



# Appendix for test report



## 1 Appendix\_A: Effective (Isotropic) Radiated Power Output Data

### Part I - Test Results

Test Band	Test Mode	Test Channel	Conducte d Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
WCDMA1700	UMTS/TM1	LCH	22.97	22.08	30	PASS
		MCH	22.95	21.90	30	PASS
		HCH	22.85	21.92	30	PASS
WCDMA1900	UMTS/TM1	LCH	23.28	21.99	33	PASS
		MCH	23.20	21.84	33	PASS
		HCH	23.14	21.60	33	PASS
Test Band	Test Mode	Test Channel	Conducte d Power [dBm]	ERP [dBm]	Limit [dBm]	Verdict
WCDMA850	UMTS/TM1	LCH	23.76	19.52	38.5	PASS
		MCH	23.84	19.43	38.5	PASS
		HCH	23.78	19.48	38.5	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:

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

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

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

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	3.13	13	PASS
		MCH	3.37	13	PASS
		HCH	3.1	13	PASS
WCDMA1700	UMTS/TM1	LCH	2.87	13	PASS
		MCH	2.75	13	PASS
		HCH	2.52	13	PASS
WCDMA1900	UMTS/TM1	LCH	2.51	13	PASS
		MCH	2.63	13	PASS
		HCH	2.74	13	PASS

### 3Appendix\_C: Modulation Characteristics

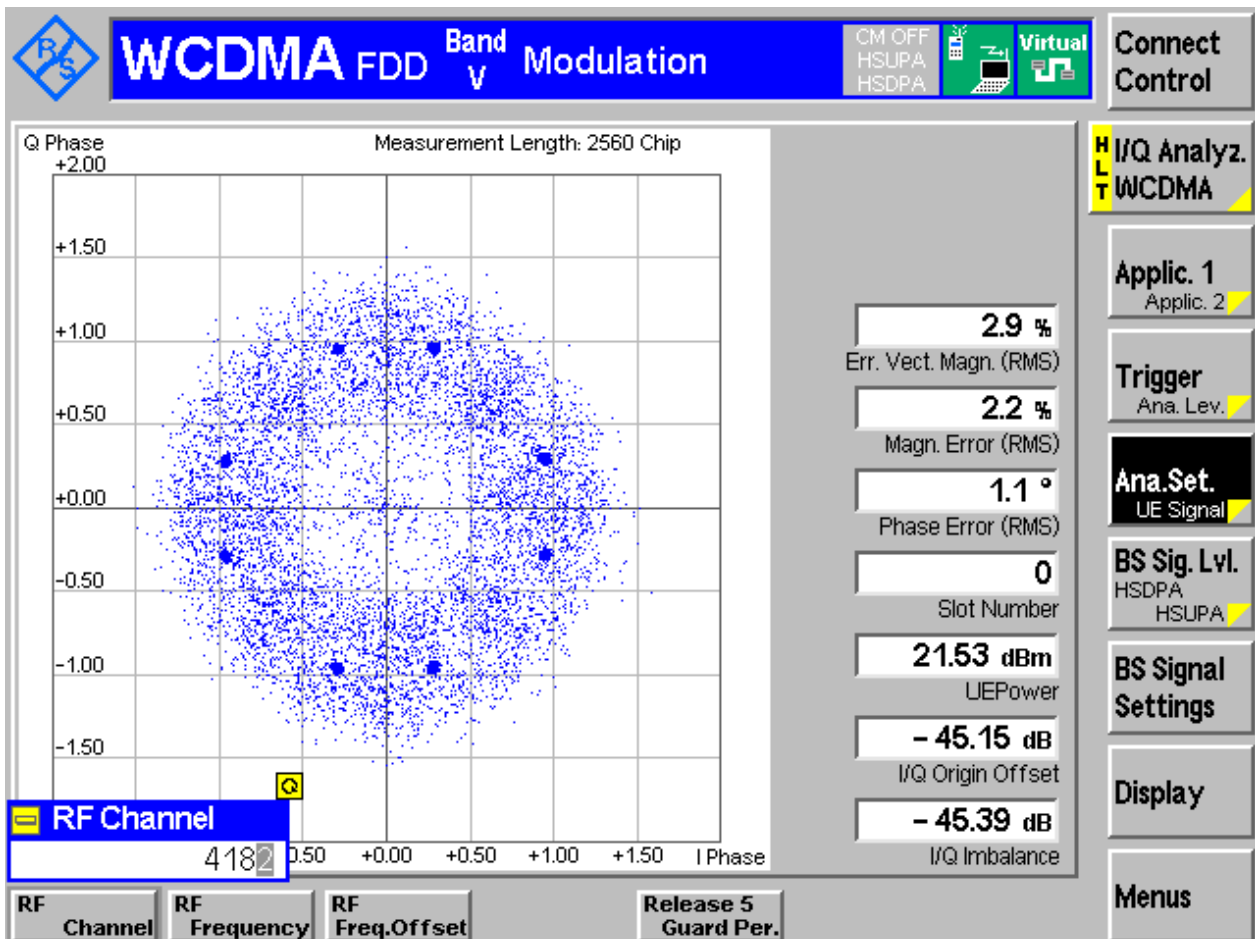
#### Part I - Test Plots

##### 3.1 For UMTS

##### 3.1.1 Test Band = WCDMA850

##### 3.1.1.1 Test Mode = UMTS/TM1

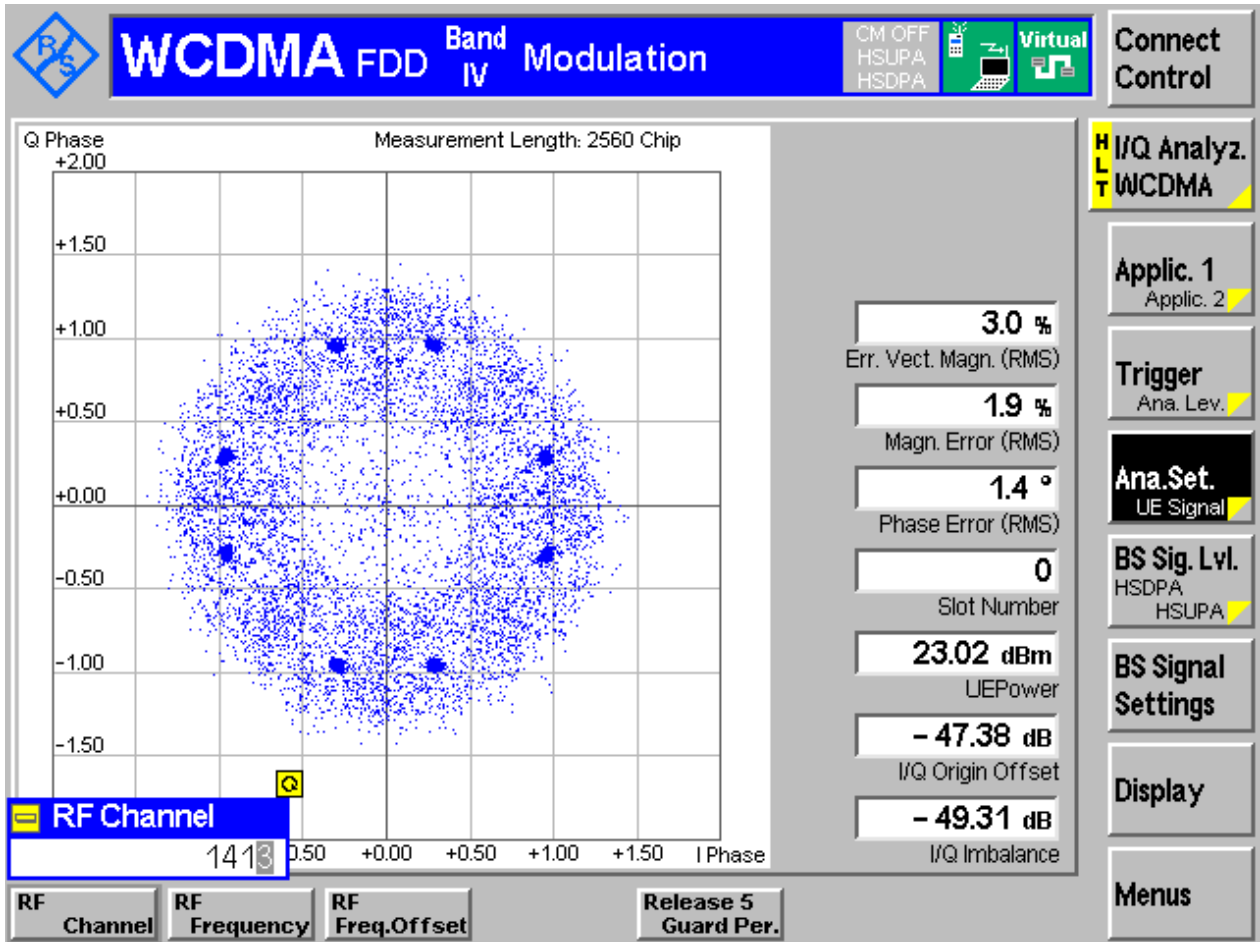
##### 3.1.1.1.1 Test Channel = MCH



3.1.2 Test Band = WCDMA1700

3.1.2.1 Test Mode = UMTS/TM1

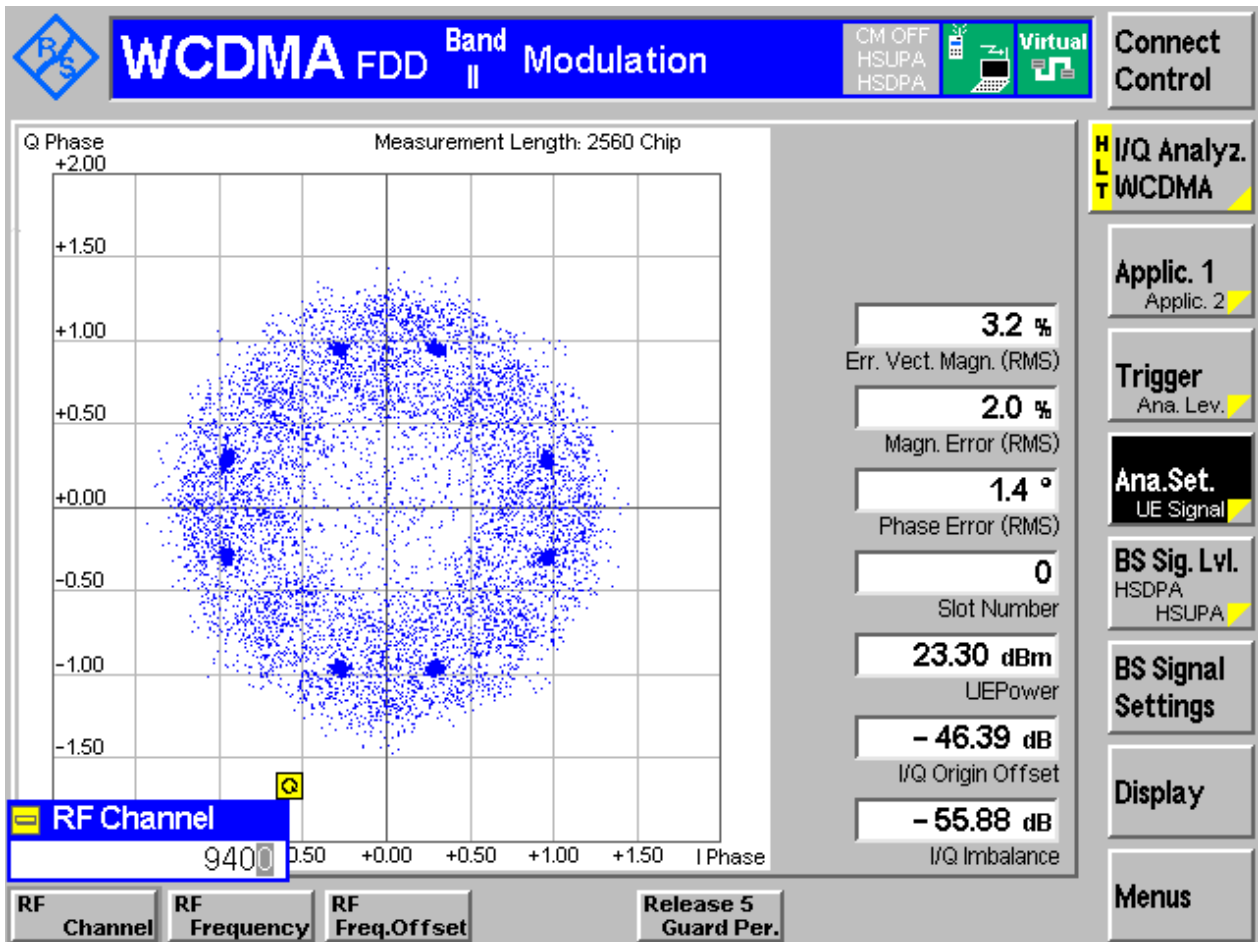
3.1.2.1.1 Test Channel = MCH



### 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	4.13	4.69	Pass
		MCH	4.13	4.69	Pass
		HCH	4.14	4.70	Pass
WCDMA1700	UMTS/TM1	LCH	4.15	4.71	Pass
		MCH	4.15	4.73	Pass
		HCH	4.16	4.73	Pass
WCDMA1900	UMTS/TM1	LCH	4.16	4.73	Pass
		MCH	4.15	4.74	Pass
		HCH	4.15	4.72	Pass



