



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	24.38	17.15	38.5	PASS
		MCH	24.38	17.15	38.5	PASS
		HCH	24.31	17.08	38.5	PASS
Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
WCDMA1700	UMTS/TM1	LCH	23.71	24.85	30	PASS
		MCH	23.75	24.89	30	PASS
		HCH	23.72	24.86	30	PASS
WCDMA1900	UMTS/TM1	LCH	23.70	23.93	33	PASS
		MCH	23.68	23.91	33	PASS
		HCH	23.57	23.80	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	2.990	13	PASS
		MCH	2.820	13	PASS
		HCH	3.070	13	PASS
WCDMA1700	UMTS/TM1	LCH	2.880	13	PASS
		MCH	3.050	13	PASS
		HCH	3.270	13	PASS
WCDMA1900	UMTS/TM1	LCH	2.880	13	PASS
		MCH	3.150	13	PASS
		HCH	3.080	13	PASS

3Appendix_C: Modulation Characteristics

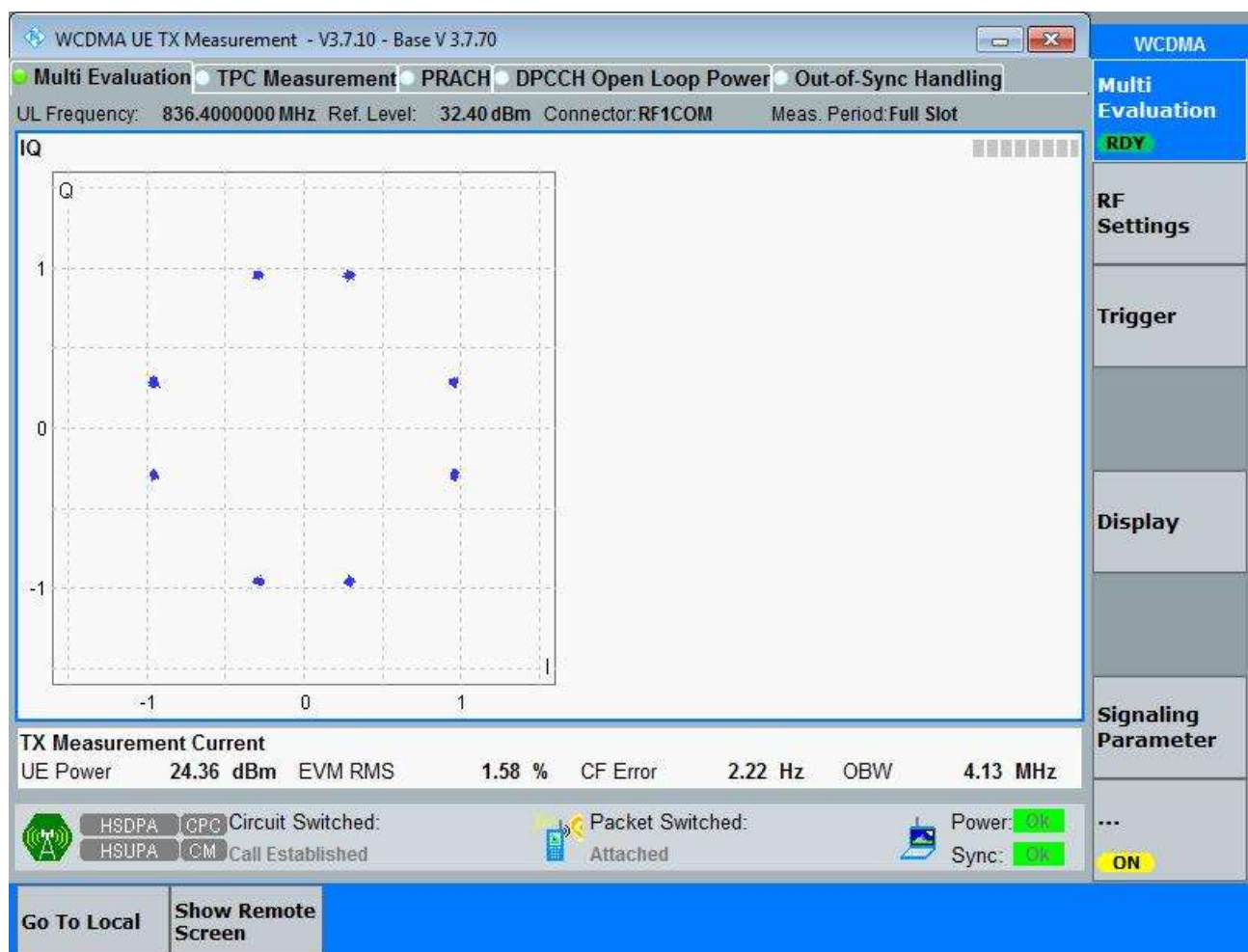
Part I - Test Plots

3.1 For UMTS

3.1.1 Test Band = WCDMA850

3.1.1.1 Test Mode = UMTS/TM1

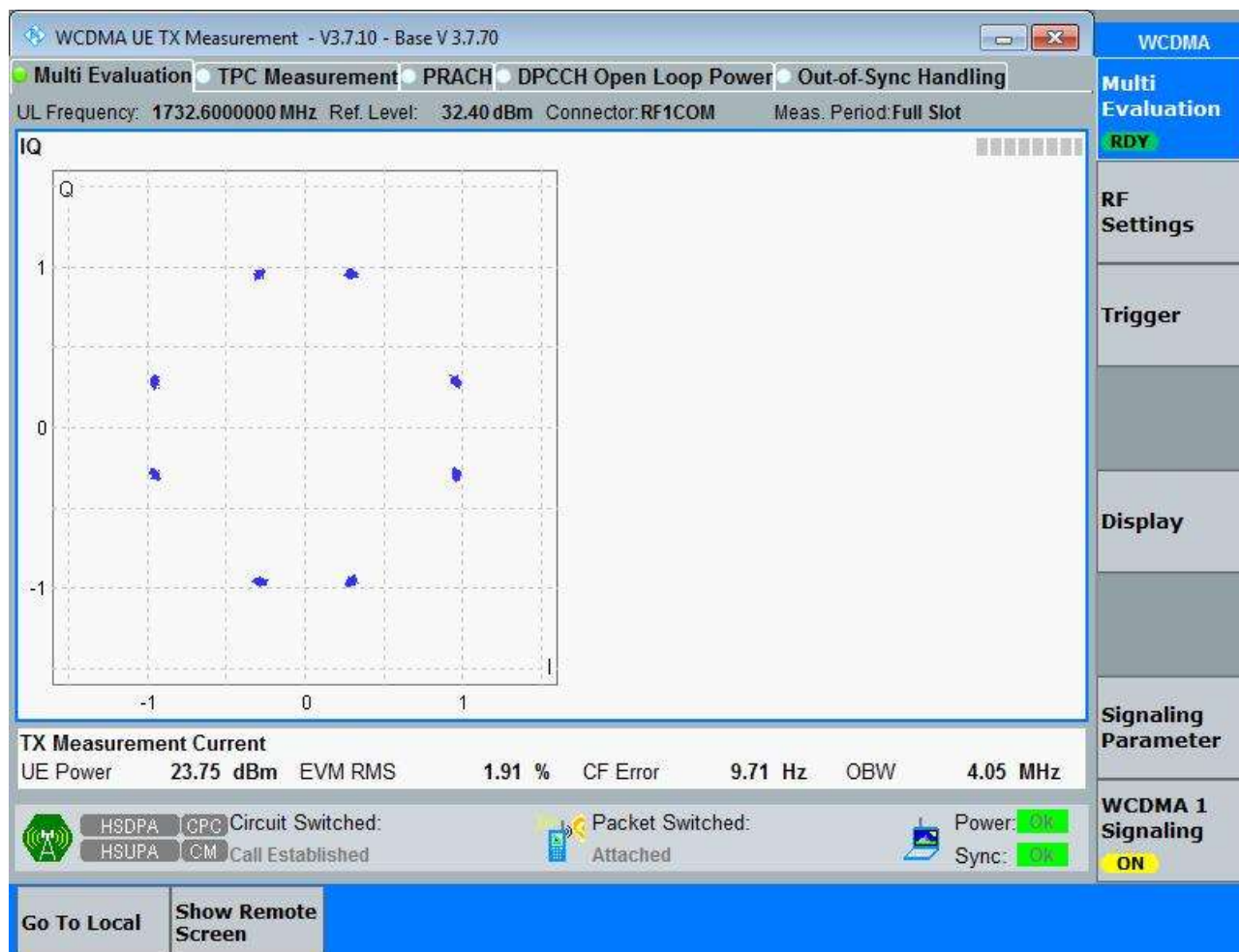
3.1.1.1.1 Test Channel = MCH



3.1.2 Test Band = WCDMA1700

3.1.2.1 Test Mode = UMTS/TM1

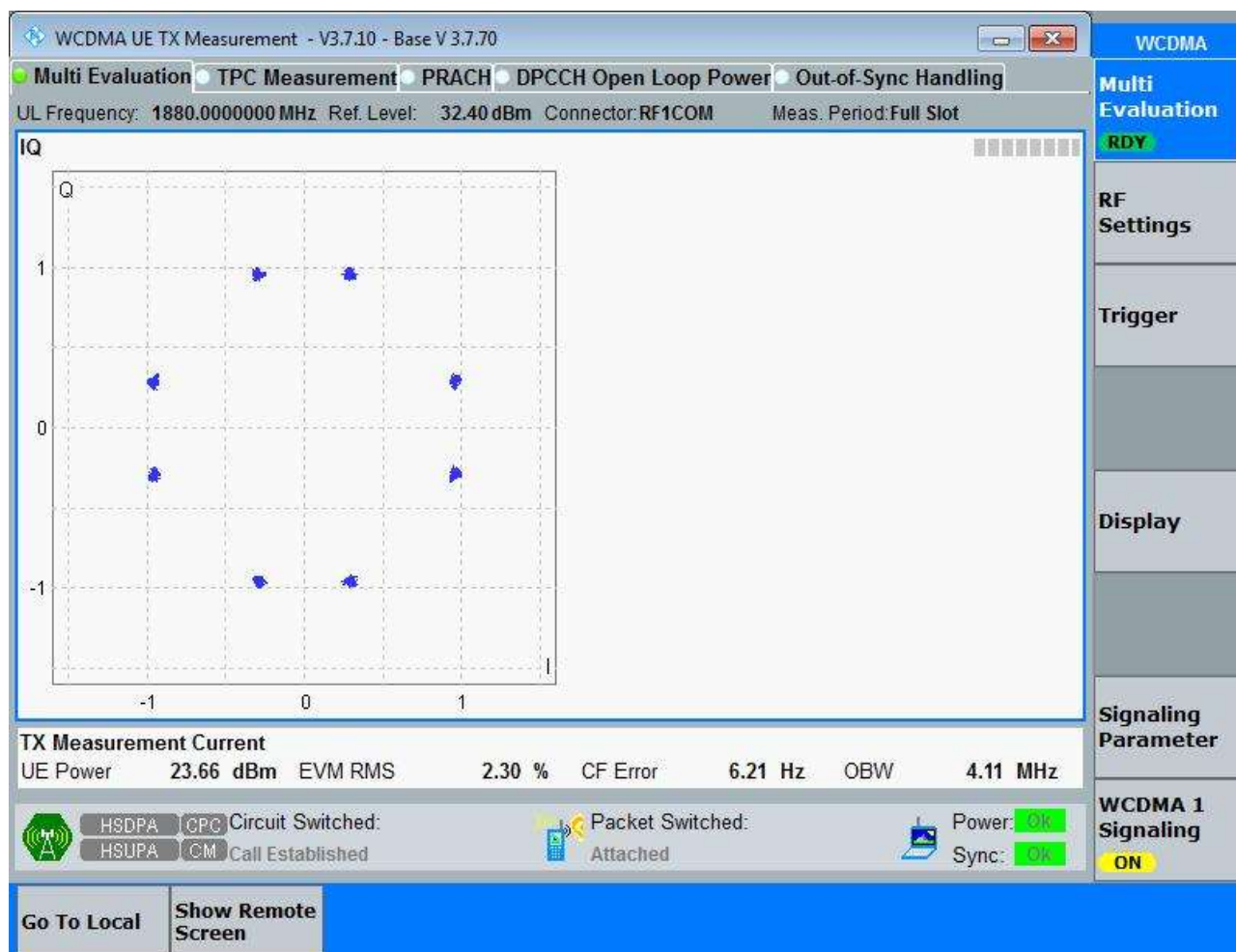
3.1.2.1.1 Test Channel = MCH



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	4.16	4.68	Pass
		MCH	4.18	4.70	Pass
		HCH	4.16	4.69	Pass
WCDMA1700	UMTS/TM1	LCH	4.17	4.70	Pass
		MCH	4.17	4.68	Pass
		HCH	4.17	4.71	Pass
WCDMA1900	UMTS/TM1	LCH	4.17	4.72	Pass
		MCH	4.16	4.69	Pass
		HCH	4.16	4.69	Pass

