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# 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	24.35	20.8	38.5	PASS
		MCH	24.35	20.8	38.5	PASS
		HCH	24.38	20.83	38.5	PASS
Test Band	Test Mode	Test Channel	Conducted Power[dBm]	EIRP [dBm]	Limit [dBm]	Verdict
WCDMA1900	UMTS/TM1	LCH	24.77	24.47	33	PASS
		MCH	24.73	24.43	33	PASS
		HCH	24.66	24.36	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
WCDMA1900	UMTS/TM1	LCH	3.17	13	PASS
		MCH	2.97	13	PASS
		HCH	3.02	13	PASS
WCDMA850	UMTS/TM1	LCH	3.18	13	PASS
		MCH	3.21	13	PASS
		HCH	3.24	13	PASS

### 3Appendix\_C: Modulation Characteristics

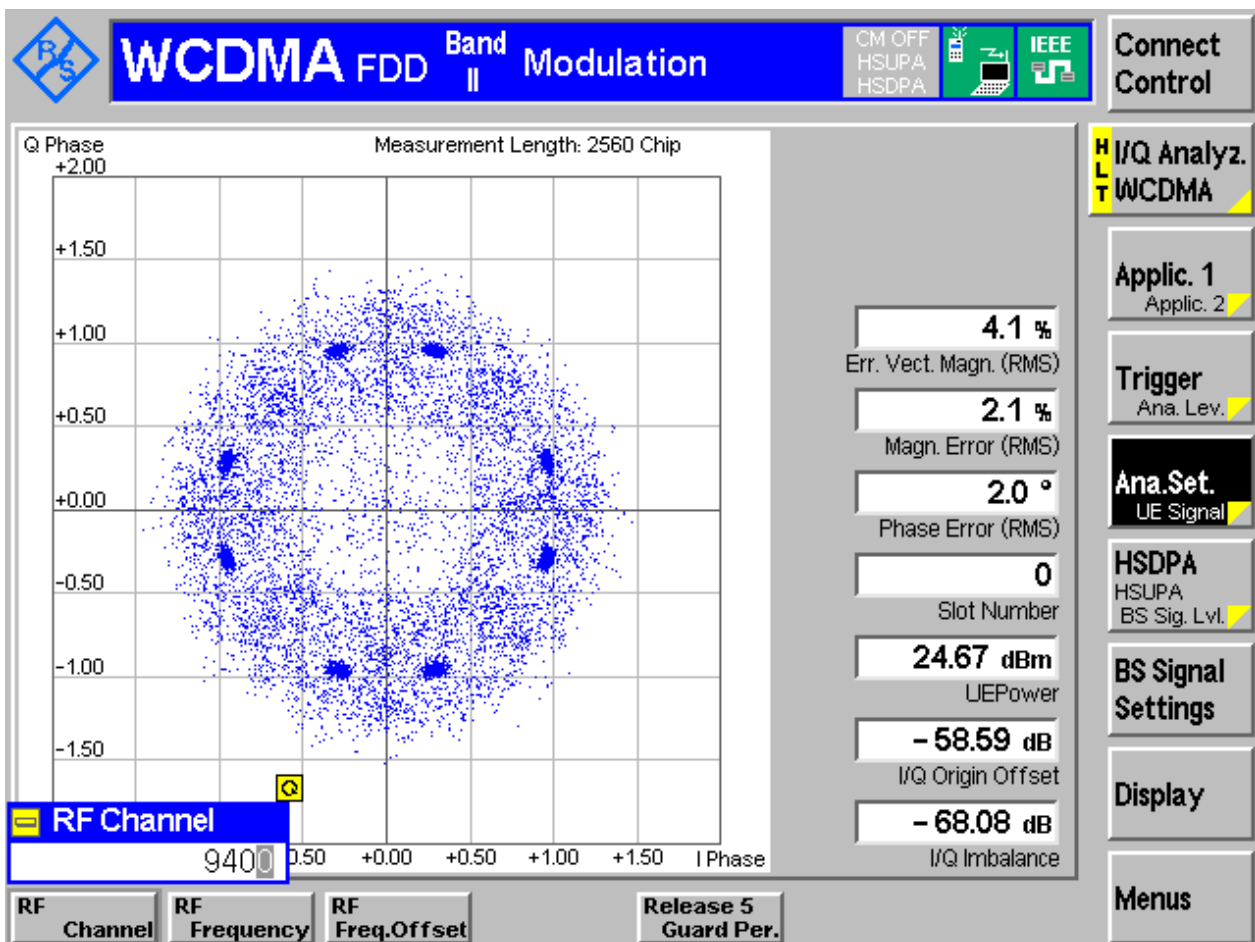
#### Part I - Test Plots

#### 3.1 For UMTS

#### 3.1.1 Test Band = WCDMA1900

#### 3.1.1.1 Test Mode = UMTS/TM1

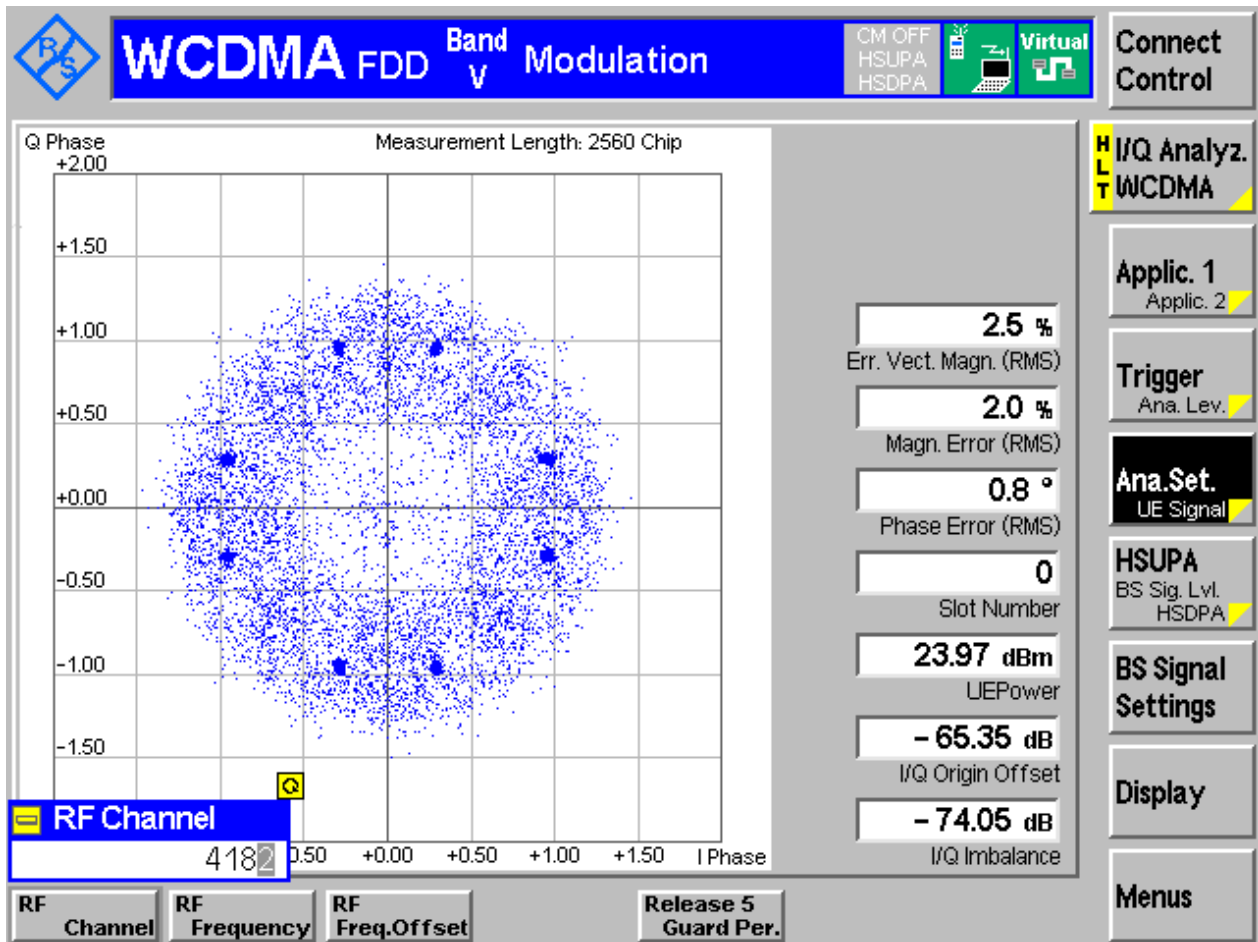
#### 3.1.1.1.1 Test Channel = MCH



3.1.2 Test Band = WCDMA850

3.1.2.1 Test Mode = UMTS/TM1

3.1.2.1.1 Test Channel = MCH



## 4Appendix\_D: Bandwidth

### Part I - Test Results

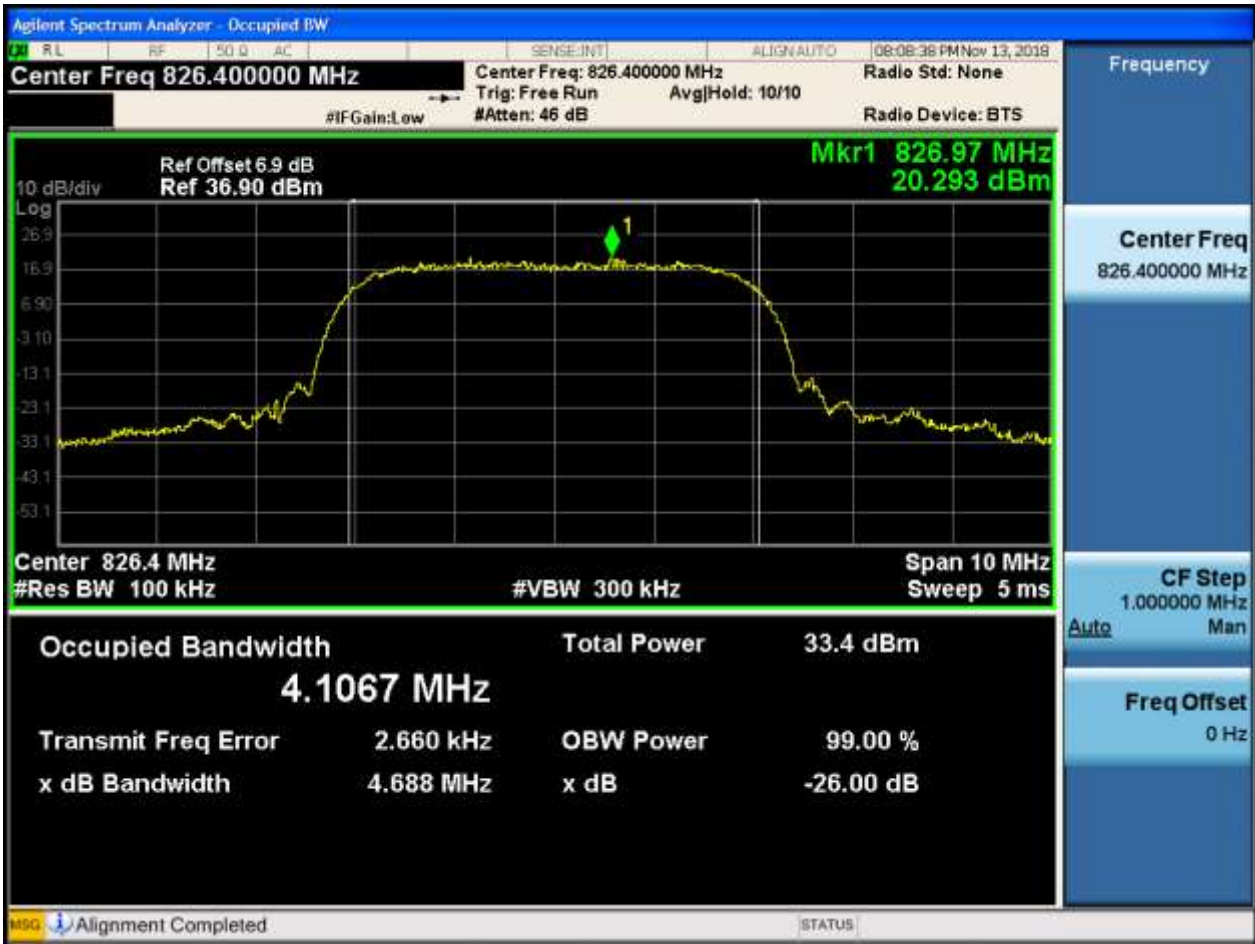
Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA850	UMTS/TM1	LCH	4.11	4.69	Pass
		MCH	4.12	4.70	Pass
		HCH	4.11	4.67	Pass
WCDMA1900	UMTS/TM1	LCH	4.11	4.70	Pass
		MCH	4.11	4.70	Pass
		HCH	4.11	4.69	Pass

