



# 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 / EIRP [dBm]	Limit [dBm]	Verdict
WCDMA850	UMTS/TM1	LCH	24.01	20.06	38.5	PASS
		MCH	24.04	20.09	38.5	PASS
		HCH	23.92	19.97	38.5	PASS
WCDMA1700	UMTS/TM1	LCH	22.61	22.91	30	PASS
		MCH	22.48	22.78	30	PASS
		HCH	22.56	22.86	30	PASS
WCDMA1900	UMTS/TM1	LCH	22.67	22.87	33	PASS
		MCH	22.62	22.82	33	PASS
		HCH	22.59	22.79	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:

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

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

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

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	3.01	13	PASS
		MCH	3.23	13	PASS
		HCH	3.34	13	PASS
WCDMA1700	UMTS/TM1	LCH	3.32	13	PASS
		MCH	3.23	13	PASS
		HCH	3.34	13	PASS
WCDMA1900	UMTS/TM1	LCH	3.44	13	PASS
		MCH	3.37	13	PASS
		HCH	3.42	13	PASS

### 3Appendix\_C: Modulation Characteristics

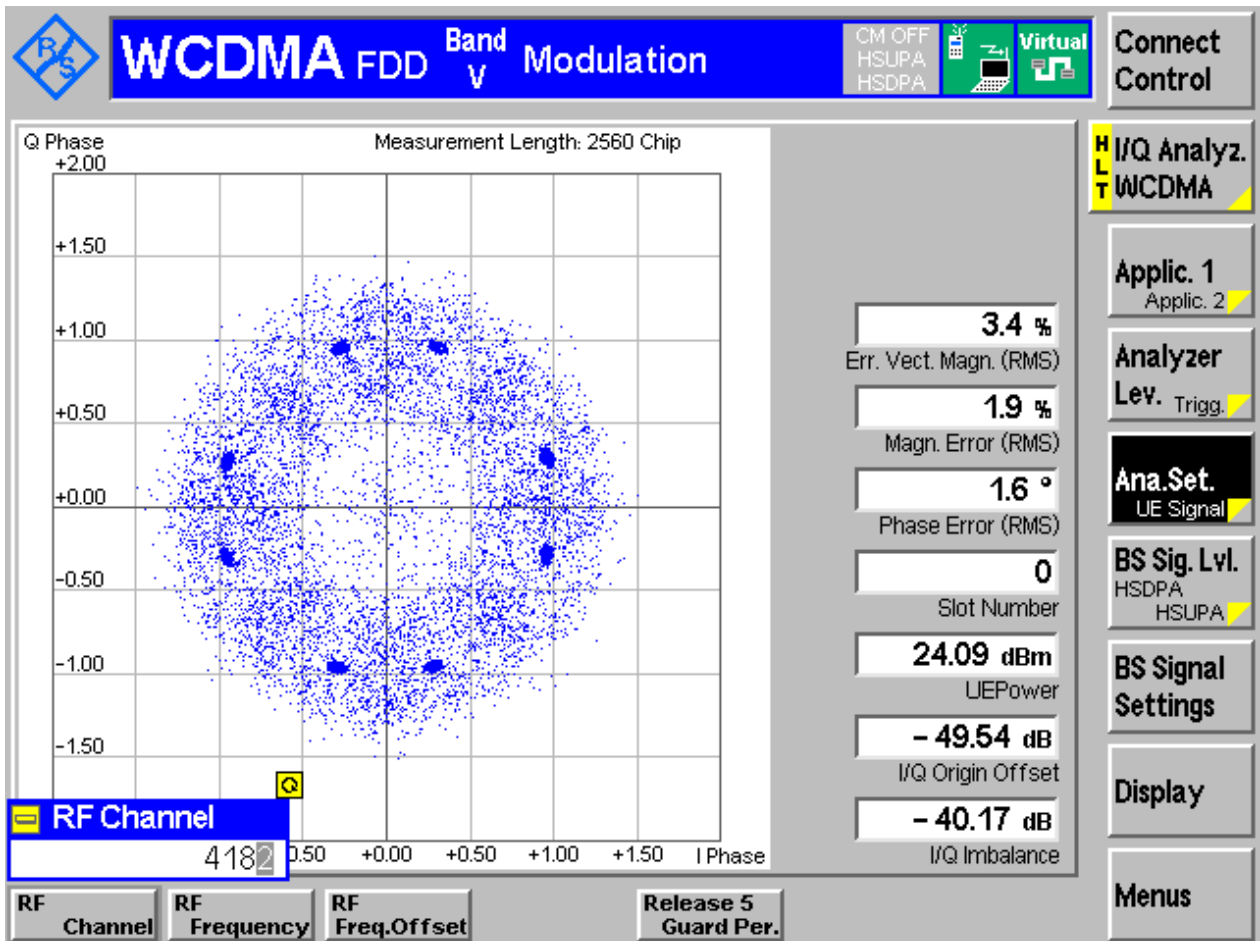
#### Part I - Test Plots

#### 3.1 For UMTS

#### 3.1.1 Test Band = WCDMA850

#### 3.1.1.1 Test Mode = UMTS/TM1

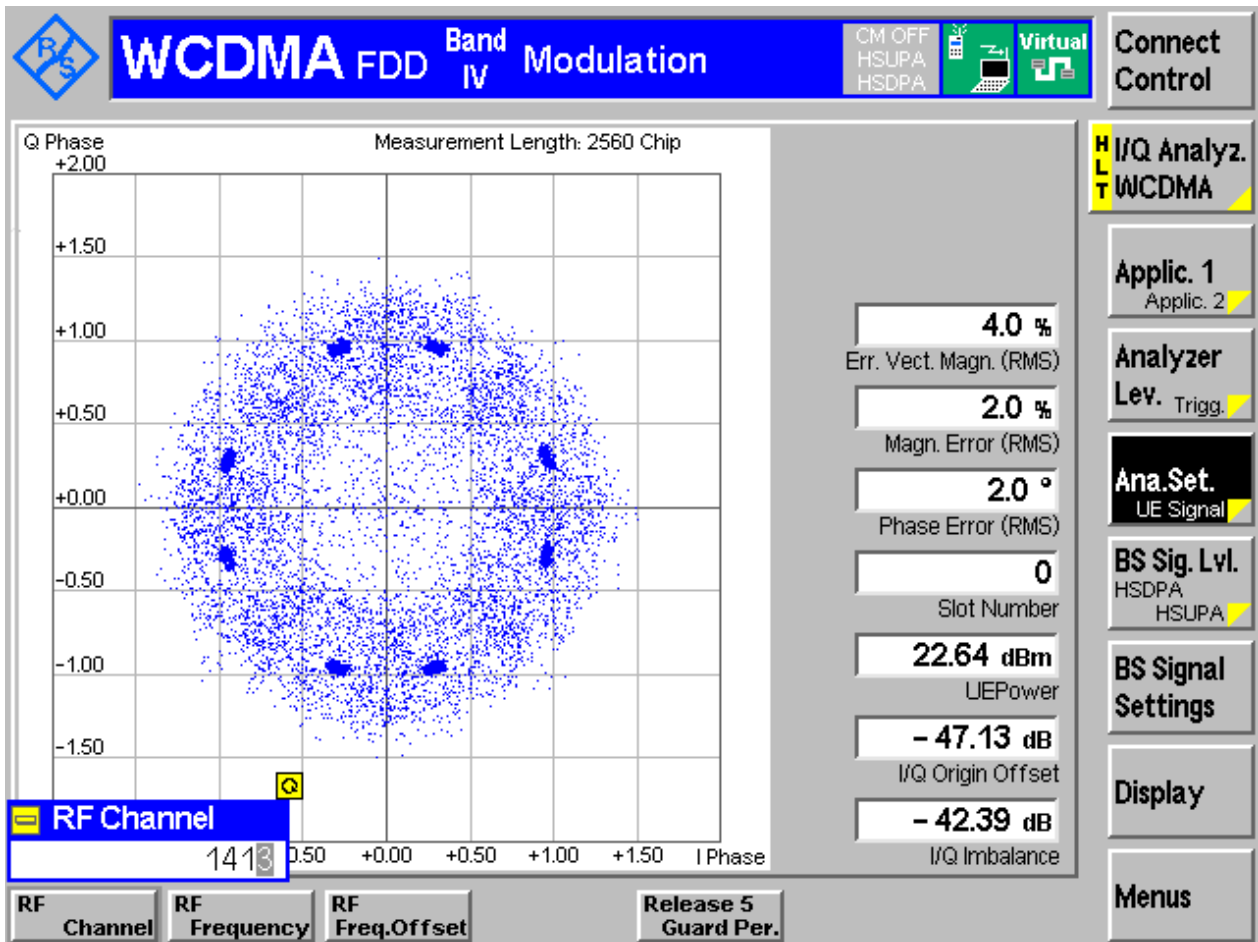
#### 3.1.1.1.1 Test Channel = MCH



### 3.1.2 Test Band = WCDMA1700

#### 3.1.2.1 Test Mode = UMTS/TM1

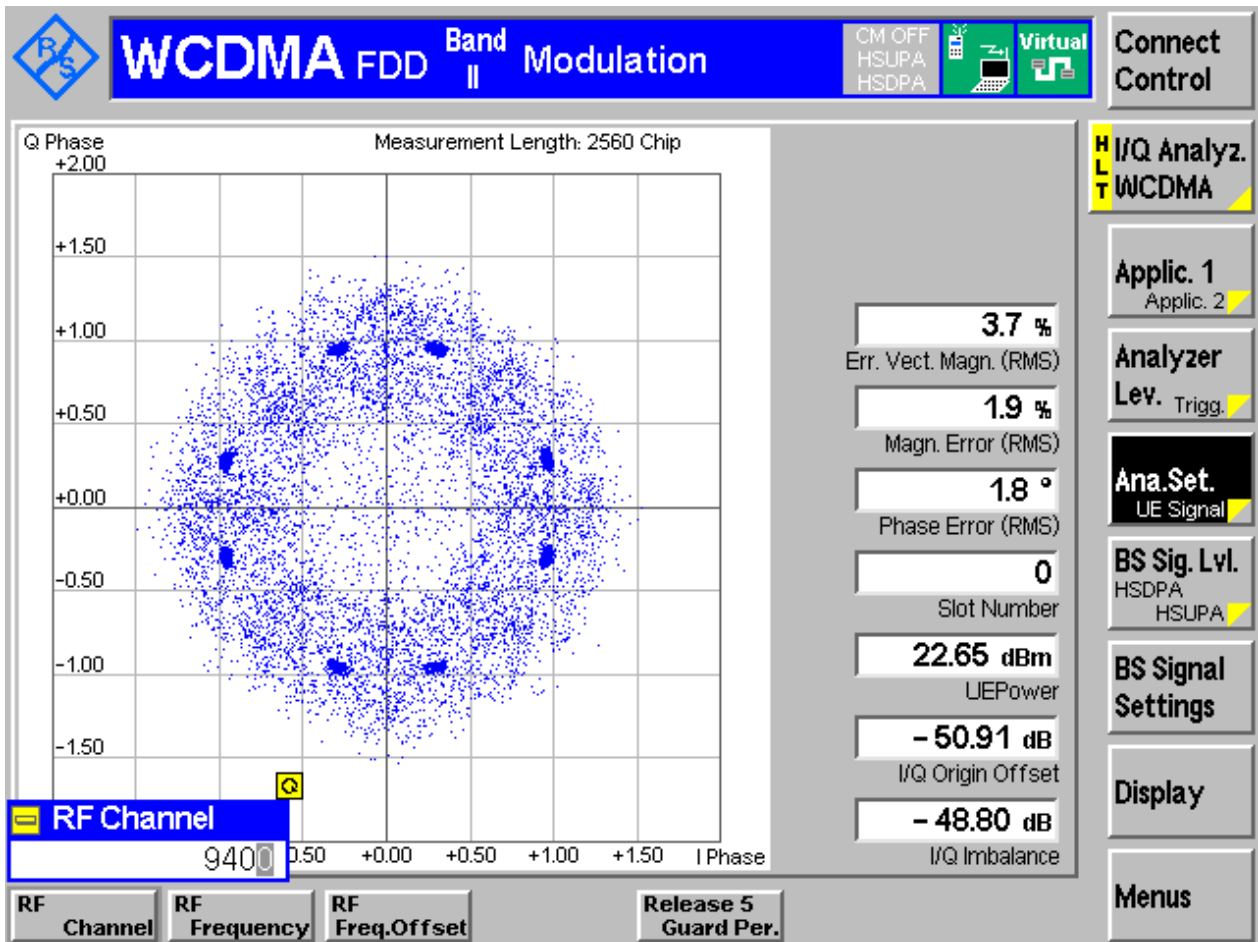
##### 3.1.2.1.1 Test Channel = MCH



### 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	4.12	4.71	Pass
		MCH	4.12	4.70	Pass
		HCH	4.11	4.69	Pass
WCDMA1700	UMTS/TM1	LCH	4.11	4.69	Pass
		MCH	4.12	4.70	Pass
		HCH	4.12	4.70	Pass
WCDMA1900	UMTS/TM1	LCH	4.12	4.69	Pass
		MCH	4.11	4.69	Pass
		HCH	4.11	4.70	Pass





