Frequency Mixer TUF-5LHSM+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) @LO (dBm)		
		+7	+10	+13
10.1	40.1	6.53	6.09	5.88
90.9	120.9	5.97	5.61	5.44
171.8	201.8	5.98	5.61	5.45
252.6	282.6	5.98	5.65	5.49
333.5	363.5	6.06	5.75	5.55
414.3	444.3	6.14	5.82	5.62
495.1	525.1	6.29	5.90	5.63
576.0	606.0	6.43	6.04	5.81
656.8	686.8	6.72	6.13	5.74
737.7	767.7	7.22	6.61	6.16
818.5	848.5	7.69	7.04	6.59
899.3	929.3	7.84	6.95	6.40
980.2	1010.2	7.82	6.78	6.32
1061.0	1091.0	7.94	6.99	6.43
1141.8	1171.8	7.72	7.12	6.56
1202.5	1232.5	7.54	6.99	6.57
1283.3	1313.3	7.34	6.91	6.51
1343.9	1373.9	7.24	6.80	6.49
1424.8	1454.8	7.22	6.80	6.53
1485.4	1515.4	7.20	6.77	6.42
1566.3	1596.3	7.18	6.50	6.08
1626.9	1656.9	6.93	6.24	5.96
1707.7	1737.7	6.71	6.14	5.97
1768.4	1798.4	6.70	6.21	6.02
1849.2	1879.2	6.80	6.33	6.11
1909.8	1939.8	7.04	6.46	6.24
1990.7	2020.7	7.47	6.63	6.30
2051.3	2081.3	7.75	6.75	6.38
2132.1	2162.1	8.17	6.76	6.34
2192.8	2222.8	9.09	7.09	6.37
2273.6	2303.6	9.84	7.53	6.52
2334.2	2364.2	9.77	7.63	6.56
2415.1	2445.1	10.13	7.85	6.74
2475.7	2505.7	10.81	8.26	7.09
2556.5	2586.5	11.28	8.44	7.21
2617.2	2647.2	11.36	8.53	7.36
2698.0	2728.0	12.34	9.24	7.63
2758.6	2788.6	12.84	9.75	7.92
2839.5	2869.5	13.08	10.01	8.20
2900.1	2930.1	14.48	10.69	8.45

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm) @LO (dBm)		
		+7	+10	+13
10.1	40.1	16.87	18.73	21.05
90.9	120.9	18.15	21.01	17.27
171.8	201.8	16.22	14.62	15.91
252.6	282.6	12.46	14.25	17.11
333.5	363.5	12.51	14.39	16.56
414.3	444.3	12.47	14.12	16.58
495.1	525.1	11.73	15.25	21.60
576.0	606.0	12.16	13.94	15.52
656.8	686.8	11.54	17.55	25.27
737.7	767.7	10.11	12.18	16.23
818.5	848.5	11.08	13.29	15.17
899.3	929.3	10.88	13.00	16.22
980.2	1010.2	11.45	13.78	15.43
1061.0	1091.0	10.52	11.85	13.32
1141.8	1171.8	10.74	10.47	11.14
1202.5	1232.5	11.08	10.91	10.54
1283.3	1313.3	11.59	10.56	10.15
1343.9	1373.9	11.45	10.05	9.27
1424.8	1454.8	10.79	9.70	9.29
1485.4	1515.4	10.34	10.89	14.16
1566.3	1596.3	11.30	15.47	15.69
1626.9	1656.9	13.83	14.04	15.41
1707.7	1737.7	11.74	15.56	18.85
1768.4	1798.4	12.81	17.65	19.34
1849.2	1879.2	14.66	19.11	20.78
1909.8	1939.8	14.71	20.60	22.18
1990.7	2020.7	13.19	18.70	24.39
2051.3	2081.3	12.97	16.85	19.92
2132.1	2162.1	13.73	14.36	17.75
2192.8	2222.8	11.44	11.99	16.53
2273.6	2303.6	9.75	12.45	13.89
2334.2	2364.2	10.86	15.12	14.18
2415.1	2445.1	10.44	14.45	15.97
2475.7	2505.7	9.03	13.19	14.39
2556.5	2586.5	8.96	12.18	13.95
2617.2	2647.2	10.21	11.56	13.06
2698.0	2728.0	7.67	12.39	13.25
2758.6	2788.6	5.44	11.05	13.85
2839.5	2869.5	3.41	8.66	12.86
2900.1	2930.1	1.92	6.77	12.16

