



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	32.78	29.23	38.5	PASS
		MCH	32.69	29.14	38.5	PASS
		HCH	32.74	29.19	38.5	PASS
	GSM/TM2	LCH	26.09	22.54	38.5	PASS
		MCH	25.93	22.38	38.5	PASS
		HCH	25.90	22.35	38.5	PASS
Test Band	Test Mode	Test Channel	Measured[dBm]	EIRP [dBm]	Limit [dBm]	Verdict
PCS1900	GSM/TM1	LCH	30.10	29.80	33	PASS
		MCH	30.18	29.88	33	PASS
		HCH	30.20	29.90	33	PASS
	GSM/TM2	LCH	25.75	25.45	33	PASS
		MCH	26.00	25.70	33	PASS
		HCH	25.97	25.67	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	1.80	13	PASS
		MCH	2.11	13	PASS
		HCH	1.85	13	PASS
	GSM/TM2	LCH	4.76	13	PASS
		MCH	4.88	13	PASS
		HCH	4.52	13	PASS
PCS1900	GSM/TM1	LCH	1.80	13	PASS
		MCH	1.97	13	PASS
		HCH	1.79	13	PASS
	GSM/TM2	LCH	5.16	13	PASS
		MCH	5.25	13	PASS
		HCH	5.08	13	PASS

3Appendix_C: Modulation Characteristics

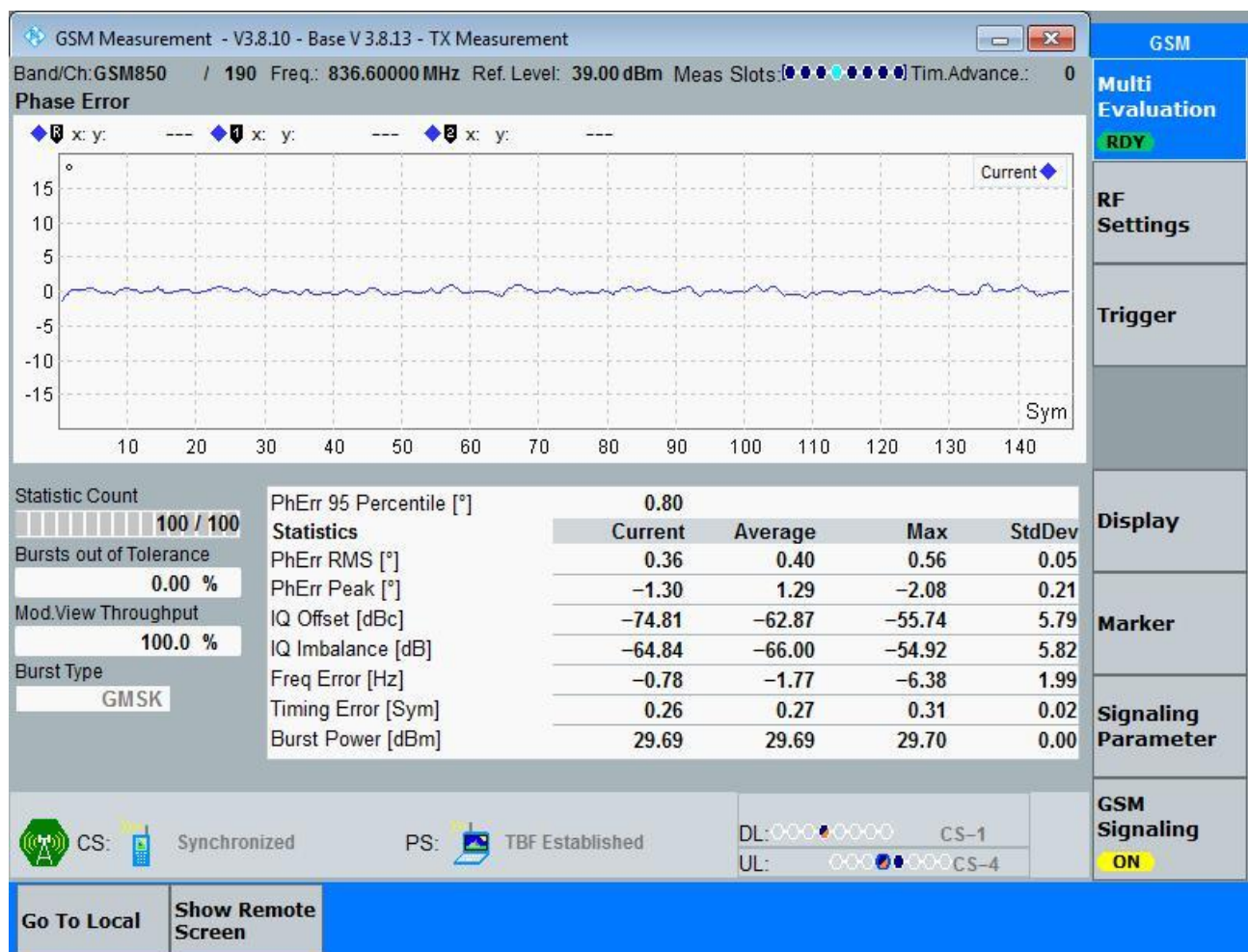
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

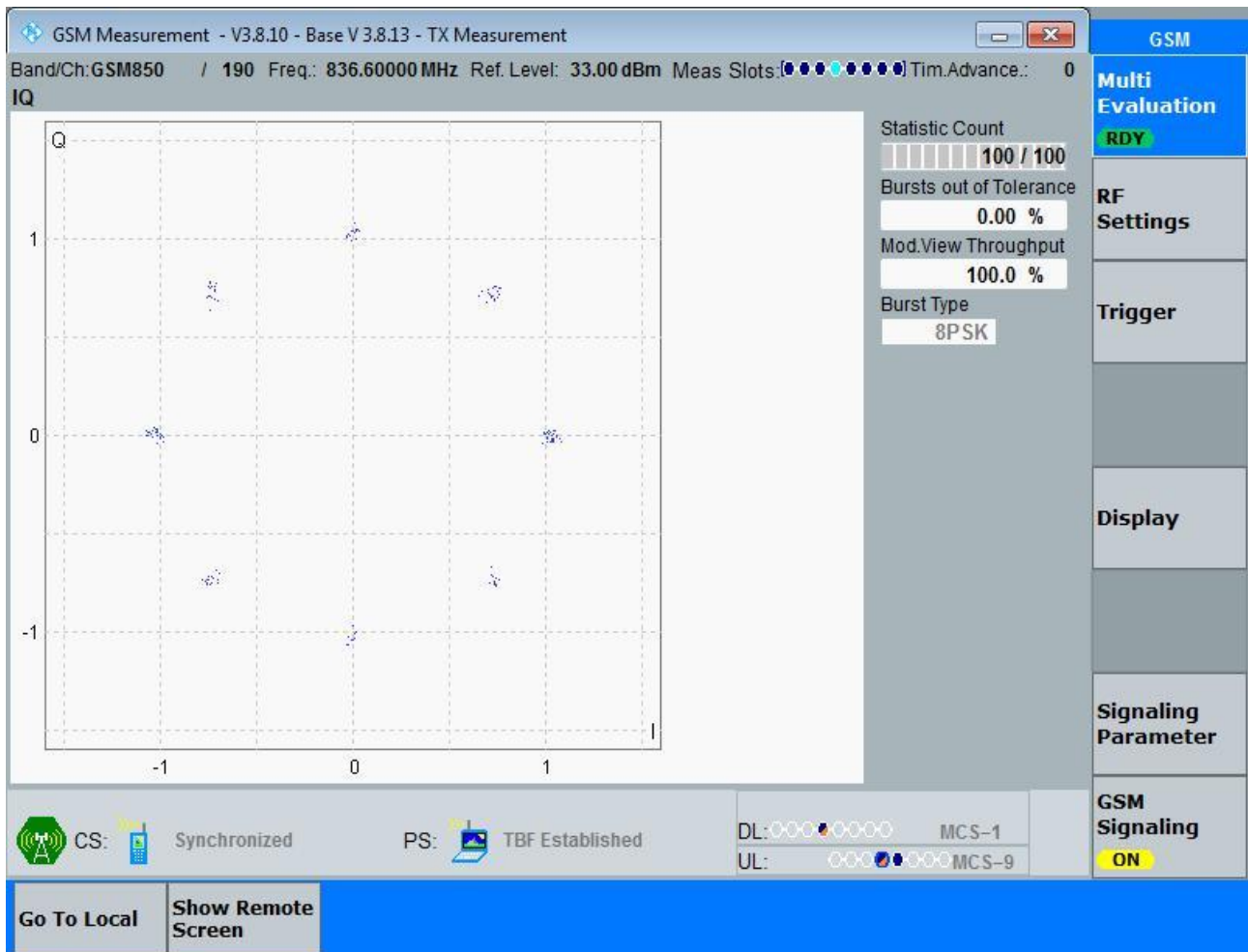
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

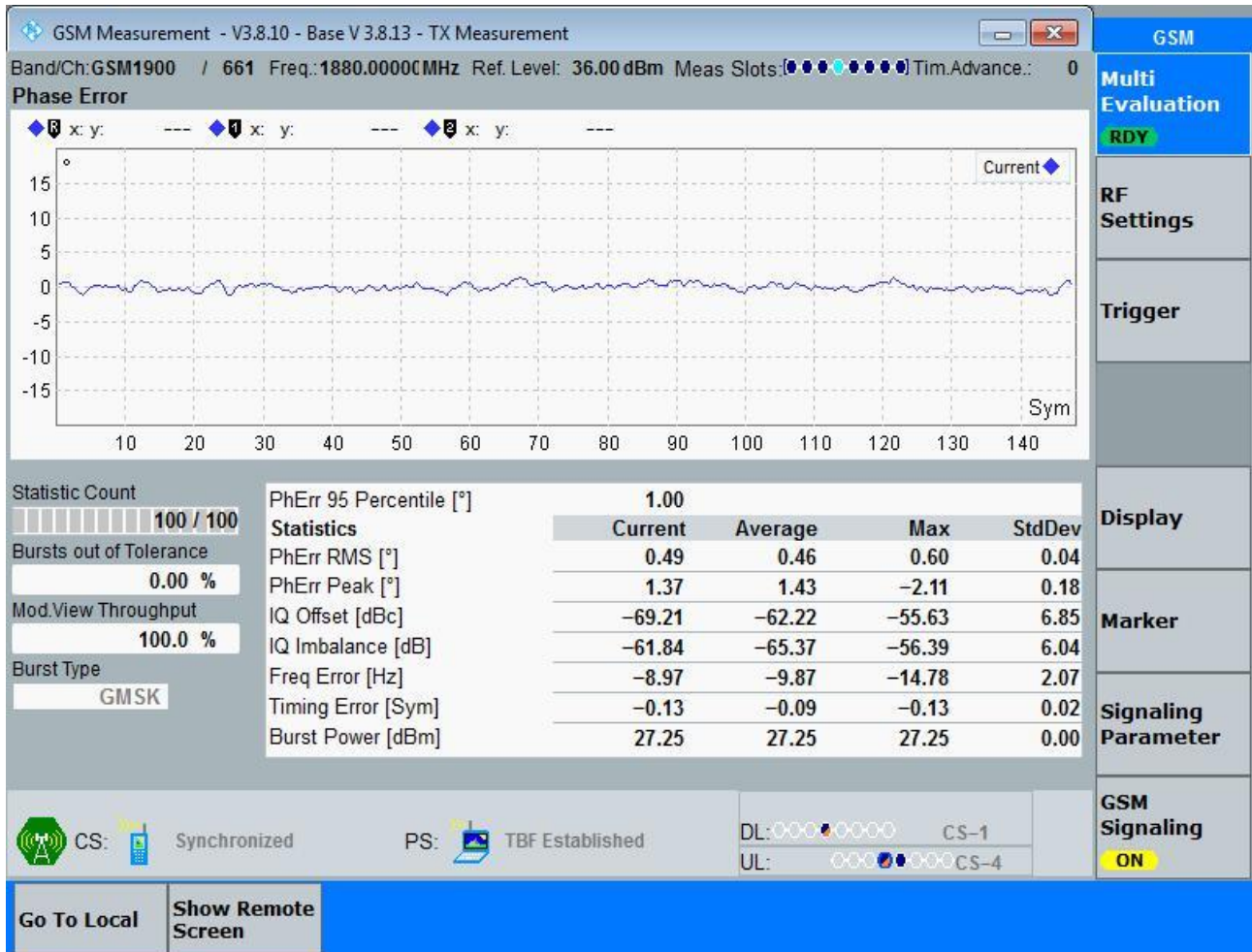
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = PCS1900

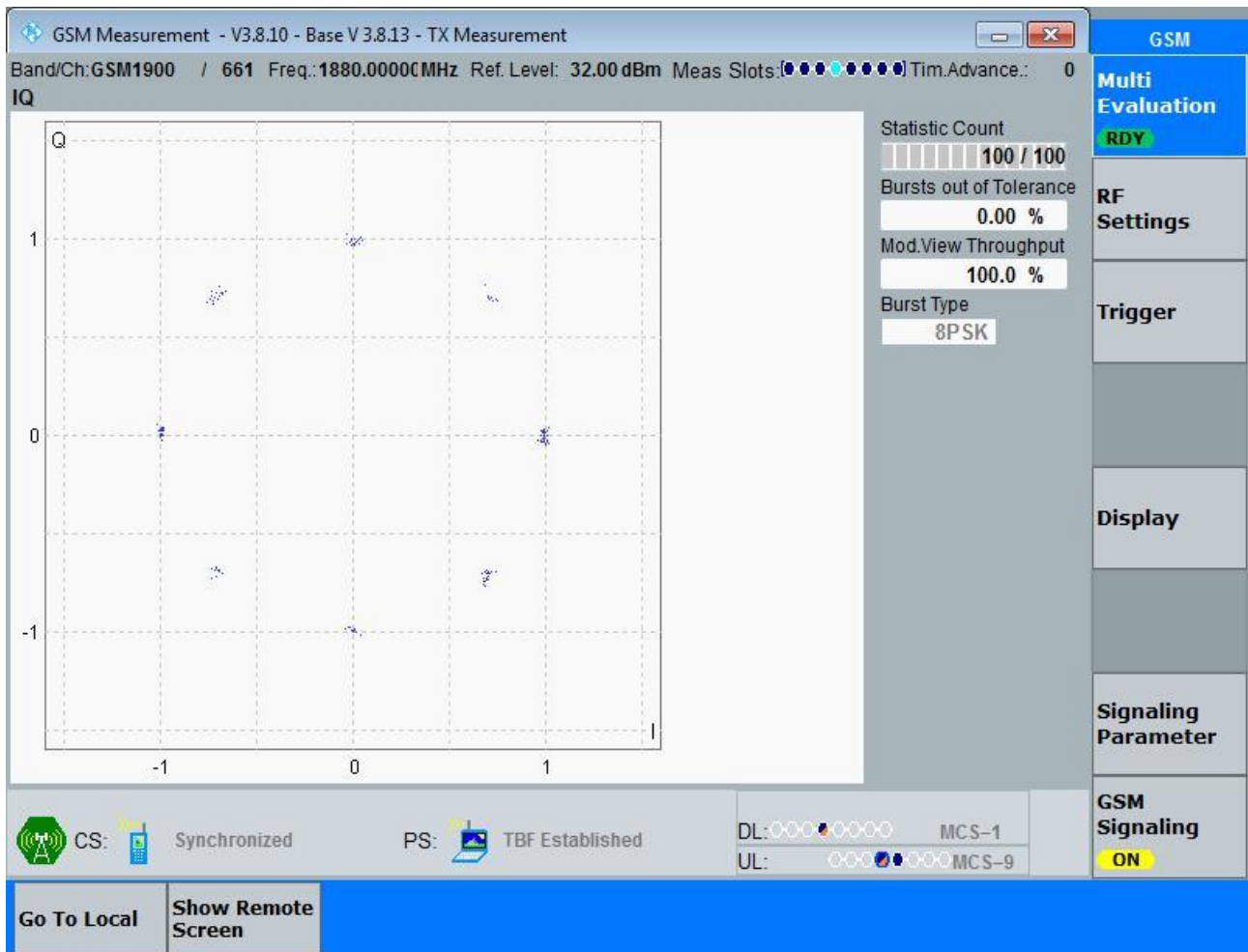
3.1.2.1 Test Mode = GSM/TM1

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	244.68	316.3	Pass
		MCH	248.69	318.5	Pass
		HCH	245.87	312.4	Pass
	GSM/TM2	LCH	250.89	322.0	Pass
		MCH	249.32	320.1	Pass
		HCH	249.21	321.6	Pass
PCS1900	GSM/TM1	LCH	244.99	312.2	Pass
		MCH	246.82	310.1	Pass
		HCH	239.13	313.8	Pass
	GSM/TM2	LCH	249.70	322.0	Pass
		MCH	246.43	307.4	Pass
		HCH	245.32	312.9	Pass

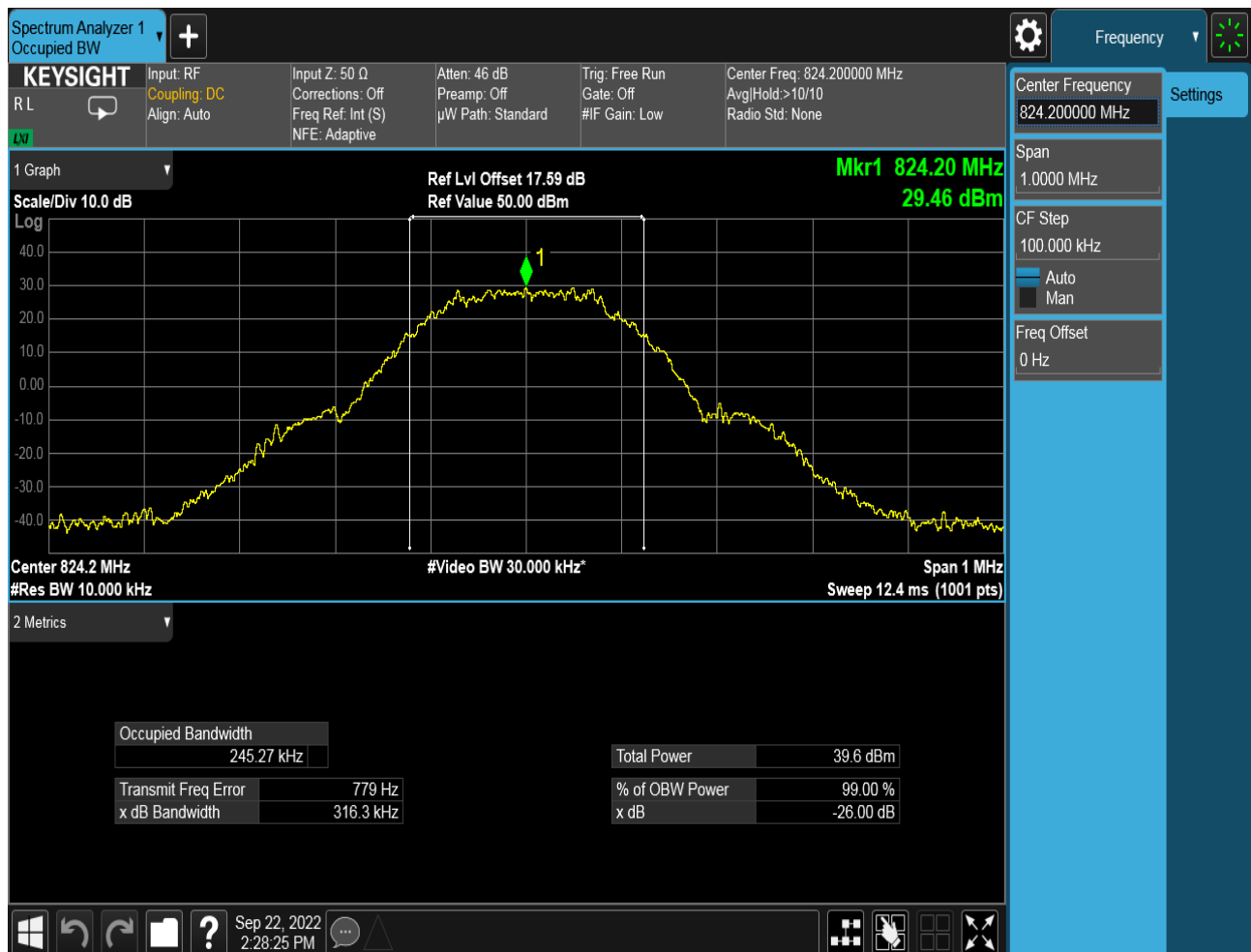
Part II - Test Plots

4.1 For GSM

4.1.1 Test Band = GSM850

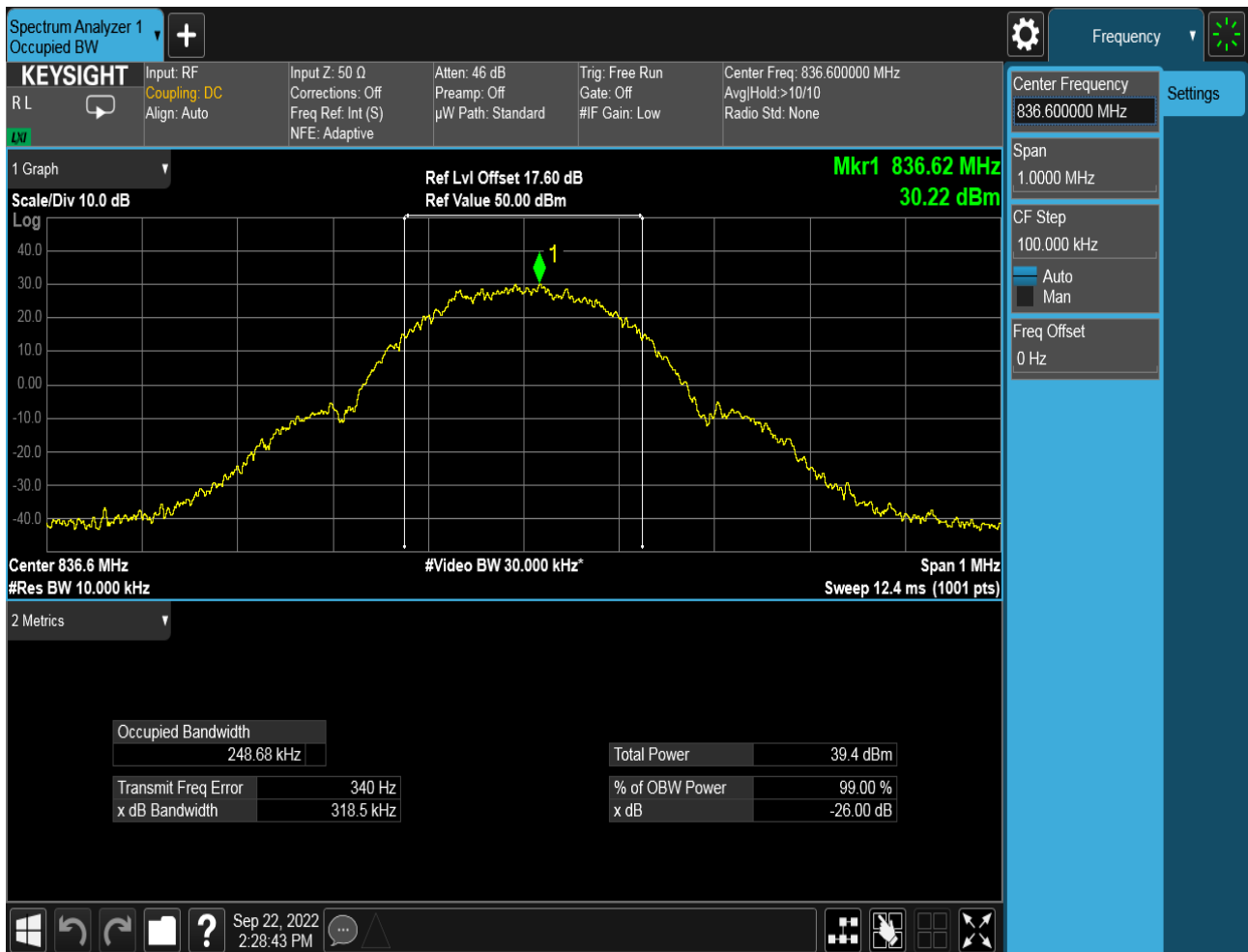
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH





4.1.1.1.2 Test Channel = MCH





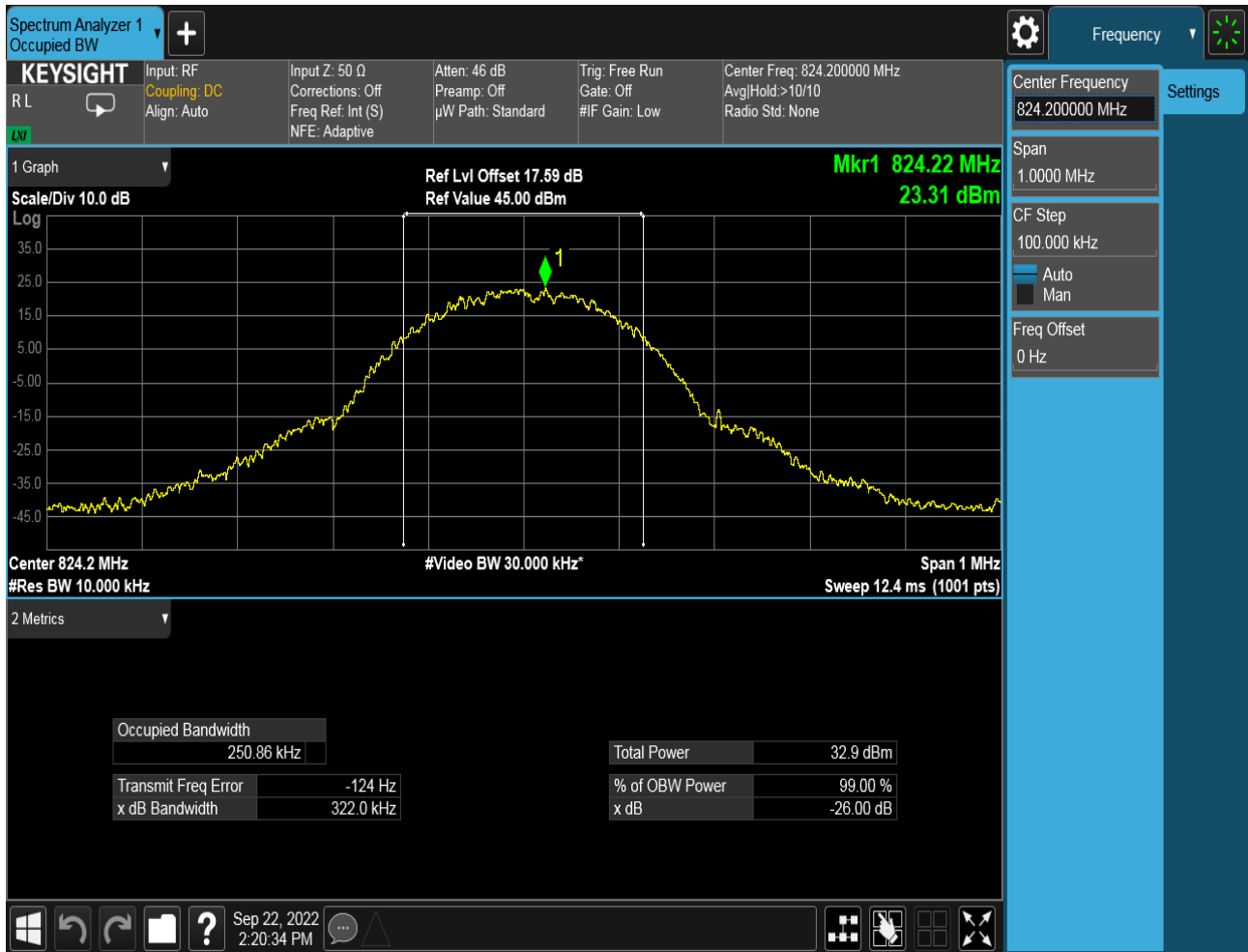
4.1.1.1.3 Test Channel = HCH





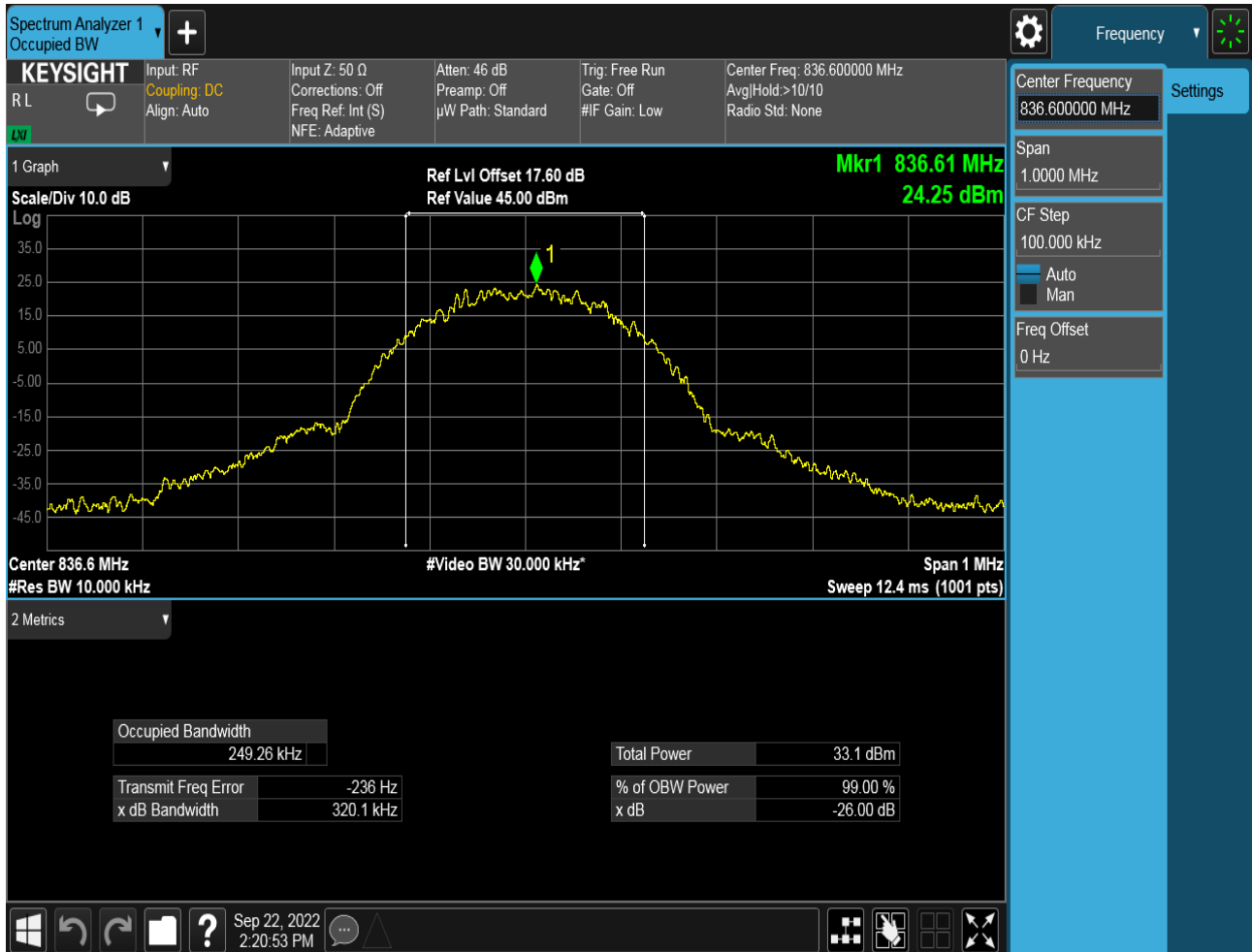
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH



