



# 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]	EIRP [dBm]	Limit [dBm]	Verdict
WCDMA1900	UMTS/TM1	LCH	23.26	20.61	33	PASS
		MCH	23.26	20.42	33	PASS
		HCH	23.33	20.71	33	PASS
WCDMA1700	UMTS/TM1	LCH	23.72	23.02	30	PASS
		MCH	23.57	22.87	30	PASS
		HCH	23.61	22.91	30	PASS
Test Band	Test Mode	Test Channel	Conducted Power [dBm]	ERP [dBm]	Limit [dBm]	Verdict
WCDMA850	UMTS/TM1	LCH	23.75	20.15	38.5	PASS
		MCH	23.74	20.14	38.5	PASS
		HCH	23.61	20.01	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:

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

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

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

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
WCDMA1900	UMTS/TM1	LCH	3.4	13	PASS
		MCH	3.45	13	PASS
		HCH	3.29	13	PASS
WCDMA1700	UMTS/TM1	LCH	3.37	13	PASS
		MCH	3.24	13	PASS
		HCH	3.31	13	PASS
WCDMA850	UMTS/TM1	LCH	3.51	13	PASS
		MCH	3.11	13	PASS
		HCH	3.13	13	PASS

### 3Appendix\_C: Modulation Characteristics

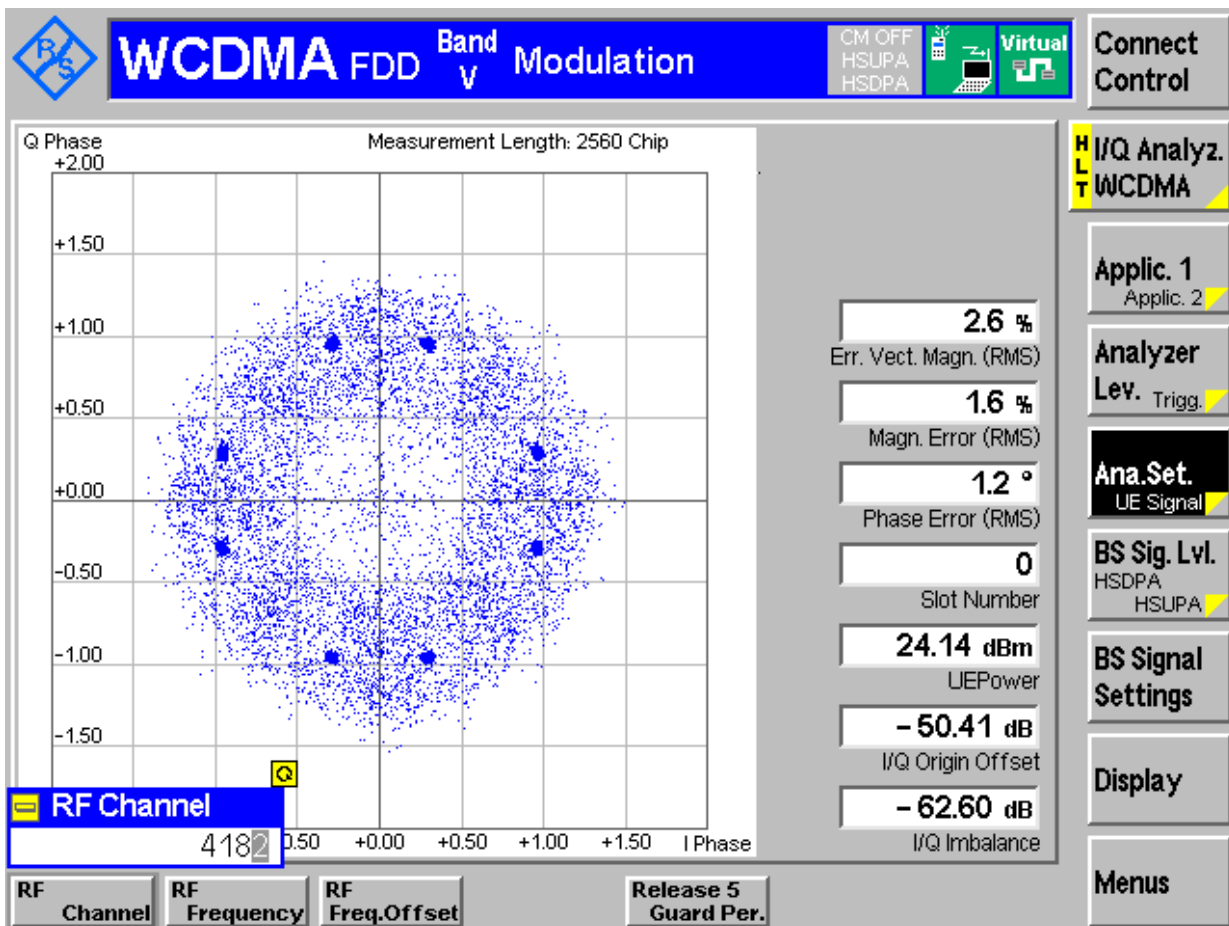
#### Part I - Test Plots

##### 3.1 For UMTS

##### 3.1.1 Test Band = WCDMA850

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

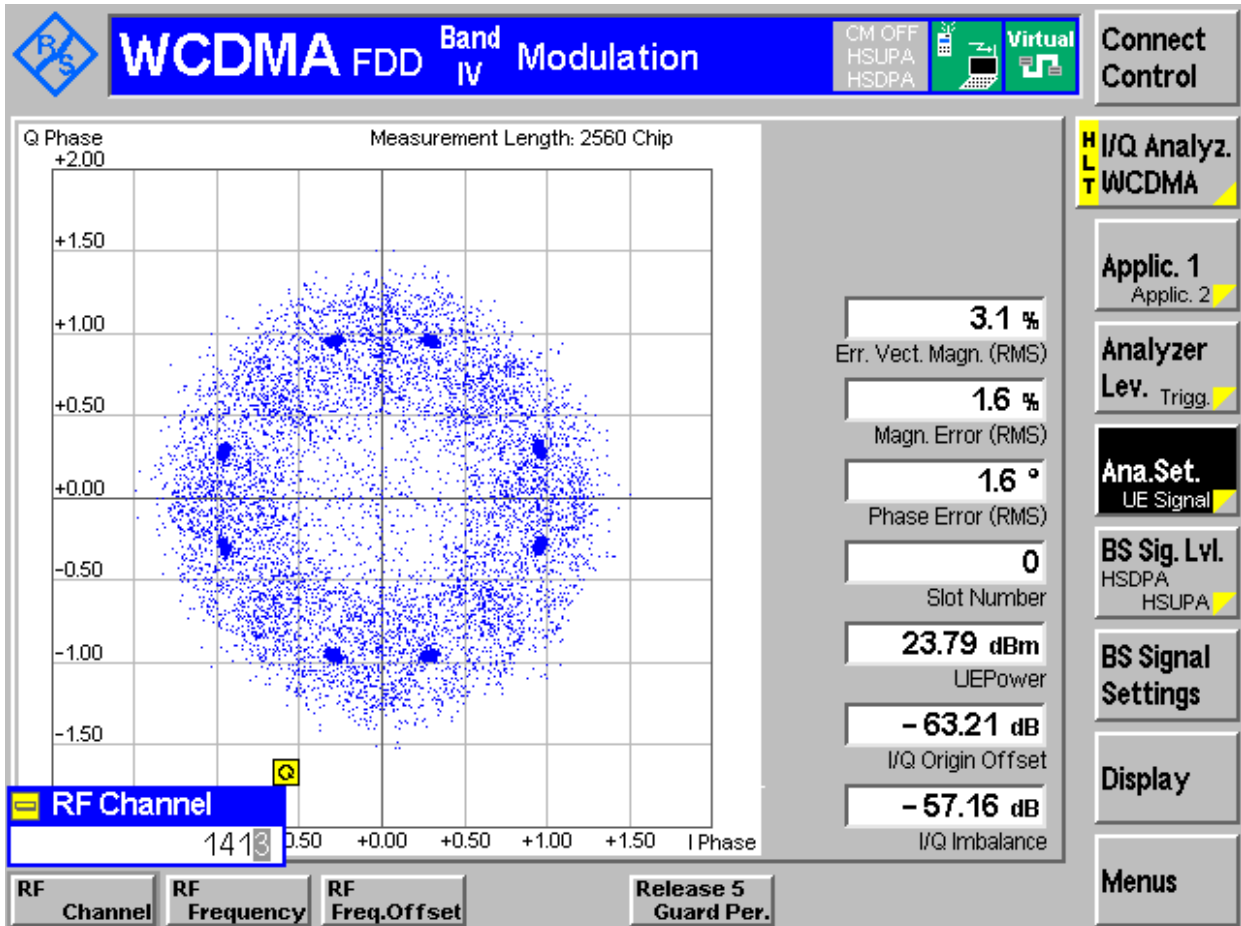
##### 3.1.1.1.1 Test Channel = MCH



3.1.2 Test Band = WCDMA1700

3.1.2.1 Test Mode = UMTS/TM1

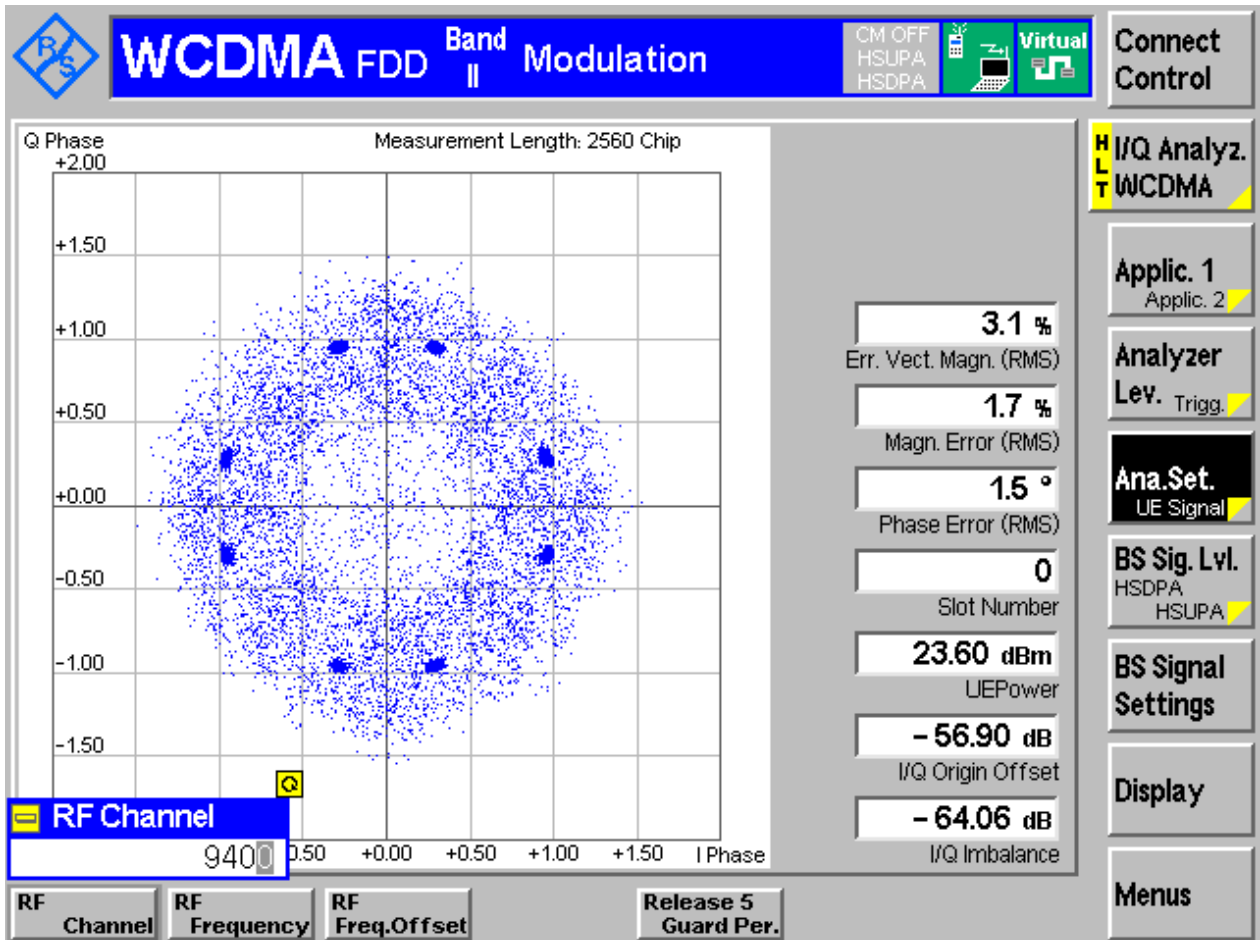
3.1.2.1.1 Test Channel = MCH



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
WCDMA1900	UMTS/TM1	LCH	4.12	4.70	Pass
		MCH	4.12	4.69	Pass
		HCH	4.13	4.71	Pass
WCDMA1700	UMTS/TM1	LCH	4.13	4.71	Pass
		MCH	4.13	4.72	Pass
		HCH	4.13	4.71	Pass
WCDMA850	UMTS/TM1	LCH	4.13	4.70	Pass
		MCH	4.13	4.71	Pass
		HCH	4.12	4.70	Pass