Part II - Test Plots

4.1 For UMTS

4.1.1 Test Band = WCDMA850

4.1.1.1 Test Mode = UMTS/TM1

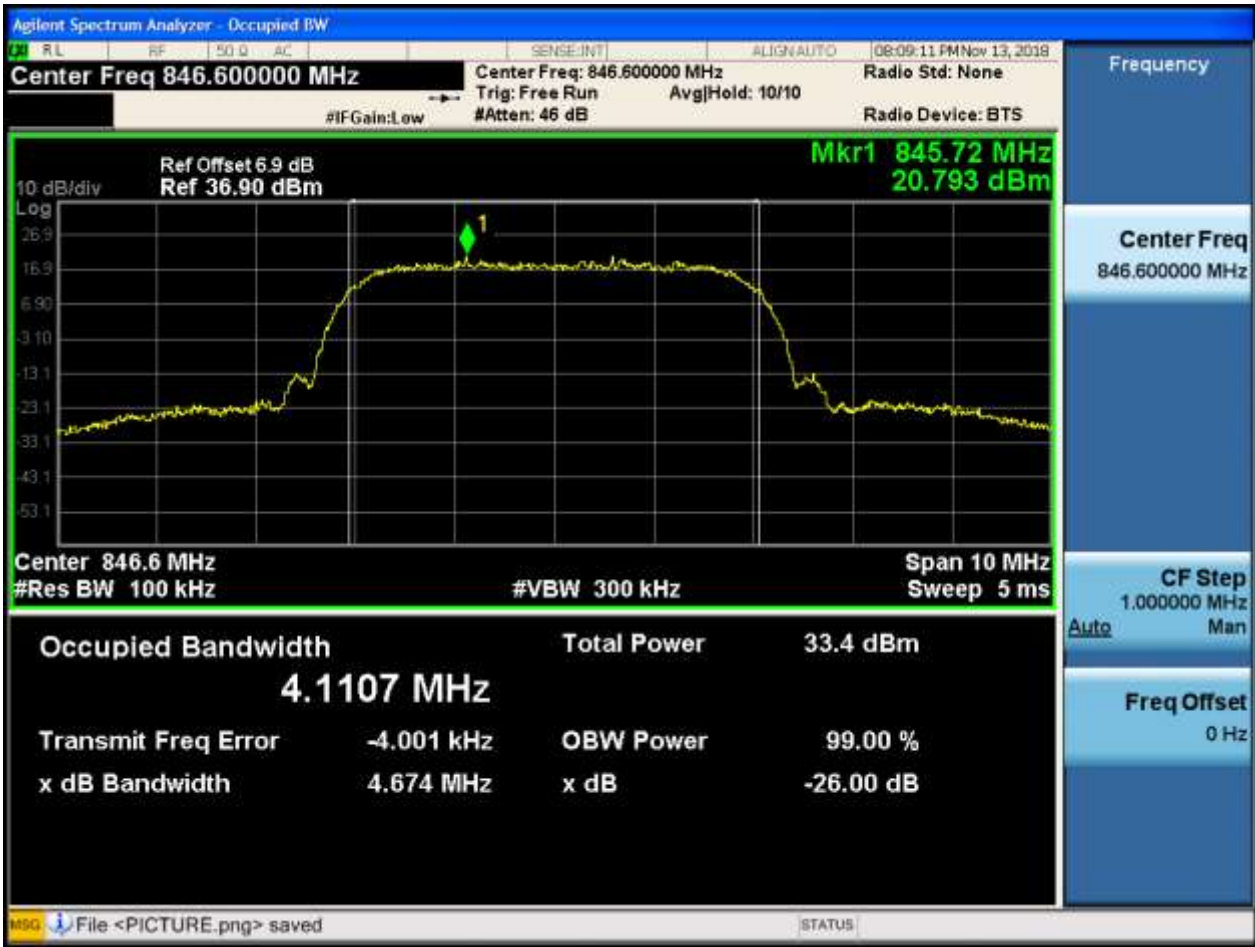


4.1.1.1.2 Test Channel = MCH





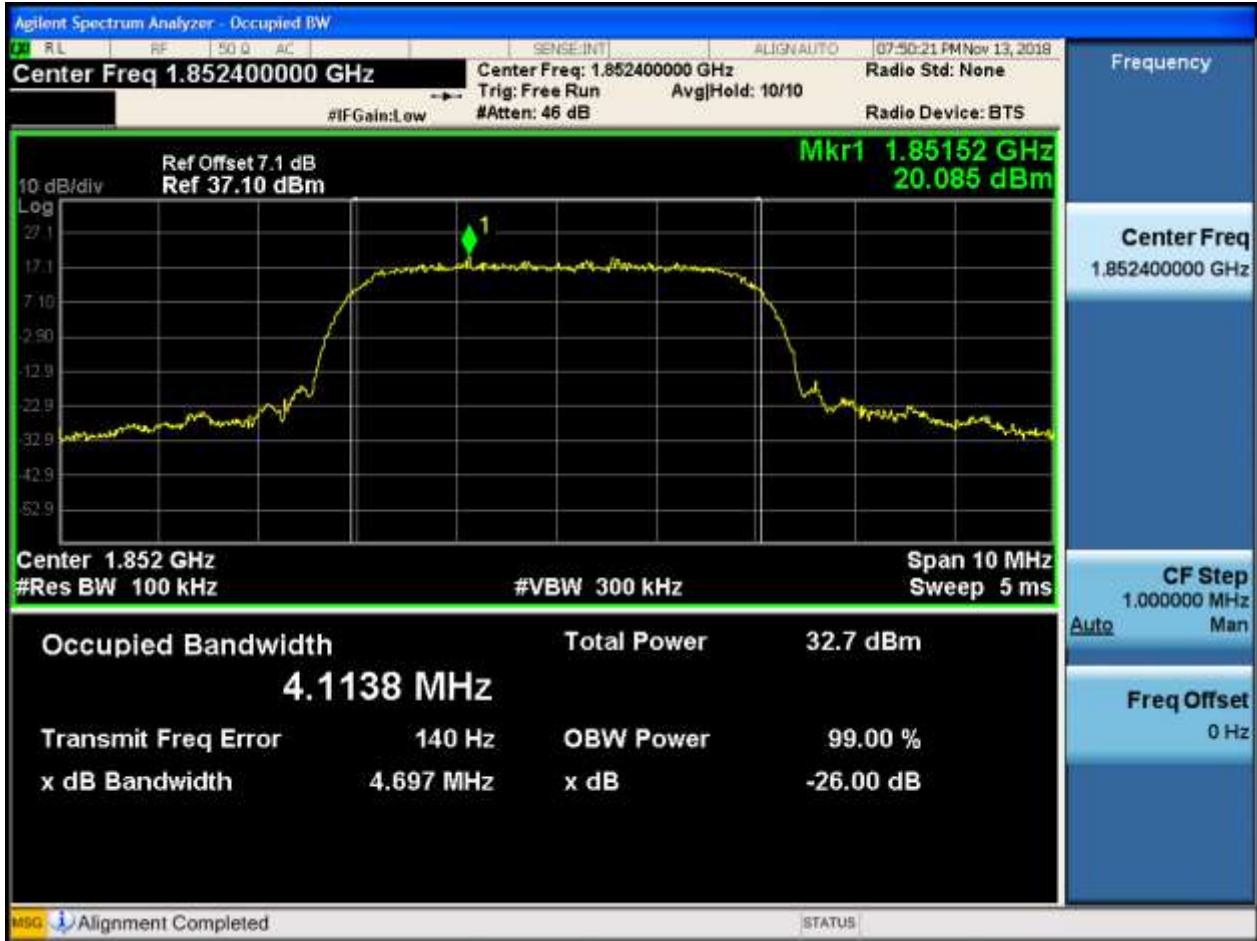
4.1.1.1.3 Test Channel = HCH



4.1.2 Test Band = WCDMA1900

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



