

Appendix for test report

1Appendix_A: Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	ERP [dBm]	Limit [dBm]	Verdict
WCDMA850	UMTS/TM1	LCH	23.79	22.44	38.5	PASS
		MCH	23.80	22.45	38.5	PASS
		HCH	23.77	22.42	38.5	PASS
Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
WCDMA1700	UMTS/TM1	LCH	23.11	21.51	30	PASS
		MCH	23.18	21.58	30	PASS
		HCH	23.28	21.68	30	PASS
WCDMA1900	UMTS/TM1	LCH	23.16	22.16	33	PASS
		MCH	23.22	22.22	33	PASS
		HCH	23.20	22.20	33	PASS

Note1:

a, For getting the ERP (Efficient Radiated Power) or EIRP (Efficient Isotropic Radiated Power) in substitution method, the following formula should be taken to calculate it,

$$\text{ERP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBd]}$$

$$\text{EIRP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBi]}$$

b, SGP = Signal Generator Level

Note2:

$$\text{SET Span} = 1.5 * \text{OBW}$$

$$\text{SET RBW} = 1\% \text{ of the OBW, not to exceed } 1\text{MHz}$$

$$\text{SET VBW} \geq 3 * \text{RBW}$$

SET Sweep time = auto - couple.

Detector: RMS

2Appendix_B: Peak-to-Average Ratio

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA850	UMTS/TM1	LCH	2.450	13	PASS
		MCH	2.300	13	PASS
		HCH	2.490	13	PASS
WCDMA1700	UMTS/TM1	LCH	2.550	13	PASS
		MCH	2.410	13	PASS
		HCH	2.430	13	PASS
WCDMA1900	UMTS/TM1	LCH	2.360	13	PASS
		MCH	2.660	13	PASS
		HCH	2.510	13	PASS

3Appendix_C: Modulation Characteristics

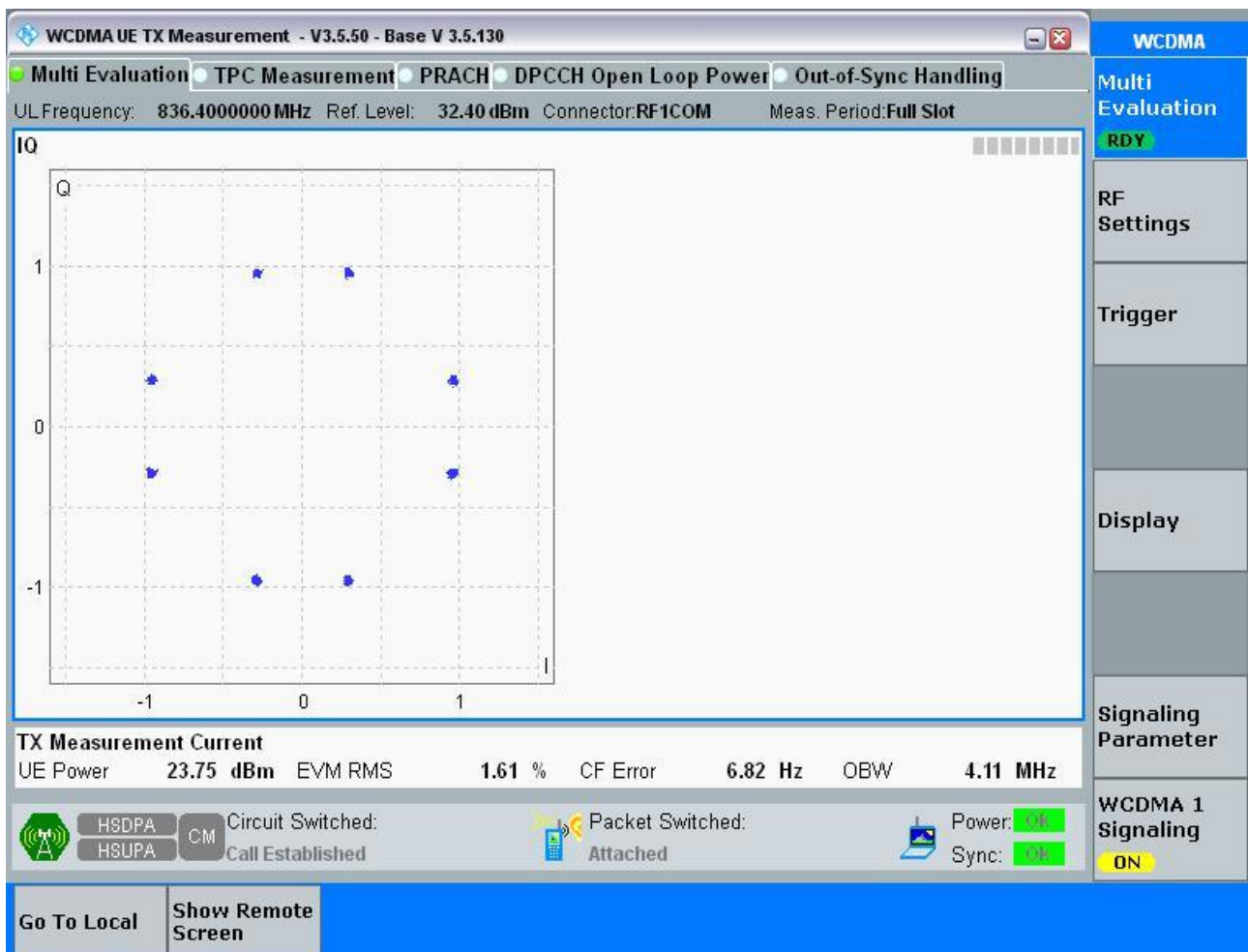
Part I - Test Plots

3.1 For UMTS

3.1.1 Test Band = WCDMA850

3.1.1.1 Test Mode = UMTS/TM1

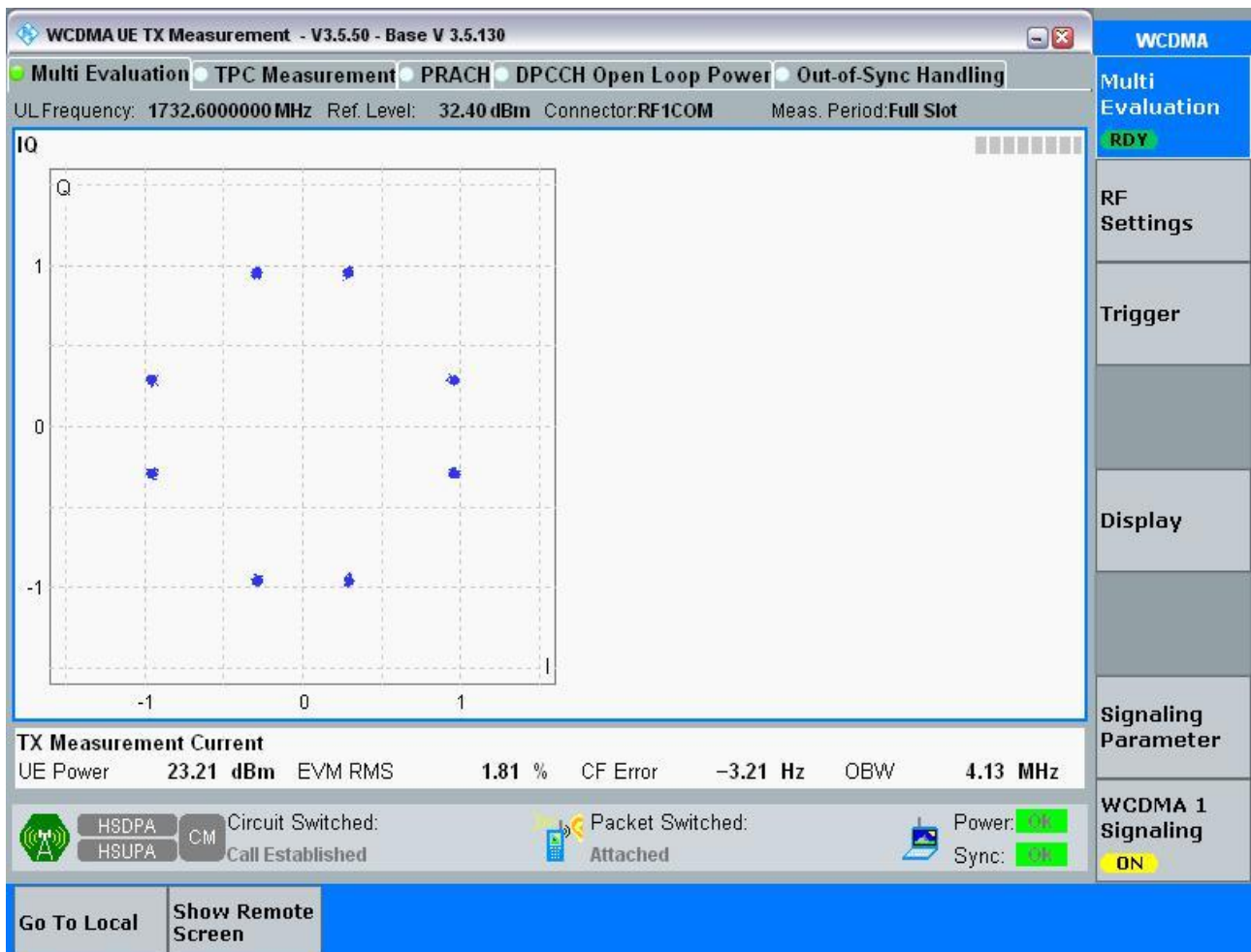
3.1.1.1.1 Test Channel = MCH



3.1.2 Test Band = WCDMA1700

3.1.2.1 Test Mode = UMTS/TM1

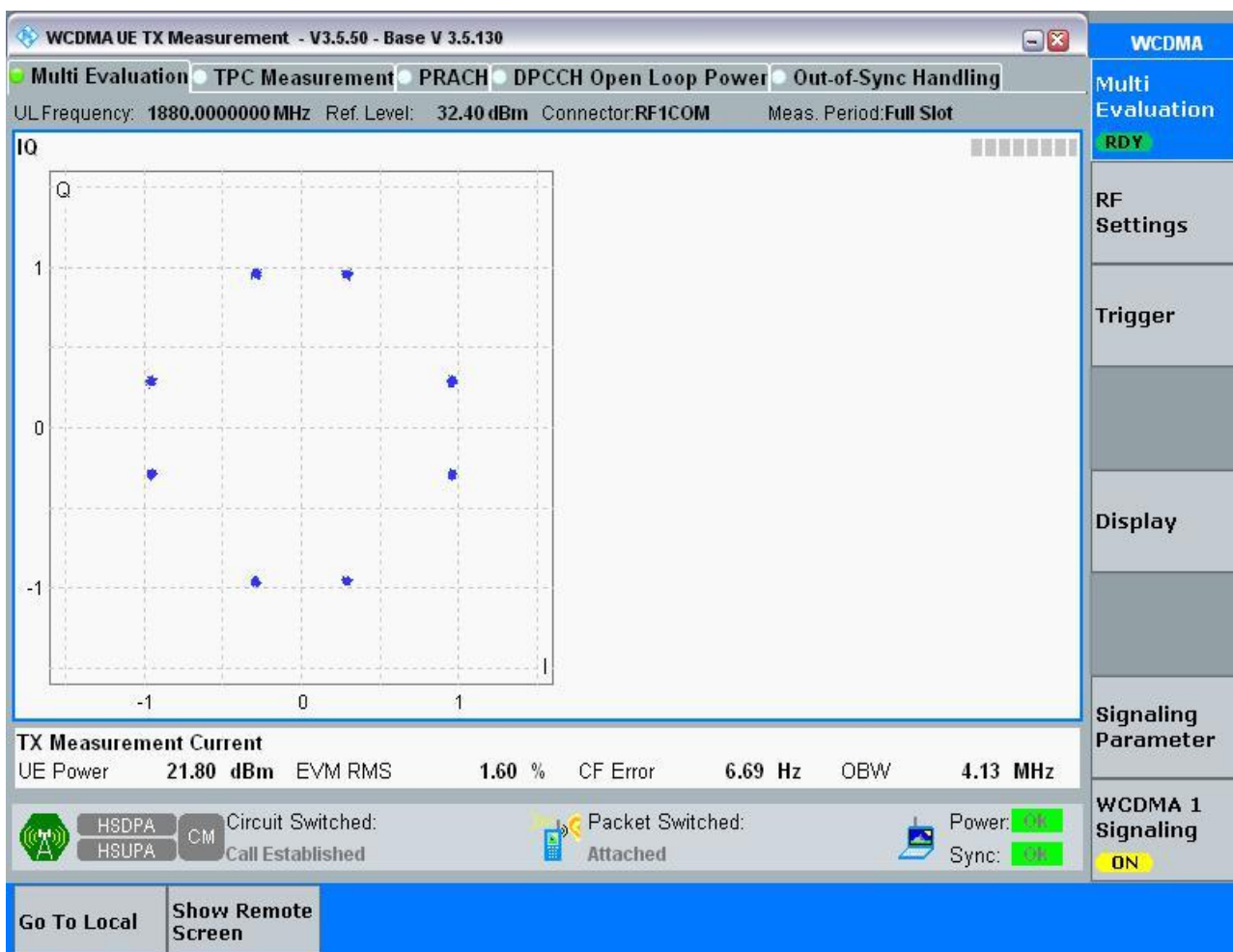
3.1.2.1.1 Test Channel = MCH



3.1.3 Test Band = WCDMA1900

3.1.3.1 Test Mode = UMTS/TM1

3.1.3.1.1 Test Channel = MCH



4Appendix_D: Bandwidth

Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA850	UMTS/TM1	LCH	4.18	4.70	Pass
		MCH	4.17	4.72	Pass
		HCH	4.17	4.72	Pass
WCDMA1700	UMTS/TM1	LCH	4.17	4.75	Pass
		MCH	4.19	4.74	Pass
		HCH	4.18	4.72	Pass
WCDMA1900	UMTS/TM1	LCH	4.18	4.72	Pass
		MCH	4.18	4.73	Pass
		HCH	4.18	4.75	Pass

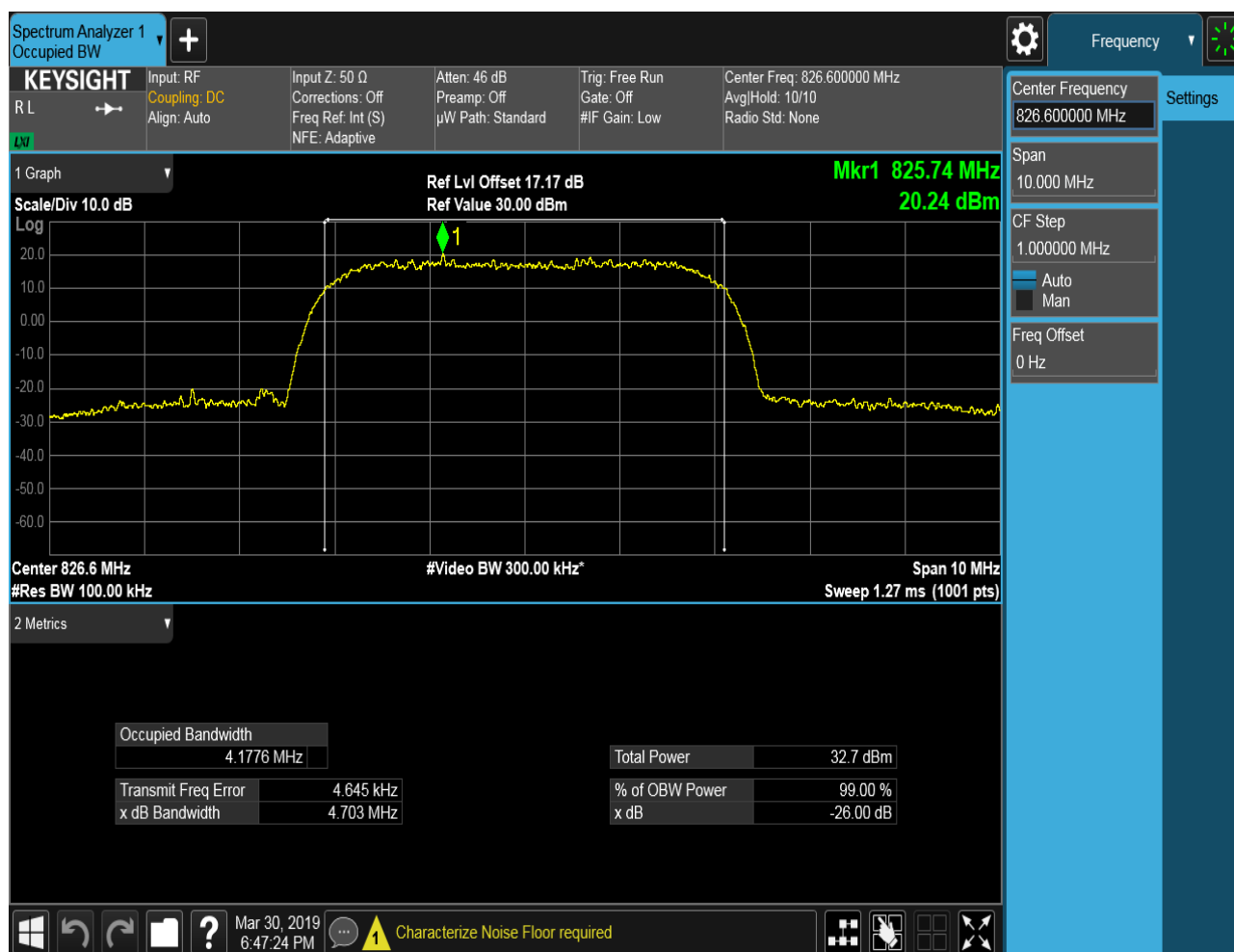
Part II - Test Plots

4.1 For UMTS

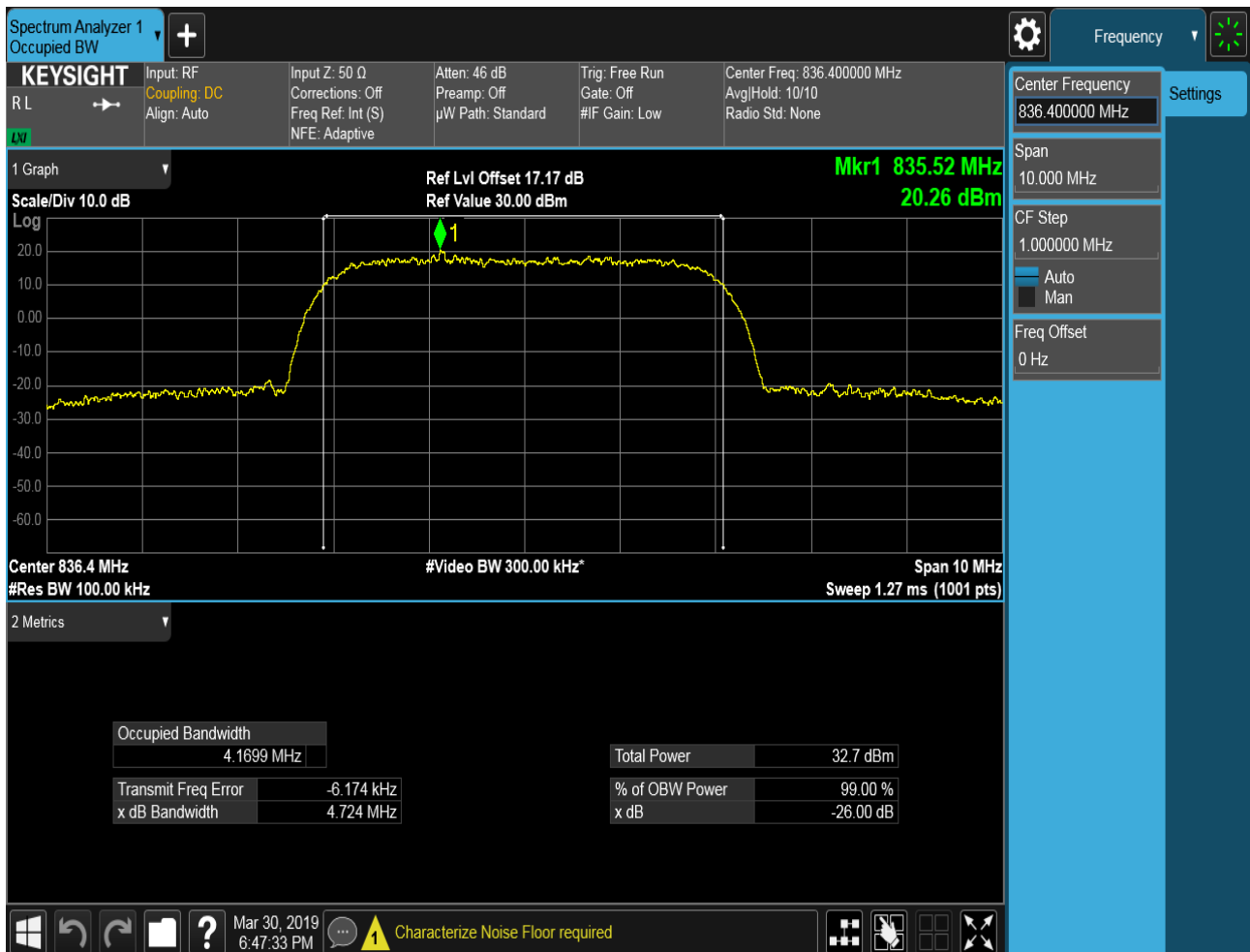
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4.1.1.1 Test Mode = UMTS/TM1