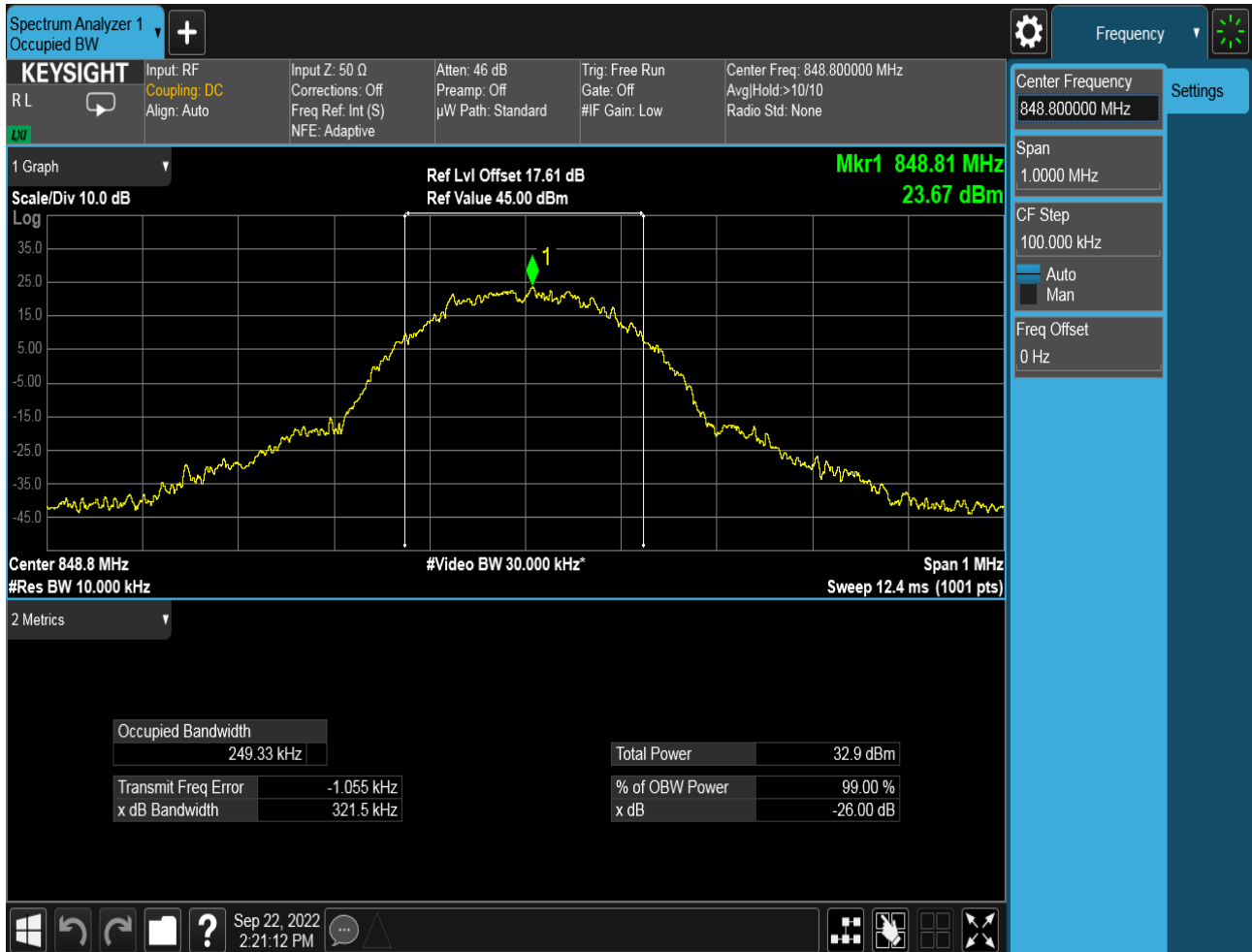


4.1.1.2.2 Test Channel = MCH





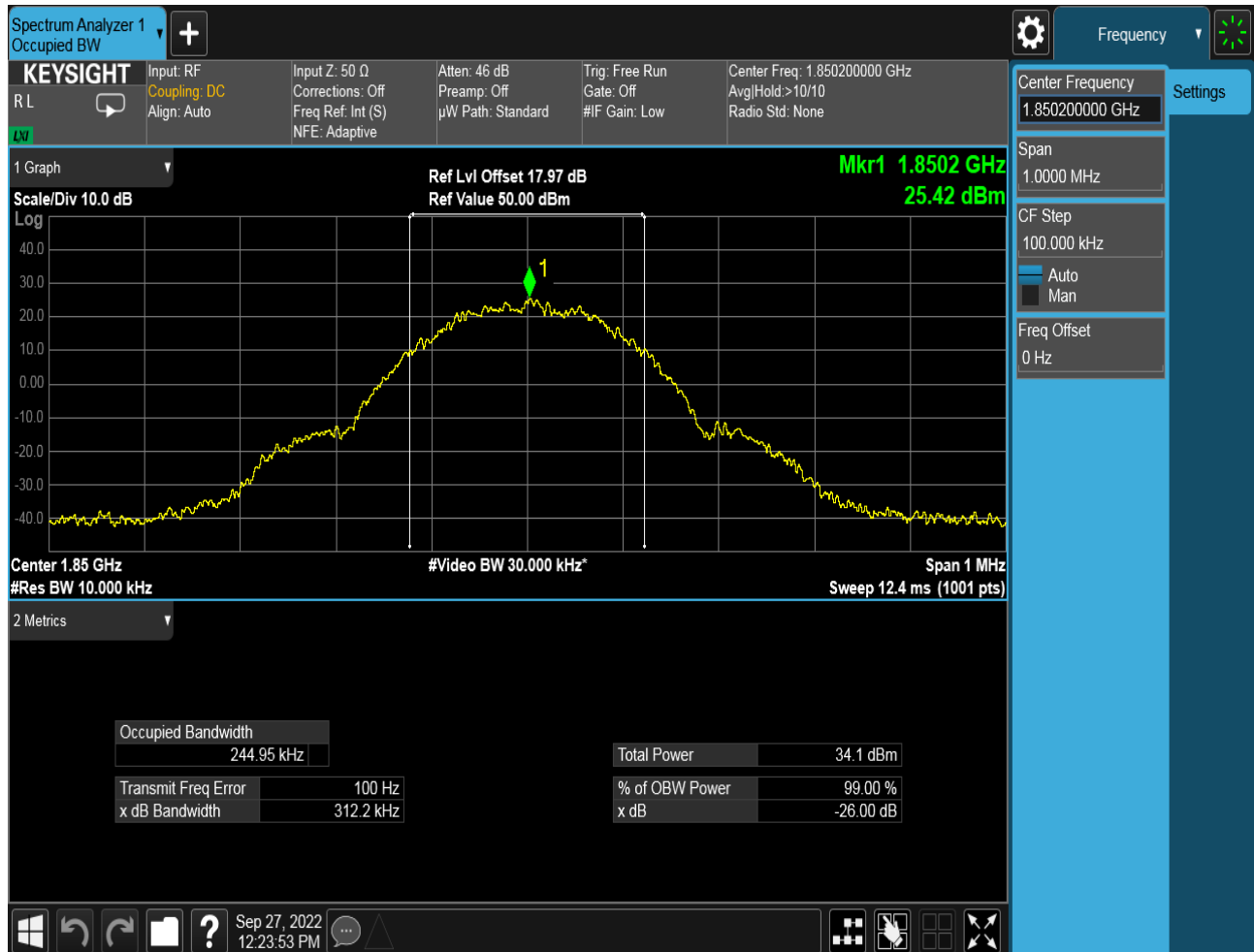
4.1.1.2.3 Test Channel = HCH



4.1.2 Test Band = PCS1900

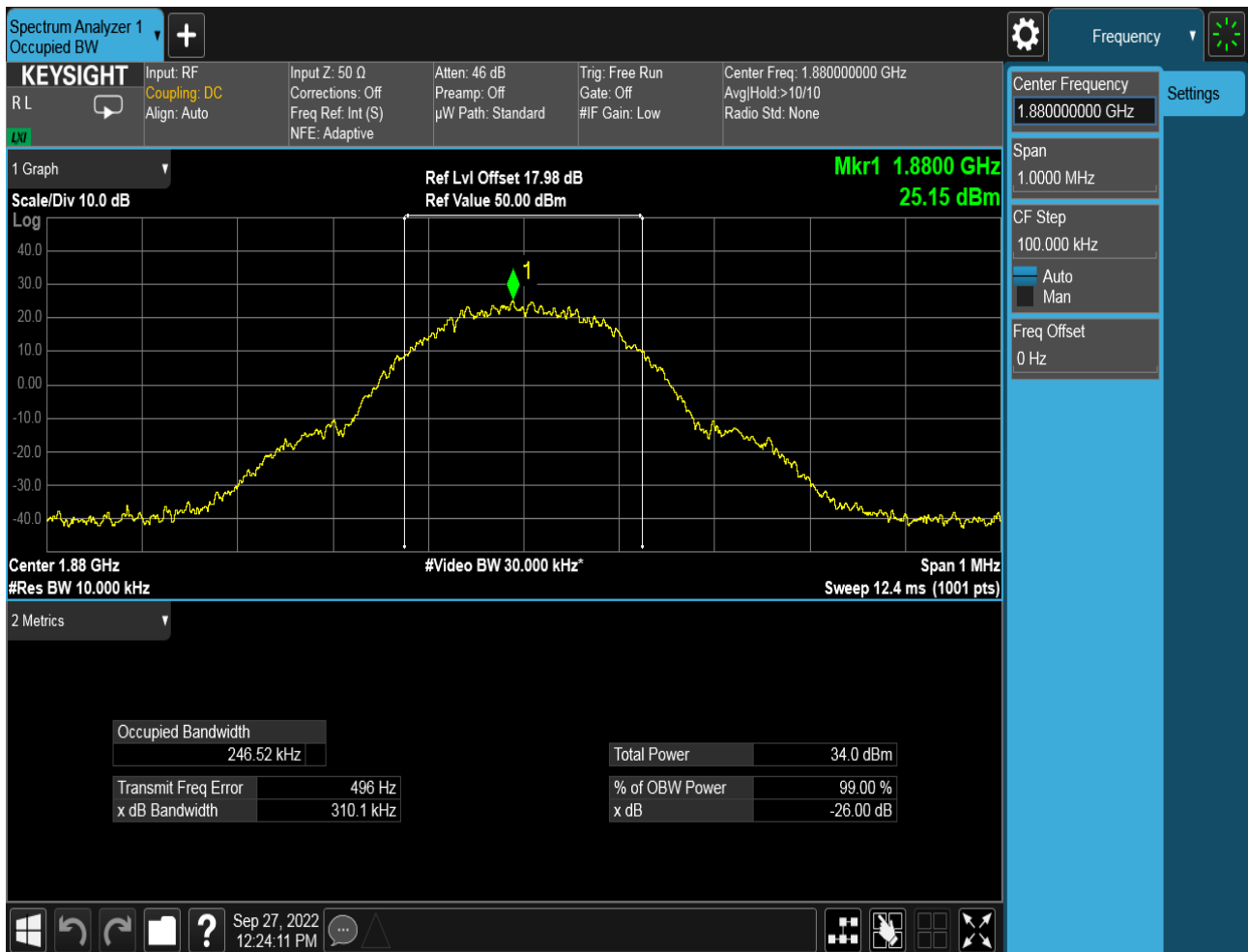
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



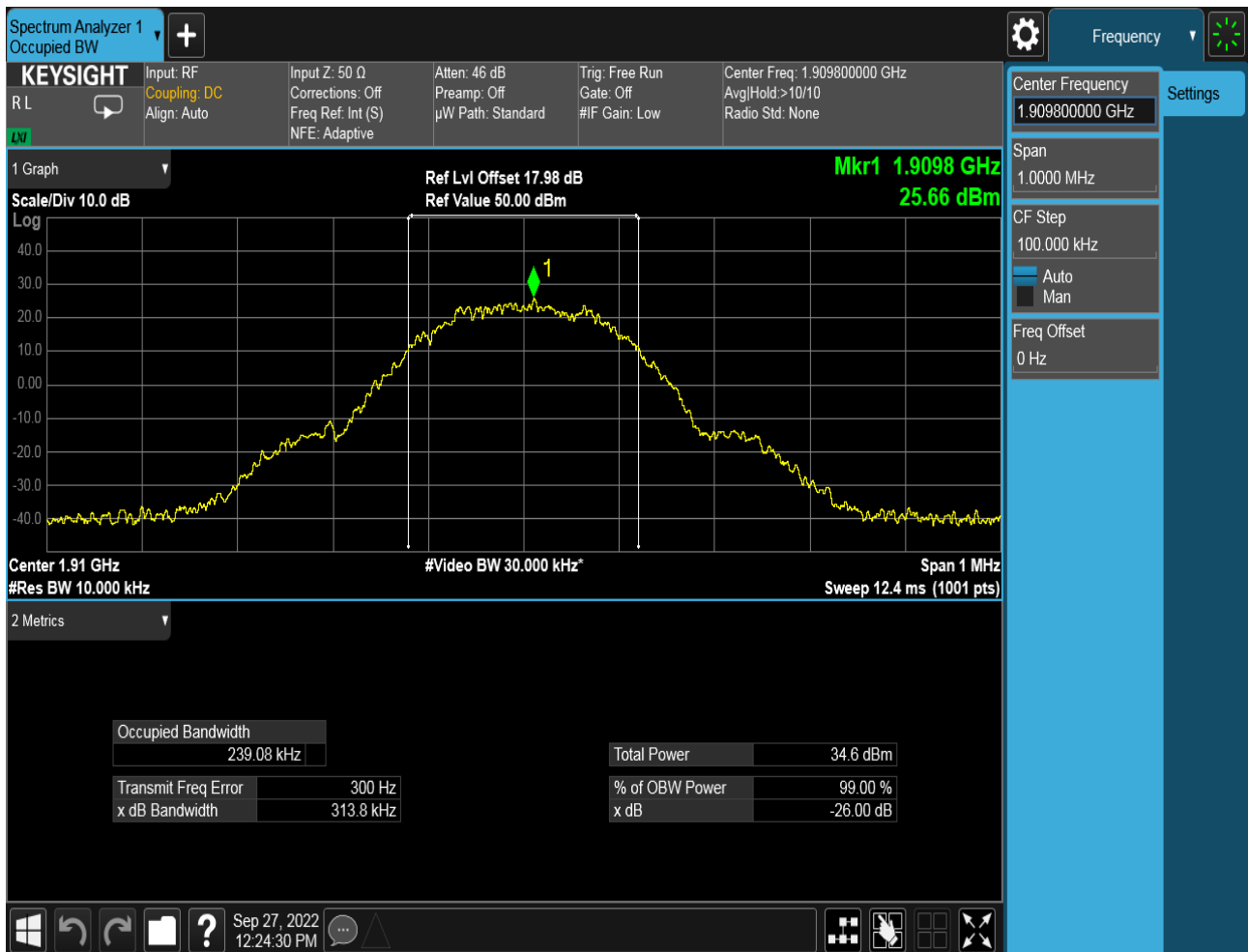


4.1.2.1.2 Test Channel = MCH





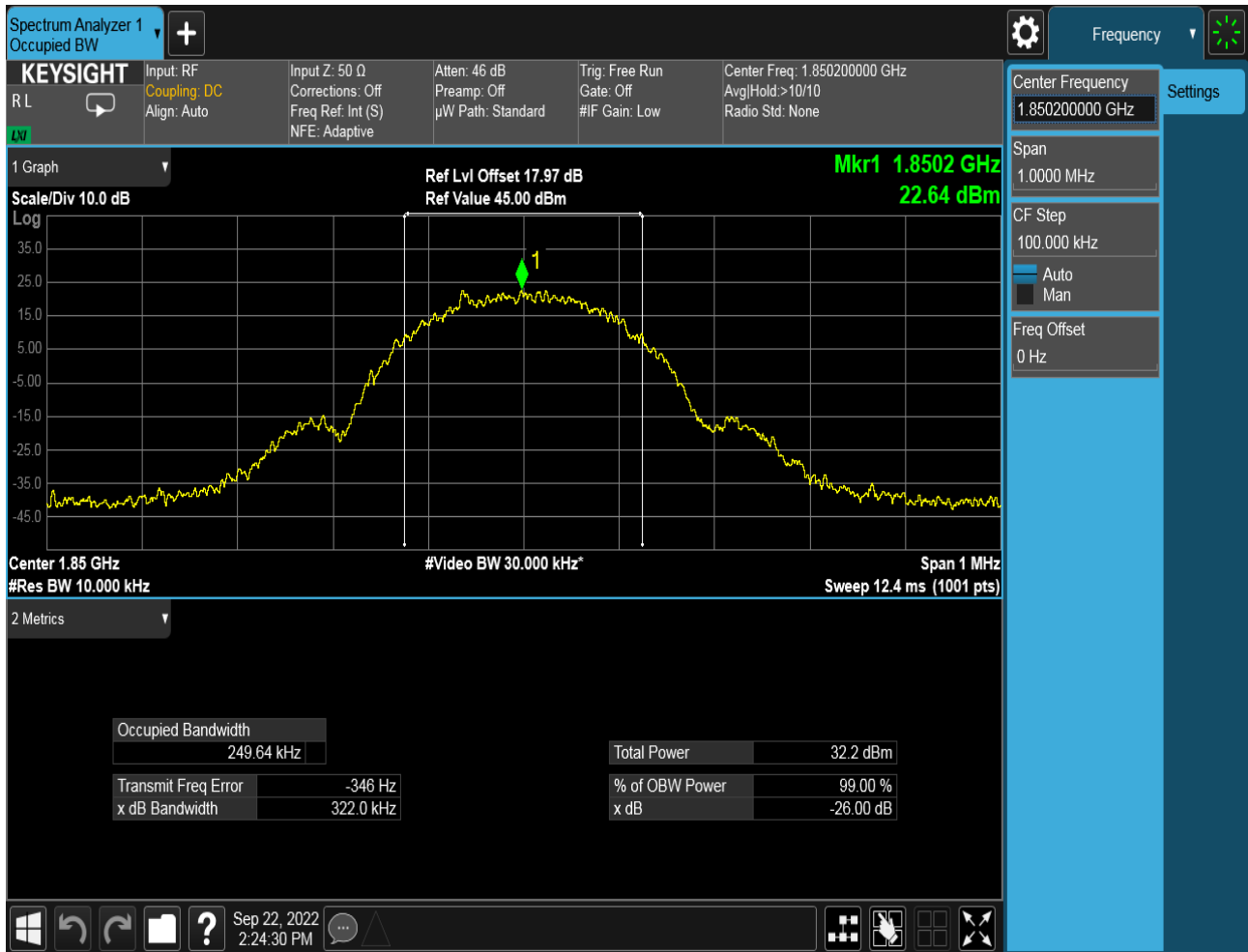
4.1.2.1.3 Test Channel = HCH





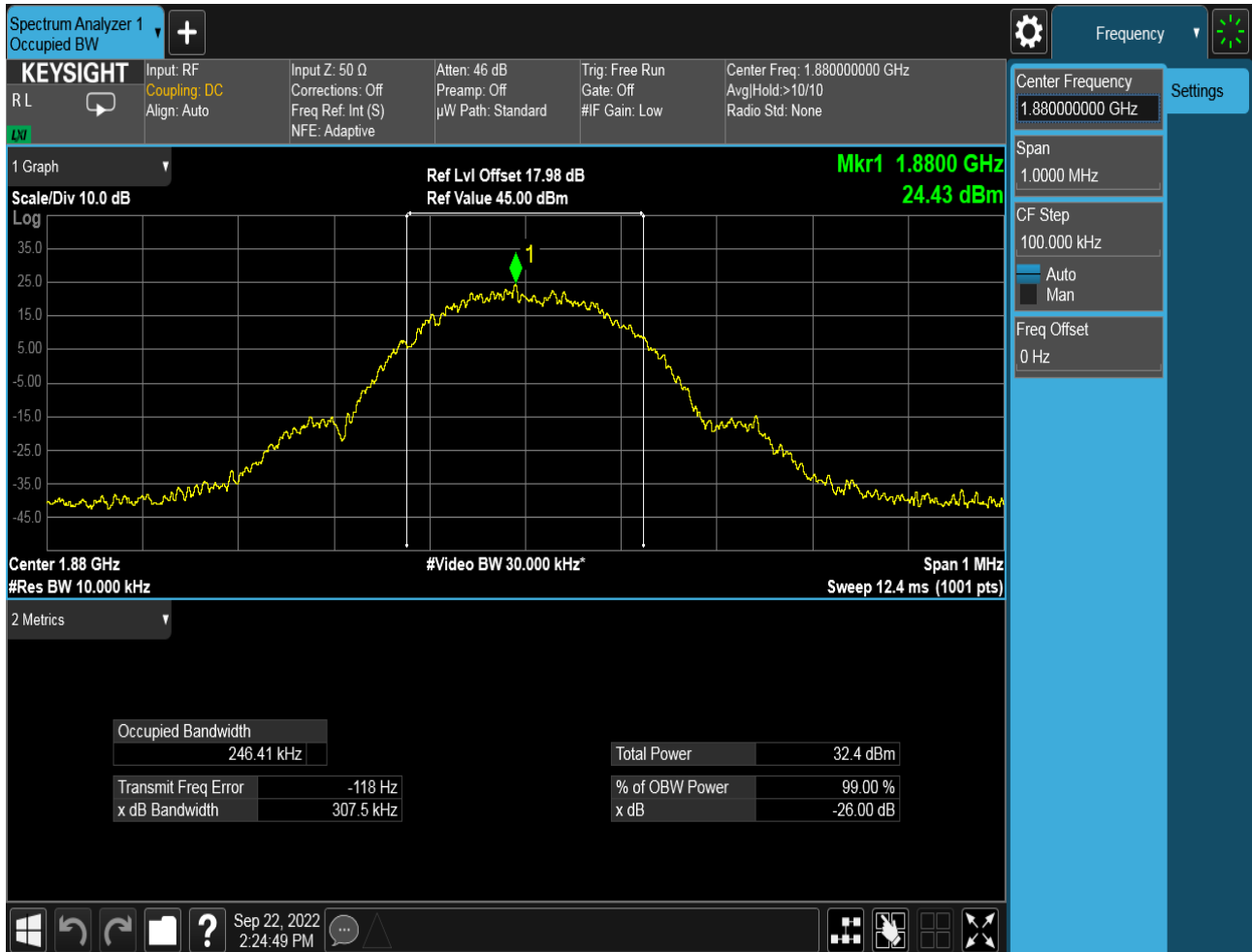
4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



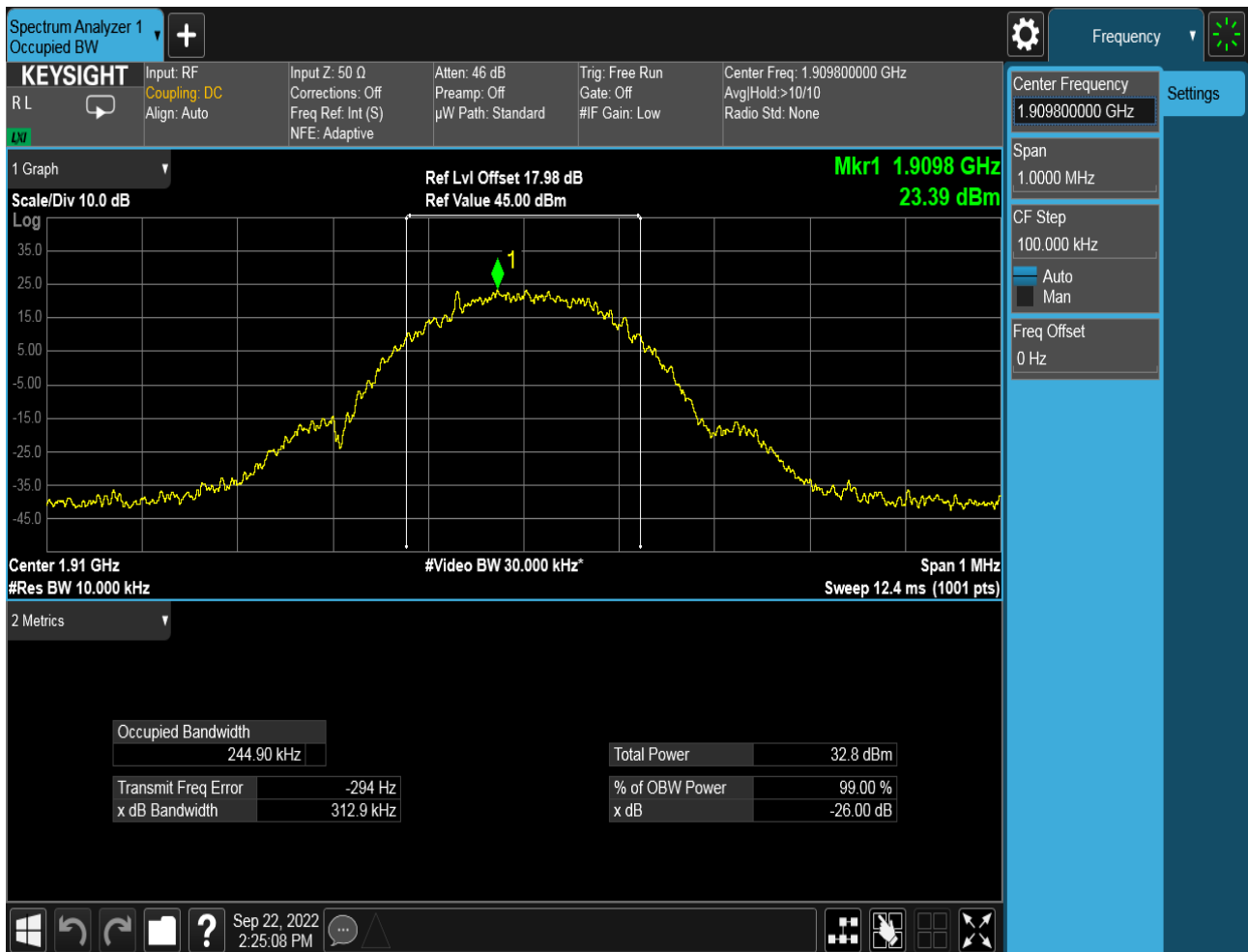


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

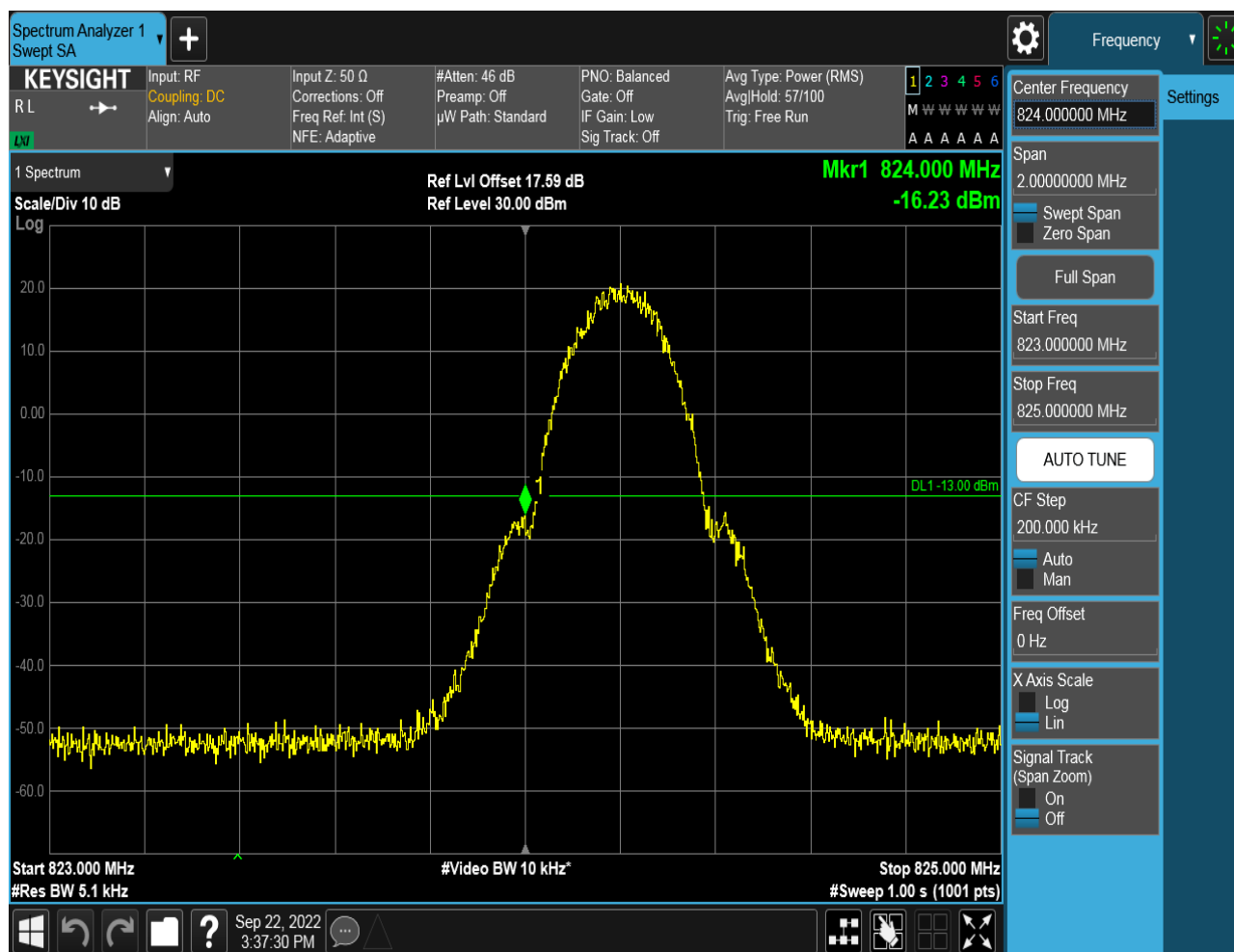
Part I - Test Plots

5.1 For GSM

5.1.1 Test Band = GSM850

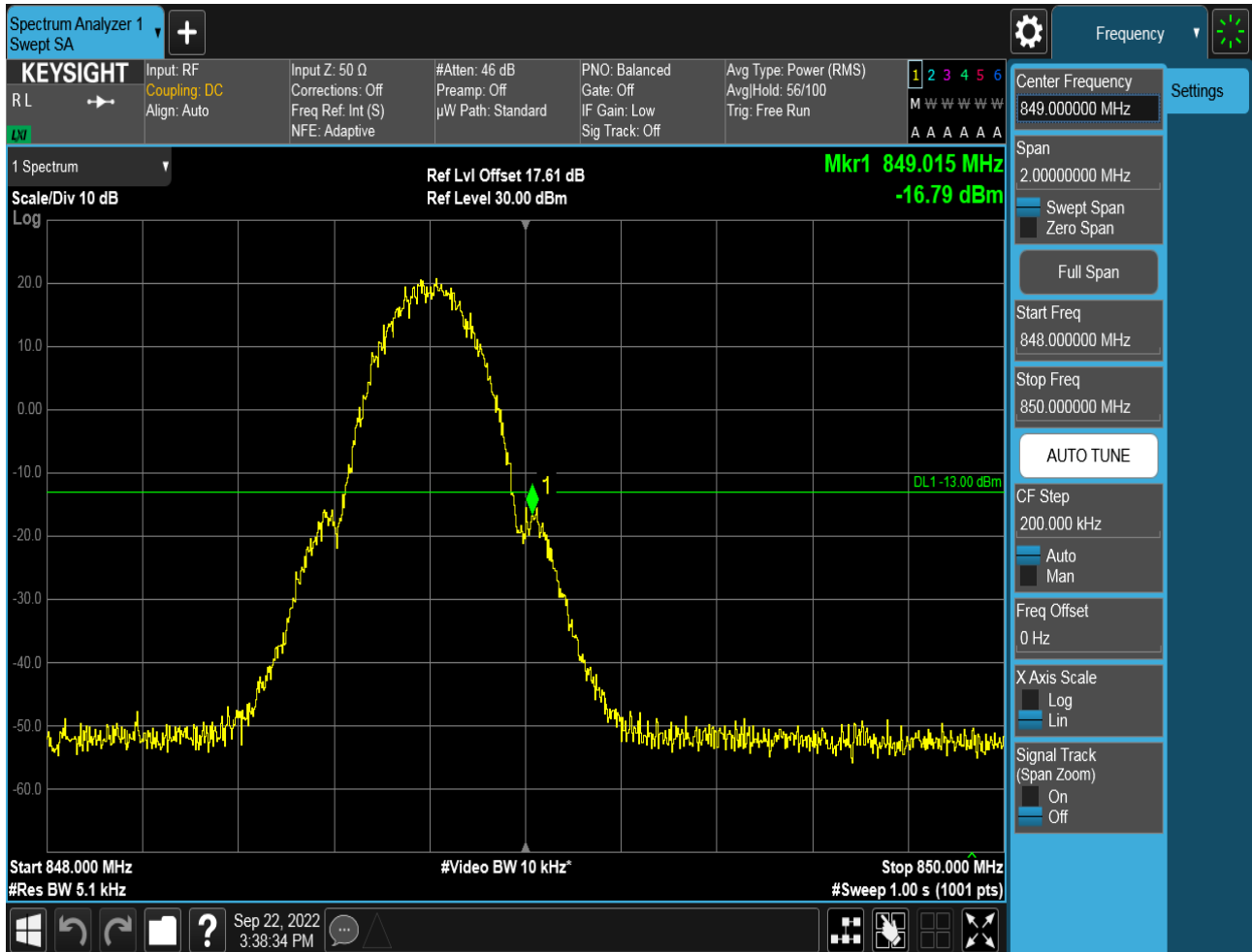
5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH





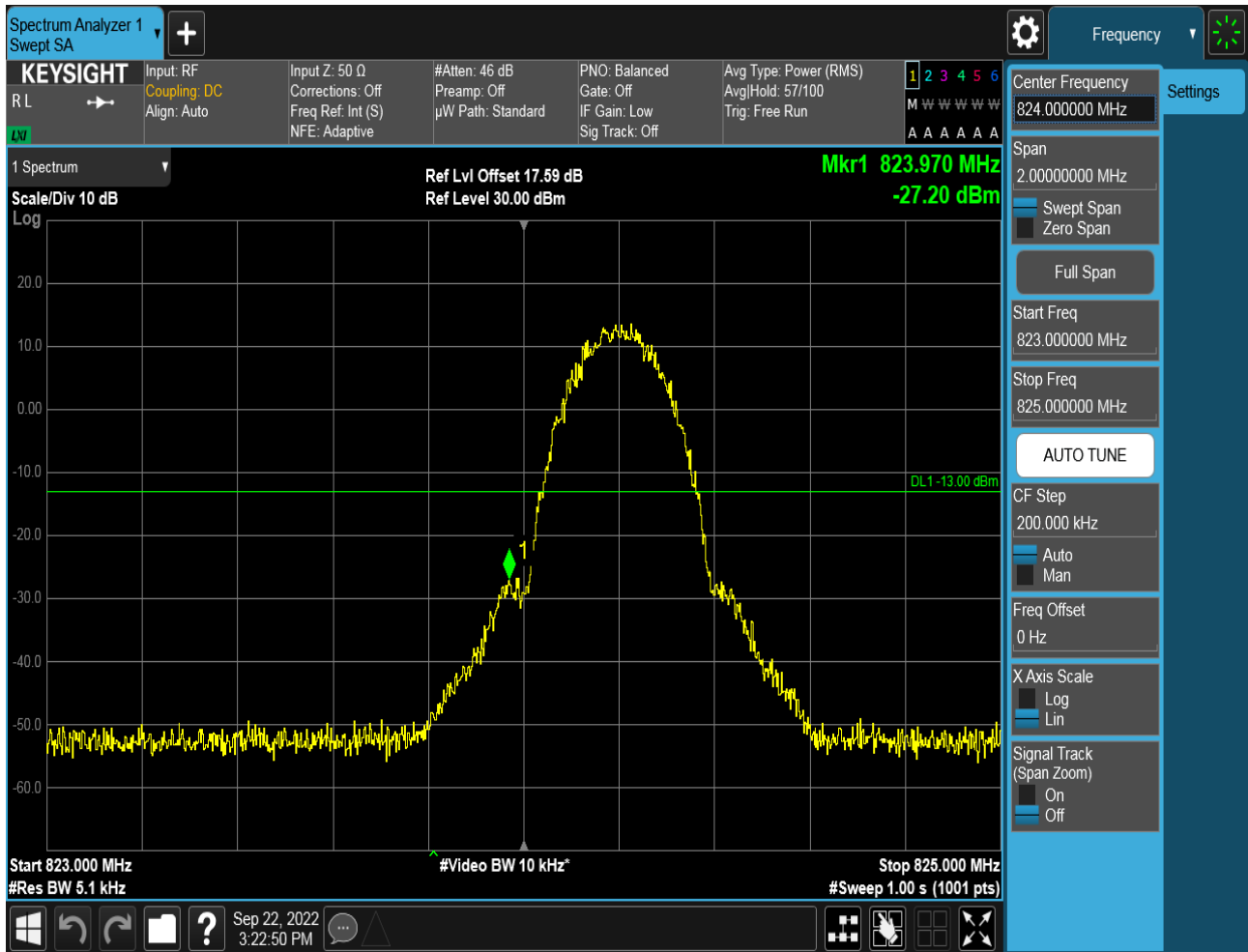
5.1.1.1.2 Test Channel = HCH





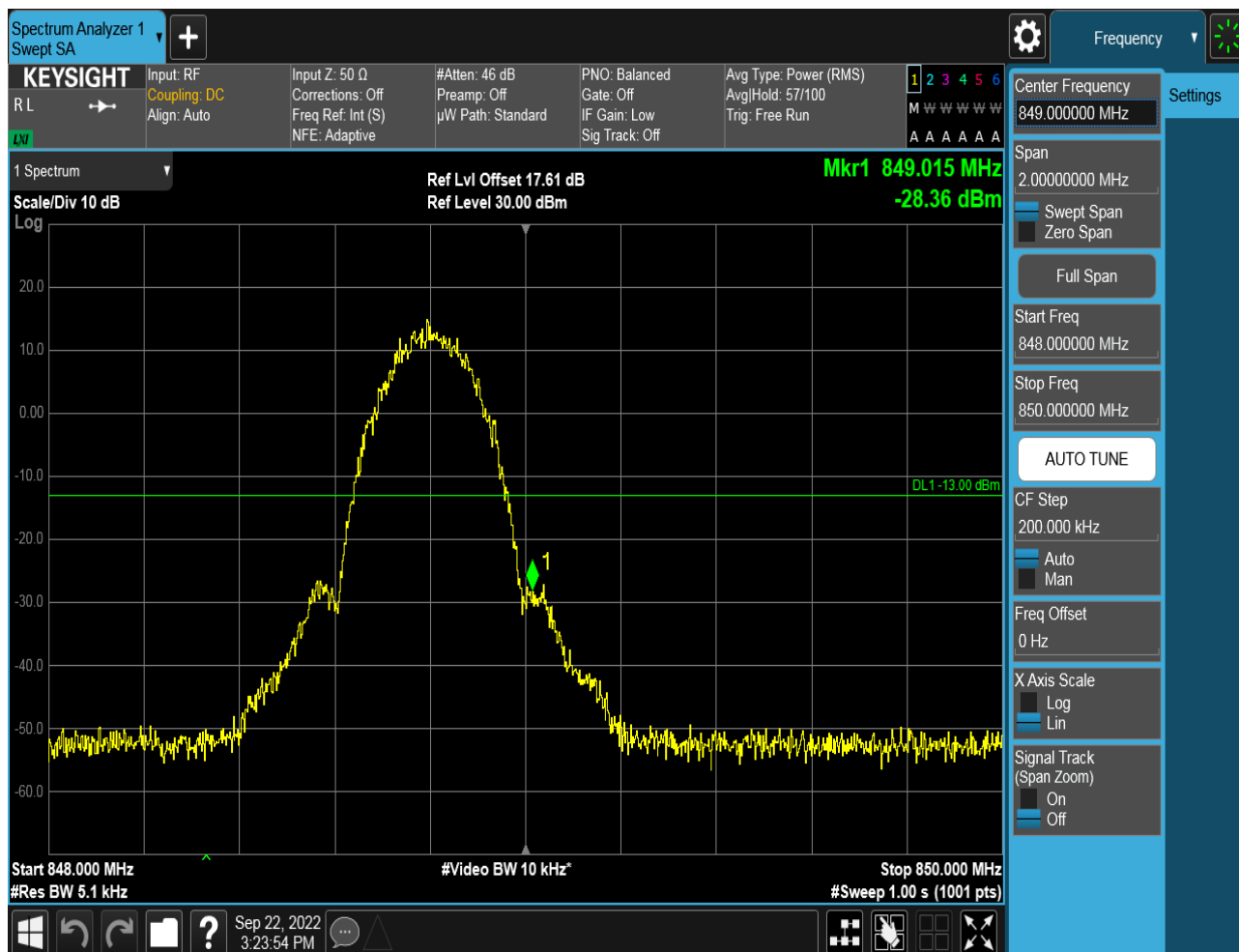
5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH





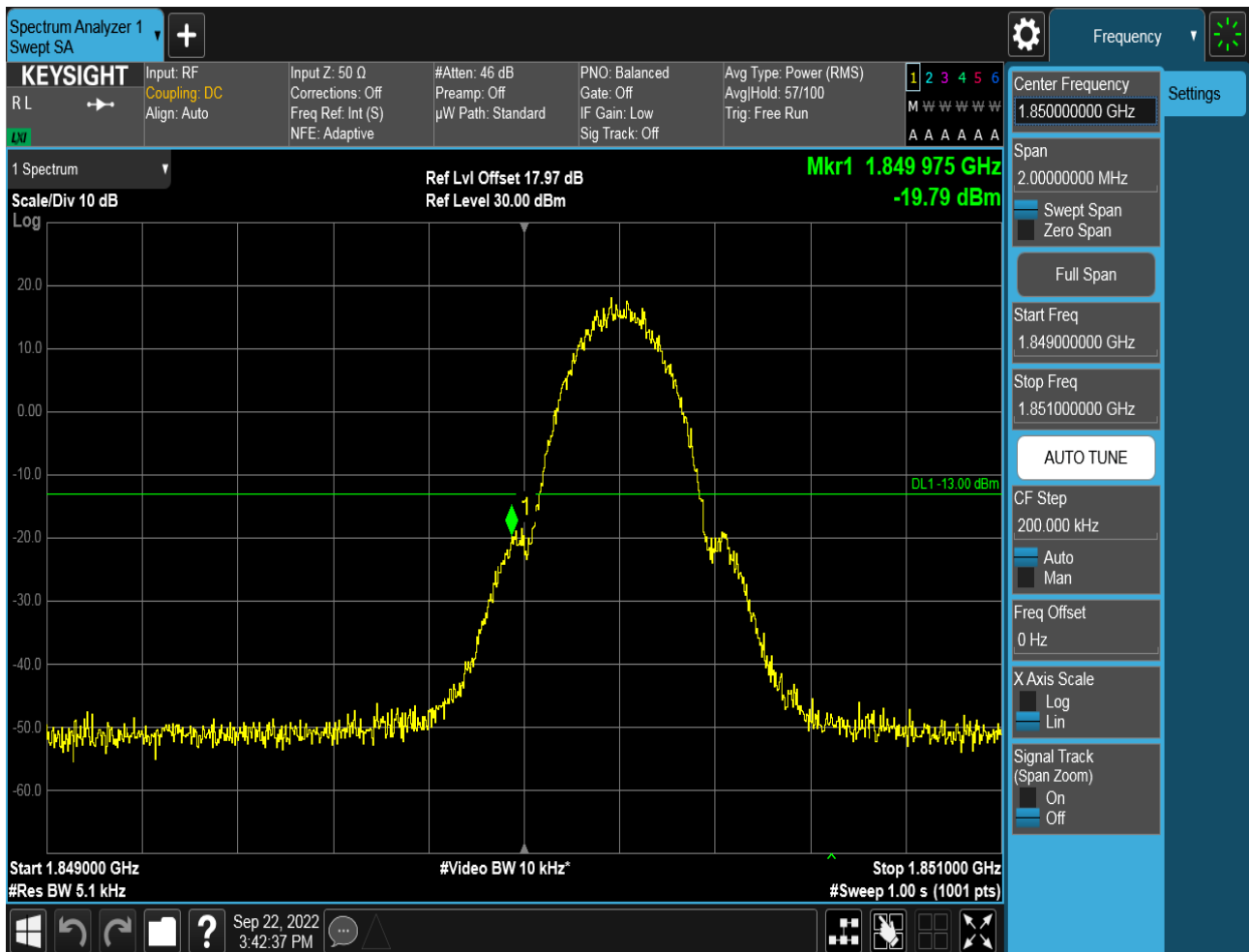
5.1.1.2.2 Test Channel = HCH



5.1.2 Test Band = PCS1900

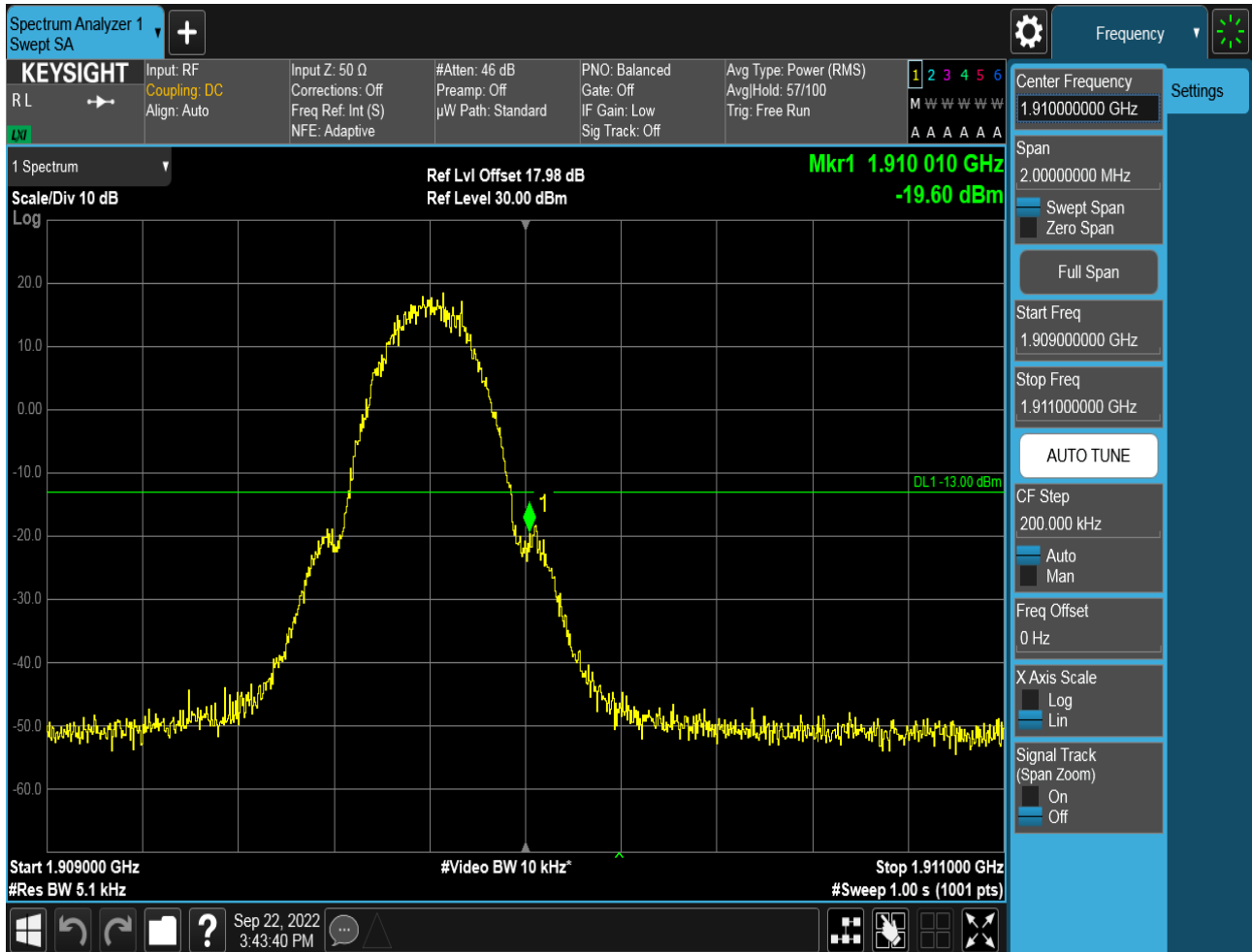
5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH



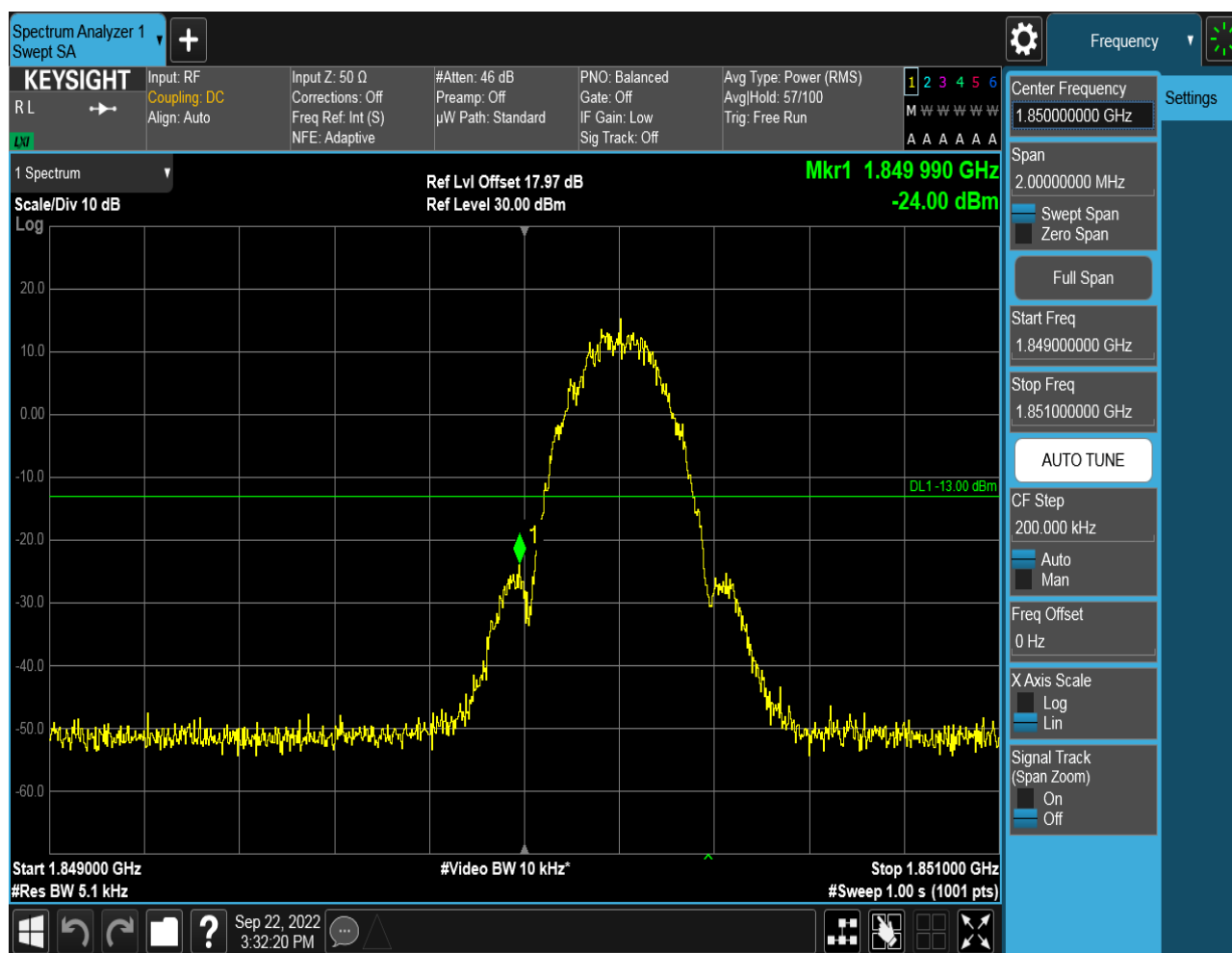


5.1.2.1.2 Test Channel = HCH

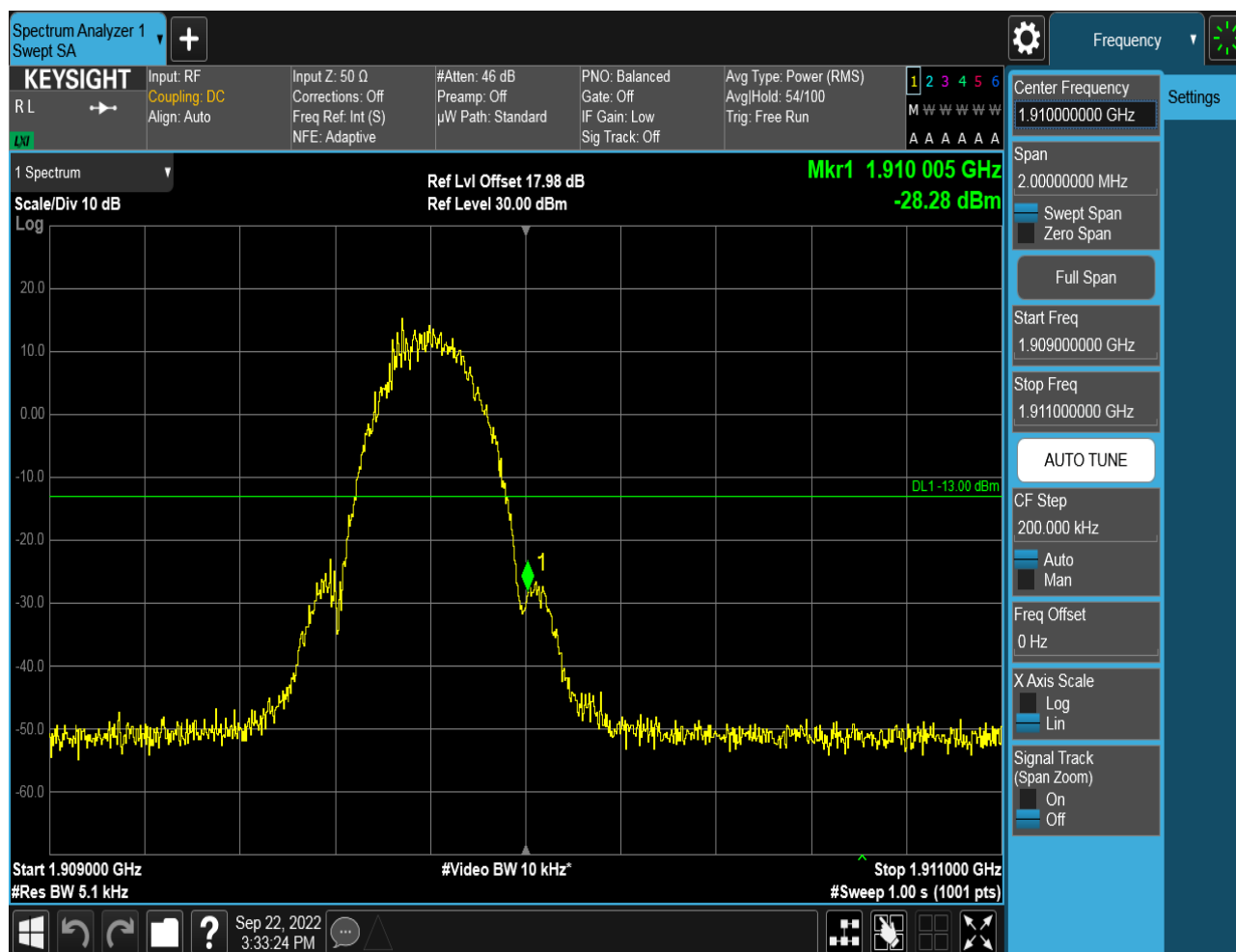


5.1.2.2 Test Mode = GSM/TM2

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

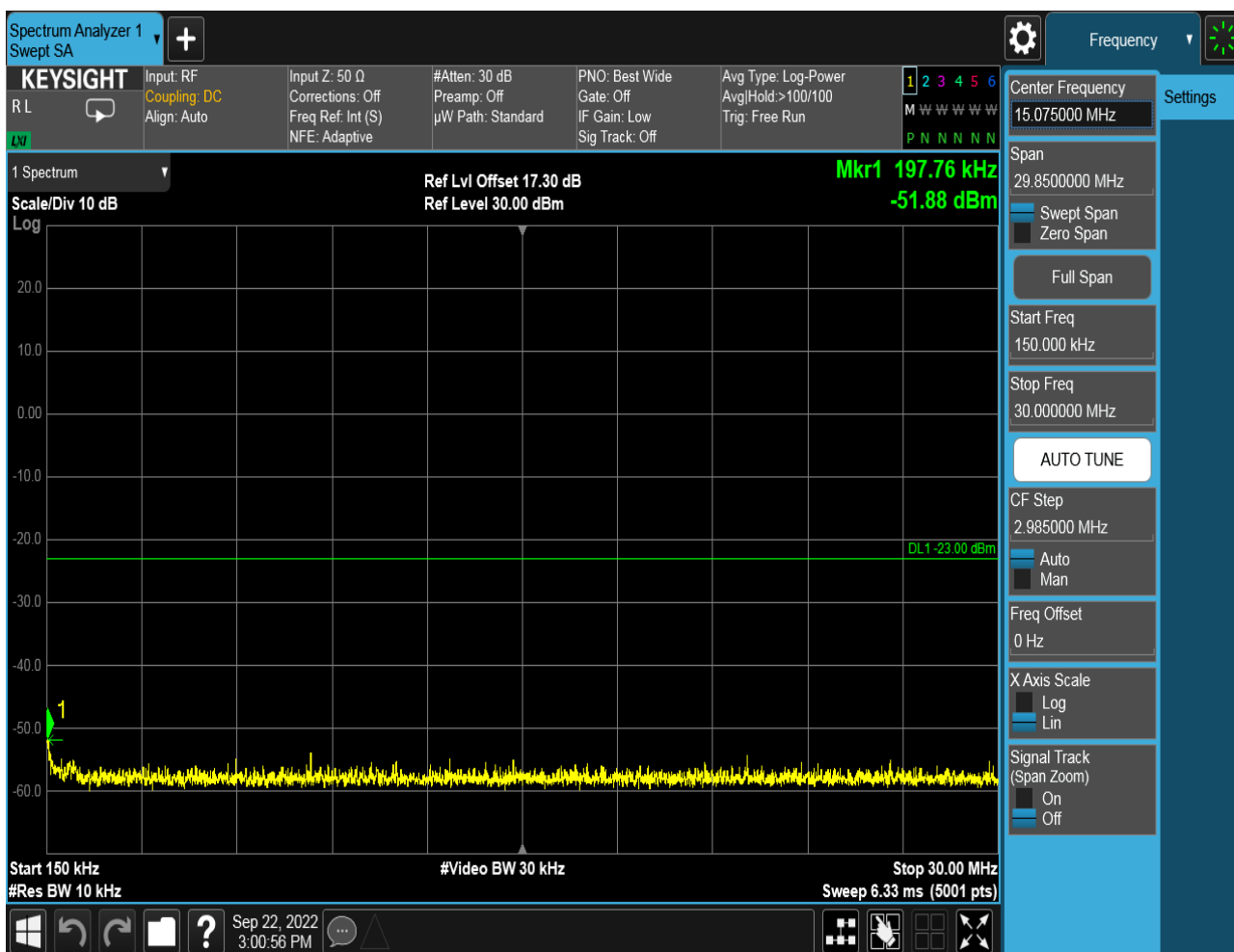
6.1 For GSM

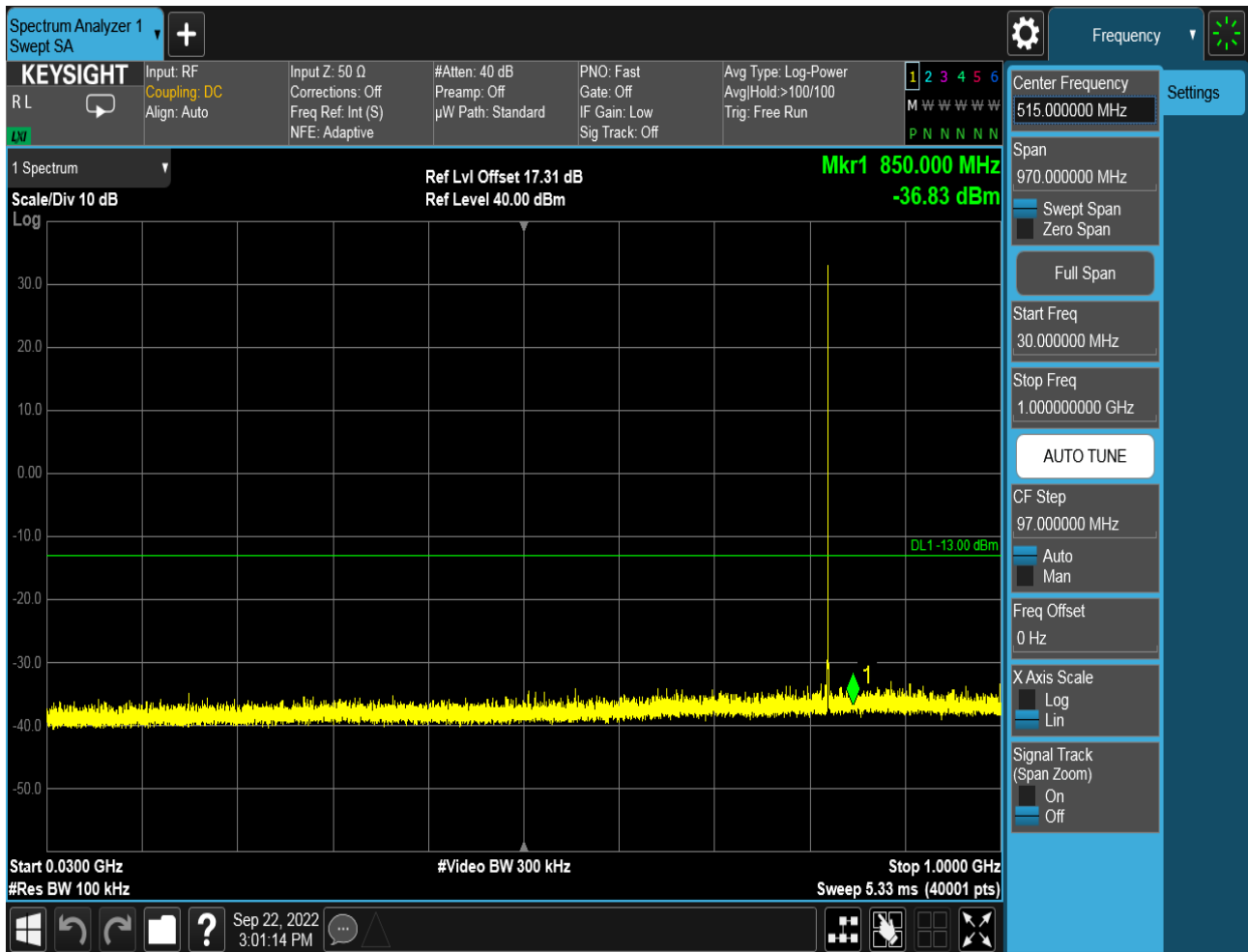
6.1.1 Test Band = GSM850

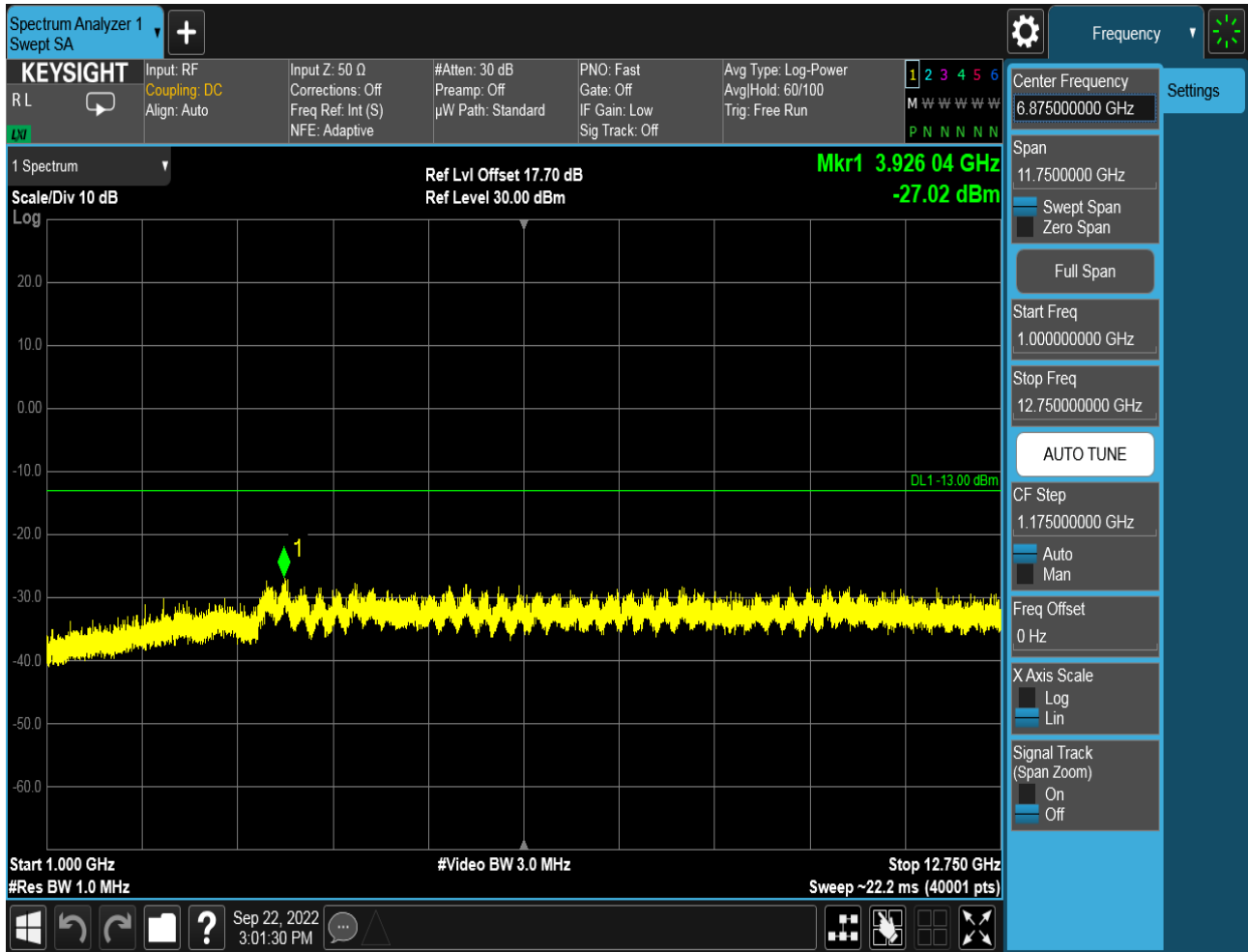
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH



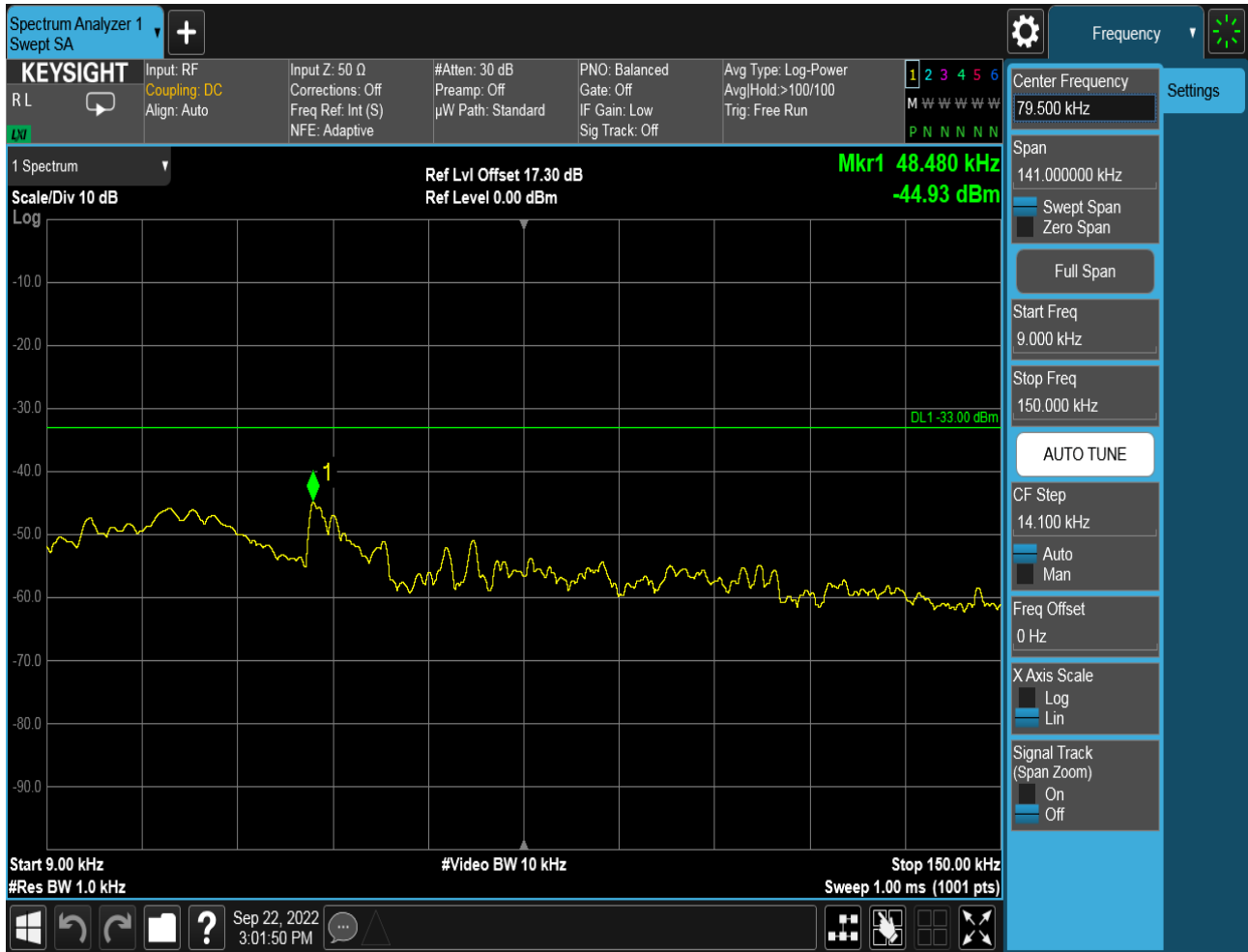


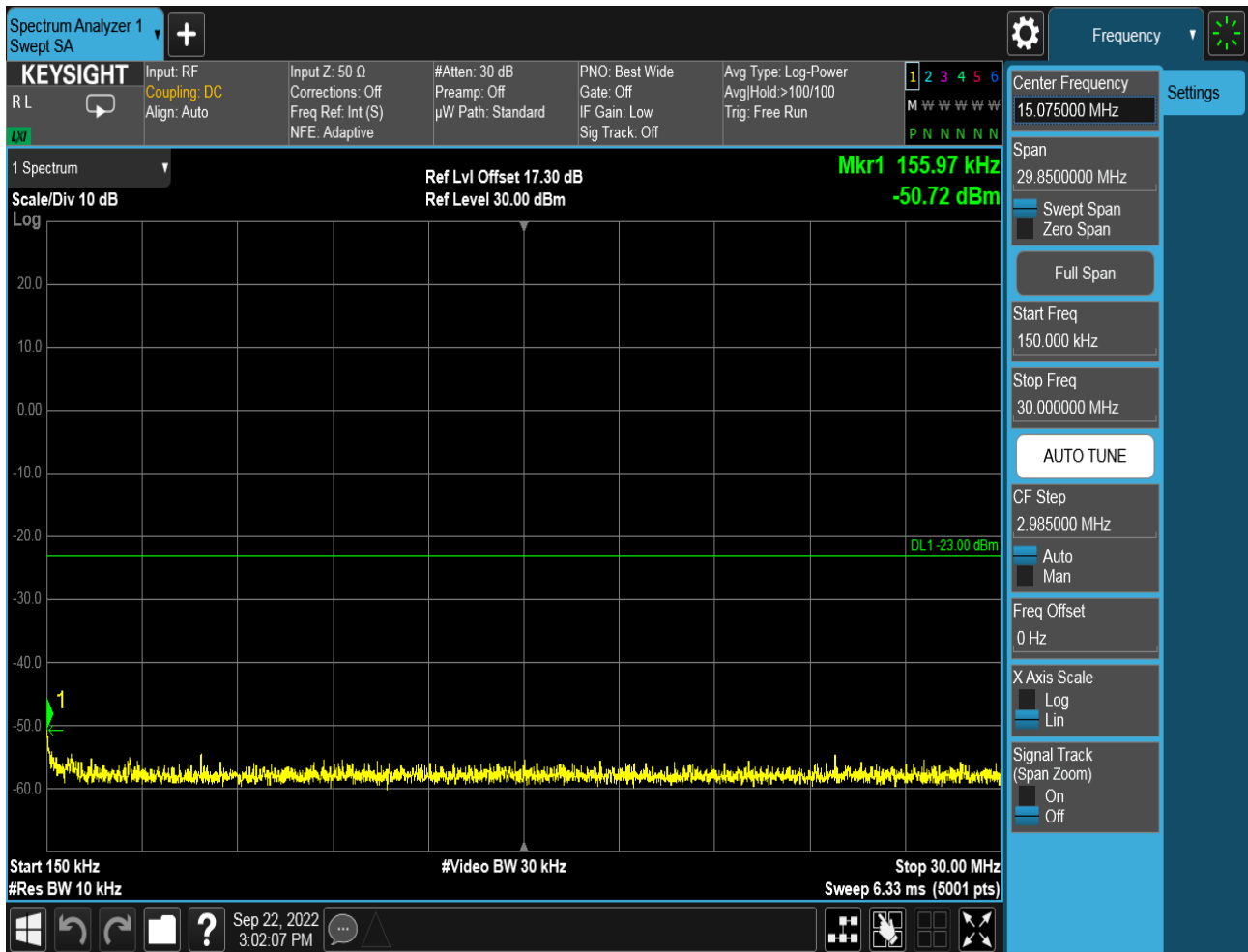


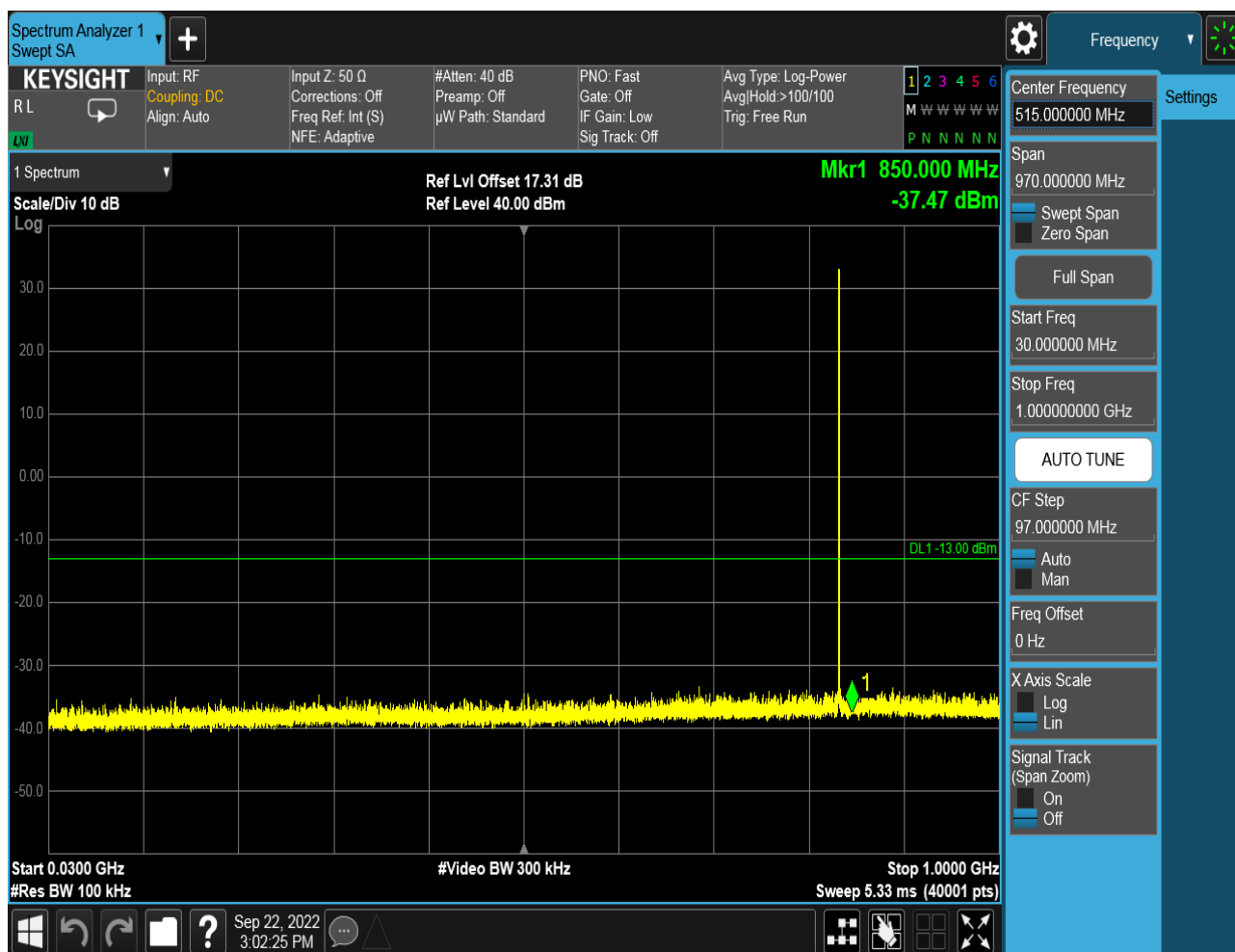


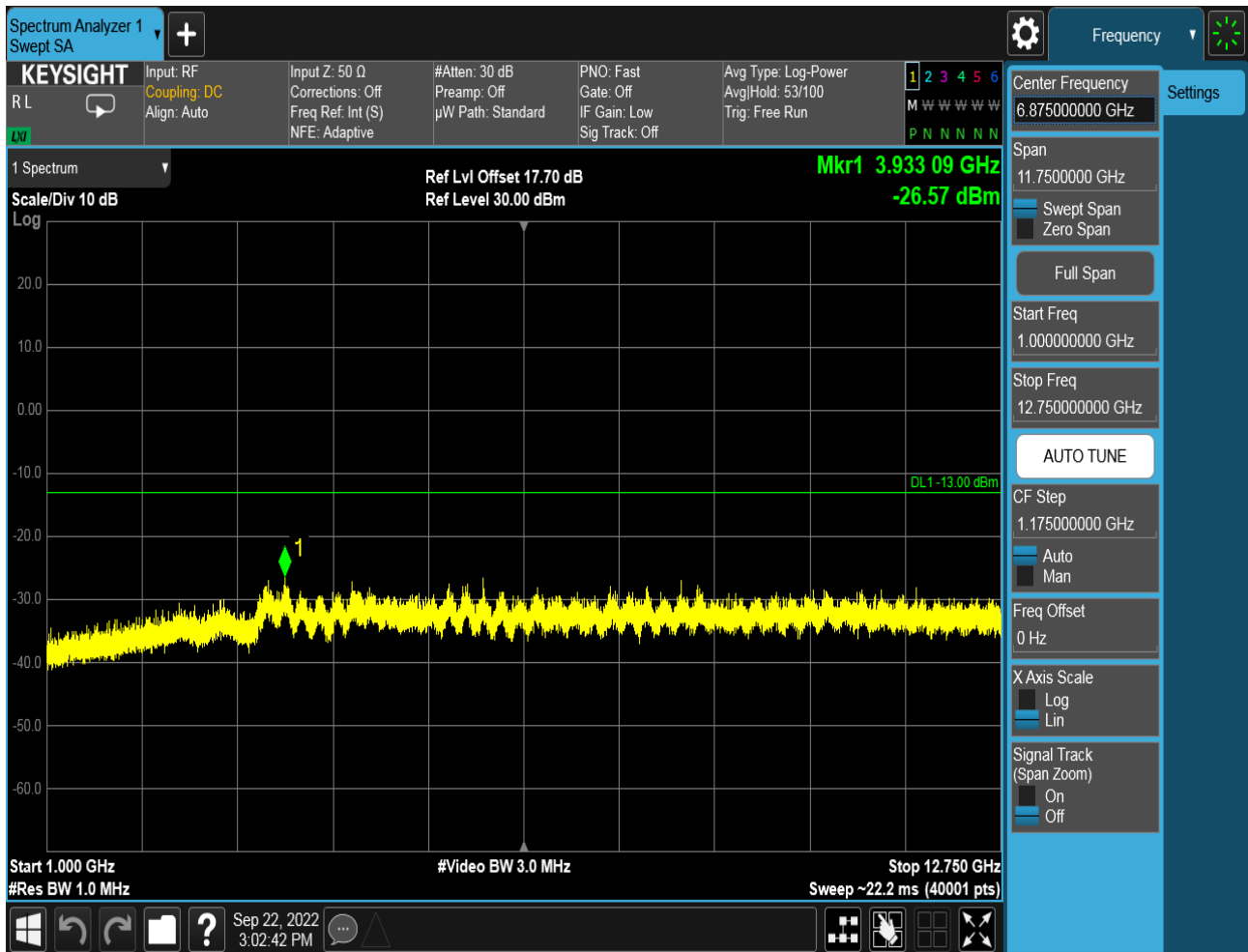


6.1.1.1.2 Test Channel = MCH



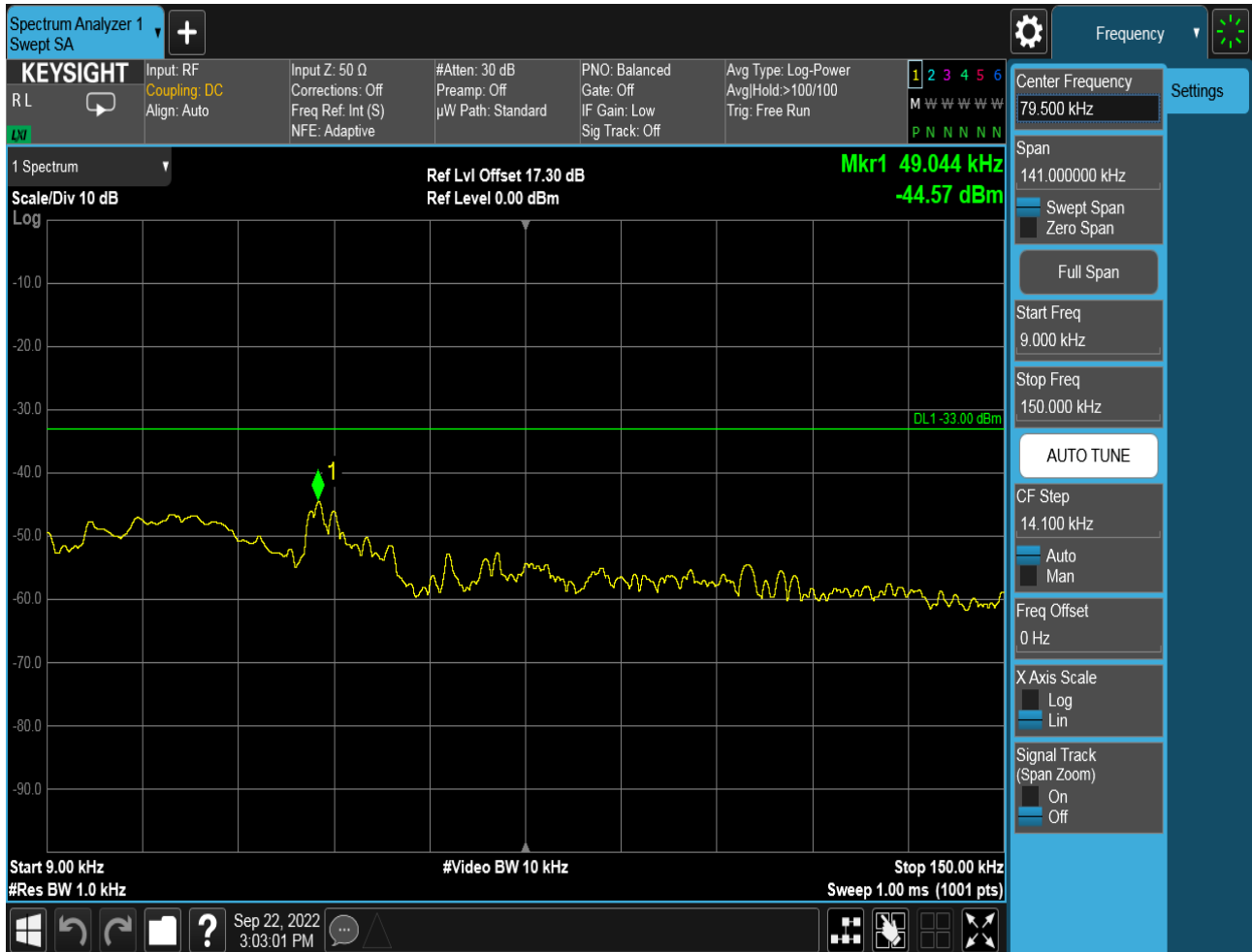


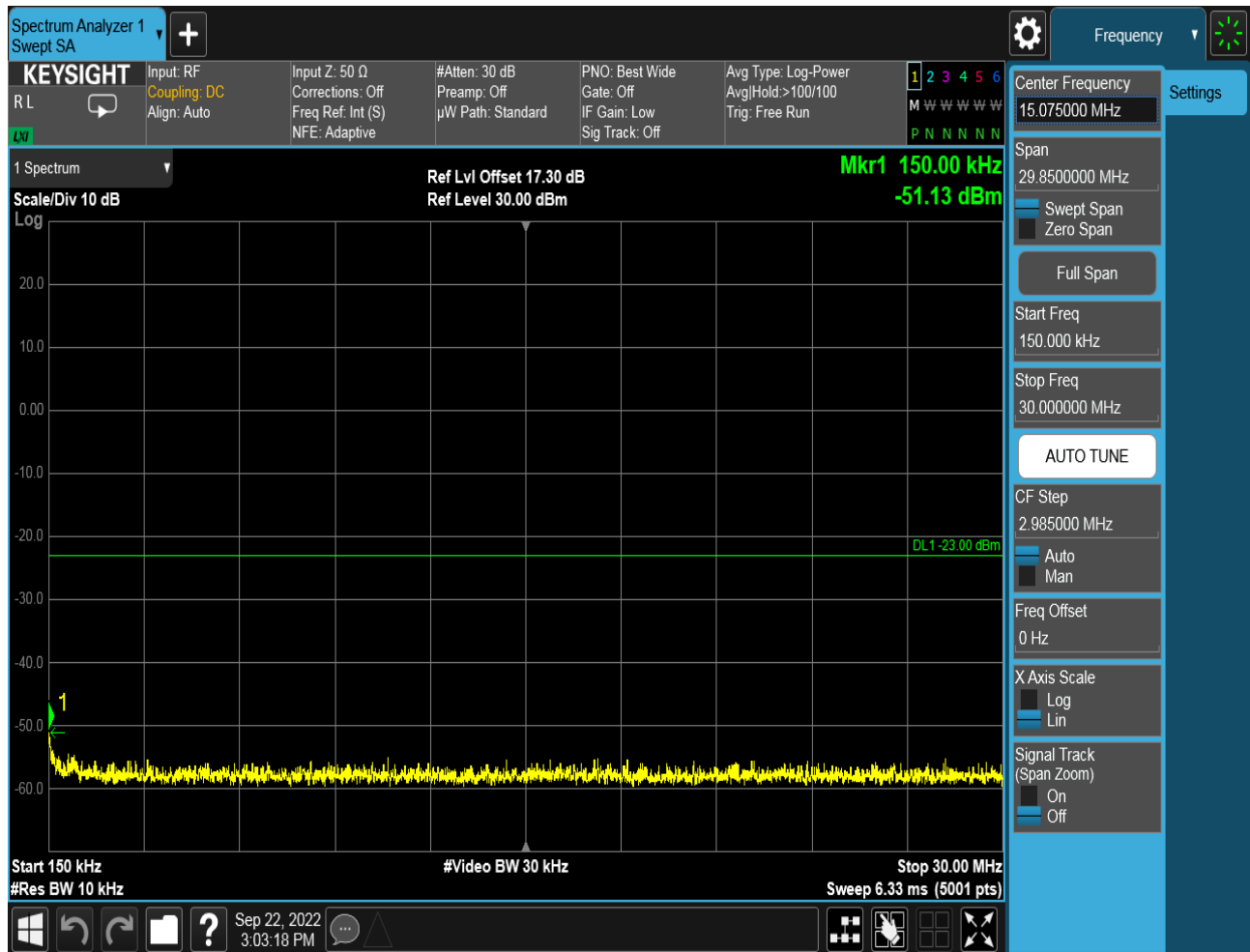


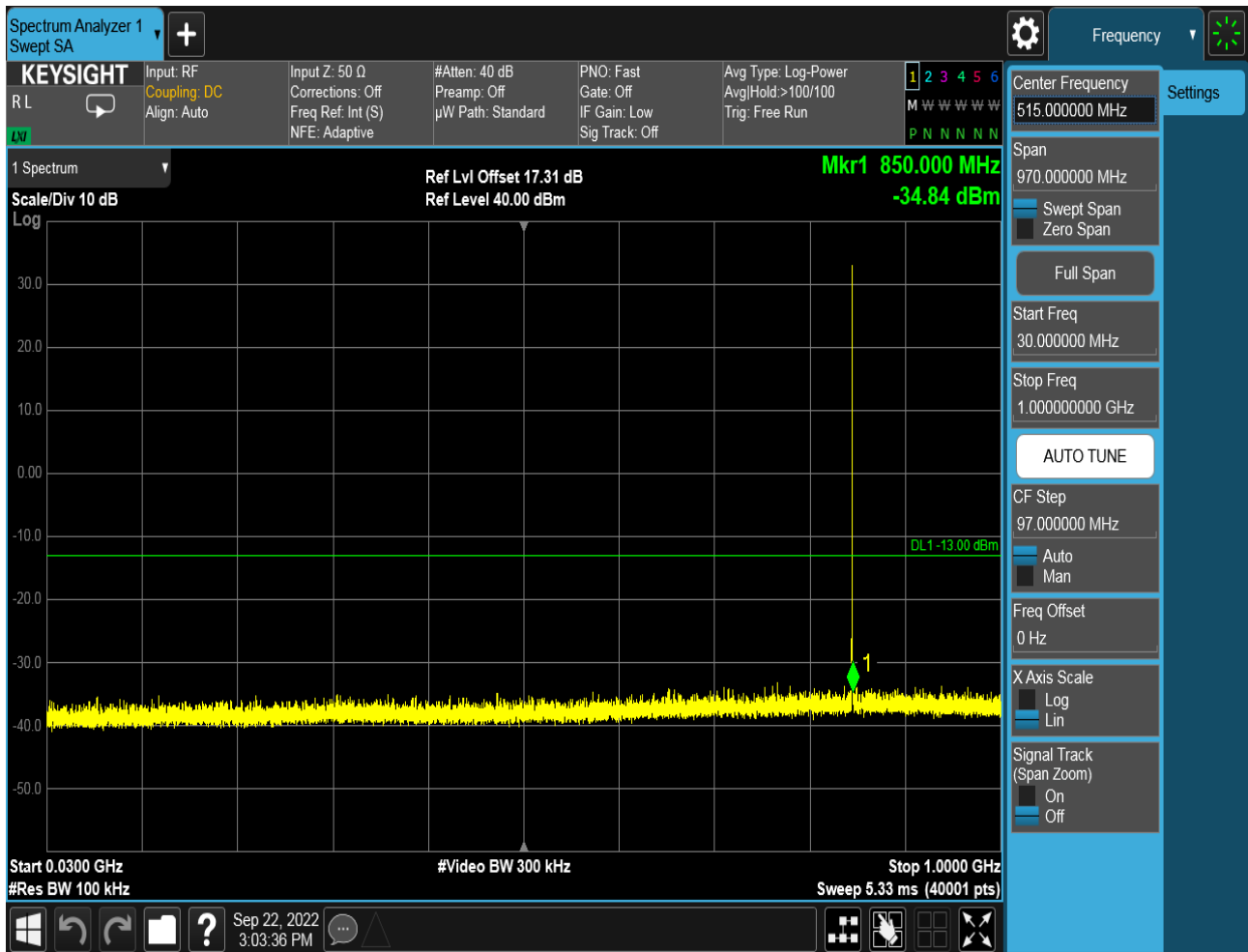


