

Frequency Mixer

SYM-ED8965F/1

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=330MHz (dB)		
		@LO (dBm)		
		+16	+19	+22
70.1	400.1	12.62	12.06	11.45
100.1	430.1	10.00	9.59	9.16
130.1	460.1	8.94	8.64	8.38
160.1	490.1	8.64	8.39	8.24
190.1	520.1	8.24	8.07	7.98
220.1	550.1	7.80	7.61	7.45
250.1	580.1	7.58	7.34	7.09
280.1	610.1	7.19	6.88	6.57
310.1	640.1	7.00	6.65	6.32
340.1	670.1	6.91	6.59	6.27
380.1	710.1	7.13	6.88	6.64
410.1	740.1	7.22	6.97	6.76
450.1	780.1	7.20	6.89	6.65
480.1	810.1	7.30	6.91	6.56
520.1	850.1	7.28	6.82	6.39
550.1	880.1	7.43	6.94	6.47
590.1	920.1	7.40	6.84	6.30
620.1	950.1	7.40	6.81	6.23
660.1	990.1	7.51	6.88	6.25
690.1	1020.1	7.42	6.77	6.14
730.1	1060.1	7.55	6.91	6.27
760.1	1090.1	7.79	7.20	6.57
800.1	1130.1	7.87	7.39	6.89
830.1	1160.1	7.81	7.35	6.93
870.1	1200.1	7.69	7.20	6.76
900.1	1230.1	7.71	7.21	6.76
940.1	1270.1	7.99	7.48	7.02
970.1	1300.1	8.16	7.70	7.27
1010.1	1340.1	8.31	7.91	7.56
1040.1	1370.1	8.48	8.12	7.83
1080.1	1410.1	8.77	8.49	8.29
1110.1	1440.1	9.06	8.82	8.67
1150.1	1480.1	9.40	9.23	9.12
1180.1	1510.1	9.67	9.54	9.45
1220.1	1550.1	9.97	9.84	9.69
1250.1	1580.1	10.00	9.85	9.66
1290.1	1620.1	10.12	9.97	9.76
1320.1	1650.1	10.12	9.99	9.81
1360.1	1690.1	10.35	10.28	10.19
1390.1	1720.1	10.88	10.85	10.84

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+16	+19	+22
70.1	400.1	19.71	22.11	23.80
100.1	430.1	17.11	18.73	20.70
130.1	460.1	20.06	22.37	25.51
160.1	490.1	22.54	25.10	28.74
190.1	520.1	26.30	29.79	34.85
220.1	550.1	27.67	34.95	34.91
250.1	580.1	29.74	33.33	30.81
280.1	610.1	24.66	26.01	27.19
310.1	640.1	22.02	23.97	26.18
340.1	670.1	20.38	22.57	25.44
380.1	710.1	19.40	21.51	24.32
410.1	740.1	19.87	21.89	24.75
450.1	780.1	20.70	22.81	25.89
480.1	810.1	21.32	23.52	26.69
520.1	850.1	21.60	23.94	27.32
550.1	880.1	21.84	24.33	27.65
590.1	920.1	22.52	25.13	28.04
620.1	950.1	22.55	25.15	28.04
660.1	990.1	22.87	25.74	28.51
690.1	1020.1	23.13	26.35	29.76
730.1	1060.1	23.87	27.62	32.05
760.1	1090.1	24.32	28.19	32.23
800.1	1130.1	24.50	28.20	31.54
830.1	1160.1	24.09	27.64	30.88
870.1	1200.1	23.66	27.08	30.09
900.1	1230.1	23.69	26.97	30.35
940.1	1270.1	23.70	26.88	30.18
970.1	1300.1	24.08	27.27	30.73
1010.1	1340.1	24.52	27.63	31.62
1040.1	1370.1	24.81	27.86	32.45
1080.1	1410.1	25.56	28.95	33.84
1110.1	1440.1	26.24	29.21	33.66
1150.1	1480.1	27.54	30.37	34.66
1180.1	1510.1	29.01	31.72	35.67
1220.1	1550.1	30.30	30.89	33.42
1250.1	1580.1	30.37	29.87	32.13
1290.1	1620.1	28.74	28.20	30.25
1320.1	1650.1	27.31	27.31	29.13
1360.1	1690.1	26.00	26.70	28.71
1390.1	1720.1	25.48	26.59	28.66

