



# Appendix for test report



## 1 Appendix\_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	24.77	18.62	38.5	PASS
		MCH	24.72	18.57	38.5	PASS
		HCH	24.82	18.67	38.5	PASS

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
WCDMA1700	UMTS/TM1	LCH	24.16	23.86	30	PASS
		MCH	23.88	23.58	30	PASS
		HCH	23.98	23.68	30	PASS
WCDMA1900	UMTS/TM1	LCH	24.16	23.56	33	PASS
		MCH	24.02	23.42	33	PASS
		HCH	24.01	23.41	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:

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

SET RBW=1%of the OBW,not to wxceed 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	2.74	13	PASS
		MCH	2.96	13	PASS
		HCH	2.92	13	PASS
WCDMA1700	UMTS/TM1	LCH	3	13	PASS
		MCH	3.21	13	PASS
		HCH	2.62	13	PASS
WCDMA1900	UMTS/TM1	LCH	3.15	13	PASS
		MCH	3.07	13	PASS
		HCH	3.13	13	PASS

### 3Appendix\_C: Modulation Characteristics

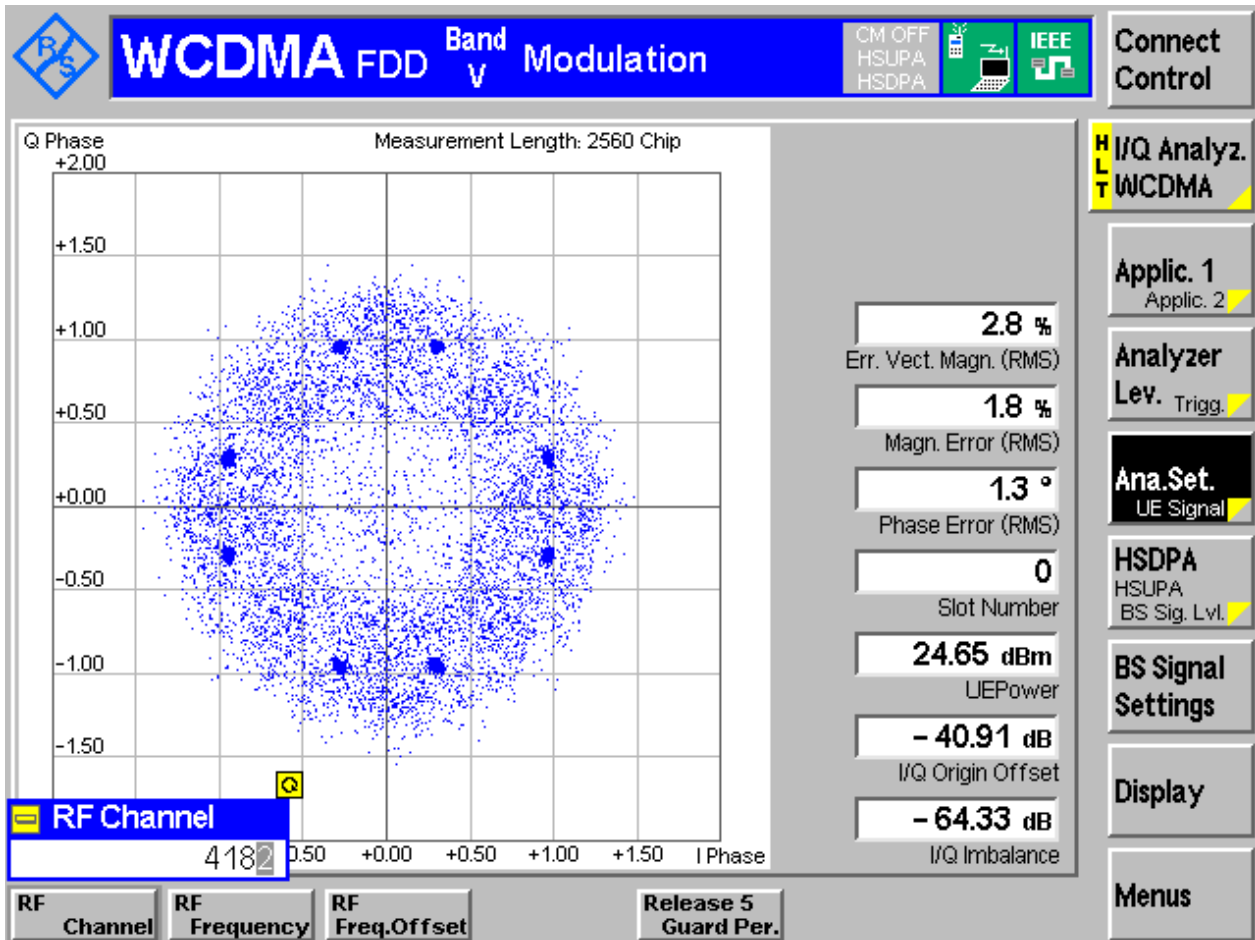
#### Part I - Test Plots

#### 3.1 For UMTS

#### 3.1.1 Test Band = WCDMA850

#### 3.1.1.1 Test Mode = UMTS/TM1

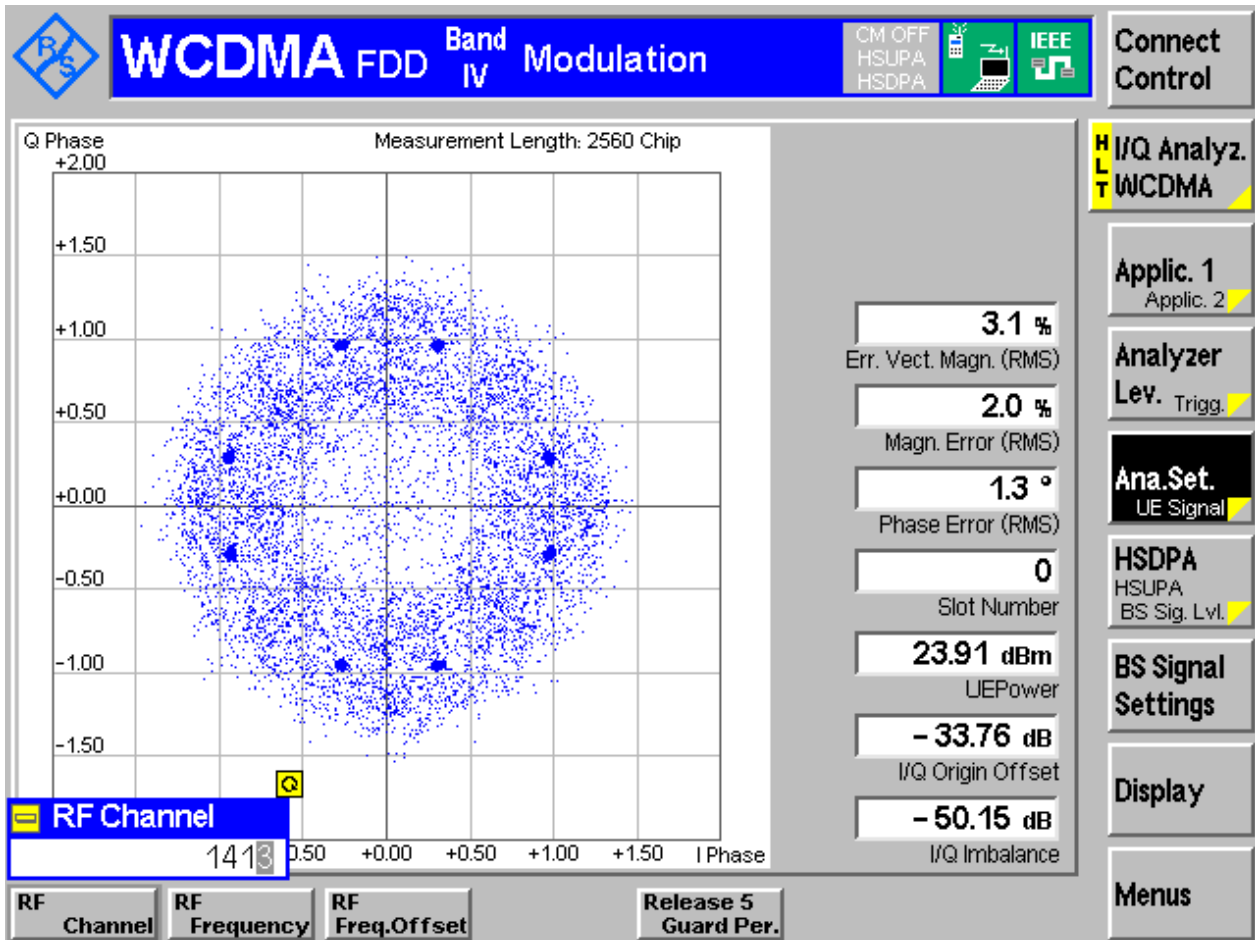
#### 3.1.1.1.1 Test Channel = MCH



### 3.1.2 Test Band = WCDMA1700

#### 3.1.2.1 Test Mode = UMTS/TM1

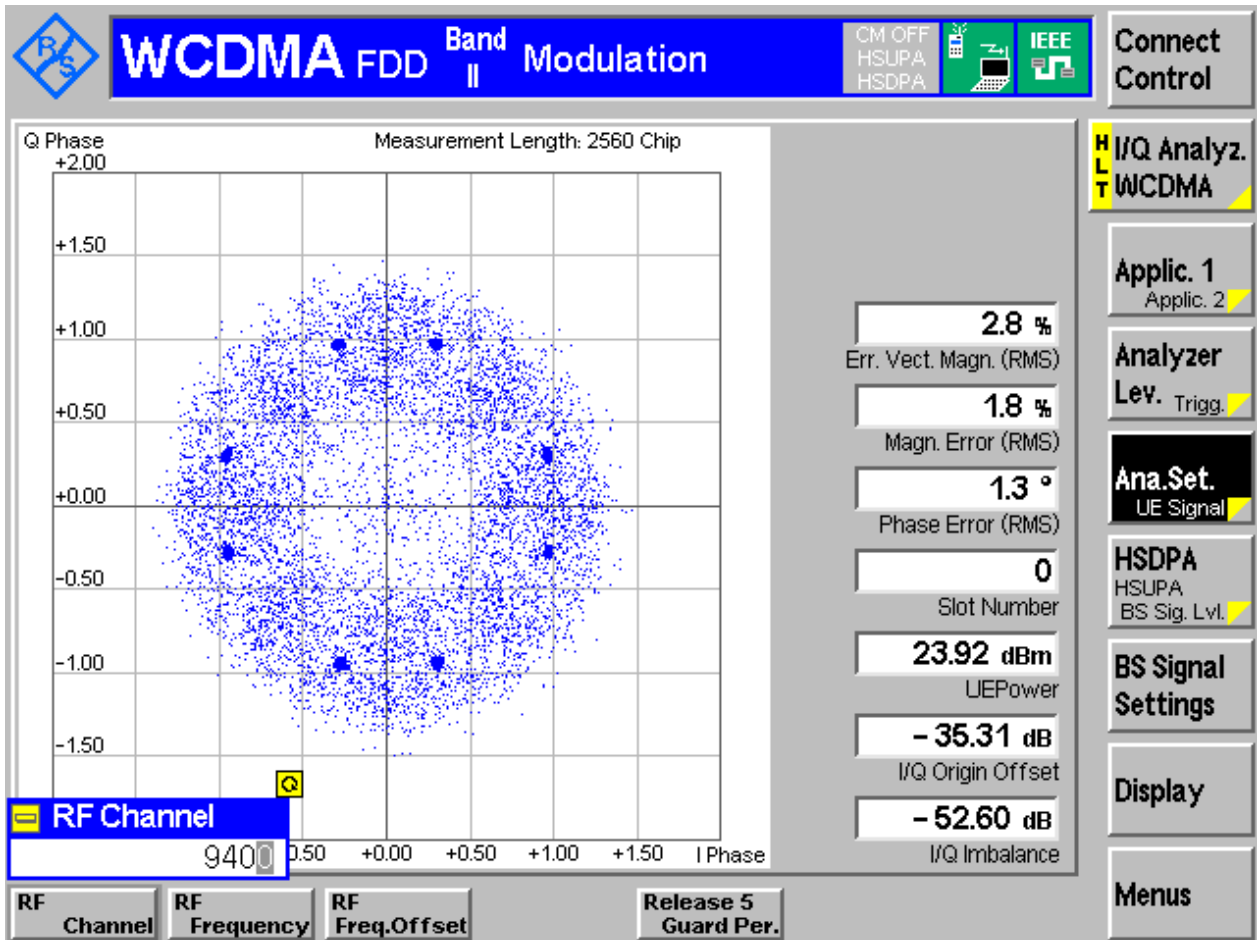
##### 3.1.2.1.1 Test Channel = MCH



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

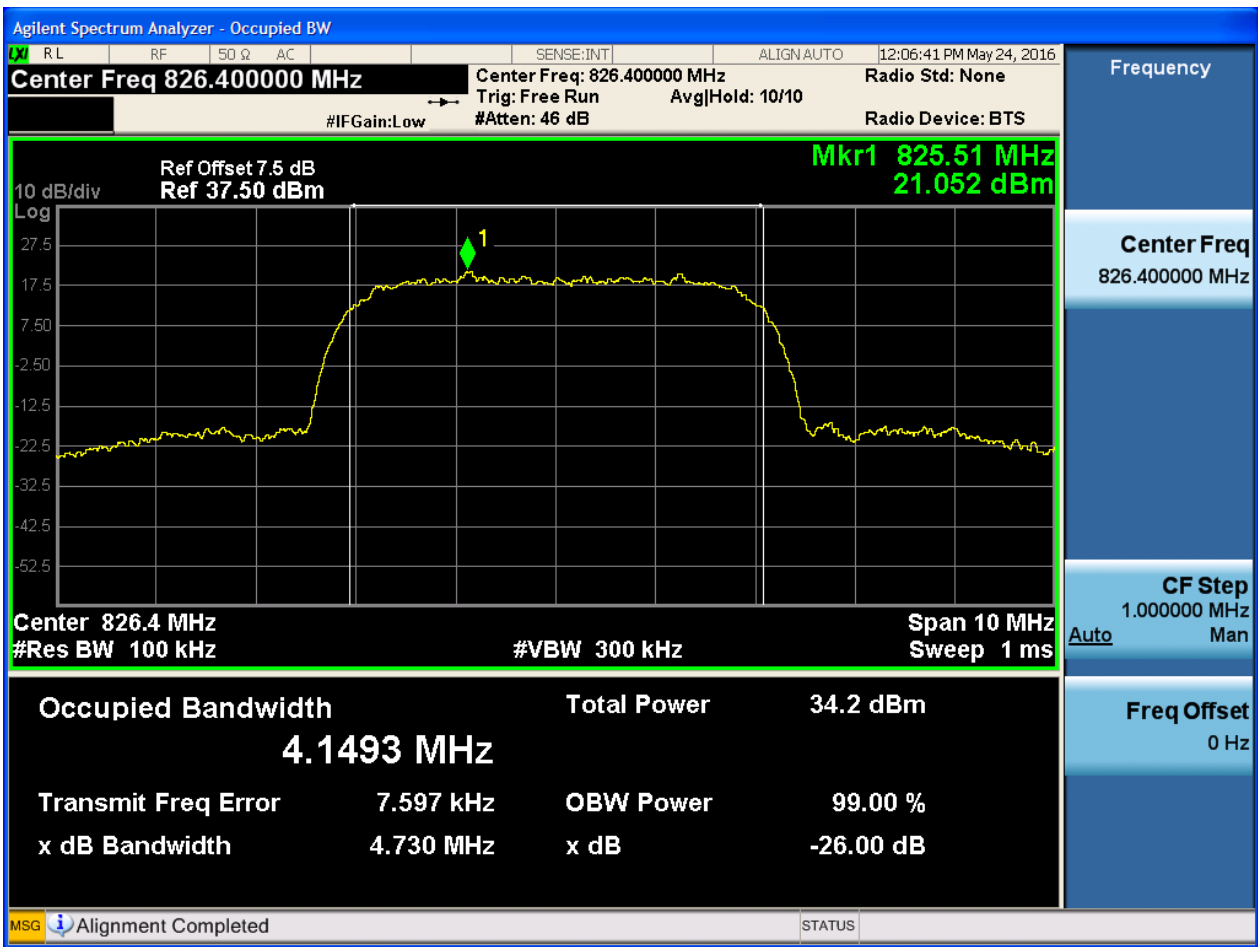
