



Appendix for test report

1Appendix_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	33.25	30.65	38.5	PASS
		MCH	33.18	30.63	38.5	PASS
		HCH	33.13	30.51	38.5	PASS
	GSM/TM2	LCH	26.98	24.47	38.5	PASS
		MCH	26.93	24.33	38.5	PASS
		HCH	26.93	24.32	38.5	PASS
WCDMA850	UMTS/TM1	LCH	22.92	20.31	38.5	PASS
		MCH	22.9	20.38	38.5	PASS
		HCH	22.65	20.03	38.5	PASS
Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	29.79	32.43	33	PASS
		MCH	29.58	32.24	33	PASS
		HCH	29.44	32.18	33	PASS
	GSM/TM2	LCH	24.88	27.59	33	PASS
		MCH	24.82	27.55	33	PASS
		HCH	25.08	27.73	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	0.34	13	PASS
		MCH	0.39	13	PASS
		HCH	0.33	13	PASS
	GSM/TM2	LCH	3.1	13	PASS
		MCH	3.12	13	PASS
		HCH	3.2	13	PASS

3Appendix_C: Modulation Characteristics

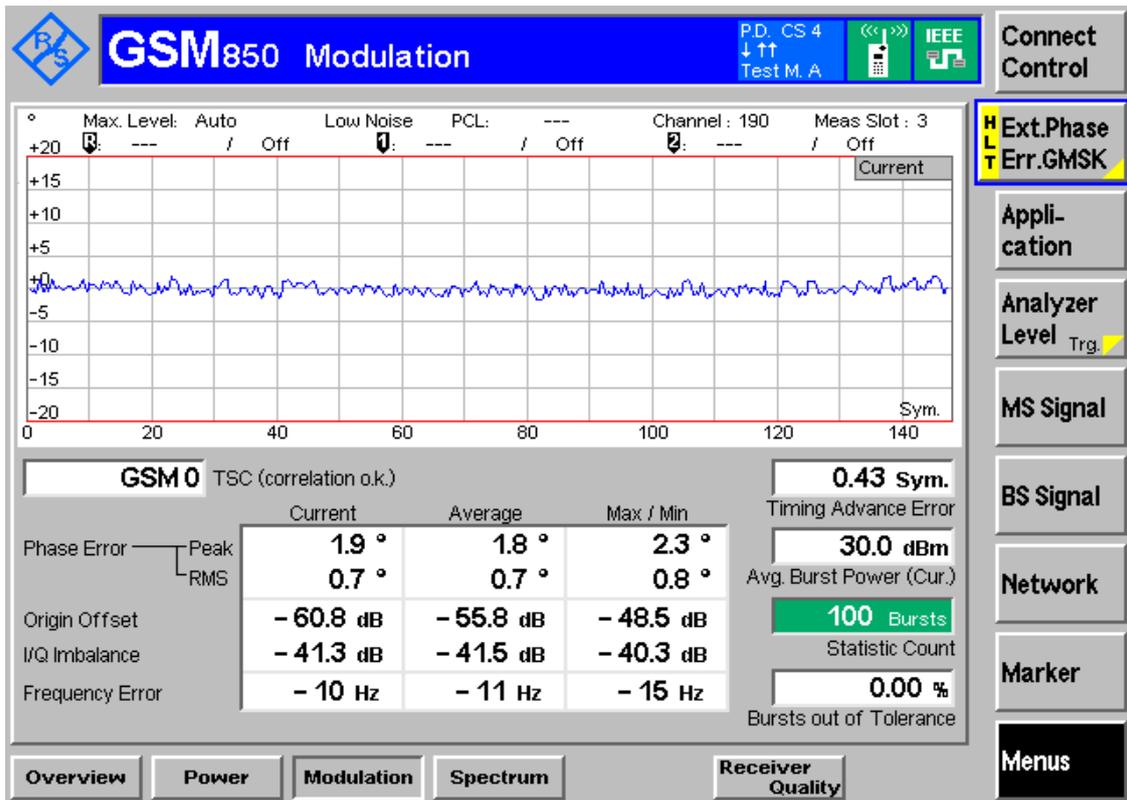
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

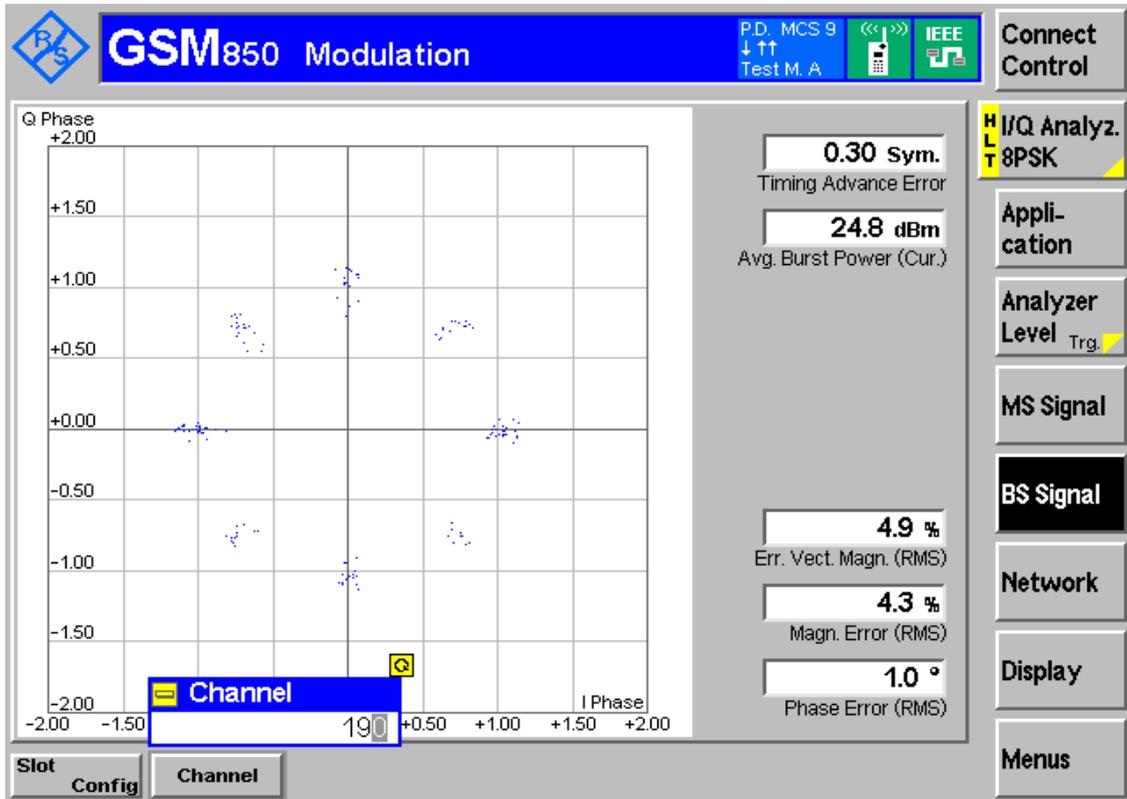
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

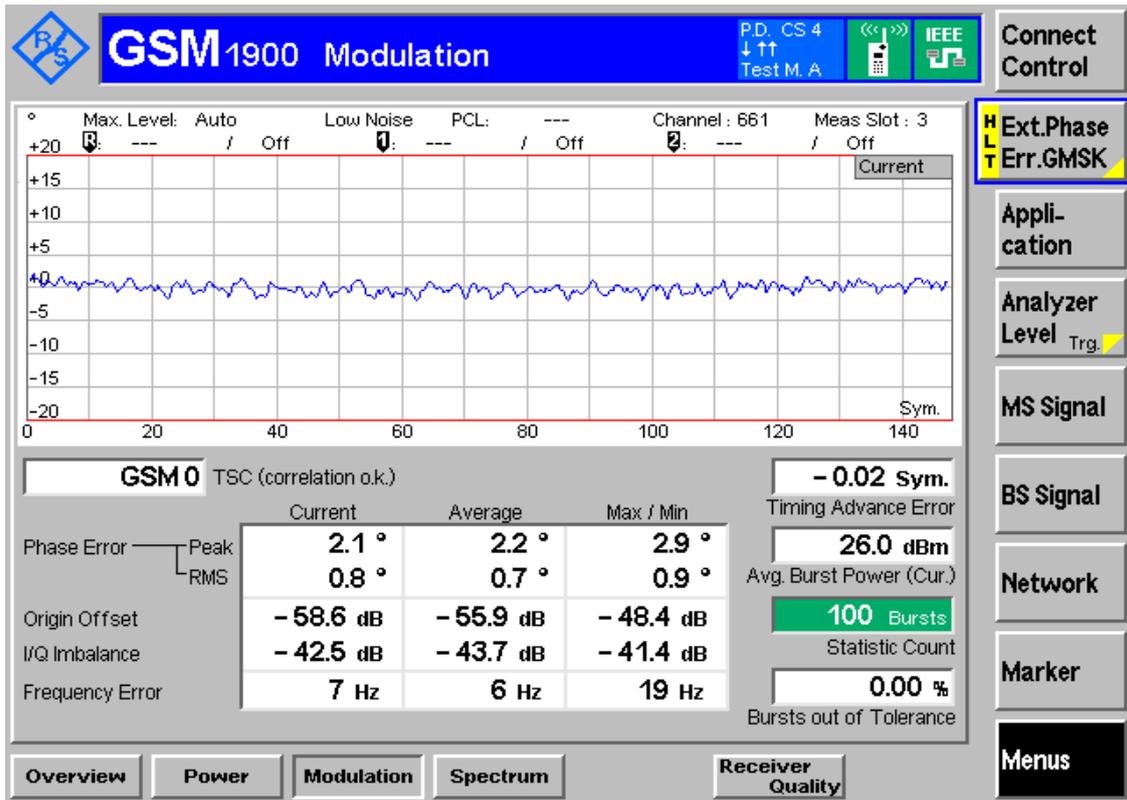
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

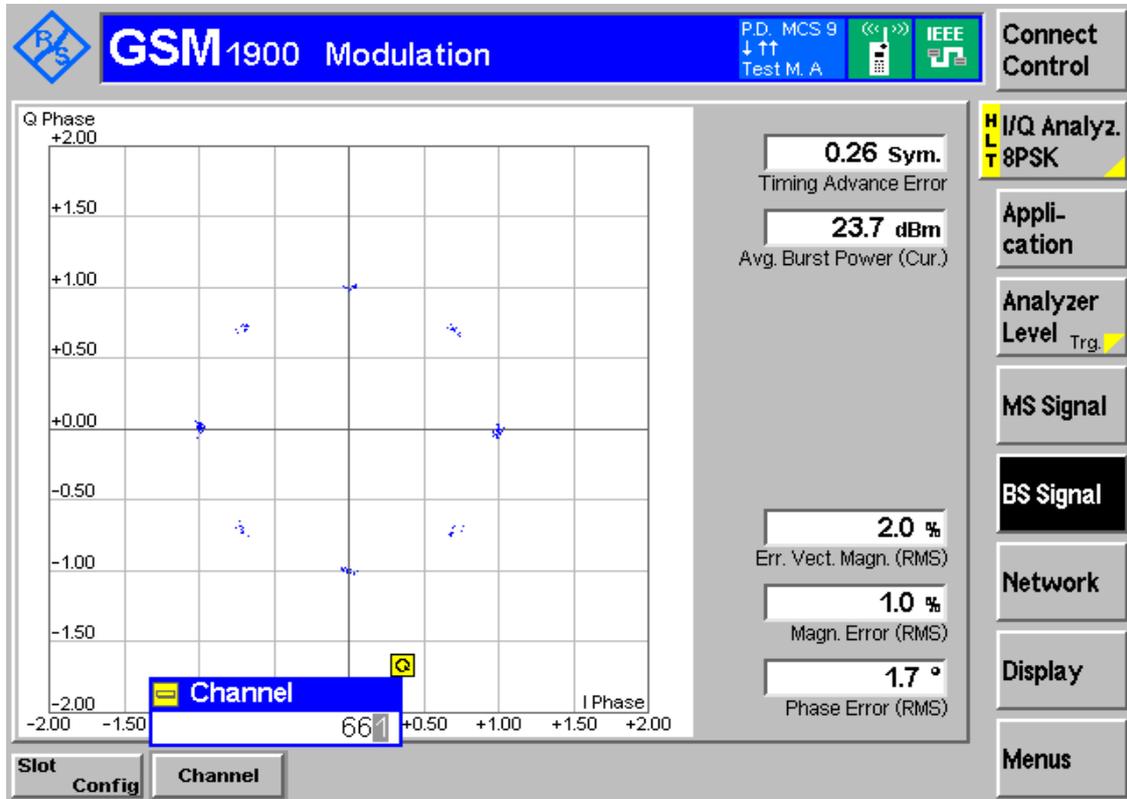
3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH



3.1.2.2 Test Mode = GSM/TM2

3.1.2.2.1 Test Channel = MCH

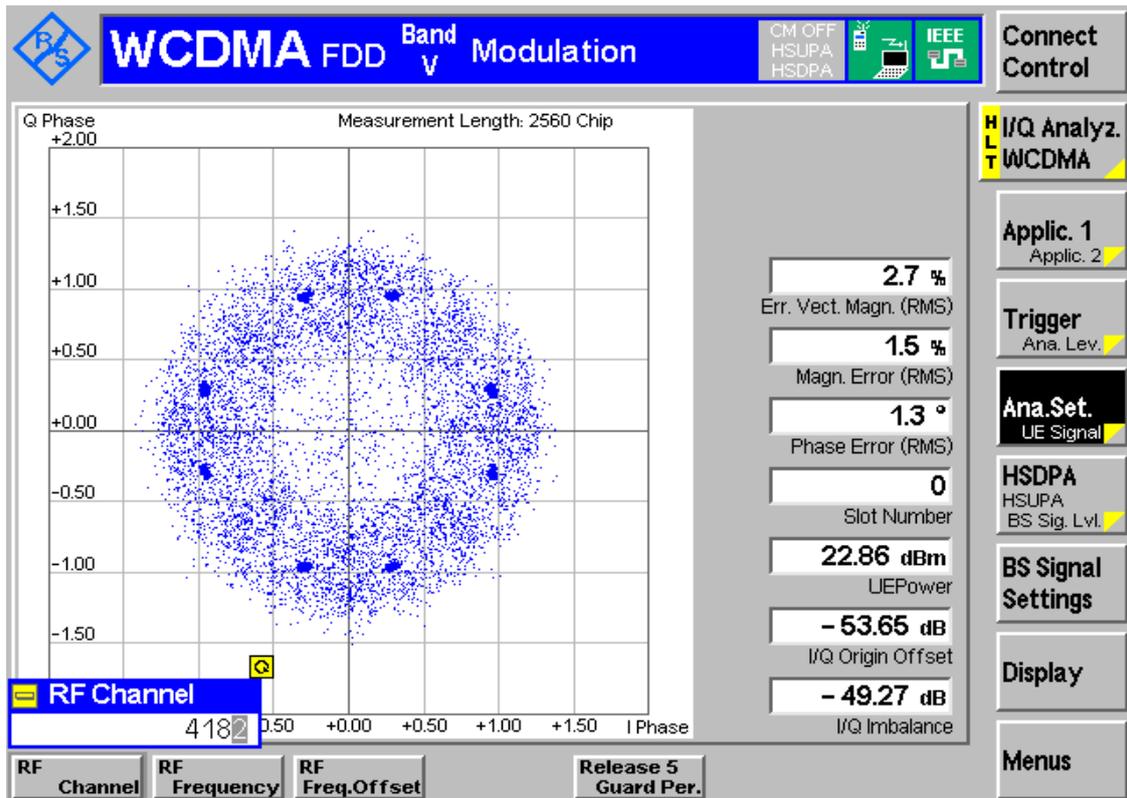


3.2 For UMTS

3.2.1 Test Band = WCDMA850

3.2.1.1 Test Mode = UMTS/TM1

3.2.1.1.1 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	240.86	318.28	Pass
		MCH	243.22	316.50	Pass
		HCH	245.03	310.82	Pass
	GSM/TM2	LCH	241.17	306.72	Pass
		MCH	243.00	308.10	Pass
		HCH	239.46	311.72	Pass
GSM1900	GSM/TM1	LCH	241.59	309.21	Pass
		MCH	242.56	311.02	Pass
		HCH	239.80	305.52	Pass
	GSM/TM2	LCH	235.48	300.04	Pass
		MCH	238.24	303.25	Pass
		HCH	243.32	306.09	Pass
Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA850	UMTS/TM1	LCH	4.17	4.74	Pass
		MCH	4.15	4.72	Pass
		HCH	4.17	4.73	Pass

Part II - Test Plots

4.1 For GSM

4.1.1 Test Band = GSM850

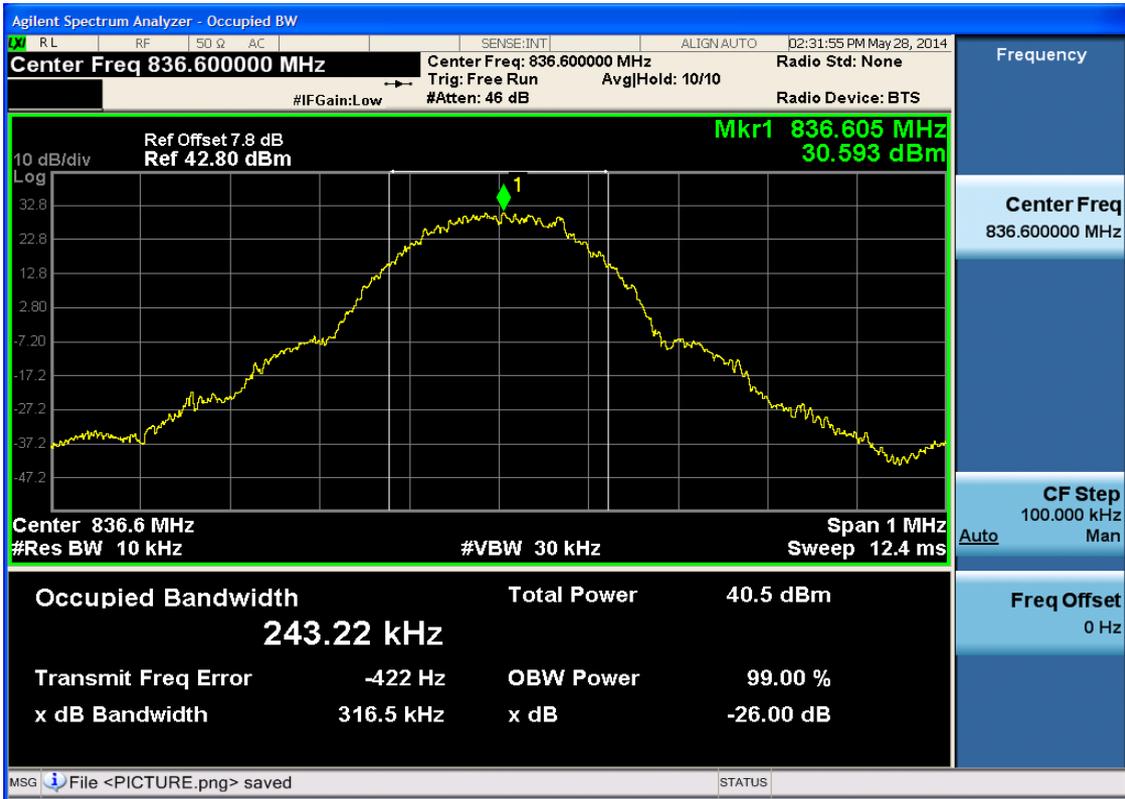
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH

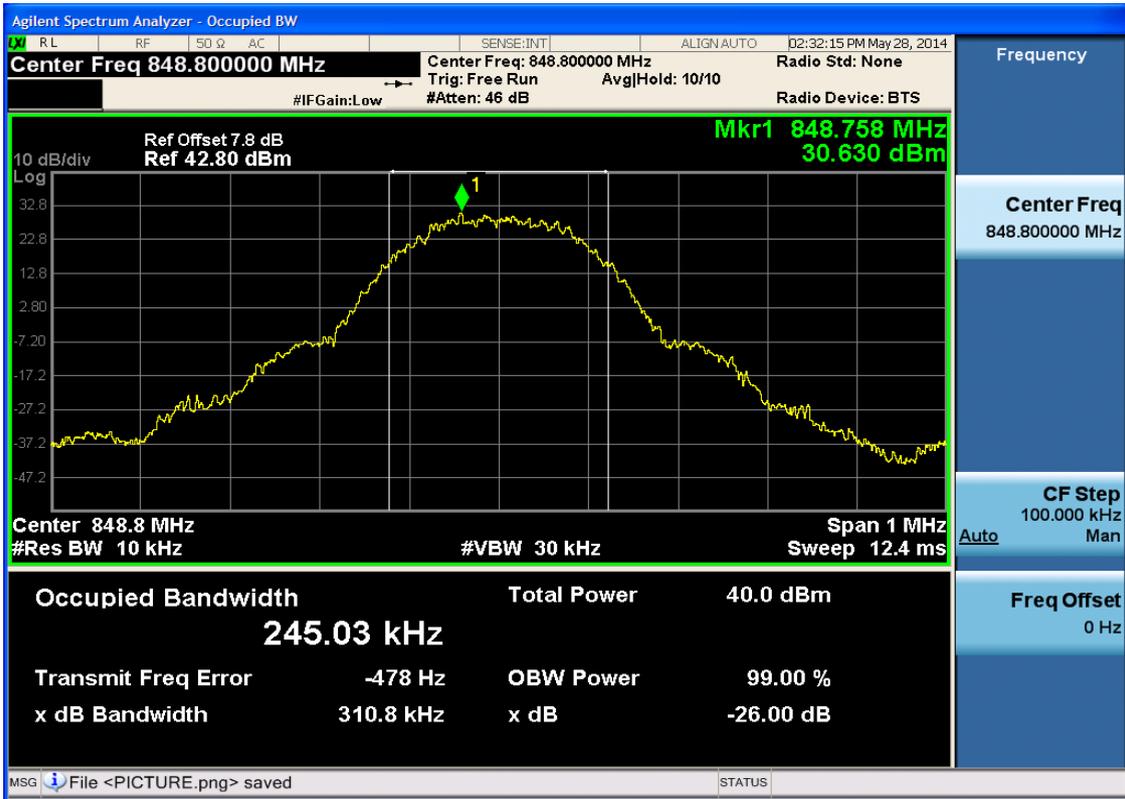




4.1.1.1.2 Test Channel = MCH



4.1.1.1.3 Test Channel = HCH





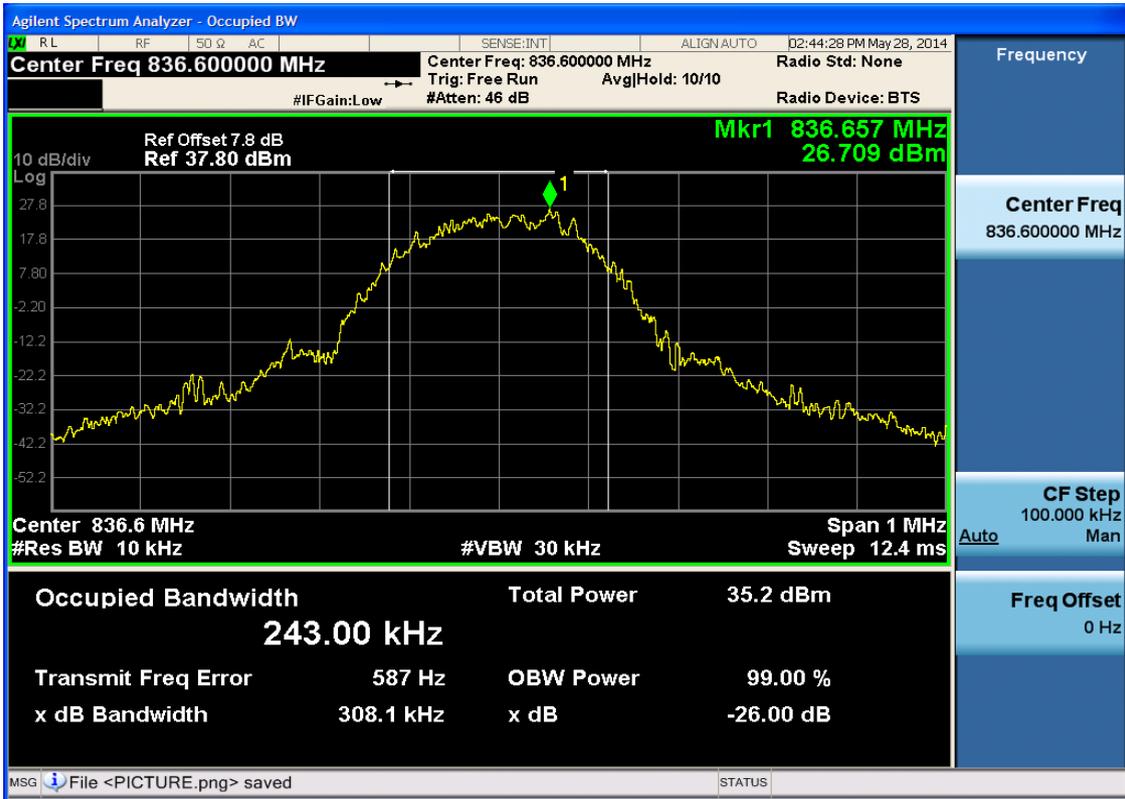
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4.1.1.2.1 Test Channel = LCH





4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH

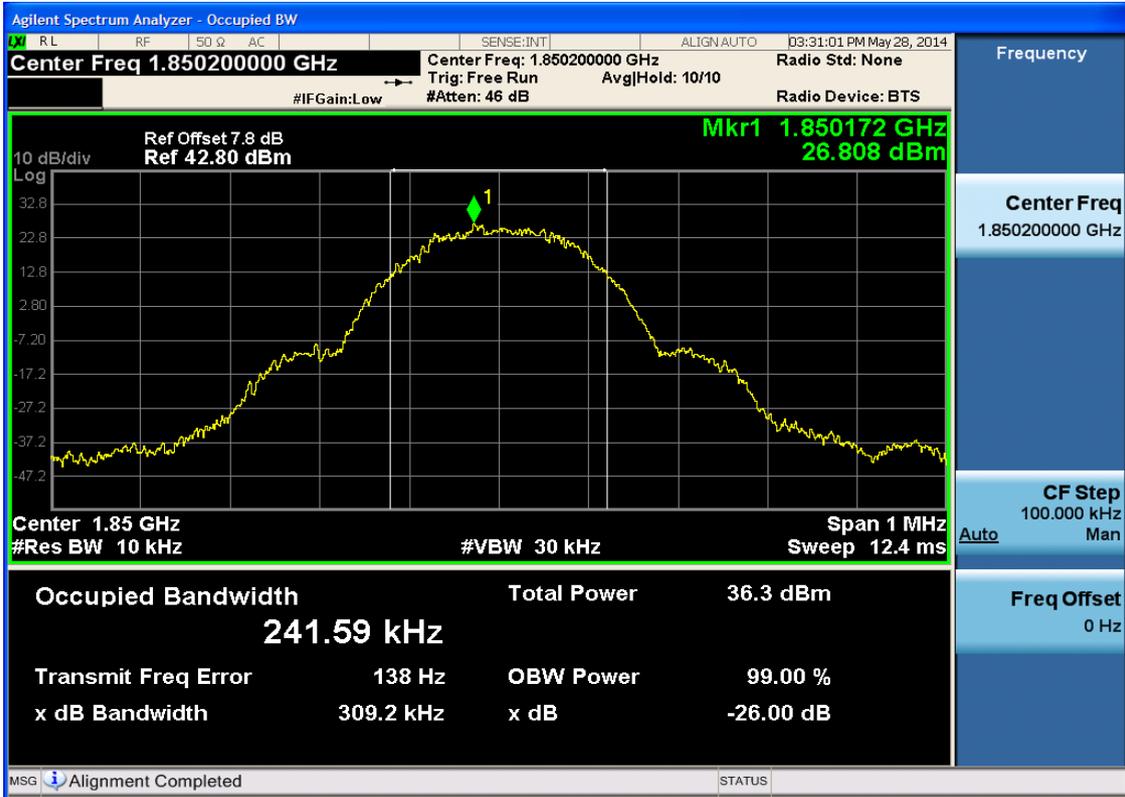




4.1.2 Test Band = GSM1900

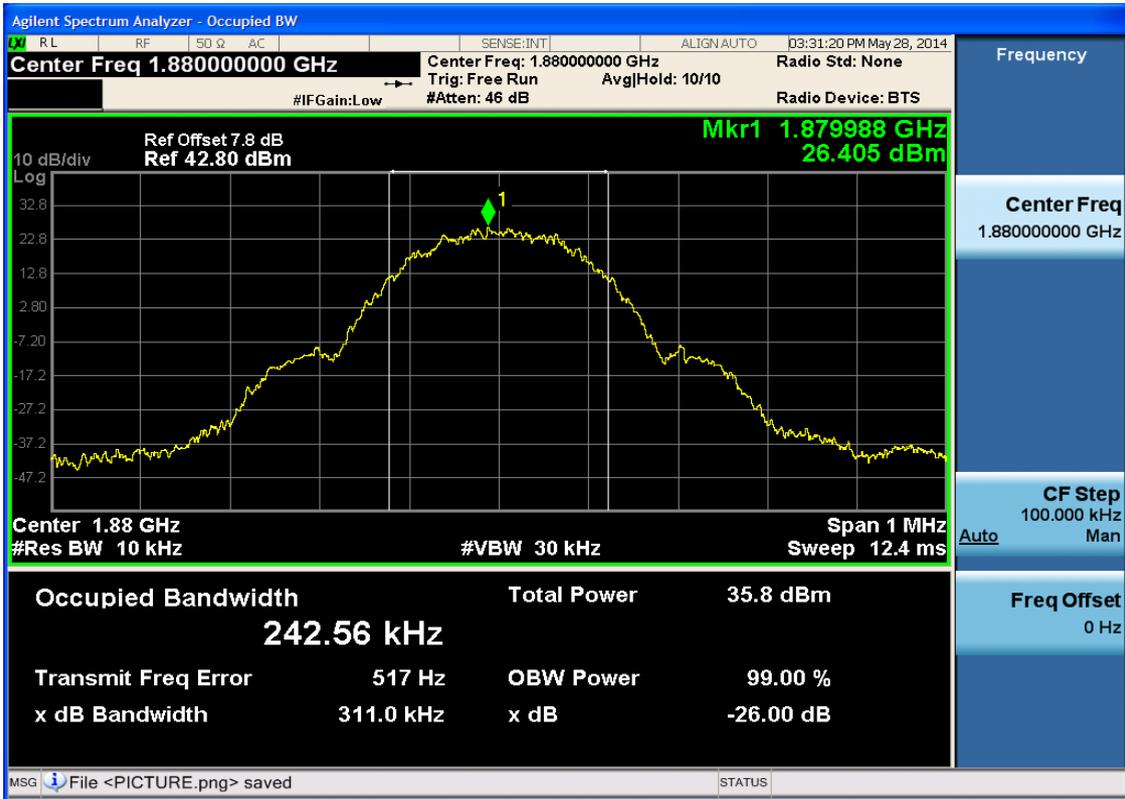
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



