



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	32.77	25.22	38.5	PASS
		MCH	32.74	25.19	38.5	PASS
		HCH	32.78	25.23	38.5	PASS
	GSM/TM2	LCH	26.12	18.57	38.5	PASS
		MCH	26.30	18.75	38.5	PASS
		HCH	26.29	18.74	38.5	PASS
Test Band	Test Mode	Test Channel	Measured[dBm]	EIRP [dBm]	Limit [dBm]	Verdict
PCS1900	GSM/TM1	LCH	30.14	30.44	33	PASS
		MCH	30.14	30.44	33	PASS
		HCH	29.91	30.21	33	PASS
	GSM/TM2	LCH	26.42	26.72	33	PASS
		MCH	26.39	26.69	33	PASS
		HCH	26.68	26.98	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	1.75	13	PASS
		MCH	1.95	13	PASS
		HCH	1.77	13	PASS
	GSM/TM2	LCH	4.47	13	PASS
		MCH	4.73	13	PASS
		HCH	4.62	13	PASS
PCS1900	GSM/TM1	LCH	1.72	13	PASS
		MCH	1.91	13	PASS
		HCH	2.05	13	PASS
	GSM/TM2	LCH	4.54	13	PASS
		MCH	4.75	13	PASS
		HCH	4.38	13	PASS

3Appendix_C: Modulation Characteristics

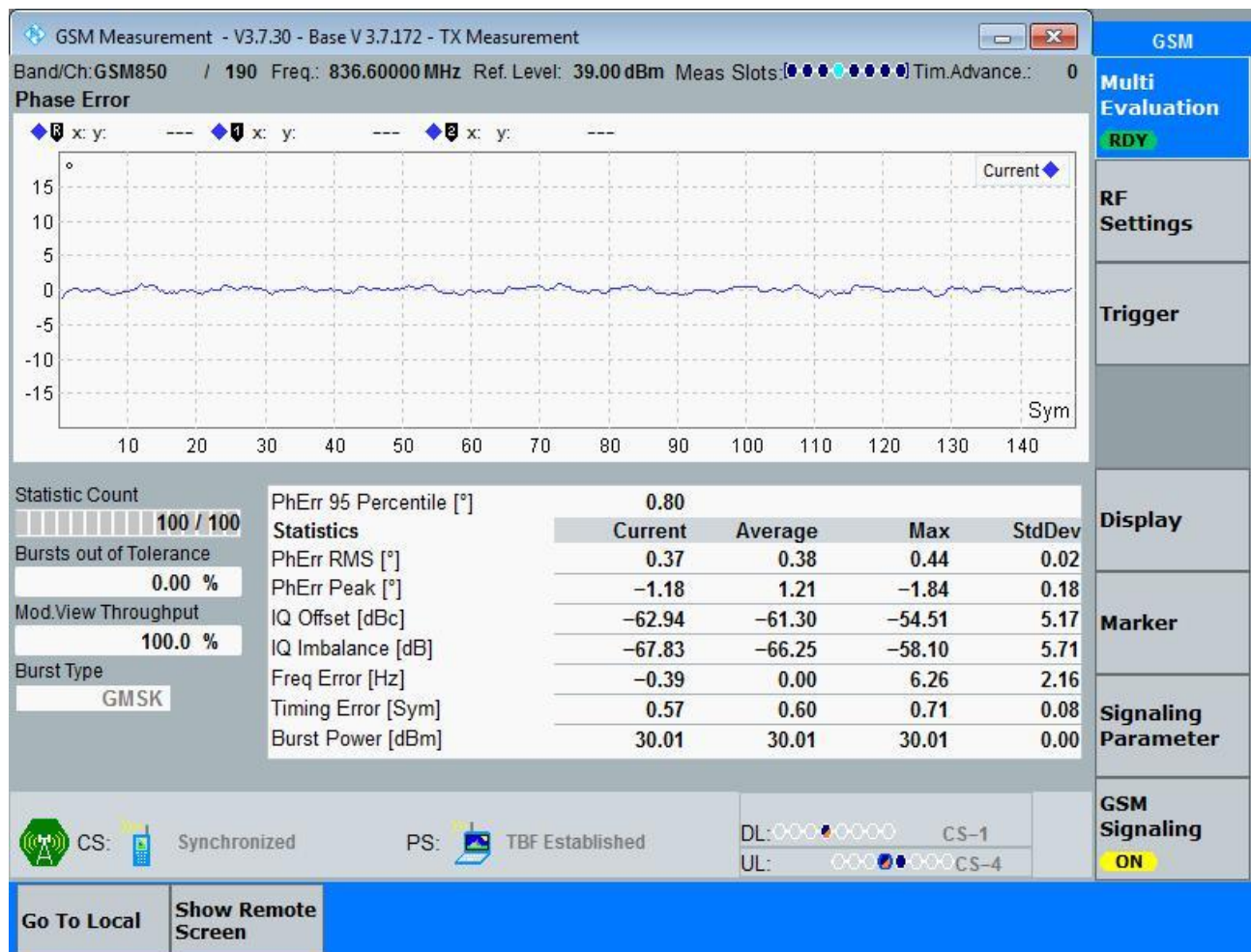
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

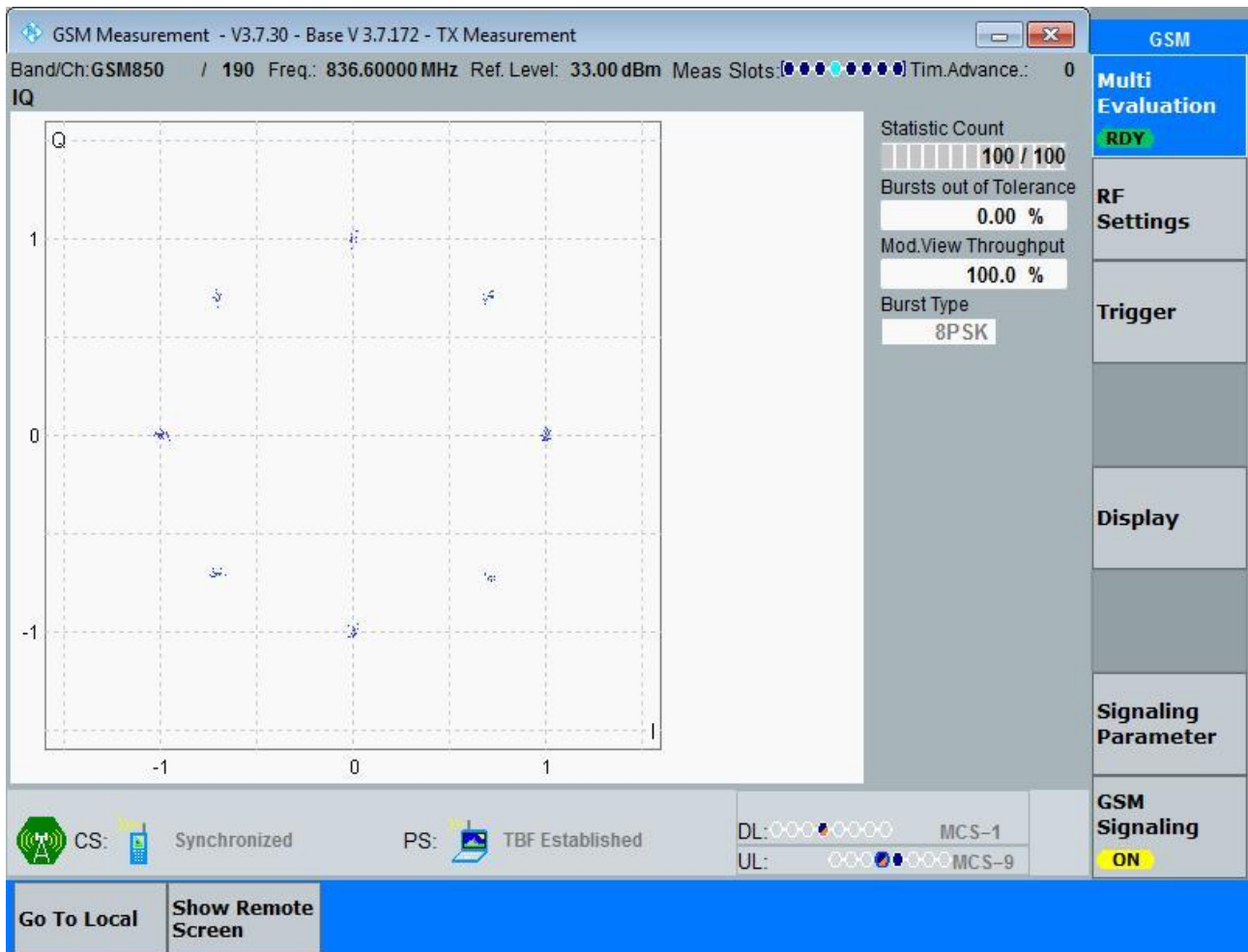
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

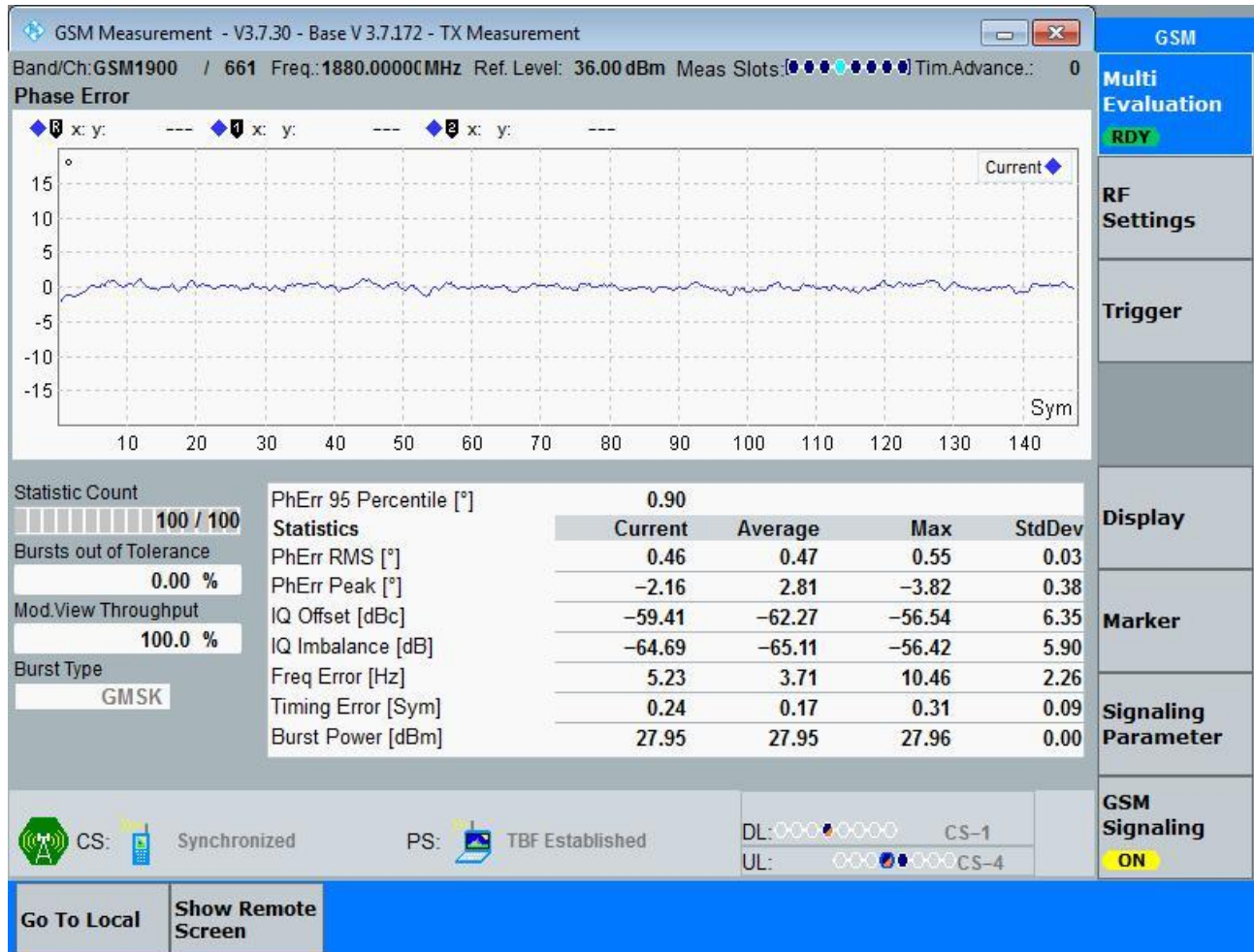
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = PCS1900

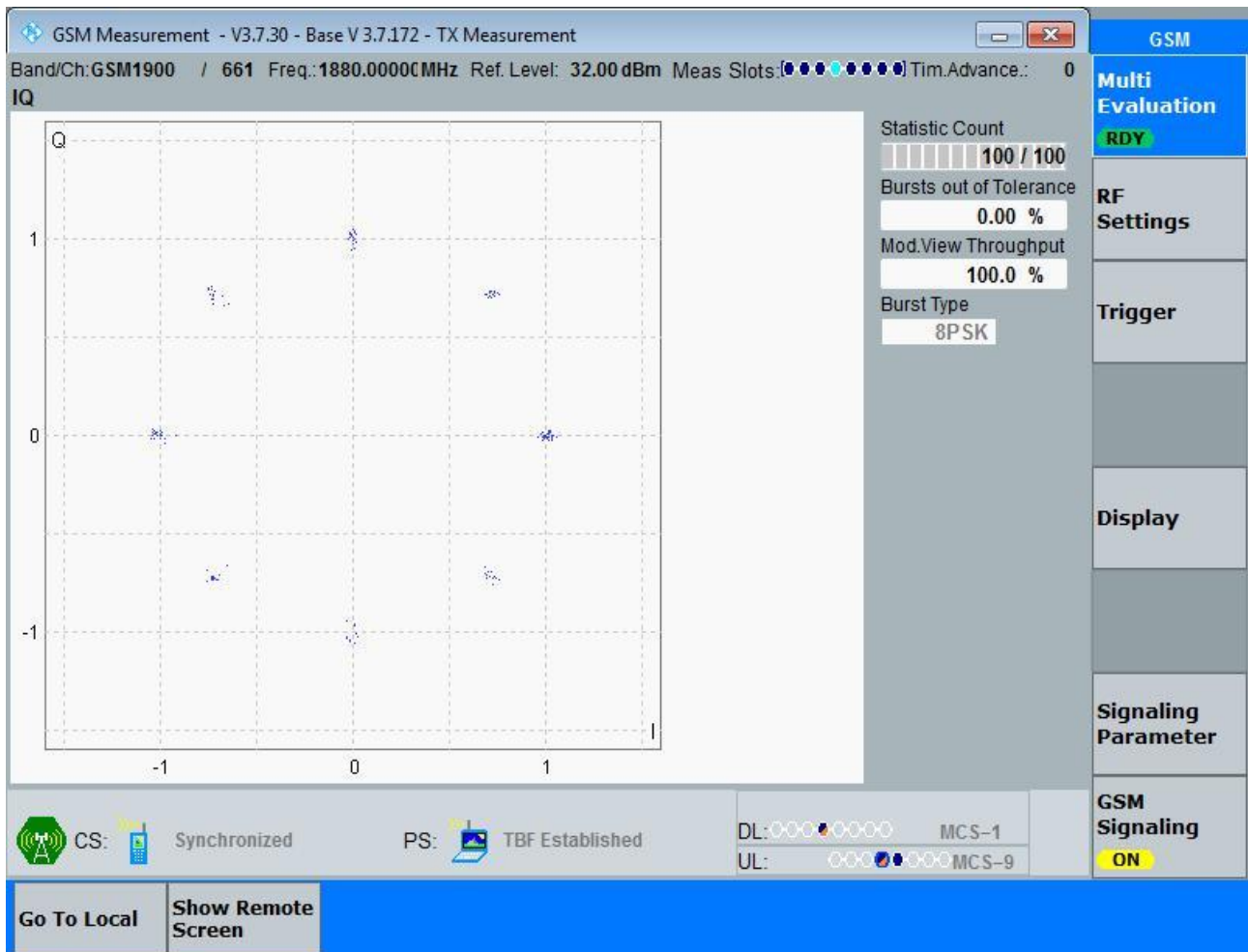
3.1.2.1 Test Mode = GSM/TM1

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	245.67	317.5	Pass
		MCH	246.71	318.0	Pass
		HCH	248.71	314.5	Pass
	GSM/TM2	LCH	249.72	322.1	Pass
		MCH	253.21	315.6	Pass
		HCH	252.65	314.6	Pass
PCS1900	GSM/TM1	LCH	243.35	313.9	Pass
		MCH	244.73	319.9	Pass
		HCH	247.70	319.6	Pass
	GSM/TM2	LCH	254.75	316.8	Pass
		MCH	250.28	318.1	Pass
		HCH	250.68	315.0	Pass

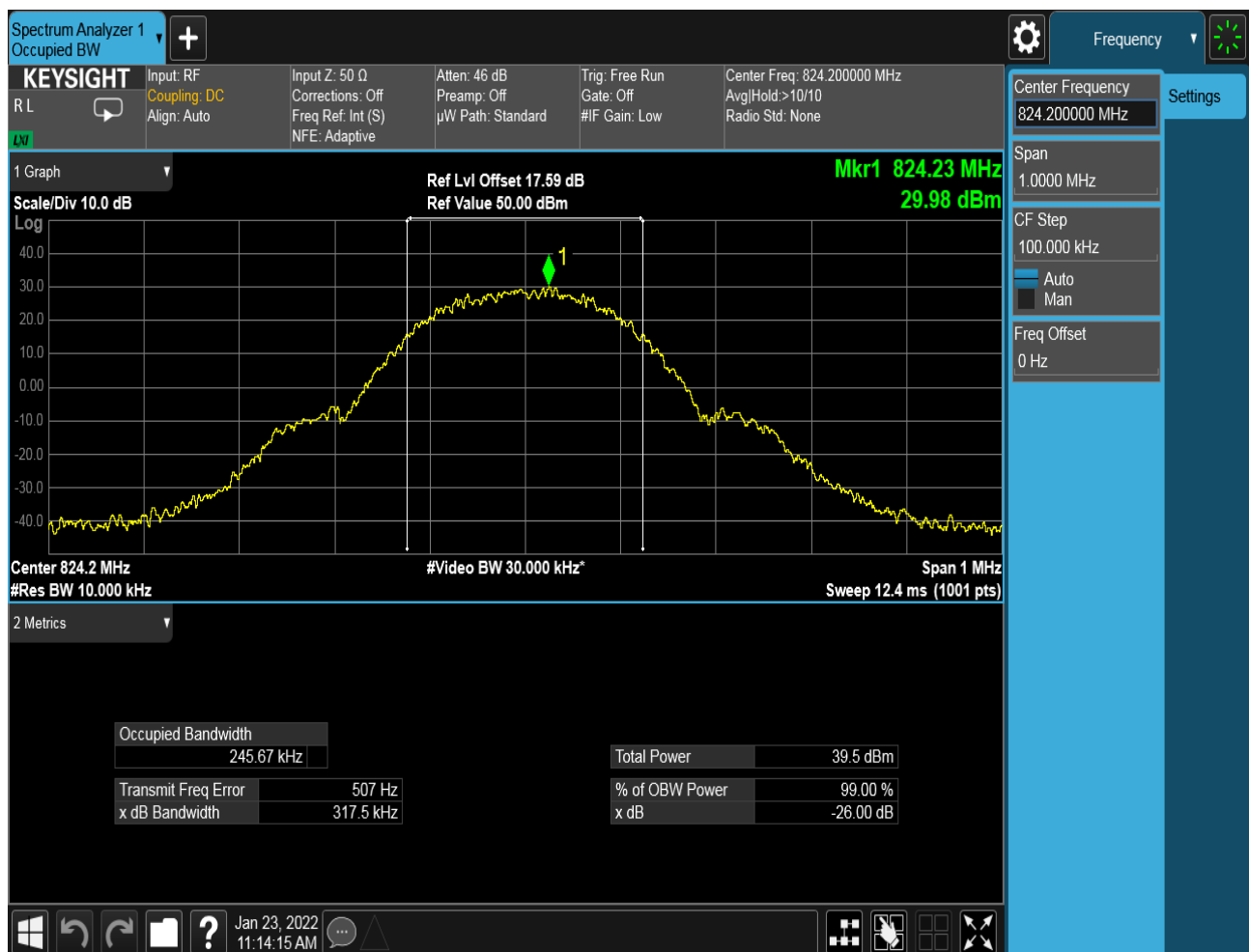
Part II - Test Plots

4.1 For GSM

4.1.1 Test Band = GSM850

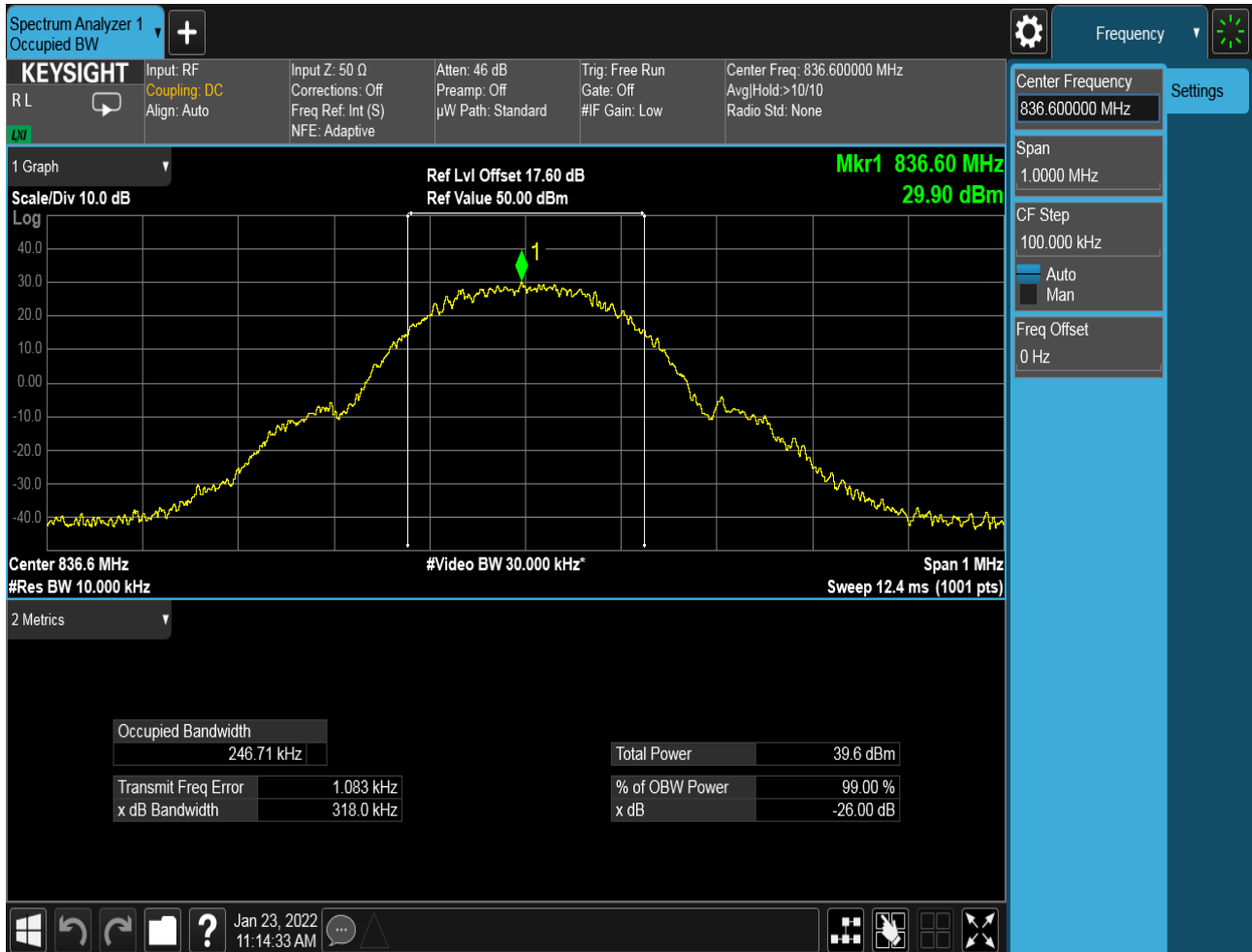
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH