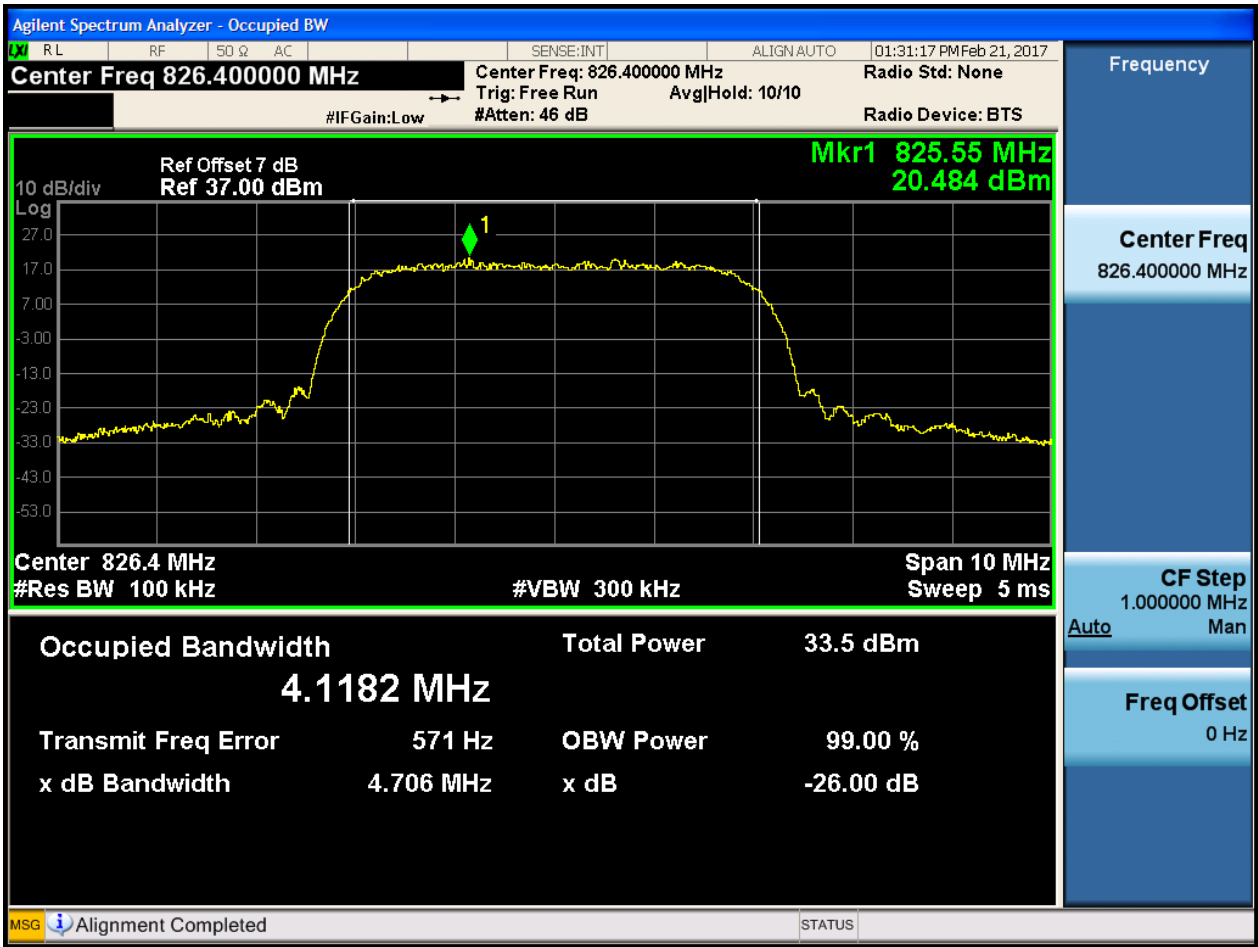
Part II - Test Plots

4.1 For UMTS

4.1.1 Test Band = WCDMA850

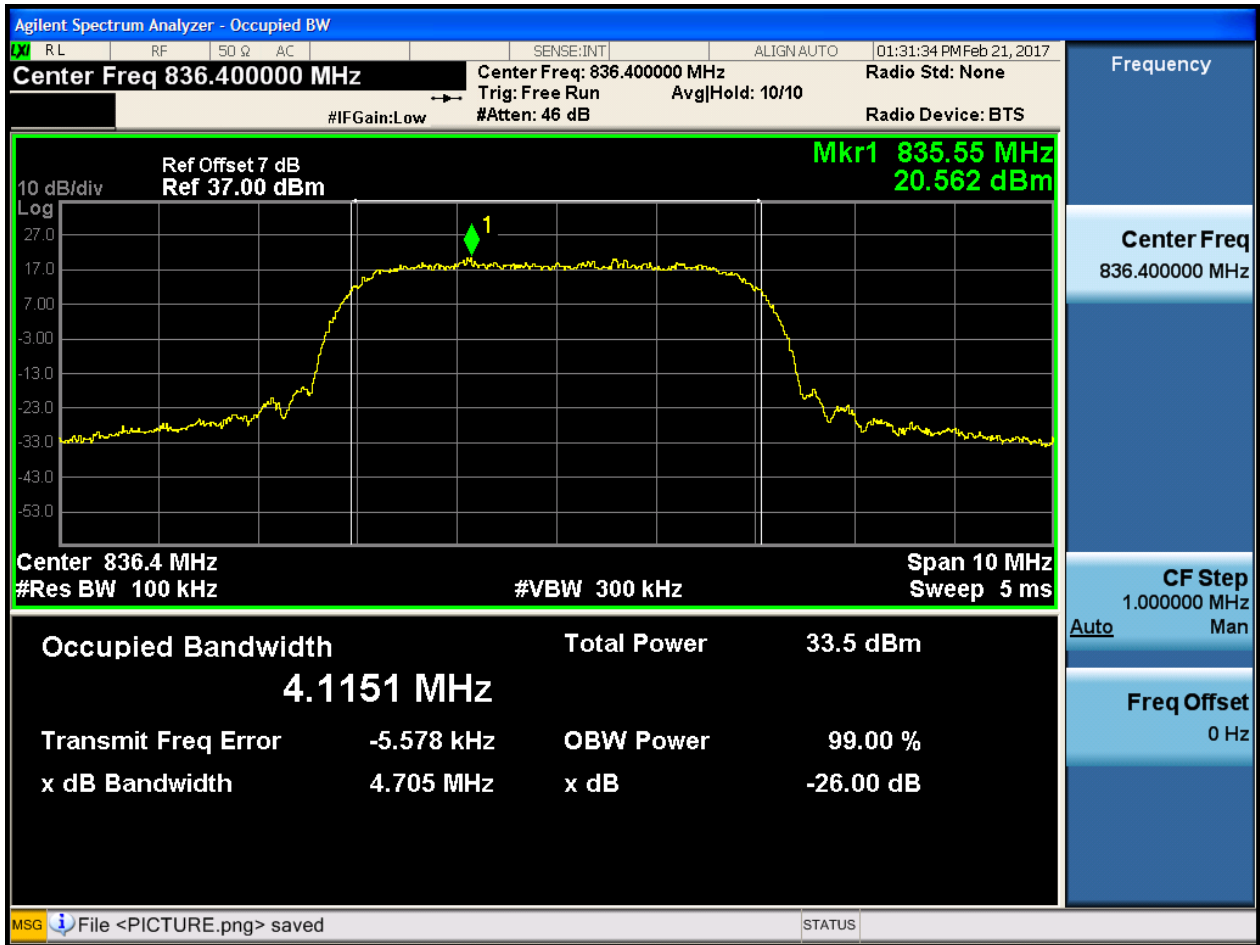
4.1.1.1 Test Mode = UMTS/TM1

4.1.1.1.1 Test Channel = LCH



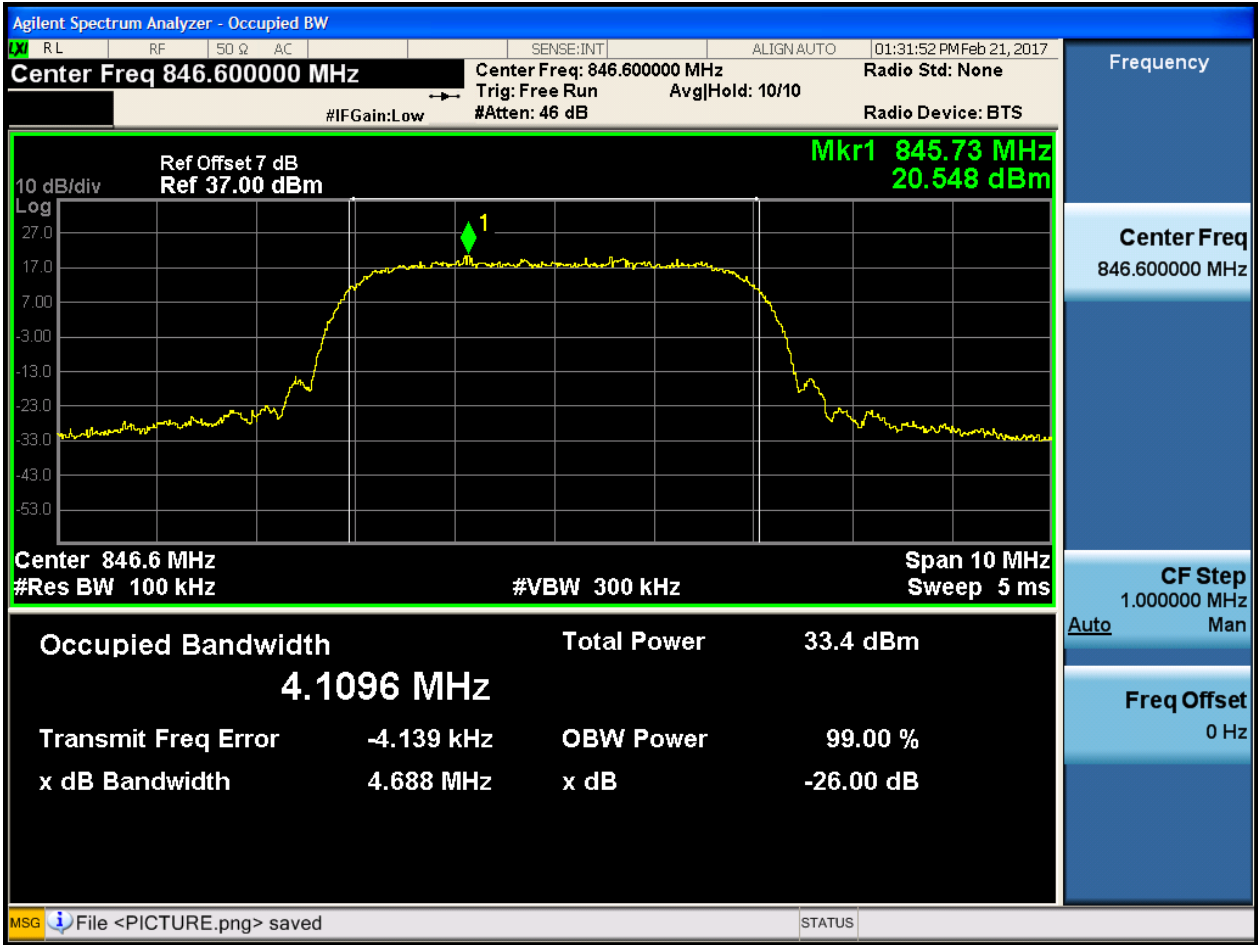


### 4.1.1.1.2 Test Channel = MCH





4.1.1.1.3 Test Channel = HCH

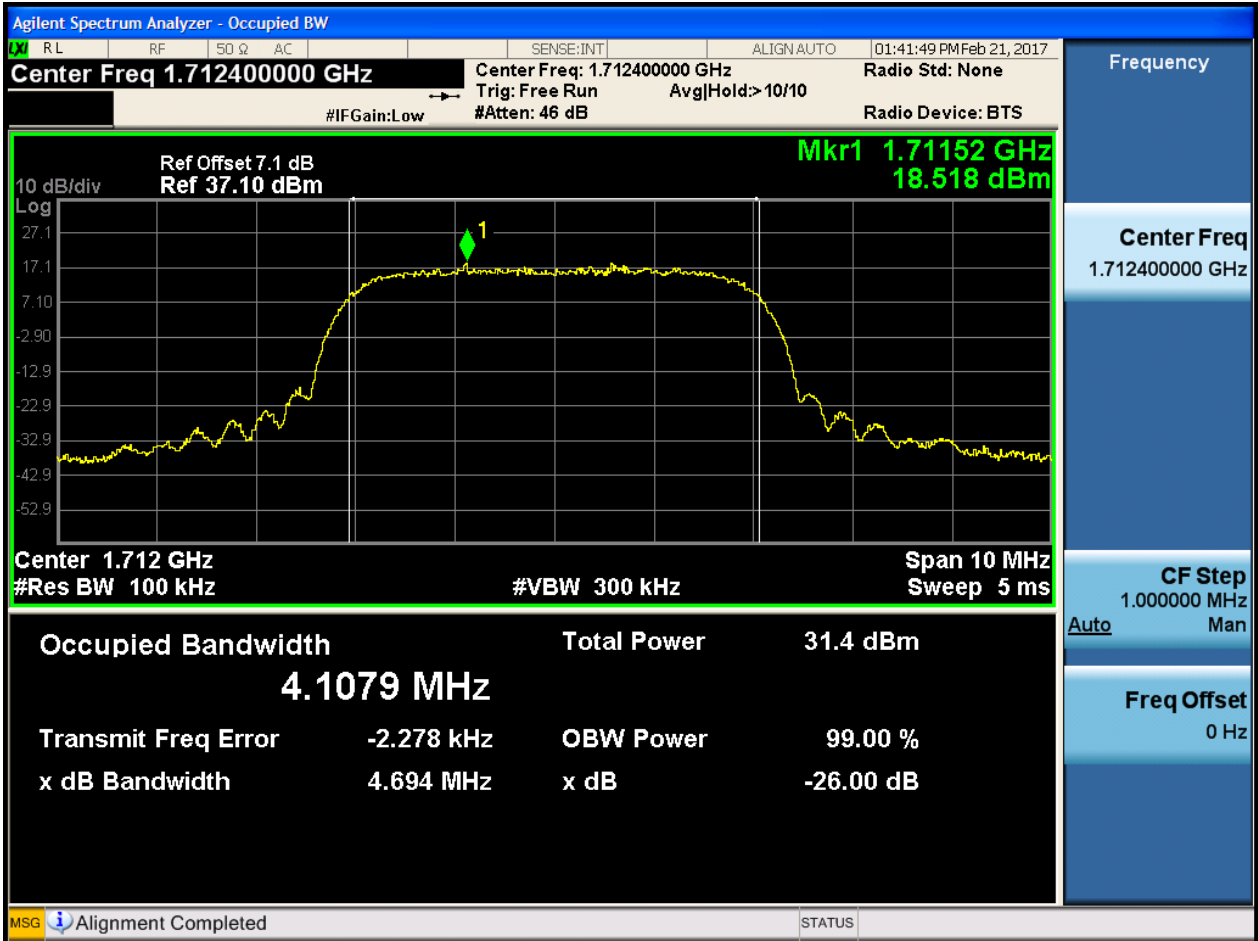




4.1.2 Test Band = WCDMA1700

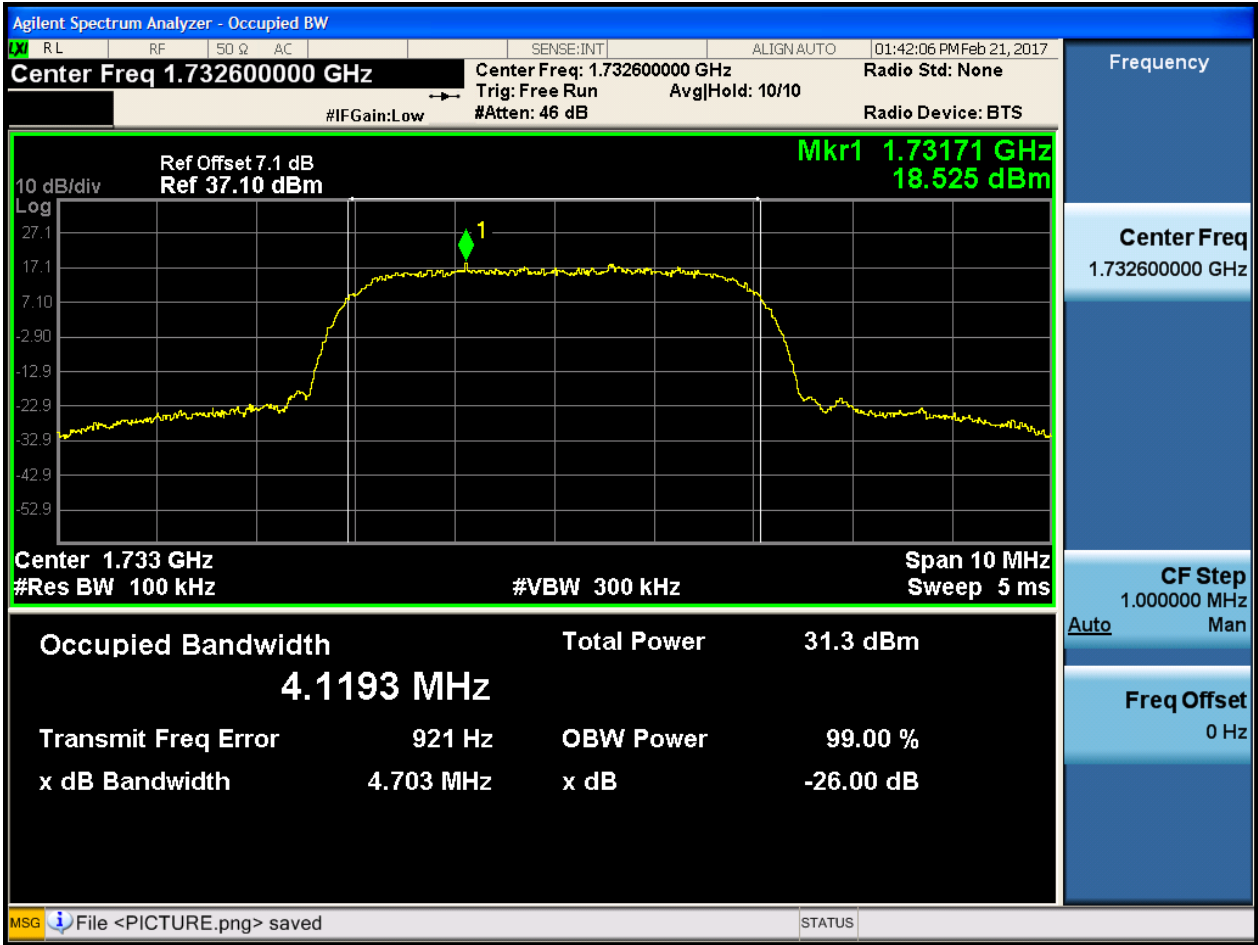
4.1.2.1 Test Mode = UMTS/TM1

