

Frequency Mixer

SYM-25DHW+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=70MHz (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	80.1	6.41	5.89	5.73
100.1	170.1	6.90	6.38	6.13
190.1	260.1	6.74	6.25	6.01
280.1	350.1	6.71	6.23	5.97
370.1	440.1	6.95	6.35	6.08
460.1	530.1	7.06	6.40	6.12
550.1	620.1	7.06	6.39	6.14
640.1	710.1	7.04	6.41	6.16
730.1	800.1	7.05	6.43	6.18
820.1	890.1	7.05	6.48	6.23
910.1	980.1	7.08	6.53	6.29
1000.1	1070.1	7.07	6.54	6.30
1090.1	1160.1	7.14	6.56	6.31
1180.1	1250.1	7.23	6.57	6.30
1270.1	1340.1	7.32	6.62	6.33
1360.1	1430.1	7.41	6.71	6.40
1450.1	1520.1	7.50	6.78	6.44
1540.1	1610.1	7.63	6.86	6.51
1630.1	1700.1	7.75	6.97	6.60
1720.1	1790.1	7.93	7.12	6.76
1810.1	1880.1	8.16	7.35	6.97
1900.1	1970.1	8.38	7.58	7.14
1990.1	2060.1	8.67	7.83	7.36
2080.1	2150.1	8.95	8.06	7.54
2170.1	2240.1	9.02	8.11	7.53
2260.1	2330.1	8.98	8.09	7.49
2350.1	2420.1	8.85	8.01	7.41
2440.1	2510.1	8.66	7.86	7.34
2530.1	2600.1	8.50	7.69	7.27
2620.1	2690.1	8.38	7.63	7.23
2710.1	2780.1	8.26	7.64	7.24
2800.1	2870.1	8.28	7.68	7.28
2890.1	2960.1	8.40	7.81	7.39
2980.1	3050.1	8.56	7.97	7.57
3080.1	3150.1	8.75	8.16	7.74
3170.1	3240.1	9.00	8.41	7.99
3270.1	3340.1	9.35	8.70	8.27
3360.1	3430.1	9.72	9.04	8.59
3460.1	3530.1	10.27	9.50	9.02
3550.1	3620.1	10.85	9.96	9.41

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+14	+17	+20
10.1	80.1	28.07	29.60	29.95
100.1	170.1	26.53	28.19	29.64
190.1	260.1	25.68	27.32	27.14
280.1	350.1	25.91	25.66	25.56
370.1	440.1	24.77	24.40	26.01
460.1	530.1	23.17	23.71	26.54
550.1	620.1	22.55	24.10	27.04
640.1	710.1	22.23	24.29	29.45
730.1	800.1	22.80	25.61	31.90
820.1	890.1	22.69	25.61	31.80
910.1	980.1	23.40	26.53	33.71
1000.1	1070.1	27.21	33.95	30.92
1090.1	1160.1	33.23	32.42	30.09
1180.1	1250.1	34.71	31.84	29.74
1270.1	1340.1	29.63	32.90	30.86
1360.1	1430.1	26.54	30.94	31.43
1450.1	1520.1	27.05	27.92	28.07
1540.1	1610.1	26.21	33.52	30.40
1630.1	1700.1	24.08	30.60	34.91
1720.1	1790.1	22.78	28.19	40.12
1810.1	1880.1	21.97	28.58	34.97
1900.1	1970.1	21.61	29.78	30.45
1990.1	2060.1	20.95	27.68	31.60
2080.1	2150.1	21.49	29.54	27.99
2170.1	2240.1	24.10	26.87	24.42
2260.1	2330.1	29.60	24.30	23.04
2350.1	2420.1	25.38	22.94	22.43
2440.1	2510.1	22.78	22.06	22.64
2530.1	2600.1	21.79	21.77	22.60
2620.1	2690.1	21.20	21.63	22.63
2710.1	2780.1	20.65	21.00	21.71
2800.1	2870.1	19.75	20.29	21.16
2890.1	2960.1	18.99	19.89	20.68
2980.1	3050.1	18.34	19.50	20.27
3080.1	3150.1	18.06	19.62	20.58
3170.1	3240.1	18.46	20.12	21.16
3270.1	3340.1	18.47	20.29	21.98
3360.1	3430.1	18.91	20.78	22.76
3460.1	3530.1	19.41	21.38	23.33
3550.1	3620.1	20.20	21.87	24.14

