



# Appendix for test report



# 1Appendix\_A: Effective (Isotropic) Radiated Power Output Data

## Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dBm]	ERP [dBm]	Limit [dBm]	Verdict
GSM850	GSM/TM1	LCH	32.53	28.58	38.5	PASS
		MCH	32.54	28.59	38.5	PASS
		HCH	32.56	28.61	38.5	PASS
	GSM/TM2	LCH	26.60	22.65	38.5	PASS
		MCH	26.49	22.54	38.5	PASS
		HCH	26.36	22.41	38.5	PASS
Test Band	Test Mode	Test Channel	Measured[dBm]	EIRP [dBm]	Limit [dBm]	Verdict
PCS1900	GSM/TM1	LCH	28.91	29.31	33	PASS
		MCH	28.64	29.04	33	PASS
		HCH	28.45	28.85	33	PASS
	GSM/TM2	LCH	26.84	27.24	33	PASS
		MCH	26.66	27.06	33	PASS
		HCH	26.45	26.85	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
GSM850	GSM/TM1	LCH	1.78	13	PASS
		MCH	1.89	13	PASS
		HCH	1.70	13	PASS
	GSM/TM2	LCH	4.73	13	PASS
		MCH	4.76	13	PASS
		HCH	5.06	13	PASS
PCS1900	GSM/TM1	LCH	1.79	13	PASS
		MCH	1.75	13	PASS
		HCH	1.93	13	PASS
	GSM/TM2	LCH	4.60	13	PASS
		MCH	4.81	13	PASS
		HCH	4.76	13	PASS

### 3Appendix\_C: Modulation Characteristics

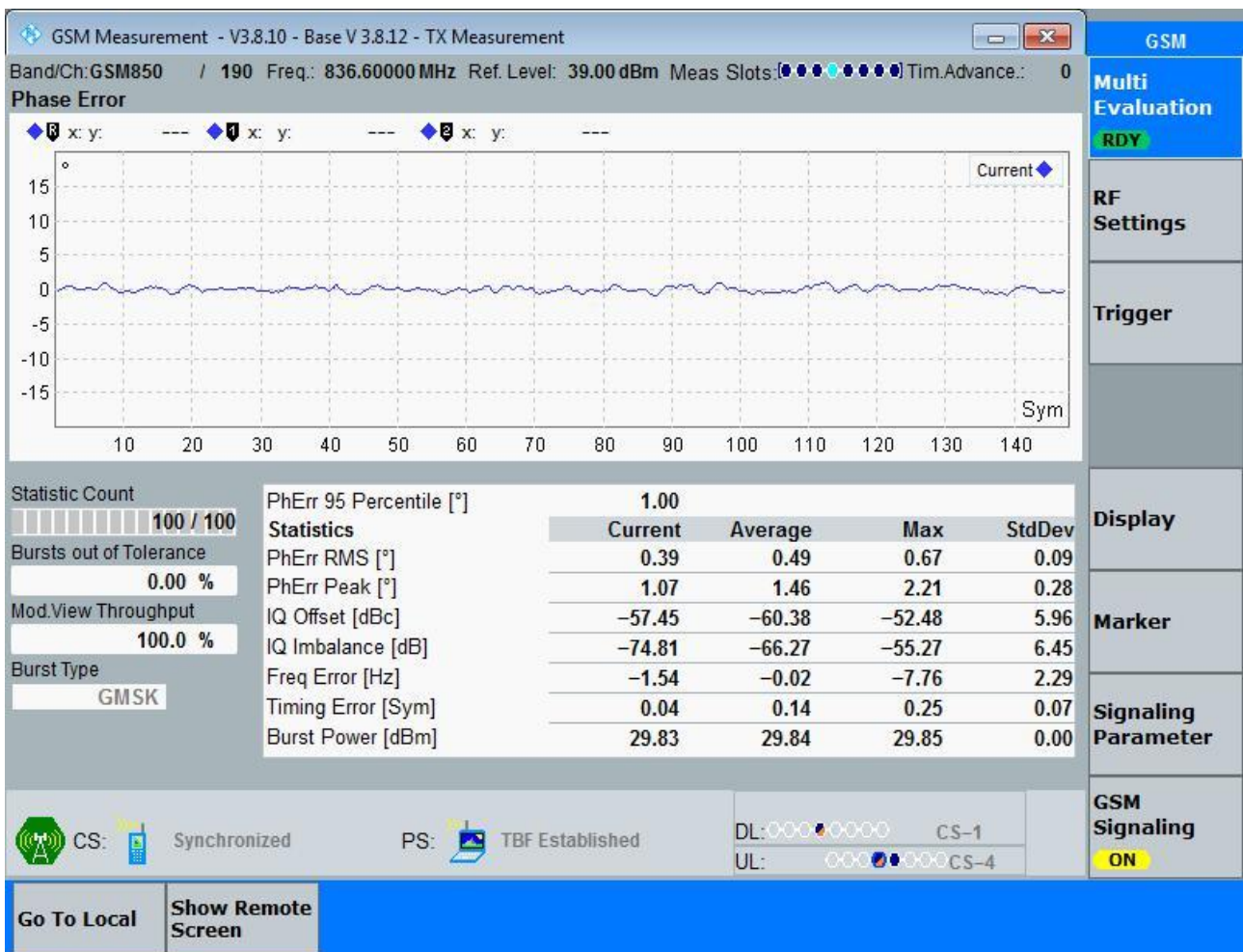
#### Part I - Test Plots

#### 3.1 For GSM

#### 3.1.1 Test Band = GSM850

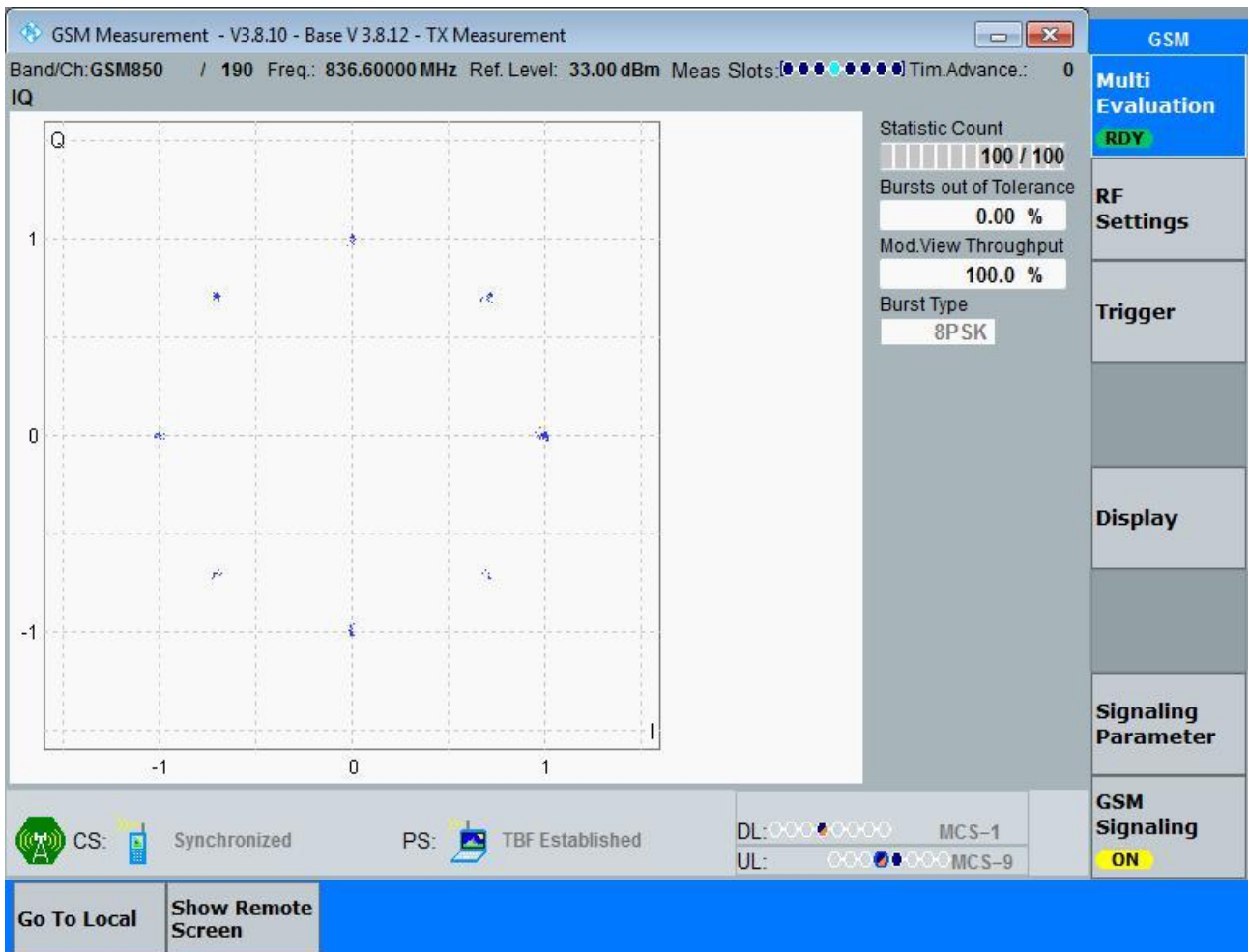
#### 3.1.1.1 Test Mode = GSM/TM1

#### 3.1.1.1.1 Test Channel = MCH



### 3.1.1.2 Test Mode = GSM/TM2

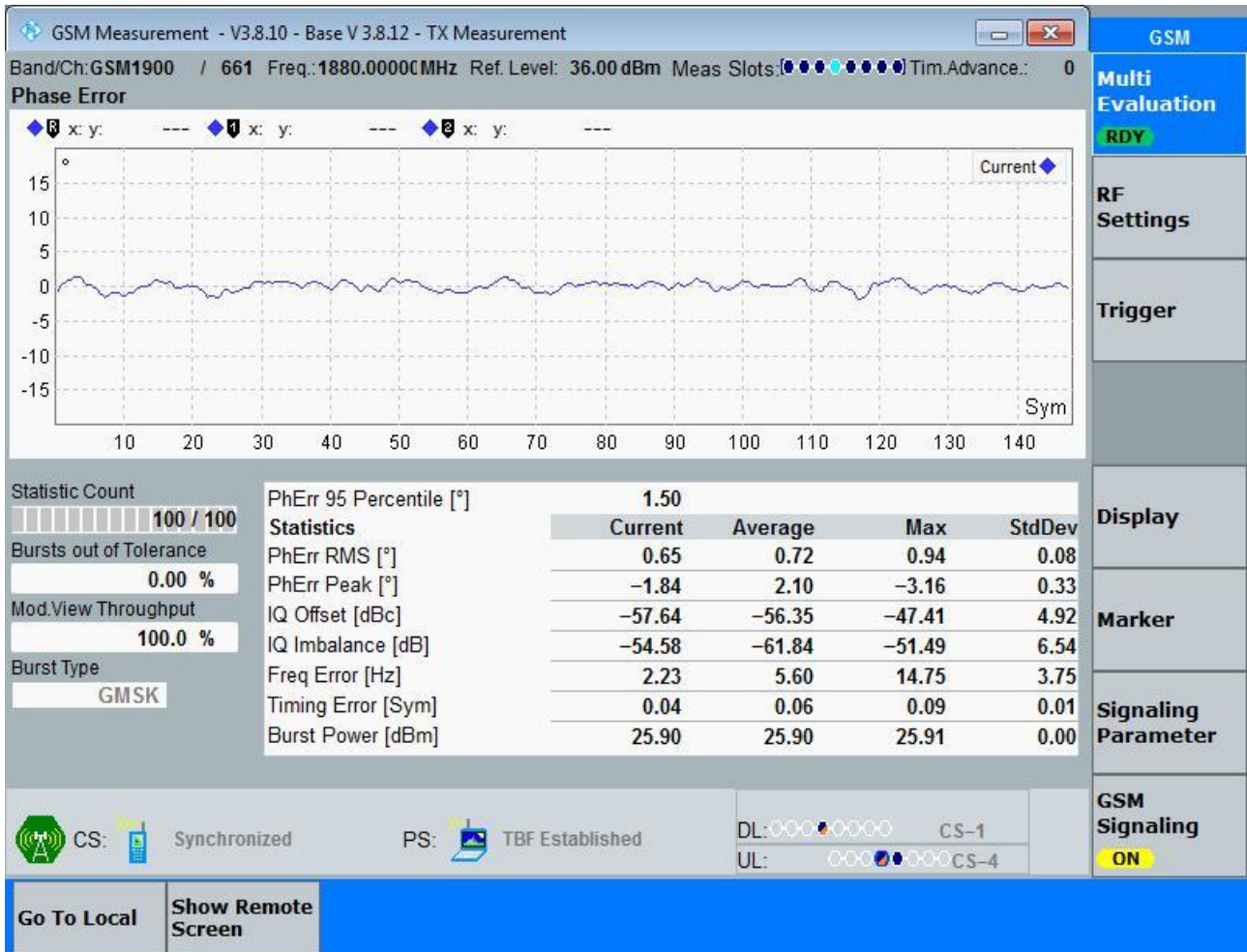
#### 3.1.1.2.1 Test Channel = MCH



### 3.1.2 Test Band = PCS1900

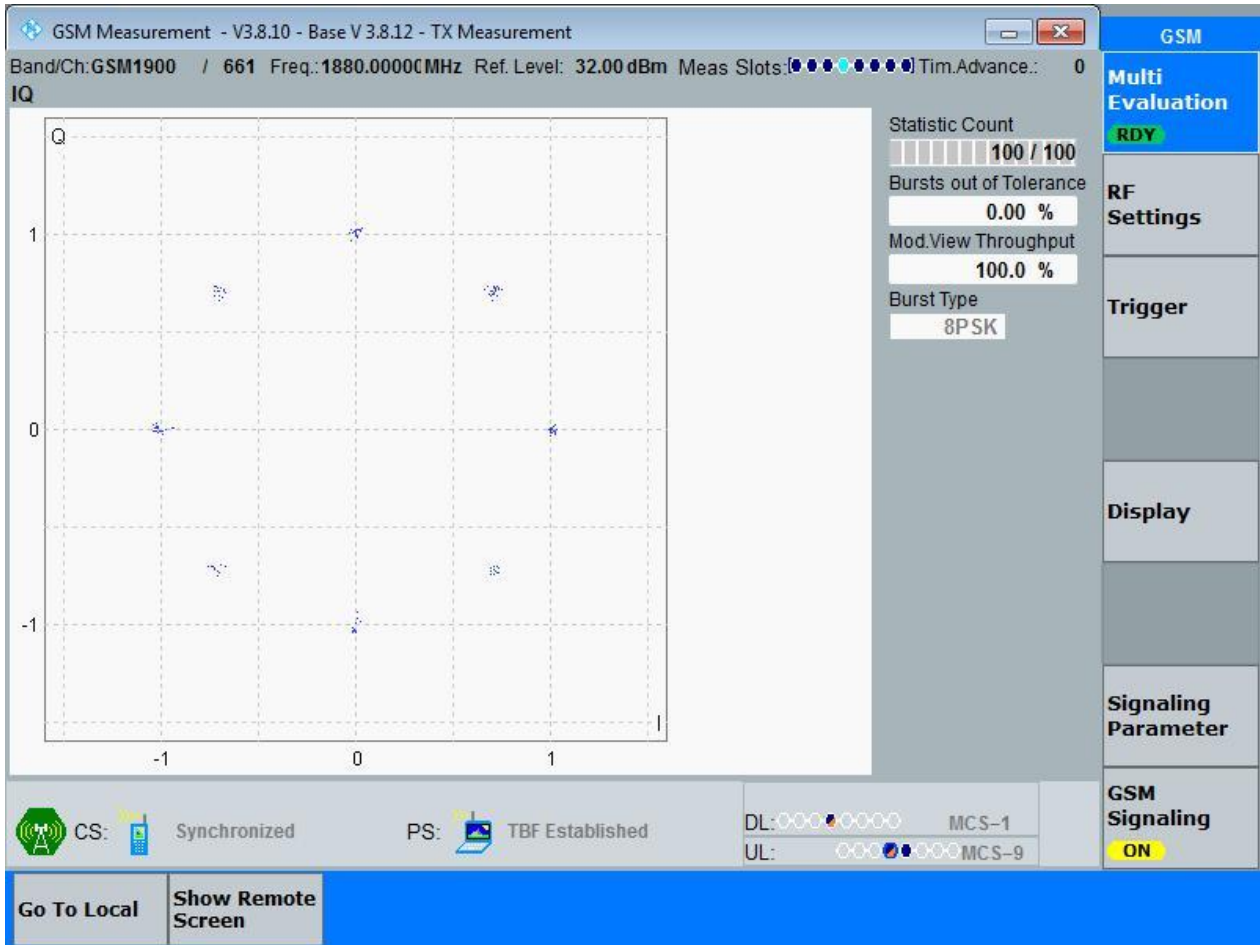
#### 3.1.2.1 Test Mode = GSM/TM1

##### 3.1.2.1.1 Test Channel = MCH



### 3.1.2.2 Test Mode = GSM/TM2

#### 3.1.2.2.1 Test Channel = MCH







## 4Appendix\_D: Bandwidth

### Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
GSM850	GSM/TM1	LCH	245.52	308.3	Pass
		MCH	248.78	318.3	Pass
		HCH	248.36	319.2	Pass
	GSM/TM2	LCH	248.57	322.9	Pass
		MCH	253.45	319.9	Pass
		HCH	250.77	319.9	Pass
PCS1900	GSM/TM1	LCH	247.83	315.1	Pass
		MCH	244.81	318.2	Pass
		HCH	247.51	314.6	Pass
	GSM/TM2	LCH	252.29	319.9	Pass
		MCH	252.64	320.4	Pass
		HCH	246.02	303.7	Pass