4.1.1.1.1 Test Channel = LCH



4.1.1.1.2 Test Channel = MCH



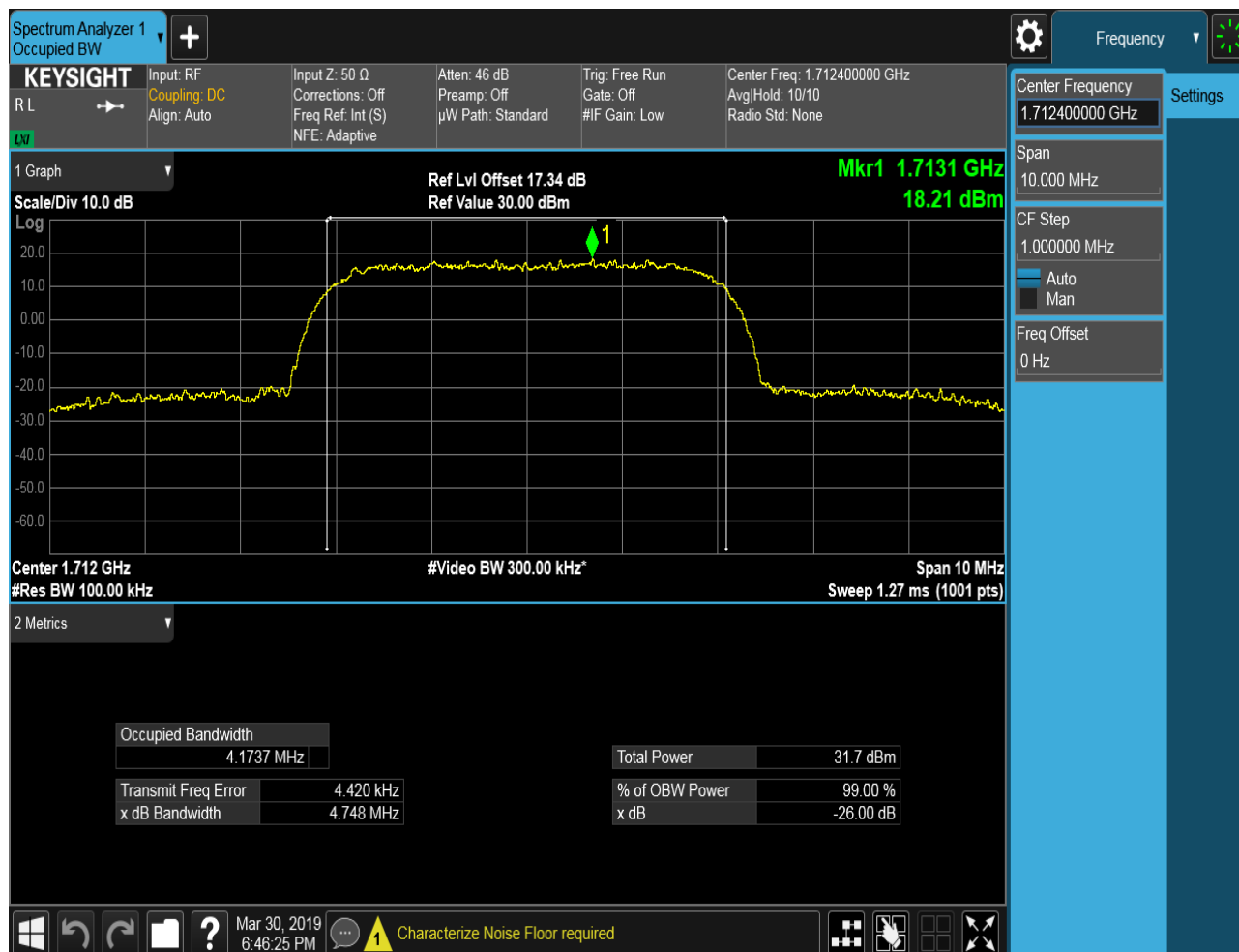
4.1.1.1.3 Test Channel = HCH



4.1.2 Test Band = WCDMA1700

4.1.2.1 Test Mode = UMTS/TM1

4.1.2.1.1 Test Channel = LCH



4.1.2.1.2 Test Channel = MCH



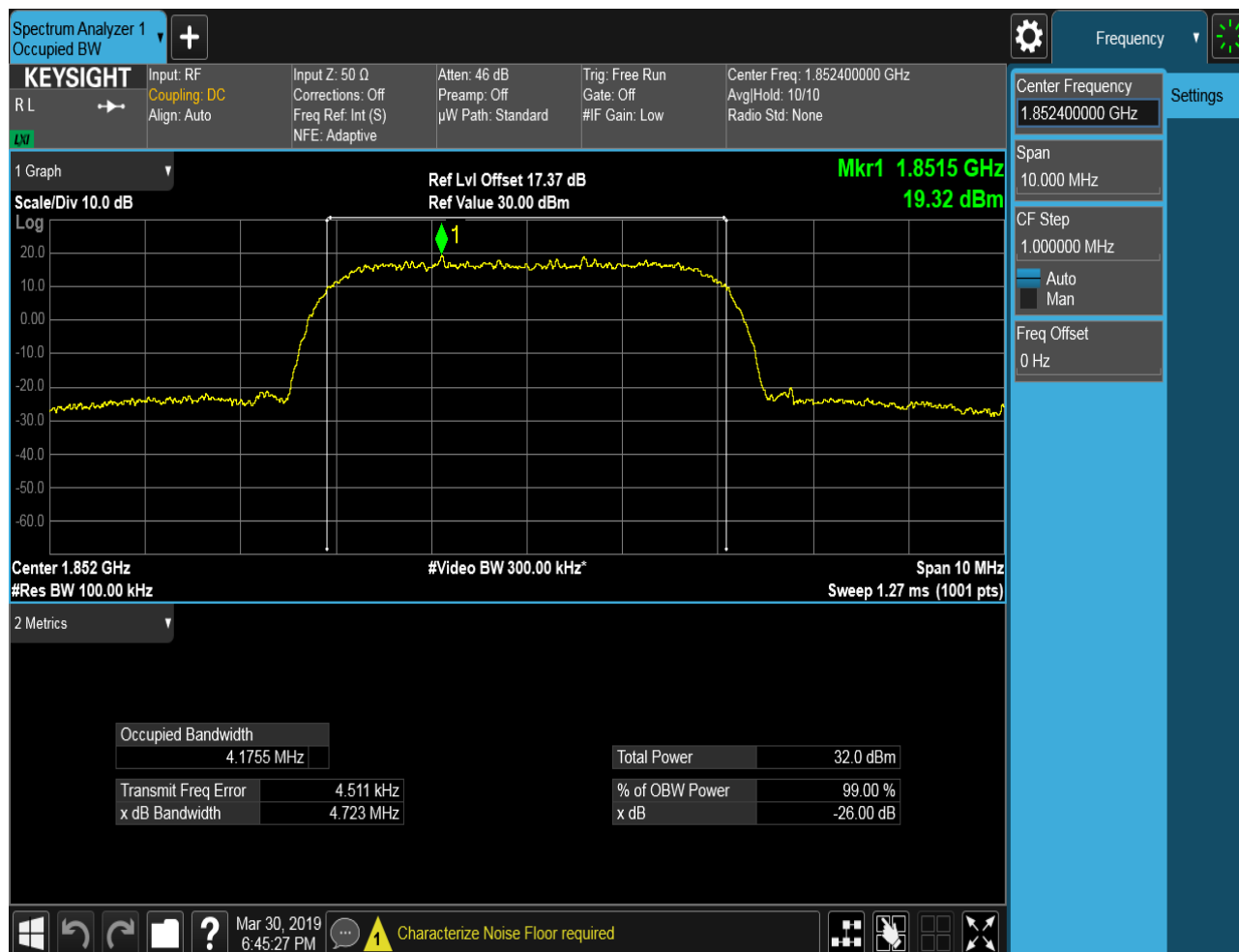
4.1.2.1.3 Test Channel = HCH



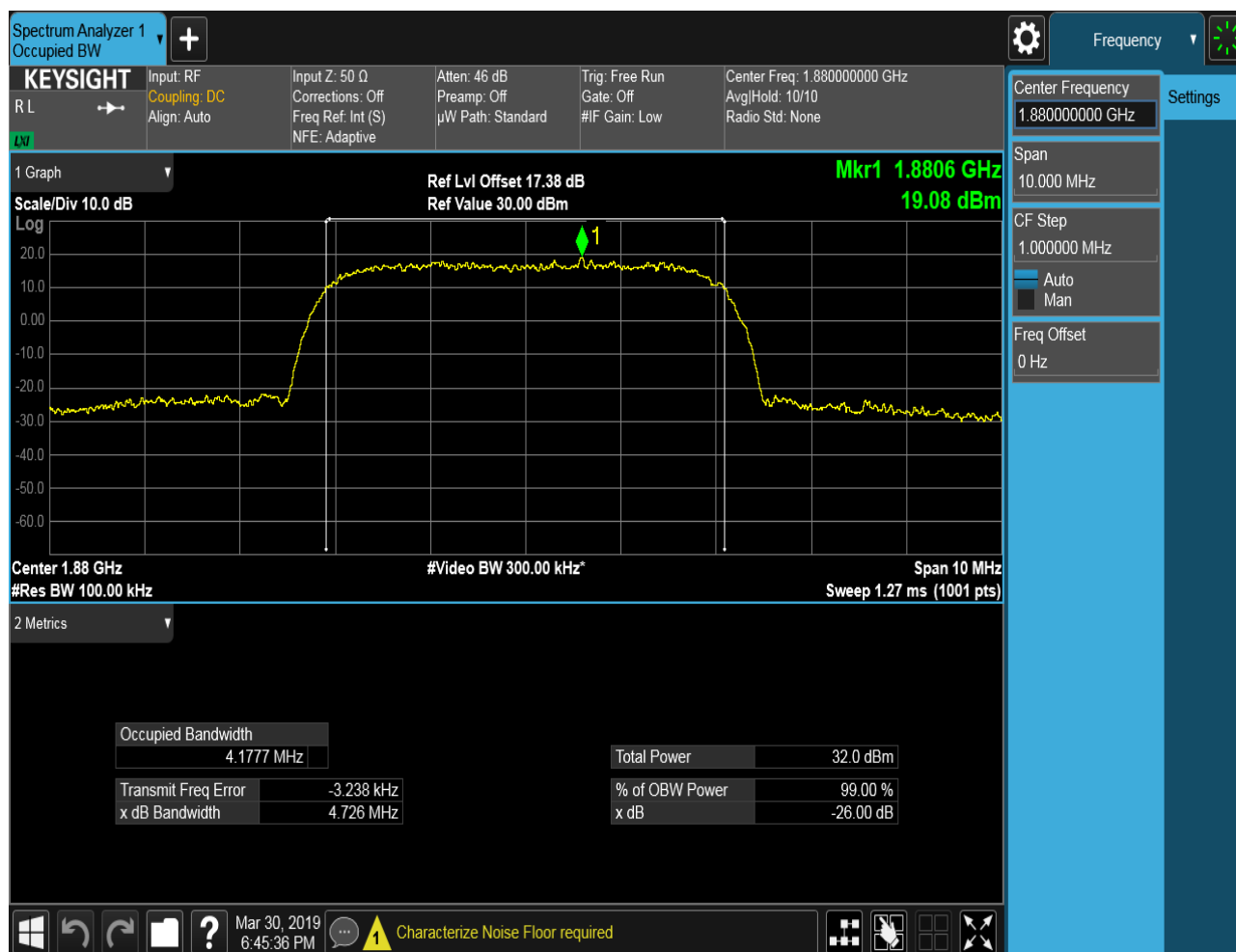
4.1.3 Test Band = WCDMA1900

4.1.3.1 Test Mode = UMTS/TM1

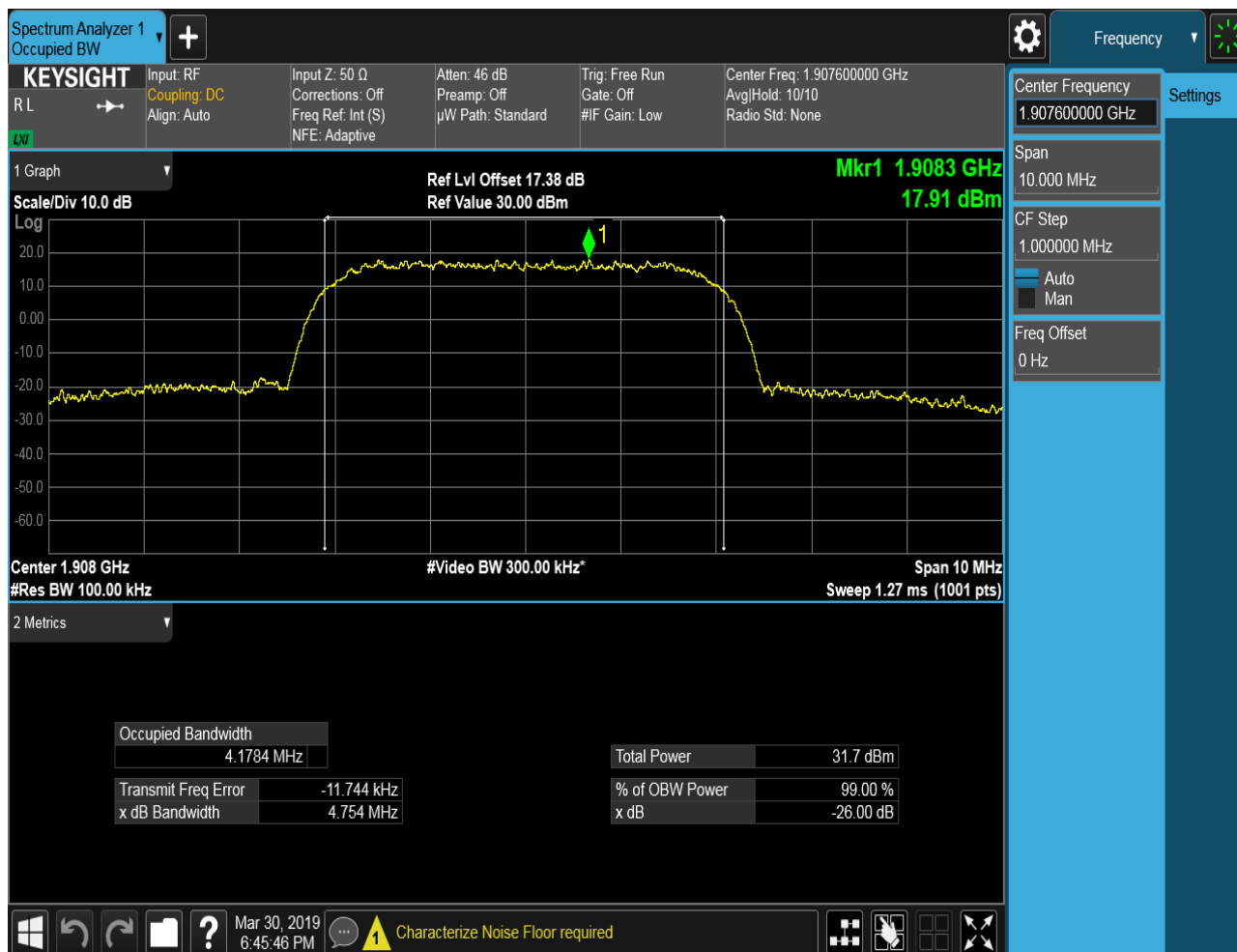
4.1.3.1.1 Test Channel = LCH



4.1.3.1.2 Test Channel = MCH



4.1.3.1.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

Part I - Test Plots

5.1 For UMTS

5.1.1 Test Band = WCDMA850

5.1.1.1 Test Mode = UMTS/TM1

5.1.1.1.1 Test Channel = LCH



5.1.1.1.2 Test Channel = HCH



5.1.2 Test Band = WCDMA1700

5.1.2.1 Test Mode = UMTS/TM1

5.1.2.1.1 Test Channel = LCH



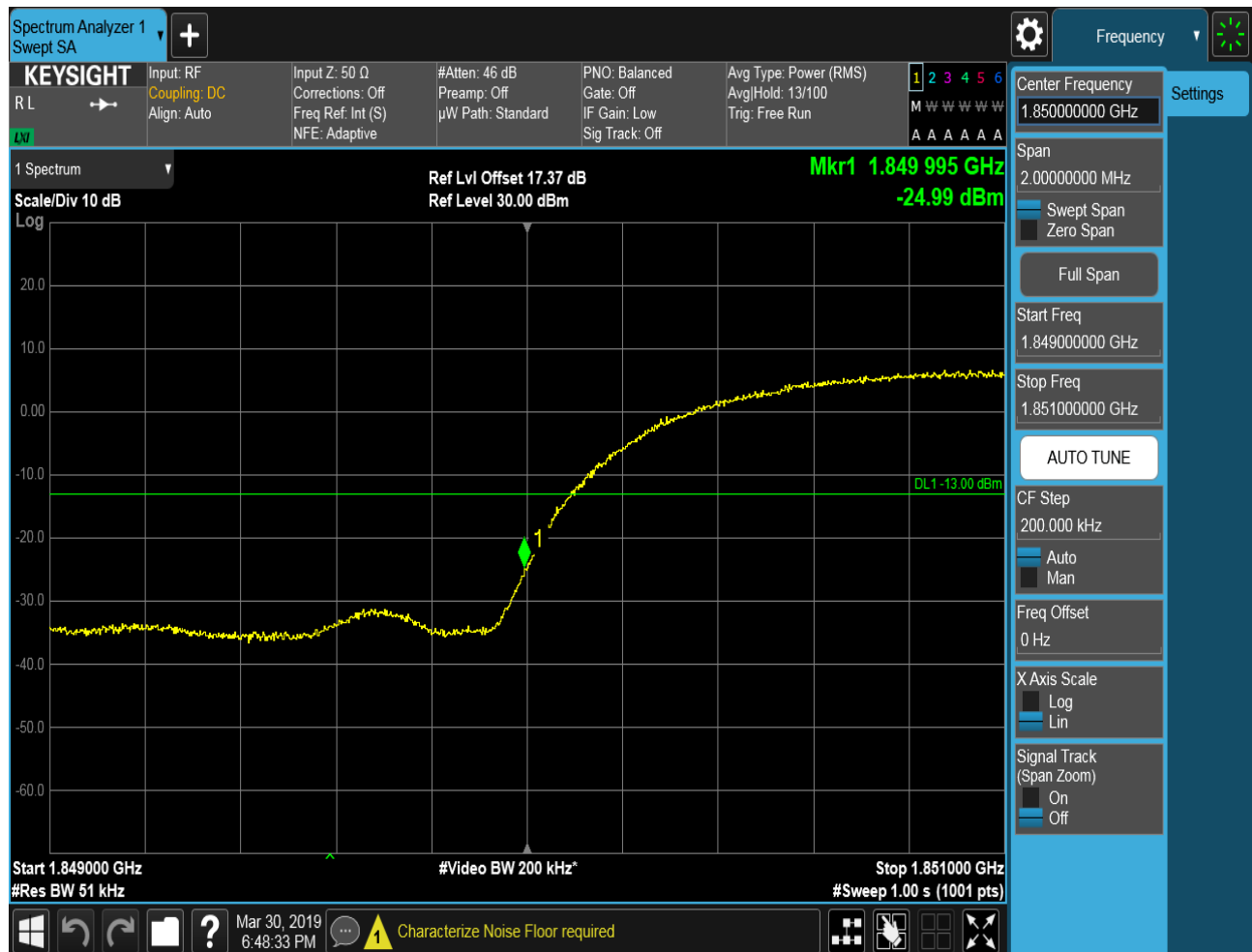
5.1.2.1.2 Test Channel = HCH



5.1.3 Test Band = WCDMA1900

5.1.3.1 Test Mode = UMTS/TM1

5.1.3.1.1 Test Channel = LCH



5.1.3.1.2 Test Channel = HCH



6Appendix_F: Spurious Emission at Antenna Terminal

NOTE: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of $< RBW/2$ so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = $k * (Span / RBW)$ " with k between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