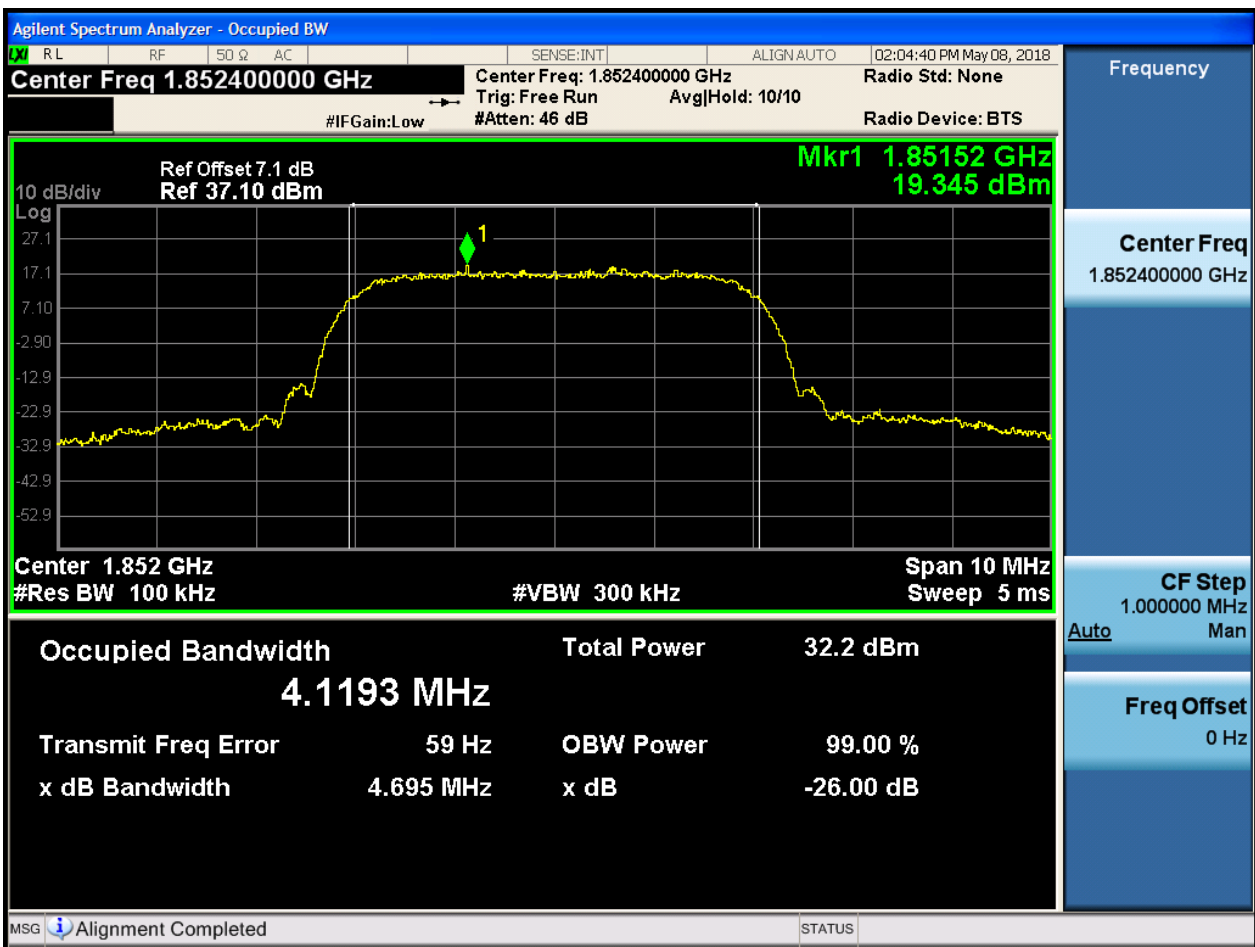
Part II - Test Plots

4.1 For UMTS

4.1.1 Test Band = WCDMA1900

4.1.1.1 Test Mode = UMTS/TM1

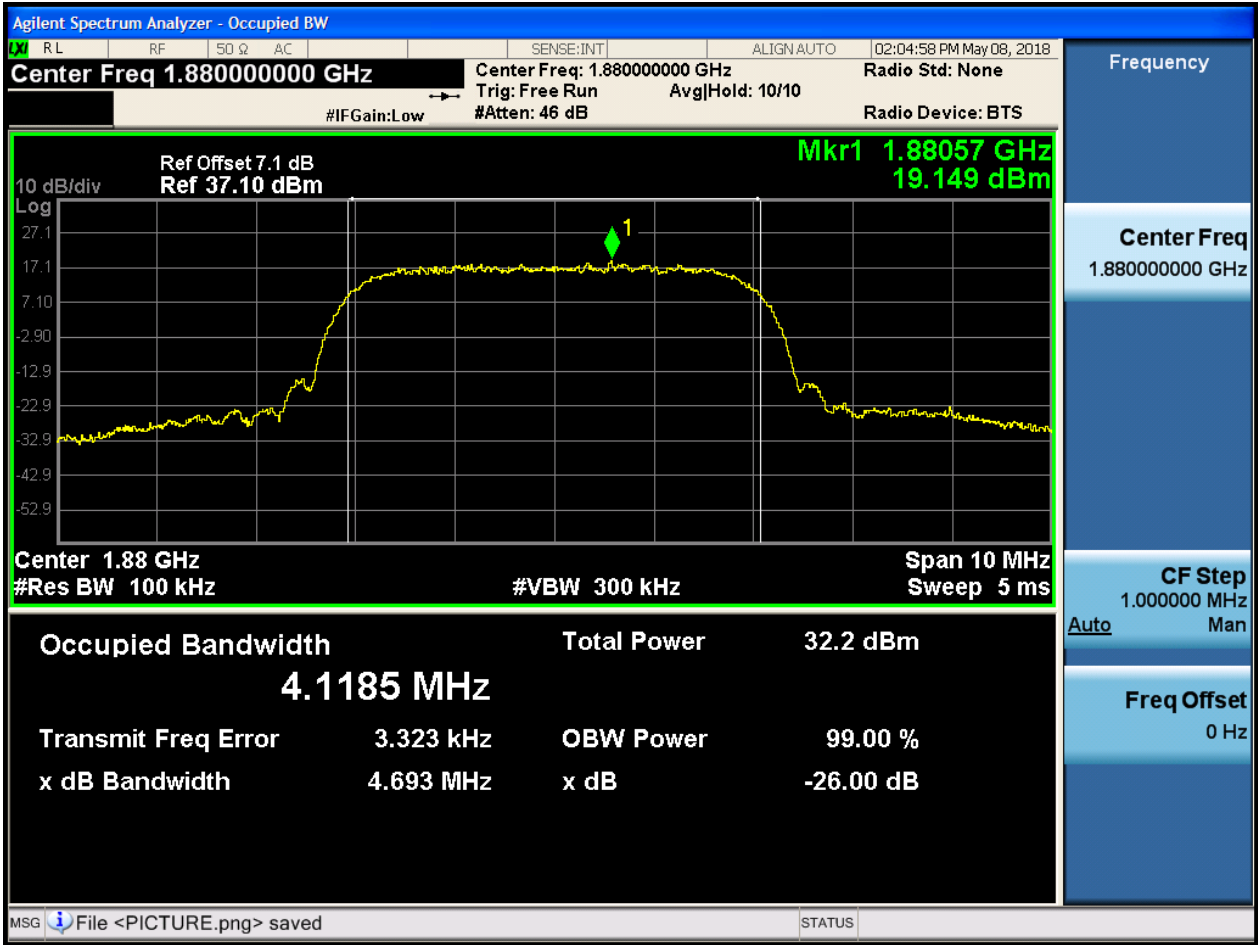
4.1.1.1.1 Test Channel = LCH





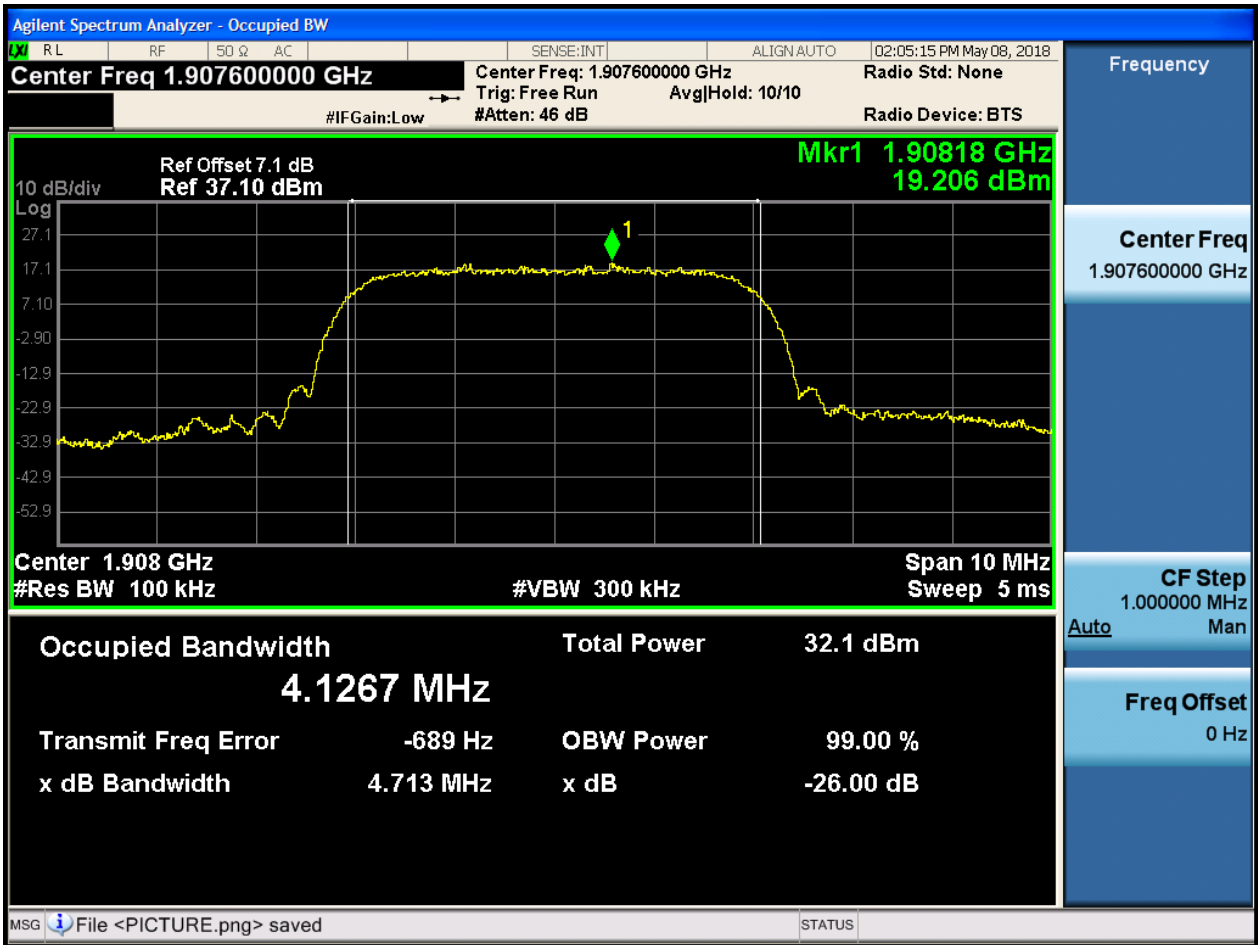


4.1.1.1.2 Test Channel = MCH





4.1.1.1.3 Test Channel = HCH

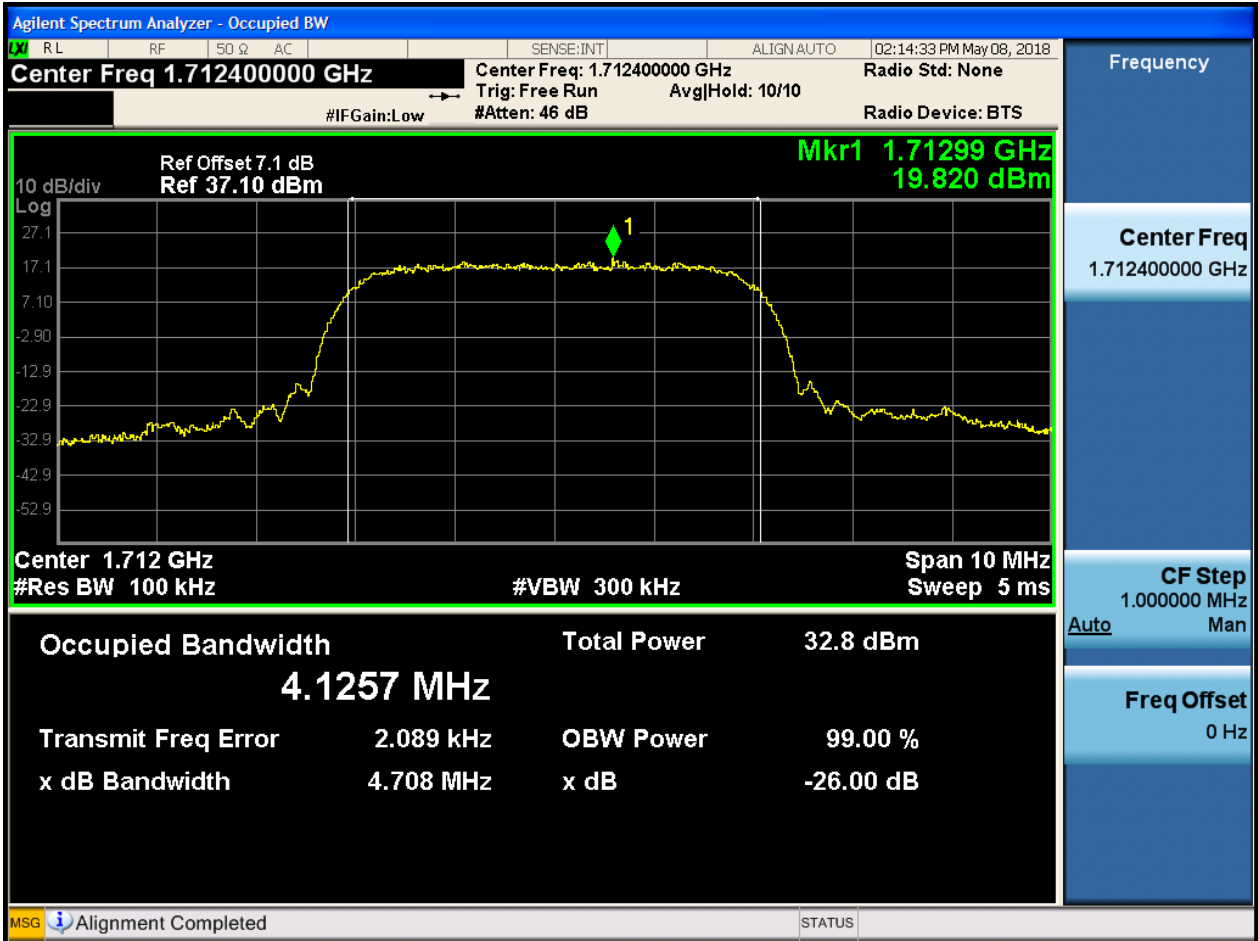




4.1.2 Test Band = WCDMA1700

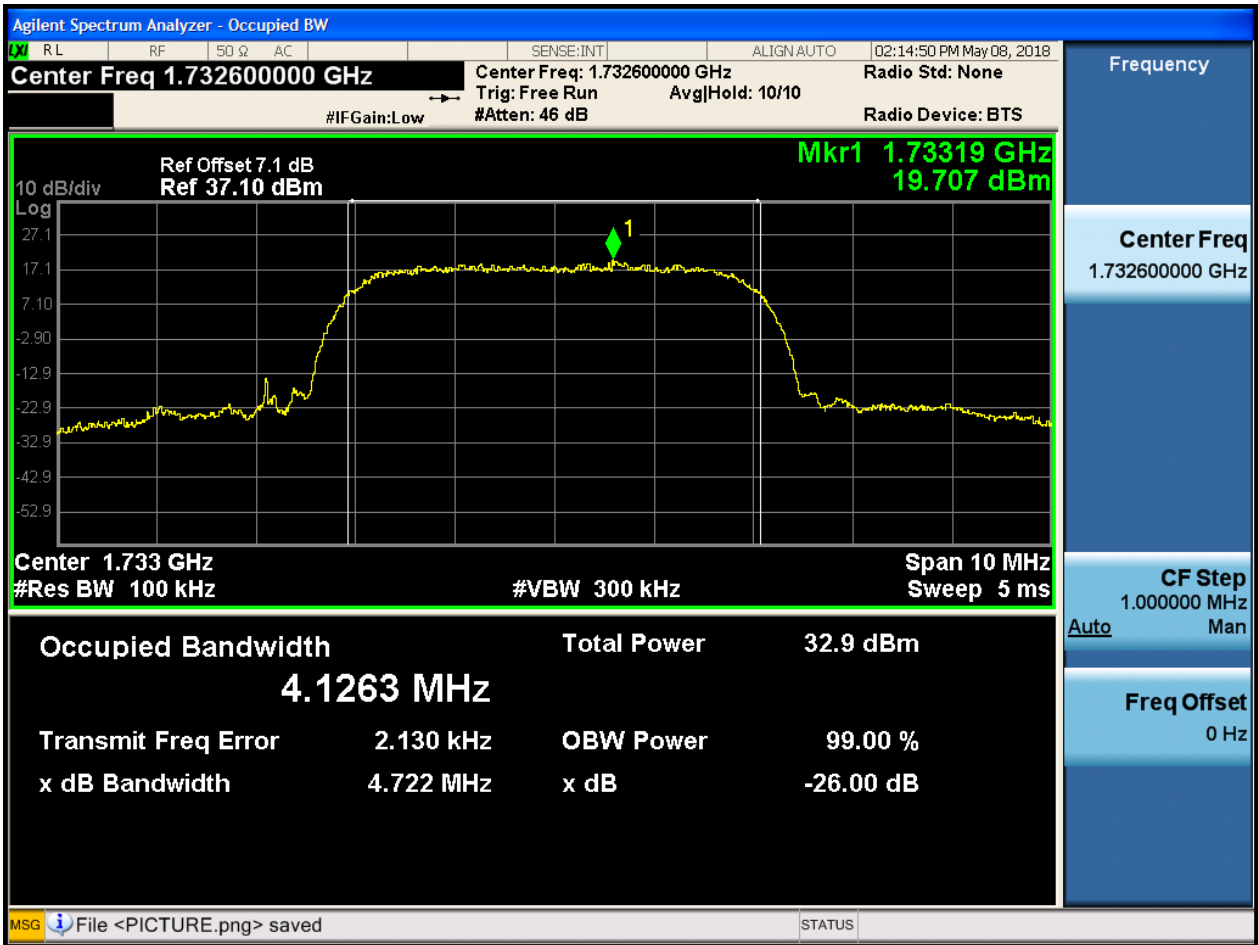
4.1.2.1 Test Mode = UMTS/TM1

4.1.2.1.1 Test Channel = LCH



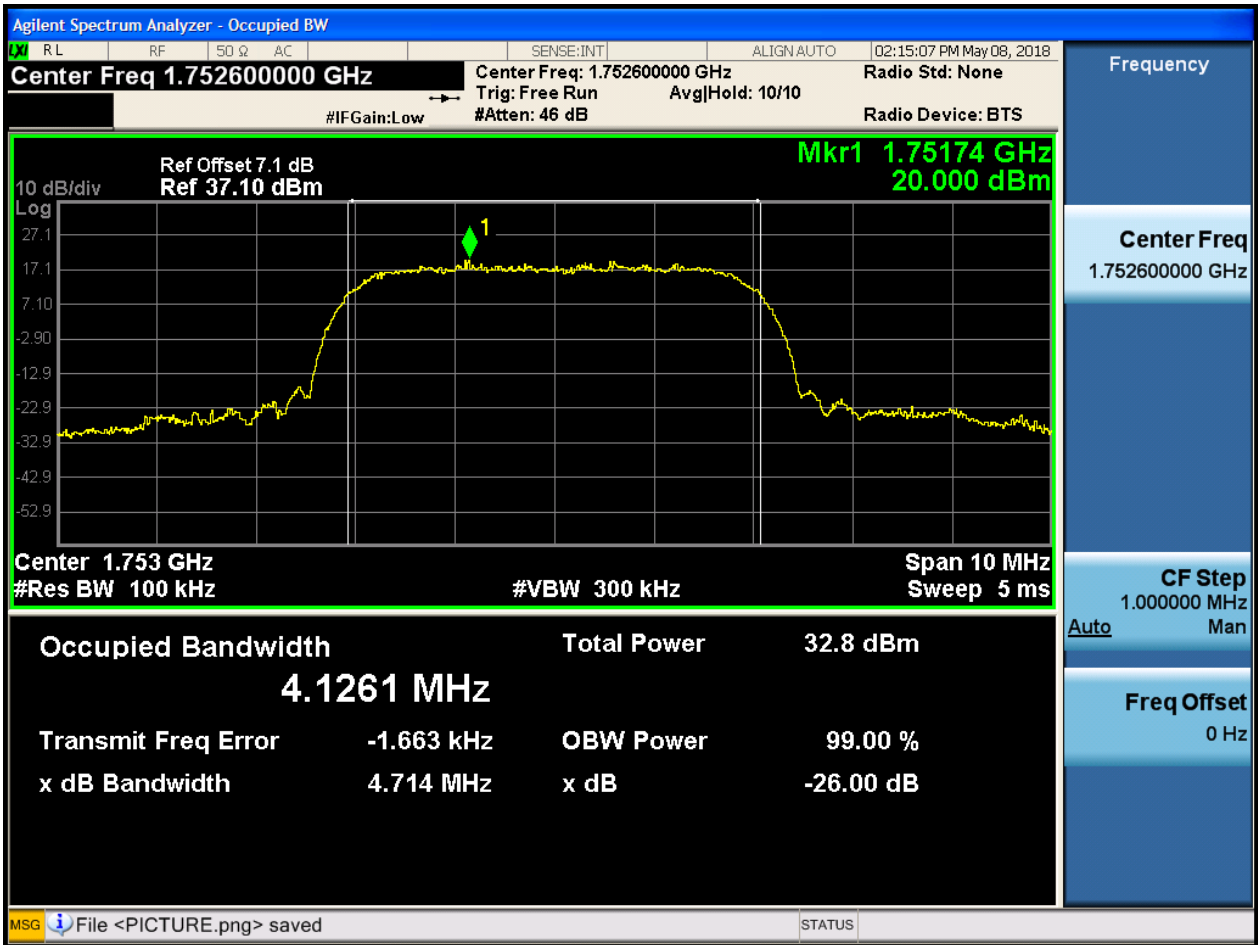


