



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	32.10	25.29	38.5	PASS
		MCH	32.20	25.39	38.5	PASS
		HCH	32.32	25.51	38.5	PASS
	GSM/TM2	LCH	26.05	19.24	38.5	PASS
		MCH	26.33	19.52	38.5	PASS
		HCH	26.34	19.53	38.5	PASS
Test Band	Test Mode	Test Channel	Measured[dBm]	EIRP [dBm]	Limit [dBm]	Verdict
PCS1900	GSM/TM1	LCH	29.09	28.60	33	PASS
		MCH	29.18	28.69	33	PASS
		HCH	29.16	28.67	33	PASS
	GSM/TM2	LCH	24.92	24.43	33	PASS
		MCH	24.97	24.48	33	PASS
		HCH	25.09	24.60	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,

$$\text{ERP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBd]}$$

$$\text{EIRP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBi]}$$

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	2.07	13	PASS
		MCH	1.71	13	PASS
		HCH	1.97	13	PASS
	GSM/TM2	LCH	4.84	13	PASS
		MCH	4.81	13	PASS
		HCH	4.78	13	PASS
PCS1900	GSM/TM1	LCH	1.72	13	PASS
		MCH	1.65	13	PASS
		HCH	1.92	13	PASS
	GSM/TM2	LCH	4.50	13	PASS
		MCH	4.69	13	PASS
		HCH	4.65	13	PASS

3Appendix_C: Modulation Characteristics

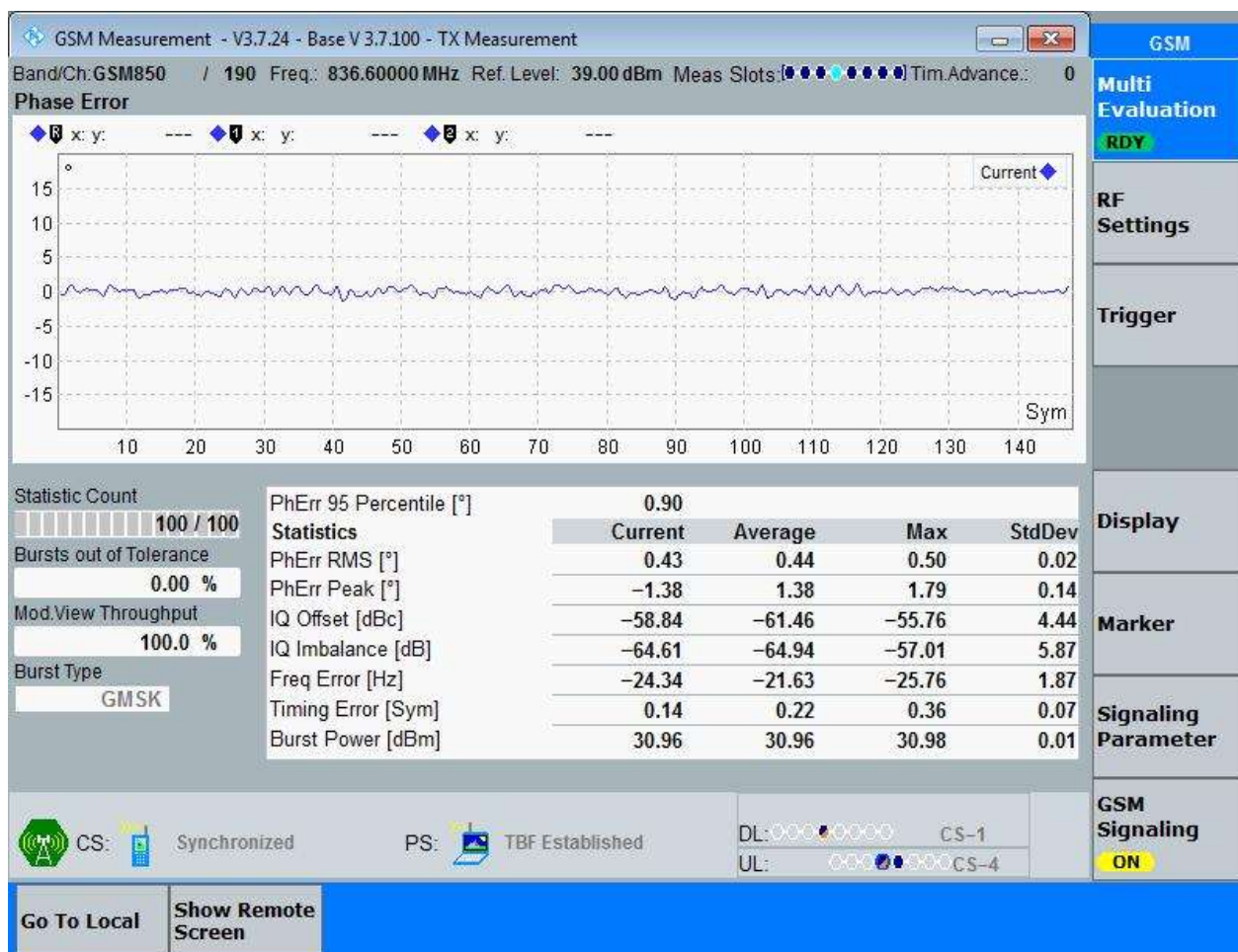
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

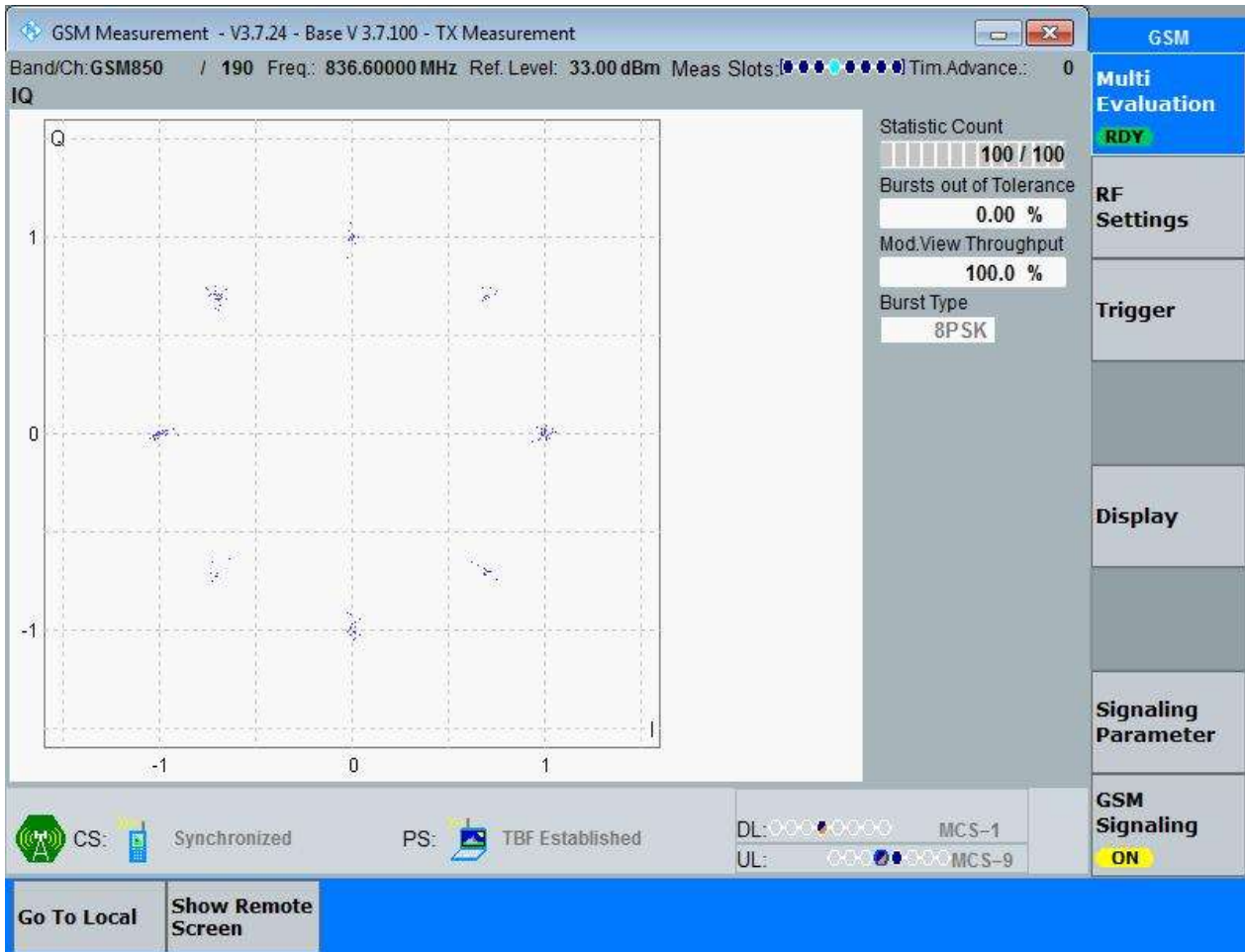
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

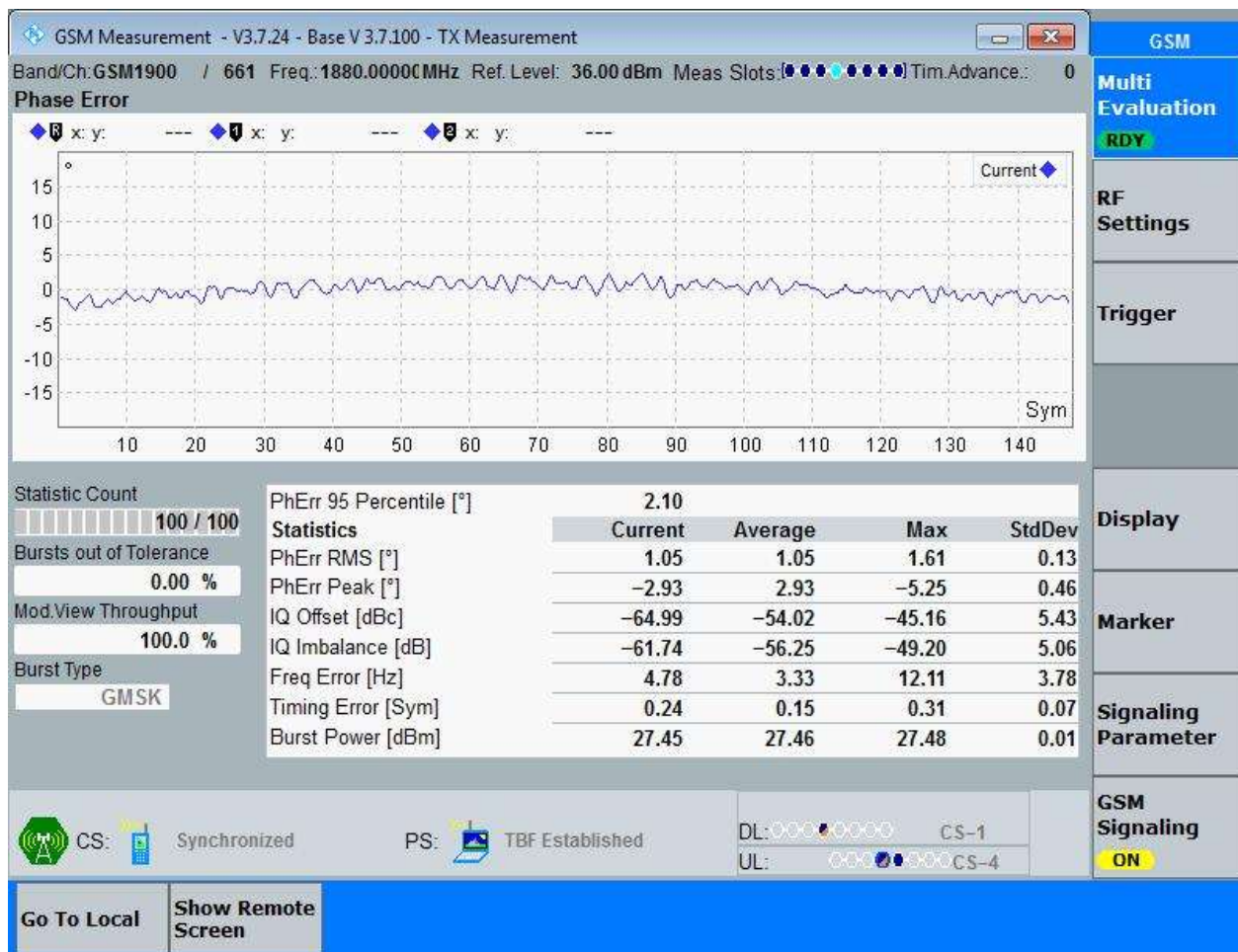
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = PCS1900

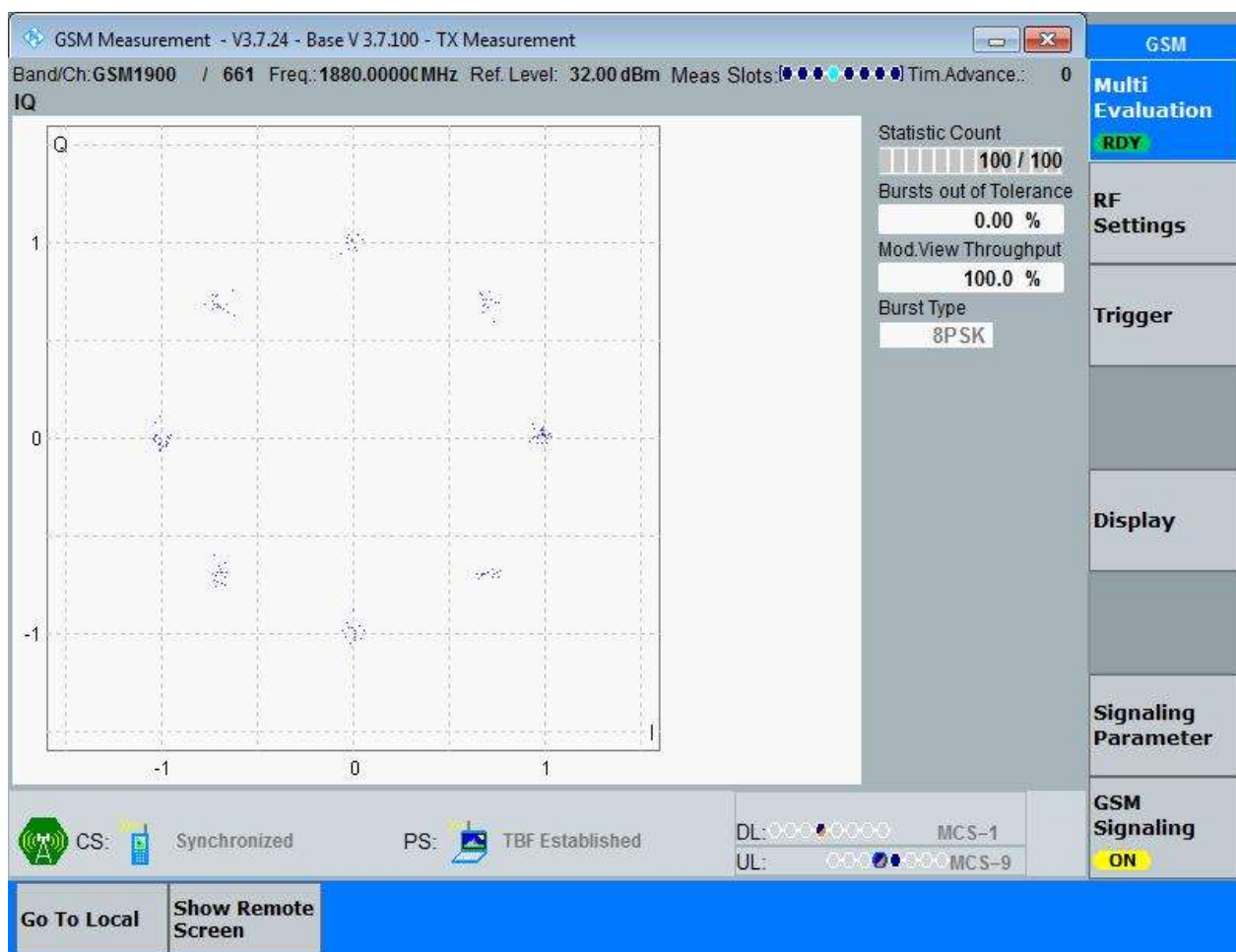
3.1.2.1 Test Mode = GSM/TM1

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	247.19	318.5	Pass
		MCH	248.11	316.6	Pass
		HCH	245.52	315.4	Pass
	GSM/TM2	LCH	252.43	320.8	Pass
		MCH	253.33	322.1	Pass
		HCH	249.37	315.7	Pass
PCS1900	GSM/TM1	LCH	240.21	310.6	Pass
		MCH	243.44	312.4	Pass
		HCH	241.31	313.5	Pass
	GSM/TM2	LCH	253.93	319.0	Pass
		MCH	248.20	323.4	Pass
		HCH	251.69	328.8	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

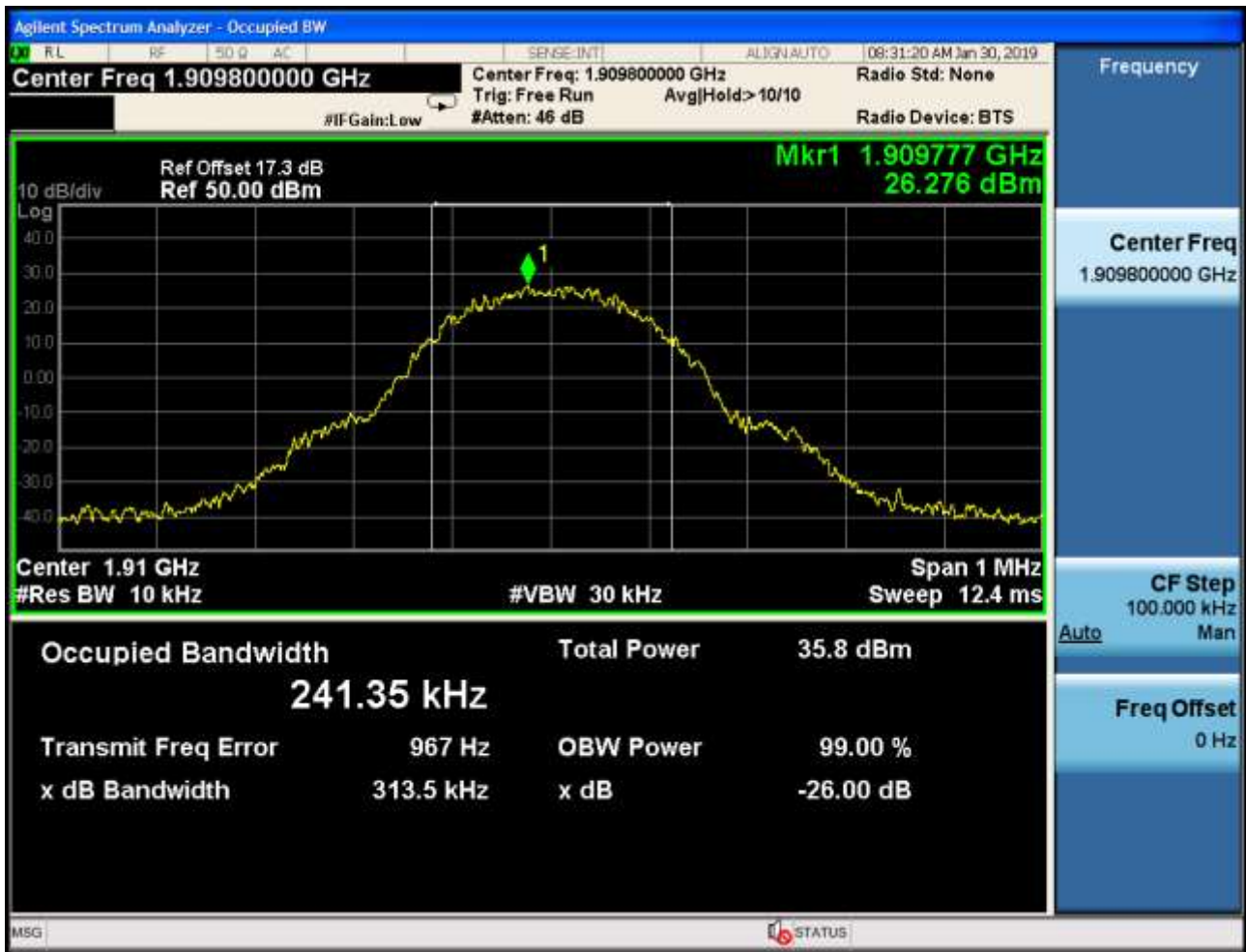
4.1.2.1.1 Test Channel = LCH



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

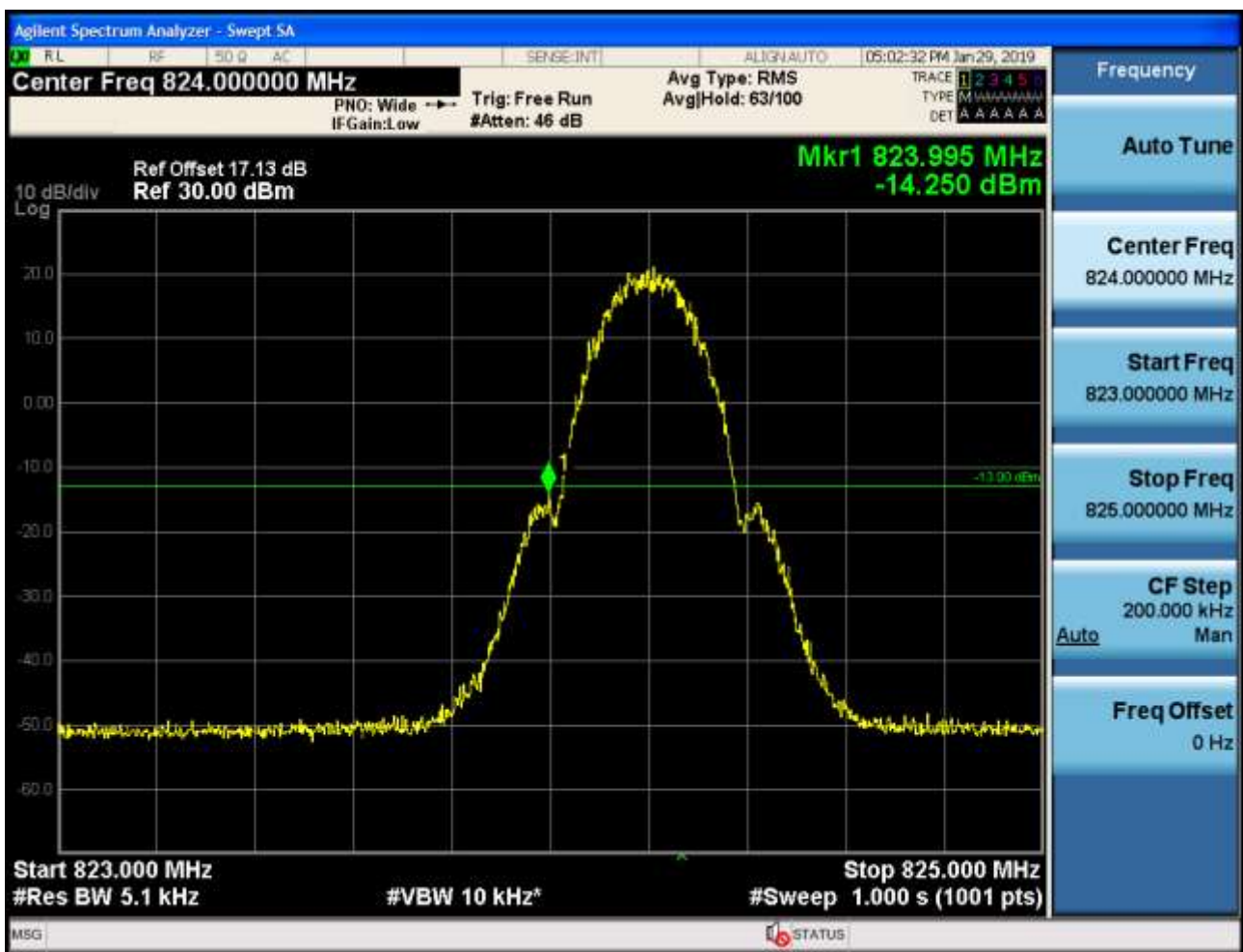
Part I - Test Plots

5.1 For GSM

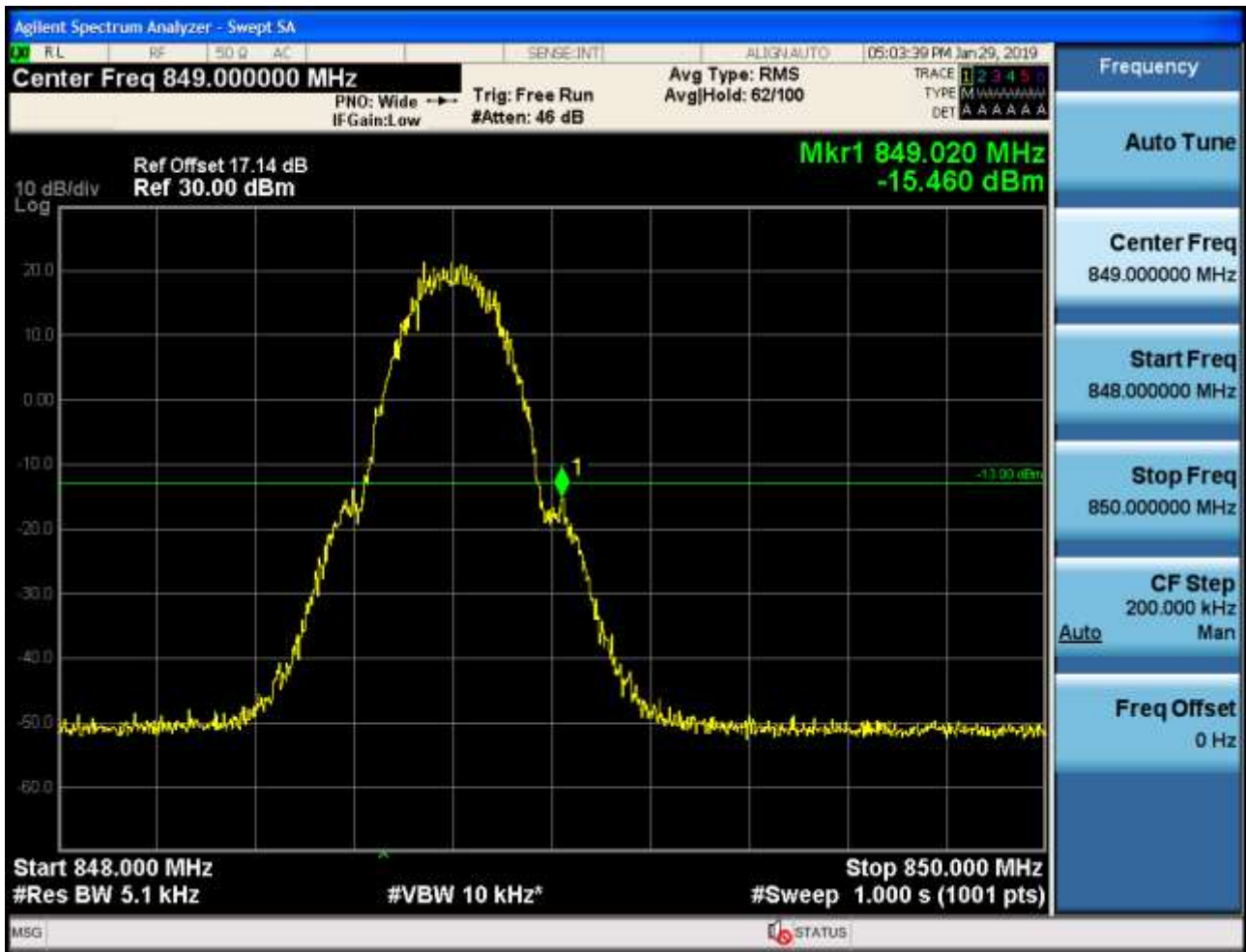
5.1.1 Test Band = GSM850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH

