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	32.73	28.75	38.5	PASS
		MCH	32.86	28.92	38.5	PASS
		HCH	32.77	28.81	38.5	PASS
	GSM/TM2	LCH	26.98	22.97	38.5	PASS
		MCH	26.99	22.88	38.5	PASS
		HCH	26.98	22.84	38.5	PASS
Test Band	**Test Mode**	**Test Channel**	**Measured[dBm]**	**EIRP [dBm]**	**Limit [dBm]**	**Verdict**
GSM1900	GSM/TM1	LCH	30.11	30.39	33	PASS
		MCH	30.06	30.34	33	PASS
		HCH	30.11	30.26	33	PASS
	GSM/TM2	LCH	26.28	26.44	33	PASS
		MCH	26.17	26.51	33	PASS
		HCH	26.22	26.60	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,

ERP [dBm] = SGP [dBm] - Cable Loss [dB] + Gain [dBd]

EIRP [dBm] = SGP [dBm] - Cable Loss [dB] + Gain [dBi]

b, SGP = Signal Generator Level

Note2:

SET Span = 1.5 * OBW

SET RBW = 1% of the OBW,not to exceed 1MHz

SET VBW >= 3 * 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	0.21	13	PASS
		MCH	0.21	13	PASS
		HCH	0.2	13	PASS
	GSM/TM2	LCH	2.92	13	PASS
		MCH	2.87	13	PASS
		HCH	2.9	13	PASS
GSM1900	GSM/TM1	LCH	0.37	13	PASS
		MCH	0.4	13	PASS
		HCH	0.39	13	PASS
	GSM/TM2	LCH	2.89	13	PASS
		MCH	2.92	13	PASS
		HCH	2.89	13	PASS

3Appendix_C: Modulation Characteristics

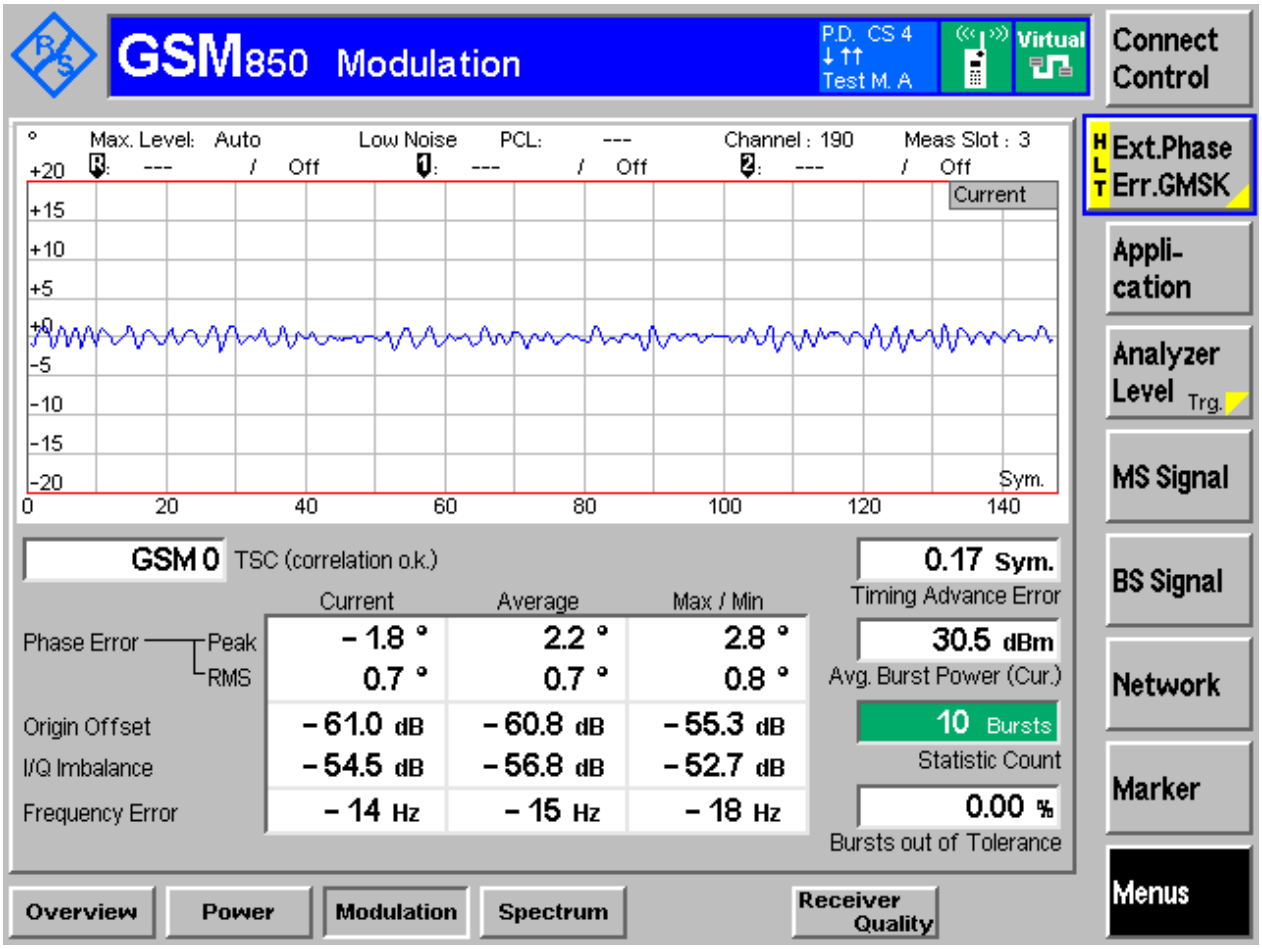
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

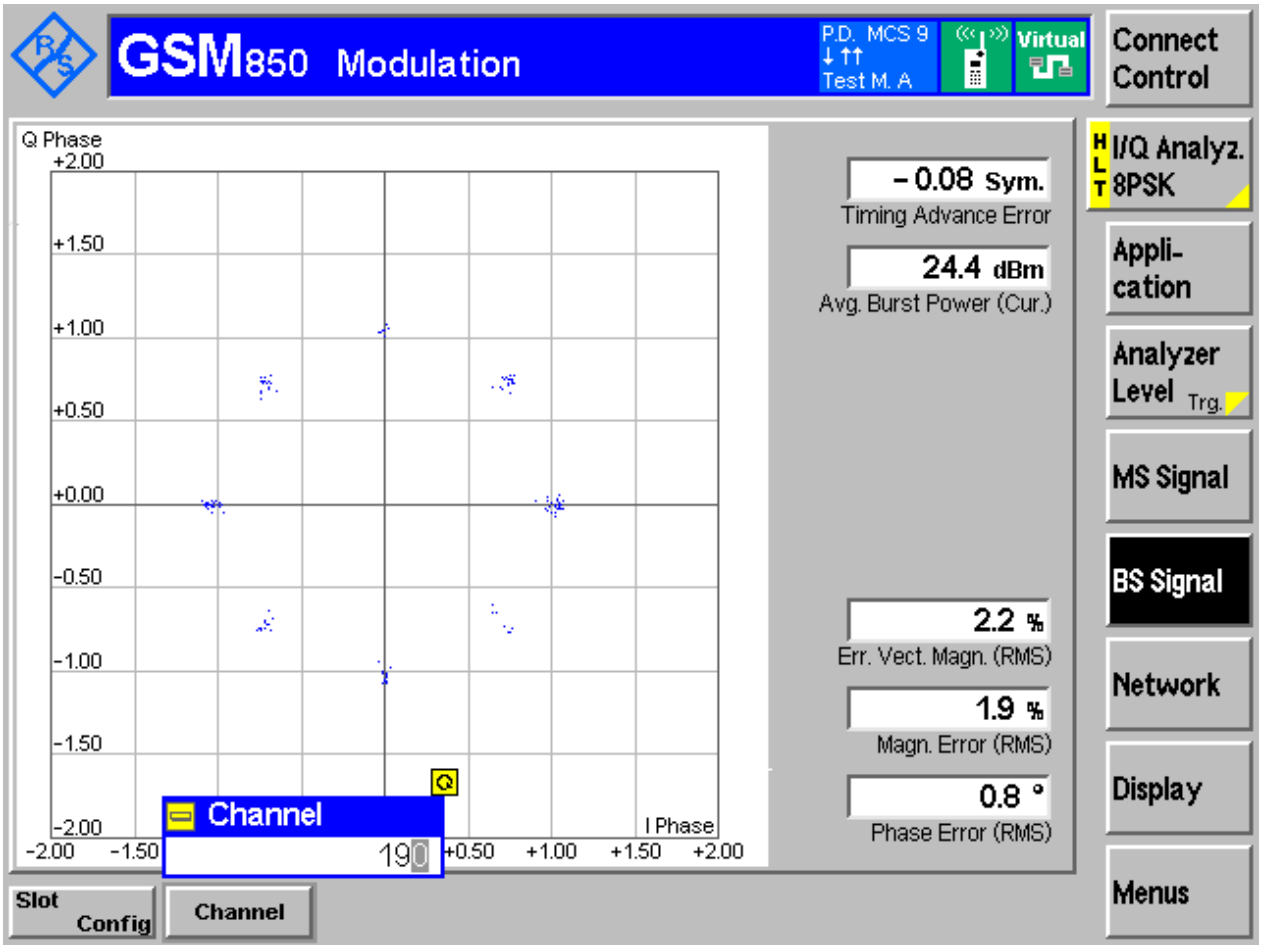
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

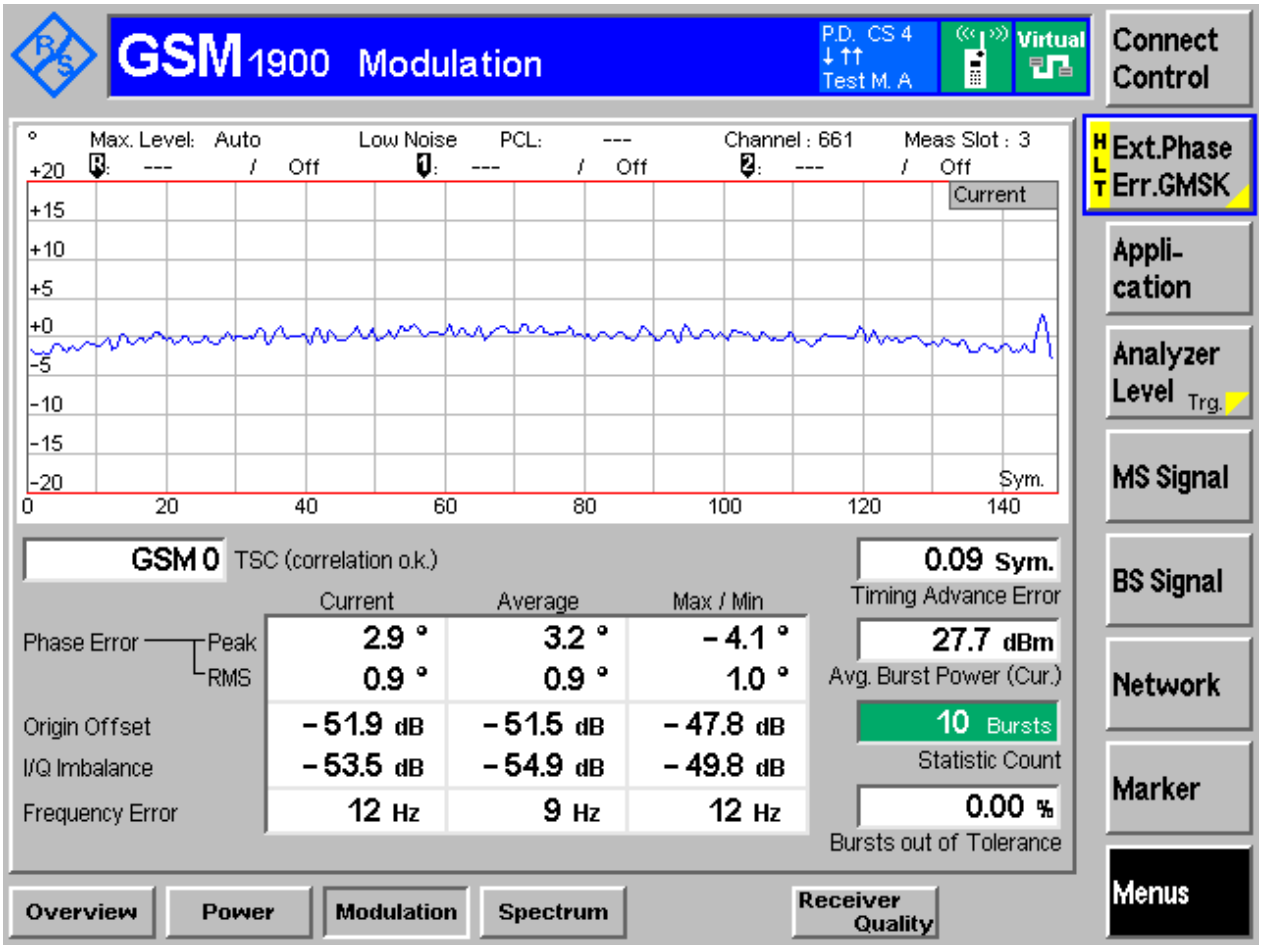
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

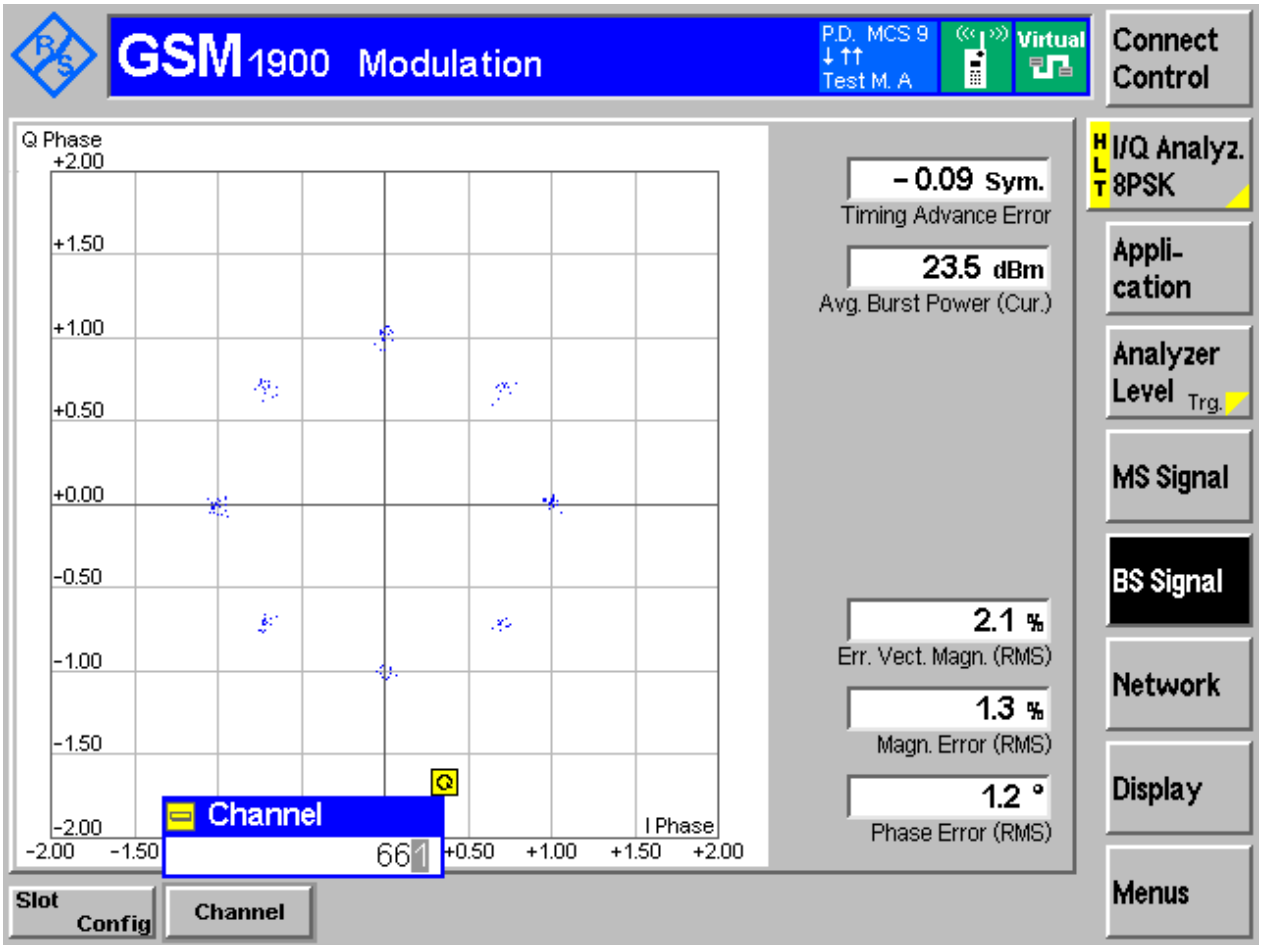
3.1.2.1 Test Mode = GSM/TM1

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	247.54	319.45	Pass
		MCH	248.57	323.54	Pass
		HCH	244.41	318.87	Pass
	GSM/TM2	LCH	252.32	328.19	Pass
		MCH	254.85	319.55	Pass
		HCH	243.85	319.25	Pass
GSM1900	GSM/TM1	LCH	239.66	311.77	Pass
		MCH	241.18	312.07	Pass
		HCH	240.38	313.34	Pass
	GSM/TM2	LCH	255.70	325.60	Pass
		MCH	255.07	328.20	Pass
		HCH	253.81	324.20	Pass

