

Frequency Mixer

SBL-173H

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=+10dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+14	+17	+20			+14	+17	+20			+14	+17	+20
5.0	35.0	5.41	5.20	5.06	10.1	40.1	30.99	32.72	29.08	10.1	40.1	0.47	0.26	0.14
7.0	37.0	5.36	5.16	5.00	90.4	120.4	26.41	22.83	22.93	90.4	120.4	0.38	0.20	0.09
10.1	40.1	5.30	5.06	4.97	170.6	200.6	21.99	20.39	20.45	170.6	200.6	0.38	0.17	0.07
90.4	120.4	5.75	5.59	5.55	250.9	280.9	19.72	19.28	19.87	250.9	280.9	0.33	0.13	0.08
170.6	200.6	5.74	5.64	5.61	331.2	361.2	18.79	19.84	21.99	331.2	361.2	0.28	0.13	0.07
250.9	280.9	5.77	5.69	5.67	411.4	441.4	20.15	21.12	23.07	411.4	441.4	0.26	0.12	0.08
331.2	361.2	5.84	5.77	5.76	491.7	521.7	18.32	19.79	22.58	491.7	521.7	0.29	0.16	0.11
411.4	441.4	5.88	5.82	5.79	572.0	602.0	19.89	23.11	38.67	572.0	602.0	0.30	0.18	0.13
491.7	521.7	5.98	5.90	5.88	652.2	682.2	22.43	23.92	26.42	652.2	682.2	0.38	0.25	0.24
572.0	602.0	6.02	5.94	5.91	732.5	762.5	19.26	22.41	36.61	732.5	762.5	0.43	0.25	0.20
732.5	762.5	6.31	6.11	6.02	812.8	842.8	17.19	22.14	35.62	812.8	842.8	0.46	0.30	0.21
812.8	842.8	6.56	6.30	6.17	893.1	923.1	17.99	24.10	29.63	893.1	923.1	0.52	0.37	0.26
893.1	923.1	6.68	6.39	6.24	973.3	1003.3	21.27	27.90	26.36	973.3	1003.3	0.57	0.41	0.30
973.3	1003.3	6.70	6.43	6.31	1053.6	1083.6	29.41	36.37	26.22	1053.6	1083.6	0.59	0.40	0.31
1053.6	1083.6	6.89	6.60	6.45	1133.9	1163.9	24.66	29.17	30.92	1133.9	1163.9	0.68	0.48	0.36
1133.9	1163.9	7.06	6.77	6.63	1214.1	1244.1	23.85	27.85	30.89	1214.1	1244.1	0.71	0.46	0.33
1214.1	1244.1	7.31	7.04	6.90	1294.4	1324.4	23.47	26.27	26.43	1294.4	1324.4	0.56	0.28	0.16
1294.4	1324.4	7.71	7.43	7.27	1374.7	1404.7	20.50	22.15	25.28	1374.7	1404.7	0.51	0.28	0.21
1374.7	1404.7	7.96	7.54	7.31	1454.9	1484.9	17.83	19.73	23.25	1454.9	1484.9	0.62	0.38	0.22
1454.9	1484.9	8.09	7.60	7.37	1535.2	1565.2	21.84	21.30	24.86	1535.2	1565.2	0.55	0.41	0.27
1535.2	1565.2	8.34	7.66	7.35	1615.5	1645.5	30.27	27.33	30.38	1615.5	1645.5	0.45	0.38	0.29
1615.5	1645.5	8.53	7.76	7.36	1695.7	1725.7	23.42	26.84	27.88	1695.7	1725.7	0.33	0.27	0.22
1695.7	1725.7	8.81	7.99	7.50	1776.0	1806.0	20.32	22.85	25.08	1776.0	1806.0	0.24	0.27	0.23
1856.3	1886.3	9.06	8.06	7.60	1856.3	1886.3	19.57	22.53	23.15	1856.3	1886.3	0.24	0.34	0.28
1936.5	1966.5	9.04	7.97	7.57	1936.5	1966.5	19.22	21.51	21.70	1936.5	1966.5	0.33	0.42	0.34
2016.8	2046.8	8.84	7.92	7.61	2016.8	2046.8	19.62	21.80	21.75	2016.8	2046.8	0.58	0.49	0.39
2097.1	2127.1	8.63	7.95	7.74	2097.1	2127.1	21.68	25.06	24.12	2097.1	2127.1	0.66	0.44	0.33
2157.3	2187.3	8.78	8.00	7.81	2157.3	2187.3	23.66	29.07	27.78	2157.3	2187.3	0.66	0.42	0.31
2237.5	2267.5	9.03	8.13	7.95	2237.5	2267.5	24.05	29.09	30.84	2237.5	2267.5	0.62	0.37	0.26
2297.8	2327.8	8.99	8.19	7.99	2297.8	2327.8	24.34	25.98	27.57	2297.8	2327.8	0.62	0.36	0.25
2378.0	2408.0	9.28	8.46	8.22	2378.0	2408.0	23.08	26.46	25.10	2378.0	2408.0	0.52	0.34	0.24
2438.2	2468.2	9.94	8.84	8.54	2438.2	2468.2	20.66	31.14	26.36	2438.2	2468.2	0.34	0.29	0.21
2518.5	2548.5	10.34	9.25	8.93	2518.5	2548.5	22.81	28.22	27.34	2518.5	2548.5	0.11	0.16	0.16
2578.7	2608.7	10.32	9.15	8.82	2578.7	2608.7	30.81	27.43	25.19	2578.7	2608.7	0.12	0.17	0.19
2659.0	2689.0	10.54	9.16	8.84	2659.0	2689.0	21.15	23.11	22.85	2659.0	2689.0	0.10	0.22	0.18
2719.2	2749.2	10.69	9.30	9.00	2719.2	2749.2	20.46	23.09	23.35	2719.2	2749.2	0.10	0.22	0.17
2799.4	2829.4	11.00	9.63	9.27	2799.4	2829.4	19.48	21.67	23.08	2799.4	2829.4	0.12	0.22	0.17
2859.6	2889.6	11.41	9.94	9.52	2859.6	2889.6	19.19	20.72	22.41	2859.6	2889.6	0.08	0.25	0.18
2939.9	2969.9	11.84	10.27	9.84	2939.9	2969.9	18.33	21.79	23.32	2939.9	2969.9	0.06	0.36	0.24
3000.1	3030.1	12.14	10.48	10.09	3000.1	3030.1	18.13	23.59	23.77	3000.1	3030.1	0.05	0.37	0.24



