Frequency Mixer TUF-R5SM+

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	6.23	5.87	5.64
70.1	100.1	6.13	5.75	5.57
130.1	160.1	6.08	5.69	5.48
190.1	220.1	5.97	5.65	5.48
250.1	280.1	6.10	5.74	5.53
310.1	340.1	6.16	5.78	5.57
370.1	400.1	6.17	5.80	5.58
430.1	460.1	6.39	5.99	5.73
490.1	520.1	6.38	5.95	5.71
550.1	580.1	6.51	6.06	5.77
610.1	640.1	6.76	6.25	5.94
670.1	700.1	6.85	6.25	5.88
730.1	760.1	7.13	6.51	6.08
790.1	820.1	7.37	6.73	6.31
850.1	880.1	7.62	6.94	6.50
910.1	940.1	7.83	7.15	6.67
970.1	1000.1	7.77	7.04	6.54
1030.1	1060.1	7.77	7.04	6.55
1110.1	1140.1	7.67	7.06	6.61
1170.1	1200.1	7.64	7.08	6.67
1250.1	1280.1	7.57	7.03	6.66
1310.1	1340.1	7.48	6.98	6.64
1390.1	1420.1	7.45	6.94	6.63
1450.1	1480.1	7.63	7.00	6.70
1530.1	1560.1	7.72	7.02	6.66
1590.1	1620.1	7.72	6.92	6.50
1670.1	1700.1	7.99	6.93	6.40
1730.1	1760.1	8.30	7.05	6.48
1810.1	1840.1	8.58	7.12	6.54
1870.1	1900.1	8.94	7.22	6.57
1950.1	1980.1	9.78	7.54	6.75
2010.1	2040.1	10.16	7.85	6.93
2090.1	2120.1	10.66	7.97	6.96
2150.1	2180.1	11.55	8.39	7.04
2230.1	2260.1	12.49	9.01	7.26
2290.1	2320.1	12.22	8.92	7.26
2370.1	2400.1	12.99	9.33	7.46
2430.1	2460.1	14.25	10.04	7.82
2510.1	2540.1	14.42	10.23	7.92
2570.1	2600.1	14.61	10.26	7.94

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm) @LO (dBm)		
		+4	+7	+10
10.1	40.1	13.76	16.48	18.90
70.1	100.1	14.54	15.80	16.72
130.1	160.1	11.65	13.01	16.15
190.1	220.1	11.79	14.46	16.97
250.1	280.1	11.29	14.29	16.93
310.1	340.1	12.22	15.31	17.54
370.1	400.1	12.35	15.21	17.23
430.1	460.1	12.63	14.79	17.01
490.1	520.1	12.20	14.94	16.51
550.1	580.1	12.68	14.95	17.90
610.1	640.1	13.19	15.94	18.35
670.1	700.1	14.61	15.72	16.16
730.1	760.1	16.31	18.07	15.77
790.1	820.1	15.90	16.07	14.99
850.1	880.1	11.78	12.34	12.76
910.1	940.1	9.02	9.70	10.45
970.1	1000.1	7.68	8.63	9.81
1030.1	1060.1	7.09	7.97	9.22
1110.1	1140.1	7.09	7.43	8.17
1170.1	1200.1	7.08	7.12	7.40
1250.1	1280.1	7.53	7.59	7.54
1310.1	1340.1	7.70	7.77	7.56
1390.1	1420.1	7.91	8.11	7.60
1450.1	1480.1	8.10	8.47	7.97
1530.1	1560.1	8.39	9.45	9.49
1590.1	1620.1	8.40	10.20	10.89
1670.1	1700.1	8.38	10.57	11.42
1730.1	1760.1	8.82	10.54	12.24
1810.1	1840.1	8.22	10.86	12.98
1870.1	1900.1	7.40	9.87	11.88
1950.1	1980.1	6.49	8.76	11.00
2010.1	2040.1	6.13	8.07	10.45
2090.1	2120.1	5.61	7.22	9.41
2150.1	2180.1	4.77	6.60	8.49
2230.1	2260.1	4.19	6.38	8.07
2290.1	2320.1	4.31	6.30	7.73
2370.1	2400.1	3.78	6.09	7.61
2430.1	2460.1	3.06	5.80	7.54
2510.1	2540.1	3.17	6.24	7.81
2570.1	2600.1	3.24	6.40	7.90