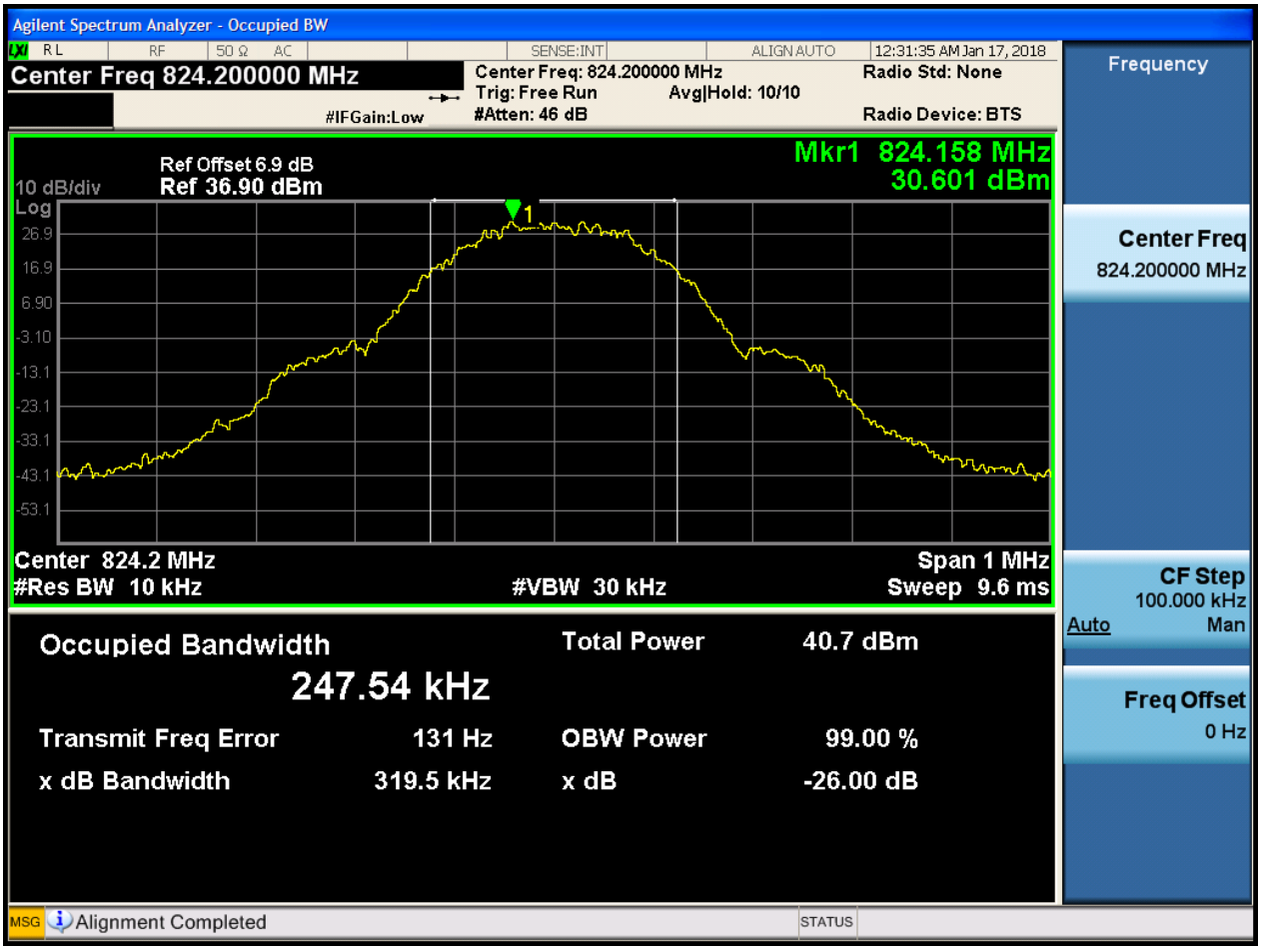
Part II - Test Plots

4.1 For GSM

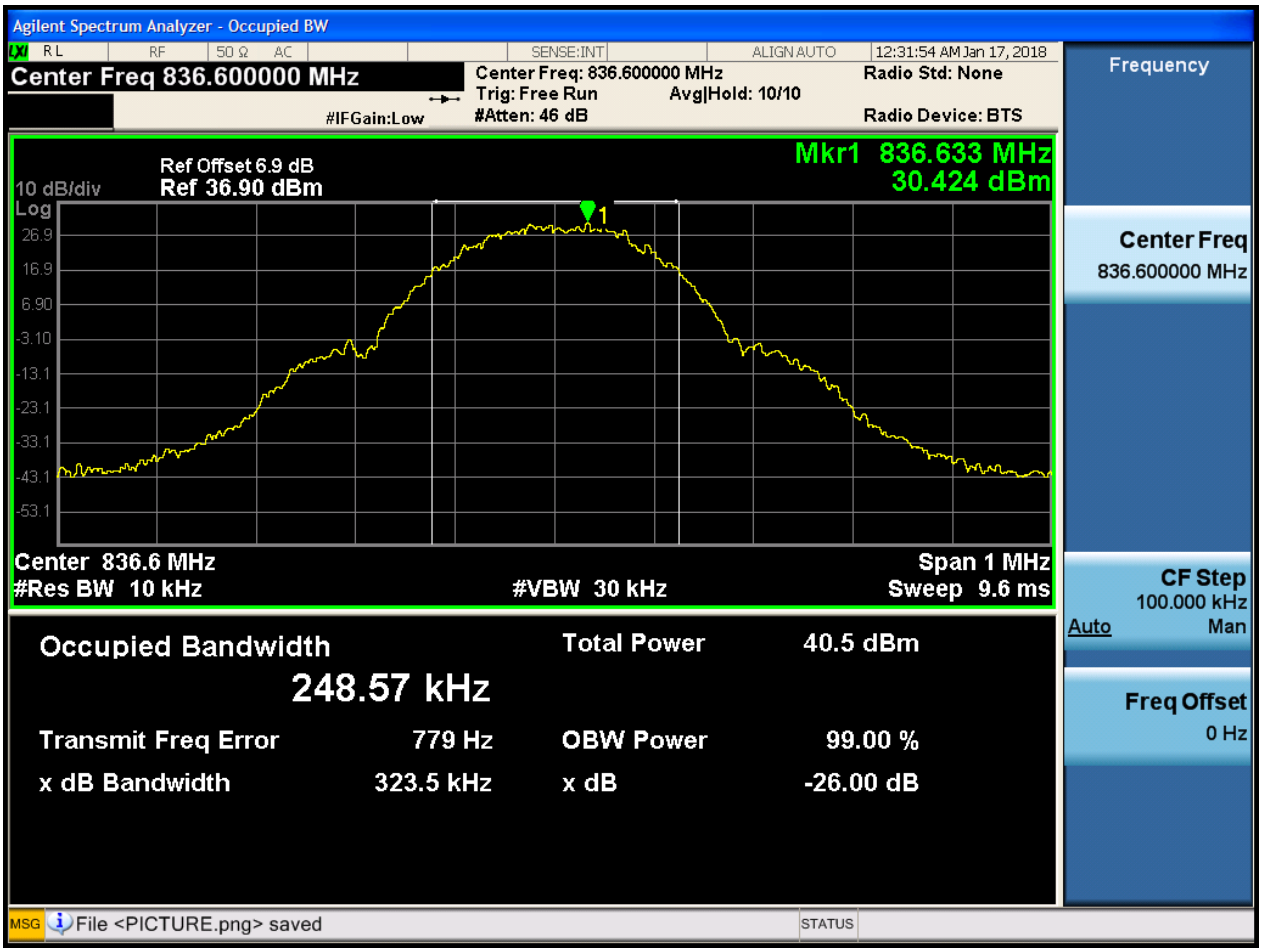
4.1.1 Test Band = GSM850

4.1.1.1 Test Mode = GSM/TM1

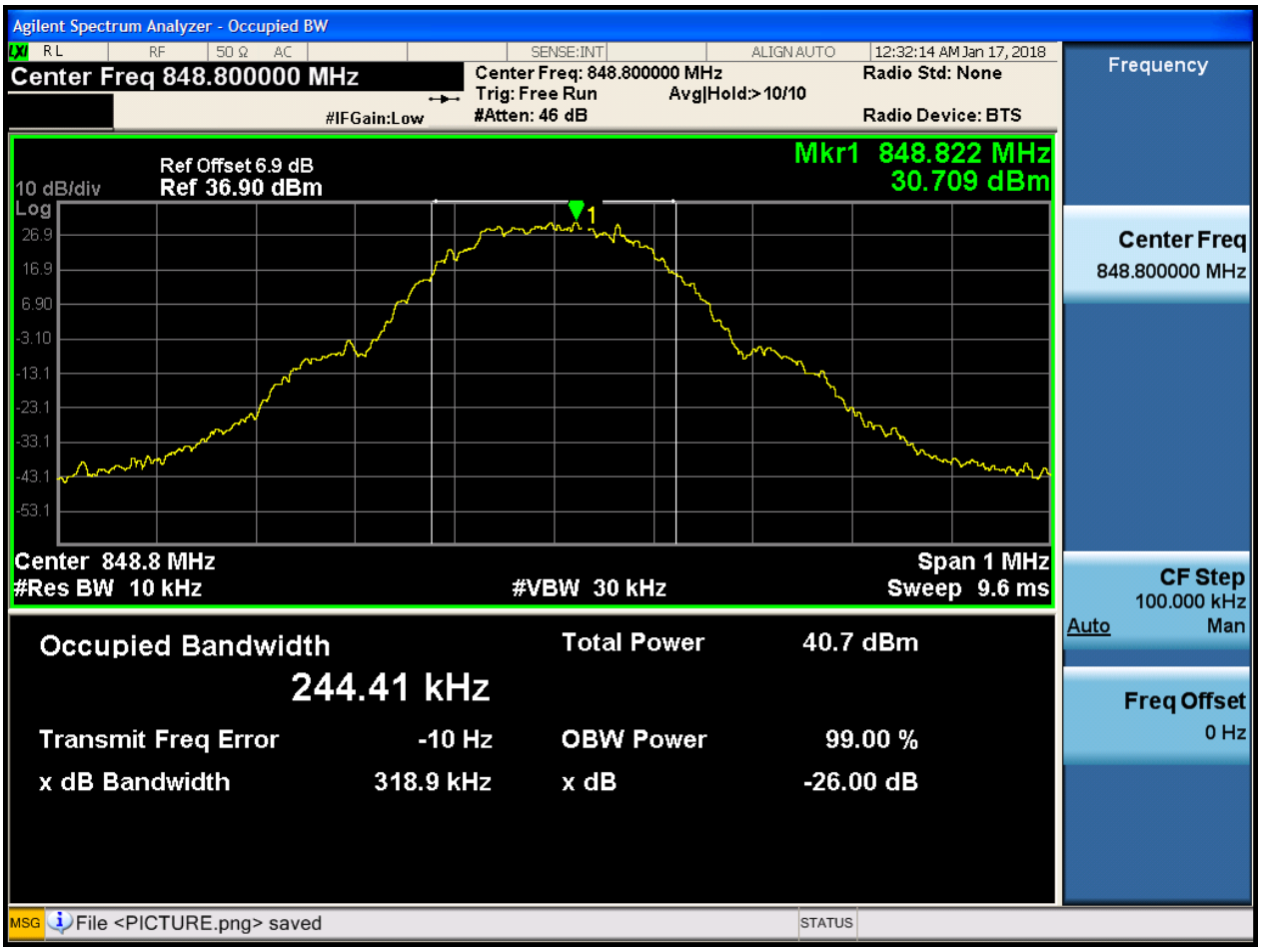
4.1.1.1.1 Test Channel = LCH



4.1.1.1.2 Test Channel = MCH

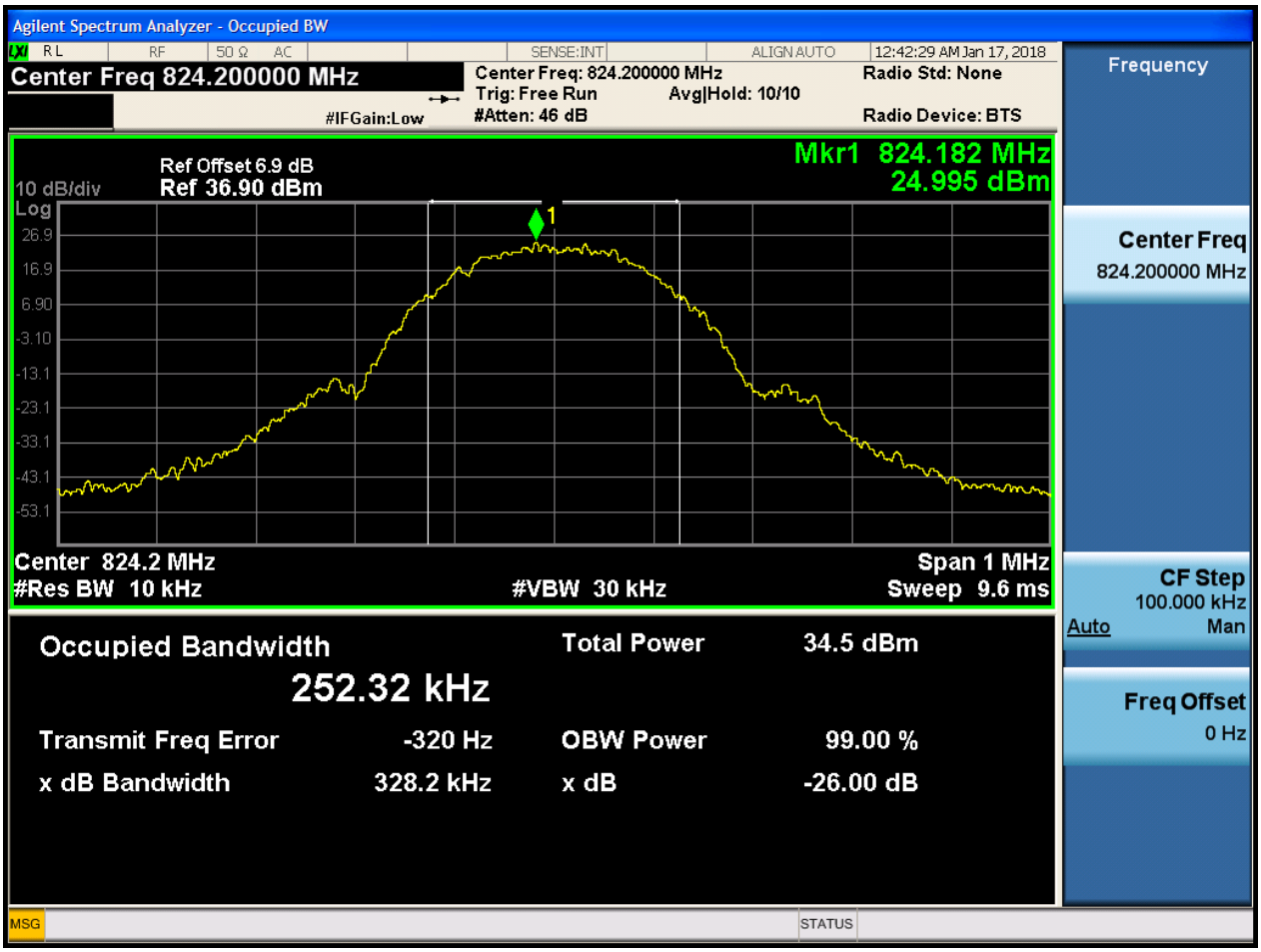


4.1.1.1.3 Test Channel = HCH

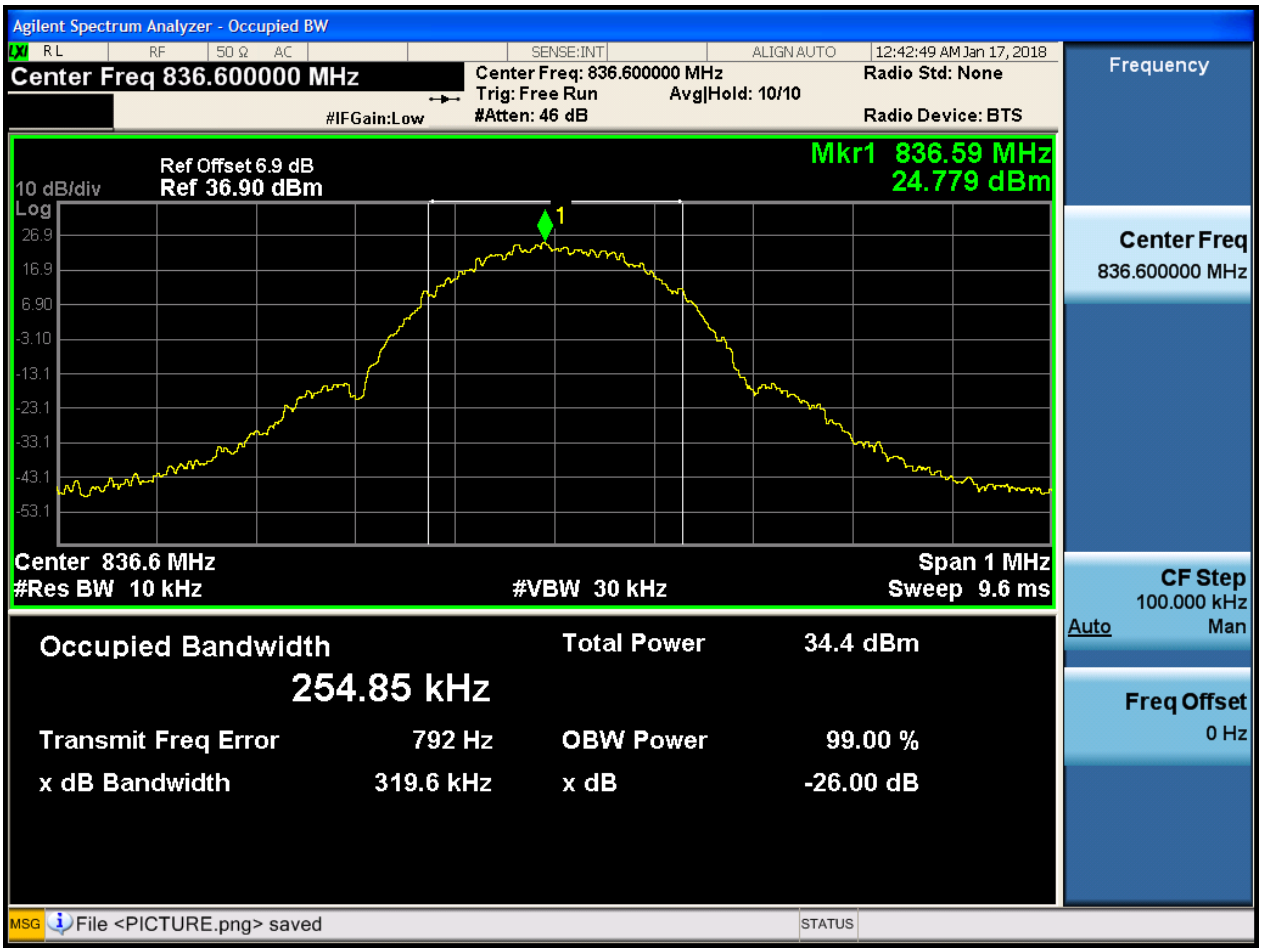


4.1.1.2 Test Mode = GSM/TM2

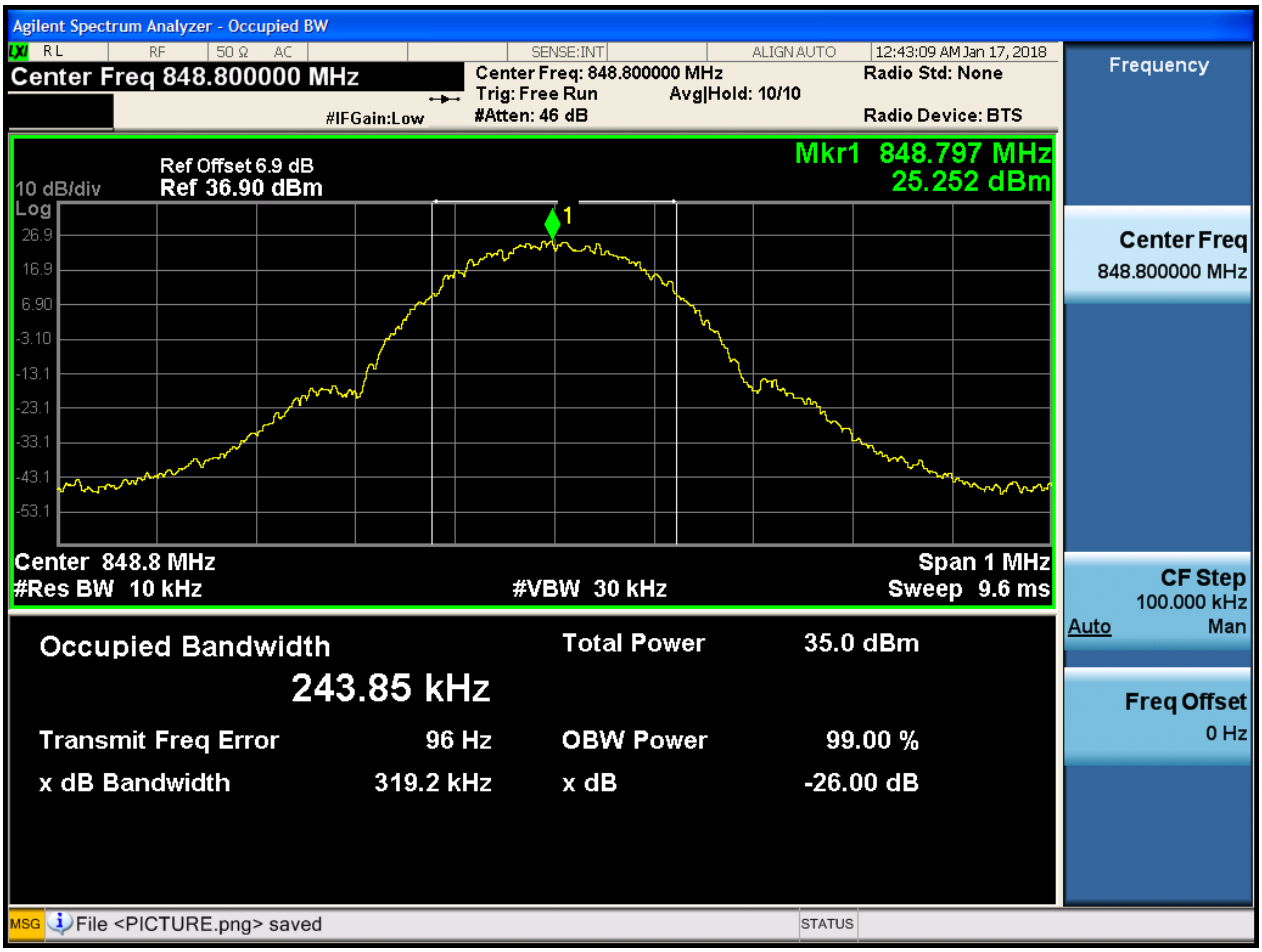
4.1.1.2.1 Test Channel = LCH



4.1.1.2.2 Test Channel = MCH



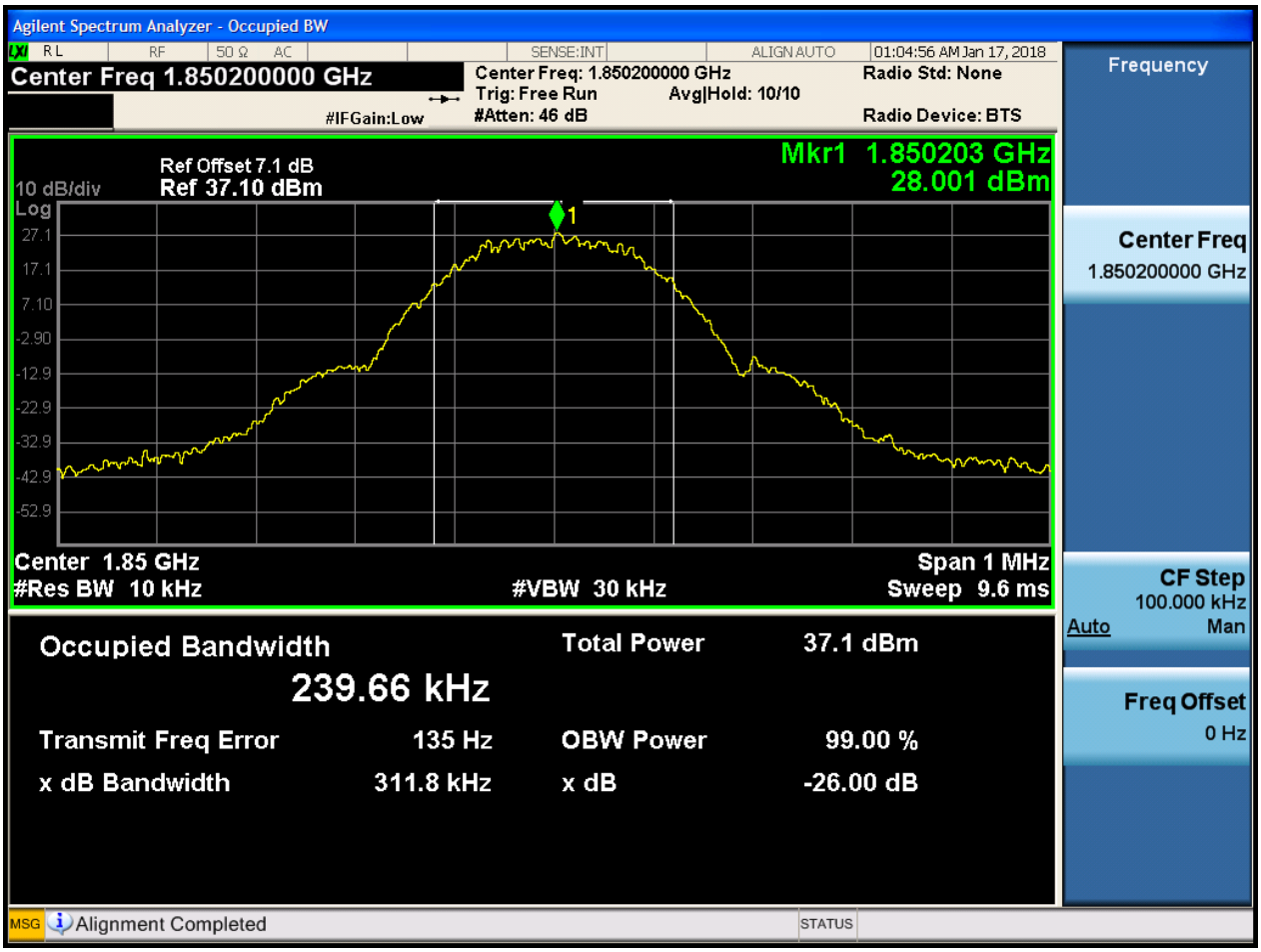
4.1.1.2.3 Test Channel = HCH



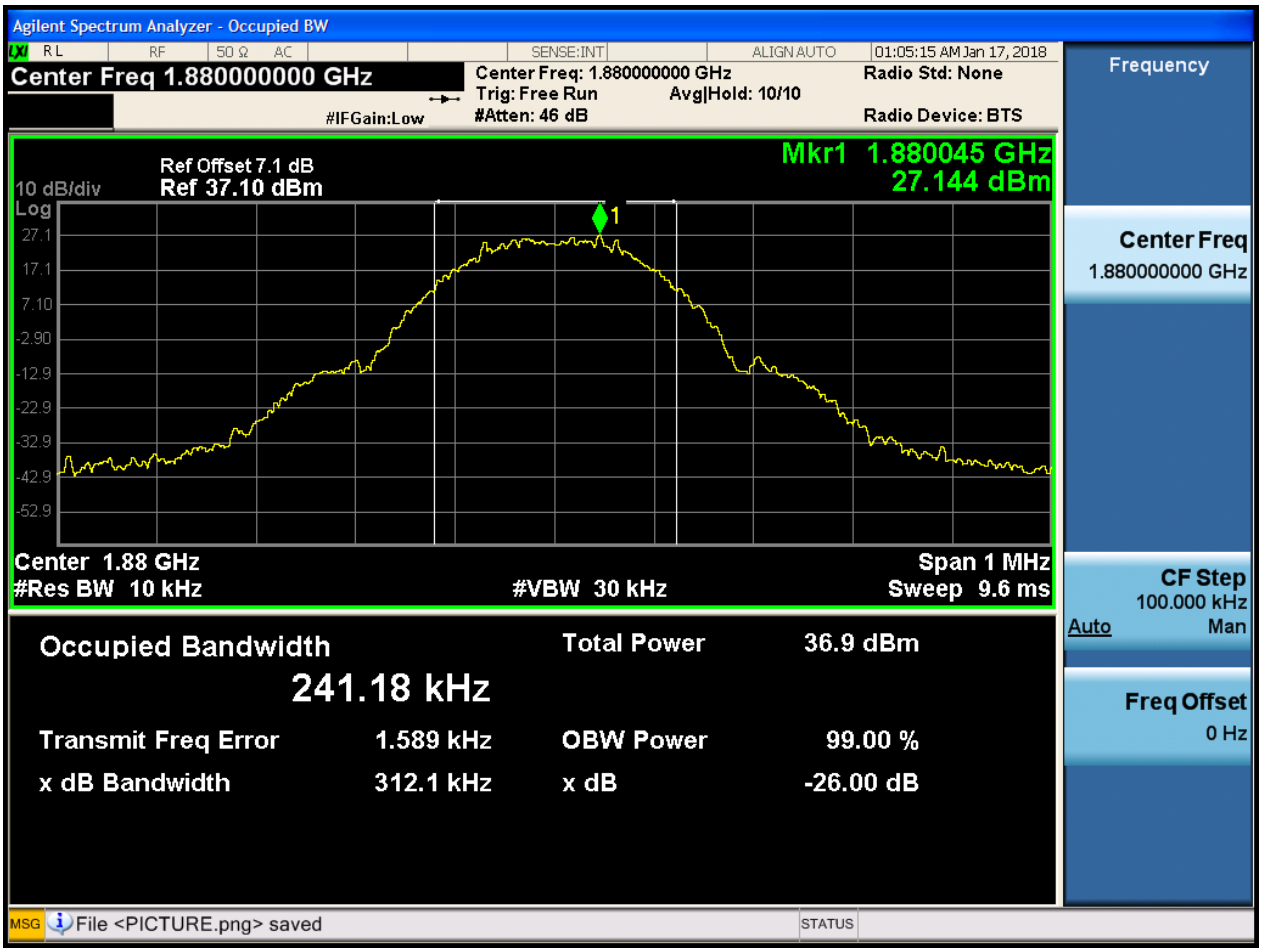
4.1.2 Test Band = GSM1900

4.1.2.1 Test Mode = GSM/TM1

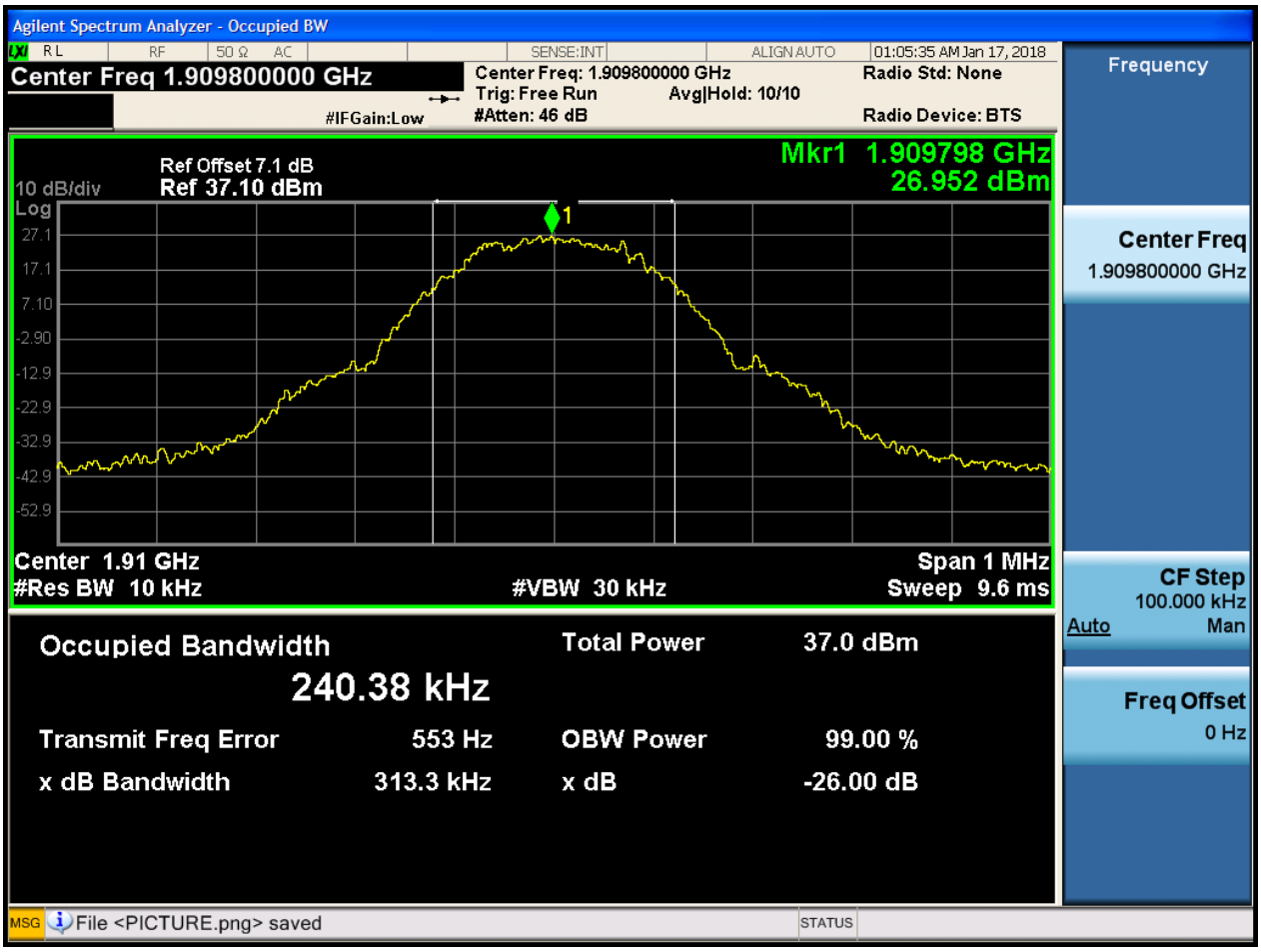
4.1.2.1.1 Test Channel = LCH



4.1.2.1.2 Test Channel = MCH

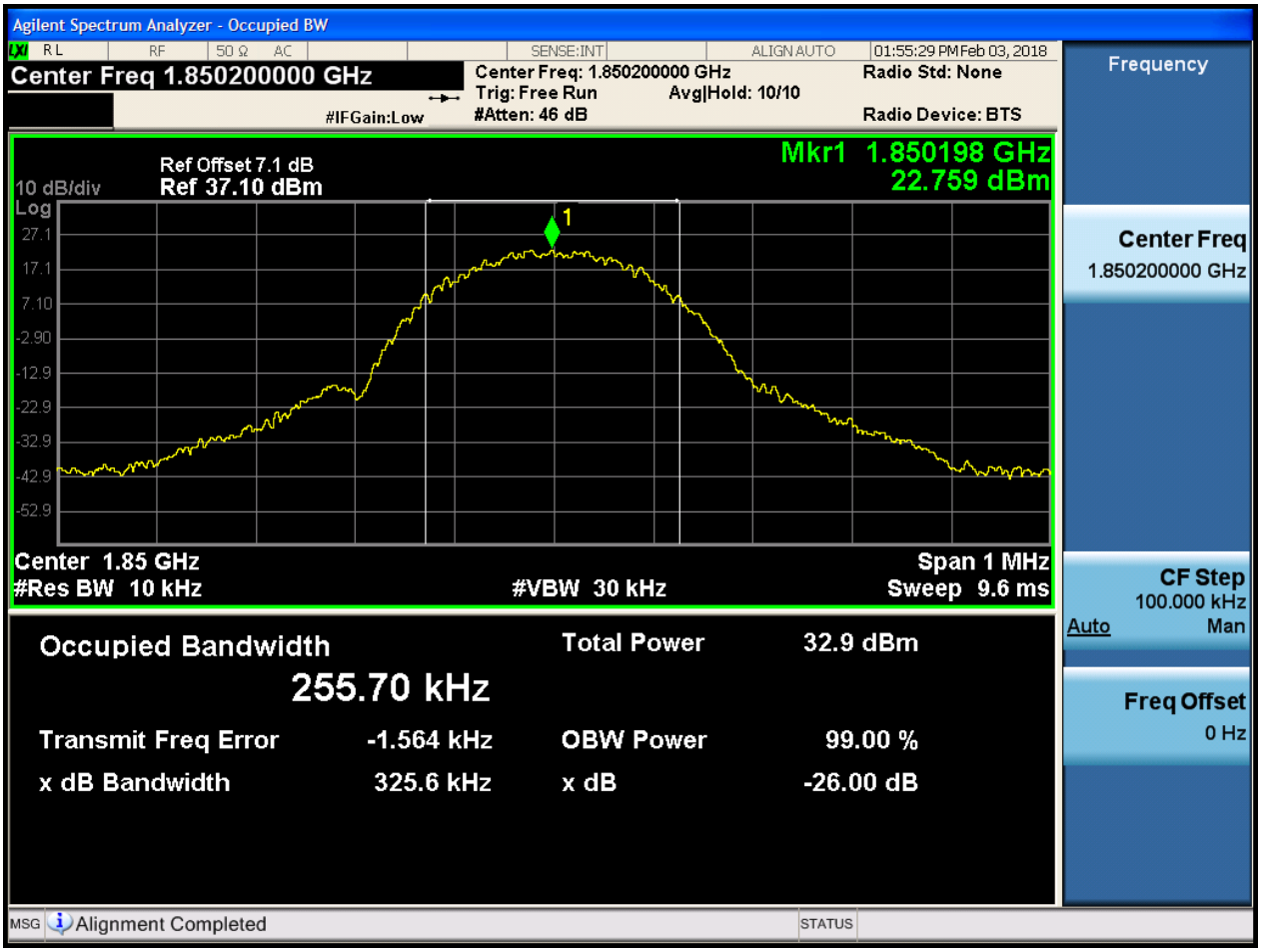


4.1.2.1.3 Test Channel = HCH

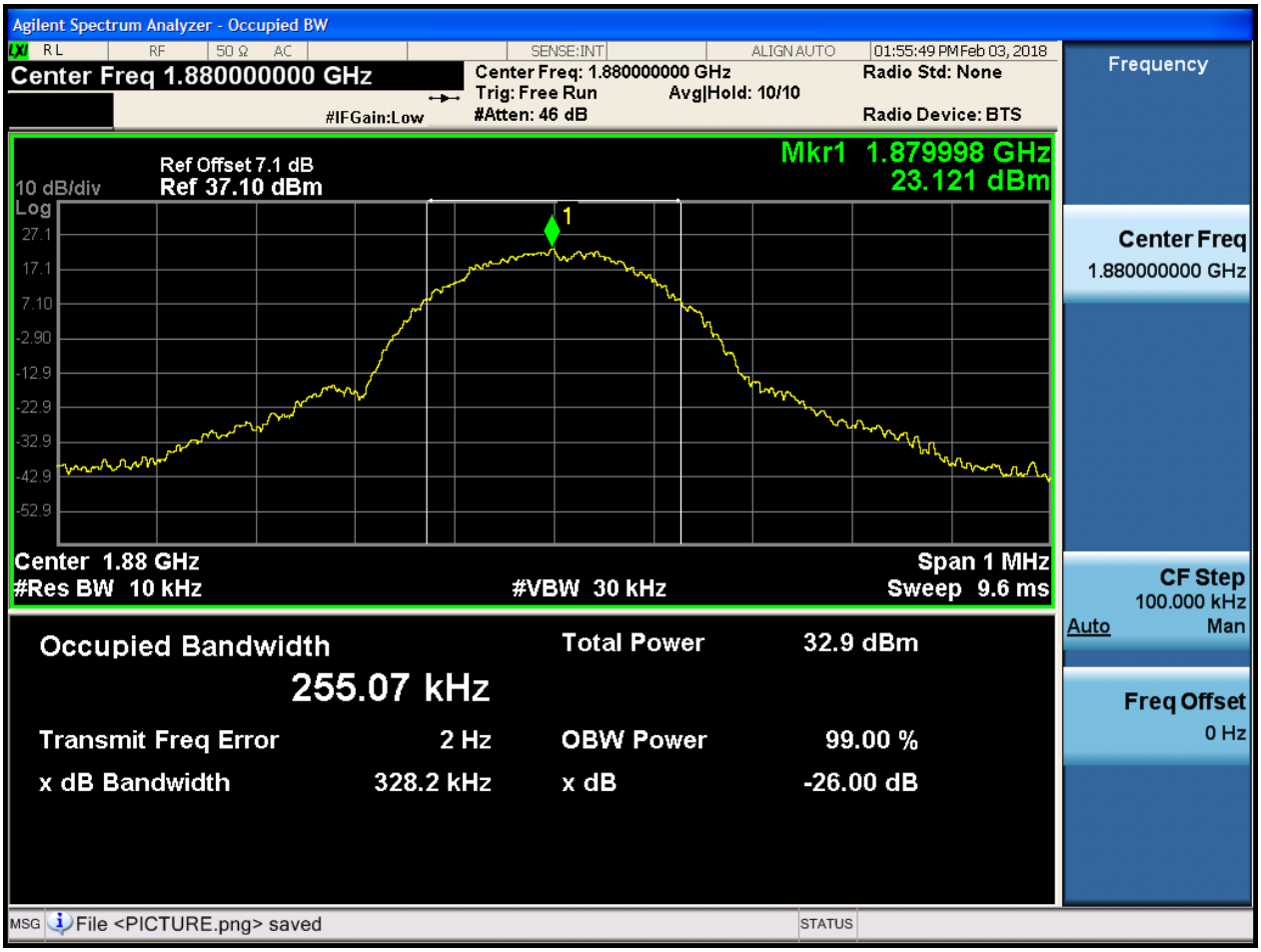


4.1.2.2 Test Mode = GSM/TM2

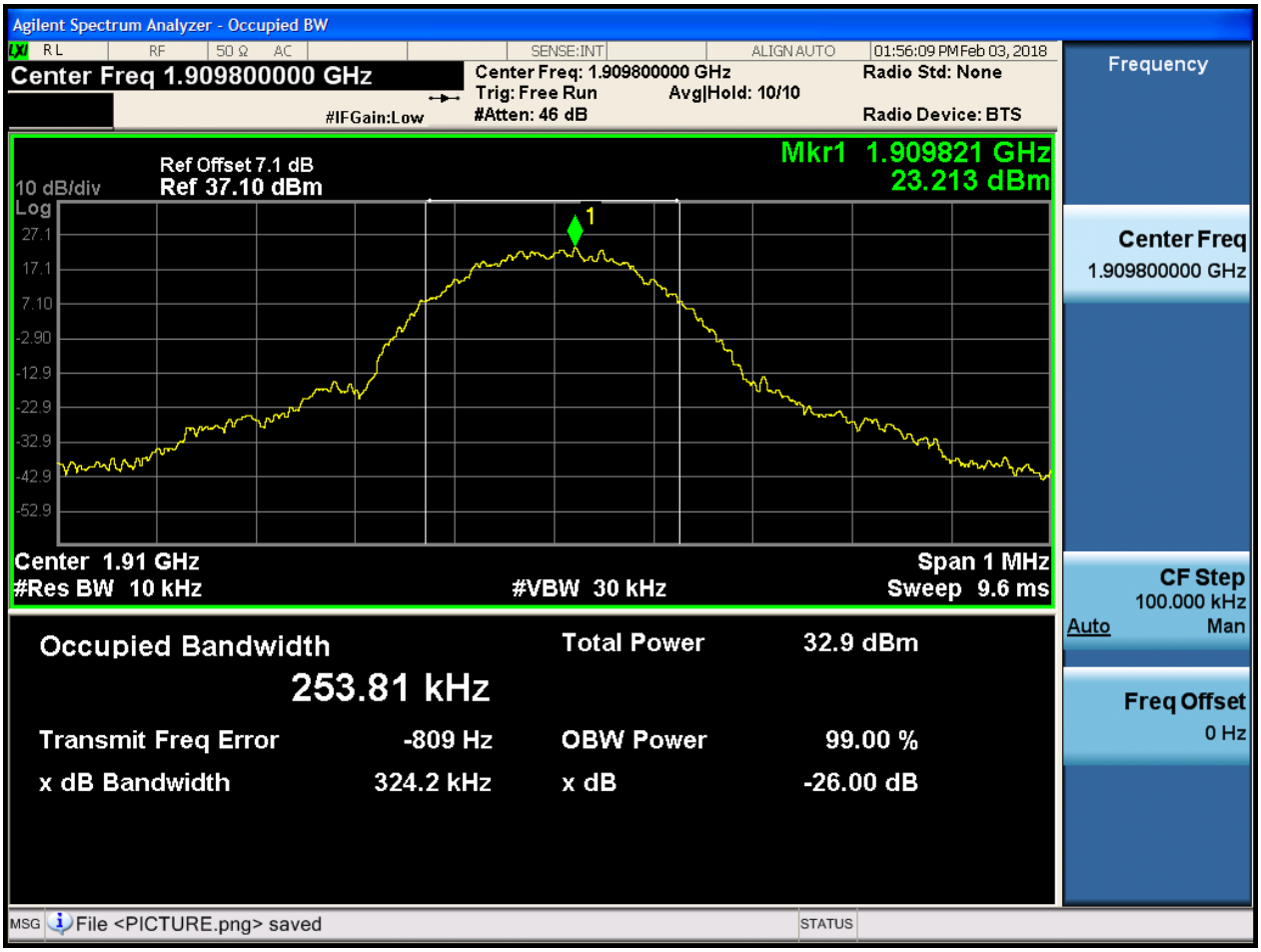
4.1.2.2.1 Test Channel = LCH



4.1.2.2.2 Test Channel = MCH



4.1.2.2.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

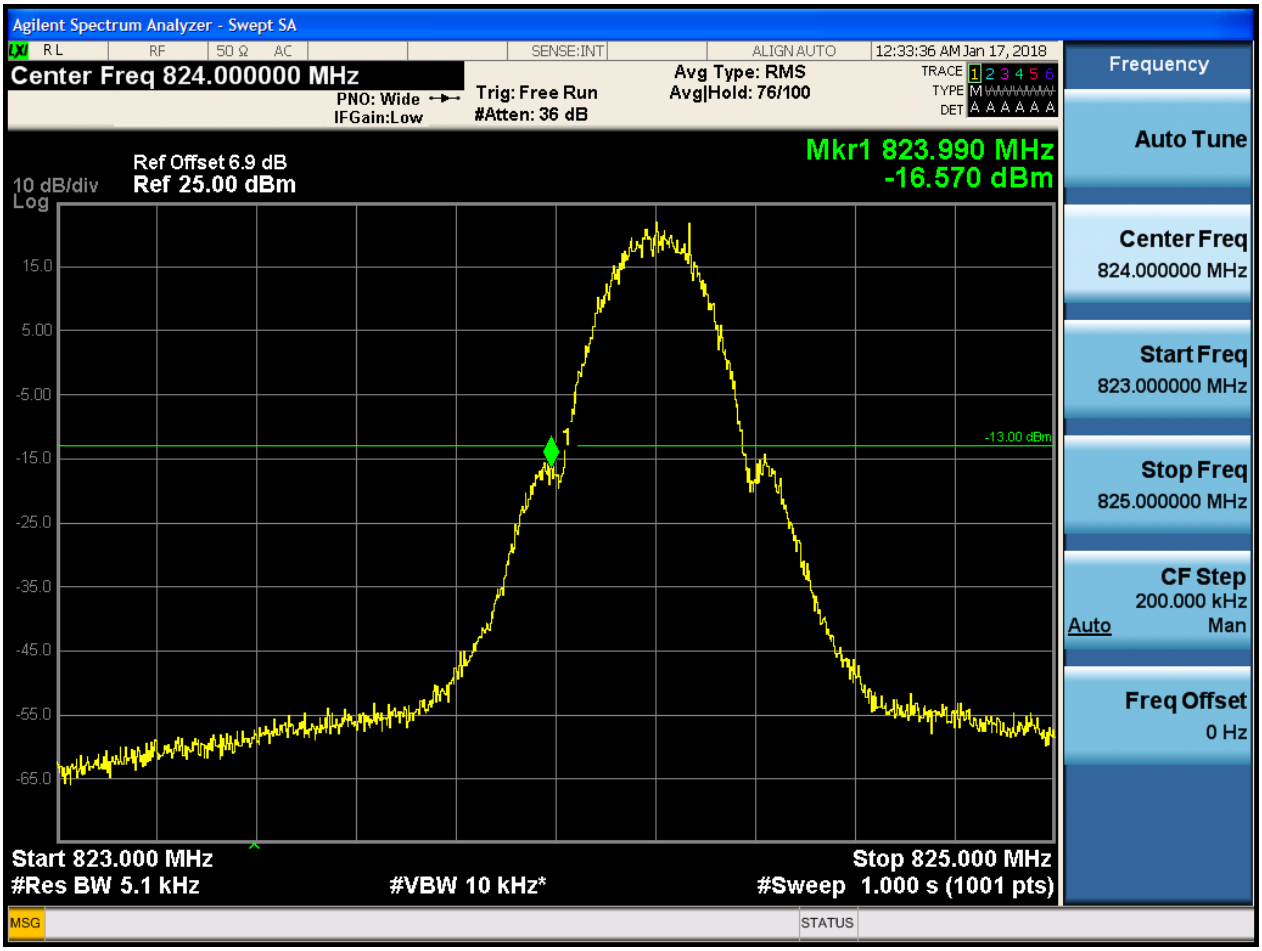
Part I - Test Plots

5.1 For GSM

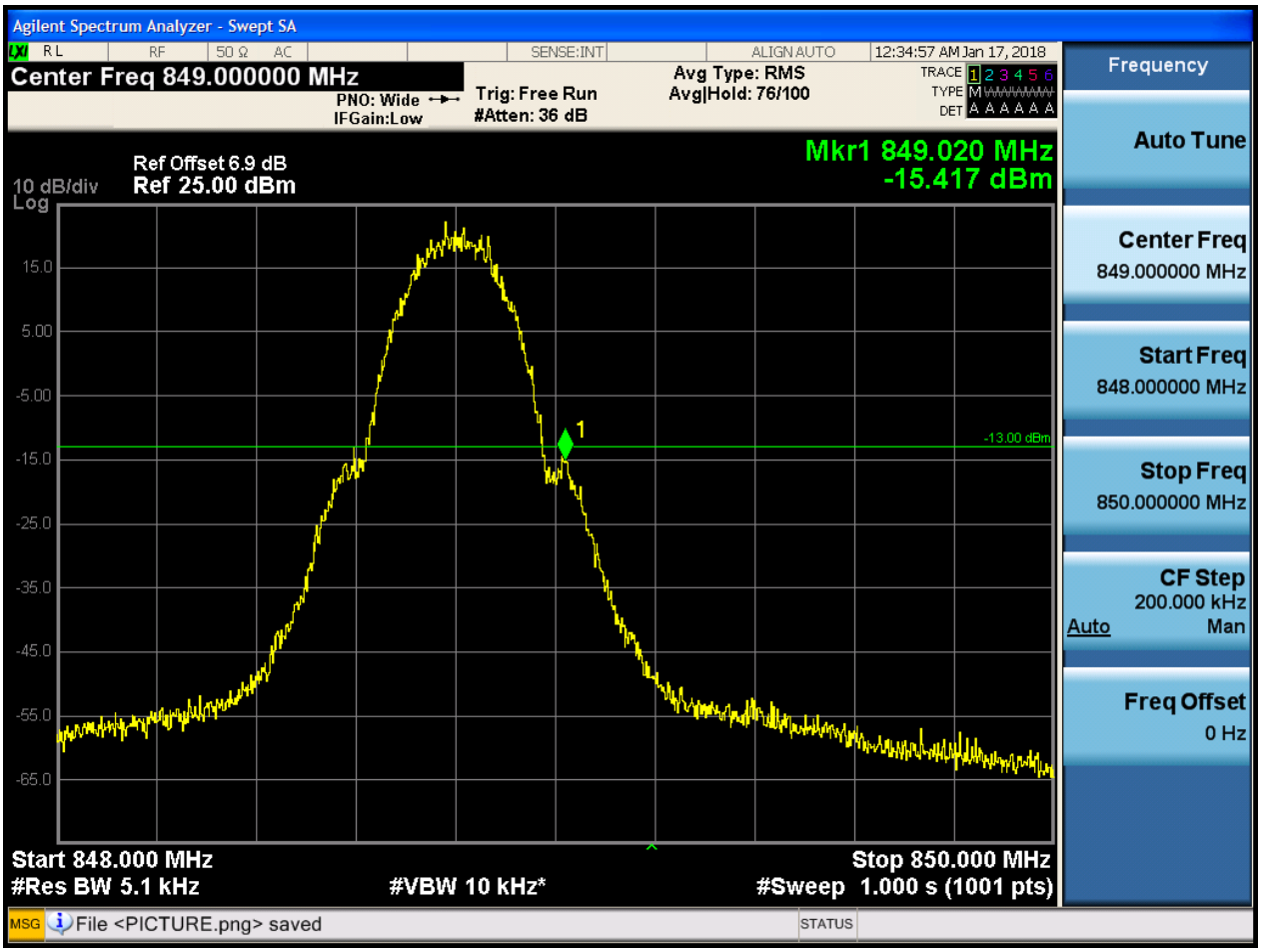
5.1.1 Test Band = GSM850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH

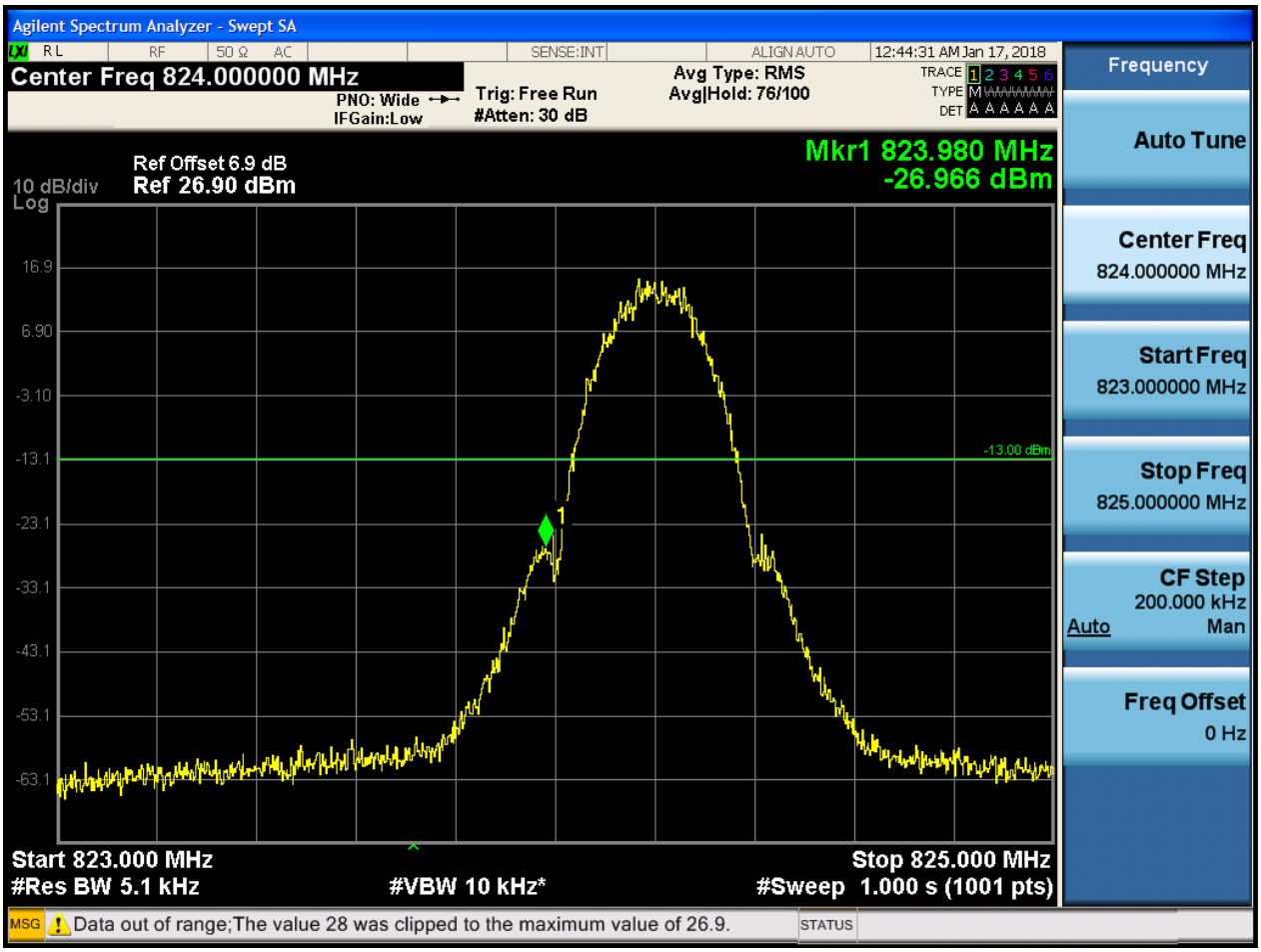


5.1.1.1.2 Test Channel = HCH

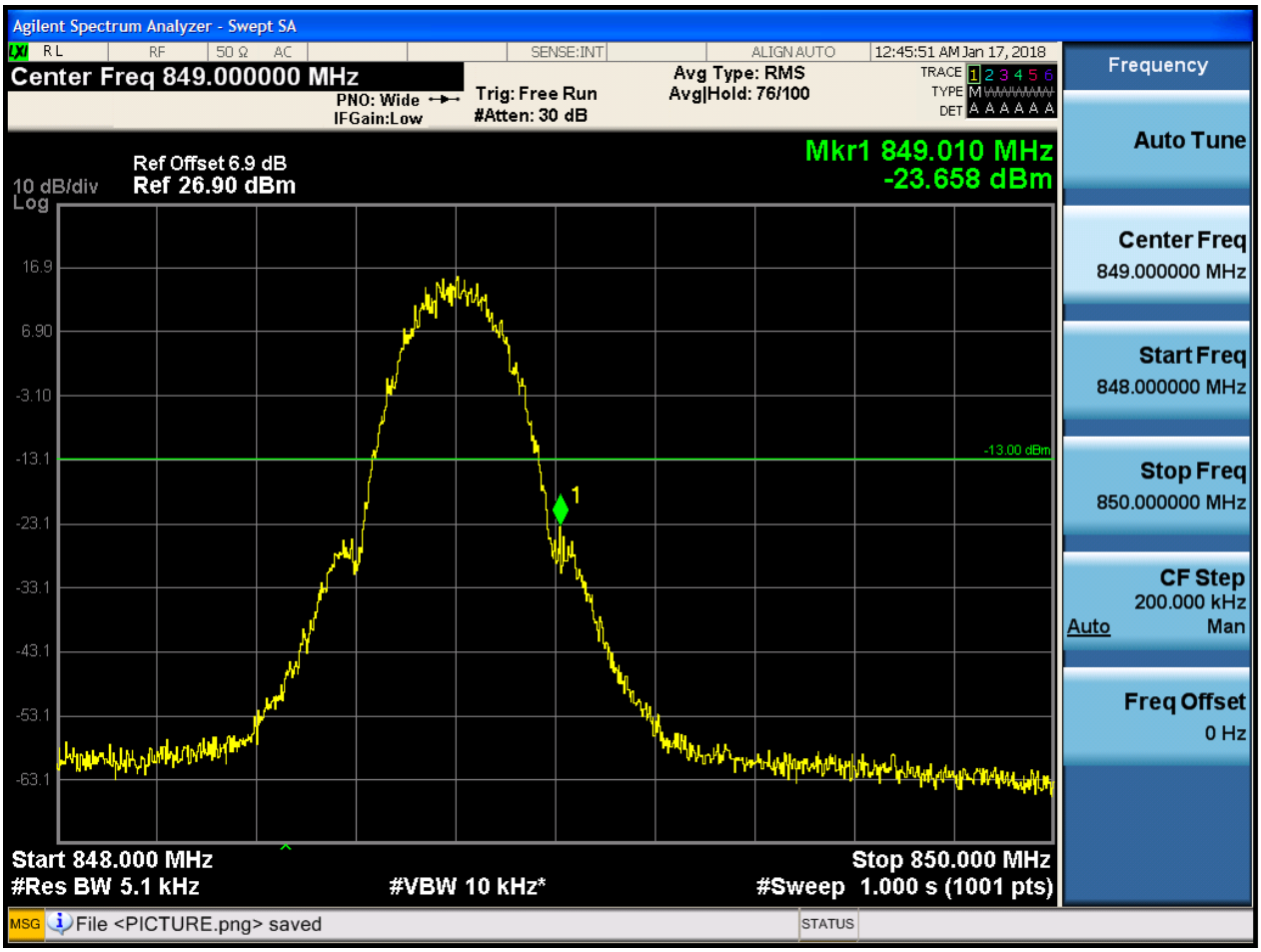


5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



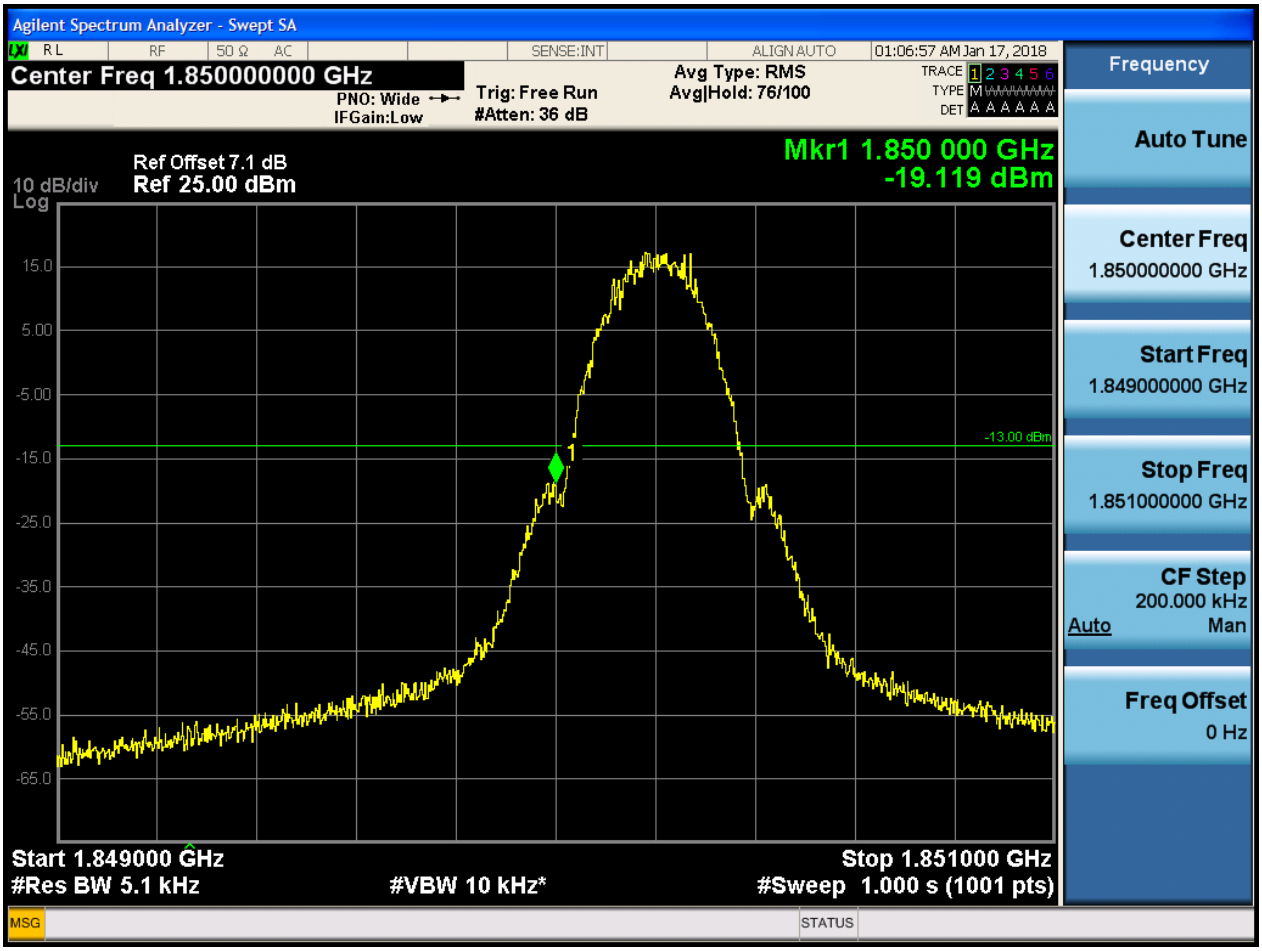
5.1.1.2.2 Test Channel = HCH



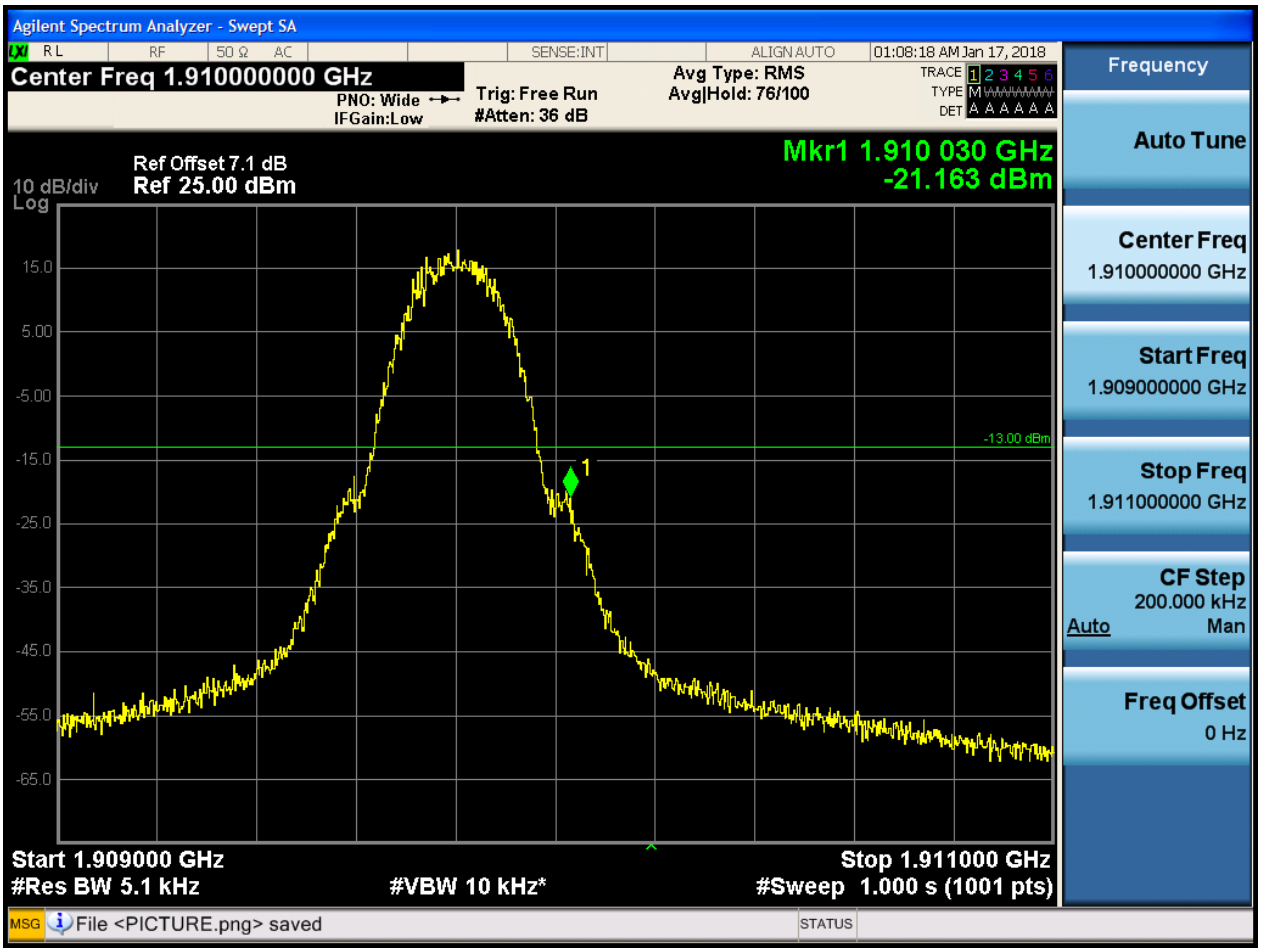
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH

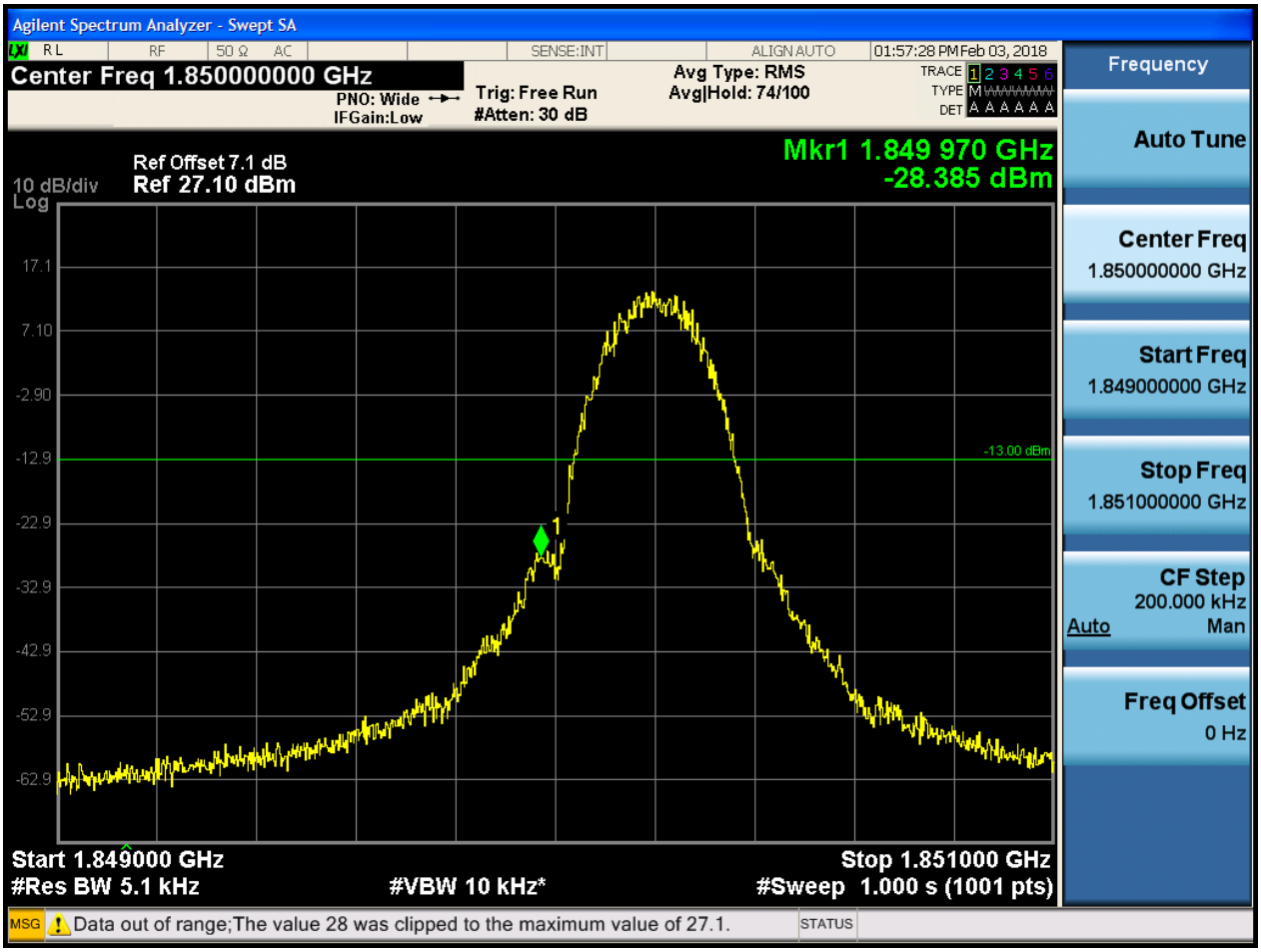


5.1.2.1.2 Test Channel = HCH

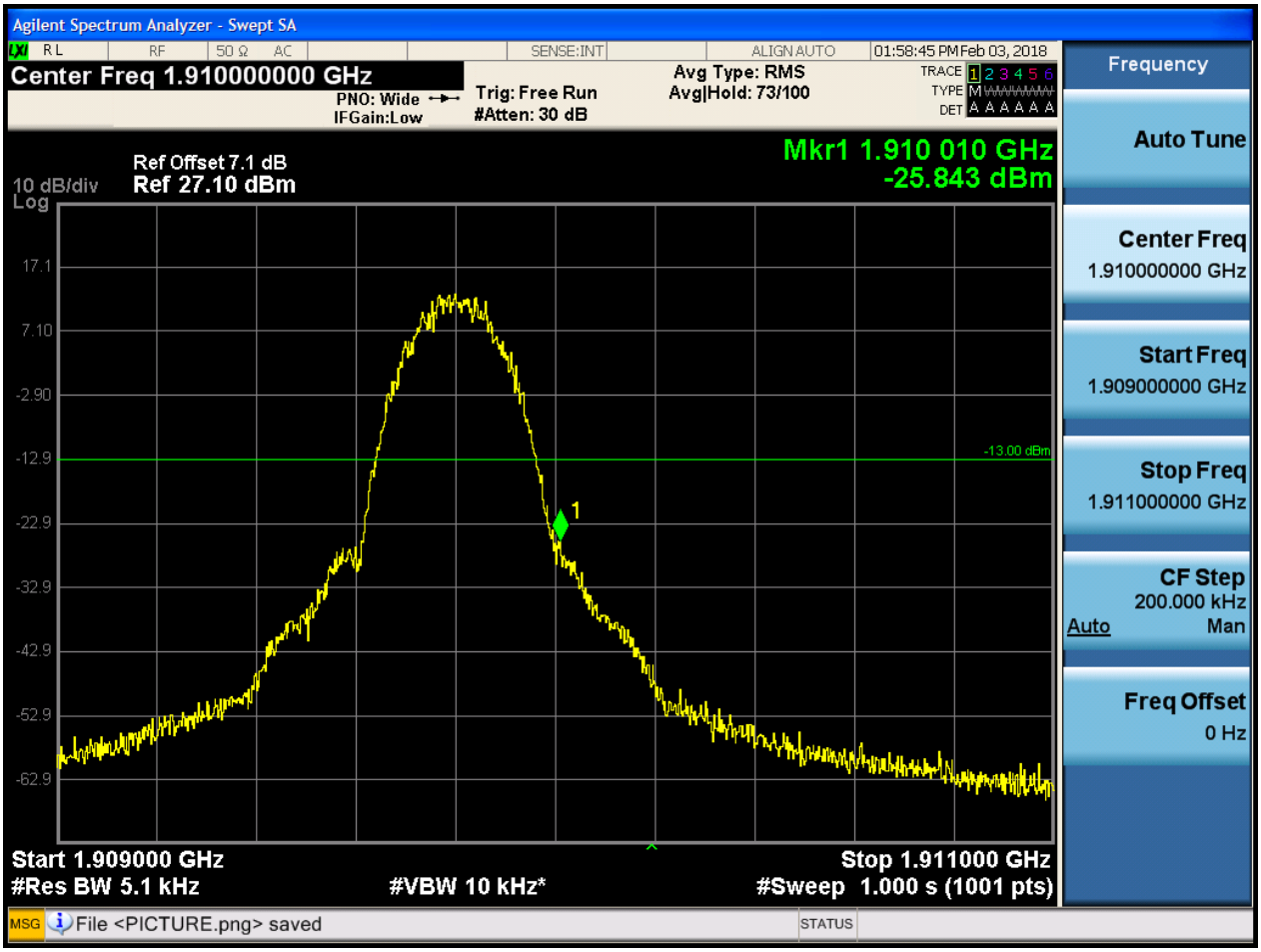


5.1.2.2 Test Mode = GSM/TM2

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.