**Part II - Test Plots**

**4.1 For UMTS**

**4.1.1 Test Band = WCDMA850**

**4.1.1.1 Test Mode = UMTS/TM1**

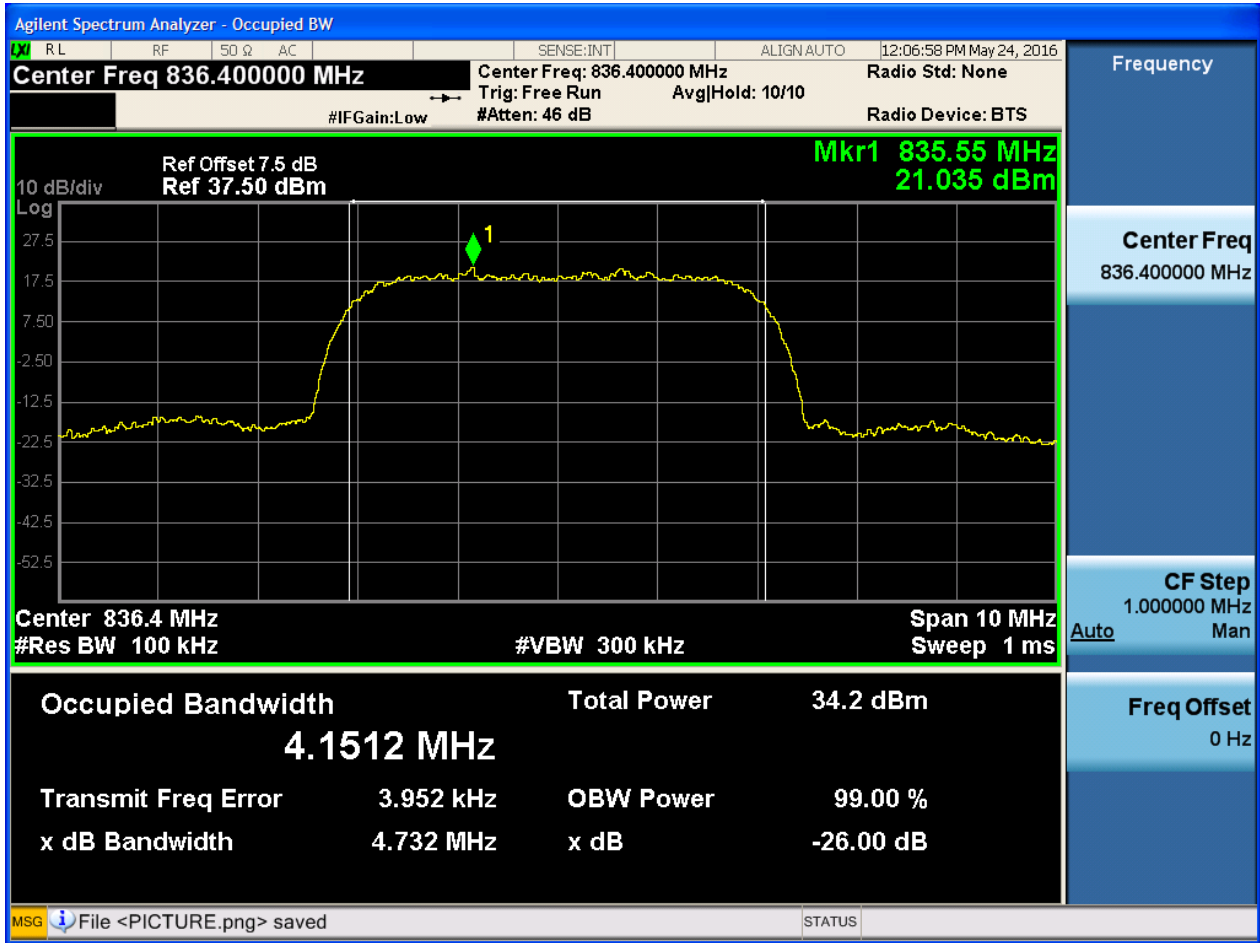
**4.1.1.1.1 Test Channel = LCH**





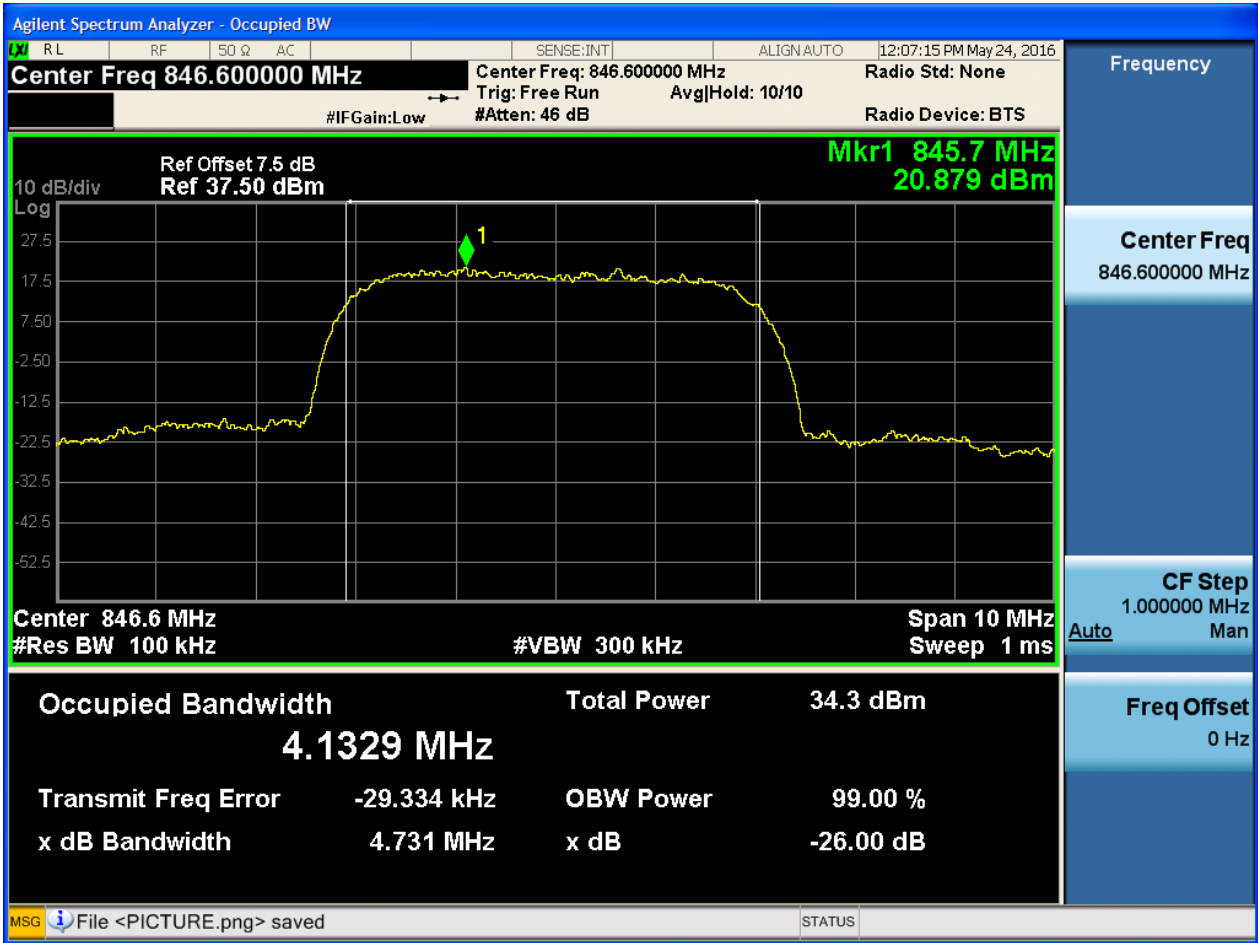


4.1.1.1.2 Test Channel = MCH





4.1.1.1.3 Test Channel = HCH

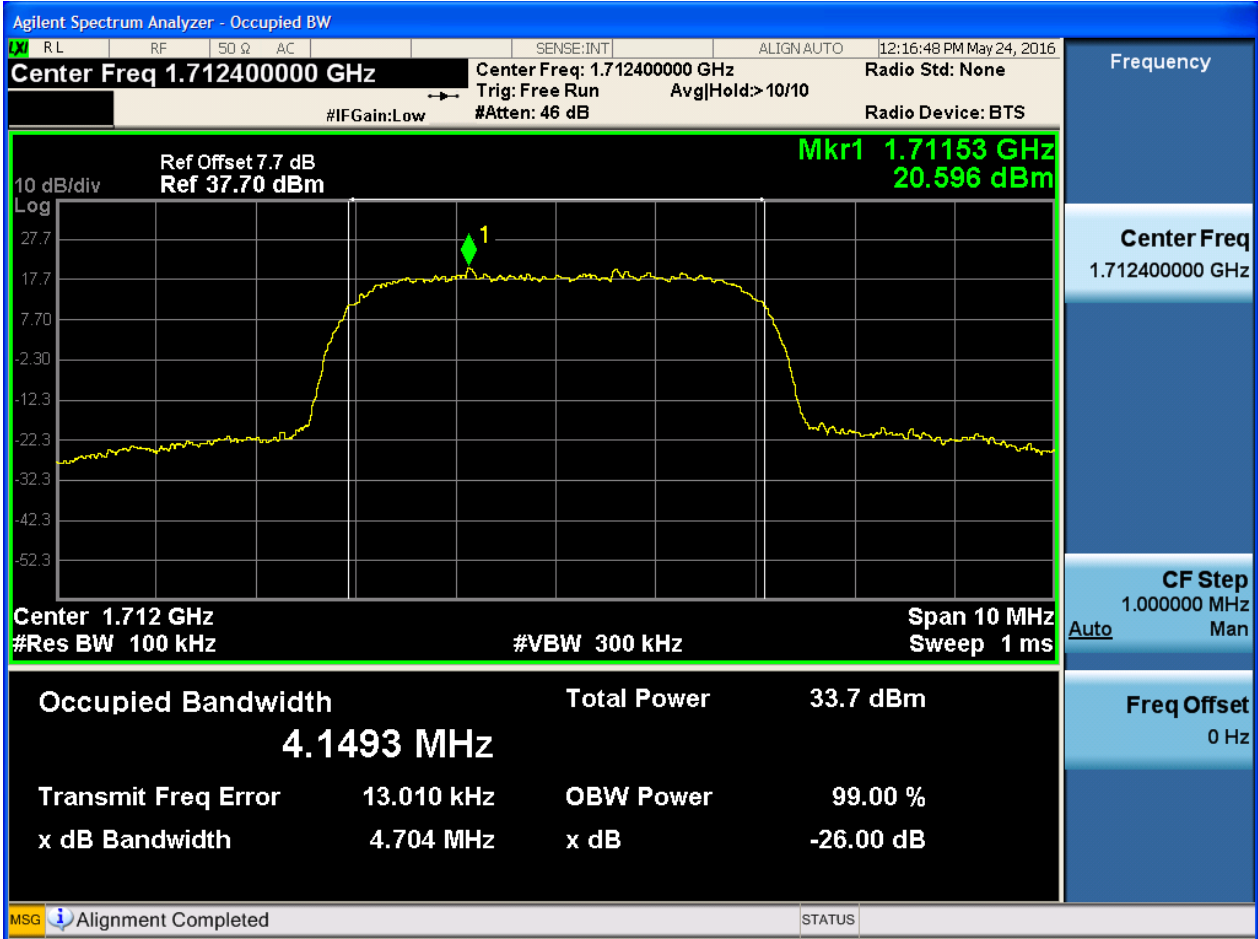




4.1.2 Test Band = WCDMA1700

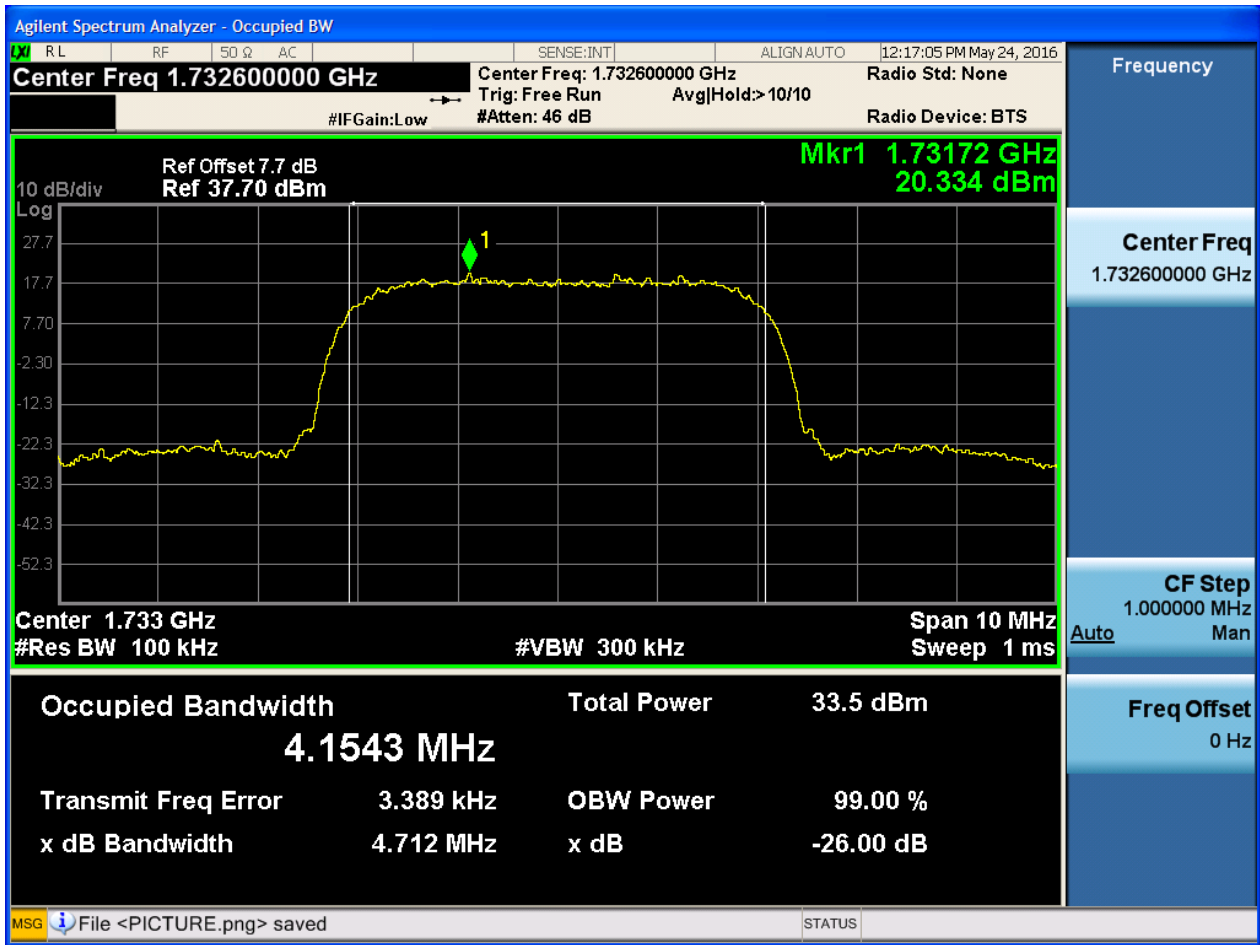
4.1.2.1 Test Mode = UMTS/TM1

4.1.2.1.1 Test Channel = LCH



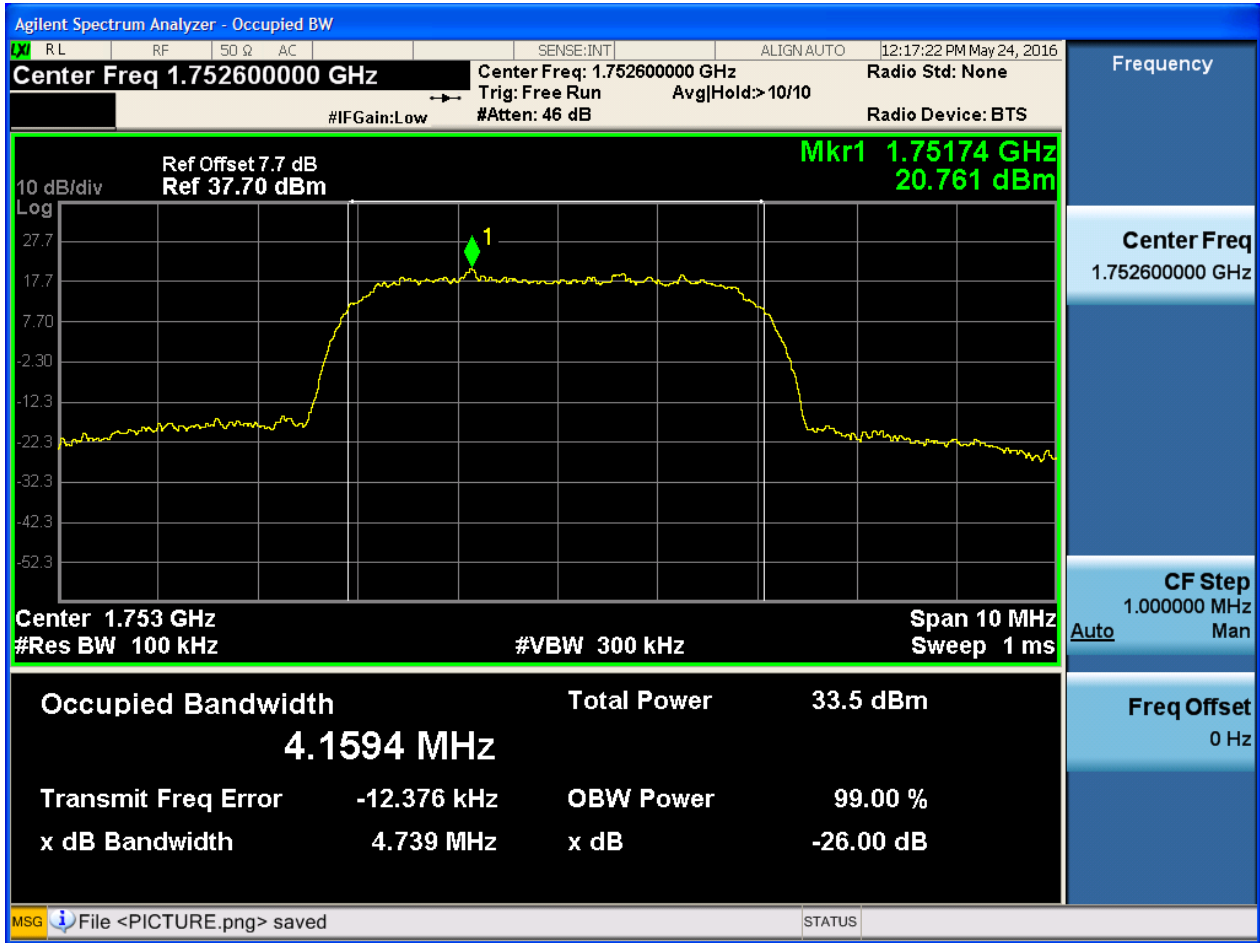


4.1.2.1.2 Test Channel = MCH





4.1.2.1.3 Test Channel = HCH

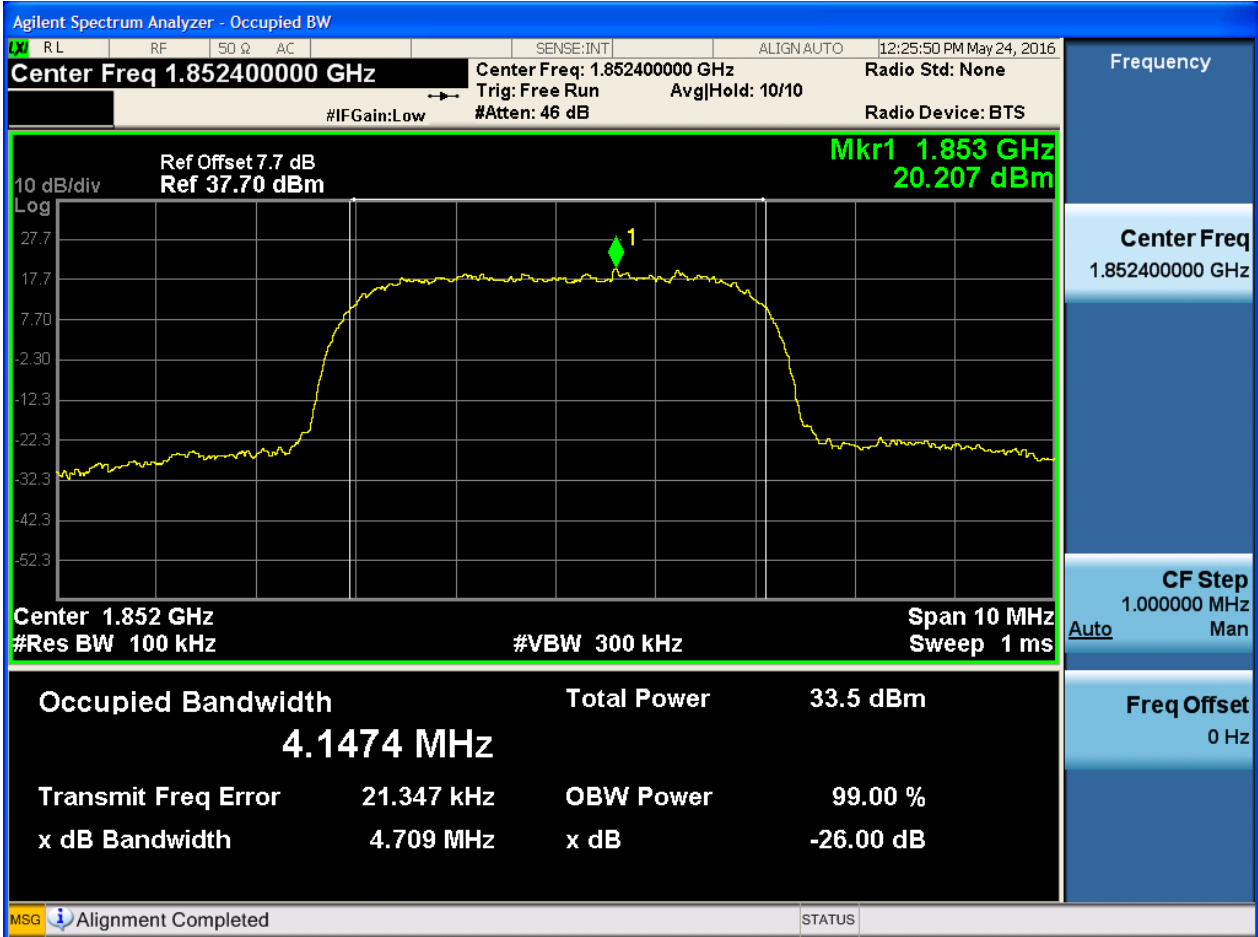




4.1.3 Test Band = WCDMA1900

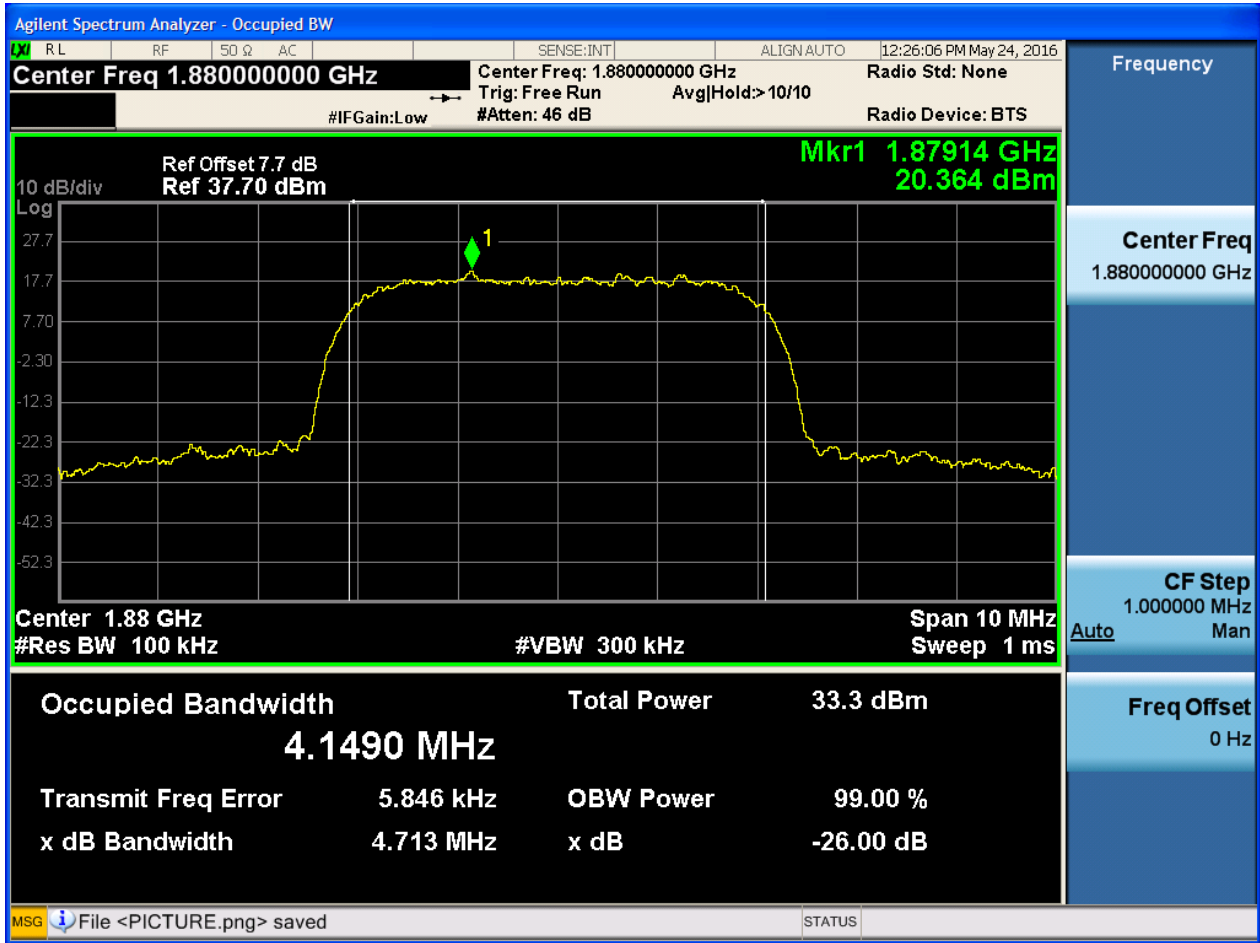
4.1.3.1 Test Mode = UMTS/TM1

4.1.3.1.1 Test Channel = LCH



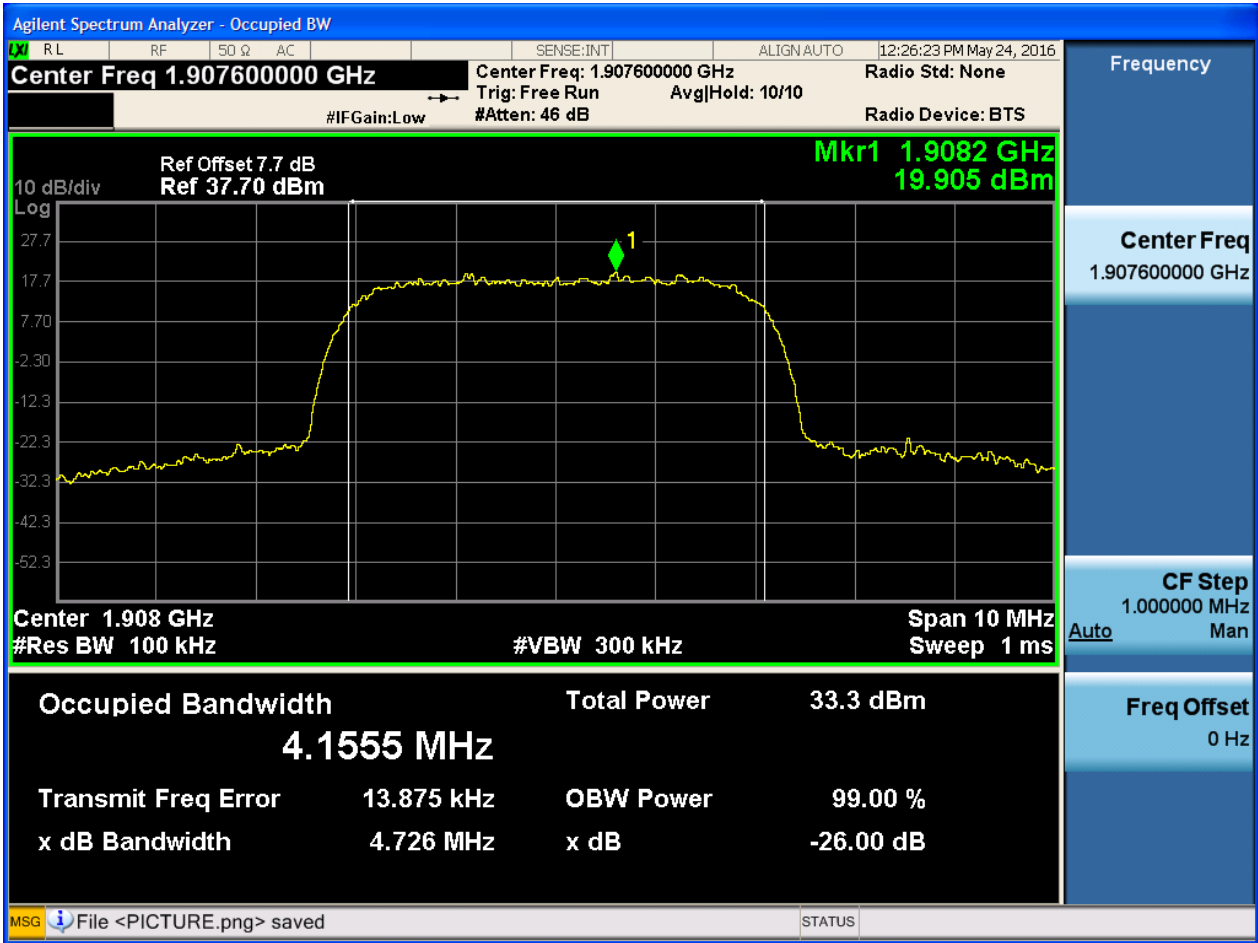


4.1.3.1.2 Test Channel = MCH





4.1.3.1.3 Test Channel = HCH







## 5Appendix\_E: Band Edges Compliance

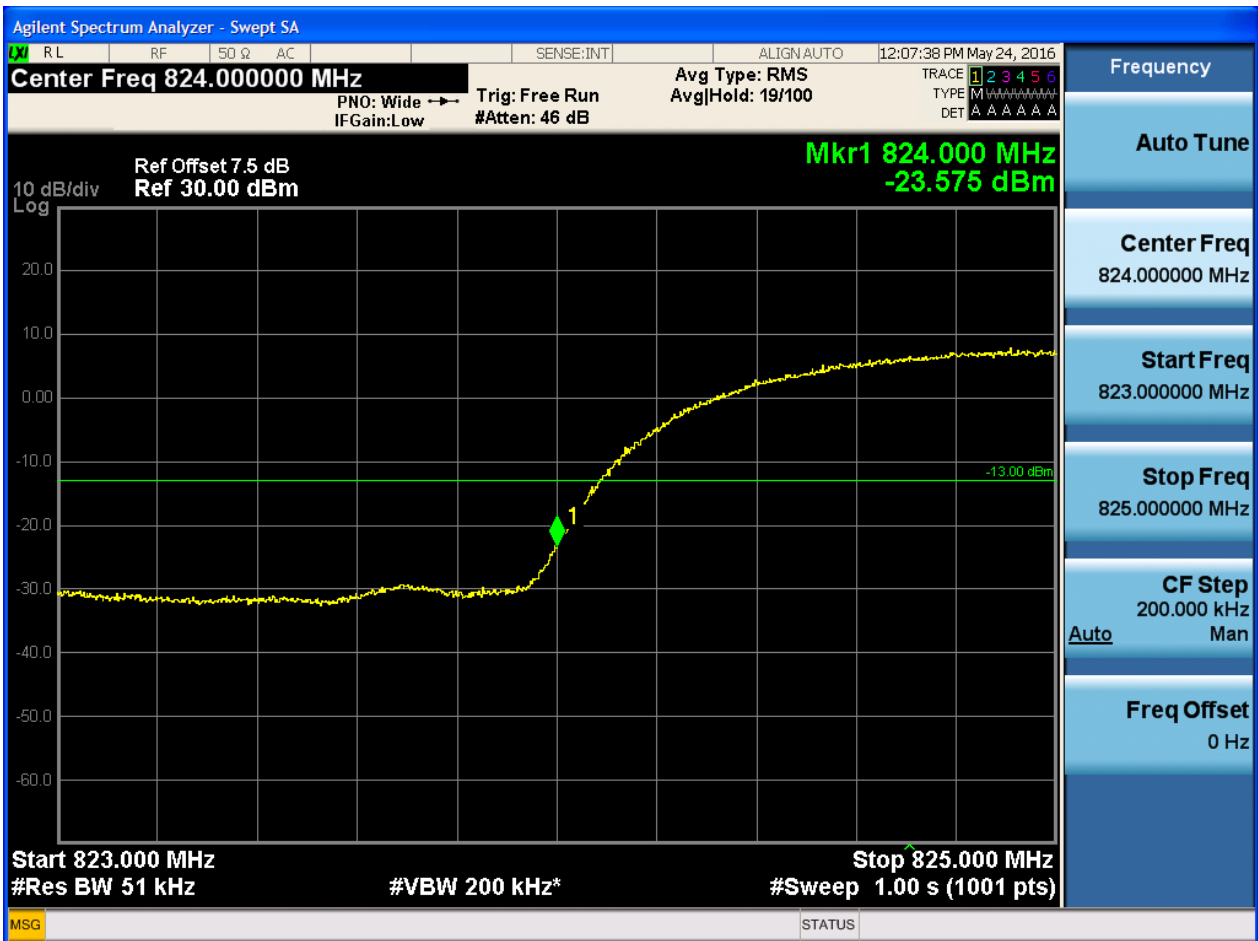
### Part I - Test Plots

#### 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

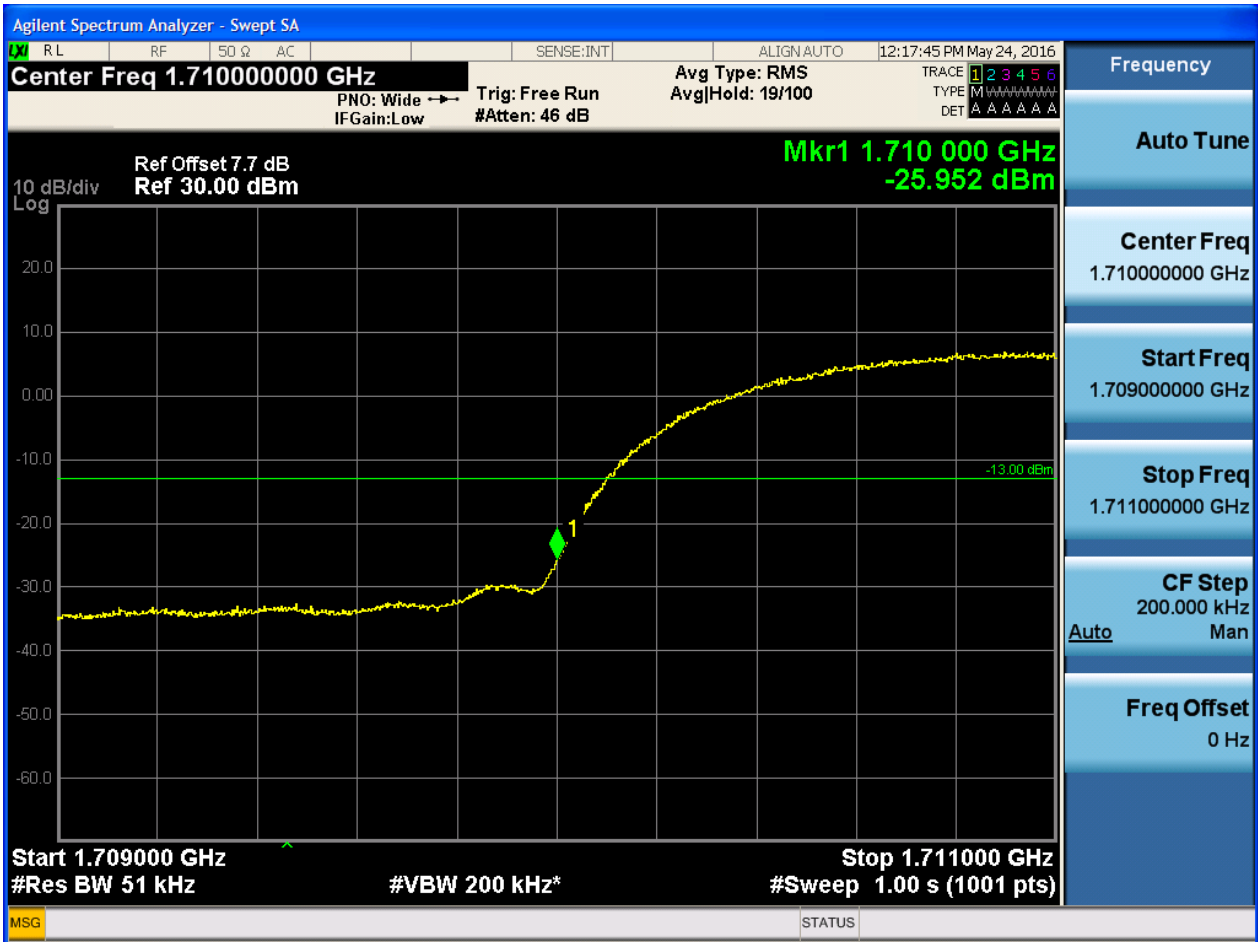




5.1.2 Test Band = WCDMA1700

5.1.2.1 Test Mode = UMTS/TM1

5.1.2.1.1 Test Channel = LCH



## 5.1.2.1.2 Test Channel = HCH

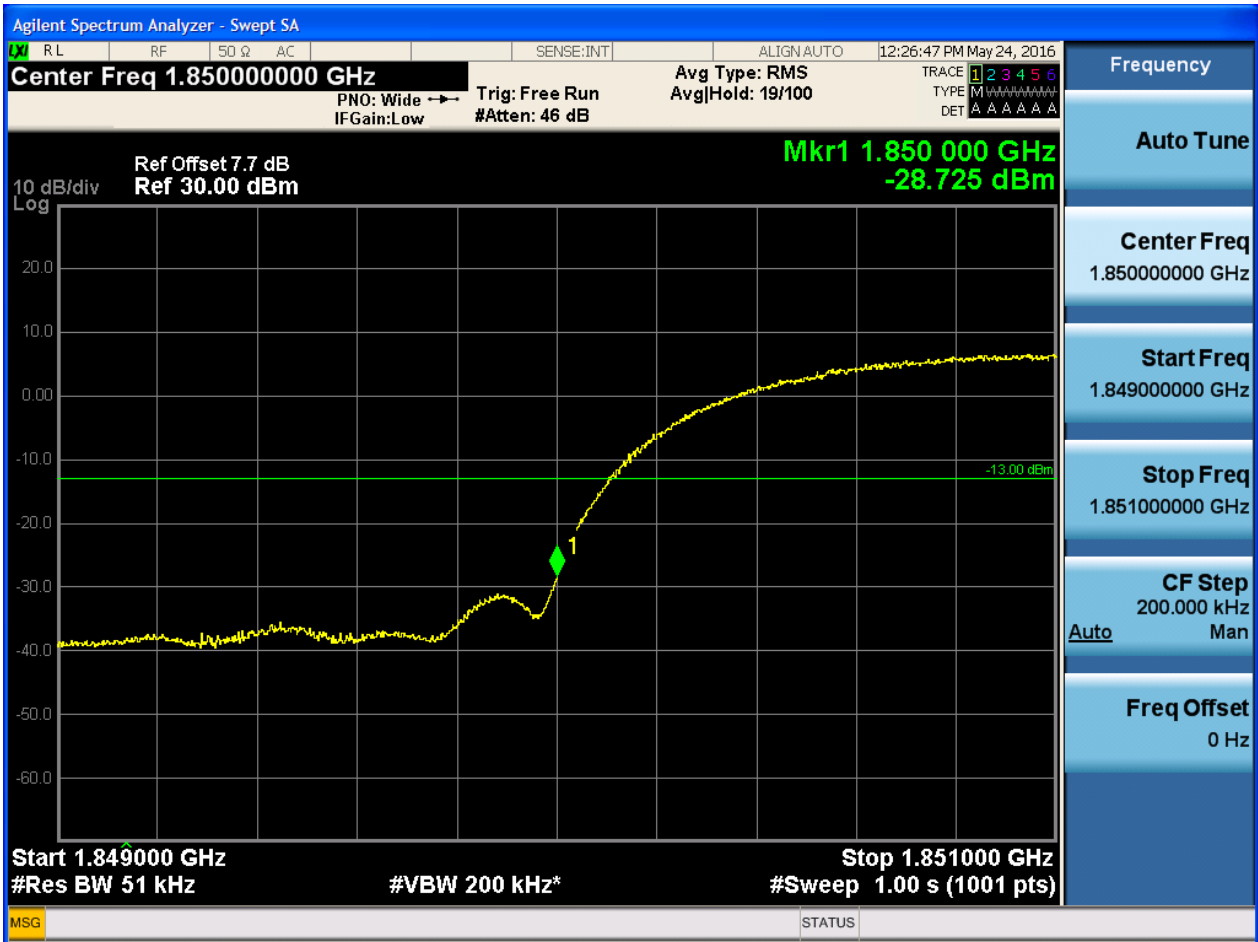




5.1.3 Test Band = WCDMA1900

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.