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+14dBm (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	80.1	1.24	0.63	0.46
100.1	170.1	1.00	0.57	0.36
190.1	260.1	1.02	0.55	0.35
280.1	350.1	1.05	0.54	0.36
370.1	440.1	0.96	0.57	0.37
460.1	530.1	0.91	0.57	0.35
550.1	620.1	0.94	0.55	0.33
640.1	710.1	0.95	0.51	0.29
730.1	800.1	0.95	0.51	0.33
820.1	890.1	0.92	0.47	0.31
910.1	980.1	0.88	0.46	0.31
1000.1	1070.1	0.85	0.41	0.29
1090.1	1160.1	0.80	0.39	0.28
1180.1	1250.1	0.78	0.41	0.30
1270.1	1340.1	0.84	0.43	0.29
1360.1	1430.1	0.91	0.44	0.26
1450.1	1520.1	1.02	0.48	0.27
1540.1	1610.1	1.12	0.52	0.32
1630.1	1700.1	1.19	0.55	0.33
1720.1	1790.1	1.19	0.58	0.38
1810.1	1880.1	1.18	0.63	0.43
1900.1	1970.1	1.13	0.65	0.49
1990.1	2060.1	1.04	0.64	0.52
2080.1	2150.1	0.91	0.57	0.50
2170.1	2240.1	0.99	0.72	0.65
2260.1	2330.1	1.04	0.84	0.81
2350.1	2420.1	1.14	0.93	0.88
2440.1	2510.1	1.36	1.08	0.94
2530.1	2600.1	1.55	1.15	1.01
2620.1	2690.1	1.74	1.24	1.05
2710.1	2780.1	1.79	1.27	1.09
2800.1	2870.1	2.03	1.40	1.17
2890.1	2960.1	2.03	1.34	1.13
2980.1	3050.1	1.92	1.20	0.98
3080.1	3150.1	2.10	1.28	0.97
3170.1	3240.1	2.00	1.14	0.84
3270.1	3340.1	2.02	1.16	0.82
3360.1	3430.1	1.87	1.06	0.73
3460.1	3530.1	1.82	1.02	0.70
3550.1	3620.1	1.68	0.95	0.65

Frequency Mixer

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1290.1MHz (dB)
		@LO (dBm) +17
1280.0	10.1	6.53
1217.1	73.0	6.73
1154.3	135.8	6.78
1091.4	198.7	6.87
1028.5	261.6	7.03
965.6	324.5	7.17
902.8	387.3	7.12
839.9	450.2	7.13
777.0	513.1	7.00
714.2	575.9	6.79
651.3	638.8	6.80
588.4	701.7	6.80
525.5	764.6	6.73
462.7	827.4	6.76
399.8	890.3	6.82
336.9	953.2	6.72
274.1	1016.0	6.73
211.2	1078.9	6.73
148.3	1141.8	6.65
85.4	1204.7	6.67
22.6	1267.5	6.76
92.9	1383.0	6.71
231.0	1521.1	6.65
369.1	1659.2	6.52
534.9	1825.0	6.35
673.0	1963.1	6.48
838.7	2128.8	6.98
976.8	2266.9	7.35
1142.6	2432.7	7.58
1280.7	2570.8	7.40
1446.4	2736.5	7.36
1584.6	2874.7	7.51
1750.3	3040.4	7.84
1888.4	3178.5	8.18
2054.2	3344.3	8.52
2192.3	3482.4	8.87
2358.0	3648.1	9.08
2496.1	3786.2	9.37
2661.9	3952.0	9.72
2800.0	4090.1	10.12

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=80.1MHz (dB)
		@LO (dBm) +17
10.0	90.1	6.60
90.0	170.1	6.41
170.0	250.1	6.30
250.0	330.1	6.31
330.0	410.1	6.17
410.0	490.1	6.07
490.0	570.1	6.13
590.0	670.1	5.97
670.0	750.1	5.94
770.0	850.1	5.97
850.0	930.1	5.94
950.0	1030.1	5.97
1030.0	1110.1	6.02
1130.0	1210.1	5.98
1210.0	1290.1	6.00
1310.0	1390.1	6.07
1390.0	1470.1	6.15
1490.0	1570.1	6.45
1570.0	1650.1	6.62
1670.0	1750.1	6.76
1750.0	1830.1	6.85
1850.0	1930.1	6.82
1930.0	2010.1	6.84
2030.0	2110.1	6.86
2110.0	2190.1	6.97
2210.0	2290.1	7.08
2290.0	2370.1	7.13
2390.0	2470.1	7.28
2470.0	2550.1	7.42
2570.0	2650.1	7.63
2650.0	2730.1	7.83
2750.0	2830.1	8.06
2830.0	2910.1	8.16
2930.0	3010.1	8.40
3010.0	3090.1	8.65
3110.0	3190.1	8.95
3190.0	3270.1	9.28
3290.0	3370.1	9.59
3370.0	3450.1	9.87
3470.0	3550.1	10.10

