



Appendix for test report



1 Appendix_A: Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	ERP [dBm]	Limit [dBm]	Verdict
GSM850	GSM/TM1	LCH	33.42	29.61	38.5	PASS
		MCH	33.34	29.53	38.5	PASS
		HCH	33.28	29.45	38.5	PASS
	GSM/TM2	LCH	27.59	23.78	38.5	PASS
		MCH	27.51	23.63	38.5	PASS
		HCH	27.38	23.57	38.5	PASS
Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	29.75	30.68	33	PASS
		MCH	29.51	30.35	33	PASS
		HCH	29.19	30.03	33	PASS
	GSM/TM2	LCH	26.38	27.24	33	PASS
		MCH	26.3	27.19	33	PASS
		HCH	26.08	26.97	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: RBW > emission bandwidth, VBW > 3 x RBW.

Detector: RMS



2Appendix_B: Peak-to-Average Ratio

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
GSM1900	GSM/TM1	LCH	0.29	13	PASS
		MCH	0.24	13	PASS
		HCH	0.27	13	PASS
	GSM/TM2	LCH	2.92	13	PASS
		MCH	2.82	13	PASS
		HCH	2.96	13	PASS

3Appendix_C: Modulation Characteristics

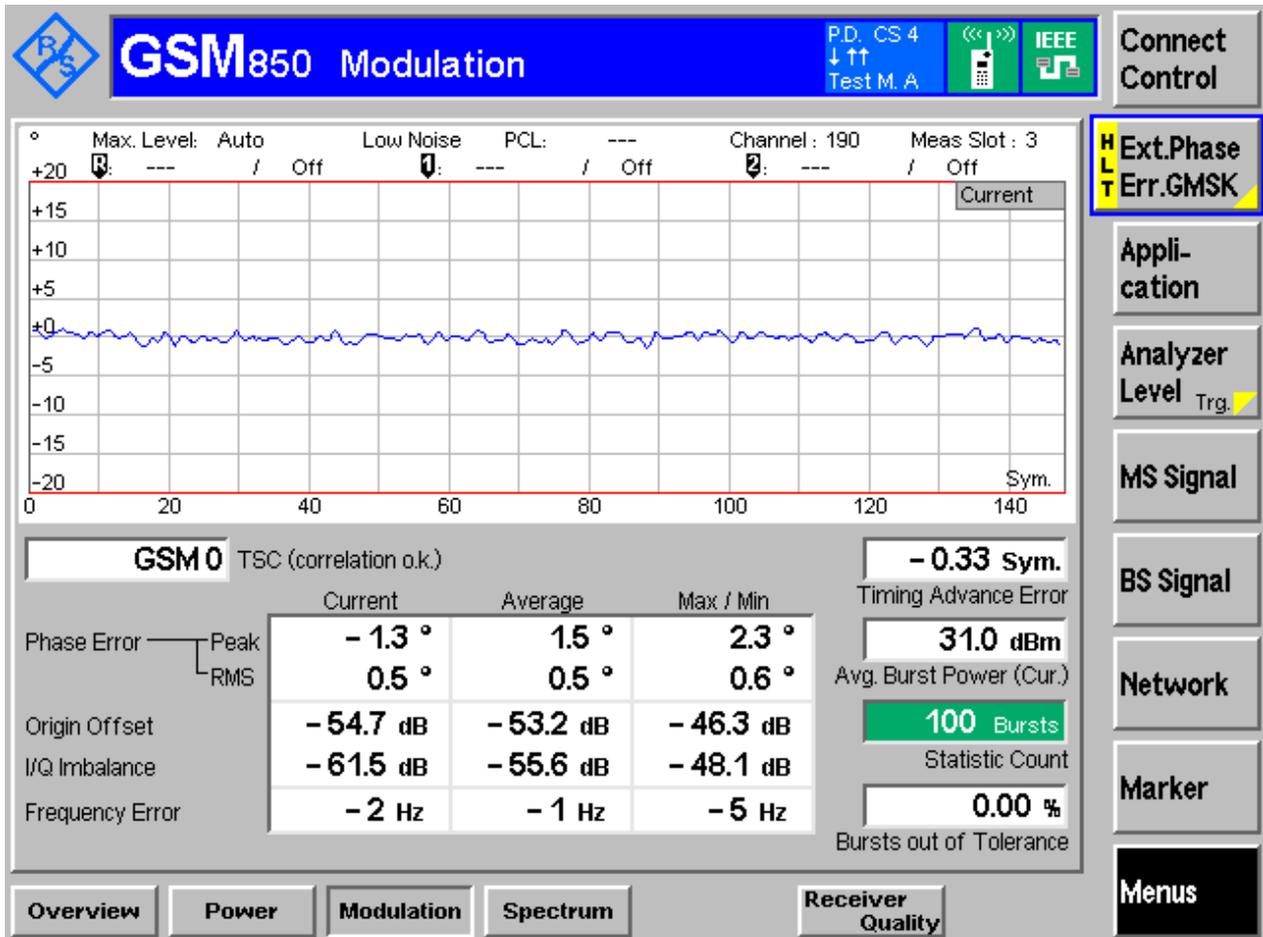
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

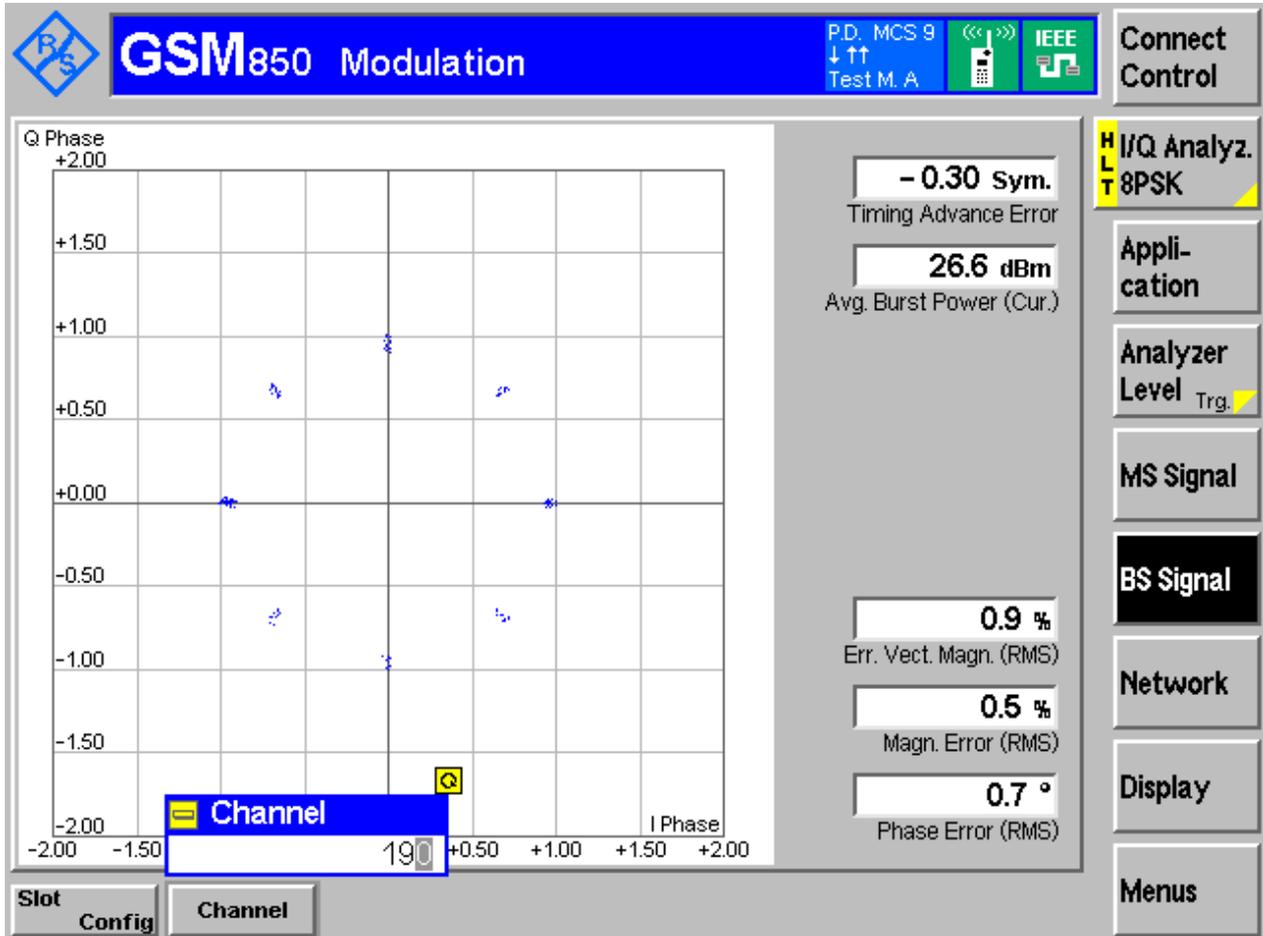
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

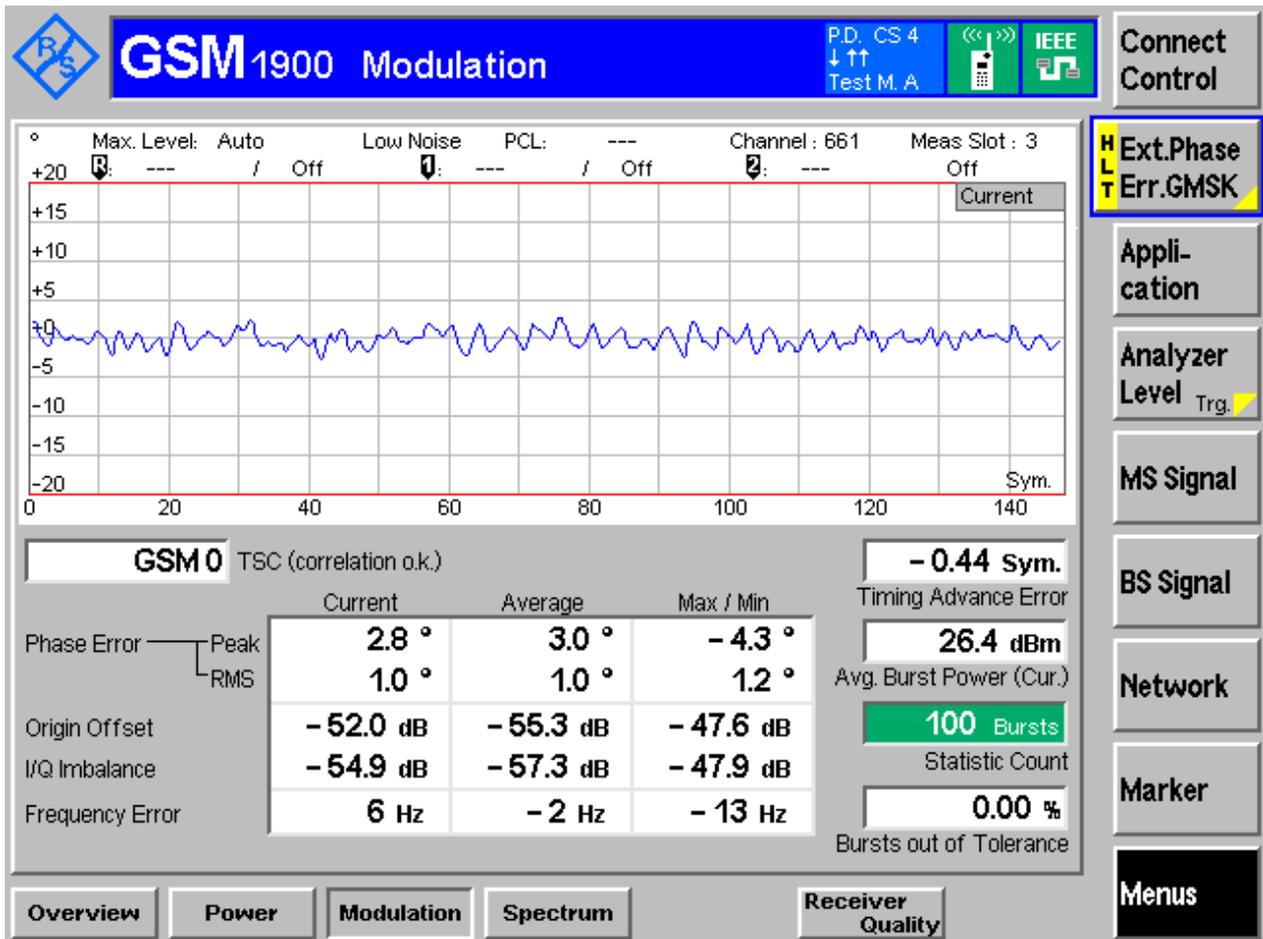
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

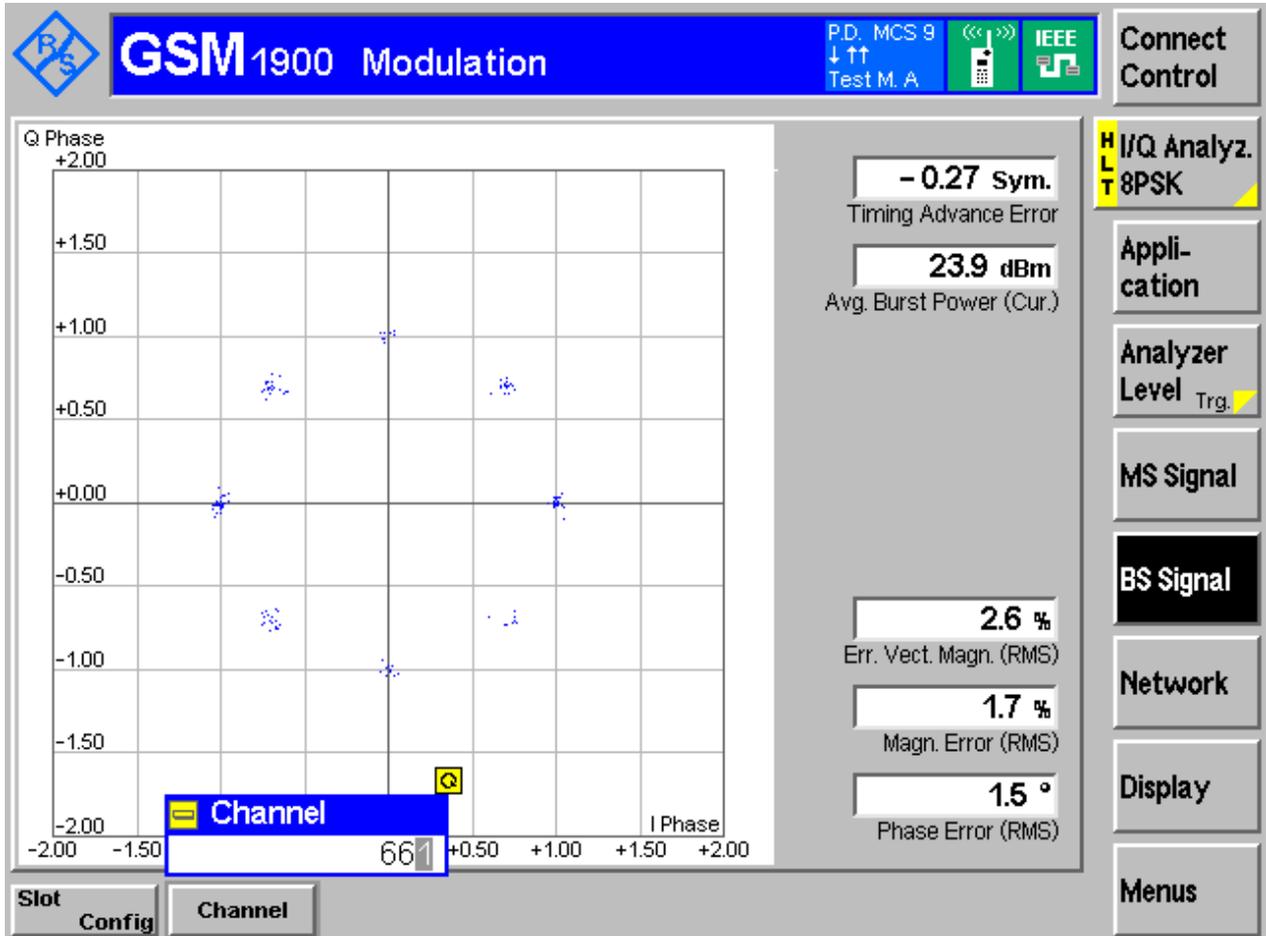
3.1.2.1 Test Mode = GSM/TM1

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	242.83	316.50	Pass
		MCH	244.79	316.90	Pass
		HCH	243.62	316.18	Pass
	GSM/TM2	LCH	244.91	321.03	Pass
		MCH	230.13	302.45	Pass
		HCH	237.03	289.74	Pass
GSM1900	GSM/TM1	LCH	243.75	312.50	Pass
		MCH	239.88	311.37	Pass
		HCH	243.04	314.34	Pass
	GSM/TM2	LCH	243.23	315.88	Pass
		MCH	241.86	311.44	Pass
		HCH	240.41	312.79	Pass



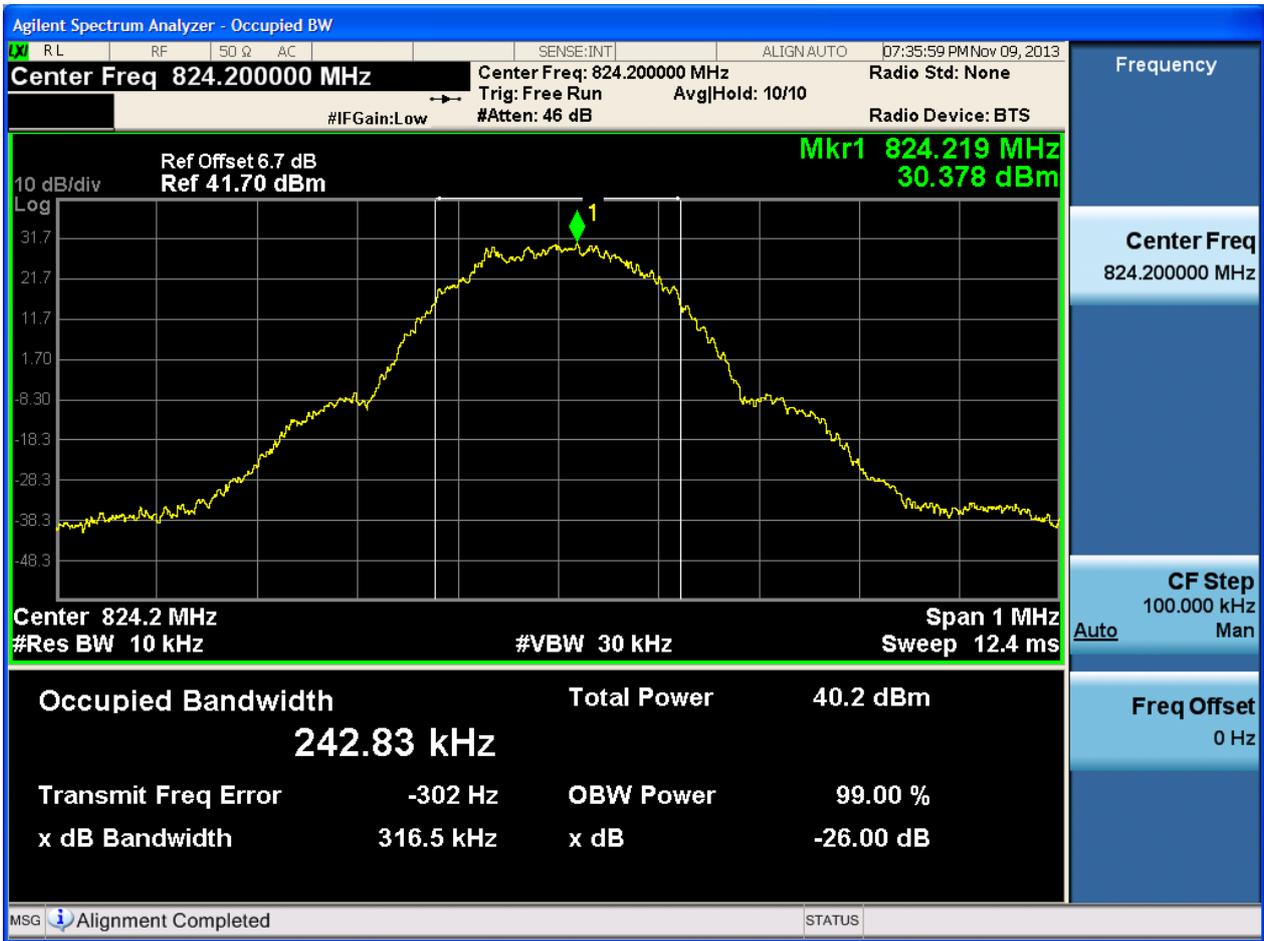
Part II - Test Plots

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



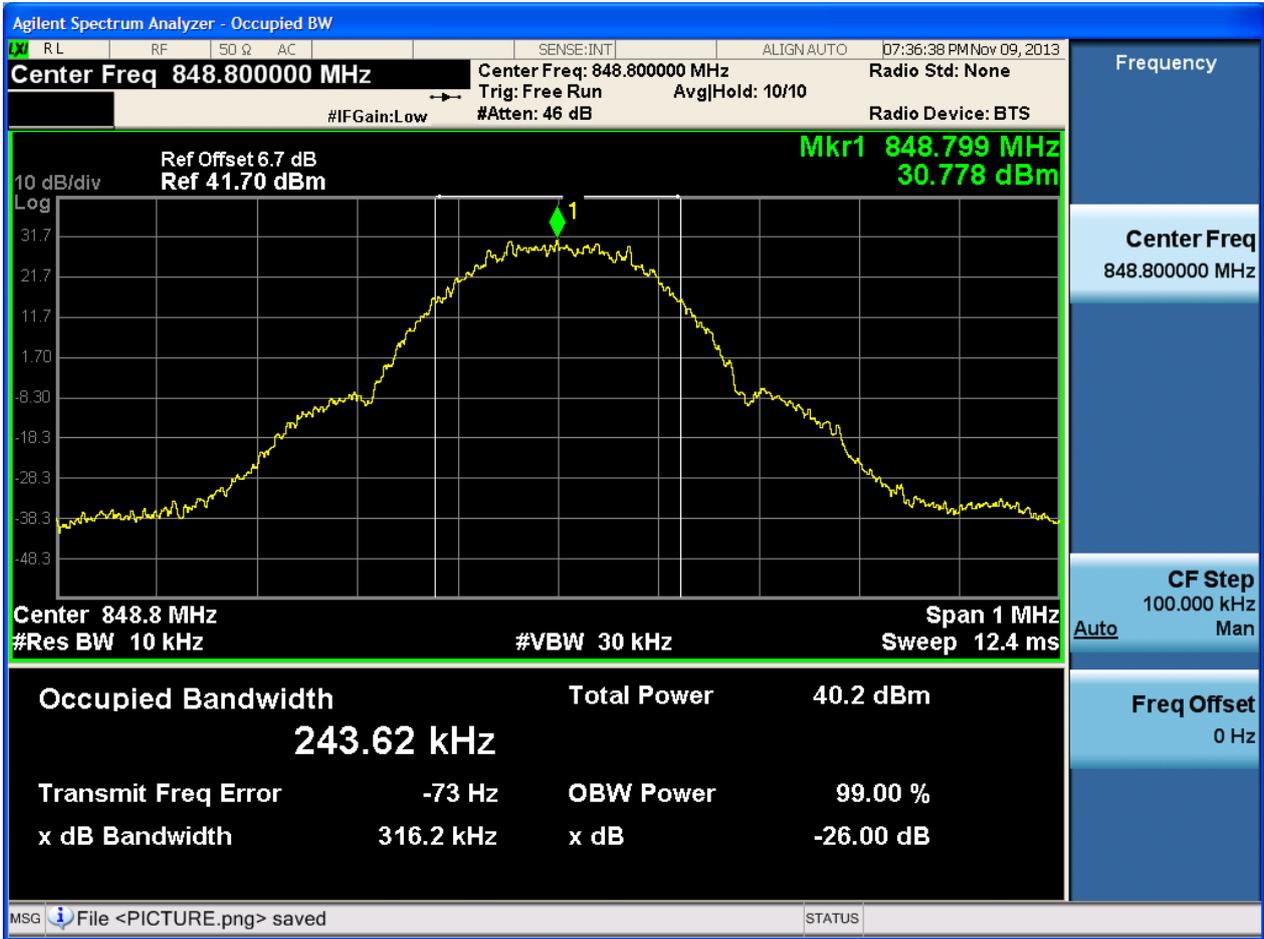


4.1.1.1.2 Test Channel = MCH





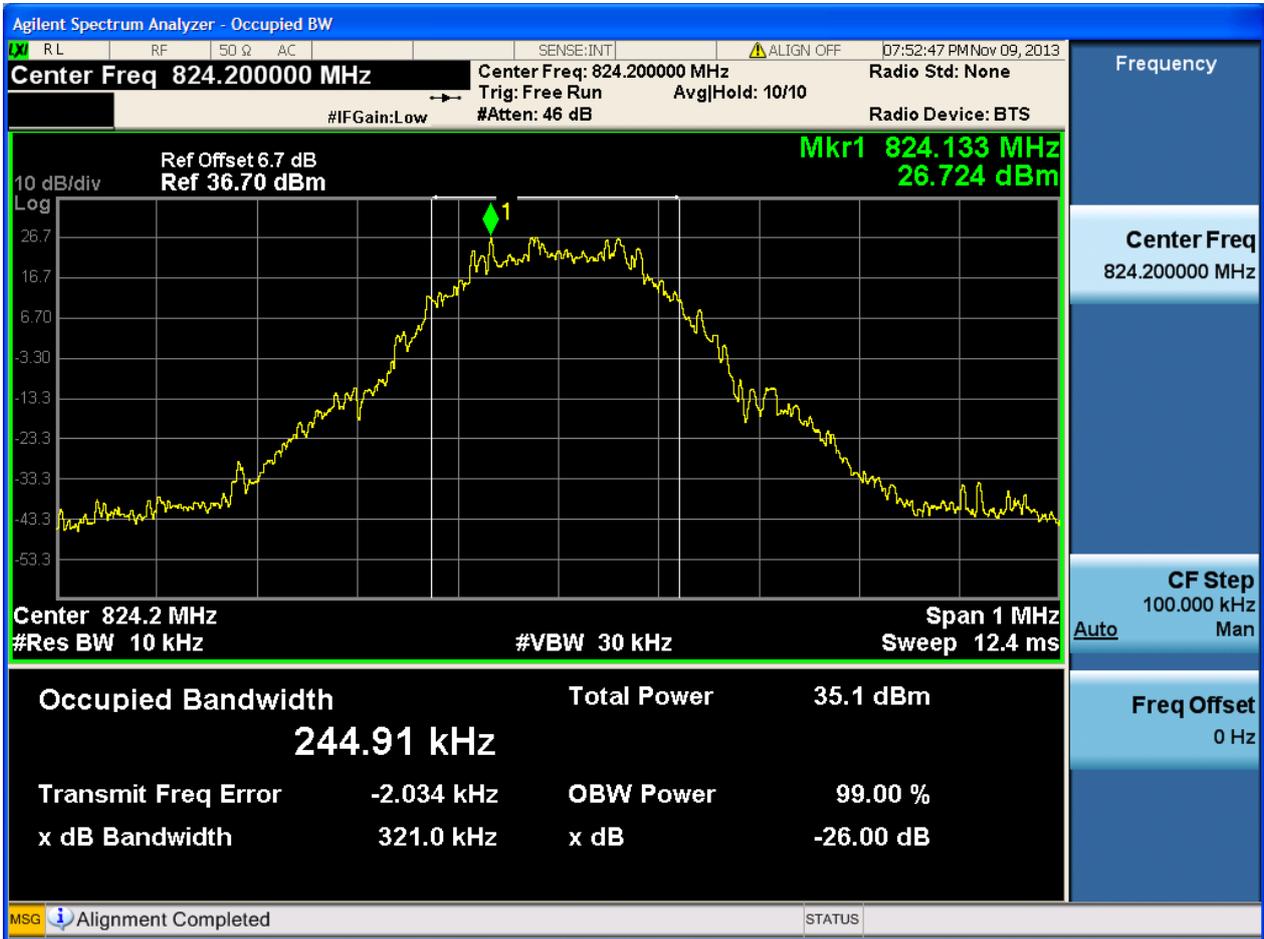
4.1.1.1.3 Test Channel = HCH





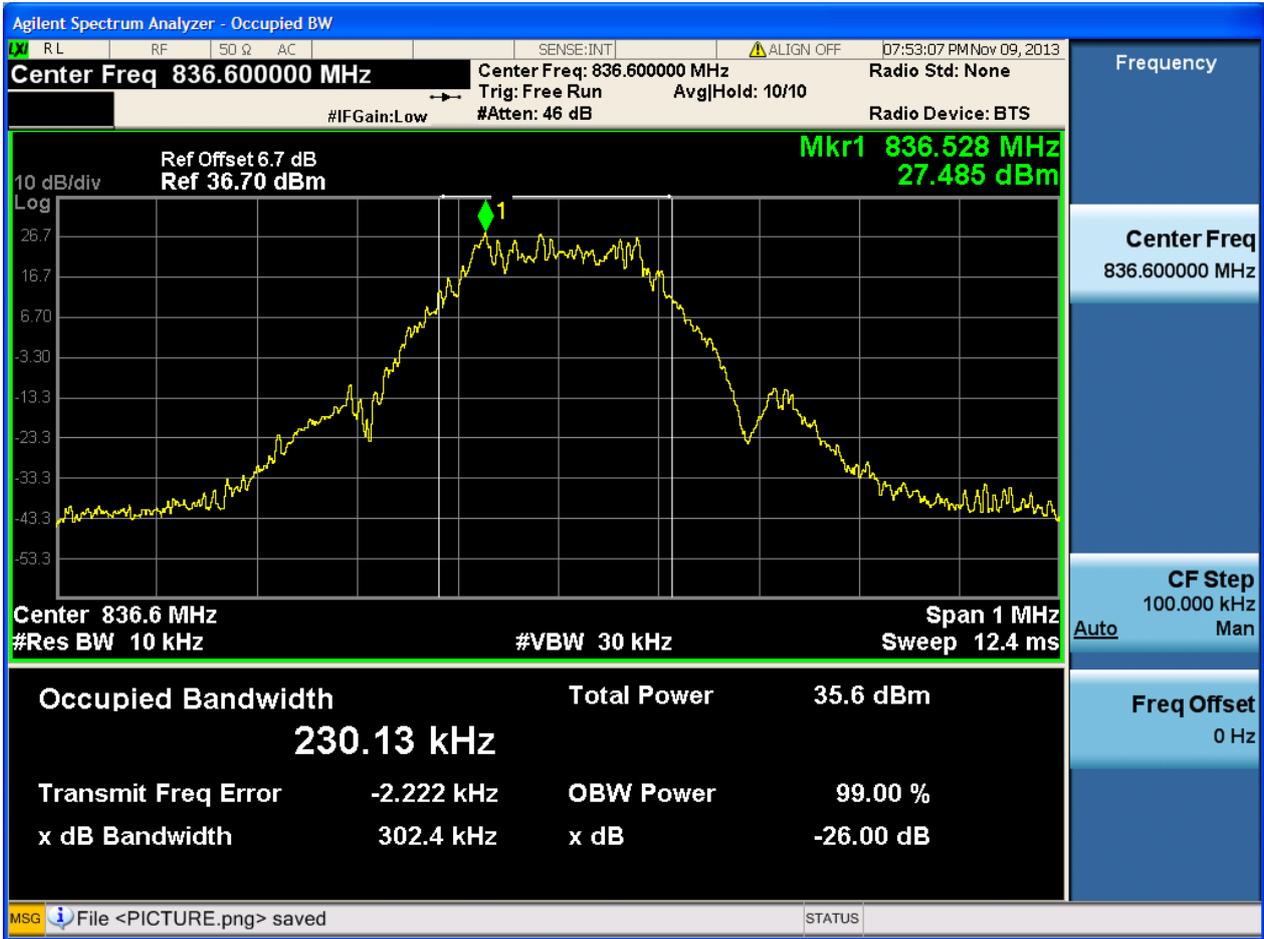
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH