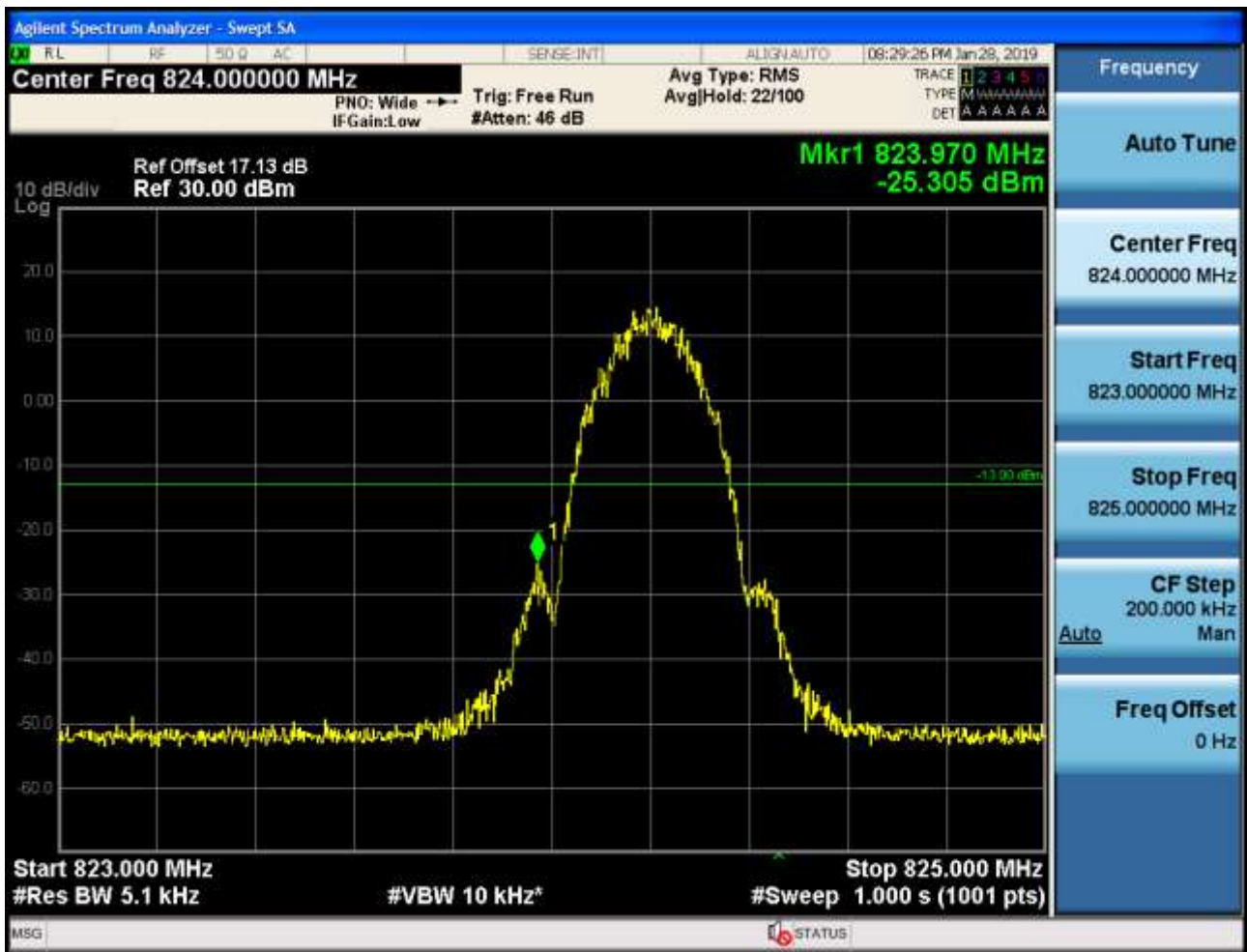


5.1.1.1.2 Test Channel = HCH

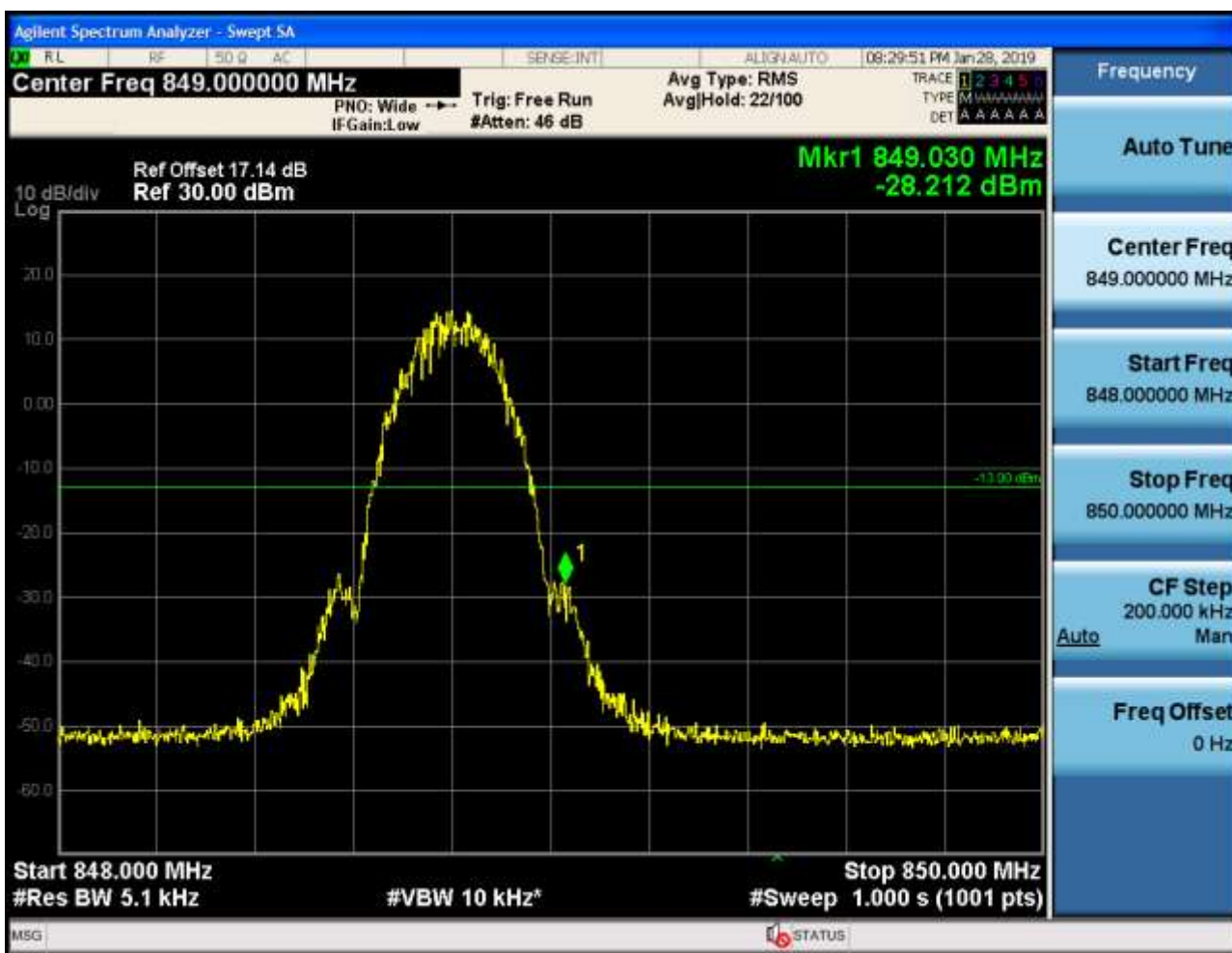


5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



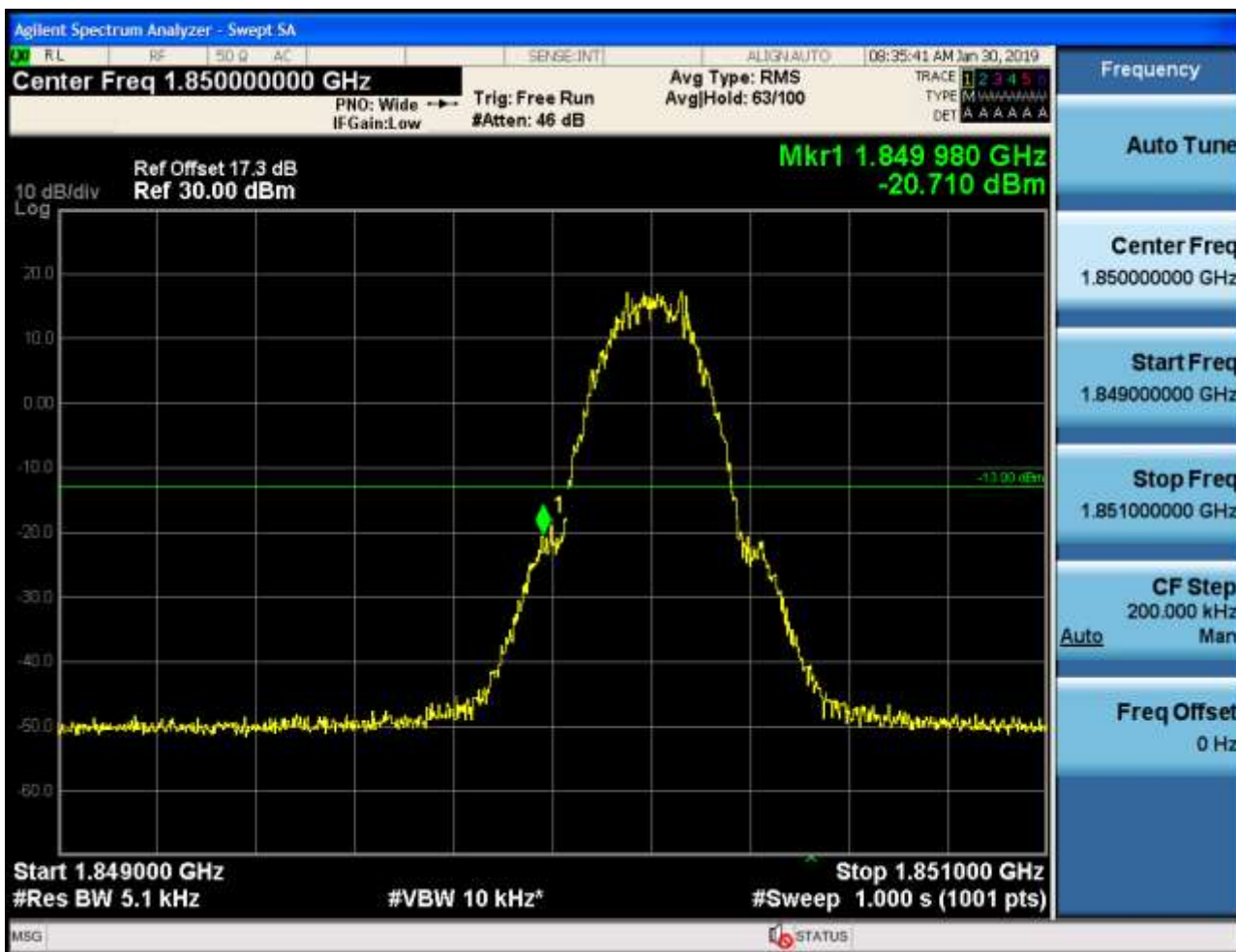
5.1.1.2.2 Test Channel = HCH



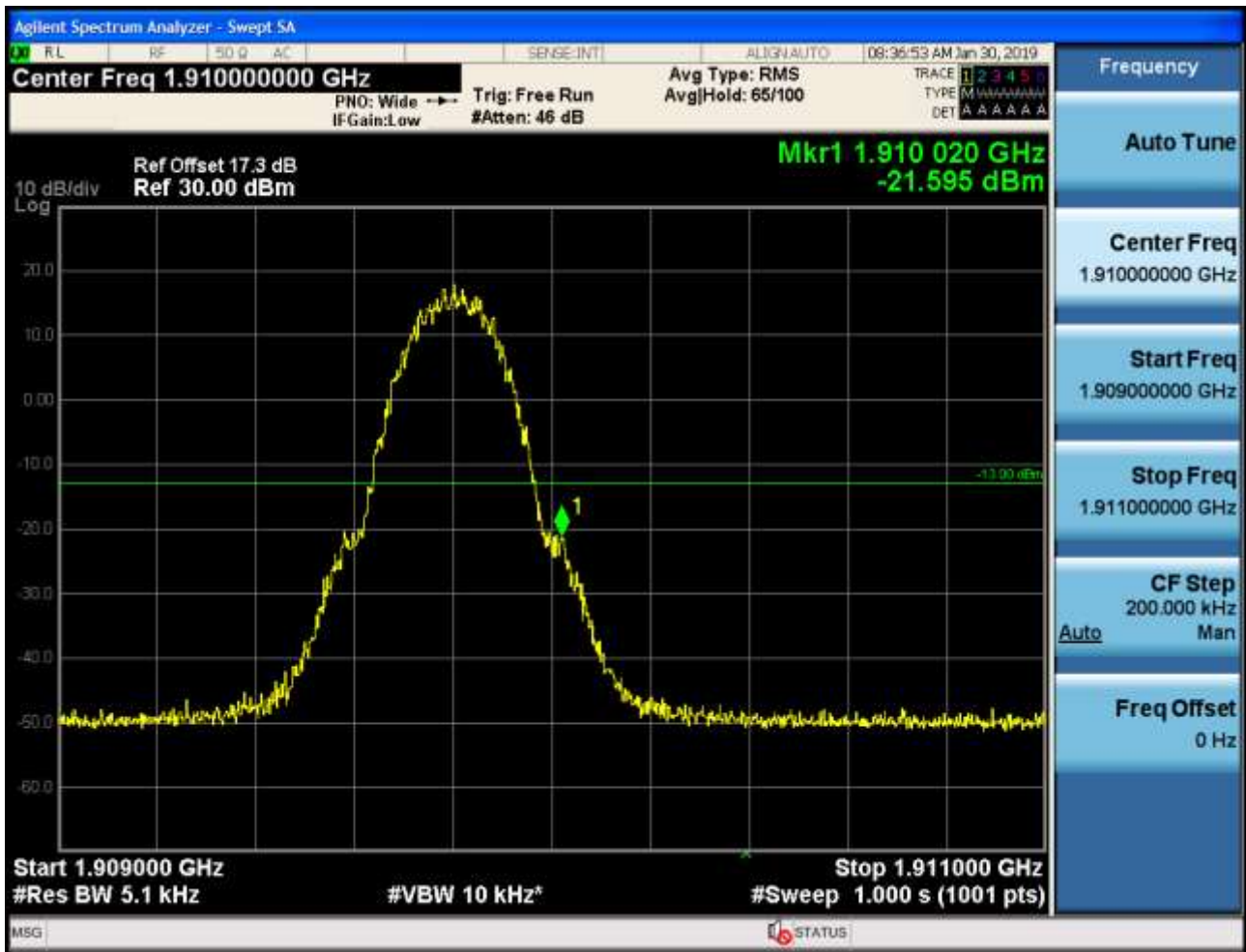
5.1.2 Test Band = PCS1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH

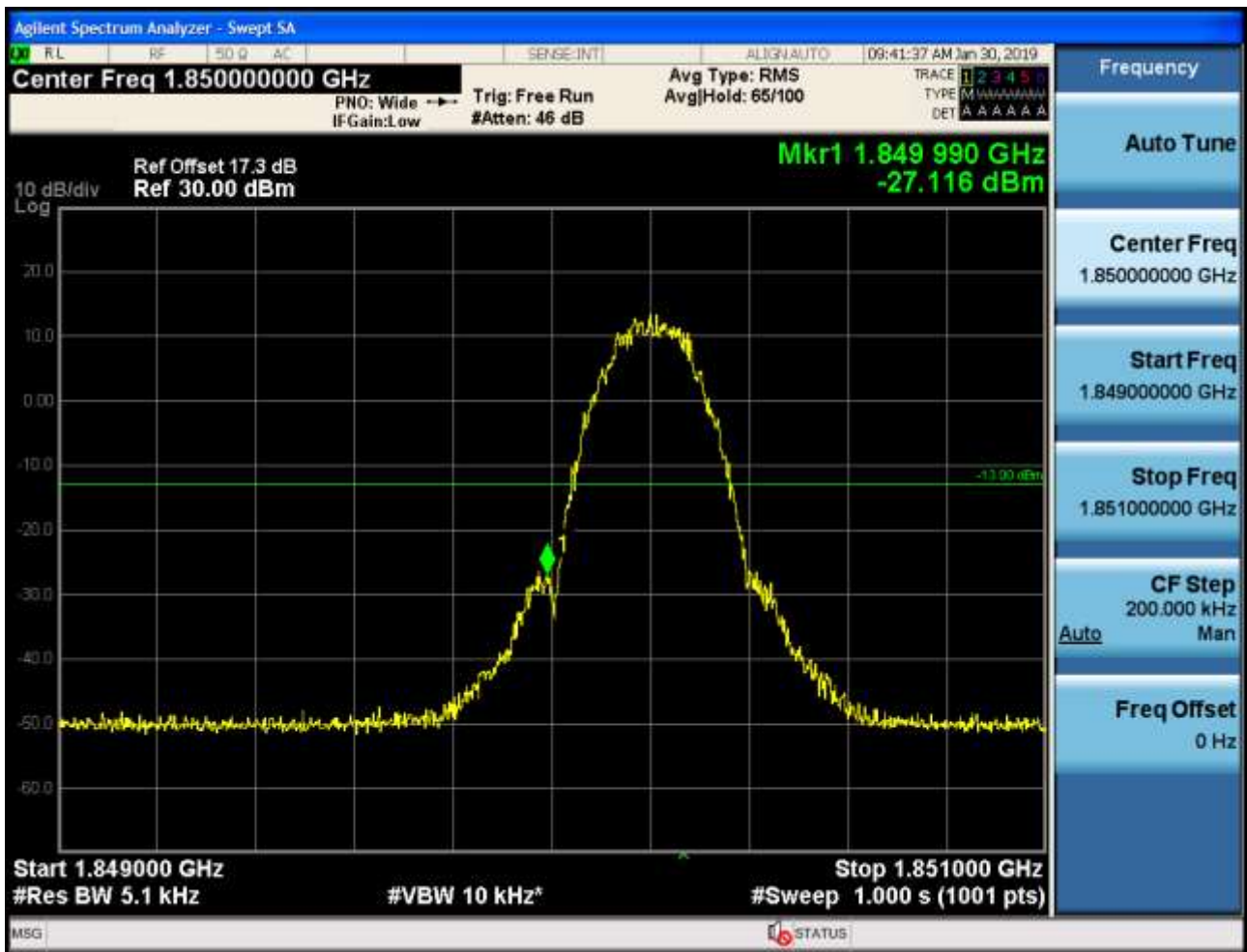


5.1.2.1.2 Test Channel = HCH

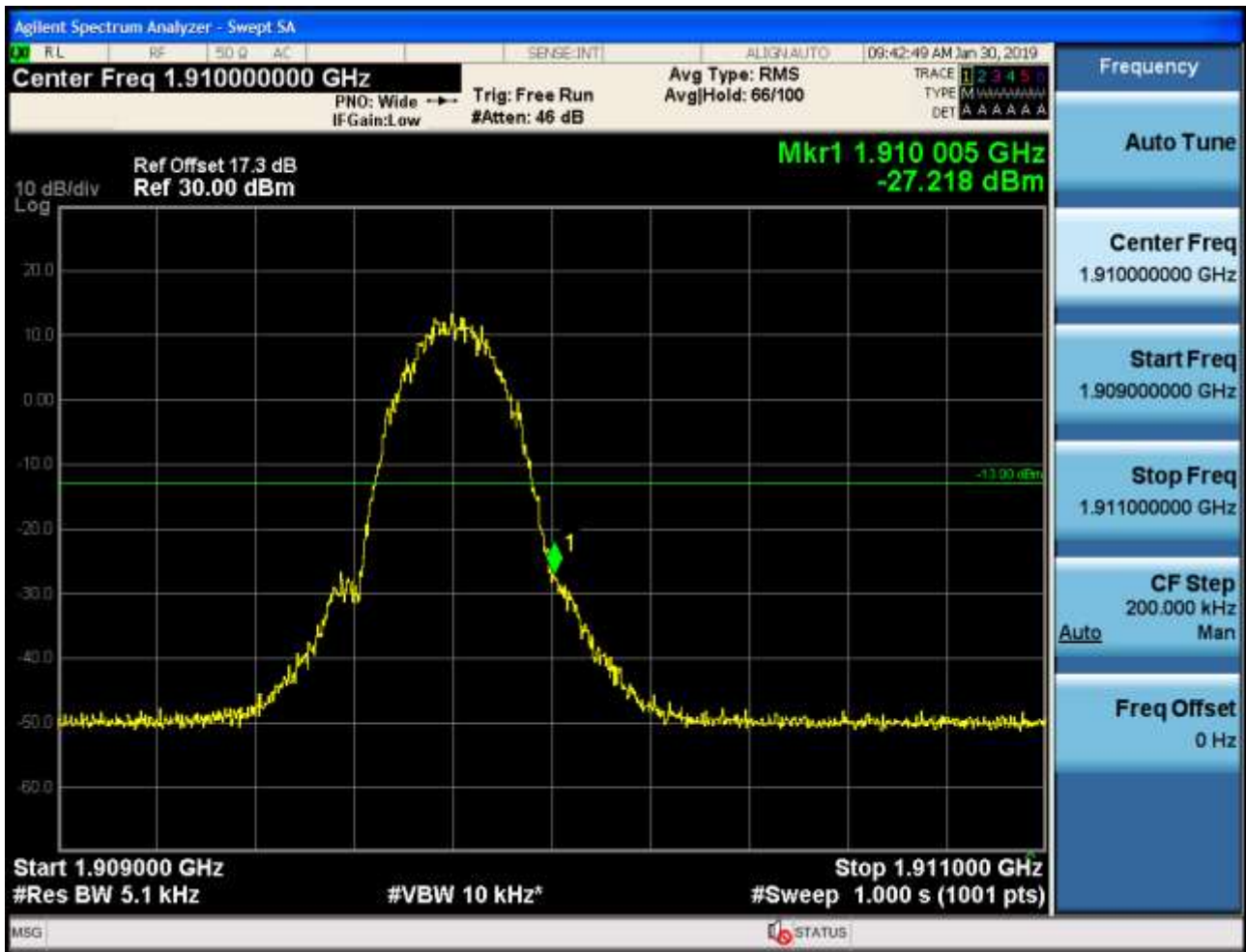


5.1.2.2 Test Mode = GSM/TM2

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

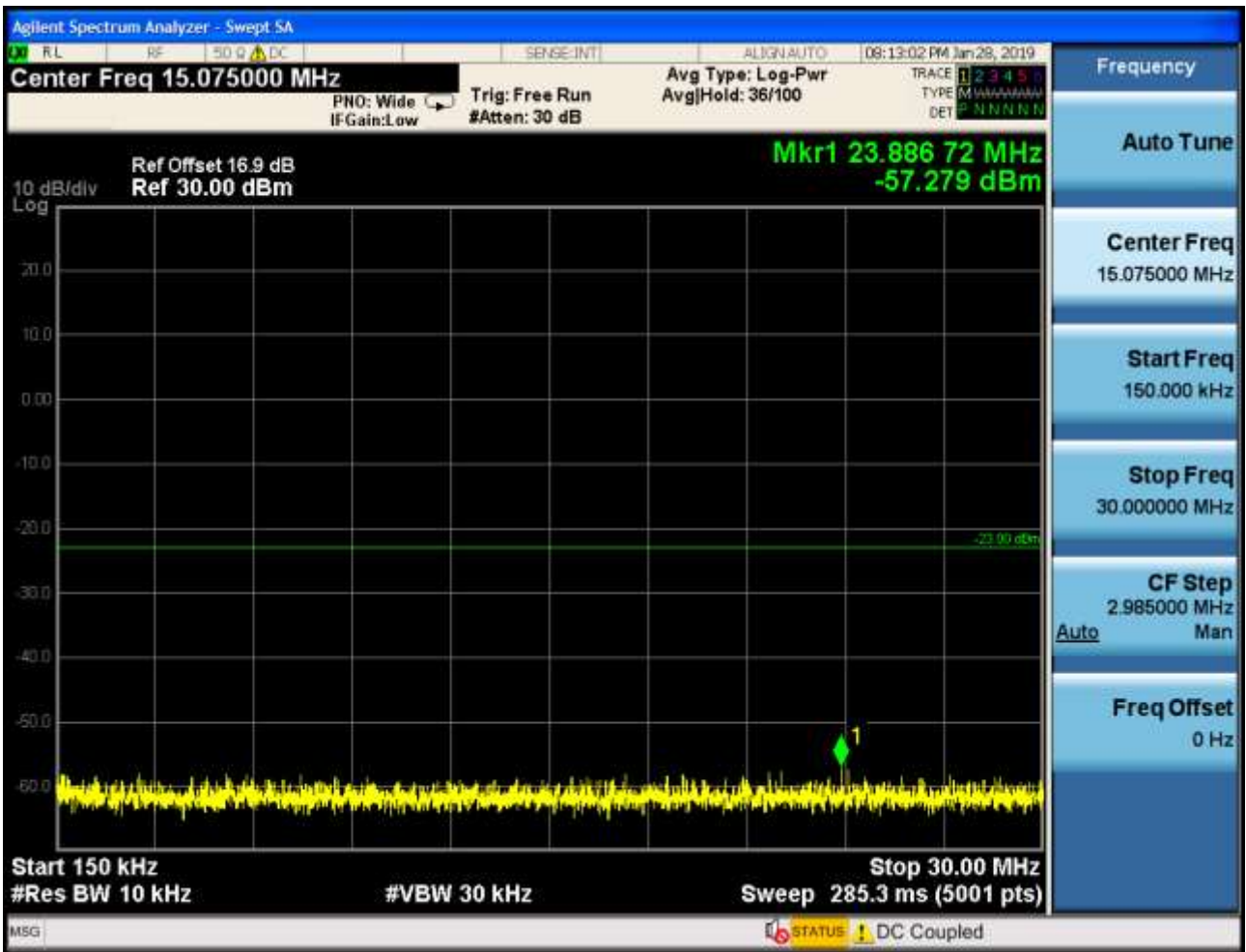
6.1 For GSM

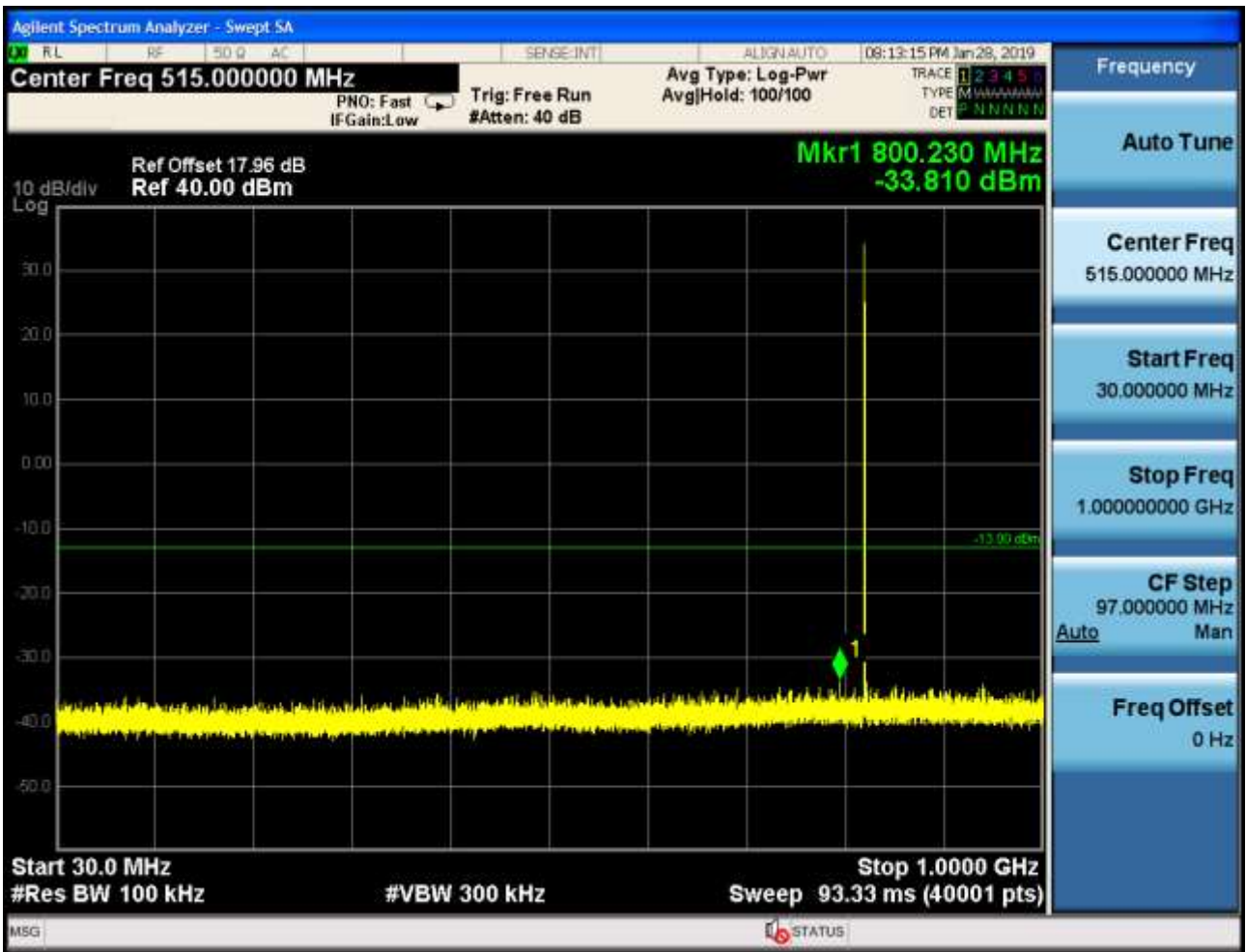
6.1.1 Test Band = GSM850

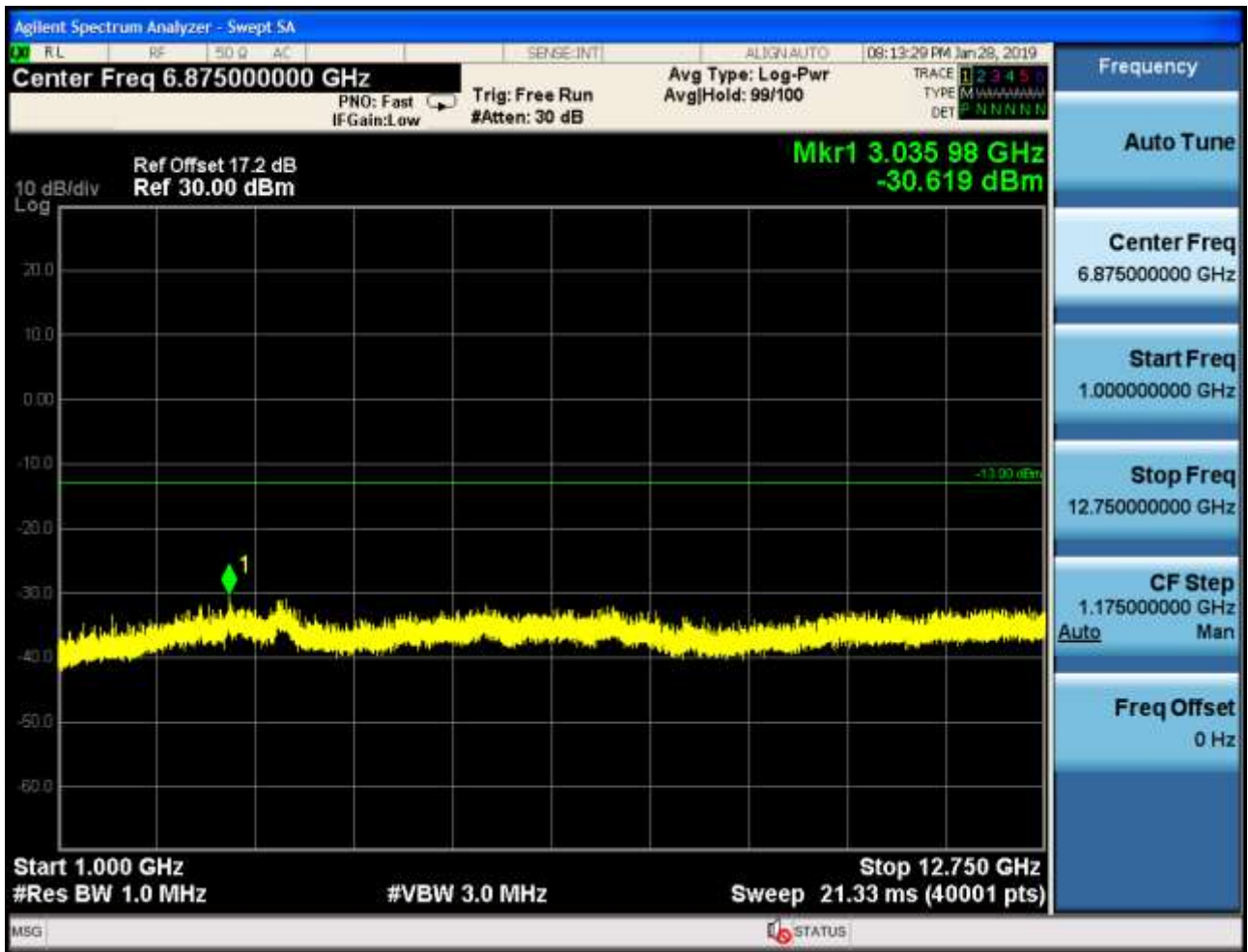
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH

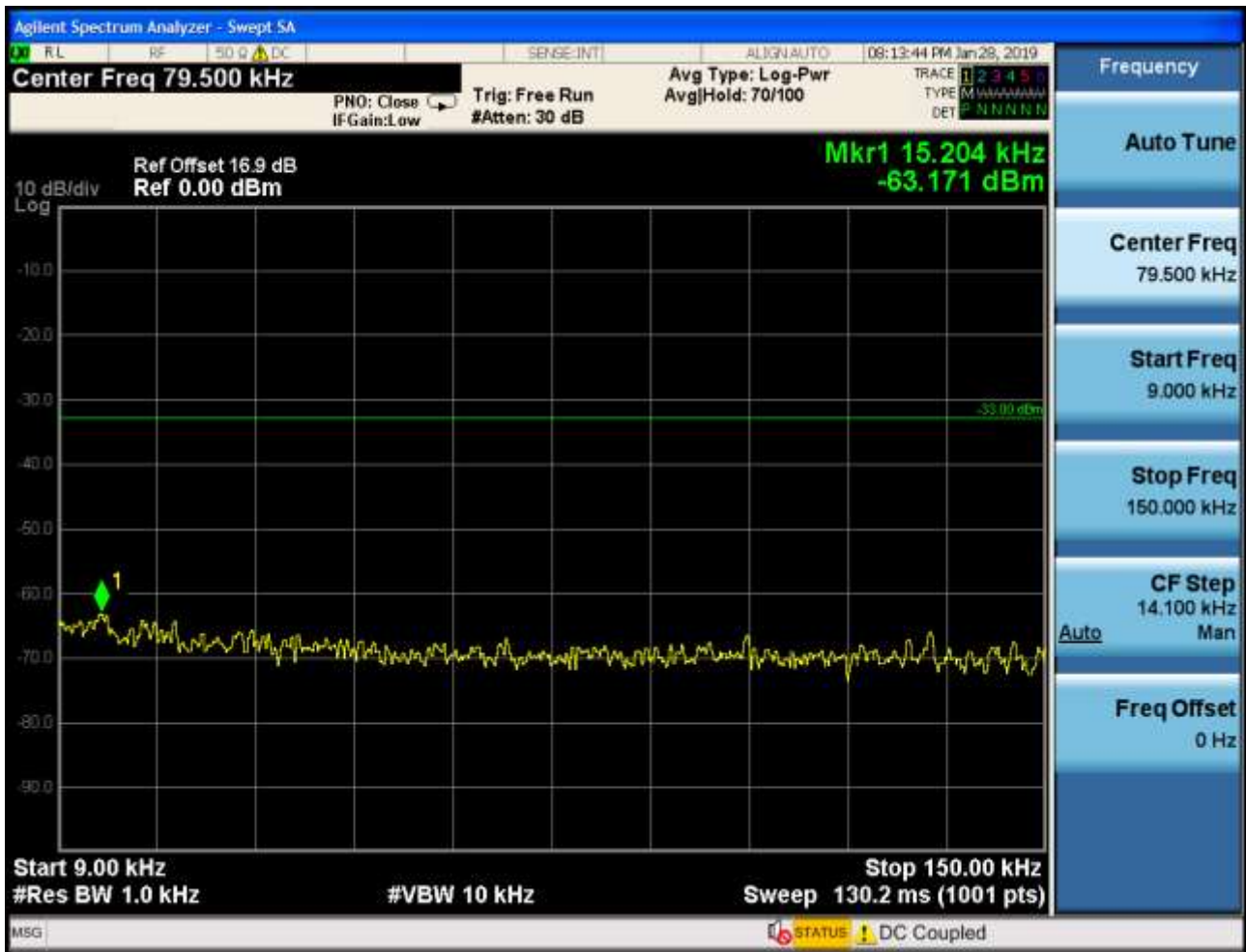


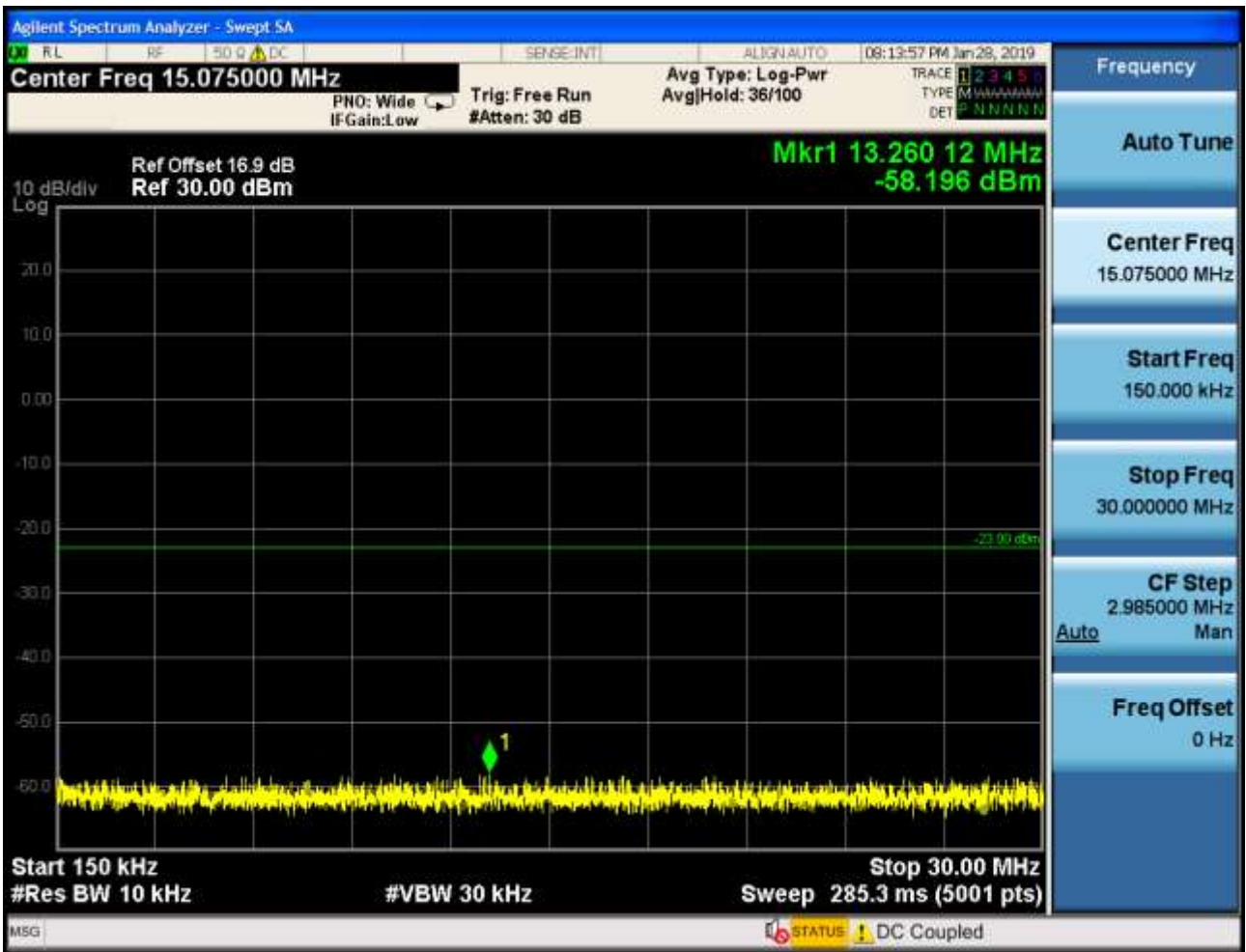


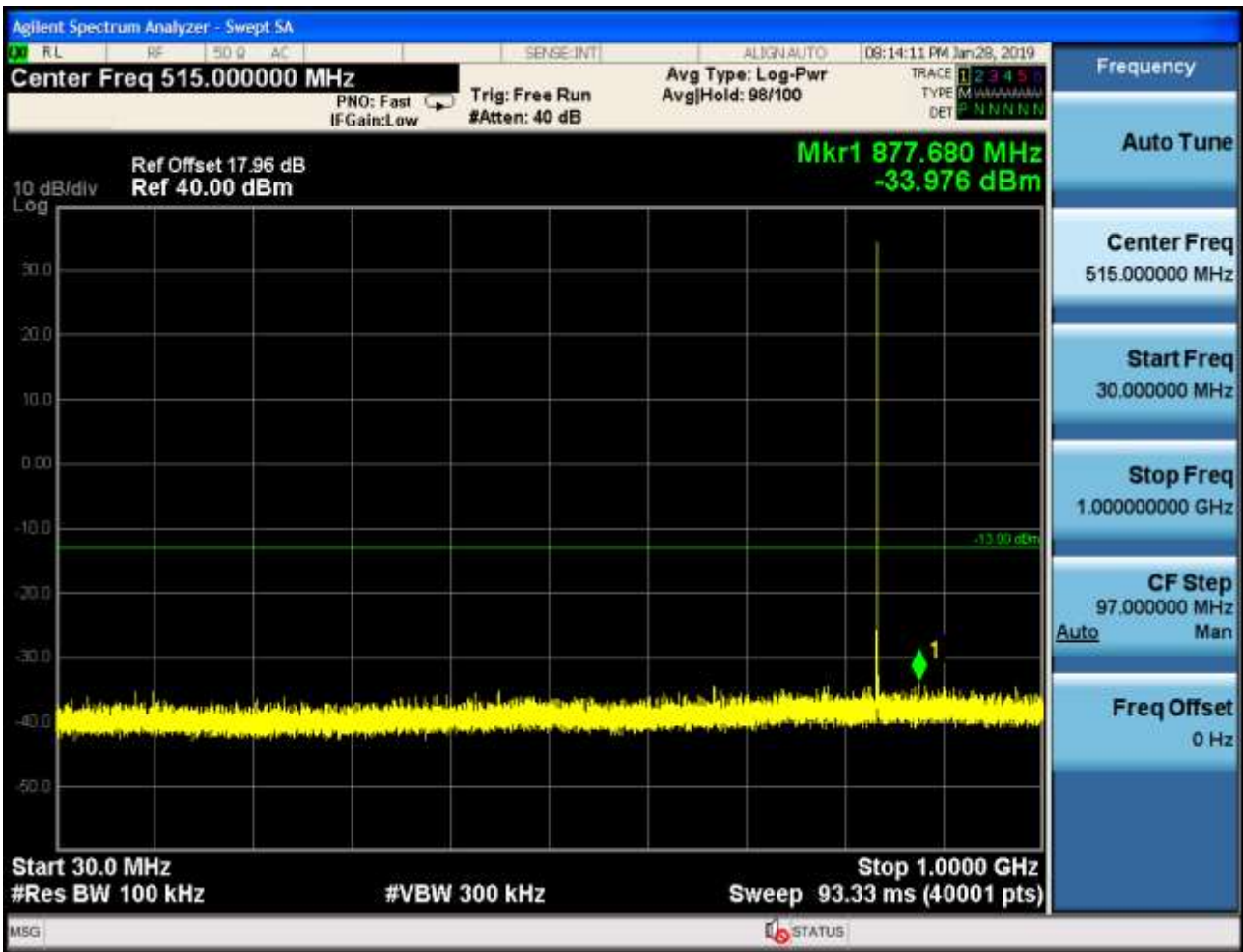




6.1.1.1.2 Test Channel = MCH



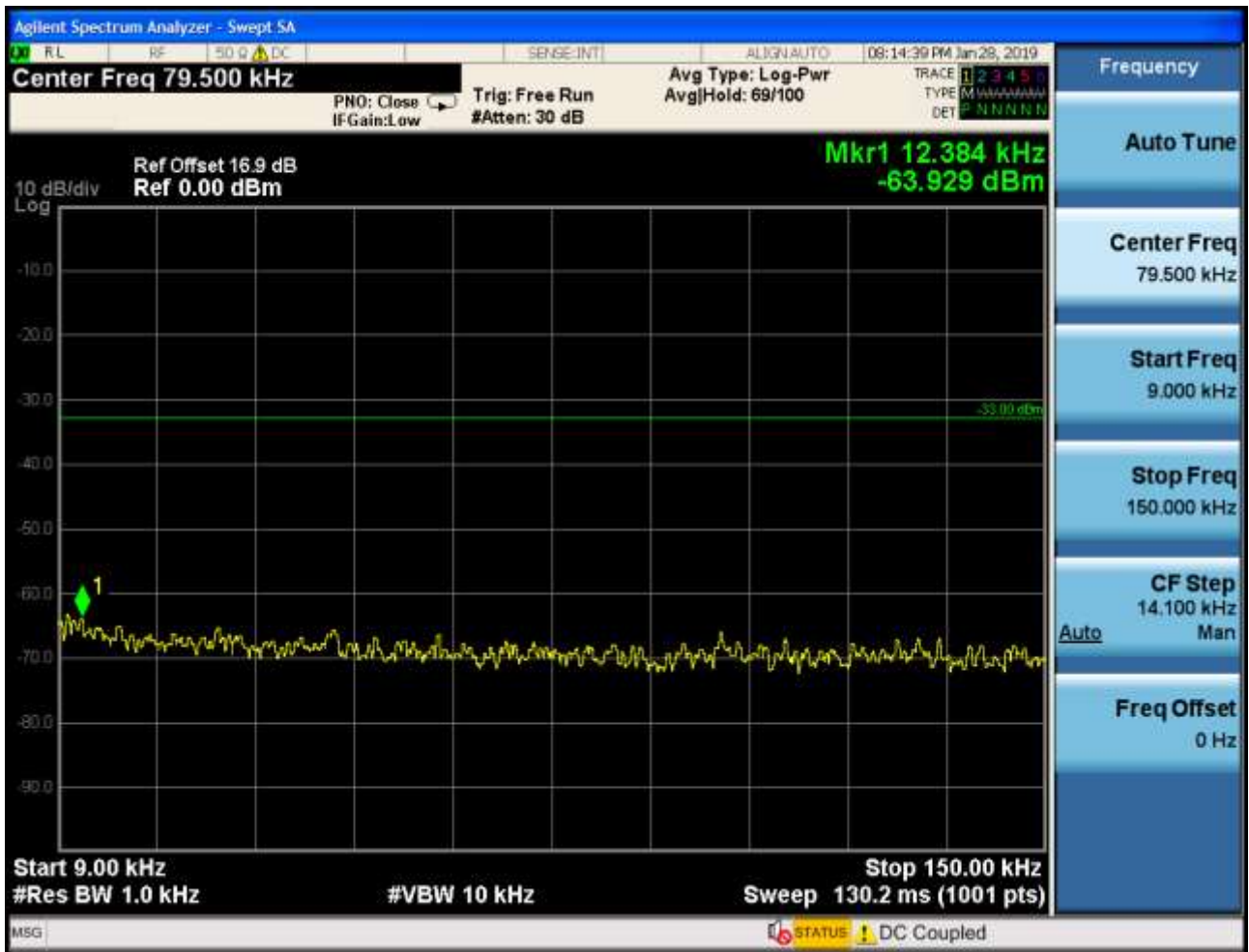


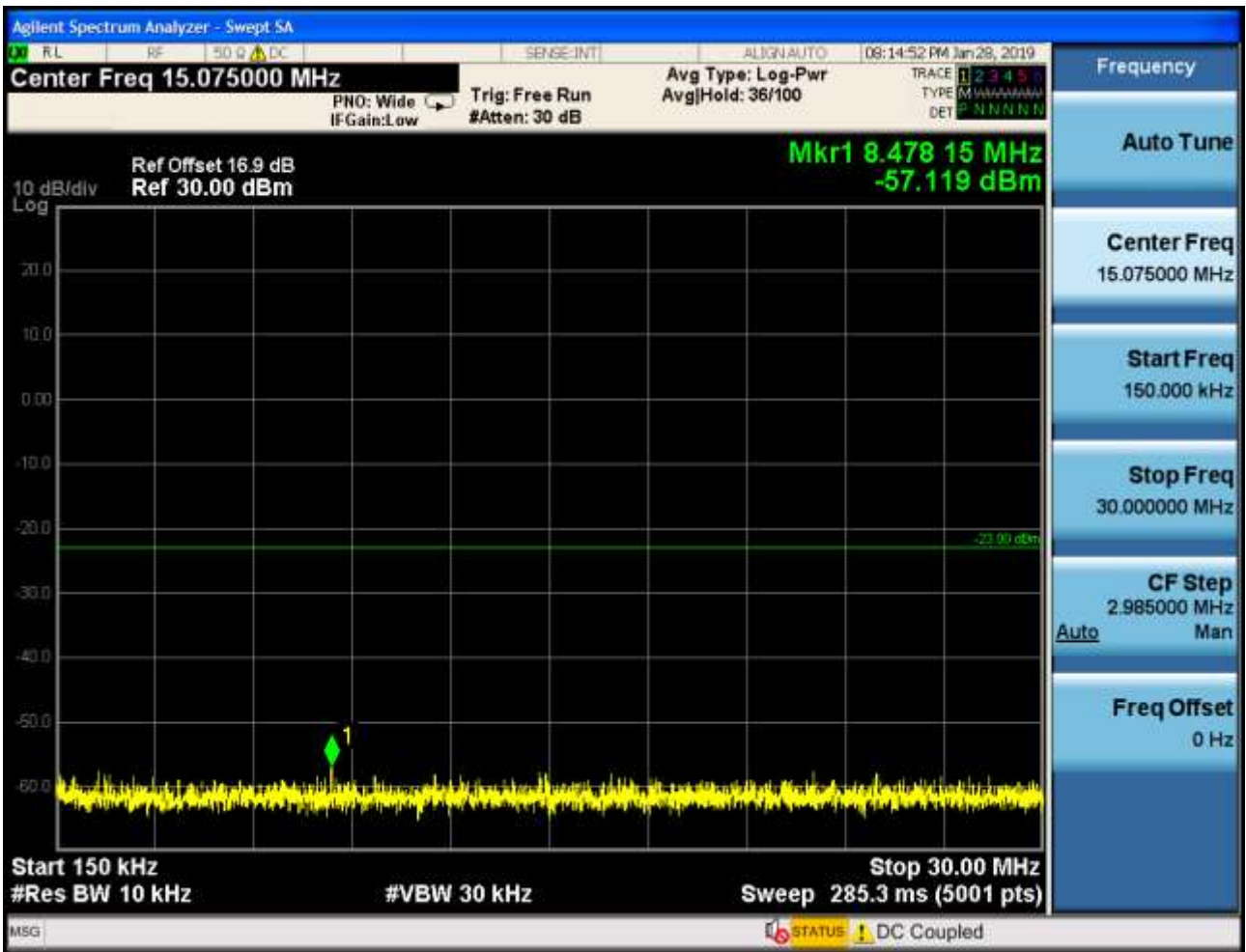


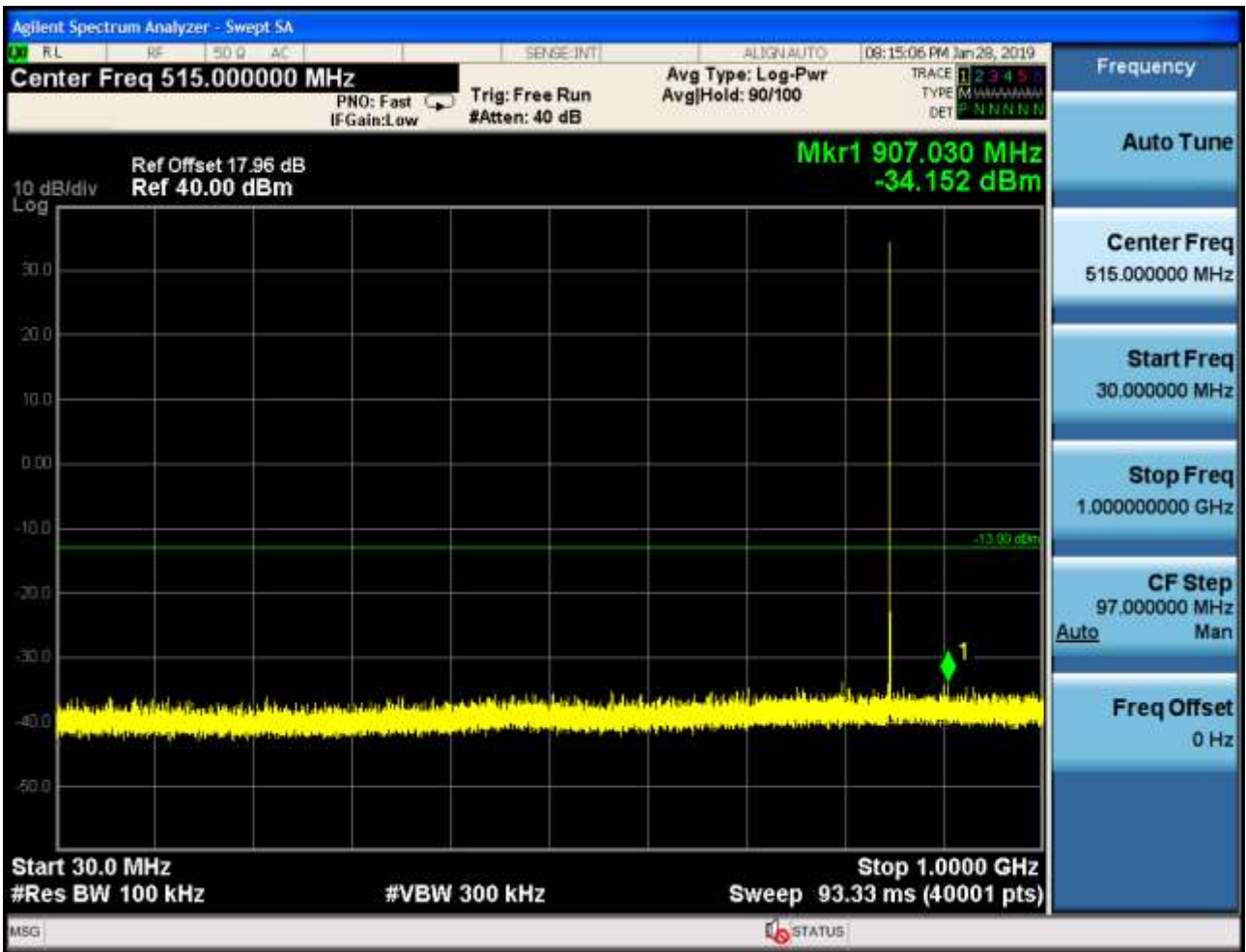




6.1.1.1.3 Test Channel = HCH



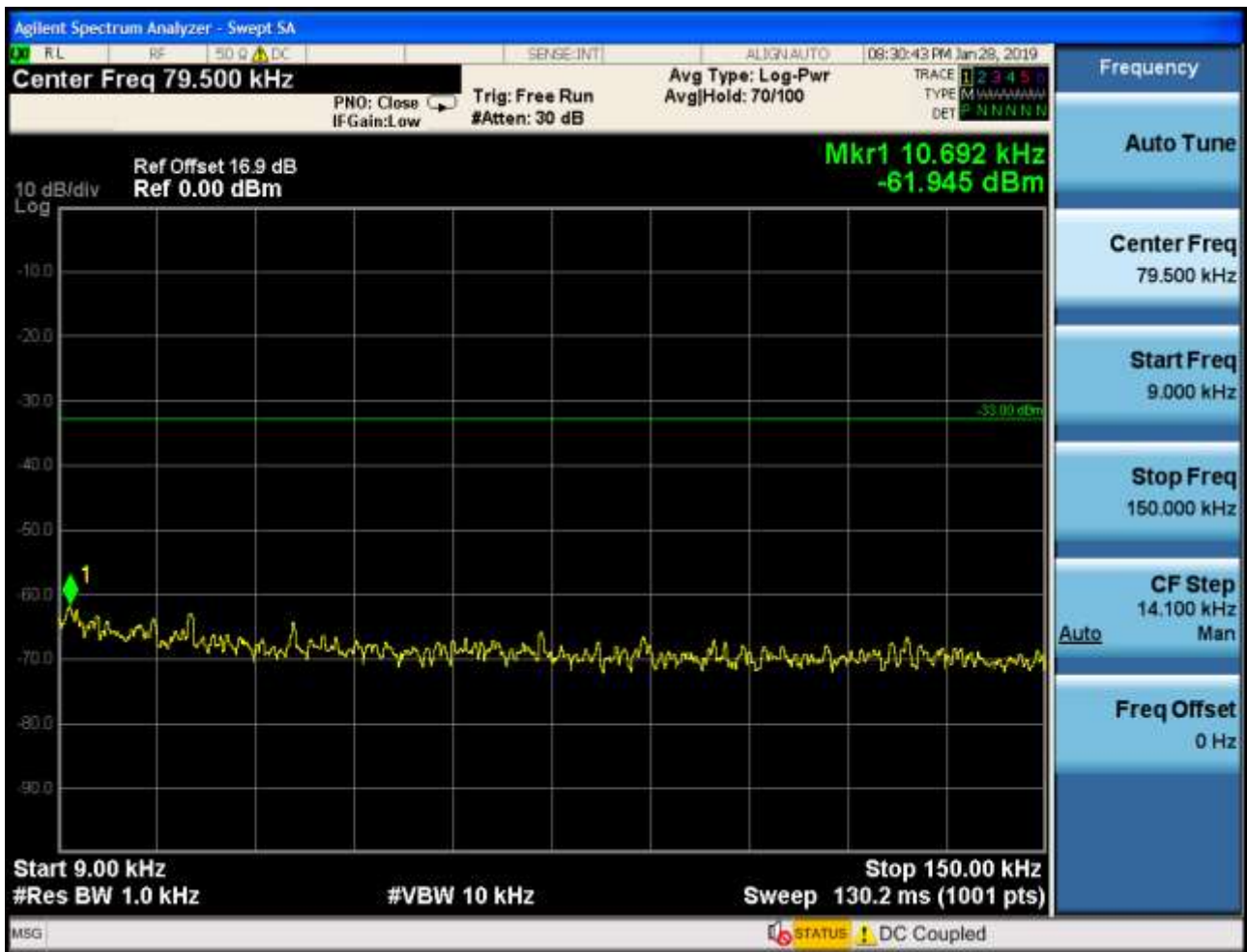


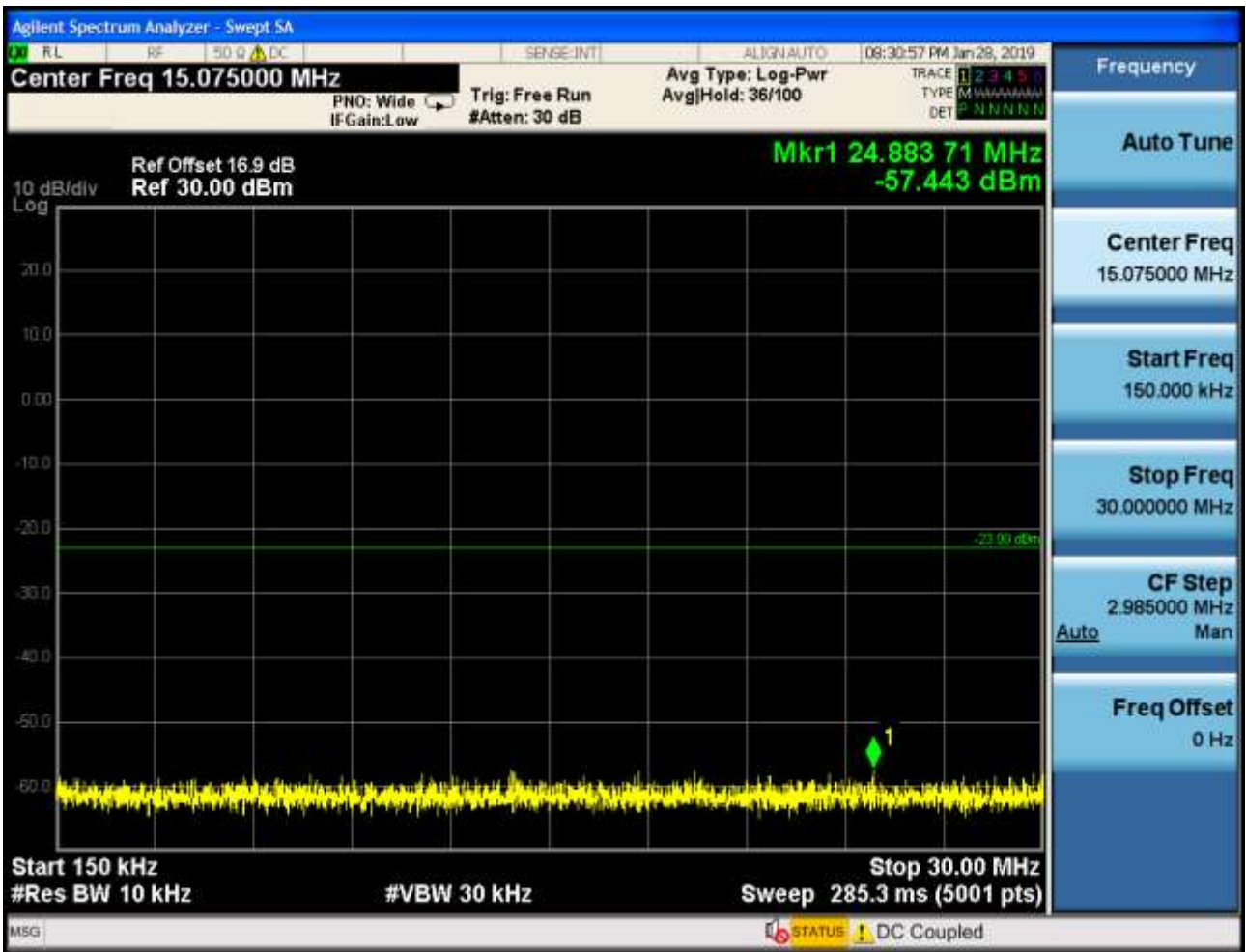


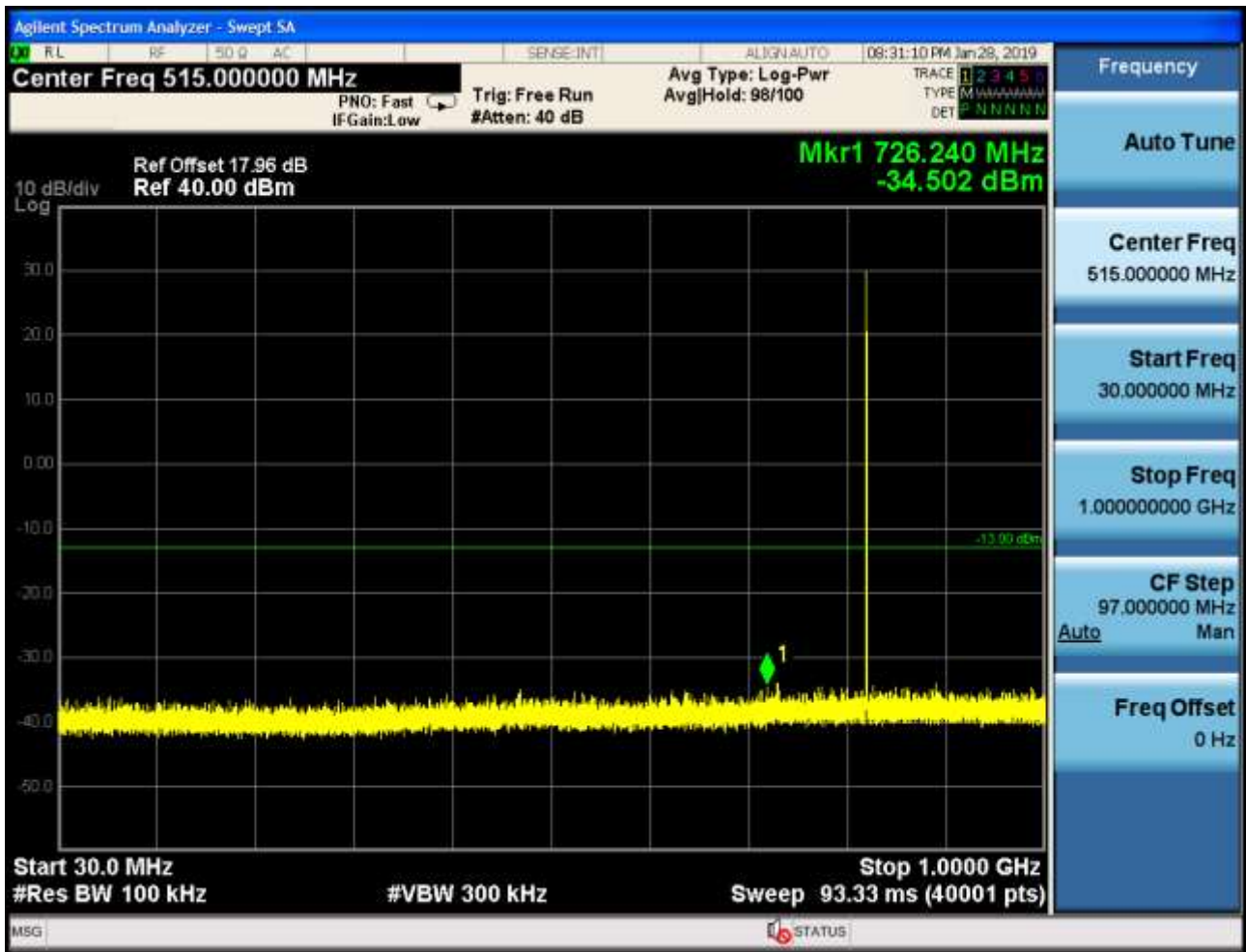


