



# 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	31.98	25.03	38.5	PASS
		MCH	32.12	25.17	38.5	PASS
		HCH	32.25	25.30	38.5	PASS
	GSM/TM2	LCH	25.86	18.91	38.5	PASS
		MCH	26.06	19.11	38.5	PASS
		HCH	26.10	19.15	38.5	PASS
Test Band	Test Mode	Test Channel	Measured[dBm]	EIRP [dBm]	Limit [dBm]	Verdict
PCS1900	GSM/TM1	LCH	29.78	27.58	33	PASS
		MCH	29.93	27.73	33	PASS
		HCH	29.90	27.70	33	PASS
	GSM/TM2	LCH	25.65	23.45	33	PASS
		MCH	25.68	23.48	33	PASS
		HCH	25.72	23.52	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
GSM850	GSM/TM1	LCH	2.17	13	PASS
		MCH	2.06	13	PASS
		HCH	1.95	13	PASS
	GSM/TM2	LCH	5.24	13	PASS
		MCH	5.02	13	PASS
		HCH	5.02	13	PASS
PCS1900	GSM/TM1	LCH	1.94	13	PASS
		MCH	2.10	13	PASS
		HCH	2.13	13	PASS
	GSM/TM2	LCH	5.14	13	PASS
		MCH	4.94	13	PASS
		HCH	4.91	13	PASS



## 3Appendix\_C: Modulation Characteristics

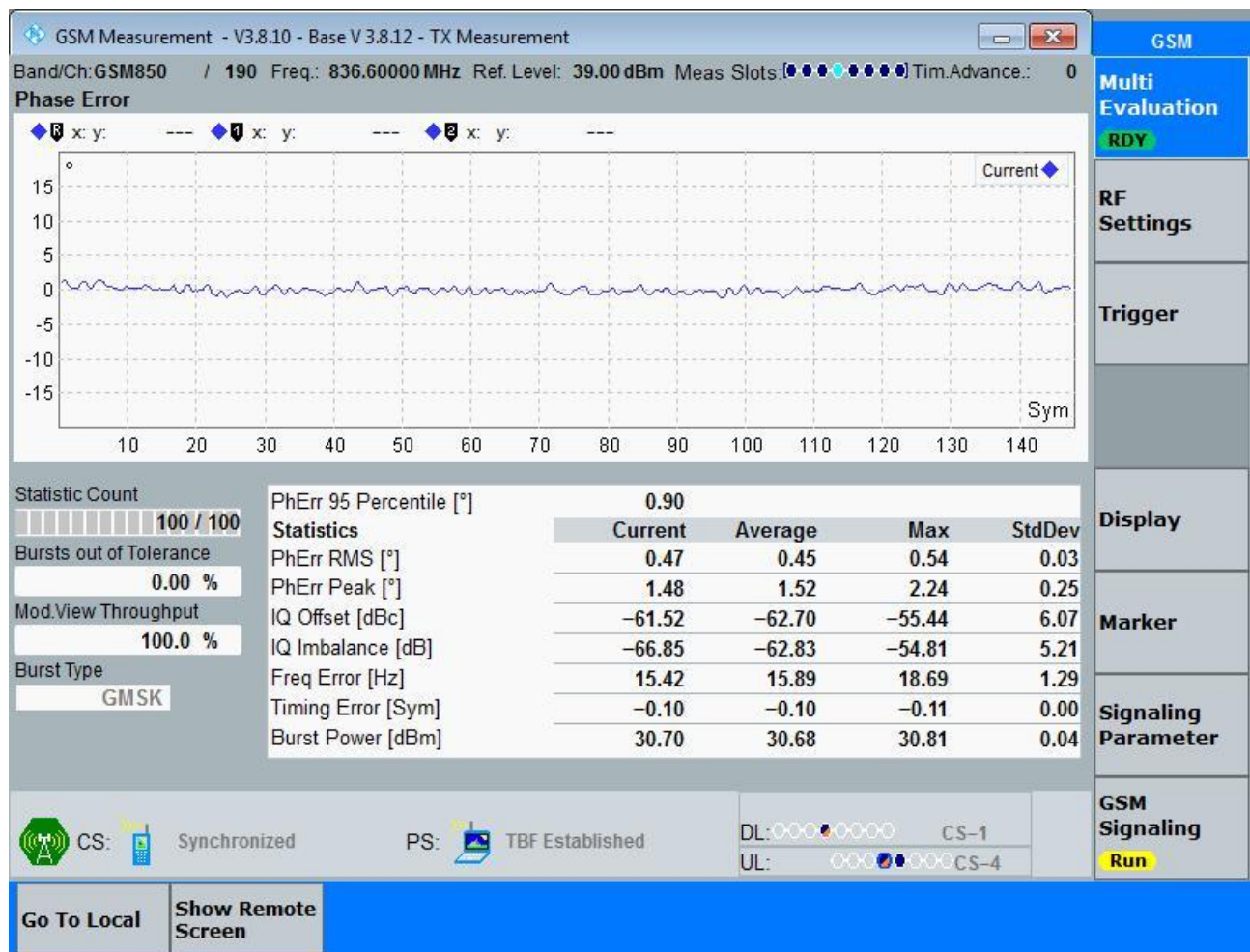
### Part I - Test Plots

#### 3.1 For GSM

##### 3.1.1 Test Band = GSM850

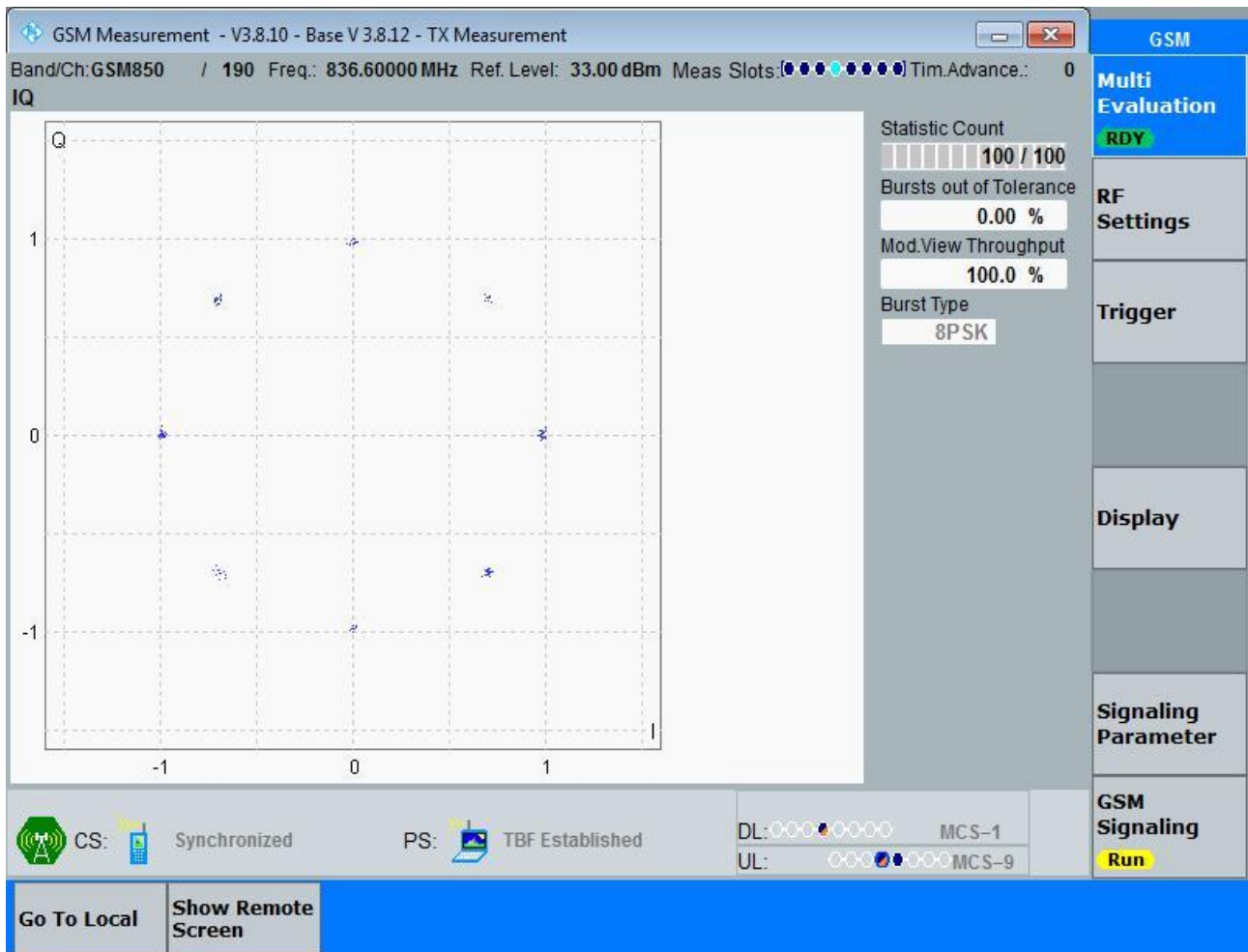
##### 3.1.1.1 Test Mode = GSM/TM1

##### 3.1.1.1.1 Test Channel = MCH



### 3.1.1.2 Test Mode = GSM/TM2

#### 3.1.1.2.1 Test Channel = MCH

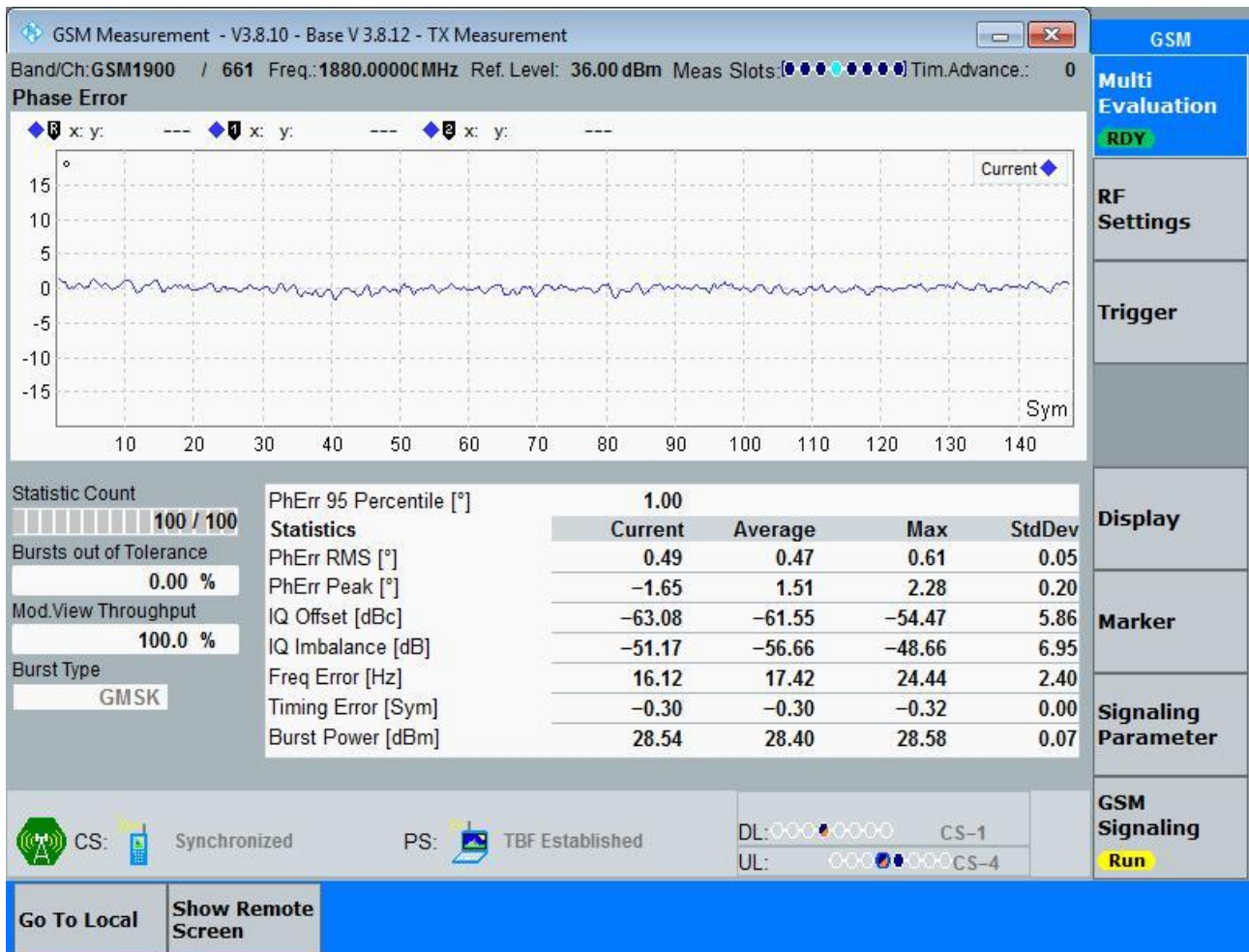




### 3.1.2 Test Band = PCS1900

#### 3.1.2.1 Test Mode = GSM/TM1

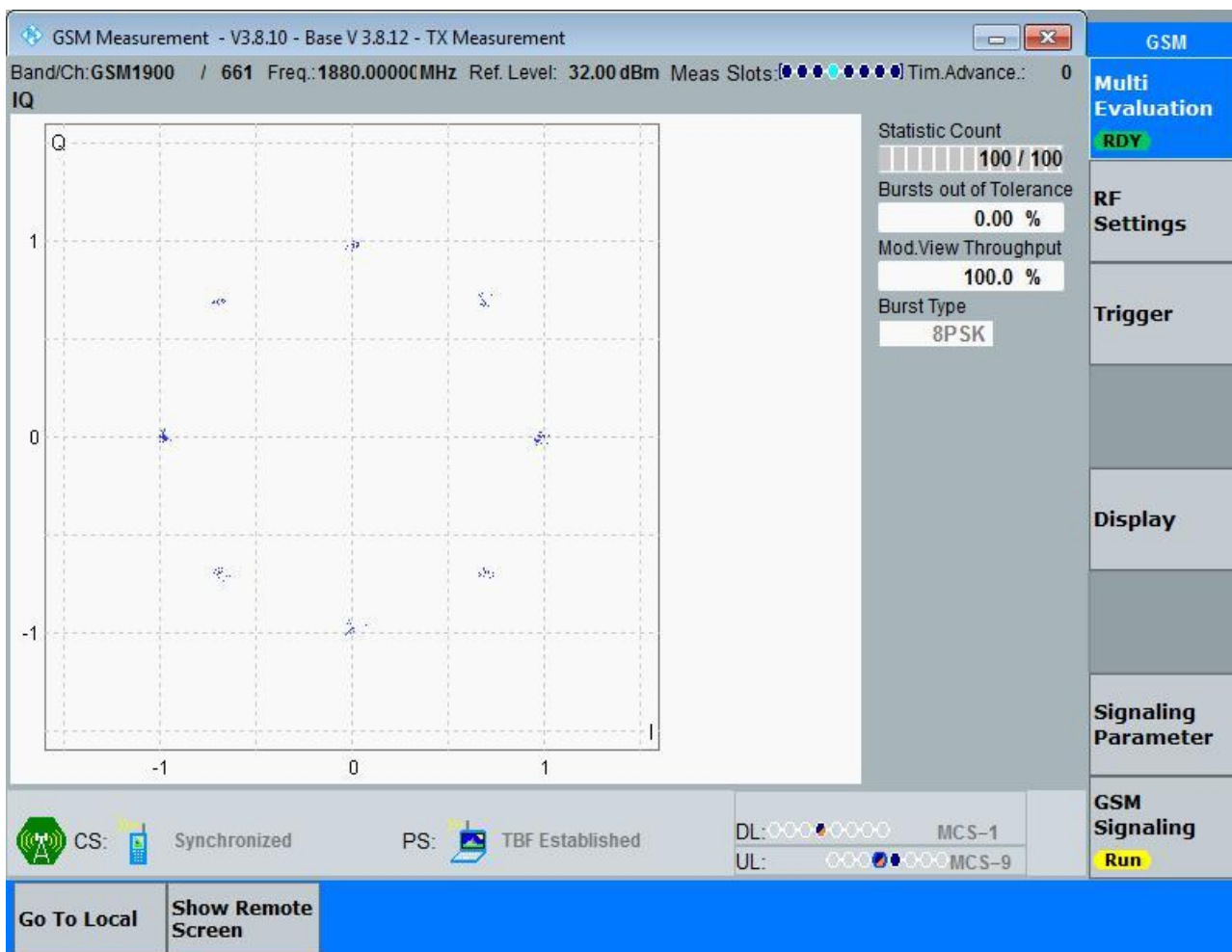
##### 3.1.2.1.1 Test Channel = MCH





### 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	245.54	316.9	Pass
		MCH	244.34	315.8	Pass
		HCH	244.24	313.4	Pass
	GSM/TM2	LCH	250.68	303.4	Pass
		MCH	249.11	309.0	Pass
		HCH	243.97	302.3	Pass
PCS1900	GSM/TM1	LCH	243.62	308.9	Pass
		MCH	244.49	314.8	Pass
		HCH	244.97	314.2	Pass
	GSM/TM2	LCH	248.95	312.7	Pass
		MCH	249.19	308.1	Pass
		HCH	247.01	316.1	Pass



