

Frequency Mixer

JMS-5MH+

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=+9dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+10	+13	+16			+10	+13	+16			+10	+13	+16
10.1	40.1	6.11	5.70	5.49	10.1	40.1	20.46	23.85	28.59	10.1	40.1	1.33	1.11	0.94
50.1	80.1	5.81	5.42	5.22	50.1	80.1	20.78	21.92	19.46	50.1	80.1	1.68	1.41	1.29
90.1	120.1	5.70	5.32	5.15	90.1	120.1	19.63	17.40	18.48	90.1	120.1	1.73	1.46	1.36
150.1	180.1	5.73	5.41	5.24	150.1	180.1	15.25	16.55	19.39	150.1	180.1	1.80	1.51	1.42
190.1	220.1	5.80	5.47	5.29	190.1	220.1	14.94	17.29	20.14	190.1	220.1	1.82	1.58	1.47
250.1	280.1	5.90	5.56	5.35	250.1	280.1	14.92	17.63	20.83	250.1	280.1	1.87	1.65	1.61
290.1	320.1	5.96	5.59	5.38	290.1	320.1	15.40	18.52	21.94	290.1	320.1	1.92	1.69	1.68
350.1	380.1	6.09	5.67	5.43	350.1	380.1	15.80	19.11	22.51	350.1	380.1	2.06	1.75	1.84
390.1	420.1	6.25	5.79	5.52	390.1	420.1	15.85	19.59	24.64	390.1	420.1	2.05	1.82	1.82
450.1	480.1	6.32	5.91	5.64	450.1	480.1	17.06	19.76	23.14	450.1	480.1	2.27	2.02	1.95
490.1	520.1	6.34	5.88	5.60	490.1	520.1	17.55	21.57	25.22	490.1	520.1	2.37	2.11	2.08
550.1	580.1	6.57	5.96	5.56	550.1	580.1	15.76	20.61	24.61	550.1	580.1	2.41	2.29	2.20
590.1	620.1	6.73	6.10	5.69	590.1	620.1	15.90	19.30	23.07	590.1	620.1	2.36	2.23	2.18
650.1	680.1	6.95	6.34	5.92	650.1	680.1	16.92	18.77	20.90	650.1	680.1	2.32	2.16	2.16
690.1	720.1	7.08	6.40	5.96	690.1	720.1	16.77	18.33	20.17	690.1	720.1	2.38	2.29	2.24
750.1	780.1	7.38	6.57	6.08	750.1	780.1	15.81	18.00	19.54	750.1	780.1	2.14	2.22	2.22
790.1	820.1	7.51	6.70	6.21	790.1	820.1	14.99	17.14	18.77	790.1	820.1	1.93	2.12	2.07
850.1	880.1	7.56	6.83	6.34	850.1	880.1	14.33	15.83	17.80	850.1	880.1	1.79	1.88	1.91
890.1	920.1	7.40	6.77	6.30	890.1	920.1	14.43	15.44	17.12	890.1	920.1	1.74	1.73	1.77
950.1	980.1	7.35	6.86	6.42	950.1	980.1	14.80	14.88	16.50	950.1	980.1	1.64	1.49	1.53
990.1	1020.1	7.34	6.94	6.54	990.1	1020.1	14.95	14.70	15.81	990.1	1020.1	1.54	1.35	1.36
1050.1	1080.1	7.31	6.96	6.67	1050.1	1080.1	15.99	14.85	15.27	1050.1	1080.1	1.52	1.23	1.16
1090.1	1120.1	7.26	6.93	6.70	1090.1	1120.1	17.63	15.66	15.56	1090.1	1120.1	1.55	1.15	1.07
1150.1	1180.1	7.25	6.90	6.69	1150.1	1180.1	18.99	18.22	16.95	1150.1	1180.1	1.53	1.10	0.98
1190.1	1220.1	7.25	6.87	6.65	1190.1	1220.1	18.28	19.17	18.71	1190.1	1220.1	1.58	1.10	0.98
1250.1	1280.1	7.22	6.78	6.55	1250.1	1280.1	16.94	18.02	20.29	1250.1	1280.1	2.12	1.48	1.27
1290.1	1320.1	7.26	6.75	6.51	1290.1	1320.1	16.13	17.08	19.83	1290.1	1320.1	1.85	1.23	0.95
1350.1	1380.1	7.33	6.75	6.50	1350.1	1380.1	15.44	16.75	19.68	1350.1	1380.1	1.93	1.23	0.92
1390.1	1420.1	7.48	6.78	6.53	1390.1	1420.1	15.47	16.70	20.01	1390.1	1420.1	2.08	1.25	0.91
1450.1	1480.1	7.63	6.83	6.60	1450.1	1480.1	15.57	17.55	21.38	1450.1	1480.1	2.11	1.25	0.91
1490.1	1520.1	7.91	6.92	6.65	1490.1	1520.1	15.49	18.40	21.29	1490.1	1520.1	2.09	1.27	0.86
1550.1	1580.1	8.39	7.19	6.85	1550.1	1580.1	15.44	19.39	23.10	1550.1	1580.1	1.97	1.28	0.86
1590.1	1620.1	9.08	7.46	7.04	1590.1	1620.1	15.54	19.94	22.87	1590.1	1620.1	1.83	1.37	0.97
1650.1	1680.1	10.17	7.86	7.29	1650.1	1680.1	18.51	20.19	24.05	1650.1	1680.1	1.31	1.36	0.95
1690.1	1720.1	11.31	8.14	7.42	1690.1	1720.1	16.17	19.36	23.45	1690.1	1720.1	0.73	1.31	0.92
1750.1	1780.1	12.96	8.62	7.60	1750.1	1780.1	10.38	18.35	21.59	1750.1	1780.1	-0.29	1.25	0.90
1790.1	1820.1	14.46	8.95	7.69	1790.1	1820.1	7.53	17.64	20.07	1790.1	1820.1	-1.22	1.29	1.02
1850.1	1880.1	16.45	9.44	7.70	1850.1	1880.1	4.55	16.21	18.69	1850.1	1880.1	-2.77	1.16	1.05
1890.1	1920.1	17.95	9.84	7.77	1890.1	1920.1	2.89	15.53	17.86	1890.1	1920.1	-3.78	1.02	1.07
1950.1	1980.1	20.43	10.29	7.92	1950.1	1980.1	0.87	14.69	16.74	1950.1	1980.1	-5.58	0.78	1.09



