Frequency Mixer TUF-5+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) @LO (dBm)		
		+4	+7	+10
10.1	40.1	6.19	5.79	5.60
70.8	100.8	6.14	5.75	5.54
131.5	161.5	6.02	5.69	5.49
192.1	222.1	6.05	5.70	5.52
252.8	282.8	6.09	5.74	5.56
313.5	343.5	6.13	5.80	5.59
374.2	404.2	6.26	5.89	5.66
434.8	464.8	6.33	5.92	5.68
515.7	545.7	6.48	6.04	5.76
576.4	606.4	6.65	6.15	5.86
657.3	687.3	6.99	6.39	5.99
718.0	748.0	7.29	6.63	6.17
798.9	828.9	7.67	6.98	6.51
859.6	889.6	7.84	7.10	6.61
940.5	970.5	7.76	7.02	6.51
1001.2	1031.2	7.57	6.86	6.38
1082.1	1112.1	7.45	6.84	6.39
1142.7	1172.7	7.31	6.75	6.36
1223.6	1253.6	7.21	6.71	6.35
1284.3	1314.3	7.16	6.69	6.39
1365.2	1395.2	7.13	6.65	6.41
1425.9	1455.9	7.15	6.61	6.37
1506.8	1536.8	7.25	6.59	6.27
1567.5	1597.5	7.37	6.61	6.22
1648.4	1678.4	7.48	6.56	6.11
1709.0	1739.0	7.70	6.58	6.10
1789.9	1819.9	8.02	6.66	6.17
1850.6	1880.6	8.23	6.75	6.24
1931.5	1961.5	8.67	6.93	6.33
1992.2	2022.2	9.30	7.13	6.43
2073.1	2103.1	10.20	7.56	6.60
2133.8	2163.8	10.22	7.59	6.62
2214.7	2244.7	10.67	8.00	6.75
2275.4	2305.4	11.55	8.53	7.05
2356.3	2386.3	11.82	8.78	7.23
2416.9	2446.9	11.64	8.76	7.35
2497.8	2527.8	12.26	9.32	7.77
2558.5	2588.5	12.65	9.72	8.10
2639.4	2669.4	12.70	9.88	8.45
2700.1	2730.1	12.83	10.15	8.76

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm) @LO (dBm)		
		+4	+7	+10
10.1	40.1	15.10	16.20	19.63
70.8	100.8	16.93	15.01	13.84
131.5	161.5	12.48	12.83	15.05
192.1	222.1	10.82	13.17	16.76
252.8	282.8	10.05	13.49	15.69
313.5	343.5	11.04	13.89	16.38
374.2	404.2	11.35	15.11	17.97
434.8	464.8	10.57	14.22	19.10
515.7	545.7	10.96	14.00	18.51
576.4	606.4	10.19	13.07	16.55
657.3	687.3	10.55	14.00	14.92
718.0	748.0	9.90	12.93	14.83
798.9	828.9	8.73	11.21	12.20
859.6	889.6	7.35	8.82	9.70
940.5	970.5	6.14	7.62	9.42
1001.2	1031.2	6.29	7.62	9.28
1082.1	1112.1	7.11	7.28	8.21
1142.7	1172.7	7.41	7.13	7.48
1223.6	1253.6	8.10	7.21	6.88
1284.3	1314.3	8.21	7.39	6.67
1365.2	1395.2	8.26	7.69	7.33
1425.9	1455.9	8.45	9.31	9.23
1506.8	1536.8	8.62	11.03	12.42
1567.5	1597.5	8.83	12.52	12.39
1648.4	1678.4	8.94	12.04	12.82
1709.0	1739.0	8.85	11.55	13.70
1789.9	1819.9	8.16	13.09	15.82
1850.6	1880.6	7.86	13.23	17.28
1931.5	1961.5	6.91	11.61	15.50
1992.2	2022.2	5.07	9.93	13.12
2073.1	2103.1	3.82	7.91	10.81
2133.8	2163.8	3.96	8.31	10.71
2214.7	2244.7	3.90	7.83	11.04
2275.4	2305.4	2.76	7.10	9.49
2356.3	2386.3	3.06	8.17	9.24
2416.9	2446.9	4.34	9.78	10.06
2497.8	2527.8	4.36	11.51	10.17
2558.5	2588.5	4.48	13.88	10.92
2639.4	2669.4	6.32	24.06	11.55
2700.1	2730.1	6.95	12.96	11.32

