Frequency Mixer TUF-860HSM

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) @LO (dBm)		
		+14	+17	+20
100.1	130.1	16.73	11.35	10.26
140.6	170.6	11.06	8.80	8.19
181.1	211.1	8.27	7.29	6.97
221.6	251.6	7.31	6.50	6.25
262.1	292.1	6.49	5.96	5.79
302.6	332.6	6.00	5.62	5.46
343.1	373.1	5.83	5.47	5.33
383.6	413.6	5.61	5.34	5.19
424.2	454.2	5.44	5.22	5.10
464.7	494.7	5.37	5.13	5.02
505.2	535.2	5.38	5.10	4.97
545.7	575.7	5.51	5.24	4.98
586.2	616.2	5.50	5.31	5.13
626.7	656.7	5.47	5.30	5.17
667.2	697.2	5.44	5.25	5.13
707.7	737.7	5.37	5.17	5.03
748.2	778.2	5.33	5.09	4.90
788.7	818.7	5.40	5.06	4.95
829.2	859.2	5.67	5.19	5.07
869.7	899.7	5.90	5.54	5.24
910.2	940.2	6.04	5.81	5.49
950.7	980.7	6.36	6.12	5.69
991.2	1021.2	6.58	6.34	6.13
1031.7	1061.7	6.91	6.61	6.40
1072.3	1102.3	7.26	6.92	6.63
1112.8	1142.8	7.65	7.28	6.88
1153.3	1183.3	8.11	7.65	7.04
1193.8	1223.8	8.50	7.84	6.75
1234.3	1264.3	8.74	7.58	5.97
1274.8	1304.8	8.72	6.82	5.60
1315.3	1345.3	8.34	6.16	5.61
1355.8	1385.8	7.66	6.09	5.73
1396.3	1426.3	7.22	6.25	5.95
1436.8	1466.8	7.28	6.59	6.29
1477.3	1507.3	7.64	7.03	6.69
1517.8	1547.8	8.19	7.57	7.16
1558.3	1588.3	8.90	8.30	7.84
1598.8	1628.8	9.22	8.76	8.46
1639.3	1669.3	9.49	9.26	9.06
1700.1	1730.1	10.13	9.94	9.80

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm) @LO (dBm)		
		+14	+17	+20
100.1	130.1	16.06	26.04	29.77
140.6	170.6	20.49	27.07	22.62
181.1	211.1	24.82	21.79	21.45
221.6	251.6	22.64	20.37	22.42
262.1	292.1	20.75	20.28	23.30
302.6	332.6	19.76	21.21	24.82
343.1	373.1	19.58	22.13	26.42
383.6	413.6	19.69	22.51	24.22
424.2	454.2	21.36	27.34	35.76
464.7	494.7	22.84	28.33	37.02
505.2	535.2	23.84	34.73	26.30
545.7	575.7	26.16	24.13	28.06
586.2	616.2	29.68	23.17	21.42
626.7	656.7	28.19	28.63	26.65
667.2	697.2	26.48	27.37	25.86
707.7	737.7	22.63	24.34	25.74
748.2	778.2	21.08	29.15	23.01
788.7	818.7	21.03	24.79	26.22
829.2	859.2	21.86	24.96	31.14
869.7	899.7	14.95	19.80	28.55
910.2	940.2	14.19	14.03	18.35
950.7	980.7	13.21	12.87	16.19
991.2	1021.2	12.92	12.11	12.83
1031.7	1061.7	13.01	12.33	12.10
1072.3	1102.3	13.18	13.10	13.16
1112.8	1142.8	13.34	14.01	15.36
1153.3	1183.3	13.81	15.33	17.59
1193.8	1223.8	14.37	15.77	18.35
1234.3	1264.3	14.82	16.34	24.49
1274.8	1304.8	14.64	19.26	26.38
1315.3	1345.3	15.27	24.18	25.63
1355.8	1385.8	18.22	24.40	24.79
1396.3	1426.3	22.27	23.99	23.87
1436.8	1466.8	22.58	23.16	23.23
1477.3	1507.3	21.75	22.08	22.50
1517.8	1547.8	20.72	21.27	22.30
1558.3	1588.3	20.42	21.38	23.03
1598.8	1628.8	21.42	22.32	25.01
1639.3	1669.3	25.24	25.29	28.73
1700.1	1730.1	26.01	30.88	30.84