6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH



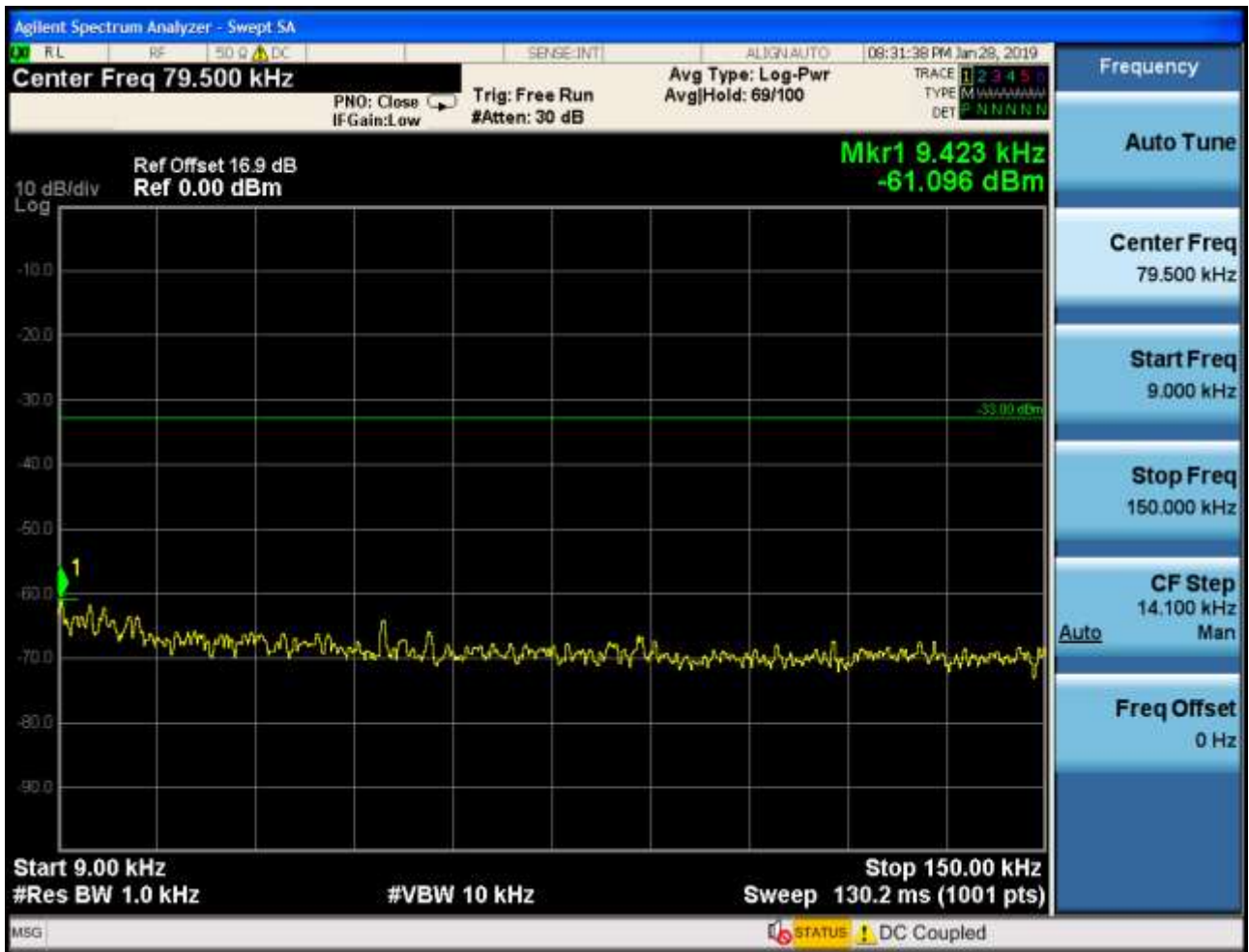


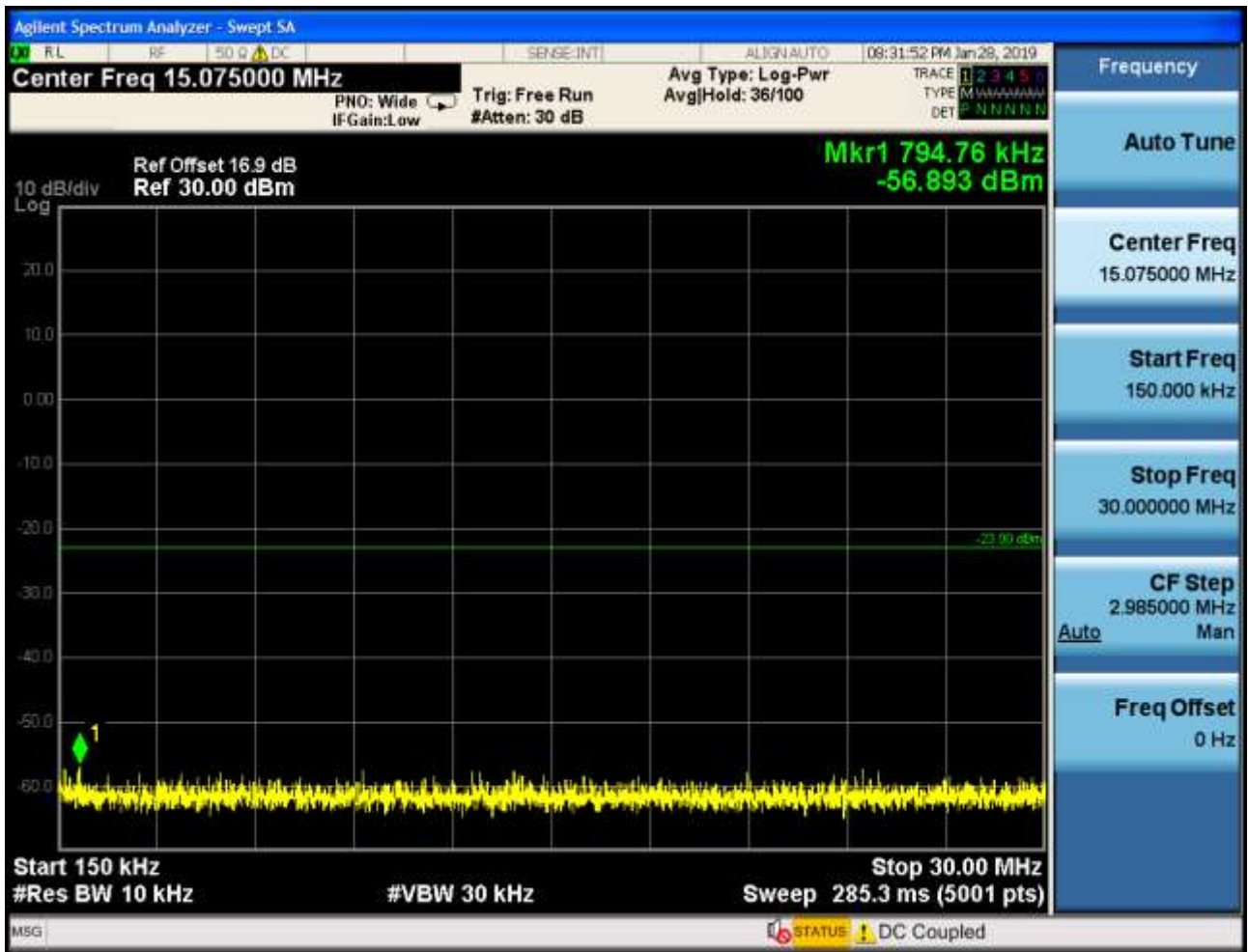


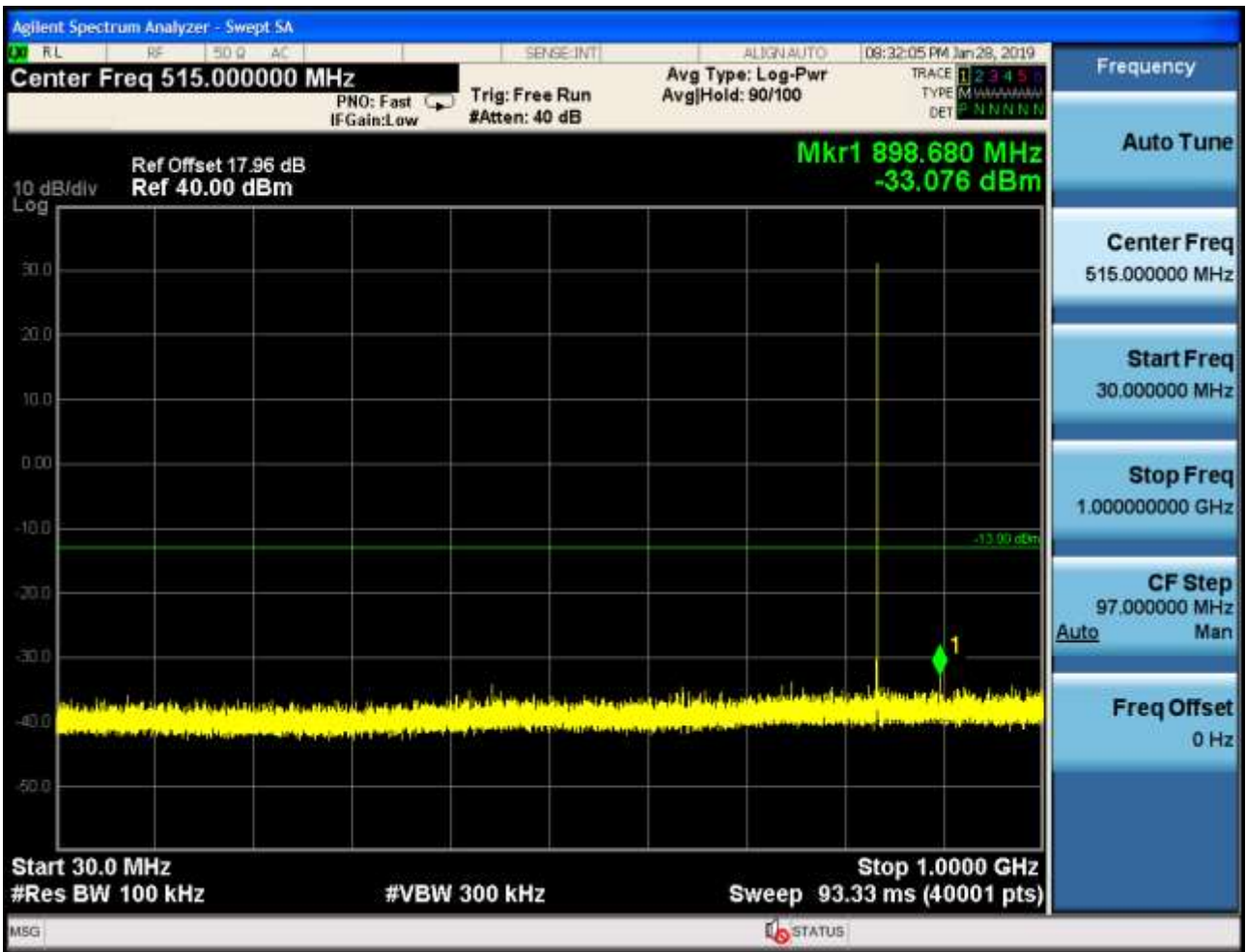




6.1.1.2.2 Test Channel = MCH



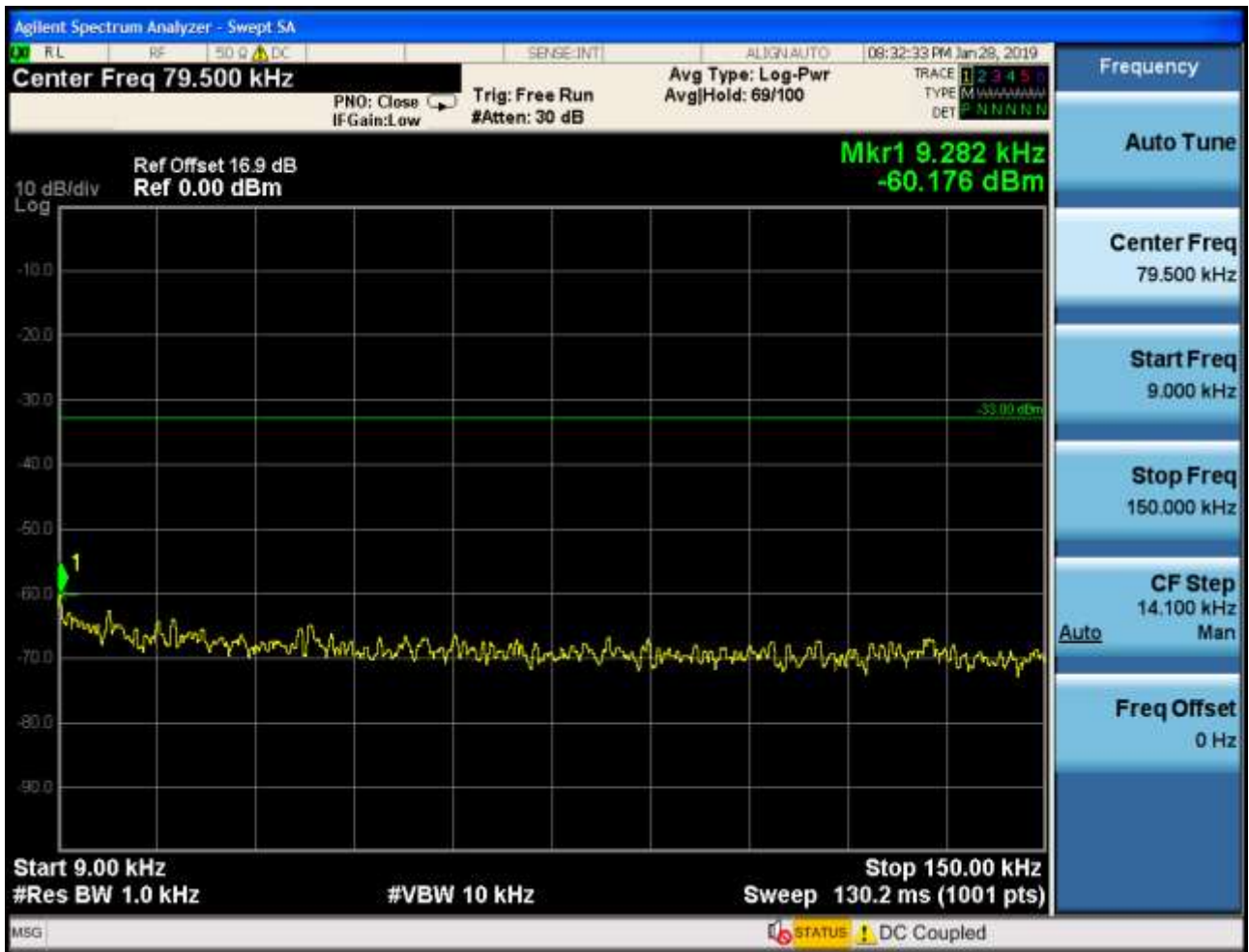


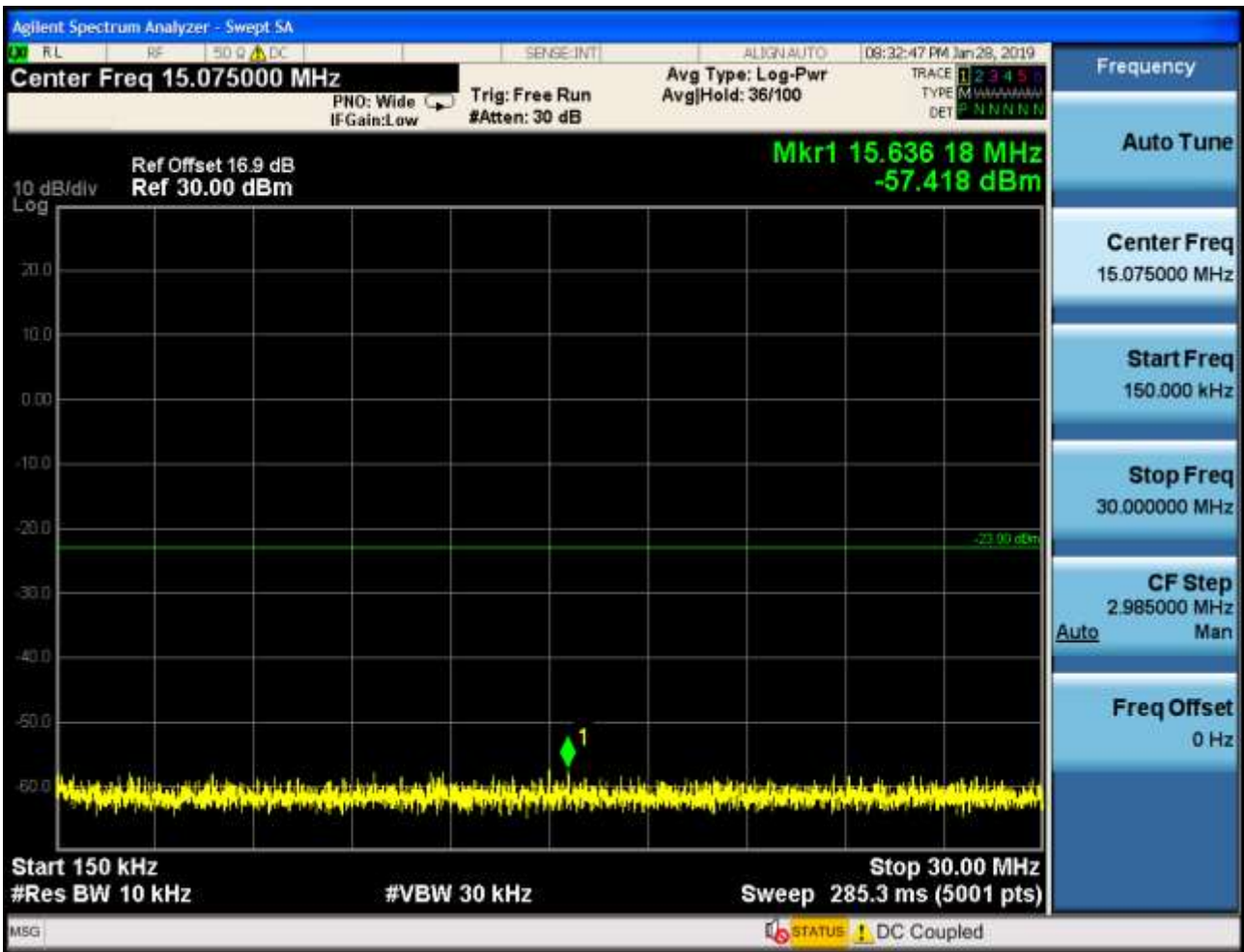


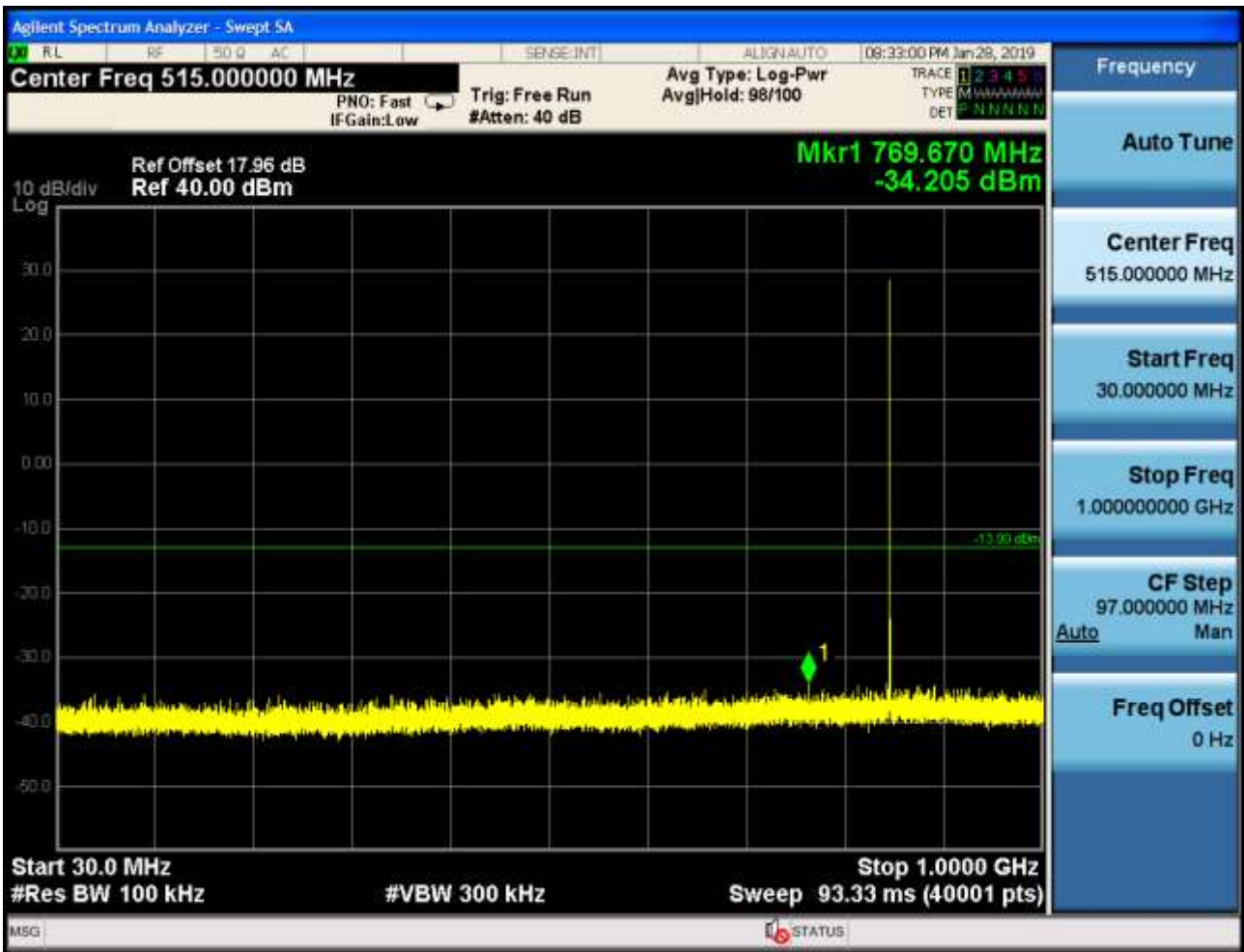




6.1.1.2.3 Test Channel = HCH





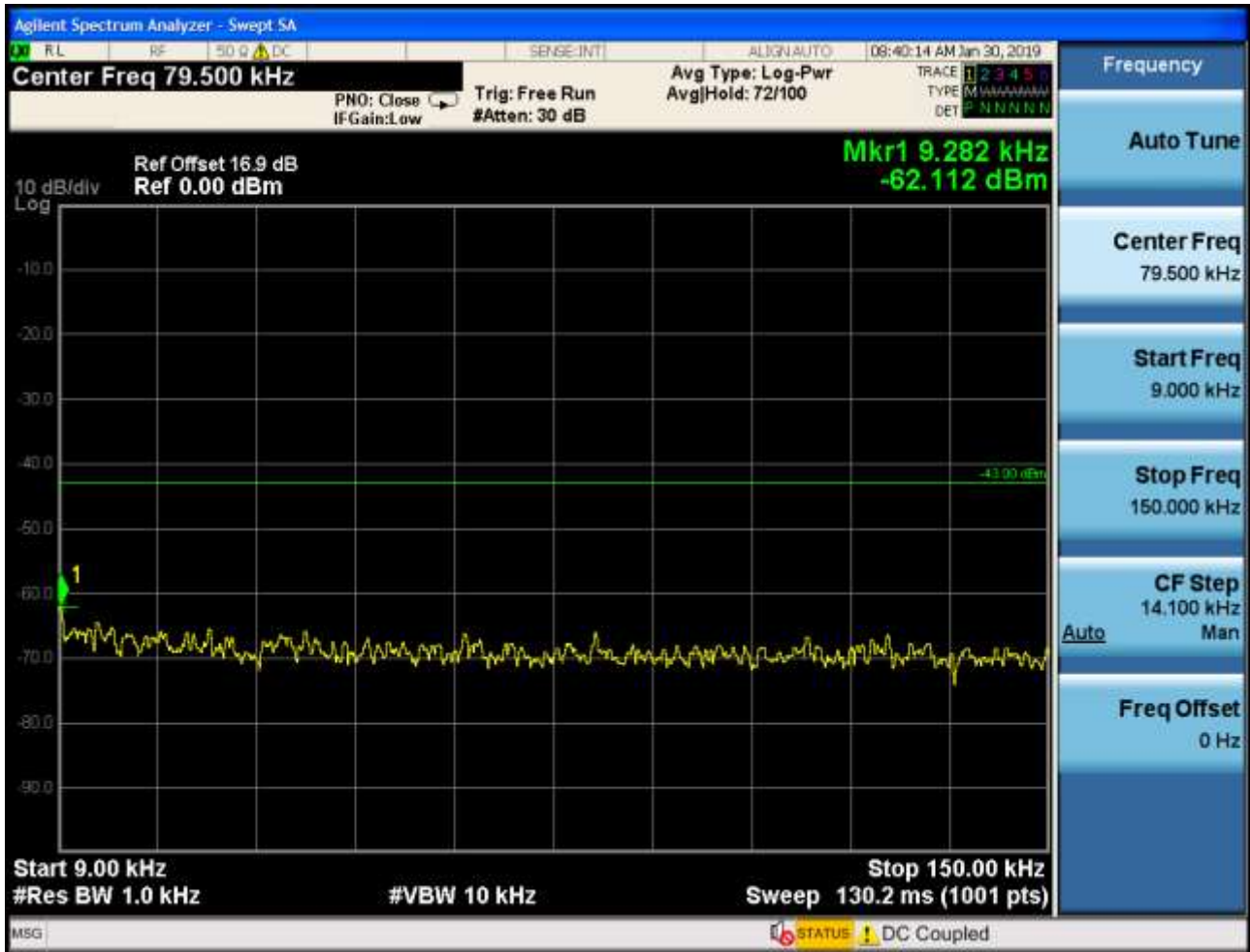




