



# 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	24.08	16.53	38.5	PASS
		MCH	24.11	16.56	38.5	PASS
		HCH	24.06	16.51	38.5	PASS
Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
WCDMA1700	UMTS/TM1	LCH	23.32	23.22	30	PASS
		MCH	23.33	23.23	30	PASS
		HCH	23.47	23.37	30	PASS
WCDMA1900	UMTS/TM1	LCH	23.40	23.70	33	PASS
		MCH	23.43	23.73	33	PASS
		HCH	23.42	23.72	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,

$$ERP [dBm] = SGP [dBm] - Cable Loss [dB] + Gain [dBd]$$

$$EIRP [dBm] = SGP [dBm] - Cable Loss [dB] + Gain [dBi]$$

b, SGP = Signal Generator Level

Note2:

$$SET Span = 1.5 * OBW$$

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

$$SET VBW \geq 3 * RBW$$

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	2.600	13	PASS
		MCH	2.390	13	PASS
		HCH	2.480	13	PASS
WCDMA1700	UMTS/TM1	LCH	2.710	13	PASS
		MCH	2.850	13	PASS
		HCH	2.740	13	PASS
WCDMA1900	UMTS/TM1	LCH	2.710	13	PASS
		MCH	2.610	13	PASS
		HCH	2.540	13	PASS

## 3Appendix\_C: Modulation Characteristics

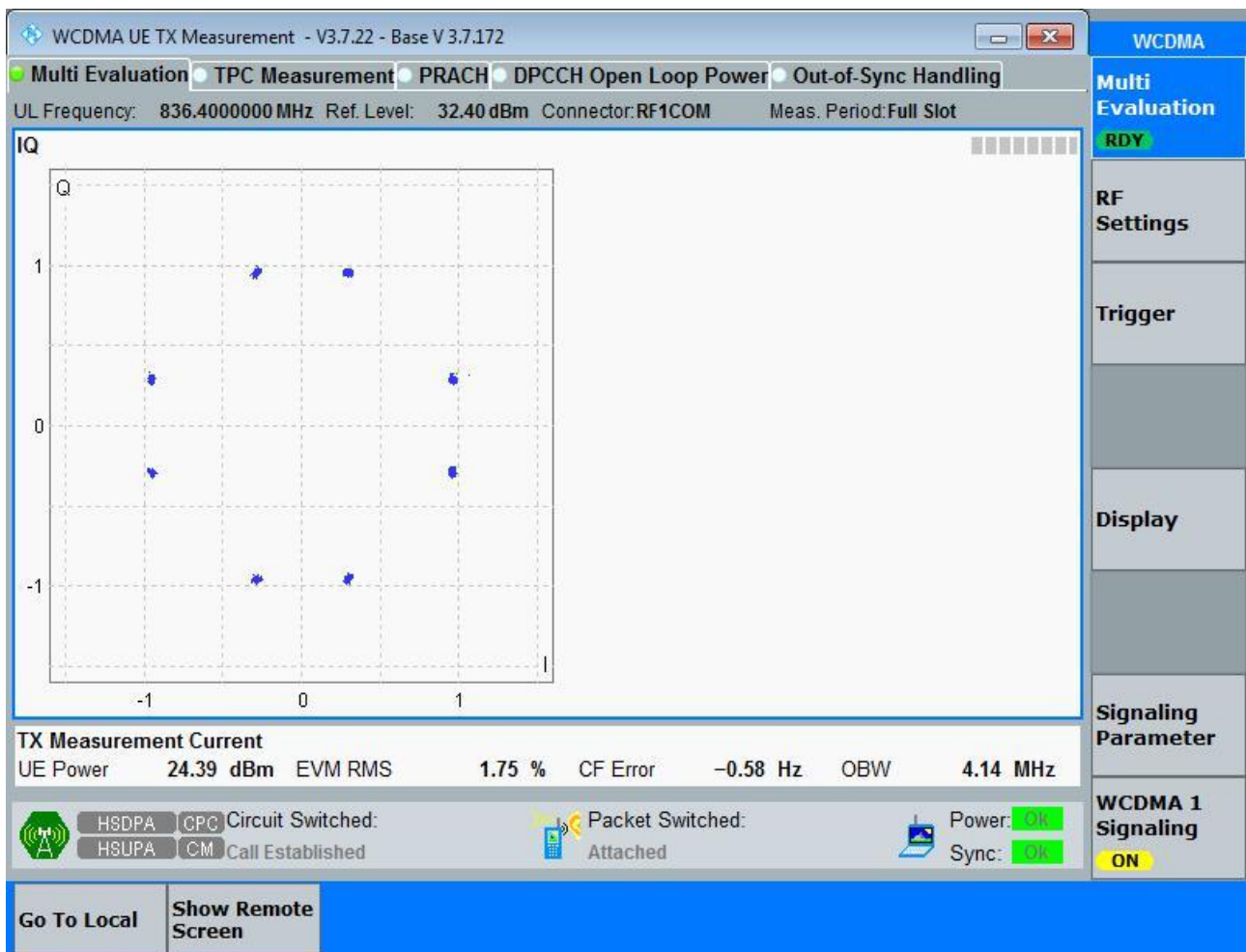
### Part I - Test Plots

#### 3.1 For UMTS

##### 3.1.1 Test Band = WCDMA850

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

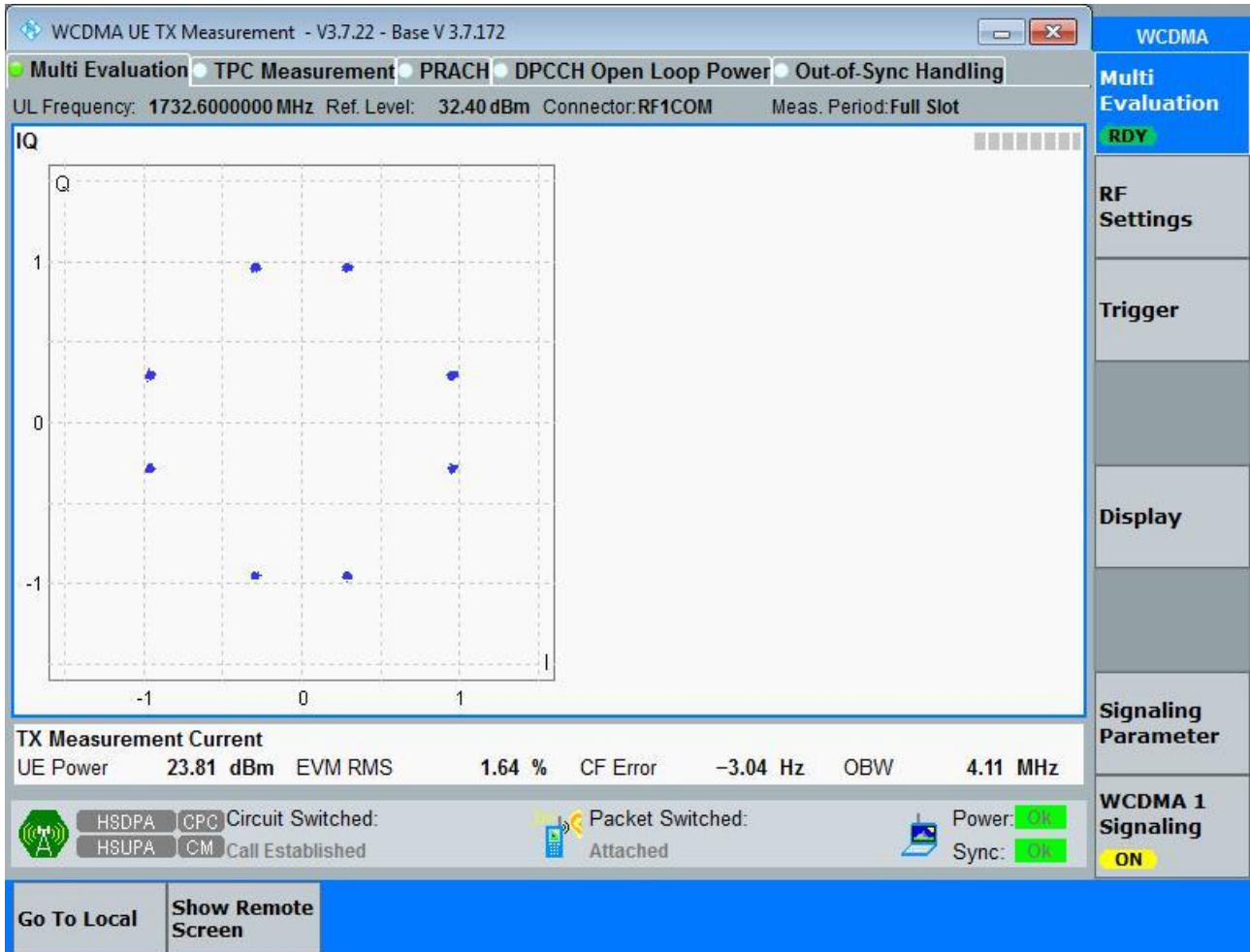
##### 3.1.1.1.1 Test Channel = MCH



### 3.1.2 Test Band = WCDMA1700

#### 3.1.2.1 Test Mode = UMTS/TM1

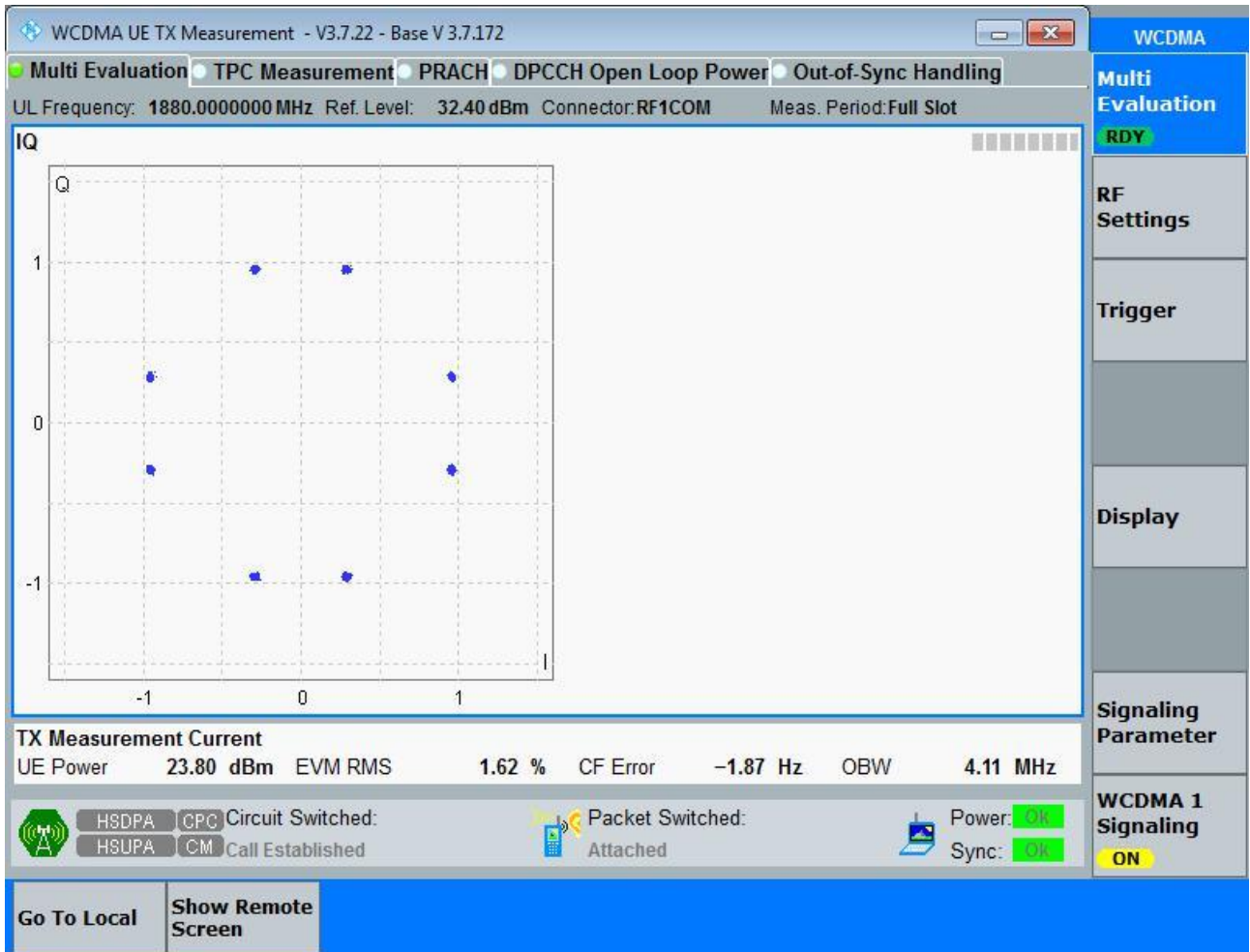
##### 3.1.2.1.1 Test Channel = MCH



### 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	4.17	4.74	Pass
		MCH	4.17	4.73	Pass
		HCH	4.17	4.74	Pass
WCDMA1700	UMTS/TM1	LCH	4.15	4.71	Pass
		MCH	4.16	4.72	Pass
		HCH	4.16	4.71	Pass
WCDMA1900	UMTS/TM1	LCH	4.16	4.73	Pass
		MCH	4.16	4.73	Pass
		HCH	4.17	4.72	Pass