4.1.2.1.1 Test Channel = LCH



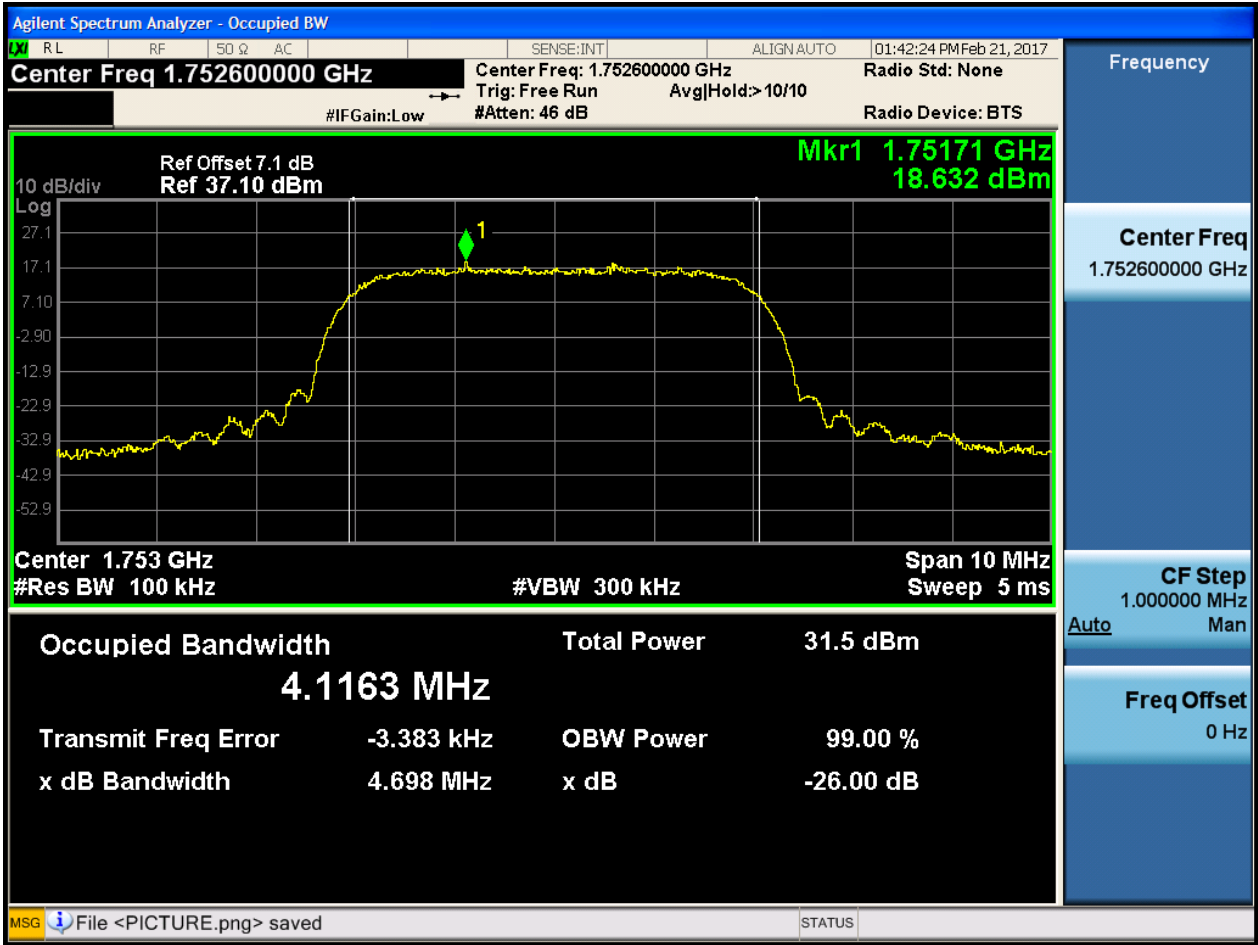


4.1.2.1.2 Test Channel = MCH





4.1.2.1.3 Test Channel = HCH

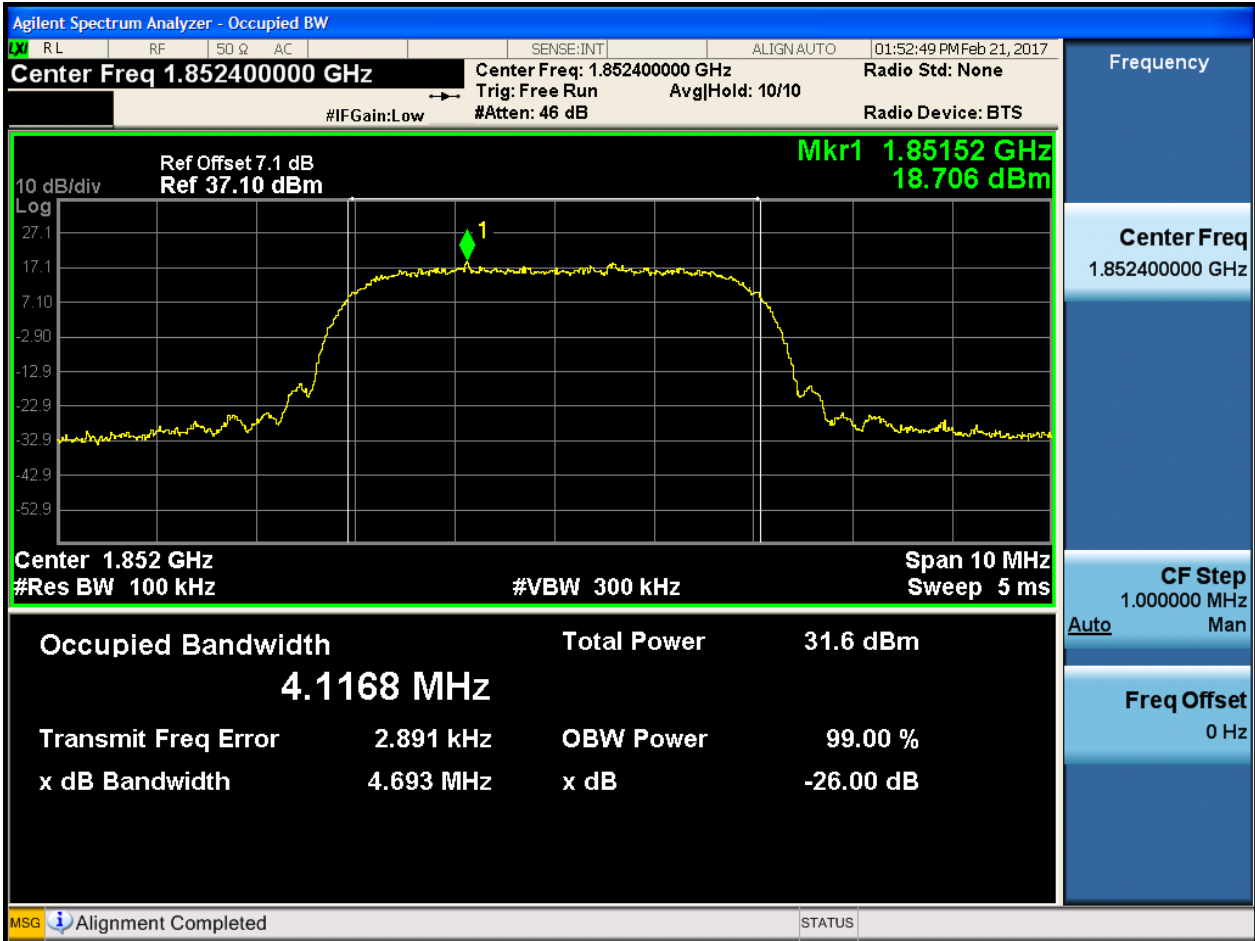




4.1.3 Test Band = WCDMA1900

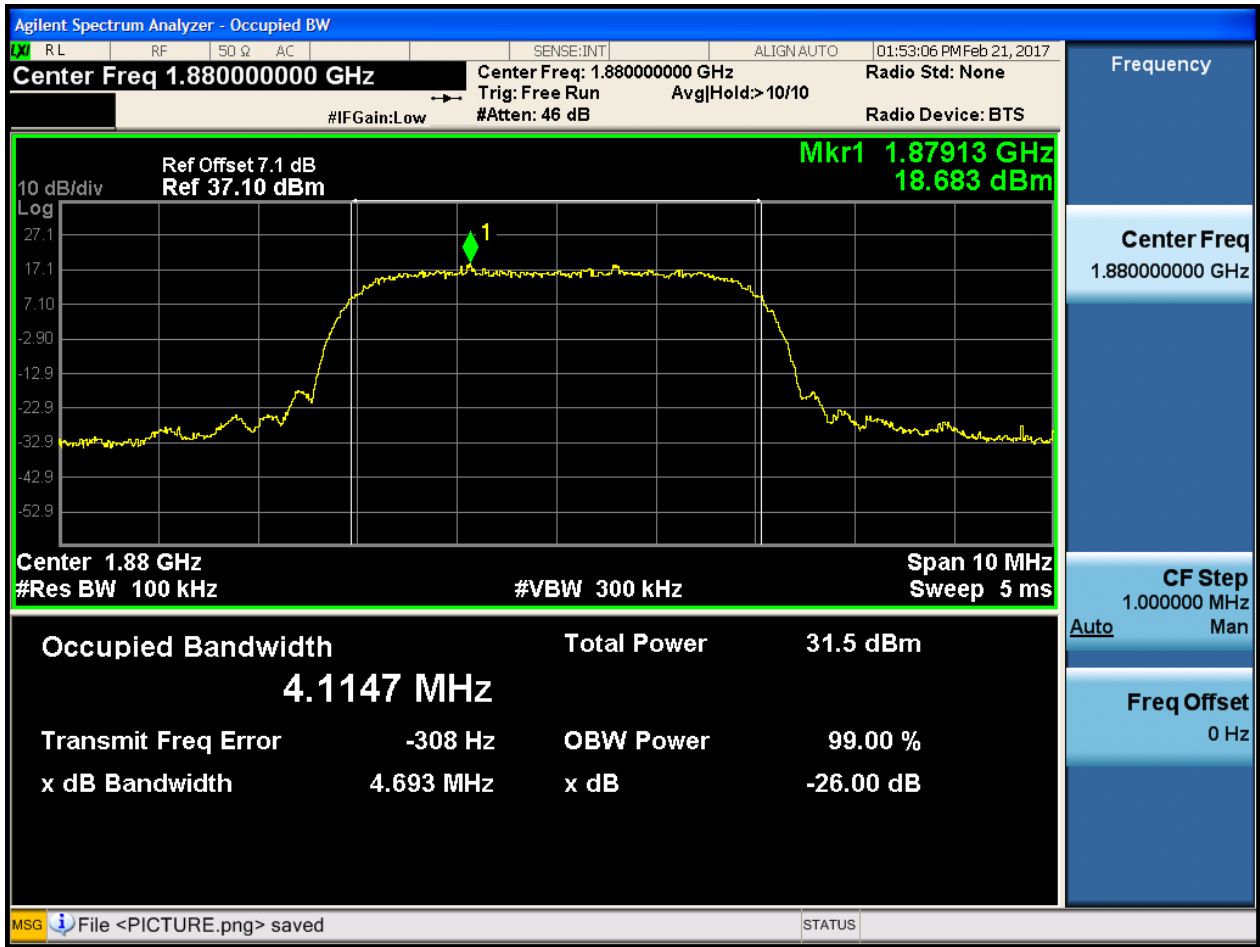
4.1.3.1 Test Mode = UMTS/TM1

4.1.3.1.1 Test Channel = LCH





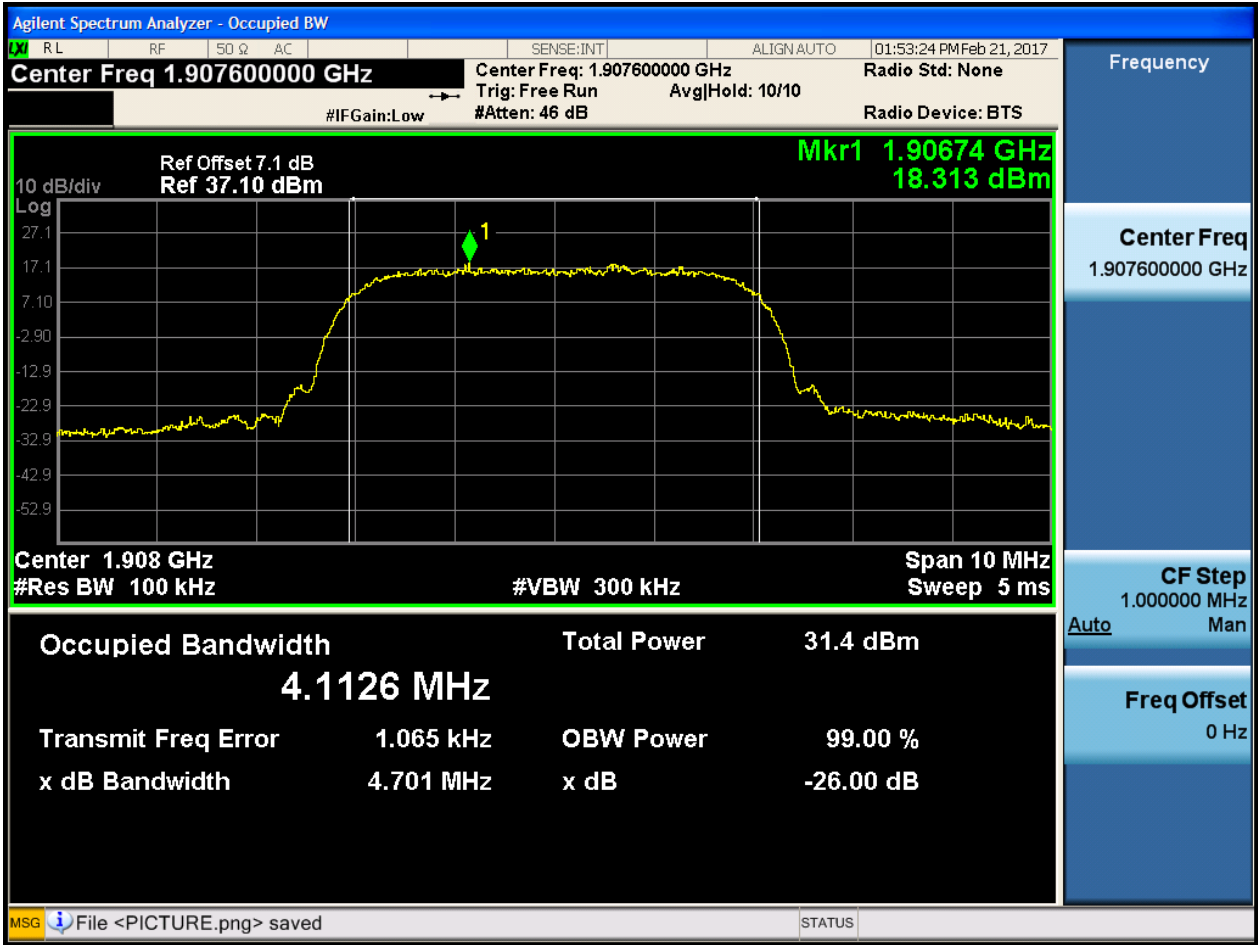
4.1.3.1.2 Test Channel = MCH







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.