Frequency Mixer

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=600.1MHz (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)=1200.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+17			+17			+17
590.0	10.1	6.27	10.0	20.1	5.46	1190.0	10.1	6.86
575.1	25.0	6.24	50.0	60.1	5.36	1150.0	50.1	6.87
560.3	39.8	6.25	90.0	100.1	5.36	1110.0	90.1	6.89
545.4	54.7	6.26	110.0	120.1	5.36	1090.0	110.1	6.87
530.5	69.6	6.25	150.0	160.1	5.37	1050.0	150.1	6.89
515.6	84.5	6.25	170.0	180.1	5.37	1030.0	170.1	6.94
500.8	99.3	6.22	210.0	220.1	5.38	990.0	210.1	6.96
485.9	114.2	6.21	230.0	240.1	5.39	970.0	230.1	7.02
471.0	129.1	6.17	270.0	280.1	5.39	930.0	270.1	7.05
456.2	143.9	6.19	290.0	300.1	5.40	910.0	290.1	7.08
441.3	158.8	6.19	330.0	340.1	5.44	870.0	330.1	7.08
426.4	173.7	6.23	350.0	360.1	5.45	850.0	350.1	7.11
411.5	188.6	6.20	390.0	400.1	5.44	810.0	390.1	7.15
396.7	203.4	6.16	410.0	420.1	5.44	790.0	410.1	7.16
381.8	218.3	6.17	450.0	460.1	5.46	750.0	450.1	7.13
366.9	233.2	6.18	470.0	480.1	5.48	730.0	470.1	7.17
352.1	248.0	6.18	510.0	520.1	5.49	690.0	510.1	7.20
337.2	262.9	6.16	530.0	540.1	5.50	670.0	530.1	7.20
322.3	277.8	6.18	570.0	580.1	5.50	630.0	570.1	7.19
307.4	292.7	6.16	590.0	600.1	5.48	610.0	590.1	7.14
292.6	307.5	6.15	630.0	640.1	5.51	570.0	630.1	7.14
277.7	322.4	6.14	650.0	660.1	5.52	550.0	650.1	7.17
262.8	337.3	6.13	690.0	700.1	5.60	510.0	690.1	7.01
247.9	352.2	6.13	710.0	720.1	5.67	490.0	710.1	6.93
233.1	367.0	6.10	750.0	760.1	5.67	450.0	750.1	7.02
218.2	381.9	6.09	770.0	780.1	5.69	430.0	770.1	7.07
203.3	396.8	6.06	810.0	820.1	5.76	390.0	810.1	7.09
188.5	411.6	6.05	830.0	840.1	5.78	370.0	830.1	7.12
173.6	426.5	6.04	870.0	880.1	5.80	330.0	870.1	7.12
158.7	441.4	6.06	890.0	900.1	5.84	310.0	890.1	7.11
143.8	456.3	6.10	930.0	940.1	5.86	270.0	930.1	7.07
129.0	471.1	6.10	950.0	960.1	5.90	250.0	950.1	7.01
114.1	486.0	6.12	990.0	1000.1	5.91	210.0	990.1	6.93
99.2	500.9	6.10	1010.0	1020.1	5.94	190.0	1010.1	6.88
84.4	515.7	6.06	1050.0	1060.1	6.01	150.0	1050.1	6.87
69.5	530.6	6.04	1070.0	1080.1	6.02	130.0	1070.1	6.89
54.6	545.5	6.00	1110.0	1120.1	6.14	90.0	1110.1	6.89
39.7	560.4	5.99	1130.0	1140.1	6.16	70.0	1130.1	6.89
24.9	575.2	5.97	1170.0	1180.1	6.23	30.0	1170.1	6.93
10.0	590.1	6.12	1190.0	1200.1	6.28	10.0	1190.1	7.05