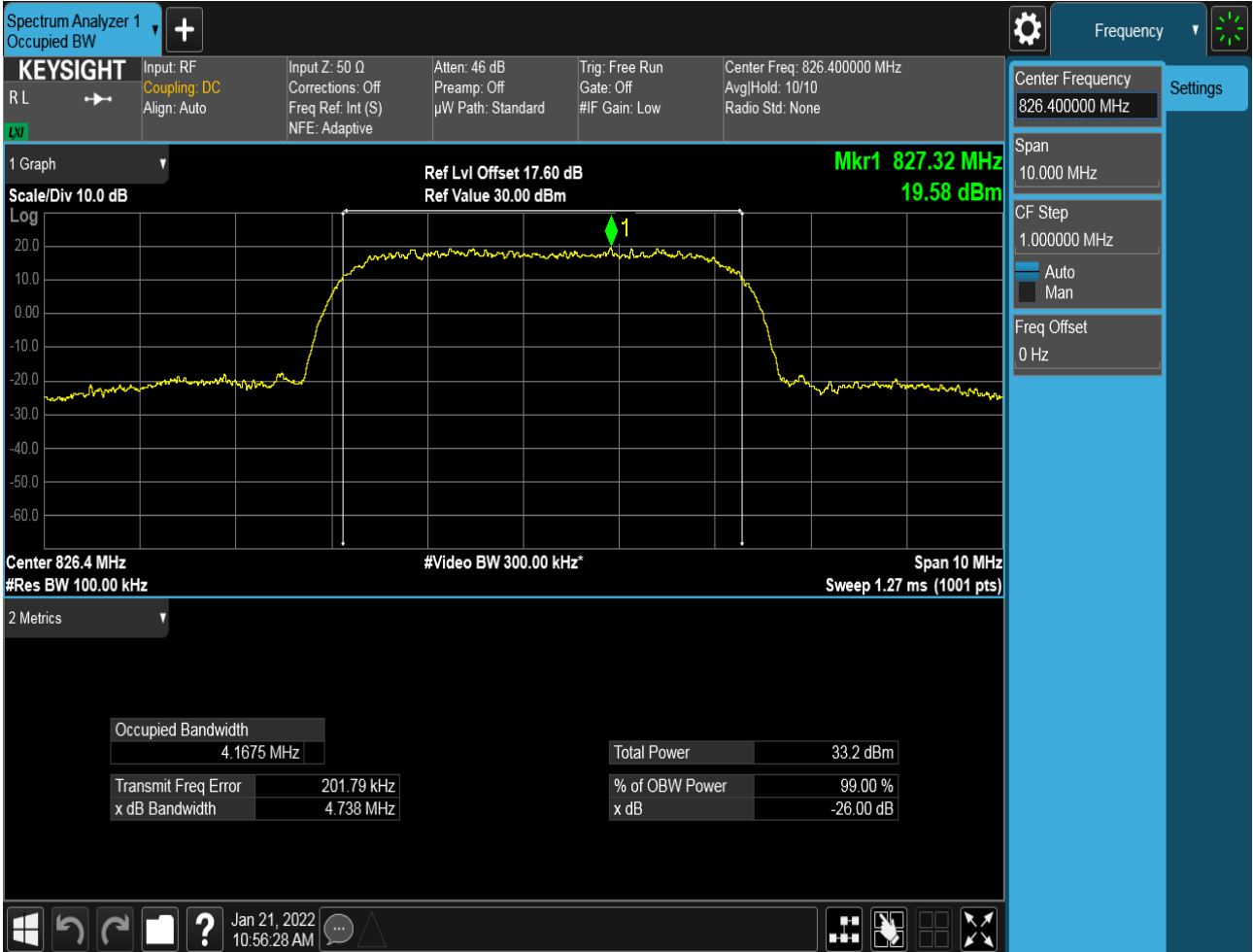
**Part II - Test Plots**

**4.1 For UMTS**

**4.1.1 Test Band = WCDMA850**

**4.1.1.1 Test Mode = UMTS/TM1**

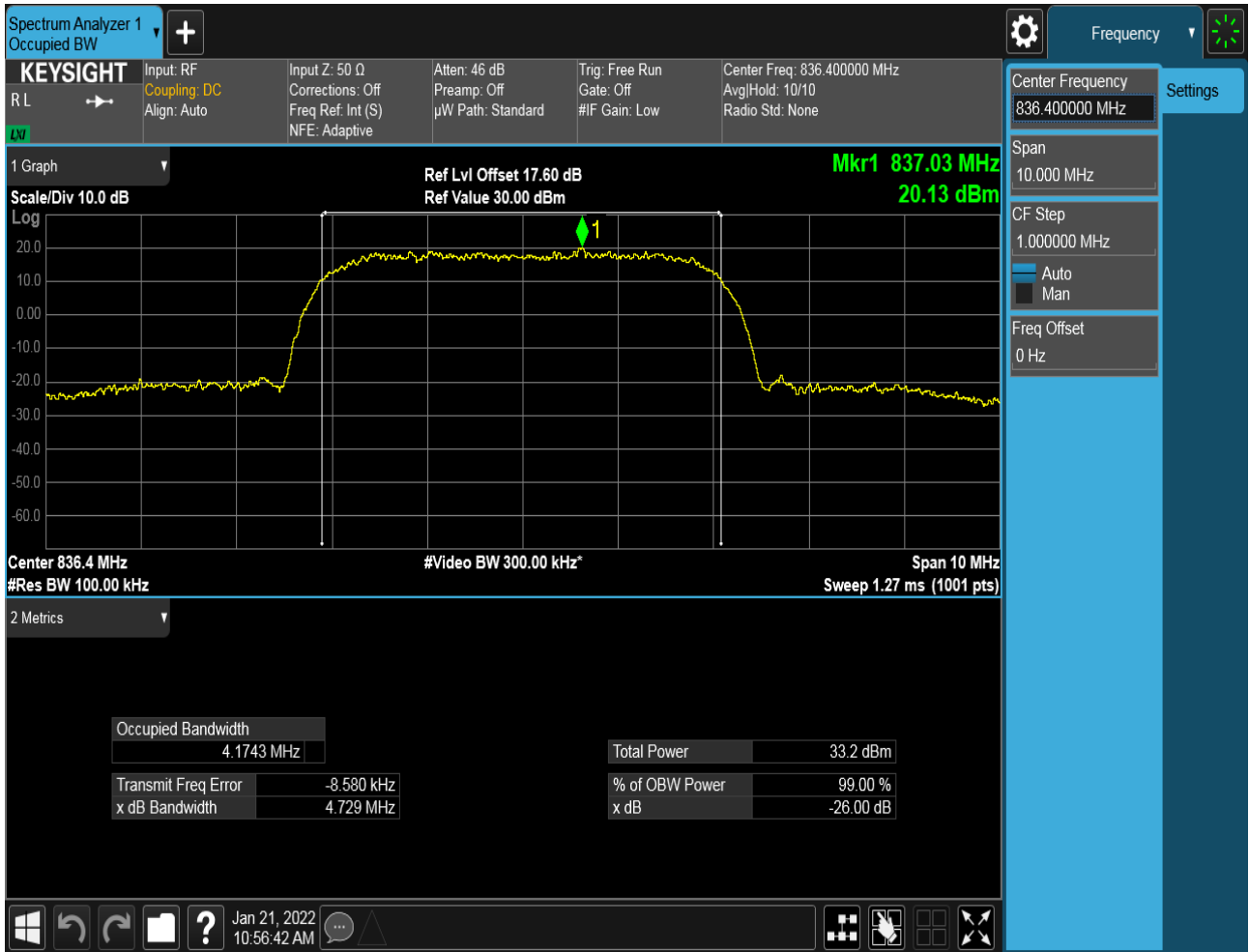
**4.1.1.1.1 Test Channel = LCH**





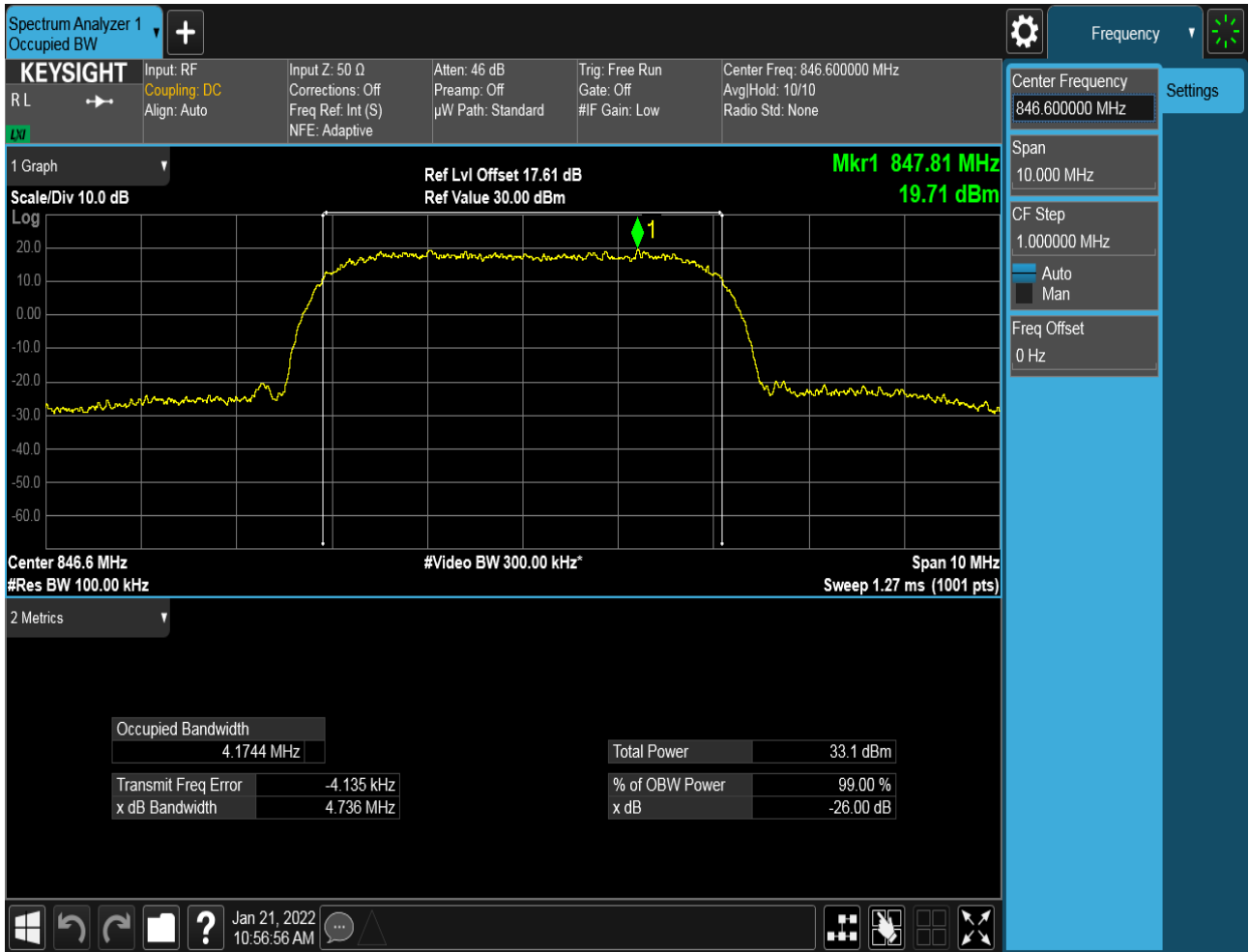


### 4.1.1.1.2 Test Channel = MCH





### 4.1.1.1.3 Test Channel = HCH

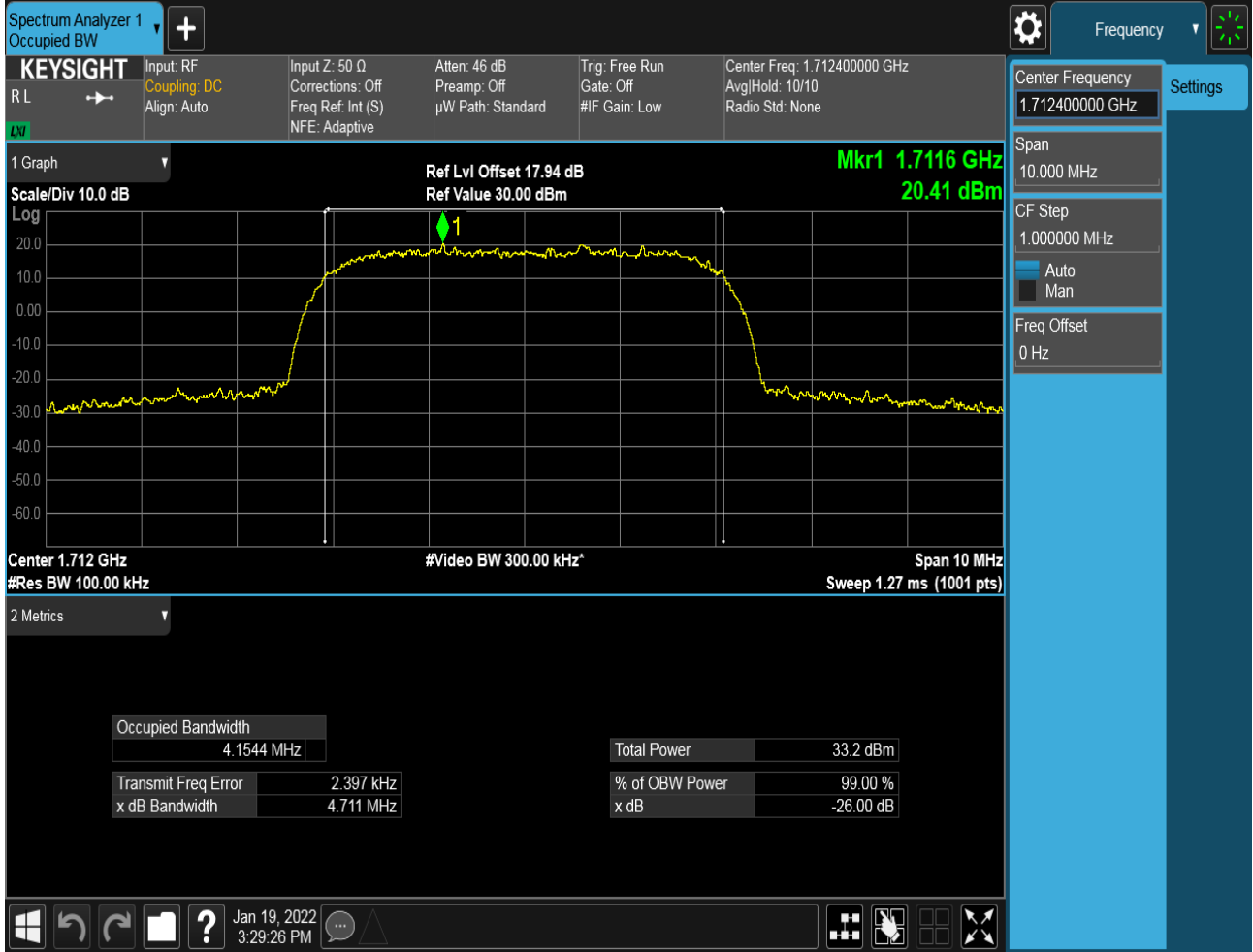




### 4.1.2 Test Band = WCDMA1700

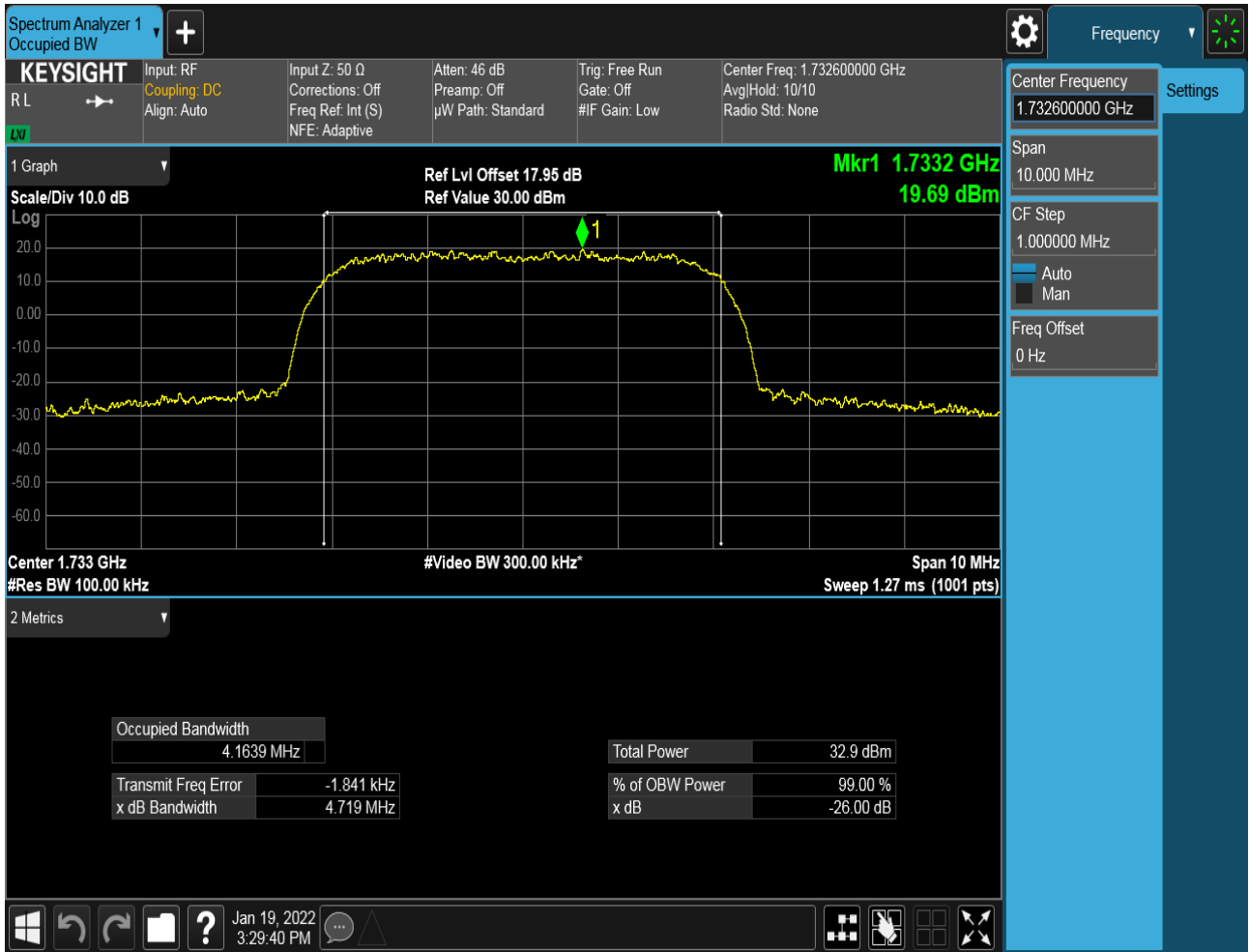
#### 4.1.2.1 Test Mode = UMTS/TM1

##### 4.1.2.1.1 Test Channel = LCH





### 4.1.2.1.2 Test Channel = MCH





### 4.1.2.1.3 Test Channel = HCH

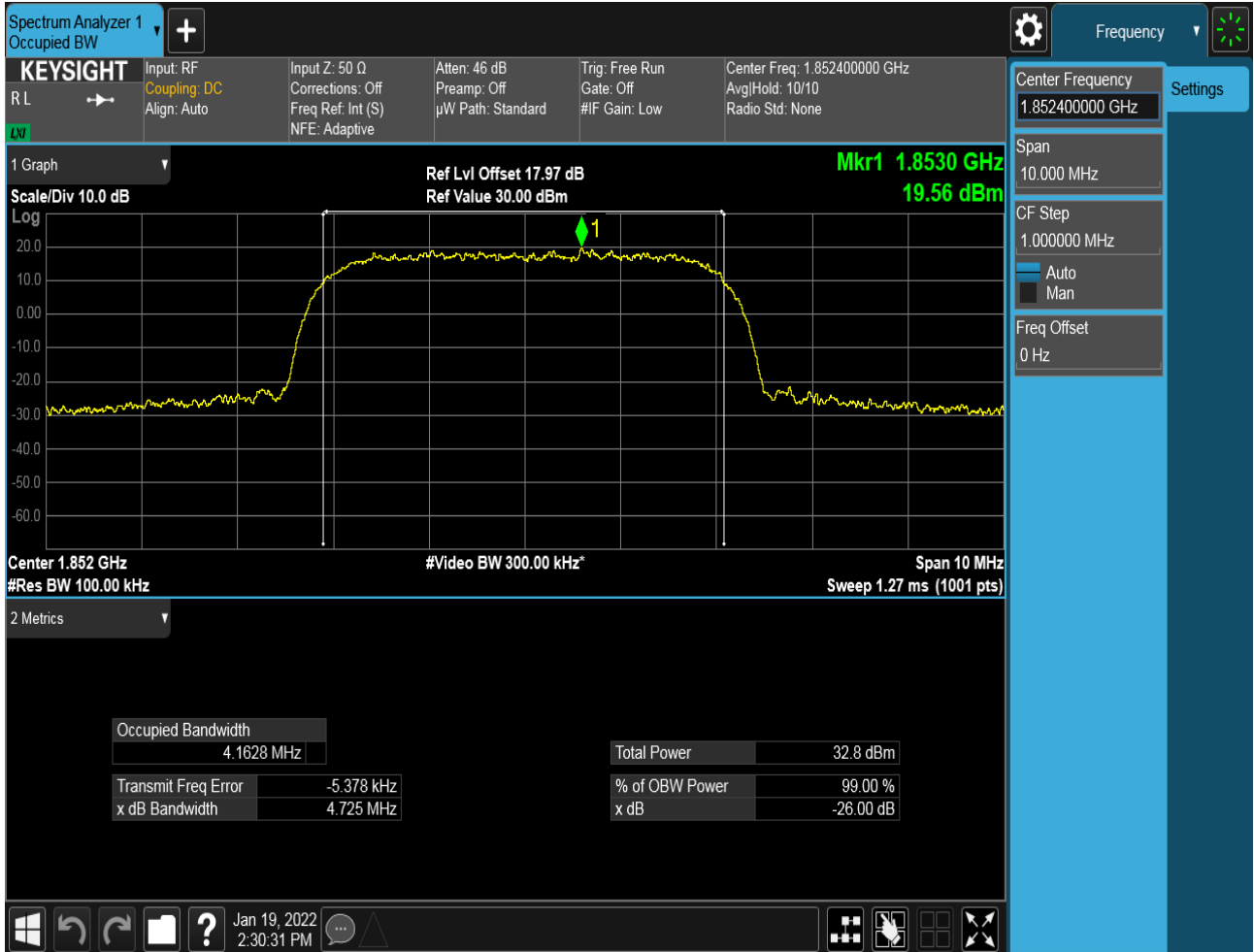




### 4.1.3 Test Band = WCDMA1900

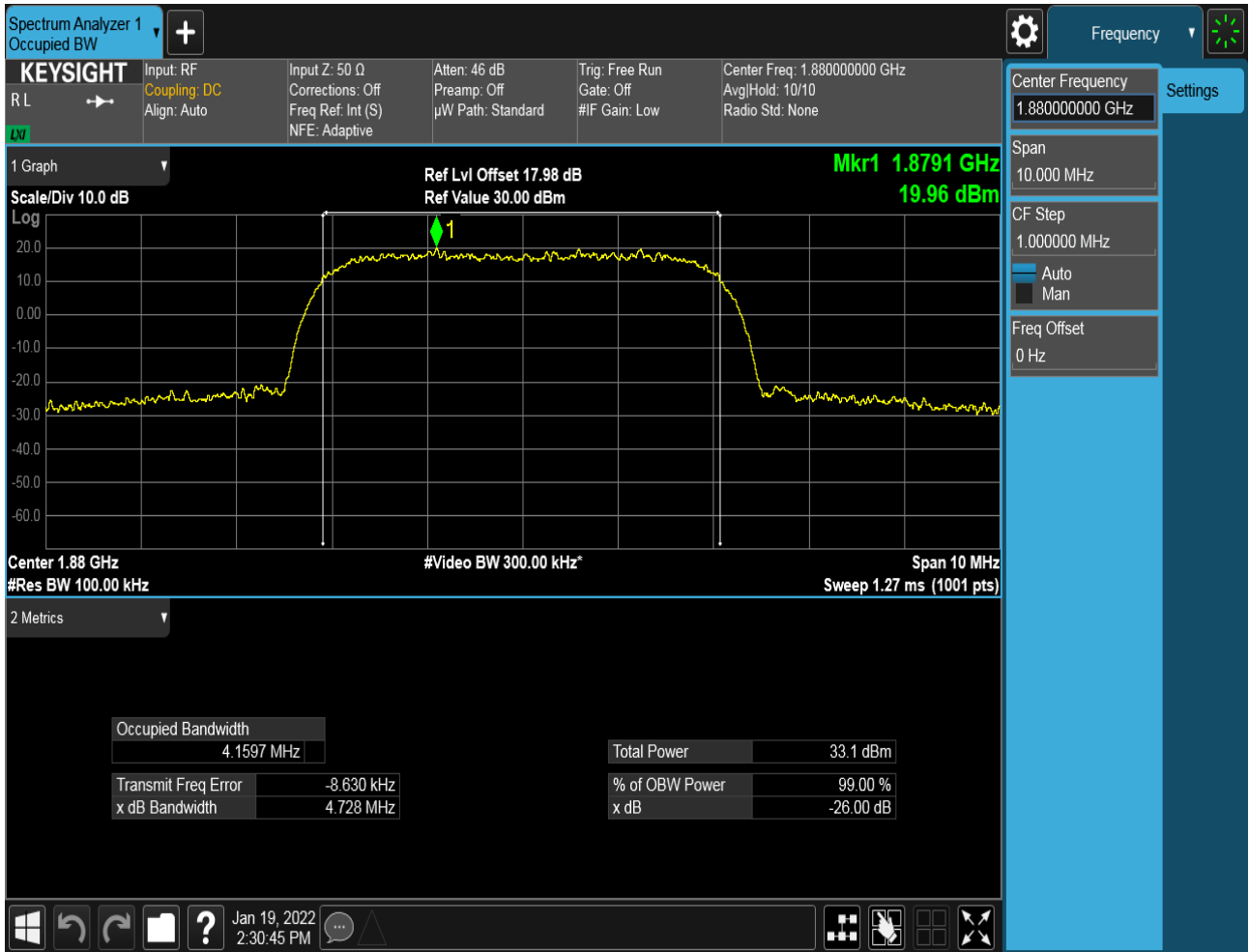
#### 4.1.3.1 Test Mode = UMTS/TM1

##### 4.1.3.1.1 Test Channel = LCH



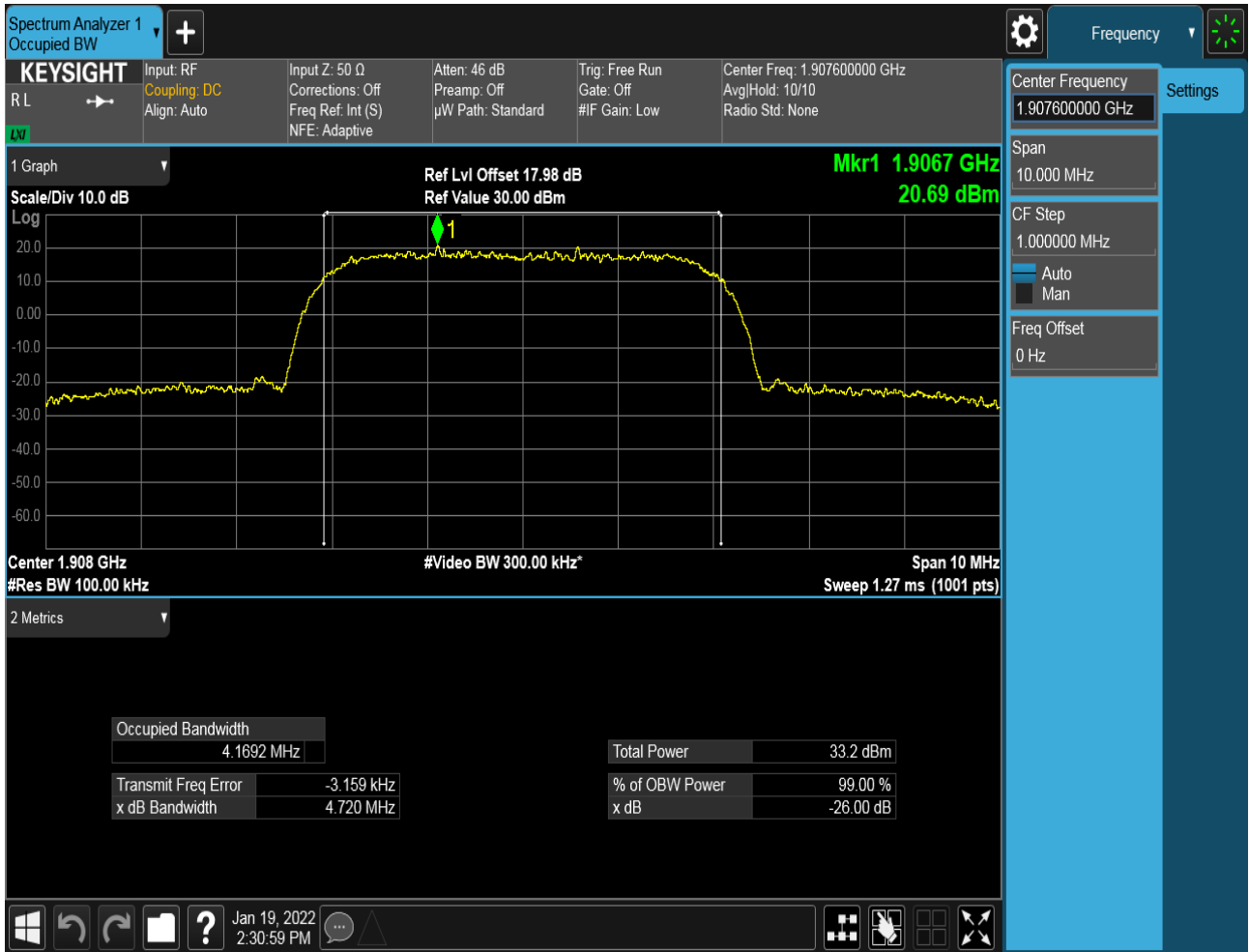


### 4.1.3.1.2 Test Channel = MCH





### 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

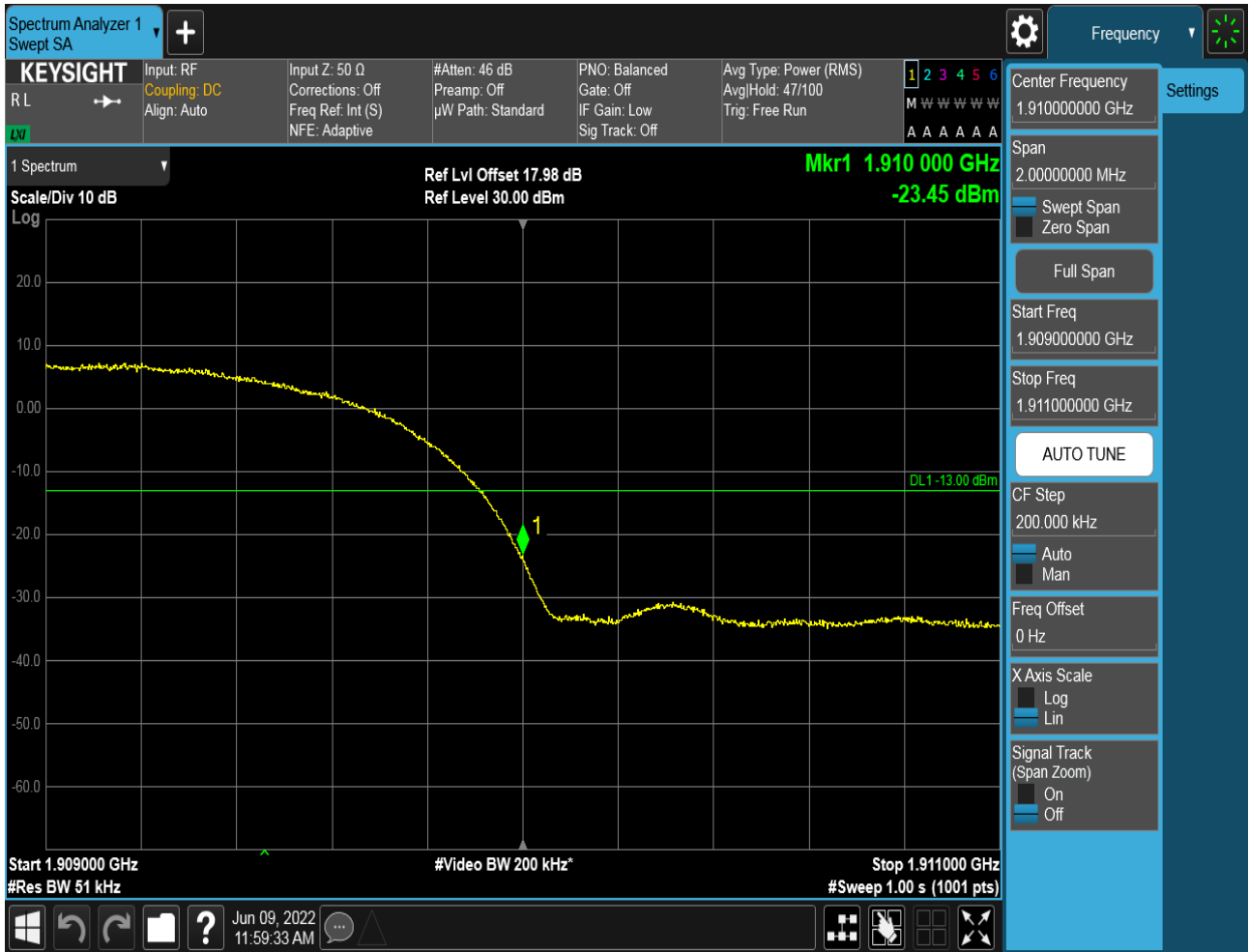
