

# Frequency Mixer

# MBA-15LH+

## 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=+5dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+7	+10	+13			+7	+10	+13			+7	+10	+13
980.0	1010.0	15.02	10.93	9.45	980.0	1010.0	5.78	13.03	12.30	980.0	1010.0	-2.08	0.04	0.38
1060.0	1090.0	11.51	9.07	8.28	1060.0	1090.0	10.13	11.60	11.70	1060.0	1090.0	-0.20	0.70	0.67
1140.0	1170.0	9.24	7.85	7.42	1140.0	1170.0	14.50	9.93	13.47	1140.0	1170.0	0.98	1.20	0.97
1220.0	1250.0	7.99	7.13	6.84	1220.0	1250.0	14.48	10.32	13.64	1220.0	1250.0	1.47	1.43	1.19
1300.0	1330.0	7.32	6.75	6.53	1300.0	1330.0	10.20	10.94	15.26	1300.0	1330.0	1.56	1.40	1.17
1380.0	1410.0	7.04	6.52	6.32	1380.0	1410.0	10.80	14.61	16.39	1380.0	1410.0	1.46	1.25	0.94
1460.0	1490.0	6.71	6.29	6.17	1460.0	1490.0	13.05	13.42	12.01	1460.0	1490.0	1.37	1.04	0.75
1540.0	1570.0	6.44	6.11	6.02	1540.0	1570.0	12.29	13.07	11.81	1540.0	1570.0	1.28	0.92	0.64
1620.0	1650.0	6.27	6.00	5.91	1620.0	1650.0	11.77	11.38	10.65	1620.0	1650.0	1.17	0.76	0.53
1700.0	1730.0	6.38	5.98	5.82	1700.0	1730.0	9.92	12.54	14.84	1700.0	1730.0	0.98	0.70	0.51
1780.0	1810.0	6.33	5.86	5.70	1780.0	1810.0	9.00	17.20	21.02	1780.0	1810.0	1.00	0.77	0.54
1860.0	1890.0	6.22	5.76	5.64	1860.0	1890.0	9.71	17.78	20.84	1860.0	1890.0	1.07	0.87	0.61
1940.0	1970.0	6.25	5.82	5.68	1940.0	1970.0	11.61	18.58	18.13	1940.0	1970.0	1.07	0.81	0.58
2020.0	2050.0	6.22	5.83	5.72	2020.0	2050.0	15.94	18.74	18.16	2020.0	2050.0	1.01	0.70	0.55
2100.0	2130.0	6.20	5.88	5.77	2100.0	2130.0	16.27	17.84	18.70	2100.0	2130.0	0.91	0.60	0.54
2200.0	2230.0	6.45	6.09	6.00	2200.0	2230.0	15.19	17.17	20.59	2200.0	2230.0	0.95	0.69	0.58
2280.0	2310.0	6.37	6.15	6.11	2280.0	2310.0	11.54	14.85	18.34	2280.0	2310.0	1.04	0.71	0.61
2380.0	2410.0	6.46	6.26	6.23	2380.0	2410.0	10.59	13.37	16.54	2380.0	2410.0	1.20	0.89	0.73
2460.0	2490.0	6.72	6.66	6.70	2460.0	2490.0	10.57	13.13	15.58	2460.0	2490.0	1.33	0.93	0.74
2560.0	2590.0	7.06	7.05	7.06	2560.0	2590.0	10.92	15.63	19.30	2560.0	2590.0	1.62	1.04	0.74
2640.0	2670.0	7.15	7.00	6.97	2640.0	2670.0	11.30	21.12	17.23	2640.0	2670.0	1.92	1.30	0.90
2740.0	2770.0	7.29	6.93	6.79	2740.0	2770.0	11.14	14.24	17.69	2740.0	2770.0	1.65	1.31	1.07
2820.0	2850.0	7.51	7.17	7.07	2820.0	2850.0	19.00	18.15	19.73	2820.0	2850.0	1.31	1.01	0.78
2920.0	2950.0	7.06	6.86	6.85	2920.0	2950.0	15.12	14.50	14.25	2920.0	2950.0	1.64	1.20	0.89