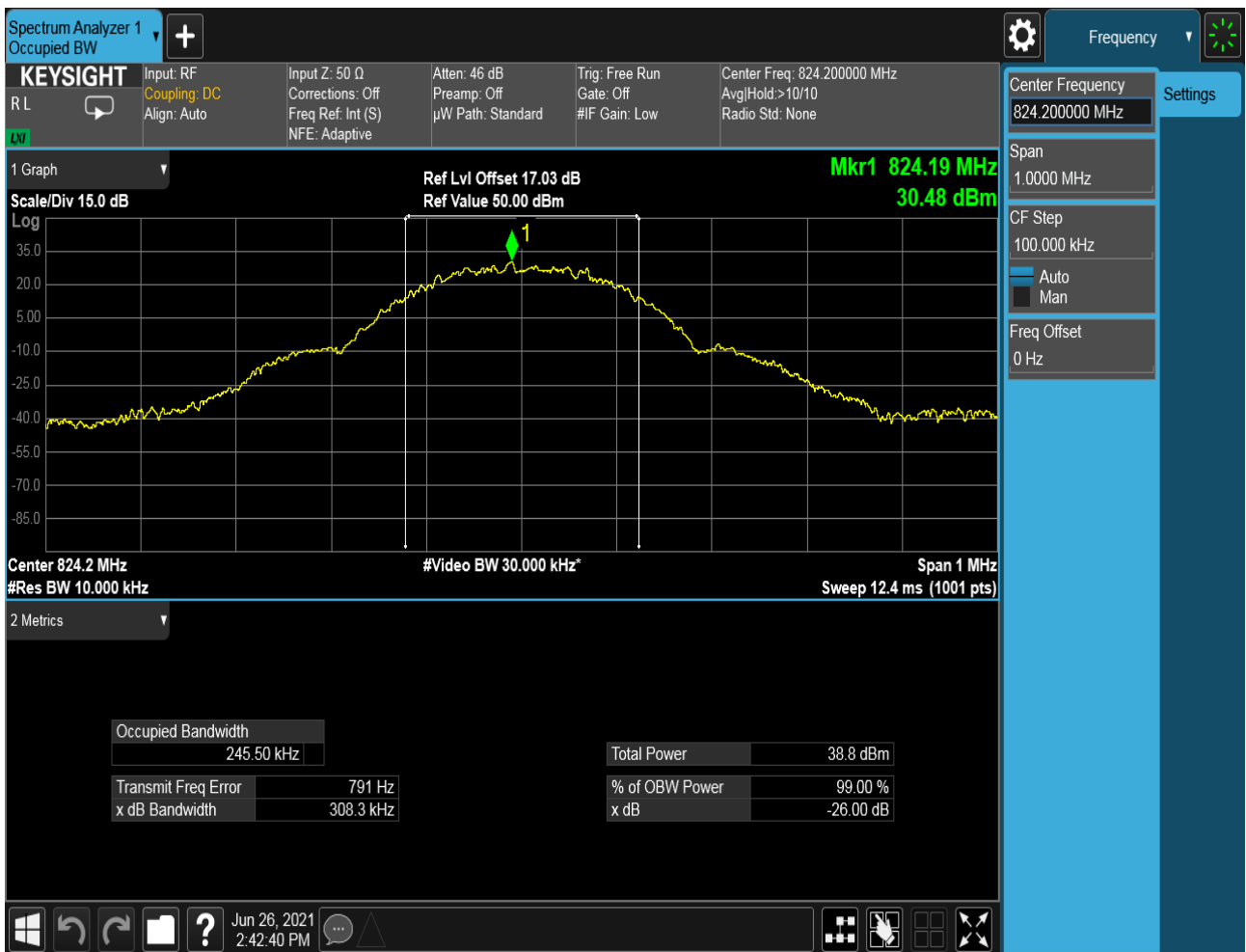
**Part II - Test Plots**

**4.1 For GSM**

**4.1.1 Test Band = GSM850**

**4.1.1.1 Test Mode = GSM/TM1**

**4.1.1.1.1 Test Channel = LCH**



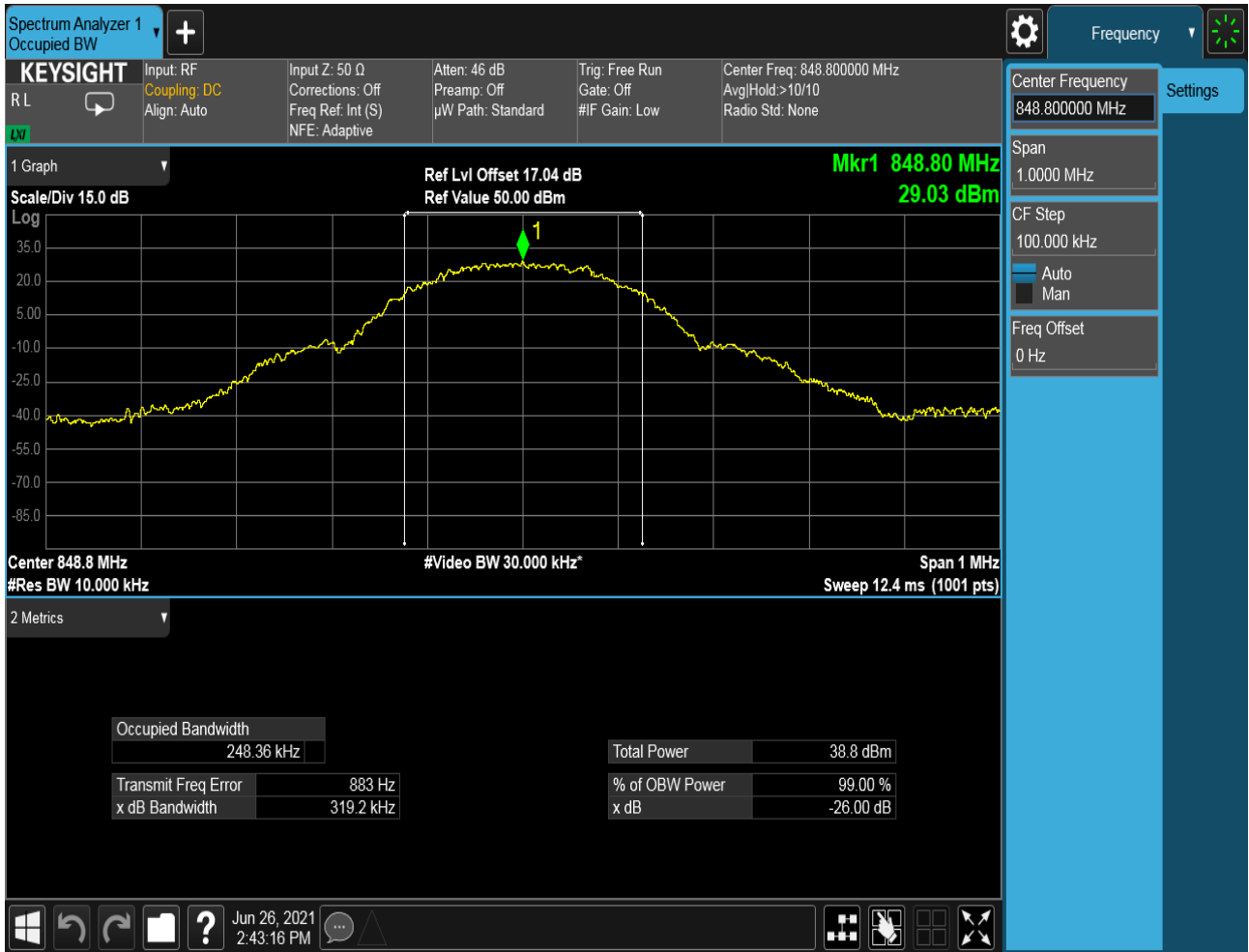


### 4.1.1.1.2 Test Channel = MCH





### 4.1.1.1.3 Test Channel = HCH





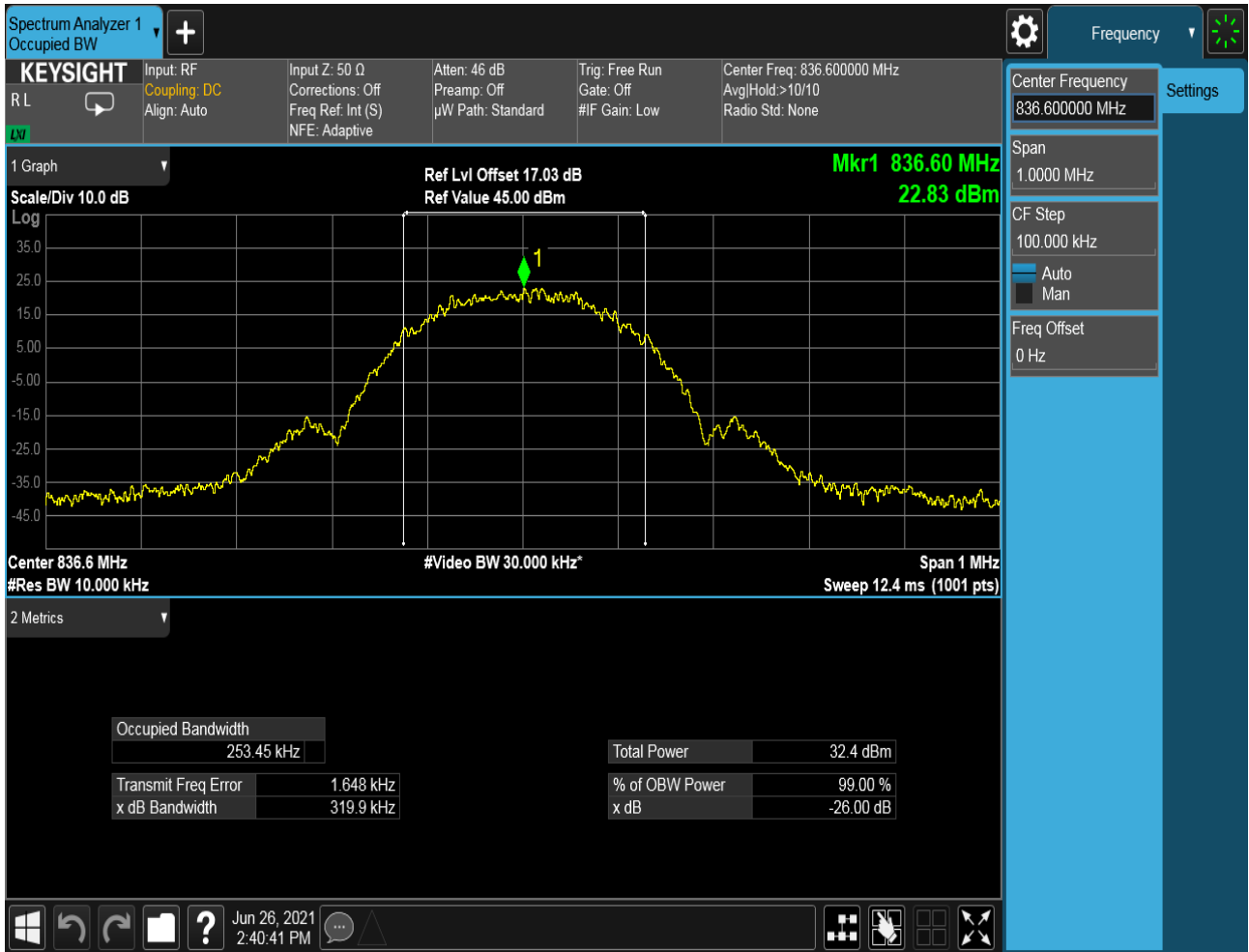
### 4.1.1.2 Test Mode = GSM/TM2

#### 4.1.1.2.1 Test Channel = LCH



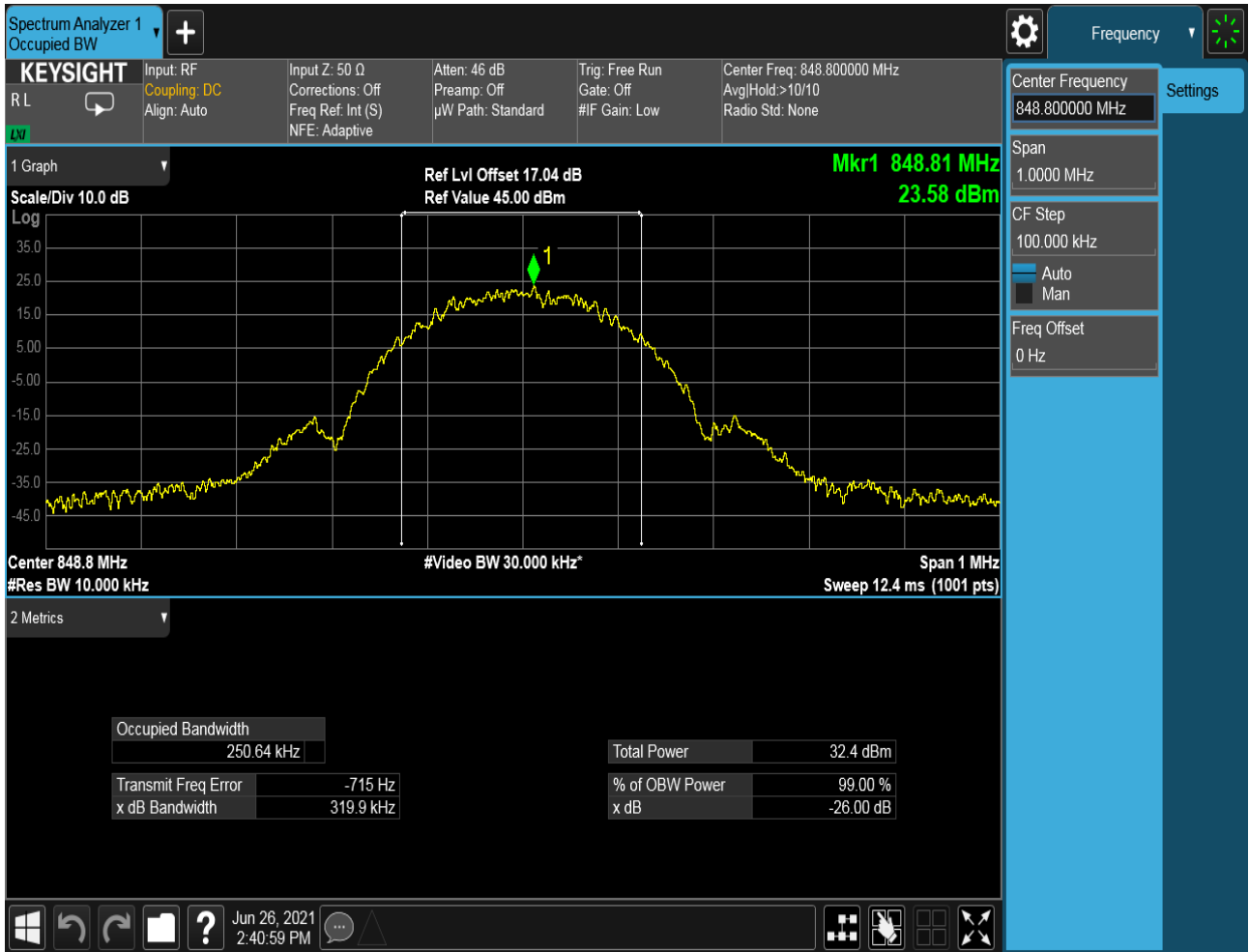


### 4.1.1.2.2 Test Channel = MCH





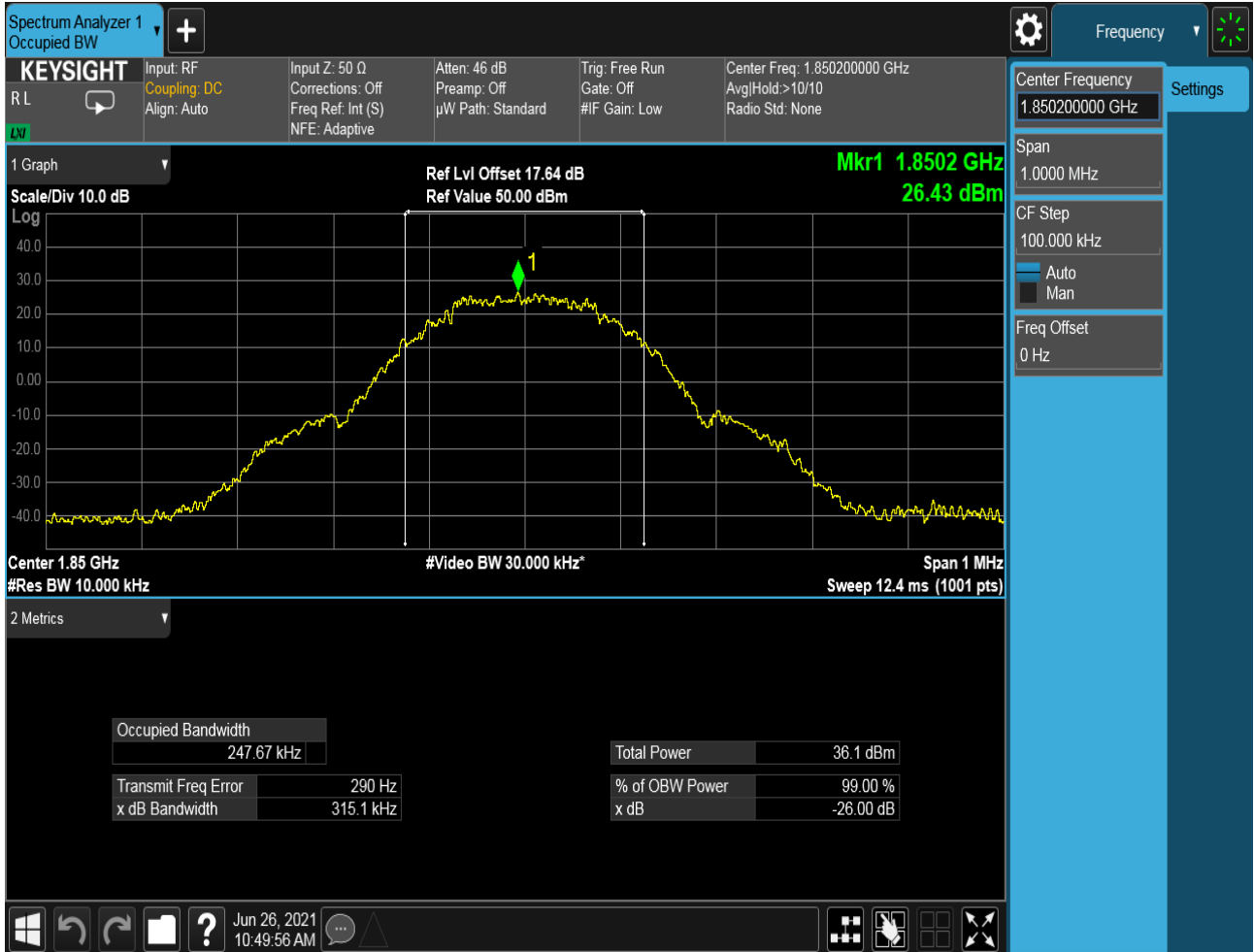
### 4.1.1.2.3 Test Channel = HCH



4.1.2 Test Band = PCS1900

4.1.2.1 Test Mode = GSM/TM1

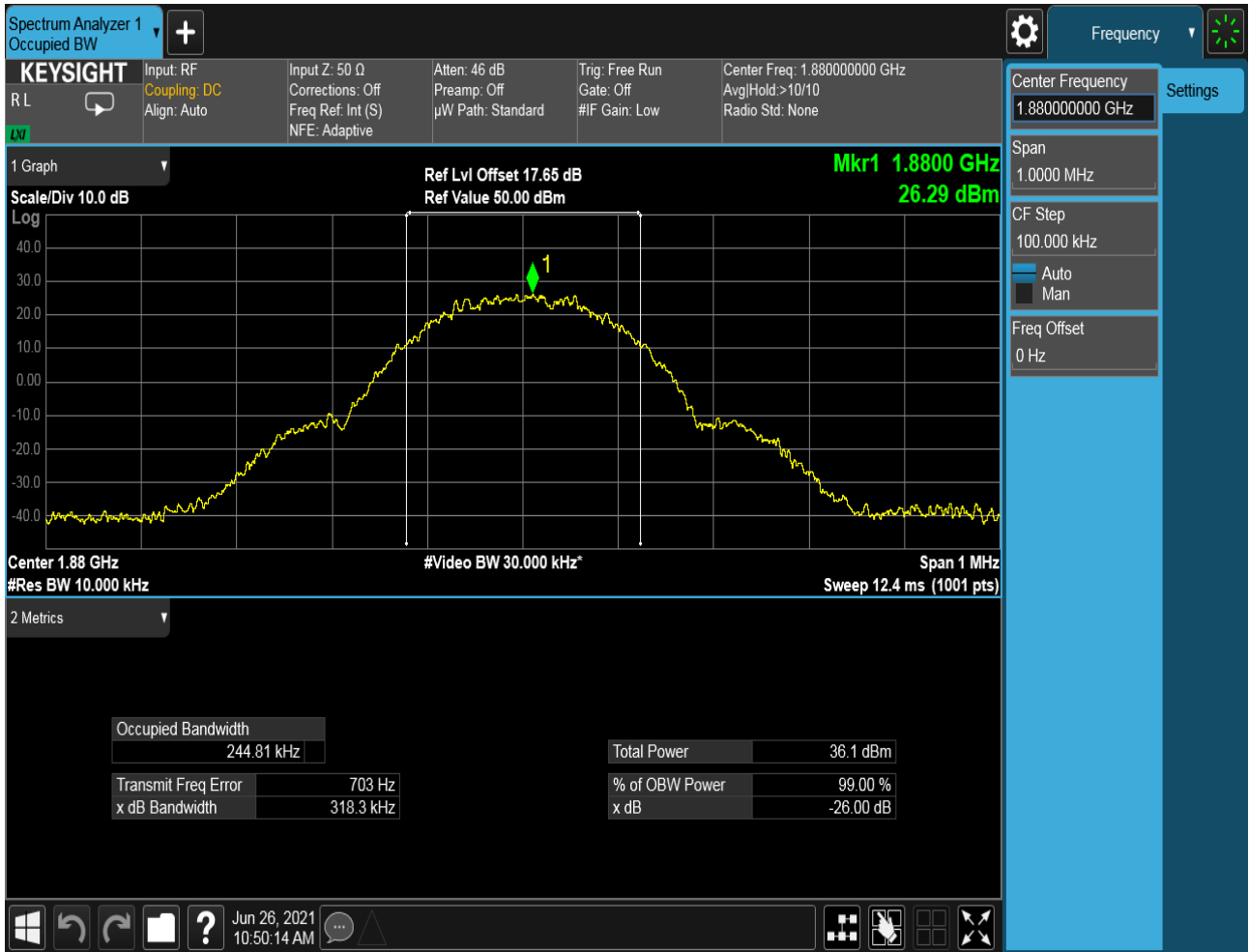
4.1.2.1.1 Test Channel = LCH





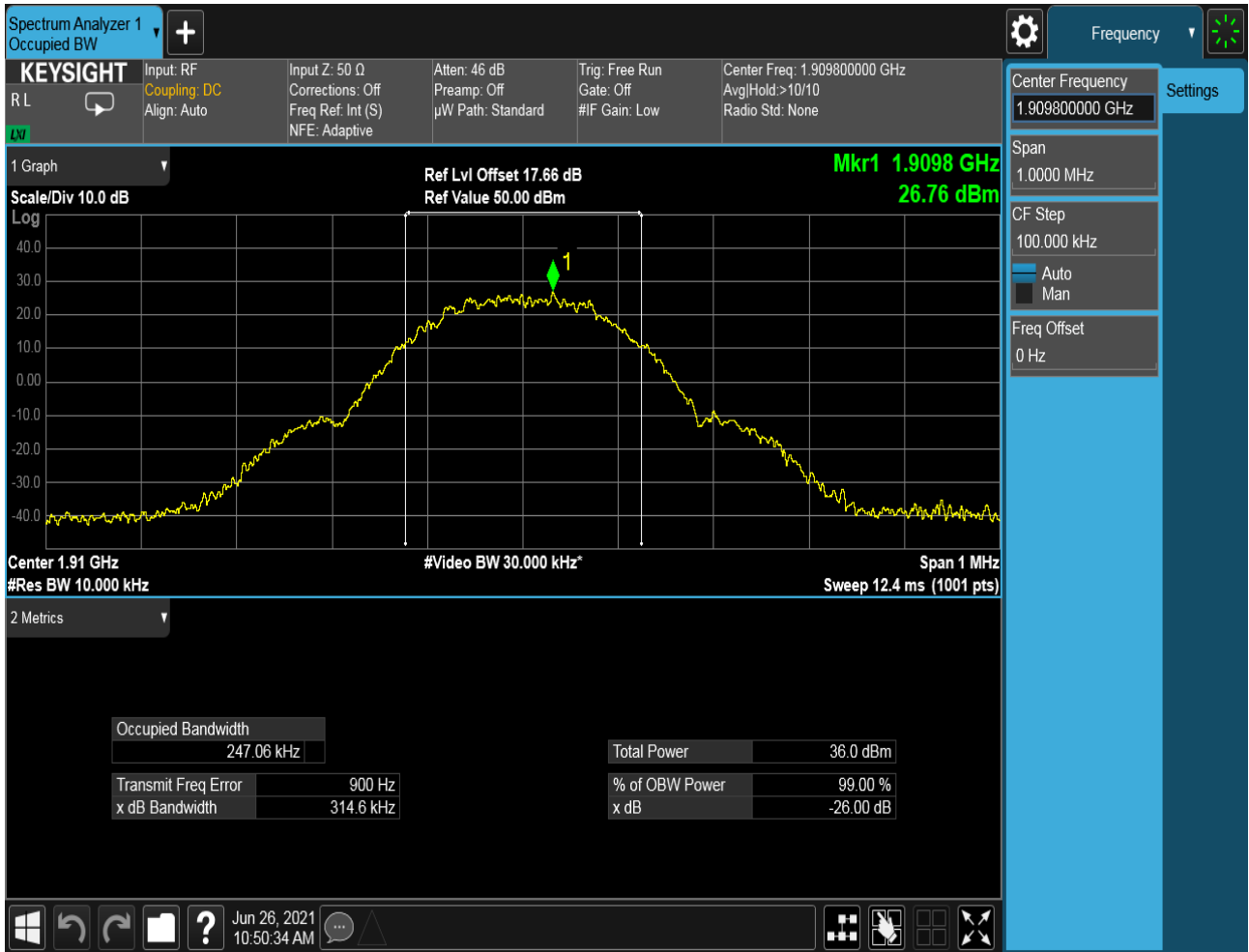


### 4.1.2.1.2 Test Channel = MCH



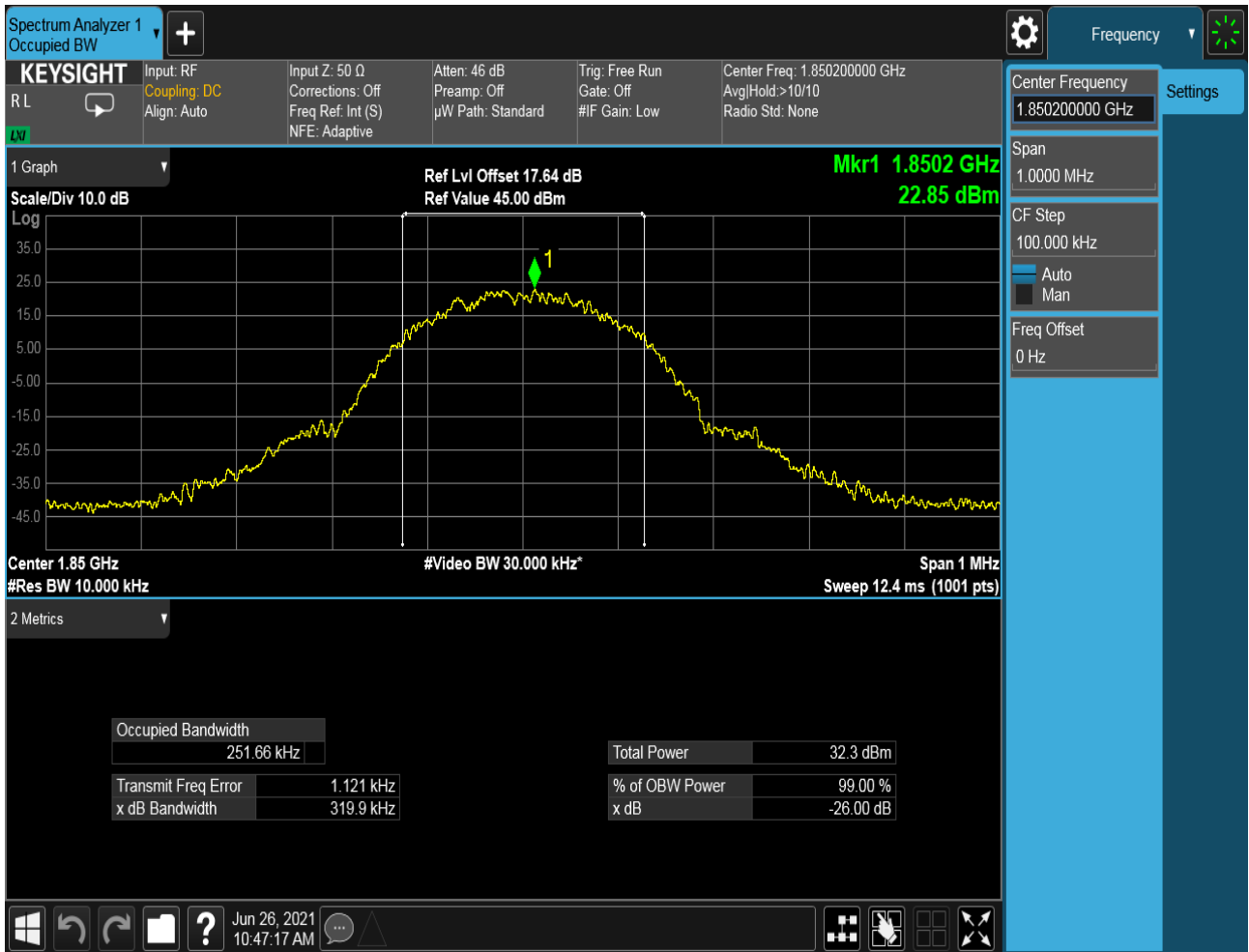


### 4.1.2.1.3 Test Channel = HCH



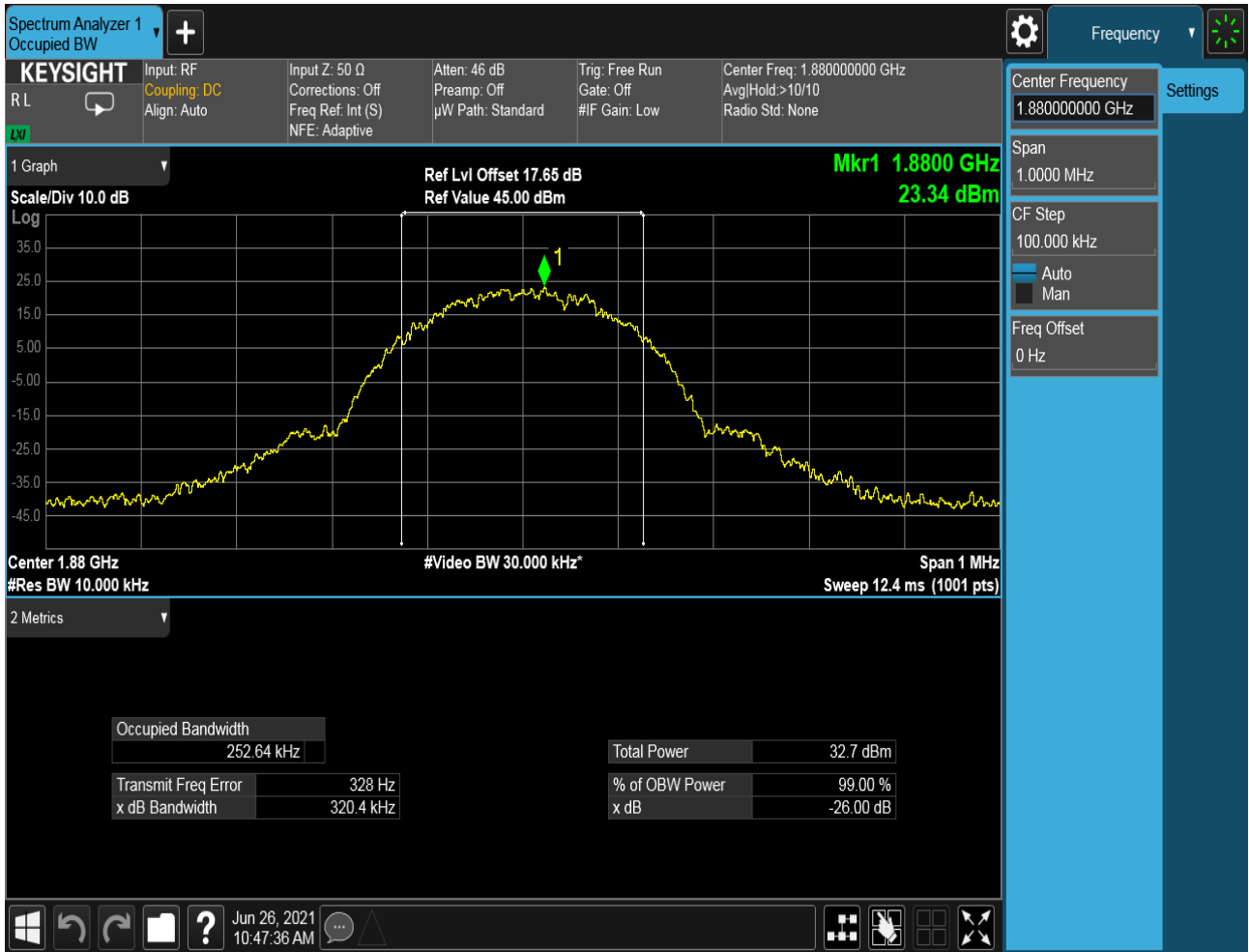
### 4.1.2.2 Test Mode = GSM/TM2

#### 4.1.2.2.1 Test Channel = LCH



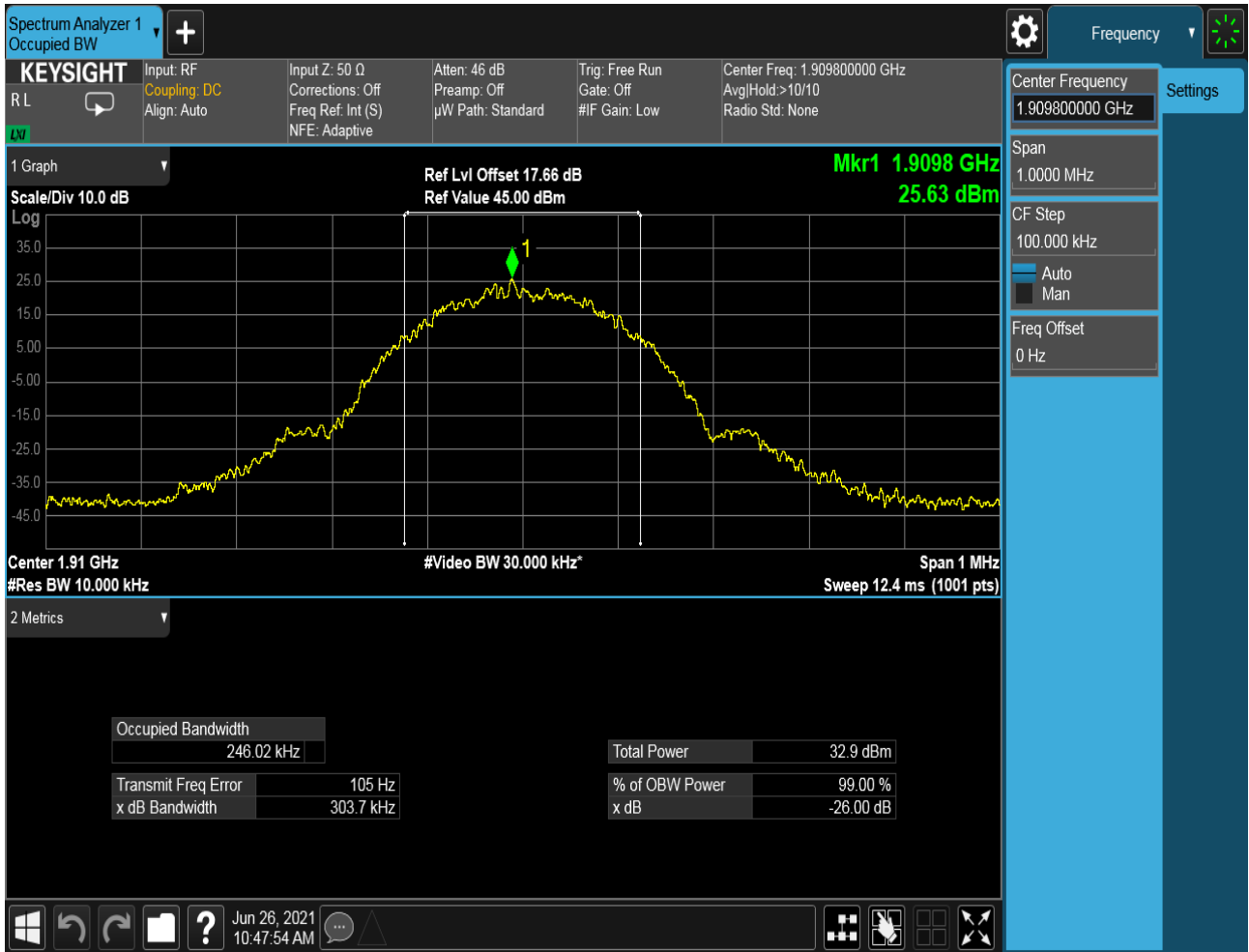


### 4.1.2.2.2 Test Channel = MCH





### 4.1.2.2.3 Test Channel = HCH



## 5Appendix\_E: Band Edges Compliance

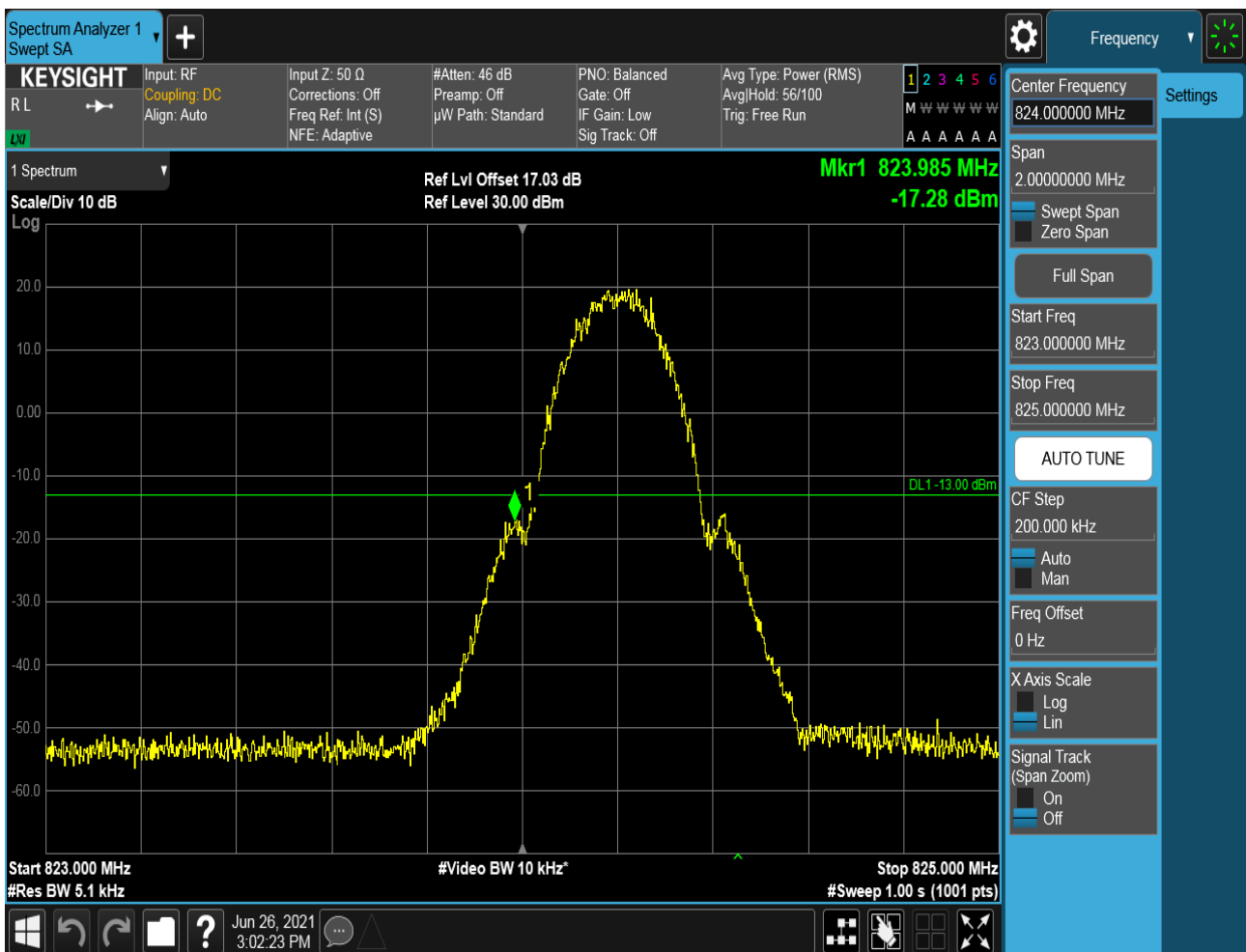
### Part I - Test Plots

#### 5.1 For GSM

##### 5.1.1 Test Band = GSM850

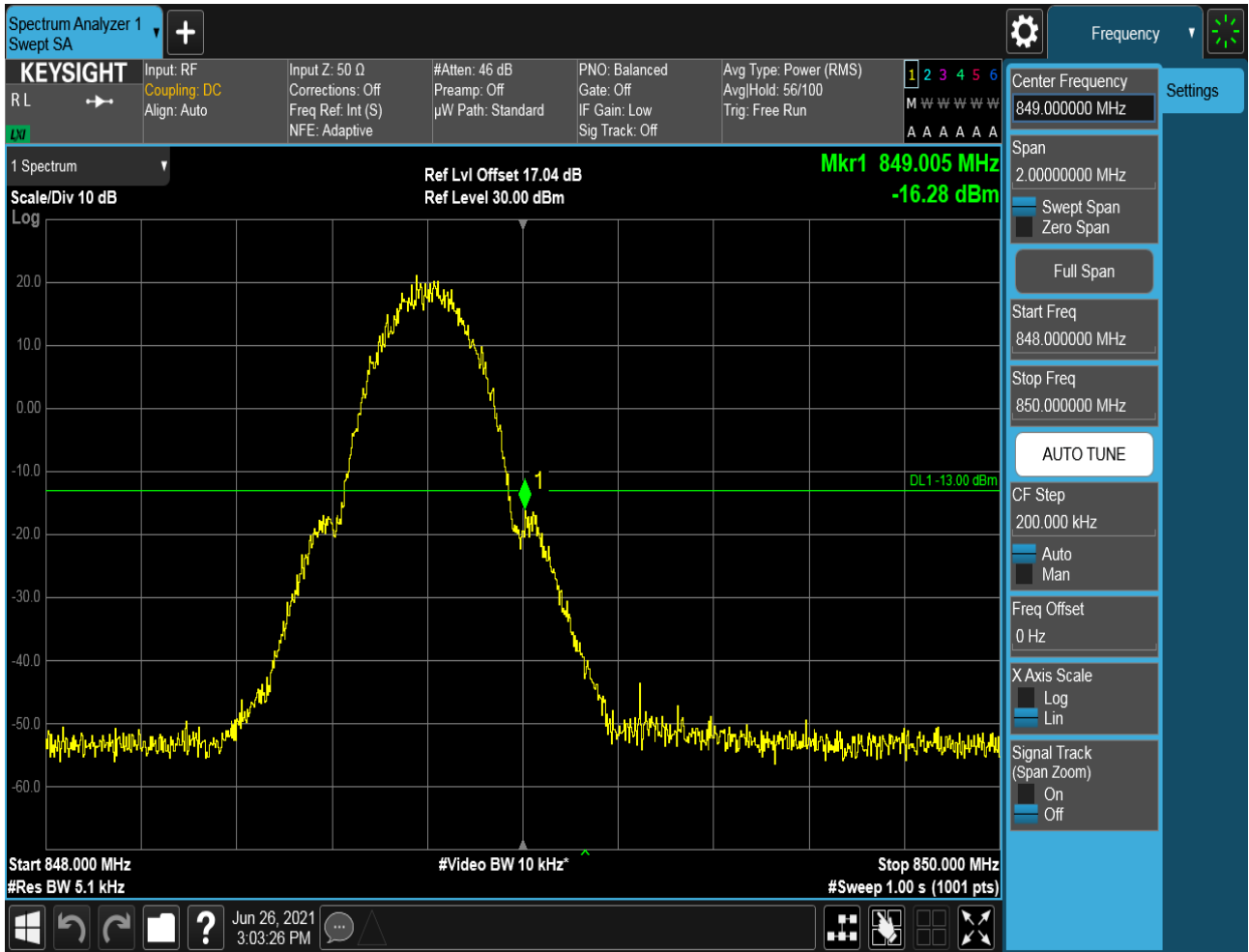
##### 5.1.1.1 Test Mode = GSM/TM1

##### 5.1.1.1.1 Test Channel = LCH





### 5.1.1.1.2 Test Channel = HCH

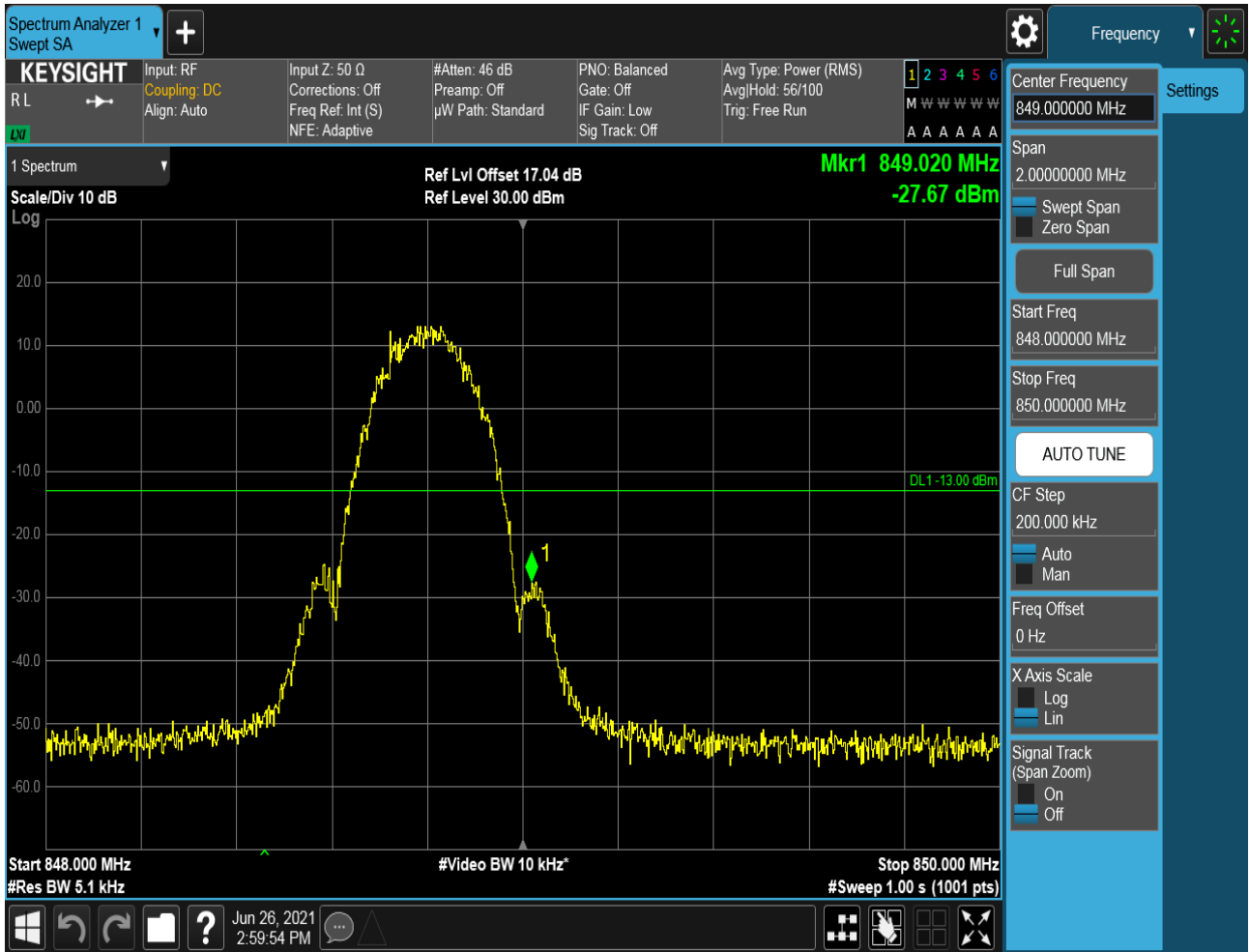