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+5dBm (dB) @LO (dBm)		
		+7	+10	+13
10.1	40.1	0.92	0.71	0.55
90.9	120.9	1.28	1.06	0.79
171.8	201.8	1.35	1.04	0.78
252.6	282.6	1.38	0.98	0.74
333.5	363.5	1.35	0.99	0.78
414.3	444.3	1.33	1.04	0.81
495.1	525.1	1.41	1.14	0.93
576.0	606.0	1.71	1.32	1.09
656.8	686.8	1.78	1.59	1.36
737.7	767.7	1.59	1.39	1.32
818.5	848.5	1.35	1.23	1.15
899.3	929.3	1.31	1.34	1.30
980.2	1010.2	1.45	1.55	1.37
1061.0	1091.0	1.16	1.32	1.26
1141.8	1171.8	1.13	1.13	1.12
1202.5	1232.5	1.23	1.13	1.06
1283.3	1313.3	1.23	1.09	1.02
1343.9	1373.9	1.24	1.05	0.98
1424.8	1454.8	1.23	0.99	0.90
1485.4	1515.4	1.31	1.04	0.91
1566.3	1596.3	1.33	1.13	0.86
1626.9	1656.9	1.54	1.15	0.74
1707.7	1737.7	1.70	0.95	0.61
1768.4	1798.4	1.75	0.90	0.61
1849.2	1879.2	1.71	0.90	0.62
1909.8	1939.8	1.80	1.00	0.70
1990.7	2020.7	1.91	1.18	0.85
2051.3	2081.3	1.92	1.30	0.95
2132.1	2162.1	1.68	1.46	1.07
2192.8	2222.8	1.37	1.52	1.21
2273.6	2303.6	1.13	1.45	1.32
2334.2	2364.2	1.20	1.33	1.28
2415.1	2445.1	1.33	1.31	1.23
2475.7	2505.7	1.33	1.47	1.20
2556.5	2586.5	1.20	1.57	1.24
2617.2	2647.2	1.27	1.56	1.24
2698.0	2728.0	1.13	1.60	1.39
2758.6	2788.6	0.77	1.45	1.46
2839.5	2869.5	0.38	1.25	1.54
2900.1	2930.1	-0.43	0.88	1.52

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=750.1MHz (dB) @LO (dBm) +10
710.0	40.1	6.11
692.1	58.0	6.13
674.1	76.0	6.20
656.2	93.9	6.19
638.2	111.9	6.21
620.3	129.8	6.20
602.3	147.8	6.26
584.4	165.7	6.26
566.4	183.7	6.35
548.5	201.6	6.36
530.5	219.6	6.37
512.6	237.5	6.32
494.6	255.5	6.39
476.7	273.4	6.37
458.7	291.4	6.43
440.8	309.3	6.46
422.8	327.3	6.39
404.9	345.2	6.36
386.9	363.2	6.34
369.0	381.1	6.31
351.0	399.1	6.41
333.1	417.0	6.42
315.1	435.0	6.43
297.2	452.9	6.41
279.2	470.9	6.41
261.3	488.8	6.45
243.3	506.8	6.40
225.4	524.7	6.46
207.4	542.7	6.47
189.5	560.6	6.49
171.5	578.6	6.48
153.6	596.5	6.52
135.6	614.5	6.45
117.7	632.4	6.46
99.7	650.4	6.38
81.8	668.3	6.41
63.8	686.3	6.37
45.9	704.2	6.46
27.9	722.2	6.49
10.0	740.1	6.59

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=20.1MHz (dB) @LO (dBm) +10
10.0	30.1	6.00
30.2	50.3	5.99
50.4	70.5	6.05
70.6	90.7	6.11
90.8	110.9	6.04
111.0	131.1	6.01
131.2	151.3	6.04
151.4	171.5	6.08
171.6	191.7	6.04
191.8	211.9	6.00
212.0	232.1	6.00
232.2	252.3	5.99
252.4	272.5	6.03
272.7	292.8	6.02
292.9	313.0	6.01
313.1	333.2	6.00
333.3	353.4	6.00
353.5	373.6	6.05
373.7	393.8	6.02
393.9	414.0	6.03
434.3	454.4	6.04
454.5	474.6	6.07
494.9	515.0	6.06
515.1	535.2	6.01
555.5	575.6	6.11
575.7	595.8	6.07
616.1	636.2	6.08
636.3	656.4	6.14
676.7	696.8	6.17
696.9	717.0	6.21
737.3	757.4	6.40
757.6	777.7	6.35
798.0	818.1	6.46
818.2	838.3	6.46
858.6	878.7	6.54
878.8	898.9	6.59
919.2	939.3	6.58
939.4	959.5	6.65
979.8	999.9	6.77
1000.0	1020.1	6.82

