

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	32.90	30.15	38.5	PASS
		MCH	33.00	30.25	38.5	PASS
		HCH	32.72	29.97	38.5	PASS
	GSM/TM2	LCH	26.78	24.03	38.5	PASS
		MCH	26.84	24.09	38.5	PASS
		HCH	26.91	24.16	38.5	PASS
Test Band	Test Mode	Test Channel	Measured[dBm]	EIRP [dBm]	Limit [dBm]	Verdict
PCS1900	GSM/TM1	LCH	29.42	26.32	33	PASS
		MCH	29.76	26.66	33	PASS
		HCH	29.77	26.67	33	PASS
	GSM/TM2	LCH	25.41	22.31	33	PASS
		MCH	25.38	22.28	33	PASS
		HCH	25.27	22.17	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	1.82	13	PASS
		MCH	1.91	13	PASS
		HCH	1.82	13	PASS
	GSM/TM2	LCH	5.01	13	PASS
		MCH	5.12	13	PASS
		HCH	5.10	13	PASS
PCS1900	GSM/TM1	LCH	1.99	13	PASS
		MCH	2.04	13	PASS
		HCH	1.86	13	PASS
	GSM/TM2	LCH	5.16	13	PASS
		MCH	4.93	13	PASS
		HCH	4.89	13	PASS

3Appendix_C: Modulation Characteristics

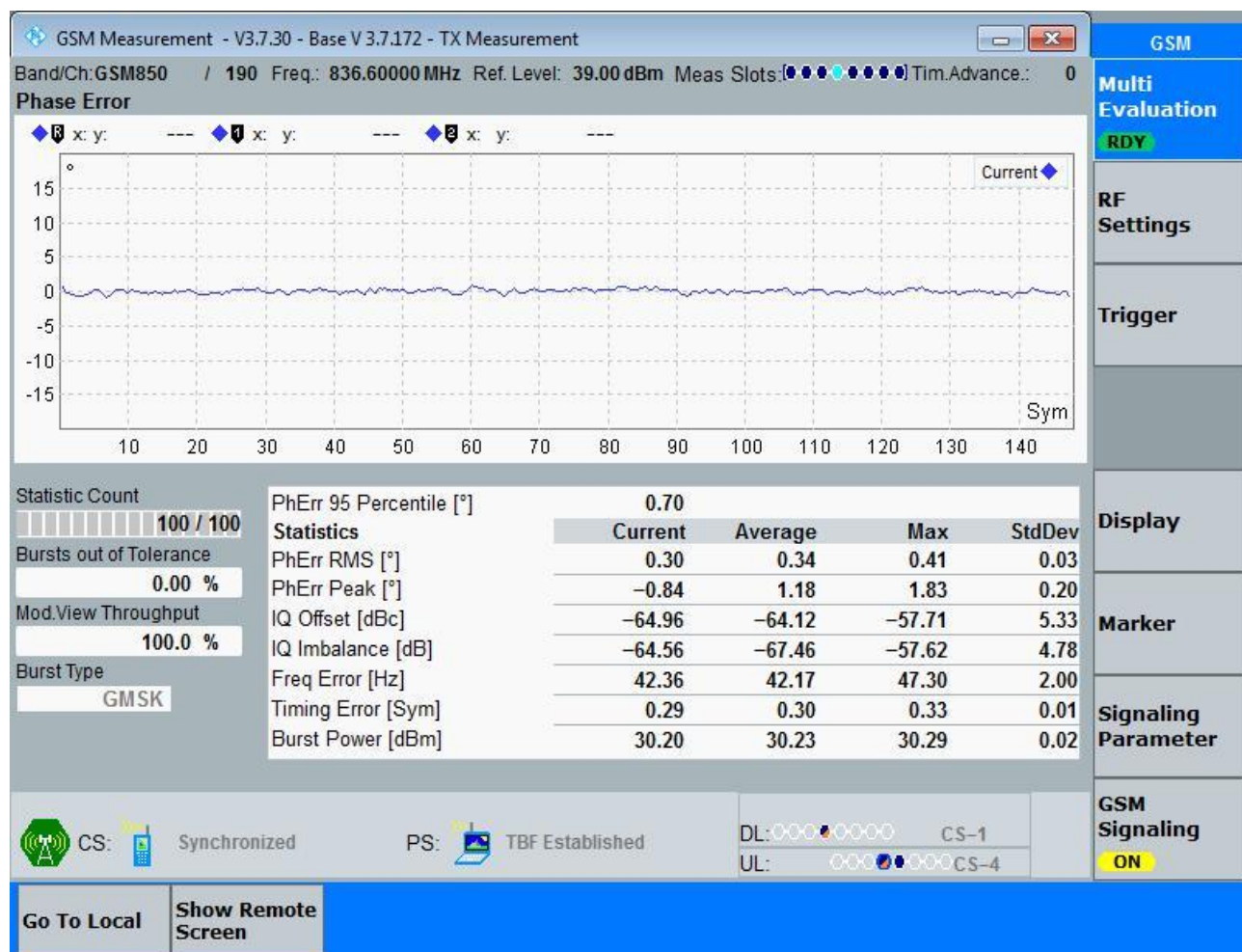
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

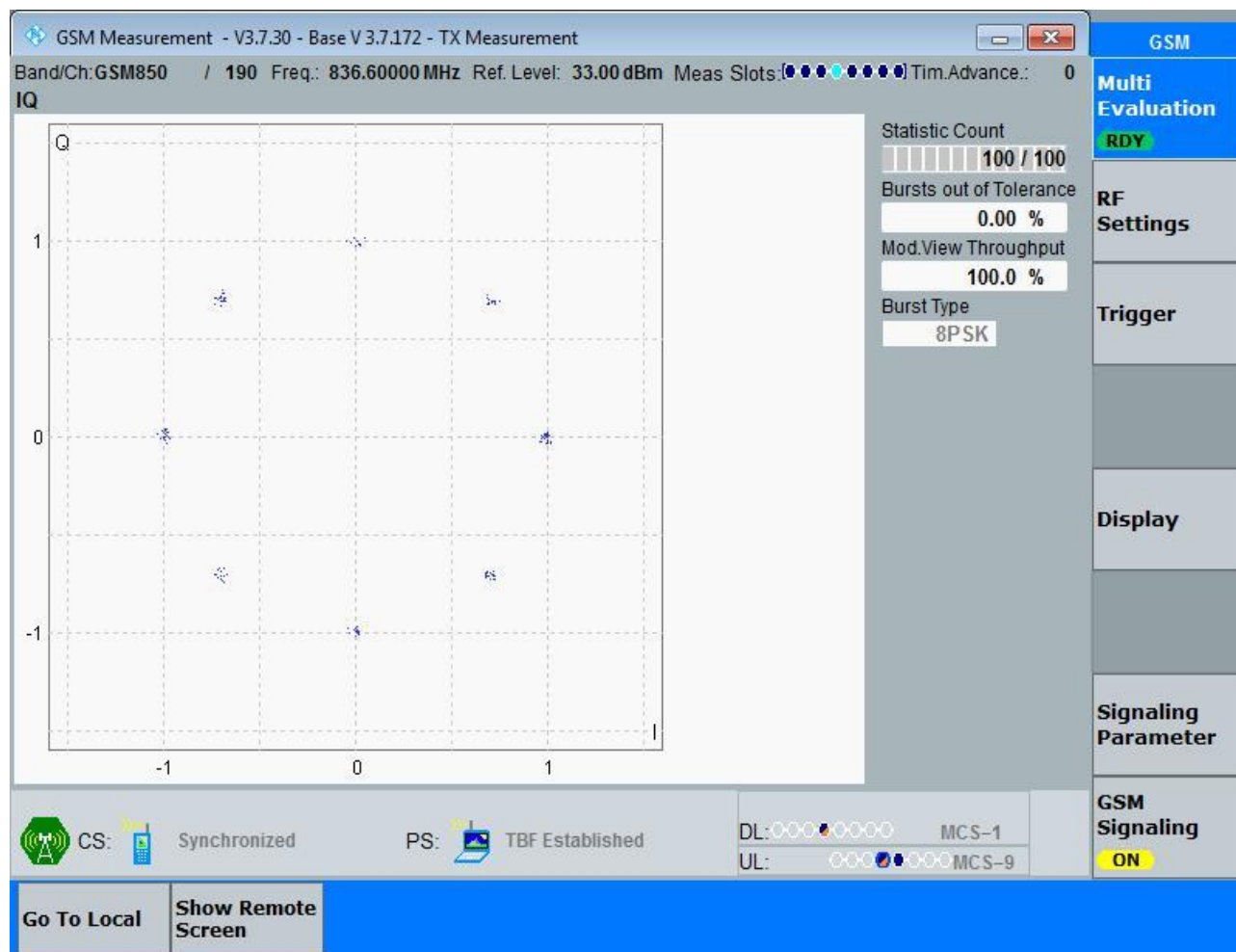
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

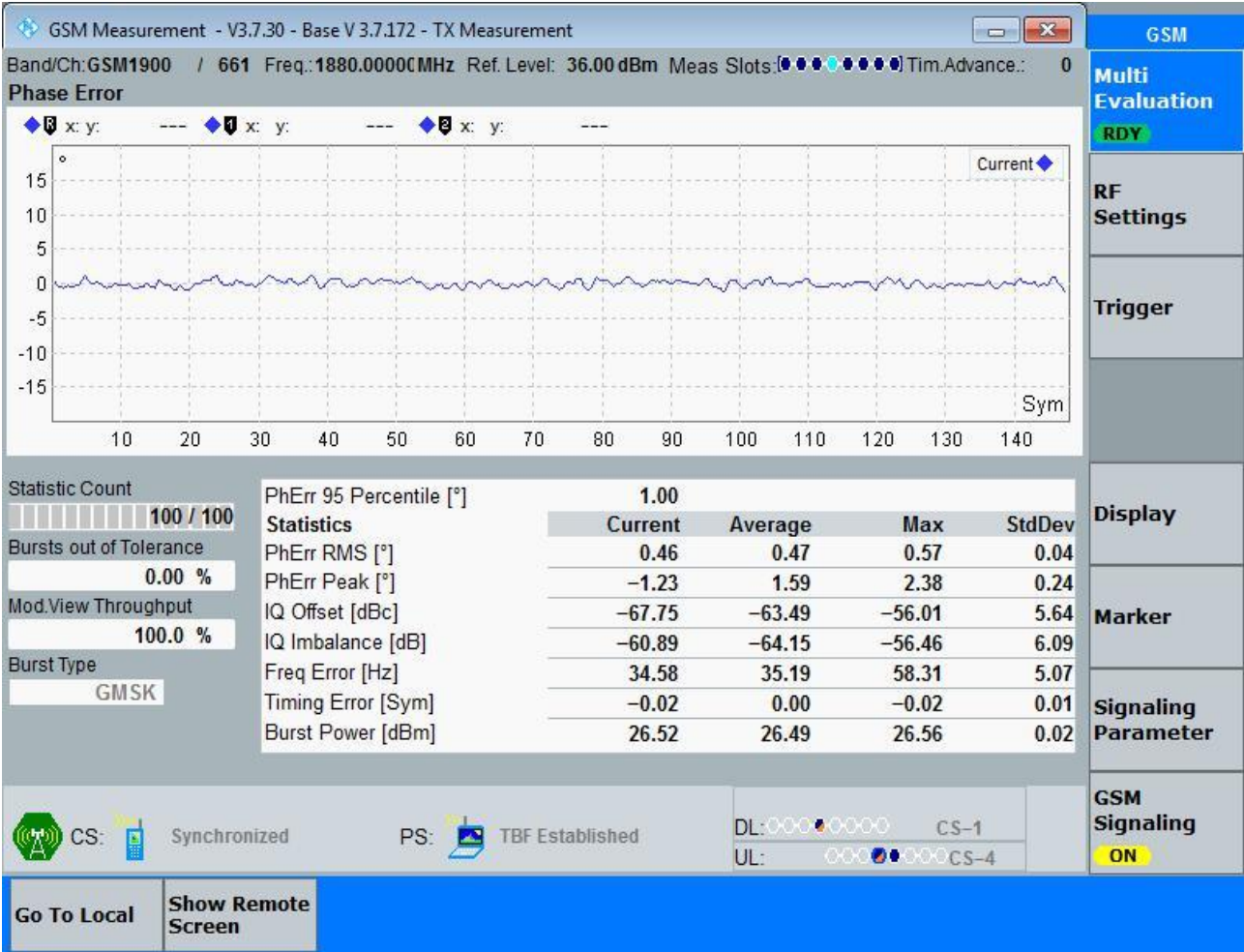
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = PCS1900

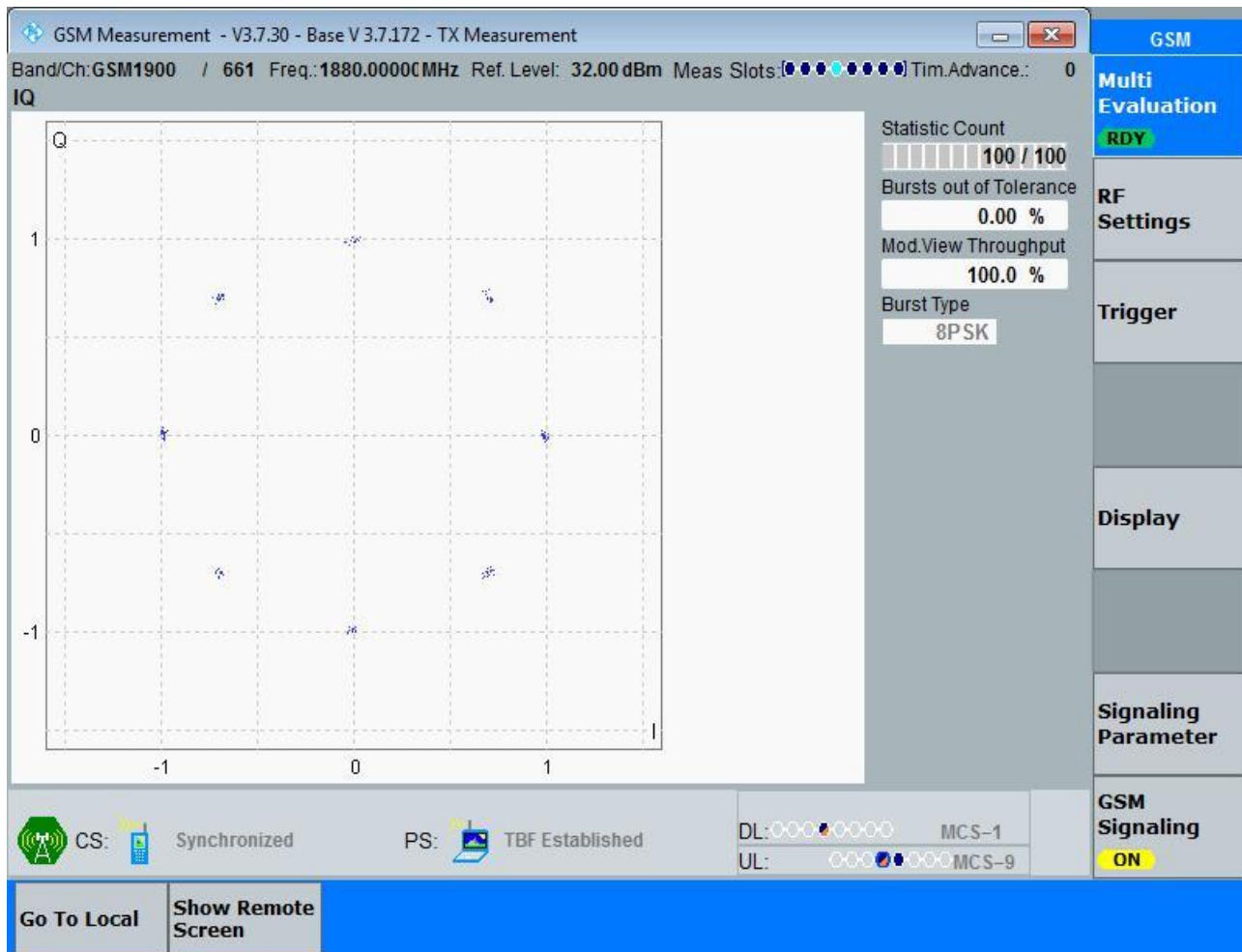
3.1.2.1 Test Mode = GSM/TM1

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	244.72	312.7	Pass
		MCH	243.64	312.3	Pass
		HCH	246.08	312.5	Pass
	GSM/TM2	LCH	242.71	311.7	Pass
		MCH	243.06	307.2	Pass
		HCH	245.32	309.1	Pass
PCS1900	GSM/TM1	LCH	246.79	316.0	Pass
		MCH	243.09	310.2	Pass
		HCH	245.68	314.8	Pass
	GSM/TM2	LCH	249.71	314.0	Pass
		MCH	247.14	314.3	Pass
		HCH	243.81	303.0	Pass