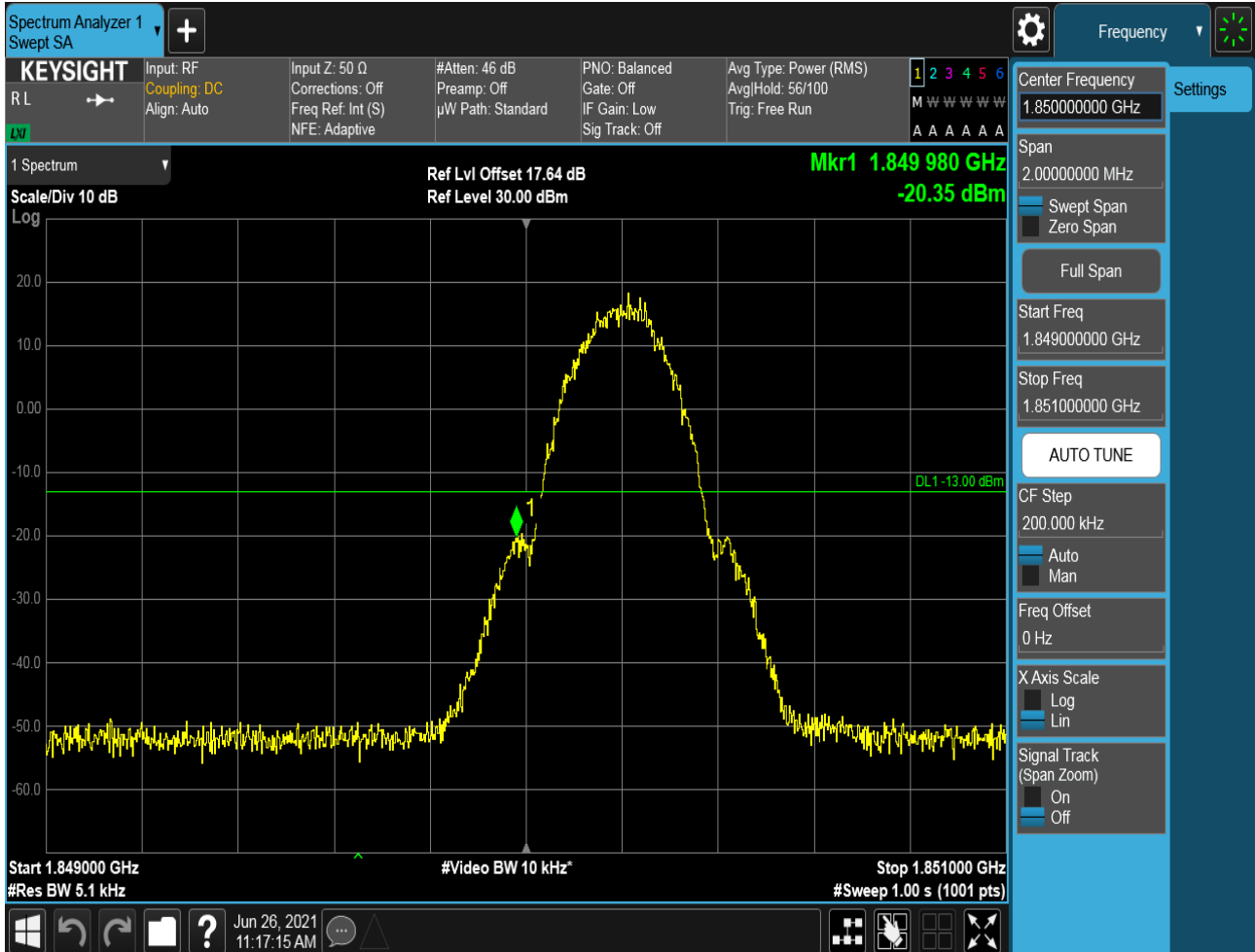
### 5.1.1.2.2 Test Channel = HCH



## 5.1.2 Test Band = PCS1900

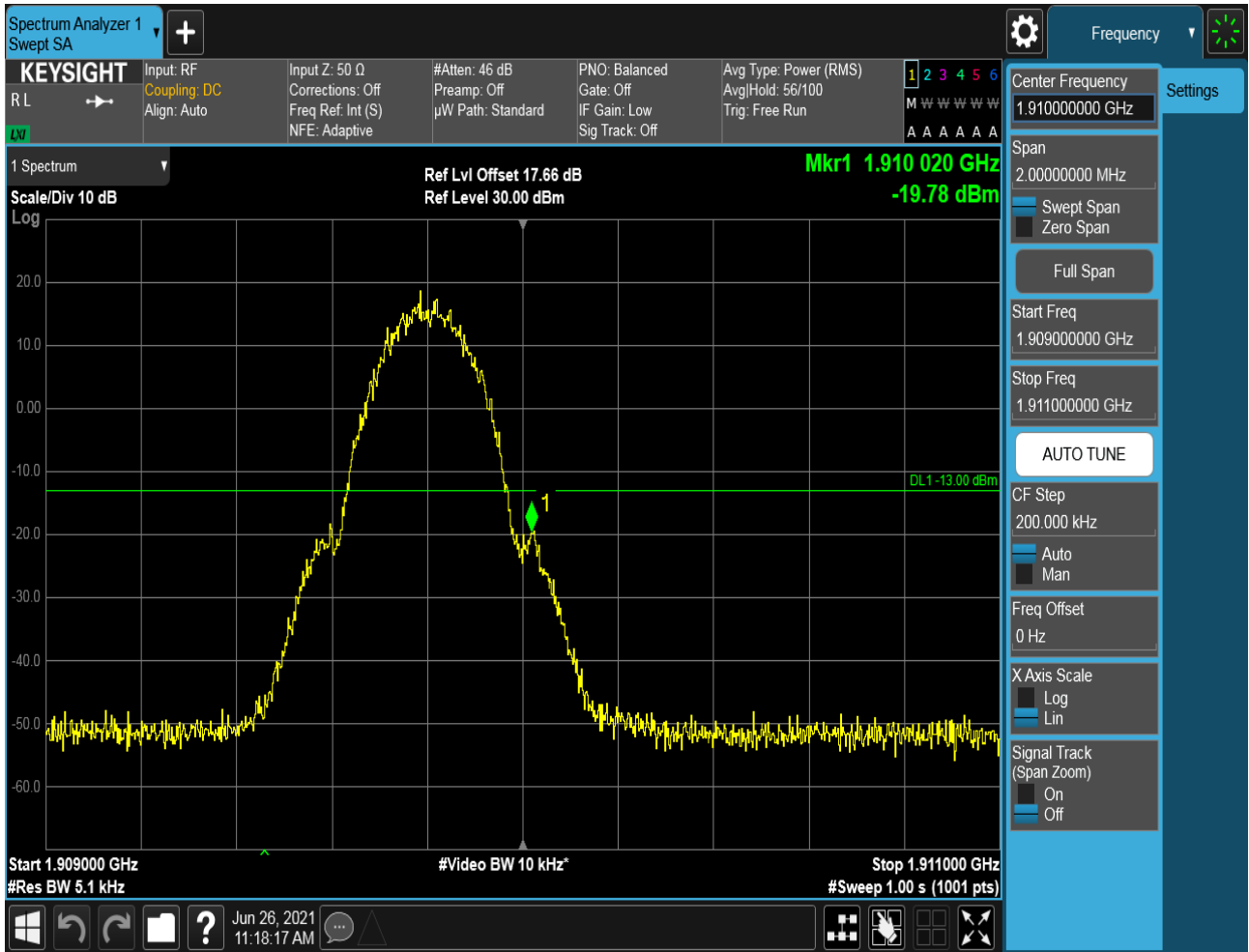
### 5.1.2.1 Test Mode = GSM/TM1

#### 5.1.2.1.1 Test Channel = LCH



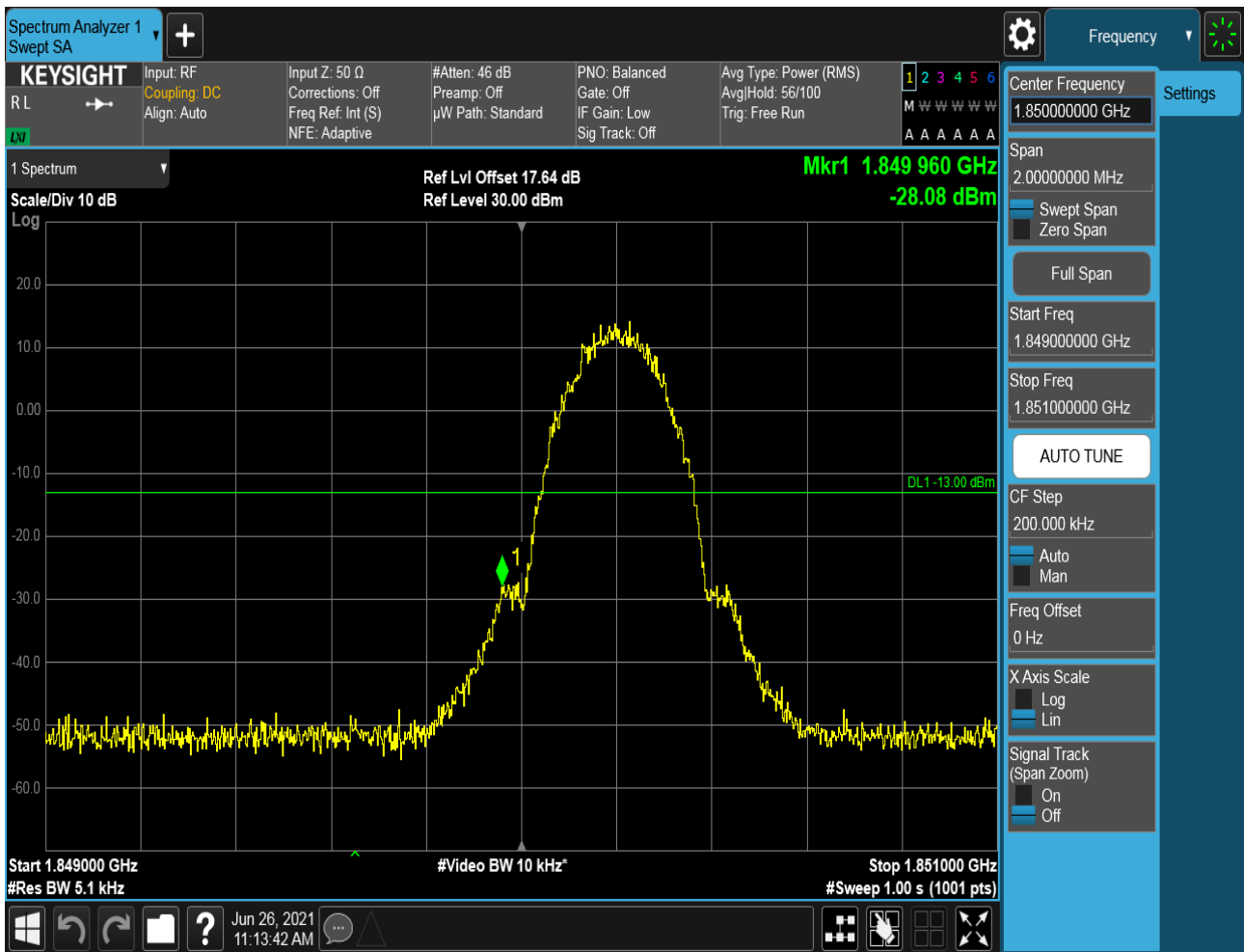


### 5.1.2.1.2 Test Channel = HCH

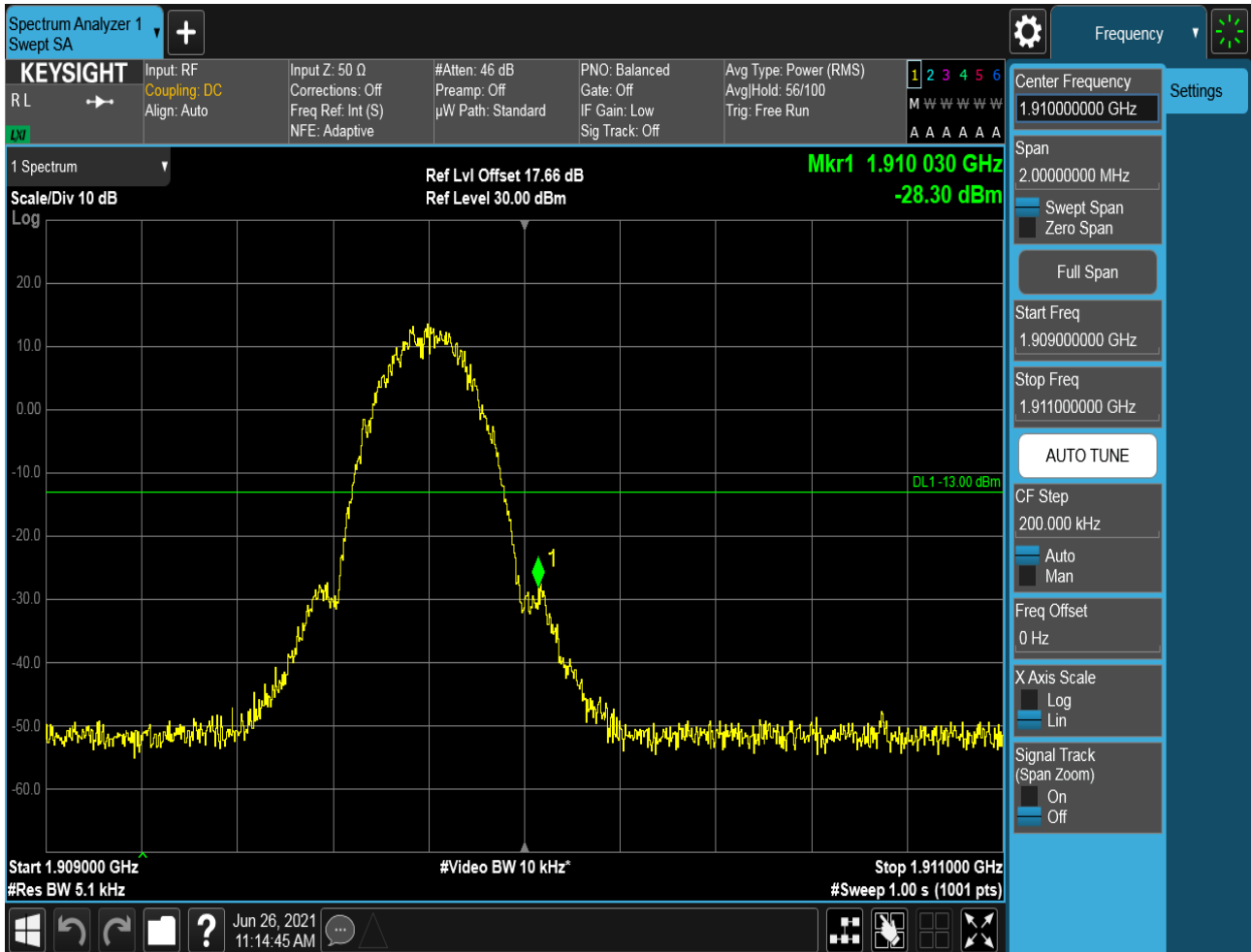


### 5.1.2.2 Test Mode = GSM/TM2

#### 5.1.2.2.1 Test Channel = LCH



## 5.1.2.2.2 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.

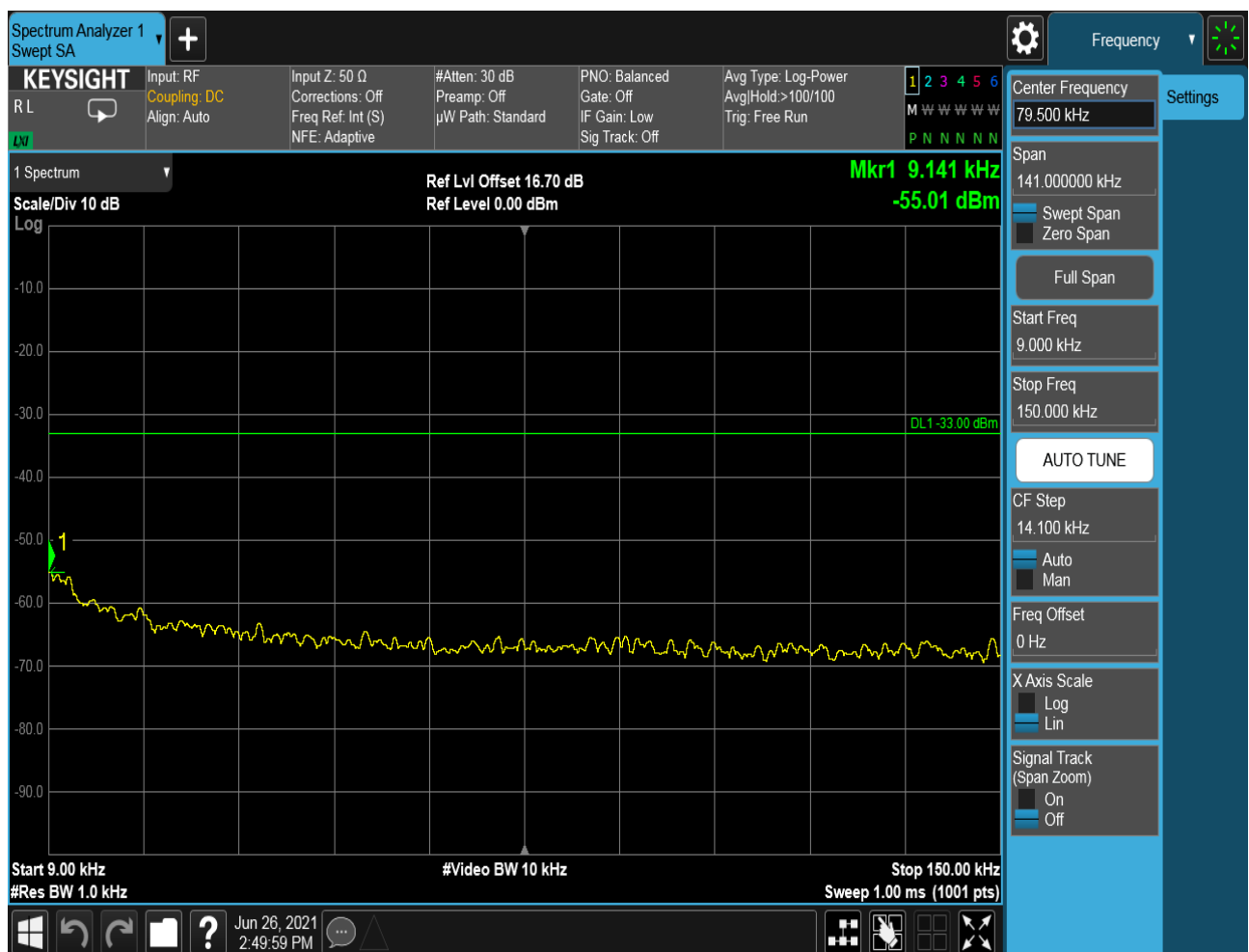
### Part I - Test Plots

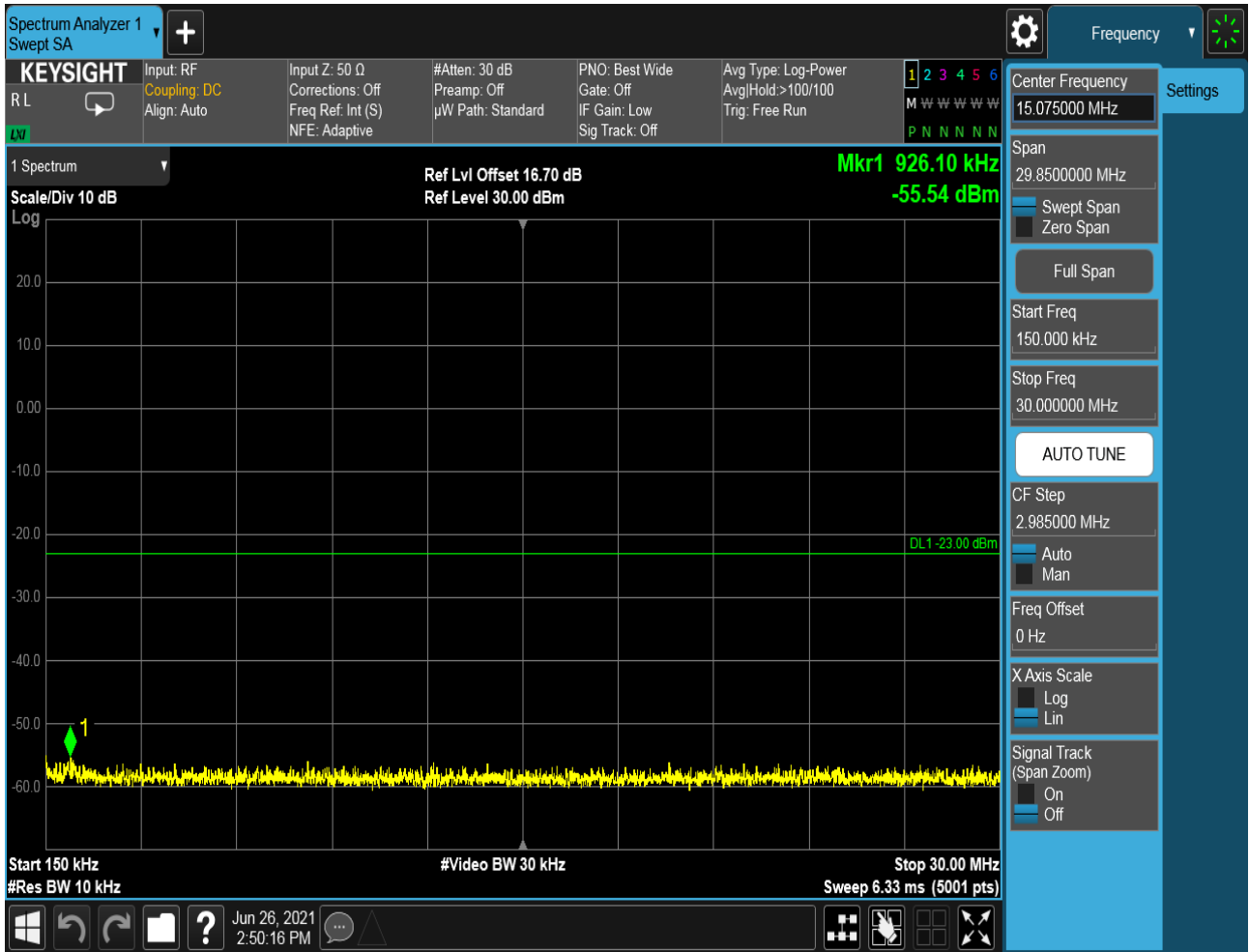
#### 6.1 For GSM

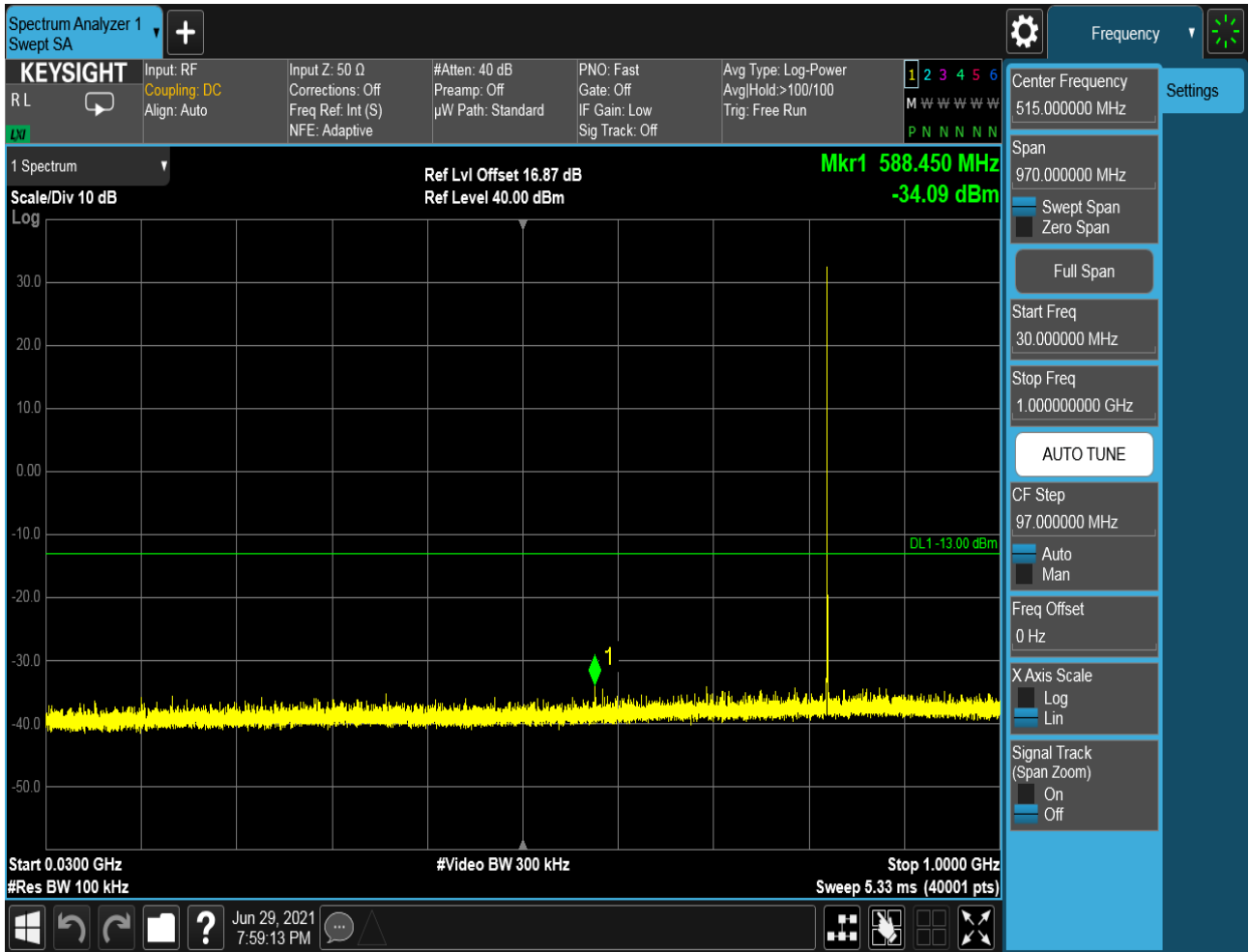
##### 6.1.1 Test Band = GSM850

##### 6.1.1.1 Test Mode = GSM/TM1

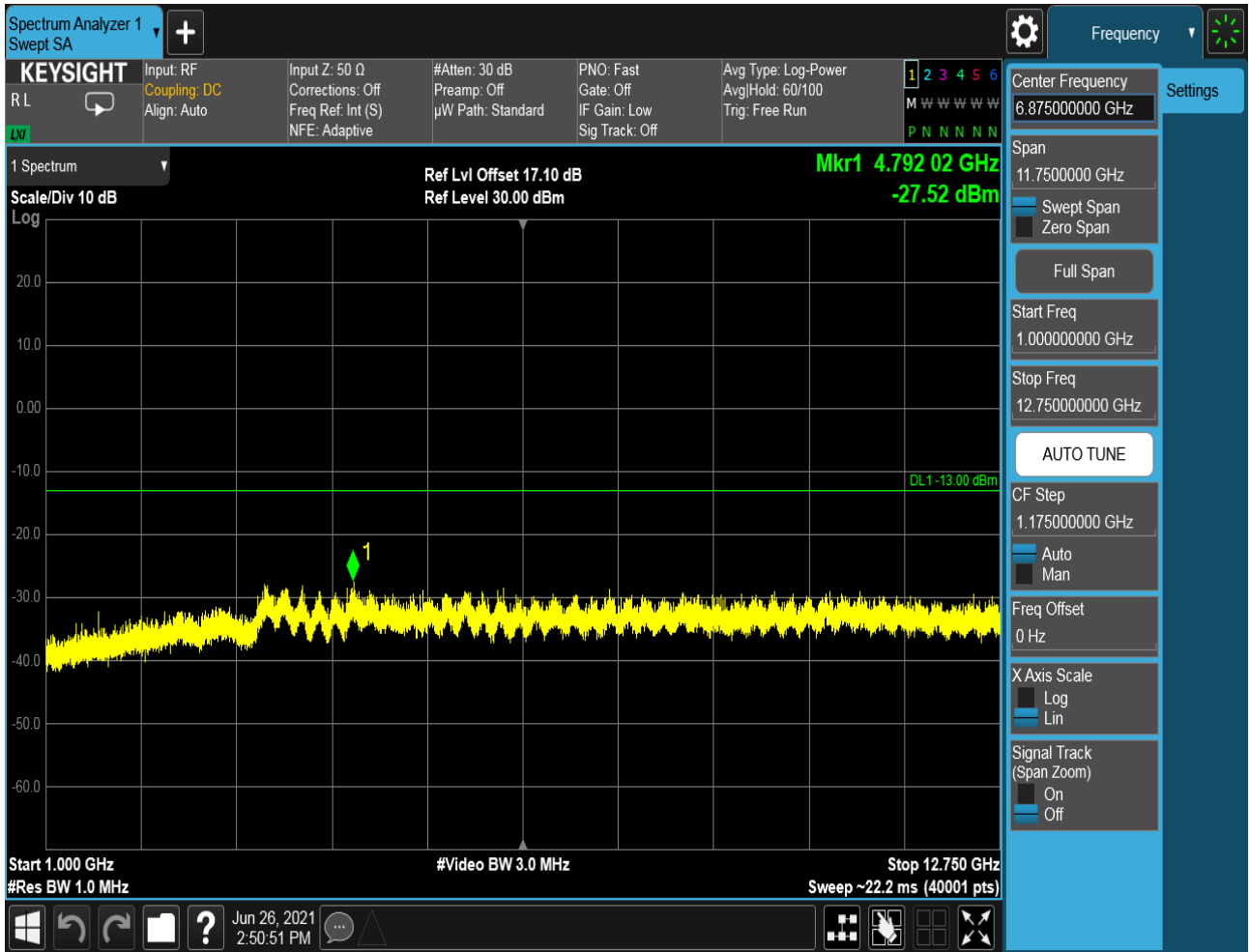
##### 6.1.1.1.1 Test Channel = LCH





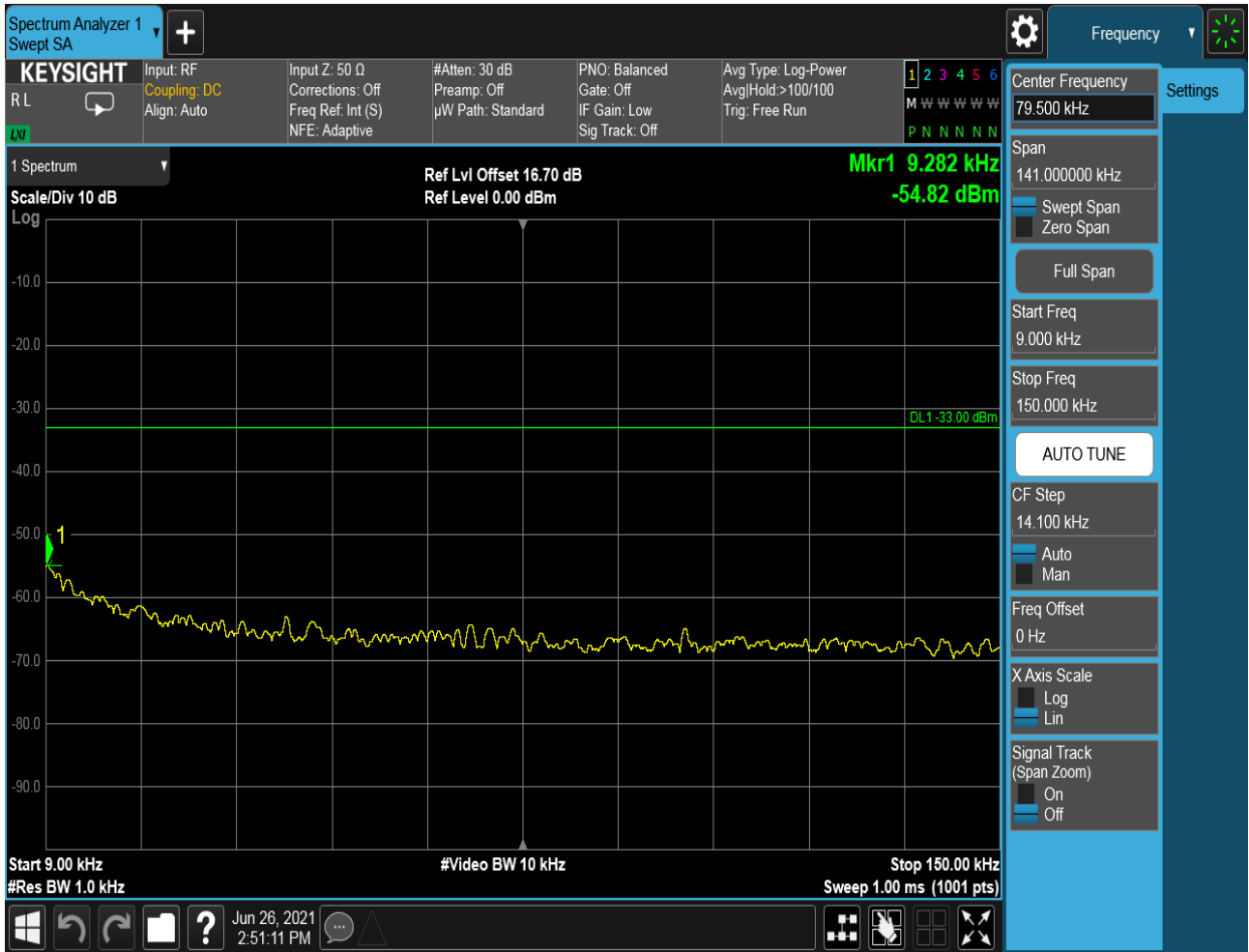


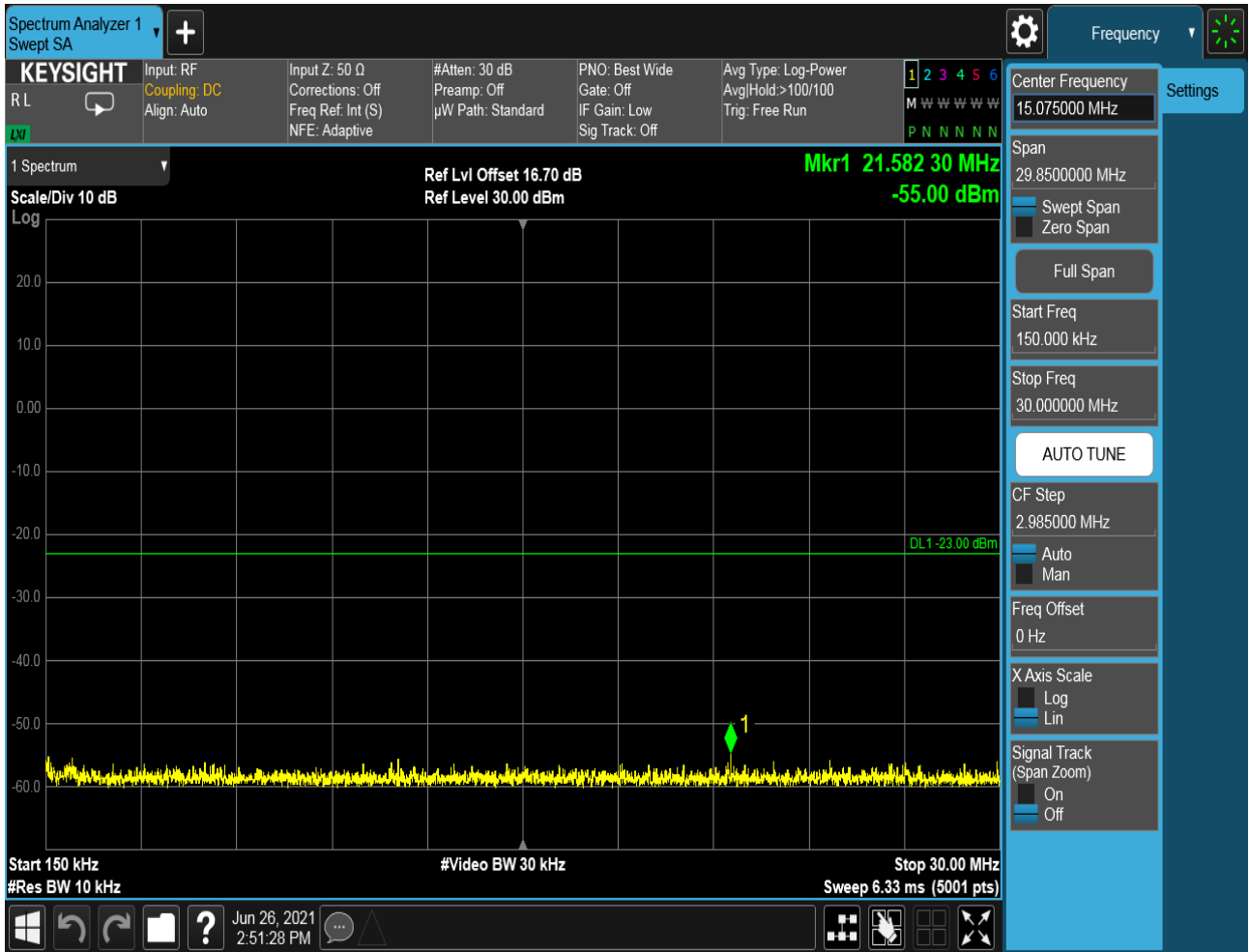


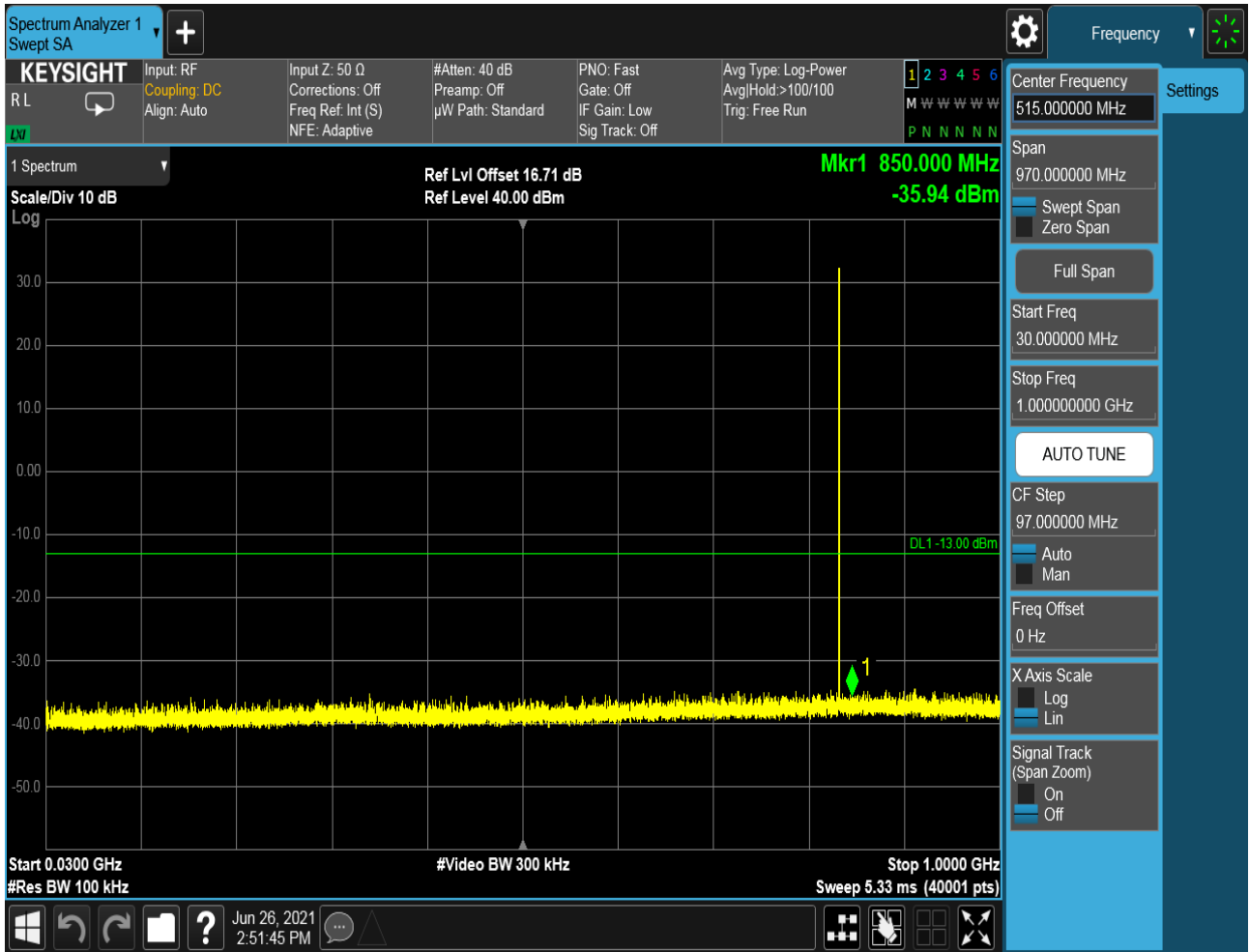


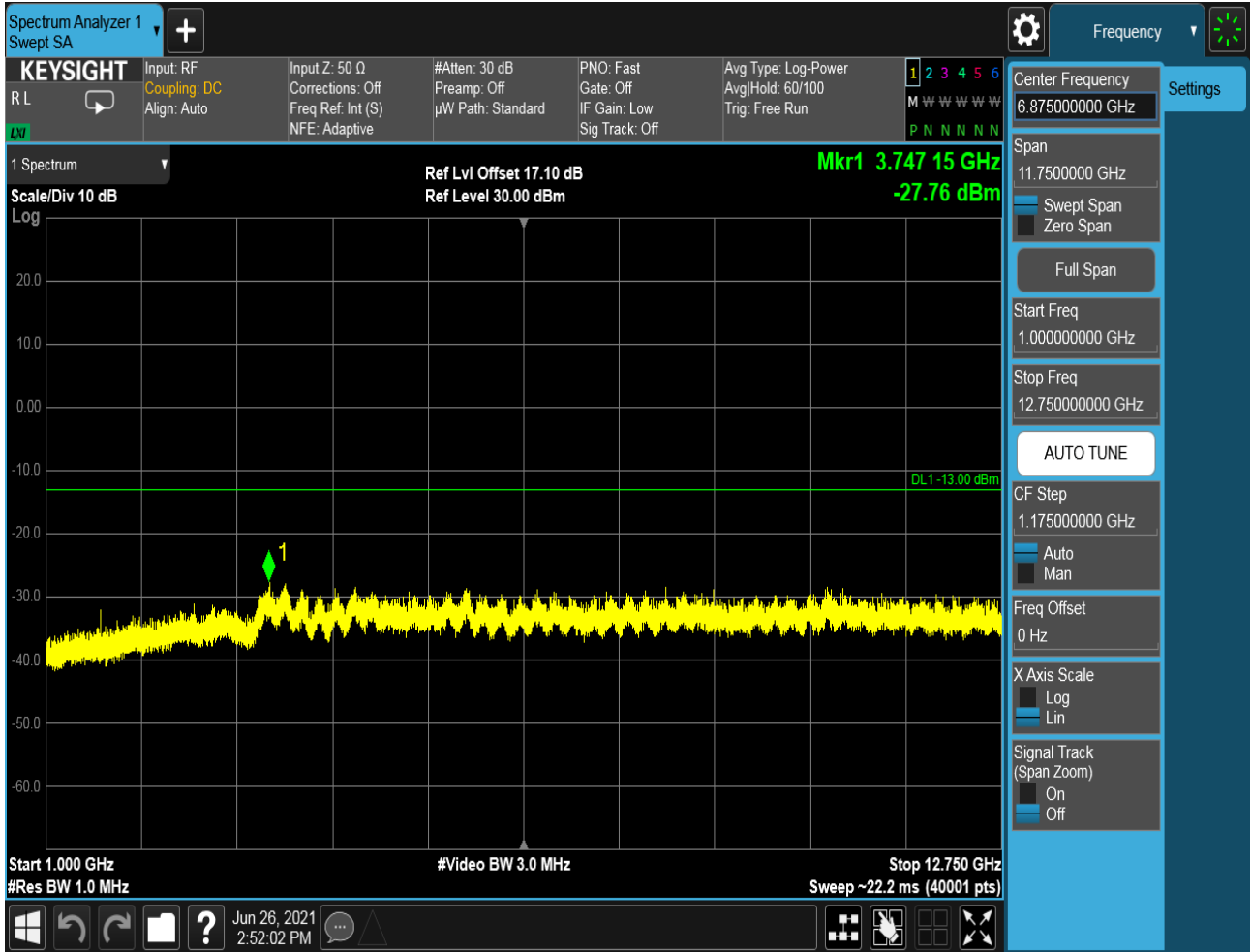


### 6.1.1.1.2 Test Channel = MCH



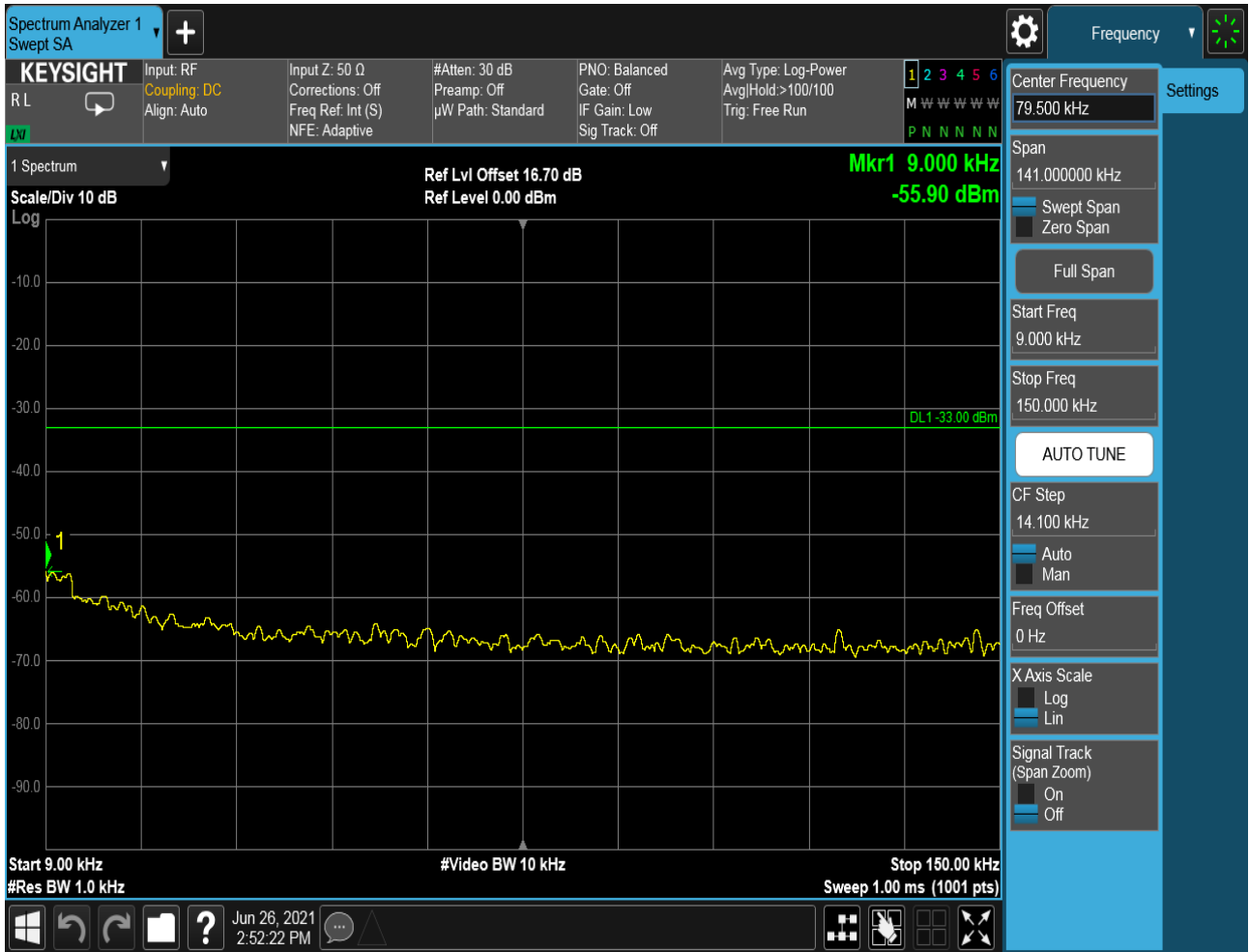


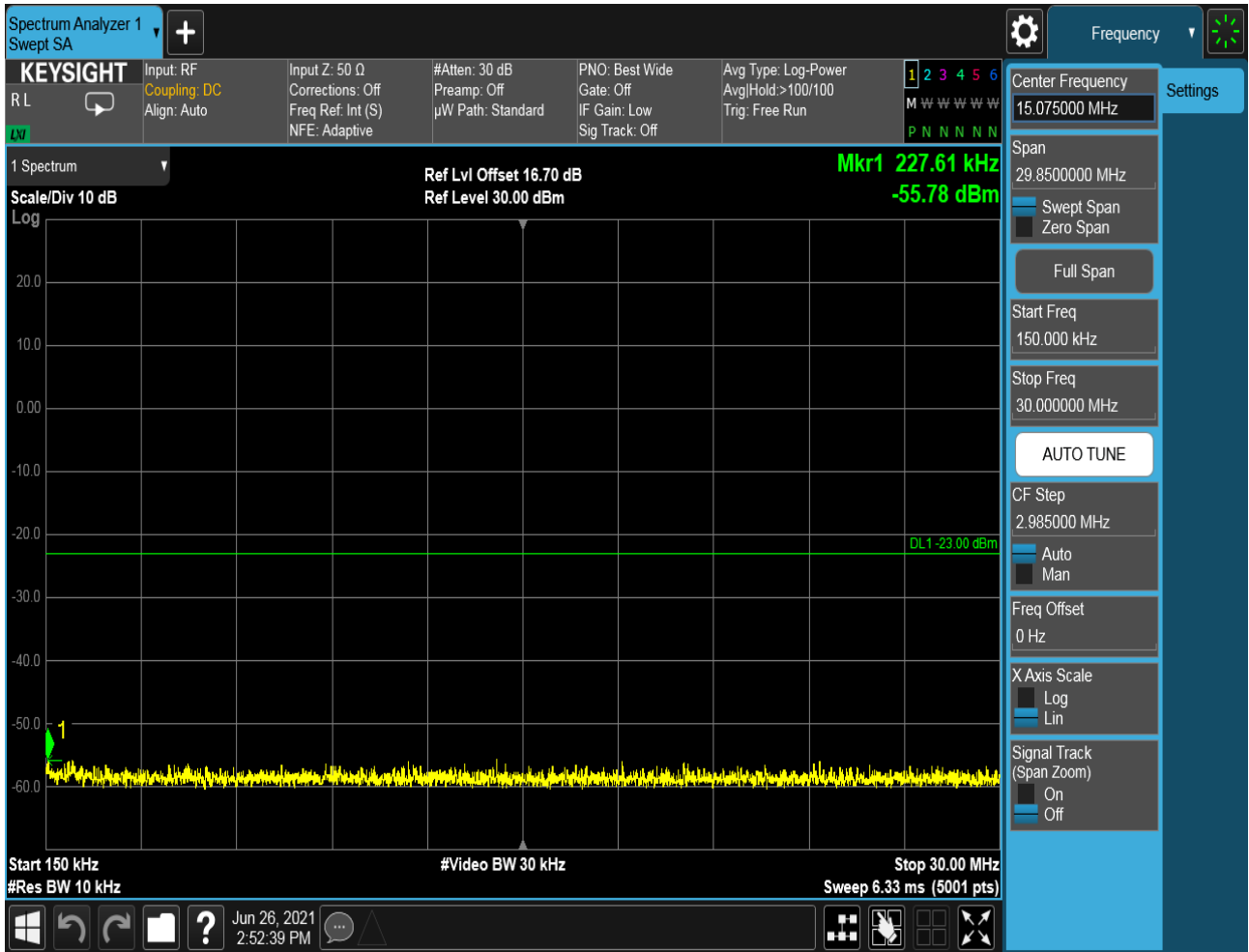


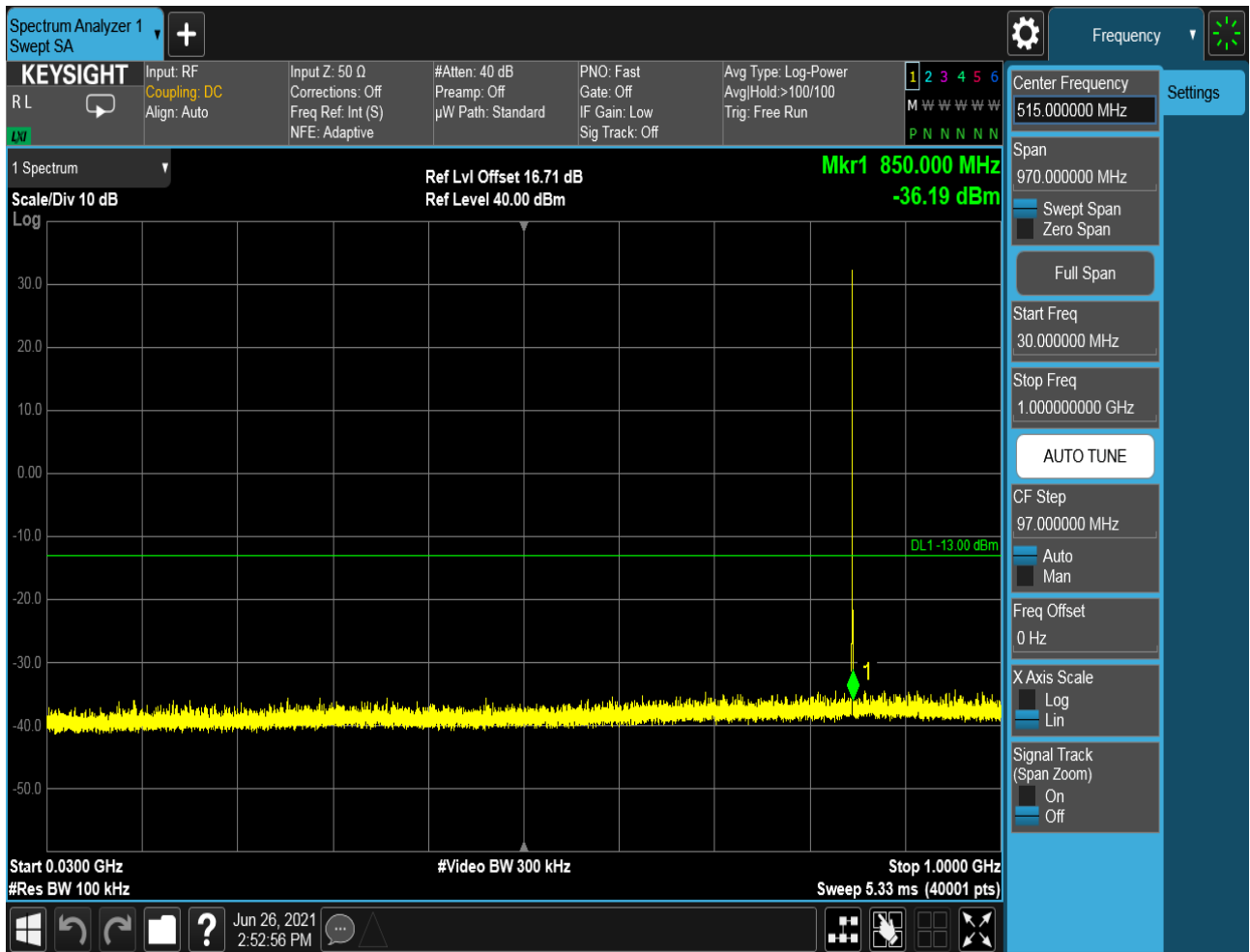




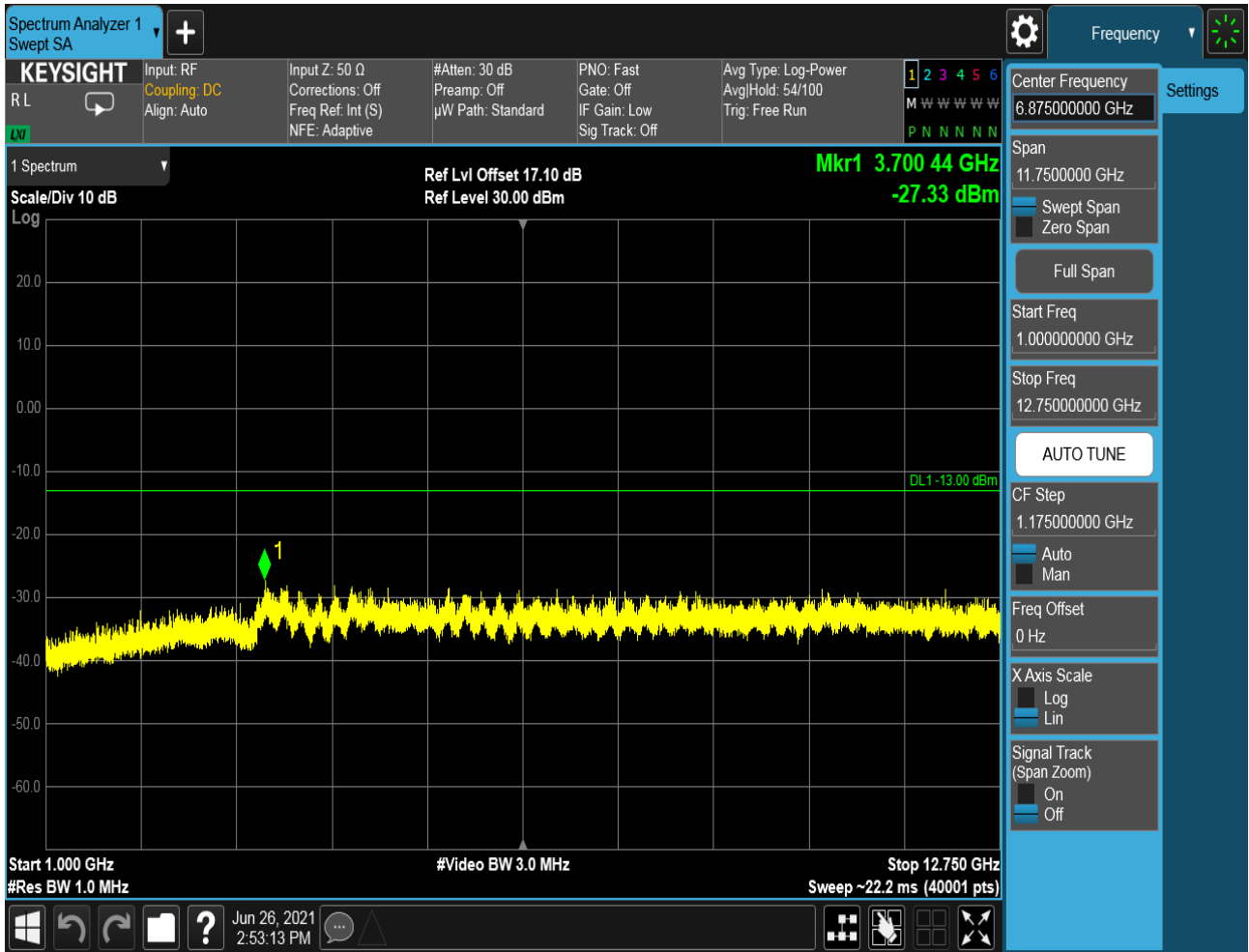
### 6.1.1.1.3 Test Channel = HCH







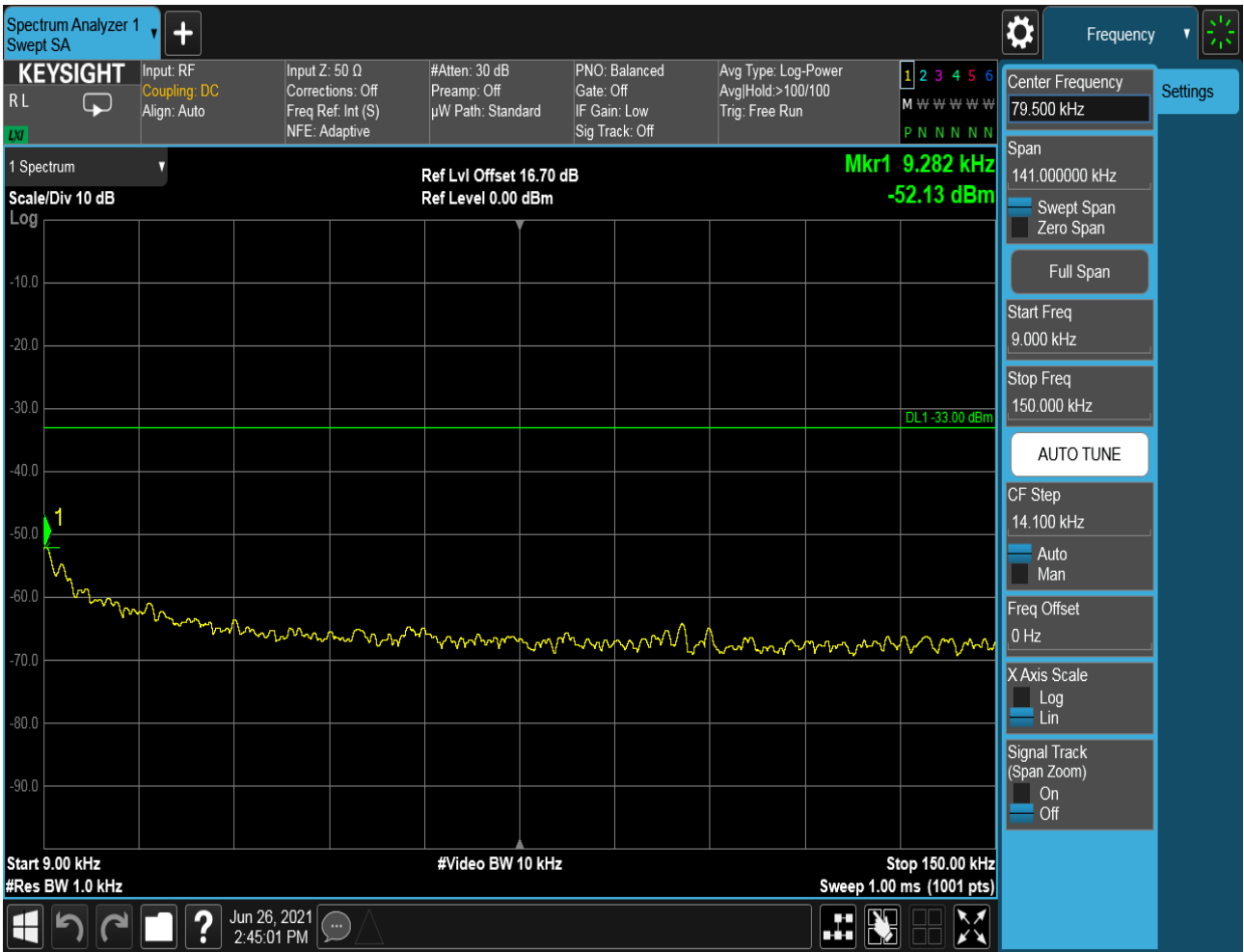


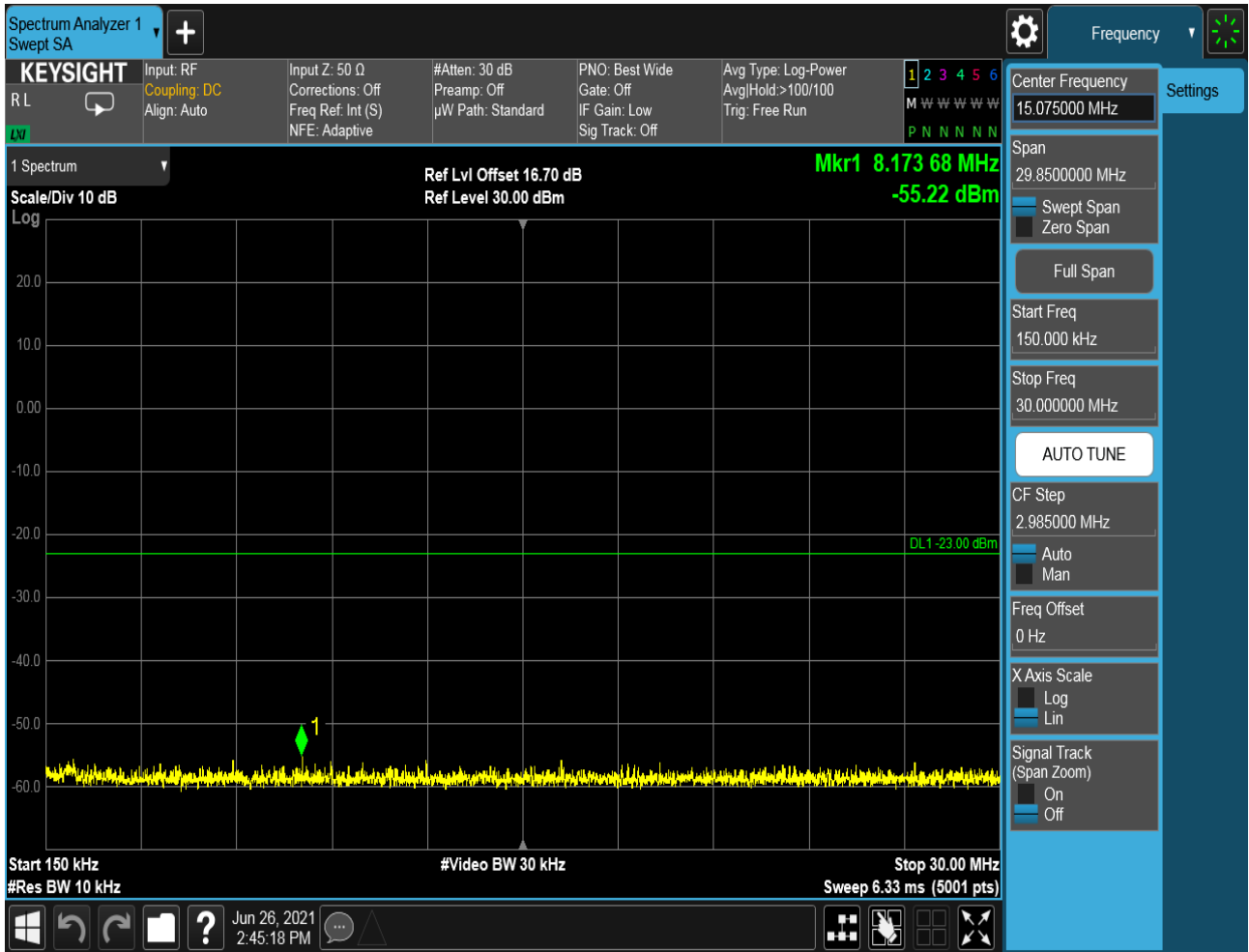


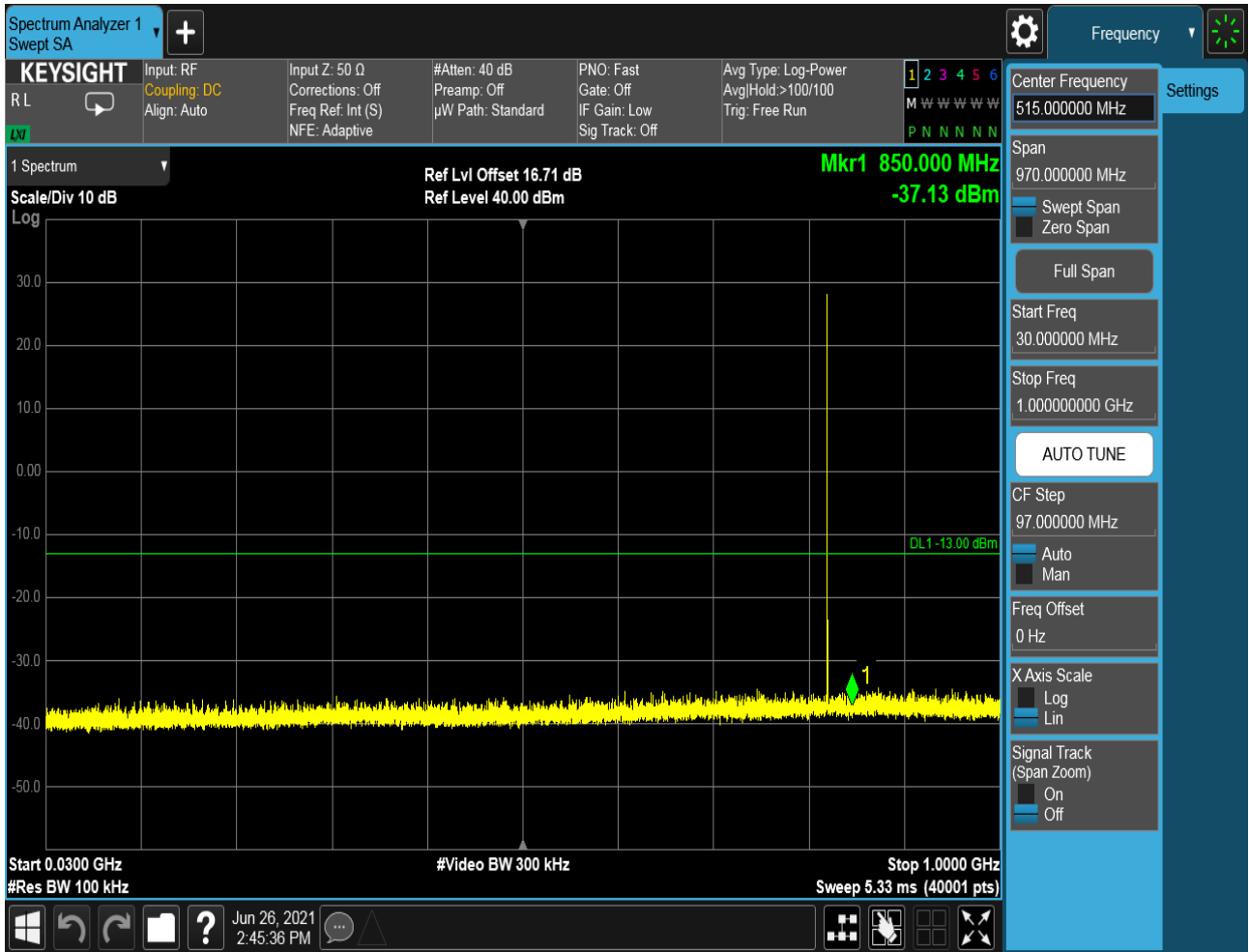


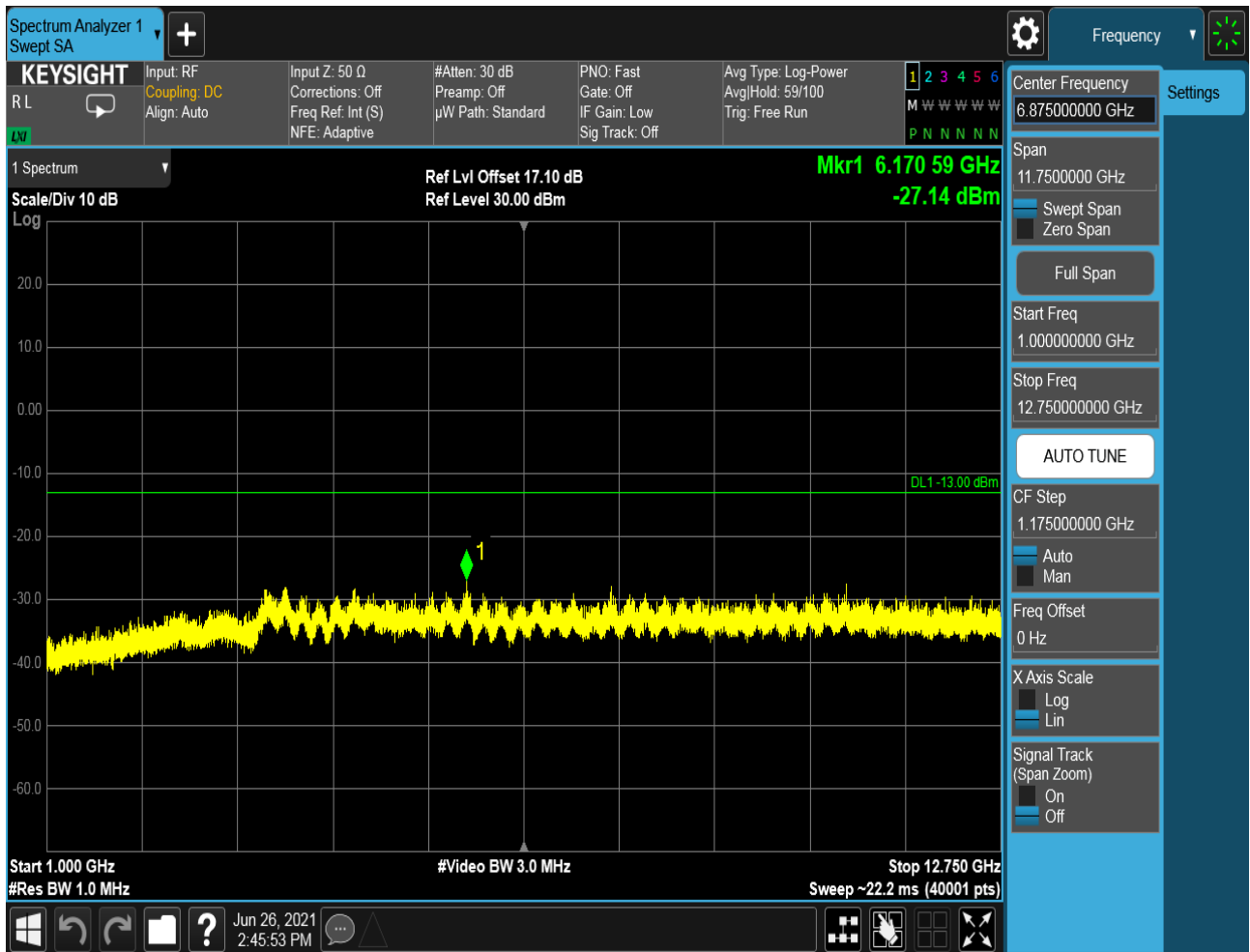