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+1dBm (dB) @LO (dBm)		
		+4	+7	+10
10.1	40.1	0.93	0.68	0.51
70.8	100.8	0.97	0.88	0.61
131.5	161.5	1.15	0.86	0.65
192.1	222.1	1.16	0.84	0.64
252.8	282.8	1.18	0.89	0.68
313.5	343.5	1.17	0.87	0.69
374.2	404.2	1.22	0.96	0.74
434.8	464.8	1.31	1.03	0.82
515.7	545.7	1.47	1.19	0.95
576.4	606.4	1.51	1.24	1.05
657.3	687.3	1.51	1.35	1.17
718.0	748.0	1.45	1.30	1.21
798.9	828.9	1.27	1.17	1.11
859.6	889.6	1.19	1.12	1.04
940.5	970.5	1.25	1.20	1.11
1001.2	1031.2	1.32	1.26	1.15
1082.1	1112.1	1.28	1.15	1.10
1142.7	1172.7	1.30	1.13	1.05
1223.6	1253.6	1.35	1.10	1.01
1284.3	1314.3	1.43	1.10	0.99
1365.2	1395.2	1.44	1.07	0.90
1425.9	1455.9	1.48	1.08	0.89
1506.8	1536.8	1.48	1.07	0.86
1567.5	1597.5	1.51	1.08	0.87
1648.4	1678.4	1.58	1.10	0.80
1709.0	1739.0	1.56	1.16	0.76
1789.9	1819.9	1.65	1.27	0.80
1850.6	1880.6	1.66	1.29	0.83
1931.5	1961.5	1.58	1.34	0.89
1992.2	2022.2	1.50	1.49	1.04
2073.1	2103.1	1.22	1.54	1.09
2133.8	2163.8	1.19	1.52	1.16
2214.7	2244.7	1.04	1.37	1.12
2275.4	2305.4	0.91	1.35	1.15
2356.3	2386.3	0.95	1.38	1.15
2416.9	2446.9	1.10	1.37	1.11
2497.8	2527.8	1.14	1.55	1.21
2558.5	2588.5	1.03	1.53	1.23
2639.4	2669.4	1.33	1.63	1.28
2700.1	2730.1	1.42	1.65	1.37

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=750.1MHz (dB) @LO (dBm) +7
710.0	40.1	6.22
692.1	58.0	6.21
674.1	76.0	6.32
656.2	93.9	6.34
638.2	111.9	6.35
620.3	129.8	6.34
602.3	147.8	6.39
584.4	165.7	6.38
566.4	183.7	6.49
548.5	201.6	6.47
530.5	219.6	6.43
512.6	237.5	6.41
494.6	255.5	6.45
476.7	273.4	6.45
458.7	291.4	6.47
440.8	309.3	6.50
422.8	327.3	6.46
404.9	345.2	6.41
386.9	363.2	6.42
369.0	381.1	6.39
351.0	399.1	6.46
333.1	417.0	6.46
315.1	435.0	6.49
297.2	452.9	6.48
279.2	470.9	6.51
261.3	488.8	6.54
243.3	506.8	6.53
225.4	524.7	6.55
207.4	542.7	6.56
189.5	560.6	6.59
171.5	578.6	6.59
153.6	596.5	6.61
135.6	614.5	6.59
117.7	632.4	6.59
99.7	650.4	6.59
81.8	668.3	6.62
63.8	686.3	6.62
45.9	704.2	6.64
27.9	722.2	6.66
10.0	740.1	6.91

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=20.1MHz (dB) @LO (dBm) +7
10.0	30.1	6.06
30.2	50.3	5.98
50.4	70.5	6.02
70.6	90.7	6.05
90.8	110.9	6.00
111.0	131.1	5.95
131.2	151.3	5.99
151.4	171.5	6.01
171.6	191.7	6.00
191.8	211.9	5.98
212.0	232.1	5.96
232.2	252.3	5.96
252.4	272.5	6.02
272.7	292.8	5.99
292.9	313.0	5.99
313.1	333.2	5.98
333.3	353.4	5.99
353.5	373.6	6.05
373.7	393.8	6.02
393.9	414.0	6.02
434.3	454.4	6.07
454.5	474.6	6.05
494.9	515.0	6.05
515.1	535.2	6.04
555.5	575.6	6.12
575.7	595.8	6.12
616.1	636.2	6.16
636.3	656.4	6.24
676.7	696.8	6.29
696.9	717.0	6.31
737.3	757.4	6.49
757.6	777.7	6.49
798.0	818.1	6.57
818.2	838.3	6.65
858.6	878.7	6.74
878.8	898.9	6.80
919.2	939.3	6.94
939.4	959.5	7.00
979.8	999.9	7.15
1000.0	1020.1	7.19