Frequency Mixer

JMS-5MH+

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=750.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1500.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+13			+13			+13
740.0	10.1	6.51	10.0	20.1	5.83	1000.0	500.1	8.71
721.3	28.8	6.49	30.0	40.1	5.70	979.8	520.3	8.55
702.6	47.5	6.46	50.0	60.1	5.76	959.6	540.5	8.43
683.8	66.3	6.54	70.0	80.1	5.77	939.4	560.7	8.31
665.1	85.0	6.58	90.0	100.1	5.75	919.2	580.9	8.20
646.4	103.7	6.62	110.0	120.1	5.72	899.0	601.1	8.13
627.7	122.4	6.63	130.0	140.1	5.69	878.8	621.3	8.06
609.0	141.1	6.58	150.0	160.1	5.74	858.6	641.5	8.01
590.3	159.8	6.59	170.0	180.1	5.75	838.4	661.7	7.92
571.5	178.6	6.61	190.0	200.1	5.75	818.2	681.9	7.84
552.8	197.3	6.58	210.0	220.1	5.76	798.0	702.1	7.77
534.1	216.0	6.55	230.0	240.1	5.75	777.8	722.3	7.67
515.4	234.7	6.51	250.0	260.1	5.83	757.6	742.5	7.66
496.7	253.4	6.50	270.0	280.1	5.85	737.3	762.8	7.41
477.9	272.2	6.48	290.0	300.1	5.87	717.1	783.0	7.39
459.2	290.9	6.50	310.0	320.1	5.89	696.9	803.2	7.41
440.5	309.6	6.47	330.0	340.1	5.90	676.7	823.4	7.37
421.8	328.3	6.43	350.0	360.1	5.94	656.5	843.6	7.37
403.1	347.0	6.39	370.0	380.1	5.97	636.3	863.8	7.35
384.4	365.7	6.39	390.0	400.1	6.00	616.1	884.0	7.32
365.6	384.5	6.28	430.0	440.1	6.05	575.7	924.4	7.25
346.9	403.2	6.31	450.0	460.1	6.11	555.5	944.6	7.24
328.2	421.9	6.32	490.0	500.1	6.14	515.1	985.0	7.20
309.5	440.6	6.32	510.0	520.1	6.14	494.9	1005.2	7.24
290.8	459.3	6.35	550.0	560.1	6.25	454.5	1045.6	7.27
272.1	478.0	6.33	570.0	580.1	6.28	434.3	1065.8	7.31
253.3	496.8	6.35	610.0	620.1	6.37	393.9	1106.2	7.29
234.6	515.5	6.32	630.0	640.1	6.45	373.7	1126.4	7.30
215.9	534.2	6.36	670.0	680.1	6.55	333.3	1166.8	7.32
197.2	552.9	6.36	690.0	700.1	6.62	313.1	1187.0	7.31
178.5	571.6	6.41	730.0	740.1	6.78	272.7	1227.4	7.28
159.7	590.4	6.46	750.0	760.1	6.85	252.4	1247.7	7.27
141.0	609.1	6.46	790.0	800.1	6.99	212.0	1288.1	7.18
122.3	627.8	6.51	810.0	820.1	7.06	191.8	1308.3	7.17
103.6	646.5	6.52	850.0	860.1	7.30	151.4	1348.7	7.09
84.9	665.2	6.60	870.0	880.1	7.42	131.2	1368.9	7.03
66.2	683.9	6.58	910.0	920.1	7.66	90.8	1409.3	6.97
47.4	702.7	6.60	930.0	940.1	7.81	70.6	1429.5	6.94
28.7	721.4	6.57	970.0	980.1	8.05	30.2	1469.9	6.87
10.0	740.1	6.74	990.0	1000.1	8.17	10.0	1490.1	6.93



