

Frequency Mixer

MWJ-ED14703/1

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)			RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)			RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+20dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
+14	+17	+20	+14	+17	+20	+14	+17	+20						
40.1	10.1	9.01	7.83	7.16	40.1	10.1	15.04	16.73	19.16	40.1	10.1	6.97	6.10	4.83
58.1	28.1	6.08	5.90	5.74	58.1	28.1	25.02	28.51	32.17	58.1	28.1	3.06	1.82	0.97
76.1	46.1	5.67	5.56	5.57	76.1	46.1	28.39	31.20	32.69	76.1	46.1	1.63	0.85	0.44
94.1	64.1	5.47	5.39	5.30	94.1	64.1	30.50	32.61	33.81	94.1	64.1	0.84	0.45	0.28
112.1	82.1	5.44	5.36	5.30	112.1	82.1	32.05	33.96	35.59	112.1	82.1	0.56	0.32	0.20
130.1	100.1	5.48	5.35	5.27	130.1	100.1	31.66	34.25	35.76	130.1	100.1	0.65	0.34	0.19
148.1	118.1	5.54	5.45	5.32	148.1	118.1	30.55	32.98	34.75	148.1	118.1	0.83	0.41	0.27
166.1	136.1	5.63	5.51	5.40	166.1	136.1	29.58	32.13	34.15	166.1	136.1	0.92	0.43	0.23
184.1	154.1	5.85	5.72	5.58	184.1	154.1	27.80	30.49	32.83	184.1	154.1	1.33	0.61	0.34
202.1	172.1	6.12	5.93	5.81	202.1	172.1	26.10	28.84	31.18	202.1	172.1	1.86	0.89	0.44
222.1	192.1	6.28	6.03	5.86	222.1	192.1	24.89	27.70	30.43	222.1	192.1	2.26	1.16	0.54
240.1	210.1	6.33	6.07	5.90	240.1	210.1	24.34	27.16	29.69	240.1	210.1	2.47	1.30	0.63
258.1	228.1	6.41	6.16	5.97	258.1	228.1	23.70	26.58	29.44	258.1	228.1	2.72	1.48	0.74
276.1	246.1	6.73	6.44	6.20	276.1	246.1	22.34	25.15	28.02	276.1	246.1	3.27	1.90	0.95
294.1	264.1	7.06	6.69	6.46	294.1	264.1	21.14	24.14	26.92	294.1	264.1	3.80	2.33	1.18
312.1	282.1	7.21	6.79	6.49	312.1	282.1	20.60	23.53	26.45	312.1	282.1	4.08	2.61	1.44
330.1	300.1	7.21	6.81	6.53	330.1	300.1	20.24	23.18	26.08	330.1	300.1	4.30	2.79	1.56
348.1	318.1	7.32	6.87	6.54	348.1	318.1	19.89	22.82	25.70	348.1	318.1	4.50	2.95	1.67
366.1	336.1	7.58	7.10	6.76	366.1	336.1	18.95	21.77	24.69	366.1	336.1	5.00	3.42	2.02
384.1	354.1	7.97	7.38	7.00	384.1	354.1	18.02	20.86	23.86	384.1	354.1	5.35	3.78	2.38
404.1	374.1	8.16	7.55	7.12	404.1	374.1	17.88	20.46	23.37	404.1	374.1	5.69	4.06	2.61
422.1	392.1	8.22	7.59	7.15	422.1	392.1	17.55	20.18	23.06	422.1	392.1	5.86	4.26	2.76
440.1	410.1	8.30	7.64	7.16	440.1	410.1	17.40	19.94	22.71	440.1	410.1	6.05	4.40	2.91
458.1	428.1	8.62	7.87	7.35	458.1	428.1	16.75	19.19	21.93	458.1	428.1	6.43	4.79	3.26
476.1	446.1	8.94	8.13	7.57	476.1	446.1	16.18	18.51	21.28	476.1	446.1	6.69	5.15	3.59