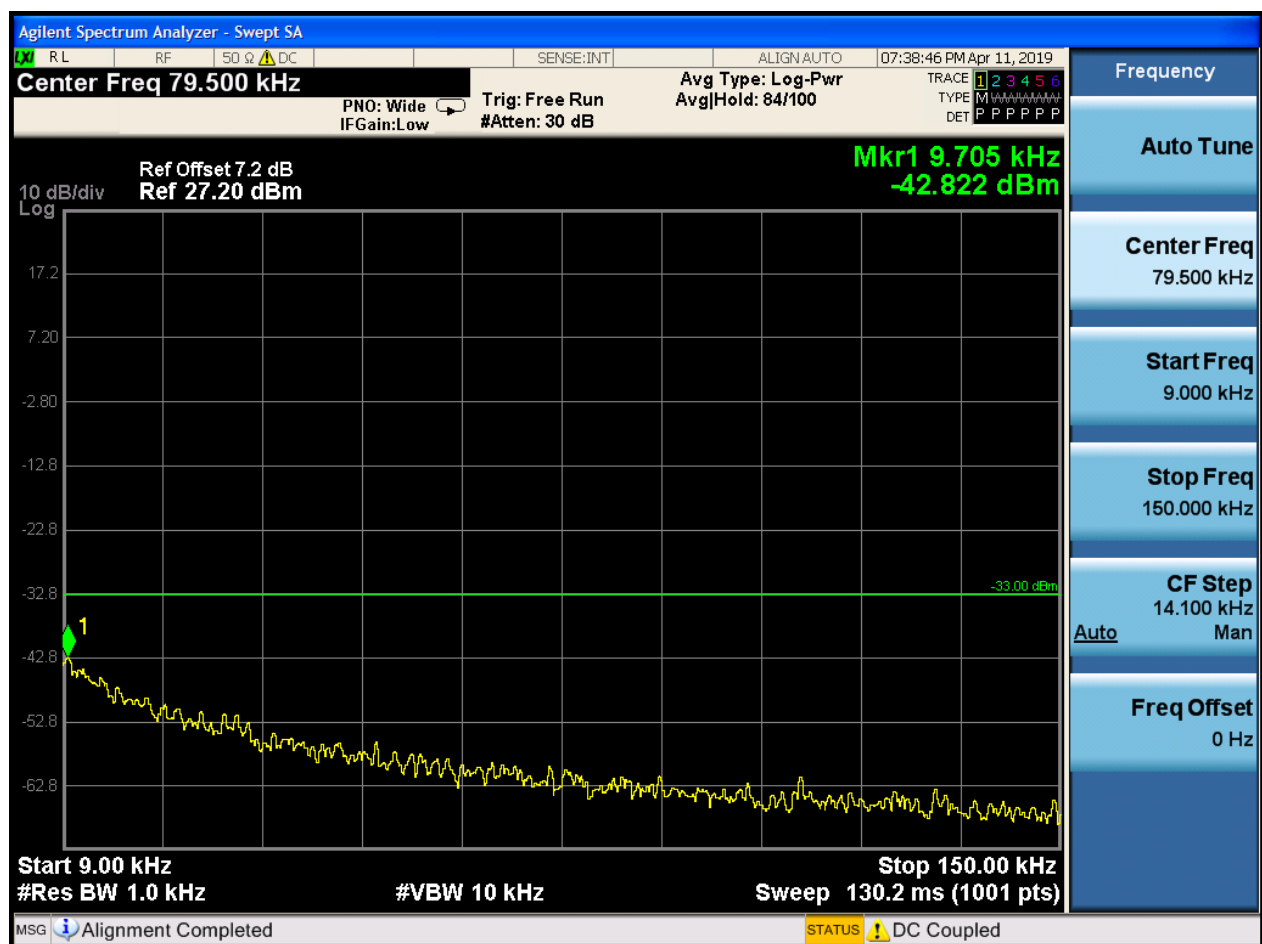
Part I - Test Plots

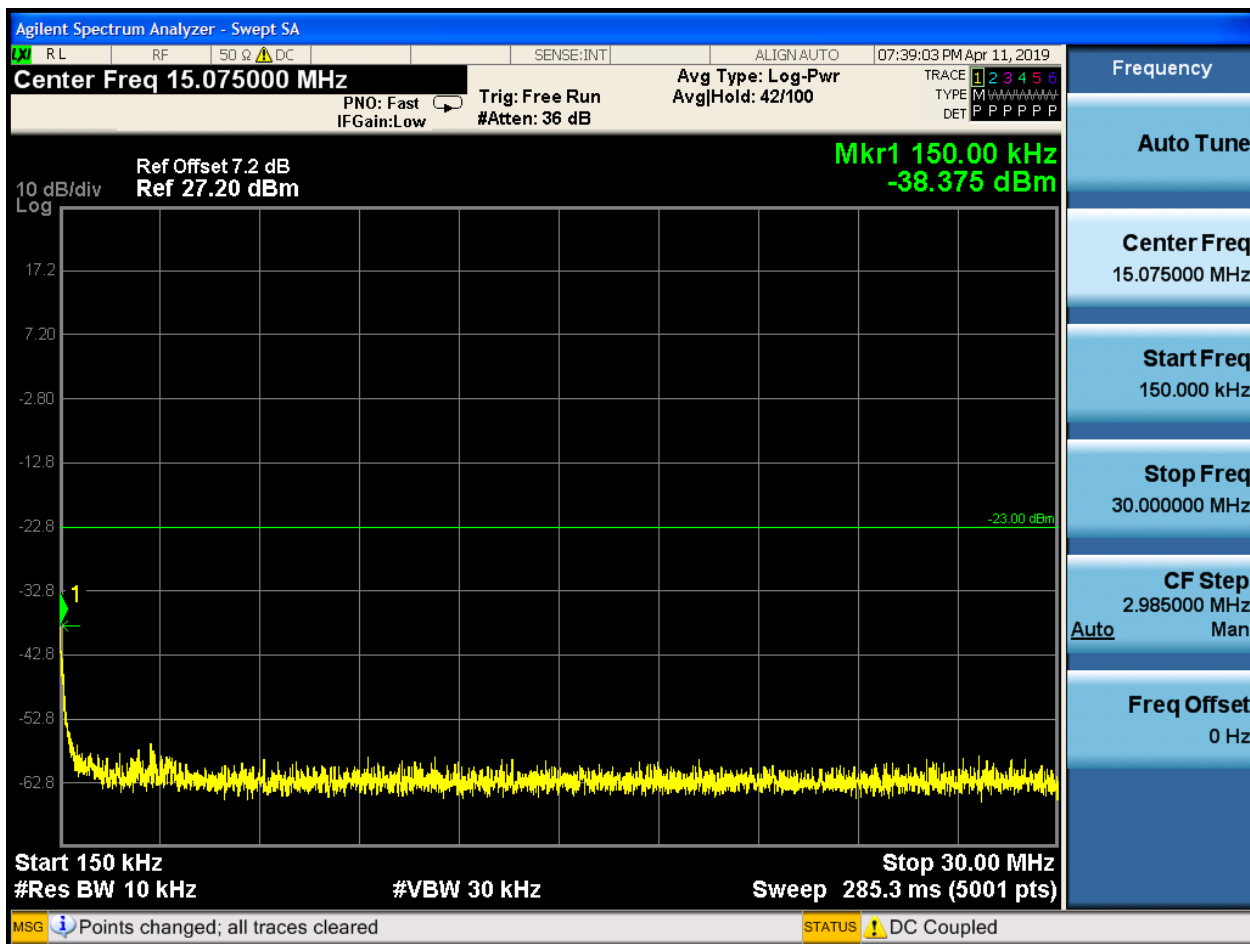
6.1 For UMTS

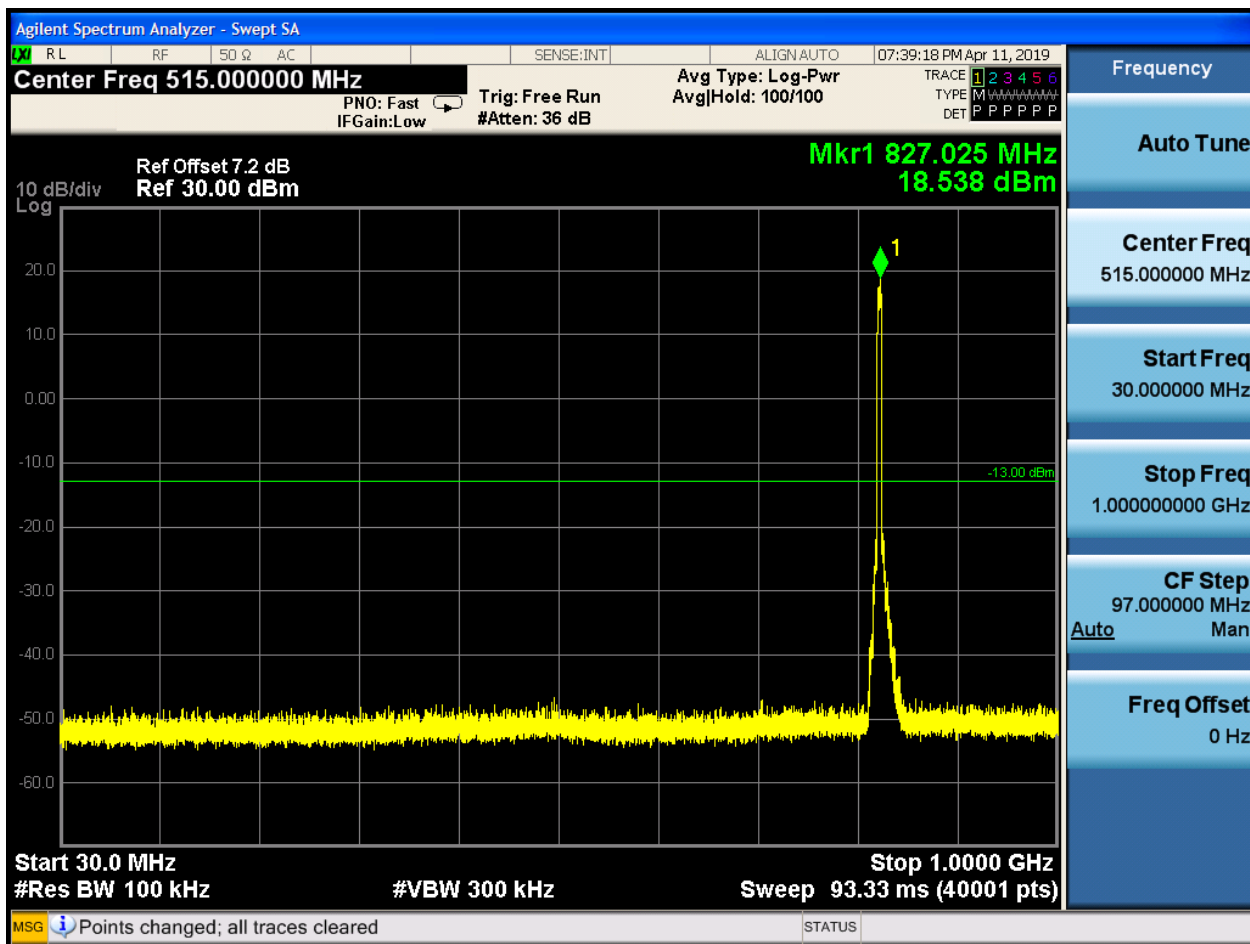
6.1.1 Test Band = WCDMA850

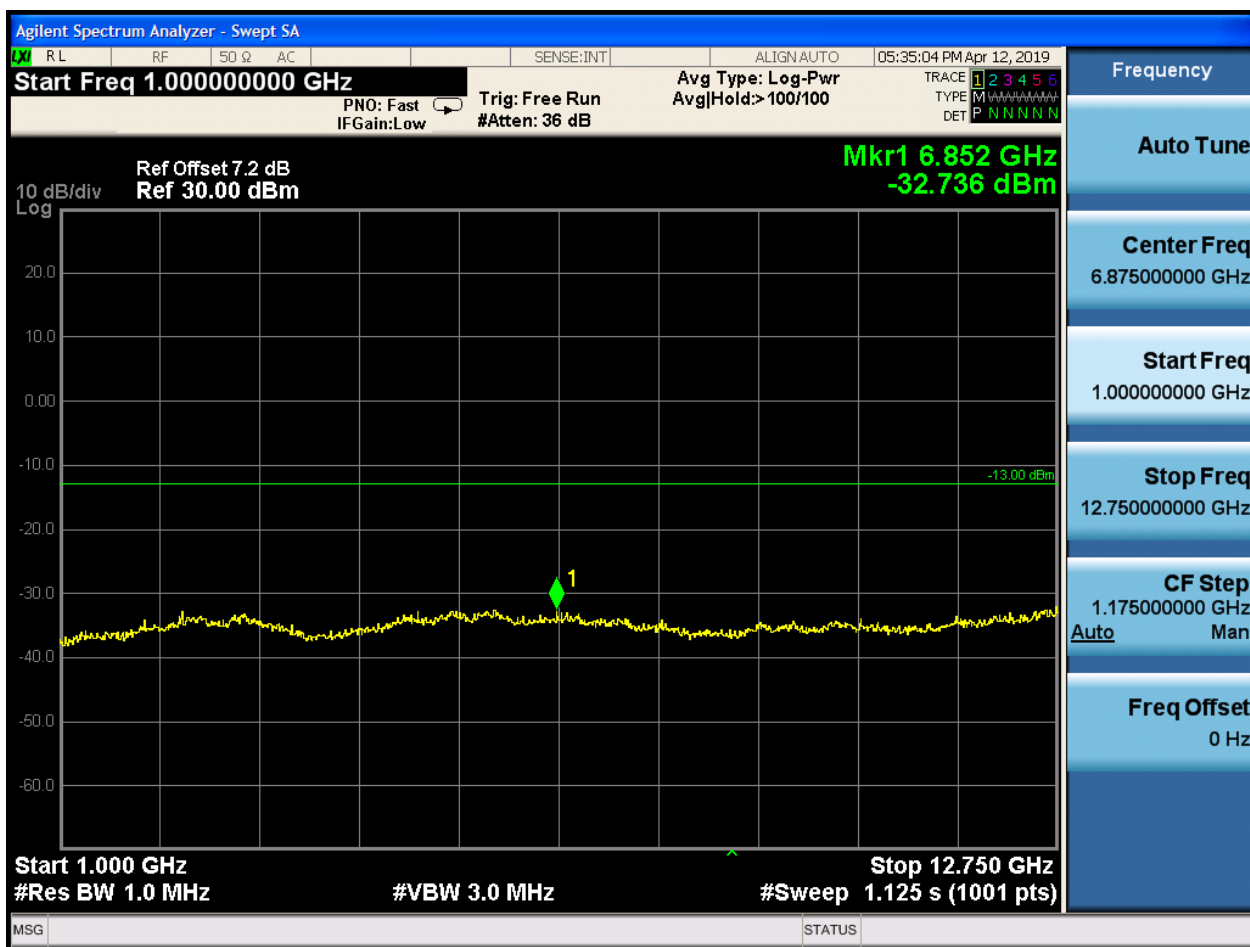
6.1.1.1 Test Mode = UMTS/TM1

6.1.1.1.1 Test Channel = LCH

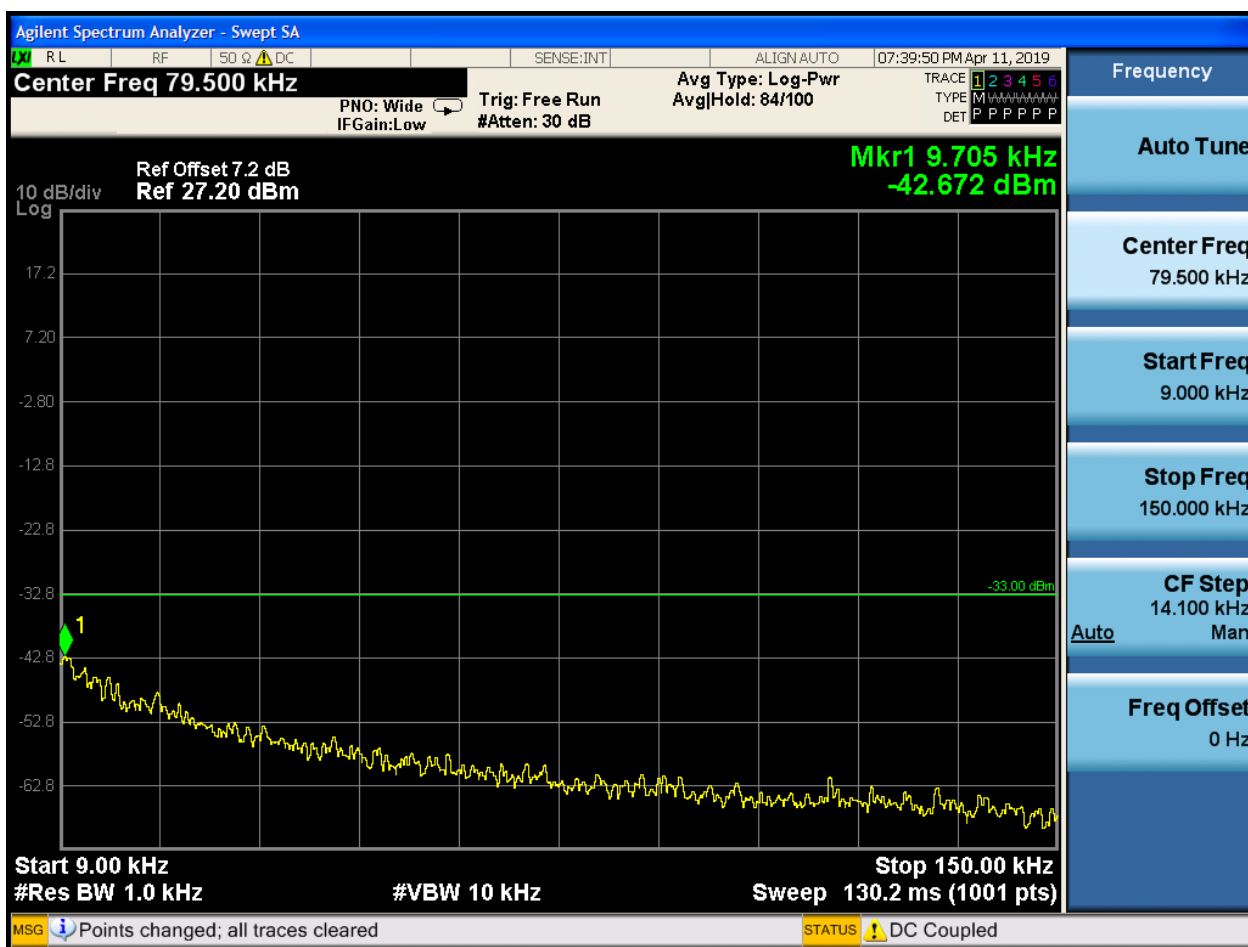


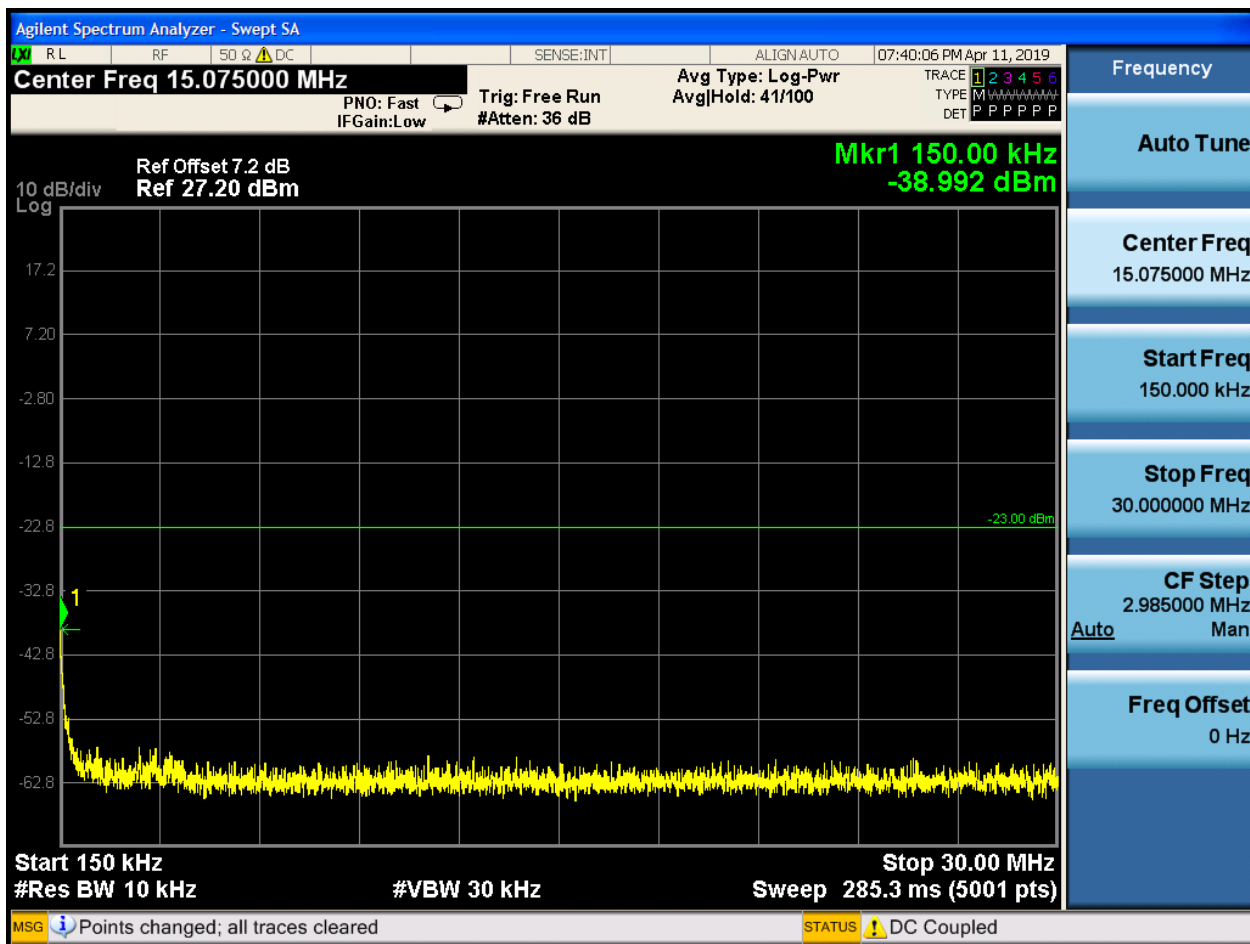


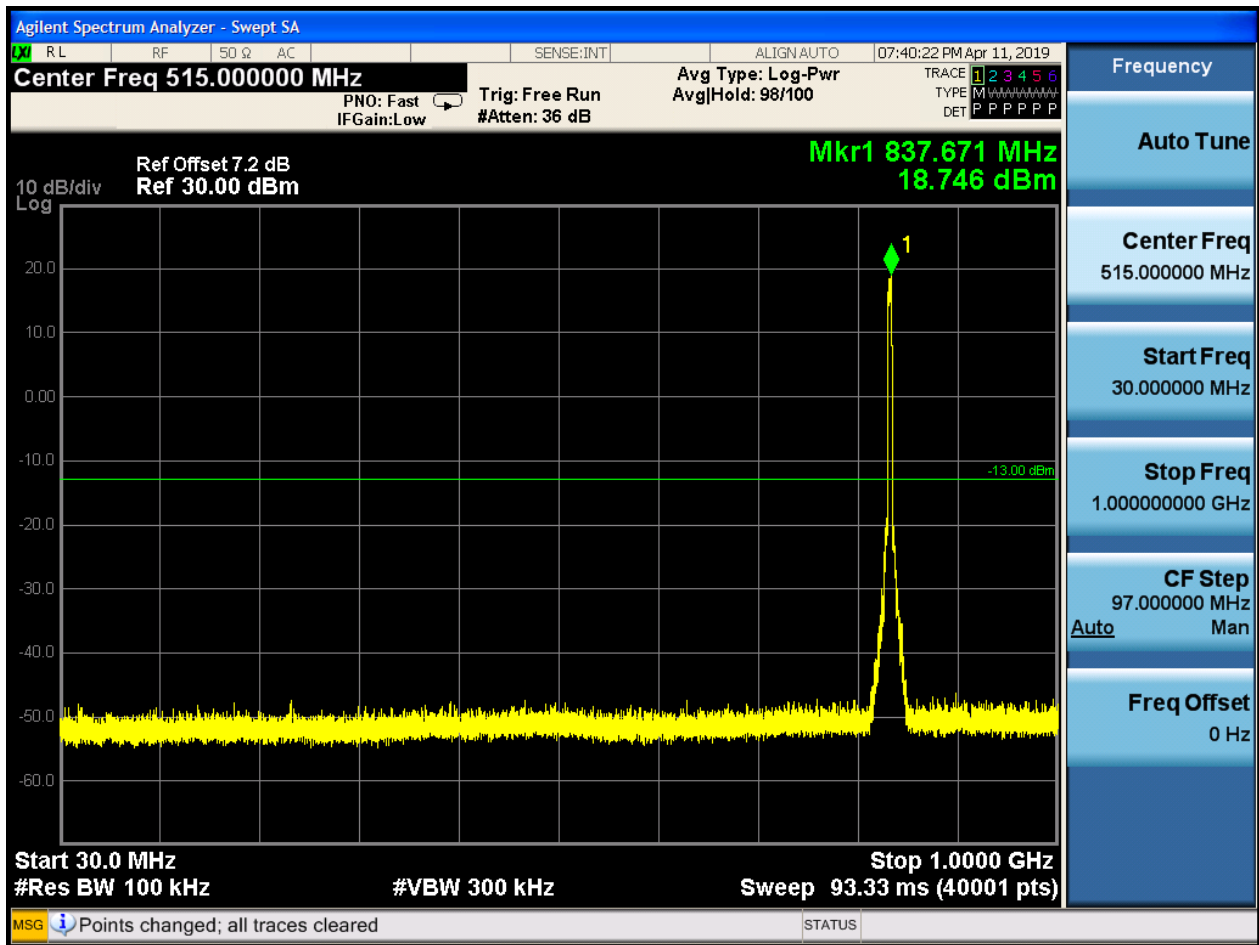


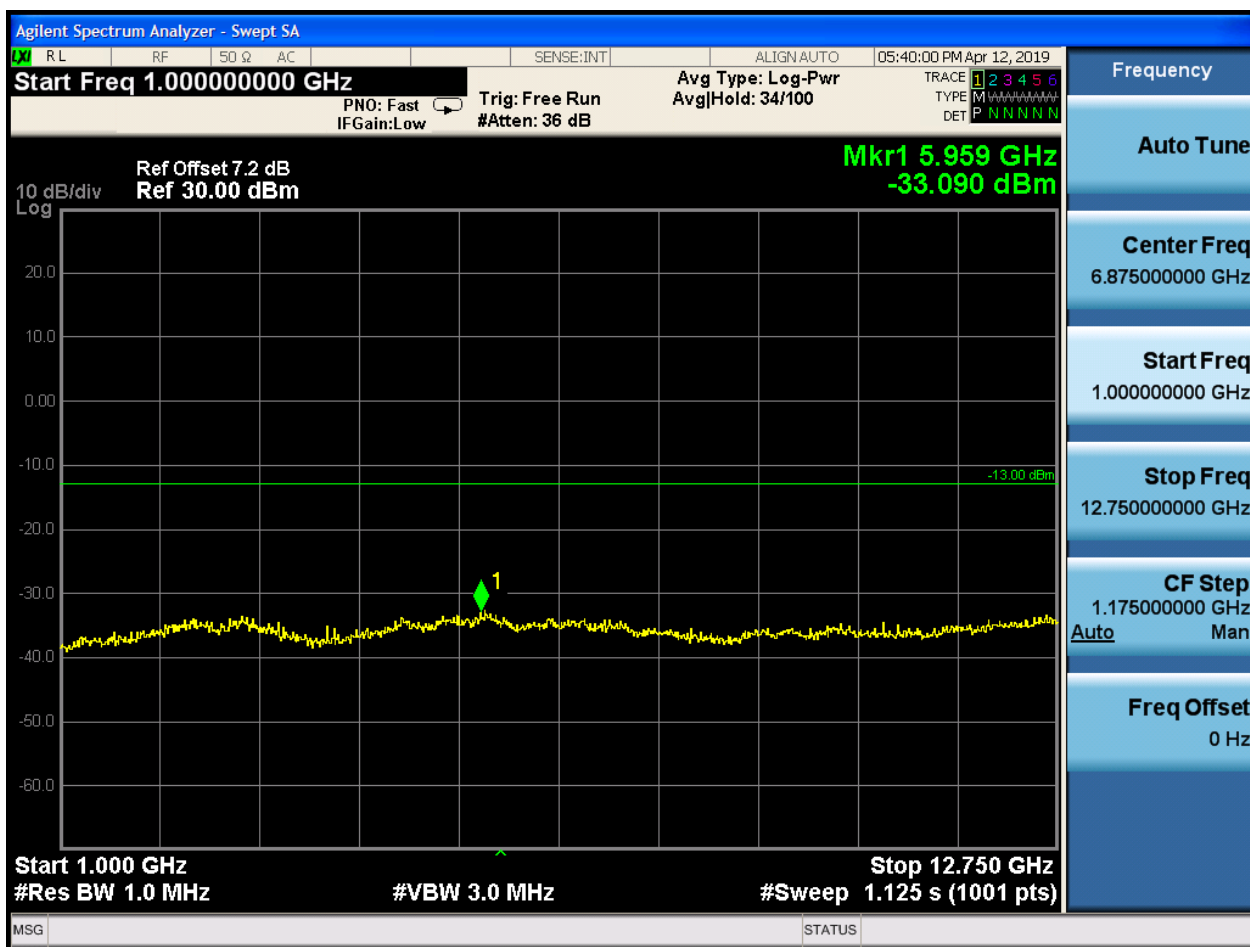


6.1.1.1.2 Test Channel = MCH

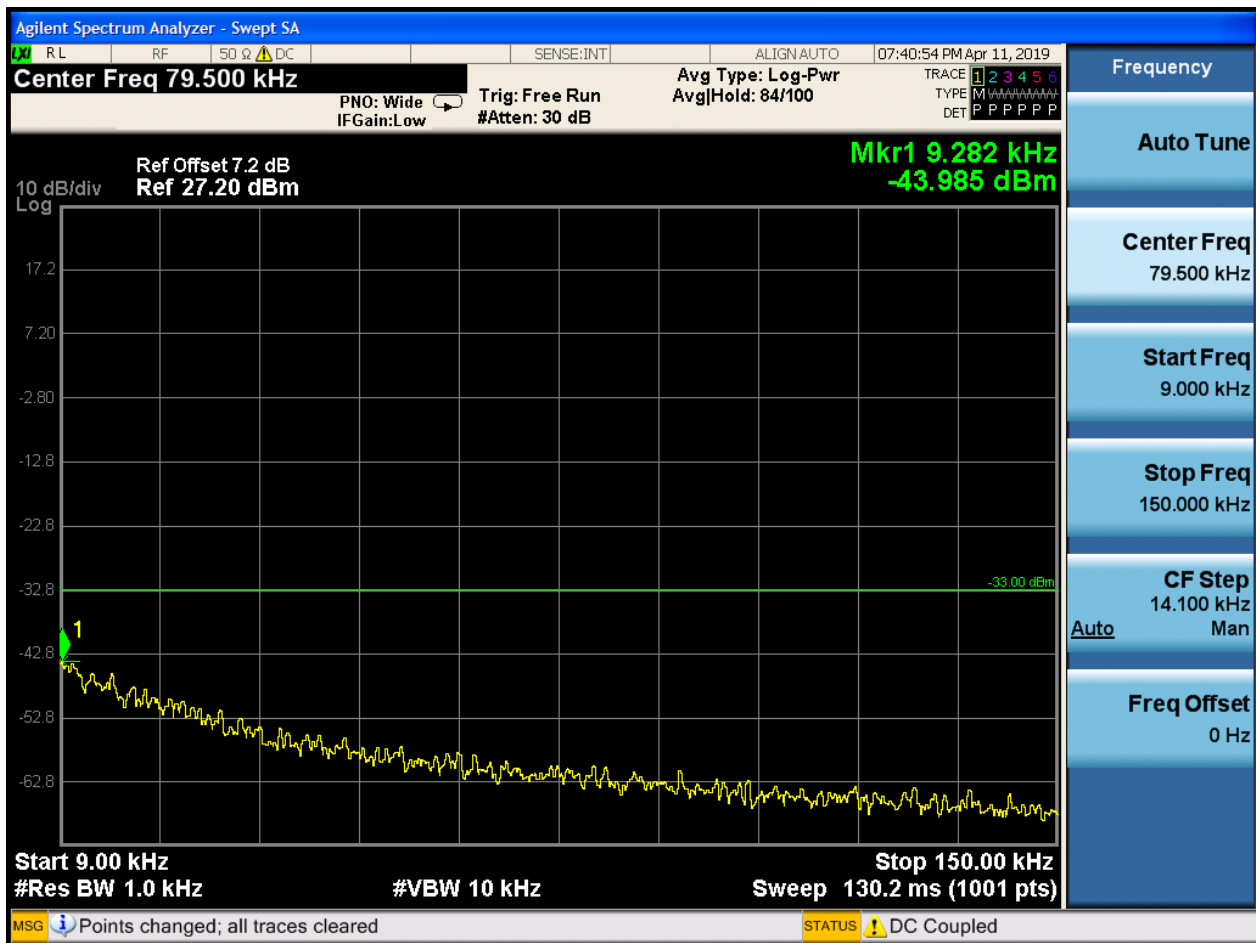