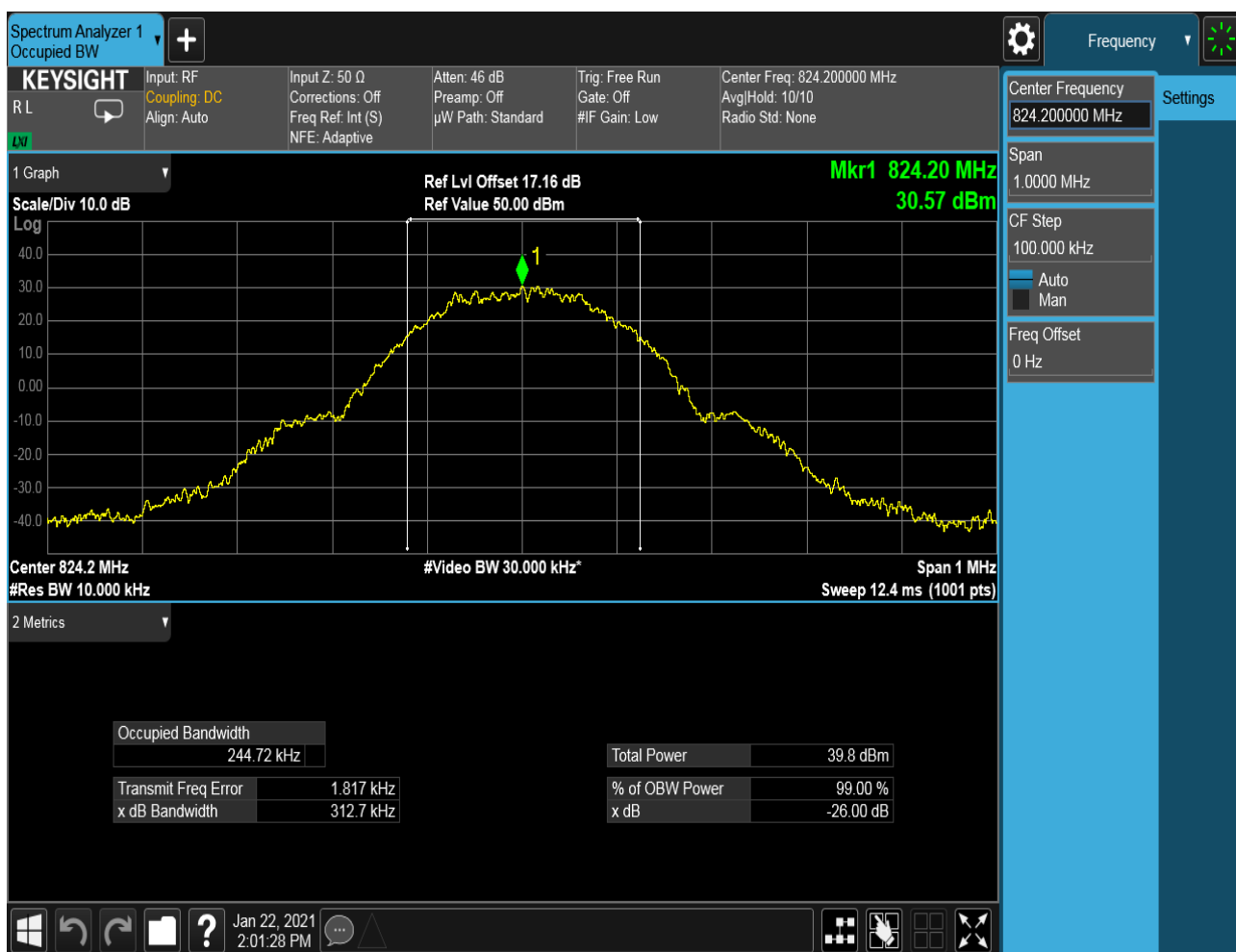
Part II - Test Plots

4.1 For GSM

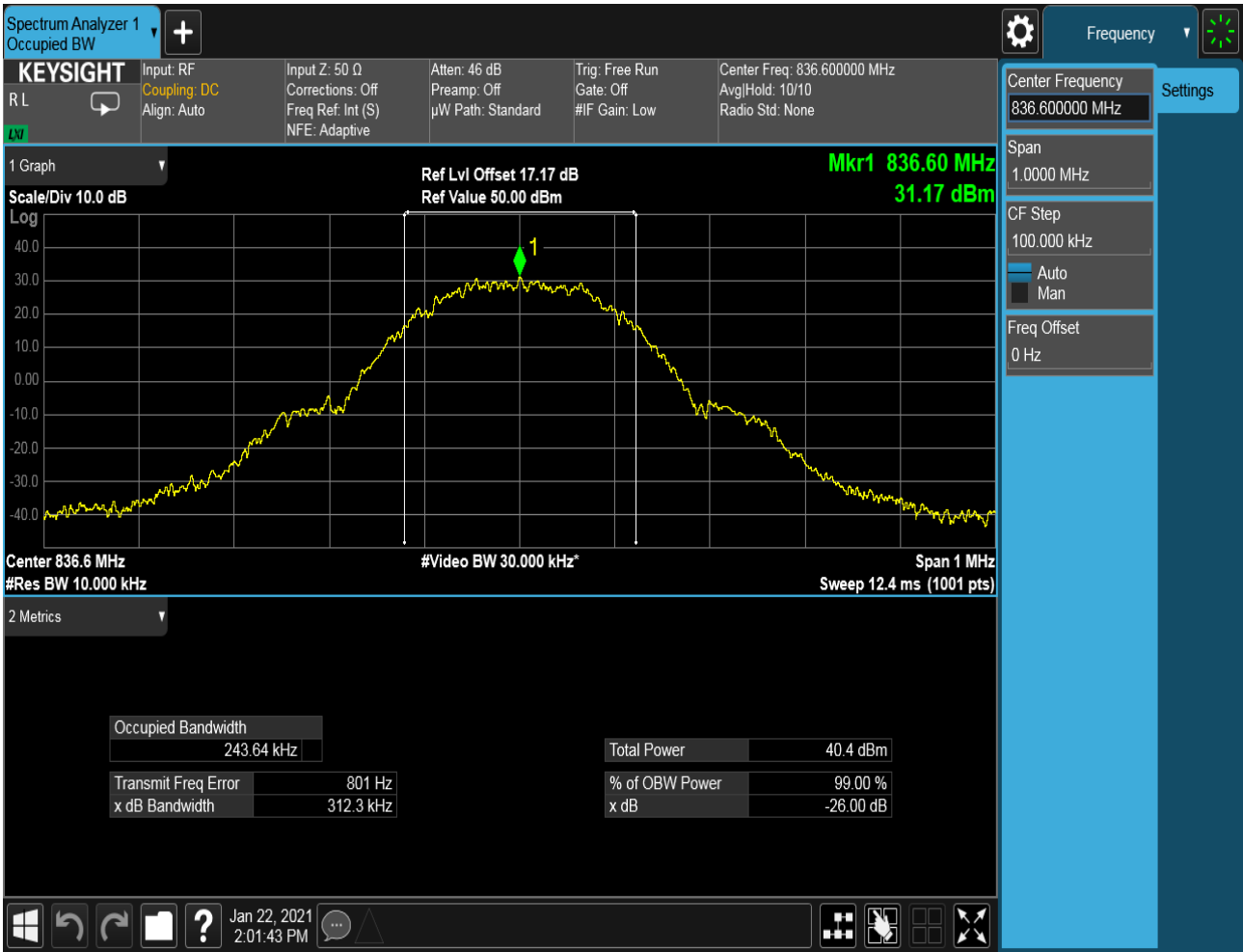
4.1.1 Test Band = GSM850

4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH



4.1.1.1.2 Test Channel = MCH

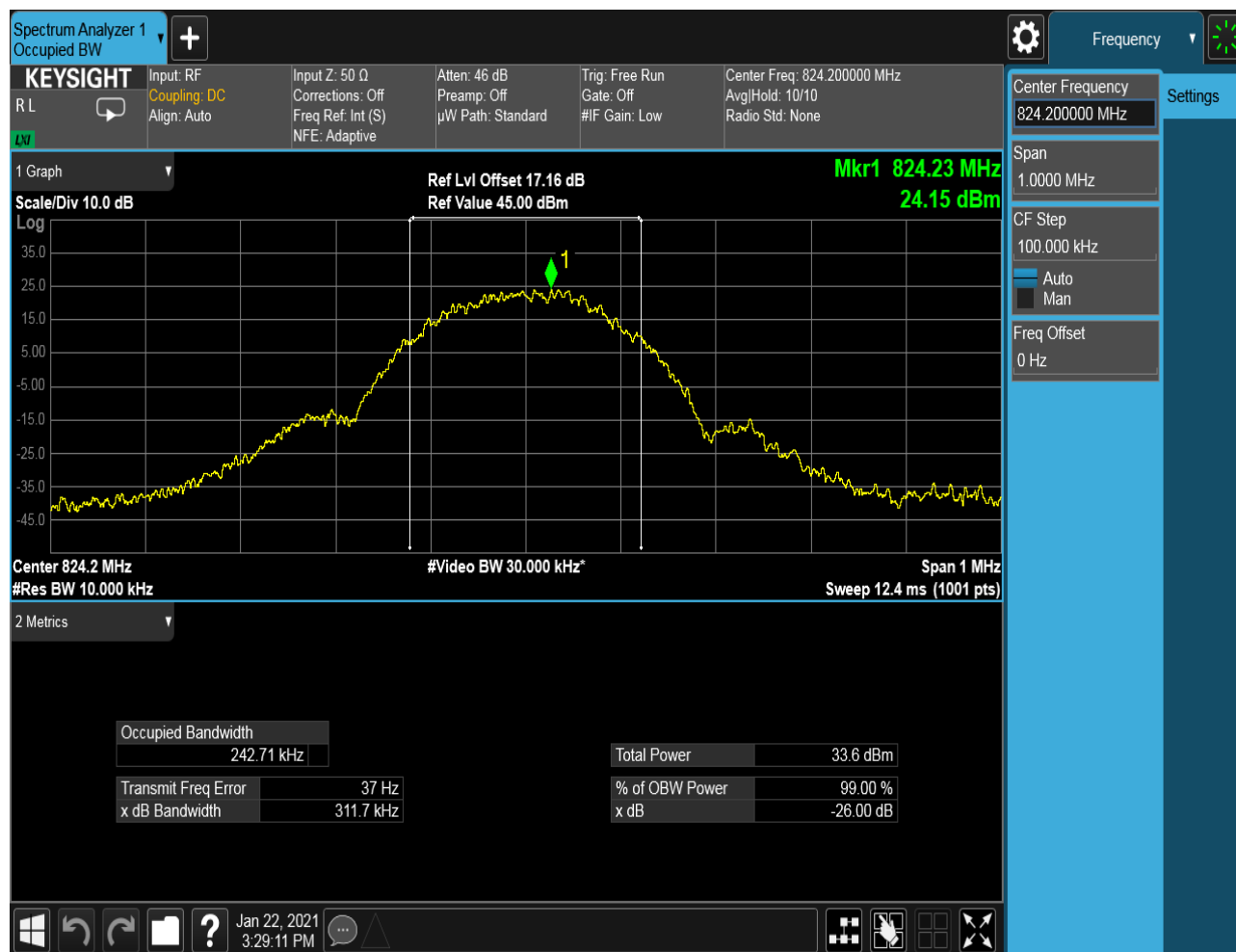


4.1.1.1.3 Test Channel = HCH

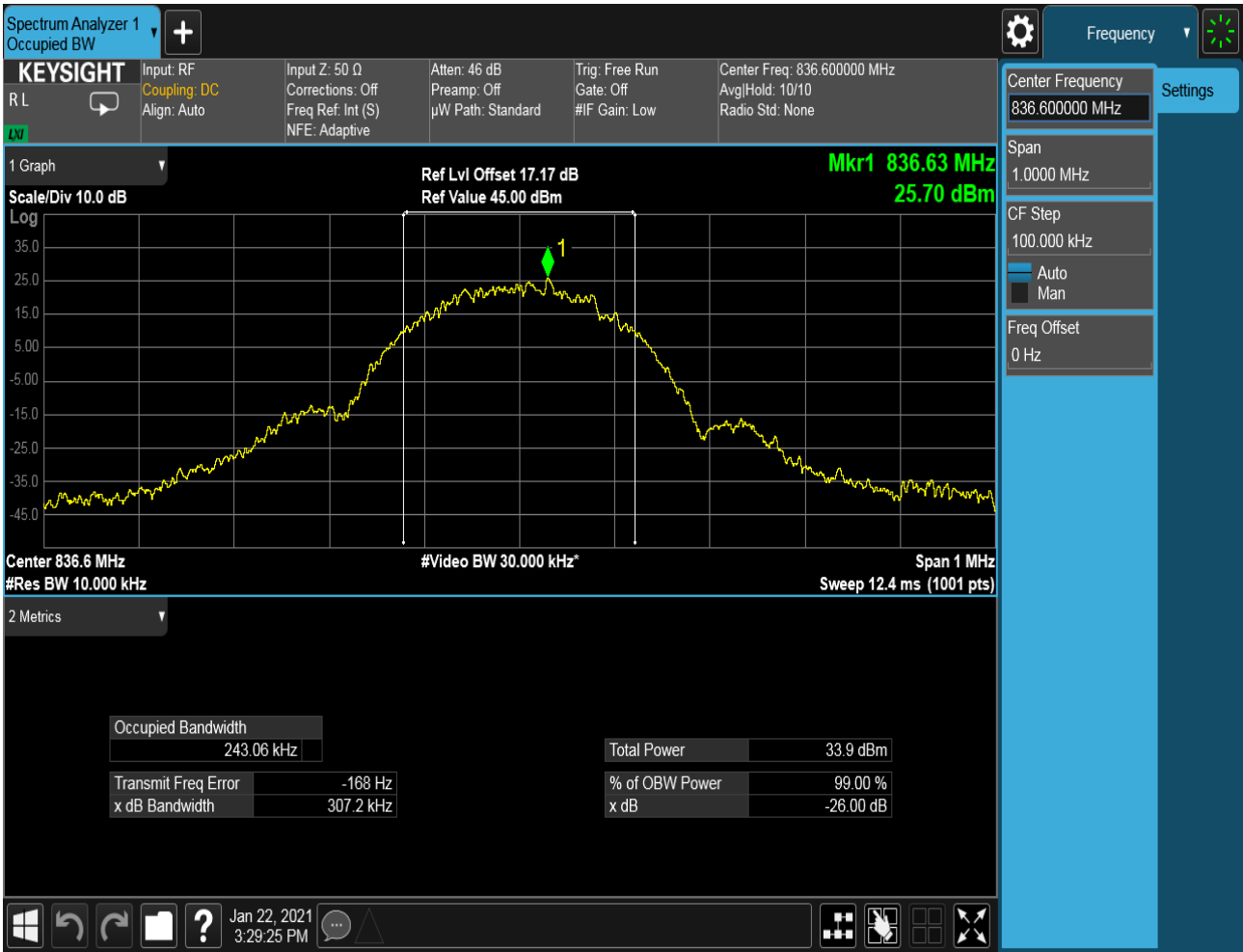


4.1.1.2 Test Mode = GSM/TM2

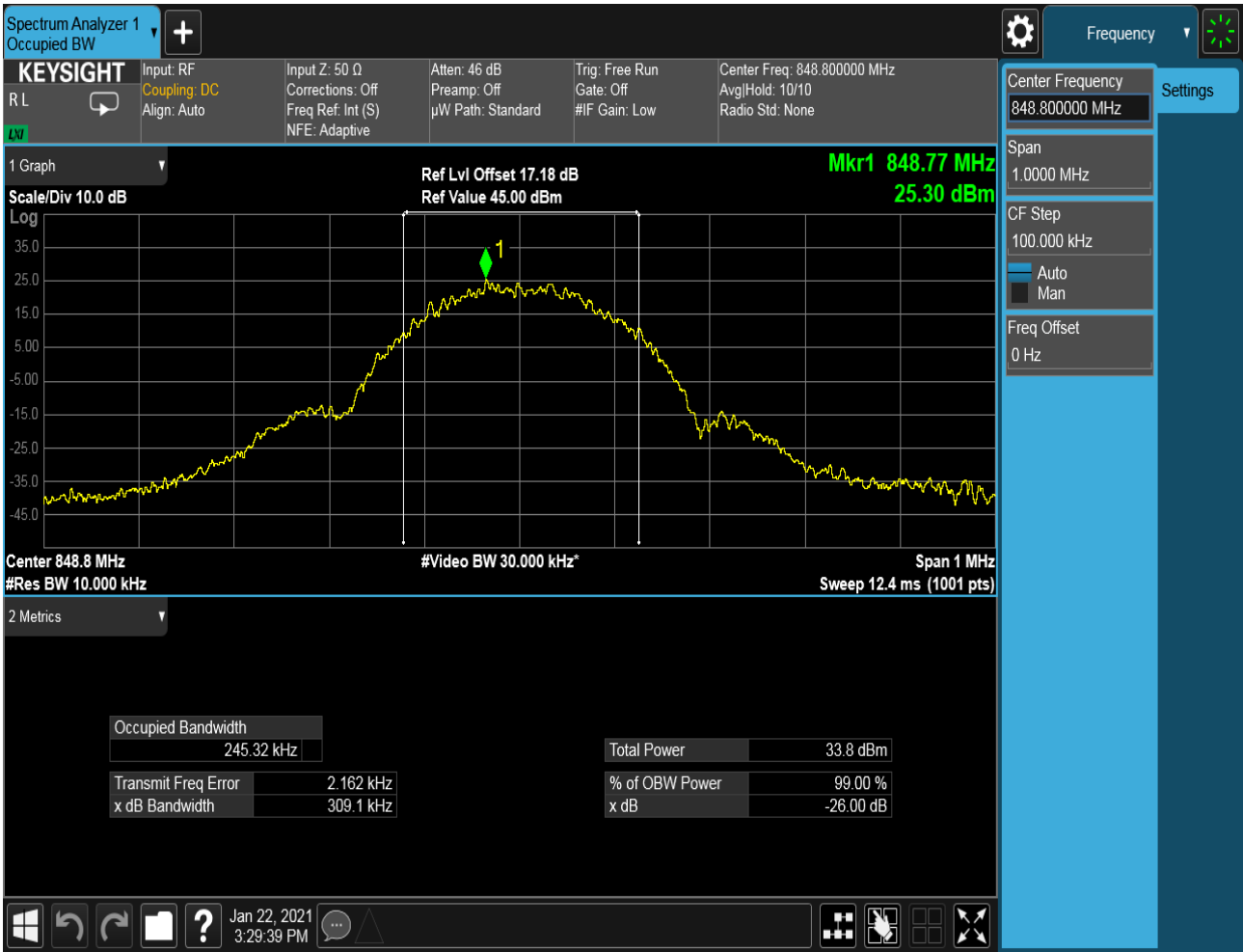
4.1.1.2.1 Test Channel = LCH



4.1.1.2.2 Test Channel = MCH



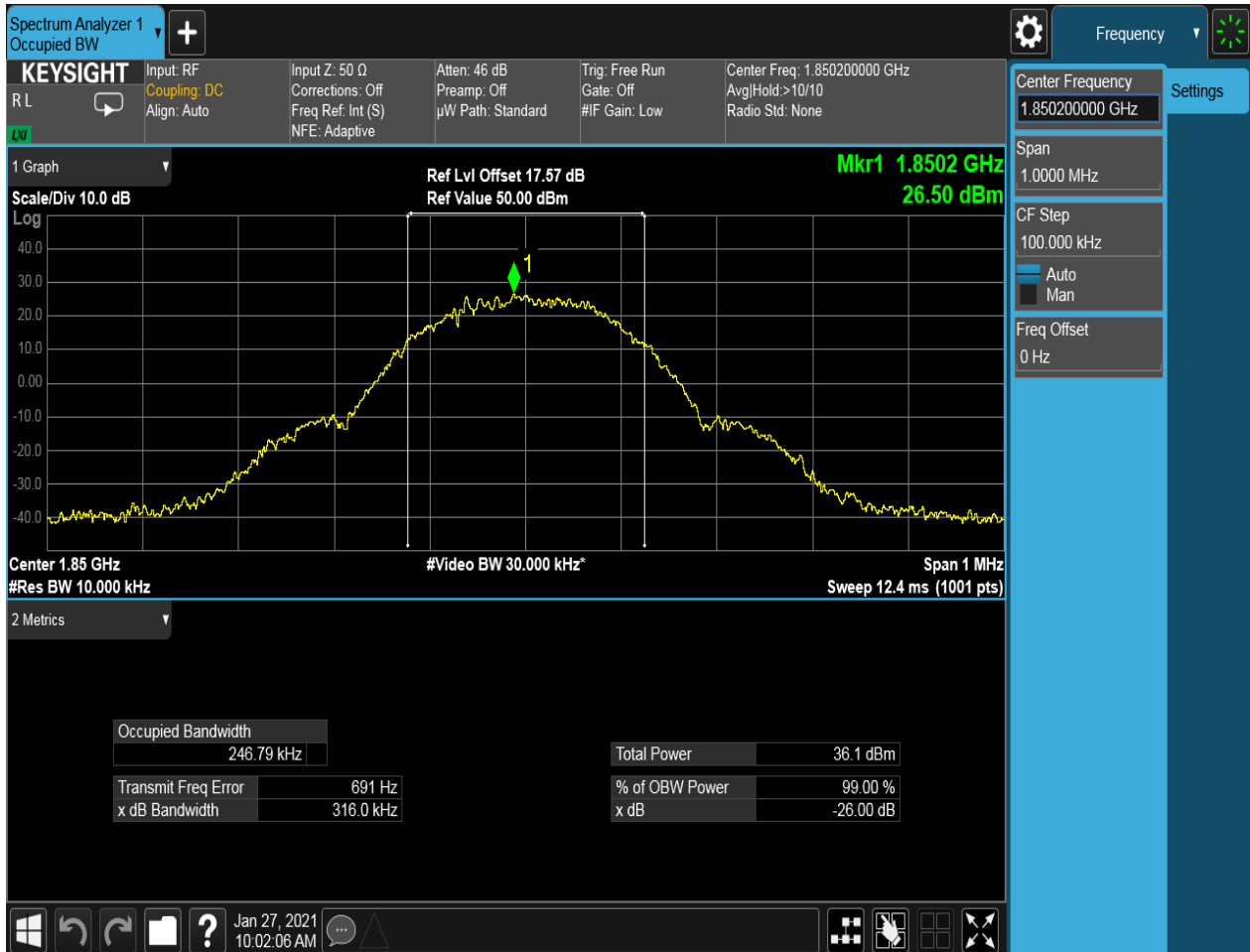
4.1.1.2.3 Test Channel = HCH



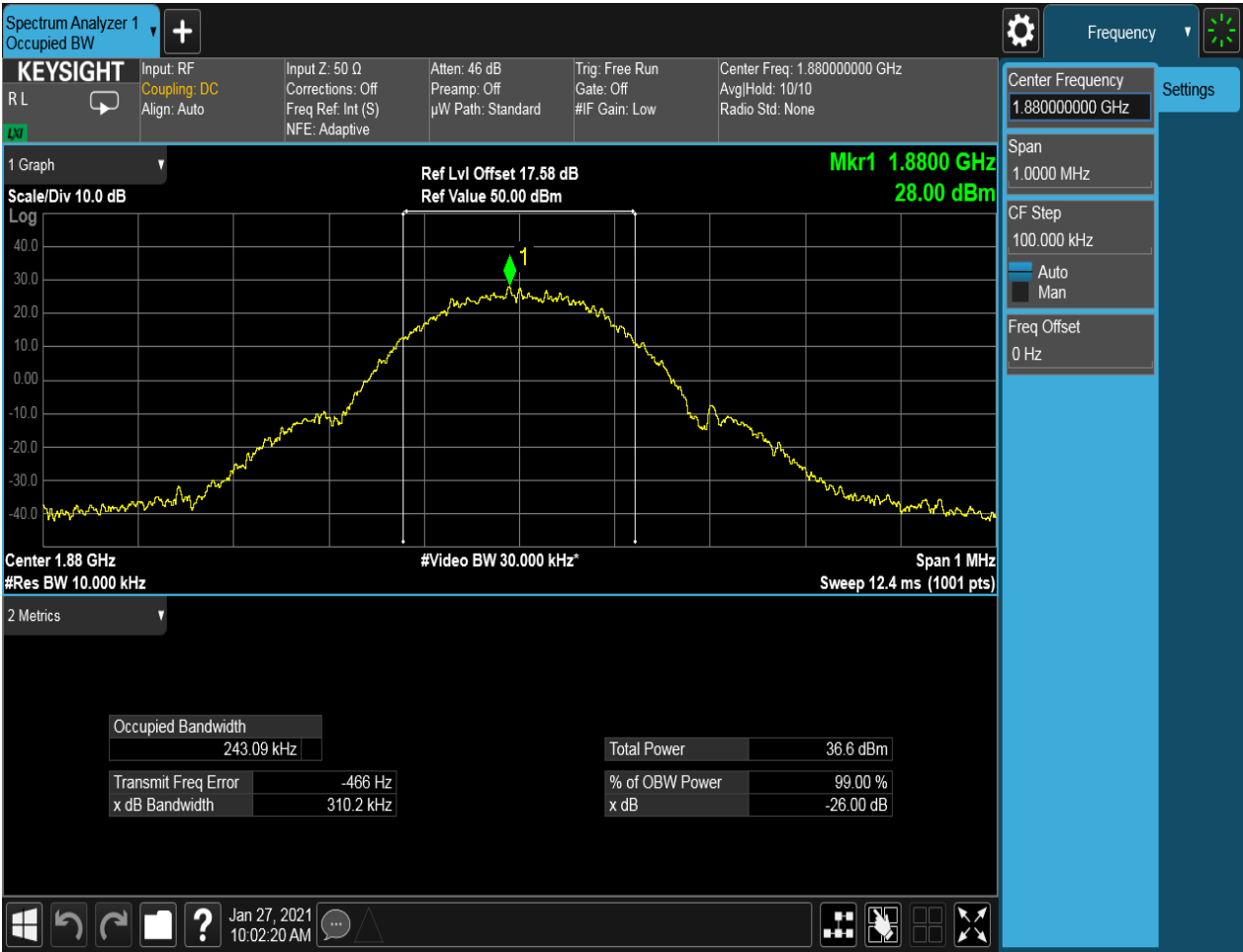
4.1.2 Test Band = PCS1900

4.1.2.1 Test Mode = GSM/TM1

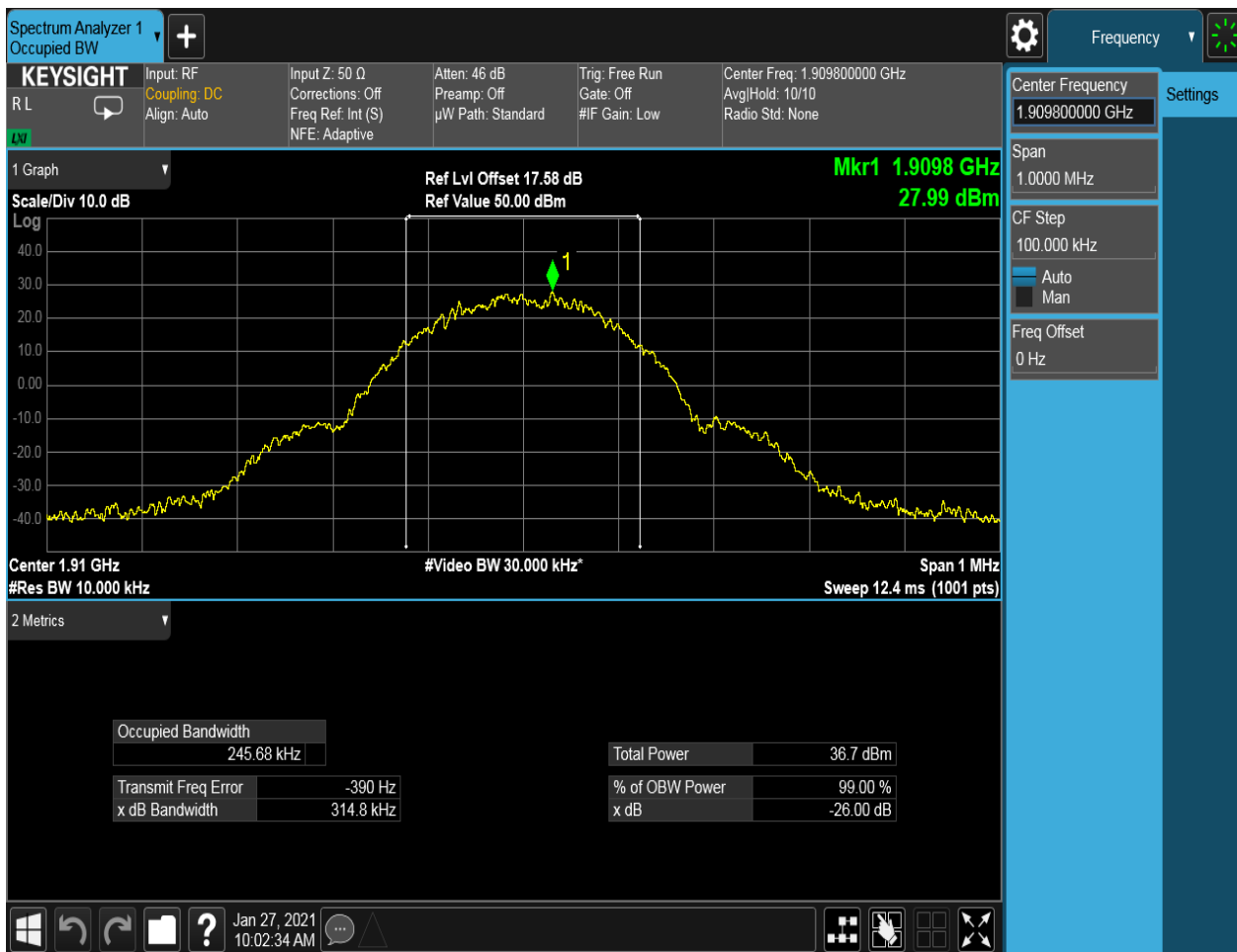
4.1.2.1.1 Test Channel = LCH



4.1.2.1.2 Test Channel = MCH

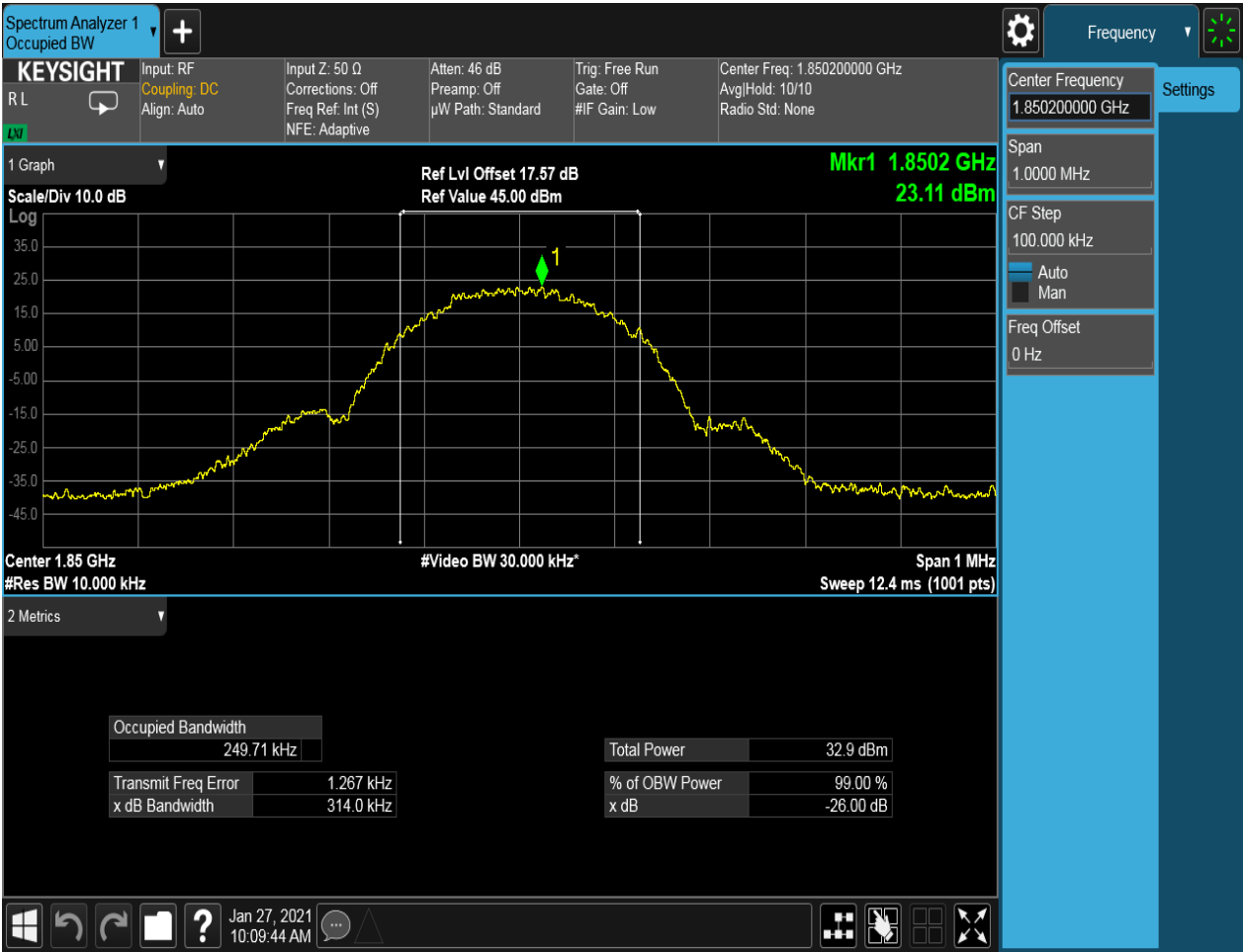


4.1.2.1.3 Test Channel = HCH

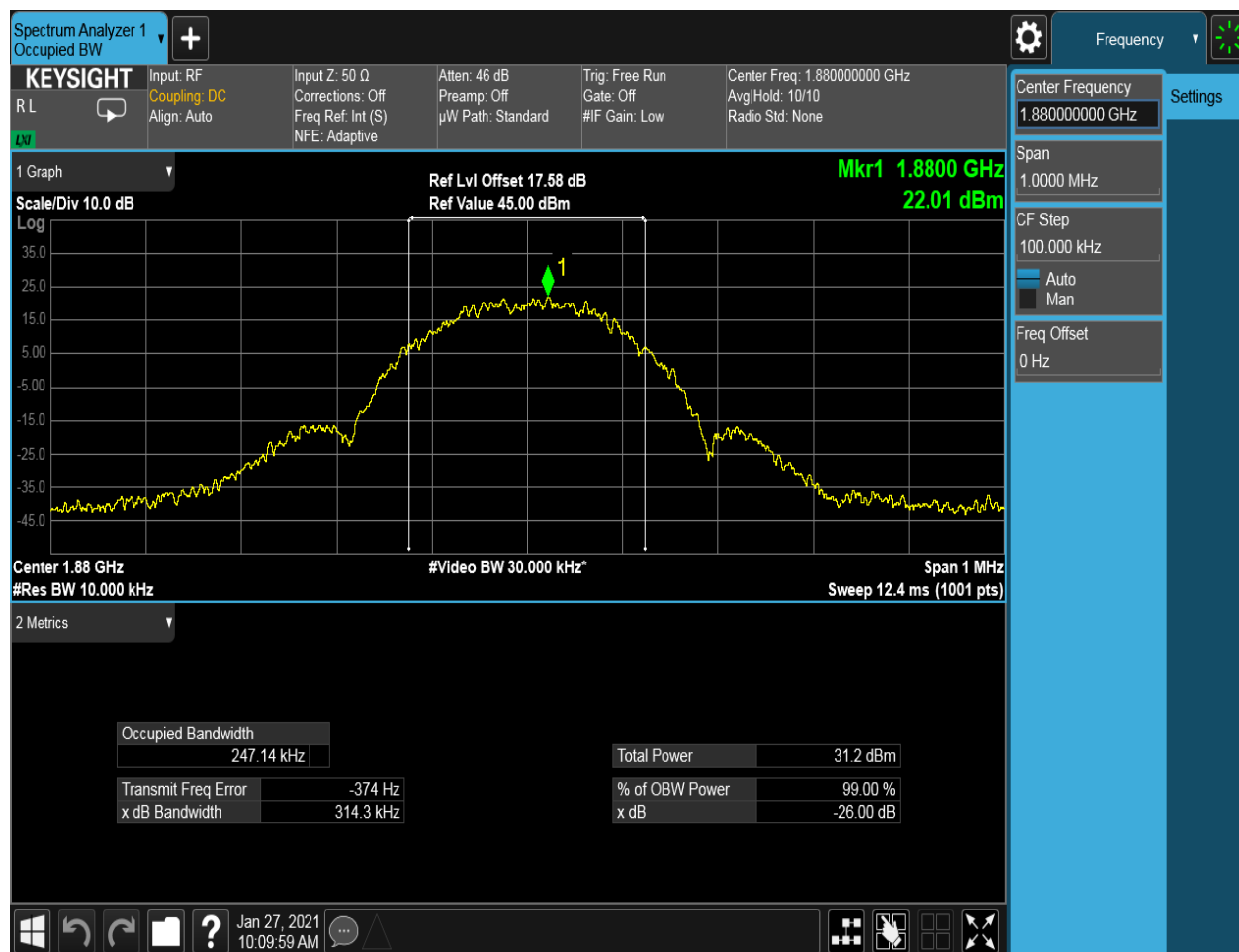


4.1.2.2 Test Mode = GSM/TM2

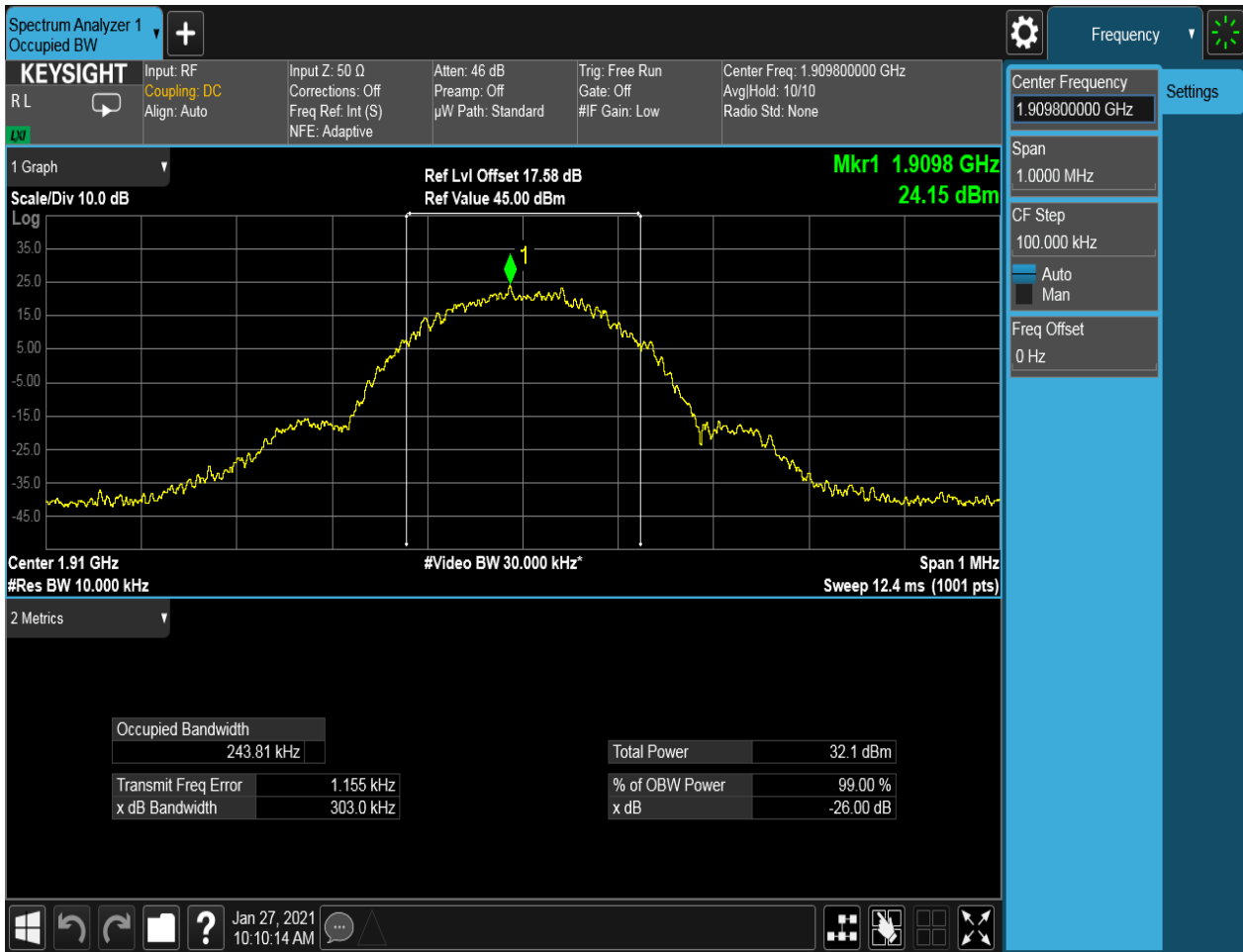
4.1.2.2.1 Test Channel = LCH



4.1.2.2.2 Test Channel = MCH



4.1.2.2.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

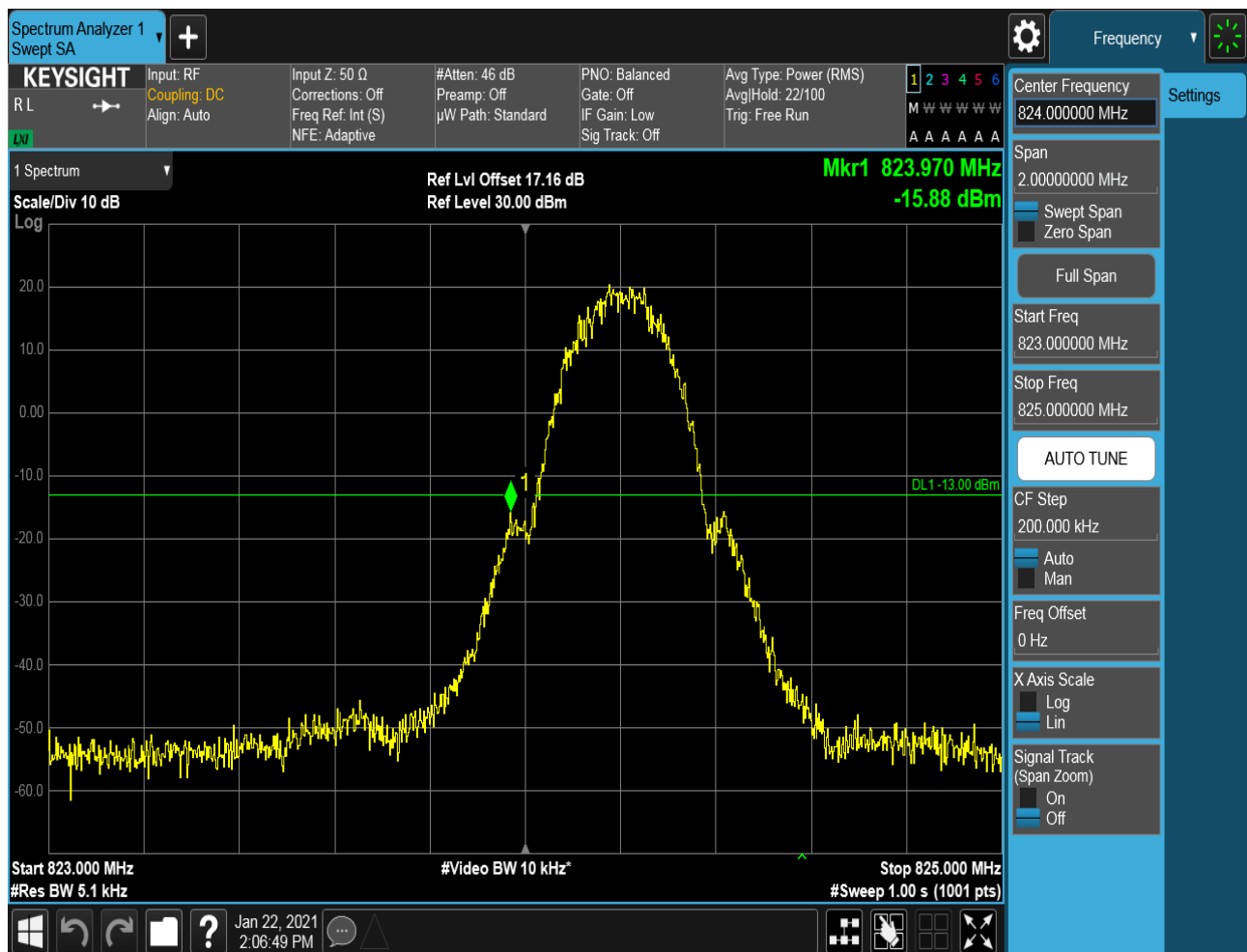
Part I - Test Plots

5.1 For GSM

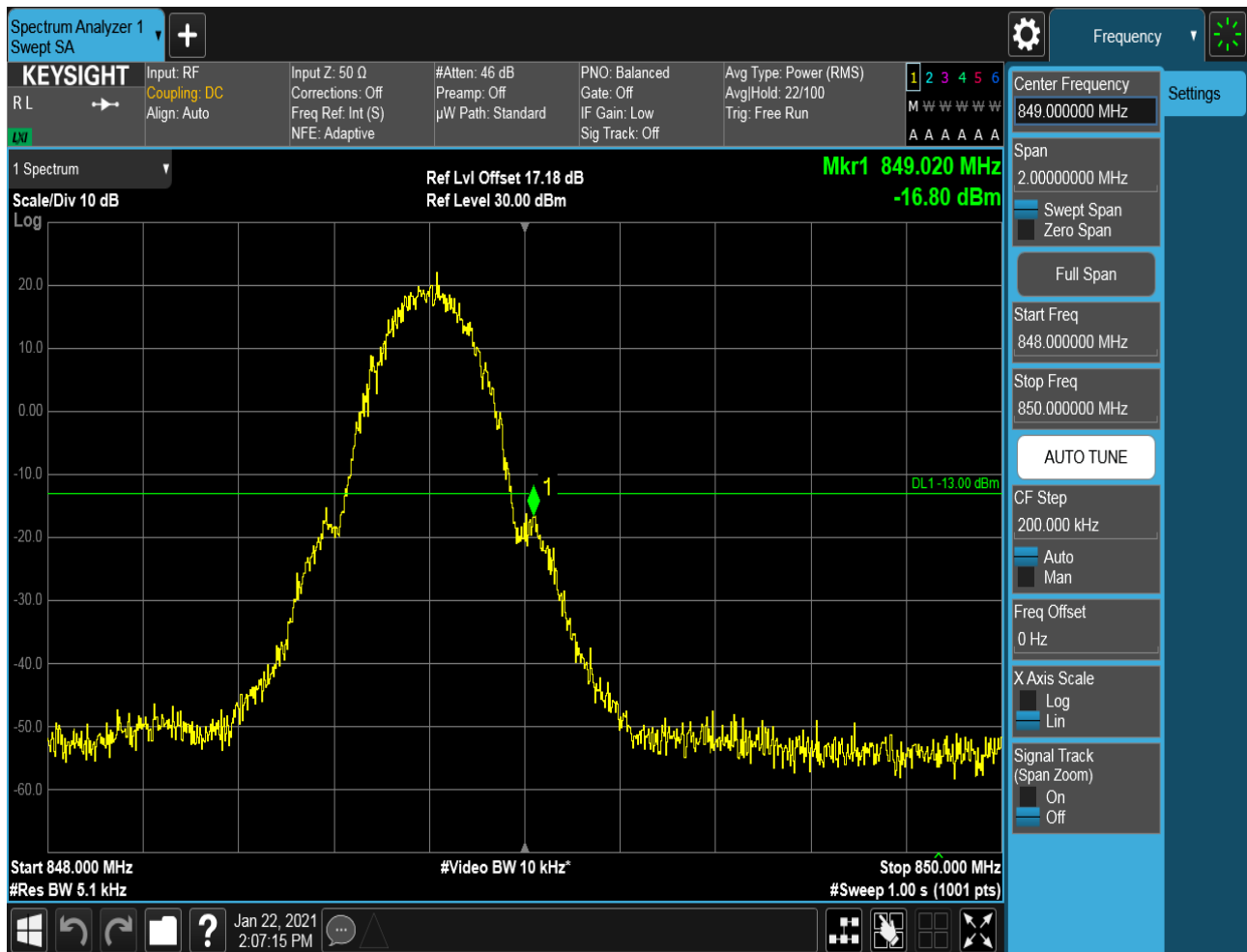
5.1.1 Test Band = GSM850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH

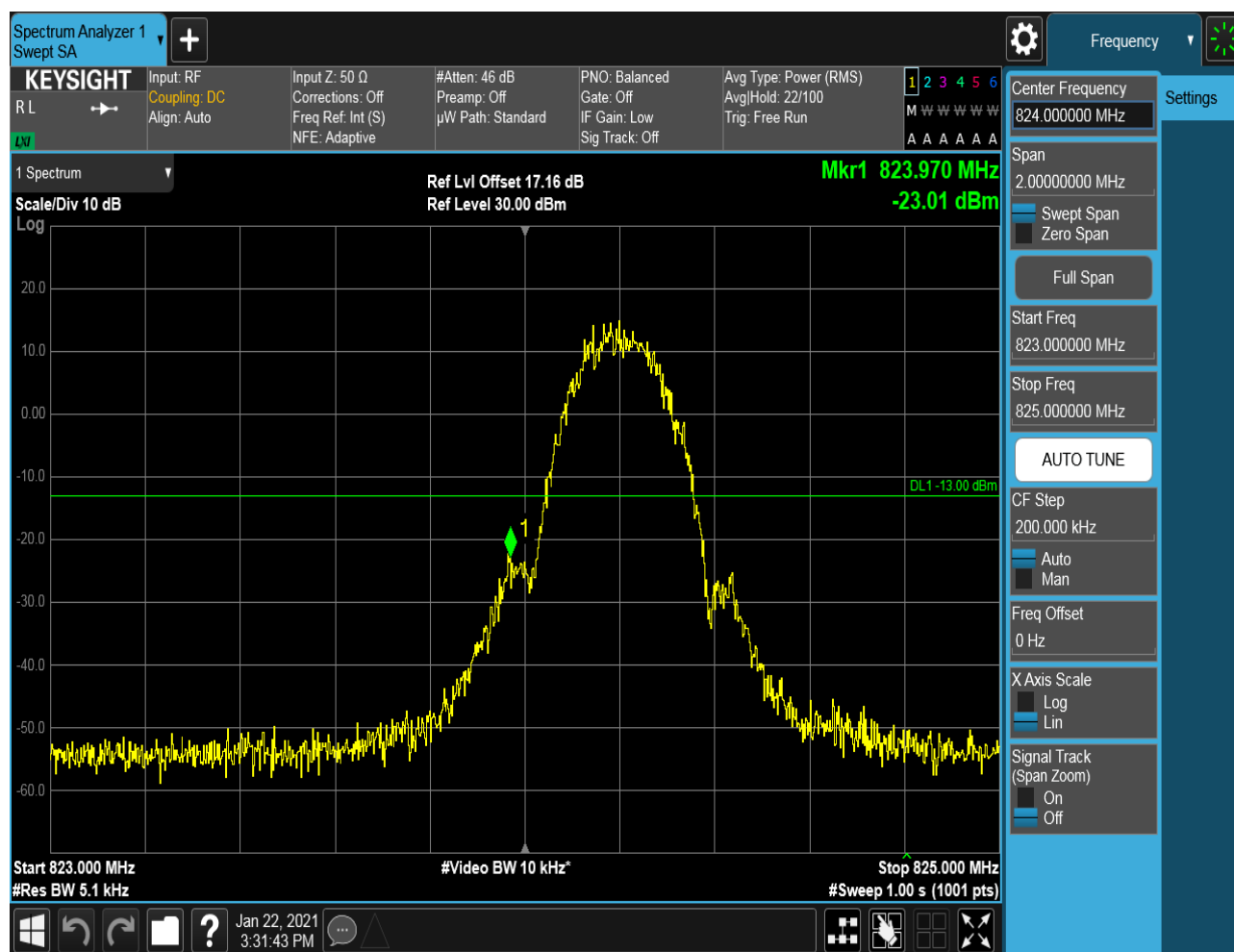


5.1.1.1.2 Test Channel = HCH

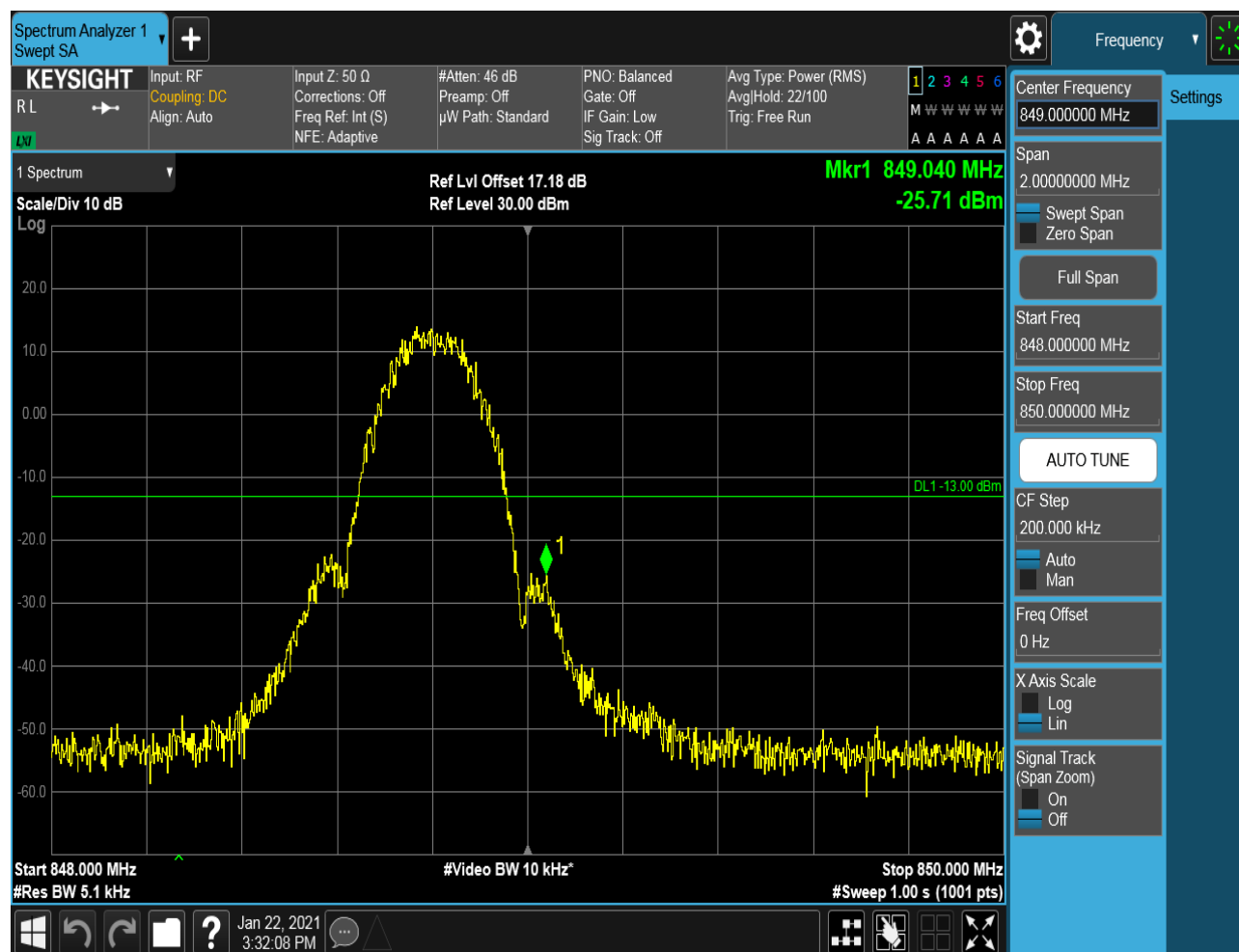


5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



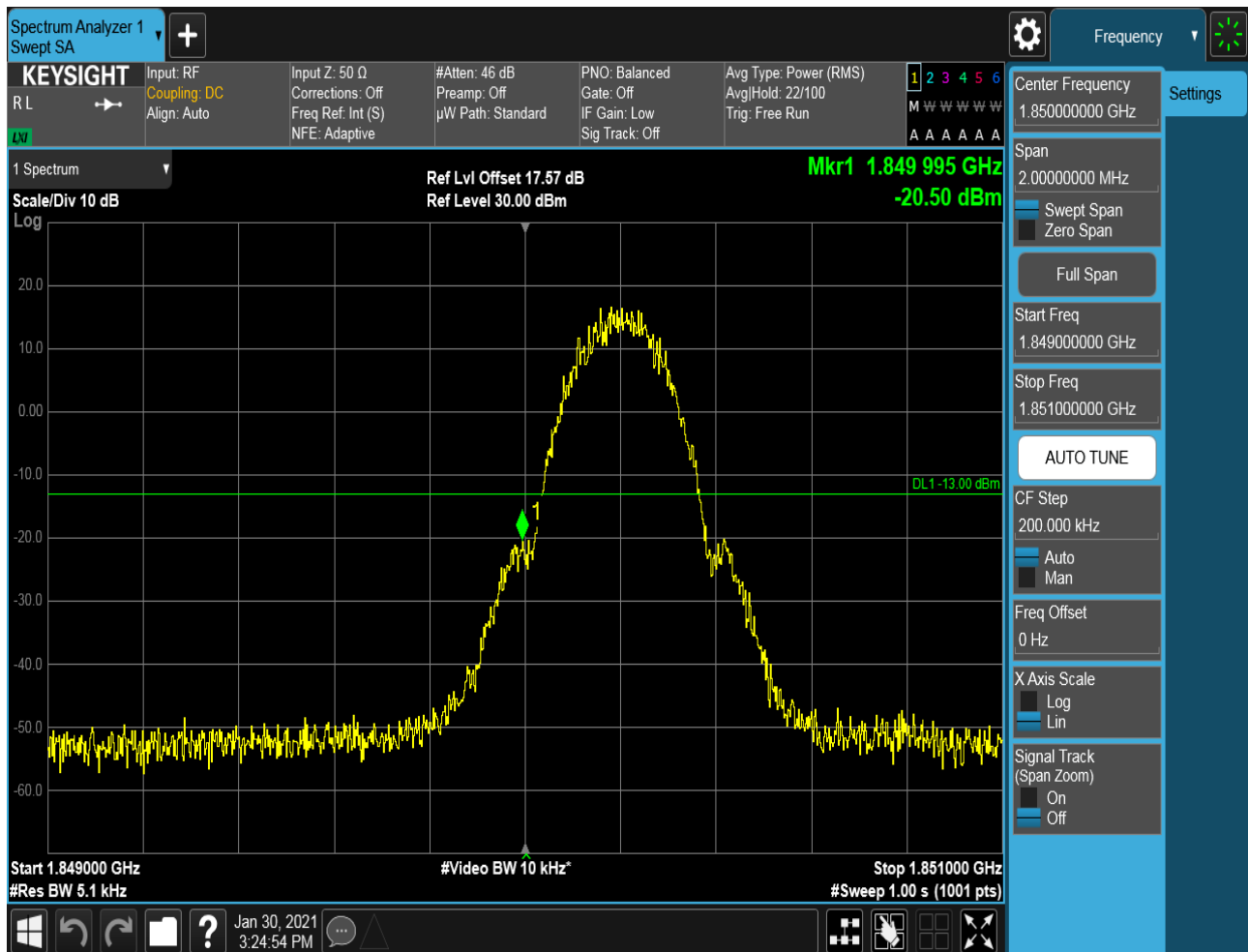
5.1.1.2.2 Test Channel = HCH



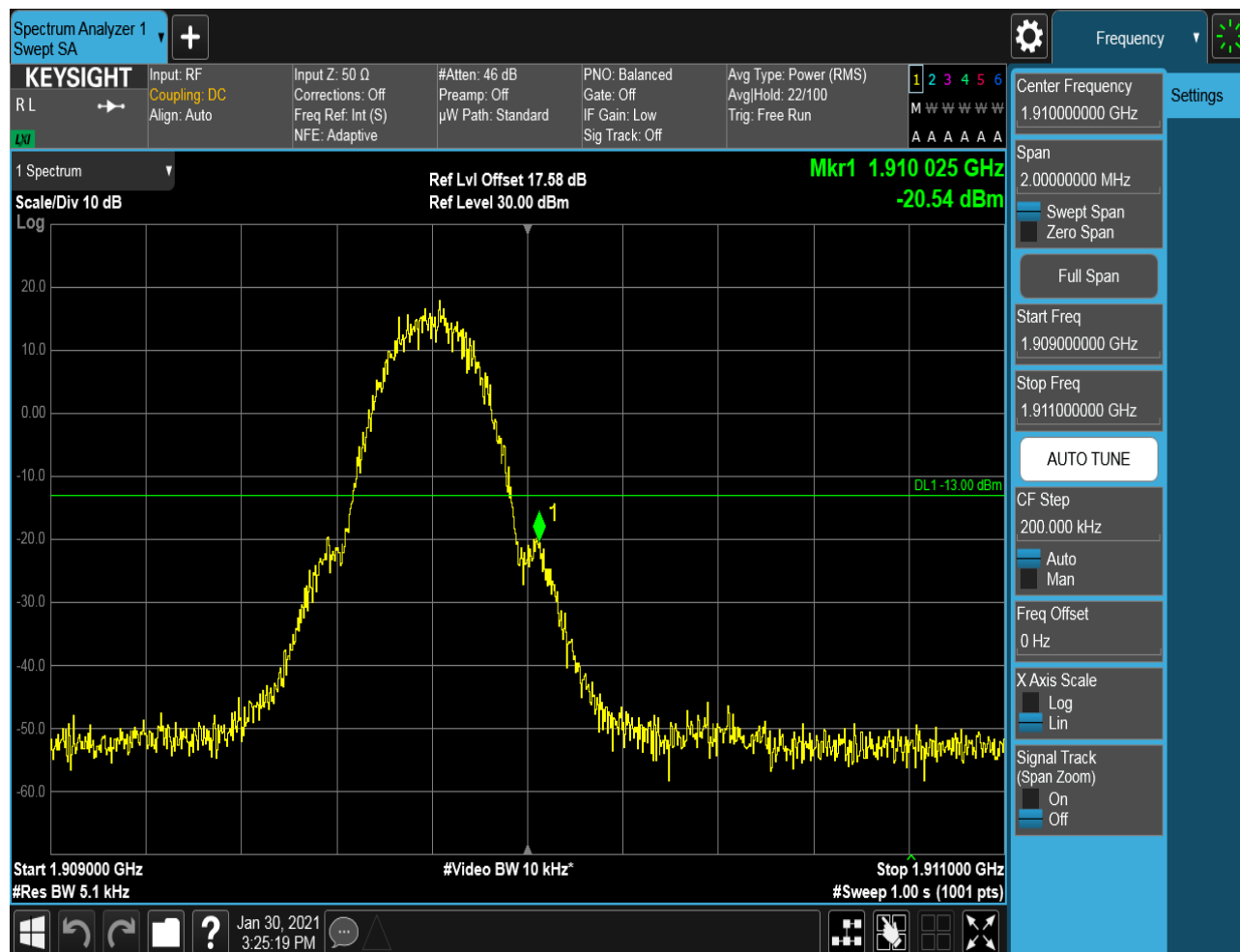
5.1.2 Test Band = PCS1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH

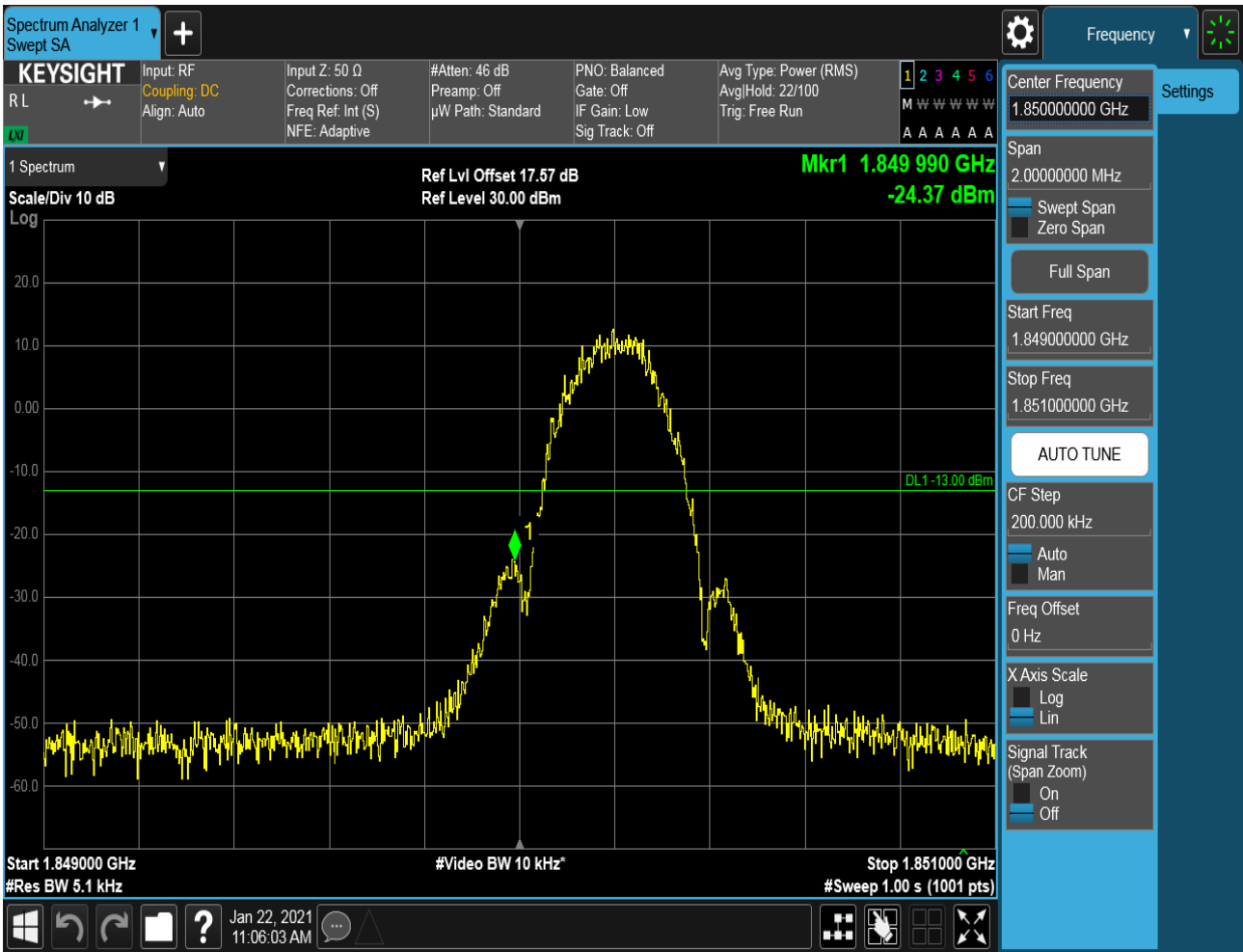


5.1.2.1.2 Test Channel = HCH

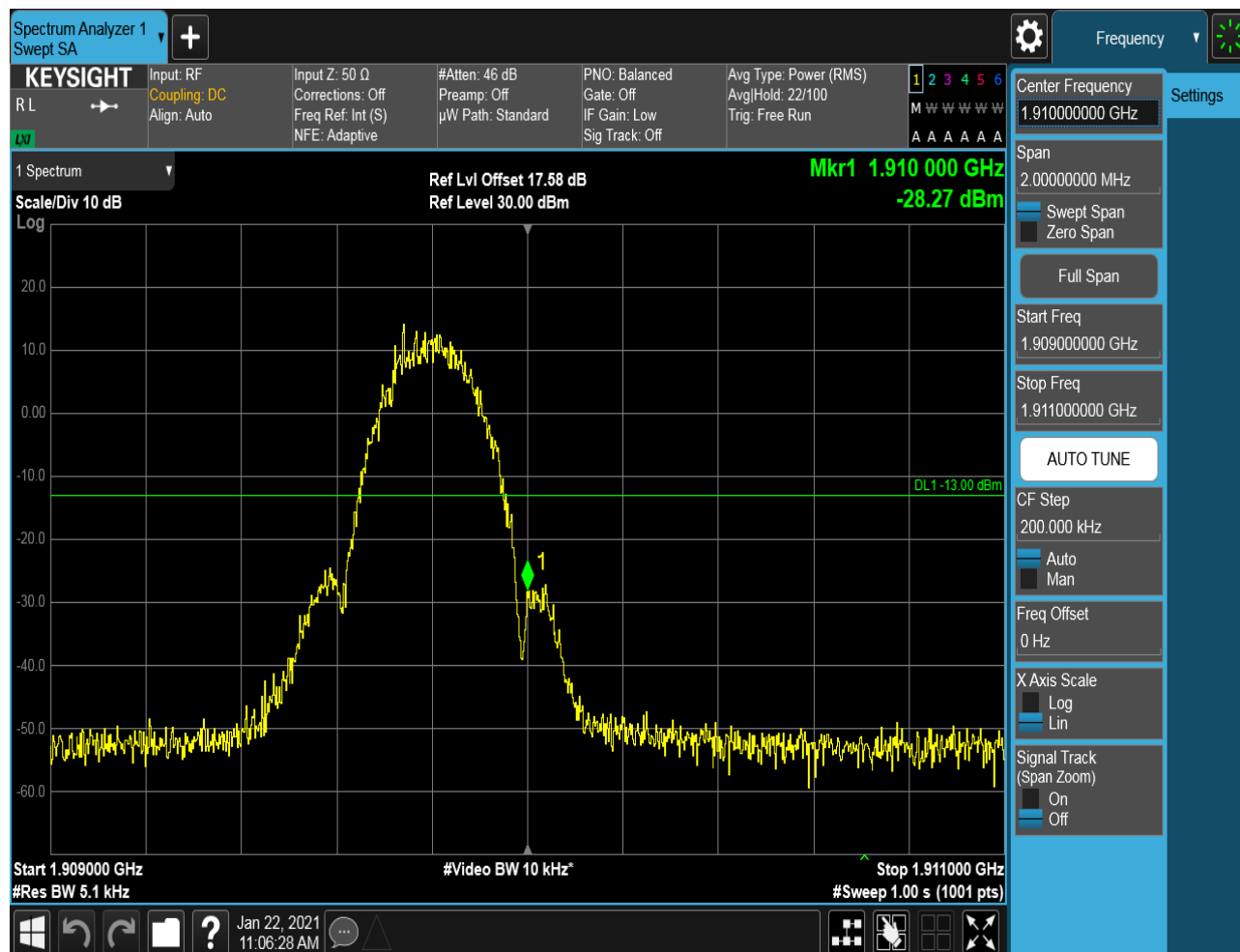


5.1.2.2 Test Mode = GSM/TM2

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.

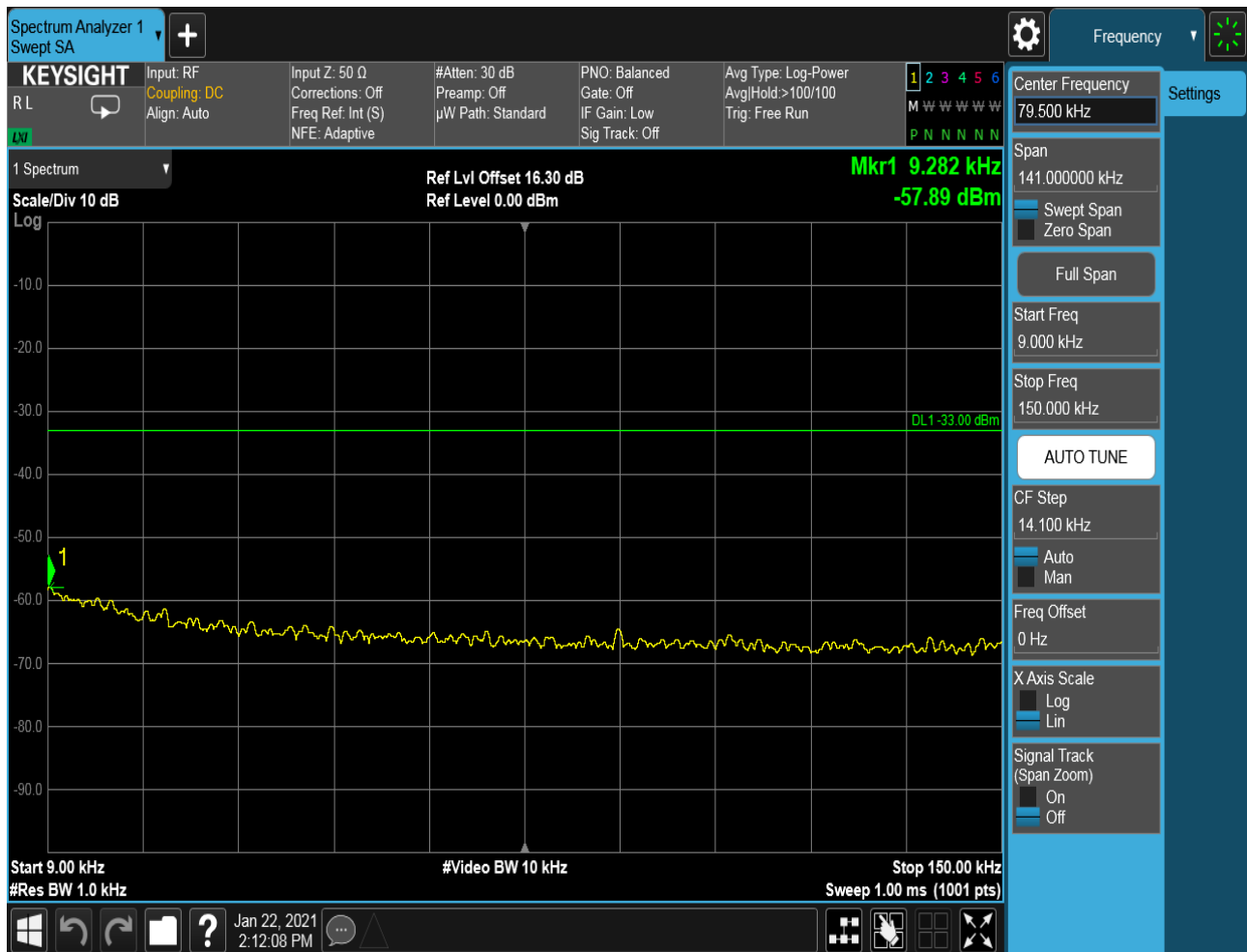
Part I - Test Plots

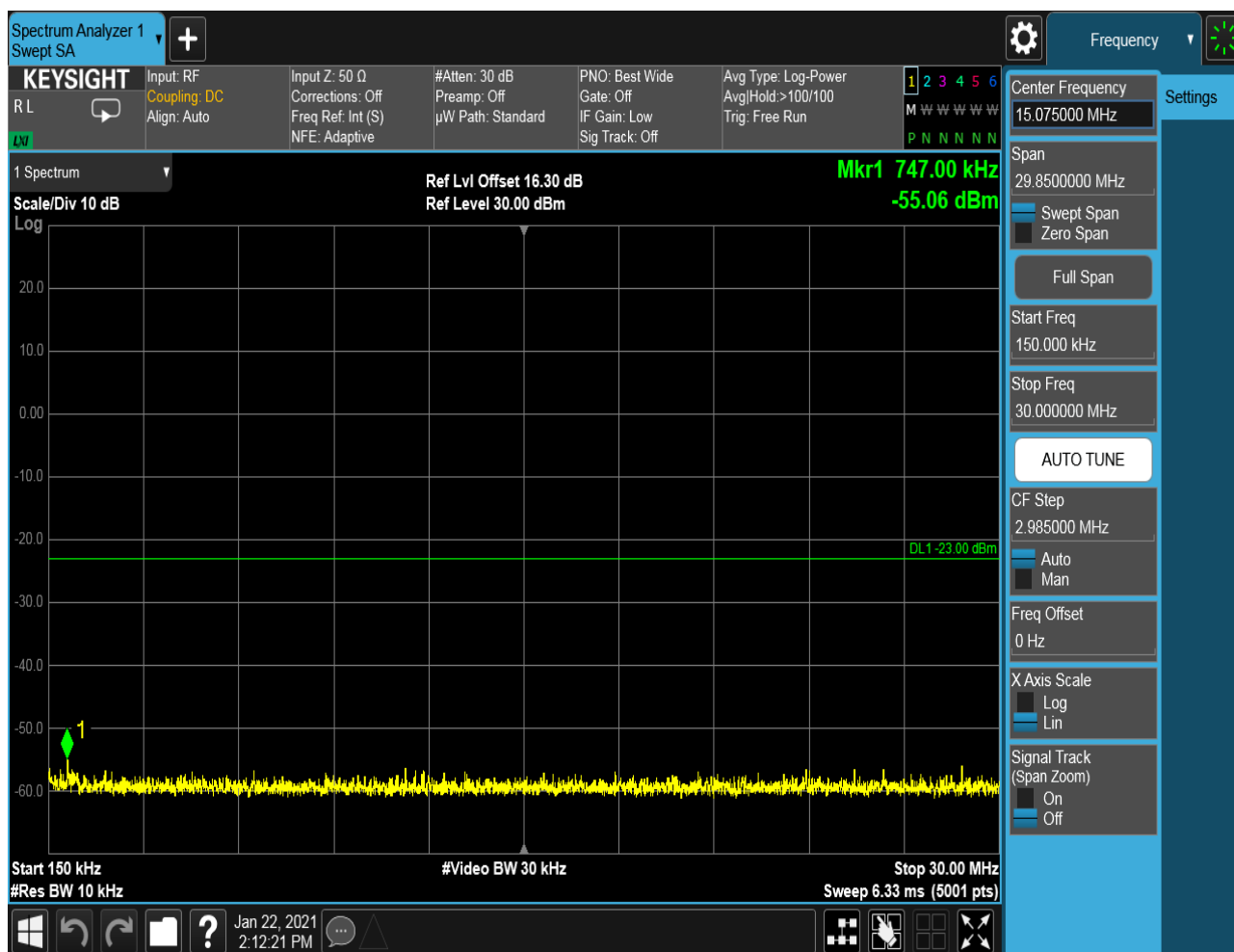
6.1 For GSM

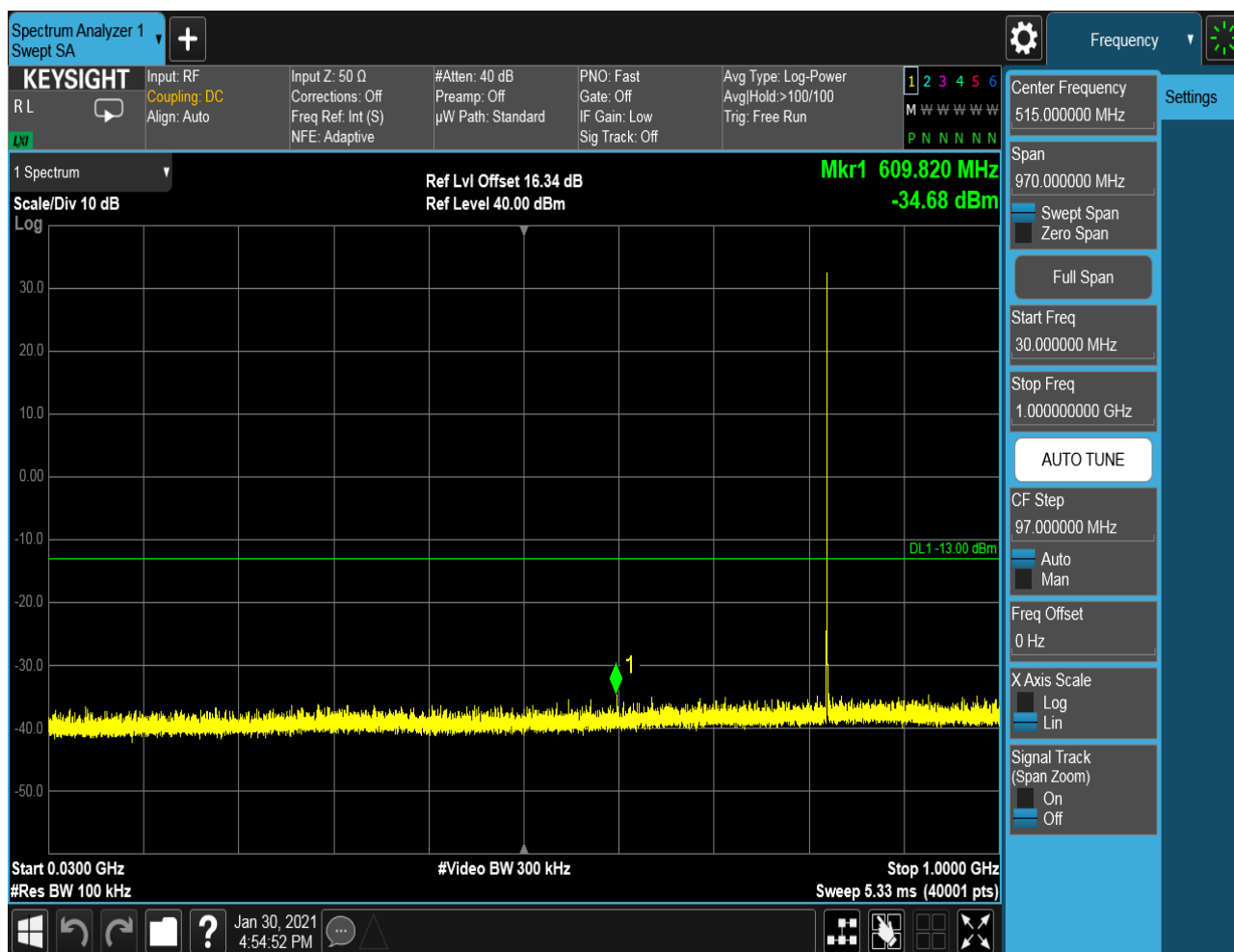
6.1.1 Test Band = GSM850

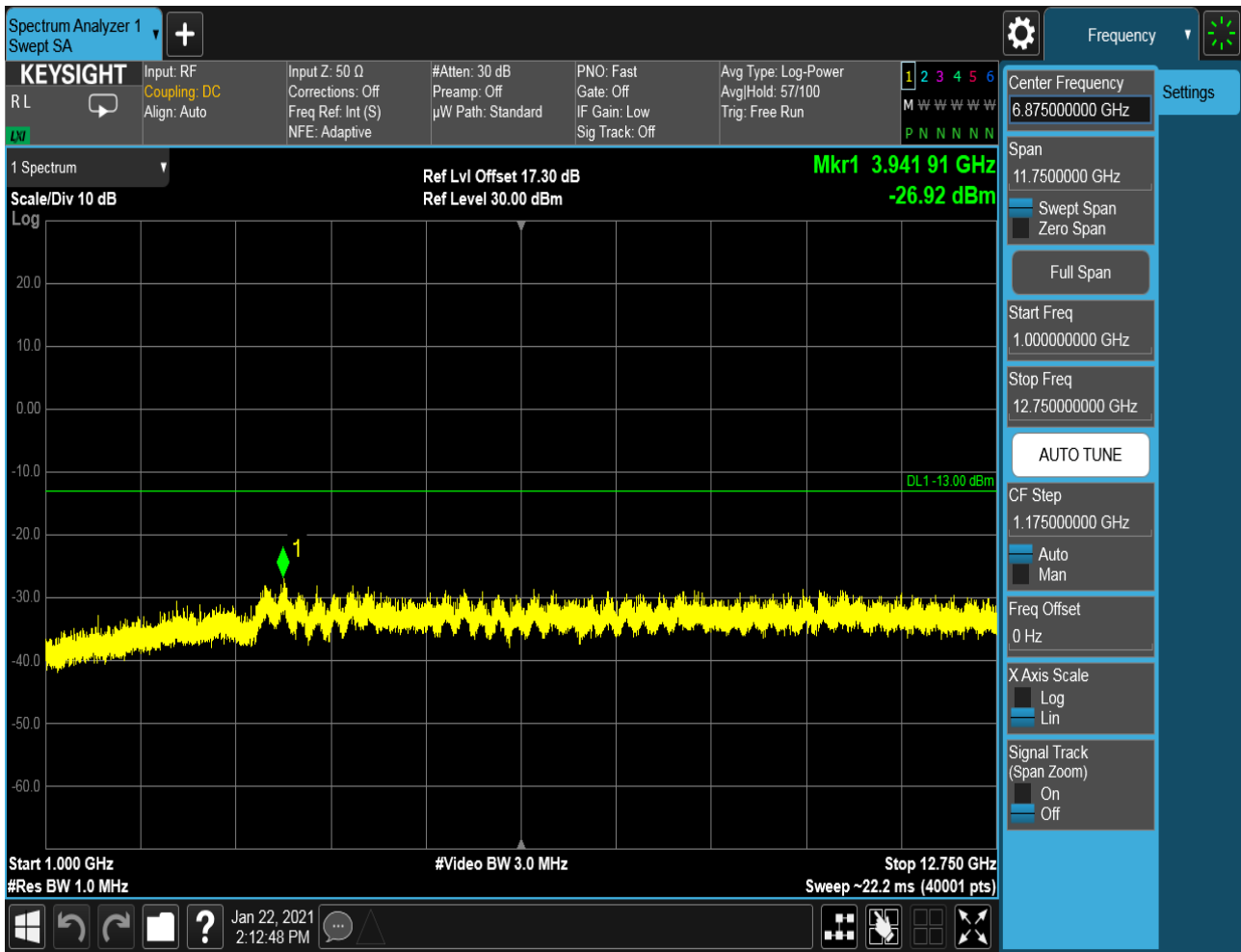
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH

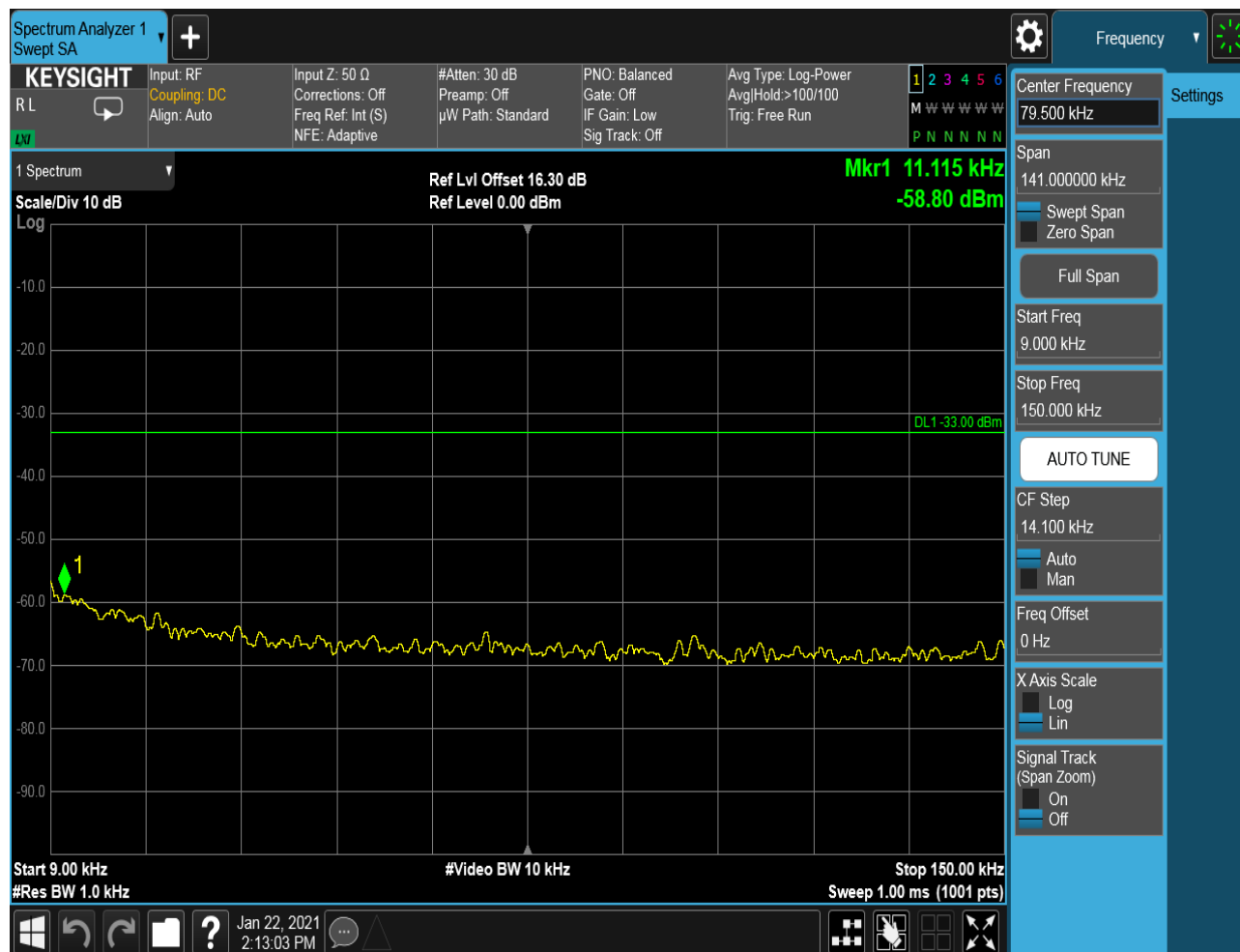


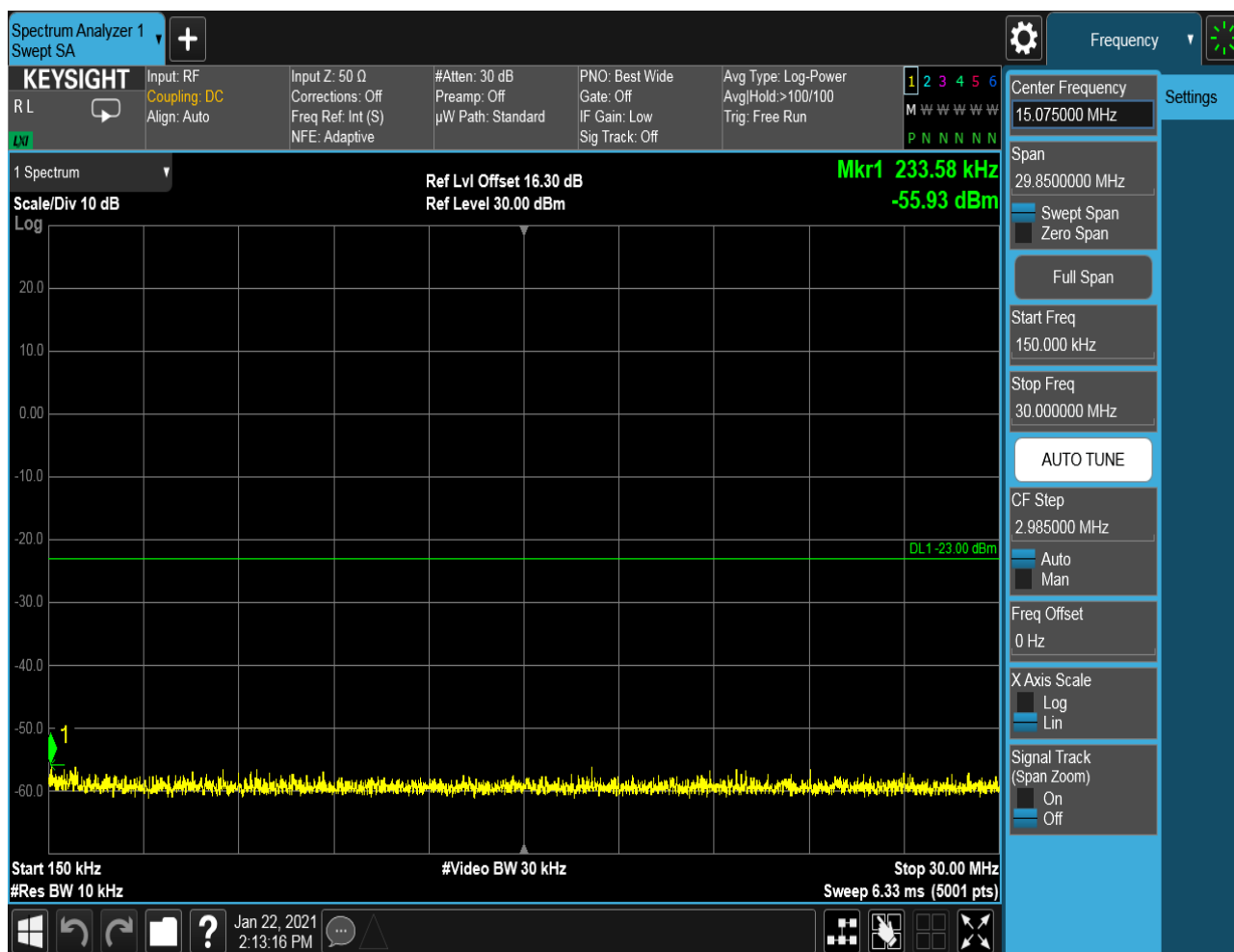


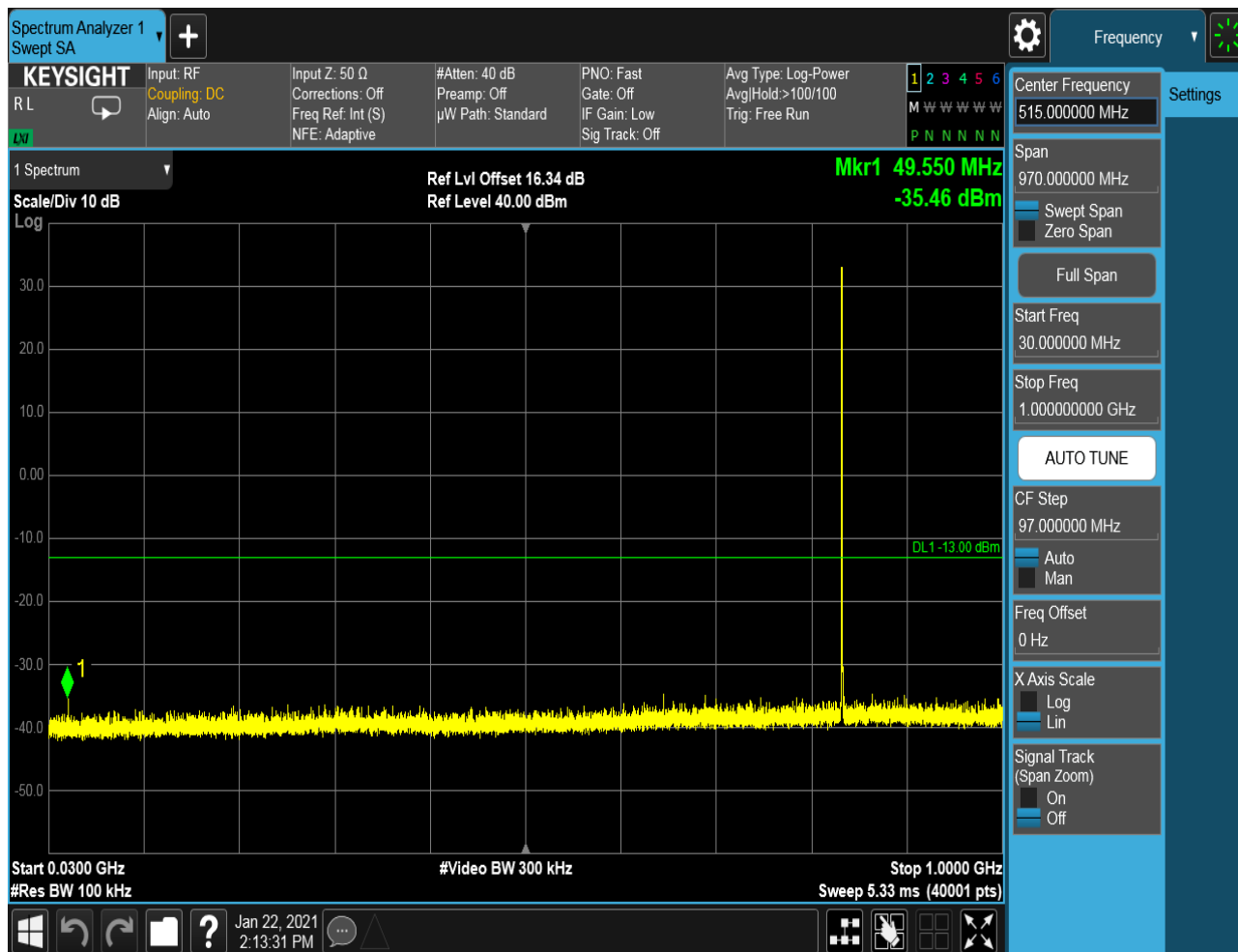


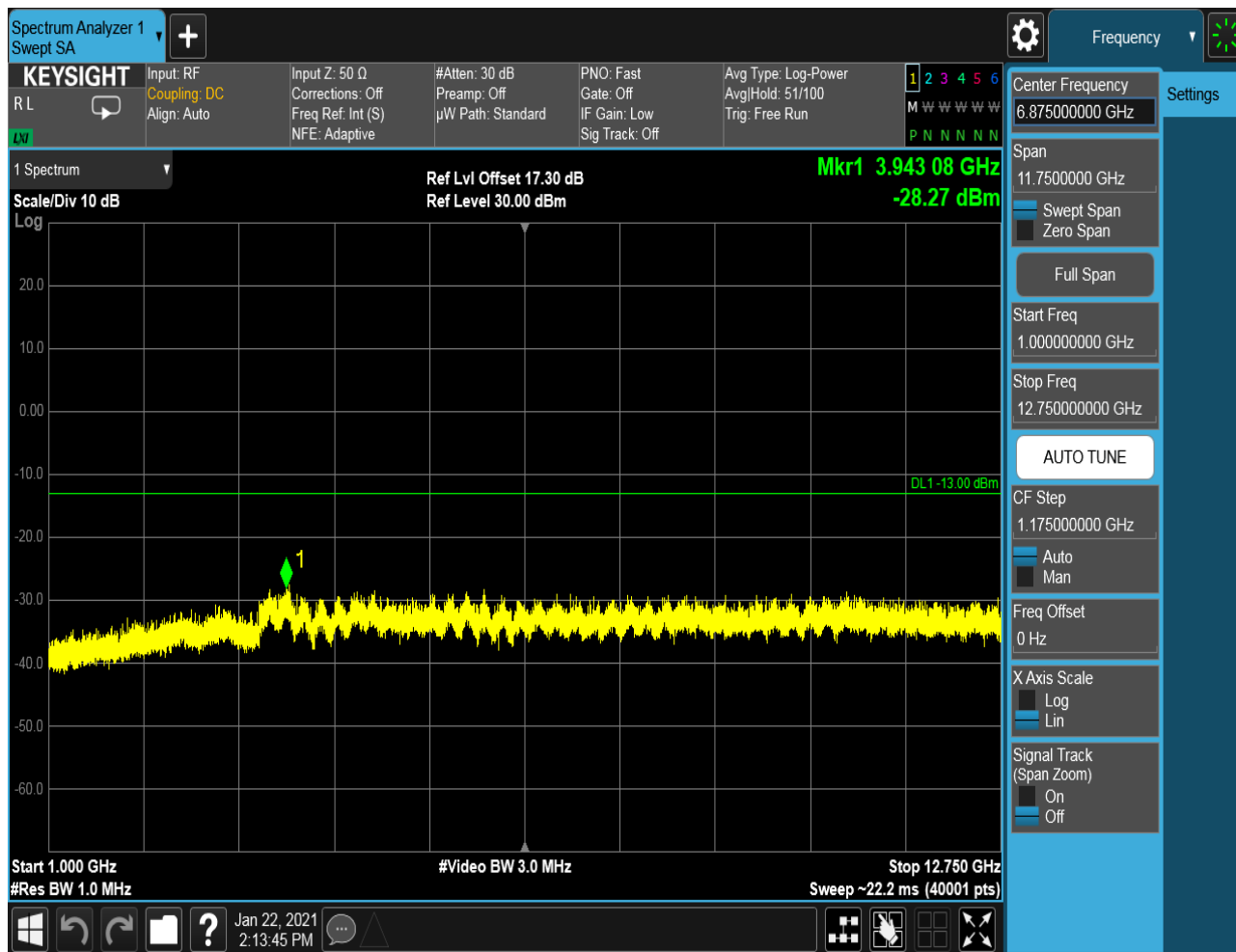


6.1.1.1.2 Test Channel = MCH

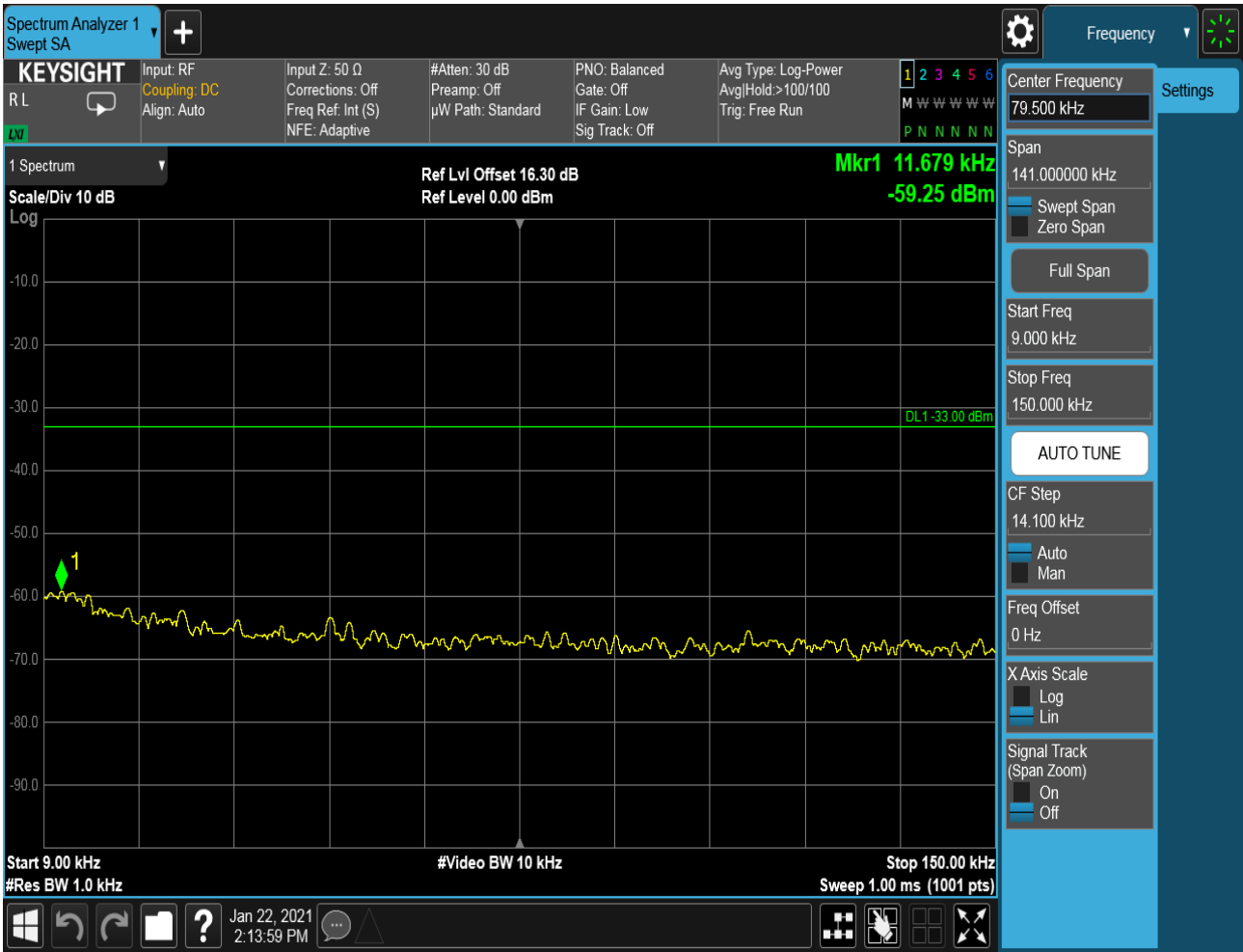


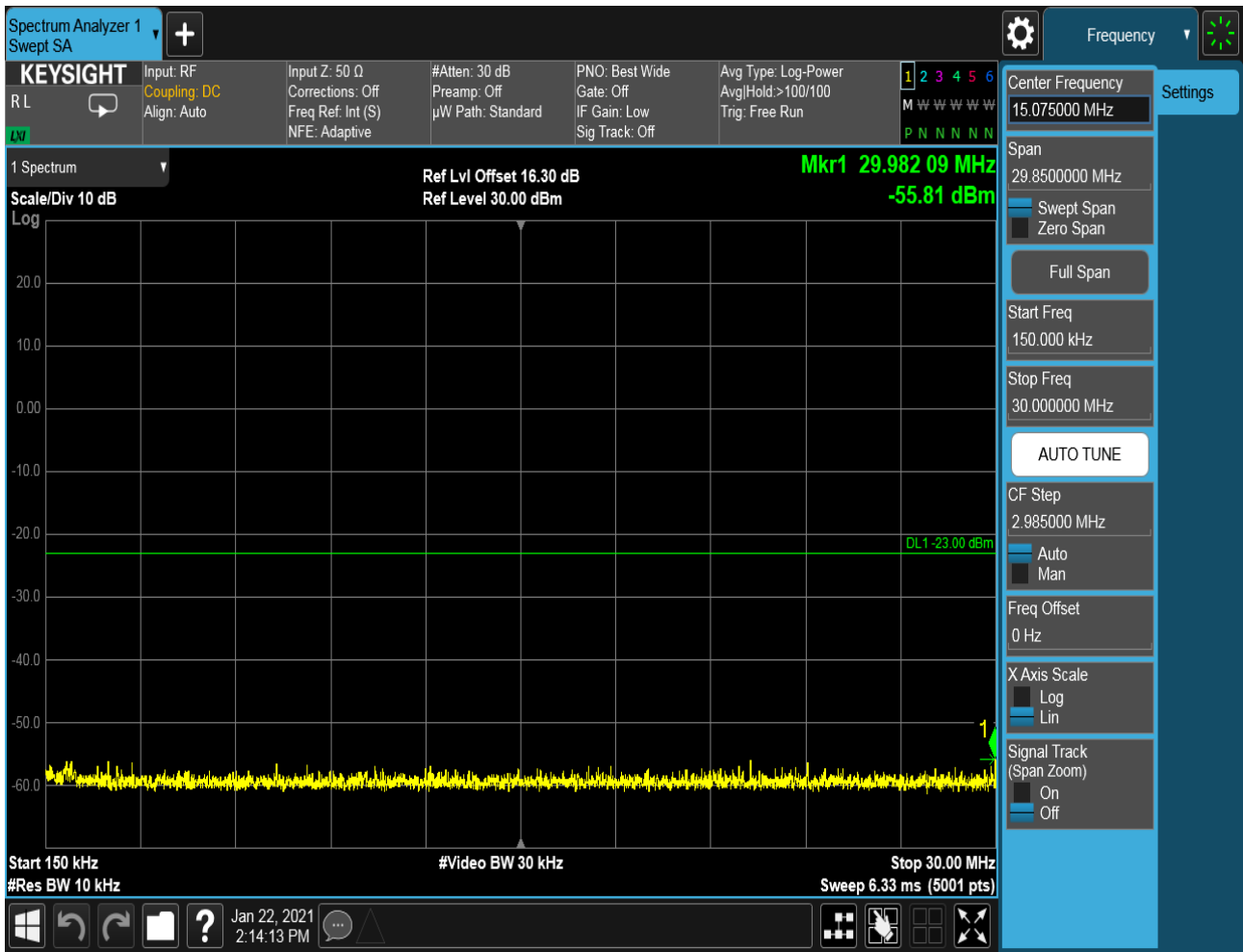


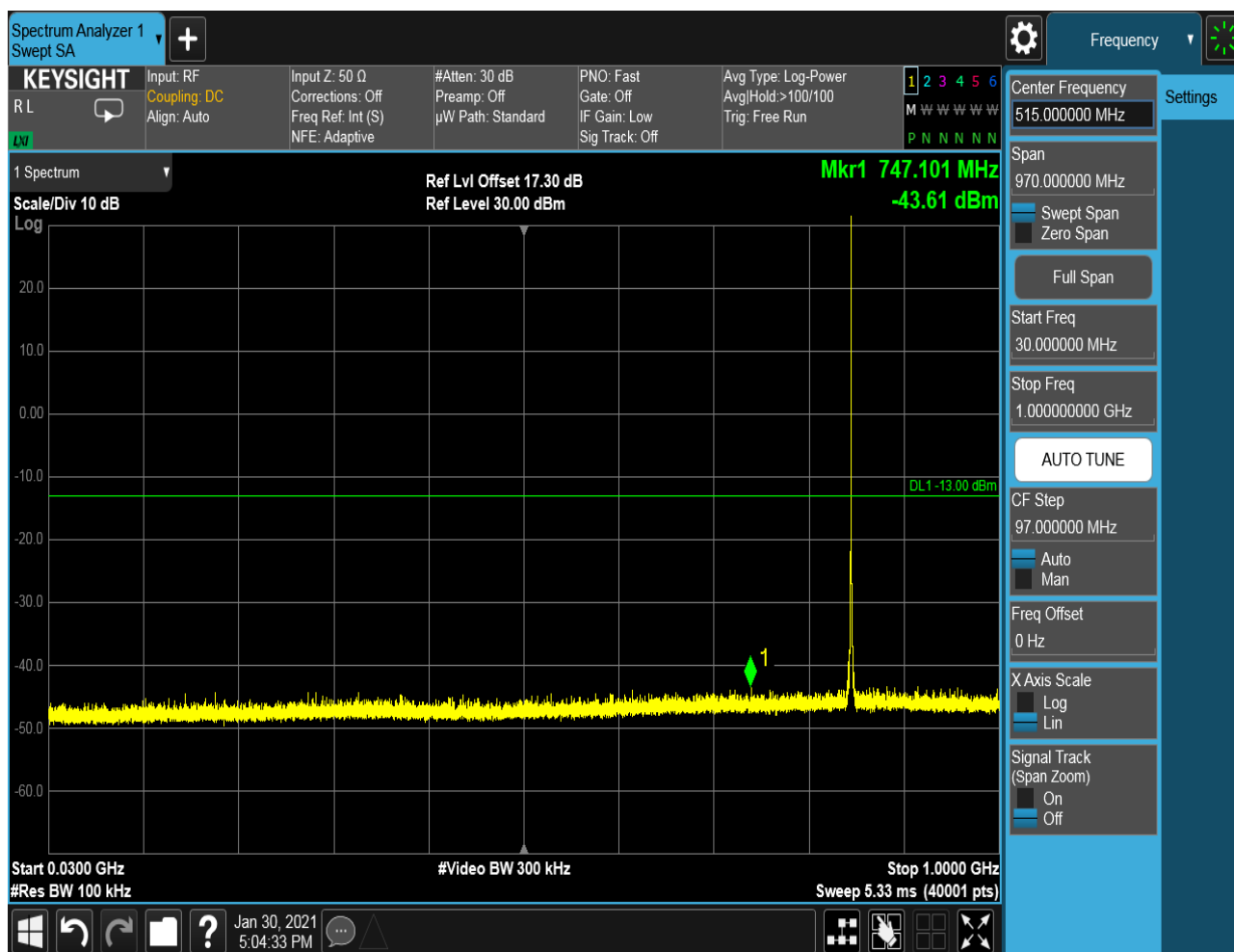


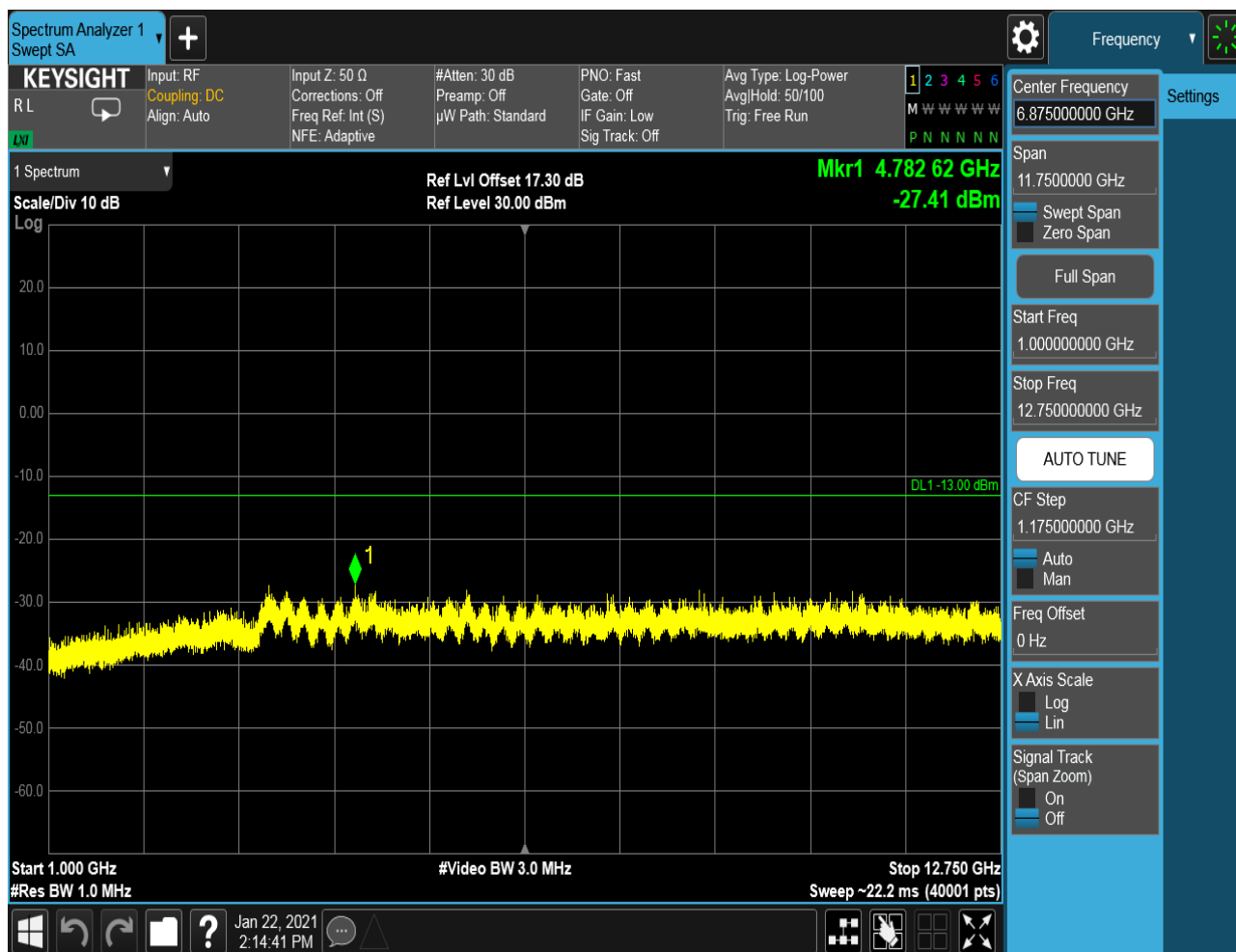


6.1.1.1.3 Test Channel = HCH



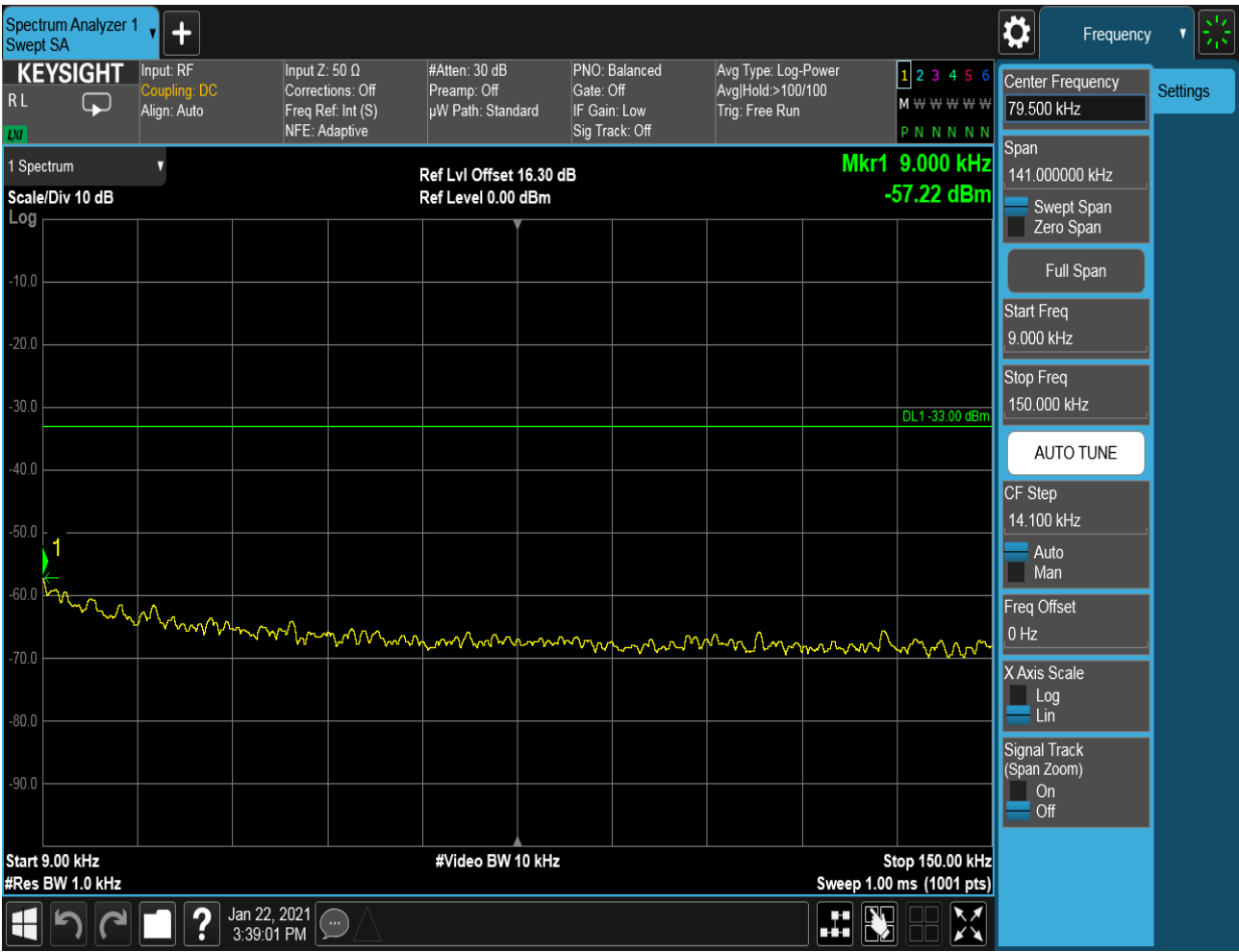


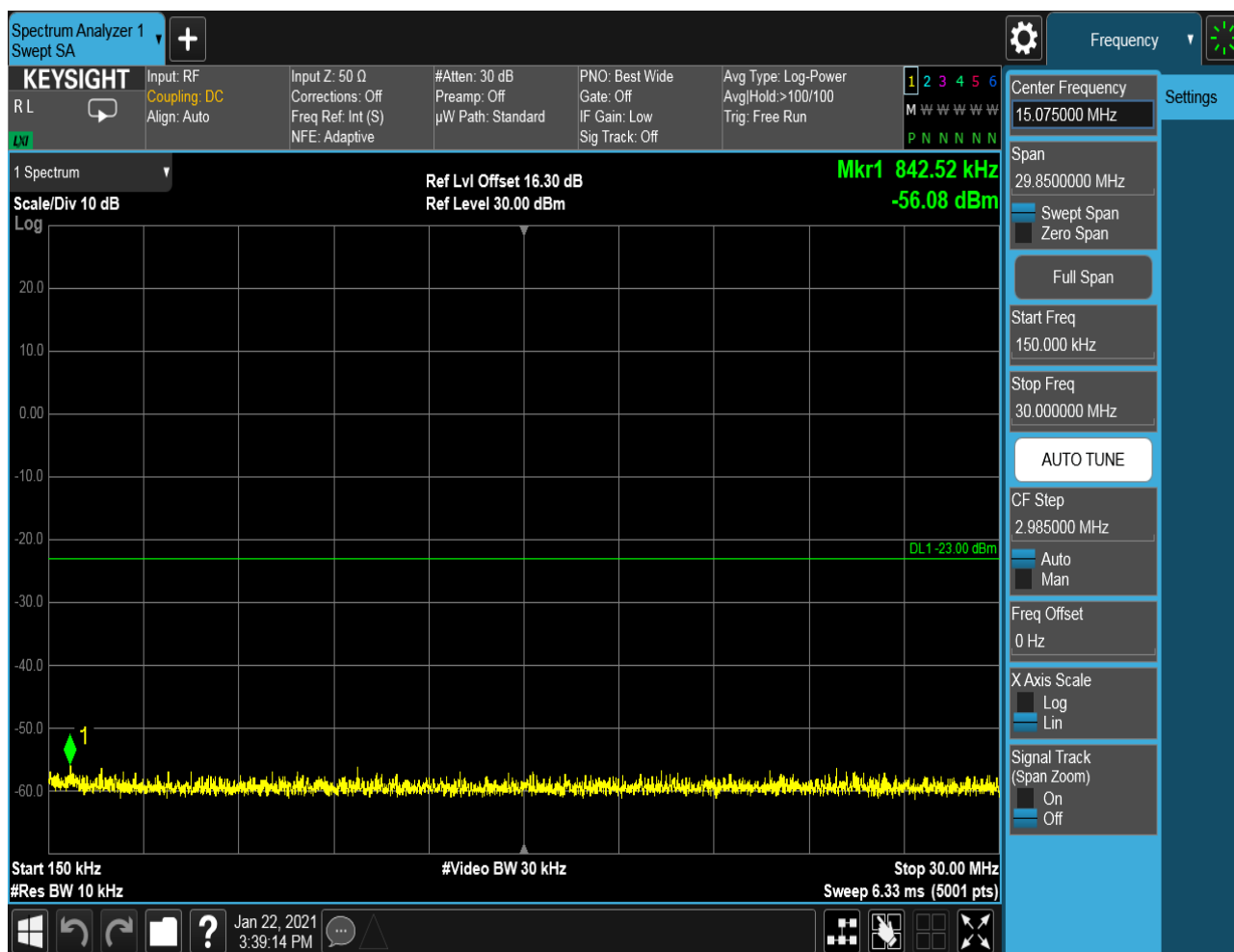


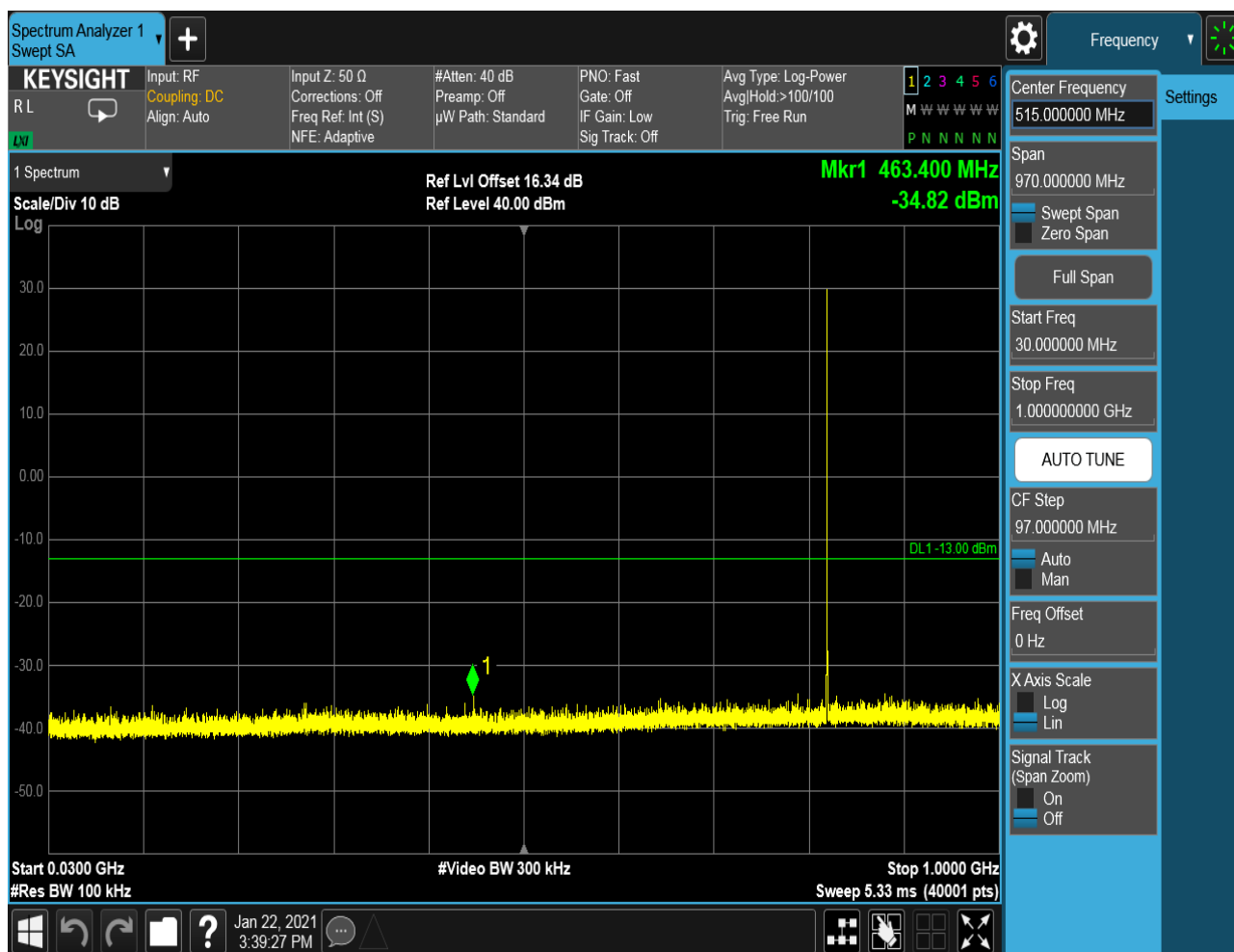


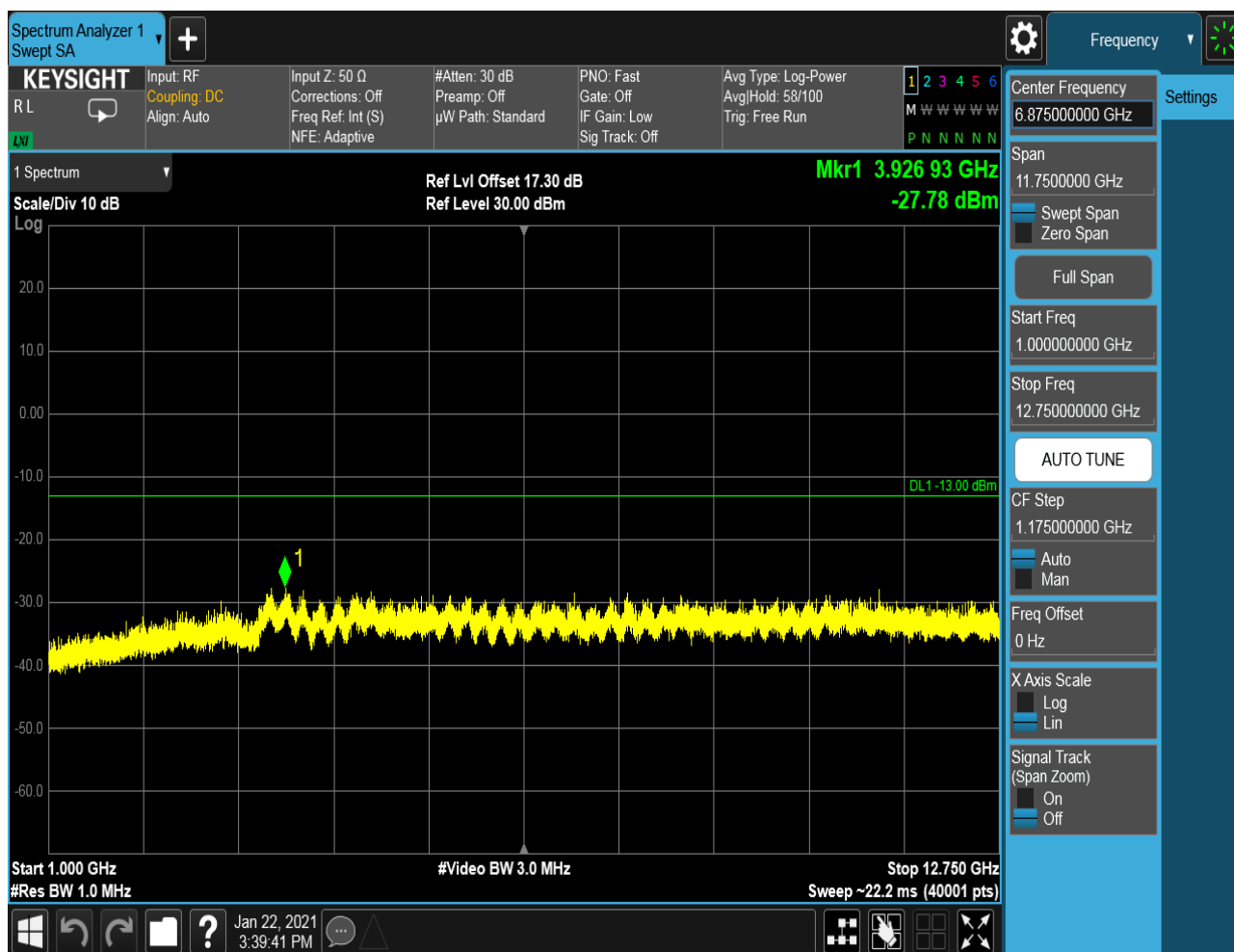
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH

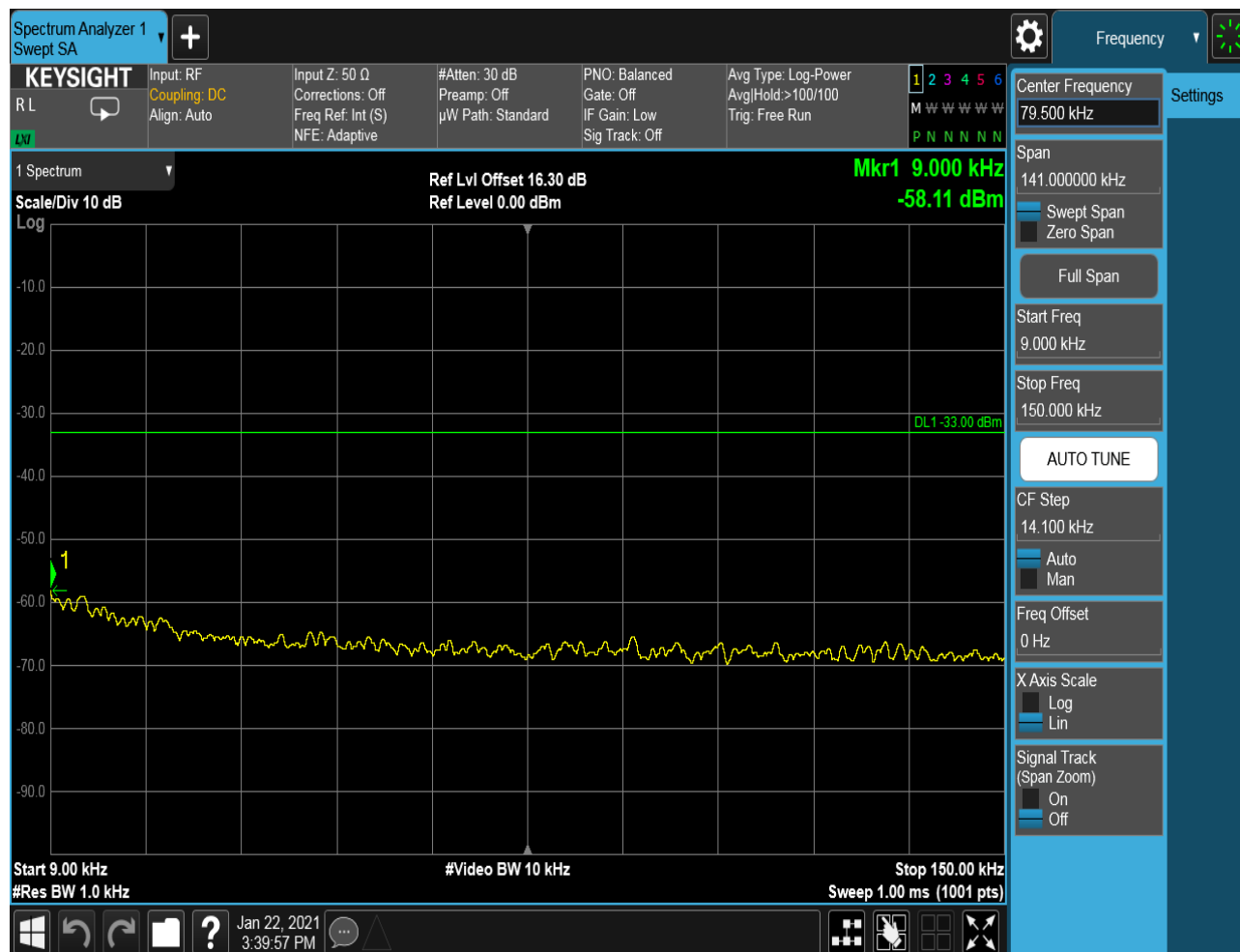


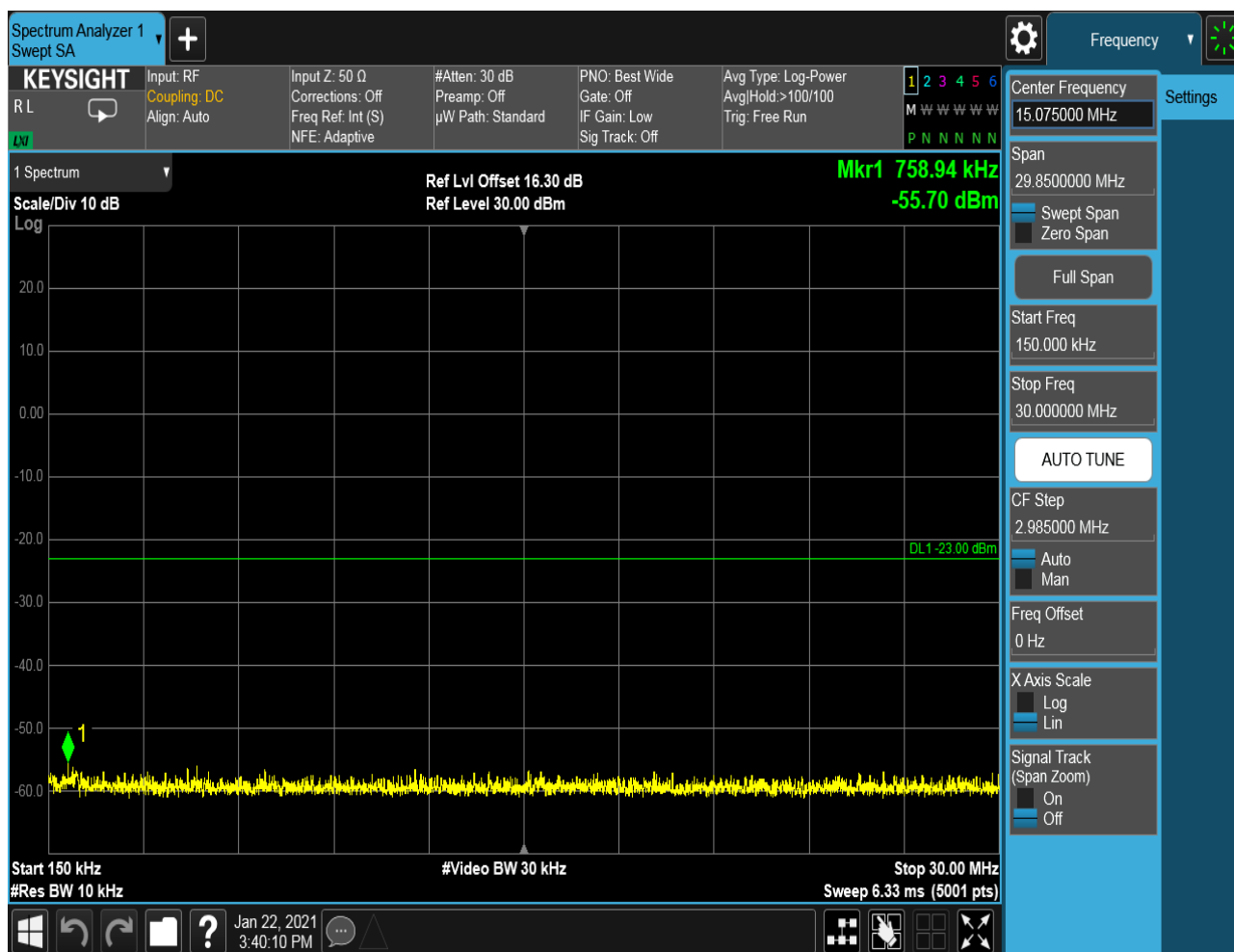


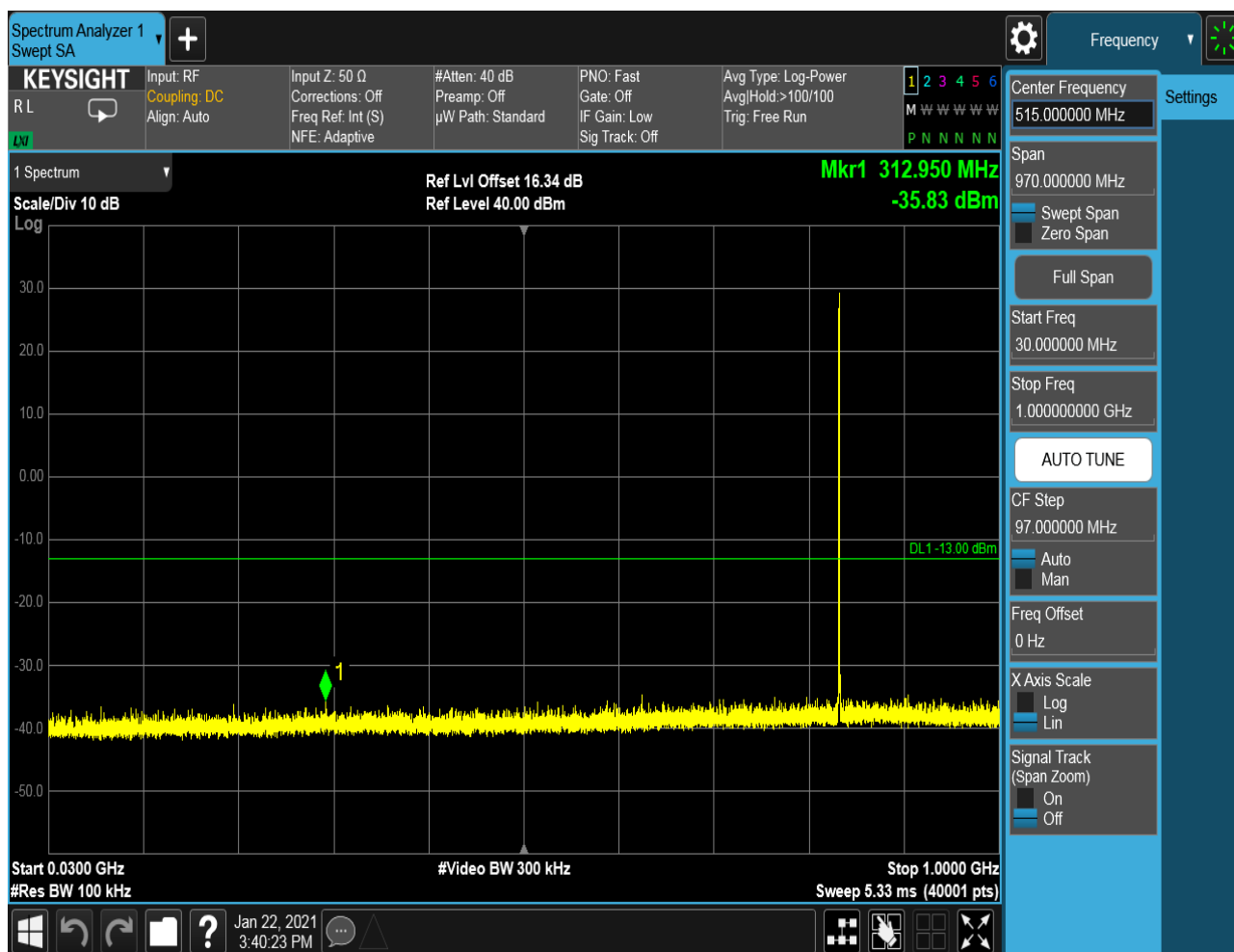


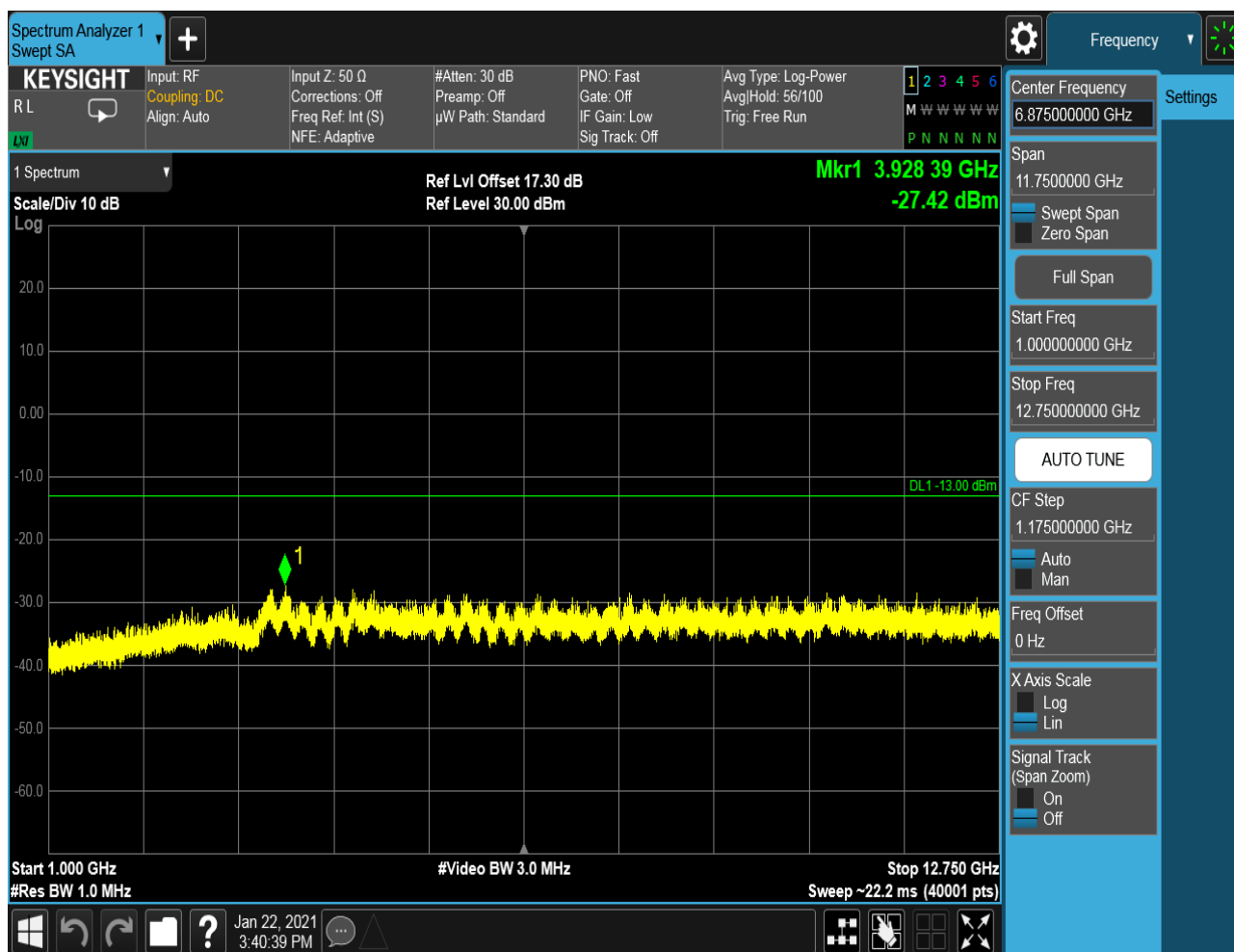


6.1.1.2.2 Test Channel = MCH

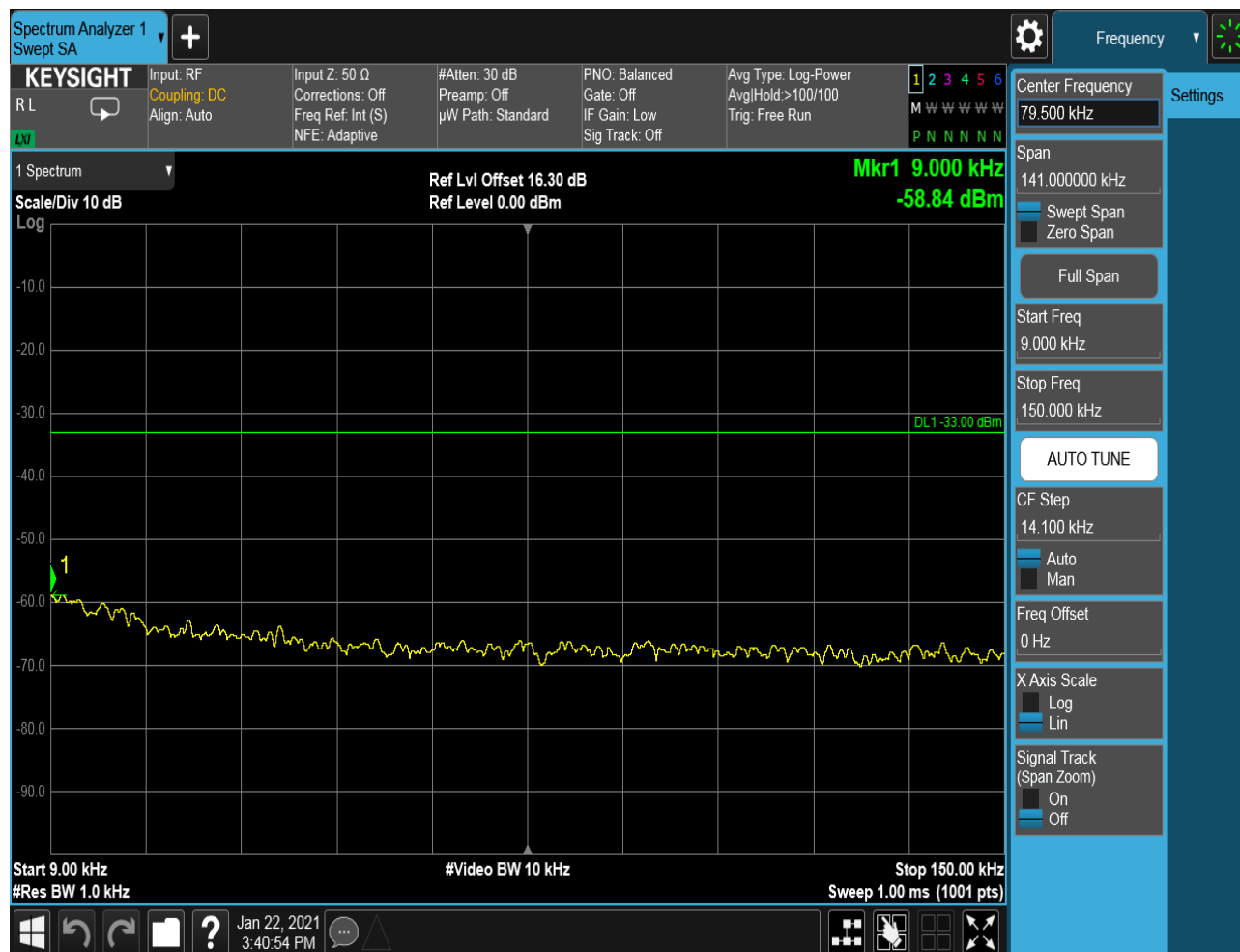


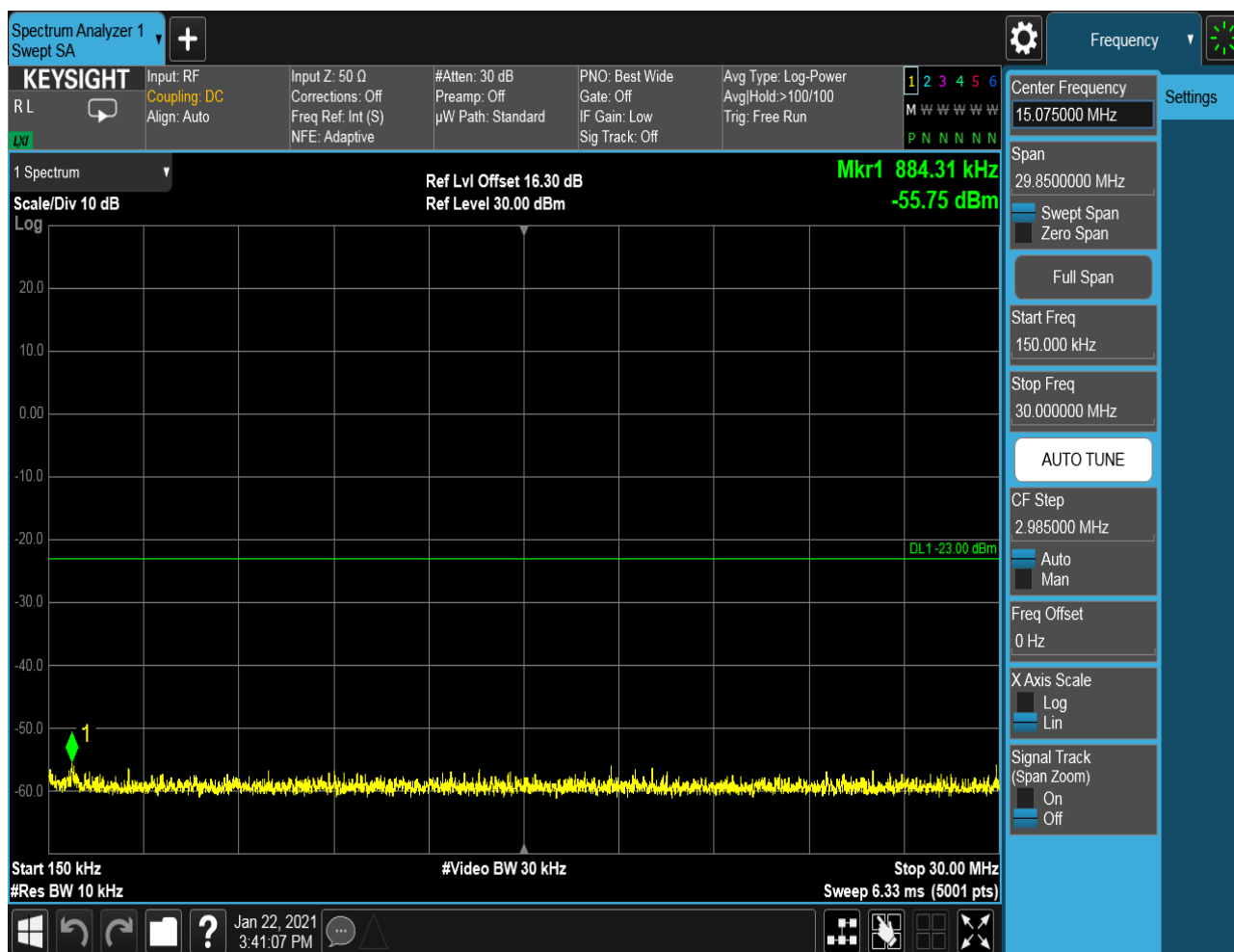


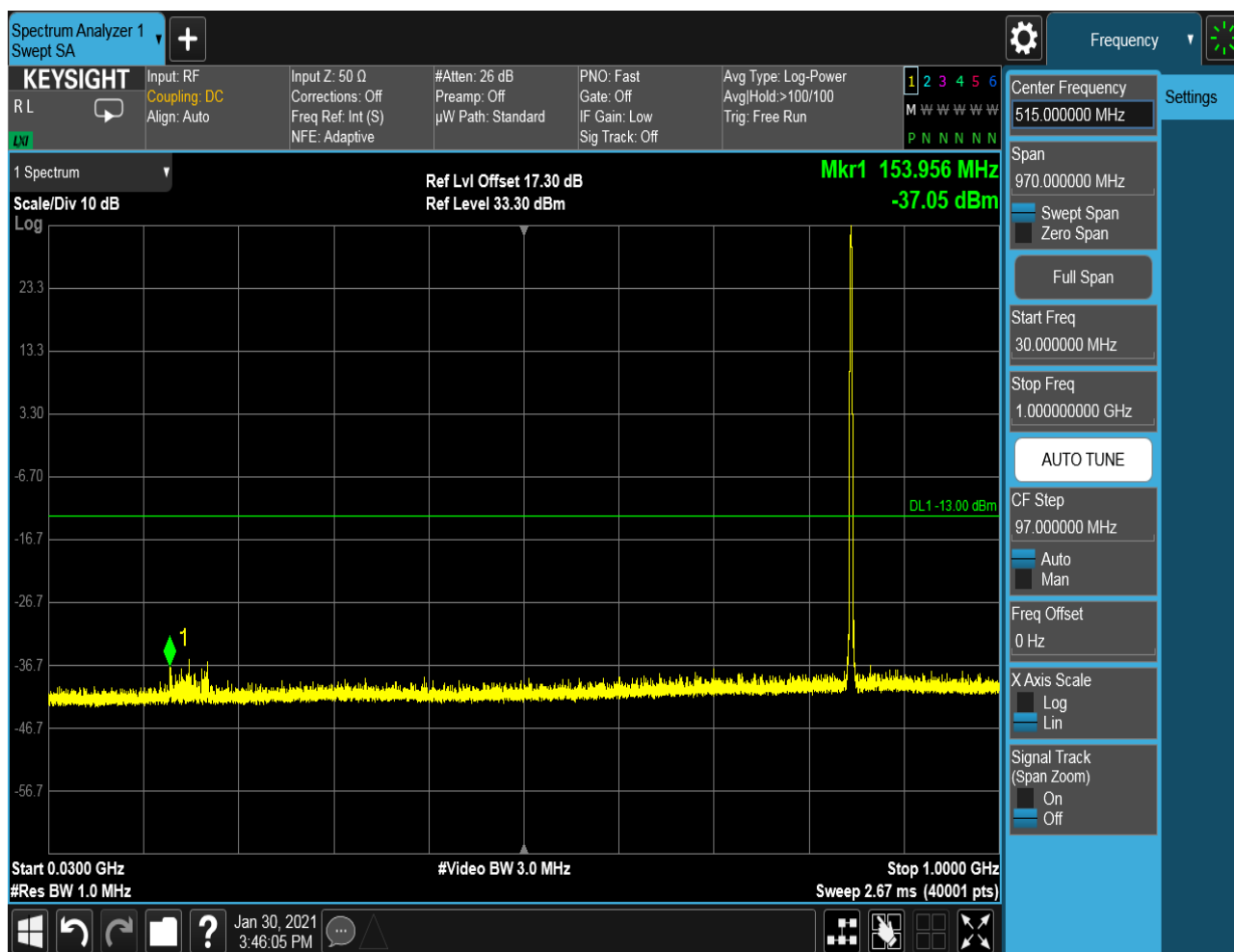


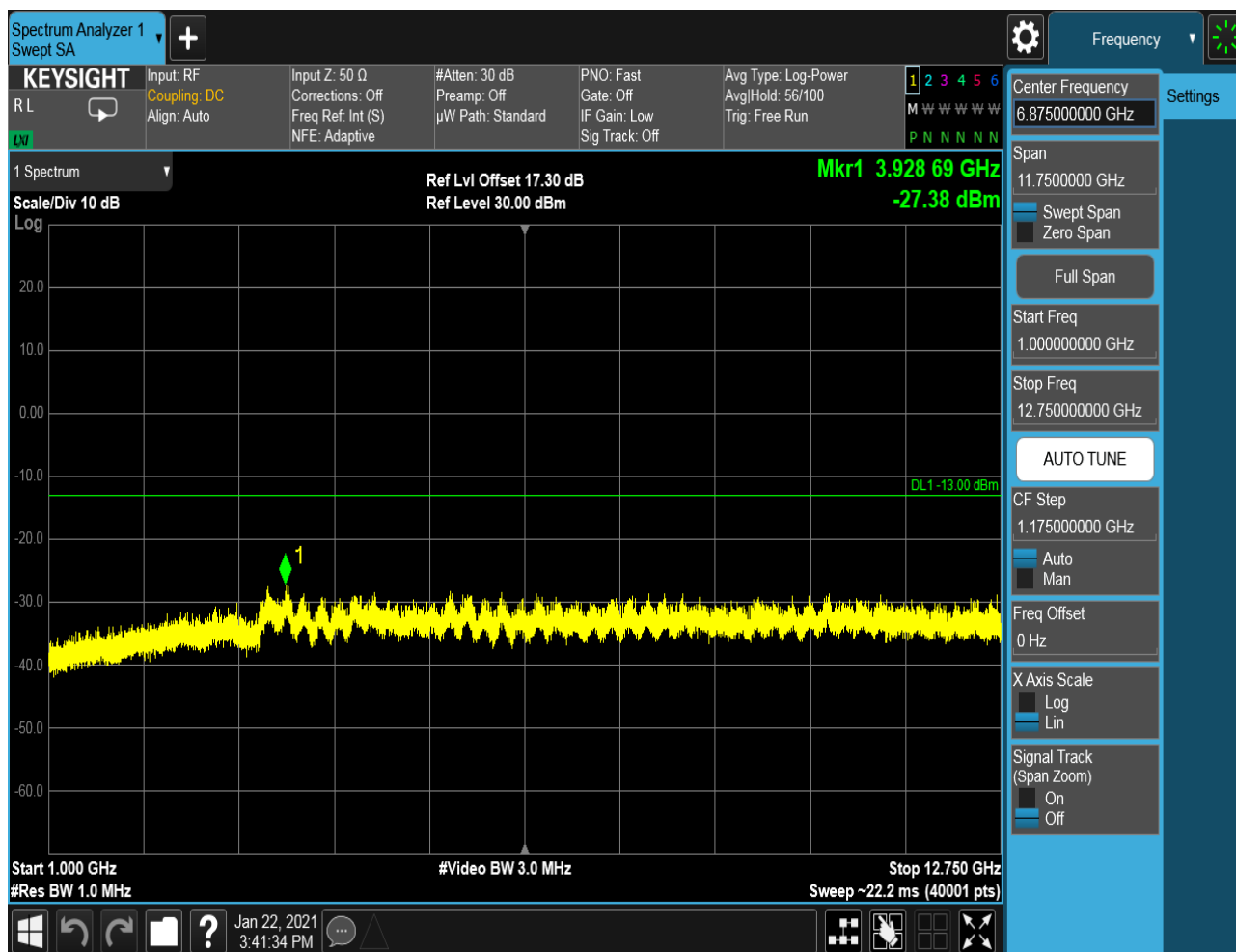


6.1.1.2.3 Test Channel = HCH





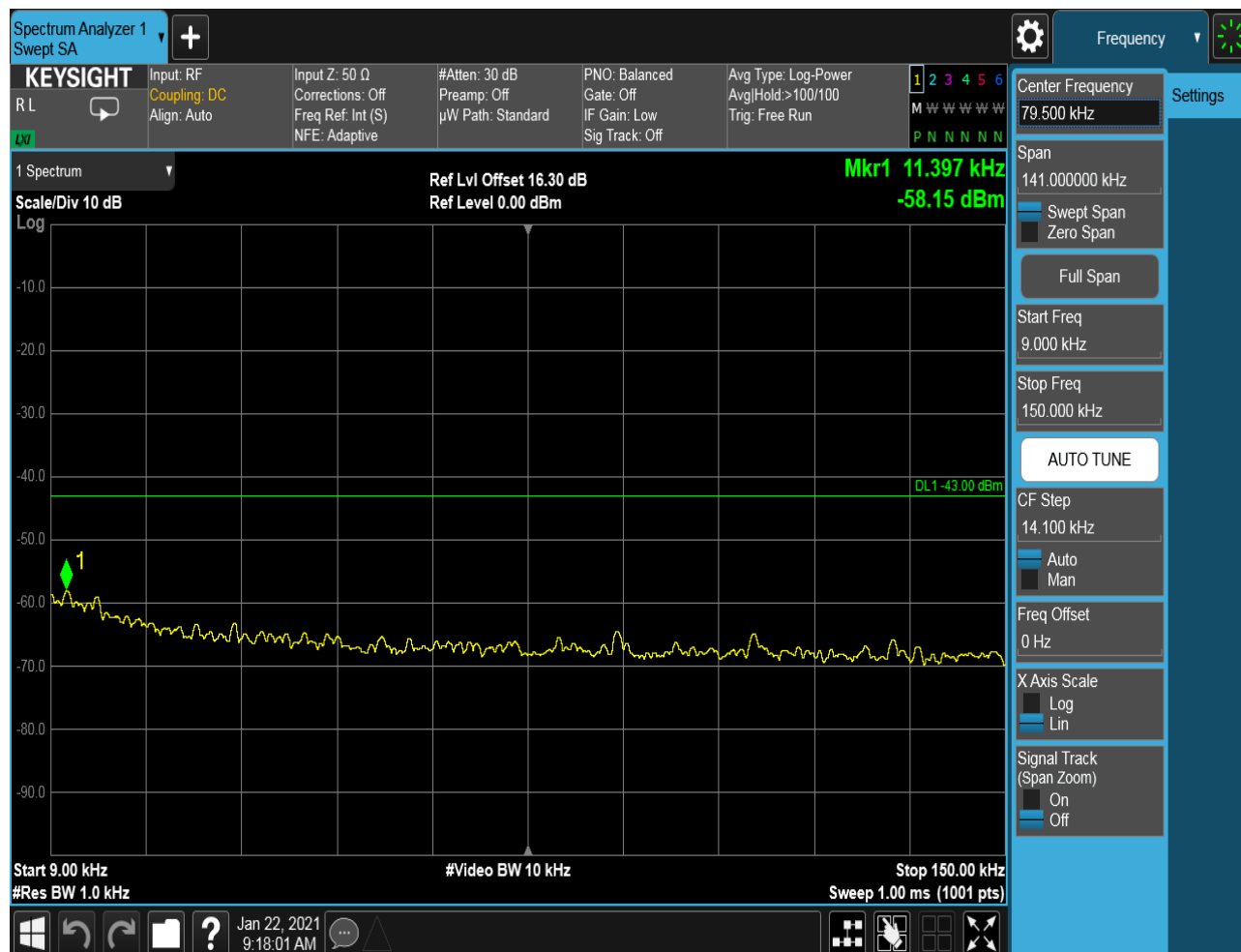


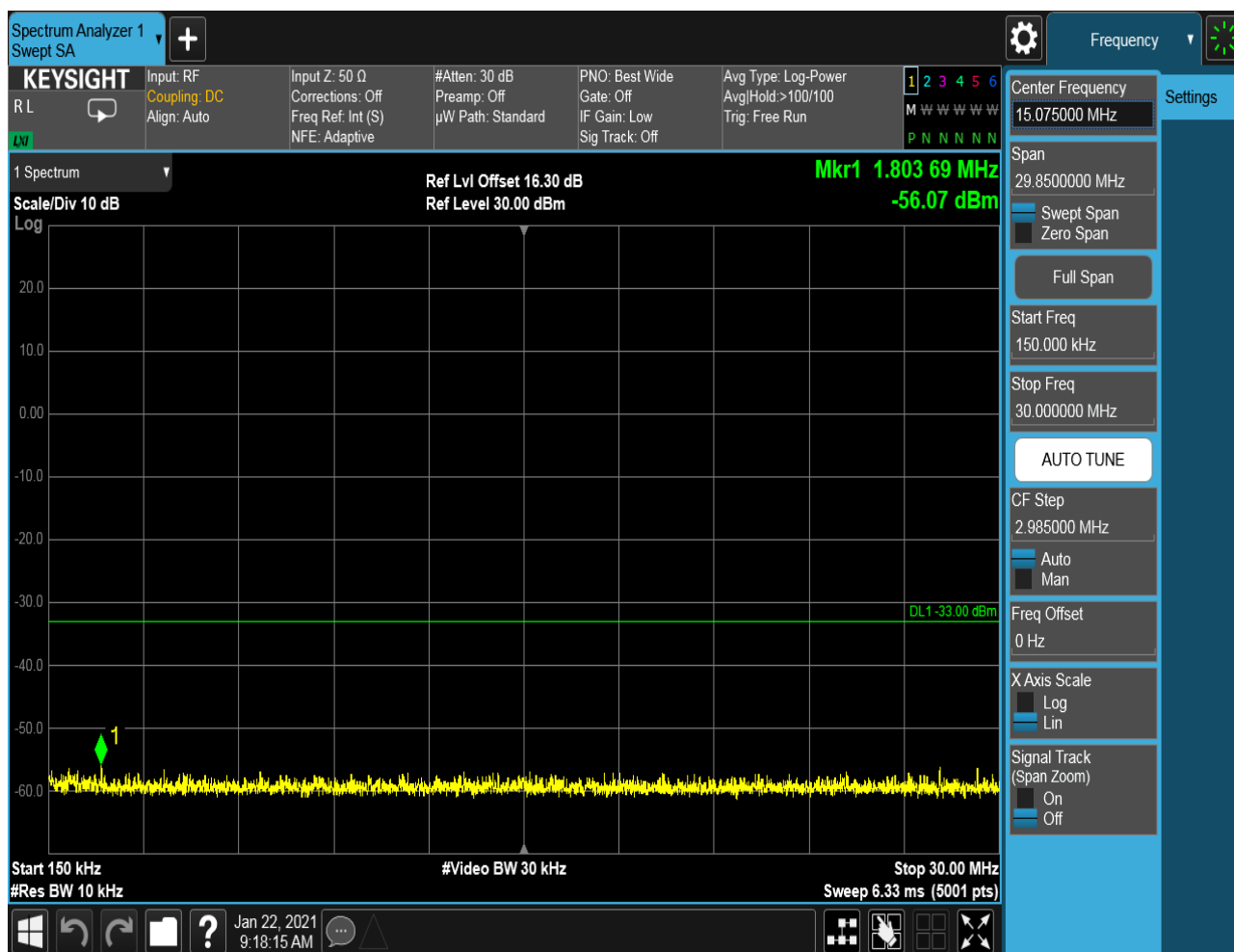


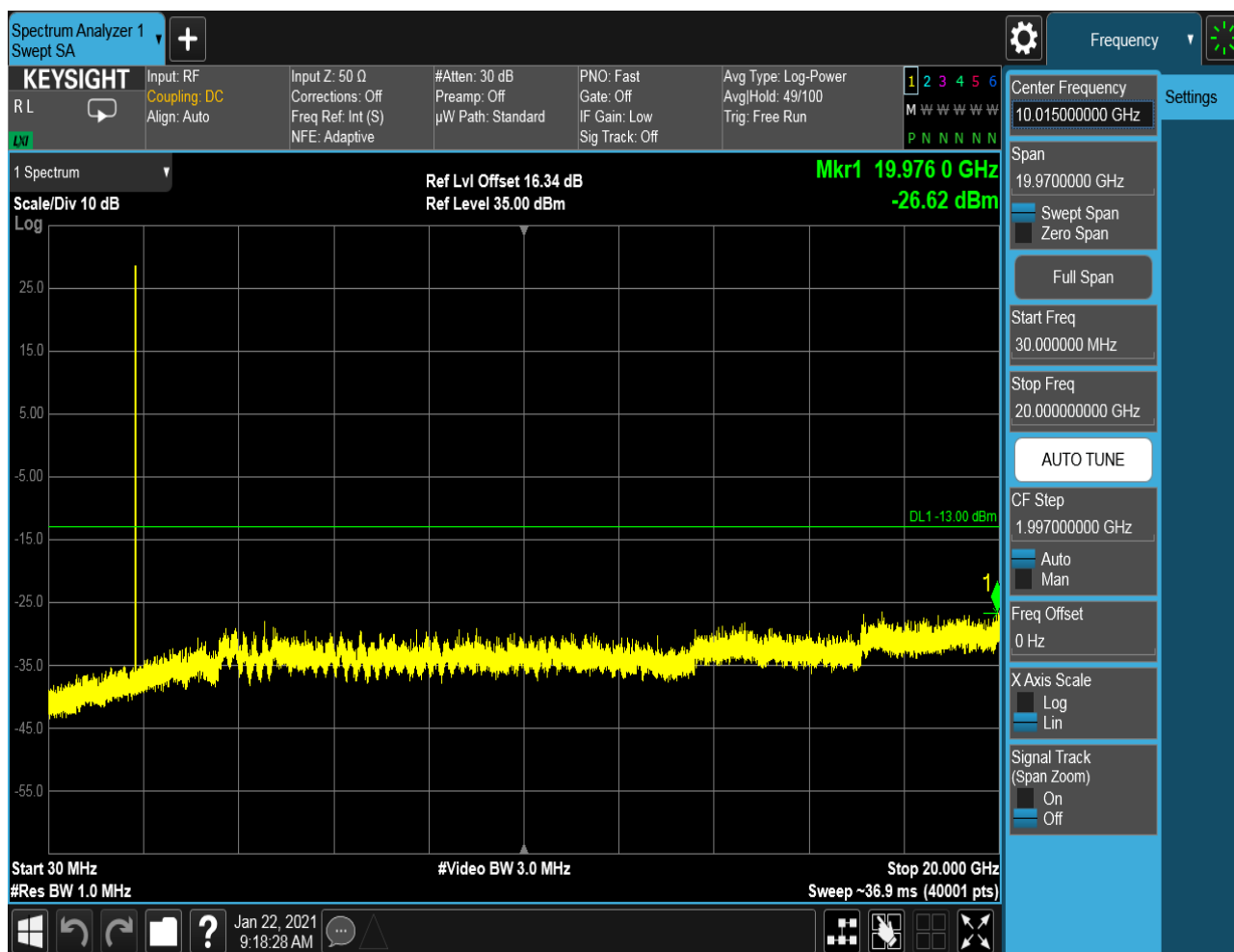
6.1.2 Test Band = PCS1900

6.1.2.1 Test Mode = GSM/TM1

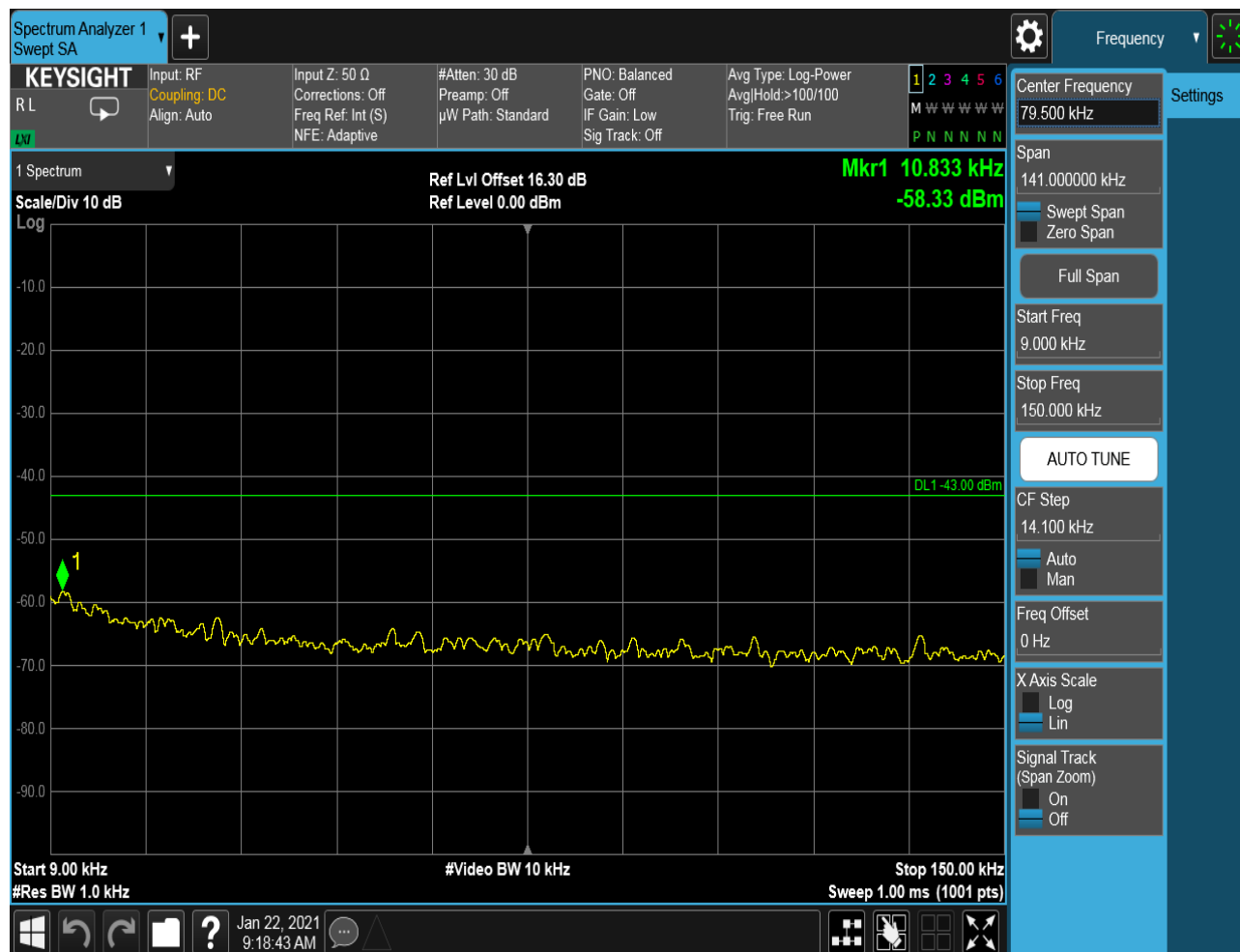
6.1.2.1.1 Test Channel = LCH

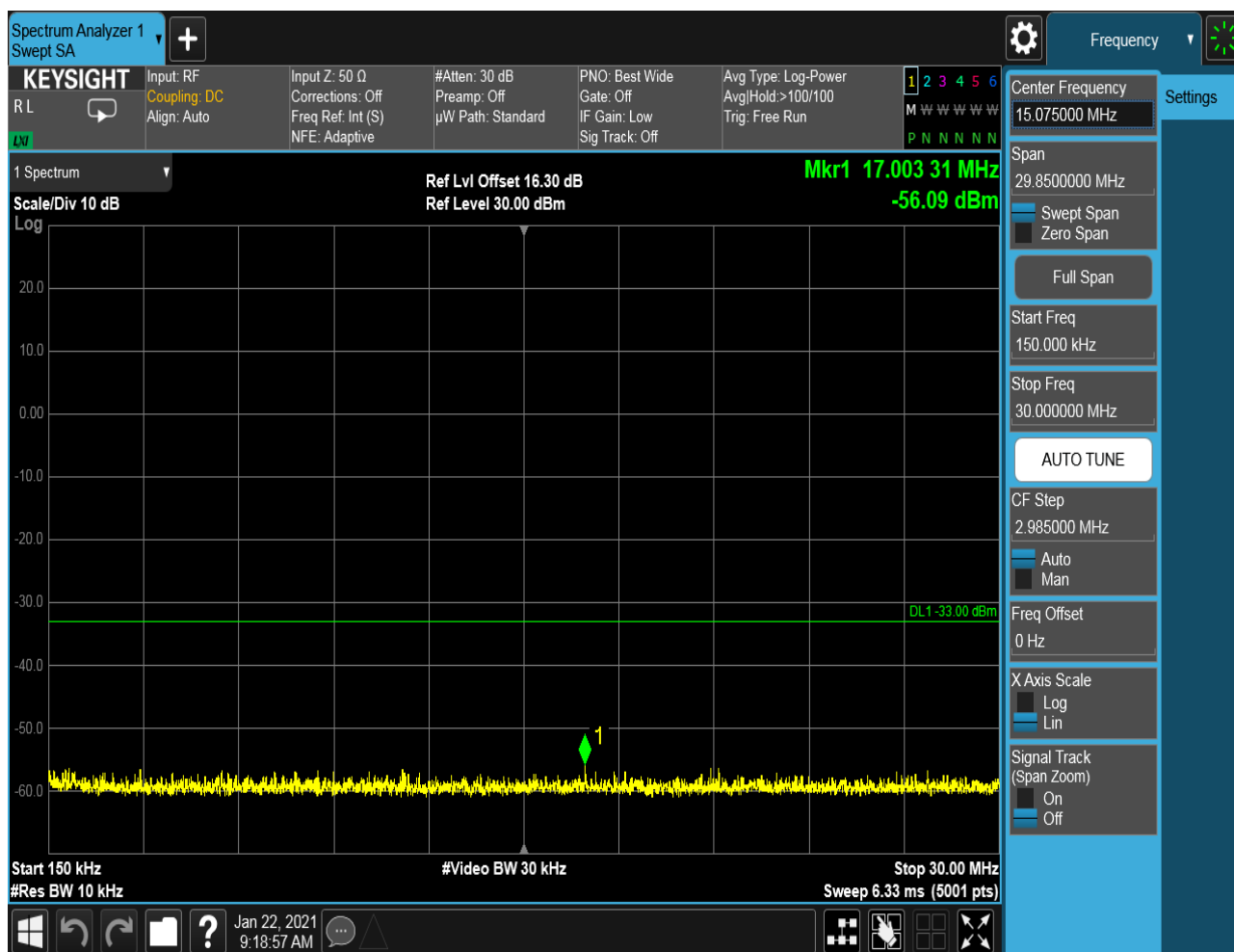


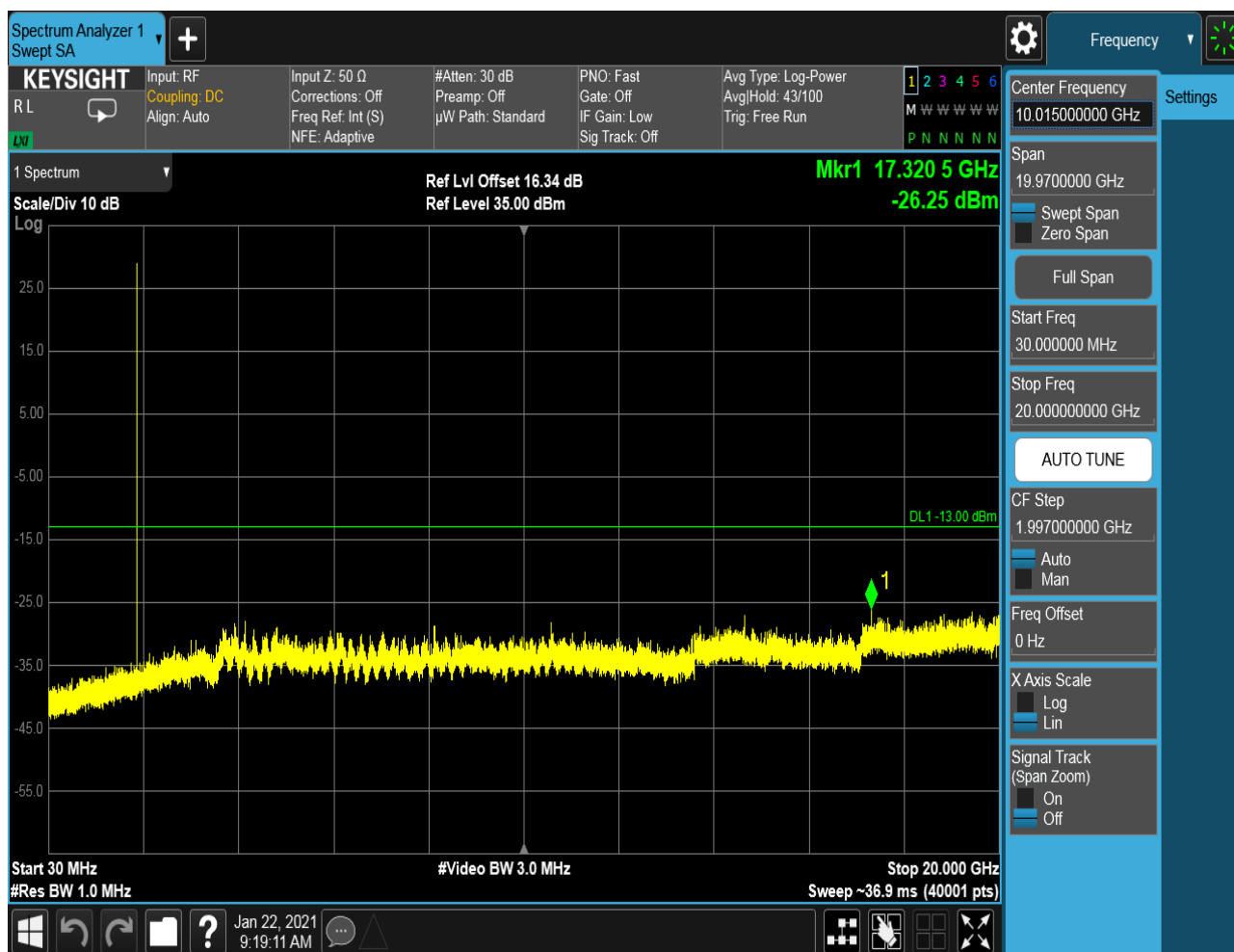




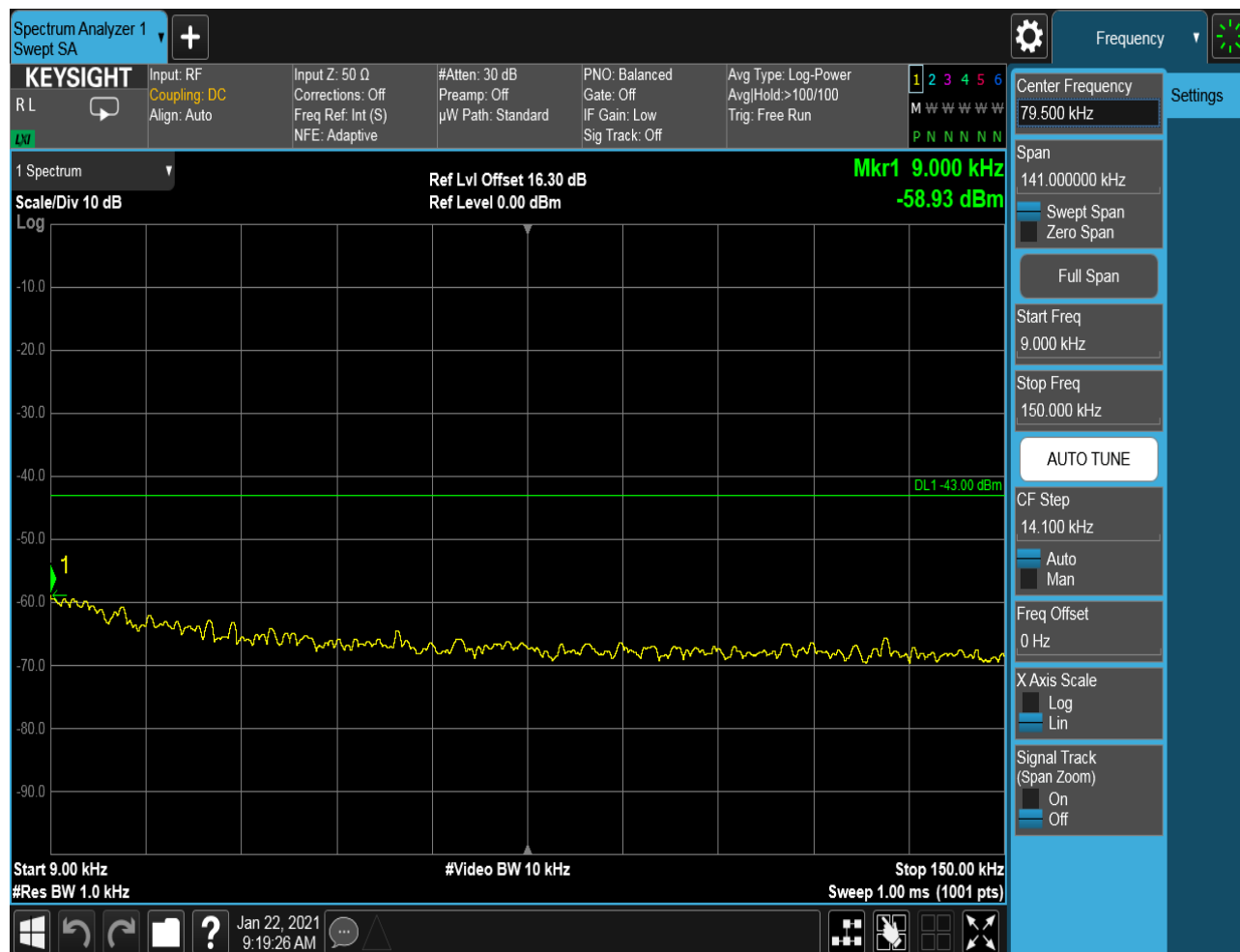
6.1.2.1.2 Test Channel = MCH

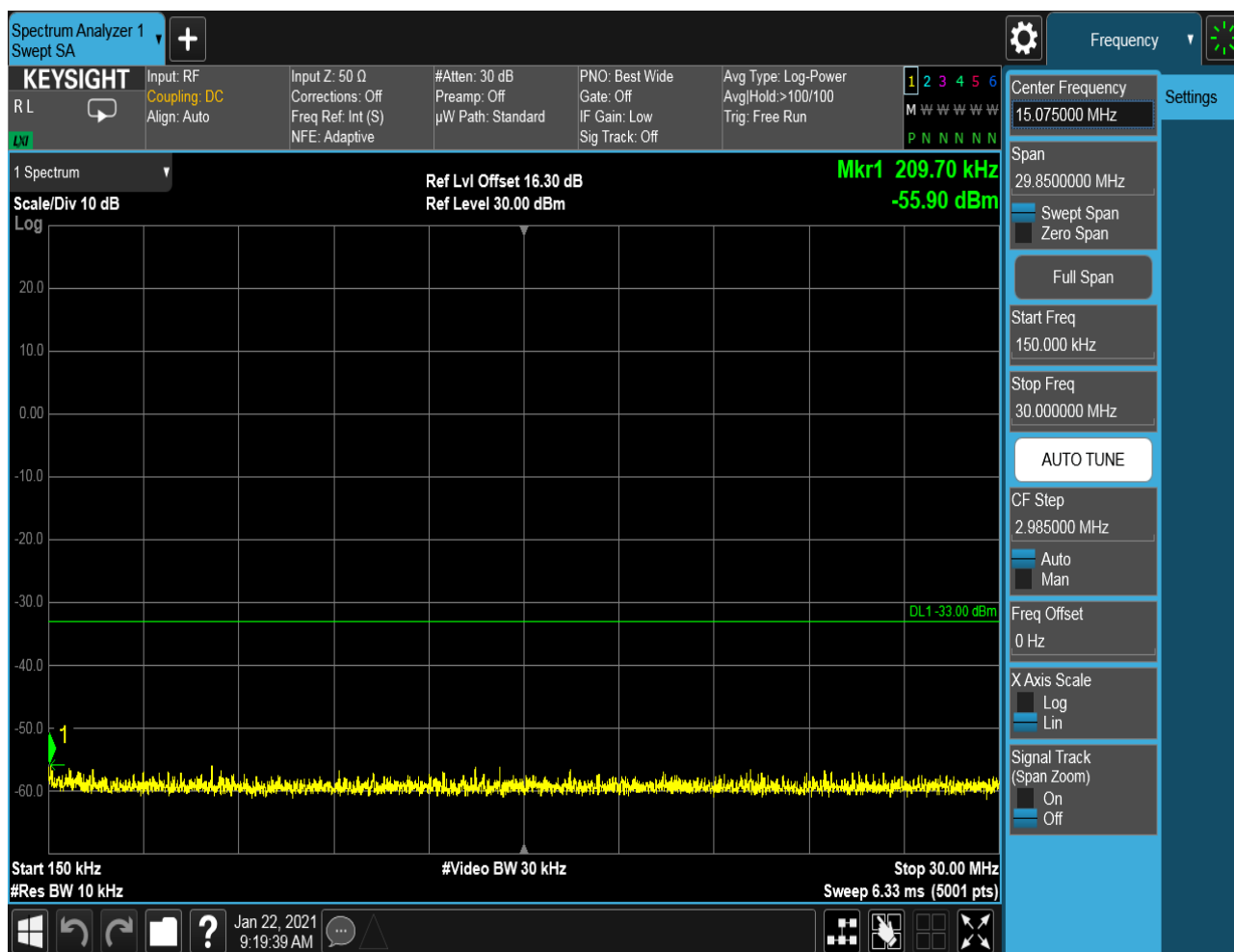


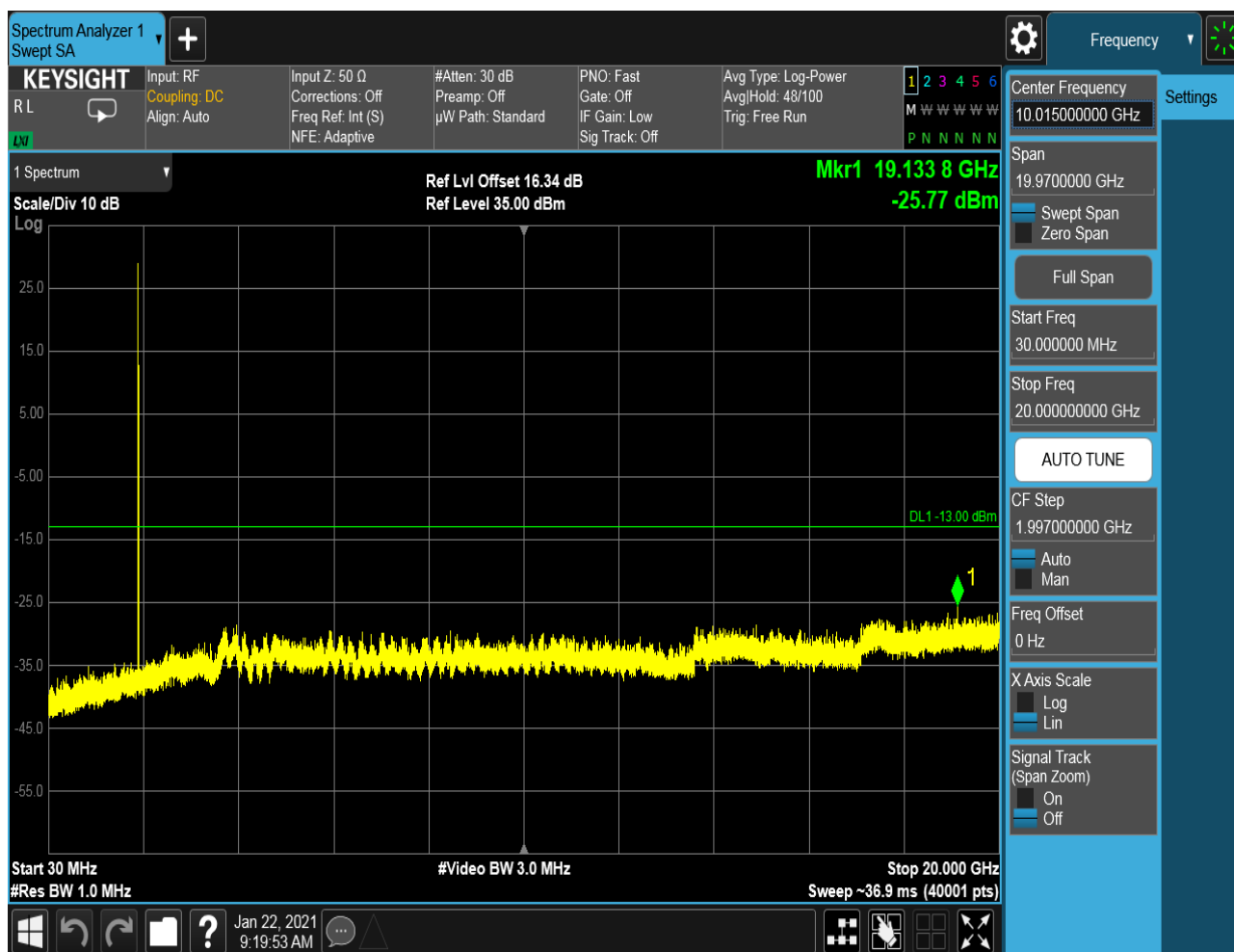




6.1.2.1.3 Test Channel = HCH

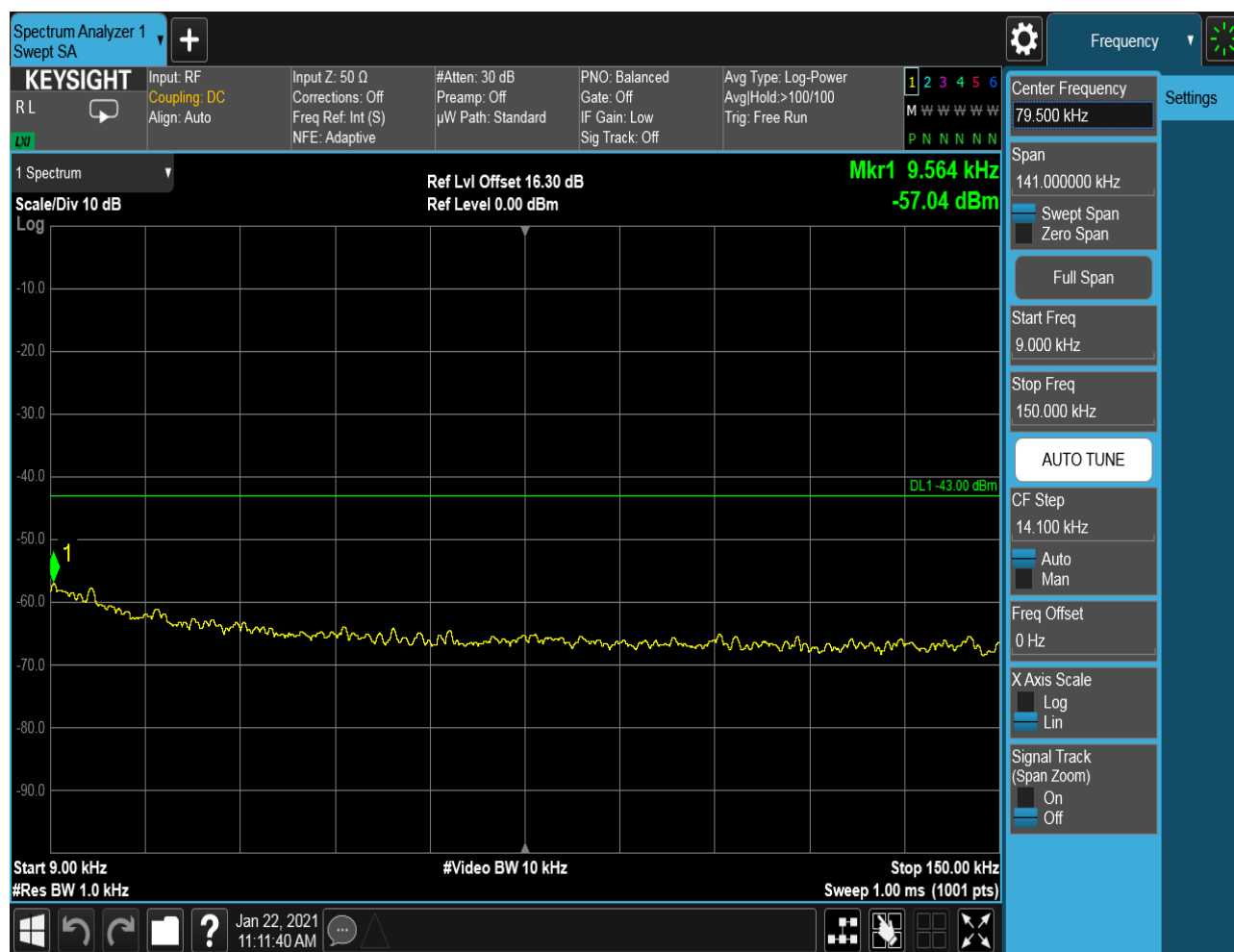


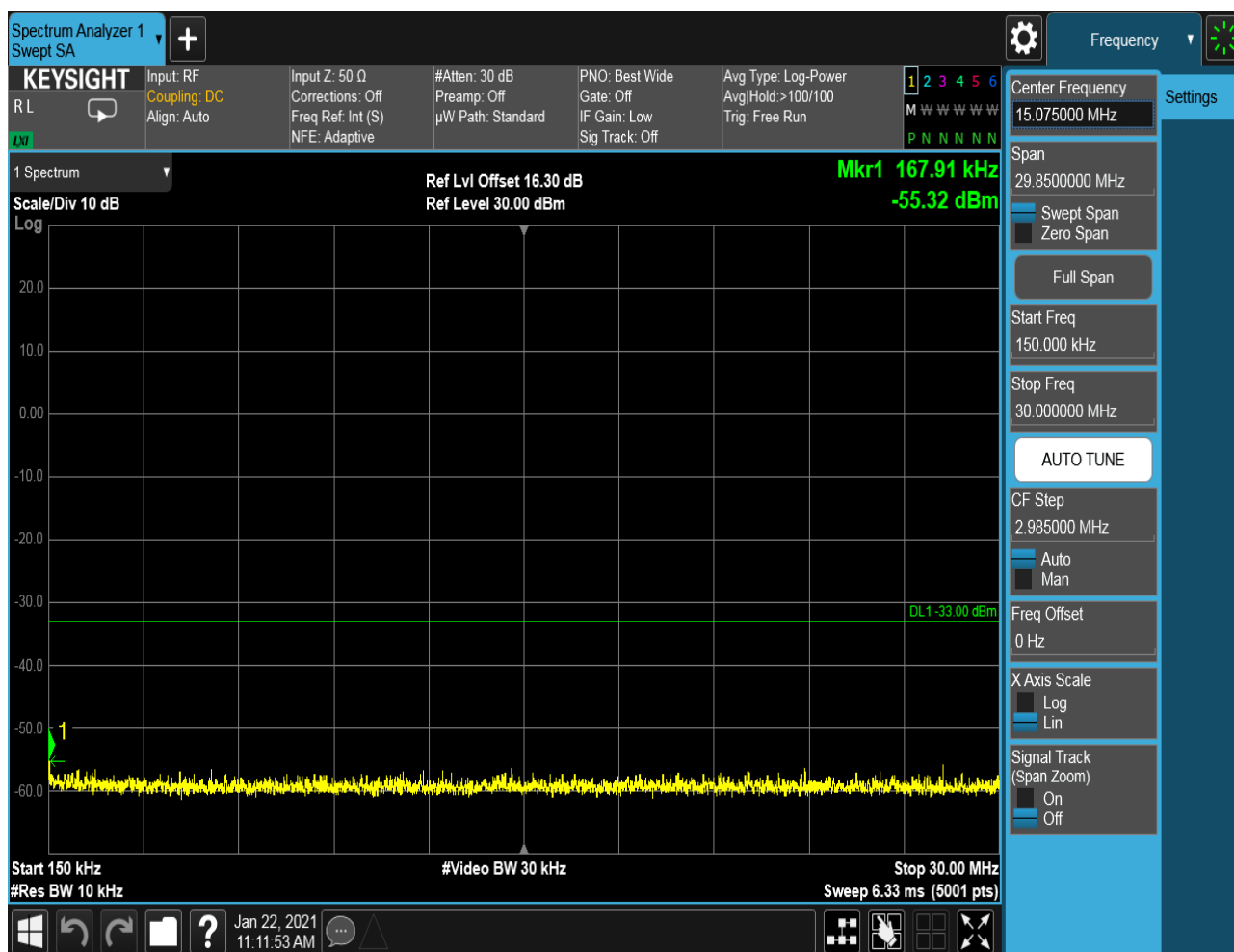


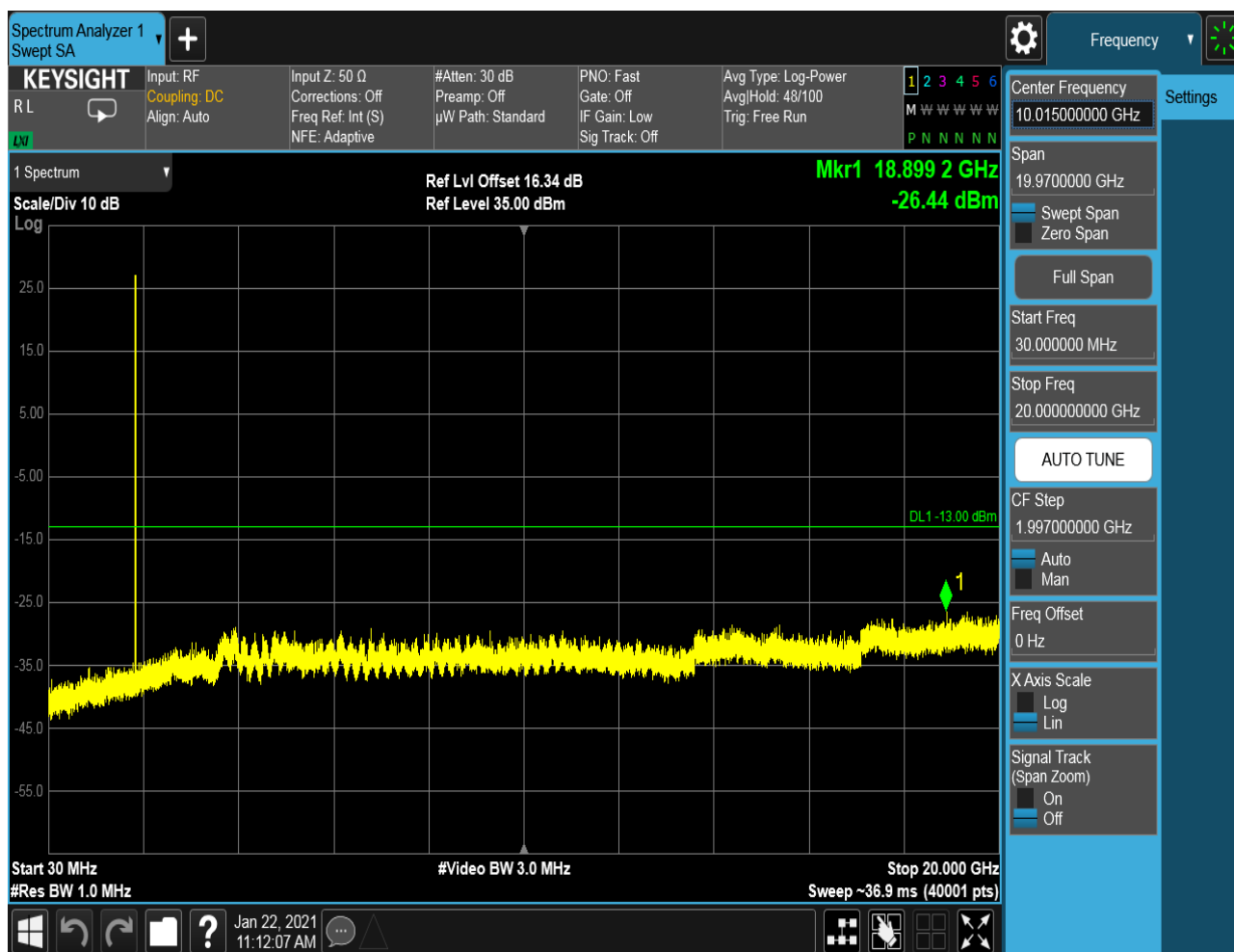


6.1.2.2 Test Mode = GSM/TM2

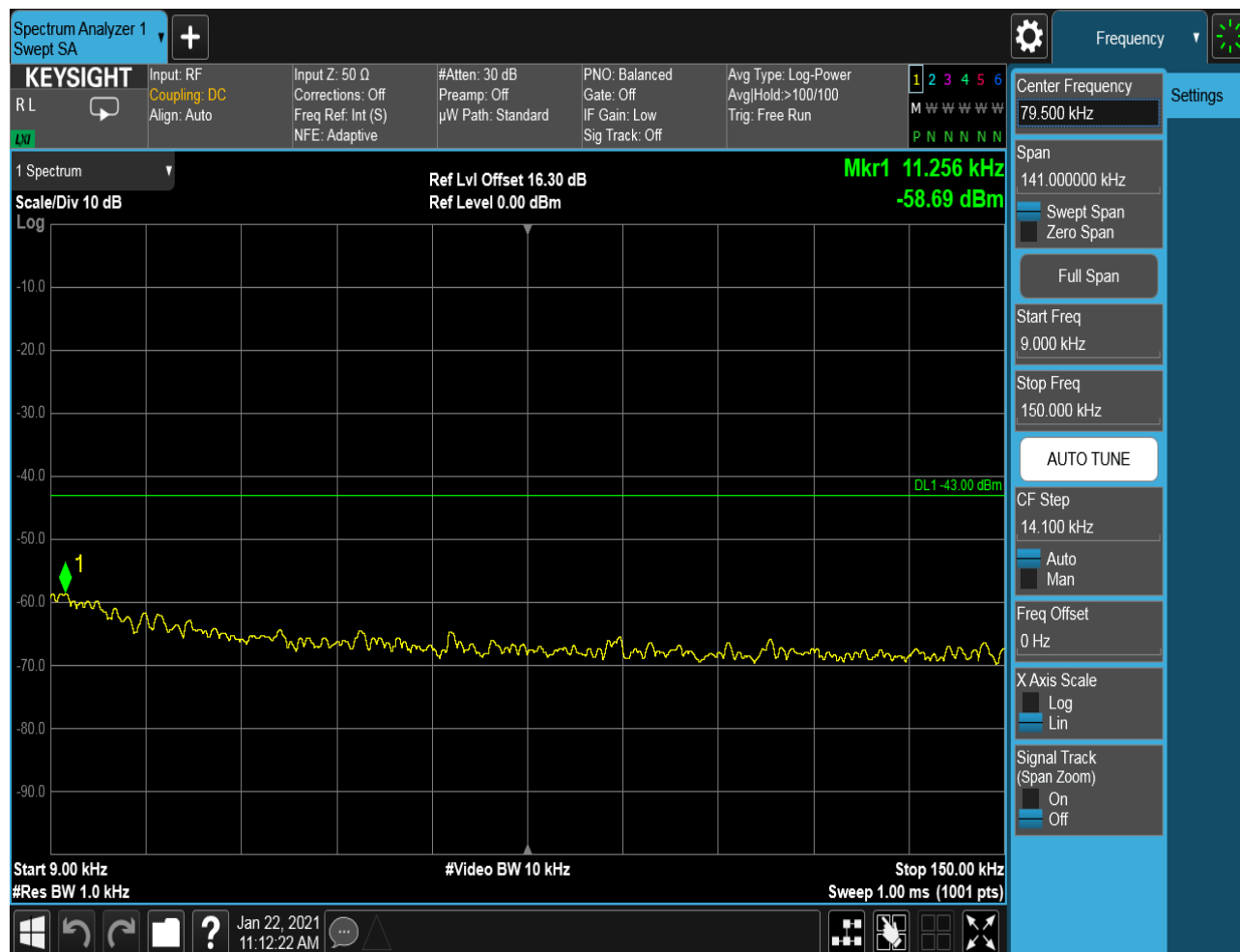
6.1.2.2.1 Test Channel = LCH

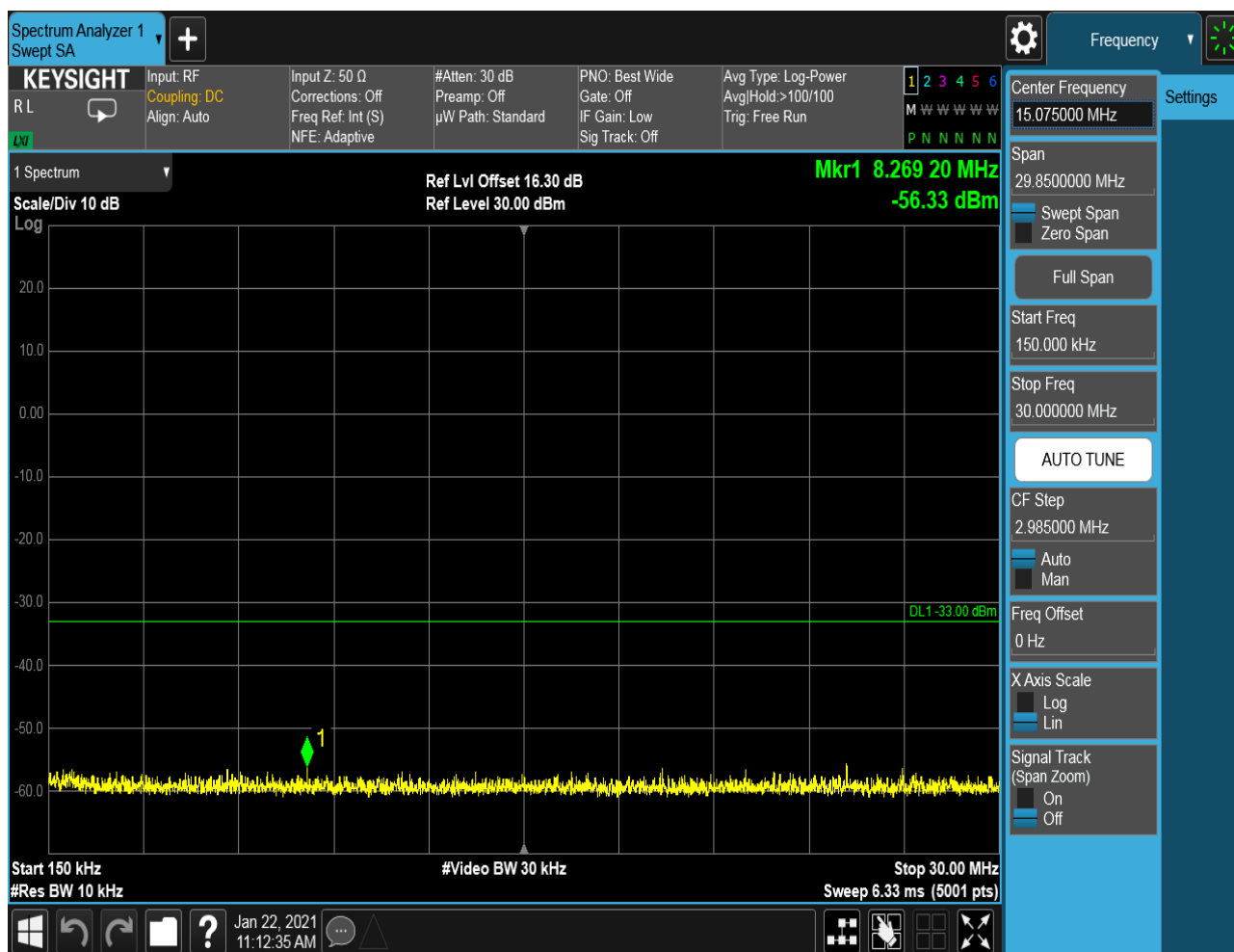


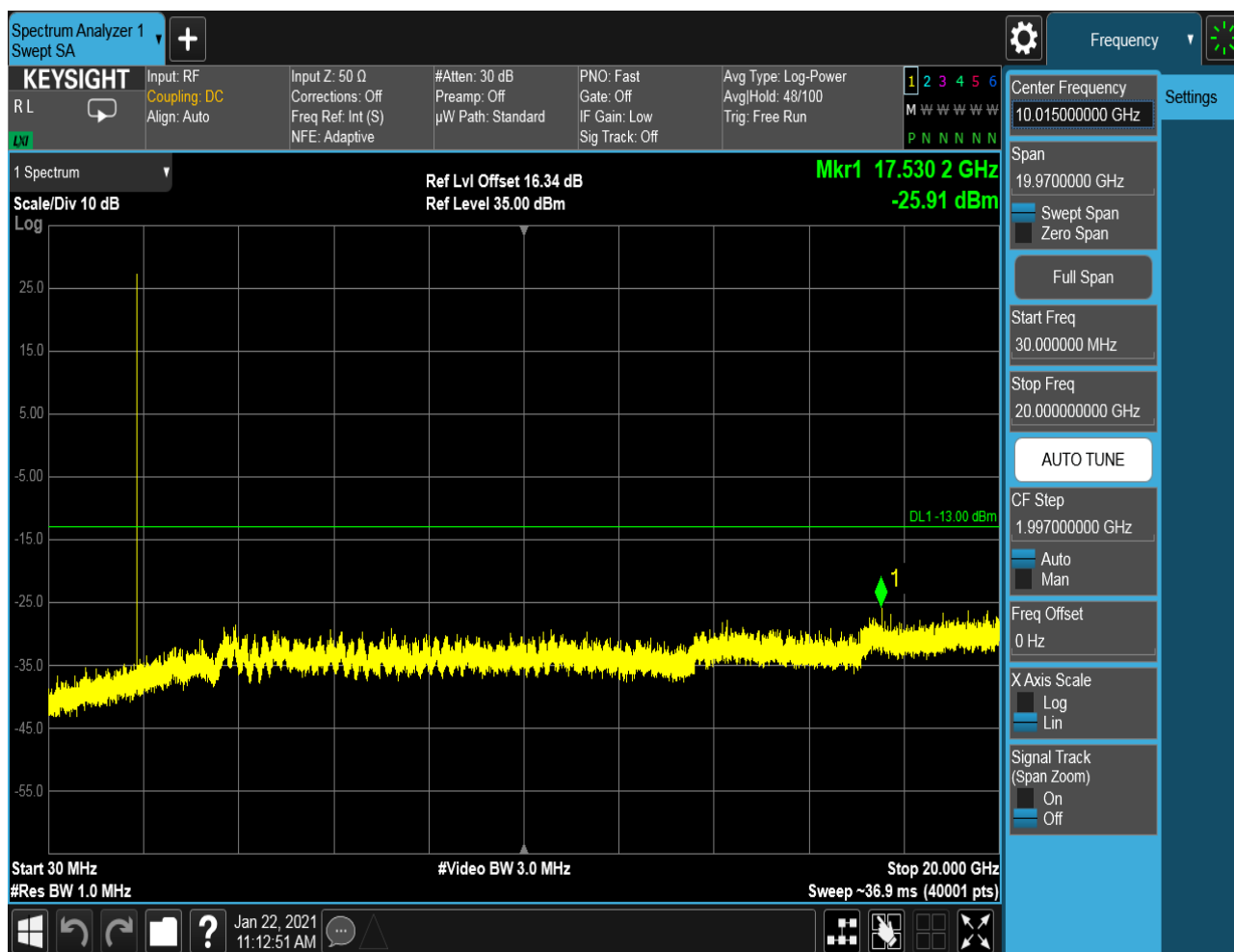




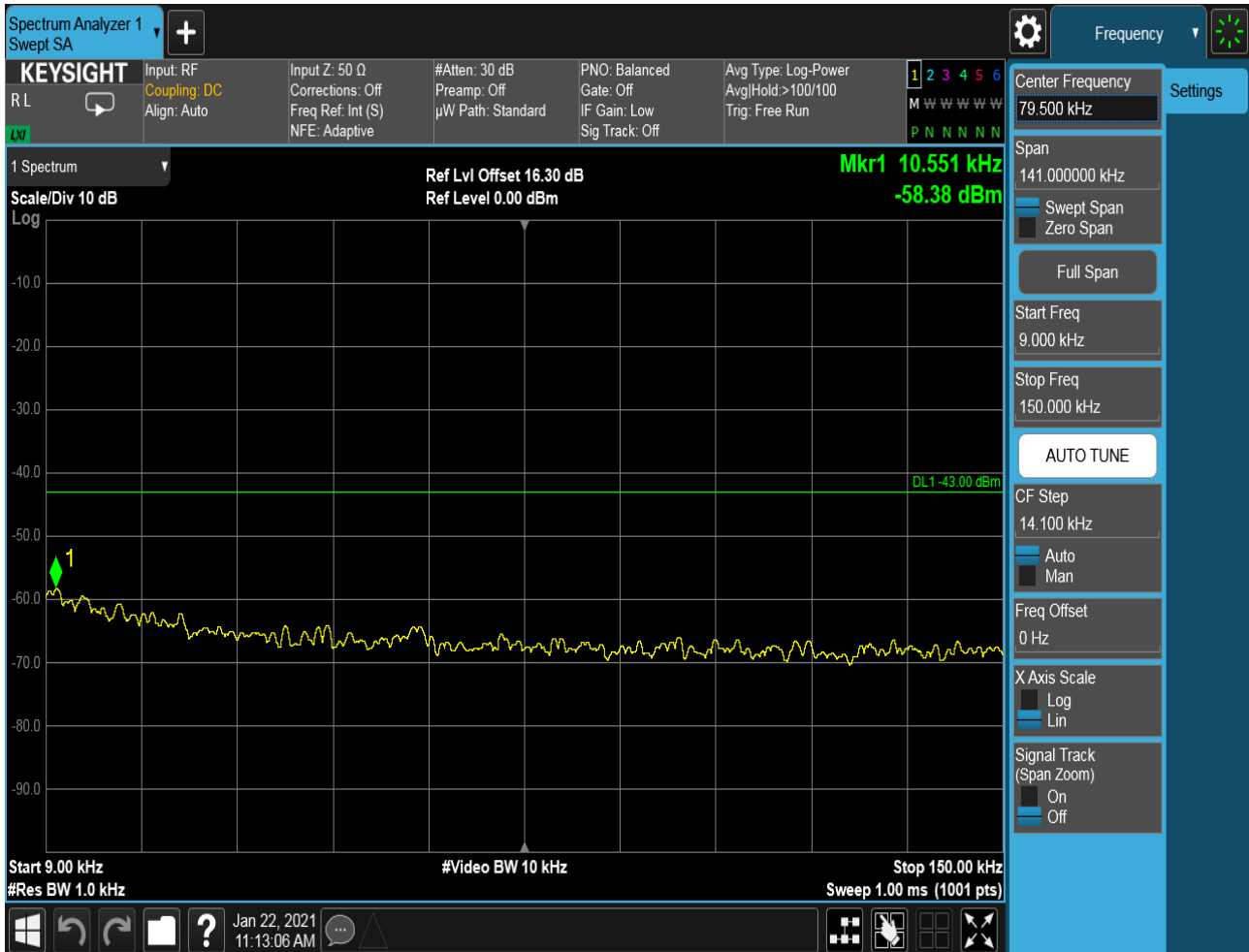
6.1.2.2.2 Test Channel = MCH

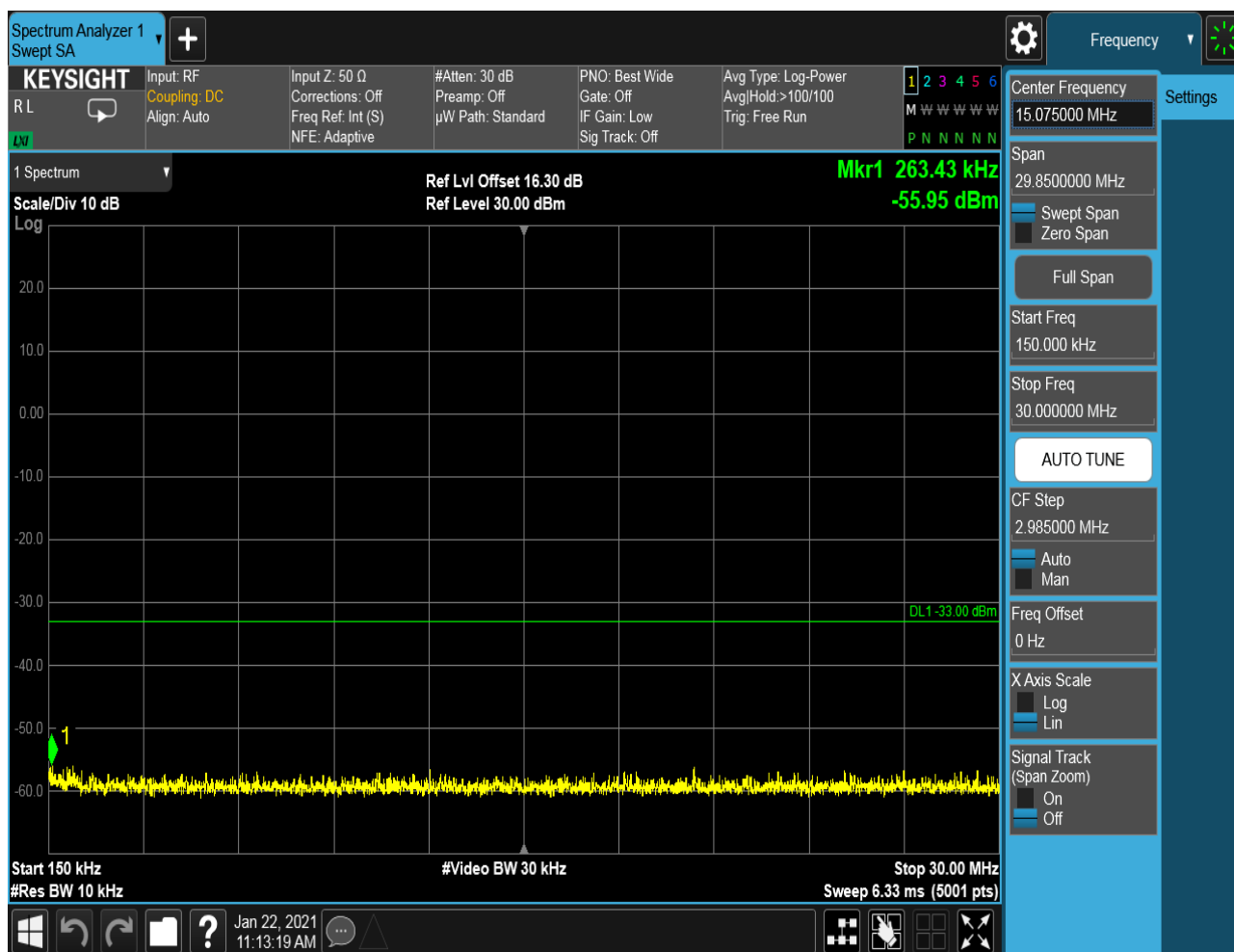


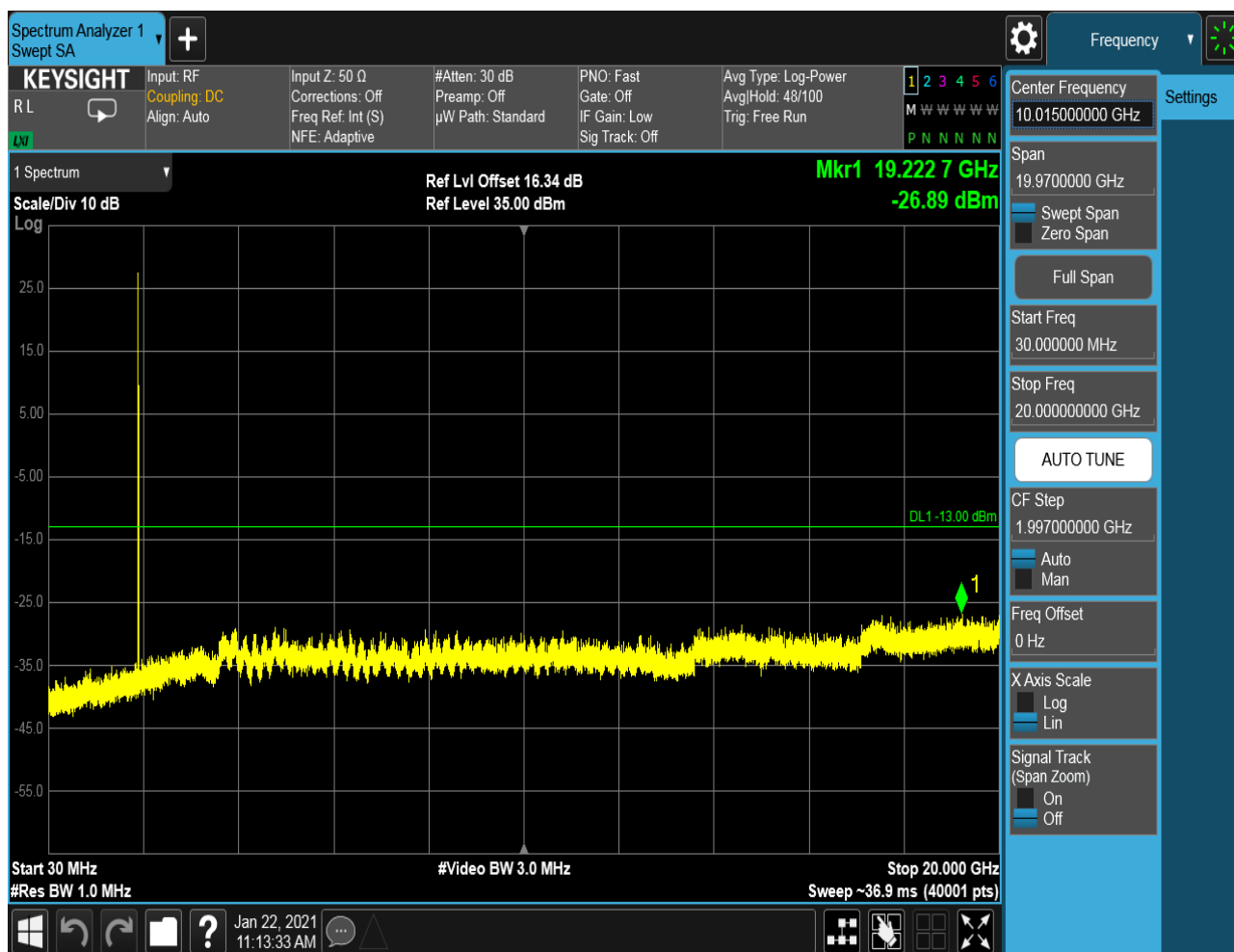




6.1.2.2.3 Test Channel = HCH







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

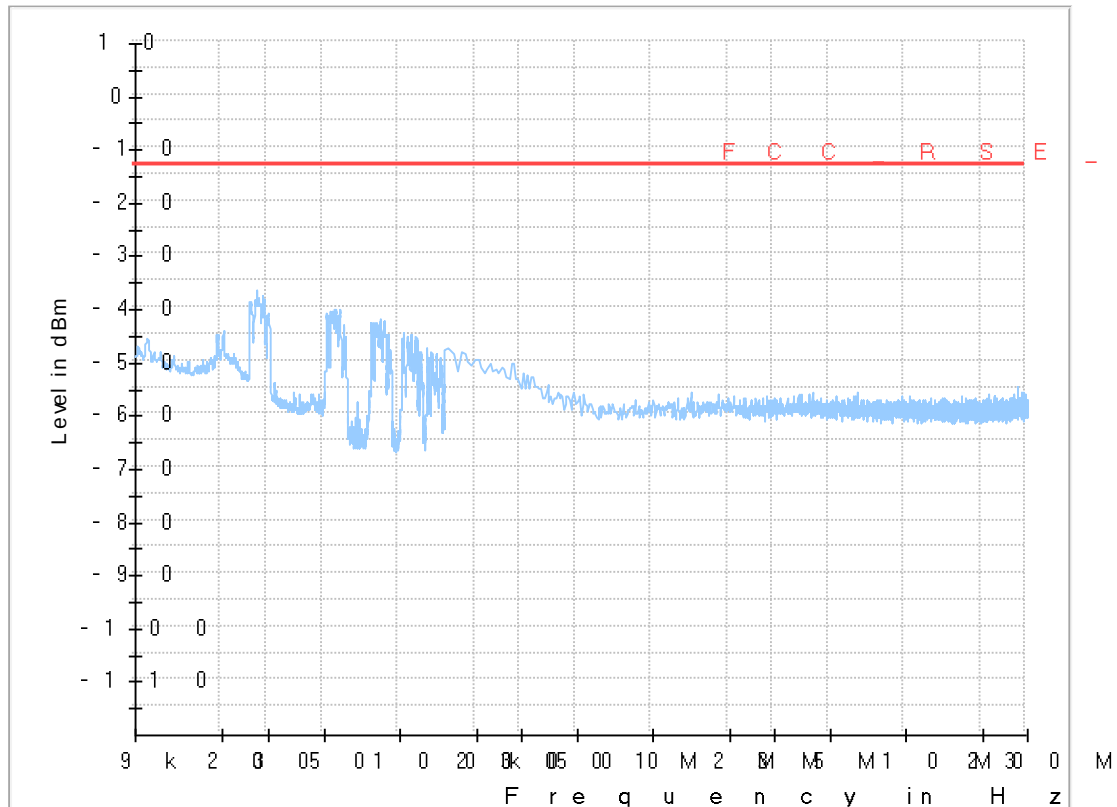
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