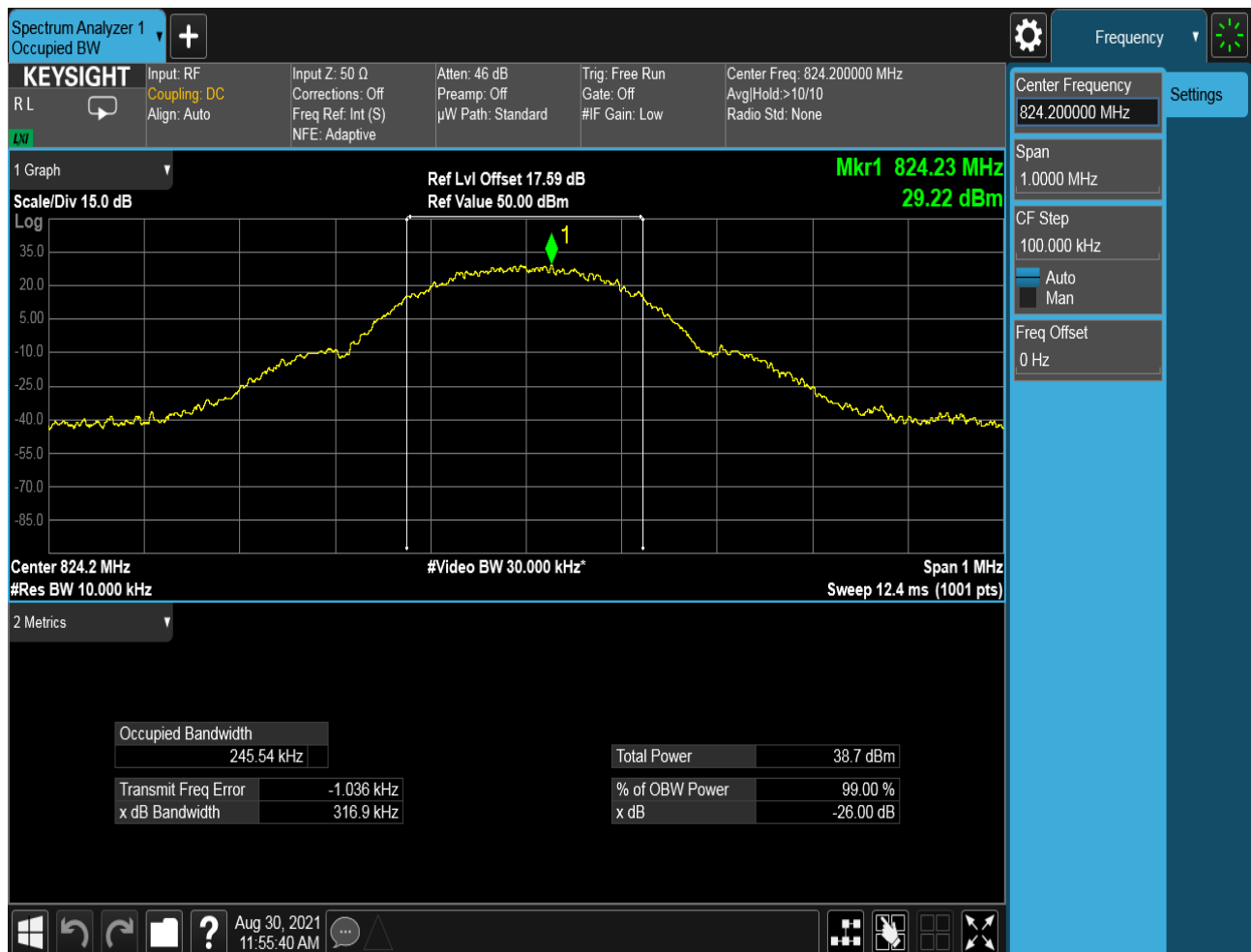
## Part II - Test Plots

### 4.1 For GSM

#### 4.1.1 Test Band = GSM850

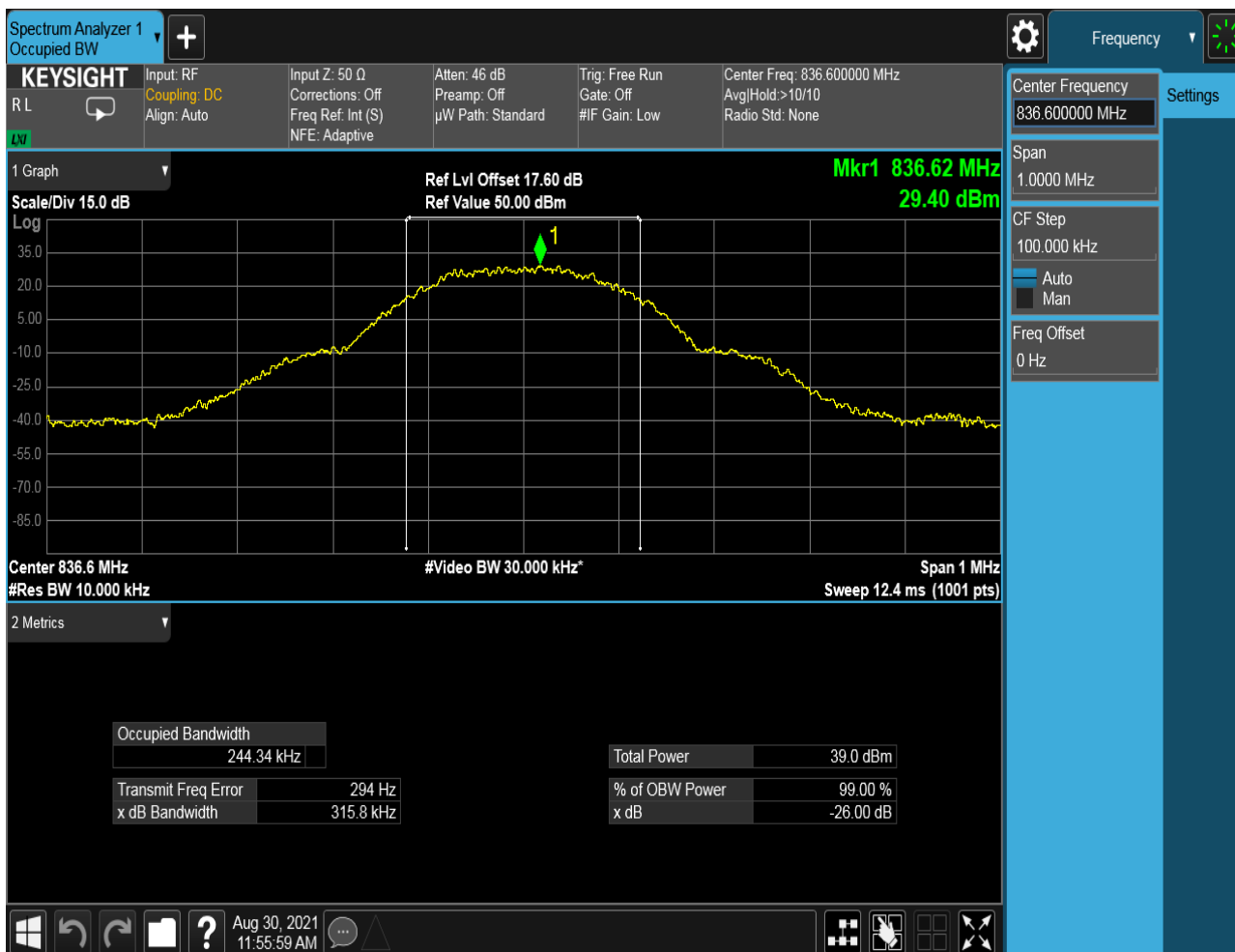
##### 4.1.1.1 Test Mode = GSM/TM1

##### 4.1.1.1.1 Test Channel = LCH



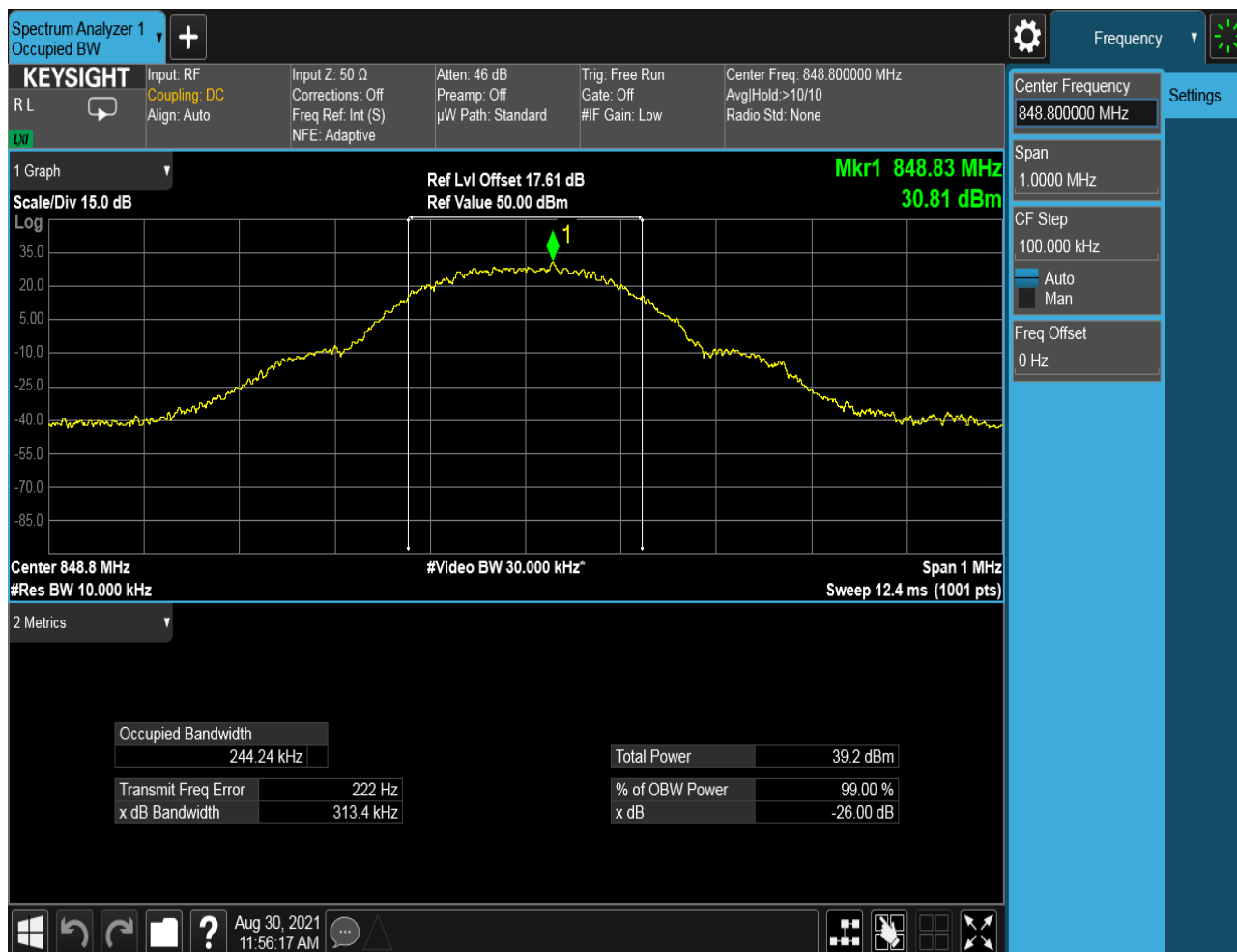


## 4.1.1.1.2 Test Channel = MCH





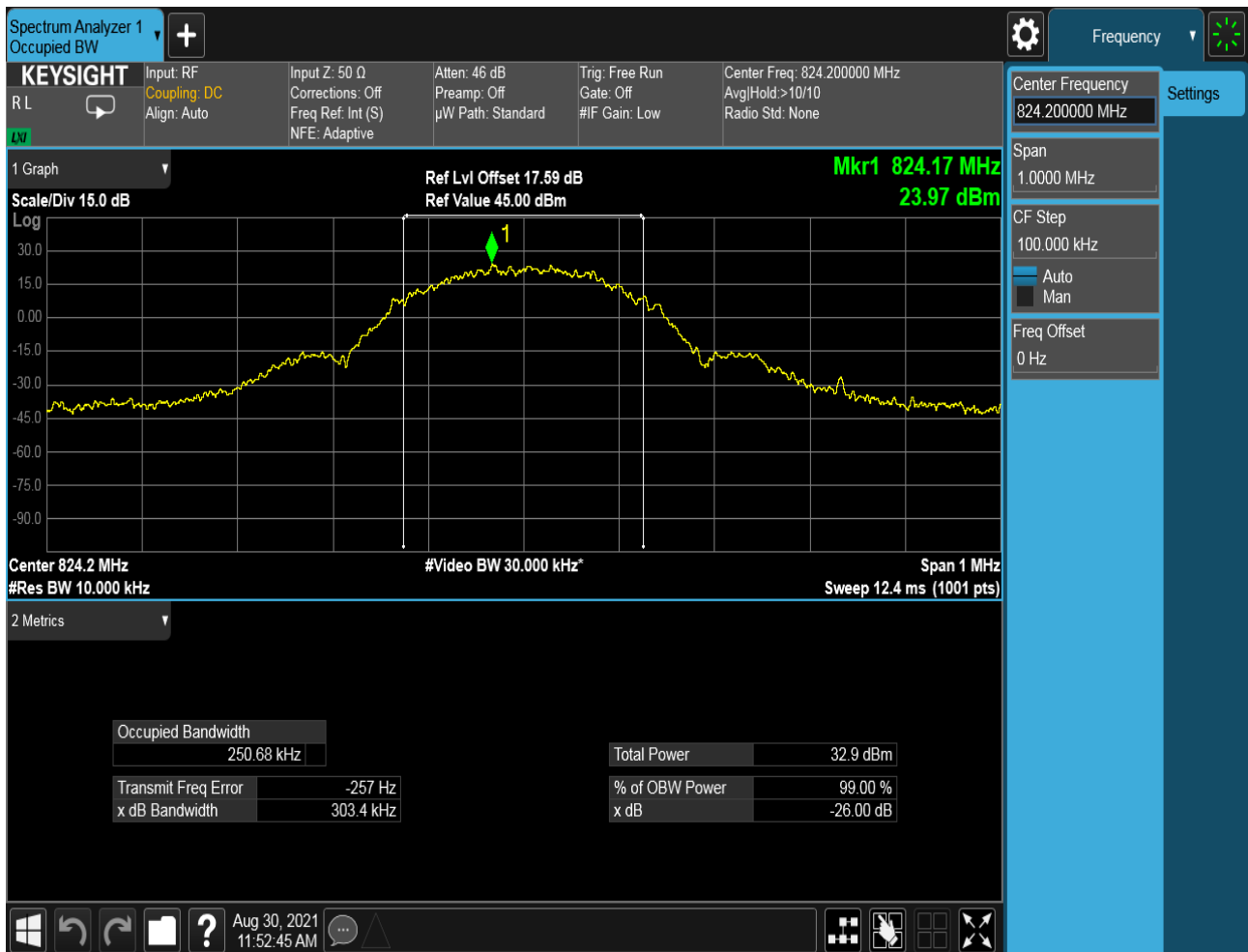
## 4.1.1.1.3 Test Channel = HCH





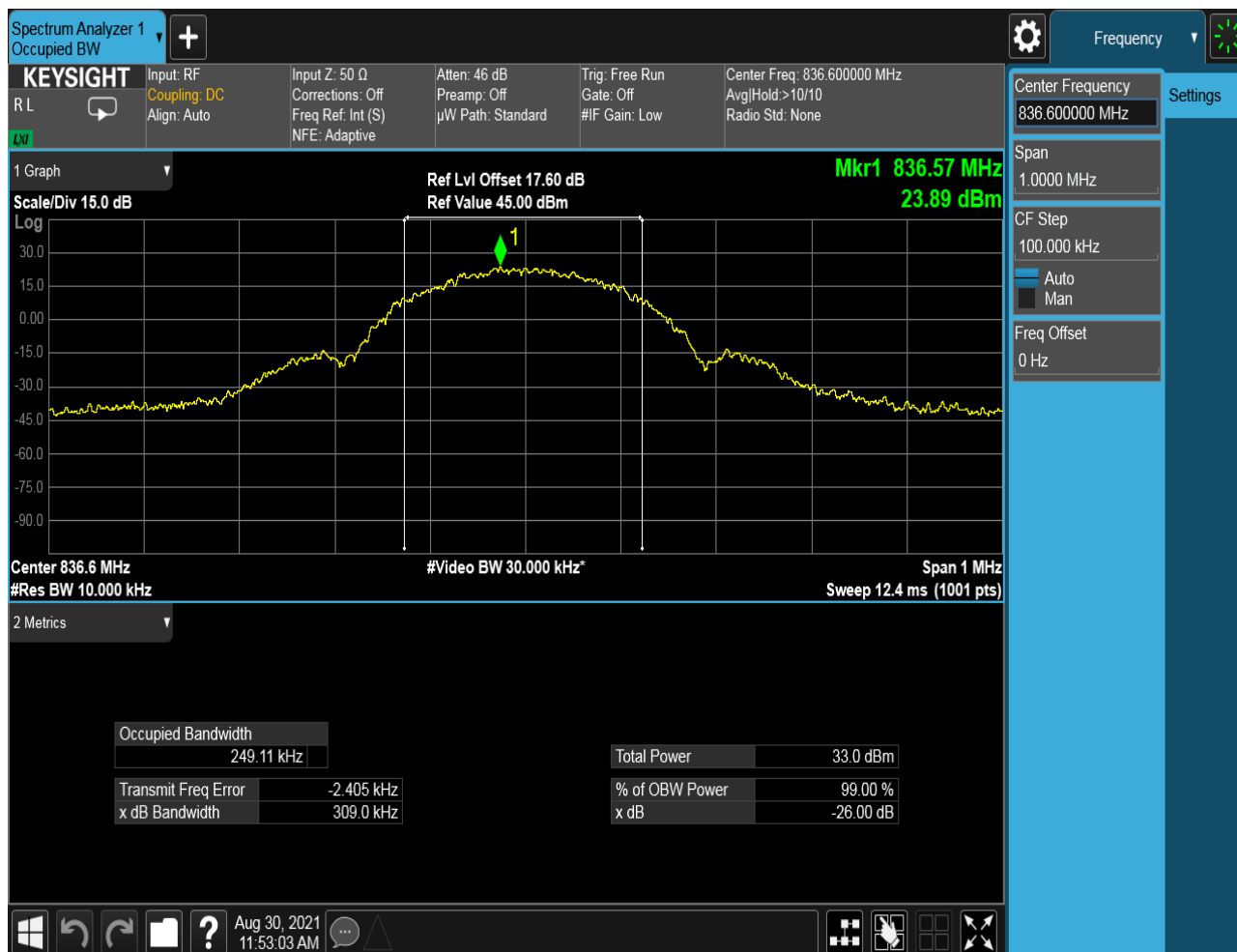
## 4.1.1.2 Test Mode = GSM/TM2

## 4.1.1.2.1 Test Channel = LCH



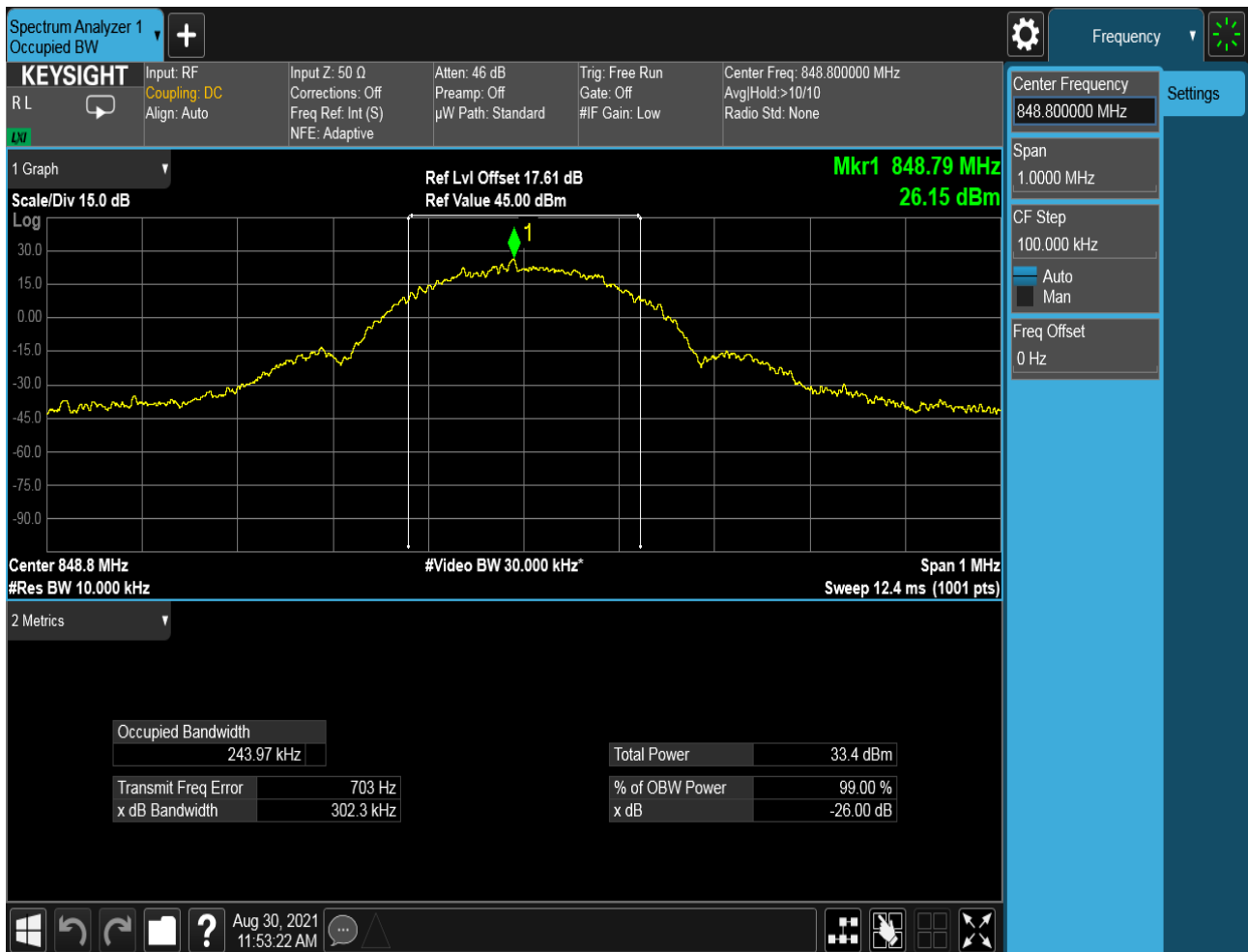


## 4.1.1.2.2 Test Channel = MCH





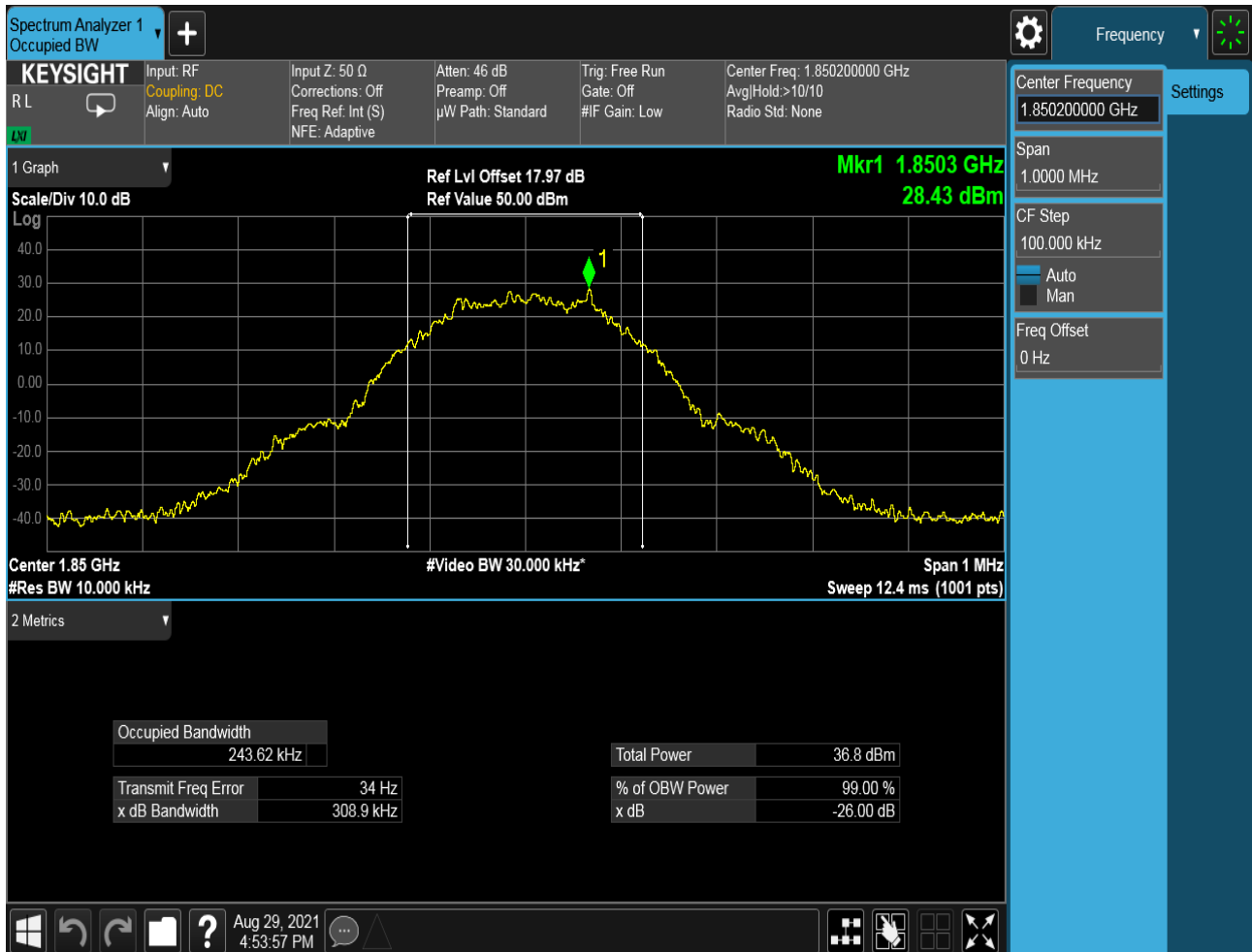
## 4.1.1.2.3 Test Channel = HCH



## 4.1.2 Test Band = PCS1900

### 4.1.2.1 Test Mode = GSM/TM1

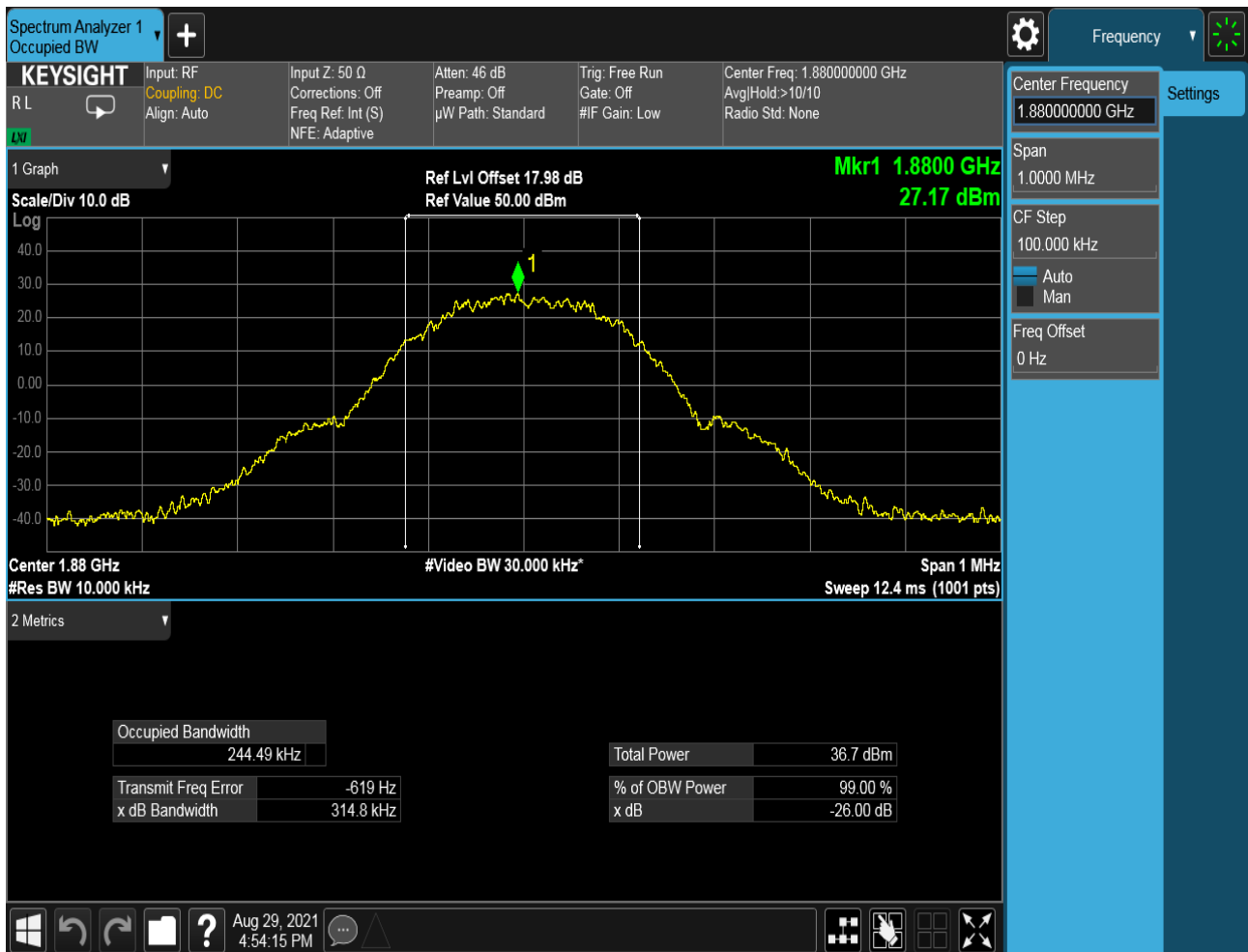
#### 4.1.2.1.1 Test Channel = LCH





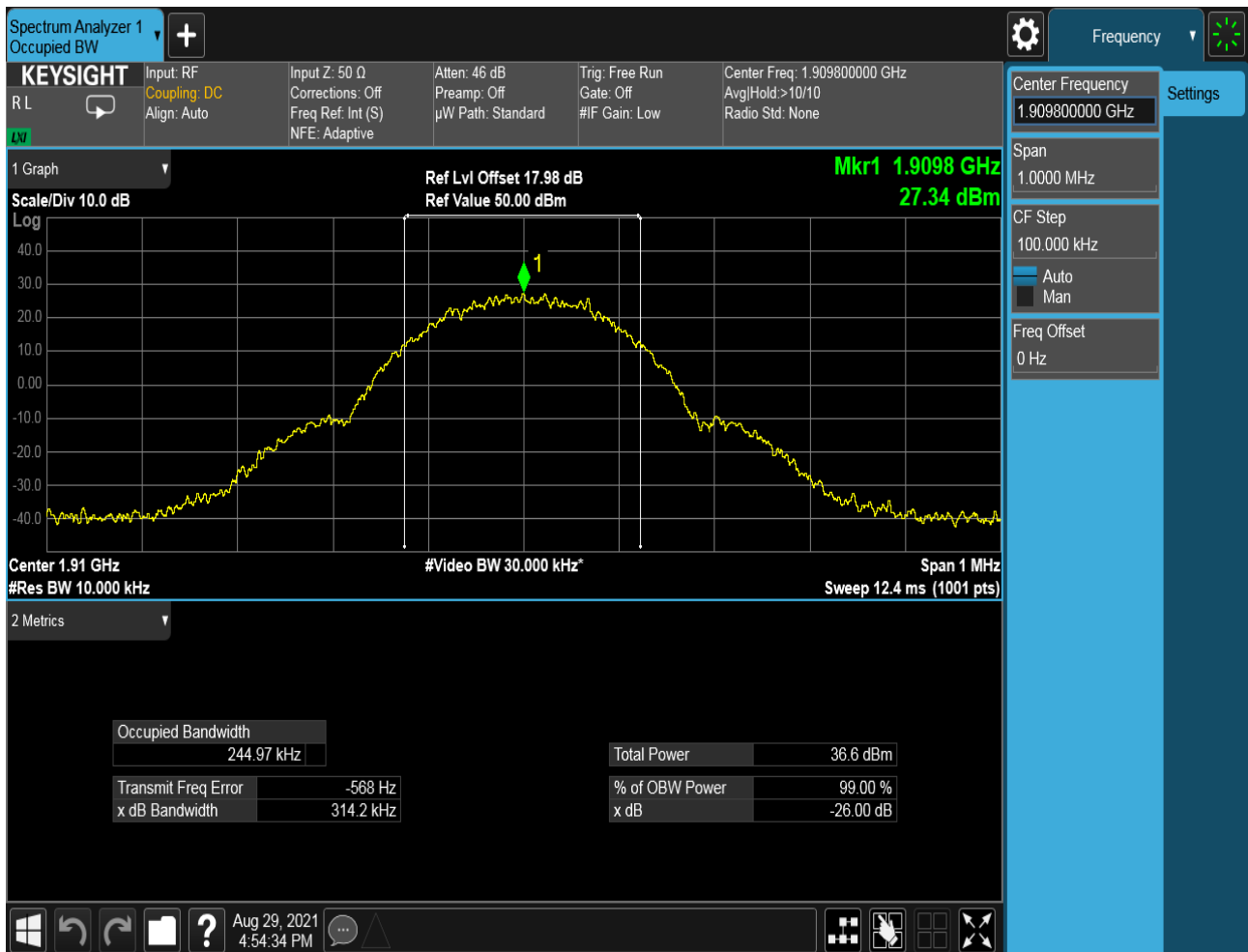


## 4.1.2.1.2 Test Channel = MCH





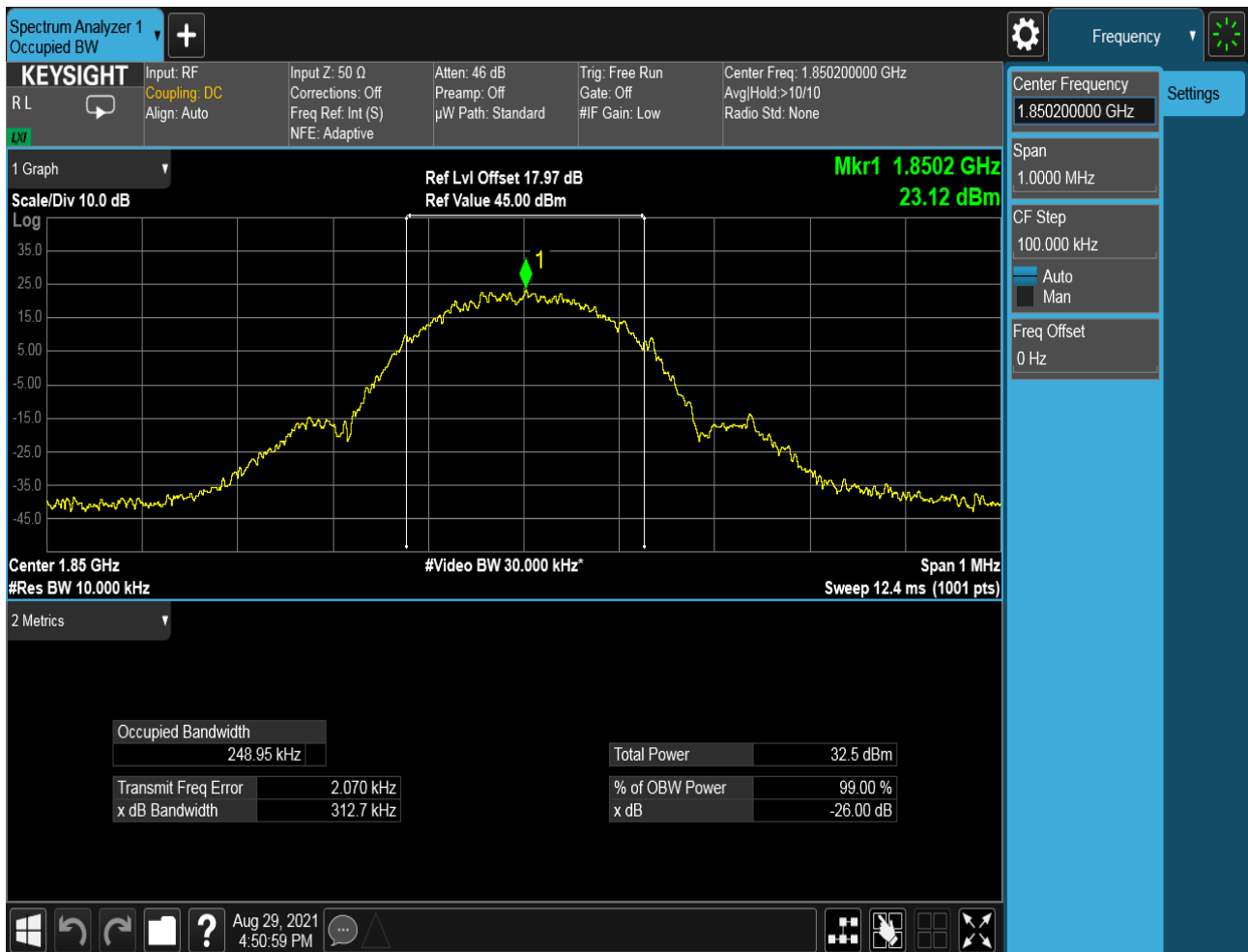
## 4.1.2.1.3 Test Channel = HCH





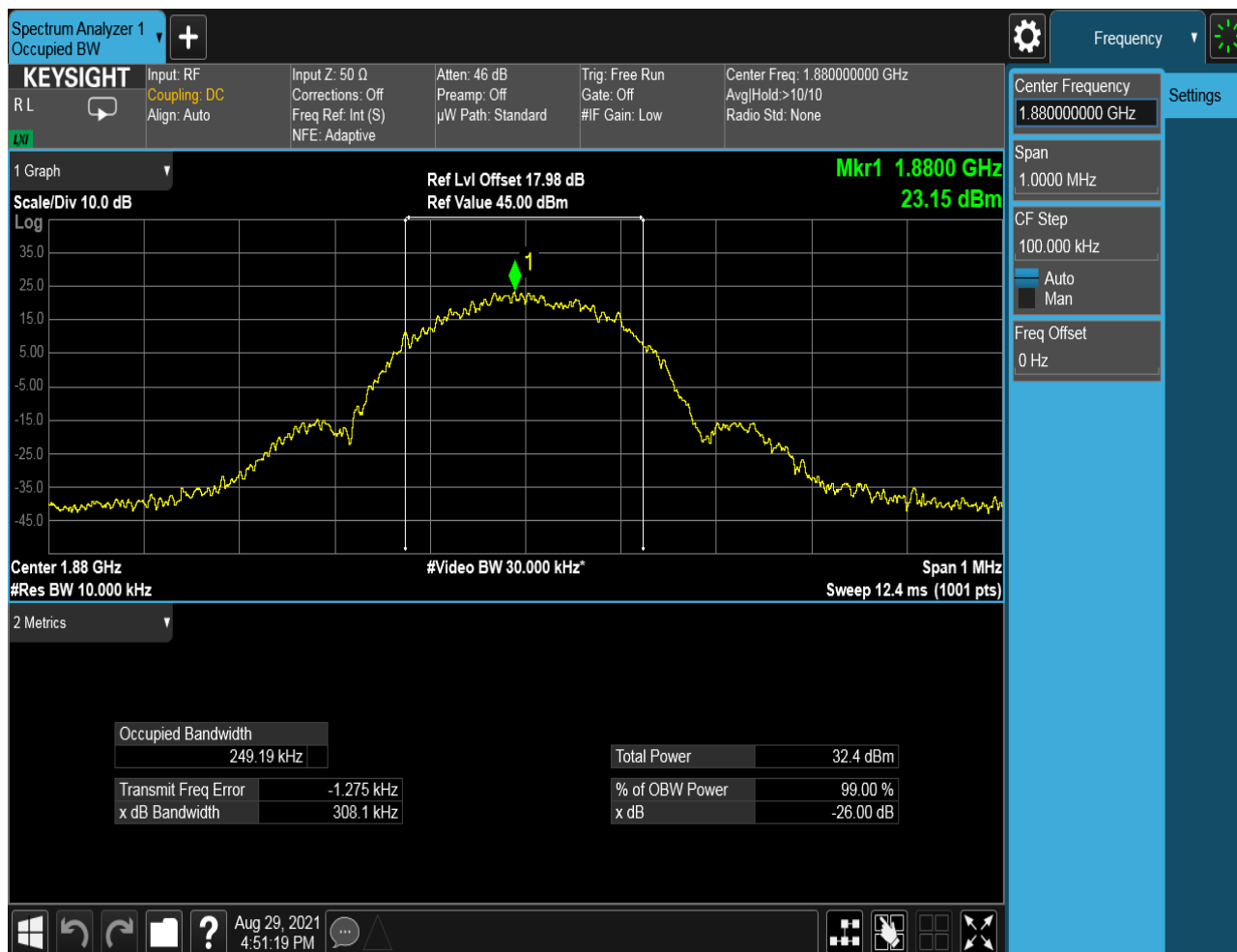
## 4.1.2.2 Test Mode = GSM/TM2

## 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

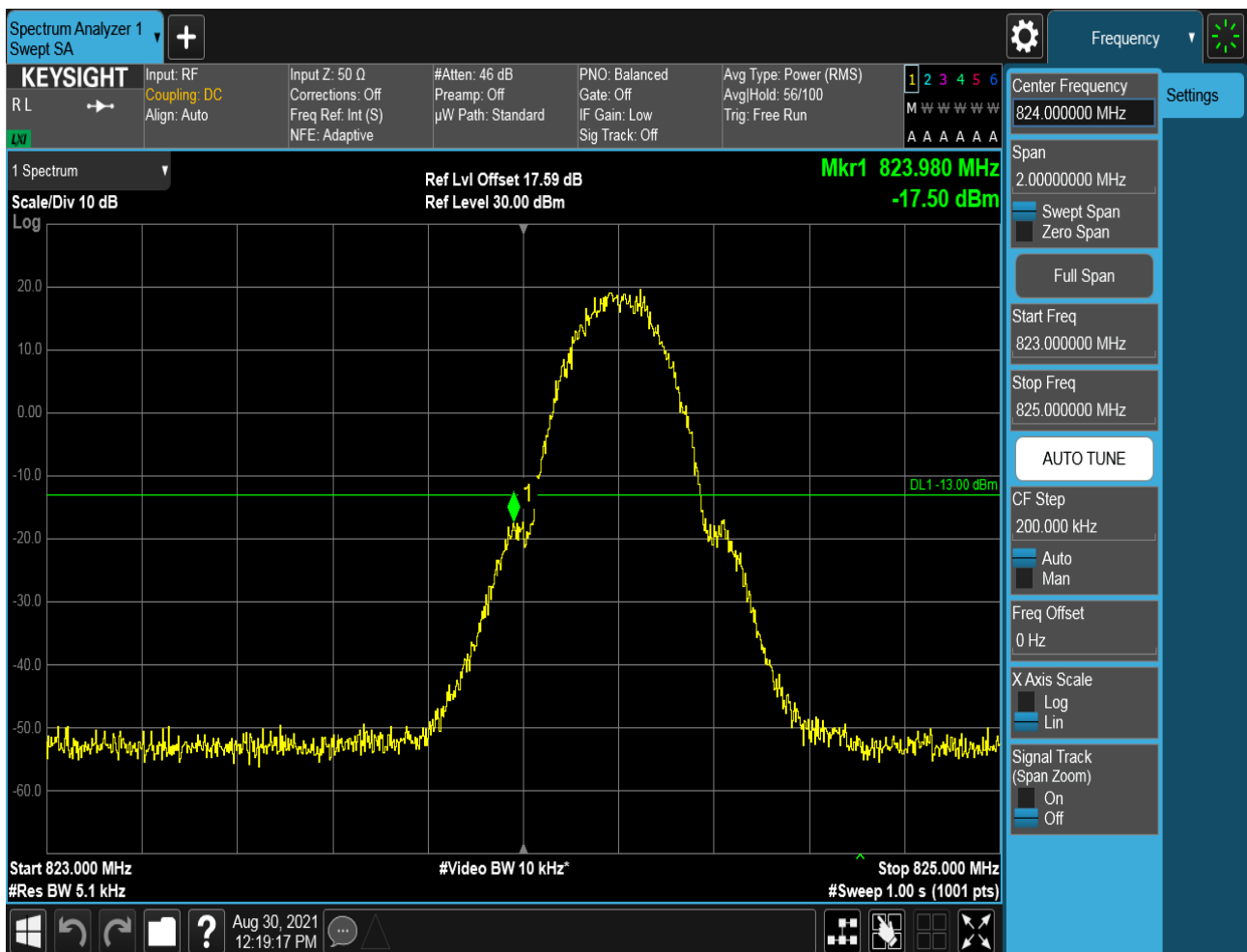
### Part I - Test Plots

#### 5.1 For GSM

##### 5.1.1 Test Band = GSM850

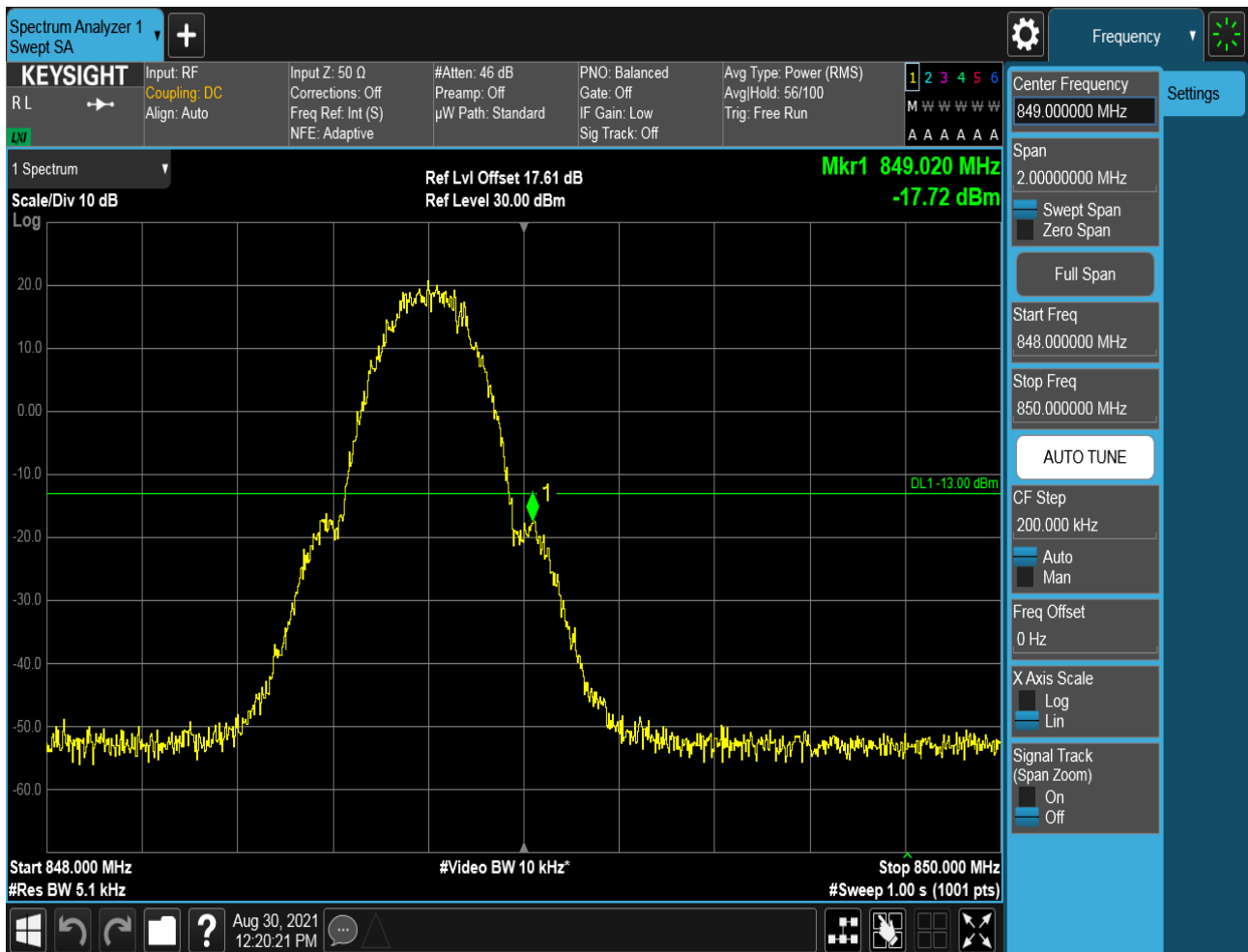
##### 5.1.1.1 Test Mode = GSM/TM1

##### 5.1.1.1.1 Test Channel = LCH





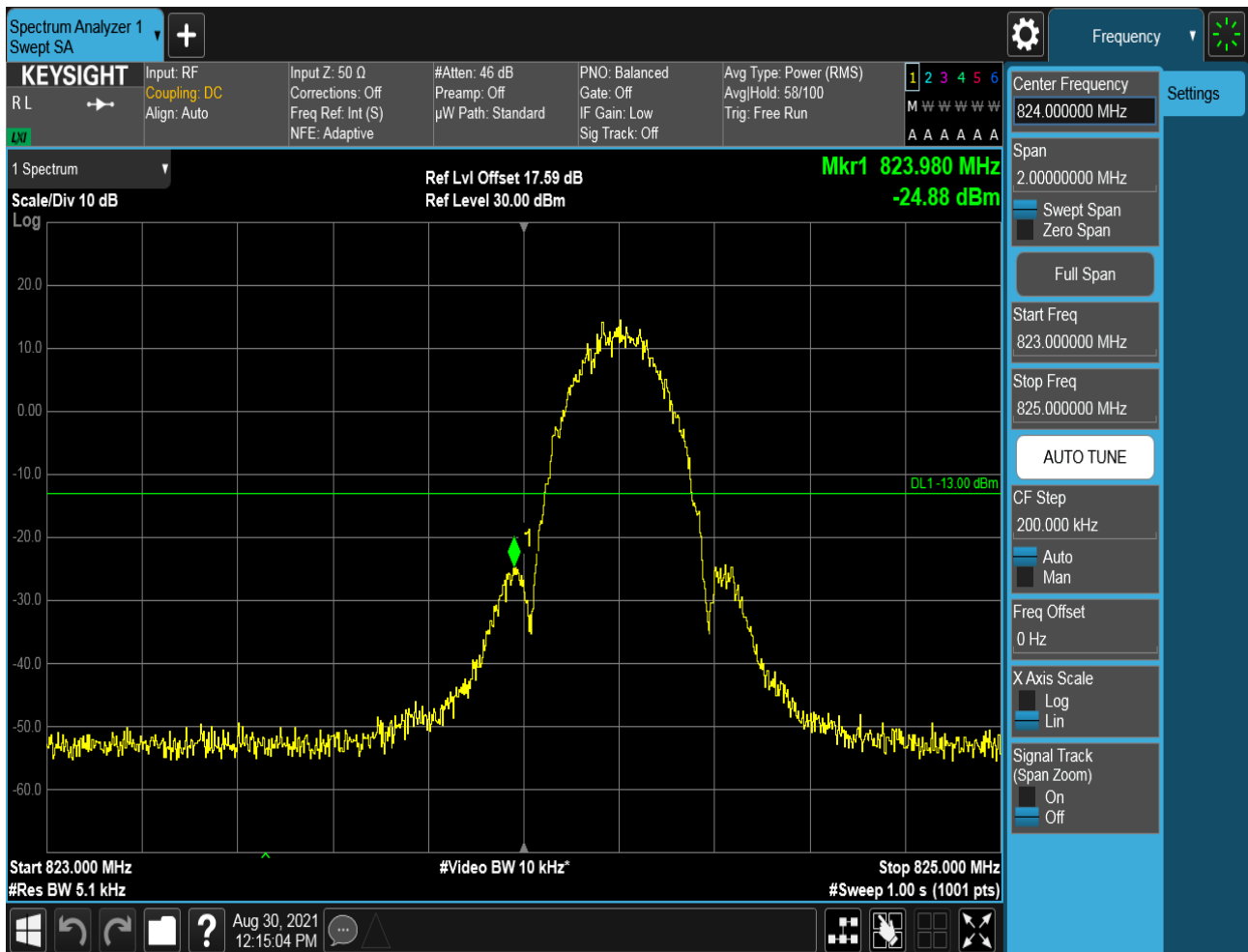