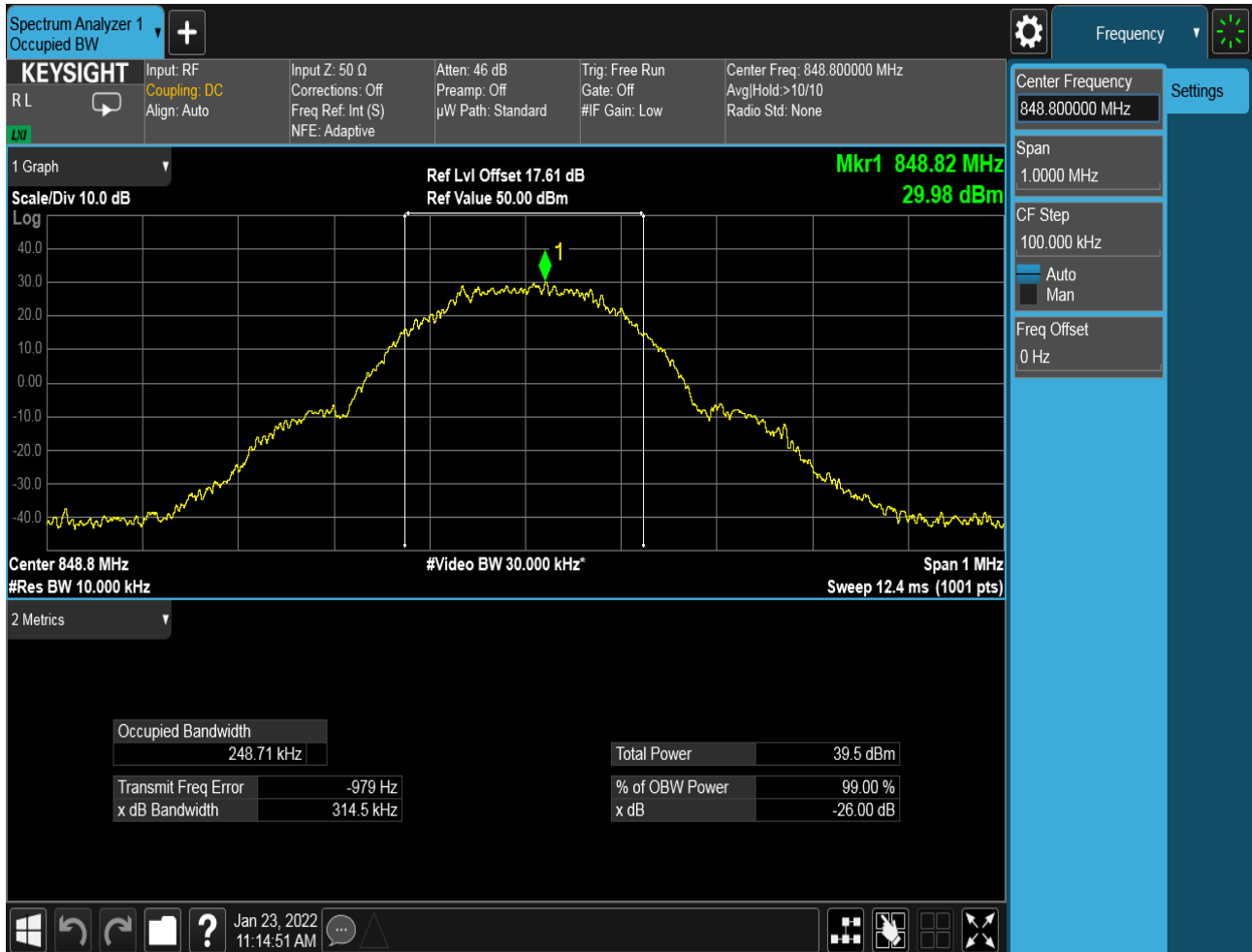


4.1.1.1.2 Test Channel = MCH





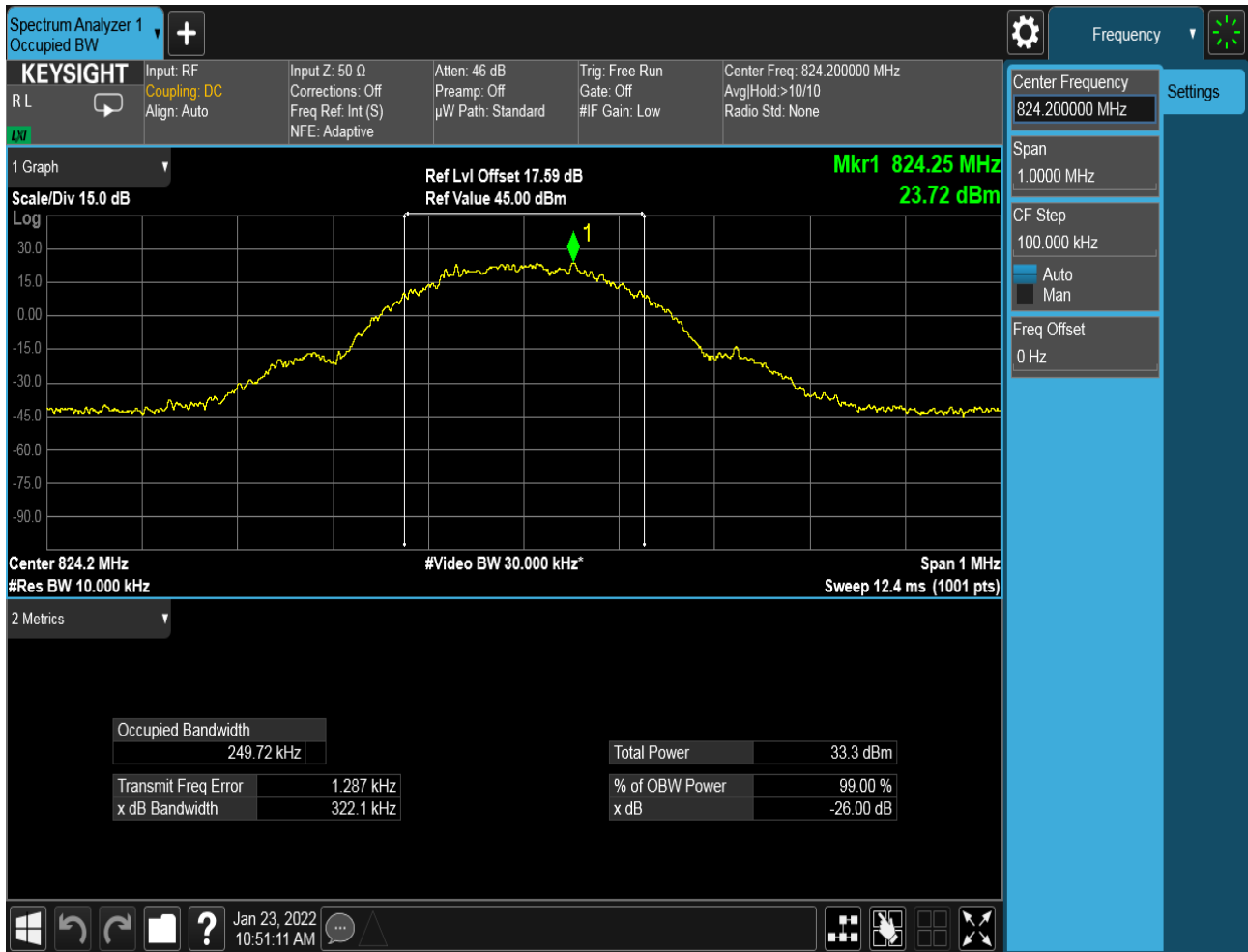
4.1.1.1.3 Test Channel = HCH





4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH





4.1.1.2.2 Test Channel = MCH





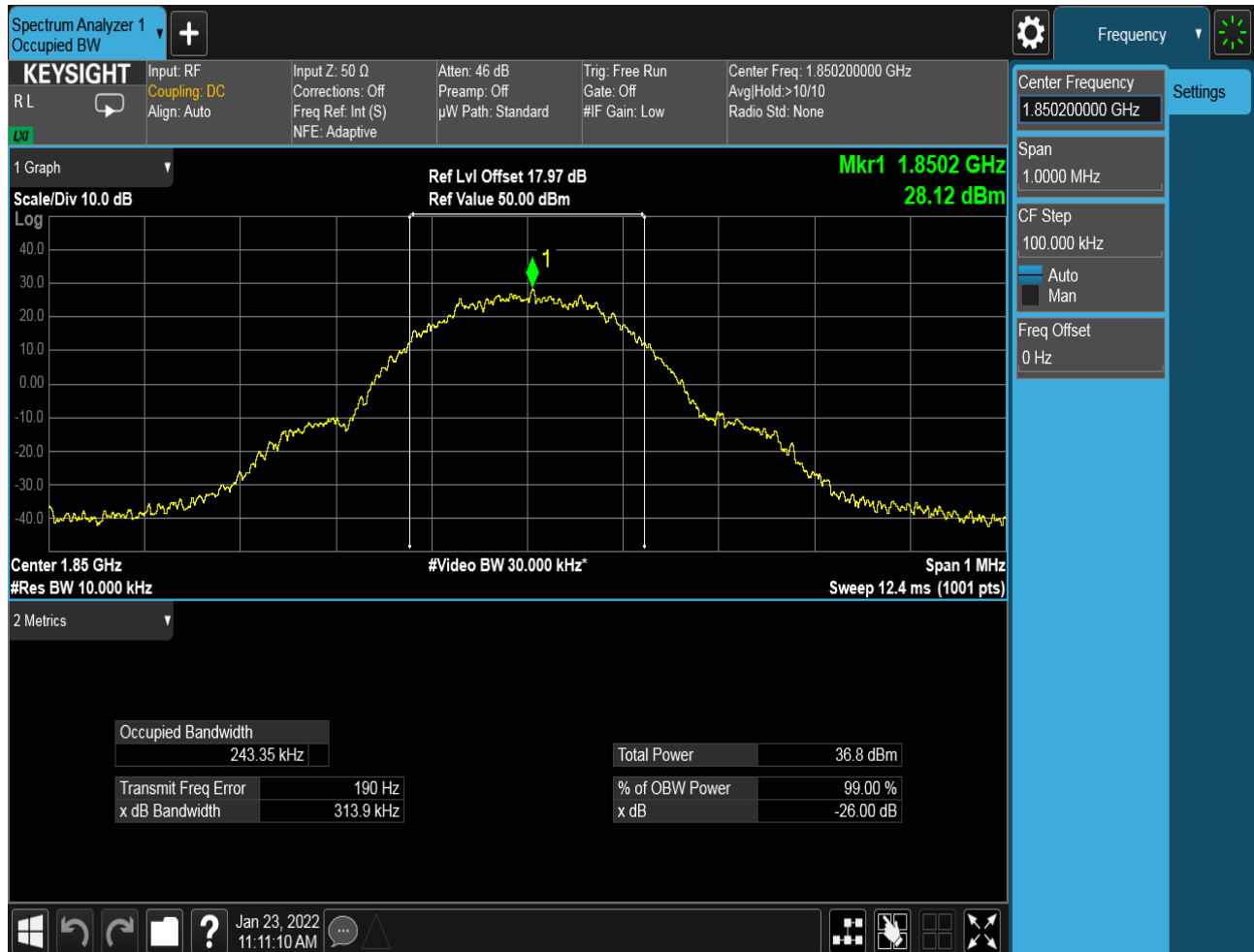
4.1.1.2.3 Test Channel = HCH



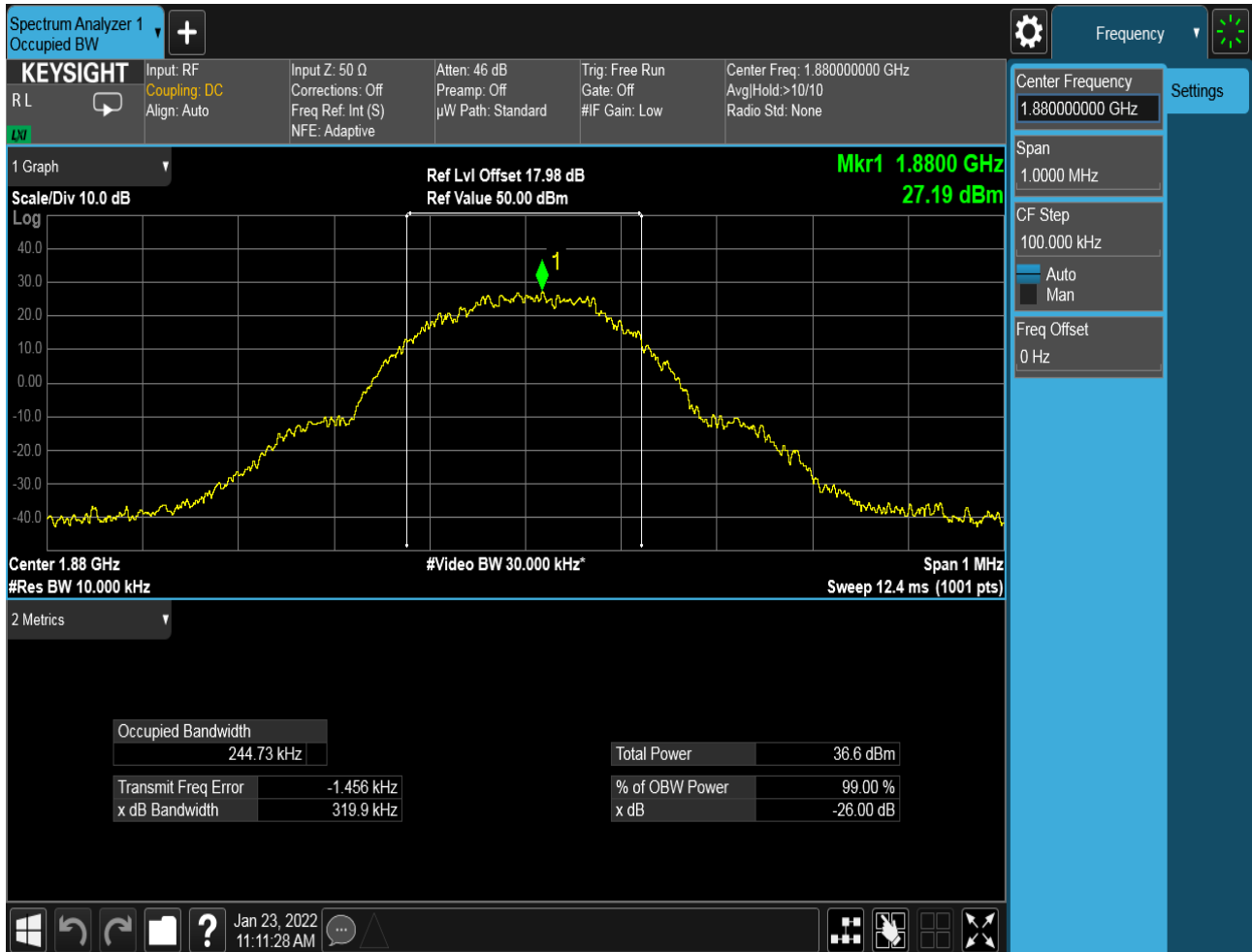
4.1.2 Test Band = PCS1900

4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH

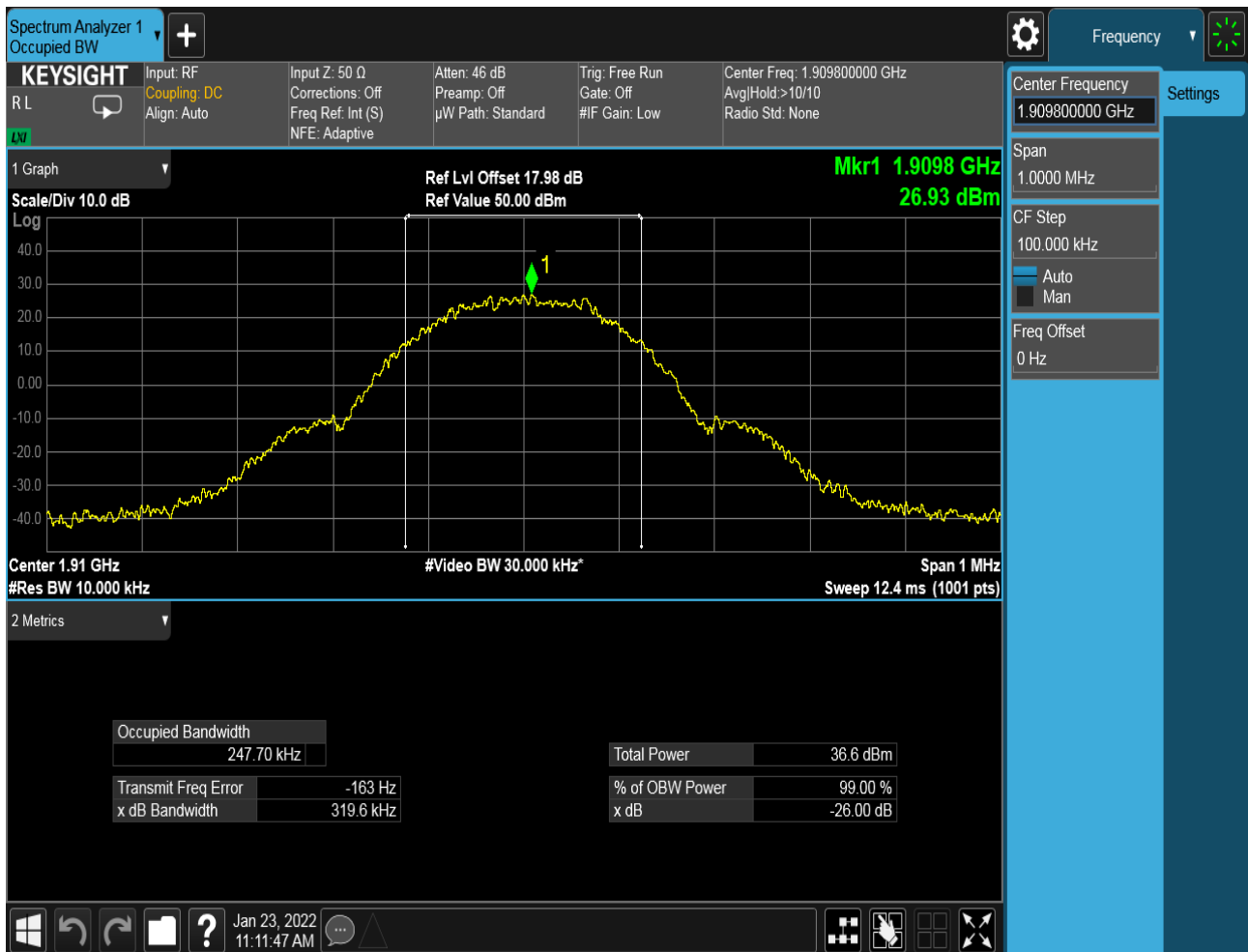


4.1.2.1.2 Test Channel = MCH





4.1.2.1.3 Test Channel = HCH





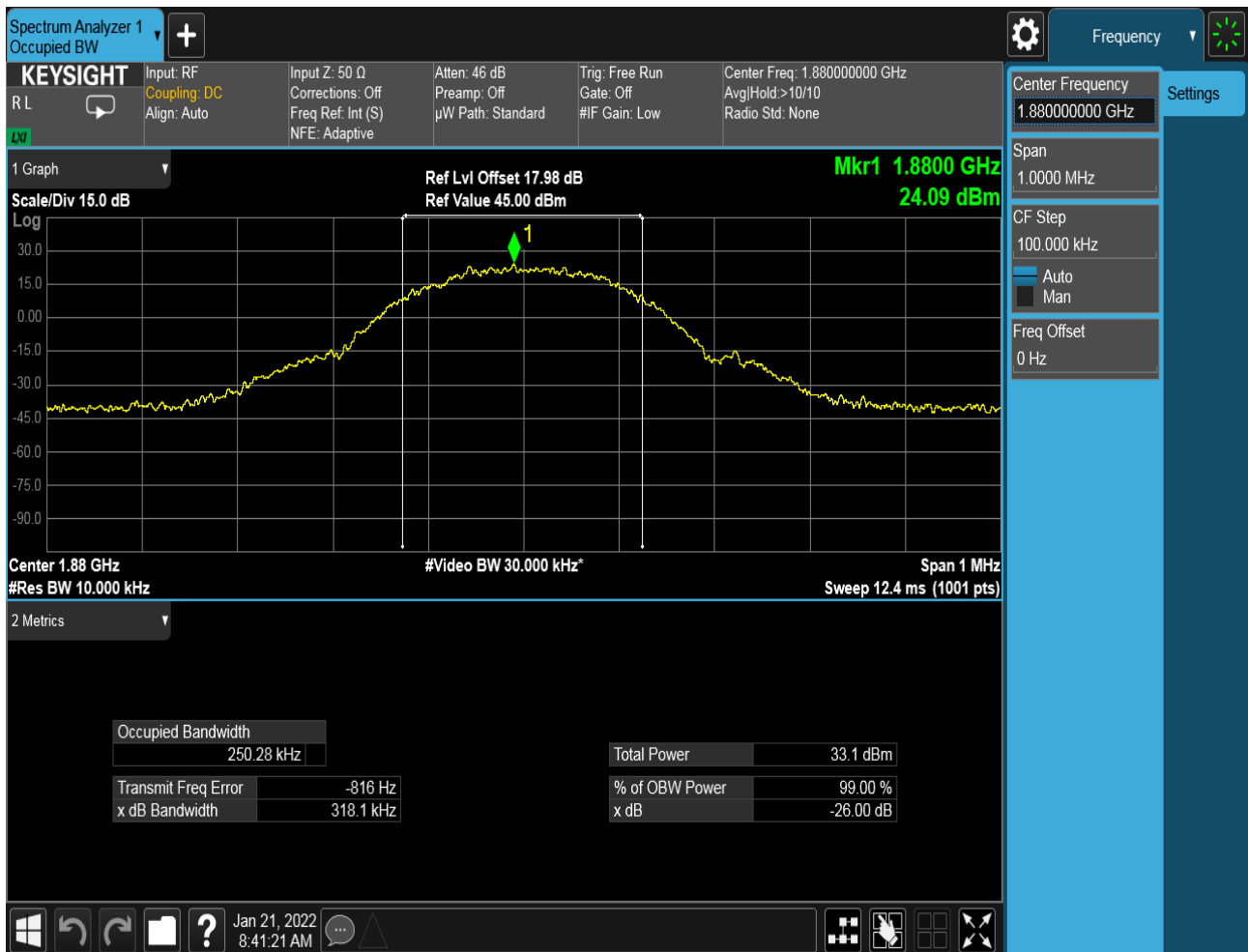
4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



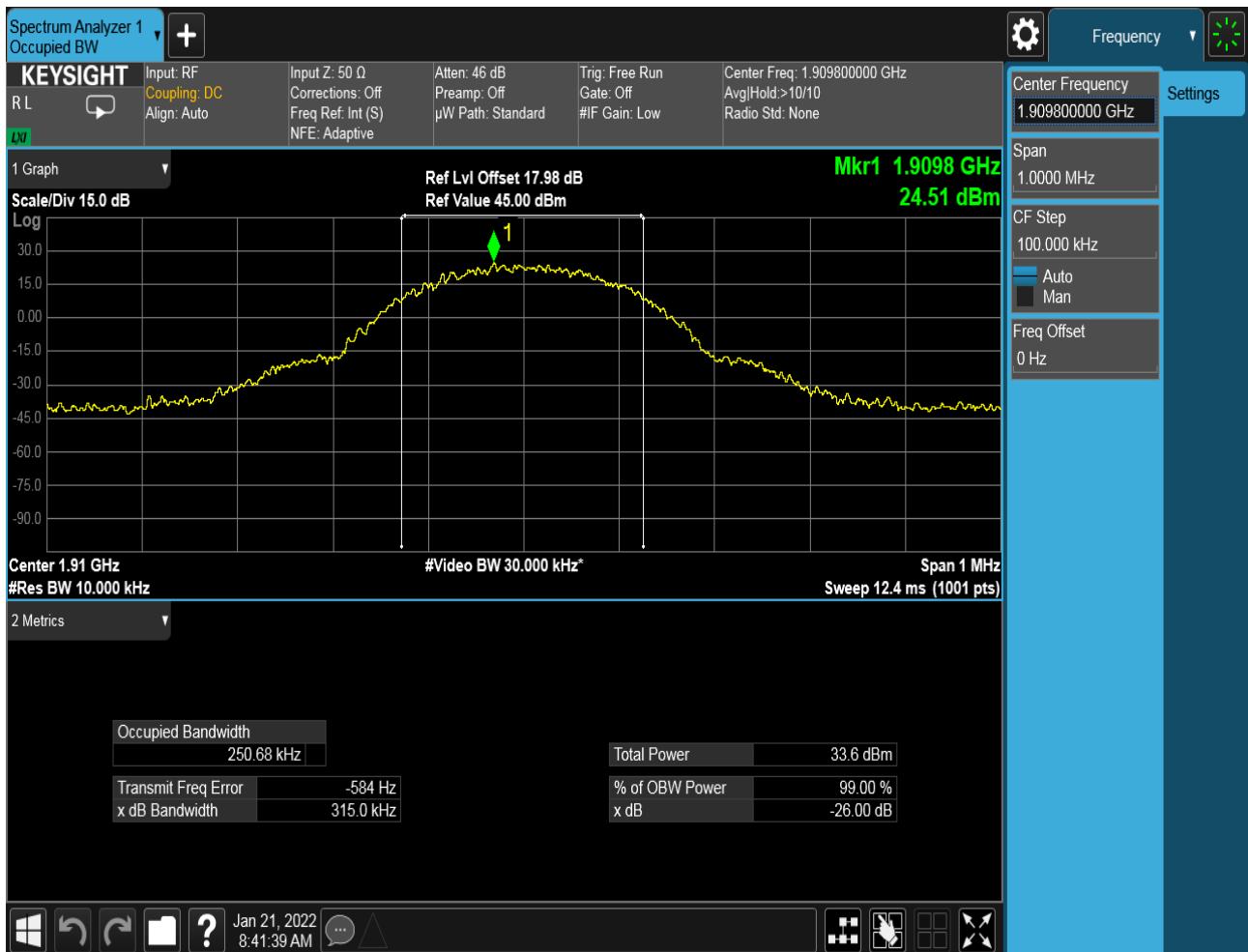


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

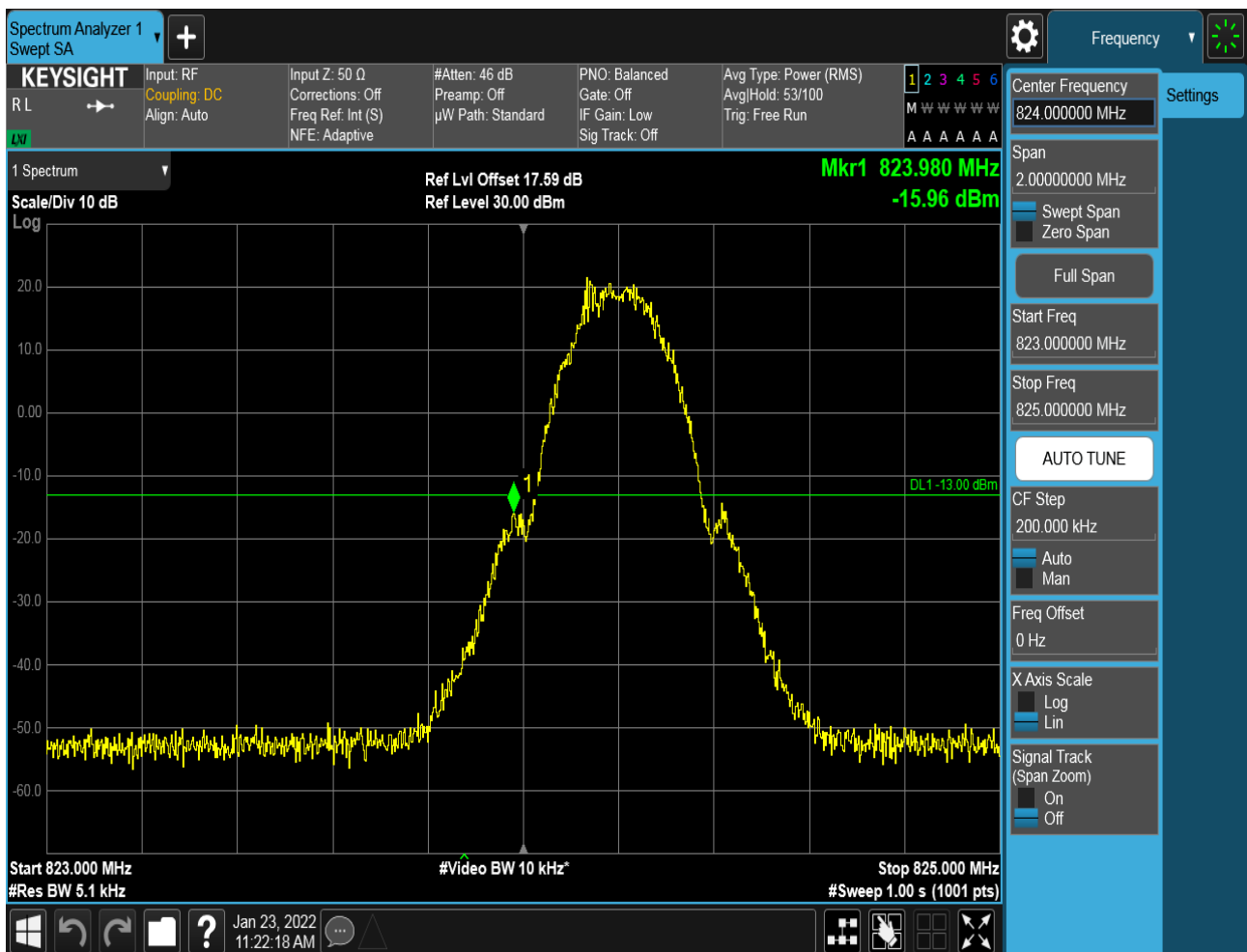
Part I - Test Plots

5.1 For GSM

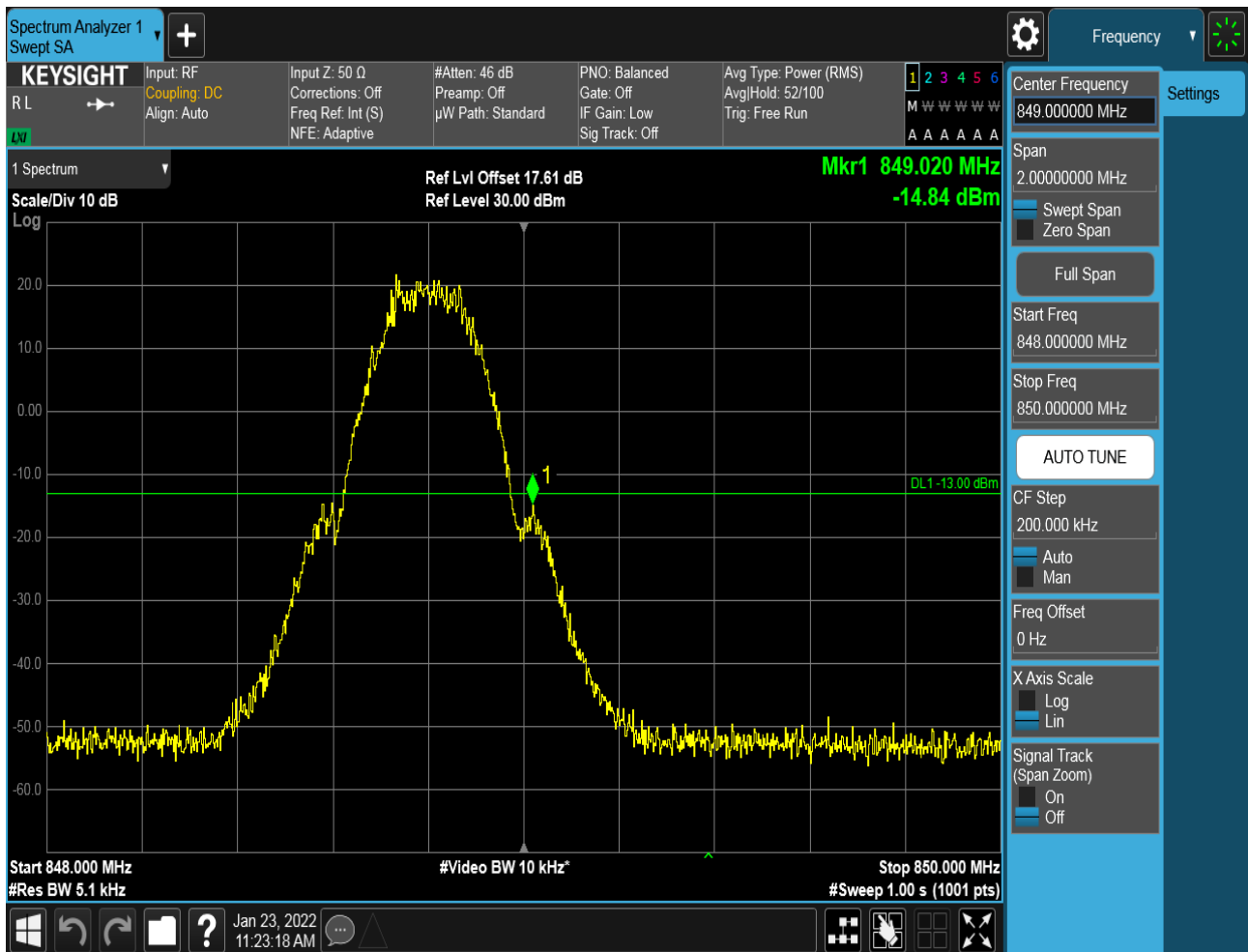
5.1.1 Test Band = GSM850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH



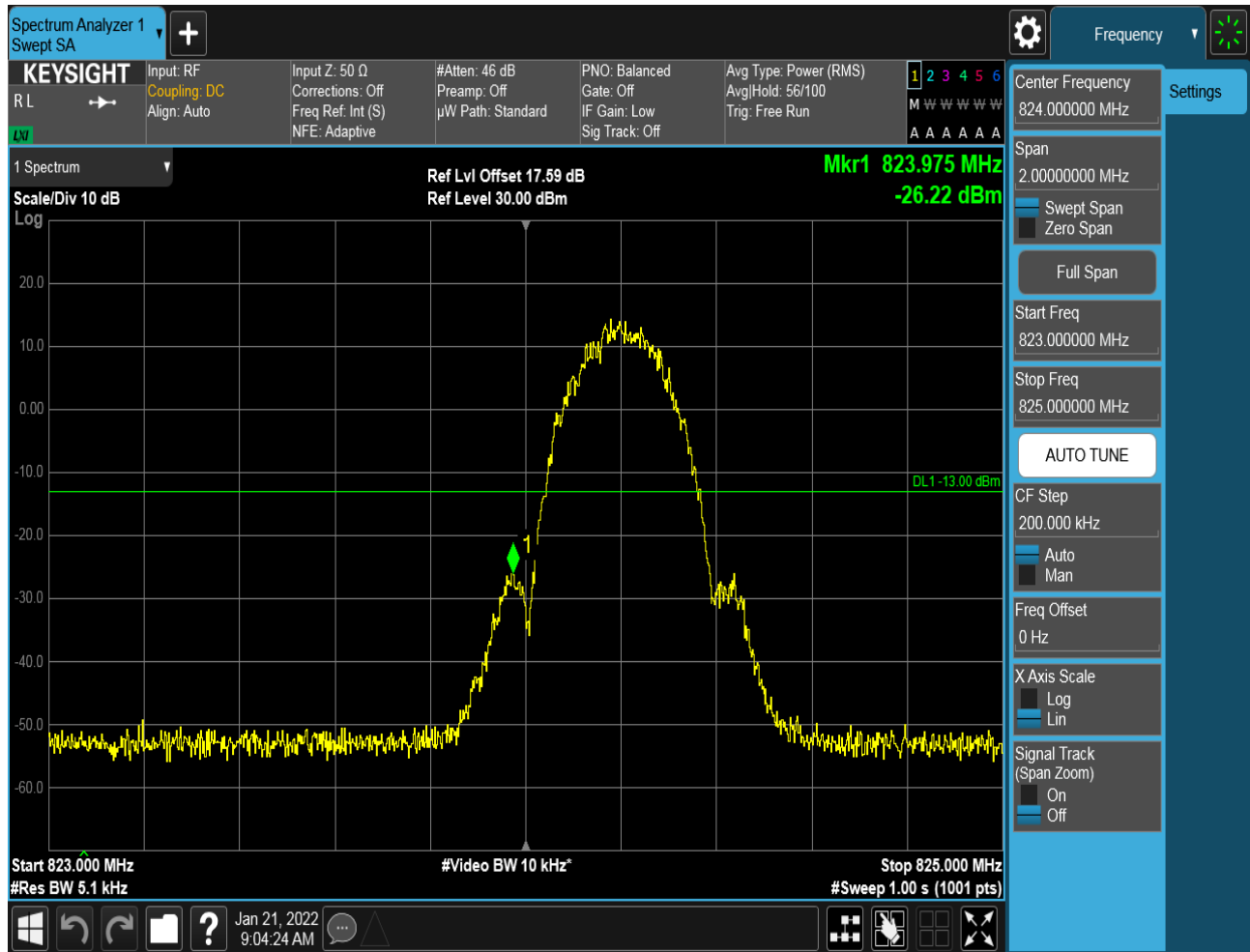
5.1.1.1.2 Test Channel = HCH





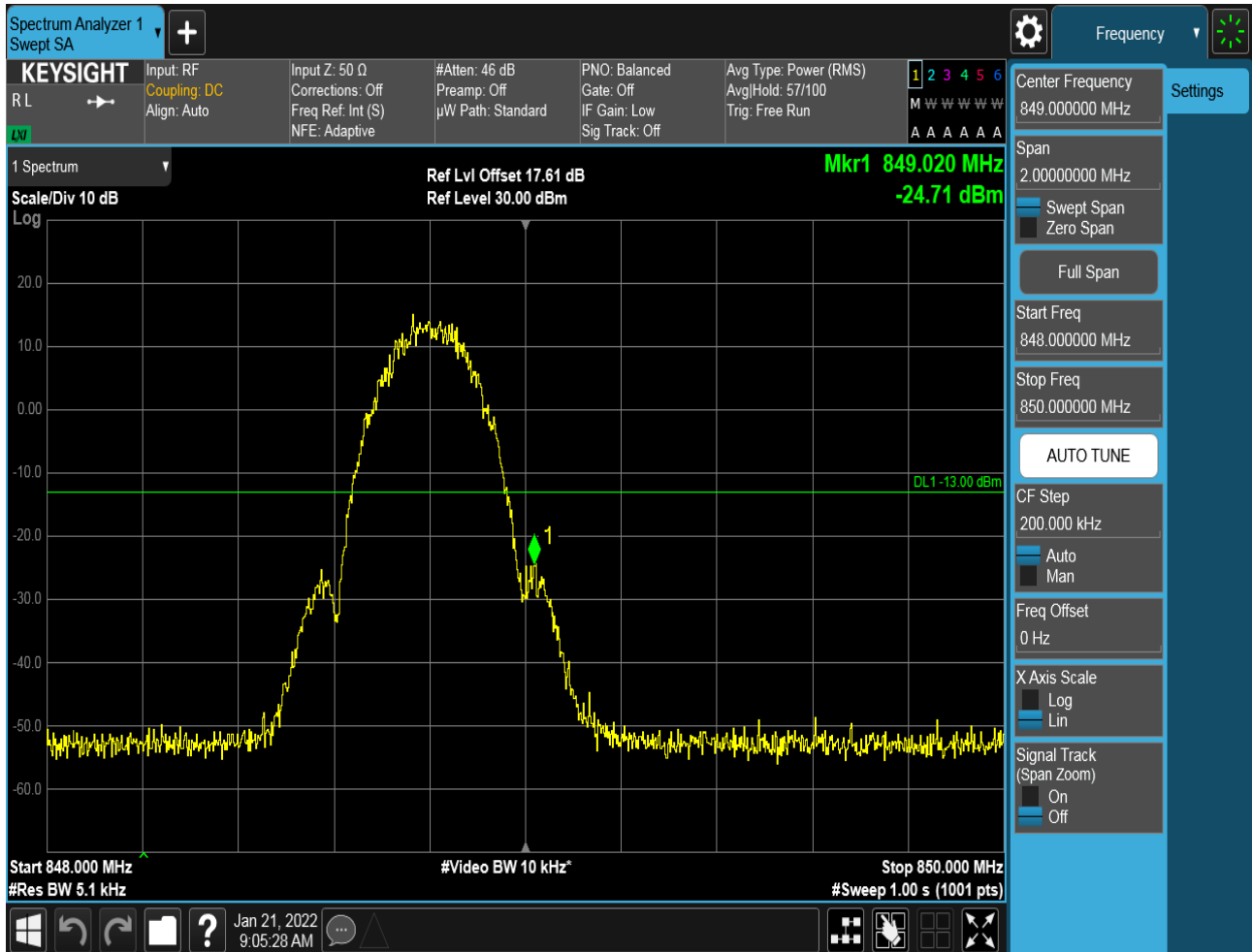
5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH





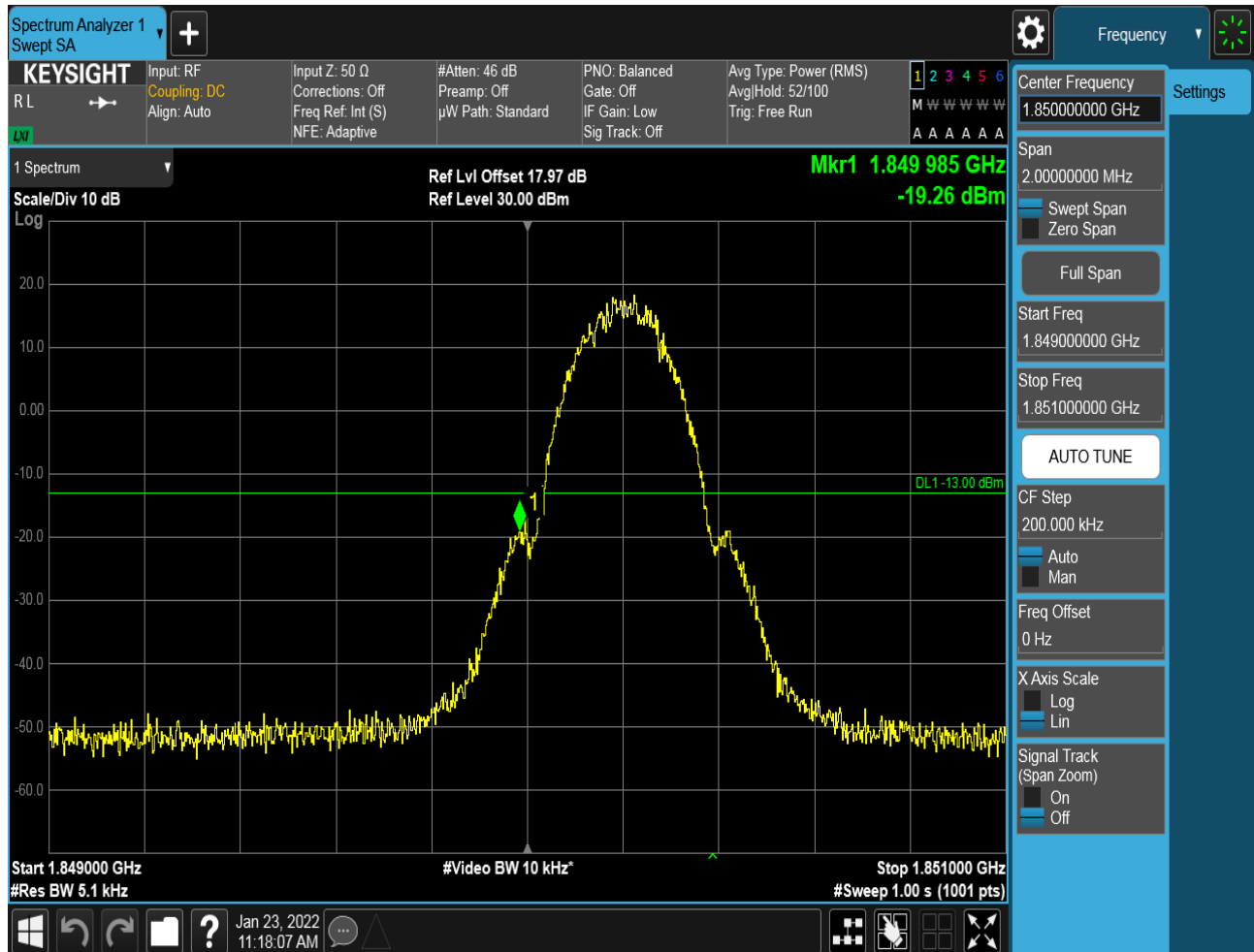
5.1.1.2.2 Test Channel = HCH



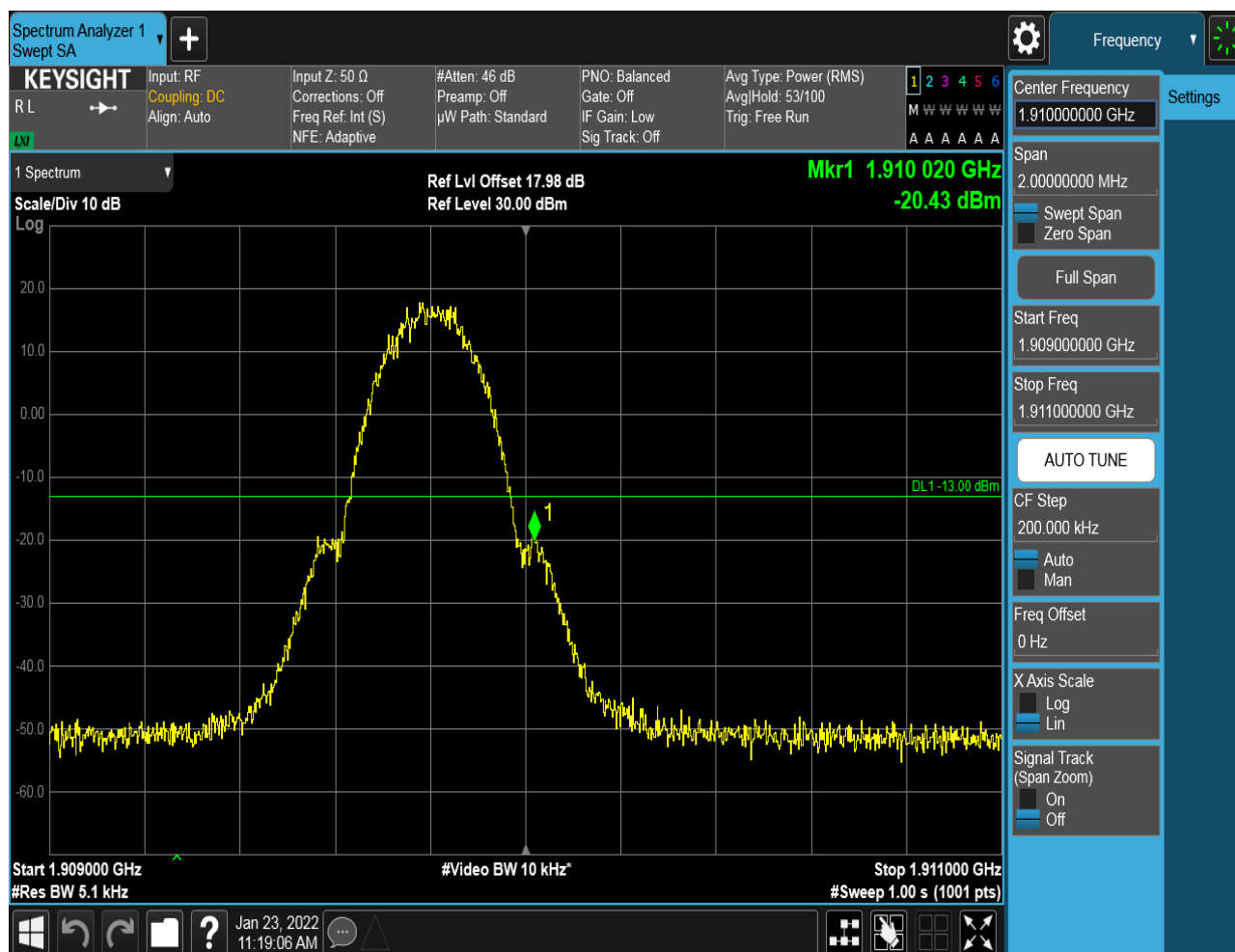
5.1.2 Test Band = PCS1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH



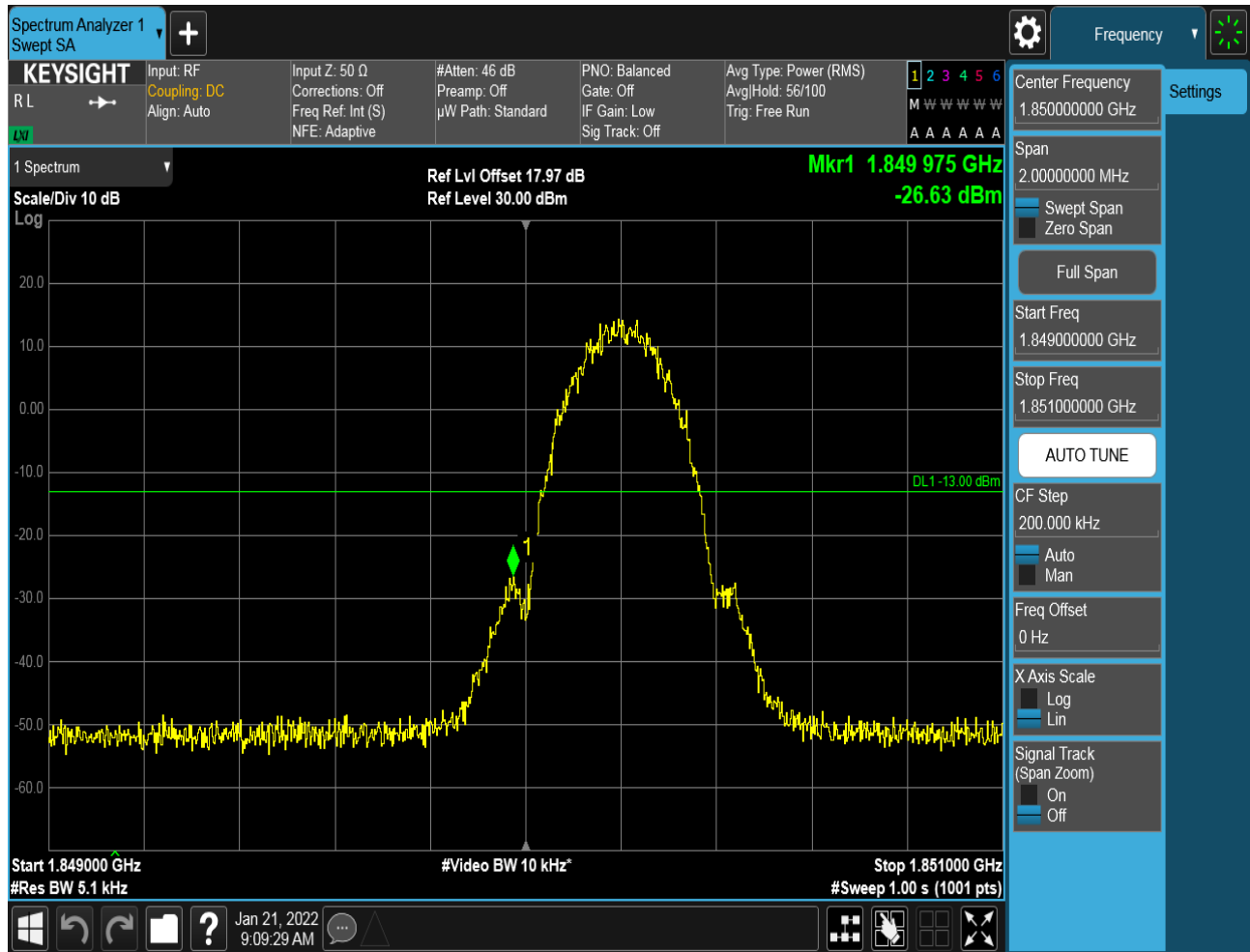
5.1.2.1.2 Test Channel = HCH





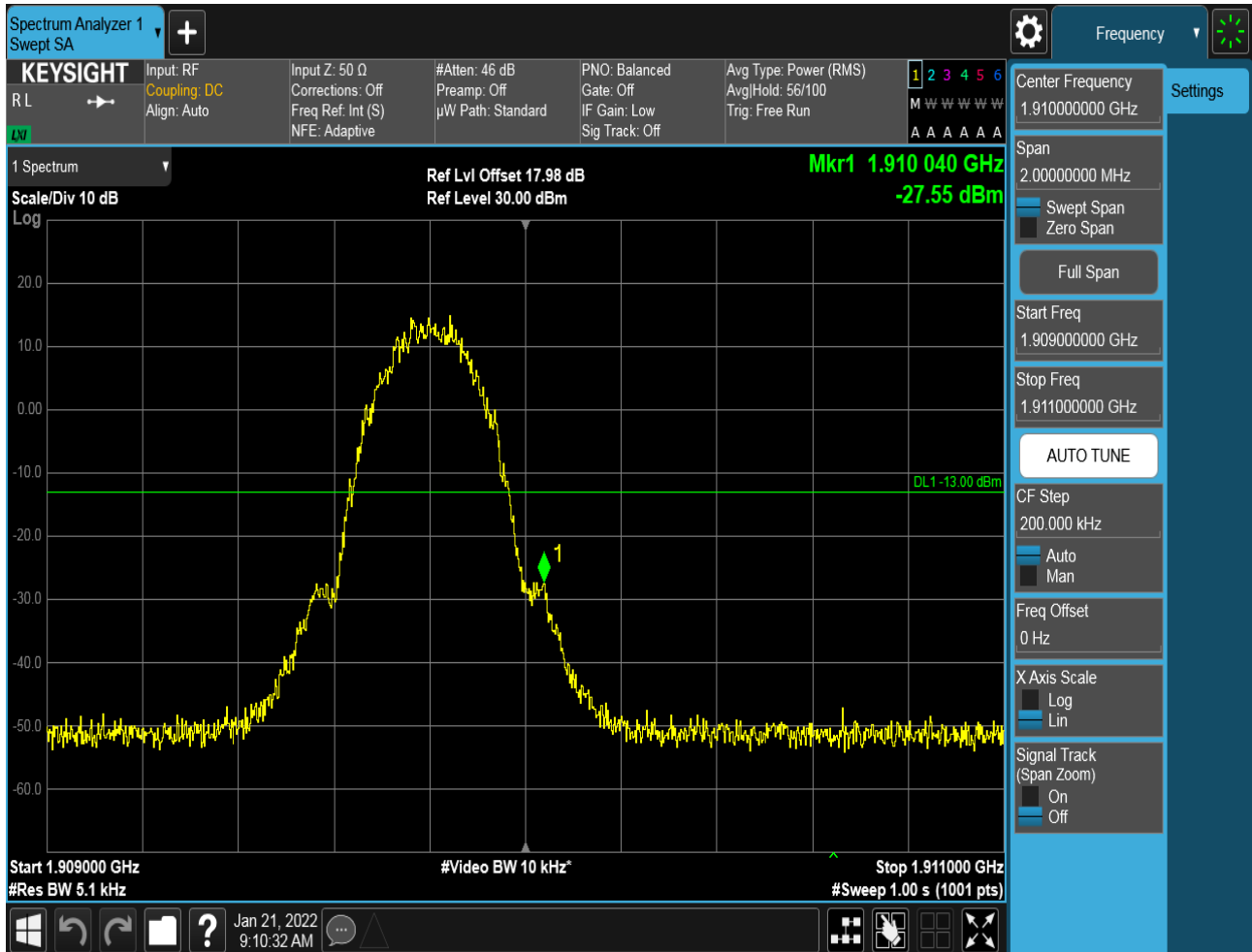
5.1.2.2 Test Mode = GSM/TM2

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.

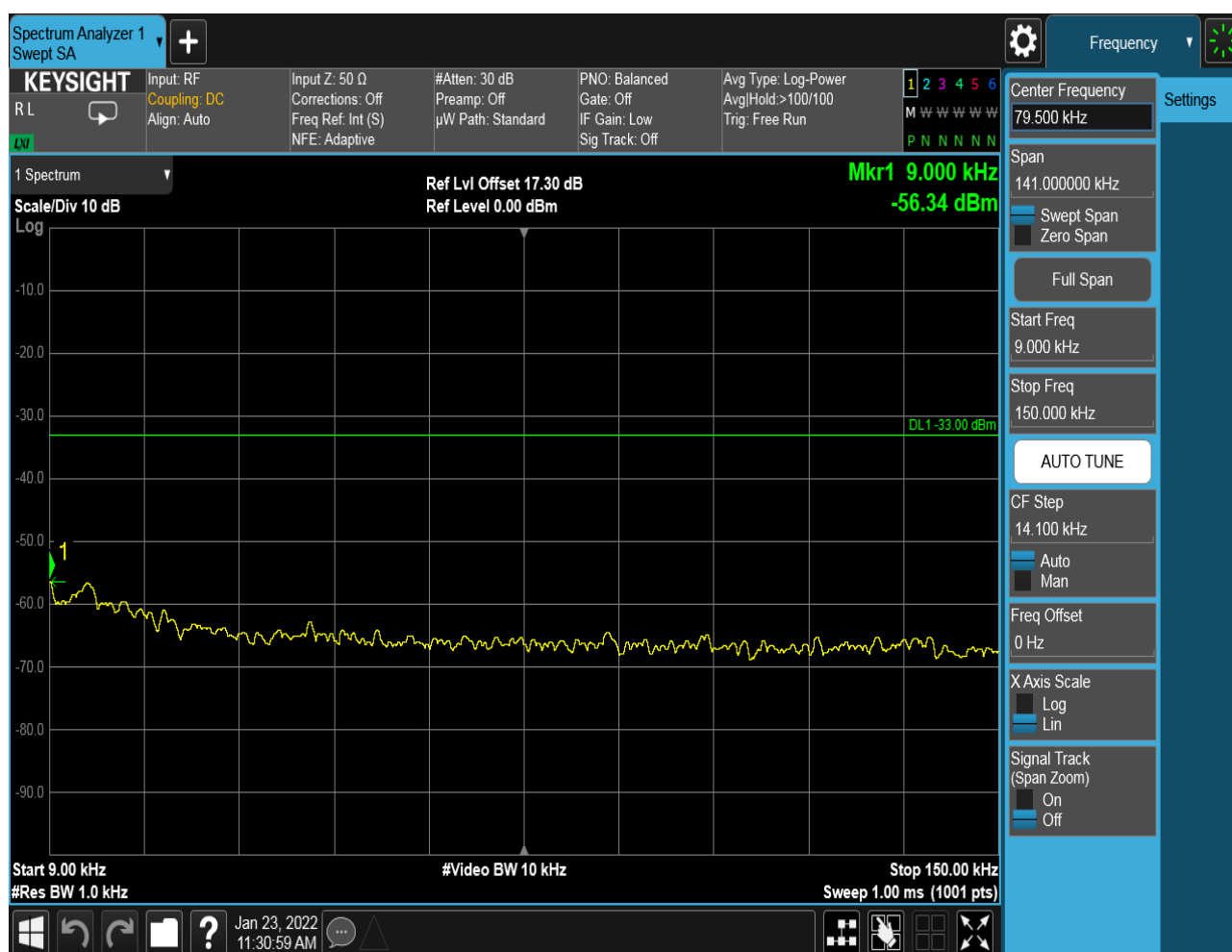
Part I - Test Plots

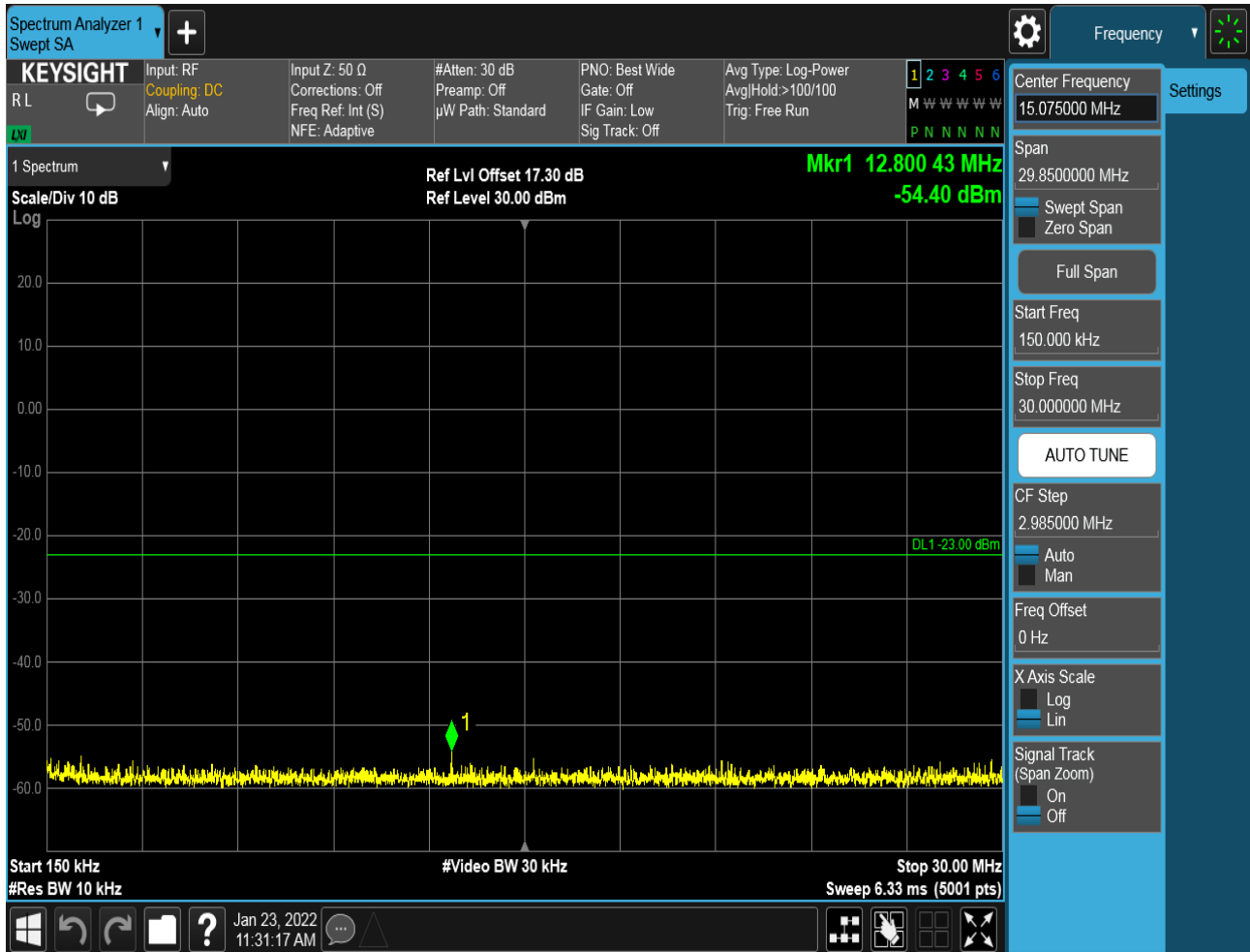
6.1 For GSM

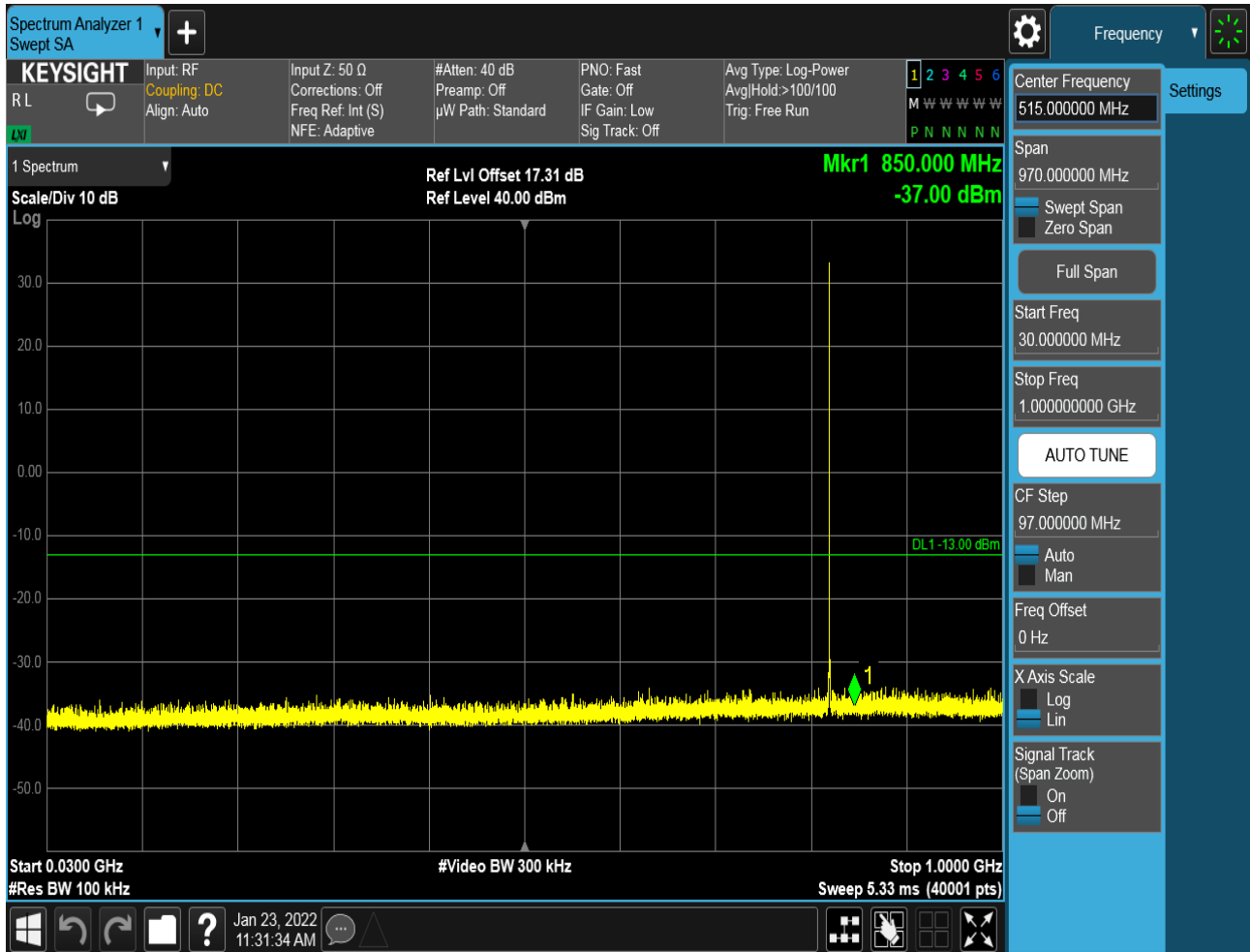
6.1.1 Test Band = GSM850

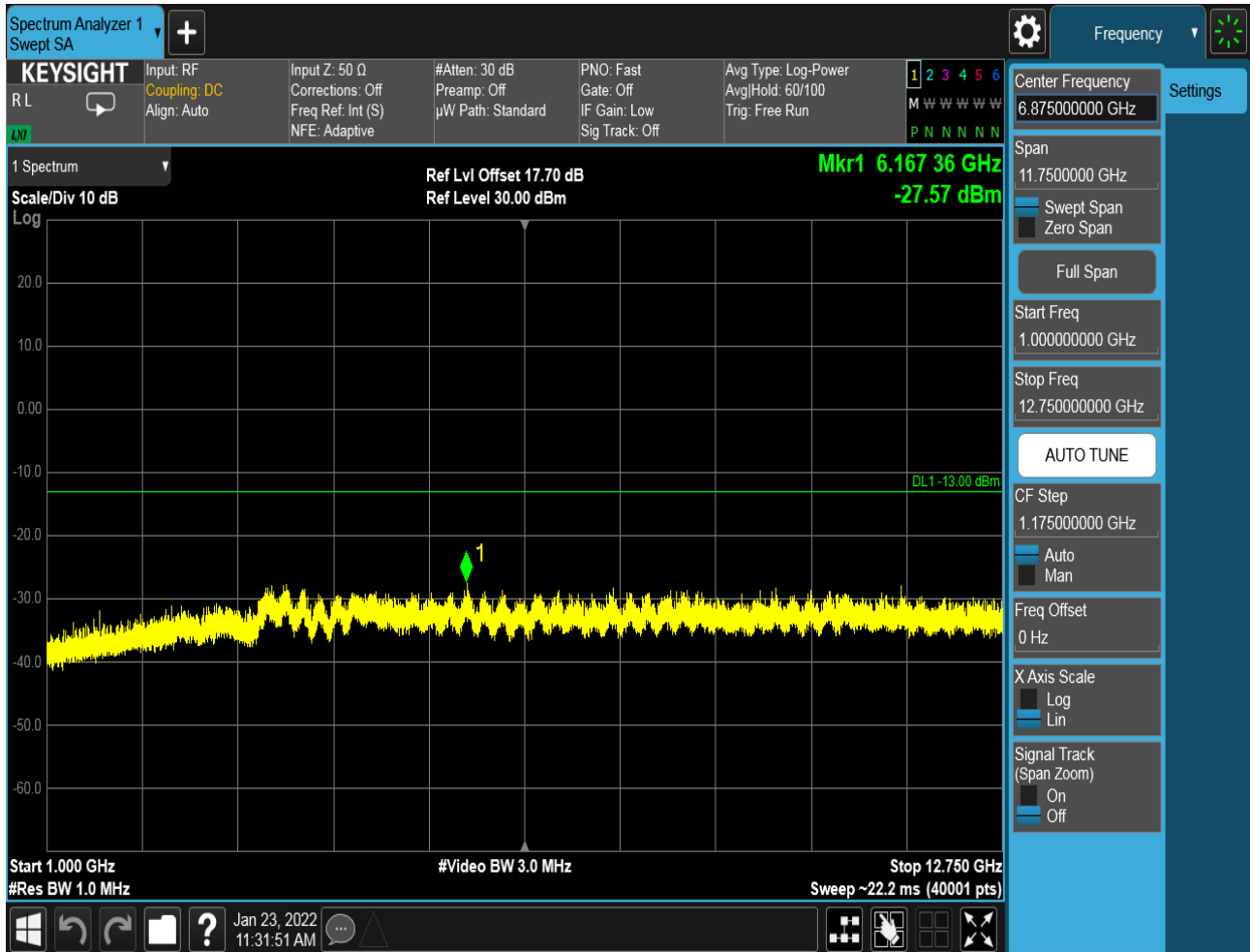
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH



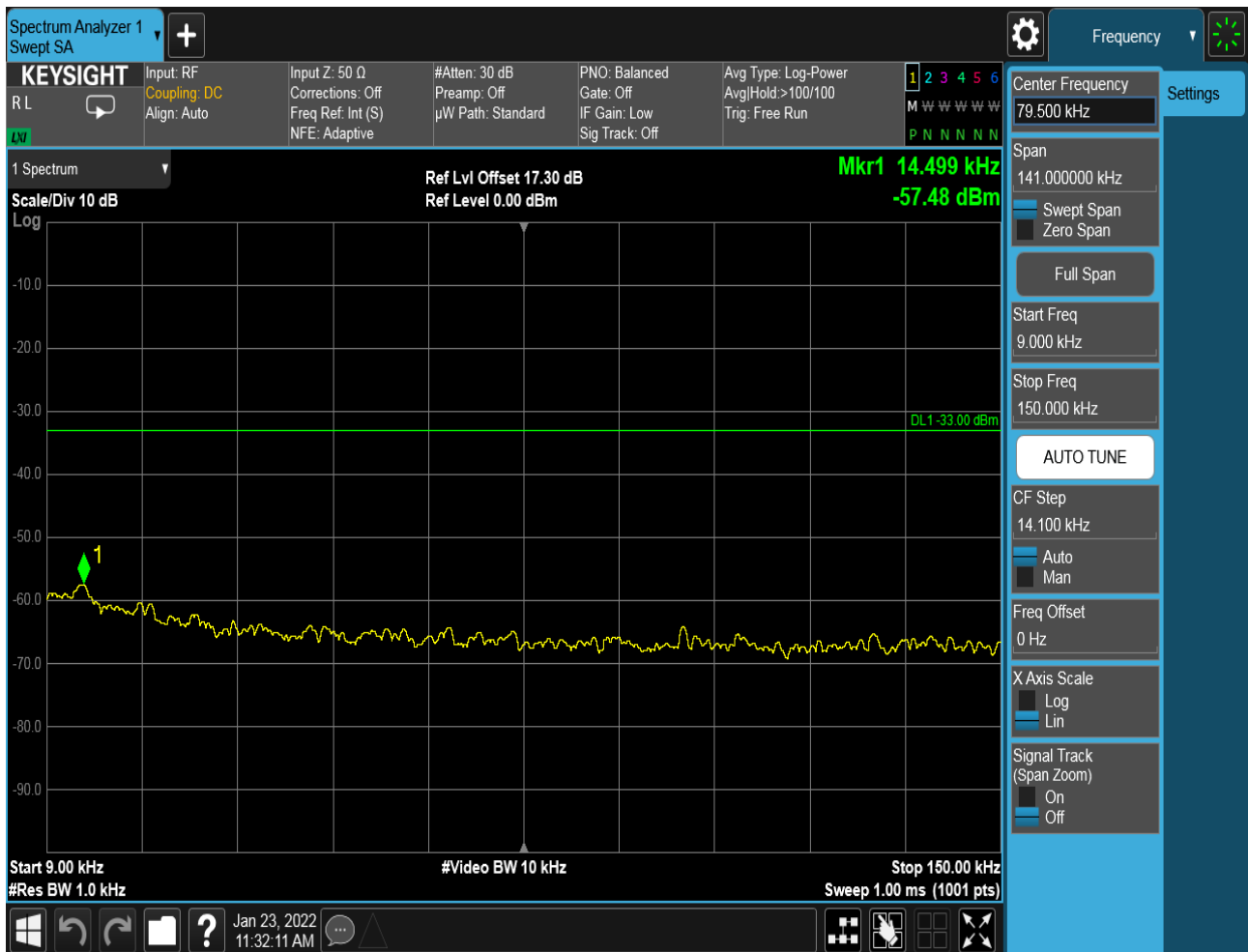


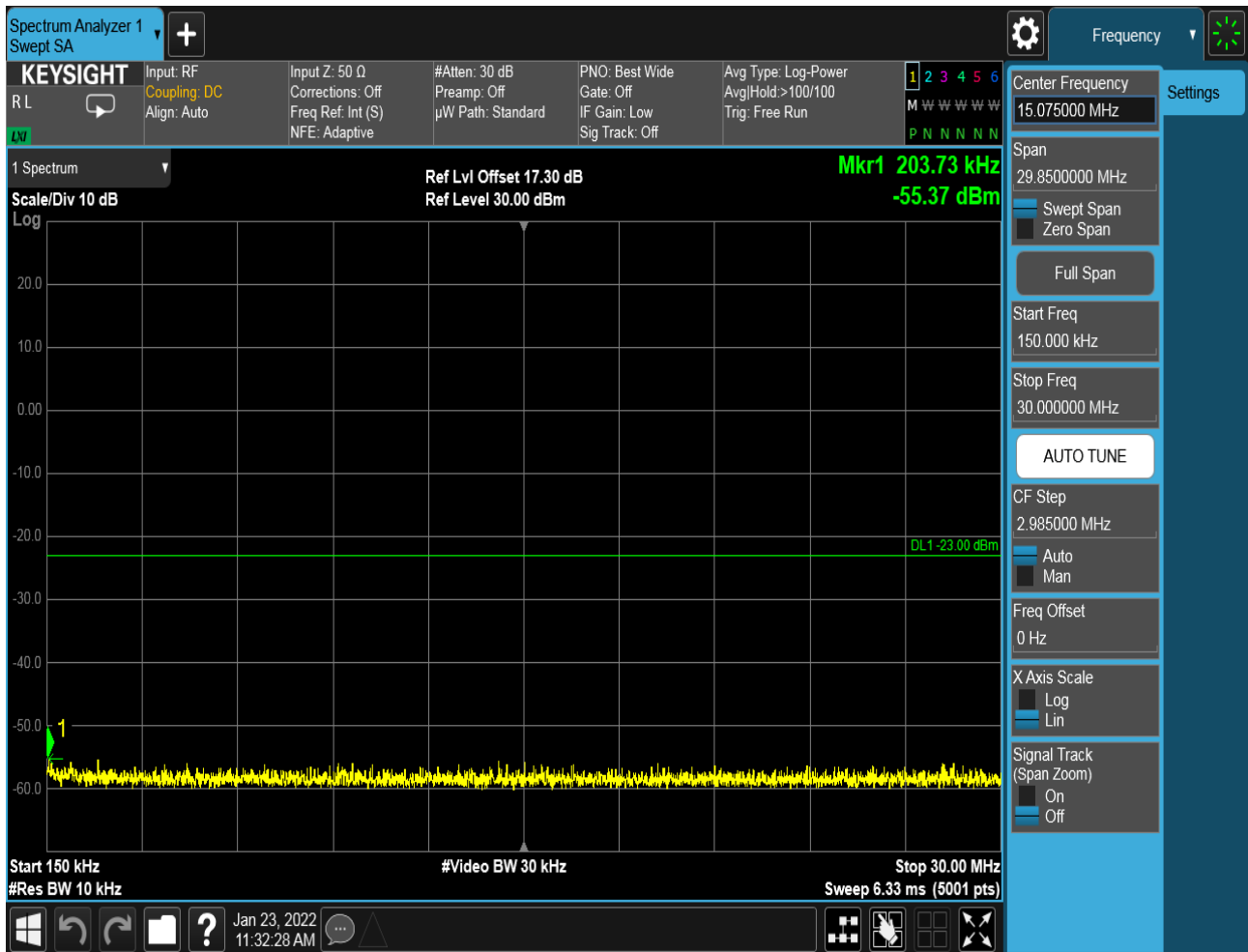


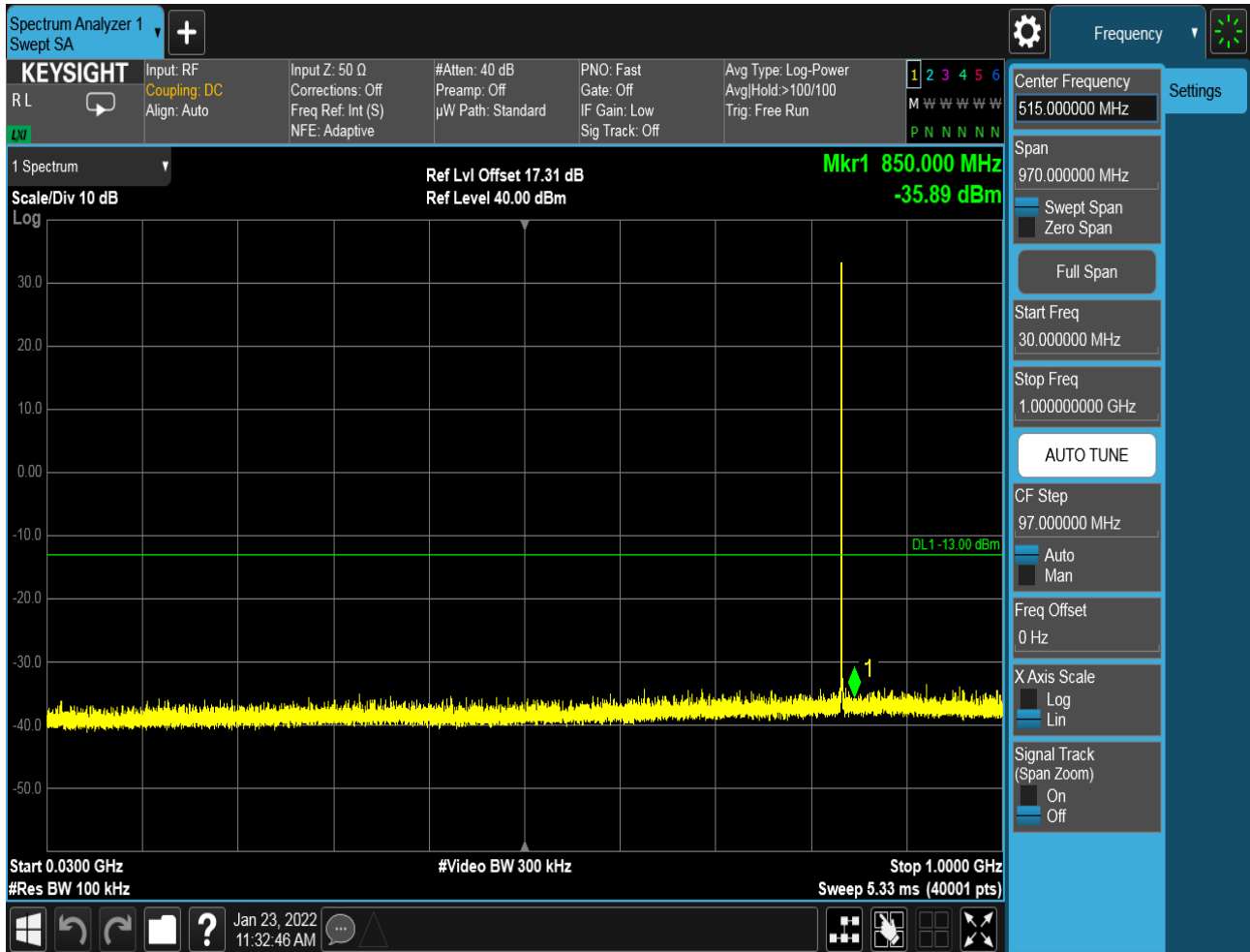


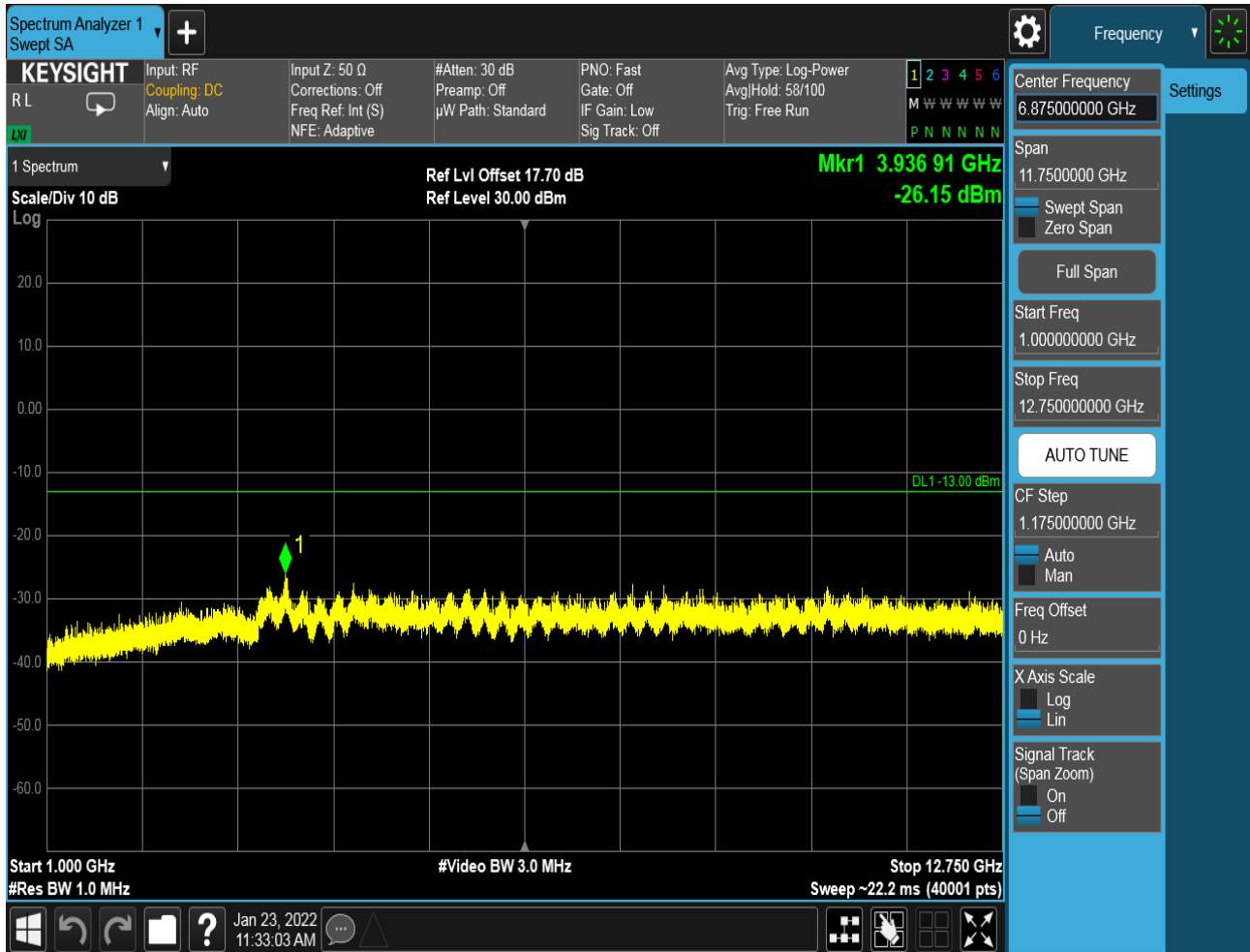


6.1.1.1.2 Test Channel = MCH



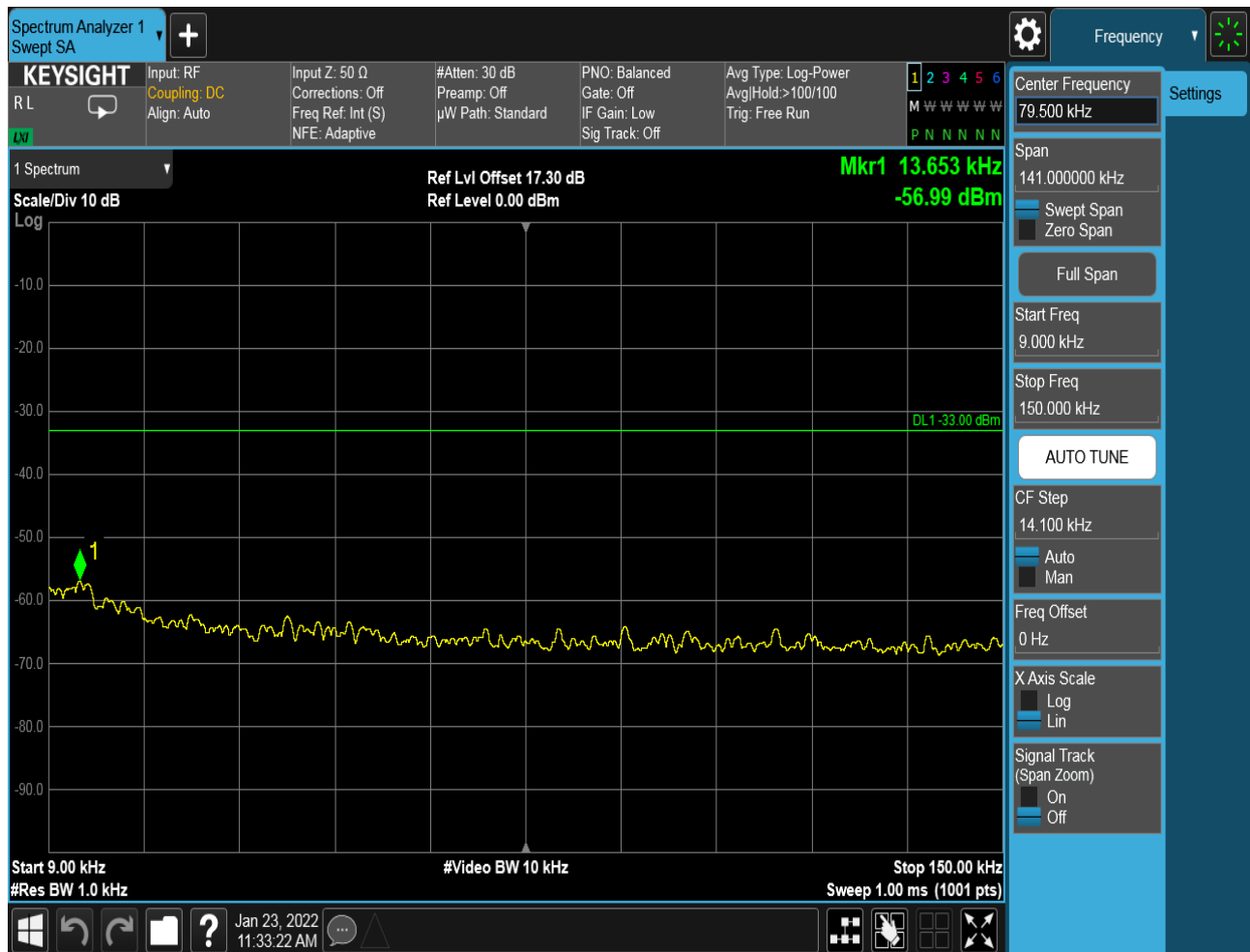


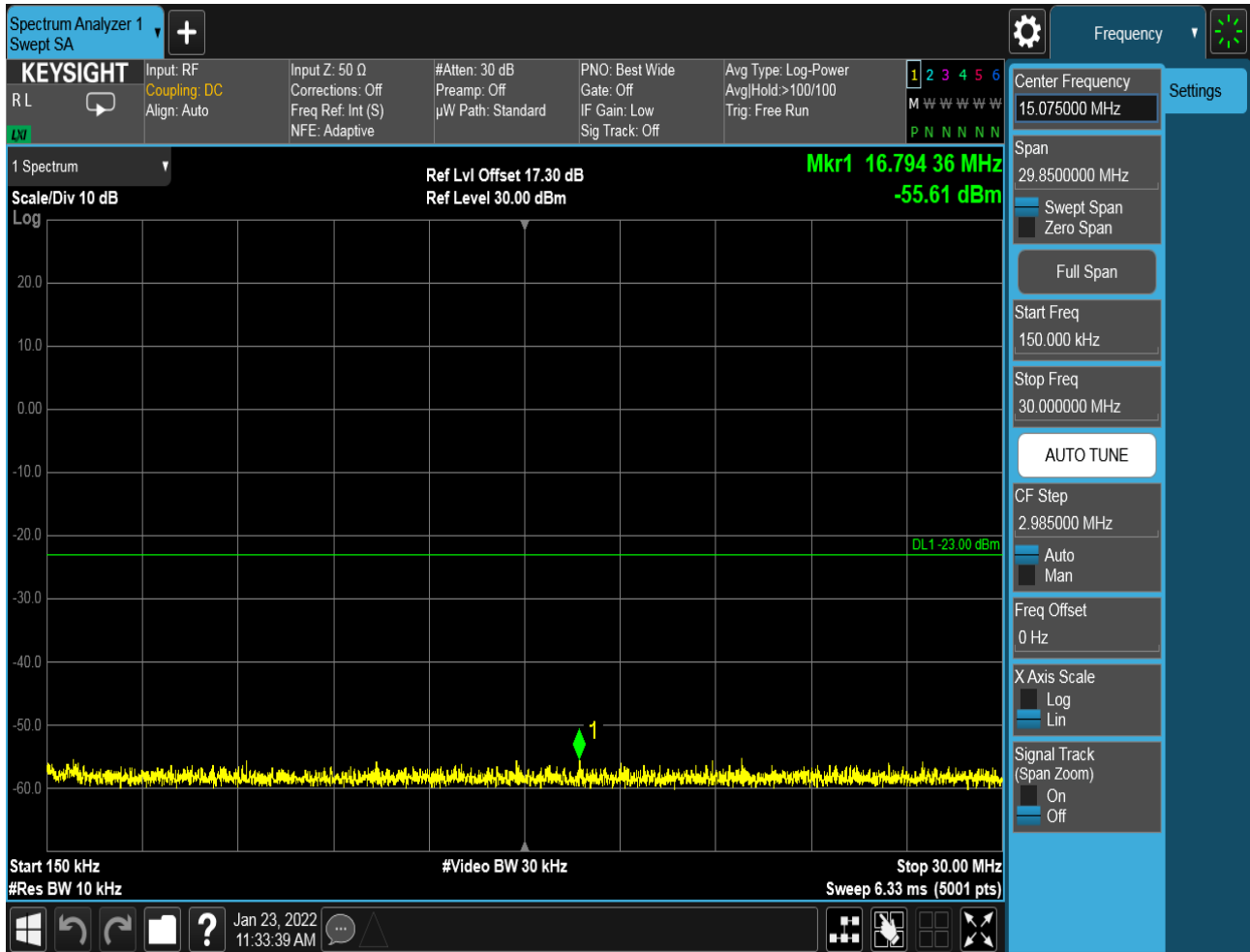


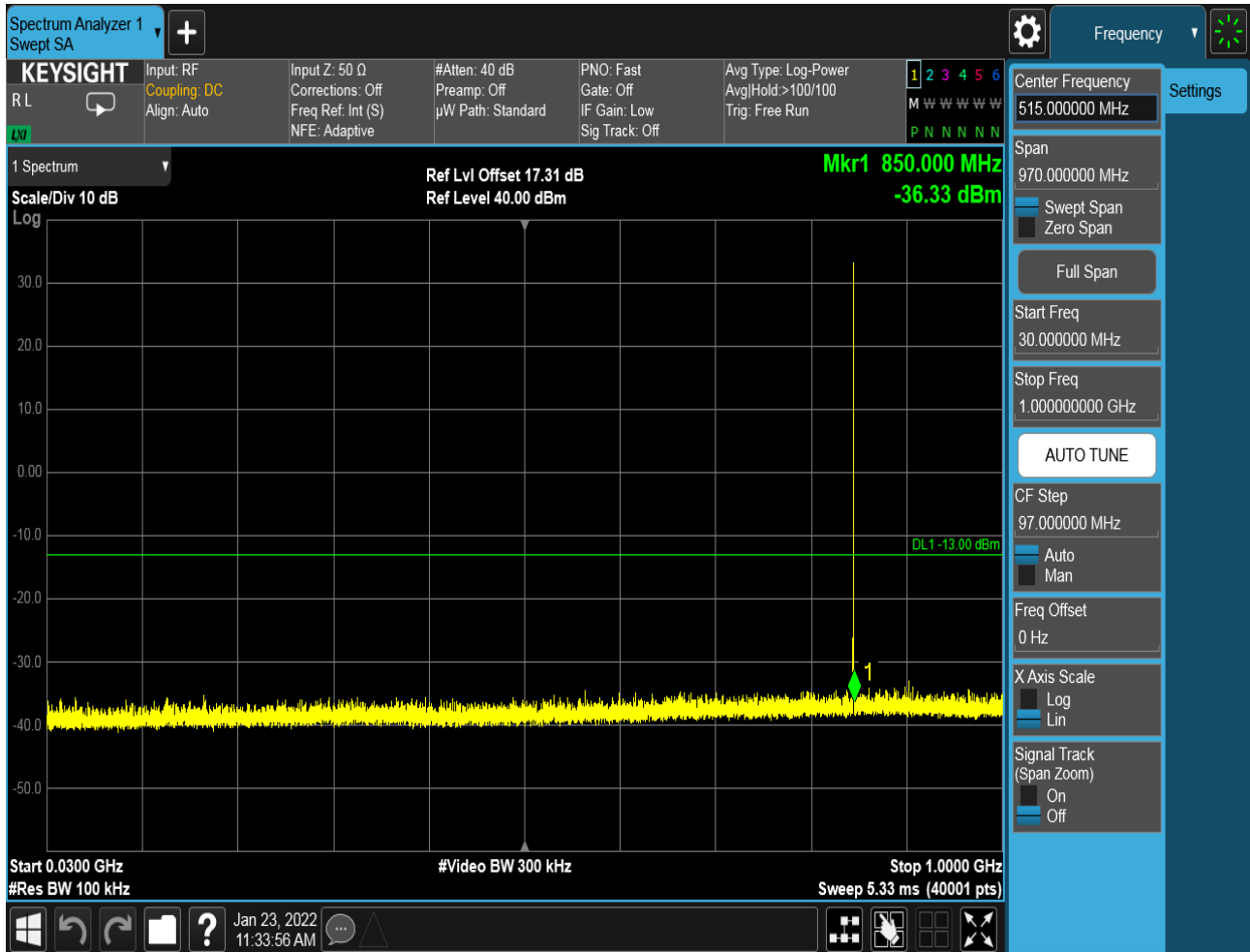


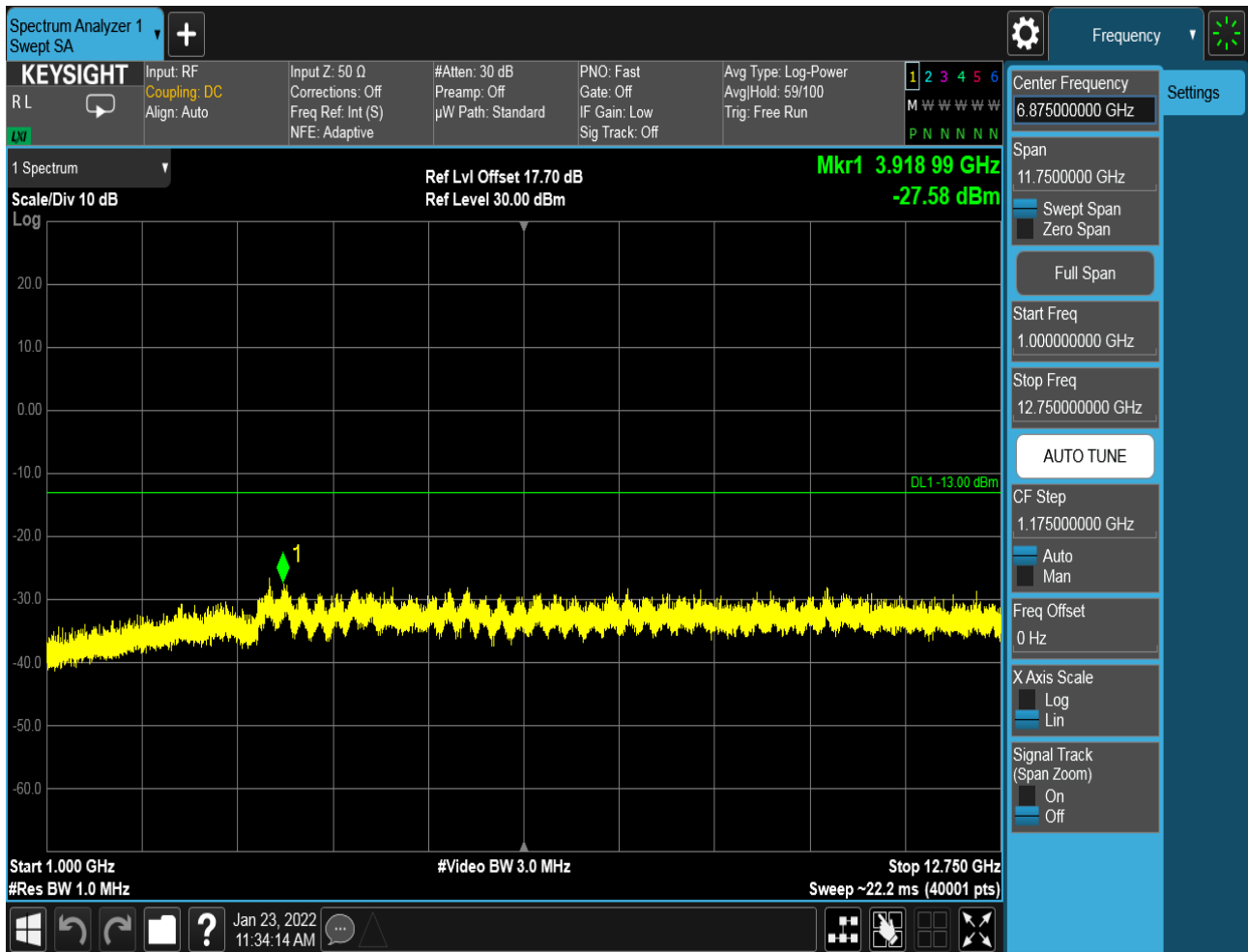


6.1.1.1.3 Test Channel = HCH





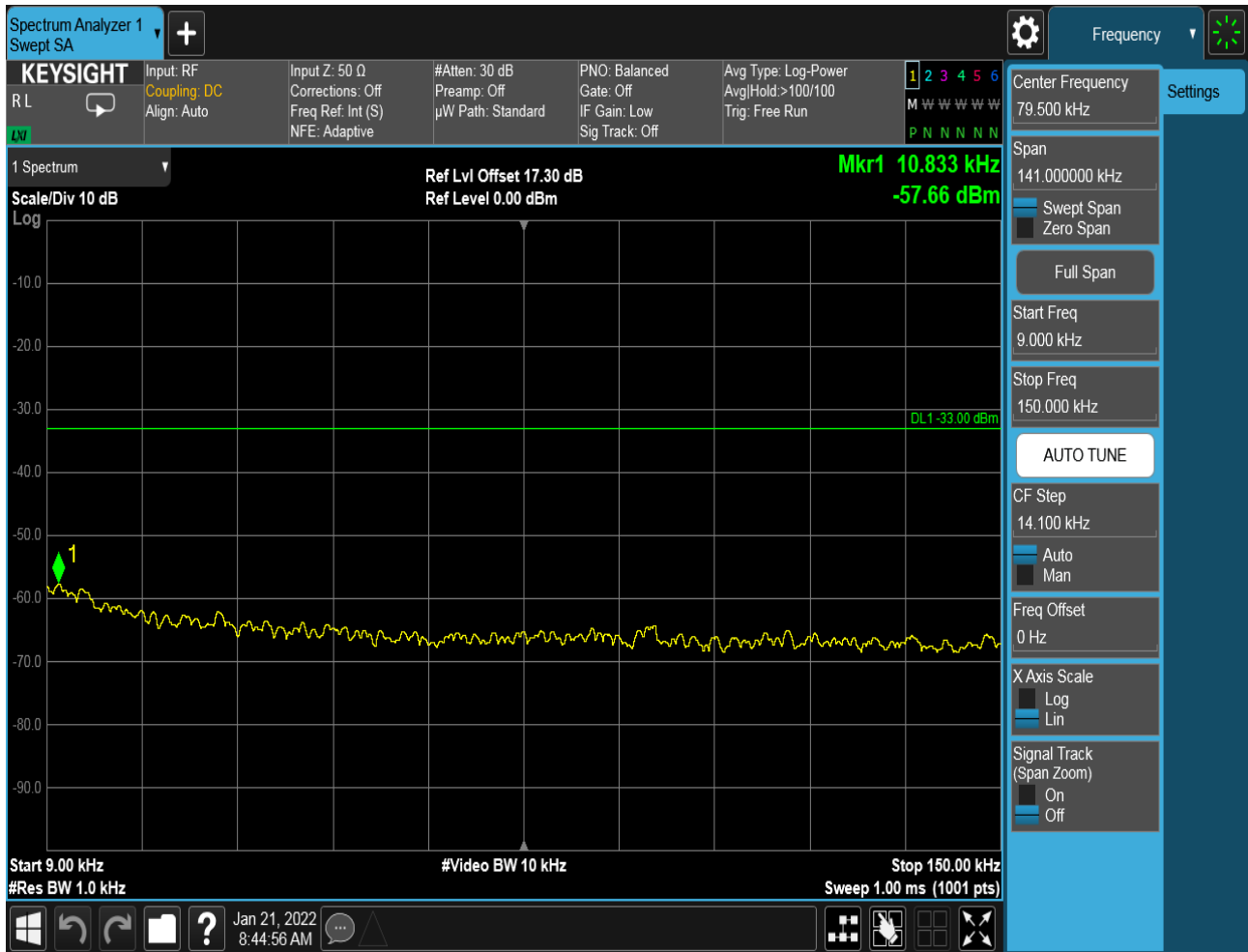


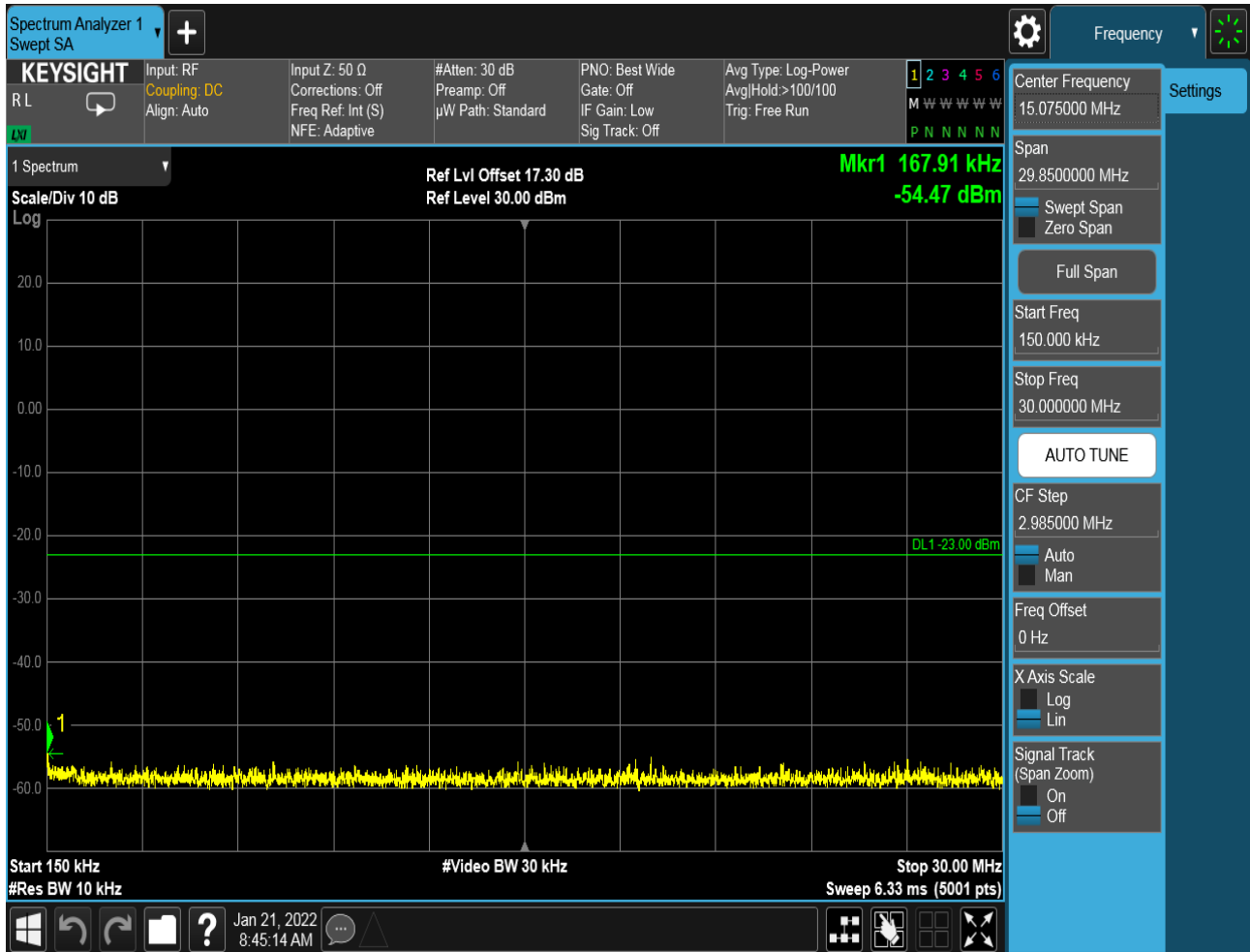


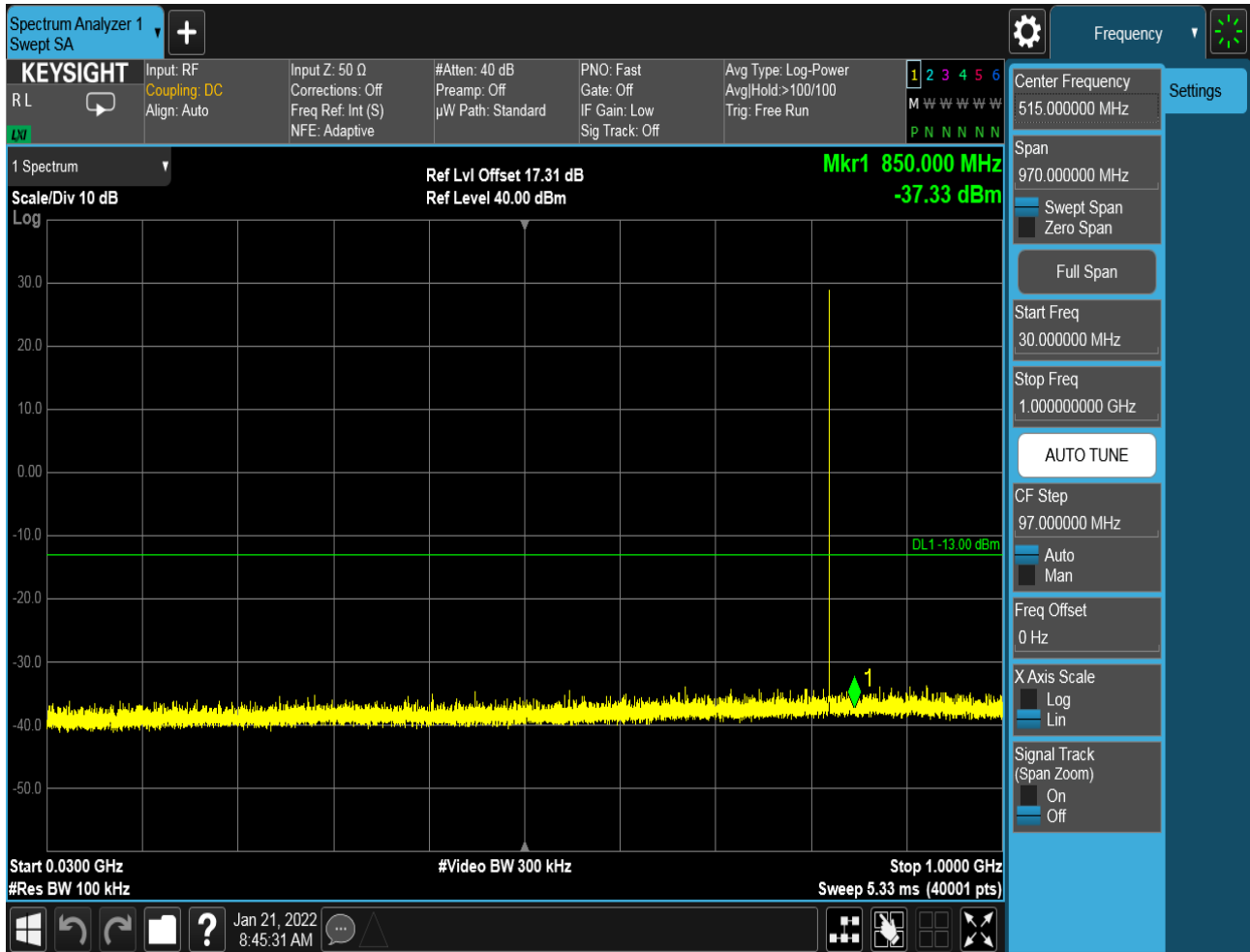


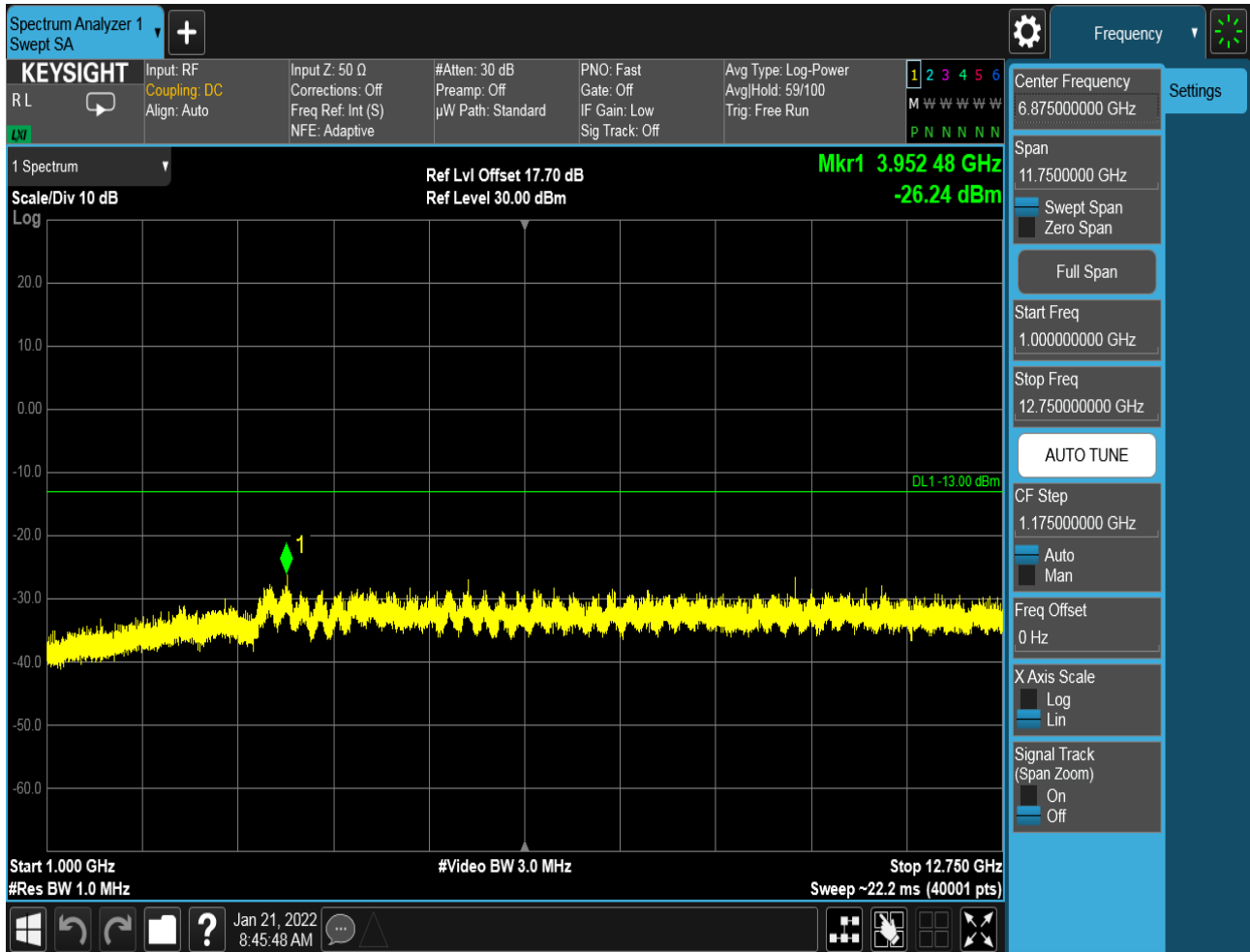
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH



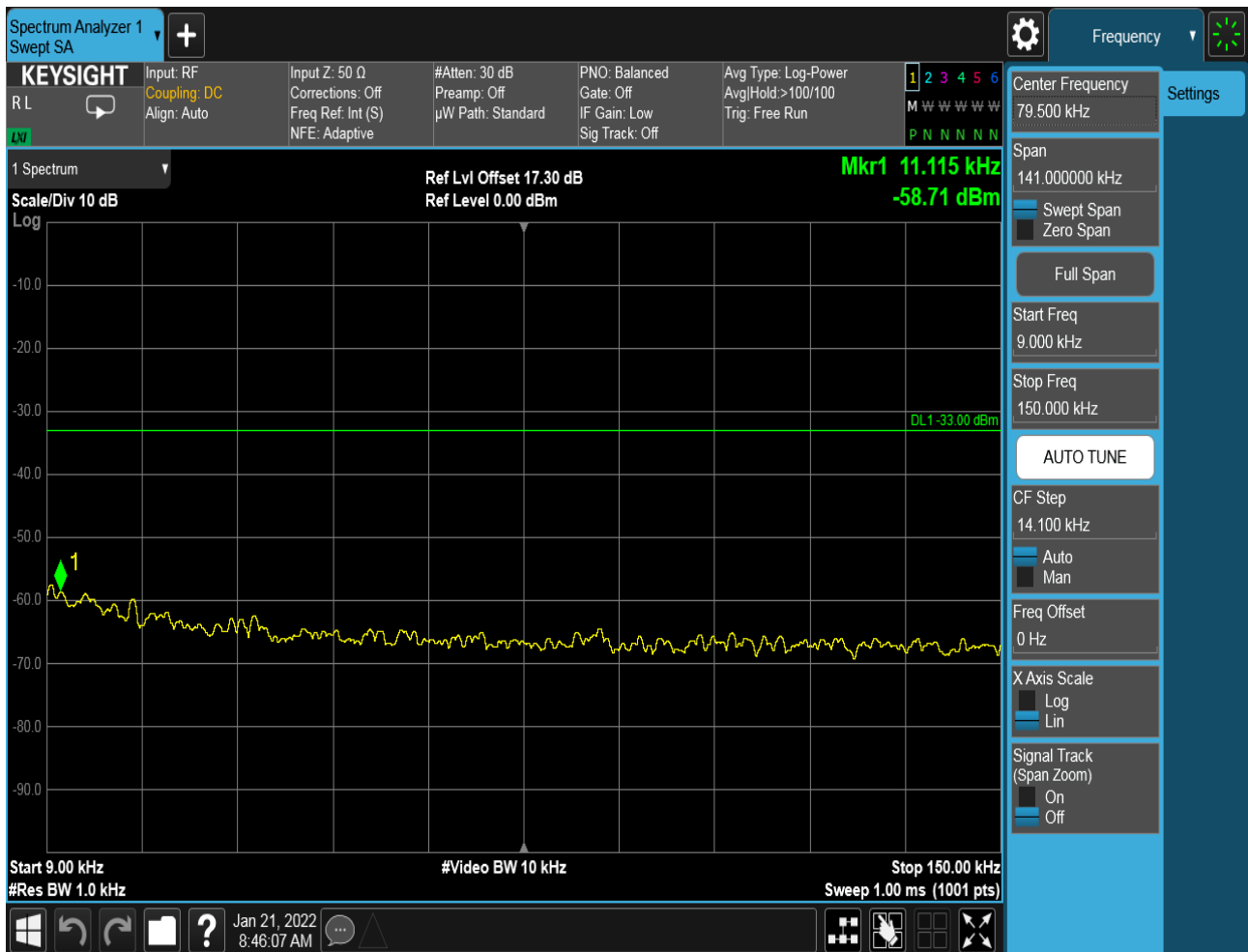


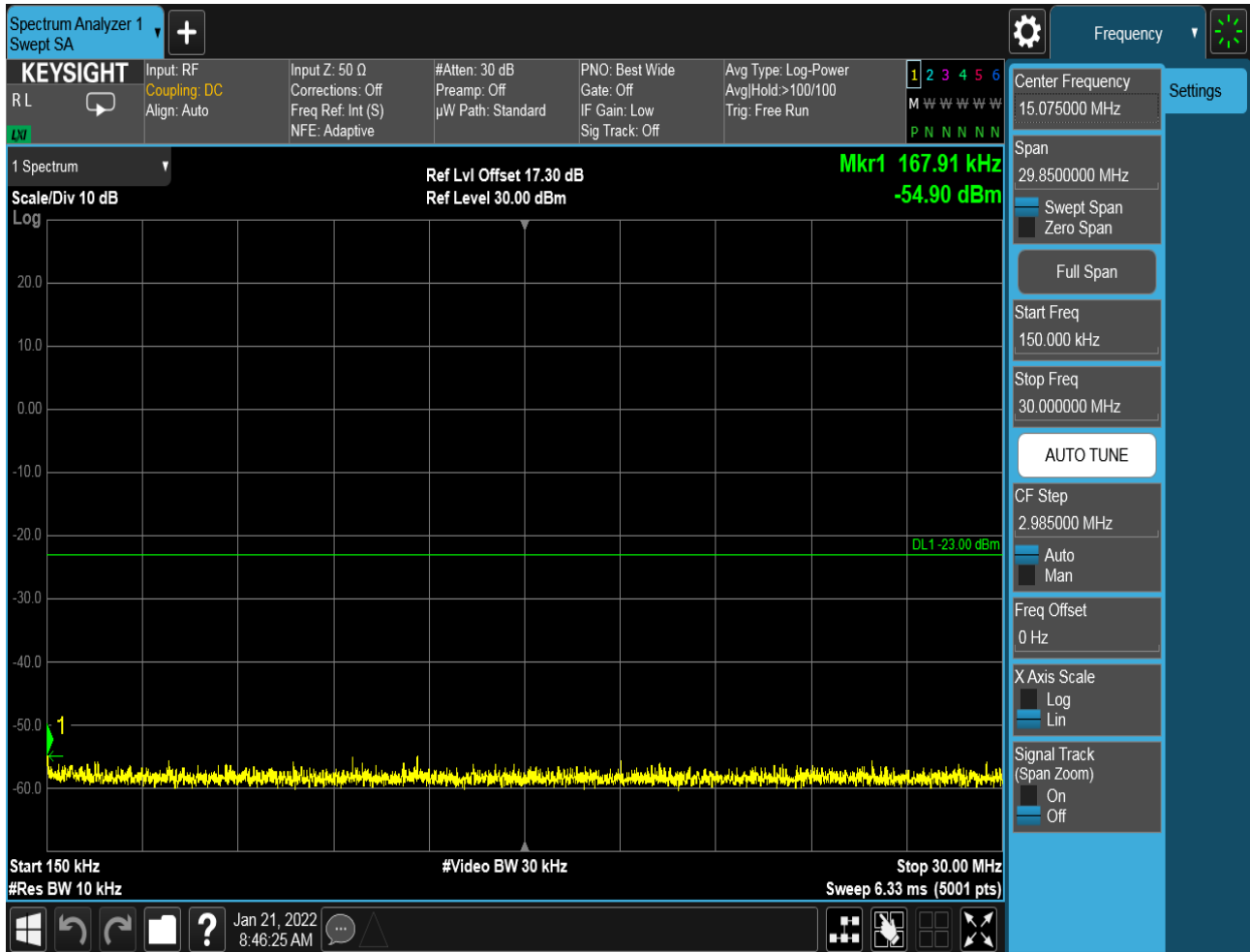


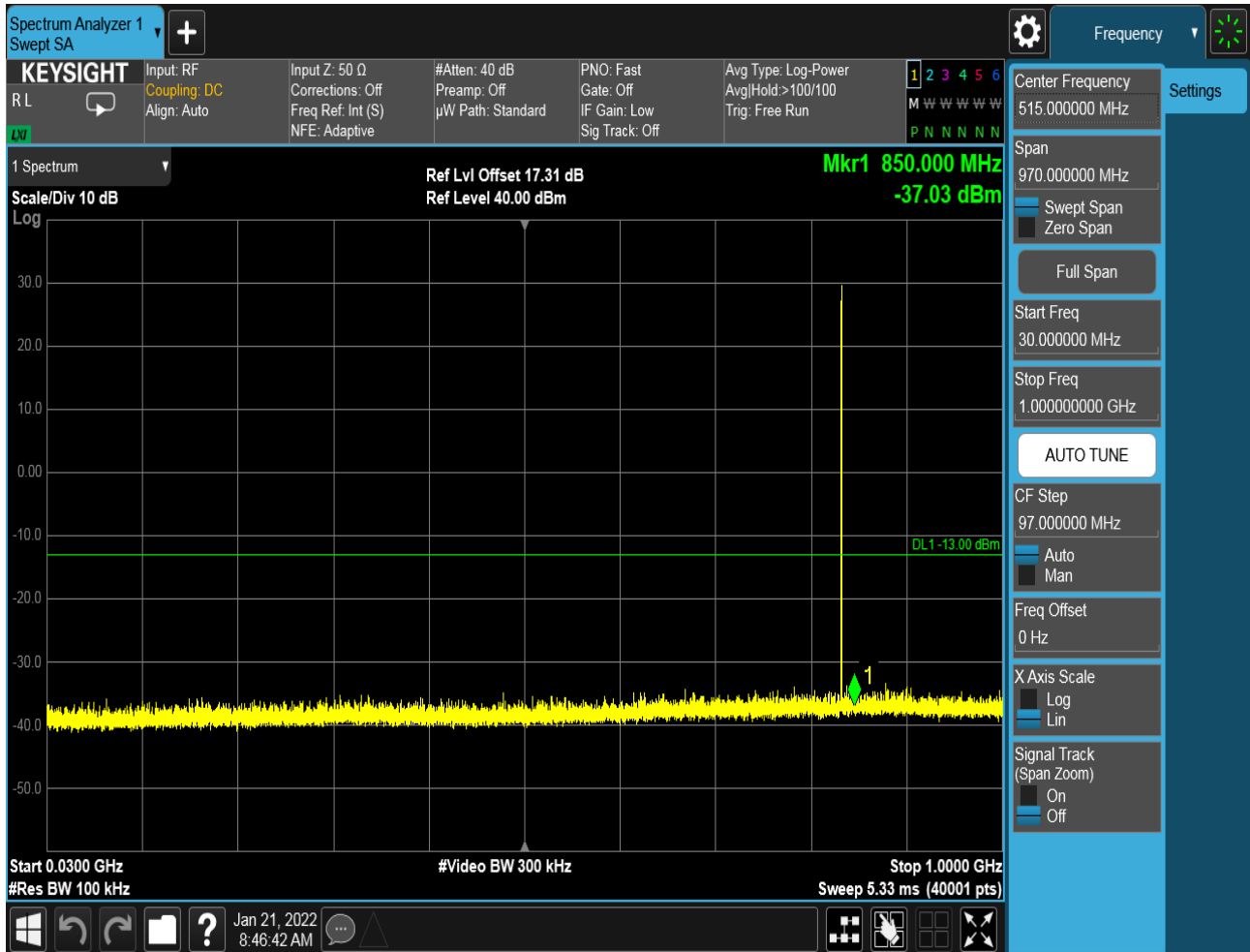


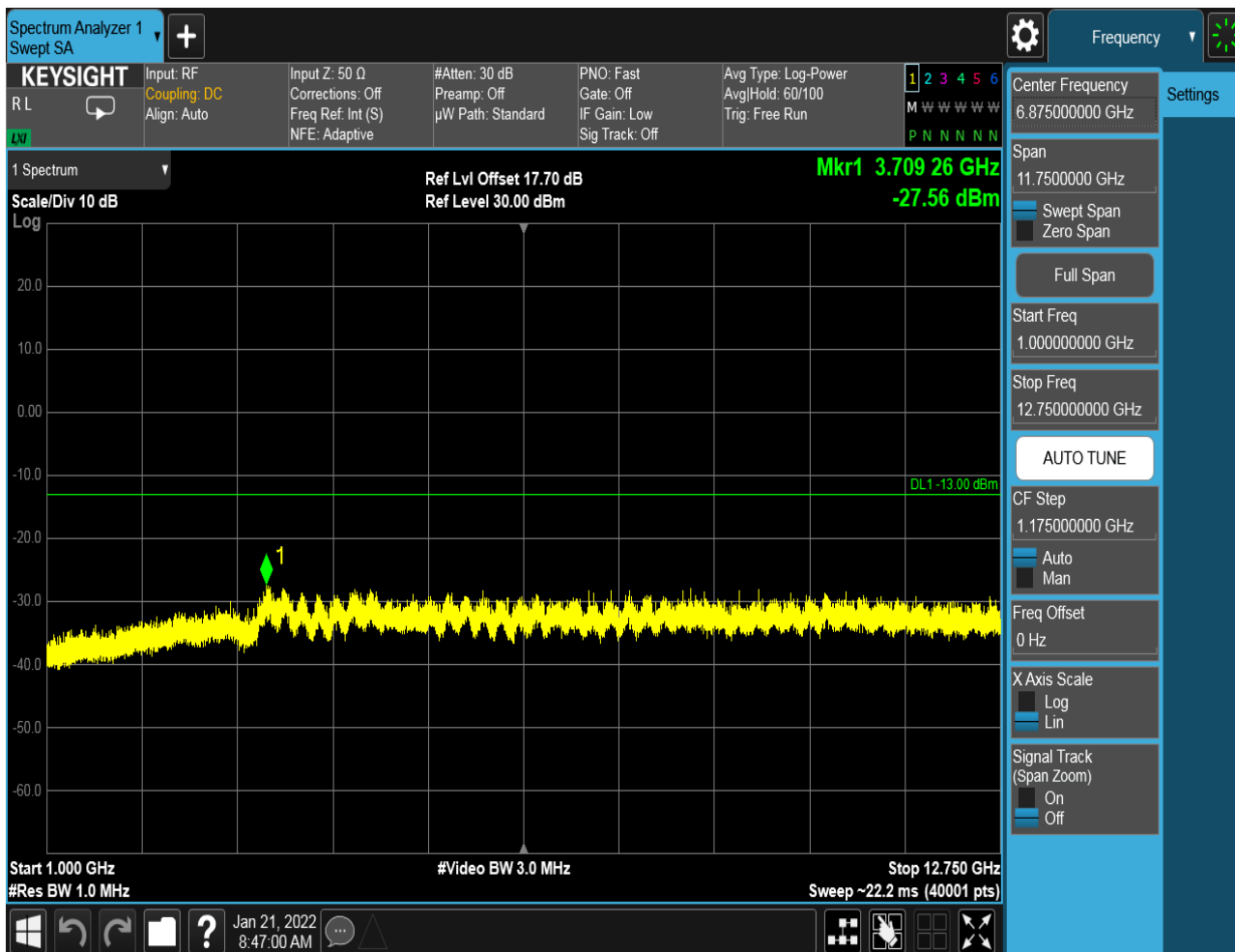


6.1.1.2.2 Test Channel = MCH



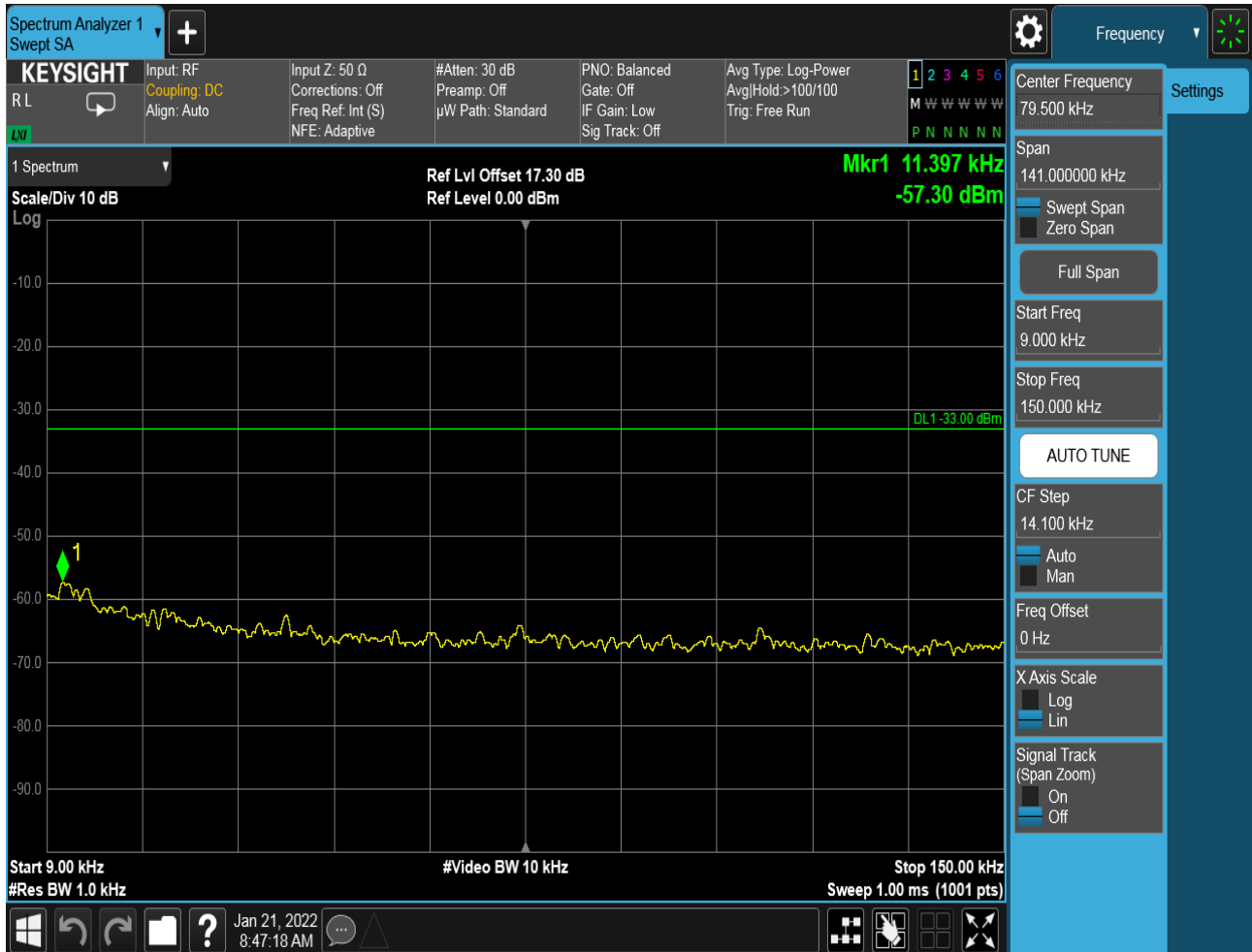


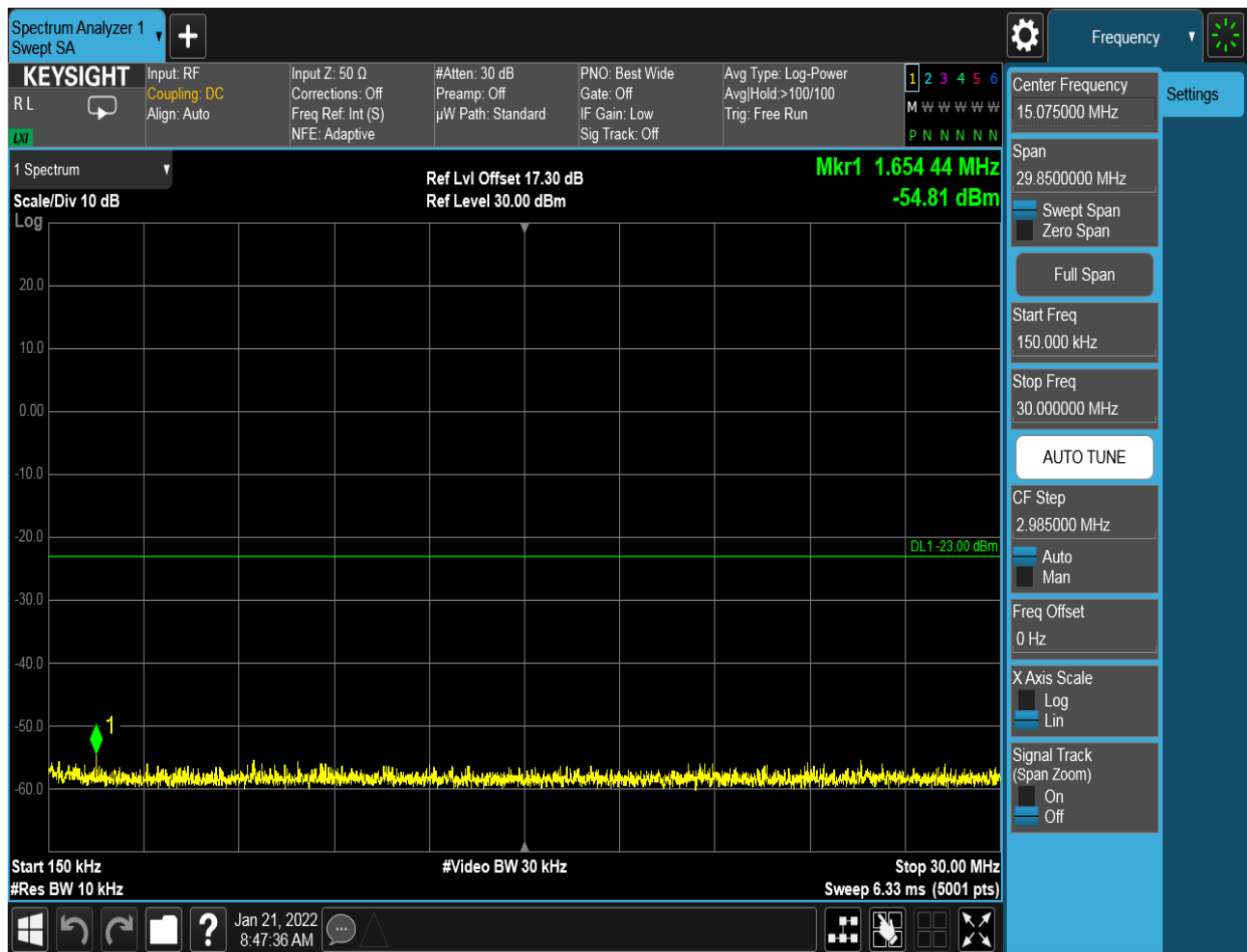


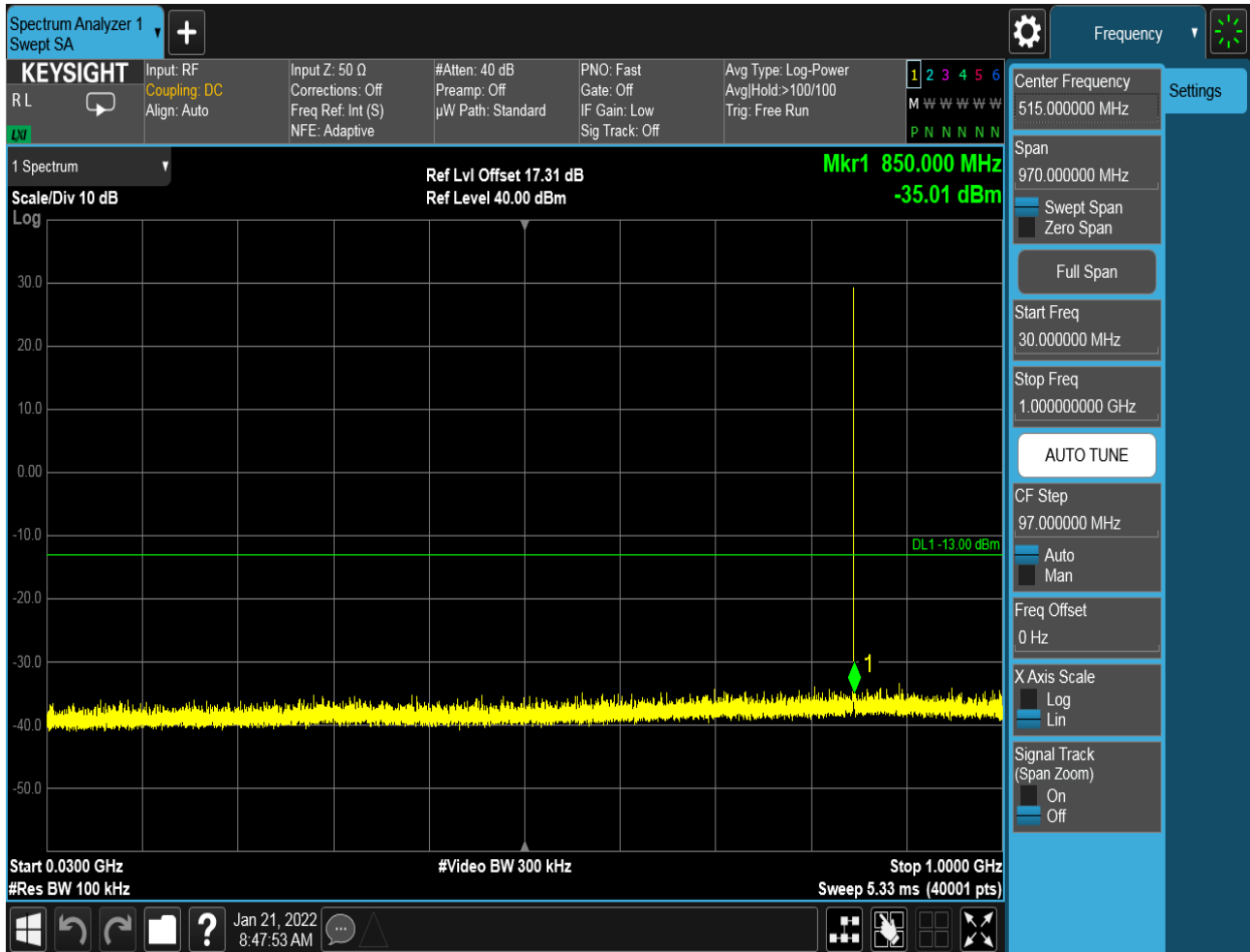


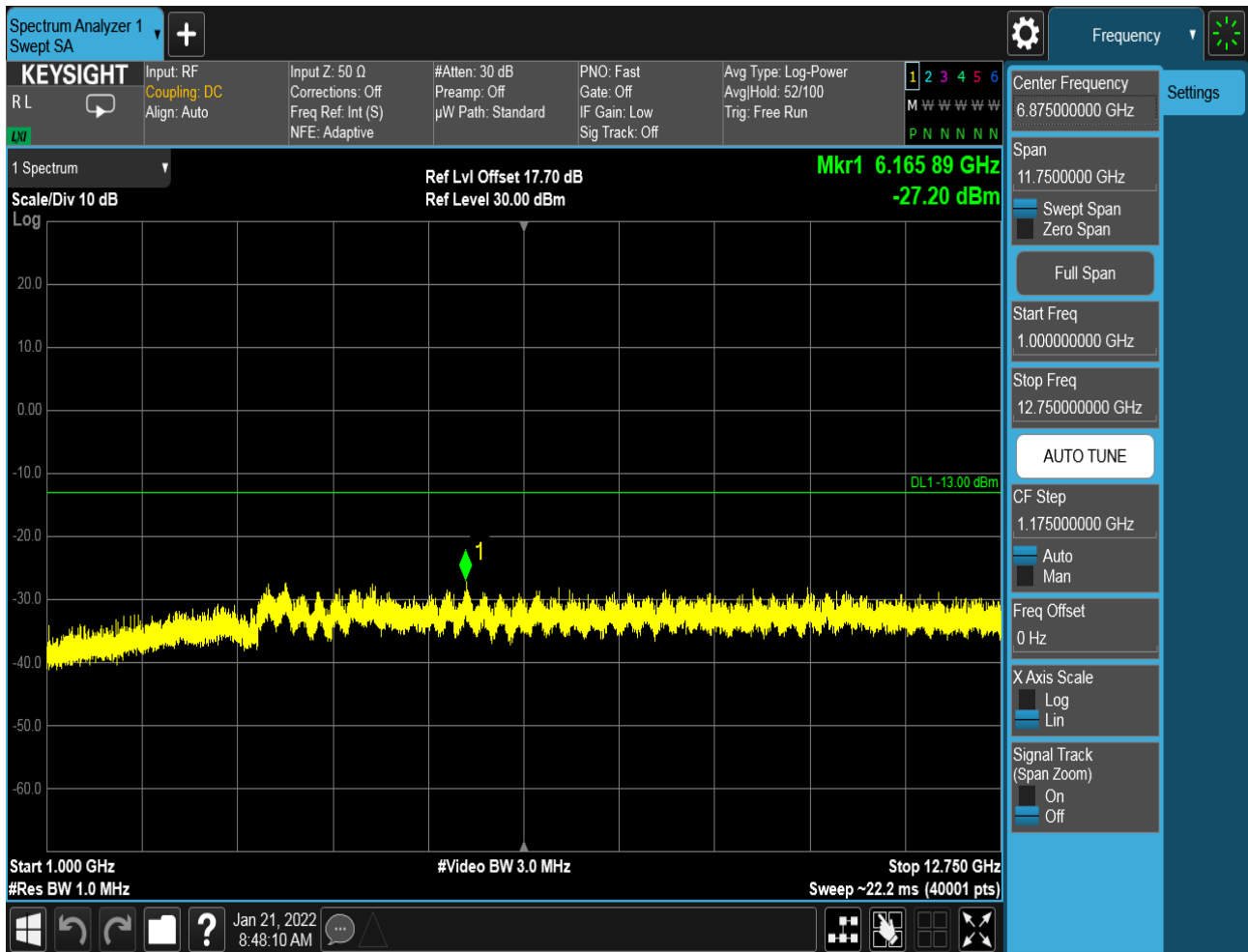


6.1.1.2.3 Test Channel = HCH







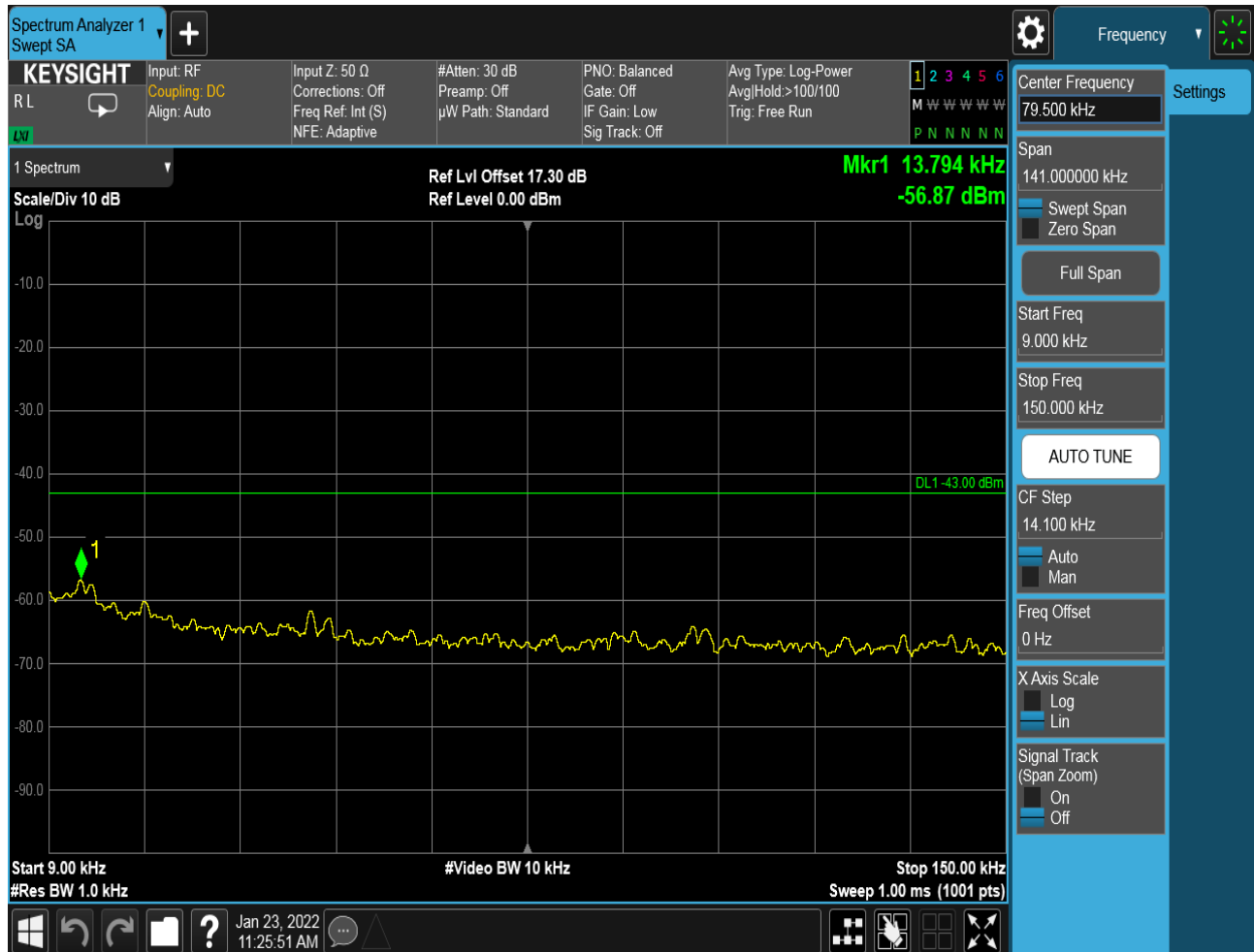


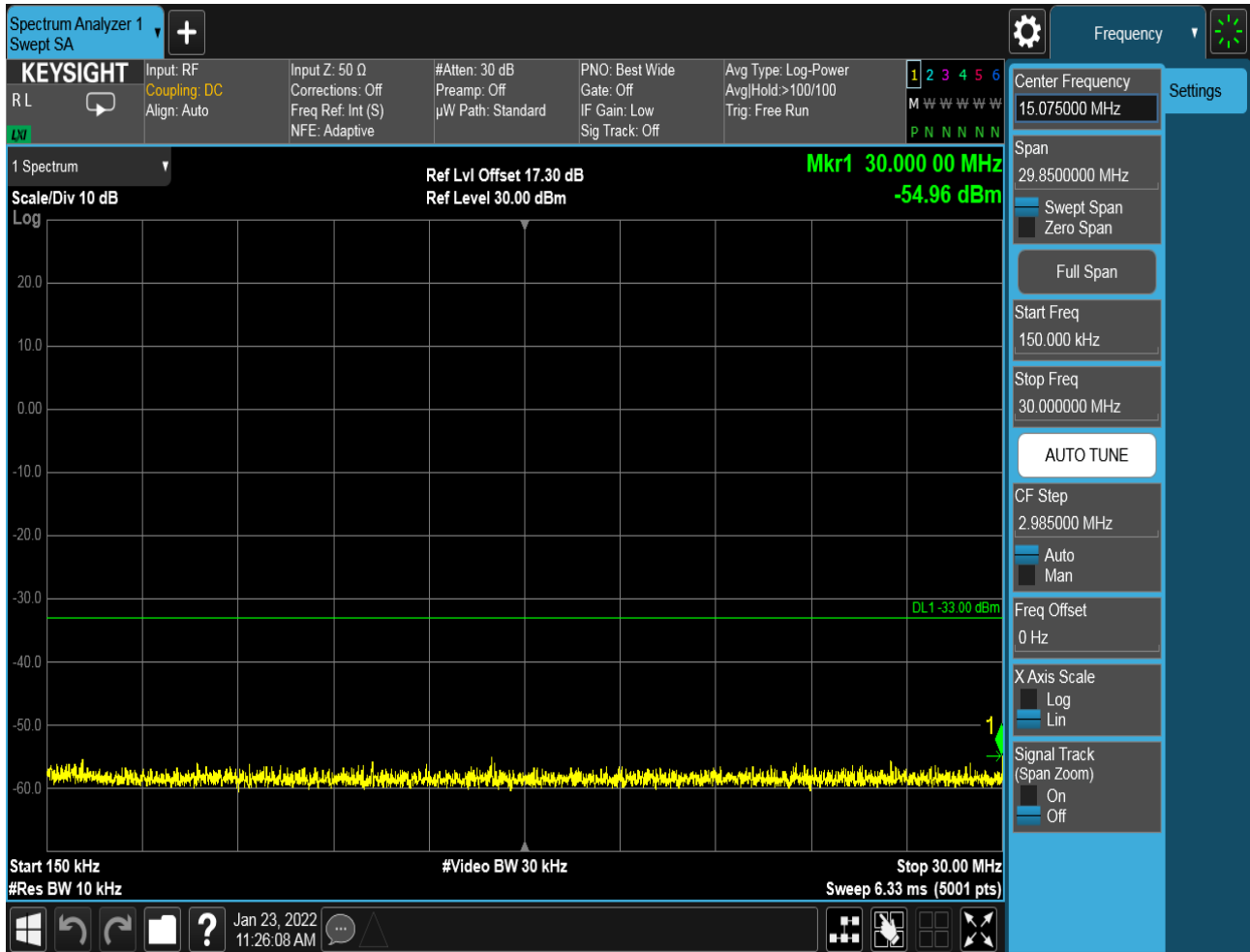


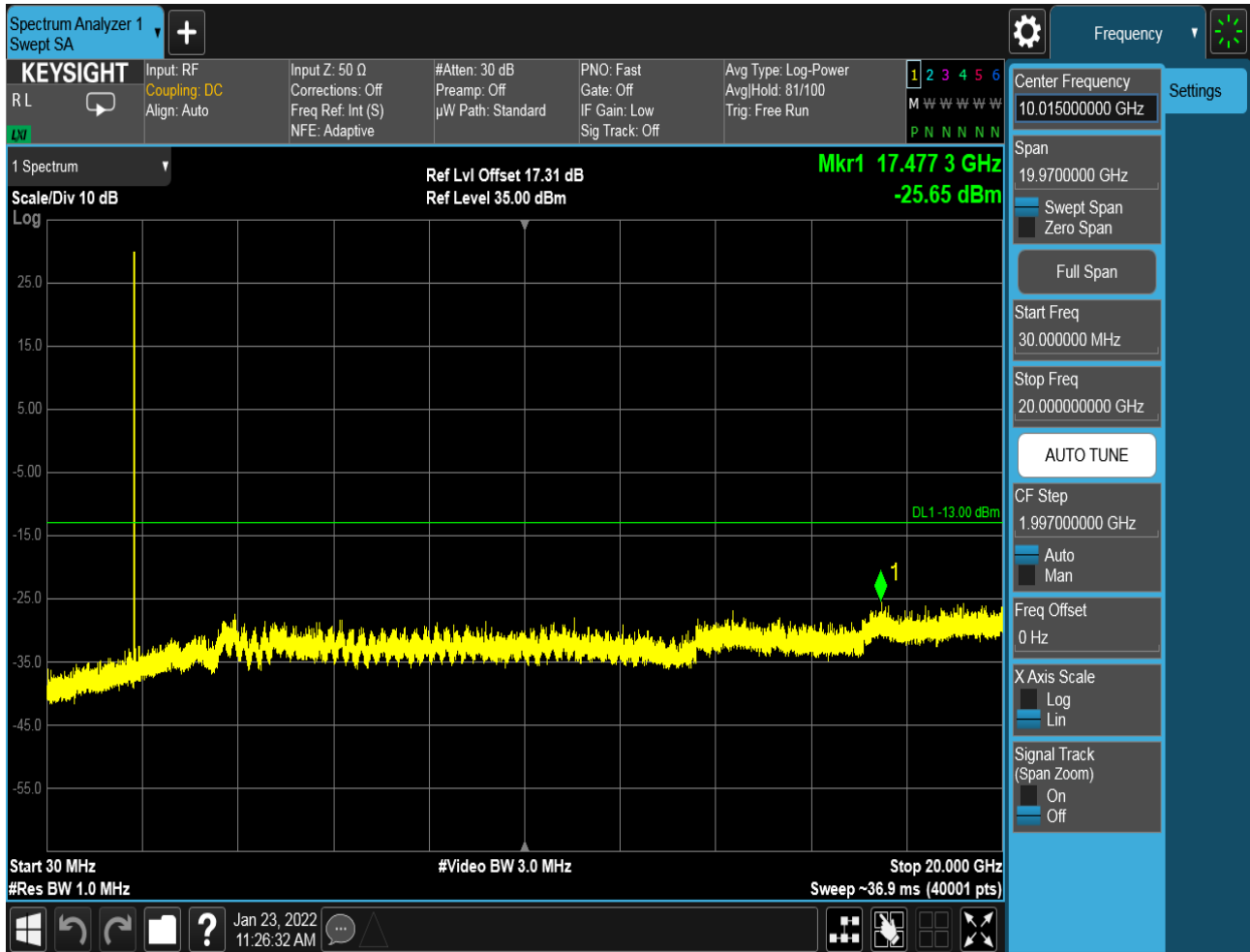
6.1.2 Test Band = PCS1900

6.1.2.1 Test Mode = GSM/TM1

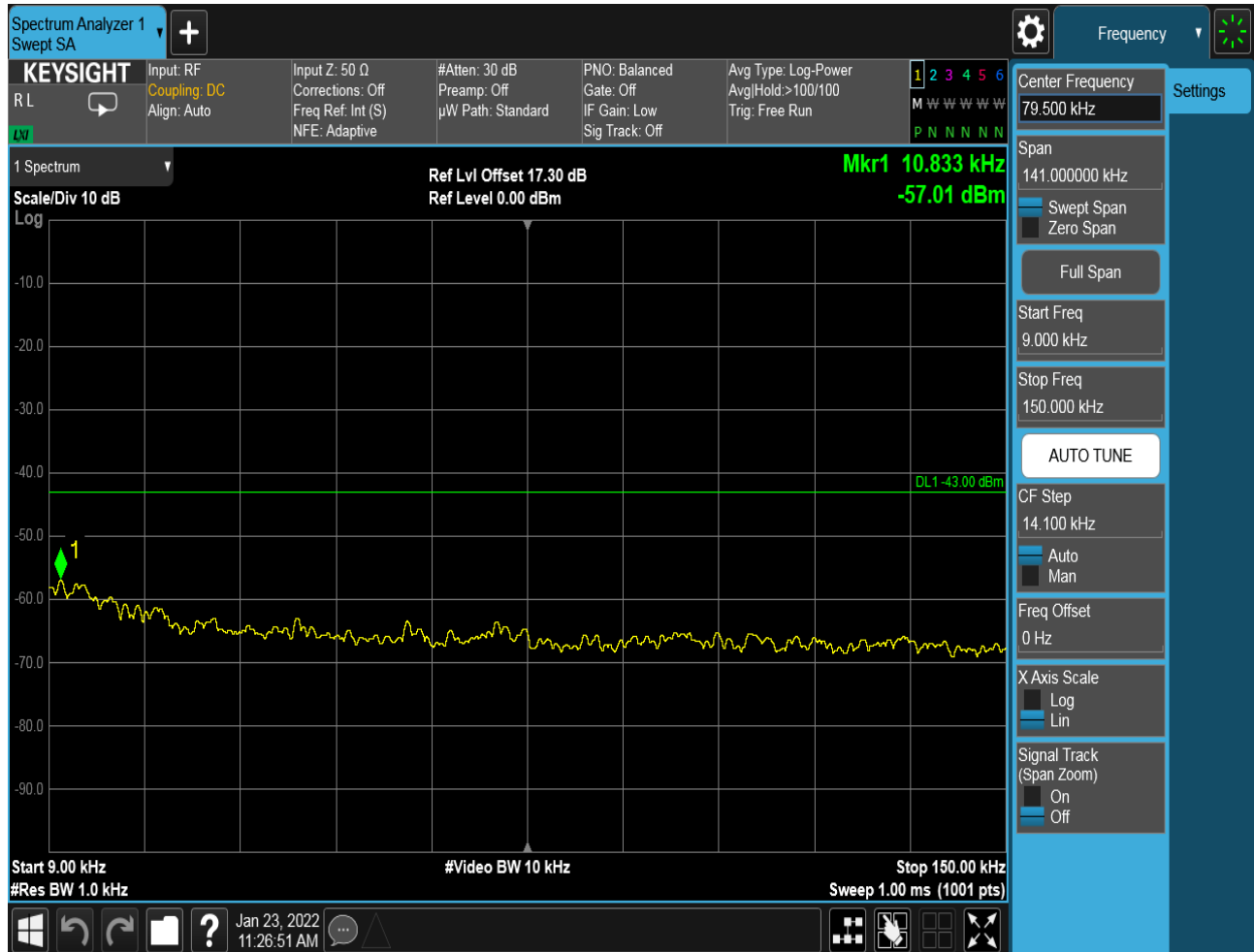
6.1.2.1.1 Test Channel = LCH

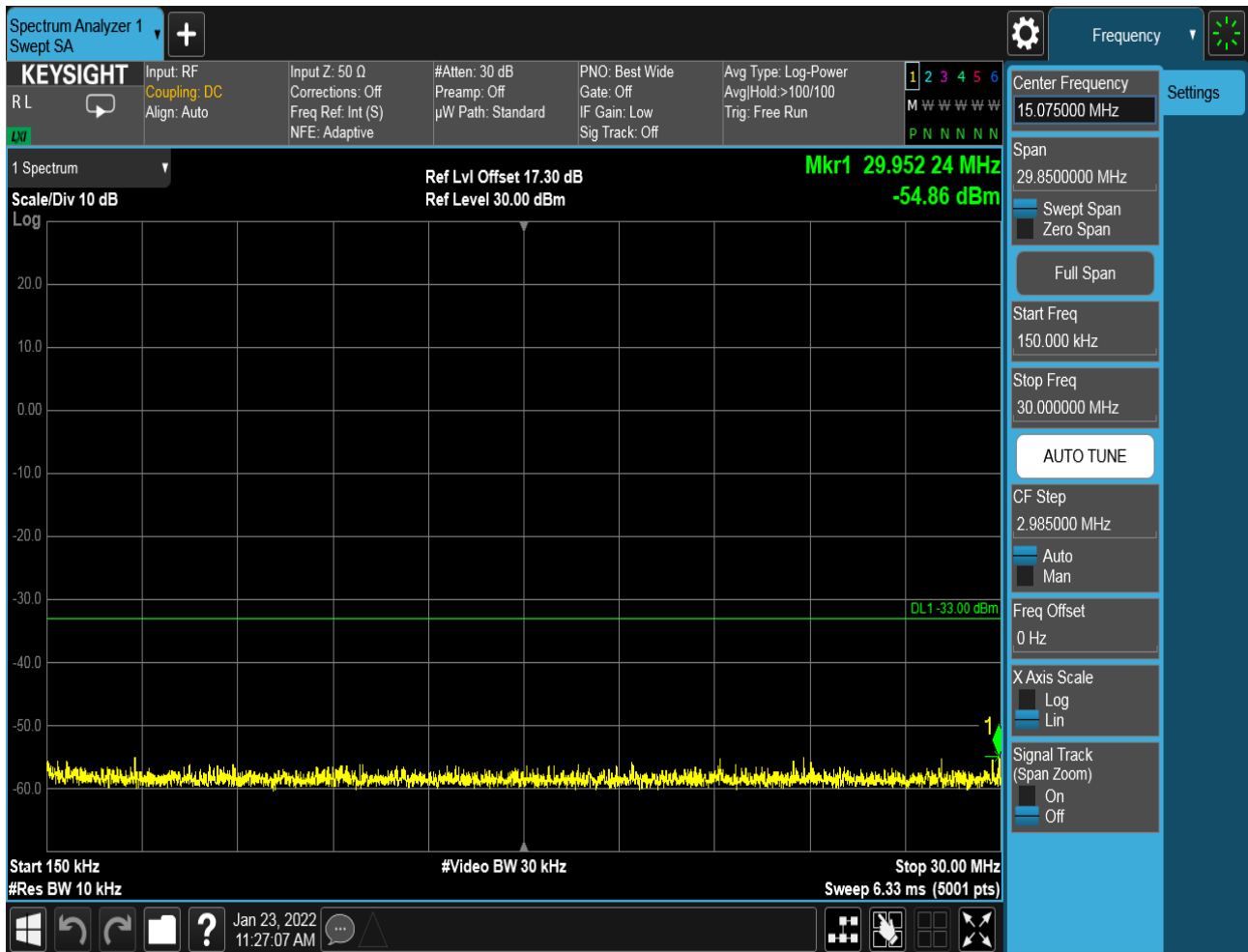


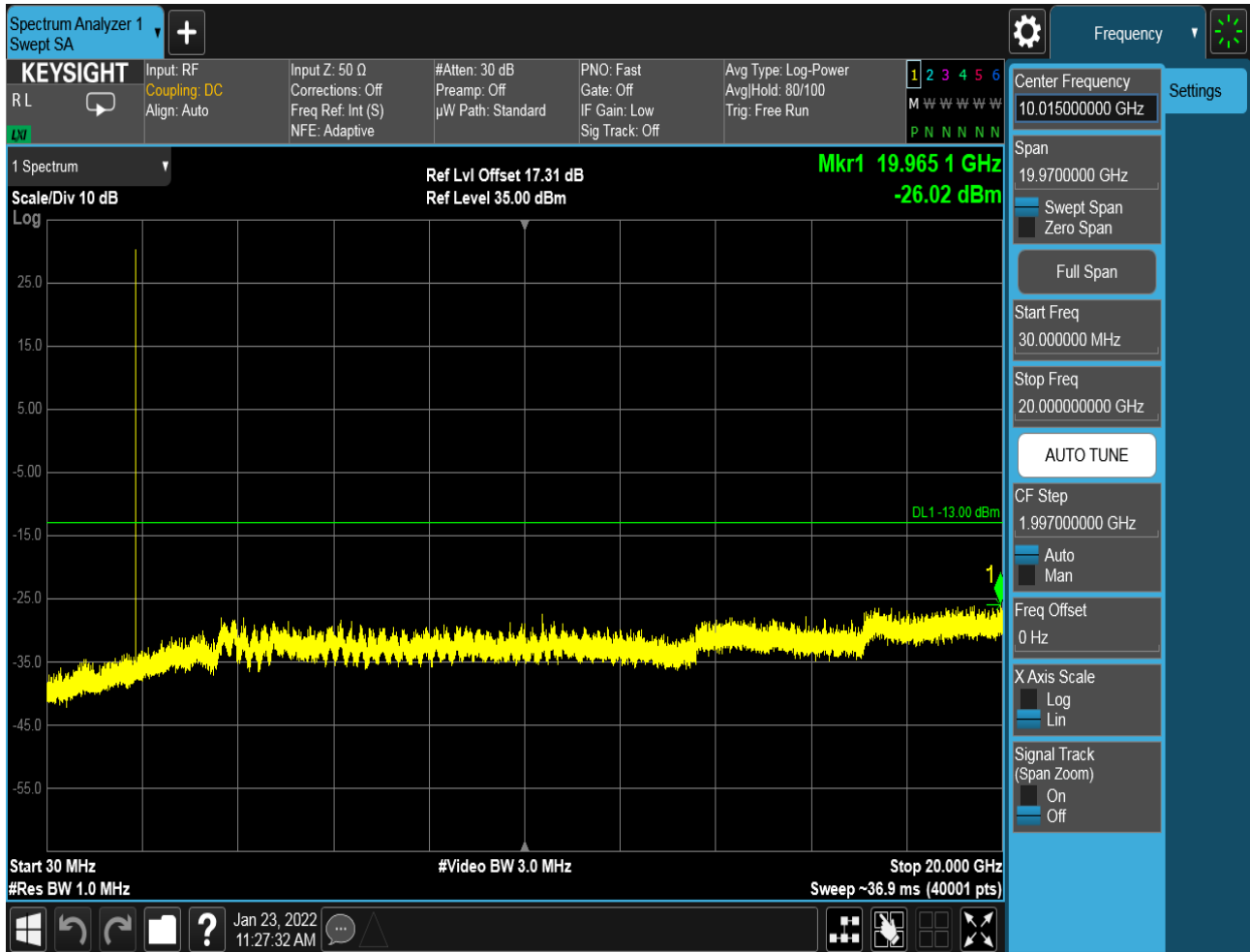




6.1.2.1.2 Test Channel = MCH

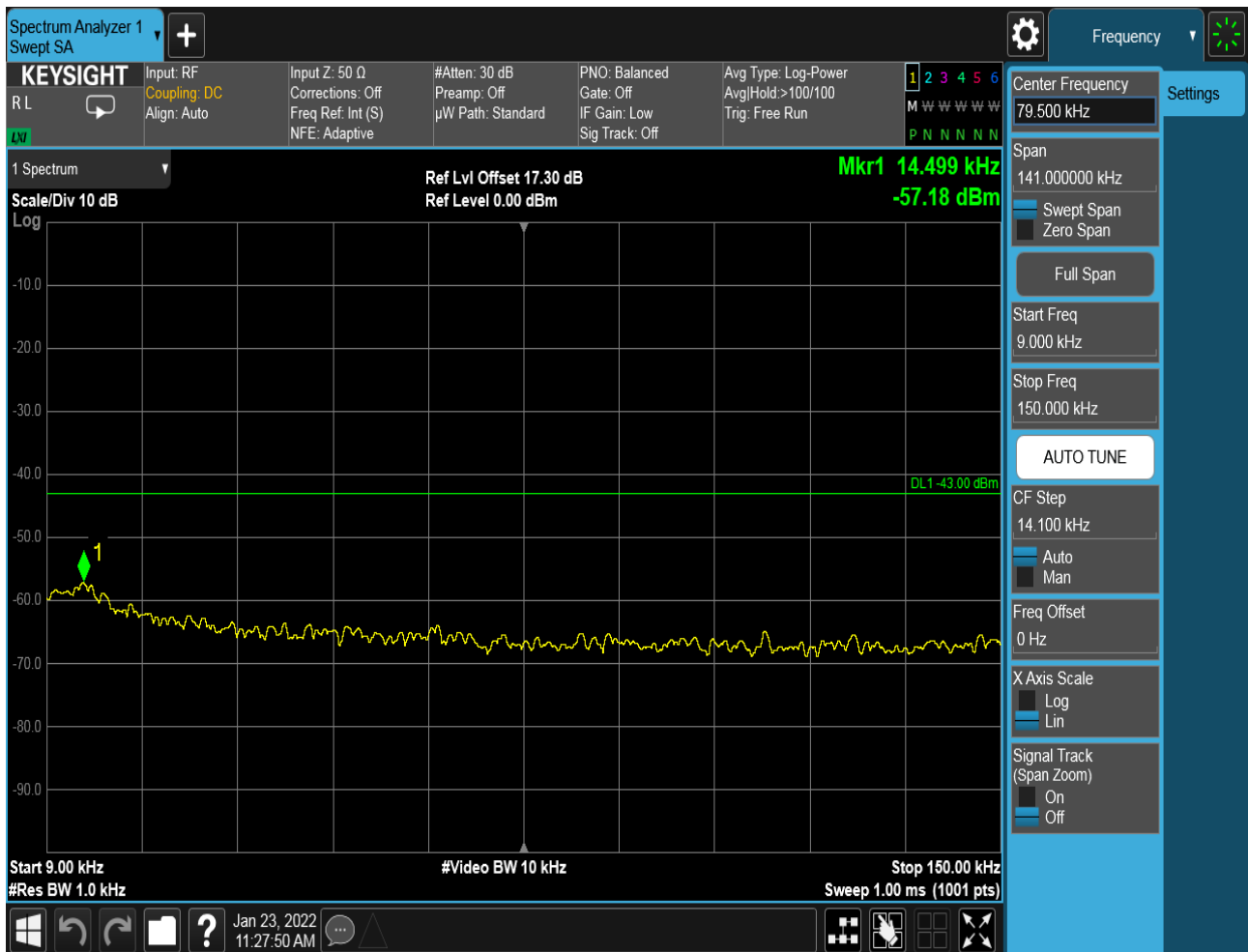


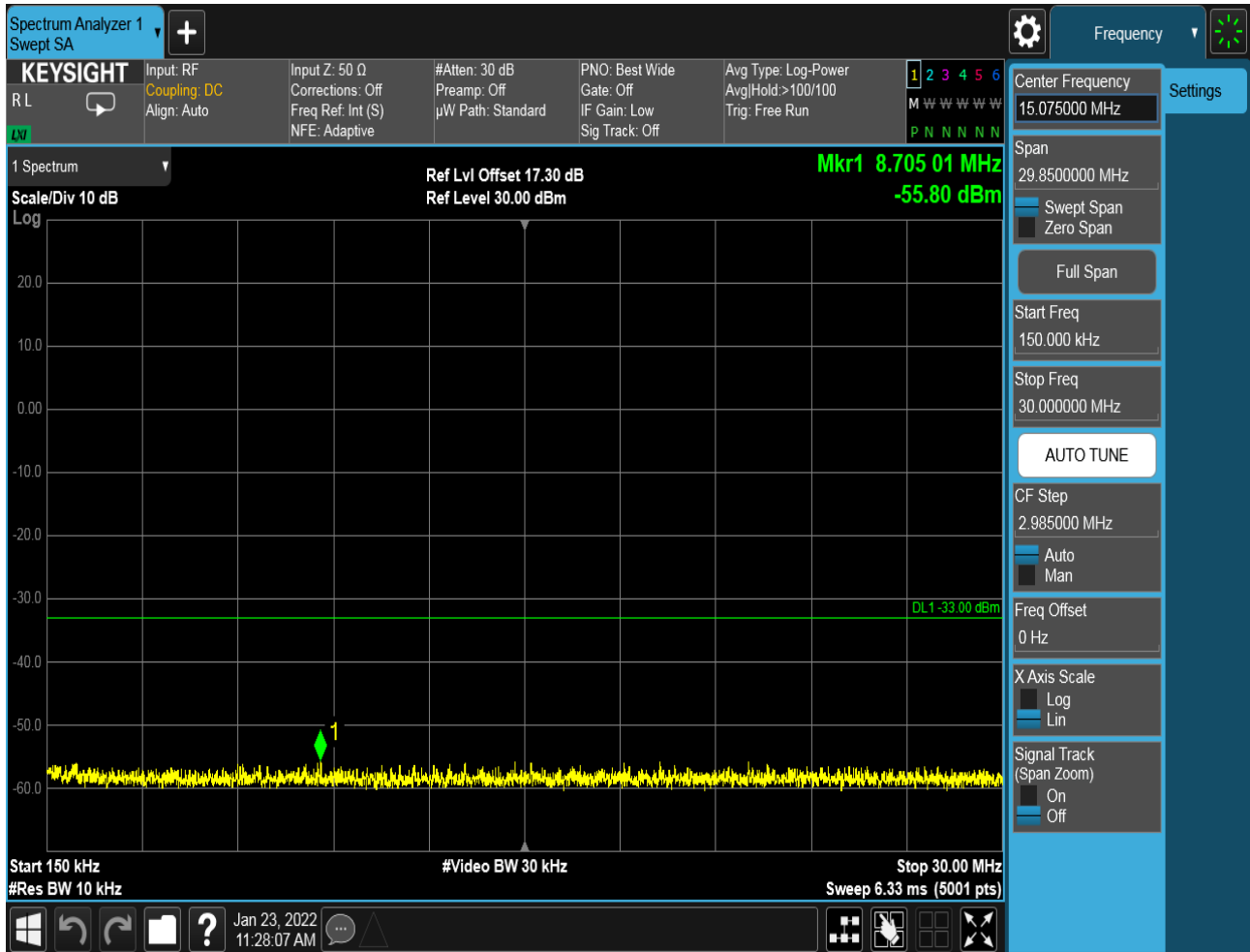


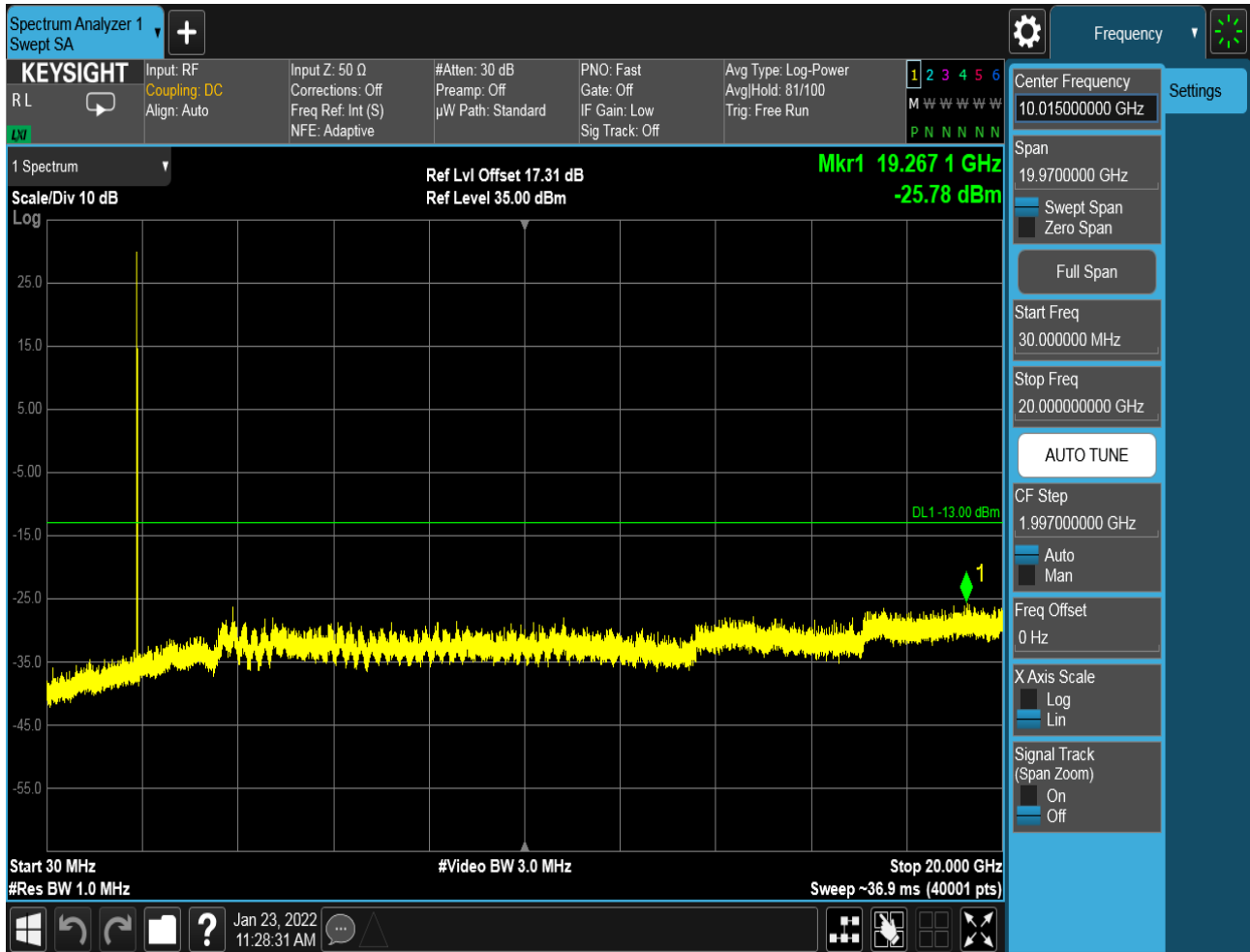




6.1.2.1.3 Test Channel = HCH



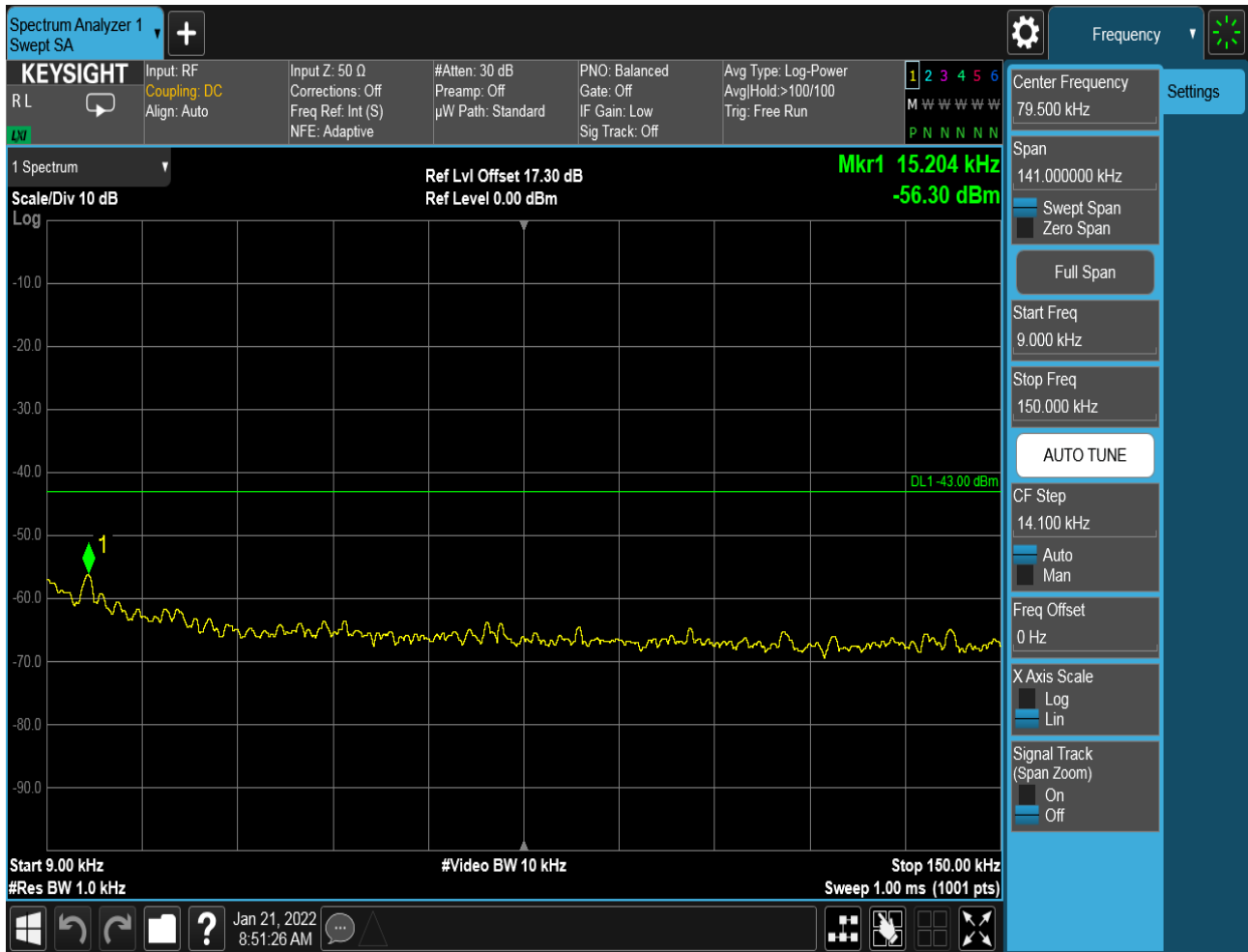


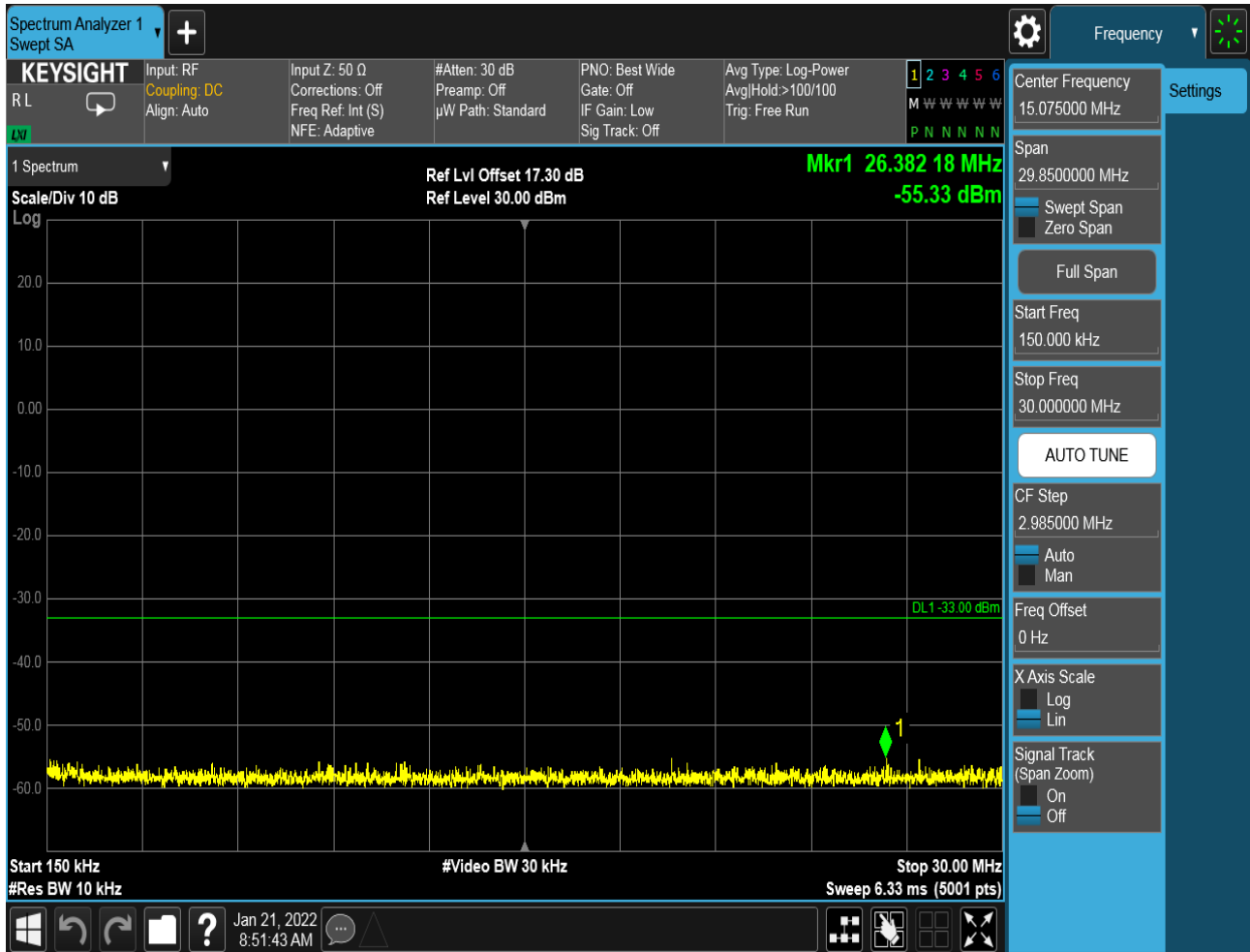


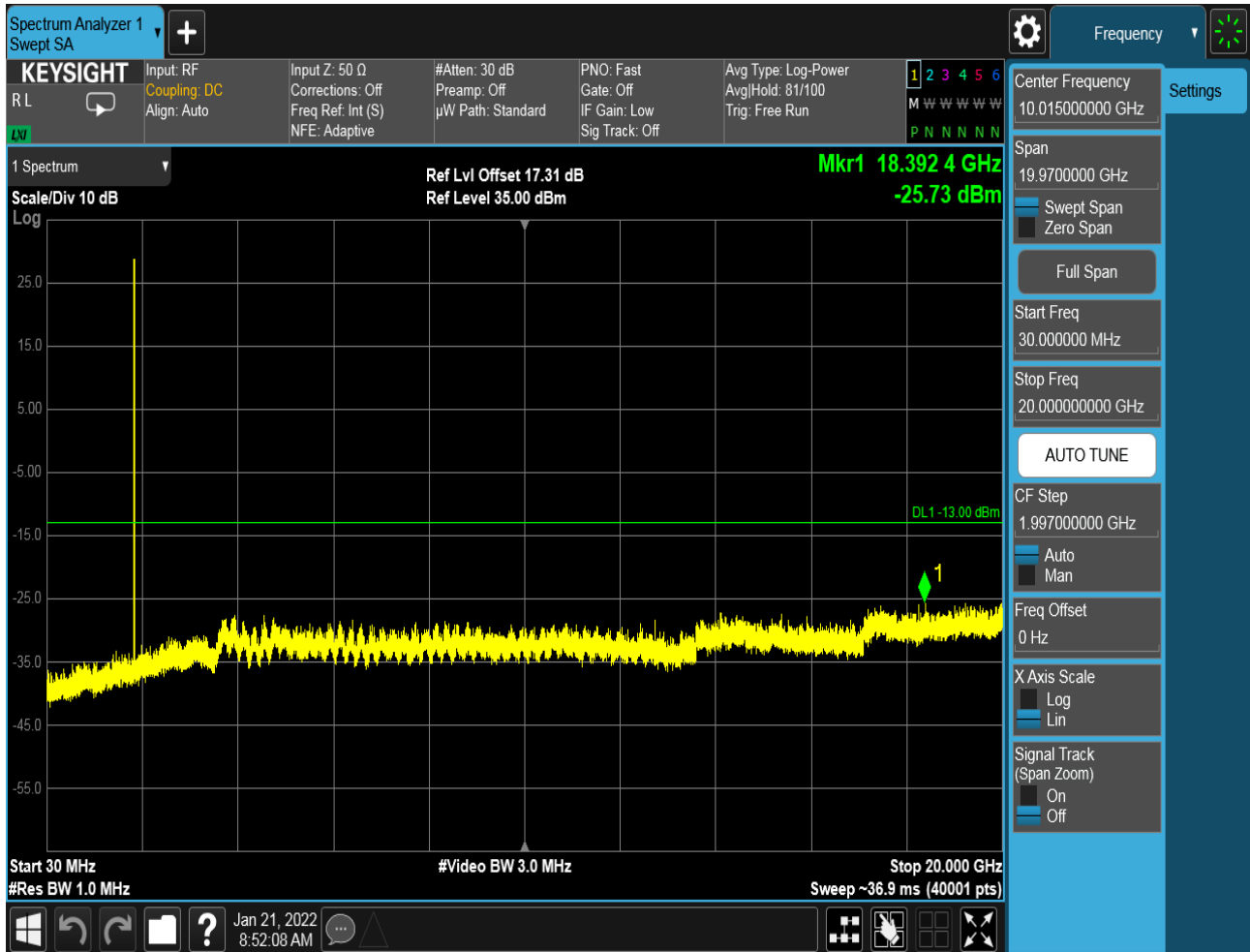


6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

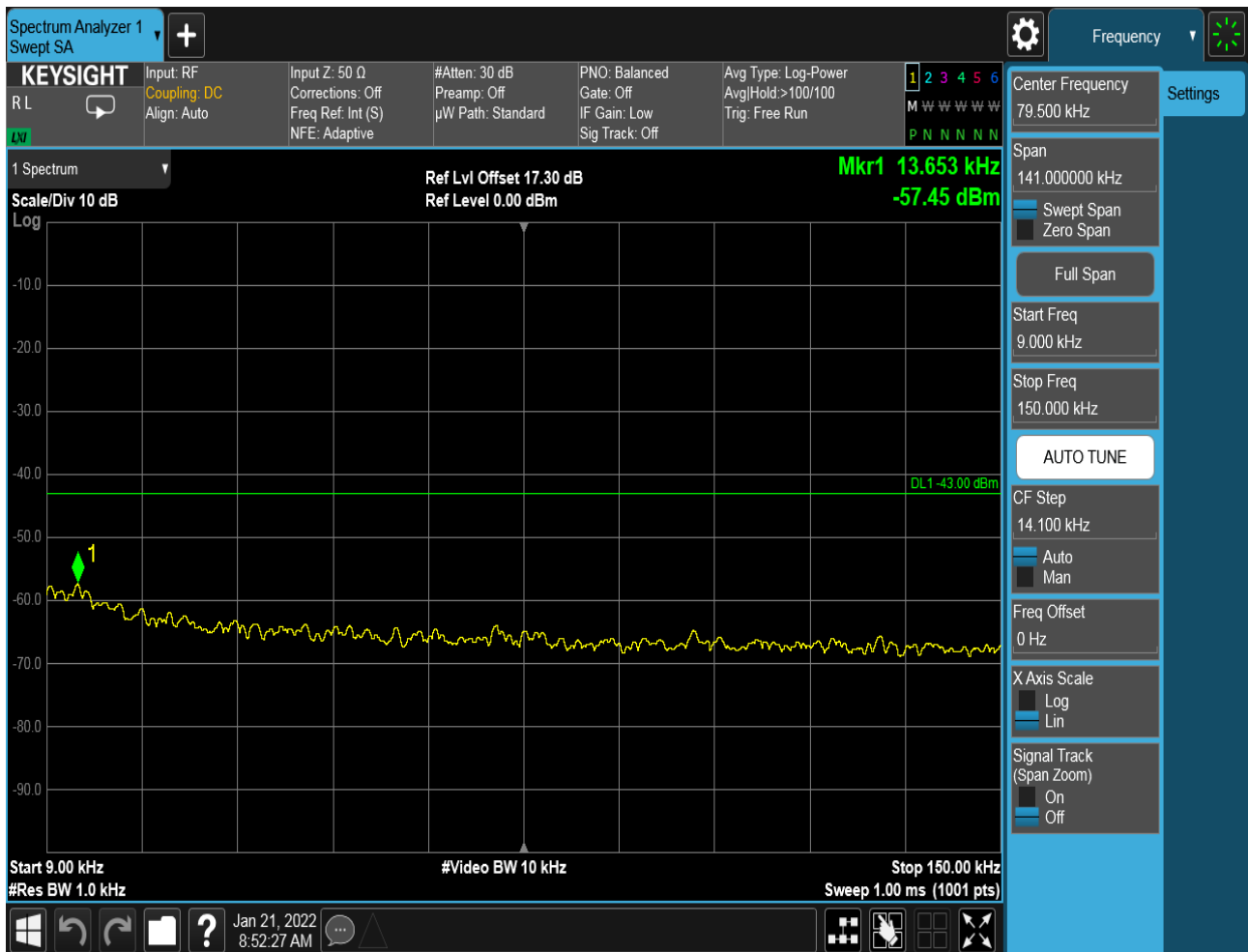


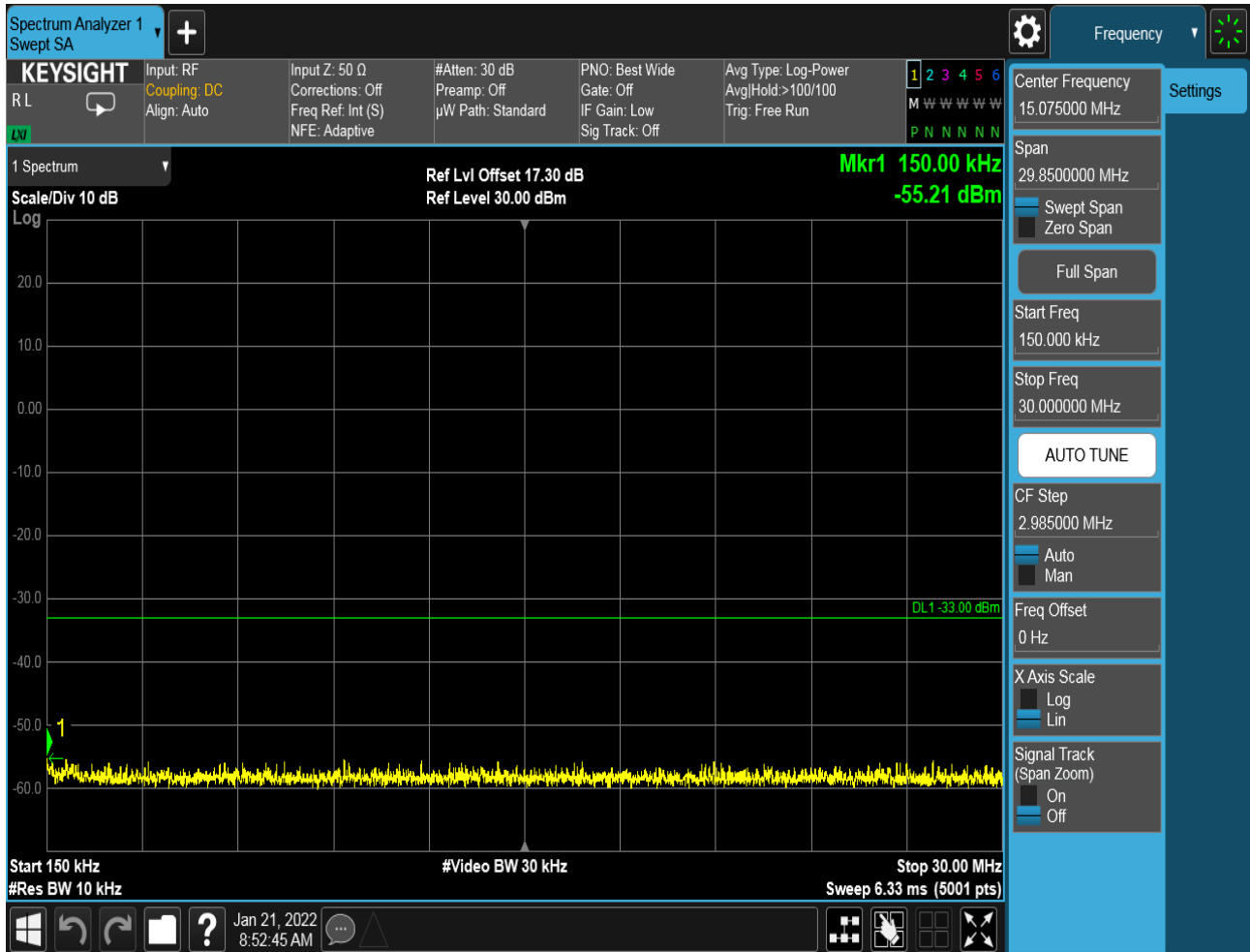


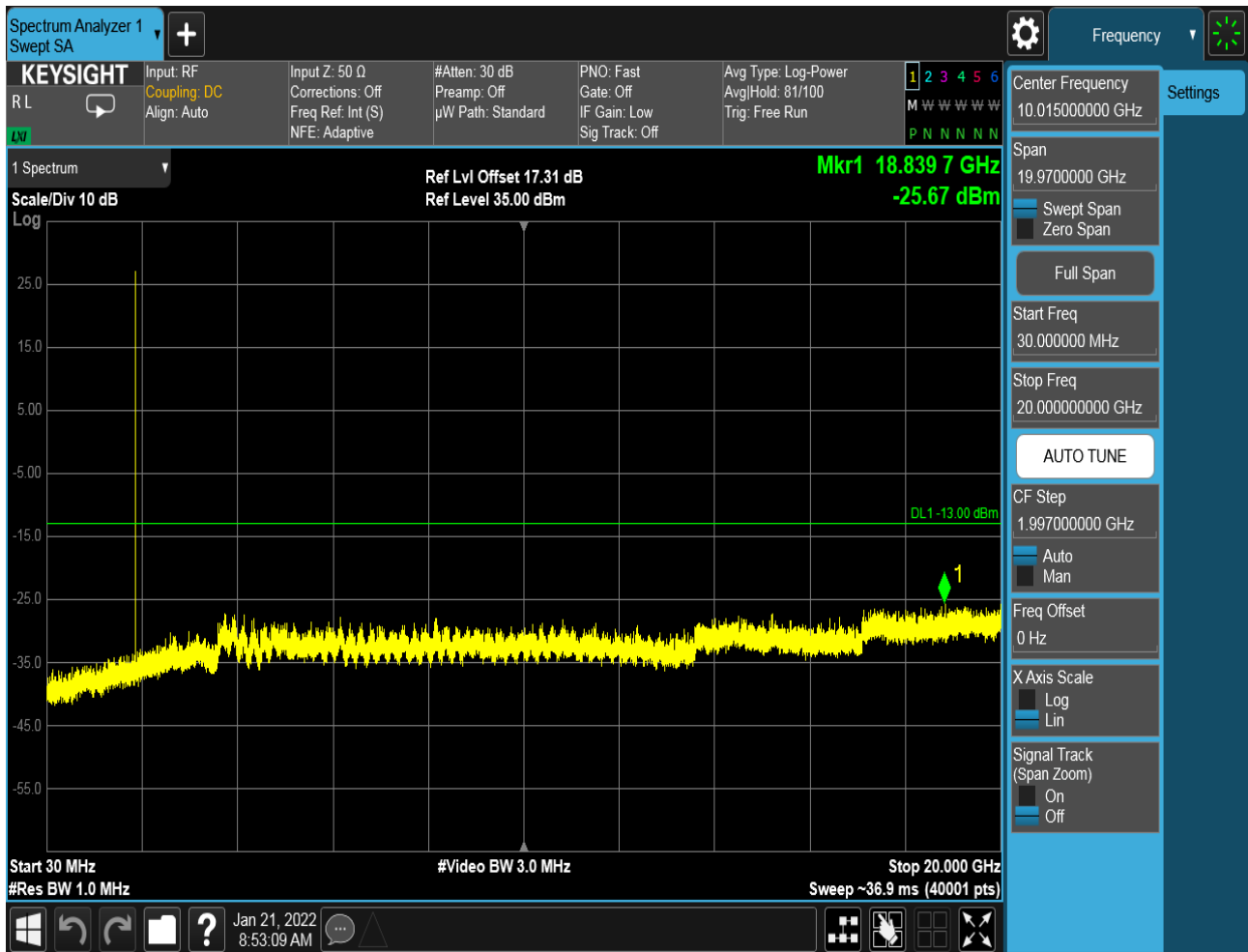




6.1.2.2.2 Test Channel = MCH

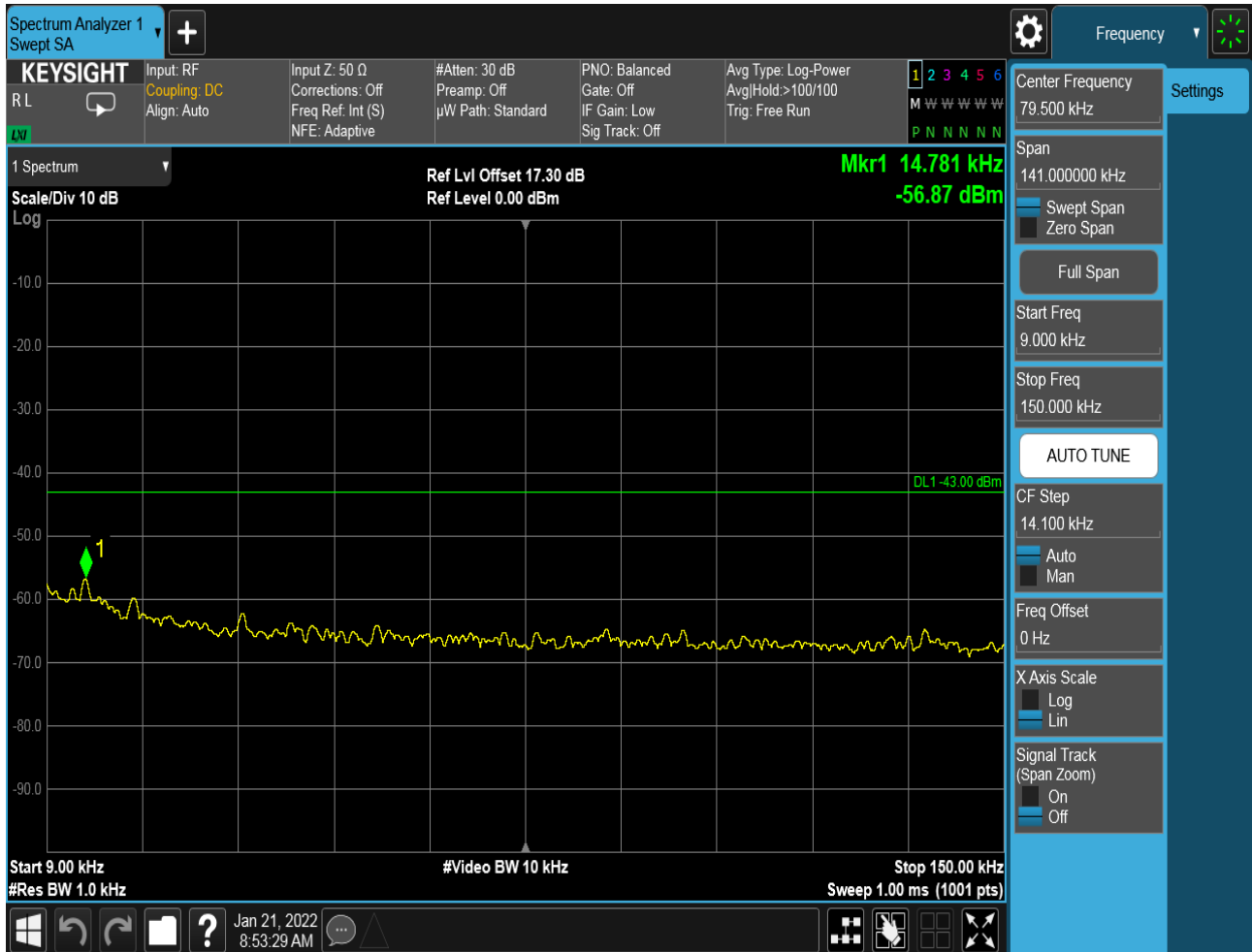


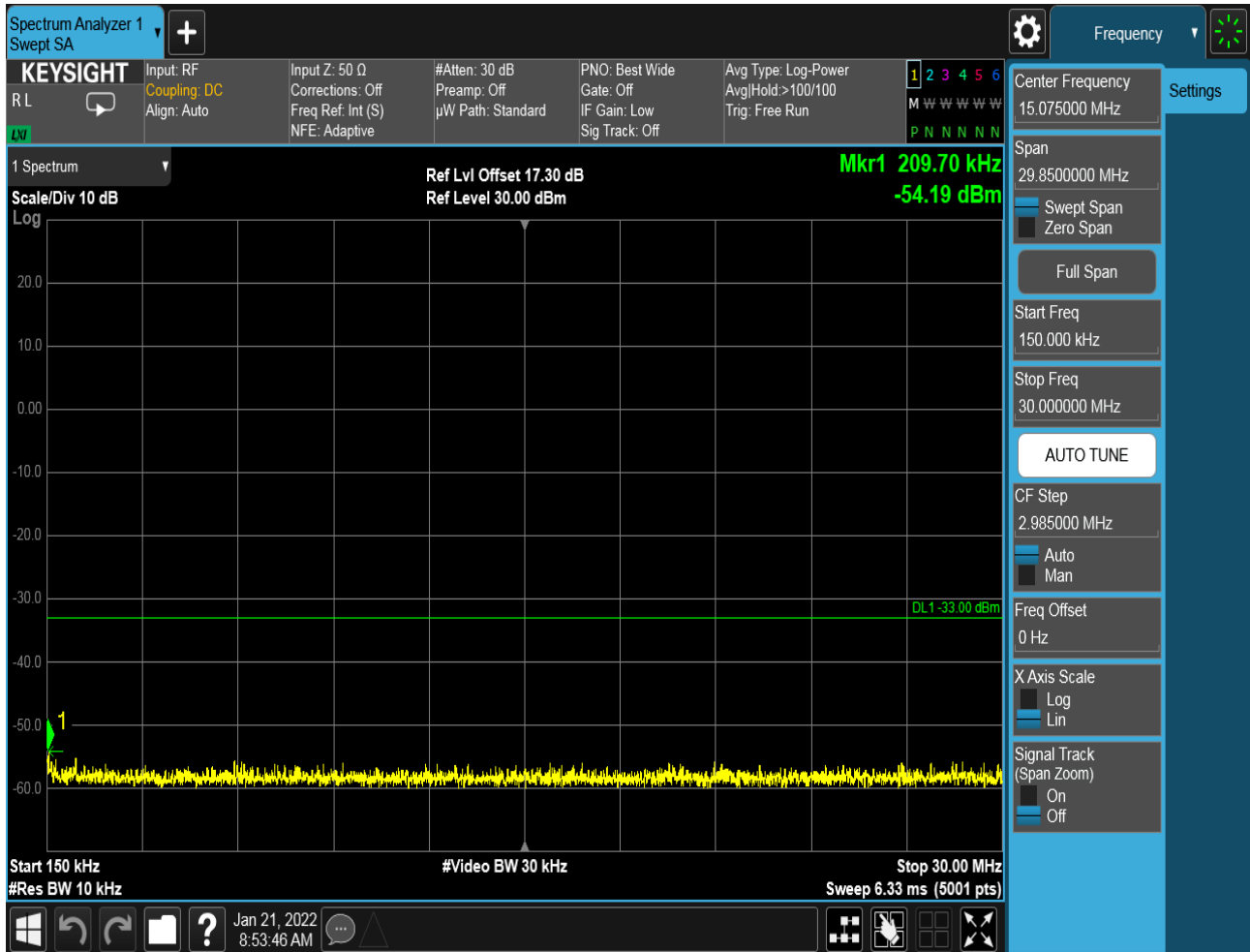


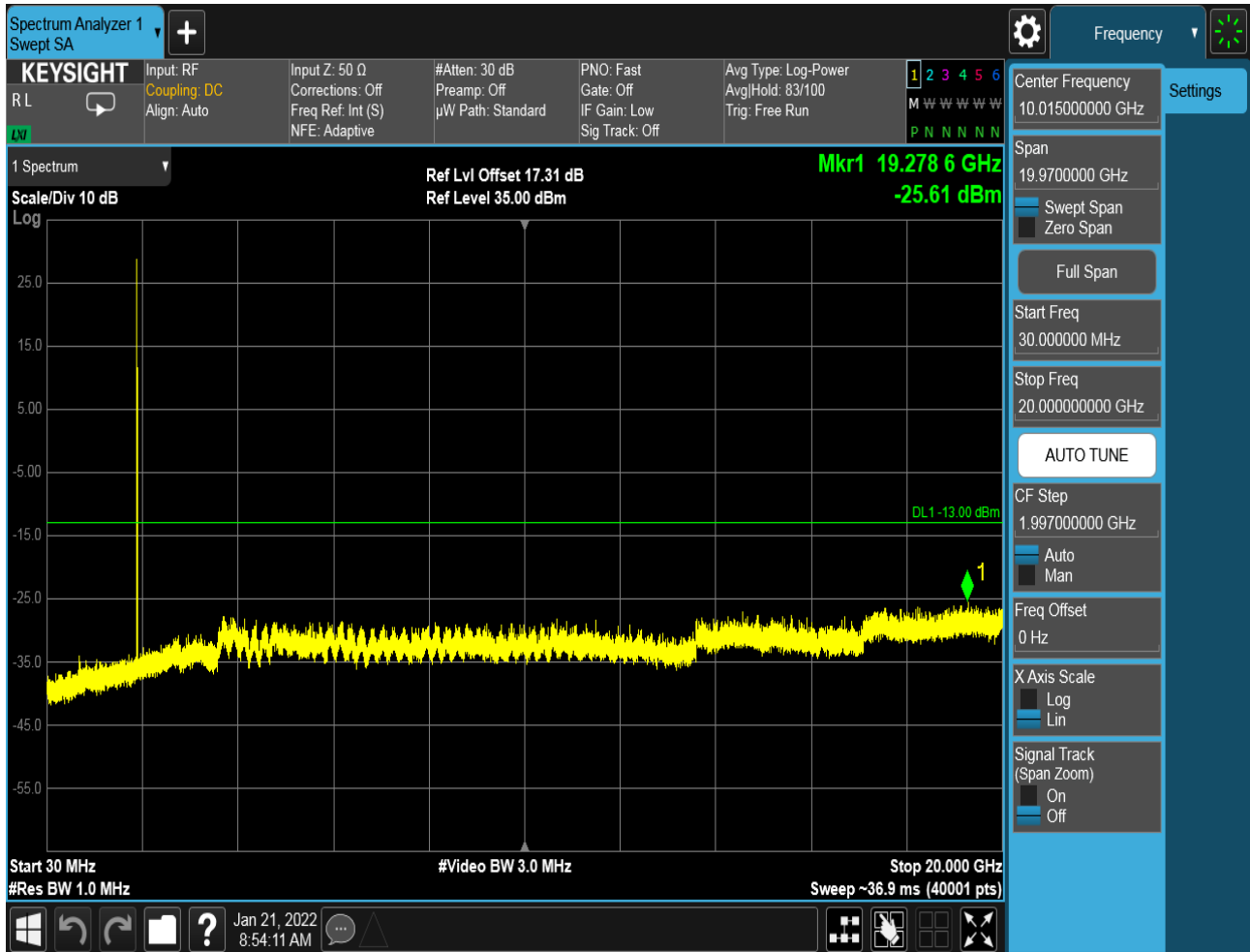




6.1.2.2.3 Test Channel = HCH







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

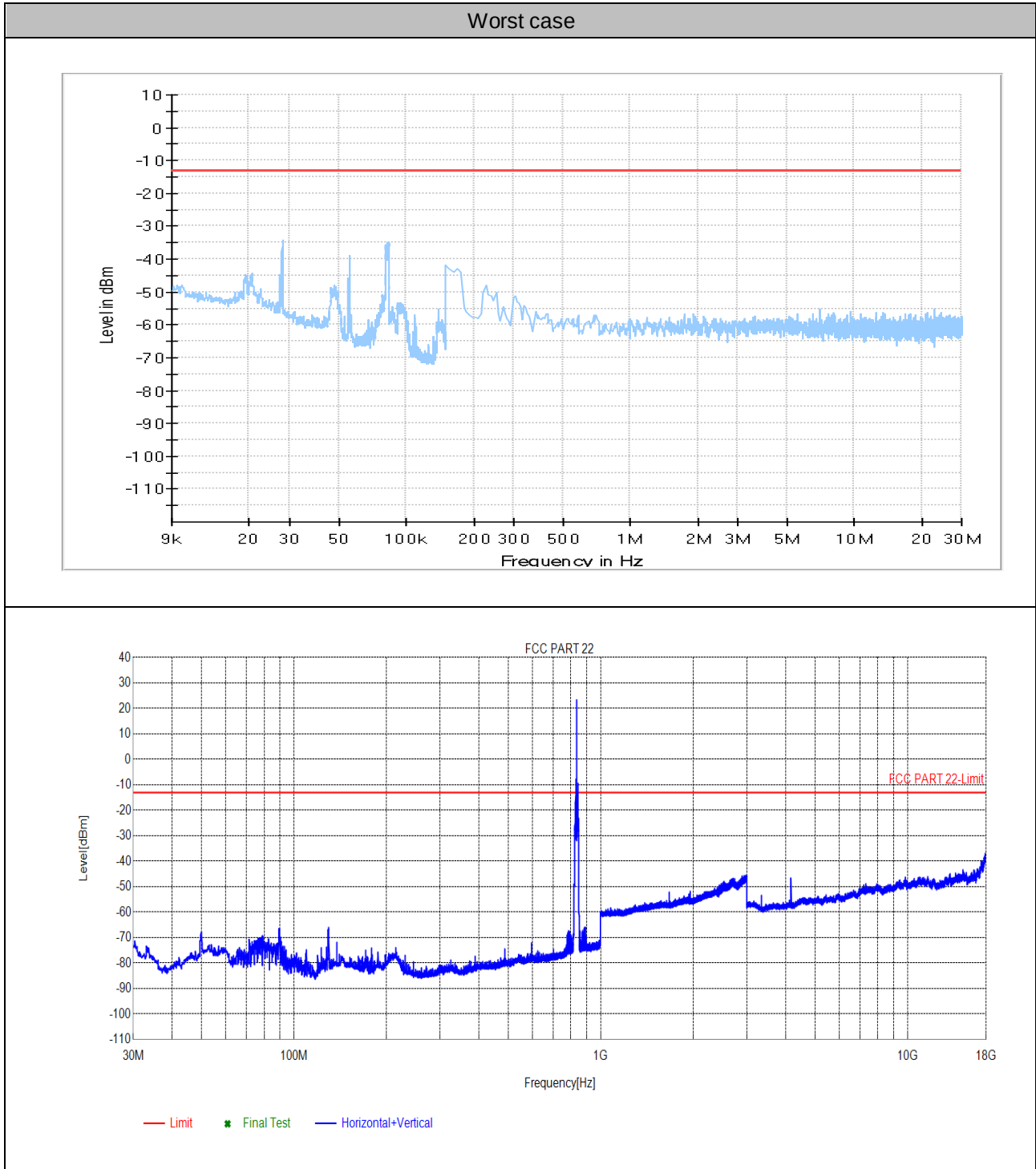
30MHz~1GHz, RBW = 100 kHz, VBW = 300 kHz. Detector: PK