## 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 = WCDMA1900

#### 5.1.2.1 Test Mode = UMTS/TM1

##### 5.1.2.1.1 Test Channel = LCH



## 5.1.2.1.2 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

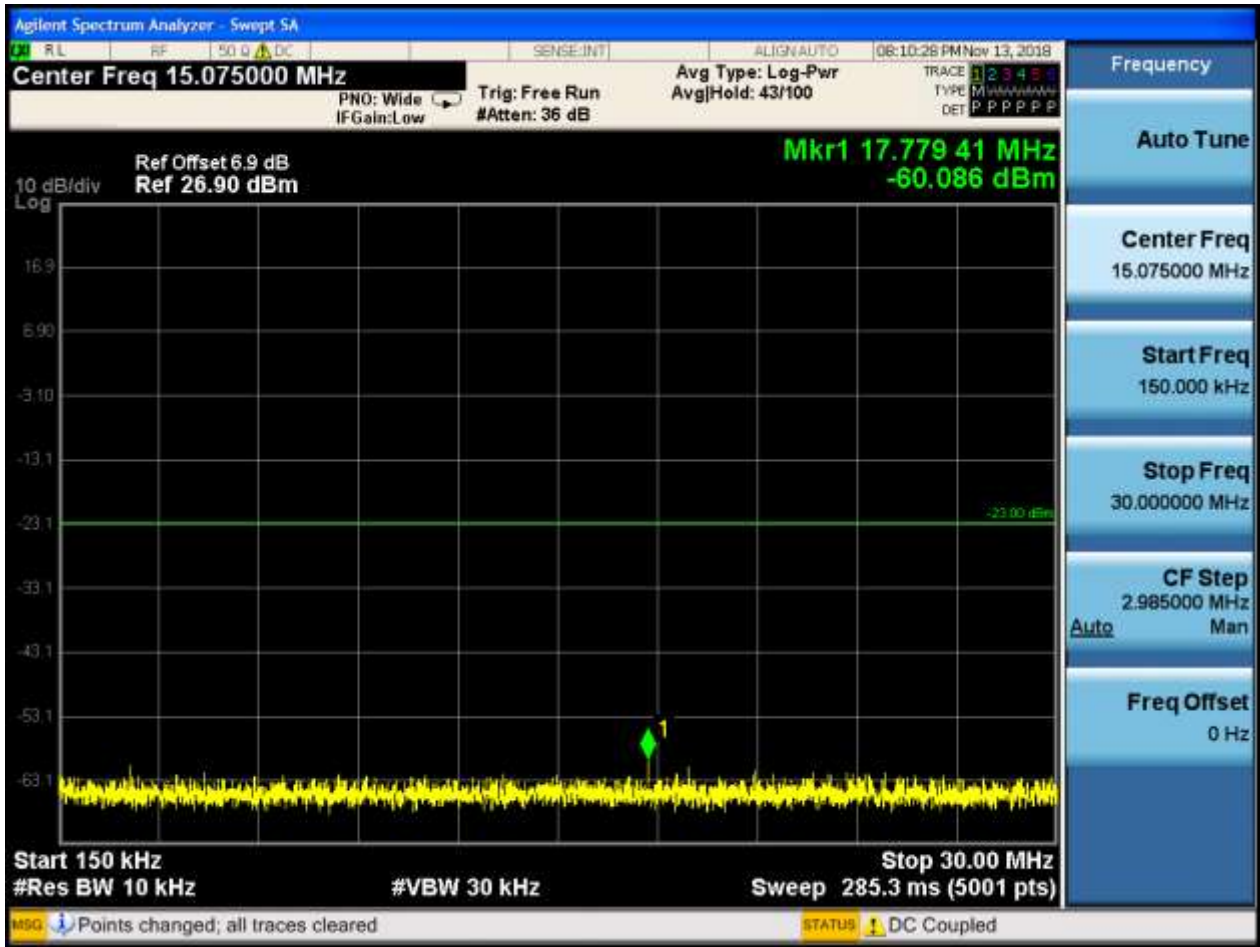
#### 6.1 For UMTS

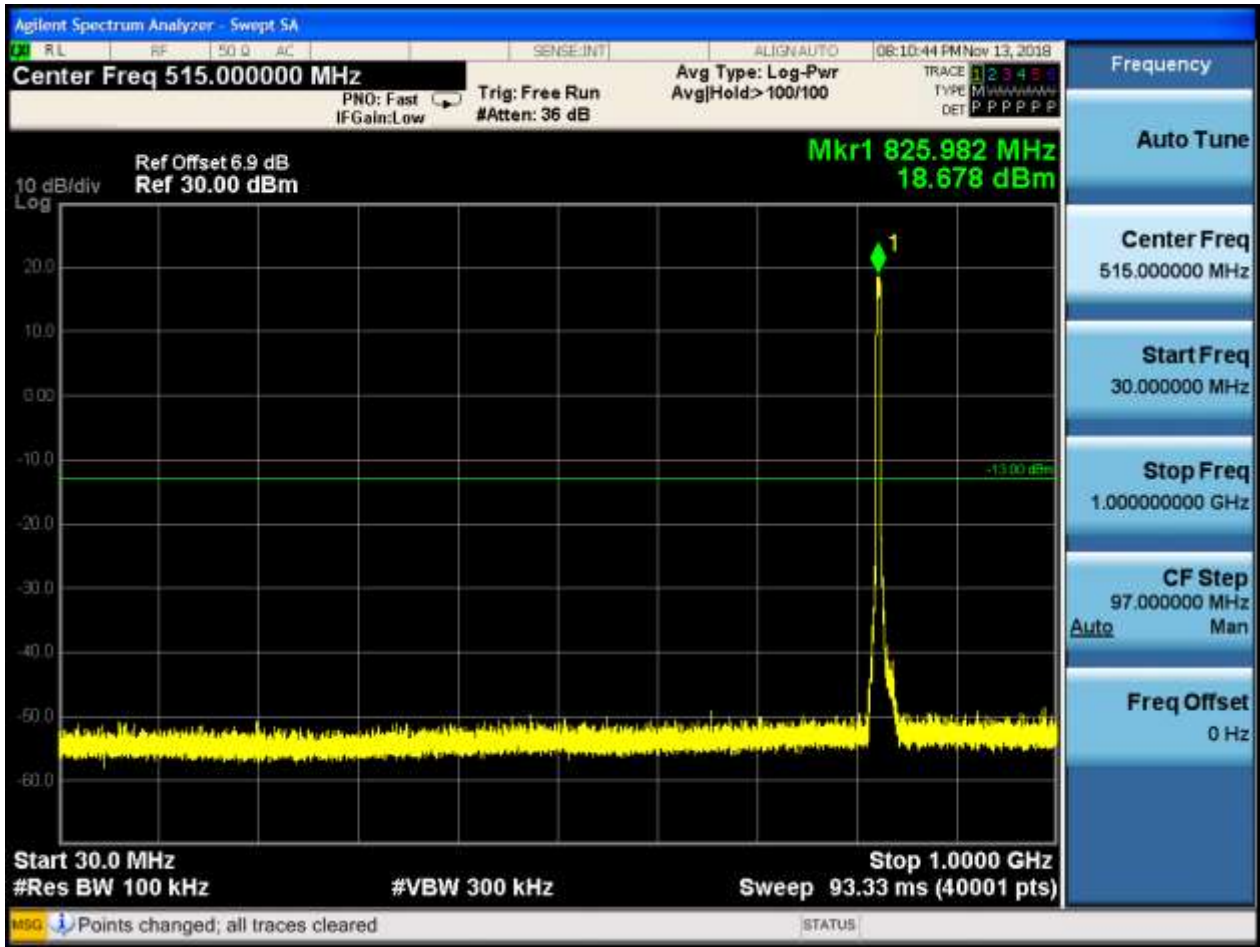
