

Frequency Mixer

HJK-ED13766/1

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=110.1MHz (dB)			RF (IN) (MHz)	LO (MHz)	IP-3 INPUT (dBm)			RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+20dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+14	+17	+19			+14	+17	+19			+14	+17	+19
300.0	410.1	10.57	9.84	9.66	300.0	410.1	17.13	22.43	27.76	300.0	410.1	2.70	1.15	0.30
315.0	425.1	8.70	8.37	8.66	315.0	425.1	20.01	24.36	28.53	315.0	425.1	2.19	0.95	0.16
325.0	435.1	7.94	7.65	8.09	325.0	435.1	22.13	26.17	30.05	325.0	435.1	1.65	0.75	0.06
340.0	450.1	7.30	7.07	7.35	340.0	450.1	24.03	27.34	32.80	340.0	450.1	1.11	0.44	0.04
355.0	465.1	7.14	6.95	7.02	355.0	465.1	23.79	27.47	34.63	355.0	465.1	0.89	0.35	0.10
365.0	475.1	7.12	6.94	6.93	365.0	475.1	23.64	27.81	32.37	365.0	475.1	0.84	0.36	0.17
380.0	490.1	7.01	6.83	6.77	380.0	490.1	25.47	31.57	35.74	380.0	490.1	0.73	0.32	0.18
395.0	505.1	6.86	6.69	6.63	395.0	505.1	30.43	34.48	34.32	395.0	505.1	0.56	0.27	0.16
410.0	520.1	6.85	6.70	6.65	410.0	520.1	32.53	33.58	33.68	410.0	520.1	0.39	0.18	0.10
430.0	540.1	6.99	6.84	6.78	430.0	540.1	31.08	33.13	33.21	430.0	540.1	0.27	0.12	0.07
440.0	550.1	6.95	6.80	6.73	440.0	550.1	31.49	34.18	34.34	440.0	550.1	0.23	0.09	0.05
455.0	565.1	6.90	6.76	6.69	455.0	565.1	29.92	32.78	33.96	455.0	565.1	0.23	0.09	0.05
465.0	575.1	6.97	6.84	6.77	465.0	575.1	29.49	32.36	33.81	465.0	575.1	0.26	0.11	0.07
480.0	590.1	7.12	6.99	6.93	480.0	590.1	30.19	33.46	35.53	480.0	590.1	0.21	0.07	0.03
495.0	605.1	7.16	7.02	6.95	495.0	605.1	30.26	33.84	36.59	495.0	605.1	0.18	0.06	0.04
505.0	615.1	7.09	6.95	6.88	505.0	615.1	29.45	33.04	35.90	505.0	615.1	0.18	0.06	0.04
520.0	630.1	7.11	6.97	6.90	520.0	630.1	28.62	32.06	34.73	520.0	630.1	0.18	0.08	0.05
550.0	660.1	7.40	7.23	7.14	550.0	660.1	28.15	31.83	34.91	550.0	660.1	0.12	0.04	0.02
570.0	680.1	7.41	7.23	7.14	570.0	680.1	27.17	30.52	33.06	570.0	680.1	0.23	0.07	0.05
600.0	710.1	7.80	7.61	7.50	600.0	710.1	25.78	29.11	31.29	600.0	710.1	0.25	0.05	0.02
630.0	740.1	7.83	7.63	7.52	630.0	740.1	24.25	27.22	29.20	630.0	740.1	0.48	0.11	0.04
660.0	770.1	8.21	8.00	7.87	660.0	770.1	23.46	26.32	28.23	660.0	770.1	0.62	0.14	0.05
680.0	790.1	8.24	8.01	7.88	680.0	790.1	22.33	24.93	26.87	680.0	790.1	1.00	0.28	0.11
710.0	820.1	8.63	8.38	8.24	710.0	820.1	21.36	23.86	25.94	710.0	820.1	1.33	0.43	0.18
740.0	850.1	8.60	8.34	8.21	740.0	850.1	20.77	23.07	25.11	740.0	850.1	1.75	0.67	0.30