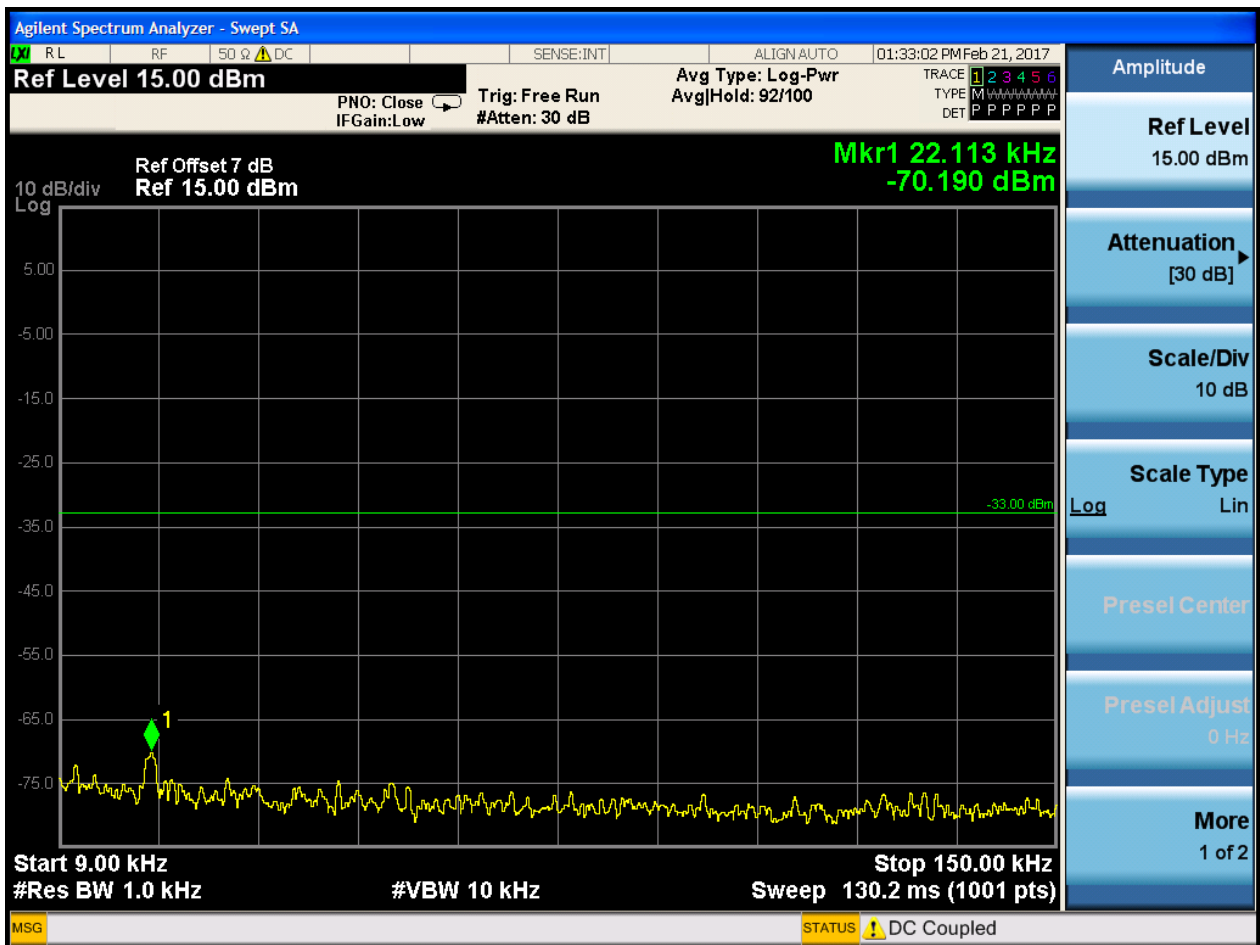
### Part I - Test Plots

#### 6.1 For UMTS

##### 6.1.1 Test Band = WCDMA850

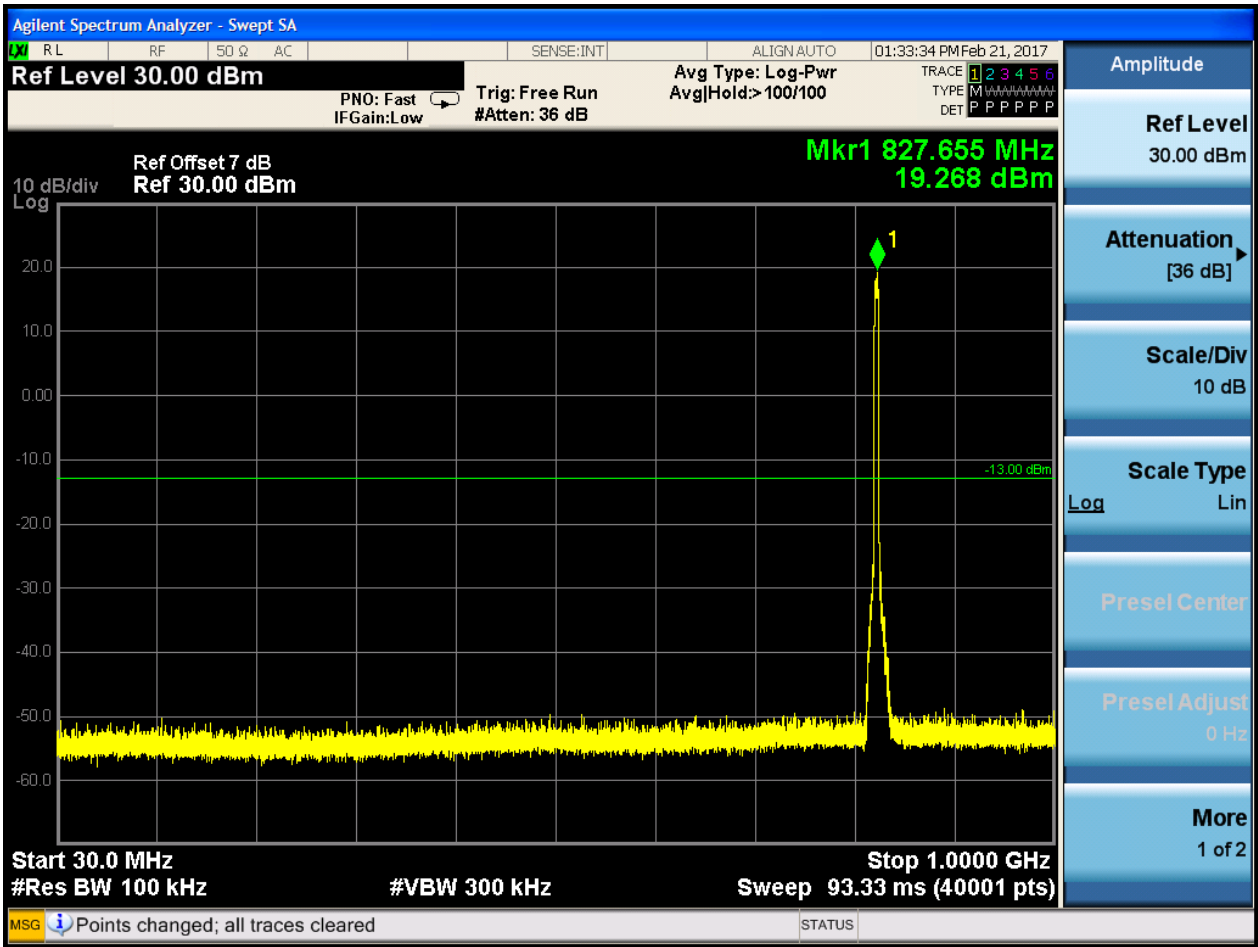
##### 6.1.1.1 Test Mode = UMTS/TM1

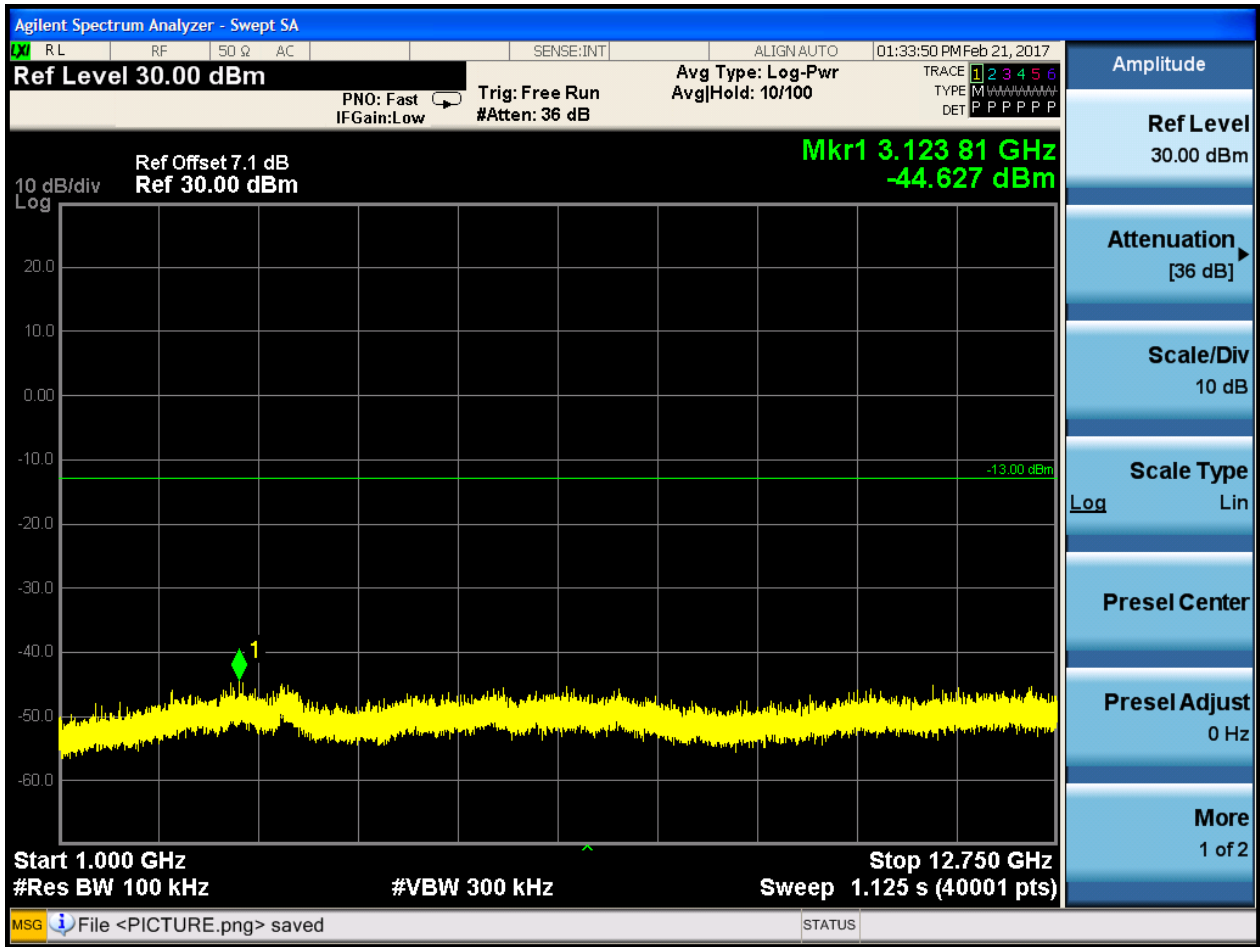
##### 6.1.1.1.1 Test Channel = LCH





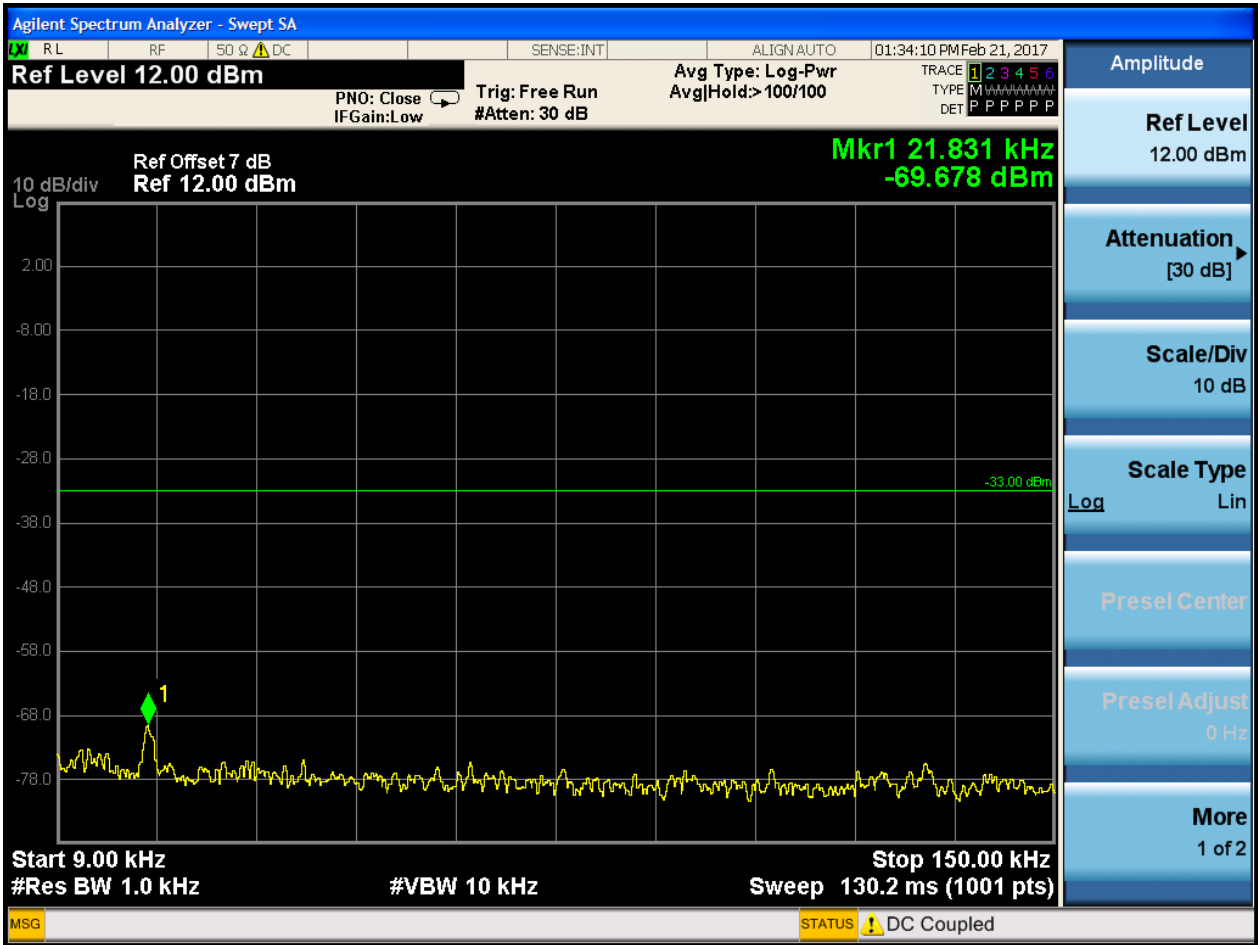








### 6.1.1.1.2 Test Channel = MCH



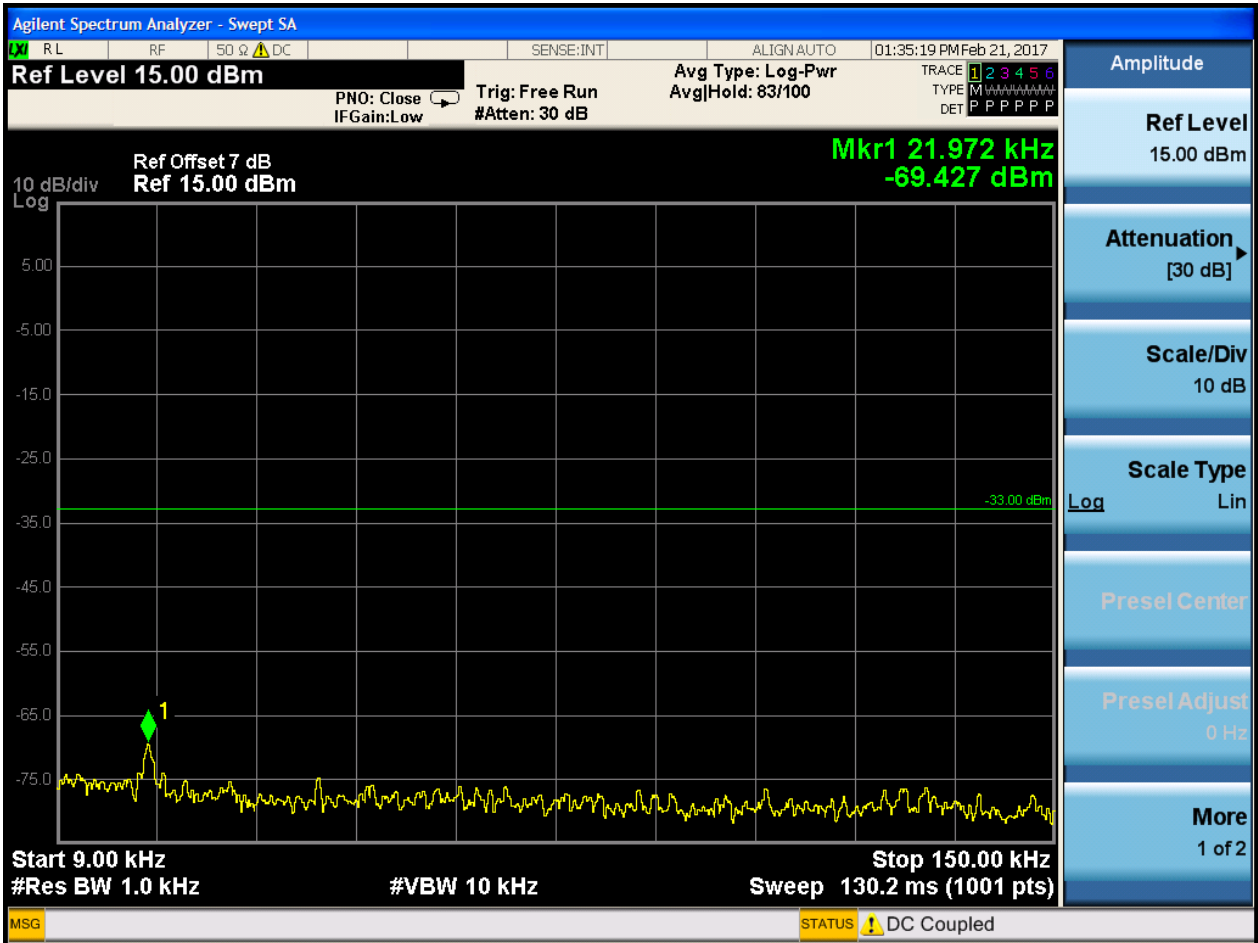