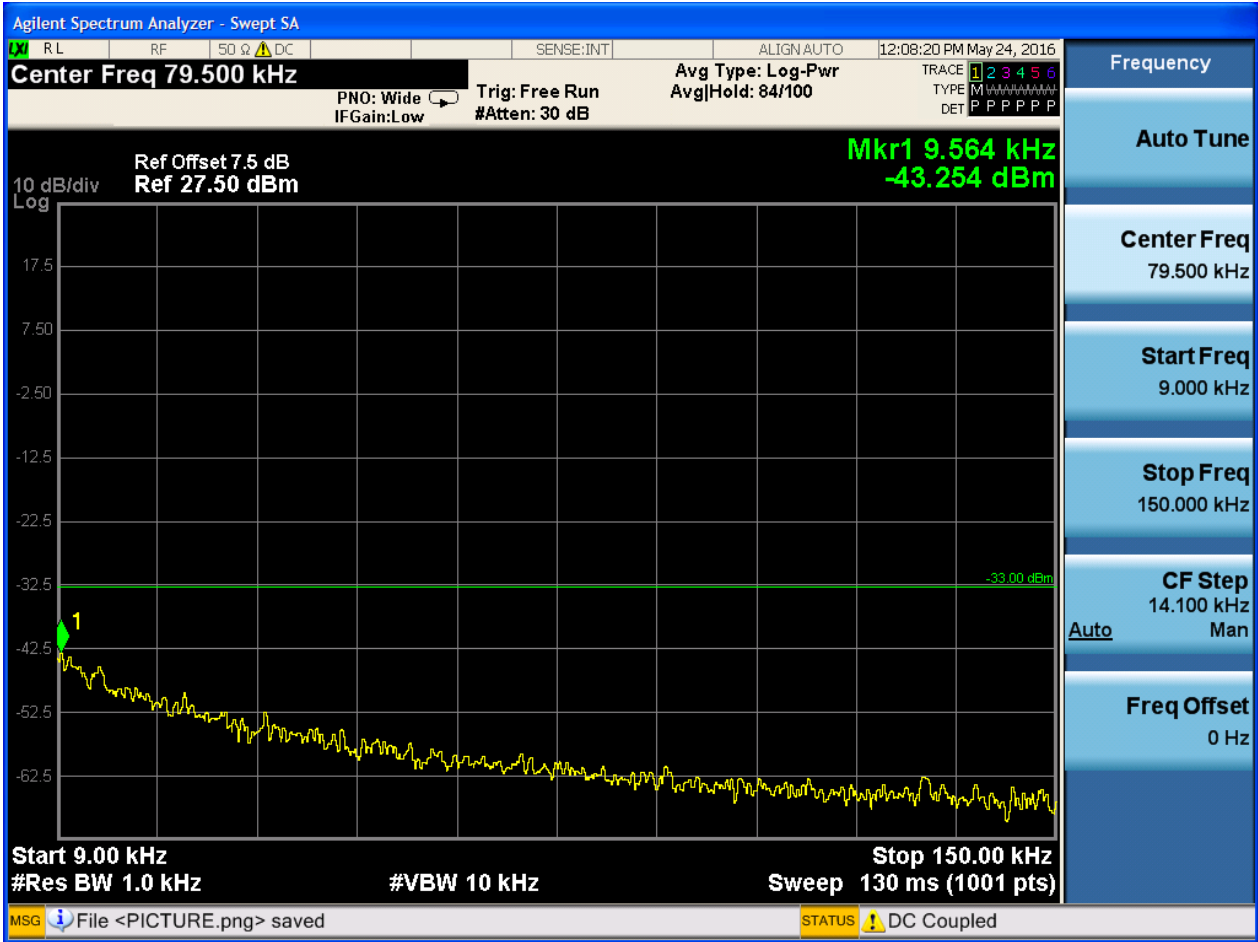
### **Part I - Test Plots**

#### **6.1 For UMTS**

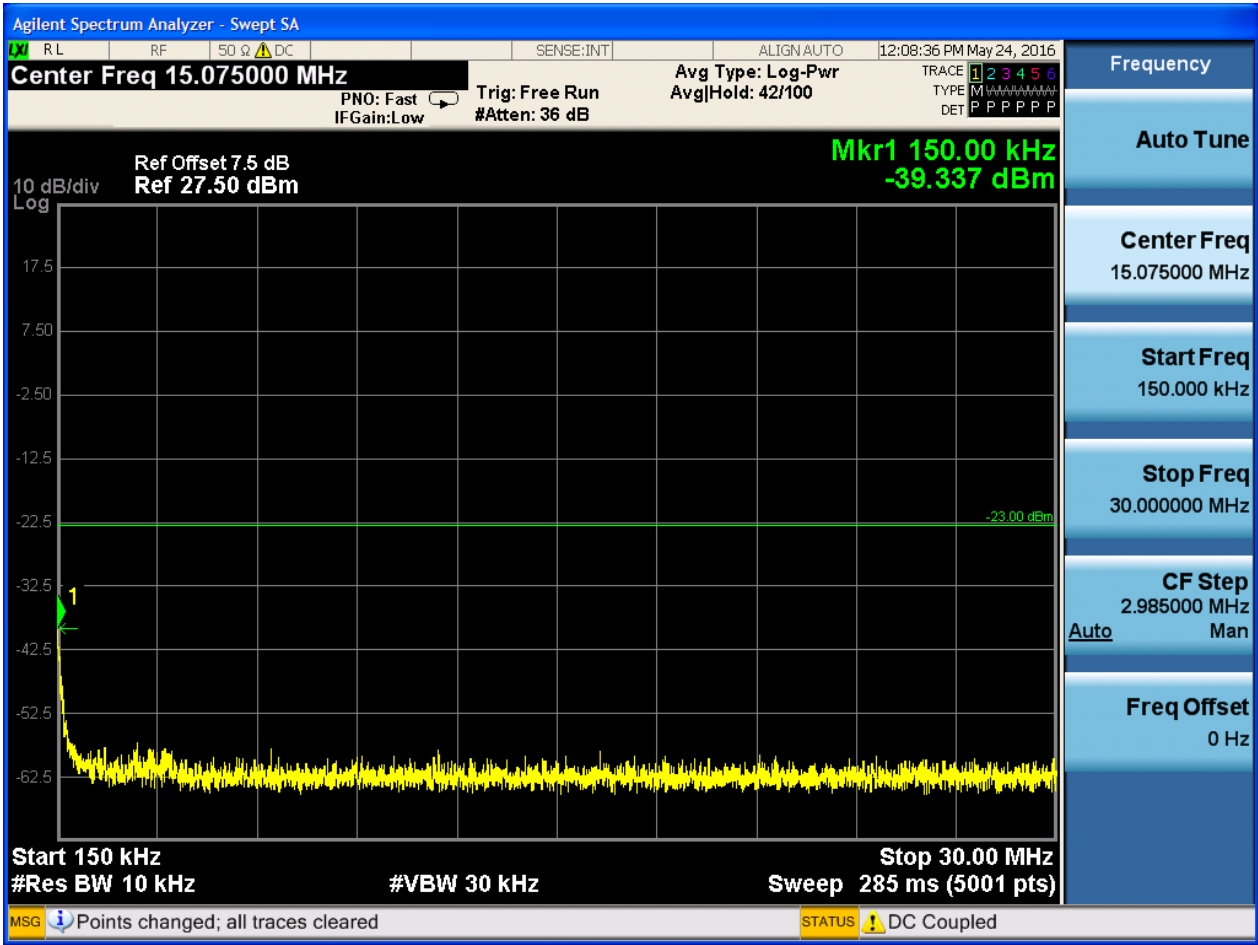
##### **6.1.1 Test Band = WCDMA850**

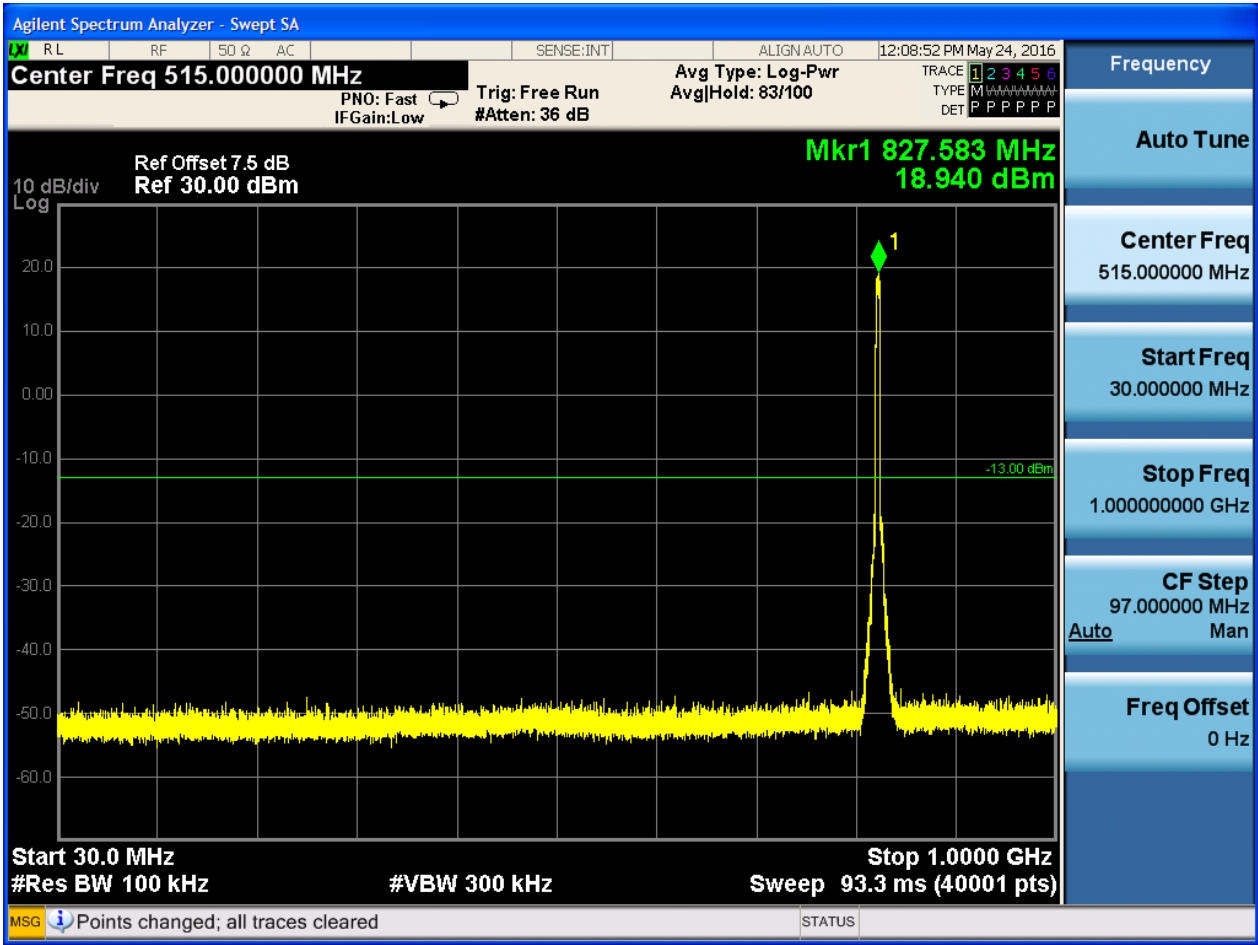
##### **6.1.1.1 Test Mode = UMTS/TM1**

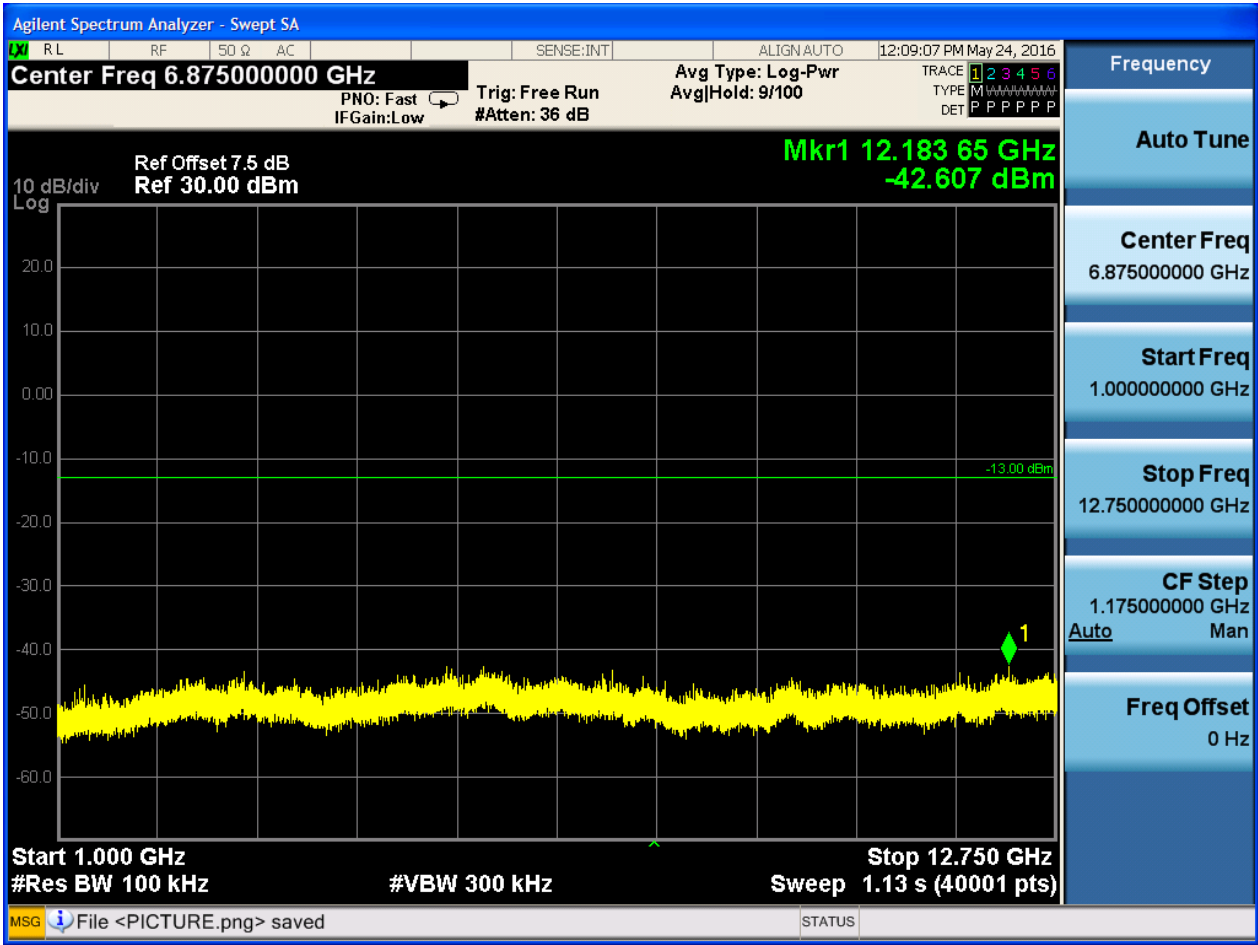
##### **6.1.1.1.1 Test Channel = LCH**





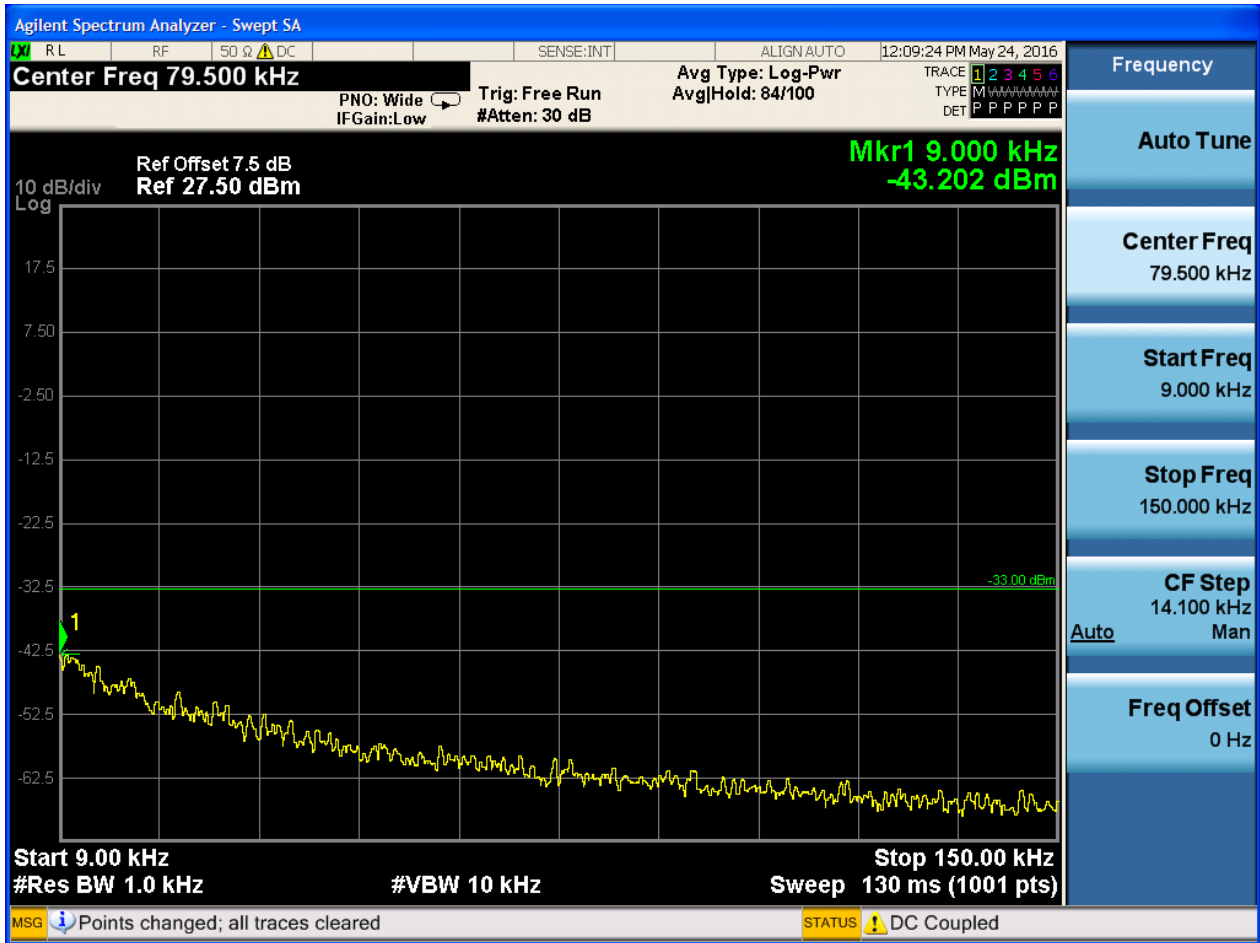


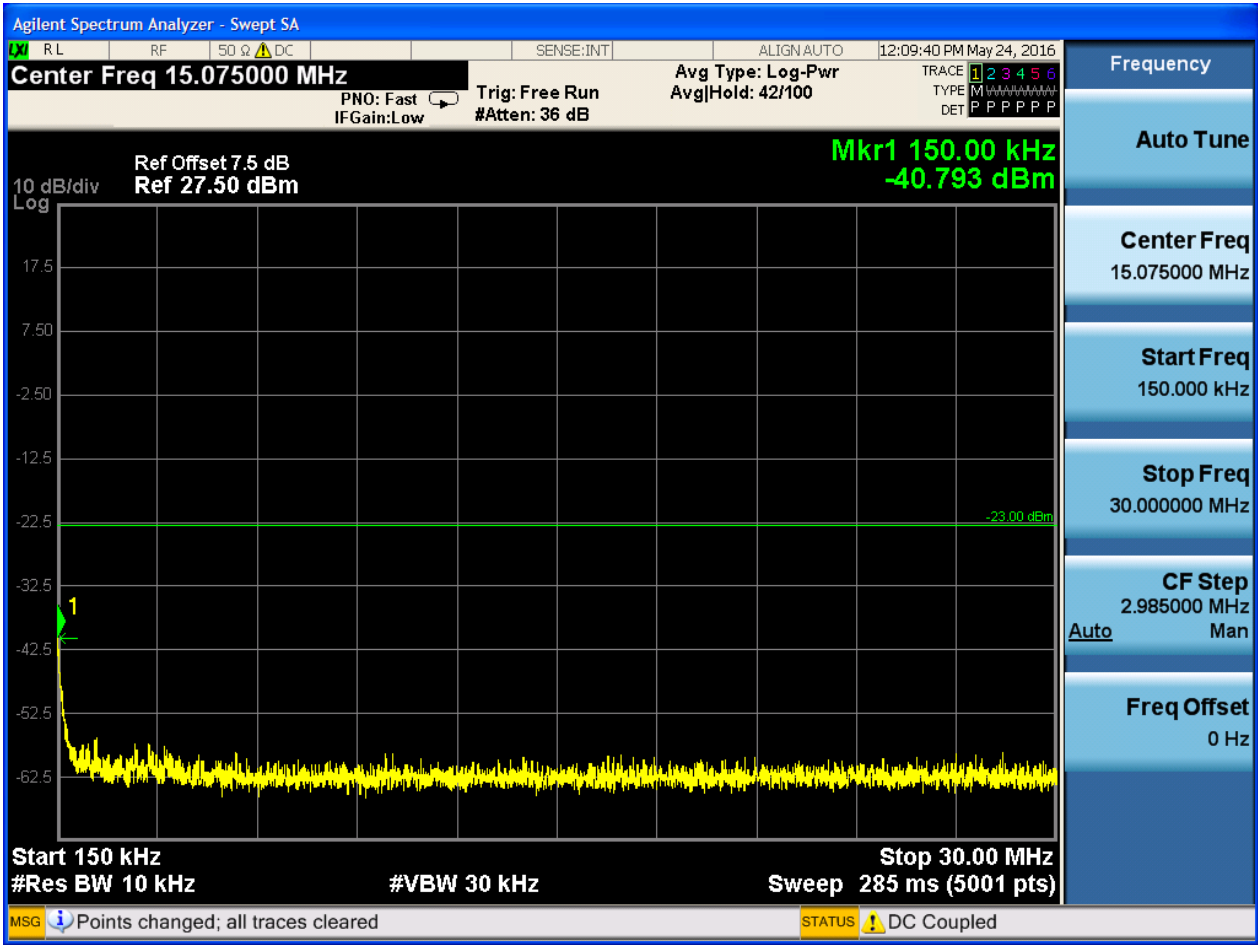


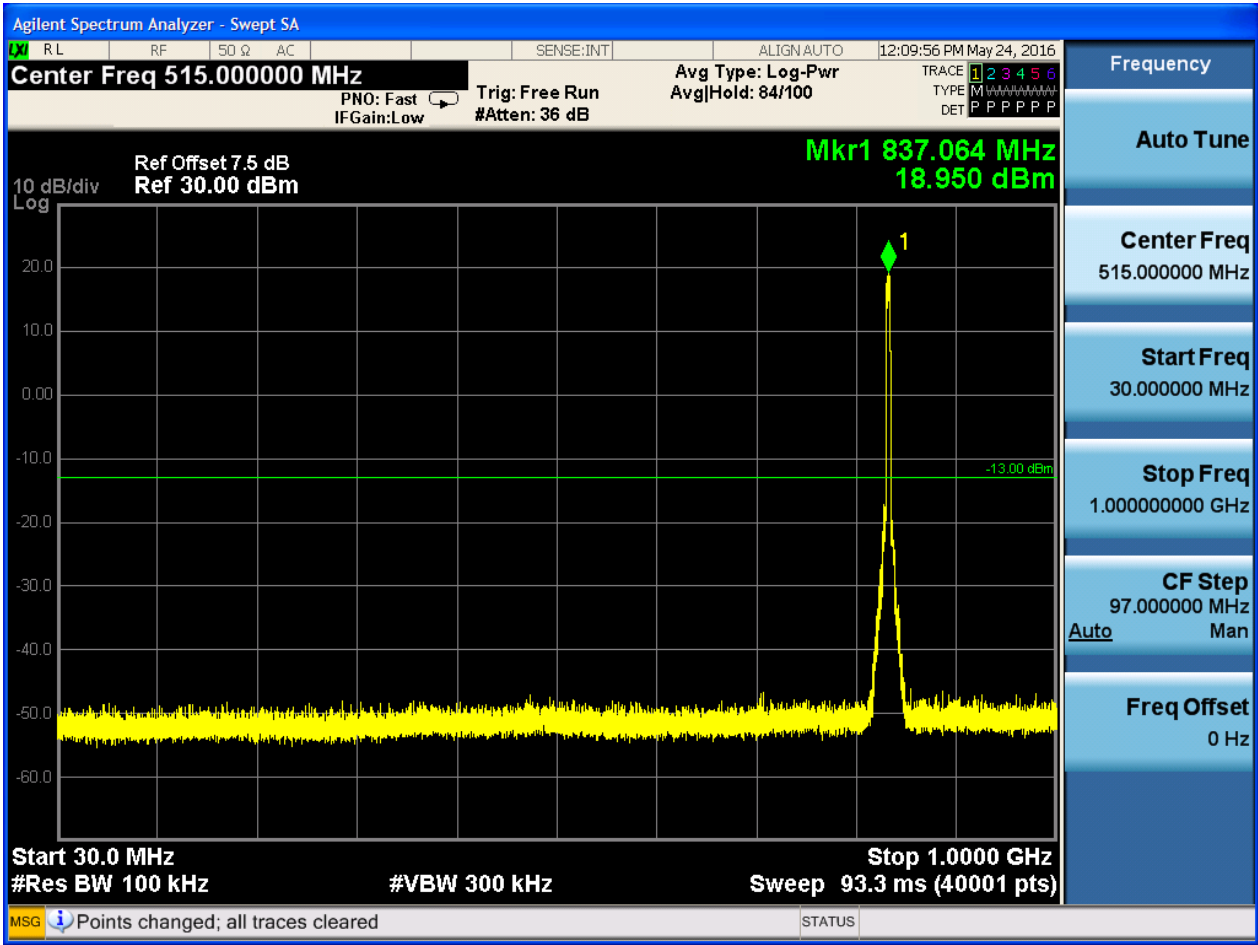


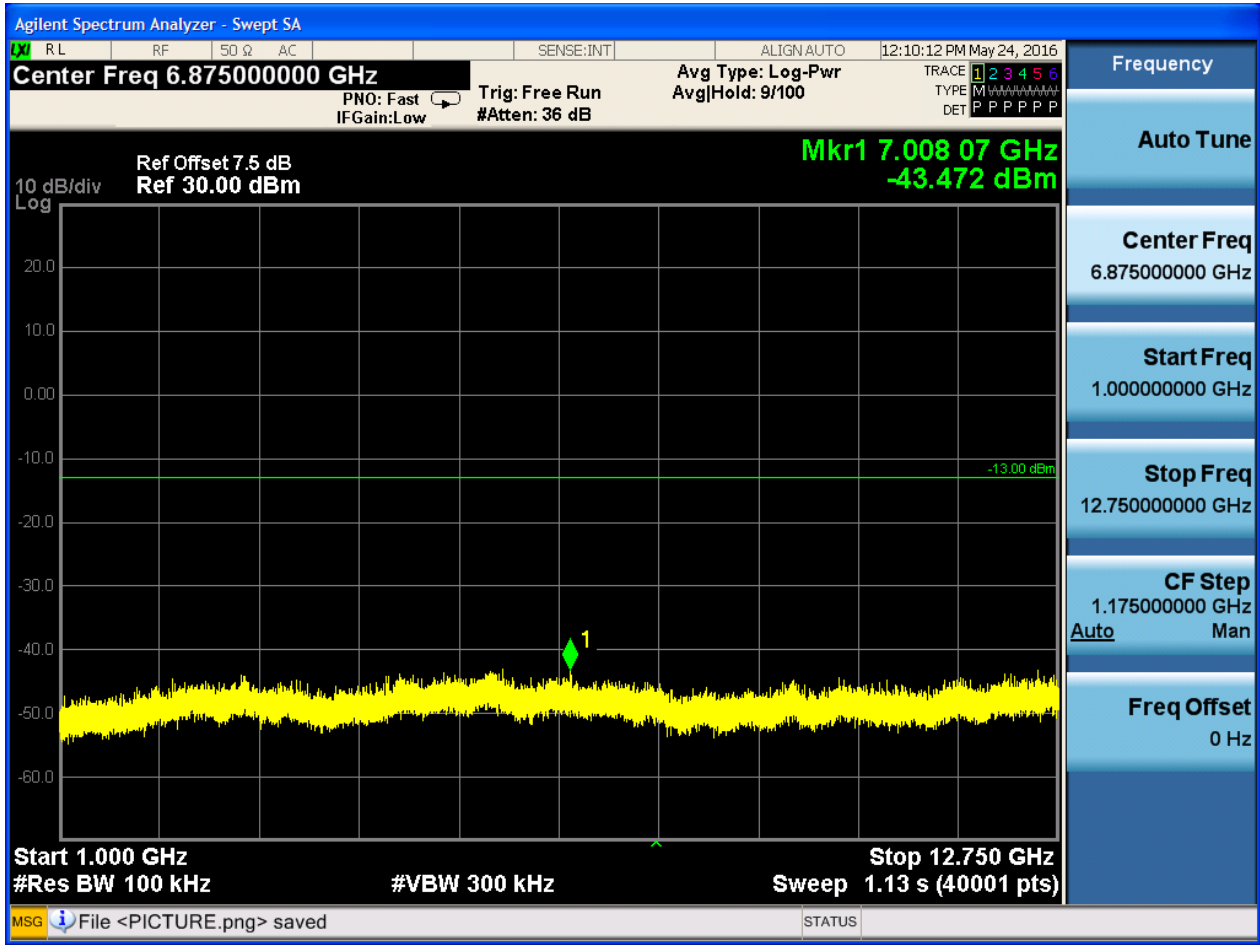


### 6.1.1.1.2 Test Channel = MCH

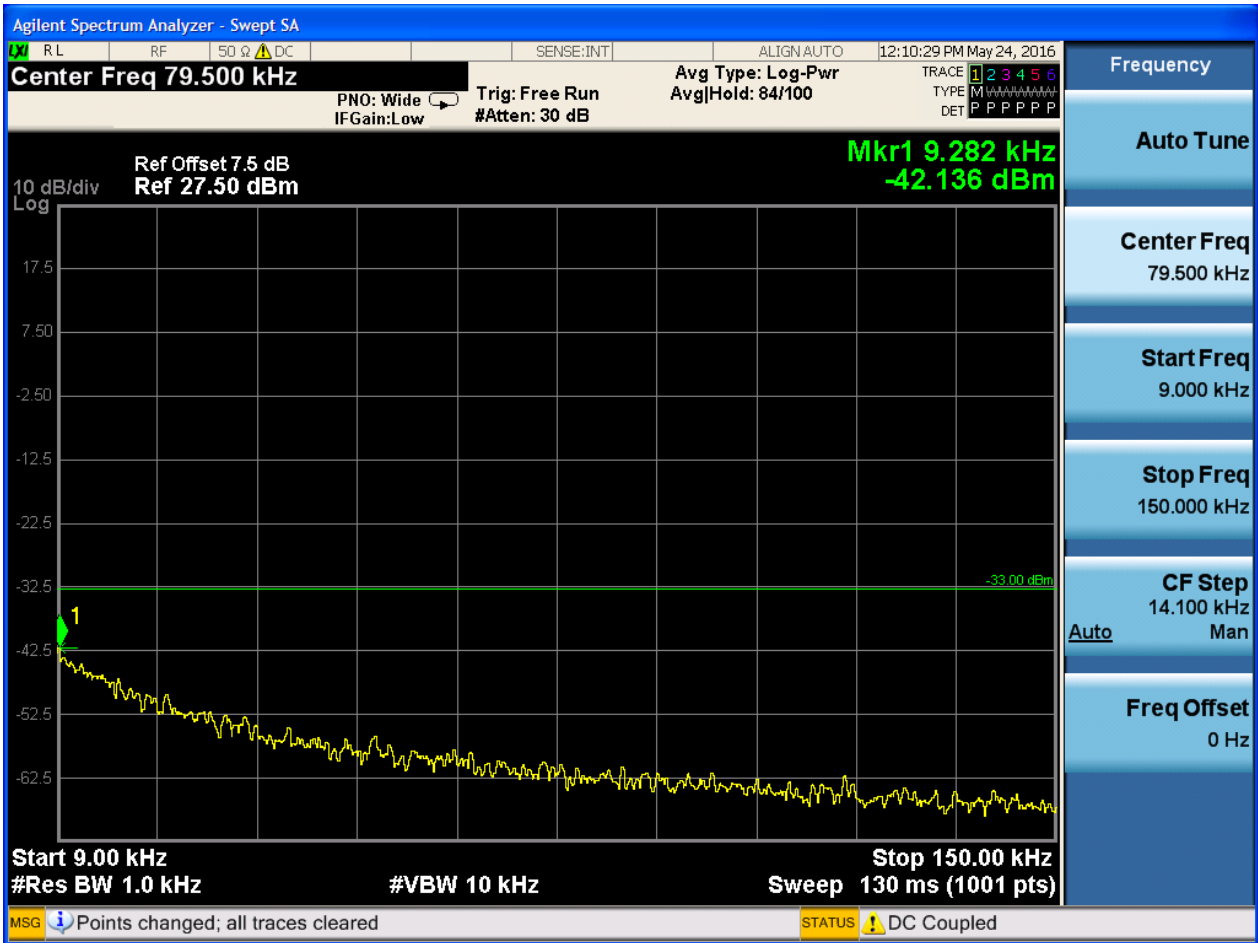