760.0	870.1	8.79	8.53	8.40	760.0	870.1	20.65	22.84	24.90	760.0	870.1	1.92	0.77	0.37
790.0	900.1	8.91	8.63	8.49	790.0	900.1	19.87	21.57	23.24	790.0	900.1	2.28	1.04	0.56
820.0	930.1	9.11	8.82	8.65	820.0	930.1	19.27	20.86	22.26	820.0	930.1	2.88	1.42	0.81
840.0	950.1	9.16	8.86	8.69	840.0	950.1	18.95	20.58	21.90	840.0	950.1	3.19	1.64	0.96
870.0	980.1	9.22	8.93	8.77	870.0	980.1	18.67	20.20	21.43	870.0	980.1	3.50	1.80	1.05
900.0	1010.1	9.47	9.15	8.98	900.0	1010.1	18.09	19.53	20.55	900.0	1010.1	3.83	2.09	1.25
920.0	1030.1	9.47	9.13	8.97	920.0	1030.1	17.89	19.36	20.30	920.0	1030.1	4.27	2.49	1.53
950.0	1060.1	9.57	9.23	9.07	950.0	1060.1	18.16	19.67	20.61	950.0	1060.1	4.59	2.76	1.74
980.0	1090.1	9.58	9.22	9.05	980.0	1090.1	18.11	19.69	20.64	980.0	1090.1	4.71	2.88	1.85
1010.0	1120.1	9.90	9.49	9.29	1010.0	1120.1	17.90	19.55	20.50	1010.0	1120.1	4.95	3.17	2.13
1030.0	1140.1	9.79	9.37	9.17	1030.0	1140.1	17.68	19.42	20.39	1030.0	1140.1	5.15	3.34	2.24
1060.0	1170.1	9.92	9.51	9.30	1060.0	1170.1	18.09	19.82	20.77	1060.0	1170.1	5.44	3.52	2.38
1090.0	1200.1	10.01	9.57	9.36	1090.0	1200.1	17.85	19.66	20.65	1090.0	1200.1	5.55	3.67	2.53
1110.0	1220.1	10.21	9.75	9.52	1110.0	1220.1	17.76	19.62	20.60	1110.0	1220.1	5.14	3.36	2.33
1130.0	1240.1	10.23	9.76	9.51	1130.0	1240.1	17.56	19.48	20.49	1130.0	1240.1	5.30	3.52	2.51

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=500.1MHz (dB)
		@LO (dBm)
		+17
100.1	400.0	10.40
98.1	402.0	10.18
96.1	404.0	9.97
94.1	406.0	9.77
92.1	408.0	9.58
89.1	411.0	9.33
87.1	413.0	9.16
85.1	415.0	9.02
83.1	417.0	8.91
81.1	419.0	8.82
79.1	421.0	8.74
77.1	423.0	8.68
75.1	425.0	8.64
73.1	427.0	8.61
71.1	429.0	8.61
68.1	432.0	8.64
66.1	434.0	8.68
64.1	436.0	8.71
62.1	438.0	8.78
60.1	440.0	8.86
39.9	520.0	10.33
59.9	540.0	8.34
79.9	560.0	7.54
99.9	580.0	7.11
124.9	605.0	6.86
144.9	625.0	6.73
164.9	645.0	6.71
184.9	665.0	6.75
204.9	685.0	6.75
224.9	705.0	6.95
249.9	730.0	7.29
269.9	750.0	7.55
289.9	770.0	7.78
309.9	790.0	8.04
329.9	810.0	8.36
349.9	830.0	8.75
369.9	850.0	9.20
394.9	875.0	9.52
414.9	895.0	9.83
434.9	915.0	10.35

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=430.1MHz (dB)
		@LO (dBm)
		+17
39.9	470.0	10.54
49.9	480.0	9.27
59.9	490.0	8.36
69.9	500.0	7.83
84.9	515.0	7.24
94.9	525.0	7.04
104.9	535.0	6.91
114.9	545.0	6.74
124.9	555.0	6.70
134.9	565.0	6.63
144.9	575.0	6.63
154.9	585.0	6.61
169.9	600.0	6.53
179.9	610.0	6.54