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+14dBm (dB) @LO (dBm)		
		+14	+17	+20
100.1	130.1	-2.36	-0.22	-0.10
140.6	170.6	-0.68	-0.11	-0.10
181.1	211.1	0.11	0.00	-0.06
221.6	251.6	0.15	0.05	-0.02
262.1	292.1	0.34	0.14	0.02
302.6	332.6	0.45	0.16	0.06
343.1	373.1	0.49	0.21	0.08
383.6	413.6	0.54	0.22	0.13
424.2	454.2	0.70	0.29	0.18
464.7	494.7	0.72	0.36	0.25
505.2	535.2	0.75	0.43	0.30
545.7	575.7	0.69	0.42	0.36
586.2	616.2	0.79	0.47	0.38
626.7	656.7	0.93	0.56	0.46
667.2	697.2	1.12	0.72	0.61
707.7	737.7	1.27	0.84	0.71
748.2	778.2	1.50	1.02	0.84
788.7	818.7	1.53	1.09	0.76
829.2	859.2	1.48	1.24	0.85
869.7	899.7	1.55	1.20	0.94
910.2	940.2	1.65	1.21	0.97
950.7	980.7	1.64	1.21	1.01
991.2	1021.2	1.67	1.26	0.90
1031.7	1061.7	1.60	1.27	0.95
1072.3	1102.3	1.52	1.23	0.98
1112.8	1142.8	1.38	1.04	0.81
1153.3	1183.3	0.97	0.66	0.55
1193.8	1223.8	0.61	0.41	0.66
1234.3	1264.3	0.35	0.54	1.14
1274.8	1304.8	0.33	1.07	1.28
1315.3	1345.3	0.79	1.61	1.40
1355.8	1385.8	1.32	1.57	1.32
1396.3	1426.3	1.95	1.70	1.49
1436.8	1466.8	1.90	1.56	1.42
1477.3	1507.3	1.48	1.27	1.22
1517.8	1547.8	1.02	0.96	1.00
1558.3	1588.3	0.43	0.44	0.57
1598.8	1628.8	0.31	0.27	0.33
1639.3	1669.3	0.32	0.19	0.24
1700.1	1730.1	0.25	0.16	0.20

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=925.1MHz (dB) @LO (dBm) +17
125.0	800.1	5.62
118.9	806.2	5.62
112.9	812.2	5.62
106.8	818.3	5.61
100.8	824.3	5.61
94.7	830.4	5.61
88.7	836.4	5.61
82.6	842.5	5.61
76.6	848.5	5.61
70.5	854.6	5.62
64.5	860.6	5.62
58.4	866.7	5.63
52.4	872.7	5.65
46.3	878.8	5.67
40.3	884.8	5.70
34.2	890.9	5.74
28.2	896.9	5.79
22.1	903.0	5.84
16.1	909.0	5.86
10.0	915.1	5.87
10.0	935.1	5.85
16.1	941.2	5.88
22.1	947.2	5.87
28.2	953.3	5.87
34.2	959.3	5.87
40.3	965.4	5.89
46.3	971.4	5.92
52.4	977.5	5.95
58.4	983.5	5.97
64.5	989.6	5.99
70.5	995.6	6.00
76.6	1001.7	6.00
82.6	1007.7	6.00
88.7	1013.8	5.98
94.7	1019.8	5.96
100.8	1025.9	5.95
106.8	1031.9	5.94
112.9	1038.0	5.96
118.9	1044.0	5.97
125.0	1050.1	6.00

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=800.1MHz (dB) @LO (dBm) +17
10.0	810.1	5.06
16.2	816.3	5.10
22.3	822.4	5.08
28.5	828.6	5.07
34.6	834.7	5.06
40.8	840.9	5.06
46.9	847.0	5.05
53.1	853.2	5.06
59.2	859.3	5.07
65.4	865.5	5.09
71.5	871.6	5.12
77.7	877.8	5.15
83.8	883.9	5.18
90.0	890.1	5.21
96.2	896.3	5.24
102.3	902.4	5.28
108.5	908.6	5.31
114.6	914.7	5.33
120.8	920.9	5.33
126.9	927.0	5.35
133.1	933.2	5.37
139.2	939.3	5.38
145.4	945.5	5.39
151.5	951.6	5.39
157.7	957.8	5.40
163.8	963.9	5.42
170.0	970.1	5.46
176.2	976.3	5.51
182.3	982.4	5.53
188.5	988.6	5.54
194.6	994.7	5.55
200.8	1000.9	5.56
206.9	1007.0	5.57
213.1	1013.2	5.55
219.2	1019.3	5.54
225.4	1025.5	5.53
231.5	1031.6	5.54
237.7	1037.8	5.58
243.8	1043.9	5.61
250.0	1050.1	5.64