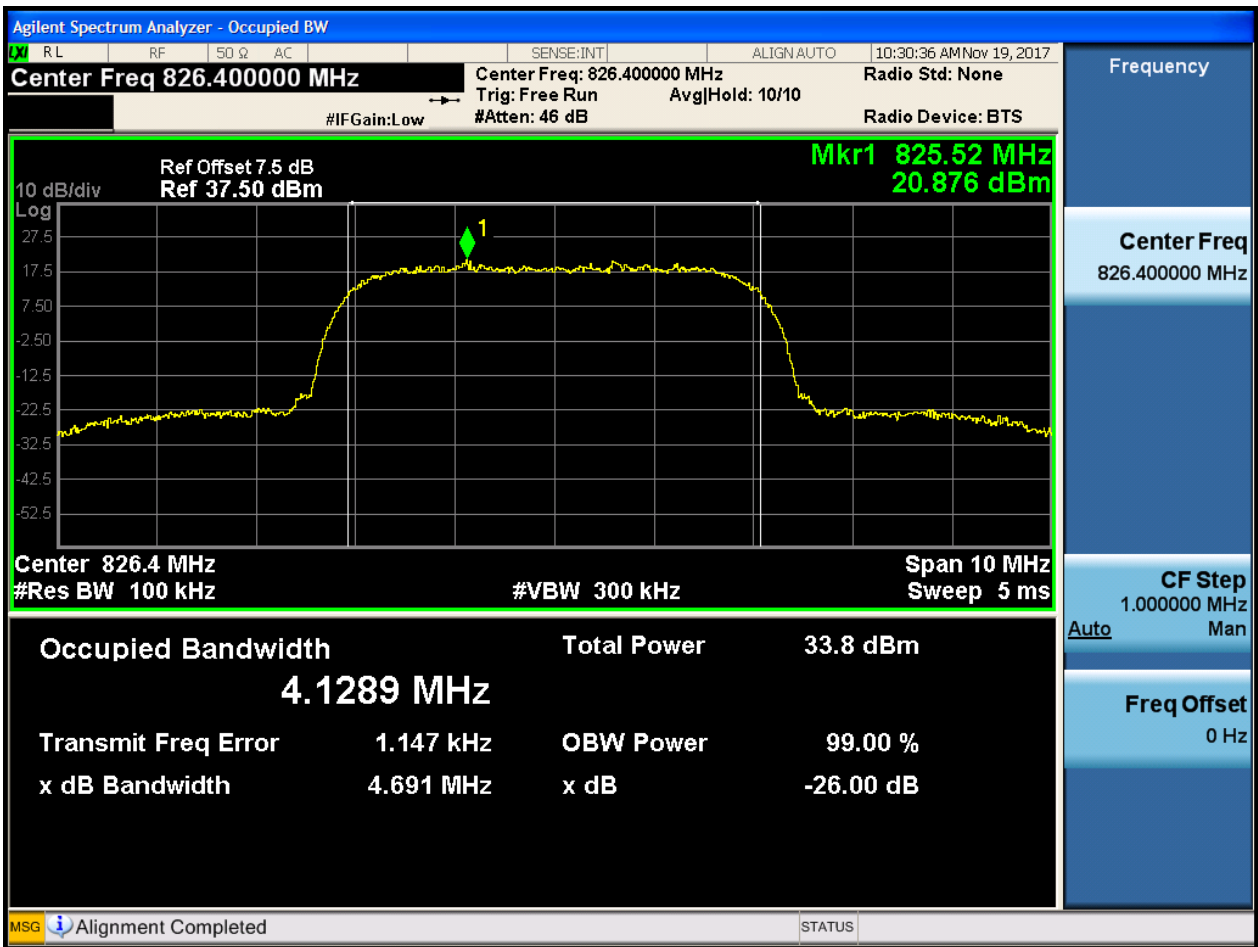
Part II - Test Plots

4.1 For UMTS

4.1.1 Test Band = WCDMA850

4.1.1.1 Test Mode = UMTS/TM1

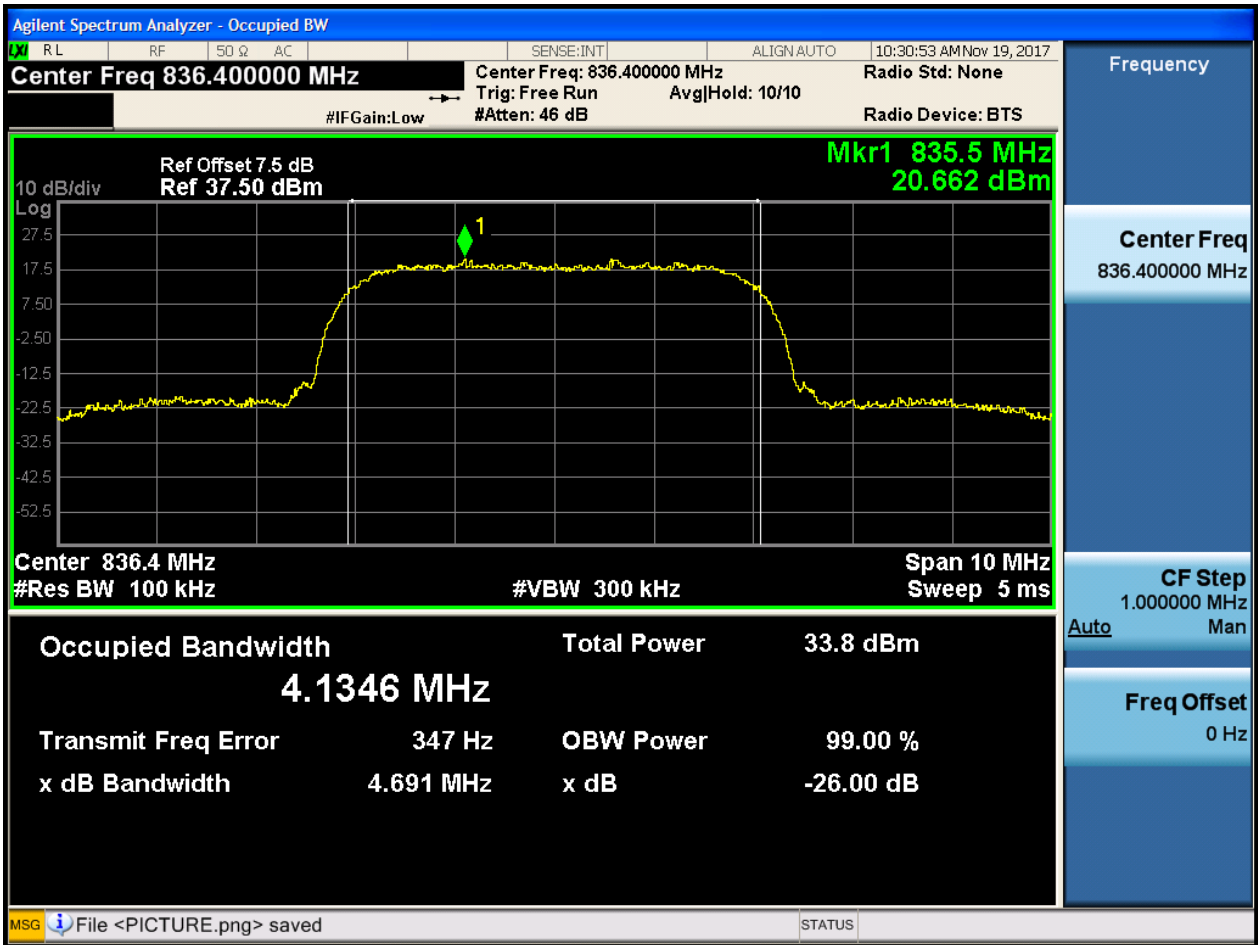
4.1.1.1.1 Test Channel = LCH





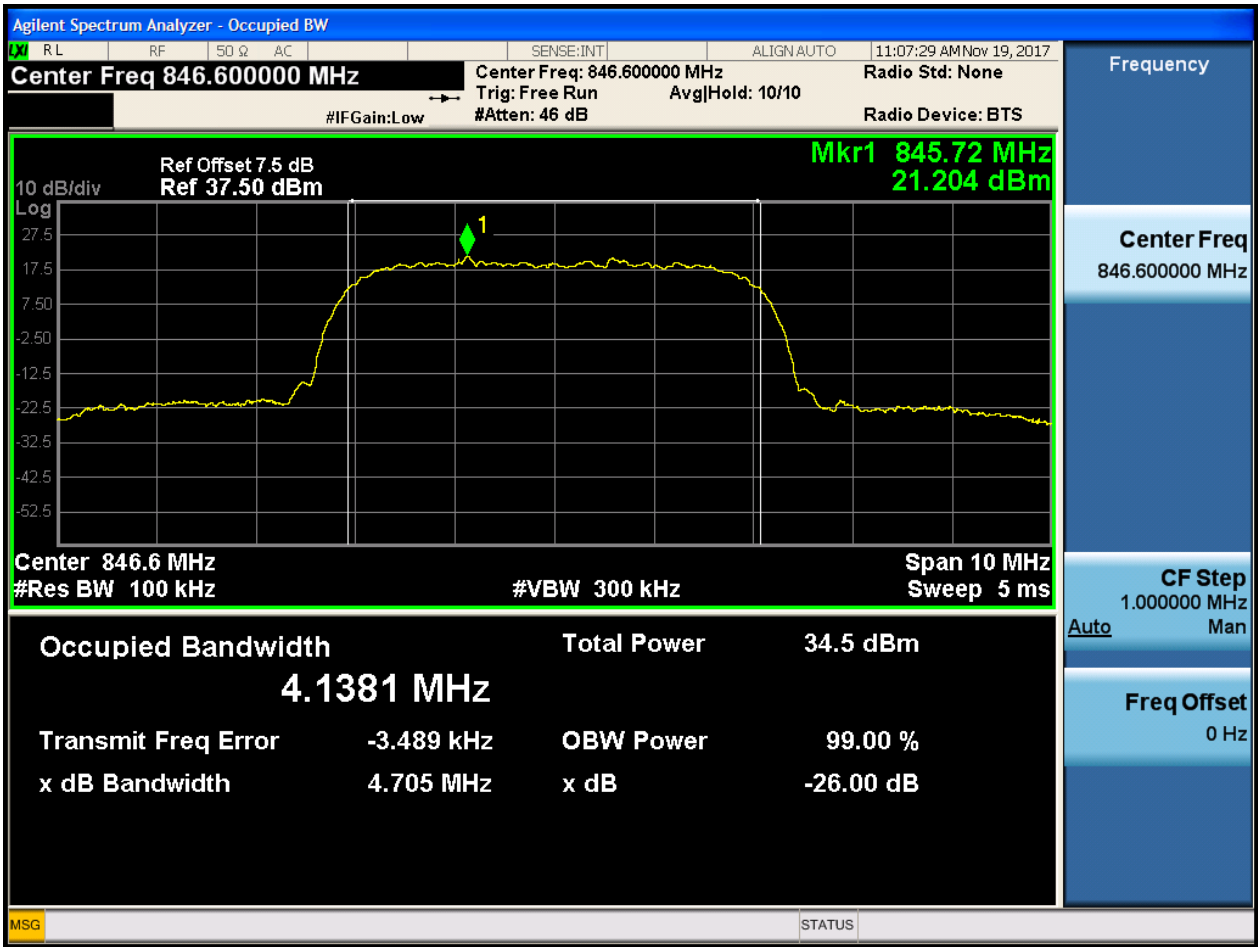


4.1.1.1.2 Test Channel = MCH





4.1.1.1.3 Test Channel = HCH

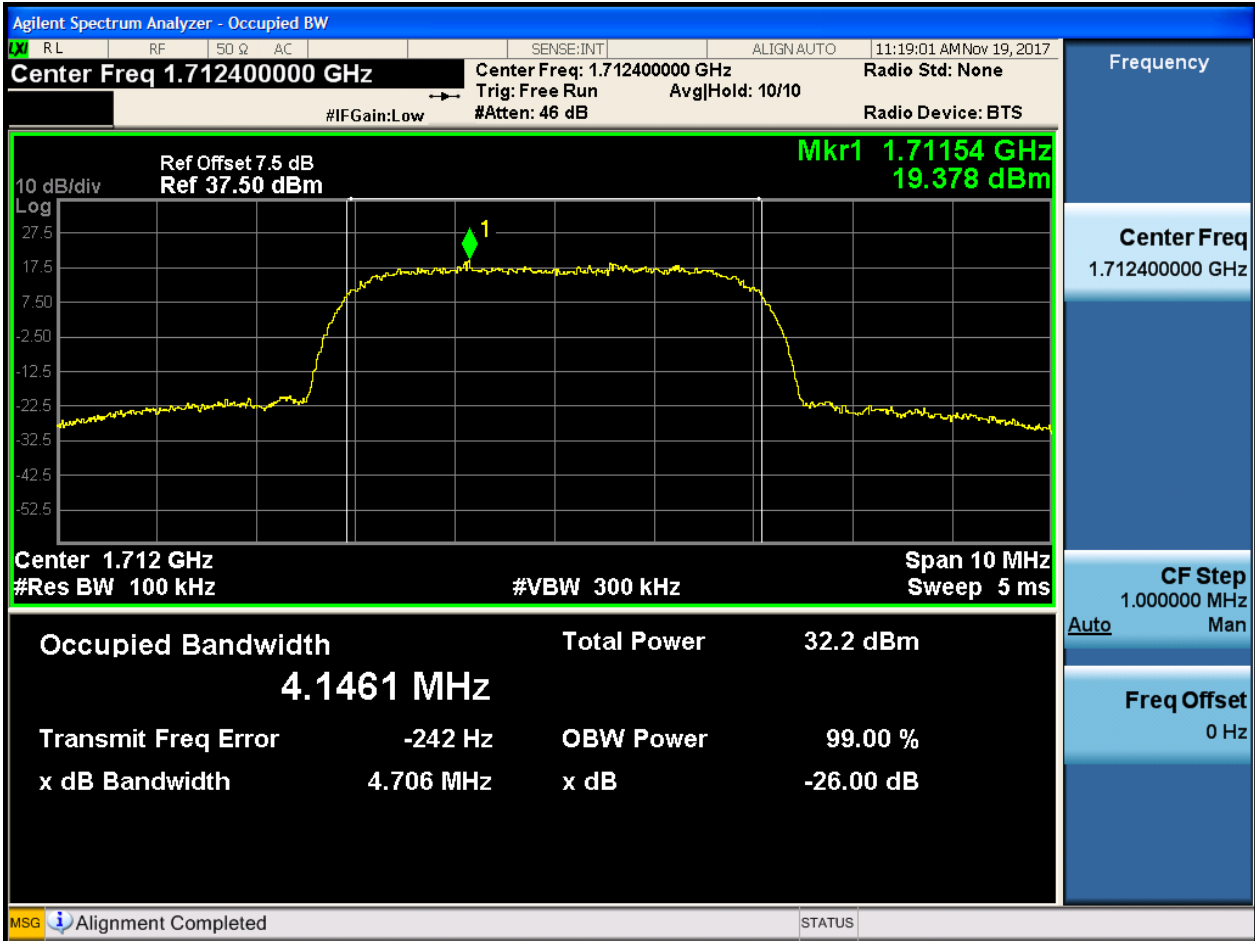




4.1.2 Test Band = WCDMA1700

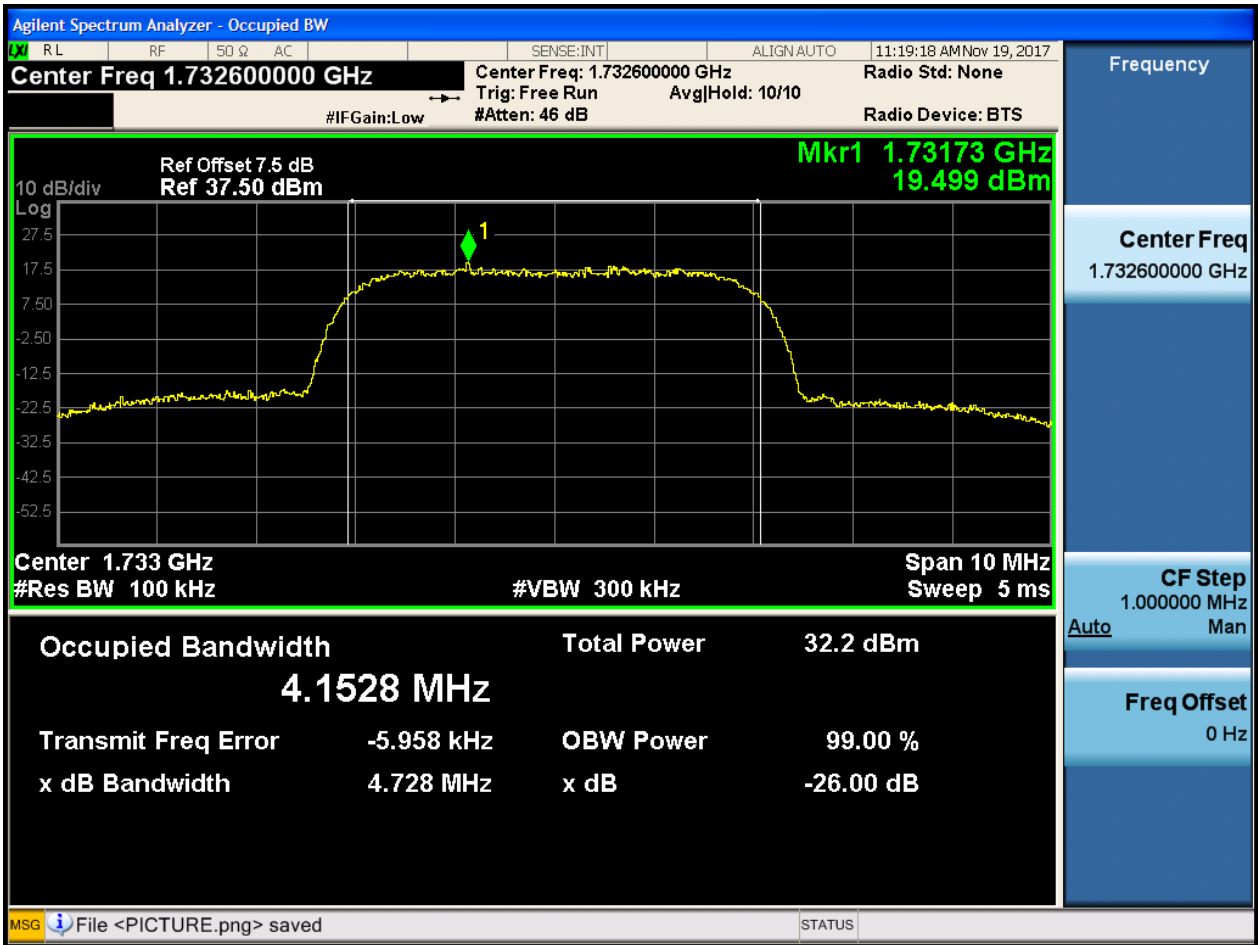
4.1.2.1 Test Mode = UMTS/TM1

4.1.2.1.1 Test Channel = LCH



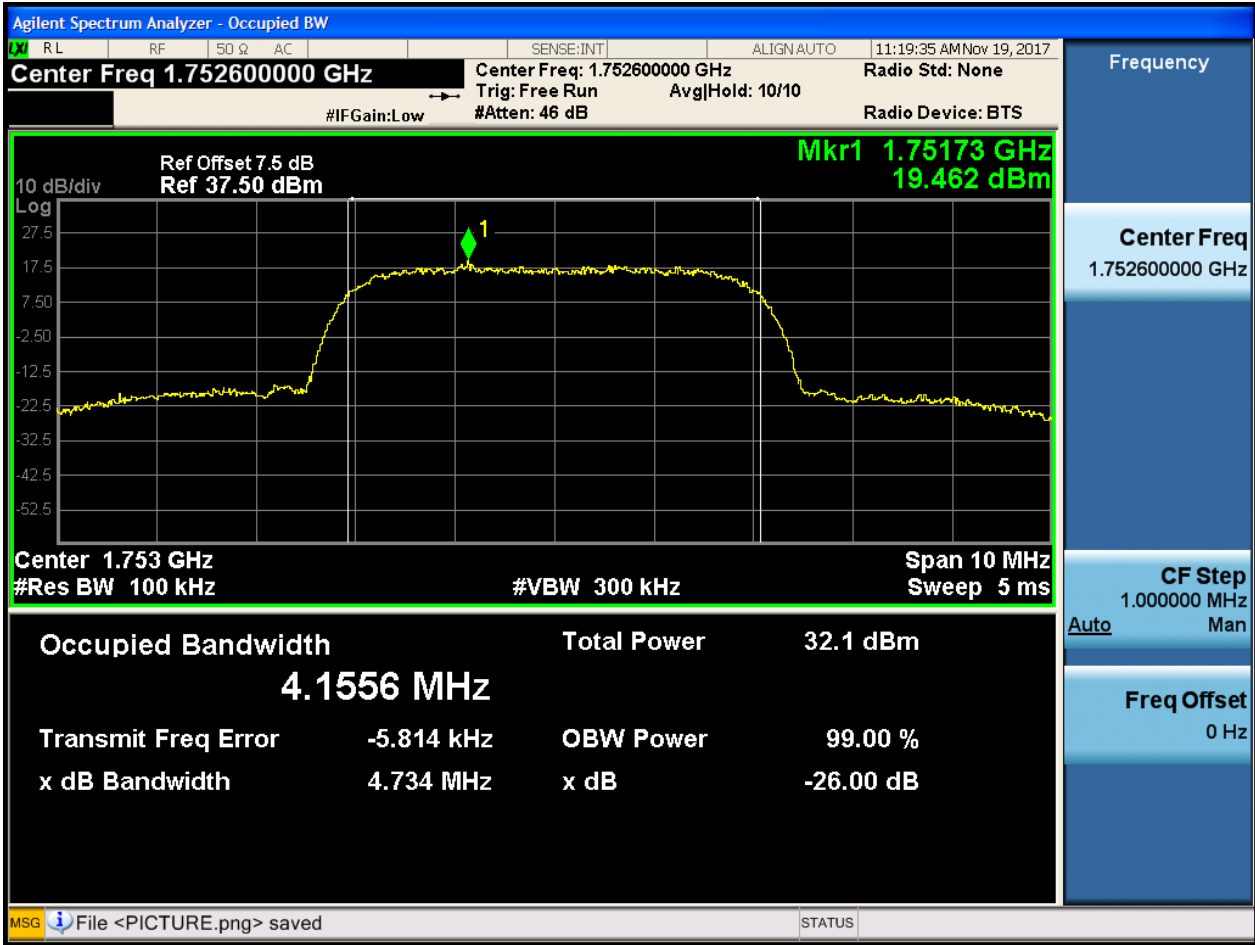


4.1.2.1.2 Test Channel = MCH