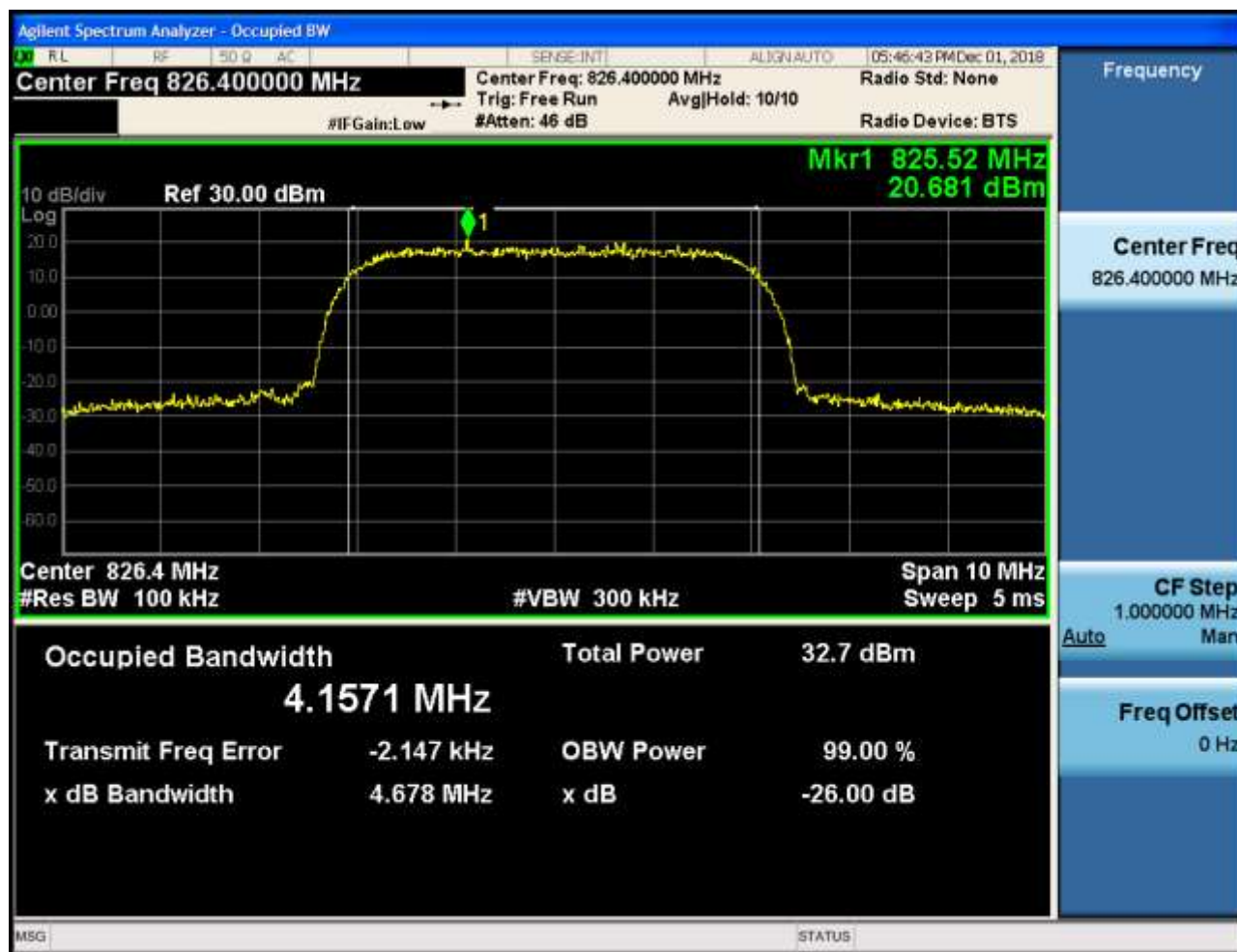
Part II - Test Plots

4.1 For UMTS

4.1.1 Test Band = WCDMA850

4.1.1.1 Test Mode = UMTS/TM1

4.1.1.1.1 Test Channel = LCH



4.1.1.1.2 Test Channel = MCH



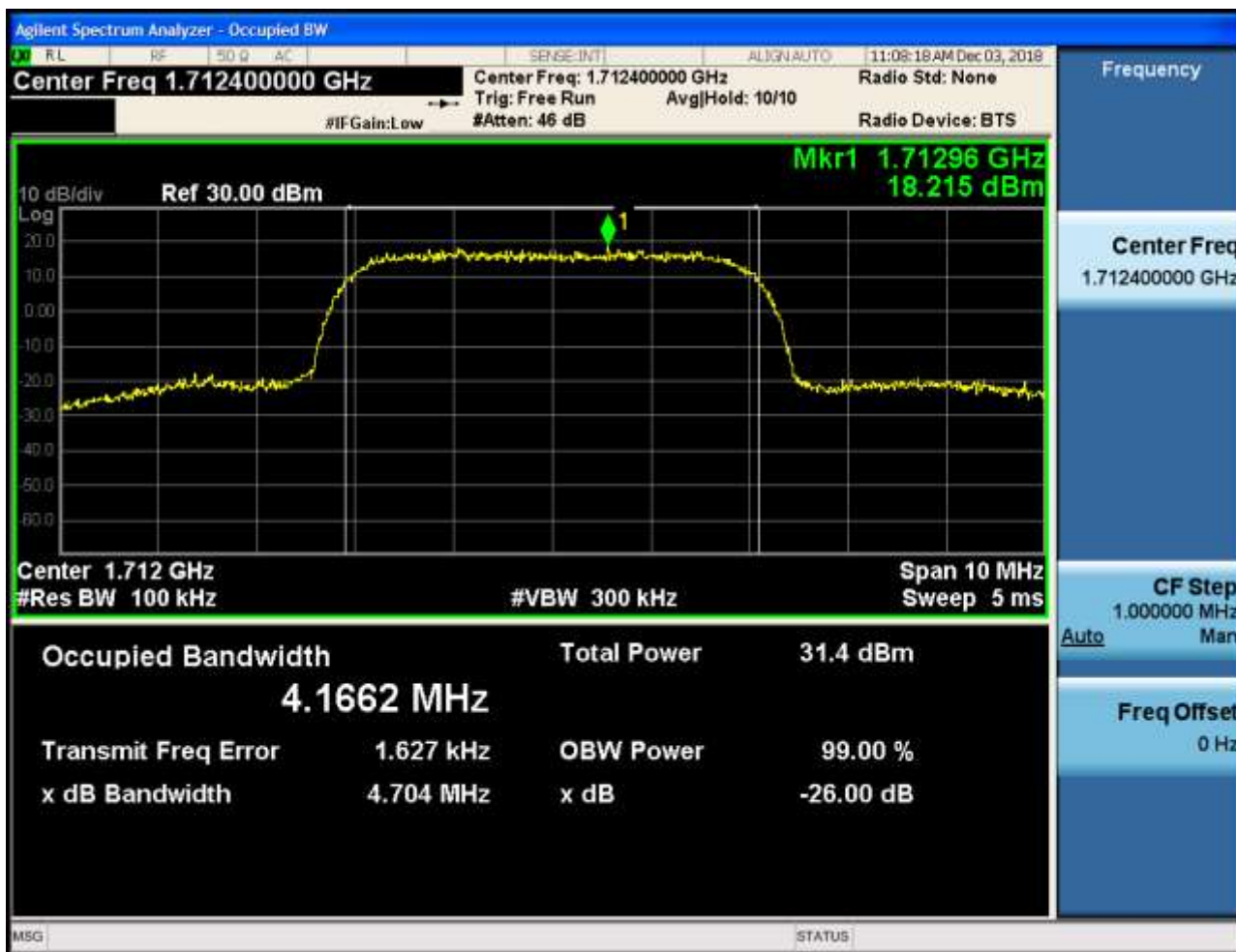
4.1.1.1.3 Test Channel = HCH



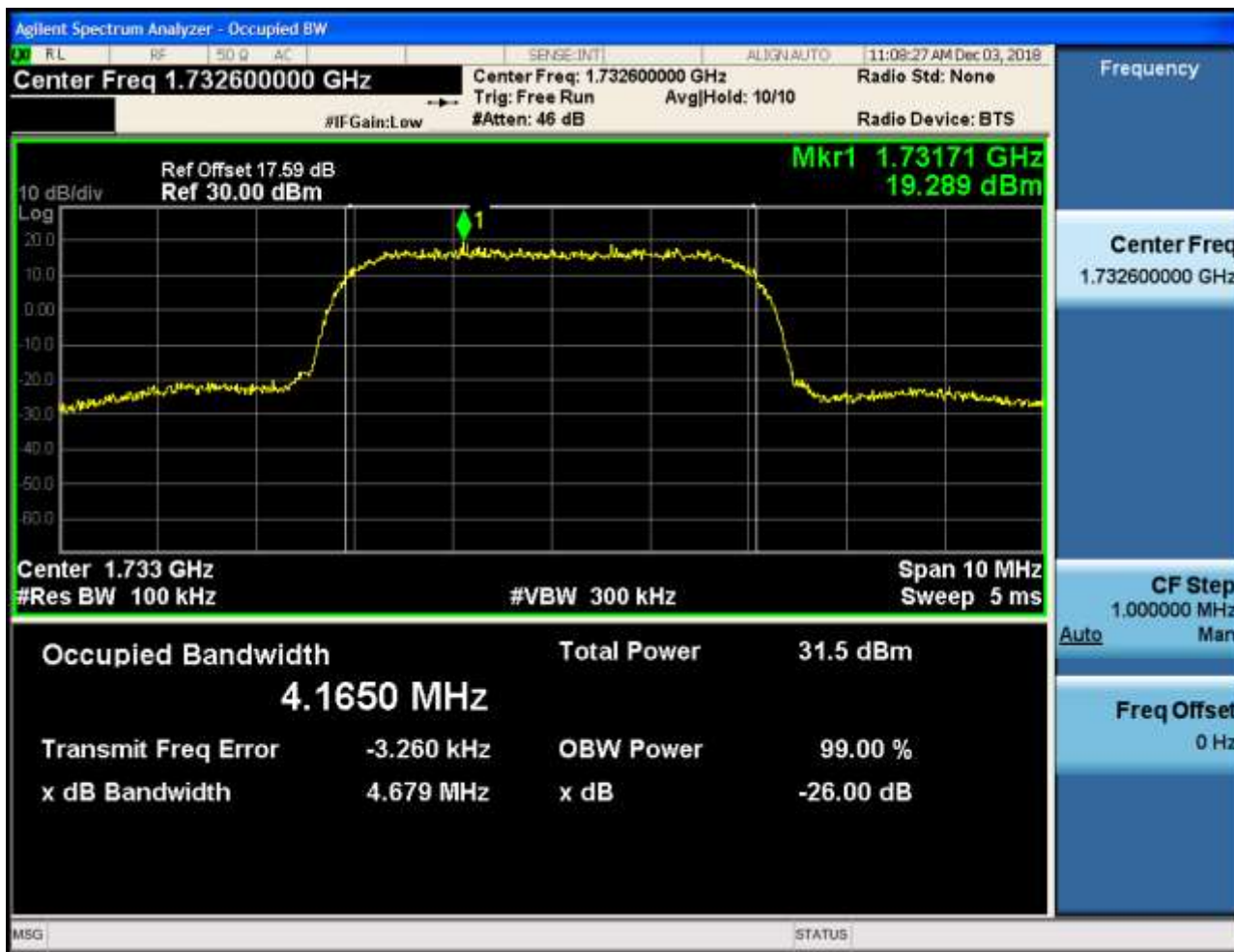
4.1.2 Test Band = WCDMA1700

4.1.2.1 Test Mode = UMTS/TM1

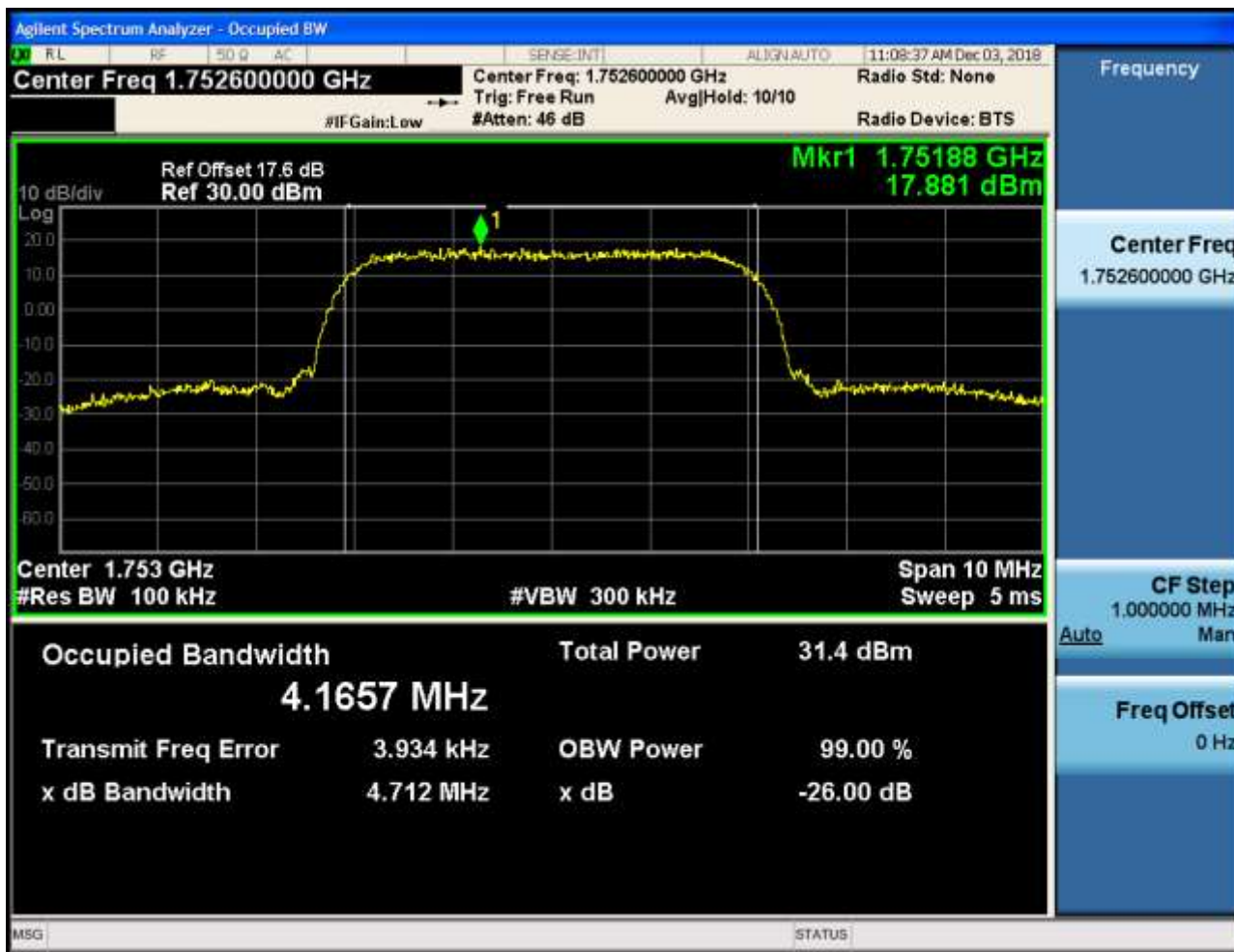
4.1.2.1.1 Test Channel = LCH



4.1.2.1.2 Test Channel = MCH



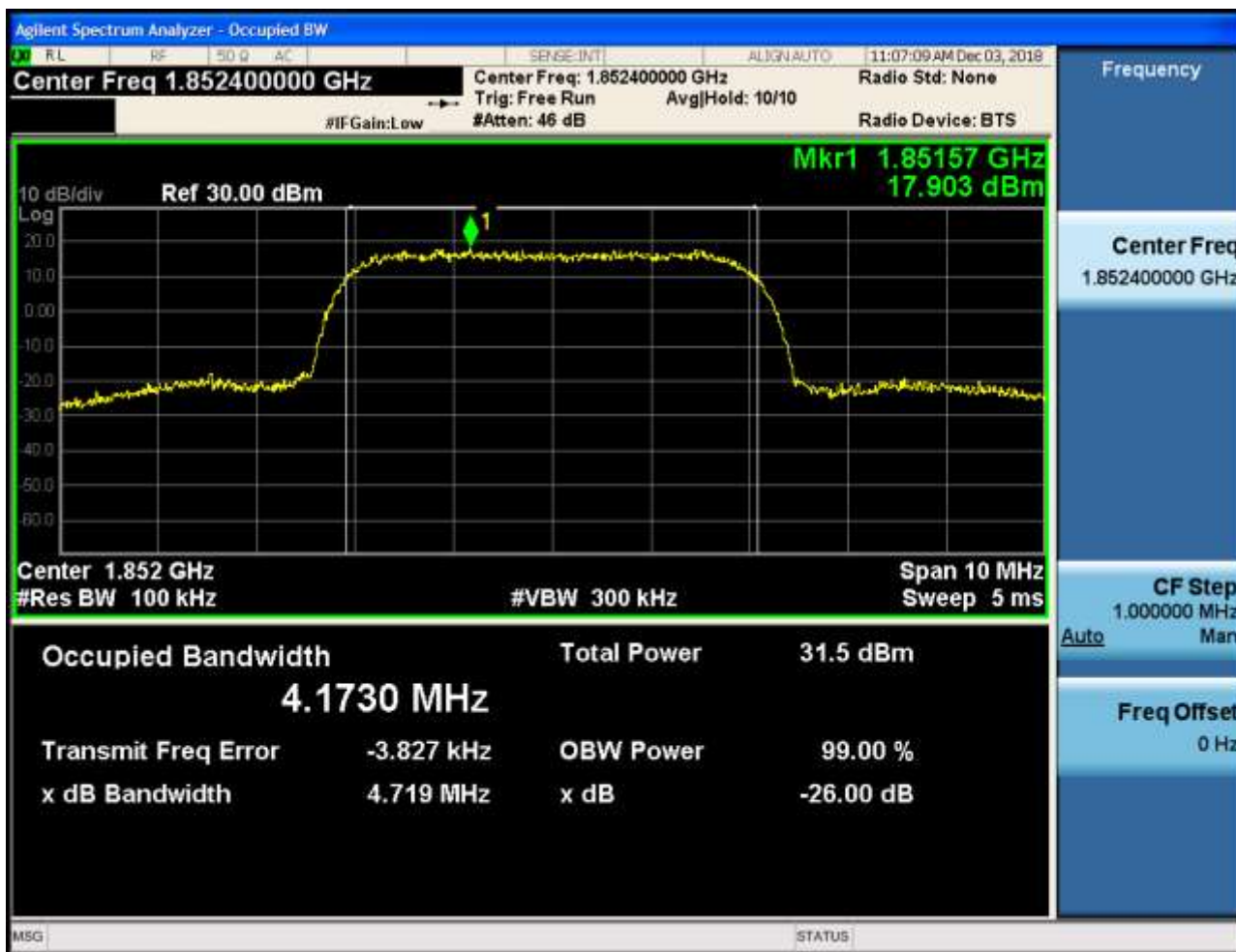
4.1.2.1.3 Test Channel = HCH



4.1.3 Test Band = WCDMA1900

4.1.3.1 Test Mode = UMTS/TM1

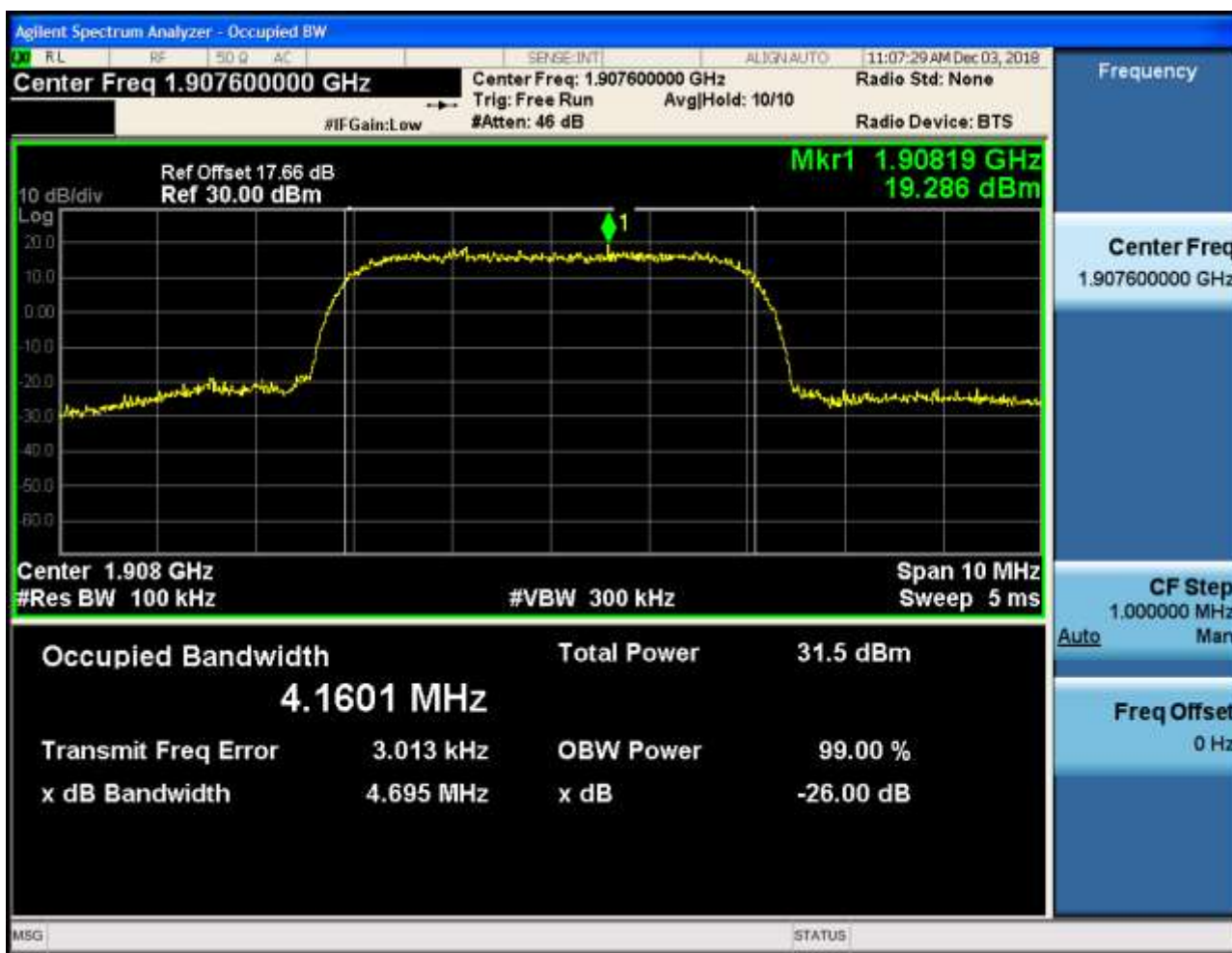
4.1.3.1.1 Test Channel = LCH



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

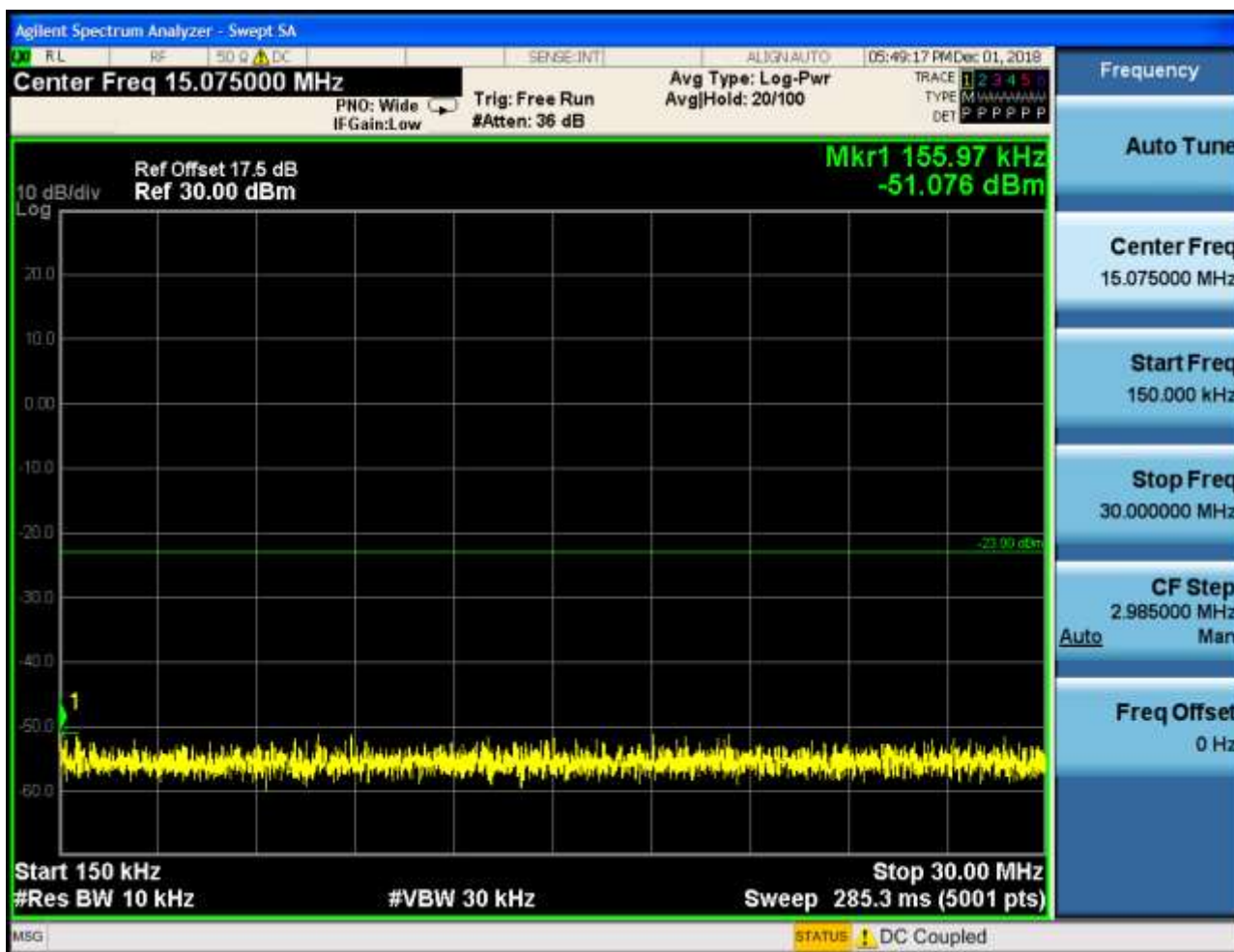
6.1 For UMTS

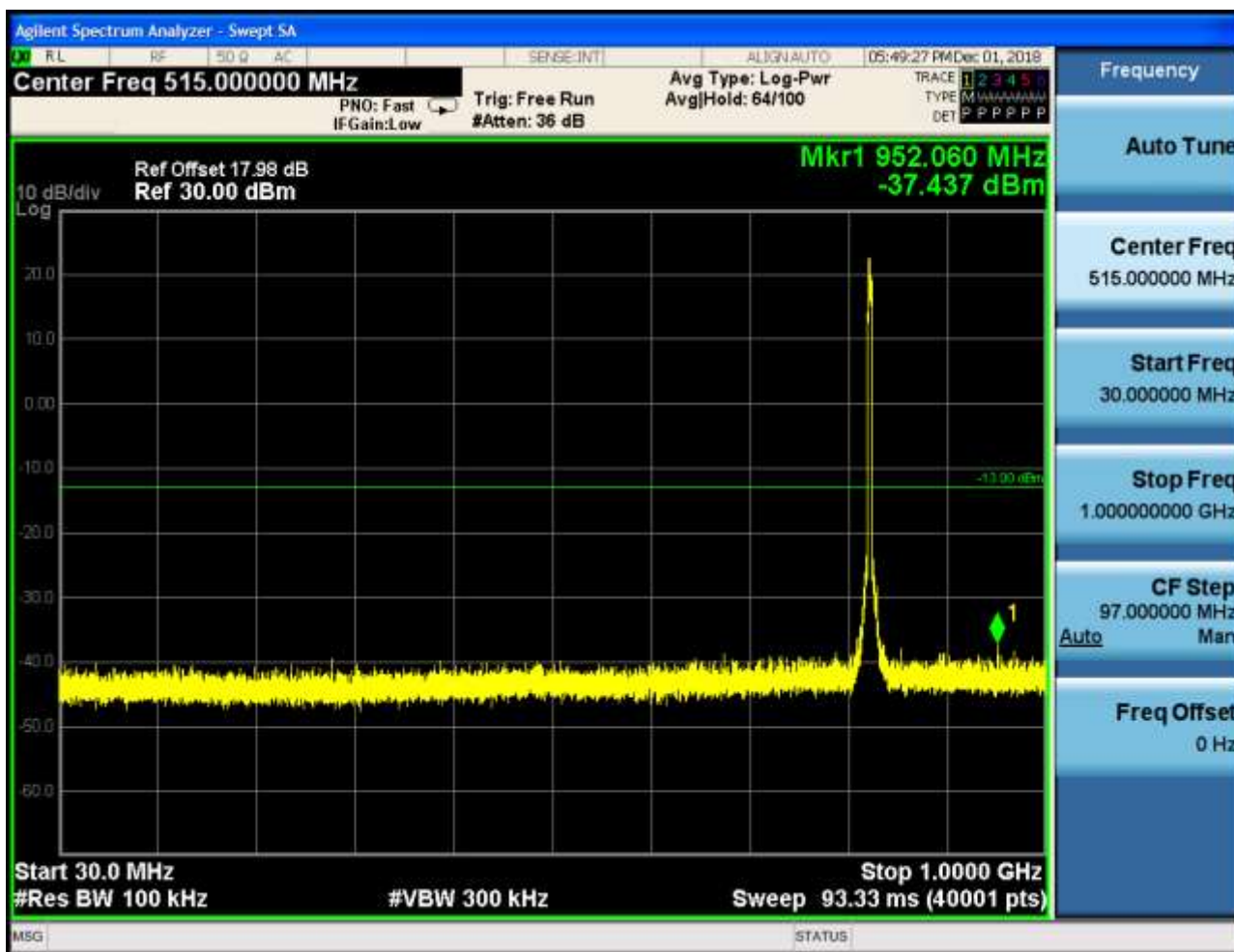
6.1.1 Test Band = WCDMA850

6.1.1.1 Test Mode = UMTS/TM1

6.1.1.1.1 Test Channel = LCH

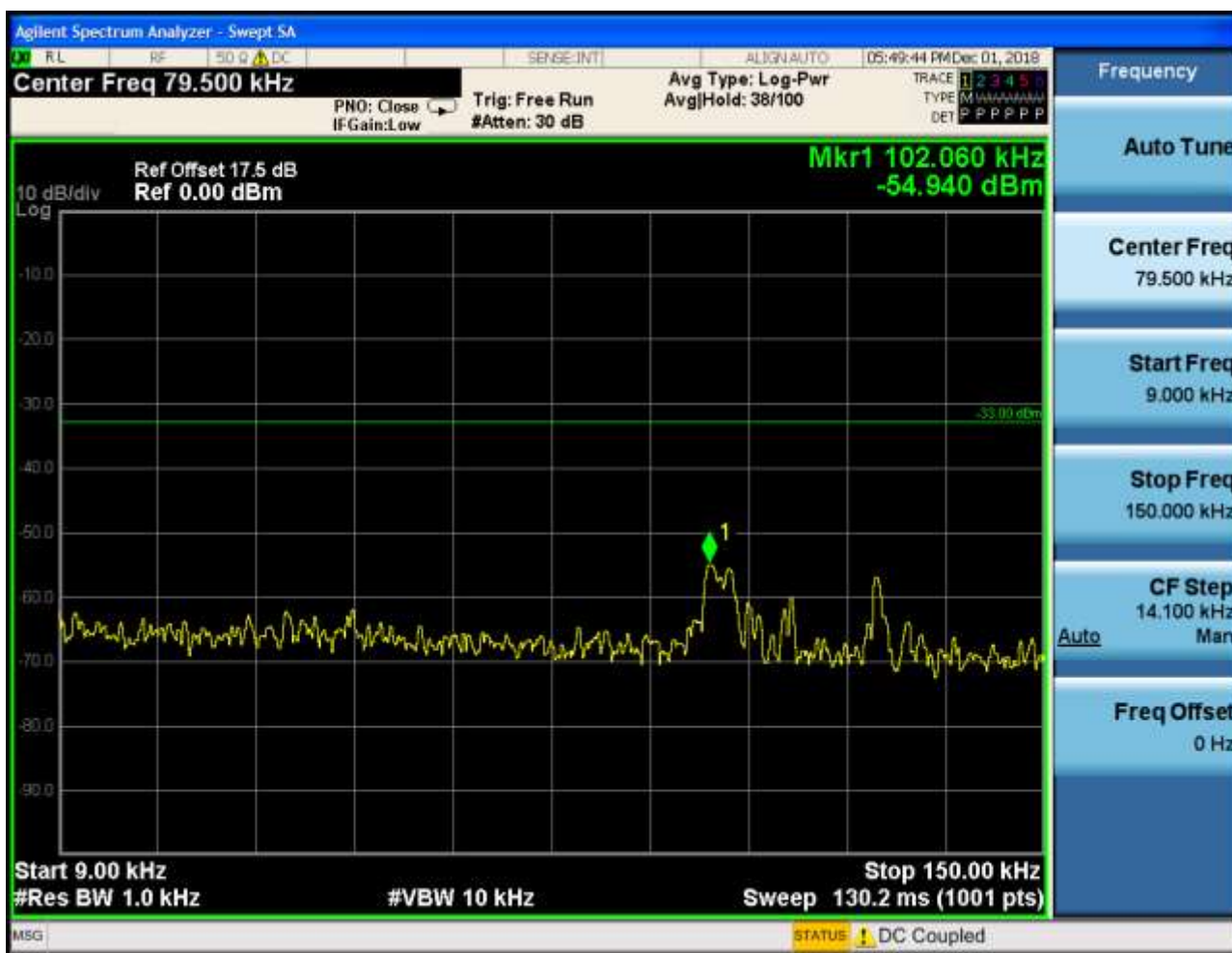


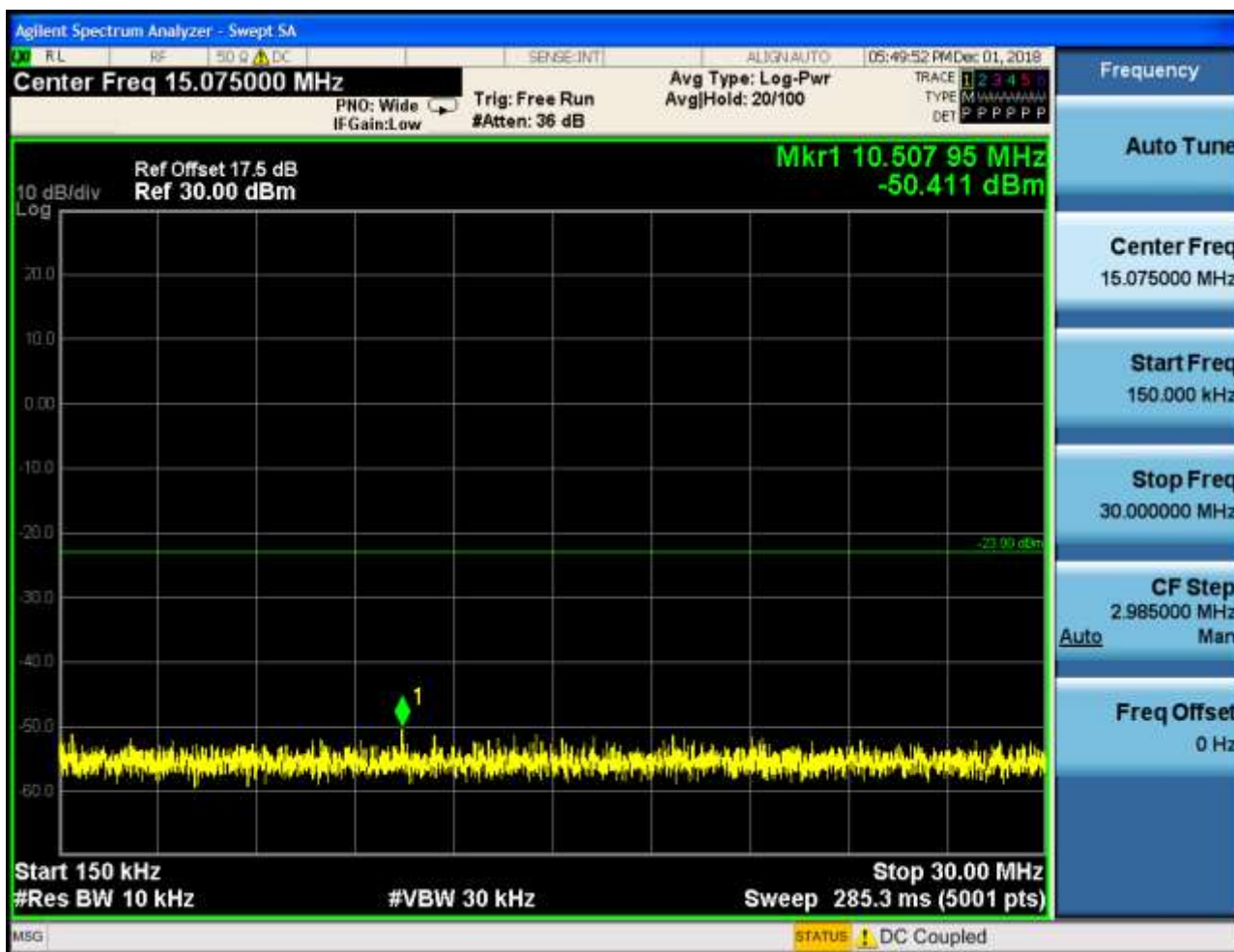


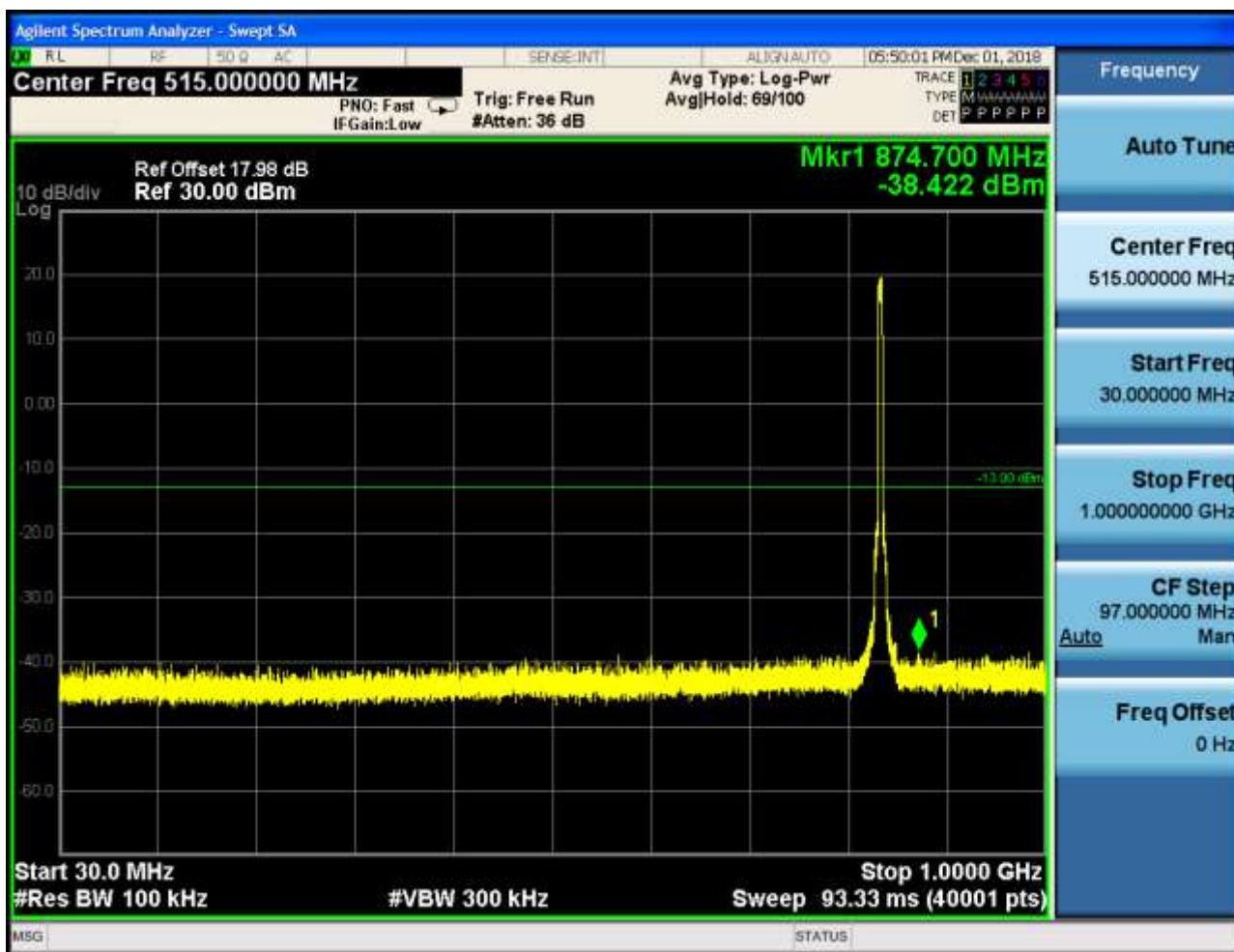




6.1.1.1.2 Test Channel = MCH