4.1.2.1.2 Test Channel = MCH





4.1.2.1.3 Test Channel = HCH

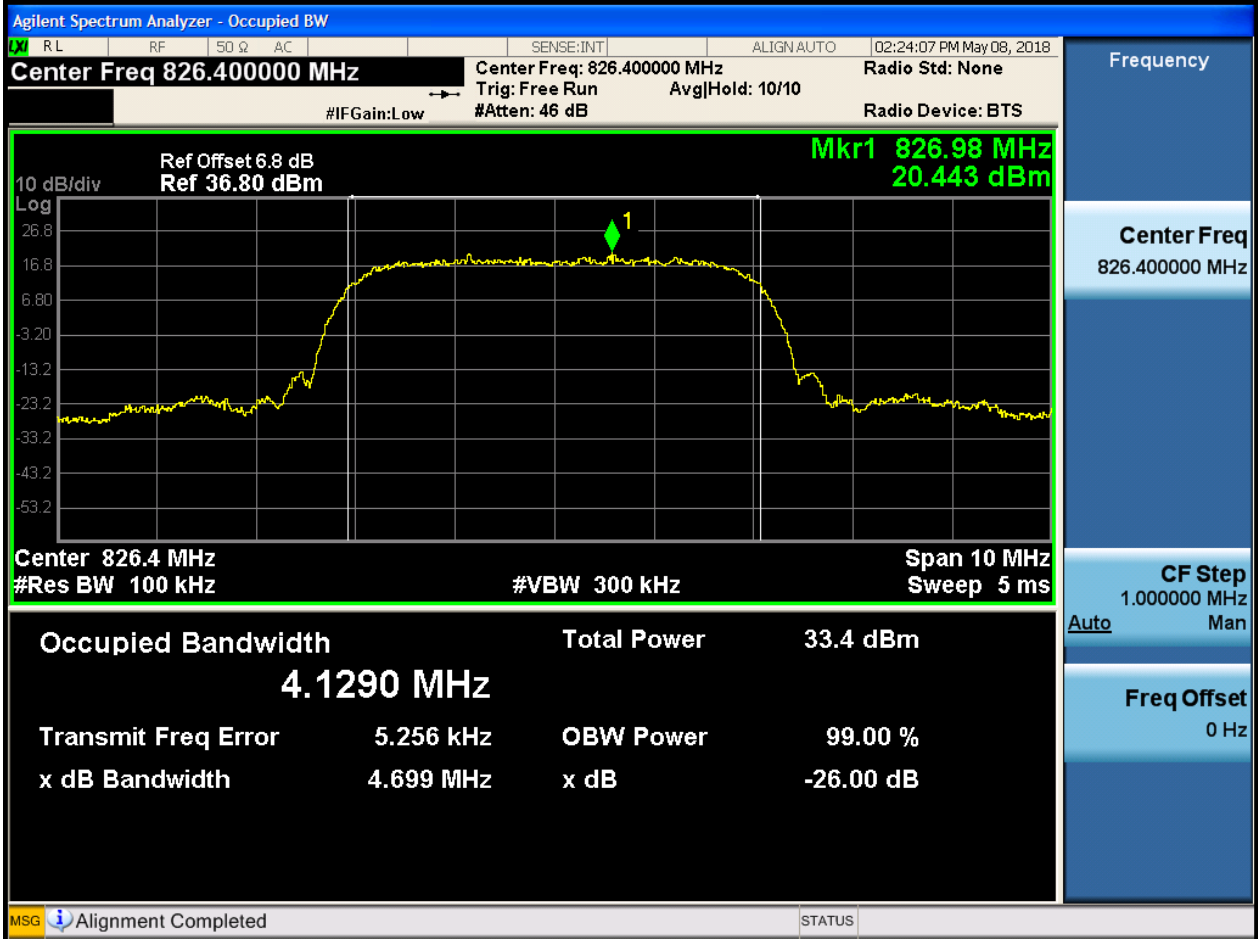




4.1.3 Test Band = WCDMA850

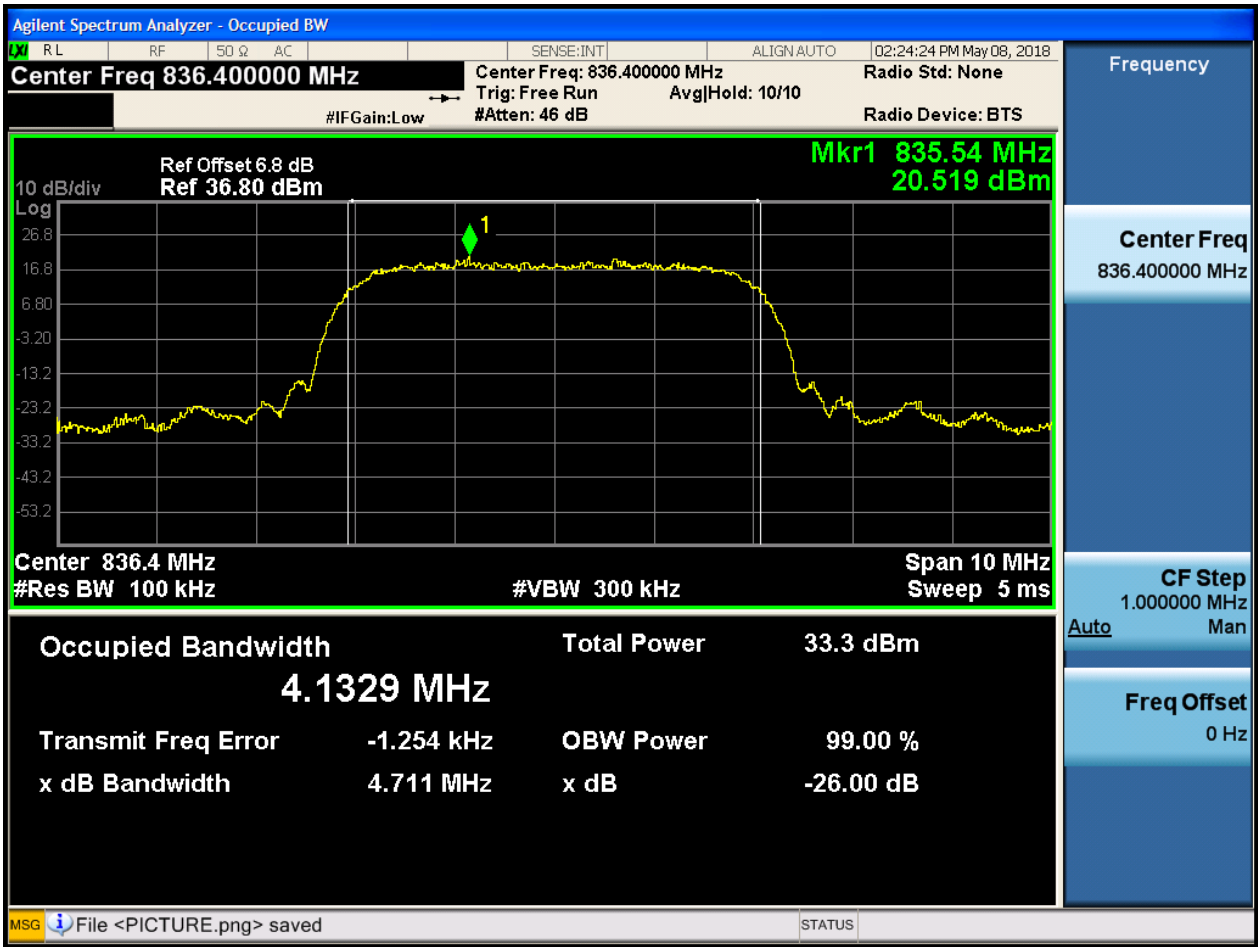
4.1.3.1 Test Mode = UMTS/TM1

4.1.3.1.1 Test Channel = LCH



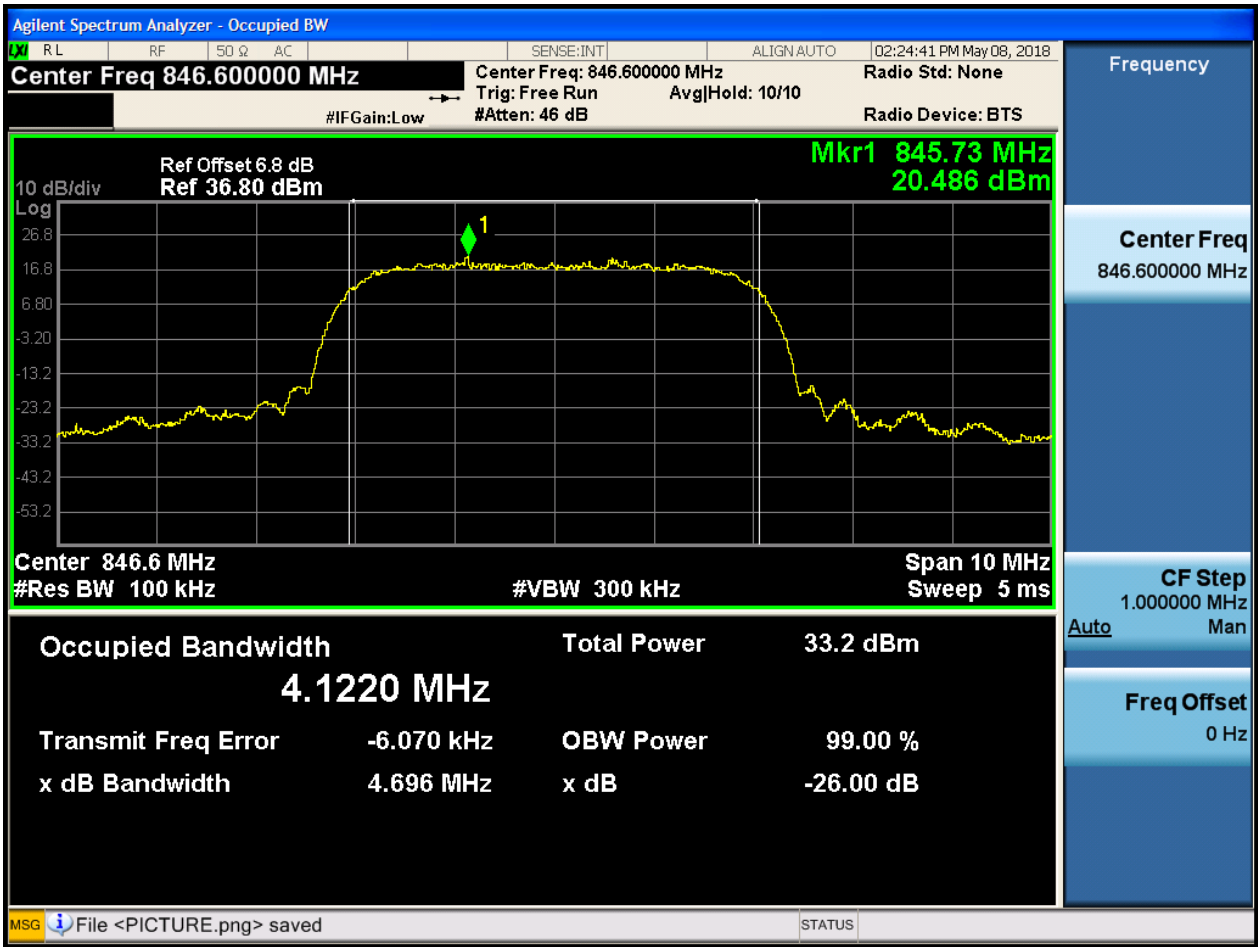


4.1.3.1.2 Test Channel = MCH





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 = WCDMA1900

##### 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 = WCDMA850

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.