4.1.2.1.3 Test Channel = HCH

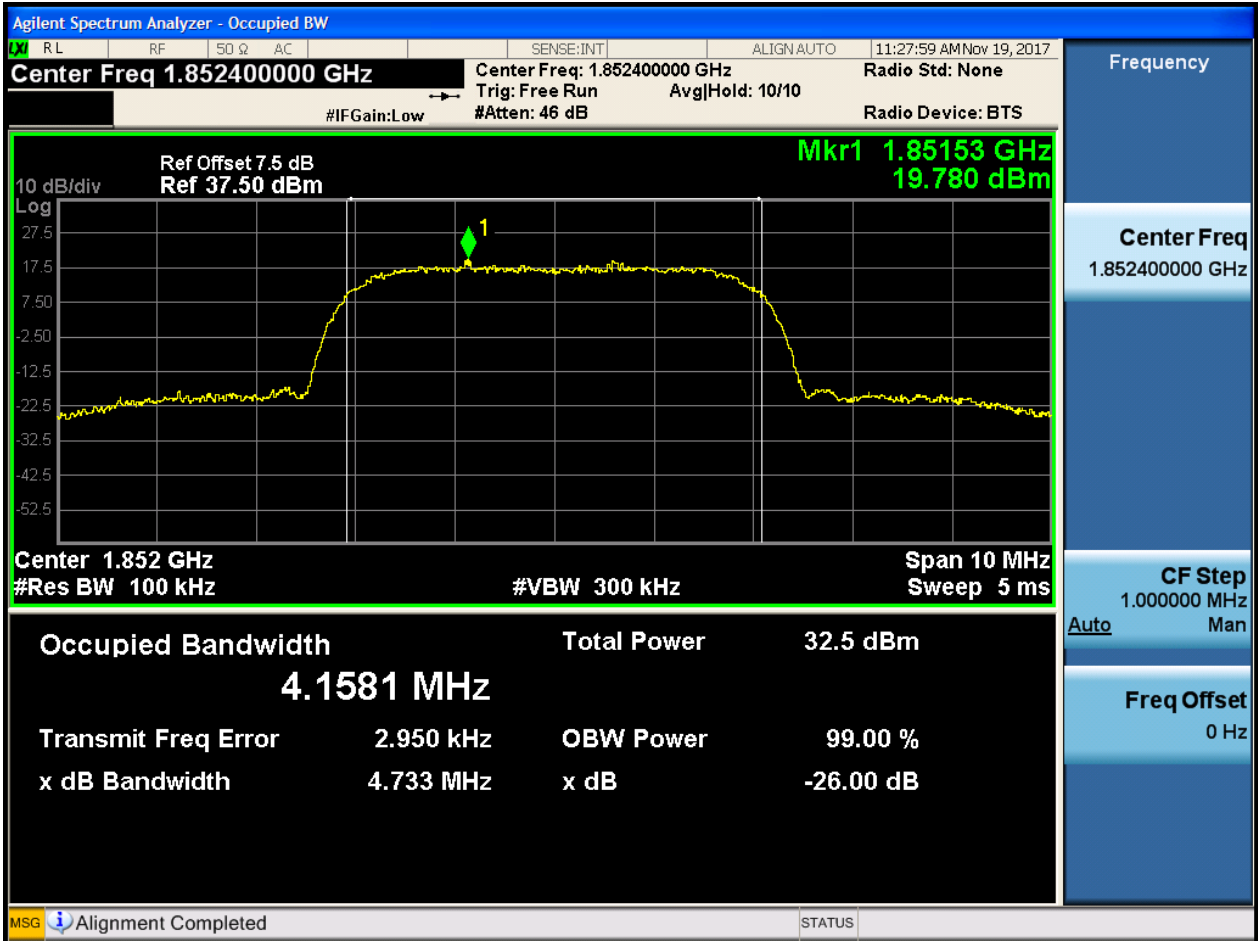




4.1.3 Test Band = WCDMA1900

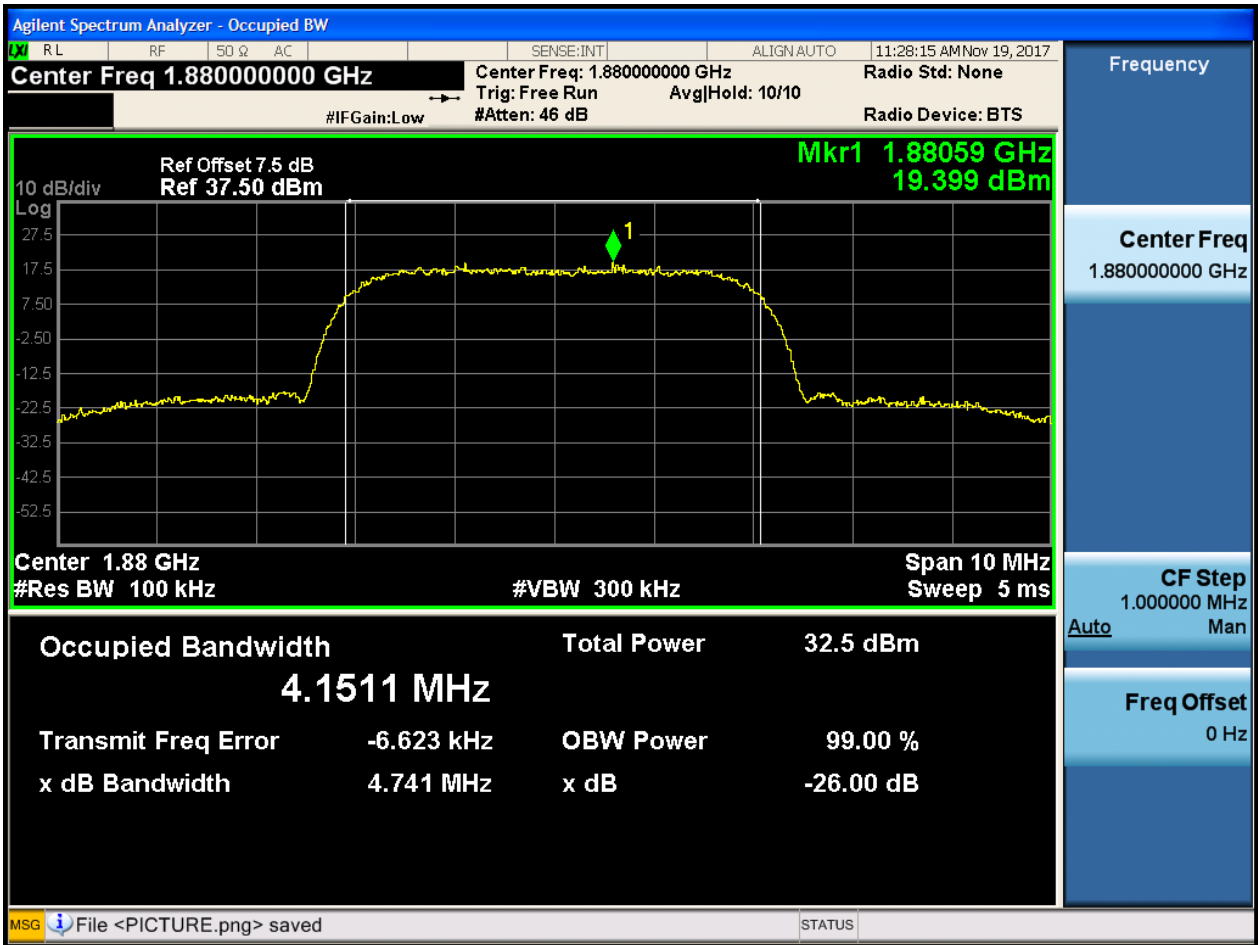
4.1.3.1 Test Mode = UMTS/TM1

4.1.3.1.1 Test Channel = LCH



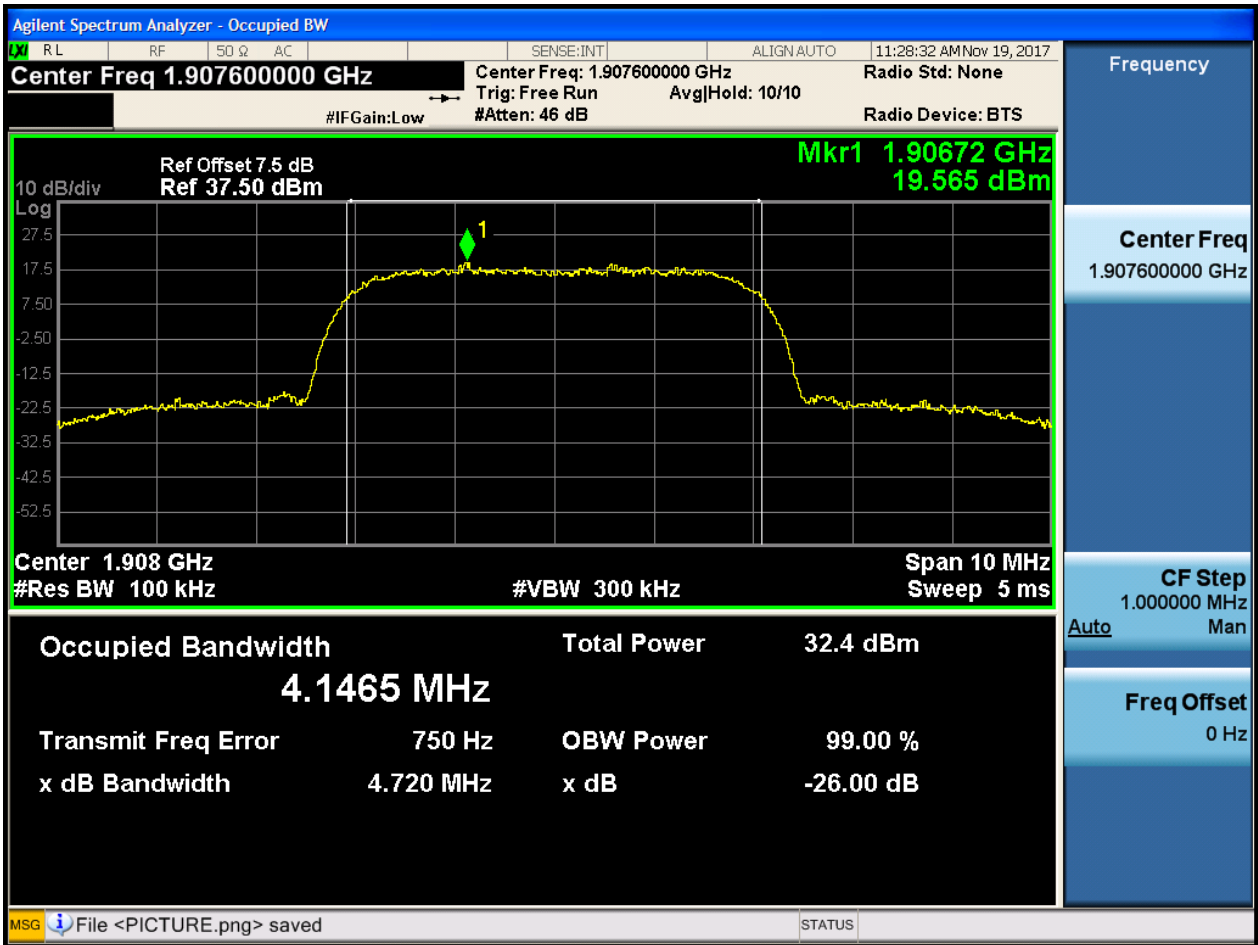


4.1.3.1.2 Test Channel = MCH





4.1.3.1.3 Test Channel = HCH







## 5Appendix\_E: Band Edges Compliance

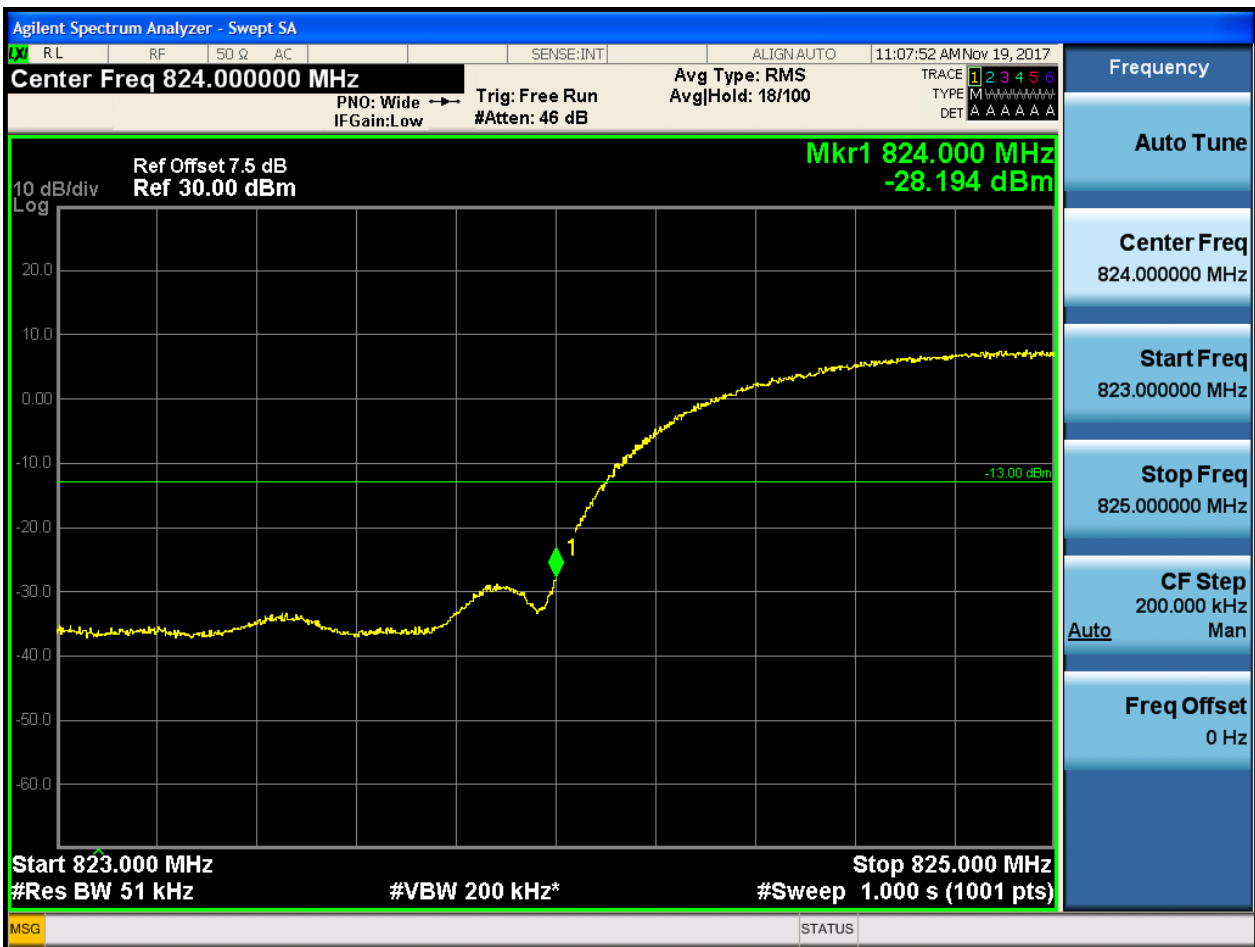
### Part I - Test Plots

#### 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.

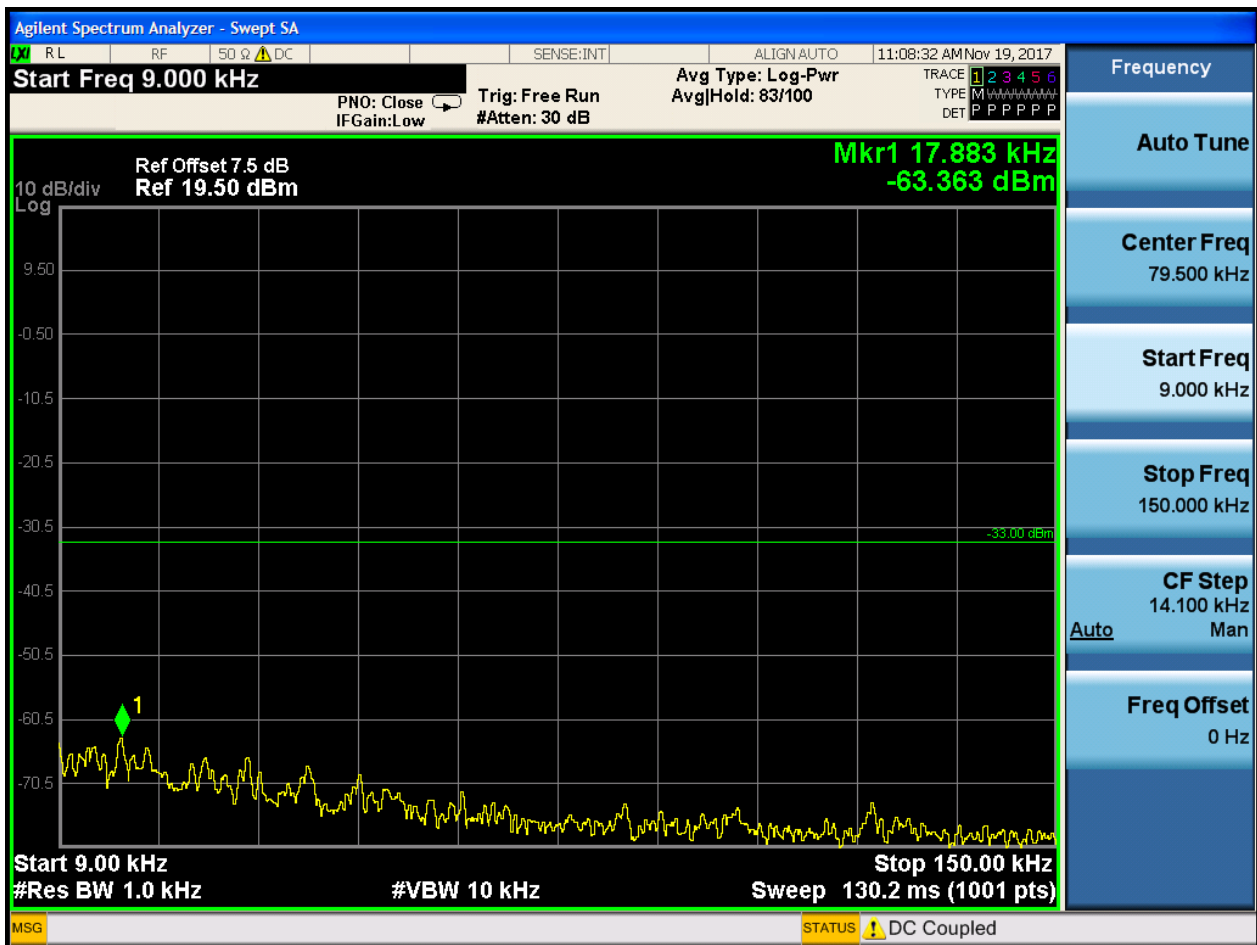
