1830.1	27.47	28.94	24.25
1980.1	1910.1	27.95	29.49	24.63
2060.1	1990.1	28.30	29.91	25.07
2140.1	2070.1	28.42	30.08	25.39
2220.1	2150.1	29.17	30.98	26.30
2300.1	2230.1	32.17	34.78	28.85
2380.1	2310.1	38.57	44.41	33.17
2480.1	2410.1	49.13	47.99	37.03
2560.1	2490.1	50.80	52.81	36.89
2660.1	2590.1	46.74	53.47	35.96
2740.1	2670.1	44.70	48.34	35.59
2840.1	2770.1	45.14	48.84	35.76
2920.1	2850.1	45.52	48.39	35.23
3020.1	2950.1	41.89	42.78	33.13
3100.1	3030.1	36.35	36.46	30.34
3200.1	3130.1	31.52	31.57	27.74
3280.1	3210.1	29.23	29.23	26.47
3380.1	3310.1	28.17	27.72	25.75
3460.1	3390.1	28.38	27.42	25.62
3560.1	3490.1	29.37	27.47	25.87

Frequency Mixer

HJK-ED9978

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=725.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+14	+17	+20		+14	+17	+20		+14	+17	+20
380.1	310.1	2.20	1.85	1.79	310.1	46.96	45.72	51.10	30.1	1.25	1.37	1.53
460.1	390.1	1.93	1.69	1.69	390.1	30.49	29.96	32.18	50.1	1.31	1.42	1.57
540.1	470.1	1.87	1.72	1.73	470.1	22.29	21.73	22.29	70.1	1.27	1.38	1.52
620.1	550.1	1.54	1.63	1.62	550.1	15.96	15.67	15.96	90.1	1.37	1.48	1.62
700.1	630.1	1.63	1.71	1.74	630.1	7.80	7.53	7.22	110.1	1.31	1.40	1.53
780.1	710.1	1.66	1.71	1.81	710.1	2.34	2.25	2.08	130.1	1.40	1.50	1.63
860.1	790.1	1.64	1.65	1.66	790.1	4.05	4.16	4.31	150.1	1.40	1.48	1.58
940.1	870.1	1.79	1.72	1.70	870.1	7.97	8.12	8.27	170.1	1.46	1.54	1.66
1020.1	950.1	2.08	1.93	1.89	950.1	10.62	10.62	10.75	190.1	1.50	1.57	1.65
1100.1	1030.1	2.13	2.02	2.03	1030.1	12.09	12.35	12.80	210.1	1.50	1.57	1.66
1180.1	1110.1	2.42	2.25	2.23	1110.1	13.92	14.03	14.15	230.1	1.61	1.66	1.73
1260.1	1190.1	2.53	2.29	2.27	1190.1	15.26	15.13	15.13	250.1	1.57	1.62	1.70
1340.1	1270.1	2.57	2.30	2.26	1270.1	15.81	15.81	15.81	270.1	1.72	1.76	1.82
1420.1	1350.1	2.63	2.34	2.29	1350.1	15.53	15.53	15.96	290.1	1.64	1.68	1.73
1500.1	1430.1	2.66	2.32	2.26	1430.1	15.53	15.53	15.96	310.1	1.77	1.80	1.84
1580.1	1510.1	2.65	2.28	2.19	1510.1	14.62	14.38	14.38	330.1	1.74	1.75	1.78
1660.1	1590.1	2.58	2.20	2.10	1590.1	13.49	13.09	12.71	350.1	1.85	1.87	1.91
1740.1	1670.1	2.40	2.05	1.98	1670.1	14.03	13.70	13.19	370.1	1.84	1.84	1.86
1820.1	1750.1	2.25	1.91	1.85	1750.1	14.15	13.92	13.60	390.1	1.88	1.89	1.92
1900.1	1830.1	2.17	1.85	1.80	1830.1	13.29	13.09	12.99	410.1	1.94	1.92	1.92
1980.1	1910.1	2.13	1.82	1.77	1910.1	12.89	12.71	12.44	430.1	1.95	1.95	1.95
2060.1	1990.1	2.09	1.80	1.75	1990.1	11.53	11.24	10.75	450.1	2.03	2.00	1.99
2140.1	2070.1	2.04	1.76	1.72	2070.1	10.25	9.90	9.38	470.1	1.98	1.96	1.96
2220.1	2150.1	1.95	1.71	1.67	2150.1	9.48	9.18	8.77	490.1	2.09	2.06	2.03
2300.1	2230.1	1.87	1.67	1.64	2230.1	8.39	8.23	8.01	500.1	2.05	2.03	2.01
2380.1	2310.1	1.82	1.64	1.61	2310.1	7.17	7.02	6.86	520.1	2.11	2.06	2.02
2480.1	2410.1	1.68	1.54	1.51	2410.1	5.93	5.79	5.59	530.1	2.17	2.13	2.09
2560.1	2490.1	1.59	1.47	1.44	2490.1	4.79	4.63	4.44	550.1	2.07	2.02	1.98
2660.1	2590.1	1.42	1.35	1.33	2590.1	3.46	3.32	3.18	560.1	2.17	2.11	2.06
2740.1	2670.1	1.33	1.29	1.27	2670.1	2.58	2.48	2.39	580.1	2.11	2.06	2.02
2840.1	2770.1	1.25	1.24	1.23	2770.1	1.87	1.84	1.80	590.1	2.13	2.07	2.01
2920.1	2850.1	1.22	1.23	1.22	2850.1	1.70	1.73	1.74	610.1	2.18	2.13	2.07
3020.1	2950.1	1.19	1.21	1.21	2950.1	1.88	1.94	1.97	620.1	2.13	2.07	2.01
3100.1	3030.1	1.19	1.22	1.22	3030.1	2.12	2.19	2.23	640.1	2.26	2.19	2.12
3200.1	3130.1	1.21	1.26	1.26	3130.1	2.50	2.58	2.63	650.1	2.19	2.13	2.07
3280.1	3210.1	1.25	1.30	1.31	3210.1	2.82	2.91	2.96	670.1	2.25	2.17	2.09
3380.1	3310.1	1.33	1.38	1.39	3310.1	3.23	3.33	3.38	680.1	2.28	2.20	2.13
3460.1	3390.1	1.43	1.46	1.48	3390.1	3.46	3.52	3.52	700.1	2.19	2.11	2.03
3560.1	3490.1	1.56	1.58	1.60	3490.1	3.66	3.71	3.70	710.1	2.31	2.22	2.14