494.1	464.1	9.19	8.31	7.70	494.1	464.1	16.26	18.50	21.12	494.1	464.1	6.84	5.26	3.71
512.1	482.1	9.23	8.34	7.71	512.1	482.1	15.97	18.18	20.84	512.1	482.1	6.97	5.42	3.86
530.1	500.1	9.36	8.42	7.76	530.1	500.1	15.93	18.06	20.78	530.1	500.1	7.02	5.53	3.93
548.1	518.1	9.65	8.65	7.97	548.1	518.1	15.51	17.53	20.16	548.1	518.1	7.32	5.79	4.19
566.1	536.1	10.01	8.95	8.23	566.1	536.1	14.97	16.85	19.40	566.1	536.1	7.49	5.96	4.41
586.1	556.1	10.28	9.16	8.39	586.1	556.1	15.18	16.99	19.53	586.1	556.1	7.55	6.12	4.53
604.1	574.1	10.35	9.22	8.46	604.1	574.1	14.86	16.60	19.13	604.1	574.1	7.61	6.20	4.57
622.1	592.1	10.45	9.28	8.50	622.1	592.1	14.83	16.51	18.90	622.1	592.1	7.68	6.25	4.66
640.1	610.1	10.72	9.46	8.64	640.1	610.1	14.70	16.29	18.57	640.1	610.1	7.86	6.51	4.94
658.1	628.1	11.05	9.77	8.87	658.1	628.1	14.17	15.62	17.76	658.1	628.1	7.94	6.61	5.07
676.1	646.1	11.25	9.93	9.00	676.1	646.1	14.35	15.75	17.81	676.1	646.1	7.93	6.68	5.17
694.1	664.1	11.35	9.96	9.03	694.1	664.1	14.17	15.56	17.59	694.1	664.1	7.99	6.73	5.21
712.1	682.1	11.44	10.07	9.10	712.1	682.1	14.13	15.46	17.38	712.1	682.1	8.00	6.75	5.22
730.1	700.1	11.65	10.18	9.16	730.1	700.1	14.07	15.36	17.20	730.1	700.1	8.14	6.97	5.51
750.1	720.1	11.98	10.50	9.44	750.1	720.1	13.57	14.78	16.52	750.1	720.1	8.20	7.05	5.60

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=255.1MHz (dB)
		@LO (dBm)
		+17
215.0	40.1	6.01
205.0	50.1	5.88
195.0	60.1	5.90
185.0	70.1	5.79
175.0	80.1	5.74
165.0	90.1	5.75
155.0	100.1	5.83
145.0	110.1	5.88
133.0	122.1	6.15
123.0	132.1	6.25
113.0	142.1	6.01
103.0	152.1	6.05
93.0	162.1	6.00
83.0	172.1	6.02
73.0	182.1	6.03
63.0	192.1	6.02
51.0	204.1	6.03
41.0	214.1	6.14
31.0	224.1	6.16
21.0	234.1	6.22
15.0	270.1	6.50
37.0	292.1	6.51
61.0	316.1	6.48
83.0	338.1	6.74
107.0	362.1	6.88
129.0	384.1	7.03
153.0	408.1	7.07
175.0	430.1	7.21
199.0	454.1	7.32
221.0	476.1	7.40
245.0	500.1	7.49
267.0	522.1	7.74
291.0	546.1	7.96
315.0	570.1	8.10
337.0	592.1	8.24
361.0	616.1	8.55
383.0	638.1	8.82
407.0	662.1	9.02
429.0	684.1	9.23
453.0	708.1	9.59

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=40.1MHz (dB)
		@LO (dBm)
		+17
10.0	50.1	6.14
26.0	66.1	5.95
44.0	84.1	5.95
60.0	100.1	5.96
78.0	118.1	6.06
94.0	134.1	6.15
112.0	152.1	6.27
130.0	170.1	6.42
146.0	186.1	6.50
164.0	204.1	6.55
180.0	220.1	6.64
198.0	238.1	6.72
216.0	256.1	6.89
232.0	272.1	7.00