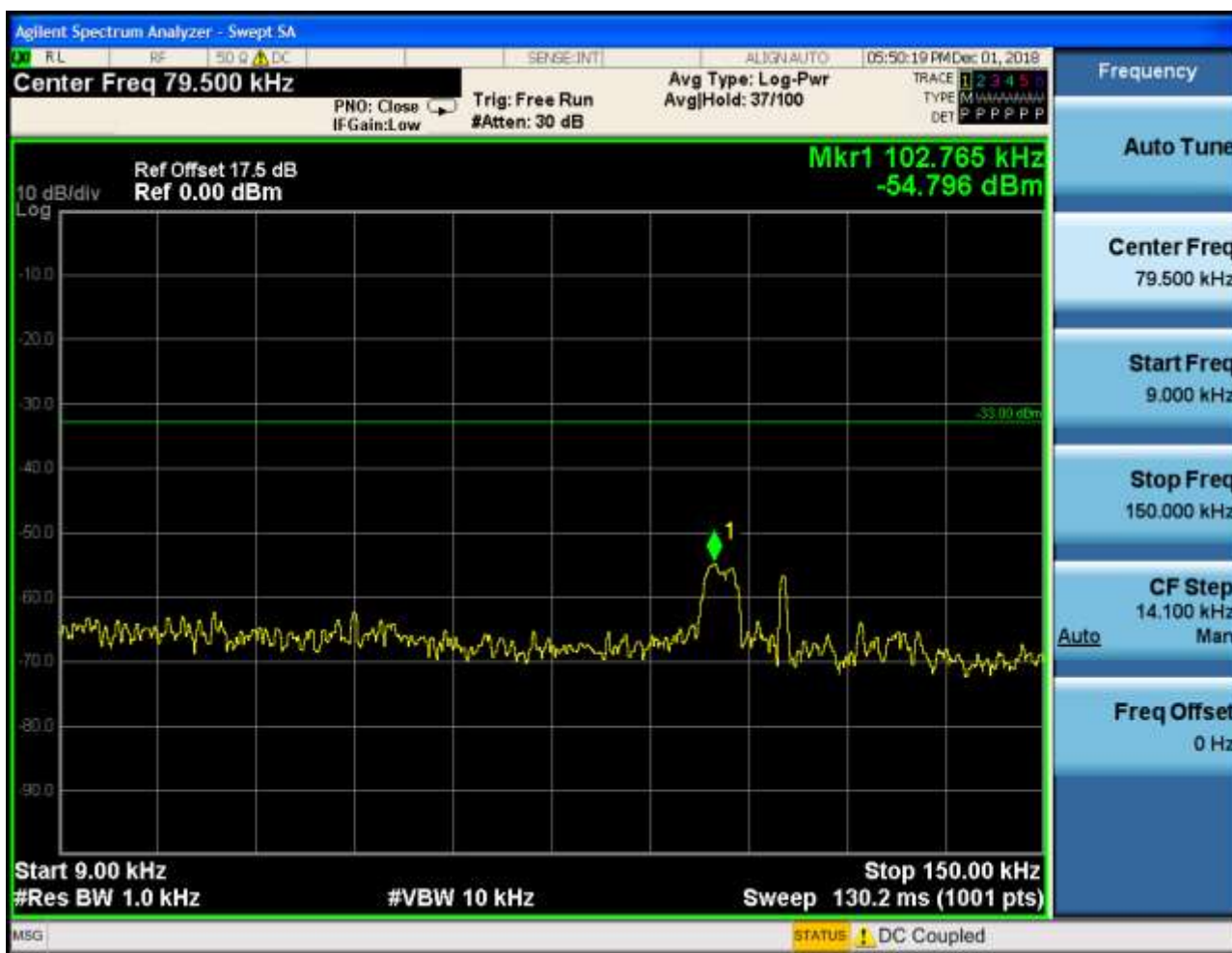


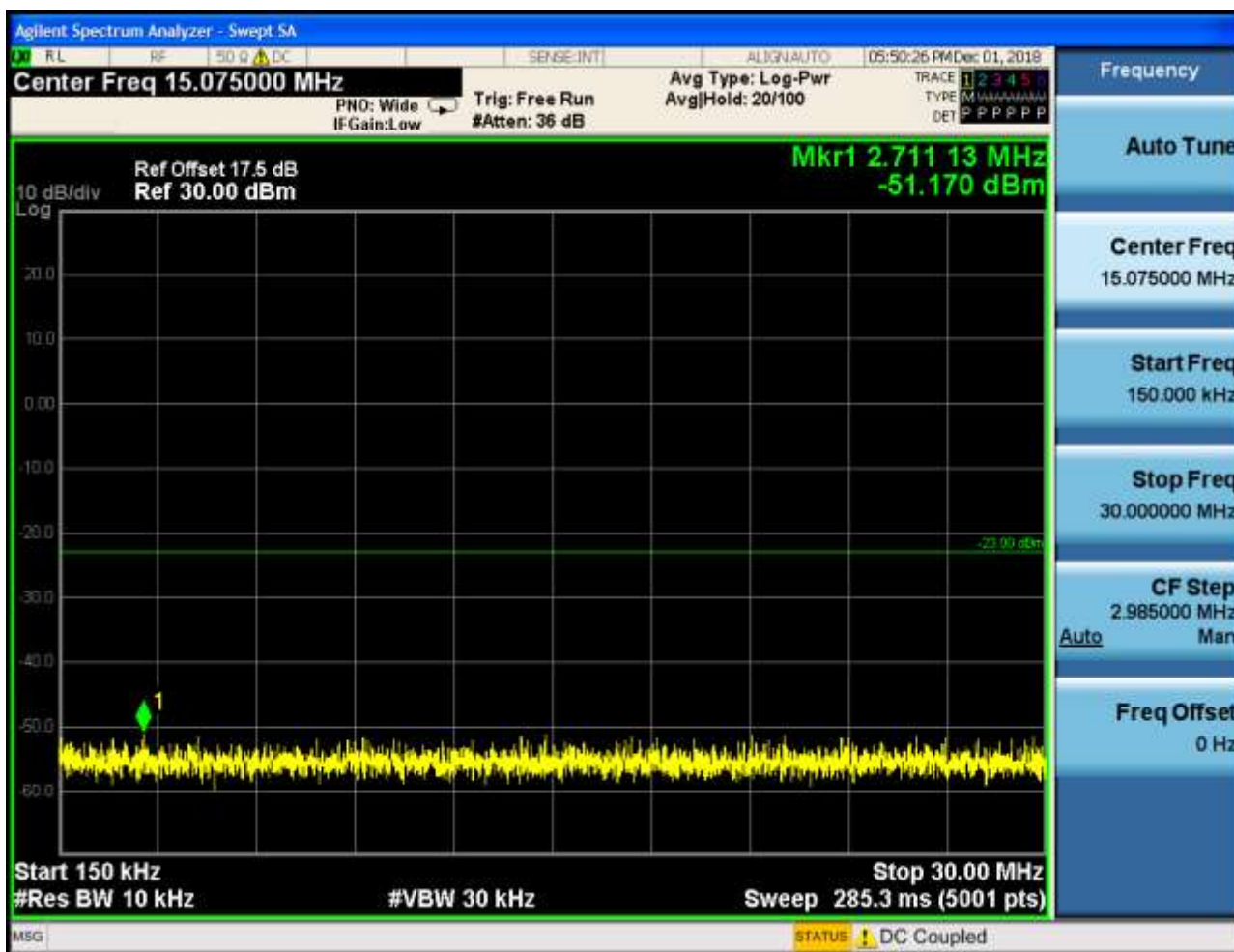


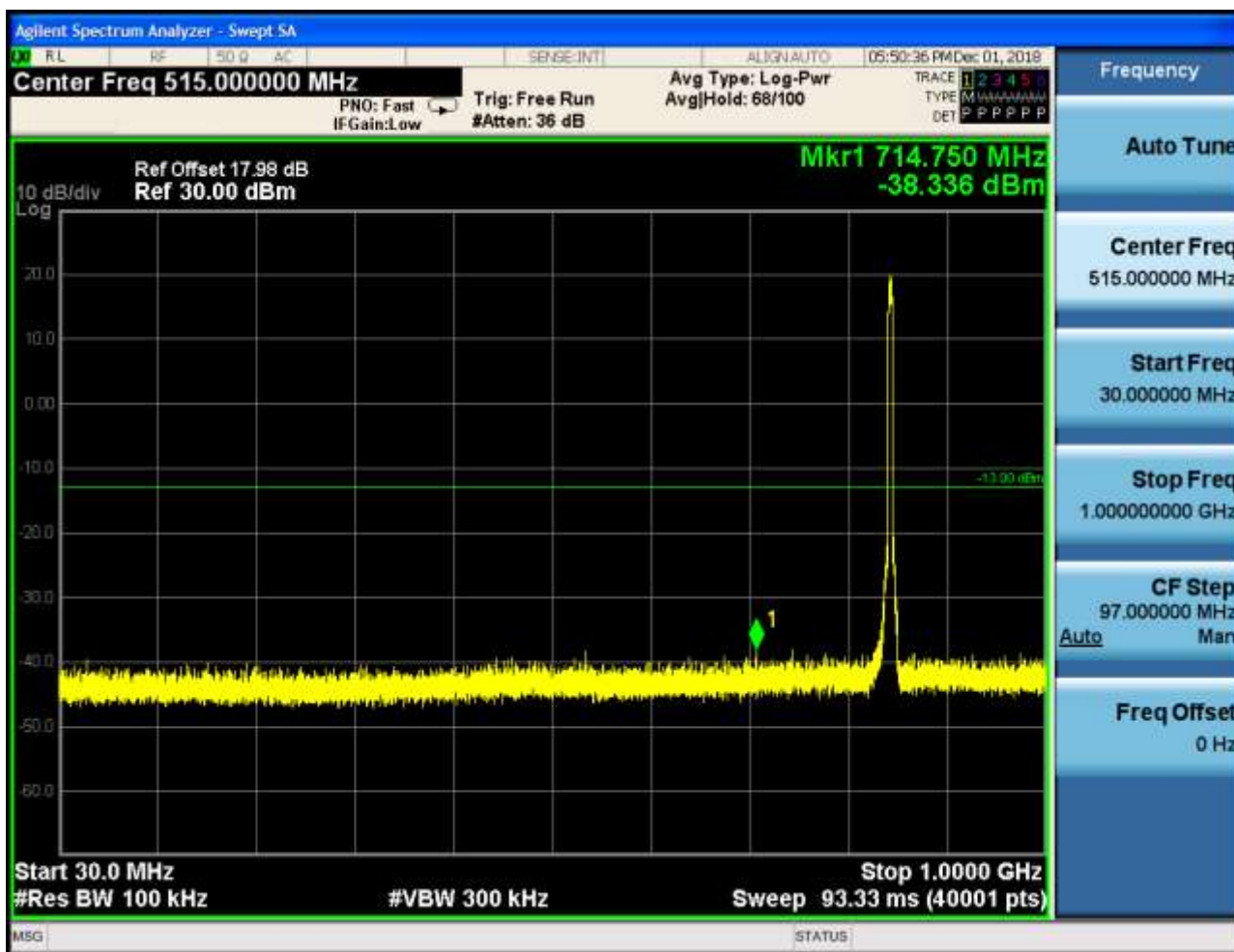




6.1.1.1.3 Test Channel = HCH







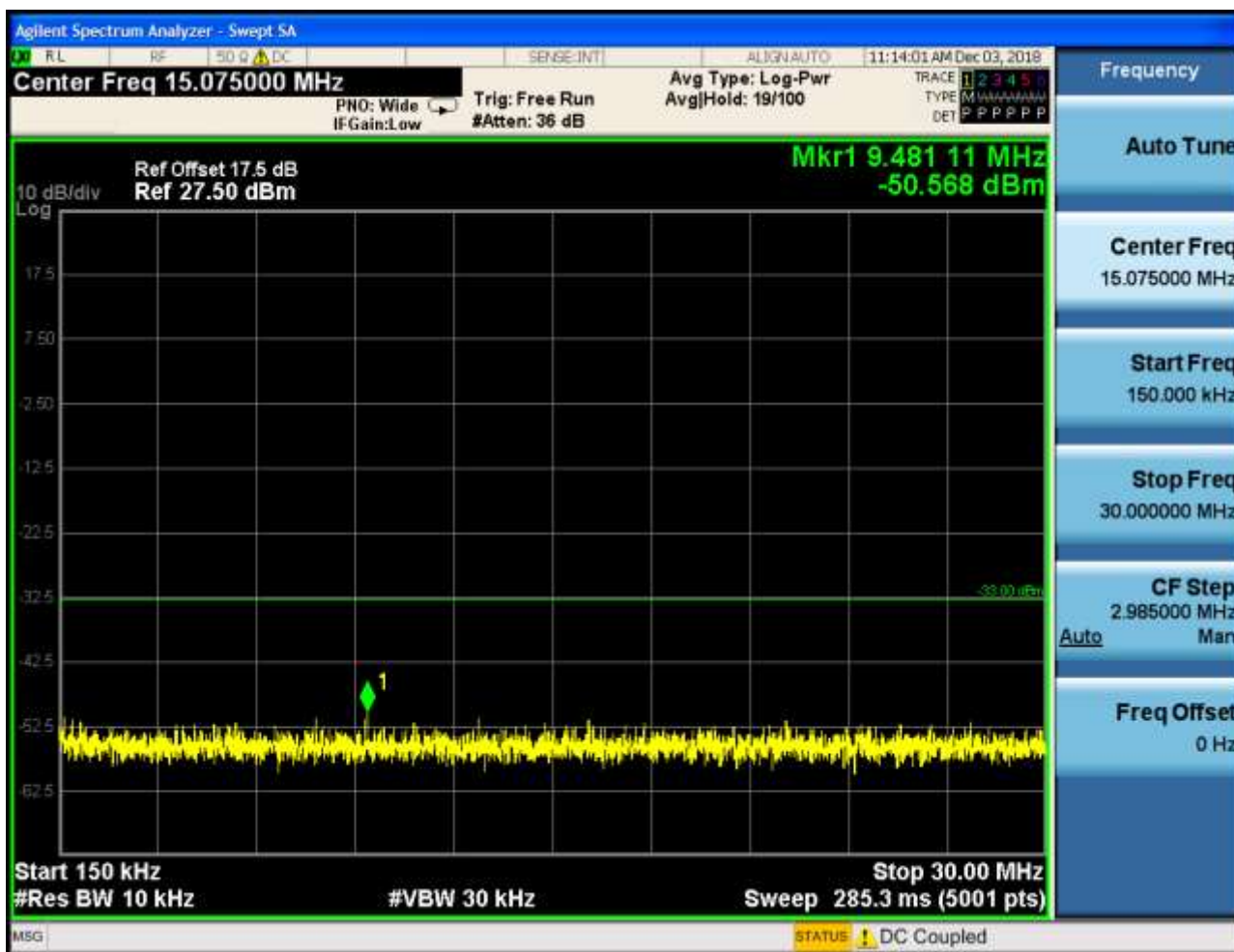


6.1.2 Test Band = WCDMA1700

6.1.2.1 Test Mode = UMTS/TM1

6.1.2.1.1 Test Channel = LCH

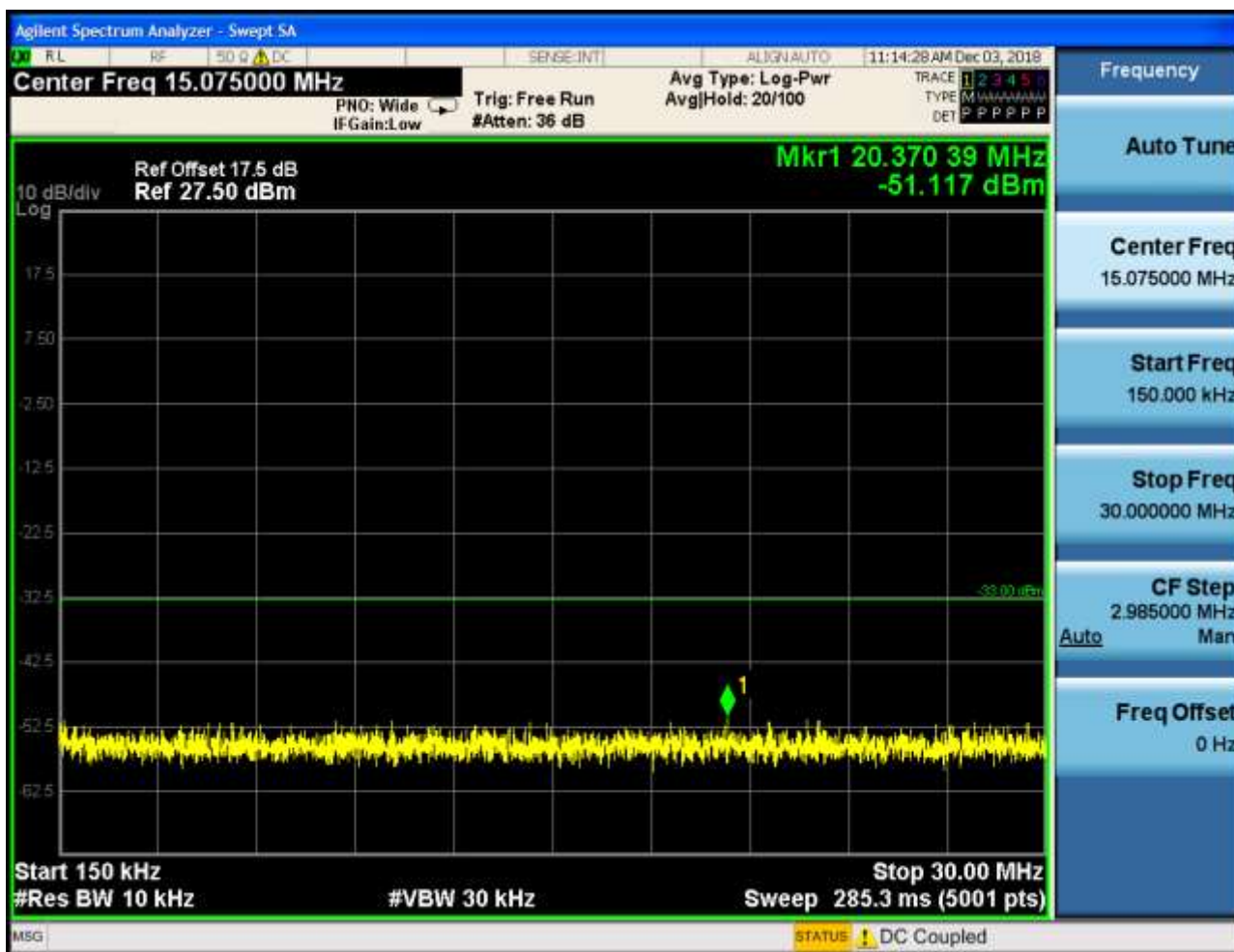






6.1.2.1.2 Test Channel = MCH

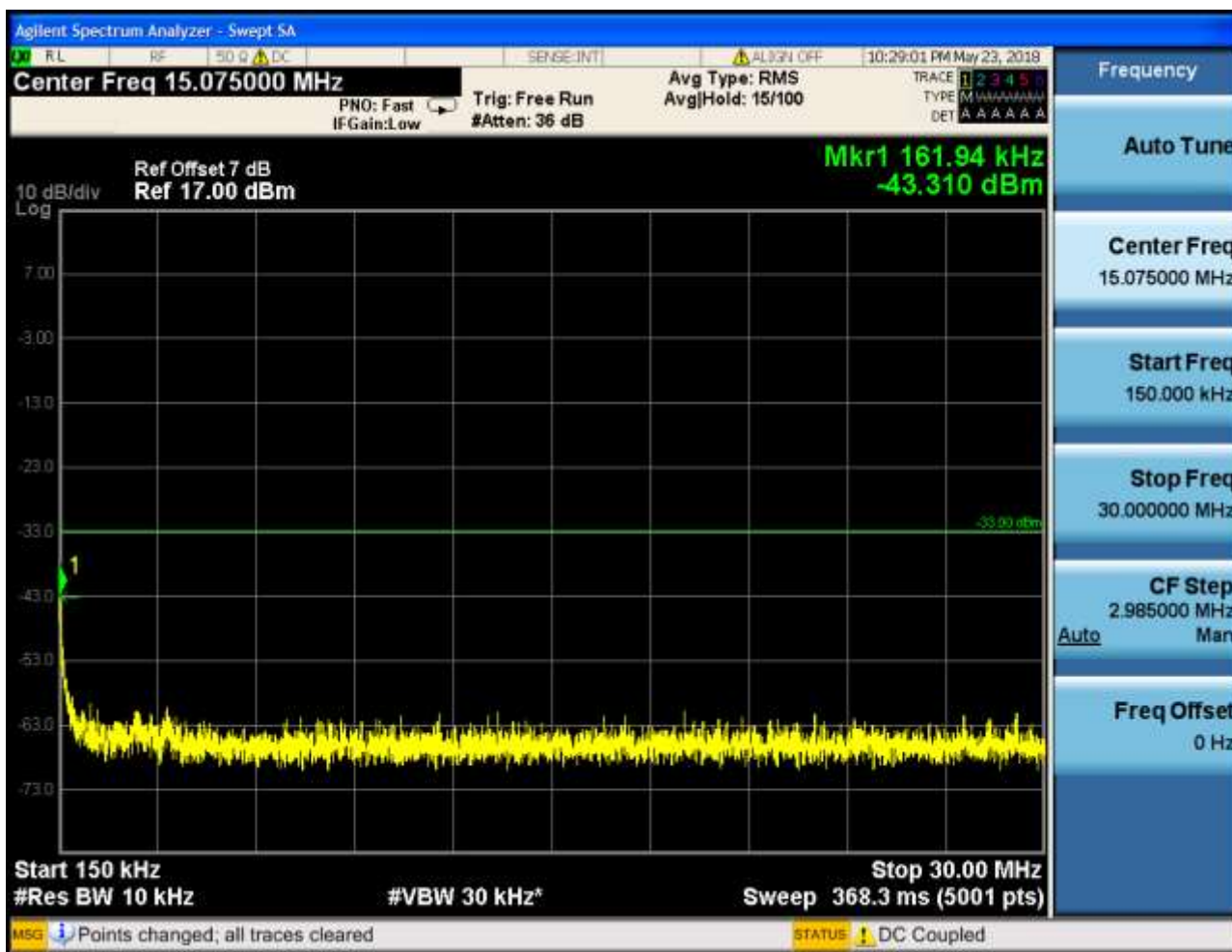






6.1.2.1.3 Test Channel = HCH



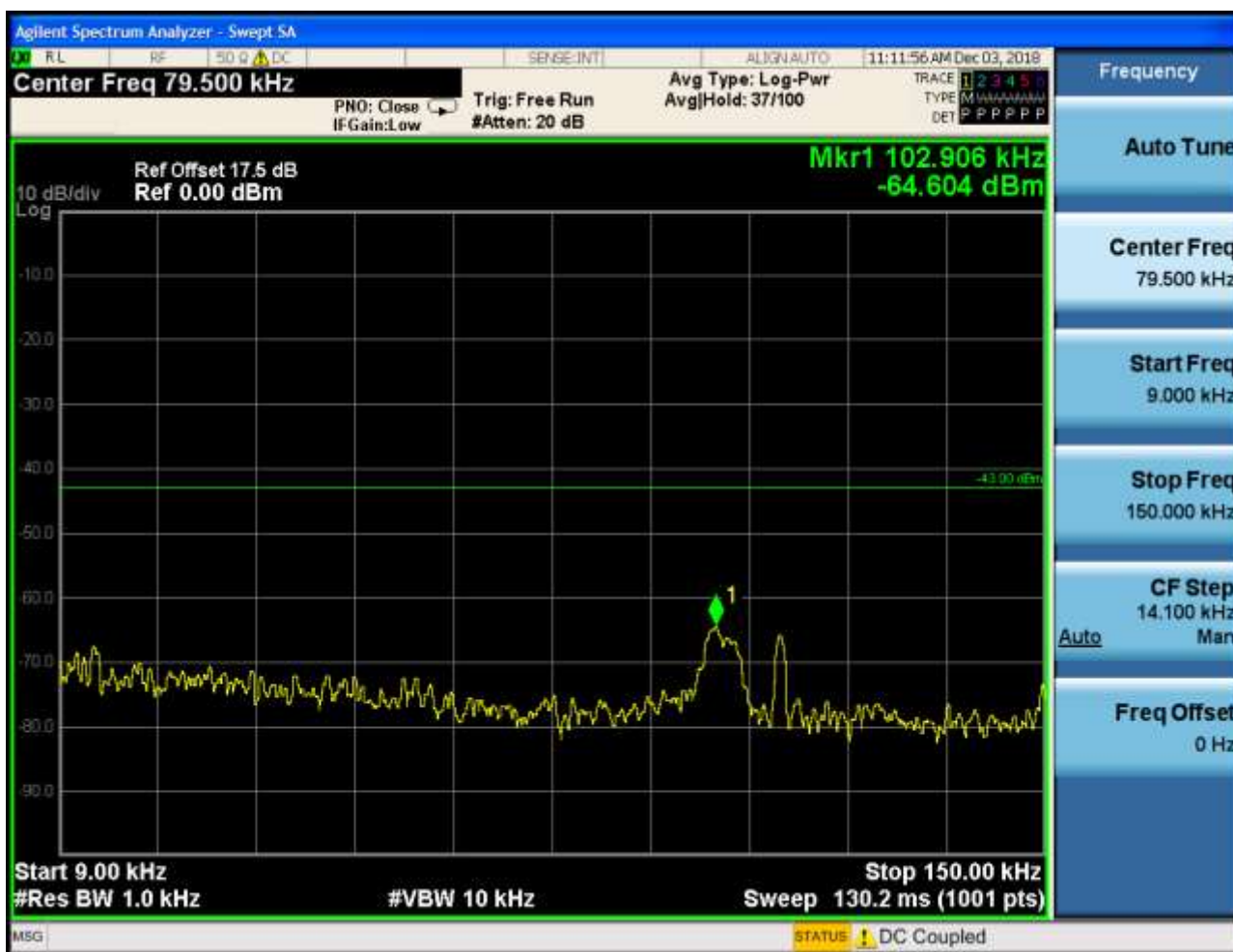


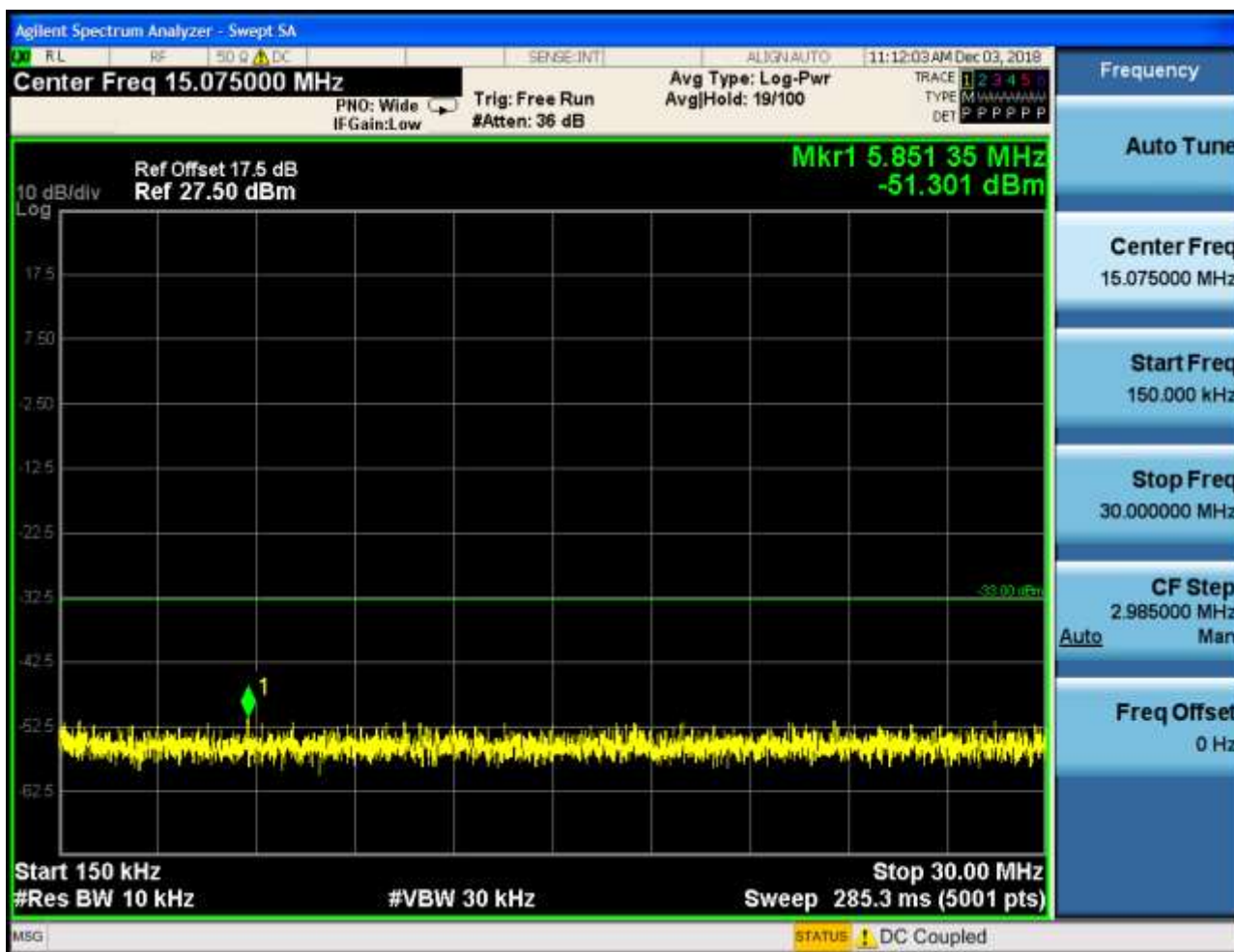


6.1.3 Test Band = WCDMA1900

6.1.3.1 Test Mode = UMTS/TM1

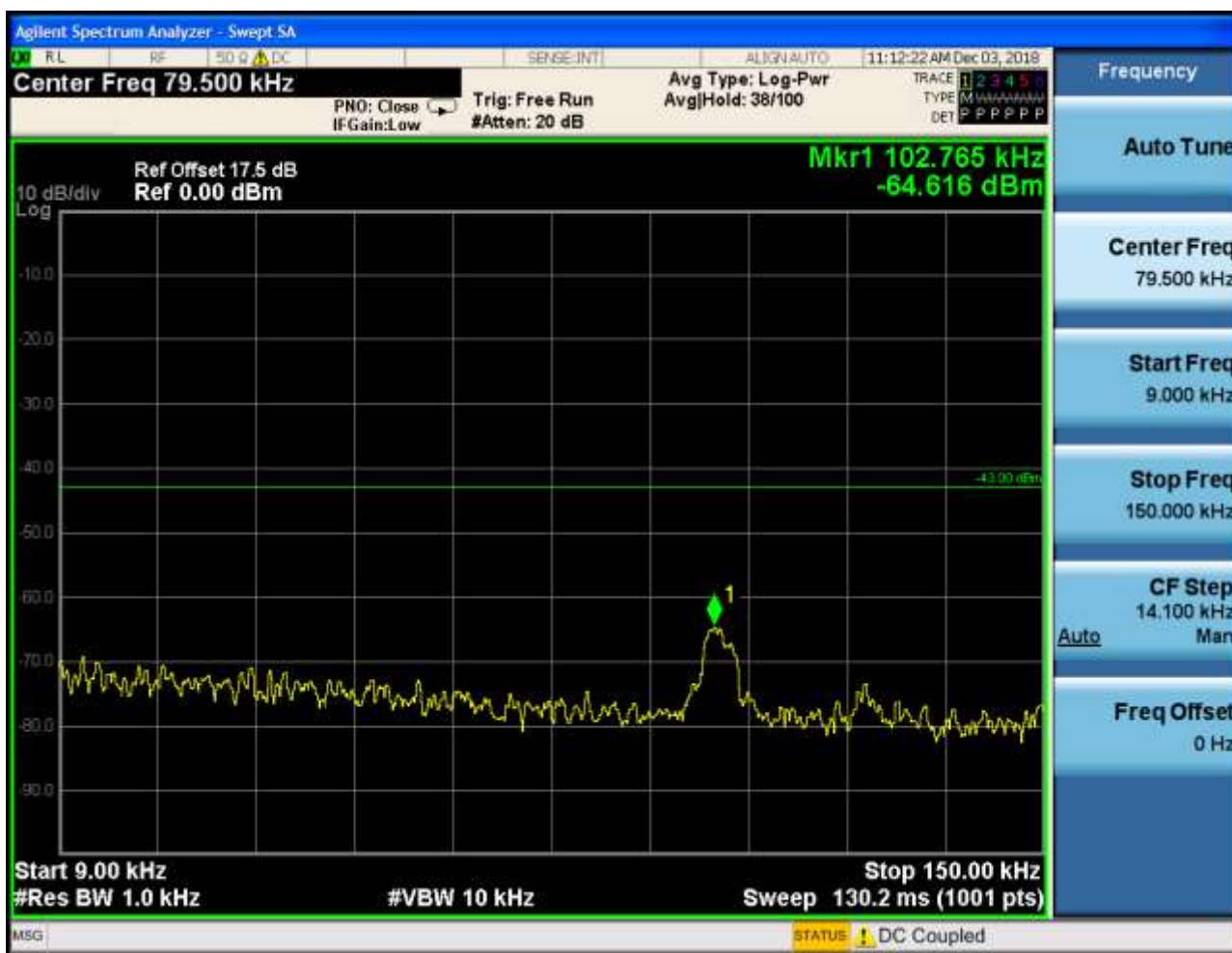
6.1.3.1.1 Test Channel = LCH

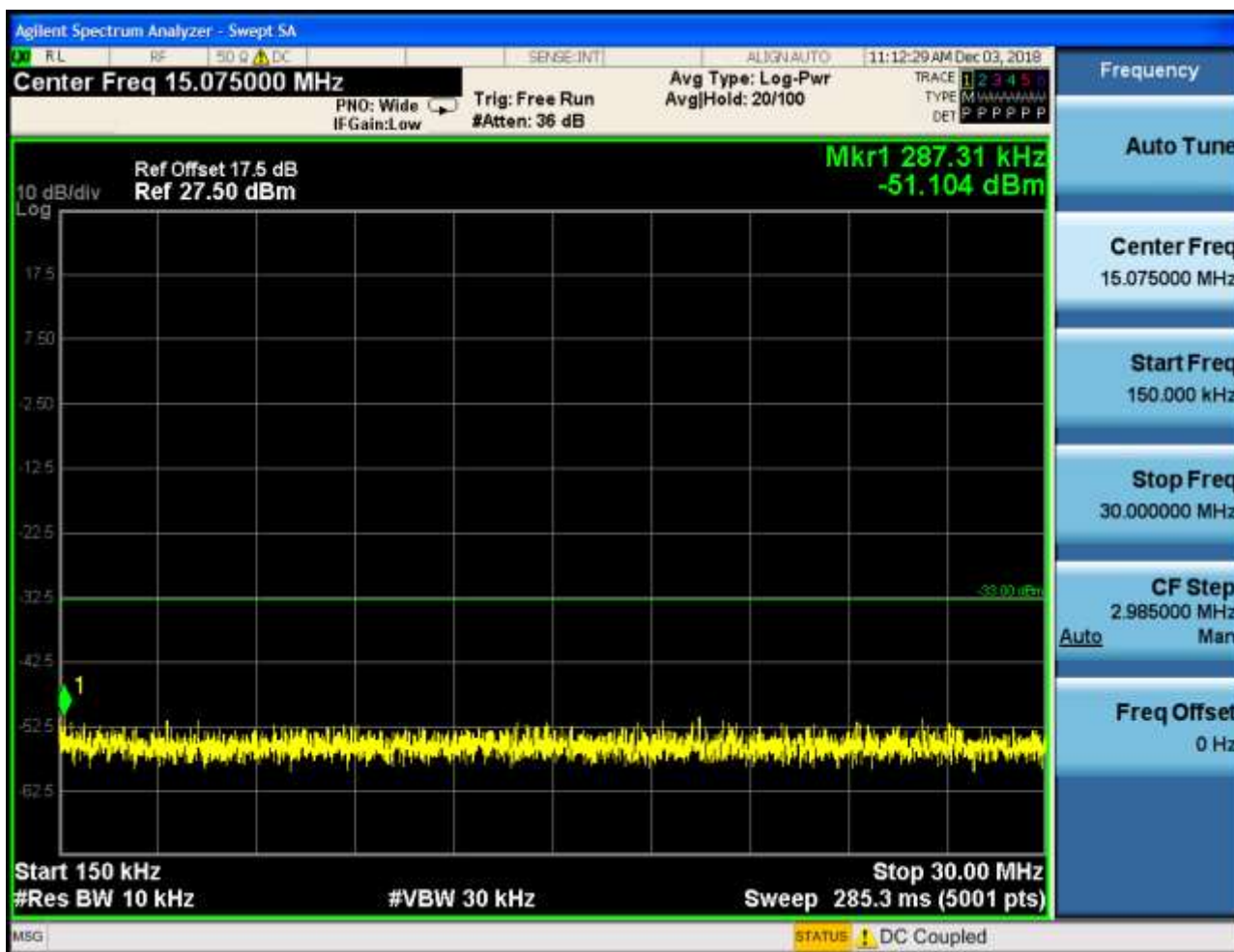






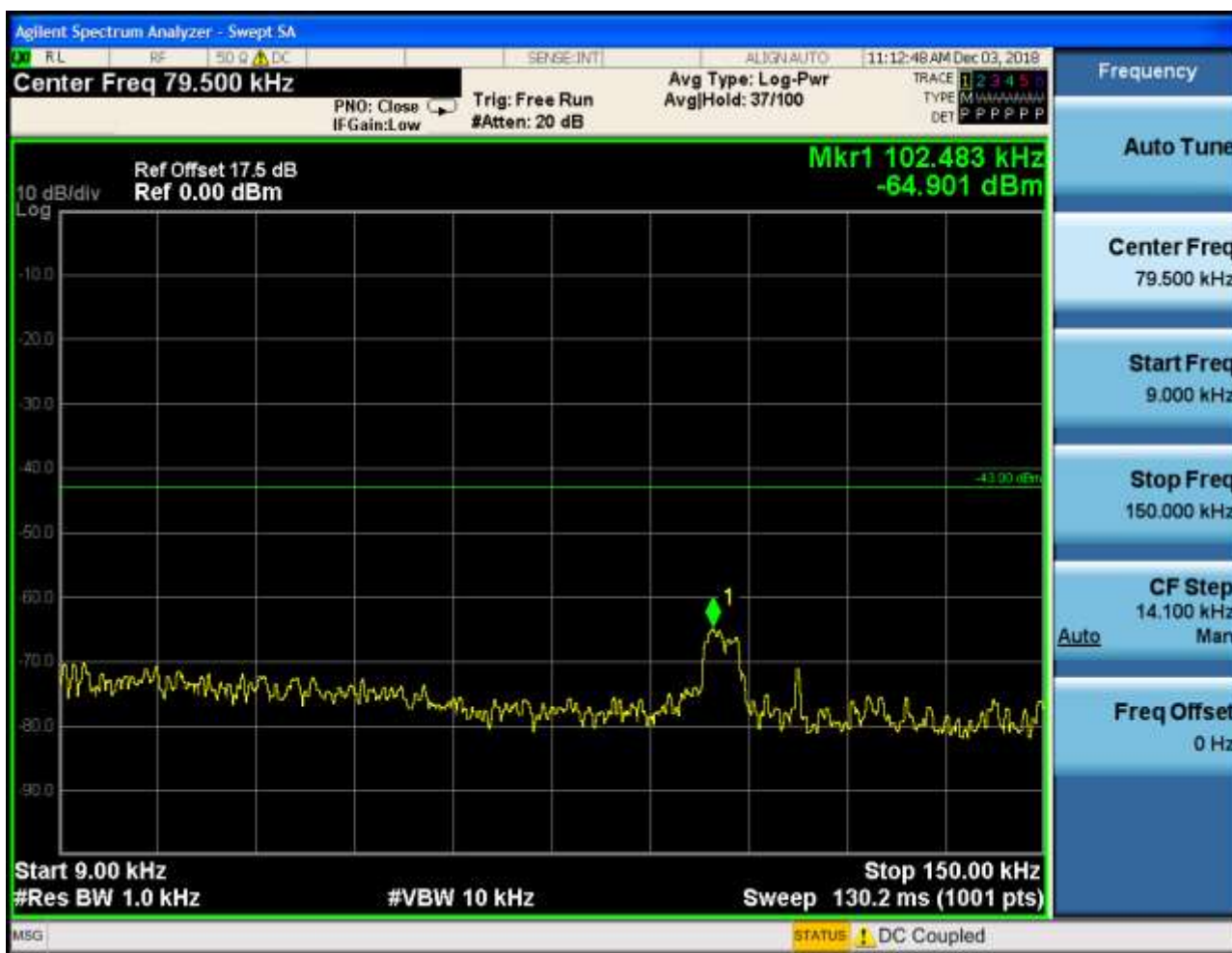
6.1.3.1.2 Test Channel = MCH

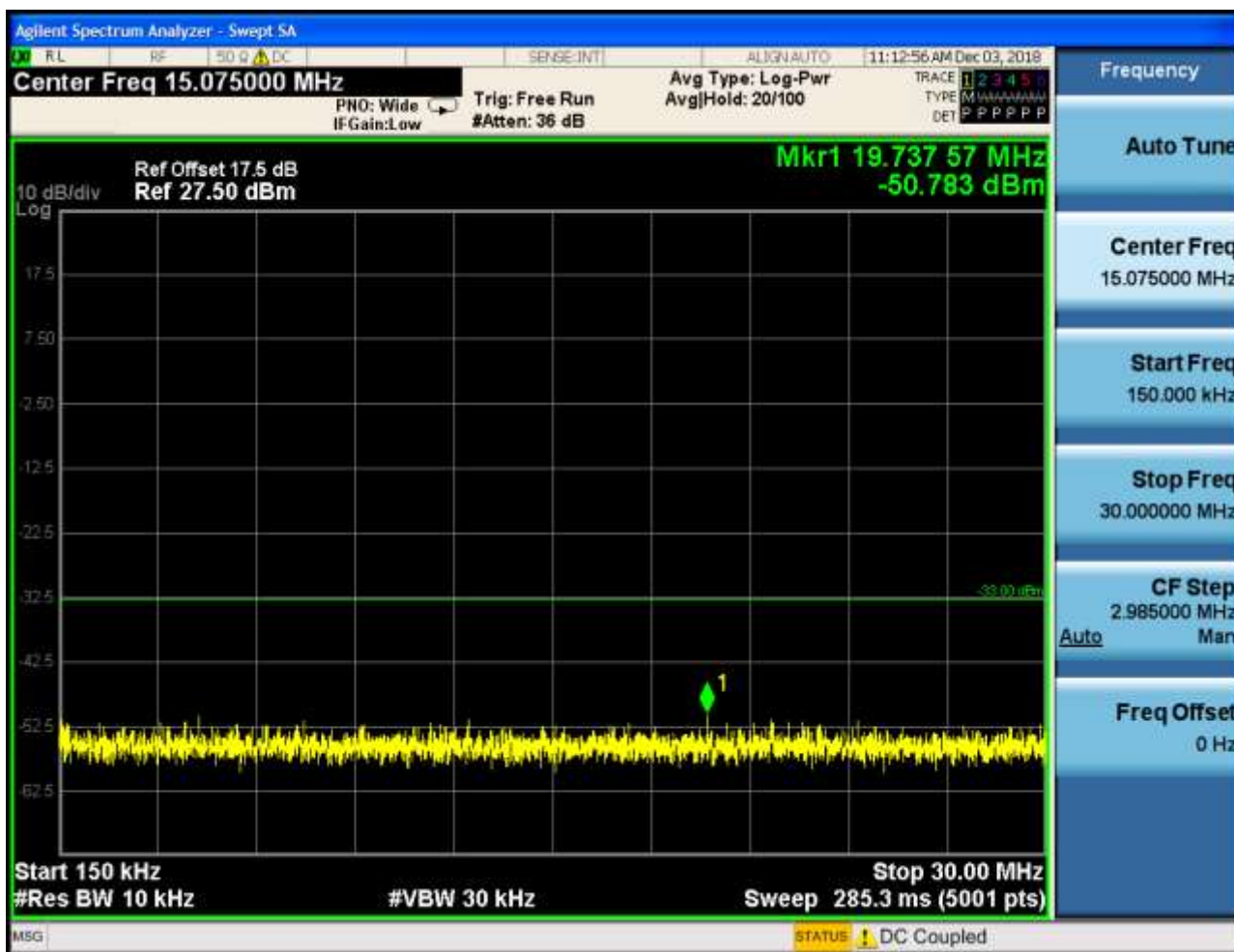






6.1.3.1.3 Test Channel = HCH







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

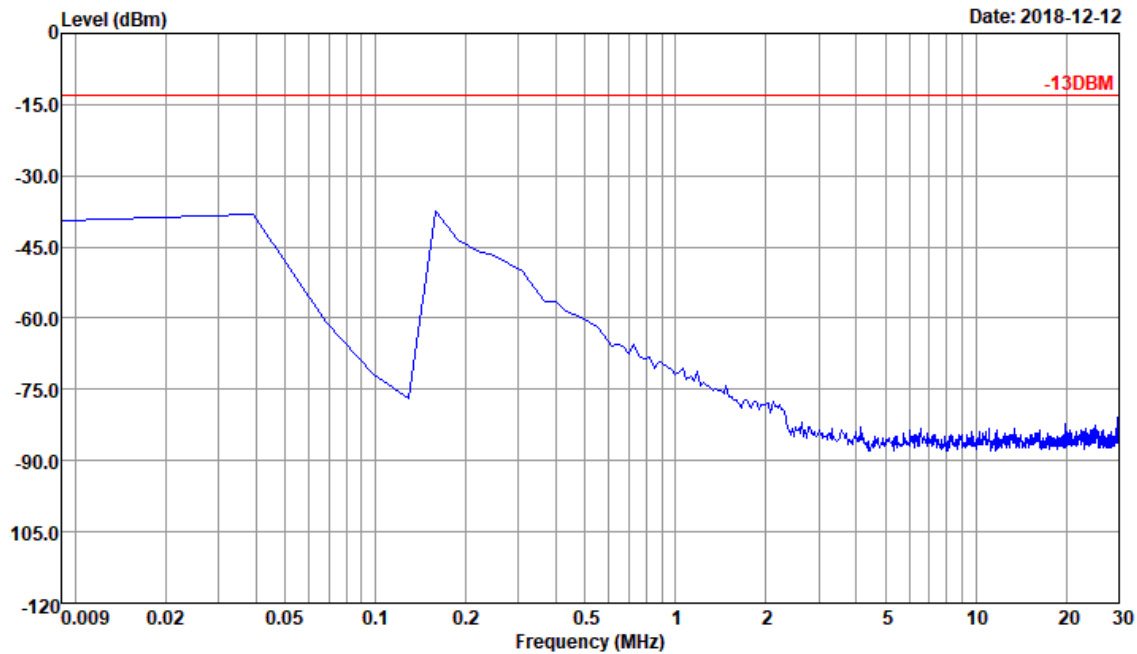
7.1.1 Test Band = WCDMA850_ANT1

7.1.1.1 Test Mode = UMTS/TM1



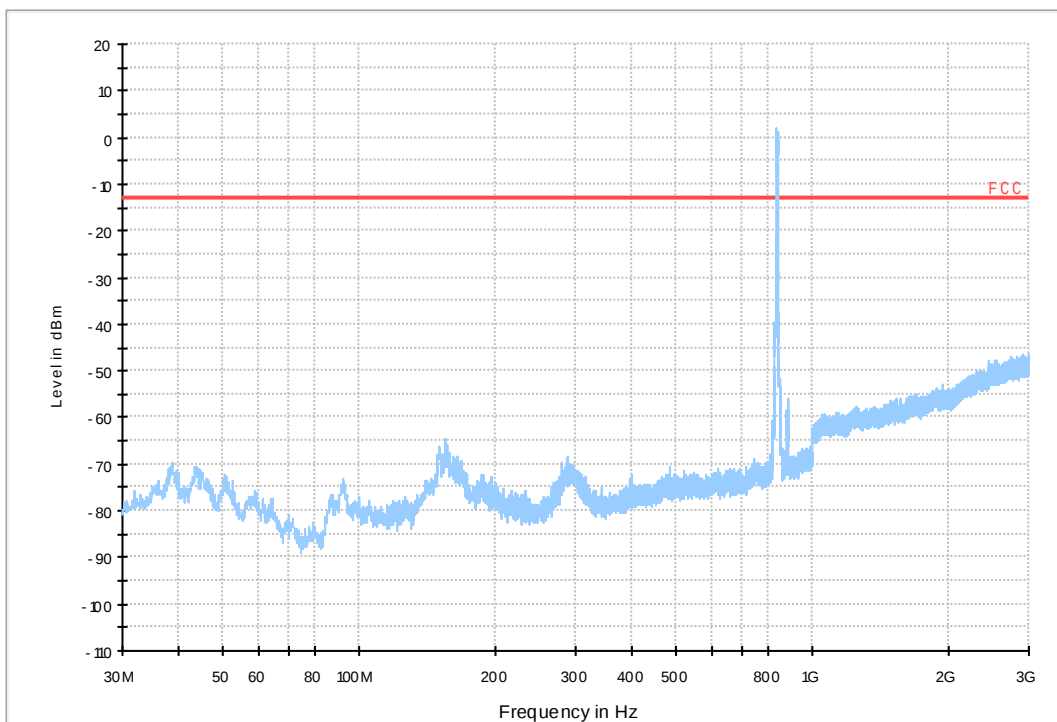