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=2502.1001MHz (dB)
		@LO (dBm) +17
2492.0	10.1	8.16
2431.5	70.6	8.15
2371.0	131.1	7.94
2310.5	191.6	7.78
2250.0	252.1	7.67
2189.6	312.5	7.55
2129.1	373.0	7.56
2068.6	433.5	7.57
2008.1	494.0	7.56
1947.6	554.5	7.58
1887.1	615.0	7.51
1826.6	675.5	7.53
1766.1	736.0	7.47
1705.7	796.4	7.53
1645.2	856.9	7.63
1584.7	917.4	7.66
1524.2	977.9	7.69
1463.7	1038.4	7.69
1403.2	1098.9	7.83
1342.7	1159.4	7.86
1282.2	1219.9	7.94
1221.8	1280.3	7.93
1161.3	1340.8	8.01
1100.8	1401.3	8.10
1040.3	1461.8	8.03
979.8	1522.3	8.09
919.3	1582.8	8.01
858.8	1643.3	8.01
778.2	1723.9	7.92
717.7	1784.4	7.96
637.0	1865.1	7.91
576.6	1925.5	7.95
495.9	2006.2	7.93
435.4	2066.7	7.88
354.8	2147.3	7.80
294.3	2207.8	7.80
213.6	2288.5	7.78
153.1	2349.0	7.73
72.5	2429.6	7.76
12.0	2490.1	7.78

Frequency Mixer

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)			RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)					@LO (dBm)		
	+14	+17	+20	+14	+17	+20			+14	+17	+20
80.1	46.22	50.25	53.95	32.82	36.33	39.66	10.1	80.1	25.20	24.95	24.97
170.1	47.43	53.35	56.12	33.17	36.91	39.61	100.1	170.1	25.20	25.26	25.38
260.1	49.82	56.61	57.24	34.36	37.86	39.33	190.1	260.1	25.60	25.74	25.90
350.1	51.83	60.35	59.25	35.51	38.48	38.40	280.1	350.1	26.33	26.52	26.72
440.1	54.15	67.62	57.07	36.27	38.12	36.80	370.1	440.1	27.19	27.74	27.85
530.1	53.62	68.26	56.62	37.19	37.28	35.41	460.1	530.1	28.28	28.70	28.68
620.1	51.82	58.29	52.88	38.17	36.18	34.23	550.1	620.1	29.72	29.91	29.62
710.1	47.42	50.25	51.03	38.33	34.98	33.14	640.1	710.1	30.78	30.76	30.20
800.1	44.95	47.76	49.05	37.41	33.93	32.31	730.1	800.1	32.01	31.61	31.37
890.1	44.04	47.34	48.70	36.35	33.21	31.69	820.1	890.1	33.96	33.40	32.82
980.1	42.97	44.89	46.73	35.51	32.68	31.14	910.1	980.1	37.68	36.40	35.66
1070.1	40.43	41.51	43.81	34.40	31.75	30.38	1000.1	1070.1	40.22	39.00	38.37
1160.1	37.56	38.74	40.53	33.41	30.82	29.55	1090.1	1160.1	37.52	39.92	39.96
1250.1	36.19	37.36	38.88	32.78	30.18	29.06	1180.1	1250.1	34.06	38.11	39.77
1340.1	35.72	36.97	38.94	32.78	29.95	28.78	1270.1	1340.1	31.86	35.75	38.01
1430.1	34.78	36.67	38.65	33.93	30.53	29.00	1360.1	1430.1	30.81	34.62	37.22
1520.1	34.09	36.94	39.13	35.66	31.38	29.51	1450.1	1520.1	30.37	33.81	35.81
1610.1	33.70	37.62	40.60	37.12	31.96	29.78	1540.1	1610.1	29.91	32.21	33.15
1700.1	34.25	39.43	43.15	38.13	32.91	30.43	1630.1	1700.1	29.62	31.64	32.22
1790.1	35.32	41.92	45.82	39.26	34.30	31.74	1720.1	1790.1	29.84	31.88	32.76
1880.1	36.30	43.69	47.12	40.72	36.39	33.94	1810.1	1880.1	30.39	32.36	33.78
1970.1	36.92	44.22	51.79	42.54	38.10	36.48	1900.1	1970.1	31.30	33.70	35.27
2060.1	37.22	43.40	55.74	46.97	41.40	39.12	1990.1	2060.1	32.53	34.23	34.99
2150.1	36.81	42.72	49.97	51.09	47.00	43.11	2080.1	2150.1	32.17	33.09	33.58
2240.1	36.45	42.56	47.06	51.48	53.19	48.82	2170.1	2240.1	32.46	32.55	32.94
2330.1	35.53	40.96	42.93	48.97	47.84	45.83	2260.1	2330.1	33.00	32.24	31.90
2420.1	34.52	39.73	41.27	44.55	44.52	43.33	2350.1	2420.1	34.01	33.16	32.31
2510.1	33.26	37.97	40.42	40.13	40.20	40.75	2440.1	2510.1	34.13	33.48	32.82
2600.1	32.24	36.18	39.52	37.50	36.81	37.17	2530.1	2600.1	33.90	33.43	32.82
2690.1	31.43	34.79	37.47	35.81	35.00	35.20	2620.1	2690.1	32.85	32.76	32.66
2780.1	30.42	33.38	35.65	34.46	34.09	34.15	2710.1	2780.1	32.28	32.07	32.19
2870.1	29.12	31.79	33.68	33.30	33.00	32.89	2800.1	2870.1	31.26	31.16	31.25
2960.1	27.83	30.27	31.78	32.40	32.18	32.02	2890.1	2960.1	29.57	29.56	29.52
3050.1	26.99	29.27	30.76	31.30	31.25	31.46	2980.1	3050.1	27.90	28.15	28.14
3150.1	26.26	28.57	29.87	30.21	30.23	30.13	3080.1	3150.1	26.46	27.12	27.43
3240.1	25.52	27.81	29.06	29.26	29.32	29.16	3170.1	3240.1	25.27	25.98	26.69
3340.1	24.76	27.07	28.54	28.88	28.86	28.74	3270.1	3340.1	24.46	25.14	25.83
3430.1	24.33	26.52	27.96	28.91	28.79	28.43	3360.1	3430.1	24.04	24.73	25.59
3530.1	23.98	25.95	27.37	29.04	28.93	28.52	3460.1	3530.1	23.56	24.35	25.26
3620.1	23.86	25.56	26.89	29.09	29.01	28.53	3550.1	3620.1	23.21	24.17	25.18