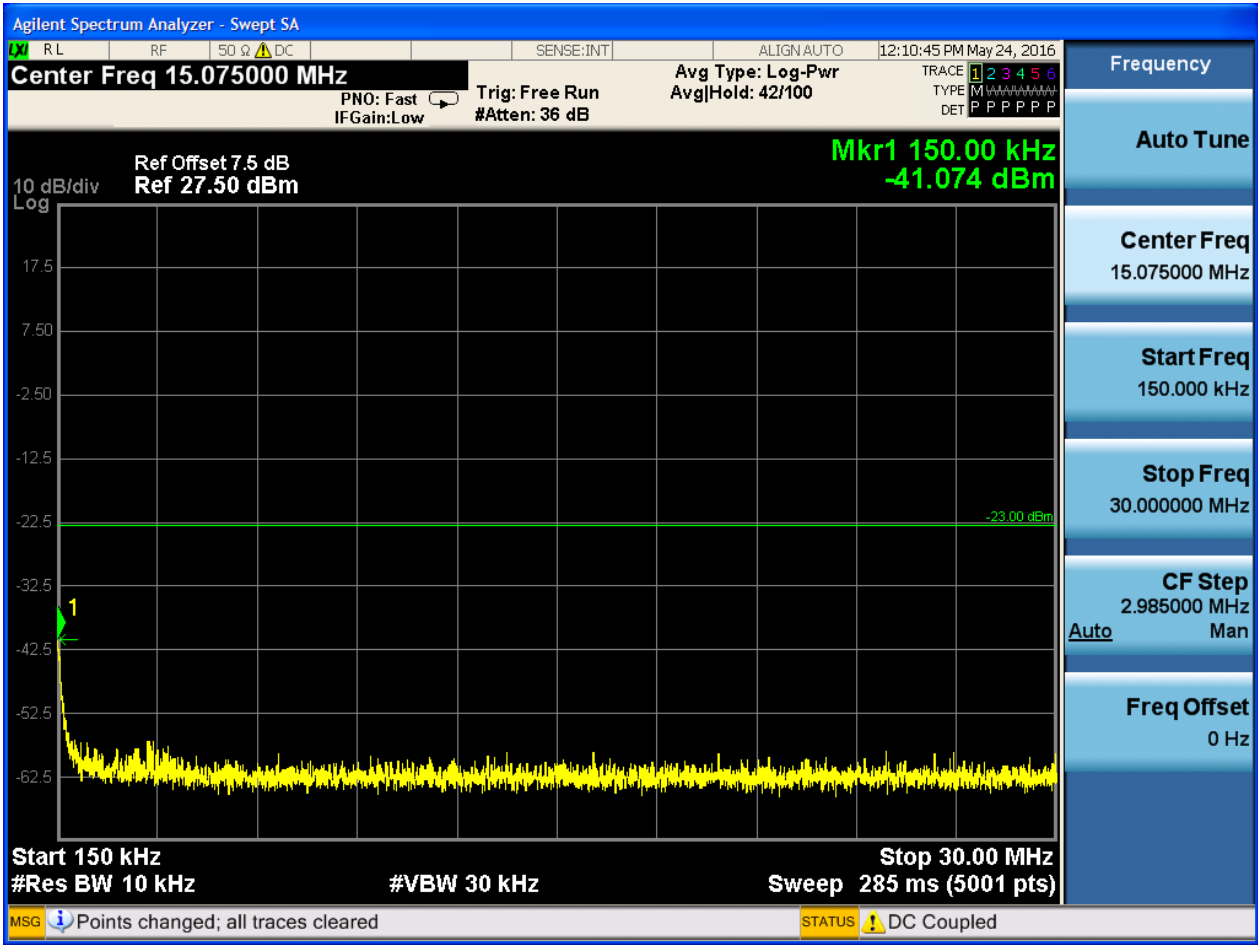


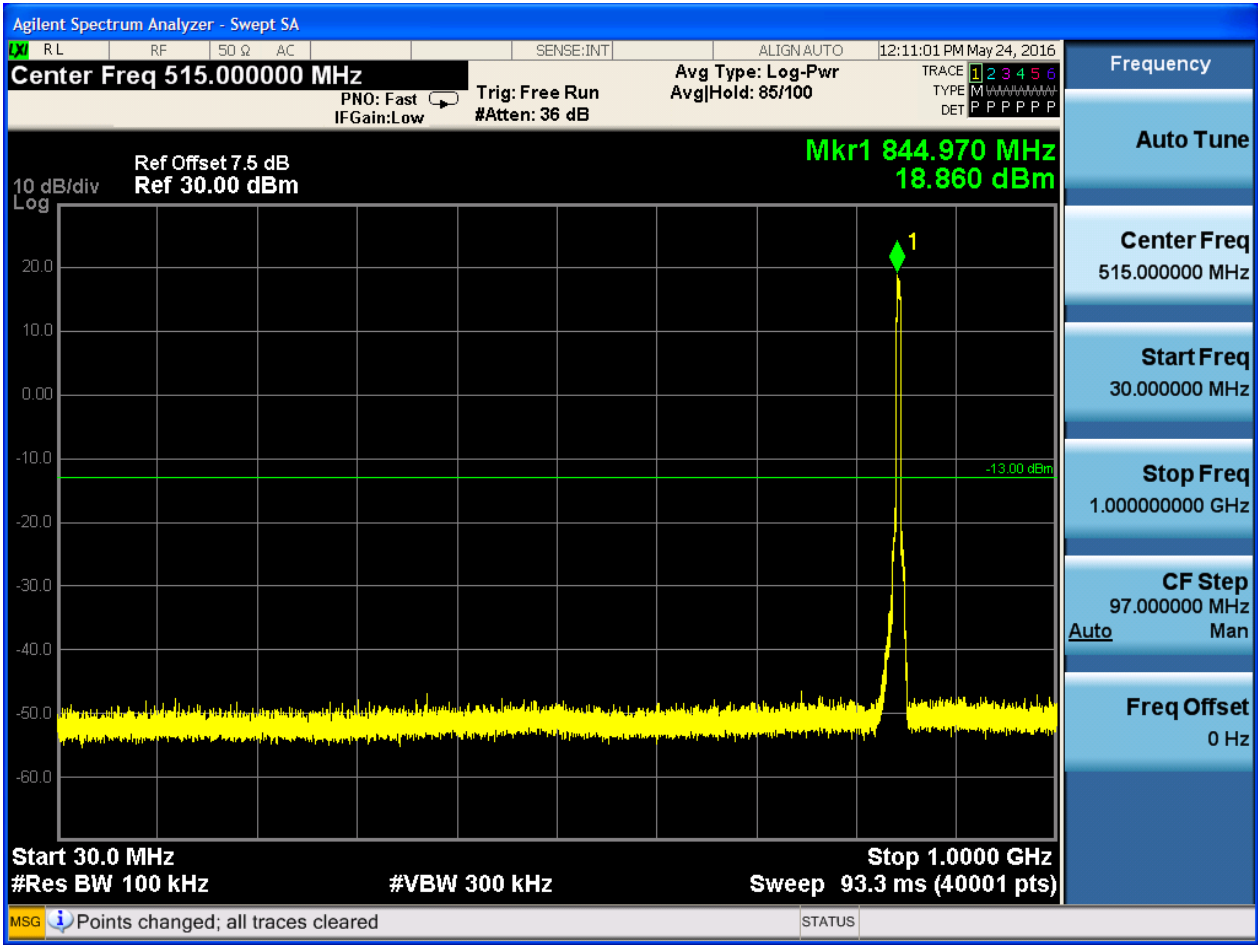


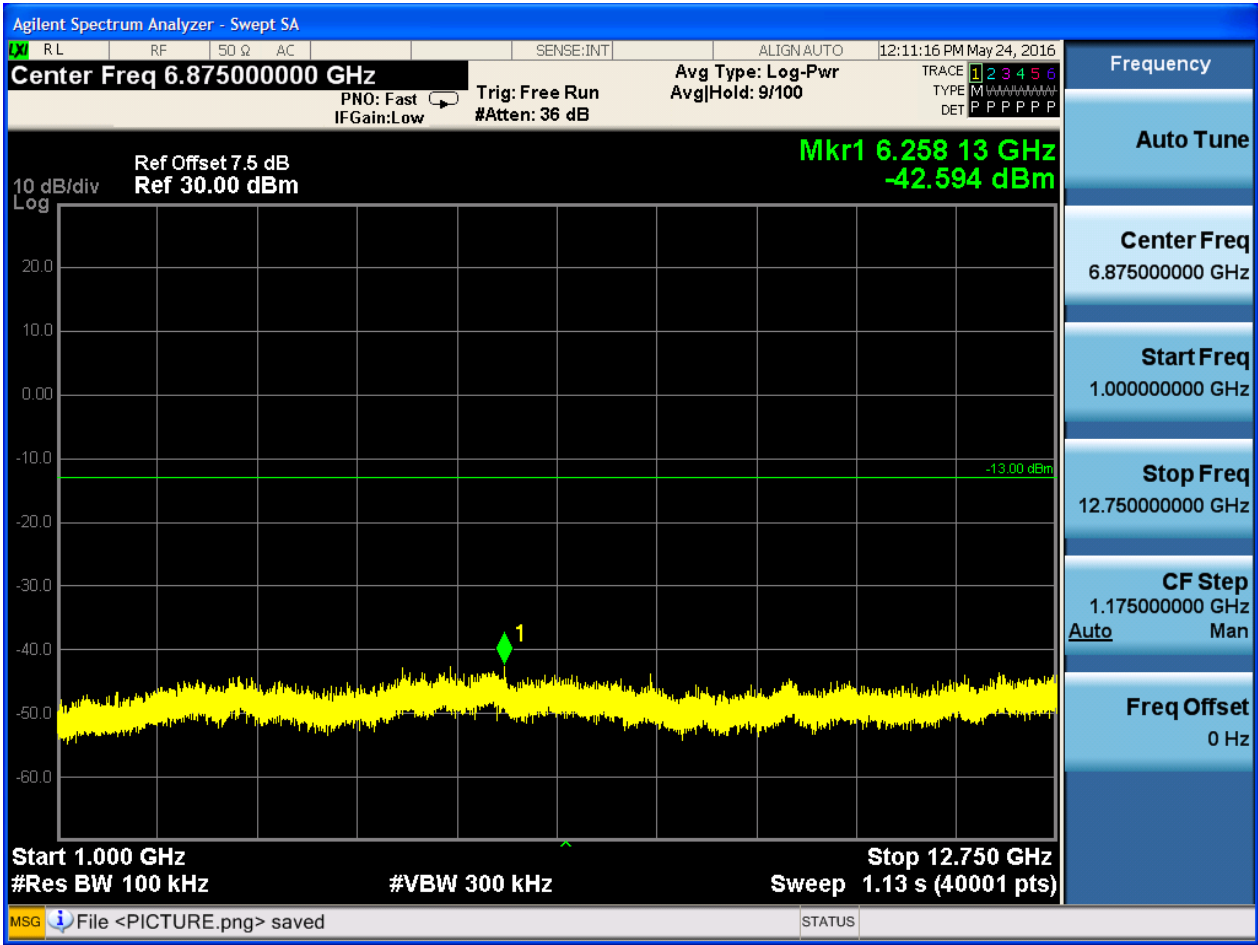
6.1.1.1.3 Test Channel = HCH









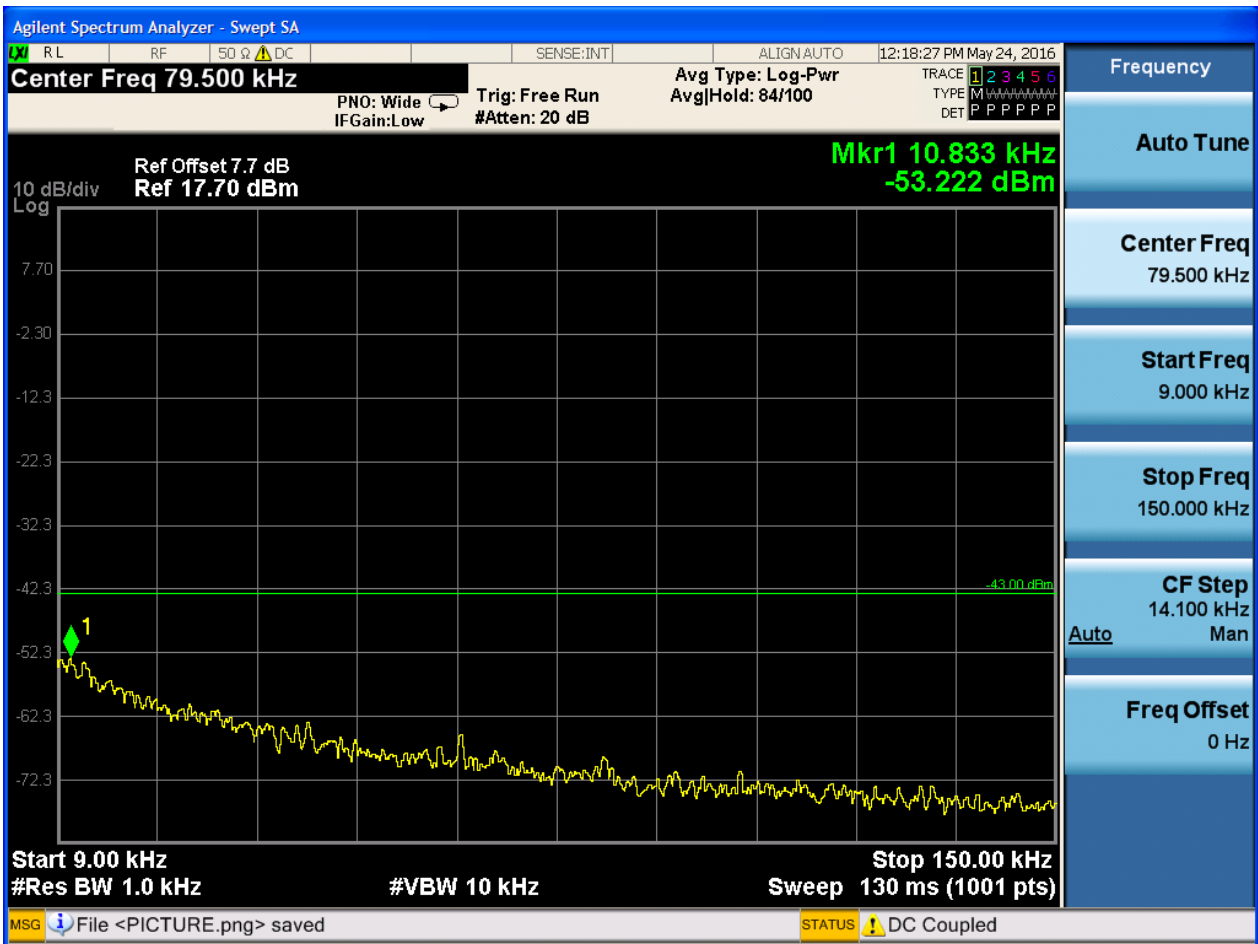


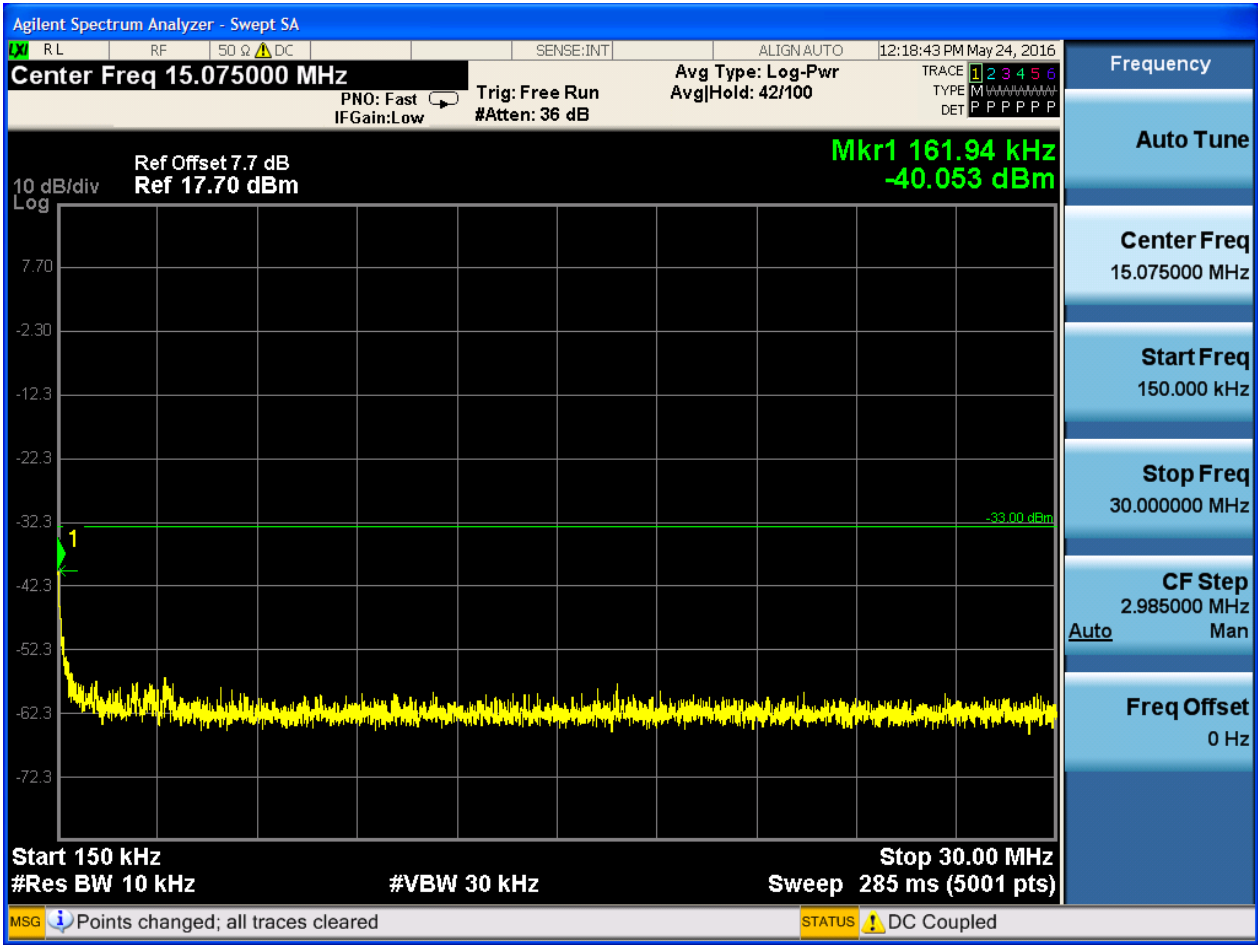


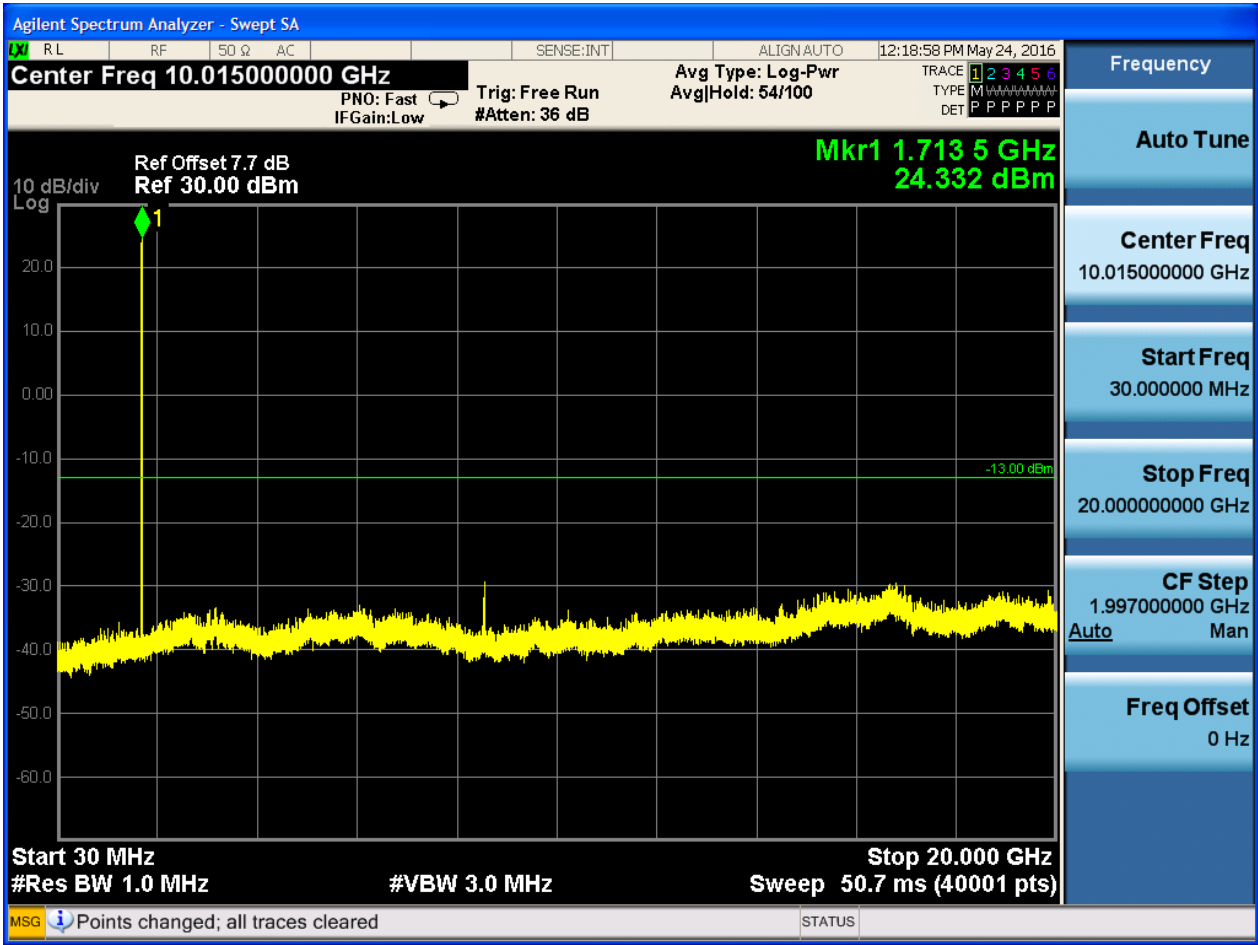
6.1.2 Test Band = WCDMA1700

6.1.2.1 Test Mode = UMTS/TM1

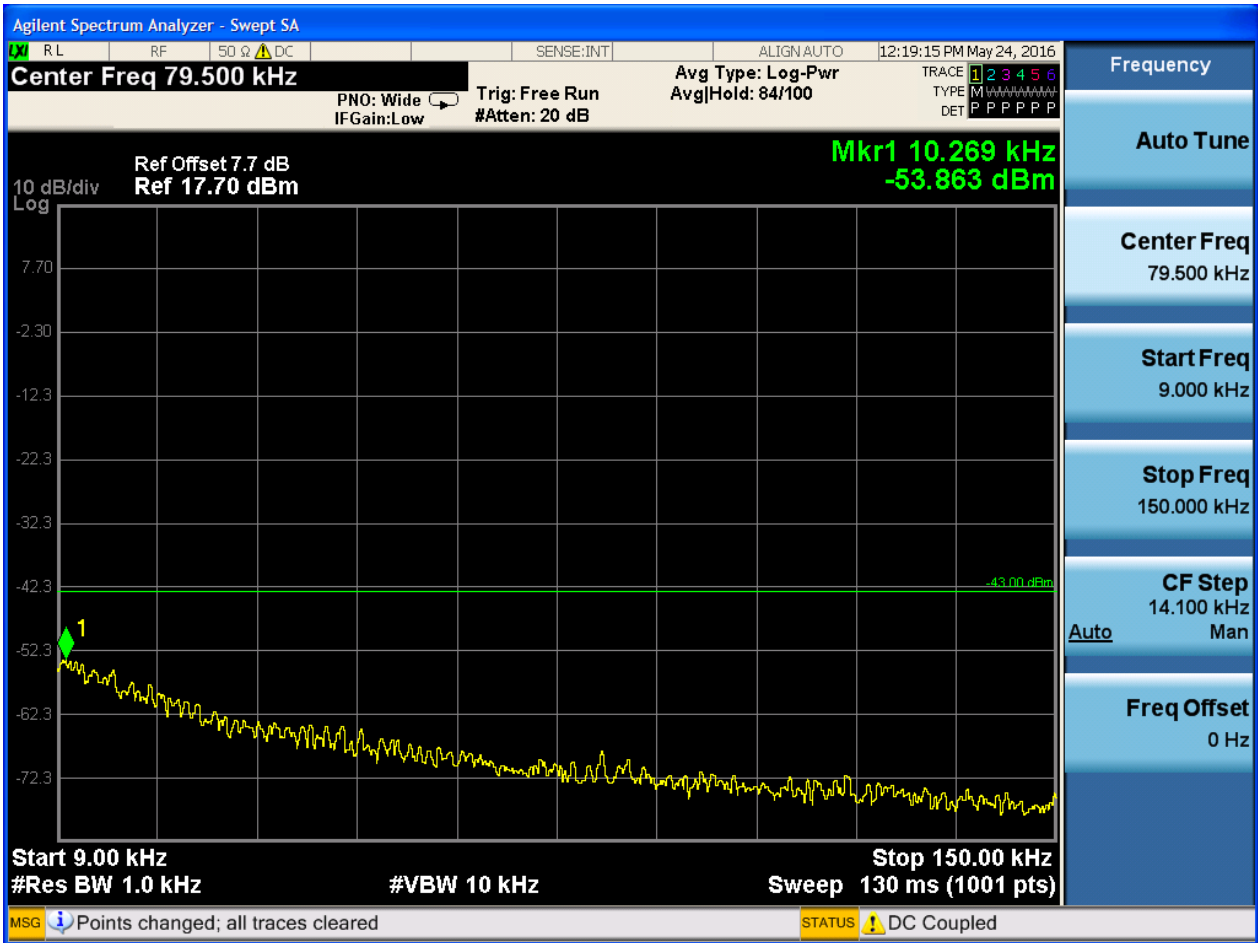
6.1.2.1.1 Test Channel = LCH

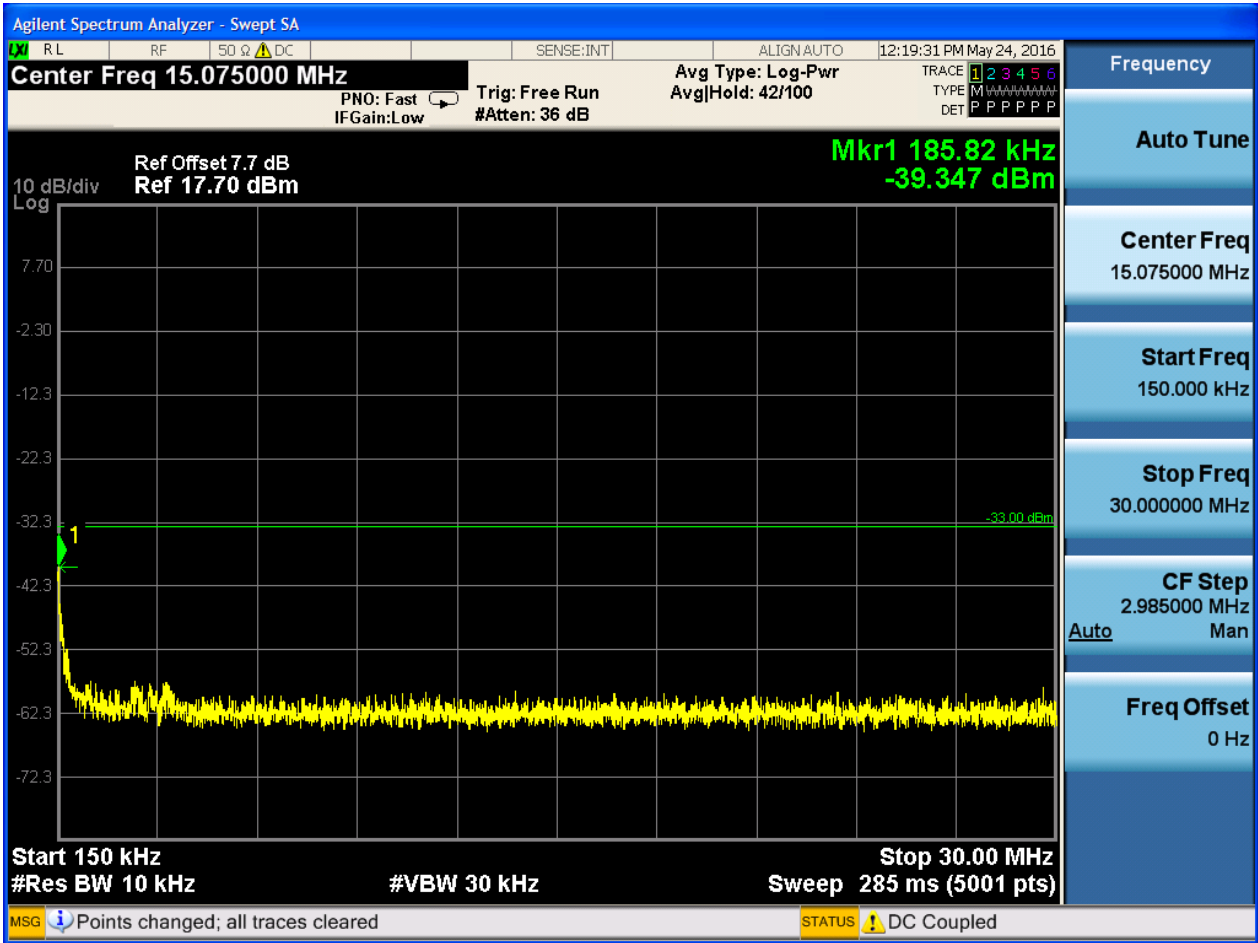




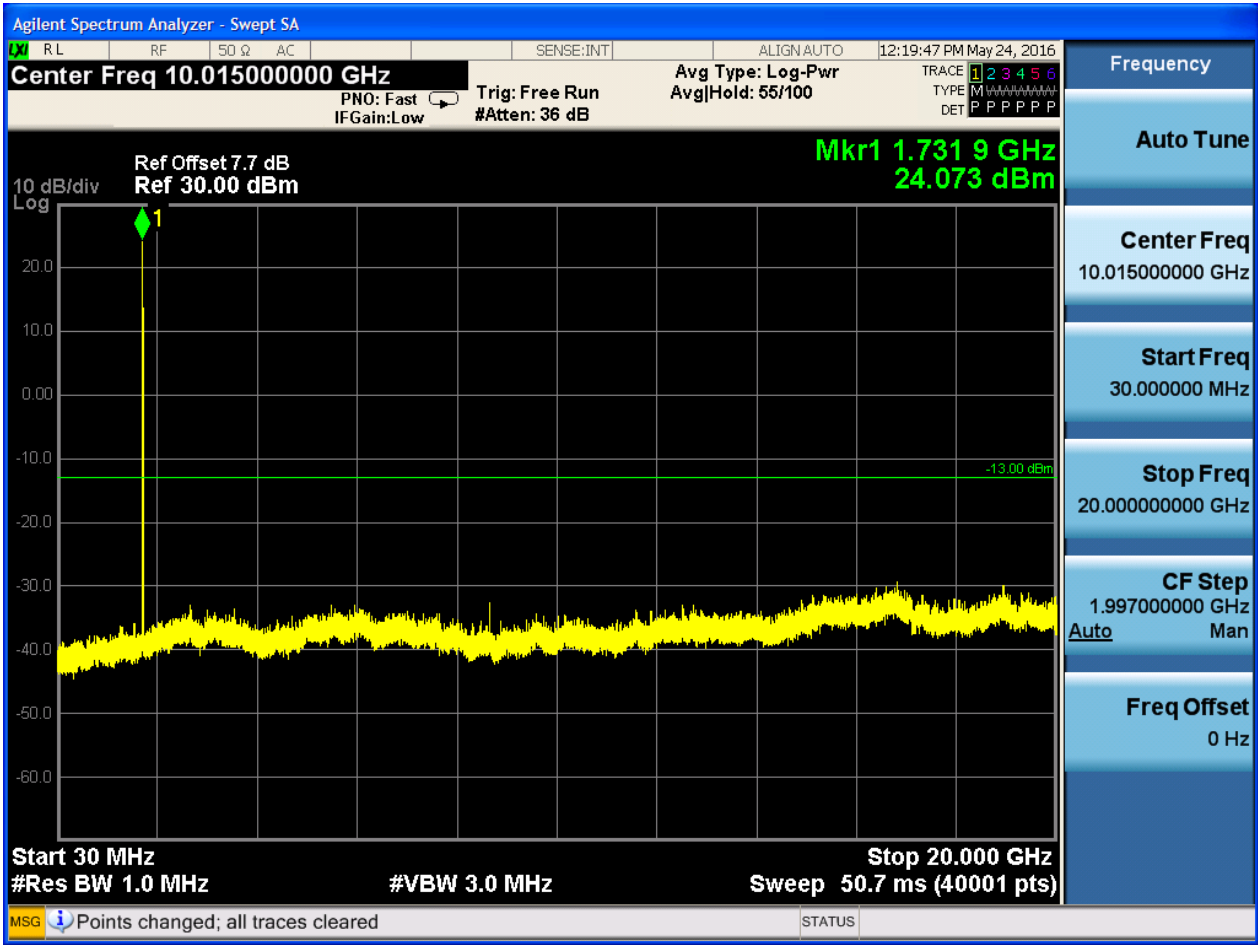