3000.0	3030.0	6.95	6.75	6.73	3000.0	3030.0	15.30	16.04	15.06	3000.0	3030.0	1.67	1.14	0.80
3100.0	3130.0	6.79	6.58	6.57	3100.0	3130.0	13.52	17.82	14.34	3100.0	3130.0	1.81	1.23	0.87
3180.0	3210.0	6.88	6.56	6.53	3180.0	3210.0	15.97	17.22	17.57	3180.0	3210.0	1.73	1.21	0.88
3280.0	3310.0	6.89	6.57	6.55	3280.0	3310.0	15.05	14.83	16.75	3280.0	3310.0	1.84	1.41	1.13
3360.0	3390.0	7.07	6.66	6.60	3360.0	3390.0	14.25	17.33	15.42	3360.0	3390.0	1.89	1.46	1.23
3460.0	3490.0	7.28	6.79	6.68	3460.0	3490.0	14.94	15.65	16.41	3460.0	3490.0	1.75	1.47	1.34
3540.0	3570.0	7.33	6.80	6.78	3540.0	3570.0	13.13	14.43	17.56	3540.0	3570.0	1.71	1.38	1.16
3640.0	3670.0	7.48	6.74	6.67	3640.0	3670.0	18.50	18.84	15.22	3640.0	3670.0	1.47	1.26	1.03
3720.0	3750.0	7.37	6.66	6.59	3720.0	3750.0	15.08	16.32	15.60	3720.0	3750.0	1.29	1.18	1.04
3820.0	3850.0	7.25	6.84	6.79	3820.0	3850.0	17.58	20.96	18.26	3820.0	3850.0	1.39	1.15	1.02
3900.0	3930.0	7.31	6.90	6.79	3900.0	3930.0	21.86	19.47	21.18	3900.0	3930.0	1.57	1.27	1.15
4000.0	4030.0	7.54	6.93	6.76	4000.0	4030.0	18.26	15.40	18.40	4000.0	4030.0	1.72	1.46	1.41
4080.0	4110.0	7.69	6.94	6.71	4080.0	4110.0	12.94	11.84	13.10	4080.0	4110.0	2.04	1.85	1.76
4180.0	4210.0	7.08	6.38	6.09	4180.0	4210.0	8.44	8.38	10.70	4180.0	4210.0	2.72	2.54	2.37
4260.0	4290.0	6.74	6.17	5.84	4260.0	4290.0	7.26	7.05	8.05	4260.0	4290.0	2.98	2.76	2.60
4360.0	4390.0	6.55	6.13	5.96	4360.0	4390.0	6.62	6.32	6.84	4360.0	4390.0	3.08	2.73	2.47

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## Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1800MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1189.9MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=2410.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+10			+10			+10
890.0	910.0	10.74	10.1	1200.0	7.75	1110.1	1300.0	10.82
852.6	947.4	9.51	30.1	1220.0	7.44	1090.1	1320.0	10.52
815.1	984.9	8.72	50.1	1240.0	7.37	1070.1	1340.0	10.09
777.7	1022.3	8.42	70.1	1260.0	7.44	1050.1	1360.0	9.63
740.2	1059.8	7.94	90.1	1280.0	7.39	1030.1	1380.0	9.14
684.0	1116.0	7.10	110.1	1300.0	7.38	1010.1	1400.0	8.78
646.6	1153.4	6.68	130.1	1320.0	7.44	990.1	1420.0	8.39
590.4	1209.6	6.25	150.1	1340.0	7.40	970.1	1440.0	8.08
553.0	1247.0	6.16	190.1	1380.0	7.41	930.1	1480.0	7.33
496.8	1303.2	6.01	210.1	1400.0	7.41	910.1	1500.0	7.04