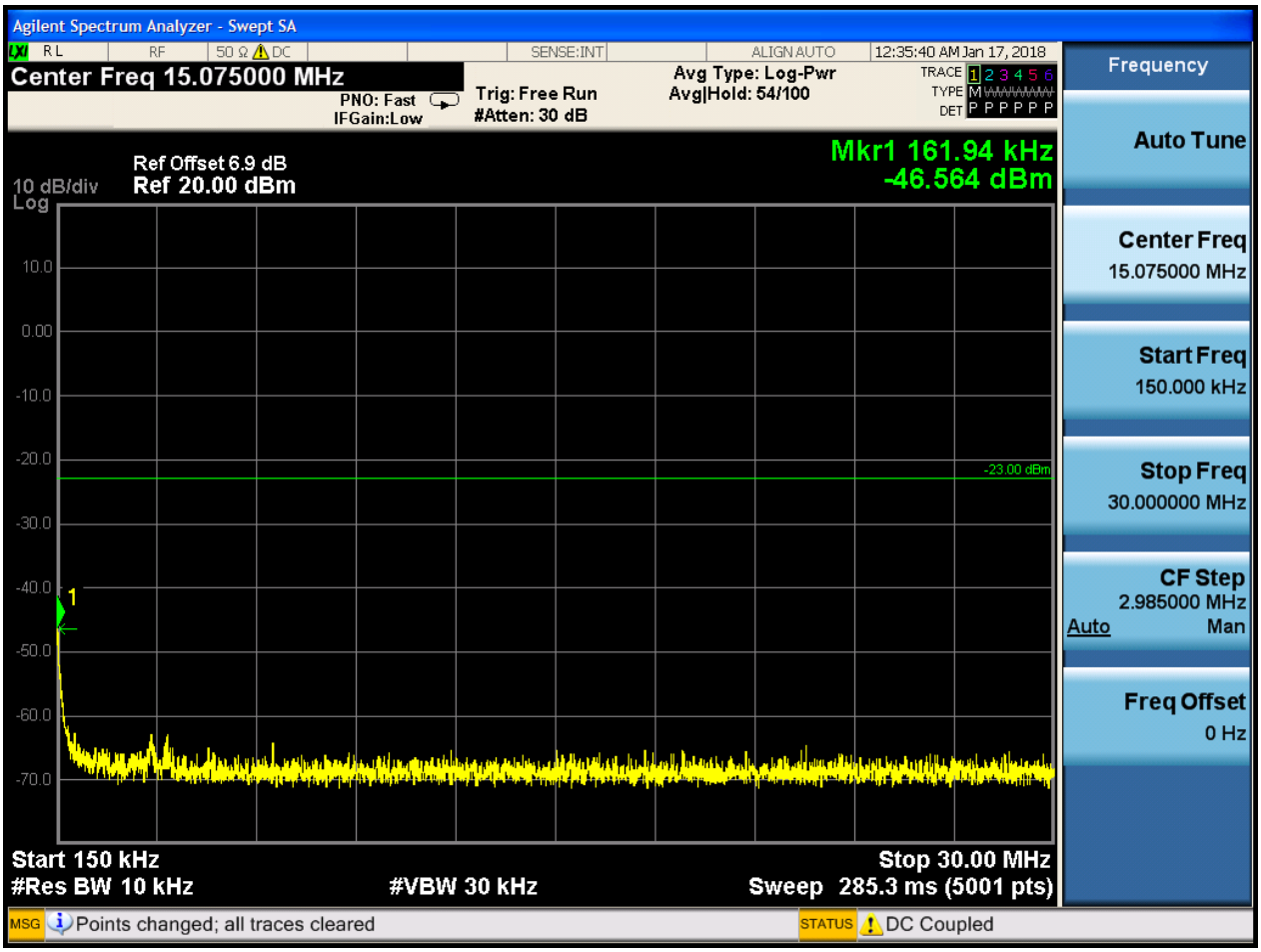
Part I - Test Plots

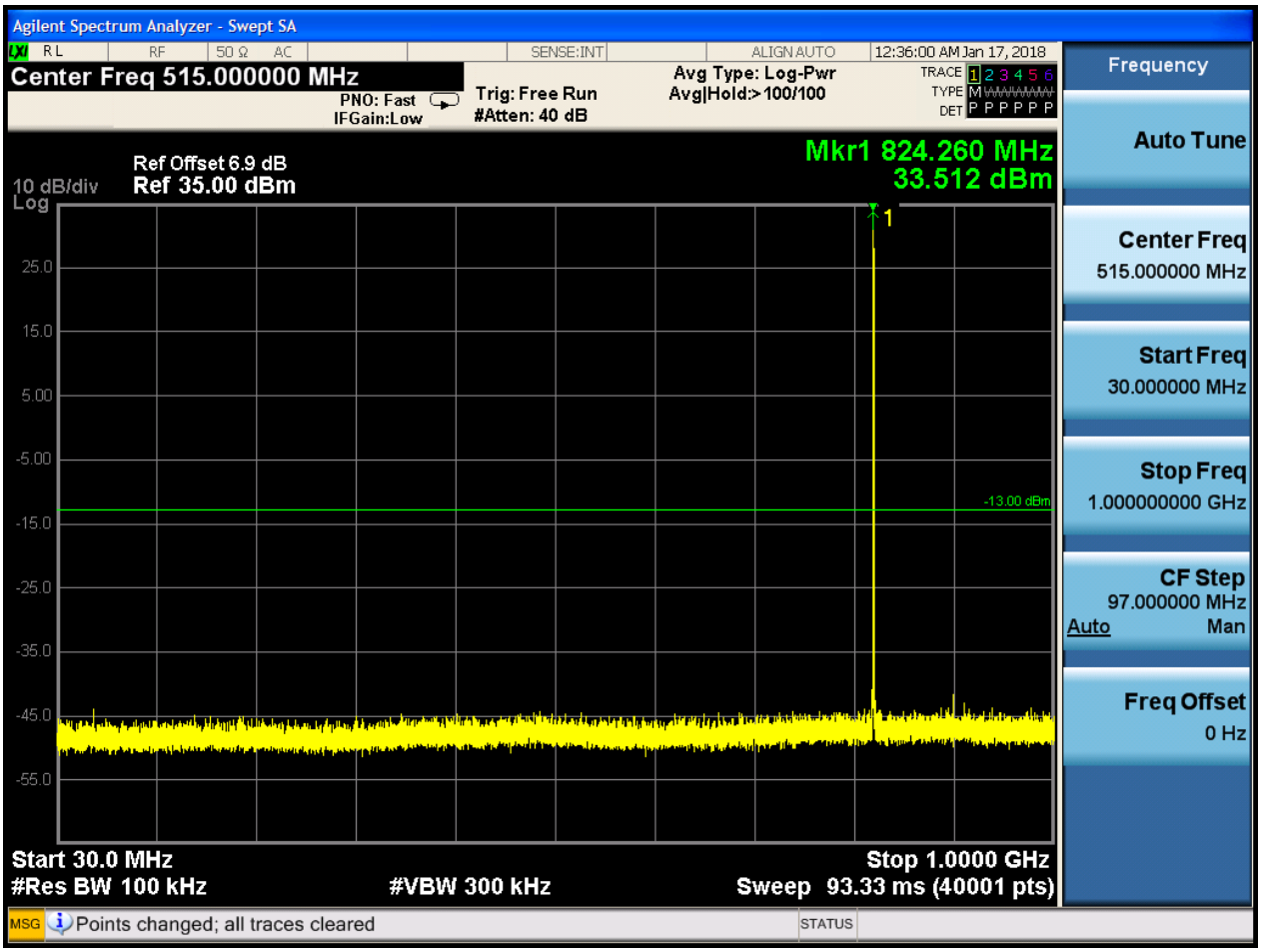
6.1 For GSM

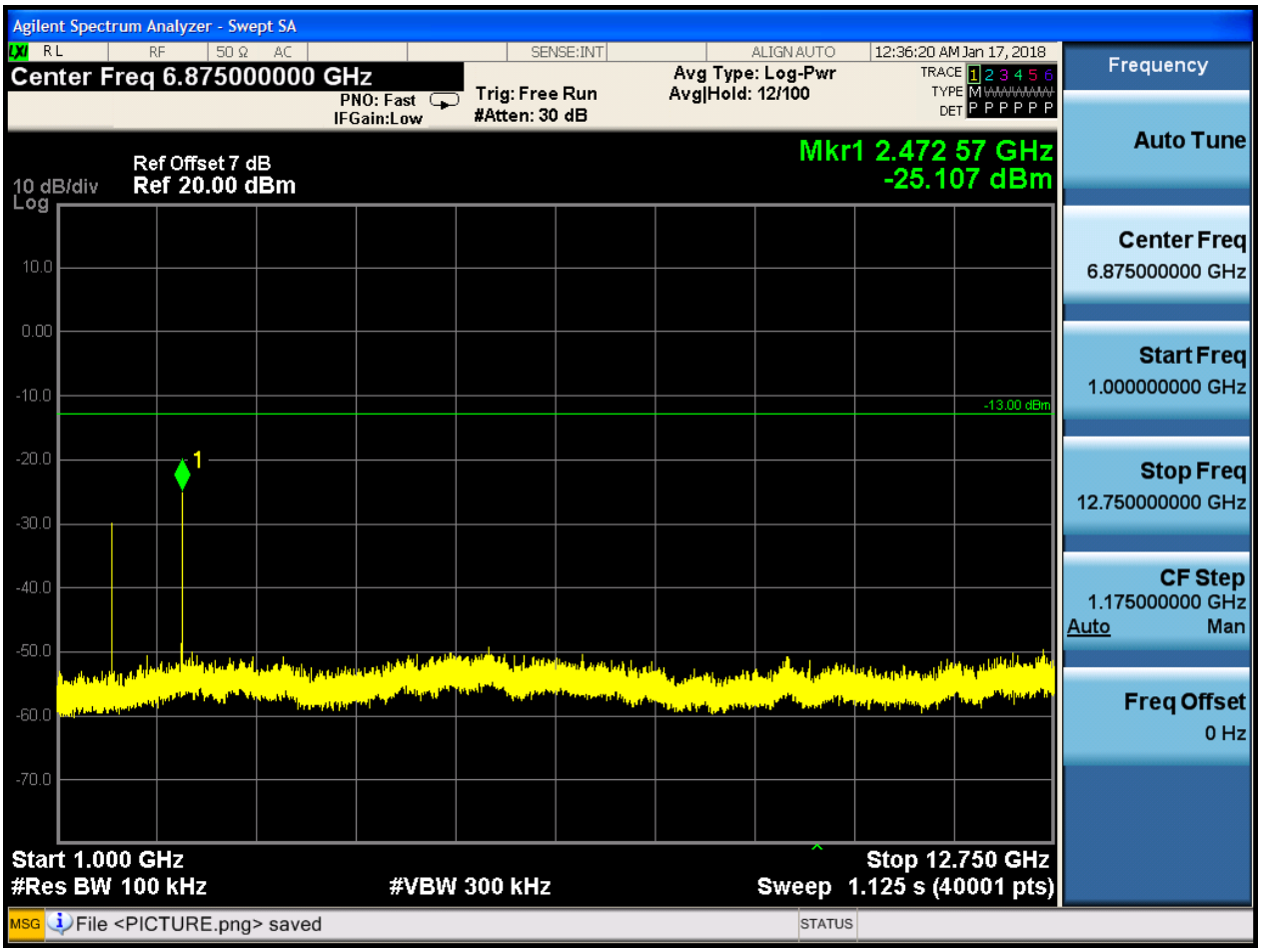
6.1.1 Test Band = GSM850

6.1.1.1 Test Mode = GSM/TM1

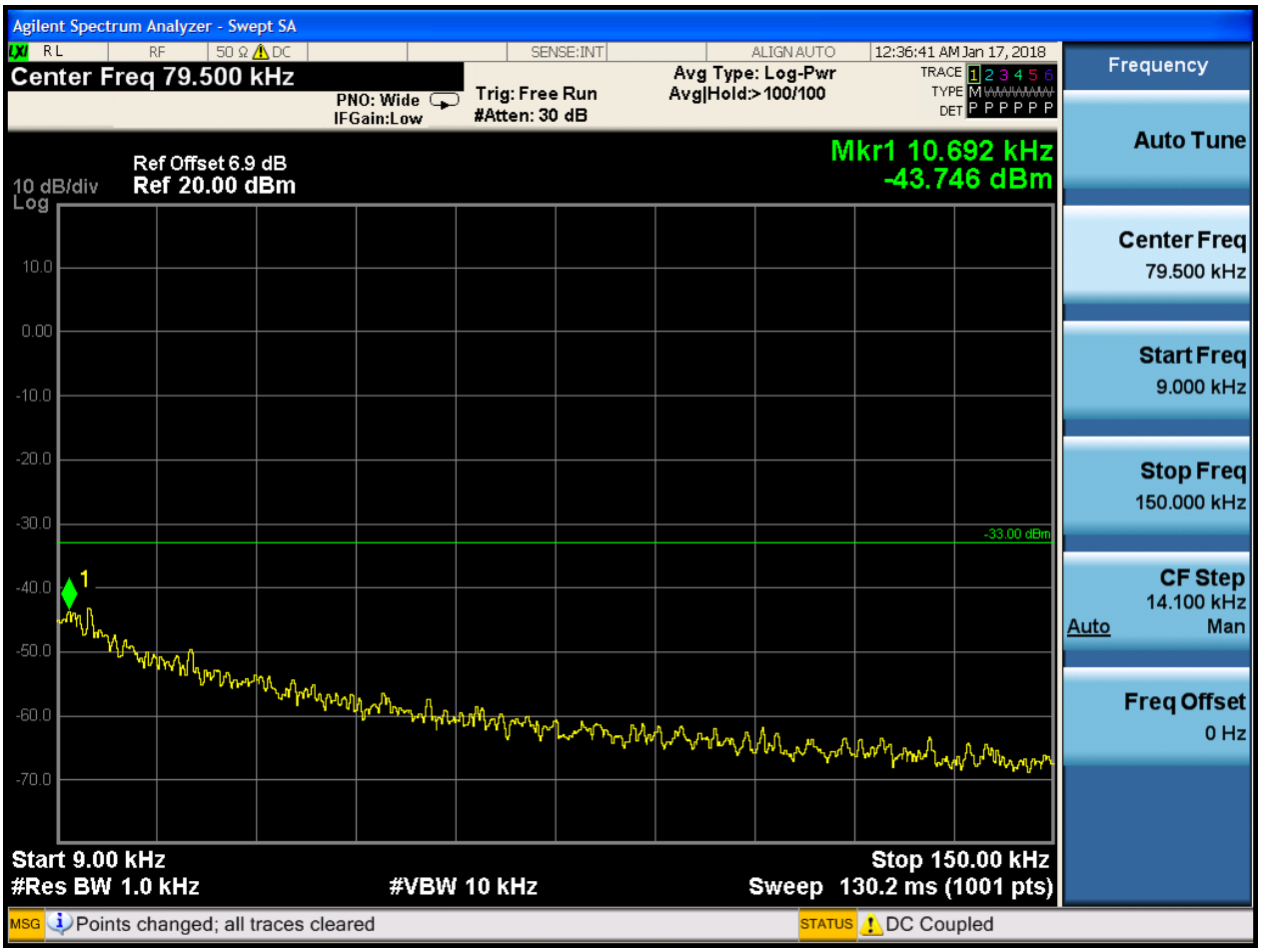
6.1.1.1.1 Test Channel = LCH

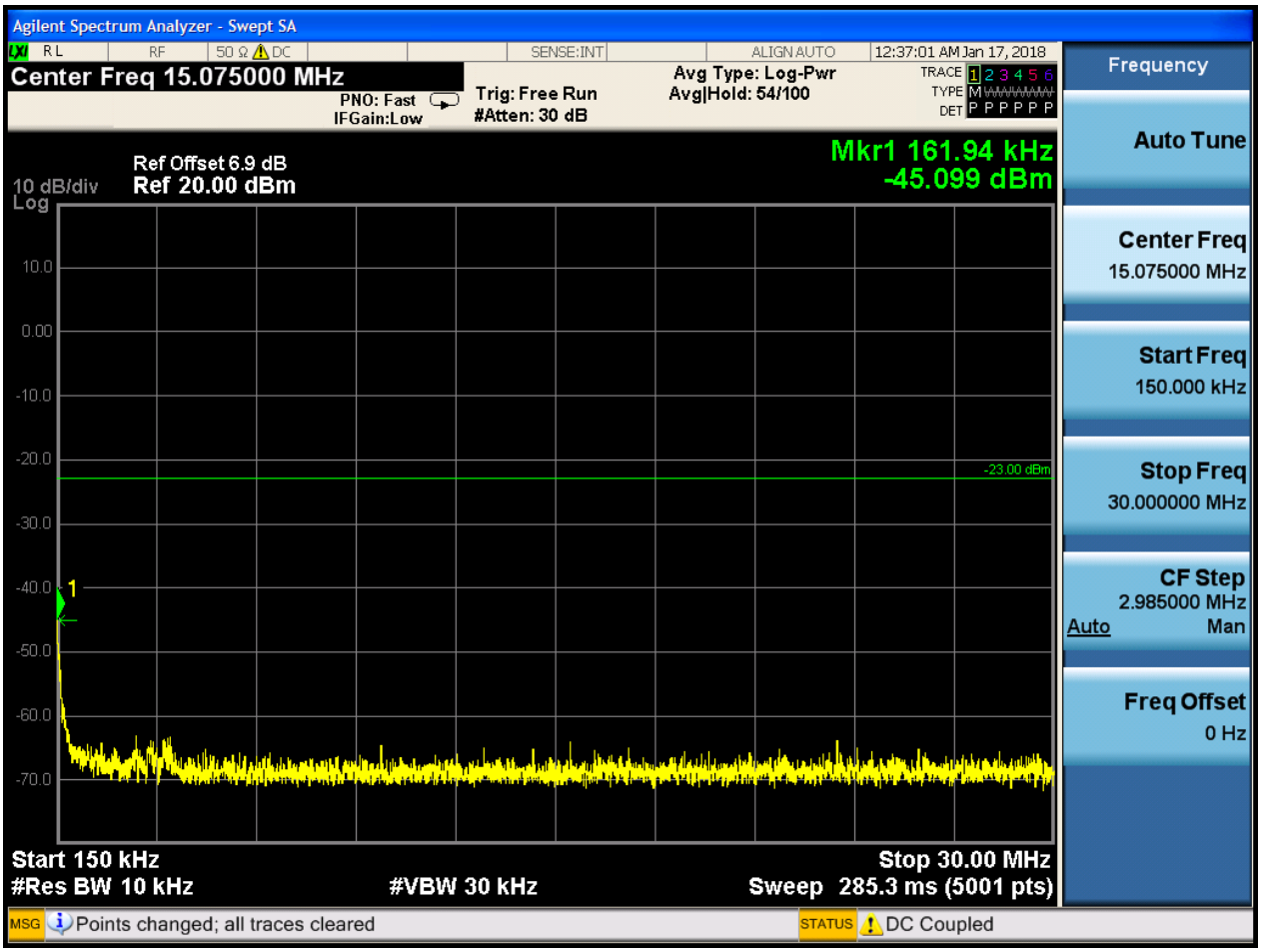


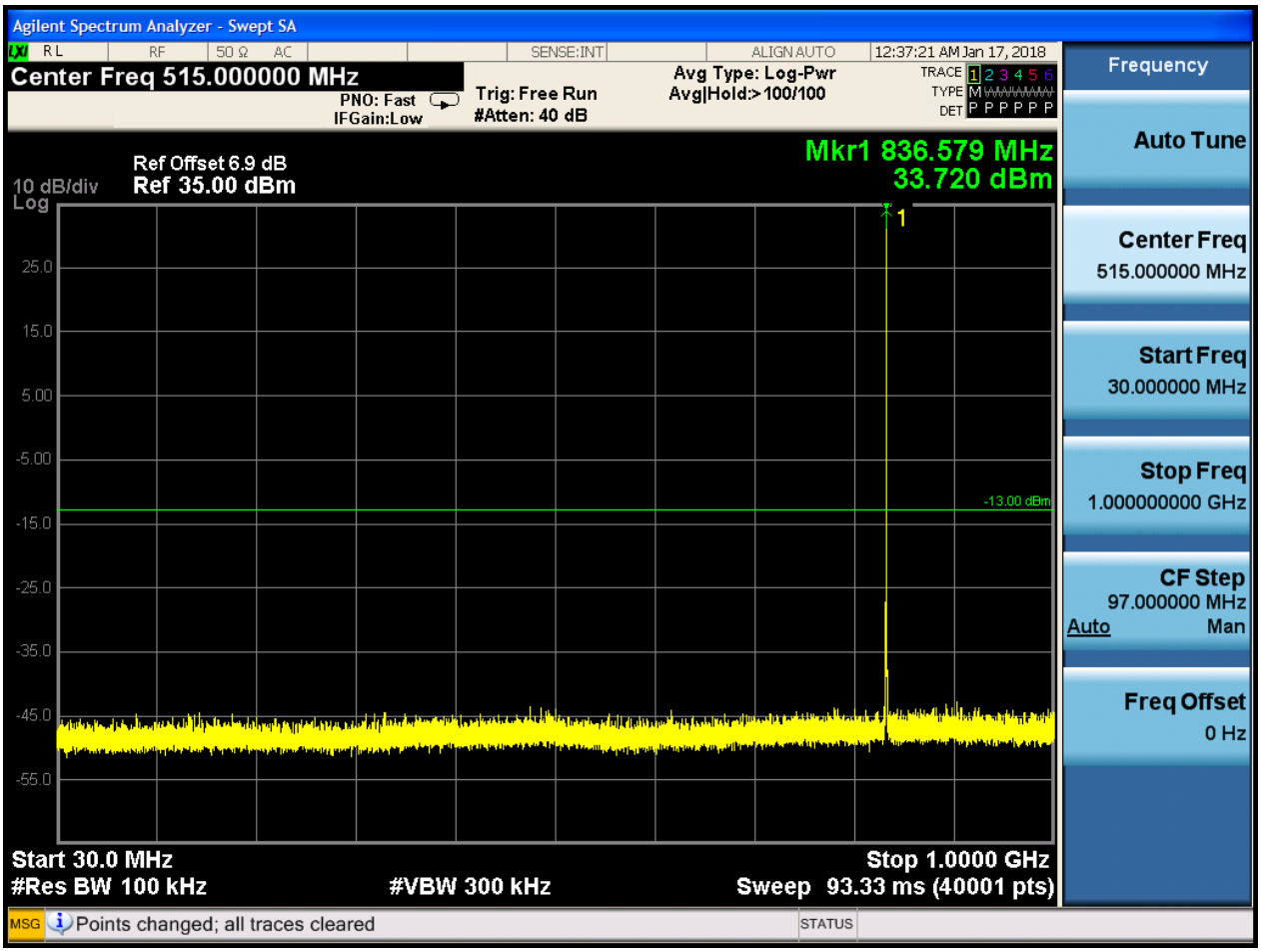


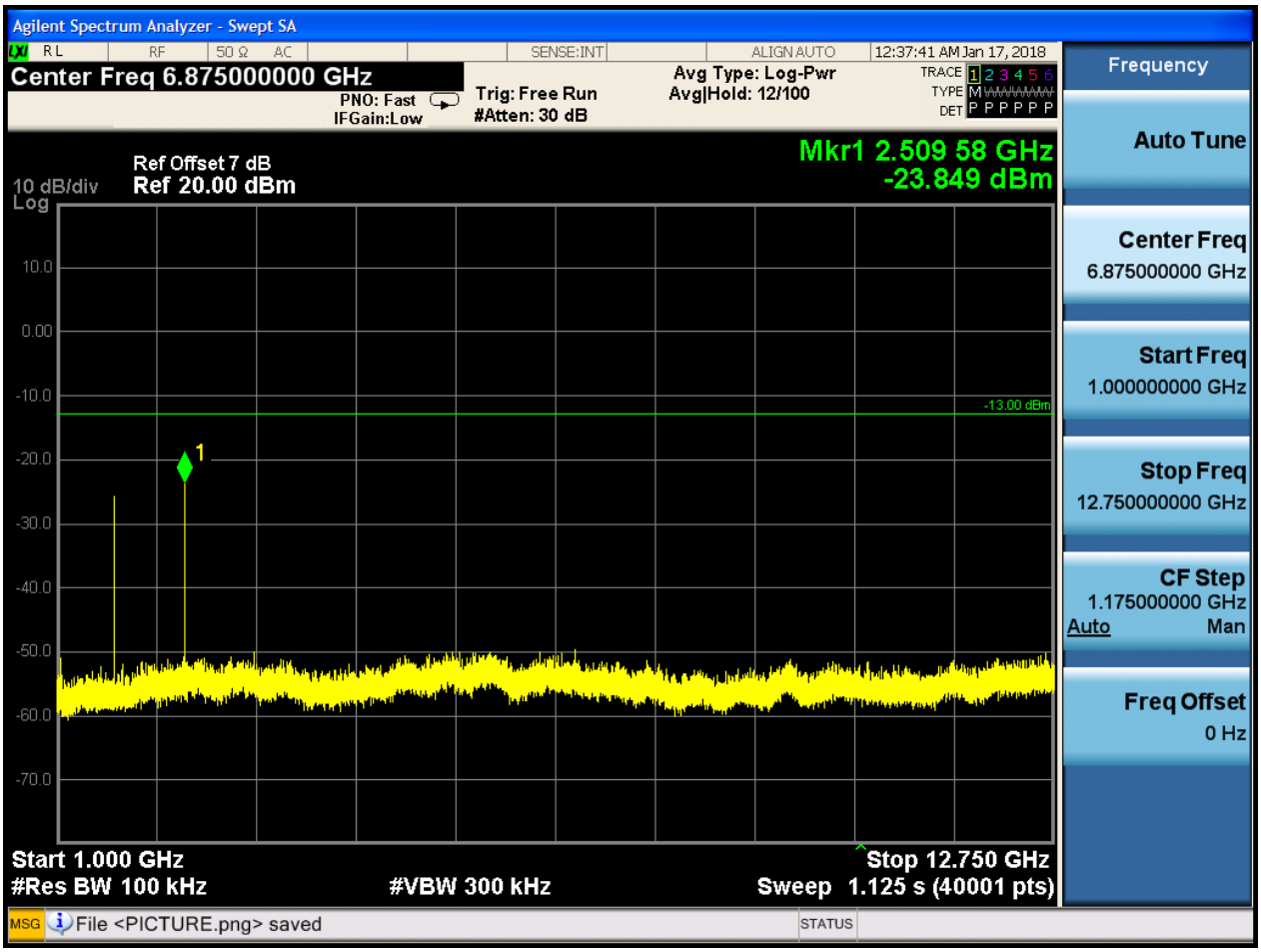


6.1.1.1.2 Test Channel = MCH