6.1.2.1.2 Test Channel = MCH

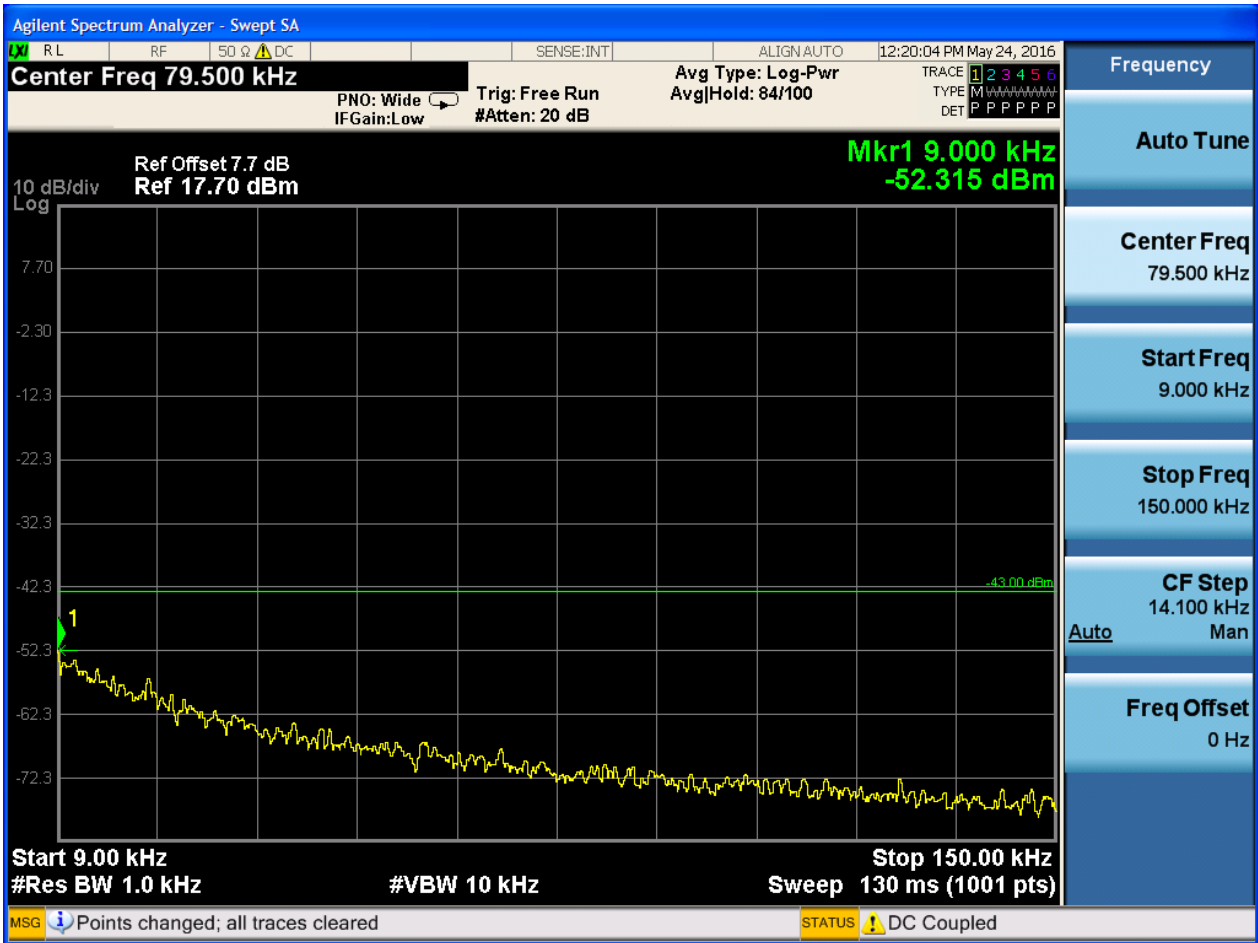


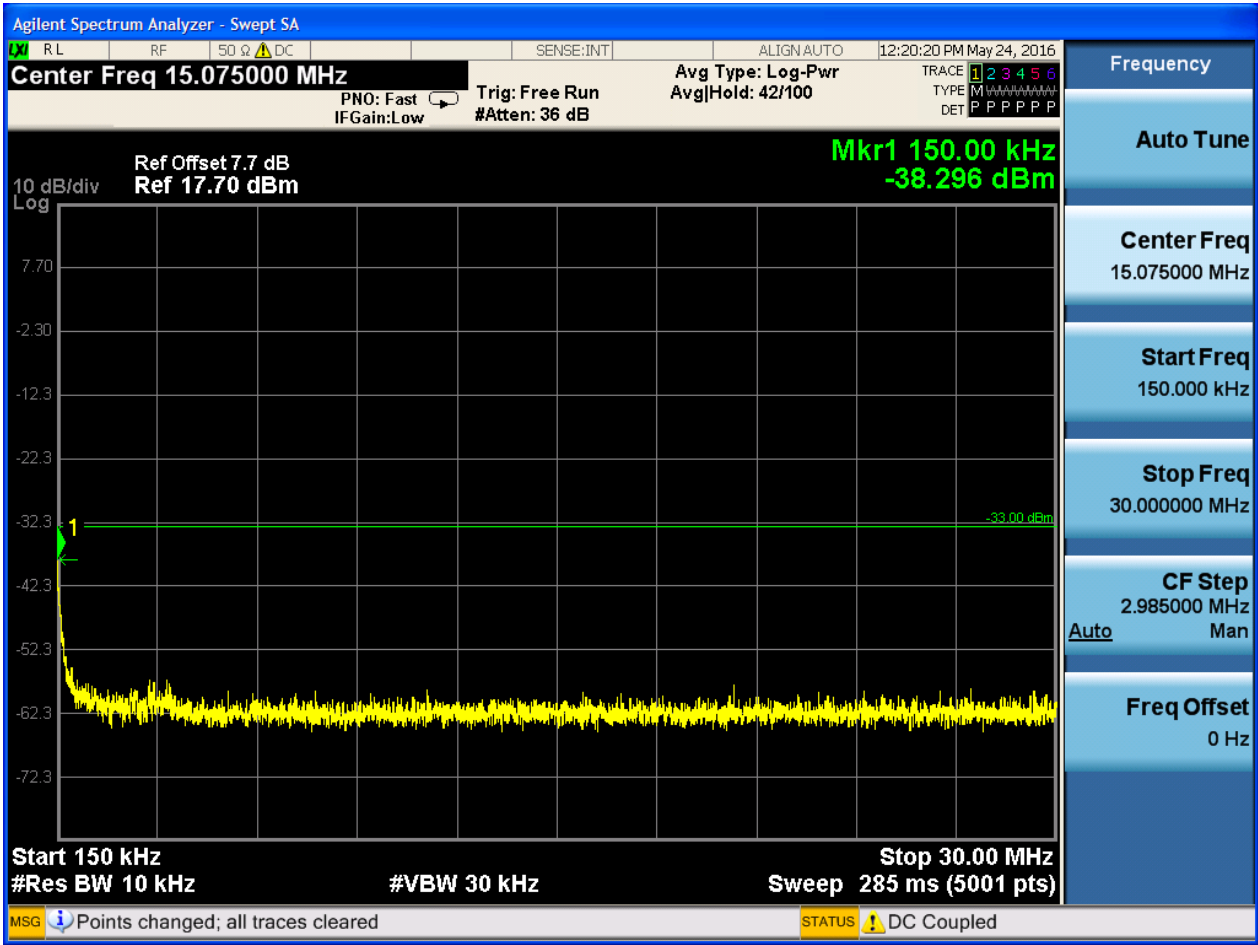


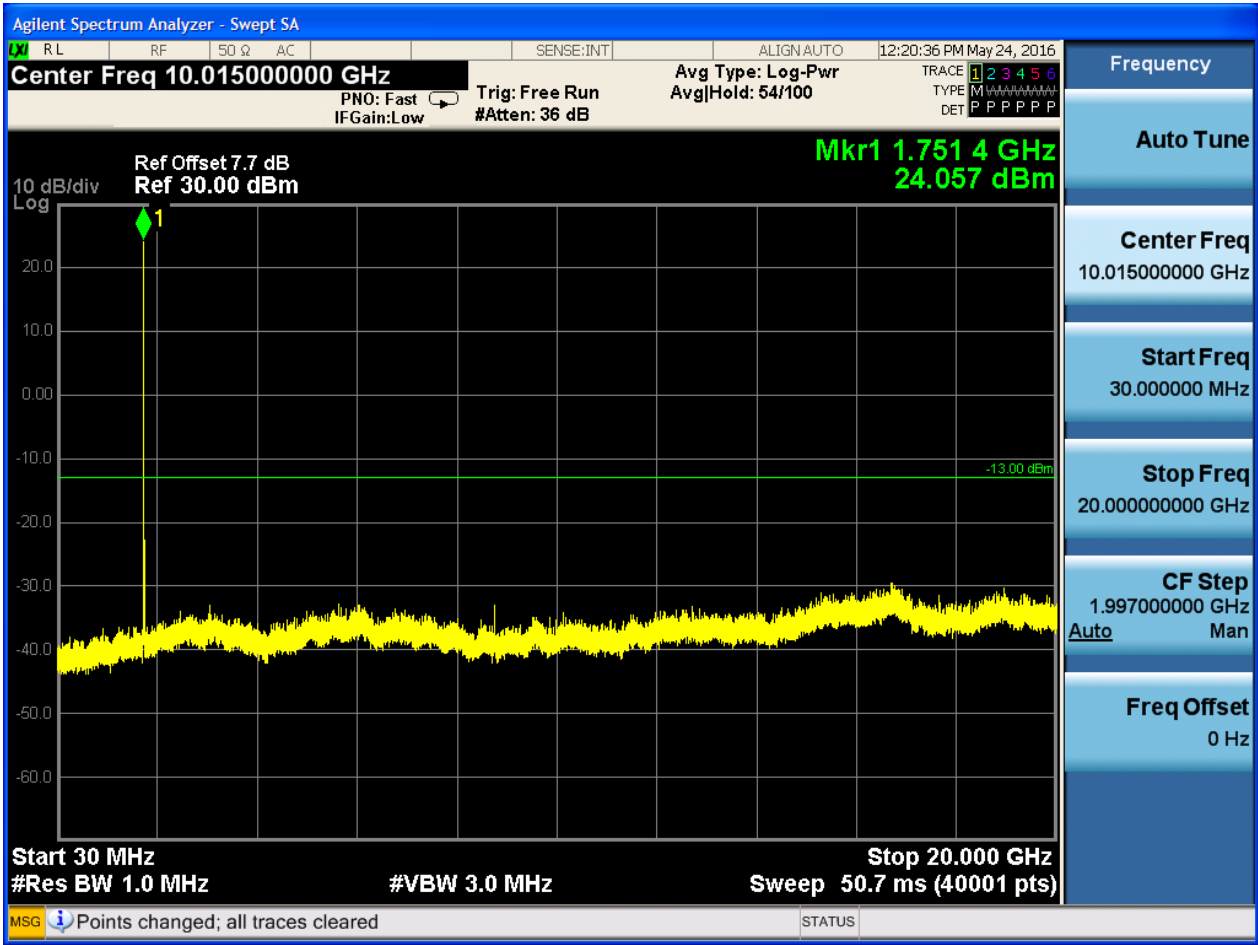




6.1.2.1.3 Test Channel = HCH





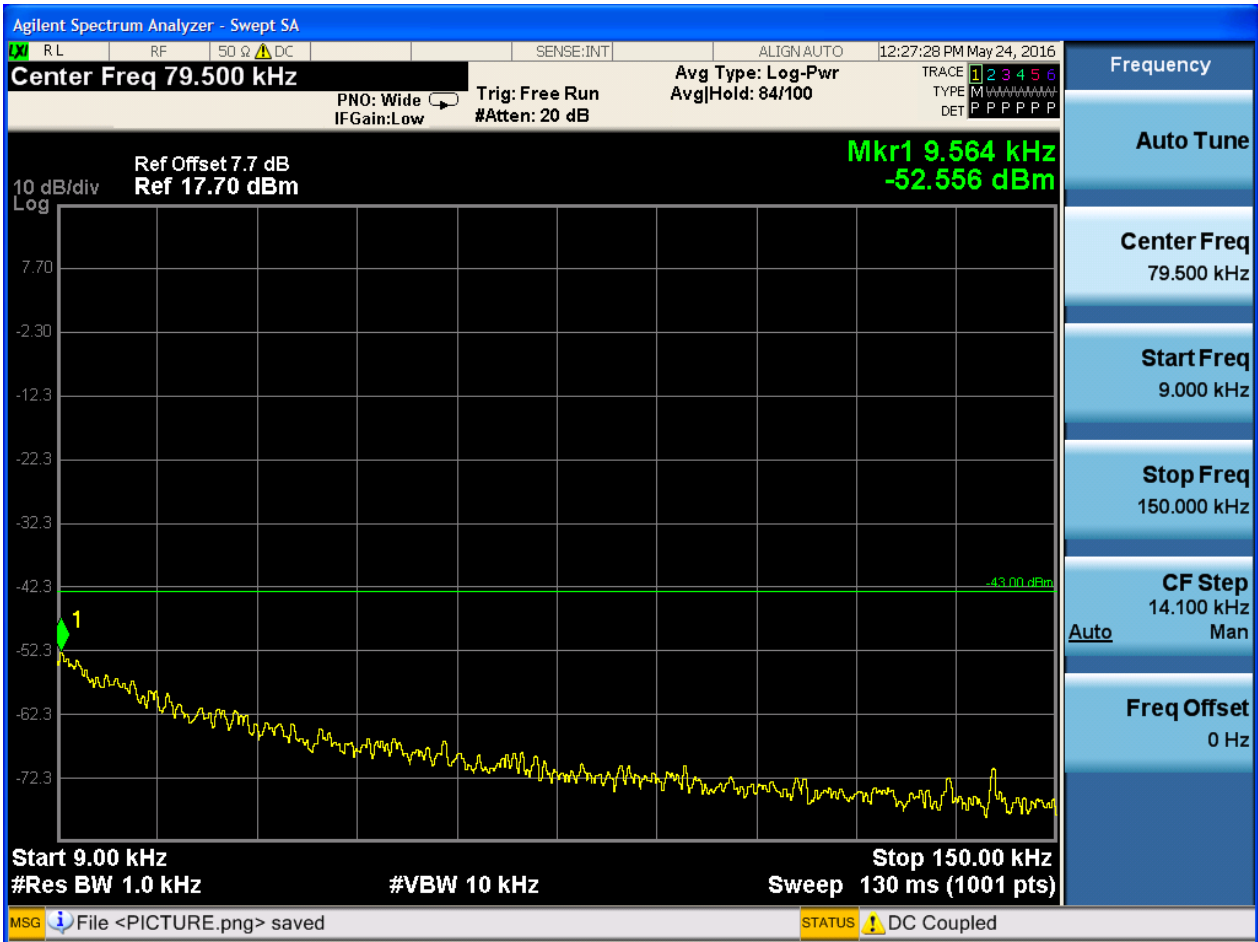


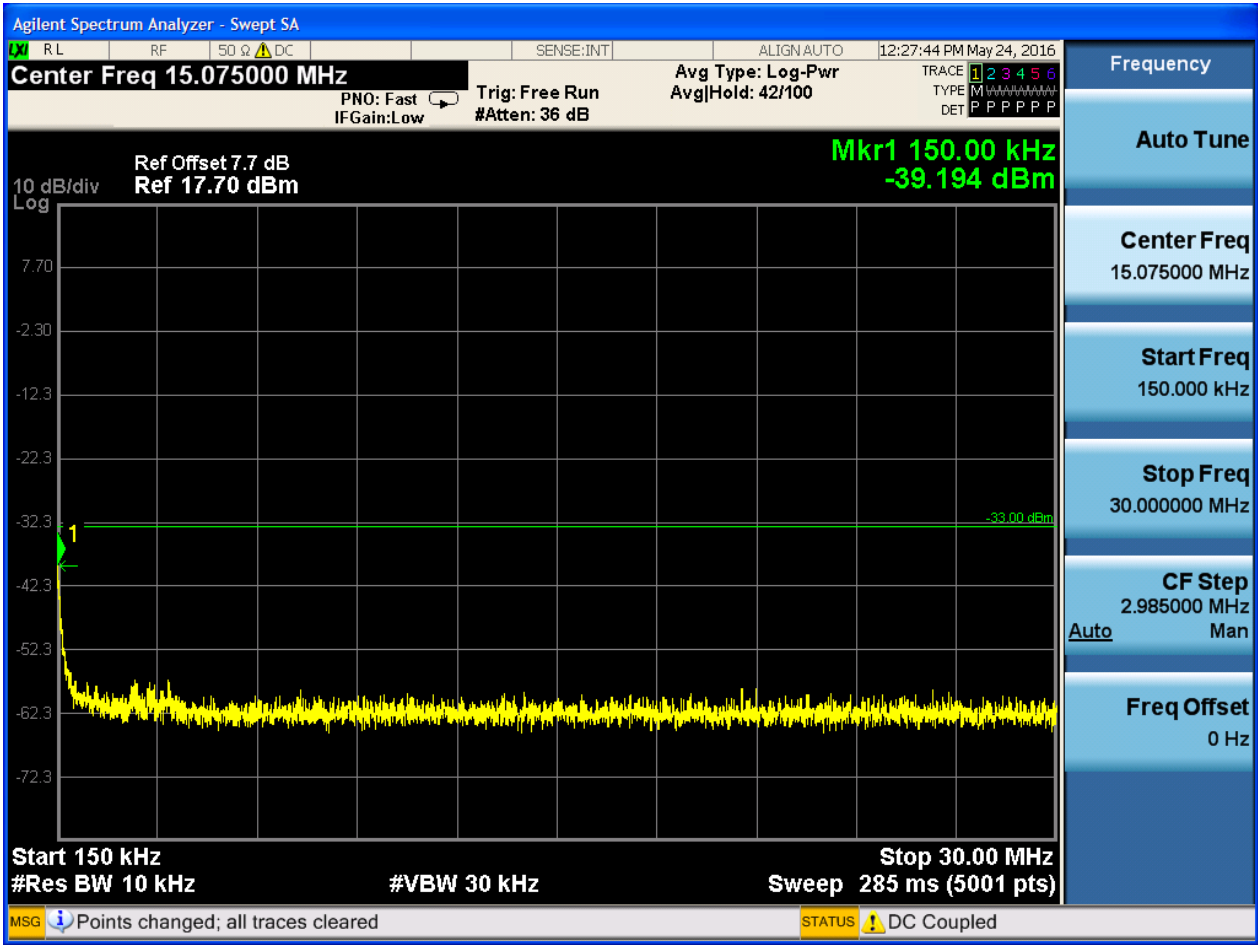


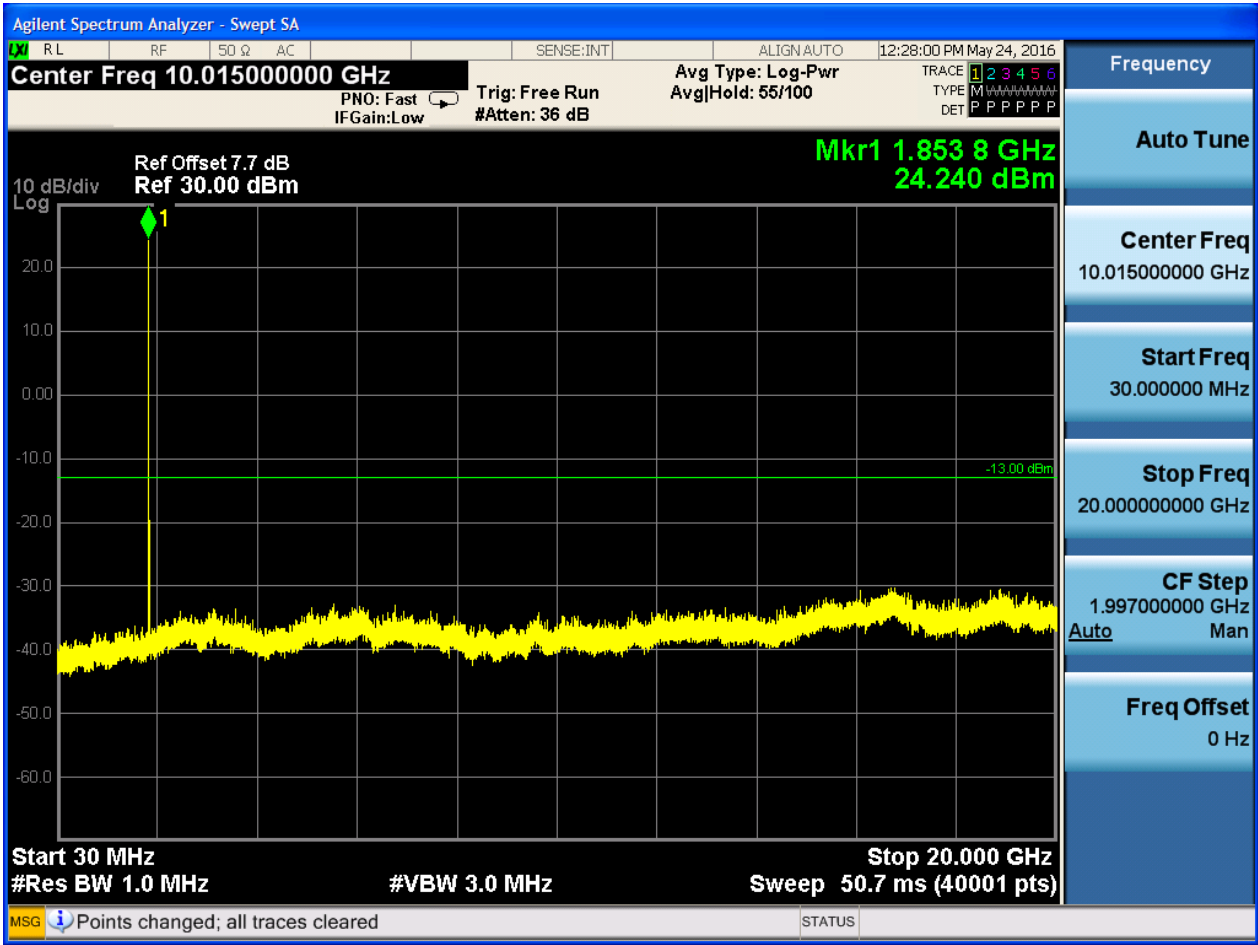
6.1.3 Test Band = WCDMA1900

6.1.3.1 Test Mode = UMTS/TM1

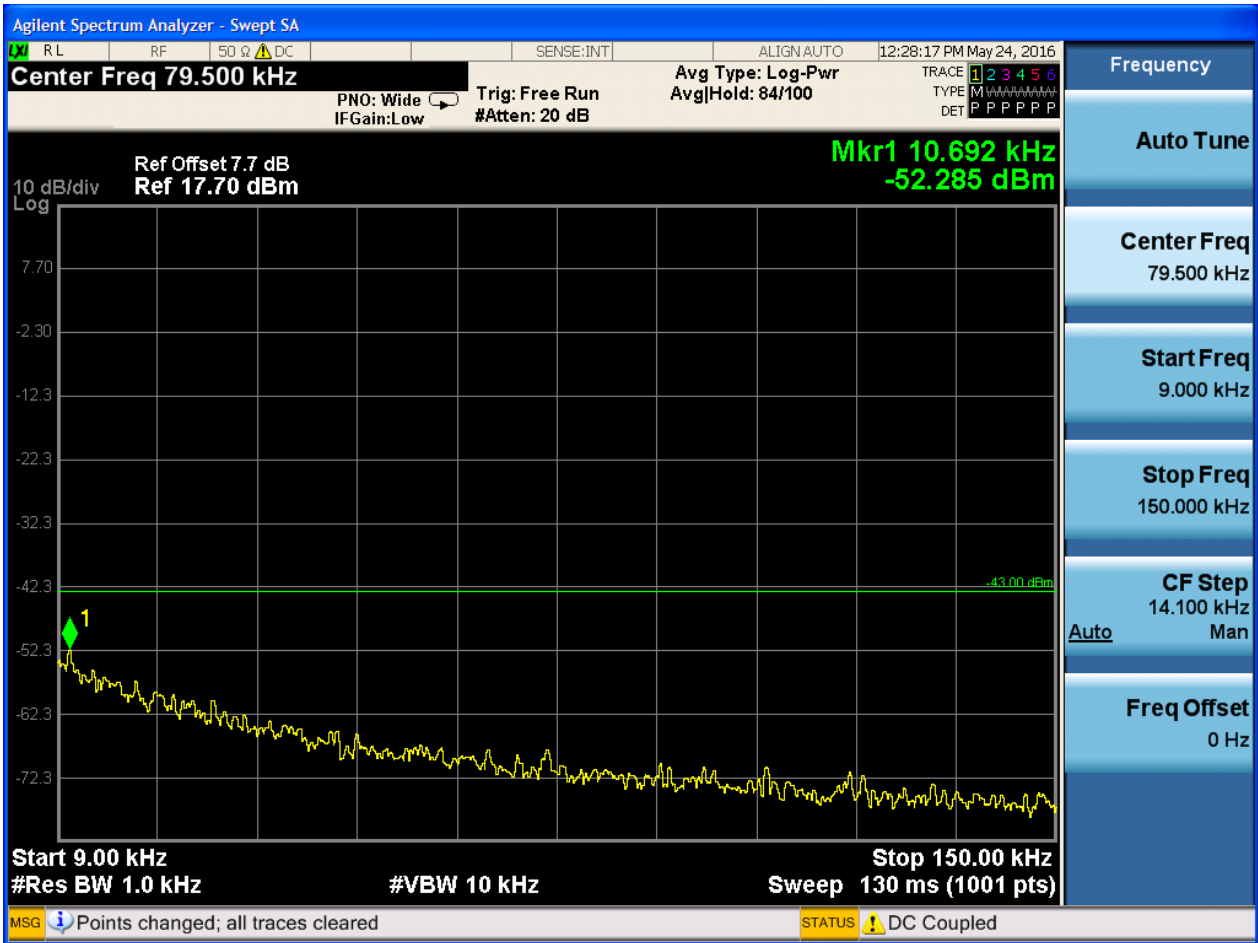
6.1.3.1.1 Test Channel = LCH



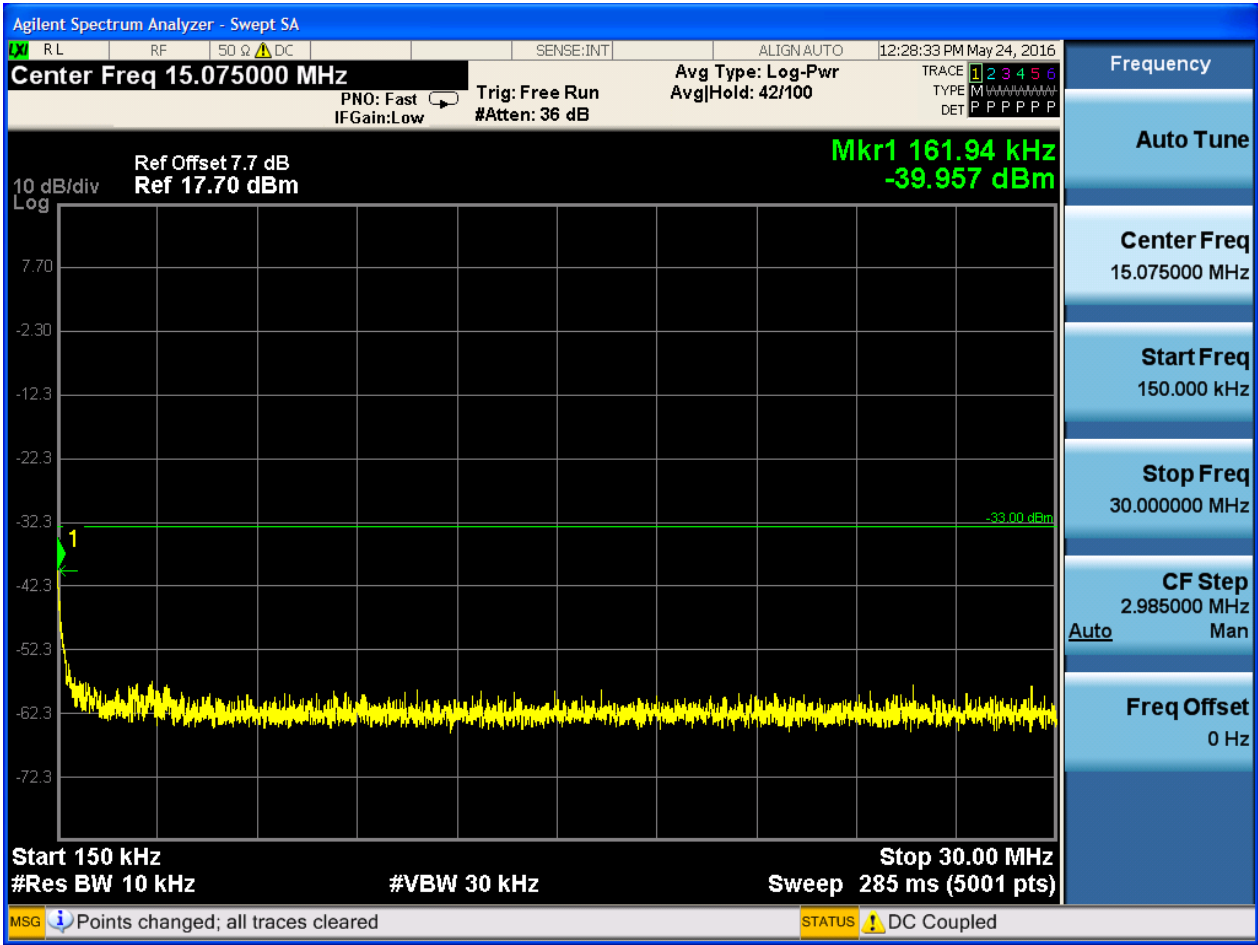


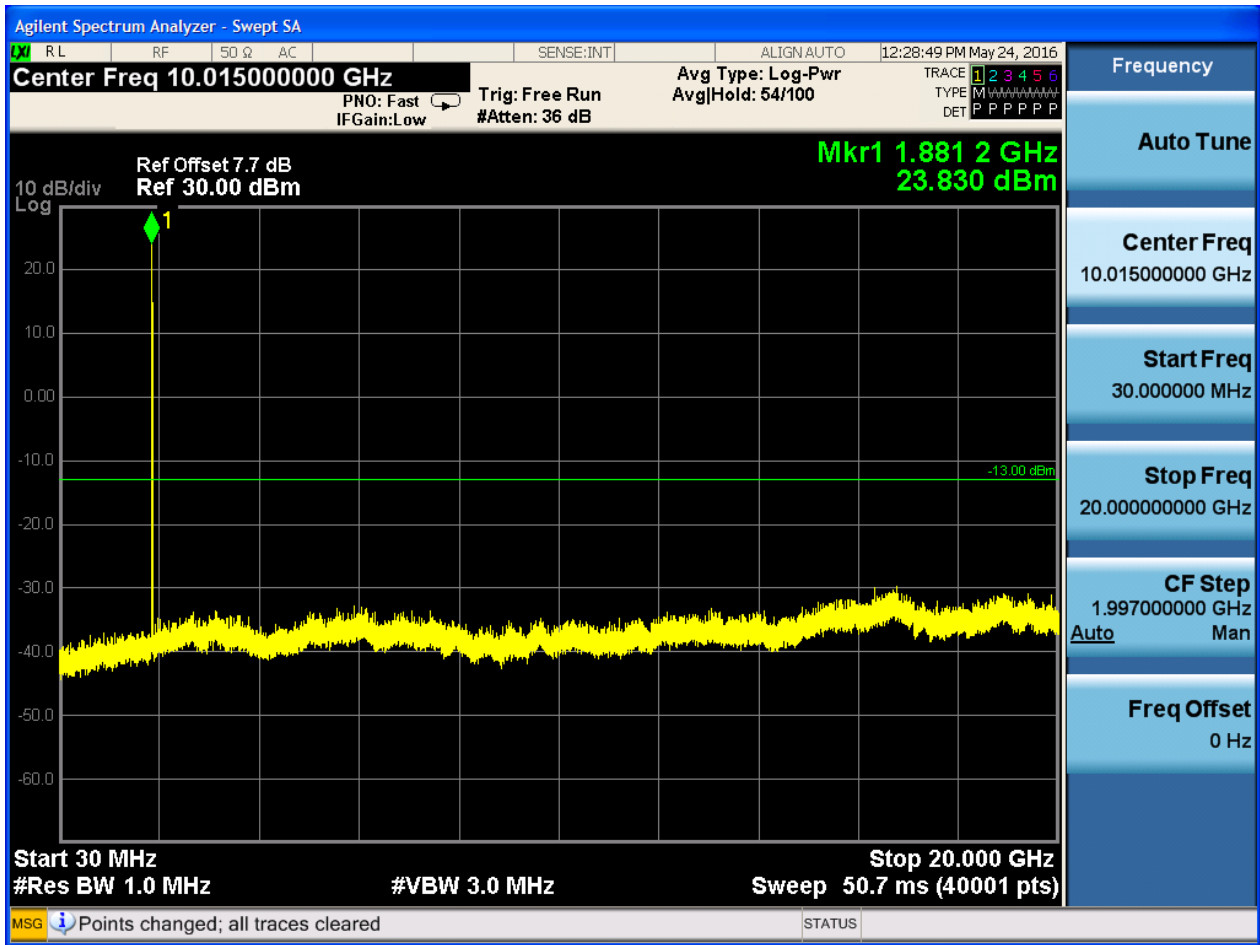