## 5.1.1.1.2 Test Channel = HCH





## 5.1.1.2 Test Mode = GSM/TM2

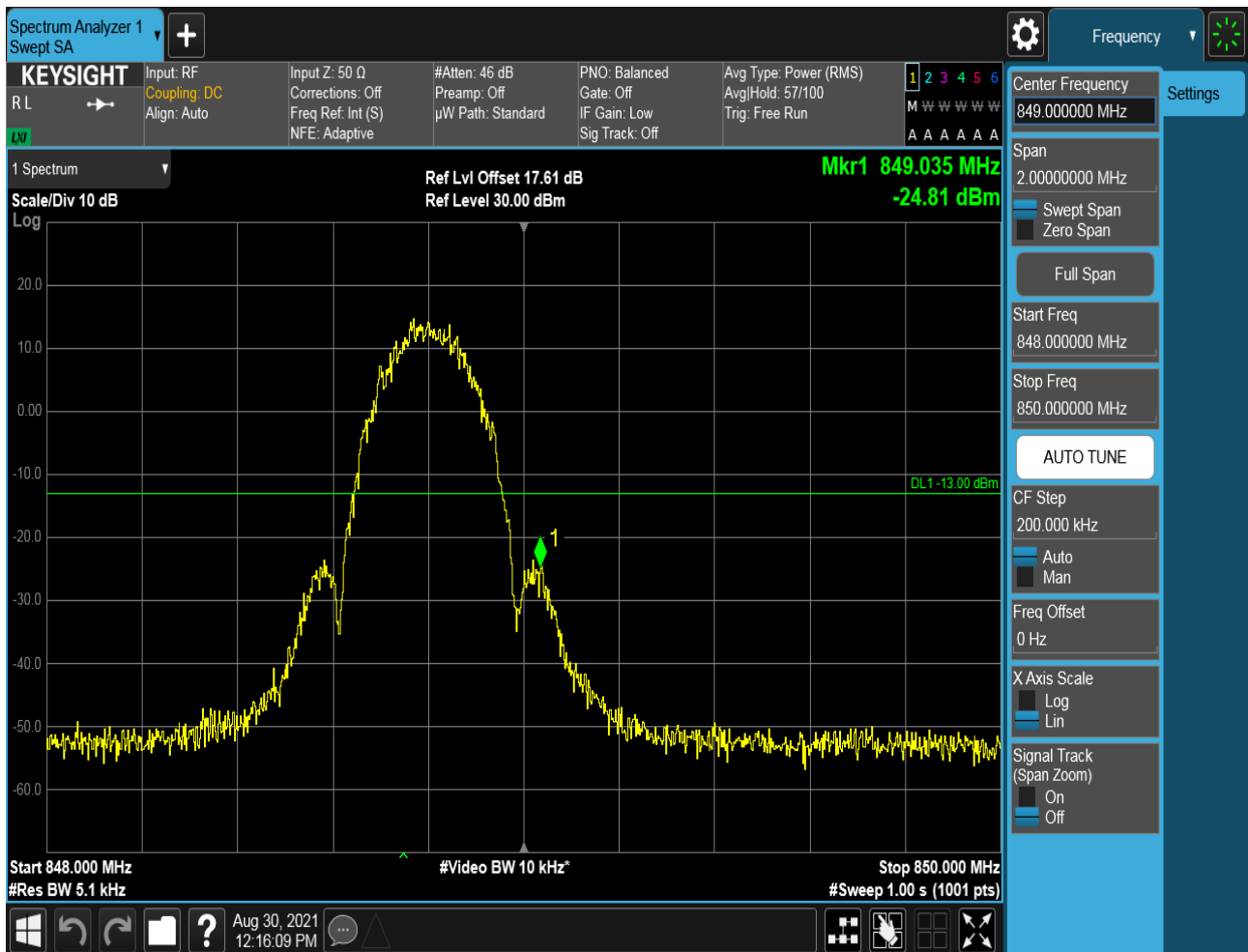
## 5.1.1.2.1 Test Channel = LCH







## 5.1.1.2.2 Test Channel = HCH

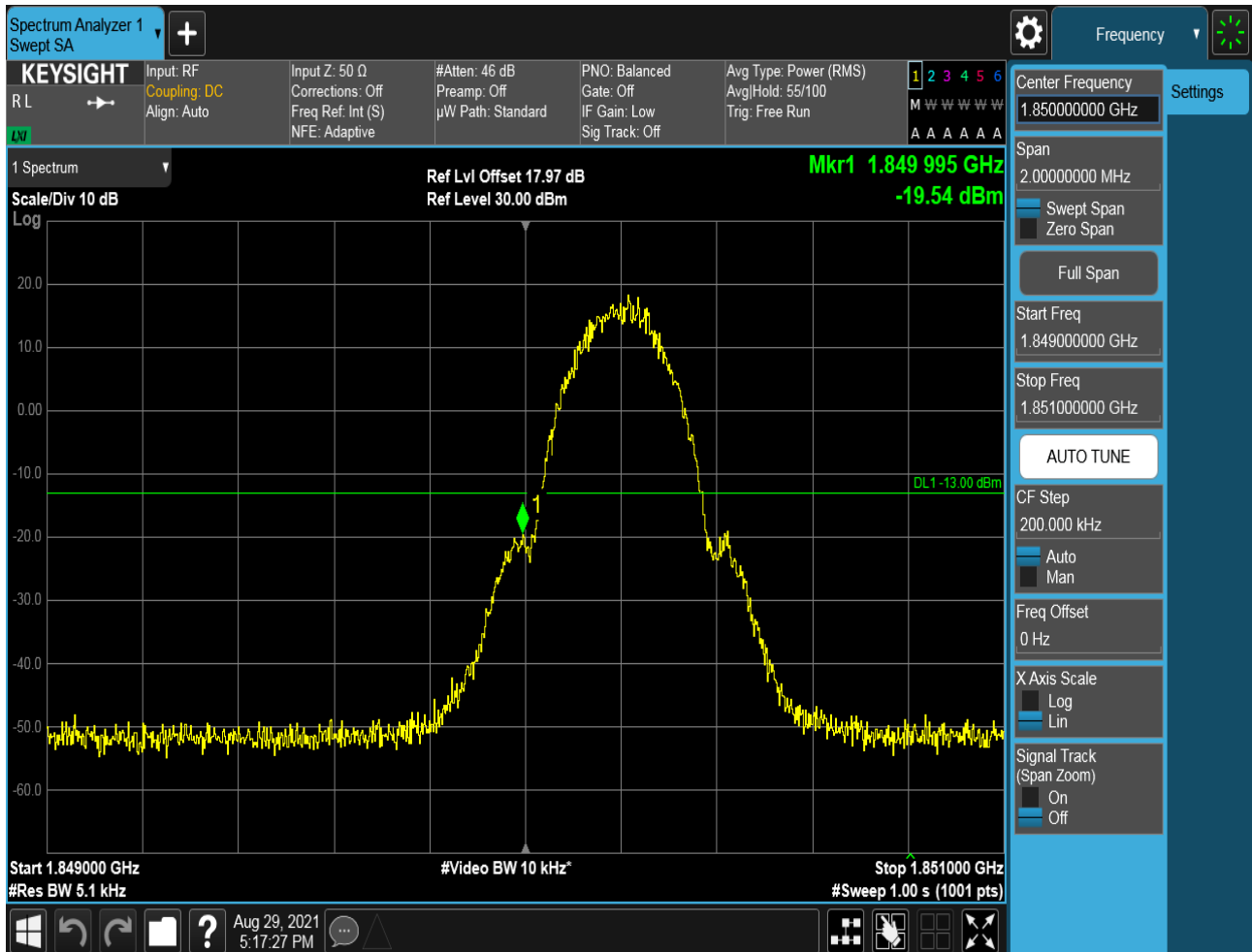




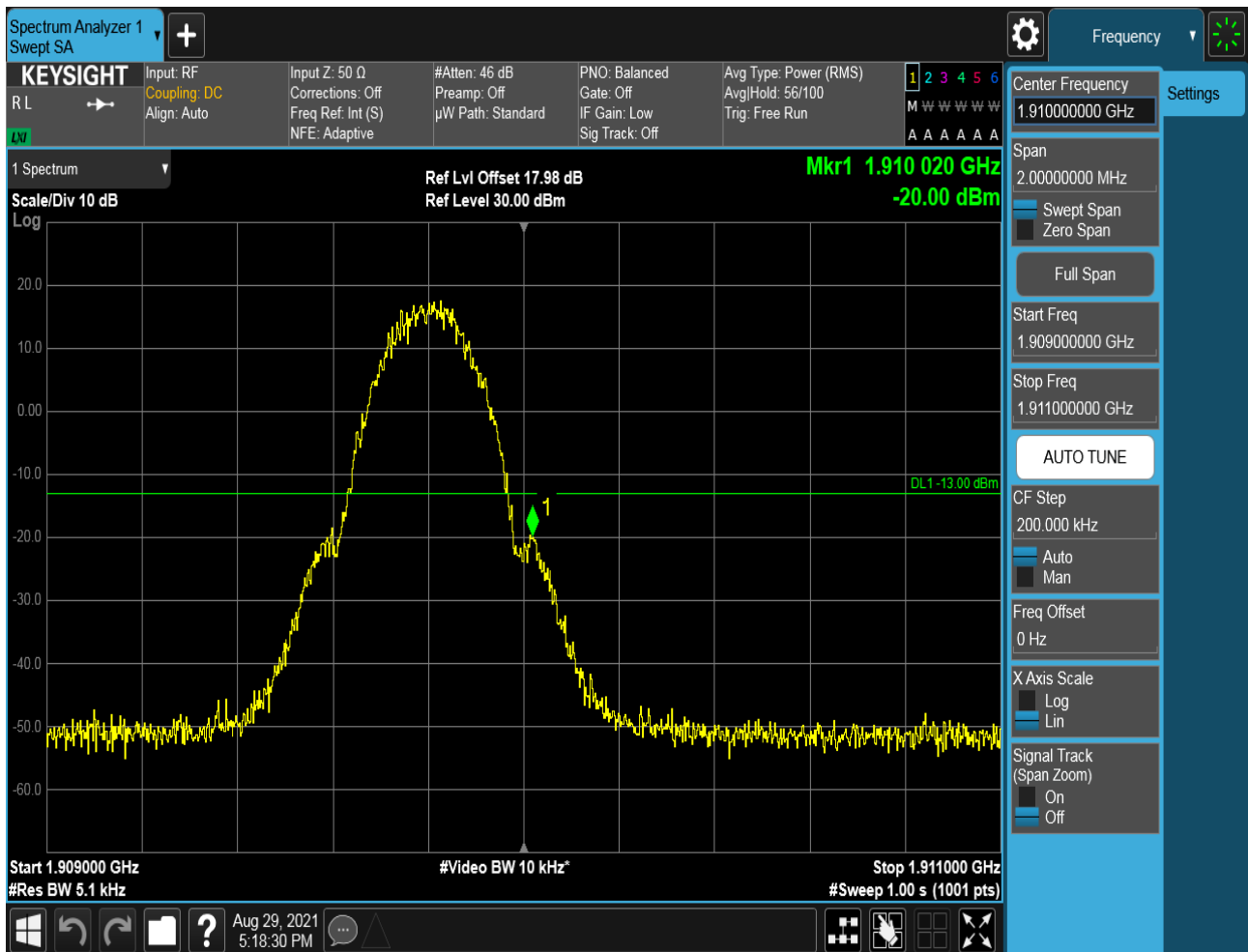
## 5.1.2 Test Band = PCS1900

### 5.1.2.1 Test Mode = GSM/TM1

#### 5.1.2.1.1 Test Channel = LCH



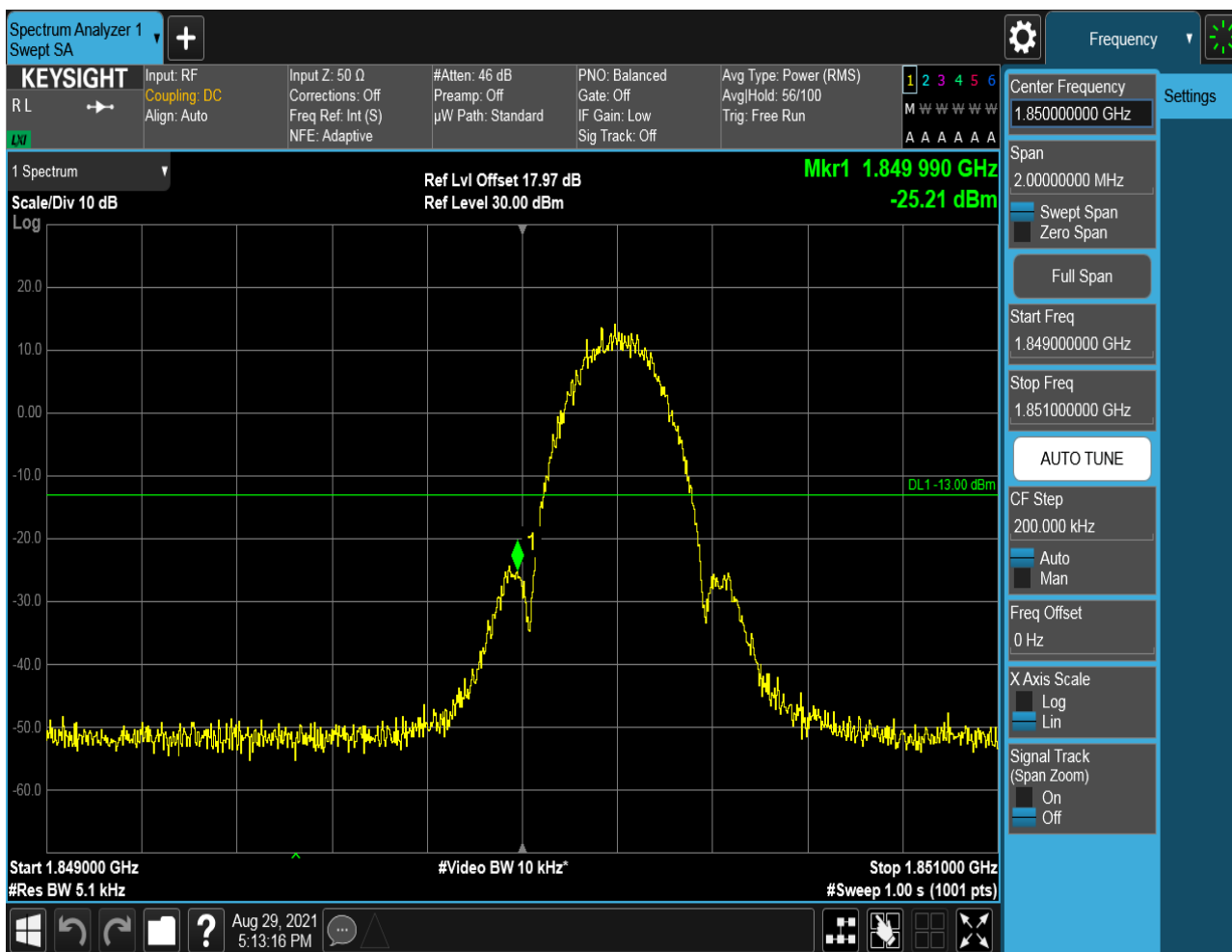
#### 5.1.2.1.2 Test Channel = HCH





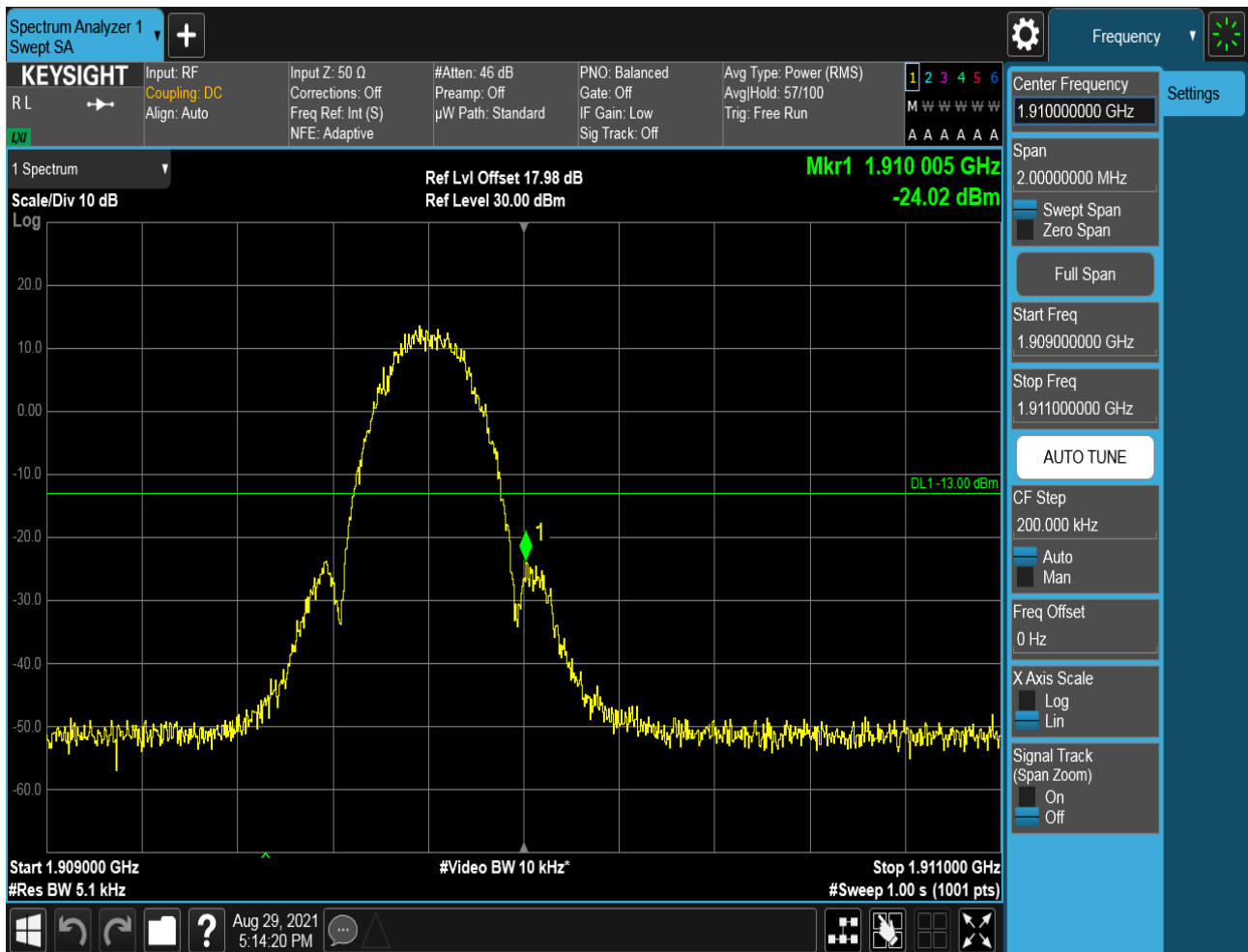
## 5.1.2.2 Test Mode = GSM/TM2

## 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.

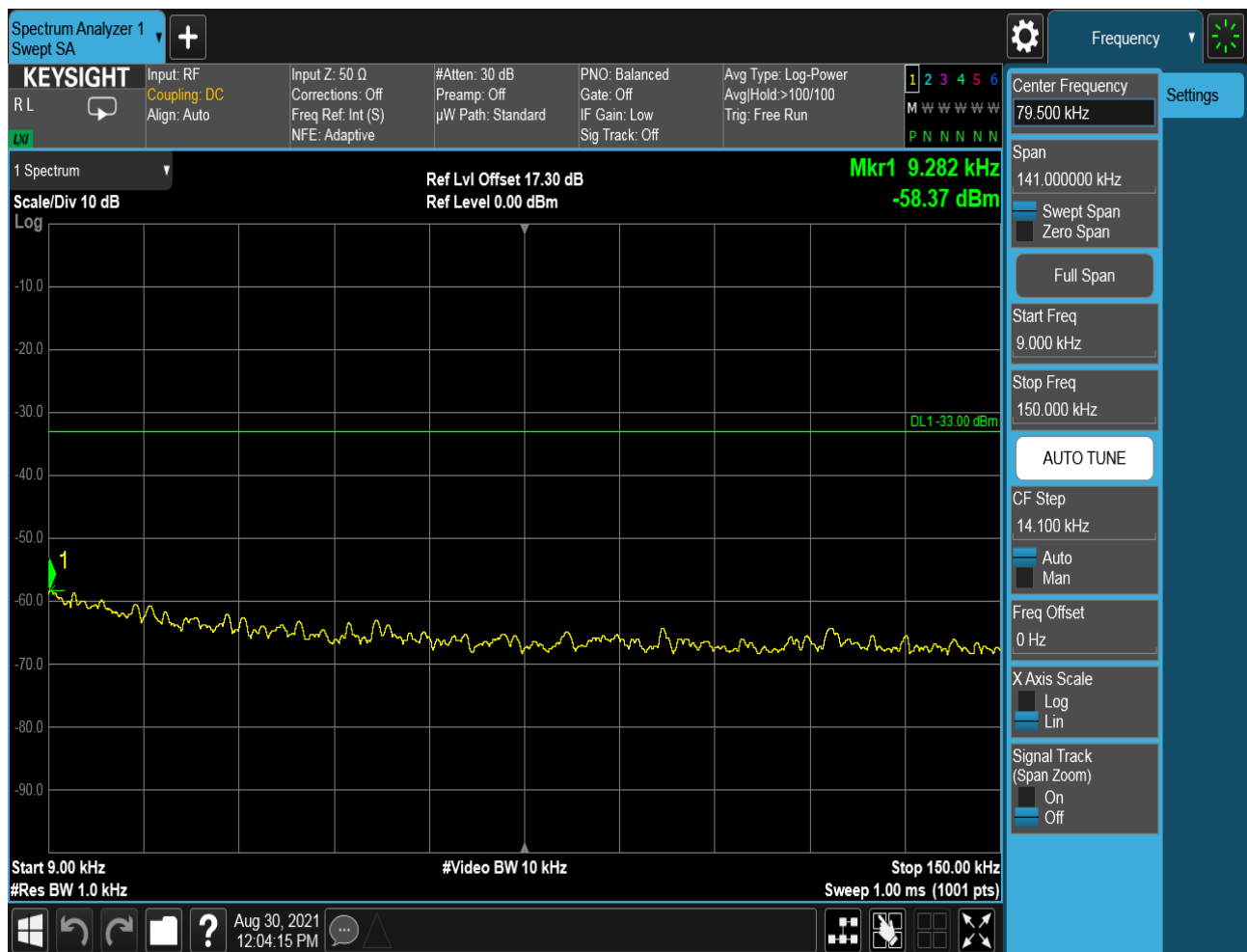
### Part I - Test Plots

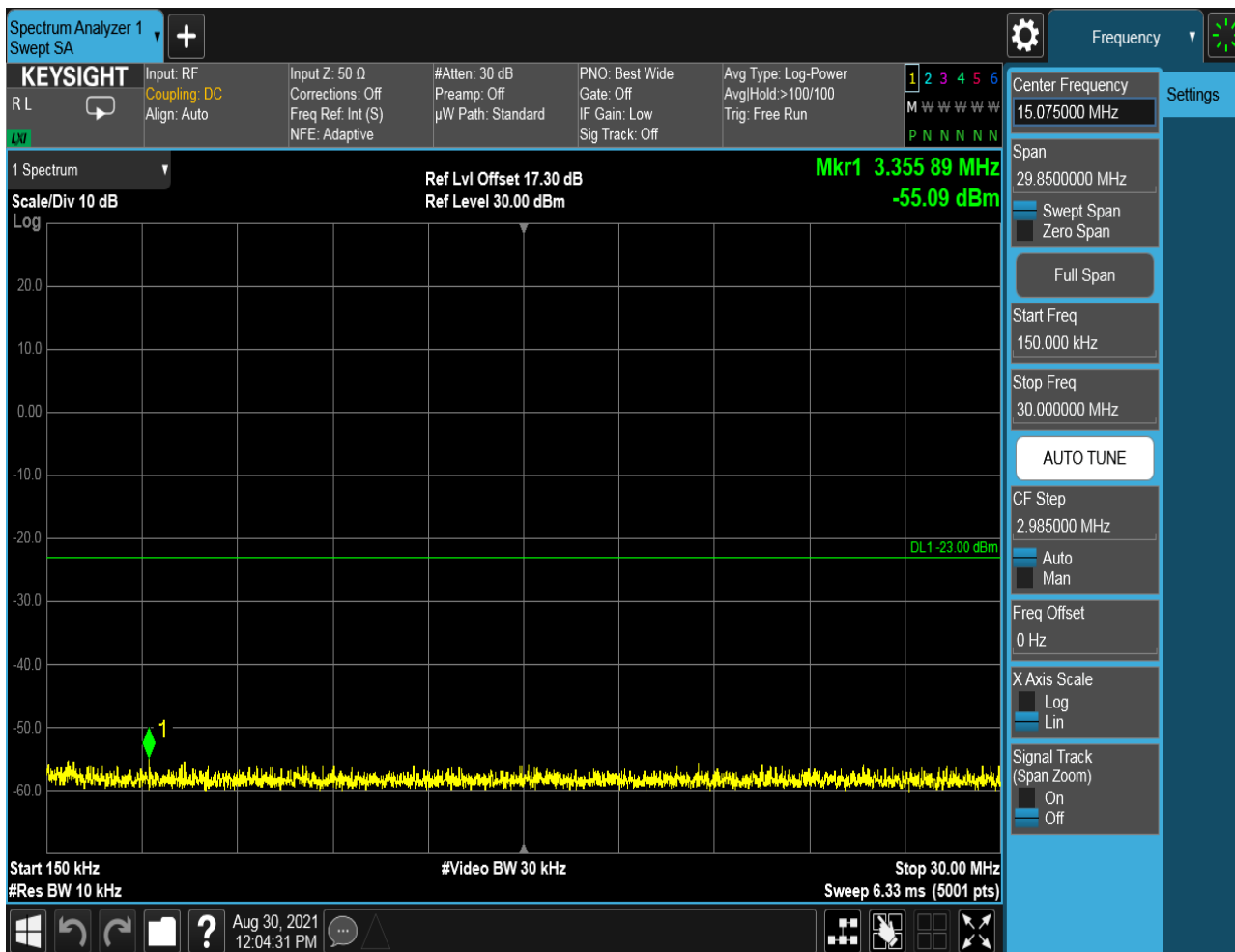
#### 6.1 For GSM

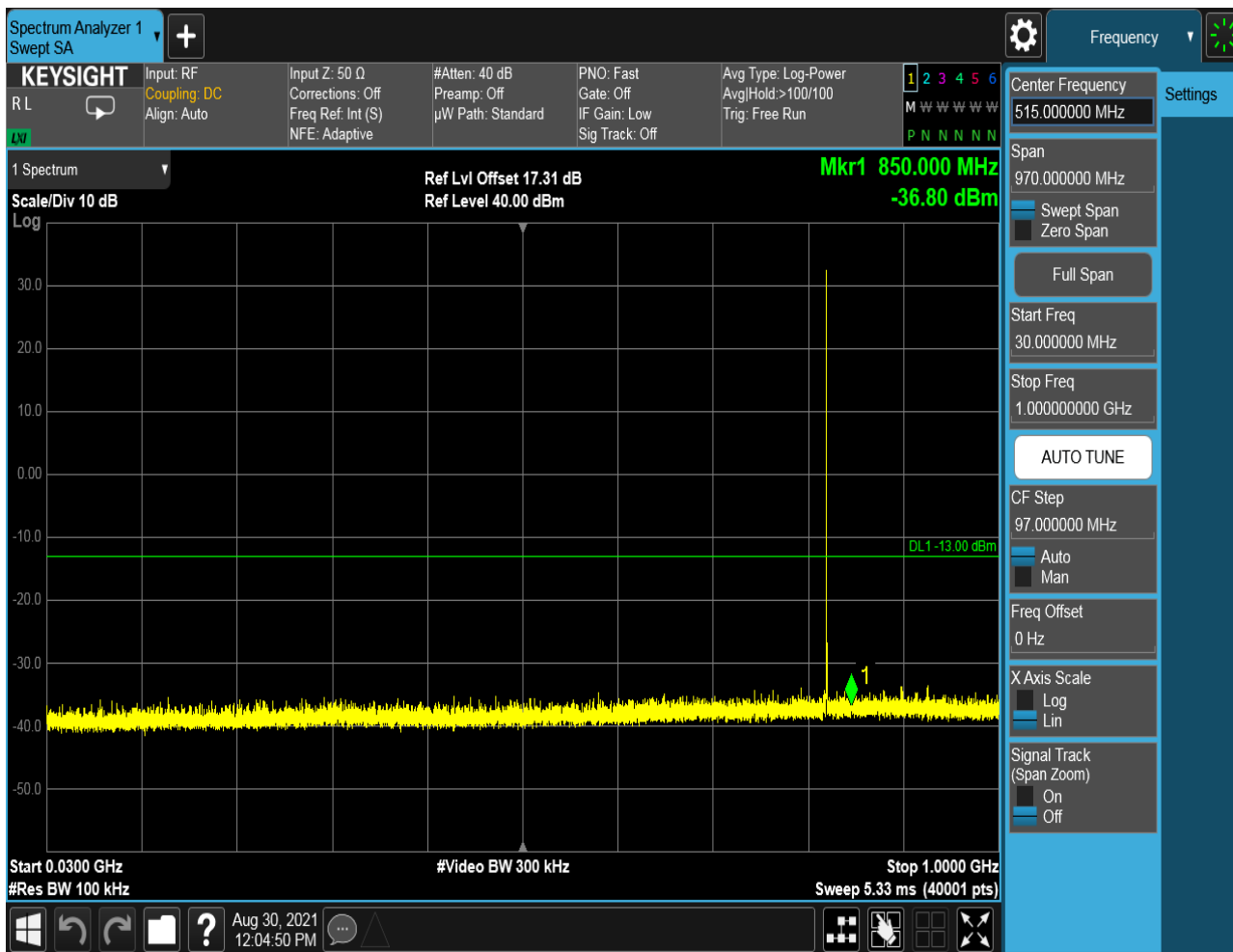
##### 6.1.1 Test Band = GSM850

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

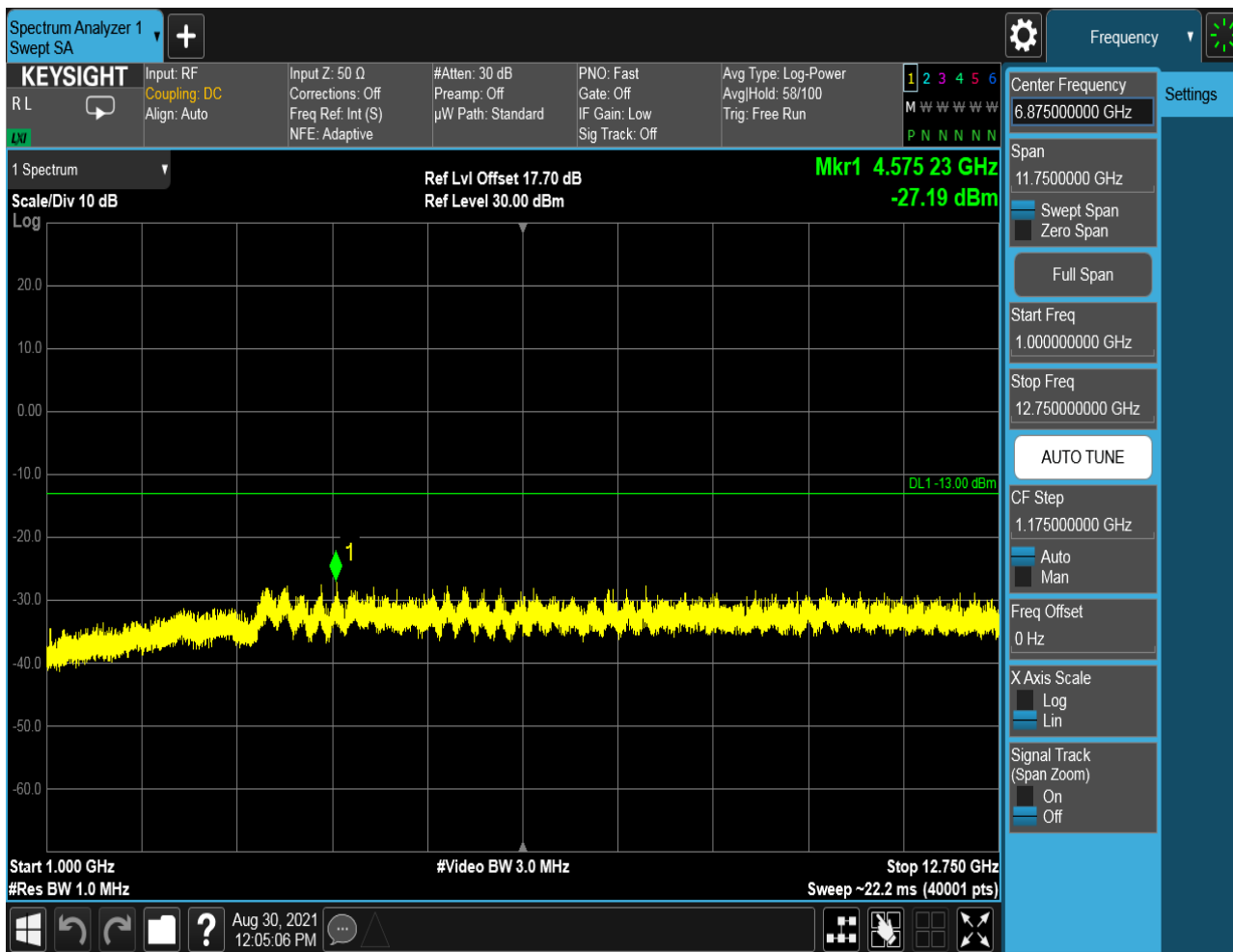
##### 6.1.1.1.1 Test Channel = LCH





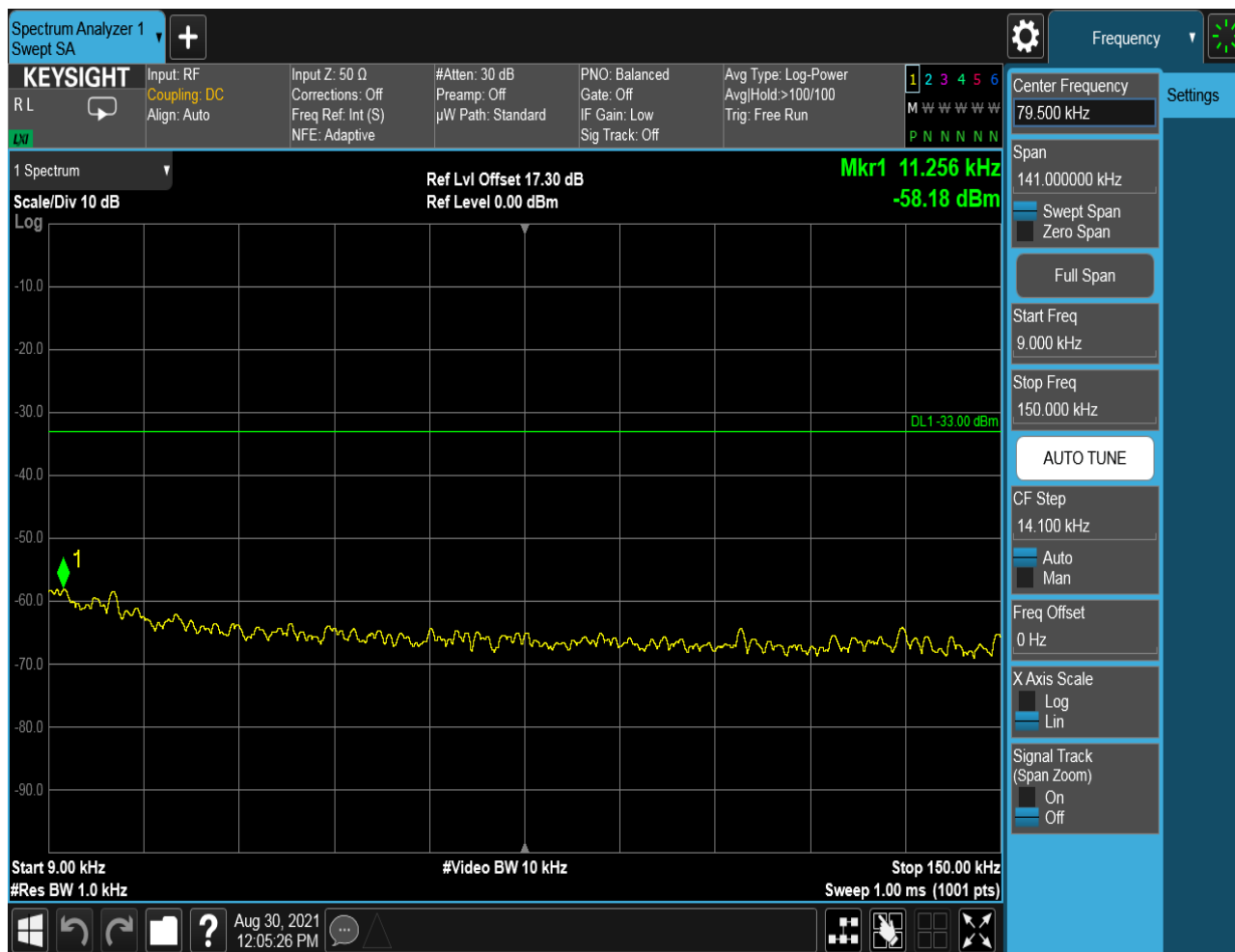


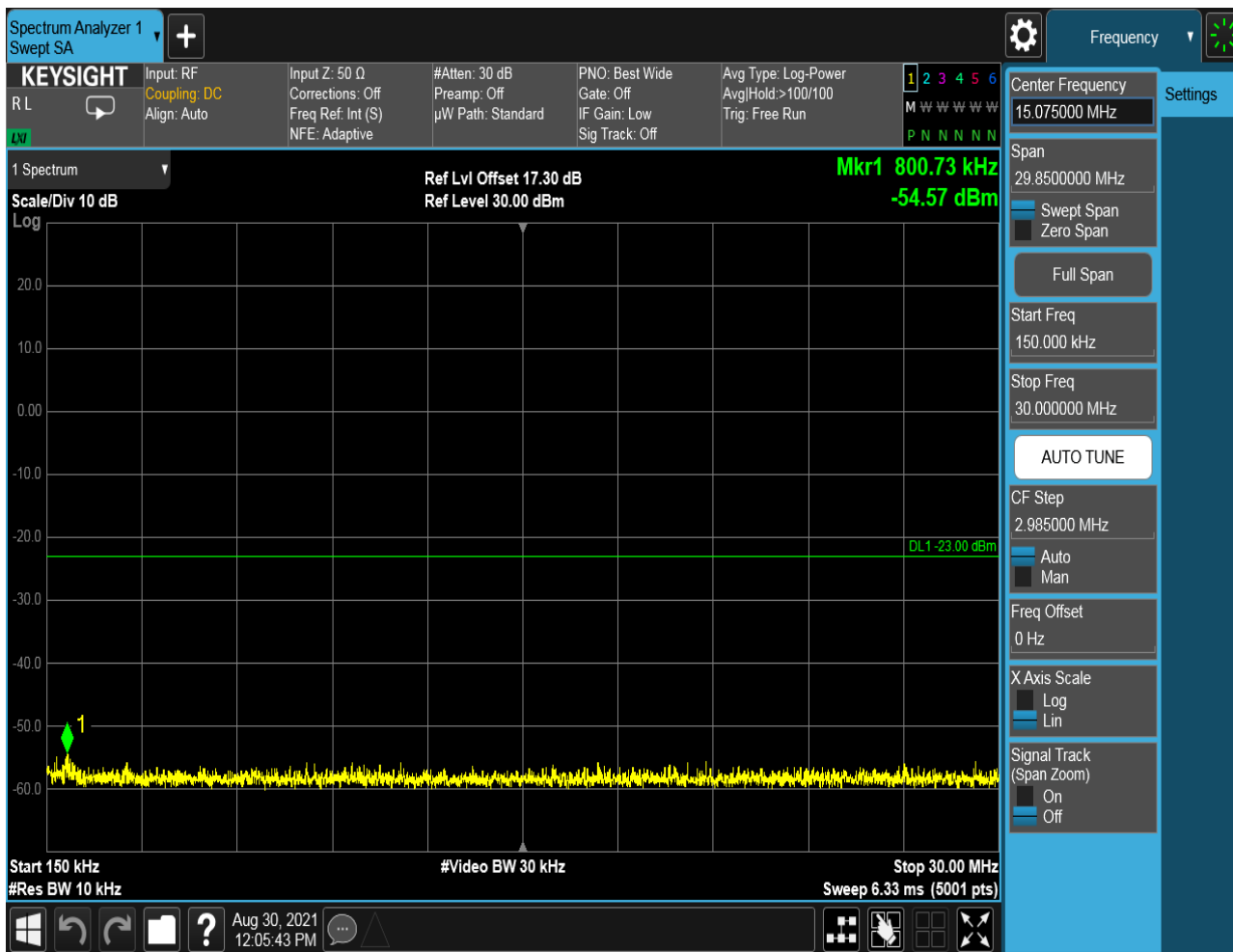


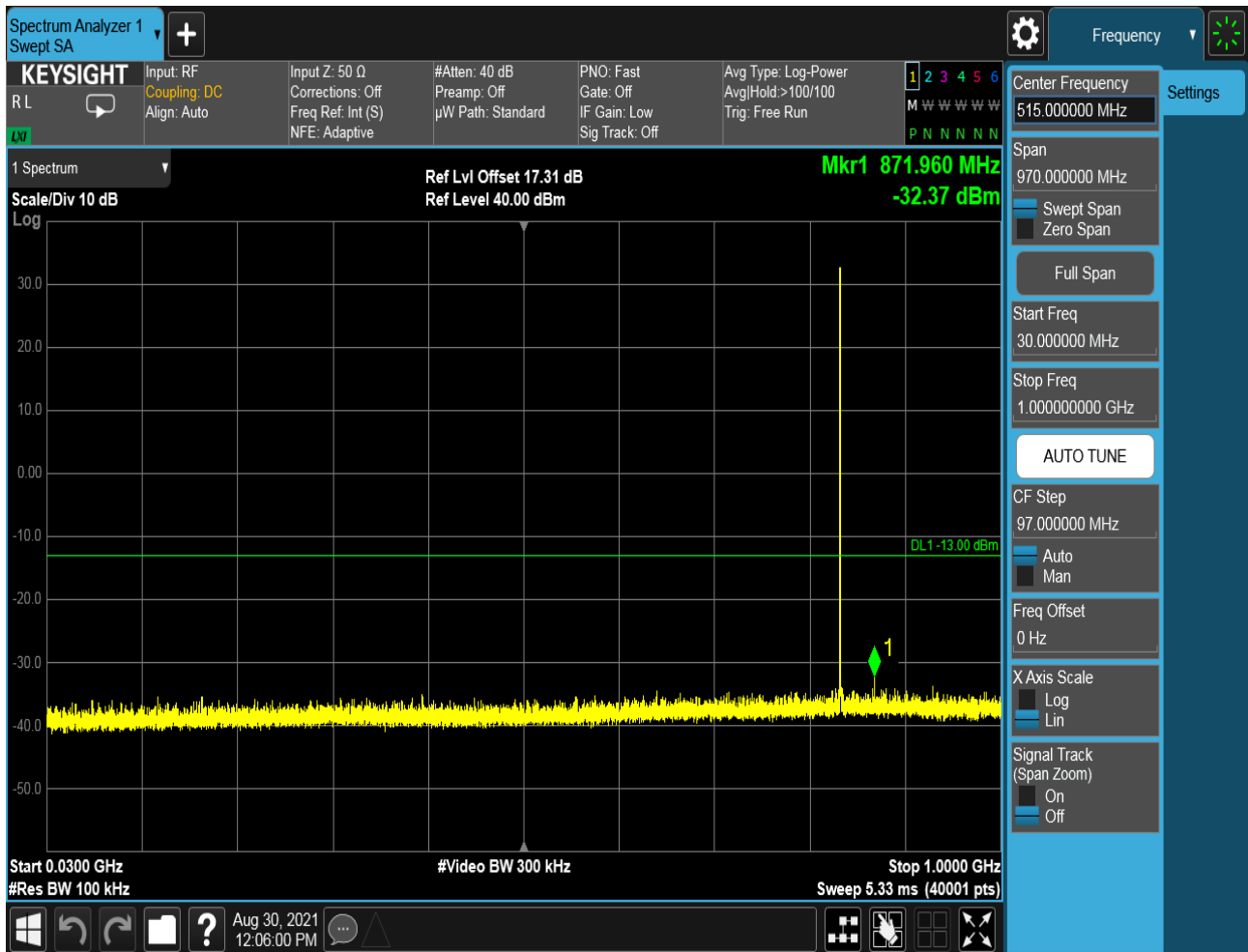


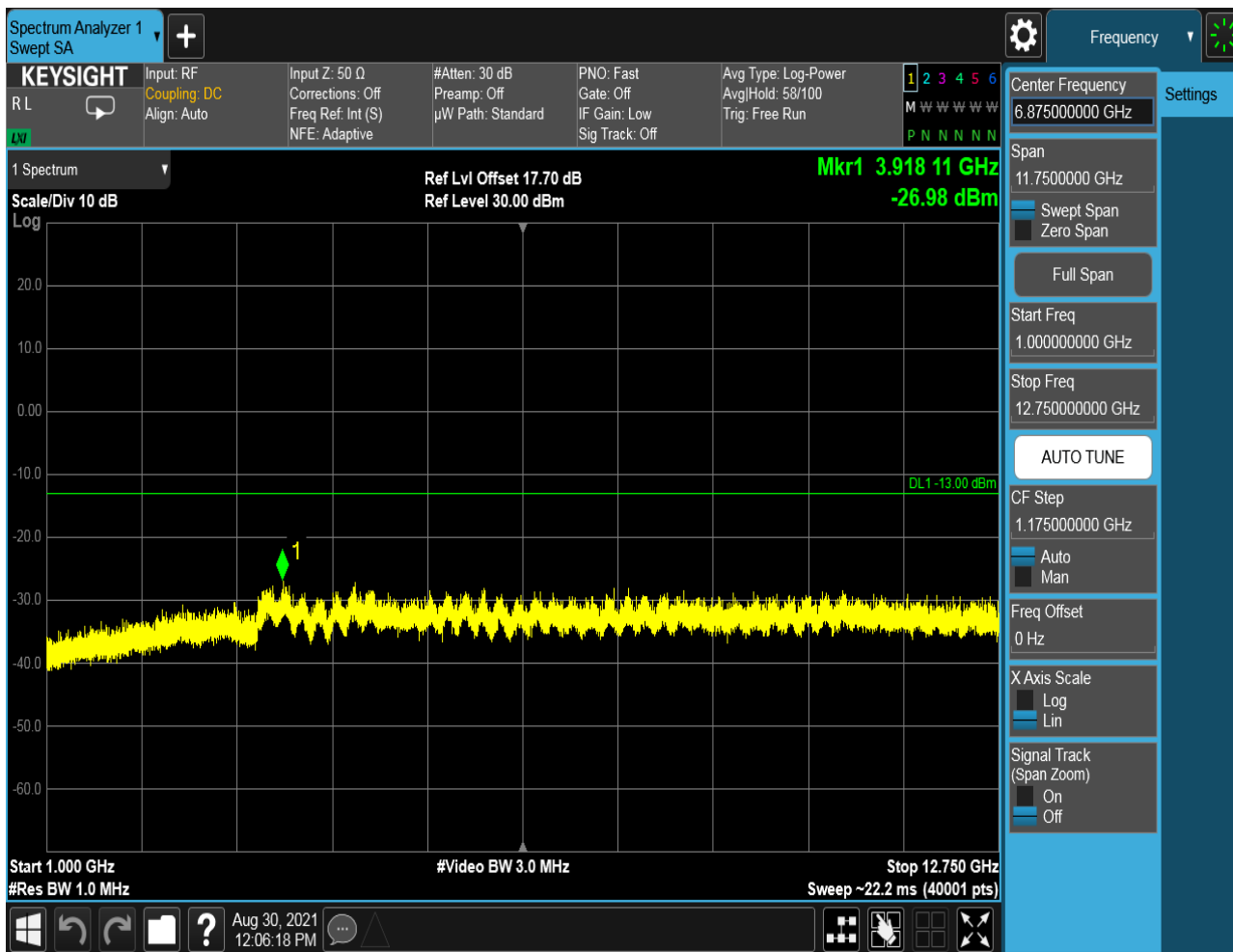


## 6.1.1.1.2 Test Channel = MCH



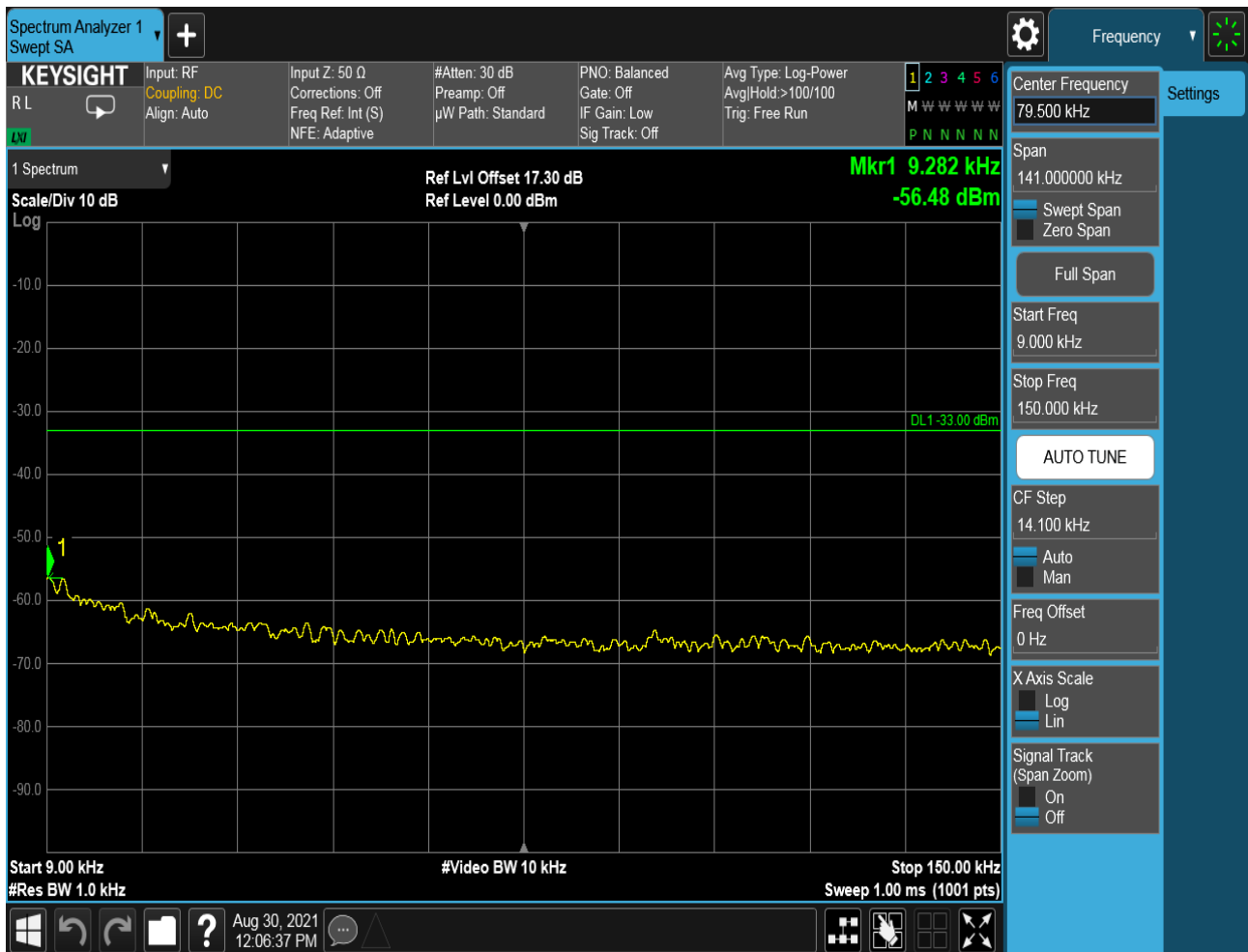


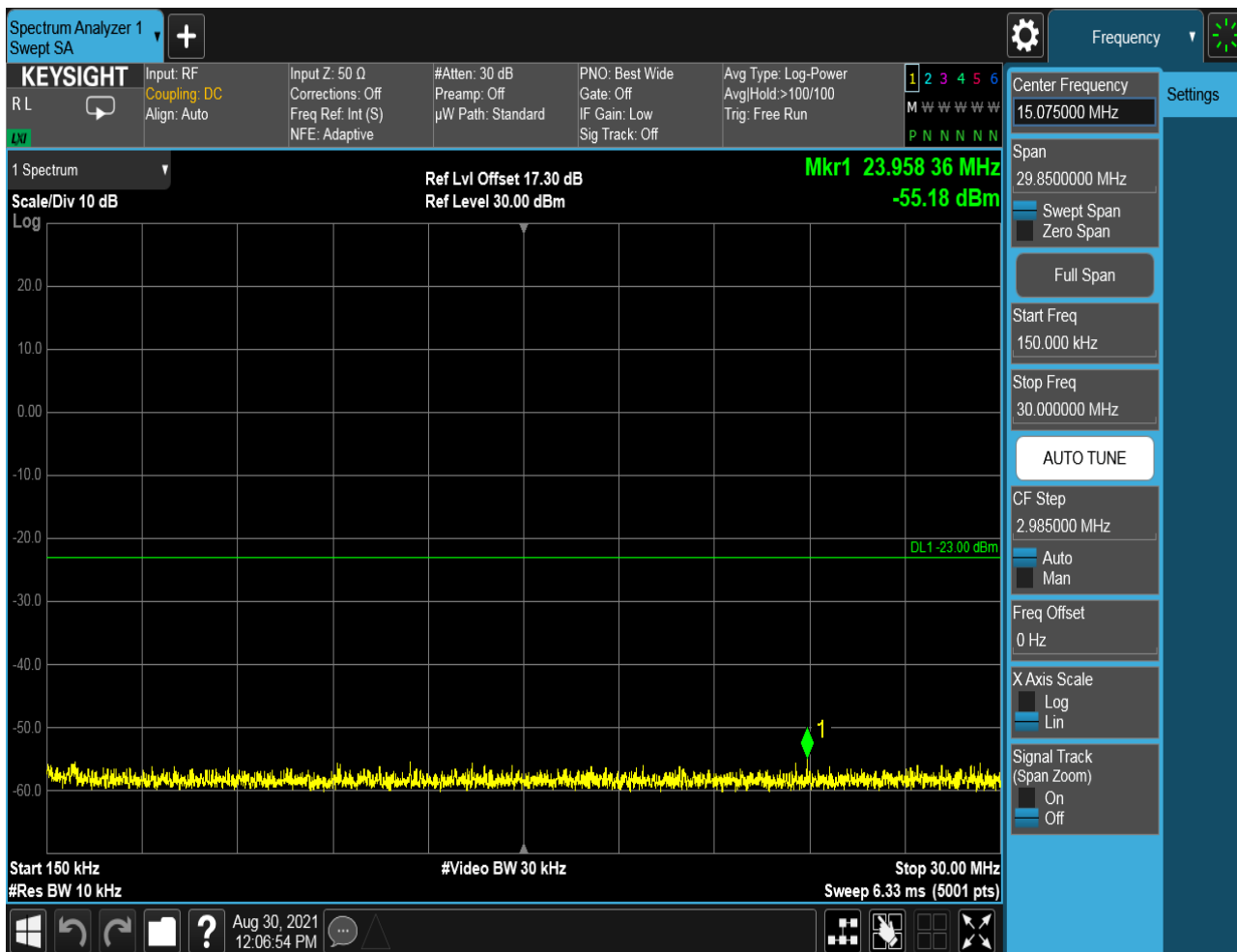


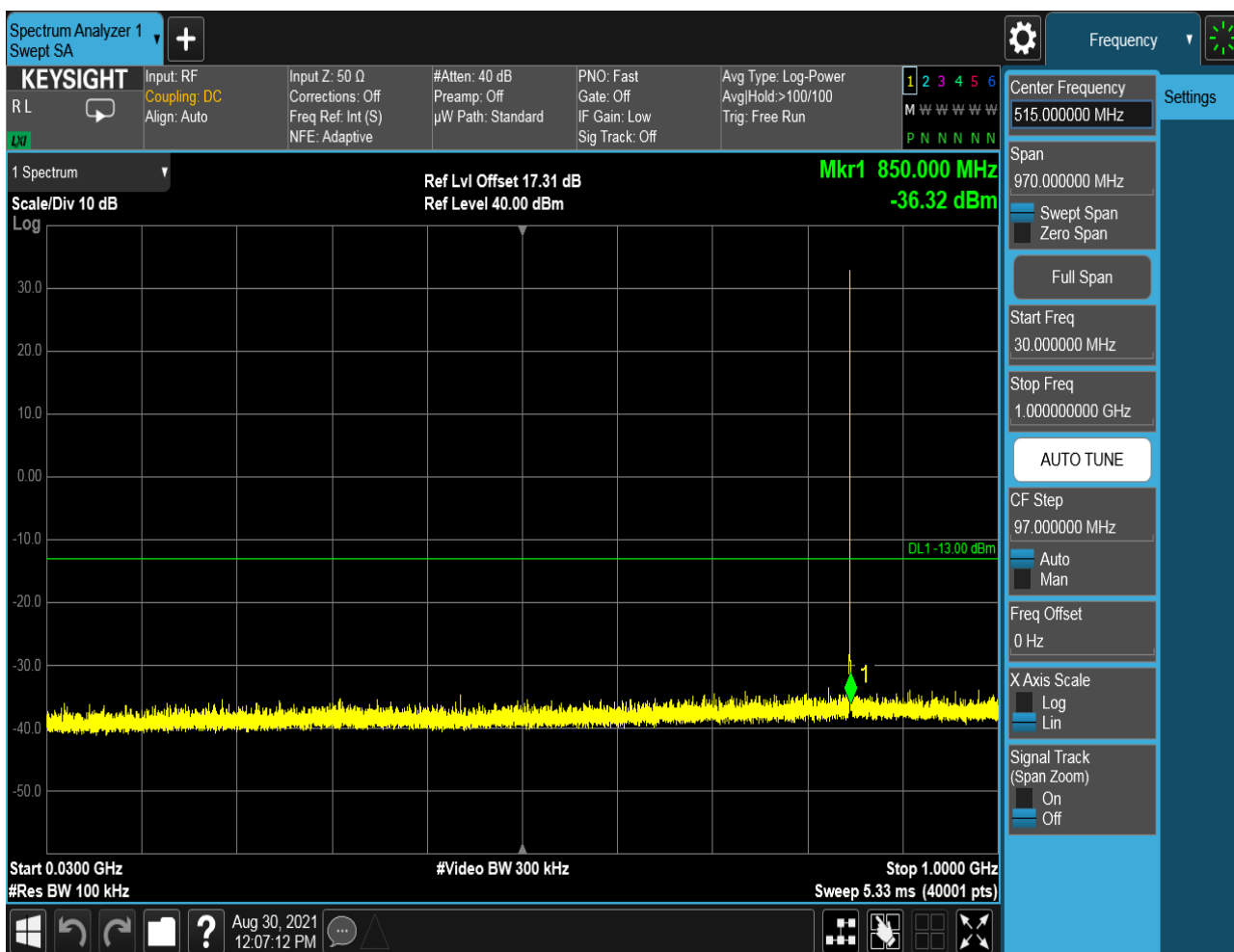




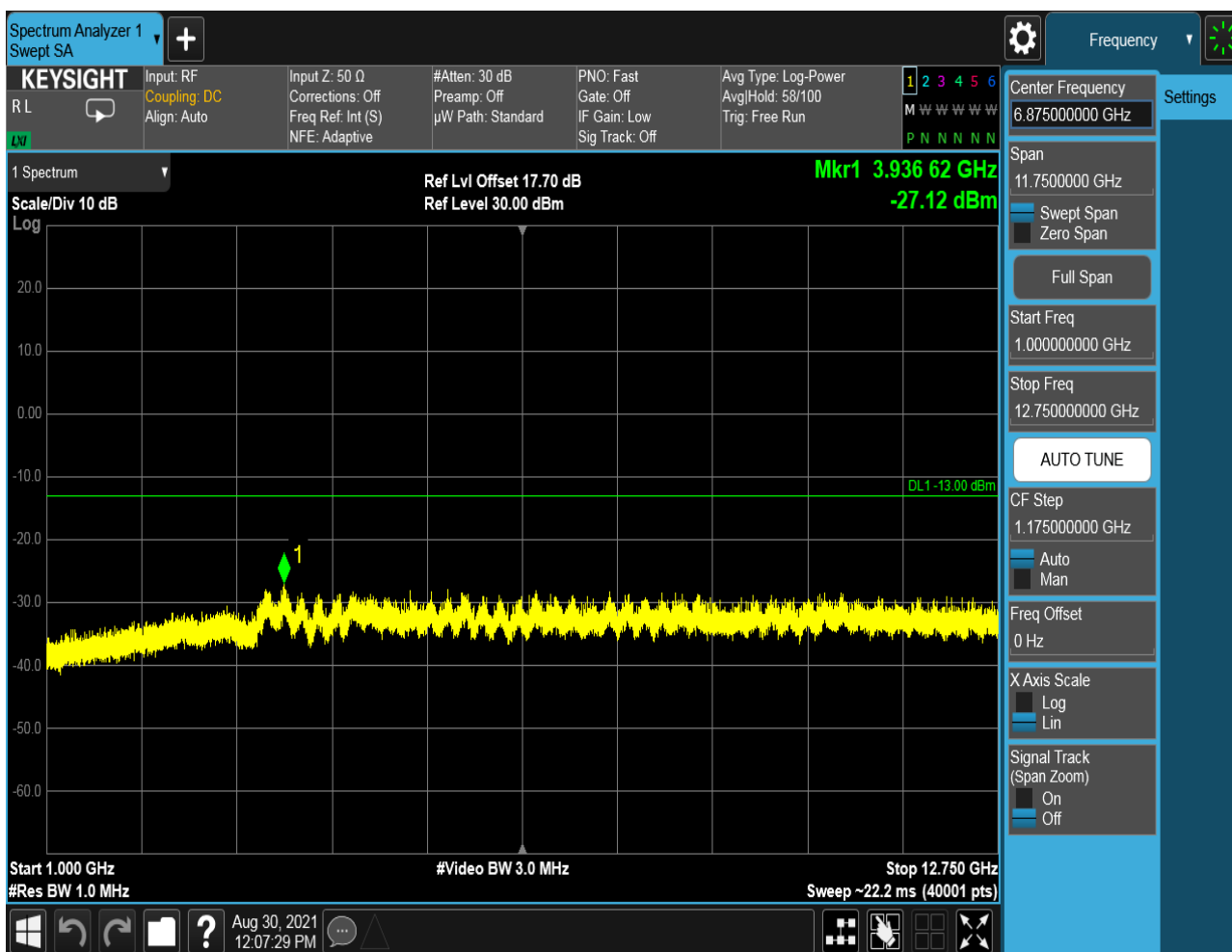
## 6.1.1.1.3 Test Channel = HCH







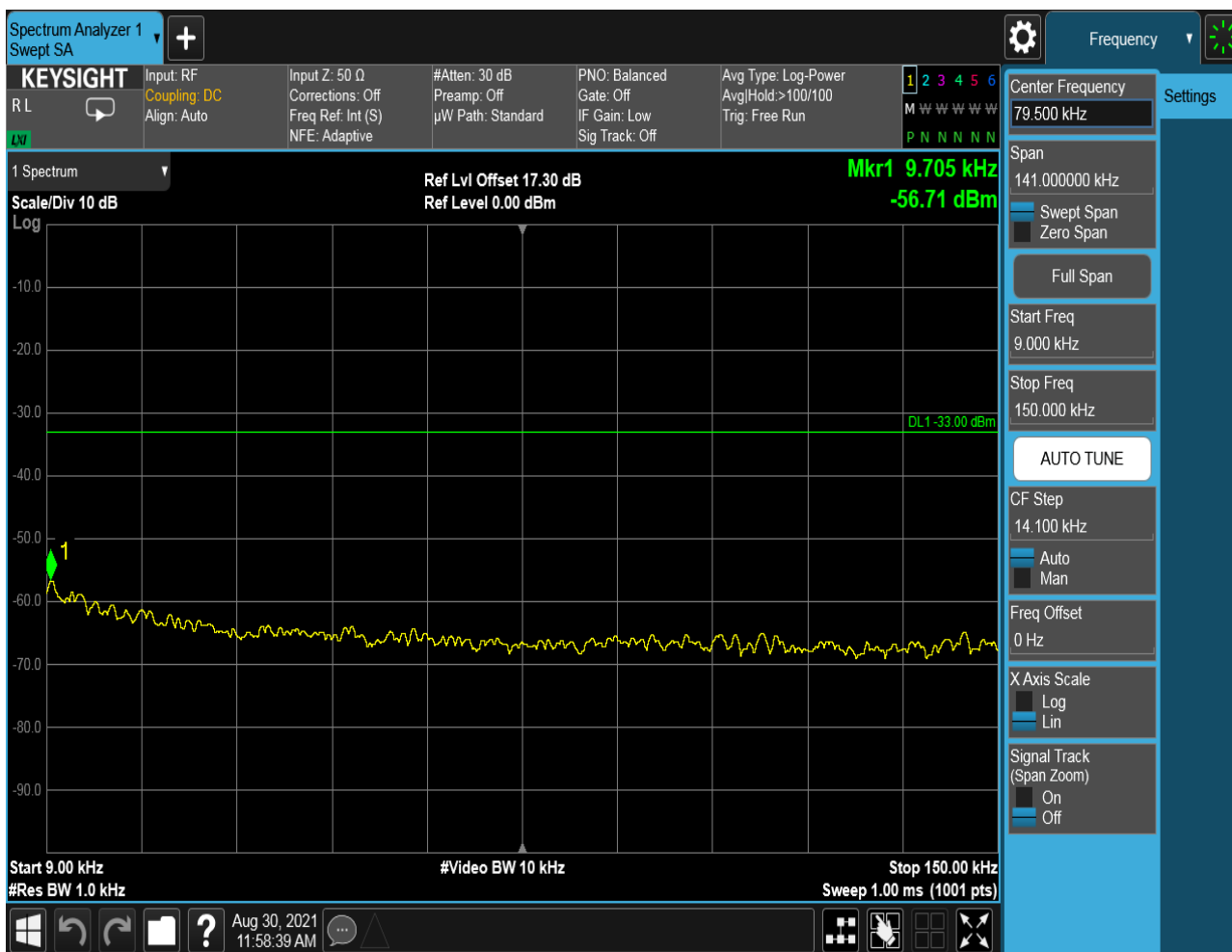