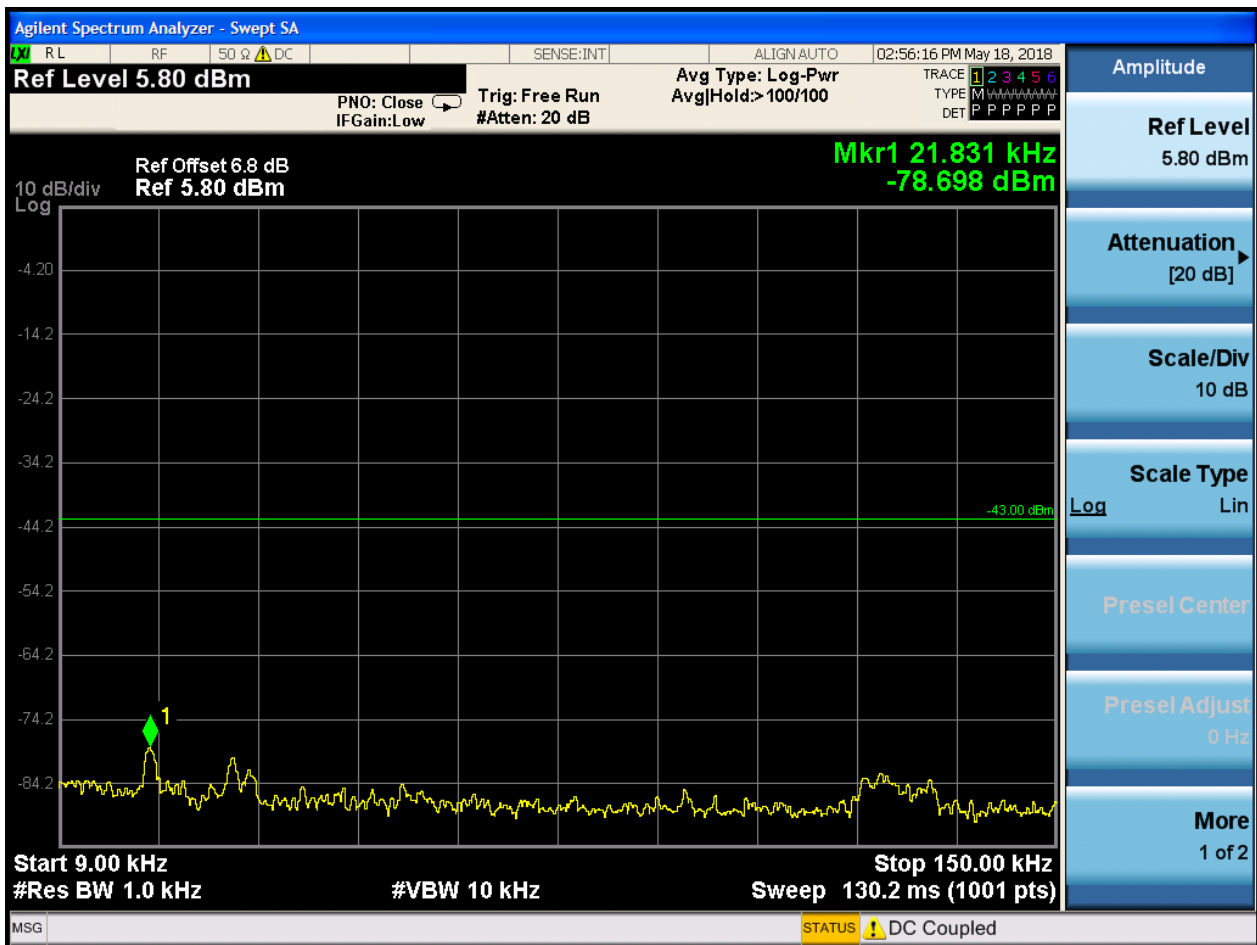
### Part I - Test Plots

#### 6.1 For UMTS

##### 6.1.1 Test Band = WCDMA1900

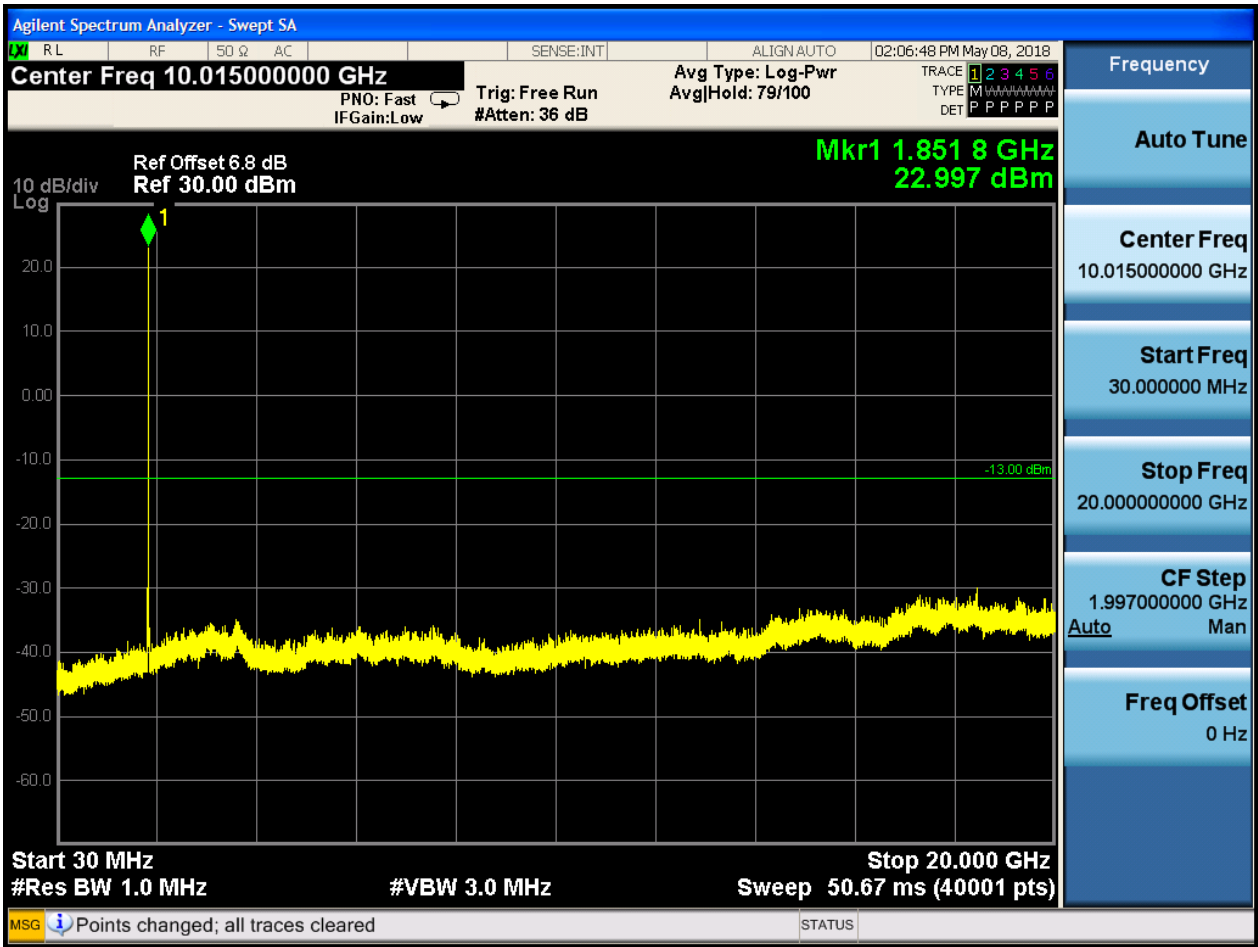
##### 6.1.1.1 Test Mode = UMTS/TM1

##### 6.1.1.1.1 Test Channel = LCH

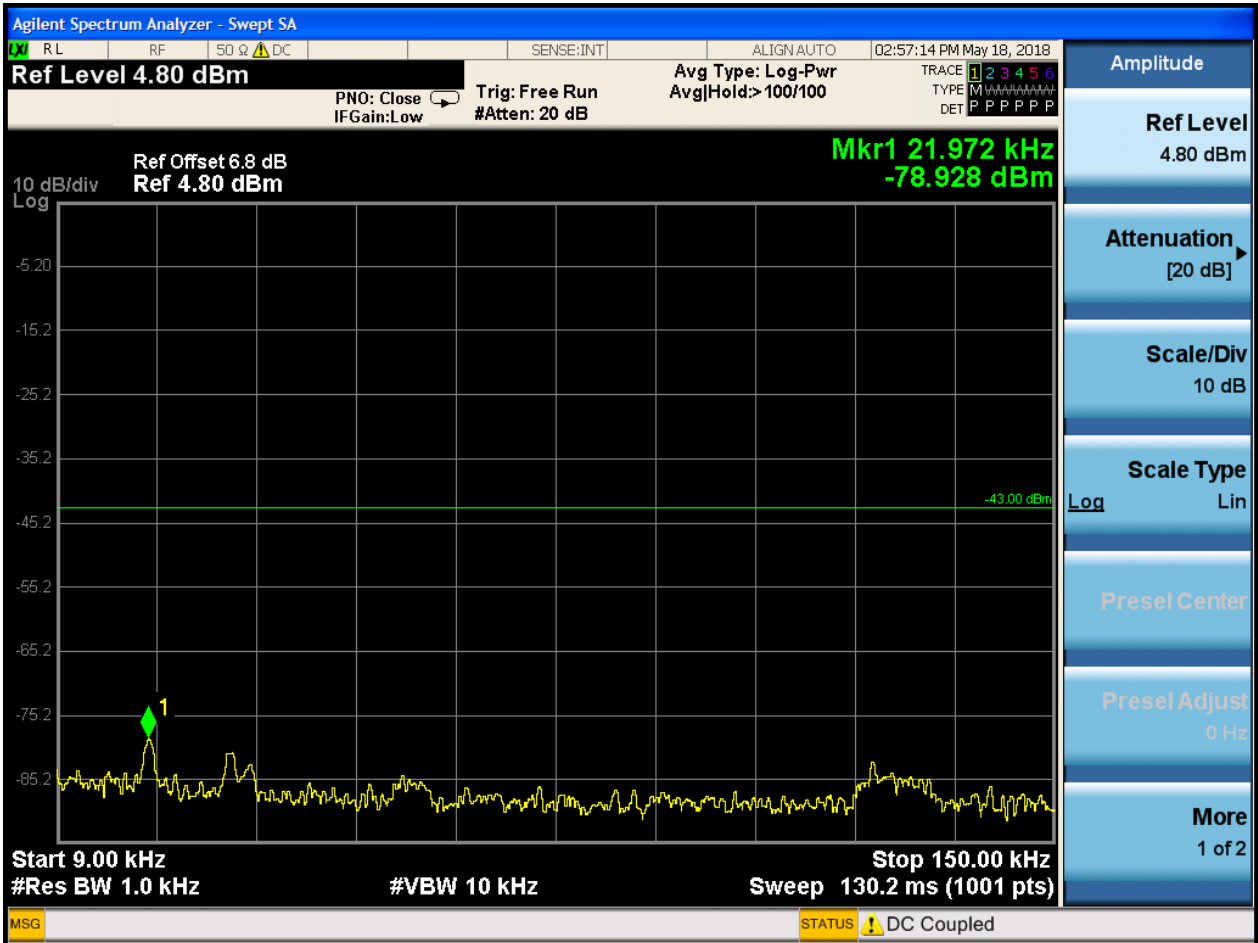


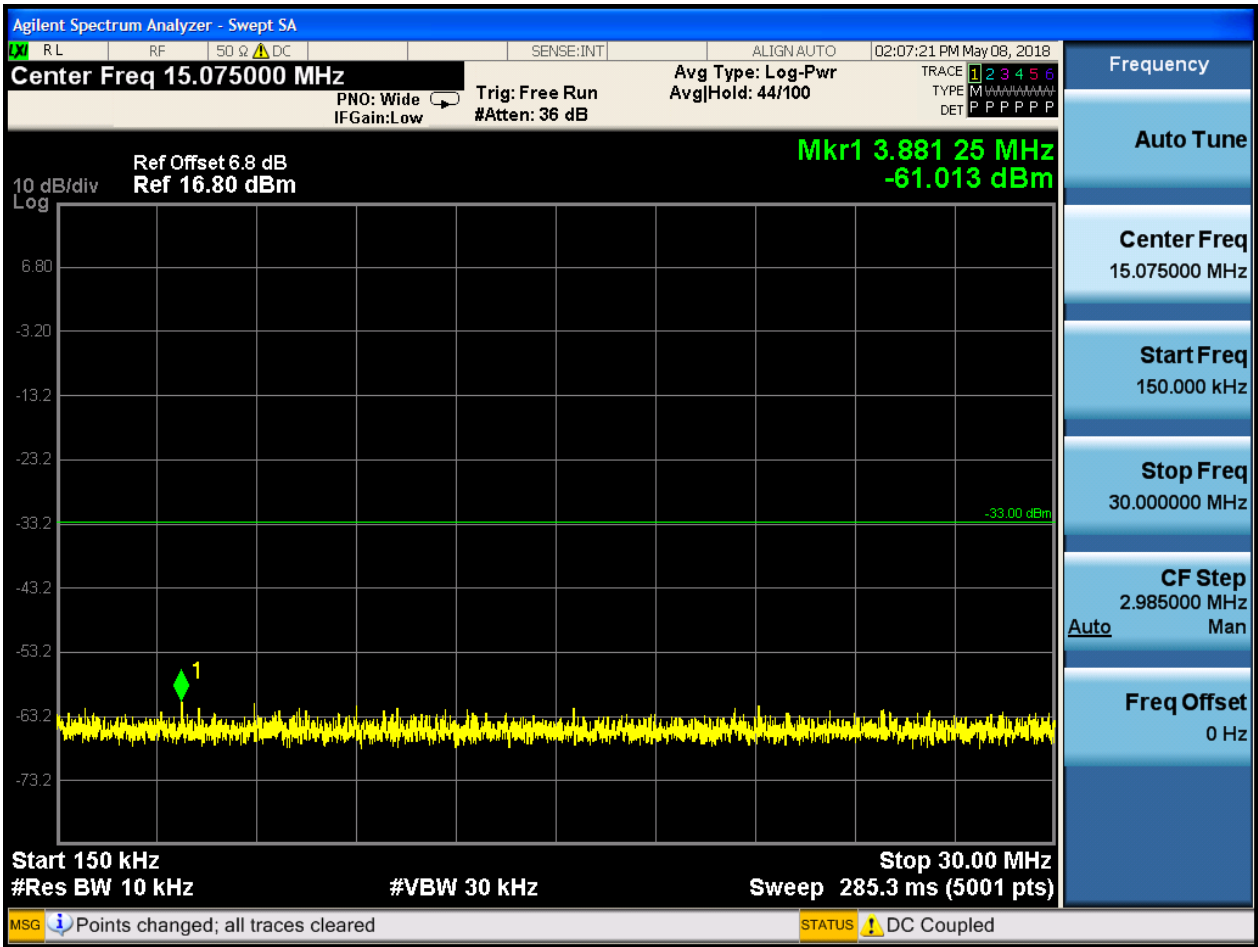


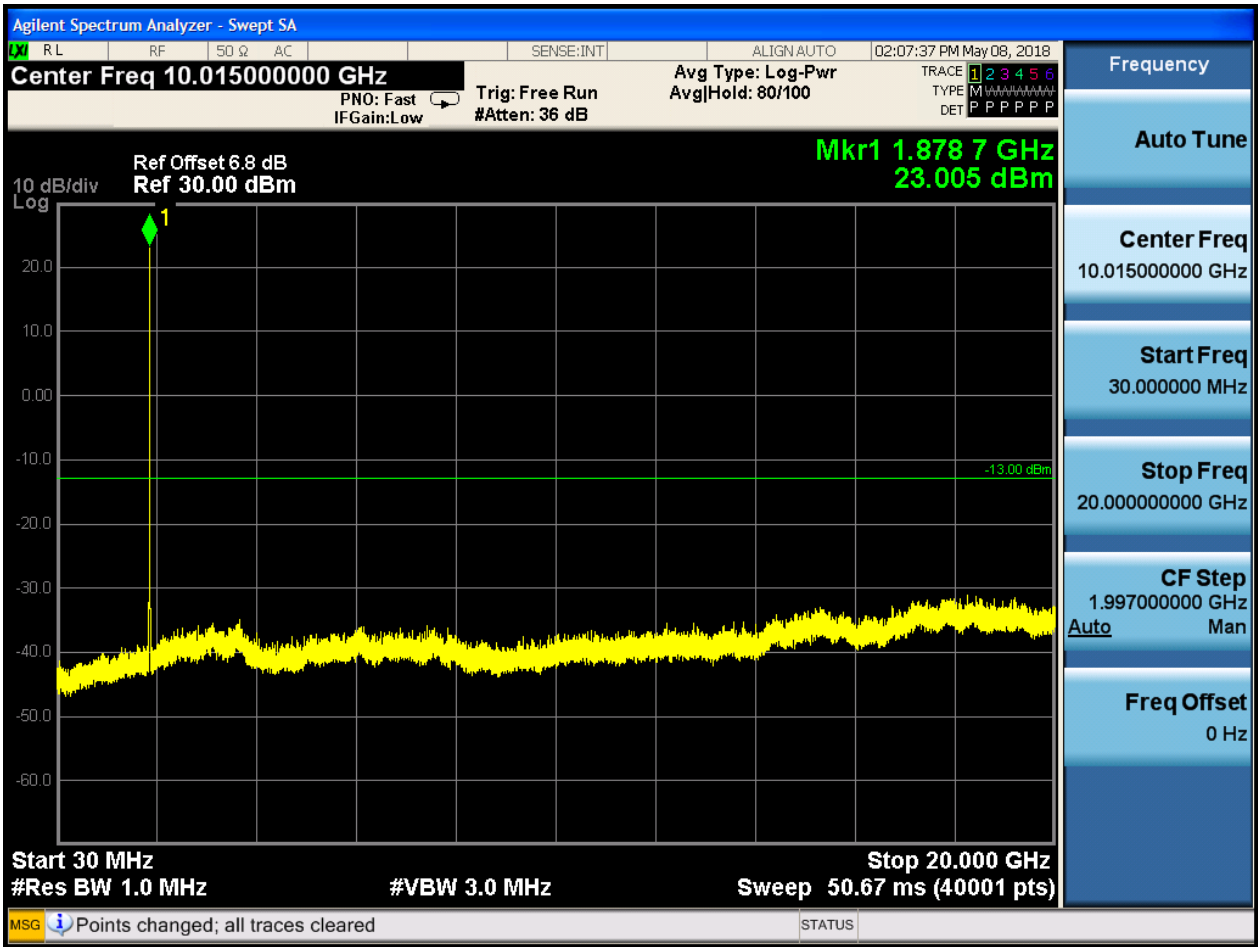




6.1.1.1.2 Test Channel = MCH