#### 5.1.3.1 Test Mode = UMTS/TM1

##### 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.

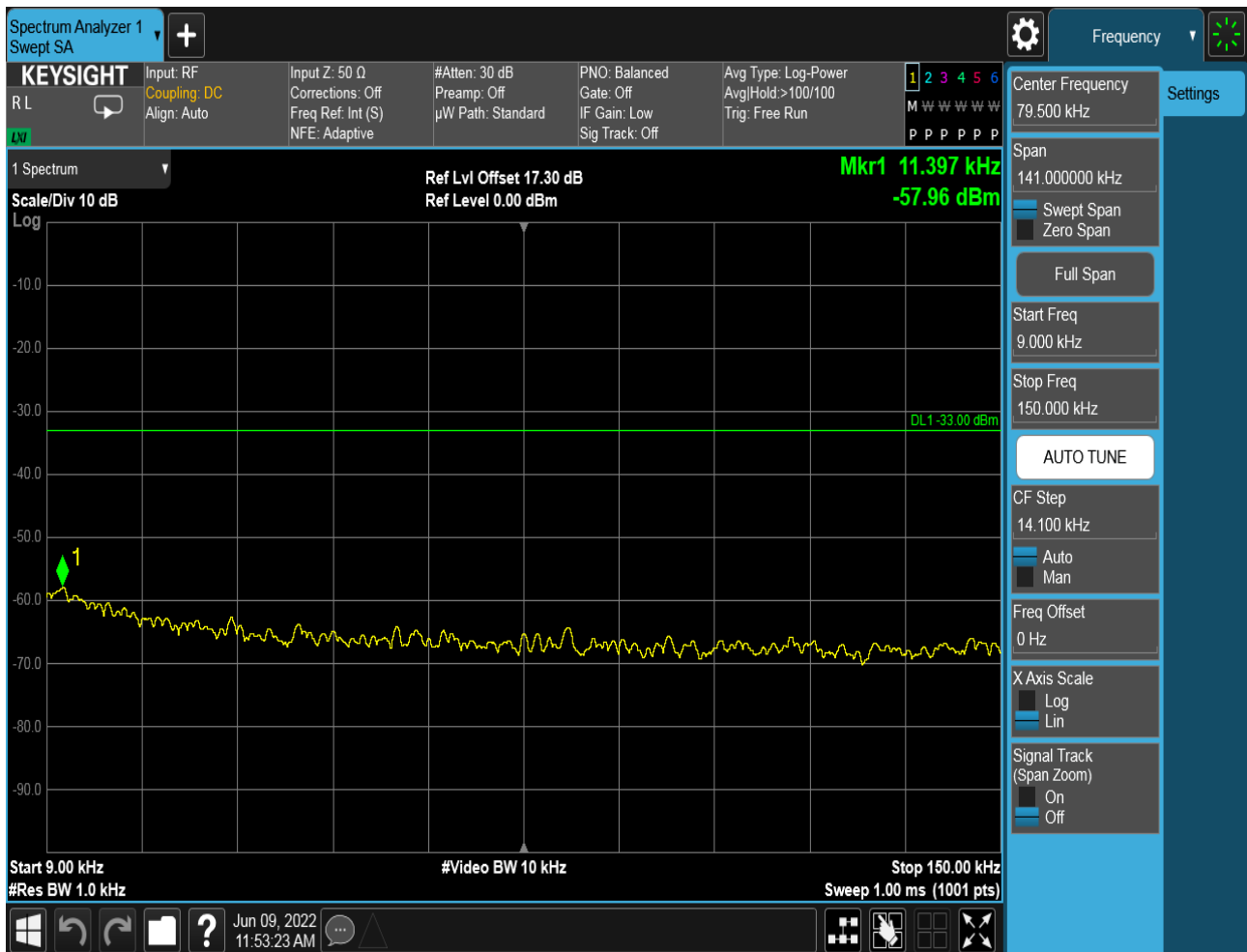
### Part I - Test Plots

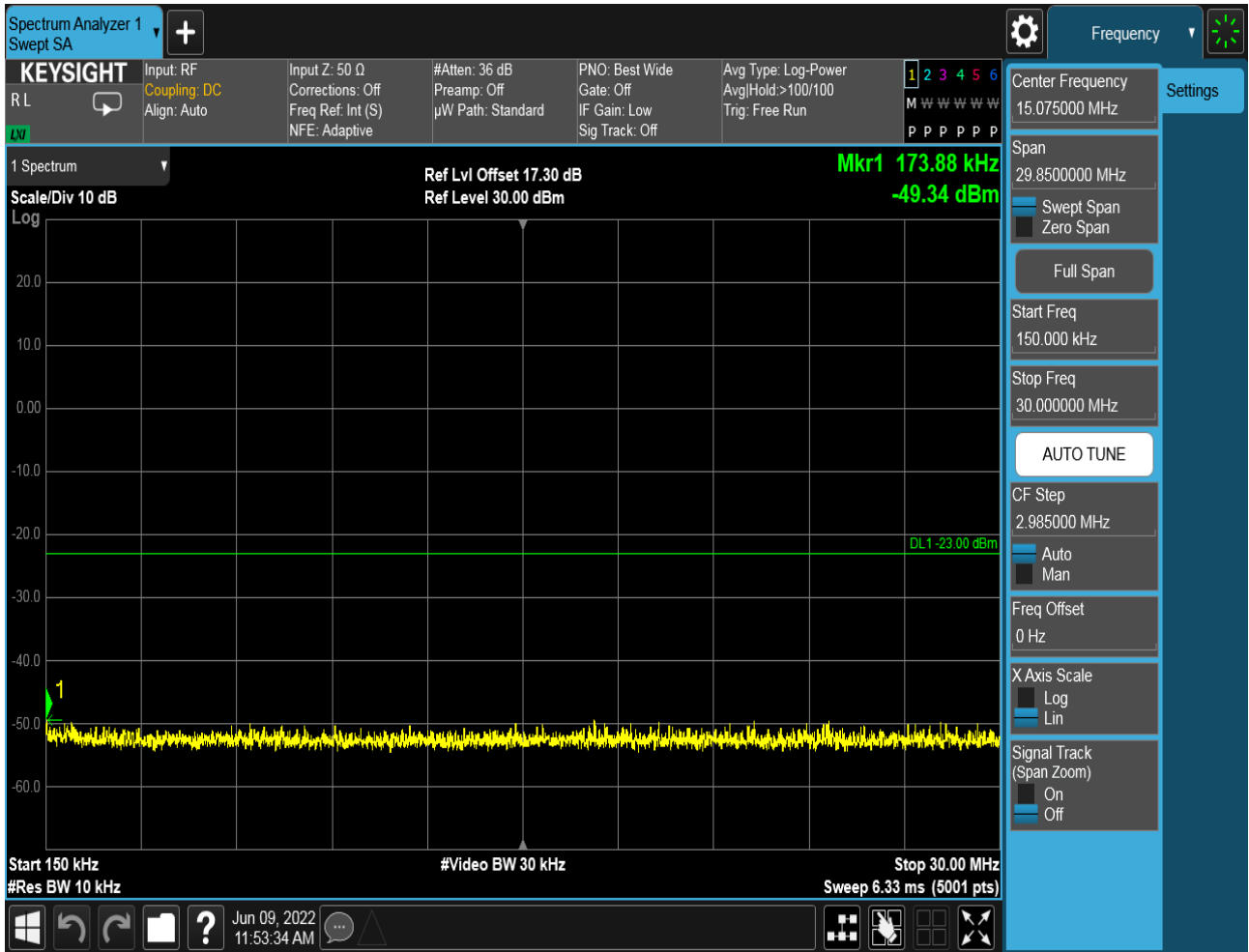
#### 6.1 For UMTS

##### 6.1.1 Test Band = WCDMA850

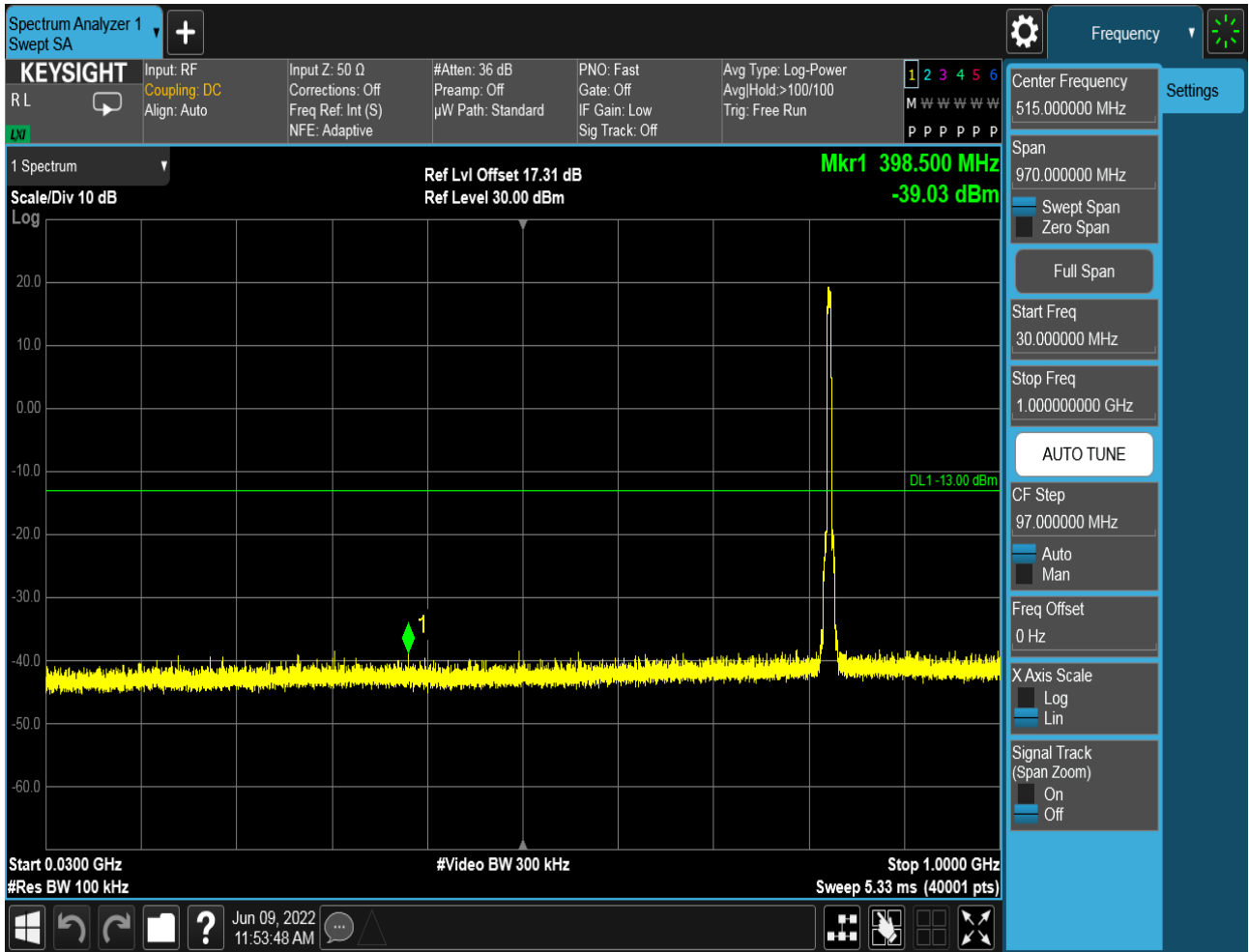
##### 6.1.1.1 Test Mode = UMTS/TM1

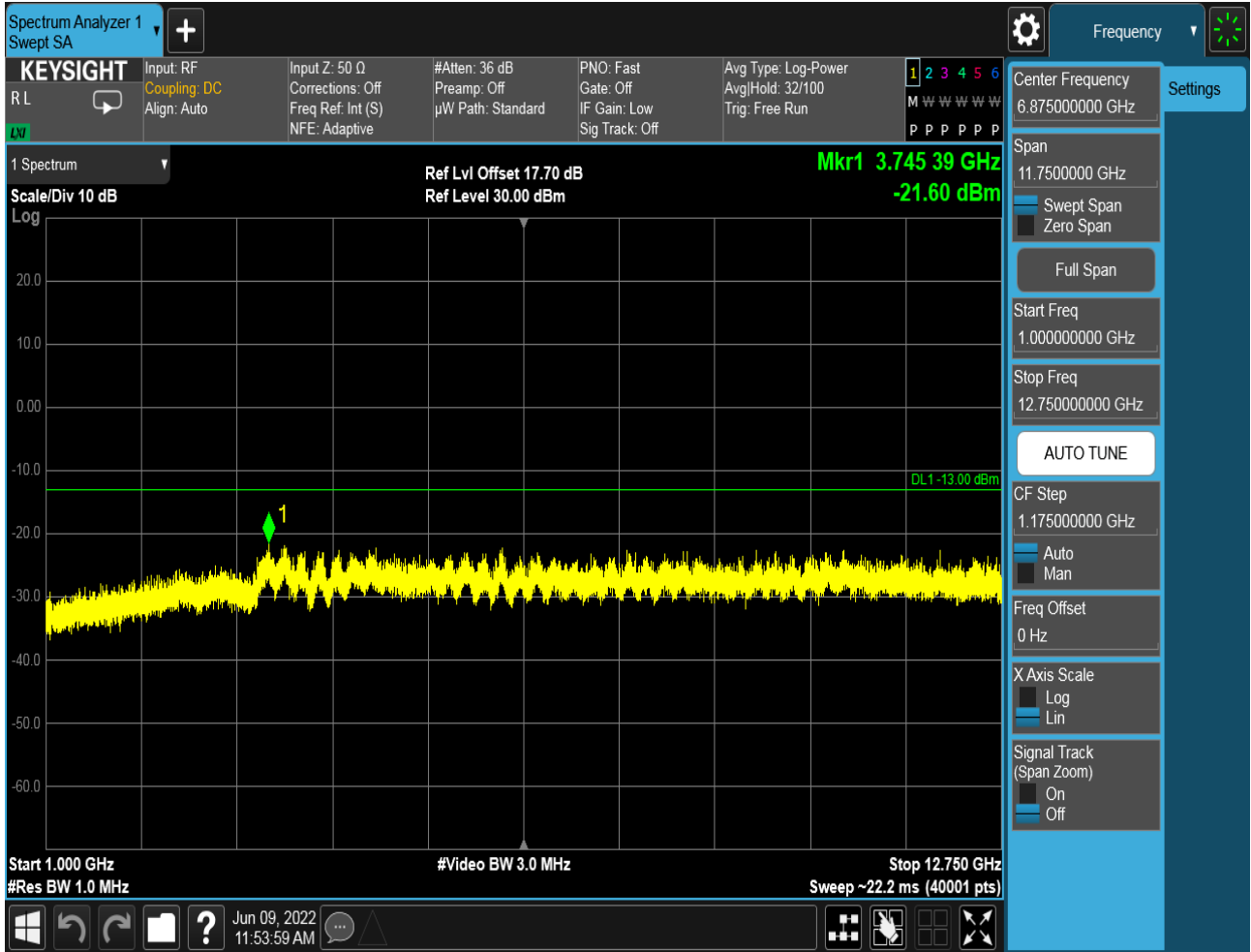
##### 6.1.1.1.1 Test Channel = LCH





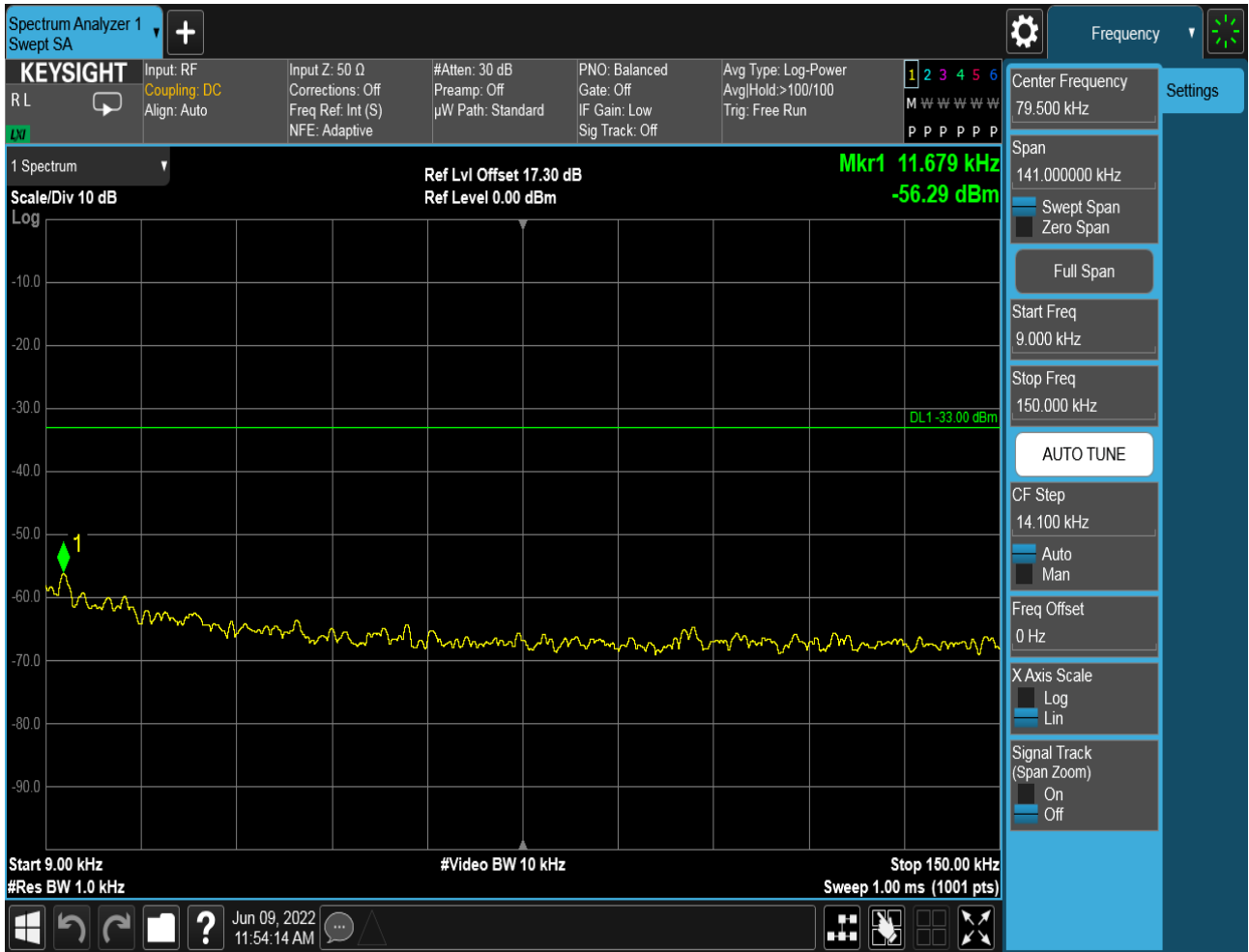


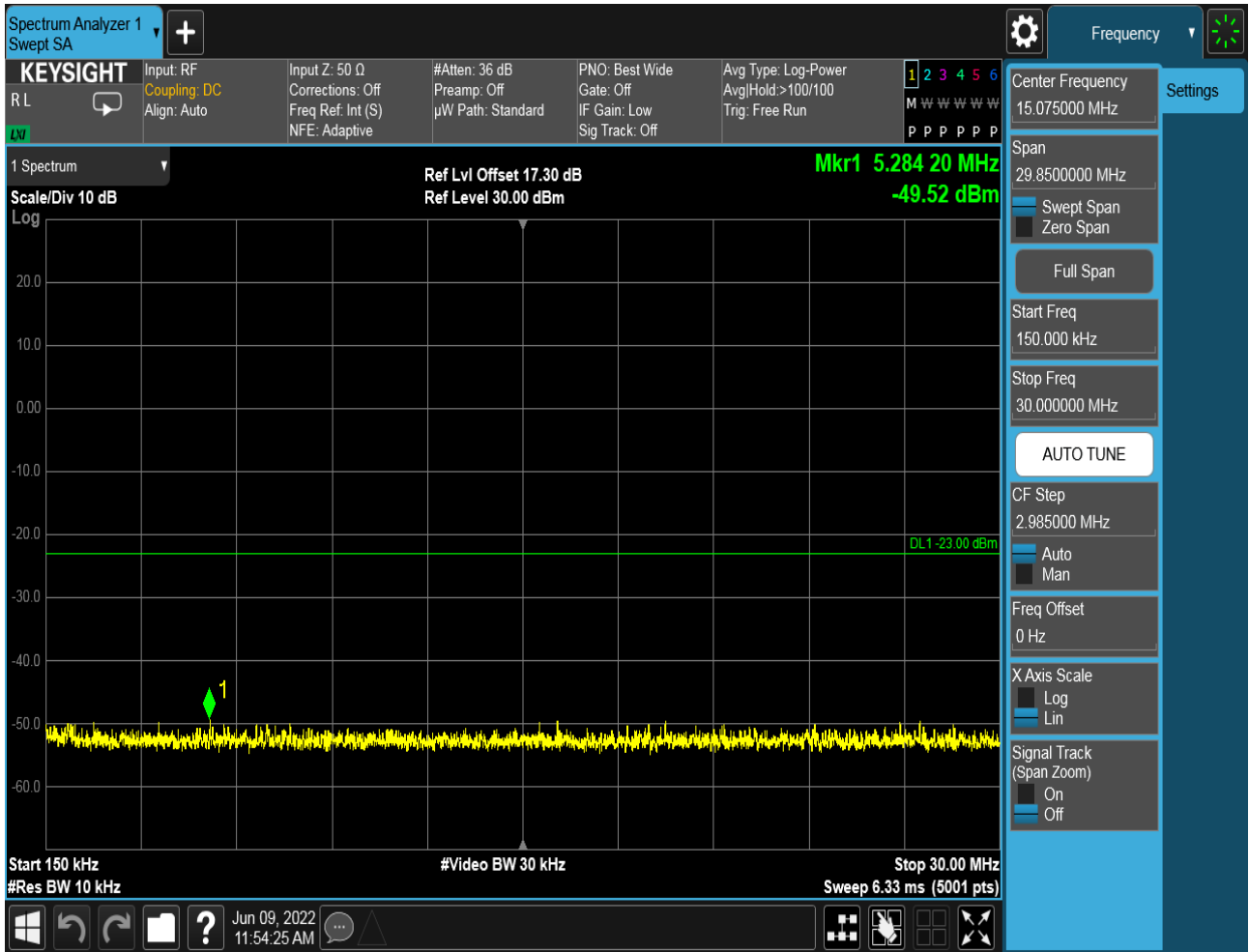


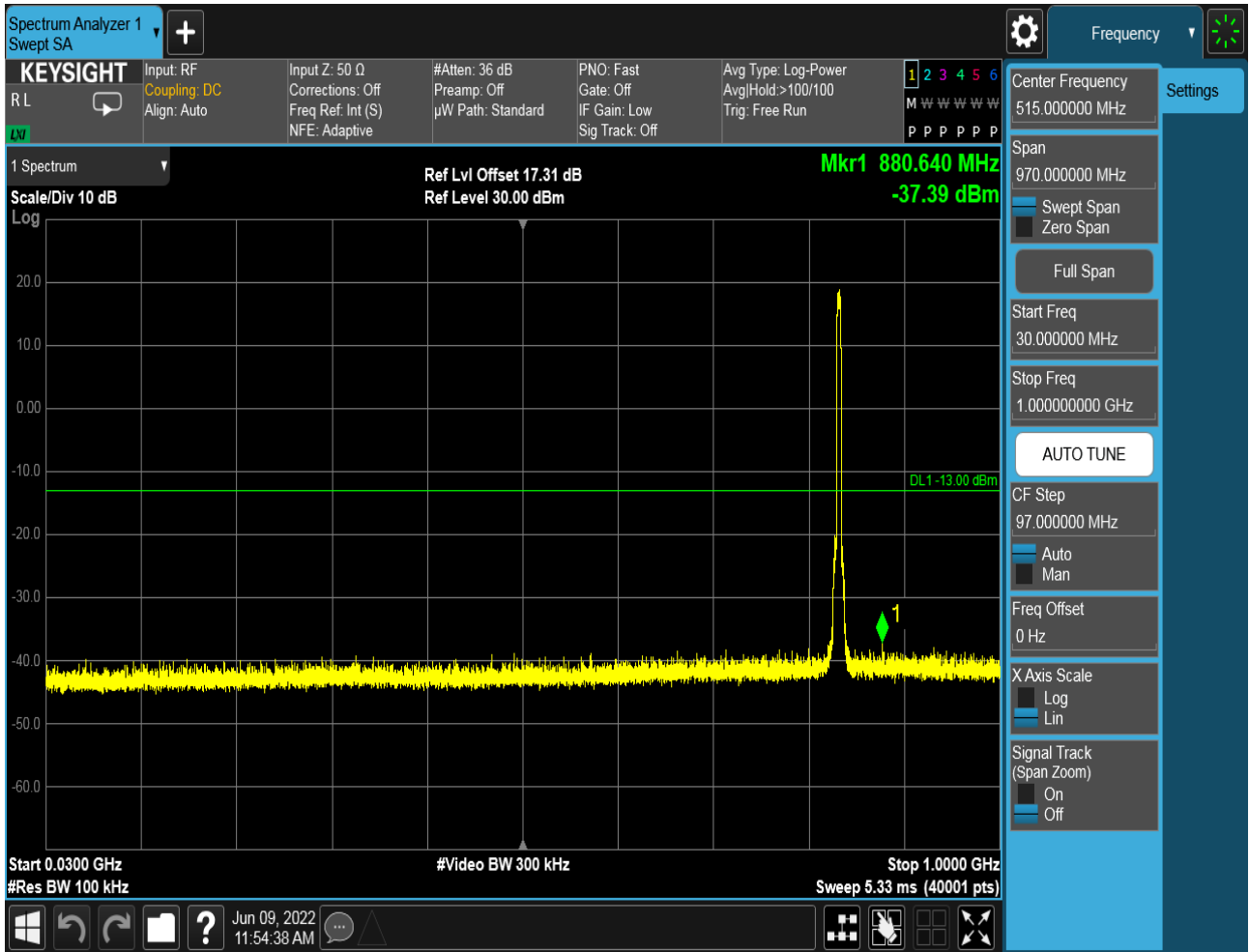


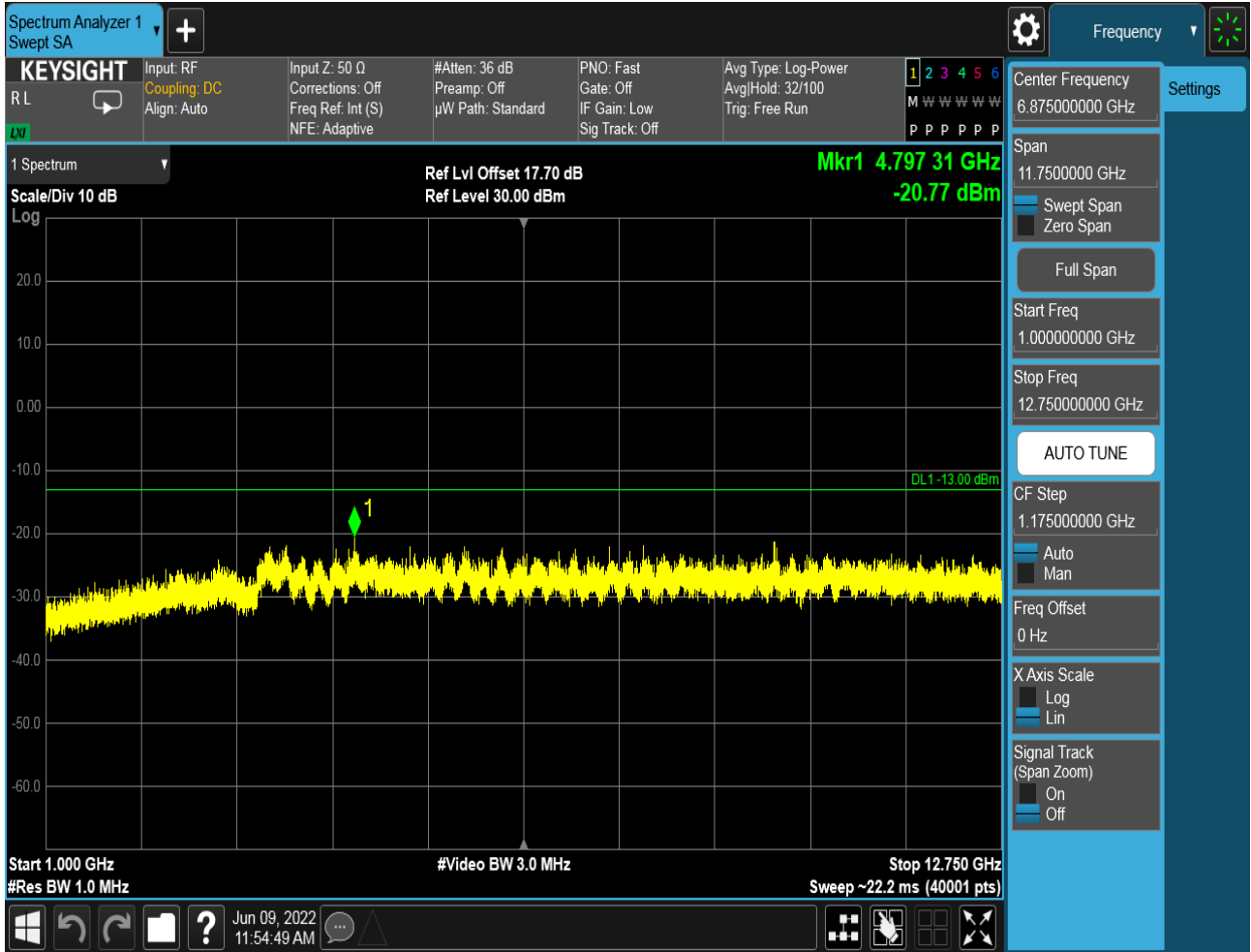


### 6.1.1.1.2 Test Channel = MCH



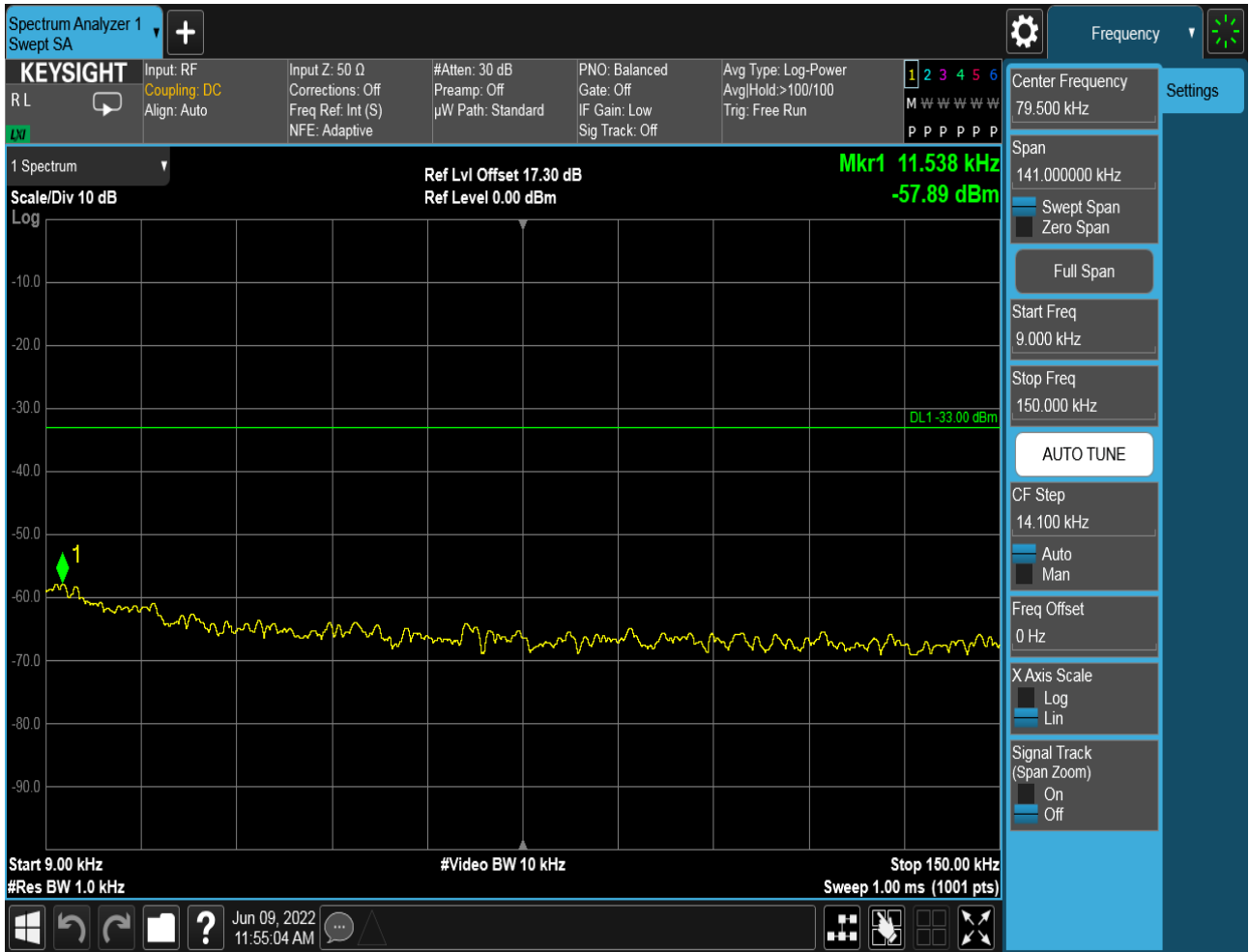


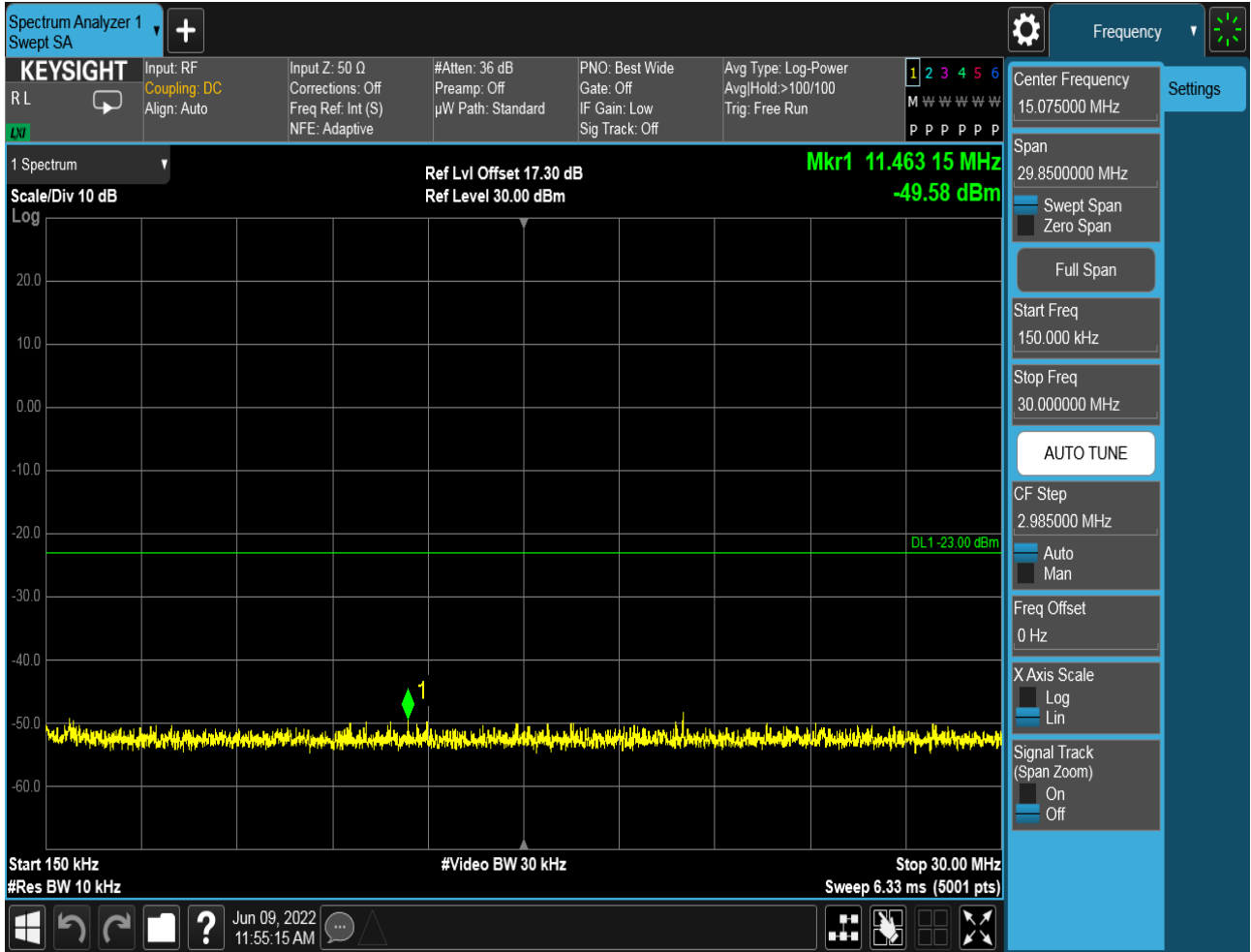




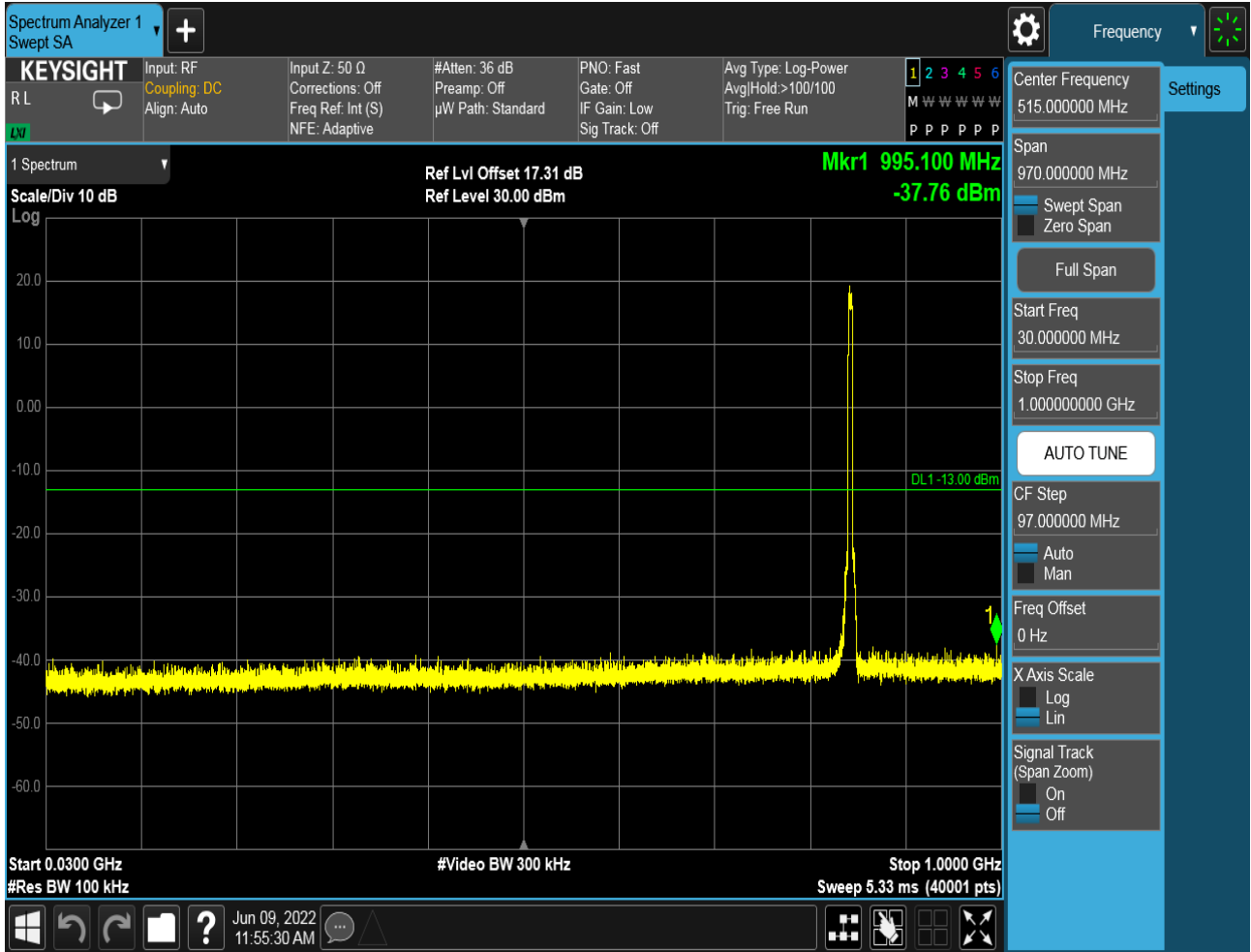


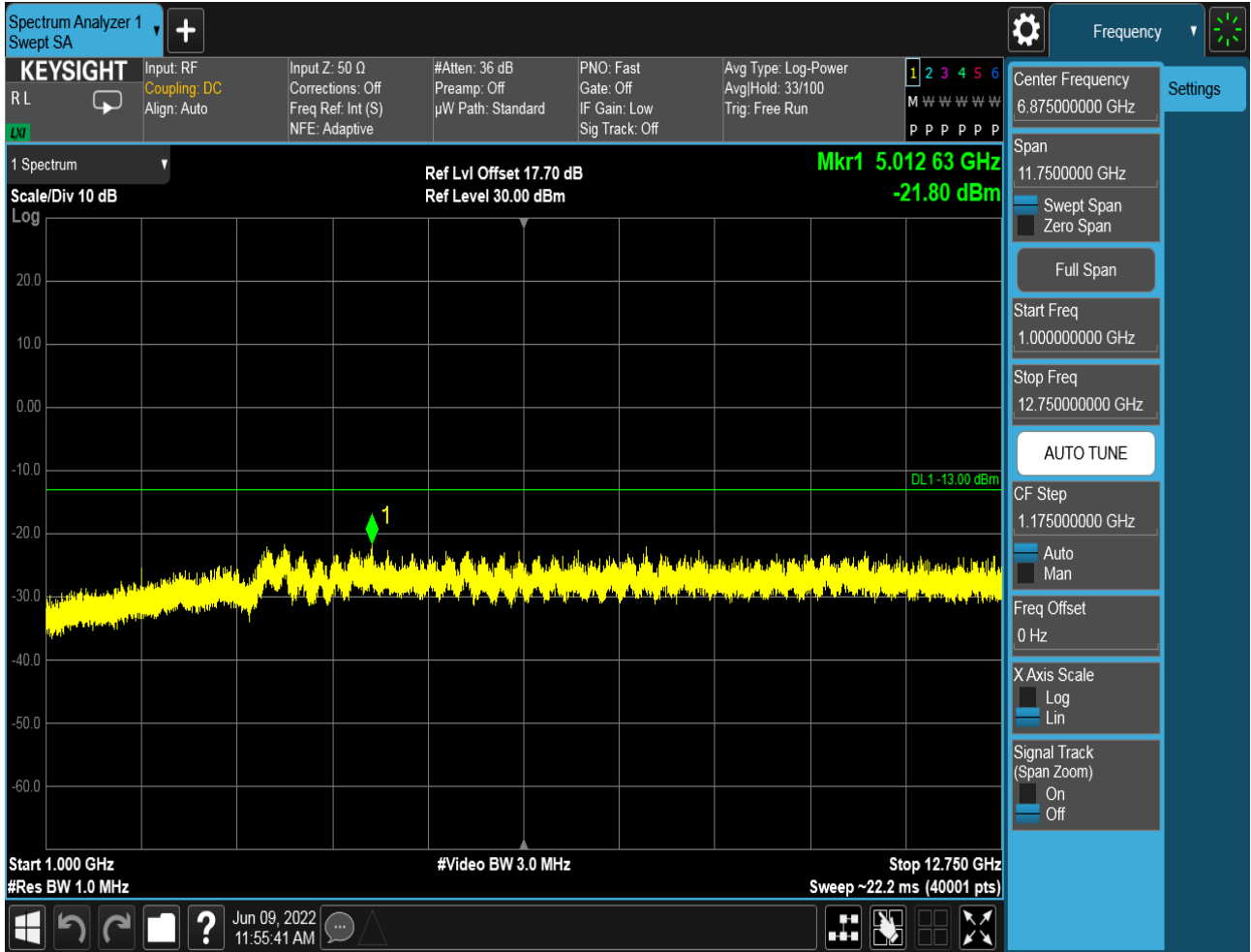
### 6.1.1.1.3 Test Channel = HCH









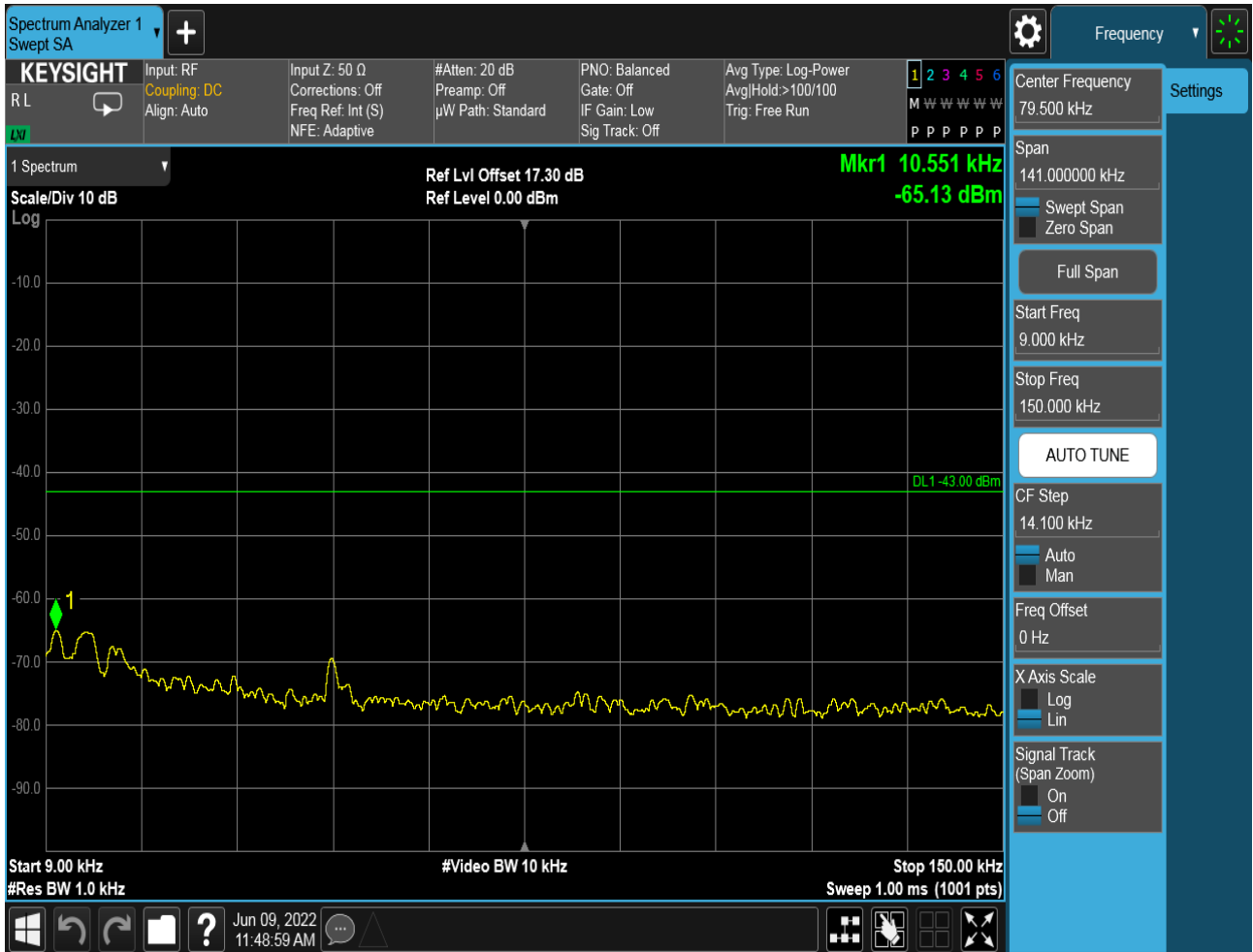


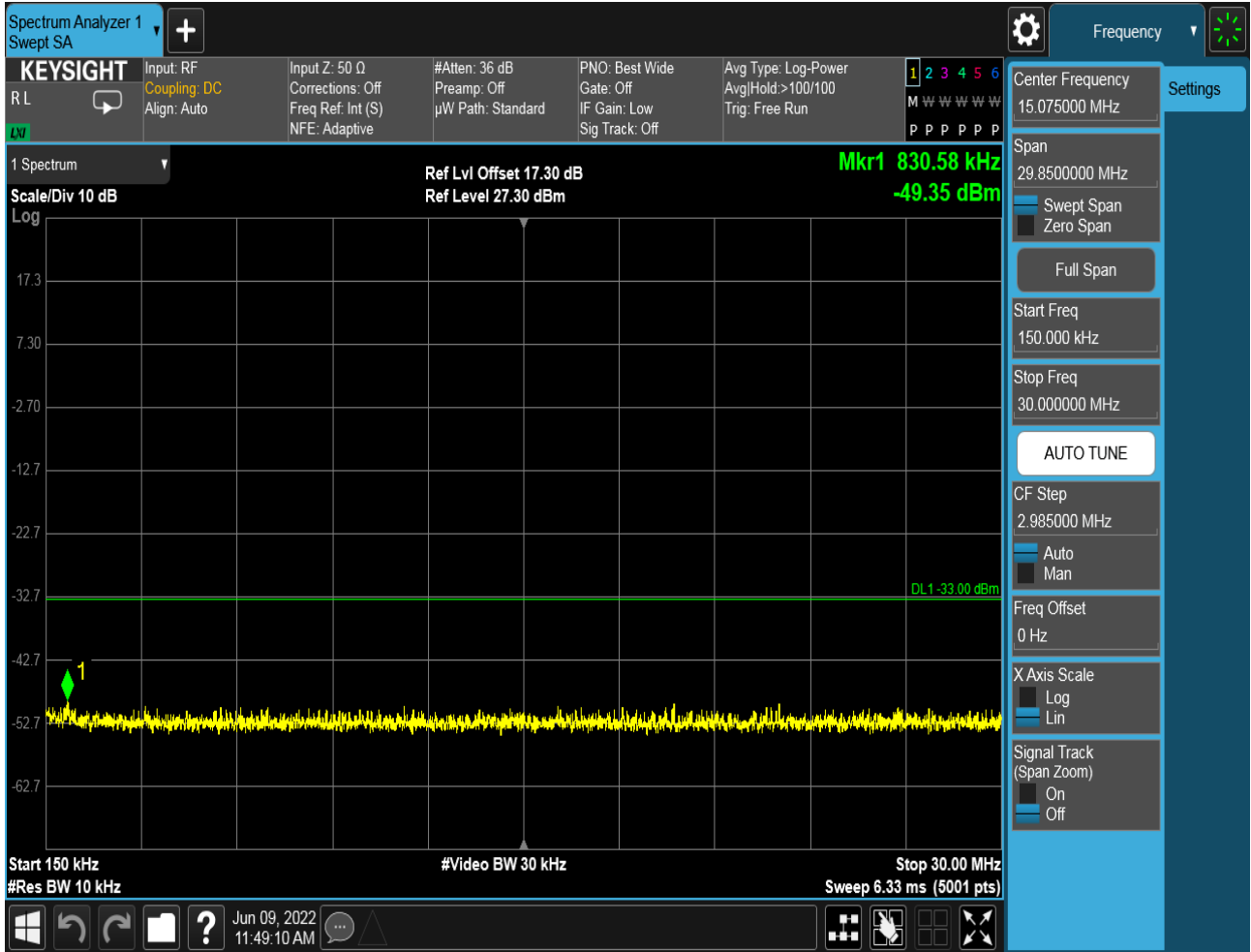


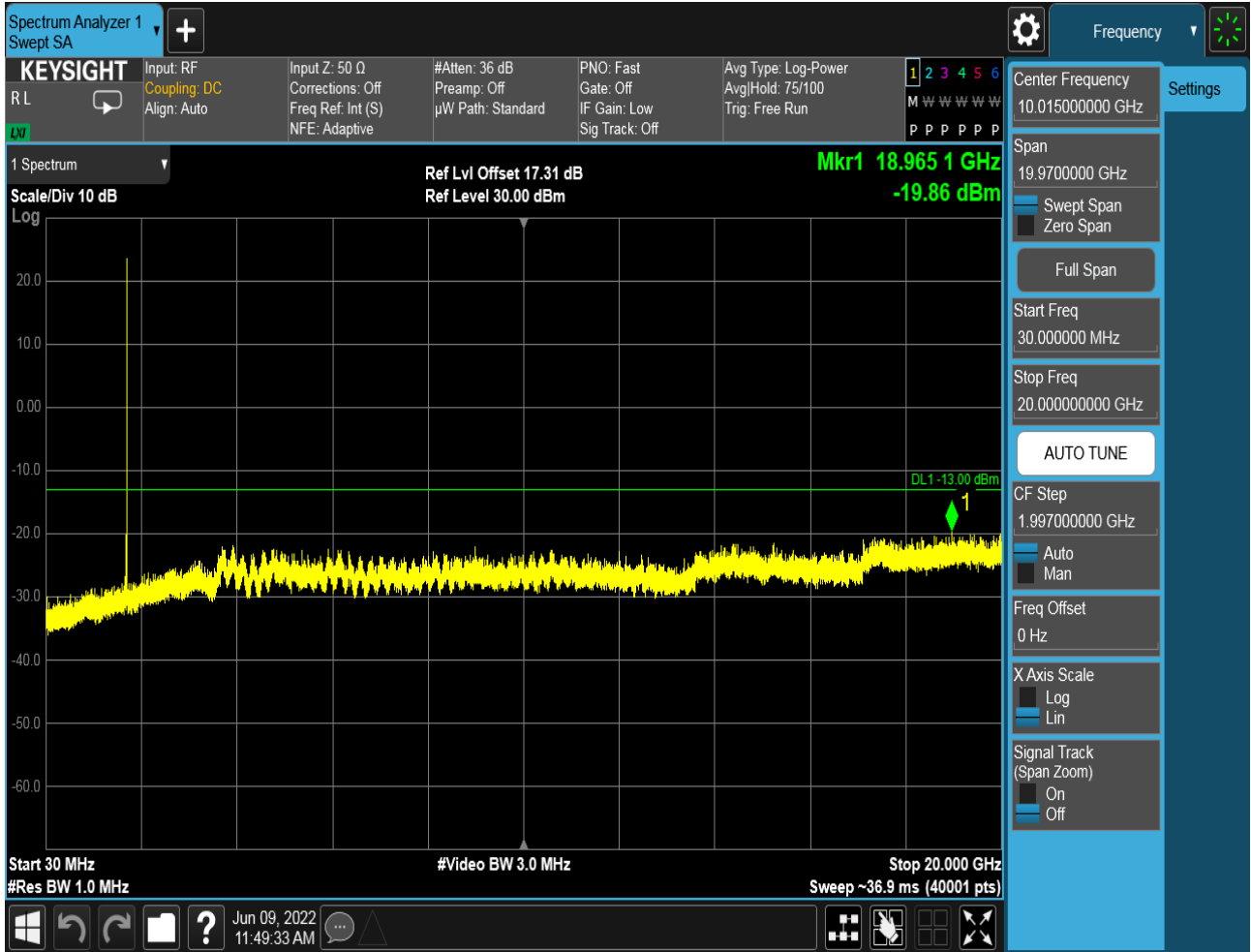
### 6.1.2 Test Band = WCDMA1700

#### 6.1.2.1 Test Mode = UMTS/TM1

##### 6.1.2.1.1 Test Channel = LCH

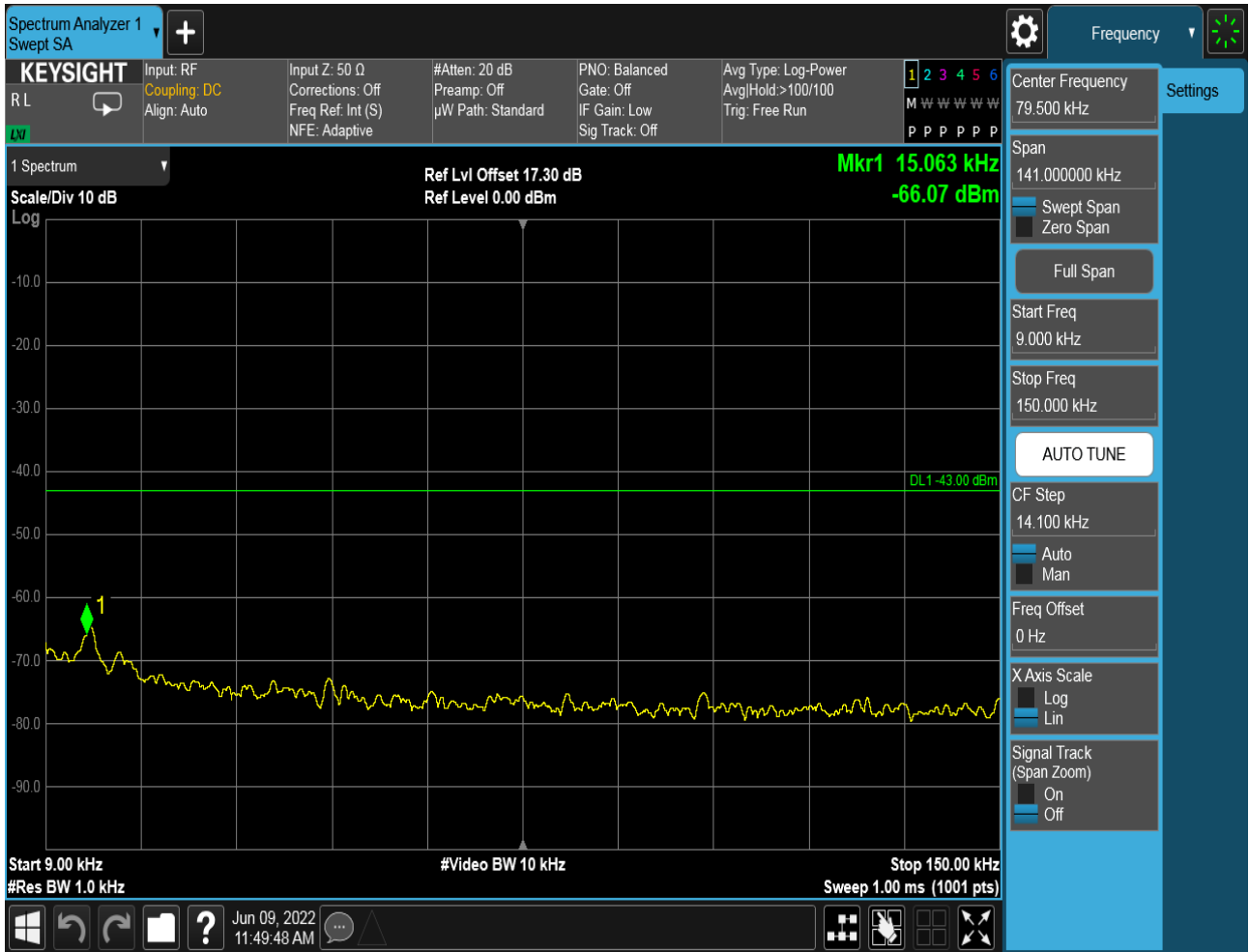