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1500.1MHz (dB) @LO (dBm) +10
1000.0	500.1	7.76
979.8	520.3	7.76
959.6	540.5	7.68
939.4	560.7	7.75
919.2	580.9	7.65
899.0	601.1	7.64
878.8	621.3	7.61
858.6	641.5	7.58
838.4	661.7	7.56
818.2	681.9	7.44
798.0	702.1	7.52
777.8	722.3	7.51
757.6	742.5	7.58
737.3	762.8	7.39
717.1	783.0	7.47
696.9	803.2	7.47
676.7	823.4	7.38
656.5	843.6	7.39
636.3	863.8	7.34
616.1	884.0	7.28
575.7	924.4	7.08
555.5	944.6	7.03
515.1	985.0	6.79
494.9	1005.2	6.72
454.5	1045.6	6.66
434.3	1065.8	6.57
393.9	1106.2	6.54
373.7	1126.4	6.56
333.3	1166.8	6.54
313.1	1187.0	6.62
272.7	1227.4	6.72
252.4	1247.7	6.74
212.0	1288.1	6.81
191.8	1308.3	6.81
151.4	1348.7	6.80
131.2	1368.9	6.79
90.8	1409.3	6.80
70.6	1429.5	6.85
30.2	1469.9	6.82
10.0	1490.1	7.03

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB) @LO (dBm)			LO-IF ISOLATION (dB) @LO (dBm)		
	+7	+10	+13	+7	+10	+13
10.1	66.48	65.32	64.64	56.15	59.28	58.27
90.9	56.08	56.42	56.76	40.10	41.45	42.69
171.8	50.94	51.49	52.07	35.33	37.07	38.39
252.6	47.83	48.74	49.41	33.24	34.73	35.68
333.5	45.81	46.85	47.61	31.37	32.66	33.61
414.3	44.19	45.17	45.87	29.89	31.18	32.21
495.1	43.25	44.32	45.13	28.42	29.91	31.16
576.0	42.54	44.01	45.28	26.90	28.54	30.11
656.8	41.08	42.44	43.59	25.84	27.67	29.24
737.7	40.18	41.81	43.12	24.58	26.39	28.28
818.5	39.52	41.38	42.96	23.95	25.51	27.05
899.3	39.34	41.44	43.30	23.46	24.79	25.99
980.2	38.45	40.29	41.77	22.58	23.50	24.11
1061.0	37.40	38.59	39.65	21.66	22.30	22.59
1141.8	36.81	37.71	38.25	20.70	20.97	20.91
1202.5	36.41	37.09	37.62	20.10	20.21	19.98
1283.3	35.83	36.50	36.82	19.31	19.22	18.81
1343.9	35.44	36.06	36.38	18.80	18.54	17.99
1424.8	34.91	35.40	35.84	18.11	17.84	17.28
1485.4	34.45	34.79	35.03	17.47	17.02	16.33
1566.3	33.64	33.88	34.20	16.14	15.43	14.50
1626.9	33.01	33.47	34.09	15.15	14.33	13.75
1707.7	32.71	33.60	34.34	14.04	13.45	12.85
1768.4	32.88	33.33	34.03	13.38	12.78	12.41
1849.2	32.85	33.29	33.71	12.51	12.23	11.93
1909.8	32.98	33.23	33.55	12.02	11.78	11.55
1990.7	32.89	33.09	33.37	11.44	11.26	11.09
2051.3	32.65	33.01	33.29	10.94	11.02	10.85
2132.1	32.52	32.71	32.98	10.60	10.63	10.73
2192.8	32.51	33.64	34.10	10.31	10.48	10.60
2273.6	32.81	34.60	35.68	10.08	10.20	10.40
2334.2	32.54	34.36	36.32	9.89	10.14	10.41
2415.1	32.75	34.23	36.25	9.75	10.00	10.28
2475.7	33.24	35.17	37.06	9.62	10.02	10.34
2556.5	33.66	36.27	38.69	9.63	10.09	10.51
2617.2	33.73	36.72	40.38	9.53	9.97	10.58
2698.0	34.50	38.17	42.69	9.52	10.05	10.72
2758.6	35.24	39.75	46.59	9.72	10.24	10.86
2839.5	35.79	40.53	49.40	9.83	10.43	11.13
2900.1	36.70	41.00	47.61	9.87	10.50	11.22