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+1dBm (dB) @LO (dBm)		
		+4	+7	+10
10.1	40.1	1.39	0.98	0.81
70.1	100.1	1.37	1.08	0.98
130.1	160.1	1.44	1.12	0.89
190.1	220.1	1.56	1.22	1.00
250.1	280.1	1.58	1.26	1.03
310.1	340.1	1.58	1.28	1.06
370.1	400.1	1.73	1.40	1.16
430.1	460.1	1.66	1.35	1.15
490.1	520.1	1.84	1.54	1.31
550.1	580.1	1.98	1.65	1.42
610.1	640.1	1.95	1.65	1.42
670.1	700.1	2.02	1.79	1.57
730.1	760.1	1.90	1.70	1.57
790.1	820.1	1.80	1.59	1.46
850.1	880.1	1.68	1.53	1.40
910.1	940.1	1.62	1.48	1.35
970.1	1000.1	1.67	1.57	1.44
1030.1	1060.1	1.67	1.58	1.44
1110.1	1140.1	1.58	1.42	1.32
1170.1	1200.1	1.60	1.37	1.24
1250.1	1280.1	1.72	1.38	1.21
1310.1	1340.1	1.74	1.36	1.19
1390.1	1420.1	1.83	1.38	1.17
1450.1	1480.1	1.84	1.33	1.10
1530.1	1560.1	1.81	1.26	1.04
1590.1	1620.1	1.90	1.34	1.08
1670.1	1700.1	1.97	1.41	1.06
1730.1	1760.1	1.88	1.42	1.02
1810.1	1840.1	1.91	1.49	1.02
1870.1	1900.1	2.00	1.67	1.16
1950.1	1980.1	1.85	1.81	1.31
2010.1	2040.1	1.56	1.69	1.25
2090.1	2120.1	1.41	1.72	1.36
2150.1	2180.1	1.13	1.73	1.44
2230.1	2260.1	0.71	1.56	1.40
2290.1	2320.1	0.78	1.47	1.33
2370.1	2400.1	0.57	1.53	1.39
2430.1	2460.1	0.09	1.47	1.43
2510.1	2540.1	-0.06	1.39	1.35
2570.1	2600.1	-0.01	1.49	1.45

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=767MHz (dB)
		@LO (dBm)
		+7
757.0	10.0	6.39
738.5	28.5	6.36
720.0	47.0	6.35
701.5	65.5	6.39
683.0	84.0	6.49
664.5	102.5	6.51
646.0	121.0	6.44
627.5	139.5	6.46
609.0	158.0	6.52
590.5	176.5	6.52
572.0	195.0	6.50
553.5	213.5	6.50
535.0	232.0	6.50
516.5	250.5	6.48
498.0	269.0	6.51
479.5	287.5	6.56
461.0	306.0	6.51
442.5	324.5	6.41
424.0	343.0	6.43
405.5	361.5	6.50
387.0	380.0	6.39
368.5	398.5	6.41
350.0	417.0	6.44
331.5	435.5	6.54
313.0	454.0	6.46
294.5	472.5	6.49
276.0	491.0	6.54
257.5	509.5	6.49
239.0	528.0	6.48
220.5	546.5	6.53
202.0	565.0	6.55
183.5	583.5	6.60
165.0	602.0	6.50
146.5	620.5	6.61
128.0	639.0	6.61
109.5	657.5	6.53
91.0	676.0	6.55
72.5	694.5	6.54
35.5	731.5	6.51
17.0	750.0	6.60

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10MHz (dB)
		@LO (dBm)
		+7
10.1	20.1	6.05
50.1	60.1	5.87
90.1	100.1	5.86
130.1	140.1	5.74
170.1	180.1	6.05
210.1	220.1	5.77
250.1	260.1	6.12
290.1	300.1	6.02
330.1	340.1	5.83
370.1	380.1	5.67
410.1	420.1	5.77
450.1	460.1	6.00
490.1	500.1	6.10
530.1	540.1	6.03
570.1	580.1	6.01
610.1	620.1	6.01
650.1	660.1	6.02
690.1	700.1	6.23
730.1	740.1	6.22
770.1	780.1	6.46
810.1	820.1	6.38
850.1	860.1	6.55
890.1	900.1	6.61
930.1	940.1	6.86
970.1	980.1	6.98
1010.1	1020.1	6.95
1050.1	1060.1	7.26
1090.1	1100.1	7.51
1130.1	1140.1	7.46
1170.1	1180.1	7.66
1210.1	1220.1	7.94
1250.1	1260.1	8.21
1290.1	1300.1	8.28
1330.1	1340.1	8.56
1370.1	1380.1	9.09
1410.1	1420.1	9.08
1450.1	1460.1	9.49
1470.1	1480.1	9.47
1510.1	1520.1	9.96
1530.1	1540.1	10.11