6.1.2 Test Band = PCS1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH

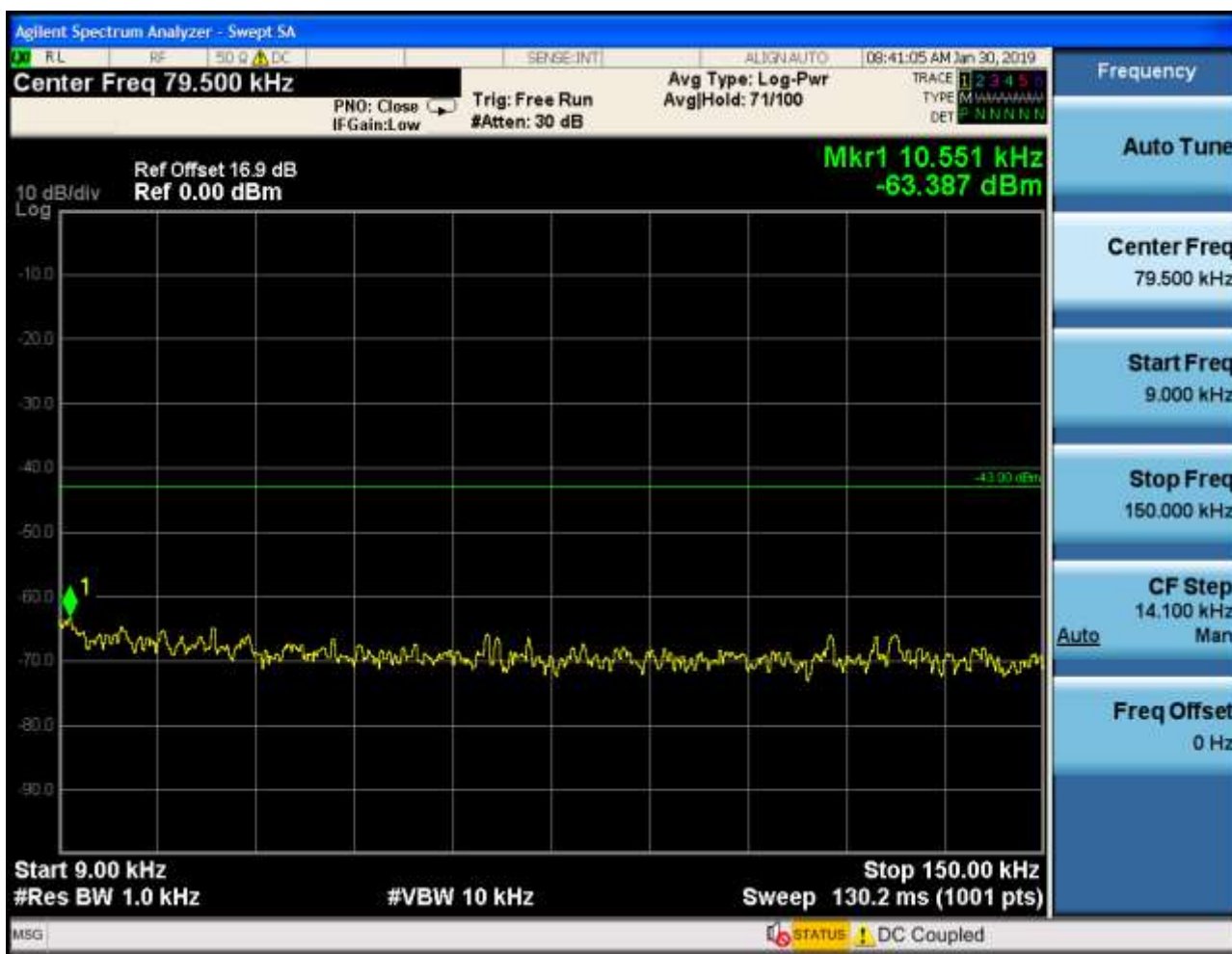


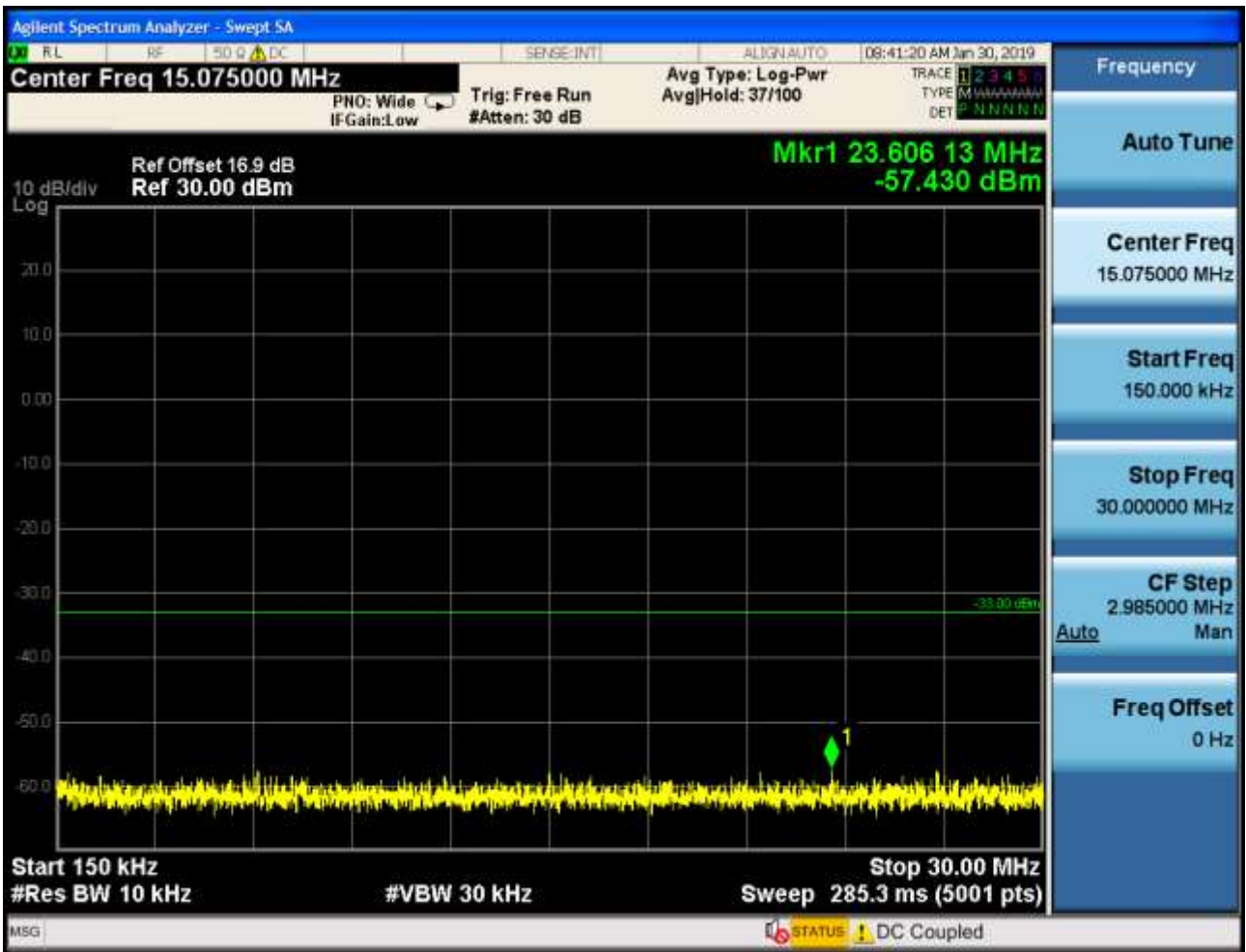






6.1.2.1.2 Test Channel = MCH



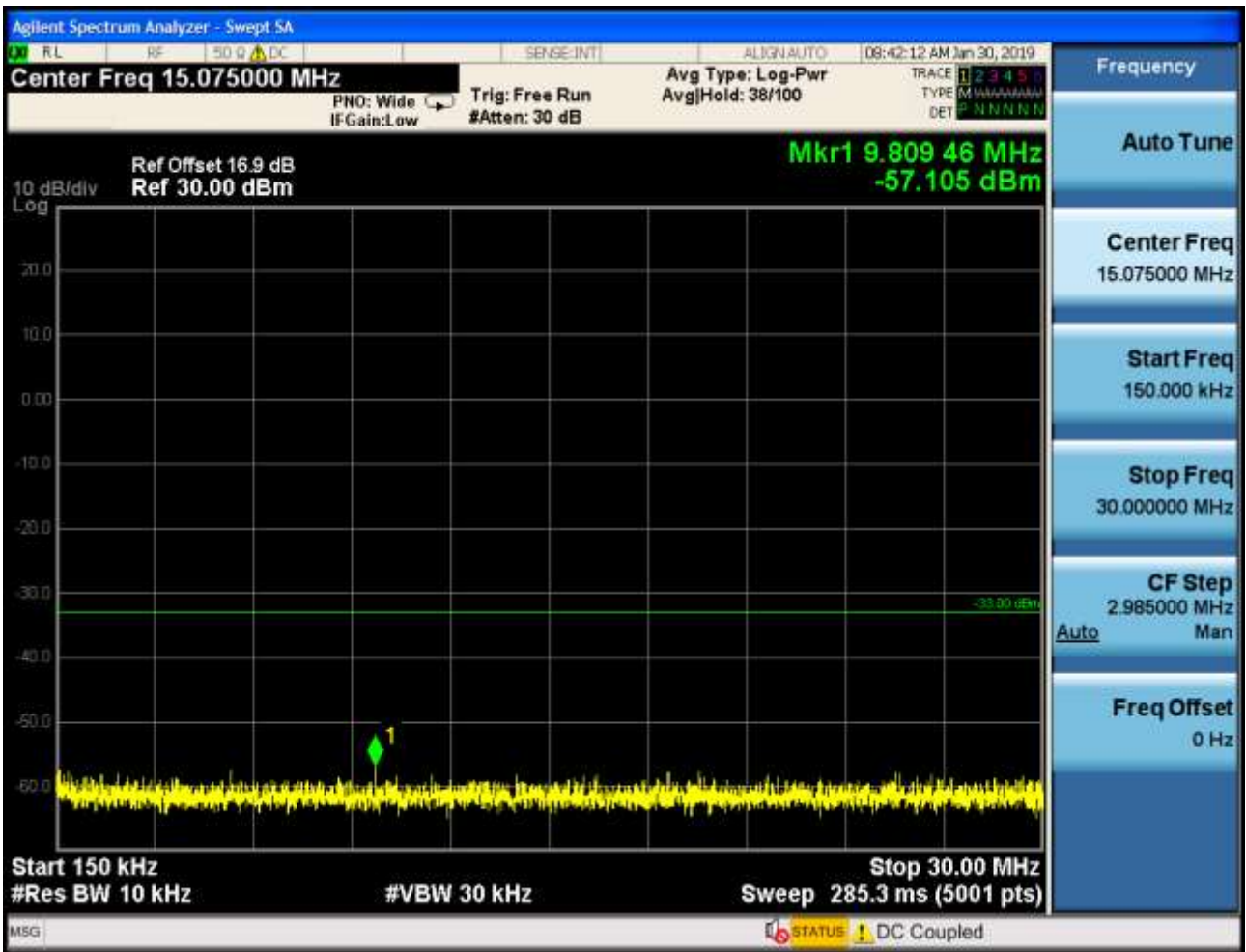






6.1.2.1.3 Test Channel = HCH

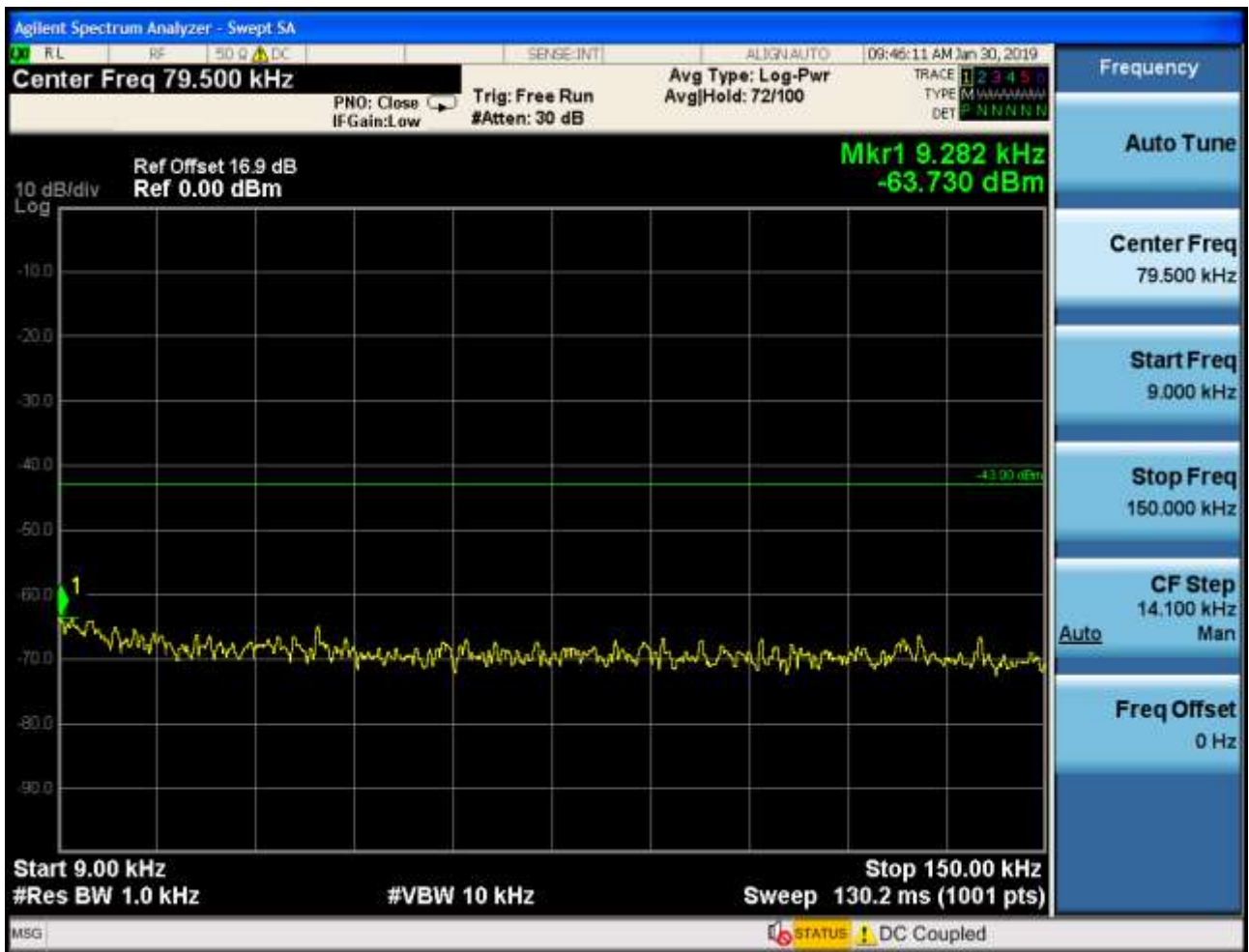


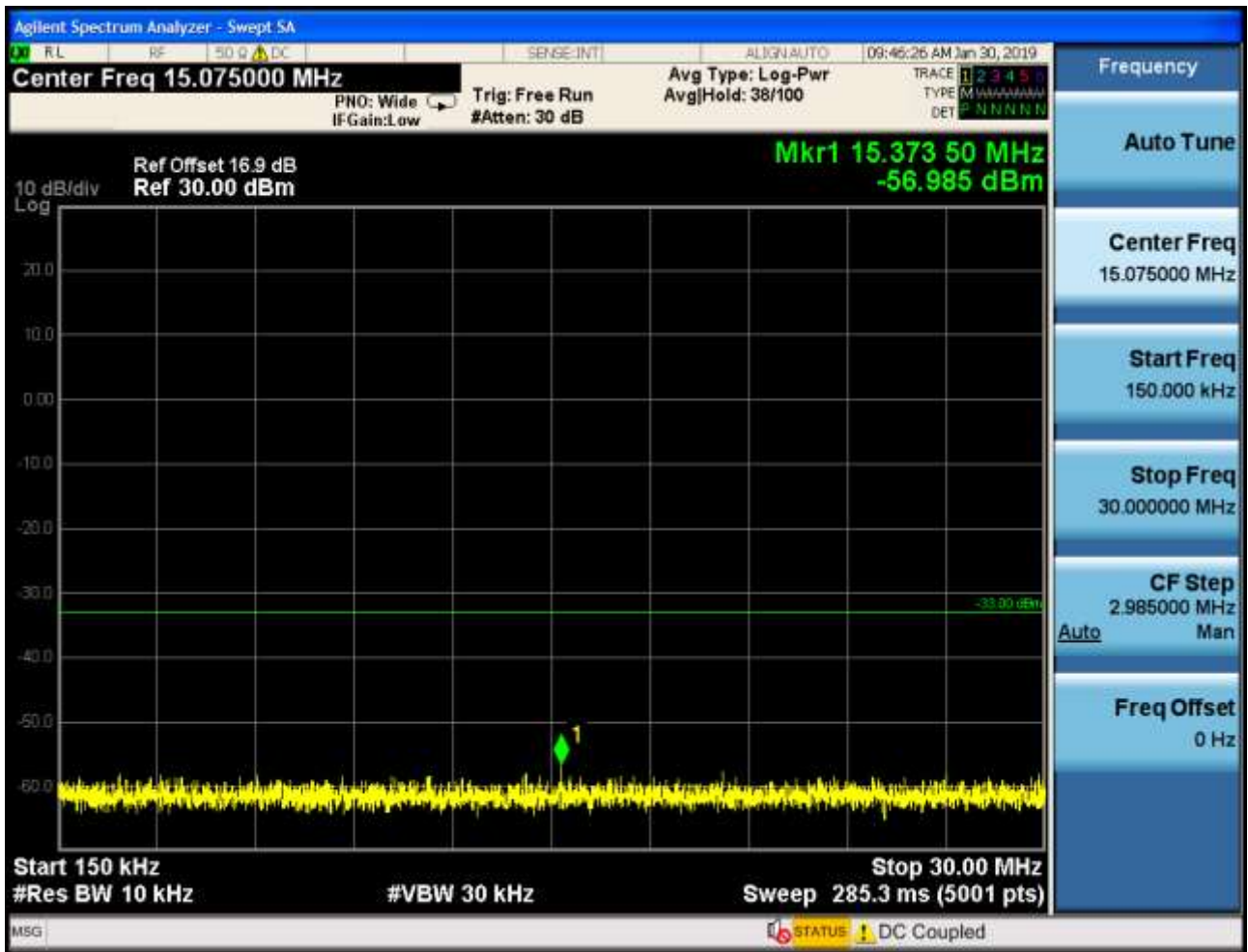




6.1.2.2 Test Mode = GSM/TM2

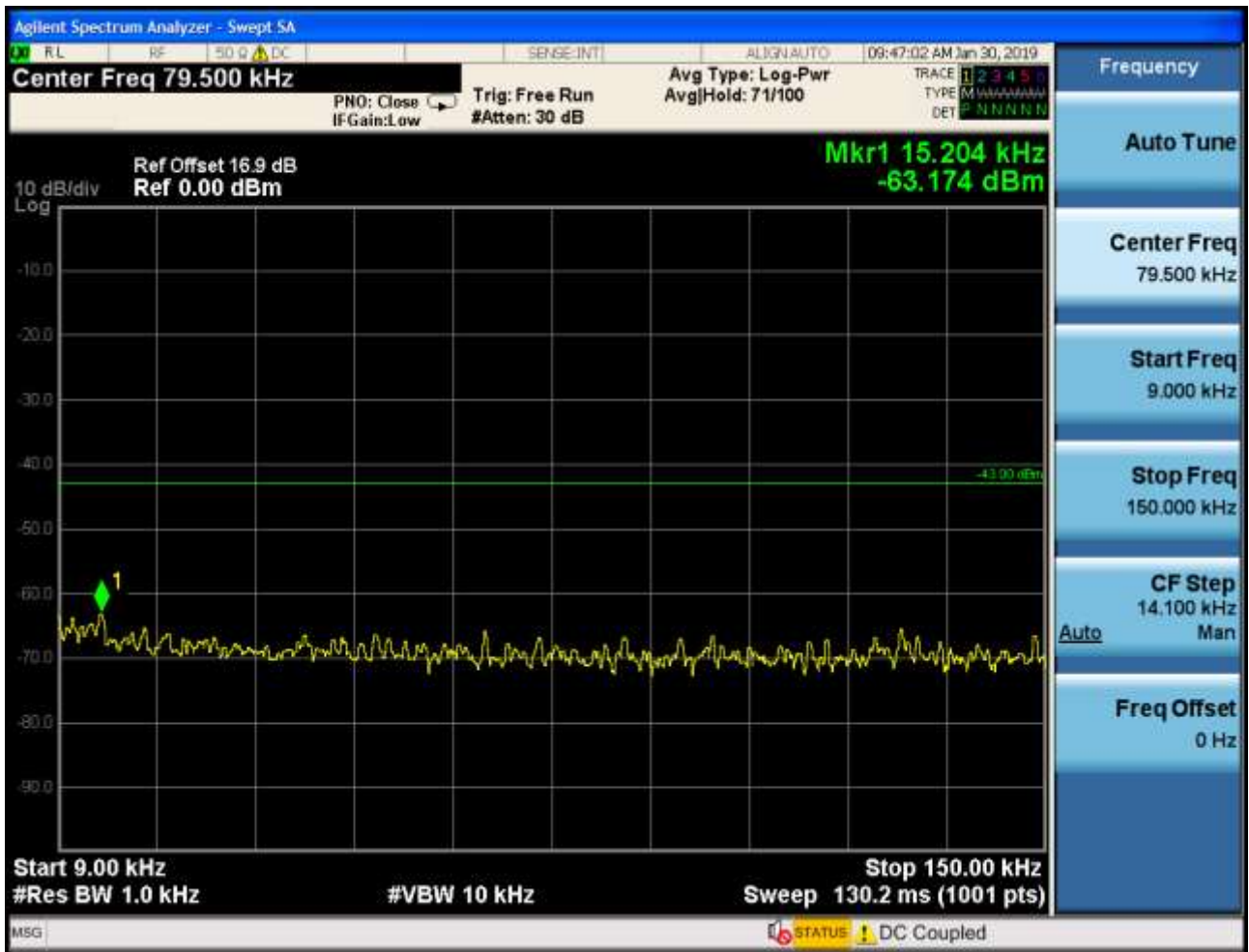
6.1.2.2.1 Test Channel = LCH