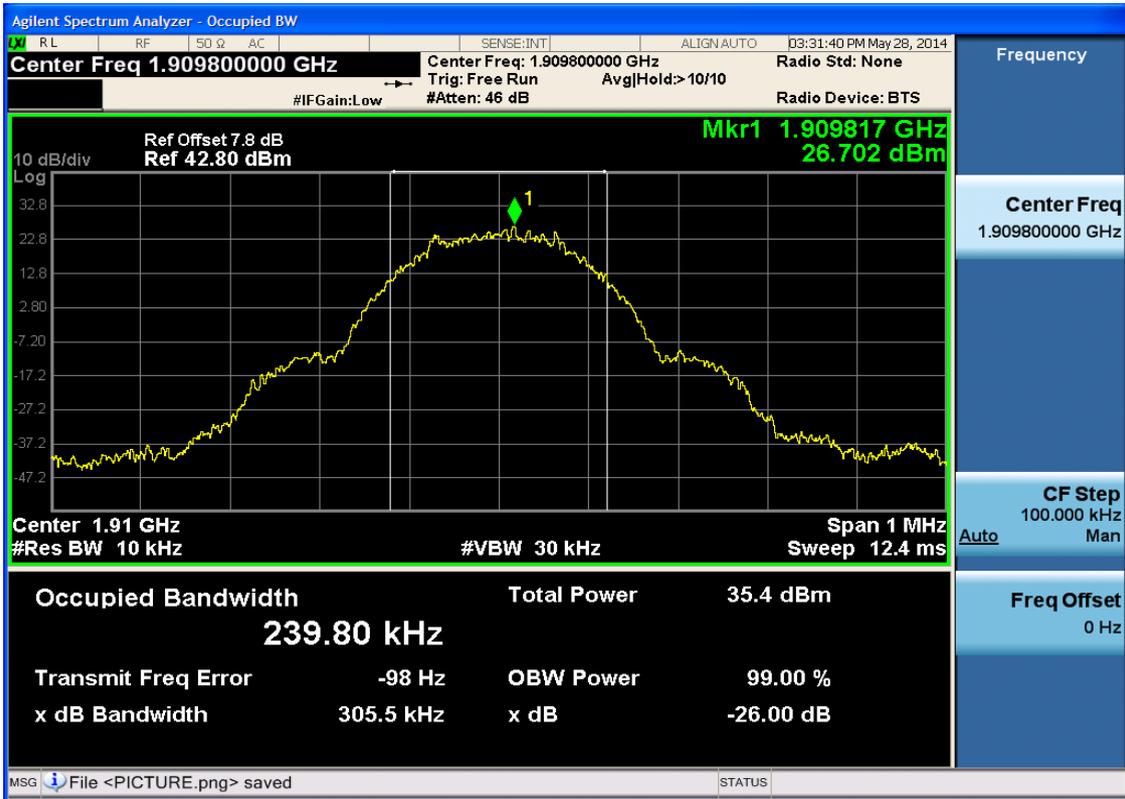


4.1.2.1.2 Test Channel = MCH





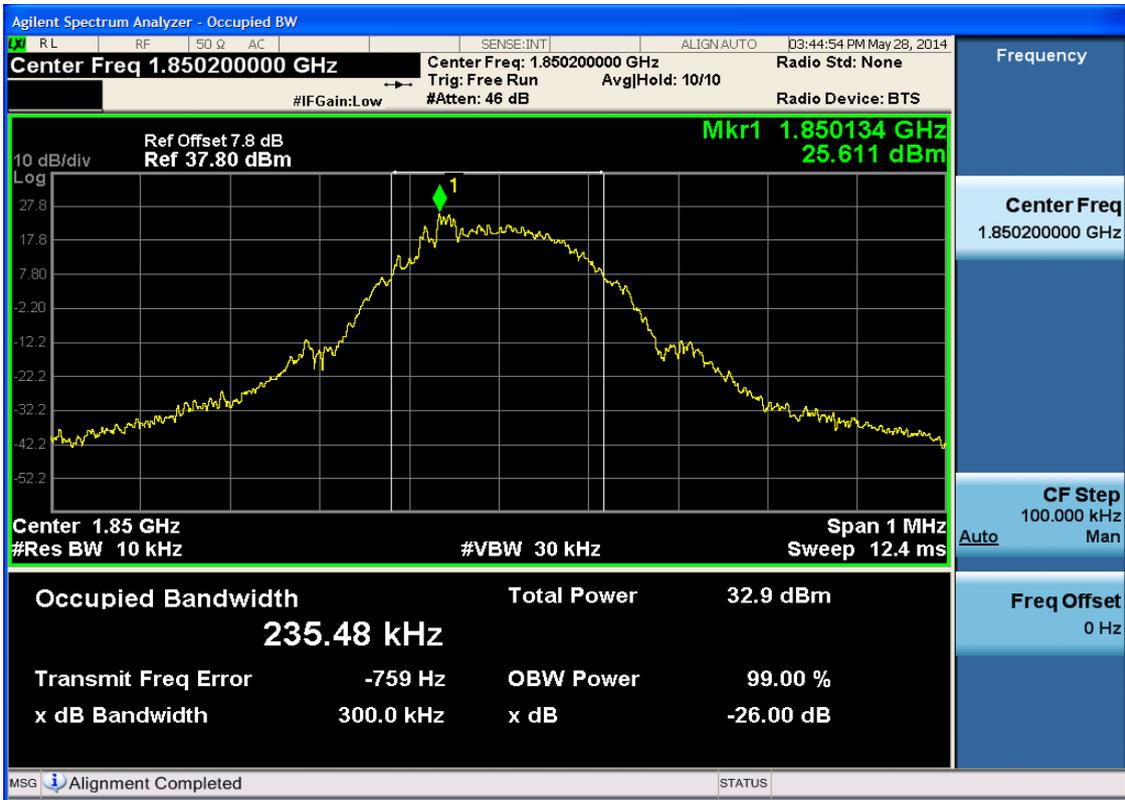
4.1.2.1.3 Test Channel = HCH





4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



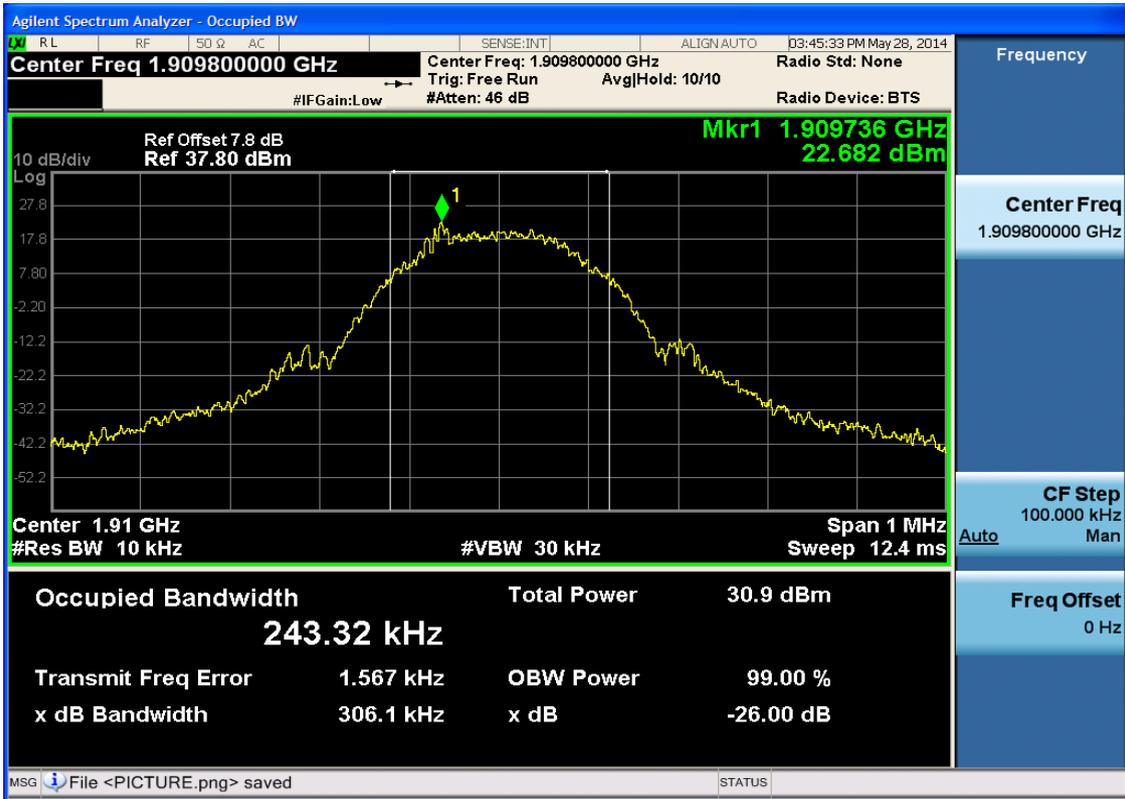


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH

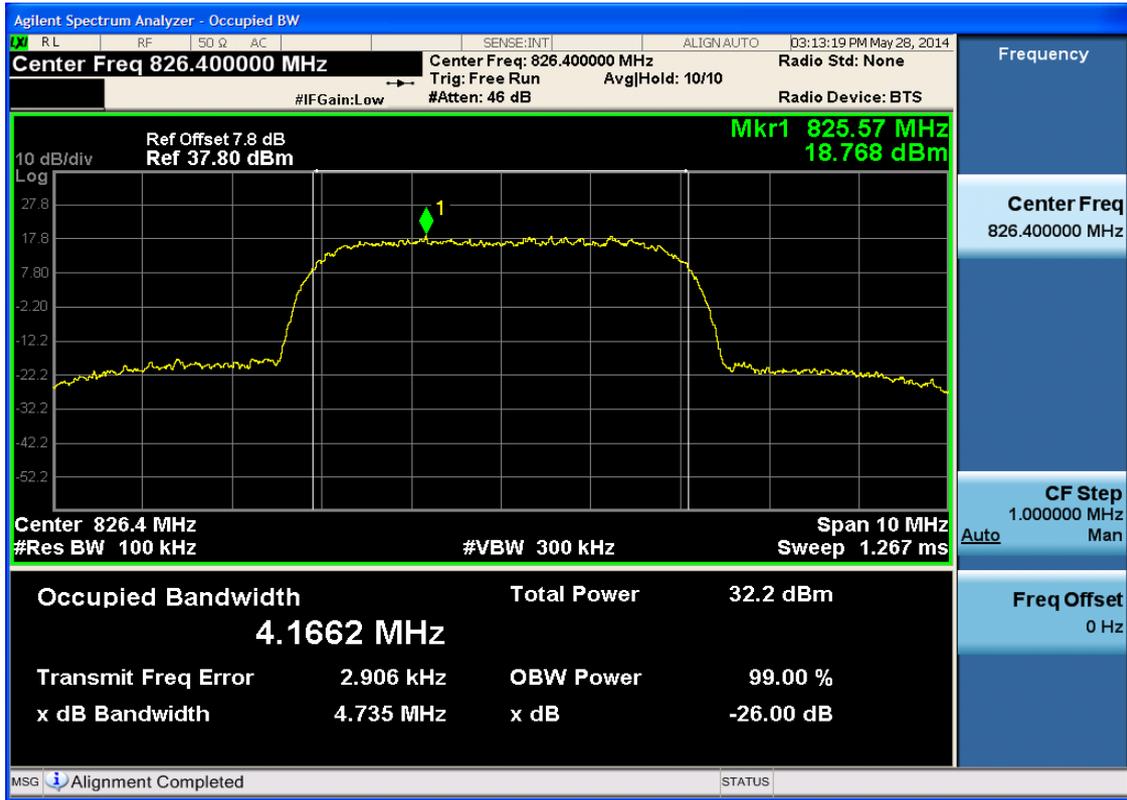


4.2 For UMTS

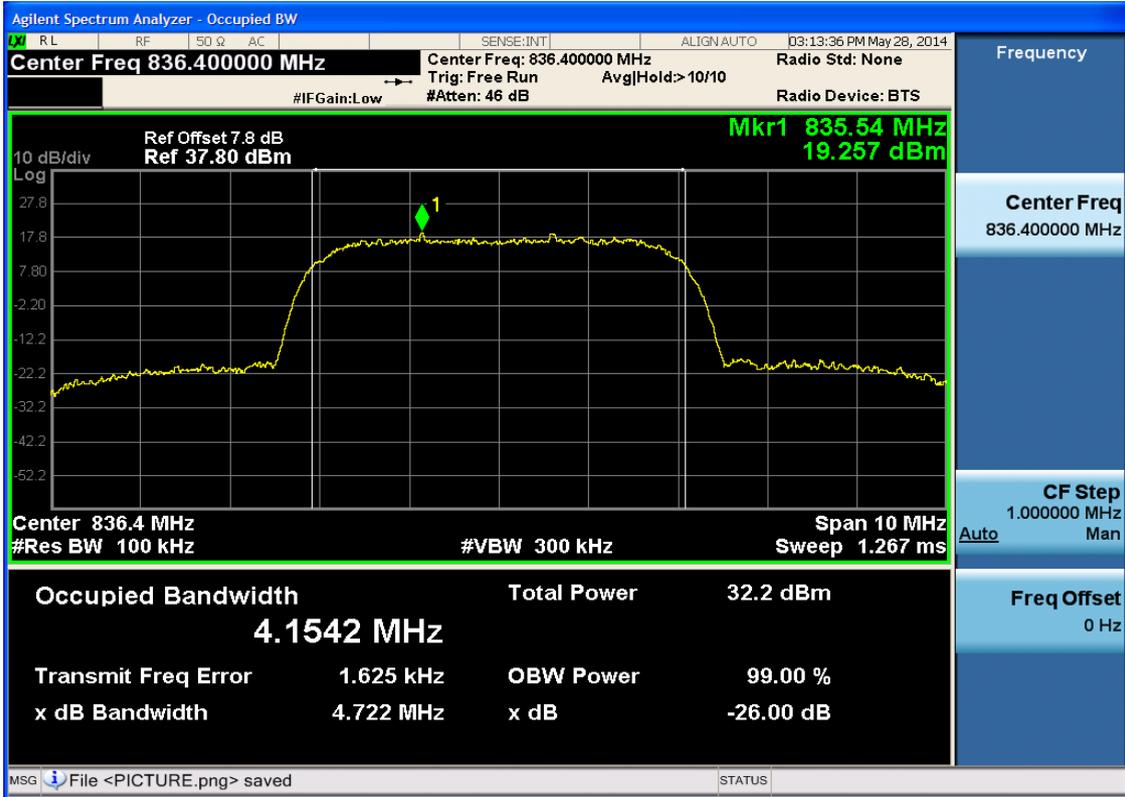
4.2.1 Test Band = WCDMA850

4.2.1.1 Test Mode = UMTS/TM1

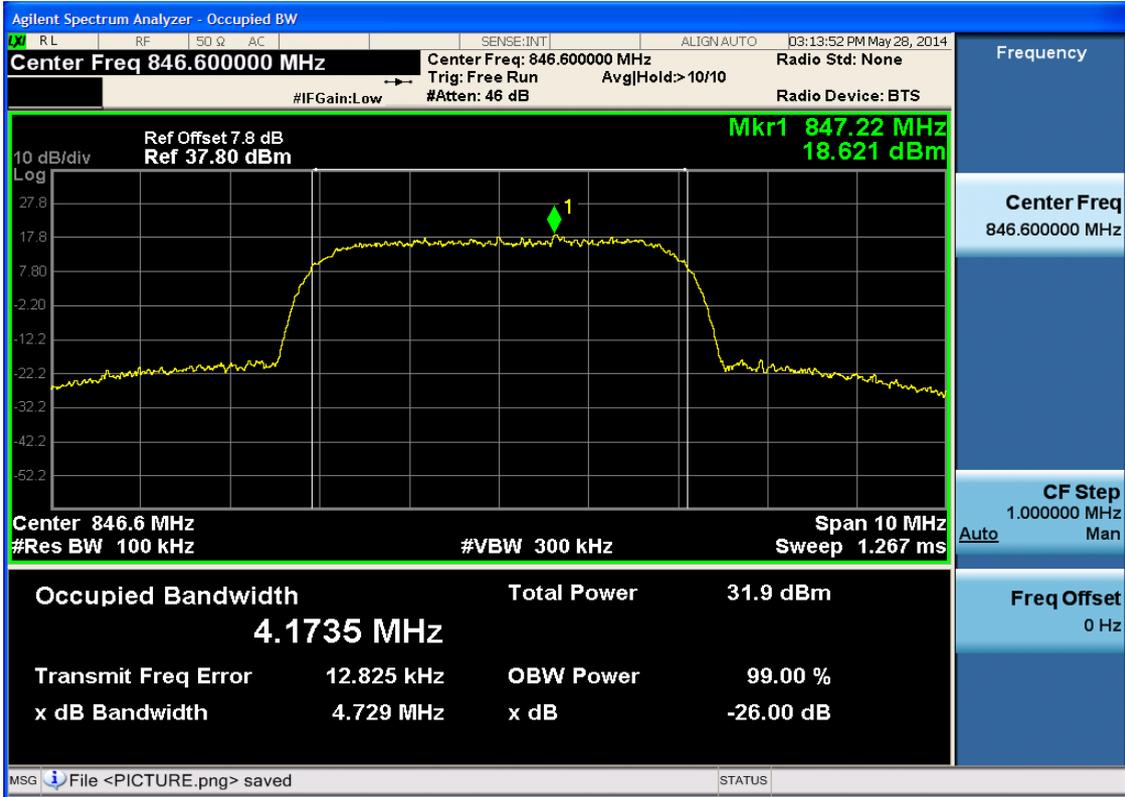
4.2.1.1.1 Test Channel = LCH



4.2.1.1.2 Test Channel = MCH



4.2.1.1.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

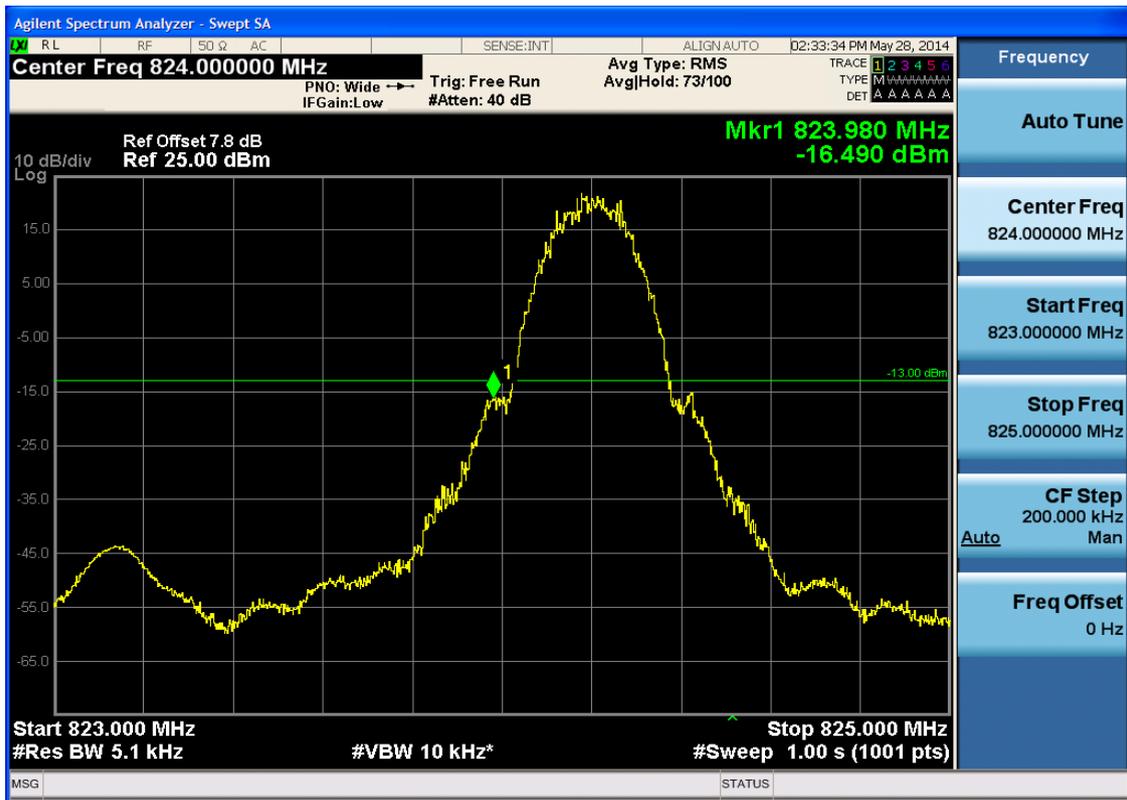
Part I - Test Plots

5.1 For GSM

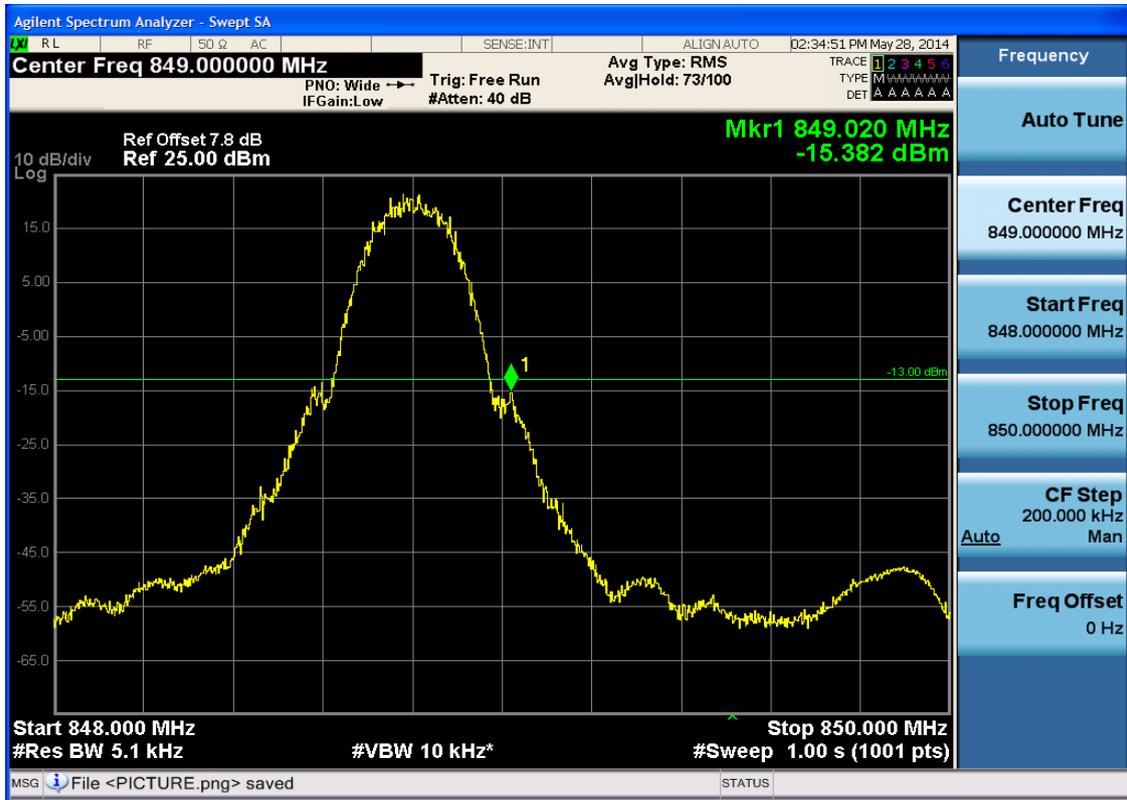
5.1.1 Test Band = GSM850