##### 6.1.1 Test Band = WCDMA850

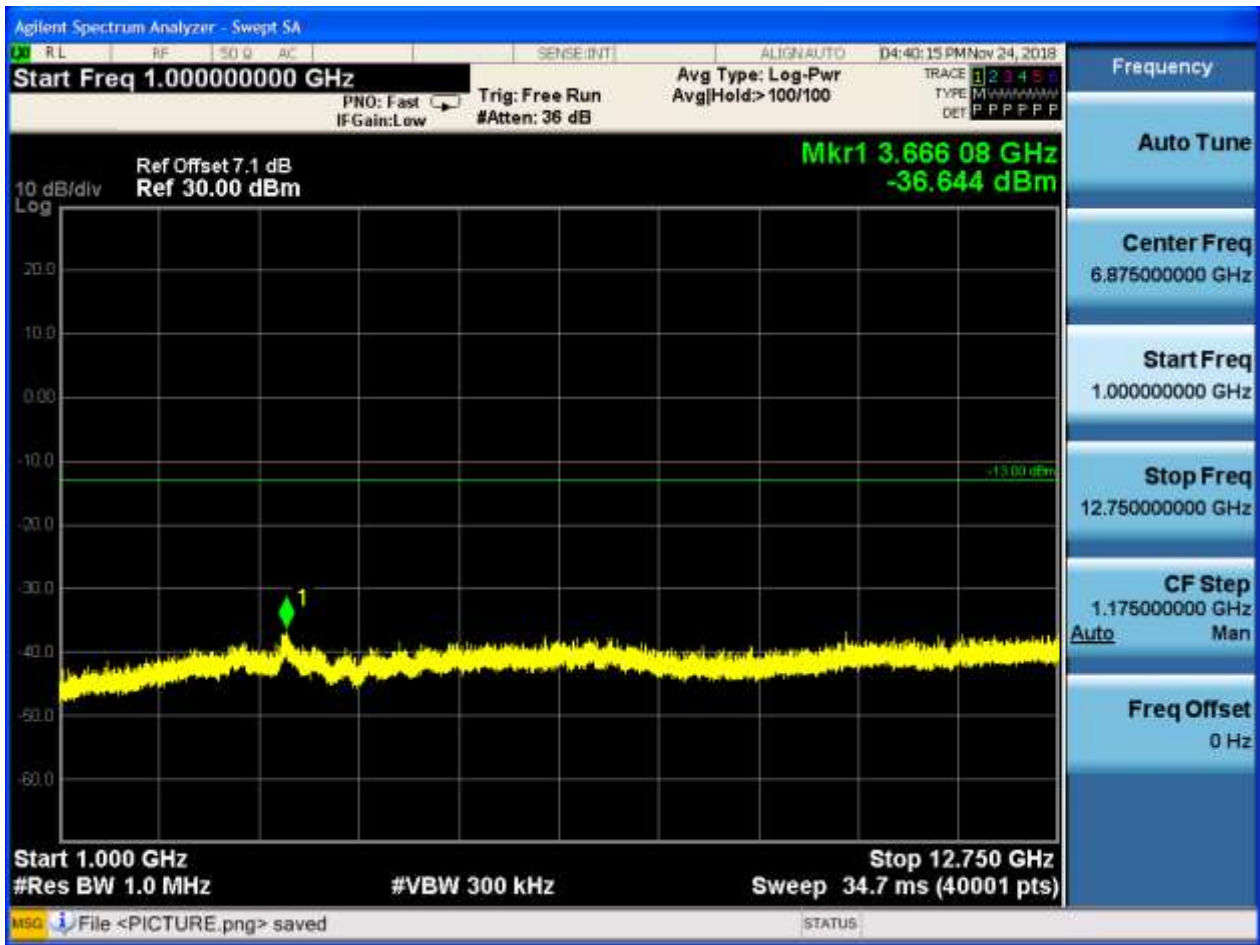
##### 6.1.1.1 Test Mode = UMTS/TM1

##### 6.1.1.1.1 Test Channel = LCH

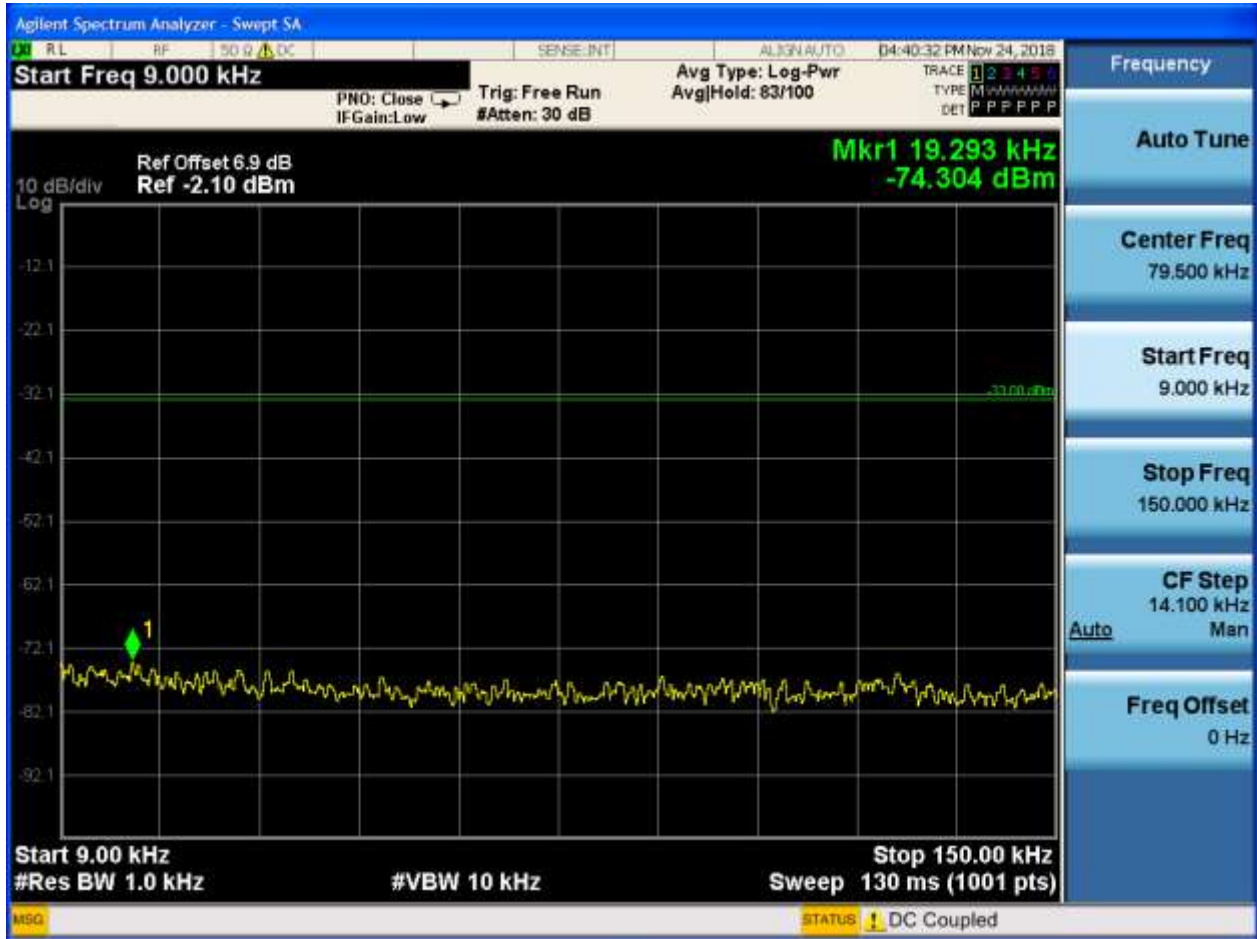


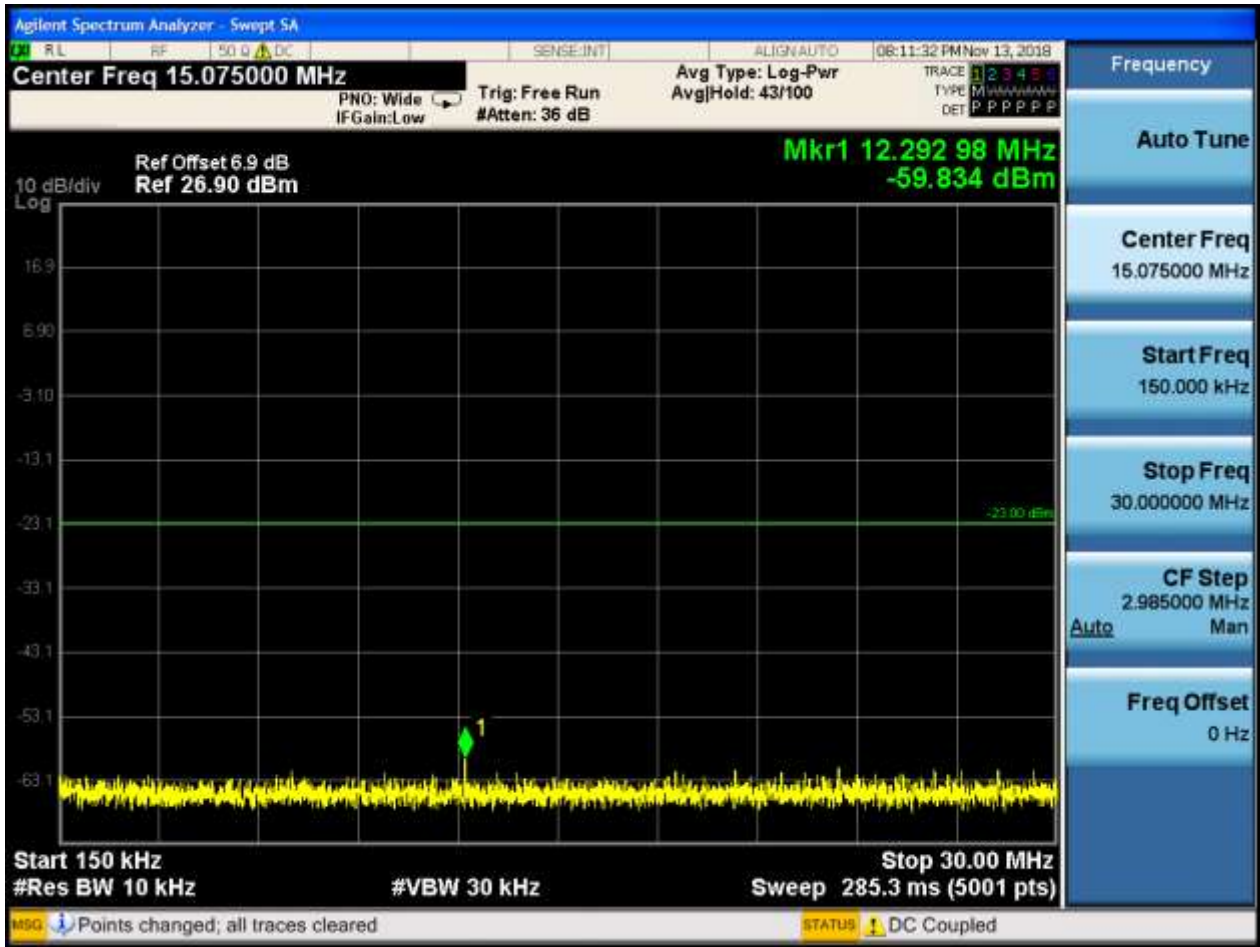


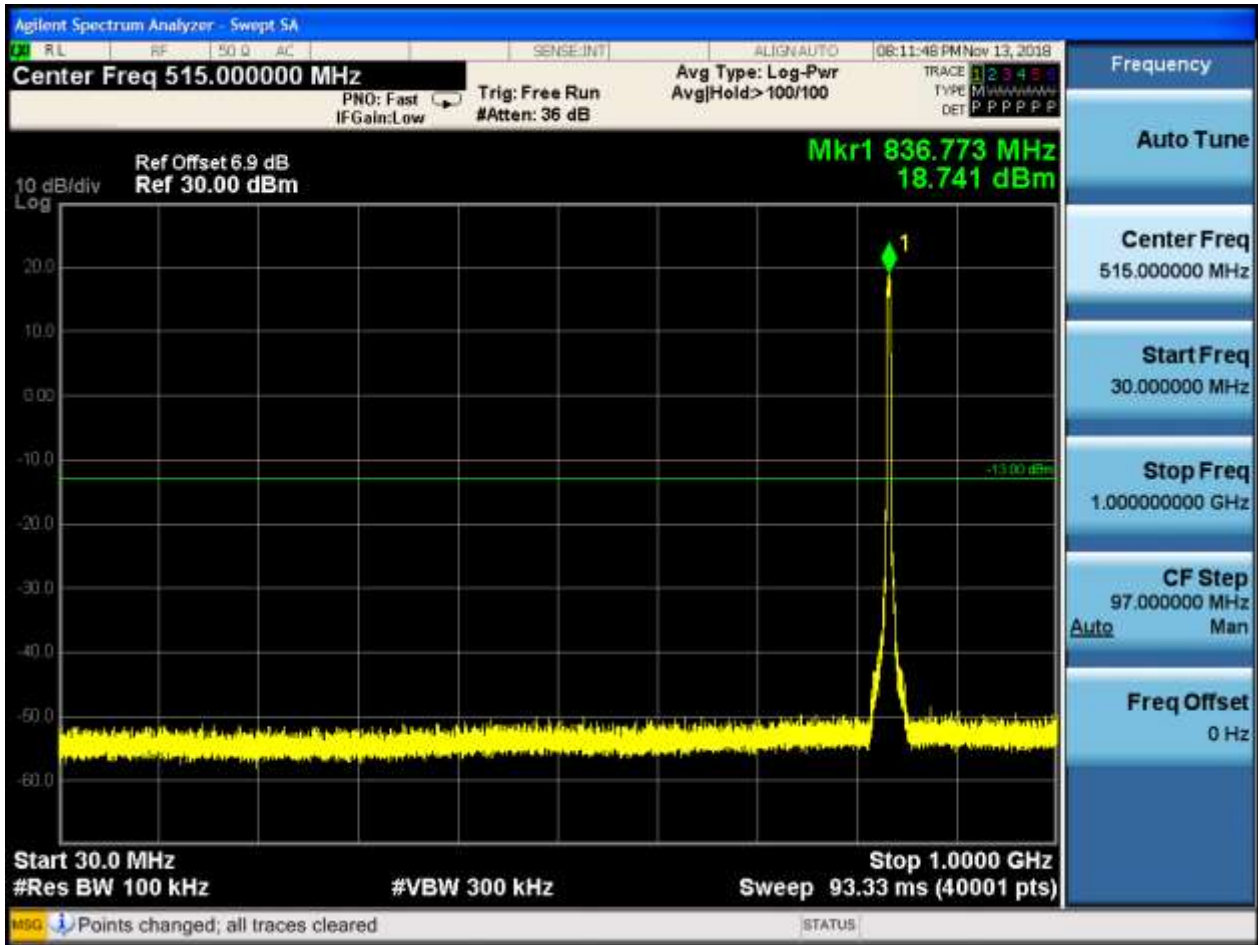


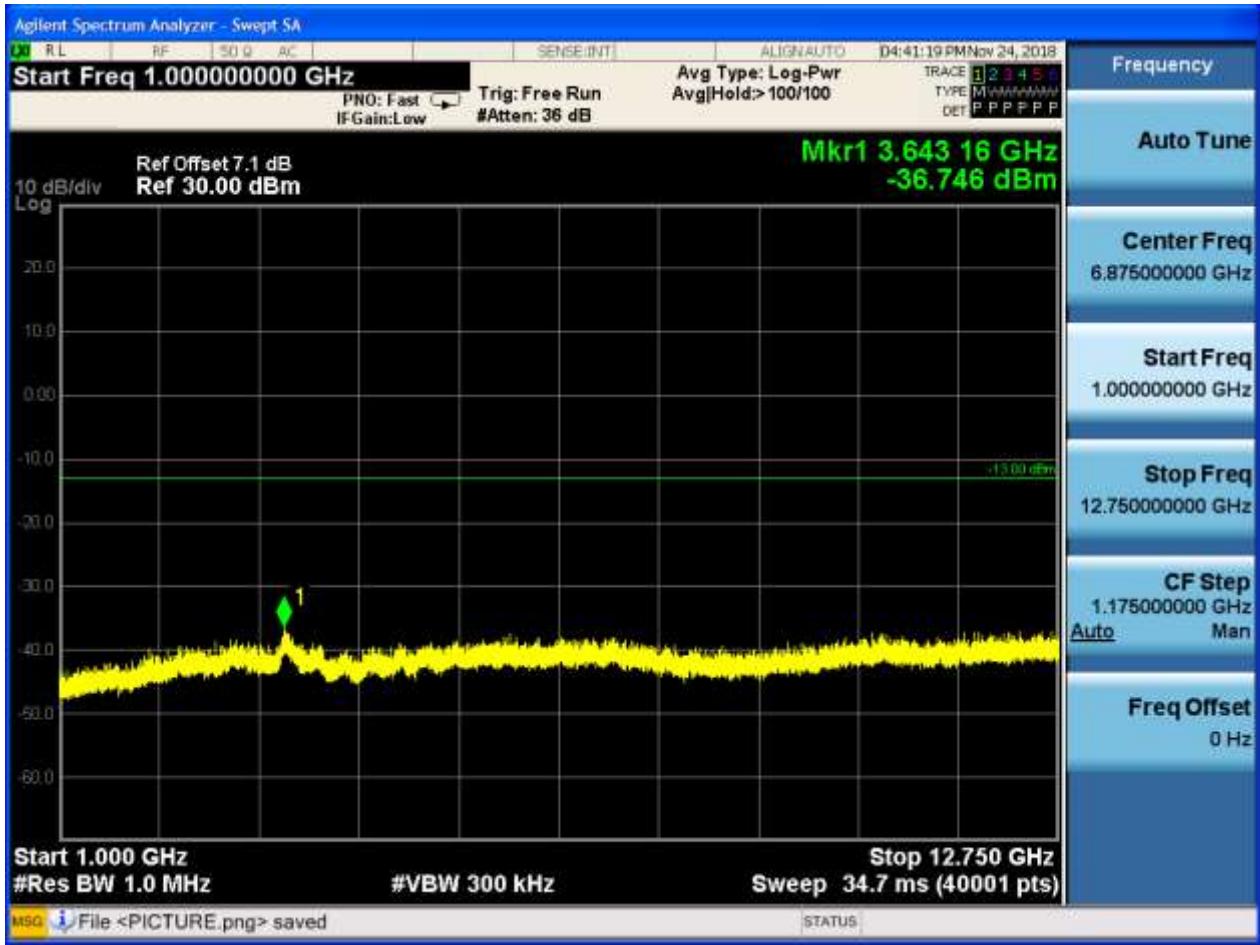


6.1.1.1.2 Test Channel = MCH