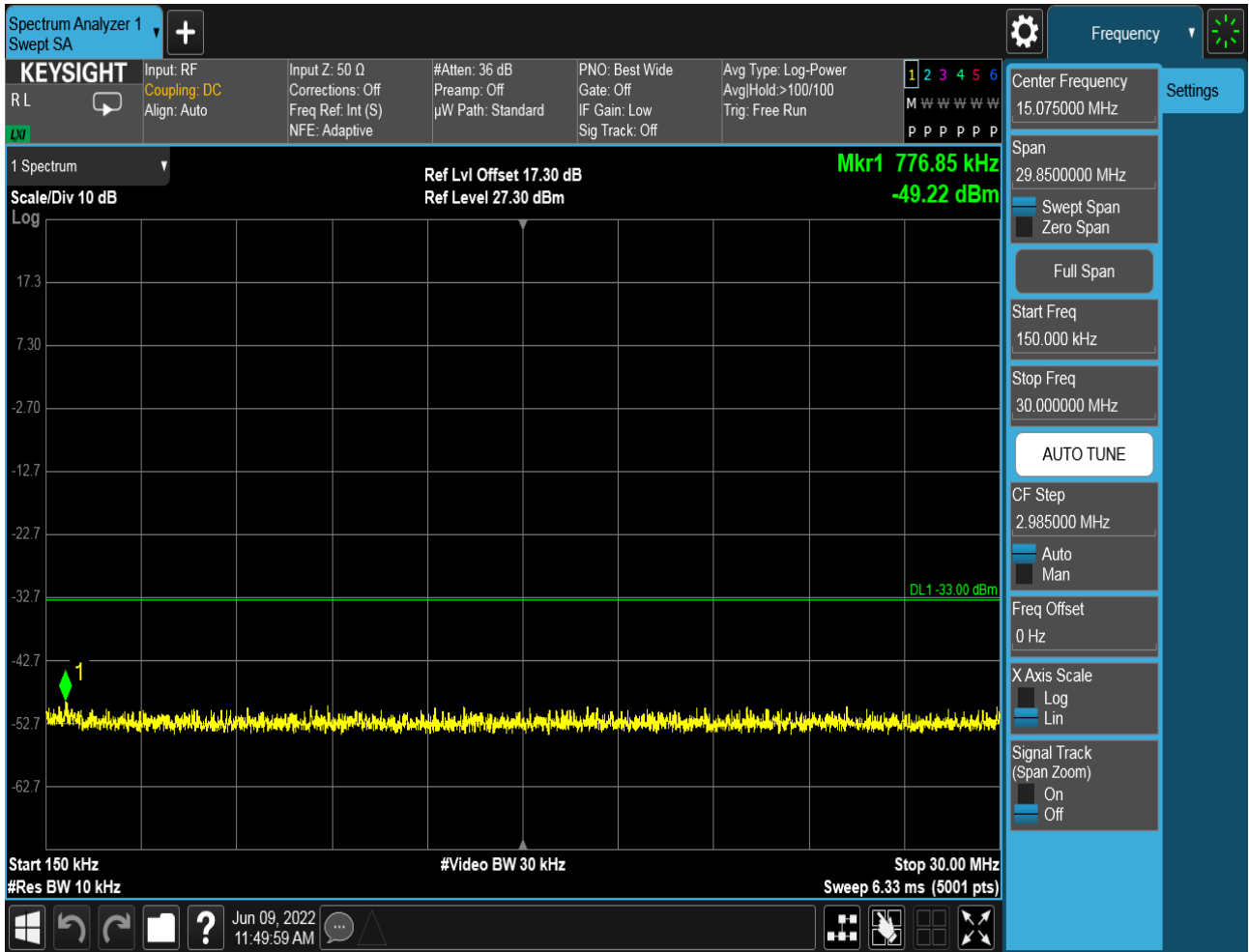


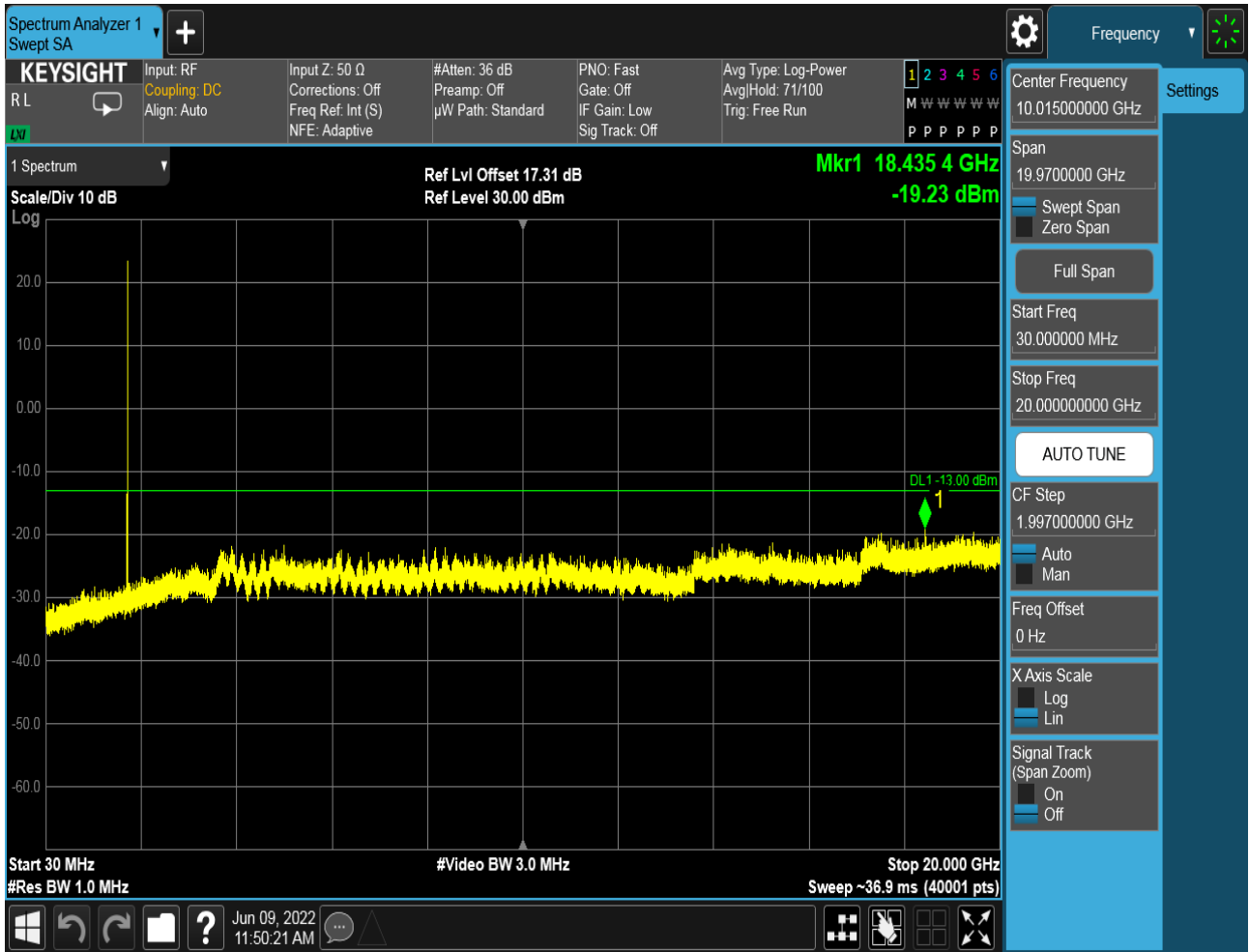




### 6.1.2.1.2 Test Channel = MCH



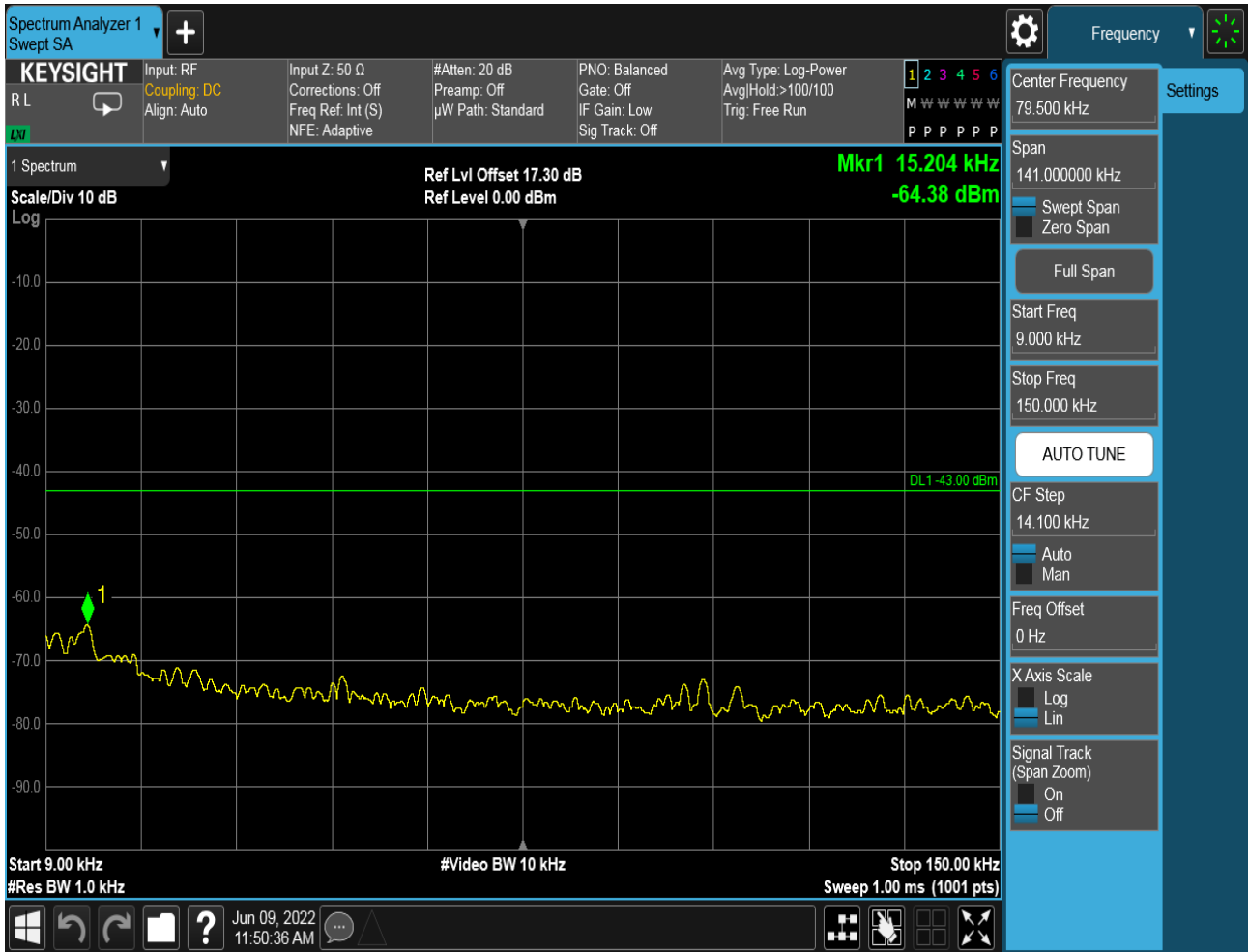


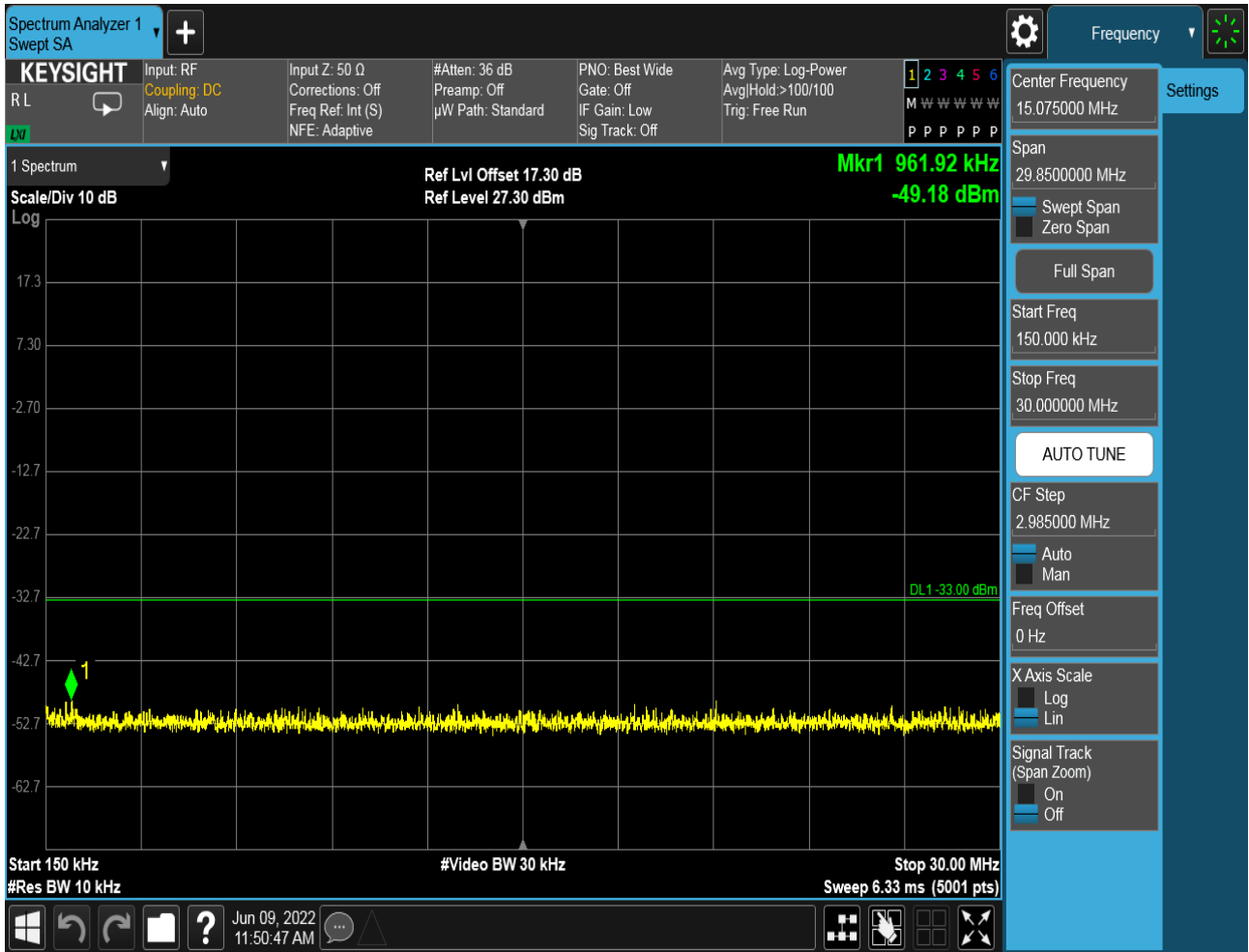


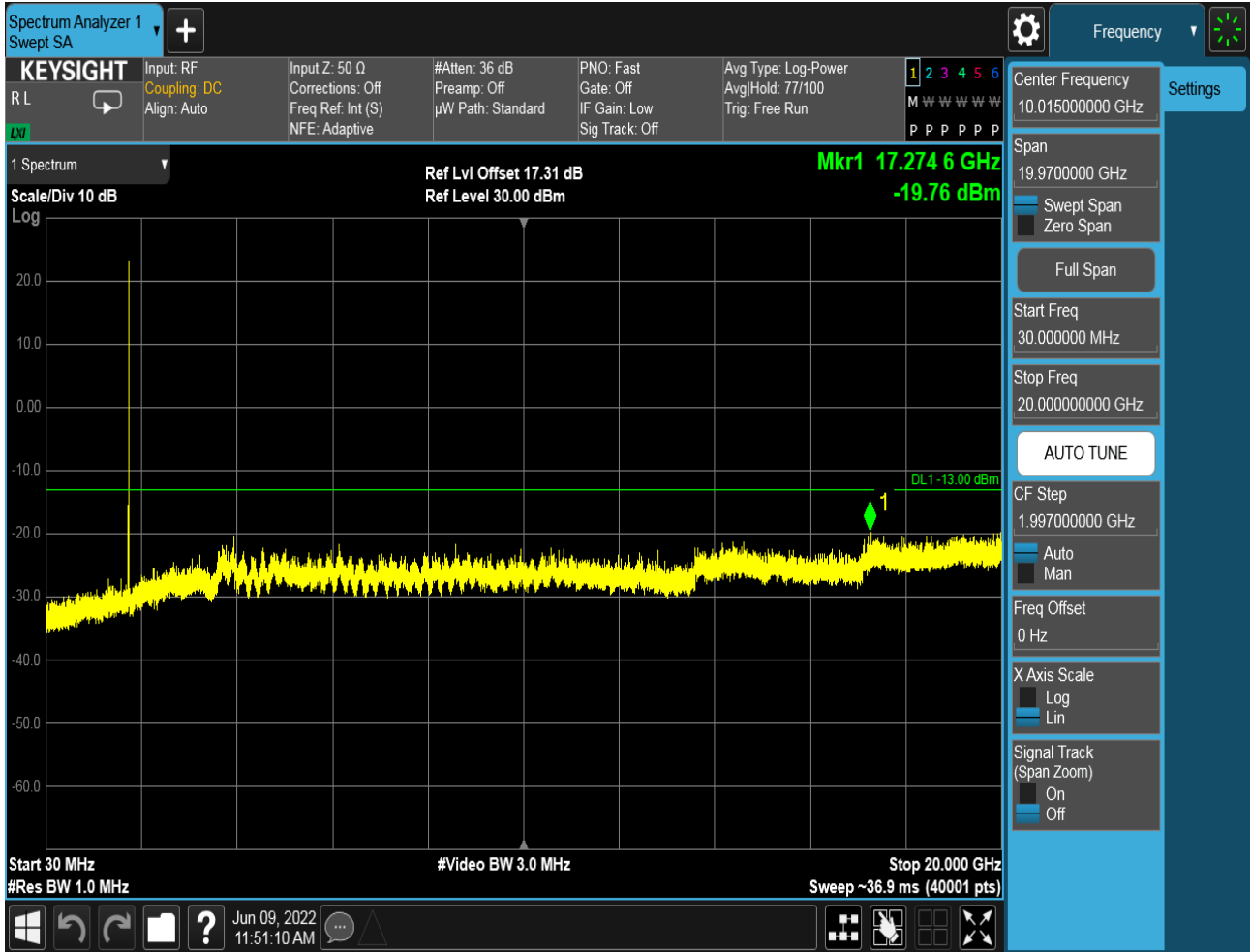




### 6.1.2.1.3 Test Channel = HCH





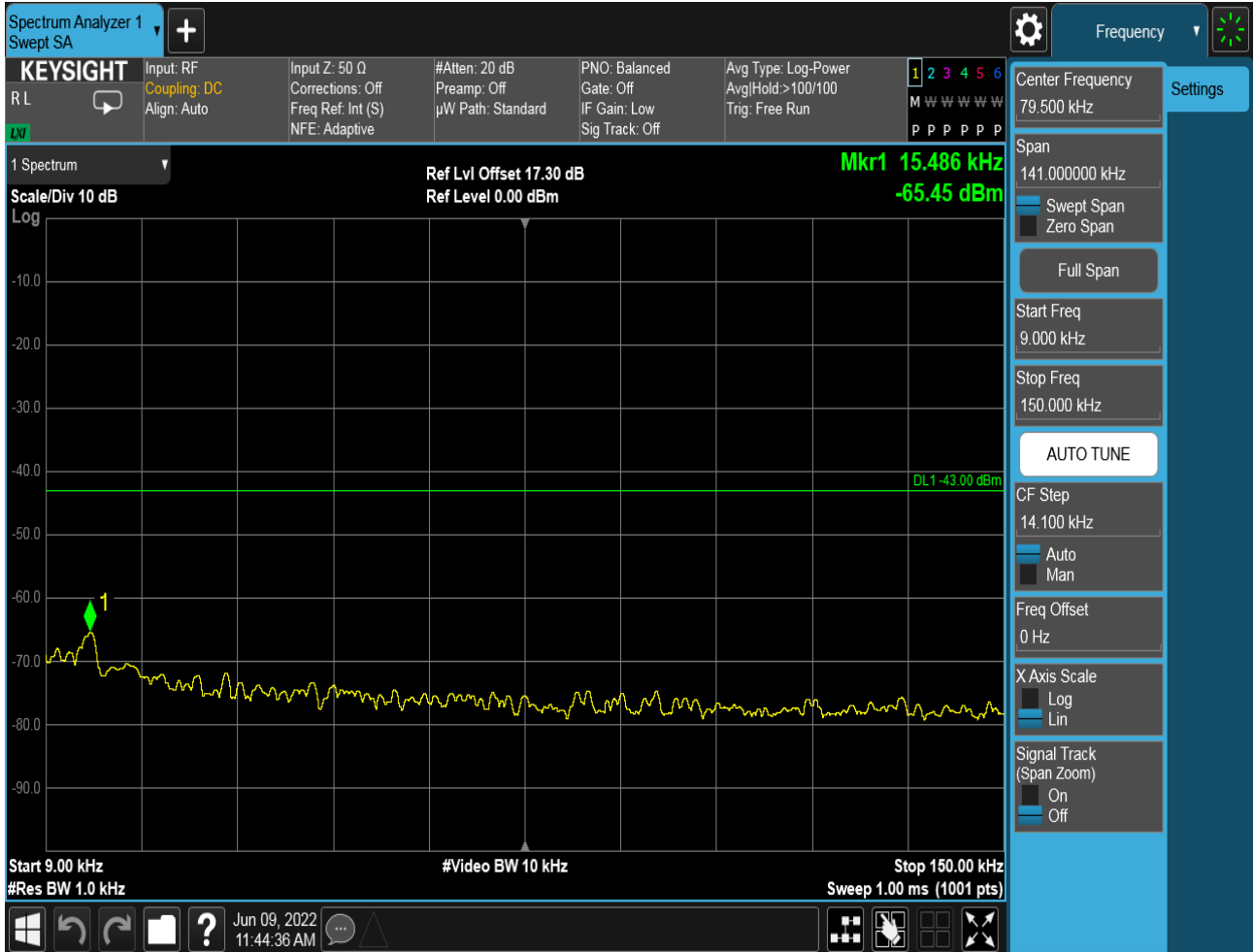


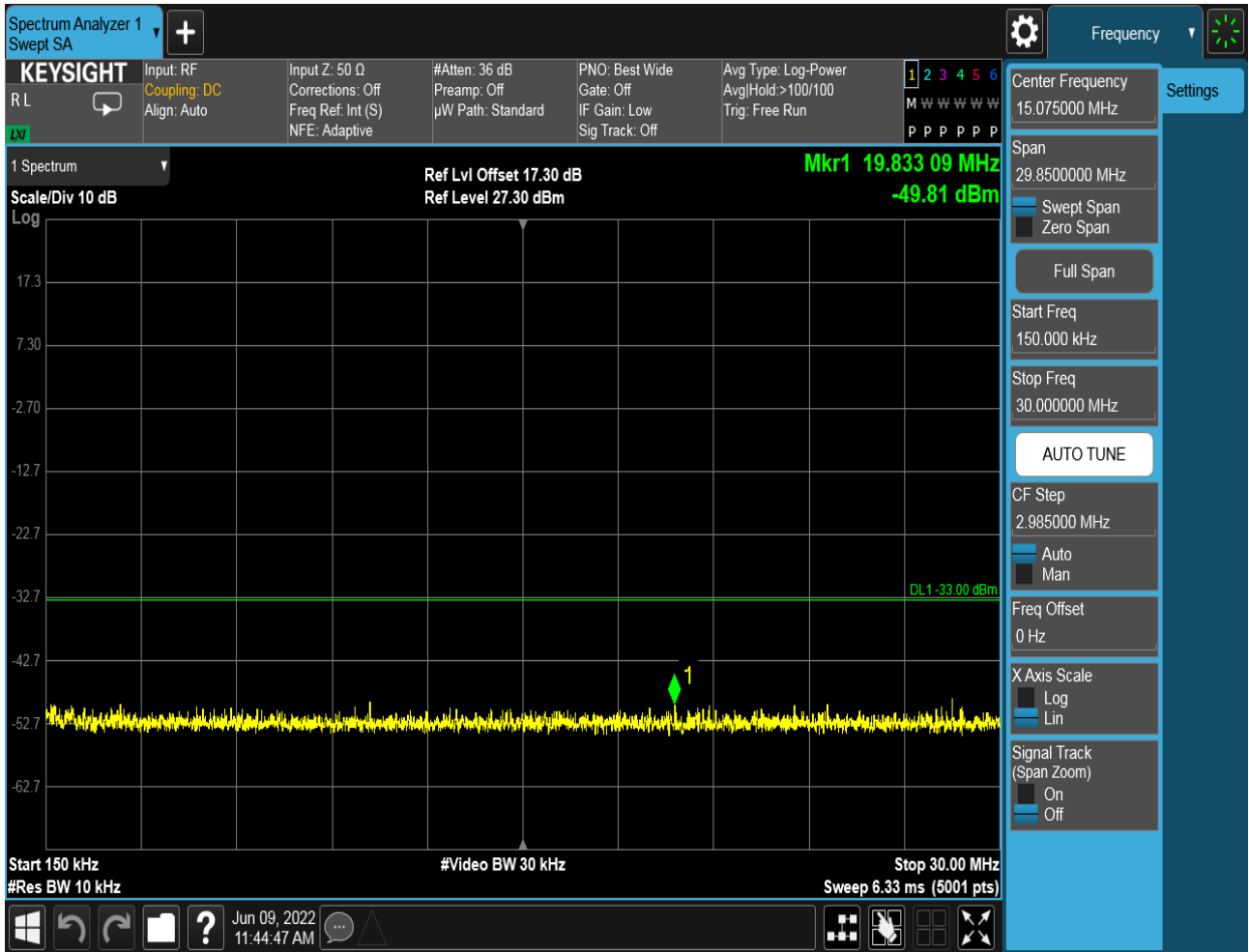


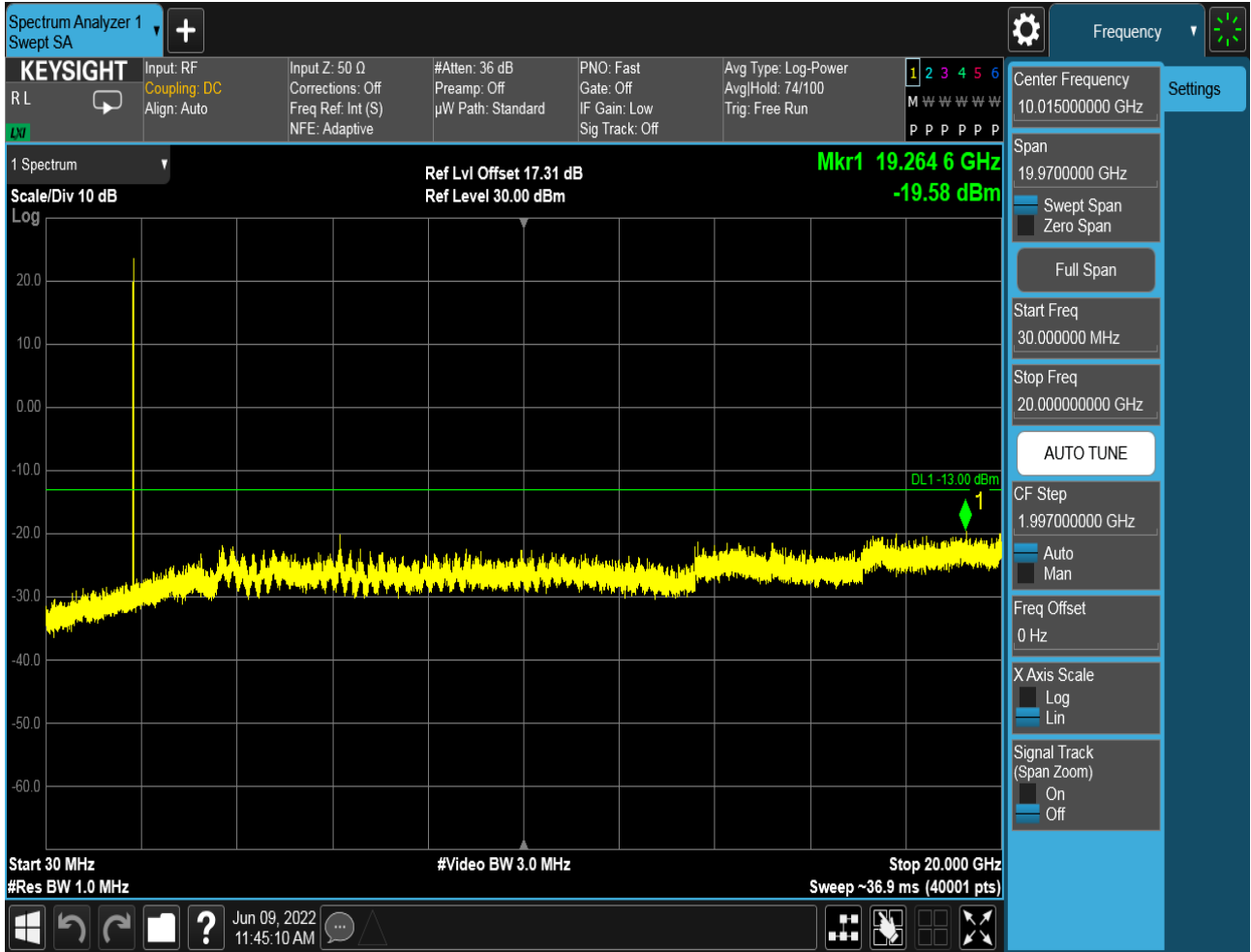
### 6.1.3 Test Band = WCDMA1900

#### 6.1.3.1 Test Mode = UMTS/TM1

##### 6.1.3.1.1 Test Channel = LCH

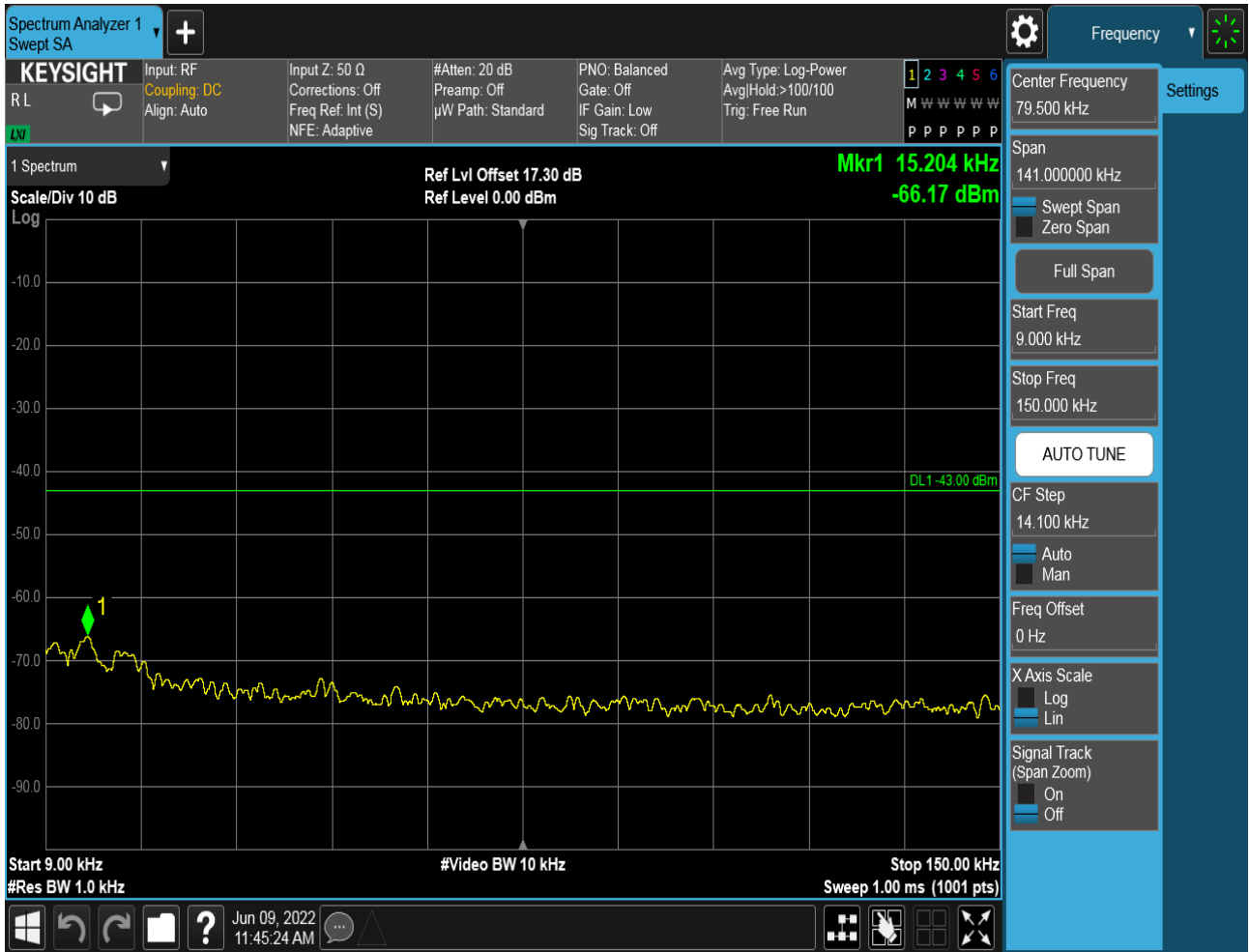


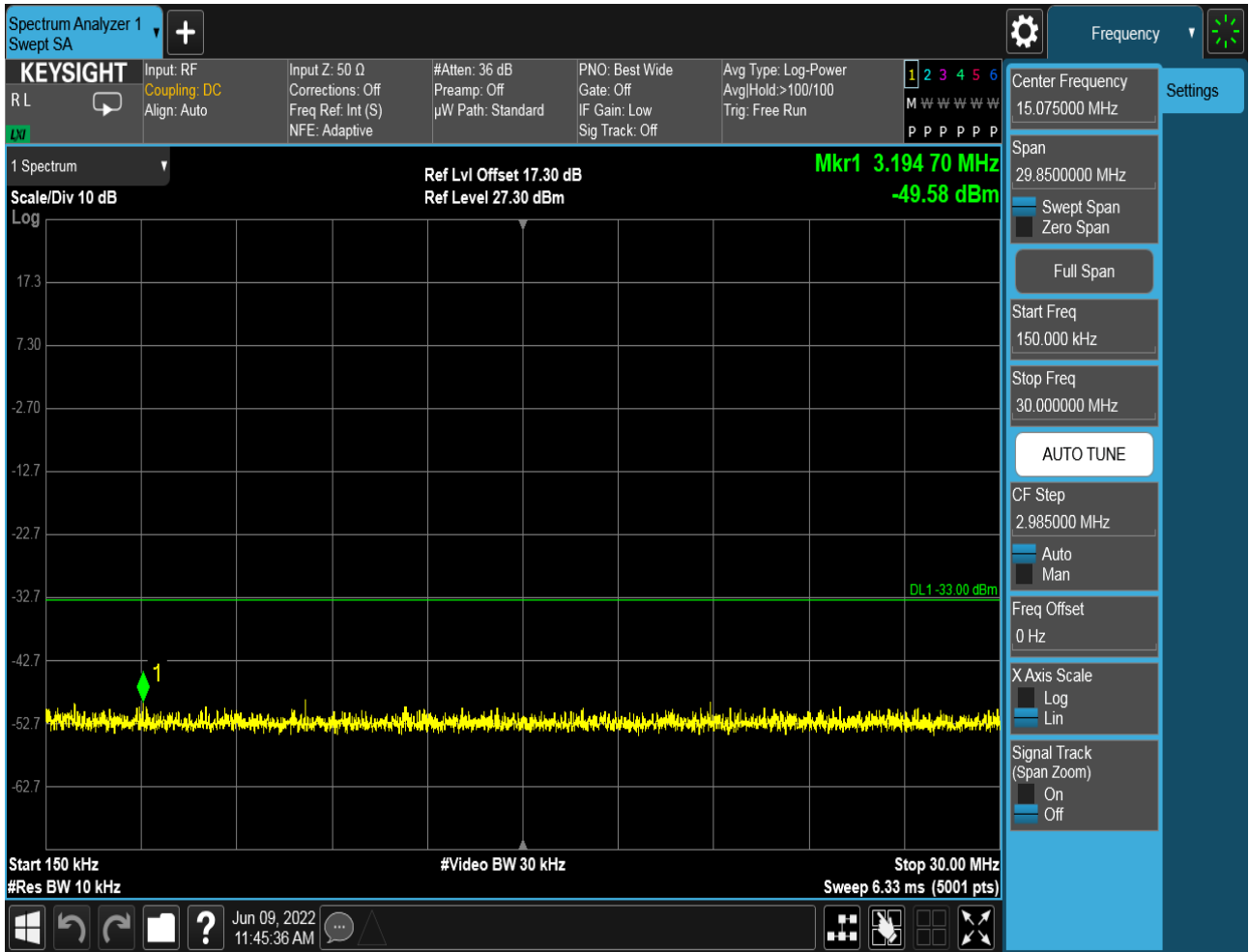




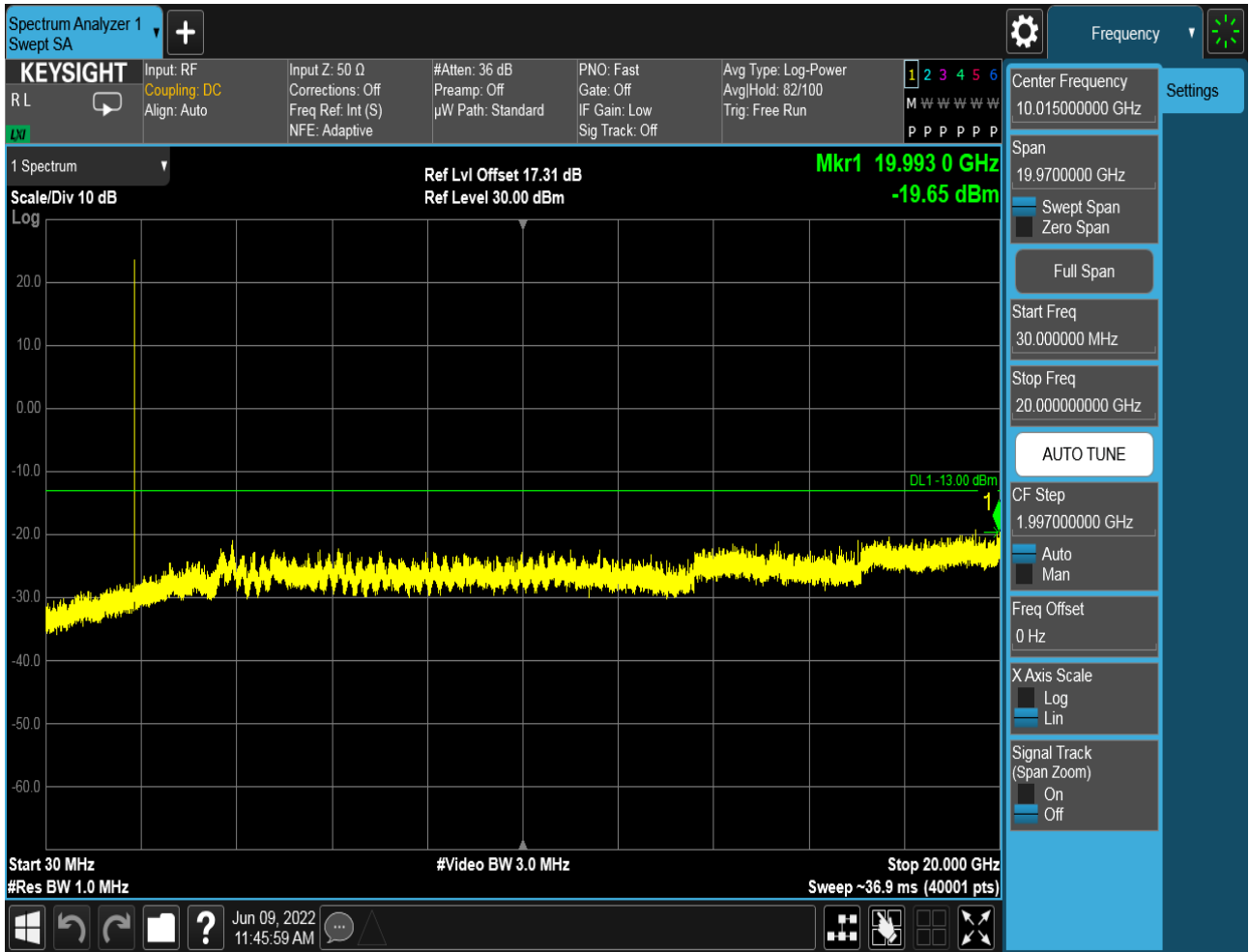


### 6.1.3.1.2 Test Channel = MCH



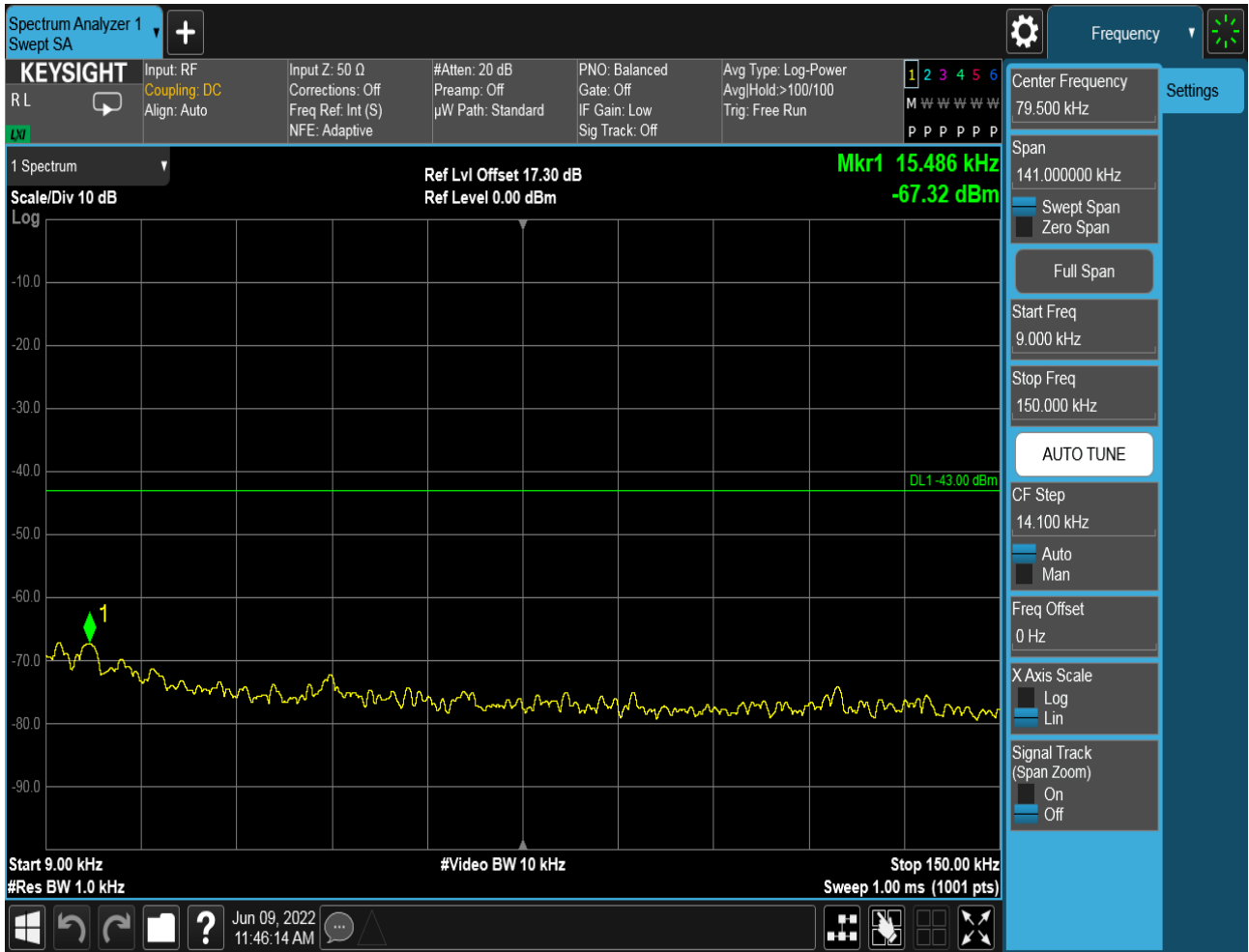


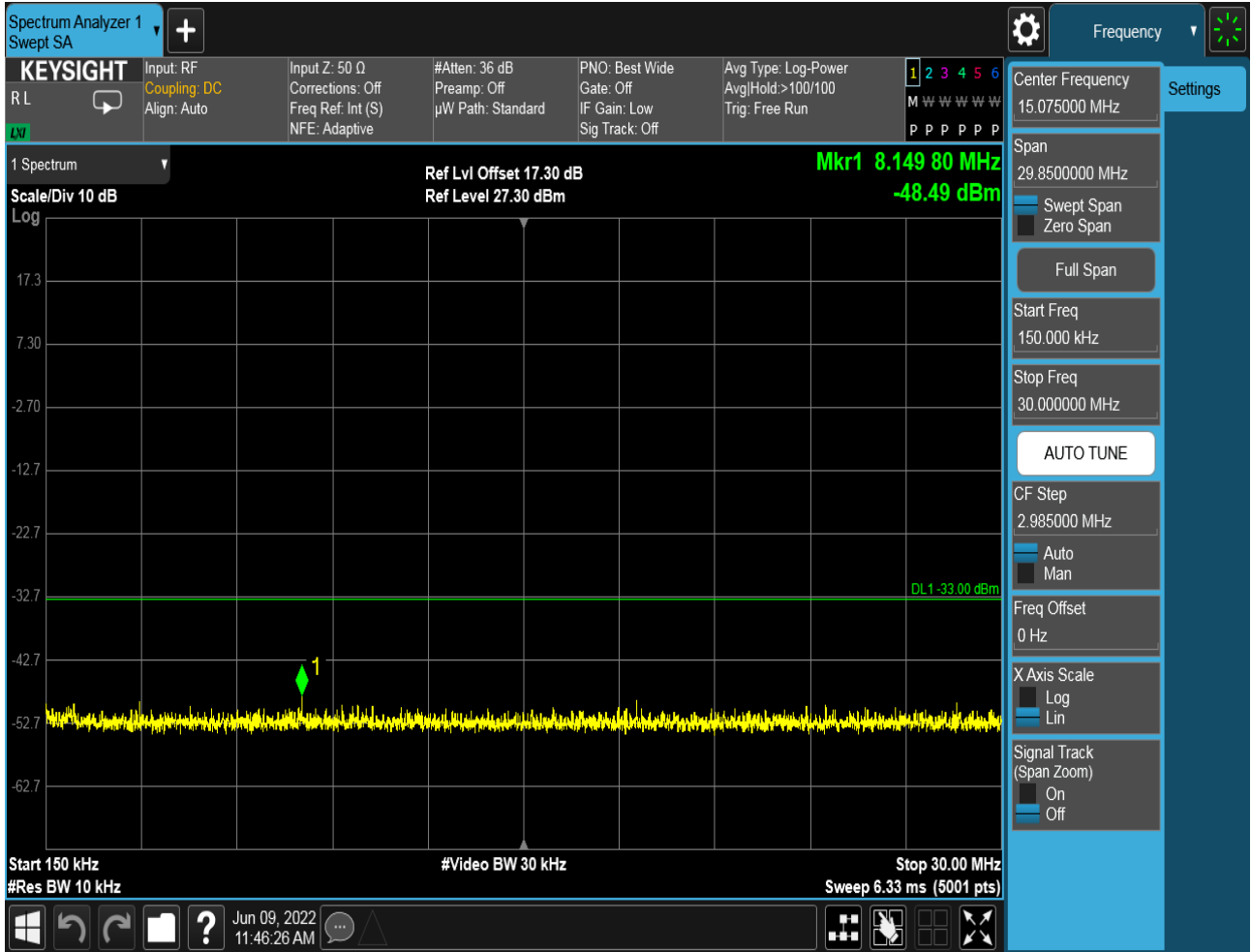


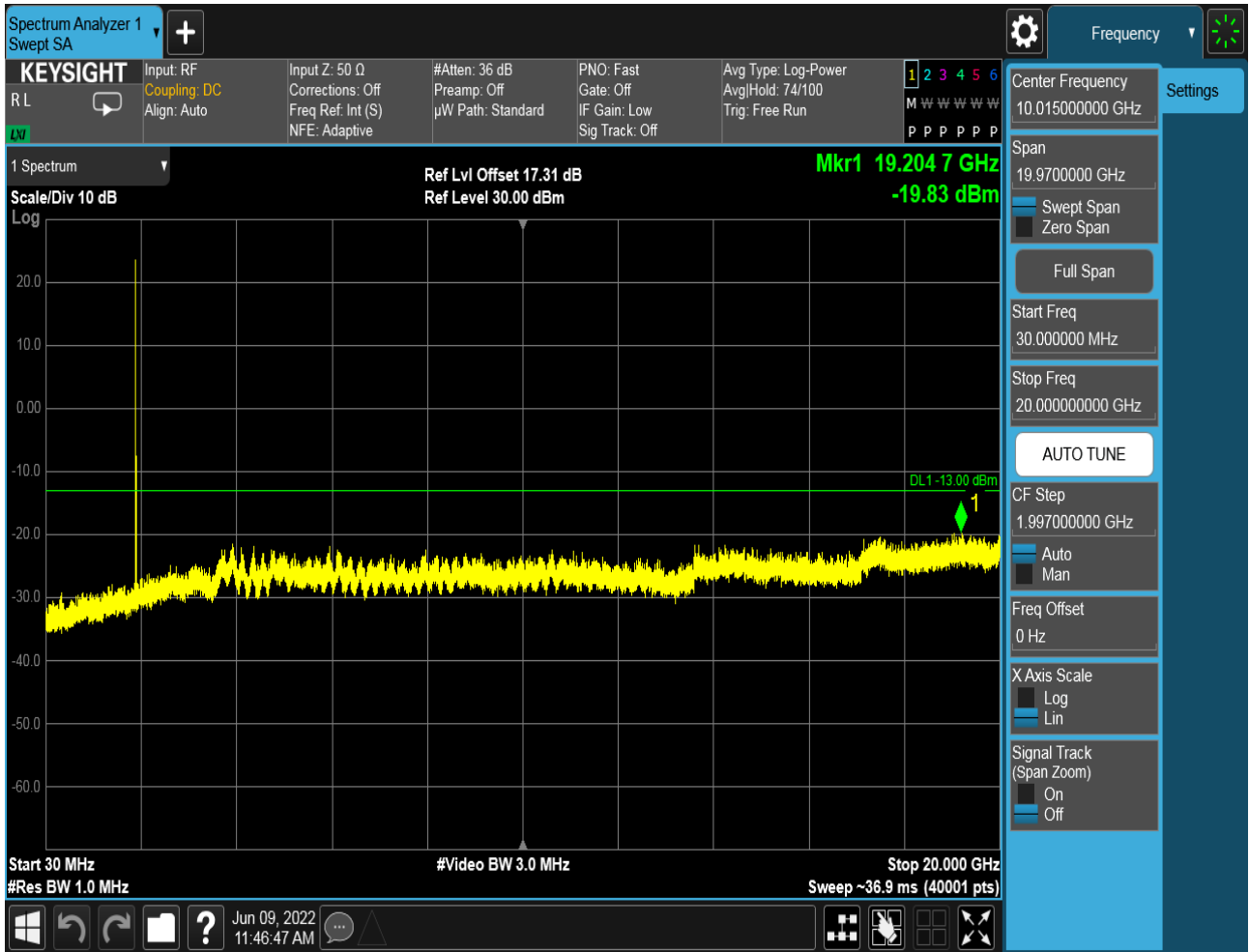




### 6.1.3.1.3 Test Channel = HCH









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

Note: We tested all modes & antennas, 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