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1050.1MHz (dB) @LO (dBm) +17
250.0	800.1	6.12
243.8	806.3	6.12
237.7	812.4	6.11
231.5	818.6	6.10
225.4	824.7	6.10
219.2	830.9	6.08
213.1	837.0	6.09
206.9	843.2	6.09
200.8	849.3	6.09
194.6	855.5	6.11
188.5	861.6	6.11
182.3	867.8	6.13
176.2	873.9	6.17
170.0	880.1	6.20
163.8	886.3	6.24
157.7	892.4	6.30
151.5	898.6	6.38
145.4	904.7	6.43
139.2	910.9	6.48
133.1	917.0	6.52
126.9	923.2	6.54
120.8	929.3	6.54
114.6	935.5	6.55
108.5	941.6	6.54
102.3	947.8	6.55
96.2	953.9	6.56
90.0	960.1	6.57
83.8	966.3	6.60
77.7	972.4	6.62
71.5	978.6	6.65
65.4	984.7	6.67
59.2	990.9	6.69
53.1	997.0	6.71
46.9	1003.2	6.71
40.8	1009.3	6.70
34.6	1015.5	6.70
28.5	1021.6	6.70
22.3	1027.8	6.71
16.2	1033.9	6.71
10.0	1040.1	6.67

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB) @LO (dBm)			LO-IF ISOLATION (dB) @LO (dBm)		
	+14	+17	+20	+14	+17	+20
100.1	54.82	54.90	55.63	55.65	55.19	58.44
140.6	55.79	55.50	54.86	50.10	53.14	59.93
181.1	55.50	53.44	52.86	47.00	51.44	55.84
221.6	50.81	50.62	50.84	45.79	49.54	53.21
262.1	47.52	48.19	48.92	43.90	46.65	50.19
302.6	45.04	46.73	48.15	41.97	44.37	48.82
343.1	43.56	44.96	45.74	40.50	43.26	46.86
383.6	42.57	44.38	45.27	38.50	41.01	44.54
424.2	41.59	44.59	46.62	37.42	40.73	44.30
464.7	40.37	42.85	44.55	36.05	39.50	43.01
505.2	39.13	41.38	43.15	35.09	37.91	40.92
545.7	37.99	39.10	40.59	34.68	36.34	38.83
586.2	37.93	38.69	39.28	34.42	36.79	37.99
626.7	37.89	39.32	40.36	33.69	36.92	39.53
667.2	38.09	39.64	40.73	32.81	36.12	39.39
707.7	38.87	39.59	39.99	31.88	34.92	37.88
748.2	41.16	40.66	40.15	31.27	33.65	36.27
788.7	45.13	43.67	42.05	30.79	32.43	35.34
829.2	42.97	42.60	40.12	30.15	31.49	33.79
869.7	36.42	39.57	38.09	29.96	30.89	32.77
910.2	34.17	35.54	35.11	30.72	29.97	32.01
950.7	33.69	34.00	33.19	30.59	30.28	31.31
991.2	32.90	32.95	32.18	31.87	31.88	30.88
1031.7	32.57	32.42	31.49	31.32	32.61	32.32
1072.3	32.45	32.48	31.59	30.86	33.06	33.76
1112.8	32.28	32.57	31.63	30.57	33.09	34.35
1153.3	32.28	32.79	31.75	29.97	32.35	34.03
1193.8	32.29	33.14	32.17	29.38	31.22	32.49
1234.3	31.89	32.96	33.34	29.00	30.22	29.81
1274.8	31.51	33.06	35.13	28.72	28.77	26.34
1315.3	31.12	33.37	33.96	28.26	26.17	24.84
1355.8	30.77	32.38	32.21	27.30	23.72	24.19
1396.3	30.49	31.56	31.68	25.51	23.25	24.02
1436.8	29.82	30.86	31.21	23.64	23.16	23.84
1477.3	29.39	30.36	30.16	23.36	23.31	23.44
1517.8	29.32	30.23	29.87	23.72	23.51	23.17
1558.3	29.40	30.14	29.27	24.76	24.06	23.11
1598.8	29.53	30.31	30.22	25.02	23.58	22.68
1639.3	29.25	29.52	29.21	23.59	22.16	21.40
1700.1	29.80	29.69	29.36	23.47	22.31	21.24