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1510.1MHz (dB)
		@LO (dBm)
		+7
1490.1	20.0	10.18
1450.1	60.0	9.90
1410.1	100.0	9.63
1370.1	140.0	9.36
1330.1	180.0	9.12
1290.1	220.0	8.84
1250.1	260.0	8.69
1210.1	300.0	8.49
1170.1	340.0	8.31
1130.1	380.0	8.14
1090.1	420.0	8.05
1050.1	460.0	8.02
1010.1	500.0	7.84
970.1	540.0	7.73
930.1	580.0	7.72
890.1	620.0	7.72
850.1	660.0	7.66
810.1	700.0	7.54
770.1	740.0	7.52
730.1	780.0	7.41
690.1	820.0	7.40
650.1	860.0	7.31
610.1	900.0	7.23
570.1	940.0	7.17
530.1	980.0	7.07
490.1	1020.0	6.91
450.1	1060.0	6.83
410.1	1100.0	6.86
370.1	1140.0	6.89
330.1	1180.0	6.87
290.1	1220.0	6.90
250.1	1260.0	6.98
210.1	1300.0	7.03
190.1	1320.0	6.97
150.1	1360.0	7.02
130.1	1380.0	6.98
90.1	1420.0	6.97
70.1	1440.0	6.98
30.1	1480.0	6.97
10.1	1500.0	7.18

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB) @LO (dBm)			LO-IF ISOLATION (dB) @LO (dBm)		
	+4	+7	+10	+4	+7	+10
40.1	62.04	61.00	61.28	45.21	45.39	45.47
100.1	56.27	56.42	56.35	38.11	38.43	38.68
160.1	52.15	52.53	52.61	34.86	35.36	35.37
220.1	50.26	50.86	51.17	32.83	33.18	33.02
280.1	48.59	49.16	49.64	31.39	31.60	31.53
340.1	47.41	48.33	49.27	29.84	30.21	30.25
400.1	46.18	47.00	47.71	28.60	29.04	29.24
460.1	45.42	46.42	47.34	27.53	28.17	28.55
520.1	44.68	45.73	46.64	26.68	27.68	28.28
580.1	43.89	45.00	46.05	25.90	27.13	28.07
640.1	43.28	44.37	45.51	25.30	26.83	28.17
700.1	42.75	43.77	44.75	24.71	26.55	28.33
760.1	42.29	43.54	44.71	24.33	26.26	28.36
820.1	41.91	43.16	44.36	24.07	26.12	28.33
880.1	41.53	42.84	44.15	23.82	25.91	28.08
940.1	41.11	42.23	43.35	23.58	25.62	27.57
1000.1	40.84	41.71	42.72	23.16	24.97	26.51
1060.1	40.70	41.31	41.95	22.81	24.23	25.13
1140.1	40.79	41.53	41.76	22.12	23.09	23.42
1200.1	41.17	41.95	42.13	21.54	22.20	22.21
1280.1	41.63	42.48	42.63	20.76	21.06	20.67
1340.1	41.10	43.21	42.74	20.05	20.26	19.70
1420.1	41.31	44.26	41.33	19.23	18.76	18.30
1480.1	43.50	45.45	45.15	18.27	17.86	17.50
1560.1	44.88	45.97	45.86	16.83	16.42	15.92
1620.1	45.20	45.66	45.14	15.85	15.48	14.94
1700.1	45.44	44.79	43.88	14.59	14.09	13.71
1760.1	45.28	44.62	43.67	13.64	13.29	12.99
1840.1	45.43	44.73	43.43	12.68	12.41	12.04
1900.1	46.08	45.57	44.21	12.10	11.89	11.57
1980.1	46.26	47.25	46.31	11.37	11.11	10.98
2040.1	45.33	47.68	47.55	10.78	10.72	10.59
2120.1	44.76	49.03	51.57	10.29	10.16	10.19
2180.1	42.72	46.85	54.61	9.86	9.87	9.93
2260.1	41.38	44.93	54.61	9.56	9.56	9.52
2320.1	41.73	45.62	56.01	9.23	9.30	9.38
2400.1	40.34	43.72	50.13	9.05	9.08	9.21
2460.1	39.42	42.43	48.21	8.90	8.96	9.05
2540.1	39.11	42.37	45.95	8.67	8.73	8.87
2600.1	38.80	42.03	44.23	8.67	8.74	8.83