### Part I - Test Plots

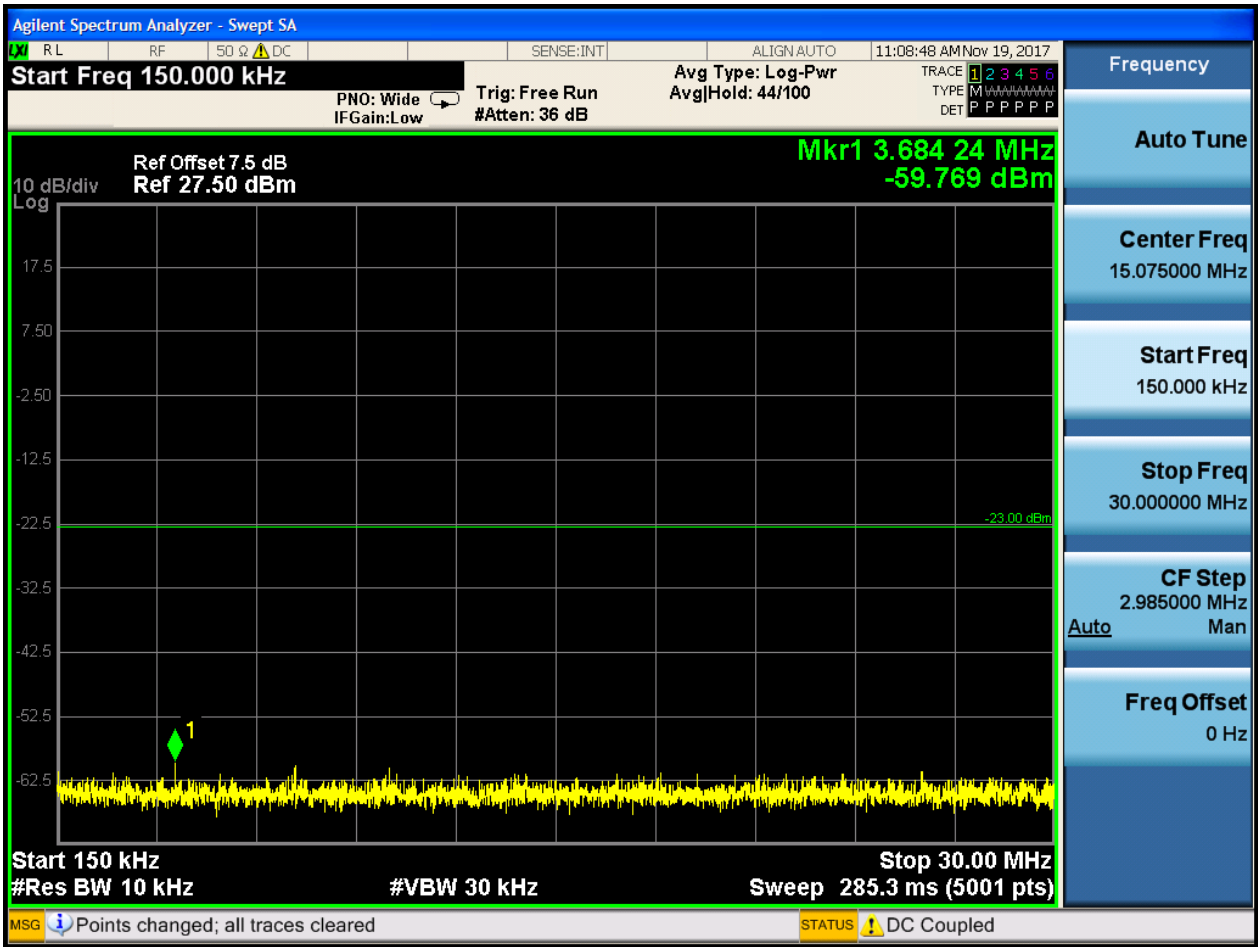
#### 6.1 For UMTS

##### 6.1.1 Test Band = WCDMA850

##### 6.1.1.1 Test Mode = UMTS/TM1

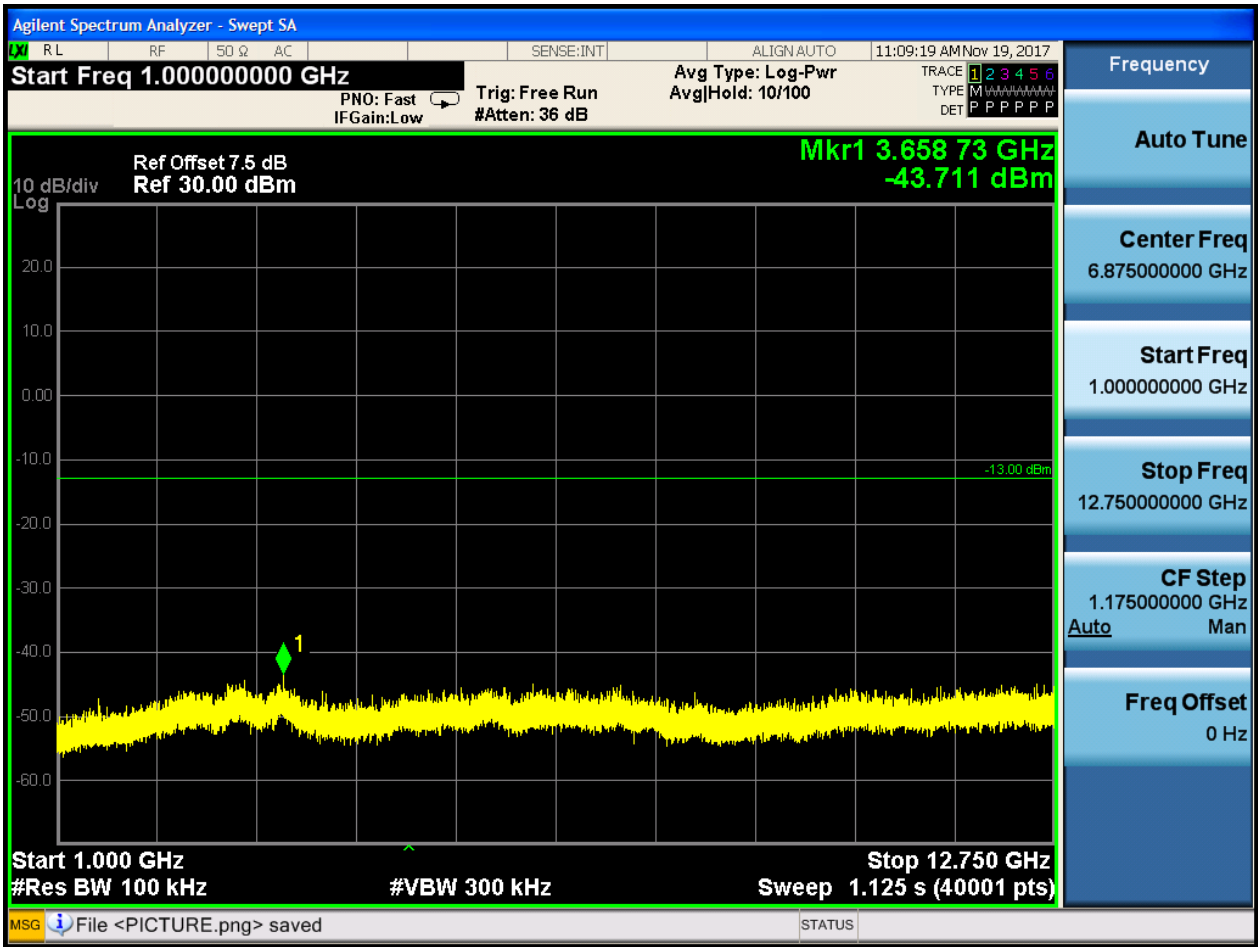
##### 6.1.1.1.1 Test Channel = LCH



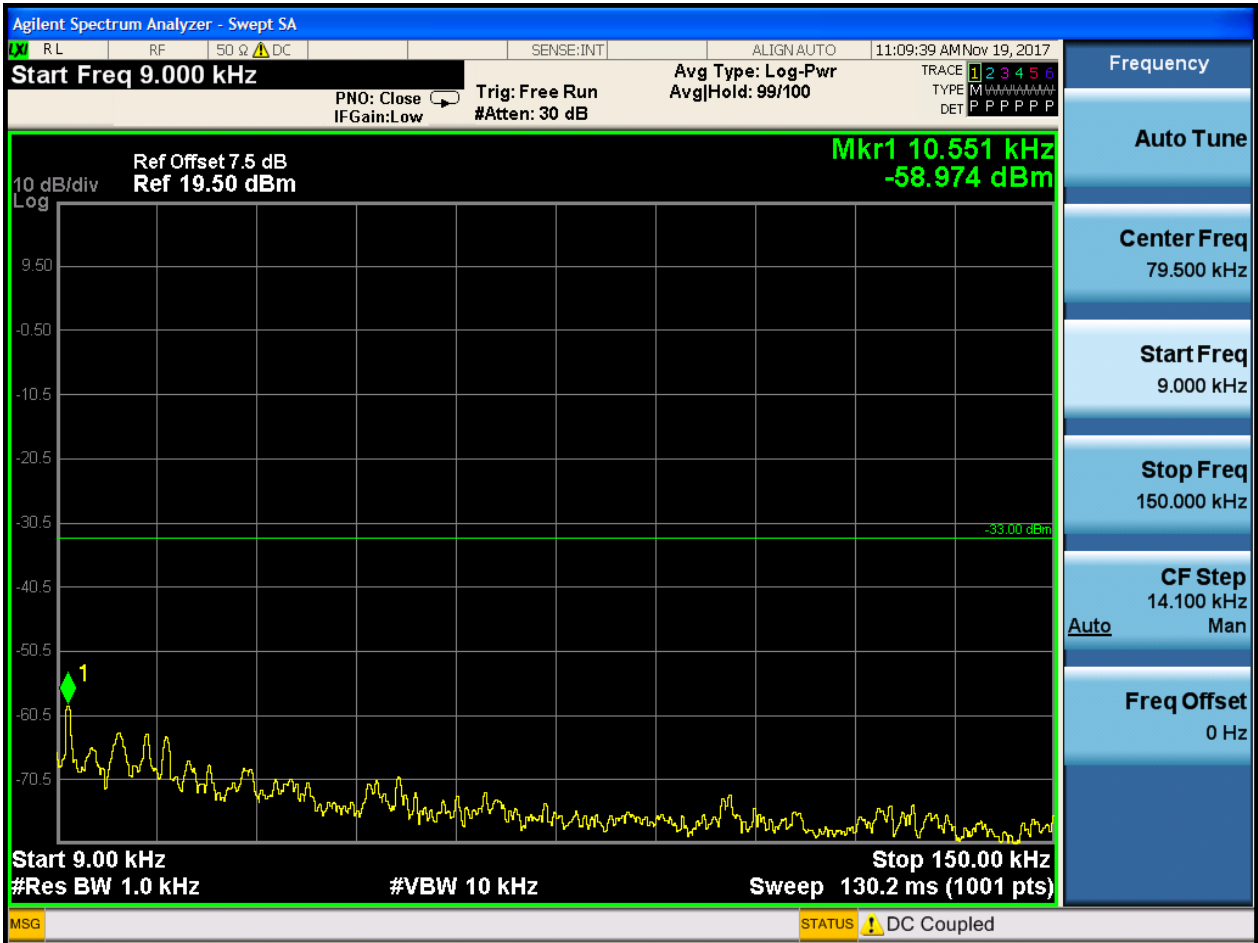


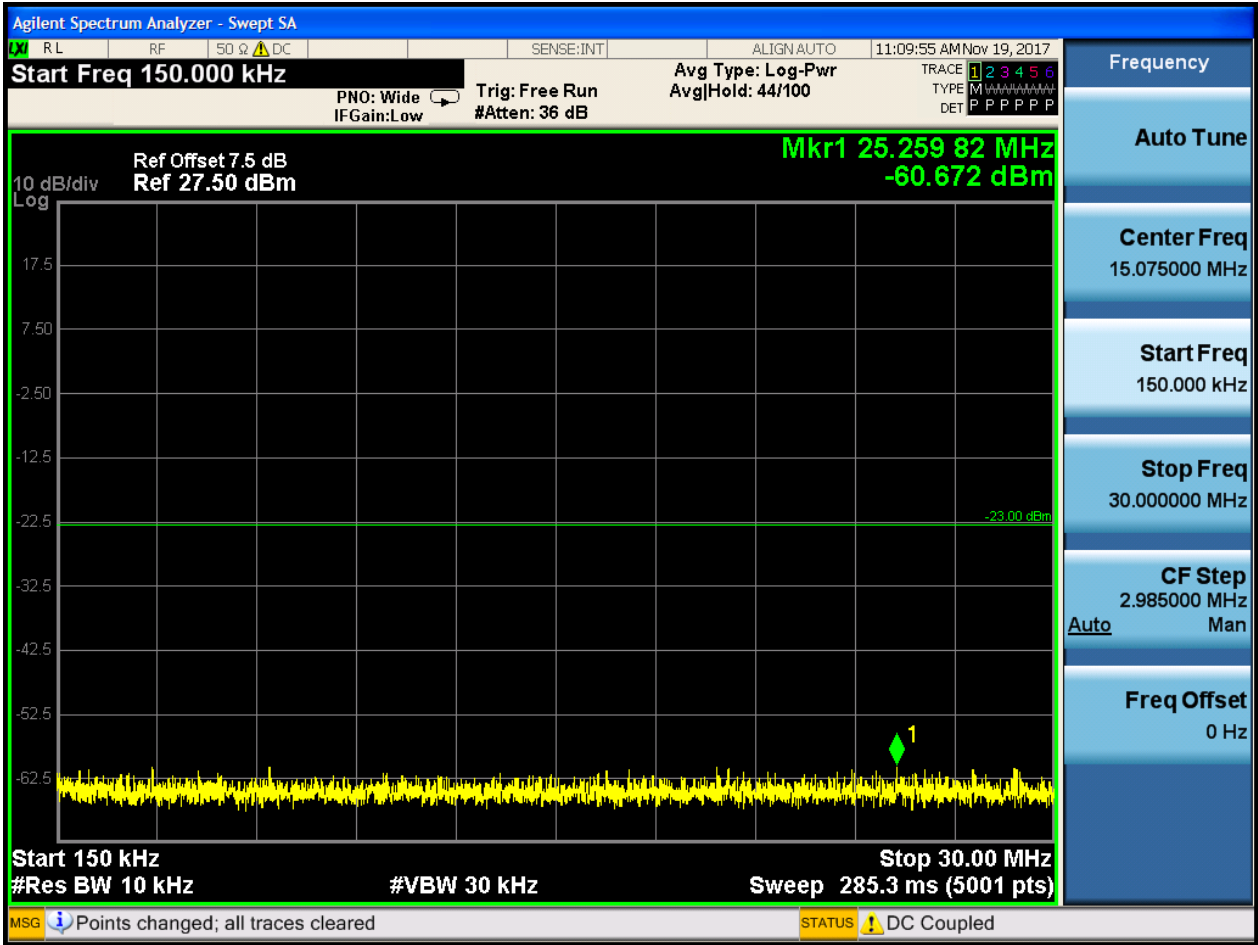


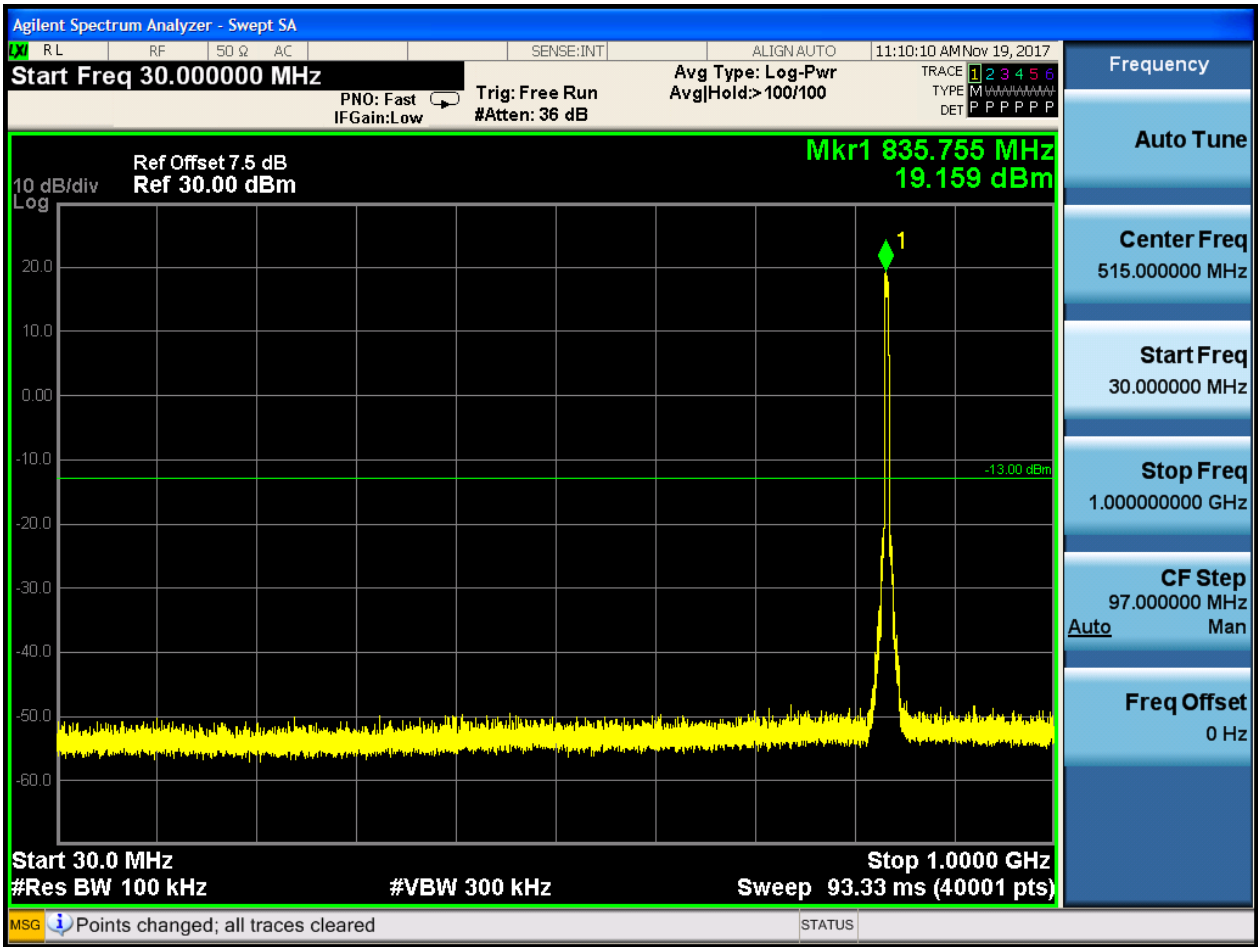


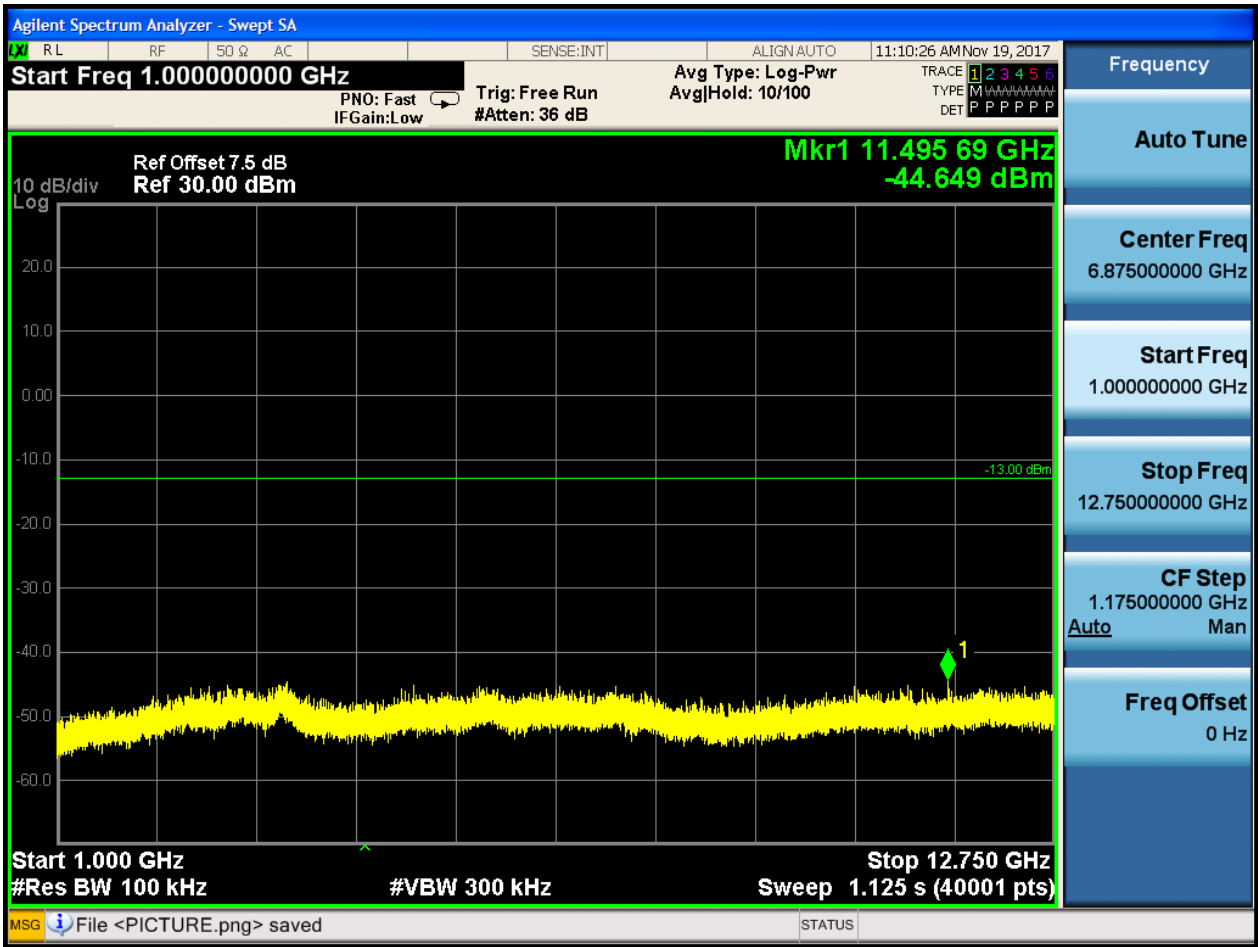


6.1.1.1.2 Test Channel = MCH

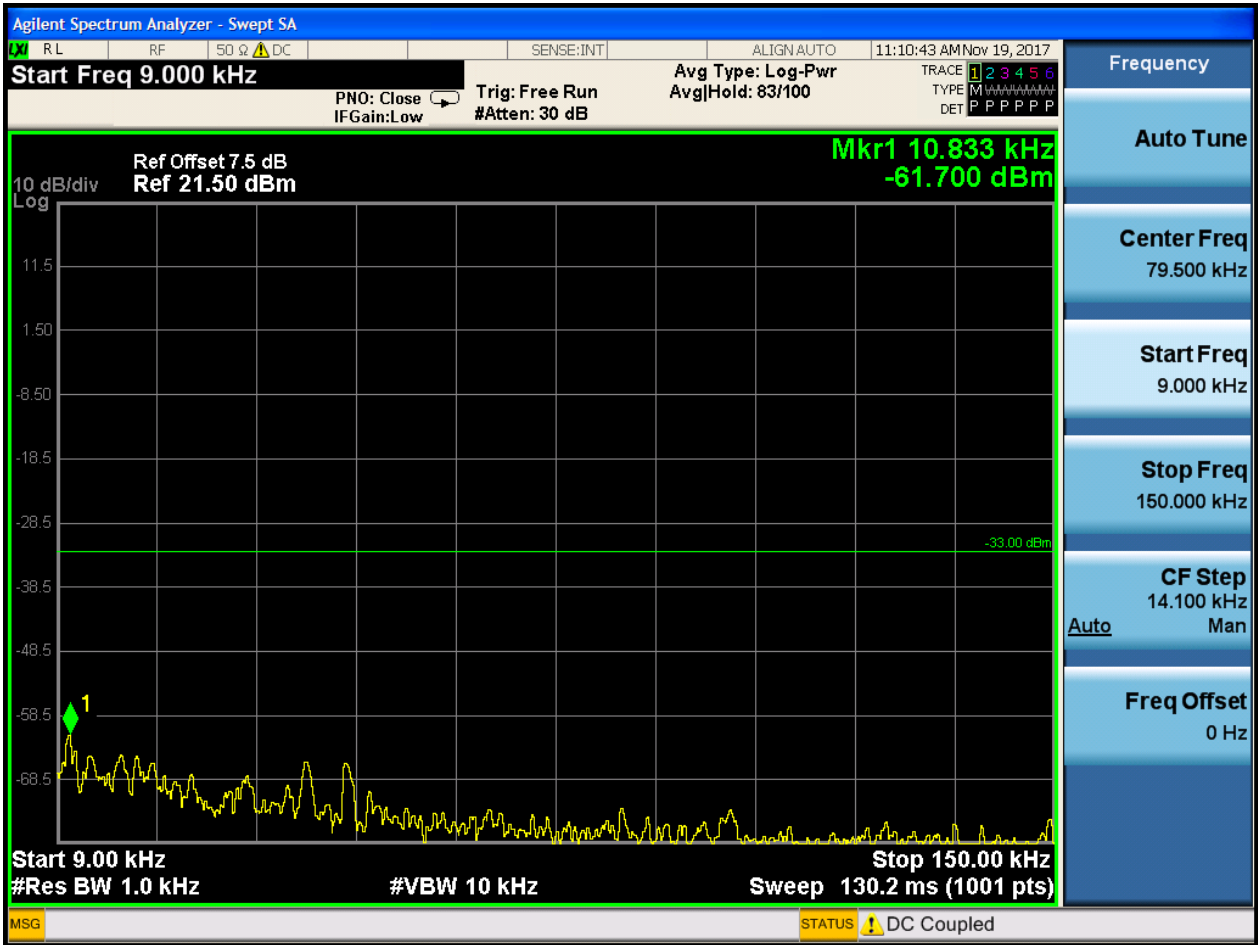


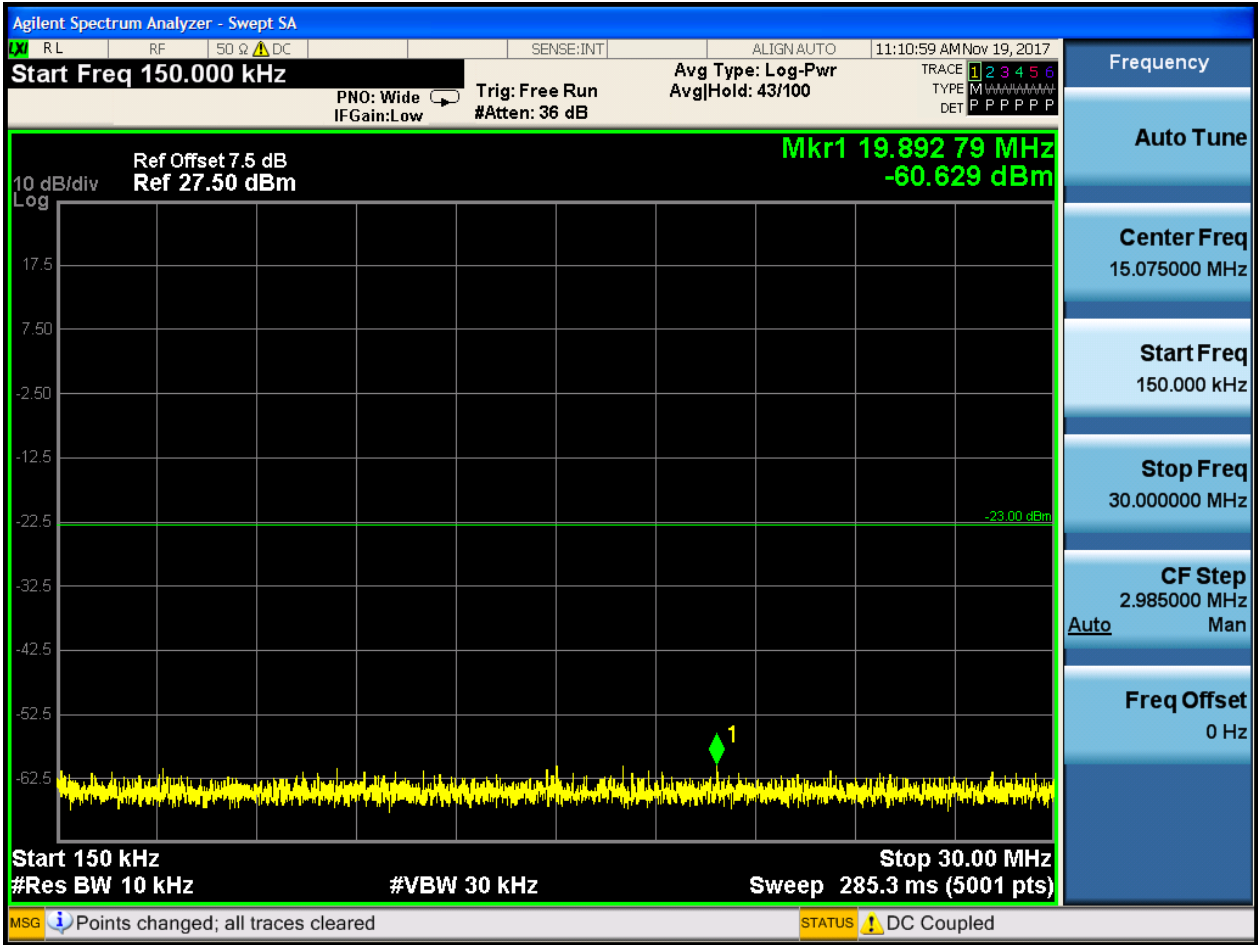




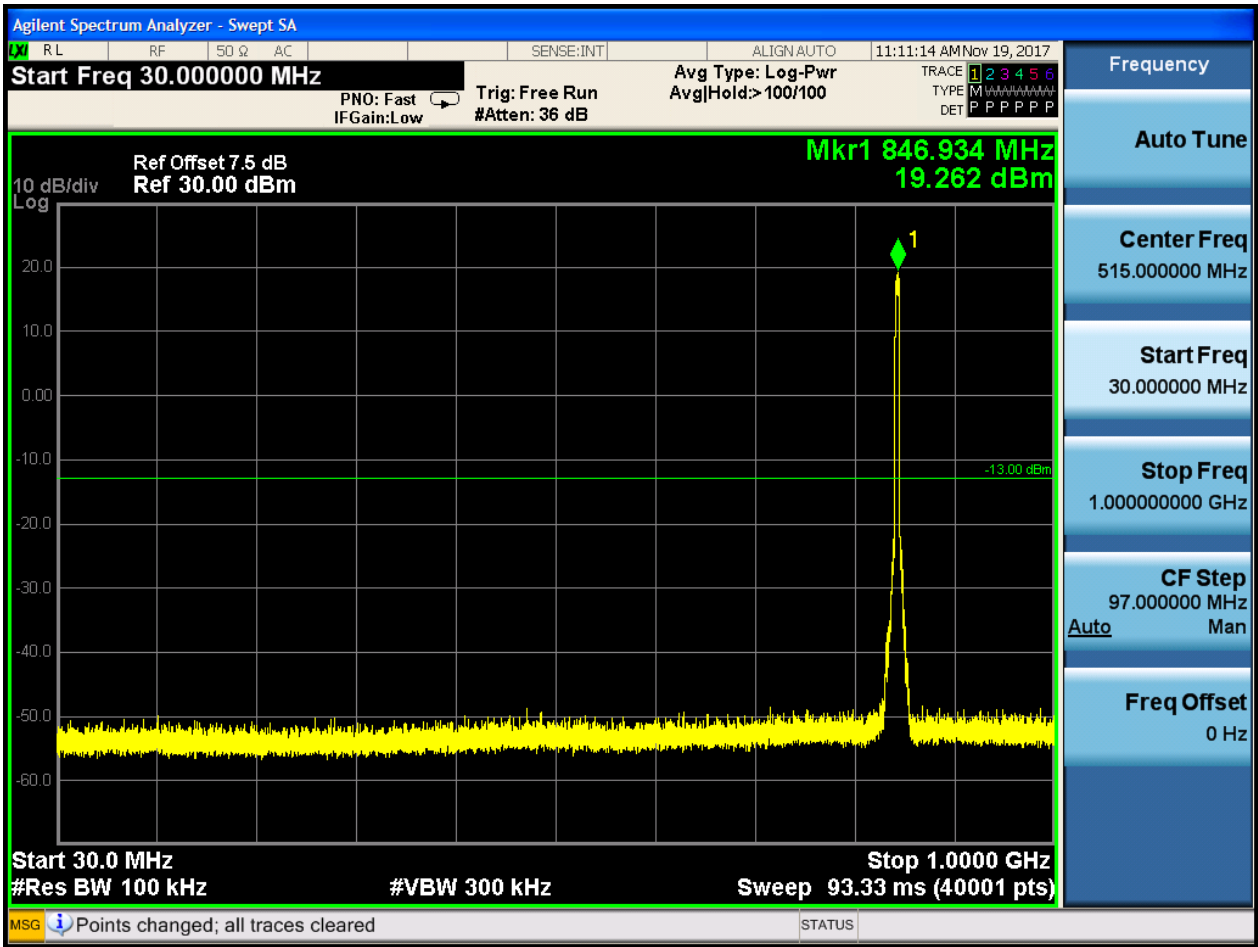