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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+20	+14	+17	+20
5.0	42.38	45.59	48.68	47.82	50.12	51.86
7.0	43.47	46.64	49.67	49.28	51.61	53.24
10.1	44.36	47.44	50.48	50.57	52.62	54.09
90.4	49.16	48.68	48.09	49.05	50.32	50.82
170.6	48.26	46.21	45.04	48.84	49.94	51.15
250.9	47.21	44.20	42.69	49.88	51.79	53.18
331.2	45.73	42.80	41.10	53.32	56.93	56.66
411.4	43.99	41.44	39.87	57.92	59.81	50.93
491.7	42.93	40.70	39.02	60.58	56.78	46.96
572.0	42.68	40.45	38.88	56.73	58.56	45.22
732.5	41.58	40.07	38.76	53.08	46.79	37.87
812.8	42.68	42.22	40.24	49.92	51.43	38.36
893.1	42.91	44.07	42.31	47.29	53.01	38.92
973.3	42.14	46.39	45.25	45.17	48.74	38.21
1053.6	41.50	46.03	47.02	47.19	41.17	36.60
1133.9	41.03	47.13	51.15	46.47	40.46	36.35
1214.1	41.19	47.24	54.82	43.20	40.67	36.50
1294.4	41.14	45.63	55.46	41.80	37.54	35.47
1374.7	41.60	44.69	48.46	40.71	36.22	34.83
1454.9	42.08	43.77	45.17	41.59	36.78	35.21
1535.2	42.42	43.91	44.81	41.34	38.11	36.09
1615.5	43.56	45.40	46.62	41.12	38.62	36.73
1695.7	46.14	48.49	49.14	39.61	40.09	38.06
1856.3	54.91	48.90	44.70	36.60	38.89	38.45
1936.5	48.00	43.79	40.93	36.78	39.75	39.95
2016.8	43.15	39.61	37.27	37.54	40.46	39.96
2097.1	41.02	37.77	35.52	37.30	38.69	37.76
2157.3	39.24	36.85	34.64	37.08	37.39	36.38
2237.5	36.50	34.43	32.97	36.36	35.99	35.46
2297.8	34.96	33.18	31.88	35.69	35.42	34.89
2378.0	33.33	31.94	30.53	35.04	34.77	33.99
2438.2	31.73	30.86	29.77	34.62	33.86	33.31
2518.5	29.62	29.15	28.47	33.19	32.14	31.87
2578.7	28.77	28.35	28.07	32.48	30.73	30.77
2659.0	28.32	28.30	28.40	32.24	30.09	30.20
2719.2	28.06	28.35	28.70	32.13	30.28	30.31
2799.4	27.71	28.45	29.19	32.23	30.71	30.70
2859.6	27.24	28.35	29.43	32.23	31.03	31.16
2939.9	26.71	28.19	29.57	32.12	31.51	31.70
3000.1	26.56	28.02	29.64	32.54	31.78	32.36