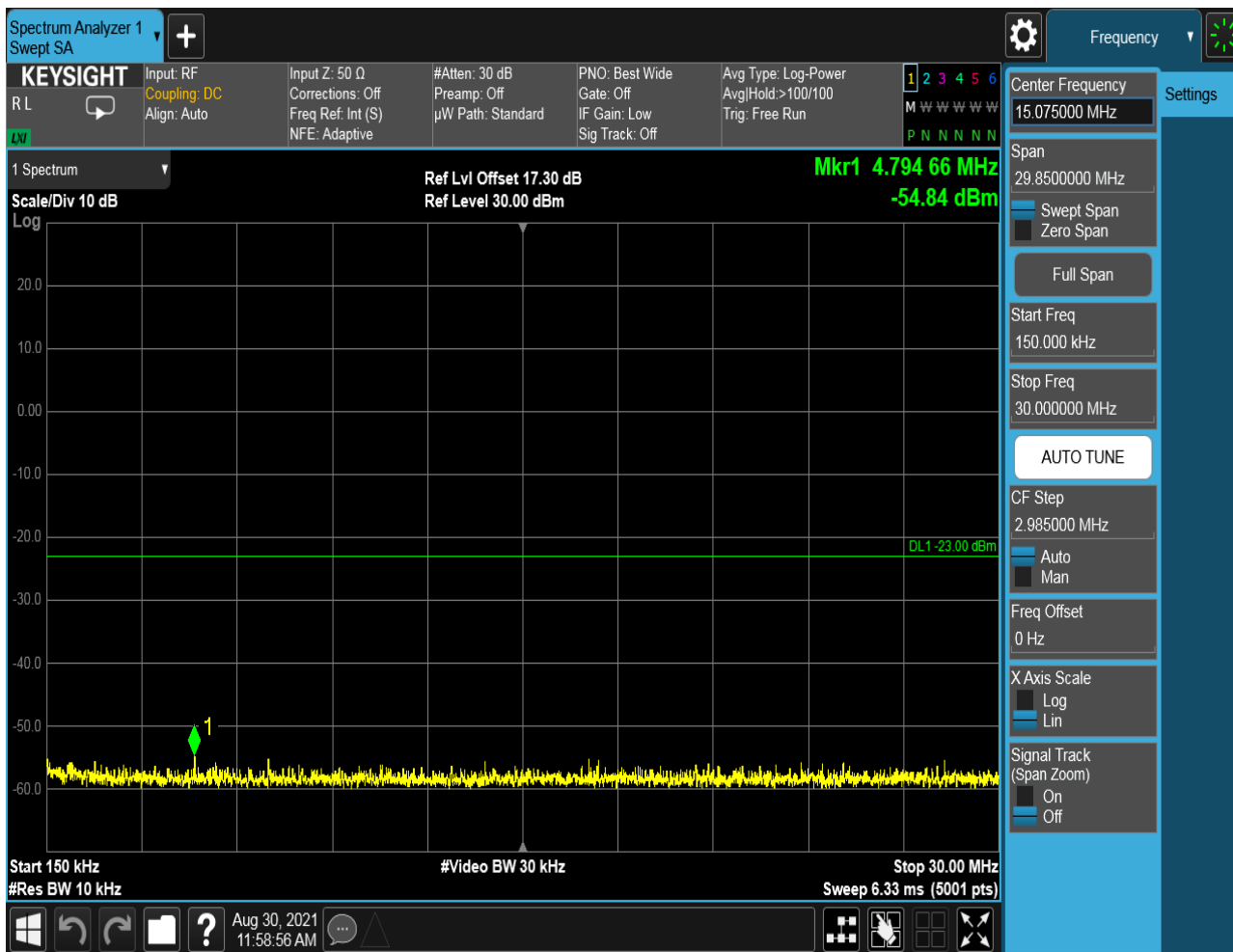


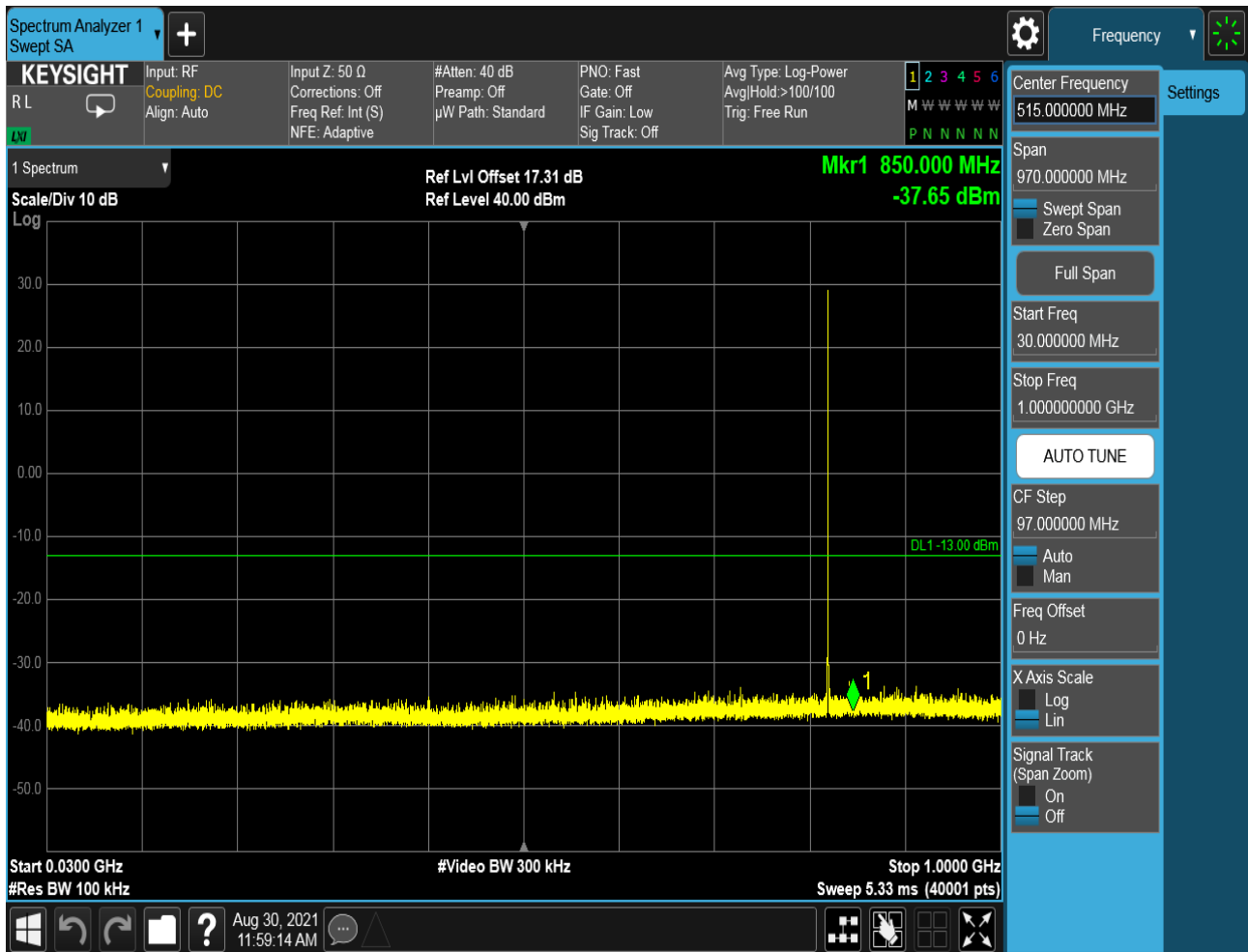


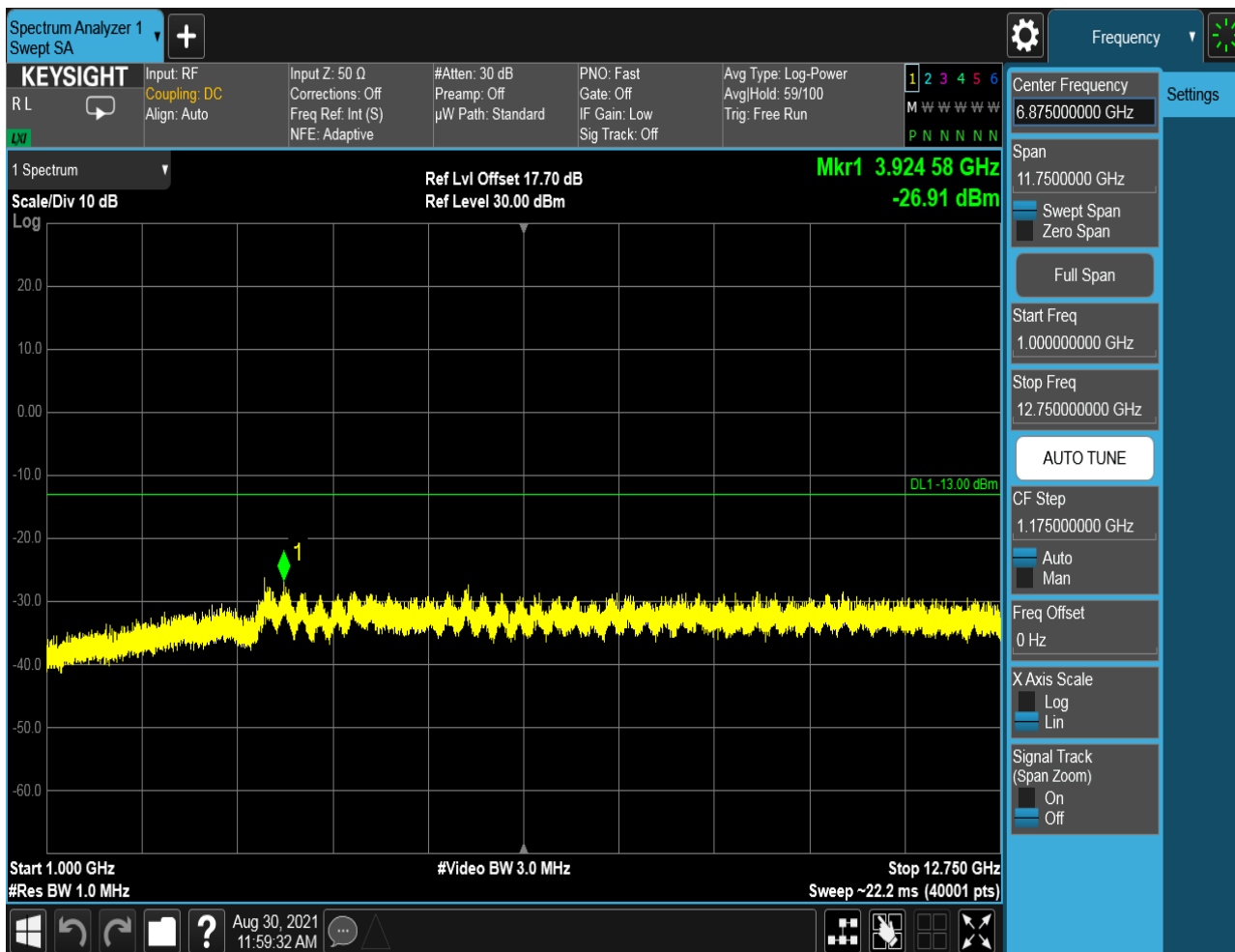
## 6.1.1.2 Test Mode = GSM/TM2

## 6.1.1.2.1 Test Channel = LCH



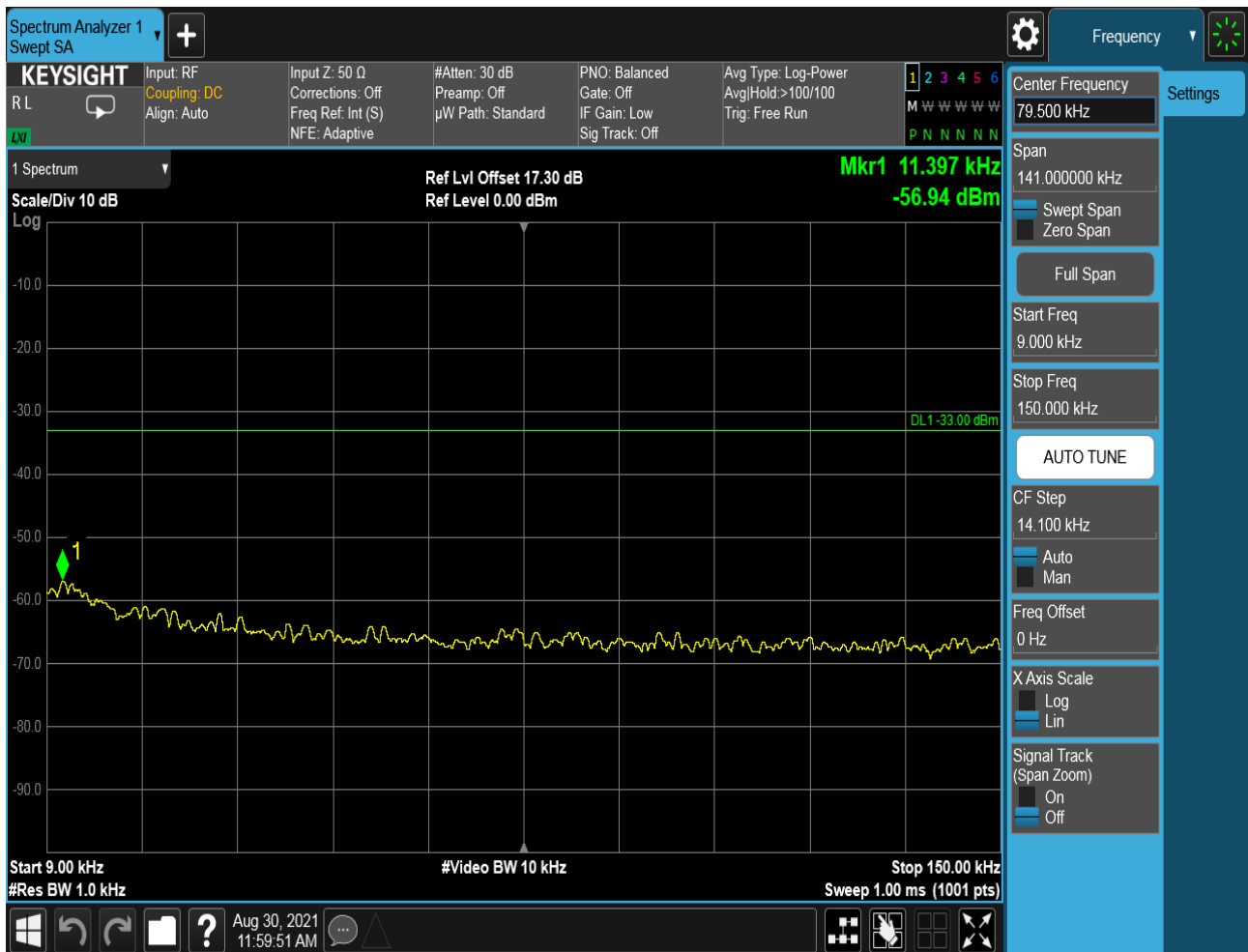


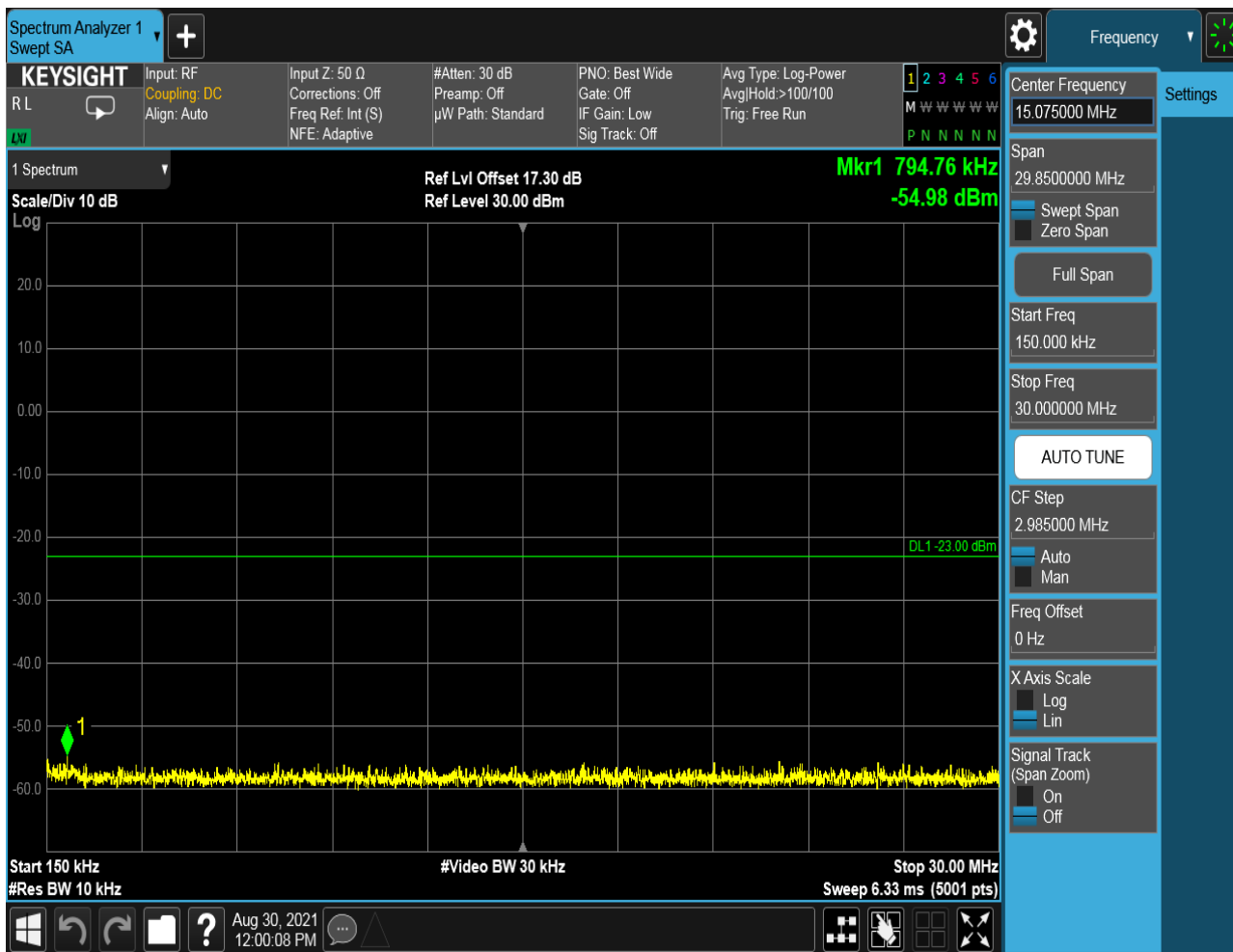


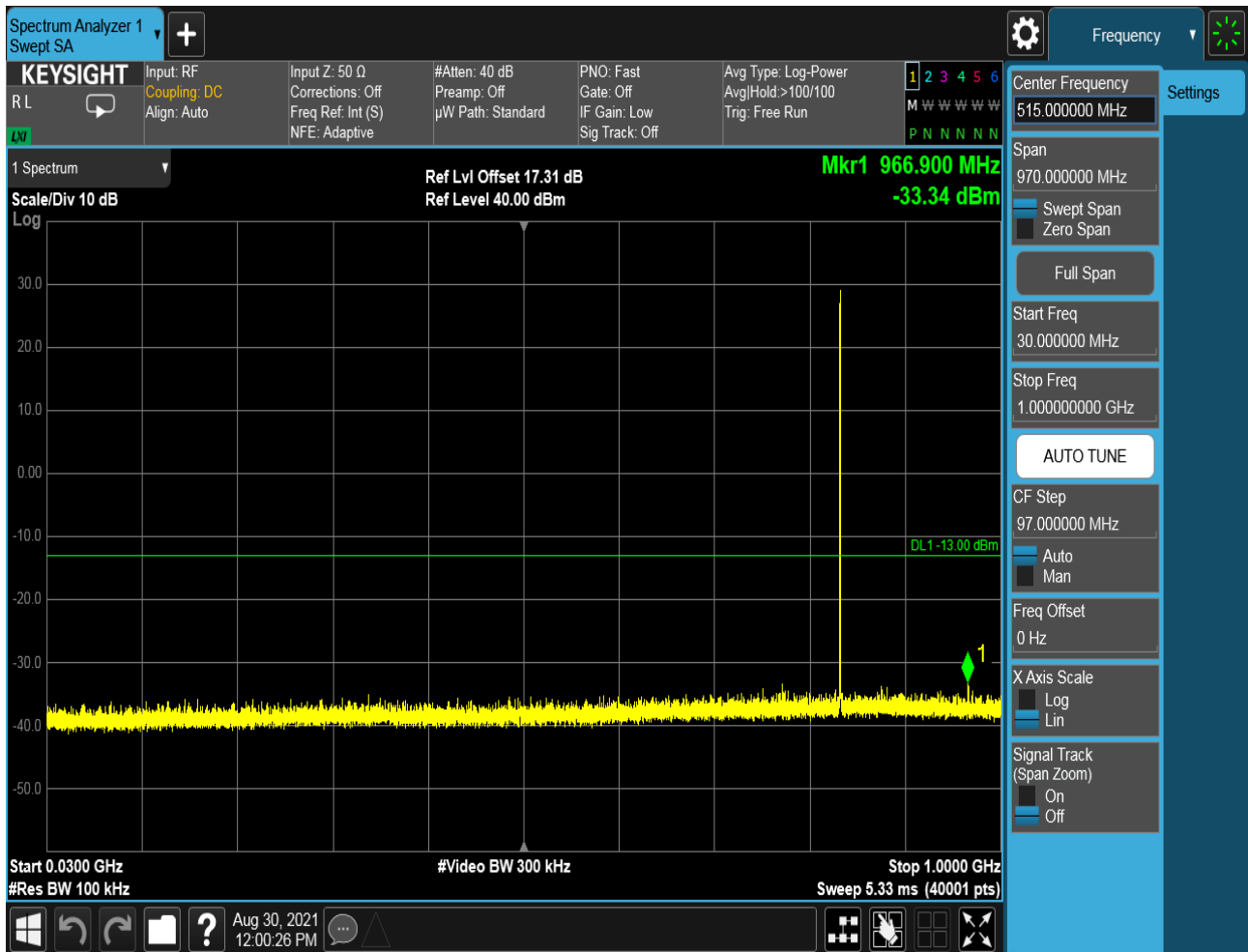




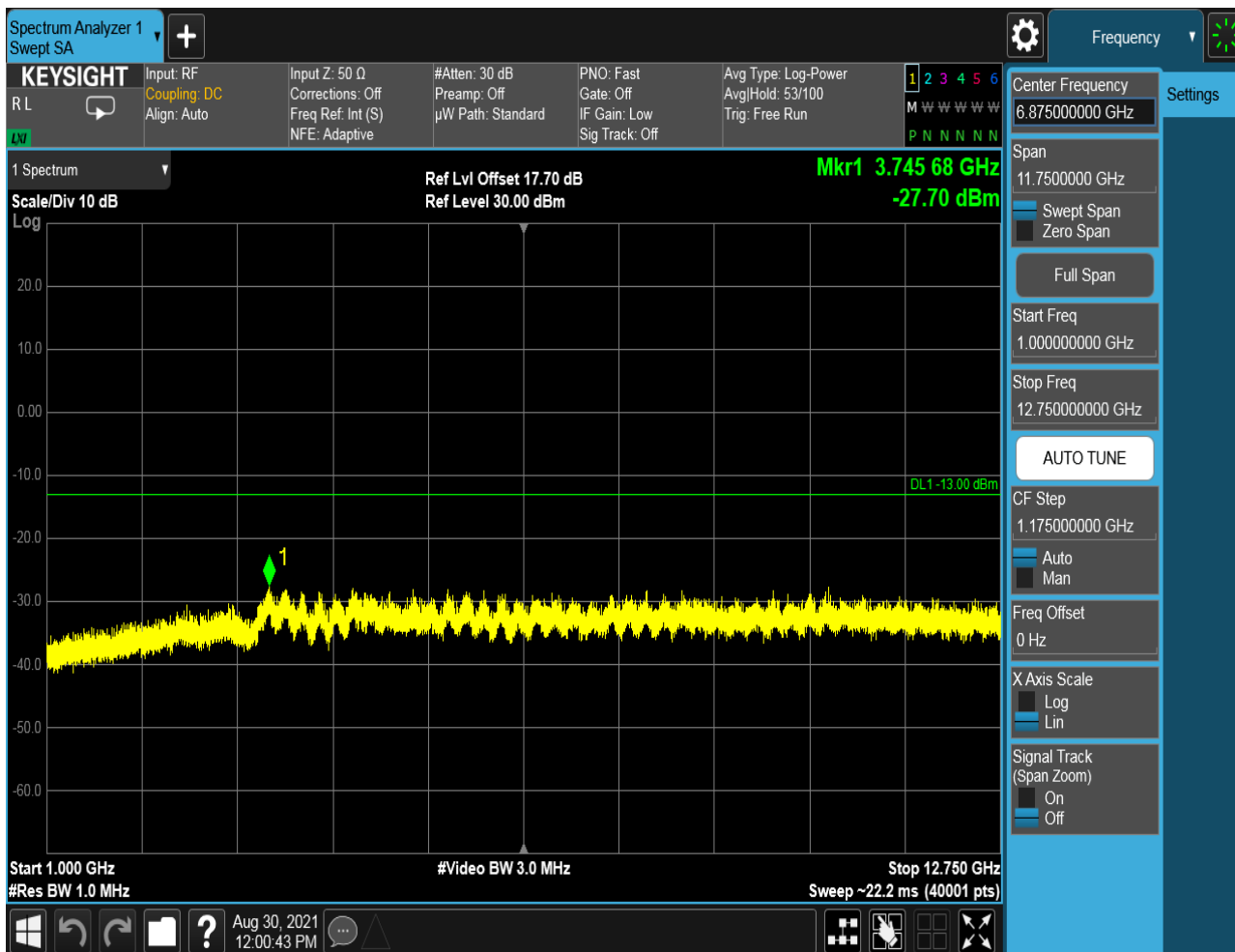
## 6.1.1.2.2 Test Channel = MCH





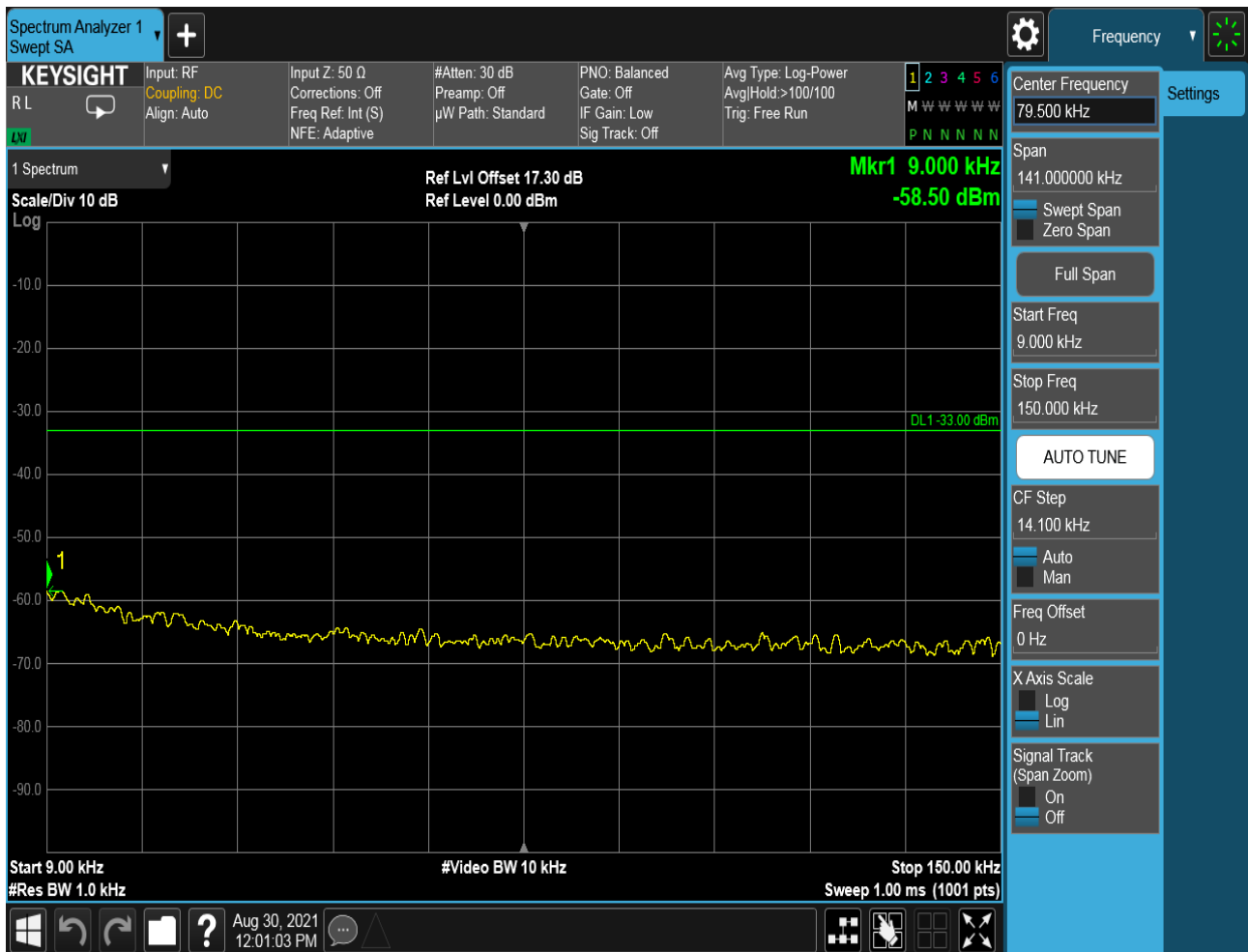


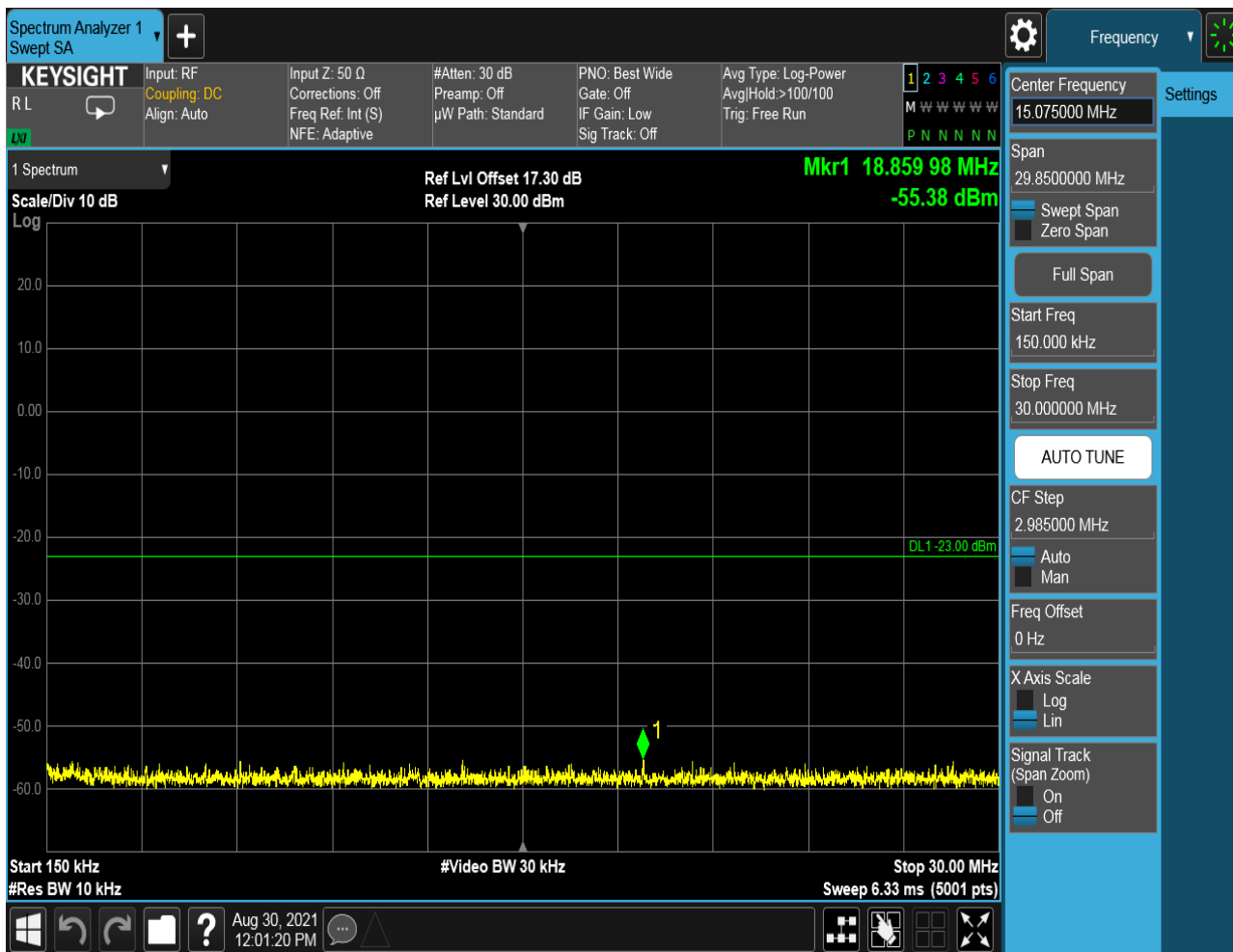


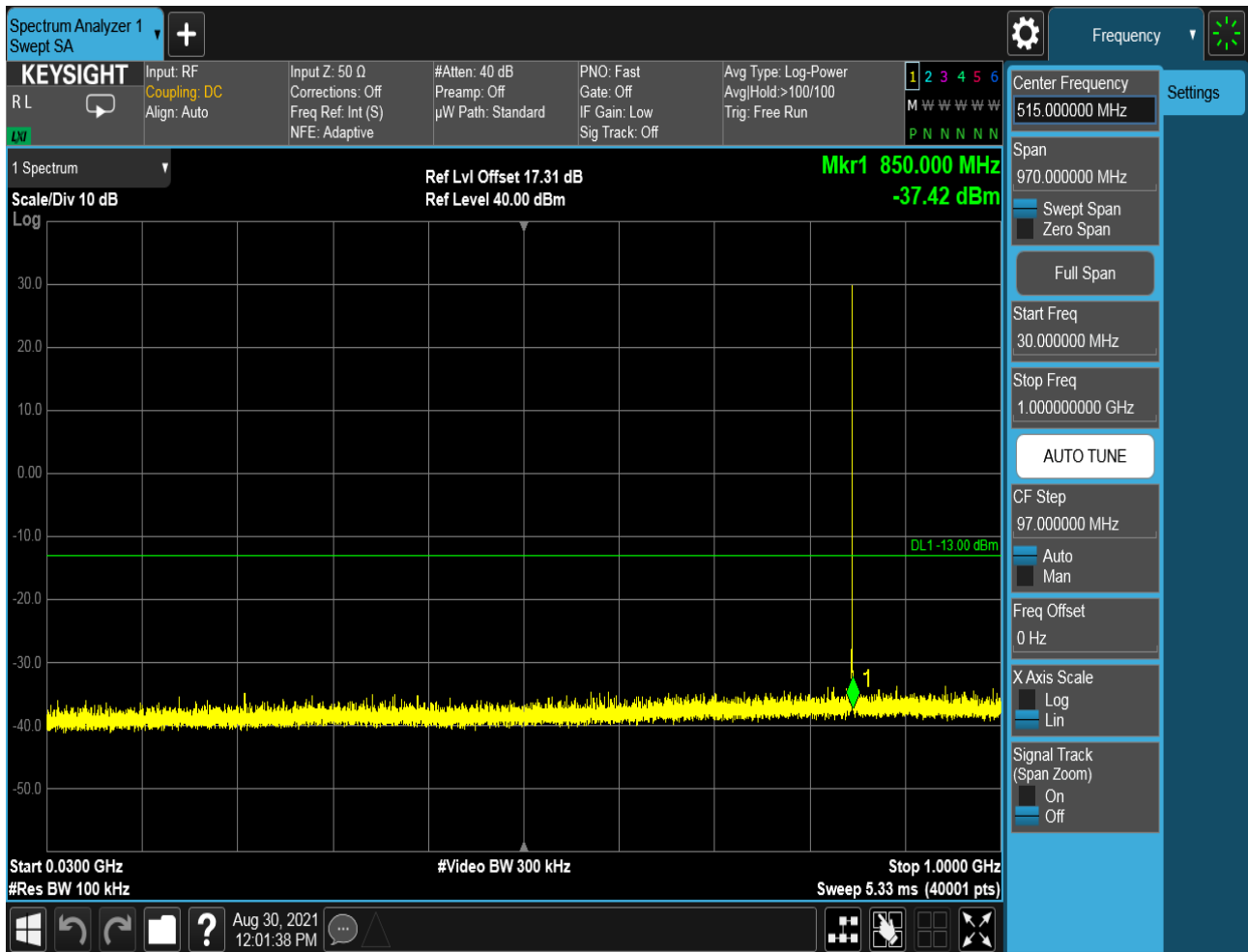


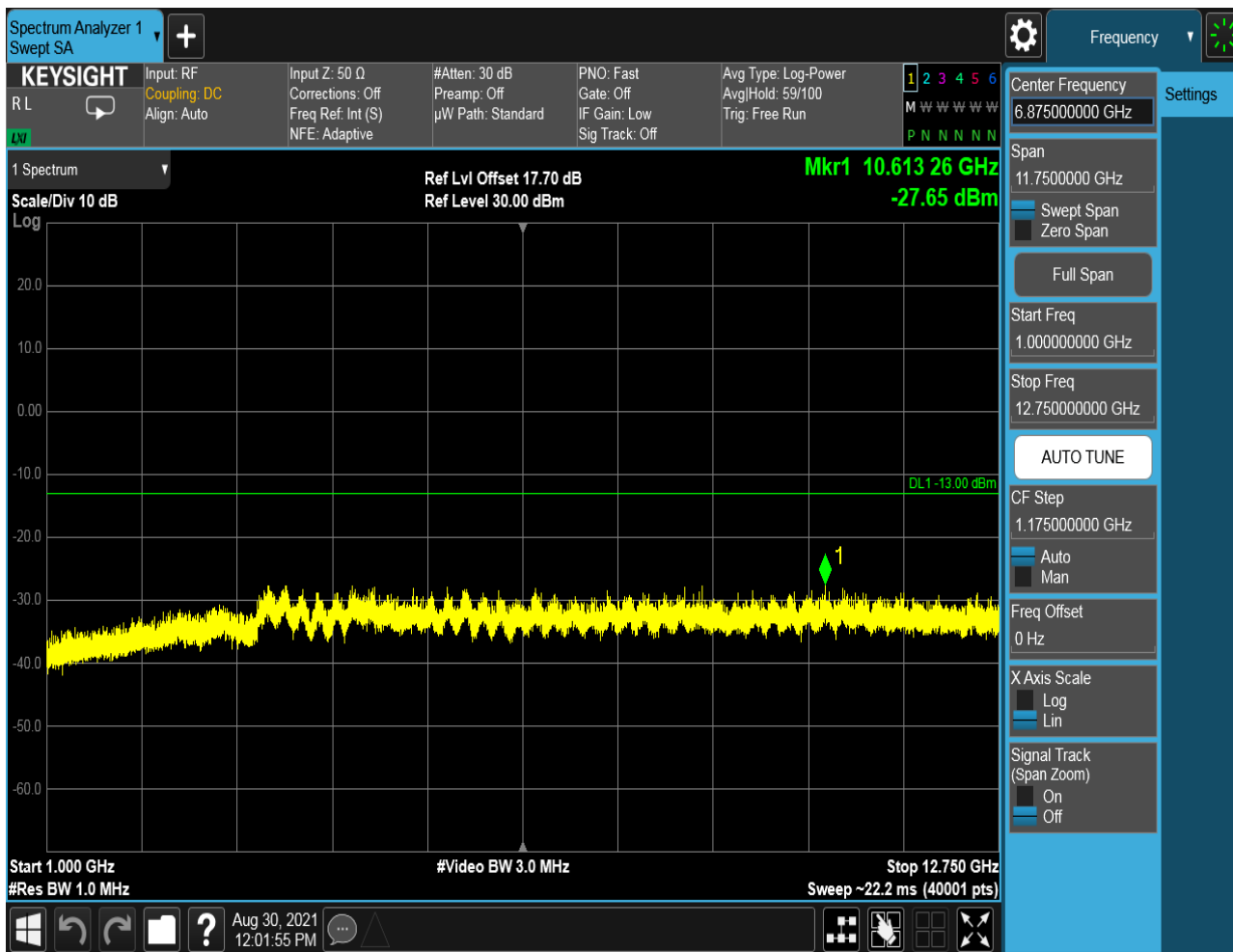


## 6.1.1.2.3 Test Channel = HCH







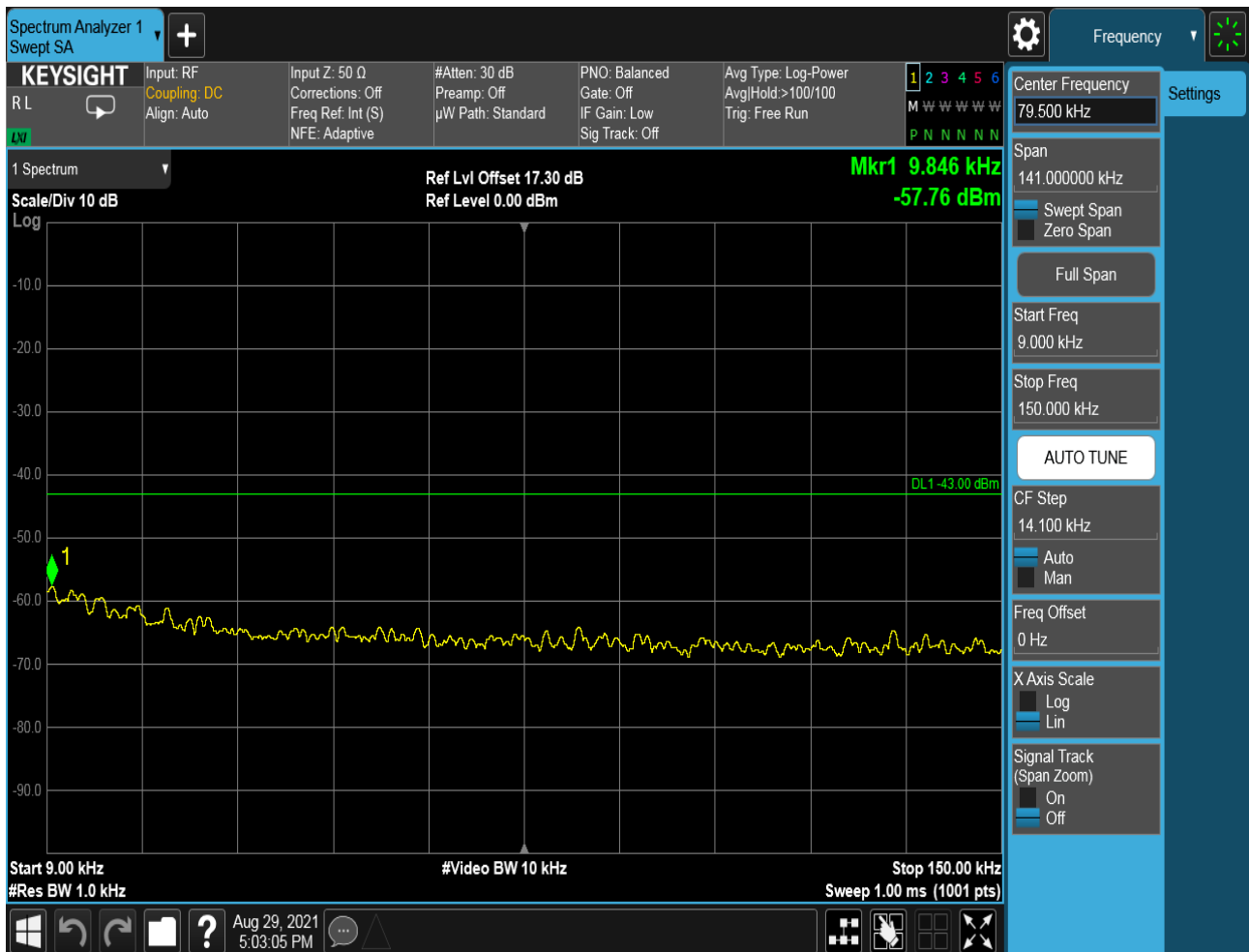


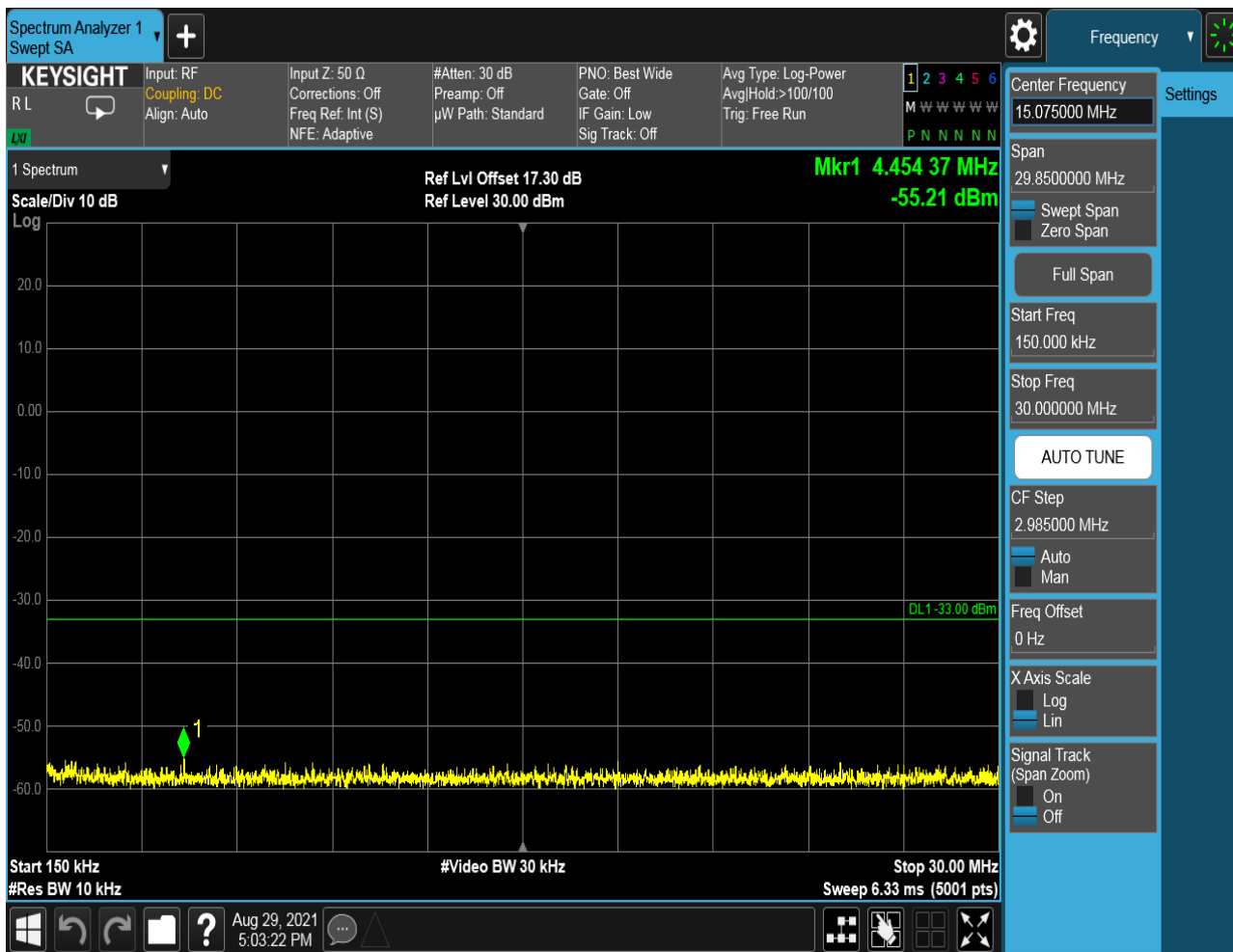


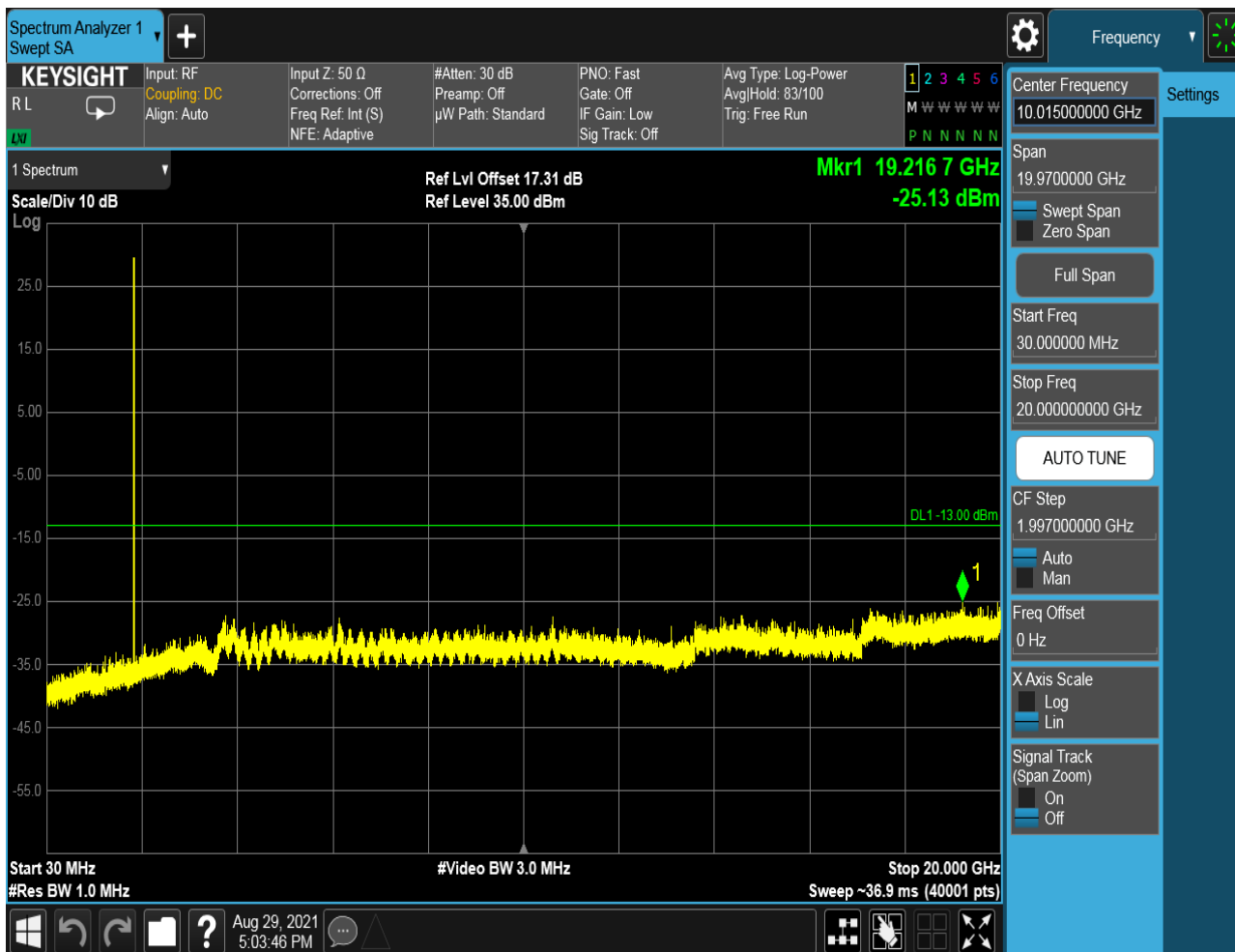
## 6.1.2 Test Band = PCS1900

### 6.1.2.1 Test Mode = GSM/TM1

#### 6.1.2.1.1 Test Channel = LCH



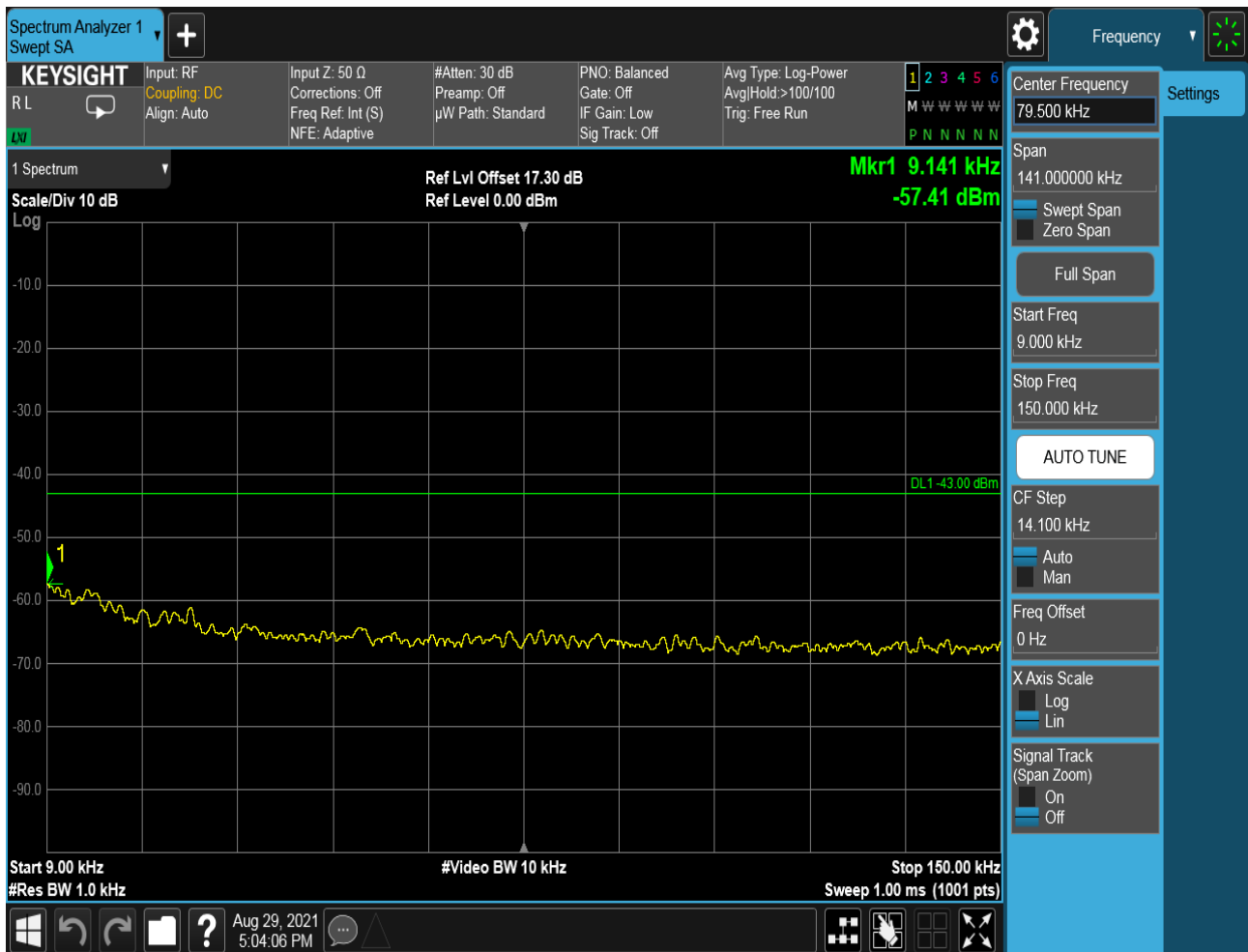


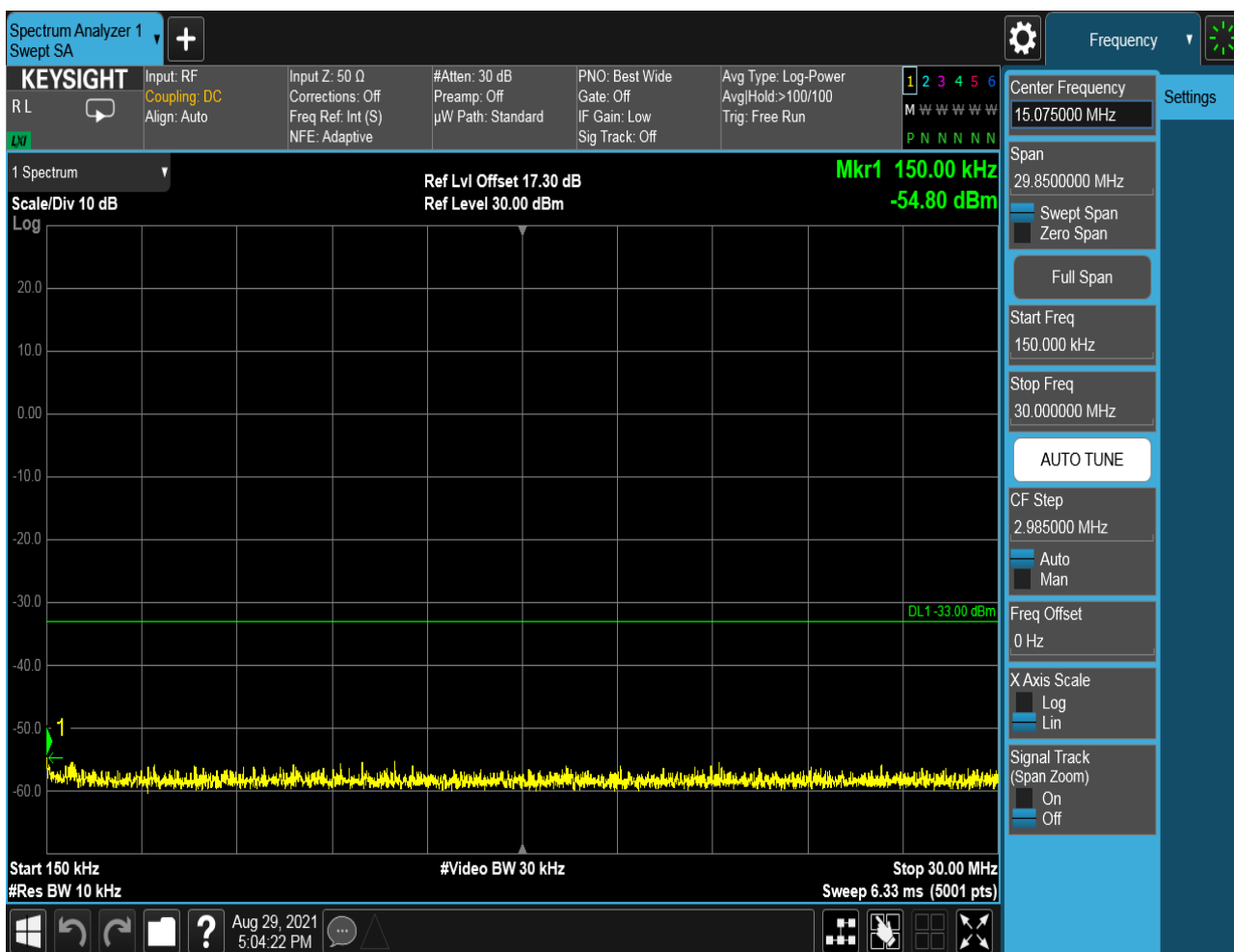


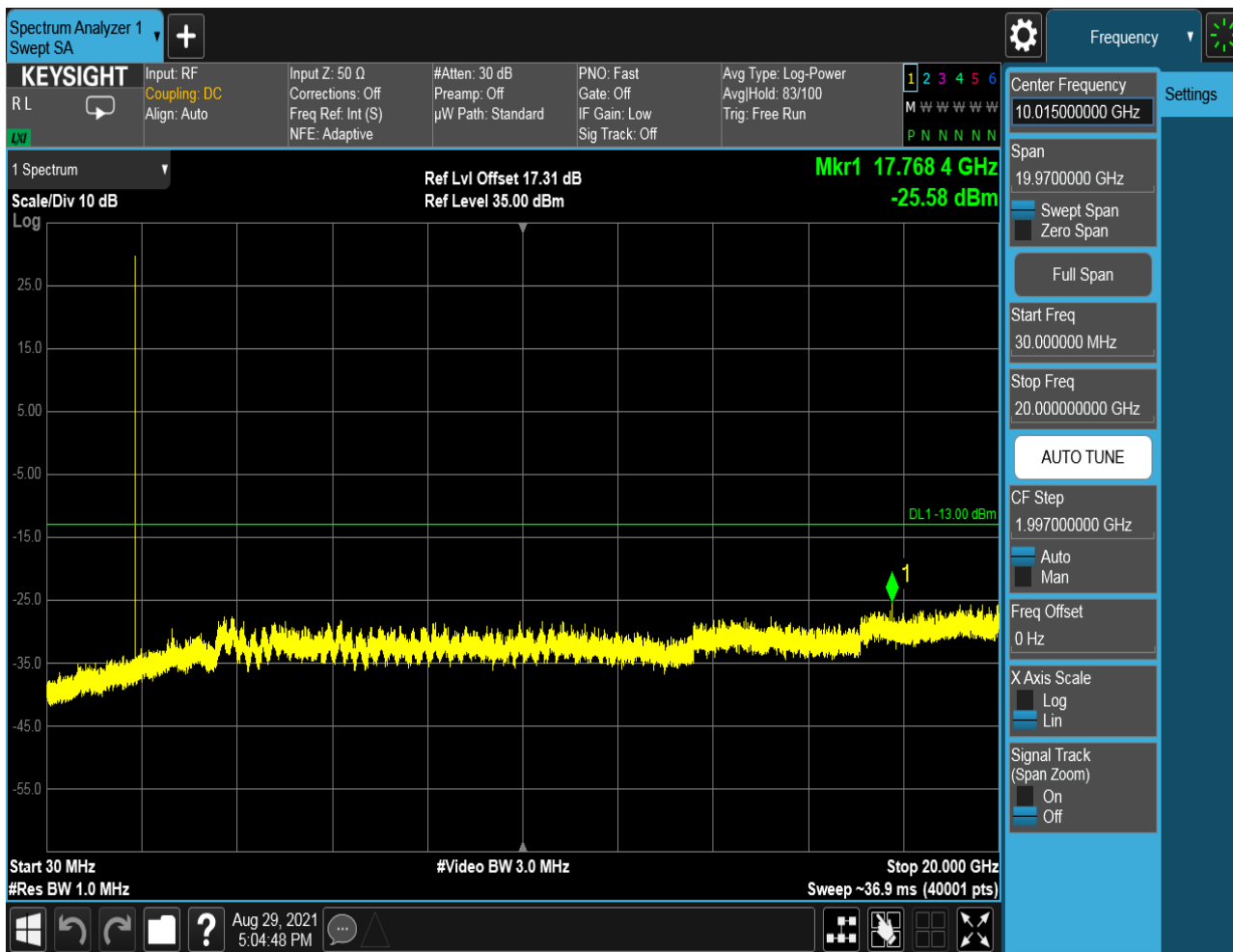




## 6.1.2.1.2 Test Channel = MCH

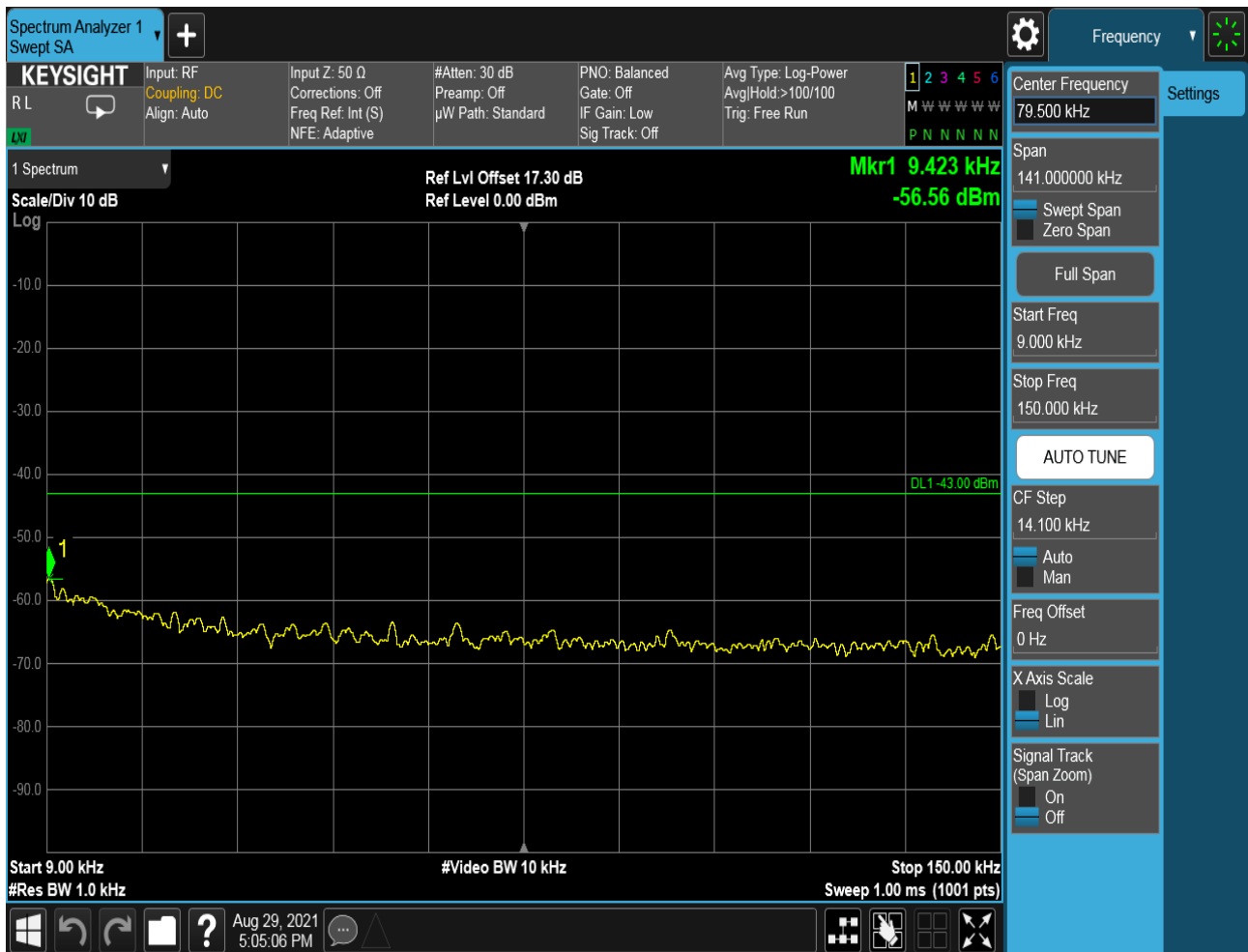


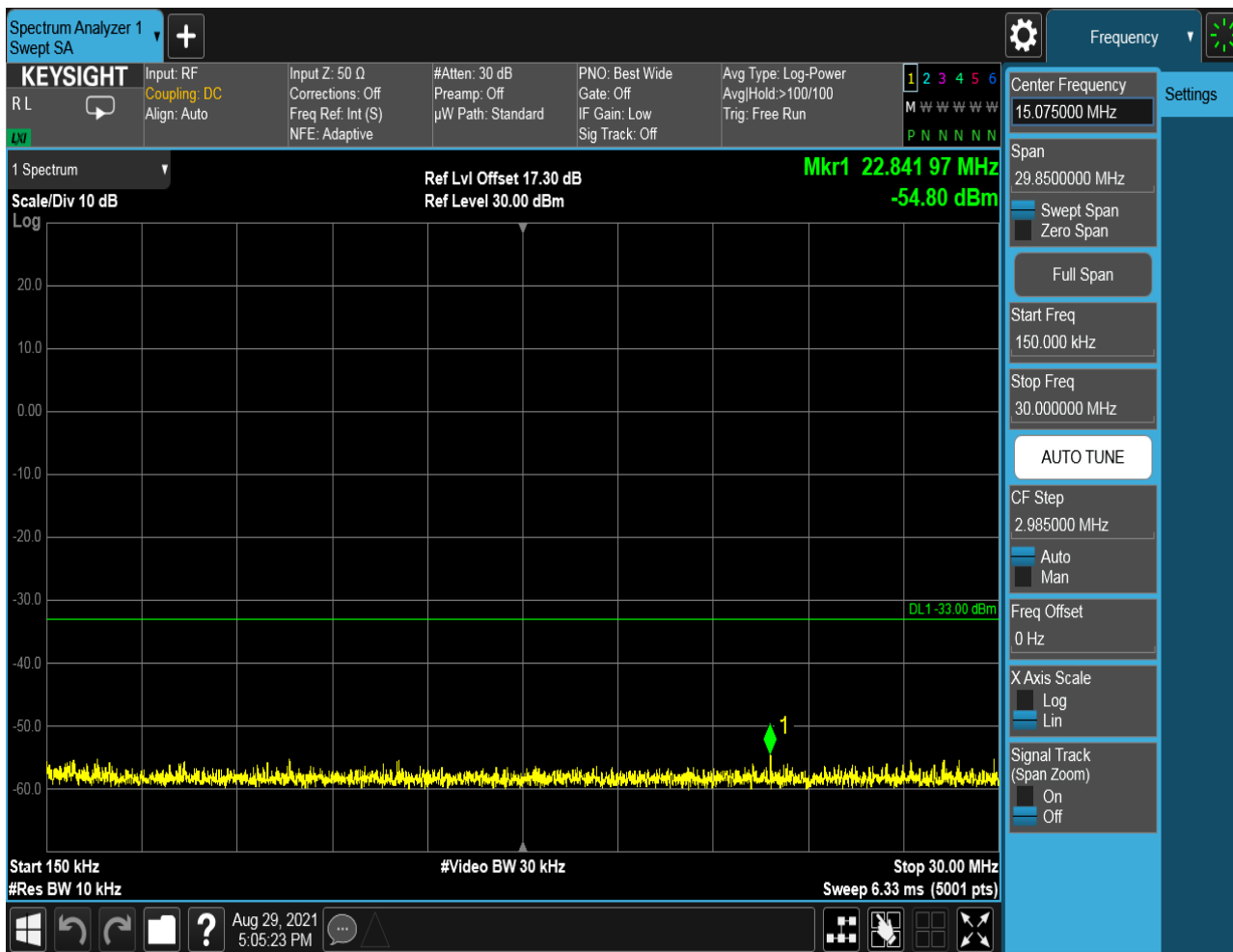


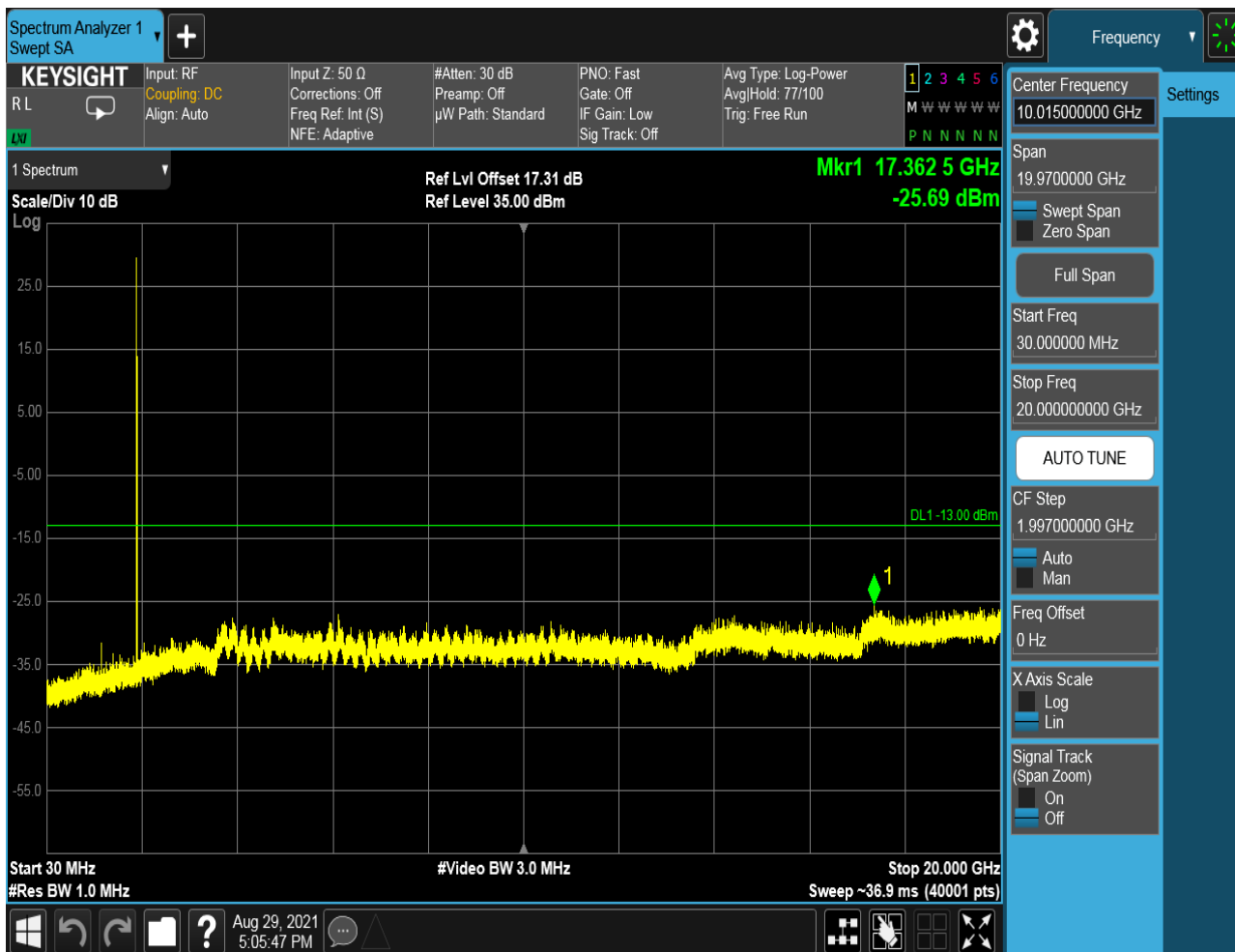




## 6.1.2.1.3 Test Channel = HCH



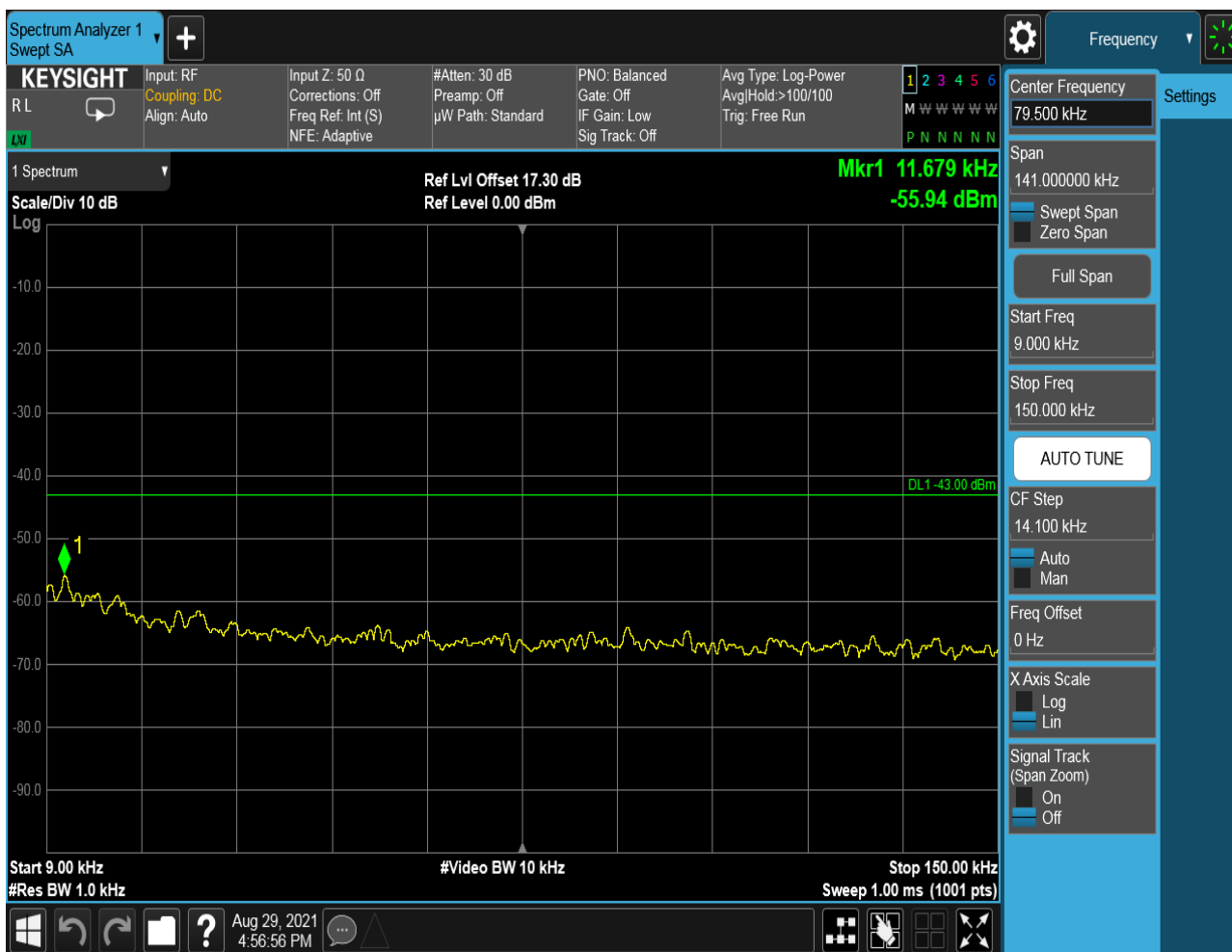


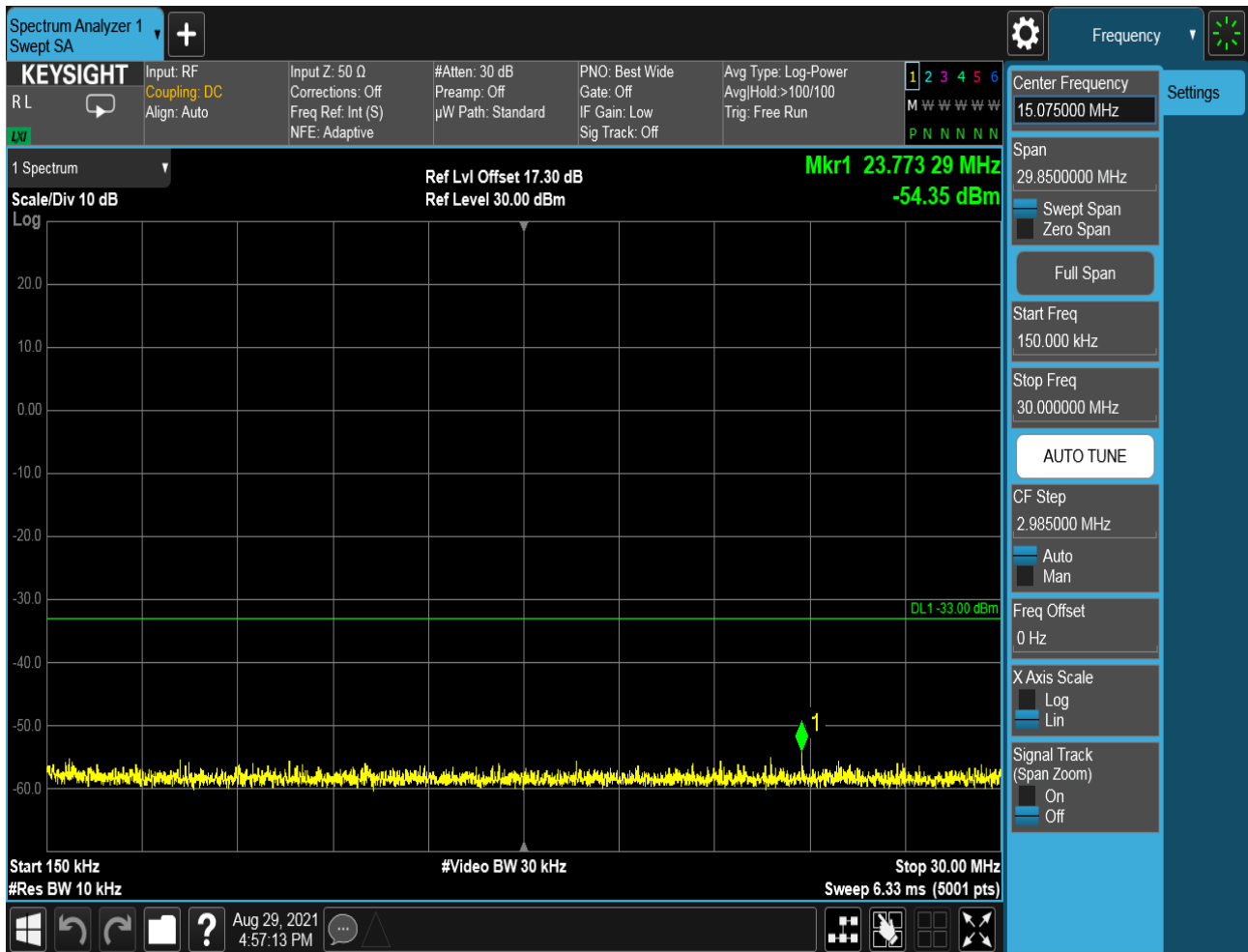




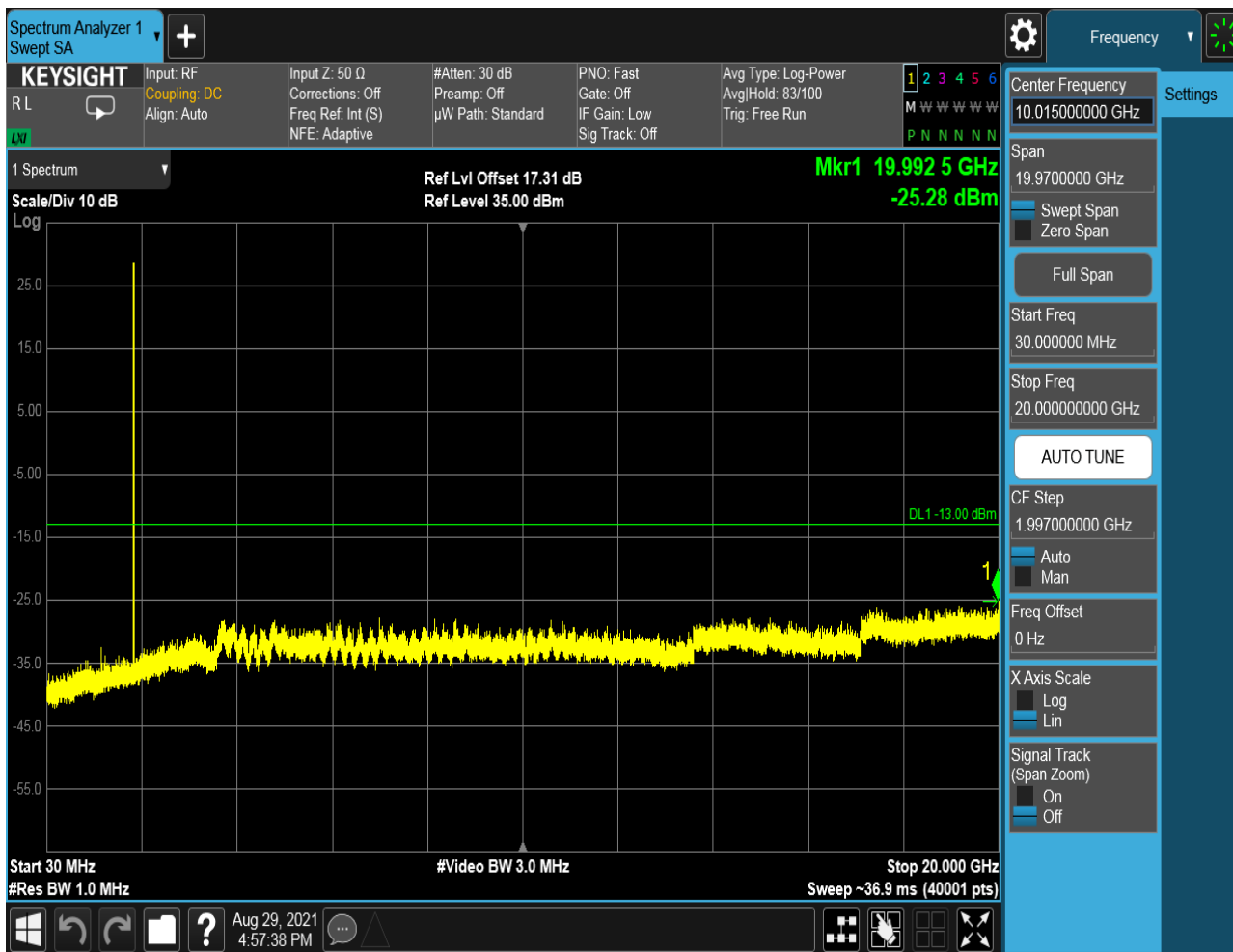
## 6.1.2.2 Test Mode = GSM/TM2

## 6.1.2.2.1 Test Channel = LCH



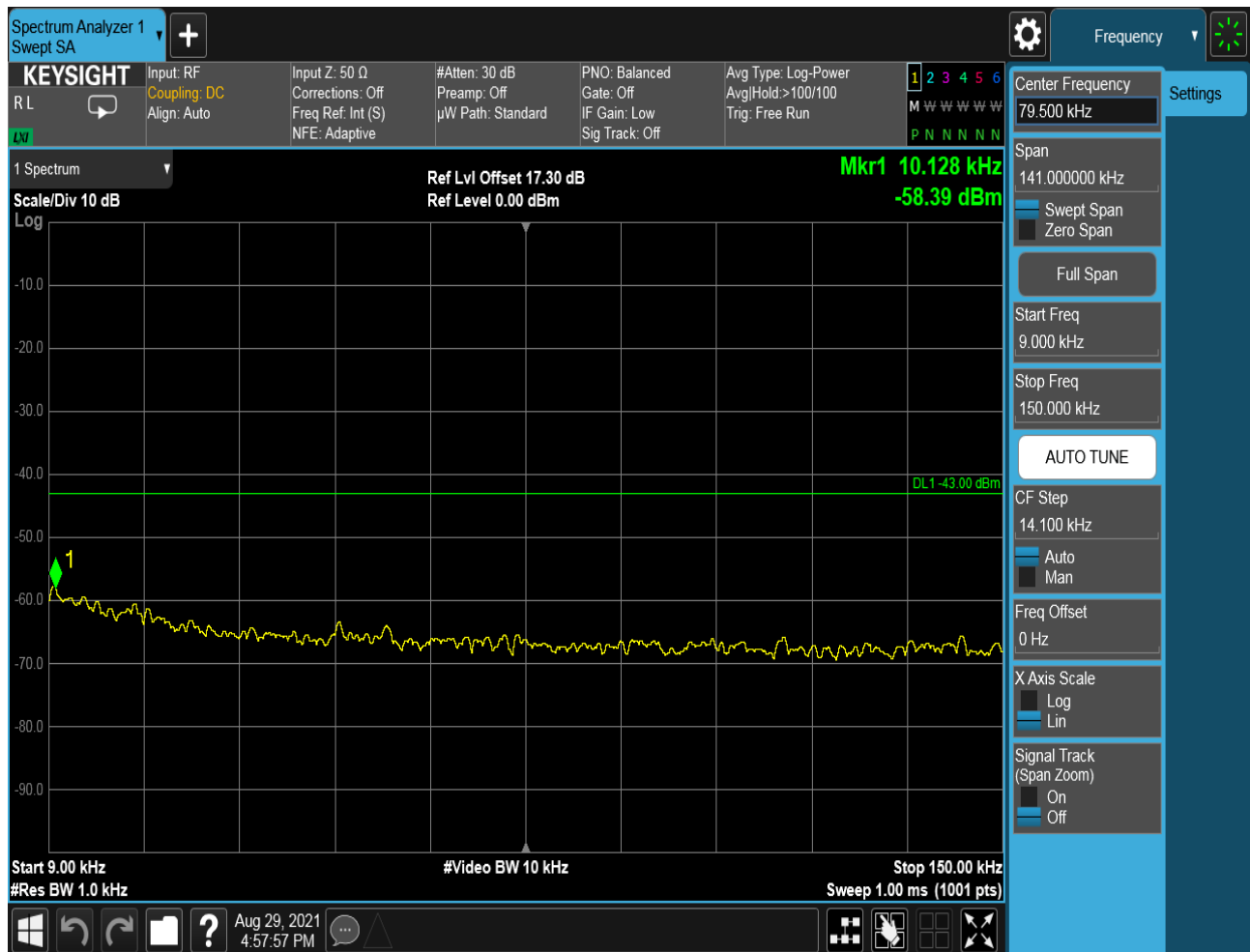