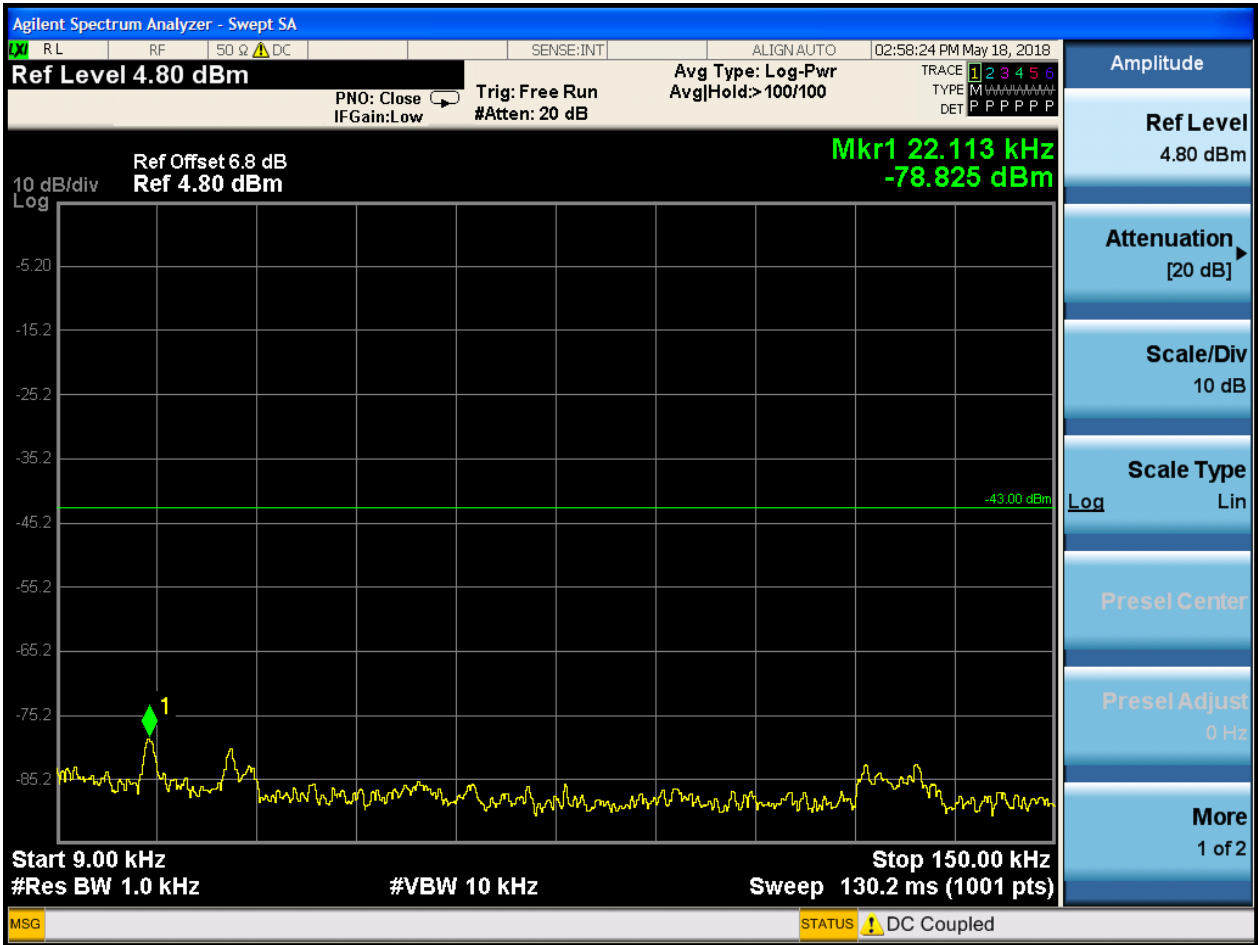




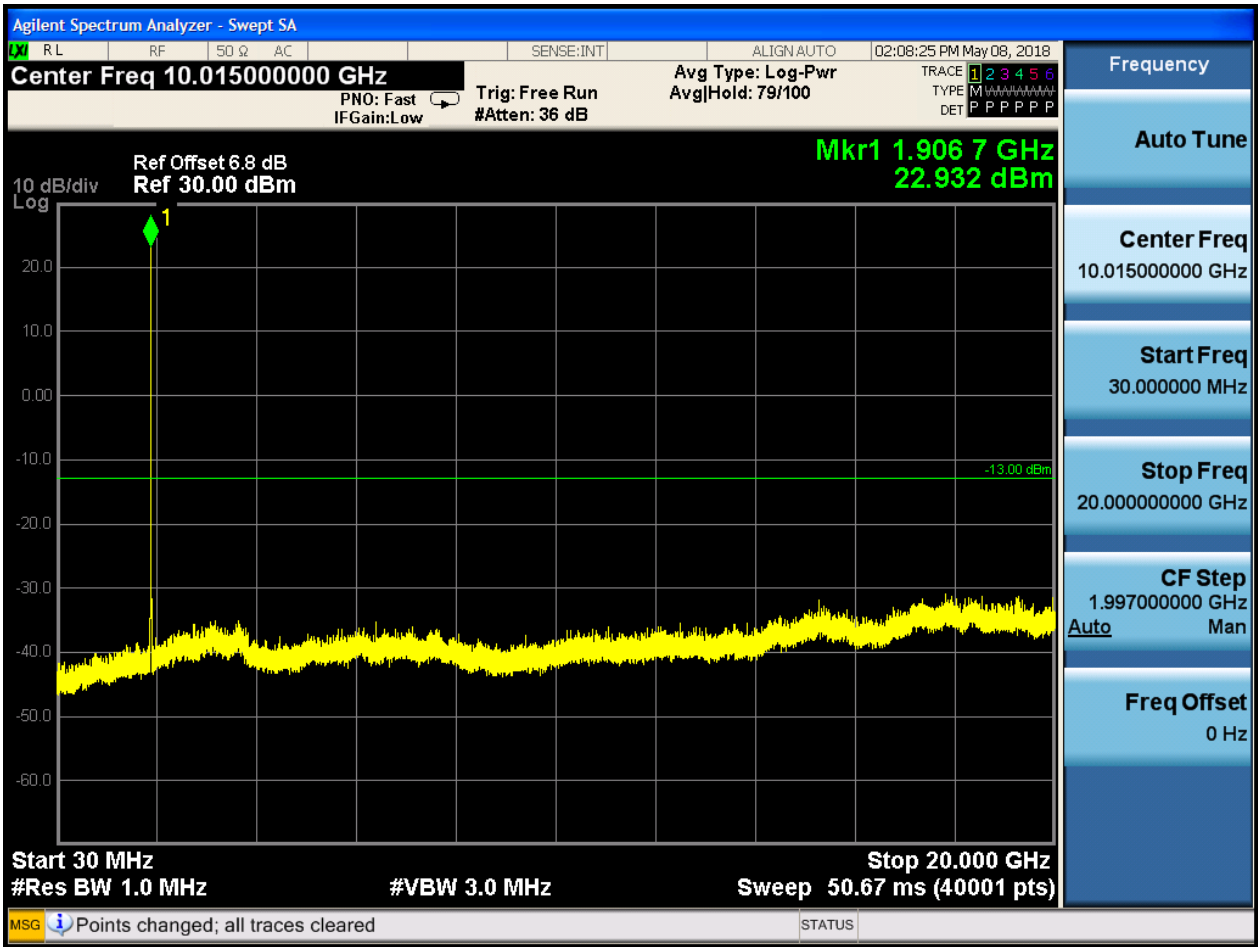




### 6.1.1.1.3 Test Channel = HCH





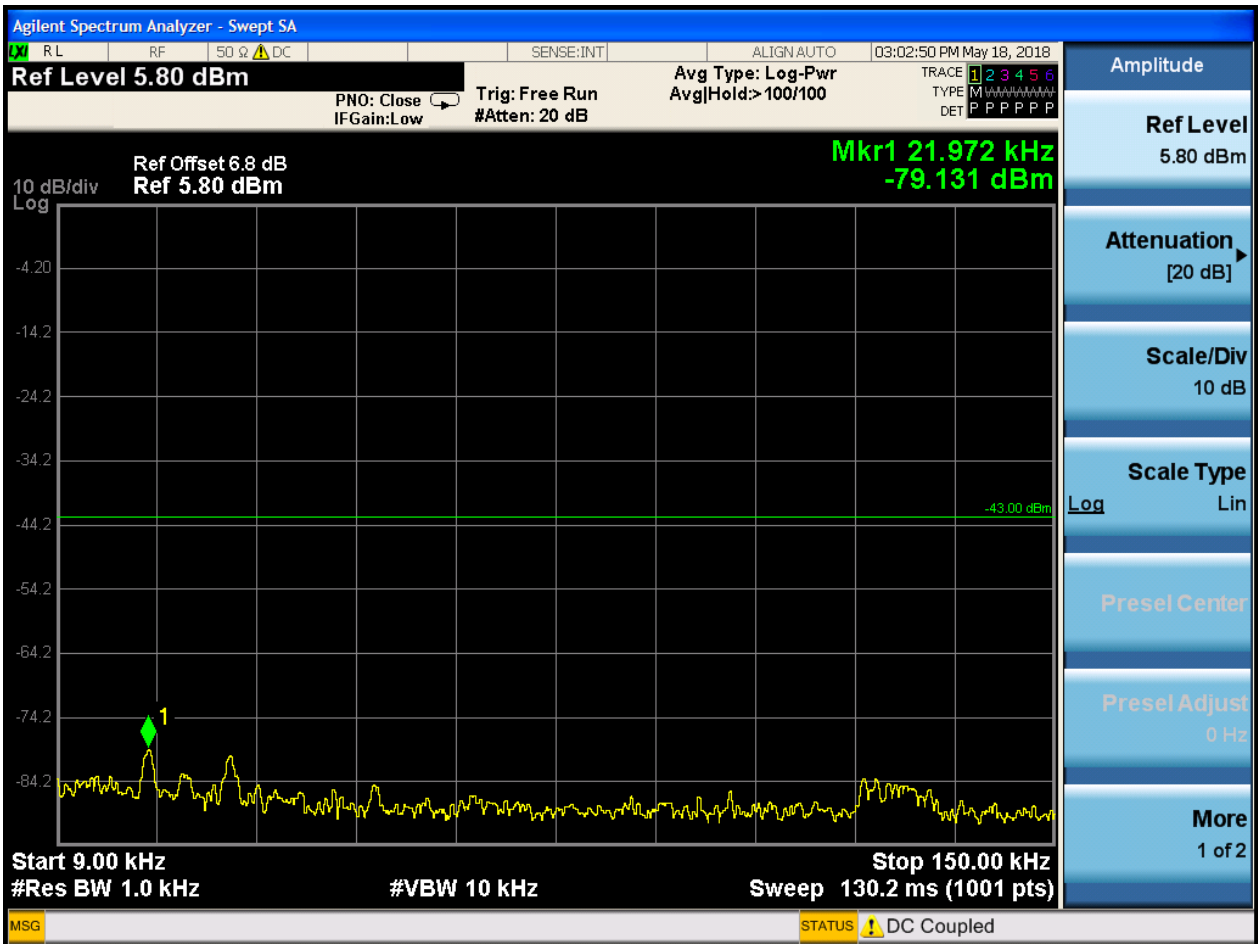




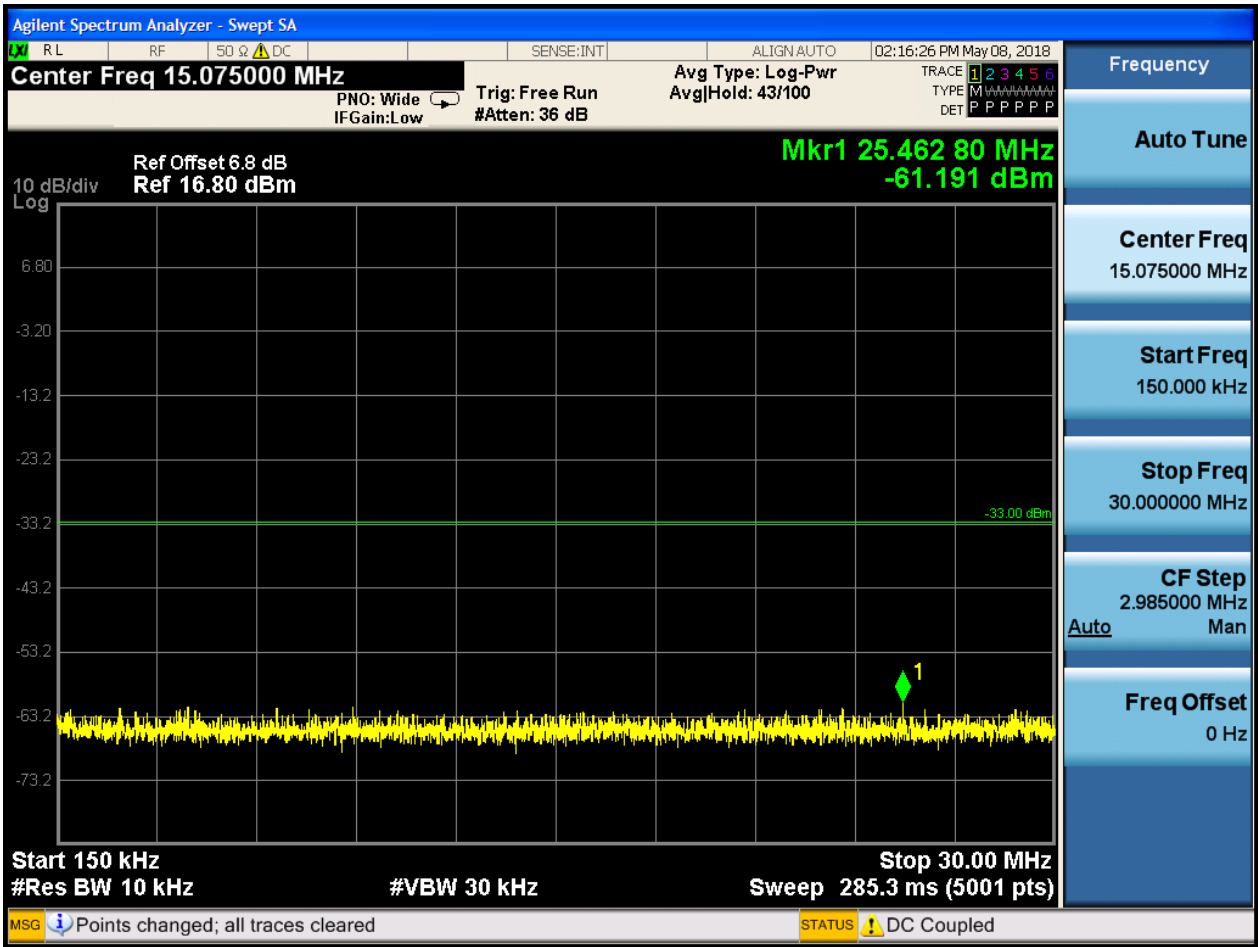
6.1.2 Test Band = WCDMA1700

6.1.2.1 Test Mode = UMTS/TM1

6.1.2.1.1 Test Channel = LCH



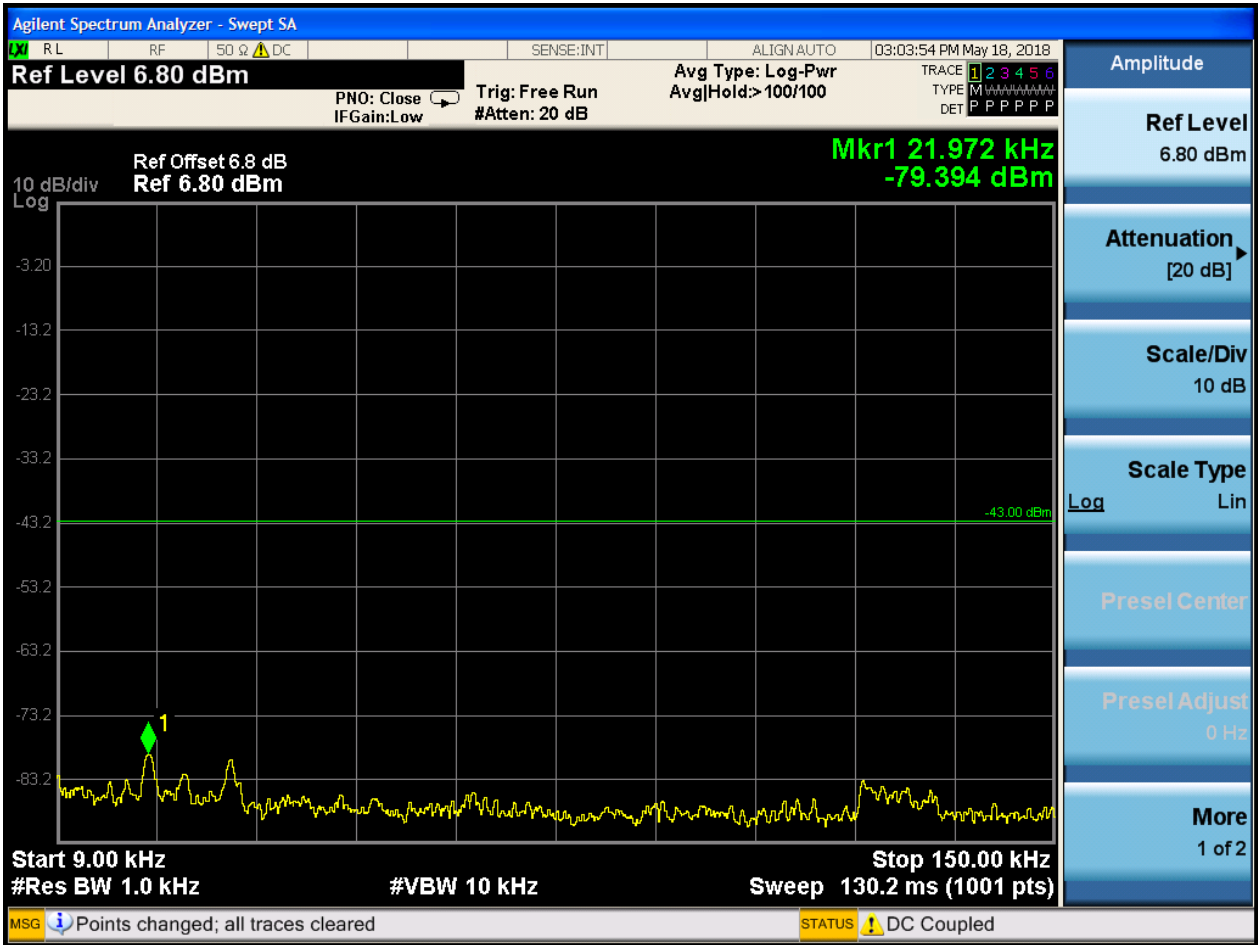


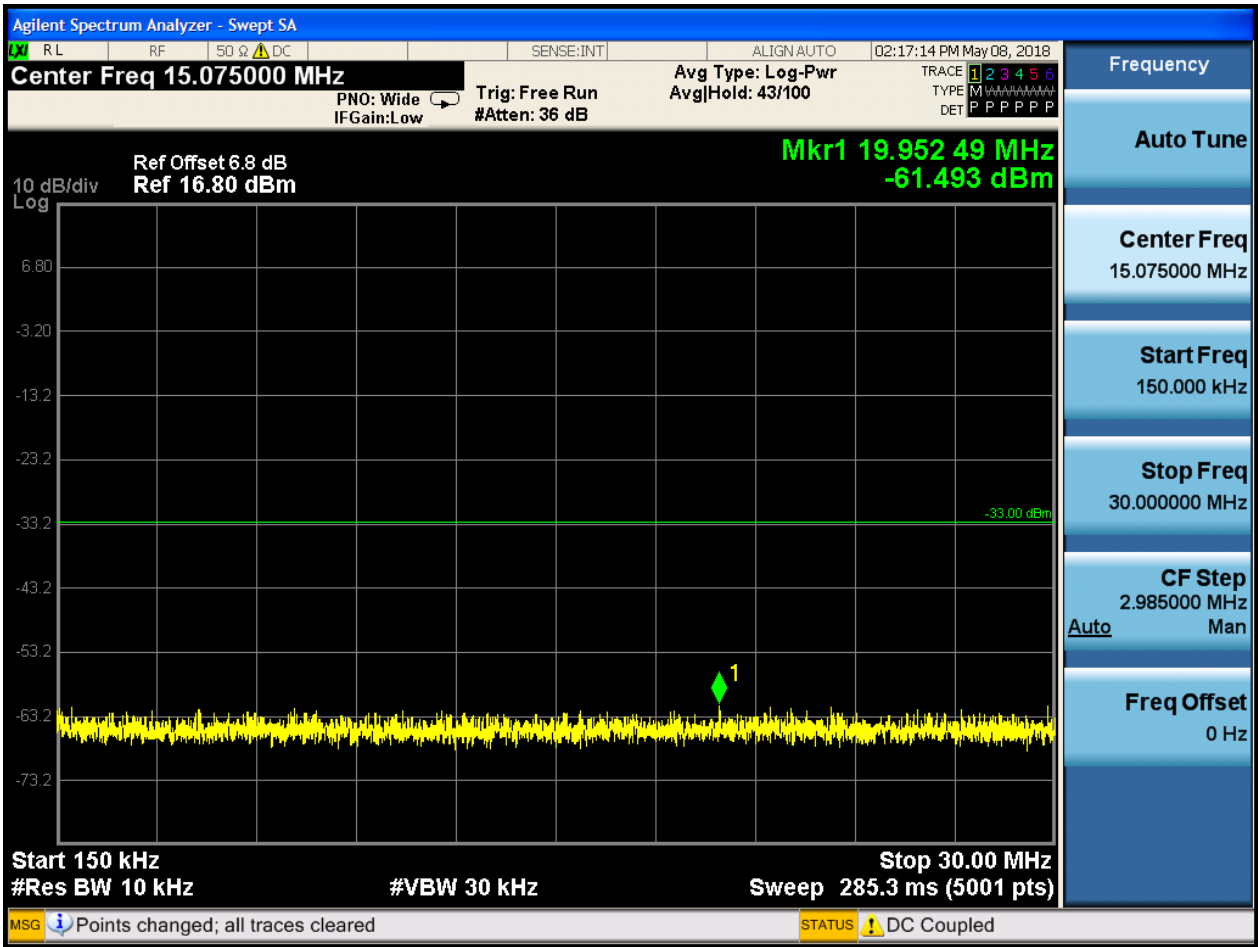






6.1.2.1.2 Test Channel = MCH