## 6.1.3.1.2 Test Channel = MCH



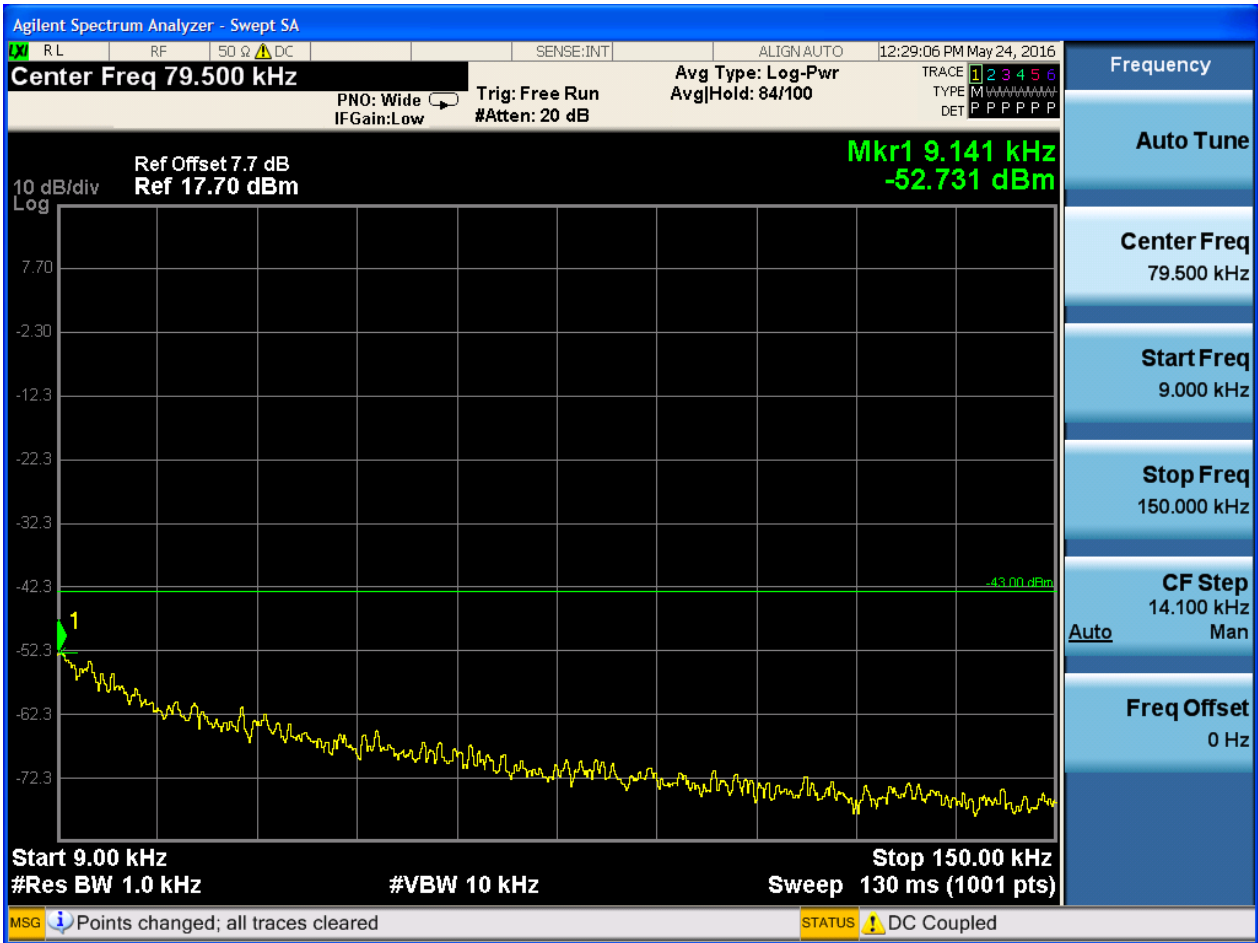


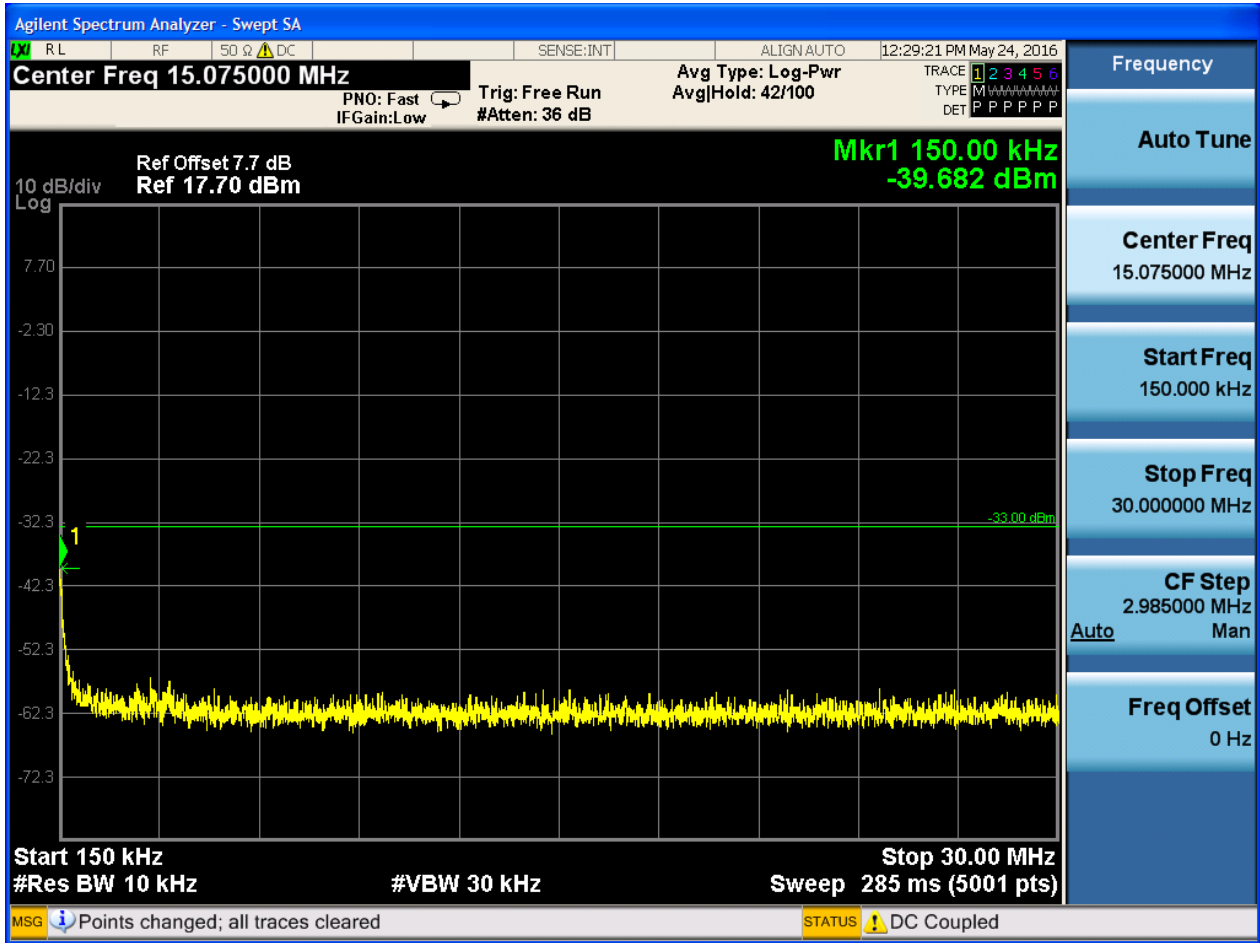


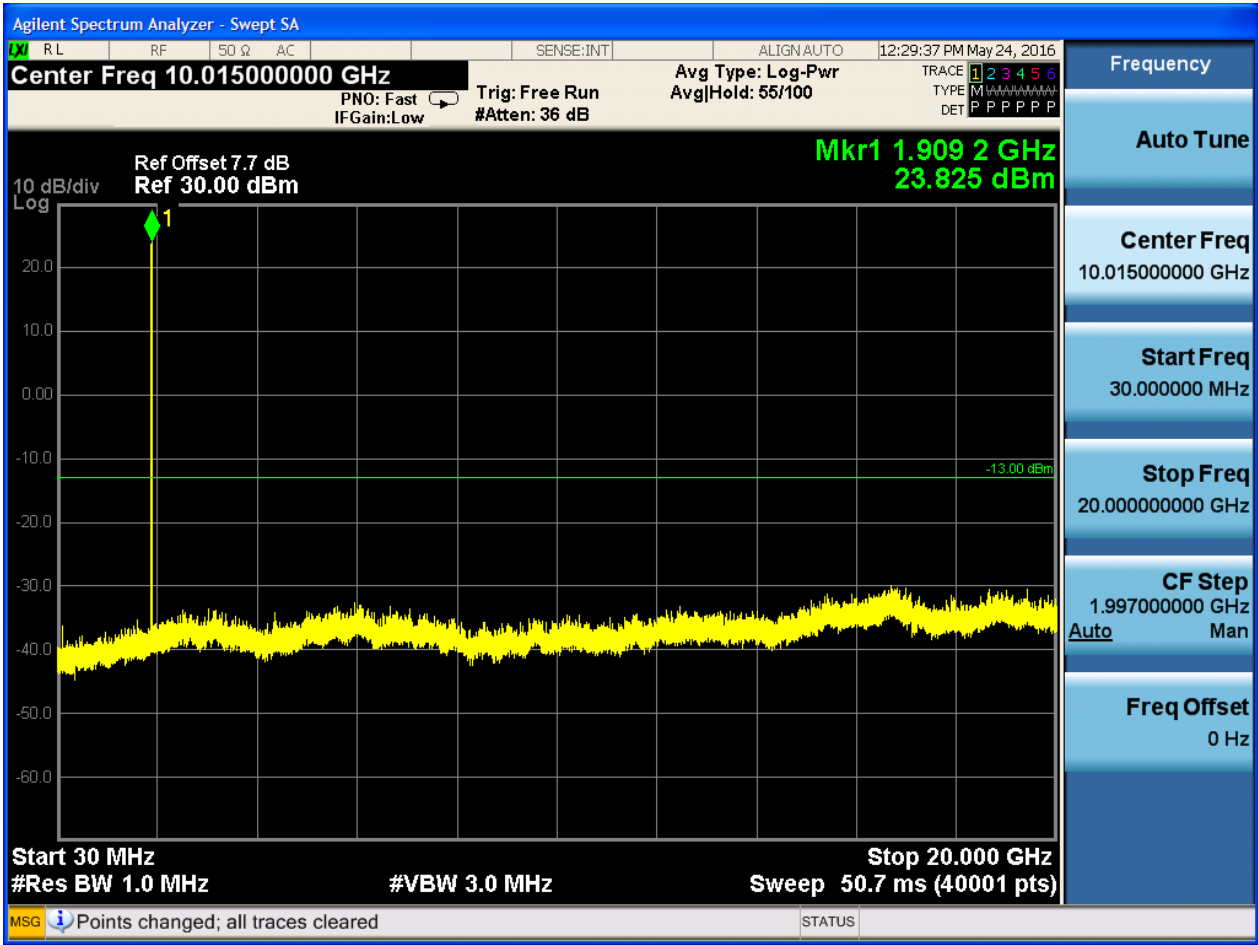




6.1.3.1.3 Test Channel = HCH







## 7Appendix\_G: Field Strength of Spurious Radiation

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

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

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

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

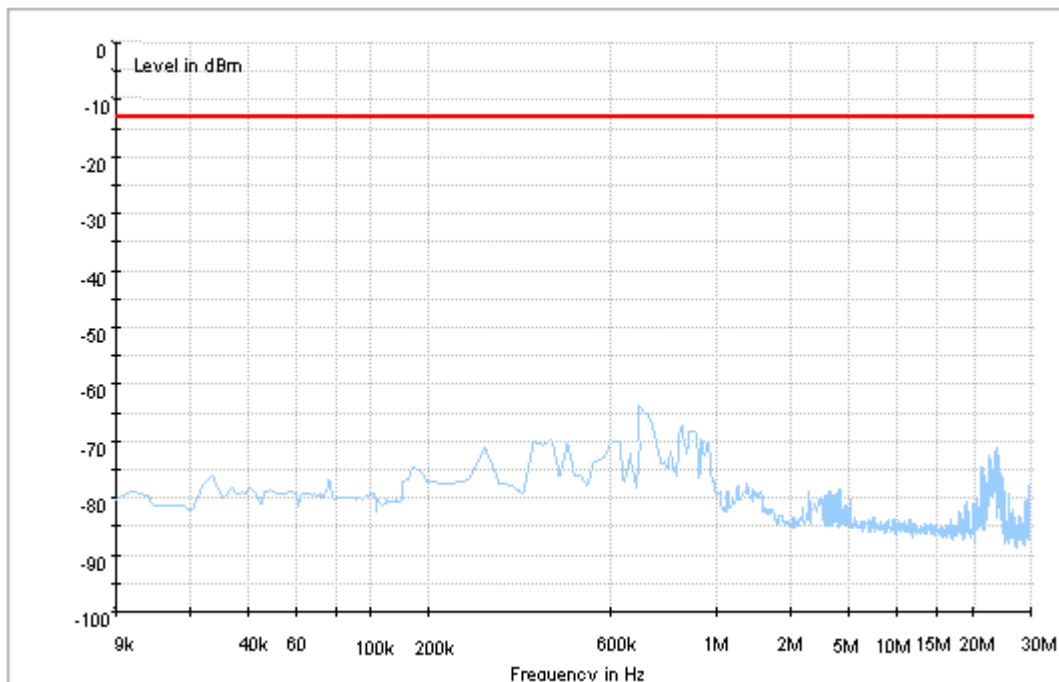
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