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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
10.1	77.68	72.68	69.95	59.40	64.50	67.73
50.1	68.43	66.92	62.98	47.18	58.70	59.74
90.1	62.15	66.21	61.83	41.15	49.70	59.03
150.1	56.00	65.14	60.20	36.71	45.02	48.03
190.1	52.59	62.46	61.05	34.57	42.61	45.02
250.1	50.13	61.32	60.11	32.85	40.66	39.86
290.1	48.83	60.09	59.18	32.00	39.39	38.22
350.1	47.33	59.40	55.65	31.35	37.70	34.67
390.1	46.24	57.12	54.87	31.25	36.68	33.14
450.1	45.05	55.13	53.69	31.33	34.50	30.56
490.1	44.21	53.75	51.39	31.29	33.65	29.56
550.1	43.51	51.44	49.41	31.36	31.46	27.35
590.1	42.94	49.52	47.17	31.48	30.61	26.32
650.1	42.76	49.06	44.95	32.51	28.51	24.87
690.1	42.32	50.44	44.89	33.05	27.29	23.93
750.1	40.79	54.79	46.89	31.38	24.80	21.86
790.1	39.07	50.14	50.96	29.29	23.49	20.82
850.1	36.47	42.76	52.94	26.92	21.83	19.49
890.1	35.33	40.02	47.36	25.67	21.09	18.75
950.1	34.36	38.41	43.07	24.26	20.07	17.83
990.1	33.86	37.85	41.86	23.50	19.54	17.38
1050.1	33.05	36.91	41.04	22.47	18.94	16.95
1090.1	32.41	36.04	39.91	21.89	18.19	16.43
1150.1	31.81	35.27	38.99	20.84	17.56	15.63
1190.1	31.51	34.84	38.29	19.92	16.91	15.07
1250.1	31.12	34.36	37.59	18.29	15.92	14.19
1290.1	30.80	33.97	37.05	17.46	15.27	13.75
1350.1	30.37	33.40	36.17	16.25	14.40	13.06
1390.1	29.96	32.83	35.51	15.63	13.96	12.65
1450.1	29.23	31.91	34.40	14.68	13.11	12.15
1490.1	28.65	31.18	33.66	13.98	12.78	11.93
1550.1	27.93	30.21	32.64	13.28	12.35	11.52
1590.1	27.39	29.55	31.95	12.88	12.10	11.39
1650.1	26.56	28.45	30.64	12.43	11.82	11.12
1690.1	25.92	27.62	29.68	12.09	11.66	11.09
1750.1	25.24	26.81	28.75	11.79	11.47	10.86
1790.1	24.80	26.19	28.01	11.64	11.48	10.84
1850.1	24.28	25.48	27.22	11.44	11.38	10.83
1890.1	23.89	24.91	26.62	11.28	11.28	10.93
1950.1	23.36	24.44	26.11	11.04	11.23	10.99