Data: 72

Date: 2018-12-12

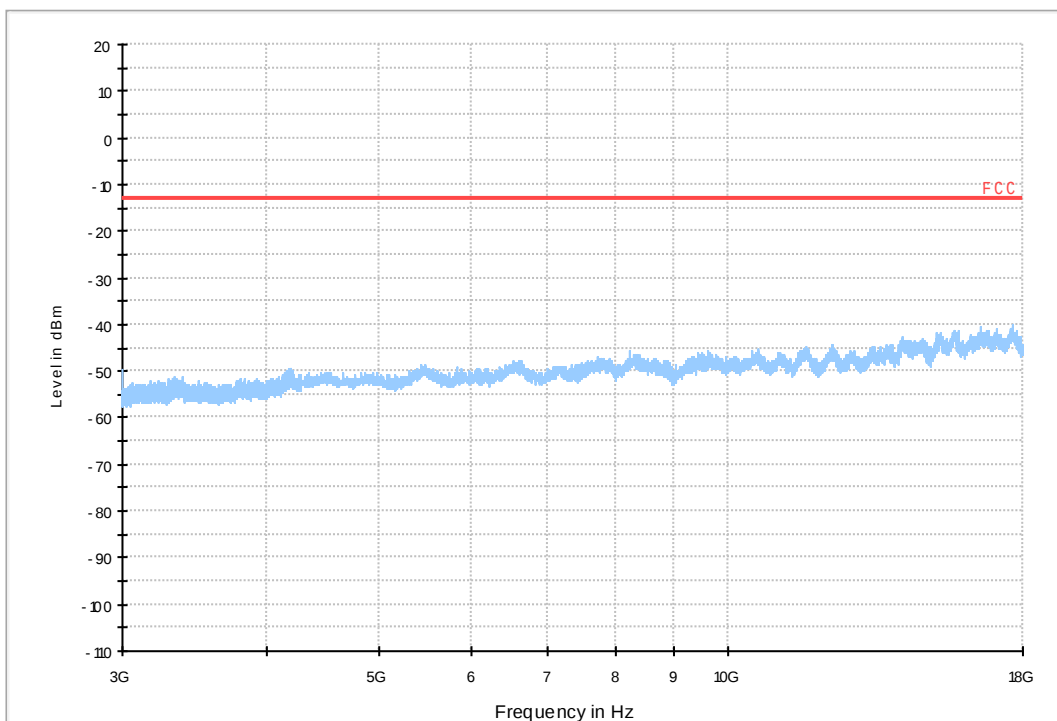


Site : 03CH01-SZ
 Condition : -13DBM
 : RBW:9.000KHz VBW:30.000KHz

06 FCC PART 22 WCDMA850_L



05 FCC PART 22 WCDMA850_H

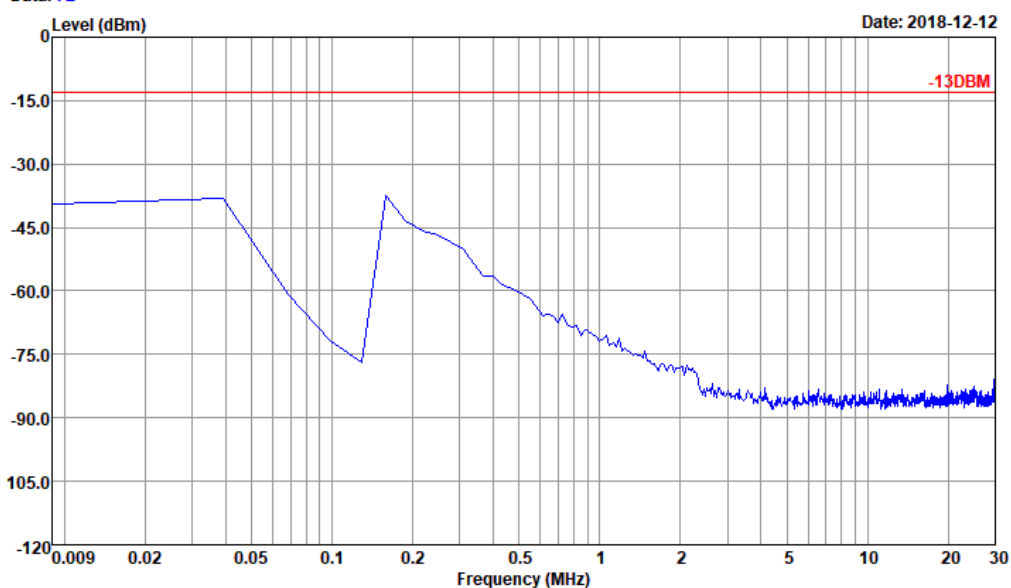


7.1.2 Test Band = WCDMA850_ANT2

7.1.2.1 Test Mode = UMTS/TM1

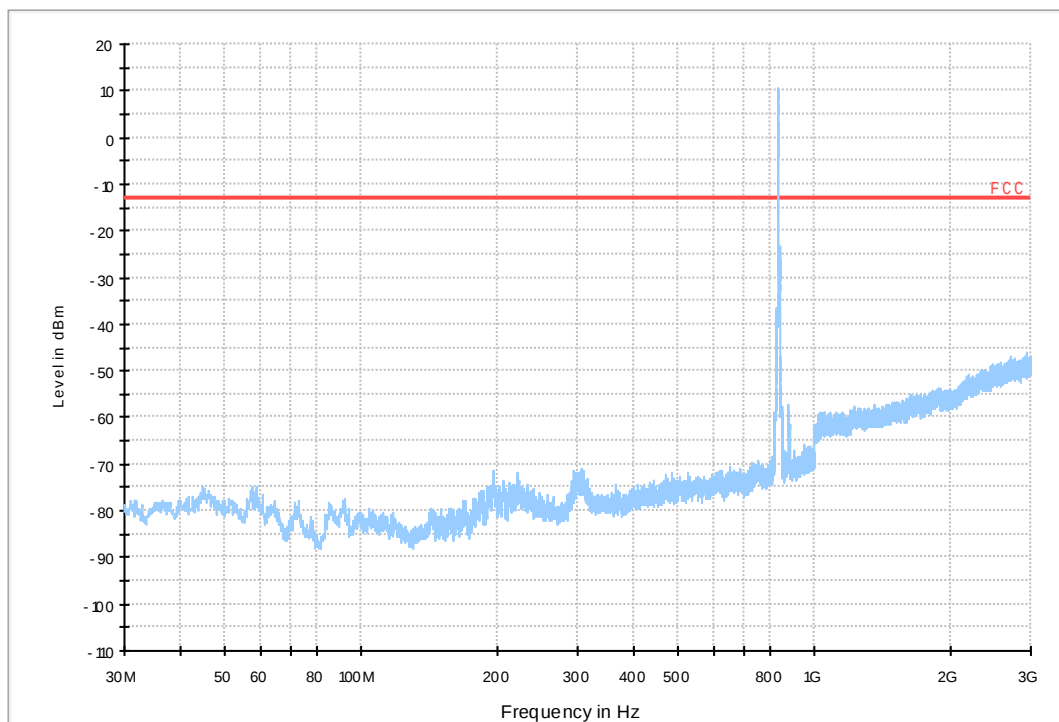


Data: 72

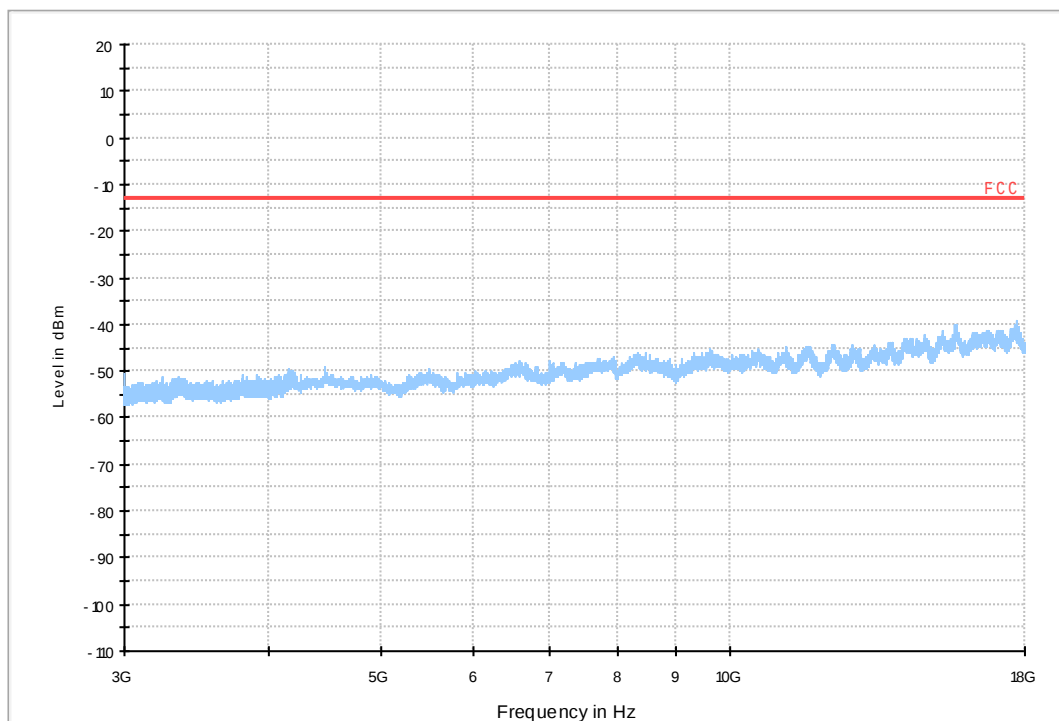


Site : 03CH01-SZ
Condition : -13DBM
: RBW:9.000KHz VBW:30.000KHz

06 FCC PART 22 WCDMA850_L



05 FCC PART 22 WCDMA850_H



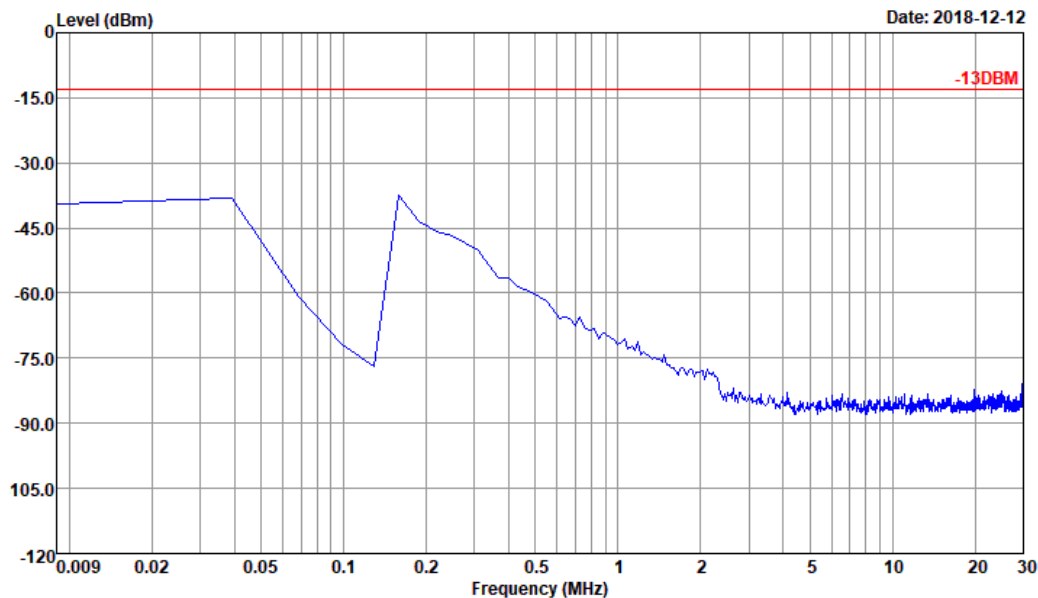
7.1.3 Test Band = WCDMA1700_ANT1

7.1.3.1 Test Mode = UMTS/TM1



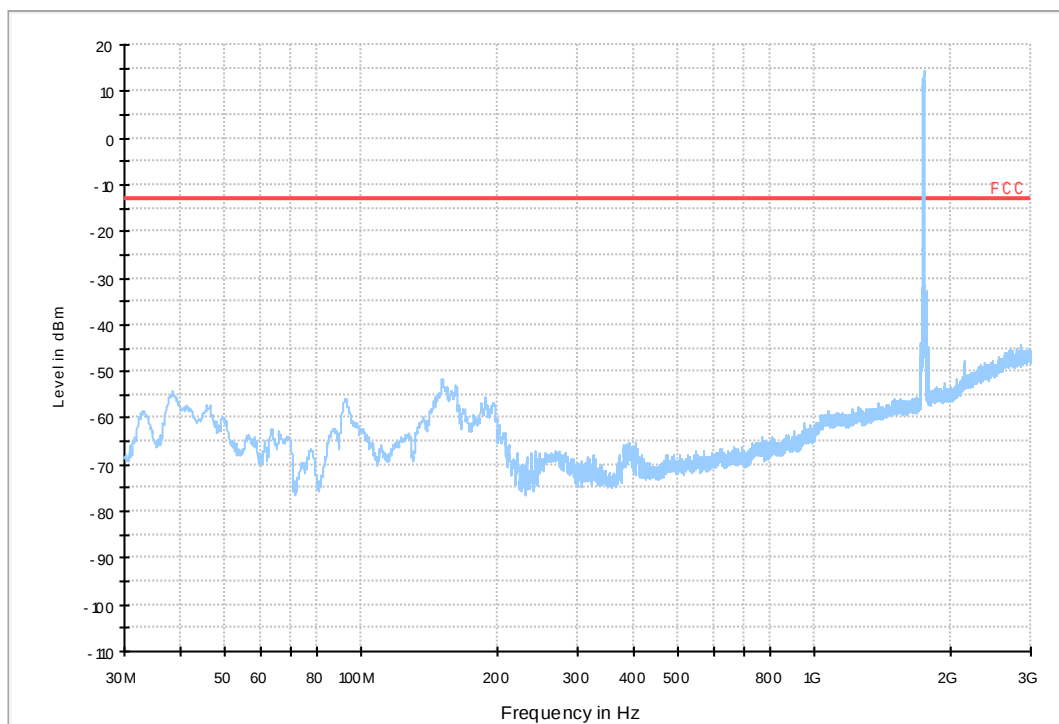
Data: 72

Date: 2018-12-12

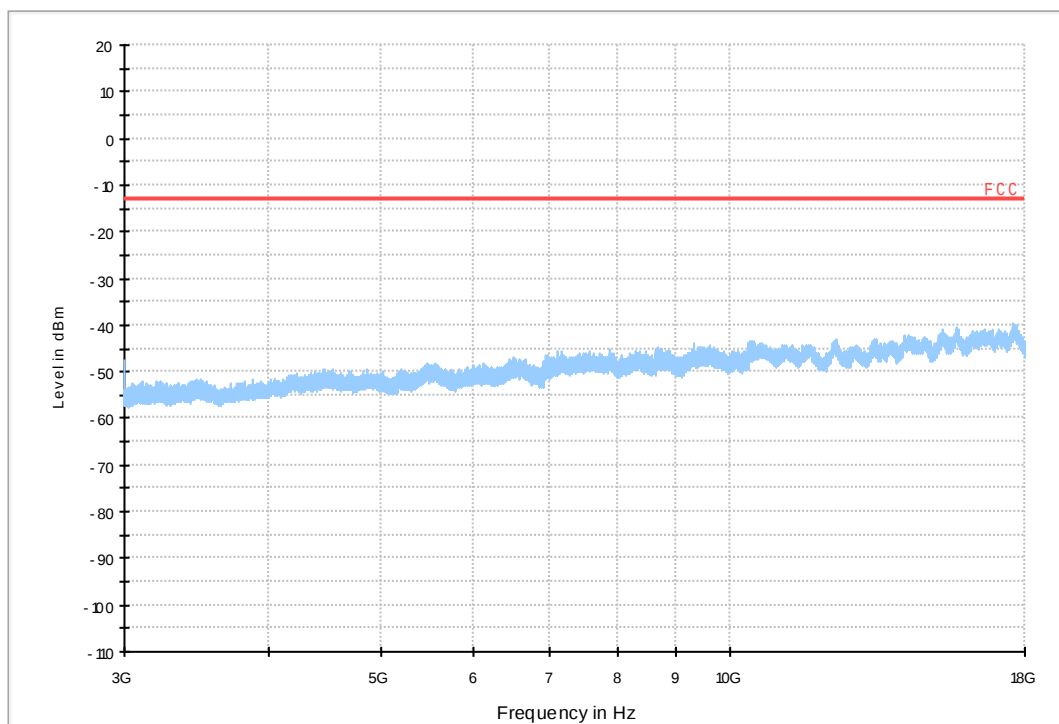


Site : 03CH01-SZ
 Condition : -13DBM
 : RBW:9.000KHz VBW:30.000KHz

18 FCC PART 27 WCDMA1700_L



17 FCC PART 27 WCDMA1700_H

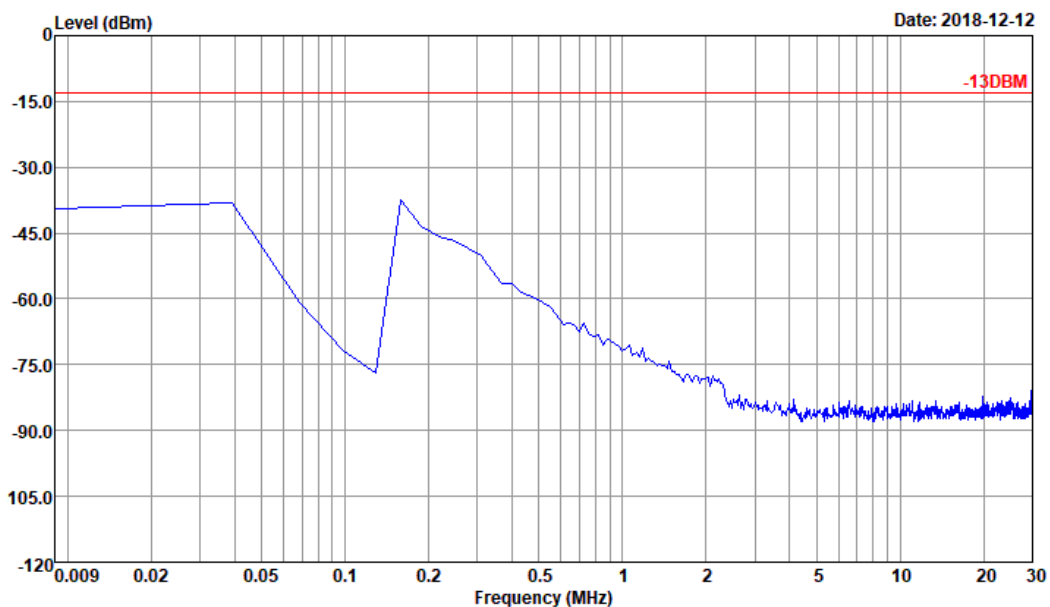


7.1.4 Test Band = WCDMA1700_ANT2

7.1.4.1 Test Mode = UMTS/TM1

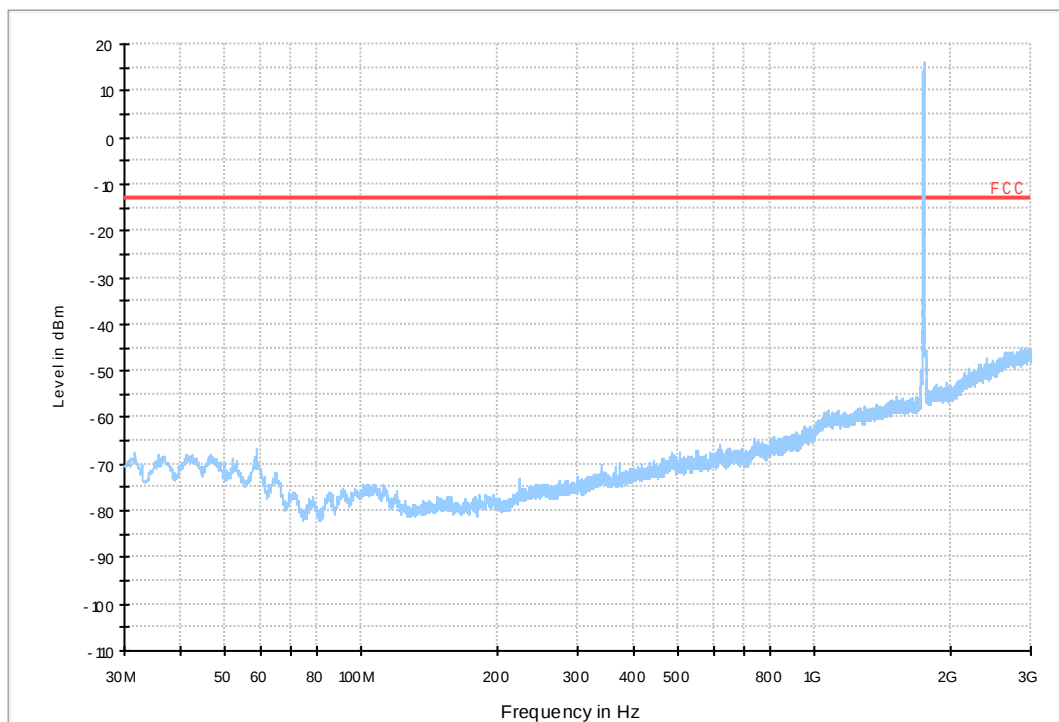


Data: 72

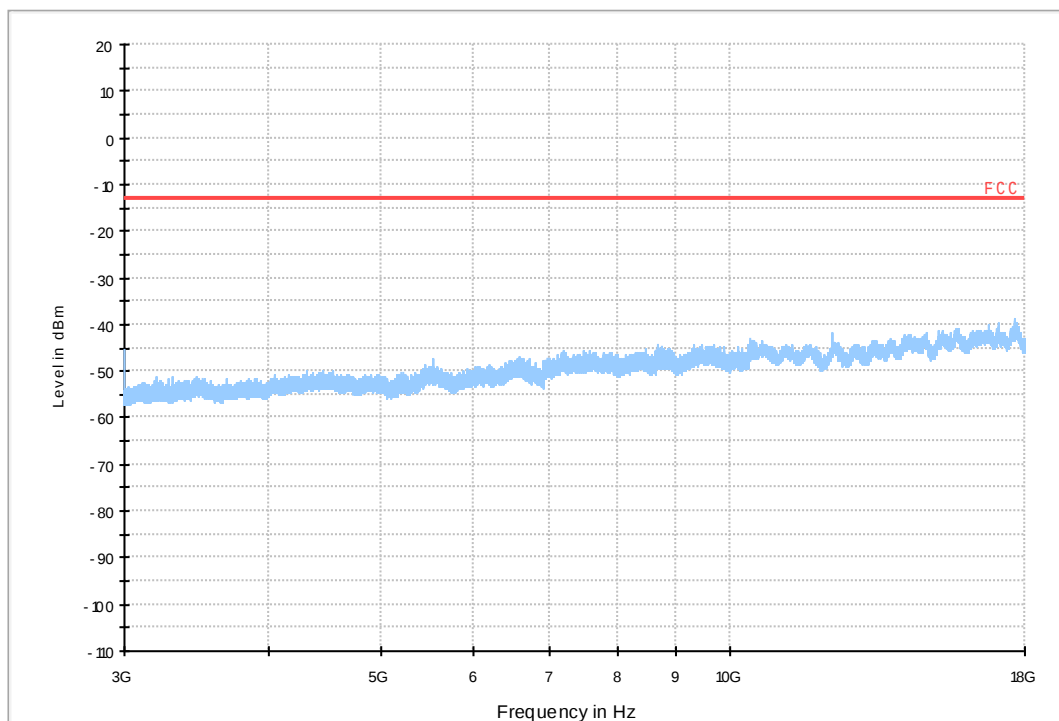