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

Part I - Test Plots

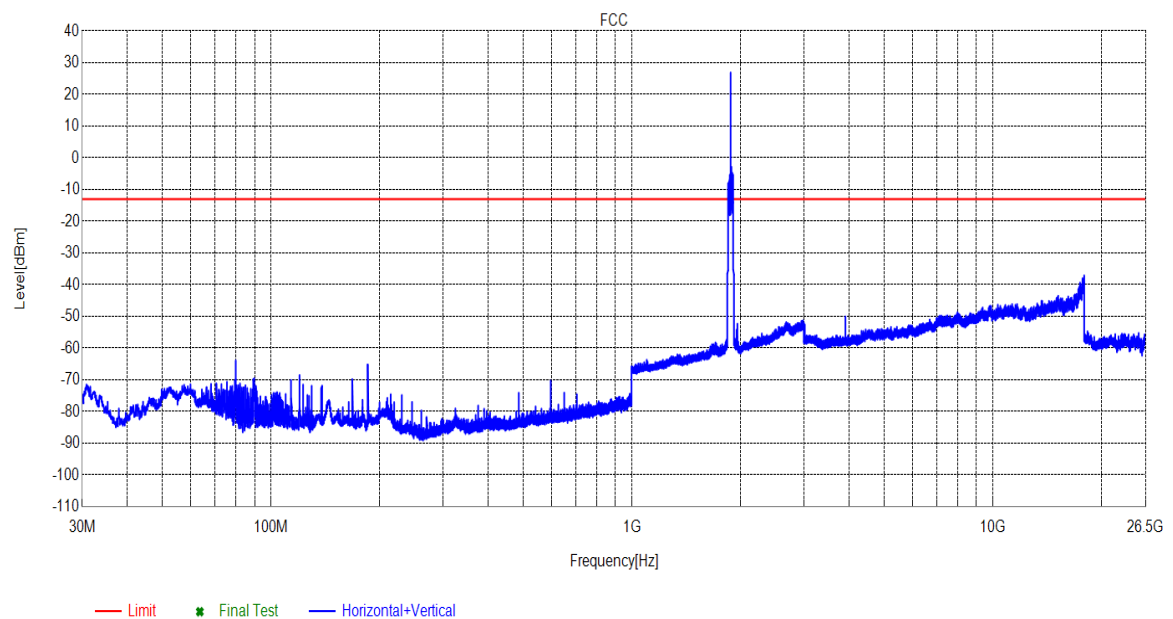
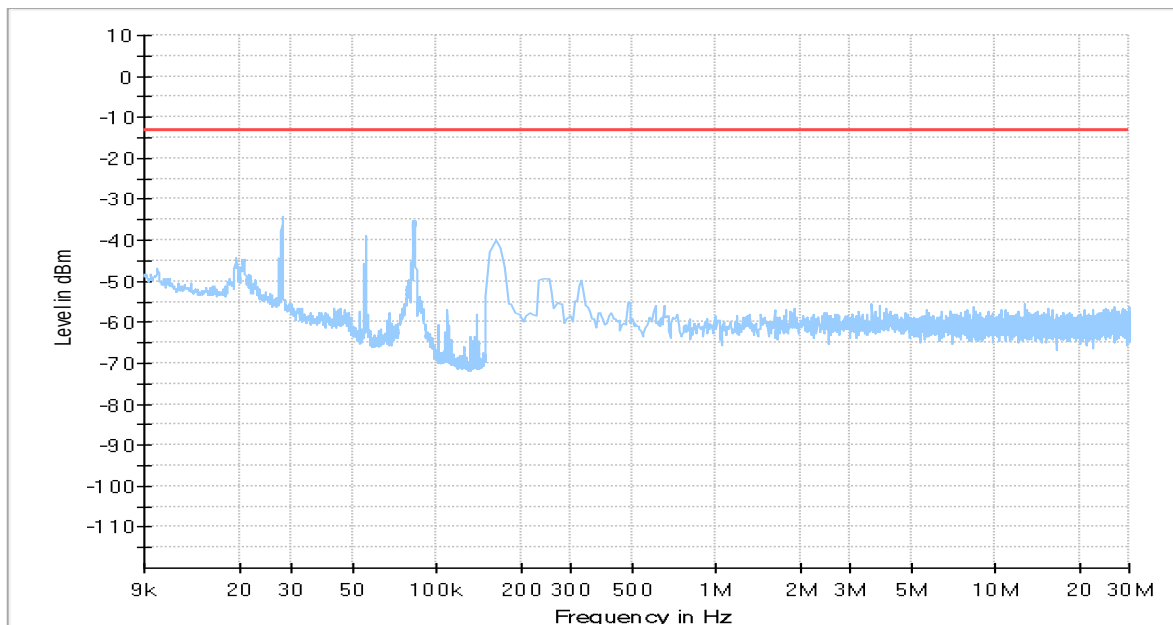
7.1 For GSM

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	-2.97030	-0.00360	PASS
				VN	-2.00172	-0.00243	PASS
				VH	-4.06802	-0.00494	PASS
		MCH	TN	VL	-3.45459	-0.00413	PASS
				VN	0.51657	0.00062	PASS
				VH	-3.13173	-0.00374	PASS
		HCH	TN	VL	-2.45372	-0.00289	PASS
				VN	-0.22600	-0.00027	PASS
				VH	-1.74344	-0.00205	PASS
	GSM/TM2	LCH	TN	VL	-1.19458	-0.00145	PASS
				VN	-0.09686	-0.00012	PASS
				VH	-0.16143	-0.00020	PASS
		MCH	TN	VL	-2.16315	-0.00259	PASS
				VN	-3.87430	-0.00463	PASS
				VH	-1.64658	-0.00197	PASS
		HCH	TN	VL	-2.58287	-0.00304	PASS
				VN	-2.74430	-0.00323	PASS
				VH	-1.54972	-0.00183	PASS
PCS1900	GSM/TM1	LCH	TN	VL	-3.64830	-0.00197	PASS
				VN	1.84029	0.00099	PASS
				VH	-3.90659	-0.00211	PASS
		MCH	TN	VL	-3.42230	-0.00182	PASS
				VN	0.96858	0.00052	PASS
				VH	-2.22772	-0.00118	PASS
		HCH	TN	VL	-3.26087	-0.00197	PASS
				VN	0.74257	0.00099	PASS
				VH	-3.06716	-0.00211	PASS
	GSM/TM2	LCH	TN	VL	-0.48429	-0.00026	PASS
				VN	-2.00172	-0.00108	PASS
				VH	-0.61343	-0.00033	PASS
		MCH	TN	VL	-1.42058	-0.00076	PASS
				VN	-0.45200	-0.00024	PASS
				VH	-0.38743	-0.00021	PASS
		HCH	TN	VL	-3.09944	-0.00026	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VN	-3.55144	-0.00108	PASS
				VH	-3.45459	-0.00033	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	-2.97030	-0.00360	PASS
				-20	-3.00258	-0.00364	PASS
				-10	-1.06543	-0.00129	PASS
				0	2.58287	0.00313	PASS
				10	0.61343	0.00074	PASS