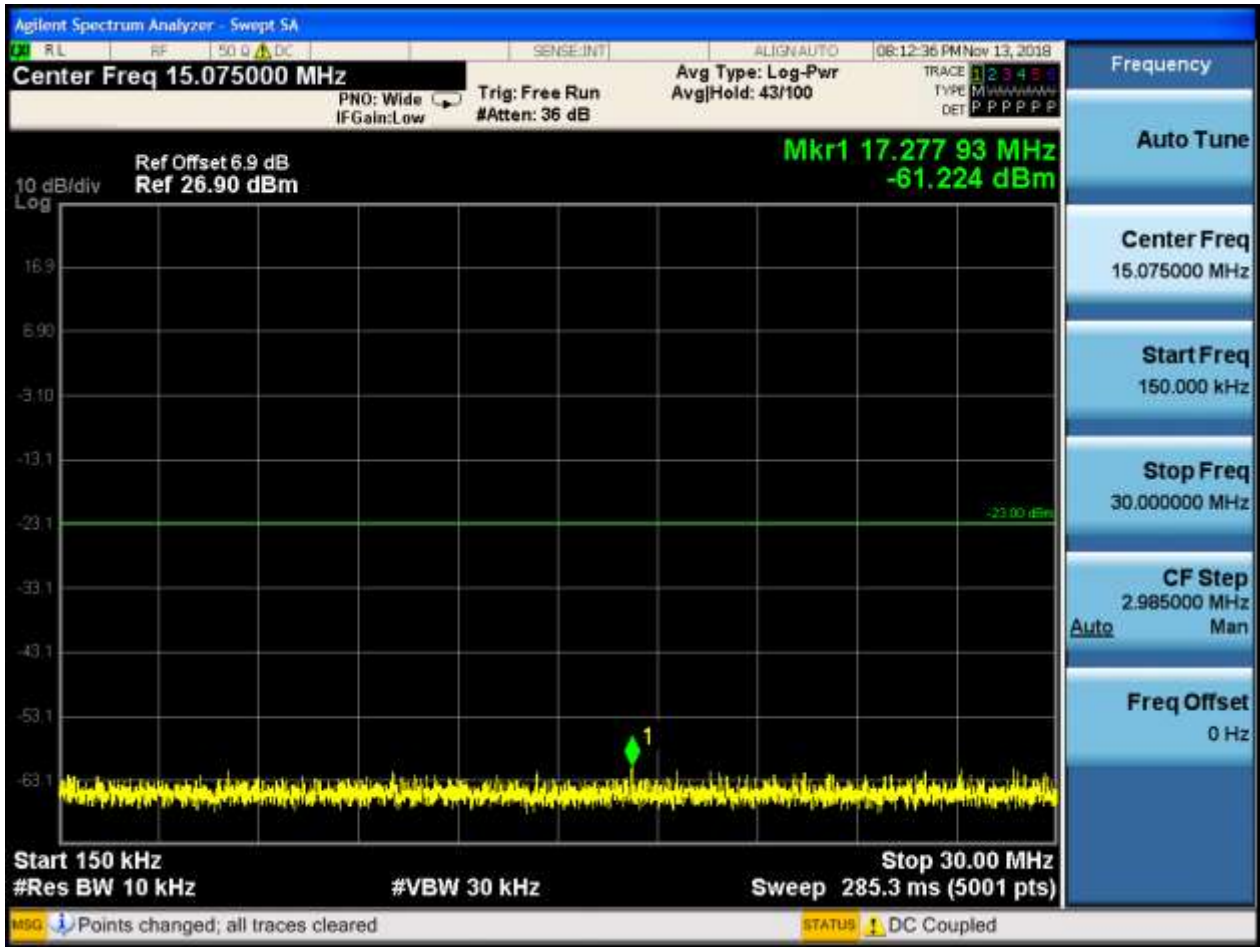


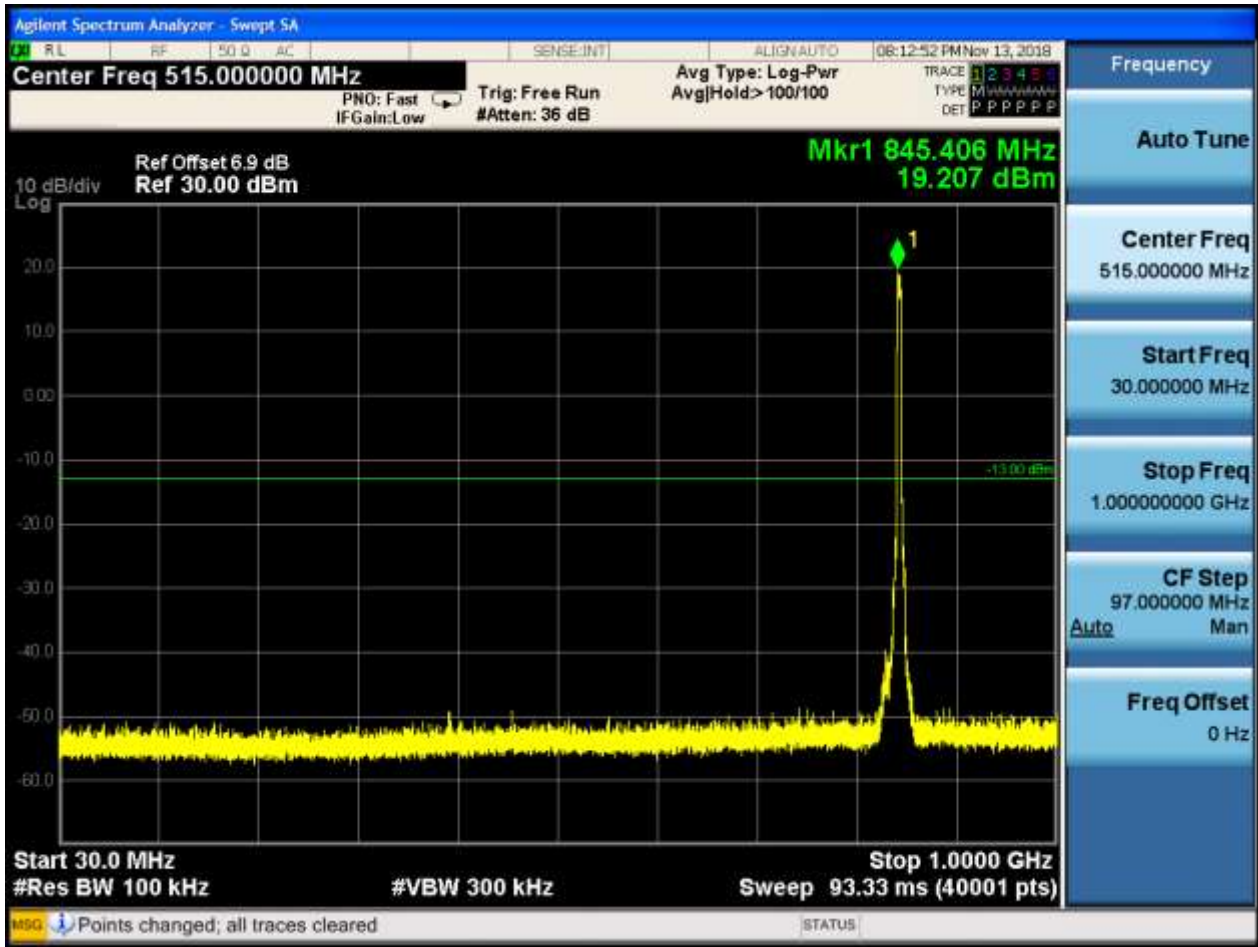




6.1.1.1.3 Test Channel = HCH





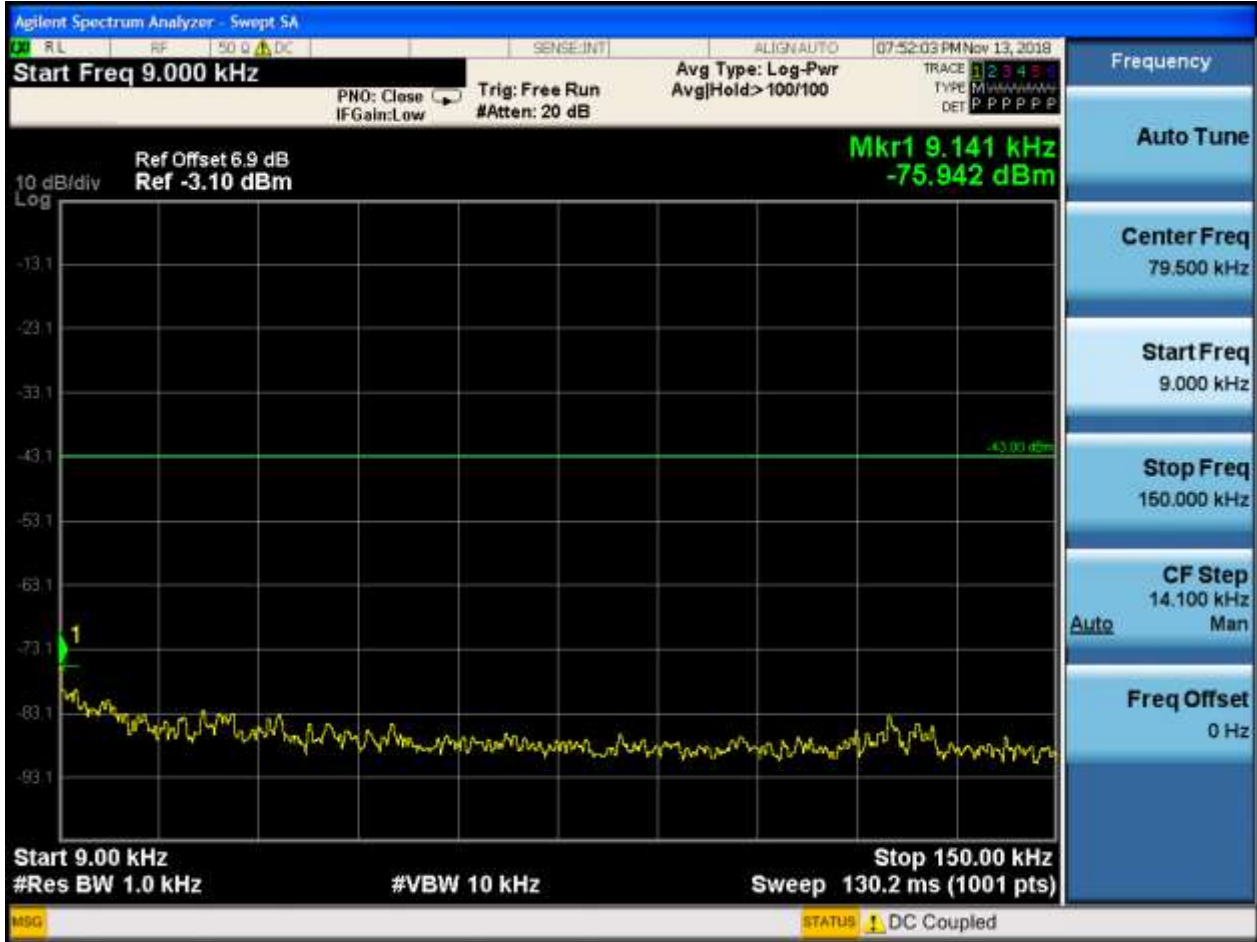


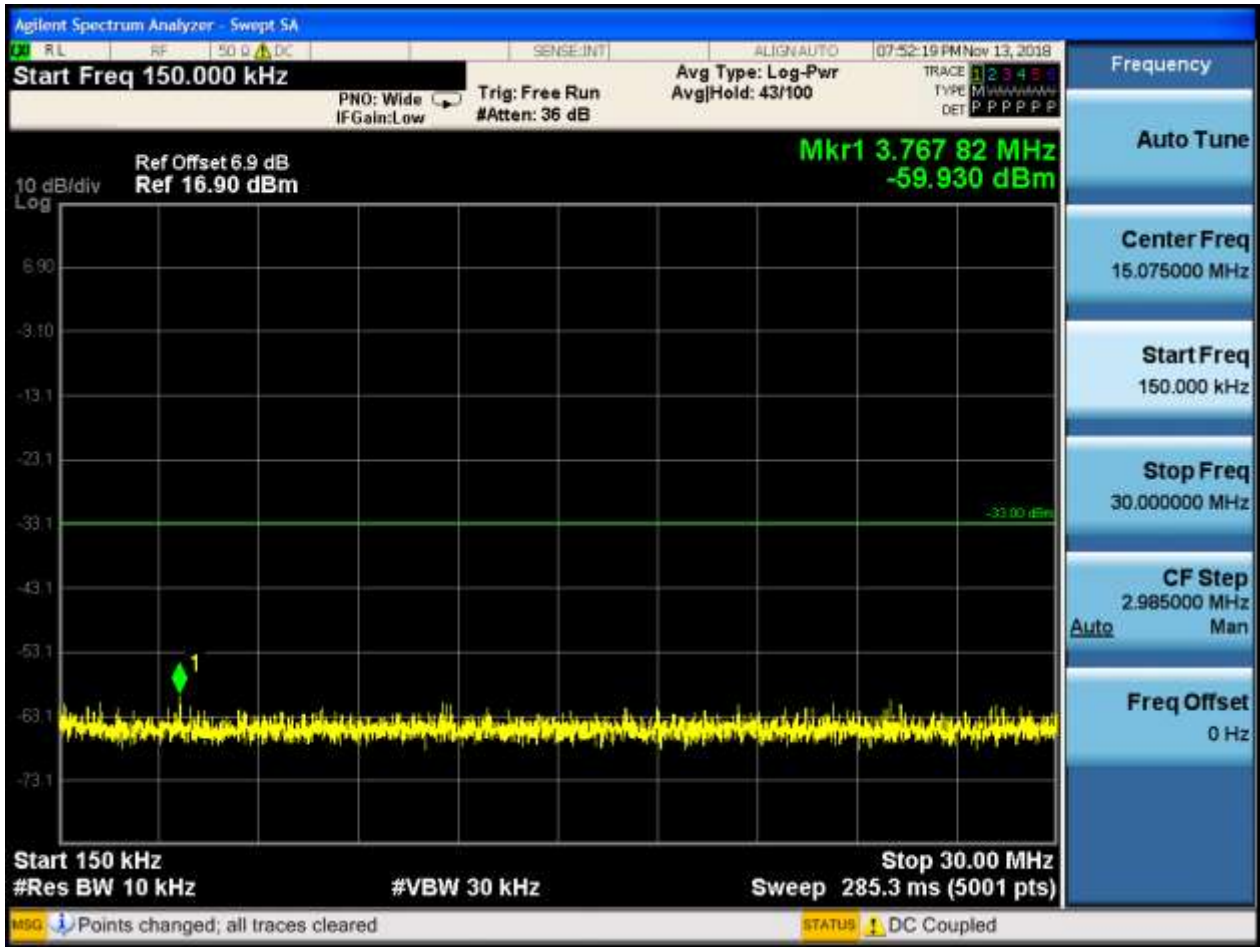


6.1.2 Test Band = WCDMA1900

6.1.2.1 Test Mode = UMTS/TM1

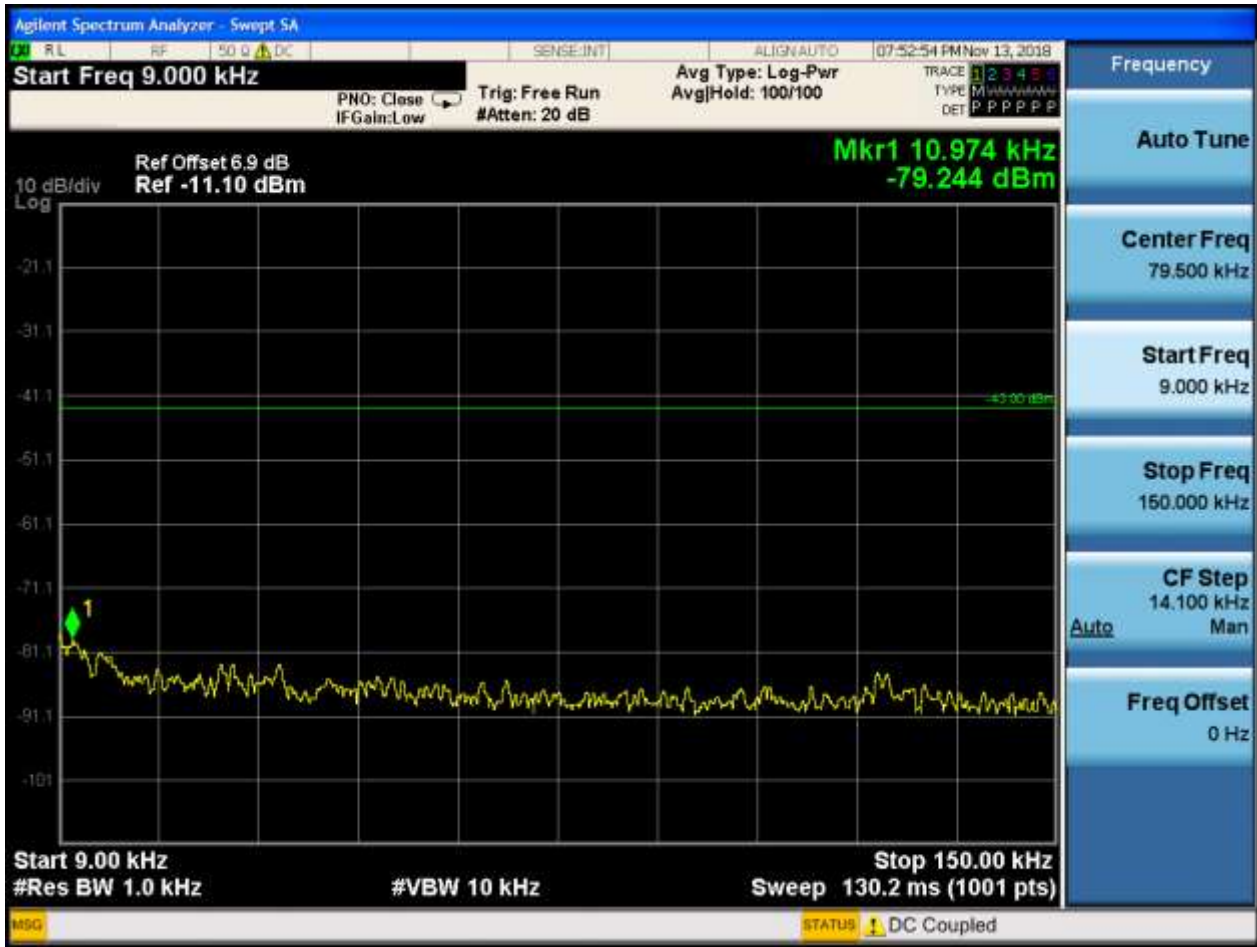