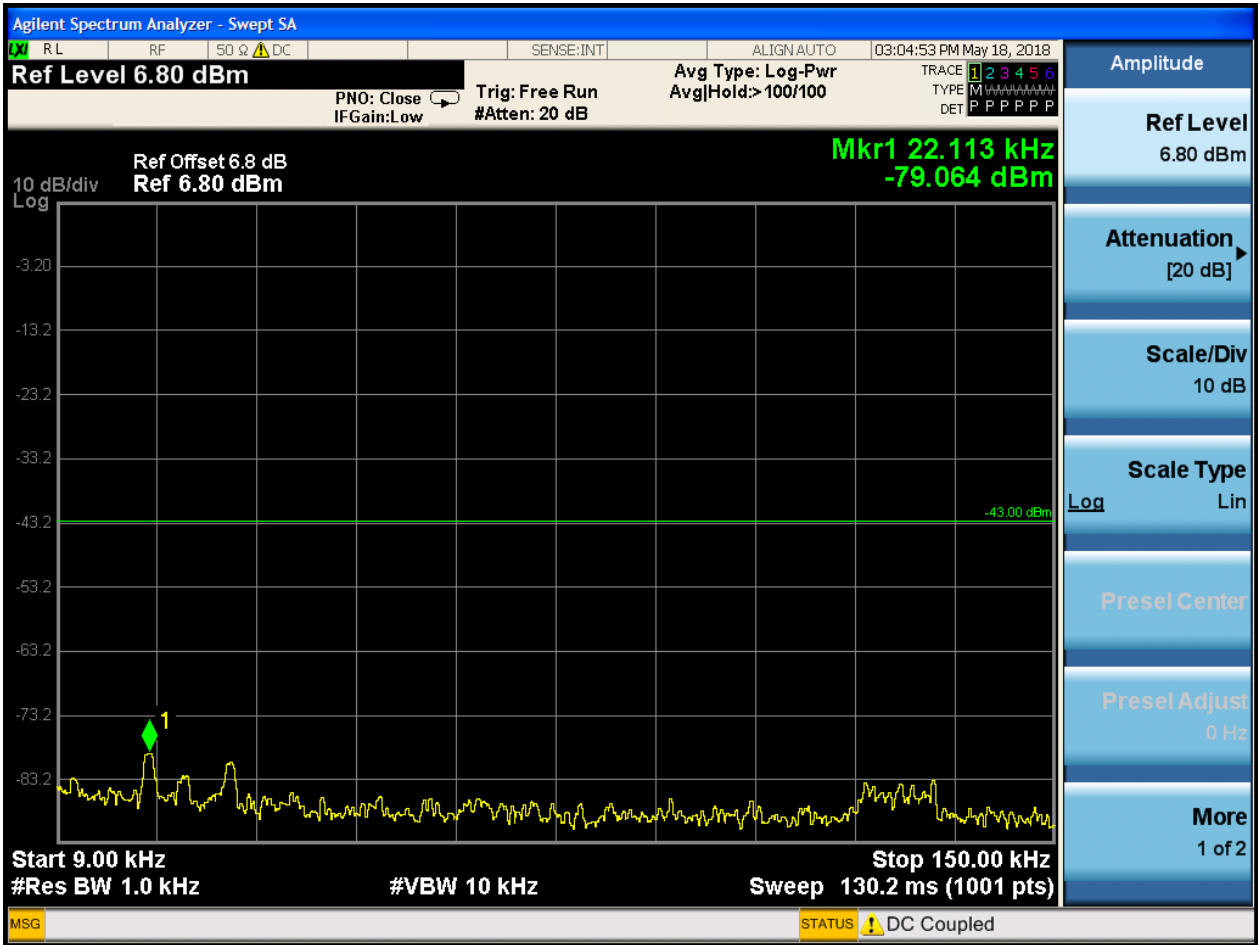


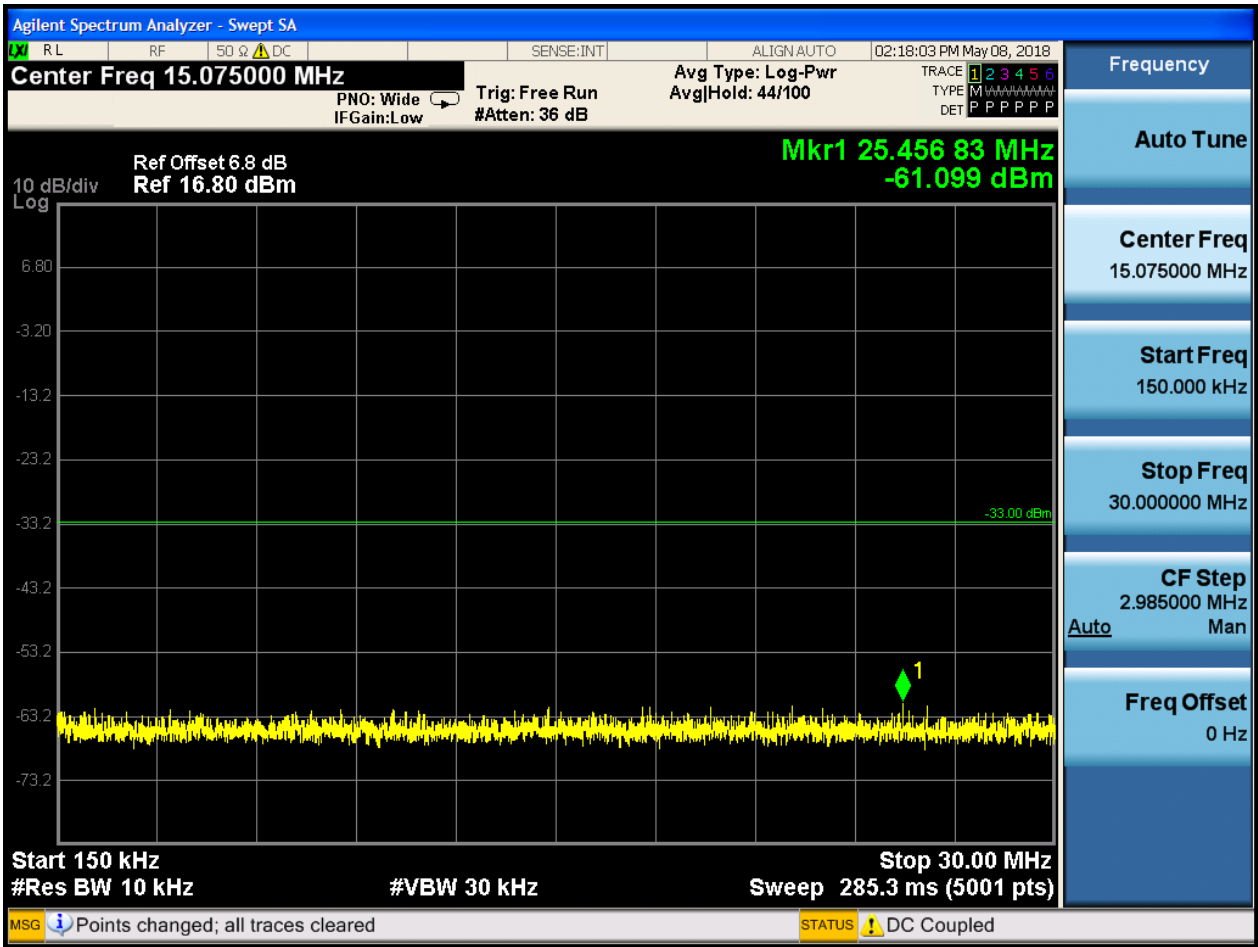






### 6.1.2.1.3 Test Channel = HCH







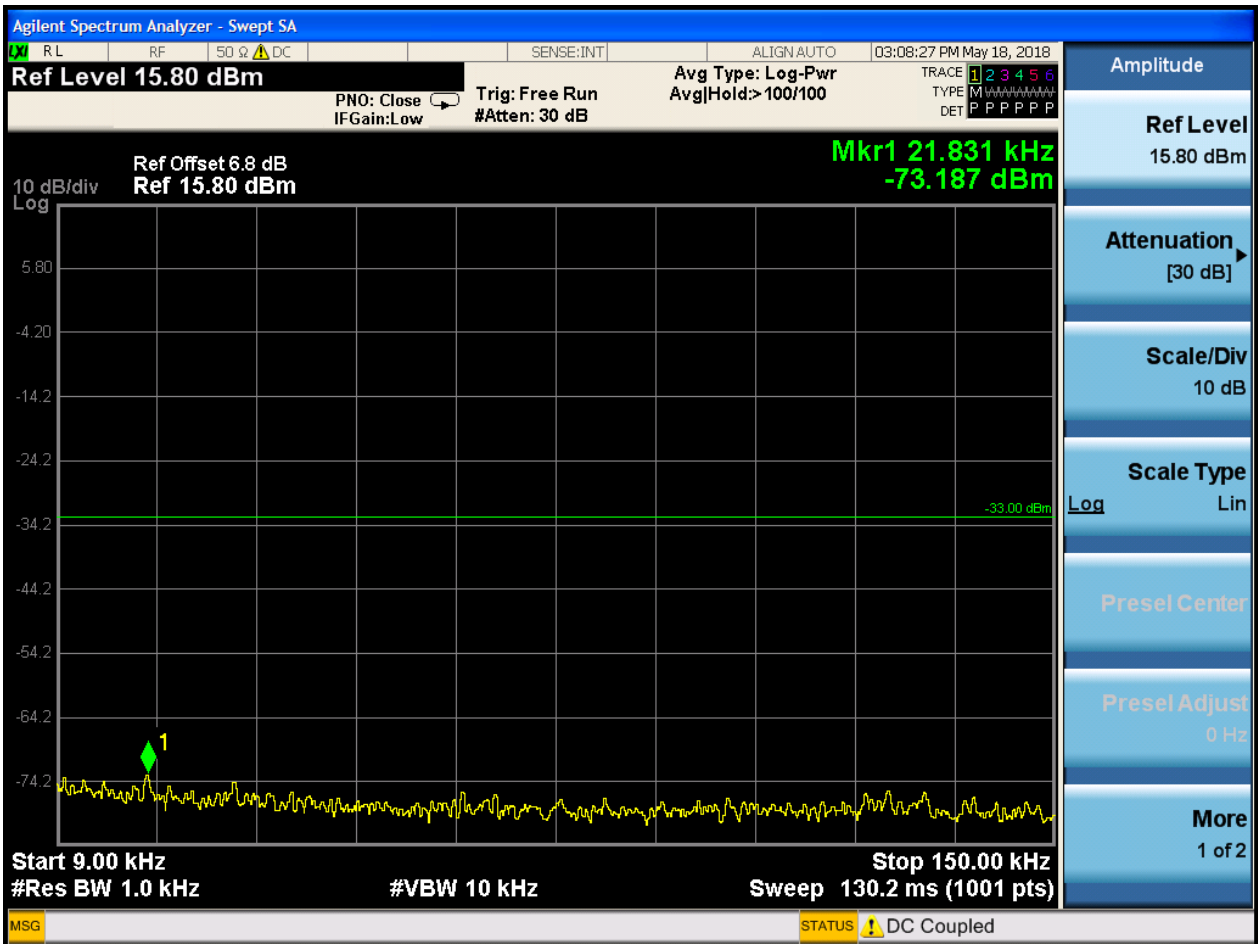


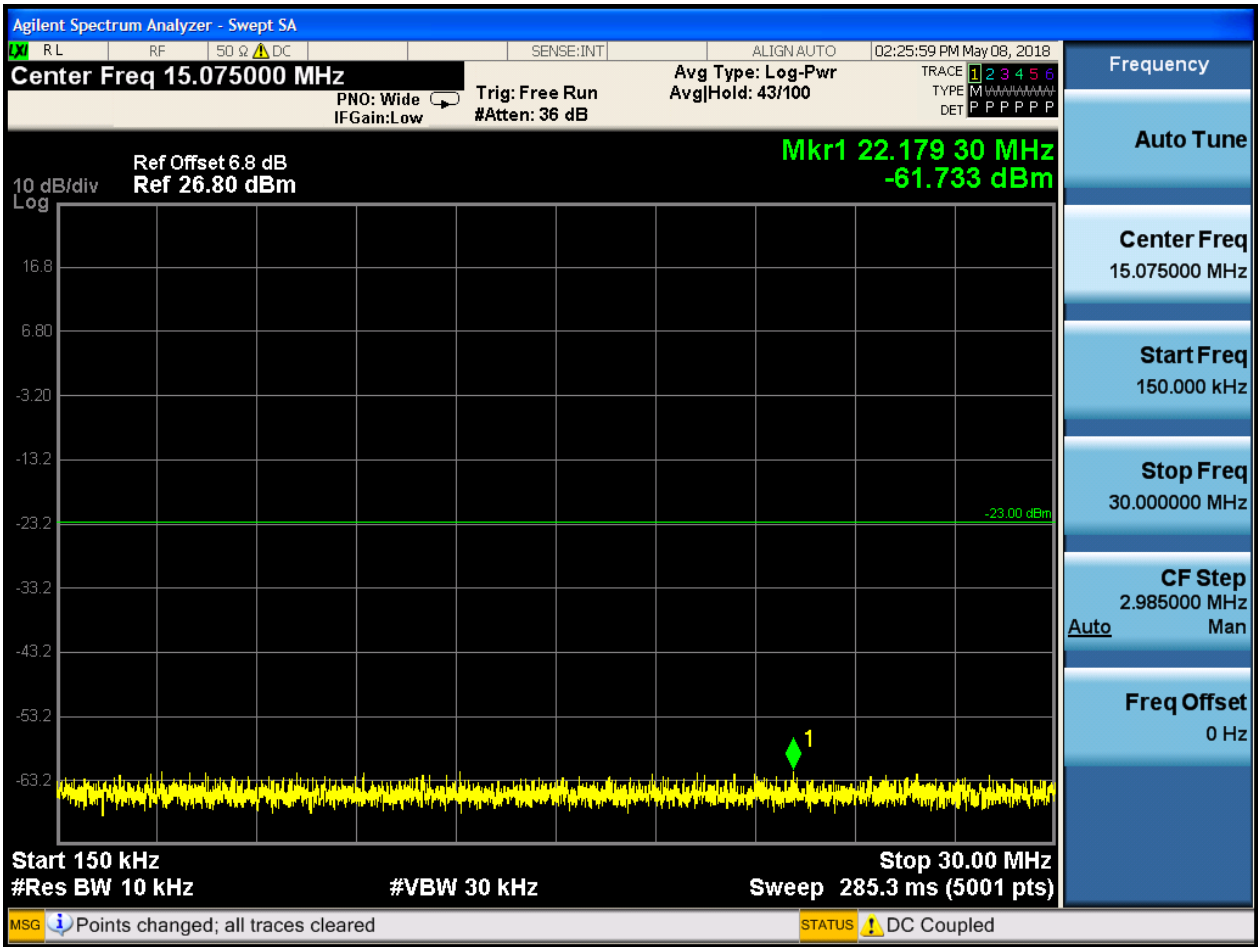


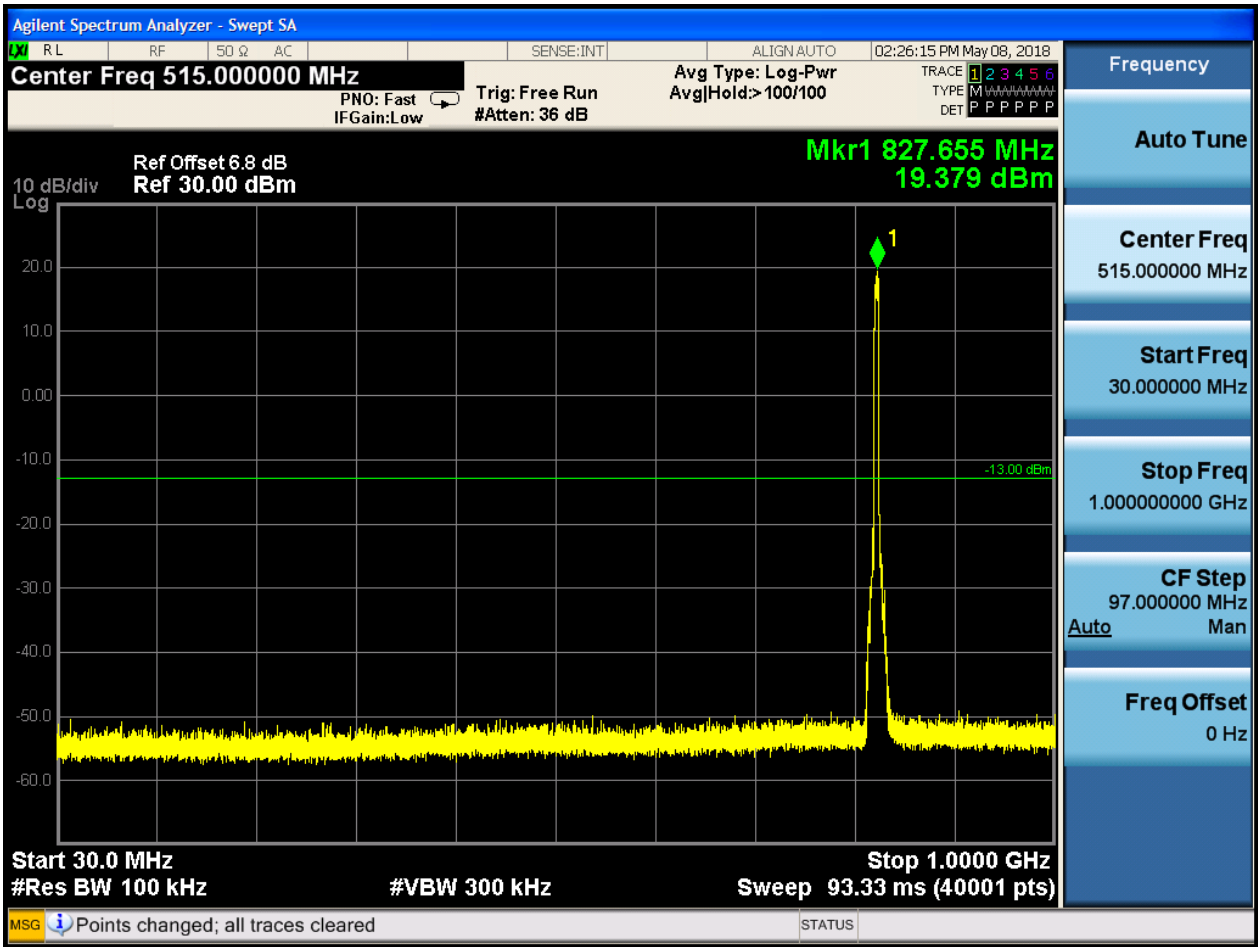
6.1.3 Test Band = WCDMA850

6.1.3.1 Test Mode = UMTS/TM1

6.1.3.1.1 Test Channel = LCH



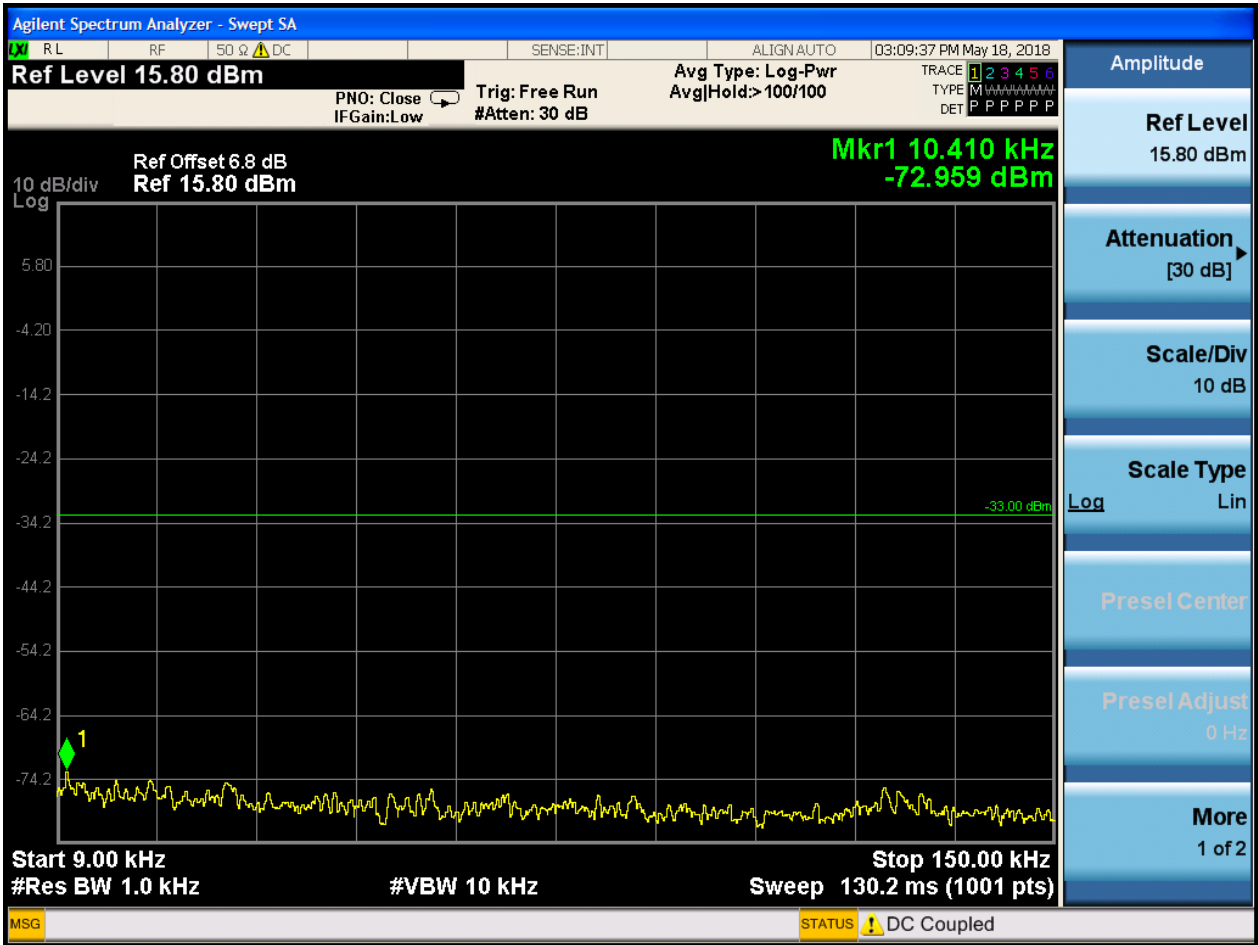