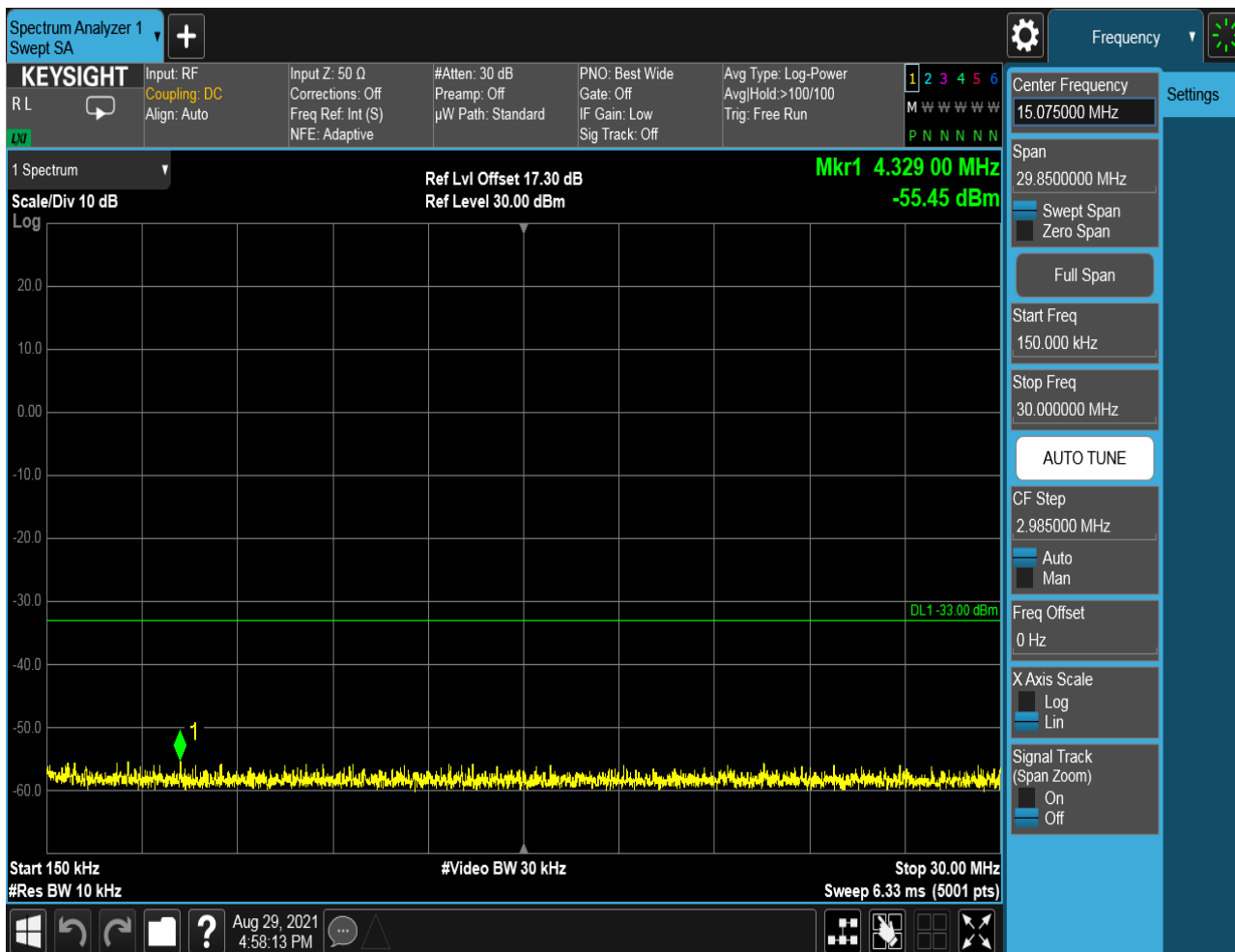


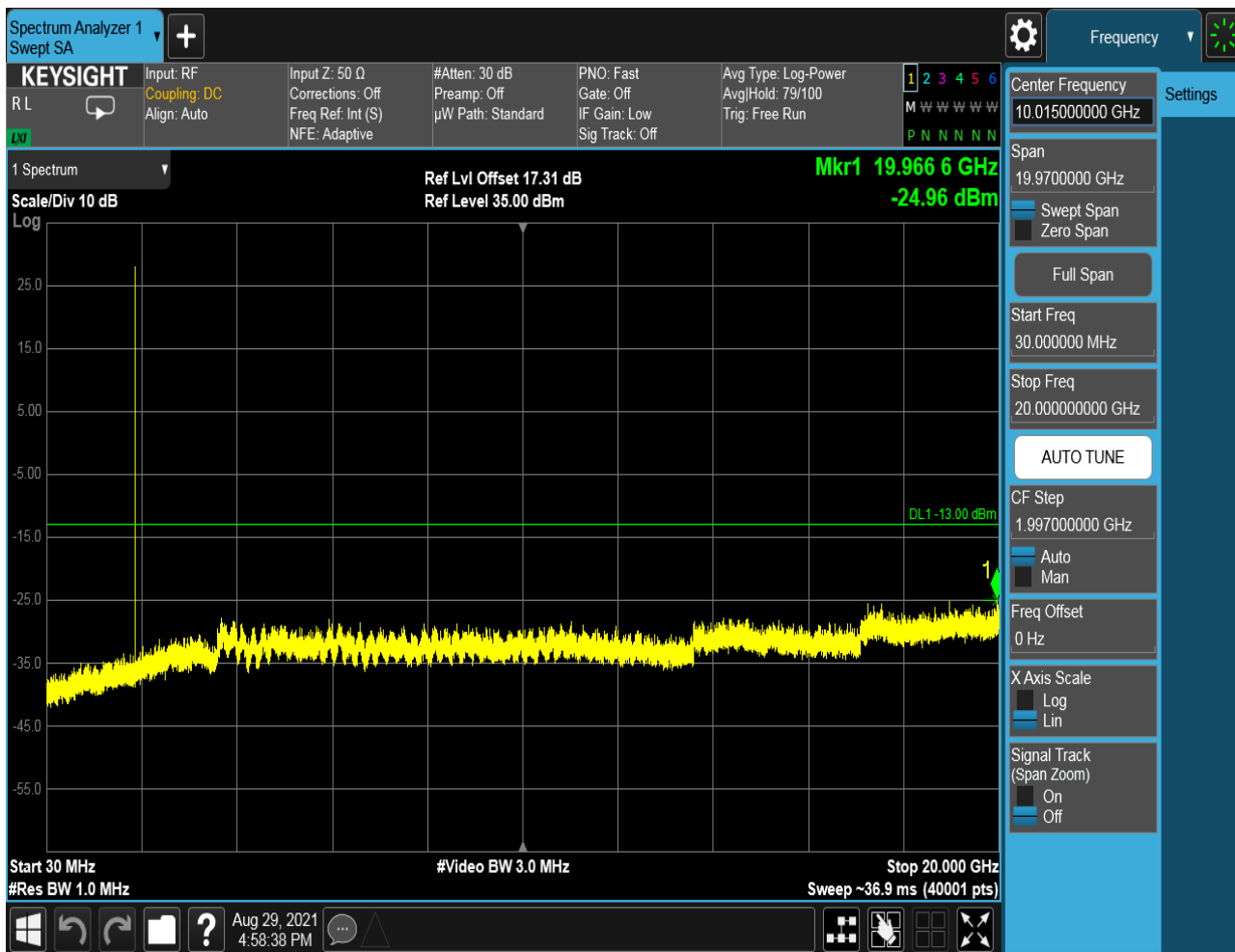




## 6.1.2.2.2 Test Channel = MCH

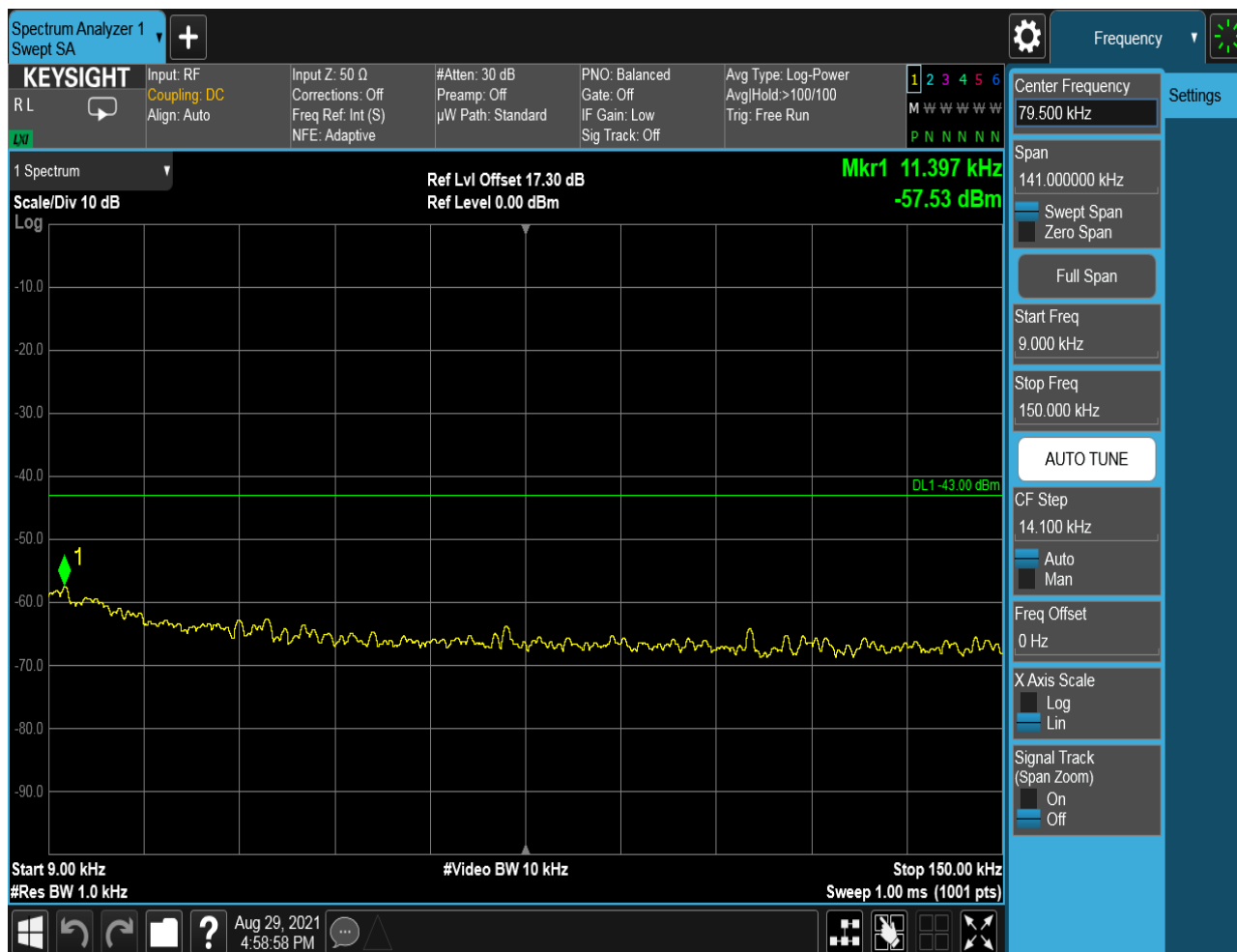


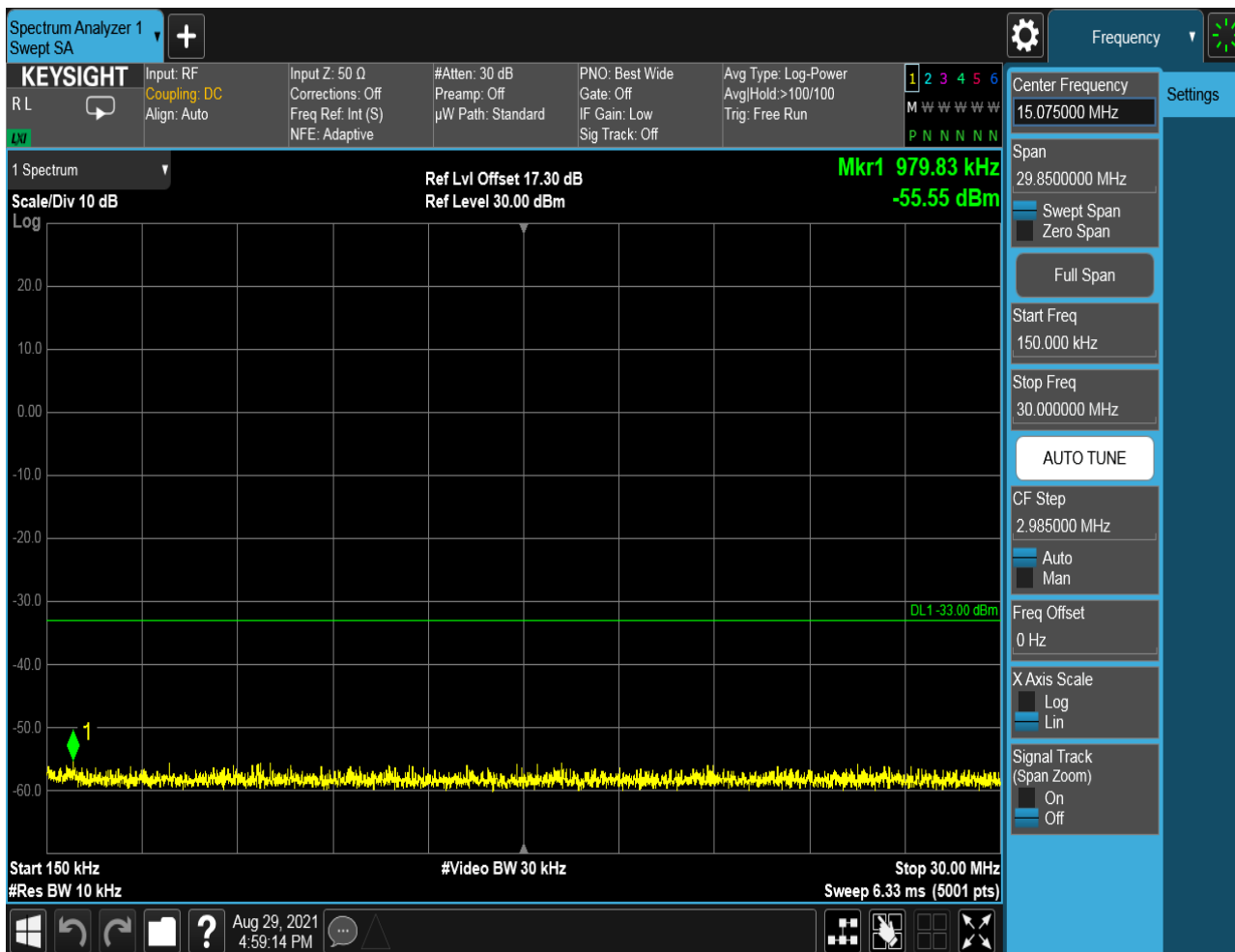


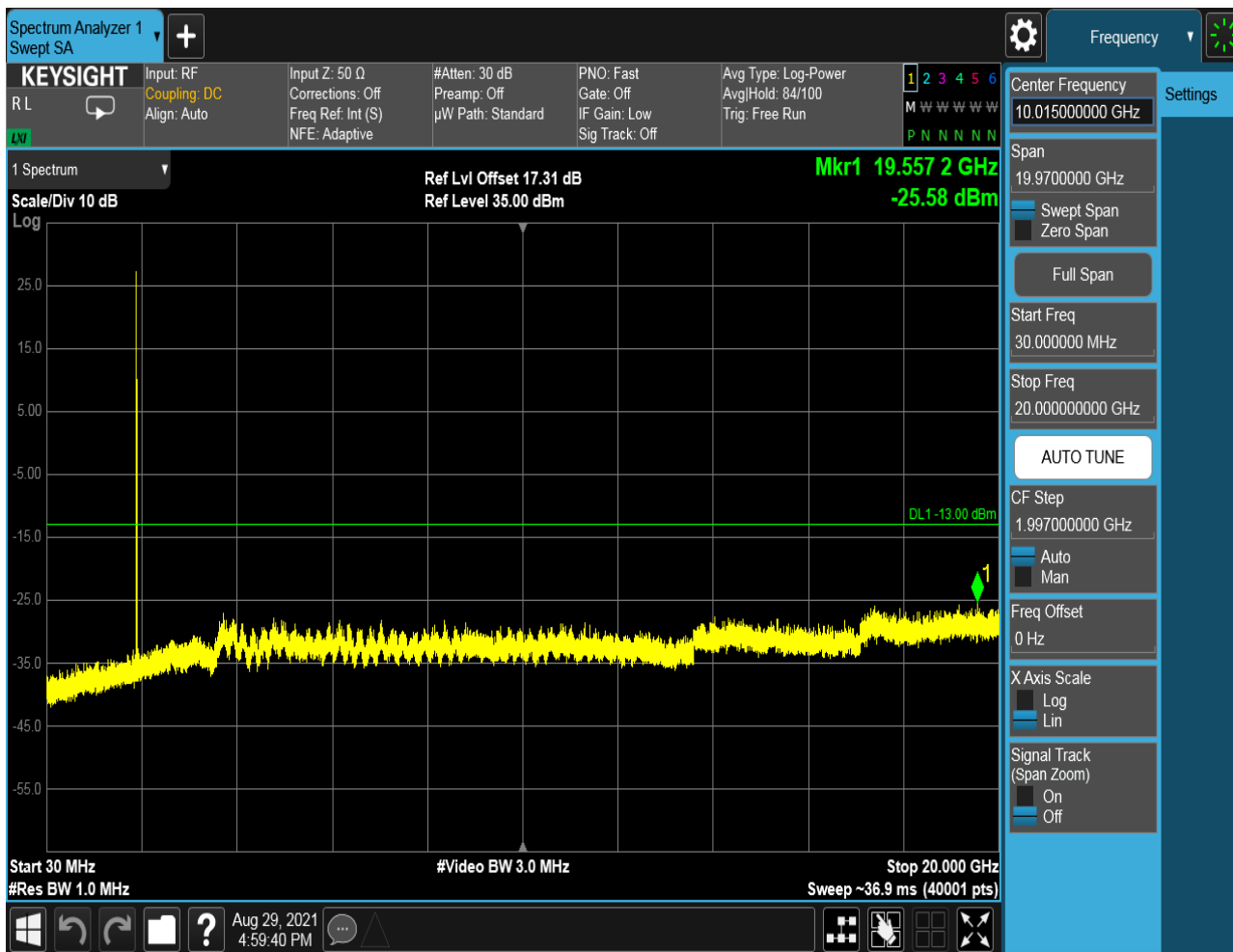




## 6.1.2.2.3 Test Channel = HCH







## 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

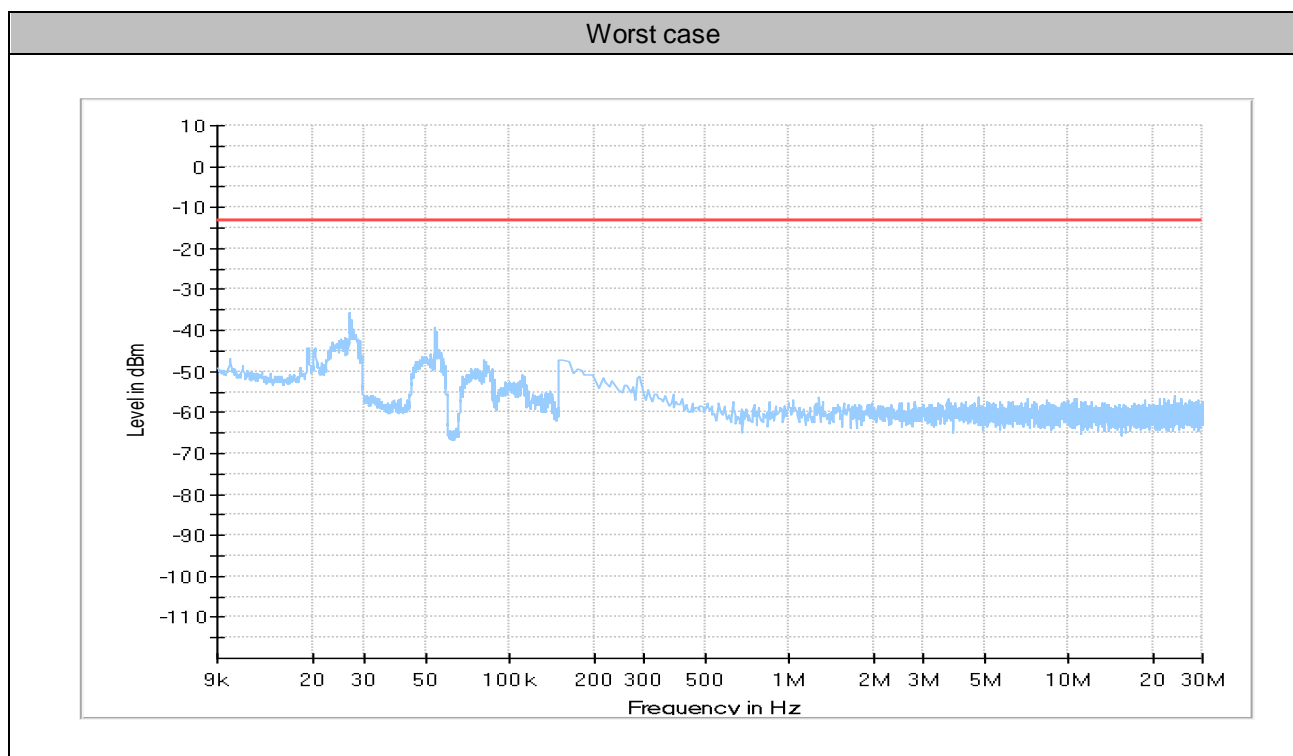
30MHz~1GHz, RBW = 100 kHz, VBW = 300 kHz. Detector: PK

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

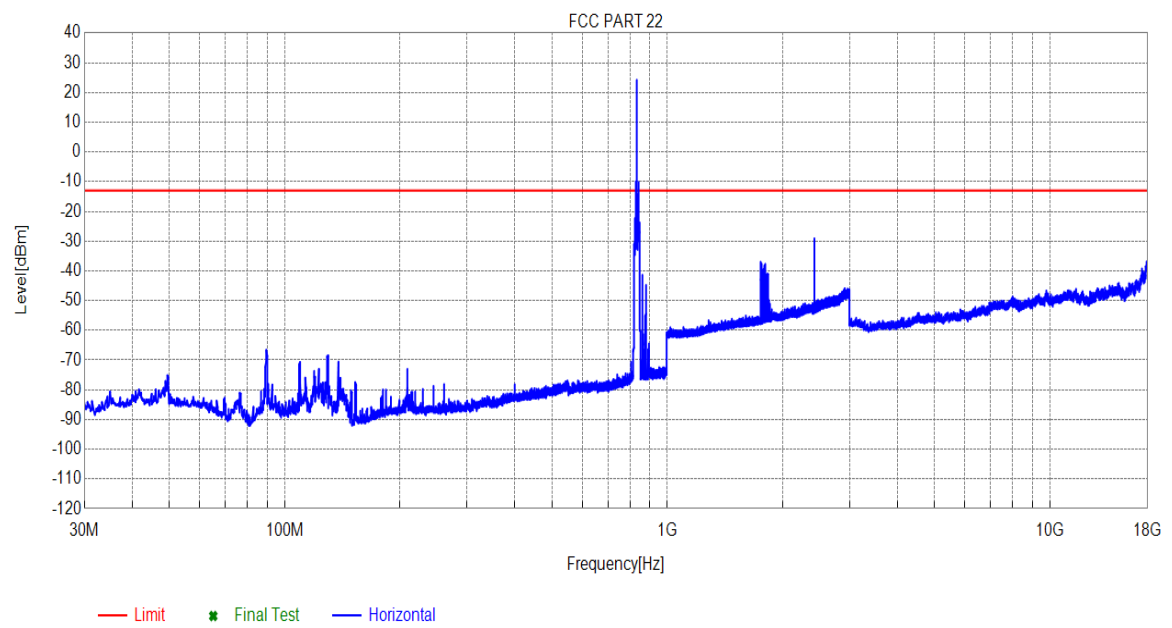
### Part I - Test Plots

#### 7.1 For GSM

##### 7.1.1 Test Band = GSM850

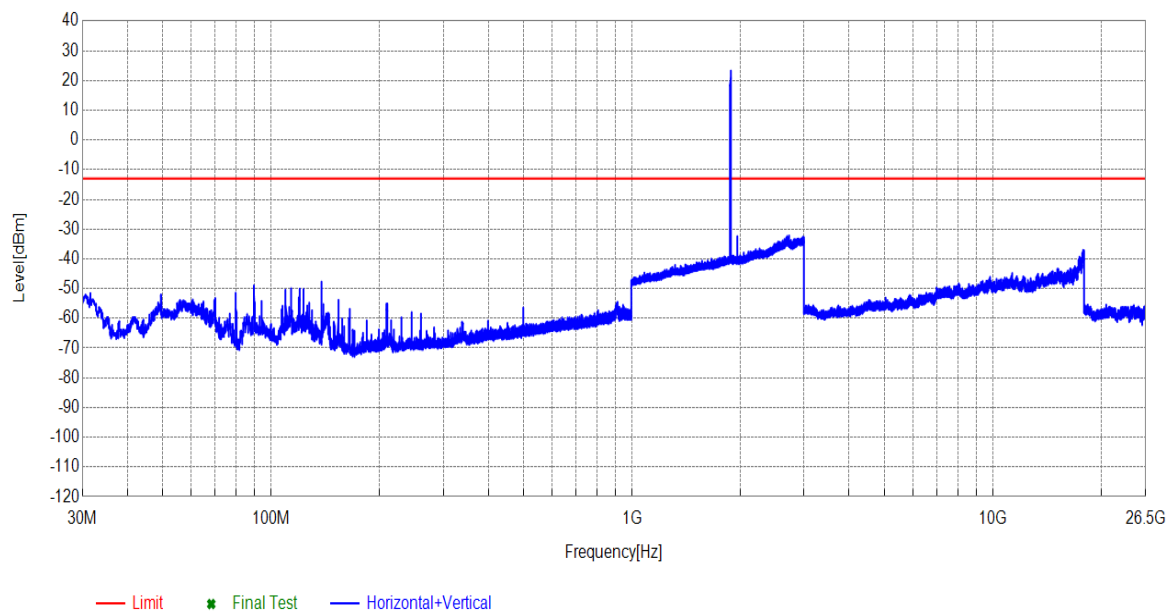
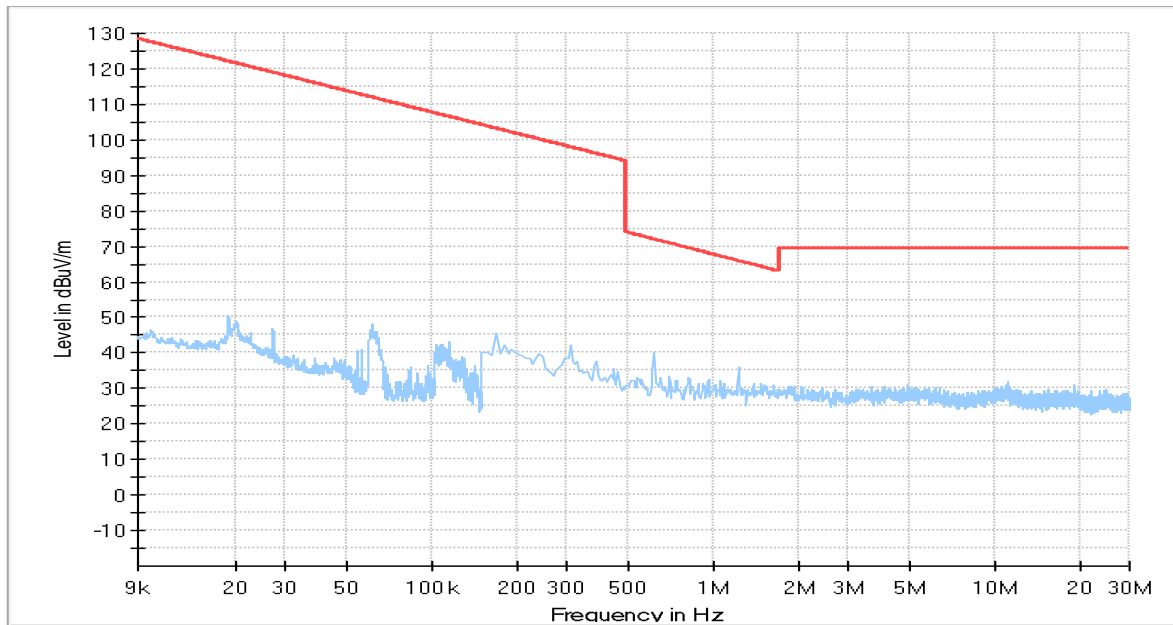






## 7.1.2 Test Band = PCS1900

Worst case





## 8Appendix\_H: Frequency Stability

### 8.1 For GSM

#### 8.1.1Frequency 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	16.19796	0.01965	PASS
				VN	14.59474	0.01771	PASS
				VH	17.70380	0.02148	PASS
		MCH	TN	VL	18.53685	0.02216	PASS
				VN	17.37711	0.02077	PASS
				VH	19.60811	0.02344	PASS
		HCH	TN	VL	18.62635	0.02194	PASS
				VN	15.57530	0.01835	PASS
				VH	18.10876	0.02133	PASS
	GSM/TM2	LCH	TN	VL	13.73751	0.01667	PASS
				VN	15.01841	0.01822	PASS
				VH	15.31128	0.01858	PASS
		MCH	TN	VL	15.81693	0.01891	PASS
				VN	17.58527	0.02102	PASS
				VH	15.33829	0.01833	PASS
