

# Frequency Mixer

# JMS-2MH

## 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	6.98	6.56	6.34	10.1	40.1	20.75	24.24	26.03	10.1	40.1	0.98	0.76	0.58
50.1	80.1	7.24	6.78	6.52	50.1	80.1	20.20	22.81	25.94	50.1	80.1	1.03	0.75	0.59
90.1	120.1	7.26	6.77	6.51	90.1	120.1	20.67	23.91	29.41	90.1	120.1	0.86	0.72	0.58
130.1	160.1	7.23	6.80	6.57	130.1	160.1	21.24	25.76	27.10	130.1	160.1	0.96	0.77	0.62
170.1	200.1	7.19	6.78	6.58	170.1	200.1	22.19	25.90	29.78	170.1	200.1	0.89	0.67	0.55
210.1	240.1	7.10	6.74	6.55	210.1	240.1	22.15	25.68	28.77	210.1	240.1	0.99	0.77	0.62
250.1	280.1	7.13	6.78	6.58	250.1	280.1	23.15	25.58	27.97	250.1	280.1	1.00	0.77	0.64
290.1	320.1	7.09	6.75	6.56	290.1	320.1	22.63	26.48	26.45	290.1	320.1	1.00	0.78	0.62
330.1	360.1	7.10	6.77	6.58	330.1	360.1	22.77	26.06	25.38	330.1	360.1	1.01	0.76	0.63
370.1	400.1	7.11	6.78	6.58	370.1	400.1	22.95	25.42	25.60	370.1	400.1	0.97	0.73	0.61
410.1	440.1	7.08	6.77	6.58	410.1	440.1	22.89	24.53	23.76	410.1	440.1	0.97	0.72	0.64
450.1	480.1	7.12	6.79	6.58	450.1	480.1	22.79	26.24	23.76	450.1	480.1	1.01	0.79	0.65
490.1	520.1	7.11	6.79	6.57	490.1	520.1	22.50	23.78	23.96	490.1	520.1	1.06	0.81	0.69
530.1	560.1	7.11	6.80	6.58	530.1	560.1	22.33	22.08	22.70	530.1	560.1	1.05	0.80	0.66
570.1	600.1	7.15	6.79	6.57	570.1	600.1	22.82	21.93	22.16	570.1	600.1	1.06	0.85	0.70
610.1	640.1	7.25	6.85	6.61	610.1	640.1	22.49	23.70	22.65	610.1	640.1	1.08	0.88	0.74
650.1	680.1	7.31	6.95	6.69	650.1	680.1	22.60	24.80	23.45	650.1	680.1	1.04	0.84	0.73
690.1	720.1	7.35	7.03	6.77	690.1	720.1	22.81	25.30	24.08	690.1	720.1	1.18	0.94	0.81
730.1	760.1	7.42	7.10	6.86	730.1	760.1	22.46	23.69	24.31	730.1	760.1	1.26	0.99	0.83
750.1	780.1	7.41	7.10	6.86	750.1	780.1	23.66	23.51	23.99	750.1	780.1	1.37	1.08	0.92
790.1	820.1	7.49	7.15	6.91	790.1	820.1	22.52	21.94	22.53	790.1	820.1	1.36	1.05	0.89
810.1	840.1	7.51	7.16	6.92	810.1	840.1	24.02	22.73	22.63	810.1	840.1	1.43	1.11	0.94
850.1	880.1	7.64	7.21	6.97	850.1	880.1	25.11	21.11	21.47	850.1	880.1	1.46	1.16	0.99
870.1	900.1	7.72	7.23	6.98	870.1	900.1	24.84	21.38	21.32	870.1	900.1	1.45	1.16	0.96
910.1	940.1	7.90	7.29	7.02	910.1	940.1	20.67	21.73	20.70	910.1	940.1	1.45	1.28	1.07
930.1	960.1	8.05	7.38	7.08	930.1	960.1	19.19	21.81	21.49	930.1	960.1	1.35	1.20	0.99
970.1	1000.1	8.29	7.57	7.19	970.1	1000.1	17.78	22.94	21.09	970.1	1000.1	1.31	1.26	1.07
990.1	1020.1	8.38	7.69	7.27	990.1	1020.1	17.73	25.12	21.27	990.1	1020.1	1.19	1.14	1.02
1030.1	1060.1	8.57	7.89	7.42	1030.1	1060.1	17.88	23.49	21.64	1030.1	1060.1	1.21	1.13	1.04
1050.1	1080.1	8.68	8.02	7.53	1050.1	1080.1	18.21	23.01	22.43	1050.1	1080.1	1.12	1.06	0.96
1090.1	1120.1	8.83	8.23	7.72	1090.1	1120.1	18.73	21.77	22.48	1090.1	1120.1	1.06	0.97	0.91
1110.1	1140.1	8.93	8.36	7.81	1110.1	1140.1	19.05	21.18	22.55	1110.1	1140.1	1.08	0.95	0.91
1150.1	1180.1	9.15	8.61	8.08	1150.1	1180.1	19.00	20.57	22.29	1150.1	1180.1	0.91	0.80	0.77
1170.1	1200.1	9.26	8.73	8.22	1170.1	1200.1	18.68	20.02	21.36	1170.1	1200.1	0.99	0.83	0.76
1210.1	1240.1	9.48	8.97	8.49	1210.1	1240.1	19.08	19.38	20.35	1210.1	1240.1	0.84	0.69	0.62
1230.1	1260.1	9.53	9.04	8.59	1230.1	1260.1	18.79	19.12	19.69	1230.1	1260.1	0.85	0.71	0.62
1270.1	1300.1	9.76	9.30	8.89	1270.1	1300.1	18.61	19.39	19.17	1270.1	1300.1	0.83	0.66	0.55
1290.1	1320.1	9.86	9.38	8.99	1290.1	1320.1	18.70	19.49	19.29	1290.1	1320.1	0.80	0.66	0.55
1330.1	1360.1	10.07	9.63	9.24	1330.1	1360.1	18.59	19.62	19.77	1330.1	1360.1	0.79	0.63	0.53
1350.1	1380.1	10.17	9.74	9.35	1350.1	1380.1	19.12	19.64	20.33	1350.1	1380.1	0.73	0.59	0.49