459.4	1340.6	6.06	250.1	1440.0	7.46	870.1	1540.0	6.67
403.2	1396.8	6.02	270.1	1460.0	7.47	850.1	1560.0	6.38
365.7	1434.3	6.03	310.1	1500.0	7.50	810.1	1600.0	6.19
309.6	1490.4	5.81	330.1	1520.0	7.59	790.1	1620.0	6.19
272.1	1527.9	5.69	370.1	1560.0	7.68	750.1	1660.0	6.26
216.0	1584.0	5.53	390.1	1580.0	7.75	730.1	1680.0	6.32
178.5	1621.5	5.55	430.1	1620.0	7.90	690.1	1720.0	6.45
122.3	1677.7	5.63	450.1	1640.0	8.02	670.1	1740.0	6.53
84.9	1715.1	5.71	490.1	1680.0	8.15	630.1	1780.0	6.57
28.7	1771.3	5.76	510.1	1700.0	8.15	610.1	1800.0	6.53
10.0	1810.0	6.09	550.1	1740.0	8.30	570.1	1840.0	6.48
73.8	1873.8	5.75	570.1	1760.0	8.25	550.1	1860.0	6.40
116.3	1916.3	5.85	610.1	1800.0	8.28	510.1	1900.0	6.36
180.0	1980.0	5.94	630.1	1820.0	8.44	490.1	1920.0	6.39
222.5	2022.5	6.06	670.1	1860.0	8.57	450.1	1960.0	6.47
286.3	2086.3	6.24	690.1	1880.0	8.64	430.1	1980.0	6.49
328.7	2128.8	6.32	730.1	1920.0	8.69	390.1	2020.0	6.40
392.5	2192.5	6.44	750.1	1940.0	8.64	370.1	2040.0	6.39
435.0	2235.0	6.43	790.1	1980.0	8.69	330.1	2080.0	6.30
498.7	2298.8	6.29	810.1	2000.0	8.63	310.1	2100.0	6.23
541.3	2341.3	6.22	850.1	2040.0	8.51	270.1	2140.0	6.19
605.0	2405.0	6.45	870.1	2060.0	8.66	250.1	2160.0	6.16
647.5	2447.5	6.66	910.1	2100.0	8.52	210.1	2200.0	6.19
711.2	2511.3	7.09	930.1	2120.0	8.54	190.1	2220.0	6.25
753.8	2553.8	7.33	970.1	2160.0	8.74	150.1	2260.0	6.37
817.5	2617.5	7.75	990.1	2180.0	8.81	130.1	2280.0	6.43
860.0	2660.0	8.27	1030.1	2220.0	9.25	90.1	2320.0	6.39
923.7	2723.8	9.01	1050.1	2240.0	9.77	70.1	2340.0	6.38
966.3	2766.3	9.78	1090.1	2280.0	10.76	30.1	2380.0	6.43
1030.0	2830.0	10.93	1110.1	2300.0	11.30	10.1	2400.0	6.67

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## Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+7	+10	+13	+7	+10	+13
1010.0	30.57	30.85	33.44	13.42	14.01	14.80
1090.0	28.96	30.52	33.60	13.50	14.13	14.72
1170.0	27.95	30.35	33.50	13.82	14.46	14.56
1250.0	27.57	30.50	34.24	14.66	14.96	14.84
1330.0	27.12	30.55	34.24	15.70	15.58	15.32
1410.0	27.29	30.53	33.25	16.92	16.52	16.08
1490.0	26.87	29.79	32.42	18.53	17.66	17.00
1570.0	26.01	28.96	32.08	20.33	19.03	18.18
1650.0	25.49	28.66	32.08	21.98	20.53	19.59
1730.0	25.43	28.66	31.38	23.80	22.23	21.29
1810.0	26.46	30.01	30.64	26.15	24.48	23.67
1890.0	29.03	30.63	28.79	27.97	27.03	26.38
1970.0	30.83	29.49	27.17	27.14	27.85	28.02