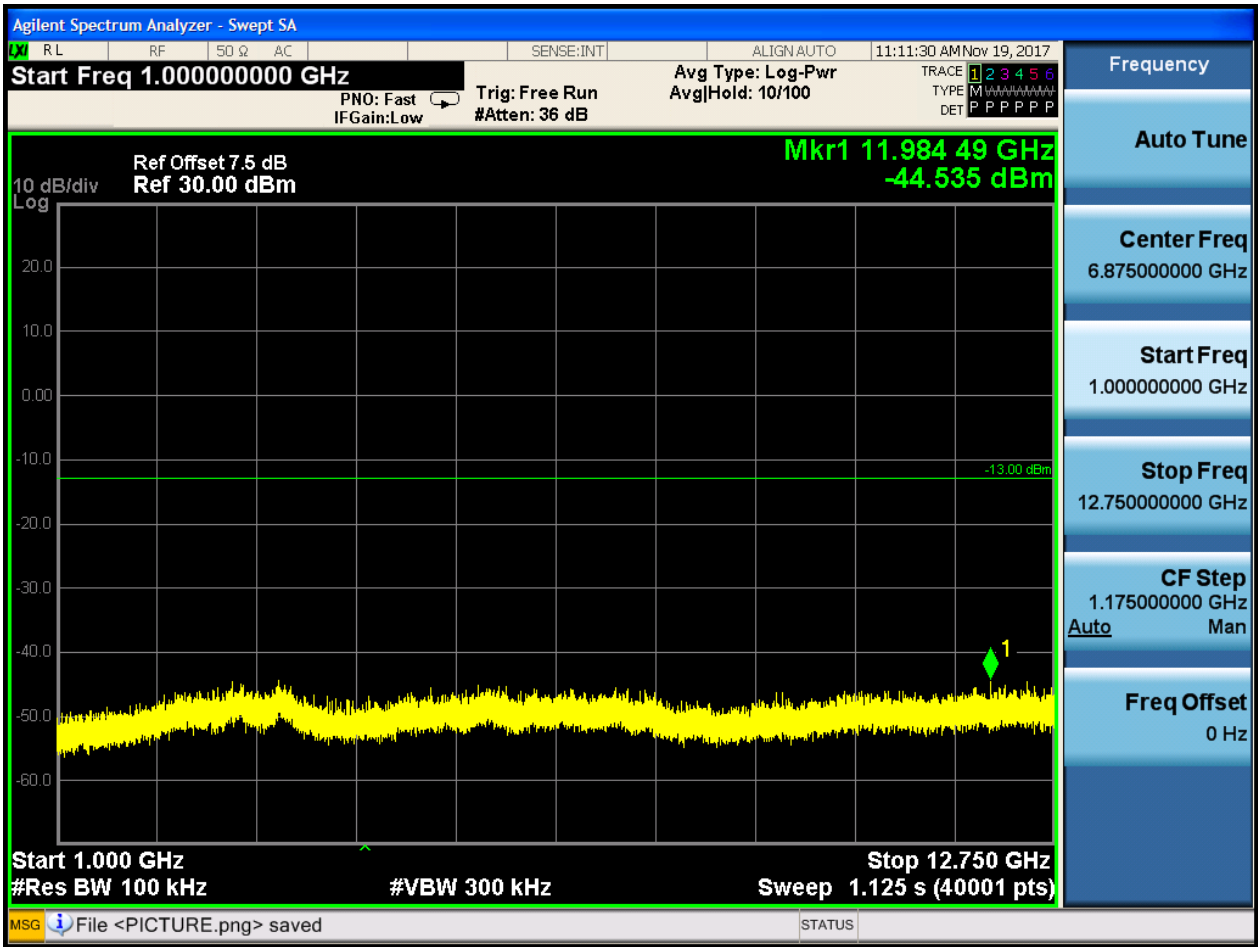
6.1.1.1.3 Test Channel = HCH









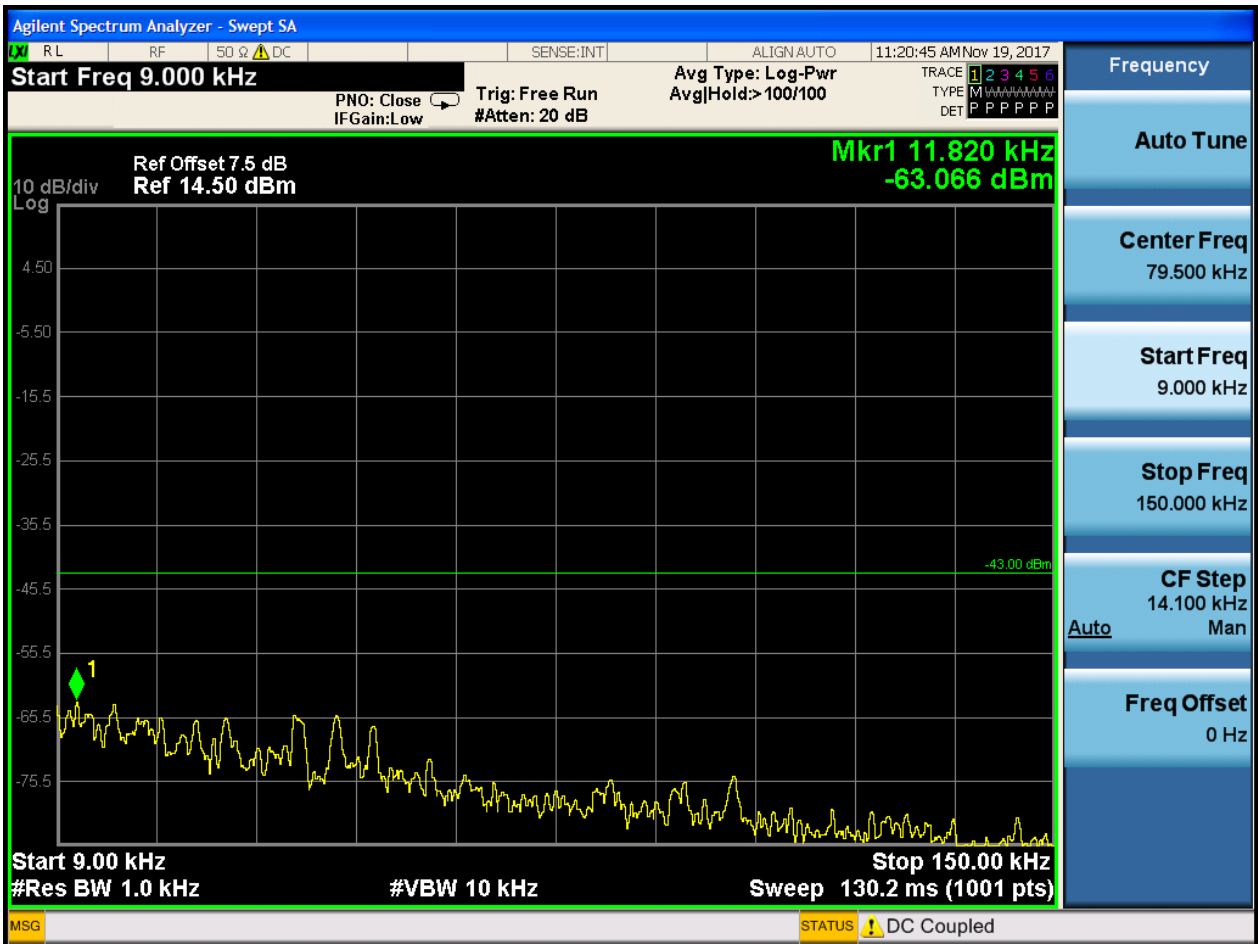


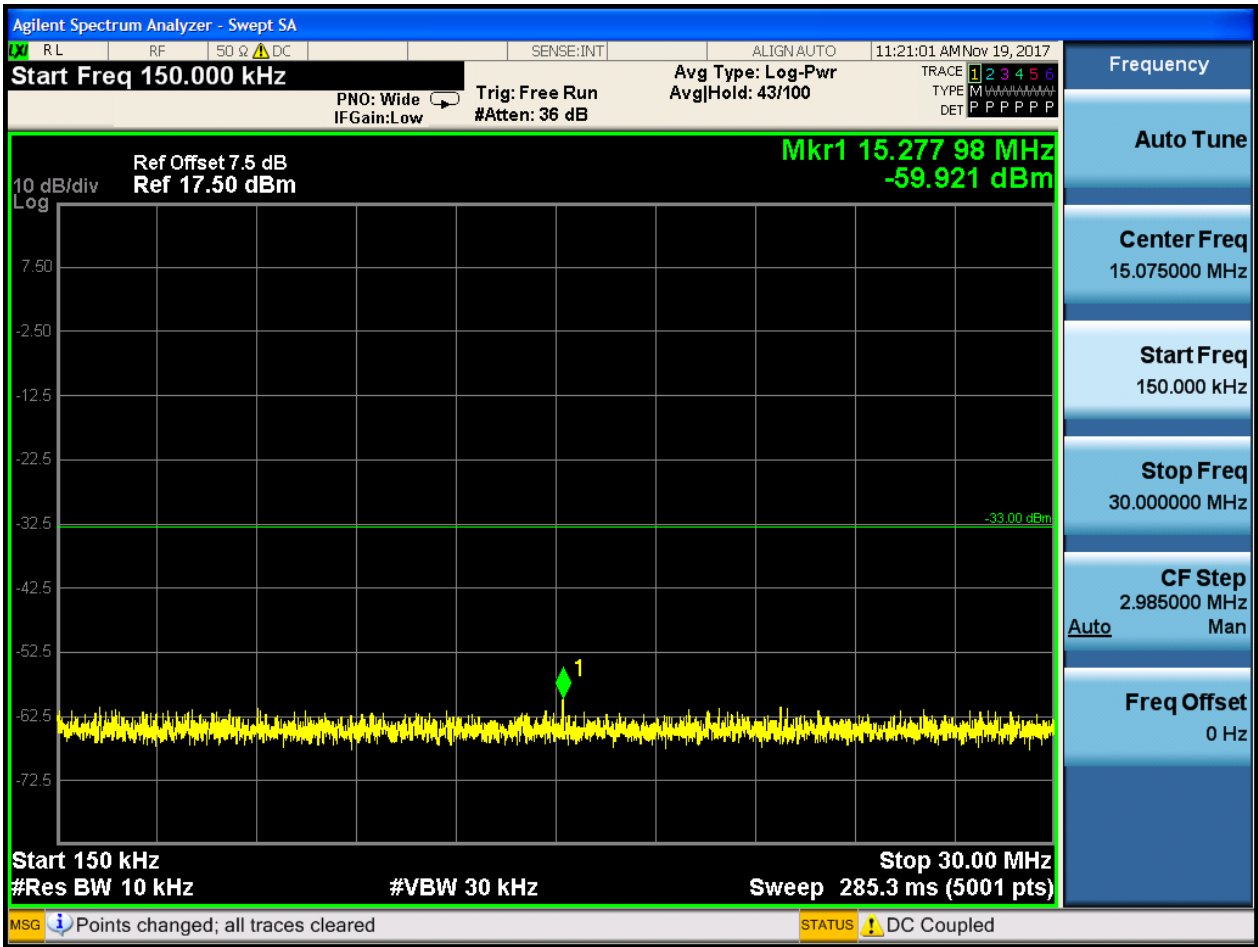


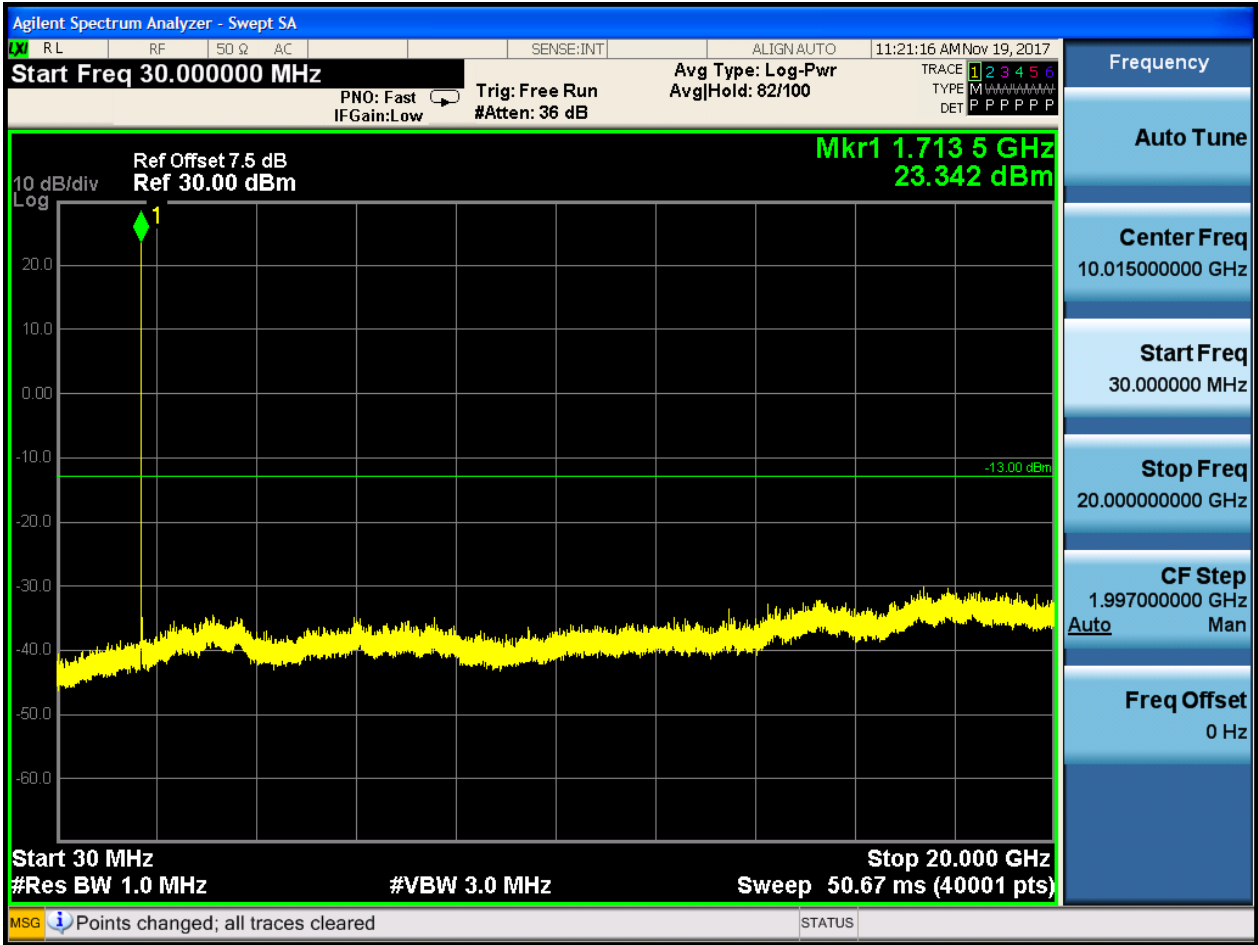
6.1.2 Test Band = WCDMA1700

6.1.2.1 Test Mode = UMTS/TM1

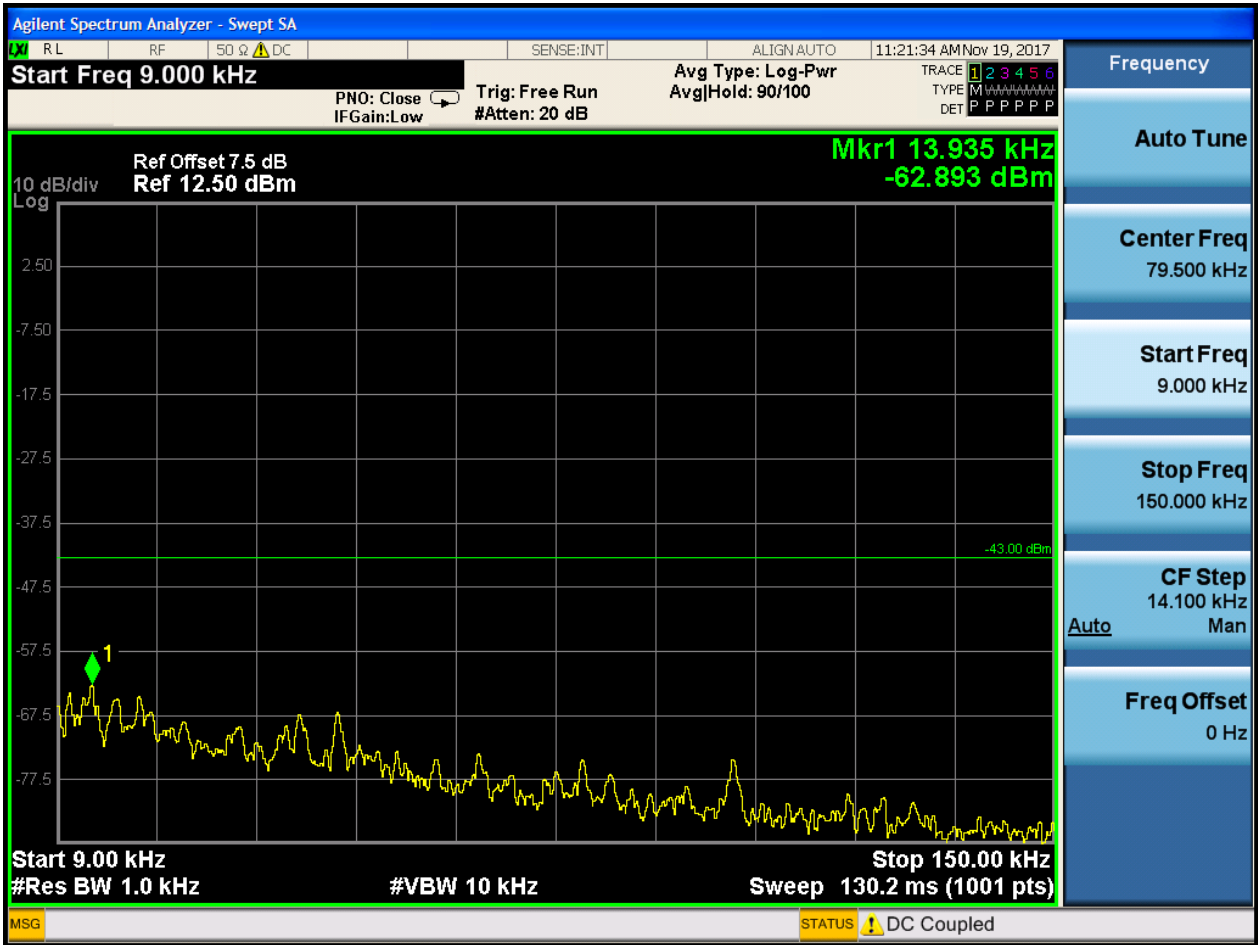
6.1.2.1.1 Test Channel = LCH

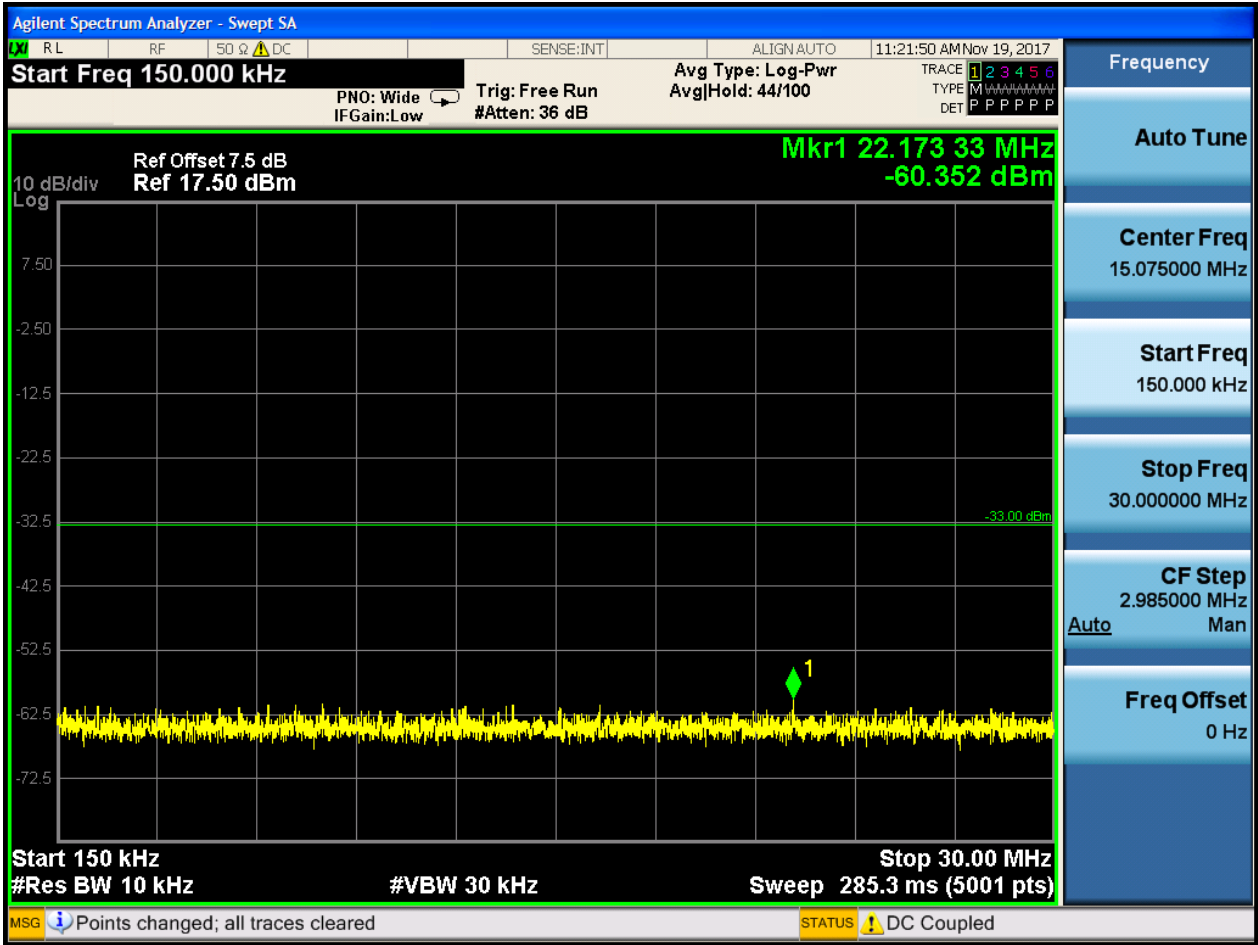






6.1.2.1.2 Test Channel = MCH

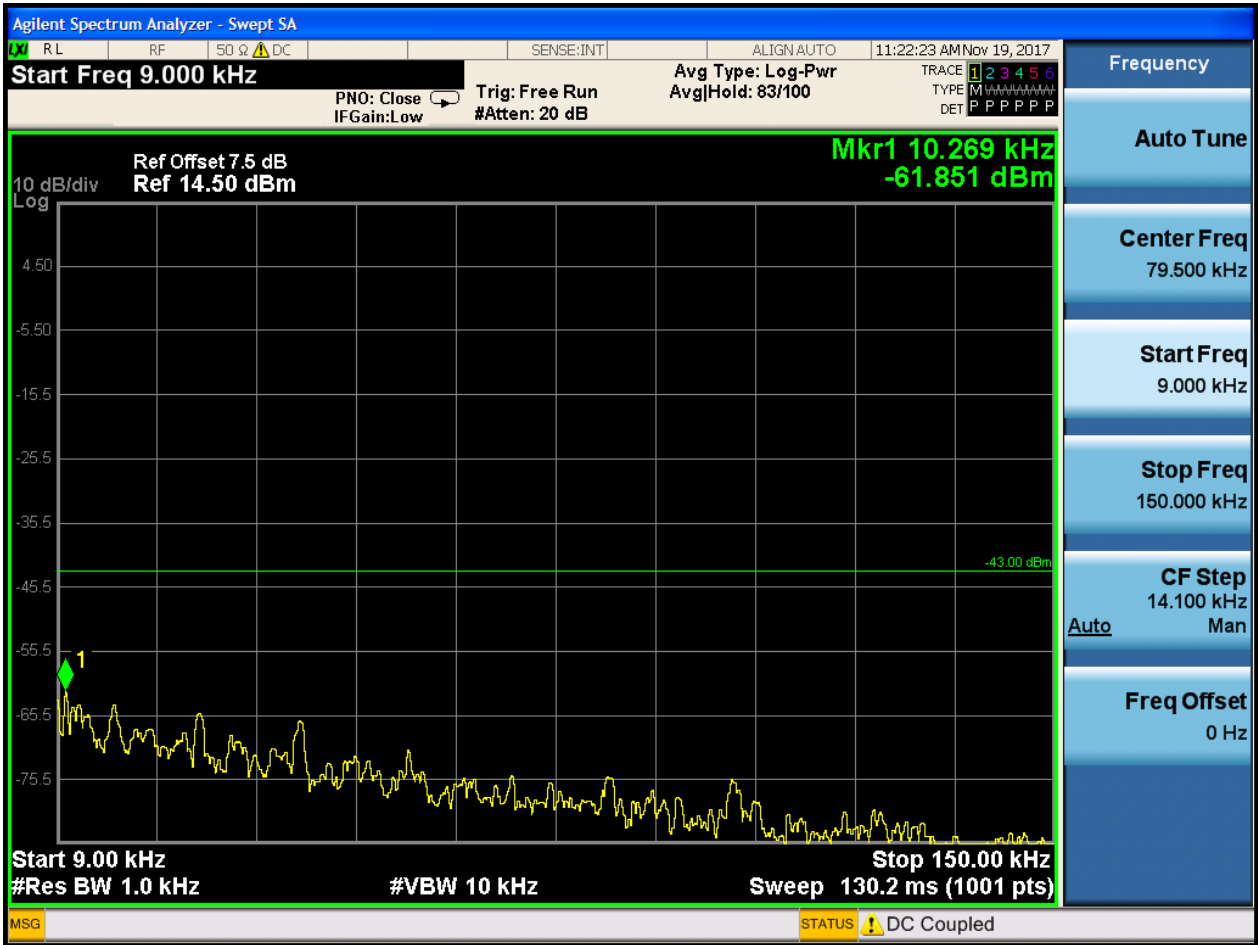


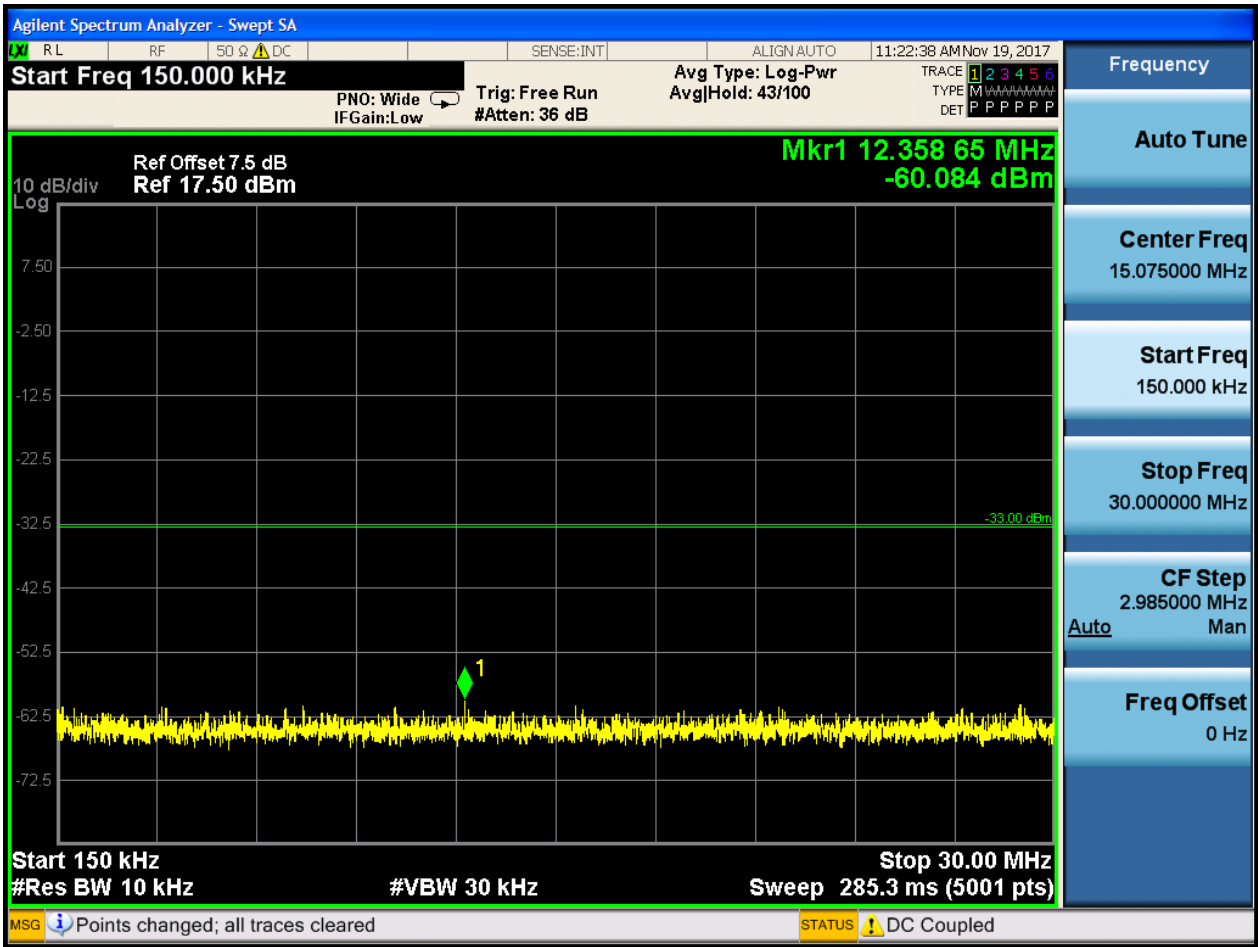






6.1.2.1.3 Test Channel = HCH