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# Frequency Mixer

# JMS-2MH

## Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=500.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=20.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1000.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+13			+13			+13
460.0	40.1	6.72	10.0	30.1	6.87	980.0	20.1	7.85
448.5	51.6	6.73	29.8	49.9	6.68	960.2	39.9	7.84
436.9	63.2	6.75	49.6	69.7	6.72	940.4	59.7	7.81
425.4	74.7	6.73	69.4	89.5	6.77	920.6	79.5	7.81
413.8	86.3	6.70	89.2	109.3	6.73	900.8	99.3	7.79
402.3	97.8	6.66	109.0	129.1	6.74	881.0	119.1	7.71
390.8	109.3	6.60	128.8	148.9	6.76	861.2	138.9	7.68
379.2	120.9	6.59	148.6	168.7	6.80	841.4	158.7	7.68
367.7	132.4	6.55	168.4	188.5	6.80	821.6	178.5	7.67
356.2	143.9	6.53	188.2	208.3	6.78	801.8	198.3	7.61
344.6	155.5	6.54	208.0	228.1	6.80	782.0	218.1	7.58
333.1	167.0	6.58	227.8	247.9	6.83	762.2	237.9	7.55
321.5	178.6	6.53	247.6	267.7	6.89	742.4	257.7	7.54
310.0	190.1	6.53	267.3	287.4	6.89	722.7	277.4	7.56
298.5	201.6	6.52	287.1	307.2	6.89	702.9	297.2	7.49
286.9	213.2	6.50	306.9	327.0	6.90	683.1	317.0	7.50
275.4	224.7	6.50	326.7	346.8	6.91	663.3	336.8	7.48
263.8	236.3	6.52	346.5	366.6	6.97	643.5	356.6	7.48
252.3	247.8	6.49	366.3	386.4	7.00	623.7	376.4	7.49
240.8	259.3	6.54	386.1	406.2	6.98	603.9	396.2	7.44
229.2	270.9	6.55	425.7	445.8	7.04	564.3	435.8	7.40
217.7	282.4	6.54	445.5	465.6	7.07	544.5	455.6	7.42
206.2	293.9	6.55	485.1	505.2	7.08	504.9	495.2	7.36
194.6	305.5	6.56	504.9	525.0	7.08	485.1	515.0	7.38
183.1	317.0	6.54	544.5	564.6	7.16	445.5	554.6	7.35
171.5	328.6	6.55	564.3	584.4	7.13	425.7	574.4	7.35
160.0	340.1	6.57	603.9	624.0	7.13	386.1	614.0	7.33
148.5	351.6	6.58	623.7	643.8	7.19	366.3	633.8	7.36
136.9	363.2	6.60	663.3	683.4	7.20	326.7	673.4	7.38
125.4	374.7	6.62	683.1	703.2	7.20	306.9	693.2	7.38
113.8	386.3	6.61	722.7	742.8	7.30	267.3	732.8	7.41
102.3	397.8	6.61	742.4	762.5	7.26	247.6	752.5	7.44
90.8	409.3	6.62	782.0	802.1	7.23	208.0	792.1	7.44
79.2	420.9	6.61	801.8	821.9	7.20	188.2	811.9	7.42
67.7	432.4	6.64	841.4	861.5	7.19	148.6	851.5	7.45
56.2	443.9	6.67	861.2	881.3	7.15	128.8	871.3	7.43
44.6	455.5	6.66	900.8	920.9	7.19	89.2	910.9	7.41
33.1	467.0	6.69	920.6	940.7	7.17	69.4	930.7	7.45
21.5	478.6	6.72	960.2	980.3	7.23	29.8	970.3	7.51
10.0	490.1	6.87	980.0	1000.1	7.22	10.0	990.1	7.61