250.0	290.1	7.11
266.0	306.1	7.15
284.0	324.1	7.21
302.0	342.1	7.38
318.0	358.1	7.55
336.0	376.1	7.62
352.0	392.1	7.68
370.0	410.1	7.74
386.0	426.1	7.94
404.0	444.1	8.13
422.0	462.1	8.28
438.0	478.1	8.35
456.0	496.1	8.46
472.0	512.1	8.70
490.0	530.1	8.96
508.0	548.1	9.14
524.0	564.1	9.28
542.0	582.1	9.44
558.0	598.1	9.62
576.0	616.1	9.94
594.0	634.1	10.24
610.0	650.1	10.37
628.0	668.1	10.52
644.0	684.1	10.71
662.0	702.1	10.95
680.0	720.1	11.21

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=470.1MHz (dB)
		@LO (dBm)
		+17
460.0	10.1	8.72
450.0	20.1	7.52
438.0	32.1	7.10
426.0	44.1	6.95
414.0	56.1	6.87
404.0	66.1	6.77
392.0	78.1	6.77
380.0	90.1	6.67
368.0	102.1	6.75
358.0	112.1	6.78
346.0	124.1	6.85
334.0	136.1	6.76
322.0	148.1	6.81
310.0	160.1	6.84
300.0	170.1	6.91
288.0	182.1	6.90
276.0	194.1	6.93
264.0	206.1	6.93
254.0	216.1	6.96
242.0	228.1	7.14
230.0	240.1	7.45
218.0	252.1	7.34
208.0	262.1	7.33
196.0	274.1	7.34
184.0	286.1	7.33
172.0	298.1	7.31
160.0	310.1	7.36
150.0	320.1	7.32
138.0	332.1	7.45
126.0	344.1	7.54
114.0	356.1	7.65
104.0	366.1	7.61
92.0	378.1	7.70
80.0	390.1	7.71
68.0	402.1	7.76
58.0	412.1	7.81
46.0	424.1	7.93
34.0	436.1	8.04
22.0	448.1	8.12
10.0	460.1	8.23

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LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+20	+14	+17	+20
10.1	71.93	66.48	77.83	79.15	77.70	77.94
28.1	55.85	54.97	55.19	55.34	55.07	54.61
46.1	50.08	49.69	49.85	50.37	50.22	50.27
64.1	47.87	47.89	48.19	49.10	49.07	49.20
82.1	47.57	47.84	48.17	48.66	48.86	49.13
100.1	49.37	49.82	50.07	50.46	50.70	51.11
118.1	51.46	52.05	52.43	52.46	52.81	53.06
136.1	52.47	52.82	53.51	53.28	53.48	53.67
154.1	54.19	54.58	55.35	54.05	53.98	54.15
172.1	55.92	56.42	56.96	55.70	55.71	55.63
192.1	57.06	57.46	57.79	57.13	56.92	56.91
210.1	57.65	58.05	58.44	57.84	57.35	57.03
228.1	58.07	58.21	58.44	58.48	57.91	57.44
246.1	59.22	59.49	59.81	59.33	58.81	58.19
264.1	60.47	60.46	60.58	61.01	60.24	59.65
282.1	61.19	61.28	61.24	62.75	61.70	61.04
300.1	61.78	61.62	61.48	63.78	62.36	61.48
318.1	62.07	61.56	61.31	63.97	62.82	61.54
336.1	63.23	62.77	62.48	66.17	64.21	62.76
354.1	64.05	63.60	63.14	68.76	66.26	64.98
374.1	64.76	63.78	63.15	69.85	67.68	65.86
392.1	64.88	64.23	63.87	69.85	67.23	65.57
410.1	65.03	64.21	63.69	70.00	67.27	65.19
428.1	64.80	63.99	63.26	69.93	66.65	64.71
446.1	65.33	64.38	63.81	70.48	67.18	64.98
