

Frequency Mixer

TFM-2H+

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=+14dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+14	+17	+20			+14	+17	+20			+14	+17	+20
10.1	40.1	7.26	6.45	6.16	10.1	40.1	23.54	27.63	30.24	10.1	40.1	0.69	0.34	0.17
50.6	80.6	7.34	6.59	6.21	50.6	80.6	25.03	28.53	31.22	50.6	80.6	0.64	0.30	0.17
91.1	121.1	7.26	6.51	6.19	91.1	121.1	24.56	29.04	32.49	91.1	121.1	0.73	0.37	0.23
131.6	161.6	7.20	6.48	6.16	131.6	161.6	31.45	36.94	32.27	131.6	161.6	0.73	0.33	0.17
172.1	202.1	7.01	6.35	6.14	172.1	202.1	33.89	29.67	33.39	172.1	202.1	0.91	0.42	0.22
212.6	242.6	7.07	6.42	6.19	212.6	242.6	34.68	28.88	30.60	212.6	242.6	0.76	0.33	0.15
253.1	283.1	6.87	6.33	6.14	253.1	283.1	33.65	35.21	27.82	253.1	283.1	0.95	0.40	0.21
293.6	323.6	6.92	6.39	6.20	293.6	323.6	27.43	32.44	28.05	293.6	323.6	0.93	0.34	0.18
334.2	364.2	6.89	6.39	6.21	334.2	364.2	33.20	27.66	26.44	334.2	364.2	0.86	0.32	0.16
374.7	404.7	6.85	6.37	6.20	374.7	404.7	34.62	26.52	27.58	374.7	404.7	1.00	0.41	0.24
415.2	445.2	7.01	6.52	6.30	415.2	445.2	29.64	22.46	22.96	415.2	445.2	0.84	0.32	0.18
455.7	485.7	6.97	6.51	6.32	455.7	485.7	28.63	24.24	23.15	455.7	485.7	0.98	0.40	0.26
496.2	526.2	7.16	6.66	6.41	496.2	526.2	24.81	26.49	27.36	496.2	526.2	0.82	0.29	0.17
536.7	566.7	7.10	6.68	6.42	536.7	566.7	22.92	23.08	28.23	536.7	566.7	1.02	0.39	0.28
577.2	607.2	7.22	6.79	6.53	577.2	607.2	24.66	22.38	23.55	577.2	607.2	1.00	0.34	0.23
617.7	647.7	7.21	6.81	6.59	617.7	647.7	25.45	22.57	22.39	617.7	647.7	1.10	0.44	0.27
658.2	688.2	7.22	6.86	6.67	658.2	688.2	25.32	23.77	22.91	658.2	688.2	1.18	0.50	0.28
698.7	728.7	7.36	6.92	6.73	698.7	728.7	21.51	23.37	23.56	698.7	728.7	1.24	0.60	0.32
739.2	769.2	7.40	6.94	6.74	739.2	769.2	19.43	22.92	24.22	739.2	769.2	1.29	0.76	0.40
779.7	809.7	7.78	7.15	6.85	779.7	809.7	16.92	21.58	25.07	779.7	809.7	1.17	0.84	0.45
820.2	850.2	8.01	7.34	6.97	820.2	850.2	15.19	18.57	23.92	820.2	850.2	1.29	0.94	0.59
860.7	890.7	8.43	7.77	7.23	860.7	890.7	14.45	15.47	20.70	860.7	890.7	1.08	0.79	0.58
901.2	931.2	8.78	8.15	7.49	901.2	931.2	14.54	14.25	17.61	901.2	931.2	1.09	0.74	0.61
941.7	971.7	9.27	8.61	7.82	941.7	971.7	14.69	14.04	16.33	941.7	971.7	0.87	0.54	0.51
982.3	1012.3	9.85	9.06	8.32	982.3	1012.3	14.52	14.25	15.18	982.3	1012.3	0.67	0.37	0.30
1022.8	1052.8	10.41	9.50	8.70	1022.8	1052.8	14.46	15.01	15.50	1022.8	1052.8	0.19	0.07	0.06
1063.3	1093.3	11.12	10.11	9.17	1063.3	1093.3	14.26	15.42	16.77	1063.3	1093.3	-0.30	-0.31	-0.18
1103.8	1133.8	11.72	10.60	9.46	1103.8	1133.8	14.39	15.68	18.36	1103.8	1133.8	-0.69	-0.59	-0.25
1144.3	1174.3	12.26	11.10	9.83	1144.3	1174.3	14.52	15.47	17.87	1144.3	1174.3	-1.04	-0.92	-0.43
1184.8	1214.8	12.68	11.39	10.08	1184.8	1214.8	15.42	15.79	17.31	1184.8	1214.8	-1.07	-0.92	-0.45
1225.3	1255.3	12.87	11.42	9.94	1225.3	1255.3	15.55	15.50	17.59	1225.3	1255.3	-1.05	-0.79	-0.19
1265.8	1295.8	13.19	11.51	9.74	1265.8	1295.8	15.87	15.89	20.17	1265.8	1295.8	-0.86	-0.51	0.23
1306.3	1336.3	13.09	11.23	9.45	1306.3	1336.3	16.36	17.73	24.98	1306.3	1336.3	-0.48	0.02	0.65
1346.8	1376.8	13.14	11.04	9.65	1346.8	1376.8	16.94	20.53	26.01	1346.8	1376.8	-0.14	0.39	0.69
1387.3	1417.3	13.32	11.19	10.08	1387.3	1417.3	18.07	23.01	25.84	1387.3	1417.3	0.14	0.55	0.61
1427.8	1457.8	13.21	11.42	10.50	1427.8	1457.8	19.03	23.43	24.75	1427.8	1457.8	0.40	0.54	0.49
1468.3	1498.3	13.61	12.08	11.34	1468.3	1498.3	19.29	23.74	24.15	1468.3	1498.3	0.40	0.32	0.28
1508.8	1538.8	13.44	12.29	11.81	1508.8	1538.8	20.04	25.30	25.80	1508.8	1538.8	0.41	0.12	0.12
1549.3	1579.3	14.15	12.67	12.44	1549.3	1579.3	20.67	26.02	28.16	1549.3	1579.3	0.14	0.02	-0.08
1610.1	1640.1	14.67	12.63	12.62	1610.1	1640.1	18.87	27.24	30.83	1610.1	1640.1	-0.50	-0.01	-0.13