### 6.1.1.2 Test Mode = GSM/TM2

#### 6.1.1.2.1 Test Channel = LCH



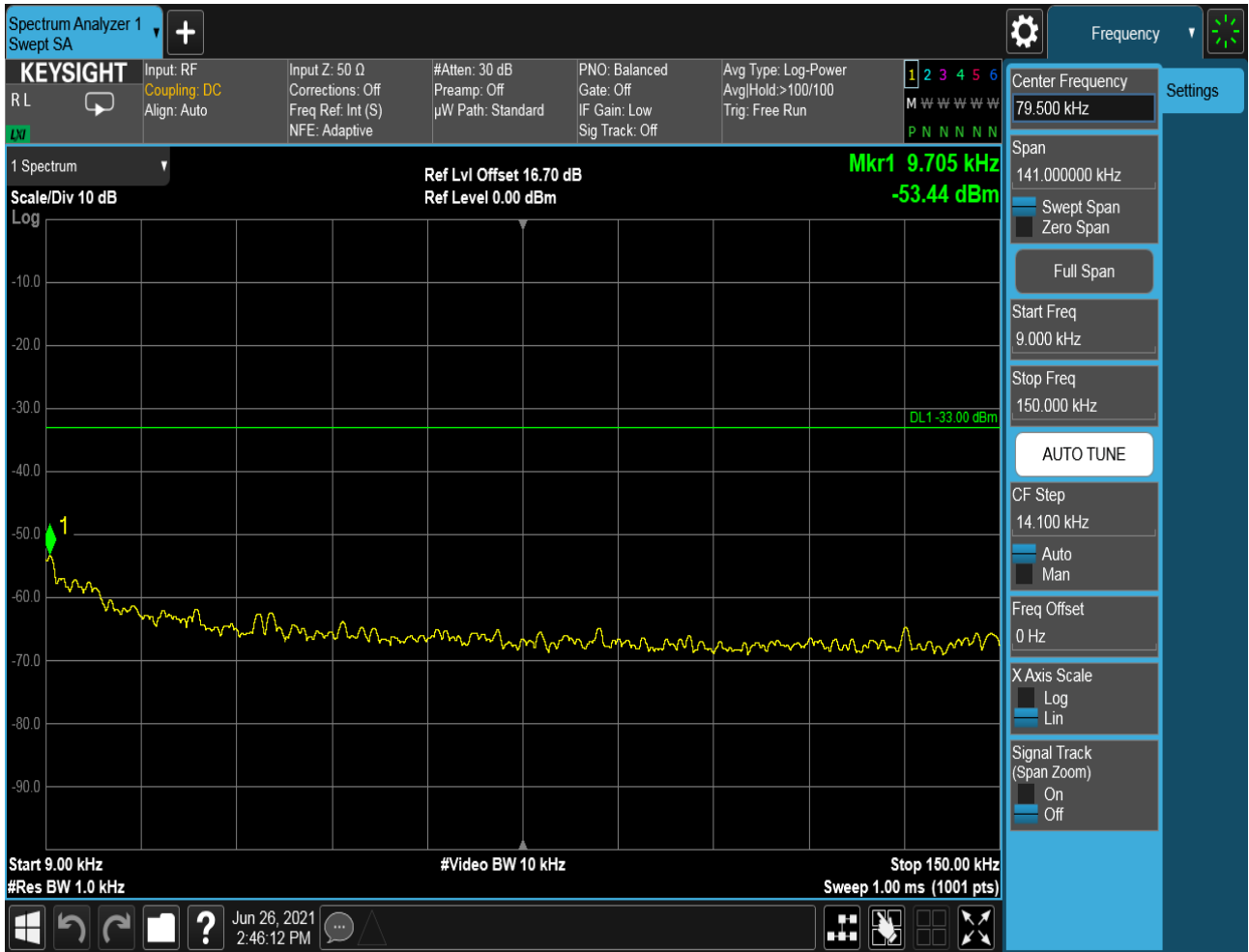


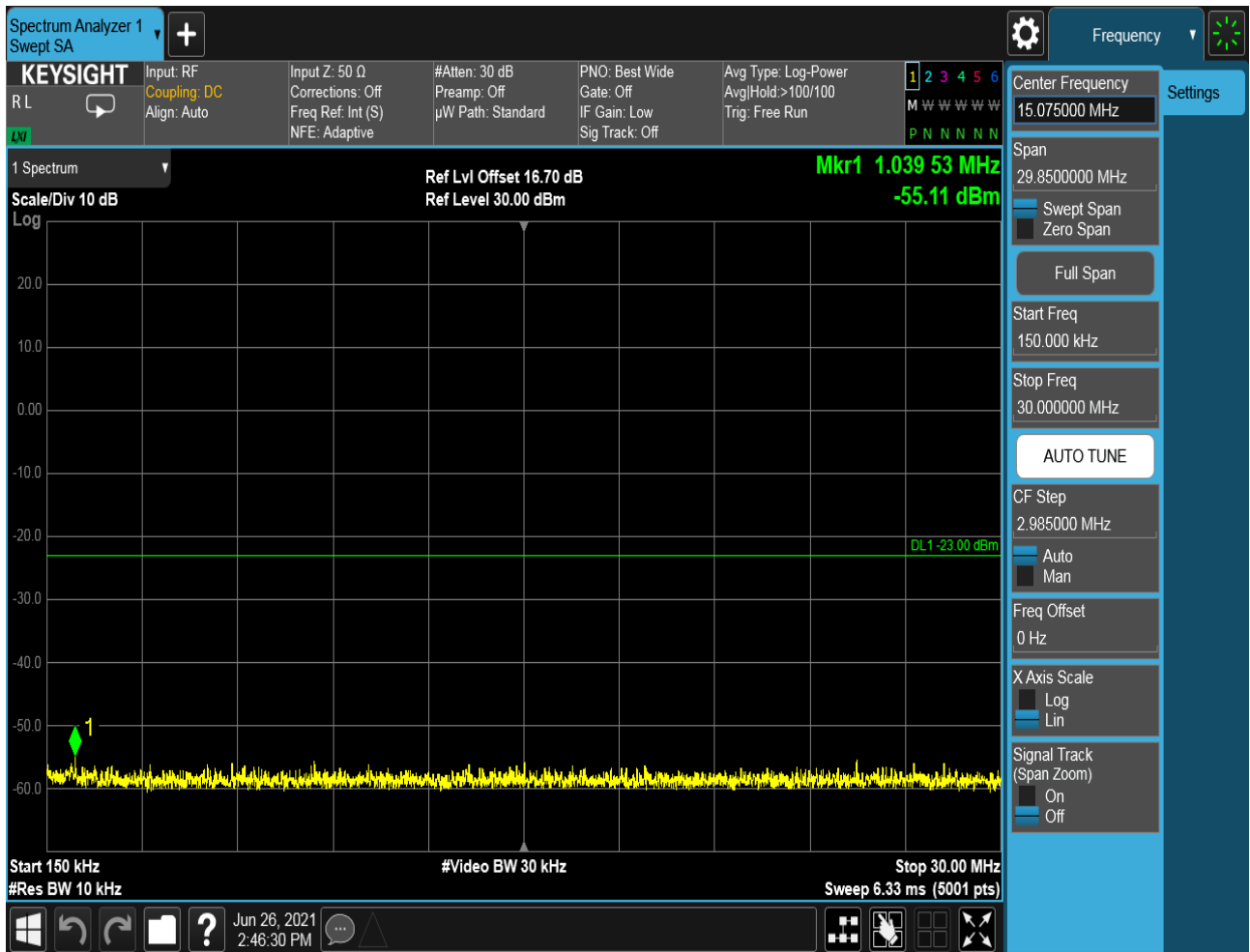


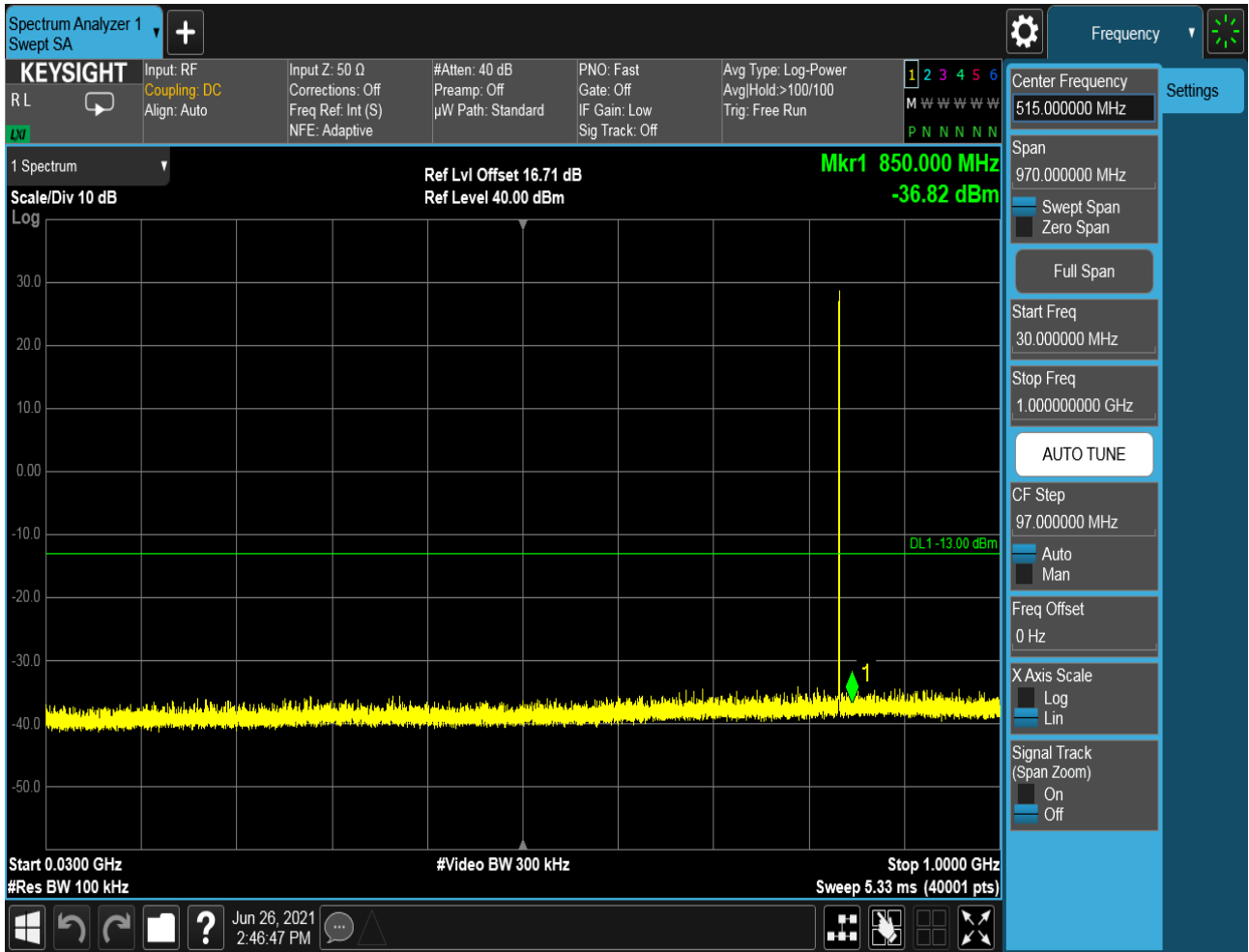




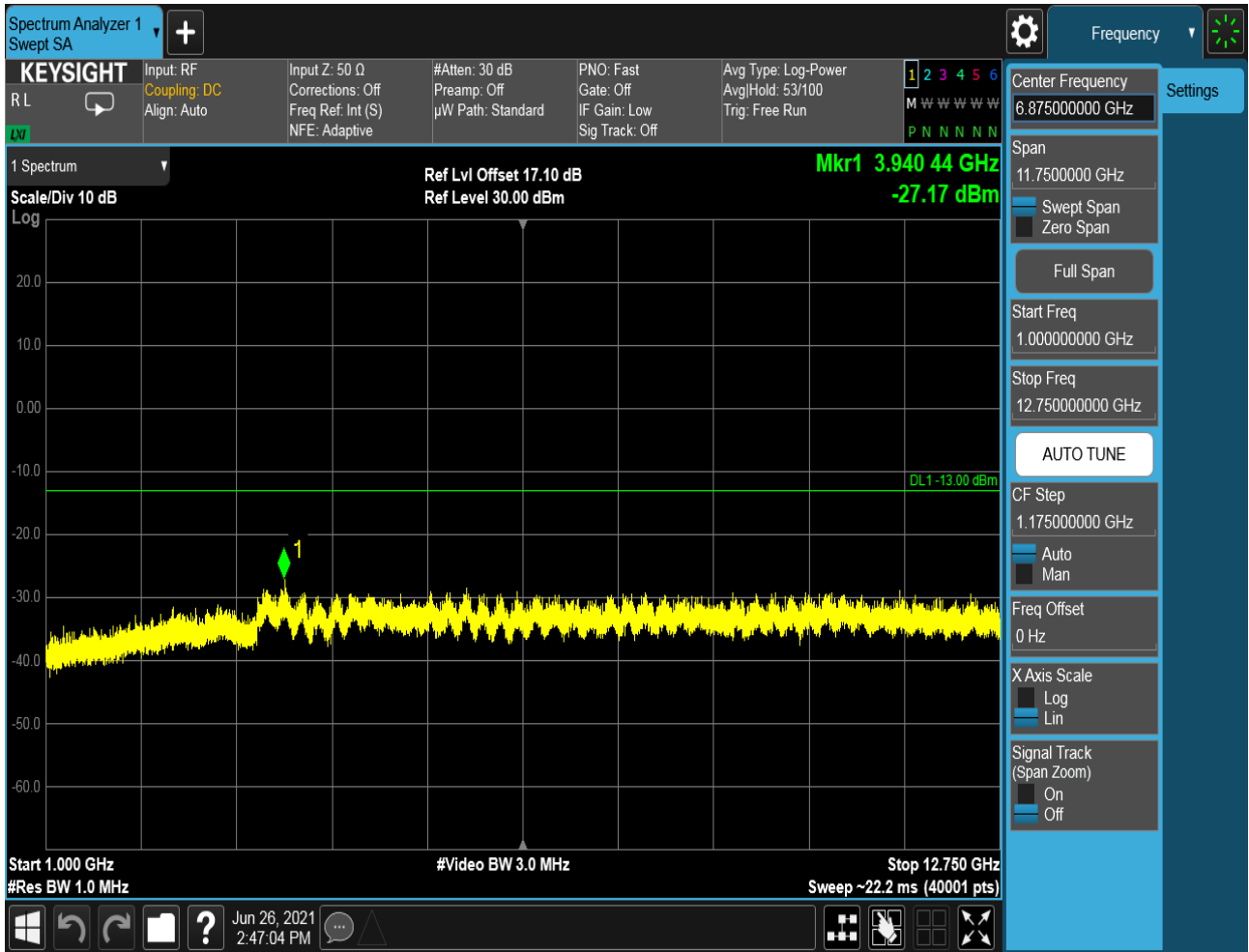
### 6.1.1.2.2 Test Channel = MCH





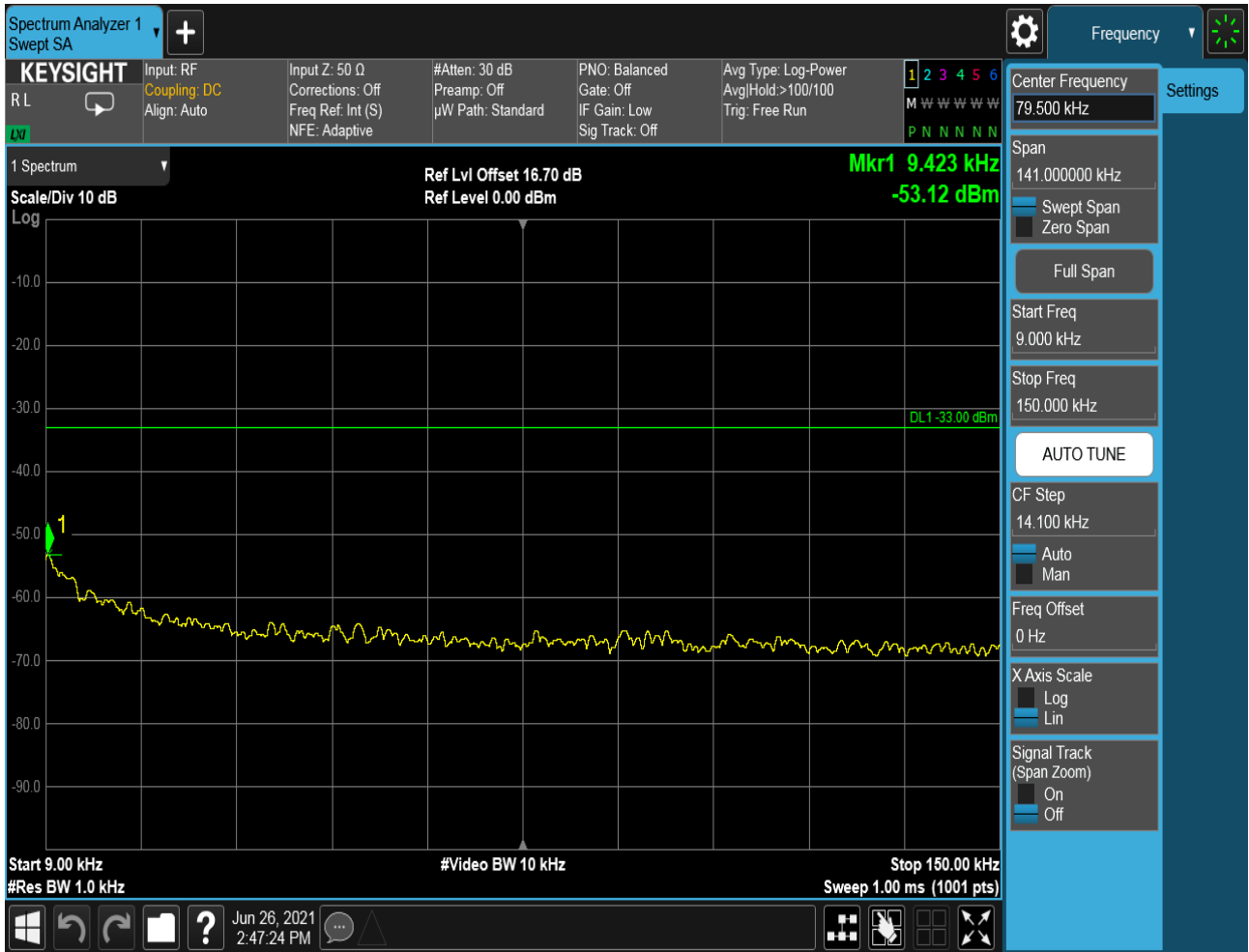


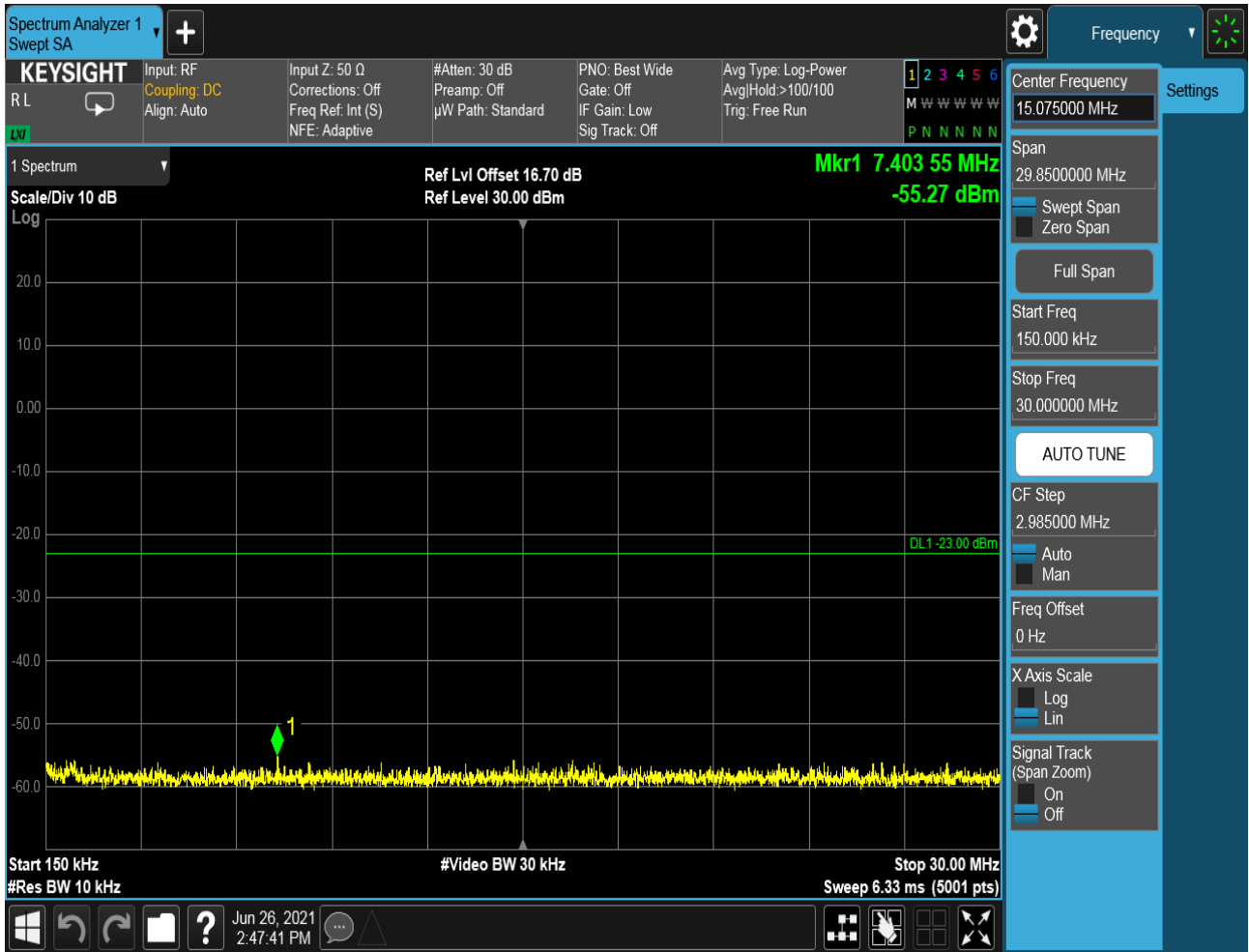


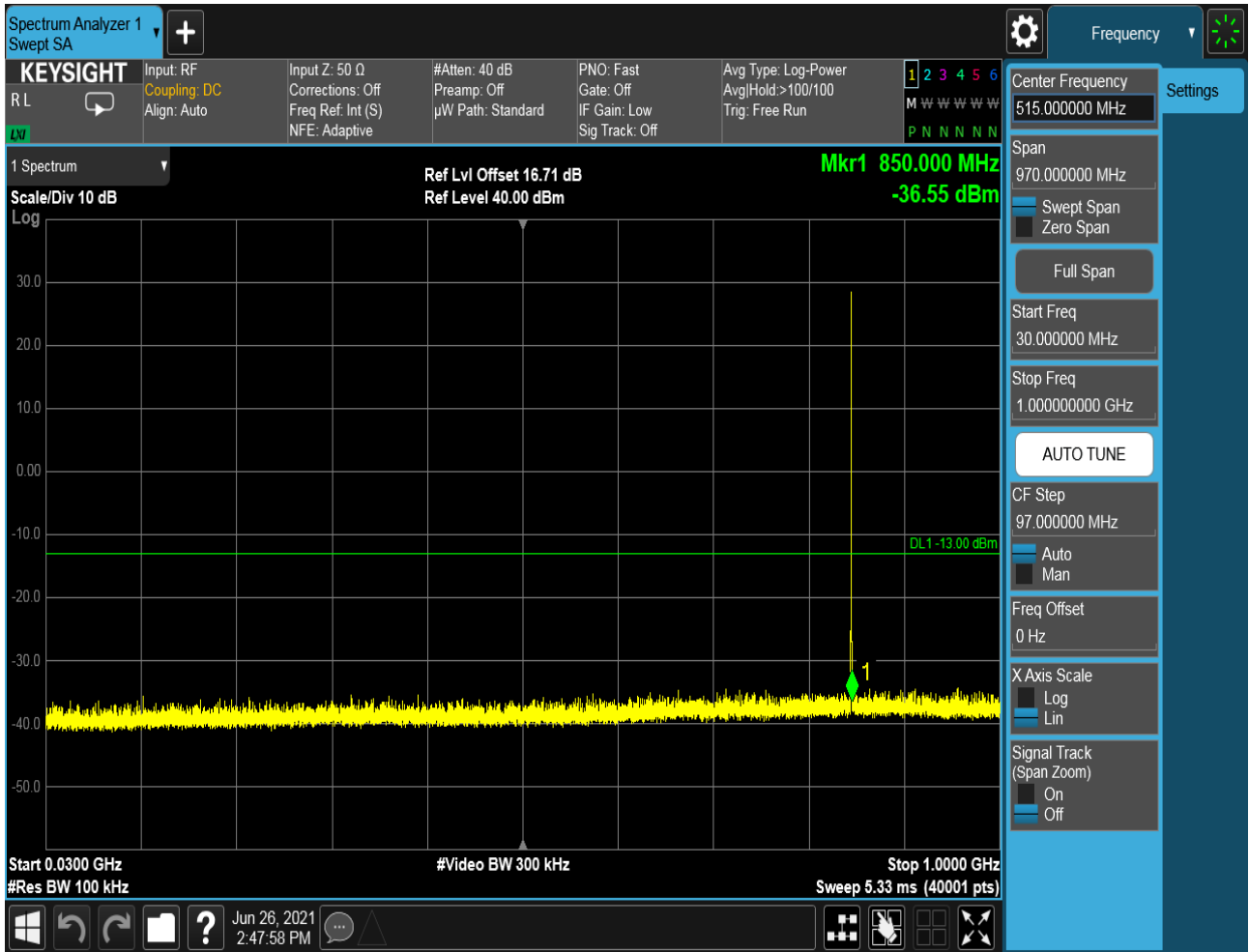


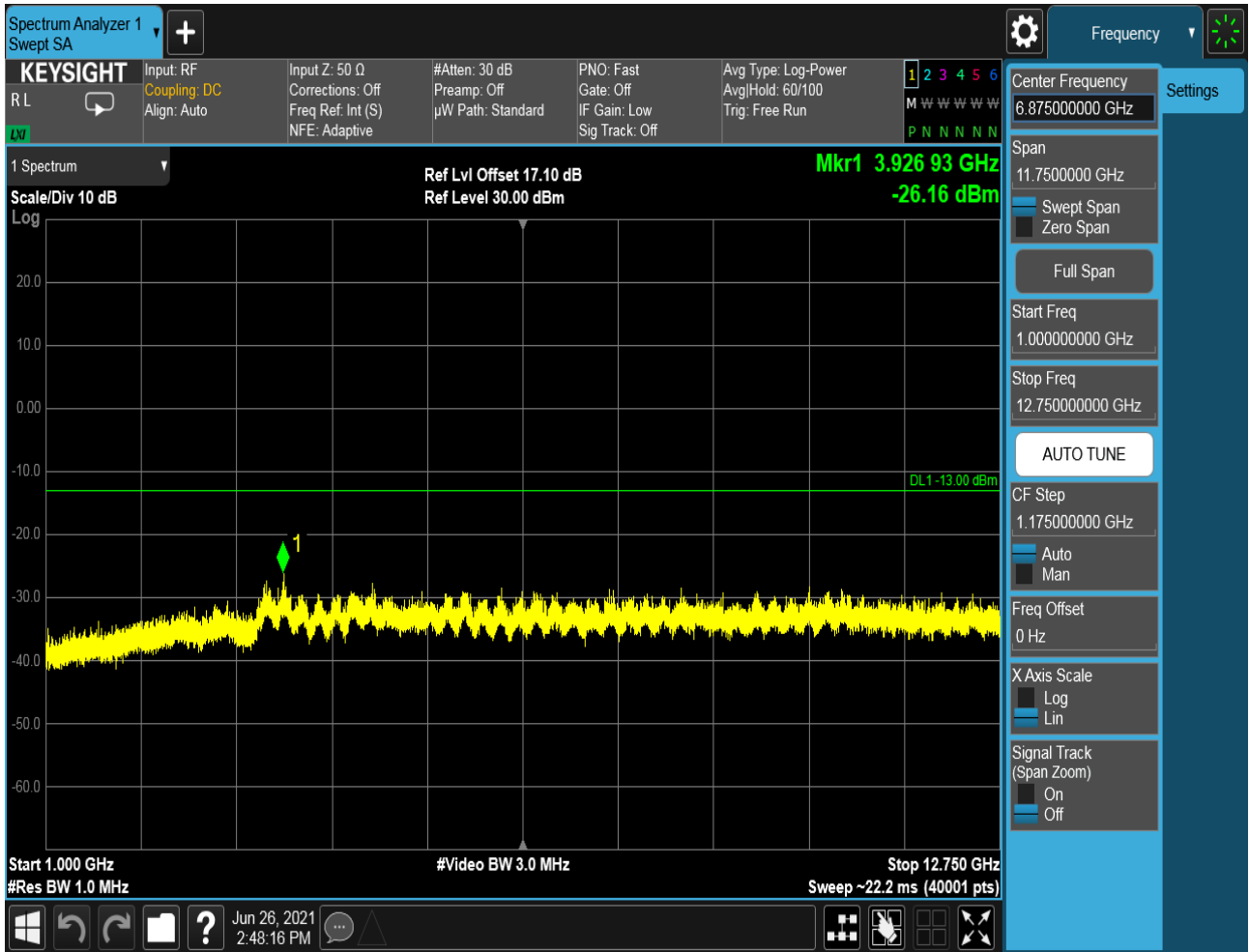


### 6.1.1.2.3 Test Channel = HCH







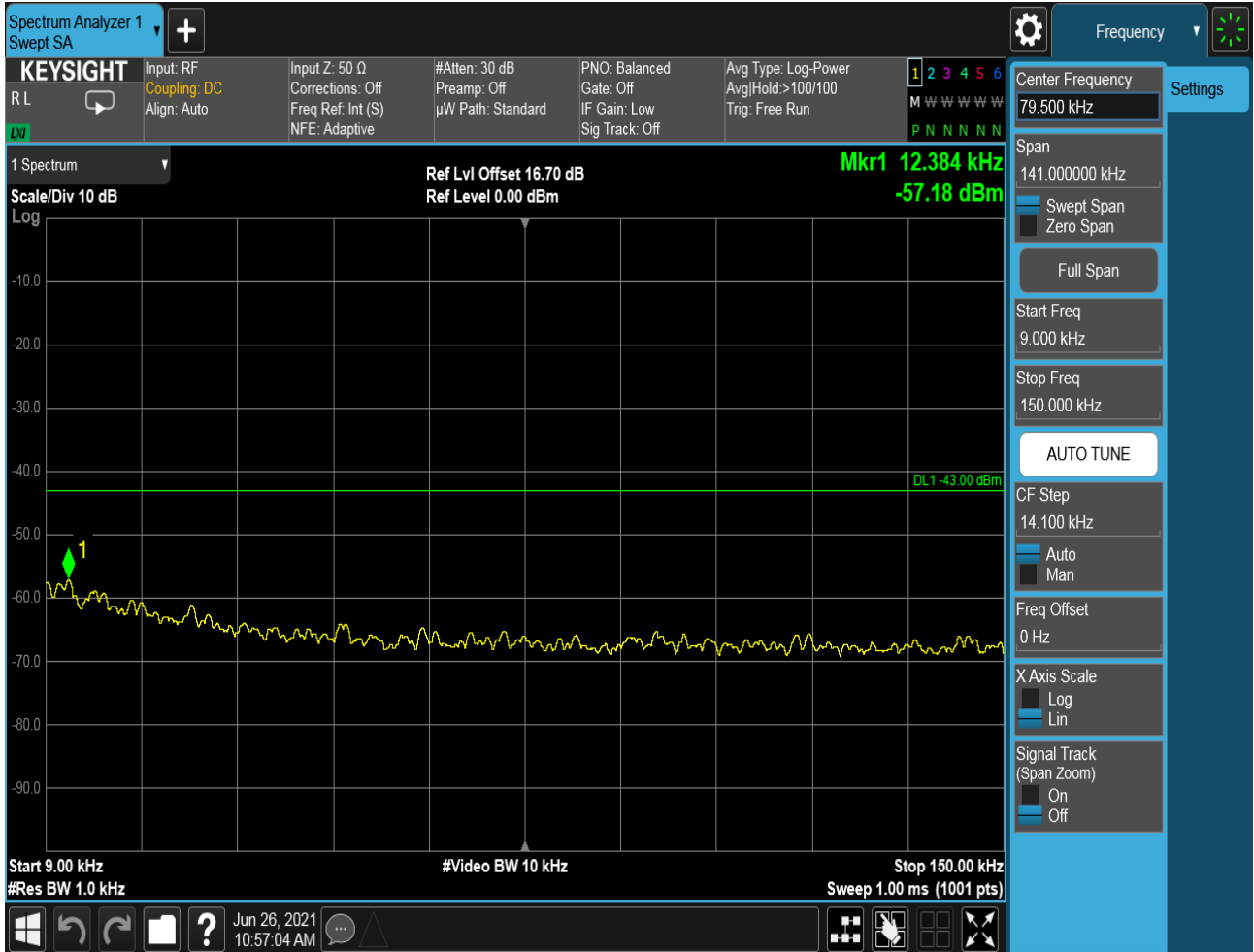


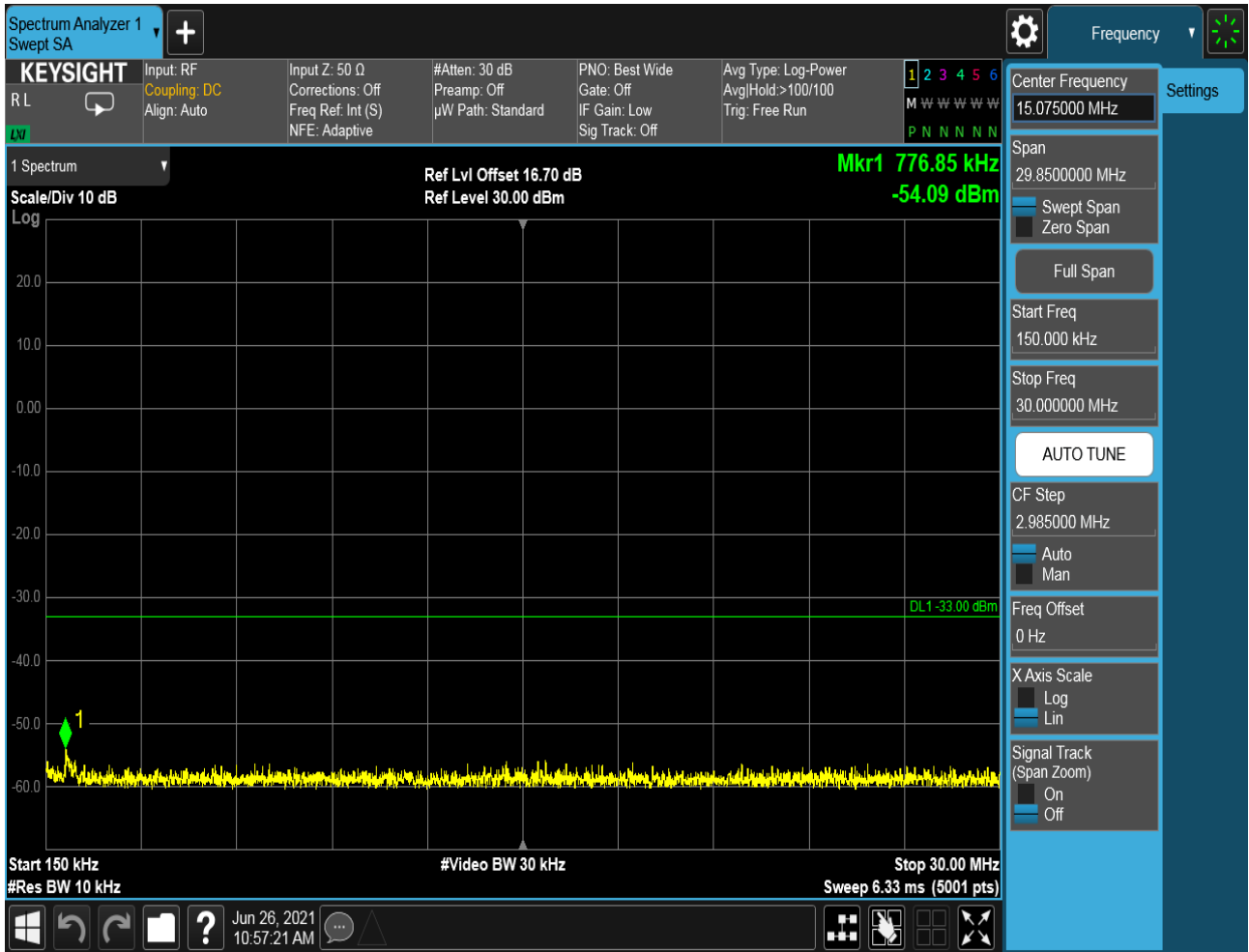


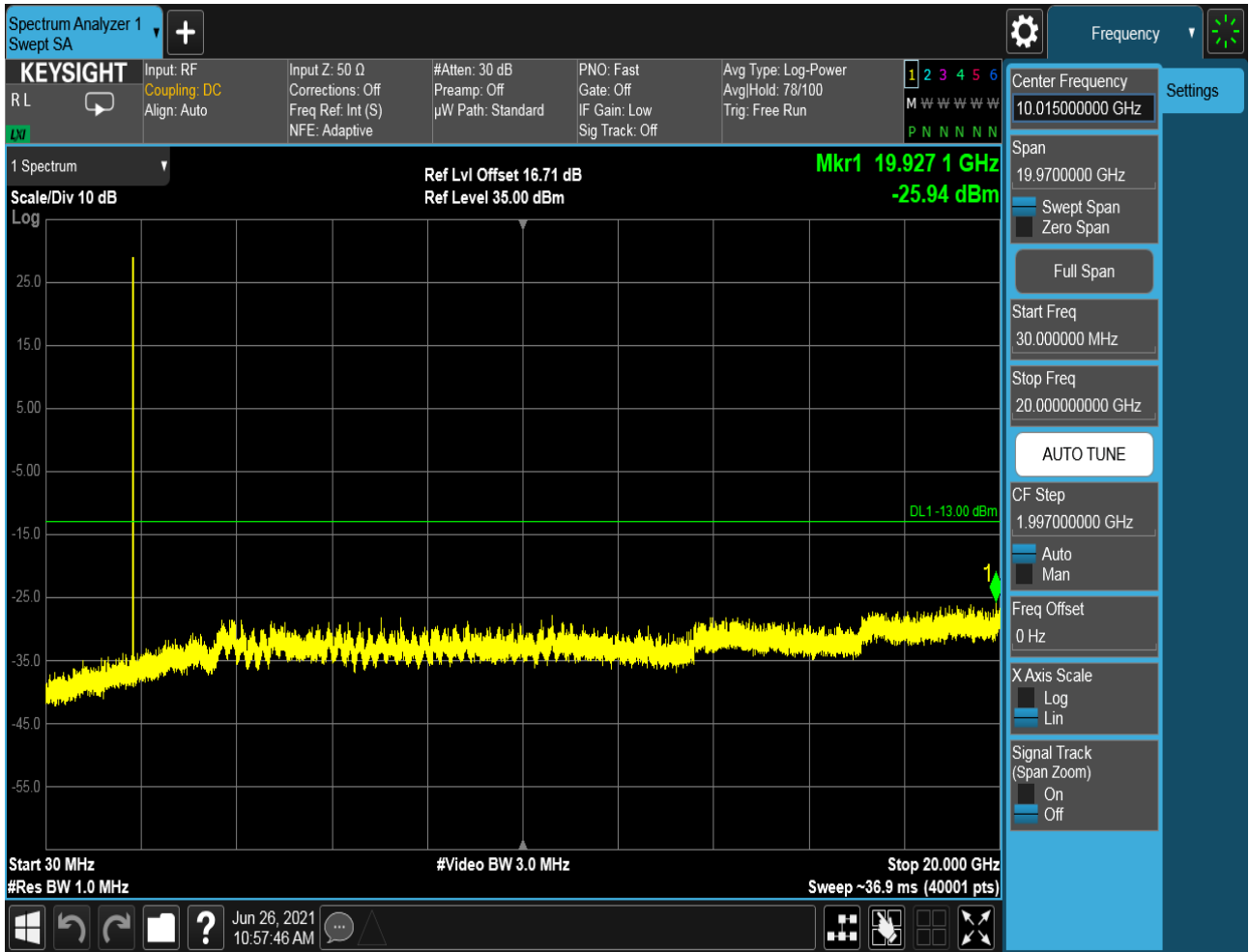
### 6.1.2 Test Band = PCS1900

#### 6.1.2.1 Test Mode = GSM/TM1

##### 6.1.2.1.1 Test Channel = LCH



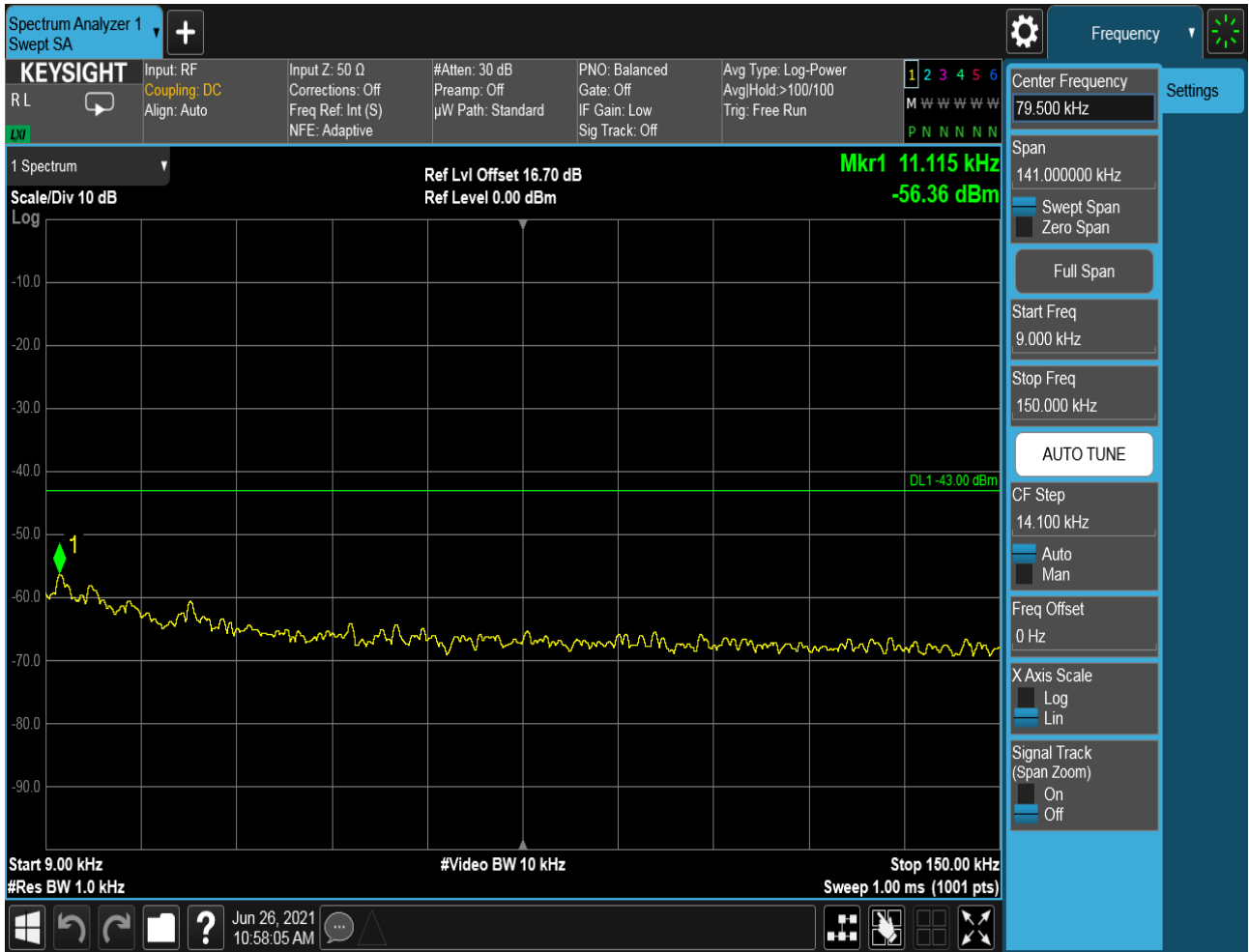


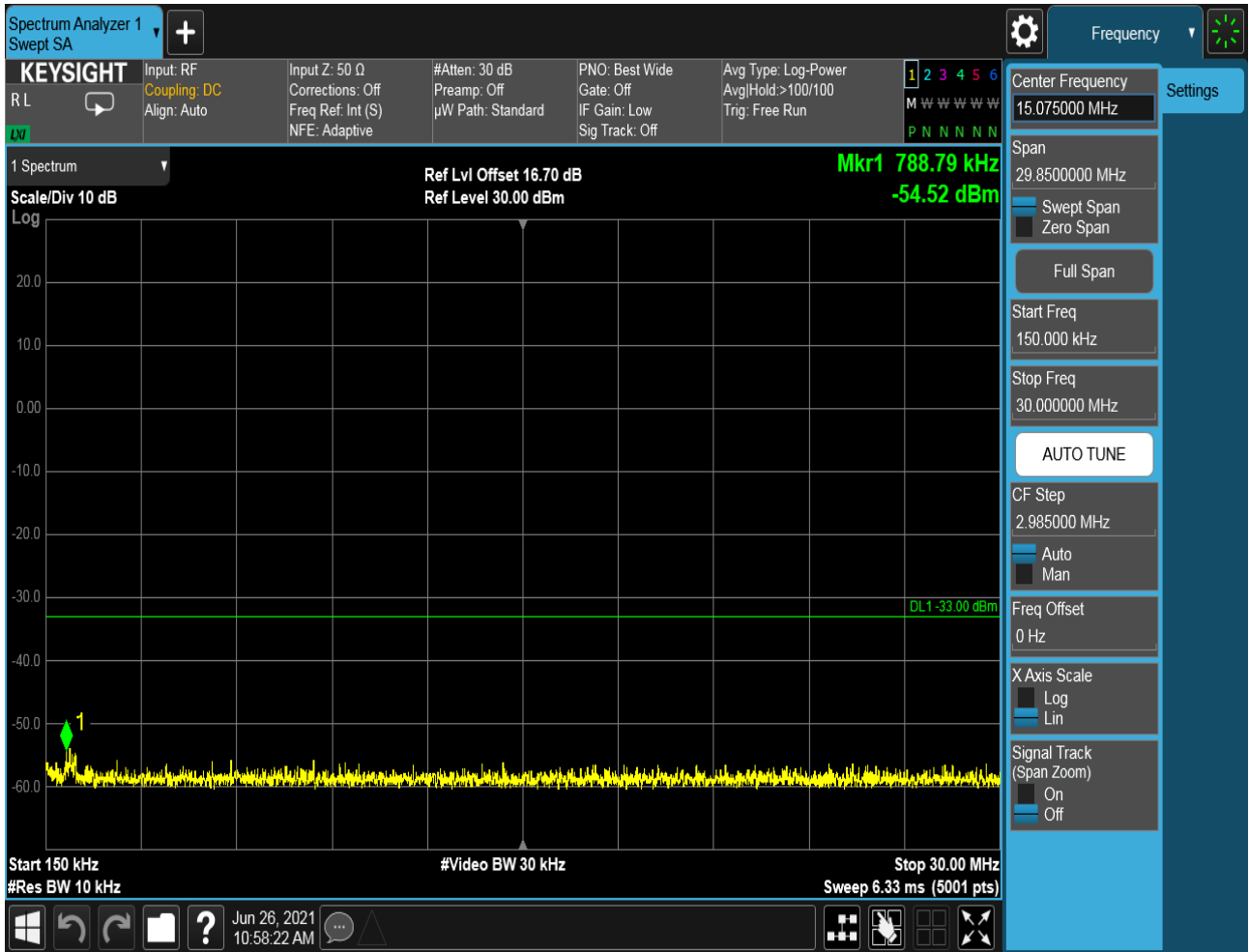


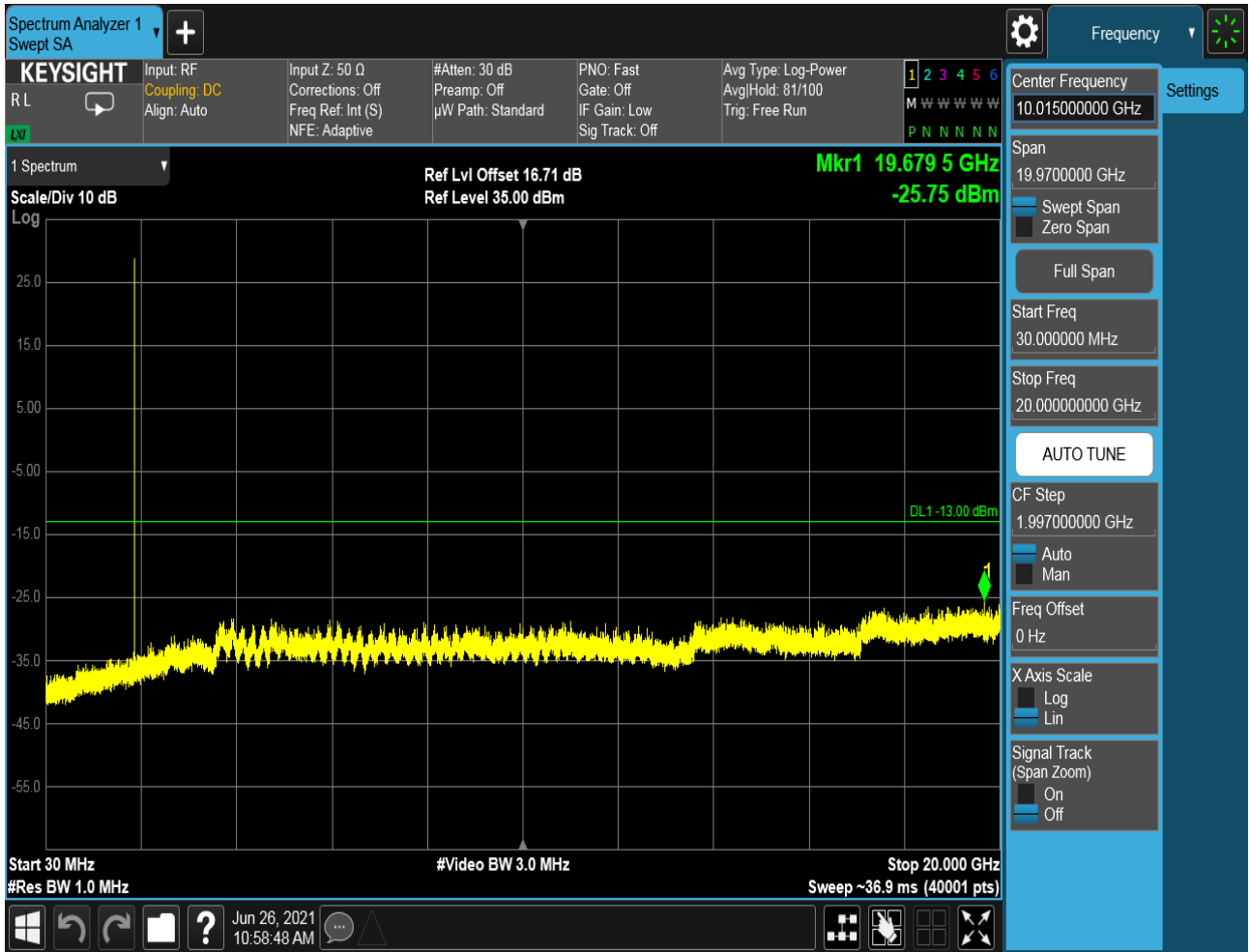




### 6.1.2.1.2 Test Channel = MCH

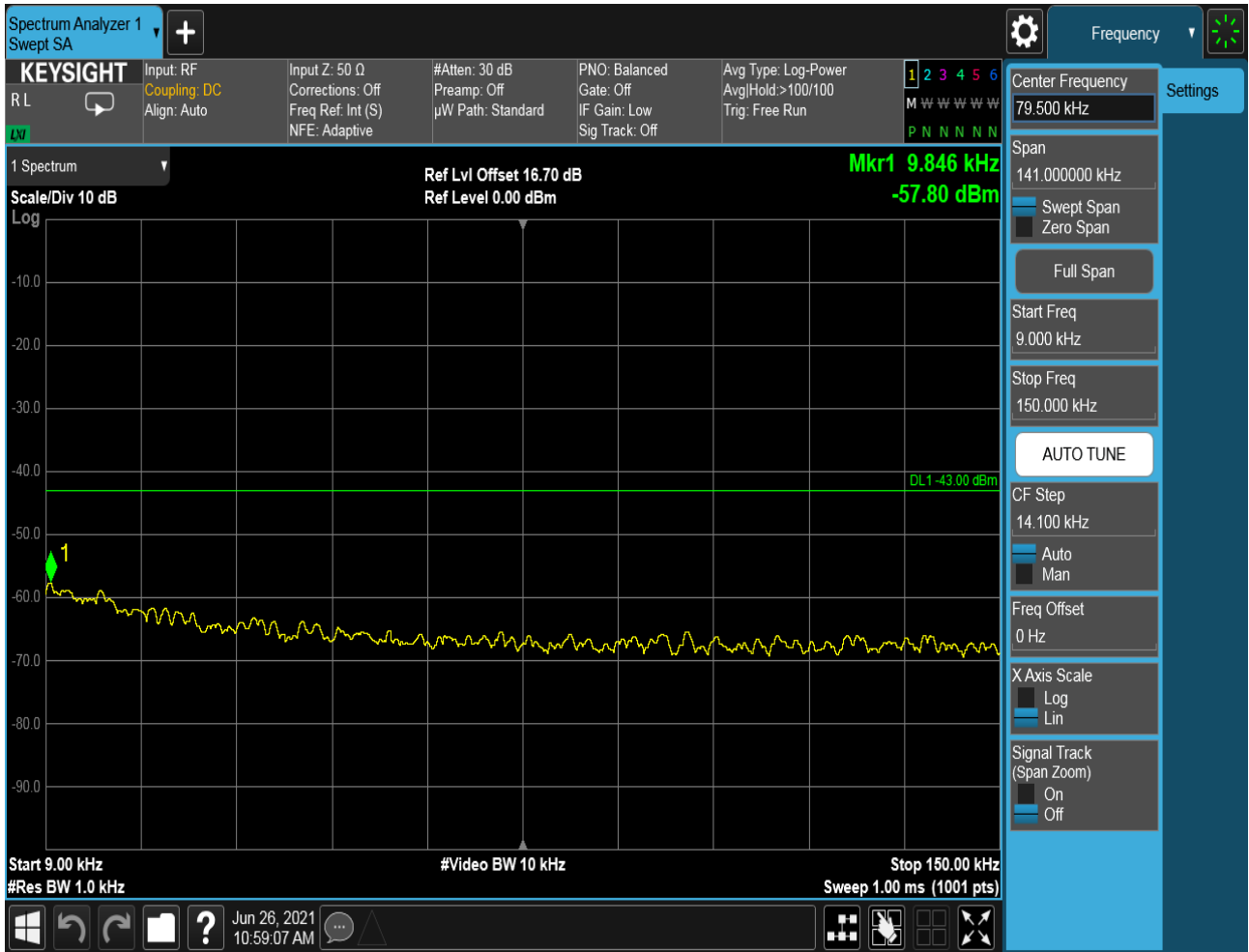


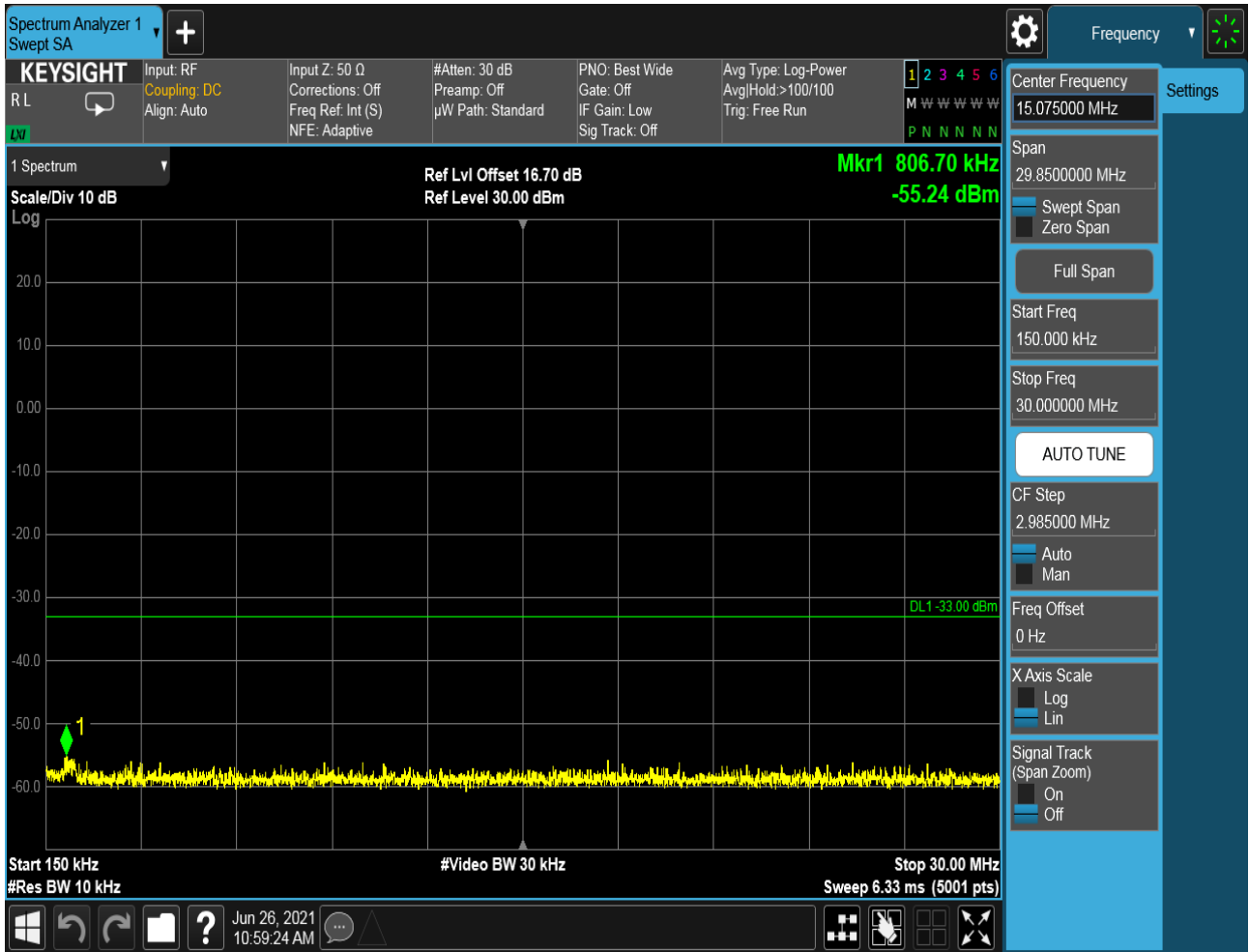


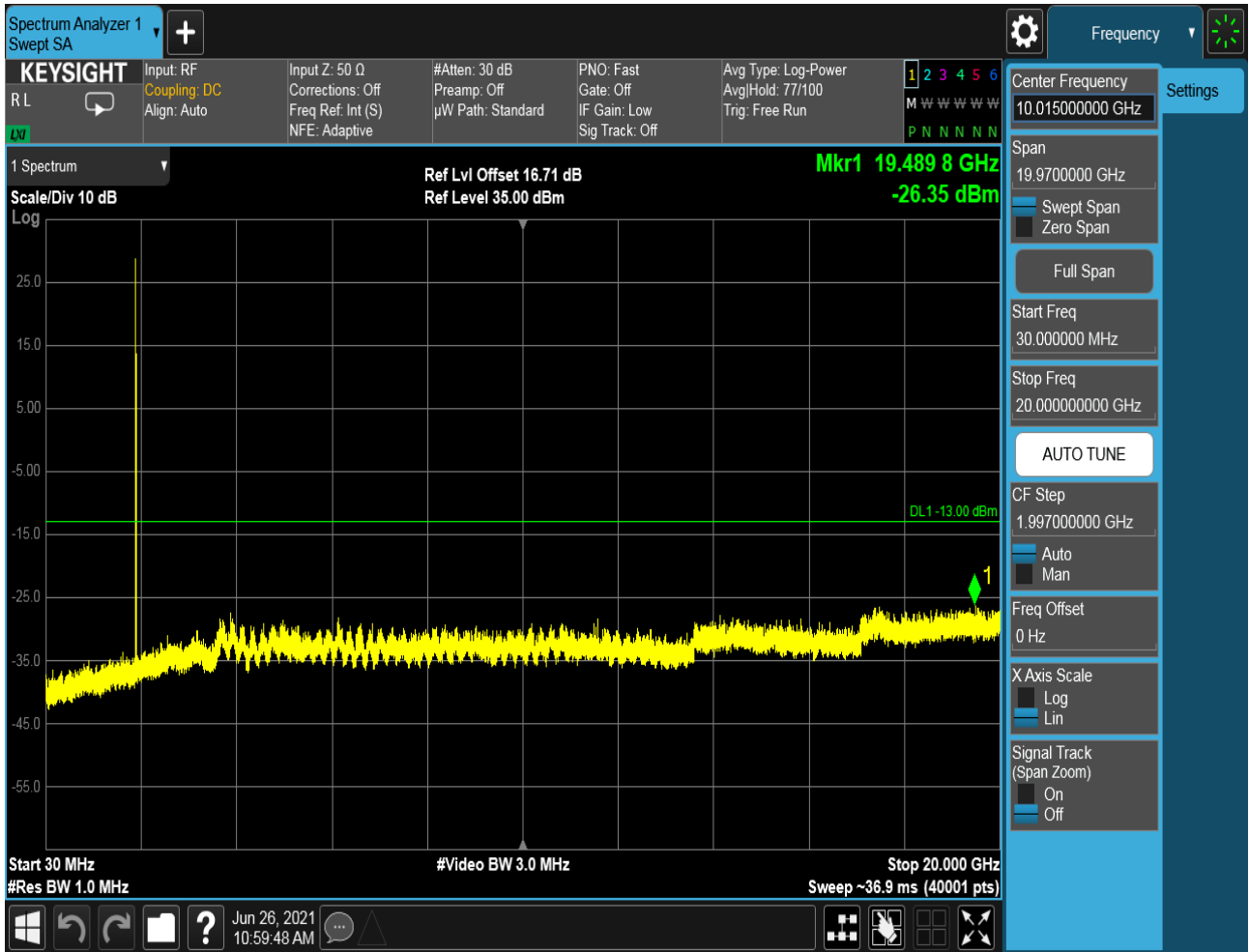




### 6.1.2.1.3 Test Channel = HCH



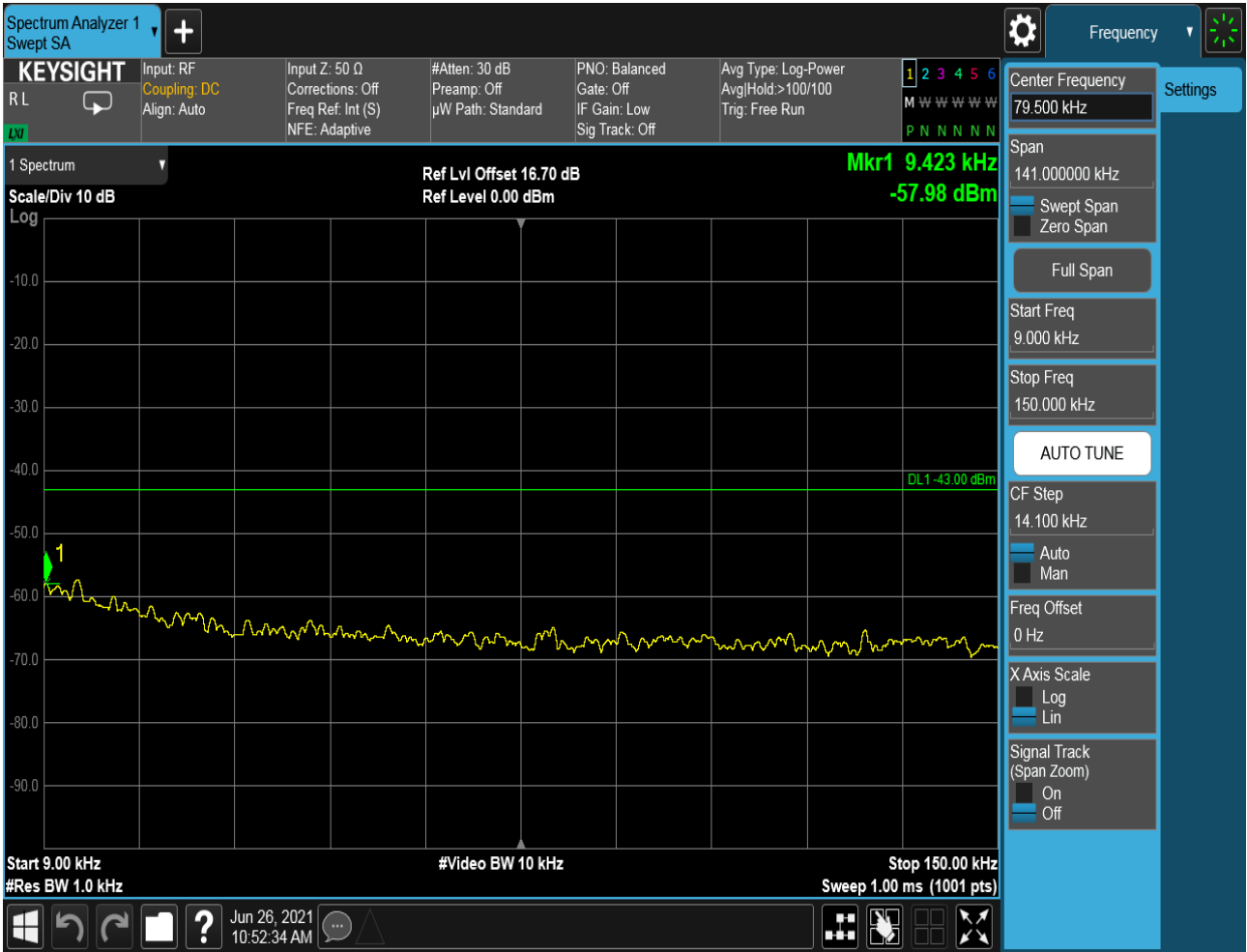


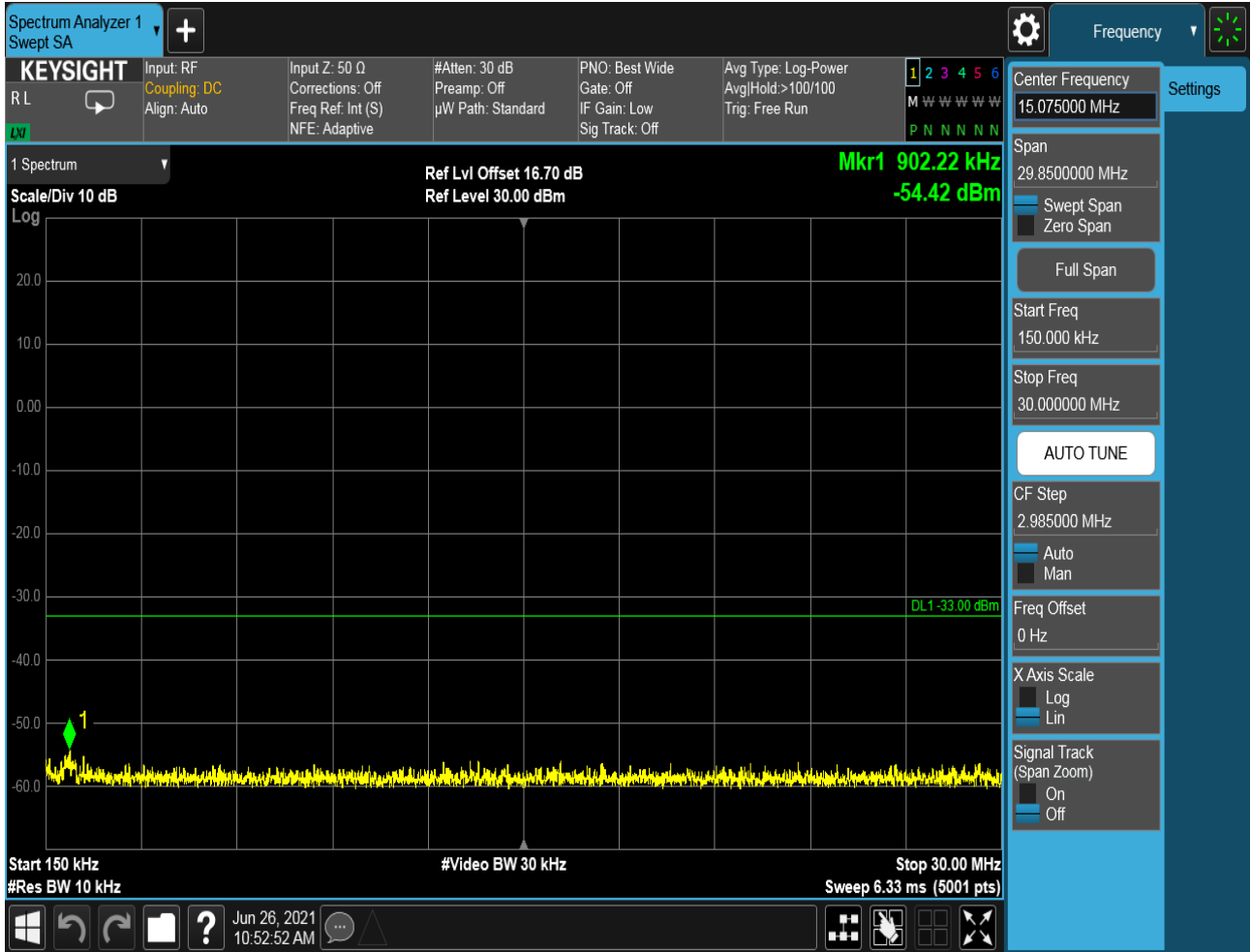




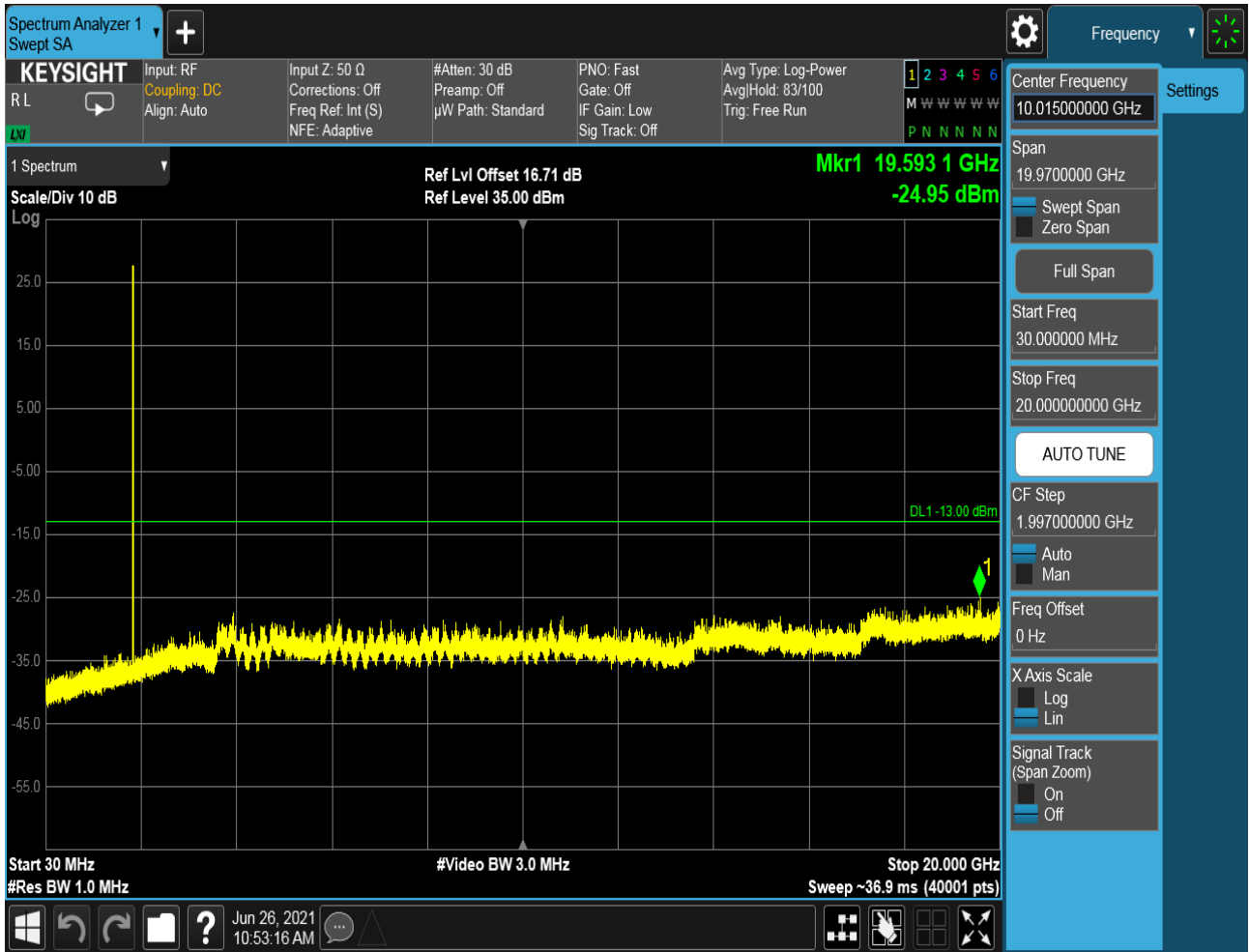
### 6.1.2.2 Test Mode = GSM/TM2

#### 6.1.2.2.1 Test Channel = LCH



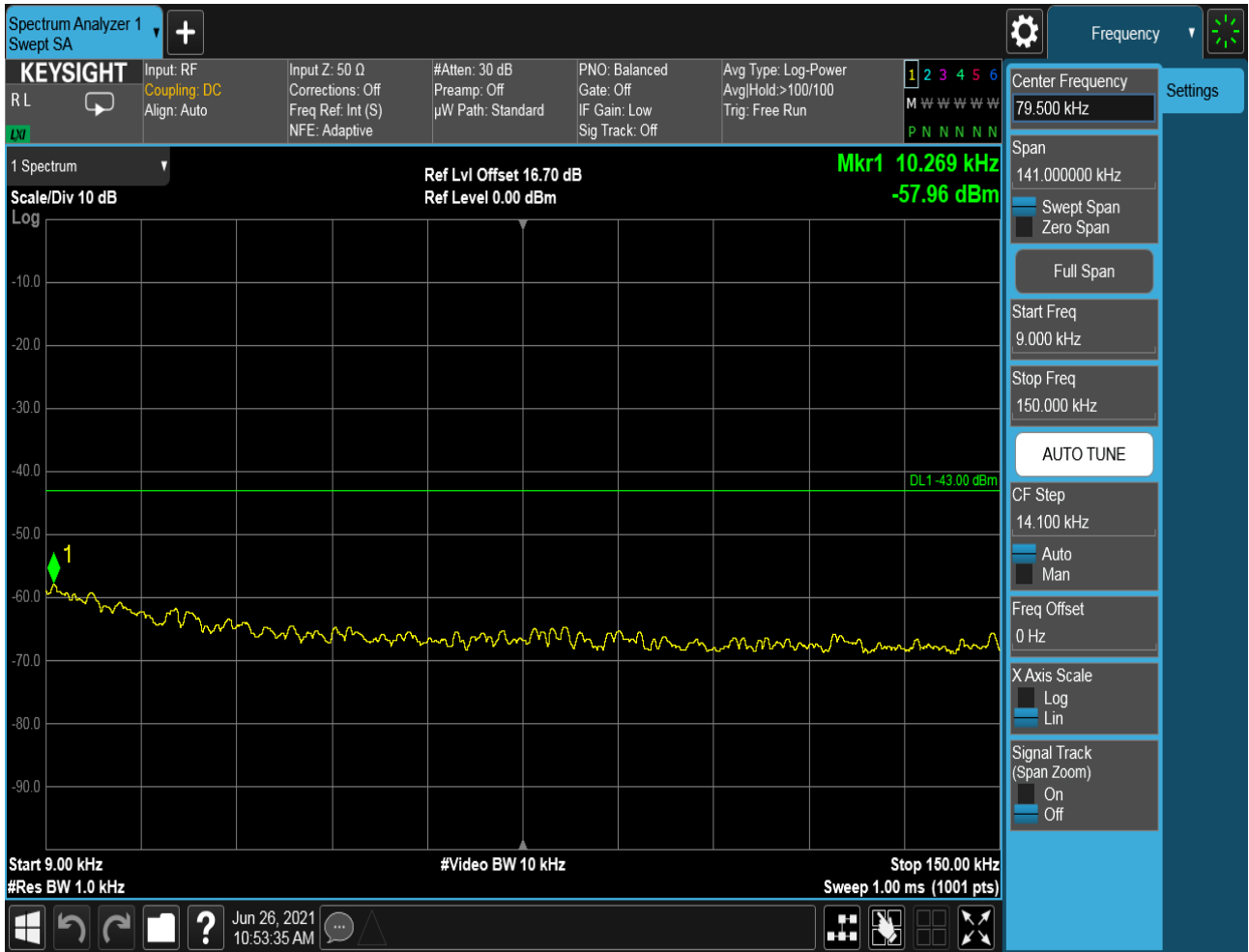


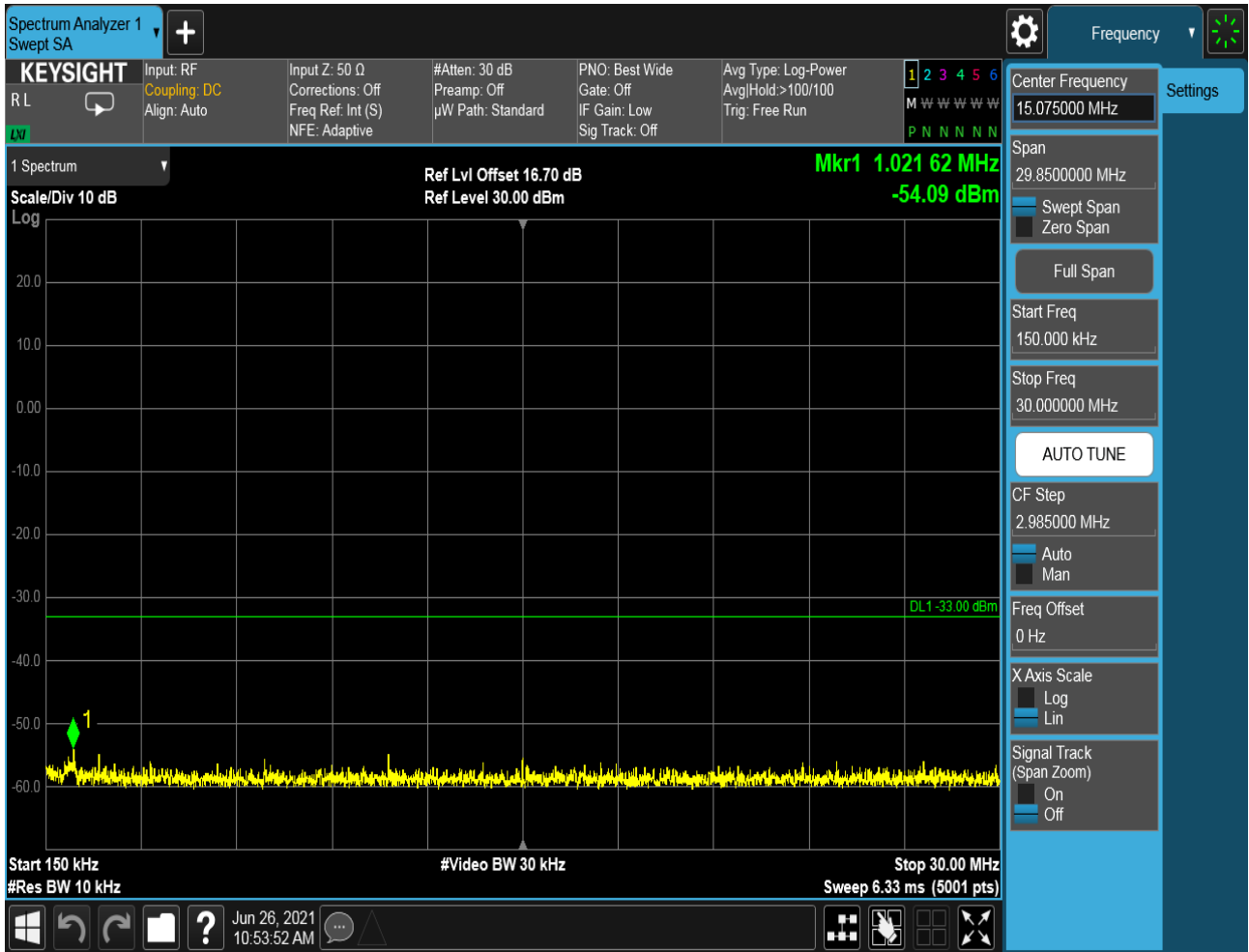


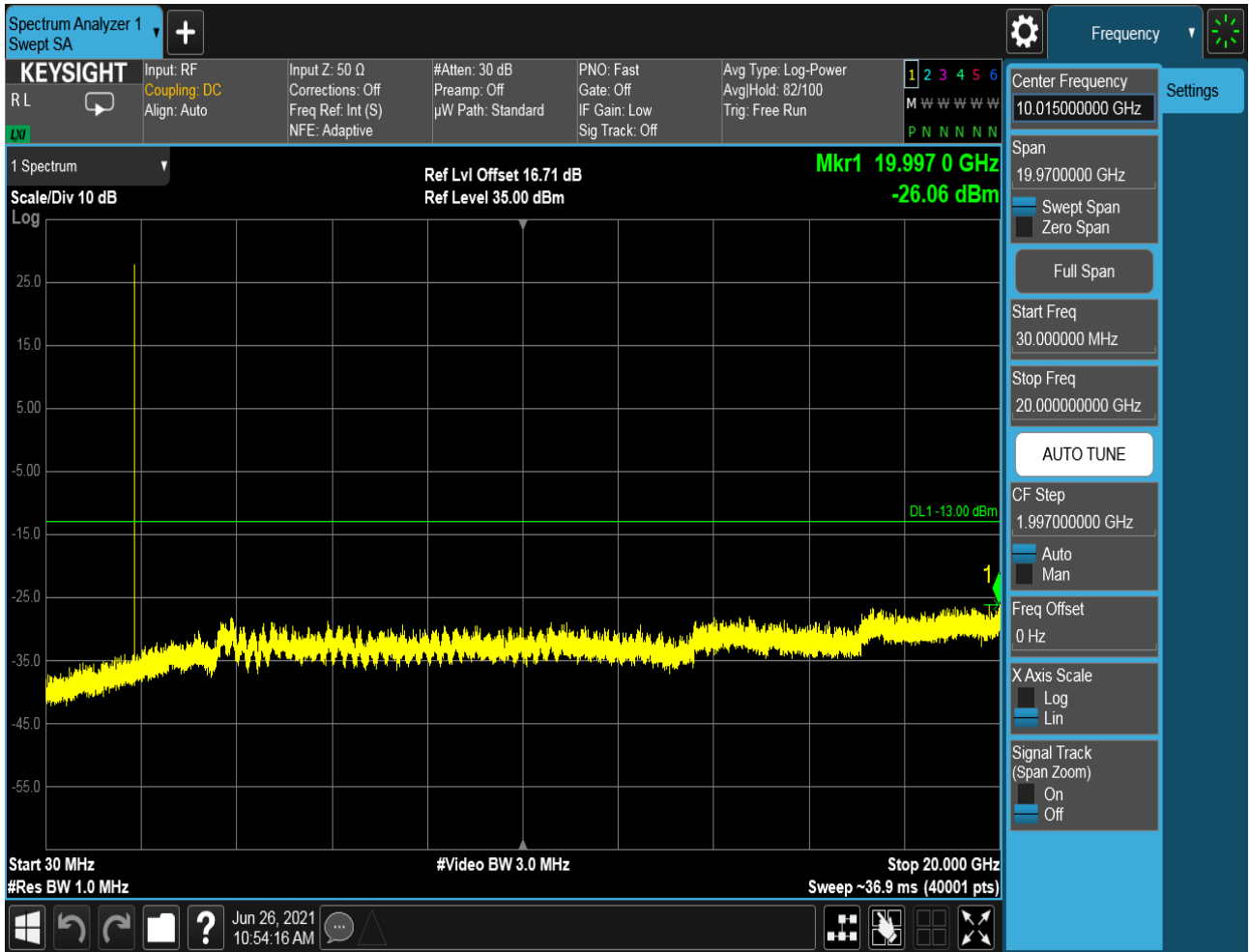




### 6.1.2.2.2 Test Channel = MCH

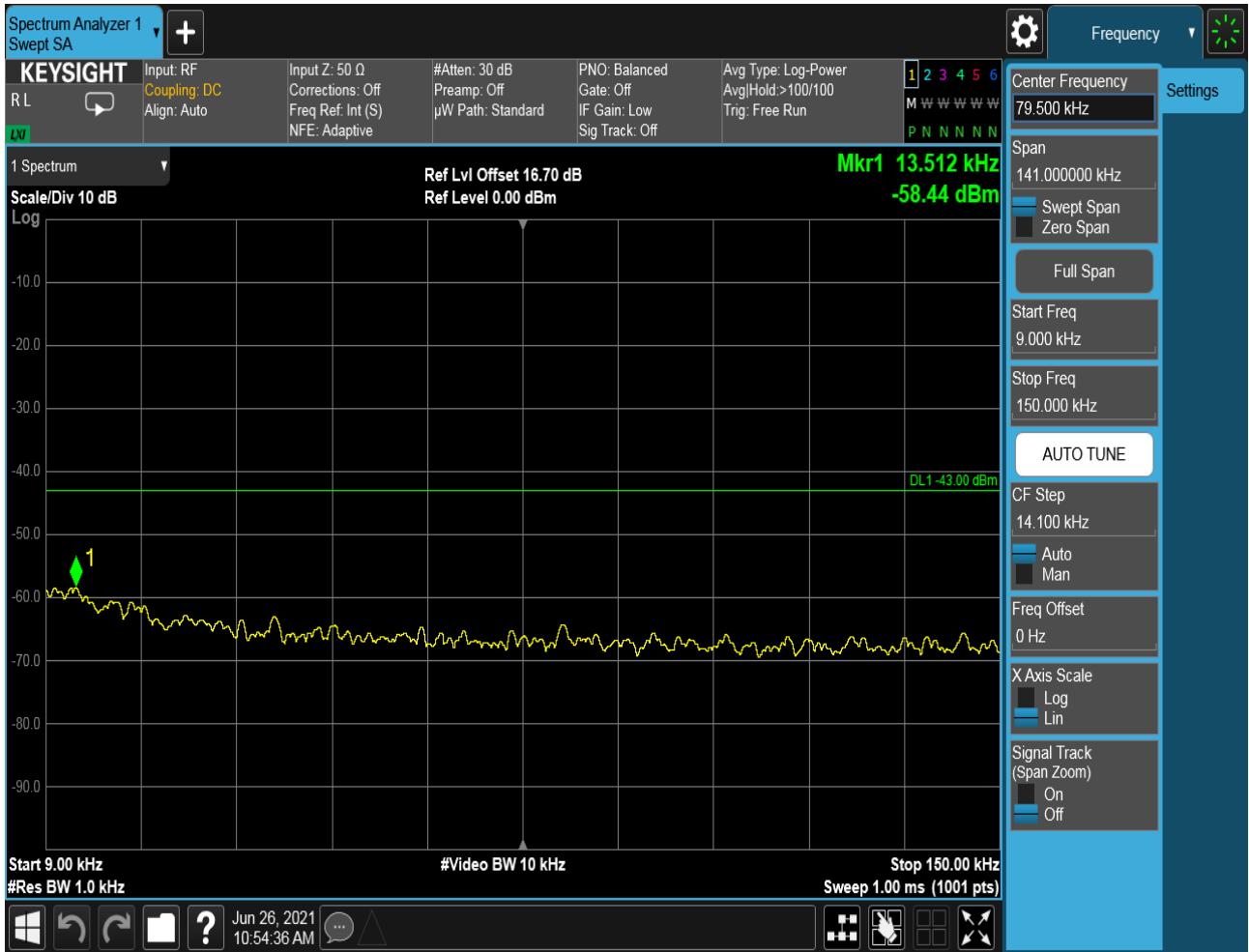