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



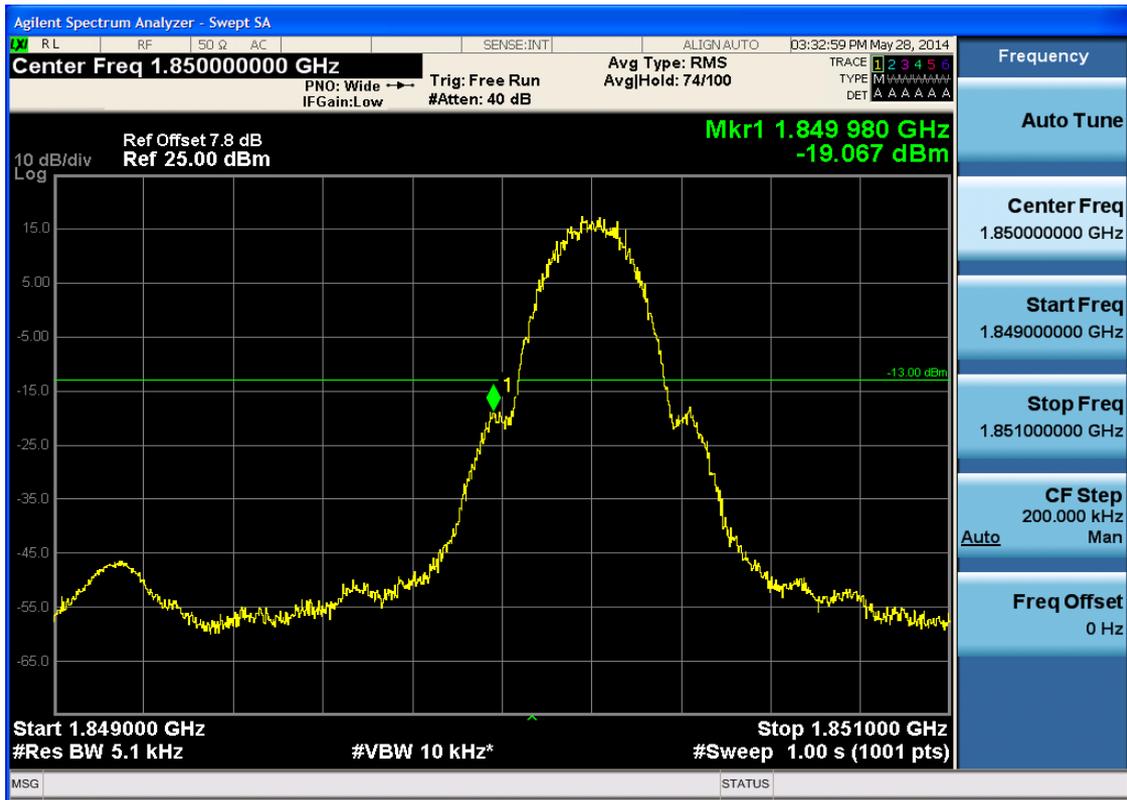
5.1.1.2.2 Test Channel = HCH



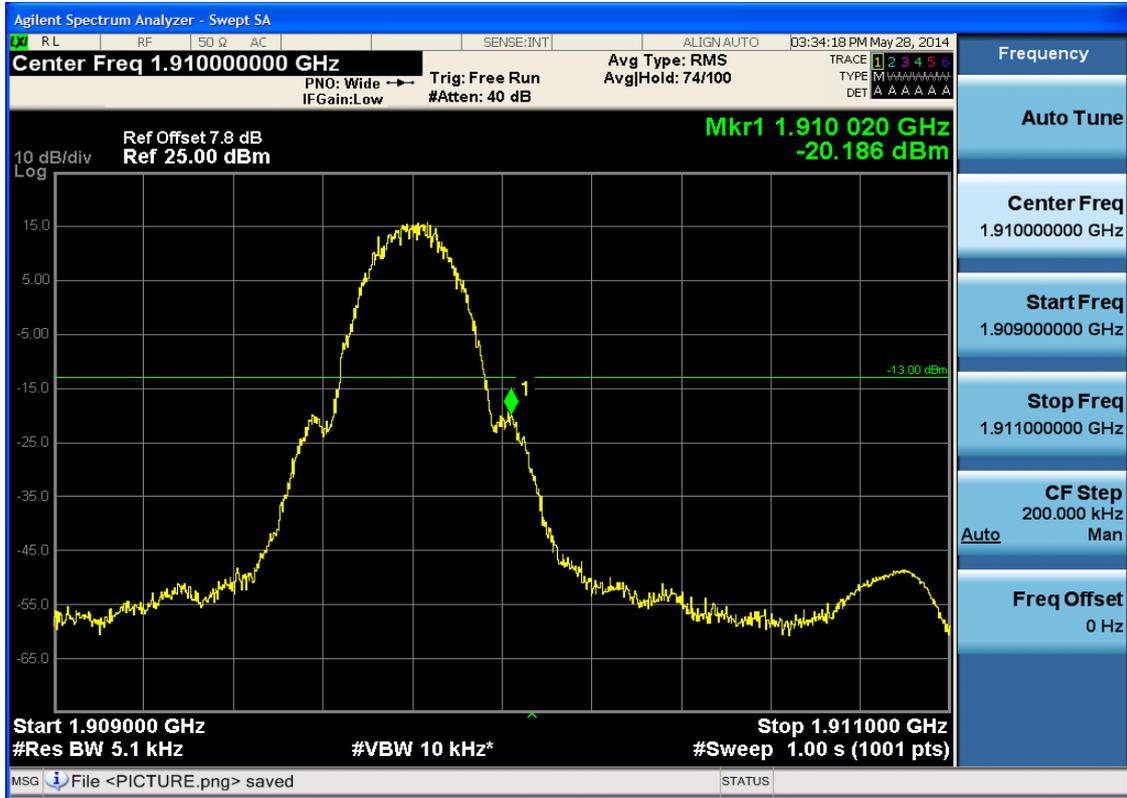
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH



5.1.2.1.2 Test Channel = HCH

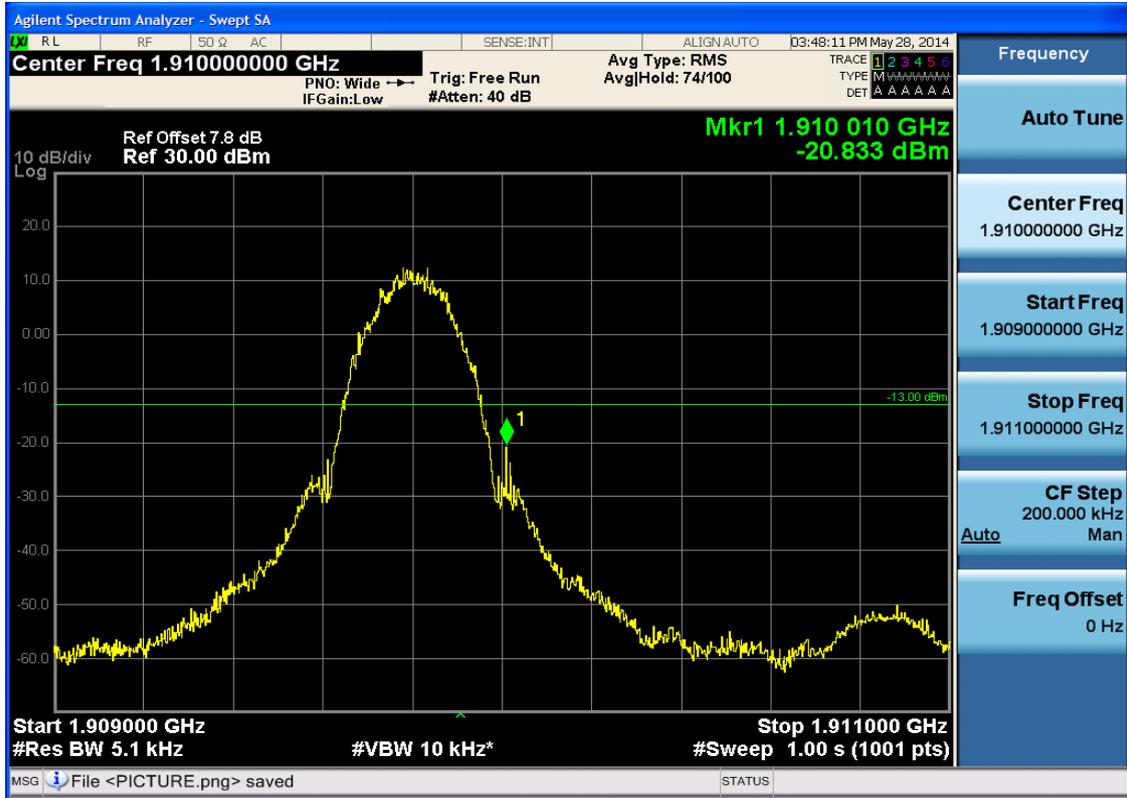


5.1.2.2 Test Mode = GSM/TM2

5.1.2.2.1 Test Channel = LCH



5.1.2.2.2 Test Channel = HCH





5.2 For UMTS

5.2.1 Test Band = WCDMA850

5.2.1.1 Test Mode = UMTS/TM1

5.2.1.1.1 Test Channel = LCH





5.2.1.1.2 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

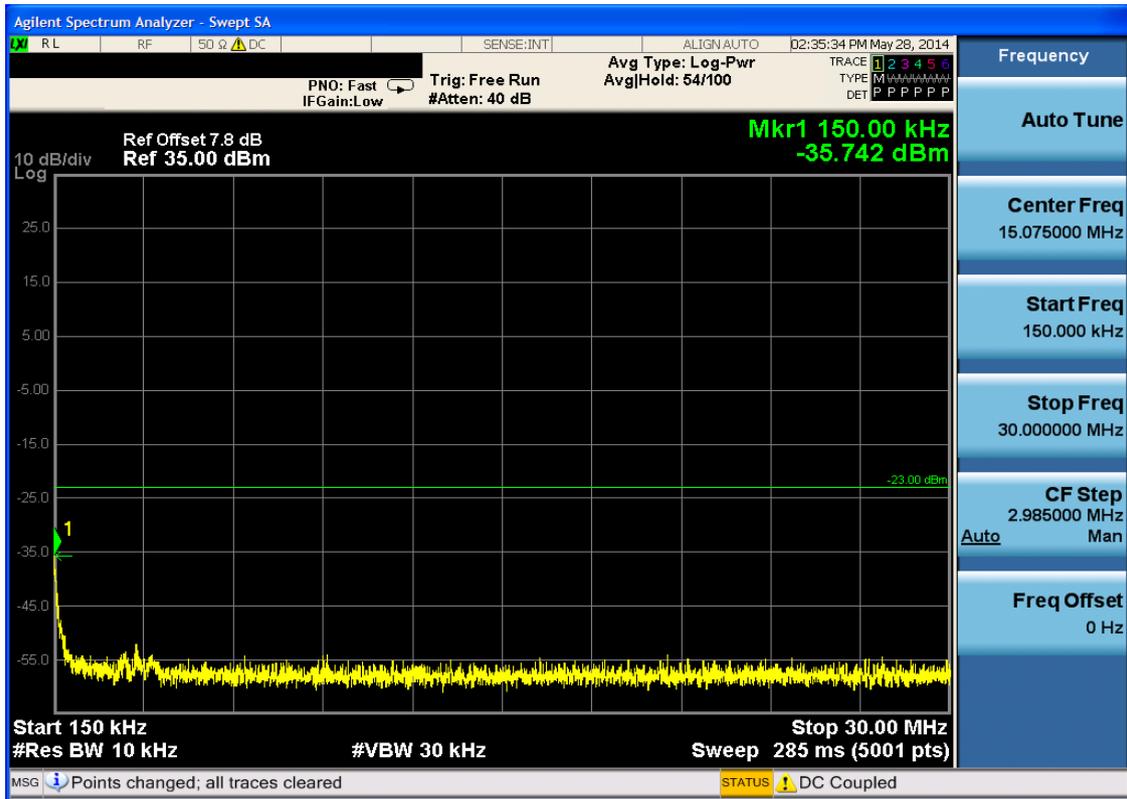
6.1 For GSM

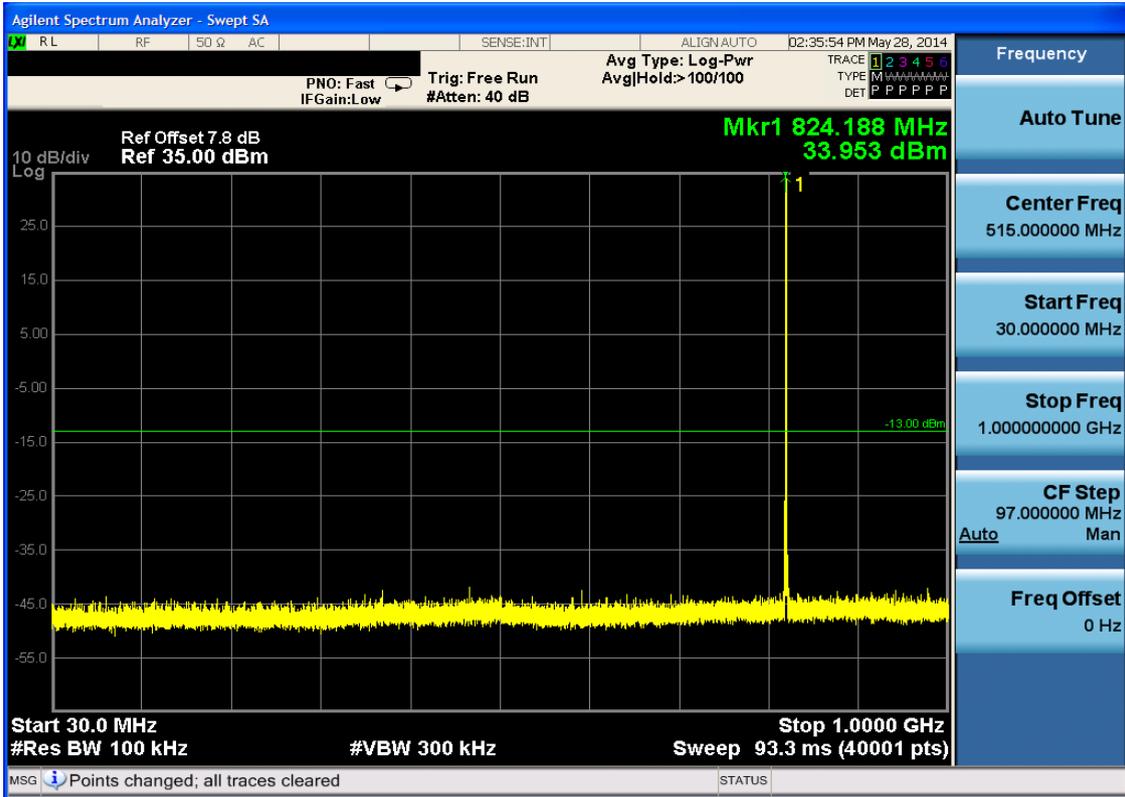
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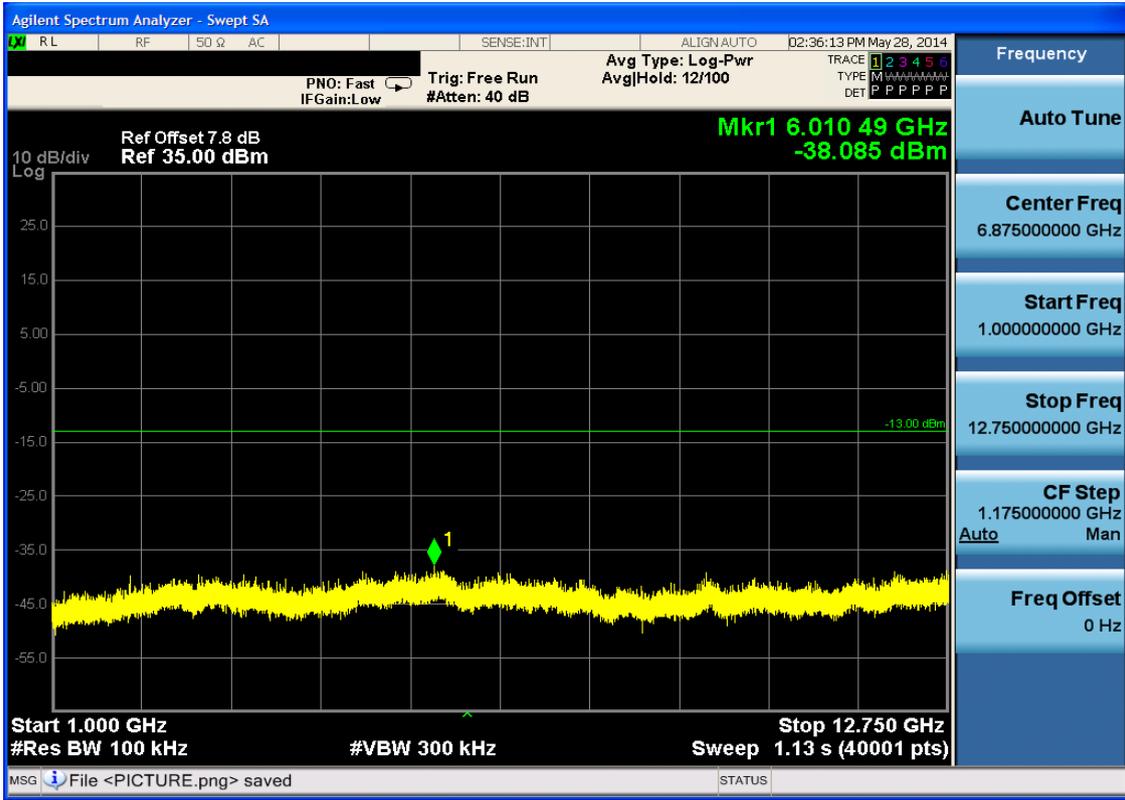
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH





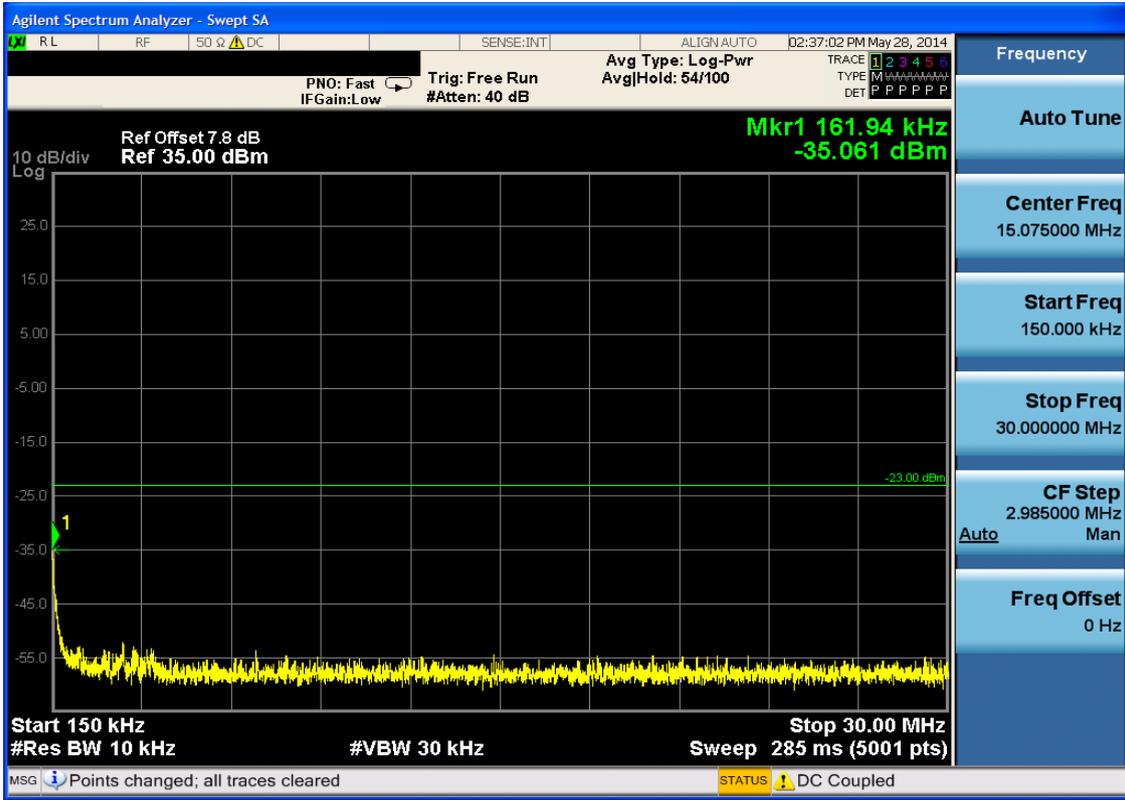


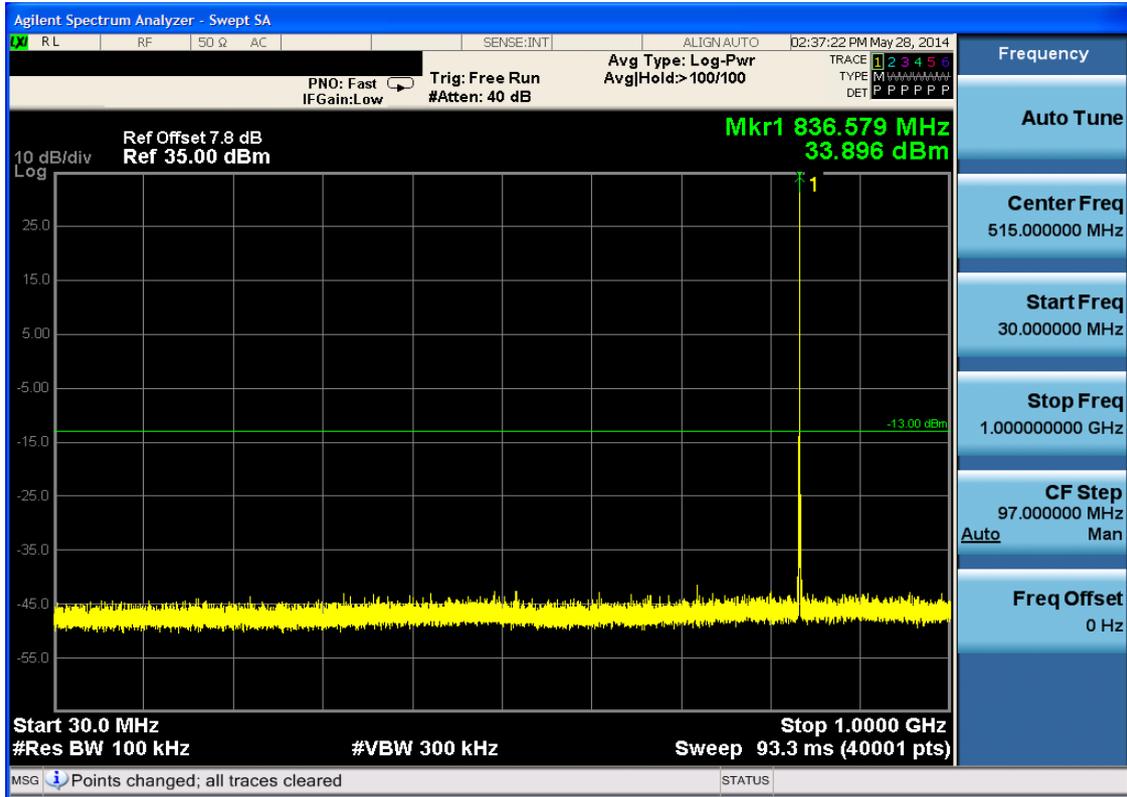


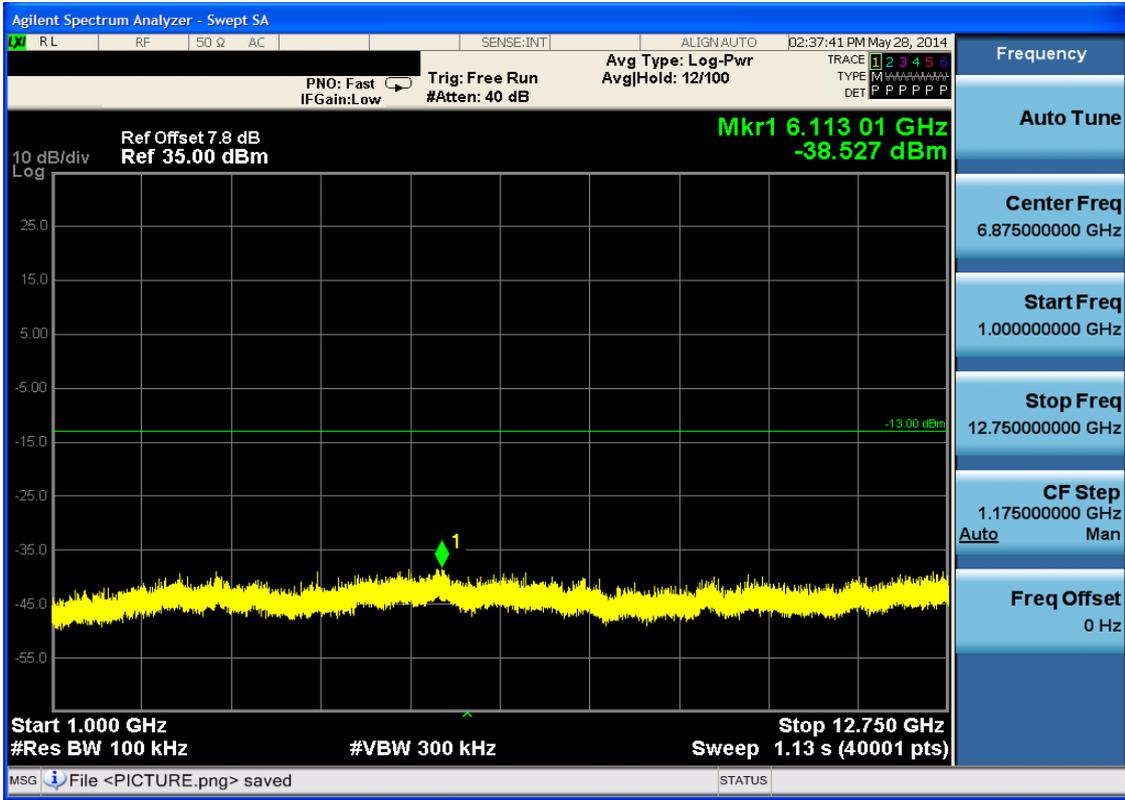


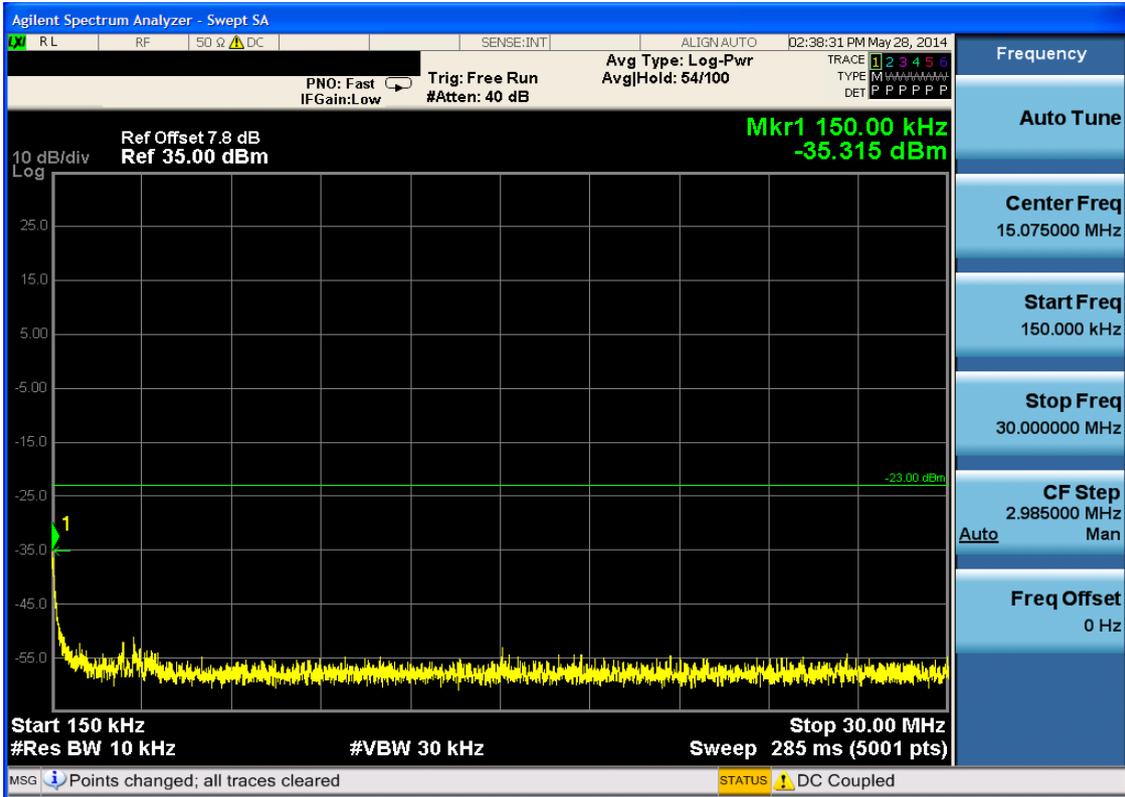
6.1.1.1.2 Test Channel = MCH

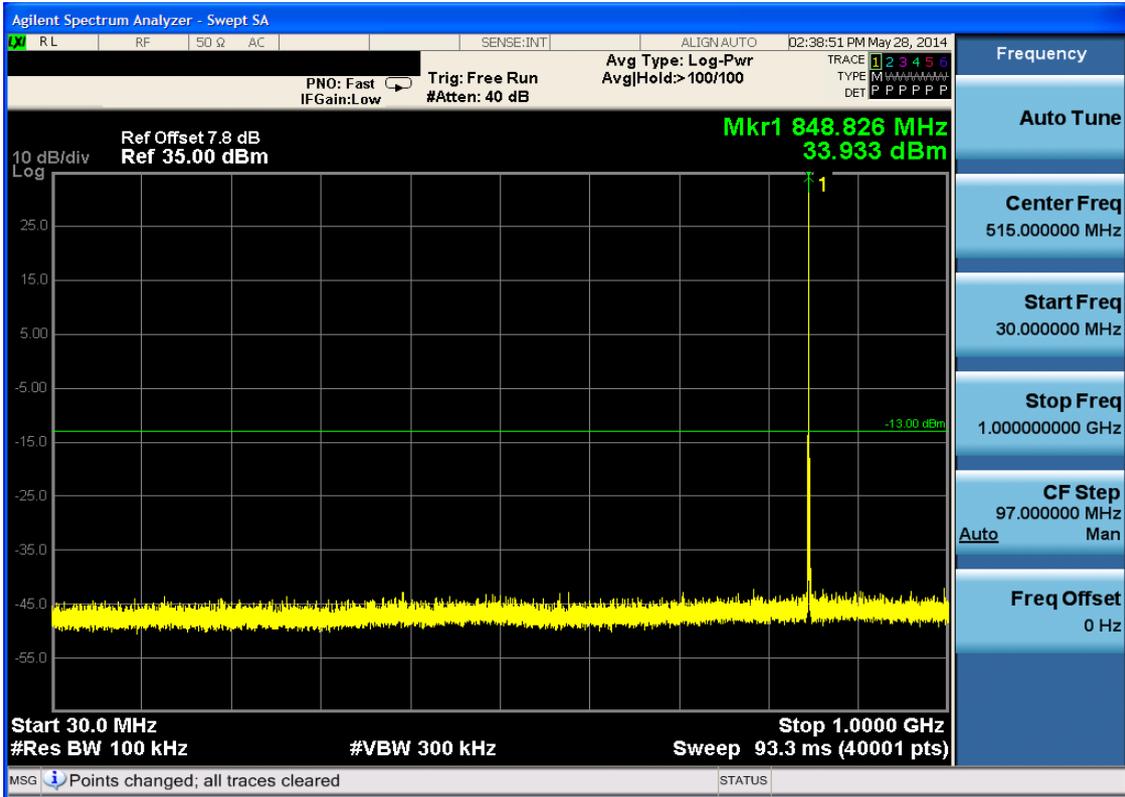


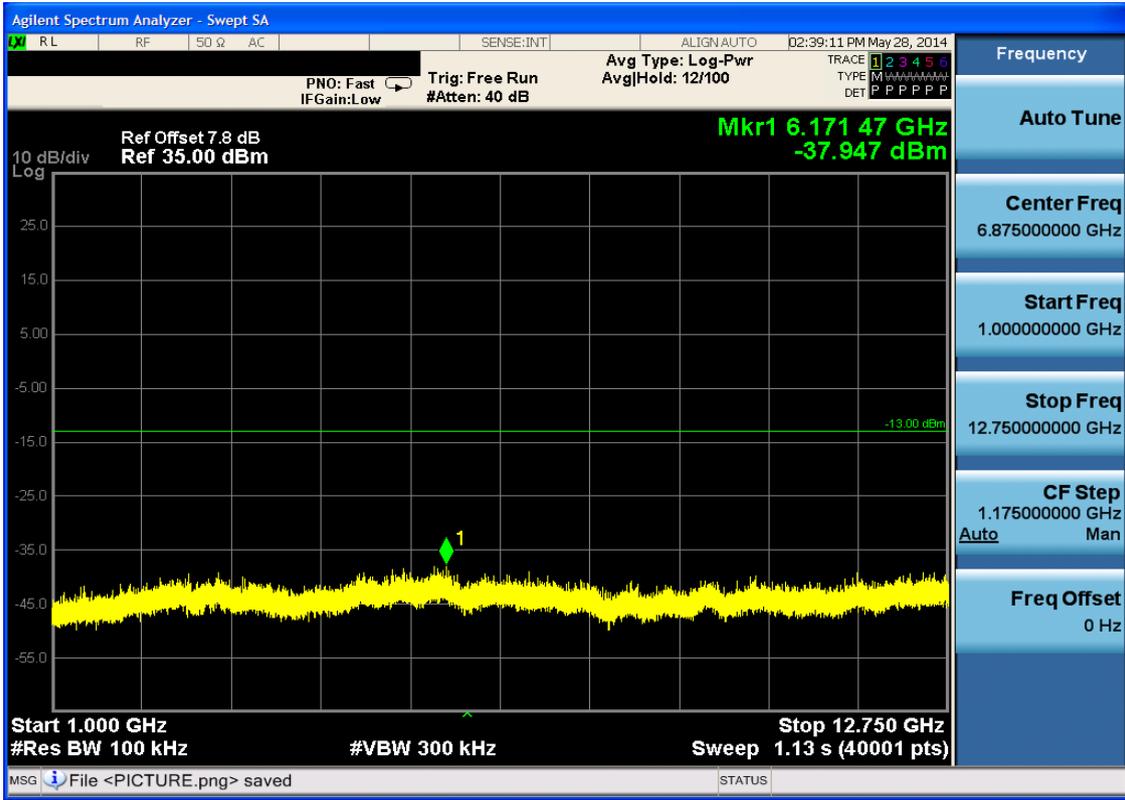








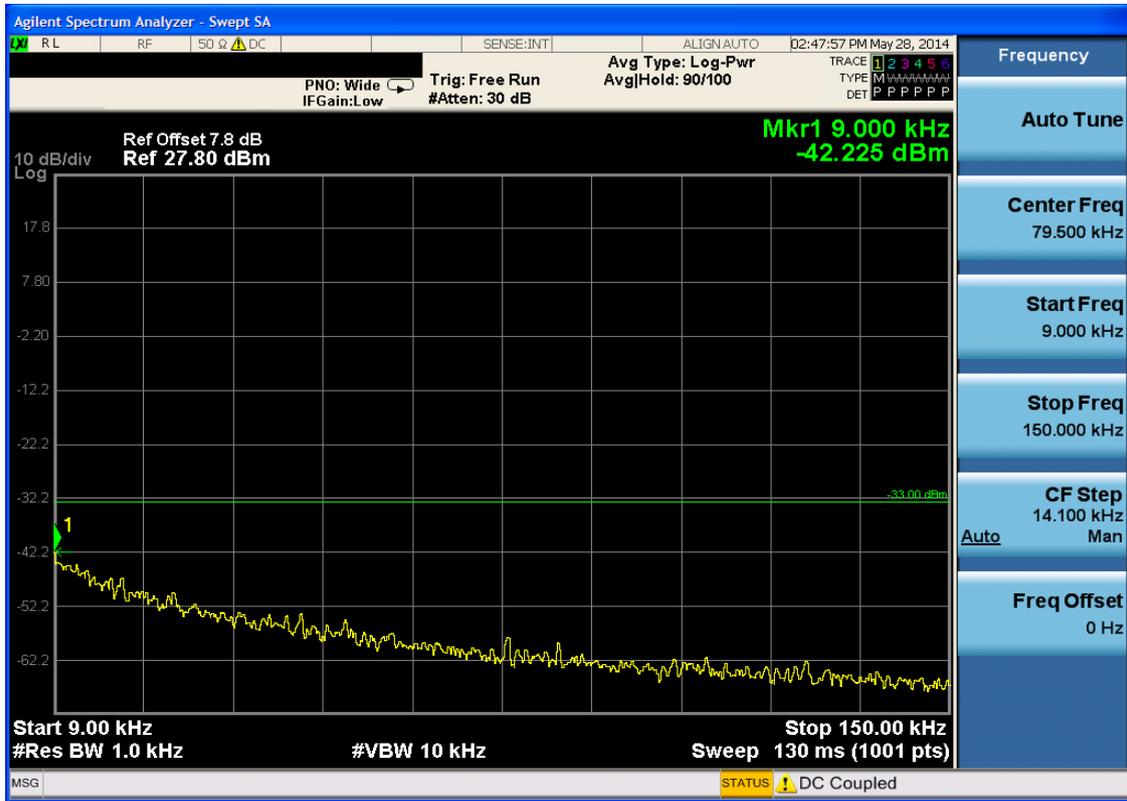