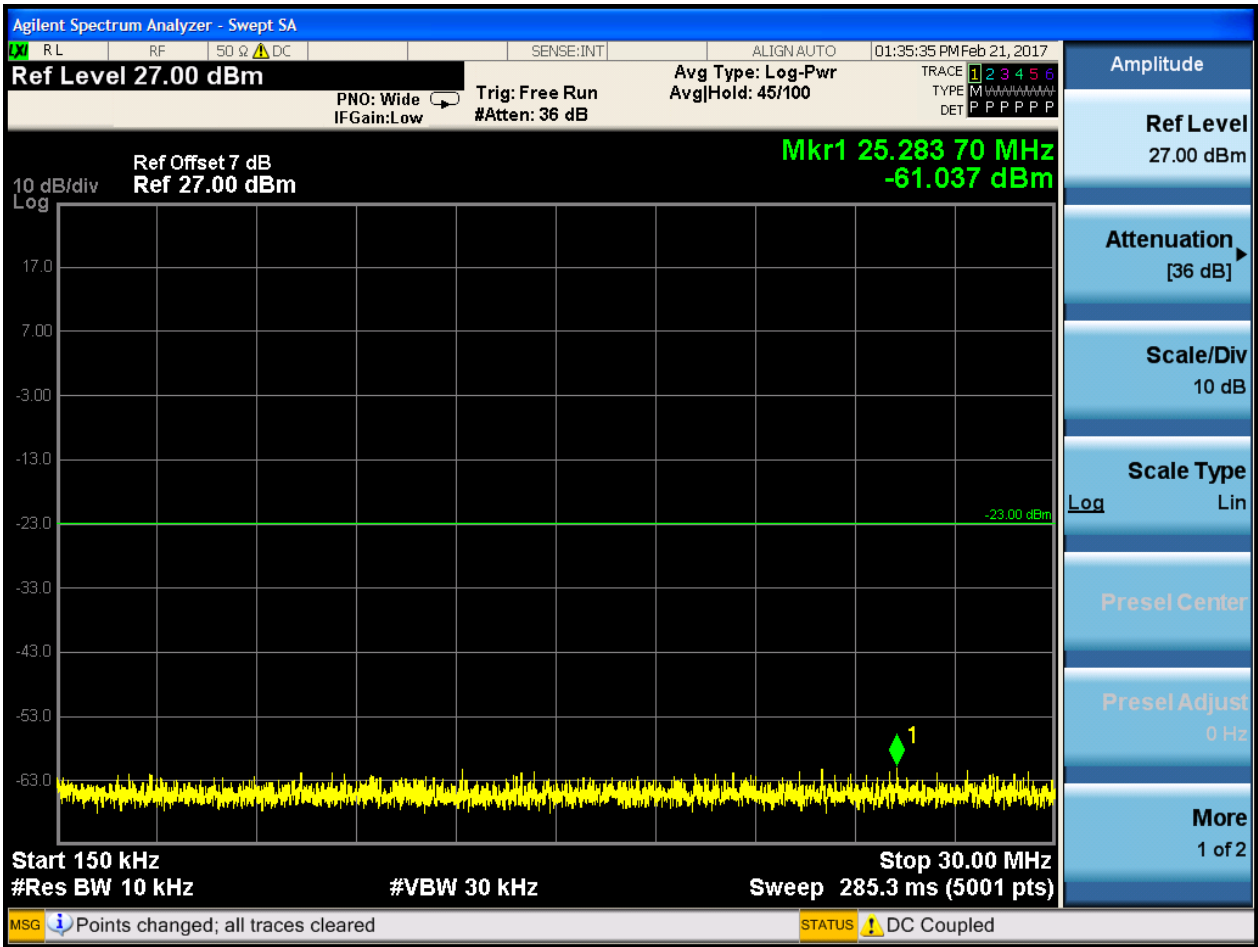




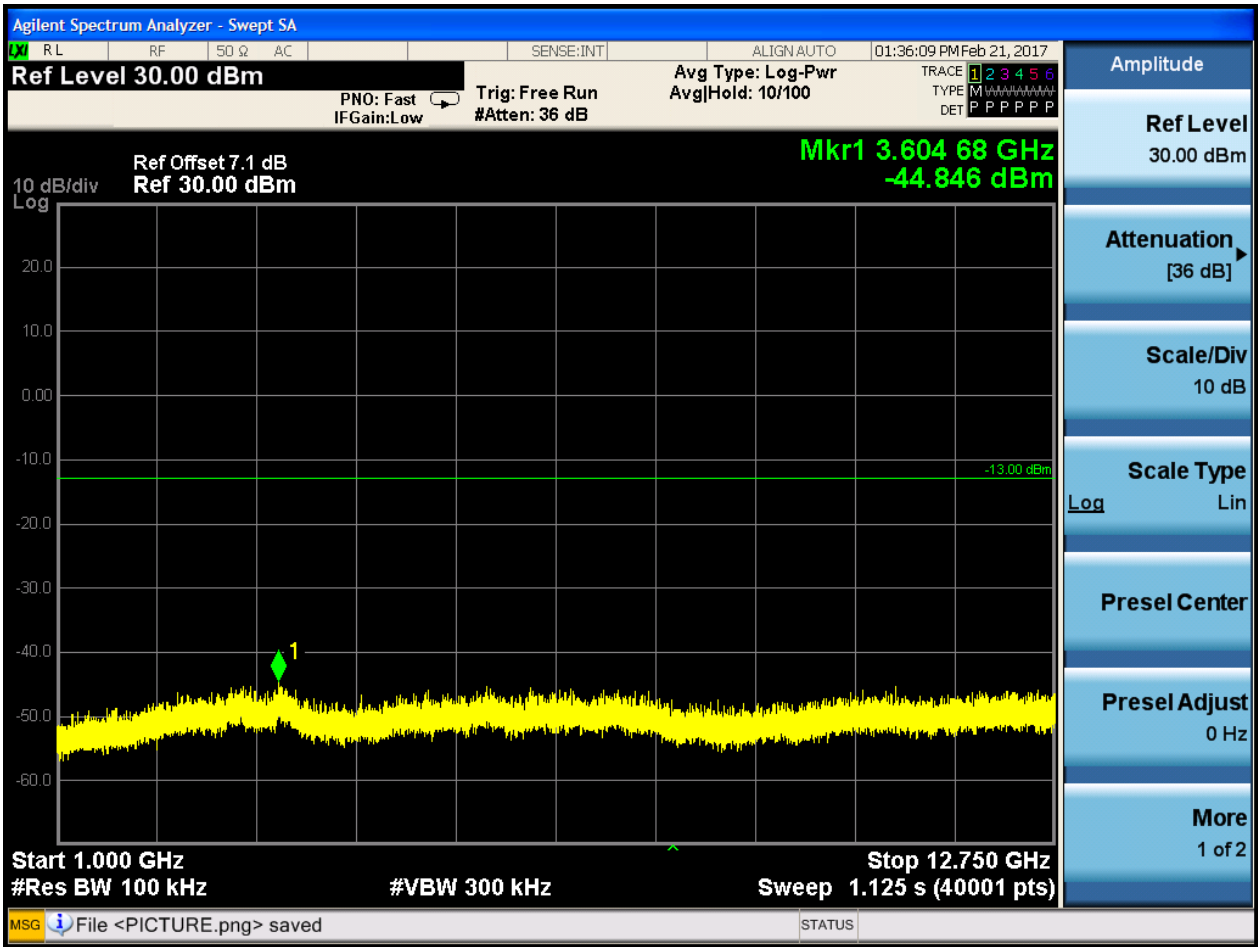
### 6.1.1.1.3 Test Channel = HCH









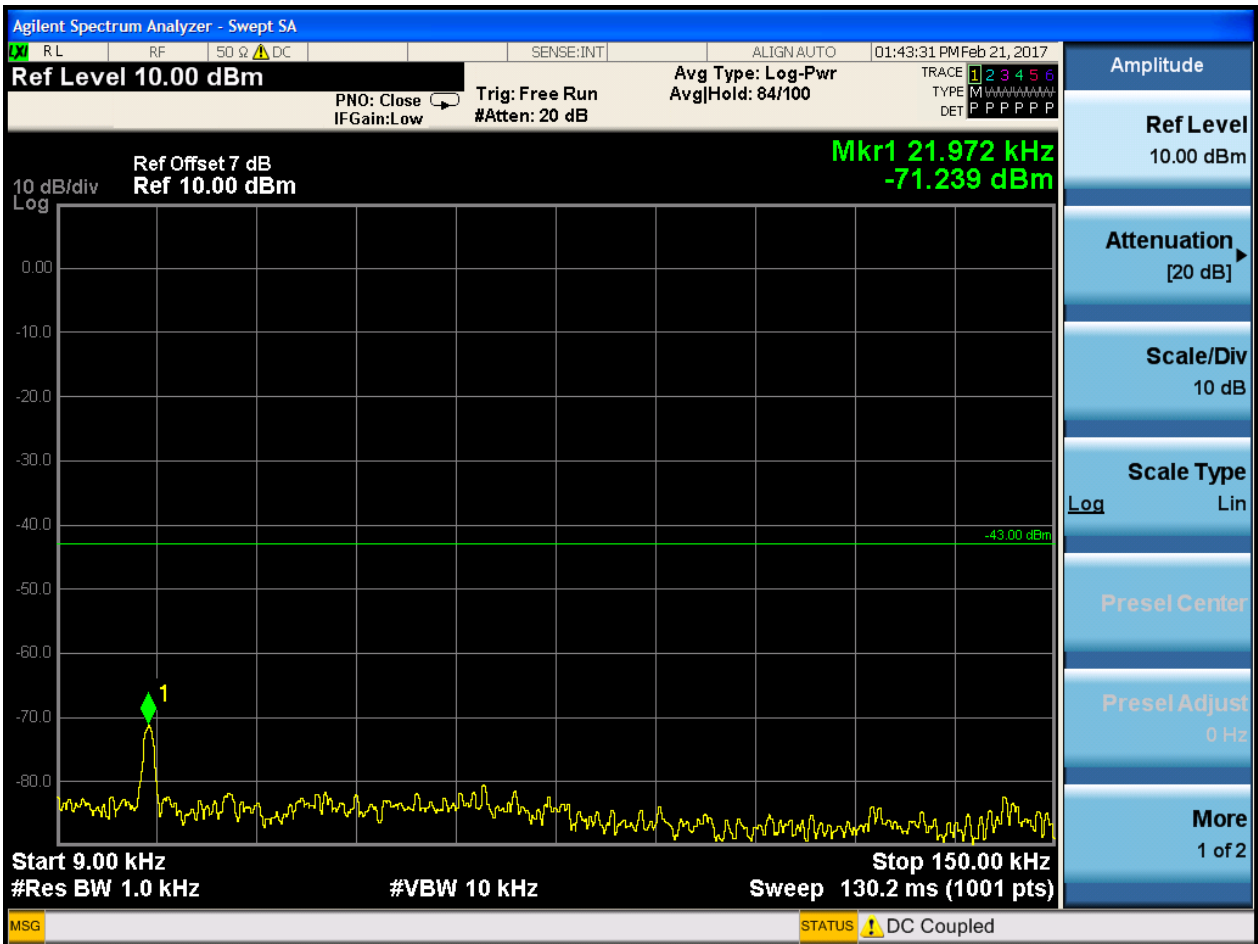


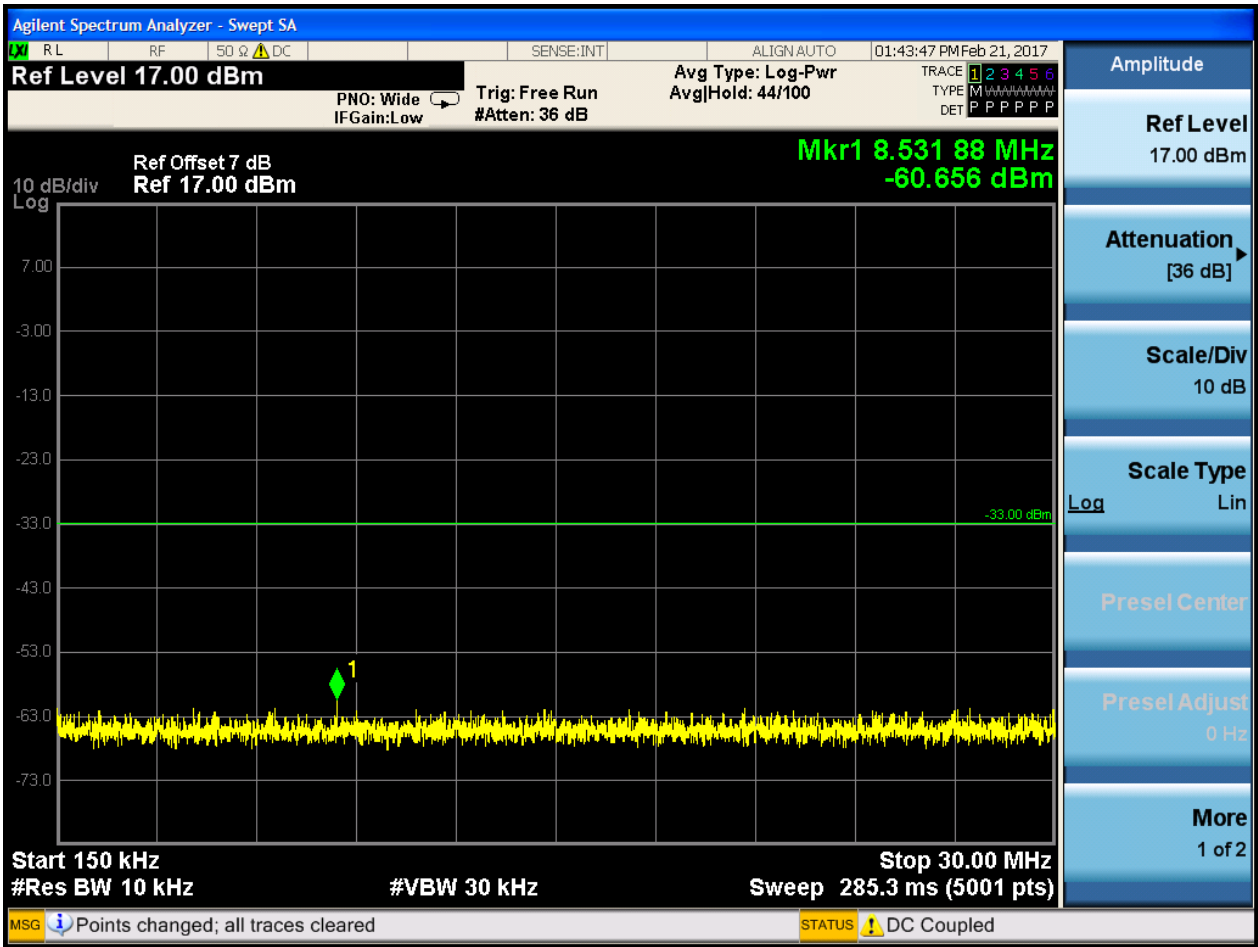


6.1.2 Test Band = WCDMA1700

6.1.2.1 Test Mode = UMTS/TM1

6.1.2.1.1 Test Channel = LCH

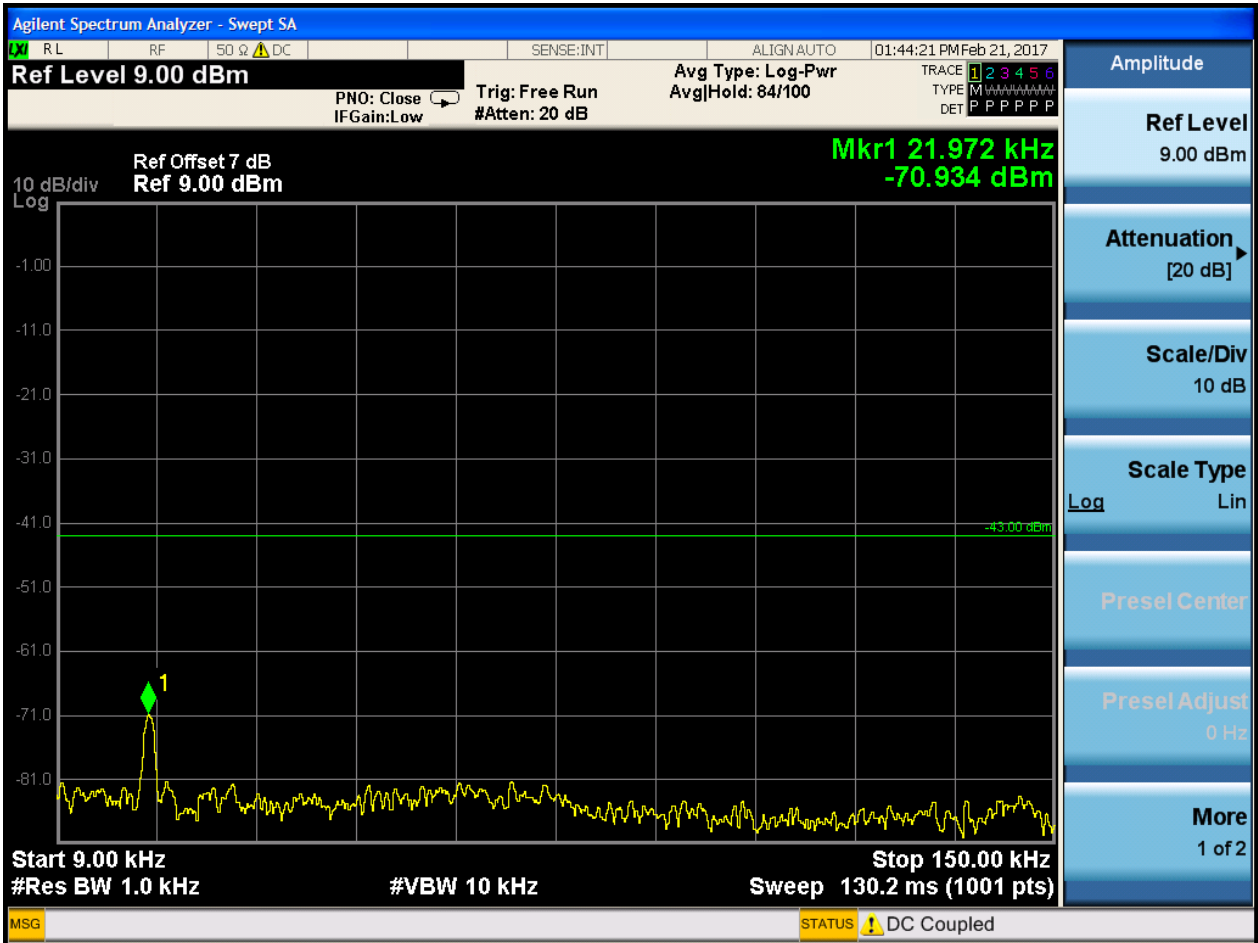


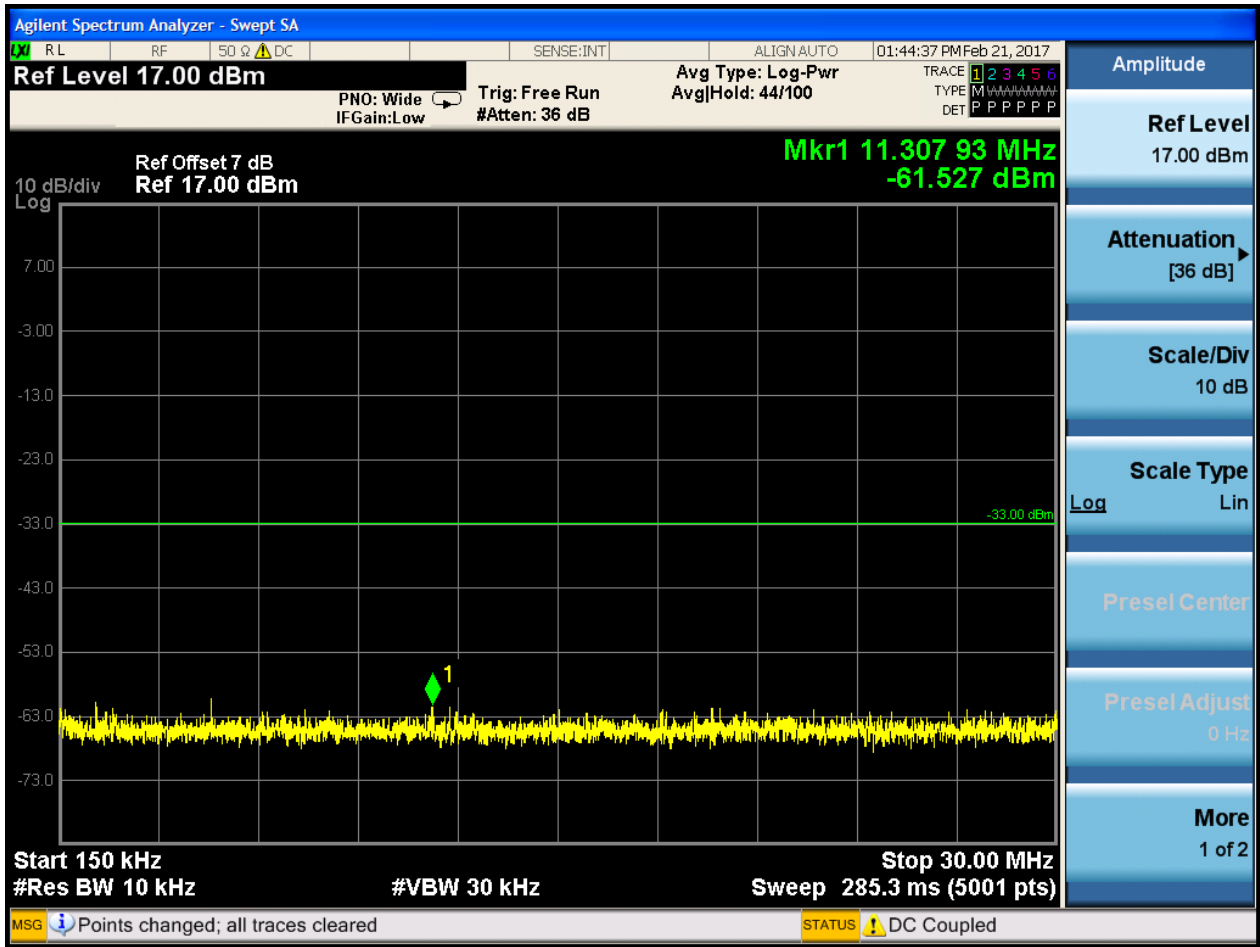