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB) @LO (dBm)		
		+7	+10	+13
10.1	40.1	51.97	57.02	46.63
90.9	120.9	48.39	45.32	44.97
171.8	201.8	42.30	41.64	40.83
252.6	282.6	39.43	38.42	38.15
333.5	363.5	37.19	36.26	35.55
414.3	444.3	34.78	34.16	33.79
495.1	525.1	32.51	31.91	31.80
576.0	606.0	30.99	30.54	30.20
656.8	686.8	29.93	29.25	28.78
737.7	767.7	28.17	27.77	27.26
818.5	848.5	27.19	26.94	26.68
899.3	929.3	27.29	26.88	26.45
980.2	1010.2	28.81	28.23	28.04
1061.0	1091.0	30.47	30.30	30.01
1141.8	1171.8	30.41	30.70	30.78
1202.5	1232.5	29.21	29.57	29.90
1283.3	1313.3	27.18	27.38	27.80
1343.9	1373.9	26.17	26.39	26.67
1424.8	1454.8	24.43	24.90	25.16
1485.4	1515.4	23.63	24.03	24.33
1566.3	1596.3	22.93	23.34	23.49
1626.9	1656.9	22.67	22.97	23.11
1707.7	1737.7	22.30	22.80	23.05
1768.4	1798.4	22.02	22.46	22.83
1849.2	1879.2	21.42	21.87	22.23
1909.8	1939.8	20.86	21.35	21.71
1990.7	2020.7	20.15	20.67	21.06
2051.3	2081.3	19.80	20.42	20.83
2132.1	2162.1	19.45	20.24	20.68
2192.8	2222.8	19.06	20.06	20.64
2273.6	2303.6	19.05	20.07	20.93
2334.2	2364.2	19.39	20.29	21.13
2415.1	2445.1	19.79	20.79	21.52
2475.7	2505.7	19.98	21.20	22.00
2556.5	2586.5	20.69	22.09	23.03
2617.2	2647.2	21.27	22.84	23.82
2698.0	2728.0	21.79	23.37	24.85
2758.6	2788.6	22.41	23.74	25.30
2839.5	2869.5	23.61	24.69	26.11
2900.1	2930.1	24.86	25.72	26.54

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1) @LO (dBm)		
		+7	+10	+13
10.1	40.1	1.89	1.85	1.83
90.9	120.9	1.17	1.07	1.05
171.8	201.8	1.19	1.09	1.07
252.6	282.6	1.26	1.19	1.16
333.5	363.5	1.34	1.28	1.25
414.3	444.3	1.42	1.36	1.32
495.1	525.1	1.54	1.46	1.41
576.0	606.0	1.72	1.64	1.59
656.8	686.8	2.01	1.87	1.77
737.7	767.7	2.41	2.27	2.14
818.5	848.5	2.81	2.65	2.52
899.3	929.3	3.16	2.91	2.73
980.2	1010.2	3.47	3.15	2.98
1061.0	1091.0	3.67	3.37	3.15
1141.8	1171.8	3.53	3.31	3.10
1202.5	1232.5	3.36	3.18	3.00
1283.3	1313.3	3.22	3.06	2.88
1343.9	1373.9	3.18	2.99	2.81
1424.8	1454.8	3.08	2.85	2.61
1485.4	1515.4	2.94	2.66	2.41
1566.3	1596.3	2.65	2.30	2.09
1626.9	1656.9	2.38	2.07	1.93
1707.7	1737.7	2.20	1.96	1.84
1768.4	1798.4	2.17	1.95	1.83
1849.2	1879.2	2.14	1.93	1.81
1909.8	1939.8	2.15	1.94	1.80
1990.7	2020.7	2.21	1.97	1.84
2051.3	2081.3	2.29	2.02	1.88
2132.1	2162.1	2.40	2.06	1.89
2192.8	2222.8	2.51	2.06	1.85
2273.6	2303.6	2.45	2.00	1.74
2334.2	2364.2	2.26	1.90	1.66
2415.1	2445.1	2.20	1.86	1.66
2475.7	2505.7	2.28	1.91	1.71
2556.5	2586.5	2.26	1.85	1.67
2617.2	2647.2	2.12	1.74	1.58
2698.0	2728.0	2.03	1.66	1.49
2758.6	2788.6	2.02	1.67	1.50
2839.5	2869.5	2.09	1.74	1.56
2900.1	2930.1	2.30	1.88	1.60