				20	-2.00172	-0.00243	PASS
				30	-1.00086	-0.00121	PASS
				40	-1.19458	-0.00145	PASS
				50	-2.93801	-0.00356	PASS
		MCH	VN	-30	-2.13087	-0.00255	PASS
				-20	-1.54972	-0.00185	PASS
				-10	-0.19372	-0.00023	PASS
				0	1.90487	0.00228	PASS
				10	0.90400	0.00108	PASS
				20	0.51657	0.00062	PASS
				30	-1.90487	-0.00228	PASS
				40	-2.61515	-0.00313	PASS
				50	-0.71029	-0.00085	PASS
		HCH	VN	-30	-2.48601	-0.00293	PASS
				-20	-1.84029	-0.00217	PASS
				-10	-0.25829	-0.00030	PASS
				0	2.06629	0.00243	PASS
				10	0.87172	0.00103	PASS
				20	-0.22600	-0.00027	PASS
				30	0.35514	0.00042	PASS
				40	-2.26001	-0.00266	PASS
				50	-1.67886	-0.00198	PASS
	GSM/TM2	LCH	VN	-30	-1.03315	-0.00125	PASS
				-20	-4.61688	-0.00560	PASS
				-10	-1.35601	-0.00165	PASS
				0	-2.32458	-0.00282	PASS
				10	1.22686	0.00149	PASS
				20	-0.09686	-0.00012	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	2.38915	0.00290	PASS
				40	1.09772	0.00133	PASS
				50	0.96858	0.00118	PASS
		MCH	VN	-30	-0.67800	-0.00081	PASS
				-20	-3.97116	-0.00475	PASS
				-10	-1.61429	-0.00193	PASS
				0	-3.42230	-0.00409	PASS
				10	-1.32372	-0.00158	PASS
				20	-3.87430	-0.00463	PASS
				30	1.58201	0.00189	PASS
				40	0.03229	0.00004	PASS
				50	-1.00086	-0.00120	PASS
		HCH	VN	-30	-1.35601	-0.00160	PASS
				-20	-1.77572	-0.00209	PASS
				-10	-0.29057	-0.00034	PASS
				0	-2.42144	-0.00285	PASS
				10	0.51657	0.00061	PASS
				20	-2.74430	-0.00323	PASS
				30	0.25829	0.00030	PASS
				40	-0.71029	-0.00084	PASS
				50	1.22686	0.00145	PASS
PCS1900	GSM/TM1	LCH	VN	-30	3.77744	0.00204	PASS
				-20	0.58115	0.00031	PASS