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+20dBm (dB)		
		@LO (dBm)		
		+16	+19	+22
70.1	400.1	0.01	0.40	0.12
100.1	430.1	1.07	1.04	0.69
130.1	460.1	1.17	1.06	0.70
160.1	490.1	1.25	0.90	0.63
190.1	520.1	1.51	0.89	0.50
220.1	550.1	1.57	1.09	0.40
250.1	580.1	1.74	1.09	0.32
280.1	610.1	1.97	1.27	0.37
310.1	640.1	1.75	0.99	0.34
340.1	670.1	2.10	1.37	0.24
380.1	710.1	1.41	0.89	0.15
410.1	740.1	1.15	0.92	0.22
450.1	780.1	1.04	0.81	0.30
480.1	810.1	0.74	0.64	0.26
520.1	850.1	0.50	0.67	0.33
550.1	880.1	0.42	0.57	0.32
590.1	920.1	0.31	0.33	0.33
620.1	950.1	0.30	0.40	0.33
660.1	990.1	0.23	0.44	0.31
690.1	1020.1	0.23	0.60	0.32
730.1	1060.1	0.13	0.45	0.25
760.1	1090.1	0.09	0.19	0.21
800.1	1130.1	0.21	0.44	0.23
830.1	1160.1	0.40	0.51	0.30
870.1	1200.1	0.54	0.65	0.38
900.1	1230.1	0.52	0.57	0.38
940.1	1270.1	0.46	0.55	0.37
970.1	1300.1	0.49	0.60	0.36
1010.1	1340.1	0.54	0.71	0.40
1040.1	1370.1	0.63	0.72	0.45
1080.1	1410.1	0.71	0.81	0.49
1110.1	1440.1	0.75	0.77	0.50
1150.1	1480.1	0.79	0.88	0.54
1180.1	1510.1	0.75	0.60	0.53
1220.1	1550.1	0.83	0.62	0.64
1250.1	1580.1	0.91	0.60	0.66
1290.1	1620.1	1.09	0.71	0.62
1320.1	1650.1	1.43	0.88	0.81
1360.1	1690.1	1.58	0.96	1.10
1390.1	1720.1	1.72	0.98	0.75

REV. X2

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Frequency Mixer

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=880.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=850.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=910.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+19			+19			+19
480.0	400.1	11.35	10.0	860.1	8.11	510.0	400.1	11.26
457.3	422.8	9.74	30.0	880.1	8.09	500.0	410.1	10.77
434.5	445.6	8.69	50.0	900.1	7.96	490.0	420.1	10.06
411.8	468.3	8.38	70.0	920.1	7.85	480.0	430.1	9.60
389.0	491.1	8.23	90.0	940.1	7.83	470.0	440.1	8.97
366.3	513.8	7.96	110.0	960.1	7.72	460.0	450.1	8.59
343.5	536.6	7.82	130.0	980.1	7.57	450.0	460.1	8.14
320.8	559.3	7.70	150.0	1000.1	7.40	440.0	470.1	8.09
298.1	582.0	7.75	170.0	1020.1	7.28	430.0	480.1	7.90
275.3	604.8	7.70	190.0	1040.1	7.27	420.0	490.1	7.95
252.6	627.5	7.58	210.0	1060.1	7.23	410.0	500.1	7.92
229.8	650.3	7.46	230.0	1080.1	7.24	400.0	510.1	7.87
207.1	673.0	7.37	250.0	1100.1	7.21	390.0	520.1	7.82
184.4	695.7	7.59	270.0	1120.1	7.23	380.0	530.1	7.74
161.6	718.5	7.62	290.0	1140.1	7.23	370.0	540.1	7.69
138.9	741.2	7.76	310.0	1160.1	7.24	360.0	550.1	7.64
116.1	764.0	7.84	330.0	1180.1	7.26	350.0	560.1	7.58
93.4	786.7	7.89	350.0	1200.1	7.35	340.0	570.1	7.62
70.6	809.5	7.89	370.0	1220.1	7.48	320.0	590.1	7.66
47.9	832.2	7.92	390.0	1240.1	7.59	310.0	600.1	7.69
25.2	854.9	7.94	410.0	1260.1	7.74	290.0	620.1	7.60
10.0	890.1	8.04	430.0	1280.1	7.84	280.0	630.1	7.56
58.9	939.0	7.84	450.0	1300.1	7.76	260.0	650.1	7.44
95.6	975.7	7.72	470.0	1320.1	7.65	250.0	660.1	7.42
144.4	1024.5	7.43	490.0	1340.1	7.55	230.0	680.1	7.46
181.1	1061.2	7.28	510.0	1360.1	7.46	220.0	690.1	7.35
230.0	1110.1	7.17	530.0	1380.1	7.46	200.0	710.1	7.53
266.7	1146.8	7.02	550.0	1400.1	7.47	190.0	720.1	7.55
315.6	1195.7	7.10	570.0	1420.1	7.53	170.0	740.1	7.62
352.2	1232.3	7.36	590.0	1440.1	7.65	160.0	750.1	7.64
401.1	1281.2	7.70	610.0	1460.1	7.81	140.0	770.1	7.76
437.8	1317.9	7.70	630.0	1480.1	7.98	130.0	780.1	7.79
486.7	1366.8	7.48	650.0	1500.1	8.16	110.0	800.1	7.82
523.3	1403.4	7.37	670.0	1520.1	8.40	100.0	810.1	7.87
572.2	1452.3	7.56	690.0	1540.1	8.70	80.0	830.1	7.86
608.9	1489.0	7.77	710.0	1560.1	9.02	70.0	840.1	7.89
657.8	1537.9	8.27	730.0	1580.1	9.38	50.0	860.1	7.94
694.4	1574.5	8.78	760.0	1610.1	10.04	40.0	870.1	7.93
743.3	1623.4	9.68	780.0	1630.1	10.59	20.0	890.1	8.01
780.0	1660.1	10.60	810.0	1660.1	11.27	10.0	900.1	7.93