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB) @LO (dBm)		
		+4	+7	+10
10.1	40.1	62.58	61.62	60.47
70.1	100.1	44.34	45.10	43.66
130.1	160.1	40.42	39.68	38.76
190.1	220.1	37.77	37.11	36.79
250.1	280.1	36.02	35.47	34.99
310.1	340.1	34.97	34.18	33.81
370.1	400.1	34.01	33.55	33.23
430.1	460.1	32.59	32.28	31.94
490.1	520.1	31.22	30.81	30.42
550.1	580.1	30.13	29.67	29.41
610.1	640.1	29.22	28.90	28.71
670.1	700.1	28.05	27.75	27.52
730.1	760.1	26.92	26.72	26.60
790.1	820.1	26.25	25.96	25.92
850.1	880.1	25.46	25.39	25.28
910.1	940.1	25.21	25.12	25.00
970.1	1000.1	25.20	25.30	25.27
1030.1	1060.1	24.92	25.11	25.07
1110.1	1140.1	24.54	24.93	25.12
1170.1	1200.1	24.13	24.61	24.86
1250.1	1280.1	23.51	24.25	24.69
1310.1	1340.1	23.10	23.90	24.18
1390.1	1420.1	22.74	23.61	23.47
1450.1	1480.1	22.62	23.35	24.00
1530.1	1560.1	22.64	23.27	23.97
1590.1	1620.1	23.00	23.75	24.58
1670.1	1700.1	23.48	24.57	25.43
1730.1	1760.1	23.99	25.22	26.17
1810.1	1840.1	24.21	25.42	26.41
1870.1	1900.1	24.06	25.26	26.35
1950.1	1980.1	23.72	24.82	25.78
2010.1	2040.1	23.65	24.60	25.60
2090.1	2120.1	23.71	24.89	25.92
2150.1	2180.1	23.84	25.09	26.24
2230.1	2260.1	24.12	25.65	27.14
2290.1	2320.1	24.88	26.52	28.25
2370.1	2400.1	25.74	27.71	29.43
2430.1	2460.1	26.31	28.33	30.58
2510.1	2540.1	28.39	30.26	32.09
2570.1	2600.1	30.14	31.49	31.71

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1) @LO (dBm)		
		+4	+7	+10
10.1	40.1	1.61	1.82	1.69
70.1	100.1	1.15	1.09	1.10
130.1	160.1	1.15	1.05	1.00
190.1	220.1	1.18	1.10	1.07
250.1	280.1	1.23	1.17	1.13
310.1	340.1	1.31	1.24	1.21
370.1	400.1	1.39	1.33	1.29
430.1	460.1	1.49	1.42	1.37
490.1	520.1	1.60	1.53	1.47
550.1	580.1	1.76	1.67	1.61
610.1	640.1	1.93	1.83	1.77
670.1	700.1	2.13	2.01	1.91
730.1	760.1	2.39	2.24	2.11
790.1	820.1	2.64	2.48	2.36
850.1	880.1	2.92	2.75	2.61
910.1	940.1	3.10	2.93	2.80
970.1	1000.1	3.23	3.03	2.88
1030.1	1060.1	3.29	3.10	2.96
1110.1	1140.1	3.30	3.14	3.00
1170.1	1200.1	3.29	3.14	3.00
1250.1	1280.1	3.18	3.04	2.90
1310.1	1340.1	3.07	2.92	2.80
1390.1	1420.1	3.00	2.83	2.66
1450.1	1480.1	2.95	2.74	2.54
1530.1	1560.1	2.84	2.59	2.38
1590.1	1620.1	2.80	2.49	2.24
1670.1	1700.1	2.76	2.34	2.08
1730.1	1760.1	2.70	2.26	2.03
1810.1	1840.1	2.69	2.26	2.04
1870.1	1900.1	2.78	2.32	2.09
1950.1	1980.1	2.91	2.37	2.14
2010.1	2040.1	2.89	2.37	2.13
2090.1	2120.1	2.88	2.33	2.08
2150.1	2180.1	2.99	2.39	2.09
2230.1	2260.1	2.97	2.37	2.03
2290.1	2320.1	2.79	2.26	1.94
2370.1	2400.1	2.77	2.24	1.92
2430.1	2460.1	2.82	2.27	1.93
2510.1	2540.1	2.66	2.16	1.85
2570.1	2600.1	2.62	2.11	1.82