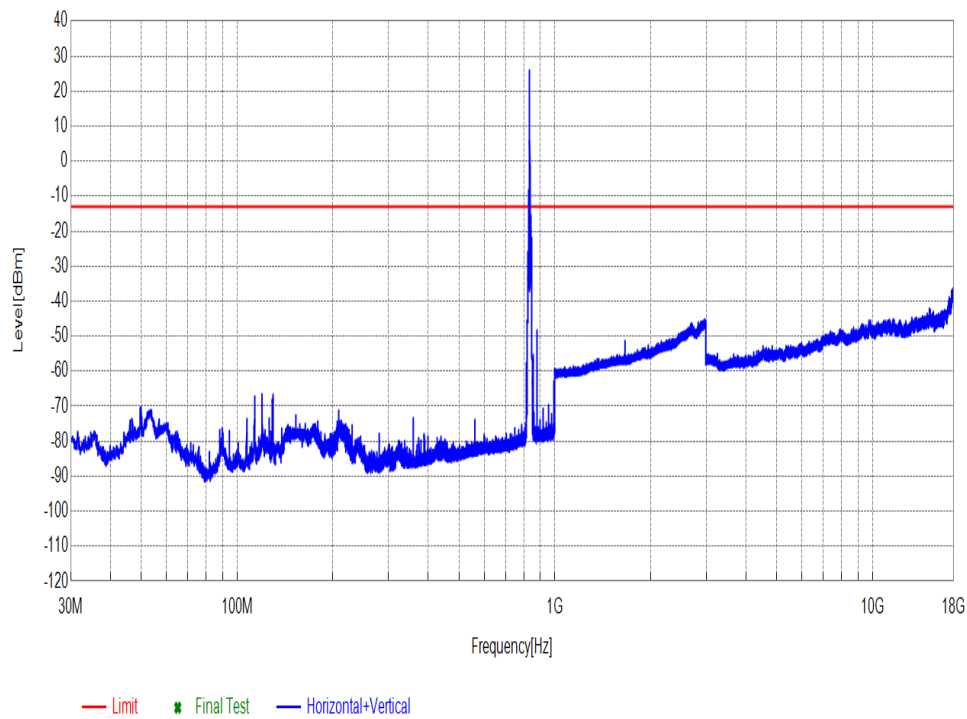
Part I - Test Plots

7.1 For GSM

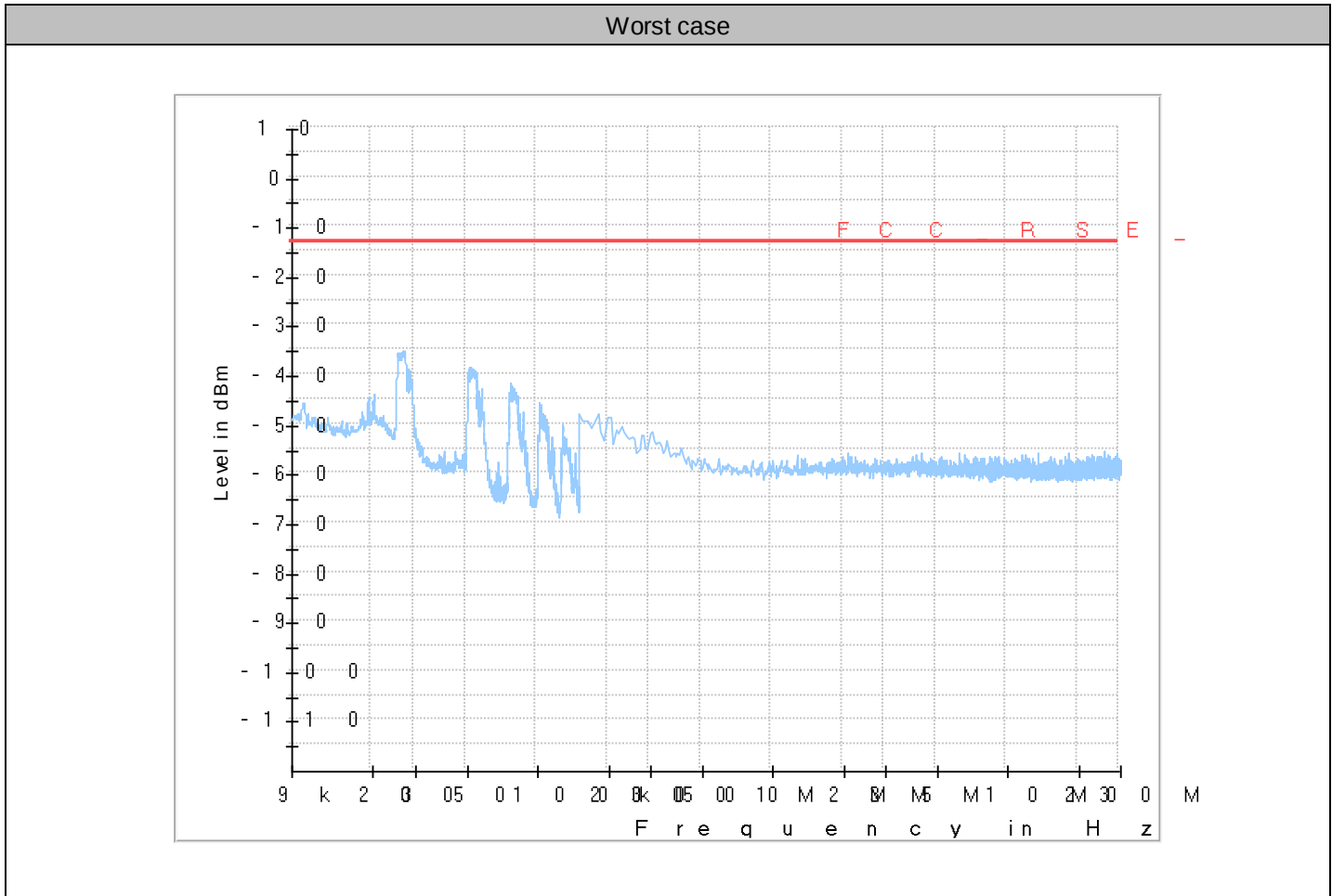
7.1.1 Test Band = GSM850

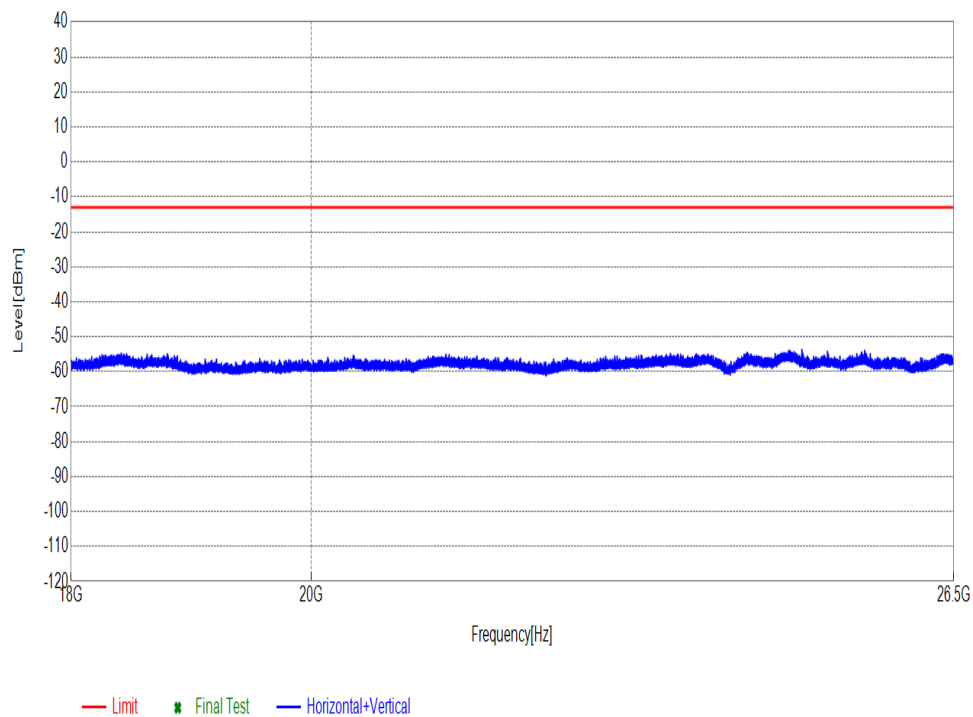
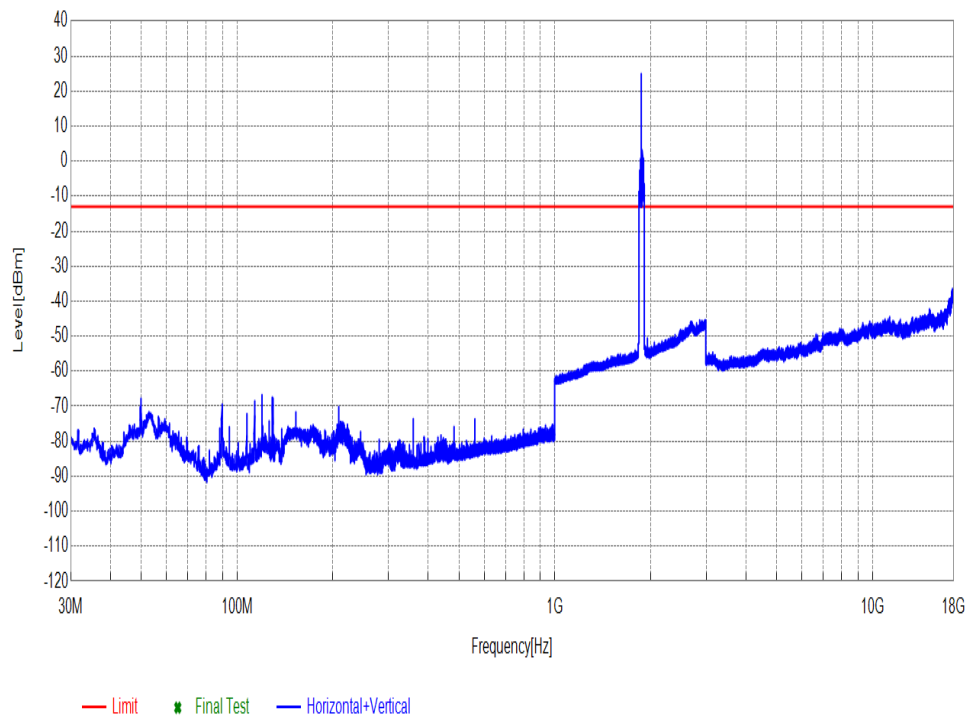
Worst case





7.1.2 Test Band = PCS1900





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	38.22645	0.04638	PASS
				VN	44.74819	0.05429	PASS
				VH	35.44986	0.04301	PASS
		MCH	TN	VL	38.35559	0.04585	PASS
				VN	42.71418	0.05106	PASS
				VH	37.48387	0.04481	PASS
		HCH	TN	VL	41.71332	0.04914	PASS
				VN	39.77617	0.04686	PASS
				VH	40.55103	0.04777	PASS
	GSM/TM2	LCH	TN	VL	48.20277	0.05848	PASS
				VN	51.04393	0.06193	PASS
				VH	48.81620	0.05923	PASS
		MCH	TN	VL	48.20277	0.05762	PASS
				VN	47.10505	0.05631	PASS
				VH	48.59020	0.05808	PASS
		HCH	TN	VL	48.17049	0.05675	PASS
				VN	46.52391	0.05481	PASS
				VH	47.04048	0.05542	PASS
PCS1900	GSM/TM1	LCH	TN	VL	35.77272	0.01933	PASS
				VN	32.67328	0.01766	PASS
				VH	37.29016	0.02015	PASS
		MCH	TN	VL	39.55017	0.02104	PASS
				VN	34.61043	0.01841	PASS
				VH	38.22645	0.02033	PASS
		HCH	TN	VL	56.43566	0.01933	PASS
				VN	55.07966	0.01766	PASS
				VH	55.53166	0.02015	PASS
	GSM/TM2	LCH	TN	VL	44.13476	0.02385	PASS
				VN	38.67845	0.02091	PASS
				VH	41.93932	0.02267	PASS
		MCH	TN	VL	43.61818	0.02320	PASS
				VN	43.77961	0.02329	PASS
				VH	41.71332	0.02219	PASS
		HCH	TN	VL	61.79512	0.02385	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VN	62.69912	0.02091	PASS
				VH	61.37540	0.02267	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	39.71159	0.04818	PASS
				-20	36.61215	0.04442	PASS
				-10	36.19244	0.04391	PASS