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=2500MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+14	+17	+20		+14	+17	+20		+14	+17	+20
10.1	80.1	1.31	1.12	1.02	80.1	1.03	1.66	2.65	10.0	1.21	1.04	1.13
100.1	170.1	1.28	1.12	1.05	170.1	1.11	1.58	2.36	70.0	1.21	1.03	1.12
190.1	260.1	1.30	1.15	1.09	260.1	1.17	1.55	2.28	130.0	1.23	1.07	1.11
280.1	350.1	1.33	1.19	1.15	350.1	1.21	1.51	2.21	190.0	1.24	1.08	1.11
370.1	440.1	1.39	1.24	1.19	440.1	1.24	1.46	2.14	250.0	1.26	1.10	1.10
460.1	530.1	1.47	1.31	1.26	530.1	1.30	1.40	2.05	310.0	1.30	1.15	1.11
550.1	620.1	1.56	1.38	1.32	620.1	1.36	1.35	1.96	370.0	1.32	1.17	1.11
640.1	710.1	1.62	1.46	1.39	710.1	1.46	1.32	1.86	430.0	1.36	1.18	1.09
730.1	800.1	1.72	1.55	1.47	800.1	1.56	1.28	1.76	490.0	1.39	1.22	1.11
820.1	890.1	1.81	1.61	1.52	890.1	1.64	1.25	1.67	550.0	1.39	1.22	1.11
910.1	980.1	1.91	1.71	1.61	980.1	1.72	1.22	1.56	610.0	1.45	1.26	1.12
1000.1	1070.1	2.00	1.79	1.70	1070.1	1.77	1.20	1.48	670.0	1.46	1.28	1.14
1090.1	1160.1	2.07	1.87	1.76	1160.1	1.81	1.18	1.41	730.0	1.48	1.29	1.15
1180.1	1250.1	2.16	1.92	1.79	1250.1	1.83	1.15	1.36	800.0	1.55	1.36	1.21
1270.1	1340.1	2.17	1.91	1.77	1340.1	1.81	1.11	1.34	860.0	1.55	1.36	1.21
1360.1	1430.1	2.18	1.90	1.75	1430.1	1.79	1.09	1.35	930.0	1.56	1.38	1.24
1450.1	1520.1	2.19	1.89	1.73	1520.1	1.76	1.09	1.39	990.0	1.59	1.41	1.28
1540.1	1610.1	2.17	1.86	1.70	1610.1	1.73	1.12	1.44	1060.0	1.61	1.43	1.30
1630.1	1700.1	2.12	1.83	1.68	1700.1	1.70	1.16	1.49	1120.0	1.60	1.44	1.32
1720.1	1790.1	2.09	1.84	1.72	1790.1	1.63	1.20	1.56	1190.0	1.58	1.43	1.32
1810.1	1880.1	2.06	1.85	1.76	1880.1	1.57	1.25	1.63	1250.0	1.59	1.44	1.36
1900.1	1970.1	2.08	1.91	1.83	1970.1	1.52	1.30	1.70	1320.0	1.58	1.45	1.35
1990.1	2060.1	2.11	1.97	1.89	2060.1	1.46	1.35	1.77	1380.0	1.57	1.45	1.36
2080.1	2150.1	2.15	2.02	1.93	2150.1	1.41	1.41	1.84	1450.0	1.61	1.49	1.41
2170.1	2240.1	2.19	2.03	1.92	2240.1	1.37	1.47	1.92	1510.0	1.55	1.45	1.39
2260.1	2330.1	2.20	2.03	1.89	2330.1	1.33	1.53	2.00	1580.0	1.57	1.47	1.41
2350.1	2420.1	2.20	2.01	1.86	2420.1	1.32	1.61	2.10	1640.0	1.58	1.51	1.45
2440.1	2510.1	2.15	1.96	1.81	2510.1	1.33	1.70	2.20	1710.0	1.52	1.45	1.41
2530.1	2600.1	2.05	1.85	1.73	2600.1	1.35	1.78	2.29	1770.0	1.57	1.51	1.48
2620.1	2690.1	1.90	1.73	1.62	2690.1	1.40	1.87	2.40	1840.0	1.57	1.54	1.52
2710.1	2780.1	1.71	1.56	1.46	2780.1	1.47	1.98	2.51	1900.0	1.56	1.52	1.51
2800.1	2870.1	1.52	1.38	1.28	2870.1	1.57	2.10	2.63	1970.0	1.63	1.62	1.61
2890.1	2960.1	1.32	1.20	1.11	2960.1	1.71	2.23	2.76	2030.0	1.66	1.65	1.65
2980.1	3050.1	1.15	1.03	1.07	3050.1	1.87	2.39	2.92	2100.0	1.72	1.71	1.71
3080.1	3150.1	1.08	1.15	1.25	3150.1	2.06	2.55	3.06	2160.0	1.77	1.78	1.79
3170.1	3240.1	1.27	1.36	1.46	3240.1	2.28	2.73	3.22	2230.0	1.80	1.82	1.83
3270.1	3340.1	1.49	1.60	1.70	3340.1	2.52	2.91	3.35	2290.0	1.89	1.91	1.92
3360.1	3430.1	1.72	1.83	1.93	3430.1	2.76	3.09	3.50	2360.0	1.95	1.99	2.02
3460.1	3530.1	1.96	2.08	2.18	3530.1	3.02	3.26	3.60	2420.0	2.03	2.07	2.09
3550.1	3620.1	2.17	2.27	2.36	3620.1	3.27	3.42	3.69	2490.0	2.18	2.23	2.27