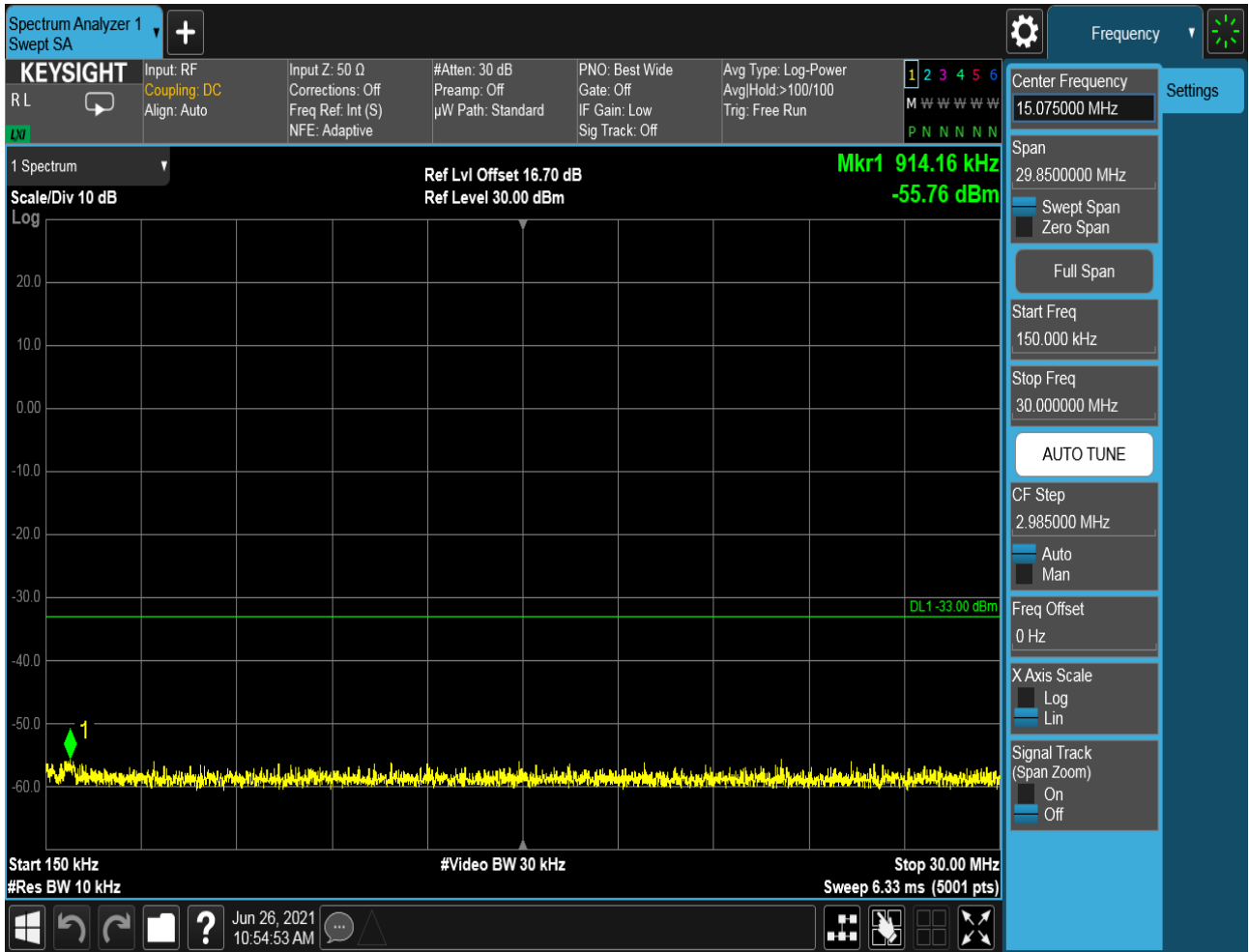


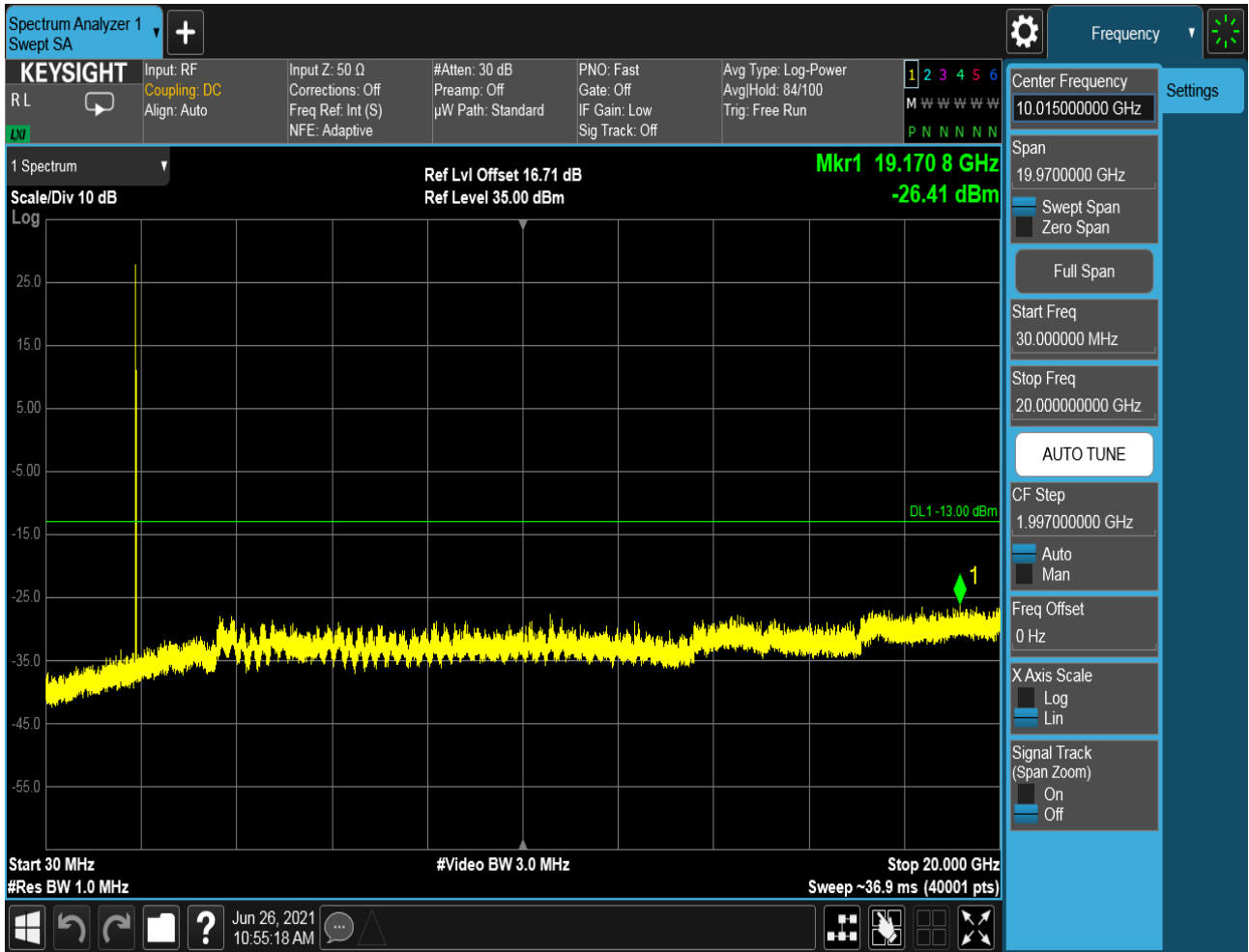




### 6.1.2.2.3 Test Channel = HCH







## 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

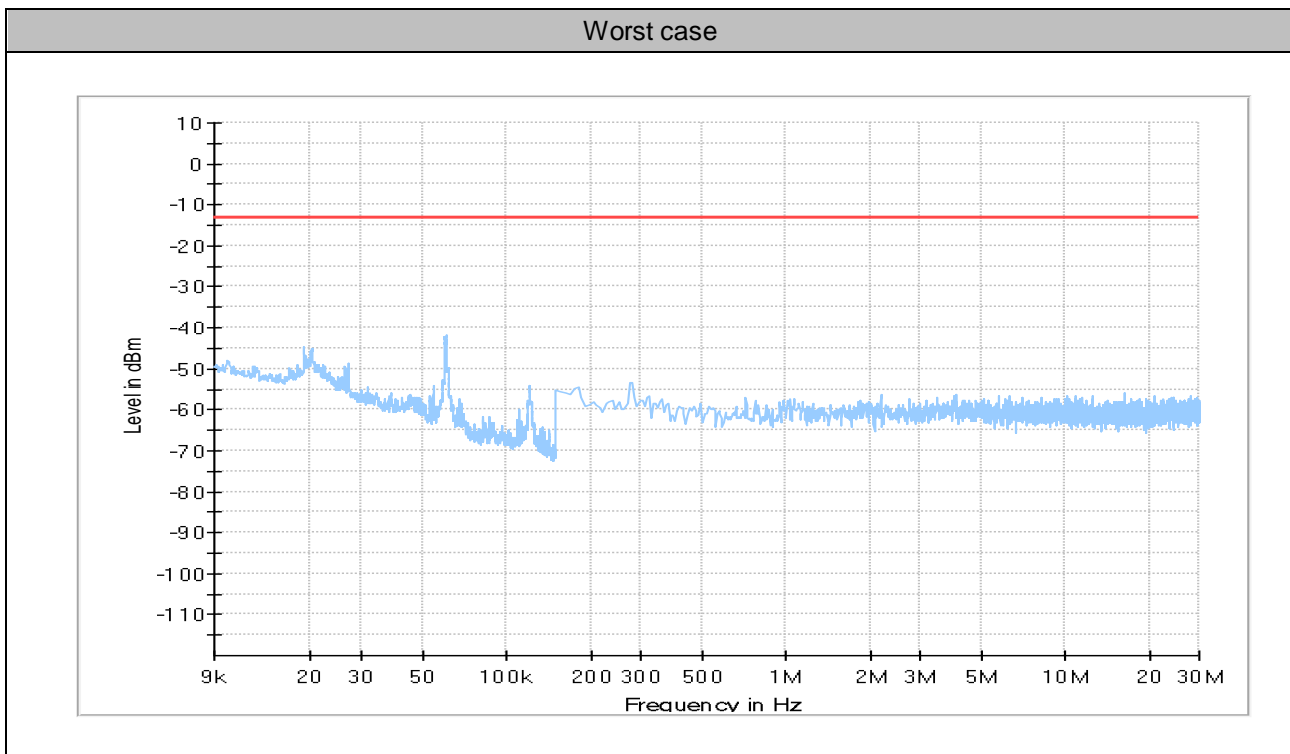
30MHz~1GHz, RBW = 100 kHz, VBW = 300 kHz. Detector: PK

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

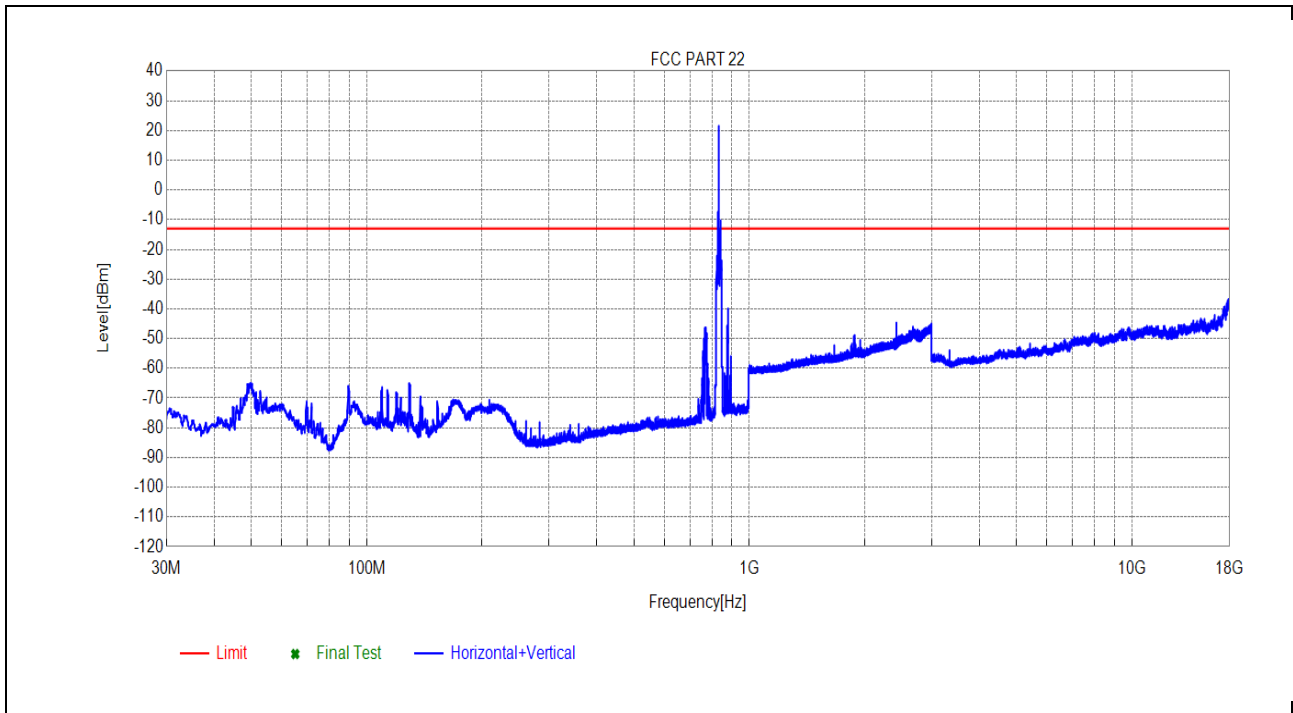
### Part I - Test Plots

#### 7.1 For GSM

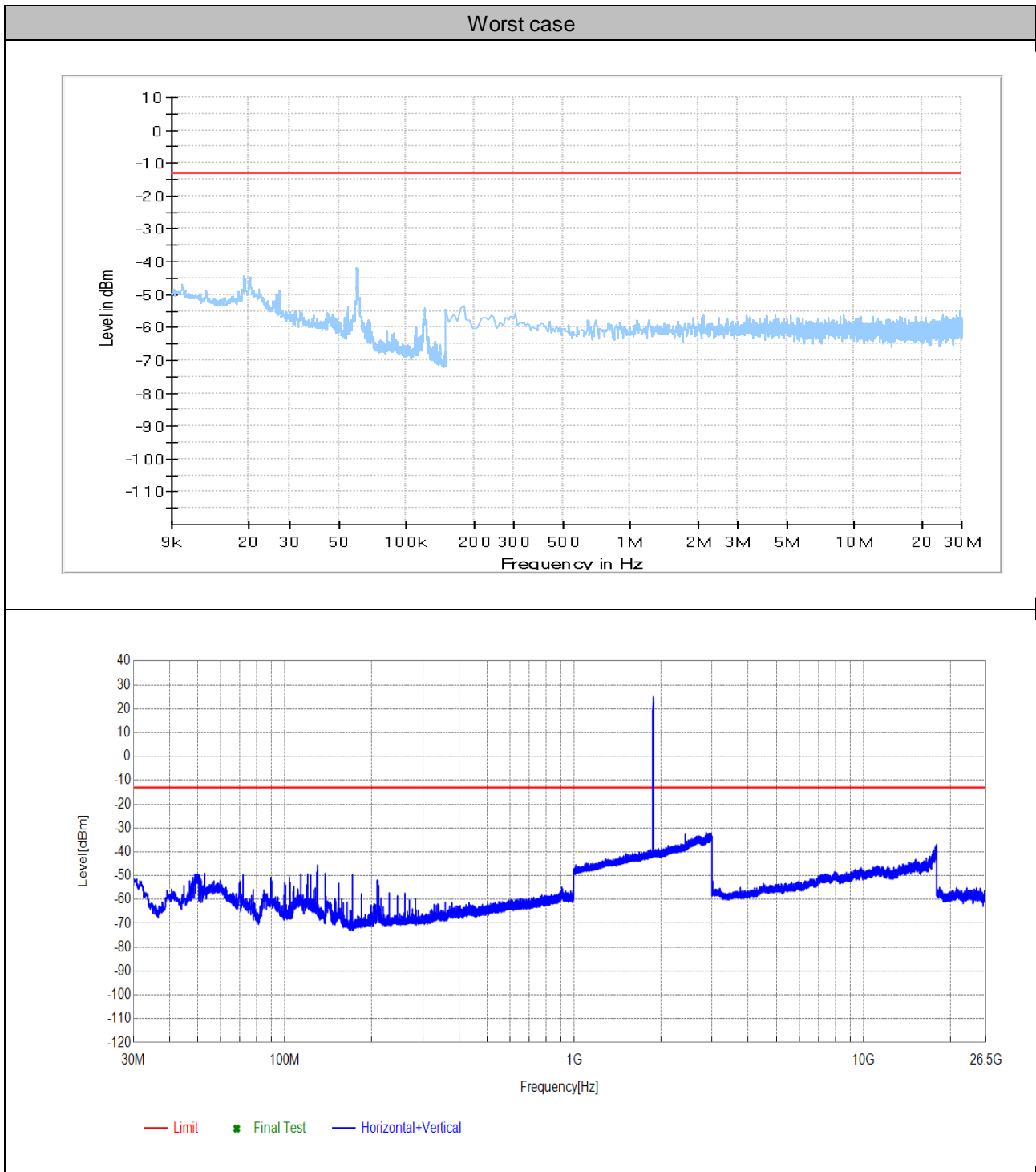
##### 7.1.1 Test Band = GSM850







### 7.1.2 Test Band = PCS1900





## 8Appendix\_H: Frequency Stability

### 8.1 For GSM

#### 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
GSM850	GSM/TM1	LCH	TN	VL	3.03091	0.00368	PASS
				VN	5.46244	0.00663	PASS
				VH	5.05172	0.00613	PASS
		MCH	TN	VL	6.93271	0.00829	PASS
				VN	6.53148	0.00781	PASS
				VH	6.52729	0.00780	PASS
		HCH	TN	VL	5.19263	0.00612	PASS
				VN	4.03161	0.00475	PASS
				VH	6.37635	0.00751	PASS
	GSM/TM2	LCH	TN	VL	0.58948	0.00072	PASS
				VN	-0.11201	-0.00014	PASS
				VH	0.64015	0.00078	PASS
		MCH	TN	VL	3.81047	0.00455	PASS
				VN	3.60450	0.00431	PASS
				VH	1.95895	0.00234	PASS
		HCH	TN	VL	2.60420	0.00307	PASS
				VN	2.45908	0.00290	PASS
				VH	1.71151	0.00202	PASS
PCS1900	GSM/TM1	LCH	TN	VL	13.88118	0.00750	PASS
				VN	19.26826	0.01041	PASS
				VH	16.73998	0.00905	PASS
		MCH	TN	VL	16.64137	0.00885	PASS
				VN	21.62958	0.01151	PASS
				VH	15.13608	0.00805	PASS
		HCH	TN	VL	16.90318	0.00750	PASS