### 6.1.2.1.2 Test Channel = MCH



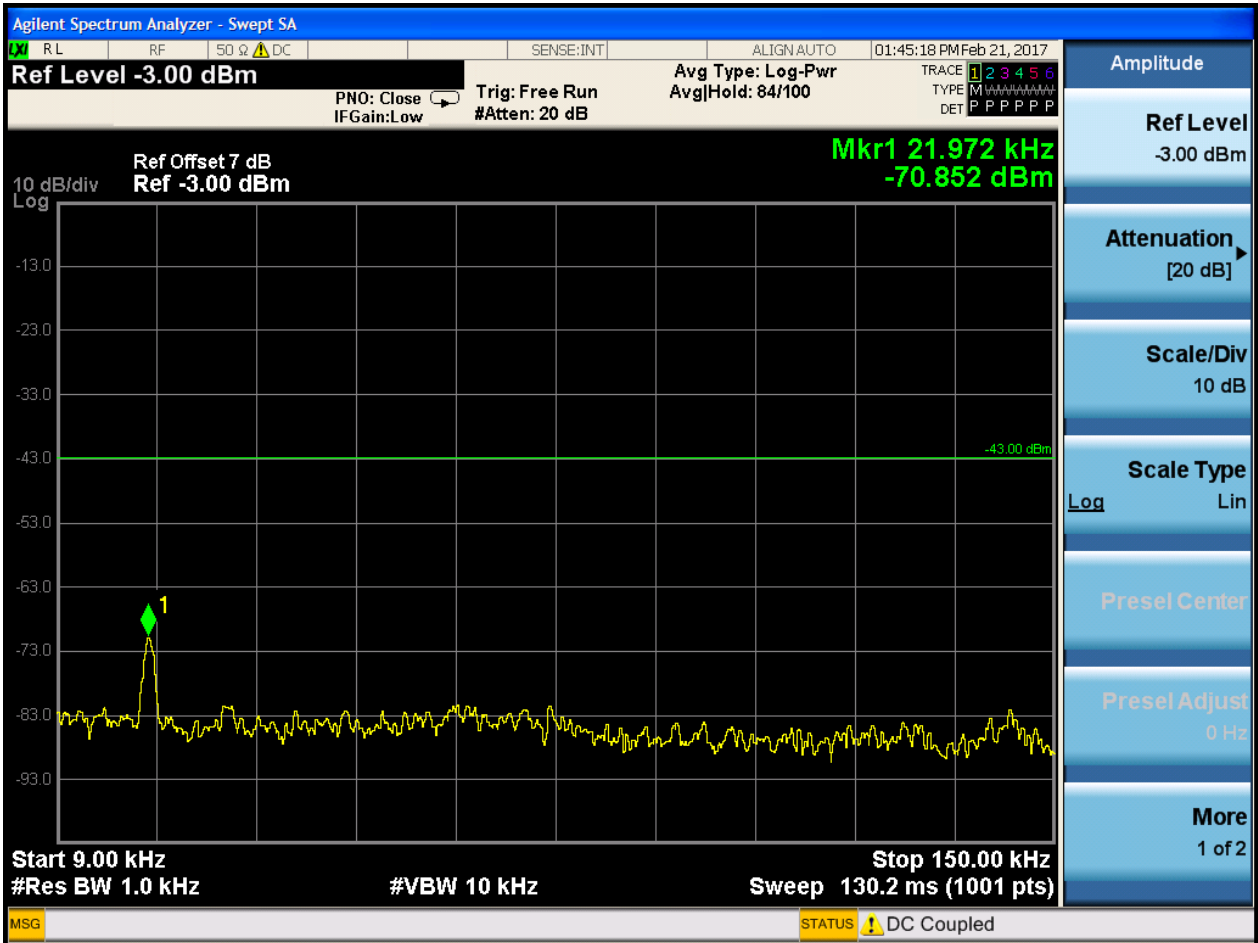


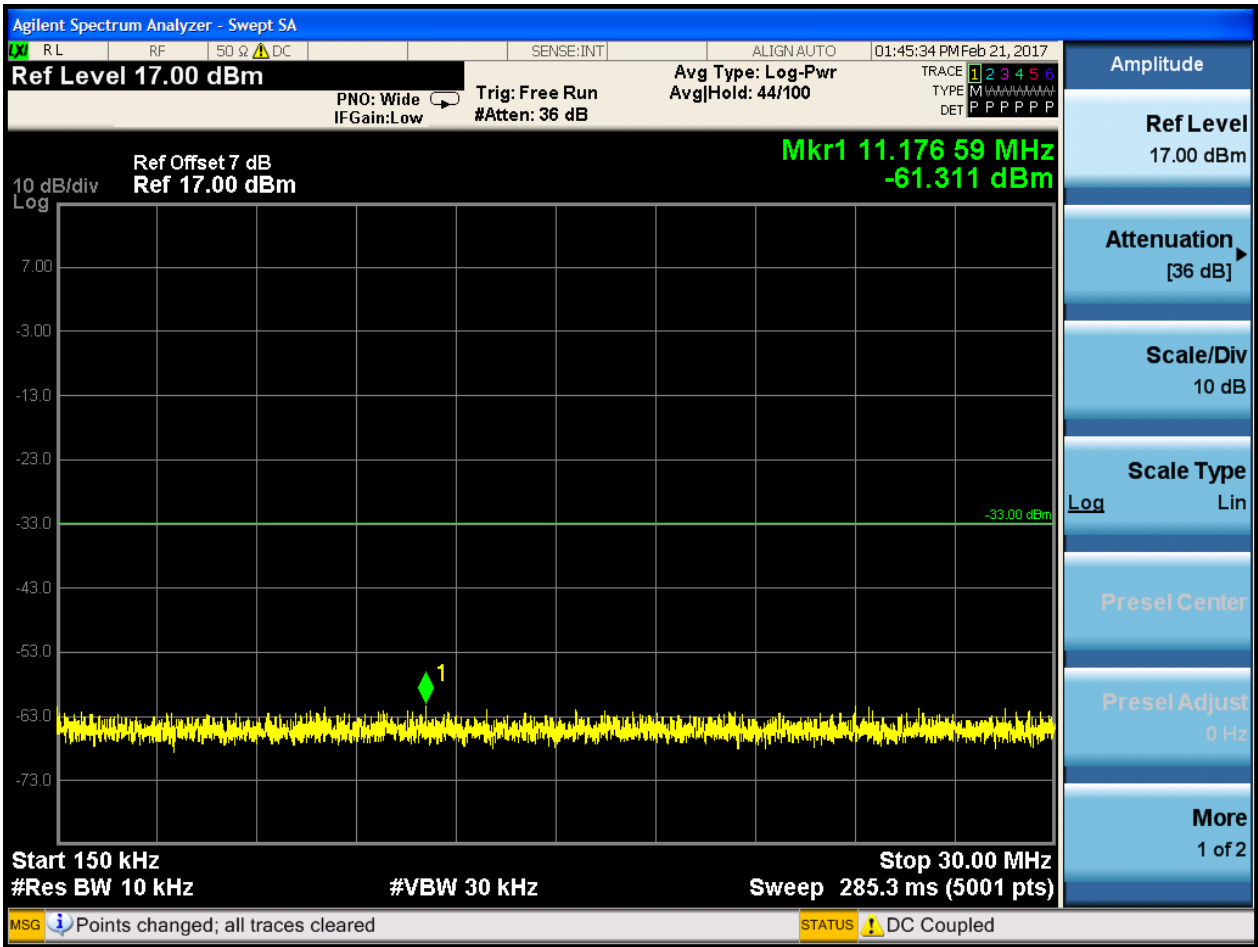






### 6.1.2.1.3 Test Channel = HCH





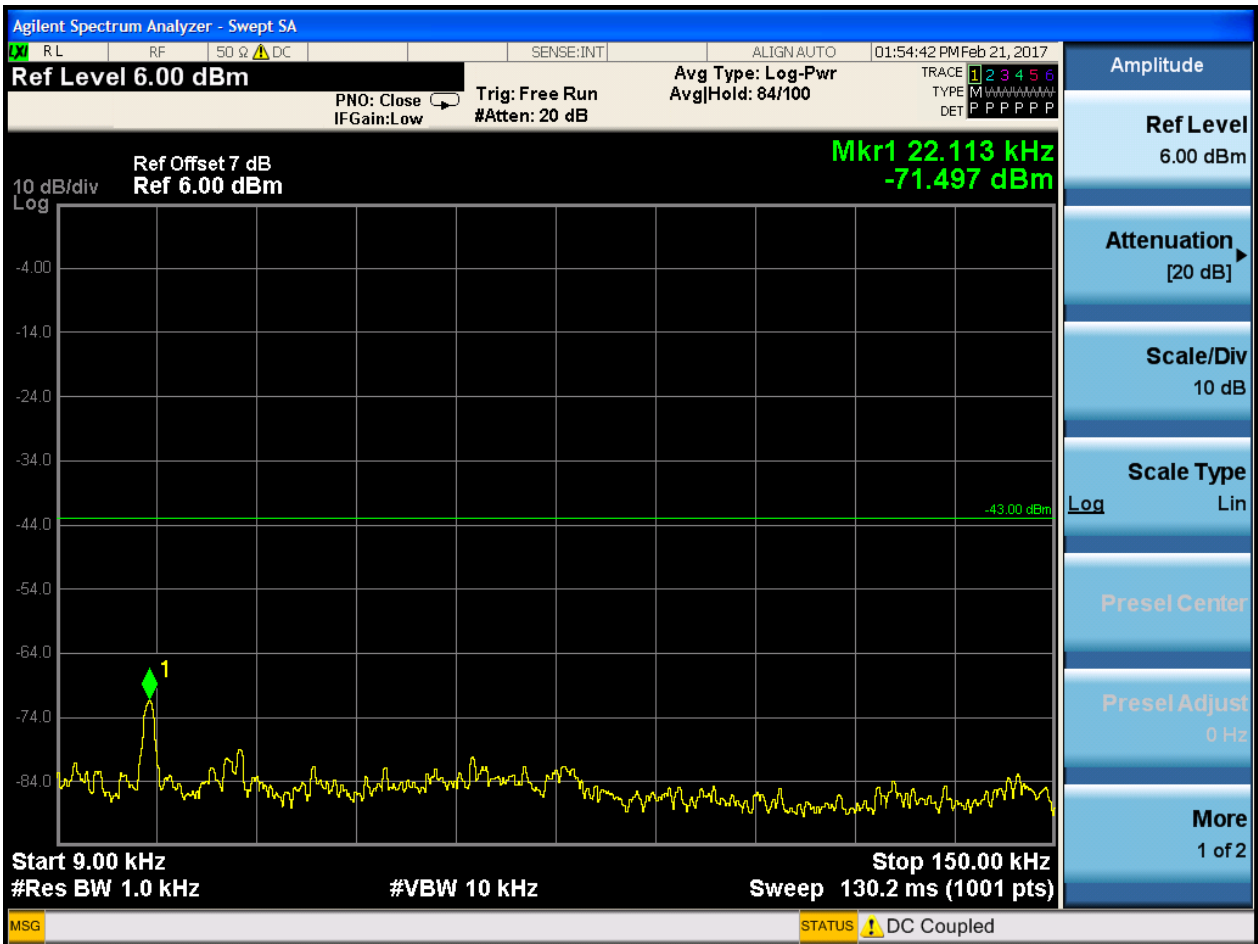


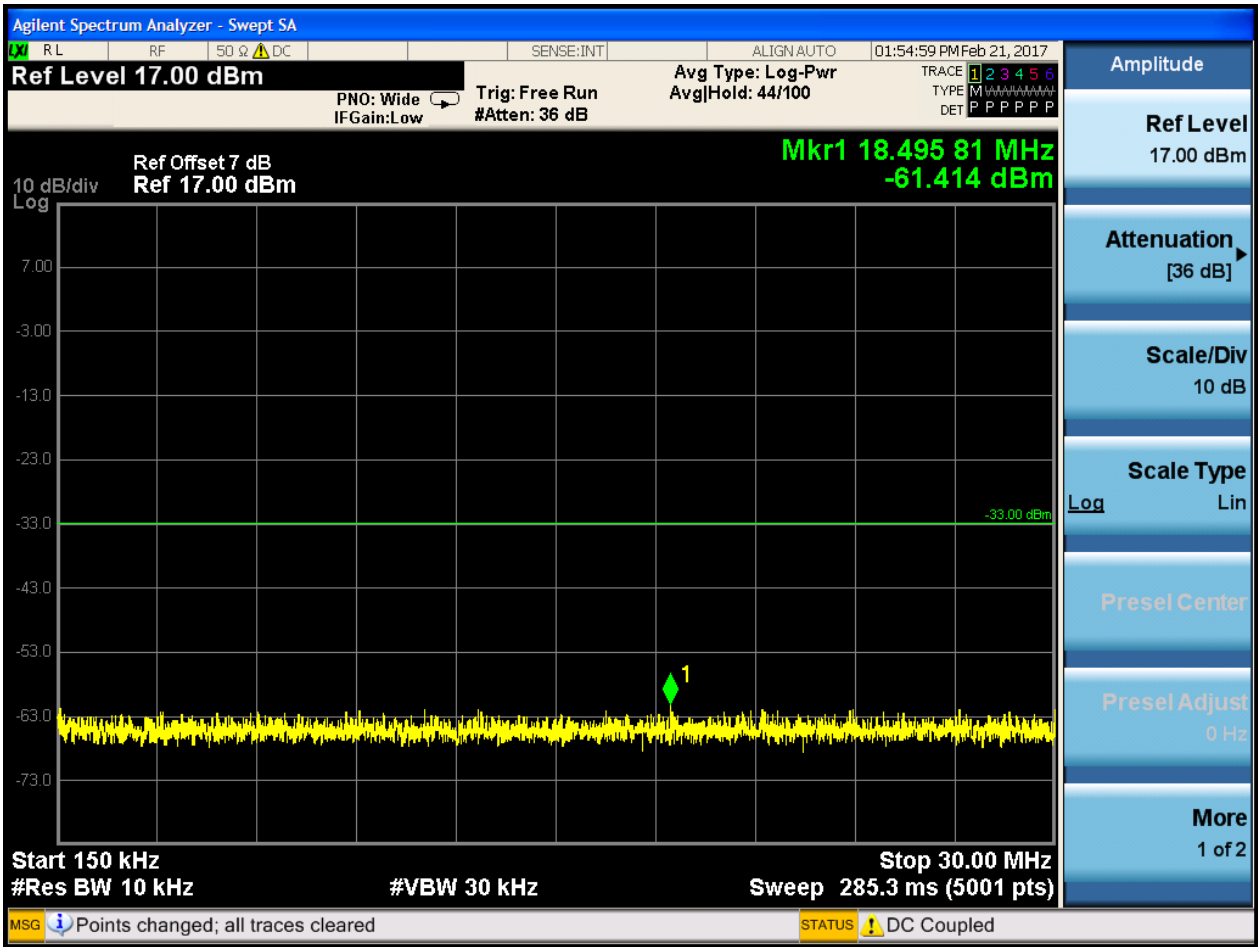


6.1.3 Test Band = WCDMA1900

6.1.3.1 Test Mode = UMTS/TM1

6.1.3.1.1 Test Channel = LCH

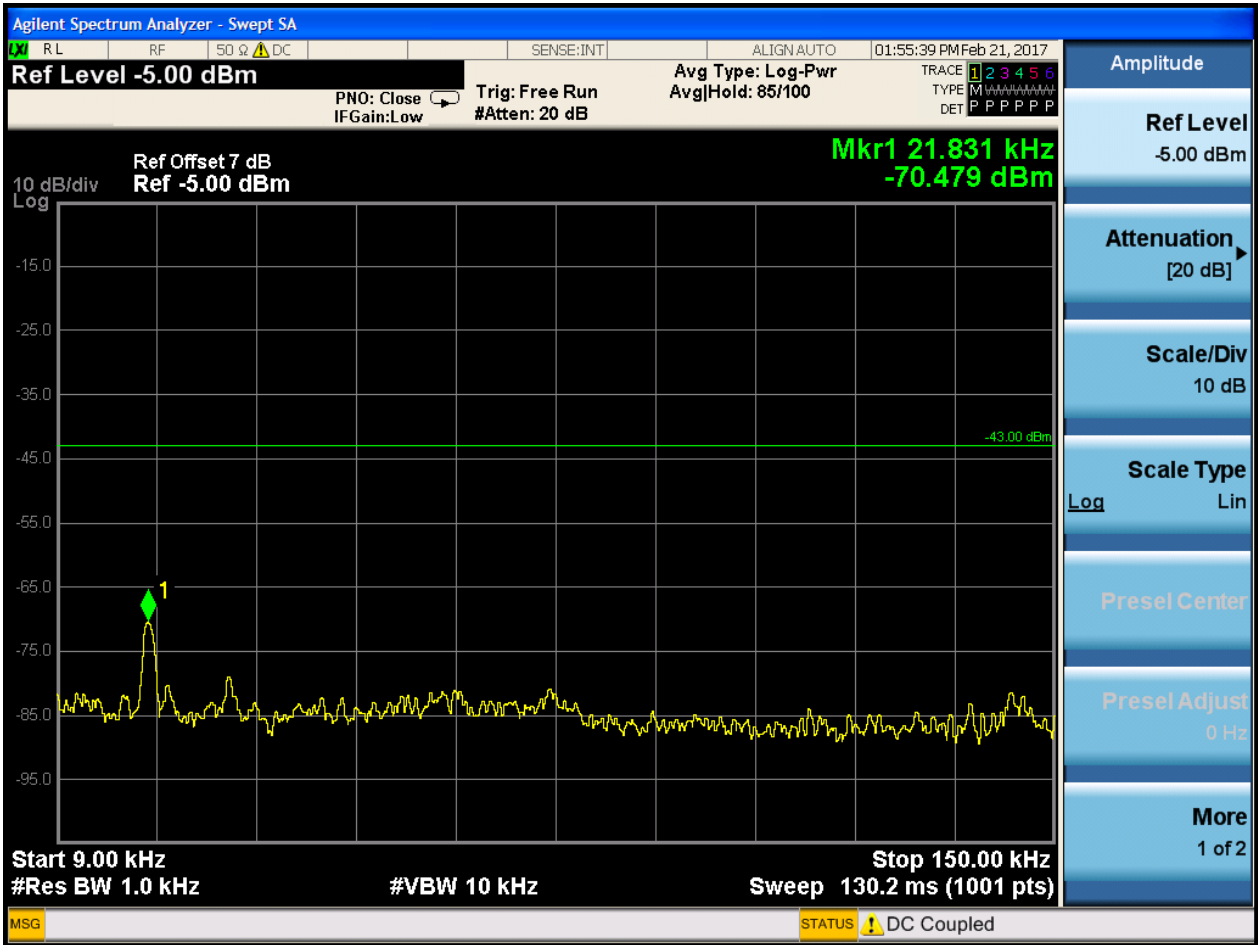




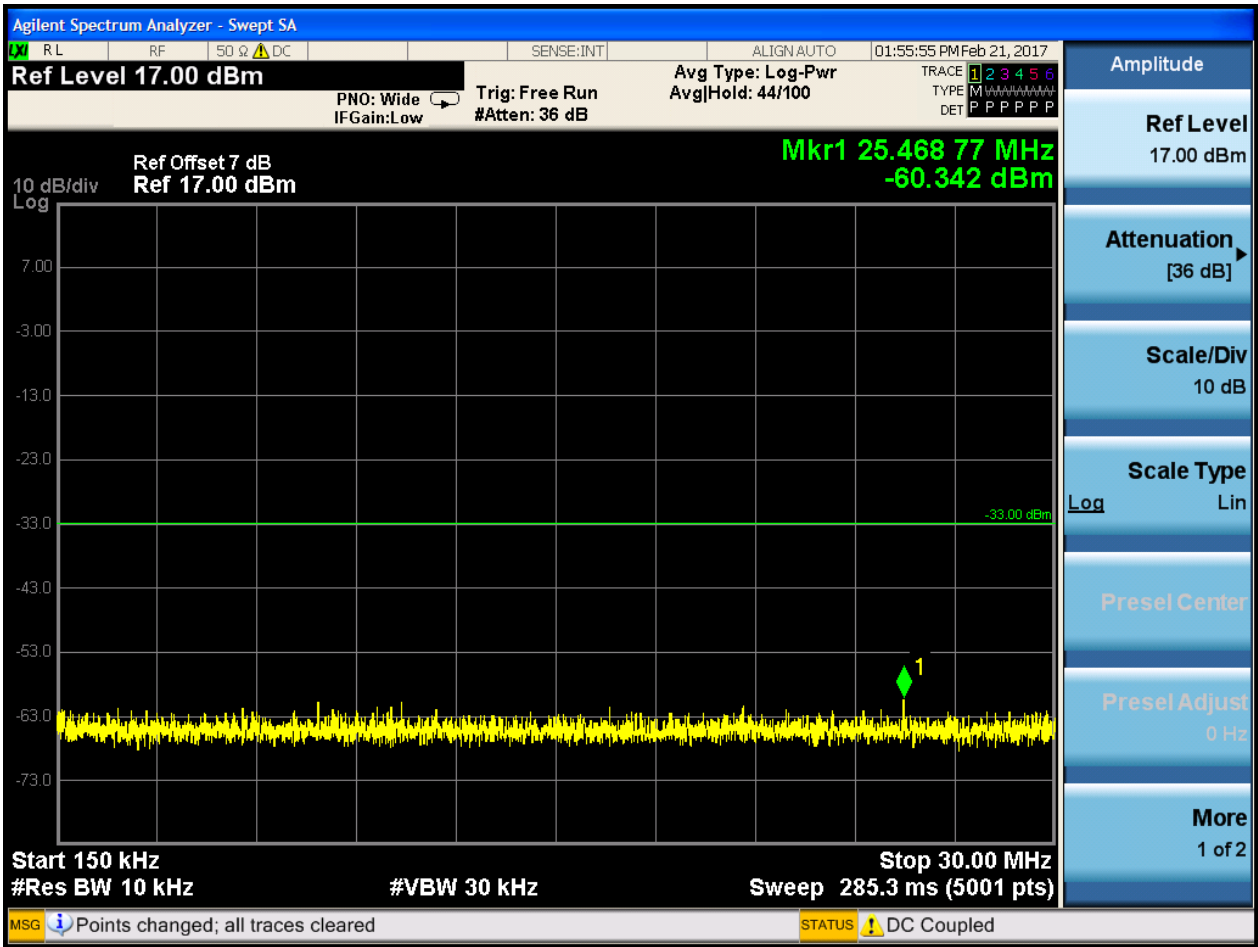