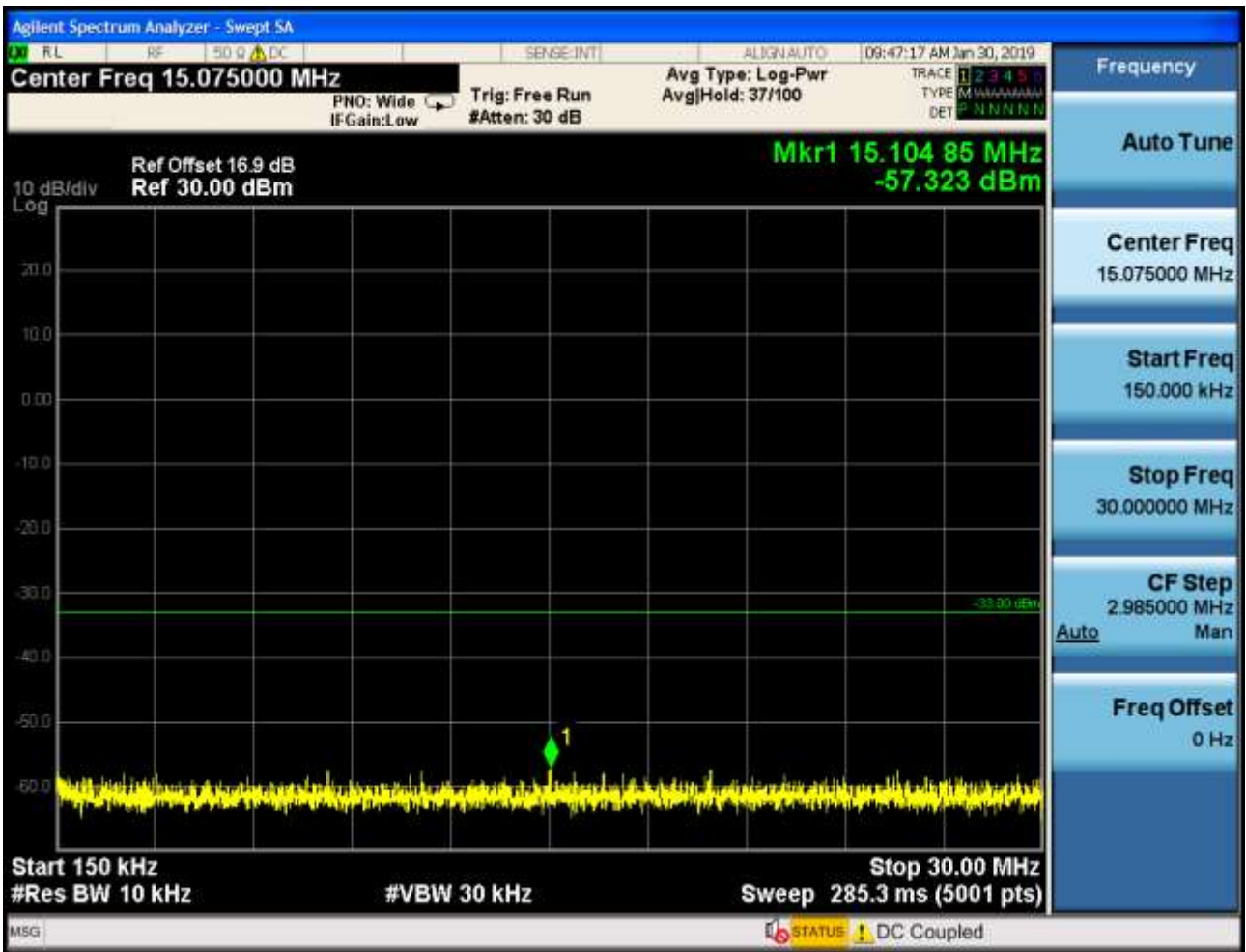






6.1.2.2.2 Test Channel = MCH

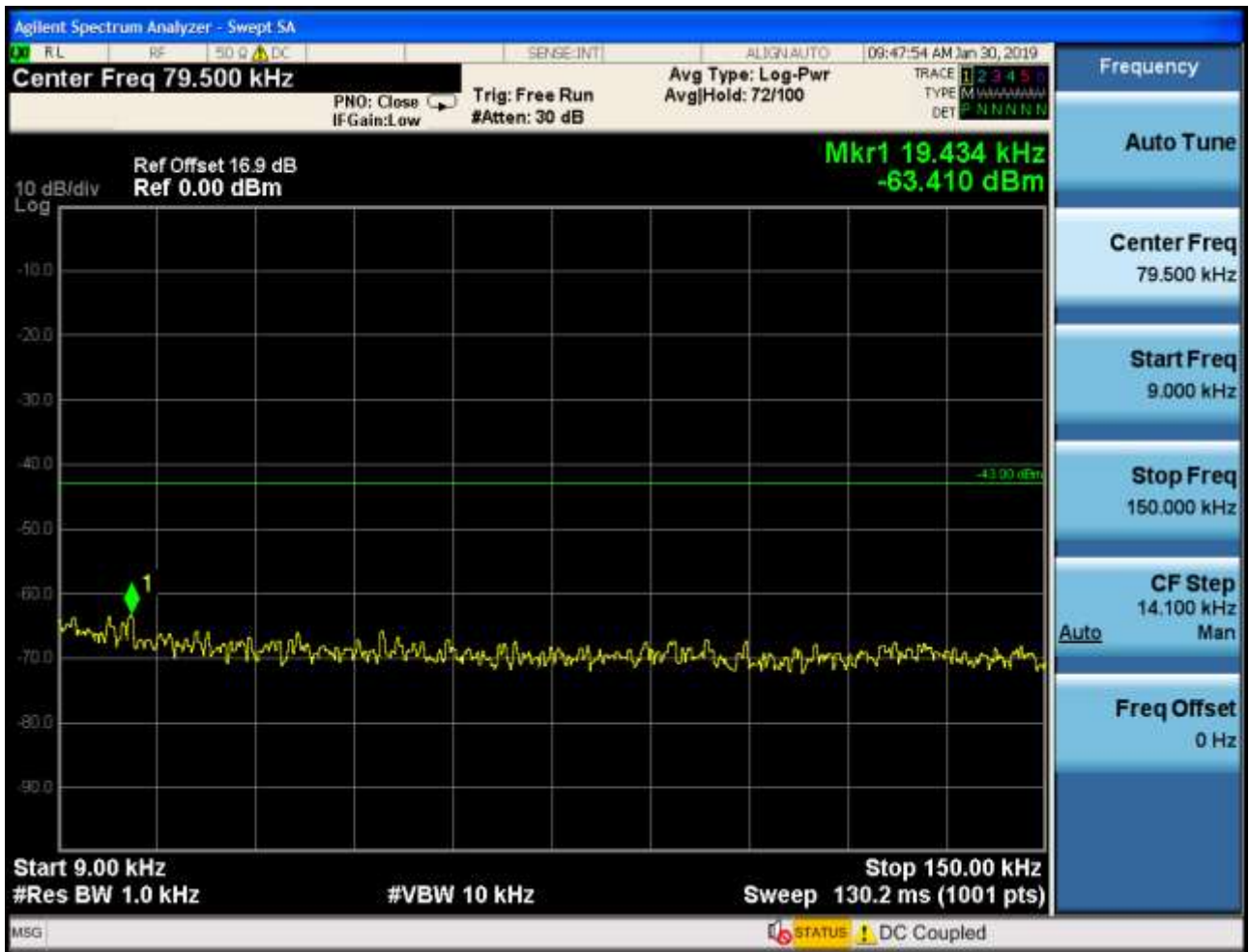


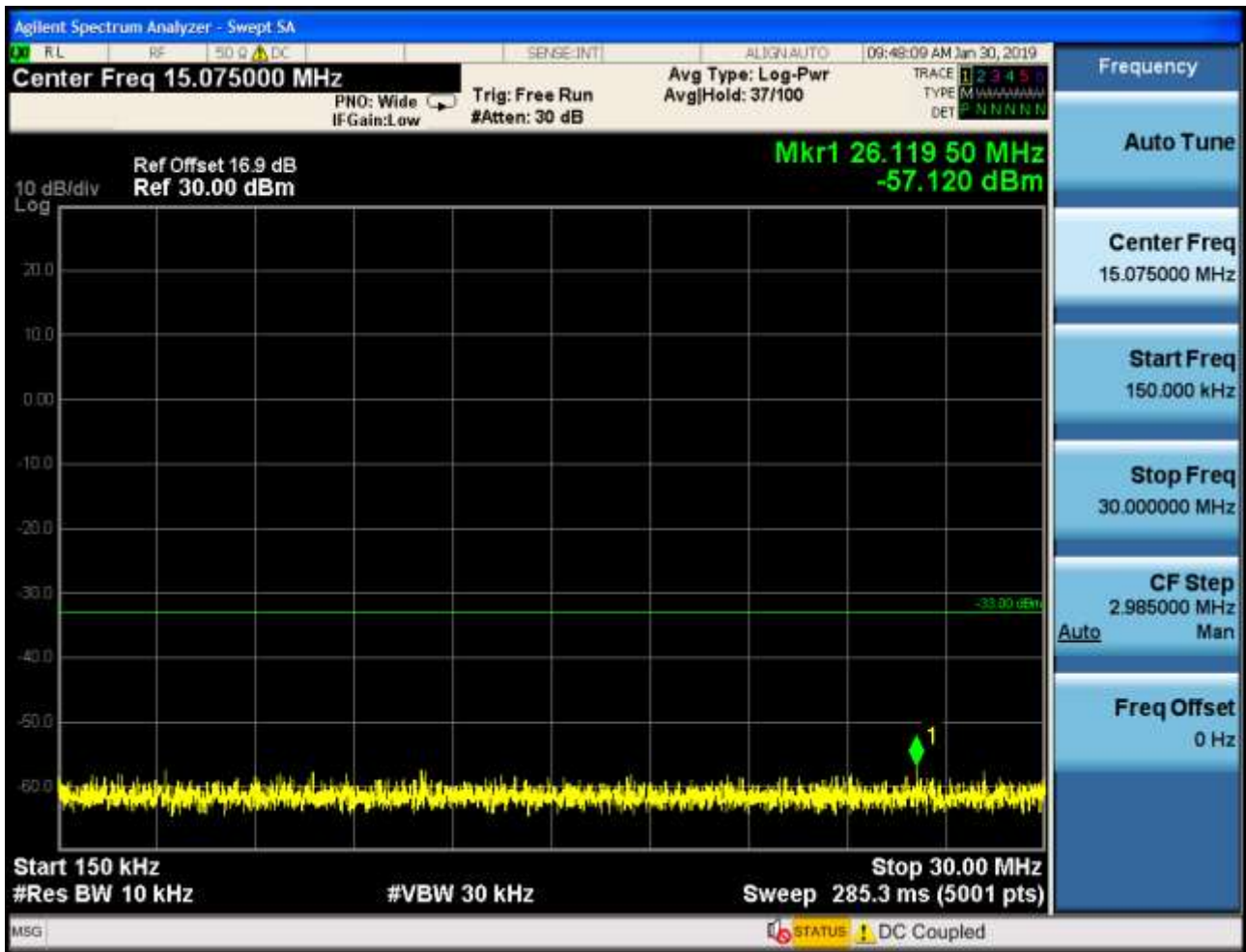






6.1.2.2.3 Test Channel = HCH







7Appendix_G: Field Strength of Spurious Radiation

Note: We tested all modes, 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

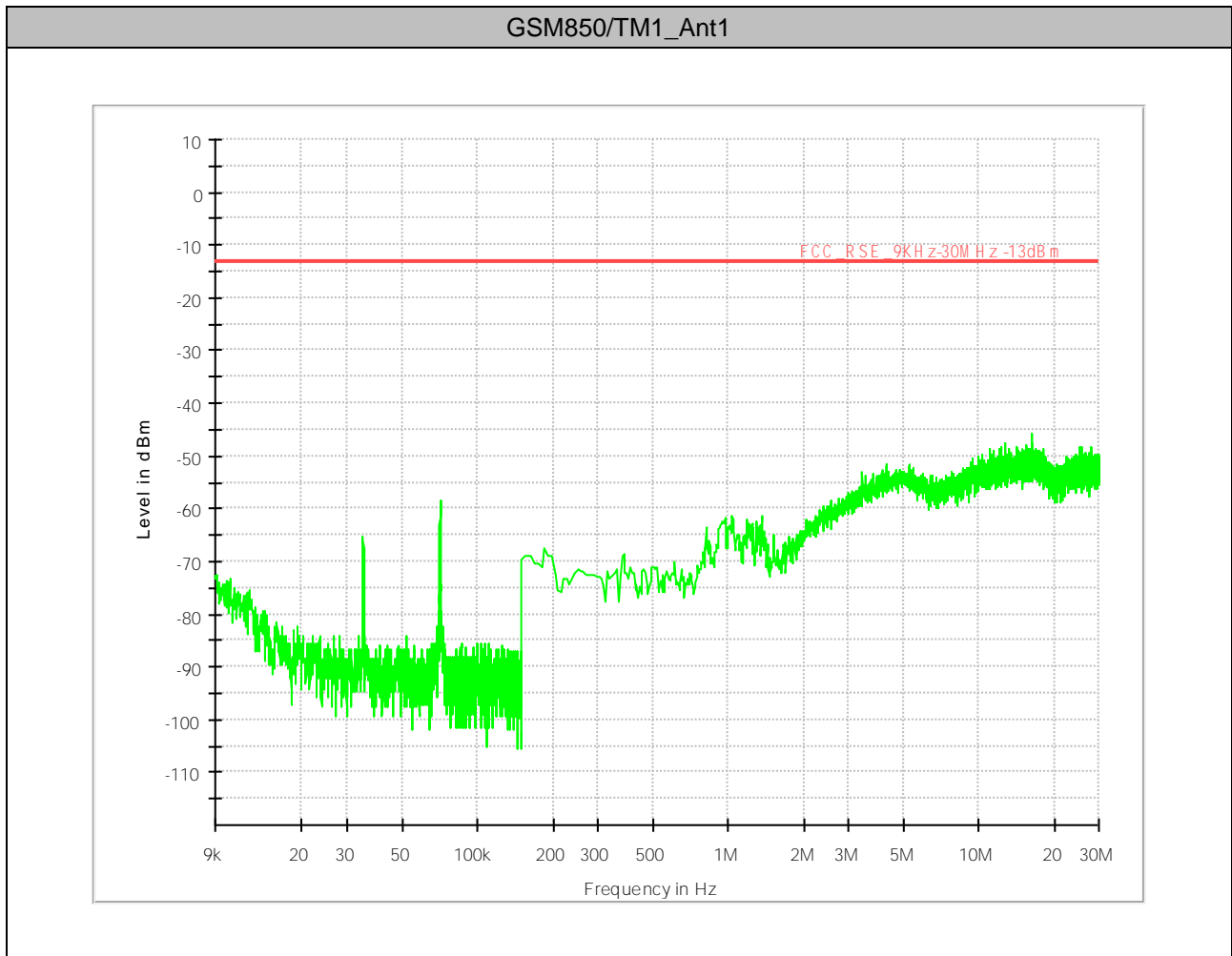
30MHz~1GHz, RBW = 100 kHz, VBW = 300 kHz. Detector: PK