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB) @LO (dBm)		
		+14	+17	+20
100.1	130.1	32.94	32.85	32.44
140.6	170.6	27.85	28.00	28.01
181.1	211.1	24.69	24.93	24.93
221.6	251.6	22.47	22.68	22.67
262.1	292.1	20.96	21.38	21.50
302.6	332.6	20.00	20.10	20.36
343.1	373.1	19.57	19.66	19.60
383.6	413.6	19.19	19.65	19.70
424.2	454.2	18.83	19.53	20.04
464.7	494.7	18.45	19.36	20.09
505.2	535.2	18.68	19.34	19.88
545.7	575.7	19.18	19.34	19.30
586.2	616.2	20.09	19.87	19.59
626.7	656.7	21.50	21.13	20.79
667.2	697.2	23.68	23.51	23.38
707.7	737.7	25.46	26.86	28.77
748.2	778.2	23.12	24.49	25.33
788.7	818.7	19.84	19.55	19.45
829.2	859.2	17.91	16.91	16.60
869.7	899.7	16.53	15.61	15.01
910.2	940.2	15.39	14.61	13.74
950.7	980.7	14.90	14.01	12.93
991.2	1021.2	14.26	13.69	12.41
1031.7	1061.7	13.59	13.18	12.29
1072.3	1102.3	13.09	12.72	12.13
1112.8	1142.8	12.67	12.29	11.87
1153.3	1183.3	12.33	11.95	11.50
1193.8	1223.8	12.15	11.64	10.85
1234.3	1264.3	12.03	11.49	11.08
1274.8	1304.8	11.70	11.43	11.44
1315.3	1345.3	11.40	11.57	11.65
1355.8	1385.8	11.13	11.64	11.73
1396.3	1426.3	10.94	11.50	11.60
1436.8	1466.8	10.95	11.36	11.42
1477.3	1507.3	10.81	11.11	11.08
1517.8	1547.8	10.46	10.62	10.55
1558.3	1588.3	10.03	10.15	10.00
1598.8	1628.8	9.48	9.46	9.24
1639.3	1669.3	8.86	8.65	8.36
1700.1	1730.1	8.08	7.67	7.33

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1) @LO (dBm)		
		+14	+17	+20
100.1	130.1	22.87	14.03	11.93
140.6	170.6	10.75	7.83	7.00
181.1	211.1	6.19	5.22	4.79
221.6	251.6	4.66	3.98	3.67
262.1	292.1	3.62	3.16	2.96
302.6	332.6	2.96	2.67	2.51
343.1	373.1	2.61	2.34	2.24
383.6	413.6	2.28	2.07	1.98
424.2	454.2	2.05	1.88	1.82
464.7	494.7	1.89	1.76	1.72
505.2	535.2	1.76	1.68	1.66
545.7	575.7	1.66	1.59	1.58
586.2	616.2	1.55	1.50	1.49
626.7	656.7	1.46	1.42	1.42
667.2	697.2	1.39	1.36	1.36
707.7	737.7	1.31	1.30	1.33
748.2	778.2	1.27	1.34	1.46
788.7	818.7	1.28	1.41	1.49
829.2	859.2	1.27	1.41	1.49
869.7	899.7	1.31	1.38	1.47
910.2	940.2	1.38	1.40	1.43
950.7	980.7	1.43	1.42	1.40
991.2	1021.2	1.49	1.47	1.41
1031.7	1061.7	1.54	1.51	1.46
1072.3	1102.3	1.59	1.54	1.48
1112.8	1142.8	1.66	1.58	1.50
1153.3	1183.3	1.77	1.66	1.53
1193.8	1223.8	1.87	1.71	1.49
1234.3	1264.3	1.94	1.70	1.44
1274.8	1304.8	1.97	1.65	1.49
1315.3	1345.3	1.95	1.64	1.58
1355.8	1385.8	1.91	1.74	1.70
1396.3	1426.3	1.95	1.87	1.83
1436.8	1466.8	2.11	2.05	2.01
1477.3	1507.3	2.30	2.24	2.18
1517.8	1547.8	2.47	2.41	2.33
1558.3	1588.3	2.59	2.55	2.47
1598.8	1628.8	2.66	2.65	2.61
1639.3	1669.3	2.75	2.73	2.71
1700.1	1730.1	2.88	2.83	2.80