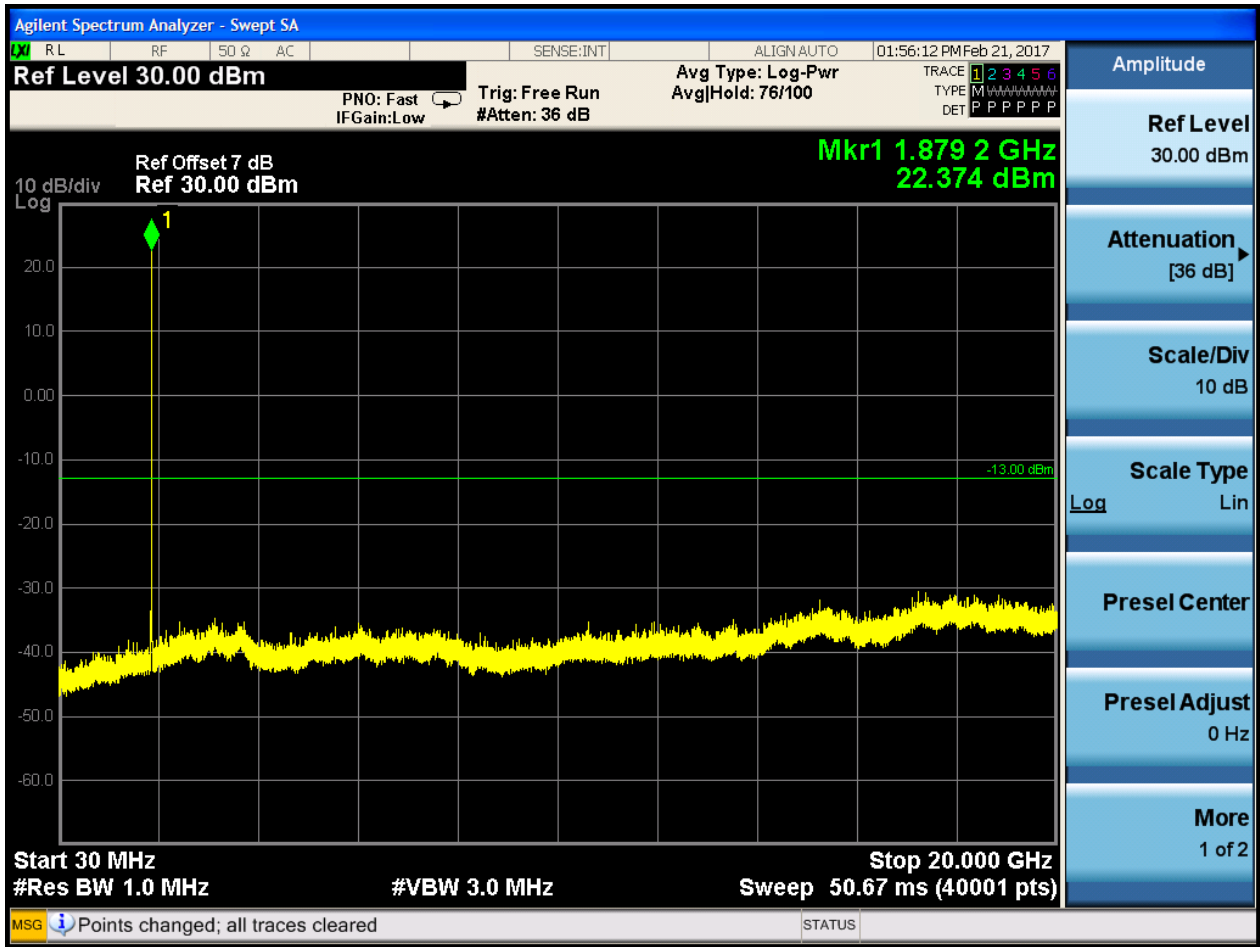


### 6.1.3.1.2 Test Channel = MCH



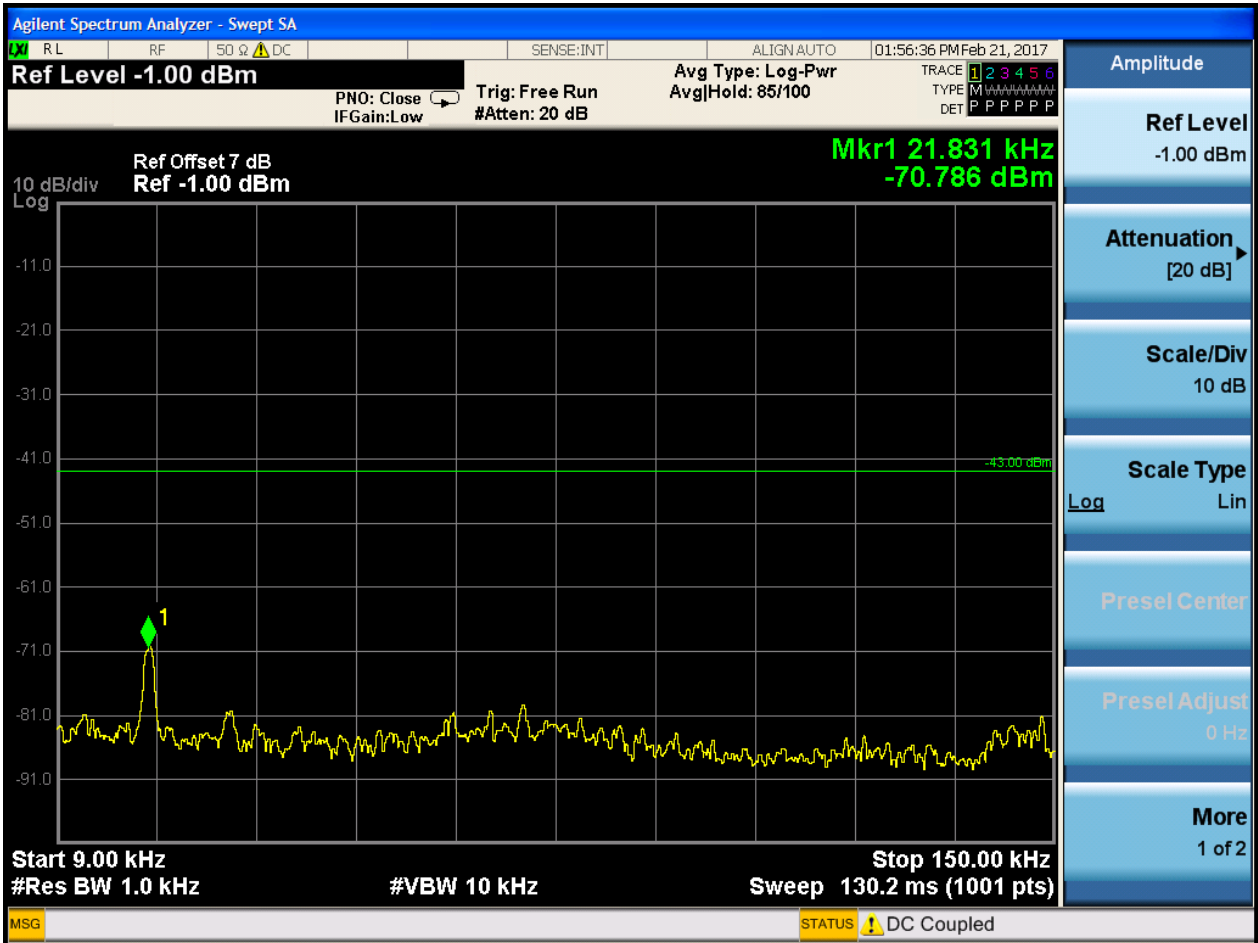


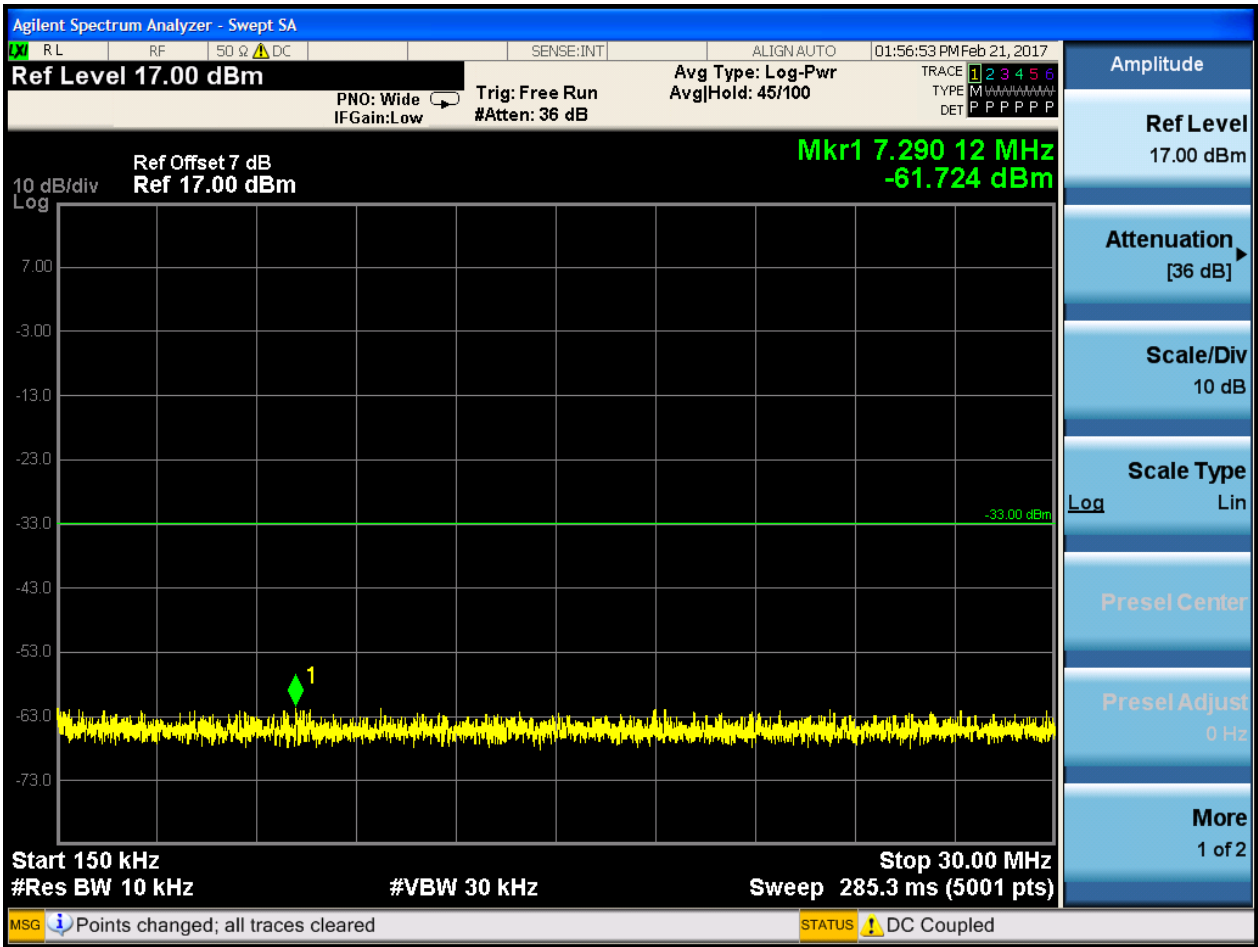


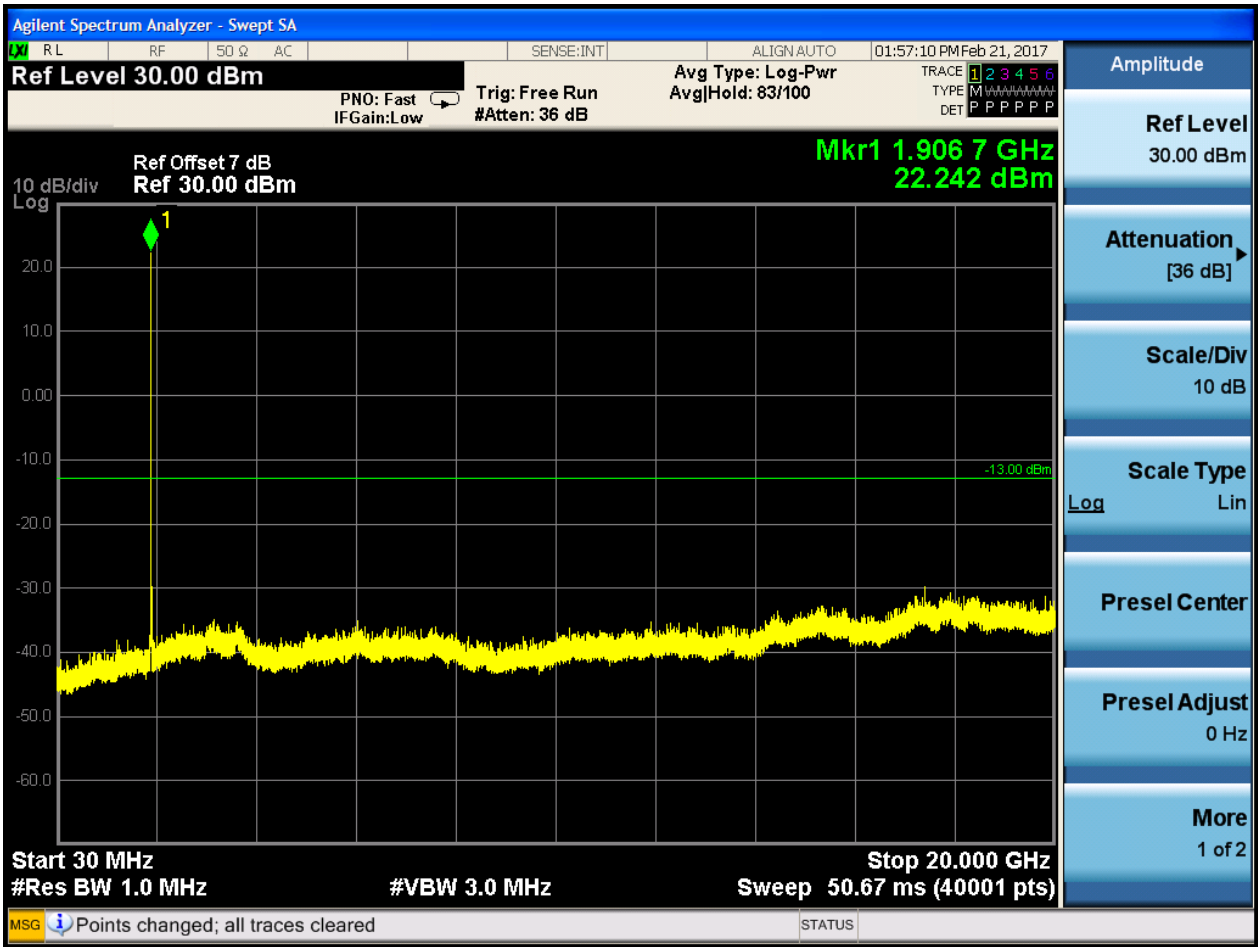




### 6.1.3.1.3 Test Channel = HCH







## 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

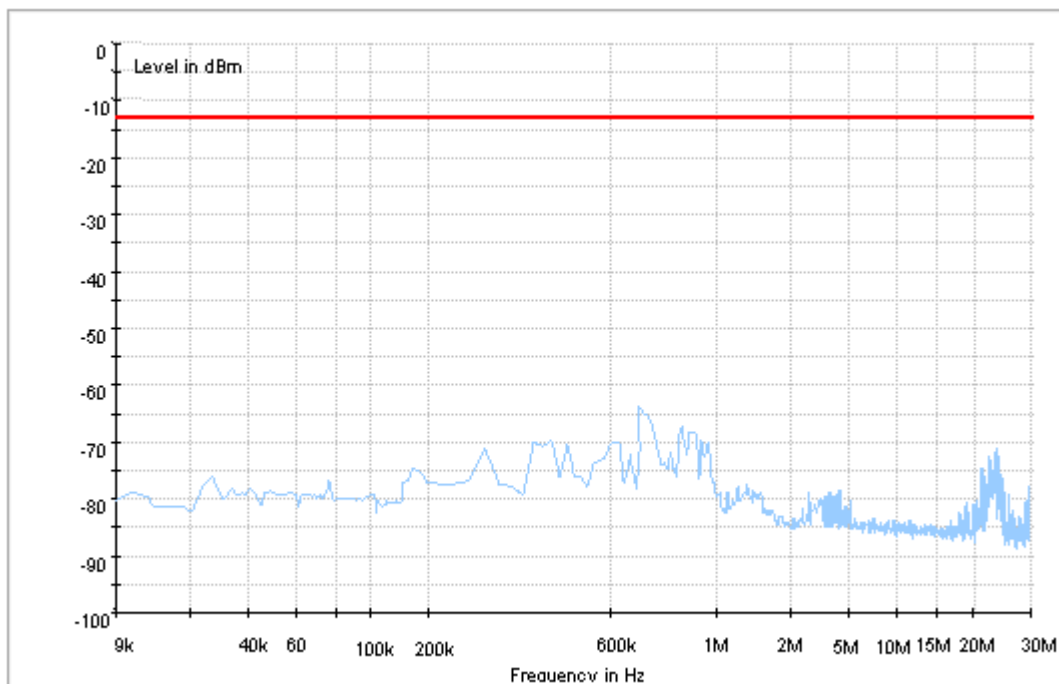
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