464.1	64.21	63.30	62.73	69.99	67.30	64.95
482.1	63.45	62.57	62.10	68.41	65.59	63.47
500.1	62.66	62.03	61.62	67.16	64.84	63.15
518.1	61.76	61.02	60.39	66.48	64.31	62.86
536.1	61.42	60.98	60.50	65.97	64.02	62.57
556.1	60.31	59.64	59.15	65.22	63.47	62.29
574.1	59.38	58.73	58.25	63.97	62.62	61.37
592.1	59.27	58.72	58.45	63.59	62.16	61.29
610.1	58.24	57.72	57.23	63.08	61.90	60.76
628.1	58.18	57.65	57.29	62.42	61.45	60.35
646.1	57.47	56.97	56.62	61.71	60.68	59.65
664.1	56.44	55.92	55.49	60.75	59.73	58.75
682.1	56.42	56.04	55.80	60.26	59.16	58.31
700.1	55.72	55.34	55.01	60.17	59.06	58.24
720.1	55.83	55.57	55.37	60.14	59.24	58.44

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
40.1	10.1	45.65	47.27	40.70
58.1	28.1	39.11	39.15	40.79
76.1	46.1	35.71	35.01	34.43
94.1	64.1	37.77	37.56	37.37
112.1	82.1	38.77	38.59	38.54
130.1	100.1	40.44	40.58	40.91
148.1	118.1	41.31	41.58	41.80
166.1	136.1	41.72	41.90	41.82
184.1	154.1	43.04	43.36	44.02
202.1	172.1	42.63	42.66	42.83
222.1	192.1	42.77	42.77	43.09
240.1	210.1	43.18	43.37	43.86
258.1	228.1	41.47	40.93	40.25
276.1	246.1	42.74	42.86	43.16
294.1	264.1	42.81	42.87	42.80
312.1	282.1	42.06	42.02	41.66
330.1	300.1	42.61	42.64	42.85
348.1	318.1	41.96	41.92	42.07
366.1	336.1	41.78	41.21	40.93
384.1	354.1	42.17	41.71	41.81
404.1	374.1	41.36	40.33	39.49
422.1	392.1	42.23	41.41	41.21
440.1	410.1	41.89	41.49	41.26
458.1	428.1	41.15	40.09	39.50
476.1	446.1	41.57	40.90	40.64
494.1	464.1	41.41	40.79	40.29
512.1	482.1	40.78	39.98	39.23
530.1	500.1	40.81	40.59	40.22
548.1	518.1	40.61	40.16	39.81
566.1	536.1	40.27	39.63	39.30
586.1	556.1	40.32	39.77	39.53
604.1	574.1	39.99	39.26	38.70
622.1	592.1	39.87	39.11	38.44
640.1	610.1	39.74	38.94	38.40
658.1	628.1	39.56	38.75	37.74
676.1	646.1	39.66	38.71	37.80
694.1	664.1	39.44	38.57	37.80
712.1	682.1	39.12	38.25	37.21
730.1	700.1	39.21	38.02	37.03
750.1	720.1	39.18	38.07	36.99

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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=440.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+14	+17	+20		+14	+17	+20		+14	+17	+20
40.1	10.1	2.84	2.75	2.65	10.1	13.43	12.45	12.27	10.1	1.15	1.17	1.24
58.1	28.1	1.73	1.69	1.66	28.1	8.81	8.84	8.79	20.1	1.07	1.10	1.19
76.1	46.1	1.32	1.31	1.31	46.1	4.54	4.54	4.53	30.1	1.05	1.07	1.17
94.1	64.1	1.12	1.14	1.16	64.1	2.08	2.08	2.07	42.1	1.06	1.04	1.14