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

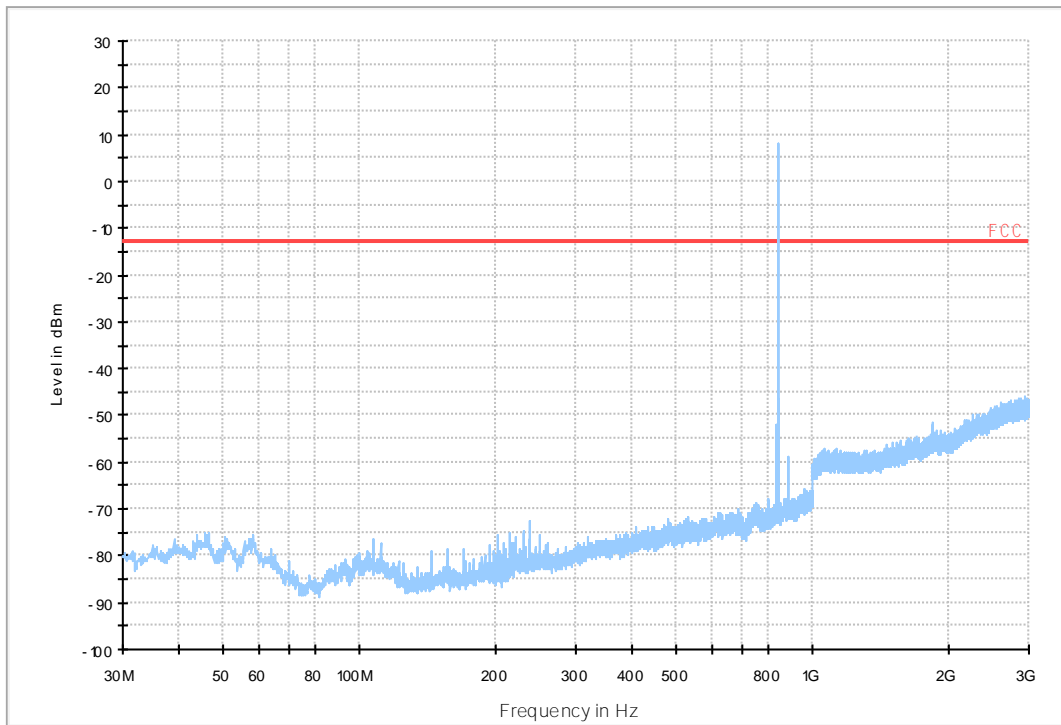
Part I - Test Plots

7.1 For GSM_ANT1

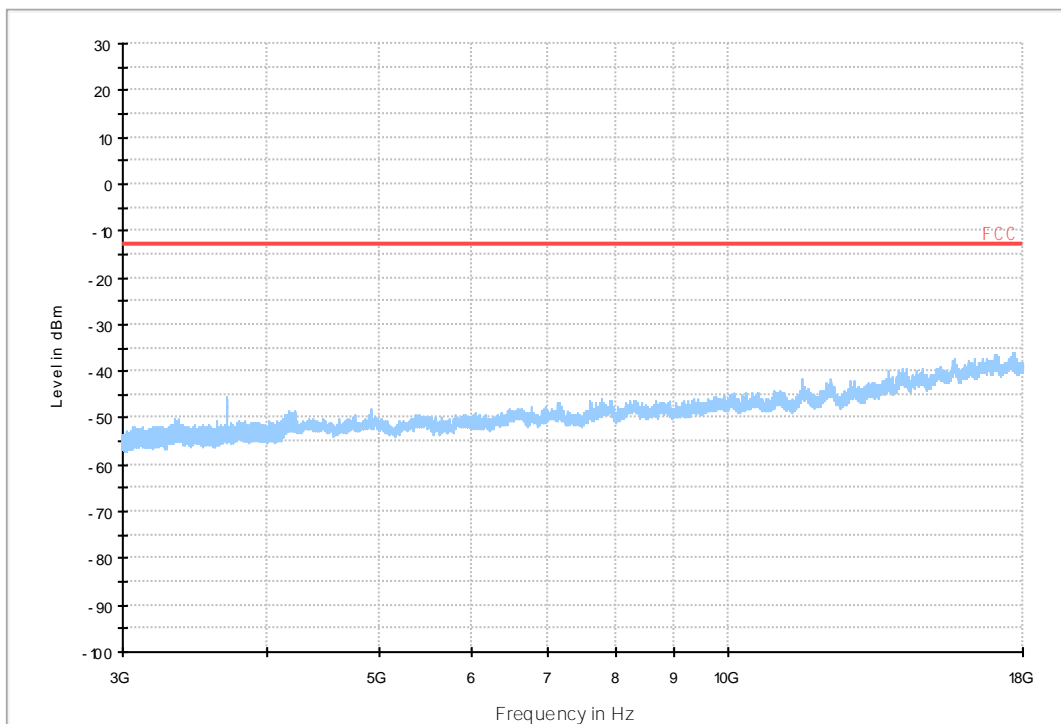
7.1.1 Test Band = GSM850



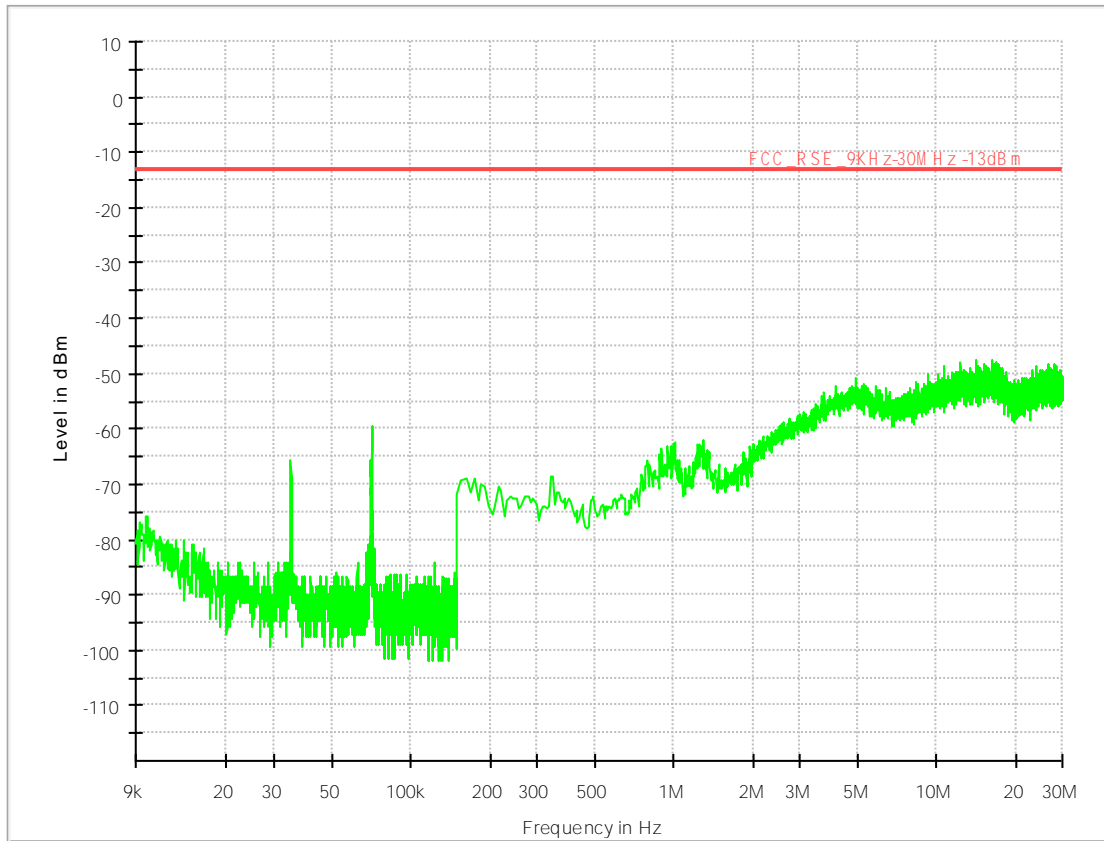
04 FCC PART 22 GSM850_L



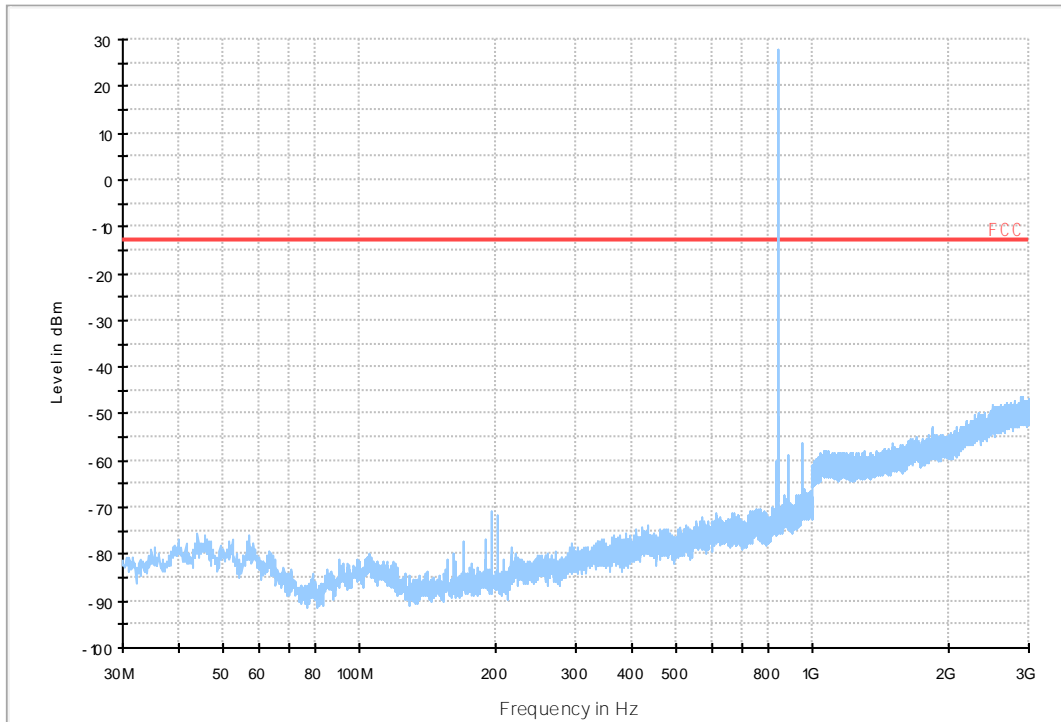
03 FCC PART 22 GSM850_H

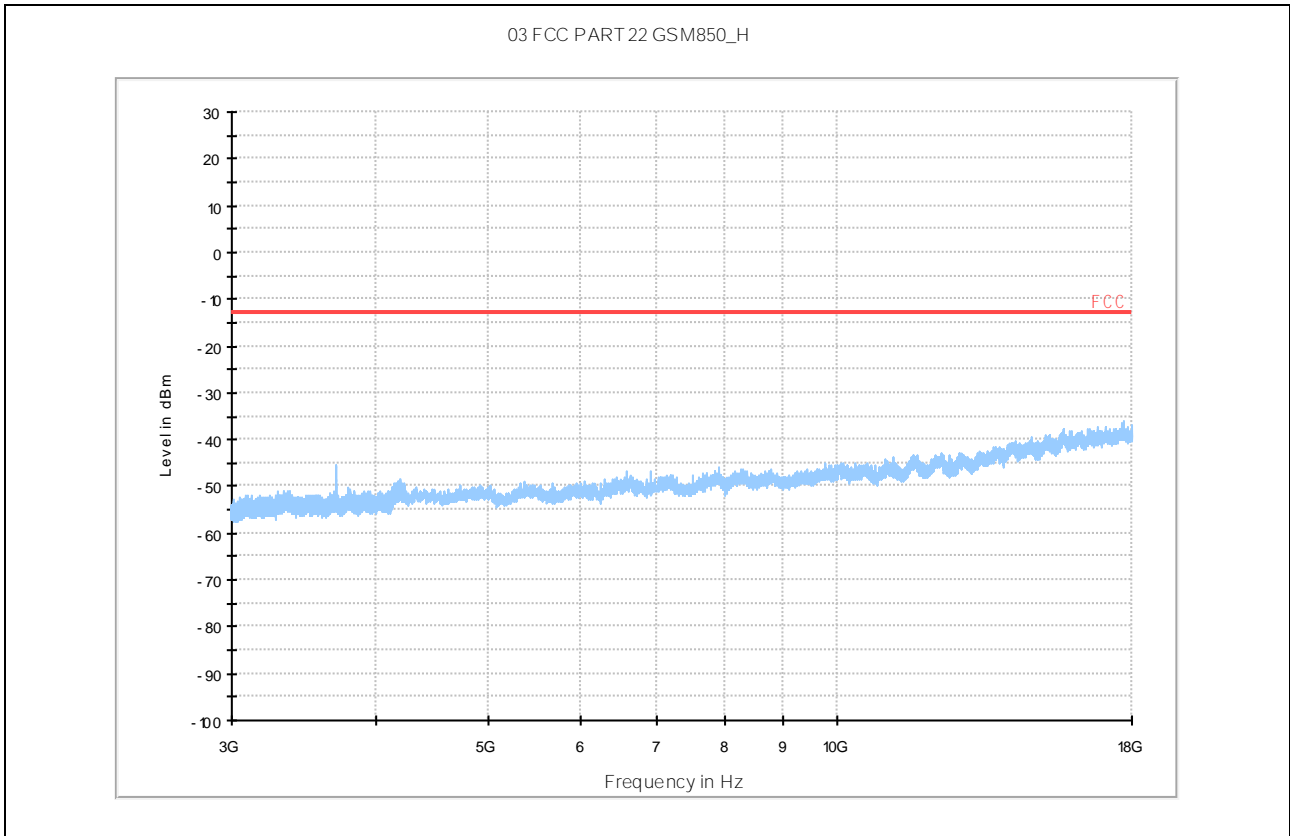


GSM850/TM1_Ant2

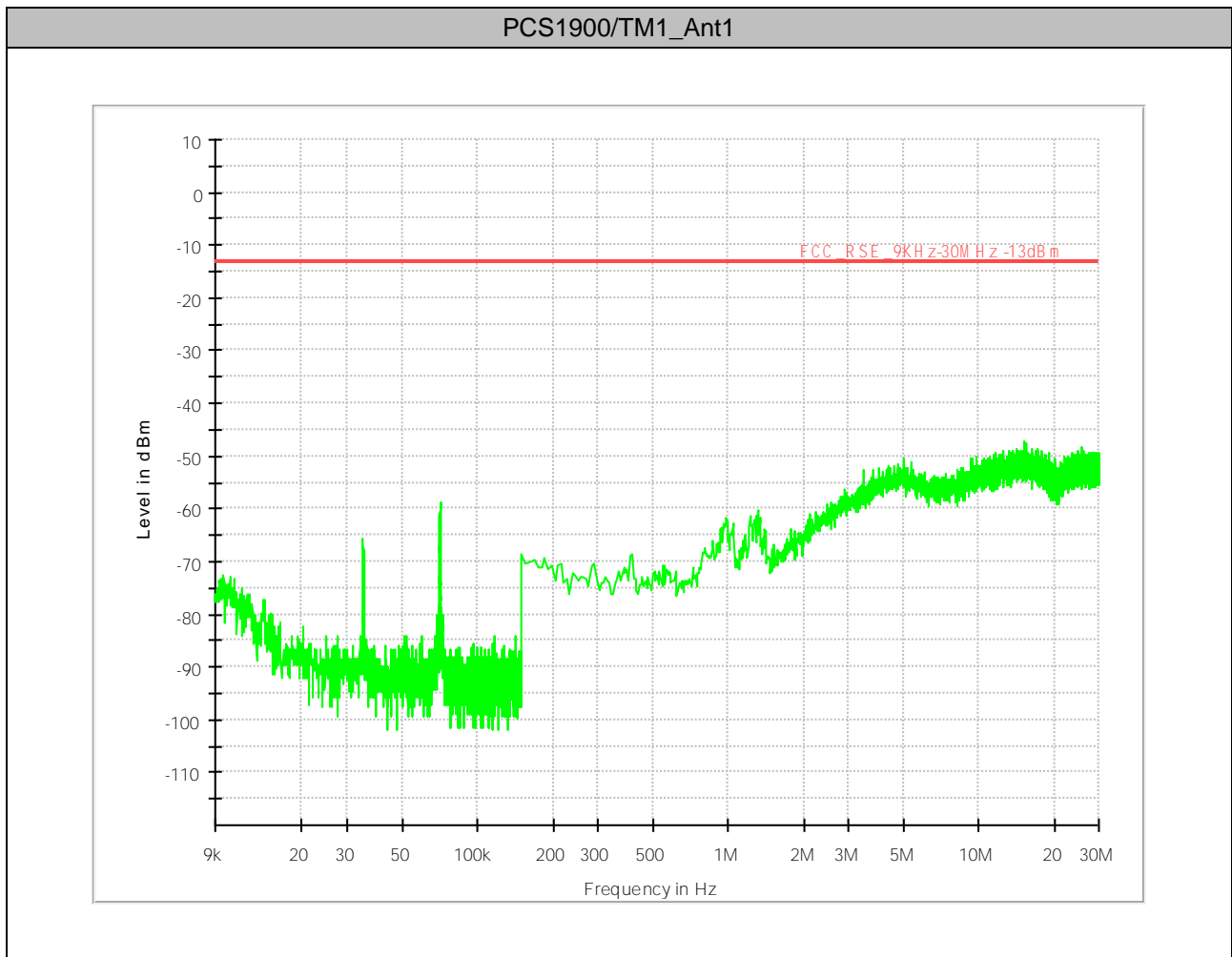


04 FCC PART 22 GSM850_L

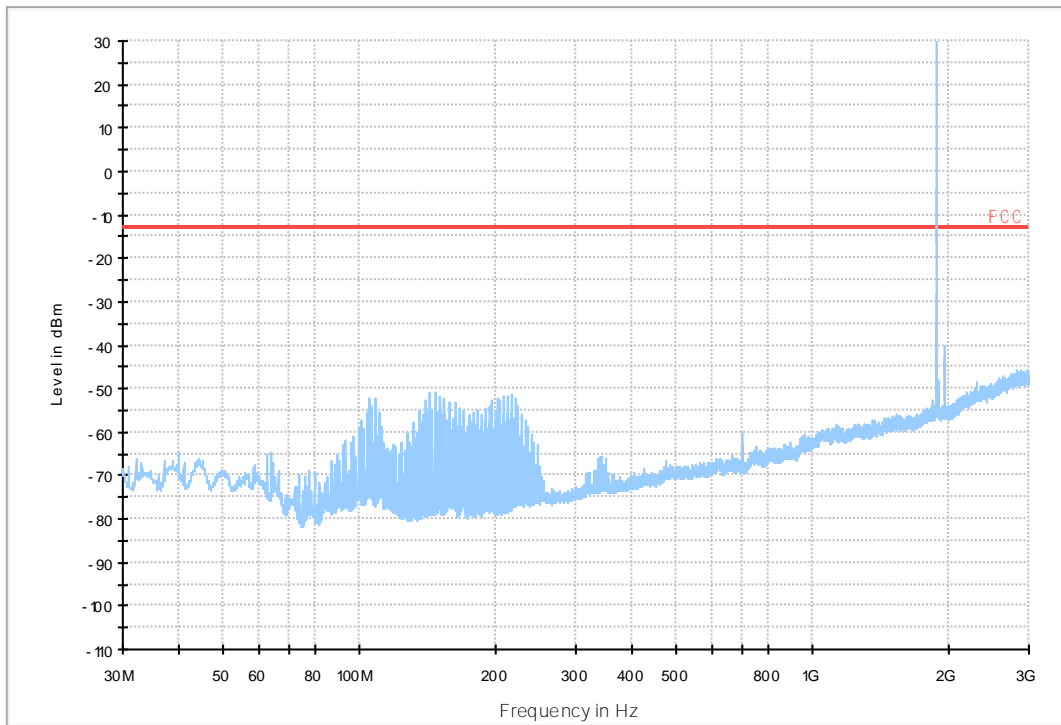




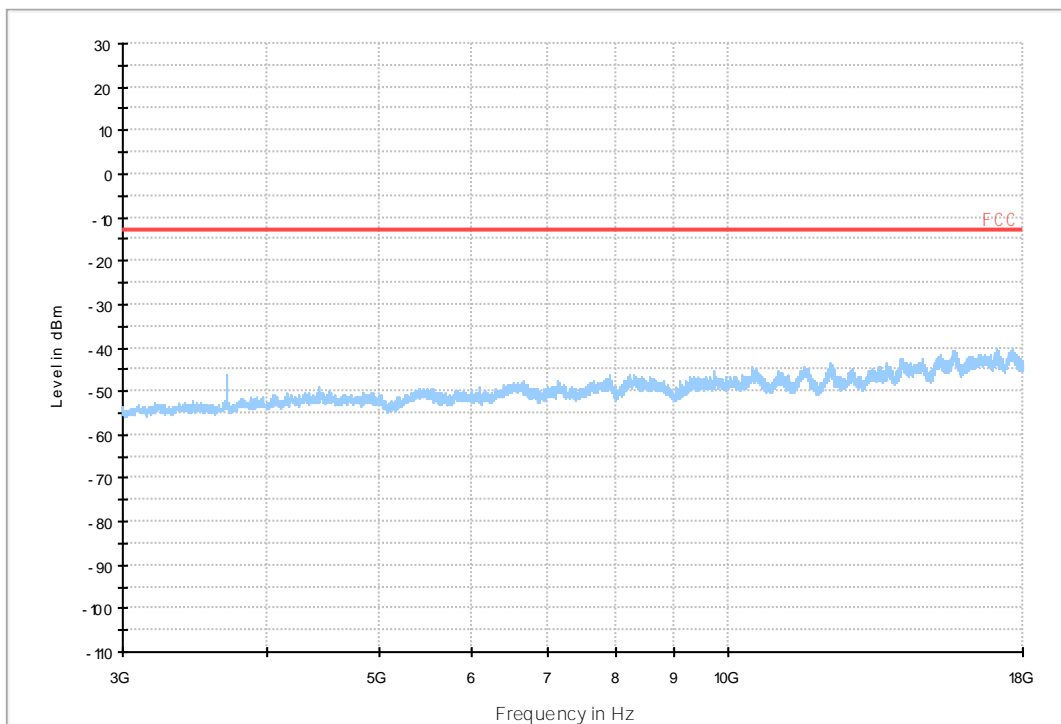
7.1.2 Test Band = PCS1900



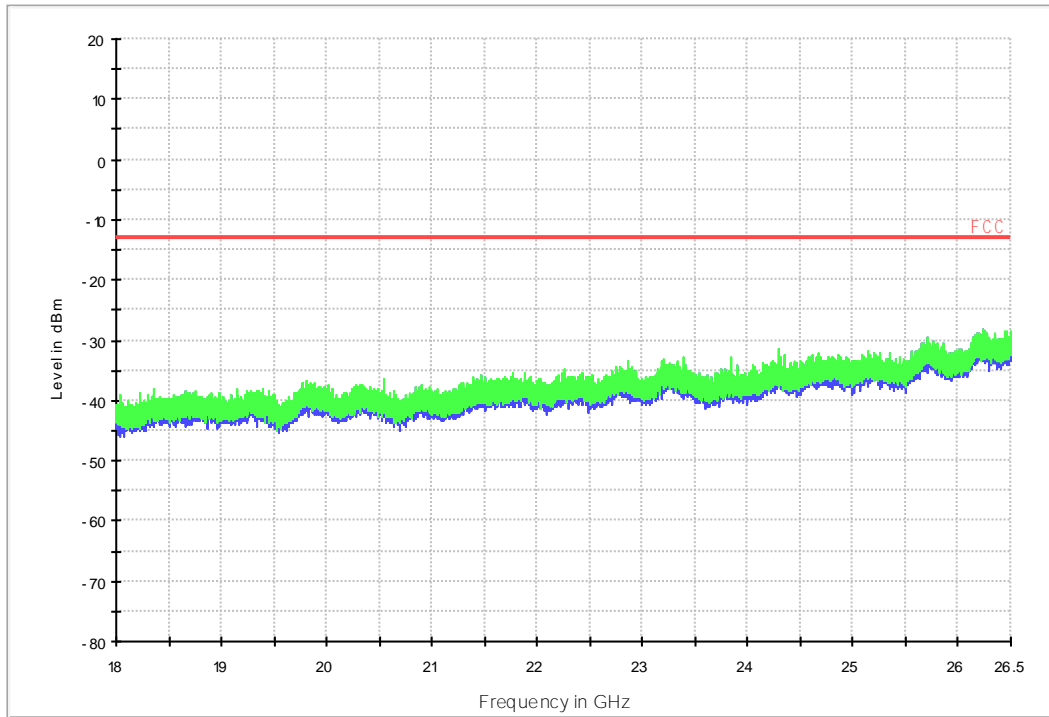
10 FCC PART 24 GSM1900_L



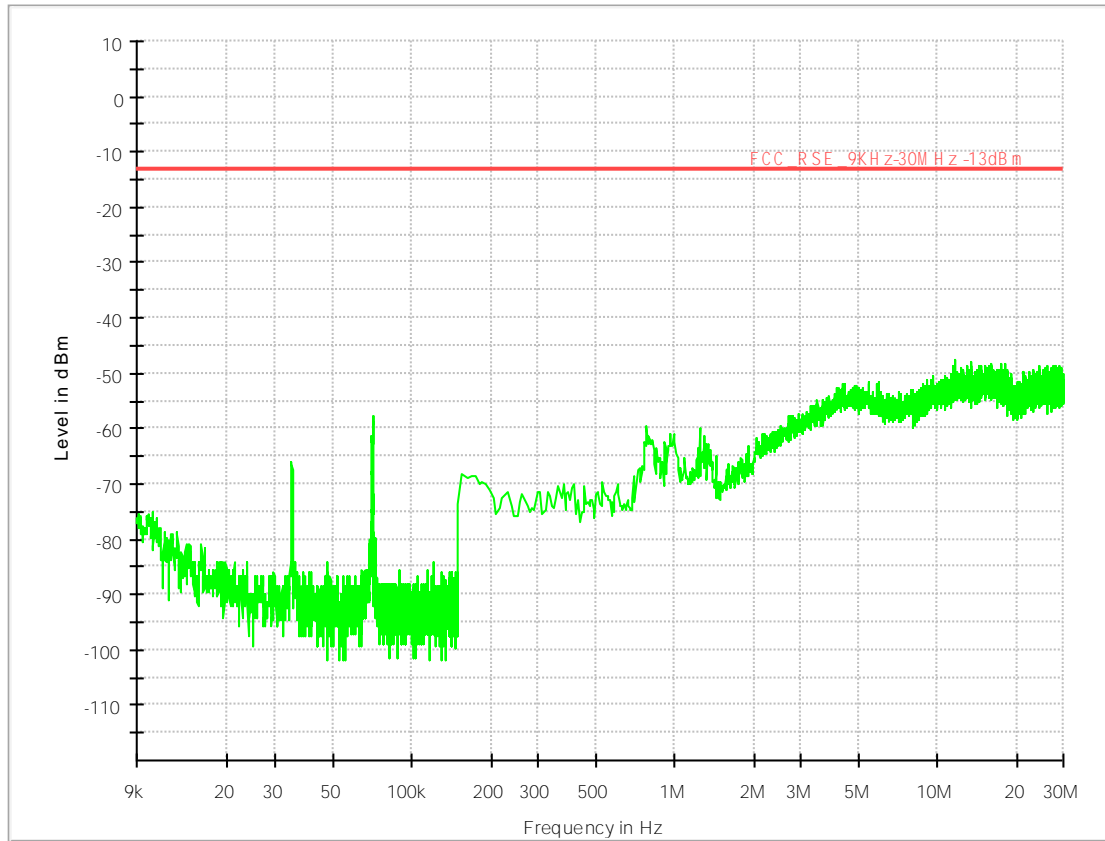
09 FCC PART 24 GSM1900_H



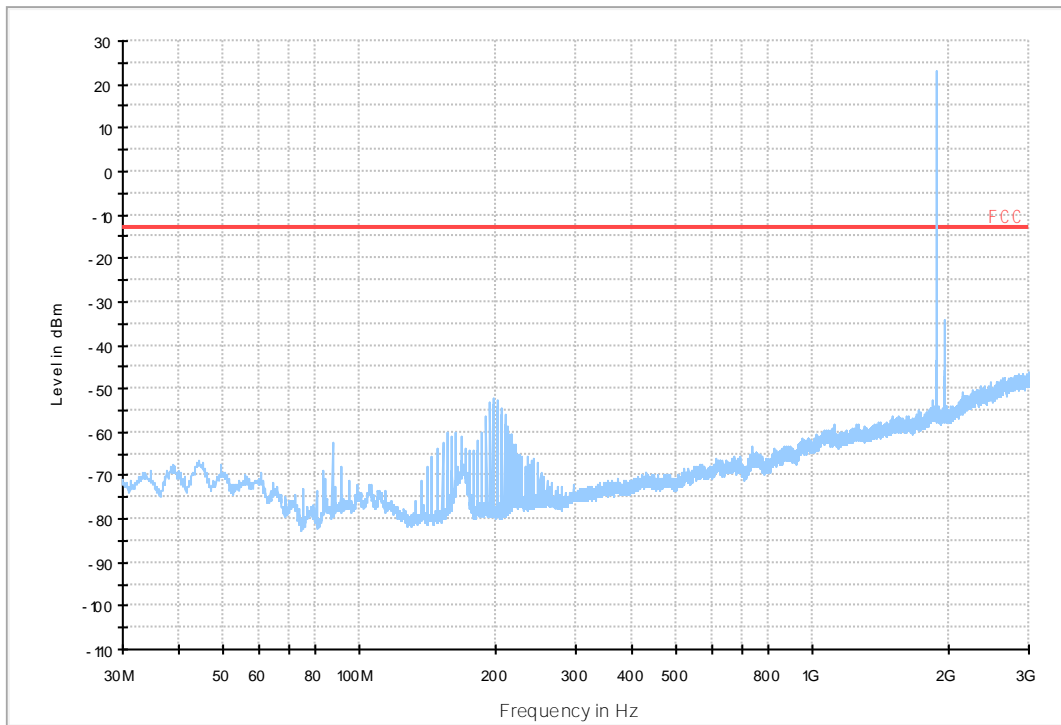
18G~26.5G RSE-TX-DIRECTOR ABOVE 1.5G PK



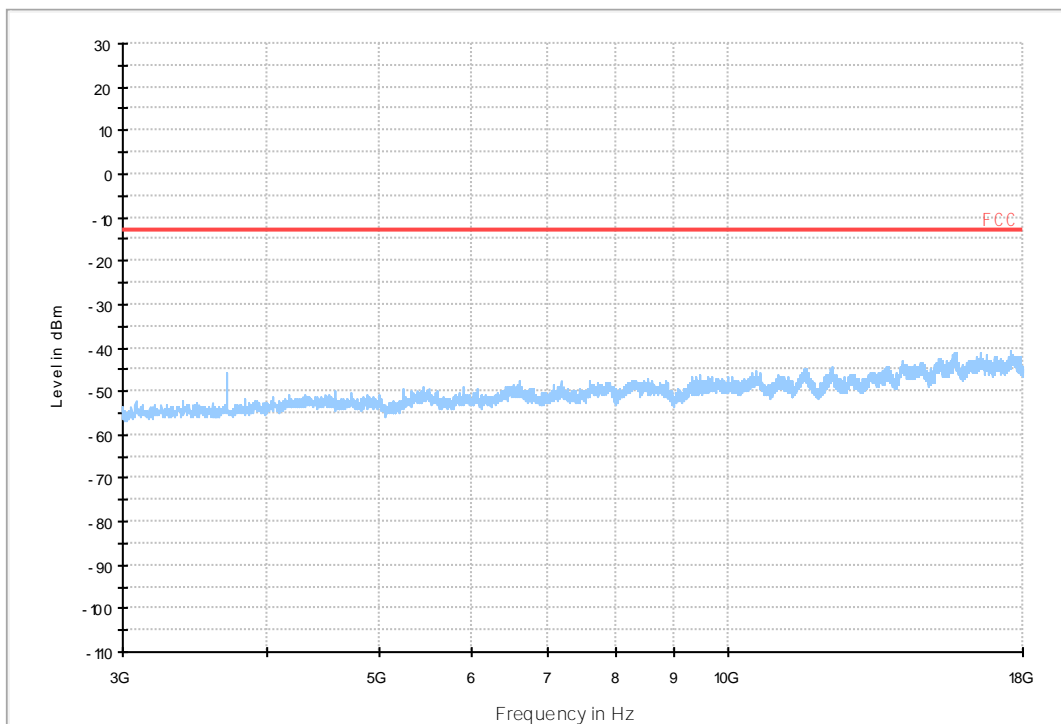
PCS1900/TM1_Ant2

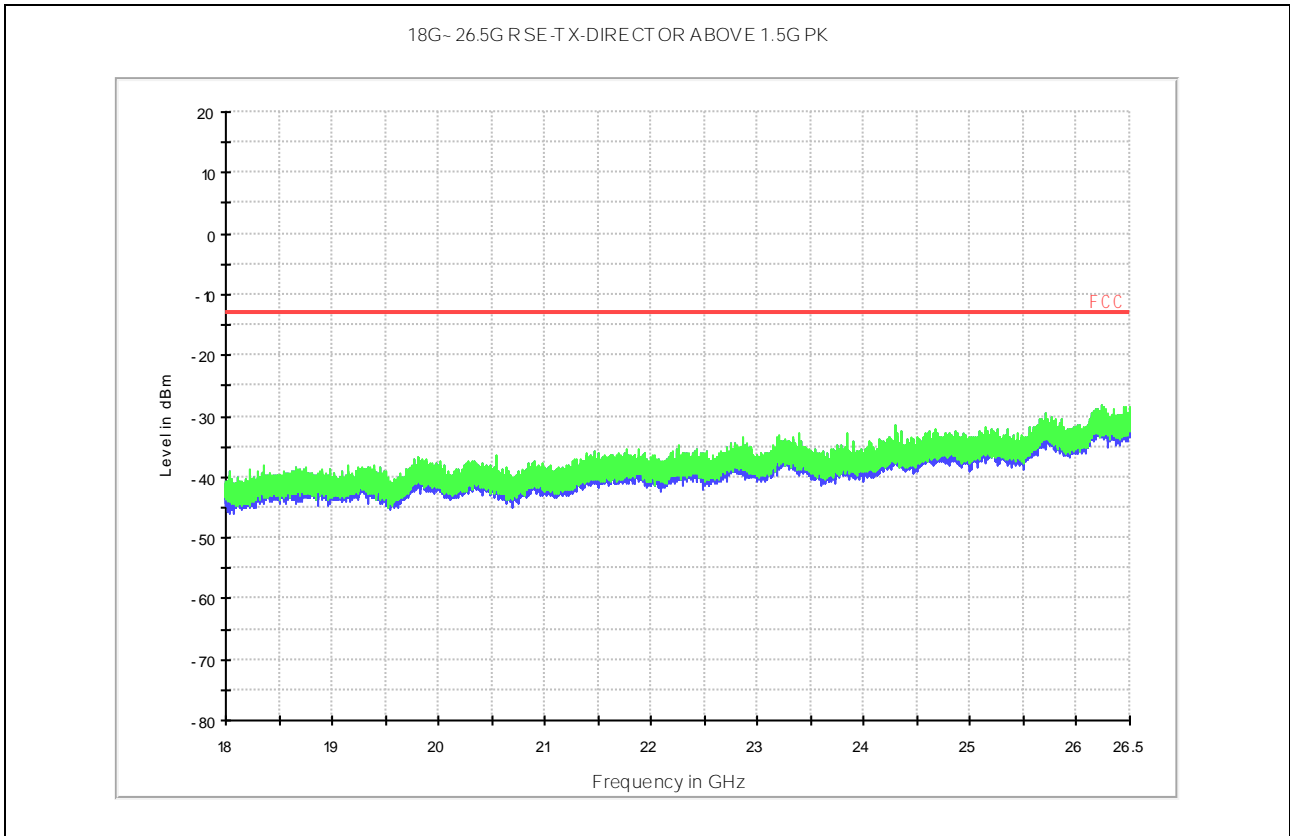


10 FCC PART 24 GSM1900_L



09 FCC PART 24 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	-11.59062	-0.01406	PASS
				VN	-7.91003	-0.00960	PASS
				VH	-11.65519	-0.01414	PASS
		MCH	TN	VL	-12.23634	-0.01463	PASS
				VN	-9.94404	-0.01189	PASS
				VH	-12.59148	-0.01505	PASS
		HCH	TN	VL	-19.43608	-0.02290	PASS
				VN	-18.43522	-0.02172	PASS
				VH	-20.30780	-0.02393	PASS
	GSM/TM2	LCH	TN	VL	-5.32716	-0.00646	PASS
				VN	-3.64830	-0.00443	PASS
				VH	-4.61688	-0.00560	PASS
		MCH	TN	VL	-7.65175	-0.00915	PASS
				VN	-6.58631	-0.00787	PASS
				VH	-7.23203	-0.00864	PASS
		HCH	TN	VL	-13.04348	-0.01537	PASS
				VN	-12.84977	-0.01514	PASS
				VH	-14.85149	-0.01750	PASS
PCS1900	GSM/TM1	LCH	TN	VL	-15.20663	-0.00822	PASS
				VN	-7.61946	-0.00412	PASS
				VH	-10.68662	-0.00578	PASS
		MCH	TN	VL	3.03487	0.00161	PASS
				VN	10.04090	0.00534	PASS
				VH	3.74516	0.00199	PASS
		HCH	TN	VL	-12.23634	-0.00607	PASS
				VN	-9.84718	-0.00630	PASS
				VH	-13.36634	-0.00832	PASS
	GSM/TM2	LCH	TN	VL	-6.23117	-0.00337	PASS
				VN	-6.10203	-0.00330	PASS
				VH	-7.03831	-0.00380	PASS
		MCH	TN	VL	14.36720	0.00764	PASS
				VN	9.71804	0.00517	PASS
				VH	10.17004	0.00541	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		HCH	TN	VL	-9.91176	-0.00562	PASS
				VN	-11.52605	-0.00583	PASS
				VH	-8.23289	-0.00492	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	-7.42575	-0.00901	PASS
				-20	-7.58718	-0.00921	PASS
				-10	-6.52174	-0.00791	PASS
				0	-7.84546	-0.00952	PASS
				10	-7.26432	-0.00881	PASS
				20	-7.91003	-0.00960	PASS
				30	-8.16832	-0.00991	PASS
				40	-8.55575	-0.01038	PASS
				50	-6.97374	-0.00846	PASS
		MCH	VN	-30	-9.49204	-0.01135	PASS
				-20	-8.03918	-0.00961	PASS
				-10	-7.81318	-0.00934	PASS
				0	-7.65175	-0.00915	PASS
				10	-8.10375	-0.00969	PASS
				20	-9.94404	-0.01189	PASS
				30	-10.17004	-0.01216	PASS
				40	-8.23289	-0.00984	PASS
				50	-8.81404	-0.01054	PASS
		HCH	VN	-30	-17.56350	-0.02069	PASS
				-20	-18.27379	-0.02153	PASS
				-10	-17.78950	-0.02096	PASS
				0	-18.72579	-0.02206	PASS
				10	-18.14465	-0.02138	PASS
				20	-18.43522	-0.02172	PASS
	30			-19.17779	-0.02259	PASS	
	40			-19.04865	-0.02244	PASS	
	50			-18.24150	-0.02149	PASS	
	GSM/TM2	LCH	VN	-30	-4.55230	-0.00552	PASS
				-20	-3.26087	-0.00396	PASS
				-10	-3.77744	-0.00458	PASS
				0	-4.52002	-0.00548	PASS
				10	-4.19716	-0.00509	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict			
				20	-3.64830	-0.00443	PASS			
				30	-6.10203	-0.00740	PASS			
				40	-2.48601	-0.00302	PASS			
				50	-4.97202	-0.00603	PASS			
		MCH	VN			-30	-7.16746	-0.00857	PASS	
						-20	-7.61946	-0.00911	PASS	
						-10	-6.06974	-0.00726	PASS	
						0	-6.87689	-0.00822	PASS	
						10	-6.32803	-0.00756	PASS	
						20	-6.58631	-0.00787	PASS	
						30	-6.55403	-0.00783	PASS	
						40	-6.90917	-0.00826	PASS	
		HCH	VN			50	-5.52088	-0.00660	PASS	
						-30	-14.91606	-0.01757	PASS	
						-20	-13.20491	-0.01556	PASS	
						-10	-13.91520	-0.01639	PASS	
						0	-13.36634	-0.01575	PASS	
						10	-14.39949	-0.01696	PASS	
						20	-12.84977	-0.01514	PASS	
						30	-15.62635	-0.01841	PASS	
		PCS1900	GSM/TM1	LCH	VN		40	-13.36634	-0.01575	PASS
							50	-13.85063	-0.01632	PASS
							-30	-5.58545	-0.00302	PASS
							-20	-4.39088	-0.00237	PASS
-10	-11.04176						-0.00597	PASS		
0	-9.65347						-0.00522	PASS		
10	-8.65261						-0.00468	PASS		
20	-7.61946						-0.00412	PASS		
30	-6.39260						-0.00346	PASS		
40	-8.23289						-0.00445	PASS		
MCH	VN					50	-4.90745	-0.00265	PASS	
						-30	7.32889	0.00390	PASS	
						-20	9.78261	0.00520	PASS	
						-10	13.88292	0.00738	PASS	
						0	13.36634	0.00711	PASS	
						10	12.59148	0.00670	PASS	
						20	10.04090	0.00534	PASS	
						30	12.23634	0.00651	PASS	
						40	15.23892	0.00811	PASS	
						50	16.82093	0.00895	PASS	

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict			
		HCH	VN	-30	36.19244	0.01895	PASS			
				-20	36.41844	0.01907	PASS			
				-10	36.41844	0.01907	PASS			
				0	35.06243	0.01836	PASS			
				10	38.35559	0.02008	PASS			
				20	36.77358	0.01926	PASS			
				30	36.54758	0.01914	PASS			
				40	39.35645	0.02061	PASS			
				50	37.45159	0.01961	PASS			
		GSM/TM2	LCH	VN	-30	-6.29574	-0.00340	PASS		
					-20	-8.00689	-0.00433	PASS		
					-10	-7.07060	-0.00382	PASS		
					0	-6.71546	-0.00363	PASS		
					10	-7.65175	-0.00414	PASS		
					20	-6.10203	-0.00330	PASS		
					30	-5.35945	-0.00290	PASS		
					40	-5.61774	-0.00304	PASS		
					50	-6.71646	-0.00353	PASS		
					MCH	VN	-30	8.81404	0.00469	PASS
							-20	13.43091	0.00714	PASS
							-10	10.04090	0.00534	PASS
							0	10.68662	0.00568	PASS
							10	10.04090	0.00534	PASS
							20	9.71804	0.00517	PASS
							30	8.00689	0.00426	PASS
							40	11.52605	0.00613	PASS
							50	9.81804	0.00522	PASS
					HCH	VN	-30	35.86958	0.01878	PASS
							-20	36.77358	0.01926	PASS
							-10	39.03359	0.02044	PASS
							0	36.64444	0.01919	PASS
							10	34.19071	0.01790	PASS
							20	36.38615	0.01905	PASS
							30	36.48301	0.01910	PASS
							40	37.03187	0.01939	PASS
							50	36.64538	0.01838	PASS

END