Site : 03CH01-SZ
Condition : -13DBM
: RBW:9.000KHz VBW:30.000KHz

18 FCC PART 27 WCDMA1700_L



17 FCC PART 27 WCDMA1700_H

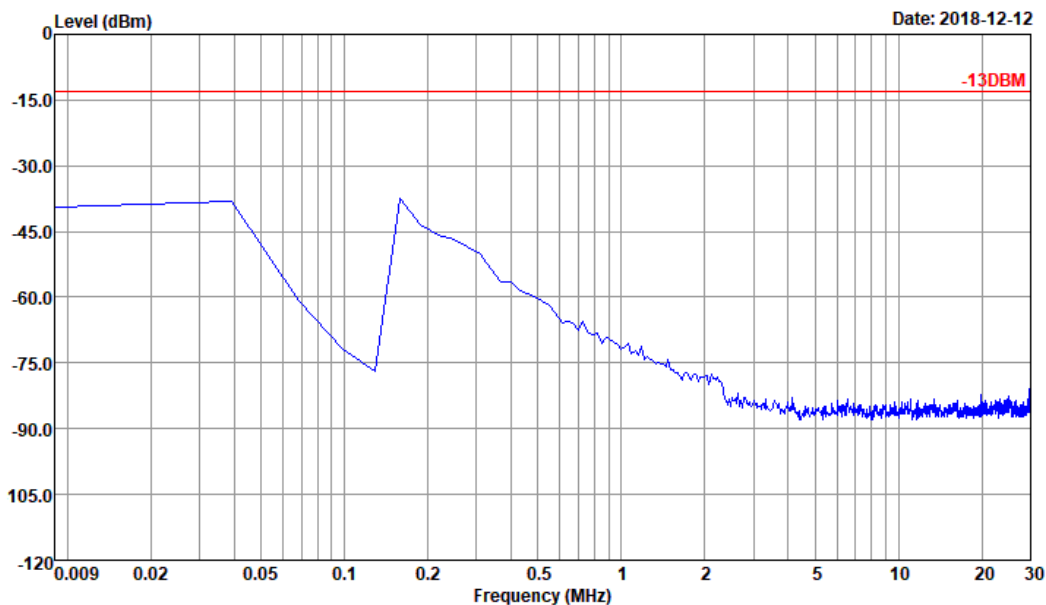


7.1.5 Test Band = WCDMA1900_ANT1

7.1.5.1 Test Mode = UMTS/TM1

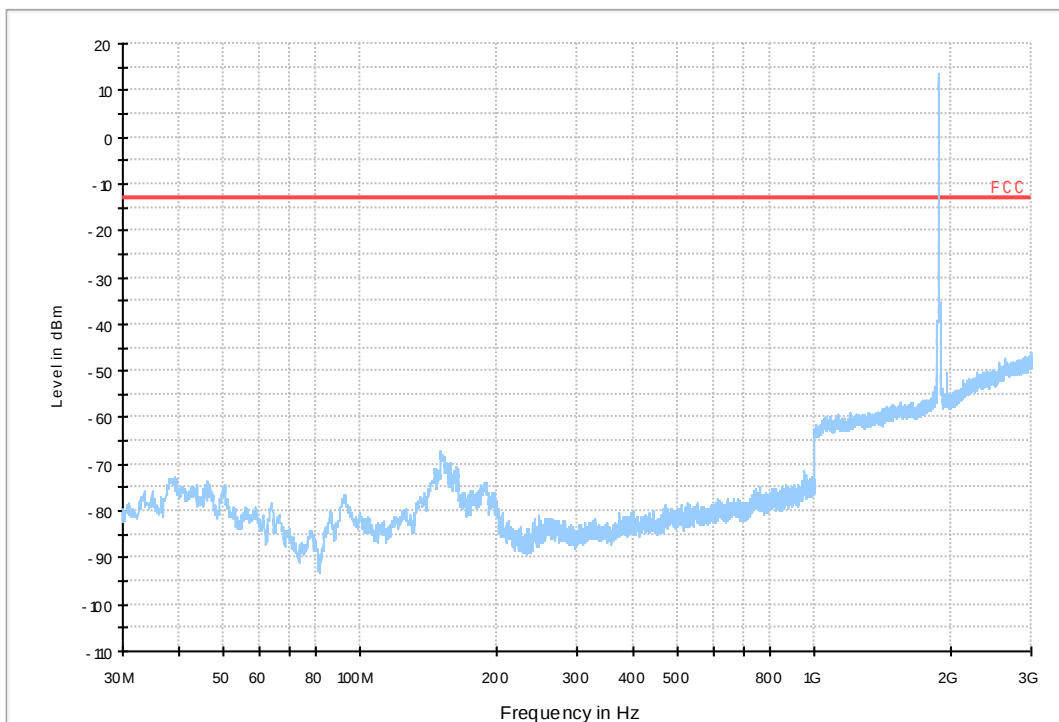


Data: 72

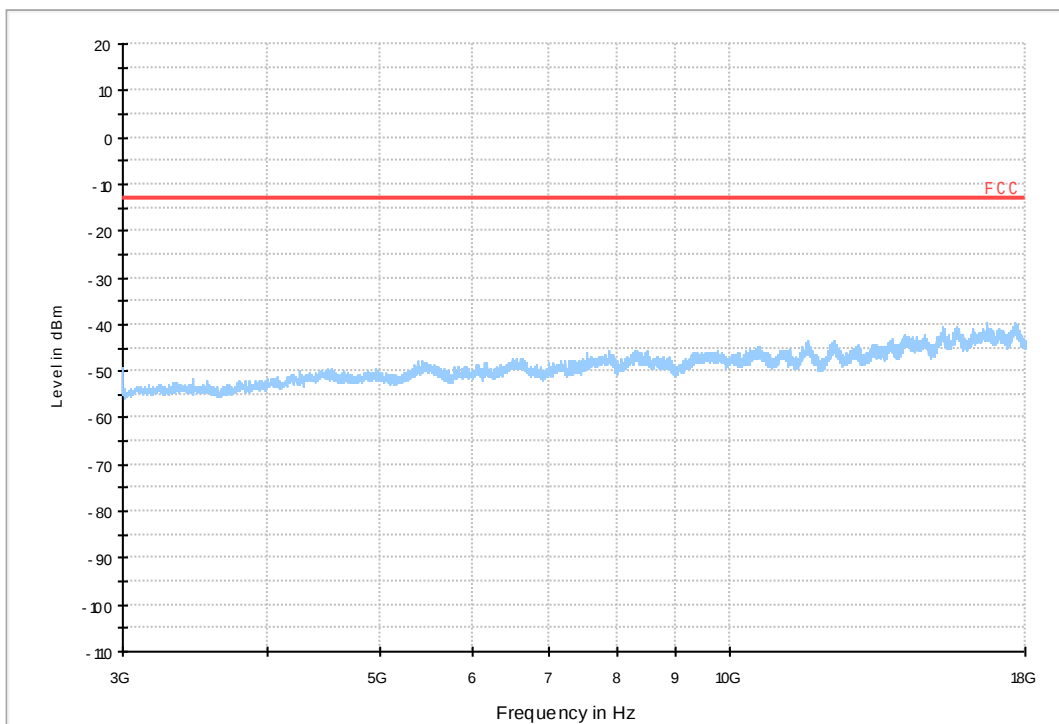


Site : 03CH01-SZ
Condition : -13DBM
: RBW:9.000KHz VBW:30.000KHz

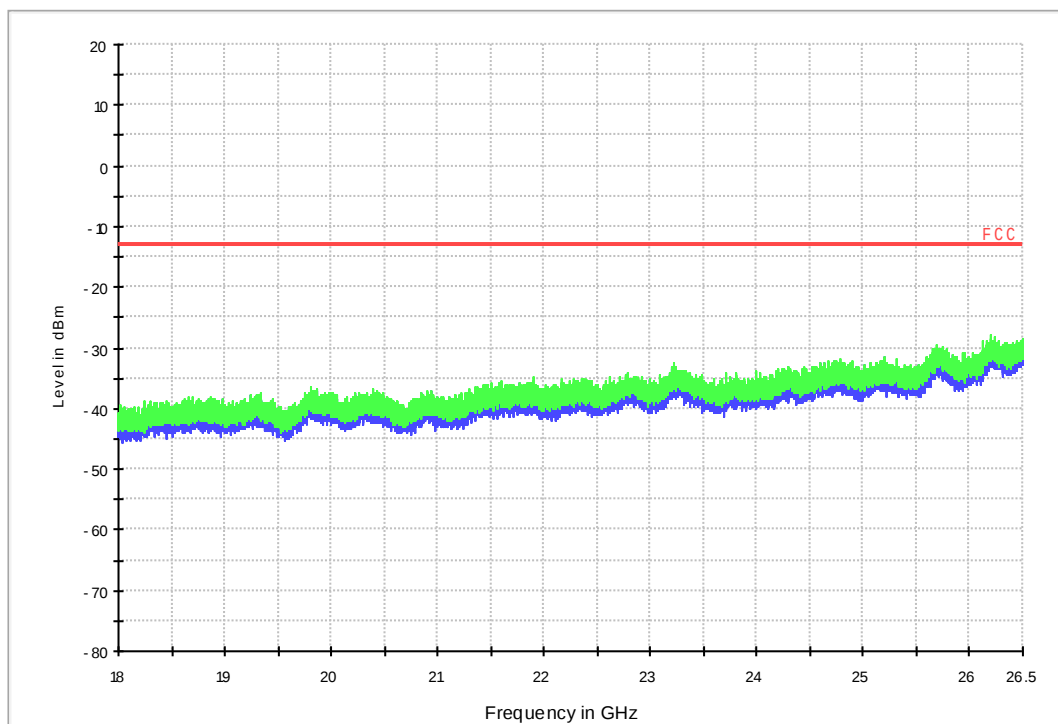
12 FCC PART 24 WCDMA1900_L



11 FCC PART 24 WCDMA1900_H

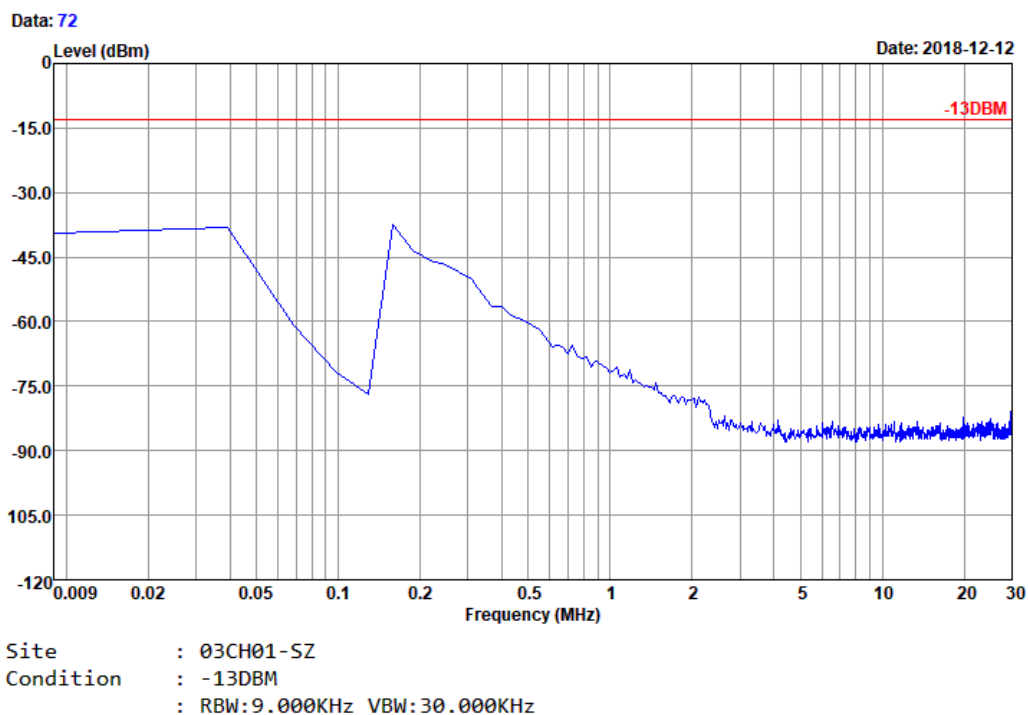


18G-26.5G RSE-TX-DIRECTOR ABOVE 1.5G PK

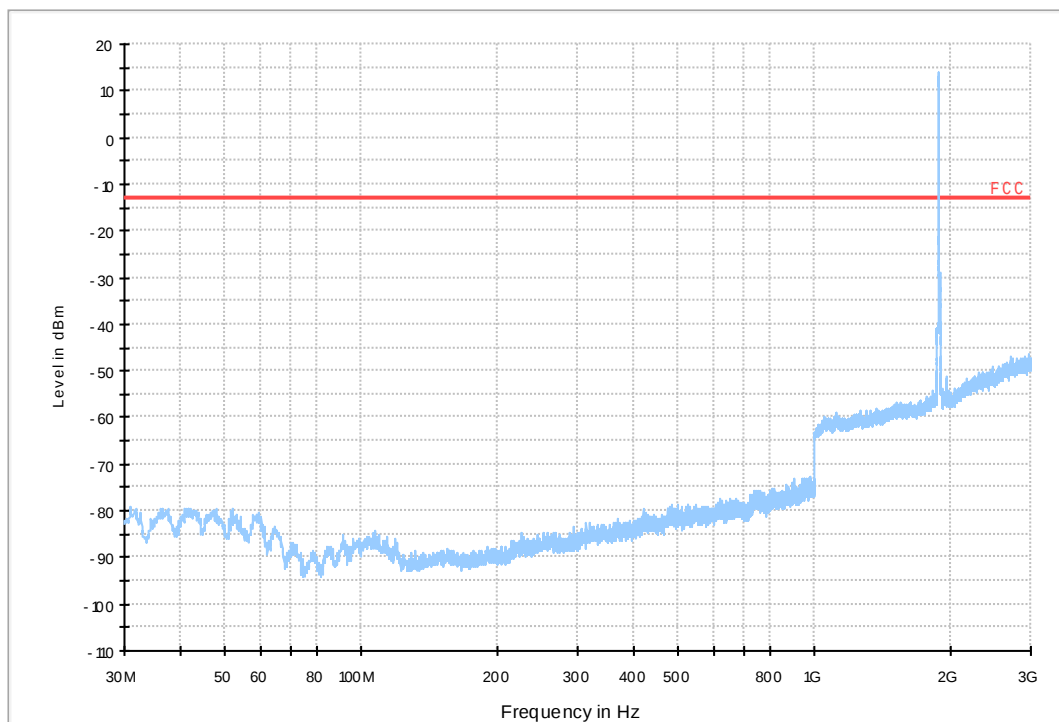


7.1.6 Test Band = WCDMA1900_ANT2

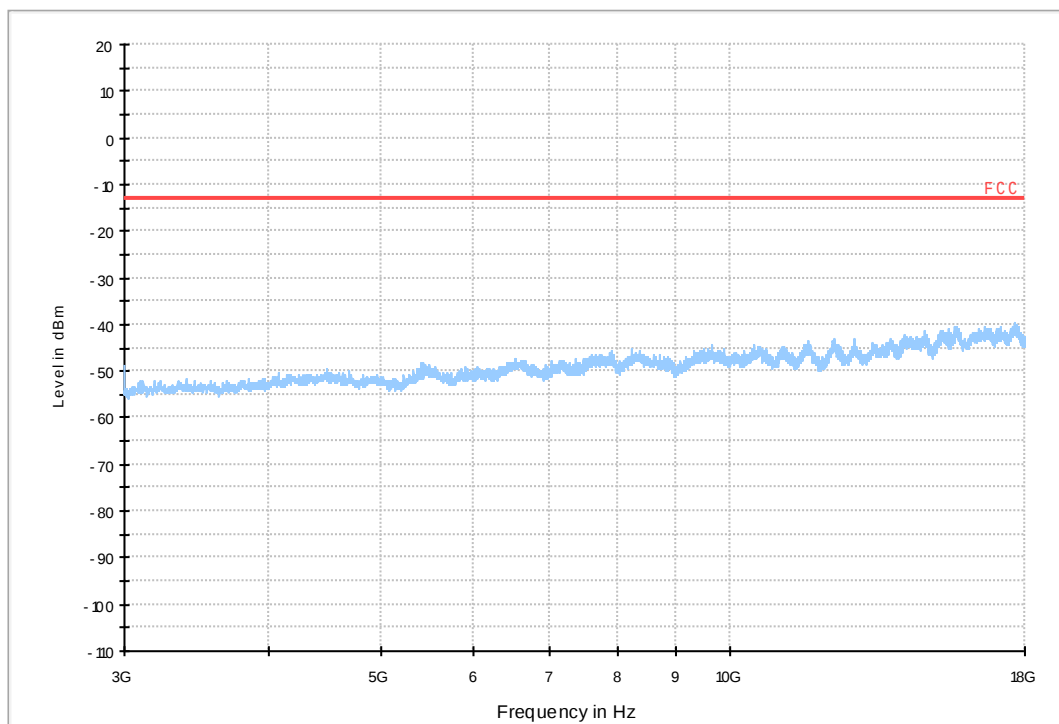
7.1.6.1 Test Mode = UMTS/TM1



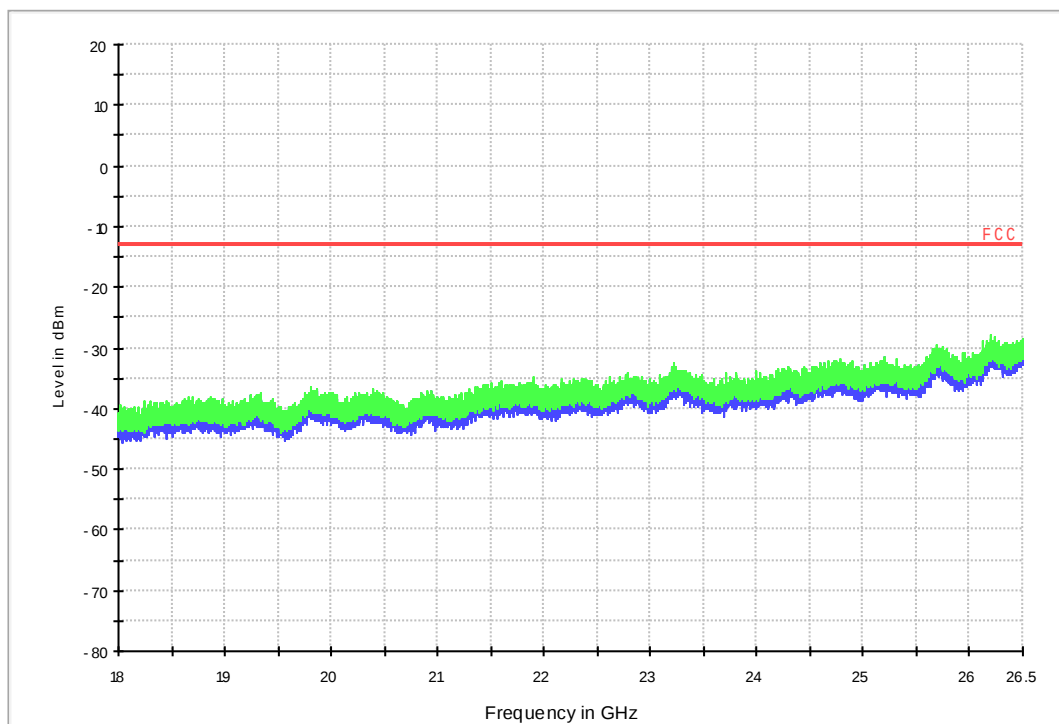
12 FCC PART 24 WCDMA1900_L



11 FCC PART 24 WCDMA1900_H



18G-26.5G RSE-TX-DIRECTOR ABOVE 1.5G PK



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	2.38180	0.00288	PASS
				VN	-0.93698	-0.00113	PASS
				VH	6.82354	0.00826	PASS
		MCH	TN	VL	8.69751	0.01040	PASS
				VN	6.03676	0.00722	PASS