		HCH	TN	VL	14.36886	0.01693	PASS
				VN	15.39763	0.01814	PASS
				VH	13.96314	0.01645	PASS
PCS1900	GSM/TM1	LCH	TN	VL	19.67677	0.01063	PASS
				VN	22.36659	0.01209	PASS
				VH	23.67626	0.01280	PASS
		MCH	TN	VL	18.27870	0.00972	PASS
				VN	19.14209	0.01018	PASS
				VH	17.97442	0.00956	PASS
		HCH	TN	VL	27.03191	0.01063	PASS
				VN	29.33493	0.01209	PASS
				VH	26.02569	0.01280	PASS
	GSM/TM2	LCH	TN	VL	21.83832	0.01180	PASS
				VN	23.12094	0.01250	PASS
				VH	23.04171	0.01245	PASS
		MCH	TN	VL	18.52813	0.00986	PASS
				VN	21.94891	0.01167	PASS
				VH	19.63276	0.01044	PASS
		HCH	TN	VL	28.84864	0.01180	PASS



Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VN	28.35550	0.01250	PASS
				VH	28.06156	0.01245	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	15.20922	0.01845	PASS
				-20	14.56906	0.01768	PASS
				-10	14.62593	0.01775	PASS
				0	15.28958	0.01855	PASS
				10	14.64052	0.01776	PASS
				20	14.59474	0.01771	PASS
				30	14.83913	0.01800	PASS
				40	13.56155	0.01645	PASS
				50	15.15429	0.01839	PASS
		MCH	VN	-30	16.61713	0.01986	PASS
				-20	17.34772	0.02074	PASS
				-10	17.42362	0.02083	PASS
				0	17.71215	0.02117	PASS
				10	17.81849	0.02130	PASS
				20	17.37711	0.02077	PASS
				30	17.50710	0.02093	PASS
				40	16.00808	0.01913	PASS
				50	17.43833	0.02084	PASS
		HCH	VN	-30	14.63891	0.01725	PASS
				-20	15.56829	0.01834	PASS