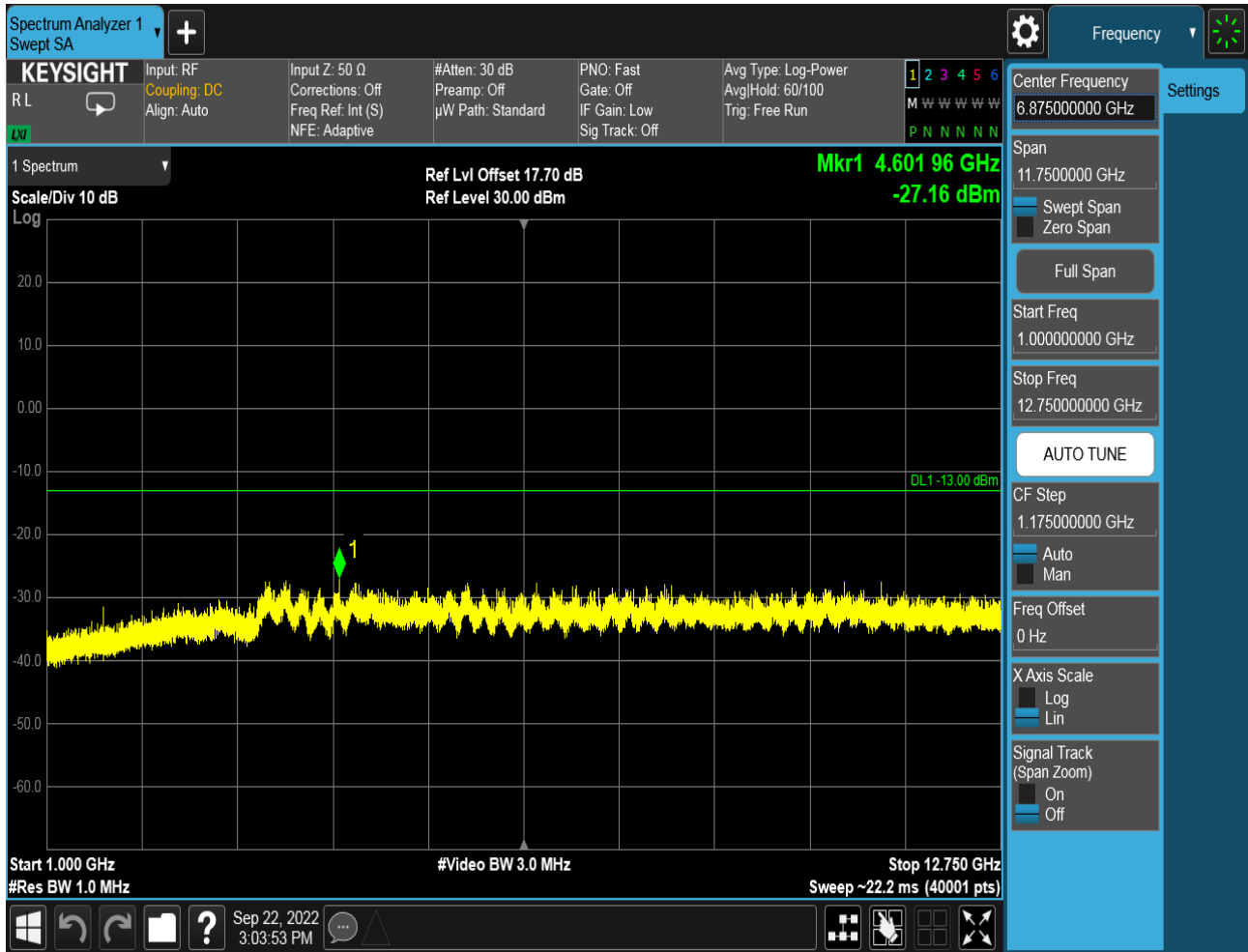


6.1.1.1.3 Test Channel = HCH





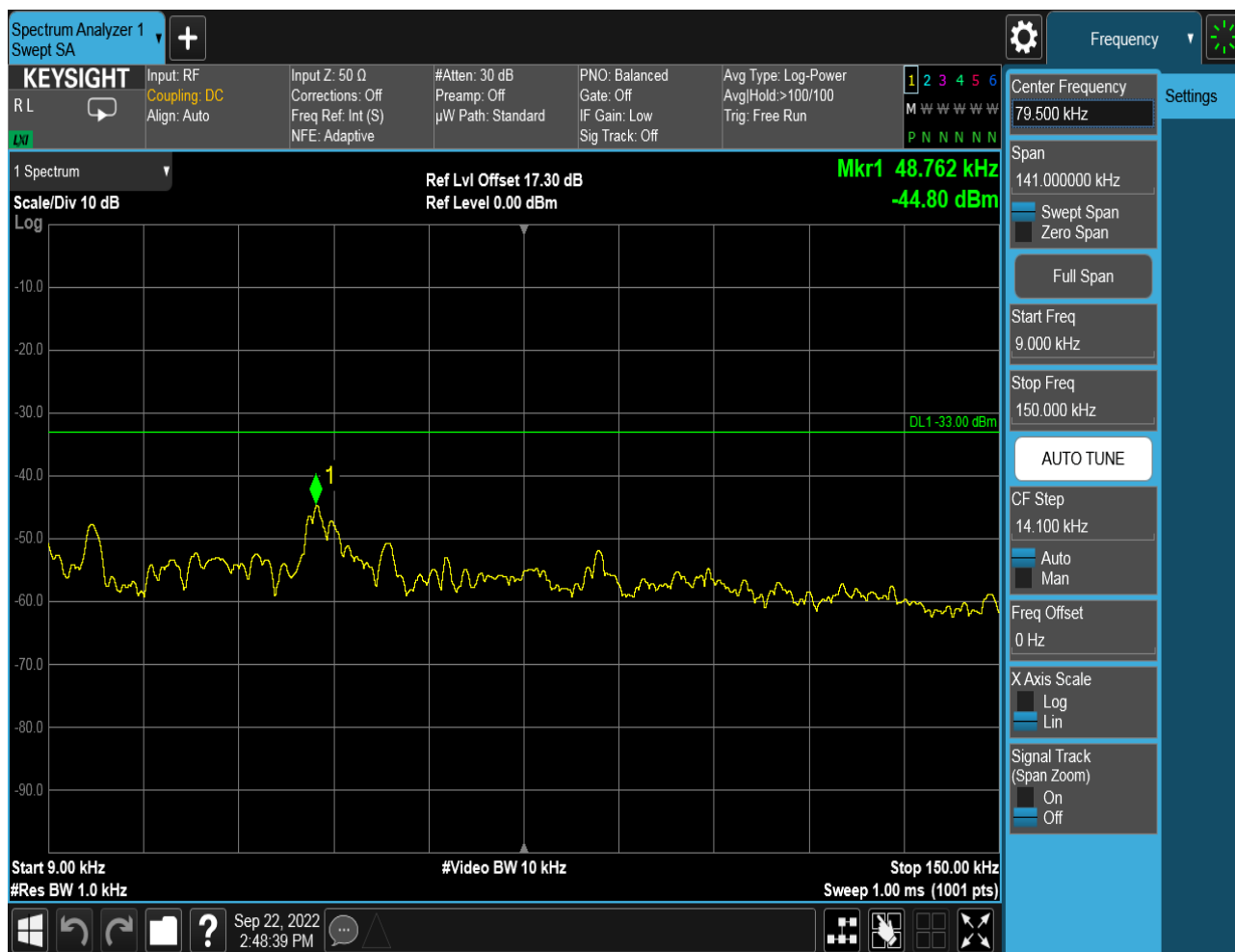


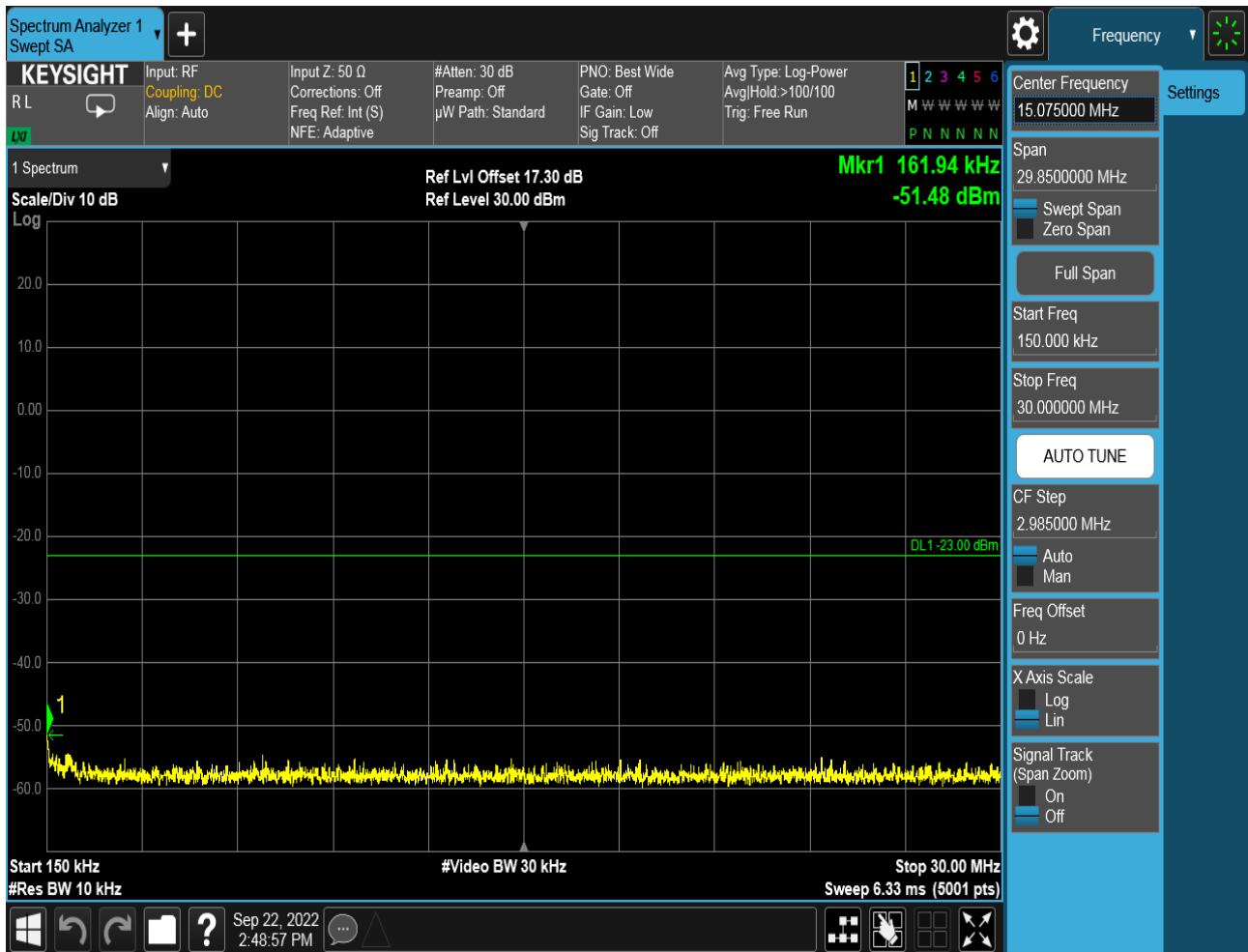


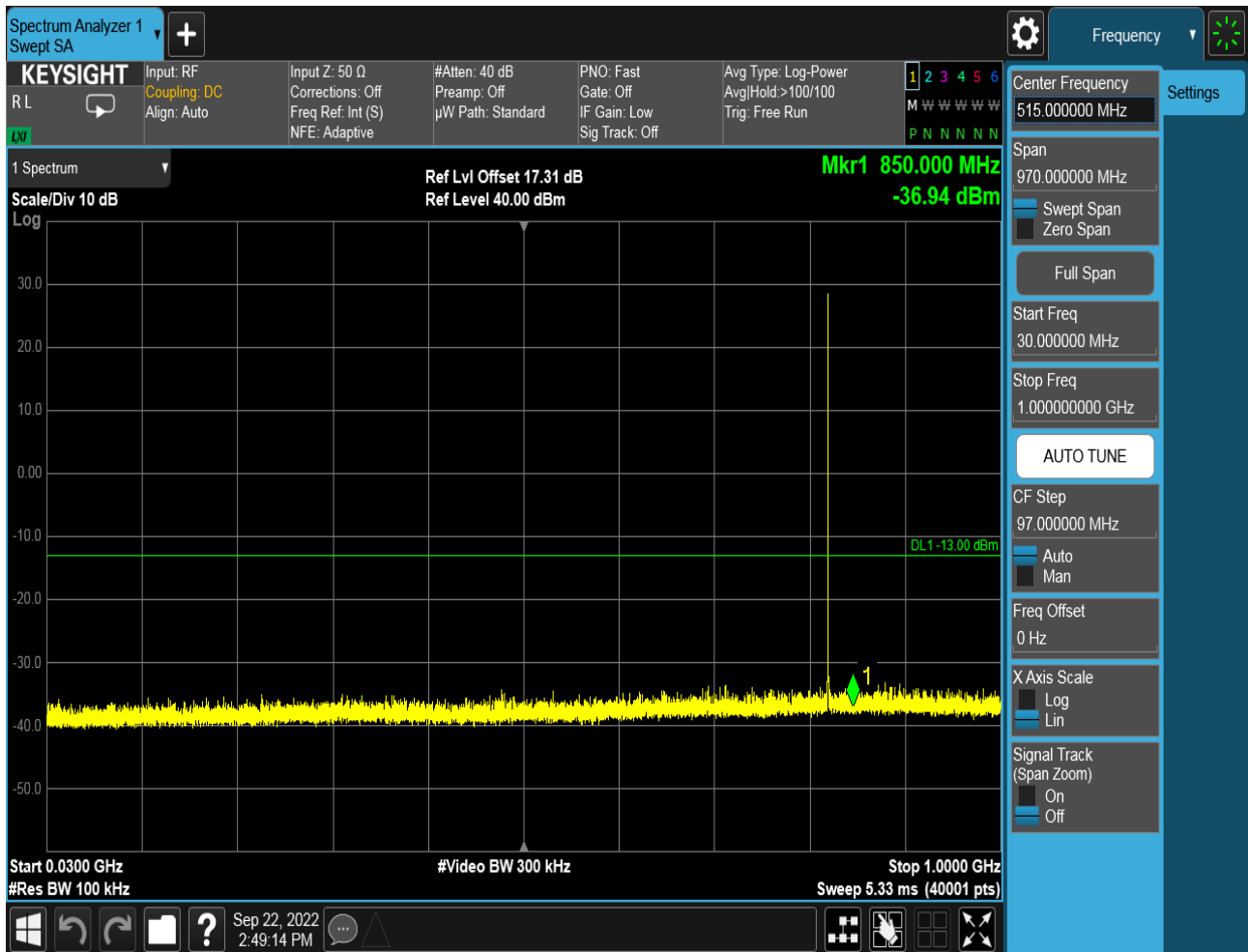


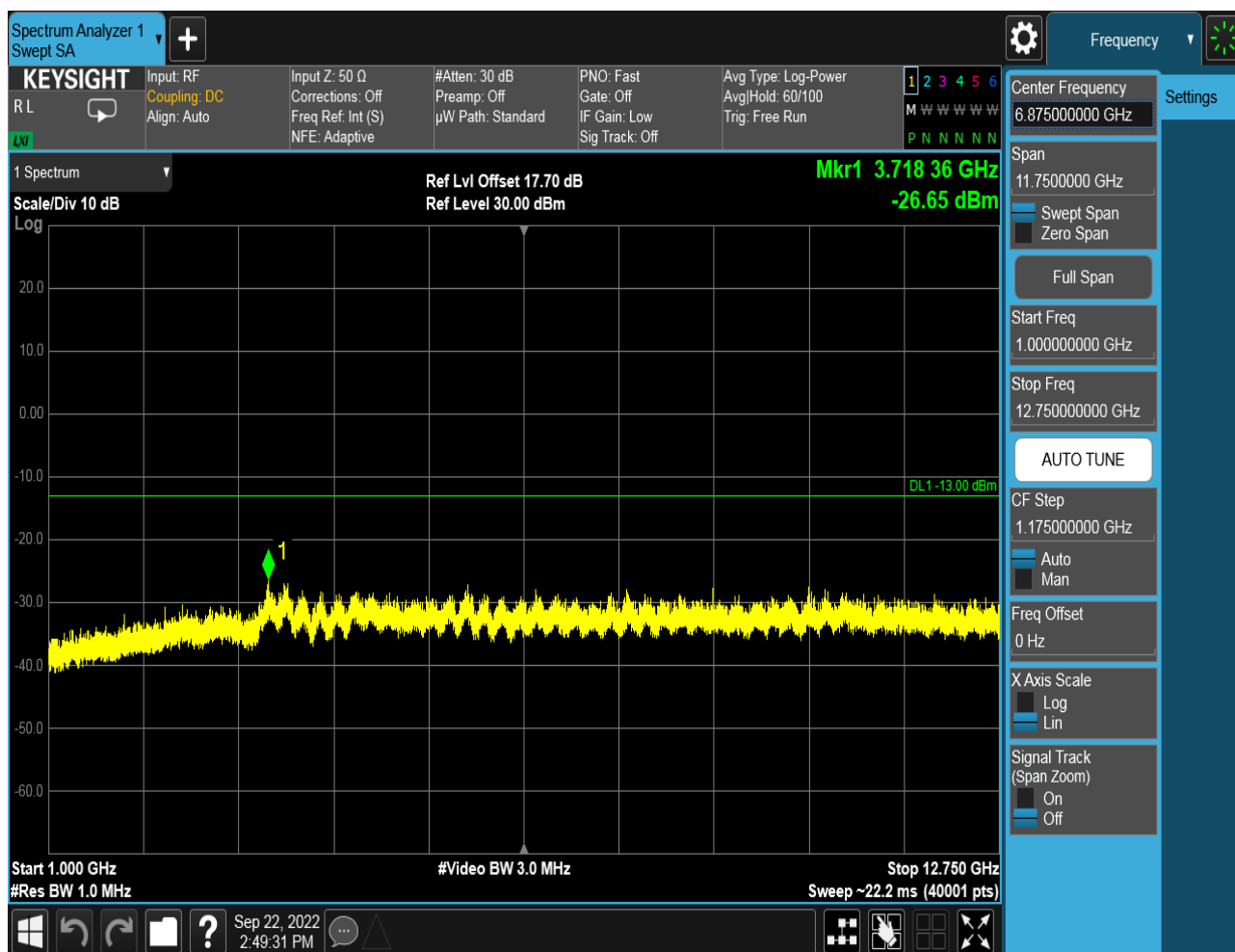
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH



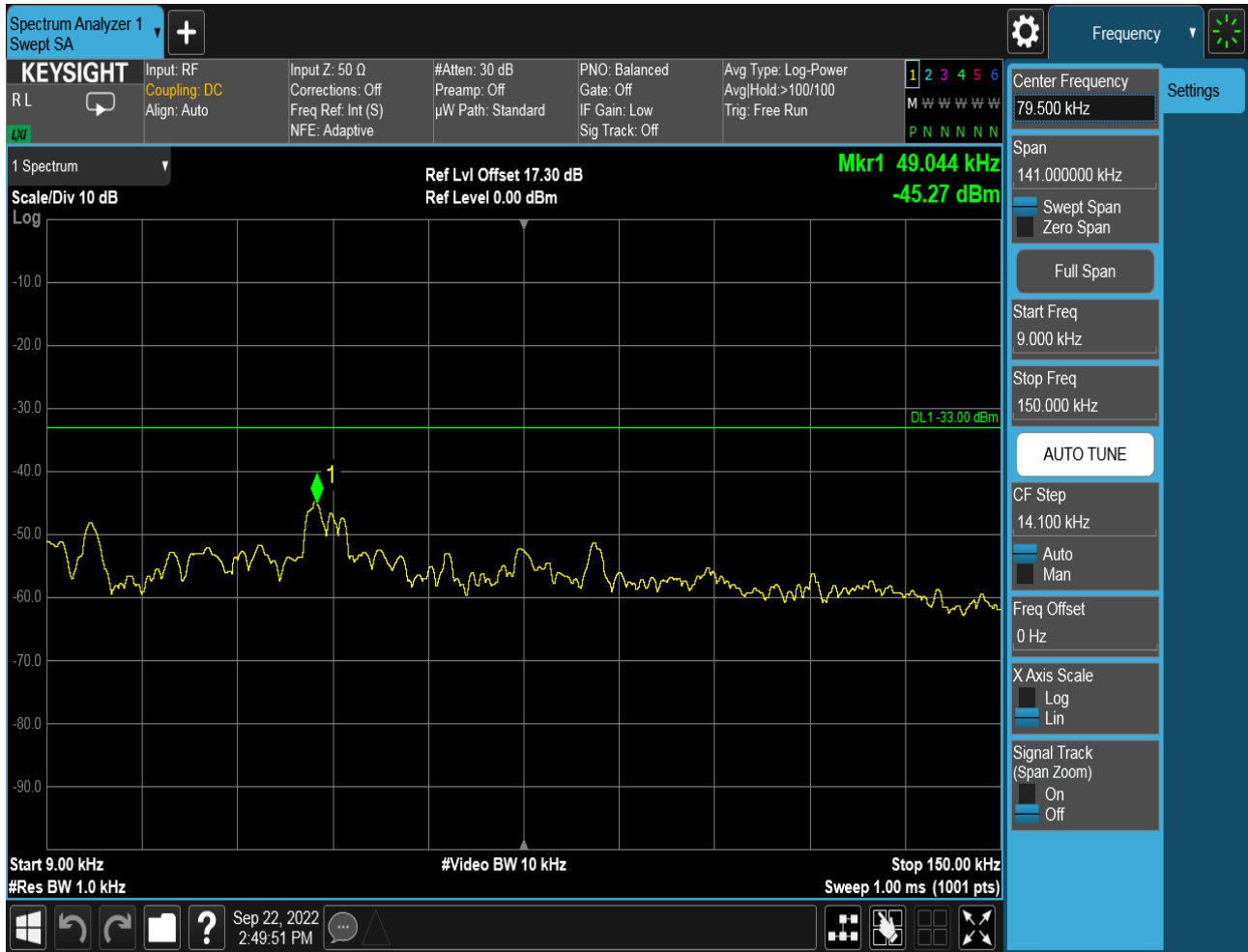


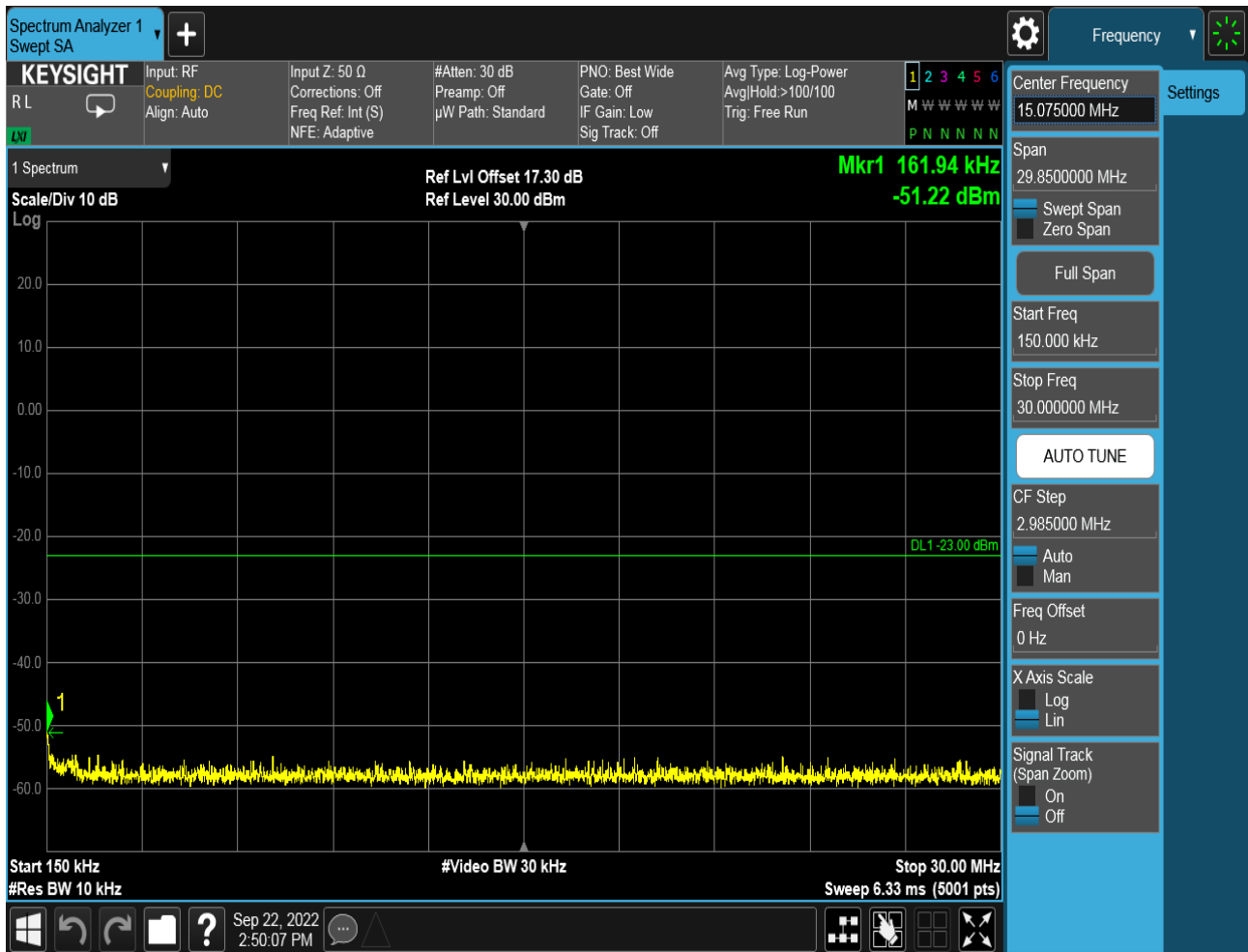


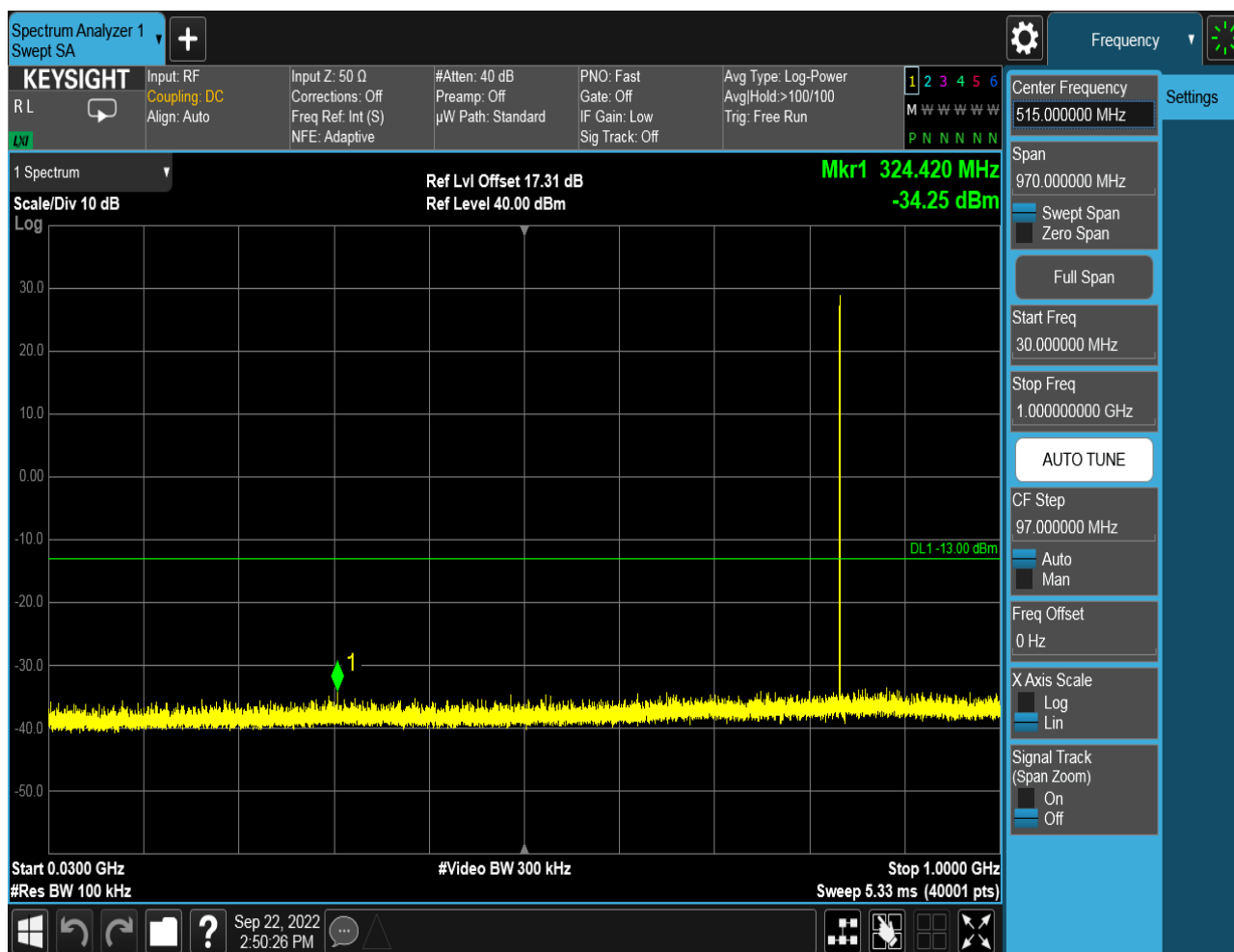


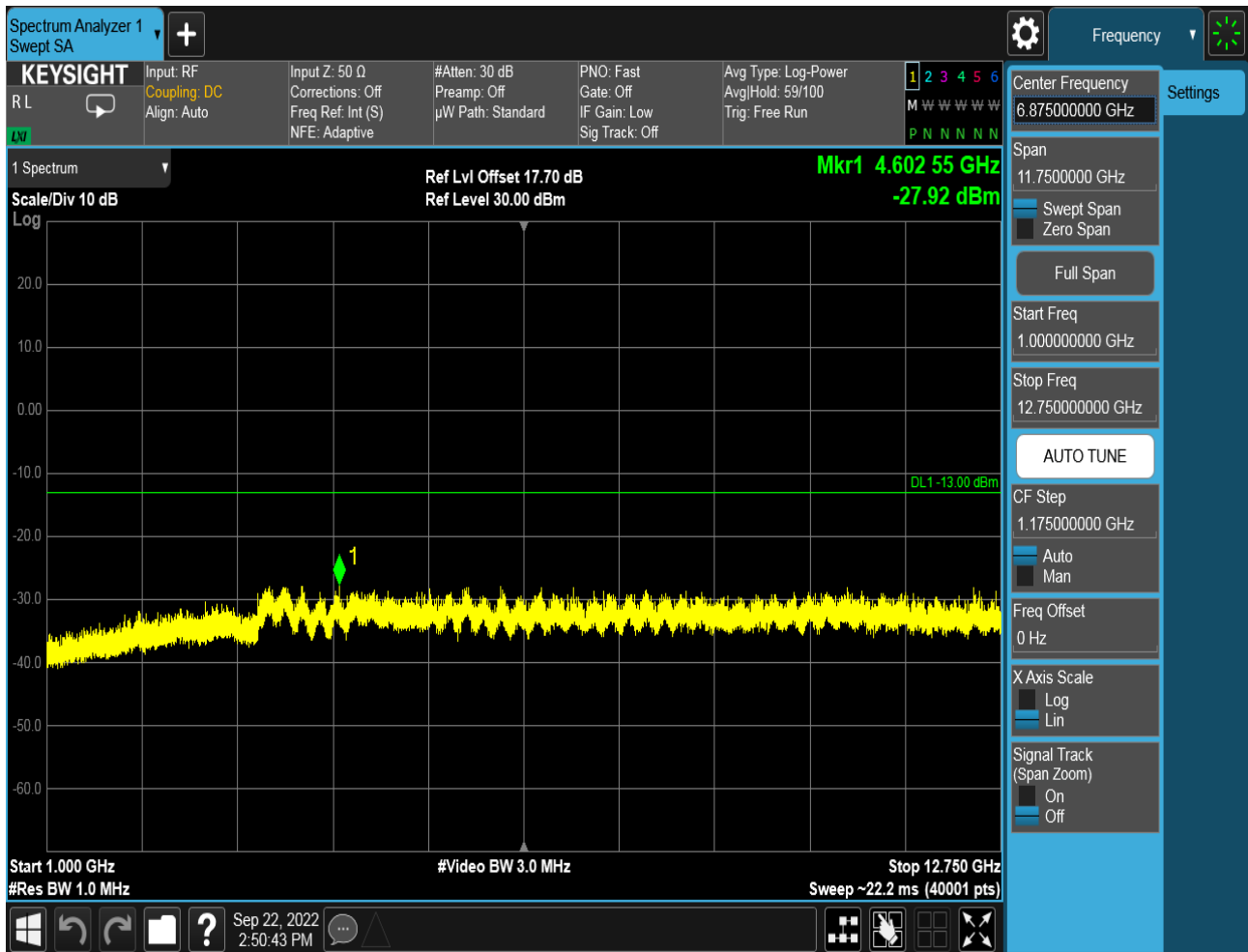


6.1.1.2.2 Test Channel = MCH



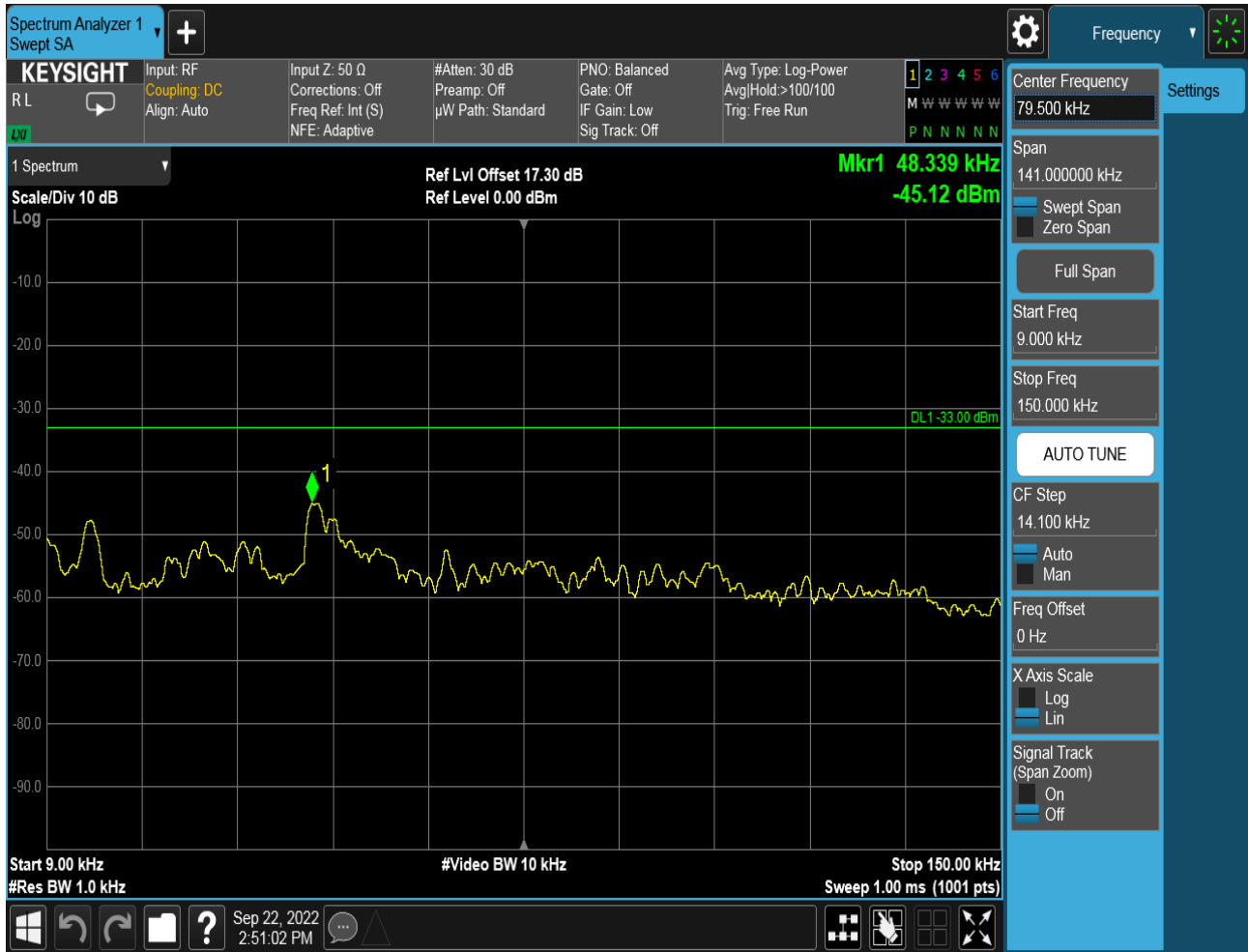


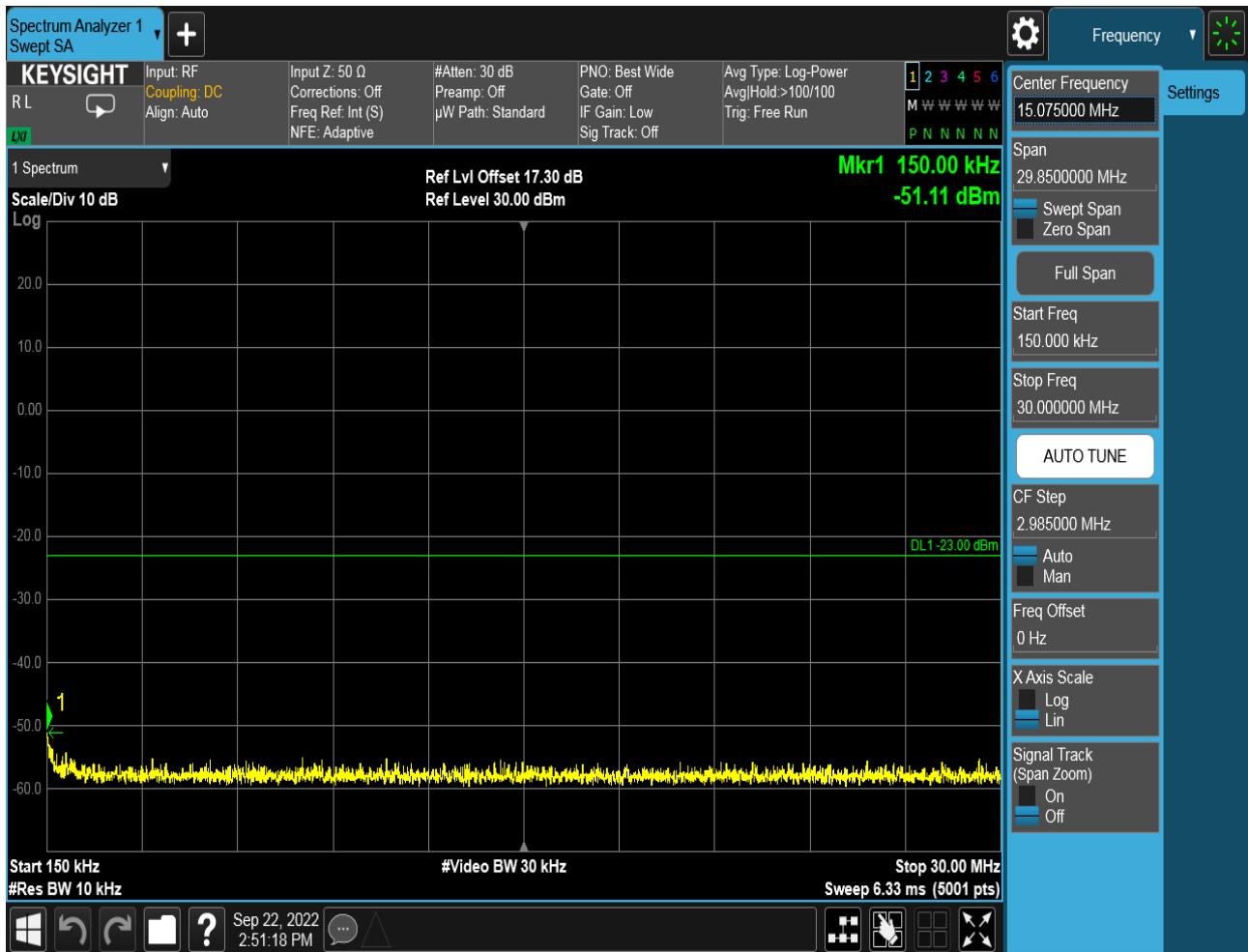


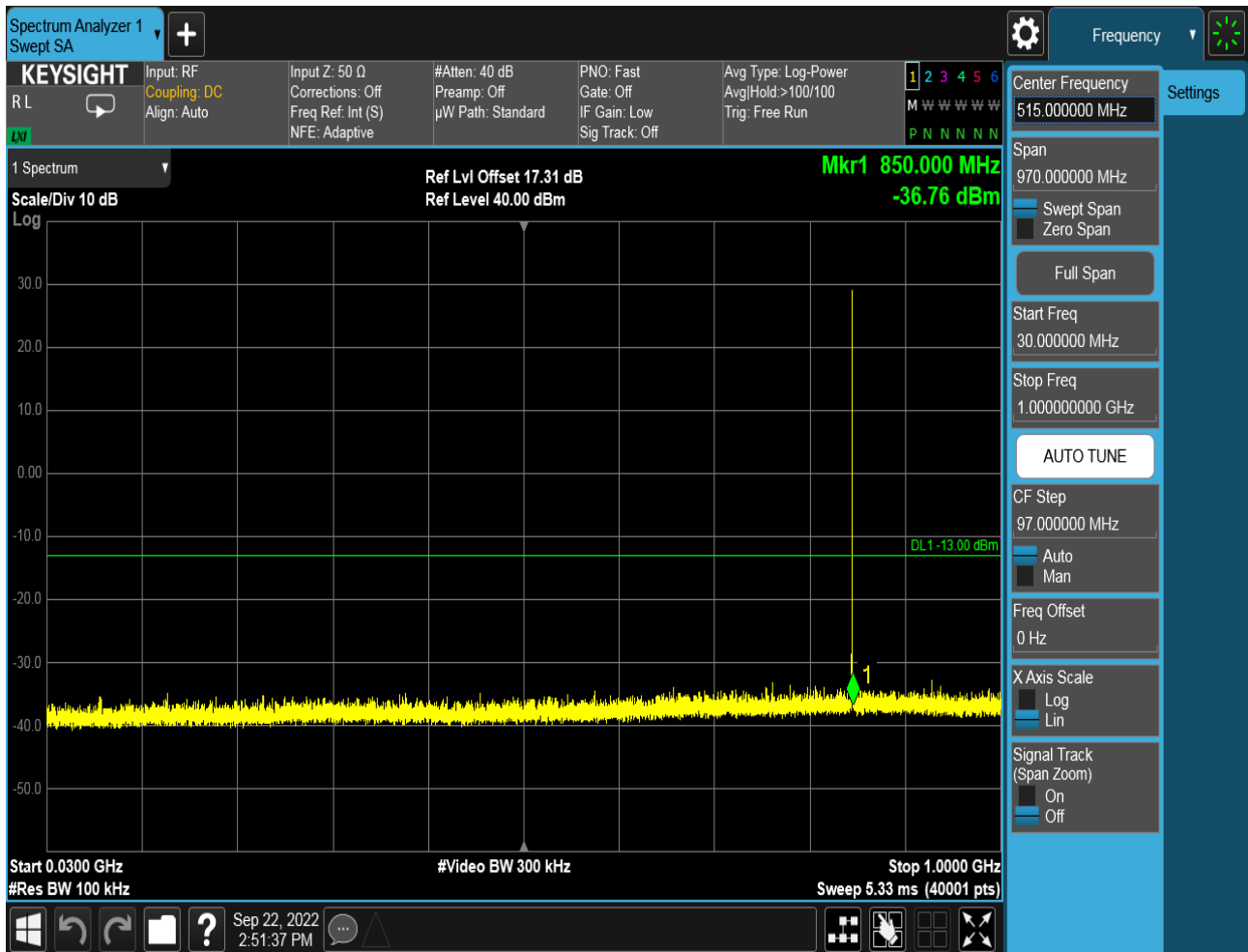


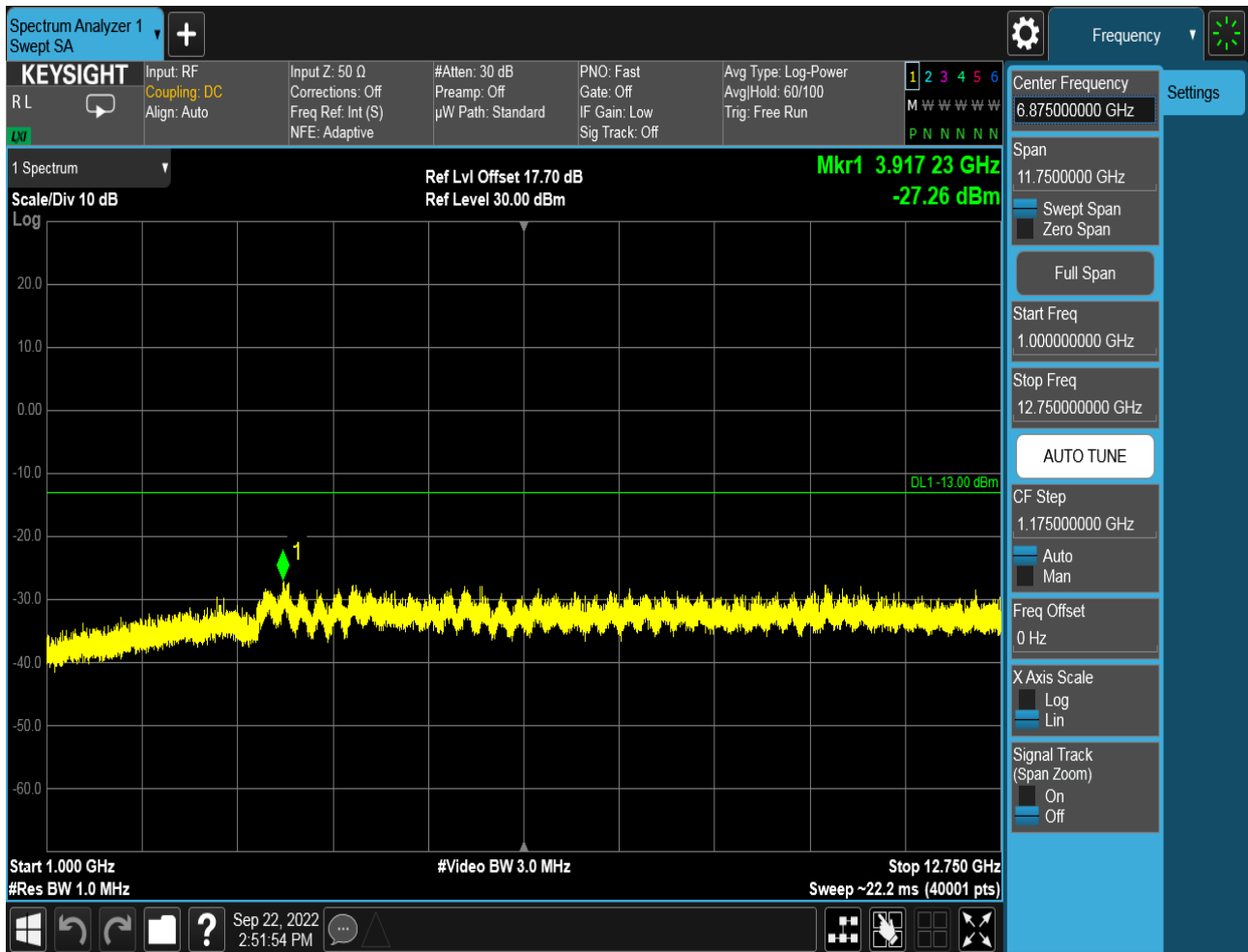


6.1.1.2.3 Test Channel = HCH







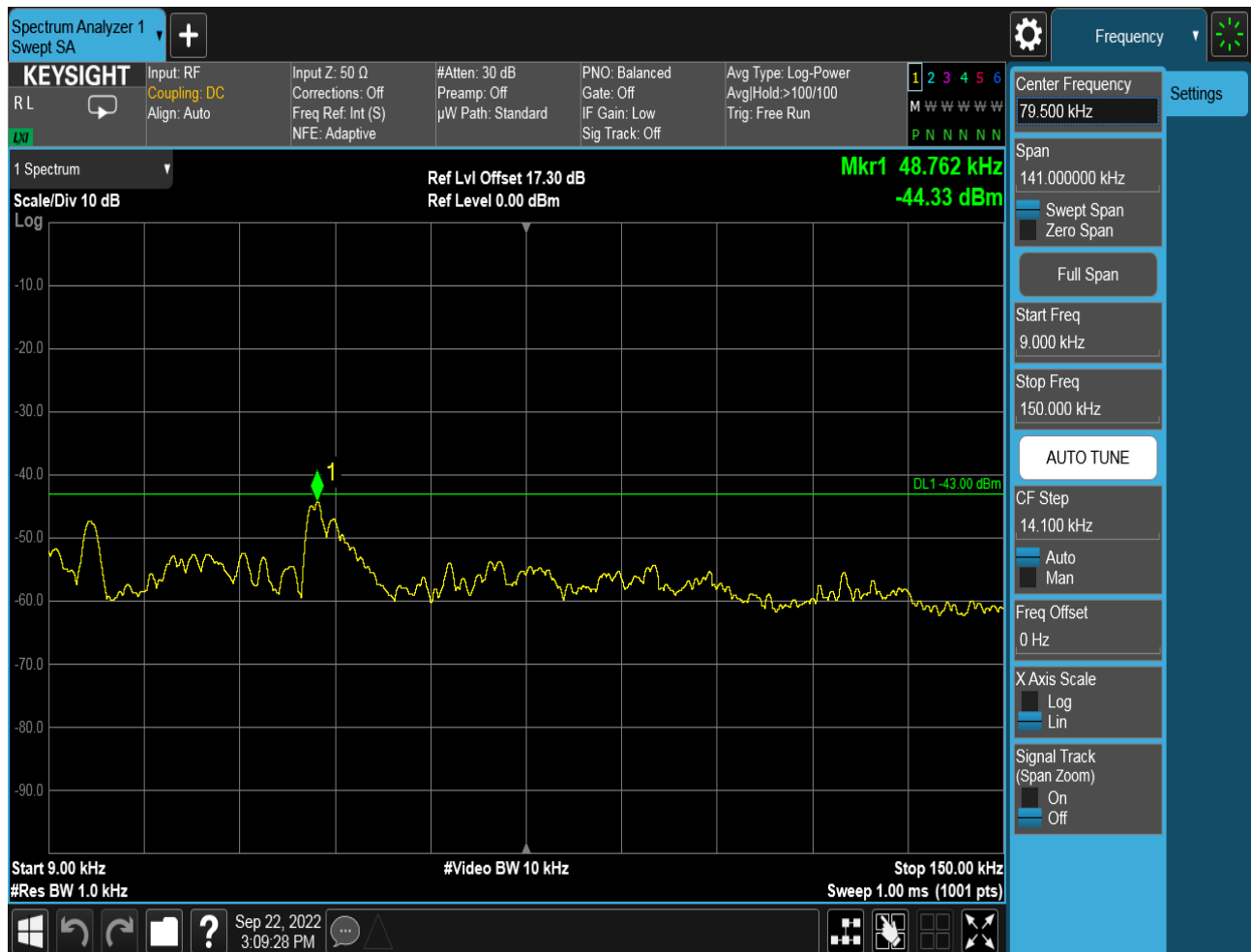


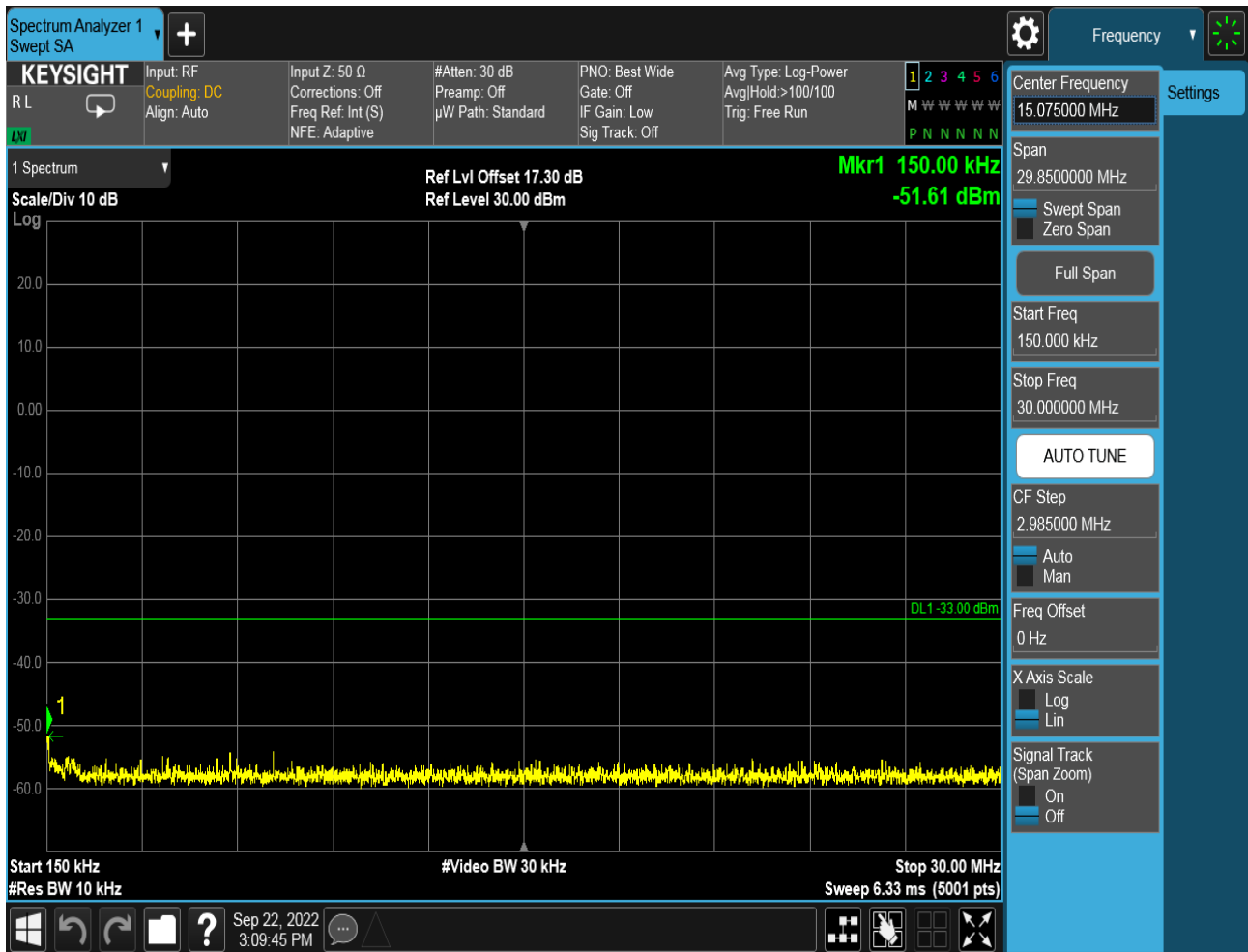


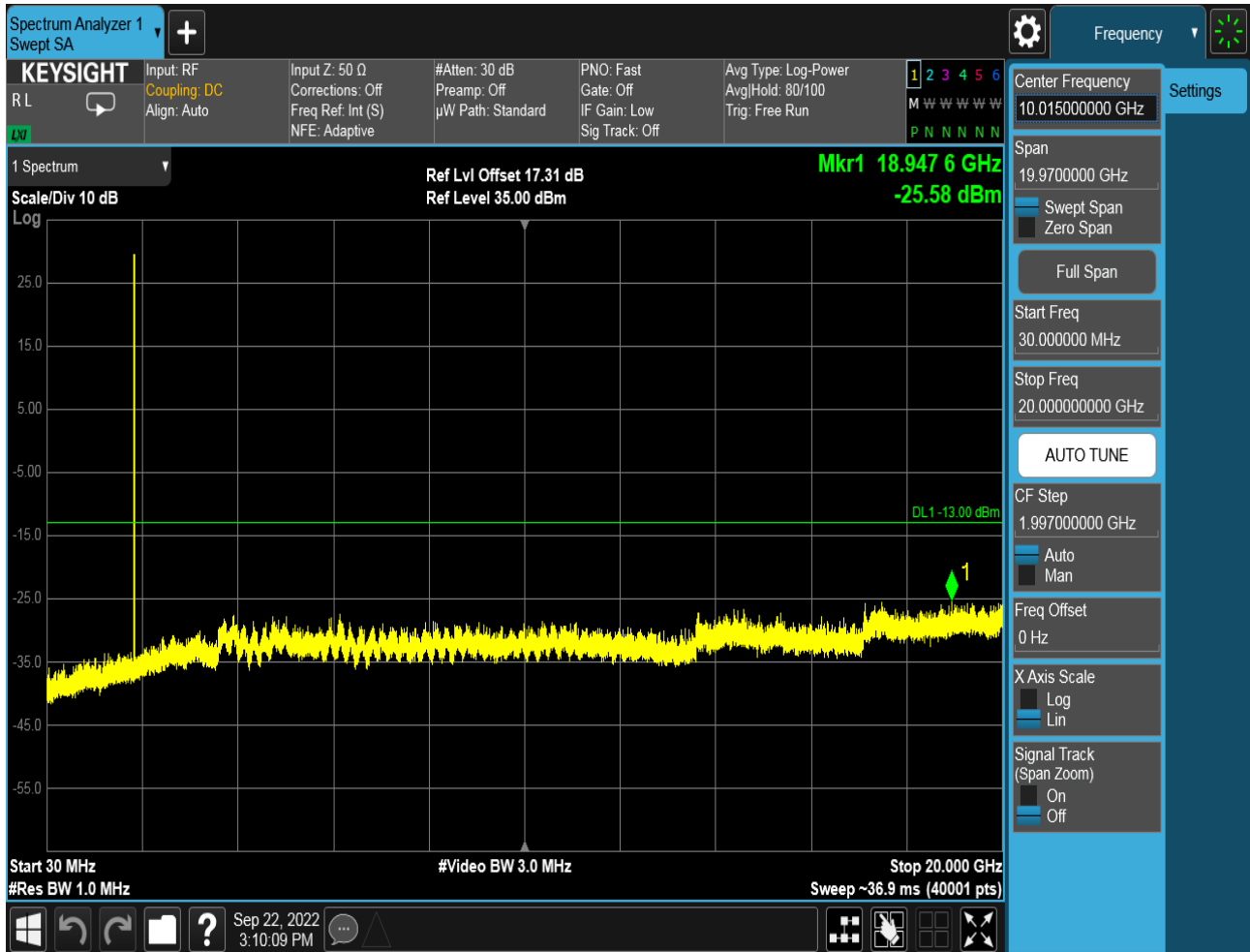
6.1.2 Test Band = PCS1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH

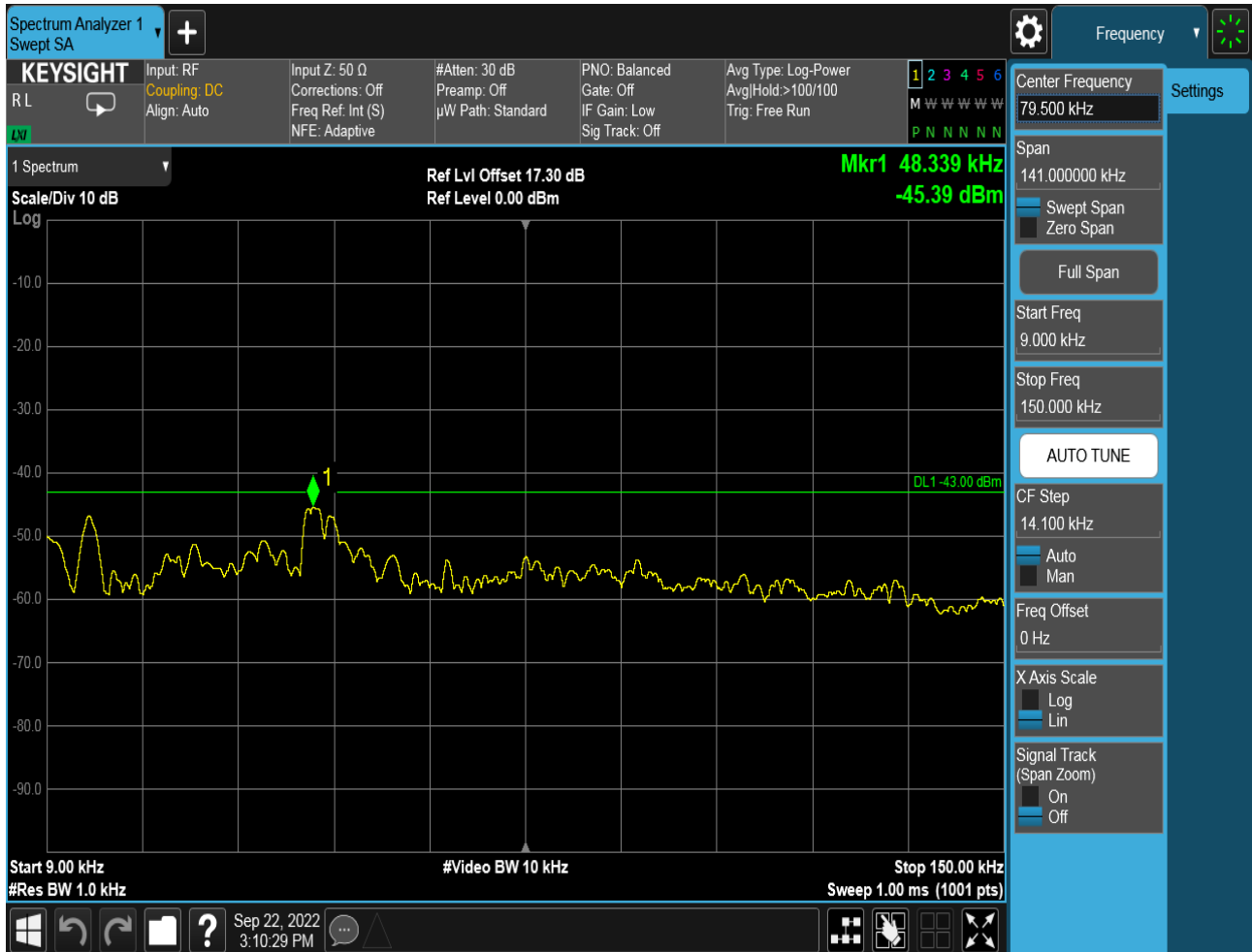


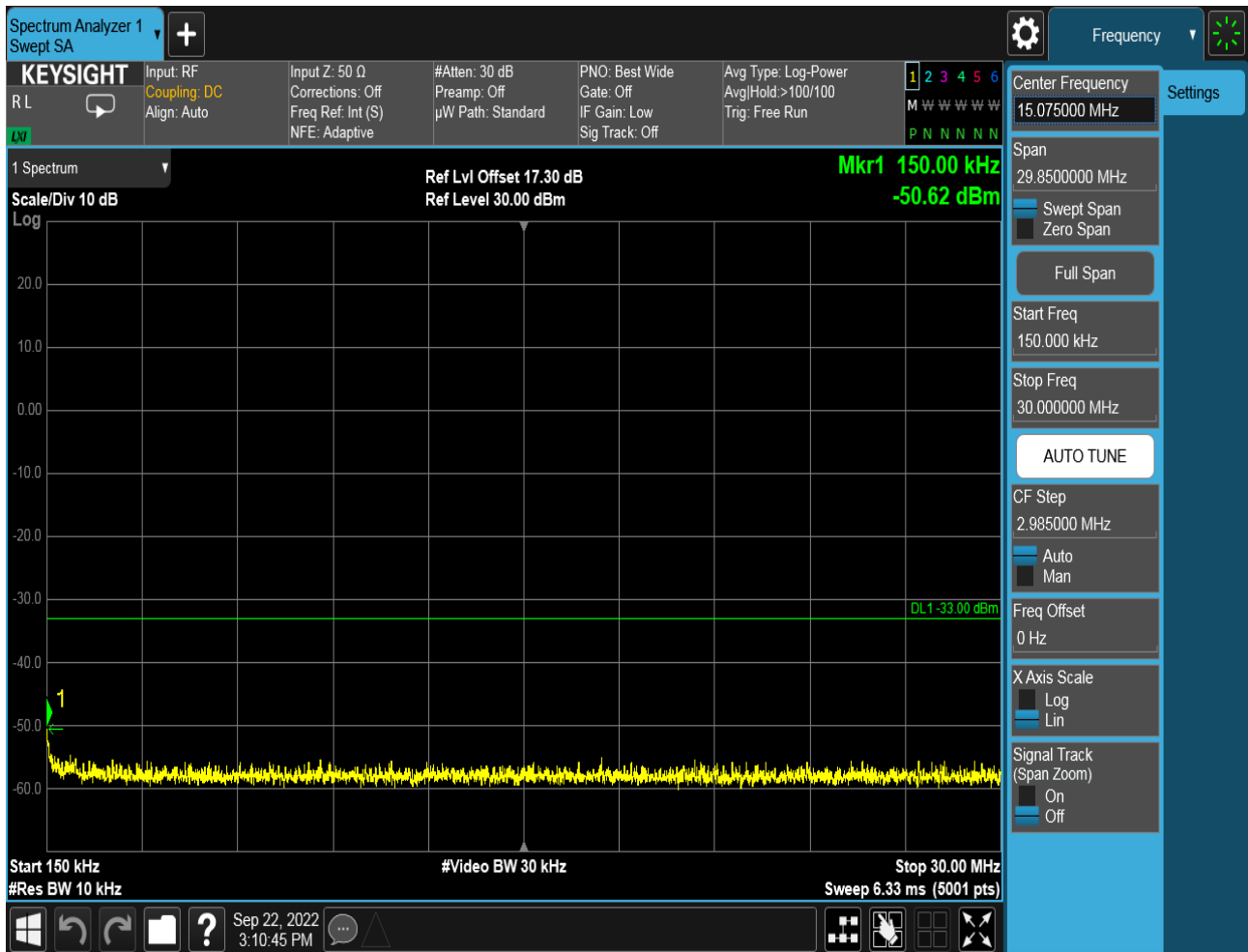


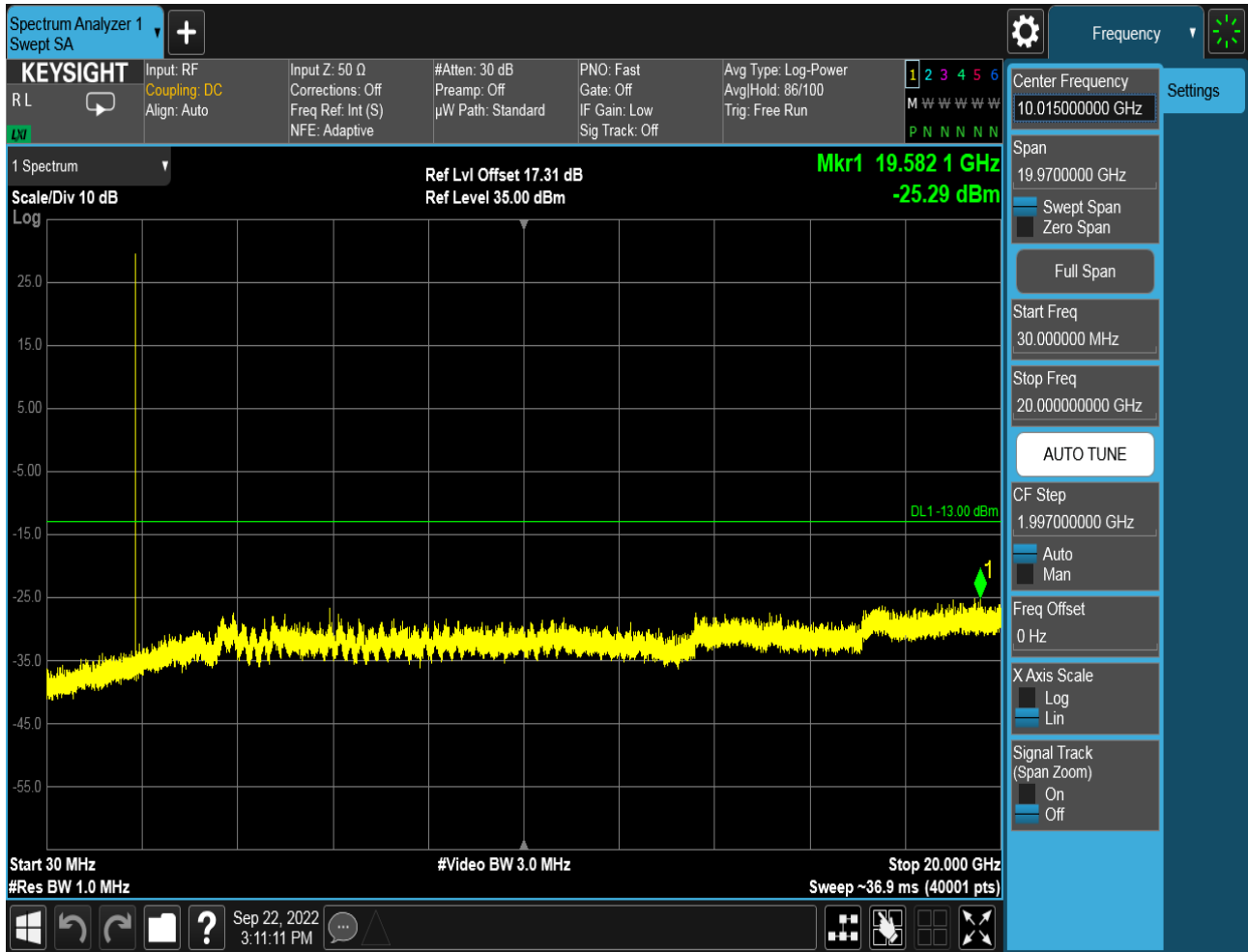




6.1.2.1.2 Test Channel = MCH

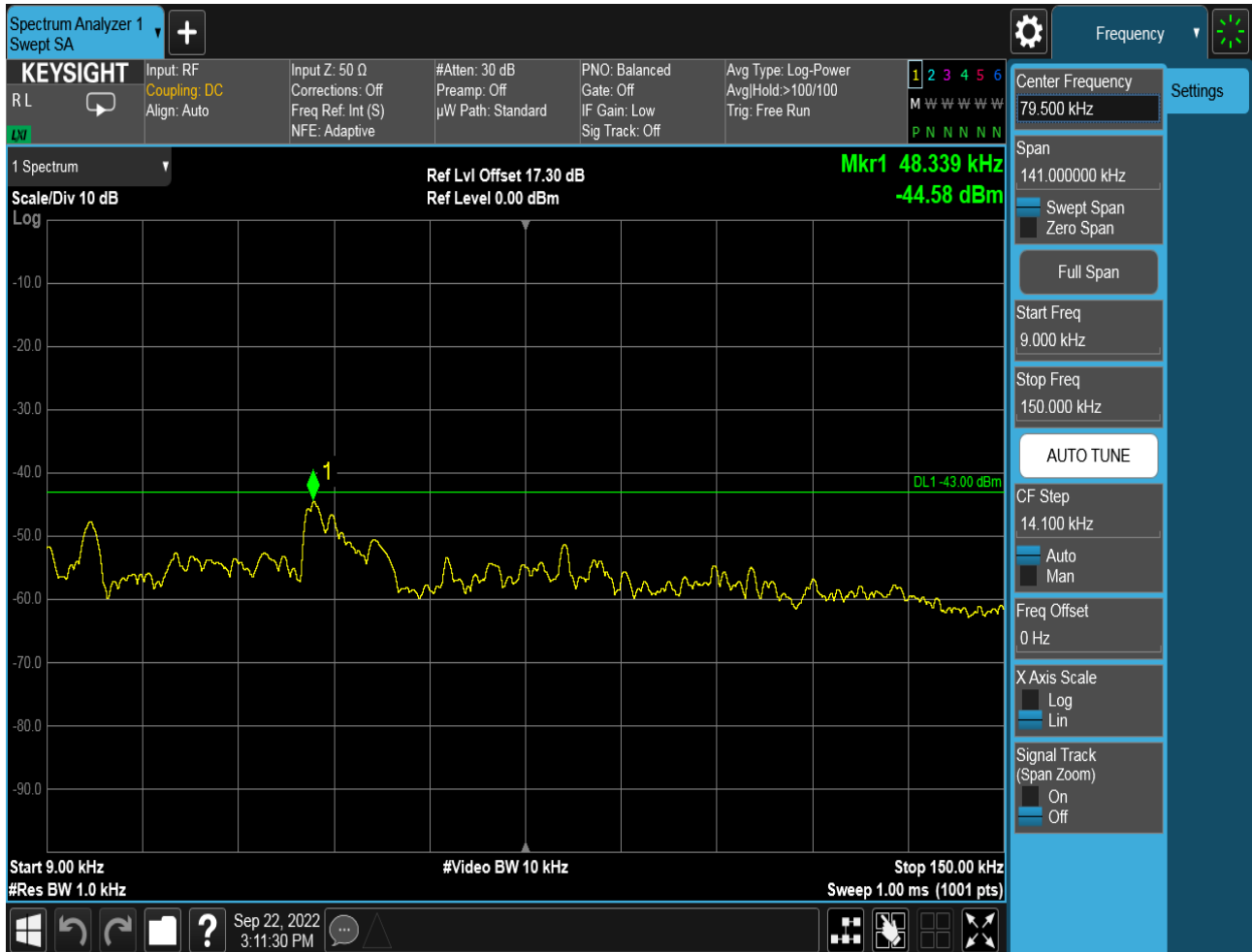


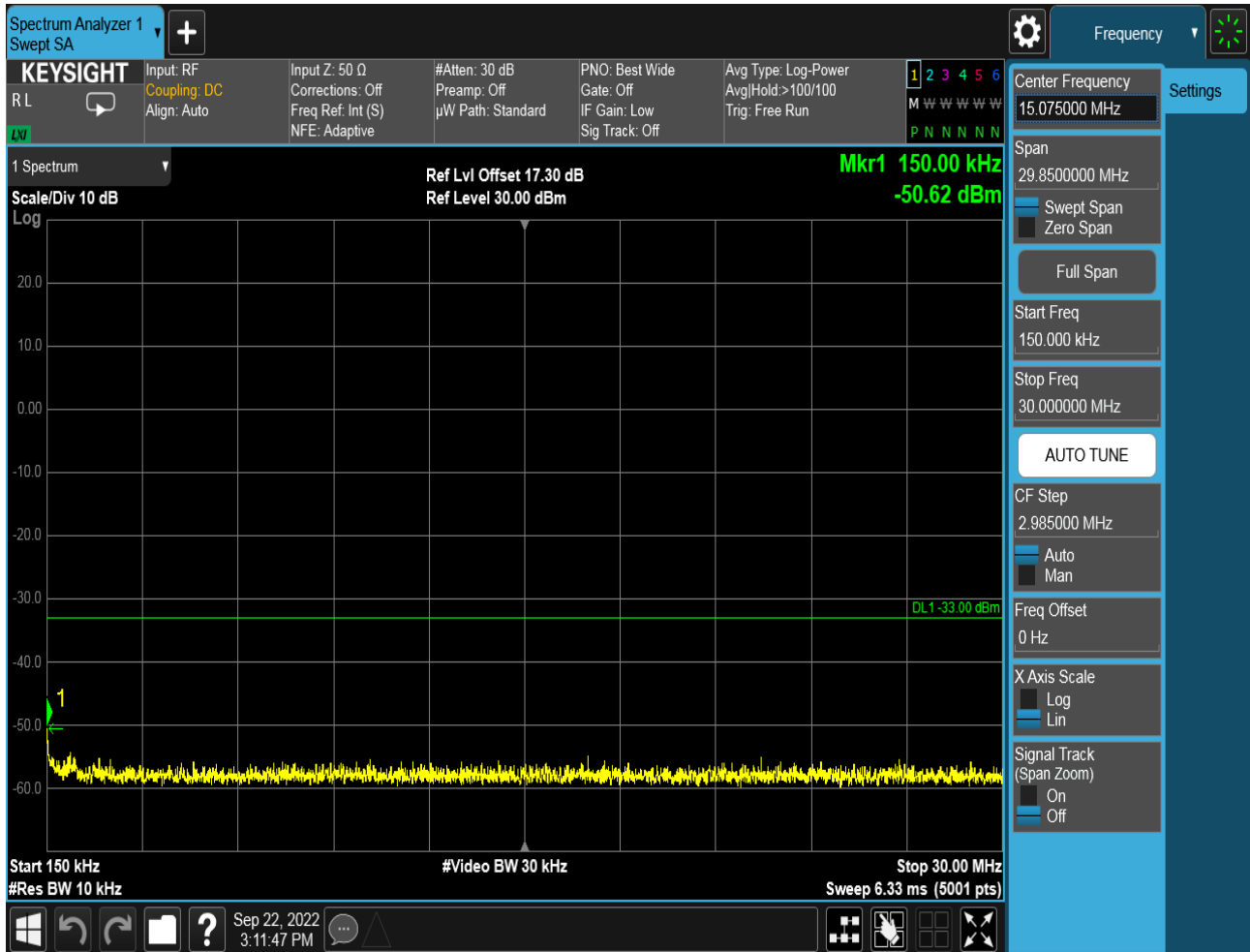


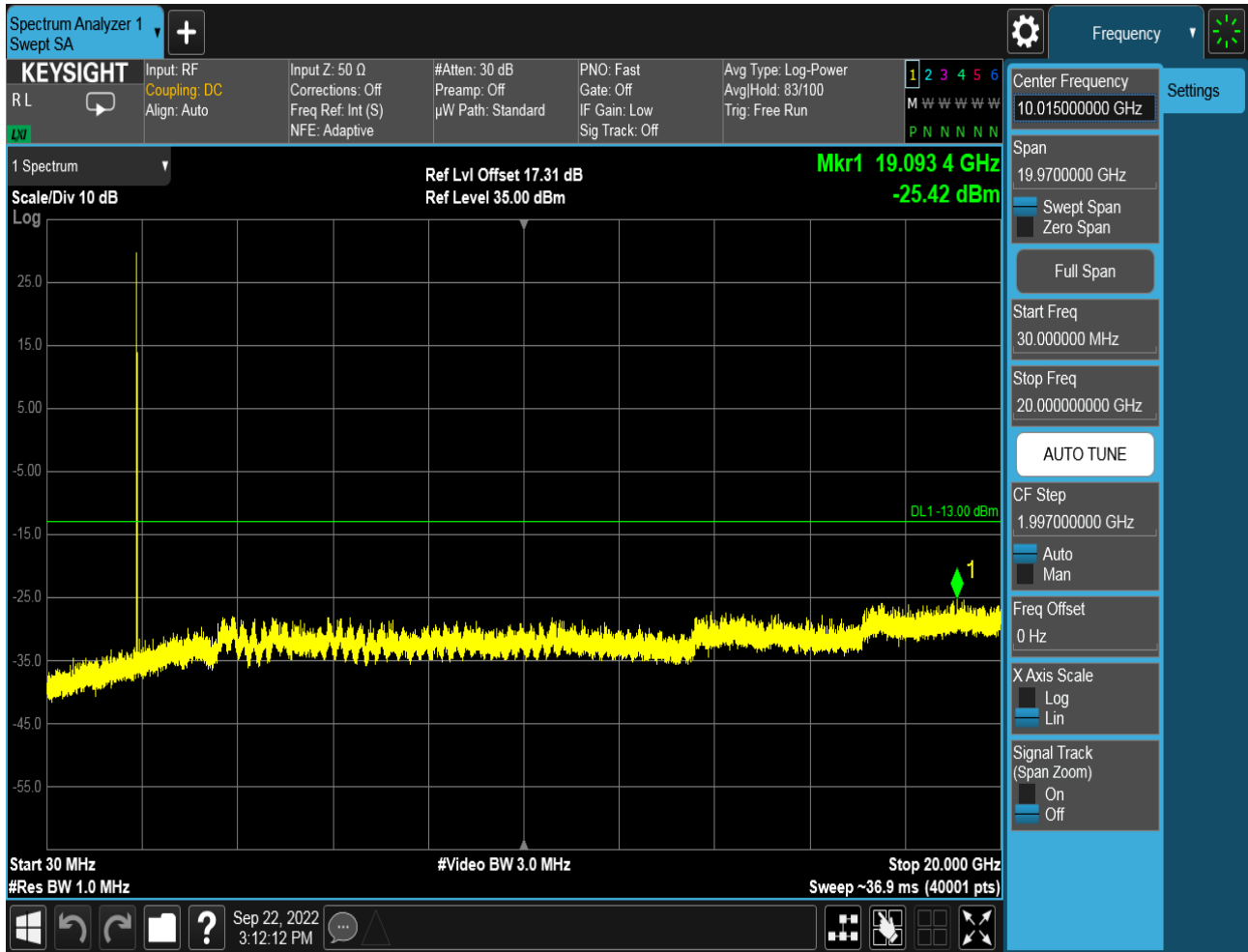




6.1.2.1.3 Test Channel = HCH



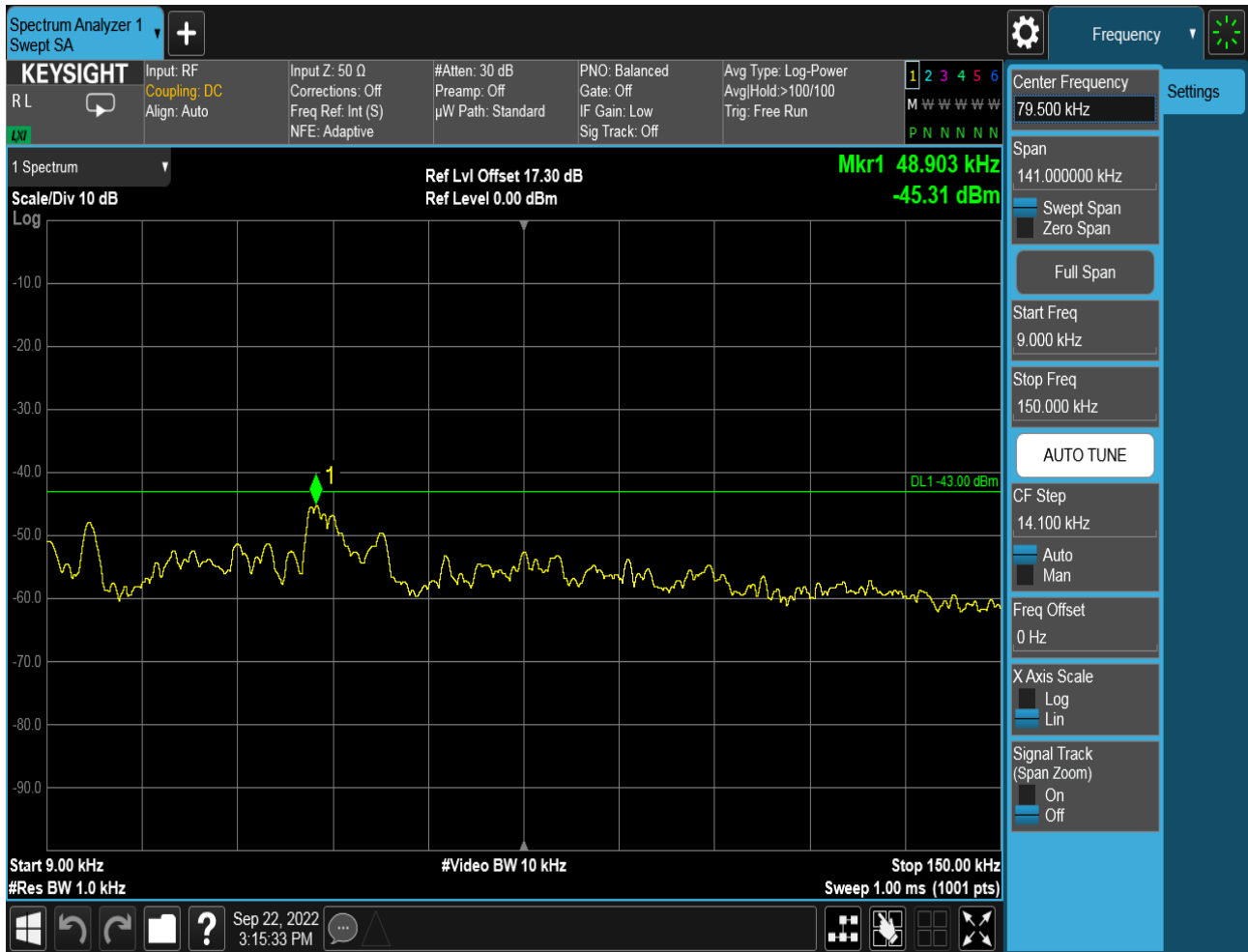


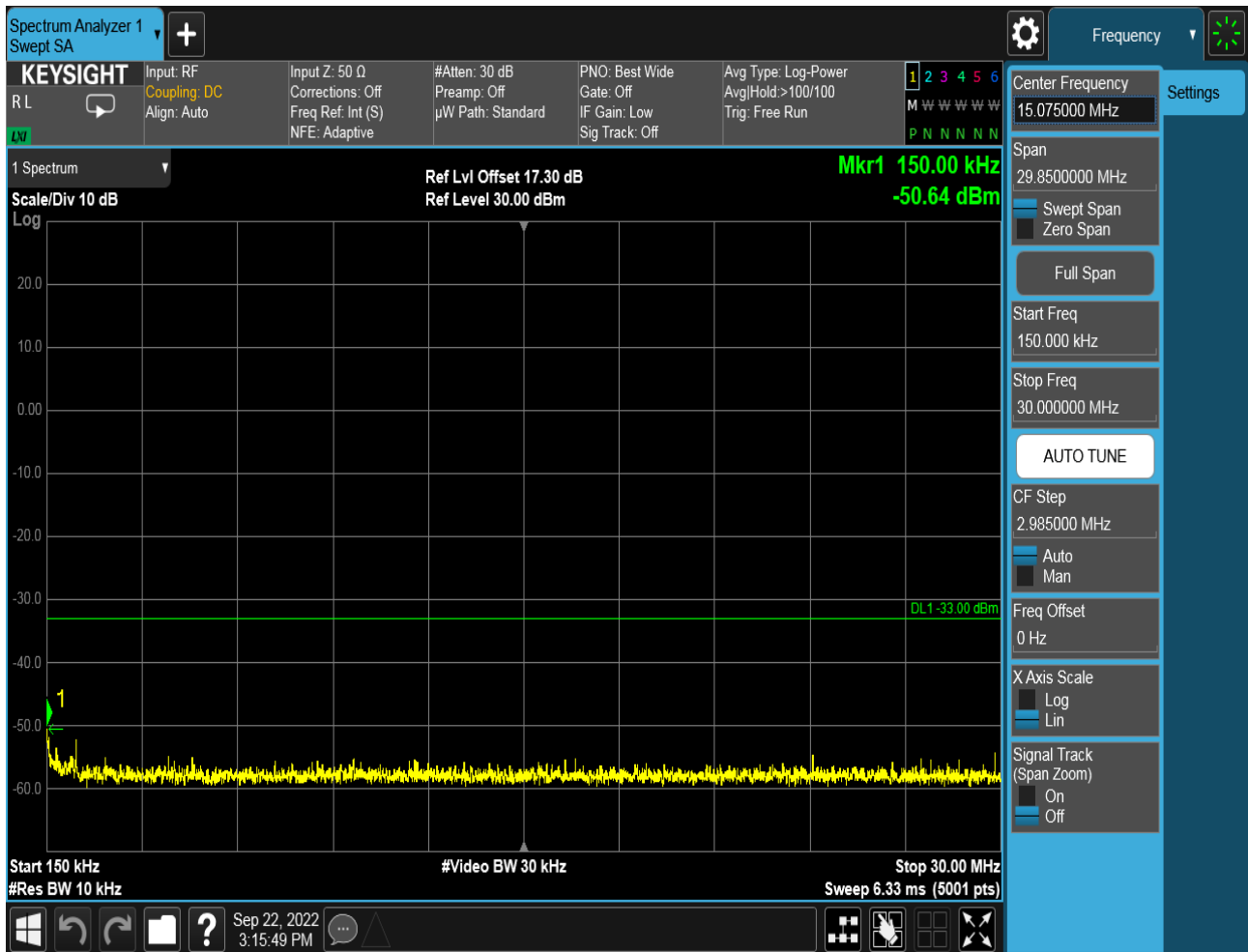


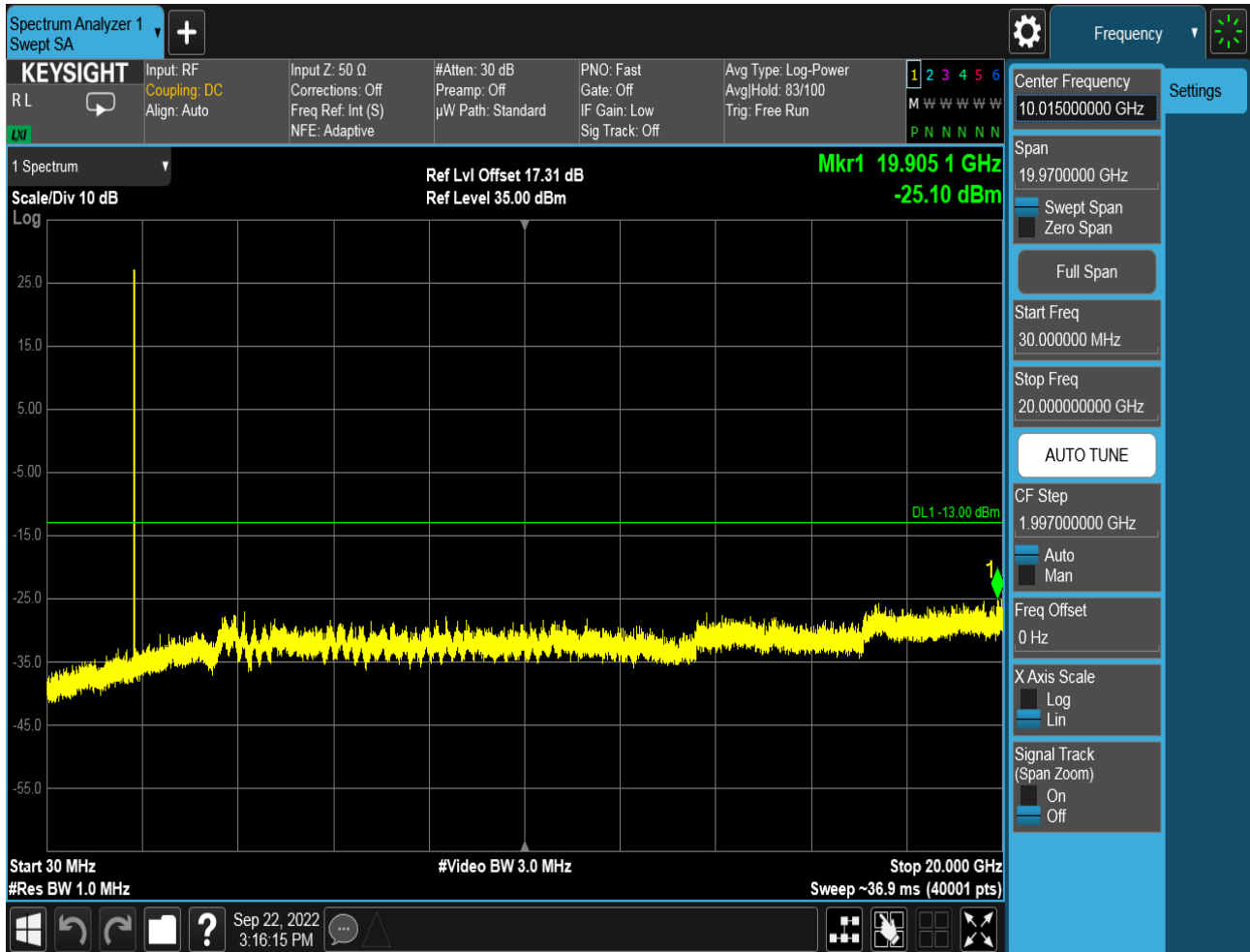


6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

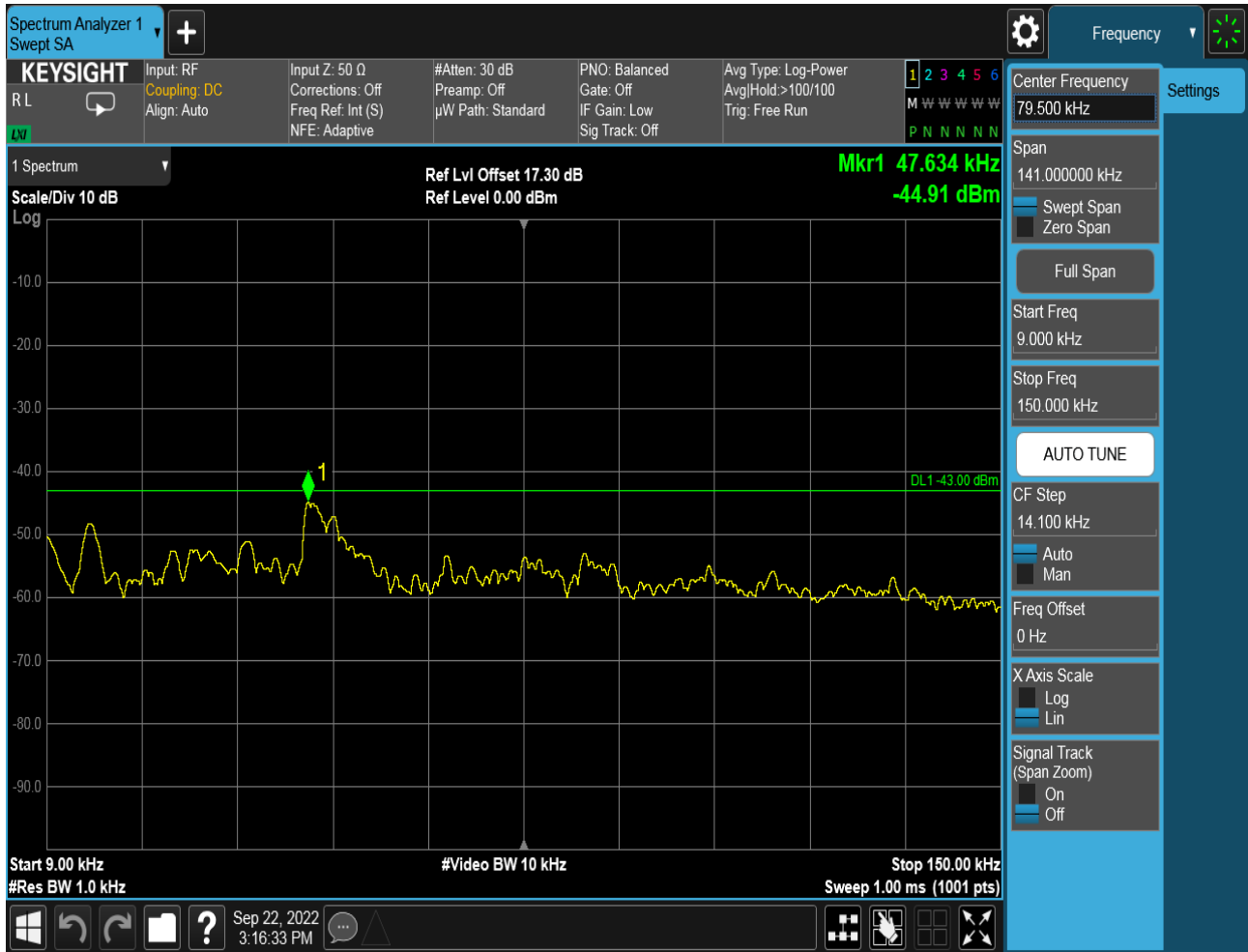


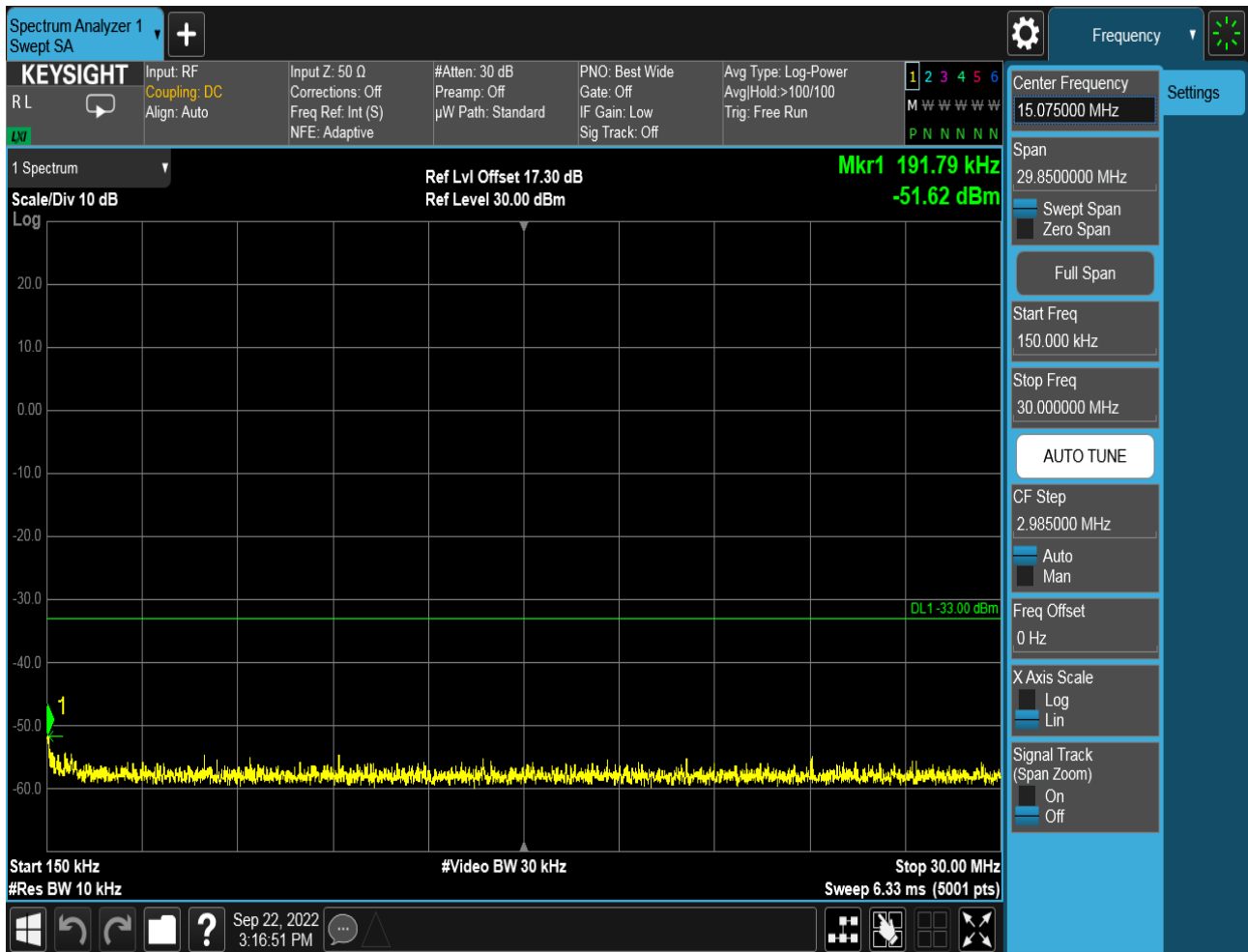


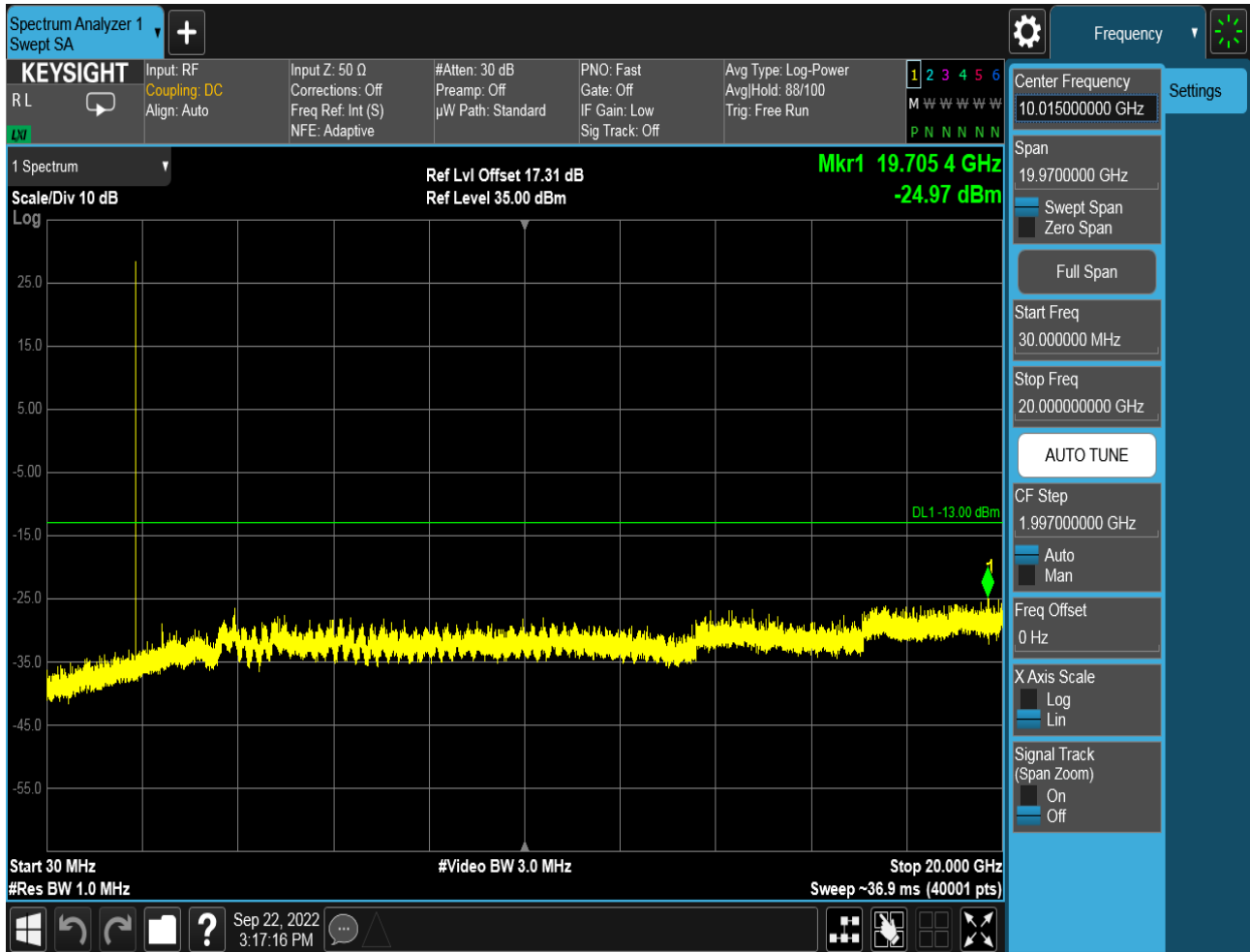




6.1.2.2.2 Test Channel = MCH

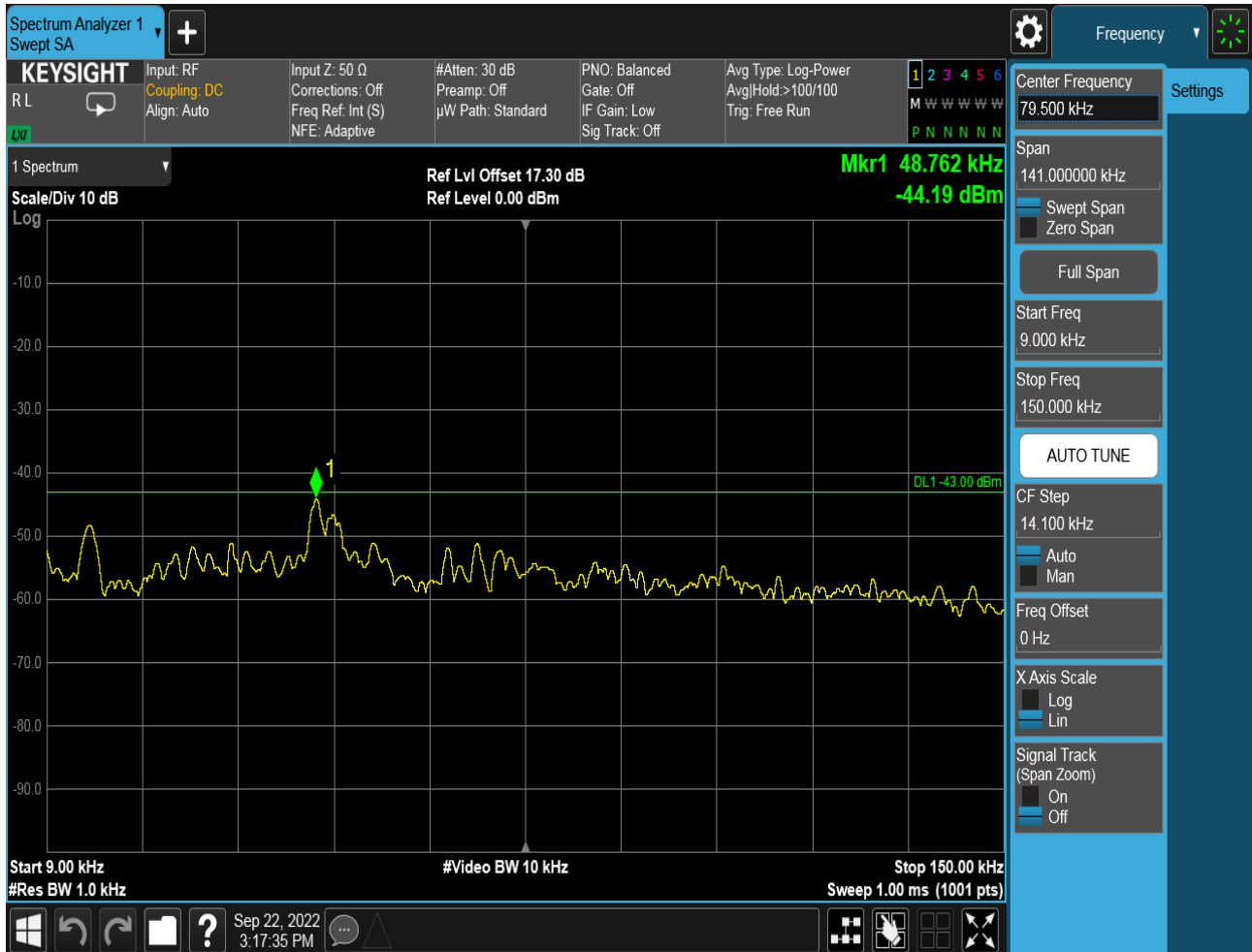


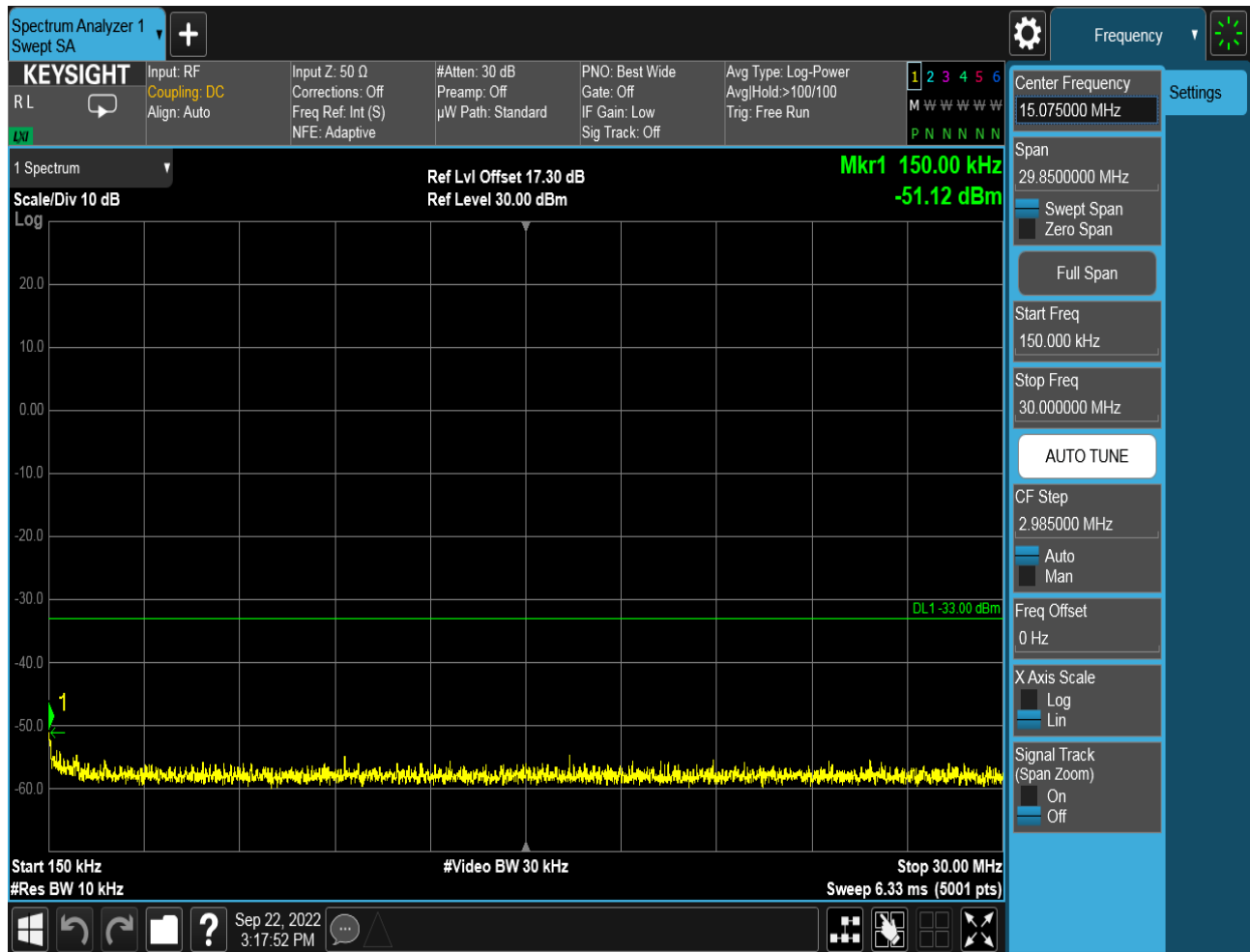


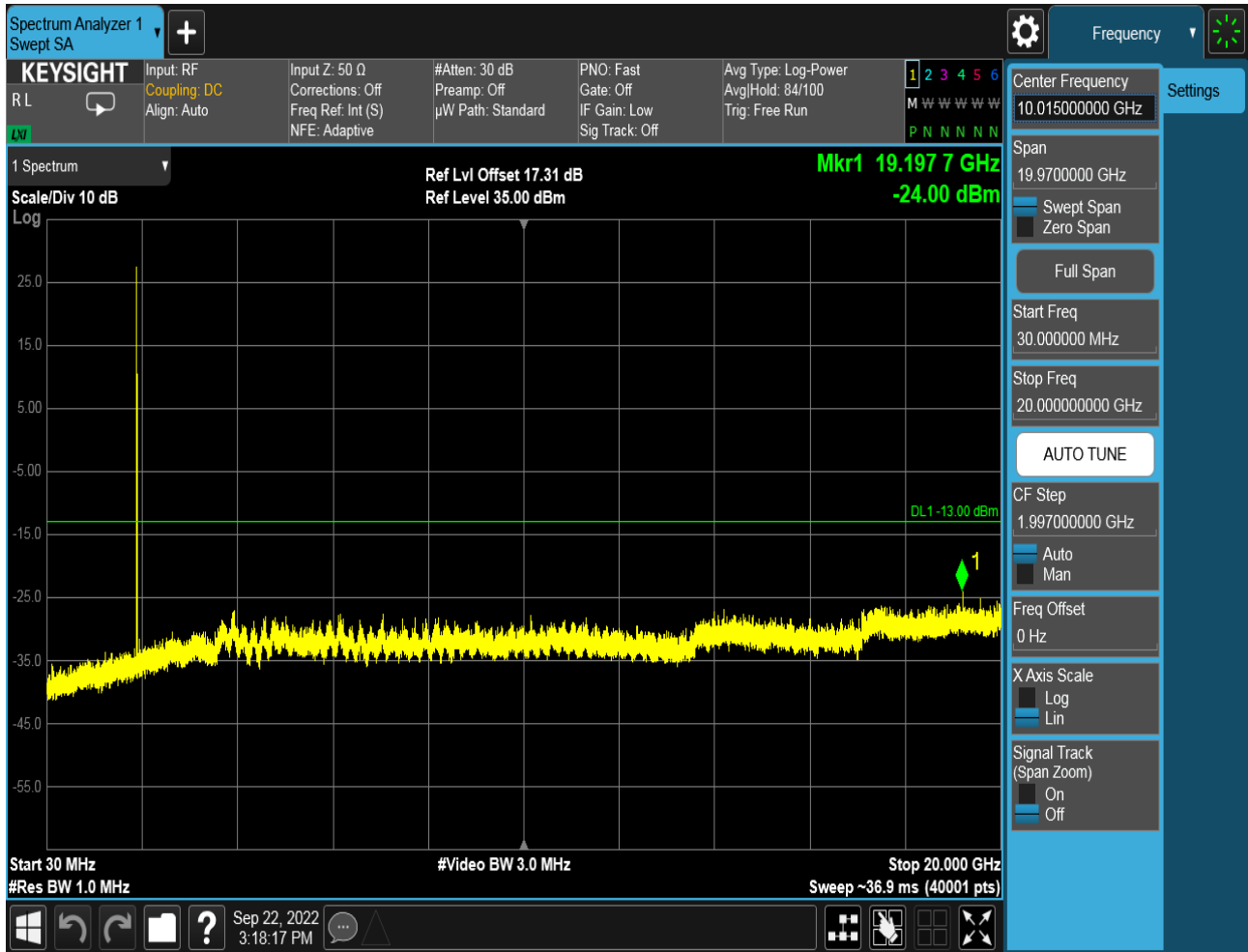




6.1.2.2.3 Test Channel = HCH







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

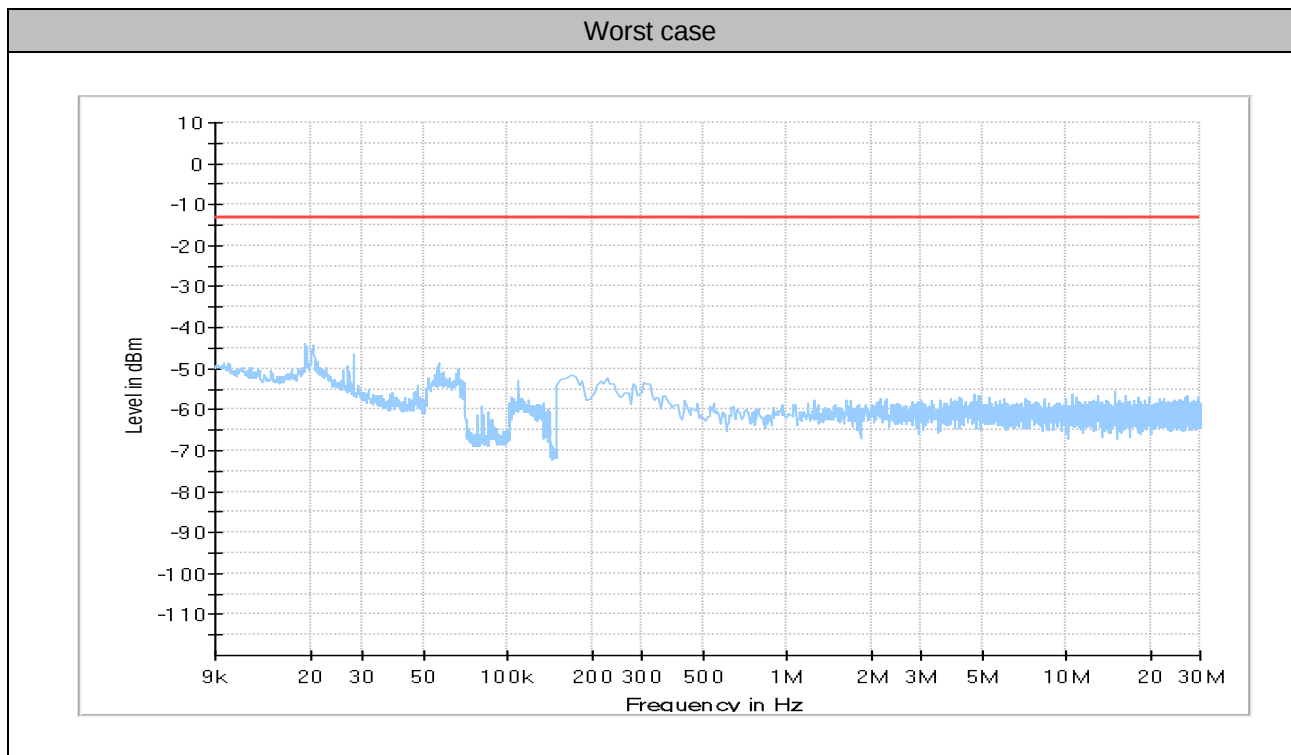
30MHz~1GHz, RBW = 100 kHz, VBW = 300 kHz. Detector: PK

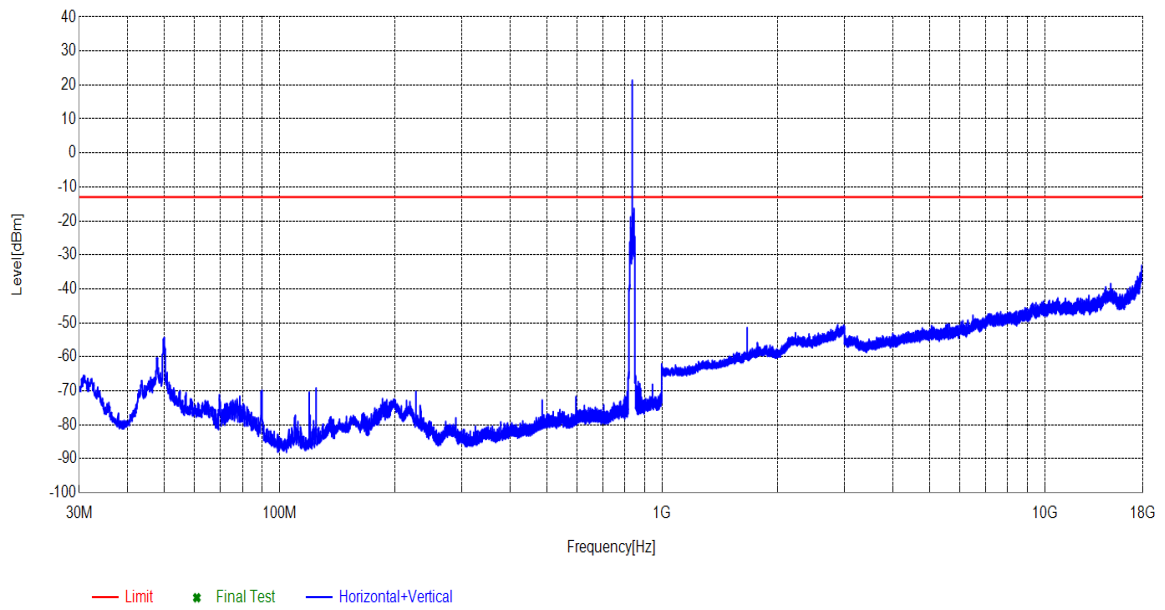
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

7.1 For GSM_ANT1

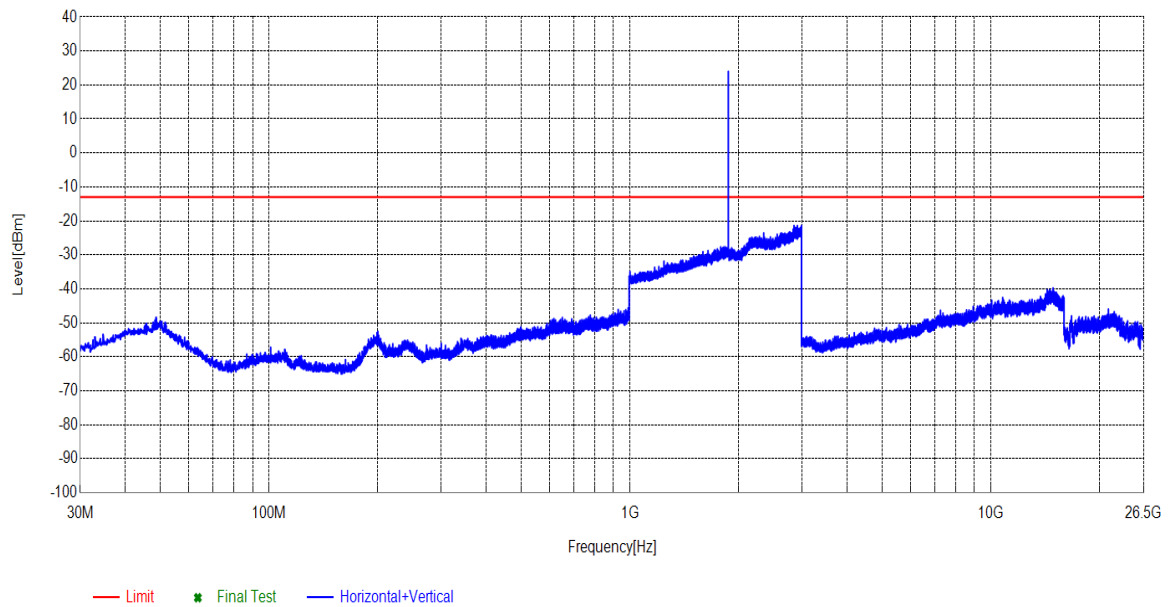
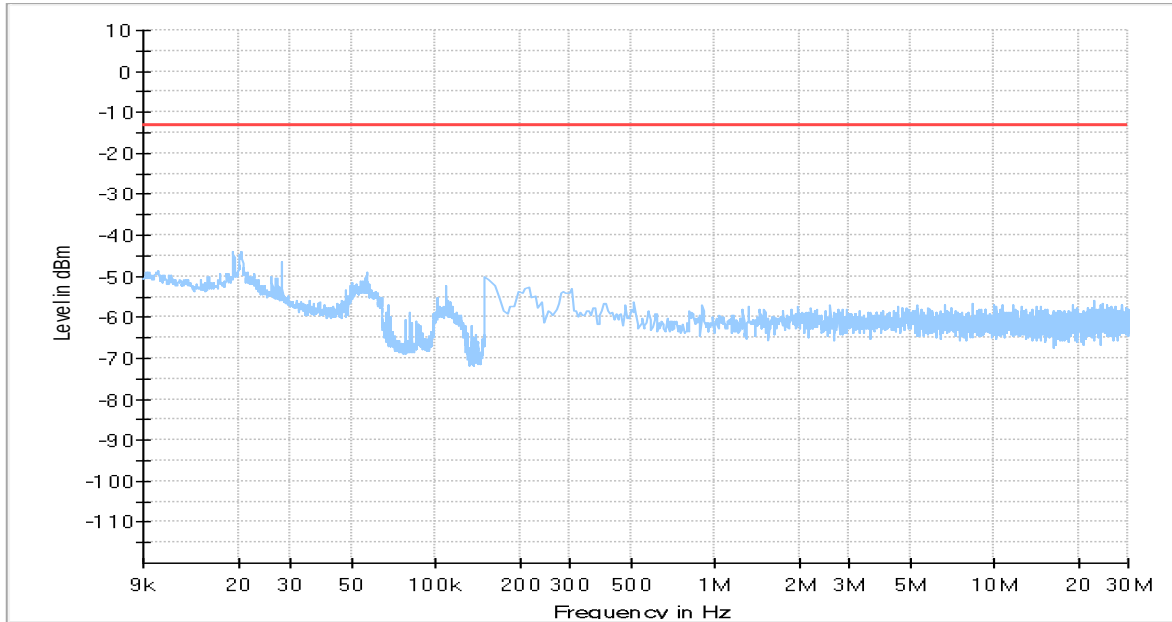
7.1.1 Test Band = GSM850





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	-3.08150	-0.00374	PASS
				VN	1.43093	0.00174	PASS
				VH	-2.01851	-0.00245	PASS
		MCH	TN	VL	-1.78284	-0.00213	PASS
				VN	-0.22589	-0.00027	PASS
				VH	-1.31529	-0.00157	PASS
		HCH	TN	VL	-1.67457	-0.00197	PASS
				VN	1.39112	0.00164	PASS
				VH	-2.29806	-0.00271	PASS
	GSM/TM2	LCH	TN	VL	-1.03213	-0.00125	PASS
				VN	-2.33752	-0.00284	PASS
				VH	0.07383	0.00009	PASS
		MCH	TN	VL	-2.05337	-0.00245	PASS
				VN	2.02875	0.00242	PASS
				VH	-2.39446	-0.00286	PASS
		HCH	TN	VL	0.60087	0.00071	PASS
				VN	-2.00291	-0.00236	PASS
				VH	-1.08883	-0.00128	PASS
PCS1900	GSM/TM1	LCH	TN	VL	-8.95958	-0.00484	PASS
				VN	-7.46434	-0.00403	PASS
				VH	-8.69525	-0.00470	PASS
		MCH	TN	VL	-10.02490	-0.00533	PASS
				VN	-5.39238	-0.00287	PASS
				VH	-8.70840	-0.00463	PASS
		HCH	TN	VL	-9.32794	-0.00484	PASS
				VN	-7.75386	-0.00403	PASS
				VH	-9.22422	-0.00470	PASS
	GSM/TM2	LCH	TN	VL	-13.86745	-0.00750	PASS
				VN	-11.95183	-0.00646	PASS
				VH	-13.09935	-0.00708	PASS
		MCH	TN	VL	-12.72563	-0.00677	PASS
				VN	-13.54805	-0.00721	PASS
				VH	-12.36478	-0.00658	PASS
		HCH	TN	VL	-12.66673	-0.00750	PASS



Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VN	-12.79237	-0.00646	PASS
				VH	-13.79903	-0.00708	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	1.33261	0.00162	PASS
				-20	1.30696	0.00159	PASS
				-10	-1.03595	-0.00126	PASS
				0	-1.66725	-0.00202	PASS
				10	-1.14305	-0.00139	PASS
				20	1.43093	0.00174	PASS
				30	-1.18939	-0.00144	PASS
				40	-0.52045	-0.00063	PASS
				50	-0.72285	-0.00088	PASS
		MCH	VN	-30	0.17411	0.00021	PASS
				-20	0.36427	0.00044	PASS
				-10	1.38565	0.00166	PASS
				0	-0.88374	-0.00106	PASS
				10	0.11428	0.00014	PASS
				20	-0.22589	-0.00027	PASS