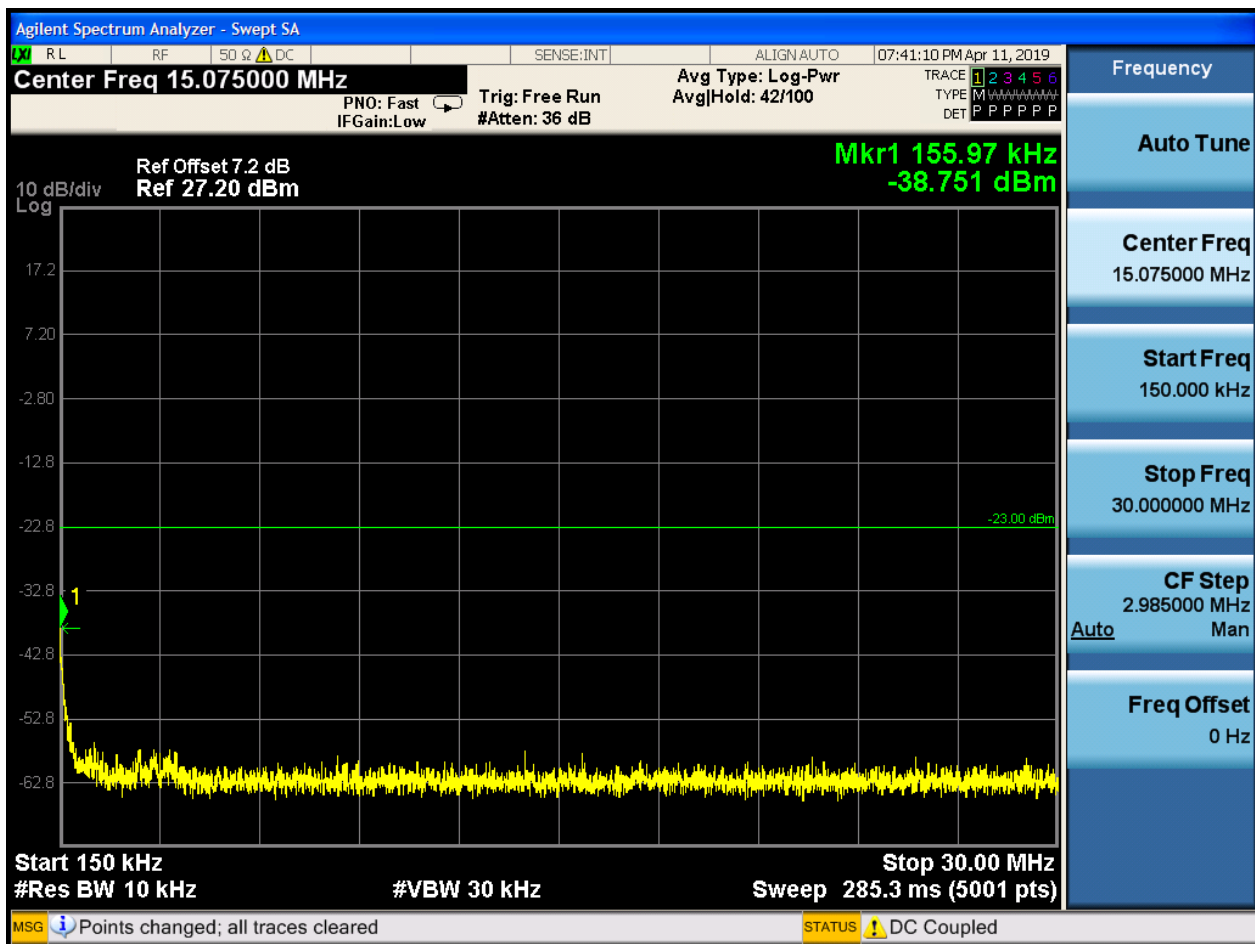


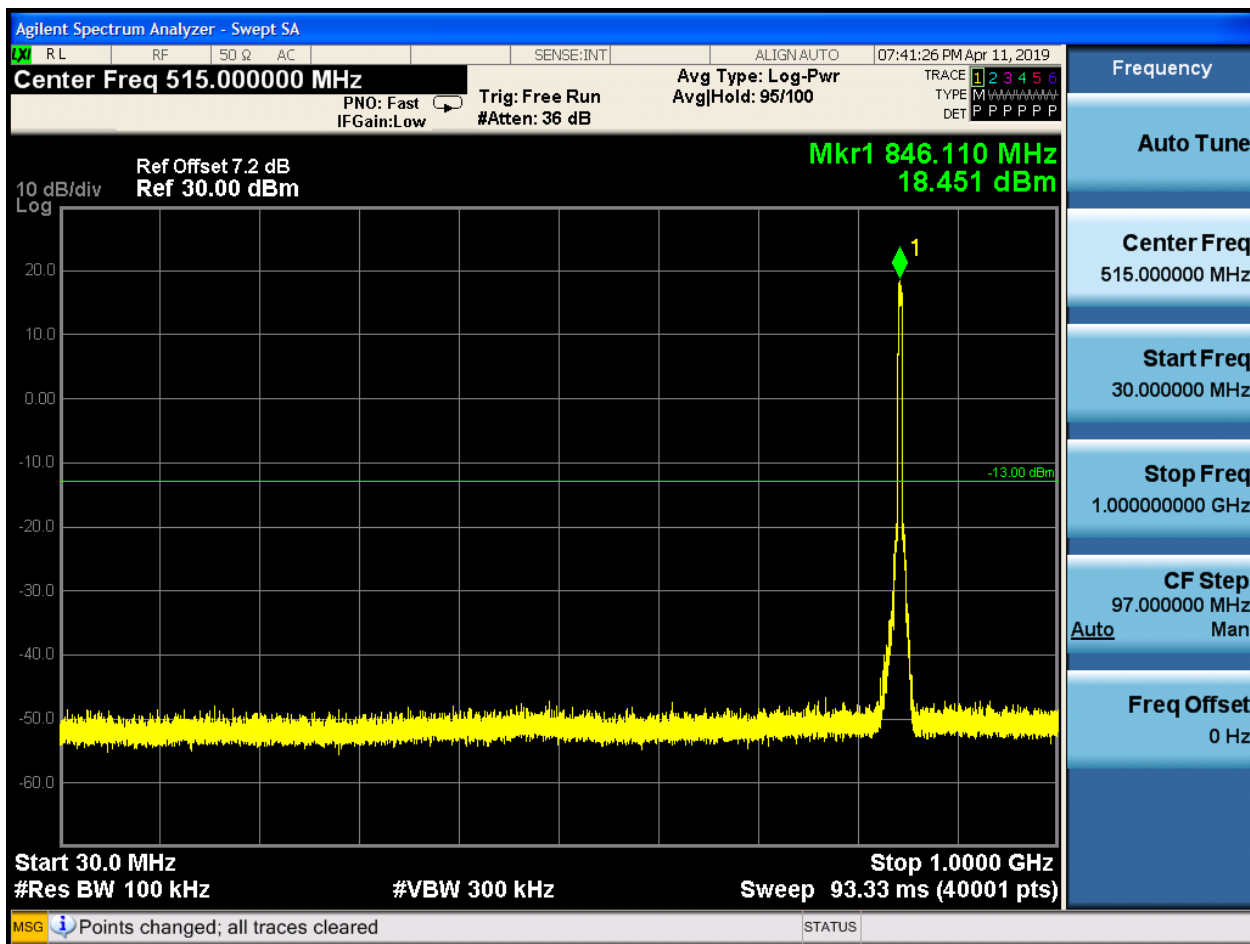




6.1.1.1.3 Test Channel = HCH





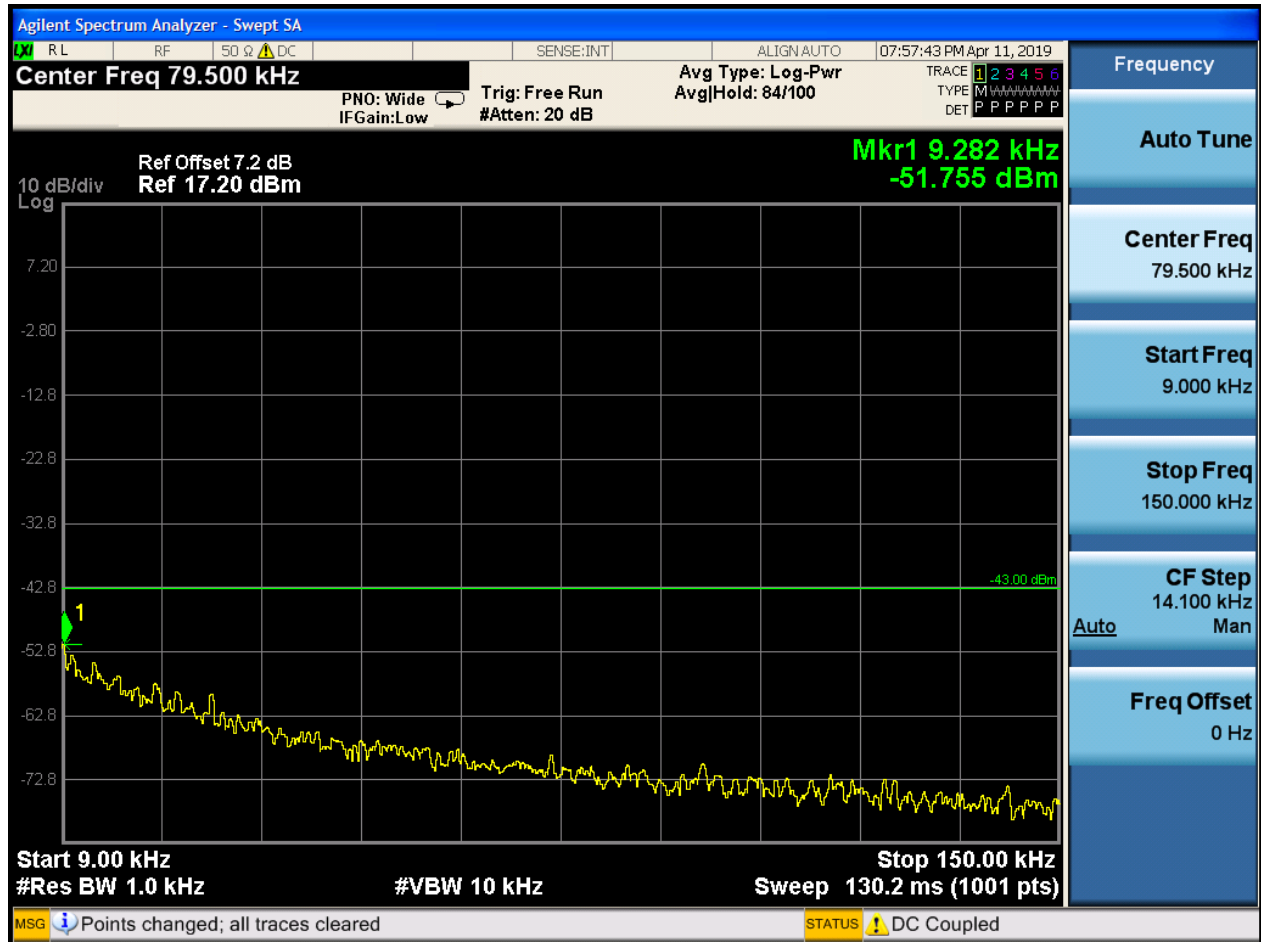


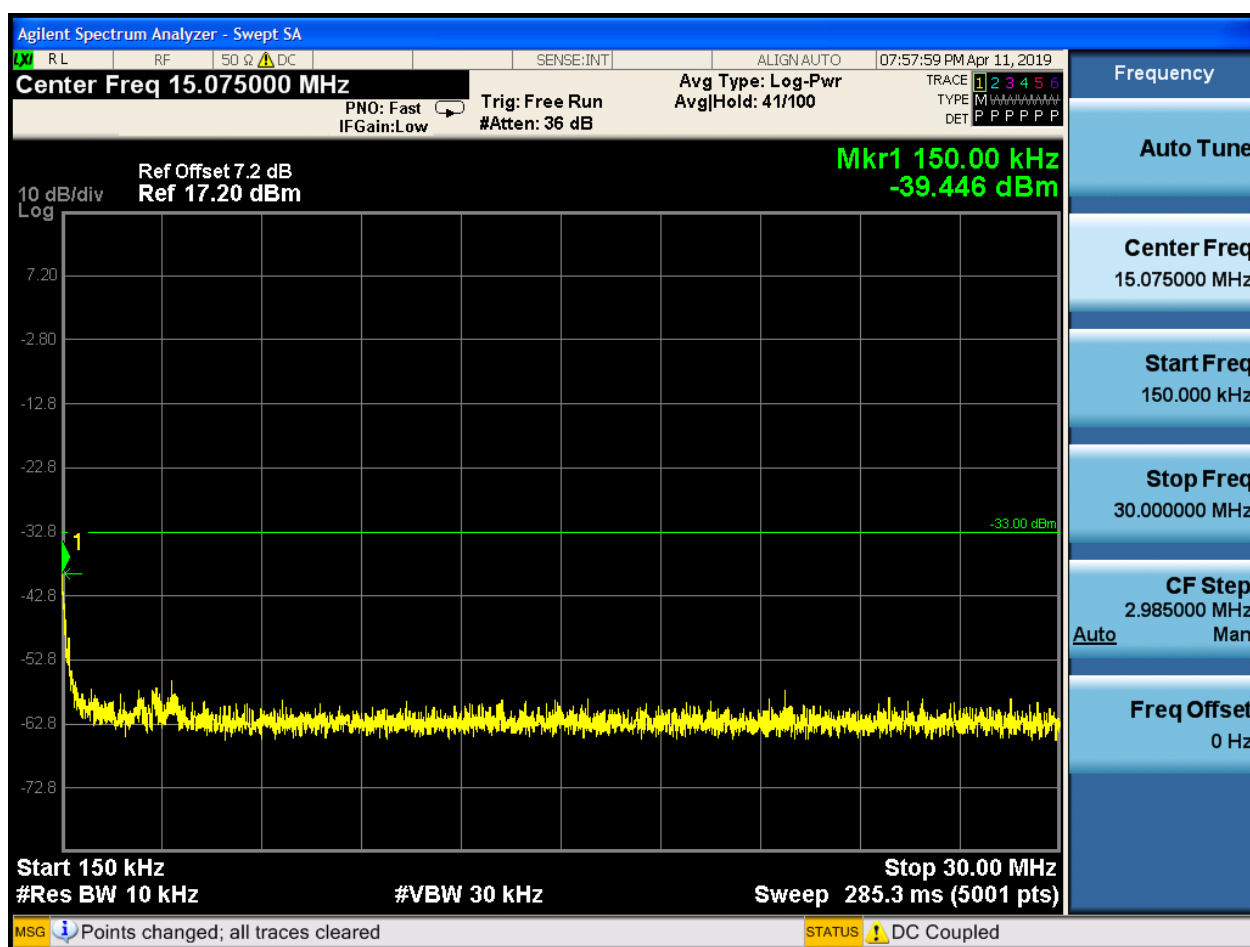


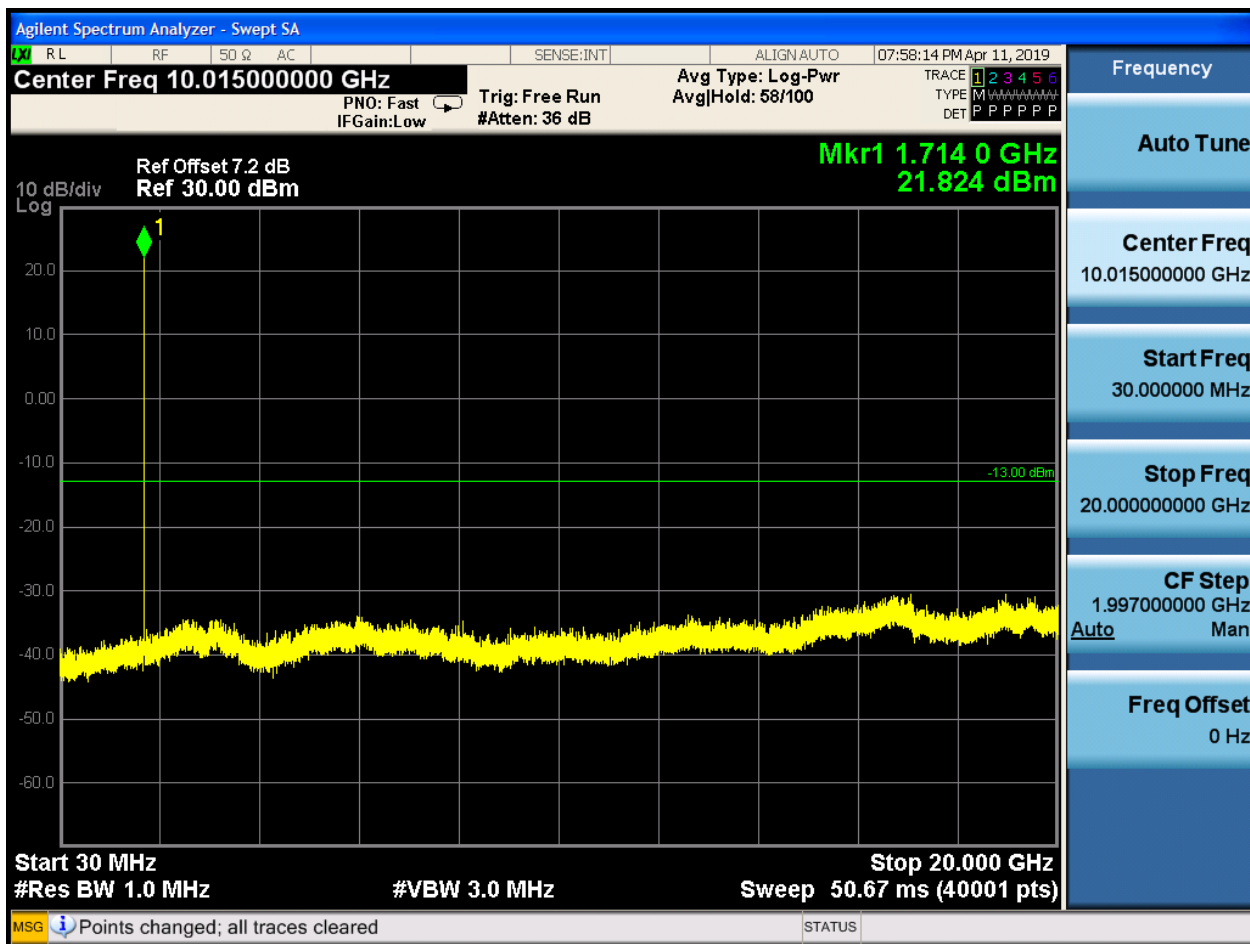
6.1.2 Test Band = WCDMA1700

6.1.2.1 Test Mode = UMTS/TM1

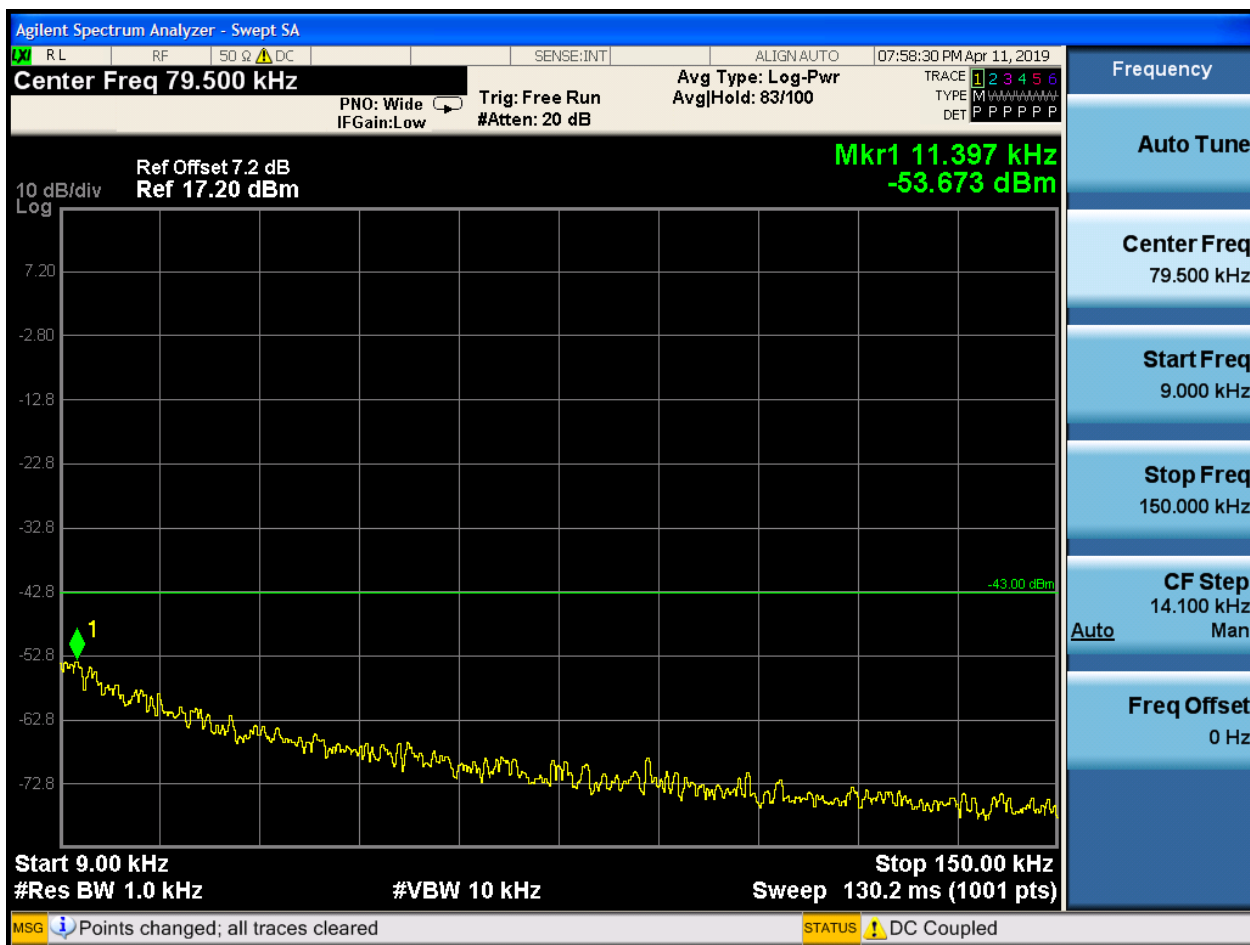
6.1.1.1.1 Test Channel = LCH

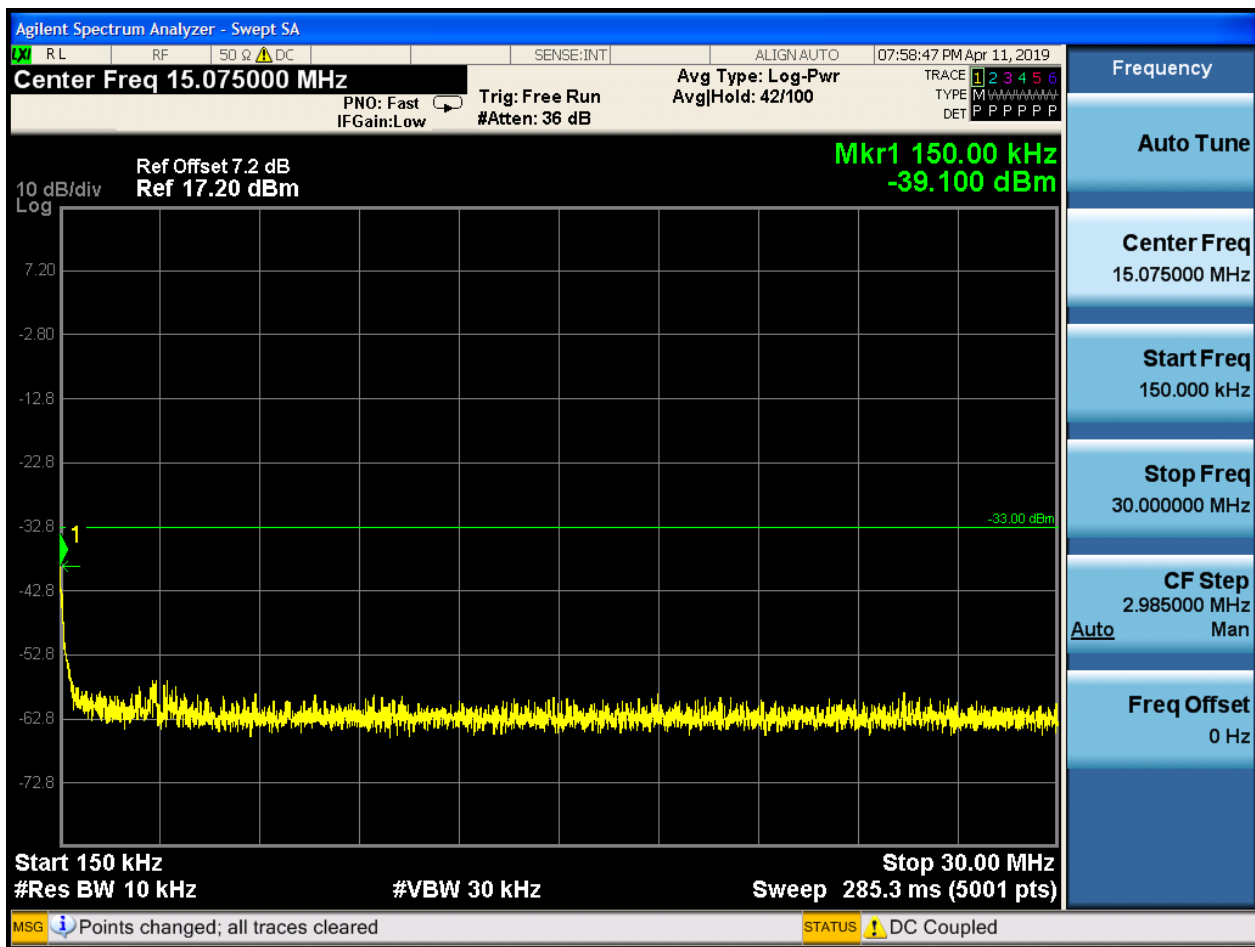


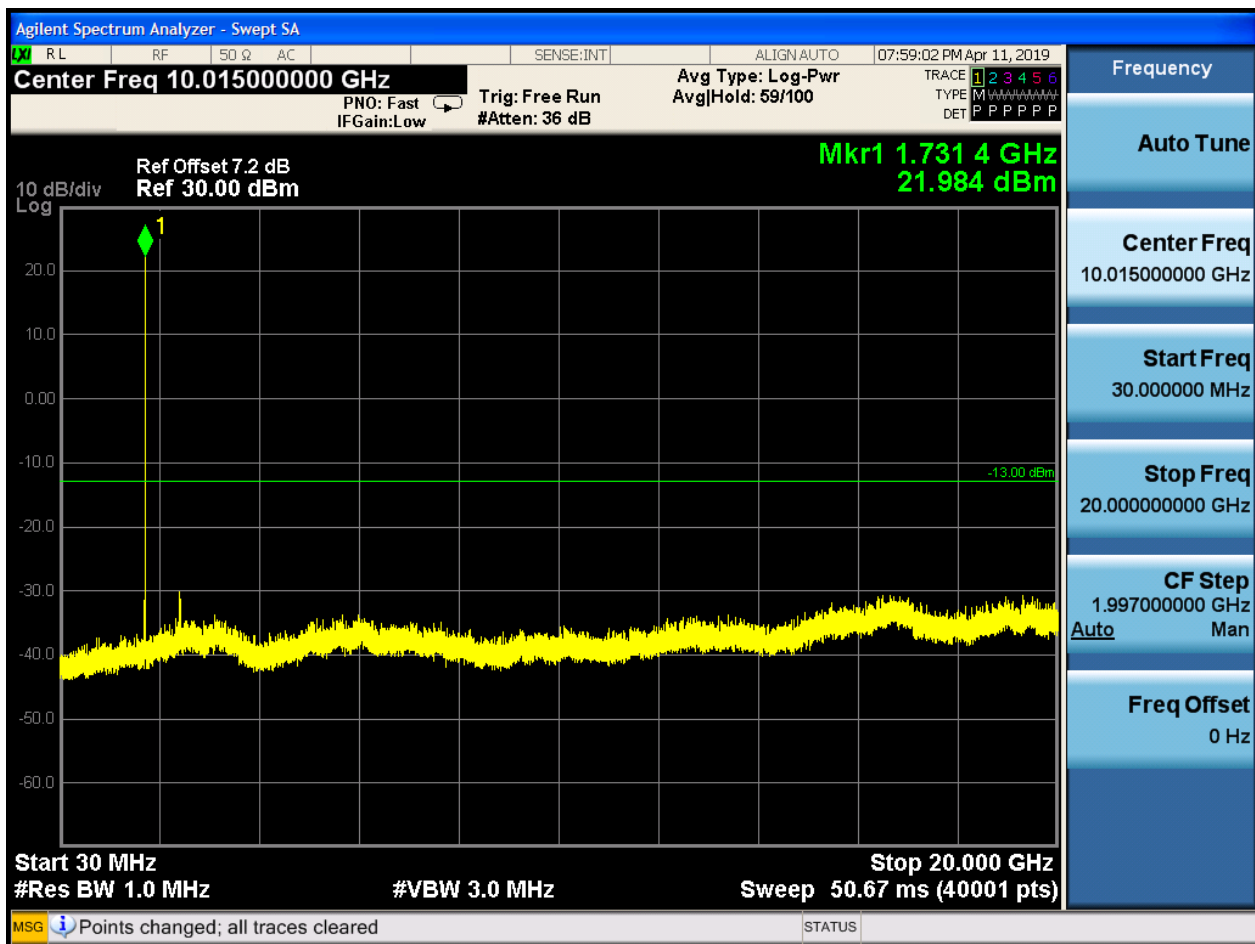




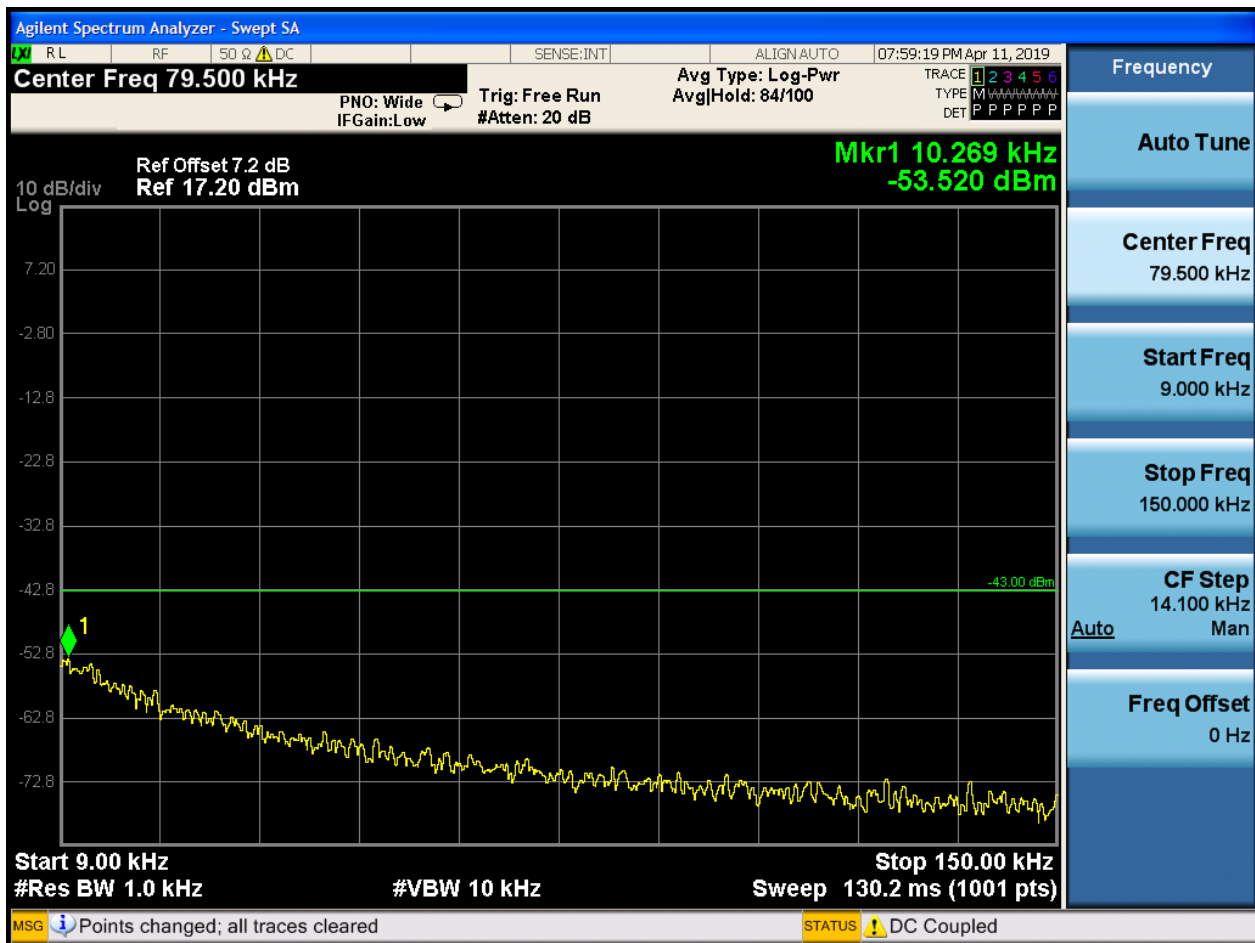
6.1.1.1.2 Test Channel = MCH