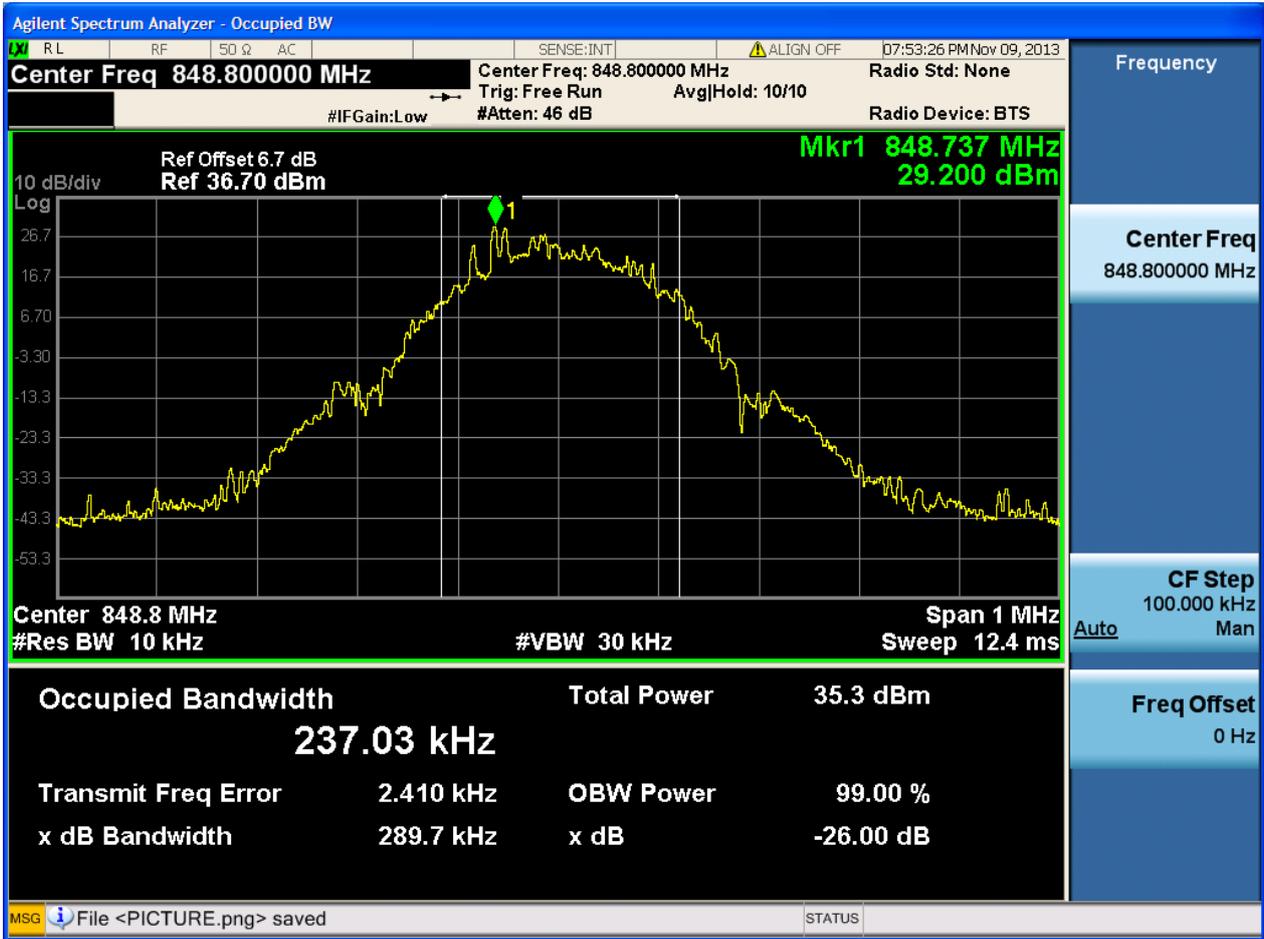


4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH

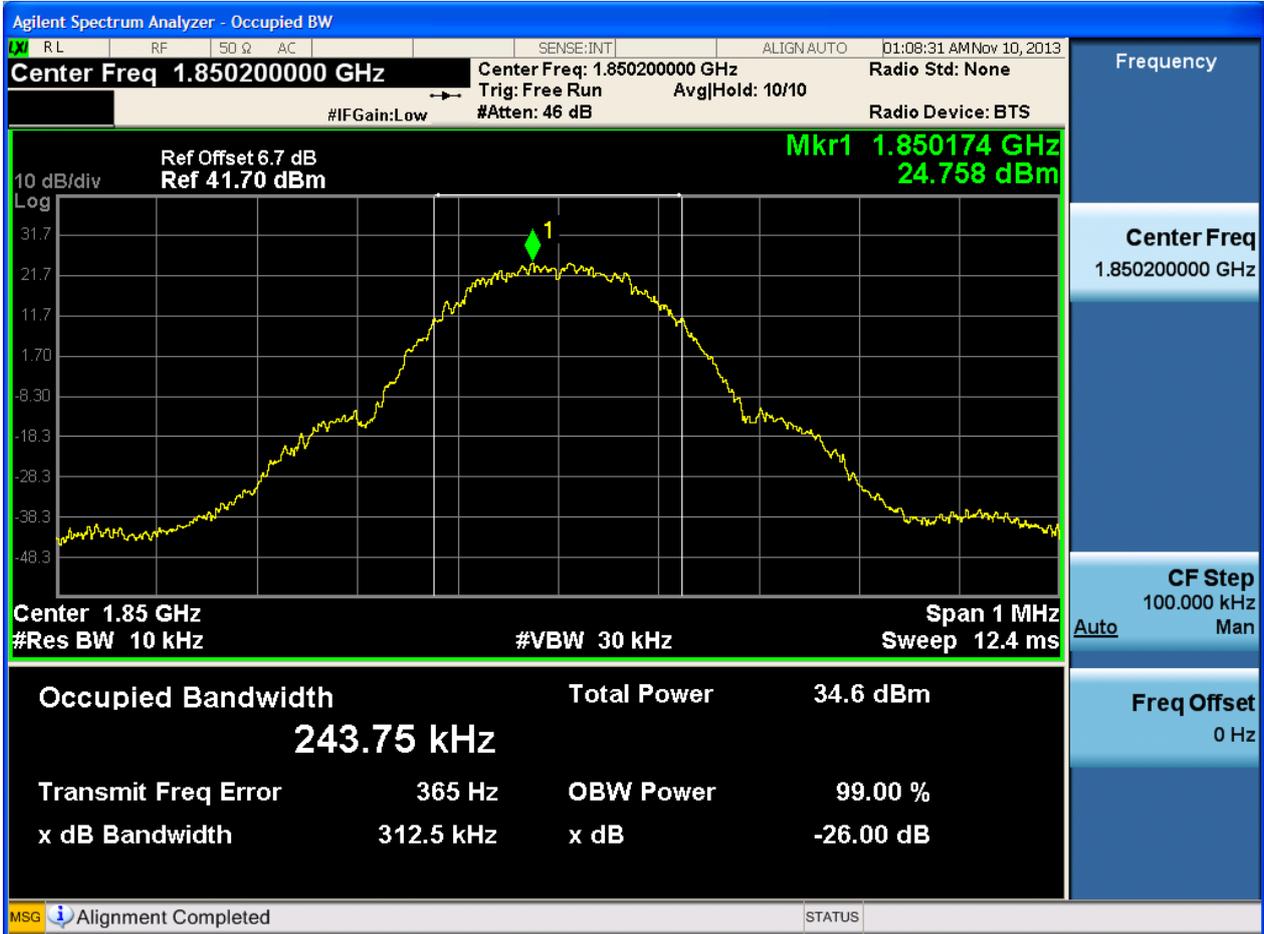




4.1.2 Test Band = GSM1900

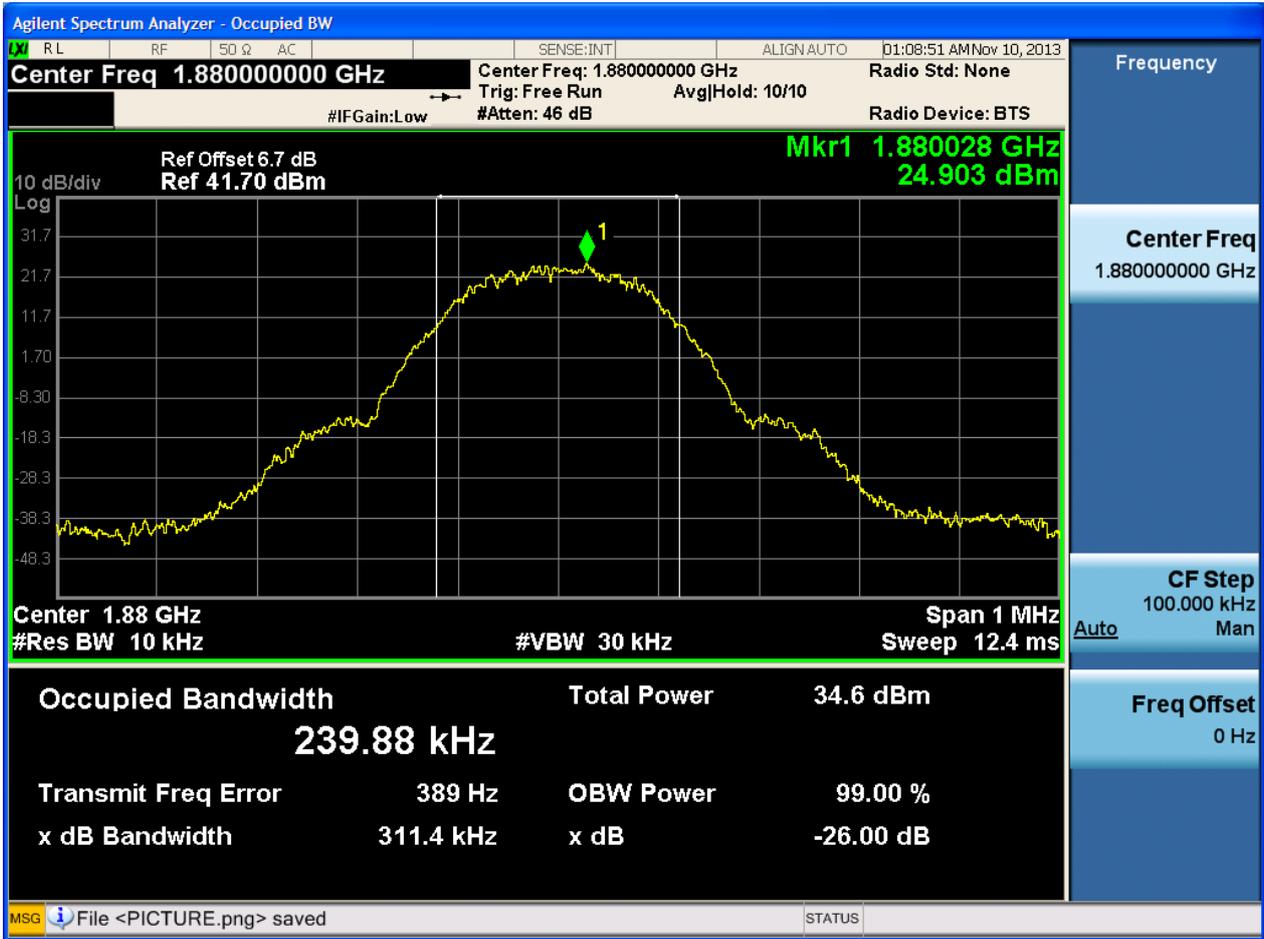
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