189.9	620.0	6.55
199.9	630.0	6.53
209.9	640.0	6.54
219.9	650.0	6.63
229.9	660.0	6.65
239.9	670.0	6.76
254.9	685.0	6.96
264.9	695.0	7.10
274.9	705.0	7.26
284.9	715.0	7.34
294.9	725.0	7.46
304.9	735.0	7.61
314.9	745.0	7.63
324.9	755.0	7.81
339.9	770.0	8.09
349.9	780.0	8.32
359.9	790.0	8.65
369.9	800.0	8.78
379.9	810.0	8.99
389.9	820.0	9.11
399.9	830.0	9.16
409.9	840.0	9.34
424.9	855.0	9.55
434.9	865.0	9.81
444.9	875.0	10.15
449.9	880.0	10.28

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=520.1MHz (dB)
		@LO (dBm)
		+17
130.1	390.0	11.22
128.1	392.0	11.05
125.1	395.0	10.75
123.1	397.0	10.57
121.1	399.0	10.36
118.1	402.0	9.99
116.1	404.0	9.76
114.1	406.0	9.53
111.1	409.0	9.23
109.1	411.0	9.06
107.1	413.0	8.89
104.1	416.0	8.65
102.1	418.0	8.50
100.1	420.0	8.38
97.1	423.0	8.22
95.1	425.0	8.15
93.1	427.0	8.09
90.1	430.0	8.02
88.1	432.0	7.98
86.1	434.0	7.95
83.1	437.0	7.90
81.1	439.0	7.91
79.1	441.0	7.96
76.1	444.0	8.02
74.1	446.0	8.08
72.1	448.0	8.13
69.1	451.0	8.22
67.1	453.0	8.29
65.1	455.0	8.36
62.1	458.0	8.48
60.1	460.0	8.60
58.1	462.0	8.75
55.1	465.0	9.00
53.1	467.0	9.18
51.1	469.0	9.37
48.1	472.0	9.67
46.1	474.0	9.88
44.1	476.0	10.12
41.1	479.0	10.49
40.1	480.0	10.63

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LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+19	+14	+17	+19
410.1	43.62	43.49	44.12	39.58	38.52	37.59
425.1	42.33	42.89	43.79	38.43	37.67	36.96
435.1	42.28	42.40	43.72	37.84	37.42	36.64
450.1	42.91	43.21	43.72	37.70	37.40	36.87
465.1	44.02	44.44	44.95	37.80	37.58	37.08
475.1	45.21	45.62	46.33	37.95	37.80	37.39
490.1	46.31	46.68	47.09	37.73	37.65	37.43
505.1	47.01	47.35	47.23	37.44	37.46	37.36
520.1	47.75	48.05	47.30	36.75	36.82	36.79
540.1	48.83	48.96	47.77	36.59	36.76	36.82
550.1	49.14	49.12	48.20	36.74	36.97	37.05
565.1	48.97	48.80	48.26	37.17	37.46	37.58
575.1	48.82	48.56	48.13	36.92	37.22	37.37
590.1	49.09	48.72	48.39	37.13	37.52	37.73
605.1	48.96	48.50	48.23	37.04	37.45	37.70
615.1	48.77	48.28	48.04	37.18	37.62	37.90
630.1	48.89	48.33	48.07	37.25	37.70	37.98
660.1	49.54	48.88	48.62	38.22	38.70	39.02
680.1	49.41	48.71	48.45	38.75	39.24	39.55
710.1	50.85	50.03	49.68	40.24	40.73	41.03
740.1	52.25	51.10	50.56	41.84	42.34	42.65
770.1	56.44	54.42	53.37	43.72	44.27	44.60
790.1	62.87	59.21	57.35	45.30	45.89	46.26
820.1	70.30	64.38	61.76	47.26	47.85	48.20
850.1	62.45	59.93	58.44	48.64	49.17	49.49