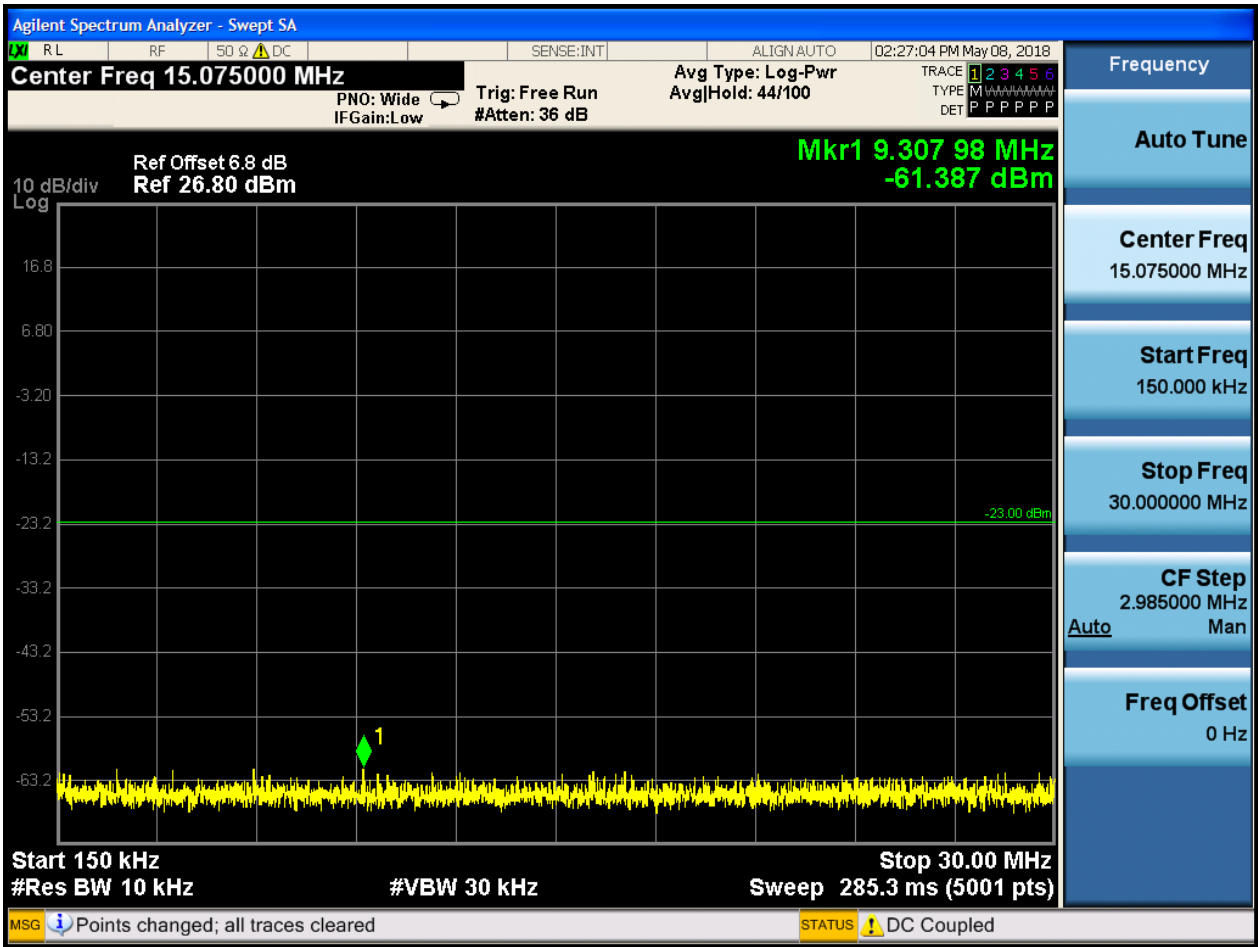


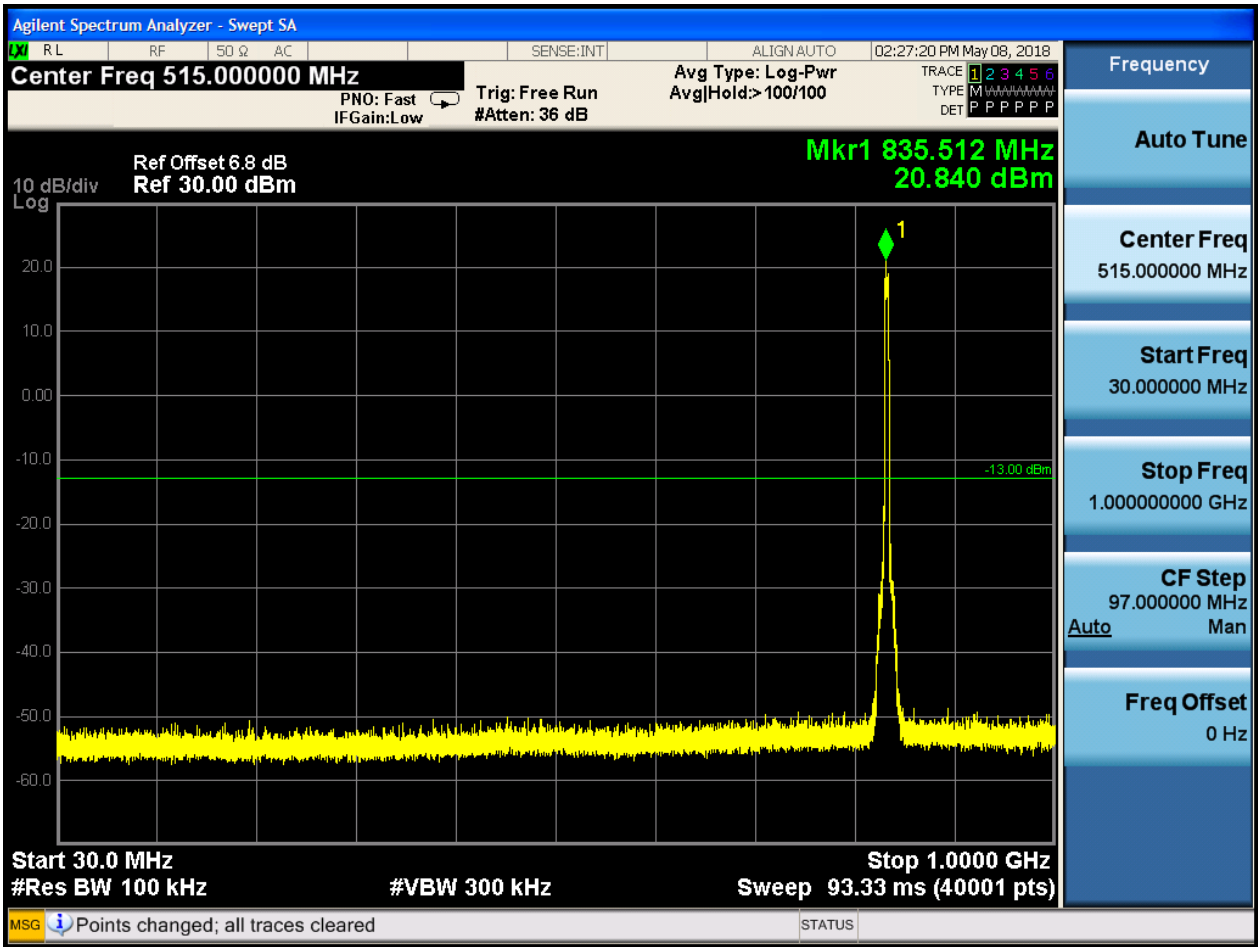


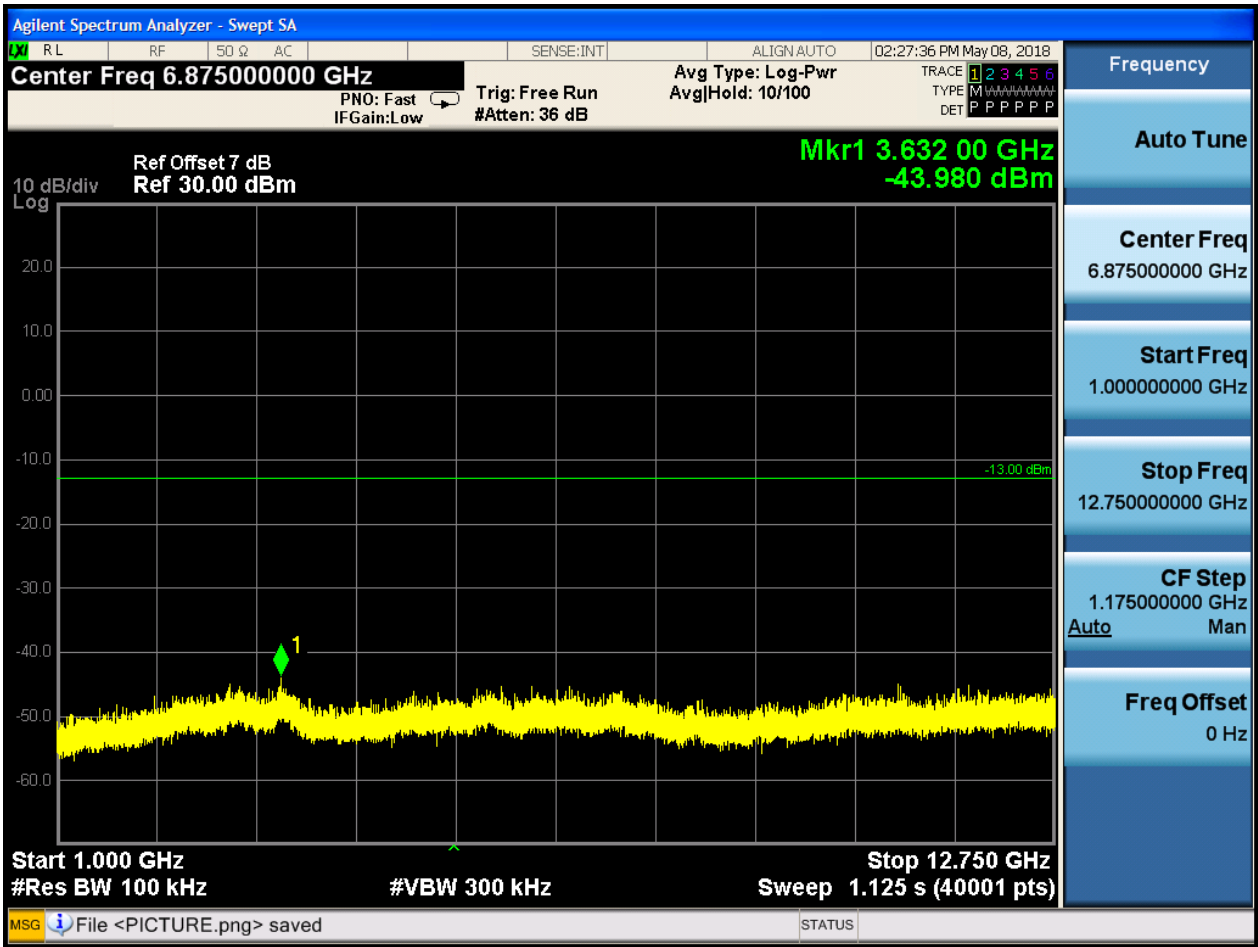


### 6.1.3.1.2 Test Channel = MCH





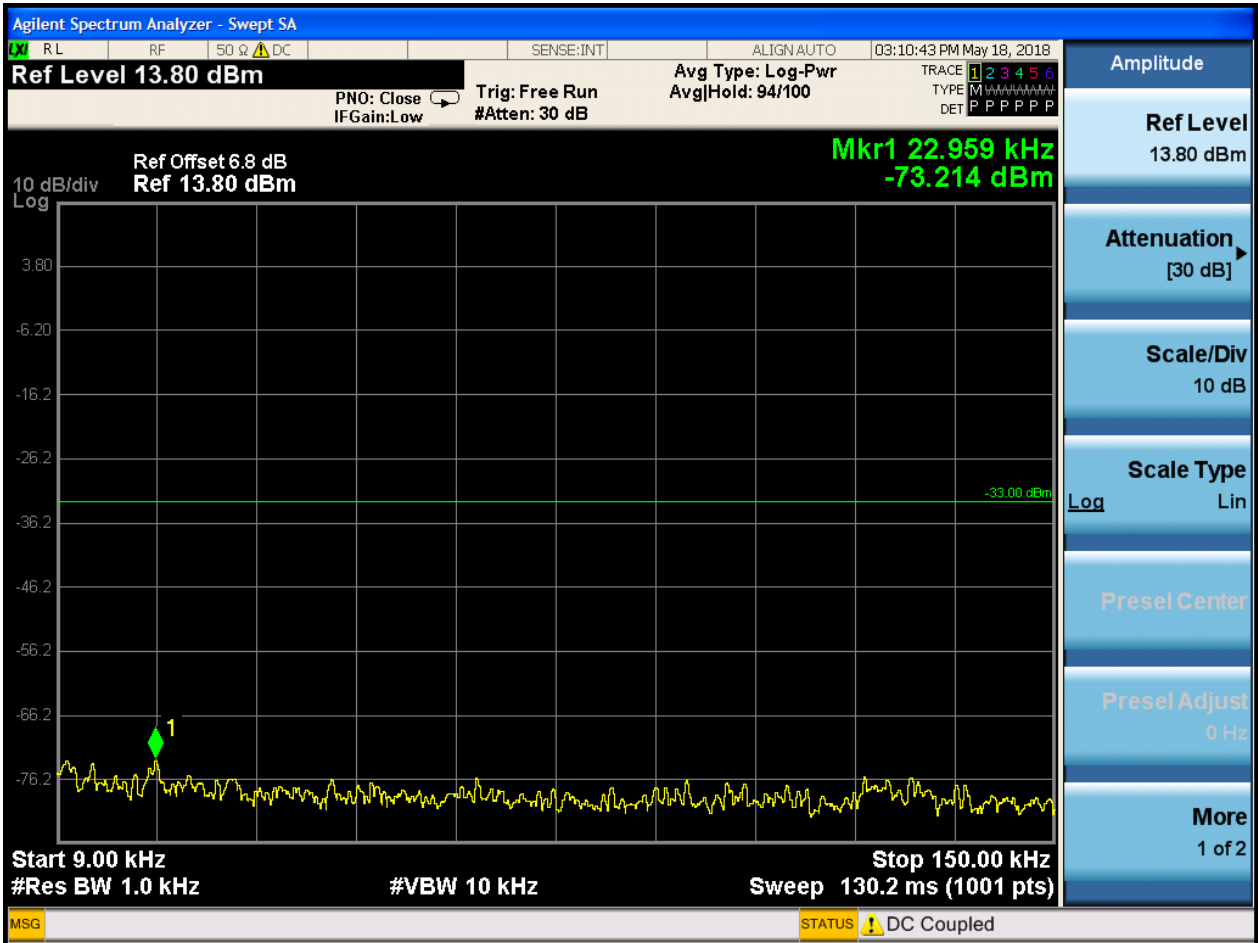








### 6.1.3.1.3 Test Channel = HCH











## 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

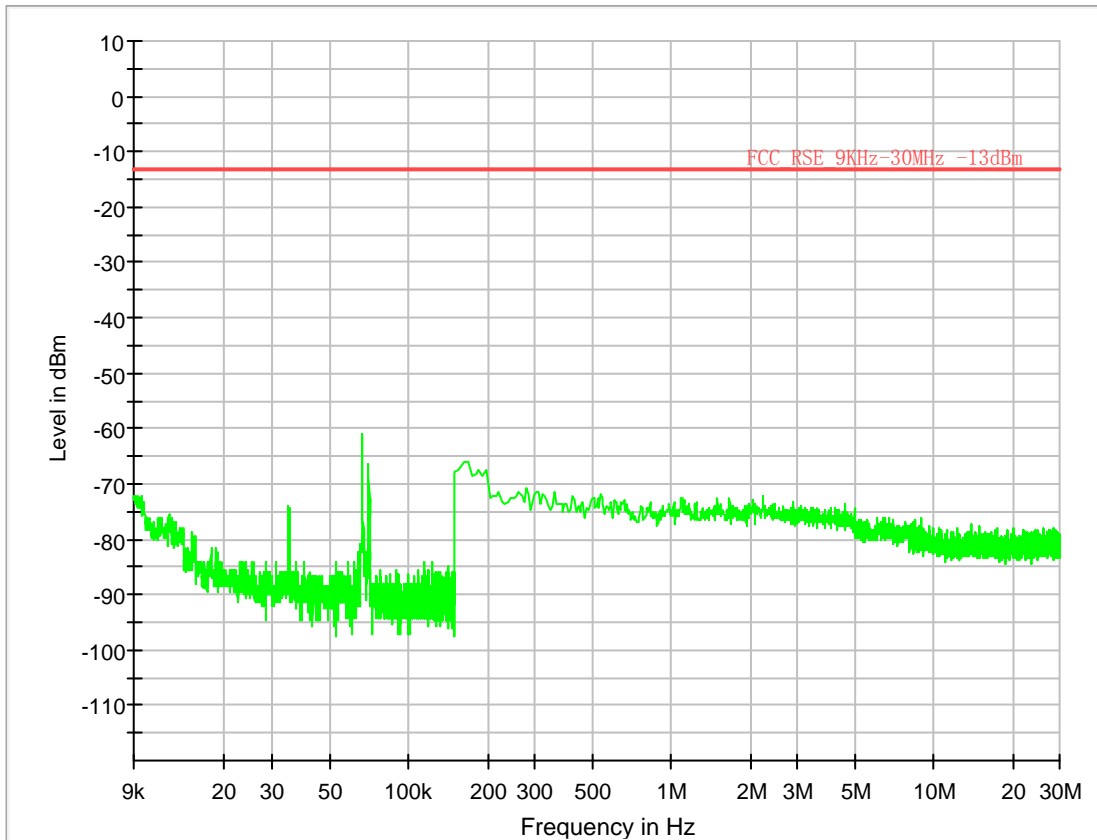
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