				VN	19.99297	0.01041	PASS
				VH	17.86556	0.00905	PASS
	GSM/TM2	LCH	TN	VL	10.35856	0.00560	PASS
				VN	13.48066	0.00729	PASS
				VH	15.19509	0.00821	PASS
		MCH	TN	VL	15.12043	0.00804	PASS
				VN	12.20560	0.00649	PASS
				VH	16.81650	0.00894	PASS
		HCH	TN	VL	15.29813	0.00560	PASS



Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VN	14.89980	0.00729	PASS
				VH	13.94881	0.00821	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
GSM850	GSM/TM1	LCH	VN	-30	5.86712	0.00712	PASS
				-20	4.15005	0.00504	PASS
				-10	3.57413	0.00434	PASS
				0	5.55925	0.00675	PASS
				10	3.00280	0.00364	PASS
				20	5.46244	0.00663	PASS
				30	5.05327	0.00613	PASS
				40	6.57411	0.00798	PASS
				50	6.25592	0.00759	PASS
		MCH	VN	-30	5.71257	0.00683	PASS
				-20	3.93010	0.00470	PASS
				-10	5.44777	0.00651	PASS
				0	6.57034	0.00785	PASS
				10	5.12741	0.00613	PASS
				20	6.53148	0.00781	PASS
				30	7.23023	0.00864	PASS
				40	6.20088	0.00741	PASS
				50	4.95174	0.00592	PASS
		HCH	VN	-30	4.30353	0.00507	PASS
				-20	5.59546	0.00659	PASS
				-10	3.27957	0.00386	PASS
				0	6.30724	0.00743	PASS
				10	4.33104	0.00510	PASS
				20	4.03161	0.00475	PASS
	30			5.01239	0.00591	PASS	
	40			5.54384	0.00653	PASS	
	50			5.61618	0.00662	PASS	
	GSM/TM2	LCH	VN	-30	1.72267	0.00209	PASS
				-20	1.67629	0.00203	PASS
				-10	0.89523	0.00109	PASS
0				0.71375	0.00087	PASS	
10				2.33521	0.00283	PASS	
20				-0.11201	-0.00014	PASS	