112.1	82.1	1.05	1.10	1.14	82.1	1.20	1.20	1.20	52.1	1.07	1.04	1.14
130.1	100.1	1.13	1.16	1.18	100.1	2.04	2.05	2.05	62.1	1.08	1.05	1.15
148.1	118.1	1.22	1.23	1.25	118.1	3.21	3.23	3.23	74.1	1.09	1.06	1.16
166.1	136.1	1.32	1.32	1.33	136.1	4.47	4.50	4.50	84.1	1.09	1.07	1.15
184.1	154.1	1.41	1.40	1.41	154.1	5.68	5.70	5.71	96.1	1.11	1.06	1.14
202.1	172.1	1.51	1.48	1.48	172.1	6.78	6.81	6.83	106.1	1.13	1.07	1.14
222.1	192.1	1.62	1.58	1.56	192.1	7.88	7.91	7.93	116.1	1.15	1.08	1.13
240.1	210.1	1.71	1.66	1.64	210.1	8.76	8.80	8.80	128.1	1.17	1.10	1.12
258.1	228.1	1.80	1.74	1.70	228.1	9.60	9.64	9.65	138.1	1.20	1.12	1.13
276.1	246.1	1.91	1.83	1.78	246.1	10.33	10.37	10.38	150.1	1.22	1.14	1.15
294.1	264.1	2.02	1.93	1.85	264.1	11.01	11.03	11.03	160.1	1.23	1.15	1.15
312.1	282.1	2.12	2.01	1.92	282.1	11.61	11.62	11.61	170.1	1.24	1.15	1.14
330.1	300.1	2.20	2.08	1.98	300.1	12.17	12.16	12.15	182.1	1.27	1.18	1.15
348.1	318.1	2.30	2.16	2.05	318.1	12.72	12.74	12.72	192.1	1.29	1.20	1.17
366.1	336.1	2.43	2.26	2.13	336.1	13.19	13.23	13.22	202.1	1.30	1.21	1.17
384.1	354.1	2.56	2.37	2.21	354.1	13.72	13.73	13.70	214.1	1.33	1.22	1.17
404.1	374.1	2.69	2.46	2.28	374.1	14.20	14.17	14.09	224.1	1.36	1.26	1.20
422.1	392.1	2.77	2.53	2.33	392.1	14.56	14.55	14.46	236.1	1.41	1.30	1.24
440.1	410.1	2.88	2.63	2.41	410.1	14.91	14.87	14.80	246.1	1.44	1.33	1.26
458.1	428.1	3.04	2.76	2.53	428.1	15.34	15.32	15.29	256.1	1.45	1.34	1.27
476.1	446.1	3.18	2.89	2.65	446.1	15.64	15.60	15.56	268.1	1.49	1.37	1.29
494.1	464.1	3.29	3.00	2.75	464.1	15.89	15.86	15.74	278.1	1.52	1.40	1.32
512.1	482.1	3.38	3.09	2.82	482.1	16.14	16.09	15.97	290.1	1.55	1.43	1.34
530.1	500.1	3.48	3.17	2.89	500.1	16.34	16.30	16.20	300.1	1.56	1.43	1.34
548.1	518.1	3.61	3.29	3.01	518.1	16.45	16.43	16.36	310.1	1.59	1.47	1.37
566.1	536.1	3.69	3.36	3.06	536.1	16.64	16.61	16.52	322.1	1.65	1.53	1.43
586.1	556.1	3.78	3.46	3.15	556.1	16.69	16.63	16.48	332.1	1.69	1.57	1.47
604.1	574.1	3.81	3.48	3.16	574.1	16.76	16.66	16.46	342.1	1.72	1.59	1.50
622.1	592.1	3.85	3.52	3.18	592.1	16.89	16.83	16.67	354.1	1.76	1.63	1.54
640.1	610.1	3.91	3.60	3.27	610.1	16.90	16.84	16.72	364.1	1.82	1.69	1.59
658.1	628.1	3.96	3.65	3.29	628.1	16.82	16.74	16.62	376.1	1.85	1.73	1.64
676.1	646.1	4.00	3.69	3.34	646.1	16.70	16.62	16.45	386.1	1.85	1.73	1.65
694.1	664.1	4.00	3.69	3.34	664.1	16.52	16.41	16.16	396.1	1.88	1.77	1.68