				30	0.10343	0.00012	PASS
				40	0.91401	0.00109	PASS
				50	0.25192	0.00030	PASS
		HCH	VN	-30	1.55845	0.00184	PASS
				-20	0.49384	0.00058	PASS
				-10	2.60659	0.00307	PASS
				0	-0.83850	-0.00099	PASS
				10	-1.83212	-0.00216	PASS
				20	1.39112	0.00164	PASS
				30	-1.18217	-0.00139	PASS
				40	-2.17507	-0.00256	PASS
				50	0.55284	0.00065	PASS
	GSM/TM2	LCH	VN	-30	-0.05518	-0.00007	PASS
				-20	-0.99150	-0.00120	PASS
				-10	1.06724	0.00129	PASS
				0	0.05918	0.00007	PASS
				10	-0.37289	-0.00045	PASS
				20	-2.33752	-0.00284	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	-0.62605	-0.00076	PASS
				40	-0.02597	-0.00003	PASS
				50	0.39342	0.00048	PASS
		MCH	VN	-30	0.35829	0.00043	PASS
				-20	0.31893	0.00038	PASS
				-10	0.44480	0.00053	PASS
				0	3.17934	0.00380	PASS
				10	-2.20134	-0.00263	PASS
				20	2.02875	0.00242	PASS
				30	2.18998	0.00262	PASS
				40	0.86917	0.00104	PASS
				50	0.41015	0.00049	PASS
		HCH	VN	-30	-1.56172	-0.00184	PASS
				-20	-1.13284	-0.00133	PASS
				-10	-2.35596	-0.00278	PASS
				0	0.39675	0.00047	PASS
				10	-1.06983	-0.00126	PASS
				20	-2.00291	-0.00236	PASS
				30	-1.14525	-0.00135	PASS
				40	1.31154	0.00155	PASS
				50	-0.52116	-0.00061	PASS
PCS1900	GSM/TM1	LCH	VN	-30	-8.54610	-0.00462	PASS
				-20	-8.41580	-0.00455	PASS
				-10	-6.73683	-0.00364	PASS
				0	-6.52017	-0.00352	PASS
				10	-7.40400	-0.00400	PASS
				20	-7.46434	-0.00403	PASS
				30	-6.49836	-0.00351	PASS
				40	-5.01562	-0.00271	PASS
				50	-7.72343	-0.00417	PASS
		MCH	VN	-30	-10.51910	-0.00560	PASS
				-20	-7.69709	-0.00409	PASS
				-10	-7.53891	-0.00401	PASS
				0	-8.38700	-0.00446	PASS
				10	-7.07548	-0.00376	PASS
				20	-5.39238	-0.00287	PASS
				30	-7.64728	-0.00407	PASS
				40	-6.75151	-0.00359	PASS
				50	-8.27593	-0.00440	PASS
		HCH	VN	-30	-8.32357	-0.00436	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-20	-8.48728	-0.00444	PASS
				-10	-7.64287	-0.00400	PASS
				0	-8.81188	-0.00461	PASS
				10	-8.39296	-0.00439	PASS
				20	-7.75386	-0.00406	PASS
				30	-7.78618	-0.00408	PASS
				40	-7.83899	-0.00410	PASS
				50	-6.91319	-0.00362	PASS
	GSM/TM2	LCH	VN	-30	-15.22920	-0.00823	PASS
				-20	-11.57647	-0.00626	PASS
				-10	-14.11900	-0.00763	PASS
				0	-11.12502	-0.00601	PASS
				10	-13.38982	-0.00724	PASS
				20	-11.95183	-0.00646	PASS
				30	-13.29900	-0.00719	PASS
				40	-10.25968	-0.00555	PASS
				50	-8.82398	-0.00477	PASS
		MCH	VN	-30	-14.59316	-0.00776	PASS
				-20	-10.79091	-0.00574	PASS
				-10	-12.91287	-0.00687	PASS
				0	-12.38294	-0.00659	PASS
				10	-14.20916	-0.00756	PASS
				20	-13.54805	-0.00721	PASS
				30	-11.22116	-0.00597	PASS
				40	-10.82524	-0.00576	PASS
				50	-9.89112	-0.00526	PASS
		HCH	VN	-30	-15.38290	-0.00805	PASS
				-20	-14.43704	-0.00756	PASS
				-10	-14.79670	-0.00775	PASS
				0	-11.92352	-0.00624	PASS
				10	-13.28462	-0.00696	PASS
				20	-12.79237	-0.00670	PASS
				30	-13.04480	-0.00683	PASS
				40	-12.48471	-0.00654	PASS
				50	-11.13873	-0.00583	PASS

END