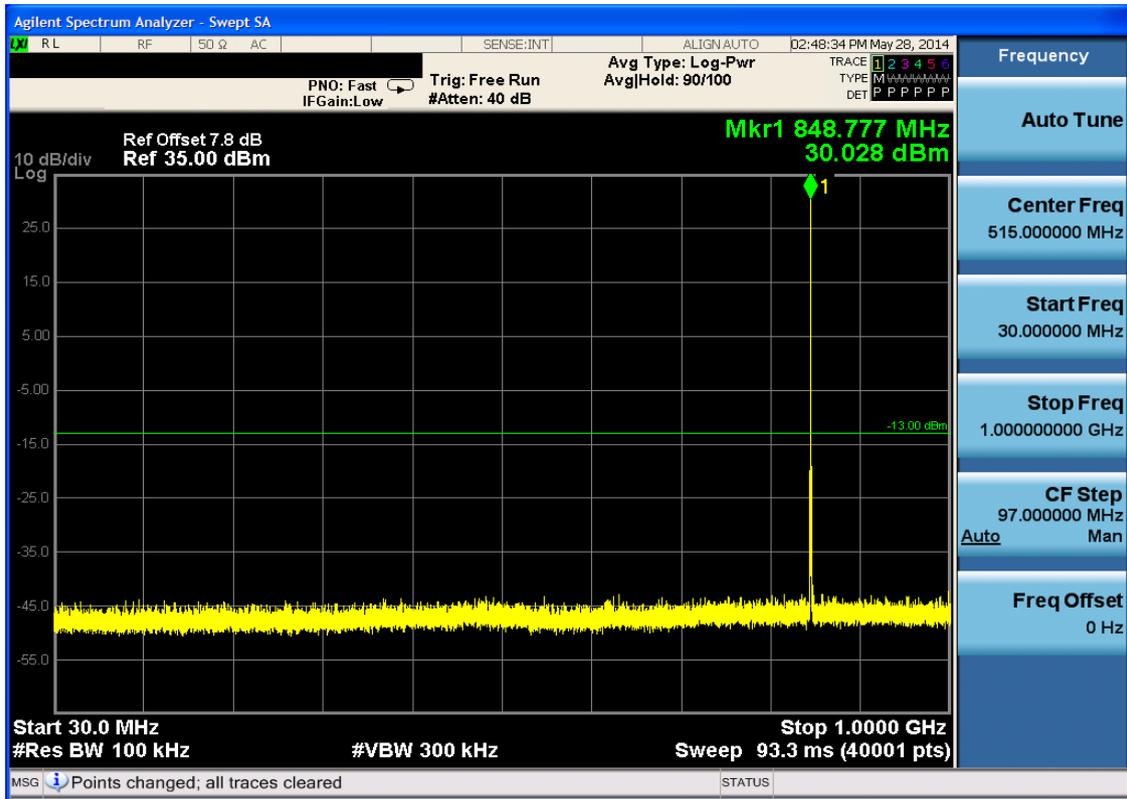


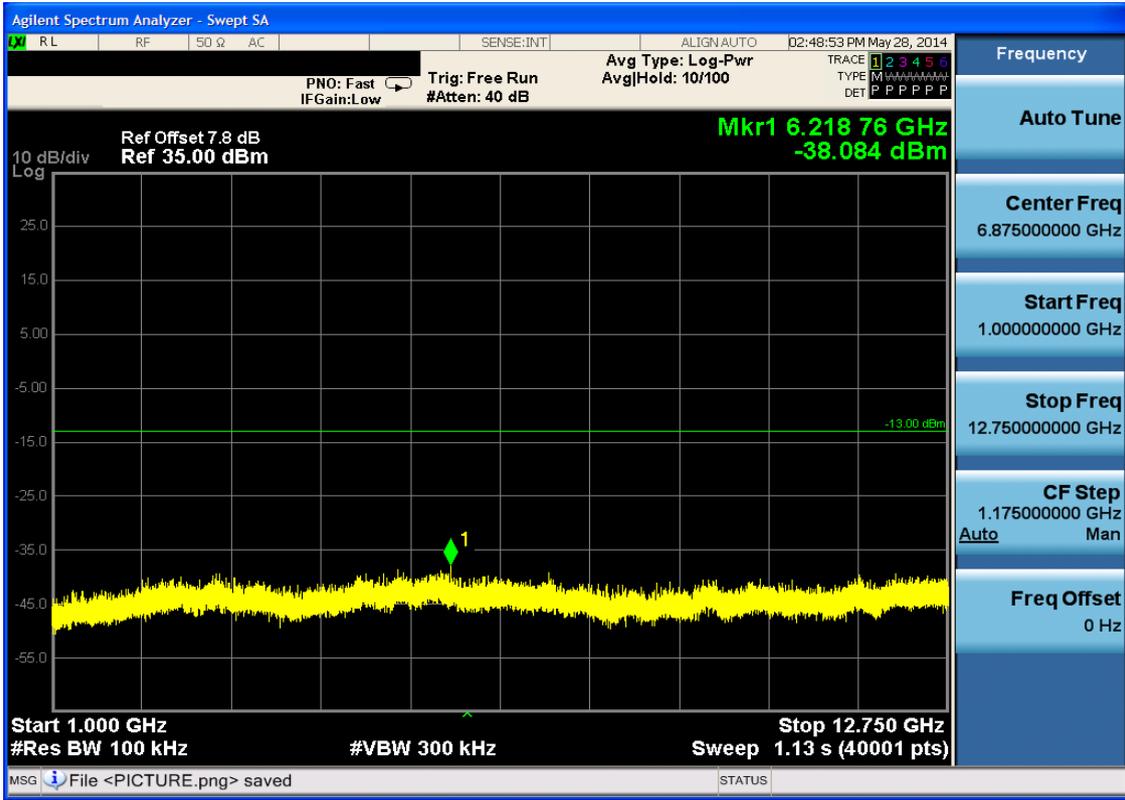


6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH

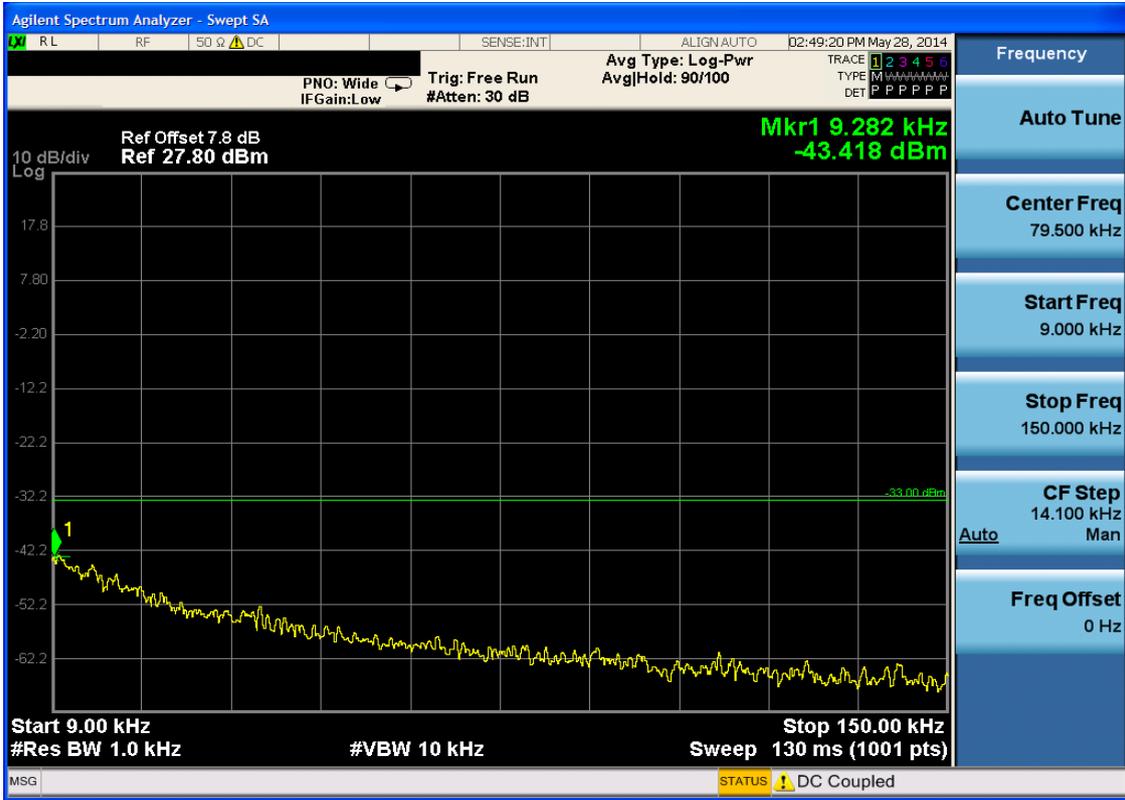


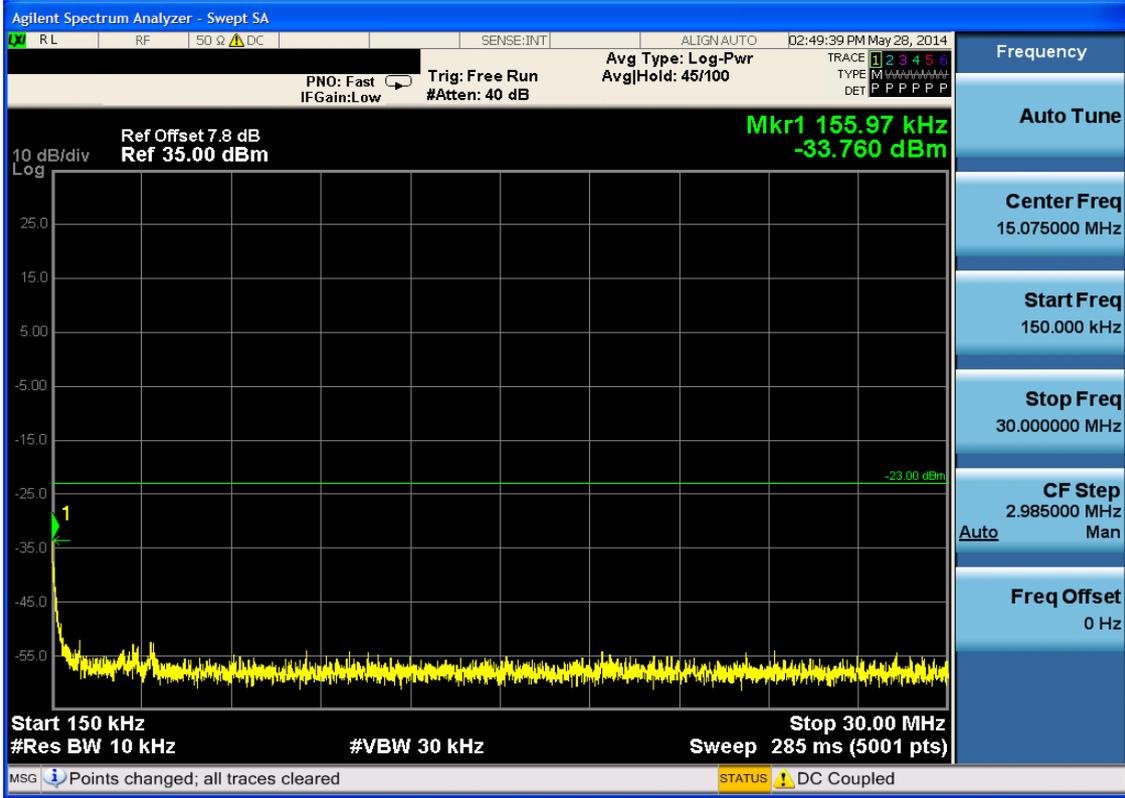


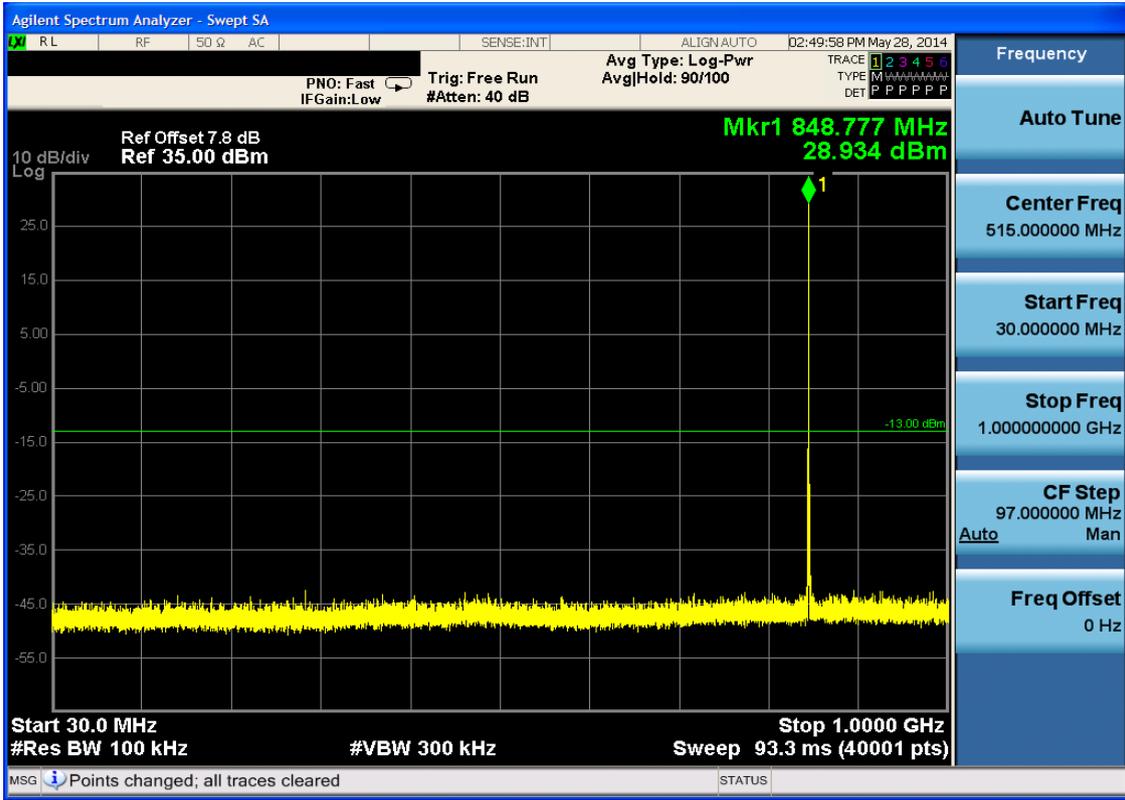


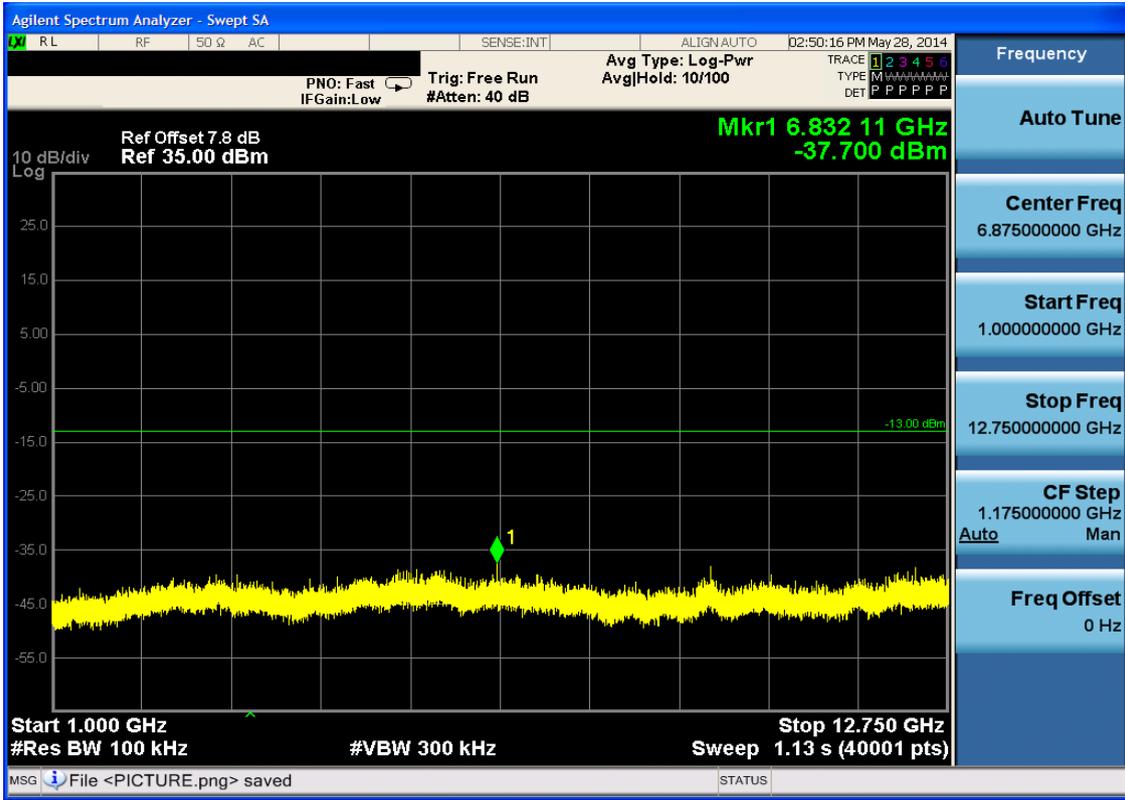


6.1.1.2.2 Test Channel = MCH