### Part I - Test Plots

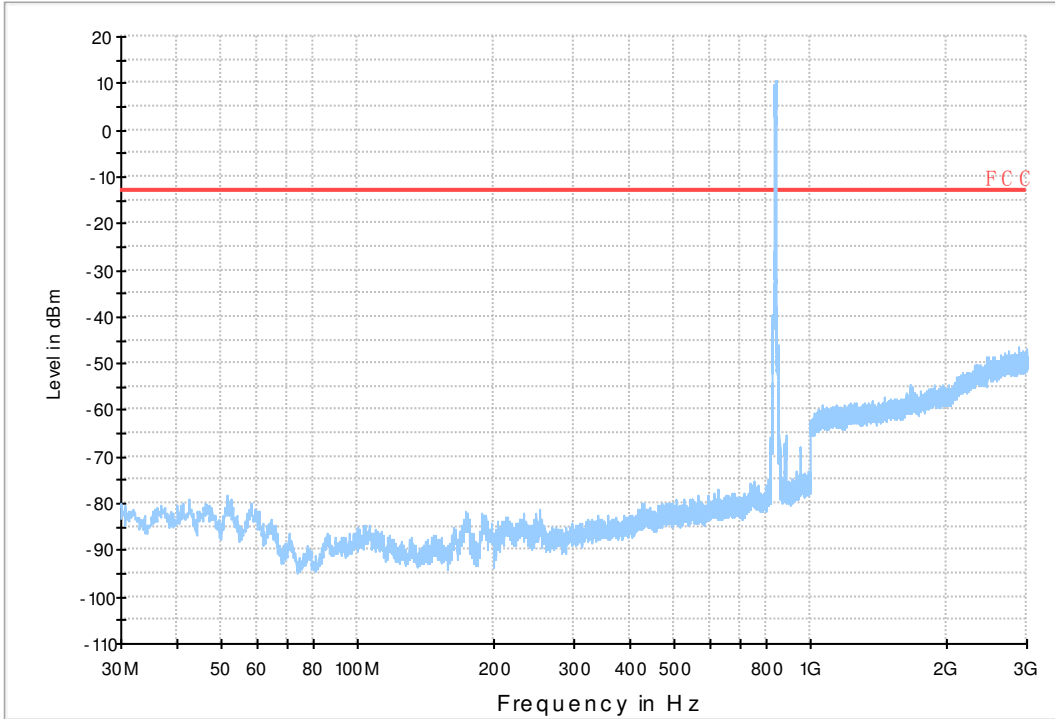
#### 7.1 For UMTS

##### 7.1.1 Test Band = WCDMA850

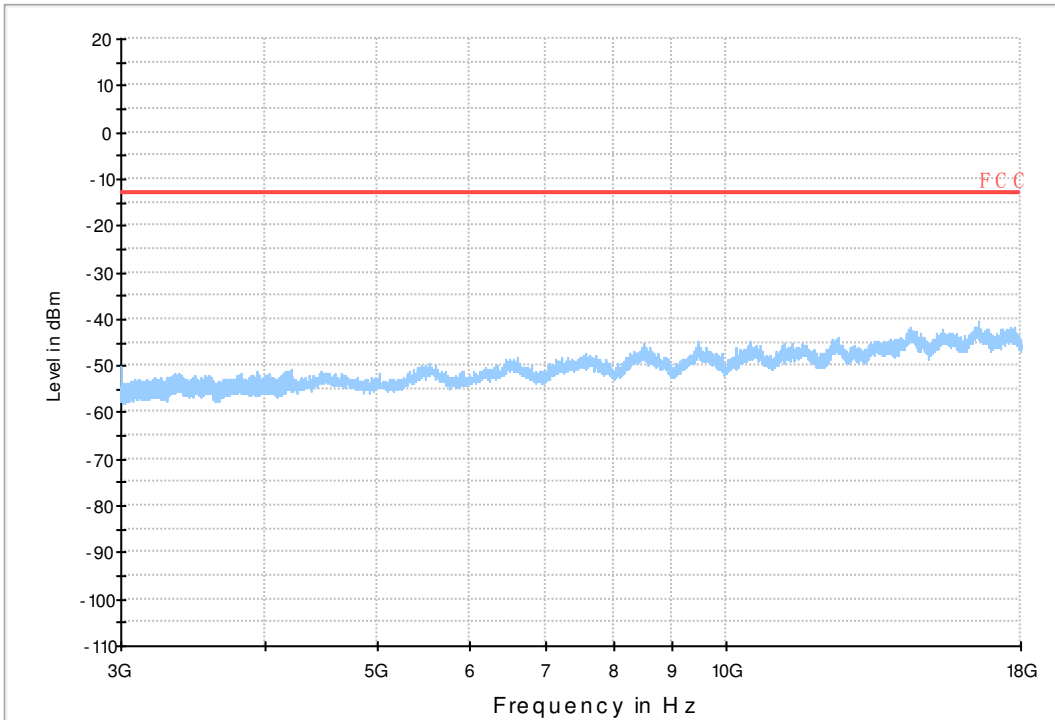
##### 7.1.1.1 Test Mode = UMTS/TM1



Copy of FCC PART22 W CDMA850\_L

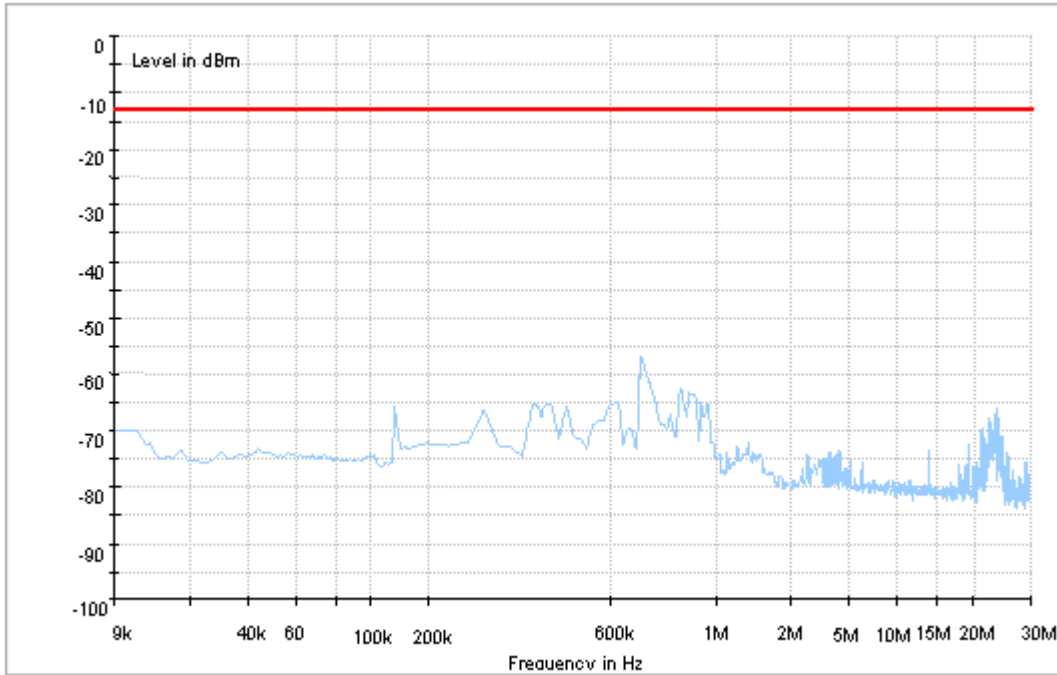


Copy of FCC PART22 W CDMA850\_H

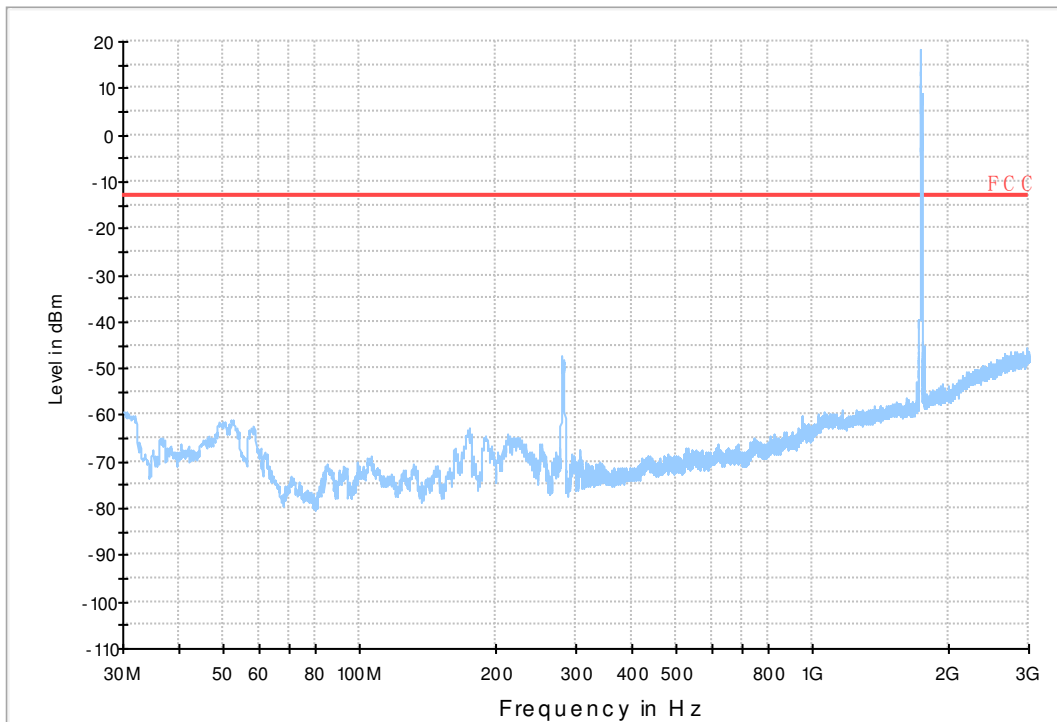


### 7.1.2 Test Band = WCDMA1700

#### 7.1.2.1 Test Mode = UMTS/TM1

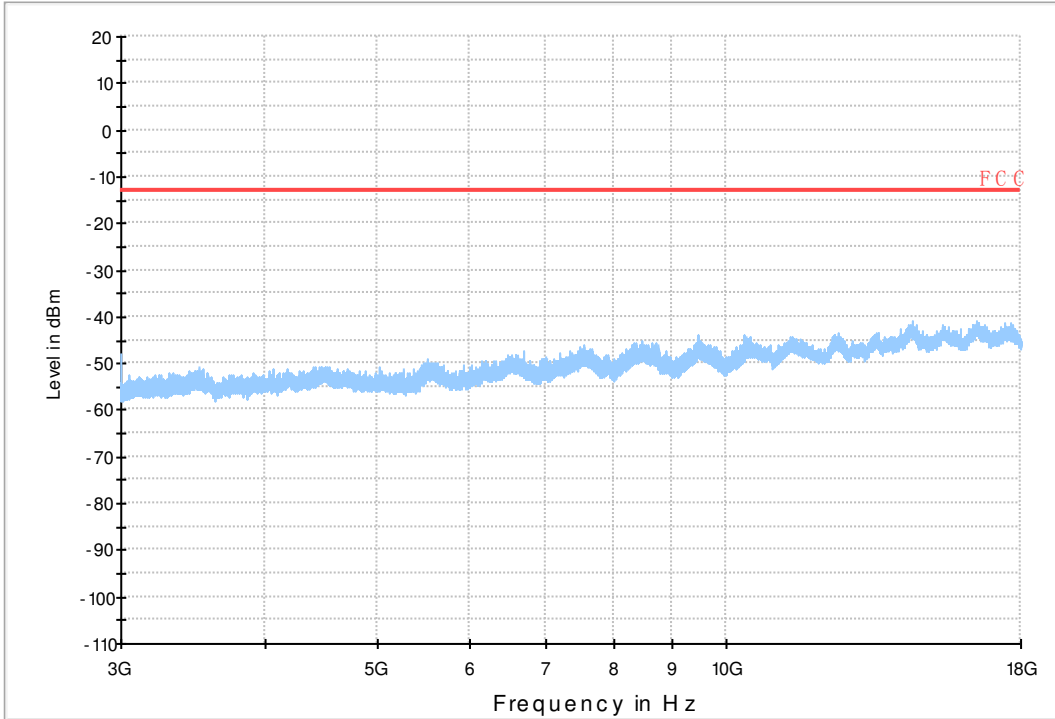


Copy of FCC PART27 W CDMA1700\_L



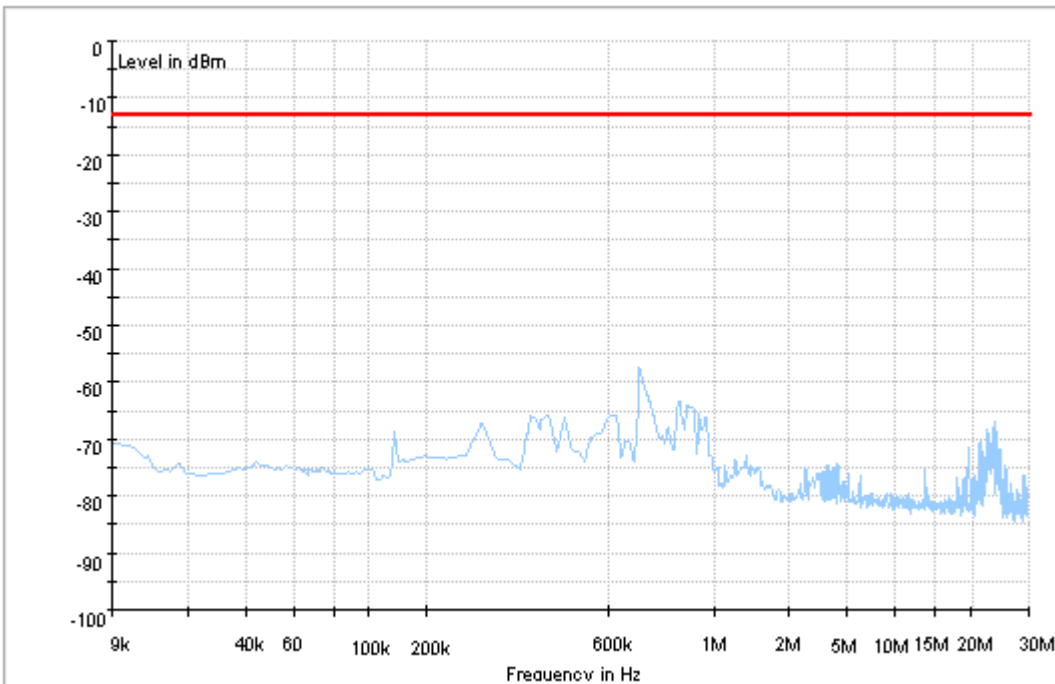


Copy of FCC PART27 W CDMA1700\_H

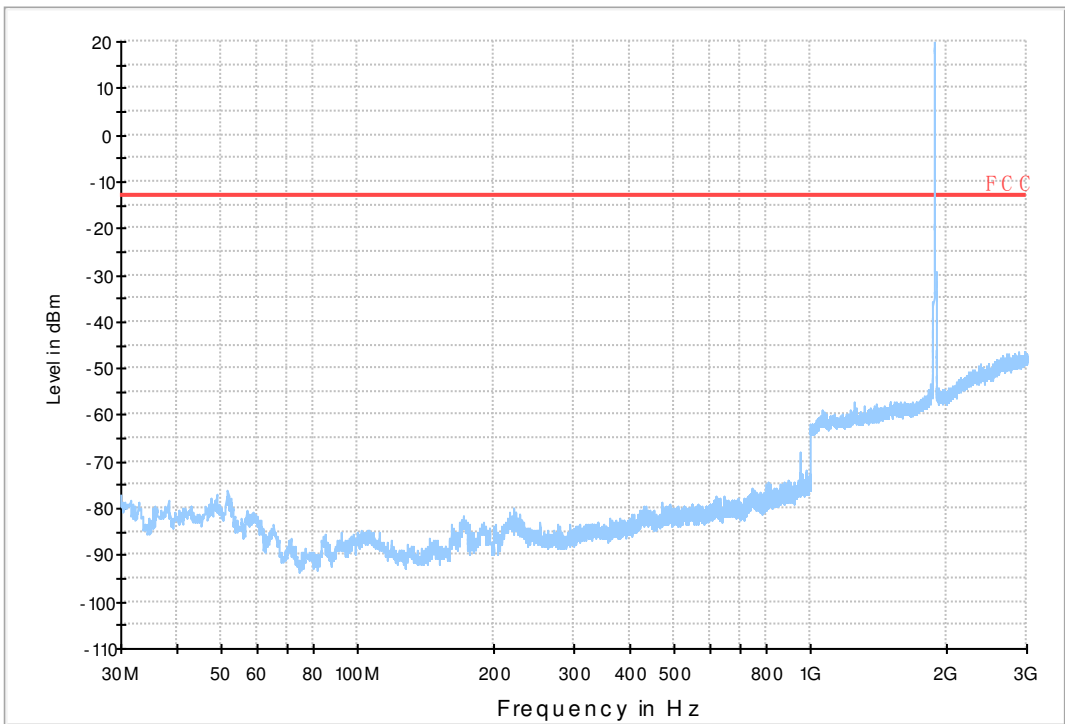


7.1.3 Test Band = WCDMA1900

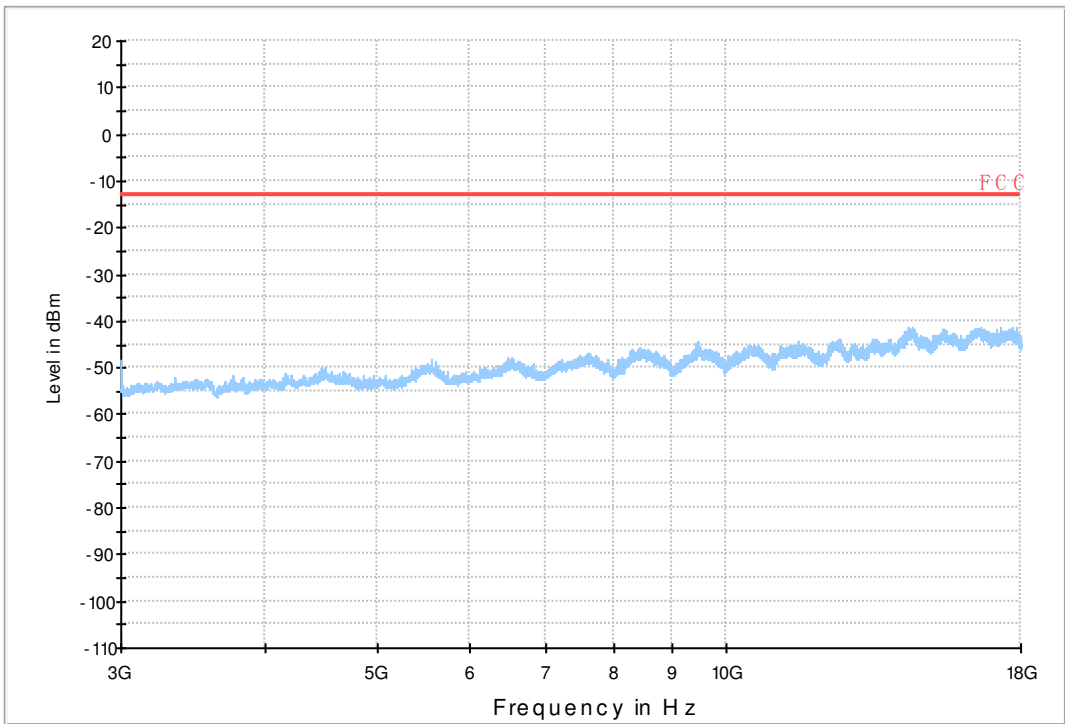
7.1.3.1 Test Mode = UMTS/TM1

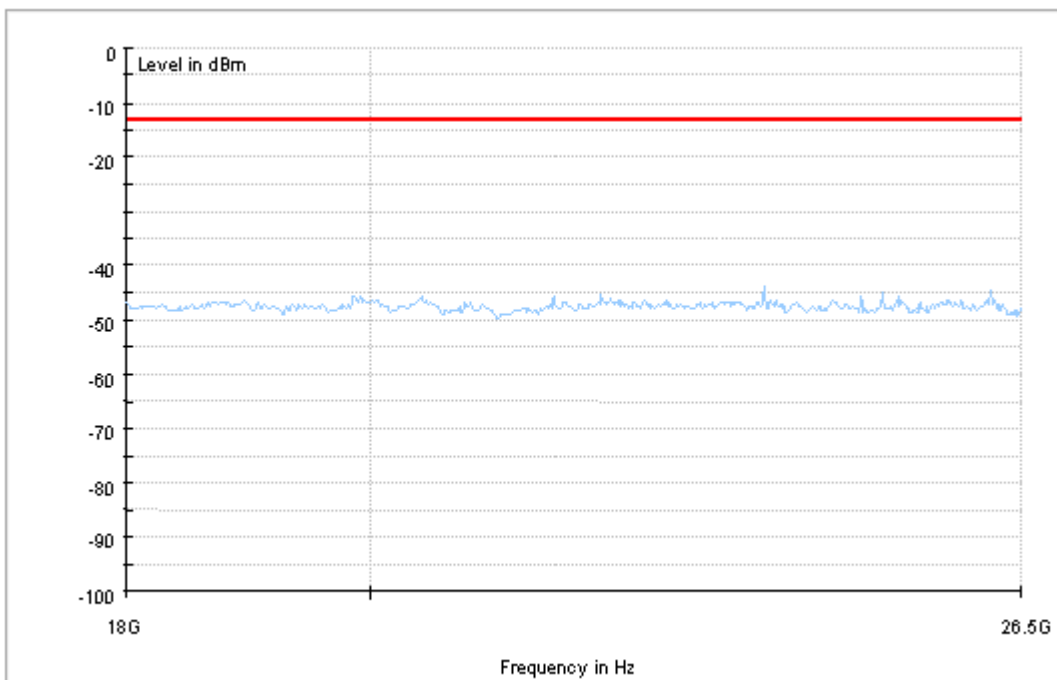


Copy of FCC PART24 W CDMA1900\_L



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	-0.05	-0.00006	PASS
				VN	-0.92	-0.00111	PASS
				VH	0.44	0.00053	PASS
		MCH	TN	VL	-1.48	-0.00177	PASS
				VN	-2.17	-0.00259	PASS
				VH	0.40	0.00048	PASS
		HCH	TN	VL	-2.73	-0.00322	PASS
				VN	-1.10	-0.0013	PASS
				VH	0.03	0.00004	PASS
WCDMA1700	UMTS/TM1	LCH	TN	VL	1.14	0.00067	PASS
				VN	3.74	0.00218	PASS
				VH	-1.89	-0.0011	PASS
		MCH	TN	VL	0.72	0.00042	PASS
				VN	0.66	0.00038	PASS
				VH	-1.60	-0.00092	PASS
		HCH	TN	VL	0.20	0.00011	PASS
				VN	-2.29	-0.00131	PASS
				VH	-3.05	-0.00174	PASS
WCDMA1900	UMTS/TM1	LCH	TN	VL	-1.83	-0.00099	PASS
				VN	2.23	0.0012	PASS
				VH	0.73	0.00039	PASS
		MCH	TN	VL	-0.26	-0.00014	PASS
				VN	1.08	0.00057	PASS
				VH	-0.06	-0.00003	PASS
		HCH	TN	VL	-3.88	-0.00203	PASS
				VN	-2.35	-0.00123	PASS
				VH	-1.19	-0.00062	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	-0.29	-0.00035	PASS
				-20	0.55	0.00067	PASS
				-10	-0.06	-0.00007	PASS
				0	2.41	0.00292	PASS
				10	1.11	0.00134	PASS
				20	0.37	0.00045	PASS
				30	0.15	0.00018	PASS
				40	0.14	0.00017	PASS
				50	-0.87	-0.00105	PASS
		MCH	VN	-30	-0.24	-0.00029	PASS
				-20	0.61	0.00073	PASS
				-10	-1.82	-0.00218	PASS
				0	0.66	0.00079	PASS
				10	-1.17	-0.0014	PASS
				20	-0.02	-0.00002	PASS
				30	-1.63	-0.00195	PASS
				40	-3.98	-0.00476	PASS
				50	-1.04	-0.00124	PASS
		HCH	VN	-30	0.06	0.00007	PASS
				-20	-1.28	-0.00151	PASS
				-10	0.49	0.00058	PASS
				0	-1.22	-0.00144	PASS
				10	-1.77	-0.00209	PASS
				20	-1.43	-0.00169	PASS
				30	-2.70	-0.00319	PASS
				40	-0.60	-0.00071	PASS
				50	-2.00	-0.00236	PASS
WCDMA1700	UMTS/TM1	LCH	VN	-30	1.08	0.00063	PASS
				-20	1.56	0.00091	PASS
				-10	4.55	0.00266	PASS
				0	0.72	0.00042	PASS
				10	3.92	0.00229	PASS
				20	1.62	0.00095	PASS
				30	3.75	0.00219	PASS
				40	0.21	0.00012	PASS
				50	1.21	0.00071	PASS
		MCH	VN	-30	-1.36	-0.00078	PASS
				-20	-4.01	-0.00231	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict		
				-10	1.05	0.00061	PASS		
				0	-3.13	-0.00181	PASS		
				10	-0.99	-0.00057	PASS		
				20	1.57	0.00091	PASS		
				30	0.23	0.00013	PASS		
				40	1.13	0.00065	PASS		
		HCH	VN	-30	-0.96	-0.00055	PASS		
				-20	-0.69	-0.00039	PASS		
				-10	-1.11	-0.00063	PASS		
				0	-2.23	-0.00127	PASS		
				10	-1.50	-0.00086	PASS		
				20	-0.05	-0.00003	PASS		
		WCDMA1900	UMTS/TM1	LCH	VN	-30	1.42	0.00077	PASS
						-20	-0.21	-0.00011	PASS
						-10	2.03	0.0011	PASS
						0	1.07	0.00058	PASS
						10	-2.47	-0.00133	PASS
						20	-0.41	-0.00022	PASS
MCH	VN			30	-0.99	-0.00053	PASS		
				40	-0.93	-0.0005	PASS		
				50	-0.87	-0.00047	PASS		
				-30	-1.85	-0.00098	PASS		
				-20	0.09	0.00005	PASS		
				-10	-2.43	-0.00129	PASS		
HCH	VN	0	-2.50	-0.00133	PASS				
		10	1.08	0.00057	PASS				
		20	-1.66	-0.00088	PASS				
		30	-2.62	-0.00139	PASS				
		40	-3.92	-0.00209	PASS				
		50	0.03	0.00002	PASS				
				-30	-0.24	-0.00013	PASS		
				-20	-0.47	-0.00025	PASS		
				-10	-0.06	-0.00003	PASS		
				0	0.99	0.00052	PASS		
				10	-2.61	-0.00137	PASS		
				20	-0.49	-0.00026	PASS		



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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	-1.39	-0.00073	PASS
				40	-0.66	-0.00035	PASS
				50	-0.87	-0.00046	PASS

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END