### Part I - Test Plots

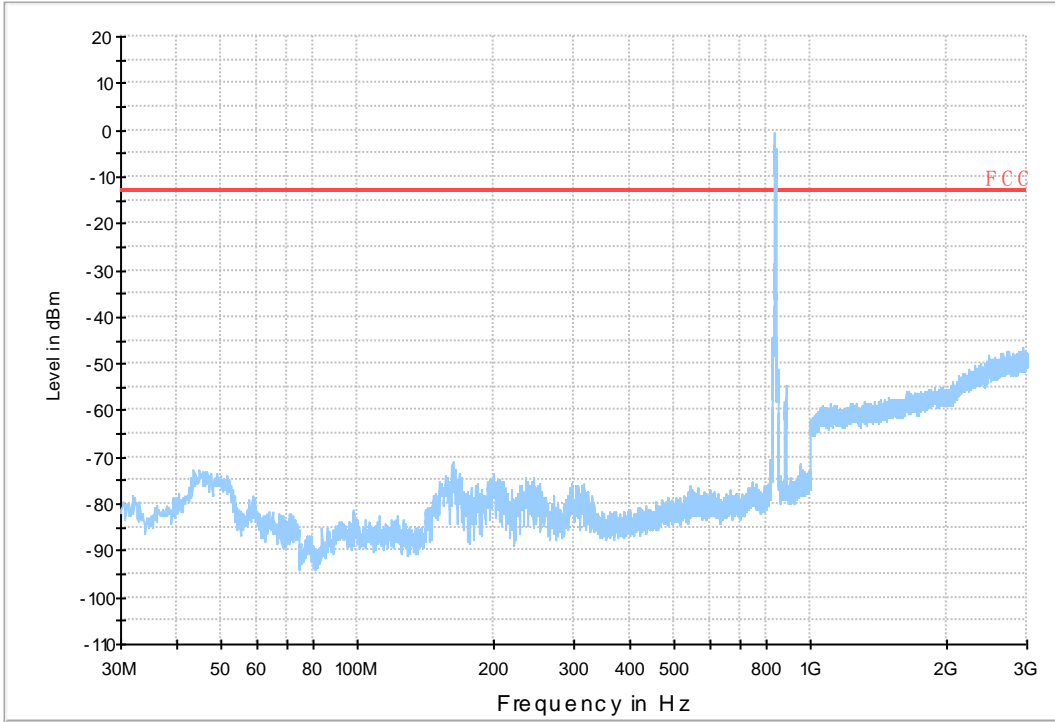
#### 7.1 For UMTS

##### 7.1.1 Test Band = WCDMA850\_Ant1

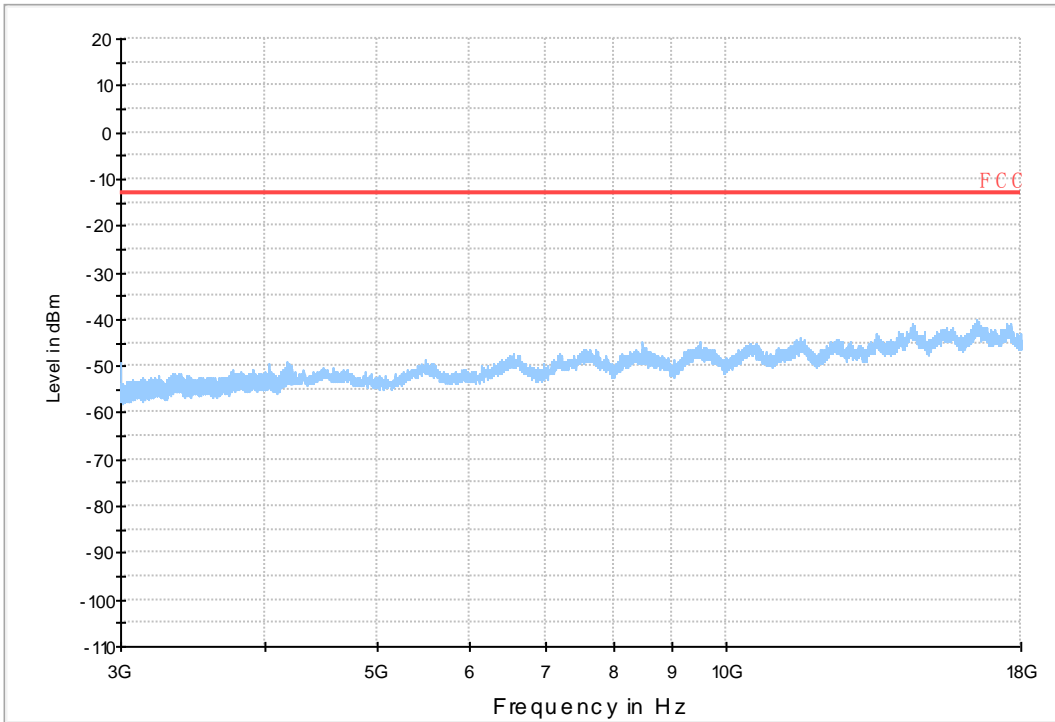
##### 7.1.1.1 Test Mode = UMTS/TM1



Copy of FCC PART22 W CDM A850\_L

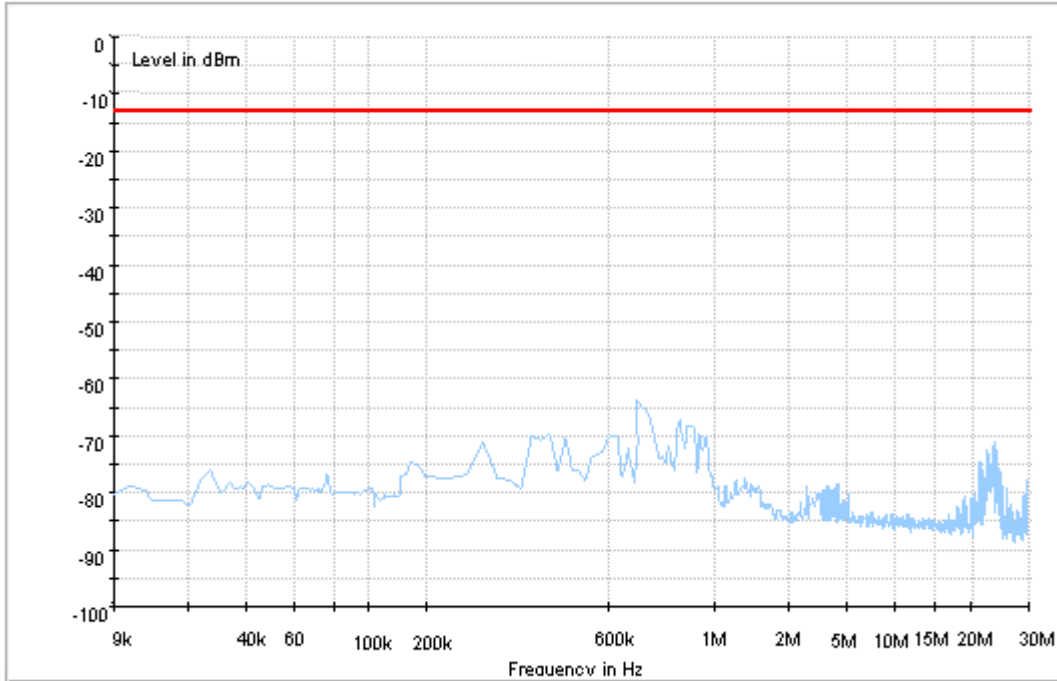


Copy of FCC PART22 W CDM A850\_H

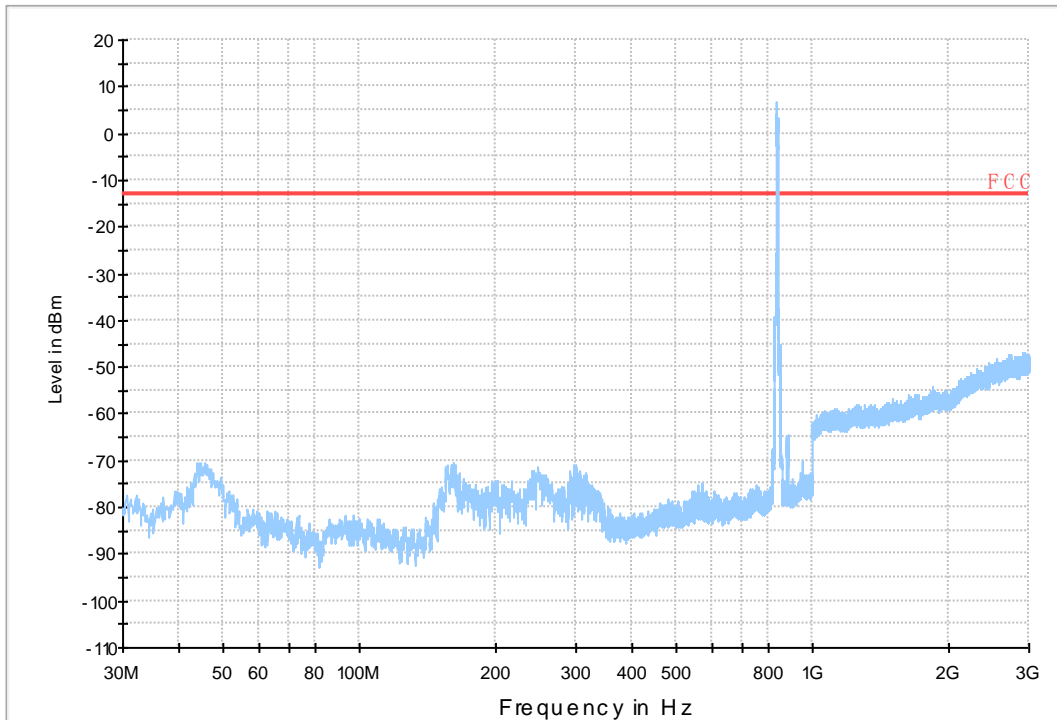


### 7.1.2 Test Band = WCDMA850\_Ant2

#### 7.1.2.1 Test Mode = UMTS/TM1

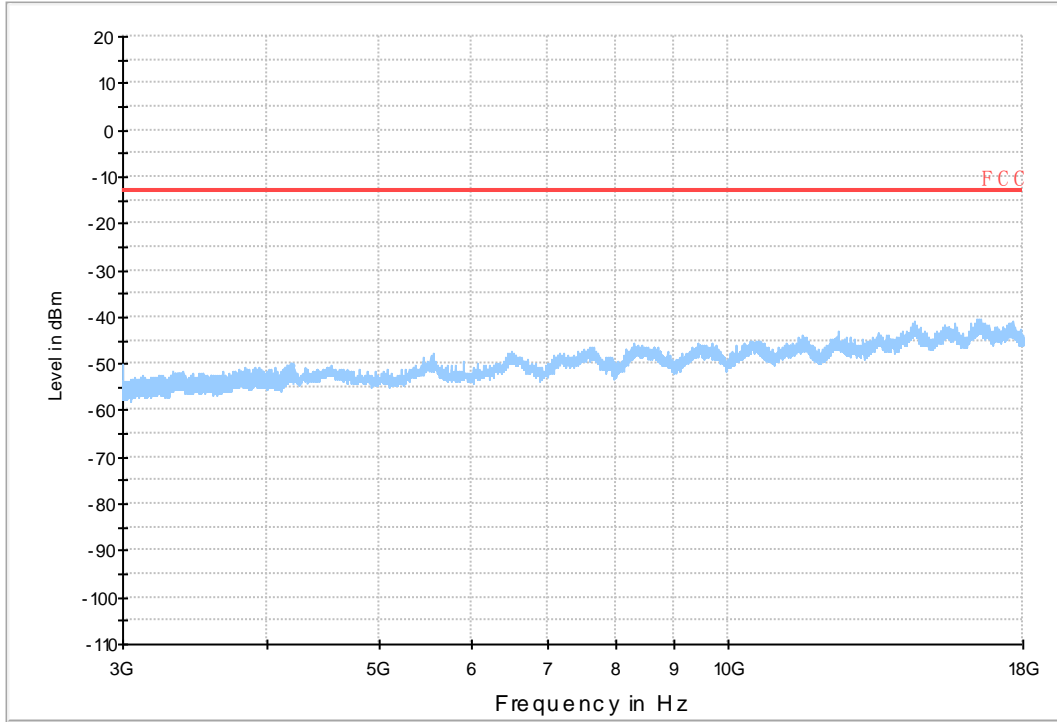


Copy of FCC PART22 WCDMA850\_L



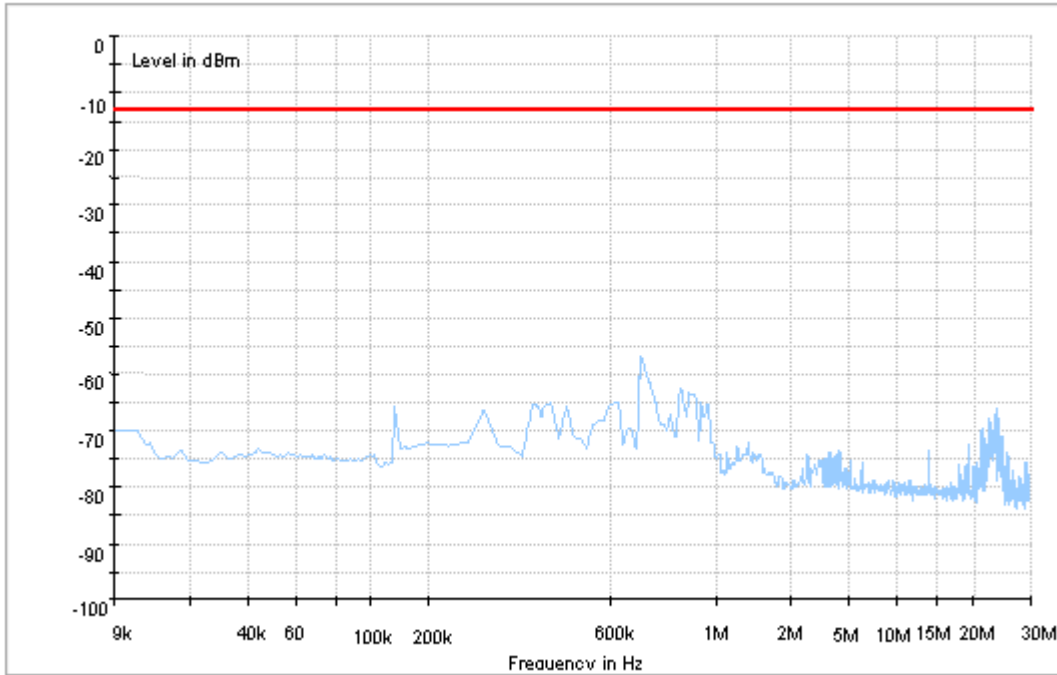


Copy of FCC PART22 W CDM A850\_H

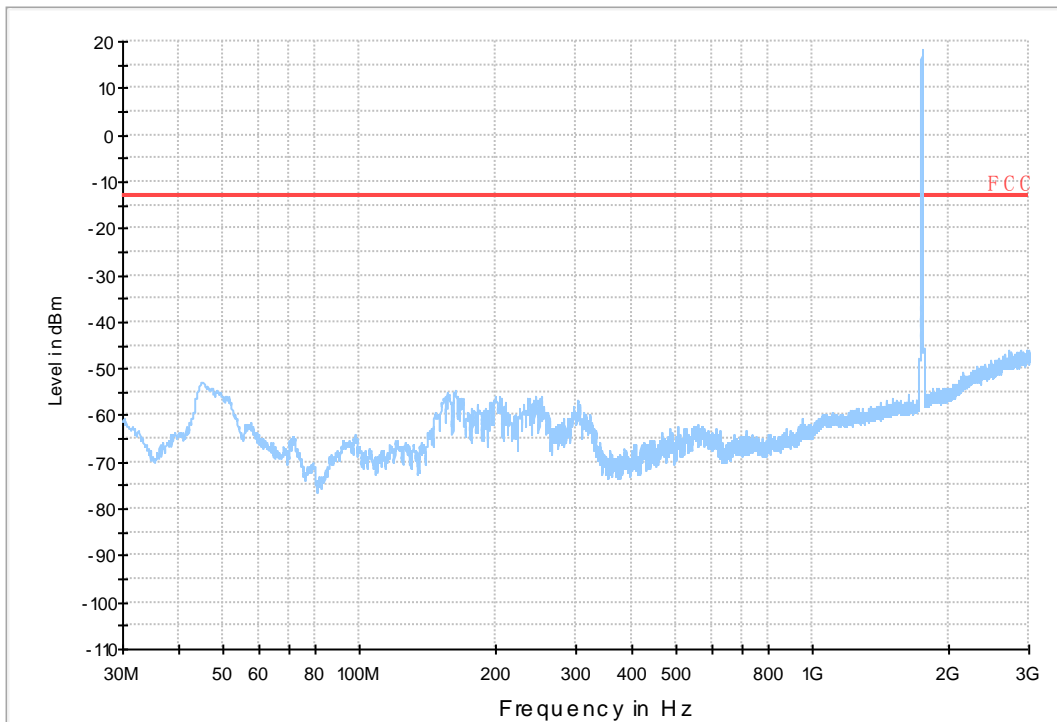


### 7.1.3 Test Band = WCDMA1700\_Ant1

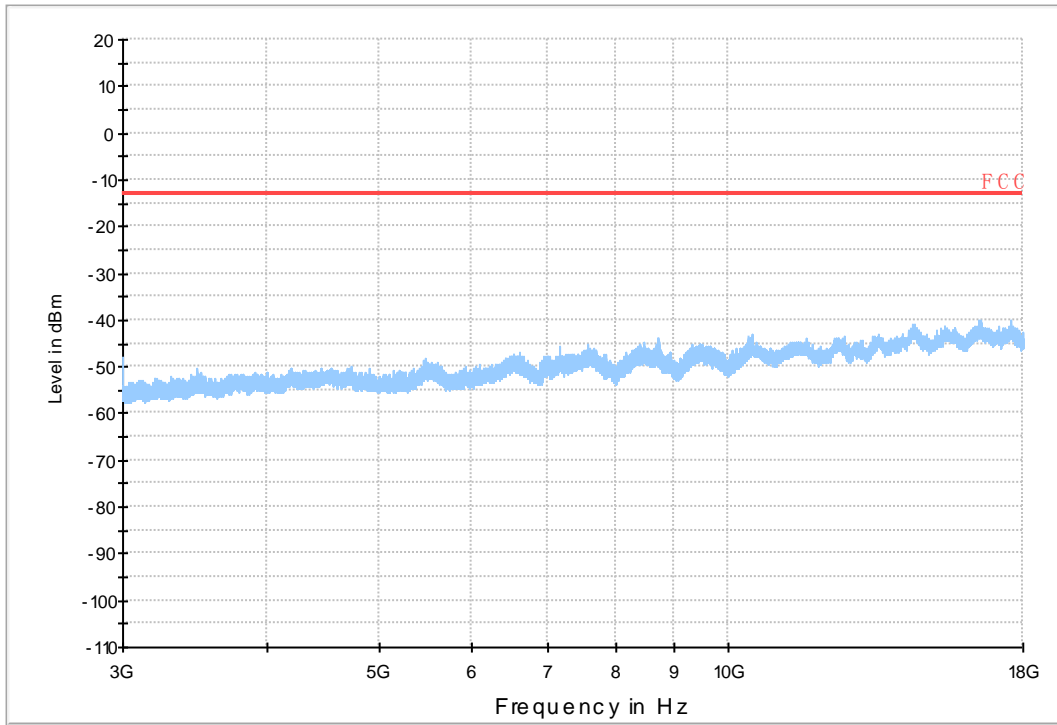
#### 7.1.3.1 Test Mode = UMTS/TM1



Copy of FCC PART27 W CDMA1700\_L

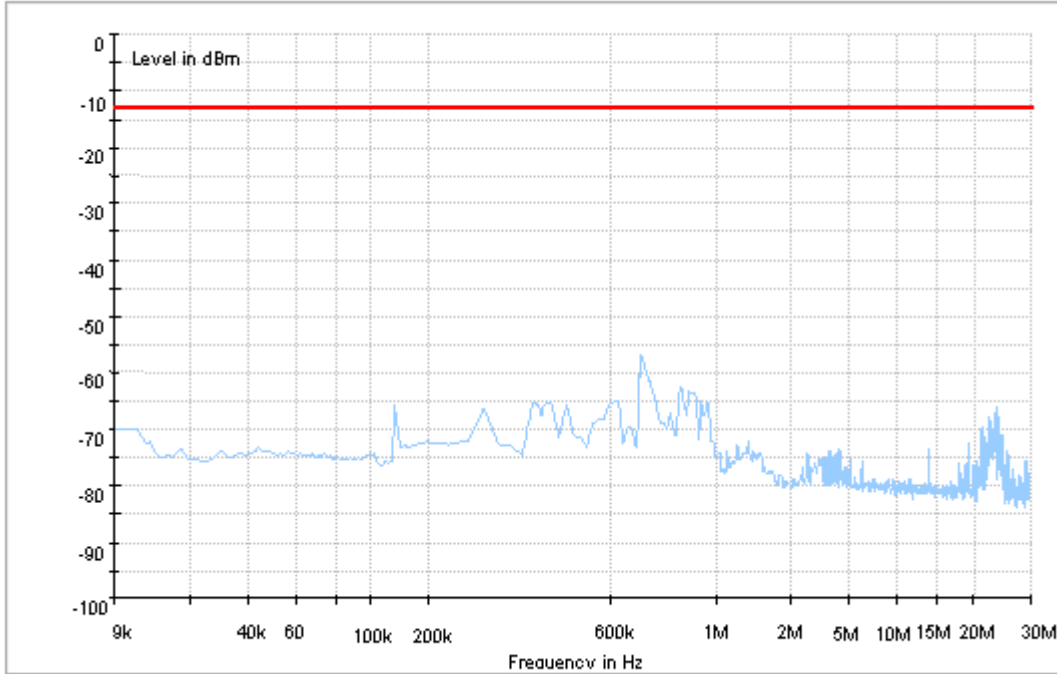


Copy of FCC PART27 W CDMA1700\_H

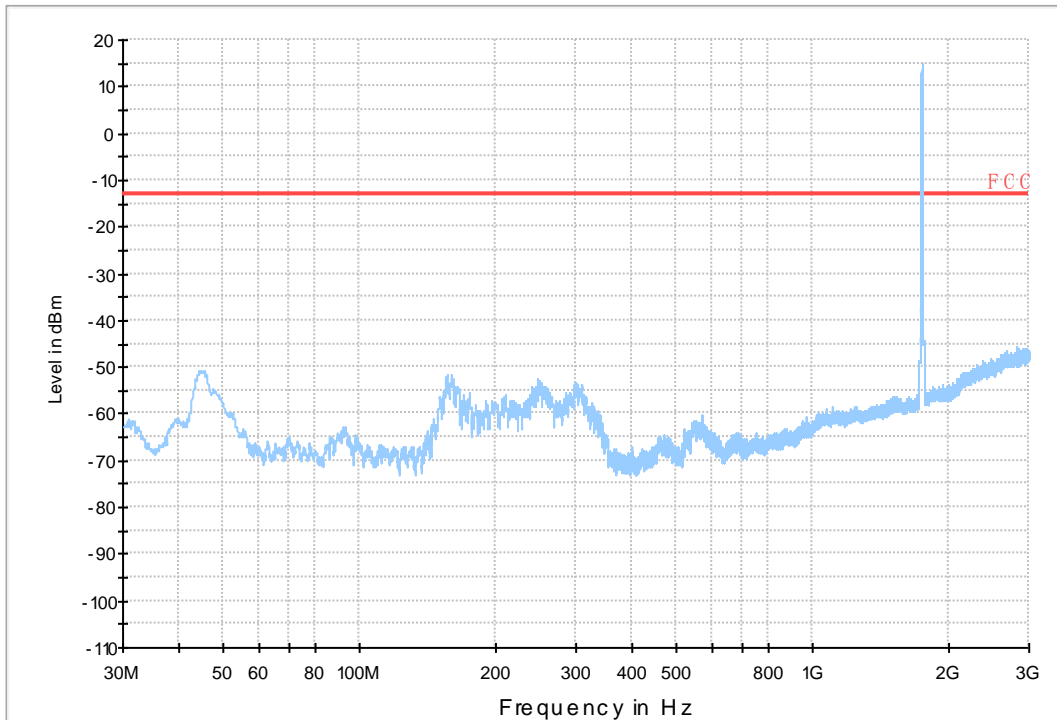


### 7.1.4 Test Band = WCDMA1700\_Ant2

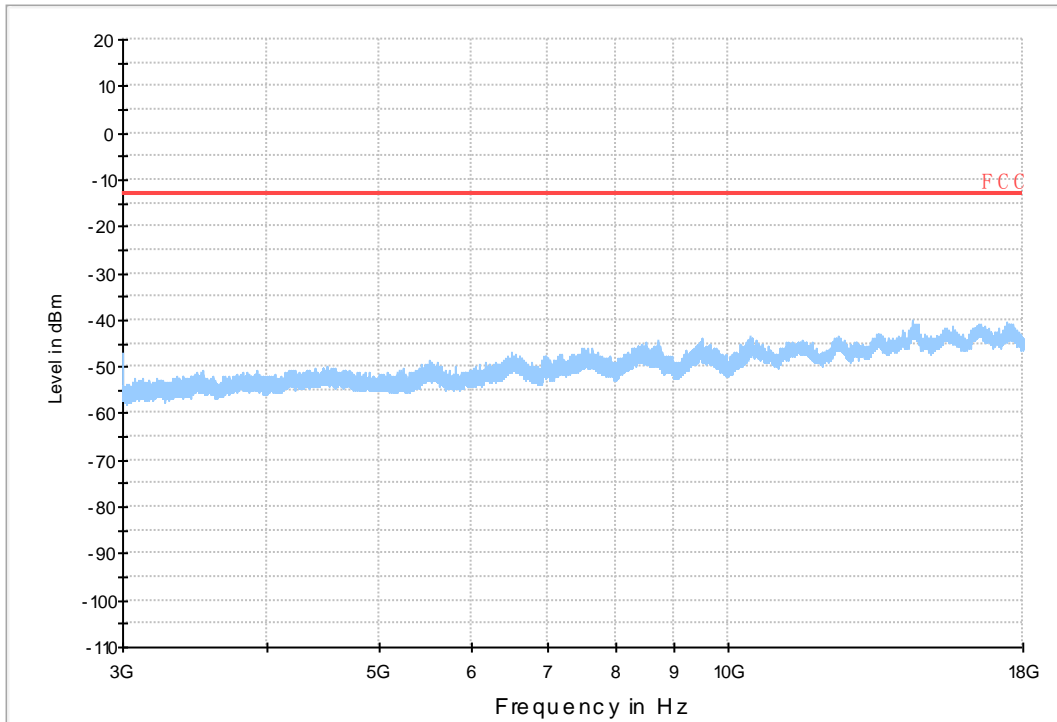
#### 7.1.4.1 Test Mode = UMTS/TM1



Copy of FCC PART27 W CDMA1700\_L

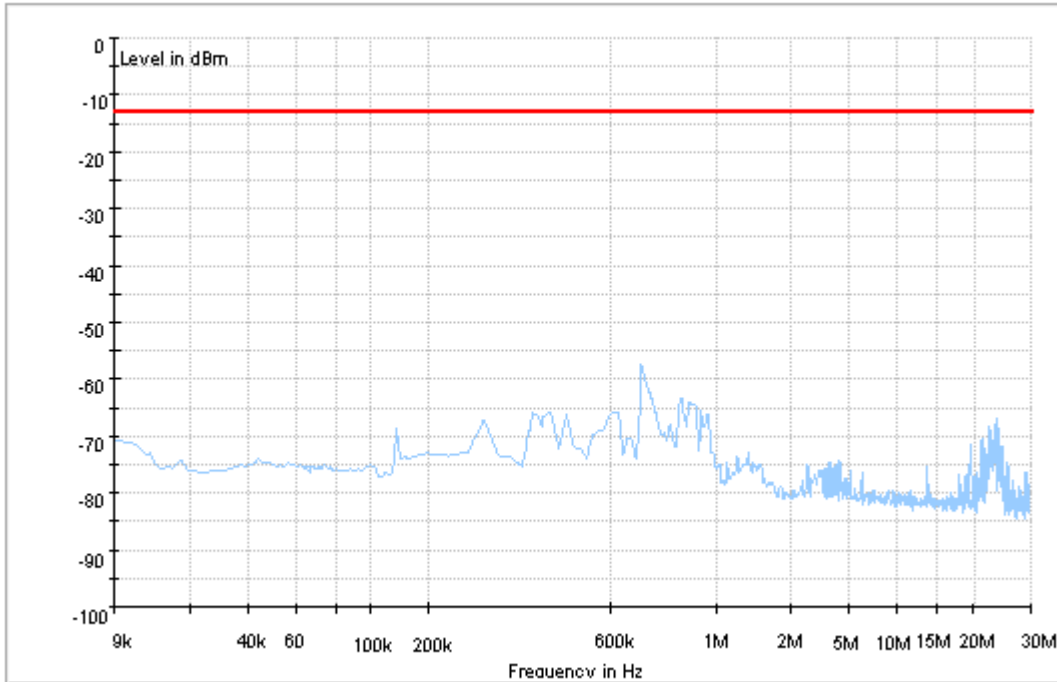


Copy of FCC PART27 W CDMA1700\_H

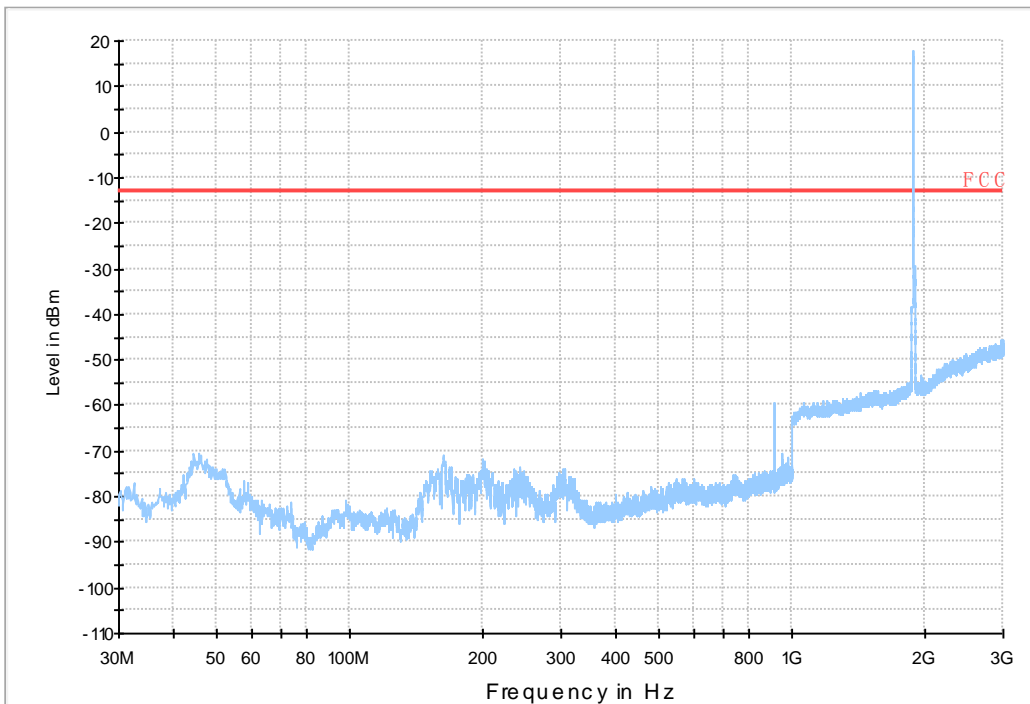


### 7.1.5 Test Band = WCDMA1900\_Ant1

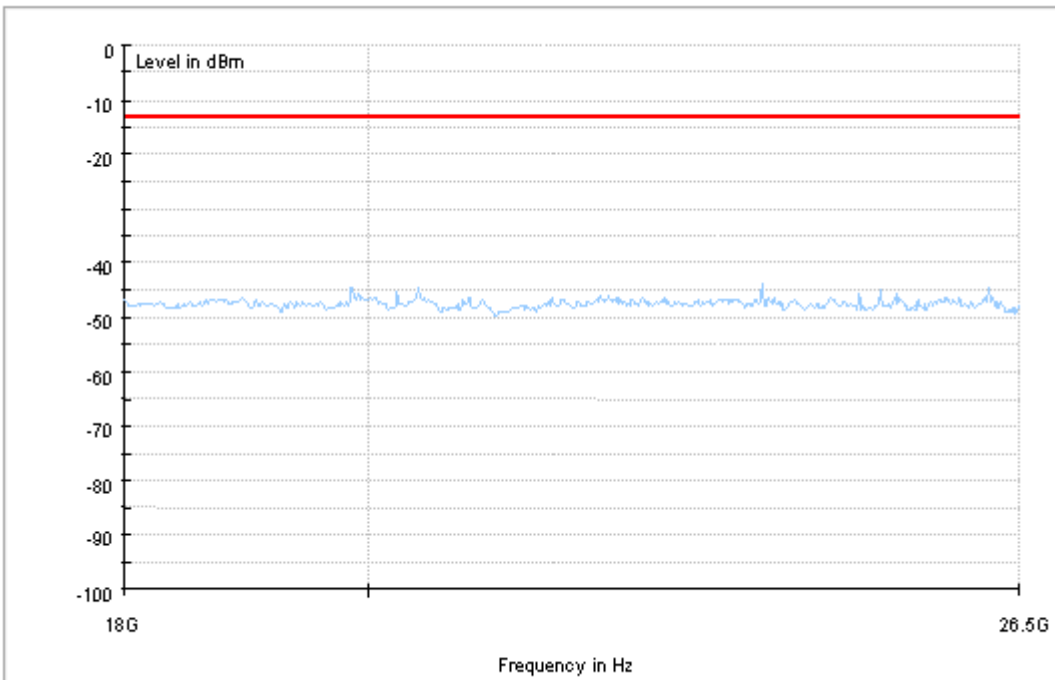
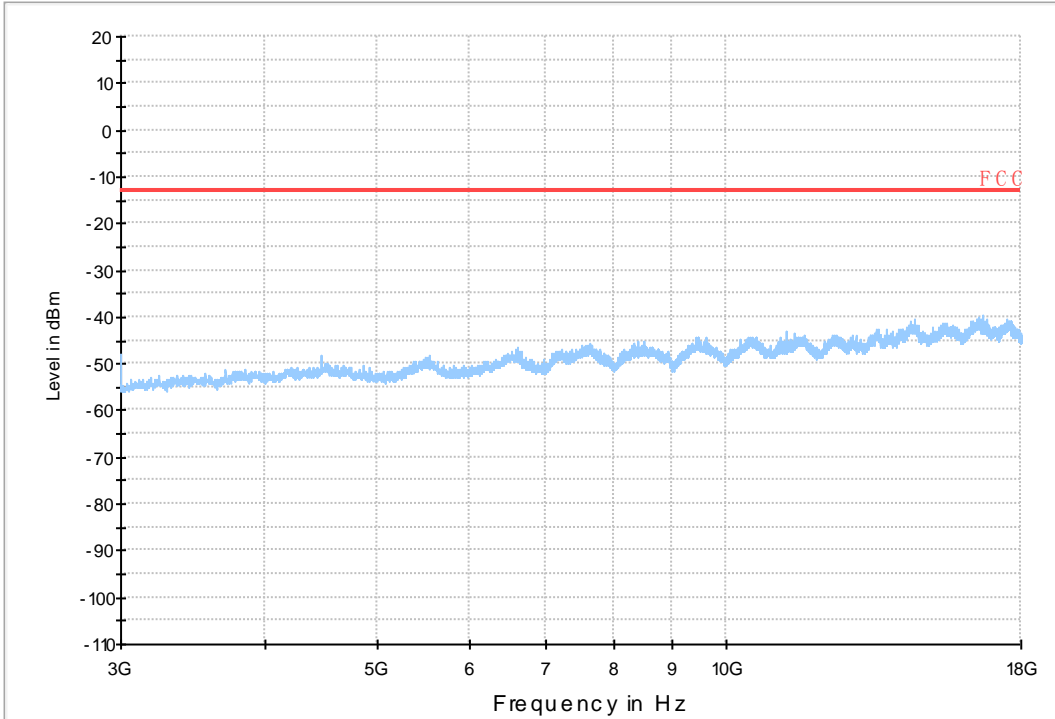
#### 7.1.5.1 Test Mode = UMTS/TM1



Copy of FCC PART24 W CDMA1900\_L

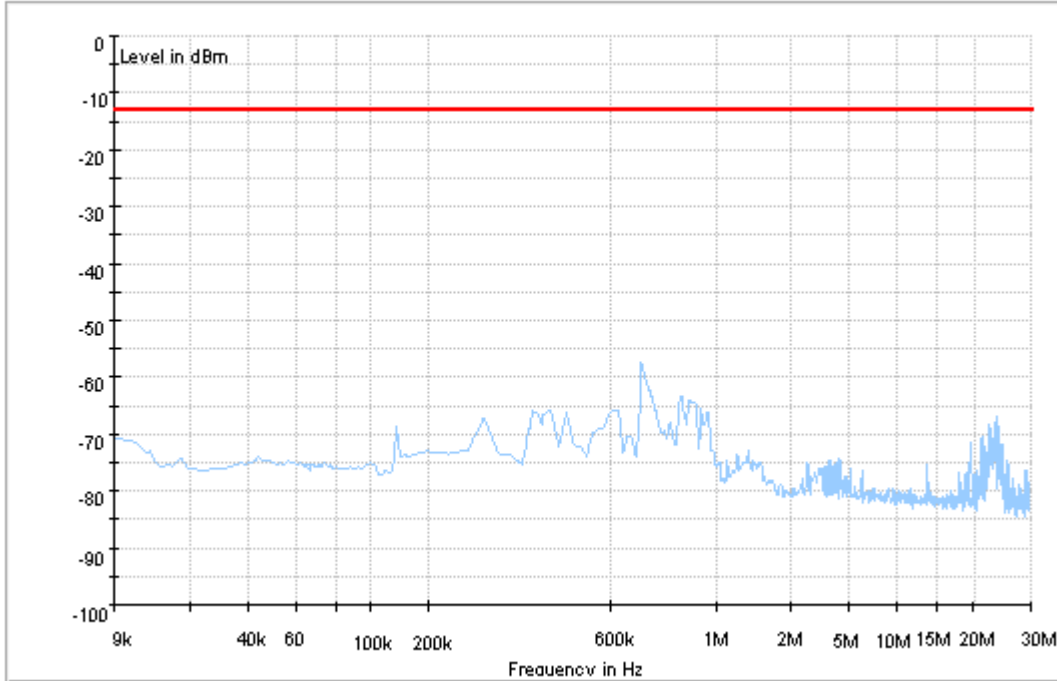


Copy of FCC PART24 W CDMA1900\_H

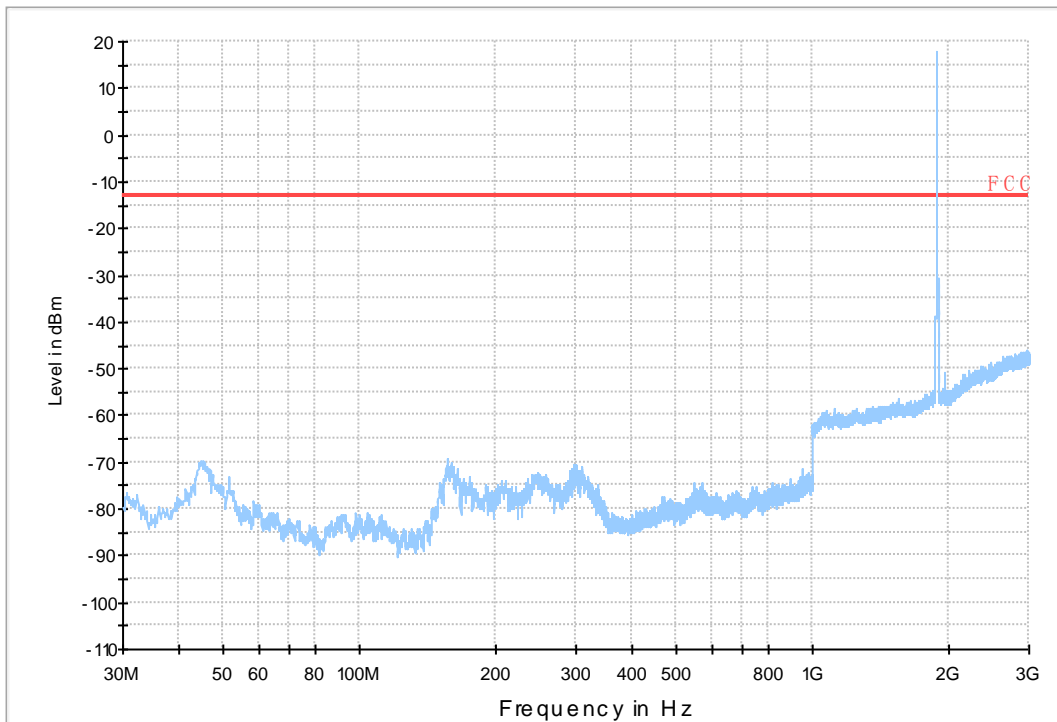


### 7.1.6 Test Band = WCDMA1900\_Ant2

#### 7.1.6.1 Test Mode = UMTS/TM1

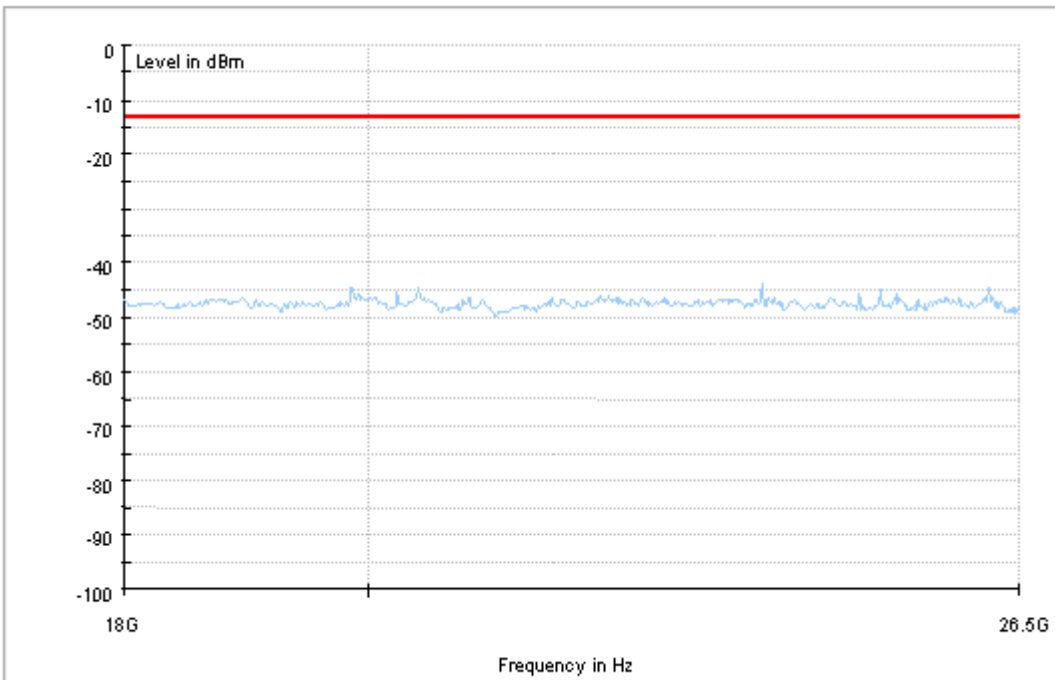
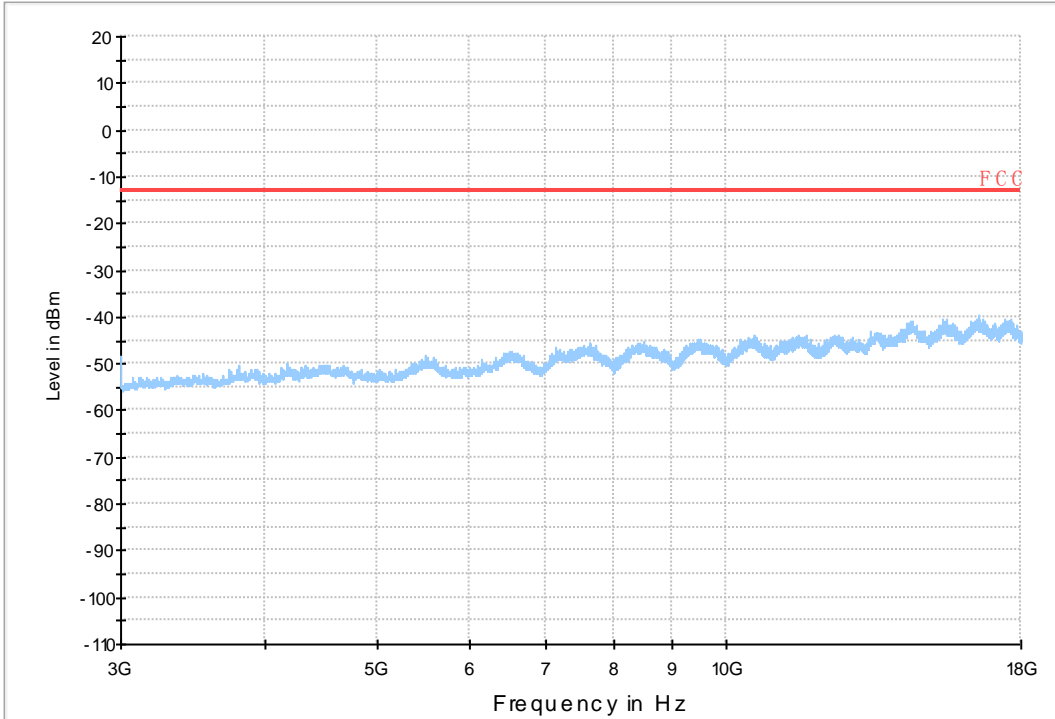


Copy of FCC PART24 W CDMA1900\_L





Copy of FCC PART24 W CDMA1900\_H



## 8Appendix\_H: Frequency Stability

### 8.1 For UMTS

#### 8.1.1 Frequency 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	3.75	0.00454	PASS
				VN	7.66	0.00927	PASS
				VH	14.72	0.01781	PASS
		MCH	TN	VL	5.34	0.00638	PASS
				VN	-2.82	-0.00337	PASS
				VH	0.84	0.001	PASS
		HCH	TN	VL	5.86	0.00692	PASS
				VN	2.3	0.00272	PASS
				VH	-1.13	-0.00133	PASS
WCDMA1700	UMTS/TM1	LCH	TN	VL	-2.03	-0.00119	PASS
				VN	-13.14	-0.00767	PASS
				VH	1.92	0.00112	PASS
		MCH	TN	VL	-7.45	-0.0043	PASS
				VN	6.42	0.00371	PASS
				VH	-4.49	-0.00259	PASS
		HCH	TN	VL	-12.54	-0.00716	PASS
				VN	-4.61	-0.00263	PASS
				VH	14.77	0.00843	PASS
WCDMA1900	UMTS/TM1	LCH	TN	VL	6.39	0.00345	PASS
				VN	-0.89	-0.00048	PASS
				VH	1.94	0.00105	PASS
		MCH	TN	VL	-0.82	-0.00044	PASS
				VN	4.07	0.00216	PASS
				VH	1.56	0.00083	PASS
		HCH	TN	VL	4.5	0.00236	PASS
				VN	-1.36	-0.00071	PASS
				VH	5.98	0.00313	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	-4.76	-0.00576	PASS