				-10	15.97494	0.01882	PASS
				0	15.64673	0.01843	PASS
				10	16.19690	0.01908	PASS
				20	15.57530	0.01835	PASS
				30	16.28445	0.01919	PASS
				40	14.58149	0.01718	PASS
				50	15.22037	0.01793	PASS
	GSM/TM2	LCH	VN	-30	14.45088	0.01753	PASS
				-20	15.01893	0.01822	PASS
				-10	15.57055	0.01889	PASS
				0	14.97342	0.01817	PASS
				10	15.93746	0.01934	PASS
				20	15.01841	0.01822	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	14.62364	0.01774	PASS
				40	14.57968	0.01769	PASS
				50	14.15874	0.01718	PASS
		MCH	VN	-30	16.53861	0.01977	PASS
				-20	16.75506	0.02003	PASS
				-10	17.25999	0.02063	PASS
				0	17.62421	0.02107	PASS
				10	17.48955	0.02091	PASS
				20	17.58527	0.02102	PASS
				30	17.00875	0.02033	PASS
				40	17.58687	0.02102	PASS
				50	16.66393	0.01992	PASS
		HCH	VN	-30	15.49132	0.01825	PASS
				-20	14.90083	0.01756	PASS
				-10	15.57726	0.01835	PASS
				0	15.55951	0.01833	PASS
				10	15.47040	0.01823	PASS
				20	15.39763	0.01814	PASS
				30	15.43381	0.01818	PASS
				40	15.44645	0.01820	PASS
				50	15.29547	0.01802	PASS
PCS1900	GSM/TM1	LCH	VN	-30	21.51831	0.01163	PASS
				-20	20.97540	0.01134	PASS
				-10	22.81486	0.01233	PASS
				0	22.71988	0.01228	PASS
				10	21.62990	0.01169	PASS
				20	22.36659	0.01209	PASS
				30	22.15964	0.01198	PASS
				40	21.68773	0.01172	PASS
				50	24.30305	0.01314	PASS
		MCH	VN	-30	22.05377	0.01173	PASS