LO (MHz)	LO VSWR (:1) @LO (dBm)		
	+7	+10	+13
10.1	1.65	2.34	3.19
90.9	1.68	2.42	3.35
171.8	1.68	2.39	3.29
252.6	1.70	2.43	3.34
333.5	1.72	2.44	3.32
414.3	1.73	2.42	3.25
495.1	1.75	2.40	3.17
576.0	1.79	2.41	3.15
656.8	1.88	2.47	3.14
737.7	1.93	2.51	3.18
818.5	1.96	2.50	3.14
899.3	1.98	2.45	3.02
980.2	2.06	2.48	3.01
1061.0	2.16	2.59	3.09
1141.8	2.20	2.64	3.11
1202.5	2.21	2.63	3.10
1283.3	2.25	2.65	3.10
1343.9	2.28	2.66	3.08
1424.8	2.27	2.60	3.00
1485.4	2.28	2.58	2.95
1566.3	2.25	2.50	2.87
1626.9	2.22	2.47	2.85
1707.7	2.30	2.55	2.91
1768.4	2.48	2.69	3.02
1849.2	2.75	2.87	3.16
1909.8	2.94	2.97	3.20
1990.7	3.24	3.15	3.29
2051.3	3.47	3.31	3.46
2132.1	3.76	3.50	3.51
2192.8	4.07	3.68	3.62
2273.6	4.35	3.99	3.86
2334.2	4.60	4.23	4.10
2415.1	4.88	4.45	4.35
2475.7	5.16	4.72	4.55
2556.5	5.46	5.00	4.80
2617.2	5.75	5.36	5.04
2698.0	6.11	5.72	5.39
2758.6	6.39	6.03	5.68
2839.5	6.73	6.32	6.03
2900.1	6.94	6.56	6.24

IF (OUT) (MHz)	IF VSWR @LO=1500.1MHz (:1) @LO (dBm)		
	+7	+10	+13
10.0	1.55	1.33	1.17
30.2	1.45	1.22	1.04
50.4	1.40	1.20	1.08
70.6	1.41	1.21	1.00
90.8	1.43	1.22	1.04
111.0	1.47	1.25	1.04
131.2	1.52	1.30	1.09
151.4	1.47	1.26	1.05
171.6	1.42	1.22	1.03
191.8	1.49	1.27	1.07
212.0	1.53	1.31	1.09
232.2	1.48	1.27	1.07
252.4	1.48	1.27	1.10
272.7	1.51	1.30	1.10
292.9	1.50	1.28	1.07
313.1	1.50	1.29	1.10
333.3	1.55	1.33	1.14
353.5	1.54	1.32	1.12
373.7	1.51	1.29	1.11
393.9	1.55	1.33	1.16
434.3	1.57	1.34	1.15
454.5	1.57	1.35	1.18
494.9	1.64	1.40	1.20
515.1	1.62	1.39	1.20
555.5	1.69	1.45	1.24
575.7	1.68	1.44	1.23
616.1	1.75	1.50	1.29
636.3	1.72	1.47	1.25
676.7	1.81	1.55	1.32
696.9	1.82	1.56	1.33
737.3	1.79	1.54	1.33
757.6	1.84	1.58	1.35
798.0	1.90	1.63	1.41
818.2	1.91	1.65	1.42
858.6	1.88	1.62	1.40
878.8	1.96	1.68	1.45
919.2	1.96	1.70	1.48
939.4	1.92	1.68	1.48
979.8	1.98	1.71	1.49
1000.0	2.02	1.75	1.54

Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	10	39	26	46	24	43	38	62	47	79
1	-	21	+0	38	19	44	37	49	49	59	57	69
2	86	74	38	58	38	67	51	70	42	56	55	76
3	>100	49	40	52	36	52	43	53	43	63	55	67
4	>100	83	76	80	50	70	52	71	65	67	64	68
5	>100	65	59	63	53	79	47	83	56	75	56	73
6	>100	77	78	85	79	83	66	79	63	79	78	82
7	>100	82	74	82	72	85	63	71	60	71	69	82
8	>100	>93	>93	>93	83	87	88	91	70	>93	71	88
9	>100	>93	>93	>93	91	92	92	86	80	>93	71	90
10	>100	>93	>93	>93	>93	>93	90	>93	>93	>93	83	>93
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: **RF IN: 750.1 MHz; 0.00 dBm.**
LO IN: 780.01 MHz; +10.00 dBm
IF OUT: 29.91 MHz; -6.67 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	+1	27	15	34	11	31	24	48	37	67
1	-	22	+0	36	20	37	36	46	47	50	53	60
2	>100	74	44	65	44	67	57	68	47	60	66	73
3	>100	74	55	68	50	69	56	76	56	76	62	80
4	>100	>83	>83	>83	81	>83	76	>83	>83	>83	76	>83
5	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
6	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
7	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
8	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
9	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
10	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: **RF IN: 750.1 MHz; -10.00 dBm.**
LO IN: 780.01 MHz; +10.00 dBm
IF OUT: 29.91 MHz; -16.9 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.