LO (MHz)	LO VSWR (:1) @LO (dBm)		
	+4	+7	+10
40.1	1.85	2.58	3.47
100.1	1.71	2.33	3.09
160.1	1.72	2.34	3.11
220.1	1.75	2.39	3.15
280.1	1.72	2.31	3.02
340.1	1.77	2.37	3.07
400.1	1.78	2.36	3.02
460.1	1.80	2.35	2.99
520.1	1.85	2.40	3.01
580.1	1.88	2.40	2.98
640.1	1.92	2.41	2.96
700.1	1.97	2.46	2.98
760.1	2.00	2.46	2.96
820.1	2.06	2.50	2.99
880.1	2.10	2.52	2.98
940.1	2.14	2.53	2.96
1000.1	2.21	2.58	2.99
1060.1	2.27	2.63	3.02
1140.1	2.35	2.71	3.08
1200.1	2.40	2.74	3.11
1280.1	2.48	2.80	3.14
1340.1	2.56	2.86	3.19
1420.1	2.65	2.91	3.21
1480.1	2.70	2.92	3.21
1560.1	2.78	2.97	3.23
1620.1	2.85	3.00	3.24
1700.1	2.93	3.00	3.22
1760.1	3.01	3.06	3.25
1840.1	3.19	3.18	3.35
1900.1	3.37	3.31	3.43
1980.1	3.58	3.47	3.51
2040.1	3.68	3.55	3.55
2120.1	3.86	3.73	3.70
2180.1	3.99	3.85	3.78
2260.1	4.02	3.90	3.89
2320.1	4.19	4.07	4.00
2400.1	4.32	4.23	4.10
2460.1	4.45	4.23	4.20
2540.1	4.60	4.46	4.34
2600.1	4.78	4.60	4.47

IF (OUT) (MHz)	IF VSWR @LO=1500MHz (:1) @LO (dBm)		
	+4	+7	+10
10.0	1.43	1.19	1.02
50.0	1.44	1.21	1.05
90.0	1.47	1.23	1.06
130.0	1.44	1.21	1.06
170.0	1.49	1.26	1.11
210.0	1.49	1.26	1.11
250.0	1.48	1.26	1.14
290.0	1.52	1.31	1.17
330.0	1.48	1.27	1.15
370.0	1.52	1.32	1.21
410.0	1.54	1.33	1.19
450.0	1.52	1.33	1.21
490.0	1.57	1.38	1.25
530.0	1.55	1.36	1.24
570.0	1.56	1.39	1.28
610.0	1.58	1.40	1.29
650.0	1.54	1.37	1.28
690.0	1.57	1.41	1.32
730.0	1.56	1.39	1.30
770.0	1.55	1.40	1.33
810.0	1.56	1.42	1.35
850.0	1.53	1.41	1.37
890.0	1.52	1.42	1.39
930.0	1.49	1.41	1.41
970.0	1.48	1.42	1.44
1010.0	1.45	1.42	1.47
1050.0	1.44	1.43	1.50
1090.0	1.41	1.43	1.52
1130.0	1.42	1.48	1.62
1170.0	1.40	1.48	1.62
1210.0	1.41	1.53	1.72
1250.0	1.44	1.59	1.79
1290.0	1.45	1.63	1.85
1310.0	1.49	1.67	1.90
1350.0	1.56	1.77	2.01
1370.0	1.58	1.78	2.03
1410.0	1.71	1.94	2.24
1430.0	1.75	1.98	2.29
1470.0	1.89	2.13	2.45
1490.0	2.00	2.25	2.58

Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	+2	18	20	37	15	33	22	50	36	59
1	-	17	+0	34	19	39	33	43	43	46	57	58
2	89	64	53	64	49	64	> 69	> 69	49	68	55	> 69
3	> 90	> 69	61	67	57	67	63	> 69	63	> 69	> 69	> 69
4	> 90	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69
5	> 90	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69
6	> 90	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69
7	> 90	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69
8	> 90	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69
9	> 90	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69
10	> 90	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69	> 69
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: **RF IN: 760 MHz; -14.00 dBm.**
LO IN: 790 MHz; +7.00 dBm
IF OUT: 30 MHz; -20.74 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	8	29	30	49	28	47	35	68	50	78
1	-	17	+0	35	18	48	32	50	47	54	67	68
2	69	56	46	50	47	55	65	62	46	68	51	> 79
3	> 90	44	43	48	48	48	49	54	55	60	65	63
4	> 90	66	68	58	55	62	56	67	73	67	59	69
5	> 90	60	62	66	54	68	51	67	59	77	60	78
6	> 90	> 79	> 79	> 79	78	79	68	72	69	74	> 79	73
7	> 90	> 79	> 79	> 79	76	> 79	71	72	70	73	78	> 79
8	> 90	> 79	> 79	> 79	> 79	> 79	> 79	> 79	> 79	> 79	> 79	> 79
9	> 90	> 79	> 79	> 79	> 79	> 79	> 79	> 79	> 79	> 79	> 79	> 79
10	> 90	> 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: 760 MHz; -4.00 dBm.**
LO IN: 790 MHz; +7.00 dBm
IF OUT: 30 MHz; -10.86 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.