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict												
				30	1.78853	0.00217	PASS												
				40	-0.92770	-0.00113	PASS												
				50	-1.16010	-0.00141	PASS												
		MCH	VN			-30	3.06587	0.00366	PASS										
						-20	2.96070	0.00354	PASS										
						-10	1.56616	0.00187	PASS										
						0	2.74658	0.00328	PASS										
						10	2.79724	0.00334	PASS										
						20	3.60450	0.00431	PASS										
						30	3.47565	0.00415	PASS										
						40	-0.71373	-0.00085	PASS										
						50	1.38535	0.00166	PASS										
						HCH	VN			-30	2.89005	0.00340	PASS						
										-20	4.13112	0.00487	PASS						
		-10	1.53578	0.00181	PASS														
		0	-0.04380	-0.00005	PASS														
		10	3.73477	0.00440	PASS														
		20	2.45908	0.00290	PASS														
		30	3.48898	0.00411	PASS														
		40	3.53851	0.00417	PASS														
		PCS1900	GSM/TM1	LCH	VN					-30	22.06328	0.01192	PASS						
										-20	23.04639	0.01246	PASS						
										-10	19.70652	0.01065	PASS						
										0	21.16392	0.01144	PASS						
10	21.74554									0.01175	PASS								
20	19.26826									0.01041	PASS								
30	19.02913									0.01028	PASS								
40	21.76776									0.01177	PASS								
50	21.45117									0.01159	PASS								
MCH	VN															-30	20.24564	0.01077	PASS
																-20	22.18470	0.01180	PASS
				-10	17.25231	0.00918	PASS												