				-20	20.84064	0.01109	PASS
				-10	21.77480	0.01158	PASS
				0	22.48462	0.01196	PASS
				10	19.79569	0.01053	PASS
				20	19.14209	0.01018	PASS
				30	20.79981	0.01106	PASS
				40	20.09118	0.01069	PASS
				50	22.60933	0.01203	PASS
		HCH	VN	-30	27.98146	0.01465	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-20	26.33598	0.01379	PASS
				-10	27.44057	0.01437	PASS
				0	25.82218	0.01352	PASS
				10	25.31848	0.01326	PASS
				20	29.33493	0.01536	PASS
				30	27.48482	0.01439	PASS
				40	25.93846	0.01358	PASS
				50	25.81635	0.01352	PASS
	GSM/TM2	LCH	VN	-30	22.77344	0.01231	PASS
				-20	22.36861	0.01209	PASS
				-10	22.62906	0.01223	PASS
				0	21.91247	0.01184	PASS
				10	23.63507	0.01277	PASS
				20	23.12094	0.01250	PASS
				30	21.86154	0.01182	PASS
				40	24.32670	0.01315	PASS
				50	23.96567	0.01295	PASS
		MCH	VN	-30	20.55382	0.01093	PASS
				-20	20.80360	0.01107	PASS
				-10	22.69401	0.01207	PASS
				0	21.55323	0.01146	PASS
				10	22.48360	0.01196	PASS
				20	21.94891	0.01167	PASS
				30	22.52843	0.01198	PASS
				40	23.58592	0.01255	PASS
				50	22.96765	0.01222	PASS
		HCH	VN	-30	27.49302	0.01440	PASS
				-20	27.43636	0.01437	PASS
				-10	28.51772	0.01493	PASS
				0	27.23063	0.01426	PASS
				10	27.81300	0.01456	PASS
				20	28.35550	0.01485	PASS
				30	26.73069	0.01400	PASS
				40	28.98070	0.01517	PASS
				50	28.85623	0.01511	PASS

END