Frequency Mixer

SYM-ED8965F/1

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+16	+19	+22	+16	+19	+22
400.1	49.02	49.22	51.91	43.18	43.89	44.45
430.1	50.56	50.40	52.91	42.56	43.18	44.12
460.1	48.36	47.88	50.01	40.81	41.17	42.09
490.1	48.30	48.08	50.26	39.56	39.88	40.82
520.1	46.54	46.55	48.38	38.33	38.57	39.35
550.1	46.65	46.71	49.24	37.20	37.47	37.96
580.1	46.17	46.29	48.78	36.04	36.28	36.56
610.1	45.81	45.78	47.79	34.78	34.93	34.93
640.1	46.23	46.16	47.38	33.57	33.73	33.71
670.1	46.44	46.45	47.92	32.59	32.87	33.16
710.1	46.45	46.51	48.29	31.63	32.27	33.18
740.1	46.72	46.64	48.32	31.12	31.98	33.24
780.1	46.99	46.77	48.05	30.07	30.94	32.37
810.1	47.41	47.05	48.39	29.78	30.74	32.30
850.1	47.22	46.94	48.66	30.44	31.45	33.00
880.1	46.35	45.85	47.37	31.33	32.21	33.52
920.1	46.57	46.09	46.80	32.91	33.48	34.44
950.1	46.82	46.56	47.16	35.05	35.63	36.45
990.1	45.16	45.31	47.05	39.65	40.90	41.99
1020.1	42.66	42.31	43.65	41.54	42.44	42.51
1060.1	44.35	44.09	45.20	39.69	40.19	40.31
1090.1	46.89	46.59	47.30	39.06	39.51	39.67
1130.1	49.23	48.85	49.27	38.83	39.17	39.35
1160.1	49.38	48.84	48.73	38.86	39.12	39.26
1200.1	49.26	48.47	47.67	38.95	39.12	39.21
1230.1	49.86	49.30	47.78	38.90	39.03	39.11
1270.1	52.26	52.57	54.02	38.86	38.93	39.04
1300.1	50.07	50.35	57.18	38.96	39.02	39.12
1340.1	47.98	48.12	53.96	39.23	39.28	39.41
1370.1	47.10	47.16	52.09	39.55	39.55	39.72
1410.1	46.04	46.05	49.99	40.14	40.16	40.33
1440.1	45.37	45.43	49.11	40.64	40.62	40.81
1480.1	44.46	44.67	47.90	41.48	41.48	41.66
1510.1	44.03	44.32	47.49	42.28	42.30	42.45
1550.1	43.35	43.73	46.76	43.71	43.67	43.88
1580.1	43.08	43.43	46.39	44.94	44.91	45.04
1620.1	43.47	43.81	46.62	46.52	46.50	46.62
1650.1	43.99	44.34	47.24	47.36	47.34	47.52
1690.1	44.82	45.11	47.90	47.93	48.04	48.16
1720.1	45.52	45.83	48.56	48.20	48.33	48.44