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1500.1MHz (dB) @LO (dBm) +7
1000.0	500.1	7.47
979.8	520.3	7.40
959.6	540.5	7.33
939.4	560.7	7.30
919.2	580.9	7.25
899.0	601.1	7.20
878.8	621.3	7.17
858.6	641.5	7.15
838.4	661.7	7.15
818.2	681.9	7.10
798.0	702.1	7.09
777.8	722.3	7.07
757.6	742.5	7.12
737.3	762.8	6.93
717.1	783.0	6.97
696.9	803.2	6.94
676.7	823.4	6.89
656.5	843.6	6.90
636.3	863.8	6.86
616.1	884.0	6.81
575.7	924.4	6.71
555.5	944.6	6.68
515.1	985.0	6.54
494.9	1005.2	6.46
454.5	1045.6	6.40
434.3	1065.8	6.37
393.9	1106.2	6.38
373.7	1126.4	6.41
333.3	1166.8	6.42
313.1	1187.0	6.46
272.7	1227.4	6.52
252.4	1247.7	6.51
212.0	1288.1	6.55
191.8	1308.3	6.54
151.4	1348.7	6.55
131.2	1368.9	6.55
90.8	1409.3	6.58
70.6	1429.5	6.58
30.2	1469.9	6.59
10.0	1490.1	6.74

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB) @LO (dBm)			LO-IF ISOLATION (dB) @LO (dBm)		
	+4	+7	+10	+4	+7	+10
10.1	75.89	77.59	76.90	58.08	58.16	57.38
70.8	58.68	59.31	60.44	41.79	42.83	43.48
131.5	53.33	54.15	55.01	37.12	38.39	38.74
192.1	50.11	51.00	51.83	34.71	35.71	36.25
252.8	48.11	49.26	50.17	33.10	33.81	34.17
313.5	46.58	47.76	48.69	31.70	32.38	32.78
374.2	45.57	46.59	47.58	30.19	30.95	31.55
434.8	45.04	46.36	47.49	29.01	30.04	30.92
515.7	43.95	45.32	46.37	27.62	29.11	30.41
576.4	43.27	44.89	46.31	26.62	28.32	29.94
657.3	41.98	43.61	45.01	25.59	27.53	29.55
718.0	41.80	43.54	44.92	24.94	26.93	29.19
798.9	41.43	43.38	44.79	24.40	26.24	28.25
859.6	41.01	42.57	43.57	23.83	25.46	27.09
940.5	40.12	41.05	41.62	23.02	24.27	25.31
1001.2	39.37	39.84	40.12	22.19	23.14	23.80
1082.1	38.66	38.81	38.85	21.28	21.76	21.91
1142.7	38.16	38.11	37.96	20.59	20.82	20.64
1223.6	37.66	37.53	37.35	19.79	19.77	19.31
1284.3	37.18	37.05	36.85	19.11	18.91	18.37
1365.2	36.39	36.37	36.36	17.91	17.54	16.92
1425.9	35.81	35.78	35.72	16.88	16.52	15.90
1506.8	35.13	35.21	35.44	15.46	15.05	14.53
1567.5	34.70	34.90	35.45	14.42	14.02	13.55
1648.4	34.30	35.05	36.01	13.27	12.91	12.57
1709.0	34.14	35.17	36.44	12.51	12.28	11.98
1789.9	33.83	35.06	36.17	11.72	11.62	11.34
1850.6	33.63	34.80	35.96	11.23	11.23	11.03
1931.5	32.92	34.06	35.23	10.73	10.72	10.73
1992.2	32.27	33.46	34.63	10.42	10.49	10.38
2073.1	31.87	33.12	34.53	10.02	10.12	10.27
2133.8	31.47	32.74	34.07	9.85	10.01	10.10
2214.7	31.26	32.62	33.98	9.61	9.82	10.05
2275.4	31.31	32.85	34.49	9.55	9.79	9.97
2356.3	31.12	32.70	34.42	9.44	9.73	10.06
2416.9	30.85	32.44	33.98	9.43	9.73	10.04
2497.8	31.07	32.62	34.15	9.50	9.76	10.18
2558.5	31.29	32.92	34.24	9.46	9.89	10.40
2639.4	31.53	33.02	34.19	9.59	10.04	10.63
2700.1	31.59	32.92	33.94	9.61	10.10	10.70