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	37.91	39.42	42.53
90.4	120.4	40.75	43.19	46.58
170.6	200.6	43.60	45.73	47.75
250.9	280.9	48.26	50.87	51.91
331.2	361.2	55.72	53.06	47.06
411.4	441.4	57.39	53.44	46.52
491.7	521.7	51.84	48.30	43.63
572.0	602.0	51.66	47.93	43.73
652.2	682.2	51.71	47.71	44.40
732.5	762.5	50.02	45.90	43.19
812.8	842.8	52.68	45.97	43.13
893.1	923.1	58.73	49.64	45.81
973.3	1003.3	51.22	46.31	45.47
1053.6	1083.6	46.26	43.70	41.27
1133.9	1163.9	41.06	39.84	39.45
1214.1	1244.1	40.87	39.83	38.31
1294.4	1324.4	42.70	42.02	36.99
1374.7	1404.7	42.18	43.02	35.97
1454.9	1484.9	43.34	42.43	36.57
1535.2	1565.2	43.61	42.62	37.62
1615.5	1645.5	41.00	40.60	37.05
1695.7	1725.7	39.08	38.26	34.89
1776.0	1806.0	37.43	36.93	35.16
1856.3	1886.3	35.91	36.85	36.03
1936.5	1966.5	35.34	36.97	36.64
2016.8	2046.8	36.40	37.96	37.91
2097.1	2127.1	35.24	36.13	36.00
2157.3	2187.3	33.19	33.25	33.19
2237.5	2267.5	31.17	31.21	31.36
2297.8	2327.8	29.99	30.05	29.86
2378.0	2408.0	28.40	28.37	28.41
2438.2	2468.2	27.07	27.09	27.10
2518.5	2548.5	25.90	26.07	26.54
2578.7	2608.7	26.23	26.25	27.04
2659.0	2689.0	26.83	26.86	27.85
2719.2	2749.2	26.96	27.09	27.86
2799.4	2829.4	26.89	27.20	27.75
2859.6	2889.6	26.68	26.96	27.48
2939.9	2969.9	26.12	26.29	26.82
3000.1	3030.1	25.57	25.81	26.20



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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+14	+17	+20
5.0	35.0	2.21	1.97	1.78
7.0	37.0	2.23	1.99	1.80
10.1	40.1	2.24	2.00	1.80
90.4	120.4	1.22	1.12	1.09
170.6	200.6	1.21	1.15	1.13
250.9	280.9	1.24	1.20	1.18
331.2	361.2	1.27	1.23	1.22
411.4	441.4	1.28	1.25	1.23
491.7	521.7	1.33	1.29	1.27
572.0	602.0	1.34	1.30	1.28
652.2	682.2	1.40	1.34	1.30
732.5	762.5	1.56	1.48	1.42
812.8	842.8	1.71	1.60	1.52
893.1	923.1	1.81	1.70	1.62
973.3	1003.3	1.86	1.75	1.67
1053.6	1083.6	1.96	1.85	1.77
1133.9	1163.9	2.03	1.92	1.84
1214.1	1244.1	2.09	1.97	1.89
1294.4	1324.4	2.15	2.03	1.93
1374.7	1404.7	2.22	2.07	1.98
1454.9	1484.9	2.30	2.15	2.06
1535.2	1565.2	2.36	2.20	2.10
1615.5	1645.5	2.34	2.17	2.06
1695.7	1725.7	2.31	2.15	2.03
1776.0	1806.0	2.25	2.09	1.98
1856.3	1886.3	2.21	2.02	1.91
1936.5	1966.5	2.12	1.93	1.83
2016.8	2046.8	2.00	1.81	1.72
2097.1	2127.1	1.85	1.69	1.62
2157.3	2187.3	1.81	1.63	1.56
2237.5	2267.5	1.78	1.57	1.49
2297.8	2327.8	1.72	1.51	1.43
2378.0	2408.0	1.67	1.47	1.38
2438.2	2468.2	1.66	1.45	1.37
2518.5	2548.5	1.63	1.46	1.40
2578.7	2608.7	1.61	1.45	1.39
2659.0	2689.0	1.53	1.39	1.33
2719.2	2749.2	1.43	1.31	1.27
2799.4	2829.4	1.30	1.21	1.18
2859.6	2889.6	1.21	1.15	1.14
2939.9	2969.9	1.12	1.14	1.17
3000.1	3030.1	1.11	1.20	1.24