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+16	+19	+22
70.1	400.1	38.53	39.25	30.63
100.1	430.1	34.37	35.37	29.82
130.1	460.1	28.95	29.83	28.12
160.1	490.1	27.64	28.29	27.39
190.1	520.1	25.50	25.76	26.20
220.1	550.1	24.28	24.45	25.76
250.1	580.1	25.30	25.53	26.59
280.1	610.1	25.49	25.47	26.46
310.1	640.1	26.60	26.39	27.63
340.1	670.1	28.36	27.85	29.94
380.1	710.1	31.84	31.02	34.05
410.1	740.1	33.97	33.13	37.06
450.1	780.1	36.53	35.90	40.11
480.1	810.1	36.27	34.74	37.38
520.1	850.1	39.85	37.72	40.56
550.1	880.1	43.46	40.96	43.35
590.1	920.1	46.35	42.88	44.53
620.1	950.1	51.88	45.79	46.18
660.1	990.1	54.47	54.68	50.62
690.1	1020.1	47.91	49.77	49.66
730.1	1060.1	48.26	52.90	55.53
760.1	1090.1	45.58	47.36	50.13
800.1	1130.1	45.11	45.20	46.21
830.1	1160.1	44.46	44.46	45.27
870.1	1200.1	41.69	41.50	42.63
900.1	1230.1	40.07	39.54	40.58
940.1	1270.1	38.07	37.21	38.06
970.1	1300.1	36.88	35.95	36.58
1010.1	1340.1	35.50	34.61	35.28
1040.1	1370.1	34.56	33.73	34.49
1080.1	1410.1	33.49	32.74	33.65
1110.1	1440.1	32.86	32.18	33.18
1150.1	1480.1	32.20	31.64	32.82
1180.1	1510.1	31.86	31.39	32.68
1220.1	1550.1	31.66	31.31	32.64
1250.1	1580.1	31.60	31.31	32.63
1290.1	1620.1	31.65	31.46	32.73
1320.1	1650.1	31.44	31.30	32.58
1360.1	1690.1	30.58	30.46	31.84
1390.1	1720.1	29.77	29.68	31.09

Frequency Mixer

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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=1290MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+16	+19	+22		+16	+19	+22		+16	+19	+22
70.1	400.1	5.95	5.99	1.28	400.1	9.69	9.79	9.96	10.1	1.31	1.44	1.51
100.1	430.1	3.74	3.80	1.31	430.1	10.50	10.62	10.69	30.1	1.31	1.43	1.51
130.1	460.1	2.86	2.99	1.32	460.1	10.75	10.75	10.82	50.1	1.39	1.50	1.58
160.1	490.1	2.40	2.56	1.35	490.1	10.75	10.75	10.75	70.1	1.46	1.55	1.64
190.1	520.1	2.18	2.37	1.36	520.1	10.37	10.31	10.25	90.1	1.54	1.63	1.73
220.1	550.1	1.90	2.07	1.47	550.1	9.96	9.96	9.85	110.1	1.69	1.76	1.86
250.1	580.1	1.57	1.66	1.64	580.1	9.48	9.48	9.38	130.1	1.74	1.80	1.93
280.1	610.1	1.24	1.25	1.84	610.1	8.86	8.77	8.68	150.1	1.87	1.92	2.07
310.1	640.1	1.14	1.08	1.92	640.1	8.20	8.12	7.97	170.1	1.94	1.97	2.16
340.1	670.1	1.44	1.41	2.03	670.1	7.60	7.53	7.41	190.1	2.01	2.03	2.25
380.1	710.1	1.74	1.78	1.94	710.1	6.68	6.63	6.49	210.1	2.13	2.15	2.38
410.1	740.1	1.89	1.94	1.80	740.1	6.07	6.01	5.89	230.1	2.17	2.17	2.42
450.1	780.1	1.99	2.01	1.76	780.1	5.33	5.28	5.17	250.1	2.22	2.22	2.48
480.1	810.1	2.11	2.10	1.79	810.1	4.83	4.77	4.66	270.1	2.31	2.29	2.56
520.1	850.1	2.32	2.29	1.84	850.1	4.23	4.19	4.09	290.1	2.32	2.30	2.56
550.1	880.1	2.39	2.37	1.85	880.1	3.85	3.80	3.72	310.1	2.43	2.40	2.62
590.1	920.1	2.42	2.39	1.81	920.1	3.39	3.35	3.16	330.1	2.39	2.35	2.55
620.1	950.1	2.44	2.40	1.80	950.1	3.10	3.06	2.88	350.1	2.37	2.33	2.48
660.1	990.1	2.42	2.37	1.80	990.1	2.74	2.70	2.55	370.1	2.42	2.37	2.47
690.1	1020.1	2.34	2.29	1.77	1020.1	2.55	2.52	2.45	390.1	2.33	2.28	2.33
730.1	1060.1	2.29	2.23	1.74	1060.1	2.42	2.41	2.38	410.1	2.30	2.25	2.22
760.1	1090.1	2.25	2.21	1.74	1090.1	2.35	2.35	2.33	430.1	2.18	2.12	2.07
800.1	1130.1	2.07	2.06	1.65	1130.1	2.30	2.32	2.33	450.1	2.11	2.05	1.94
830.1	1160.1	1.89	1.87	1.54	1160.1	2.31	2.34	2.35	470.1	2.07	2.00	1.82
870.1	1200.1	1.70	1.63	1.50	1200.1	2.38	2.42	2.46	490.1	1.90	1.82	1.63
900.1	1230.1	1.59	1.48	1.53	1230.1	2.47	2.52	2.57	510.1	1.83	1.73	1.50
940.1	1270.1	1.52	1.36	1.64	1270.1	2.65	2.70	2.76	530.1	1.76	1.65	1.40
970.1	1300.1	1.50	1.34	1.79	1300.1	2.83	2.90	2.99	550.1	1.68	1.55	1.28
1010.1	1340.1	1.56	1.44	2.05	1340.1	3.11	3.18	3.26	570.1	1.65	1.51	1.24
1040.1	1370.1	1.68	1.59	2.26	1370.1	3.33	3.41	3.50	590.1	1.60	1.46	1.28
1080.1	1410.1	1.89	1.88	2.62	1410.1	3.67	3.77	3.89	610.1	1.61	1.47	1.37
1110.1	1440.1	2.09	2.13	2.87	1440.1	3.94	4.02	4.10	630.1	1.70	1.57	1.52
1150.1	1480.1	2.42	2.52	3.17	1480.1	4.31	4.41	4.54	650.1	1.75	1.65	1.72
1180.1	1510.1	2.69	2.85	3.42	1510.1	4.59	4.68	4.80	670.1	1.88	1.81	1.94
1220.1	1550.1	2.95	3.13	3.52	1550.1	4.93	5.00	5.07	690.1	2.07	2.04	2.24
1250.1	1580.1	3.08	3.26	3.54	1580.1	5.23	5.33	5.46	710.1	2.25	2.26	2.54
1290.1	1620.1	3.08	3.26	3.54	1620.1	5.59	5.66	5.70	730.1	2.49	2.54	2.87
1320.1	1650.1	3.00	3.18	3.48	1650.1	5.85	5.91	5.93	750.1	2.76	2.86	3.30
1360.1	1690.1	3.08	3.32	3.65	1690.1	6.24	6.30	6.39	770.1	3.08	3.23	3.75
1390.1	1720.1	3.25	3.54	3.86	1720.1	6.39	6.44	6.39	790.1	3.54	3.75	4.29