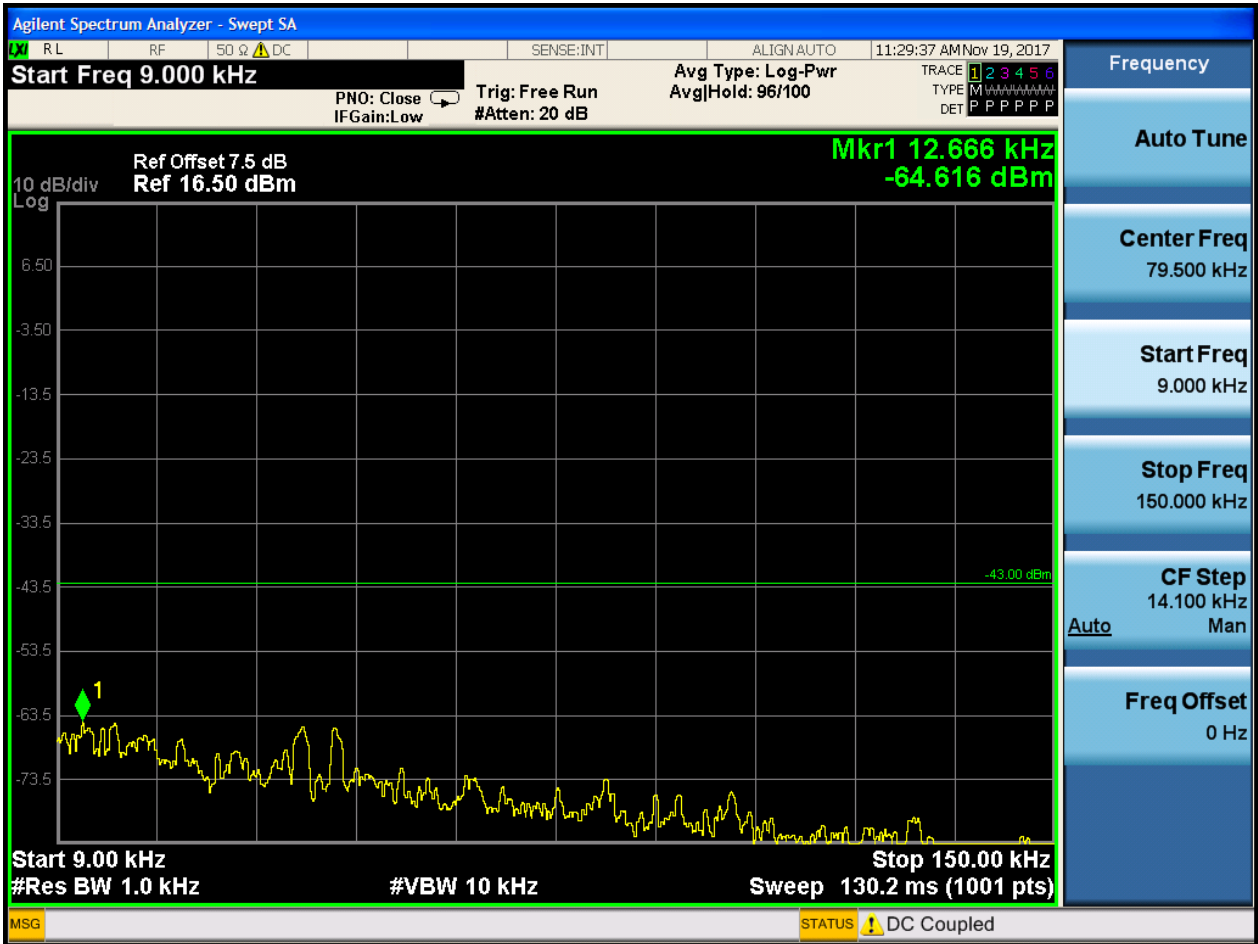


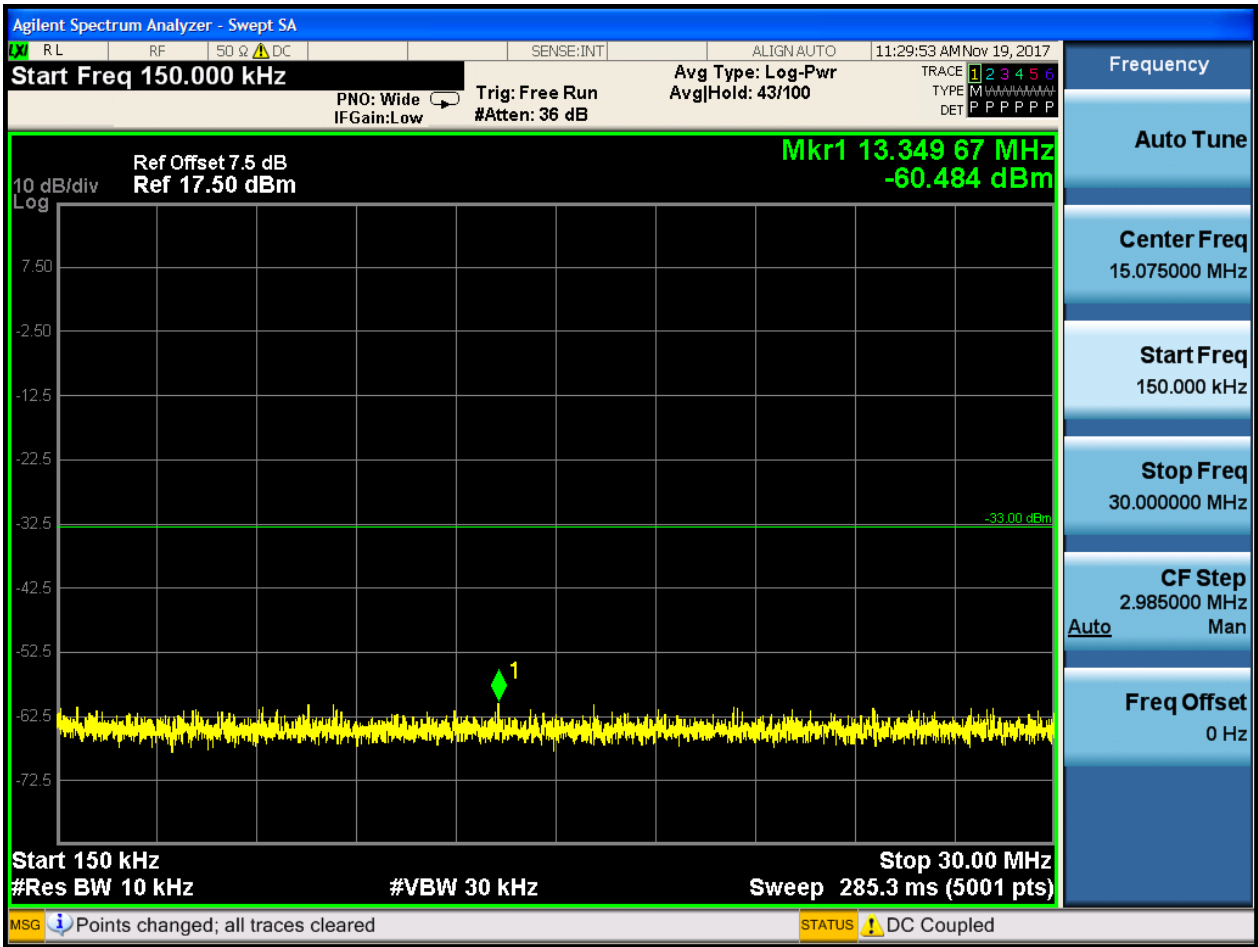


6.1.3 Test Band = WCDMA1900

6.1.3.1 Test Mode = UMTS/TM1

6.1.3.1.1 Test Channel = LCH

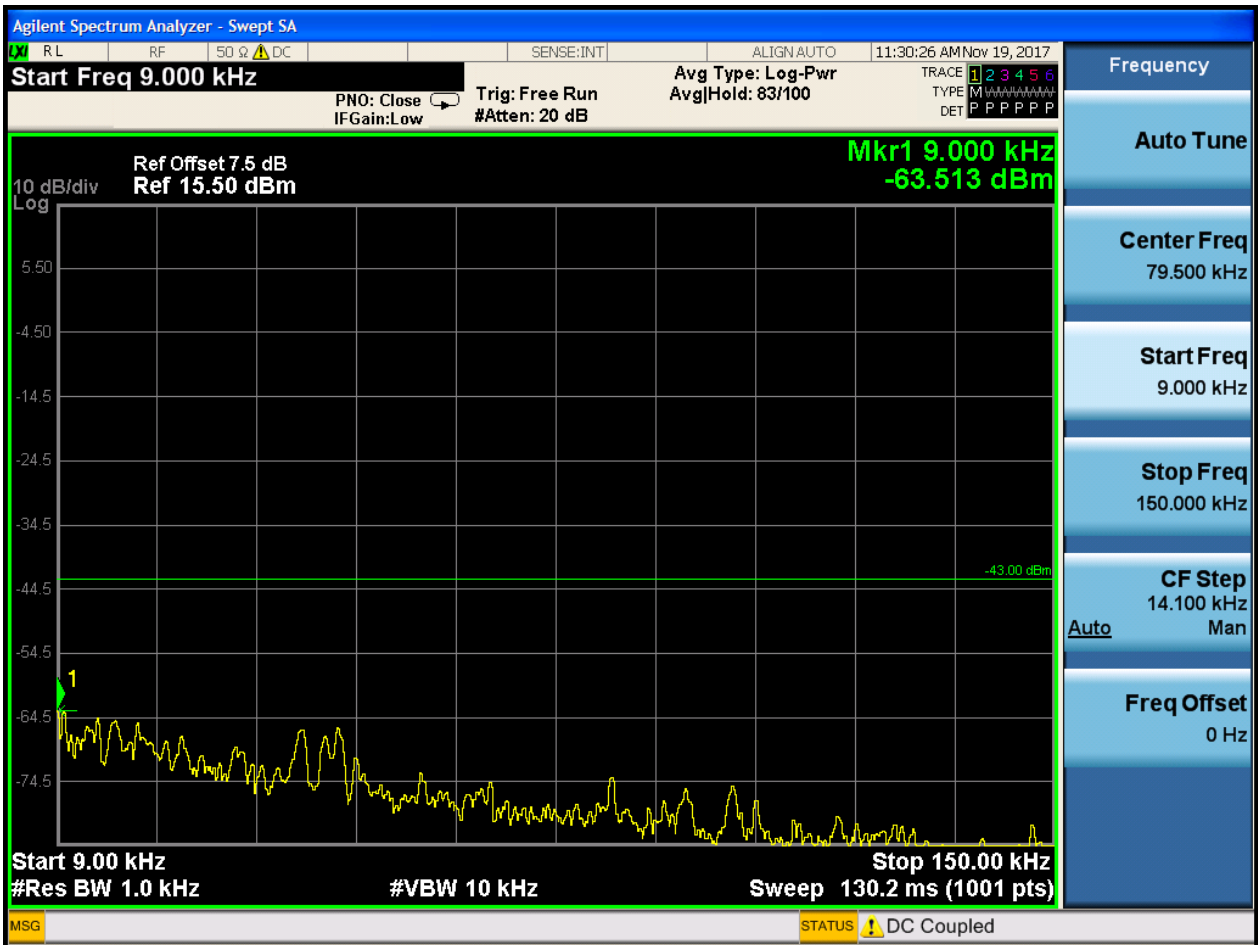


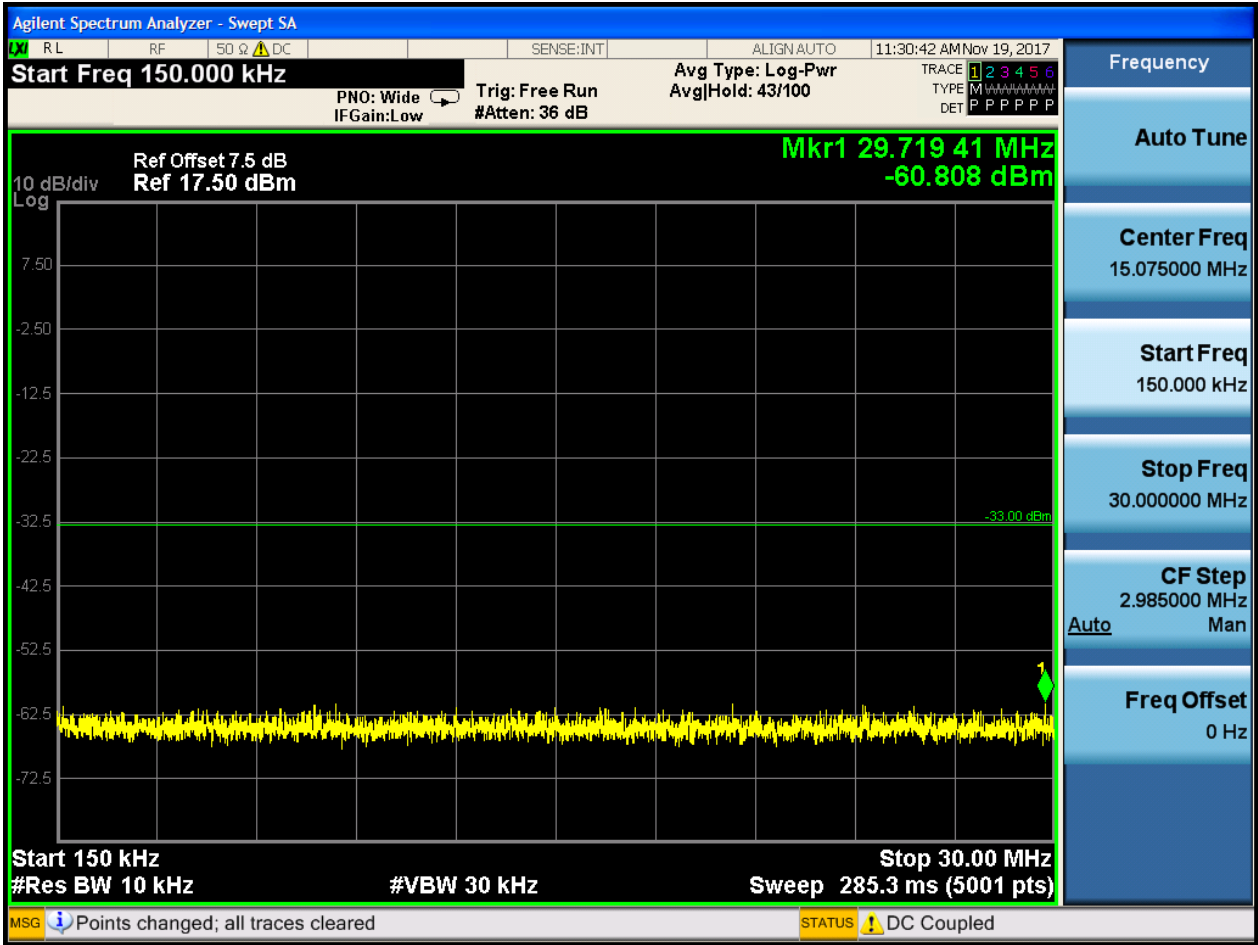






6.1.3.1.2 Test Channel = MCH



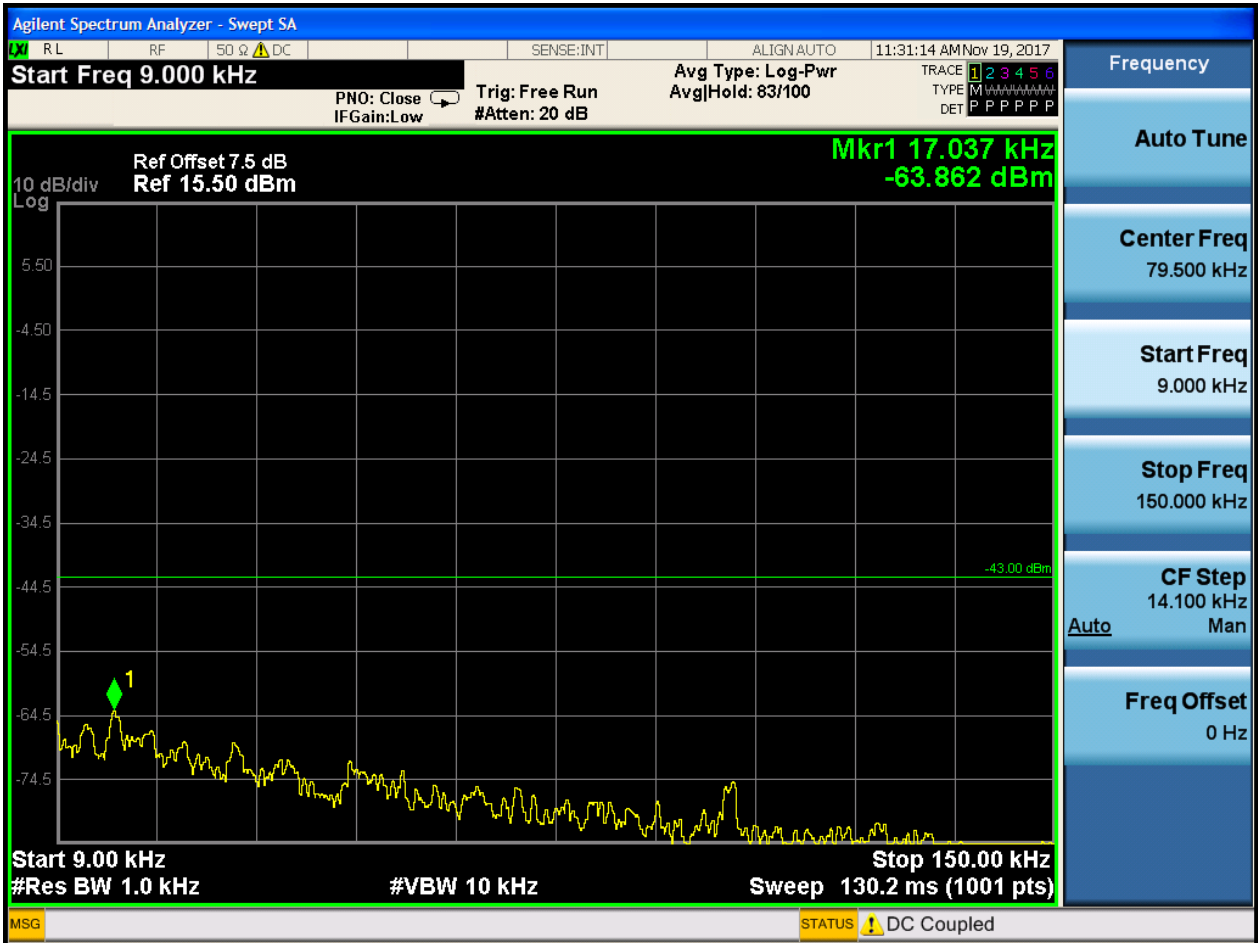


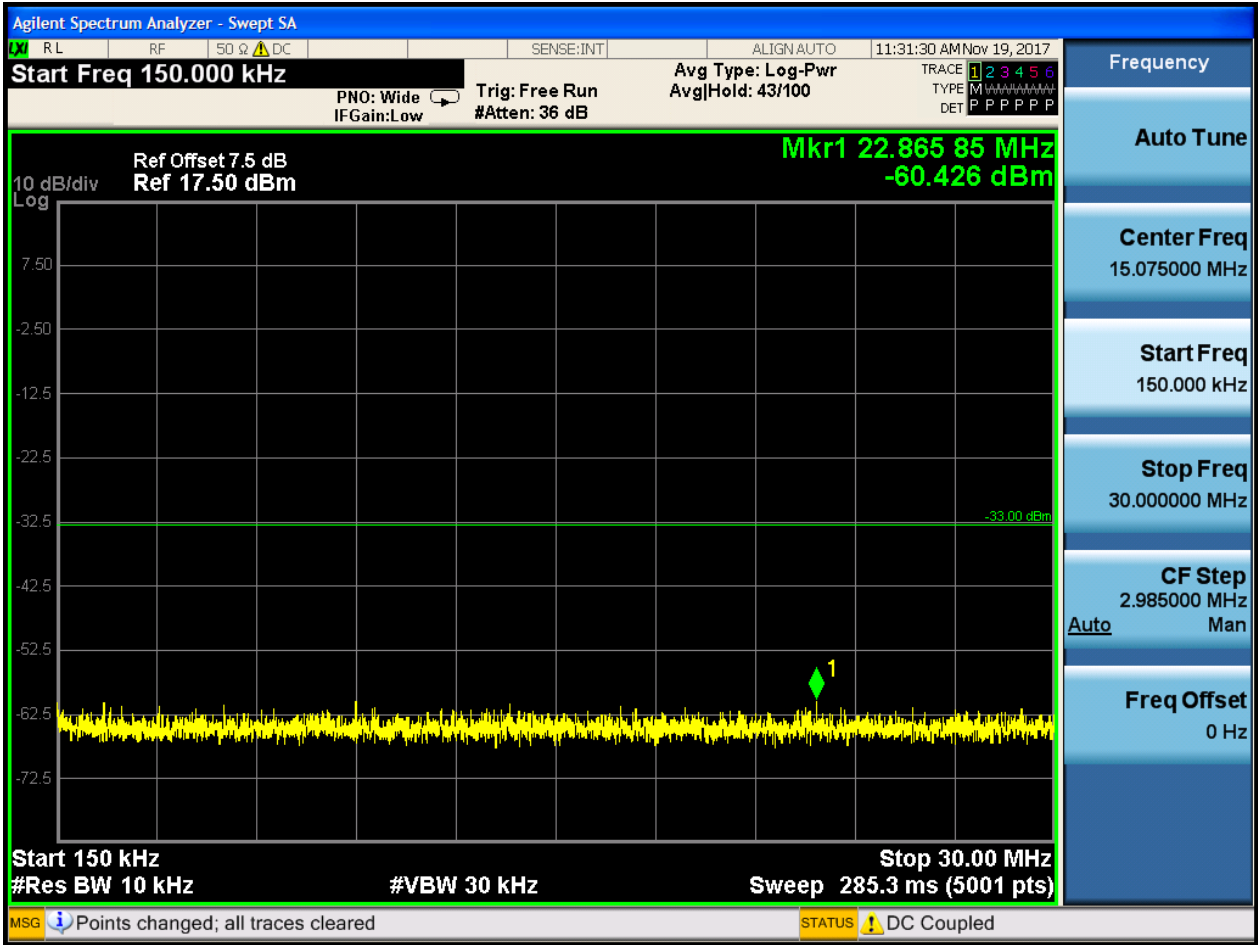






6.1.3.1.3 Test Channel = HCH







## 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

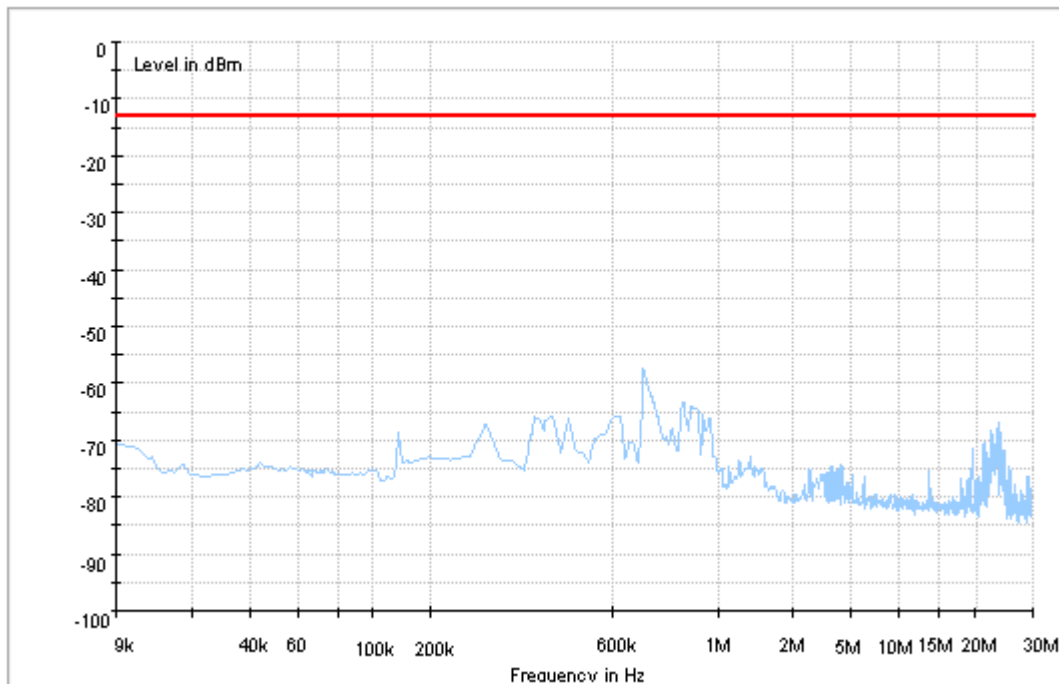
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