				-10	3.09944	0.00168	PASS
				0	-0.83943	-0.00045	PASS
				10	3.77744	0.00204	PASS
				20	1.84029	0.00099	PASS
				30	3.09944	0.00168	PASS
				40	4.16488	0.00225	PASS
				50	0.41972	0.00023	PASS
		MCH	VN	-30	3.42230	0.00182	PASS
				-20	0.64572	0.00034	PASS
				-10	4.19716	0.00223	PASS
				0	0.41972	0.00022	PASS
				10	2.03401	0.00108	PASS
				20	0.96858	0.00052	PASS
				30	2.71201	0.00144	PASS
				40	2.09858	0.00112	PASS
				50	1.93715	0.00103	PASS
		HCH	VN	-30	2.19544	0.00115	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-20	-0.06457	-0.00003	PASS
				-10	2.42144	0.00127	PASS
				0	-1.03315	-0.00054	PASS
				10	1.54972	0.00081	PASS
				20	0.74257	0.00039	PASS
				30	-0.32286	-0.00017	PASS
				40	1.87258	0.00098	PASS
				50	-2.42144	-0.00127	PASS
	GSM/TM2	LCH	VN	-30	-0.32286	-0.00017	PASS
				-20	-2.74430	-0.00148	PASS
				-10	-1.58201	-0.00086	PASS
				0	-2.29230	-0.00124	PASS
				10	-3.22858	-0.00174	PASS
				20	-2.00172	-0.00108	PASS
				30	-1.54972	-0.00084	PASS
				40	-4.93973	-0.00267	PASS
				50	-1.58201	-0.00086	PASS
		MCH	VN	-30	-1.03315	-0.00055	PASS
				-20	-2.48601	-0.00132	PASS
				-10	-0.80715	-0.00043	PASS
				0	-2.61515	-0.00139	PASS
				10	-3.97116	-0.00211	PASS
				20	-0.45200	-0.00024	PASS
				30	-3.84202	-0.00204	PASS
				40	-3.42230	-0.00182	PASS
				50	-2.38915	-0.00127	PASS
		HCH	VN	-30	-2.87344	-0.00150	PASS
				-20	-4.22945	-0.00221	PASS
				-10	-2.74430	-0.00144	PASS
				0	-4.97202	-0.00260	PASS
				10	-5.19802	-0.00272	PASS
				20	-3.55144	-0.00186	PASS
				30	-4.61688	-0.00242	PASS
				40	-5.23031	-0.00274	PASS
				50	-3.19630	-0.00167	PASS

END