				-20	-5.31	-0.00643	PASS
				-10	7.57	0.00916	PASS
				0	-4.21	-0.00509	PASS
				10	-0.52	-0.00063	PASS
				20	10.18	0.01232	PASS
				30	-12.56	-0.0152	PASS
				40	6.48	0.00784	PASS
				50	-6.87	-0.00831	PASS
		MCH	VN	-30	2.09	0.0025	PASS
				-20	7.26	0.00868	PASS
				-10	-3.17	-0.00379	PASS
				0	5.95	0.00711	PASS
				10	4.35	0.0052	PASS
				20	4.56	0.00545	PASS
				30	1.04	0.00124	PASS
				40	7.77	0.00929	PASS
				50	4.41	0.00527	PASS
		HCH	VN	-30	4.03	0.00476	PASS
				-20	-5.28	-0.00624	PASS
				-10	-0.69	-0.00082	PASS
				0	0.35	0.00041	PASS
				10	7.72	0.00912	PASS
				20	-0.89	-0.00105	PASS
				30	-3.07	-0.00363	PASS
				40	-4.79	-0.00566	PASS
				50	-0.93	-0.0011	PASS
WCDMA1700	UMTS/TM1	LCH	VN	-30	-2.78	-0.00162	PASS
				-20	8.67	0.00506	PASS
				-10	-1.62	-0.00095	PASS
				0	-4.94	-0.00288	PASS
				10	-4.55	-0.00266	PASS
				20	3.08	0.0018	PASS
				30	5.17	0.00302	PASS
				40	1.59	0.00093	PASS
				50	-4.01	-0.00234	PASS
		MCH	VN	-30	-8.21	-0.00474	PASS
				-20	1.1	0.00063	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict						
				-10	-19.82	-0.01144	PASS						
				0	-23.76	-0.01371	PASS						
				10	0.9	0.00052	PASS						
				20	-3.52	-0.00203	PASS						
				30	-0.72	-0.00042	PASS						
				40	6.93	0.004	PASS						
		HCH	VN			50	-0.64	-0.00037	PASS				
						-30	4.01	0.00229	PASS				
						-20	5.05	0.00288	PASS				
						-10	-1.89	-0.00108	PASS				
						0	-0.41	-0.00023	PASS				
						10	3.4	0.00194	PASS				
						20	2.24	0.00128	PASS				
						30	6.03	0.00344	PASS				
						40	2.5	0.00143	PASS				
						50	-4.82	-0.00275	PASS				
						WCDMA1900	UMTS/TM1	LCH	VN	-30	-0.78	-0.00042	PASS
										-20	6	0.00324	PASS
-10	8.87	0.00479	PASS										
0	3.83	0.00207	PASS										
10	4.21	0.00227	PASS										
20	1.56	0.00084	PASS										
30	0.2	0.00011	PASS										
40	4.88	0.00263	PASS										
50	4.52	0.00244	PASS										
MCH	VN			-30	-1.75			-0.00093	PASS				
				-20	0.78			0.00041	PASS				
				-10	3.65			0.00194	PASS				
				0	5.2			0.00277	PASS				
				10	-1.46			-0.00078	PASS				
				20	-6.71			-0.00357	PASS				
				30	-4.88			-0.0026	PASS				
				40	1.75			0.00093	PASS				
				50	-6.16			-0.00328	PASS				
HCH	VN			-30	0.64			0.00034	PASS				
				-20	-0.5			-0.00026	PASS				
				-10	-0.41			-0.00021	PASS				
				0	4.65			0.00244	PASS				
				10	5.33			0.00279	PASS				
				20	10.09			0.00529	PASS				



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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	-0.82	-0.00043	PASS
				40	-1.83	-0.00096	PASS
				50	4.91	0.00257	PASS

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END