### Part I - Test Plots

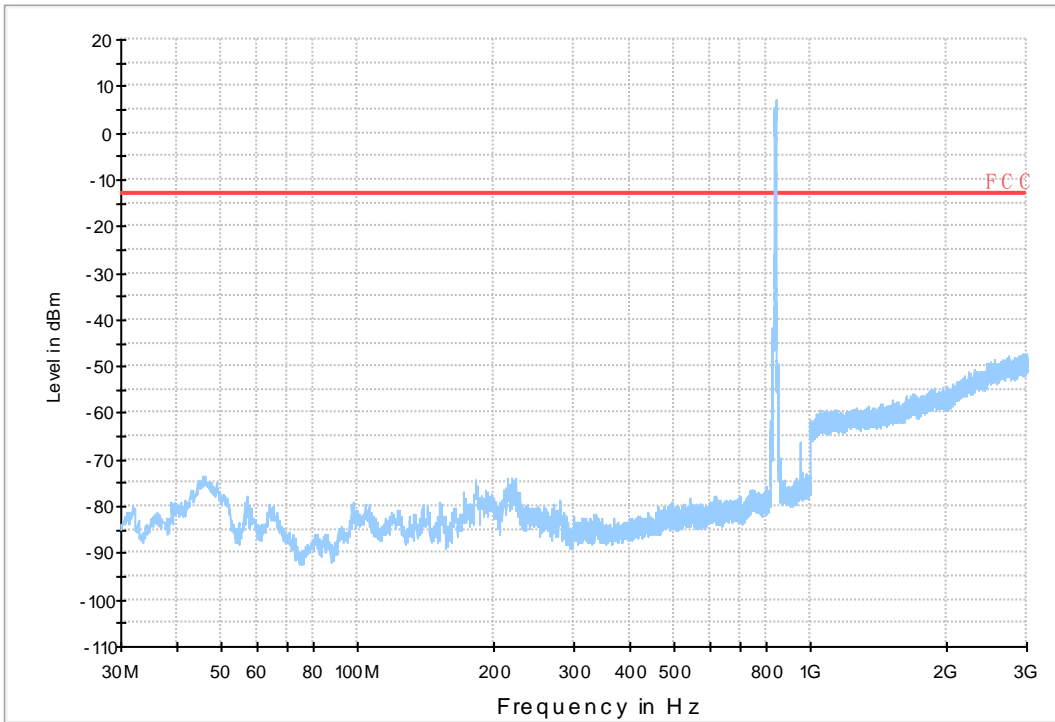
#### 7.1 For UMTS

##### 7.1.1 Test Band = WCDMA850\_ANT1

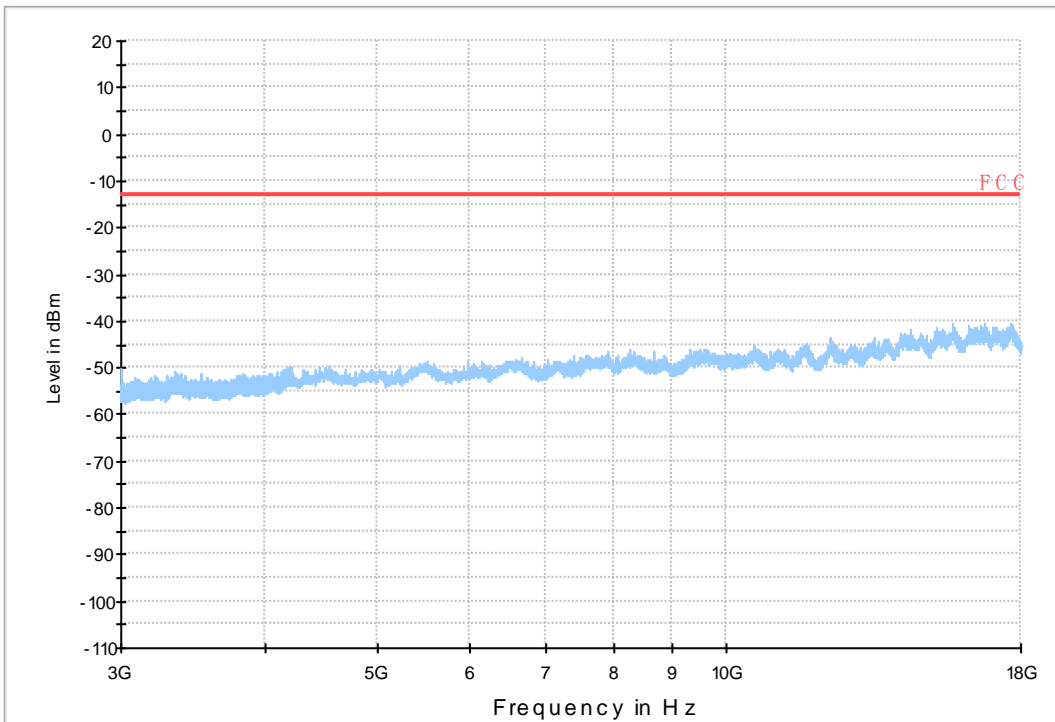
##### 7.1.1.1 Test Mode = UMTS/TM1



Copy of FCC PART22 W CDMA850\_L

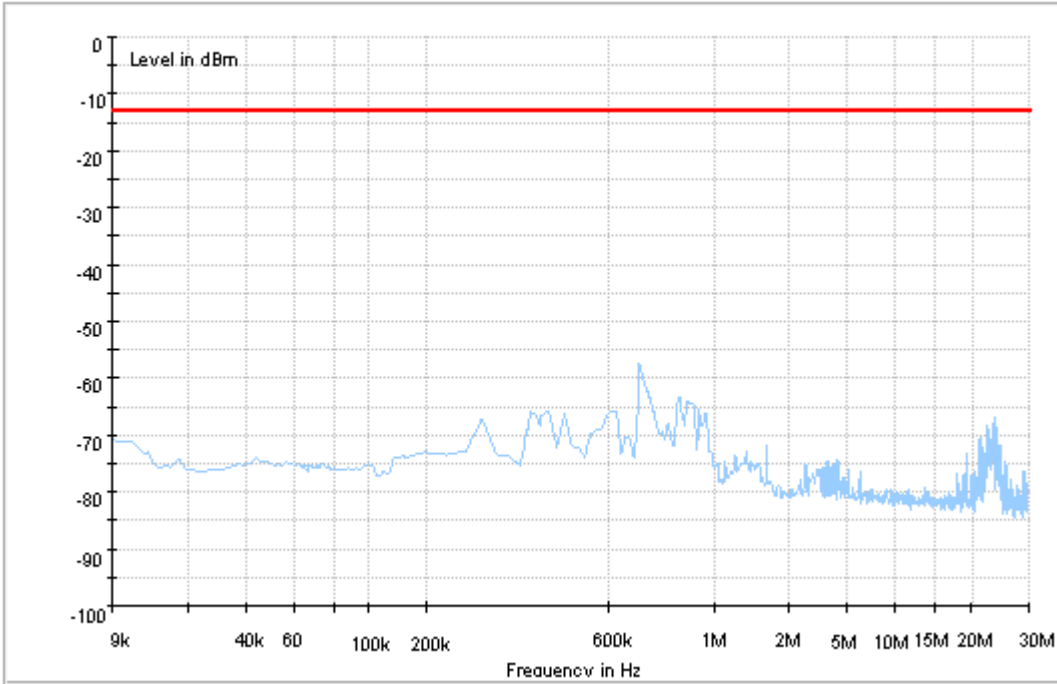


Copy of FCC PART22 W CDMA850\_H

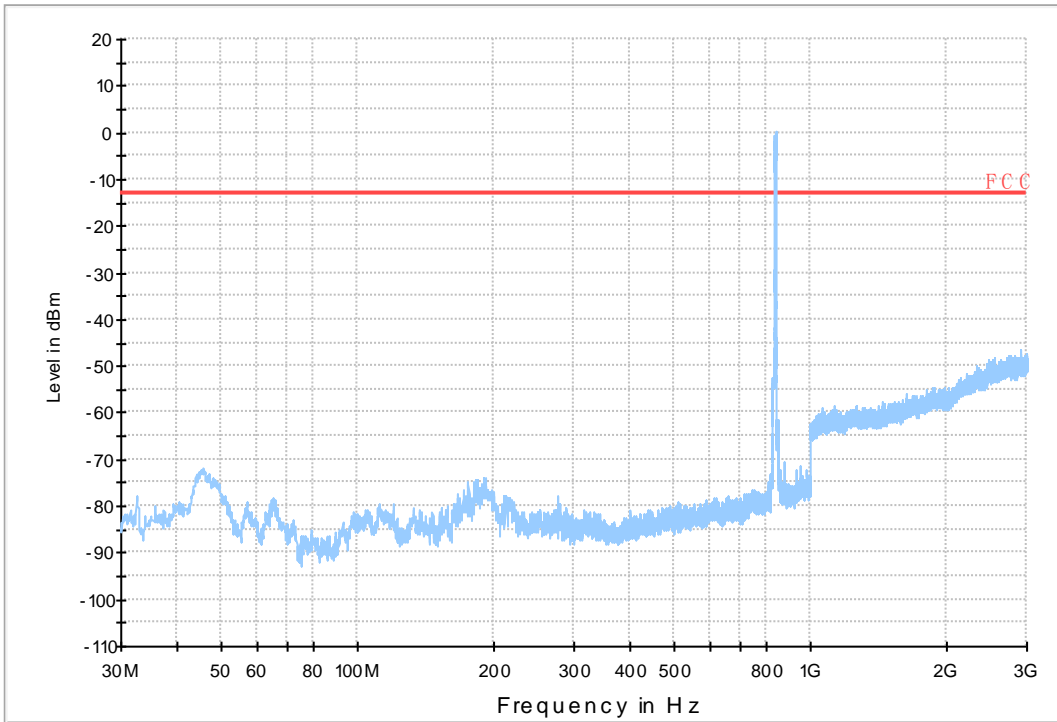


### 7.1.2 Test Band = WCDMA850\_ANT2

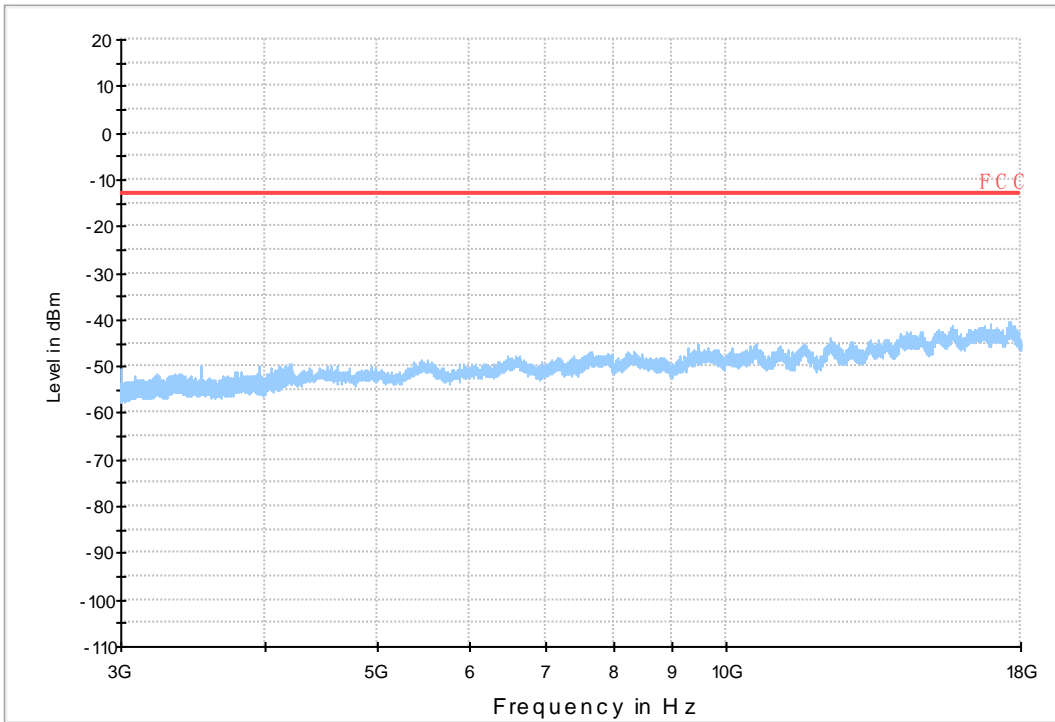
#### 7.1.2.1 Test Mode = UMTS/TM1



Copy of FCC PART22 W CDMA850\_L

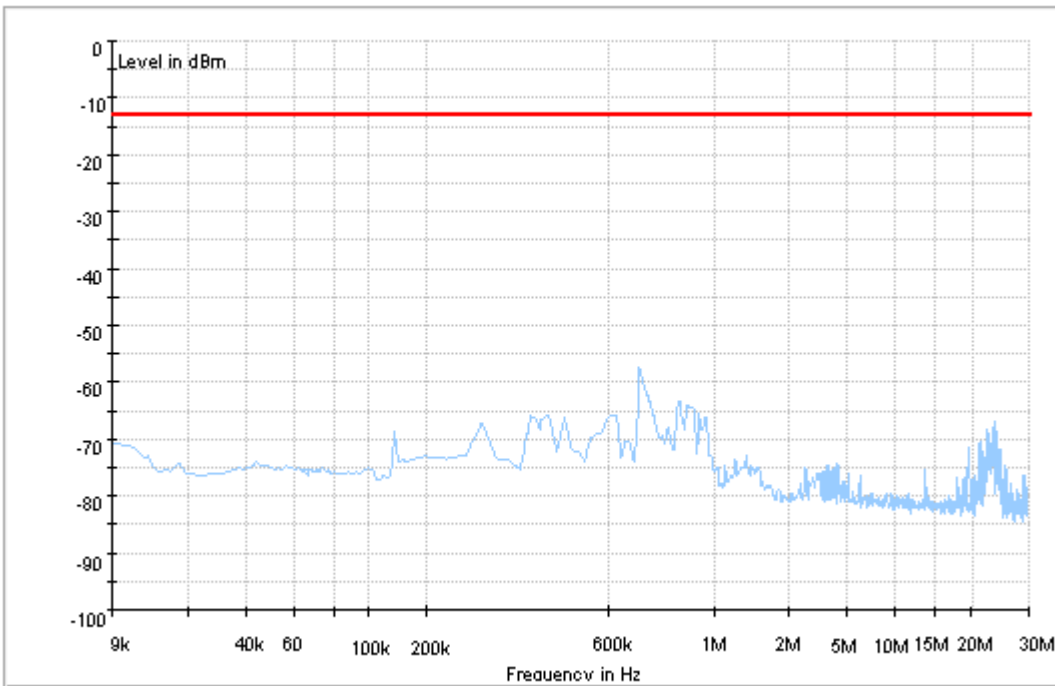


Copy of FCC PART22 W CDMA850\_H



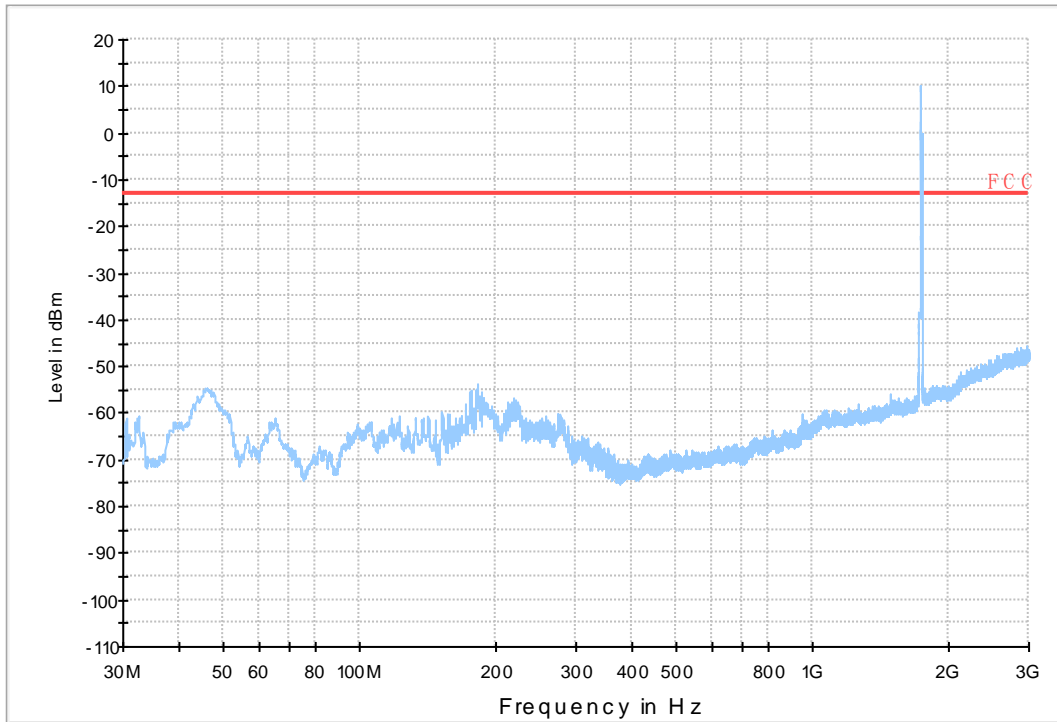
7.1.3 Test Band = WCDMA1700\_ANT1

7.1.3.1 Test Mode = UMTS/TM1

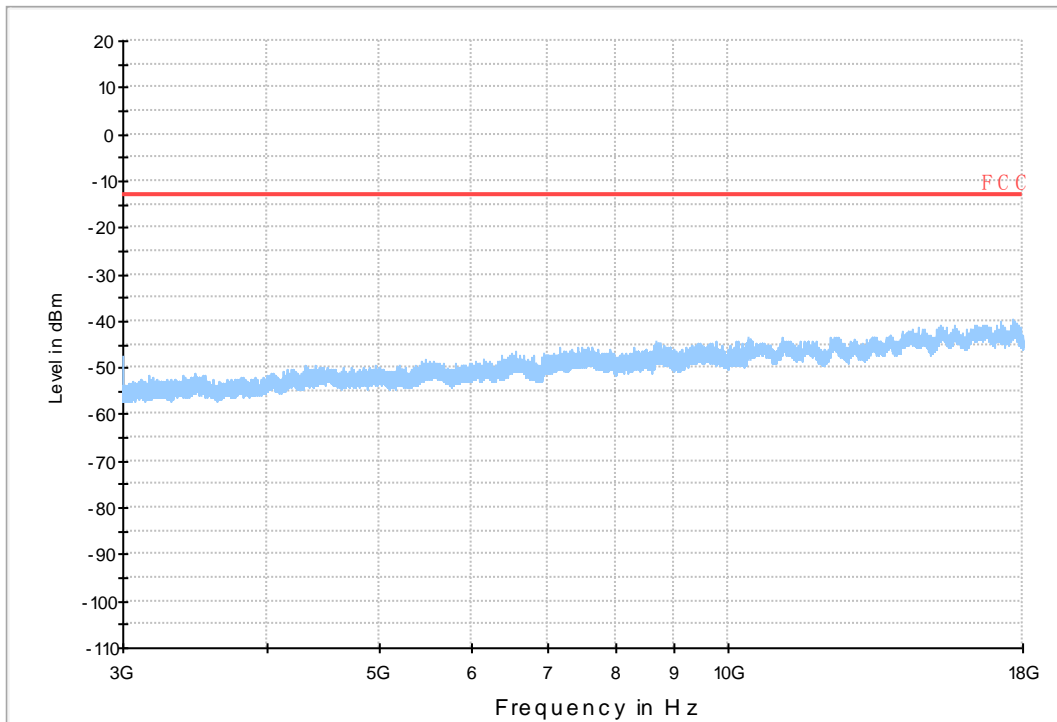




Copy of FCC PART27 W CDMA1700\_L

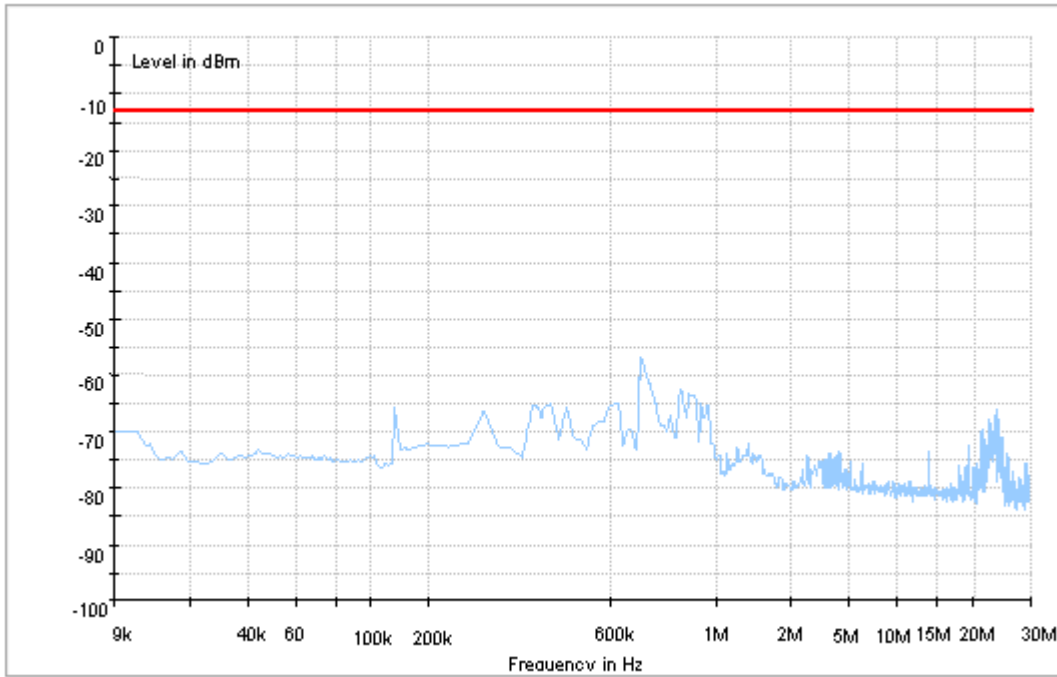


Copy of FCC PART27 W CDMA1700\_H

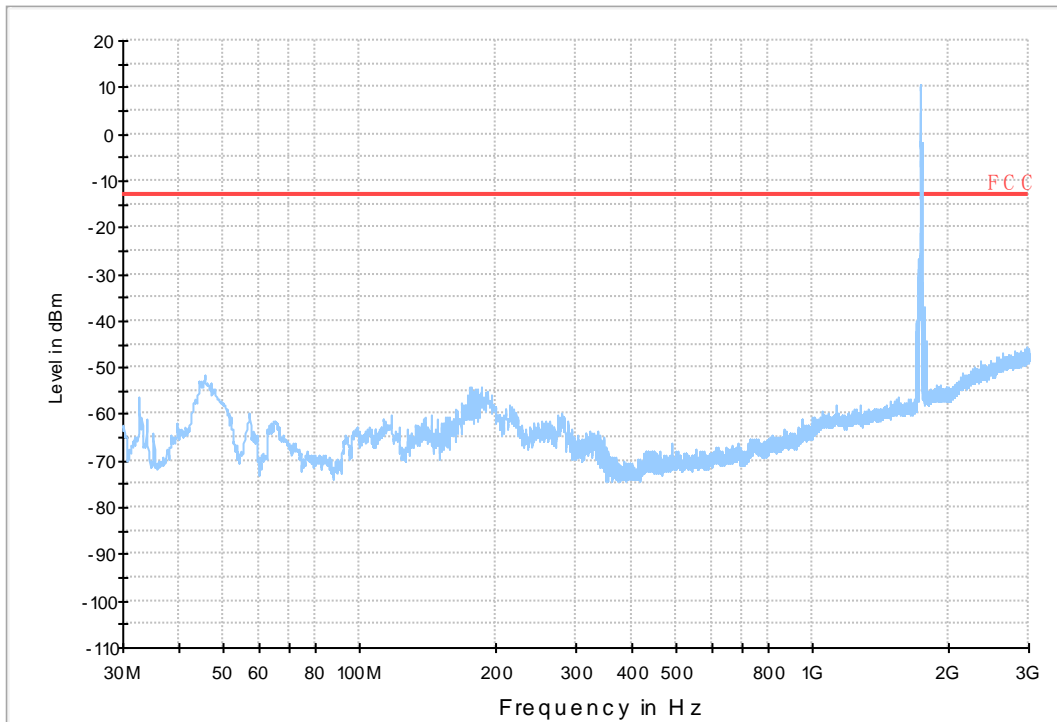


**7.1.4 Test Band = WCDMA1700\_ANT2**

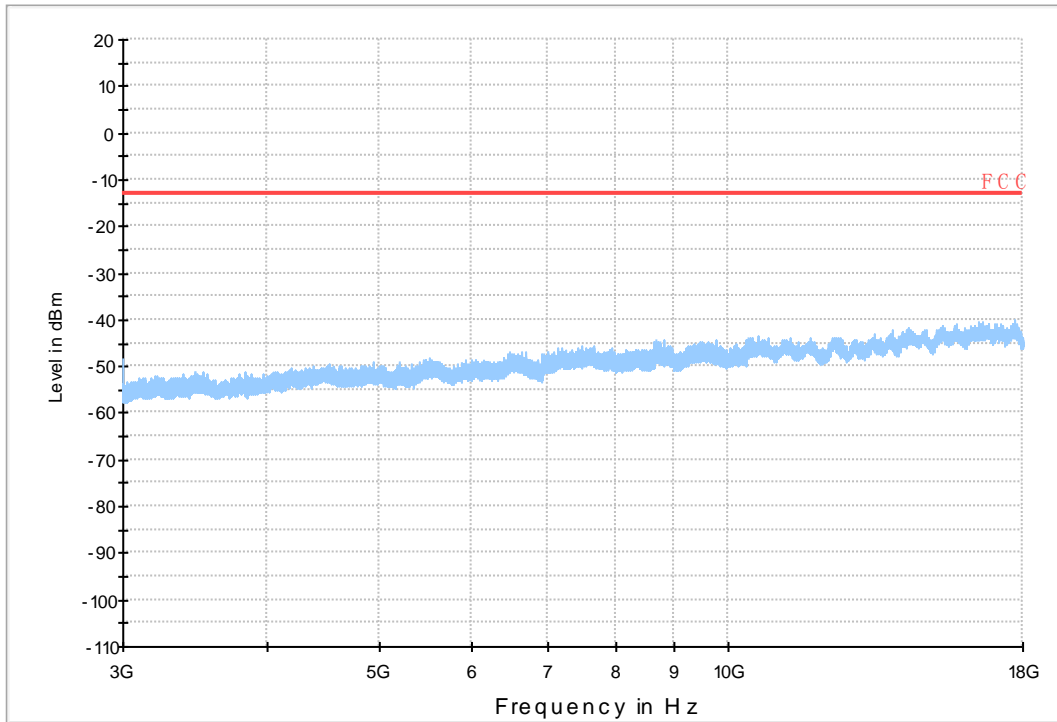
**7.1.4.1 Test Mode = UMTS/TM1**



Copy of FCC PART 27 W CDMA1700\_L

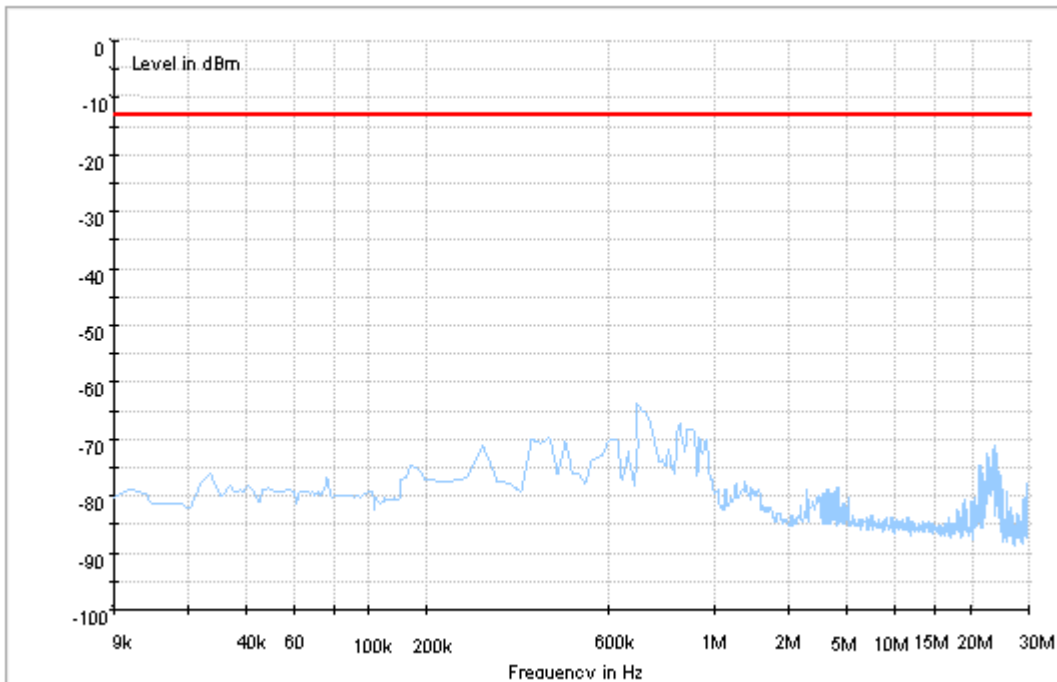


Copy of FCC PART27 W CDMA1700\_H

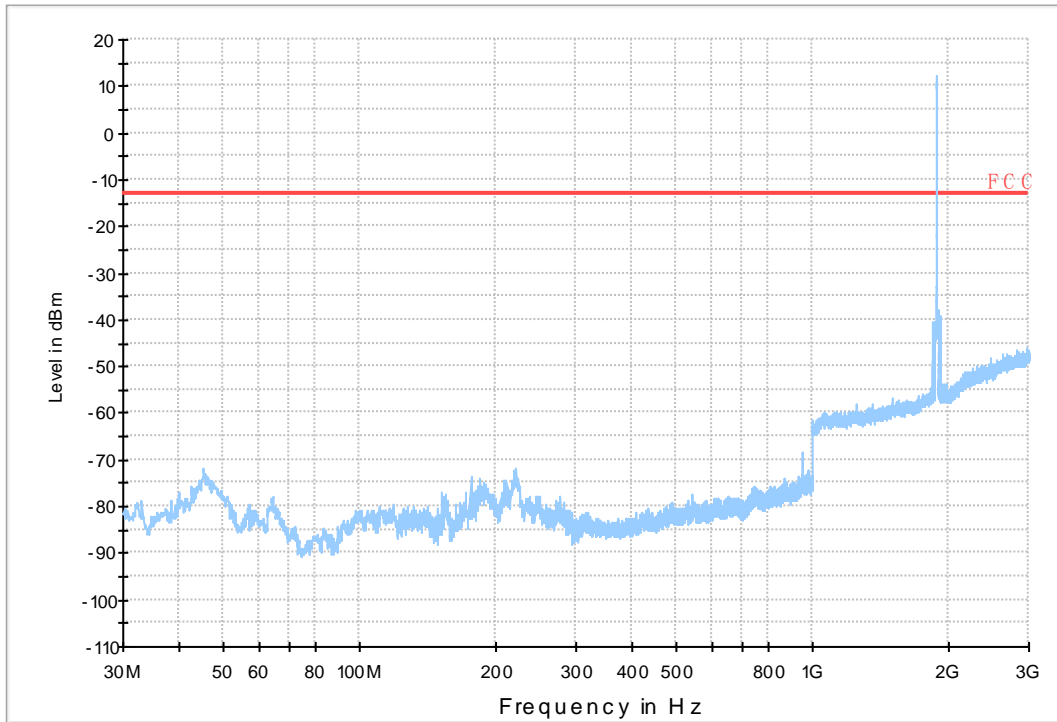


7.1.5 Test Band = WCDMA1900\_ANT1

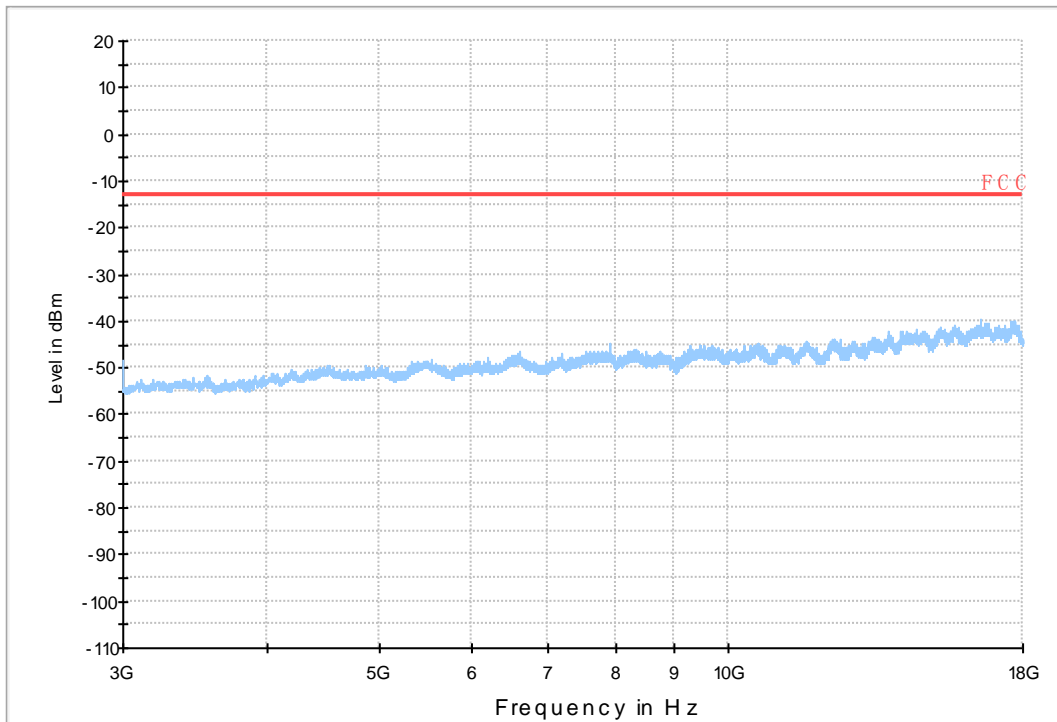
7.1.5.1 Test Mode = UMTS/TM1

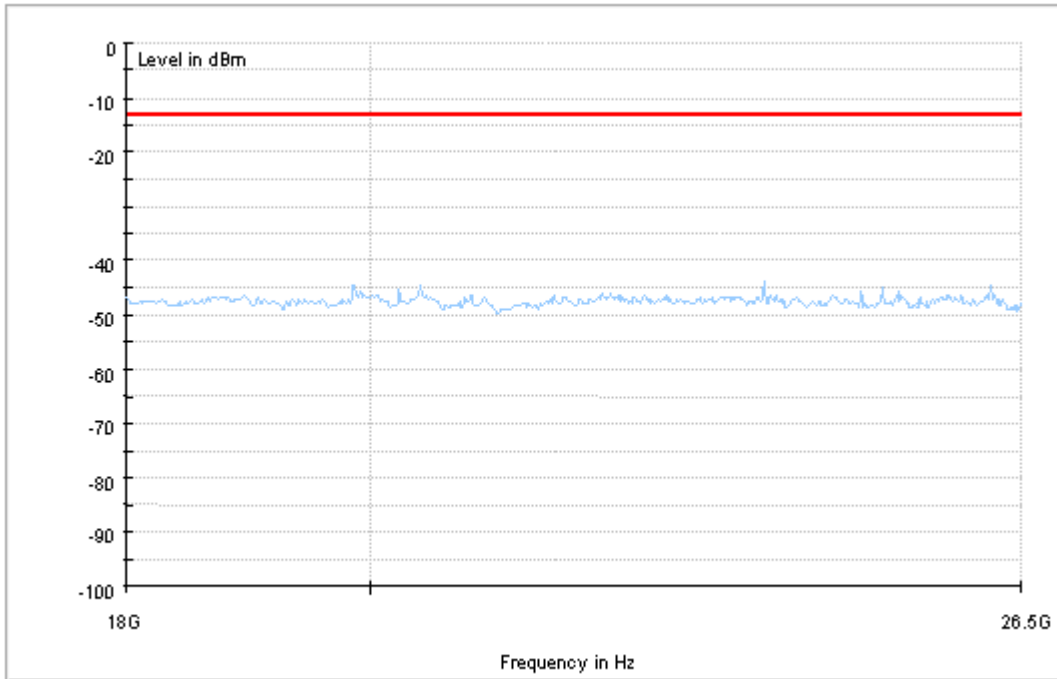


Copy of FCC PART24 W CDMA1900\_L



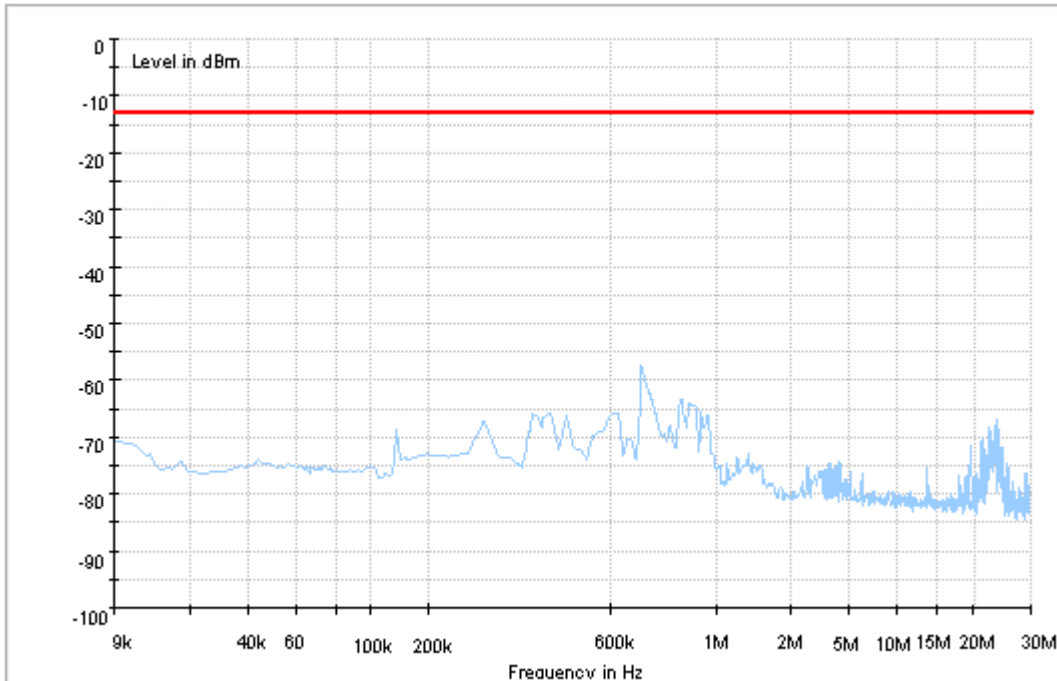
Copy of FCC PART24 W CDMA1900\_H



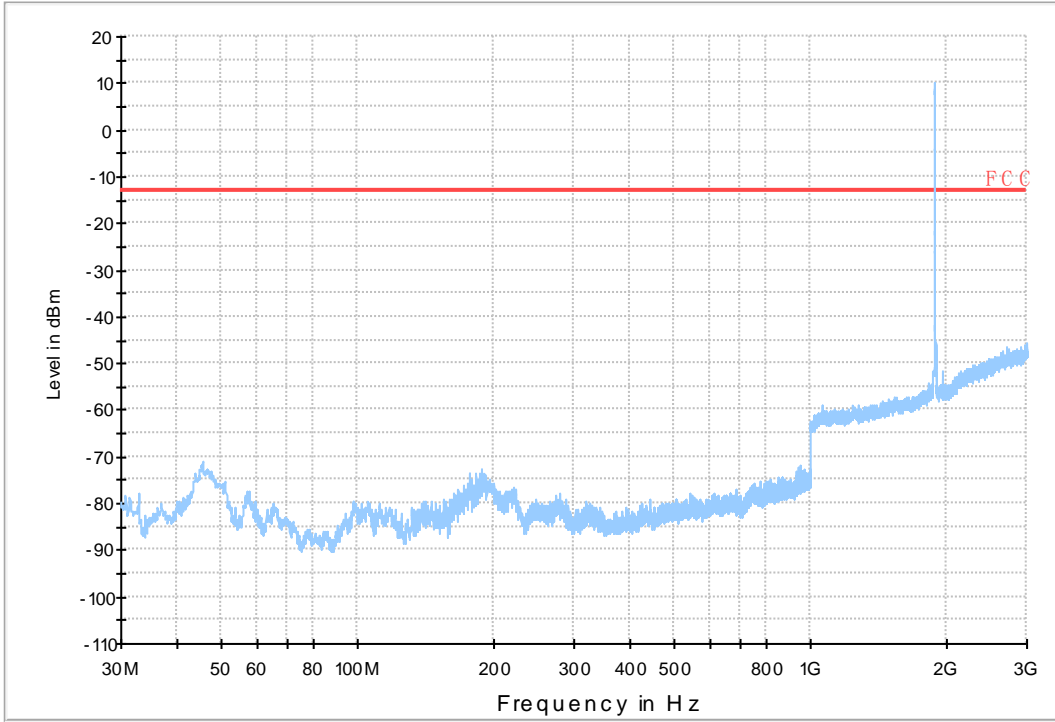


**7.1.6 Test Band = WCDMA1900\_ANT2**

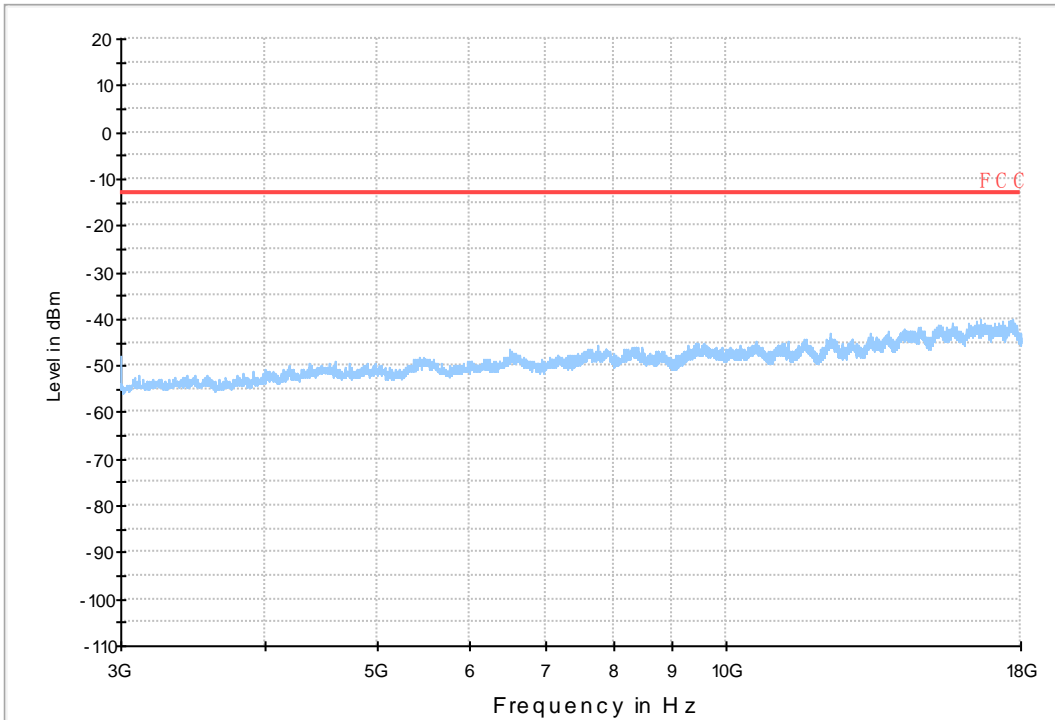
**7.1.6.1 Test Mode = UMTS/TM1**

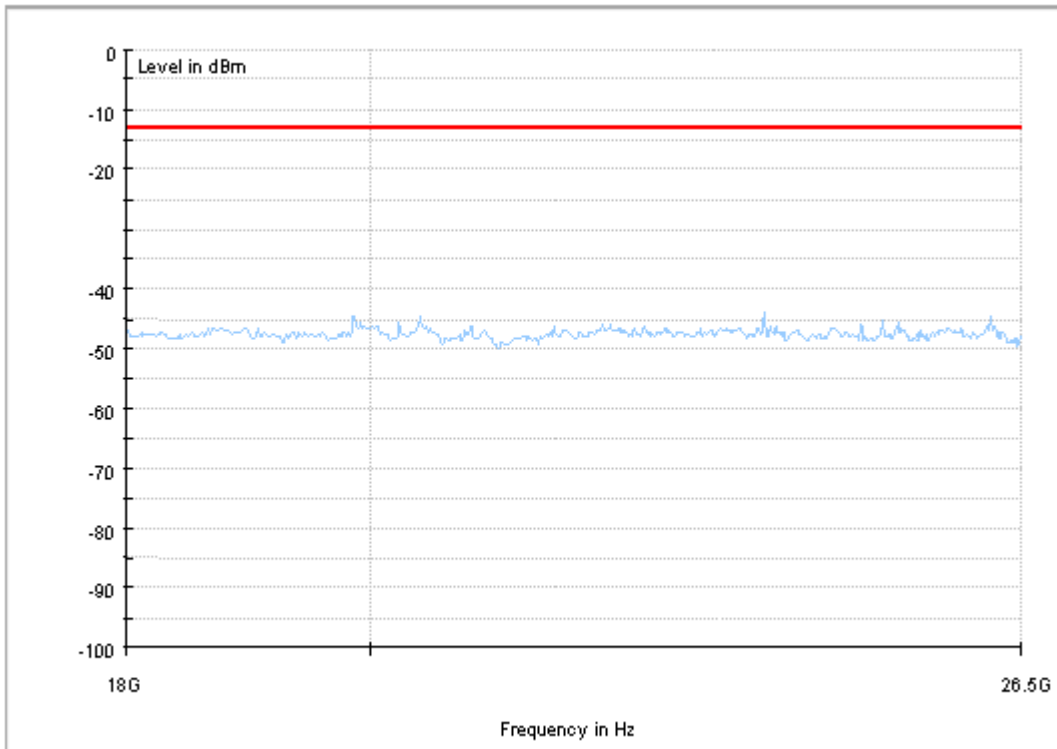


Copy of FCC PART24 W CDMA1900\_L



Copy of FCC PART24 W CDMA1900\_H





## 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	-2.98	-0.00361	PASS
				VN	-0.27	-0.00033	PASS
				VH	3.31	0.00401	PASS
		MCH	TN	VL	4.61	0.00551	PASS
				VN	3.23	0.00386	PASS
				VH	0.02	0.00002	PASS
		HCH	TN	VL	1.19	0.00141	PASS
				VN	1.63	0.00193	PASS
				VH	0.47	0.00056	PASS
WCDMA1700	UMTS/TM1	LCH	TN	VL	-3.37	-0.00197	PASS
				VN	1.17	0.00068	PASS
				VH	3.17	0.00185	PASS
		MCH	TN	VL	0.98	0.00057	PASS
				VN	11.31	0.00653	PASS
				VH	-0.5	-0.00029	PASS
		HCH	TN	VL	2.55	0.00145	PASS
				VN	6.35	0.00362	PASS
				VH	-5.19	-0.00296	PASS
WCDMA1900	UMTS/TM1	LCH	TN	VL	0.76	0.00041	PASS
				VN	2.15	0.00116	PASS
				VH	0.53	0.00029	PASS
		MCH	TN	VL	3.49	0.00186	PASS
				VN	-2.18	-0.00116	PASS
				VH	-1.54	-0.00082	PASS
		HCH	TN	VL	-12.25	-0.00642	PASS