870.1	60.47	58.58	57.29	49.70	50.24	50.58
900.1	59.51	58.37	57.34	51.87	52.50	52.89
930.1	58.23	57.74	57.12	54.17	54.93	55.40
950.1	57.31	57.05	56.64	56.44	57.33	57.90
980.1	55.55	55.52	55.34	60.75	62.20	63.19
1010.1	54.73	54.94	54.85	67.06	70.21	73.03
1030.1	53.89	54.18	54.12	66.98	67.97	68.25
1060.1	53.24	53.48	53.37	60.95	60.71	60.51
1090.1	52.55	53.02	53.03	56.63	56.48	56.35
1120.1	52.24	52.97	53.18	53.92	53.82	53.75
1140.1	51.43	52.31	52.65	52.35	52.28	52.23
1170.1	50.58	51.43	51.81	50.23	50.18	50.15
1200.1	49.89	50.68	51.09	48.69	48.66	48.64
1220.1	49.82	50.62	51.08	47.92	47.90	47.88
1240.1	49.66	50.43	50.88	47.11	47.09	47.08

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+19
300.0	410.1	17.79	16.95	16.28
315.0	425.1	19.96	19.50	17.77
325.0	435.1	22.20	22.55	19.07
340.0	450.1	25.58	25.83	21.56
355.0	465.1	28.21	28.26	24.82
365.0	475.1	29.62	29.64	27.24
380.0	490.1	31.60	31.65	30.12
395.0	505.1	32.81	32.84	31.26
410.0	520.1	34.29	34.37	32.20
430.0	540.1	36.58	36.66	34.16
440.0	550.1	37.15	37.30	35.01
455.0	565.1	38.60	38.70	36.84
465.0	575.1	39.76	39.92	38.22
480.0	590.1	41.33	41.47	39.83
495.0	605.1	42.77	43.19	41.74
505.0	615.1	43.71	44.39	44.66
520.0	630.1	45.21	46.41	46.96
550.0	660.1	46.90	49.37	50.49
570.0	680.1	47.41	49.86	51.47
600.0	710.1	46.64	48.54	50.68
630.0	740.1	45.82	46.81	48.39
660.0	770.1	45.51	45.96	46.90
680.0	790.1	45.08	45.24	45.85
710.0	820.1	44.79	45.07	45.44
740.0	850.1	44.80	45.11	45.27
760.0	870.1	44.93	45.11	45.19
790.0	900.1	44.60	44.55	44.52
820.0	930.1	44.26	44.16	44.04
840.0	950.1	44.33	44.20	44.02
870.0	980.1	44.51	44.32	44.09
900.0	1010.1	44.48	44.17	43.88
920.0	1030.1	44.14	43.69	43.37
950.0	1060.1	43.96	43.53	43.31
980.0	1090.1	43.56	43.12	42.94
1010.0	1120.1	42.87	42.38	42.14
1030.0	1140.1	42.06	41.59	41.35
1060.0	1170.1	41.68	41.33	41.10
1090.0	1200.1	41.04	40.82	40.72
1110.0	1220.1	40.51	40.36	40.26
1130.0	1240.1	39.89	39.80	39.75

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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=630MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+14	+17	+19		+14	+17	+19		+14	+17	+19
300.0	410.1	1.76	1.80	1.85	410.1	7.61	6.60	4.83	90.0	1.99	1.99	2.00
315.0	425.1	1.66	1.72	1.79	425.1	7.12	6.34	4.70	95.0	1.86	1.87	1.88
325.0	435.1	1.62	1.67	1.76	435.1	6.61	6.00	4.54	100.0	1.75	1.76	1.77
340.0	450.1	1.63	1.69	1.78	450.1	5.77	5.67	4.35	110.0	1.57	1.59	1.60