				0	44.19933	0.05363	PASS
				10	45.03876	0.05465	PASS
				20	44.74819	0.05429	PASS
				30	46.52391	0.05645	PASS
				40	37.51616	0.04552	PASS
				50	42.87561	0.05202	PASS
		MCH	VN	-30	39.55017	0.04727	PASS
				-20	41.51960	0.04963	PASS
				-10	40.22817	0.04809	PASS
				0	42.84332	0.05121	PASS
				10	42.97247	0.05137	PASS
				20	42.71418	0.05106	PASS
				30	42.90789	0.05129	PASS
				40	39.87302	0.04766	PASS
				50	41.81017	0.04998	PASS
		HCH	VN	-30	36.70901	0.04325	PASS
				-20	35.38529	0.04169	PASS
				-10	34.93329	0.04116	PASS
				0	38.19416	0.04500	PASS
				10	38.64616	0.04553	PASS
				20	39.77617	0.04686	PASS
				30	40.48645	0.04770	PASS
				40	34.67500	0.04085	PASS
				50	36.03101	0.04245	PASS
	GSM/TM2	LCH	VN	-30	51.04393	0.06193	PASS
				-20	51.30221	0.06224	PASS
				-10	52.59365	0.06381	PASS
				0	50.94707	0.06181	PASS
				10	52.91651	0.06420	PASS
				20	51.04393	0.06193	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	51.94793	0.06303	PASS
				40	48.68706	0.05907	PASS
				50	47.65391	0.05782	PASS
		MCH	VN	-30	47.97677	0.05735	PASS
				-20	45.61990	0.05453	PASS
				-10	48.29963	0.05773	PASS
				0	47.46020	0.05673	PASS
				10	50.46278	0.06032	PASS
				20	47.10505	0.05631	PASS
				30	47.52477	0.05681	PASS
				40	49.55878	0.05924	PASS
				50	45.20019	0.05403	PASS
		HCH	VN	-30	41.51960	0.04892	PASS
				-20	38.74302	0.04564	PASS
				-10	47.16963	0.05557	PASS
				0	49.88164	0.05877	PASS
				10	47.87991	0.05641	PASS
				20	46.52391	0.05481	PASS
				30	45.16790	0.05321	PASS
				40	50.97936	0.06006	PASS
				50	48.26734	0.05687	PASS
PCS1900	GSM/TM1	LCH	VN	-30	34.31986	0.01855	PASS