## Part I - Test Plots

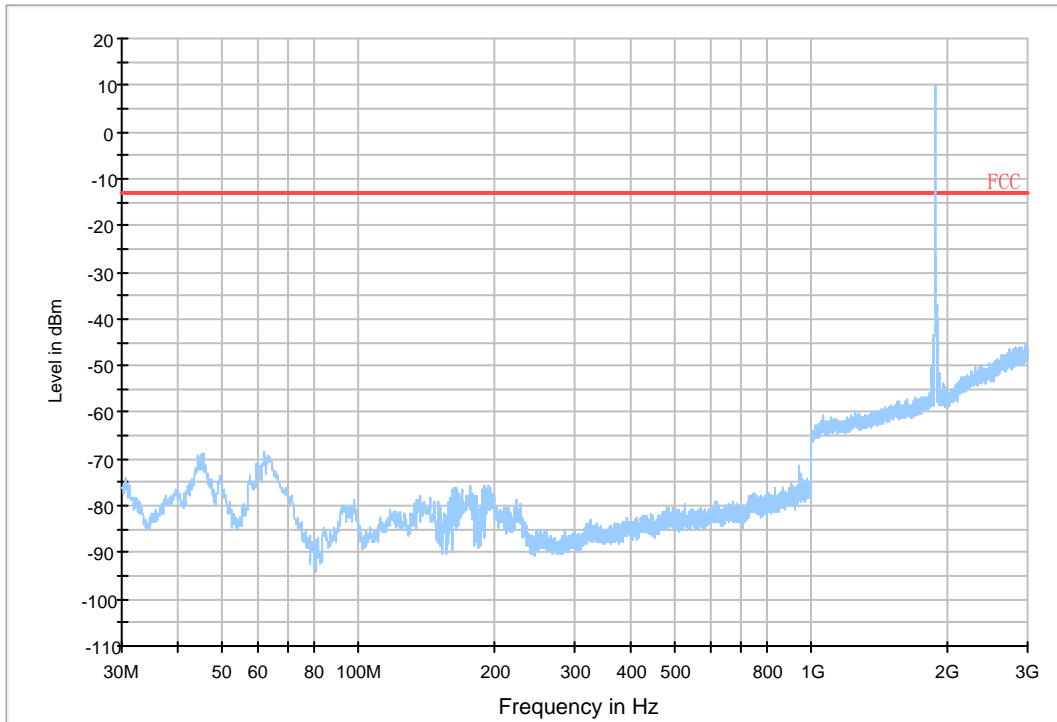
### 7.1 For UMTS

#### 7.1.1 Test Band = WCDMA1900

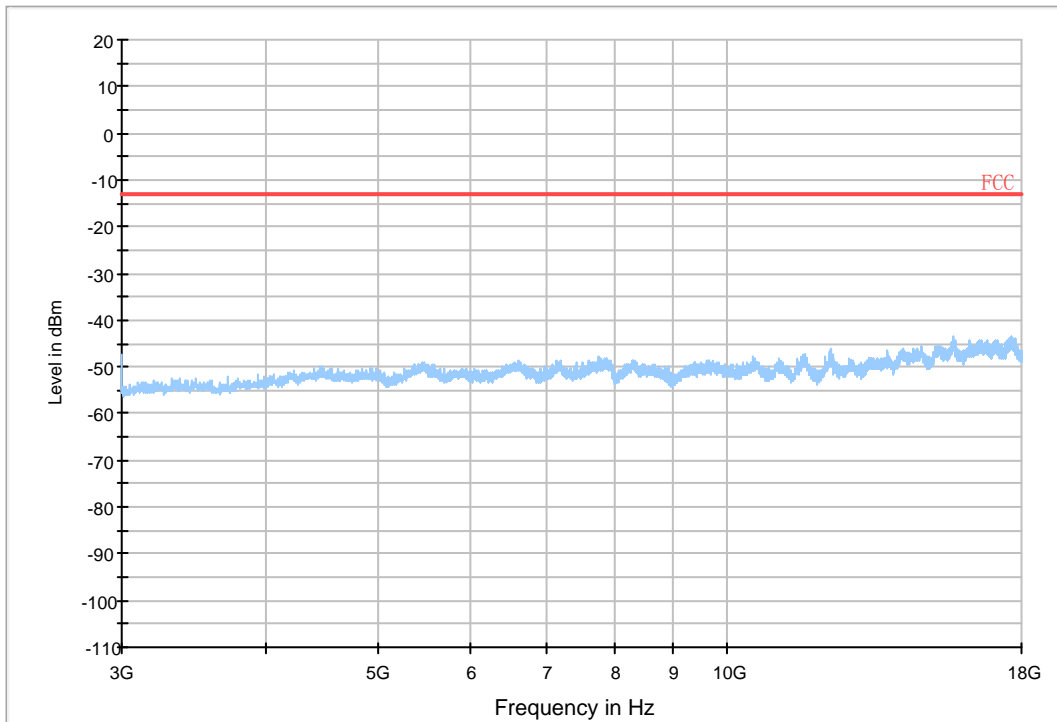
##### 7.1.1.1 Test Mode = UMTS/TM1



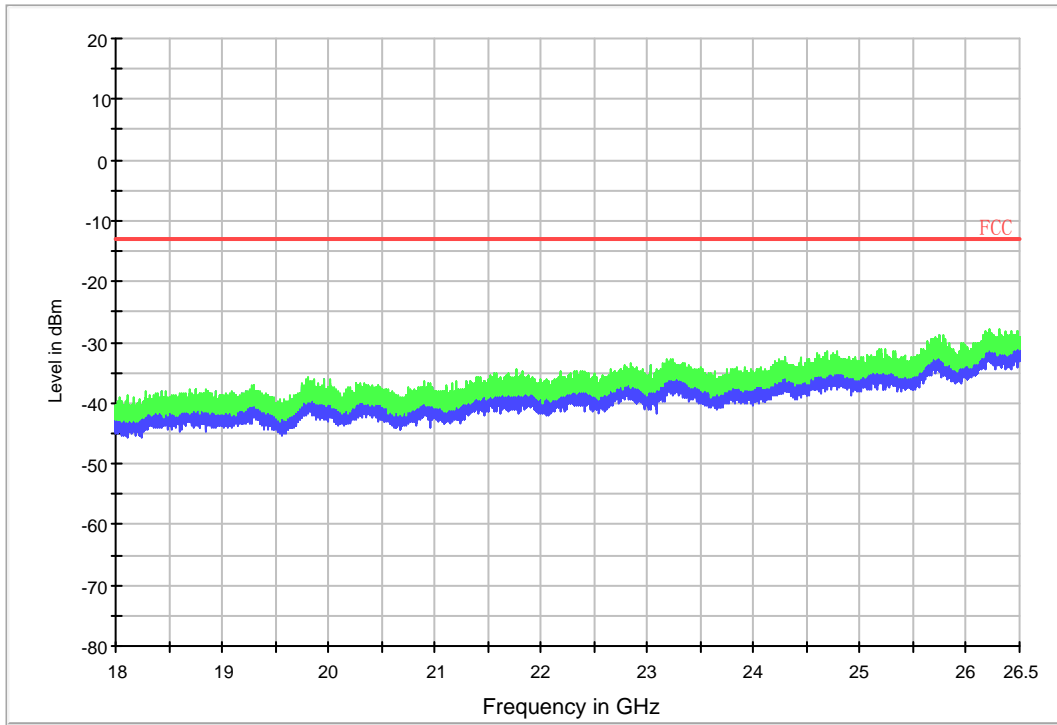
12 FCC PART24 WCDMA1900\_L



11 FCC PART24 WCDMA1900\_H



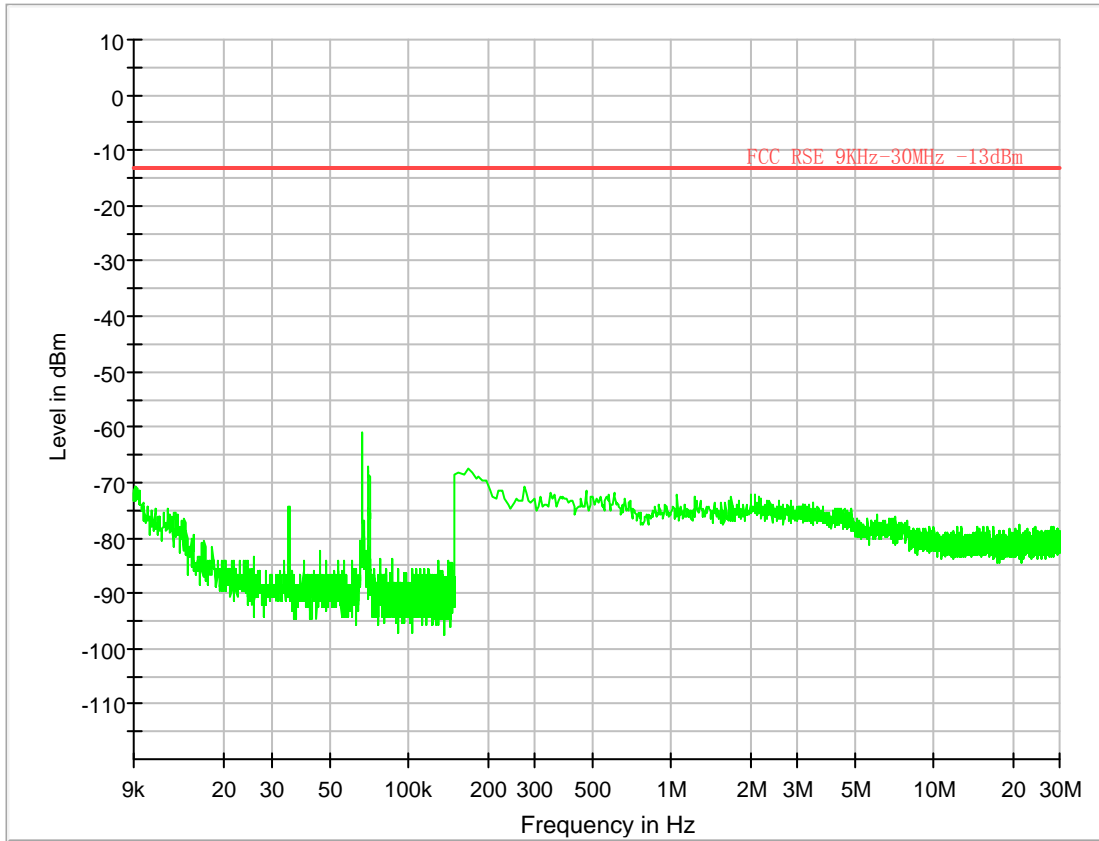
18G~26.5G RSE-TX-DIRECTOR ABOVE 1.5G PK



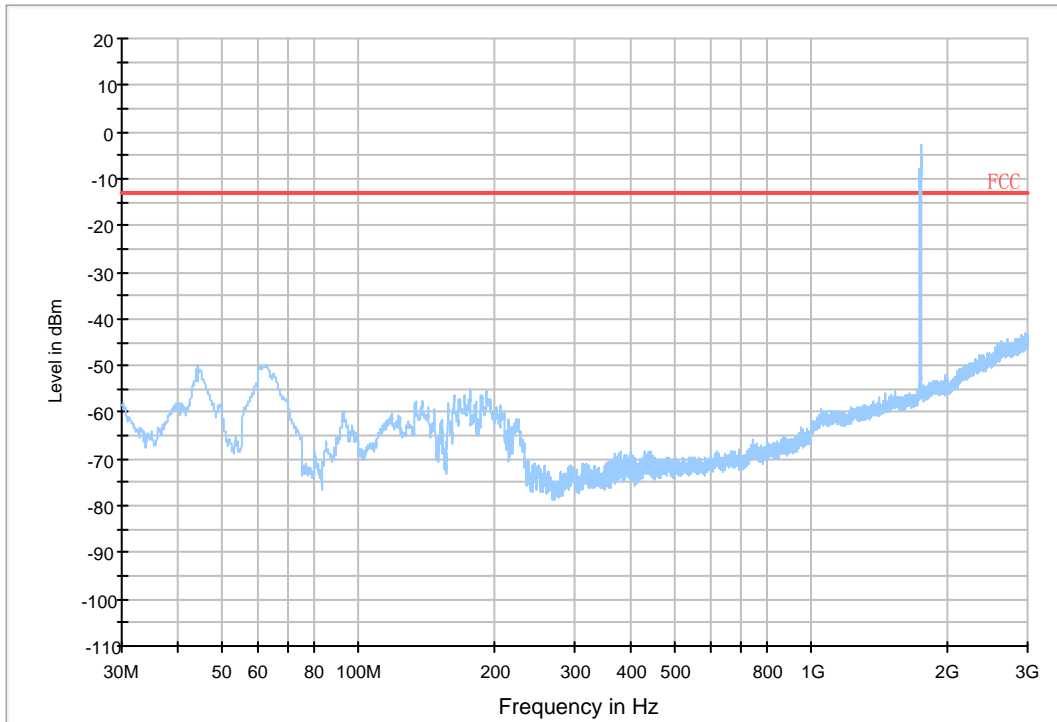


7.1.2 Test Band = WCDMA1700

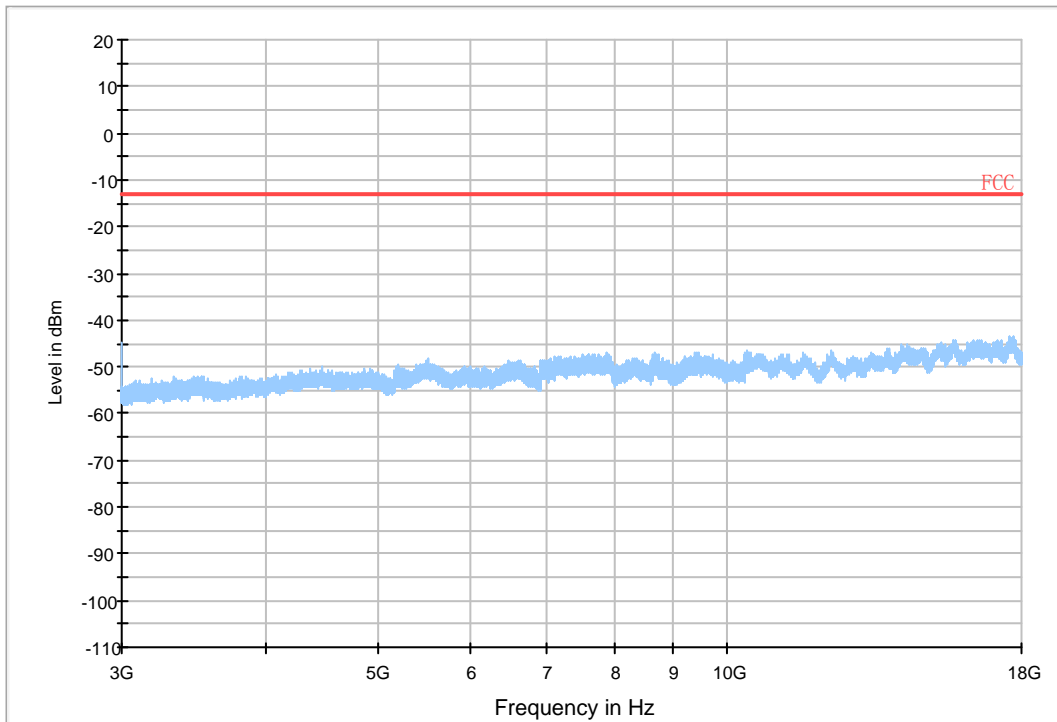
7.1.2.1 Test Mode = UMTS/TM1



18 FCC PART27 WCDMA1700\_L

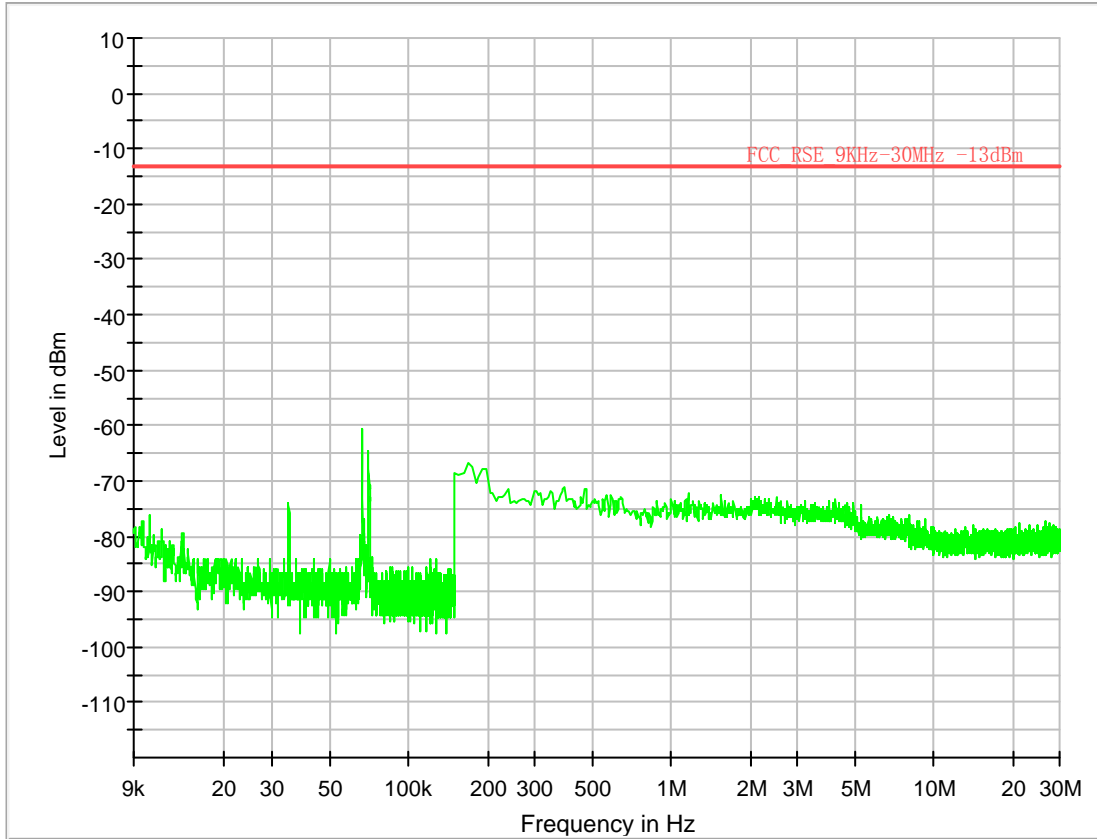


17 FCC PART27 WCDMA1700\_H

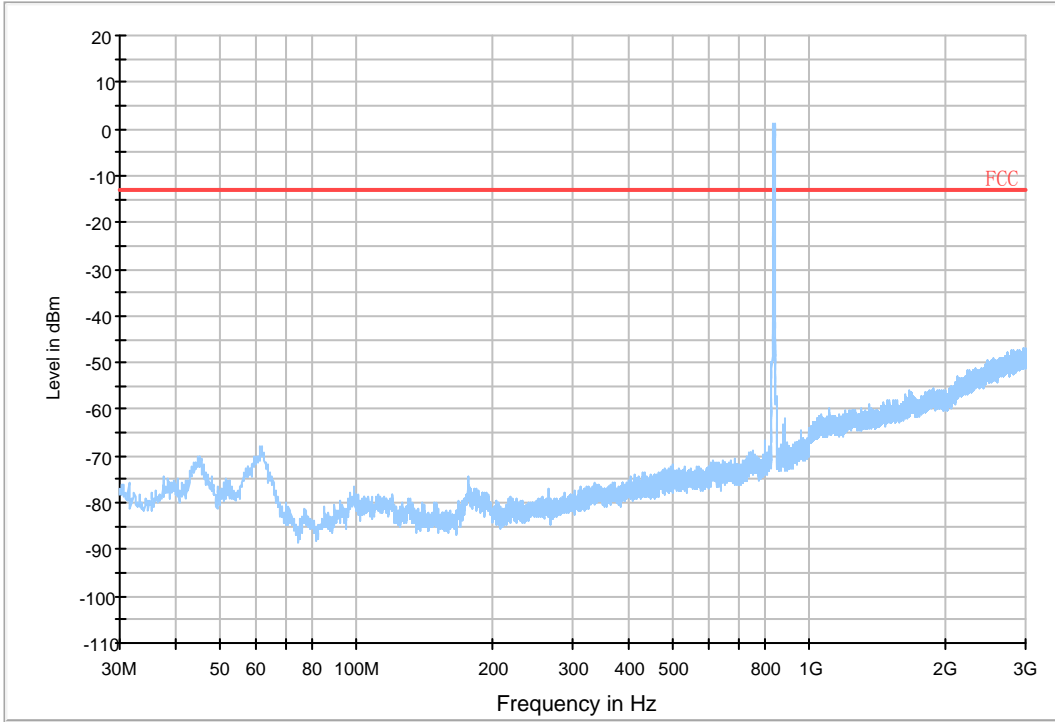


### 7.1.3 Test Band = WCDMA850

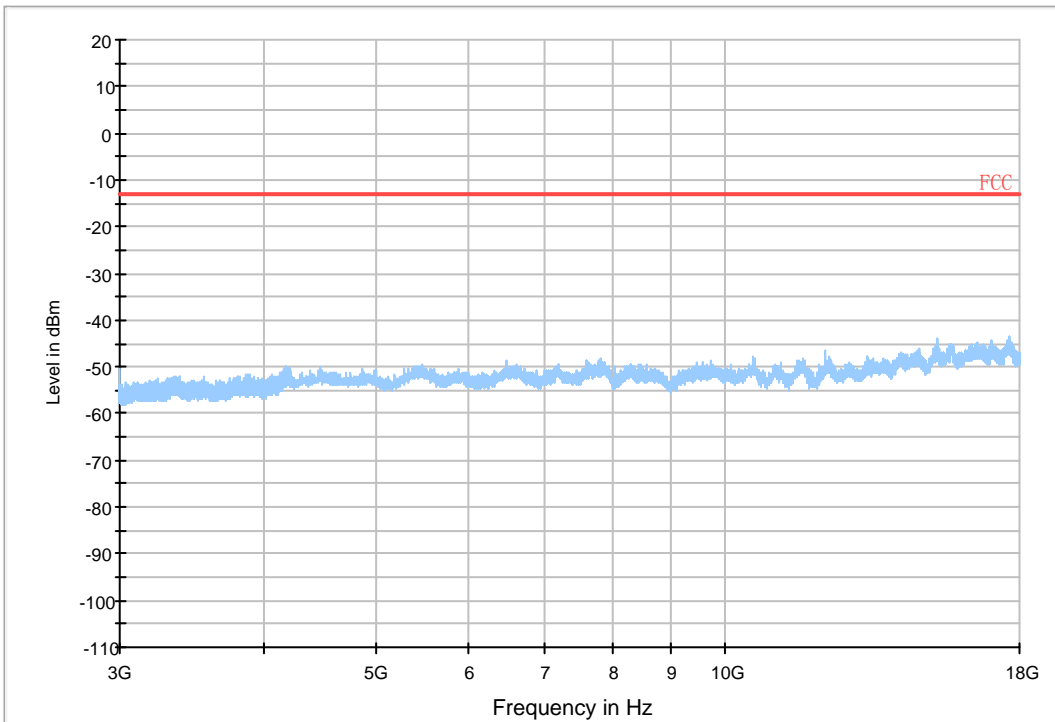
#### 7.1.3.1 Test Mode = UMTS/TM1



06 FCC PART22 WCDMA850\_L



05 FCC PART22 WCDMA850\_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
WCDMA1900	UMTS/TM1	LCH	TN	VL	-0.02	-0.00001	PASS
				VN	0.17	0.00009	PASS
				VH	0.6	0.00032	PASS
		MCH	TN	VL	-2.35	-0.00125	PASS
				VN	-0.56	-0.0003	PASS
				VH	-1.24	-0.00066	PASS
		HCH	TN	VL	-0.84	-0.00044	PASS
				VN	-6.68	-0.0035	PASS
				VH	-2.88	-0.00151	PASS
WCDMA1700	UMTS/TM1	LCH	TN	VL	5.22	0.00305	PASS
				VN	7.45	0.00435	PASS
				VH	5.78	0.00338	PASS
		MCH	TN	VL	-0.82	-0.00047	PASS
				VN	1.68	0.00097	PASS
				VH	-0.96	-0.00055	PASS
		HCH	TN	VL	-9.05	-0.00516	PASS
				VN	-6.24	-0.00356	PASS
				VH	-7.02	-0.00401	PASS
WCDMA850	UMTS/TM1	LCH	TN	VL	-1.34	-0.00162	PASS
				VN	3.17	0.00384	PASS
				VH	0.34	0.00041	PASS
		MCH	TN	VL	-0.6	-0.00072	PASS
				VN	-1.3	-0.00155	PASS
				VH	-1.77	-0.00212	PASS
		HCH	TN	VL	-2.37	-0.0028	PASS
				VN	-2.11	-0.00249	PASS
				VH	2.21	0.00261	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
WCDMA1900	UMTS/TM1	LCH	VN	-30	1.19	0.00064	PASS
				-20	2.38	0.00128	PASS
				-10	4.38	0.00236	PASS
				0	-1.94	-0.00105	PASS
				10	0.24	0.00013	PASS
				20	-1.24	-0.00067	PASS
				30	-0.26	-0.00014	PASS
				40	1.6	0.00086	PASS
				50	-0.44	-0.00024	PASS
		MCH	VN	-30	-2.78	-0.00148	PASS
				-20	-1.25	-0.00066	PASS
				-10	-1.43	-0.00076	PASS
				0	-1.53	-0.00081	PASS
				10	-1.77	-0.00094	PASS
				20	0.95	0.00051	PASS
				30	-2.58	-0.00137	PASS
				40	-0.82	-0.00044	PASS
				50	-1.11	-0.00059	PASS
		HCH	VN	-30	-3.13	-0.00164	PASS
				-20	-2.4	-0.00126	PASS
				-10	-1.66	-0.00087	PASS
				0	-1.51	-0.00079	PASS
				10	-2.01	-0.00105	PASS
				20	-3.42	-0.00179	PASS
				30	-2.43	-0.00127	PASS
				40	-1.68	-0.00088	PASS
				50	-7.14	-0.00374	PASS
WCDMA1700	UMTS/TM1	LCH	VN	-30	6.55	0.00383	PASS
				-20	7.77	0.00454	PASS
				-10	8.36	0.00488	PASS
				0	6.42	0.00375	PASS
				10	5.29	0.00309	PASS
				20	8.22	0.0048	PASS
				30	7.51	0.00439	PASS
				40	6.81	0.00398	PASS
				50	9.58	0.00559	PASS
		MCH	VN	-30	-2.64	-0.00152	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-20	-1.62	-0.00094	PASS
				-10	-1.08	-0.00062	PASS
				0	0.95	0.00055	PASS
				10	0.4	0.00023	PASS
				20	0.41	0.00024	PASS
				30	-0.76	-0.00044	PASS
				40	-0.81	-0.00047	PASS
				50	-1.31	-0.00076	PASS
		HCH	VN	-30	-6.82	-0.00389	PASS
				-20	-5.58	-0.00318	PASS
				-10	-7.19	-0.0041	PASS
				0	-7.51	-0.00429	PASS
				10	-9.28	-0.00529	PASS
				20	-7.71	-0.0044	PASS
				30	-7.87	-0.00449	PASS
				40	-8.09	-0.00462	PASS
				50	-7.58	-0.00433	PASS
				WCDMA850	UMTS/TM1	LCH	VN
-20	-0.26	-0.00031	PASS				
-10	-0.24	-0.00029	PASS				
0	-2.46	-0.00298	PASS				
10	-0.44	-0.00053	PASS				
20	-2.66	-0.00322	PASS				
30	0.79	0.00096	PASS				
40	0.05	0.00006	PASS				
50	1.08	0.00131	PASS				
MCH	VN	-30	1.62			0.00194	PASS
		-20	2.09			0.0025	PASS
		-10	-3.22			-0.00385	PASS
		0	-0.02			-0.00002	PASS
		10	0			0	PASS
		20	5.46			0.00653	PASS
		30	-1.34			-0.0016	PASS
		40	-0.18			-0.00022	PASS
HCH	VN	50	0.63			0.00075	PASS
		-30	-1.43			-0.00169	PASS
		-20	-0.08			-0.00009	PASS
		-10	0.6			0.00071	PASS
		0	-1.98			-0.00234	PASS
		10	-0.09			-0.00011	PASS



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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				20	1.3	0.00154	PASS
				30	1.46	0.00172	PASS
				40	-2.44	-0.00288	PASS
				50	-2.53	-0.00299	PASS

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END