Frequency Mixer

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=510.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1010.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+17			+17			+17
500.0	10.1	7.00	10.0	20.1	6.57	1000.0	10.1	8.35
487.4	22.7	6.89	50.0	60.1	6.32	979.8	30.3	8.22
474.9	35.2	6.75	90.0	100.1	6.46	959.6	50.5	8.13
462.3	47.8	6.81	130.0	140.1	6.45	939.4	70.7	8.15
449.7	60.4	6.80	170.0	180.1	6.49	919.2	90.9	8.08
437.2	72.9	6.66	210.0	220.1	6.43	899.0	111.1	8.03
424.6	85.5	6.61	250.0	260.1	6.49	878.8	131.3	7.94
412.1	98.0	6.59	310.0	320.1	6.55	858.6	151.5	7.80
399.5	110.6	6.58	350.0	360.1	6.54	838.4	171.7	7.87
386.9	123.2	6.53	410.0	420.1	6.64	818.2	191.9	7.69
374.4	135.7	6.50	450.0	460.1	6.70	798.0	212.1	7.80
361.8	148.3	6.54	510.0	520.1	6.75	777.8	232.3	7.63
349.2	160.9	6.49	550.0	560.1	6.81	757.6	252.5	7.56
336.7	173.4	6.47	610.0	620.1	7.00	737.3	272.8	7.71
324.1	186.0	6.39	650.0	660.1	7.04	717.1	293.0	7.71
311.5	198.6	6.34	710.0	720.1	7.01	696.9	313.2	7.85
299.0	211.1	6.33	750.0	760.1	6.88	676.7	333.4	7.79
286.4	223.7	6.30	810.0	820.1	6.77	656.5	353.6	7.88
273.8	236.3	6.32	850.0	860.1	6.85	636.3	373.8	7.83
261.3	248.8	6.35	910.0	920.1	7.00	616.1	394.0	7.89
248.7	261.4	6.37	950.0	960.1	7.02	575.7	434.4	7.83
236.2	273.9	6.34	1010.0	1020.1	7.10	555.5	454.6	7.91
223.6	286.5	6.31	1050.0	1060.1	7.14	515.1	495.0	7.87
211.0	299.1	6.31	1110.0	1120.1	7.22	494.9	515.2	7.86
198.5	311.6	6.29	1150.0	1160.1	7.12	454.5	555.6	7.96
185.9	324.2	6.30	1210.0	1220.1	6.96	434.3	575.8	7.82
173.3	336.8	6.33	1250.0	1260.1	6.88	393.9	616.2	7.92
160.8	349.3	6.39	1310.0	1320.1	6.77	373.7	636.4	7.97
148.2	361.9	6.42	1350.0	1360.1	6.69	333.3	676.8	7.94
135.6	374.5	6.40	1410.0	1420.1	6.74	313.1	697.0	8.09
123.1	387.0	6.40	1450.0	1460.1	6.93	272.7	737.4	8.17
110.5	399.6	6.41	1510.0	1520.1	7.12	252.4	757.7	8.10
97.9	412.2	6.44	1550.0	1560.1	7.29	212.0	798.1	8.24
85.4	424.7	6.45	1610.0	1620.1	7.72	191.8	818.3	8.25
72.8	437.3	6.52	1650.0	1660.1	7.92	151.4	858.7	8.47
60.3	449.8	6.59	1710.0	1720.1	8.57	131.2	878.9	8.66
47.7	462.4	6.58	1750.0	1760.1	9.24	90.8	919.3	8.84
35.1	475.0	6.58	1810.0	1820.1	9.61	70.6	939.5	8.99
22.6	487.5	6.61	1850.0	1860.1	9.91	30.2	979.9	9.21
10.0	500.1	6.84	1910.0	1920.1	10.50	10.0	1000.1	9.48