2050.0	31.90	28.97	26.58	24.96	26.11	26.75
2130.0	34.99	28.89	25.73	22.34	23.39	23.98
2230.0	36.91	27.88	24.47	19.65	20.34	20.74
2310.0	29.65	25.25	22.89	18.73	19.15	19.39
2410.0	26.42	23.66	21.83	17.69	18.00	18.13
2490.0	23.85	22.25	21.18	16.70	17.05	17.37
2590.0	22.73	21.91	21.13	15.50	16.02	16.44
2670.0	22.27	22.49	22.08	14.53	15.10	15.61
2770.0	21.30	22.50	22.81	13.98	14.44	15.10
2850.0	20.96	21.80	22.47	13.66	14.04	14.82
2950.0	21.29	21.21	21.61	13.19	13.34	14.28
3030.0	21.88	21.34	21.10	12.80	13.14	13.93
3130.0	23.54	22.49	21.48	12.22	12.62	13.52
3210.0	25.13	24.21	22.35	12.06	12.32	13.18
3310.0	25.74	25.40	23.83	12.05	12.11	12.94
3390.0	25.07	25.22	24.17	12.26	12.34	13.16
3490.0	23.91	24.19	23.80	12.37	12.45	13.40
3570.0	23.35	23.56	22.68	12.26	12.44	13.42
3670.0	22.68	22.17	20.89	12.03	12.25	13.18
3750.0	21.65	21.16	20.36	11.79	11.99	13.05
3850.0	20.66	20.33	19.86	11.83	11.87	12.92
3930.0	20.74	20.49	19.94	11.94	11.86	12.80
4030.0	21.13	20.68	20.05	12.36	12.07	12.85
4110.0	21.28	20.89	19.84	12.62	12.49	13.02
4210.0	21.82	21.60	20.49	12.95	13.03	13.73
4290.0	22.79	22.81	21.80	13.23	13.43	14.18
4390.0	23.69	24.21	24.07	13.54	13.60	14.54

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+7	+10	+13
980.0	1010.0	24.11	19.12	17.50
1060.0	1090.0	22.30	19.93	18.94
1140.0	1170.0	22.76	22.27	20.82
1220.0	1250.0	23.96	23.64	22.85
1300.0	1330.0	23.32	22.71	22.62
1380.0	1410.0	22.10	21.64	21.74
1460.0	1490.0	20.78	20.72	20.87
1540.0	1570.0	19.53	19.63	19.70
1620.0	1650.0	18.53	18.72	18.86
1700.0	1730.0	17.27	17.68	17.93
1780.0	1810.0	16.30	16.95	17.33
1860.0	1890.0	16.01	16.63	16.96
1940.0	1970.0	15.38	16.06	16.33
2020.0	2050.0	14.75	15.22	15.48
2100.0	2130.0	14.12	14.35	14.53
2200.0	2230.0	13.13	13.32	13.43
2280.0	2310.0	12.64	12.78	12.85
2380.0	2410.0	12.04	12.22	12.39
2460.0	2490.0	11.34	11.51	11.67
2560.0	2590.0	10.80	11.07	11.31
2640.0	2670.0	10.97	11.18	11.39
2740.0	2770.0	11.58	11.79	11.94
2820.0	2850.0	12.07	12.14	12.20
2920.0	2950.0	13.28	13.37	13.39
3000.0	3030.0	14.31	14.34	14.35
3100.0	3130.0	15.76	15.70	15.72
3180.0	3210.0	17.14	16.83	16.44
3280.0	3310.0	18.43	19.11	18.63
3360.0	3390.0	18.88	19.81	19.92
3460.0	3490.0	18.83	19.35	19.54
3540.0	3570.0	18.23	18.62	18.99
3640.0	3670.0	17.43	17.93	18.51
3720.0	3750.0	16.94	17.36	17.71
3820.0	3850.0	16.34	16.33	16.67