				VH	7.43866	0.00889	PASS
		HCH	TN	VL	5.87225	0.00694	PASS
				VN	-1.10865	-0.00131	PASS
				VH	0.86546	0.00102	PASS
WCDMA1700	UMTS/TM1	LCH	TN	VL	11.98053	0.00700	PASS
				VN	8.38280	0.00490	PASS
				VH	14.00471	0.00818	PASS
		MCH	TN	VL	9.33409	0.00539	PASS
				VN	11.96623	0.00691	PASS
				VH	10.72884	0.00619	PASS
		HCH	TN	VL	6.21557	0.00355	PASS
				VN	4.37737	0.00250	PASS
				VH	12.50267	0.00713	PASS
WCDMA1900	UMTS/TM1	LCH	TN	VL	6.66618	0.00360	PASS
				VN	3.41892	0.00185	PASS
				VH	6.47306	0.00349	PASS
		MCH	TN	VL	10.32829	0.00549	PASS
				VN	4.37021	0.00232	PASS
				VH	11.75880	0.00625	PASS
		HCH	TN	VL	0.81539	0.00360	PASS
				VN	1.25885	0.00185	PASS
				VH	0.38624	0.00349	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	7.93219	0.00960	PASS
				-20	3.22580	0.00390	PASS
				-10	1.63794	0.00198	PASS
				0	3.81231	0.00461	PASS
				10	3.67641	0.00445	PASS
				20	-0.93698	-0.00113	PASS
				30	5.69344	0.00689	PASS
				40	4.24147	0.00513	PASS
				50	4.04120	0.00489	PASS
		MCH	VN	-30	3.16143	0.00378	PASS
				-20	0.75102	0.00090	PASS