Frequency Mixer

SYM-25DHW+

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	6	14	19	19	29	41	26	33	36	38
1	-	28	+0	30	16	30	25	31	37	34	50	40
2	67	55	46	52	53	64	52	65	69	56	58	53
3	>100	81	72	71	70	69	65	71	67	72	67	84
4	>100	90	87	>92	>92	88	>92	85	>92	87	87	91
5	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
6	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
7	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
8	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
9	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
10	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

Test conditions: RF IN: 1290.1 MHz; -1.00 dBm.
 LO IN: 1360.1 MHz; +17.00 dBm
 IF OUT: 70 MHz; -7.59 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	16	23	31	31	42	50	41	47	55	69
1	-	28	+0	30	16	32	26	35	41	39	46	50
2	47	47	36	44	44	55	43	54	57	51	53	55
3	96	59	47	58	62	50	51	50	57	50	56	54
4	>100	66	64	66	81	69	64	66	64	65	63	61
5	>100	83	71	70	61	74	59	71	61	65	62	67
6	>100	79	94	75	82	67	69	64	70	69	73	69
7	>100	84	82	84	84	80	85	>102	93	84	93	83
8	>100	91	95	94	94	100	91	94	89	87	96	99
9	>100	91	>102	98	99	93	101	87	87	86	86	91
10	>100	>102	100	>102	>102	101	>102	98	>102	86	96	84
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 1290.1 MHz; 9.00 dBm.
 LO IN: 1360.1 MHz; +17.00 dBm
 IF OUT: 70 MHz; 2.37 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.