6.1.2.1.1 Test Channel = LCH



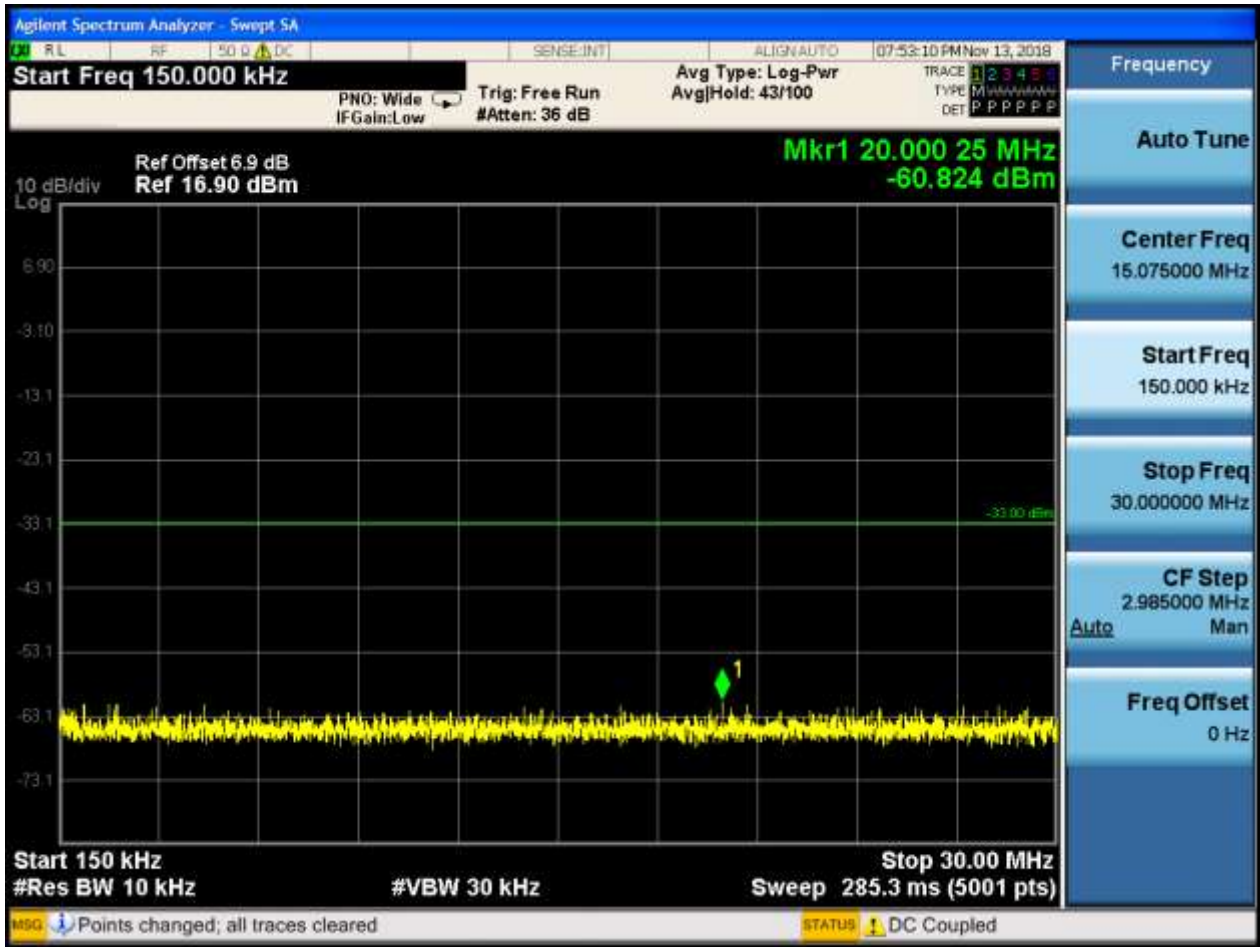




6.1.2.1.2 Test Channel = MCH

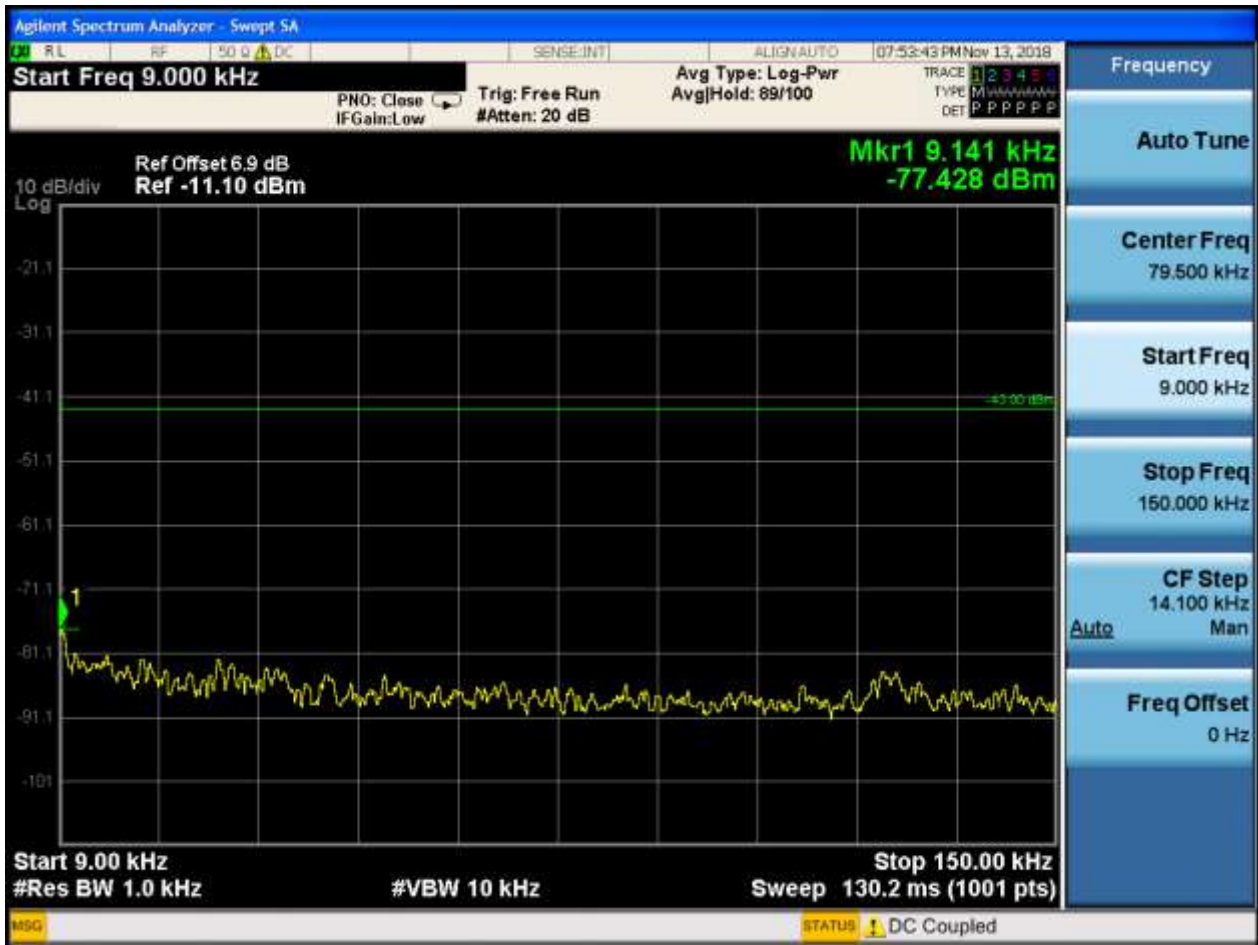


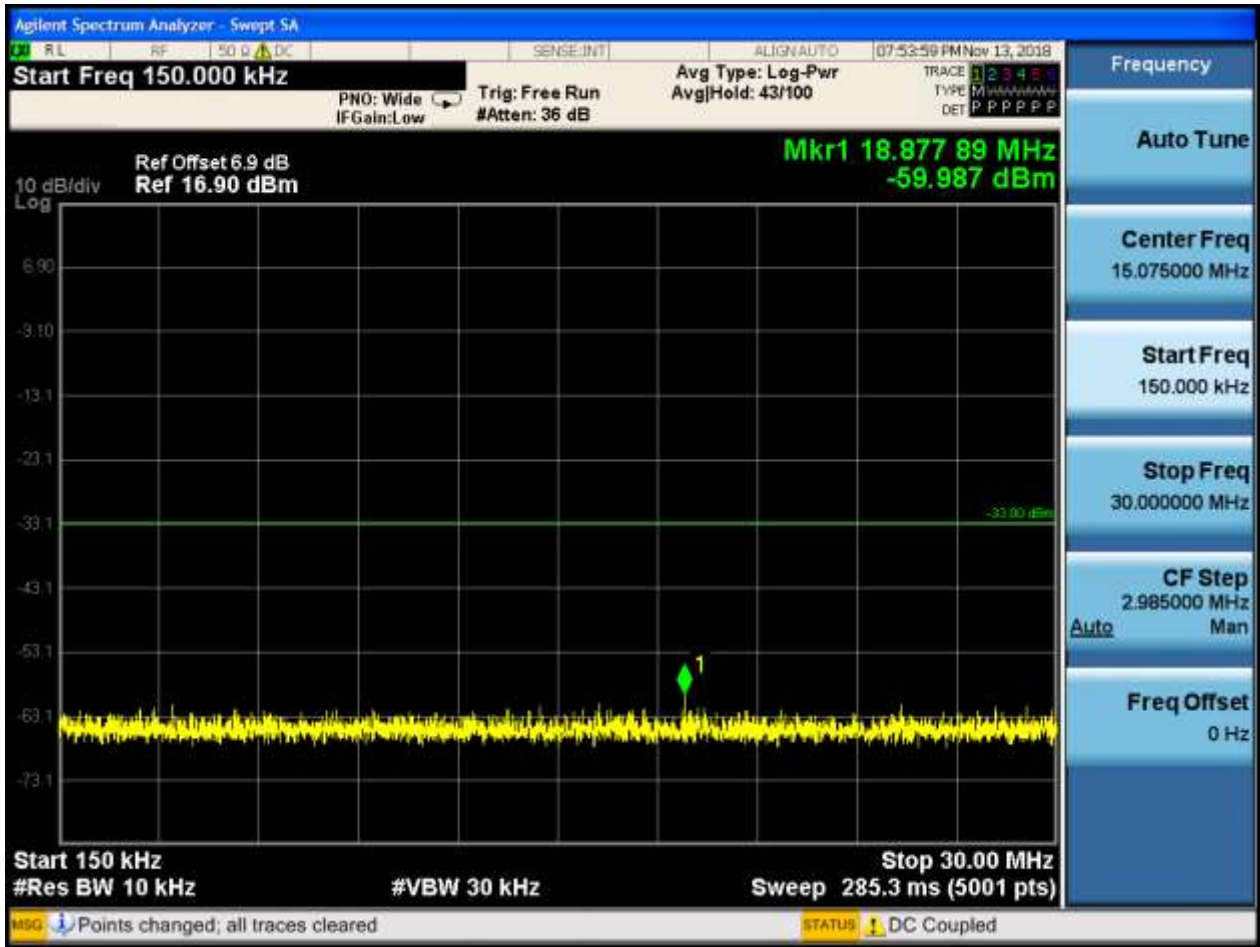






## 6.1.2.1.3 Test Channel = HCH







## 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

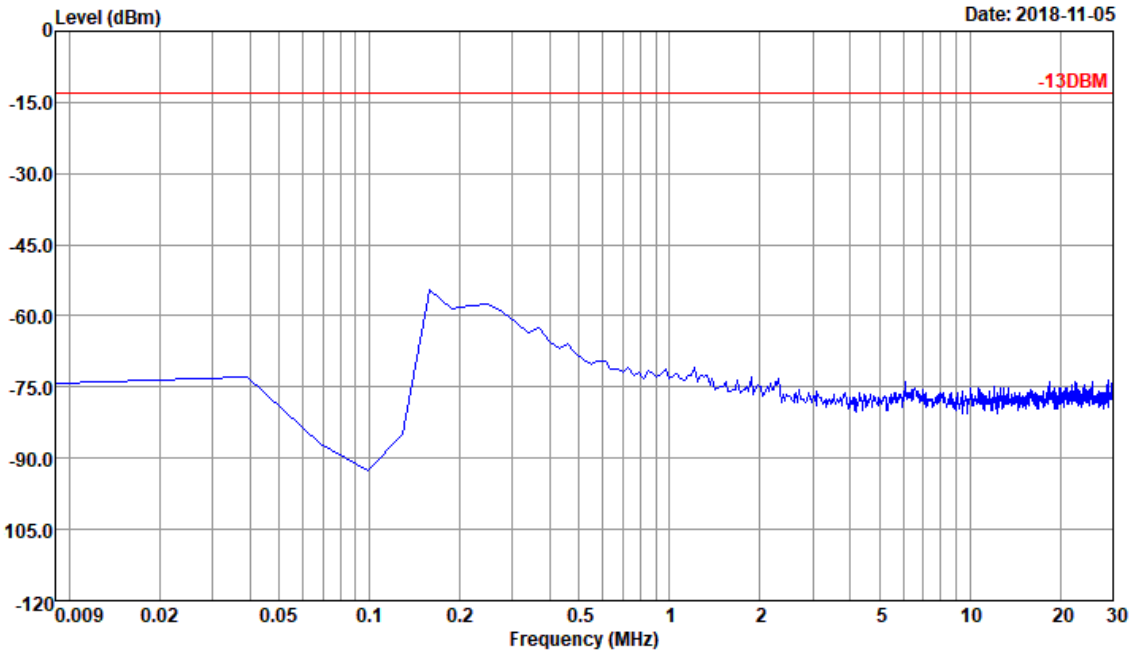