				0	20.40503	0.01085	PASS												
				10	20.80267	0.01107	PASS												
				20	21.62958	0.01151	PASS												
				30	20.03931	0.01066	PASS												
				40	18.81037	0.01001	PASS												
50	20.67601			0.01100	PASS														
HCH	VN					-30	19.67650	0.01030	PASS										



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict		
				-20	18.89465	0.00989	PASS		
				-10	22.41868	0.01174	PASS		
				0	20.64115	0.01081	PASS		
				10	20.21505	0.01058	PASS		
				20	19.99297	0.01047	PASS		
				30	17.73534	0.00929	PASS		
				40	20.51191	0.01074	PASS		
				50	18.36474	0.00962	PASS		
	GSM/TM2	LCH	VN	-30	16.11236	0.00871	PASS		
				-20	15.44245	0.00835	PASS		
				-10	12.19312	0.00659	PASS		
				0	12.07697	0.00653	PASS		
				10	14.36623	0.00776	PASS		
				20	13.48066	0.00729	PASS		
				30	16.60709	0.00898	PASS		
				40	11.57676	0.00626	PASS		
				50	11.93084	0.00645	PASS		
				MCH	VN	-30	14.63956	0.00779	PASS
						-20	15.04854	0.00800	PASS
						-10	15.22734	0.00810	PASS
		0	14.57558			0.00775	PASS		
		10	11.72454			0.00624	PASS		
		20	12.20560			0.00649	PASS		
		30	13.44018			0.00715	PASS		
		40	13.68438			0.00728	PASS		
		HCH	VN	-30	13.71700	0.00718	PASS		
				-20	14.74302	0.00772	PASS		
				-10	15.58913	0.00816	PASS		
				0	16.21287	0.00849	PASS		
				10	9.96068	0.00522	PASS		
20				14.89980	0.00780	PASS			
30				14.61242	0.00765	PASS			
40	14.53203			0.00761	PASS				
50	14.45844	0.00757	PASS						

END