				-20	31.28499	0.01691	PASS
				-10	33.35128	0.01803	PASS
				0	32.02756	0.01731	PASS
				10	31.89842	0.01724	PASS
				20	32.67328	0.01766	PASS
				30	30.44556	0.01646	PASS
				40	33.80328	0.01827	PASS
				50	35.22386	0.01904	PASS
		MCH	VN	-30	32.77014	0.01743	PASS
				-20	36.87044	0.01961	PASS
				-10	38.80759	0.02064	PASS
				0	34.96557	0.01860	PASS
				10	38.38787	0.02042	PASS
				20	34.61043	0.01841	PASS
				30	33.28671	0.01771	PASS
				40	35.25615	0.01875	PASS
				50	35.77272	0.01903	PASS
		HCH	VN	-30	52.81965	0.02766	PASS
				-20	51.59279	0.02701	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-10	55.14423	0.02887	PASS
				0	57.14595	0.02992	PASS
				10	54.20794	0.02838	PASS
				20	55.07966	0.02884	PASS
				30	49.46192	0.02590	PASS
				40	53.23937	0.02788	PASS
				50	55.78995	0.02921	PASS
	GSM/TM2	LCH	VN	-30	39.93760	0.02159	PASS
				-20	39.58245	0.02139	PASS
				-10	39.64702	0.02143	PASS
				0	39.13045	0.02115	PASS
				10	40.64788	0.02197	PASS
				20	38.67845	0.02091	PASS
				30	41.19674	0.02227	PASS
				40	39.55017	0.02138	PASS
				50	39.93760	0.02159	PASS
		MCH	VN	-30	43.39218	0.02308	PASS
				-20	43.52132	0.02315	PASS
				-10	41.71332	0.02219	PASS
				0	40.74474	0.02167	PASS
				10	40.45417	0.02152	PASS
				20	43.77961	0.02329	PASS
				30	39.64702	0.02109	PASS
				40	42.39132	0.02255	PASS
				50	42.39132	0.02255	PASS
		HCH	VN	-30	61.02026	0.03195	PASS
				-20	58.59882	0.03068	PASS
				-10	59.47053	0.03114	PASS
				0	59.98711	0.03141	PASS
				10	61.21397	0.03205	PASS
				20	62.69912	0.03283	PASS
				30	59.37368	0.03109	PASS
				40	60.66511	0.03177	PASS
				50	60.24539	0.03155	PASS

END