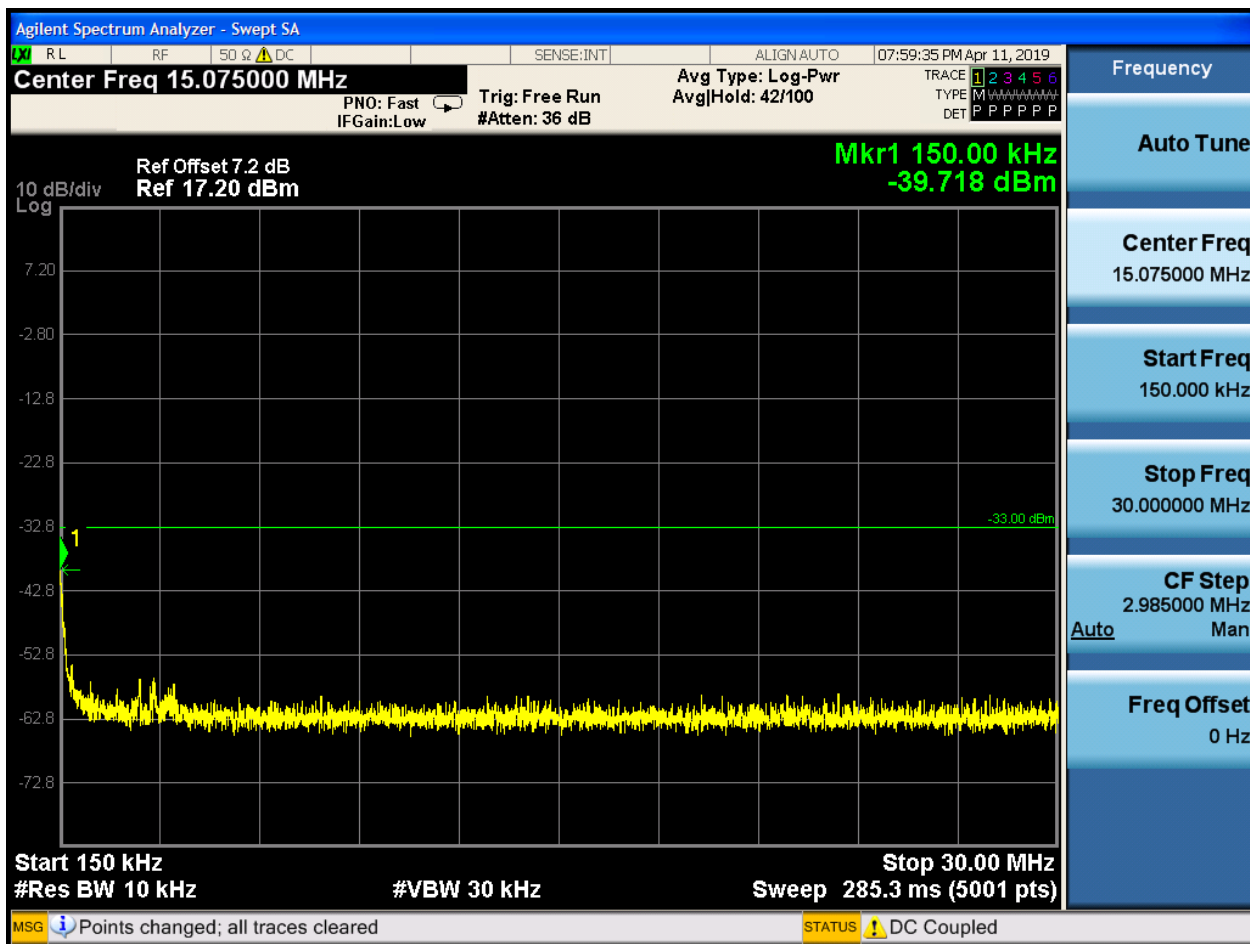


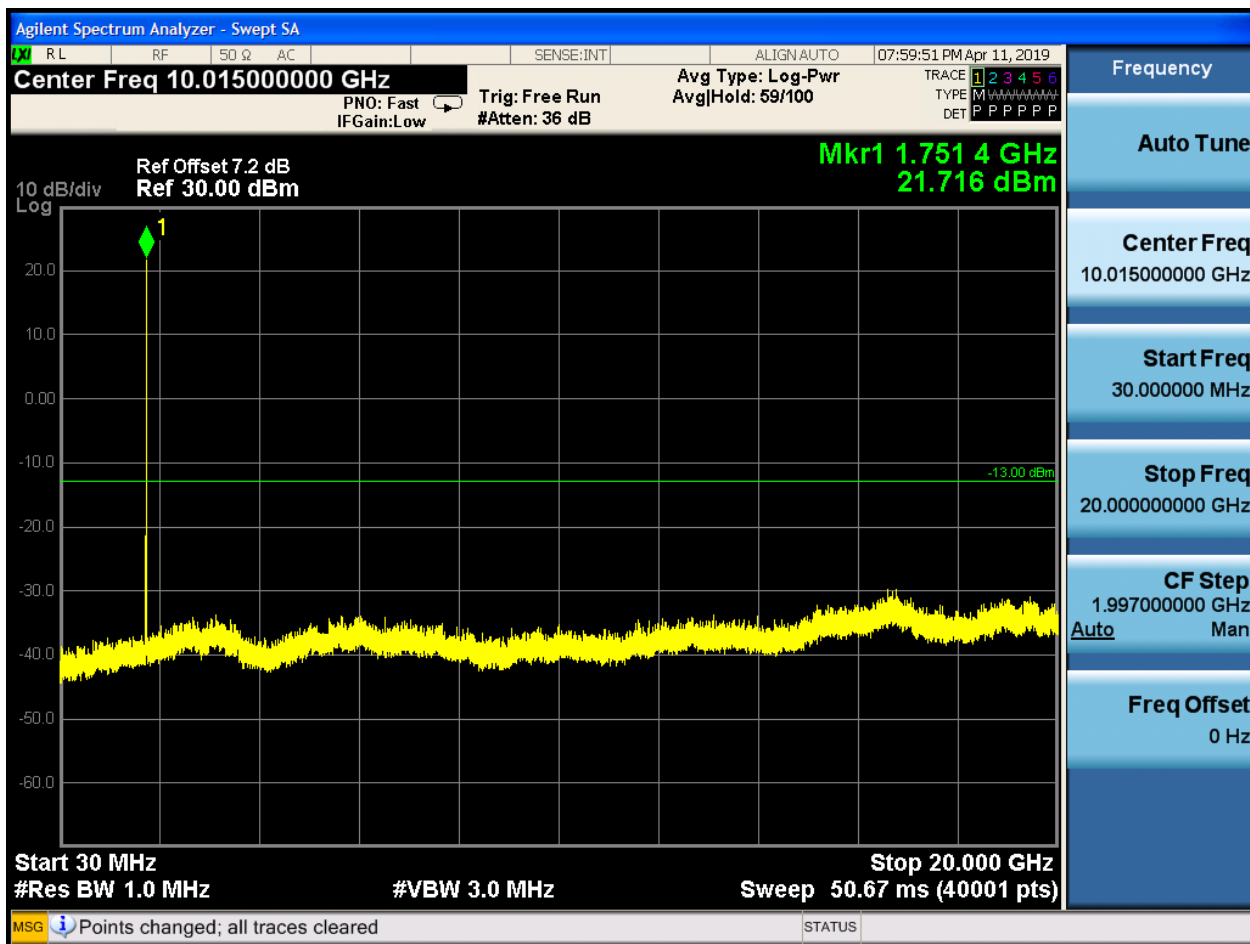




6.1.1.1.3 Test Channel = HCH



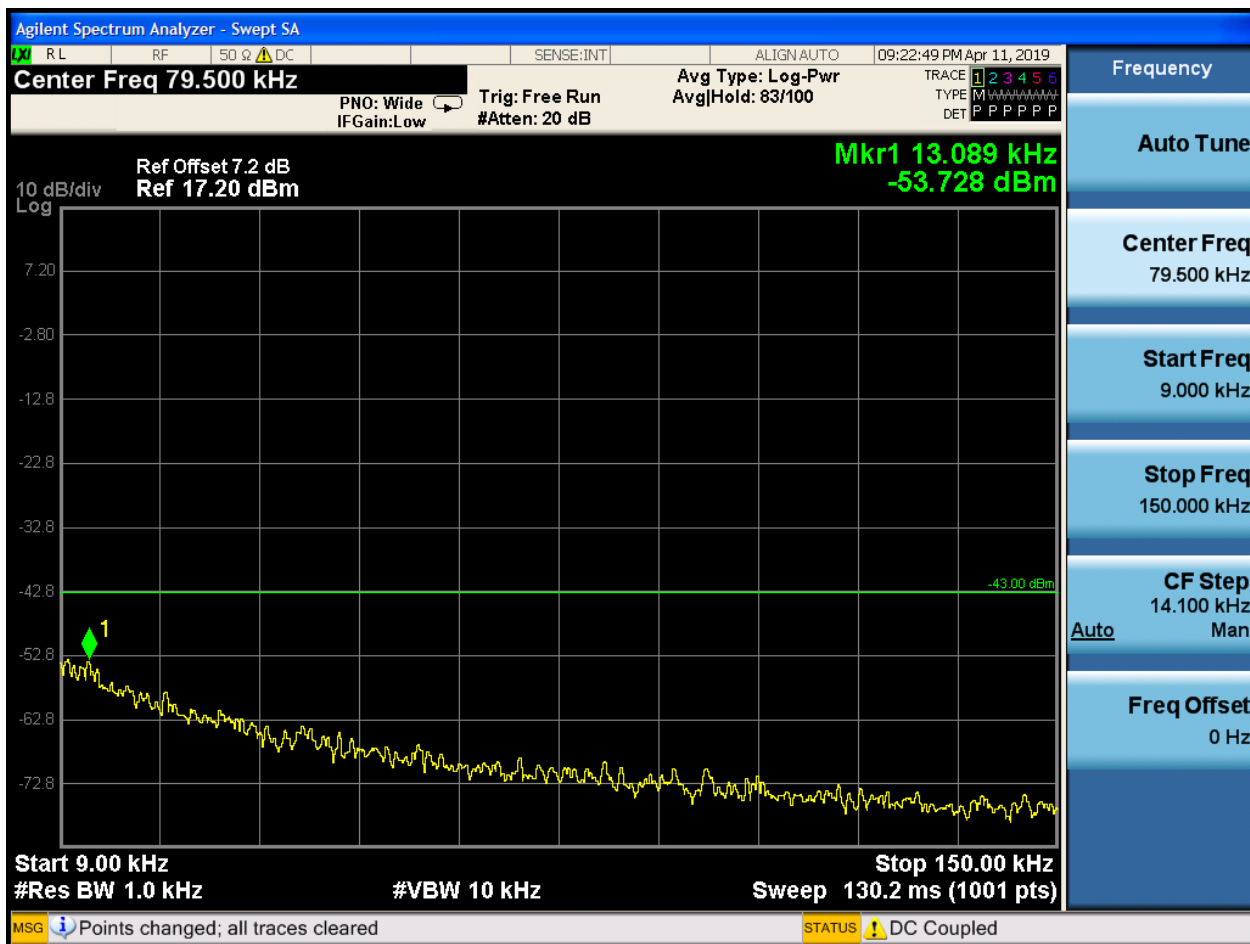


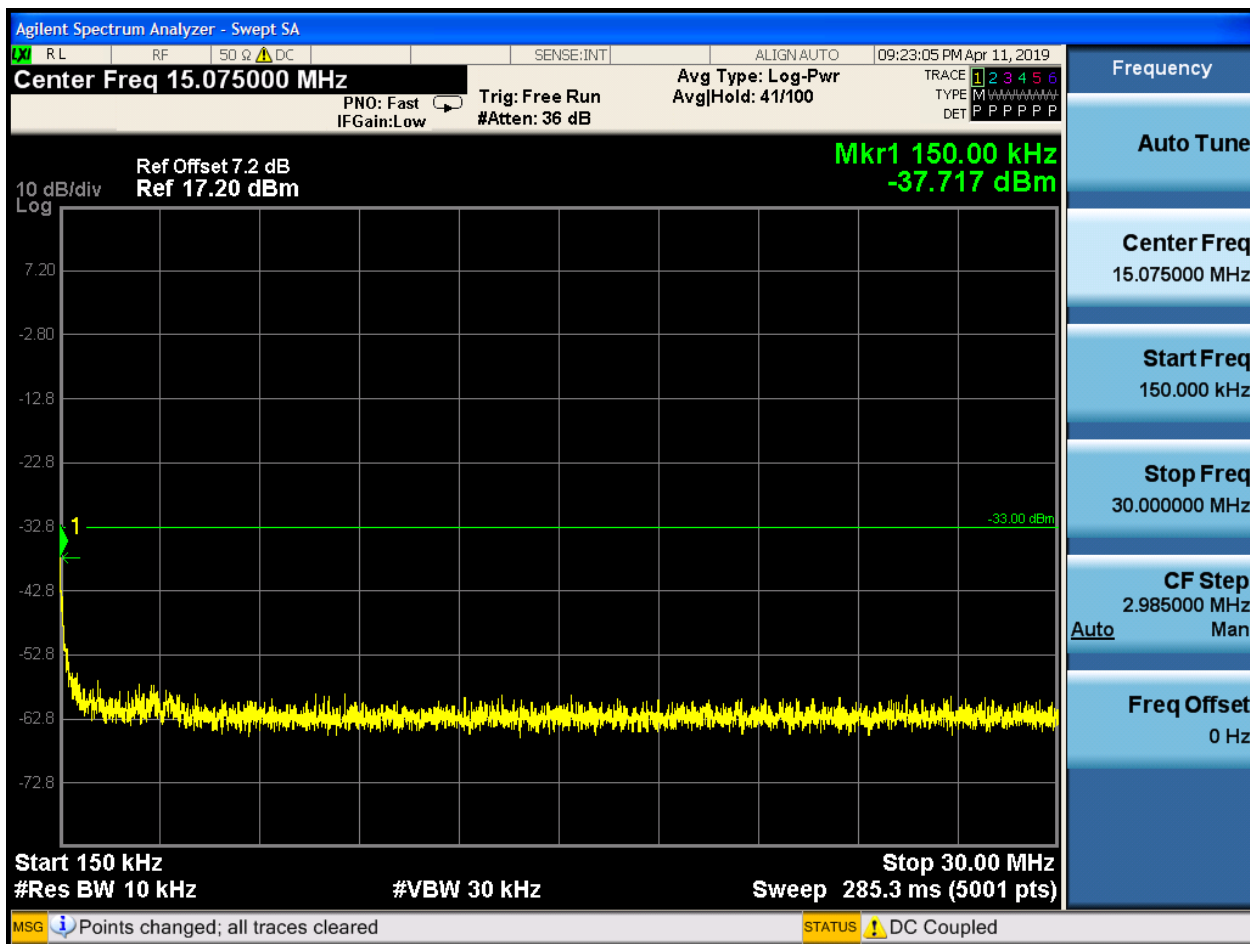


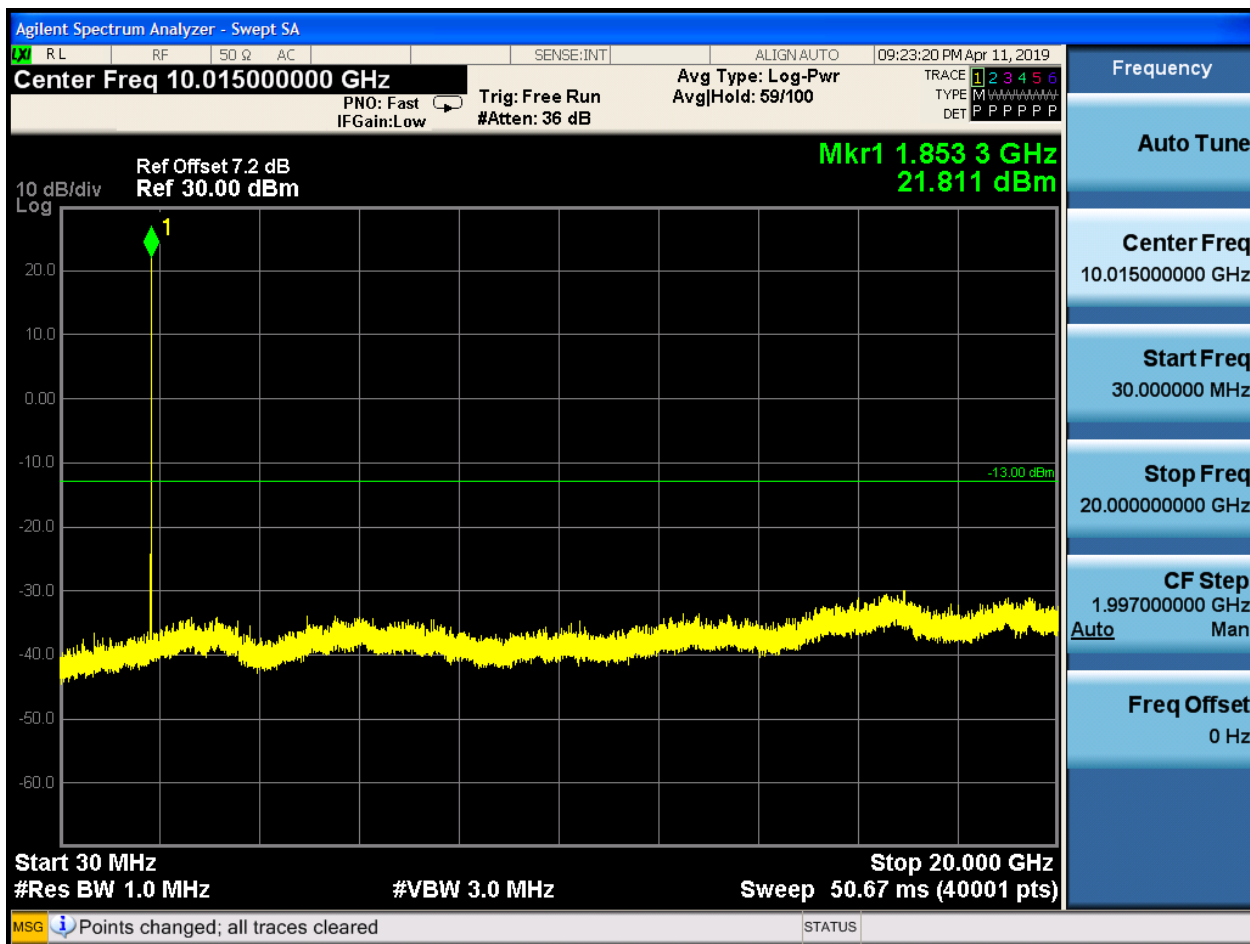
6.1.3 Test Band = WCDMA1900

6.1.3.1 Test Mode = UMTS/TM1

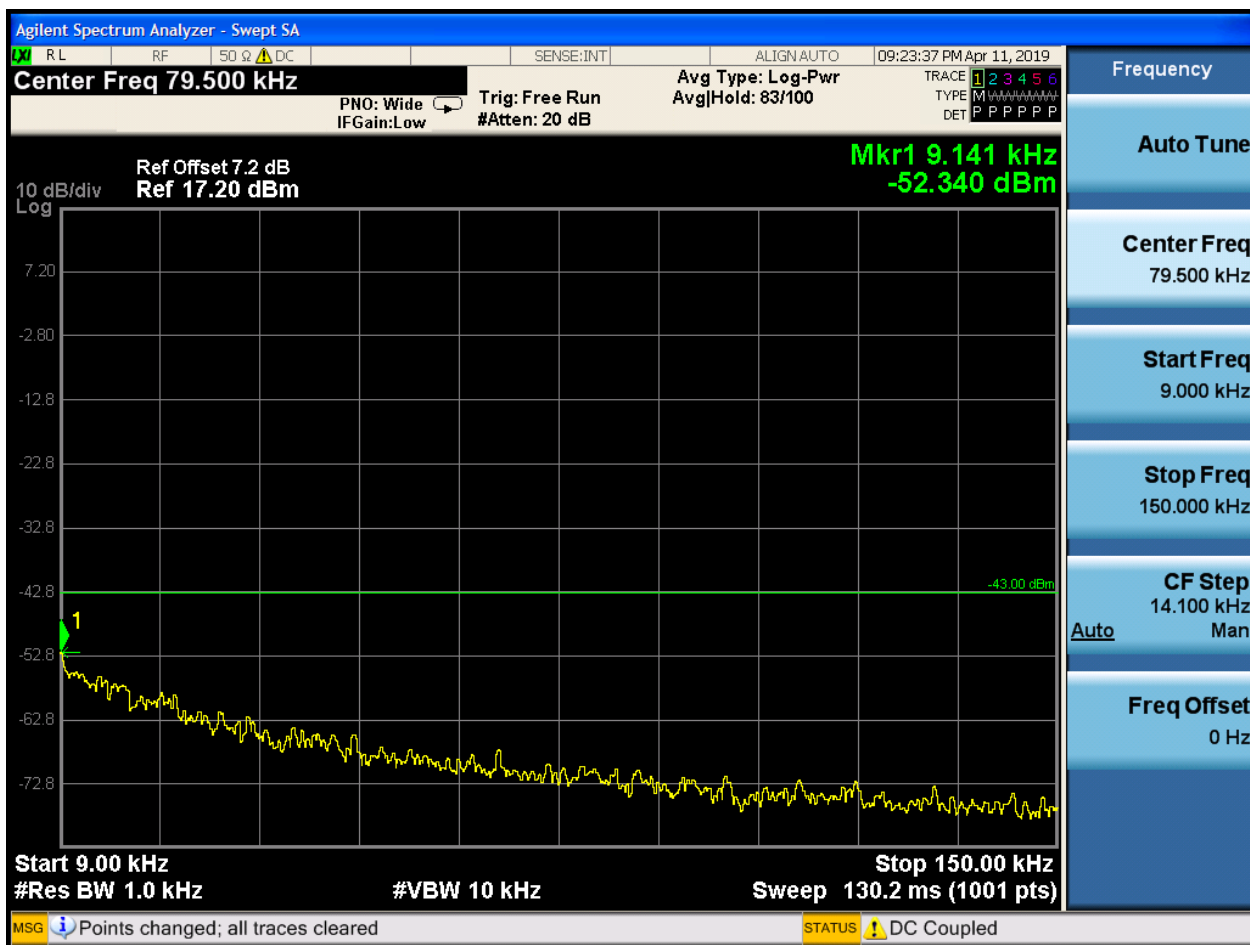
6.1.1.1.1 Test Channel = LCH

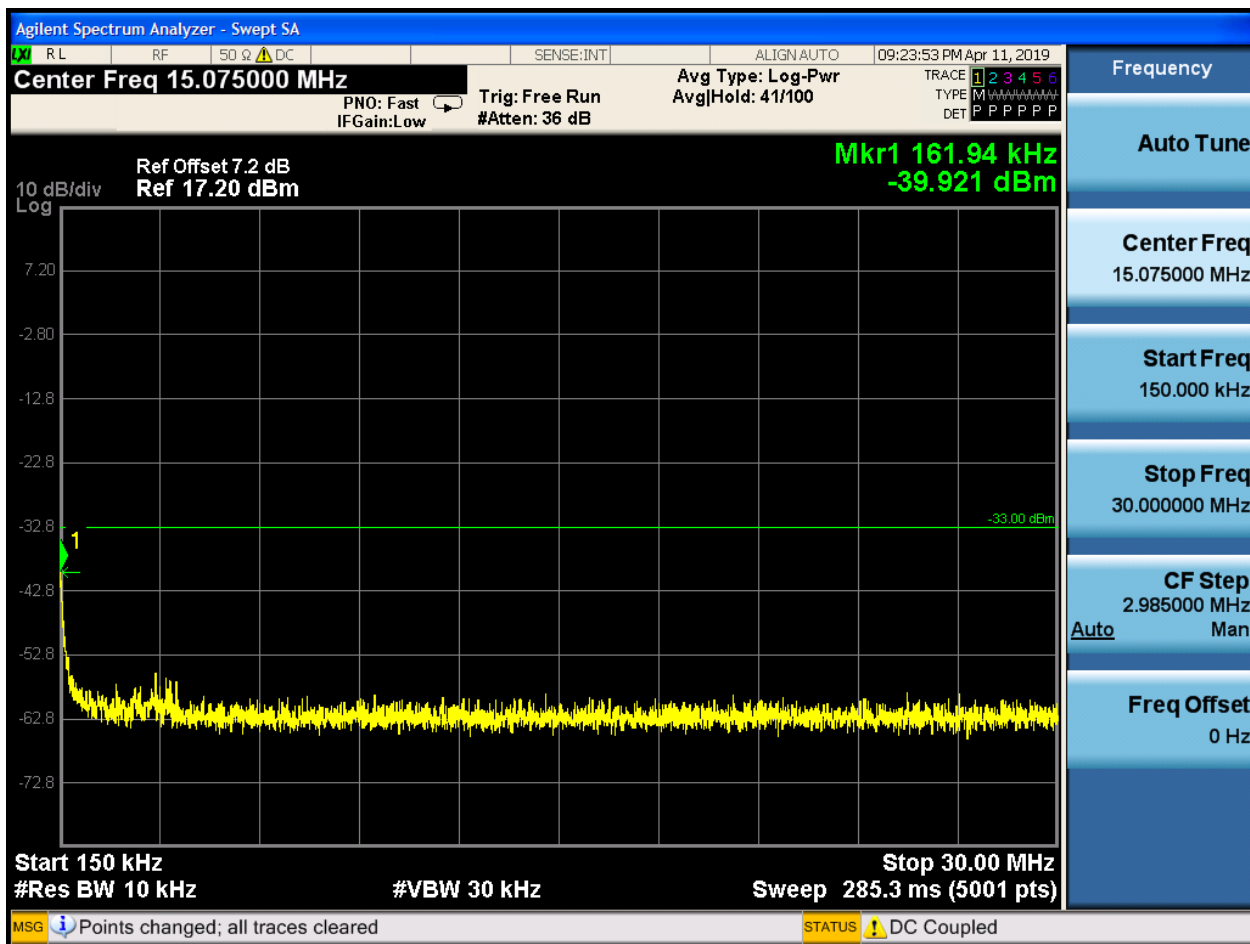


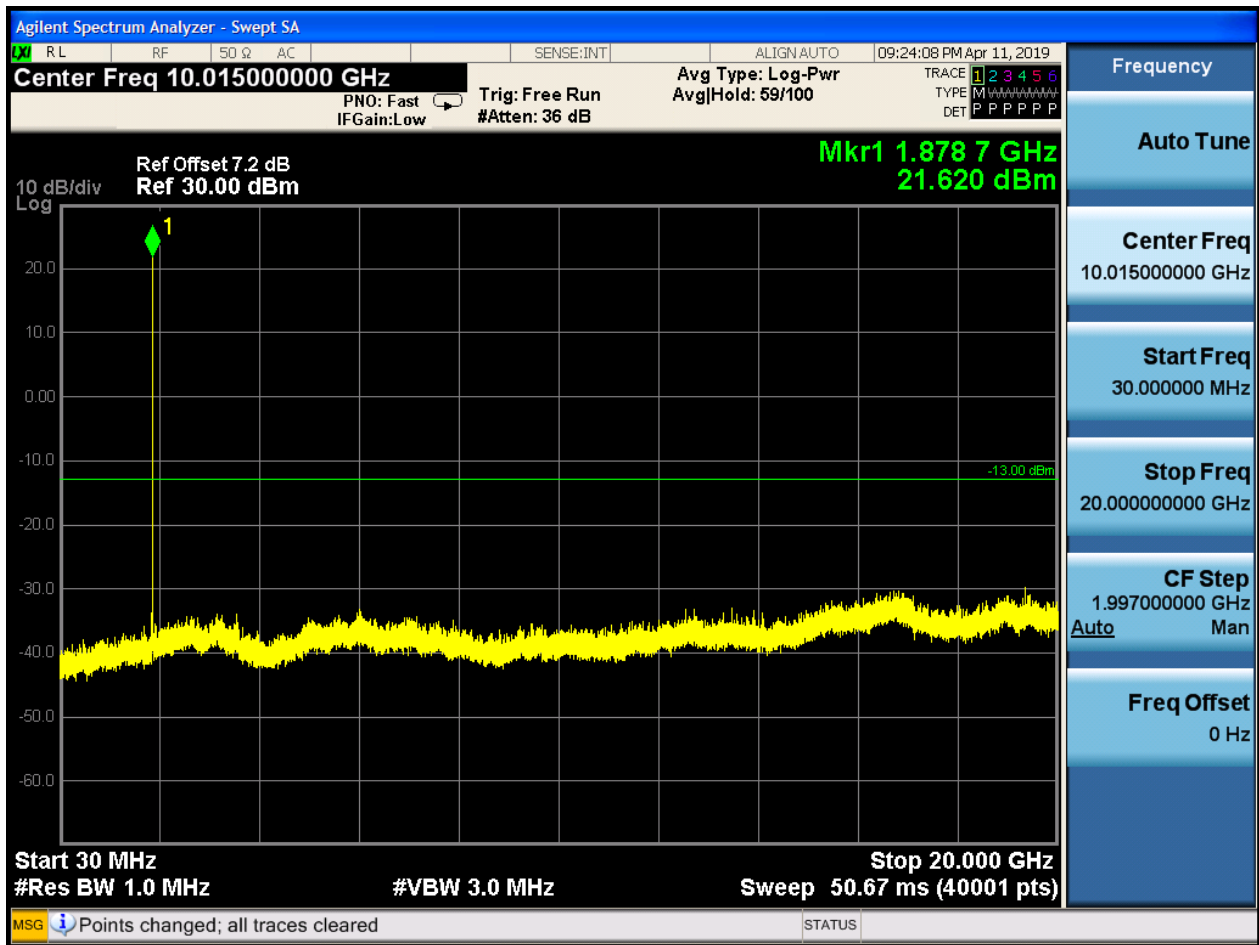




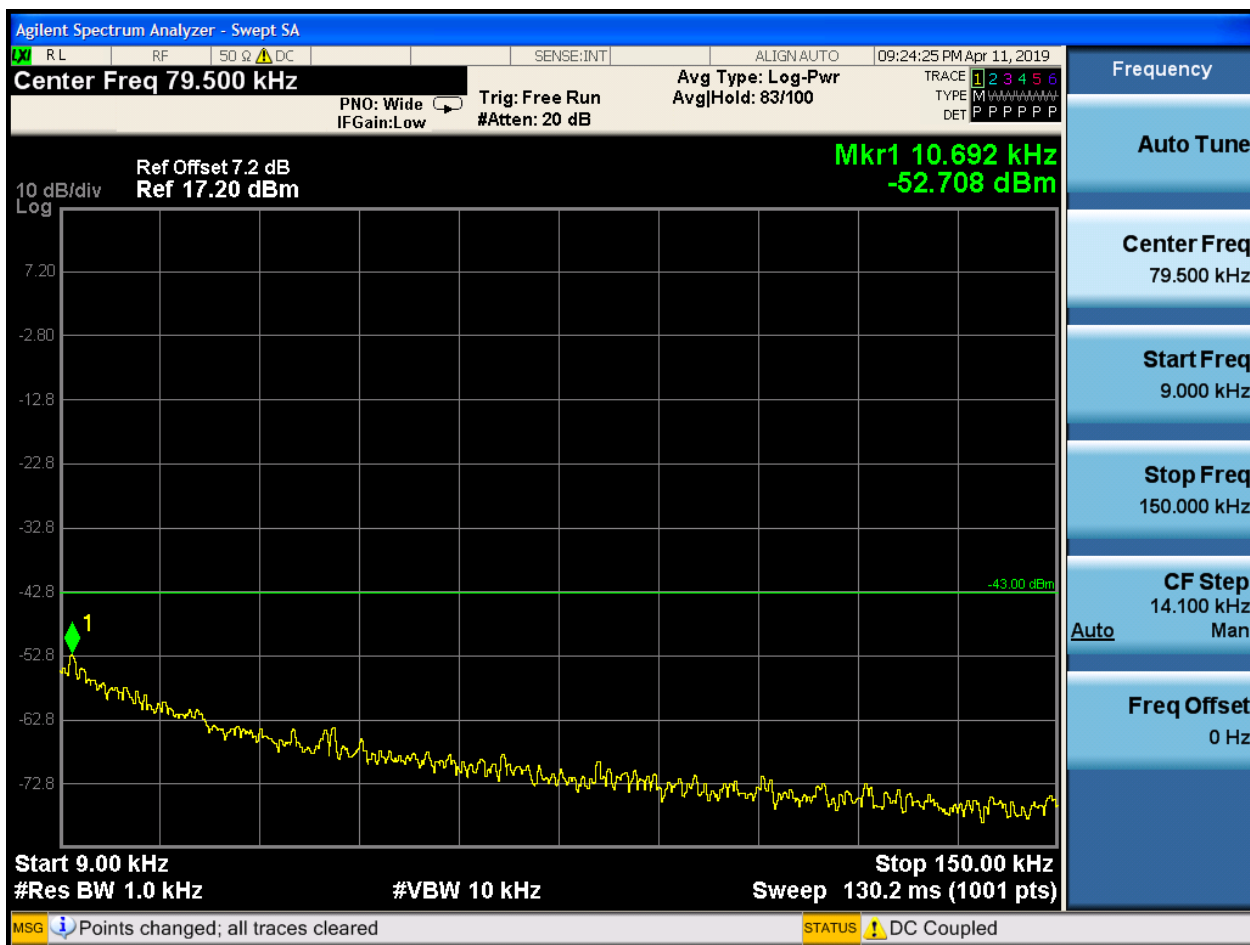