Frequency Mixer

TFM-2H+

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+20	+14	+17	+20
40.1	64.65	64.36	64.38	74.24	62.93	58.58
80.6	58.43	58.81	59.02	83.19	60.33	54.82
121.1	55.36	55.77	56.06	71.00	57.13	51.27
161.6	53.01	53.65	53.99	62.64	55.86	50.38
202.1	51.35	51.87	52.10	56.53	53.73	49.12
242.6	50.33	50.98	51.21	52.32	51.17	47.54
283.1	49.34	49.79	50.06	48.56	48.42	46.32
323.6	48.71	49.08	48.63	45.44	45.48	43.99
364.2	47.83	48.01	47.87	42.64	43.04	42.70
404.7	46.80	47.89	47.53	40.35	40.74	40.95
445.2	45.90	46.46	46.87	38.39	38.99	39.30
485.7	45.33	44.90	44.91	36.57	37.16	37.86
526.2	44.75	44.39	43.92	35.18	35.45	36.19
566.7	44.00	44.27	44.00	34.10	34.55	34.98
607.2	43.78	43.58	44.22	32.79	33.64	34.53
647.7	44.61	43.56	43.64	31.53	32.70	33.88
688.2	45.42	43.98	43.34	30.40	31.92	33.20
728.7	46.28	44.69	43.77	29.38	30.92	32.45
769.2	46.49	45.55	44.88	28.62	30.06	31.84
809.7	46.22	47.11	46.05	27.94	29.19	30.90
850.2	44.24	46.61	45.68	27.62	28.49	30.01
890.7	42.83	44.89	45.06	27.09	27.93	29.11
931.2	42.16	43.11	44.16	26.56	27.43	28.46
971.7	41.39	41.80	42.38	26.12	27.10	28.04
1012.3	40.71	41.00	41.43	25.56	26.52	27.55
1052.8	39.63	40.09	40.48	25.13	26.23	27.37
1093.3	38.91	39.55	40.11	24.66	25.81	27.00
1133.8	38.15	38.94	39.66	24.31	25.60	26.87
1174.3	37.37	38.34	39.12	23.98	25.31	26.72
1214.8	36.65	37.67	38.65	23.55	24.85	26.37
1255.3	35.93	36.97	38.15	23.26	24.50	26.06
1295.8	35.23	36.27	37.74	22.94	23.99	25.51
1336.3	34.51	35.81	37.72	22.37	23.40	25.04
1376.8	33.88	35.58	37.78	22.05	22.96	24.71
1417.3	33.78	36.23	38.62	21.52	22.51	24.40
1457.8	33.12	36.01	37.71	21.45	22.61	24.29
1498.3	32.26	35.09	37.23	22.72	23.32	24.81
1538.8	32.48	35.32	38.03	22.92	23.64	25.24
1579.3	32.51	35.02	38.19	23.36	23.80	25.40
1640.1	32.74	35.35	38.68	23.70	24.29	26.07