REV. X2

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	13	29	45	19	36	20	26	40	37	50
1	-	34	+0	43	24	52	46	50	45	54	41	62
2	71	83	59	69	76	71	77	58	66	66	77	59
3	>100	>93	83	79	77	92	>93	>93	>93	83	85	80
4	>100	90	92	>93	72	>93	92	89	>93	>93	>93	>93
5	>100	>93	>93	>93	93	92	>93	>93	>93	>93	>93	>93
6	>100	>93	>93	>93	>93	93	91	>93	>93	>93	>93	>93
7	>100	92	>93	90	>93	>93	71	>93	91	90	>93	92
8	>100	84	>93	>93	>93	92	77	78	83	92	83	81
9	>100	65	65	58	76	71	76	69	59	82	60	68
10	>100	54	45	50	46	52	24	43	+0	34	20	33
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 880 MHz; 0.00 dBm.
LO IN: 1210 MHz; +19.00 dBm
IF OUT: 330 MHz; -7.03 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	23	38	54	30	47	30	37	45	49	59
1	-	34	+0	43	24	52	47	53	47	58	42	62
2	52	72	50	55	66	65	73	53	60	59	71	55
3	85	77	62	61	53	72	64	75	73	67	66	74
4	>100	80	79	80	60	87	81	72	82	67	69	72
5	>100	96	98	102	77	80	101	93	102	80	96	82
6	>100	80	103	91	103	80	77	99	97	95	98	80
7	>100	67	82	72	82	88	61	81	79	80	93	67
8	>100	67	73	74	64	72	53	61	61	77	56	72
9	>100	59	60	53	72	65	67	55	50	72	50	55
10	>100	58	47	53	47	52	24	43	+0	34	20	32
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 880 MHz; 10.00 dBm.
LO IN: 1210 MHz; +19.00 dBm
IF OUT: 330 MHz; 2.89 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.