6.1.1.1.2 Test Channel = MCH

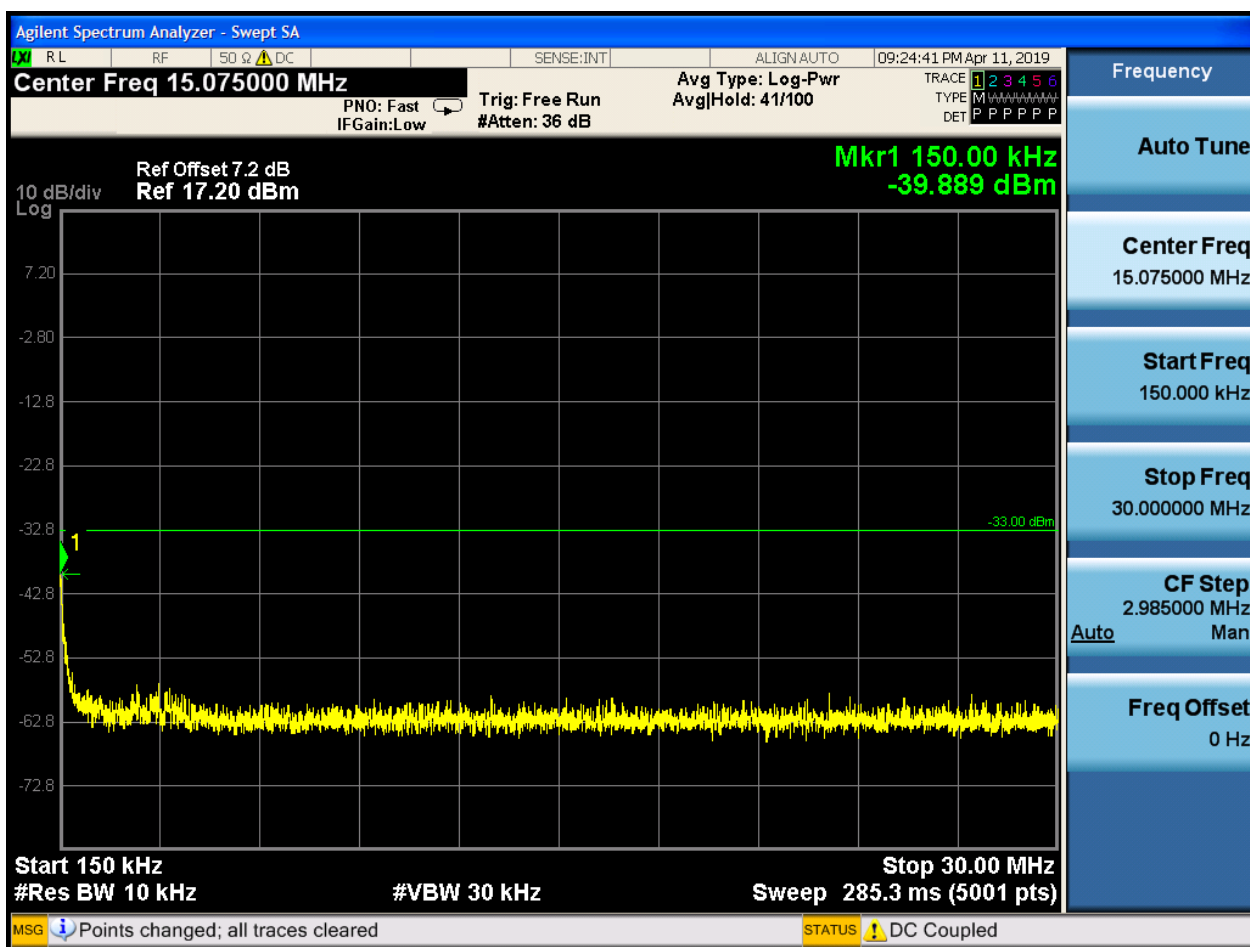


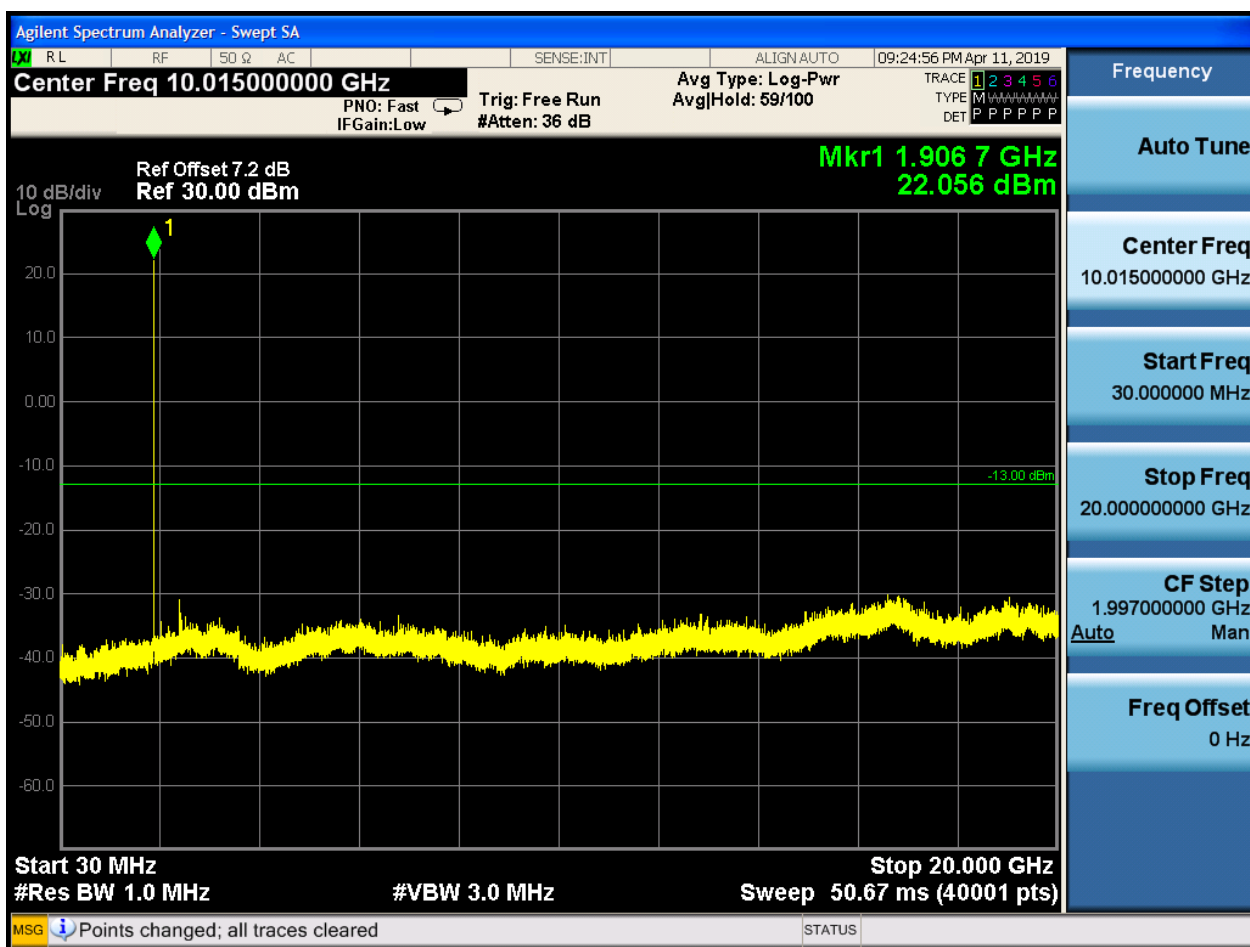




6.1.1.1.3 Test Channel = HCH







7Appendix_G: Field Strength of Spurious Radiation

Note: We tested all modes, but the data presented below is the worst case.

9kHz~150kHz, RBW = 200Hz, VBW = 600 Hz, Detector: PK

150kHz~30MHz, RBW = 9kHz, VBW = 30k Hz, Detector: PK

30MHz~1GHz, RBW = 100 kHz, VBW = 300 kHz. Detector: PK

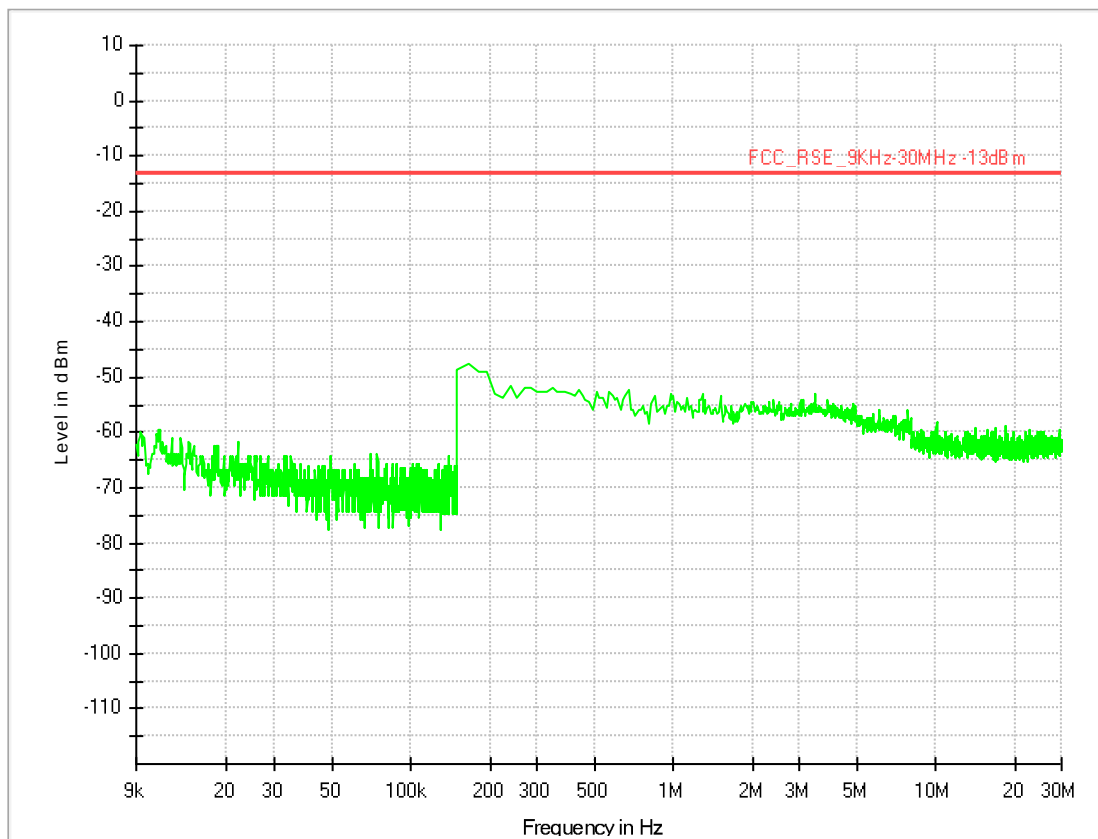
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