3900.0	3930.0	15.71	15.93	16.23
4000.0	4030.0	15.27	15.60	16.03
4080.0	4110.0	15.17	15.16	15.44
4180.0	4210.0	15.91	16.63	16.64
4260.0	4290.0	16.43	17.83	18.21
4360.0	4390.0	16.56	18.37	19.26

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## Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+7	+10	+13
980.0	1010.0	10.13	7.41	6.39
1060.0	1090.0	7.31	5.72	5.12
1140.0	1170.0	5.52	4.53	4.09
1220.0	1250.0	4.57	3.79	3.39
1300.0	1330.0	3.91	3.20	2.86
1380.0	1410.0	3.31	2.72	2.46
1460.0	1490.0	2.87	2.45	2.26
1540.0	1570.0	2.57	2.23	2.06
1620.0	1650.0	2.33	2.03	1.86
1700.0	1730.0	2.29	1.94	1.73
1780.0	1810.0	2.17	1.79	1.59
1860.0	1890.0	2.04	1.71	1.56
1940.0	1970.0	1.81	1.58	1.50
2020.0	2050.0	1.64	1.52	1.49
2100.0	2130.0	1.53	1.47	1.47
2200.0	2230.0	1.50	1.47	1.51
2280.0	2310.0	1.45	1.47	1.52
2380.0	2410.0	1.44	1.45	1.49
2460.0	2490.0	1.52	1.54	1.57
2560.0	2590.0	1.79	1.79	1.78
2640.0	2670.0	2.12	2.04	1.99
2740.0	2770.0	2.46	2.26	2.12
2820.0	2850.0	2.66	2.46	2.33
2920.0	2950.0	2.75	2.49	2.35
3000.0	3030.0	2.80	2.49	2.32
3100.0	3130.0	2.89	2.48	2.27
3180.0	3210.0	3.05	2.52	2.22
3280.0	3310.0	3.10	2.66	2.33
3360.0	3390.0	3.10	2.61	2.33
3460.0	3490.0	3.08	2.60	2.27
3540.0	3570.0	2.95	2.42	2.06
3640.0	3670.0	2.87	2.25	1.91
3720.0	3750.0	2.78	2.22	1.94
3820.0	3850.0	2.58	2.25	2.03
3900.0	3930.0	2.59	2.35	2.13
4000.0	4030.0	2.69	2.41	2.21
4080.0	4110.0	2.77	2.43	2.19
4180.0	4210.0	2.35	2.04	1.78
4260.0	4290.0	1.99	1.72	1.47
4360.0	4390.0	1.73	1.44	1.23

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+7	+10	+13
1010.0	13.49	8.12	5.61
1090.0	9.96	5.59	4.44
1170.0	7.00	4.36	3.83
1250.0	5.06	3.56	3.37
1330.0	4.01	3.15	3.14
1410.0	3.34	2.85	2.90
1490.0	2.84	2.47	2.64
1570.0	2.44	2.20	2.44
1650.0	2.12	1.94	2.26
1730.0	1.88	1.79	2.14
1810.0	1.71	1.65	2.03
1890.0	1.62	1.58	1.96
1970.0	1.57	1.49	1.88
2050.0	1.52	1.38	1.77
2130.0	1.43	1.27	1.66
2230.0	1.46	1.24	1.59
2310.0	1.46	1.13	1.50
2410.0	1.49	1.06	1.43
2490.0	1.51	1.03	1.39
2590.0	1.52	1.01	1.37
2670.0	1.52	1.02	1.36
2770.0	1.49	1.04	1.38
2850.0	1.46	1.05	1.40
2950.0	1.43	1.08	1.41
3030.0	1.45	1.15	1.44
3130.0	1.49	1.24	1.48
3210.0	1.57	1.33	1.52
3310.0	1.71	1.45	1.56
3390.0	1.84	1.51	1.55
3490.0	2.03	1.57	1.50
3570.0	2.26	1.65	1.46
3670.0	2.44	1.78	1.46
3750.0	2.46	1.82	1.42
3850.0	2.49	1.78	1.36
3930.0	2.39	1.69	1.26
4030.0	2.27	1.56	1.13