# Frequency Mixer

# JMS-2MH

## 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	70.19	69.25	68.86	65.20	63.98	62.01
50.1	57.05	56.74	56.43	53.20	51.33	50.23
90.1	52.46	52.38	52.26	48.37	46.77	45.75
130.1	49.88	50.24	50.33	45.63	43.97	42.90
170.1	48.70	49.23	48.87	43.64	42.07	41.06
210.1	48.08	48.17	47.54	42.22	40.70	39.78
250.1	47.98	47.71	46.75	41.19	39.66	38.71
290.1	47.63	46.92	45.67	40.32	38.87	37.76
330.1	47.35	46.03	44.79	39.33	37.72	36.76
370.1	46.73	45.54	44.21	38.31	36.85	35.90
410.1	45.97	44.50	43.26	37.42	35.99	35.10
450.1	45.01	44.02	42.70	36.35	35.25	34.34
490.1	43.91	43.03	42.12	35.69	34.60	33.82
530.1	42.86	41.98	41.08	34.59	33.57	32.87
570.1	41.87	41.41	40.43	33.71	32.90	32.10
610.1	40.71	40.64	39.99	32.71	32.05	31.38
650.1	39.80	39.79	39.60	31.88	31.20	30.73
690.1	38.85	38.91	38.82	31.09	30.47	30.07
730.1	37.94	38.34	38.33	30.04	29.64	29.32
750.1	37.52	37.90	37.88	29.81	29.36	29.01
790.1	36.79	37.56	37.67	29.05	28.87	28.58
810.1	36.36	37.29	37.43	28.68	28.64	28.33
850.1	35.65	36.88	37.38	28.01	28.14	27.99
870.1	35.20	36.51	37.23	27.90	28.07	27.94
910.1	34.43	35.76	36.74	27.13	27.32	27.26
930.1	34.14	35.43	36.62	27.02	27.21	27.39
970.1	33.59	34.91	36.05	26.54	26.76	26.89
990.1	33.39	34.75	35.89	26.46	26.65	26.79
1030.1	32.79	34.25	35.48	25.97	26.22	26.44
1050.1	32.64	34.17	35.42	25.95	26.30	26.53
1090.1	32.13	33.67	34.92	25.69	25.93	26.17
1110.1	31.99	33.56	34.82	25.56	25.87	26.13
1150.1	31.62	33.26	34.54	25.46	25.78	26.01
1170.1	31.48	33.13	34.47	25.41	25.76	26.04
1210.1	31.18	32.91	34.29	25.14	25.65	25.90
1230.1	31.03	32.79	34.13	25.16	25.79	25.97
1270.1	30.97	32.76	34.10	25.07	25.81	26.03
1290.1	30.85	32.63	34.00	25.10	25.91	26.24
1330.1	30.73	32.55	33.92	24.95	25.88	26.25
1350.1	30.69	32.49	33.83	25.09	26.11	26.51