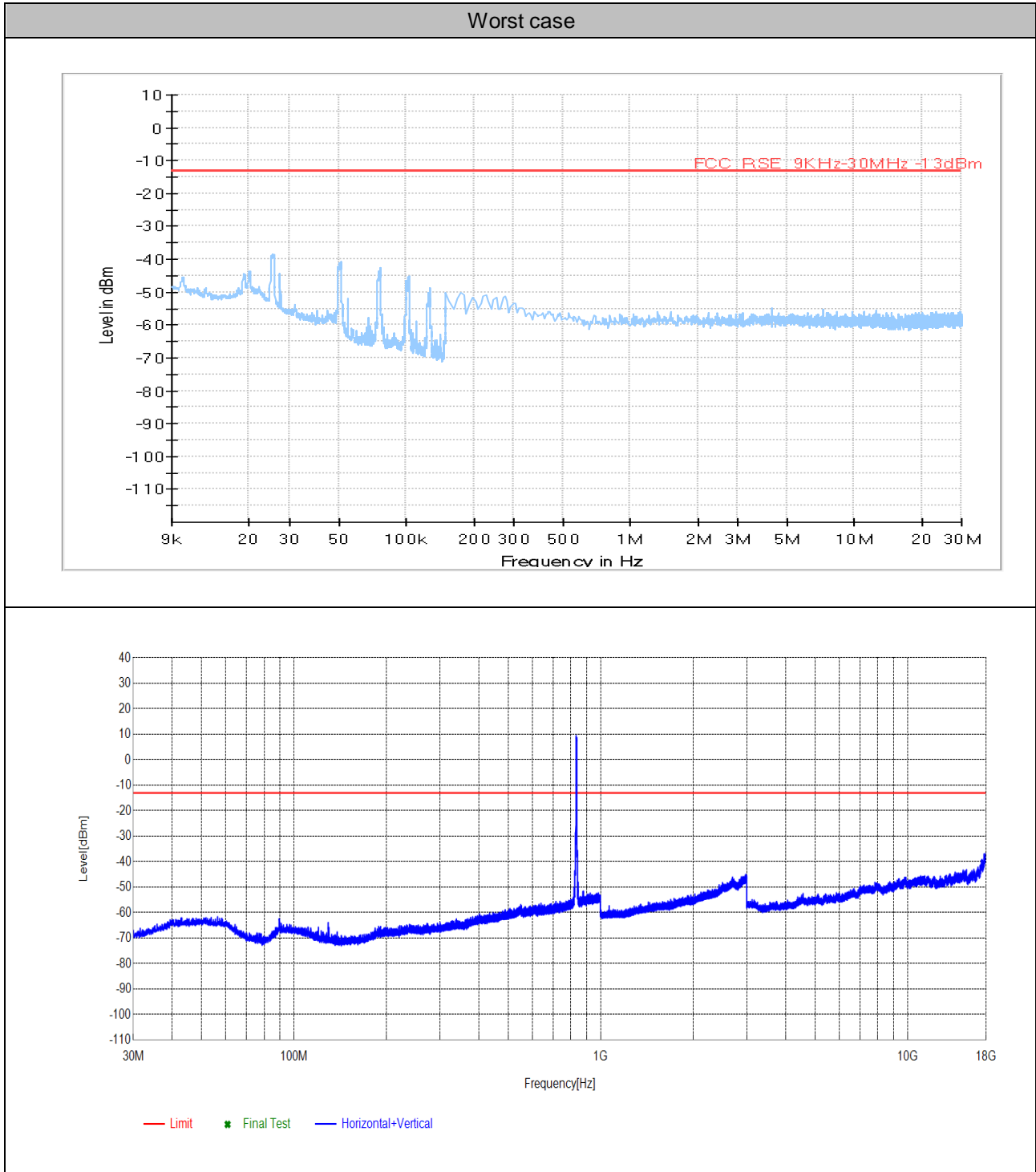
30MHz~1GHz, RBW = 100 kHz, VBW = 300 kHz. Detector: PK

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

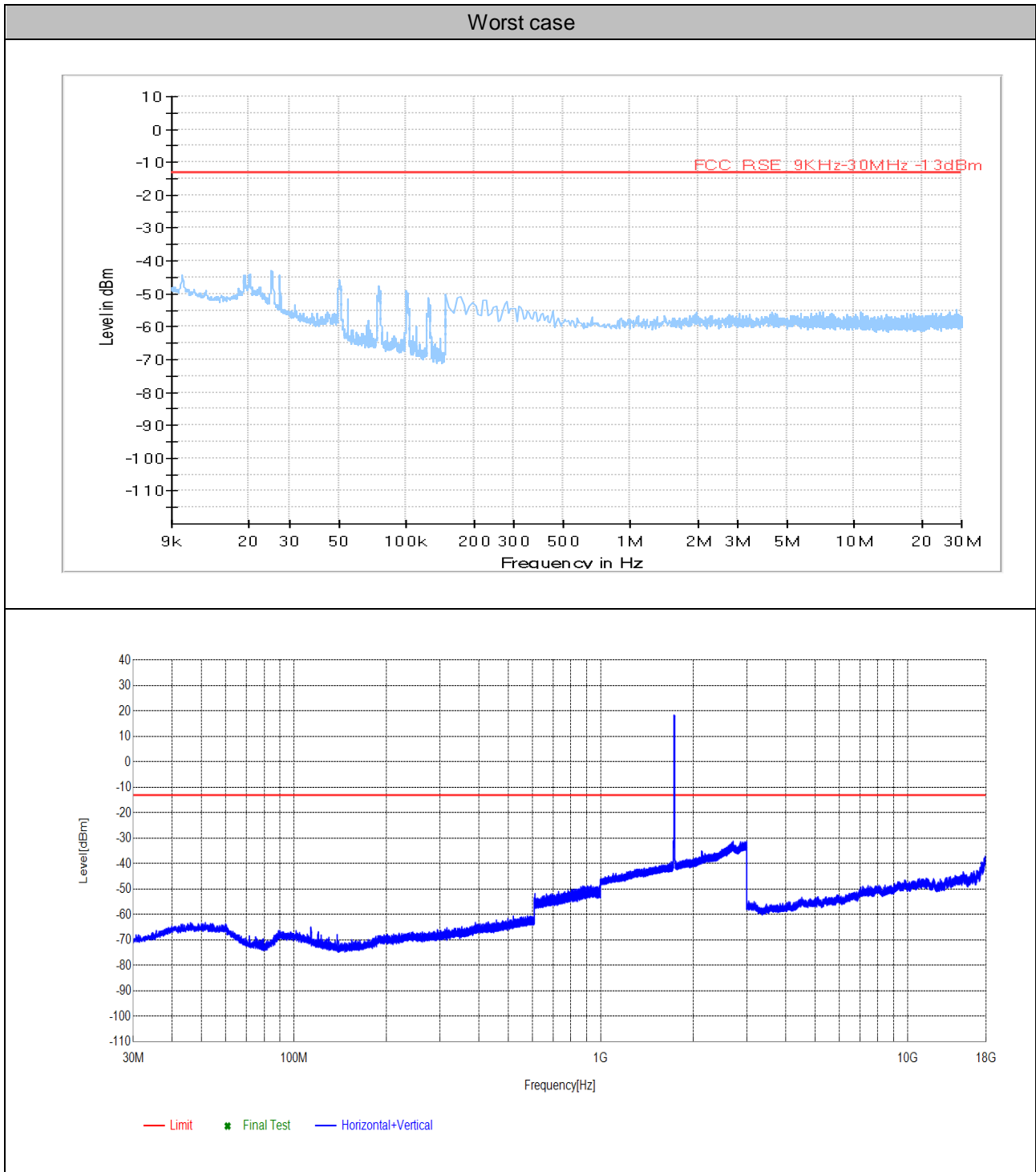
### Part I - Test Plots

#### 7.1 For UMTS

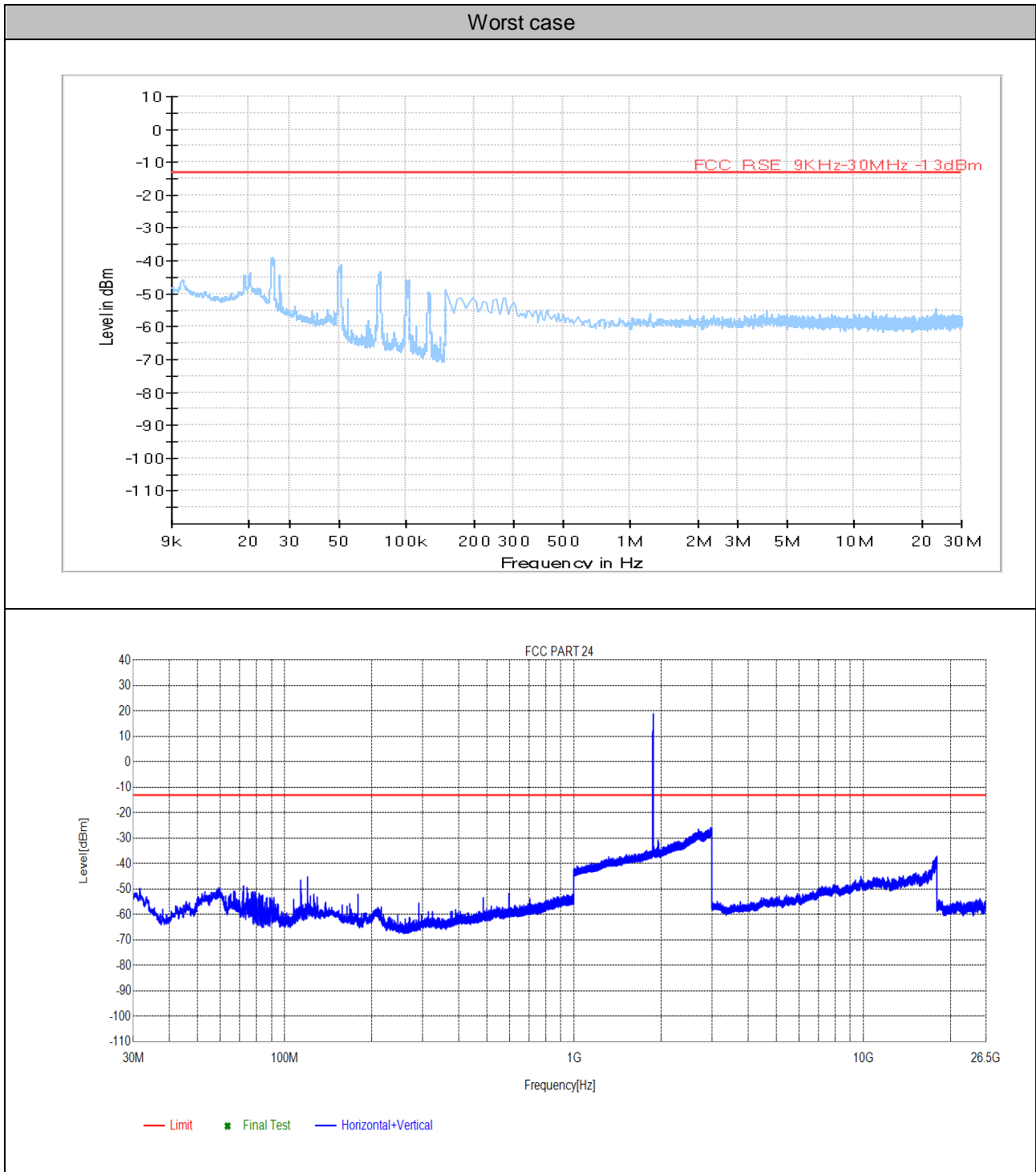
##### 7.1.1 Test Band = WCDMA850



### 7.1.2 Test Band = WCDMA1700



### 7.1.3 Test Band = WCDMA1900







## 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	-2.73943	-0.00331	PASS
				VN	-1.75953	-0.00213	PASS
				VH	-3.23296	-0.00391	PASS
		MCH	TN	VL	3.47614	0.00416	PASS
				VN	0.60797	0.00073	PASS
				VH	0.50783	0.00061	PASS
		HCH	TN	VL	-0.26464	-0.00031	PASS
				VN	5.06401	0.00598	PASS
				VH	-1.03712	-0.00123	PASS
WCDMA1700	UMTS/TM1	LCH	TN	VL	1.94550	0.00114	PASS
				VN	-3.97682	-0.00232	PASS
				VH	6.74486	0.00394	PASS
		MCH	TN	VL	1.09434	0.00063	PASS
				VN	2.34604	0.00135	PASS
				VH	4.74215	0.00274	PASS
		HCH	TN	VL	-0.28610	-0.00016	PASS
				VN	0.62227	0.00036	PASS
				VH	1.29461	0.00074	PASS