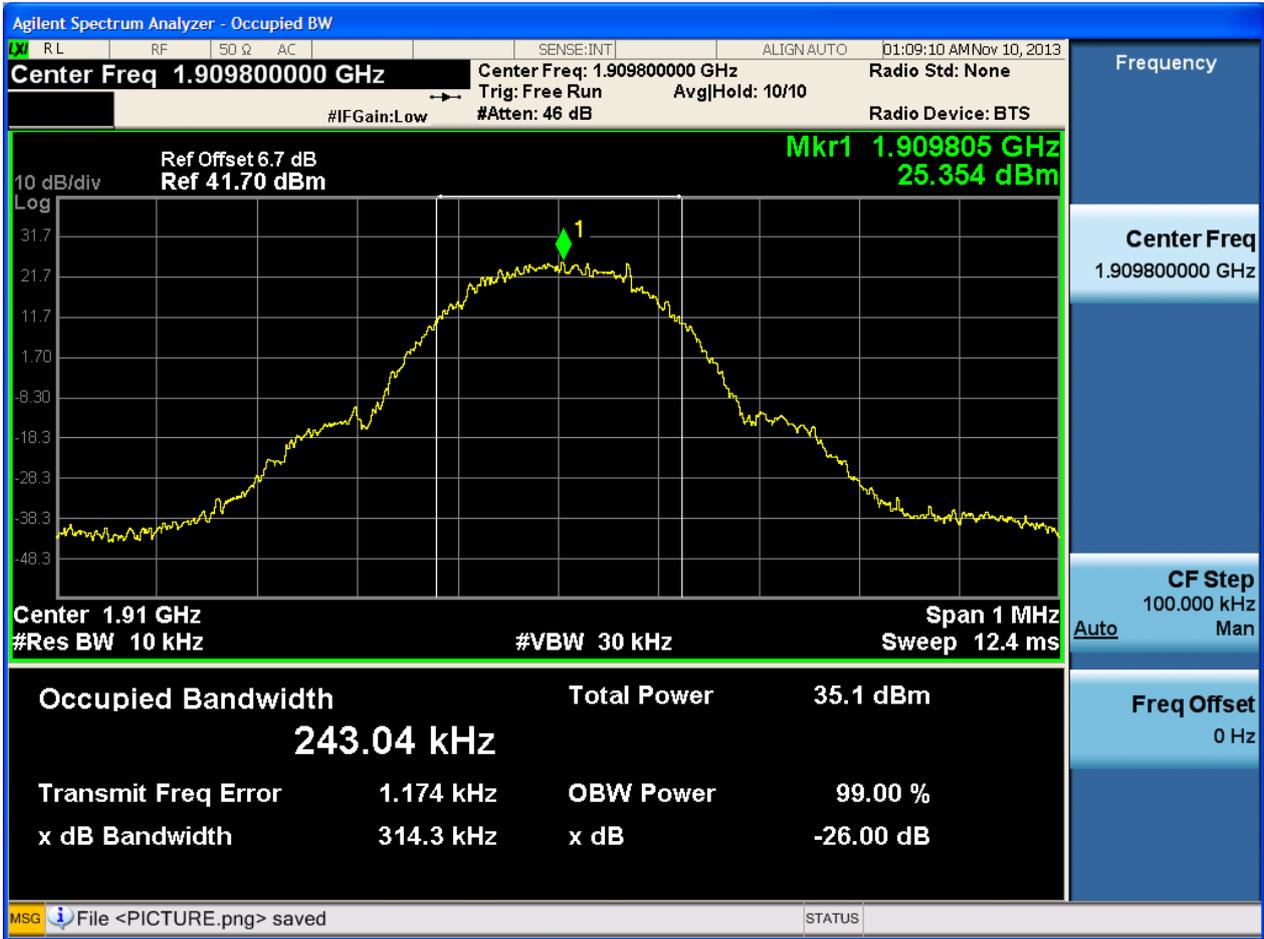


4.1.2.1.2 Test Channel = MCH





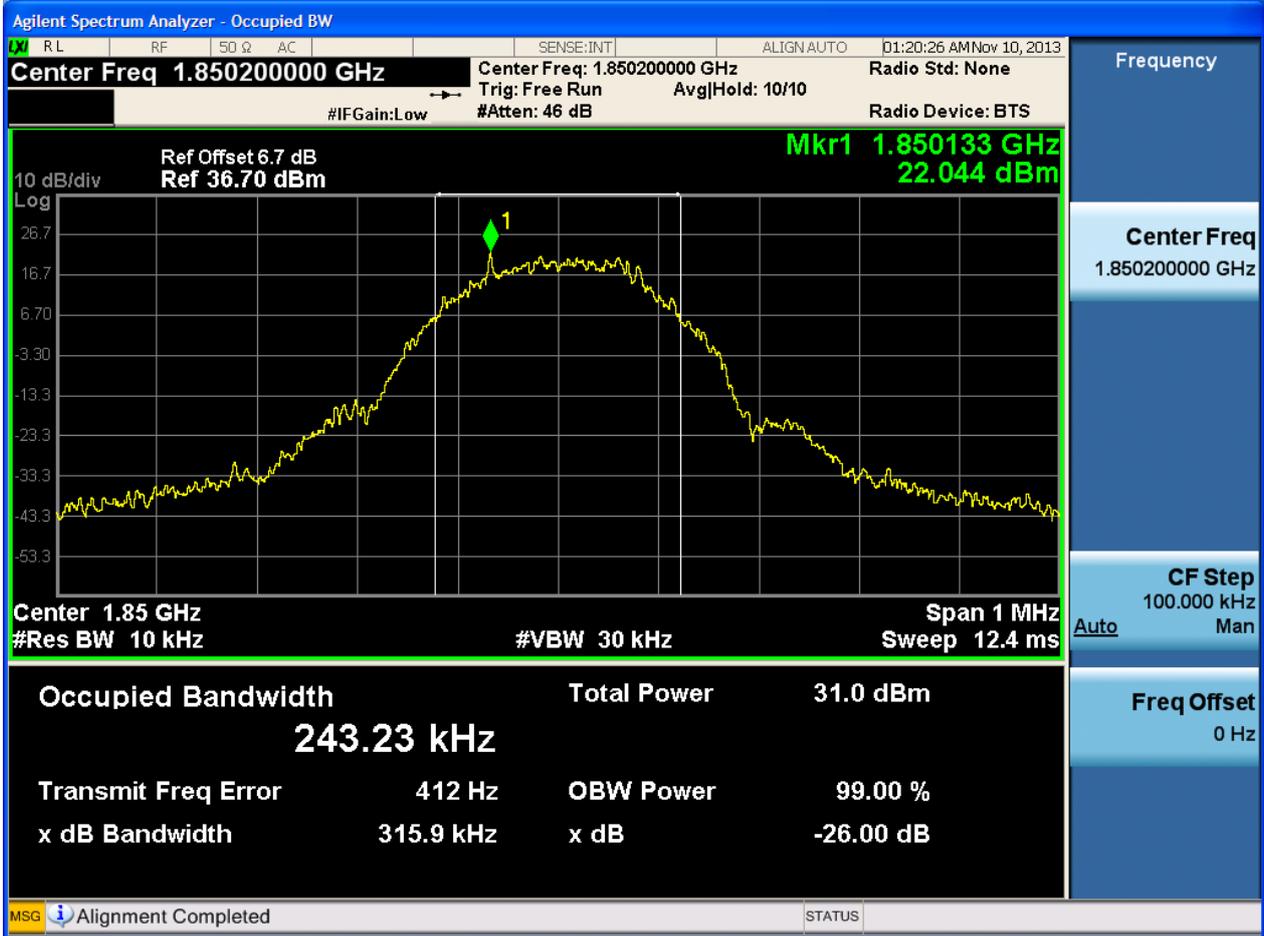
4.1.2.1.3 Test Channel = HCH





4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



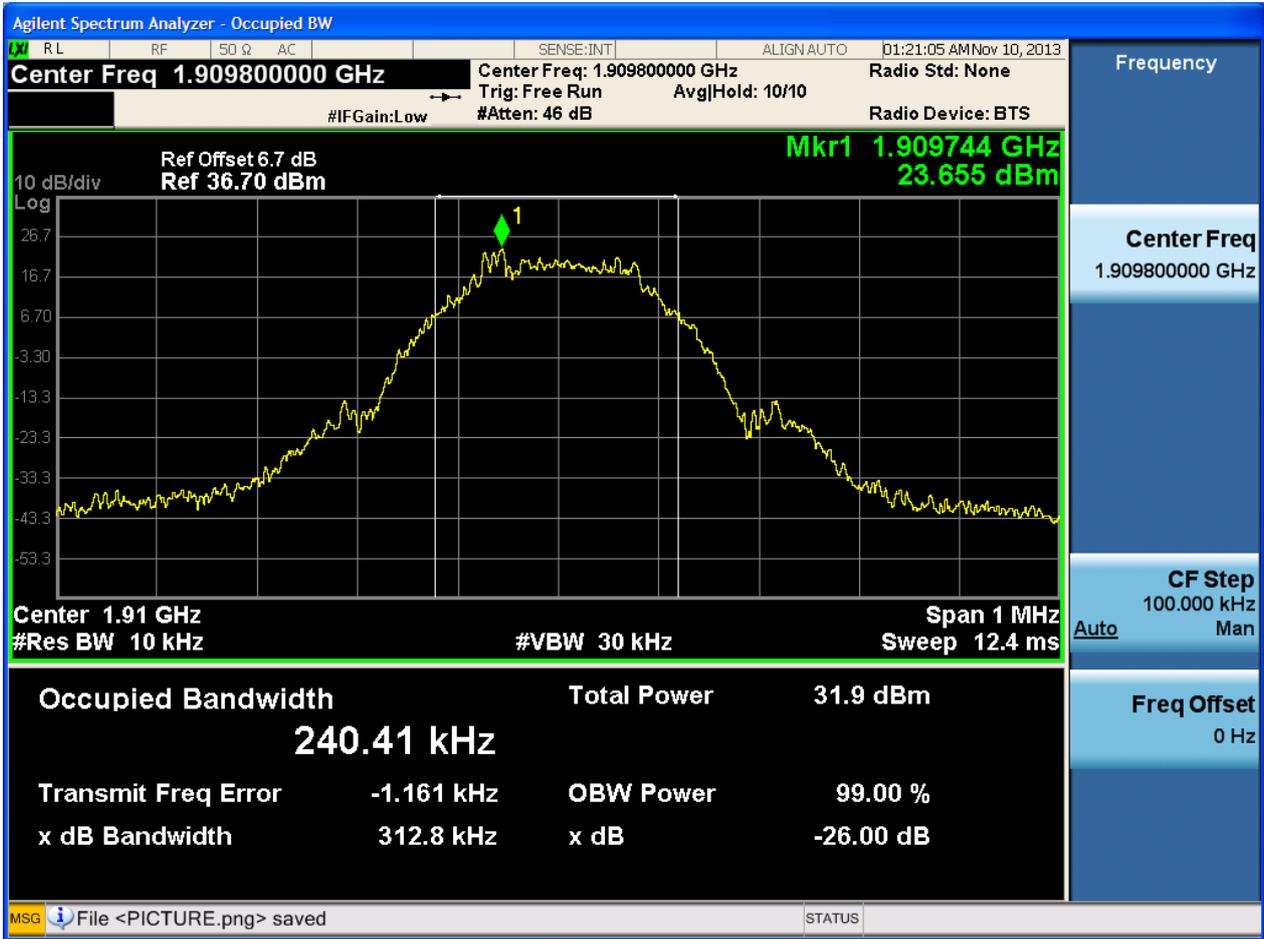


4.1.2.2.2 Test Channel = MCH



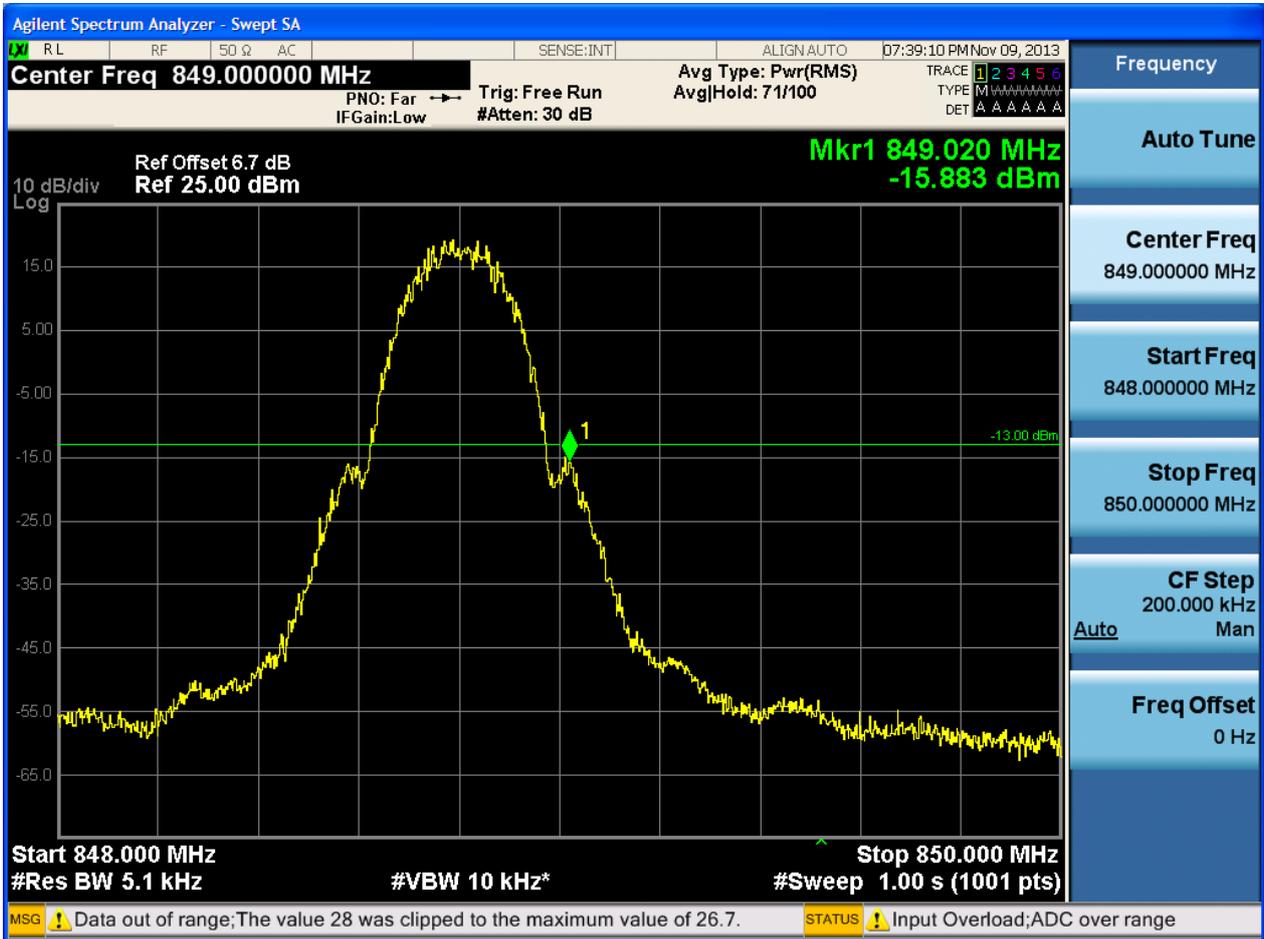


4.1.2.2.3 Test Channel = HCH





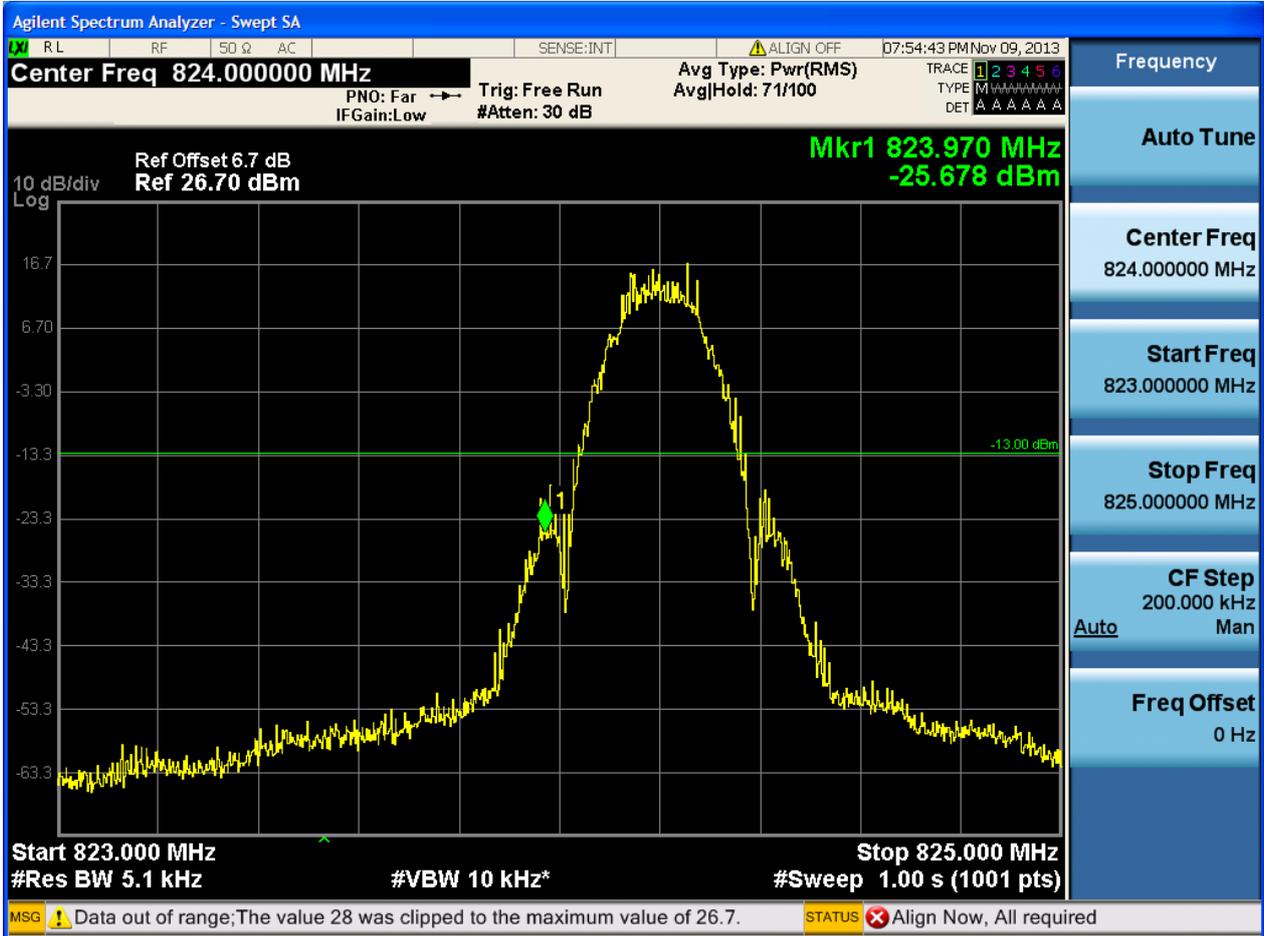
5.1.1.1.2 Test Channel = HCH



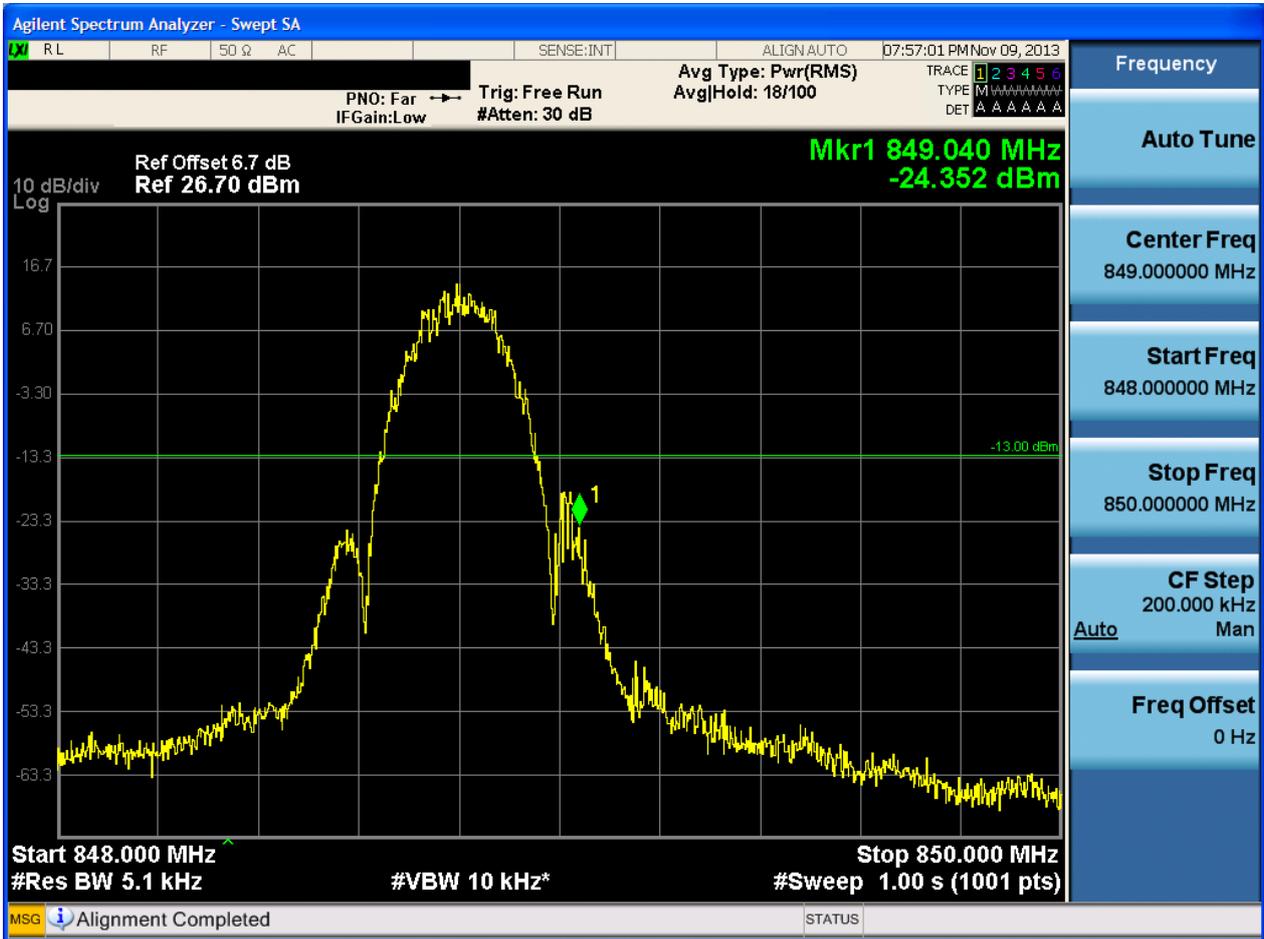


5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