LO (MHz)	LO VSWR (:1) @LO (dBm)		
	+14	+17	+20
100.1	57.91	28.03	9.79
140.6	19.98	6.61	4.52
181.1	7.94	3.80	3.40
221.6	4.01	2.80	3.03
262.1	2.85	2.30	2.75
302.6	2.18	2.02	2.61
343.1	1.88	1.90	2.58
383.6	1.57	1.74	2.47
424.2	1.43	1.71	2.48
464.7	1.28	1.66	2.44
505.2	1.14	1.61	2.41
545.7	1.07	1.60	2.39
586.2	1.02	1.60	2.37
626.7	1.05	1.62	2.40
667.2	1.13	1.61	2.37
707.7	1.20	1.60	2.35
748.2	1.29	1.59	2.30
788.7	1.39	1.57	2.26
829.2	1.52	1.66	2.31
869.7	1.56	1.79	2.37
910.2	1.53	1.86	2.45
950.7	1.56	1.86	2.49
991.2	1.52	1.84	2.49
1031.7	1.53	1.82	2.49
1072.3	1.55	1.80	2.44
1112.8	1.55	1.76	2.39
1153.3	1.54	1.72	2.34
1193.8	1.52	1.65	2.25
1234.3	1.50	1.58	2.17
1274.8	1.47	1.50	2.08
1315.3	1.44	1.42	2.01
1355.8	1.42	1.38	2.00
1396.3	1.43	1.39	1.99
1436.8	1.52	1.45	2.02
1477.3	1.65	1.52	2.04
1517.8	1.79	1.60	2.07
1558.3	1.94	1.72	2.16
1598.8	1.90	1.71	2.15
1639.3	1.78	1.64	2.14
1700.1	1.97	1.79	2.23

IF (OUT) (MHz)	IF VSWR @LO=1050.1MHz (:1) @LO (dBm)		
	+14	+17	+20
10.0	3.70	3.33	2.78
16.2	3.82	3.34	2.88
22.3	3.74	3.34	2.86
28.5	3.58	3.18	2.73
34.6	3.51	3.15	2.71
40.8	3.43	3.09	2.69
46.9	3.39	3.05	2.66
53.1	3.34	3.00	2.63
59.2	3.34	2.98	2.63
65.4	3.33	2.99	2.62
71.5	3.34	2.99	2.63
77.7	3.35	3.01	2.64
83.8	3.39	3.05	2.67
90.0	3.42	3.08	2.69
96.2	3.47	3.11	2.72
102.3	3.52	3.16	2.76
108.5	3.54	3.18	2.77
114.6	3.56	3.20	2.78
120.8	3.56	3.20	2.78
126.9	3.54	3.19	2.78
133.1	3.52	3.16	2.76
139.2	3.51	3.16	2.77
145.4	3.48	3.14	2.75
151.5	3.48	3.14	2.76
157.7	3.48	3.14	2.76
163.8	3.49	3.15	2.77
170.0	3.50	3.16	2.78
176.2	3.50	3.17	2.80
182.3	3.54	3.19	2.81
188.5	3.54	3.19	2.82
194.6	3.55	3.20	2.82
200.8	3.55	3.20	2.82
206.9	3.58	3.22	2.84
213.1	3.57	3.22	2.84
219.2	3.58	3.24	2.85
225.4	3.58	3.24	2.86
231.5	3.60	3.25	2.88
237.7	3.61	3.27	2.89
243.8	3.60	3.26	2.89
250.0	3.60	3.26	2.90

Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	8	24	9	19	22	44	36	65	35	43
1	-	9	+0	16	15	26	31	26	48	44	49	42
2	93	37	35	38	35	43	40	43	59	50	58	55
3	>100	73	35	37	36	35	42	48	45	46	57	72
4	>100	64	62	51	64	51	59	55	58	59	63	65
5	>100	73	72	69	57	52	60	49	66	69	62	68
6	>100	77	68	77	75	61	72	61	66	66	73	70
7	>100	>93	82	77	82	78	69	66	73	62	69	86
8	>100	>93	>93	86	84	>93	85	71	73	73	71	78
9	>100	>93	>93	>93	91	85	>93	87	76	80	77	78
10	>100	>93	>93	>93	>93	92	>93	>93	90	83	82	84
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: **RF IN: 920.1 MHz; -1.00 dBm.**
LO IN: 950.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; -7.02 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	17	41	21	30	32	48	45	53	49	62
1	-	9	+0	20	16	37	45	32	43	48	51	45
2	77	42	34	52	35	41	43	55	41	59	62	76
3	>100	47	28	31	30	31	41	46	56	42	55	57
4	>100	54	53	49	47	51	44	47	58	58	51	67
5	>100	64	50	52	41	39	43	39	55	59	56	52
6	>100	62	57	67	63	55	59	54	52	51	64	71
7	>100	67	63	73	60	55	54	45	61	46	63	68
8	>100	82	83	71	62	71	73	58	65	57	60	57
9	>100	73	73	73	66	65	67	60	58	53	65	55
10	>100	78	83	83	84	87	66	73	82	62	65	61
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: **RF IN: 920.1 MHz; 9.00 dBm.**
LO IN: 950.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; 2.81 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.