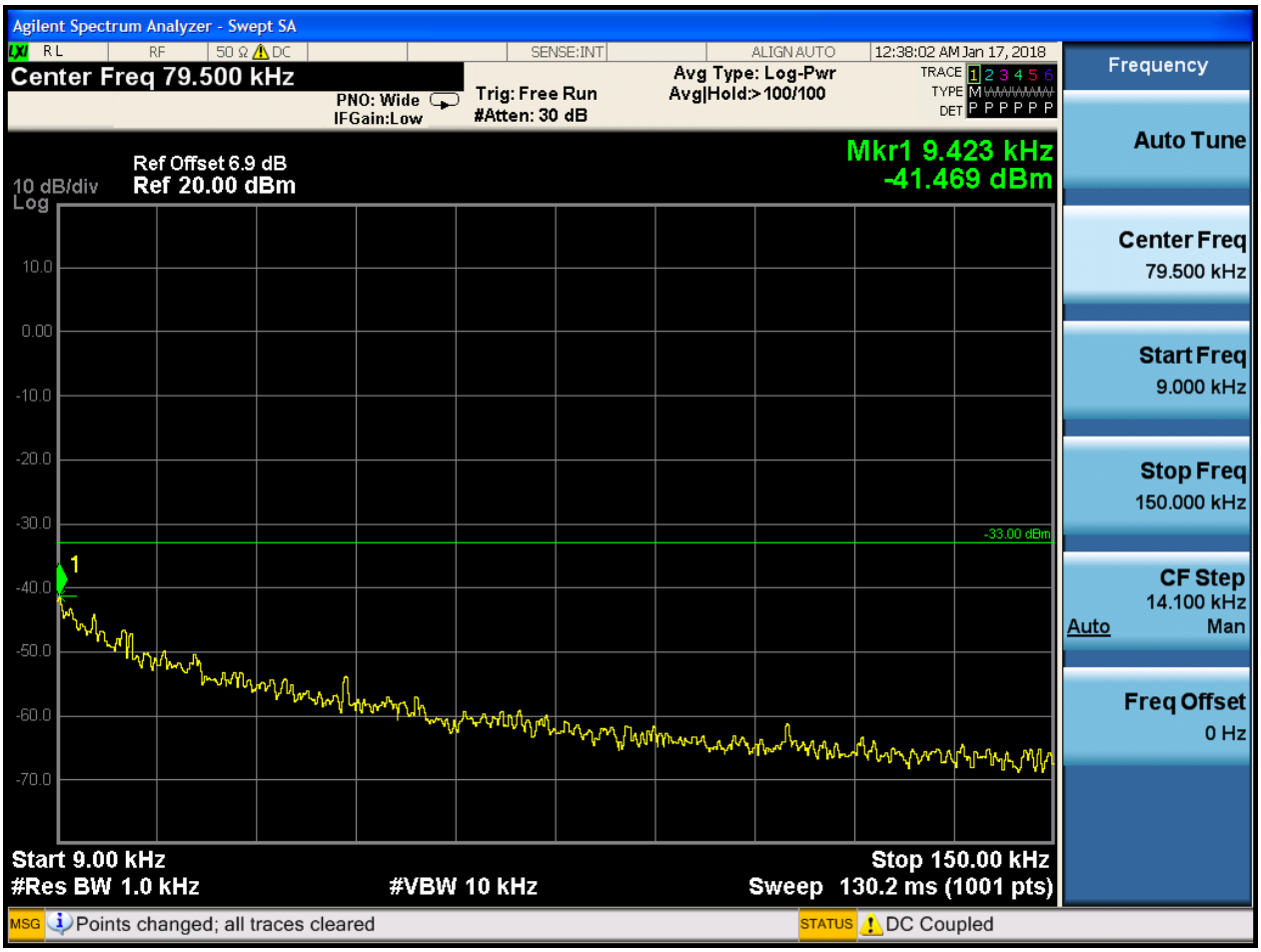


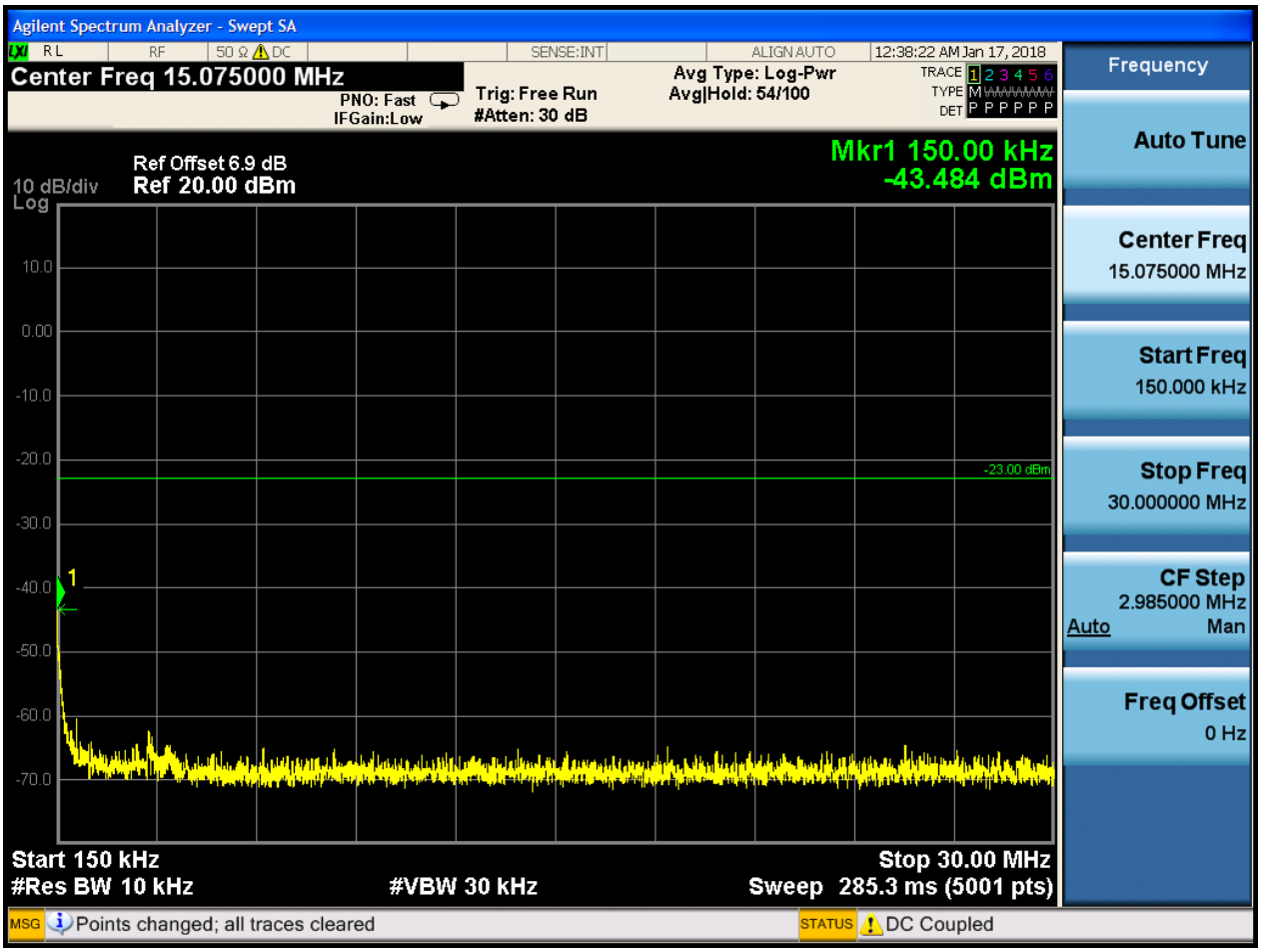


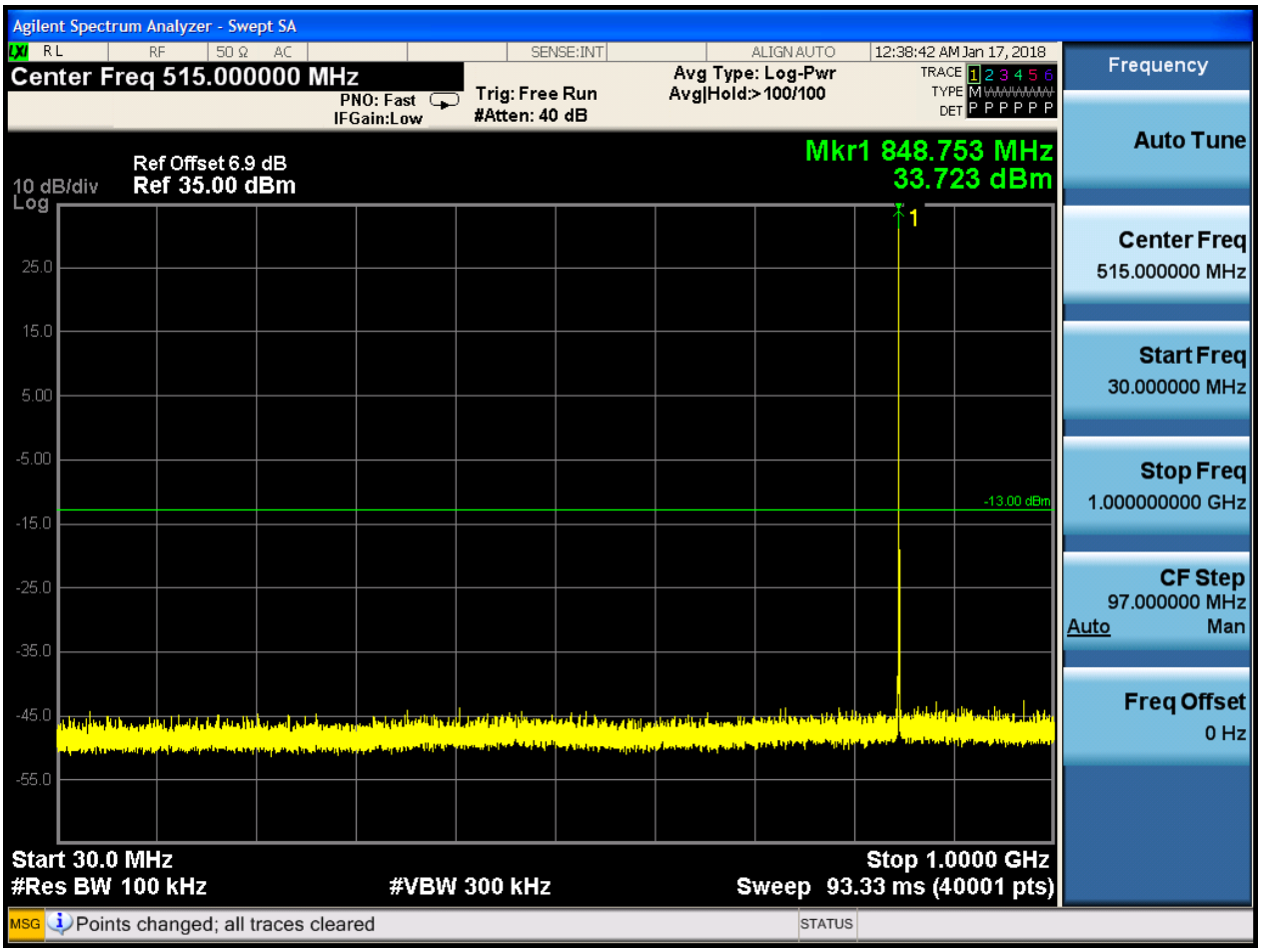


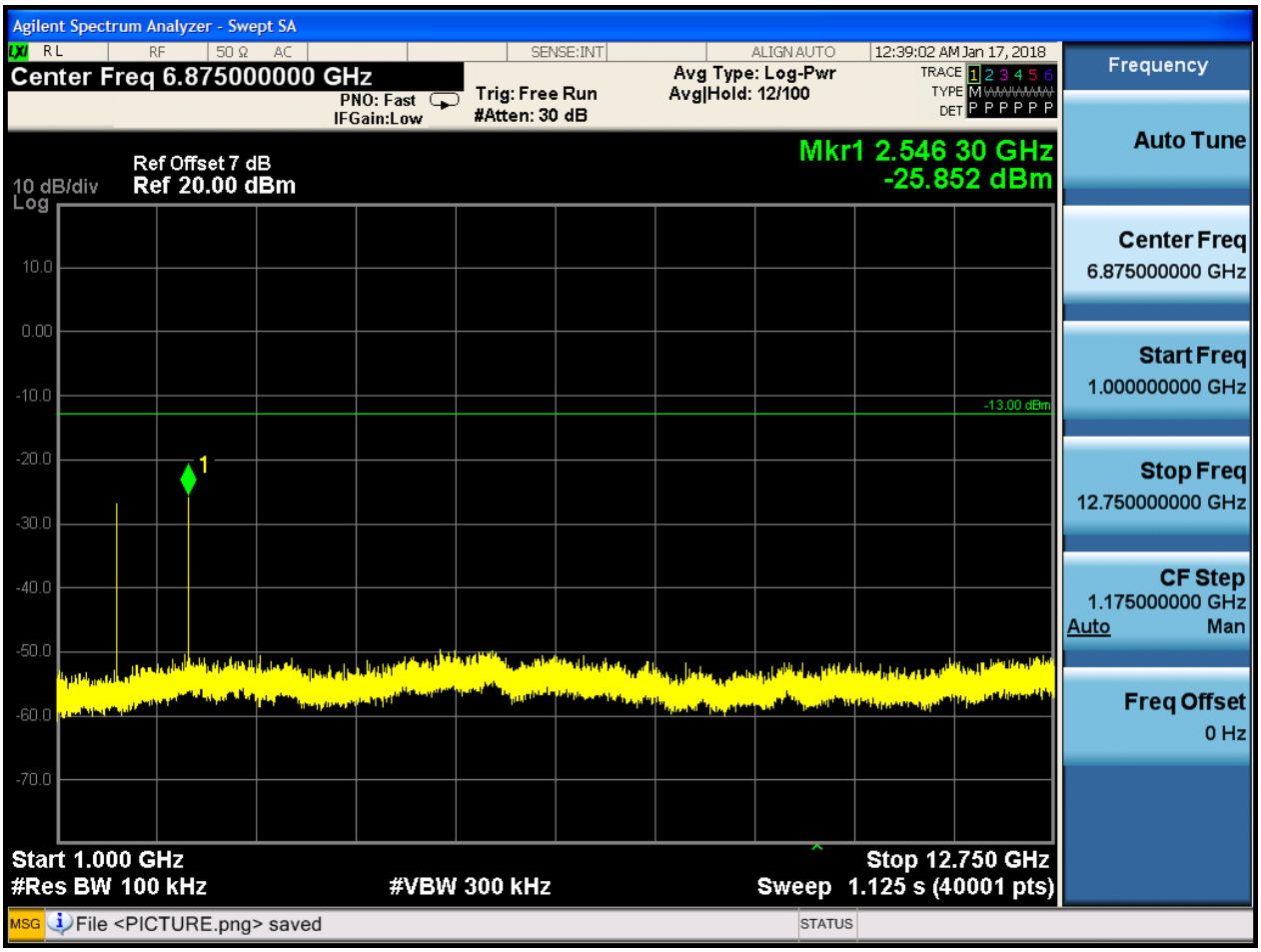


6.1.1.1.3 Test Channel = HCH



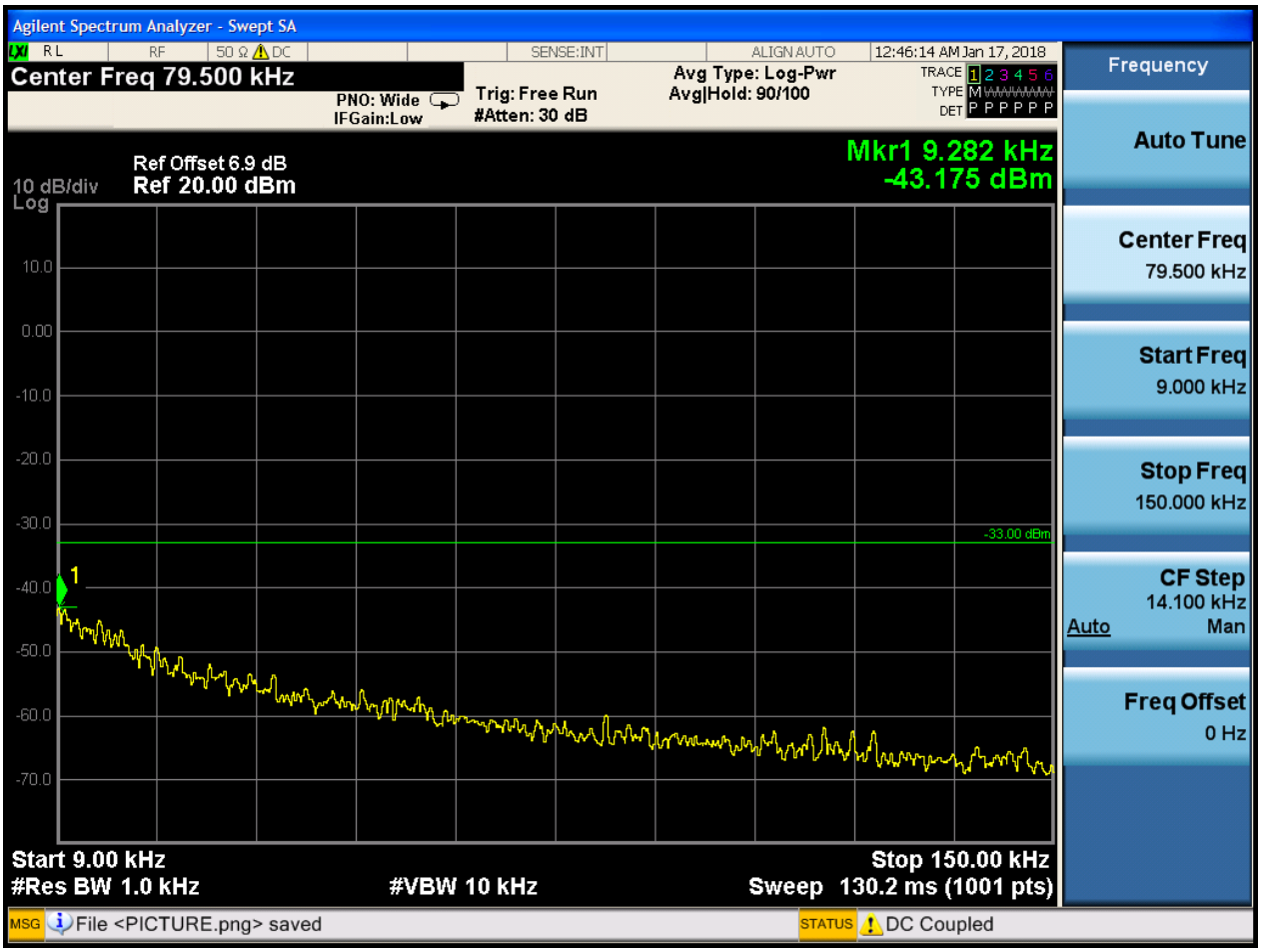


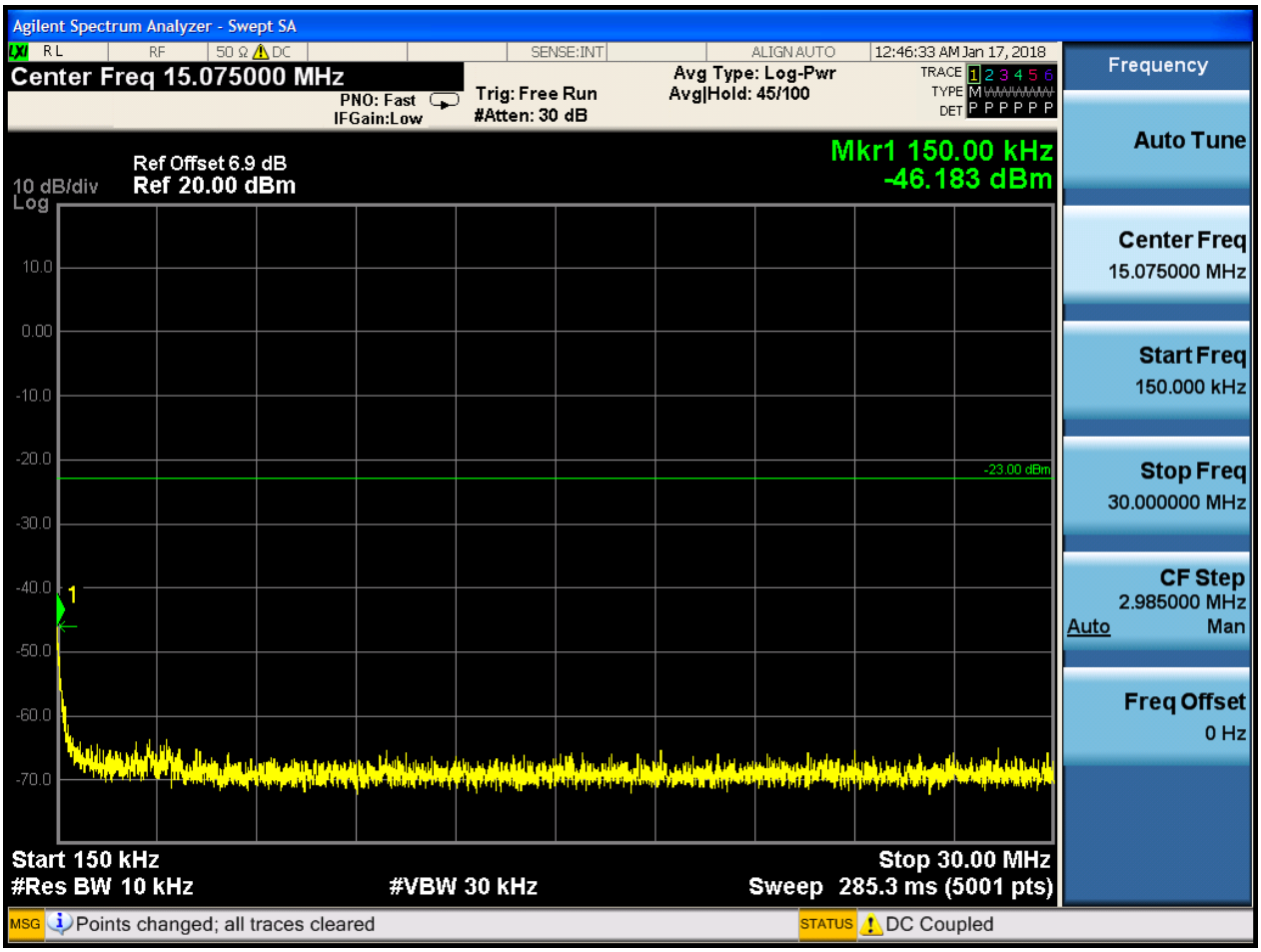


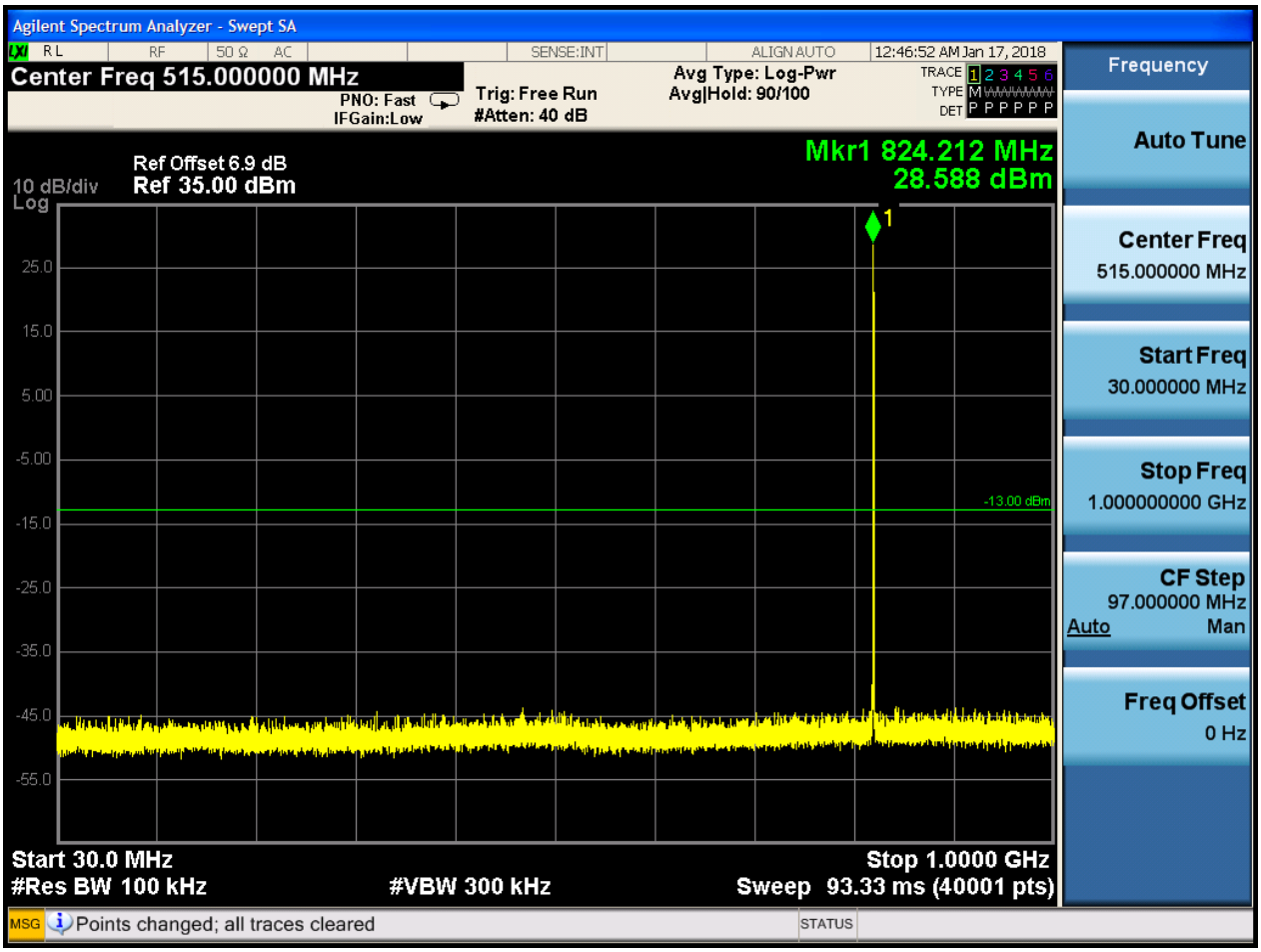


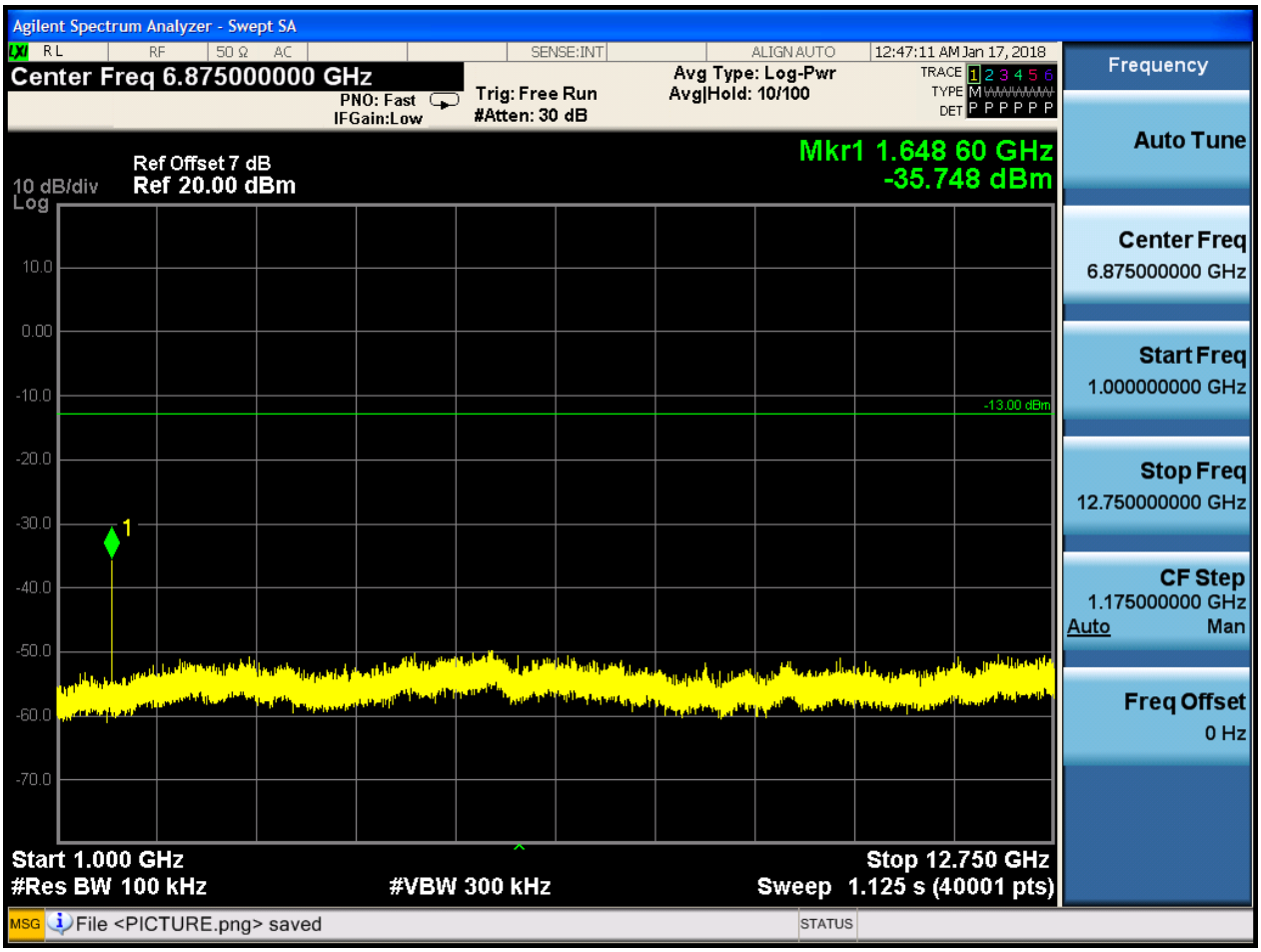
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH

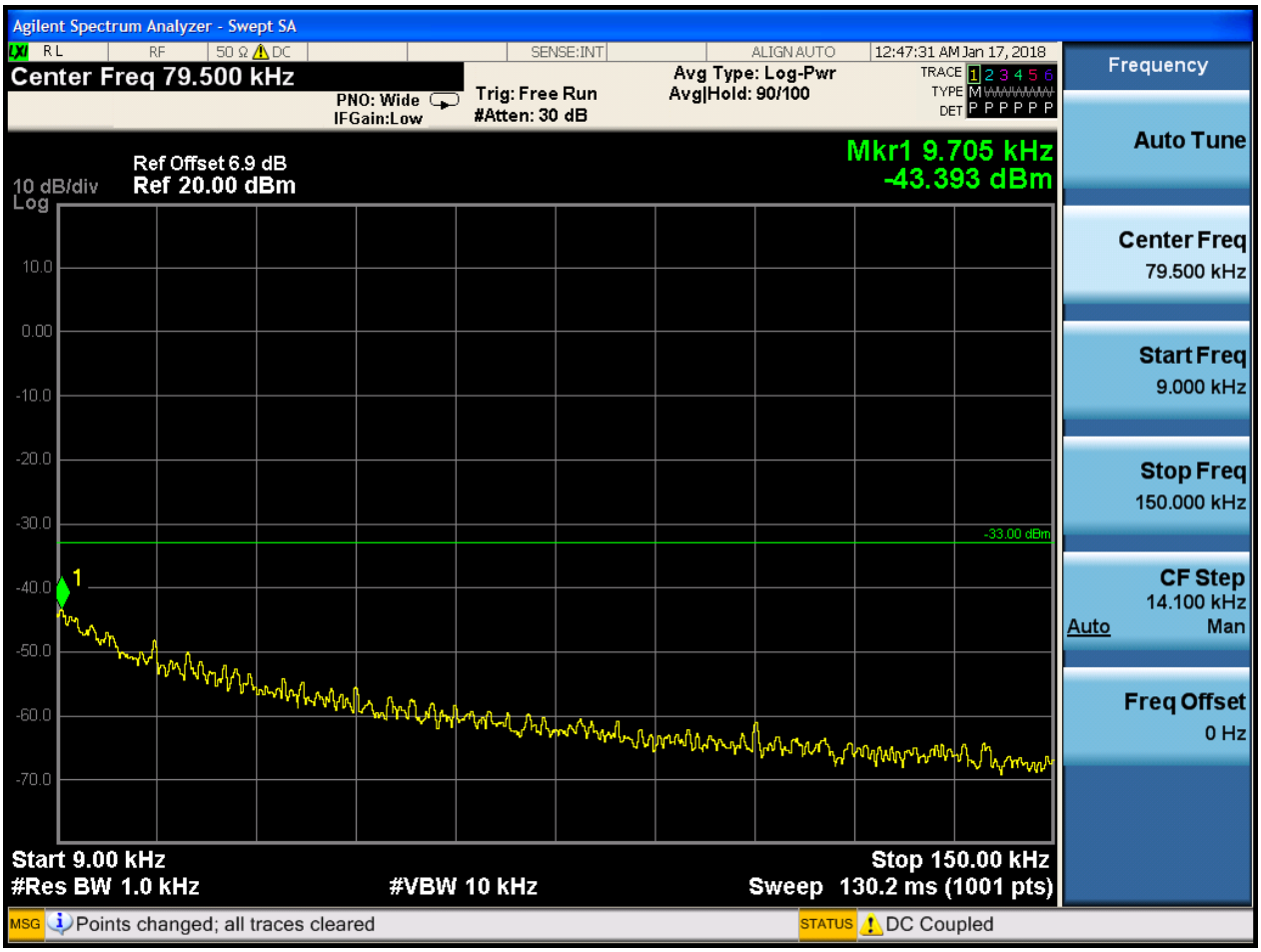


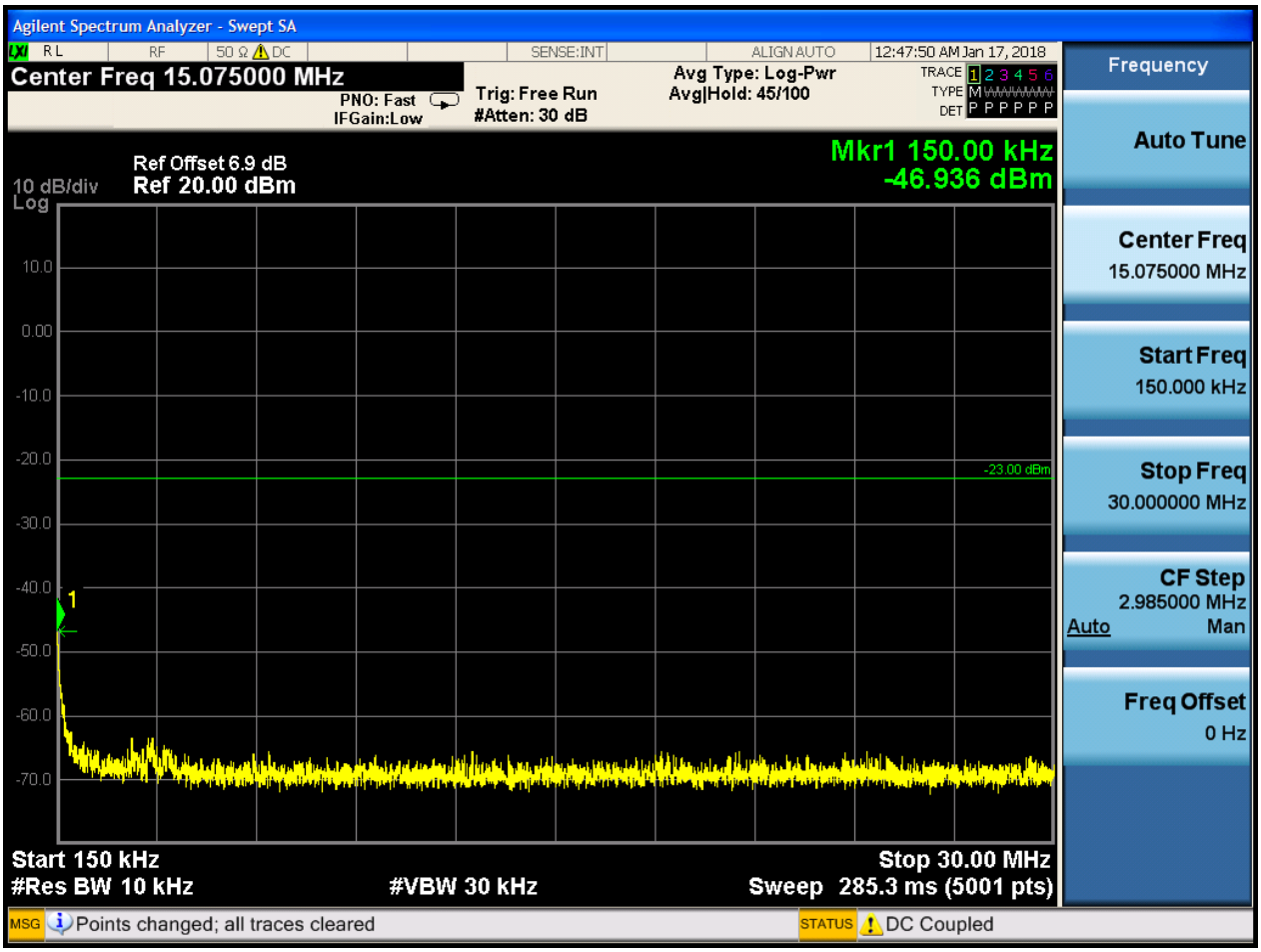


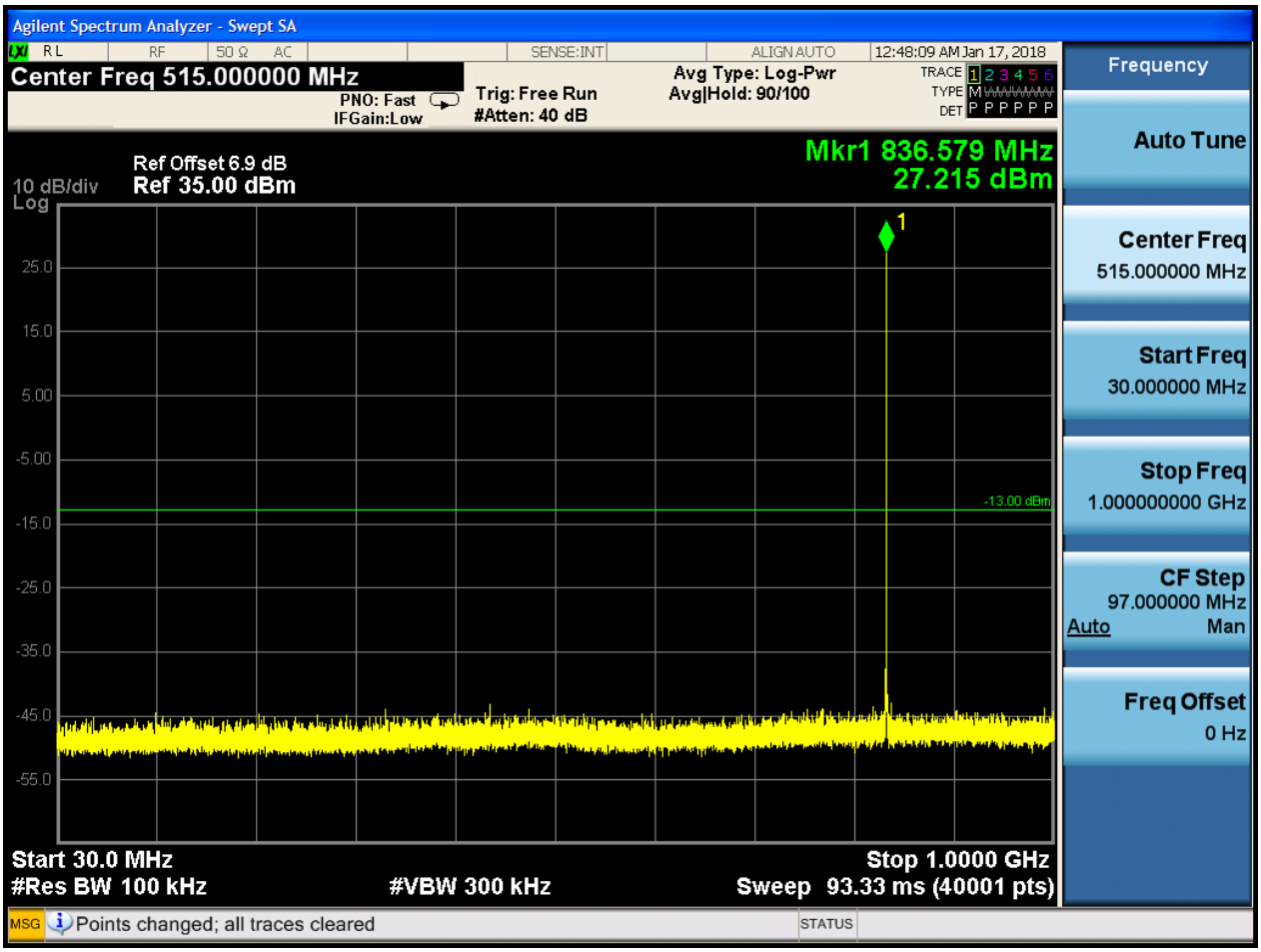


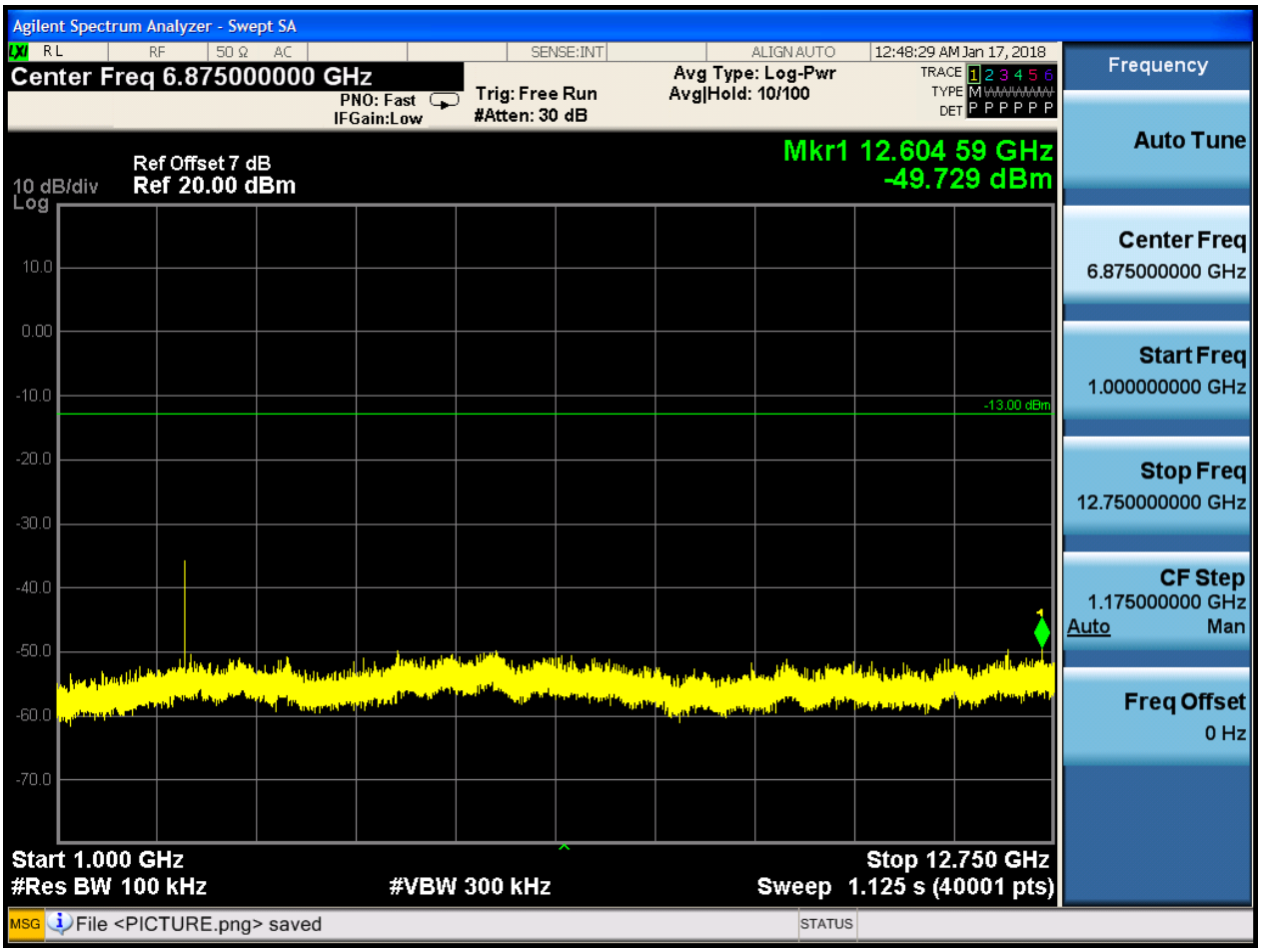


6.1.1.2.2 Test Channel = MCH

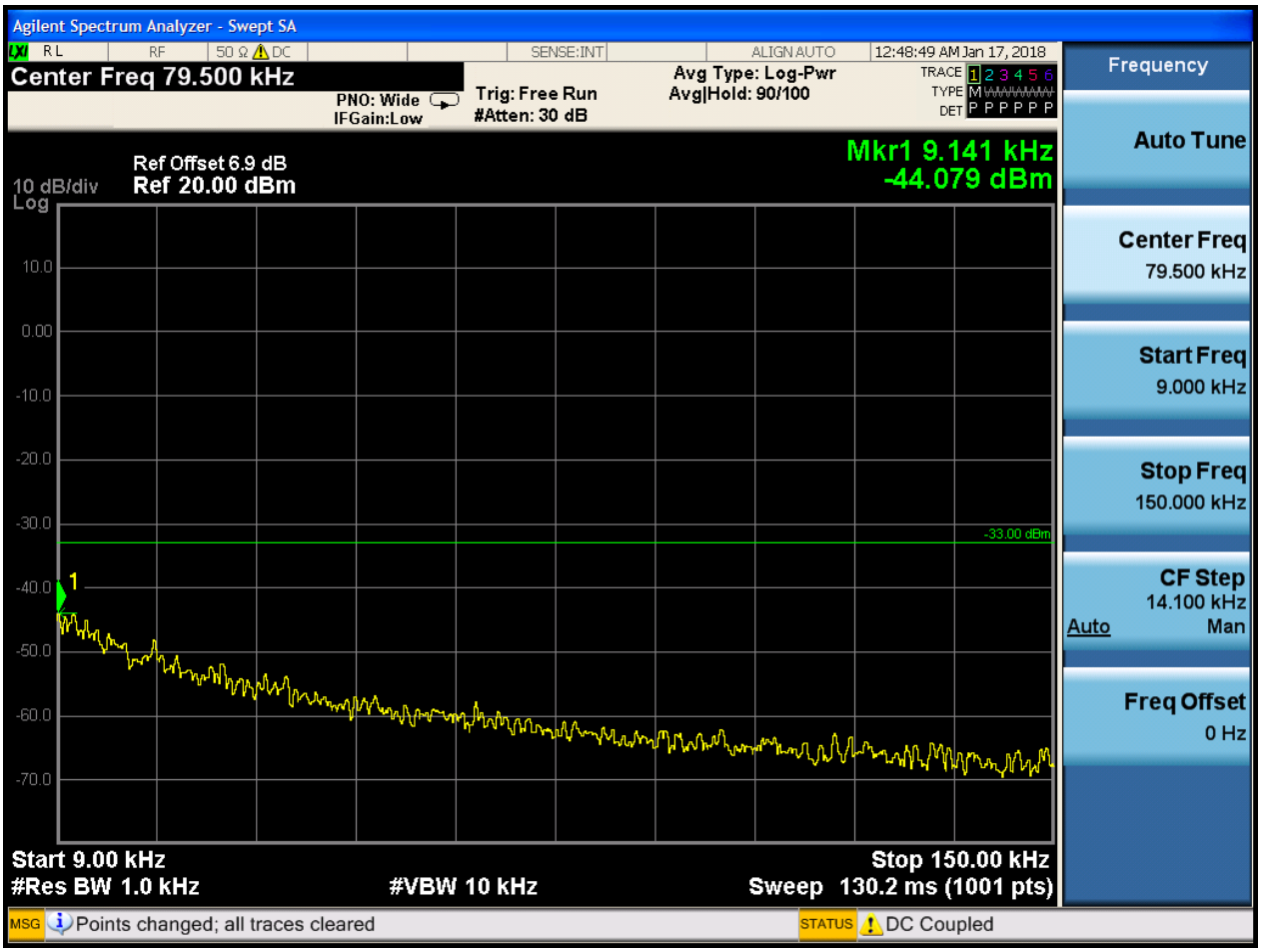


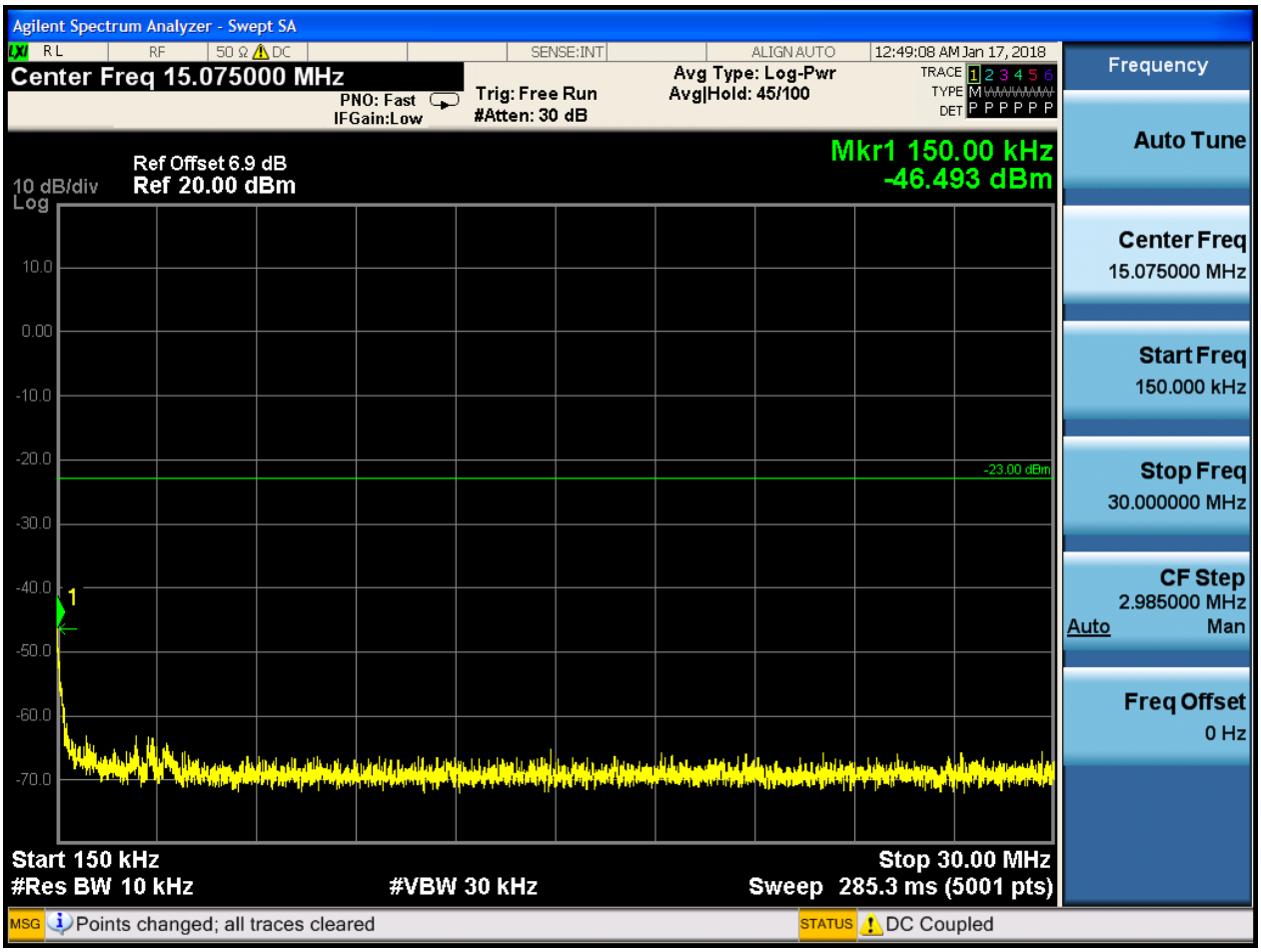


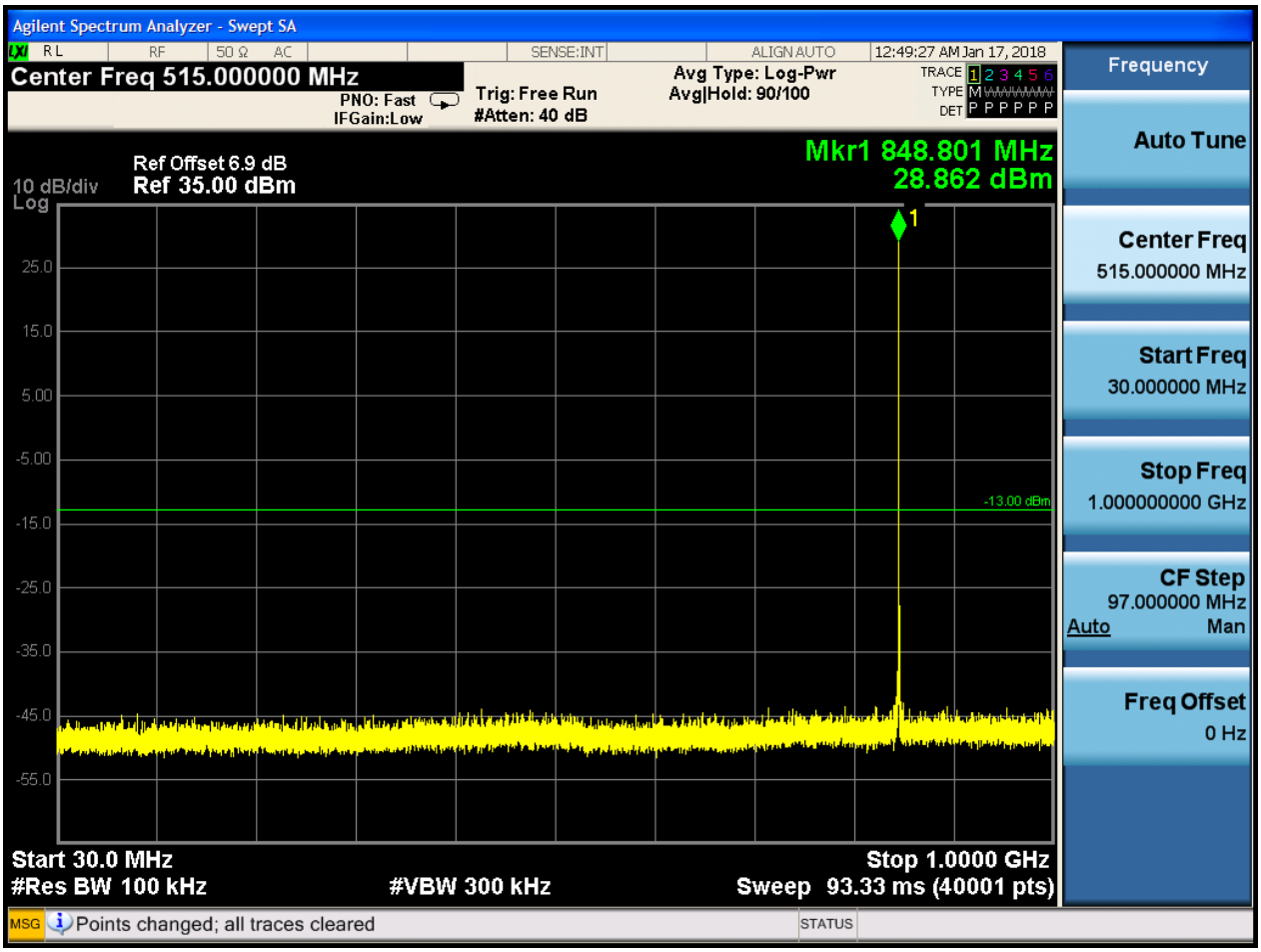


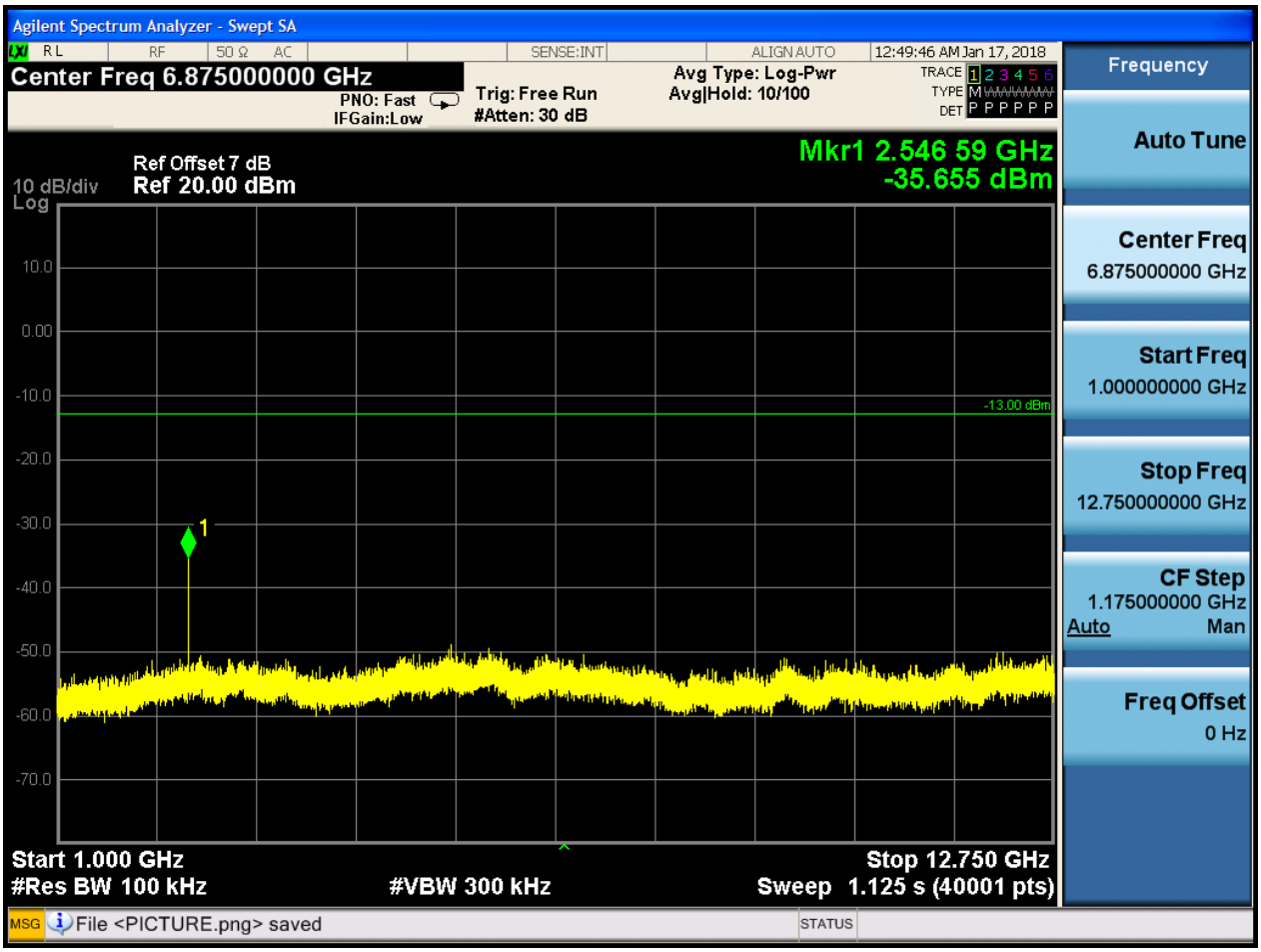


6.1.1.2.3 Test Channel = HCH





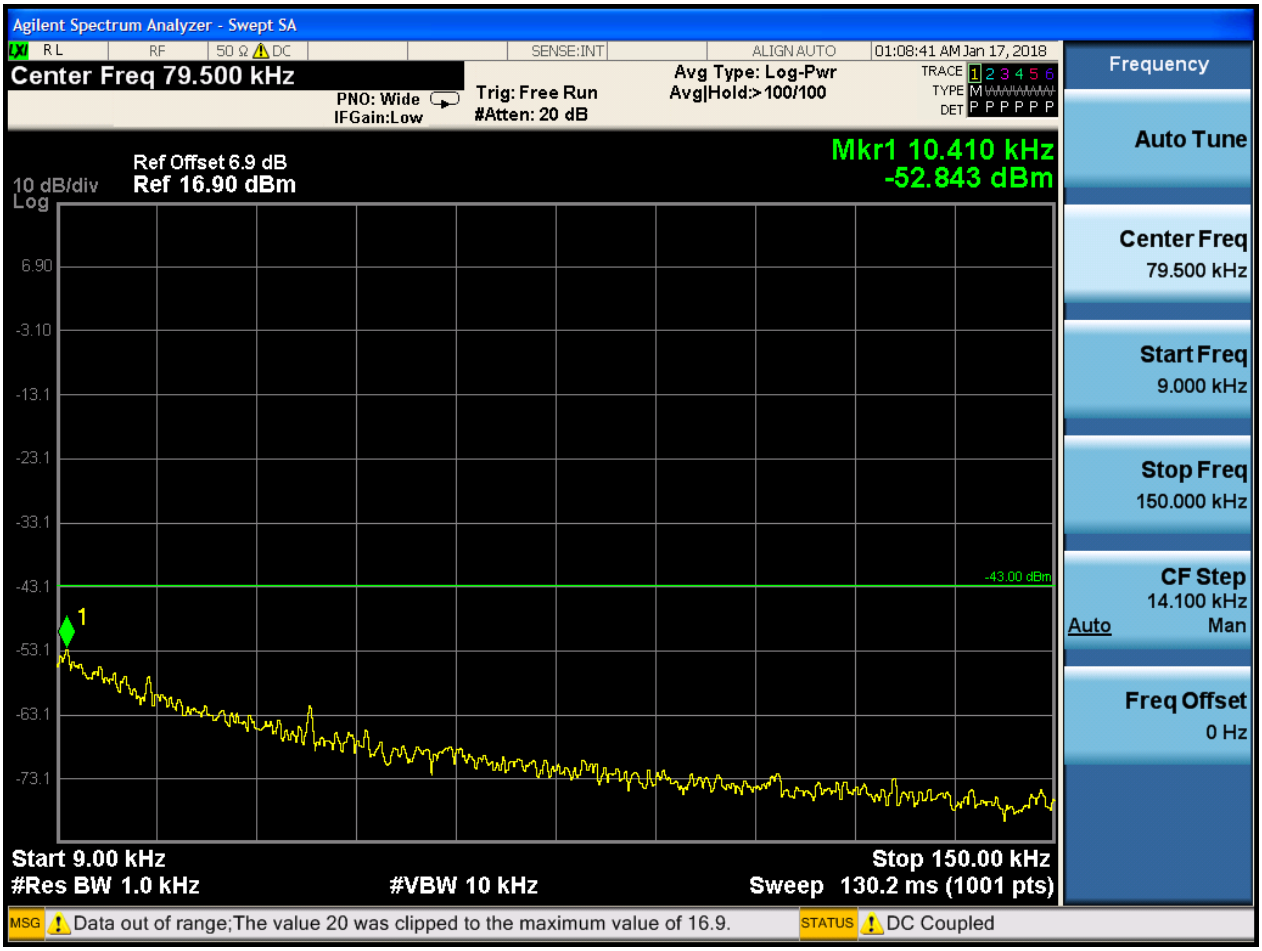


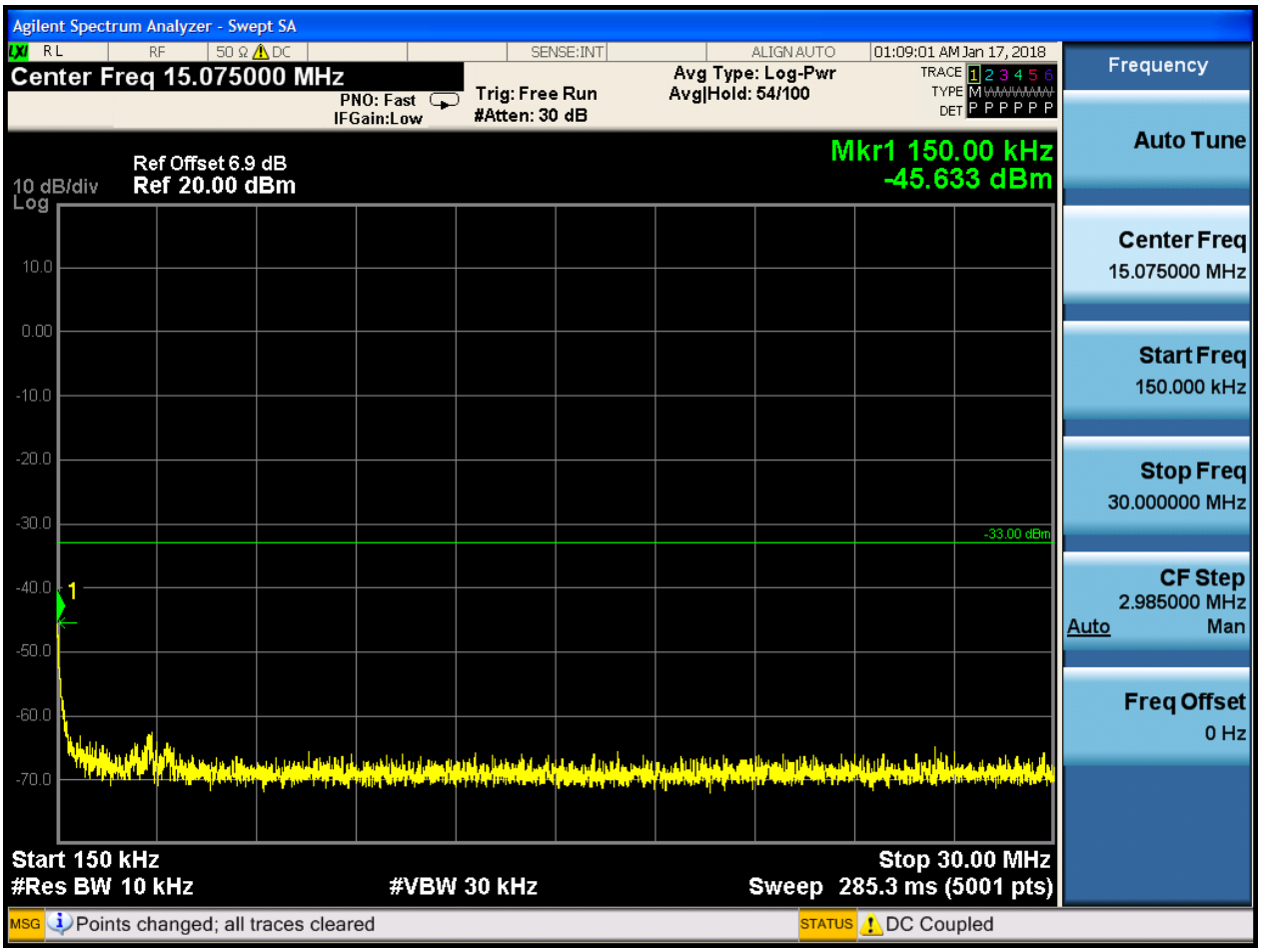


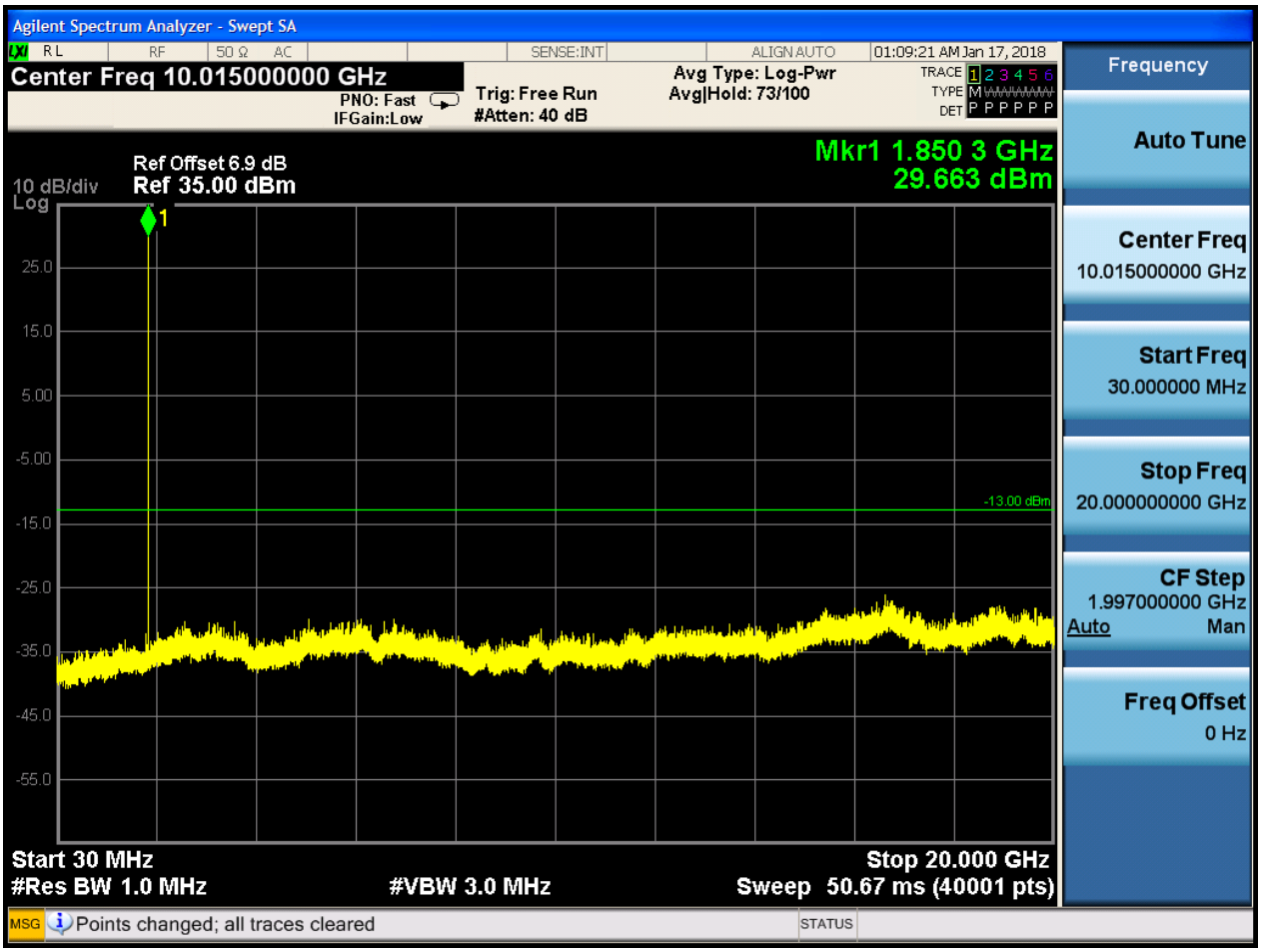
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