				-10	5.35011	0.00640	PASS
				0	3.60489	0.00431	PASS
				10	9.15527	0.01095	PASS
				20	6.03676	0.00722	PASS
				30	6.51598	0.00779	PASS
				40	5.85079	0.00700	PASS
				50	7.48873	0.00895	PASS
		HCH	VN	-30	5.87225	0.00694	PASS
				-20	3.93391	0.00465	PASS
				-10	-1.60932	-0.00190	PASS
				0	5.57899	0.00659	PASS
				10	1.18732	0.00140	PASS
				20	-1.10865	-0.00131	PASS
				30	0.30041	0.00035	PASS
				40	5.09977	0.00603	PASS
				50	0.57936	0.00068	PASS
WCDMA1700	UMTS/TM1	LCH	VN	-30	9.55582	0.00558	PASS
				-20	10.95772	0.00640	PASS
				-10	7.88212	0.00460	PASS
				0	10.37121	0.00606	PASS
				10	8.94070	0.00522	PASS
				20	8.38280	0.00490	PASS
				30	11.25813	0.00657	PASS
				40	9.42707	0.00551	PASS
				50	10.48565	0.00612	PASS
		MCH	VN	-30	5.90801	0.00341	PASS
				-20	11.55853	0.00667	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-10	3.99828	0.00231	PASS
				0	7.57456	0.00437	PASS
				10	13.98325	0.00807	PASS
				20	11.96623	0.00691	PASS
				30	8.62598	0.00498	PASS
				40	3.46899	0.00200	PASS
				50	12.55989	0.00725	PASS
		HCH	VN	-30	6.20842	0.00354	PASS