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	49.74	49.49	48.93
50.6	80.6	36.31	36.64	36.64
91.1	121.1	31.40	31.86	32.43
131.6	161.6	28.93	29.50	29.87
172.1	202.1	27.36	27.91	28.35
212.6	242.6	26.28	26.95	27.27
253.1	283.1	25.61	26.05	26.38
293.6	323.6	25.20	25.97	26.14
334.2	364.2	24.86	25.89	26.46
374.7	404.7	24.62	25.70	26.47
415.2	445.2	25.07	25.67	26.46
455.7	485.7	25.82	26.58	26.78
496.2	526.2	26.27	27.06	27.49
536.7	566.7	26.06	26.54	27.25
577.2	607.2	24.82	25.31	25.98
617.7	647.7	22.79	23.20	23.76
658.2	688.2	21.28	21.40	21.77
698.7	728.7	20.15	20.00	20.11
739.2	769.2	19.33	18.98	18.79
779.7	809.7	18.73	18.14	17.82
820.2	850.2	18.37	17.55	17.13
860.7	890.7	18.05	17.36	16.87
901.2	931.2	17.73	17.30	16.83
941.7	971.7	17.38	17.06	16.66
982.3	1012.3	17.14	16.88	16.58
1022.8	1052.8	16.82	16.57	16.38
1063.3	1093.3	16.71	16.53	16.37
1103.8	1133.8	16.72	16.64	16.56
1144.3	1174.3	16.69	16.74	16.78
1184.8	1214.8	16.43	16.65	16.79
1225.3	1255.3	15.97	16.34	16.56
1265.8	1295.8	15.41	15.96	16.07
1306.3	1336.3	14.93	15.42	15.17
1346.8	1376.8	14.42	14.62	14.15
1387.3	1417.3	13.86	13.57	13.08
1427.8	1457.8	13.38	12.63	12.13
1468.3	1498.3	13.34	12.28	11.59
1508.8	1538.8	12.74	11.37	10.66
1549.3	1579.3	12.33	10.86	10.10
1610.1	1640.1	11.86	10.17	9.38