WCDMA1900	UMTS/TM1	LCH	TN	VL	3.82662	0.00207	PASS
				VN	3.00407	0.00162	PASS
				VH	6.20127	0.00335	PASS
		MCH	TN	VL	0.69380	0.00037	PASS
				VN	4.28438	0.00228	PASS
				VH	5.43594	0.00289	PASS
		HCH	TN	VL	-0.37193	0.00207	PASS
				VN	7.48873	0.00162	PASS
				VH	3.31879	0.00335	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	3.79801	0.00459	PASS
				-20	4.77076	0.00577	PASS
				-10	3.03268	0.00367	PASS
				0	1.28031	0.00155	PASS
				10	3.66926	0.00444	PASS
				20	-1.75953	-0.00213	PASS
				30	-0.23603	-0.00029	PASS
				40	2.99692	0.00363	PASS
				50	2.94685	0.00357	PASS
		MCH	VN	-30	8.64744	0.01034	PASS
				-20	2.11716	0.00253	PASS
				-10	4.37737	0.00523	PASS
				0	1.73092	0.00207	PASS
				10	0.17166	0.00021	PASS
				20	0.60797	0.00073	PASS
				30	0.60797	0.00073	PASS
				40	-0.47207	-0.00056	PASS
				50	0.65804	0.00079	PASS
		HCH	VN	-30	3.11851	0.00368	PASS
				-20	1.17302	0.00139	PASS
				-10	-5.19276	-0.00614	PASS
				0	2.99692	0.00354	PASS
				10	-2.73228	-0.00323	PASS
				20	5.06401	0.00598	PASS
				30	-0.24319	-0.00029	PASS