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB) @LO (dBm)		
		+4	+7	+10
10.1	40.1	47.48	60.01	50.07
70.8	100.8	52.71	52.70	54.66
131.5	161.5	48.30	48.94	48.95
192.1	222.1	45.24	44.91	44.58
252.8	282.8	42.29	41.99	41.94
313.5	343.5	39.86	39.65	39.63
374.2	404.2	37.55	37.38	37.23
434.8	464.8	35.62	35.44	35.40
515.7	545.7	34.04	33.78	33.56
576.4	606.4	33.55	33.25	33.08
657.3	687.3	32.16	31.97	31.68
718.0	748.0	30.86	30.62	30.66
798.9	828.9	29.83	29.78	29.81
859.6	889.6	30.17	30.20	30.28
940.5	970.5	31.70	31.71	32.14
1001.2	1031.2	33.33	33.41	33.95
1082.1	1112.1	35.14	34.90	35.31
1142.7	1172.7	34.70	34.17	33.92
1223.6	1253.6	32.34	31.73	31.12
1284.3	1314.3	30.60	29.68	29.04
1365.2	1395.2	28.43	27.83	27.45
1425.9	1455.9	27.12	26.65	26.47
1506.8	1536.8	25.73	25.70	25.55
1567.5	1597.5	25.01	25.10	25.14
1648.4	1678.4	24.28	24.52	24.56
1709.0	1739.0	23.96	24.41	24.48
1789.9	1819.9	23.51	24.21	24.46
1850.6	1880.6	23.22	23.92	24.23
1931.5	1961.5	22.62	23.39	23.82
1992.2	2022.2	22.29	23.14	23.59
2073.1	2103.1	21.87	22.89	23.29
2133.8	2163.8	21.94	22.93	23.41
2214.7	2244.7	22.18	23.10	23.74
2275.4	2305.4	22.13	23.21	24.03
2356.3	2386.3	22.66	23.75	24.61
2416.9	2446.9	23.25	24.38	25.22
2497.8	2527.8	23.90	25.04	25.93
2558.5	2588.5	24.35	25.59	26.52
2639.4	2669.4	25.32	26.54	27.48
2700.1	2730.1	25.72	26.87	27.92

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1) @LO (dBm)		
		+4	+7	+10
10.1	40.1	1.57	1.54	1.54
70.8	100.8	1.11	1.06	1.07
131.5	161.5	1.13	1.05	1.05
192.1	222.1	1.19	1.13	1.11
252.8	282.8	1.26	1.20	1.18
313.5	343.5	1.34	1.27	1.24
374.2	404.2	1.43	1.37	1.33
434.8	464.8	1.54	1.46	1.42
515.7	545.7	1.71	1.62	1.56
576.4	606.4	1.91	1.81	1.73
657.3	687.3	2.26	2.11	2.01
718.0	748.0	2.60	2.43	2.29
798.9	828.9	3.04	2.86	2.71
859.6	889.6	3.29	3.09	2.92
940.5	970.5	3.42	3.19	3.03
1001.2	1031.2	3.40	3.18	3.01
1082.1	1112.1	3.33	3.14	2.99
1142.7	1172.7	3.25	3.05	2.89
1223.6	1253.6	3.09	2.91	2.75
1284.3	1314.3	2.98	2.77	2.61
1365.2	1395.2	2.83	2.60	2.42
1425.9	1455.9	2.73	2.47	2.26
1506.8	1536.8	2.62	2.32	2.10
1567.5	1597.5	2.55	2.21	1.97
1648.4	1678.4	2.42	2.01	1.78
1709.0	1739.0	2.35	1.92	1.70
1789.9	1819.9	2.29	1.87	1.67
1850.6	1880.6	2.25	1.84	1.66
1931.5	1961.5	2.24	1.83	1.66
1992.2	2022.2	2.27	1.83	1.66
2073.1	2103.1	2.30	1.82	1.62
2133.8	2163.8	2.20	1.76	1.58
2214.7	2244.7	2.14	1.74	1.56
2275.4	2305.4	2.18	1.77	1.58
2356.3	2386.3	2.14	1.78	1.62
2416.9	2446.9	2.08	1.77	1.67
2497.8	2527.8	2.13	1.83	1.75
2558.5	2588.5	2.18	1.88	1.82
2639.4	2669.4	2.23	1.93	1.91
2700.1	2730.1	2.29	1.99	1.96