712.1	682.1	3.98	3.68	3.31	682.1	16.39	16.30	16.09	408.1	1.93	1.83	1.77
730.1	700.1	4.01	3.73	3.39	700.1	16.34	16.28	16.14	418.1	1.86	1.79	1.76
750.1	720.1	3.98	3.71	3.36	720.1	16.06	16.00	15.86	430.1	1.67	1.60	1.60

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	---	---	20.22	14.69	17.21	24.93	23.90	33.66	29.06	32.40	30.51	39.71
1	---	34.84	---	38.63	10.78	43.97	16.89	43.90	20.99	42.50	24.07	41.97
2	111.40	57.76	61.88	61.11	63.01	62.12	56.61	57.00	56.38	59.31	54.48	55.56
3	124.14	95.92	80.47	103.03	77.13	71.95	80.73	86.64	77.71	84.40	78.42	83.37
4	120.51	102.27	99.08	104.79	97.92	101.20	106.09	96.46	103.31	99.67	102.80	98.26
5	124.53	103.11	101.10	108.94	102.43	102.41	83.97	103.56	103.37	105.12	104.78	103.65
6	117.05	99.62	103.00	100.11	102.36	100.97	102.85	102.12	108.29	83.75	101.28	99.13
7	117.19	100.96	106.47	108.58	103.61	107.45	97.18	103.45	97.36	100.81	101.09	104.11
8	119.61	101.61	99.93	103.51	102.39	105.27	102.80	104.92	103.97	94.61	106.61	105.39
9	119.88	101.13	104.75	100.45	104.53	101.63	104.39	106.08	100.89	103.42	104.17	100.11
10	118.78	100.35	104.77	99.42	103.70	105.49	102.07	105.88	100.83	101.11	103.49	102.37
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 120.1 MHz; -5 dBm.
 LO IN: 90.1 MHz; +17.00 dBm
 IF OUT: 30 MHz; -10.22 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	---	---	31.81	25.06	27.69	36.13	34.88	42.48	42.34	40.81	43.17	43.70
1	---	34.41	---	38.71	10.80	44.15	17.08	44.07	21.36	42.22	24.67	41.94
2	94.77	48.24	52.00	51.67	54.01	51.08	46.87	47.13	46.75	49.22	44.72	45.83
3	117.43	76.62	63.15	83.45	59.74	85.46	63.44	67.40	60.29	65.08	60.54	64.63
4	120.70	91.78	88.59	90.24	87.05	92.48	84.03	83.64	88.15	84.05	80.69	81.74
5	117.32	98.35	86.46	97.74	84.31	96.40	93.03	97.57	83.89	112.64	86.27	92.95
6	119.28	99.36	102.68	97.84	108.06	95.65	103.82	98.65	100.76	88.58	102.44	108.20
7	118.47	105.72	108.22	109.16	110.29	108.29	108.58	107.70	99.74	108.75	103.48	110.20
8	118.99	114.23	116.51	113.07	111.14	117.52	106.78	112.29	114.52	103.67	114.26	110.83
9	114.59	112.16	112.59	108.52	113.89	110.75	113.14	117.42	115.64	116.99	107.13	111.75
10	118.97	118.25	110.25	114.71	114.05	114.01	117.34	110.86	114.45	112.90	111.82	109.29
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 120.1 MHz; +5 dBm.
 LO IN: 90.1 MHz; +17.00 dBm
 IF OUT: 30 MHz; -0.32 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.