#### 7.1 For UMTS

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

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

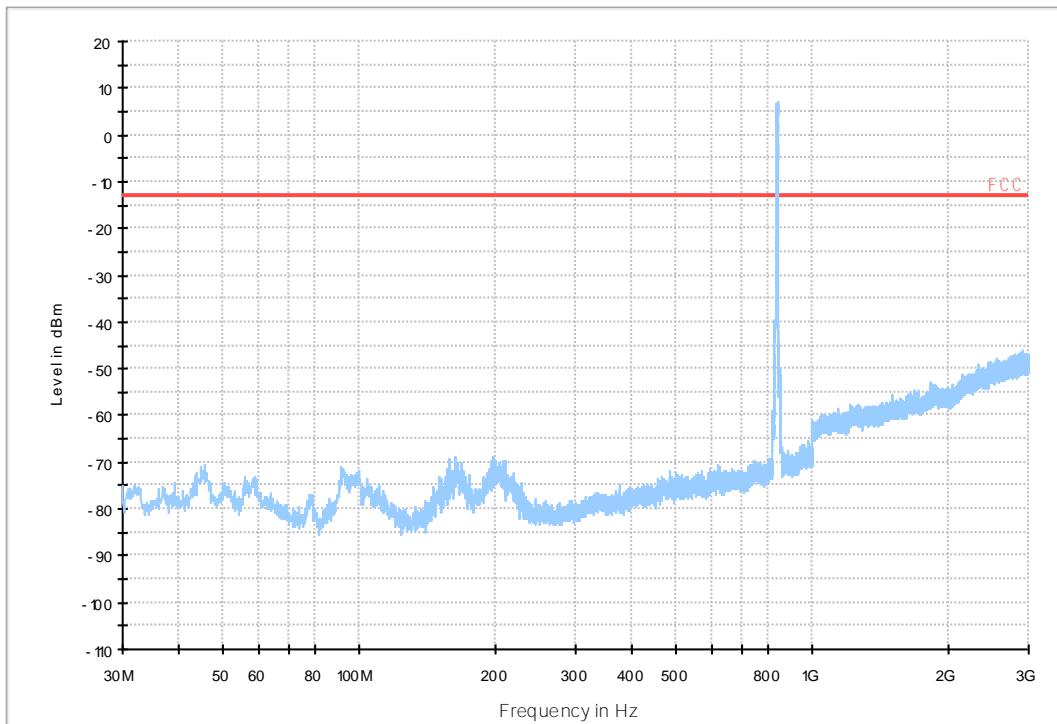


Data: 48

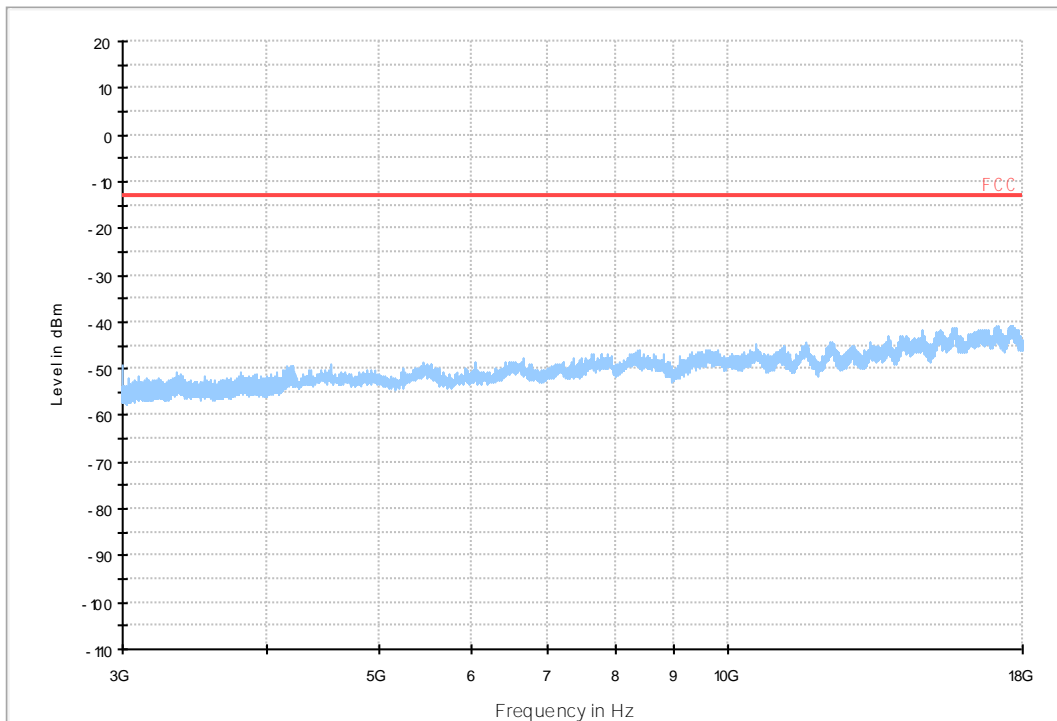


Site : 03CH01-SZ  
Condition : -13DBM 9K-30M AMP NEUTRAL  
: RBW:0.200KHz VBW:0.600KHz  
: DUB-LX1#6 WCDMA