LO (MHz)	LO VSWR (:1) @LO (dBm)		
	+4	+7	+10
10.1	1.87	2.53	3.44
70.8	1.83	2.59	3.54
131.5	1.87	2.66	3.69
192.1	1.78	2.48	3.38
252.8	1.83	2.57	3.48
313.5	1.83	2.55	3.42
374.2	1.84	2.51	3.33
434.8	1.91	2.59	3.40
515.7	1.94	2.58	3.33
576.4	1.95	2.55	3.25
657.3	2.02	2.58	3.23
718.0	2.07	2.62	3.24
798.9	2.10	2.61	3.18
859.6	2.14	2.60	3.14
940.5	2.19	2.61	3.09
1001.2	2.22	2.61	3.06
1082.1	2.27	2.65	3.06
1142.7	2.31	2.67	3.07
1223.6	2.34	2.66	3.03
1284.3	2.37	2.67	3.02
1365.2	2.41	2.67	2.99
1425.9	2.42	2.64	2.94
1506.8	2.44	2.62	2.89
1567.5	2.48	2.63	2.88
1648.4	2.52	2.62	2.85
1709.0	2.57	2.62	2.84
1789.9	2.68	2.70	2.89
1850.6	2.82	2.82	3.00
1931.5	3.04	2.96	3.09
1992.2	3.18	3.08	3.13
2073.1	3.42	3.27	3.30
2133.8	3.55	3.39	3.41
2214.7	3.72	3.58	3.54
2275.4	3.85	3.73	3.67
2356.3	4.07	3.90	3.91
2416.9	4.13	4.01	3.97
2497.8	4.38	4.27	4.22
2558.5	4.66	4.54	4.44
2639.4	4.88	4.78	4.74
2700.1	5.02	4.92	4.88

IF (OUT) (MHz)	IF VSWR @LO=1500.1MHz (:1) @LO (dBm)		
	+4	+7	+10
10.0	1.53	1.36	1.17
30.2	1.50	1.24	1.05
50.4	1.42	1.19	1.06
70.6	1.44	1.19	1.02
90.8	1.46	1.21	1.01
111.0	1.51	1.24	1.05
131.2	1.52	1.26	1.08
151.4	1.49	1.23	1.06
171.6	1.47	1.21	1.06
191.8	1.50	1.24	1.07
212.0	1.52	1.26	1.08
232.2	1.50	1.25	1.09
252.4	1.50	1.25	1.11
272.7	1.52	1.27	1.11
292.9	1.52	1.27	1.11
313.1	1.52	1.27	1.13
333.3	1.53	1.29	1.15
353.5	1.51	1.27	1.13
373.7	1.51	1.27	1.13
393.9	1.53	1.30	1.16
434.3	1.53	1.30	1.16
454.5	1.54	1.30	1.16
494.9	1.60	1.35	1.18
515.1	1.60	1.35	1.19
555.5	1.61	1.36	1.19
575.7	1.62	1.37	1.19
616.1	1.68	1.43	1.25
636.3	1.65	1.40	1.23
676.7	1.69	1.43	1.24
696.9	1.72	1.46	1.26
737.3	1.70	1.45	1.28
757.6	1.71	1.46	1.28
798.0	1.73	1.47	1.30
818.2	1.73	1.48	1.31
858.6	1.71	1.46	1.31
878.8	1.73	1.49	1.34
919.2	1.72	1.49	1.36
939.4	1.69	1.48	1.37
979.8	1.70	1.49	1.38
1000.0	1.71	1.51	1.41

Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	+1	23	13	38	13	40	21	50	36	58
1	-	23	+0	36	21	39	36	51	46	59	58	60
2	>100	79	49	63	49	66	55	75	49	72	55	>79
3	>100	74	60	76	54	75	61	79	61	>79	71	>79
4	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
5	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
6	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
7	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
8	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
9	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
10	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:
RF IN: 750.1 MHz; -14.00 dBm.
LO IN: 780.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -20.99 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	9	34	23	48	26	53	35	64	48	74
1	-	24	+0	38	21	45	33	59	45	70	62	73
2	88	59	40	53	41	58	50	75	45	66	52	74
3	>100	50	41	61	40	65	48	56	49	75	64	81
4	>100	73	78	78	56	71	58	75	68	77	62	89
5	>100	72	67	67	57	68	51	73	62	75	59	88
6	>100	80	73	87	85	89	81	78	75	85	86	89
7	>100	89	87	>89	74	>89	67	80	67	88	78	85
8	>100	>89	>89	>89	85	>89	>89	>89	79	83	84	>89
9	>100	>89	>89	>89	>89	>89	>89	>89	83	85	76	>89
10	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89	87
	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; +7.00 dBm
IF OUT: 29.91 MHz; -10.79 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.