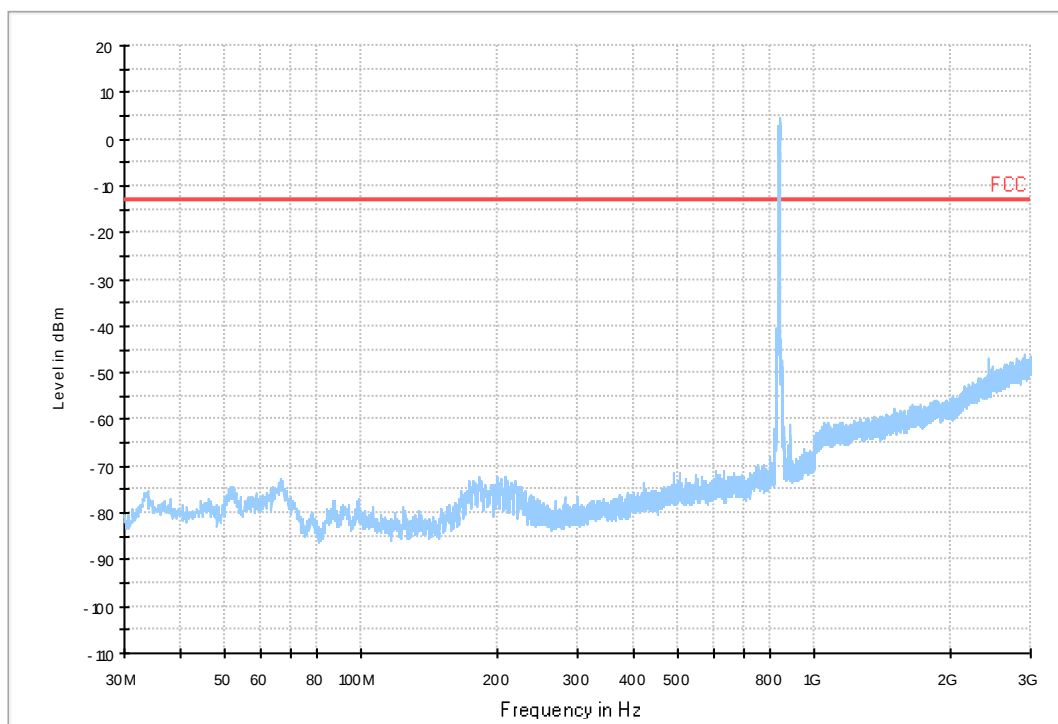
7.1 For UMTS

7.1.1 Test Band = WCDMA850_ANT1

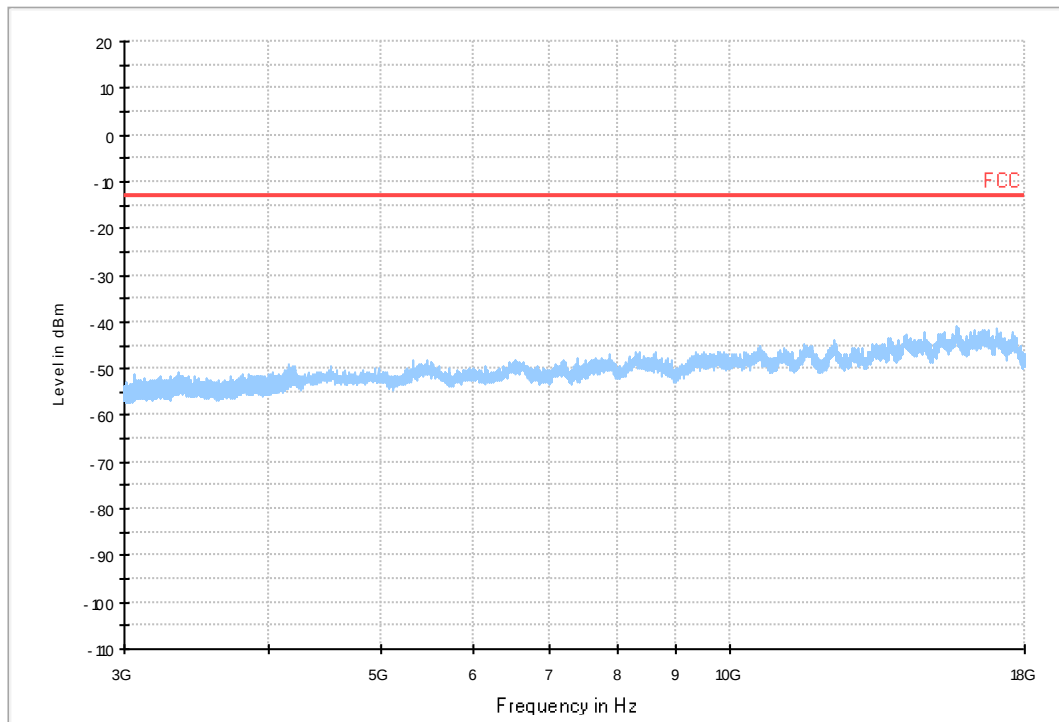
7.1.1.1 Test Mode = UMTS/TM1



06 FCC PART 22 WCDMA850_L

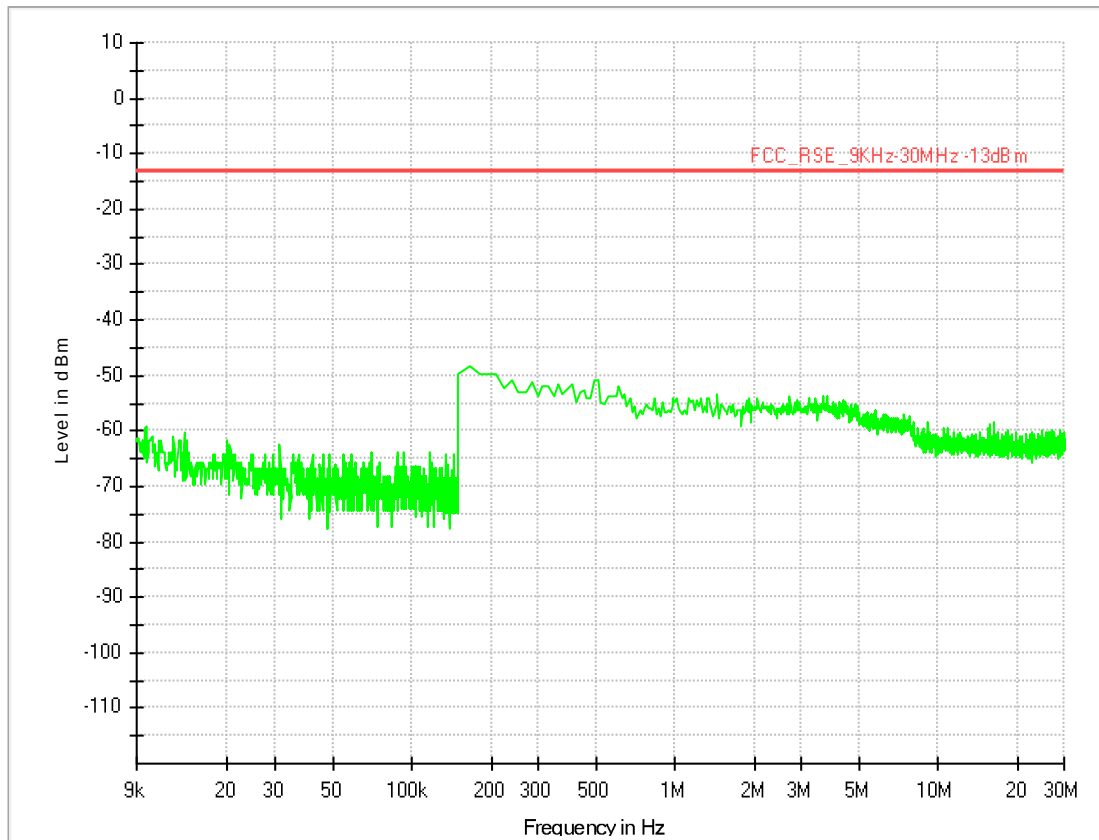


05 FCC PART 22 WCDMA850_H

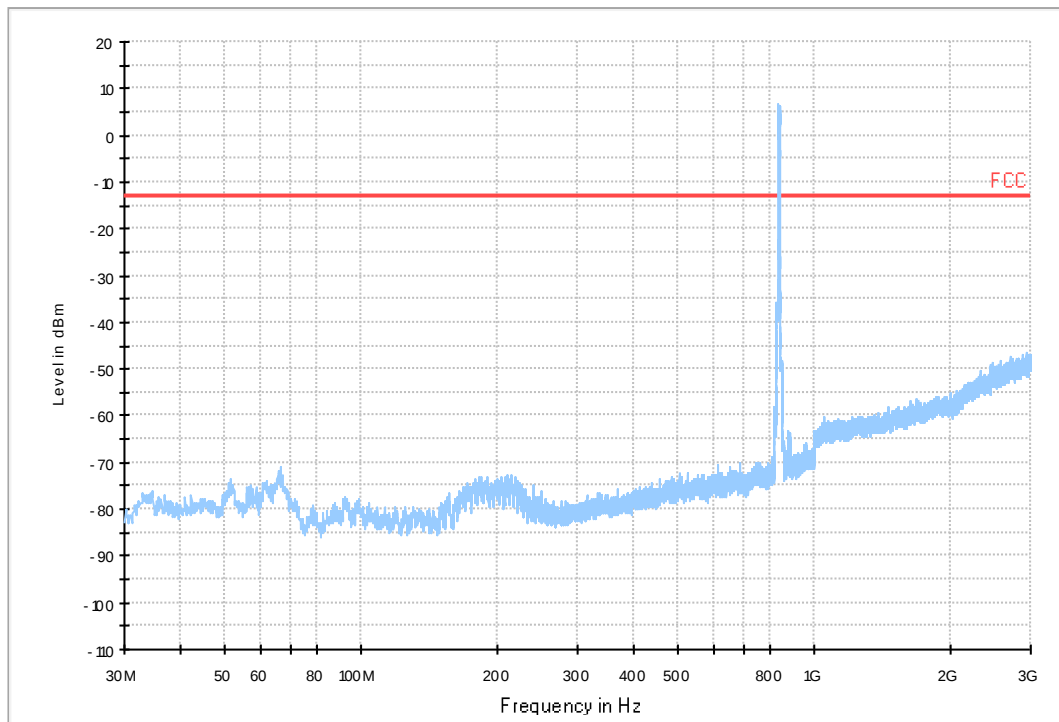


7.1.2 Test Band = WCDMA850_ANT2

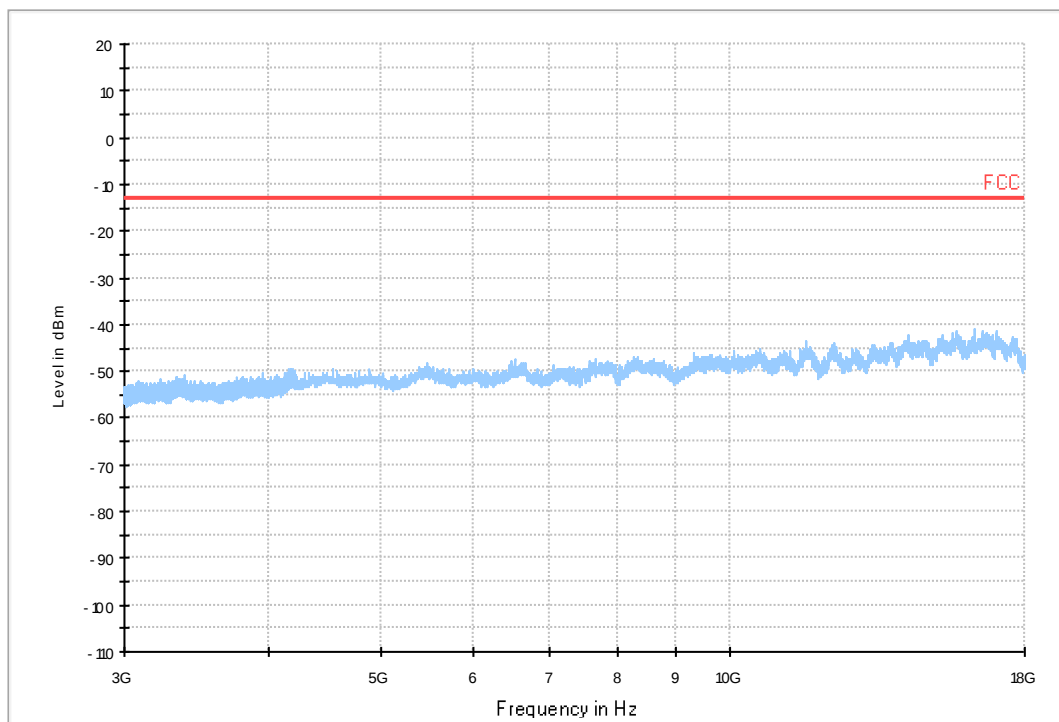
7.1.2.1 Test Mode = UMTS/TM1



06 FCC PART 22 WCDMA850_L

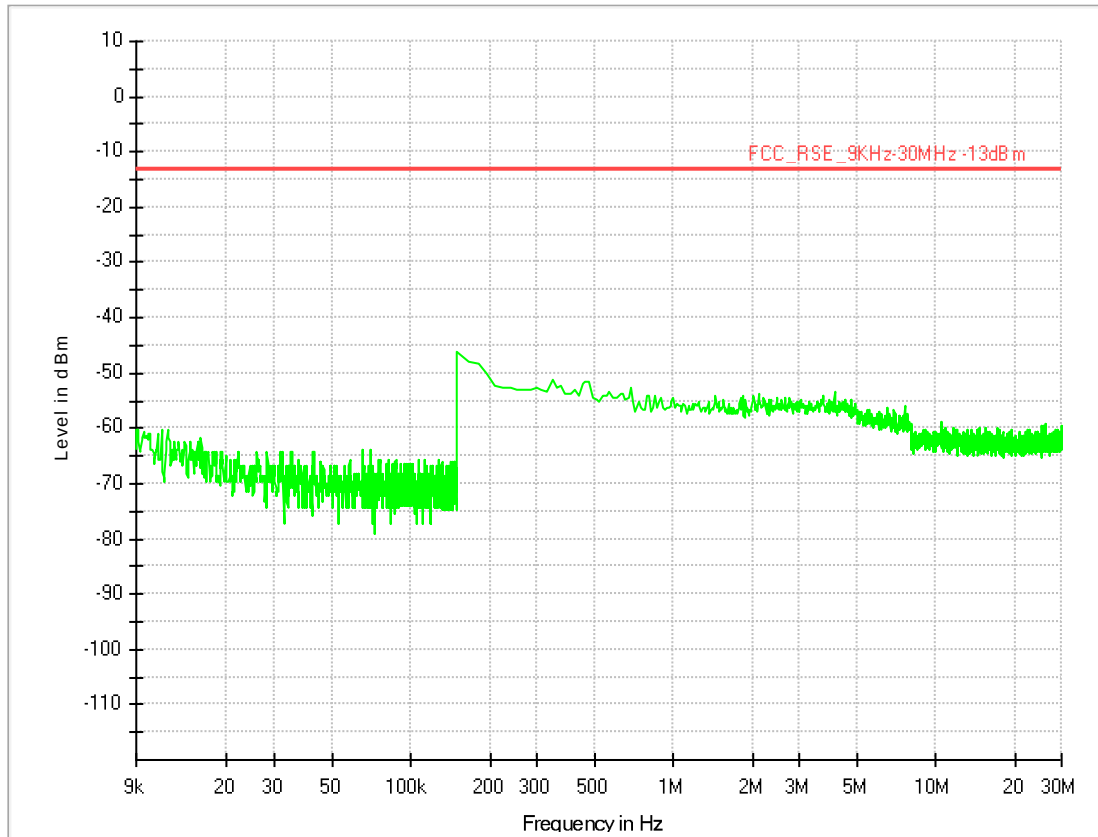


05 FCC PART 22 WCDMA850_H

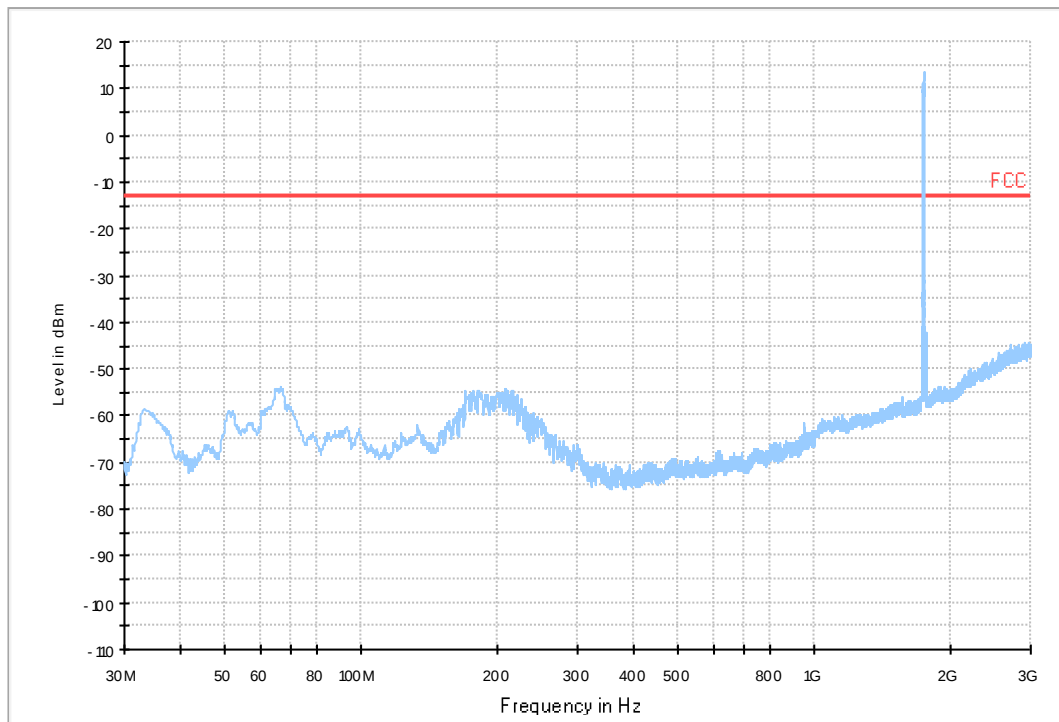


7.1.3 Test Band = WCDMA1700_ANT1

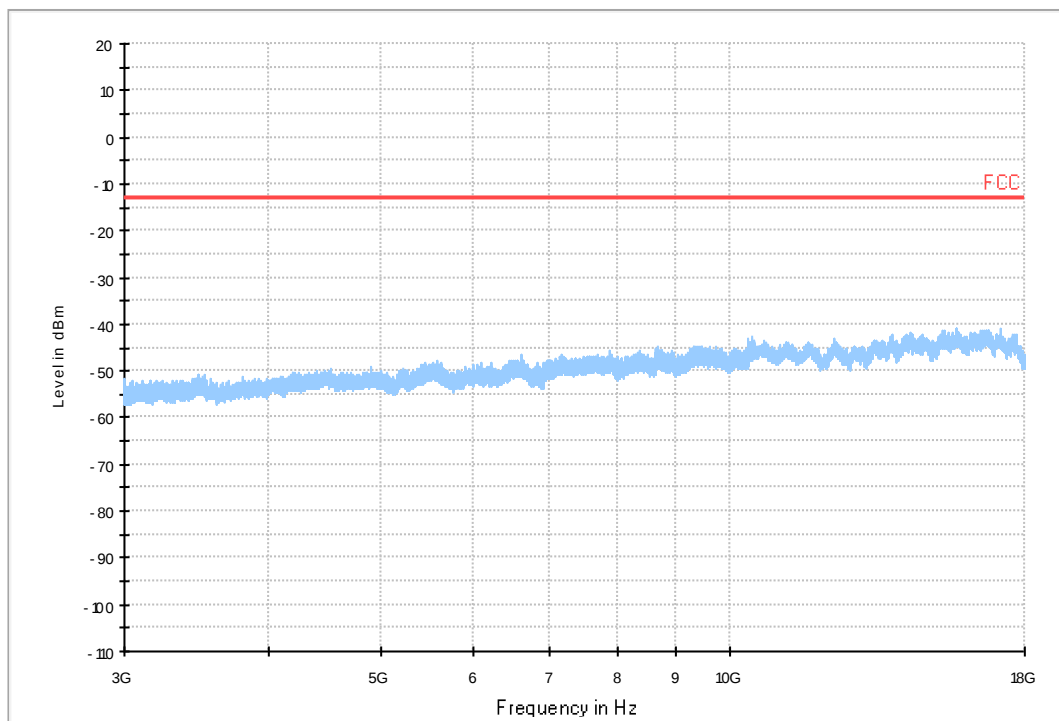
7.1.3.1 Test Mode = UMTS/TM1



18FCC PART 27WCDMA1700_L

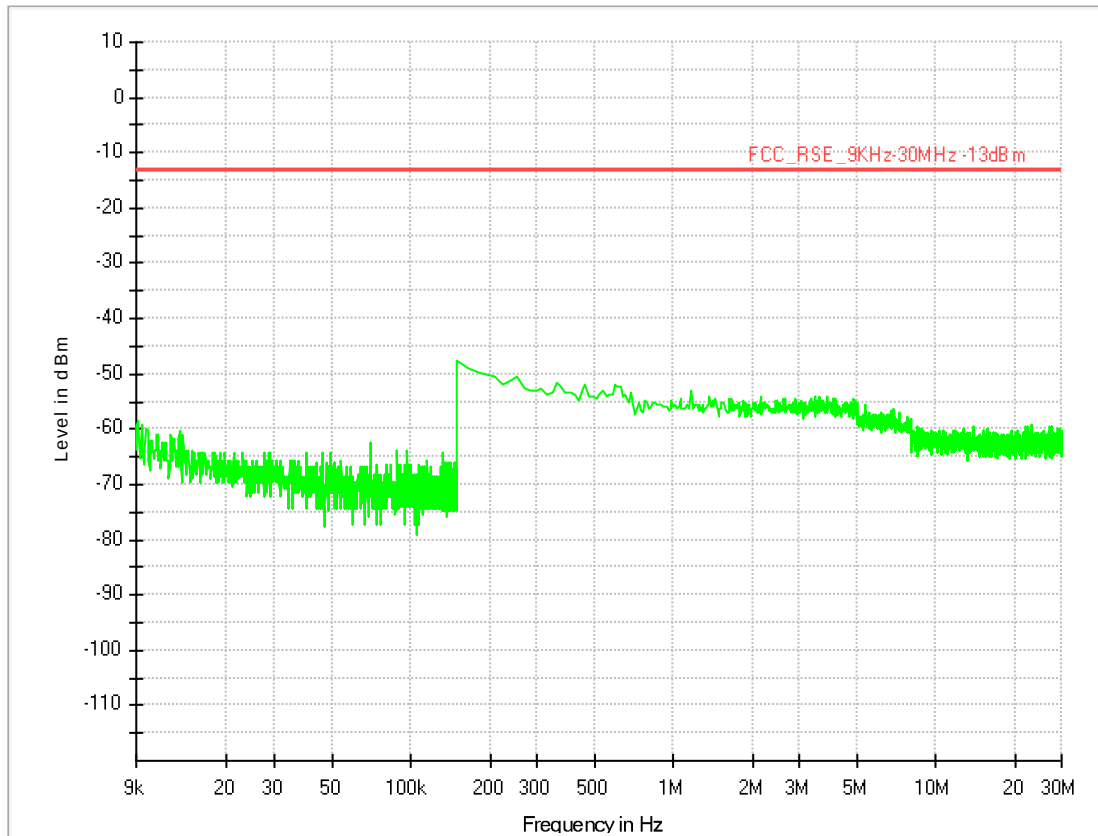


17FCC PART 27WCDMA1700_H

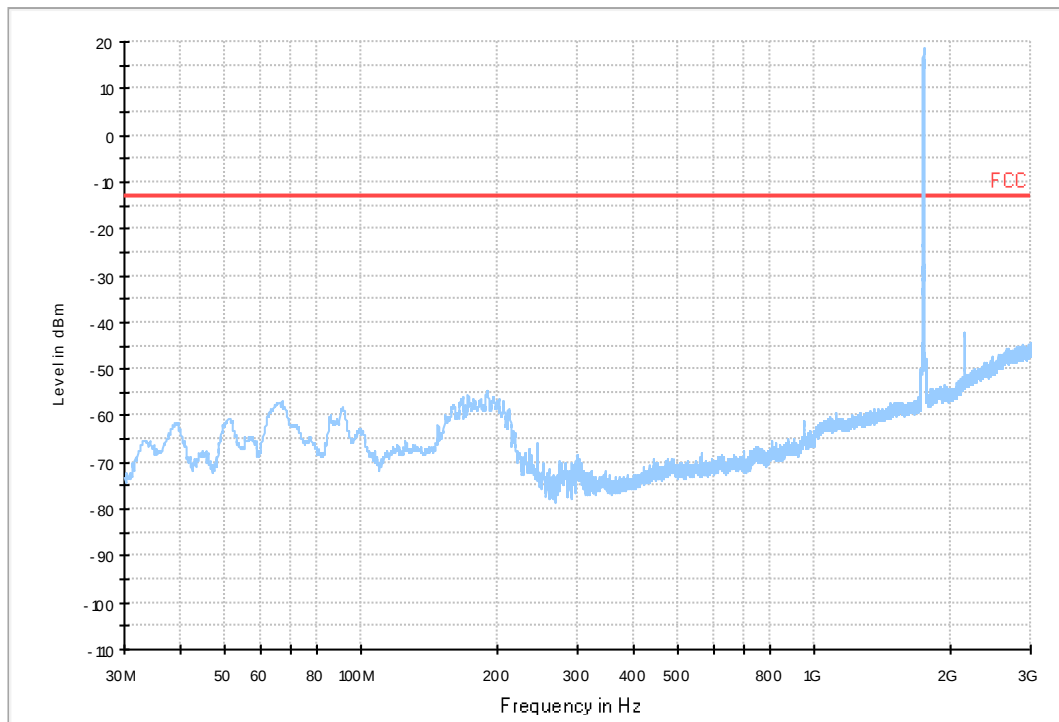


7.1.4 Test Band = WCDMA1700_ANT2

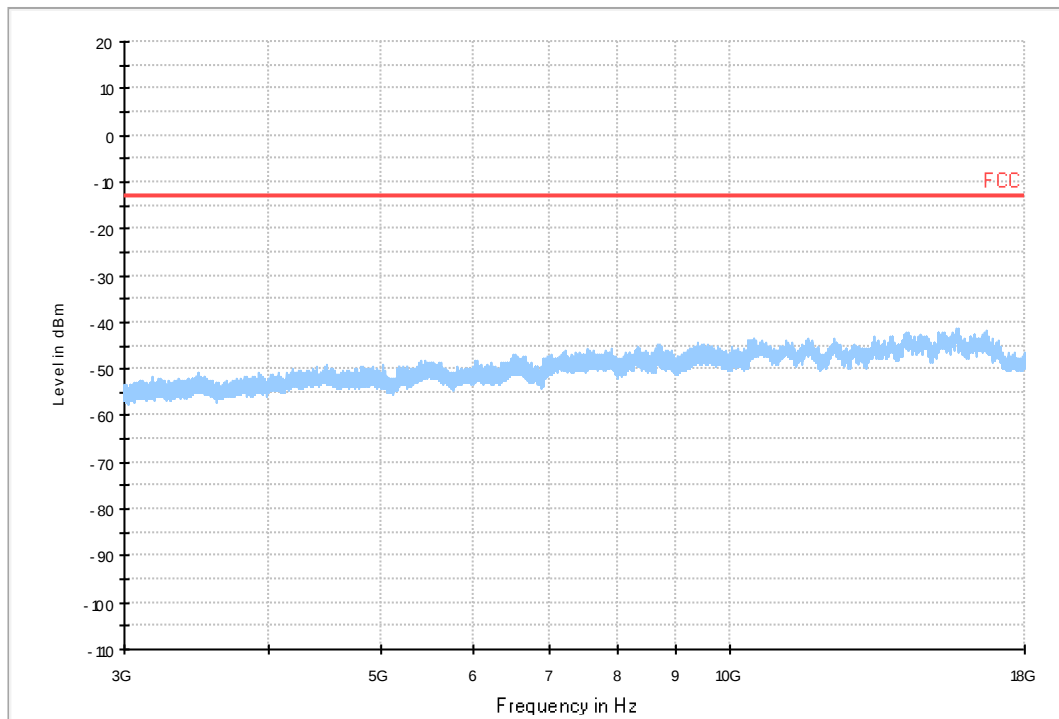
7.1.4.1 Test Mode = UMTS/TM1



18 FCC PART 27 WCDMA1700_L

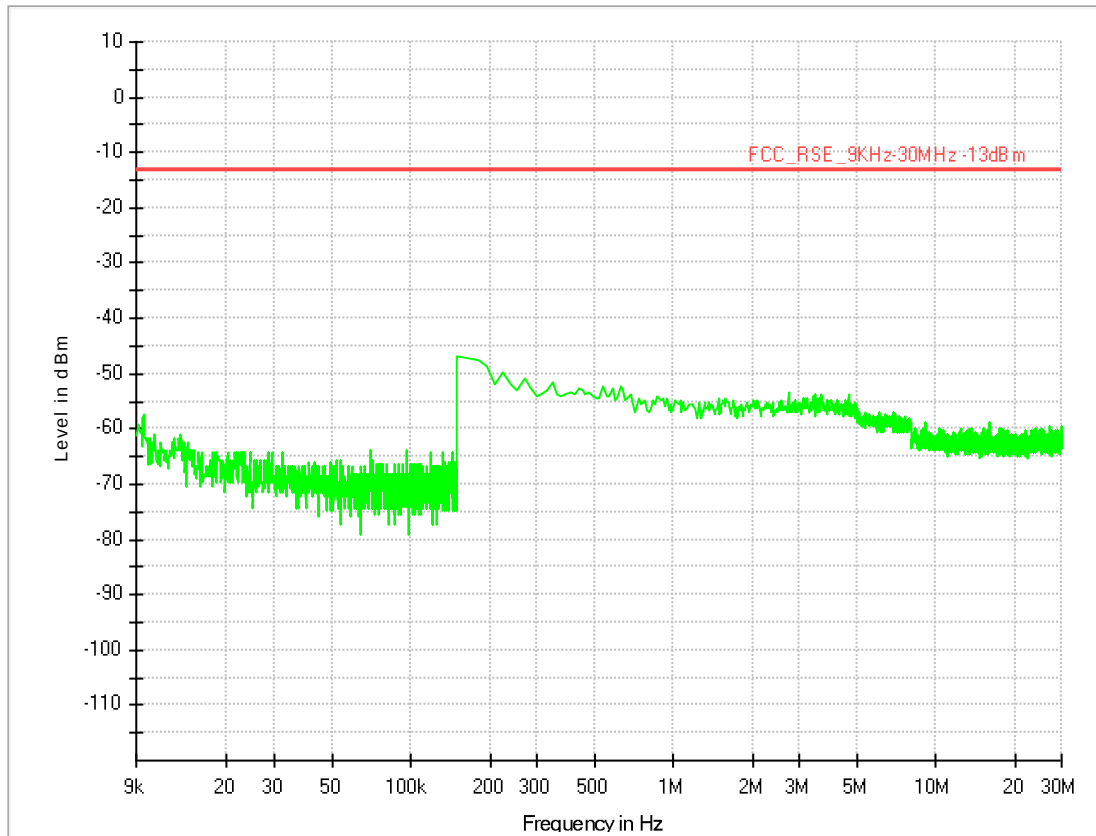


17 FCC PART 27 WCDMA1700_H

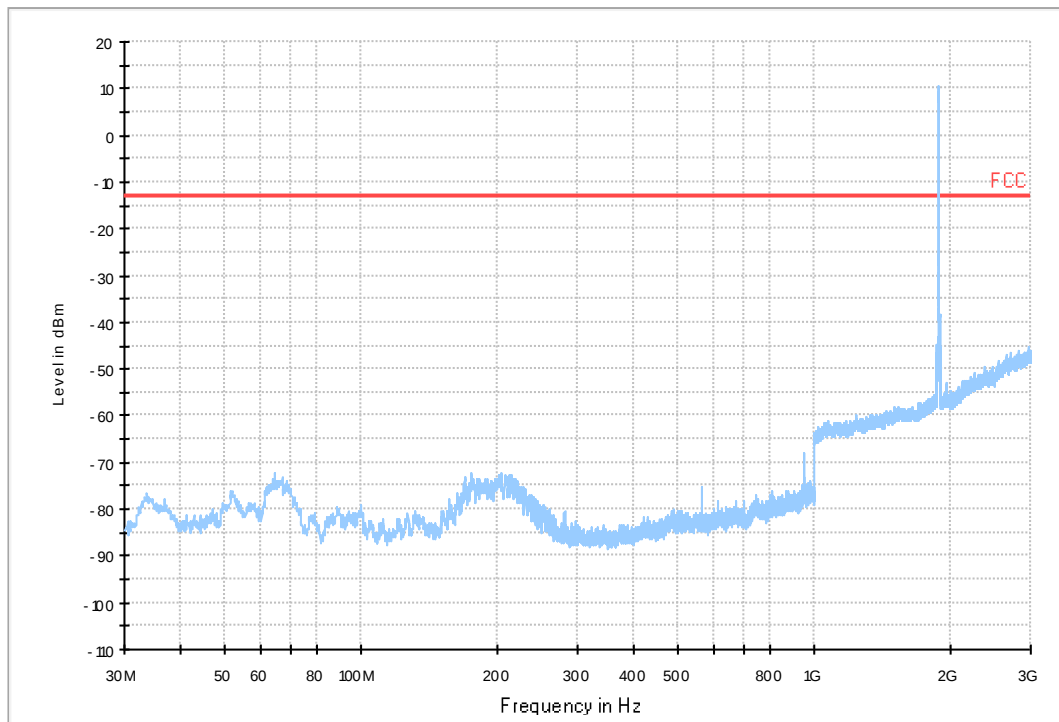


7.1.5 Test Band = WCDMA1900_ANT1

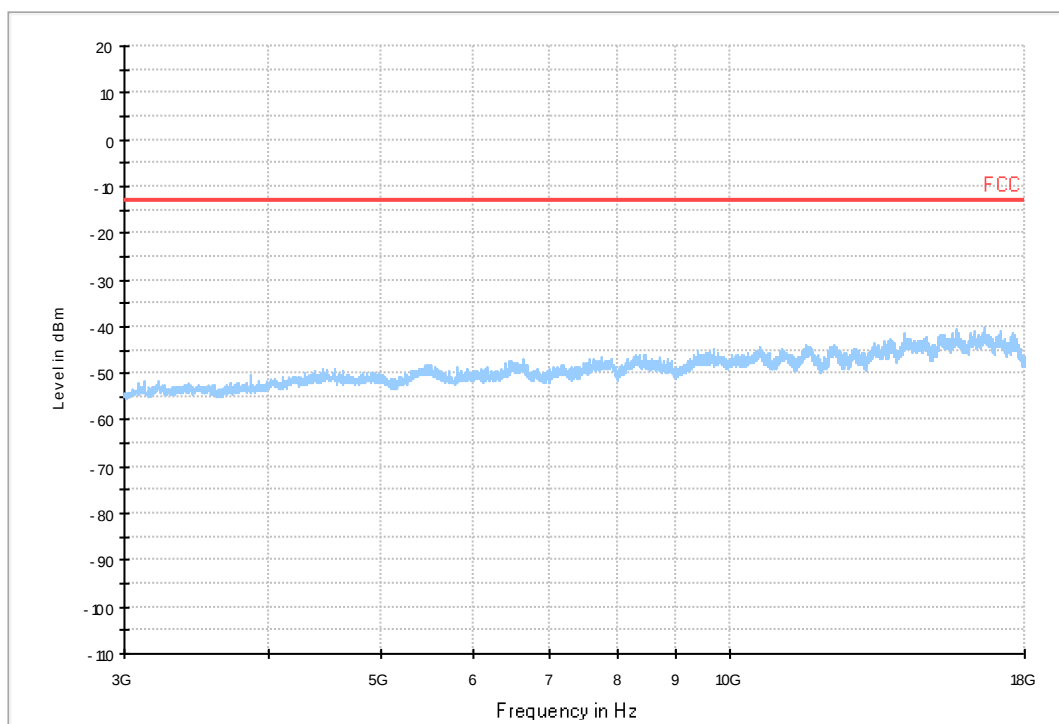
7.1.5.1 Test Mode = UMTS/TM1



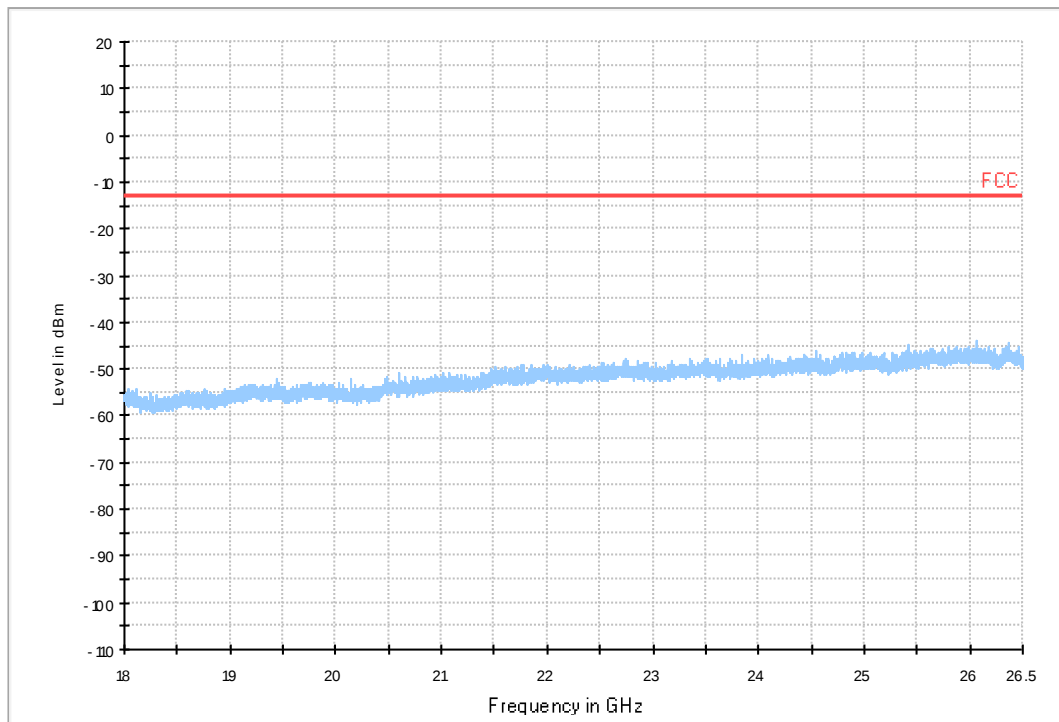
12 FCC PART 24 WCDMA1900_L



11 FCC PART 24 WCDMA1900_H

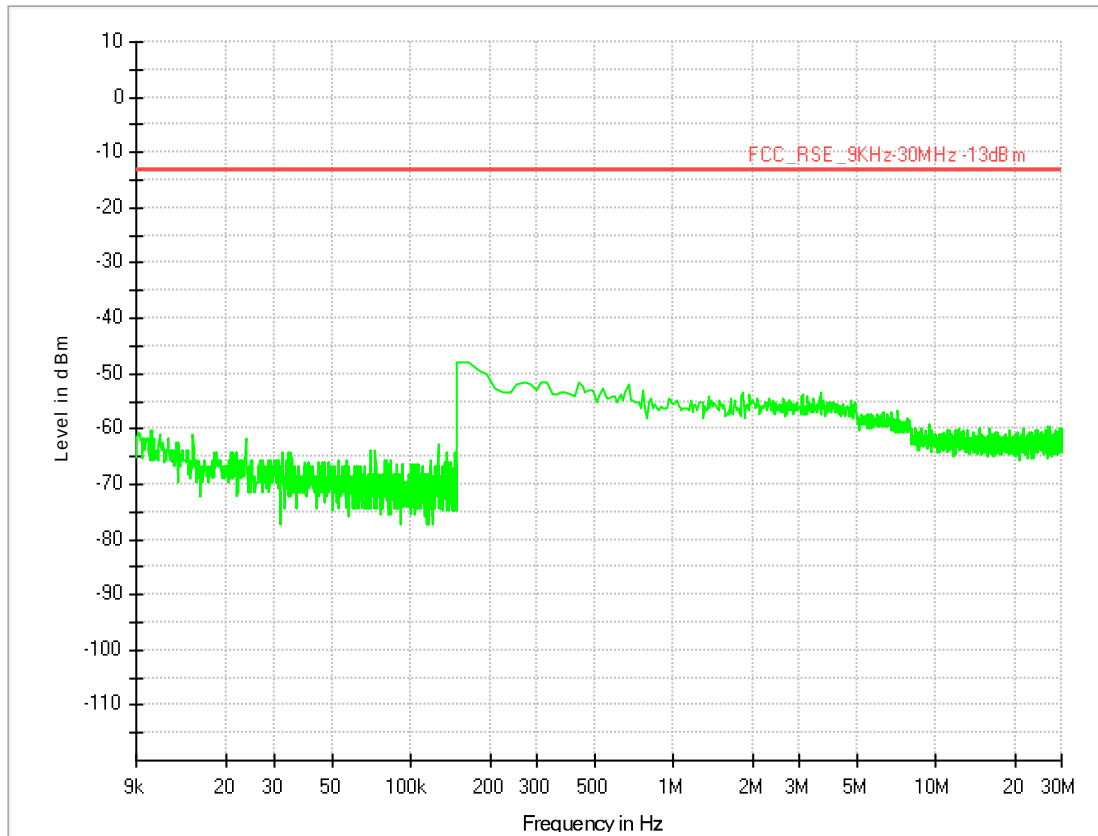


FCC 18-26.5G -13dBm

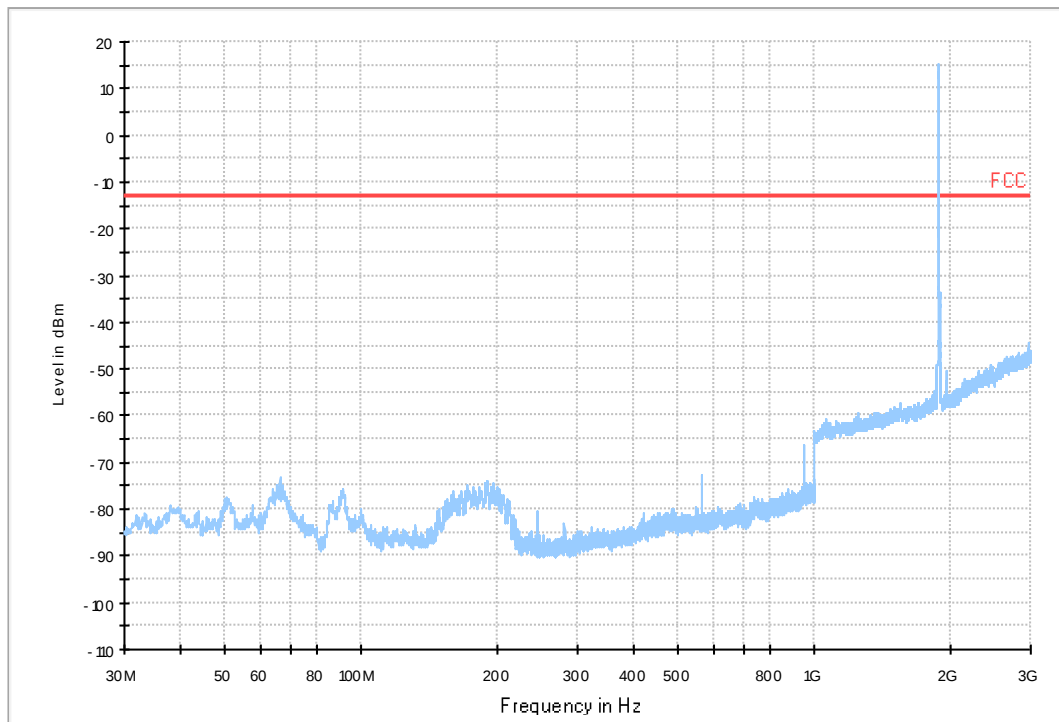


7.1.6 Test Band = WCDMA1900_ANT2

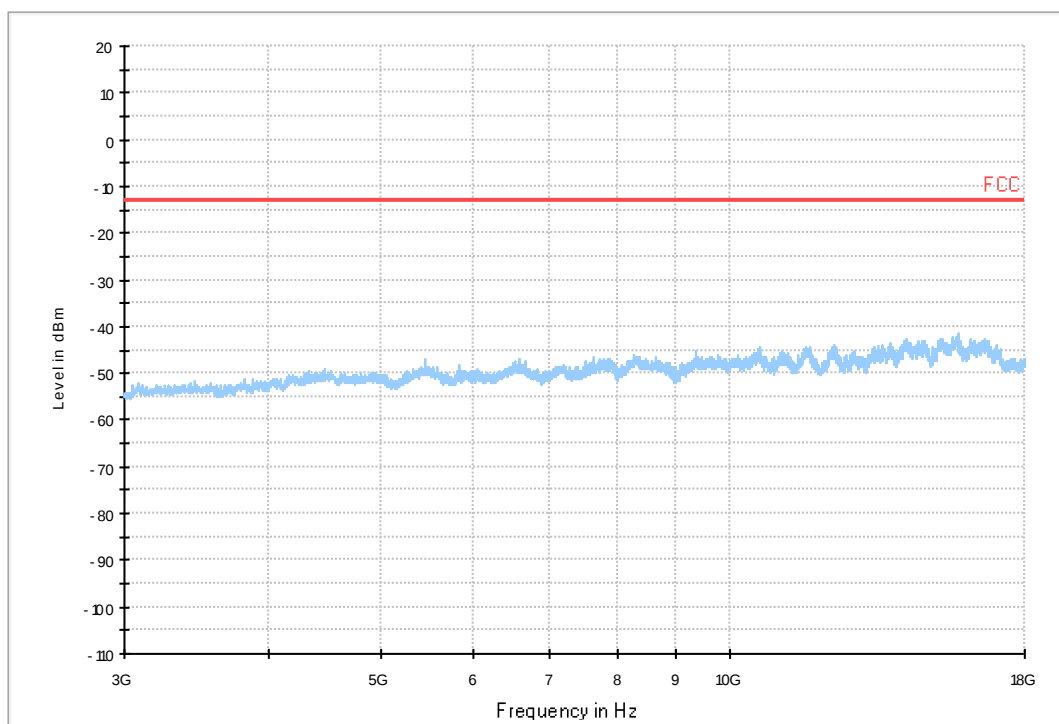
7.1.6.1 Test Mode = UMTS/TM1



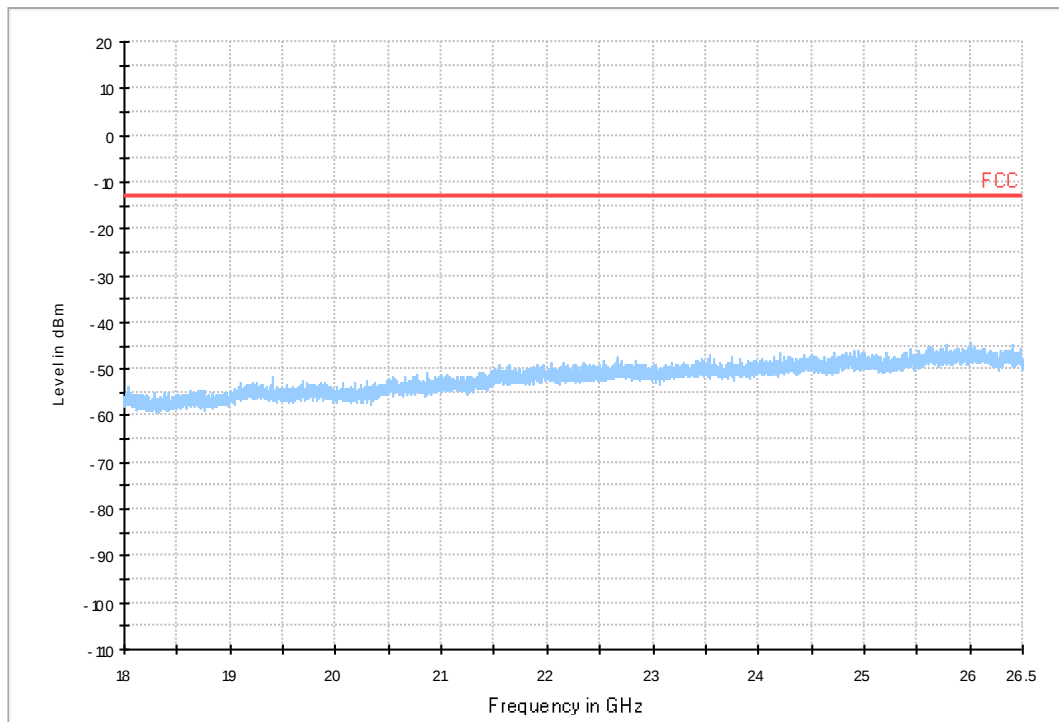
12 FCC PART 24 WCDMA1900_L



11 FCC PART 24 WCDMA1900_H



FCC 18-26.5G -13dBm



8Appendix_H: Frequency Stability

8.1 For UMTS

8.1.1Frequency Error vs. Voltage:

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA850	UMTS/TM1	LCH	TN	VL	2.76804	0.00335	PASS
				VN	-0.88692	-0.00107	PASS
				VH	-1.00851	-0.00122	PASS
		MCH	TN	VL	-5.46455	-0.00653	PASS
				VN	-4.75645	-0.00569	PASS
				VH	4.91381	0.00587	PASS
		HCH	TN	VL	-3.01838	-0.00357	PASS
				VN	4.17709	0.00494	PASS
				VH	-2.83956	-0.00335	PASS
WCDMA1700	UMTS/TM1	LCH	TN	VL	0.46492	0.00027	PASS
				VN	-1.30892	-0.00076	PASS
				VH	2.23875	0.00131	PASS
		MCH	TN	VL	3.15428	0.00182	PASS
				VN	-3.40462	-0.00197	PASS
				VH	-2.16007	-0.00125	PASS
		HCH	TN	VL	-3.78370	-0.00216	PASS
				VN	3.46899	0.00198	PASS
				VH	-0.21458	-0.00012	PASS
WCDMA1900	UMTS/TM1	LCH	TN	VL	1.75953	0.00095	PASS
				VN	-0.97275	-0.00053	PASS
				VH	3.42607	0.00185	PASS
		MCH	TN	VL	-0.81539	-0.00043	PASS
				VN	2.09570	0.00111	PASS
				VH	0.43631	0.00023	PASS
		HCH	TN	VL	7.52449	0.00095	PASS
				VN	-0.39339	-0.00053	PASS
				VH	4.74930	0.00185	PASS