4110.0	2.16	1.49	1.14
4210.0	2.01	1.42	1.24
4290.0	1.81	1.38	1.36
4390.0	1.59	1.39	1.56

IF (OUT) (MHz)	IF VSWR @LO=2400MHz (:1)		
	@LO (dBm)		
	+7	+10	+13
10.0	1.09	1.23	1.31
30.0	1.09	1.22	1.31
50.0	1.13	1.22	1.29
70.0	1.16	1.25	1.32
90.0	1.19	1.28	1.36
110.0	1.22	1.29	1.36
130.0	1.24	1.29	1.35
150.0	1.29	1.32	1.38
170.0	1.36	1.40	1.45
190.0	1.40	1.43	1.48
210.0	1.39	1.41	1.45
230.0	1.43	1.44	1.47
250.0	1.55	1.54	1.56
270.0	1.58	1.57	1.59
290.0	1.59	1.58	1.60
310.0	1.64	1.61	1.62
330.0	1.72	1.67	1.66
350.0	1.78	1.72	1.71
370.0	1.85	1.80	1.78
390.0	1.88	1.81	1.79
410.0	1.91	1.82	1.78
430.0	2.01	1.91	1.86
450.0	2.13	2.02	1.96
470.0	2.18	2.06	1.99
490.0	2.17	2.03	1.96
510.0	2.28	2.12	2.03
530.0	2.42	2.24	2.13
550.0	2.45	2.26	2.15
590.0	2.56	2.34	2.21
610.0	2.62	2.39	2.24
650.0	2.82	2.57	2.41
670.0	2.79	2.52	2.36
710.0	2.93	2.65	2.48
730.0	3.09	2.78	2.60
770.0	3.10	2.78	2.59
790.0	3.22	2.89	2.70
830.0	3.42	3.07	2.87
850.0	3.48	3.12	2.92
890.0	3.65	3.29	3.10
910.0	3.82	3.46	3.28

## Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+0	14	+1	12	14	30	38	28	40	51
1	-	11	+0	23	18	20	23	50	40	46	46	46
2	79	46	43	36	39	50	35	41	43	54	52	56
3	>90	56	56	61	53	56	54	49	58	62	65	73
4	>90	67	73	65	70	56	64	64	58	64	65	69
5	>90	>74	>74	>74	>74	>74	69	>74	>74	>74	73	>74
6	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
7	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
8	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
9	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
10	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 1800 MHz; -10.00 dBm.  
 LO IN: 1830 MHz; +10.00 dBm  
 IF OUT: 30 MHz; -15.92 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	9	25	11	28	28	39	46	53	53	57
1	-	11	+0	27	18	27	26	43	48	67	65	62
2	59	47	44	44	43	43	32	36	44	61	69	53
3	>90	42	36	43	41	39	39	36	41	50	55	58
4	>90	56	51	48	53	41	49	52	46	50	54	64
5	>90	64	58	64	65	60	49	52	50	45	52	58
6	>90	72	65	66	59	55	63	48	58	55	56	65
7	>90	73	80	71	65	69	66	80	57	67	60	56
8	>90	71	79	>84	75	75	66	66	76	57	68	64
9	>90	>84	75	>84	80	78	78	72	>84	84	77	71
10	>90	>84	>84	80	>84	>84	79	82	78	78	>84	76
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 1800 MHz; 0.00 dBm.  
 LO IN: 1830 MHz; +10.00 dBm  
 IF OUT: 30 MHz; -6.1 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.