06 FCC PART 22 WCDMA850\_L



05 FCC PART 22 WCDMA850\_H





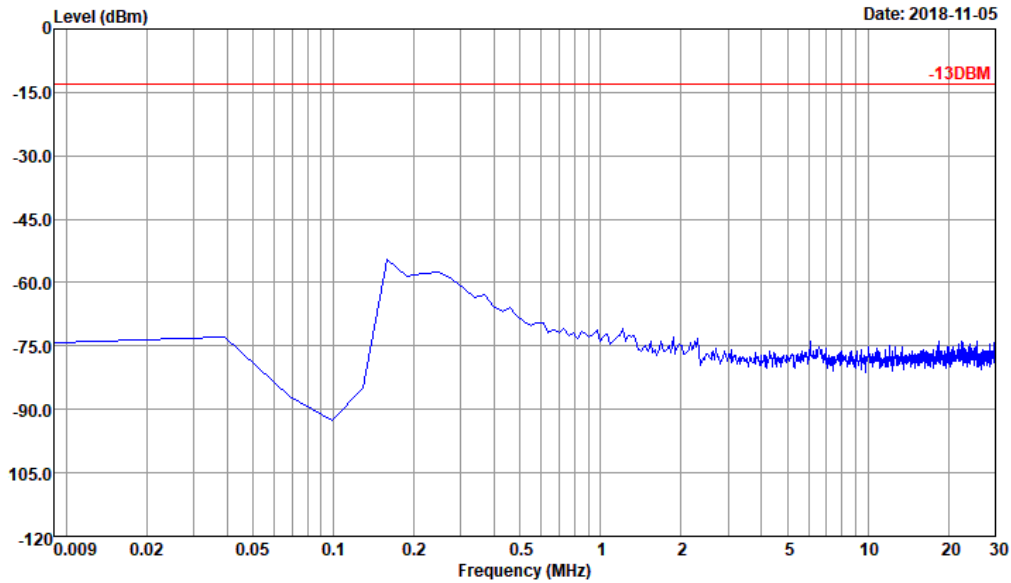
### 7.1.5 Test Band = WCDMA1900\_ANT1

#### 7.1.5.1 Test Mode = UMTS/TM1



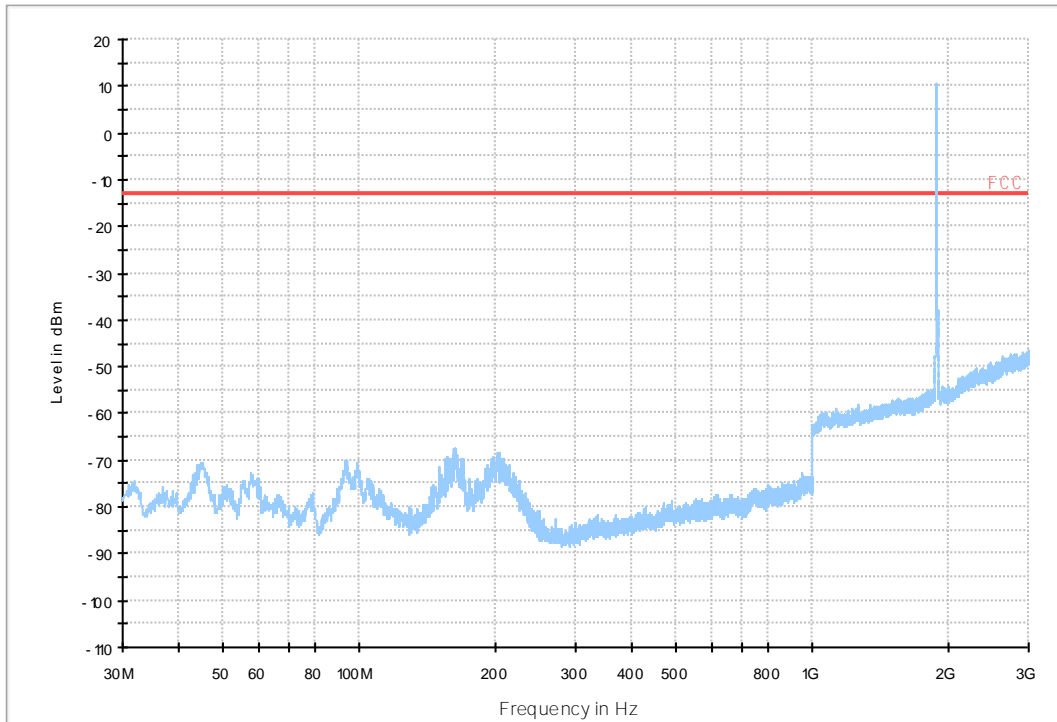
Data: 46

Date: 2018-11-05

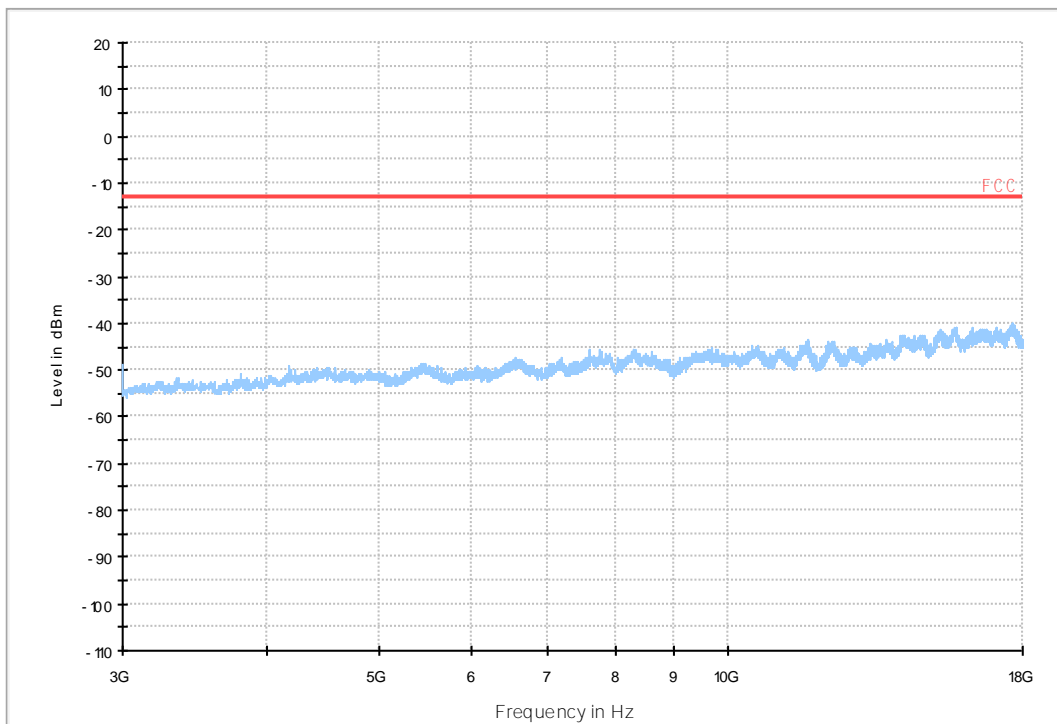


Site : 03CH01-SZ  
Condition : -13DBM 9K-30M AMP NEUTRAL  
: RBW:0.200KHz VBW:0.600KHz  
: DUB-LX1#6 WCDMA

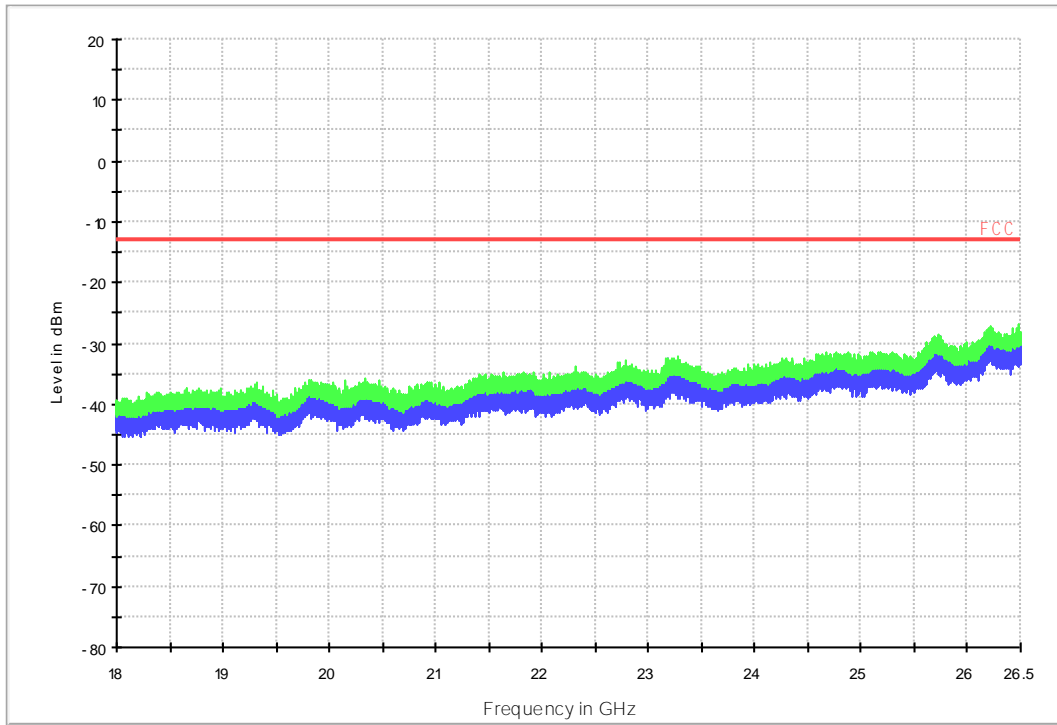
12 FCC PART 24 WCDMA1900\_L



11 FCC PART 24 WCDMA1900\_H



18G-26.5G RSE-TX-DIRECT OR ABOVE 1.5G PK



## 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	1.24	0.00067	PASS
				VN	-1.17	-0.00063	PASS
				VH	-0.52	-0.00028	PASS
		MCH	TN	VL	-4.49	-0.00239	PASS
				VN	-5.89	-0.00313	PASS
				VH	-1.02	-0.00054	PASS
		HCH	TN	VL	-4.81	-0.00252	PASS
				VN	-4.91	-0.00257	PASS
				VH	-6.04	-0.00317	PASS
WCDMA850	UMTS/TM1	LCH	TN	VL	-0.67	-0.00036	PASS
				VN	-0.08	-0.00004	PASS
				VH	-4.1	-0.00221	PASS
		MCH	TN	VL	0.56	0.0003	PASS
				VN	1.4	0.00074	PASS
				VH	-1.48	-0.00079	PASS
		HCH	TN	VL	-0.03	-0.00002	PASS
				VN	-2.69	-0.00141	PASS
				VH	-1.59	-0.00083	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	0.72	0.00039	PASS
				-20	0.02	0.00001	PASS
				-10	0.9	0.00049	PASS
				0	0.18	0.0001	PASS
				10	3.23	0.00174	PASS
				20	-0.09	-0.00005	PASS
				30	-1.21	-0.00065	PASS

		MCH	VN	40	-0.61	-0.00033	PASS		
				50	0.84	0.00045	PASS		
				-30	-3.74	-0.00199	PASS		
				-20	-2.27	-0.00121	PASS		
				-10	-2.29	-0.00122	PASS		
				0	1.22	0.00065	PASS		
				10	-0.38	-0.0002	PASS		
				20	0.95	0.00051	PASS		
				30	-2	-0.00106	PASS		
				40	-1.74	-0.00093	PASS		
		50	-2.81	-0.00149	PASS				
		HCH	VN	-30	-2.75	-0.00144	PASS		
				-20	-6.21	-0.00326	PASS		
				-10	-3.83	-0.00201	PASS		
				0	-3.57	-0.00187	PASS		
				10	-3.75	-0.00197	PASS		
				20	-6.39	-0.00335	PASS		
				30	-5.75	-0.00301	PASS		
				40	-3.89	-0.00204	PASS		
				50	-5.42	-0.00284	PASS		
				WCDMA850	UMTS/TM1	LCH	VN	-30	0.63
		-20	2.96					0.0016	PASS
		-10	-0.21					-0.00011	PASS
		0	-2					-0.00108	PASS
		10	0.09					0.00005	PASS
		20	1.53					0.00083	PASS
		30	2.11					0.00114	PASS
		40	-0.38					-0.00021	PASS
50	-0.35	-0.00019	PASS						
MCH	VN	-30	0.53			0.00028	PASS		
		-20	-1.95			-0.00104	PASS		
		-10	-0.12			-0.00006	PASS		
		0	-4.85			-0.00258	PASS		
		10	2.15			0.00114	PASS		
		20	-0.84			-0.00045	PASS		
		30	2.06			0.0011	PASS		
		40	-1.74			-0.00093	PASS		
		50	0.76			0.0004	PASS		
HCH	VN	-30	-0.87	-0.00046	PASS				
		-20	-0.58	-0.0003	PASS				
		-10	0.82	0.00043	PASS				



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				0	-2.44	-0.00128	PASS
				10	2.12	0.00111	PASS
				20	-0.98	-0.00051	PASS
				30	1.48	0.00078	PASS
				40	1.16	0.00061	PASS
				50	1.01	0.00053	PASS

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END