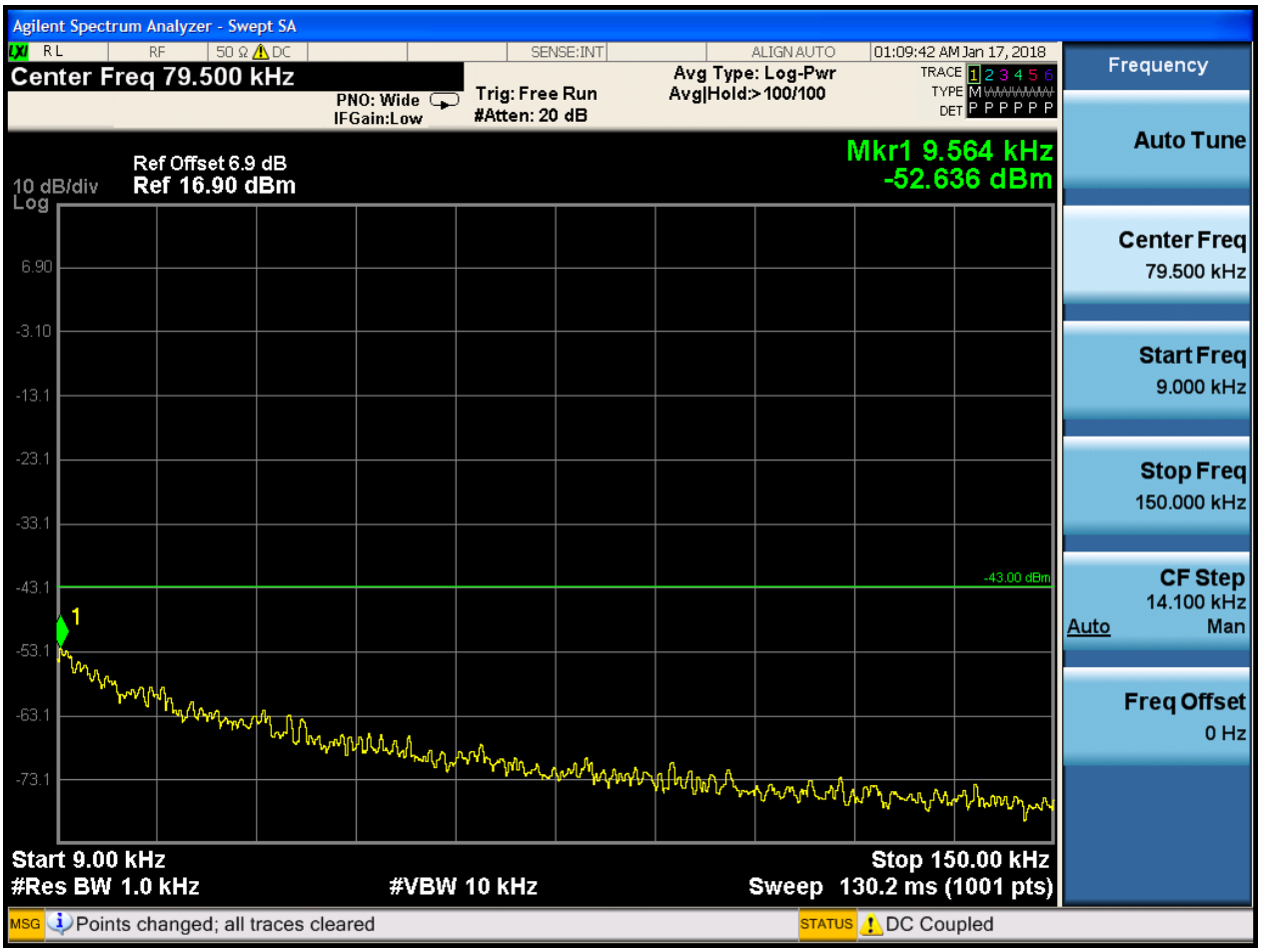
6.1.2.1.1 Test Channel = LCH

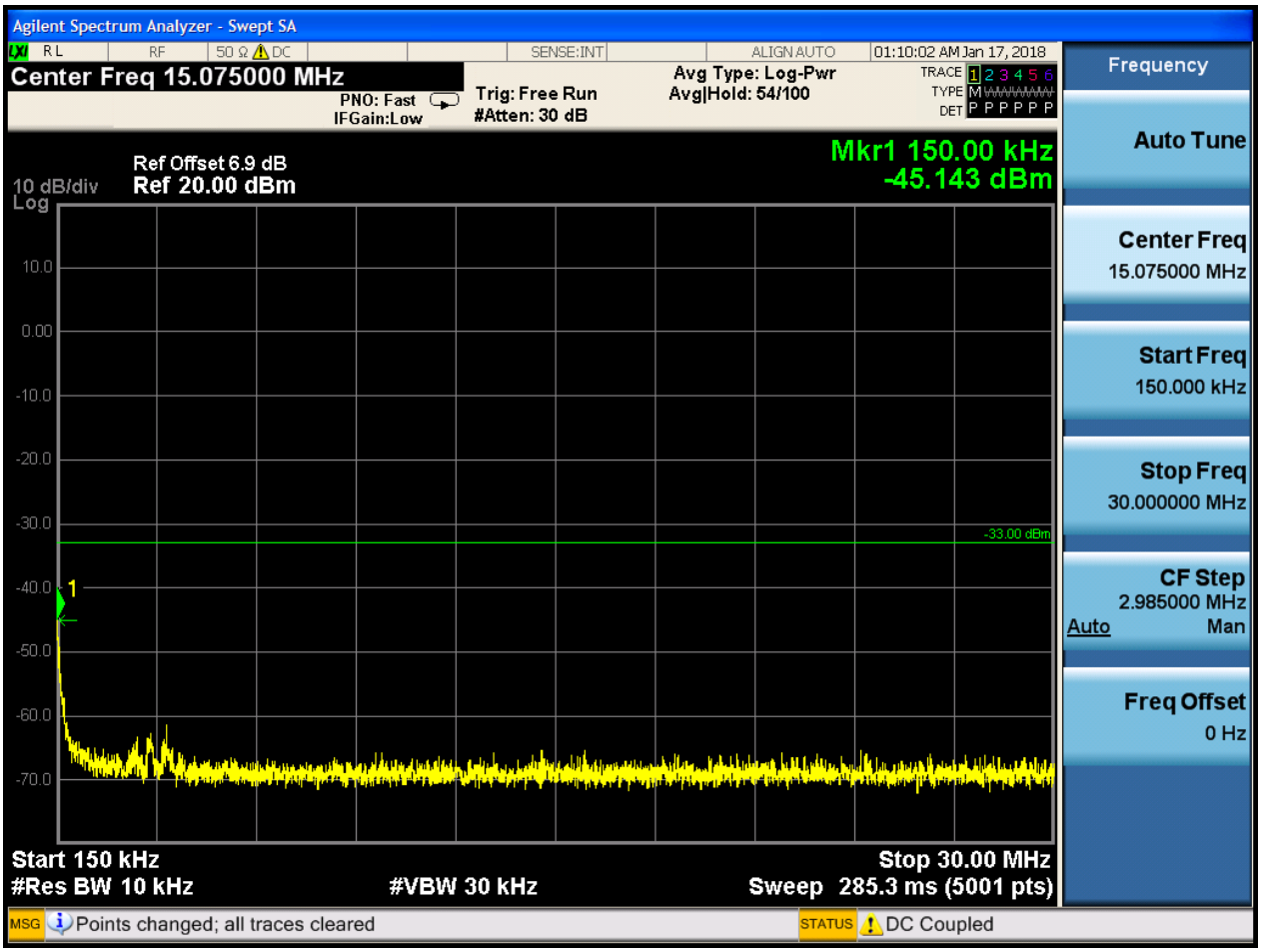


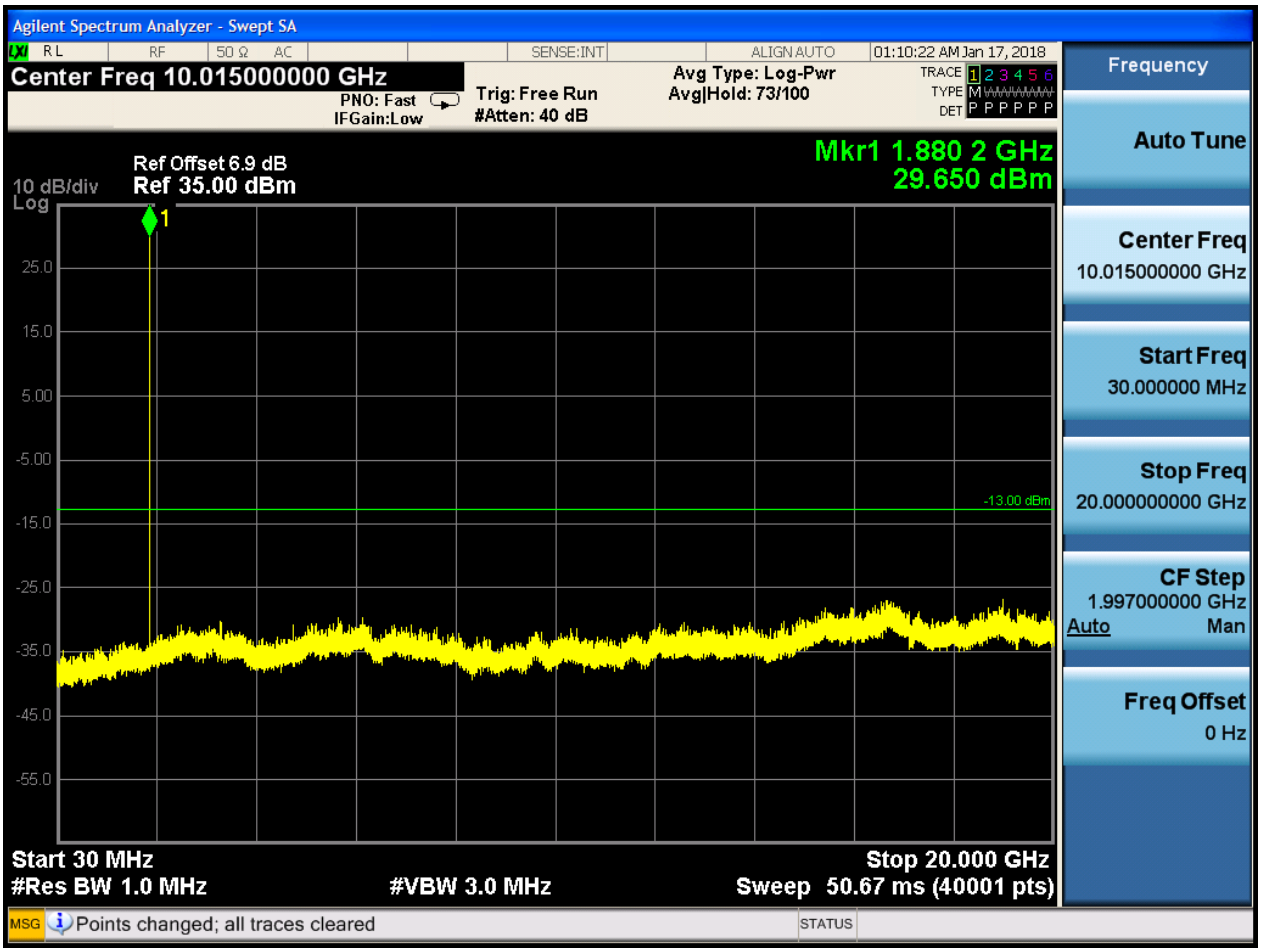




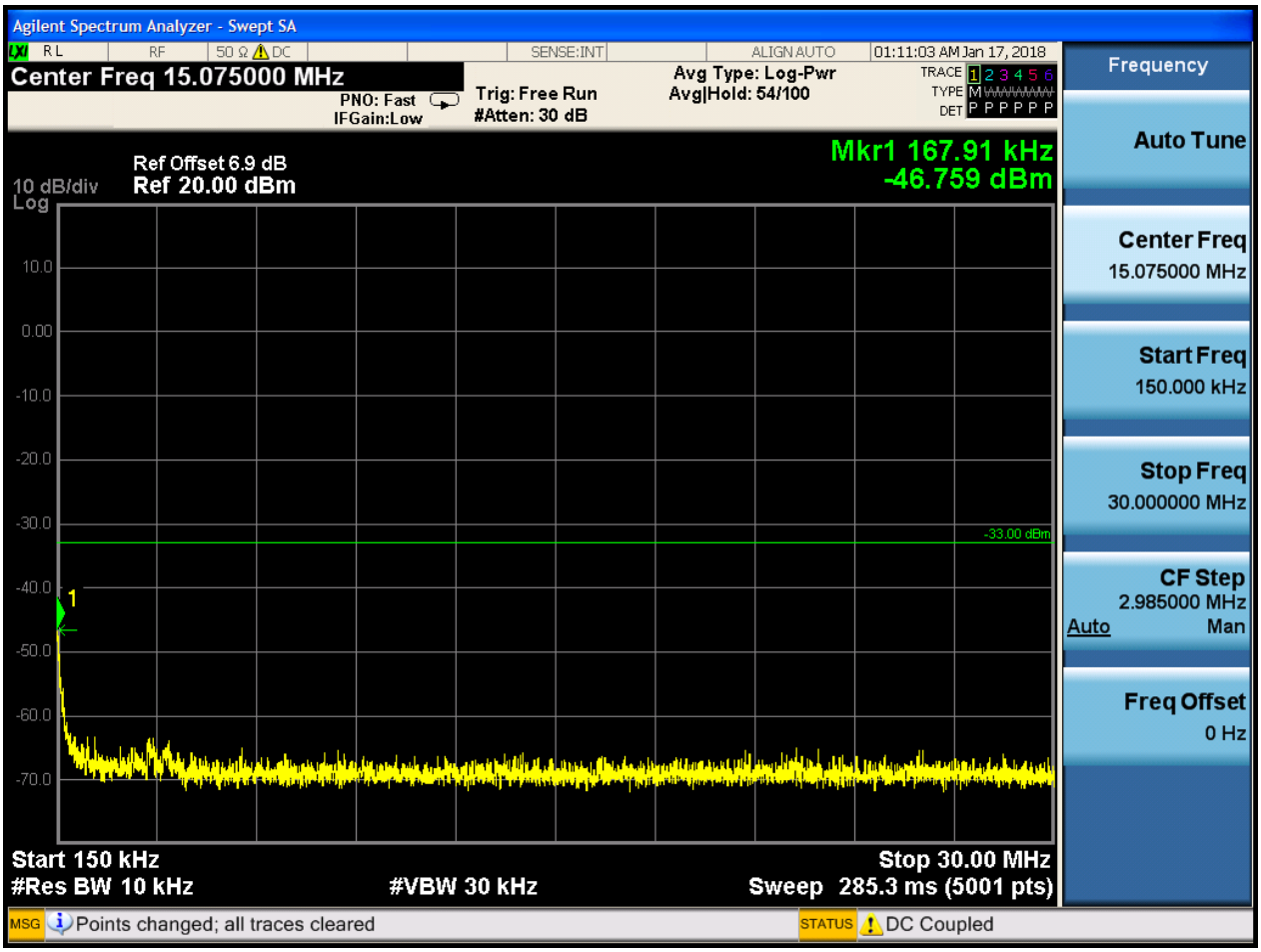
6.1.2.1.2 Test Channel = MCH

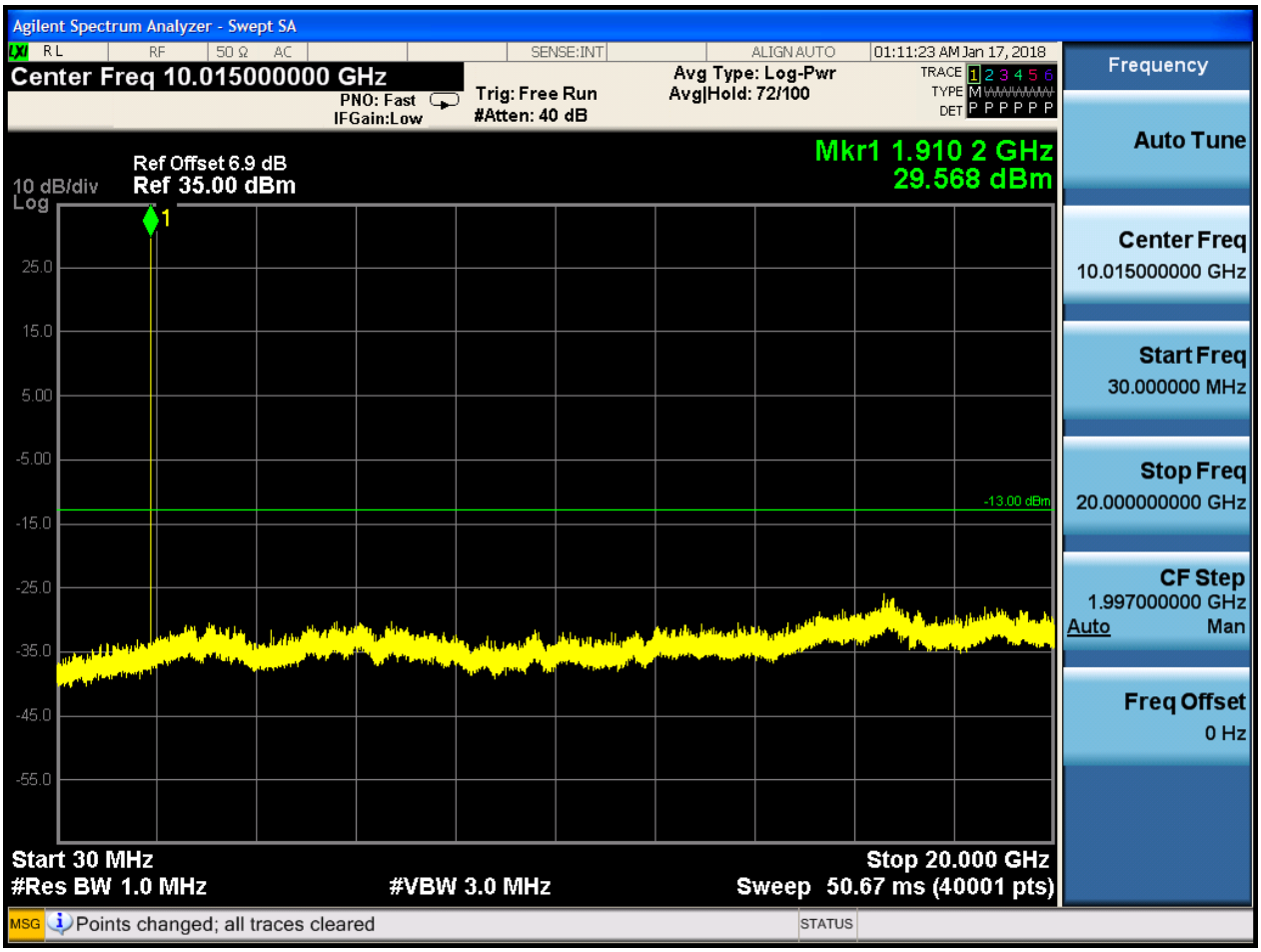






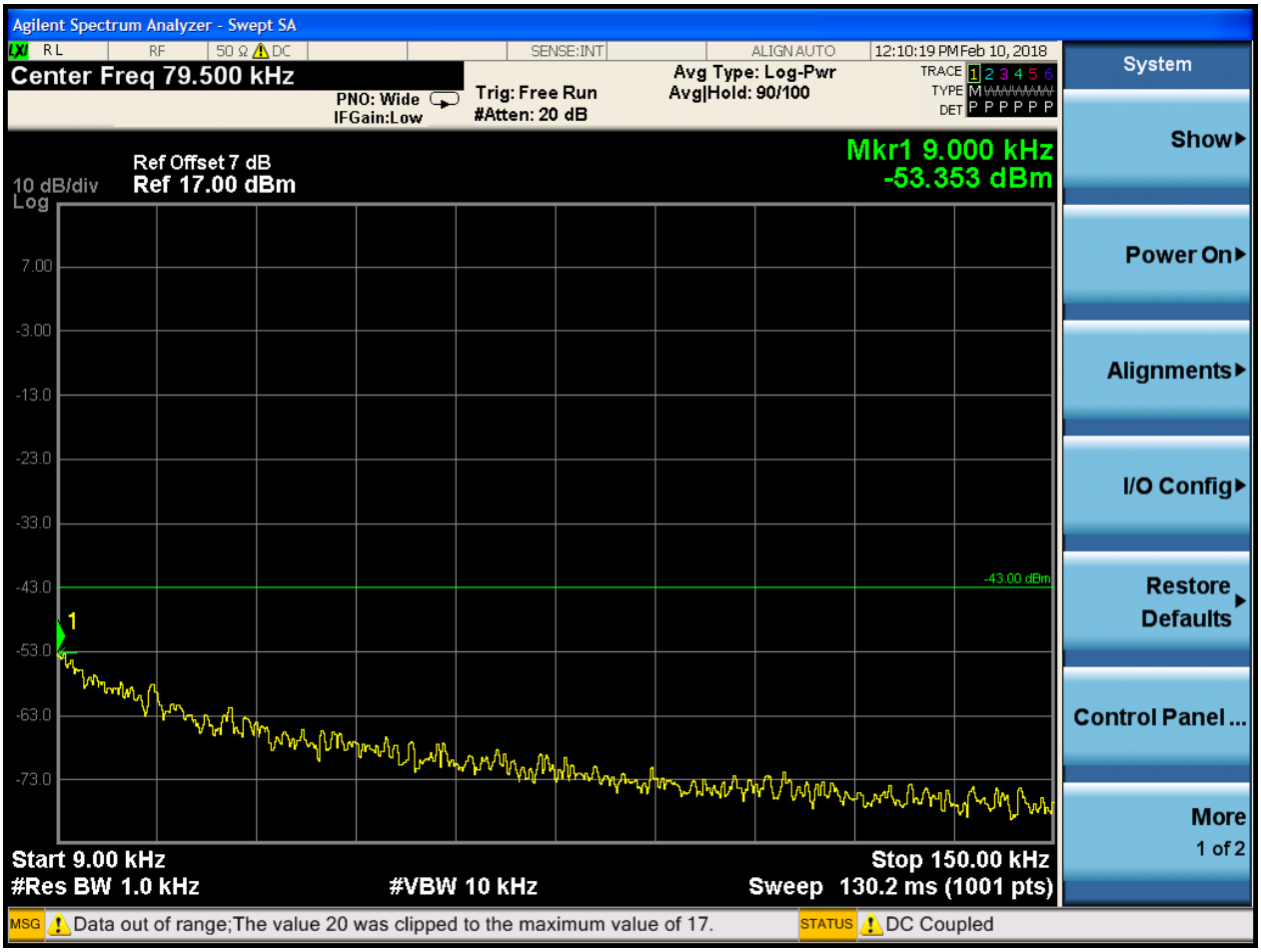
6.1.2.1.3 Test Channel = HCH

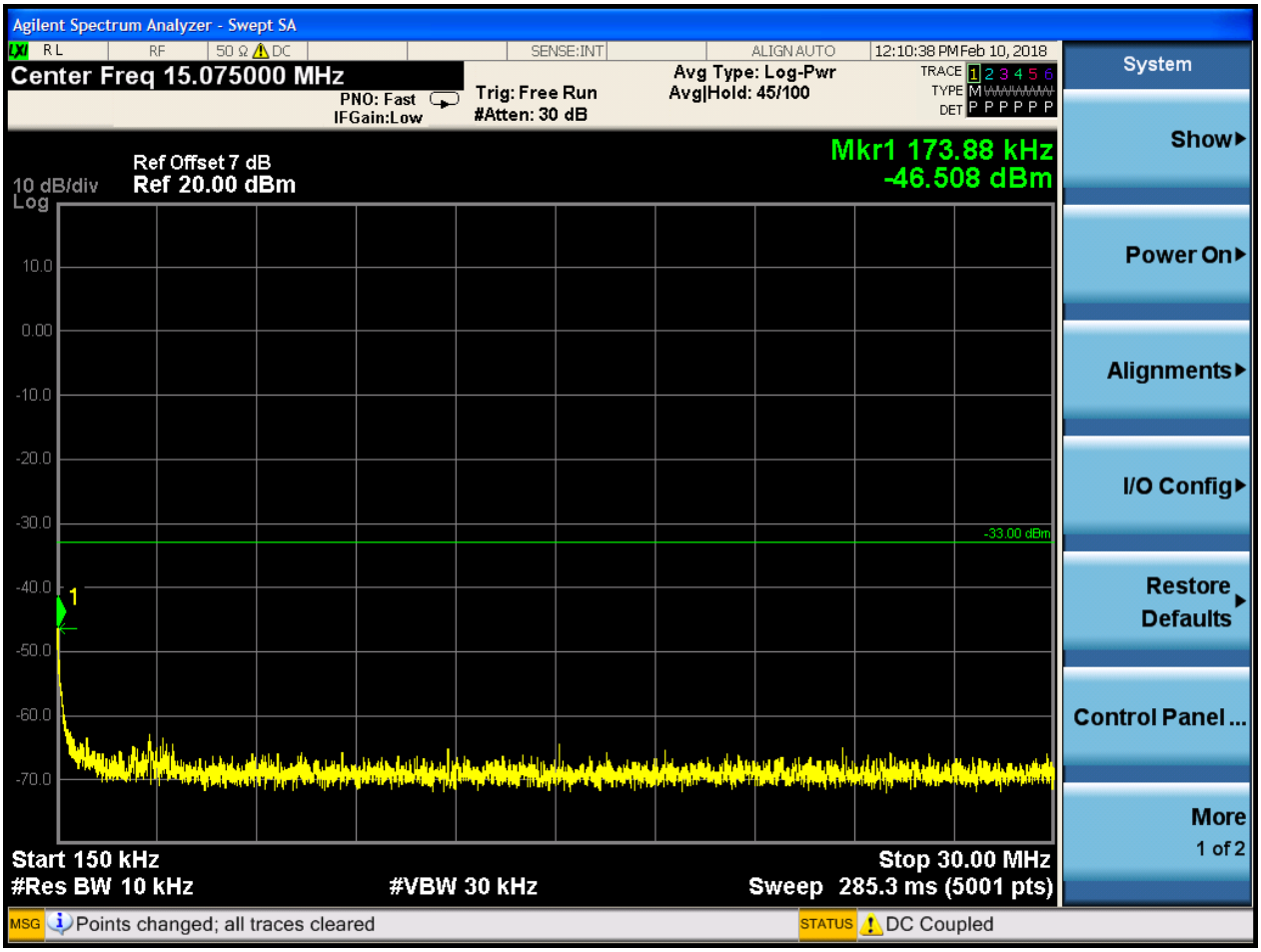


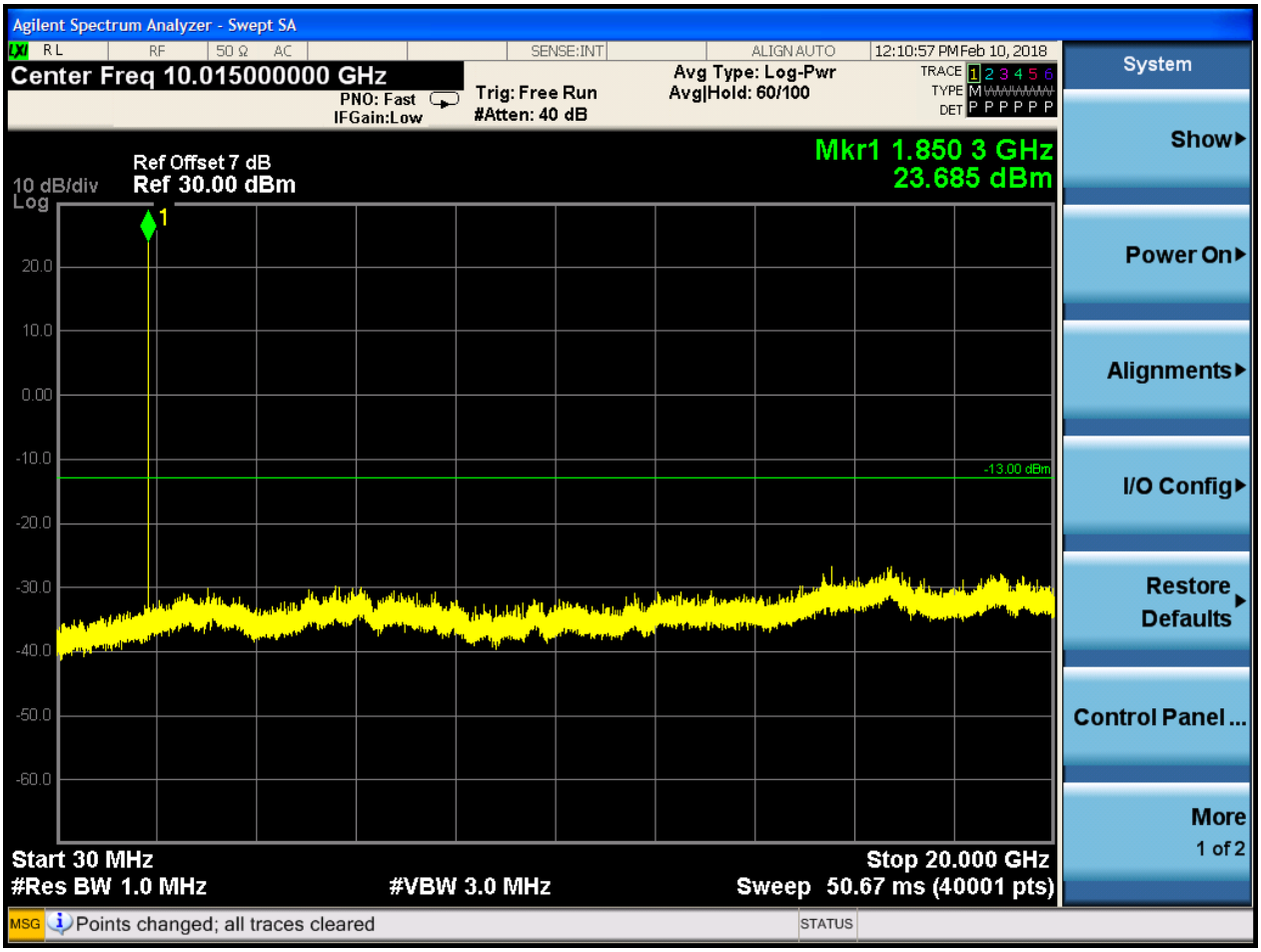


6.1.2.2 Test Mode = GSM/TM2

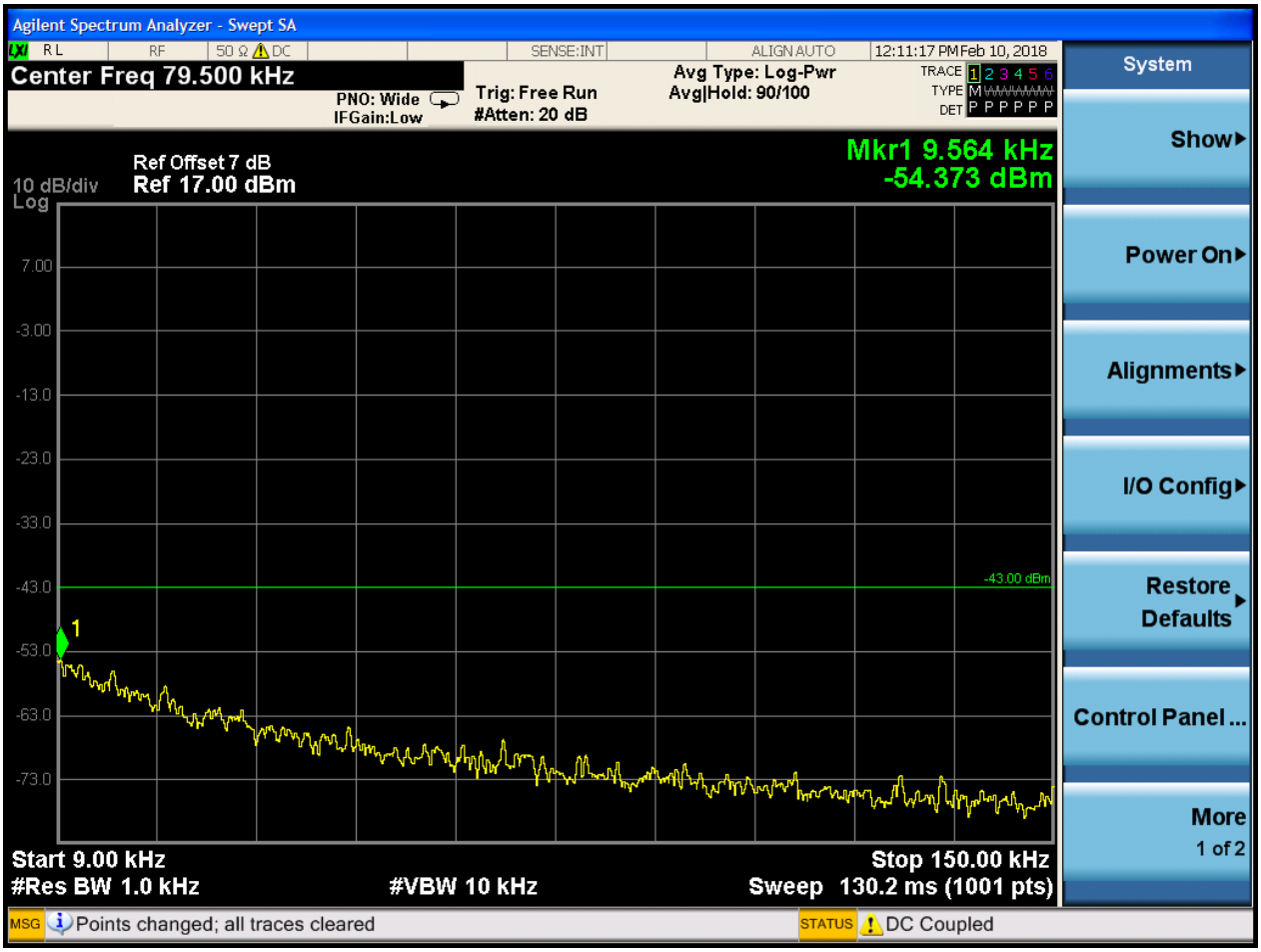
6.1.2.2.1 Test Channel = LCH

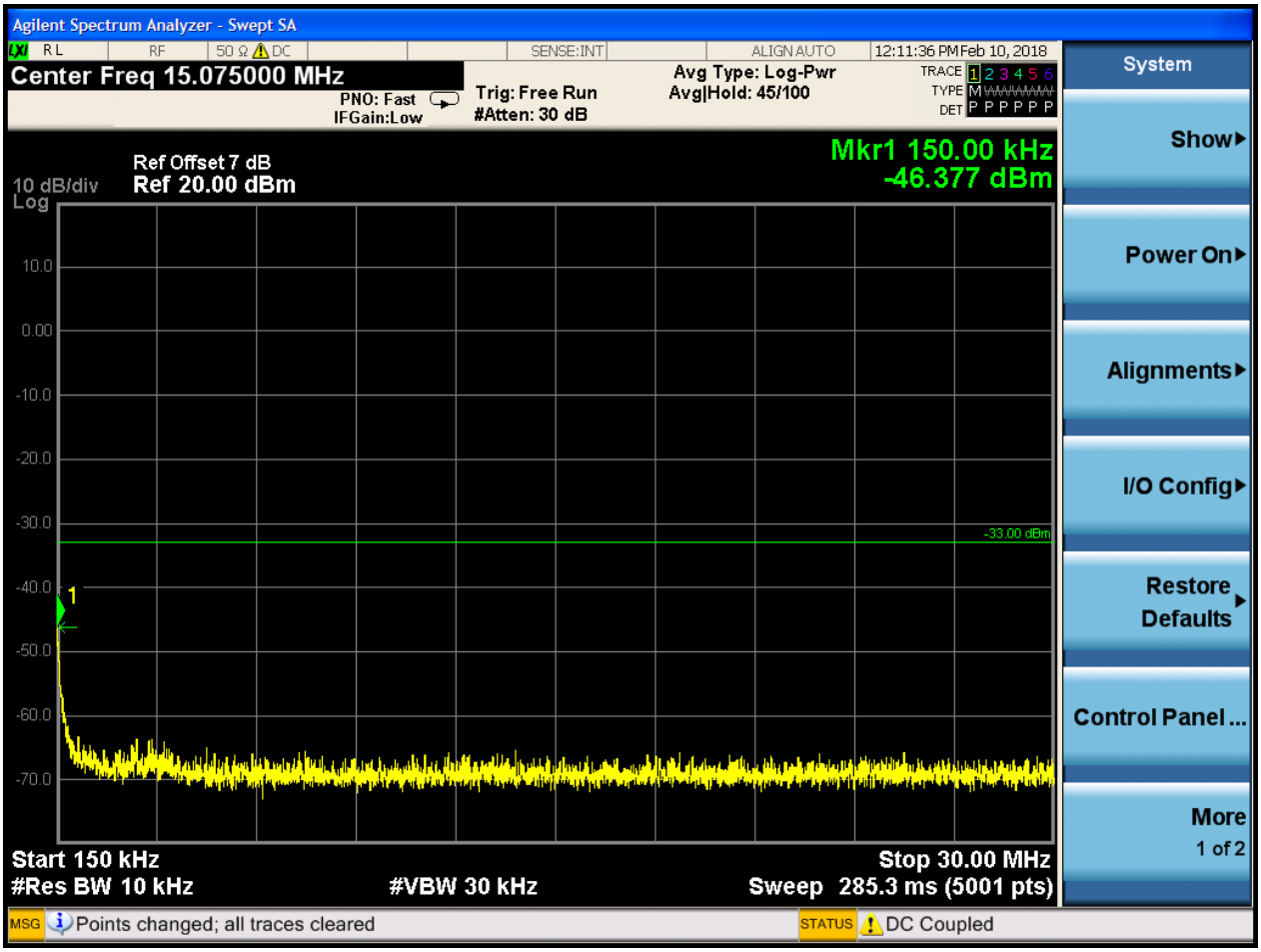


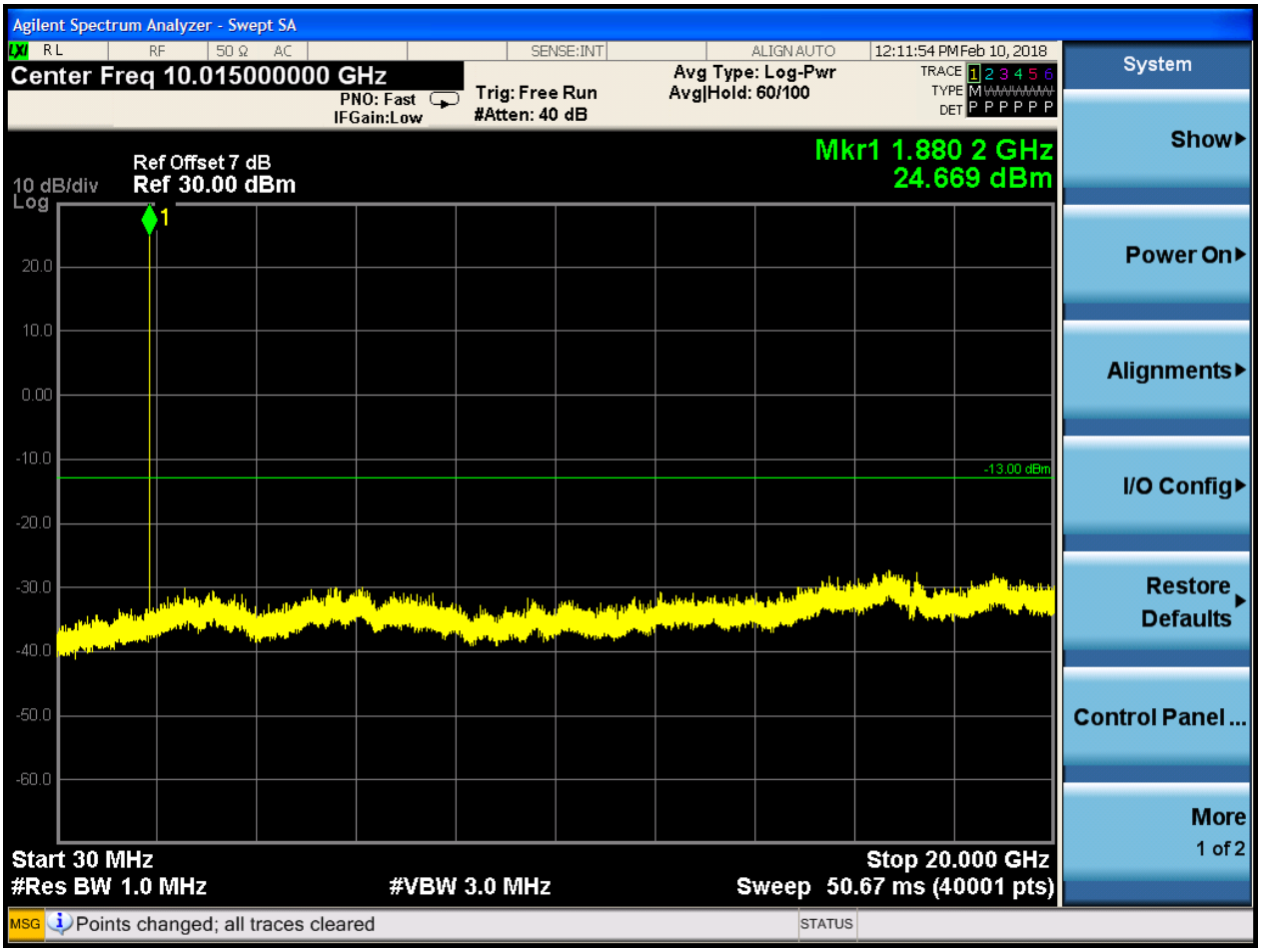




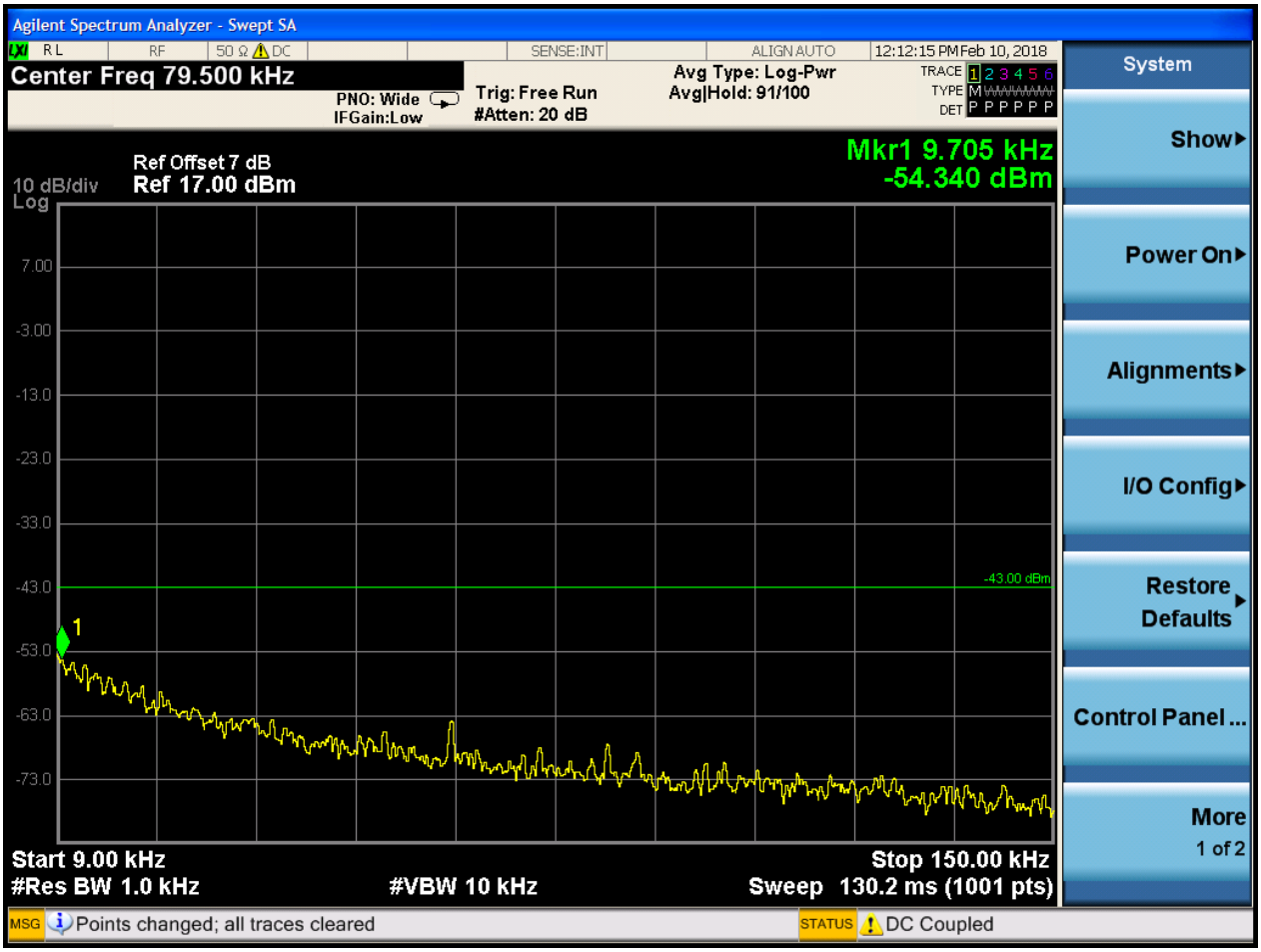
6.1.2.2.2 Test Channel = MCH

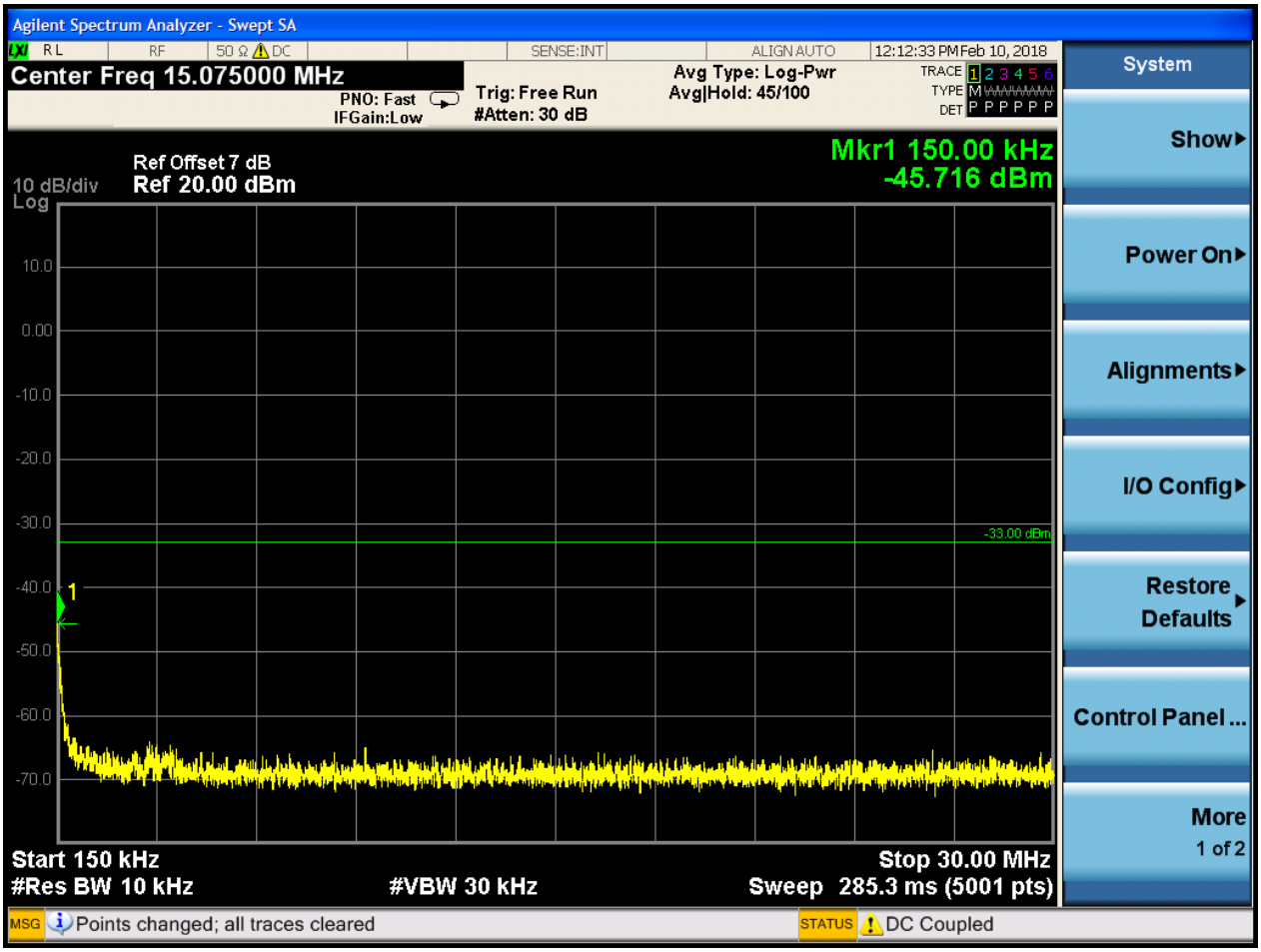


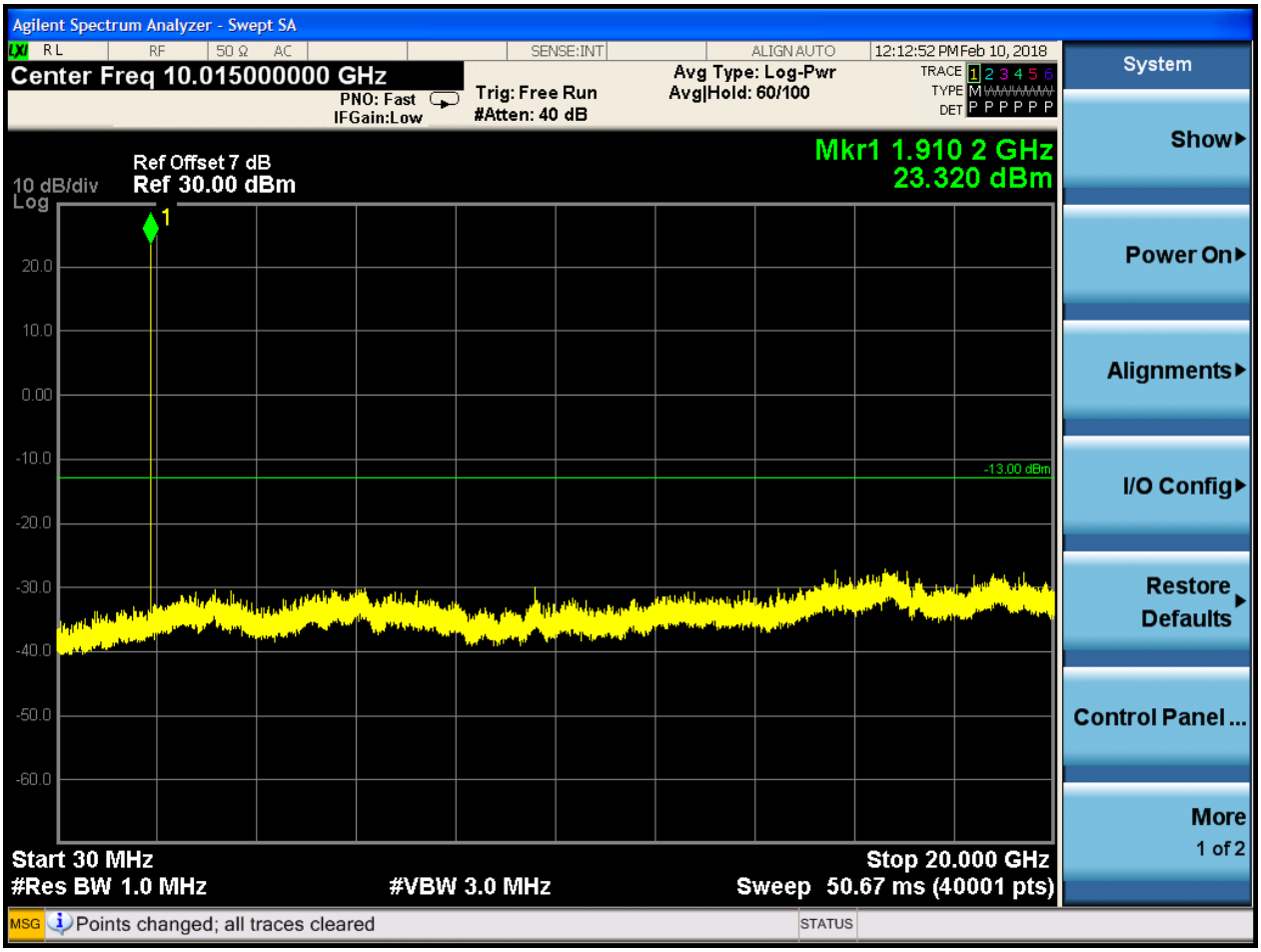




6.1.2.2.3 Test Channel = HCH







7Appendix_G: Field Strength of Spurious Radiation

Note:We tested all modes, but 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

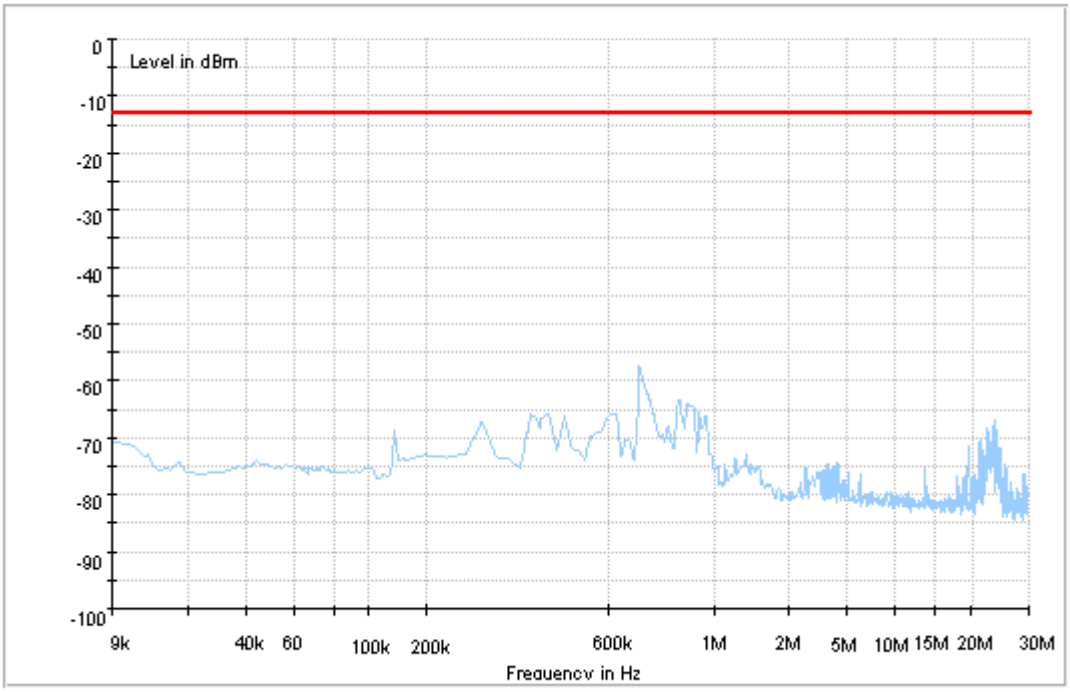
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