8.1.2 Frequency Error vs. Temperature:

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA850	UMTS/TM1	LCH	VN	-30	1.38044	0.00167	PASS
				-20	1.50919	0.00183	PASS
				-10	2.03133	0.00246	PASS
				0	-2.53200	-0.00306	PASS
				10	-5.74350	-0.00695	PASS
				20	-0.88692	-0.00107	PASS
				30	2.57492	0.00312	PASS
				40	-2.96831	-0.00359	PASS
				50	-3.94821	-0.00478	PASS
		MCH	VN	-30	0.04292	0.00005	PASS
				-20	0.02861	0.00003	PASS
				-10	2.23875	0.00268	PASS
				0	0.72956	0.00087	PASS
				10	-2.49624	-0.00298	PASS
				20	-4.75645	-0.00569	PASS
				30	-0.40770	-0.00049	PASS
				40	3.03268	0.00363	PASS
				50	-6.73771	-0.00806	PASS
		HCH	VN	-30	2.11716	0.00250	PASS
				-20	1.43766	0.00170	PASS
				-10	4.83513	0.00571	PASS
				0	1.49488	0.00177	PASS
				10	3.24011	0.00383	PASS
				20	4.17709	0.00494	PASS
				30	-4.93527	-0.00583	PASS
				40	2.68221	0.00317	PASS
				50	0.87976	0.00104	PASS
WCDMA1700	UMTS/TM1	LCH	VN	-30	1.53065	0.00089	PASS
				-20	-0.50783	-0.00030	PASS
				-10	-2.77519	-0.00162	PASS
				0	-0.58651	-0.00034	PASS
				10	3.57628	0.00209	PASS
				20	-1.30892	-0.00076	PASS
				30	0.47207	0.00028	PASS
				40	-2.79665	-0.00163	PASS
				50	1.43051	0.00084	PASS
		MCH	VN	-30	-2.11000	-0.00122	PASS
				-20	3.44753	0.00199	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-10	1.88827	0.00109	PASS
				0	0.88692	0.00051	PASS
				10	4.56333	0.00263	PASS
				20	-3.40462	-0.00197	PASS
				30	4.83513	0.00279	PASS
				40	4.14133	0.00239	PASS
				50	-1.38760	-0.00080	PASS
		HCH	VN	-30	0.43631	0.00025	PASS
				-20	-0.82254	-0.00047	PASS
				-10	-2.53200	-0.00144	PASS
				0	0.08583	0.00005	PASS
				10	0.42915	0.00024	PASS
				20	3.46899	0.00198	PASS
				30	-0.31471	-0.00018	PASS
				40	0.20742	0.00012	PASS
				50	0.72956	0.00042	PASS
WCDMA1900	UMTS/TM1	LCH	VN	-30	6.07967	0.00328	PASS
				-20	-3.28302	-0.00177	PASS
				-10	2.52485	0.00136	PASS
				0	-1.93119	-0.00104	PASS
				10	5.92232	0.00320	PASS
				20	-0.97275	-0.00053	PASS
				30	1.28031	0.00069	PASS
				40	-0.37909	-0.00020	PASS
				50	1.48773	0.00080	PASS
		MCH	VN	-30	-2.19584	-0.00117	PASS
				-20	0.73671	0.00039	PASS
				-10	4.39882	0.00234	PASS
				0	-6.50883	-0.00346	PASS
				10	-1.93119	-0.00103	PASS
				20	2.09570	0.00111	PASS
				30	3.36885	0.00179	PASS
				40	5.65767	0.00301	PASS
				50	2.54631	0.00135	PASS
		HCH	VN	-30	1.56641	0.00082	PASS
				-20	0.70095	0.00037	PASS
				-10	4.68492	0.00246	PASS
				0	3.69787	0.00194	PASS
				10	2.43902	0.00128	PASS
				20	-0.39339	-0.00021	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	3.26872	0.00171	PASS
				40	0.57936	0.00030	PASS
				50	1.11580	0.00058	PASS

END