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	48.78	47.32	49.51
50.1	80.1	37.52	37.72	36.95
90.1	120.1	32.91	32.77	32.57
130.1	160.1	30.18	30.00	29.94
170.1	200.1	28.34	28.21	28.16
210.1	240.1	27.03	26.92	26.92
250.1	280.1	26.03	26.00	26.00
290.1	320.1	25.42	25.37	25.36
330.1	360.1	24.93	24.97	24.91
370.1	400.1	24.57	24.65	24.69
410.1	440.1	24.30	24.39	24.44
450.1	480.1	24.02	24.13	24.20
490.1	520.1	23.82	23.92	23.98
530.1	560.1	23.43	23.62	23.68
570.1	600.1	22.84	22.99	23.12
610.1	640.1	22.02	22.15	22.28
650.1	680.1	20.96	21.08	21.22
690.1	720.1	20.07	20.21	20.31
730.1	760.1	19.25	19.34	19.43
750.1	780.1	18.80	18.86	18.99
790.1	820.1	18.15	18.17	18.28
810.1	840.1	17.83	17.88	17.96
850.1	880.1	17.30	17.28	17.36
870.1	900.1	17.08	17.12	17.23
910.1	940.1	16.64	16.72	16.84
930.1	960.1	16.47	16.58	16.63
970.1	1000.1	16.11	16.27	16.40
990.1	1020.1	15.92	16.10	16.26
1030.1	1060.1	15.75	15.92	16.13
1050.1	1080.1	15.63	15.84	16.05
1090.1	1120.1	15.46	15.67	15.85
1110.1	1140.1	15.42	15.63	15.82
1150.1	1180.1	15.35	15.62	15.83
1170.1	1200.1	15.33	15.65	15.86
1210.1	1240.1	15.32	15.67	15.96
1230.1	1260.1	15.32	15.64	15.96
1270.1	1300.1	15.31	15.66	16.00
1290.1	1320.1	15.28	15.65	15.98
1330.1	1360.1	15.34	15.73	15.99
1350.1	1380.1	15.39	15.75	15.99



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## Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	1.25	1.33	1.39
50.1	80.1	1.16	1.25	1.32
90.1	120.1	1.16	1.26	1.33
130.1	160.1	1.17	1.27	1.34
170.1	200.1	1.18	1.29	1.36
210.1	240.1	1.20	1.30	1.37
250.1	280.1	1.21	1.31	1.37
290.1	320.1	1.23	1.33	1.39
330.1	360.1	1.25	1.34	1.40
370.1	400.1	1.28	1.36	1.43
410.1	440.1	1.31	1.40	1.46
450.1	480.1	1.35	1.42	1.49
490.1	520.1	1.39	1.47	1.53
530.1	560.1	1.44	1.52	1.58
570.1	600.1	1.48	1.56	1.64
610.1	640.1	1.53	1.61	1.68
650.1	680.1	1.59	1.66	1.73
690.1	720.1	1.64	1.70	1.77
730.1	760.1	1.70	1.77	1.83
750.1	780.1	1.72	1.79	1.85
790.1	820.1	1.80	1.87	1.94
810.1	840.1	1.83	1.91	1.97
850.1	880.1	1.92	2.00	2.07
870.1	900.1	1.97	2.05	2.12
910.1	940.1	2.09	2.15	2.22
930.1	960.1	2.16	2.21	2.27
970.1	1000.1	2.33	2.35	2.40
990.1	1020.1	2.41	2.42	2.46
1030.1	1060.1	2.61	2.60	2.62
1050.1	1080.1	2.68	2.66	2.69
1090.1	1120.1	2.90	2.88	2.88
1110.1	1140.1	3.01	2.98	2.97
1150.1	1180.1	3.24	3.21	3.19
1170.1	1200.1	3.36	3.34	3.31
1210.1	1240.1	3.62	3.58	3.56
1230.1	1260.1	3.73	3.70	3.67
1270.1	1300.1	3.98	3.95	3.91
1290.1	1320.1	4.08	4.04	4.01
1330.1	1360.1	4.32	4.29	4.25
1350.1	1380.1	4.41	4.39	4.35