5.1.1.2.2 Test Channel = HCH

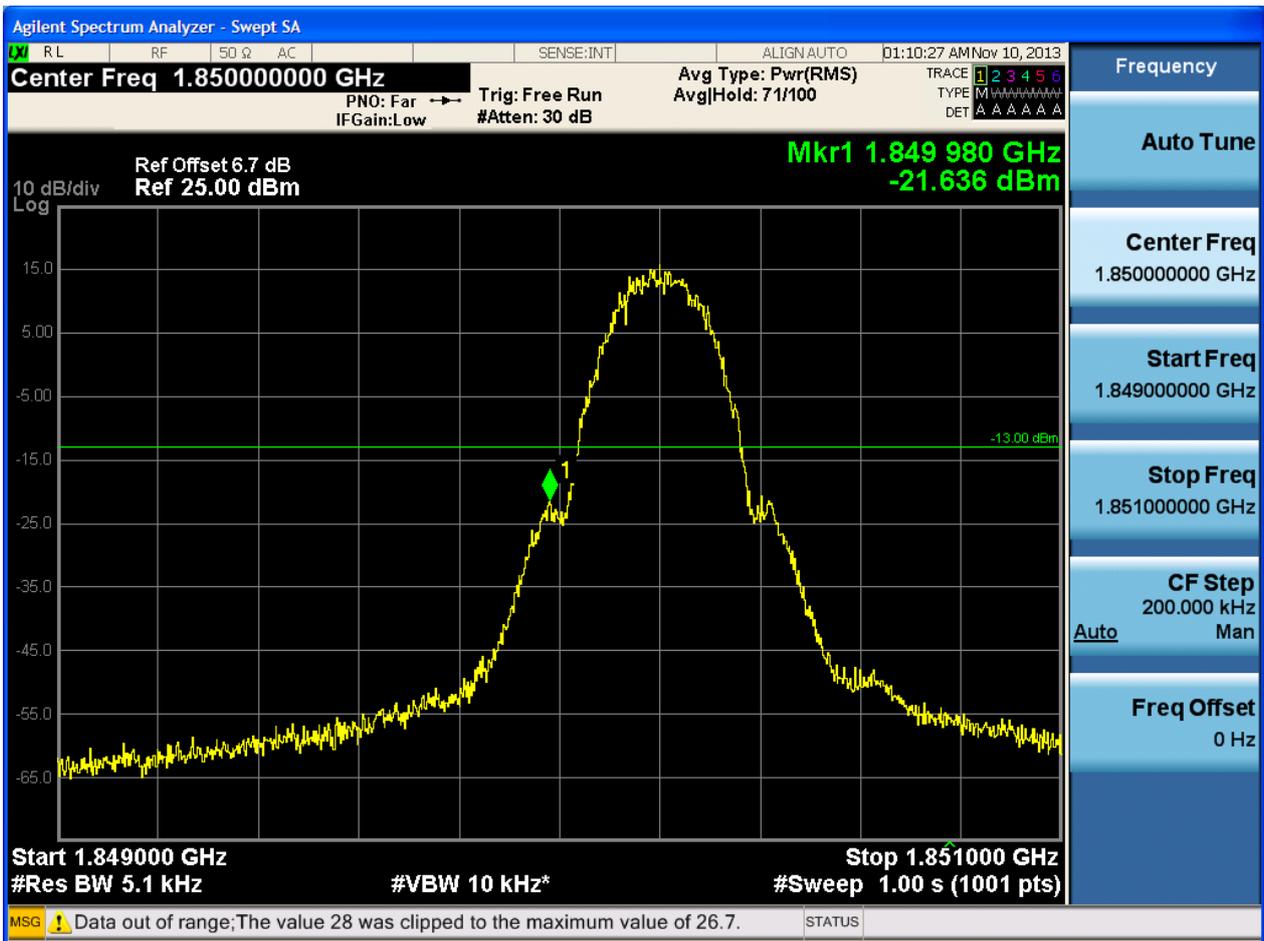




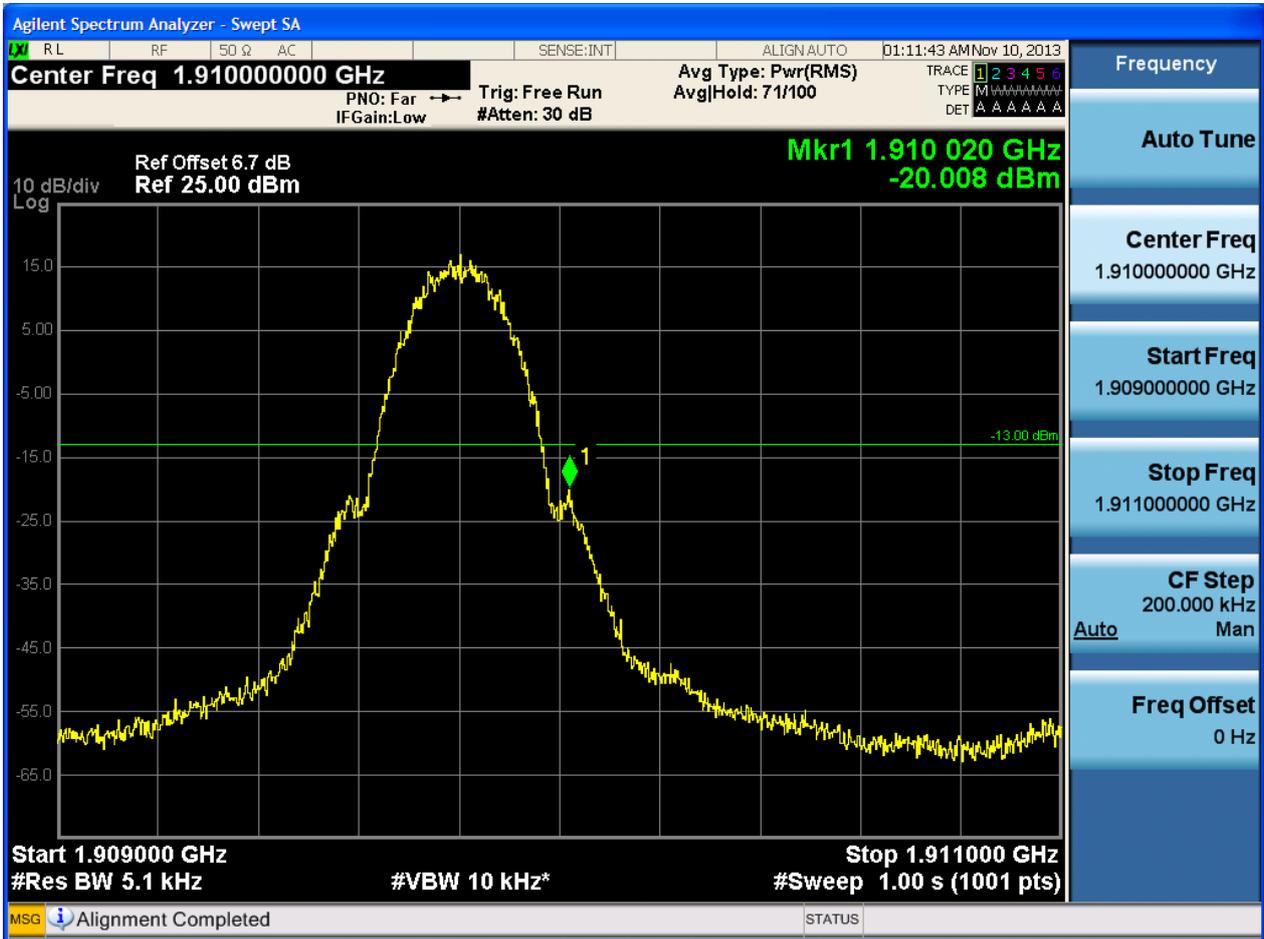
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH



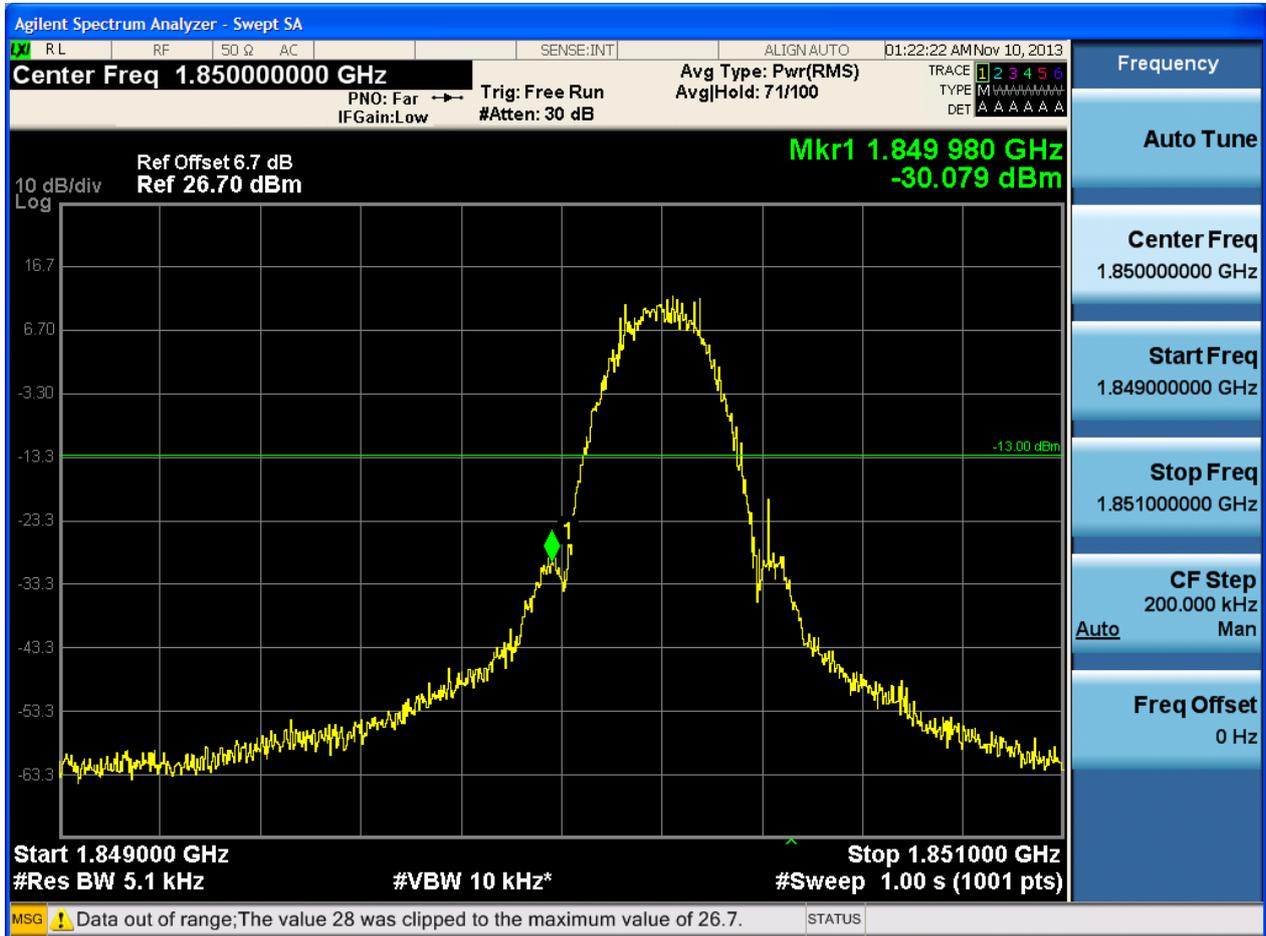
5.1.2.1.2 Test Channel = HCH



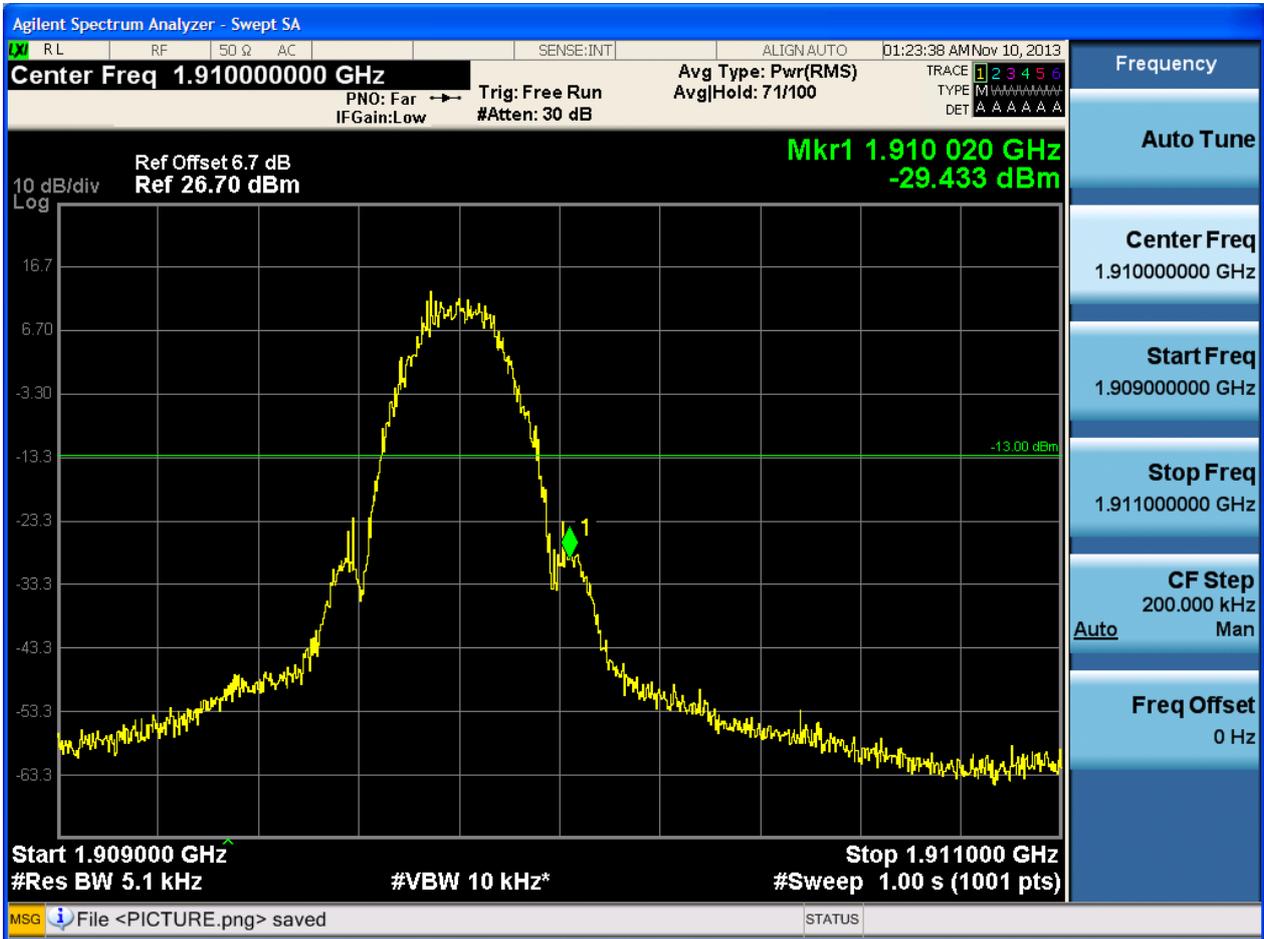


5.1.2.2 Test Mode = GSM/TM2

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

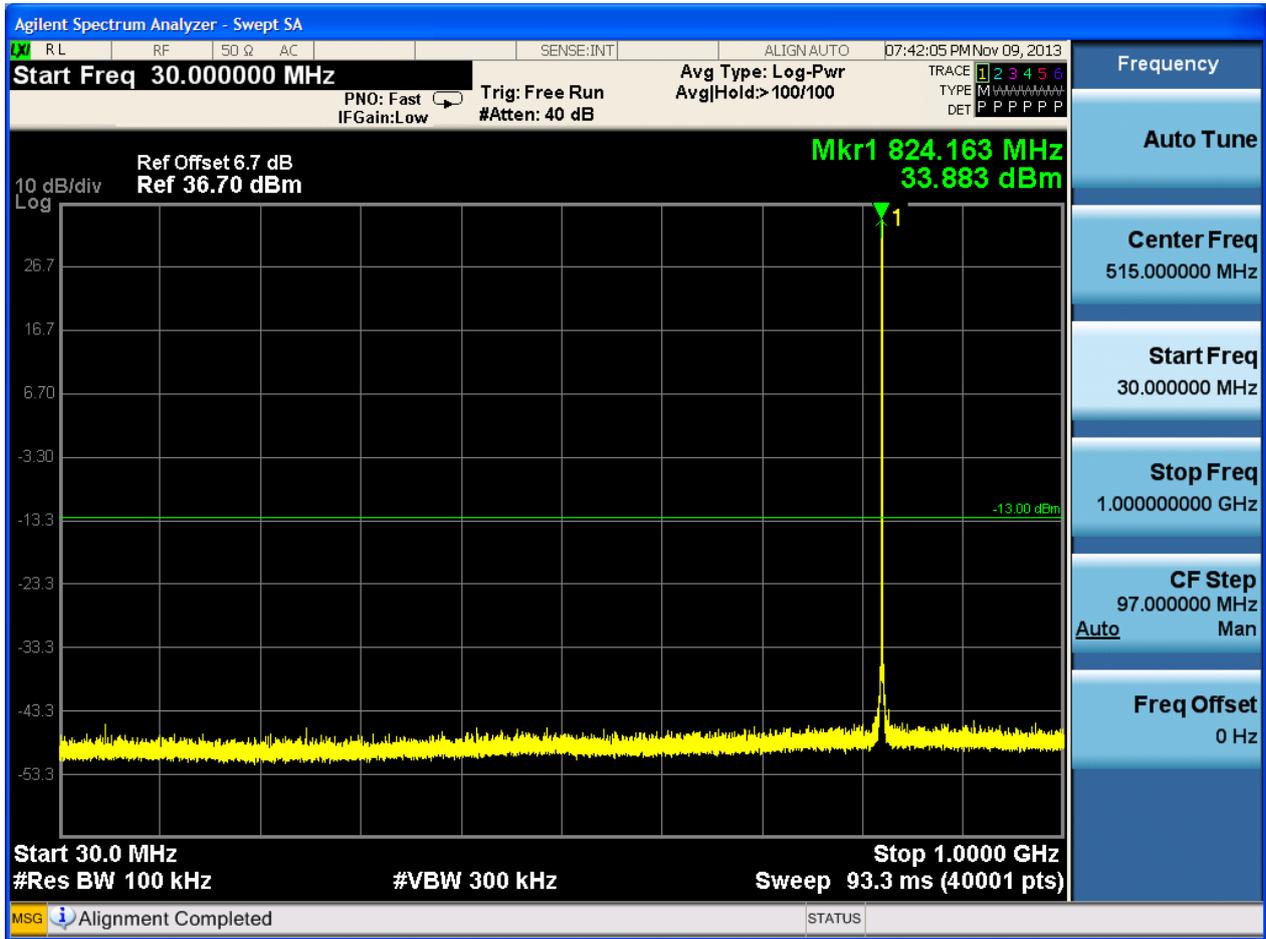
6.1.1 Test Band = GSM850

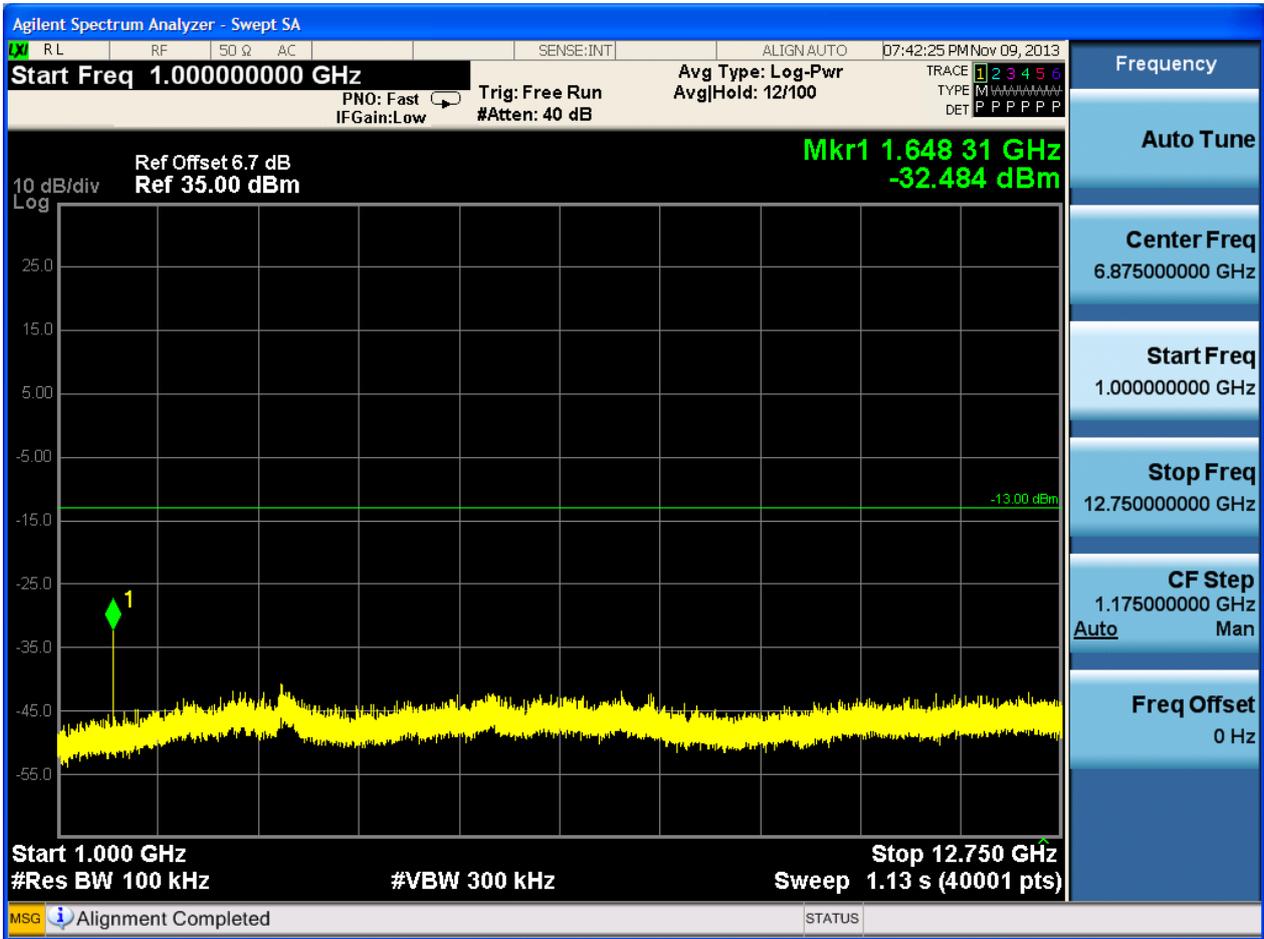
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH

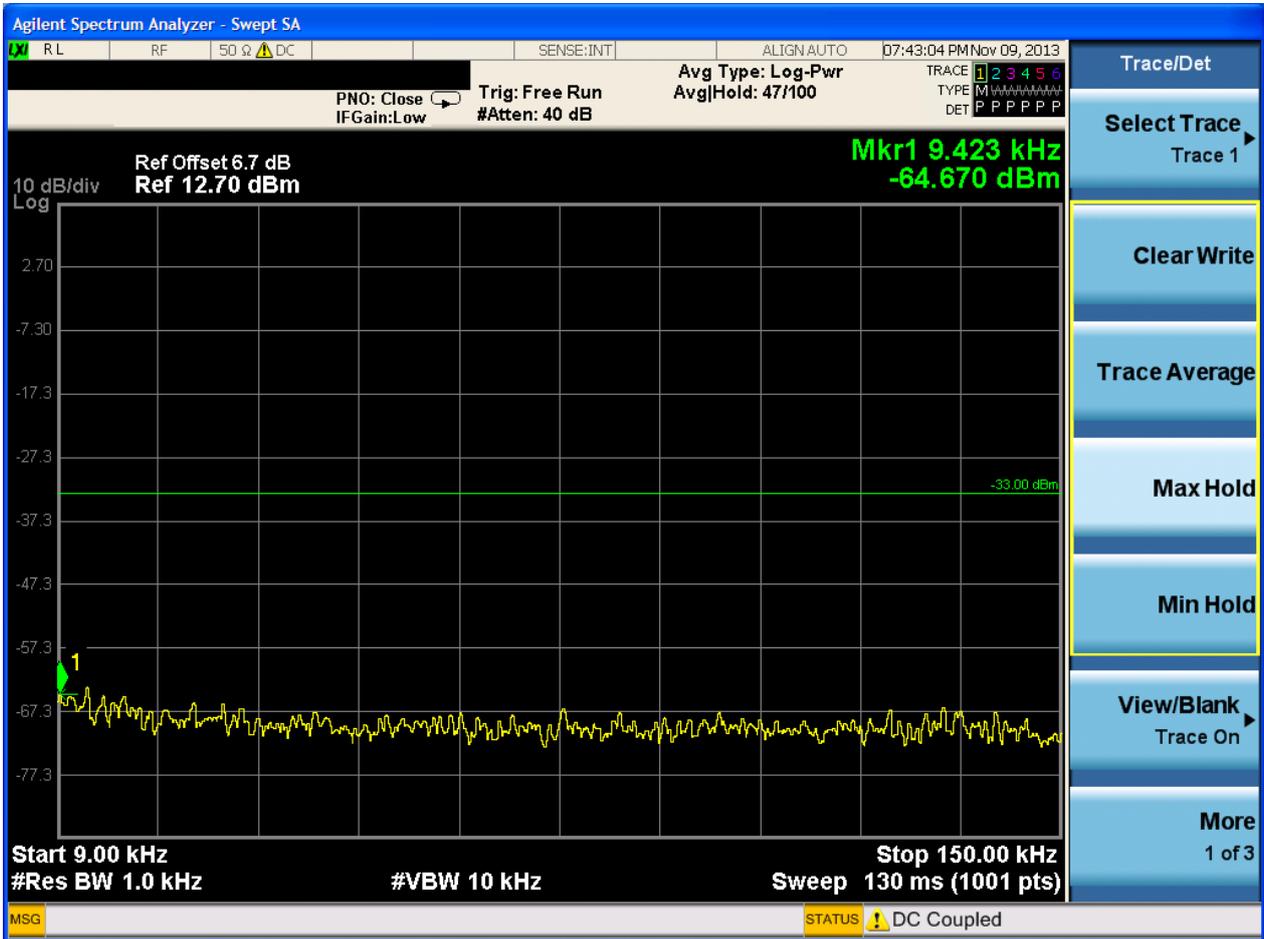


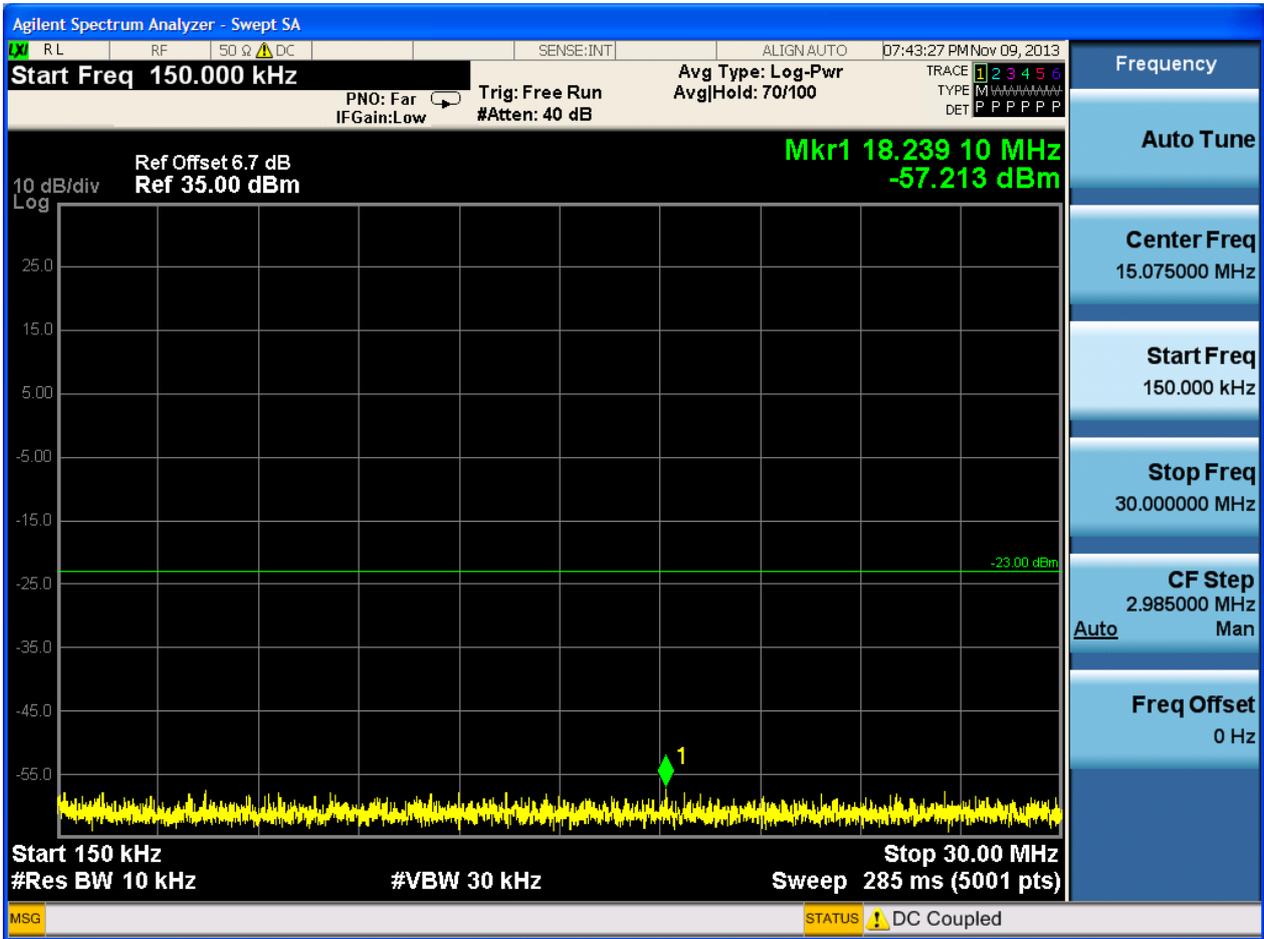


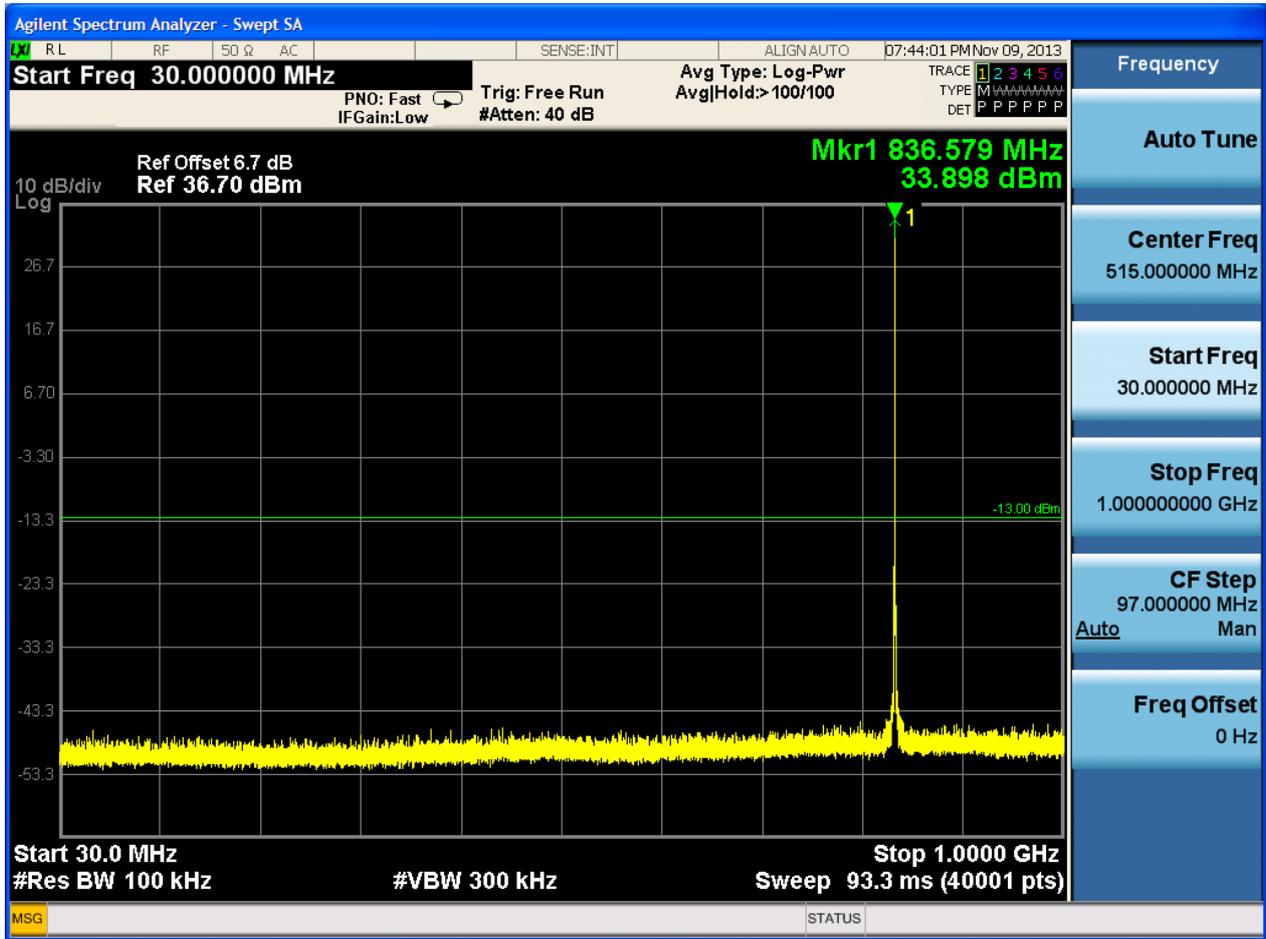


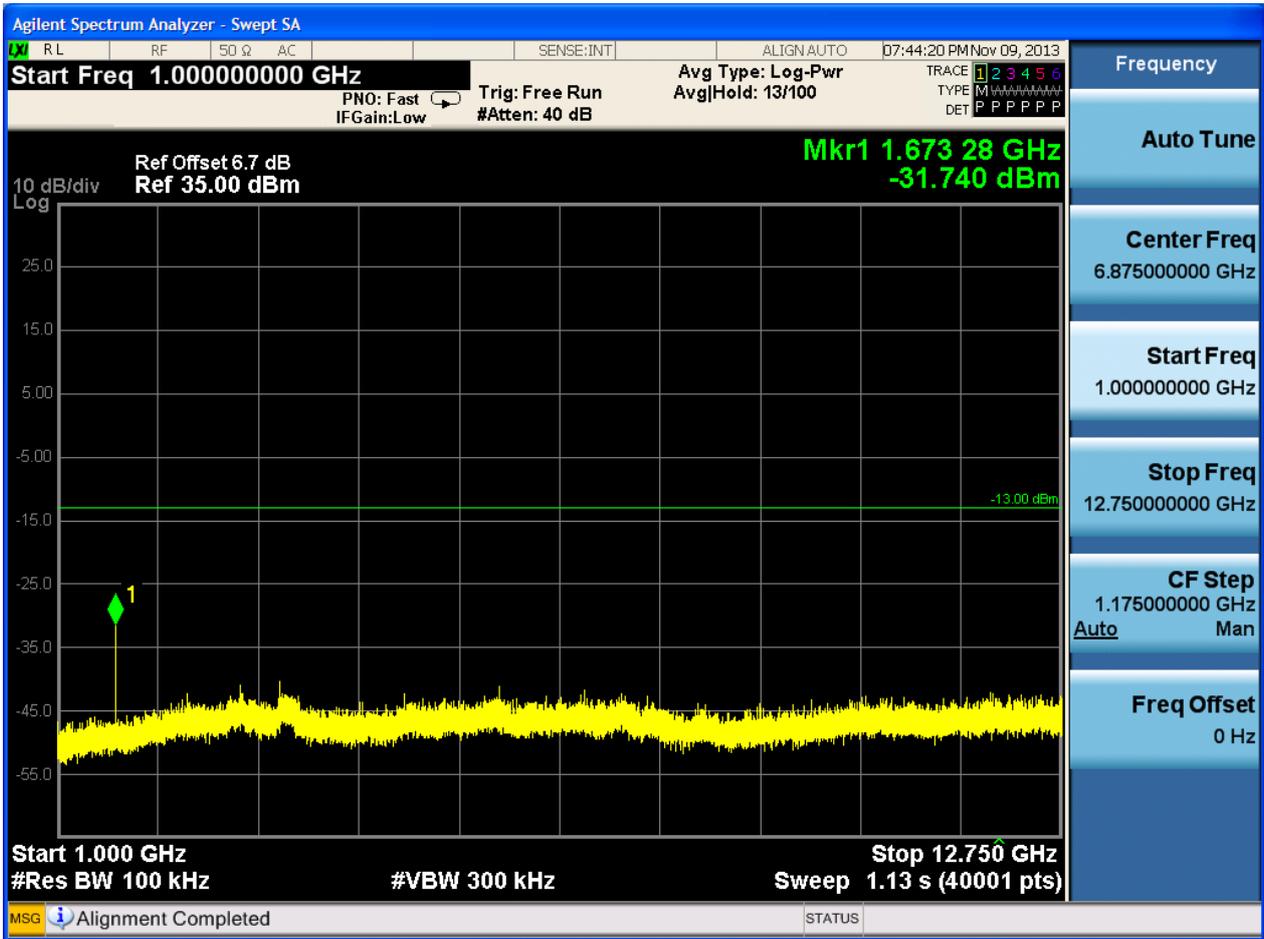


6.1.1.1.2 Test Channel = MCH



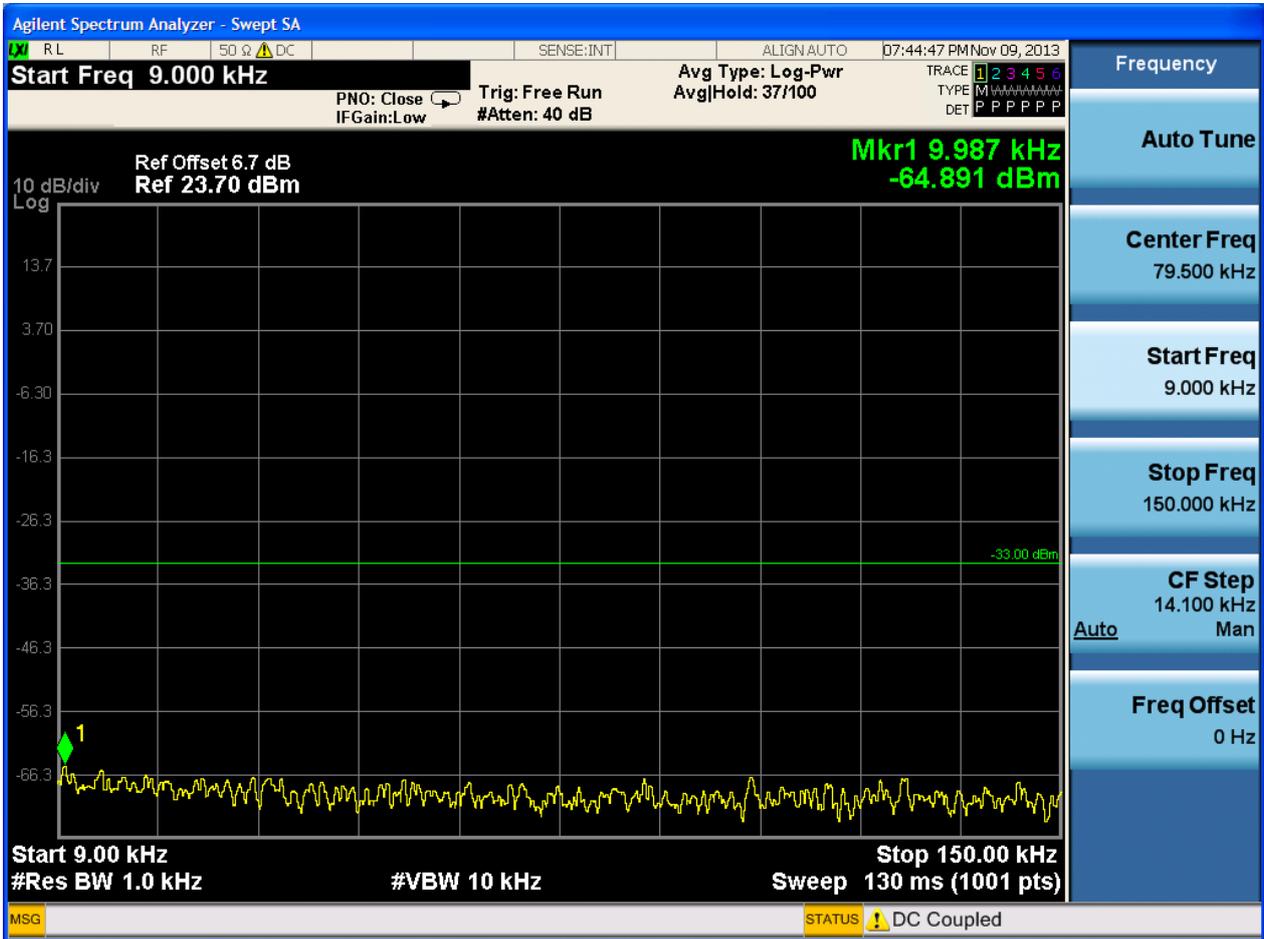


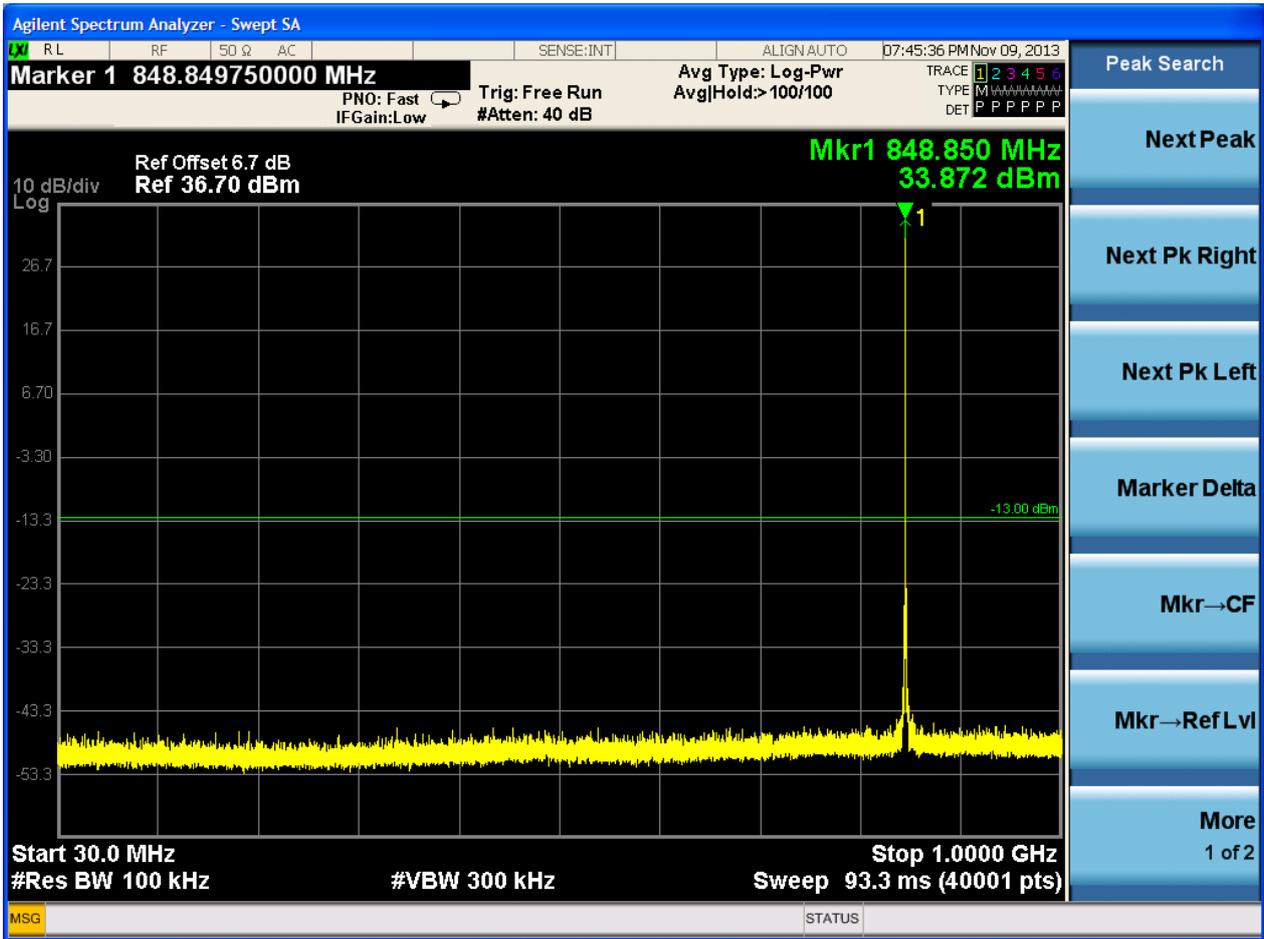






6.1.1.1.3 Test Channel = HCH

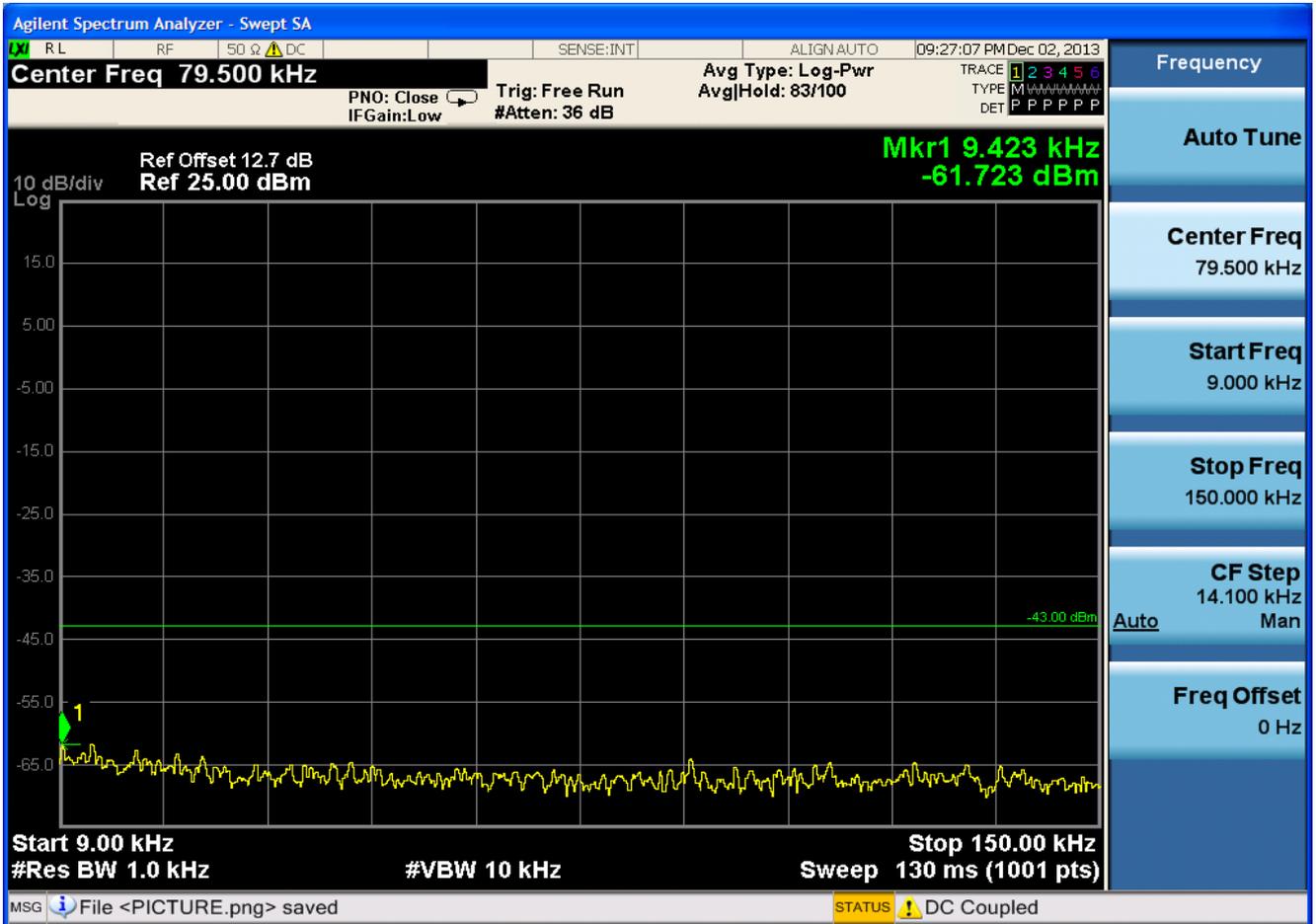


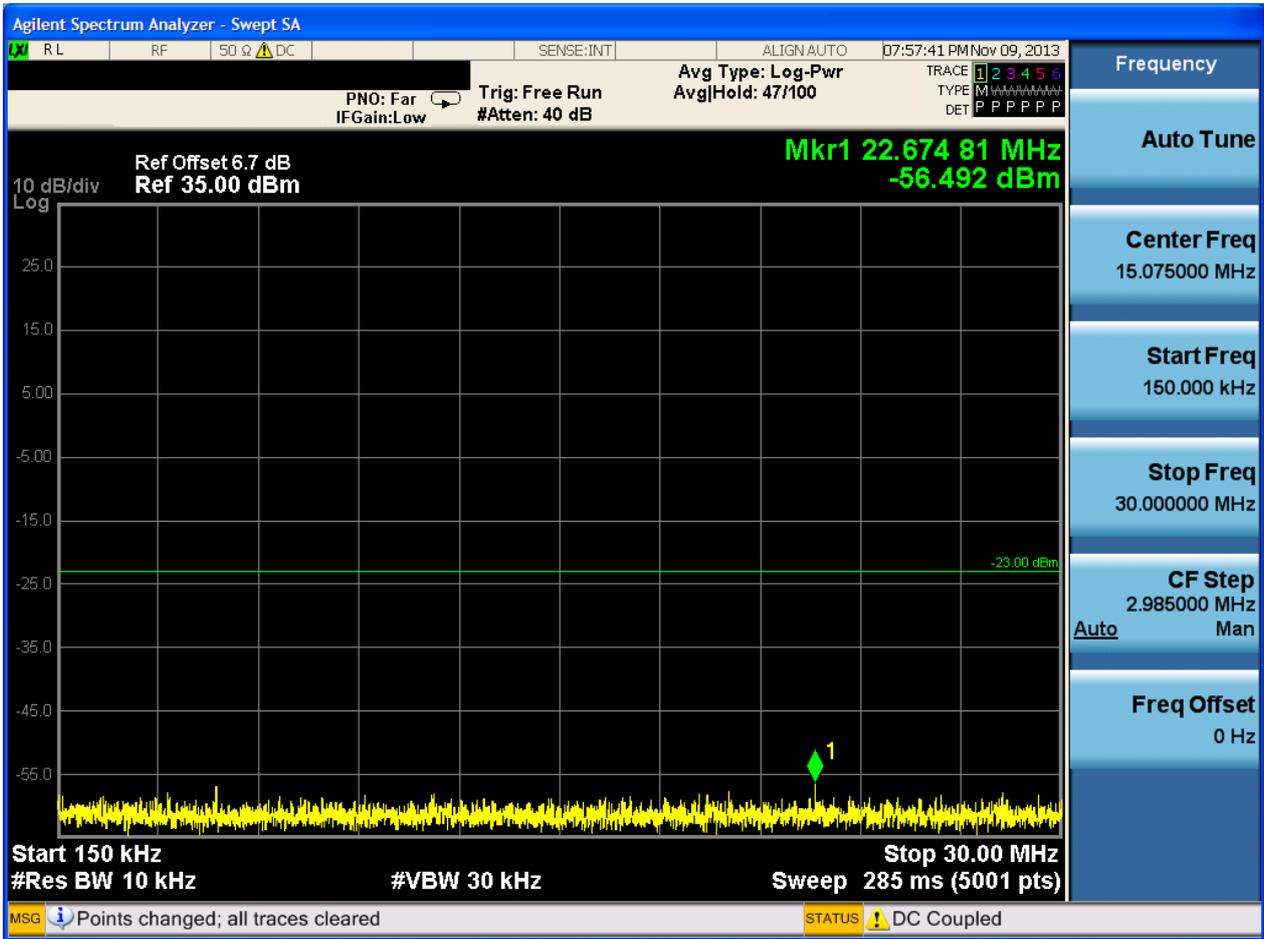


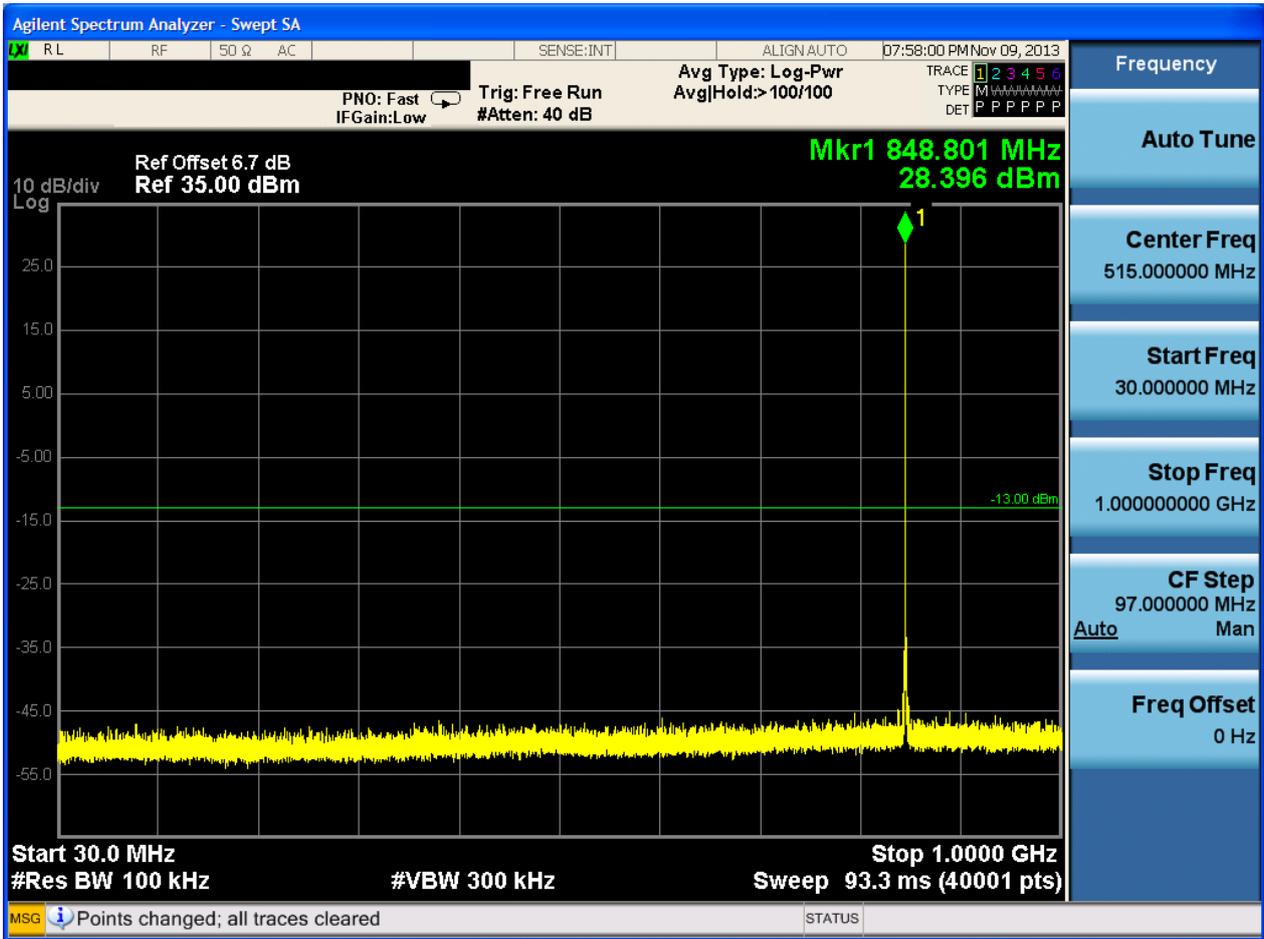


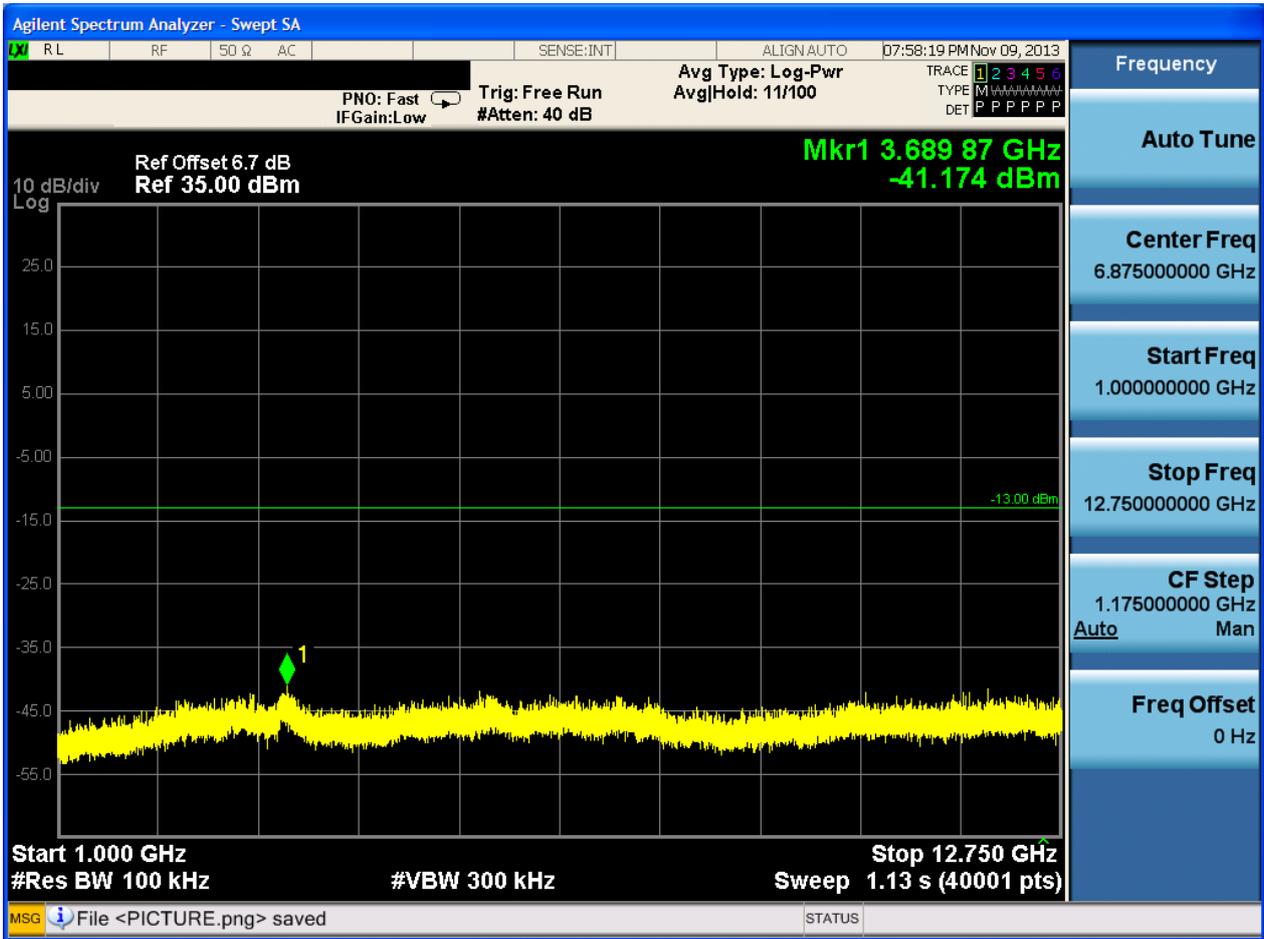
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH



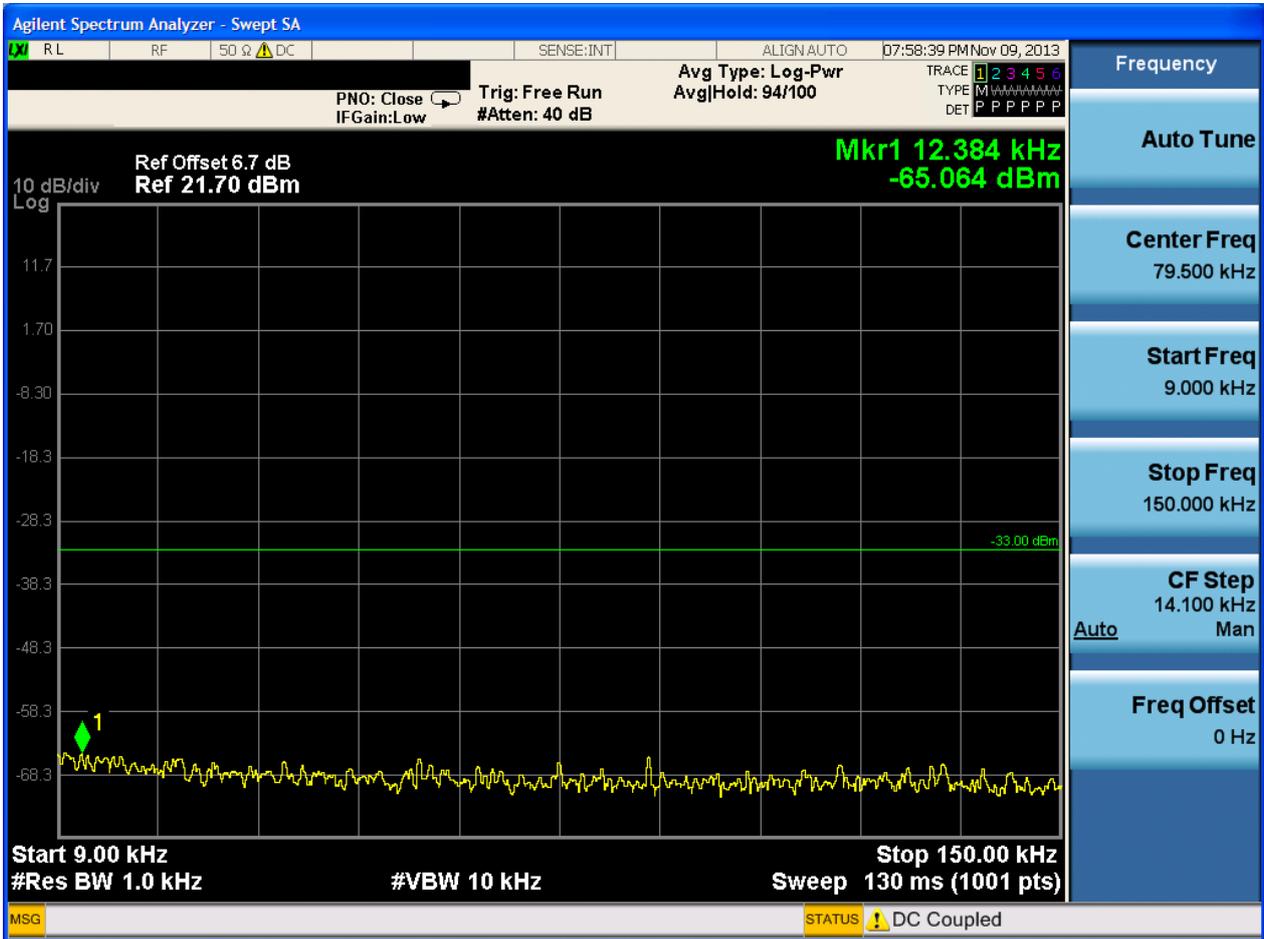


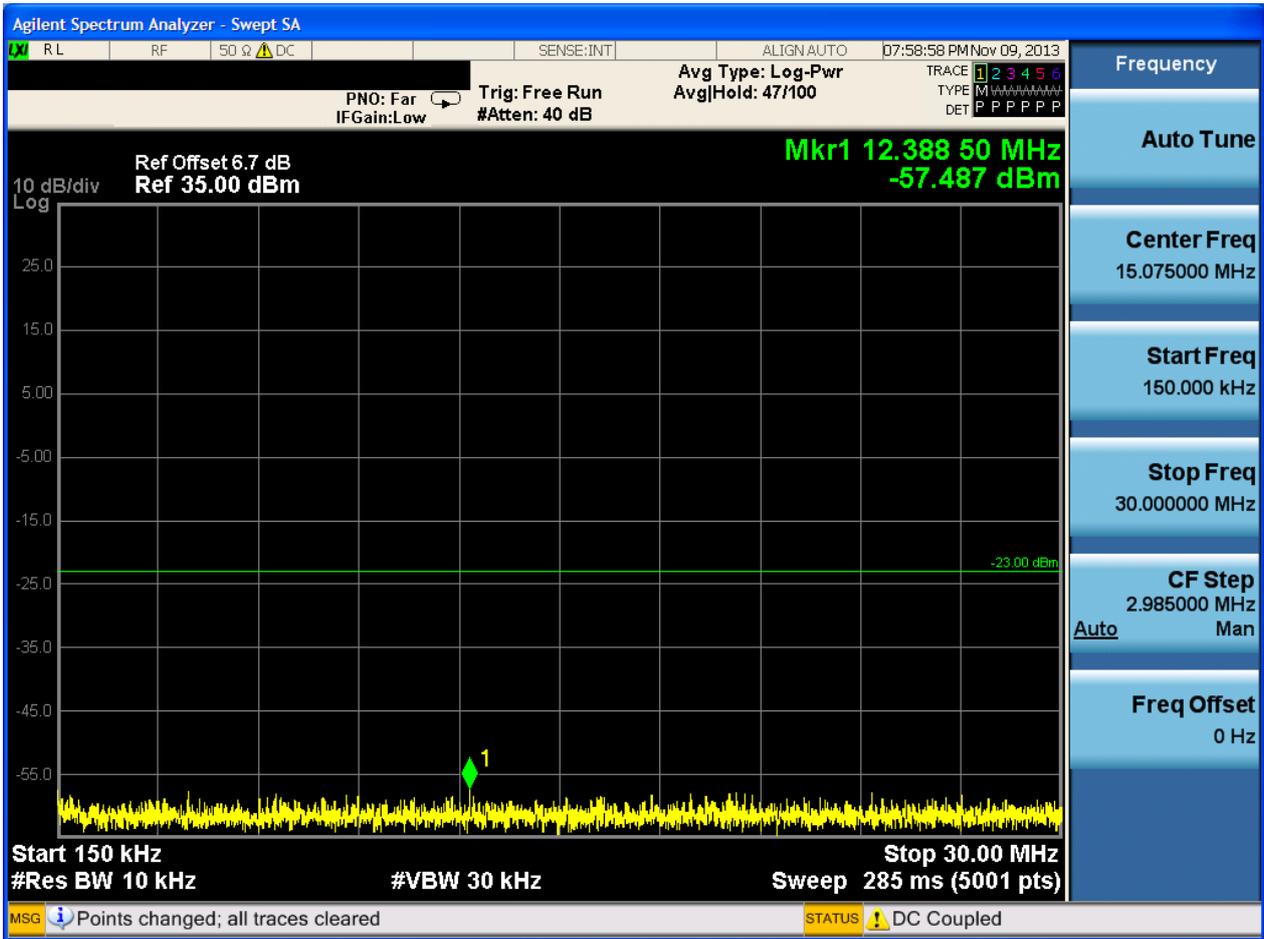


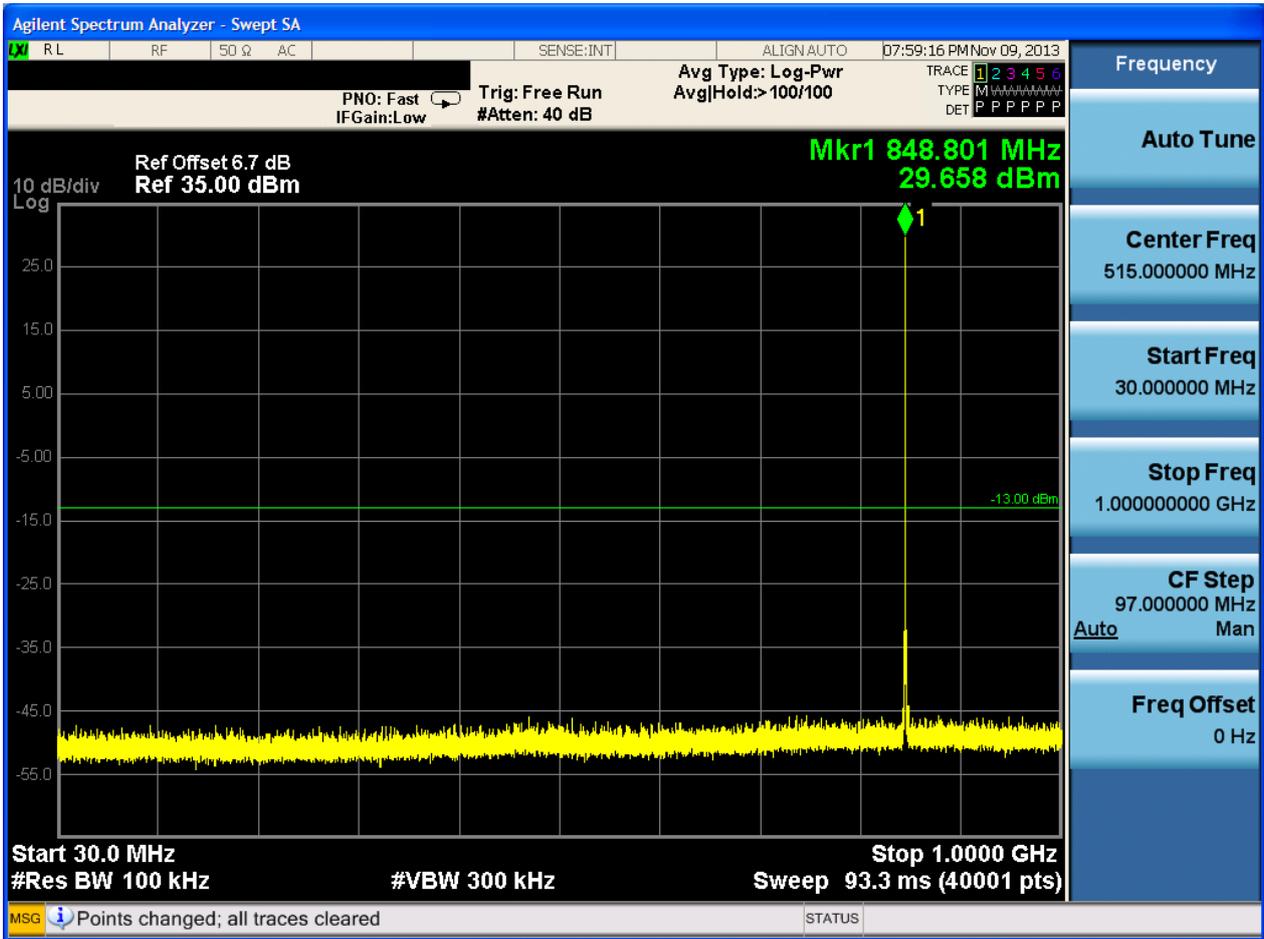


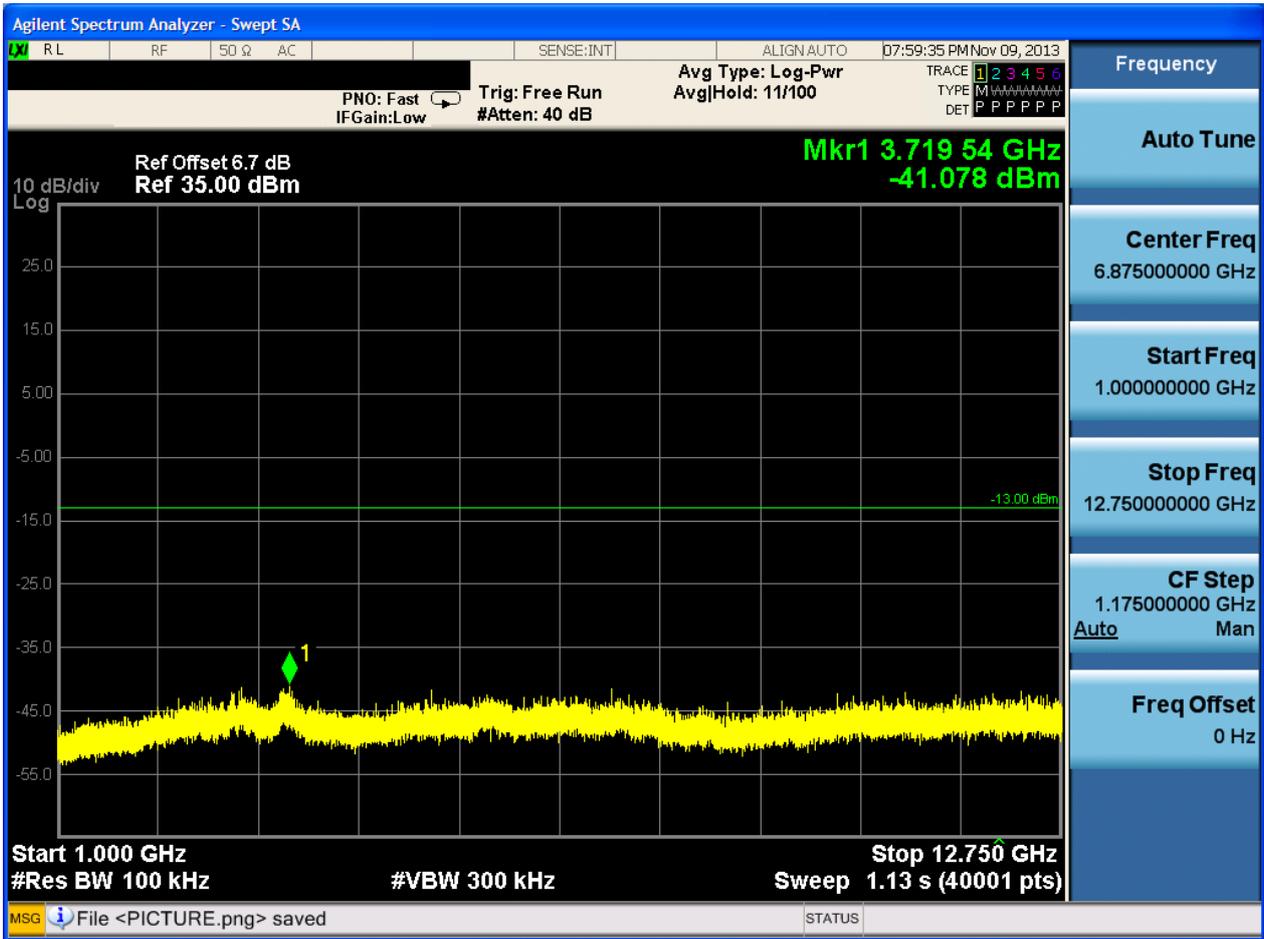


6.1.1.2.2 Test Channel = MCH



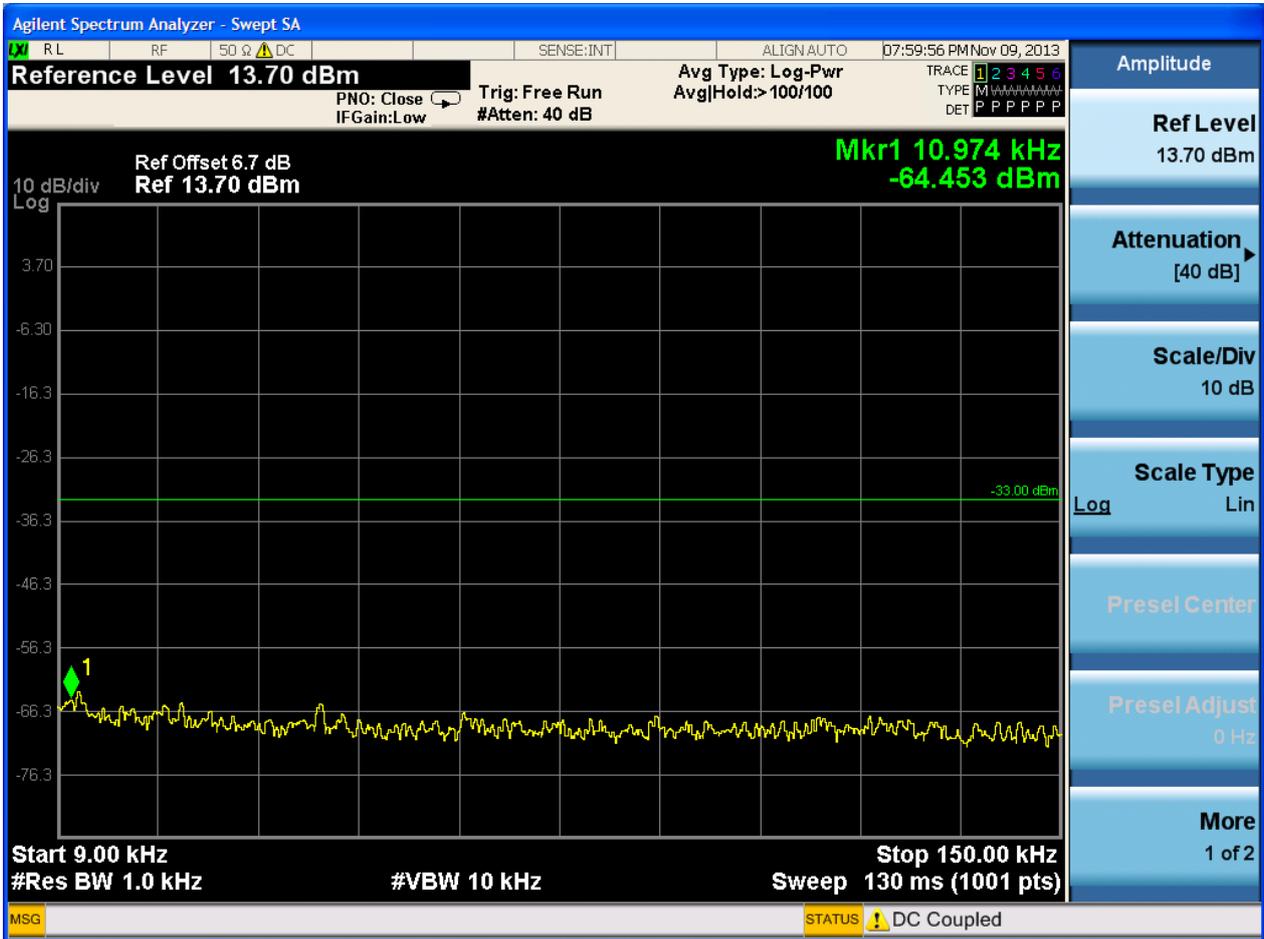




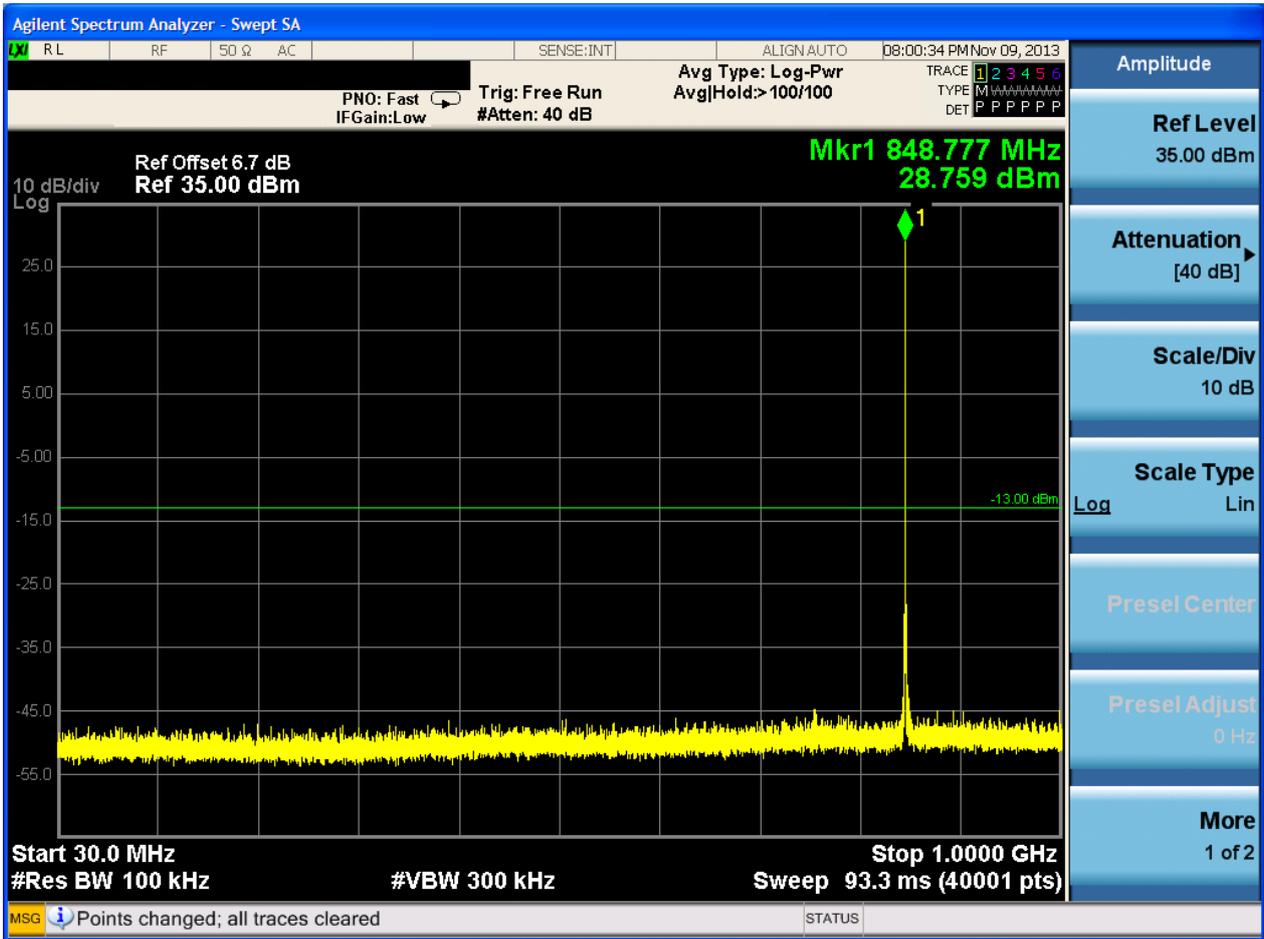


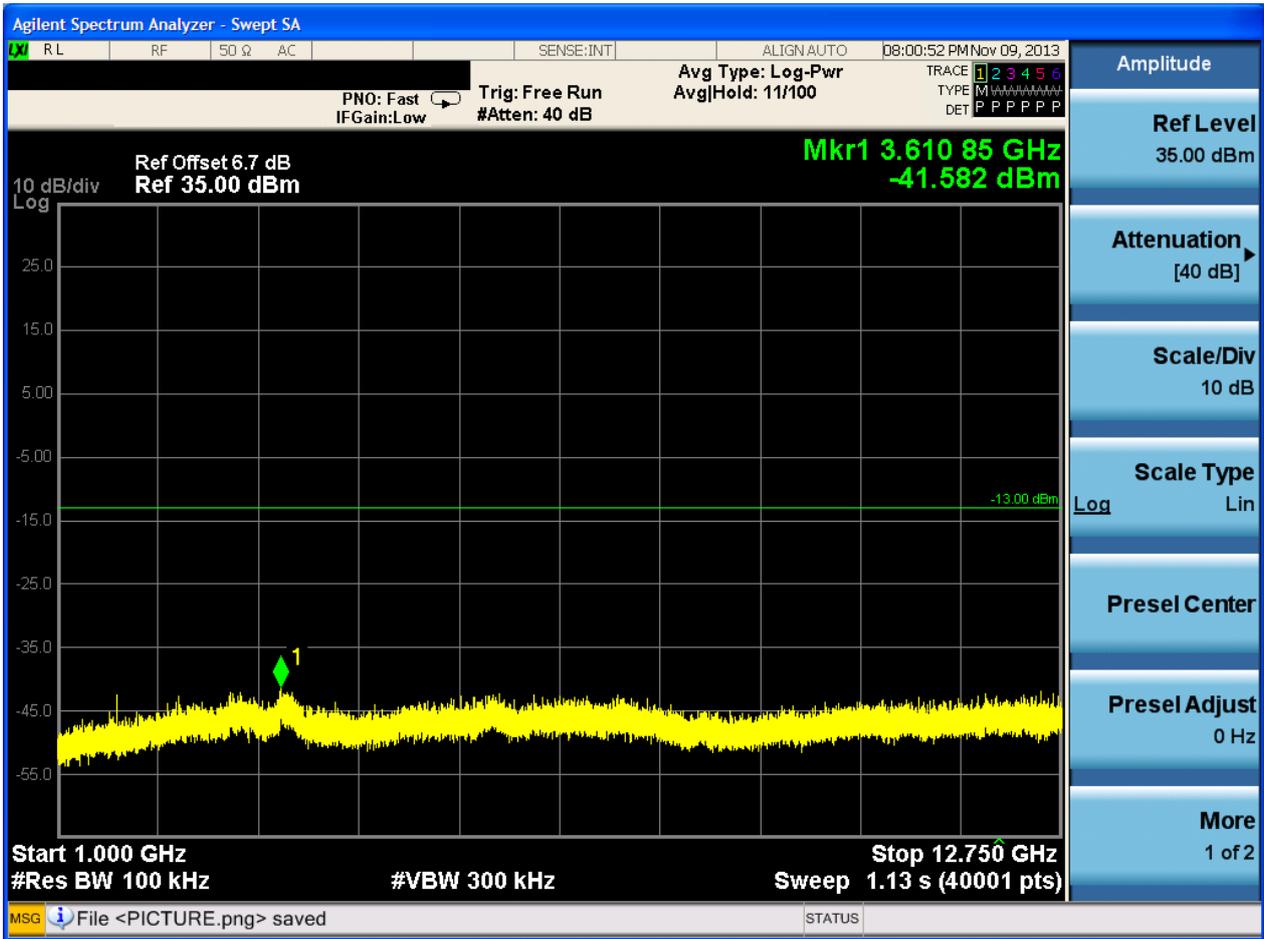


6.1.1.2.3 Test Channel = HCH







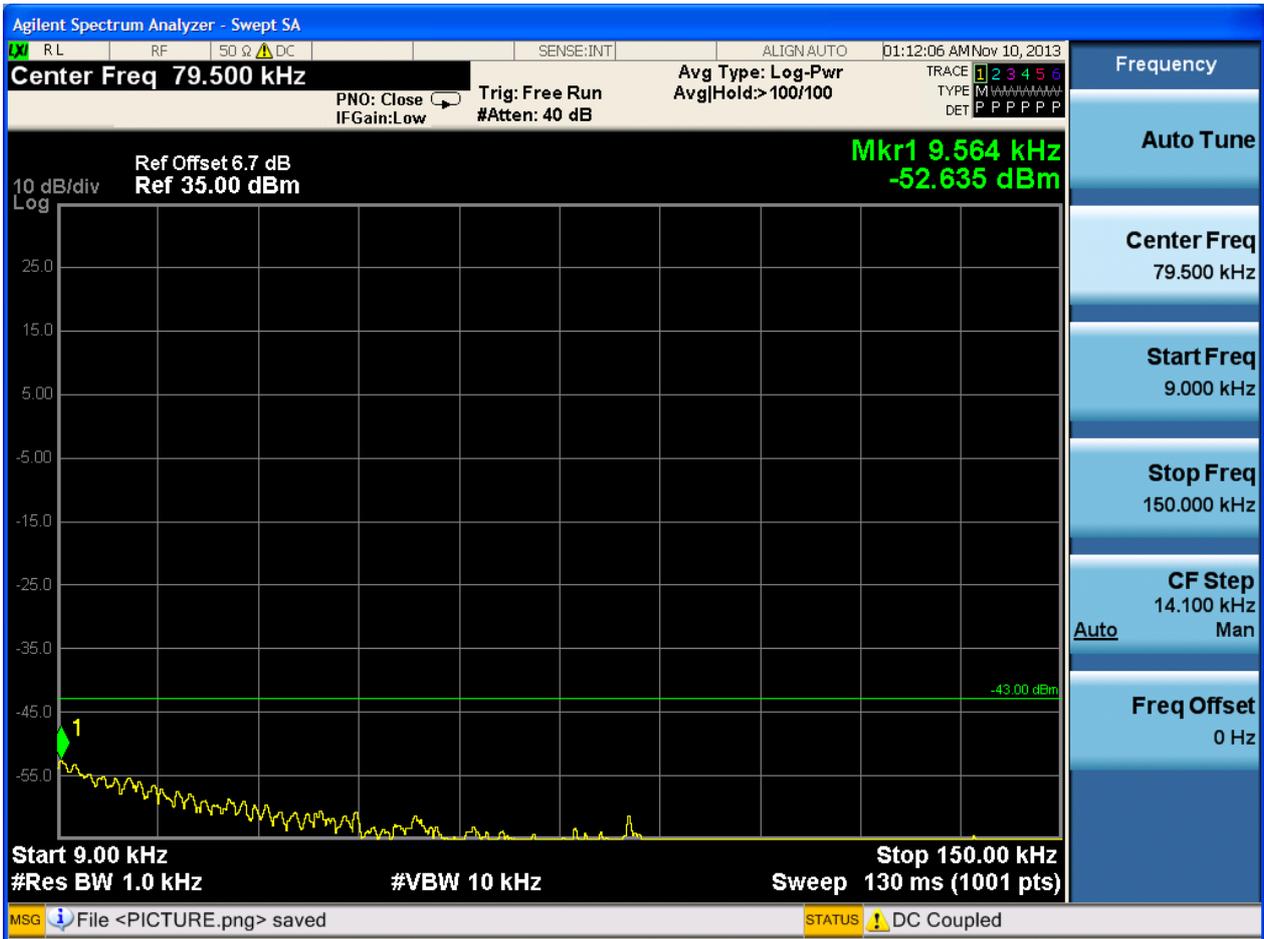


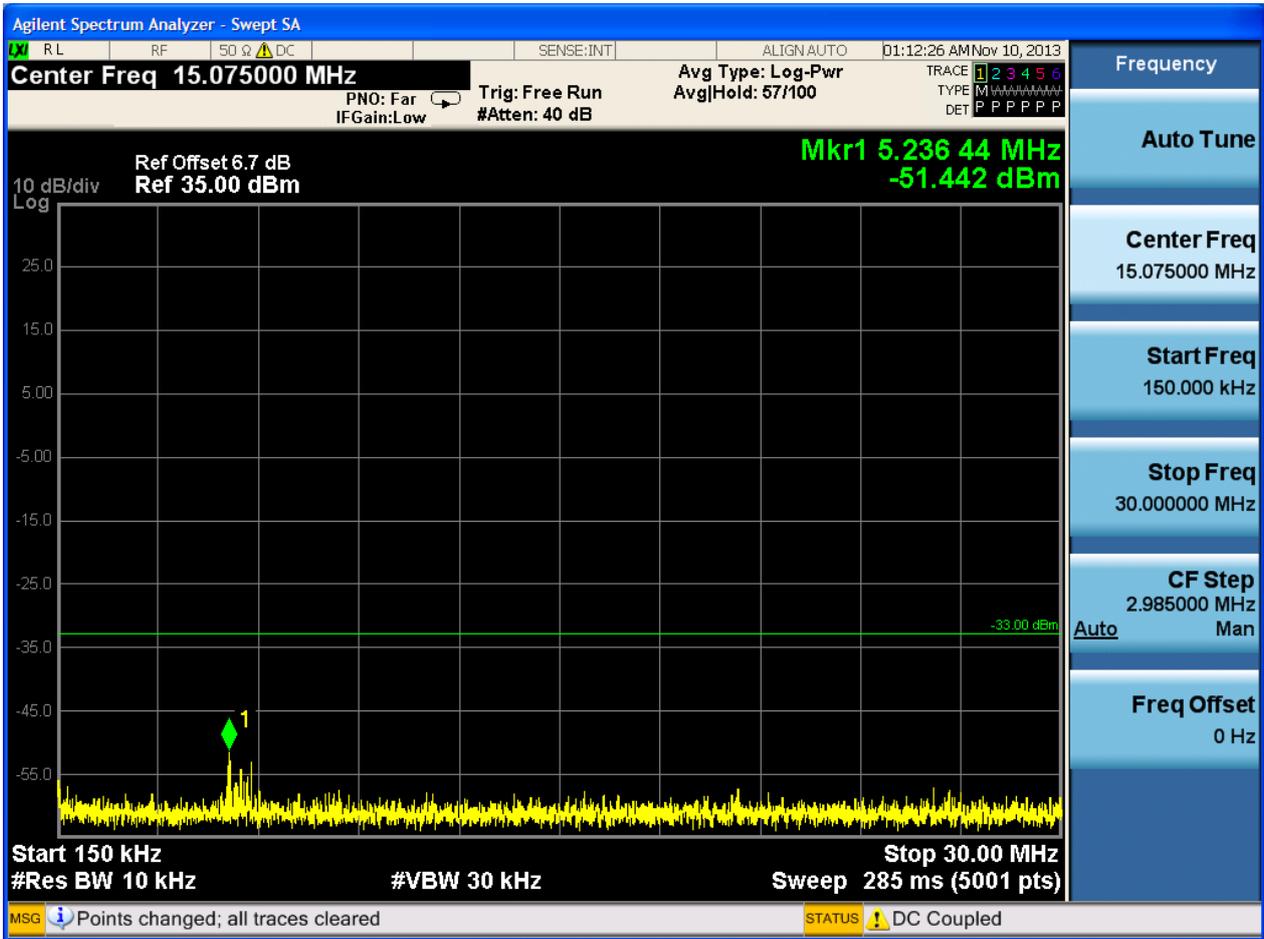


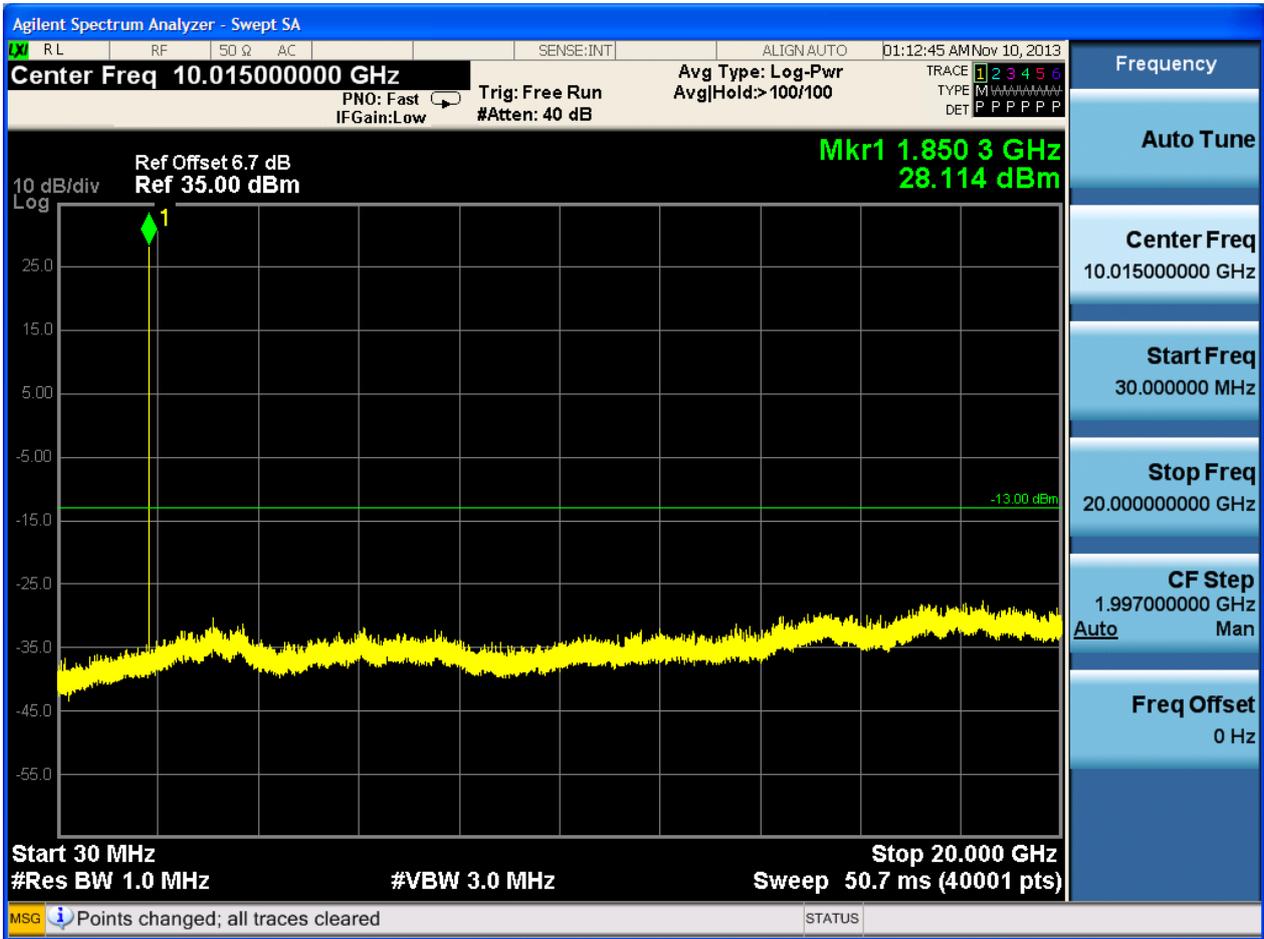
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH



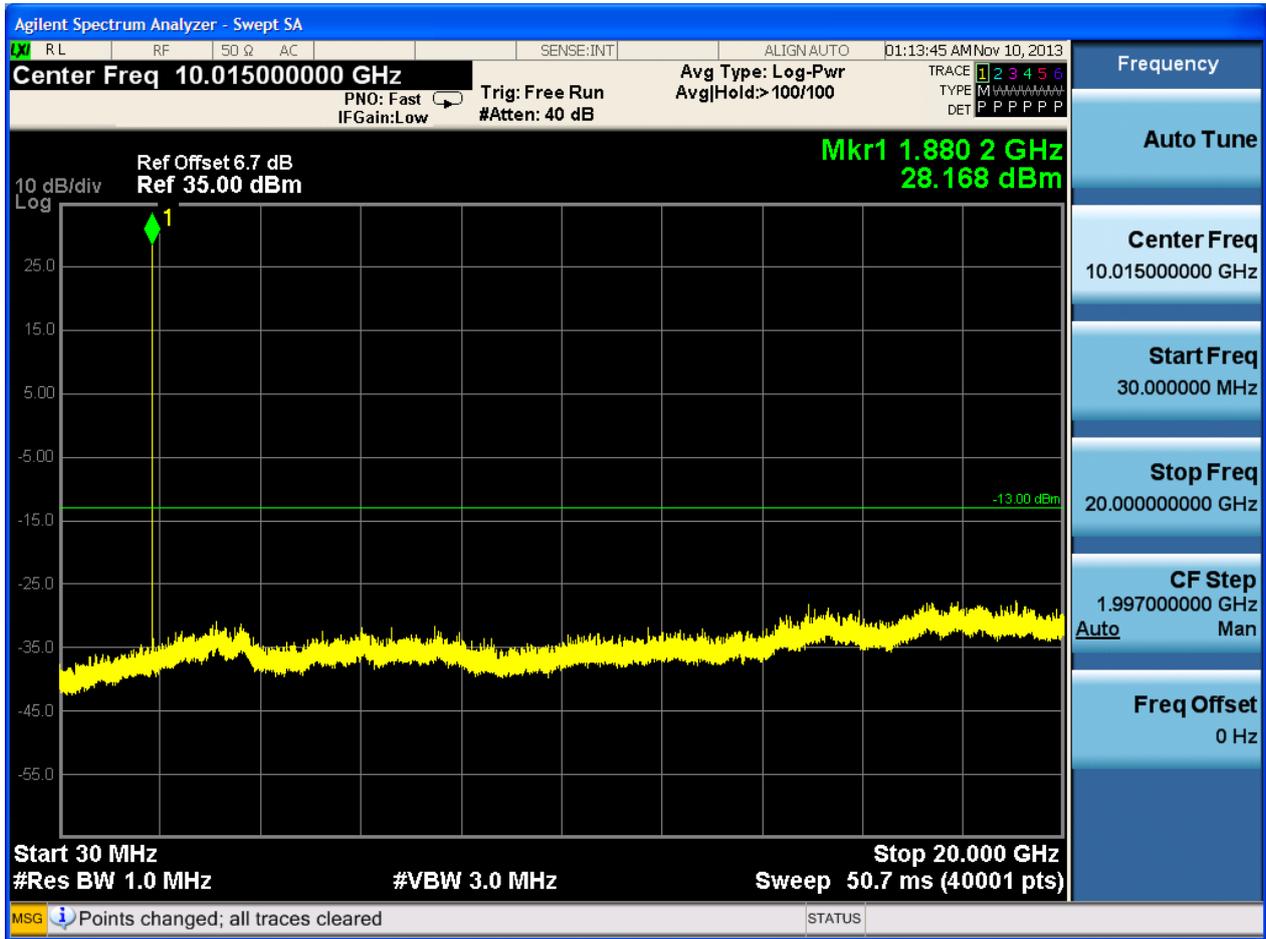




6.1.2.1.2 Test Channel = MCH









6.1.2.1.3 Test Channel = HCH



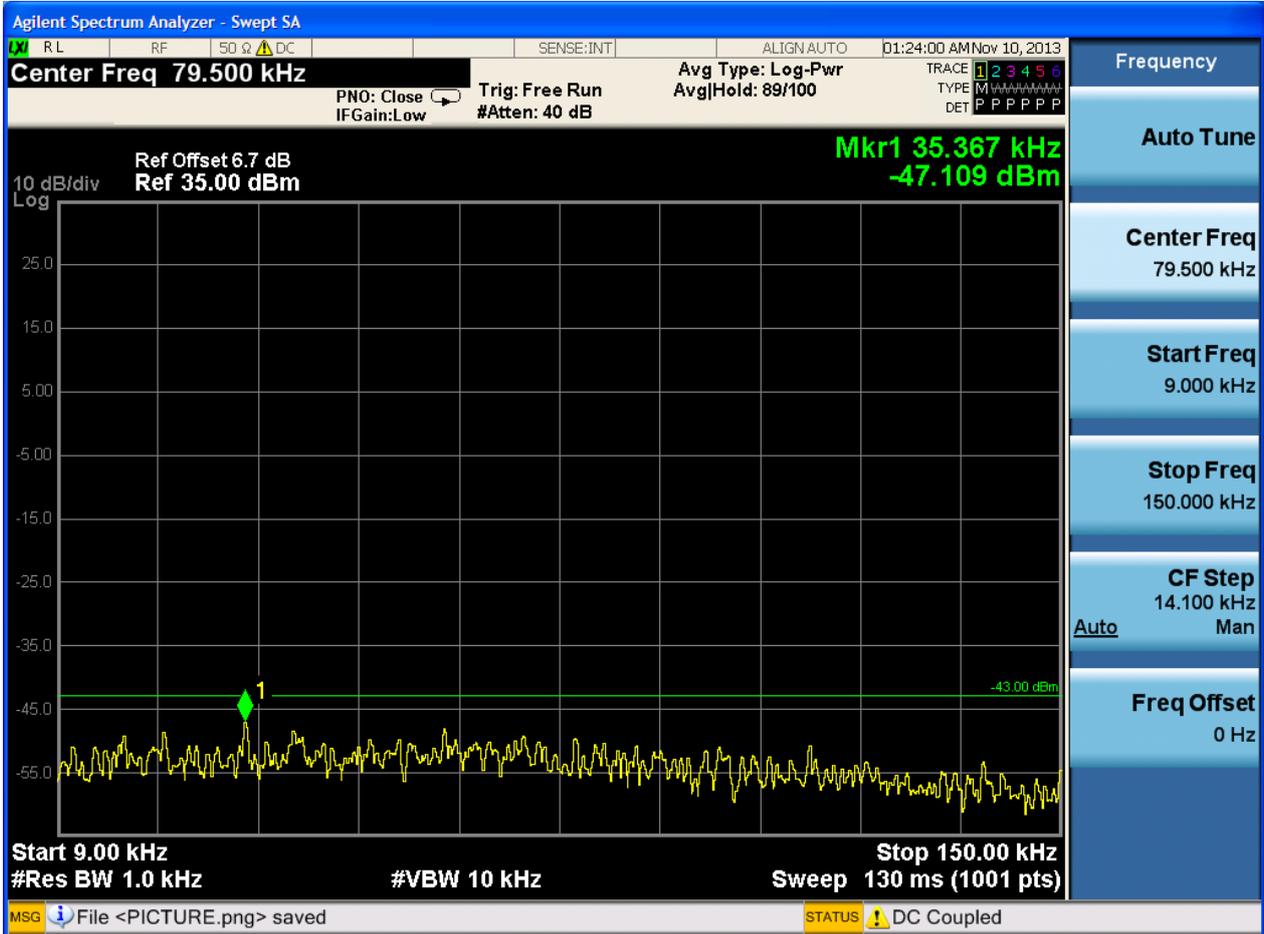


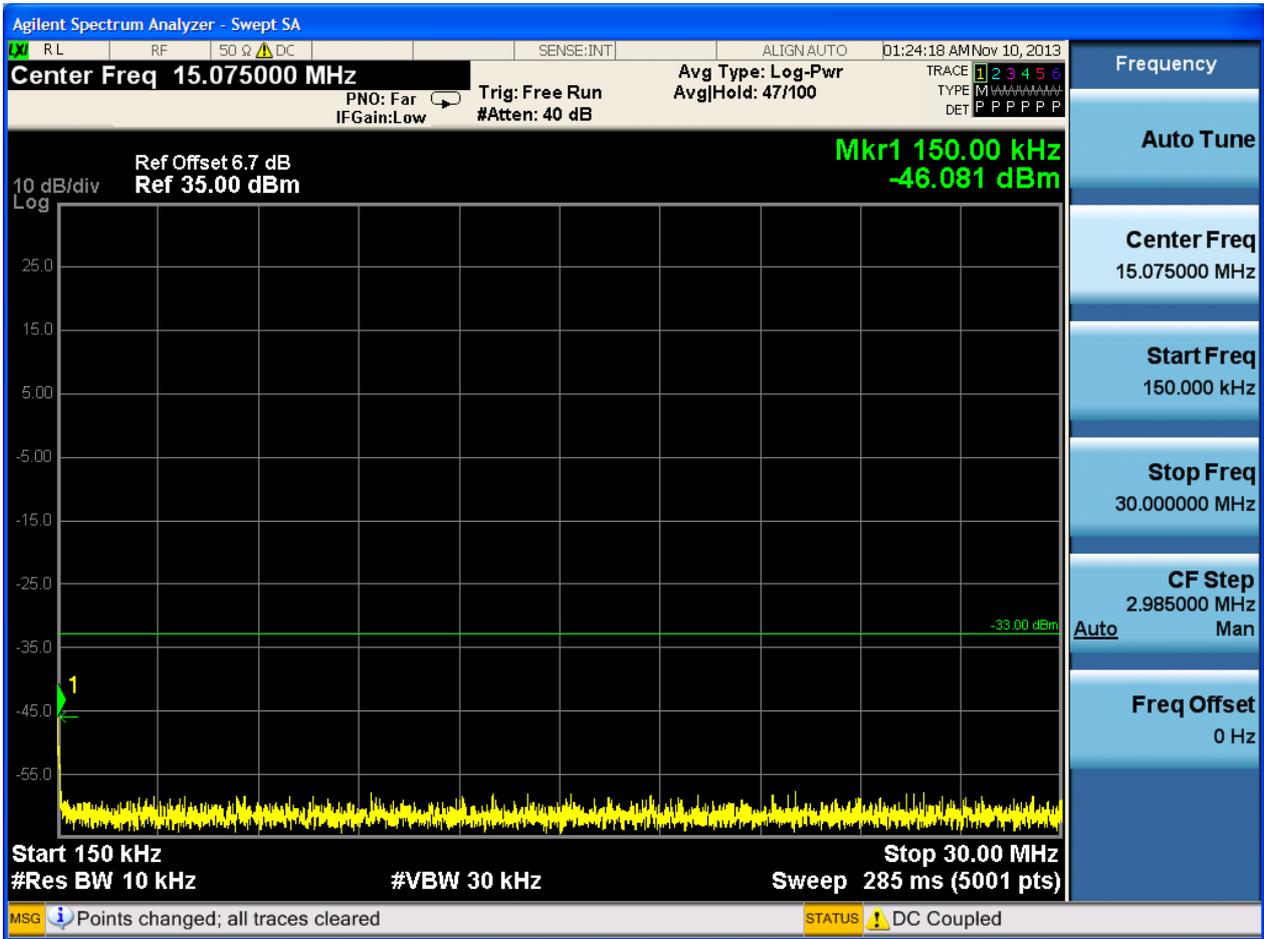




6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

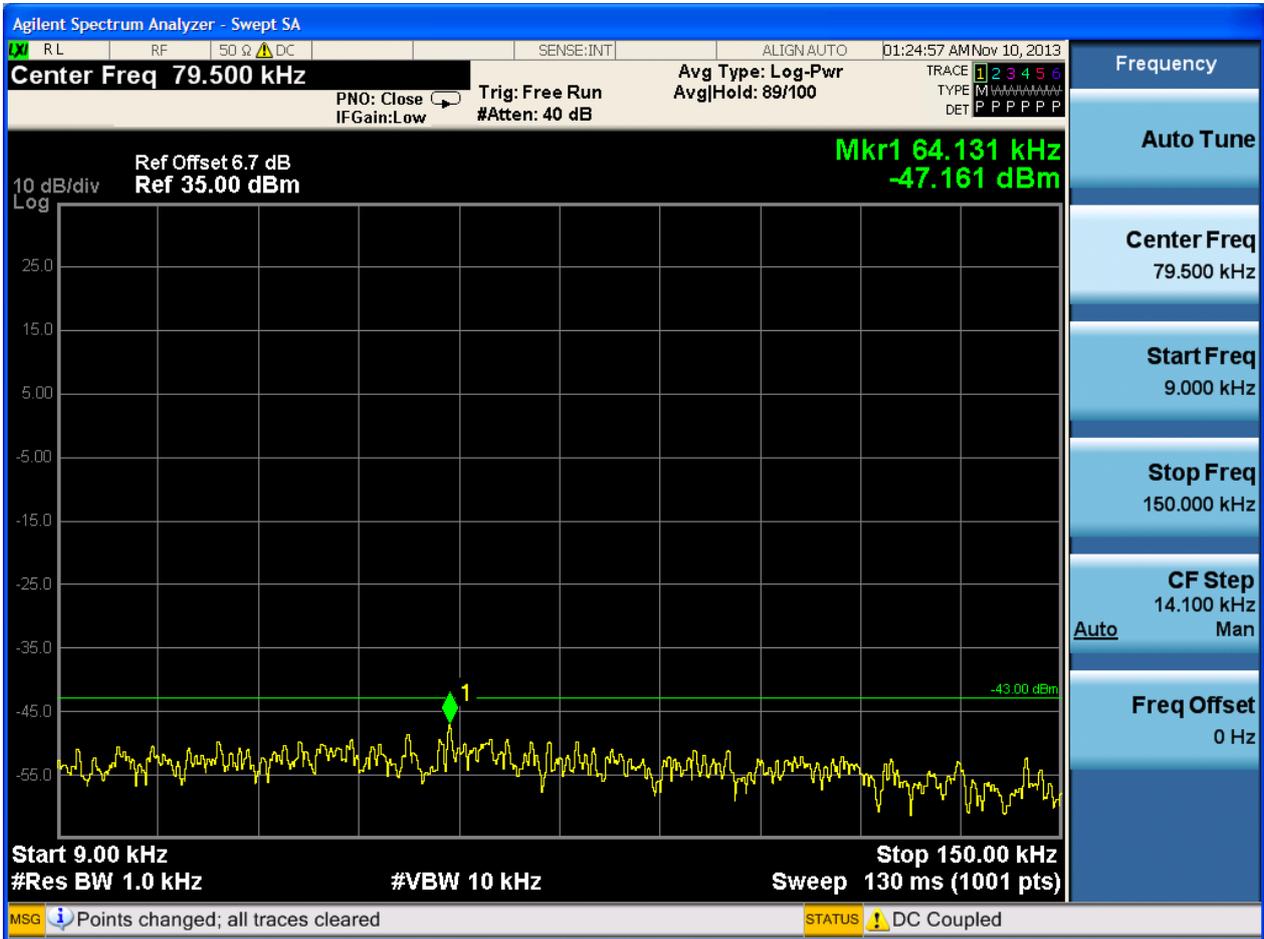




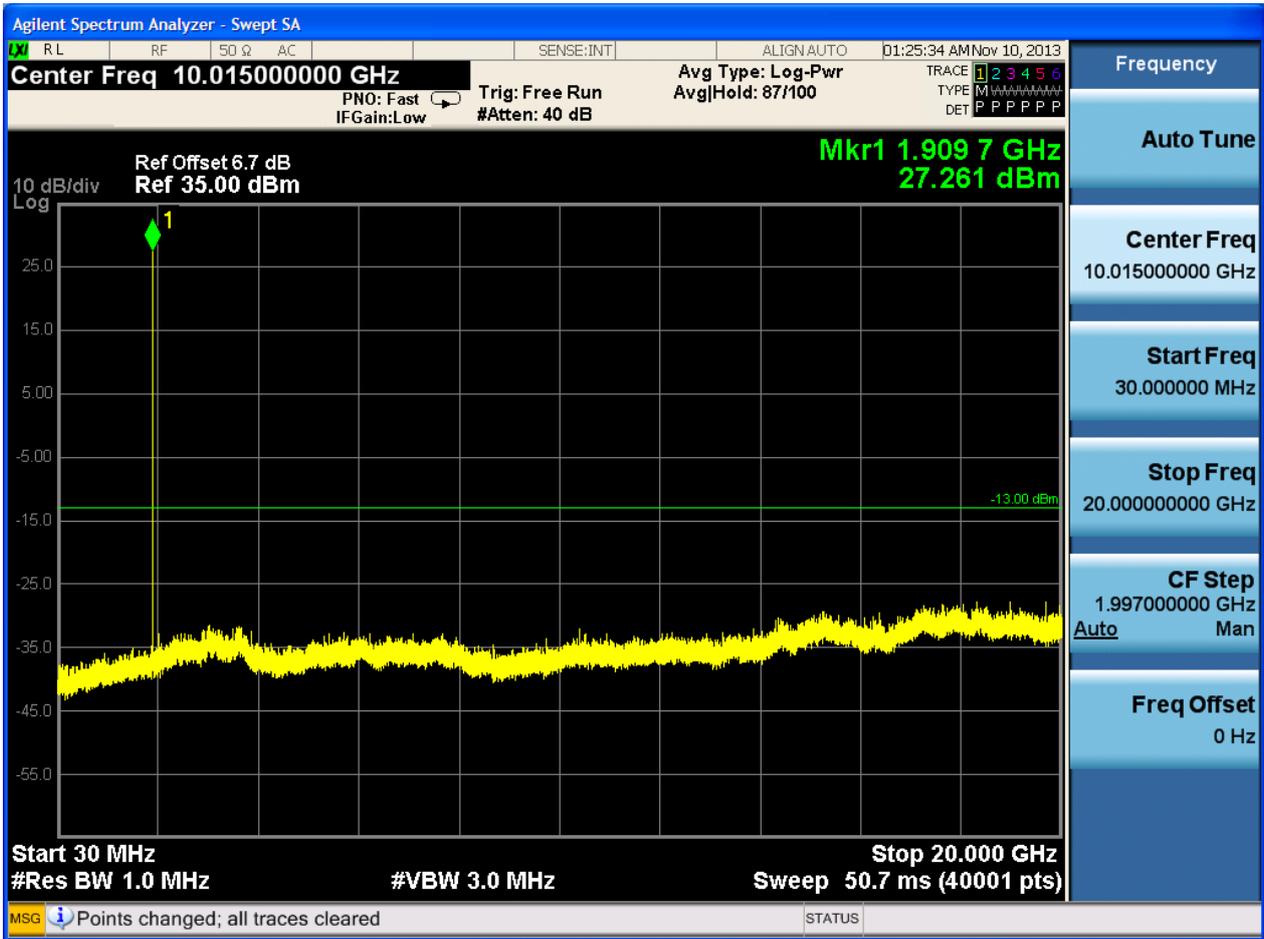




6.1.2.2.2 Test Channel = MCH

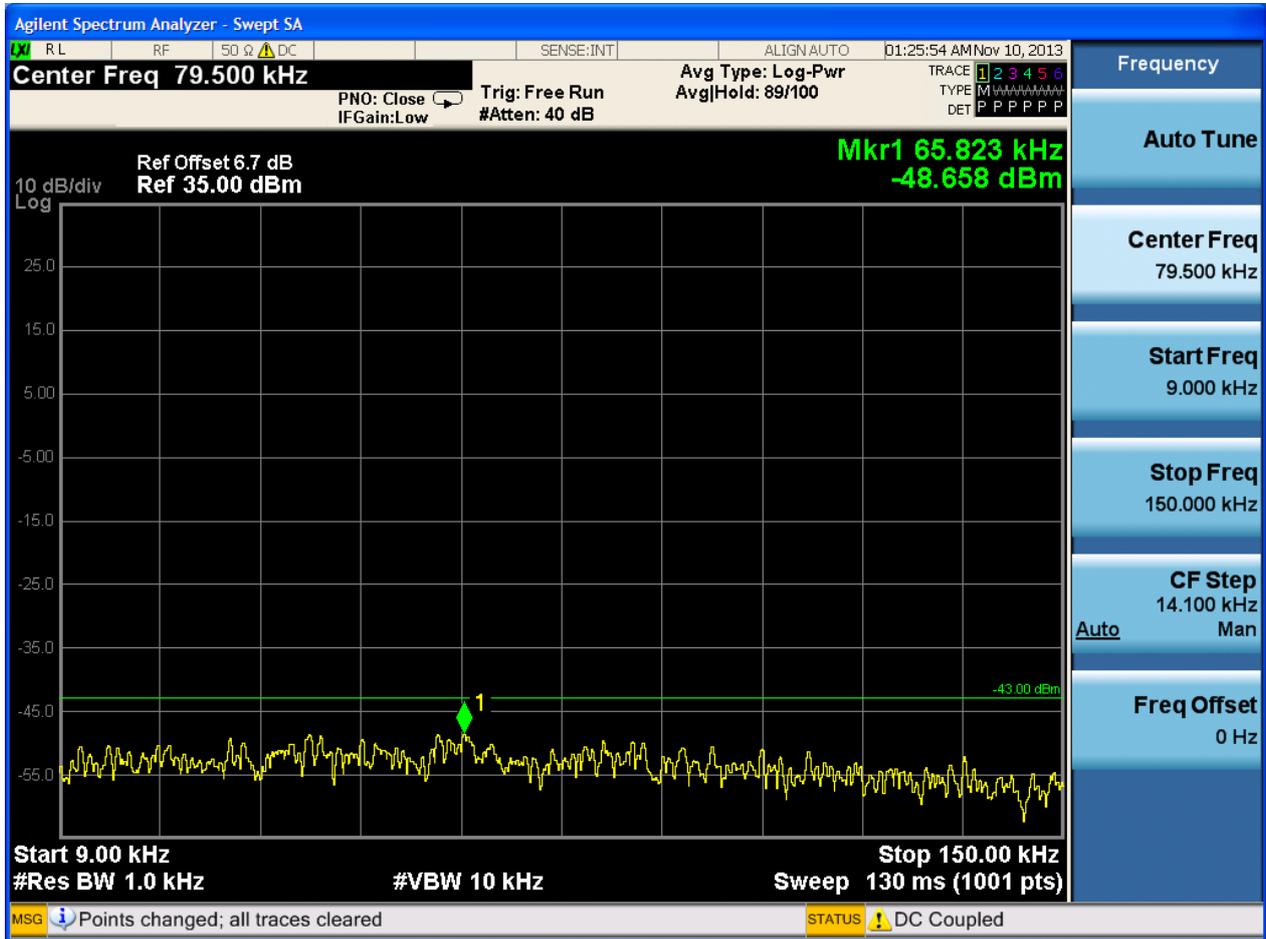


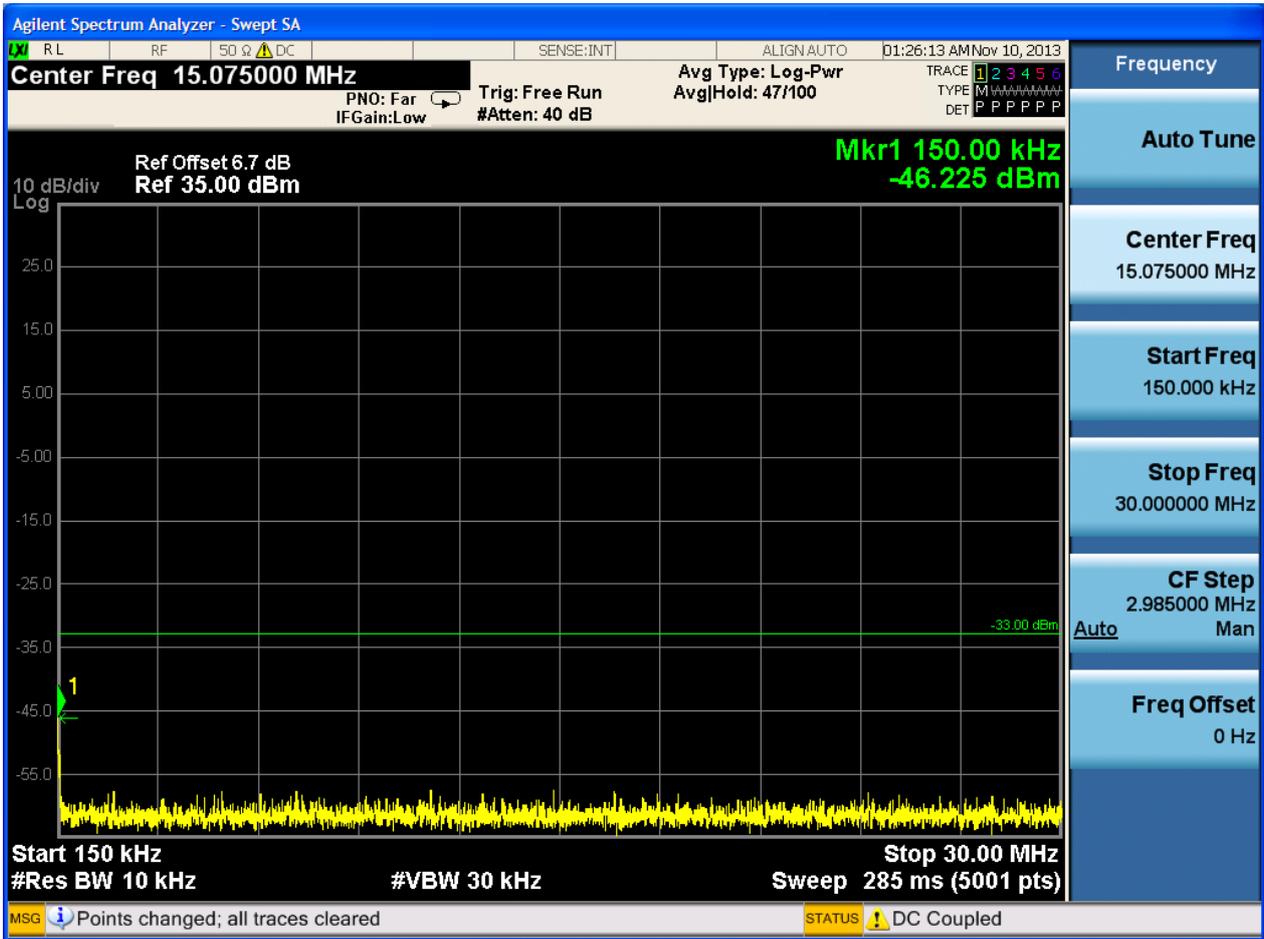


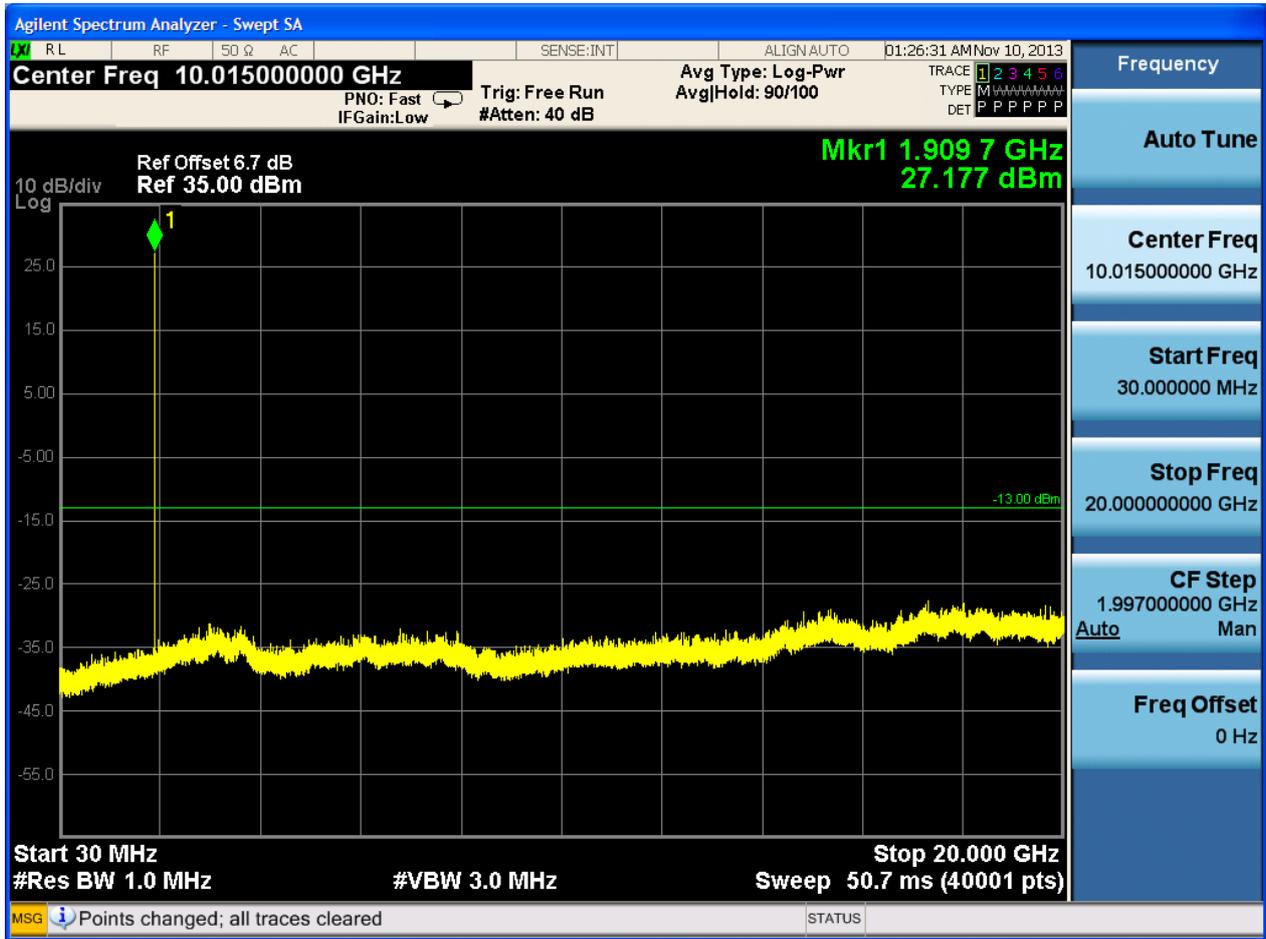




6.1.2.2.3 Test Channel = HCH







7Appendix_G: Field Strength of Spurious Radiation

Note:

9kHz~150kHz, VBW = 200Hz, VBW = 600 Hz, Detector: PK

150kHz~30MHz, VBW = 9kHz, VBW = 30k Hz, Detector: PK

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

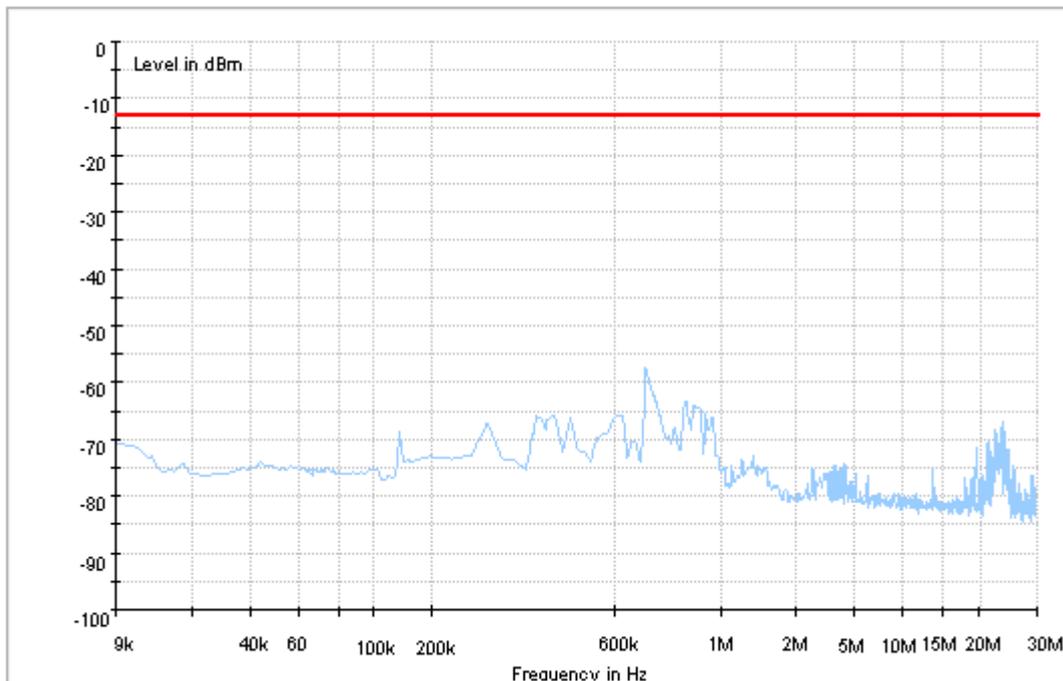
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