				40	1.76668	0.00209	PASS
				50	2.90394	0.00343	PASS
WCDMA1700	UMTS/TM1	LCH	VN	-30	3.61204	0.00211	PASS
				-20	3.29018	0.00192	PASS
				-10	2.34604	0.00137	PASS
				0	7.07388	0.00413	PASS
				10	5.32150	0.00311	PASS
				20	-3.97682	-0.00232	PASS
				30	-3.56913	-0.00208	PASS
				40	-0.98705	-0.00058	PASS
				50	1.18017	0.00069	PASS
		MCH	VN	-30	7.22408	0.00417	PASS
				-20	4.49181	0.00259	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict				
				-10	2.17438	0.00125	PASS				
				0	4.23431	0.00244	PASS				
				10	1.35183	0.00078	PASS				
				20	2.34604	0.00135	PASS				
				30	3.60489	0.00208	PASS				
				40	-4.79221	-0.00277	PASS				
				50	-4.11987	-0.00238	PASS				
		HCH	VN	-30	1.58787	0.00091	PASS				
				-20	5.30720	0.00303	PASS				
				-10	3.23296	0.00184	PASS				
				0	-0.69380	-0.00040	PASS				
				10	7.34568	0.00419	PASS				
				20	0.62227	0.00036	PASS				
				30	1.93834	0.00111	PASS				
				40	2.49624	0.00142	PASS				
				50	6.47306	0.00369	PASS				
				WCDMA1900	UMTS/TM1	LCH	VN	-30	5.76496	0.00311	PASS
								-20	-1.50204	-0.00081	PASS
-10	6.20842	0.00335	PASS								
0	6.27279	0.00339	PASS								
10	2.84672	0.00154	PASS								
20	3.00407	0.00162	PASS								
30	3.76940	0.00203	PASS								
40	-3.46899	-0.00187	PASS								
50	0.36478	0.00020	PASS								
MCH	VN	-30	4.97818			0.00265	PASS				
		-20	-2.17438			-0.00116	PASS				
		-10	7.83920			0.00417	PASS				
		0	0.62943			0.00033	PASS				
		10	1.07288			0.00057	PASS				
		20	4.28438			0.00228	PASS				
		30	7.88212			0.00419	PASS				
		40	-2.50339			-0.00133	PASS				
		50	-0.00715			0.00000	PASS				
HCH	VN	-30	4.39882			0.00231	PASS				
		-20	-3.76940			-0.00198	PASS				
		-10	1.18017			0.00062	PASS				
		0	-2.46763			-0.00129	PASS				
		10	4.86374			0.00255	PASS				
		20	7.48873			0.00393	PASS				



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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	9.54866	0.00501	PASS
				40	3.90530	0.00205	PASS
				50	4.14848	0.00217	PASS

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END