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	54.72	48.14	51.94
50.1	80.1	40.62	39.56	38.96
90.1	120.1	36.03	35.49	34.81
150.1	180.1	32.98	32.31	31.73
190.1	220.1	31.84	31.00	30.57
250.1	280.1	30.82	30.01	29.49
290.1	320.1	30.70	29.73	29.20
350.1	380.1	29.99	29.26	28.76
390.1	420.1	29.12	28.55	28.04
450.1	480.1	28.29	27.82	27.49
490.1	520.1	27.06	26.75	26.41
550.1	580.1	24.77	24.72	24.52
590.1	620.1	23.23	23.22	23.19
650.1	680.1	21.68	21.59	21.54
690.1	720.1	21.17	21.14	21.17
750.1	780.1	20.94	21.02	21.12
790.1	820.1	20.80	21.05	21.25
850.1	880.1	20.37	20.97	21.42
890.1	920.1	20.01	20.74	21.31
950.1	980.1	19.38	20.09	20.82
990.1	1020.1	18.97	19.65	20.34
1050.1	1080.1	18.61	19.24	19.91
1090.1	1120.1	18.49	19.06	19.67
1150.1	1180.1	18.61	19.10	19.61
1190.1	1220.1	18.87	19.30	19.78
1250.1	1280.1	19.50	19.92	20.35
1290.1	1320.1	20.08	20.54	20.94
1350.1	1380.1	21.12	21.62	22.03
1390.1	1420.1	21.64	22.17	22.61
1450.1	1480.1	21.62	22.22	22.76
1490.1	1520.1	21.02	21.65	22.16
1550.1	1580.1	19.65	20.17	20.60
1590.1	1620.1	18.67	19.22	19.60
1650.1	1680.1	17.49	18.10	18.42
1690.1	1720.1	16.85	17.62	17.87
1750.1	1780.1	16.09	17.13	17.42
1790.1	1820.1	15.74	17.00	17.30
1850.1	1880.1	15.47	16.92	17.43
1890.1	1920.1	15.49	16.92	17.61
1950.1	1980.1	15.66	16.97	18.03

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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	1.81	1.73	1.70
50.1	80.1	1.28	1.18	1.14
90.1	120.1	1.26	1.13	1.08
150.1	180.1	1.24	1.14	1.08
190.1	220.1	1.26	1.17	1.12
250.1	280.1	1.32	1.23	1.18
290.1	320.1	1.37	1.28	1.23
350.1	380.1	1.45	1.37	1.31
390.1	420.1	1.52	1.43	1.37
450.1	480.1	1.64	1.55	1.49
490.1	520.1	1.73	1.63	1.56
550.1	580.1	1.95	1.81	1.70
590.1	620.1	2.11	1.96	1.83
650.1	680.1	2.37	2.21	2.08
690.1	720.1	2.56	2.37	2.22
750.1	780.1	2.84	2.61	2.46
790.1	820.1	2.99	2.76	2.60
850.1	880.1	3.11	2.92	2.77
890.1	920.1	3.10	2.95	2.81
950.1	980.1	3.08	2.95	2.82
990.1	1020.1	3.06	2.94	2.82
1050.1	1080.1	3.02	2.90	2.80
1090.1	1120.1	2.99	2.86	2.77
1150.1	1180.1	2.94	2.79	2.68
1190.1	1220.1	2.92	2.75	2.63
1250.1	1280.1	2.85	2.65	2.52
1290.1	1320.1	2.82	2.58	2.44
1350.1	1380.1	2.75	2.48	2.33
1390.1	1420.1	2.75	2.44	2.29
1450.1	1480.1	2.72	2.39	2.25
1490.1	1520.1	2.81	2.42	2.27
1550.1	1580.1	2.95	2.52	2.35
1590.1	1620.1	3.14	2.60	2.42
1650.1	1680.1	3.40	2.76	2.53
1690.1	1720.1	3.65	2.84	2.58
1750.1	1780.1	3.96	2.95	2.64
1790.1	1820.1	4.18	3.01	2.66
1850.1	1880.1	4.44	3.08	2.64
1890.1	1920.1	4.52	3.13	2.61
1950.1	1980.1	4.64	3.18	2.57