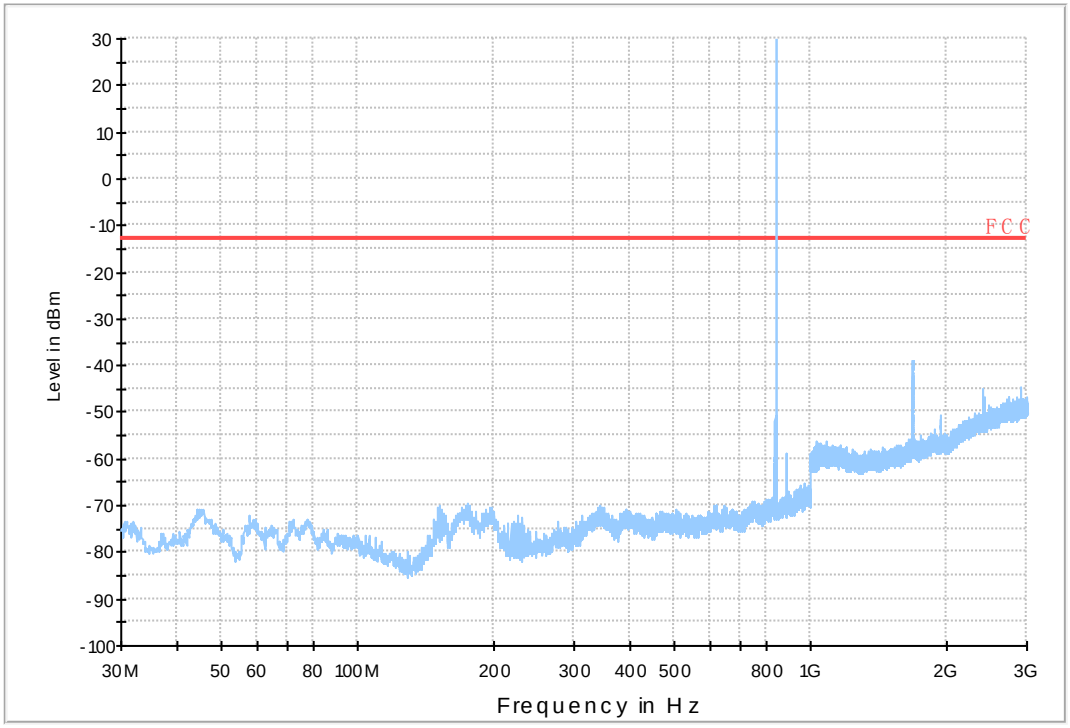
7.1 For GSM

7.1.1 Test Band = GSM850_ANT1

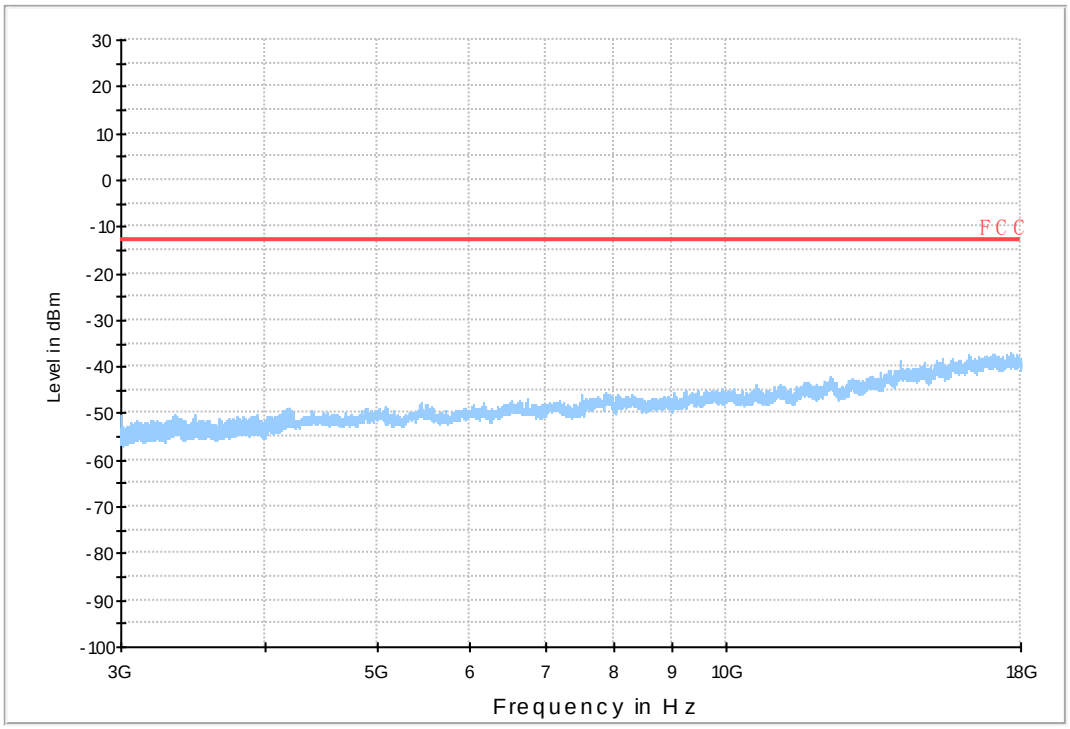
7.1.1.1 Test Mode = GSM/TM1



Copy of FCC PART22 GSM850_L

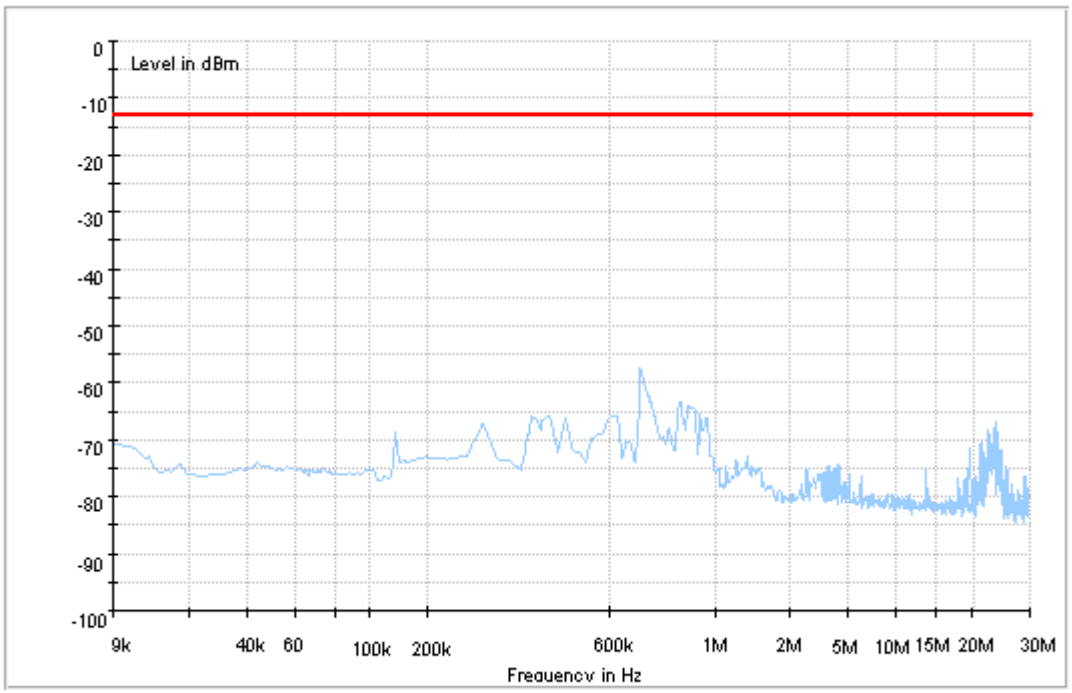


Copy of FCC PART22 GSM850_H

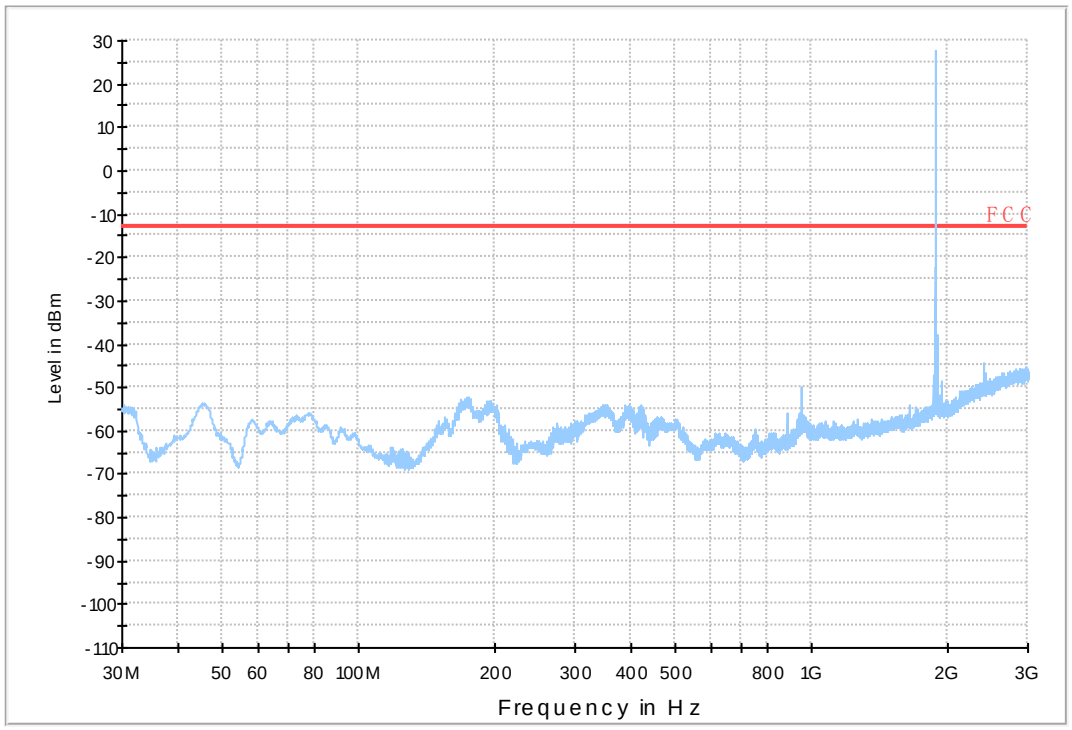


7.1.2 Test Band = GSM1900_ANT1

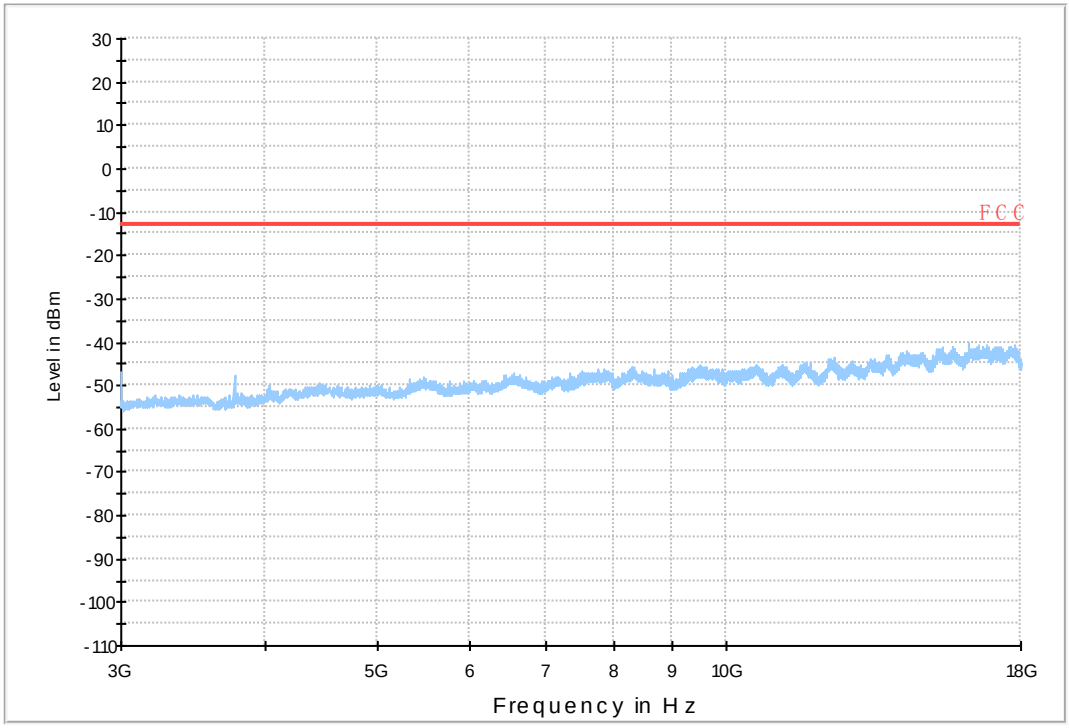
7.1.2.1 Test Mode = GSM/TM1

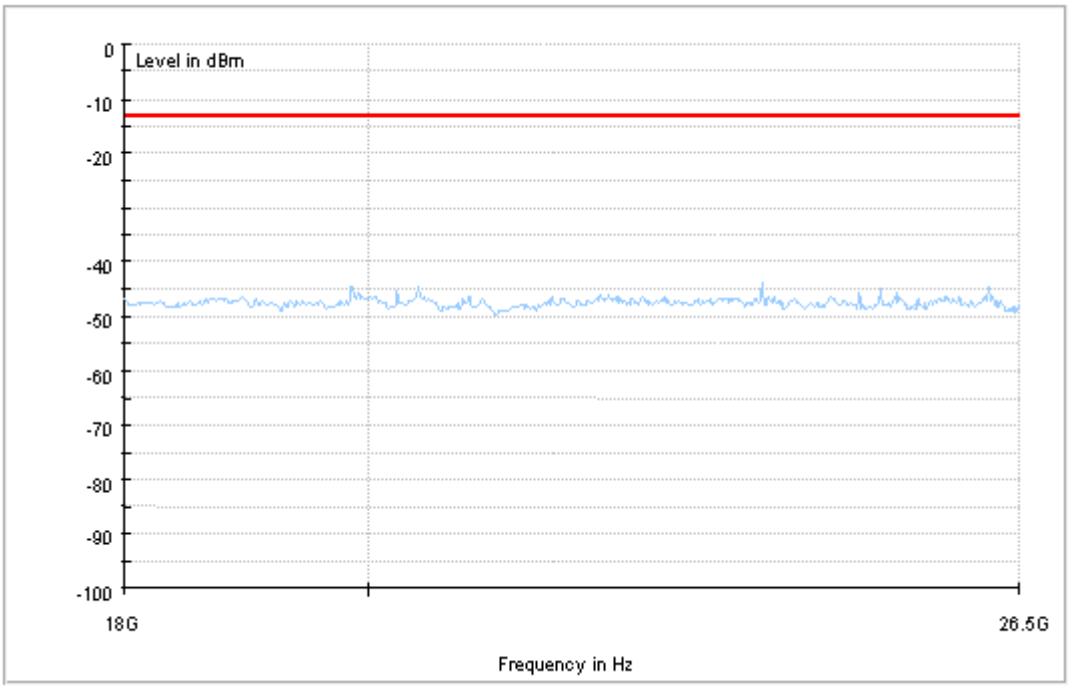


Copy of FCC PART24 GSM1900_L



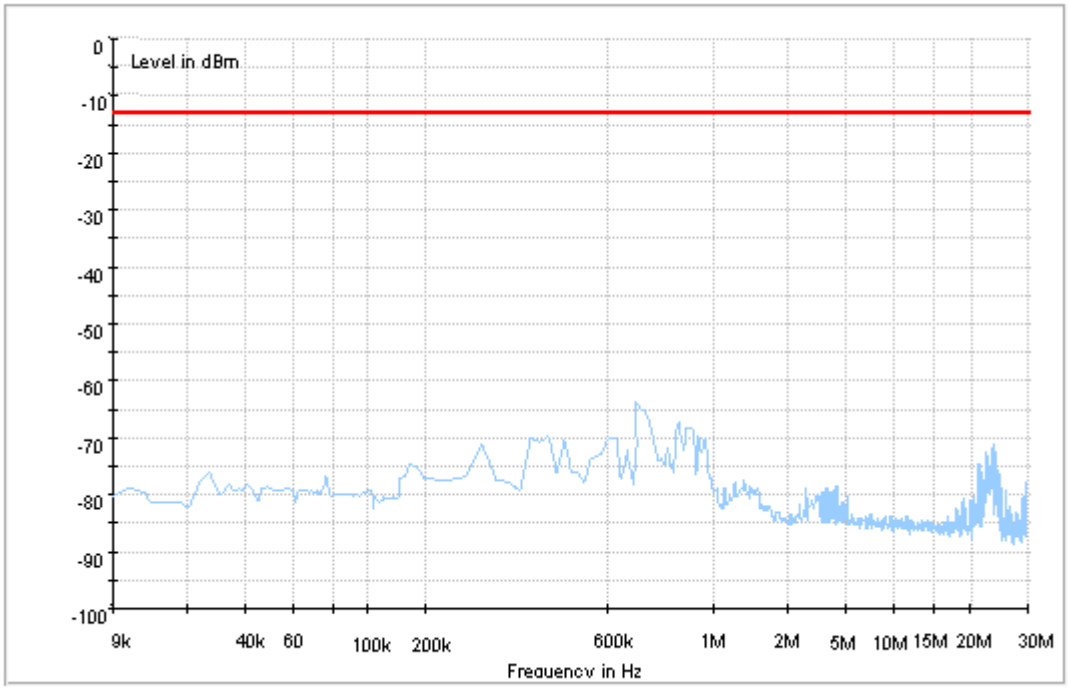
Copy of FCC PART24 GSM1900_H



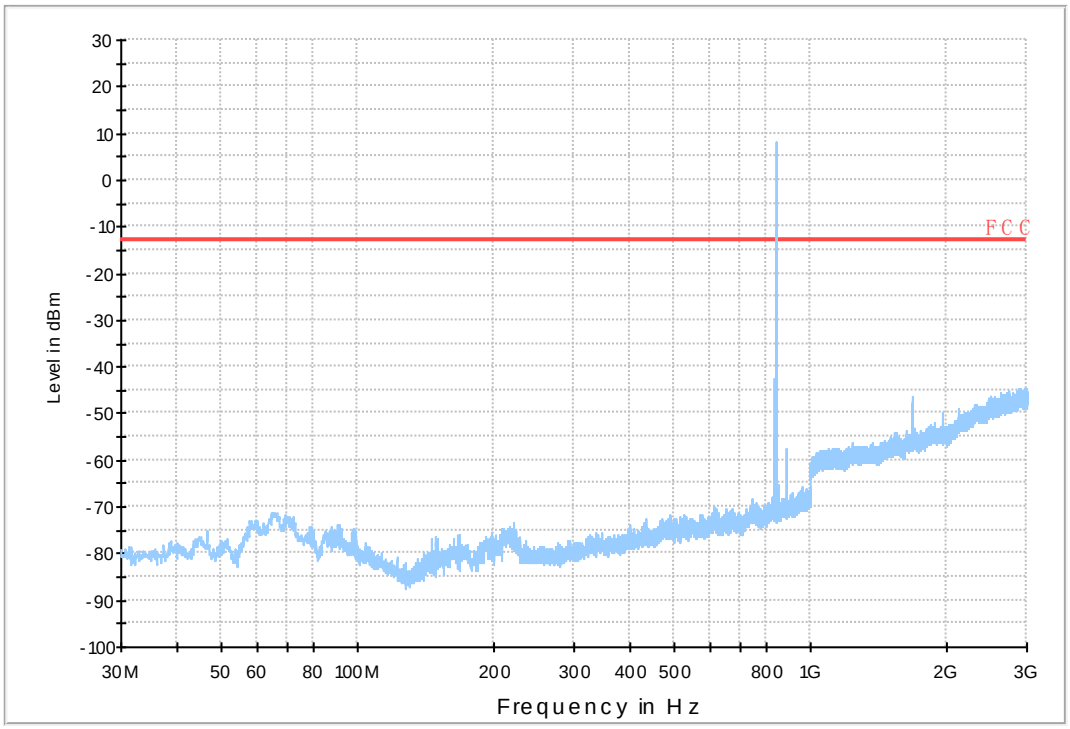


7.1.3 Test Band = GSM850_ANT2

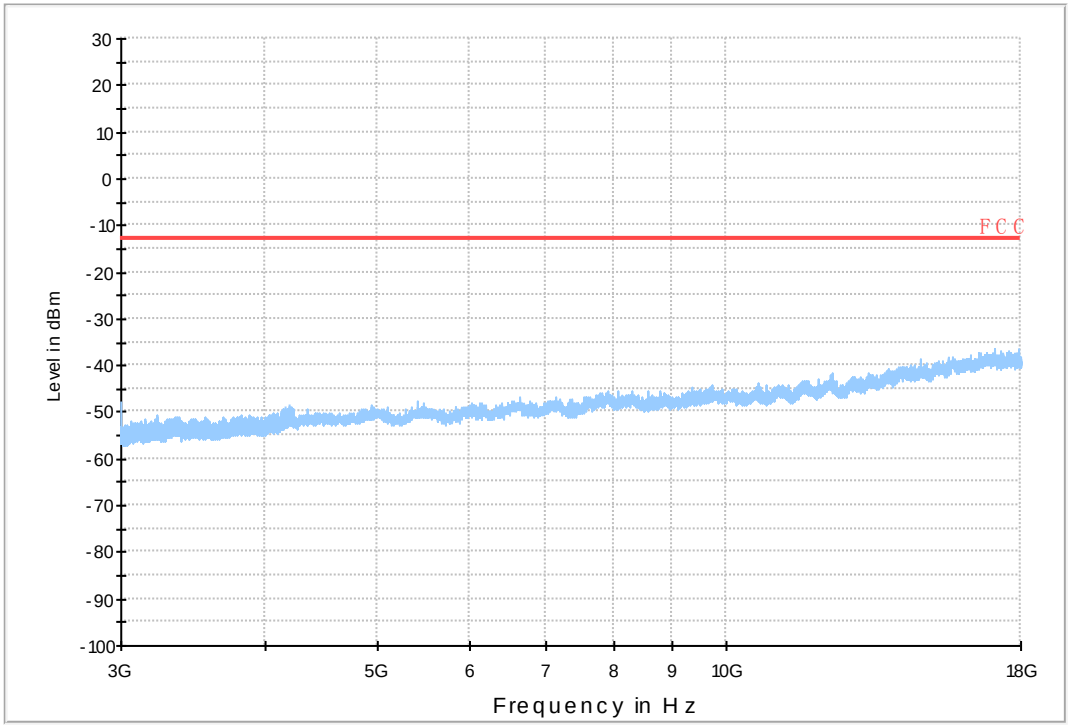
7.1.3.1 Test Mode = GSM/TM1



Copy of FCC PART22 GSM850_L

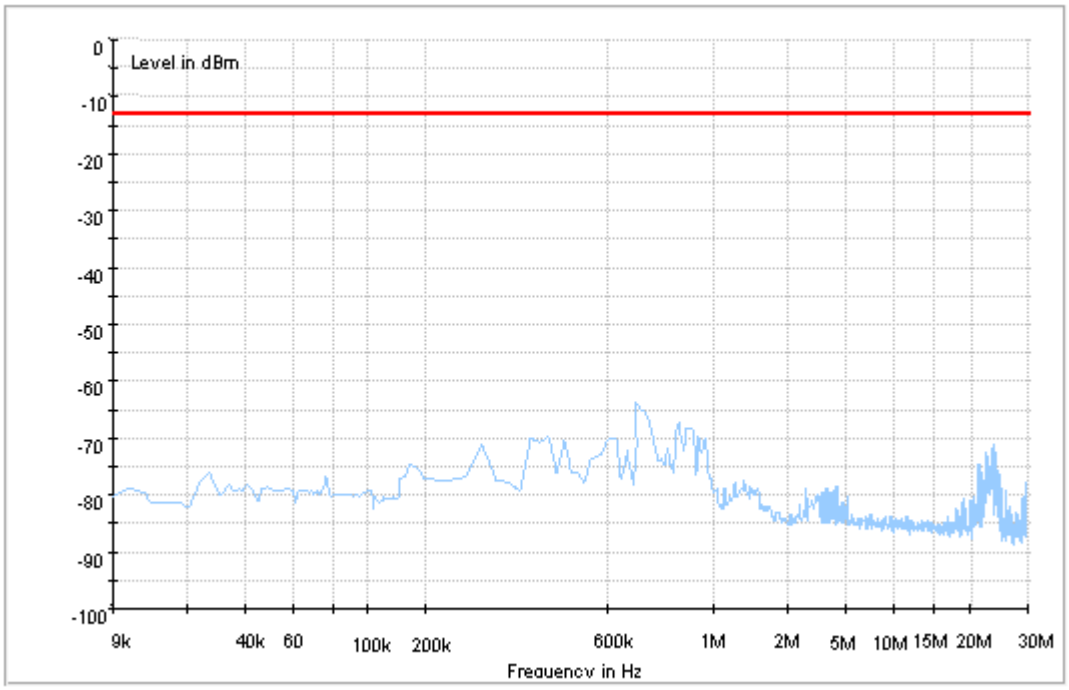


Copy of FCC PART22 GSM850_H

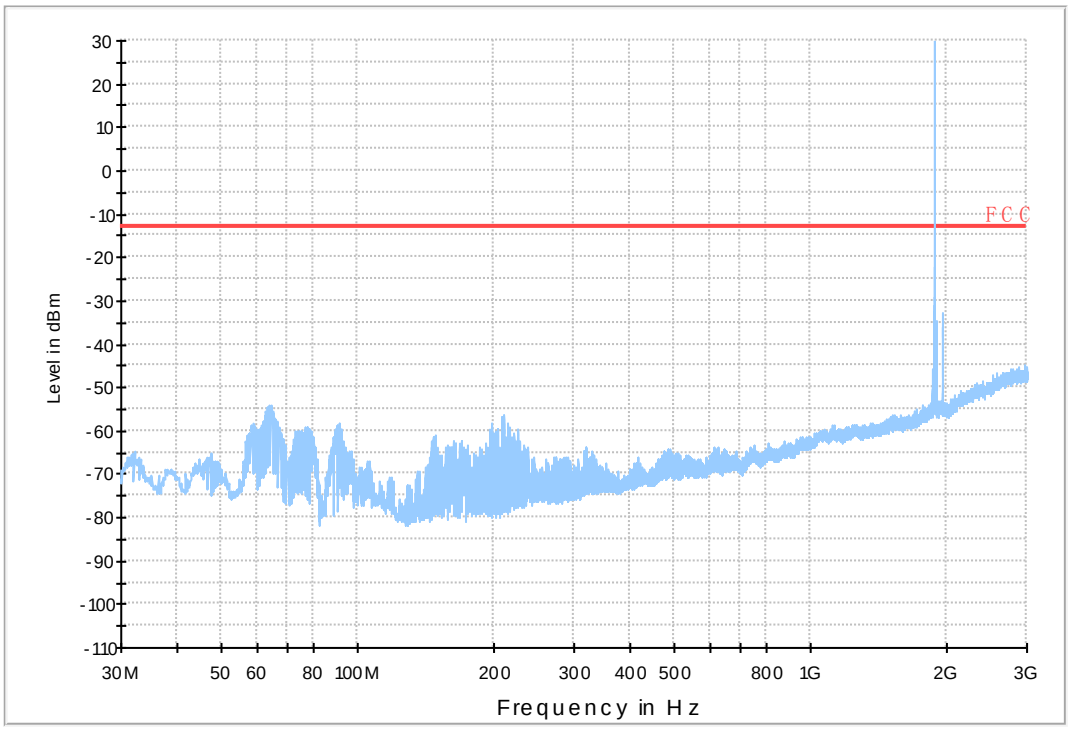


7.1.4 Test Band = GSM1900_ANT2

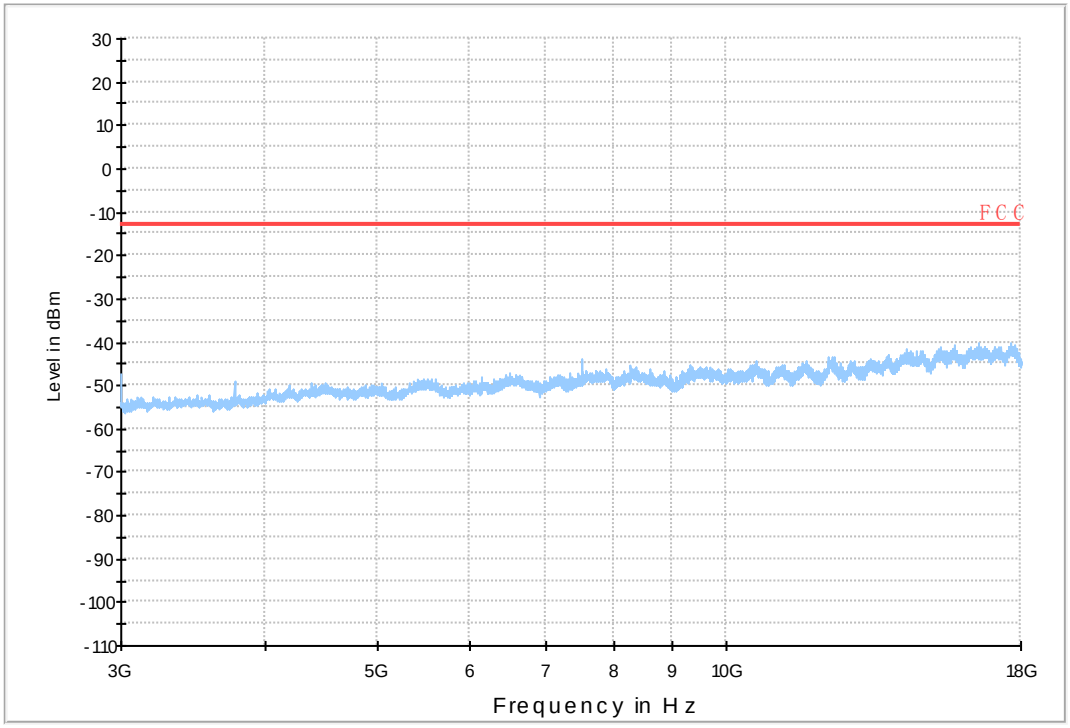
7.1.4.1 Test Mode = GSM/TM1

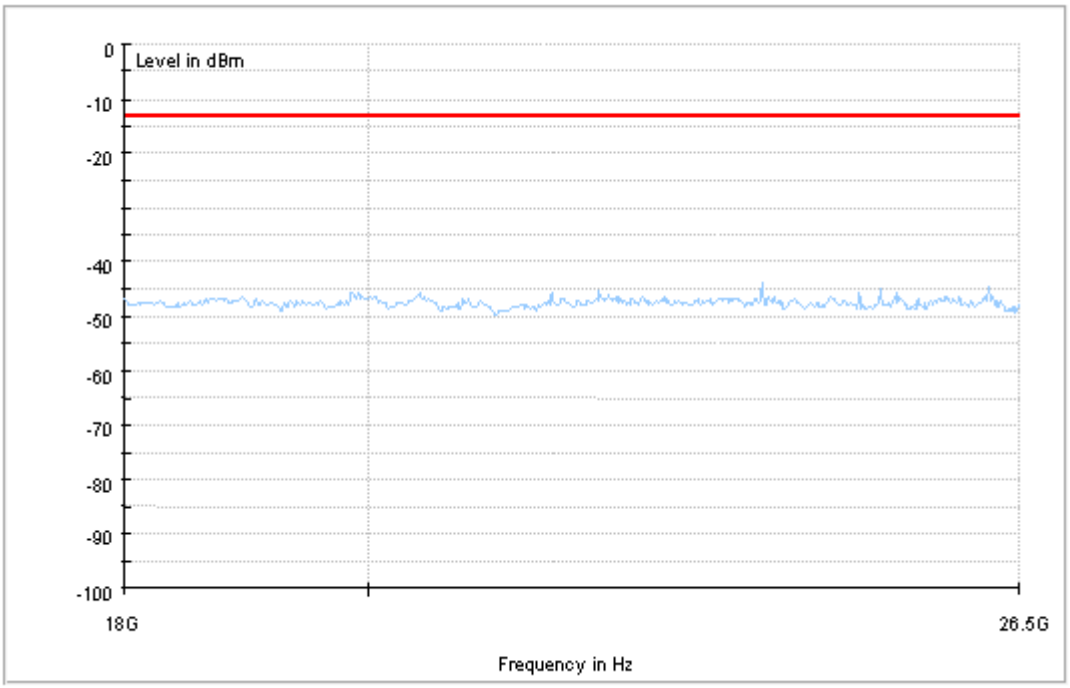


Copy of FCC PART24 GSM1900_L



Copy of FCC PART24 GSM1900_H





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	-9.49	-0.01151	PASS
				VN	-9.81	-0.0119	PASS
				VH	-9.88	-0.01199	PASS
		MCH	TN	VL	-19.82	-0.02369	PASS
				VN	-18.79	-0.02246	PASS
				VH	-18.85	-0.02253	PASS
		HCH	TN	VL	-8.33	-0.00981	PASS
				VN	-9.10	-0.01072	PASS
				VH	-11.17	-0.01316	PASS
	GSM/TM2	LCH	TN	VL	-4.07	-0.00494	PASS
				VN	-8.68	-0.01053	PASS
				VH	-2.65	-0.00322	PASS
		MCH	TN	VL	-11.27	-0.01347	PASS
				VN	-11.75	-0.01404	PASS
				VH	-8.65	-0.01034	PASS
		HCH	TN	VL	-4.94	-0.00582	PASS
				VN	0.39	0.00046	PASS
				VH	-0.06	-0.00007	PASS
GSM1900	GSM/TM1	LCH	TN	VL	-20.79	-0.01124	PASS
				VN	-7.17	-0.00388	PASS
				VH	-21.50	-0.01162	PASS
		MCH	TN	VL	7.17	0.00381	PASS
				VN	1.03	0.00055	PASS
				VH	-3.94	-0.0021	PASS
		HCH	TN	VL	3.75	0.00196	PASS
				VN	10.59	0.00555	PASS
				VH	9.43	0.00494	PASS
	GSM/TM2	LCH	TN	VL	2.13	0.00115	PASS
				VN	10.94	0.00591	PASS
				VH	-5.68	-0.00307	PASS
		MCH	TN	VL	7.36	0.00391	PASS
				VN	27.02	0.01437	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VH	22.86	0.01216	PASS
		HCH	TN	VL	17.47	0.00915	PASS
				VN	24.50	0.01283	PASS
				VH	28.48	0.01491	PASS

8.1.2Frequency 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	-12.14	-0.01473	PASS
				-20	-12.01	-0.01457	PASS
				-10	-9.04	-0.01097	PASS
				0	-8.98	-0.0109	PASS
				10	-7.81	-0.00948	PASS
				20	-10.20	-0.01238	PASS
				30	-10.65	-0.01292	PASS
				40	-12.07	-0.01464	PASS
				50	-12.59	-0.01528	PASS
		MCH	VN	-30	-15.56	-0.0186	PASS
				-20	-16.85	-0.02014	PASS
				-10	-17.11	-0.02045	PASS
				0	-17.89	-0.02138	PASS
				10	-13.95	-0.01667	PASS
				20	-17.11	-0.02045	PASS
				30	-14.08	-0.01683	PASS
				40	-17.05	-0.02038	PASS
				50	-15.50	-0.01853	PASS
		HCH	VN	-30	-9.88	-0.01164	PASS
				-20	-11.75	-0.01384	PASS
				-10	-10.65	-0.01255	PASS
				0	-8.46	-0.00997	PASS
				10	-8.01	-0.00944	PASS
				20	-9.36	-0.01103	PASS
				30	-12.01	-0.01415	PASS
				40	-7.43	-0.00875	PASS
				50	-8.14	-0.00959	PASS
	GSM/TM2	LCH	VN	-30	-2.87	-0.00348	PASS
				-20	-6.91	-0.00838	PASS
				-10	-6.97	-0.00846	PASS
				0	-2.32	-0.00281	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				10	-2.97	-0.0036	PASS
				20	6.07	0.00736	PASS
				30	-4.71	-0.00571	PASS
				40	-4.58	-0.00556	PASS
				50	-0.42	-0.00051	PASS
		MCH	VN	-30	-12.17	-0.01455	PASS
				-20	-8.36	-0.00999	PASS
				-10	-10.01	-0.01197	PASS
				0	-7.46	-0.00892	PASS
				10	-9.49	-0.01134	PASS
				20	-6.59	-0.00788	PASS
				30	-5.29	-0.00632	PASS
				40	-9.46	-0.01131	PASS
				50	-3.94	-0.00471	PASS
		HCH	VN	-30	-1.61	-0.0019	PASS
				-20	2.20	0.00259	PASS
				-10	-1.71	-0.00201	PASS
				0	-2.62	-0.00309	PASS
				10	-3.45	-0.00406	PASS
				20	-3.55	-0.00418	PASS
				30	-4.97	-0.00586	PASS
				40	-0.32	-0.00038	PASS
				50	0.36	0.00042	PASS
GSM1900	GSM/TM1	LCH	VN	-30	-15.95	-0.00862	PASS
				-20	-14.40	-0.00778	PASS
				-10	-14.27	-0.00771	PASS
				0	-19.89	-0.01075	PASS
				10	-16.72	-0.00904	PASS
				20	-18.08	-0.00977	PASS
				30	-18.27	-0.00987	PASS
				40	-18.79	-0.01016	PASS
				50	-12.27	-0.00663	PASS
		MCH	VN	-30	7.23	0.00385	PASS
				-20	-0.90	-0.00048	PASS
				-10	1.23	0.00065	PASS
				0	5.49	0.00292	PASS
				10	4.46	0.00237	PASS
				20	5.23	0.00278	PASS
				30	2.20	0.00117	PASS
				40	0.90	0.00048	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				50	1.81	0.00096	PASS
		HCH	VN	-30	6.01	0.00315	PASS
				-20	-0.77	-0.0004	PASS
				-10	16.14	0.00845	PASS
				0	2.45	0.00128	PASS
				10	11.56	0.00605	PASS
				20	9.69	0.00507	PASS
				30	1.87	0.00098	PASS
				40	11.88	0.00622	PASS
				50	12.20	0.00639	PASS
	GSM/TM2	LCH	VN	-30	3.65	0.00197	PASS
				-20	4.33	0.00234	PASS
				-10	13.85	0.00749	PASS
				0	10.27	0.00555	PASS
				10	1.52	0.00082	PASS
				20	15.82	0.00855	PASS
				30	16.69	0.00902	PASS
				40	6.20	0.00335	PASS
				50	4.23	0.00229	PASS
		MCH	VN	-30	23.50	0.0125	PASS
				-20	24.28	0.01291	PASS
				-10	20.11	0.0107	PASS
				0	30.80	0.01638	PASS
				10	29.74	0.01582	PASS
				20	26.02	0.01384	PASS
				30	20.37	0.01084	PASS
				40	22.37	0.0119	PASS
				50	22.47	0.01195	PASS
		HCH	VN	-30	30.38	0.01591	PASS
				-20	22.96	0.01202	PASS
				-10	20.47	0.01072	PASS
				0	35.58	0.01863	PASS
				10	25.05	0.01312	PASS
				20	22.70	0.01189	PASS
				30	16.95	0.00888	PASS
				40	29.48	0.01544	PASS
				50	18.53	0.0097	PASS

END