355.0	465.1	1.66	1.71	1.79	465.1	4.95	4.87	4.17	120.0	1.41	1.43	1.45
365.0	475.1	1.70	1.75	1.81	475.1	4.45	4.38	3.96	130.0	1.29	1.32	1.34
380.0	490.1	1.77	1.82	1.86	490.1	3.77	3.71	3.48	140.0	1.20	1.23	1.25
395.0	505.1	1.89	1.94	1.97	505.1	3.17	3.12	3.08	150.0	1.11	1.15	1.17
410.0	520.1	2.01	2.05	2.08	520.1	2.65	2.60	2.45	160.0	1.07	1.10	1.13
430.0	540.1	2.17	2.20	2.22	540.1	2.08	2.04	1.94	170.0	1.12	1.13	1.15
440.0	550.1	2.22	2.25	2.27	550.1	1.84	1.81	1.73	180.0	1.18	1.18	1.18
455.0	565.1	2.35	2.37	2.39	565.1	1.54	1.51	1.49	190.0	1.26	1.25	1.24
465.0	575.1	2.43	2.45	2.47	575.1	1.36	1.33	1.32	200.0	1.35	1.33	1.32
480.0	590.1	2.53	2.55	2.56	590.1	1.13	1.11	1.09	210.0	1.44	1.42	1.40
495.0	605.1	2.63	2.64	2.65	605.1	1.07	1.09	1.11	220.0	1.55	1.51	1.49
505.0	615.1	2.71	2.71	2.72	615.1	1.21	1.23	1.25	230.0	1.66	1.61	1.59
520.0	630.1	2.82	2.81	2.81	630.1	1.44	1.47	1.50	240.0	1.75	1.70	1.68
550.0	660.1	3.00	2.98	2.97	660.1	2.05	2.11	2.15	250.0	1.86	1.80	1.77
570.0	680.1	3.11	3.09	3.07	680.1	2.57	2.65	2.71	260.0	1.99	1.93	1.90
600.0	710.1	3.30	3.27	3.25	710.1	3.48	3.60	3.68	270.0	2.11	2.04	2.01
630.0	740.1	3.44	3.41	3.39	740.1	4.60	4.75	4.86	280.0	2.21	2.14	2.10
660.0	770.1	3.55	3.52	3.50	770.1	5.91	6.11	6.25	290.0	2.34	2.26	2.21
680.0	790.1	3.57	3.54	3.52	790.1	6.77	6.96	7.10	300.0	2.48	2.40	2.34
710.0	820.1	3.61	3.58	3.56	820.1	8.14	8.35	8.53	310.0	2.63	2.54	2.48
740.0	850.1	3.58	3.56	3.54	850.1	9.75	10.14	10.48	320.0	2.81	2.70	2.64
760.0	870.1	3.59	3.56	3.55	870.1	10.68	11.11	11.46	330.0	2.98	2.87	2.80
790.0	900.1	3.54	3.51	3.50	900.1	11.64	12.00	12.33	340.0	3.12	3.00	2.92
820.0	930.1	3.49	3.47	3.45	930.1	12.42	12.78	13.14	350.0	3.25	3.12	3.04
840.0	950.1	3.44	3.43	3.41	950.1	12.81	13.22	13.58	360.0	3.44	3.31	3.23
870.0	980.1	3.32	3.31	3.30	980.1	12.99	13.25	13.48	370.0	3.64	3.49	3.40
900.0	1010.1	3.22	3.20	3.19	1010.1	12.90	13.05	13.18	380.0	3.77	3.62	3.52
920.0	1030.1	3.12	3.11	3.10	1030.1	12.76	12.81	12.85	390.0	3.90	3.74	3.65
950.0	1060.1	3.02	2.99	2.98	1060.1	12.48	12.44	12.32	400.0	4.07	3.91	3.81
980.0	1090.1	2.90	2.87	2.85	1090.1	12.03	11.95	11.82	410.0	4.28	4.11	4.01
1010.0	1120.1	2.81	2.78	2.75	1120.1	11.47	11.36	11.20	420.0	4.53	4.35	4.24
1030.0	1140.1	2.74	2.71	2.68	1140.1	11.11	10.97	10.76	430.0	4.76	4.58	4.46
1060.0	1170.1	2.63	2.60	2.57	1170.1	10.64	10.52	10.31	440.0	4.90	4.71	4.59
1090.0	1200.1	2.52	2.48	2.46	1200.1	10.16	10.09	9.96	450.0	5.00	4.80	4.68