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+10	+13	+16
10.1	1.61	2.30	3.35
50.1	1.62	2.48	3.62
90.1	1.56	2.34	3.37
150.1	1.58	2.39	3.43
190.1	1.55	2.32	3.31
250.1	1.60	2.37	3.35
290.1	1.60	2.34	3.26
350.1	1.66	2.39	3.28
390.1	1.68	2.37	3.21
450.1	1.75	2.42	3.22
490.1	1.77	2.41	3.17
550.1	1.84	2.45	3.17
590.1	1.88	2.46	3.15
650.1	1.93	2.48	3.14
690.1	1.97	2.49	3.11
750.1	2.05	2.51	3.07
790.1	2.11	2.54	3.07
850.1	2.18	2.60	3.09
890.1	2.22	2.63	3.11
950.1	2.27	2.67	3.14
990.1	2.30	2.68	3.14
1050.1	2.38	2.73	3.16
1090.1	2.40	2.71	3.12
1150.1	2.49	2.75	3.13
1190.1	2.52	2.73	3.09
1250.1	2.62	2.77	3.09
1290.1	2.65	2.74	3.04
1350.1	2.78	2.79	3.06
1390.1	2.87	2.82	3.06
1450.1	3.09	2.95	3.14
1490.1	3.25	3.03	3.16
1550.1	3.58	3.22	3.29
1590.1	3.79	3.33	3.33
1650.1	4.13	3.55	3.47
1690.1	4.34	3.68	3.54
1750.1	4.61	3.95	3.68
1790.1	4.72	4.08	3.75
1850.1	4.92	4.36	3.95
1890.1	4.96	4.50	4.05
1950.1	5.06	4.68	4.24

IF (OUT) (MHz)	IF VSWR @LO=1500.1MHz (:1)		
	@LO (dBm)		
	+10	+13	+16
10.1	1.35	1.10	1.21
30.1	1.38	1.06	1.12
50.1	1.34	1.04	1.16
70.1	1.33	1.05	1.18
90.1	1.37	1.07	1.16
110.1	1.40	1.10	1.15
130.1	1.38	1.13	1.20
150.1	1.37	1.15	1.22
170.1	1.38	1.13	1.20
190.1	1.40	1.13	1.19
210.1	1.43	1.19	1.23
230.1	1.45	1.22	1.25
250.1	1.42	1.22	1.26
270.1	1.40	1.23	1.29
290.1	1.43	1.26	1.32
310.1	1.45	1.27	1.32
330.1	1.43	1.29	1.35
350.1	1.43	1.31	1.38
370.1	1.43	1.30	1.36
390.1	1.42	1.29	1.35
430.1	1.45	1.34	1.40
450.1	1.42	1.32	1.38
490.1	1.41	1.33	1.39
510.1	1.42	1.33	1.39
550.1	1.41	1.36	1.44
570.1	1.41	1.36	1.43
610.1	1.38	1.37	1.45
630.1	1.40	1.39	1.47
670.1	1.38	1.41	1.50
690.1	1.39	1.43	1.53
730.1	1.37	1.43	1.53
750.1	1.39	1.46	1.56
790.1	1.38	1.46	1.56
810.1	1.36	1.47	1.58
850.1	1.36	1.47	1.58
870.1	1.35	1.48	1.60
910.1	1.35	1.51	1.63
930.1	1.34	1.50	1.63
970.1	1.38	1.57	1.70
990.1	1.39	1.59	1.73

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	7	27	18	40	27	78	52	57	57	56
1	-	14	+0	38	27	38	37	53	52	69	51	56
2	78	38	28	41	28	50	37	53	47	69	60	64
3	>100	36	38	40	38	52	60	50	56	60	58	68
4	>100	56	48	53	44	47	46	54	50	60	64	95
5	>100	64	53	53	51	59	47	55	68	67	62	68
6	>100	73	64	59	61	64	50	59	49	80	55	70
7	>100	81	77	77	62	69	67	62	62	75	66	69
8	>100	86	83	83	79	75	72	66	58	65	62	73
9	>100	87	83	94	85	87	74	84	69	68	66	72
10	96	84	83	91	93	93	85	85	82	84	66	69
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; 4.00 dBm.
 LO IN: 780.01 MHz; +13.00 dBm
 IF OUT: 29.91 MHz; -2.44 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+2	16	6	24	14	64	31	41	36	37
1	-	14	+0	35	26	33	33	44	41	51	42	60
2	98	50	38	54	37	58	41	53	47	68	53	54
3	>100	60	57	62	52	65	73	63	62	67	64	68
4	>100	86	80	87	67	75	66	87	68	76	72	82
5	>100	>88	>88	>88	>88	>88	83	>88	>88	86	84	>88
6	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
7	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
8	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
9	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
10	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; -6.00 dBm.
 LO IN: 780.01 MHz; +13.00 dBm
 IF OUT: 29.91 MHz; -12.29 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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