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	9	10	28	18	32	41	44	47	49	50
1	-	33	+0	48	14	47	25	52	46	54	43	55
2	66	56	64	61	69	64	69	68	69	65	71	74
3	>100	81	78	77	77	78	83	78	>93	88	92	87
4	>100	>93	>93	92	>93	91	92	>93	93	>93	>93	>93
5	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
6	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
7	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
8	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
9	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
10	>100	>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: 795.1 MHz; 0.00 dBm.
LO IN: 725.1 MHz; +17.00 dBm
IF OUT: 70 MHz; -6.94 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	19	20	37	28	43	49	60	54	60	59
1	-	32	+0	52	14	67	25	50	49	54	42	53
2	47	46	55	51	57	55	56	59	58	58	59	66
3	75	69	54	65	53	67	55	67	60	74	70	72
4	>100	91	99	89	90	86	99	86	89	90	92	83
5	>100	85	85	85	80	86	80	82	83	79	87	85
6	>100	99	>103	103	98	98	98	100	96	99	96	102
7	>100	99	93	99	92	100	87	98	88	>103	89	95
8	>100	>103	>103	>103	>103	>103	>103	101	101	103	102	>103
9	>100	>103	>103	>103	>103	>103	>103	>103	>103	>103	>103	>103
10	>100	>103	>103	>103	>103	>103	>103	>103	>103	>103	>103	>103
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 795.1 MHz; 10.00 dBm.
LO IN: 725.1 MHz; +17.00 dBm
IF OUT: 70 MHz; 3 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.