1110.0	1220.1	2.46	2.42	2.39	1220.1	9.83	9.75	9.59	460.0	5.23	5.03	4.91
1130.0	1240.1	2.40	2.36	2.34	1240.1	9.52	9.41	9.15	470.0	5.53	5.32	5.20

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	--	--	16.83	56.25	45.67	49.98	35.02	44.87	40.15	53.91	53.79	69.24
1	--	32.78	--	48.45	52.41	61.66	31.64	42.75	29.89	41.35	58.49	63.33
2	97.54	79.69	50.65	57.93	67.61	97.20	76.53	71.91	62.44	65.83	65.80	75.85
3	110.98	102.21	71.30	70.57	64.40	79.63	85.82	86.45	71.36	74.44	63.52	83.79
4	110.06	108.79	120.58	96.40	93.59	92.08	107.38	113.37	105.01	101.23	92.40	95.47
5	110.35	117.42	119.65	119.47	107.03	98.98	105.68	116.63	119.91	110.80	109.35	107.03
6	110.76	109.96	112.71	120.52	119.11	105.15	100.64	107.71	121.64	120.80	114.05	108.08
7	110.60	117.28	112.58	120.53	118.92	120.76	104.37	101.87	106.04	120.20	118.50	120.32
8	110.65	113.41	106.87	119.90	118.24	120.71	116.48	107.59	105.33	117.38	121.49	119.05
9	109.87	119.60	116.86	120.79	118.14	119.86	122.37	120.02	109.85	114.20	118.90	118.90
10	110.94	120.80	114.41	119.26	118.17	119.84	122.16	121.54	119.34	116.55	109.56	122.00
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 480 MHz; 0.00 dBm.
 LO IN: 585 MHz; +17.00 dBm
 IF OUT: 105 MHz; -7.22 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	--	--	18.92	47.94	52.04	58.20	40.76	50.10	44.89	59.34	56.39	64.27
1	--	29.08	--	50.61	52.89	43.44	33.51	42.06	35.36	43.62	67.35	51.57
2	73.95	72.11	46.08	50.05	61.89	84.08	71.29	63.70	56.44	59.31	59.69	73.69
3	84.39	95.58	62.02	67.03	55.88	70.28	76.85	90.64	61.59	68.91	55.26	81.21
4	114.73	101.67	100.89	85.57	75.70	76.59	90.82	99.94	86.68	83.49	77.10	79.76
5	115.78	100.21	95.44	117.50	78.64	83.98	75.87	101.66	93.81	101.27	84.93	82.48
6	113.23	110.54	108.18	122.50	116.90	108.59	102.43	99.02	121.31	112.29	112.35	98.97
7	113.23	103.66	109.51	113.54	117.07	118.24	97.88	96.83	104.70	122.69	119.48	109.52
8	113.33	124.20	121.12	121.48	122.60	123.17	123.11	115.33	105.58	119.49	121.64	121.06
9	113.43	114.38	110.09	119.13	120.93	115.61	123.80	119.47	108.67	115.71	119.74	122.54
10	115.01	121.19	113.73	120.26	115.52	122.95	122.84	124.49	110.94	116.31	108.79	121.93
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 480 MHz; 10.00 dBm.
 LO IN: 585 MHz; +17.00 dBm
 IF OUT: 105 MHz; 2.86 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 represents the Harmonics level of the RF Input Signal to the mixer