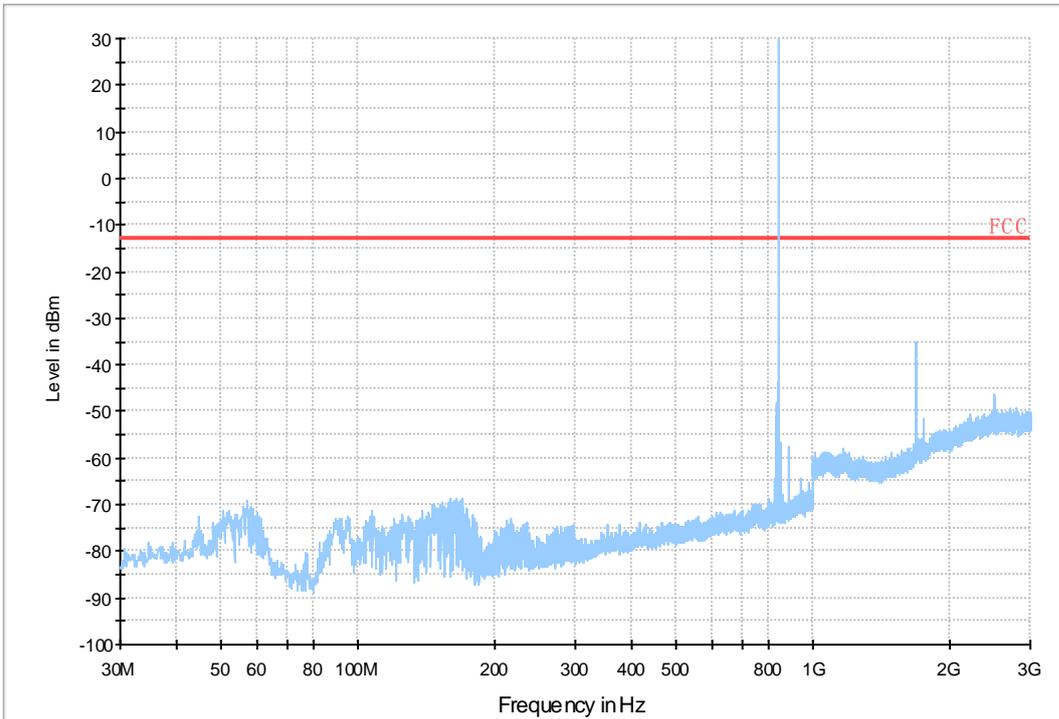
7.1 For GSM

7.1.1 Test Band = GSM850

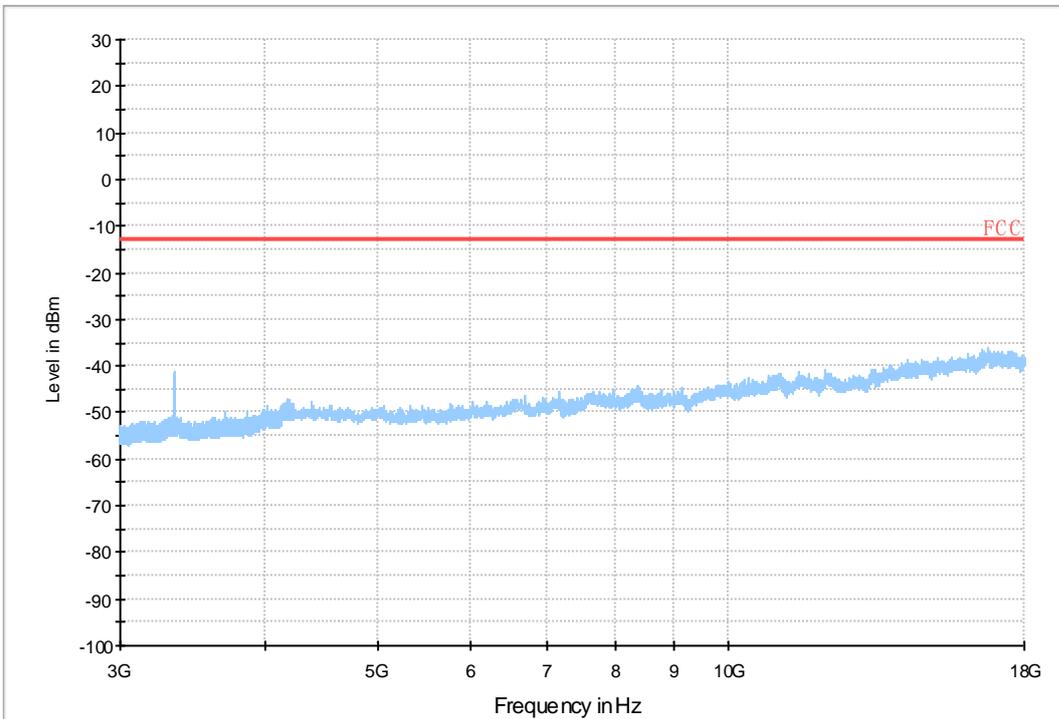
7.1.1.1 Test Mode = GSM/TM1



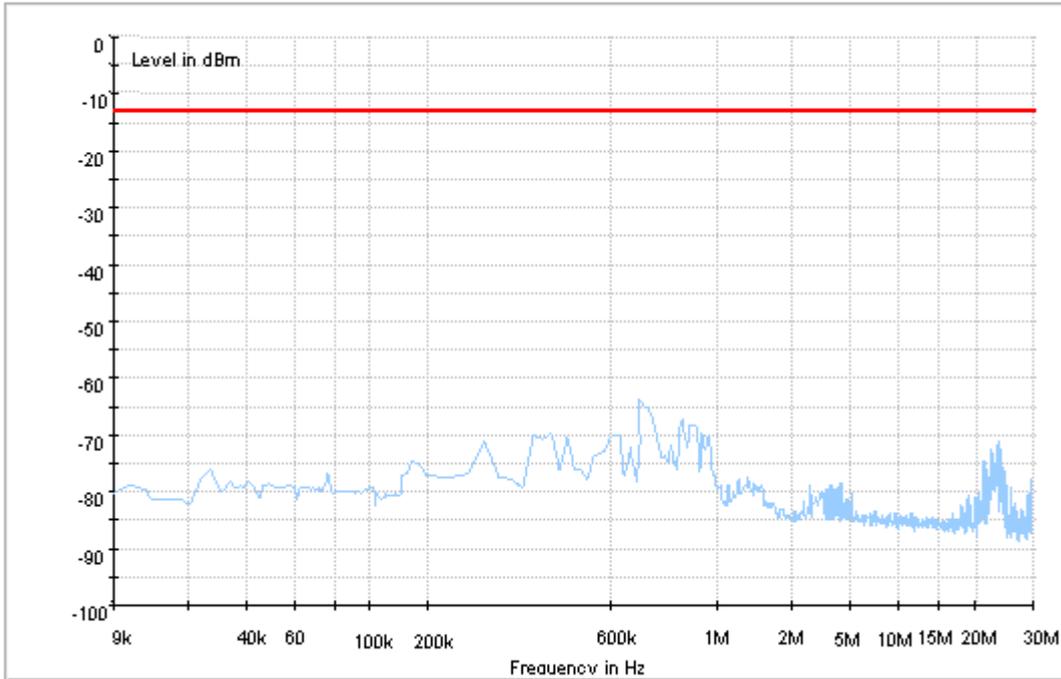
Copy of FCC PART22 GSM850_L



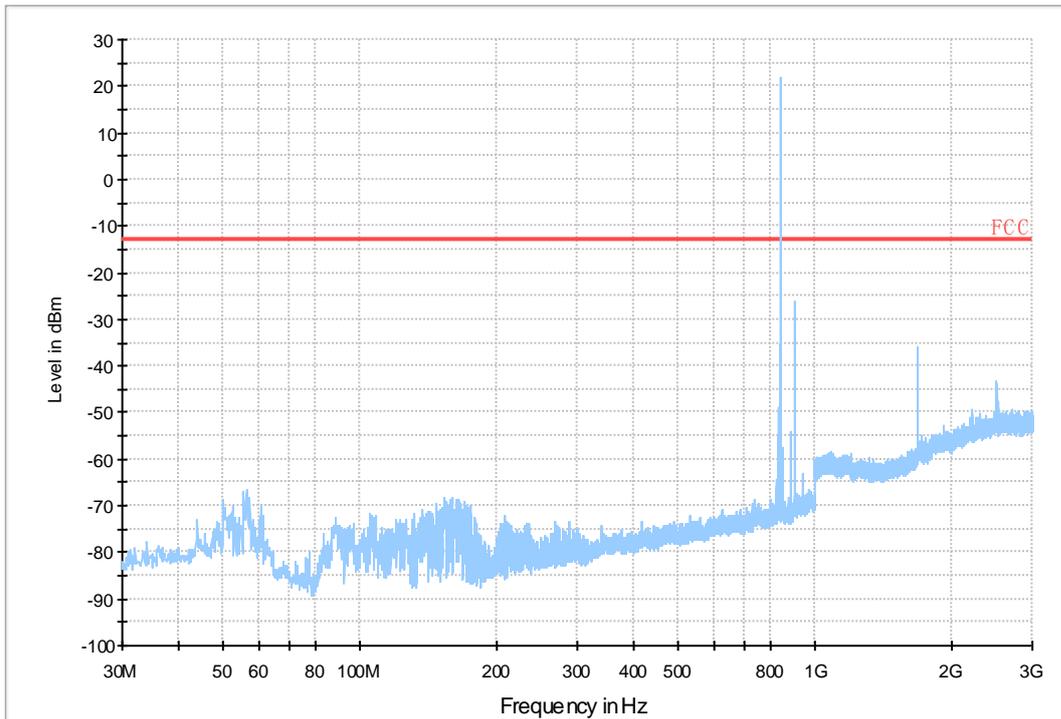
Copy of FCC PART22 GSM850_H



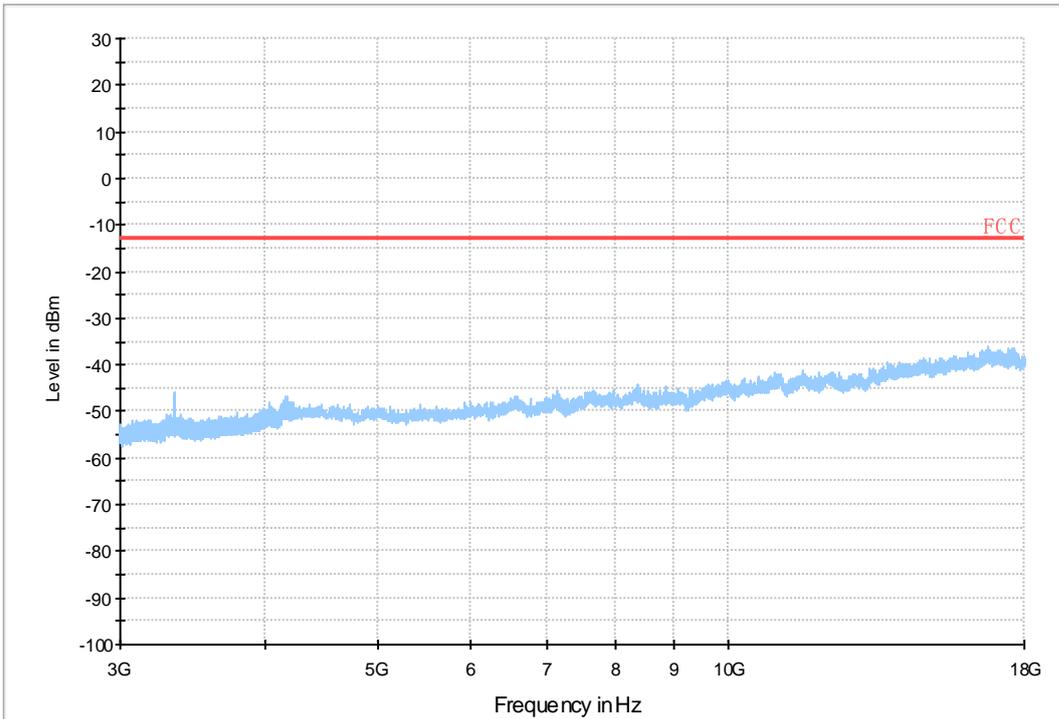
7.1.1.2 Test Mode = GSM/TM2



Copy of FCC PART22 GSM850_L

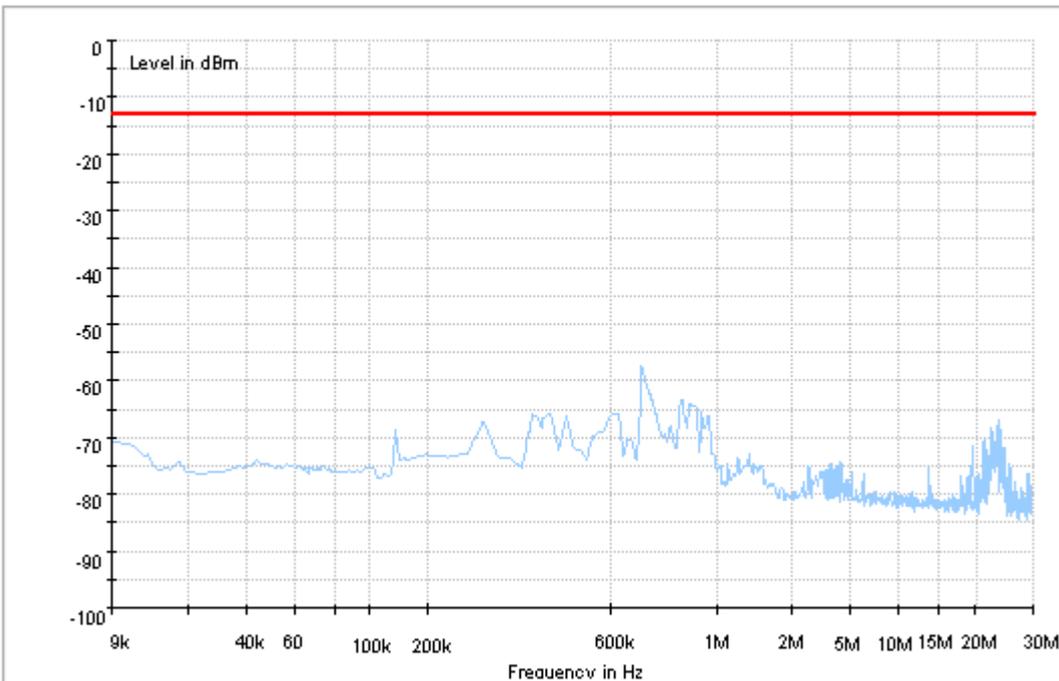


Copy of FCC PART22 GSM850_H

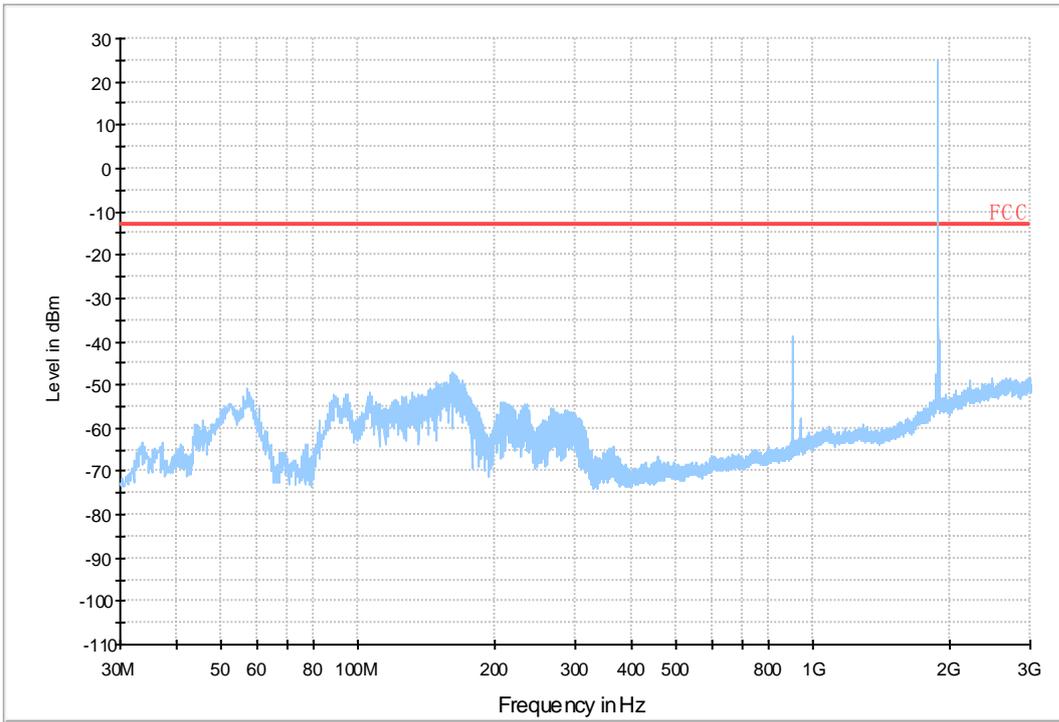


7.1.2 Test Band = GSM1900

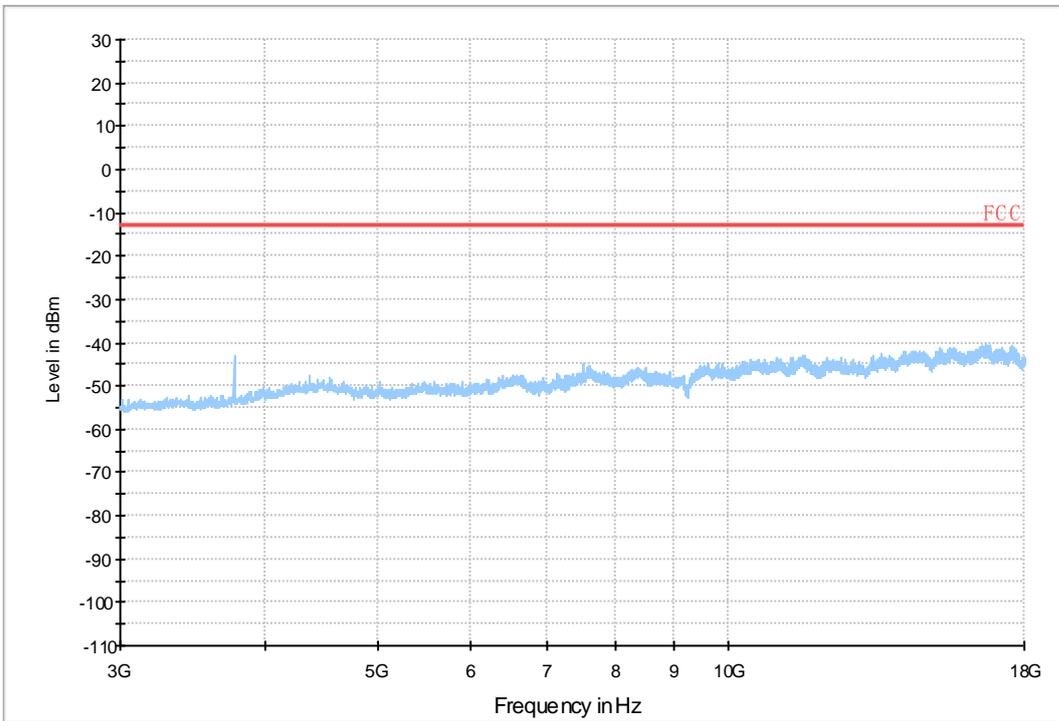
7.1.2.1 Test Mode = GSM/TM1

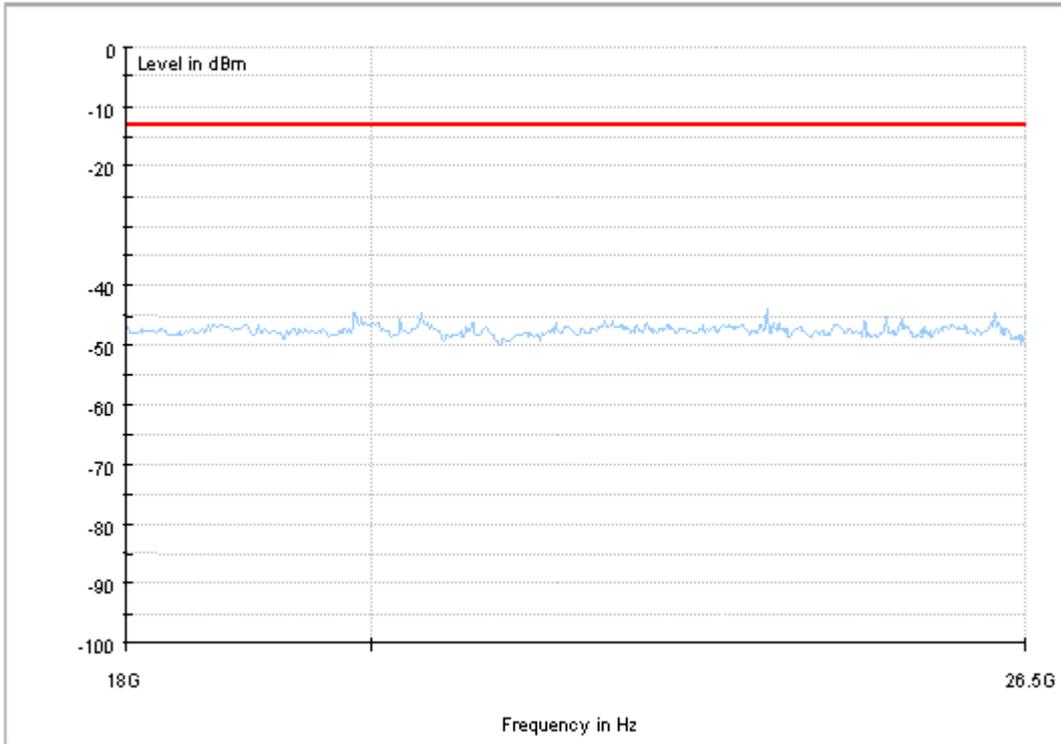


Copy of FCC PART24 GSM1900_L

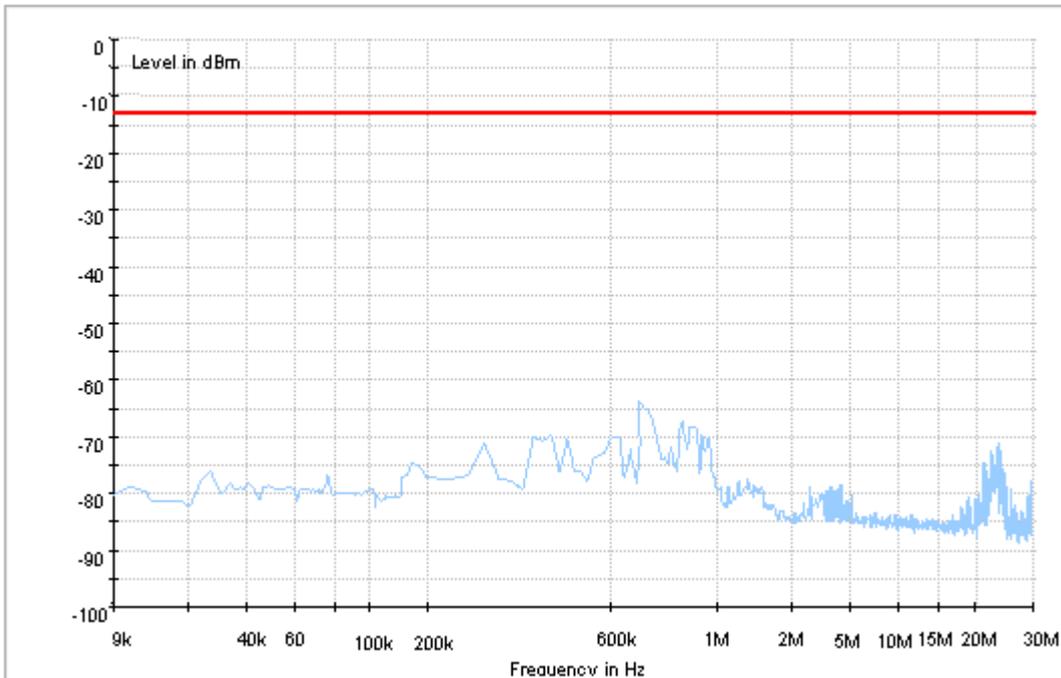


Copy of FCC PART24 GSM1900_H

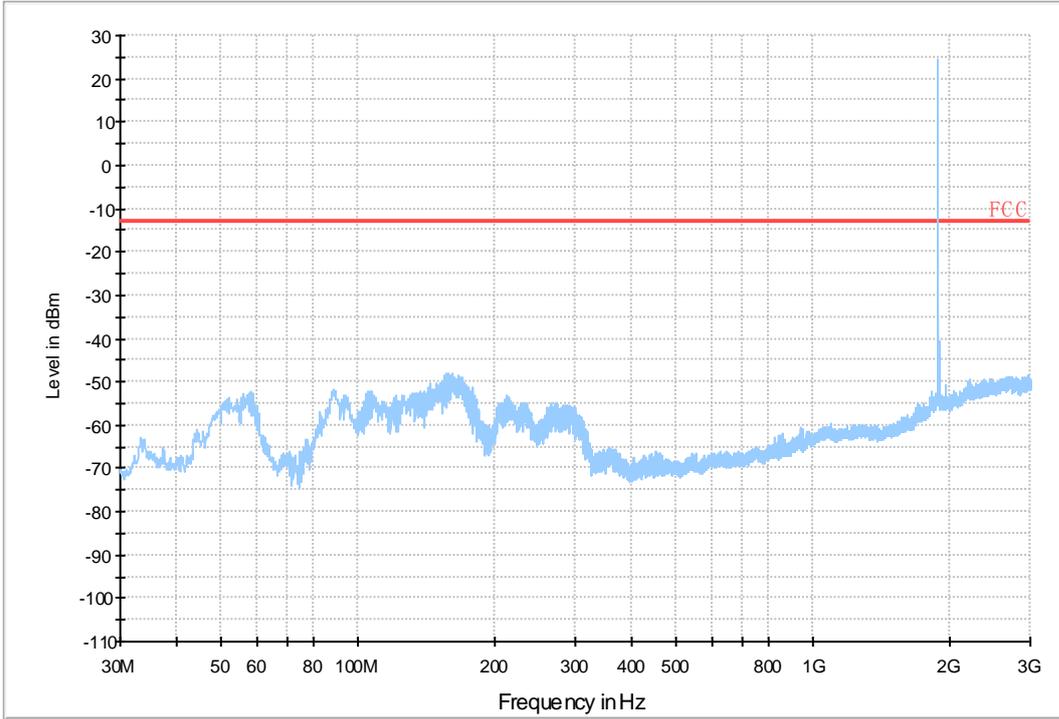




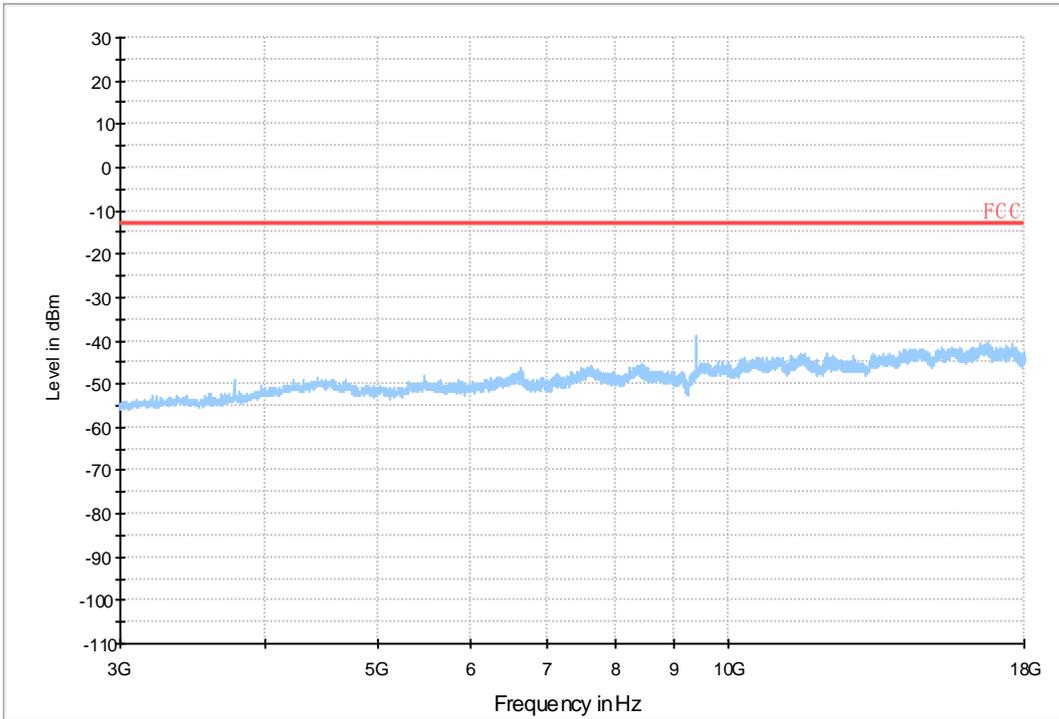
7.1.2.2 Test Mode = GSM/TM2

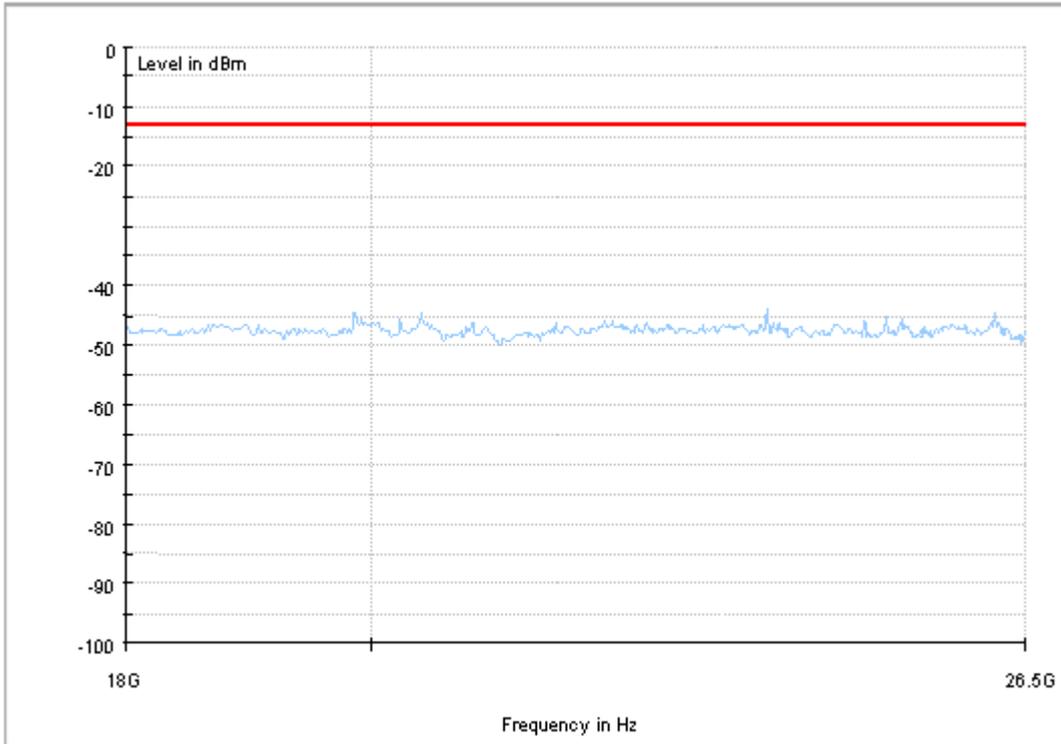


Copy of FCC PART24 GSM1900_L



Copy of FCC PART24 GSM1900_H





8Appendix_H: Frequency Stability

8.1 For GSM

8.1.1 Frequency 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	-0.26	-0.00032	PASS
				VN	-2.65	-0.00322	PASS
				VH	1.49	0.00181	PASS
		MCH	TN	VL	2.65	0.00317	PASS
				VN	-4.00	-0.00478	PASS
				VH	-6.46	-0.00772	PASS
		HCH	TN	VL	-1.36	-0.0016	PASS
				VN	0.77	0.00091	PASS
				VH	2.45	0.00289	PASS
	GSM/TM2	LCH	TN	VL	-2.78	-0.00337	PASS
				VN	-1.97	-0.00239	PASS
				VH	-4.78	-0.0058	PASS
		MCH	TN	VL	-3.94	-0.00471	PASS
				VN	-0.23	-0.00027	PASS
				VH	-6.78	-0.0081	PASS
		HCH	TN	VL	-2.26	-0.00266	PASS
				VN	-4.49	-0.00529	PASS
				VH	-3.91	-0.00461	PASS
GSM1900	GSM/TM1	LCH	TN	VL	2.97	0.00161	PASS
				VN	11.56	0.00625	PASS
				VH	-4.52	-0.00244	PASS
		MCH	TN	VL	7.43	0.00395	PASS
				VN	1.74	0.00093	PASS
				VH	-4.65	-0.00247	PASS
		HCH	TN	VL	2.91	0.00152	PASS
				VN	-3.62	-0.0019	PASS
				VH	-4.39	-0.0023	PASS
	GSM/TM2	LCH	TN	VL	-6.13	-0.00331	PASS
				VN	-12.98	-0.00702	PASS
				VH	-9.49	-0.00513	PASS
		MCH	TN	VL	-9.30	-0.00495	PASS
				VN	-6.84	-0.00364	PASS
				VH	-6.84	-0.00364	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VH	-3.75	-0.00199	PASS
		HCH	TN	VL	-6.88	-0.0036	PASS
				VN	-0.42	-0.00022	PASS
				VH	-4.04	-0.00212	PASS

8.1.2 Frequency Error vs. Temperature:

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
GSM850	GSM/TM1	LCH	VN	-30	2.26	0.00274	PASS
				-20	0.39	0.00047	PASS
				-10	1.94	0.00235	PASS
				0	5.23	0.00635	PASS
				10	5.62	0.00682	PASS
				20	-1.16	-0.00141	PASS
				30	0.26	0.00032	PASS
				40	-3.16	-0.00383	PASS
		50	-1.10	-0.00133	PASS		
		MCH	VN	-30	-4.97	-0.00594	PASS
				-20	2.52	0.00301	PASS
				-10	-1.81	-0.00216	PASS
				0	2.52	0.00301	PASS
				10	5.75	0.00687	PASS
				20	-2.00	-0.00239	PASS
				30	-2.07	-0.00247	PASS
				40	4.71	0.00563	PASS
		50	2.65	0.00317	PASS		
		HCH	VN	-30	-0.71	-0.00084	PASS
				-20	3.68	0.00434	PASS
				-10	5.36	0.00631	PASS
				0	4.71	0.00555	PASS
				10	1.29	0.00152	PASS
				20	-4.26	-0.00502	PASS
	30			6.84	0.00806	PASS	
	40			1.42	0.00167	PASS	
	50	-0.13	-0.00015	PASS			
	GSM/TM2	LCH	VN	-30	-6.04	-0.00733	PASS
				-20	-4.49	-0.00545	PASS
				-10	-5.20	-0.00631	PASS
				0	-6.84	-0.0083	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict		
				10	-1.26	-0.00153	PASS		
				20	-0.77	-0.00093	PASS		
				30	-5.23	-0.00635	PASS		
				40	-6.94	-0.00842	PASS		
				50	-4.65	-0.00564	PASS		
		MCH	VN	-30	-4.55	-0.00544	PASS		
				-20	-3.71	-0.00443	PASS		
				-10	-1.90	-0.00227	PASS		
				0	-4.20	-0.00502	PASS		
				10	0.90	0.00108	PASS		
				20	-6.10	-0.00729	PASS		
				30	-4.13	-0.00494	PASS		
				40	-3.91	-0.00467	PASS		
				50	-1.13	-0.00135	PASS		
				HCH	VN	-30	-8.81	-0.01038	PASS
		-20	-2.32			-0.00273	PASS		
		-10	-7.94			-0.00935	PASS		
		0	-4.84			-0.0057	PASS		
		10	-3.45			-0.00406	PASS		
		20	-1.97			-0.00232	PASS		
		30	-2.10			-0.00247	PASS		
		40	-1.87			-0.0022	PASS		
		50	-5.91	-0.00696	PASS				
		GSM1900	GSM/TM1	LCH	VN	-30	-0.45	-0.00024	PASS
						-20	-0.58	-0.00031	PASS
-10	-7.62					-0.00412	PASS		
0	-6.59					-0.00356	PASS		
10	-12.20					-0.00659	PASS		
20	0.19					0.0001	PASS		
30	0.19					0.0001	PASS		
40	3.94					0.00213	PASS		
50	0.13					0.00007	PASS		
MCH	VN			-30	-2.39	-0.00127	PASS		
				-20	-1.55	-0.00082	PASS		
				-10	-5.81	-0.00309	PASS		
				0	-2.20	-0.00117	PASS		
				10	4.71	0.00251	PASS		
				20	-3.23	-0.00172	PASS		
				30	0.90	0.00048	PASS		
				40	8.91	0.00474	PASS		



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		HCH	VN	50	-8.27	-0.0044	PASS
				-30	4.39	0.0023	PASS
				-20	-1.03	-0.00054	PASS
				-10	-6.33	-0.00331	PASS
				0	-5.10	-0.00267	PASS
				10	-3.75	-0.00196	PASS
				20	1.42	0.00074	PASS
				30	4.26	0.00223	PASS
				40	1.81	0.00095	PASS
				50	-2.26	-0.00118	PASS
	GSM/TM2	LCH	VN	-30	-3.49	-0.00189	PASS
				-20	1.58	0.00085	PASS
				-10	-2.26	-0.00122	PASS
				0	-1.87	-0.00101	PASS
				10	4.75	0.00257	PASS
				20	-4.23	-0.00229	PASS
				30	2.84	0.00153	PASS
				40	-8.94	-0.00483	PASS
				50	-7.78	-0.0042	PASS
				MCH	VN	-30	-4.04
		-20	3.39			0.0018	PASS
		-10	-14.88			-0.00791	PASS
		0	-6.20			-0.0033	PASS
		10	4.75			0.00253	PASS
		20	-4.55			-0.00242	PASS
		30	-12.27			-0.00653	PASS
		40	1.61			0.00086	PASS
		50	-7.01			-0.00373	PASS
		HCH	VN			-30	-2.81
				-20	-0.19	-0.0001	PASS
				-10	4.39	0.0023	PASS
				0	-1.00	-0.00052	PASS
				10	-10.01	-0.00524	PASS
				20	5.07	0.00265	PASS
				30	2.23	0.00117	PASS
				40	0.42	0.00022	PASS
				50	1.84	0.00096	PASS

END