				-20	8.66890	0.00495	PASS
				-10	7.18117	0.00410	PASS
				0	11.02209	0.00629	PASS
				10	6.03676	0.00344	PASS
				20	4.37737	0.00250	PASS
				30	9.30548	0.00531	PASS
				40	6.47306	0.00369	PASS
				50	4.00543	0.00229	PASS
WCDMA1900	UMTS/TM1	LCH	VN	-30	9.63449	0.00520	PASS
				-20	7.70330	0.00416	PASS
				-10	5.92947	0.00320	PASS
				0	6.70195	0.00362	PASS
				10	5.29289	0.00286	PASS
				20	3.41892	0.00185	PASS
				30	14.05478	0.00759	PASS
				40	8.08239	0.00436	PASS
				50	1.88827	0.00102	PASS
		MCH	VN	-30	7.23124	0.00385	PASS
				-20	12.25948	0.00652	PASS
				-10	9.74894	0.00519	PASS
				0	10.45704	0.00556	PASS
				10	10.93626	0.00582	PASS
				20	4.37021	0.00232	PASS
				30	12.30955	0.00655	PASS
				40	4.52757	0.00241	PASS
				50	2.56777	0.00137	PASS
		HCH	VN	-30	0.85115	0.00045	PASS
				-20	3.18289	0.00167	PASS
				-10	7.34568	0.00385	PASS
				0	-0.11444	-0.00006	PASS
				10	5.55039	0.00291	PASS
				20	1.25885	0.00066	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	0.85831	0.00045	PASS
				40	0.54359	0.00028	PASS
				50	1.29461	0.00068	PASS

END