Frequency Mixer

TFM-2H+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=1000MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+14	+17	+20		+14	+17	+20		+14	+17	+20
10.1	40.1	1.29	1.13	1.09	40.1	1.10	1.50	2.27	10.0	3.10	2.52	2.00
50.6	80.6	1.24	1.09	1.01	80.6	1.09	1.41	2.04	30.0	3.07	2.49	1.96
91.1	121.1	1.24	1.09	1.06	121.1	1.11	1.44	2.14	50.0	3.13	2.53	2.02
131.6	161.6	1.21	1.08	1.08	161.6	1.11	1.42	2.08	70.0	3.16	2.56	2.04
172.1	202.1	1.21	1.11	1.11	202.1	1.12	1.41	2.06	90.0	3.07	2.48	1.98
212.6	242.6	1.22	1.12	1.13	242.6	1.13	1.44	2.12	110.0	3.08	2.49	1.98
253.1	283.1	1.21	1.13	1.15	283.1	1.14	1.43	2.05	130.0	3.14	2.56	2.05
293.6	323.6	1.22	1.15	1.17	323.6	1.17	1.47	2.12	150.0	3.11	2.54	2.03
334.2	364.2	1.23	1.17	1.19	364.2	1.19	1.48	2.09	170.0	3.07	2.50	2.00
374.7	404.7	1.26	1.19	1.22	404.7	1.21	1.51	2.11	190.0	3.09	2.53	2.04
415.2	445.2	1.26	1.19	1.21	445.2	1.23	1.53	2.11	210.0	3.08	2.52	2.03
455.7	485.7	1.27	1.20	1.21	485.7	1.27	1.55	2.12	230.0	3.04	2.50	2.02
496.2	526.2	1.29	1.23	1.24	526.2	1.29	1.59	2.14	250.0	3.12	2.57	2.09
536.7	566.7	1.31	1.25	1.27	566.7	1.31	1.61	2.13	270.0	3.08	2.55	2.07
577.2	607.2	1.32	1.27	1.28	607.2	1.34	1.65	2.18	290.0	3.00	2.48	2.01
617.7	647.7	1.31	1.28	1.29	647.7	1.38	1.65	2.16	310.0	3.05	2.52	2.06
658.2	688.2	1.30	1.27	1.28	688.2	1.42	1.68	2.17	330.0	3.11	2.59	2.12
698.7	728.7	1.29	1.25	1.27	728.7	1.47	1.71	2.17	350.0	3.04	2.53	2.08
739.2	769.2	1.28	1.22	1.24	769.2	1.51	1.73	2.15	370.0	3.02	2.52	2.07
779.7	809.7	1.30	1.20	1.22	809.7	1.54	1.79	2.20	390.0	3.07	2.57	2.12
820.2	850.2	1.33	1.20	1.20	850.2	1.57	1.83	2.23	430.0	3.01	2.53	2.09
860.7	890.7	1.38	1.25	1.23	890.7	1.59	1.87	2.28	450.0	3.07	2.59	2.15
901.2	931.2	1.44	1.34	1.29	931.2	1.61	1.90	2.31	490.0	2.93	2.48	2.06
941.7	971.7	1.54	1.45	1.40	971.7	1.65	1.91	2.32	510.0	3.01	2.55	2.13
982.3	1012.3	1.66	1.57	1.52	1012.3	1.69	1.93	2.33	550.0	2.97	2.52	2.12
1022.8	1052.8	1.81	1.71	1.66	1052.8	1.73	1.95	2.33	570.0	2.93	2.49	2.09
1063.3	1093.3	1.97	1.87	1.80	1093.3	1.77	1.96	2.33	610.0	3.03	2.58	2.17
1103.8	1133.8	2.12	2.03	1.94	1133.8	1.81	1.98	2.34	630.0	2.96	2.53	2.13
1144.3	1174.3	2.29	2.19	2.08	1174.3	1.86	1.98	2.32	670.0	2.98	2.54	2.14
1184.8	1214.8	2.41	2.31	2.20	1214.8	1.90	1.99	2.31	690.0	2.94	2.51	2.11
1225.3	1255.3	2.52	2.40	2.28	1255.3	1.95	2.00	2.29	730.0	3.02	2.59	2.19
1265.8	1295.8	2.61	2.48	2.32	1295.8	2.02	1.99	2.26	750.0	2.91	2.49	2.09
1306.3	1336.3	2.67	2.52	2.36	1336.3	2.07	2.00	2.29	790.0	2.97	2.56	2.16
1346.8	1376.8	2.72	2.55	2.42	1376.8	2.16	2.03	2.30	810.0	2.95	2.53	2.13
1387.3	1417.3	2.74	2.57	2.45	1417.3	2.28	2.10	2.37	850.0	2.92	2.52	2.13
1427.8	1457.8	2.75	2.61	2.50	1457.8	2.39	2.21	2.44	870.0	2.90	2.50	2.12
1468.3	1498.3	2.76	2.62	2.52	1498.3	2.61	2.32	2.49	910.0	2.89	2.50	2.12
1508.8	1538.8	2.77	2.65	2.56	1538.8	2.77	2.44	2.59	930.0	2.90	2.52	2.13
1549.3	1579.3	2.80	2.64	2.57	1579.3	3.04	2.59	2.65	970.0	2.77	2.39	2.03
1610.1	1640.1	2.82	2.59	2.54	1640.1	3.33	2.81	2.80	990.0	2.89	2.52	2.15

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	11	21	13	44	31	38	29	42	43	55
1	-	19	+0	32	13	32	33	35	36	31	37	43
2	66	59	48	59	48	60	47	57	63	65	58	58
3	>90	68	63	69	57	65	52	61	54	73	65	76
4	>90	>82	81	>82	>82	>82	>82	>82	80	>82	>82	>82
5	>90	>82	>82	>82	>82	>82	>82	>82	79	>82	>82	>82
6	>90	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82
7	>90	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82
8	>90	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82
9	>90	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82
10	>90	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82	>82
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 500 MHz; -1.00 dBm.
 LO IN: 530 MHz; +17.00 dBm
 IF OUT: 30 MHz; -7.76 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	21	31	26	57	44	49	44	46	60	68
1	-	20	+0	30	13	35	29	40	44	37	51	47
2	46	57	42	57	40	57	39	54	54	63	51	78
3	71	60	49	65	51	51	42	53	46	53	52	47
4	>90	69	58	62	57	61	58	60	58	63	71	66
5	>90	68	58	58	53	61	50	57	48	56	54	87
6	>90	86	78	76	75	74	70	71	66	69	65	76
7	>90	75	>92	88	69	70	70	68	67	68	63	67
8	>90	89	>92	>92	>92	88	86	80	76	77	75	75
9	>90	>92	>92	>92	>92	88	81	79	79	77	78	76
10	>90	>92	>92	>92	>92	>92	>92	90	90	84	84	80
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 500 MHz; 9.00 dBm.
 LO IN: 530 MHz; +17.00 dBm
 IF OUT: 30 MHz; 2.31 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.