				VN	-1.22	-0.00064	PASS
				VH	8.24	0.00432	PASS

#### 8.1.2Frequency 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	3.01	0.00364	PASS
				-20	4.49	0.00543	PASS
				-10	1.24	0.0015	PASS
				0	-1.98	-0.0024	PASS
				10	-3.46	-0.00419	PASS
				20	3.43	0.00415	PASS
				30	4.46	0.0054	PASS
				40	2.4	0.0029	PASS
				50	-3.2	-0.00387	PASS
		MCH	VN	-30	8.3	0.00992	PASS
				-20	2.61	0.00312	PASS
				-10	-3.59	-0.00429	PASS
				0	7.98	0.00954	PASS
				10	-2.99	-0.00357	PASS
				20	-10.8	-0.01291	PASS
				30	5.84	0.00698	PASS
				40	-4.14	-0.00495	PASS
				50	-5.8	-0.00693	PASS
		HCH	VN	-30	-5.83	-0.00689	PASS
				-20	-2.37	-0.0028	PASS
				-10	-0.02	-0.00002	PASS
				0	0.21	0.00025	PASS
				10	7.48	0.00884	PASS
				20	2.84	0.00335	PASS
				30	2.01	0.00237	PASS
				40	-1.82	-0.00215	PASS
				50	1.28	0.00151	PASS
WCDMA1700	UMTS/TM1	LCH	VN	-30	4.1	0.00239	PASS
				-20	-0.81	-0.00047	PASS
				-10	2.84	0.00166	PASS
				0	1.3	0.00076	PASS
				10	2.17	0.00127	PASS
				20	-1.07	-0.00062	PASS
				30	-0.46	-0.00027	PASS
				40	2.81	0.00164	PASS
				50	3.83	0.00224	PASS
		MCH	VN	-30	1.14	0.00066	PASS
				-20	4.71	0.00272	PASS
				-10	10.03	0.00579	PASS
				0	17.75	0.01024	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				10	5.65	0.00326	PASS
				20	6.47	0.00373	PASS
				30	-4.52	-0.00261	PASS
				40	6.74	0.00389	PASS
				50	0.55	0.00032	PASS
		HCH	VN	-30	-4.52	-0.00258	PASS
				-20	-0.26	-0.00015	PASS
				-10	-6.71	-0.00383	PASS
				0	-4.85	-0.00277	PASS
				10	7.35	0.00419	PASS
				20	0.49	0.00028	PASS
				30	-1.48	-0.00084	PASS
				40	-2.11	-0.0012	PASS
				50	4.96	0.00283	PASS
				WCDMA1900	UMTS/TM1	LCH	VN
-20	-0.23	-0.00012	PASS				
-10	-1.63	-0.00088	PASS				
0	-0.73	-0.00039	PASS				
10	6.3	0.0034	PASS				
20	2.99	0.00161	PASS				
30	1.83	0.00099	PASS				
40	-2.76	-0.00149	PASS				
50	-1.82	-0.00098	PASS				
MCH	VN	-30	7.16			0.00381	PASS
		-20	3.34			0.00178	PASS
		-10	3.39			0.0018	PASS
		0	6.41			0.00341	PASS
		10	0.85			0.00045	PASS
		20	-2.66			-0.00141	PASS
		30	6.18			0.00329	PASS
		40	-0.72			-0.00038	PASS
		50	2.32			0.00123	PASS
HCH	VN	-30	-6.45			-0.00338	PASS
		-20	6.01			0.00315	PASS
		-10	7.19			0.00377	PASS
		0	3.19			0.00167	PASS
		10	3.13			0.00164	PASS
		20	-1.59			-0.00083	PASS
		30	3.69			0.00193	PASS
		40	-0.99			-0.00052	PASS



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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				50	0.87	0.00046	PASS

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END