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+14	+17	+20
5.0	1.52	2.34	3.34
7.0	1.52	2.33	3.31
10.1	1.50	2.22	3.34
90.4	1.45	2.05	2.74
170.6	1.42	2.00	2.65
250.9	1.40	1.97	2.58
331.2	1.39	1.94	2.53
411.4	1.42	1.94	2.51
491.7	1.47	1.98	2.53
572.0	1.60	2.10	2.65
652.2	1.72	2.25	2.82
732.5	1.89	2.47	3.08
812.8	2.15	2.77	3.44
893.1	2.48	3.15	3.88
973.3	2.75	3.49	4.29
1053.6	2.95	3.76	4.62
1133.9	3.19	4.11	5.07
1214.1	3.45	4.46	5.52
1294.4	3.71	4.80	5.99
1374.7	3.98	5.13	6.37
1454.9	4.31	5.49	6.78
1535.2	4.70	5.93	7.31
1615.5	5.09	6.37	7.83
1695.7	5.34	6.51	7.97
1776.0	5.61	6.63	8.01
1856.3	5.79	6.61	7.80
1936.5	5.83	6.44	7.50
2016.8	5.91	6.37	7.31
2097.1	5.89	6.05	6.78
2157.3	5.89	5.74	6.19
2237.5	5.93	5.58	5.79
2297.8	6.01	5.41	5.39
2378.0	6.13	5.14	4.79
2438.2	6.03	4.88	4.38
2518.5	5.99	4.62	3.92
2578.7	6.03	4.51	3.63
2659.0	6.11	4.53	3.54
2719.2	6.07	4.57	3.60
2799.4	6.44	4.98	4.00
2859.6	6.61	5.30	4.38
2939.9	6.97	5.91	5.13
3000.1	7.38	6.53	5.83

IF (OUT) (MHz)	IF VSWR @LO=1200.1MHz (:1)		
	@LO (dBm)		
	+14	+17	+20
5.0	1.19	1.38	1.62
7.0	1.15	1.35	1.59
10.1	1.15	1.35	1.59
90.4	1.03	1.16	1.29
170.6	1.03	1.13	1.25
250.9	1.04	1.10	1.21
331.2	1.04	1.10	1.20
411.4	1.04	1.09	1.19
491.7	1.09	1.04	1.13
572.0	1.09	1.05	1.14
652.2	1.12	1.01	1.10
732.5	1.14	1.01	1.08
812.8	1.17	1.04	1.05
893.1	1.17	1.05	1.05
973.3	1.22	1.10	1.02
1053.6	1.24	1.12	1.03
1133.9	1.26	1.13	1.05
1214.1	1.29	1.17	1.08
1294.4	1.32	1.19	1.10
1374.7	1.33	1.20	1.11
1454.9	1.37	1.25	1.16
1535.2	1.40	1.27	1.18
1615.5	1.43	1.29	1.19
1695.7	1.44	1.30	1.20
1776.0	1.51	1.36	1.26
1856.3	1.51	1.36	1.25
1936.5	1.57	1.40	1.29
2016.8	1.58	1.41	1.30
2097.1	1.63	1.45	1.33
2157.3	1.64	1.46	1.34
2237.5	1.69	1.50	1.38
2297.8	1.71	1.52	1.39
2378.0	1.73	1.54	1.41
2438.2	1.77	1.57	1.44
2518.5	1.76	1.57	1.44
2578.7	1.78	1.59	1.46
2659.0	1.82	1.63	1.50
2719.2	1.84	1.65	1.52
2799.4	1.83	1.64	1.51
2859.6	1.85	1.66	1.53
2939.9	1.89	1.71	1.58
3000.1	1.56	1.37	1.24

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	26	25	27	56	30	49	33	53	40	50
1	-	41	+0	42	12	53	23	46	34	48	40	53
2	80	55	35	49	36	56	37	71	46	61	58	65
3	>100	63	56	62	52	65	65	63	69	66	61	71
4	>100	77	53	76	53	79	53	62	54	73	62	69
5	>100	98	74	82	76	76	69	78	70	79	78	82
6	>100	88	72	90	66	82	64	81	62	75	62	86
7	>100	90	83	90	78	85	79	85	96	86	88	89
8	>100	94	81	92	79	91	75	86	74	85	74	83
9	>100	97	87	94	88	>99	82	93	81	97	78	>99
10	>100	>99	97	>99	95	>99	93	97	>99	>99	91	>99
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 600.1 MHz; 5.00 dBm.
 LO IN: 630.01 MHz; +17.00 dBm
 IF OUT: 29.91 MHz; -.97 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	23	15	14	42	19	35	23	43	29	39
1	-	42	+0	42	12	50	24	44	35	47	38	46
2	98	63	43	58	43	67	46	72	56	67	64	70
3	>100	75	73	86	82	>89	69	>89	68	86	68	83
4	>100	>89	79	>89	85	>89	82	>89	84	>89	83	>89
5	>100	>89	>89	>89	>89	88	89	>89	89	>89	>89	>89
6	>100	>89	>89	>89	>89	>89	>89	87	>89	>89	>89	>89
7	>100	>89	>89	>89	>89	>89	>89	>89	87	>89	>89	>89
8	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89
9	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89
10	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 600.1 MHz; -5.00 dBm.
 LO IN: 630.01 MHz; +17.00 dBm
 IF OUT: 29.91 MHz; -10.93 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.

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