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+10	+13	+16
10.1	1.64	2.42	3.50
50.1	1.71	2.58	3.79
90.1	1.65	2.45	3.52
130.1	1.67	2.51	3.63
170.1	1.65	2.46	3.54
210.1	1.65	2.47	3.54
250.1	1.67	2.50	3.58
290.1	1.66	2.46	3.51
330.1	1.70	2.53	3.60
370.1	1.71	2.51	3.54
410.1	1.73	2.54	3.58
450.1	1.78	2.58	3.60
490.1	1.79	2.58	3.58
530.1	1.84	2.63	3.63
570.1	1.87	2.64	3.62
610.1	1.92	2.69	3.66
650.1	1.96	2.72	3.67
690.1	2.00	2.75	3.69
730.1	2.05	2.79	3.71
750.1	2.06	2.79	3.70
790.1	2.11	2.81	3.70
810.1	2.14	2.84	3.72
850.1	2.19	2.86	3.70
870.1	2.22	2.87	3.70
910.1	2.30	2.95	3.76
930.1	2.34	2.98	3.79
970.1	2.39	3.03	3.81
990.1	2.42	3.06	3.85
1030.1	2.49	3.15	3.93
1050.1	2.52	3.17	3.95
1090.1	2.55	3.18	3.94
1110.1	2.57	3.19	3.95
1150.1	2.65	3.25	4.01
1170.1	2.67	3.26	4.01
1210.1	2.71	3.26	4.00
1230.1	2.75	3.30	4.03
1270.1	2.80	3.31	4.02
1290.1	2.81	3.29	3.99
1330.1	2.86	3.31	3.98
1350.1	2.89	3.33	4.00

IF (OUT) (MHz)	IF VSWR @LO=1000.1MHz (:1)		
	@LO (dBm)		
	+10	+13	+16
10.1	2.22	1.78	1.51
30.1	2.24	1.78	1.50
50.1	2.18	1.70	1.45
70.1	2.19	1.72	1.47
90.1	2.22	1.74	1.49
110.1	2.25	1.76	1.51
130.1	2.22	1.74	1.50
150.1	2.18	1.72	1.49
170.1	2.17	1.71	1.49
190.1	2.24	1.76	1.54
210.1	2.28	1.78	1.57
230.1	2.22	1.75	1.54
250.1	2.17	1.72	1.52
270.1	2.19	1.75	1.55
290.1	2.21	1.77	1.58
310.1	2.20	1.75	1.57
330.1	2.18	1.74	1.57
350.1	2.15	1.75	1.58
370.1	2.14	1.76	1.60
390.1	2.16	1.78	1.63
430.1	2.16	1.78	1.65
450.1	2.13	1.77	1.65
490.1	2.18	1.84	1.73
510.1	2.18	1.84	1.73
550.1	2.16	1.83	1.74
570.1	2.16	1.85	1.77
610.1	2.17	1.86	1.78
630.1	2.17	1.87	1.80
670.1	2.13	1.85	1.78
690.1	2.14	1.86	1.80
730.1	2.13	1.87	1.82
750.1	2.14	1.87	1.82
790.1	2.10	1.86	1.82
810.1	2.09	1.85	1.81
850.1	2.11	1.88	1.83
870.1	2.09	1.86	1.82
910.1	2.08	1.86	1.82
930.1	2.09	1.87	1.83
970.1	2.11	1.88	1.83
990.1	2.12	1.90	1.86

## Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	17	39	32	37	36	51	36	58	43	62
1	-	17	+0	31	12	40	22	44	40	45	71	46
2	85	47	41	55	41	51	43	62	49	63	47	58
3	>100	69	48	58	52	53	44	53	55	57	52	54
4	>100	70	72	72	64	73	68	74	58	69	65	70
5	>100	70	70	73	57	67	53	63	52	65	54	71
6	>100	96	82	93	76	83	70	76	66	75	67	78
7	>100	88	84	88	77	89	74	87	73	78	87	76
8	>100	94	94	>98	92	>98	92	>98	91	97	88	88
9	>100	94	96	>98	94	95	87	94	85	97	87	88
10	>100	>98	>98	>98	>98	>98	97	>98	93	>98	92	95
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; 4.00 dBm.  
 LO IN: 530.01 MHz; +13.00 dBm  
 IF OUT: 29.91 MHz; -2.46 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	7	29	18	26	23	36	21	40	29	49
1	-	17	+0	32	12	38	22	41	39	39	66	38
2	>100	57	50	76	51	62	50	72	59	67	55	58
3	>100	>88	71	79	64	74	60	78	63	>88	66	77
4	>100	>88	87	>88	85	>88	82	>88	85	>88	86	>88
5	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>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: 500.1 MHz; -6.00 dBm.  
 LO IN: 530.01 MHz; +13.00 dBm  
 IF OUT: 29.91 MHz; -12.43 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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