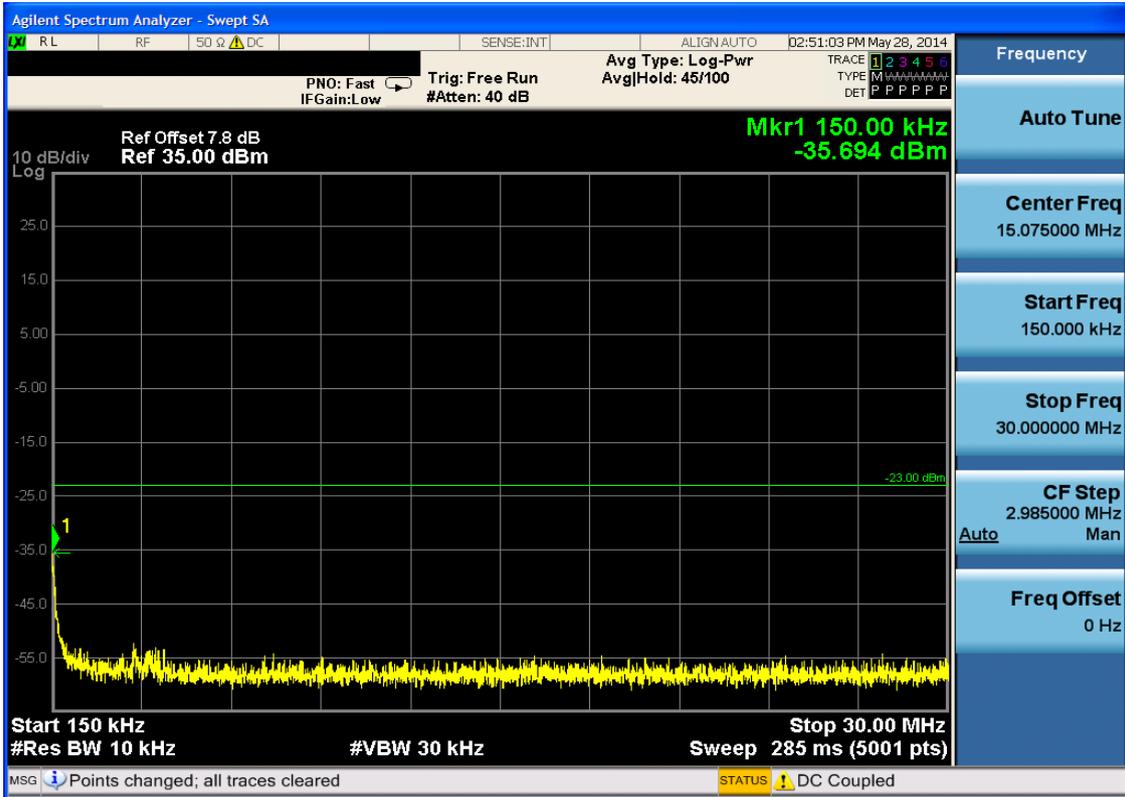


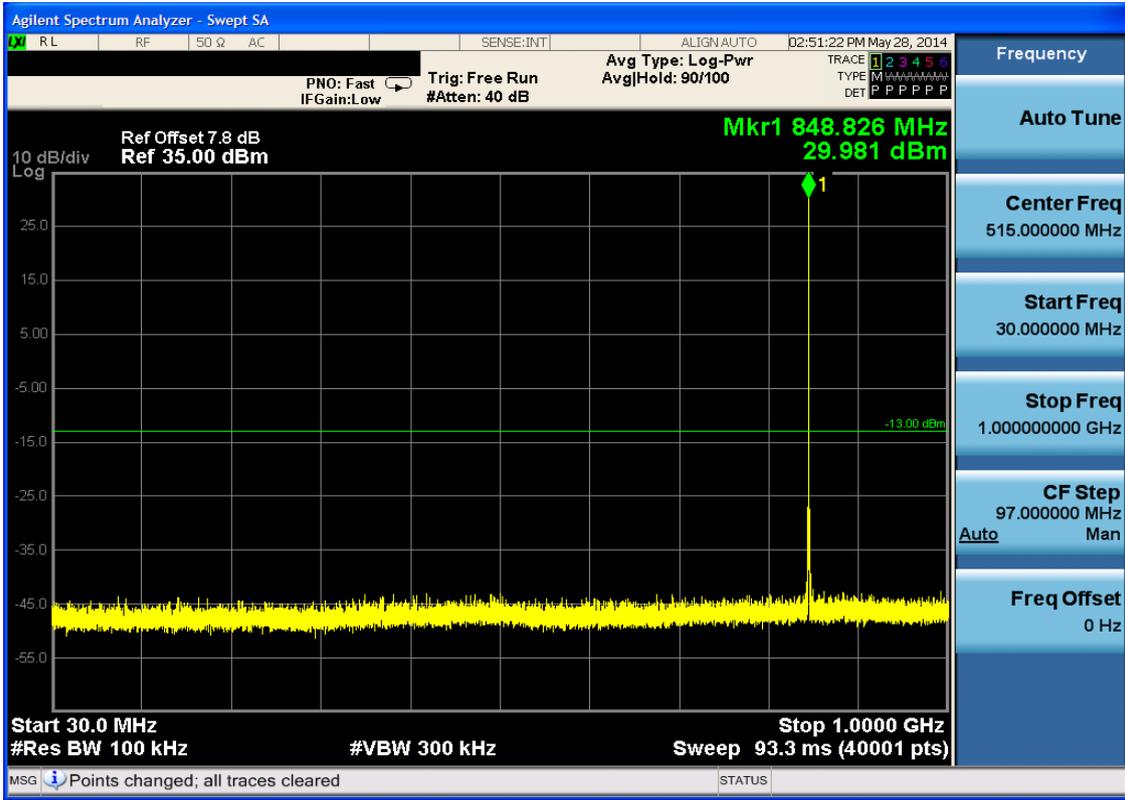


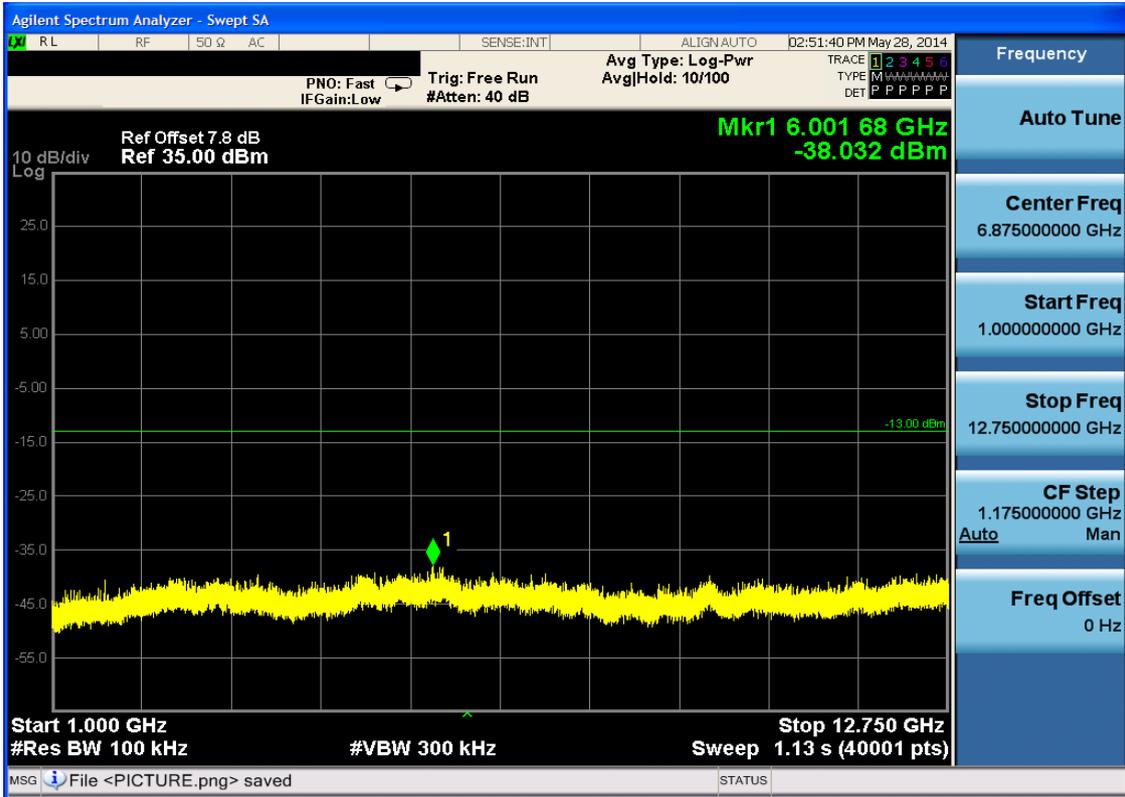


6.1.1.2.3 Test Channel = HCH







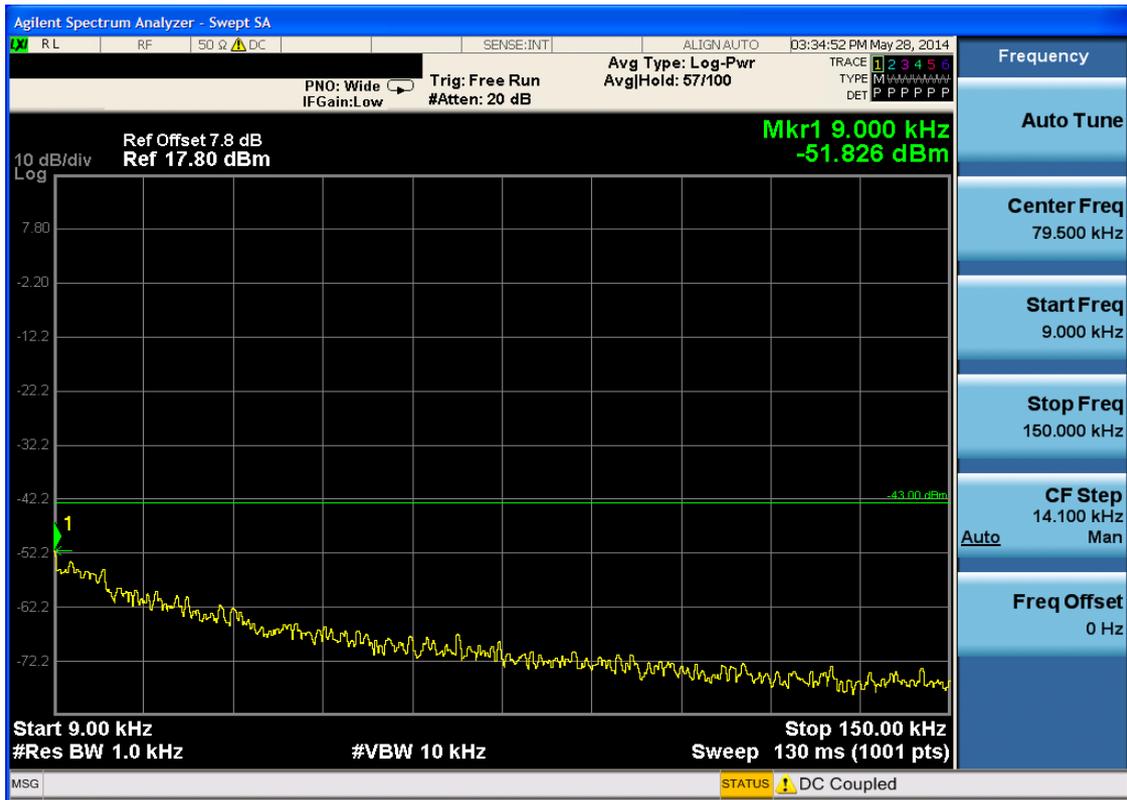


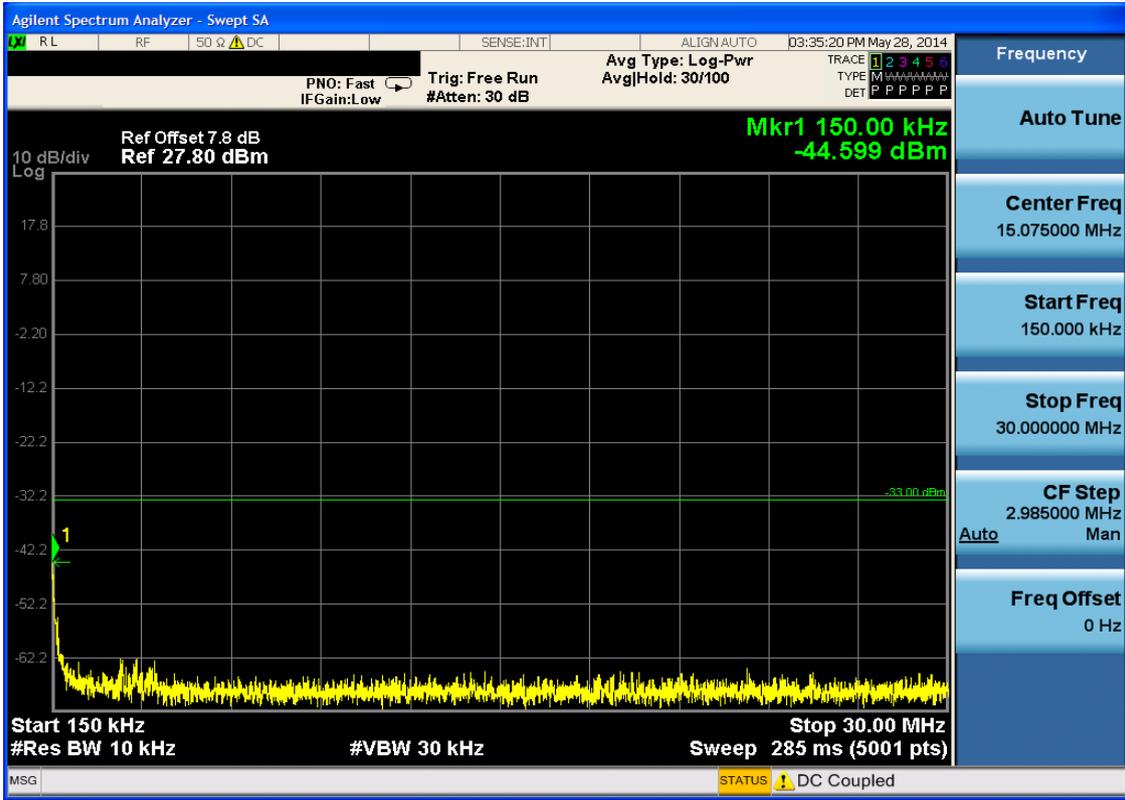


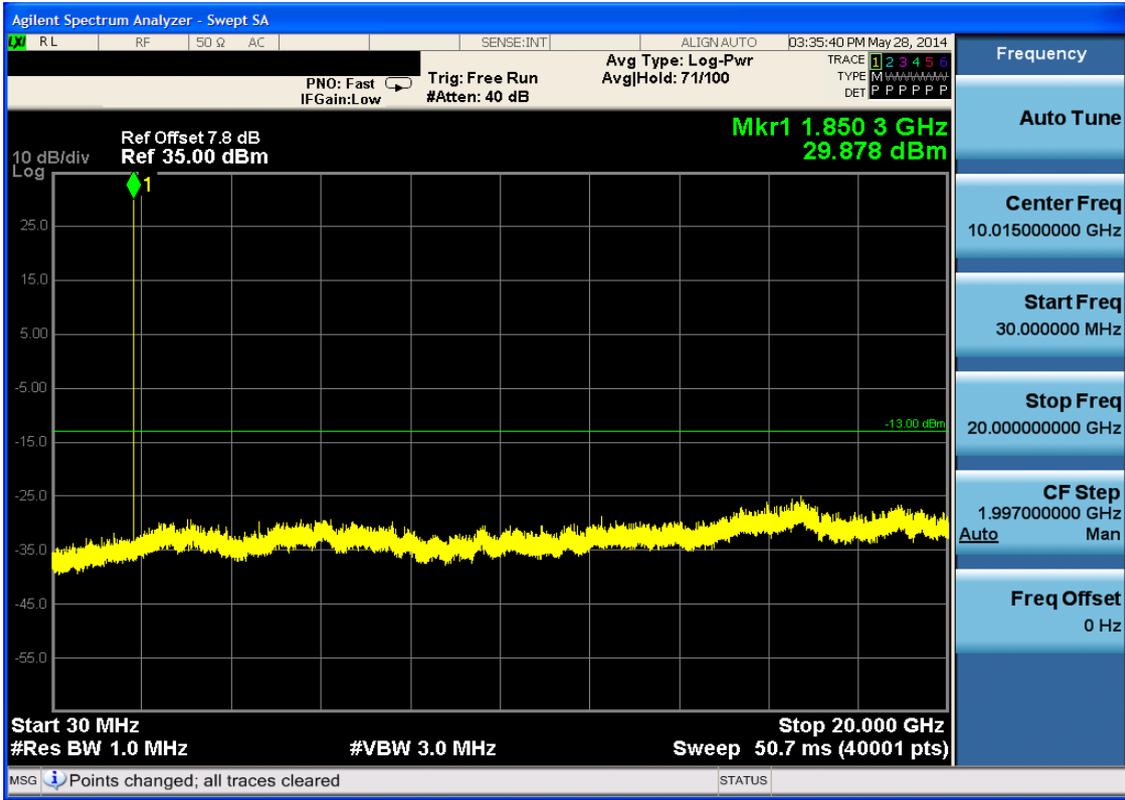
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH

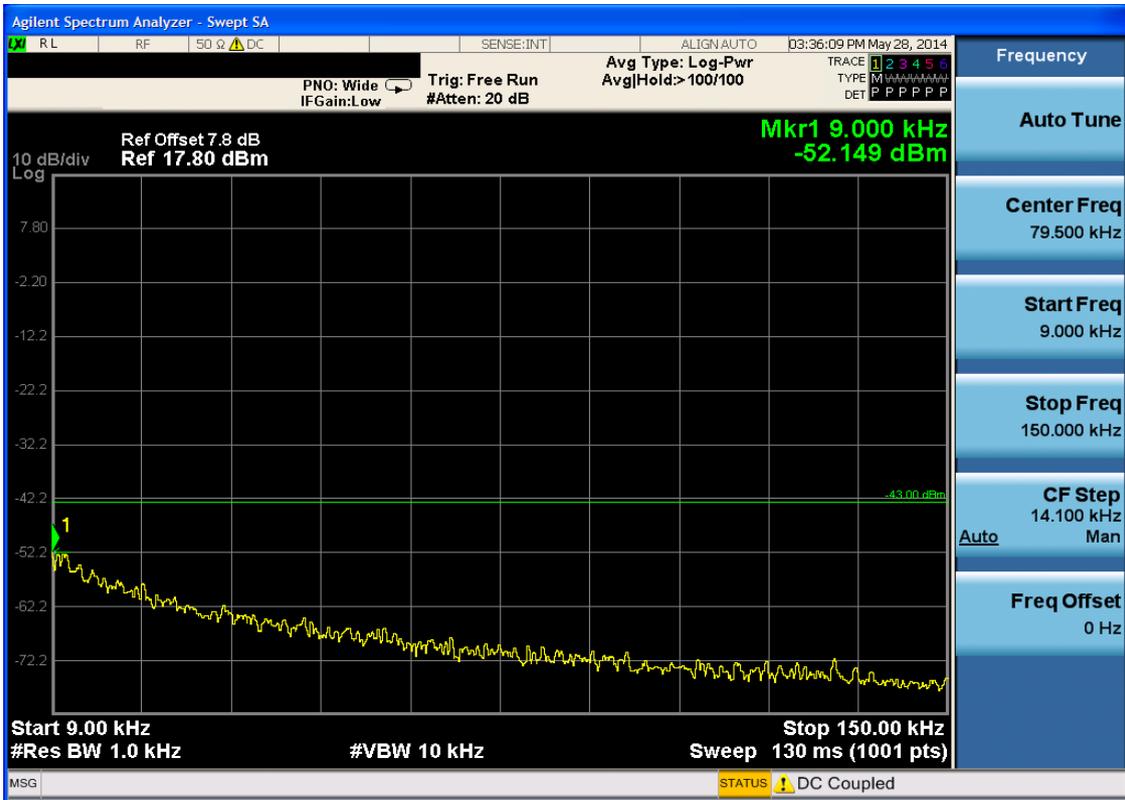


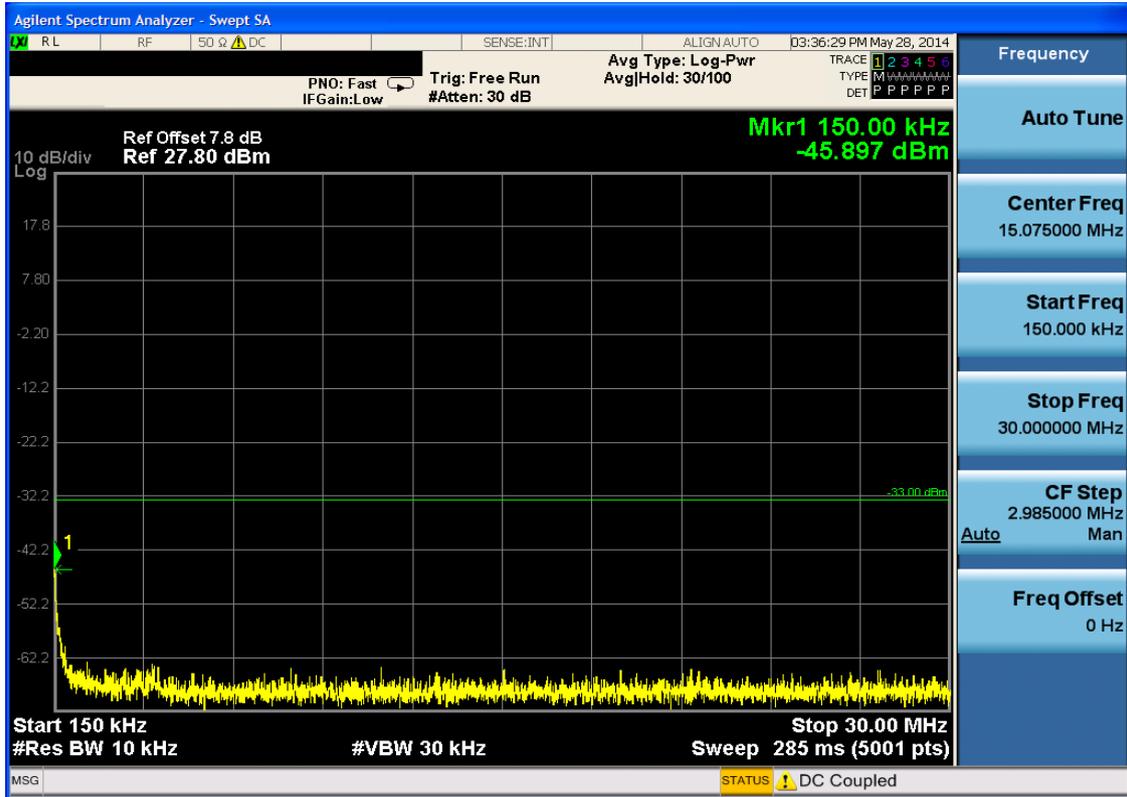






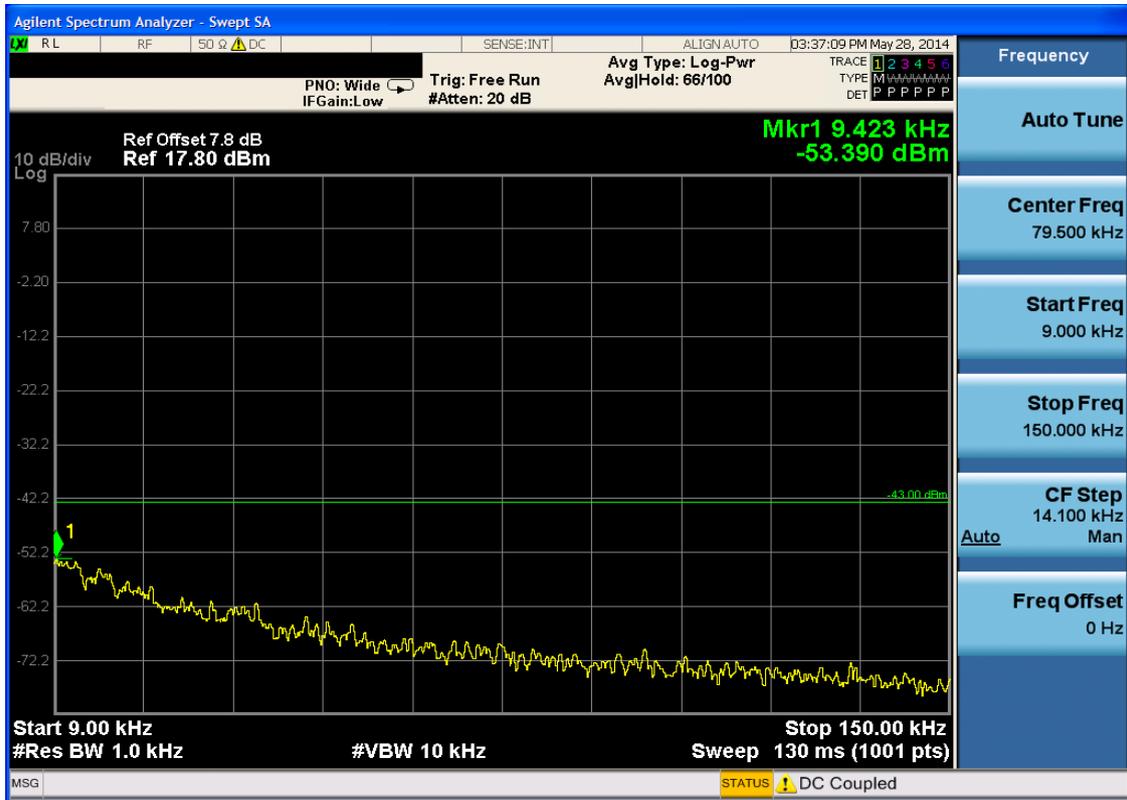
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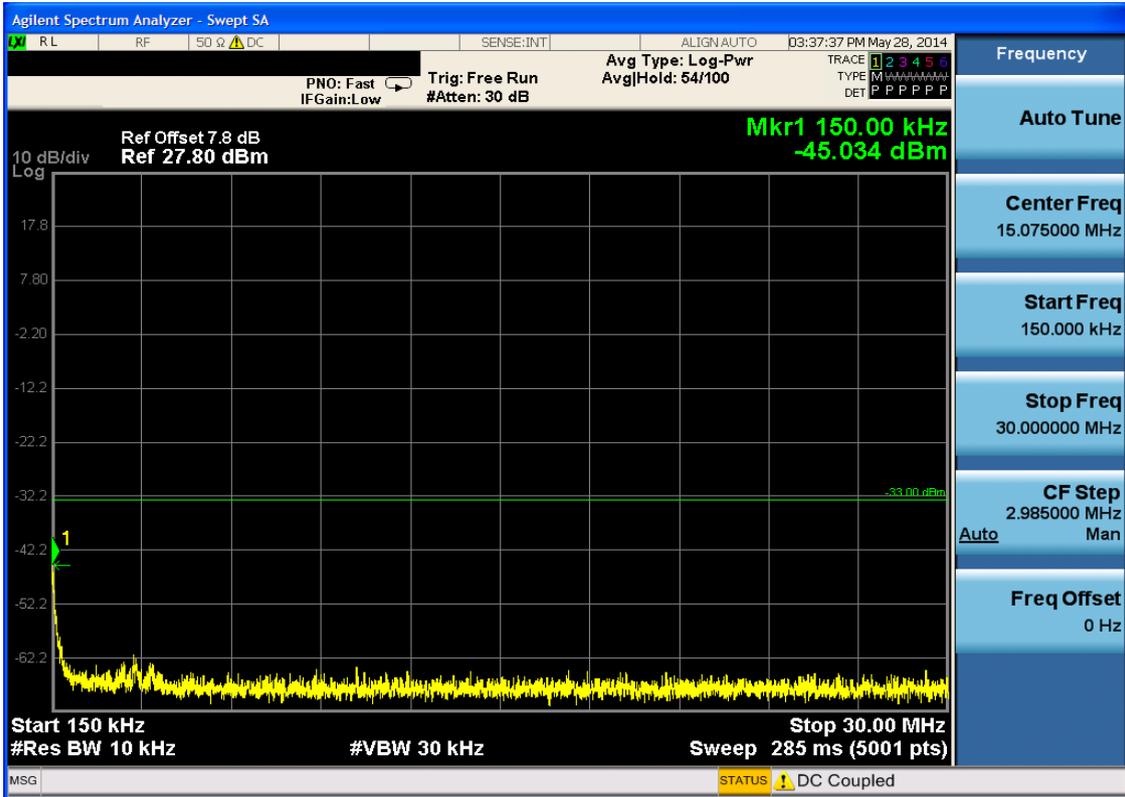


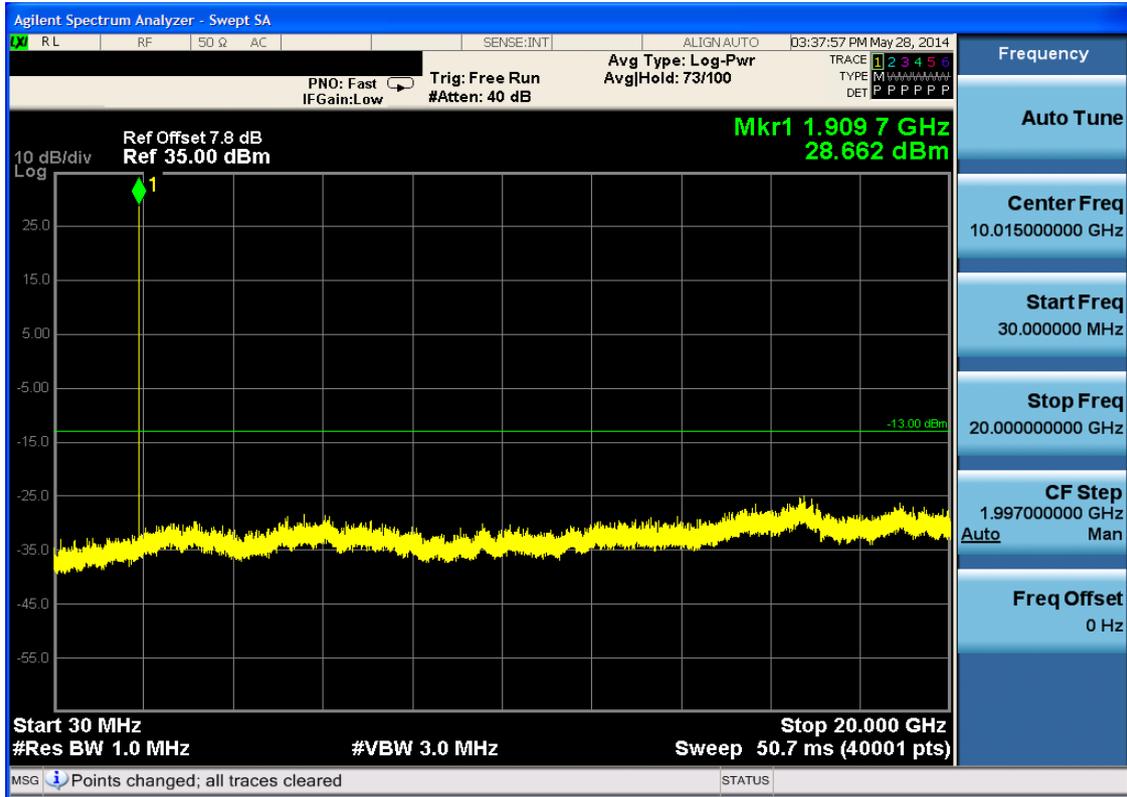




6.1.2.1.3 Test Channel = HCH

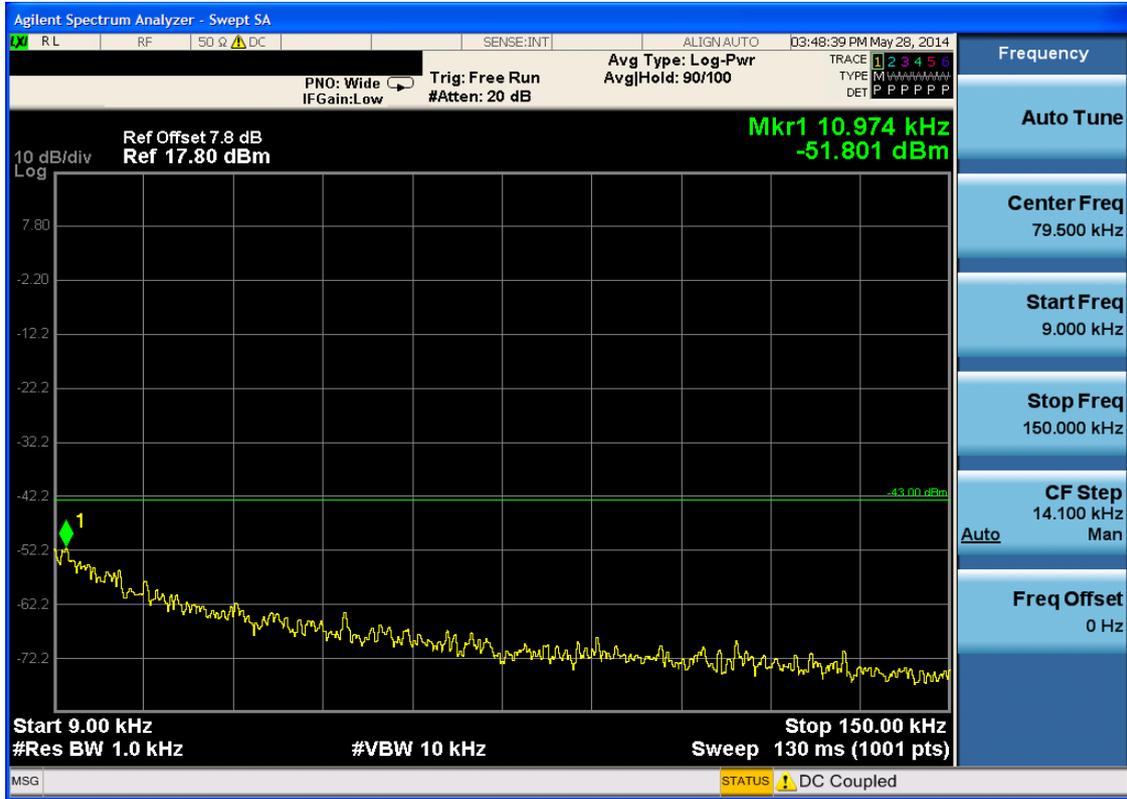


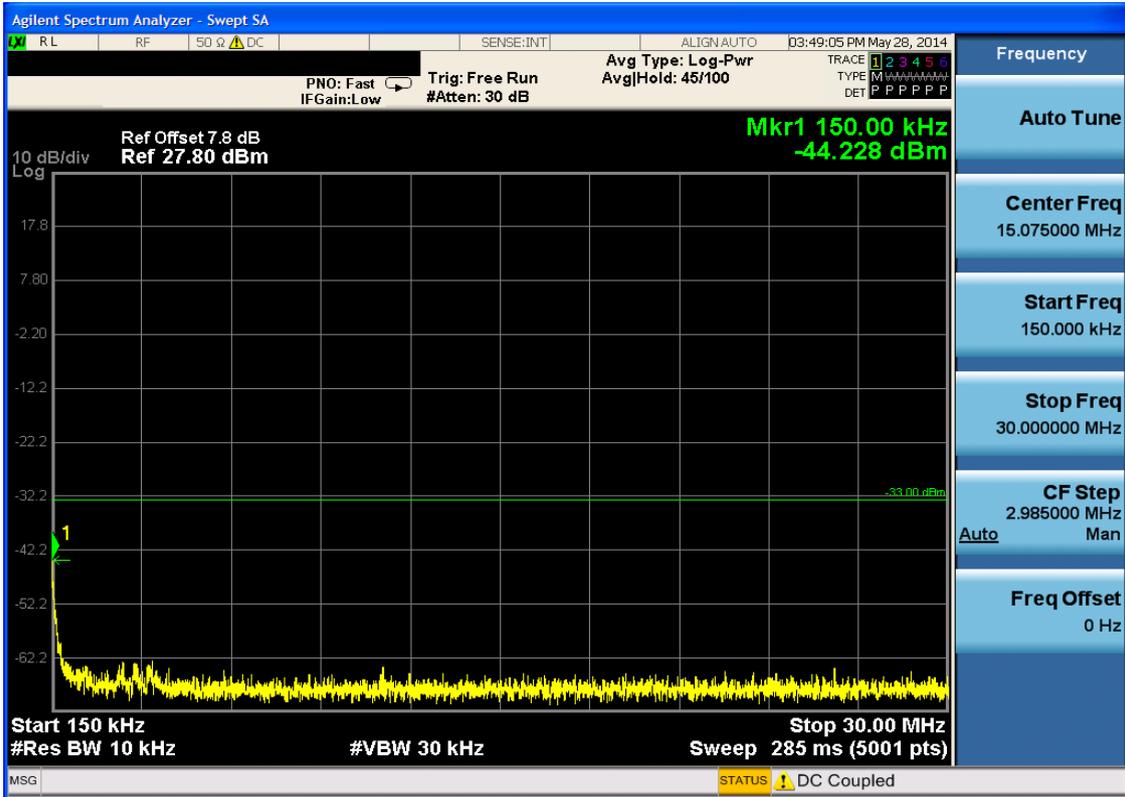


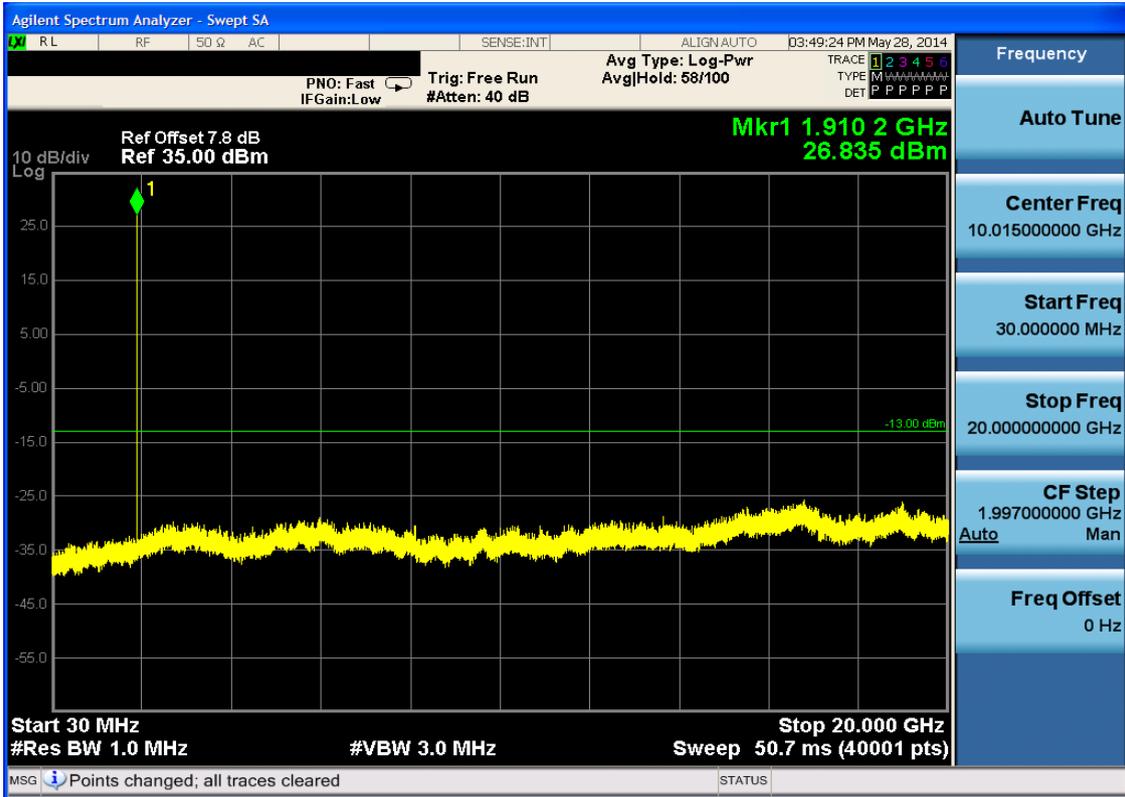


6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

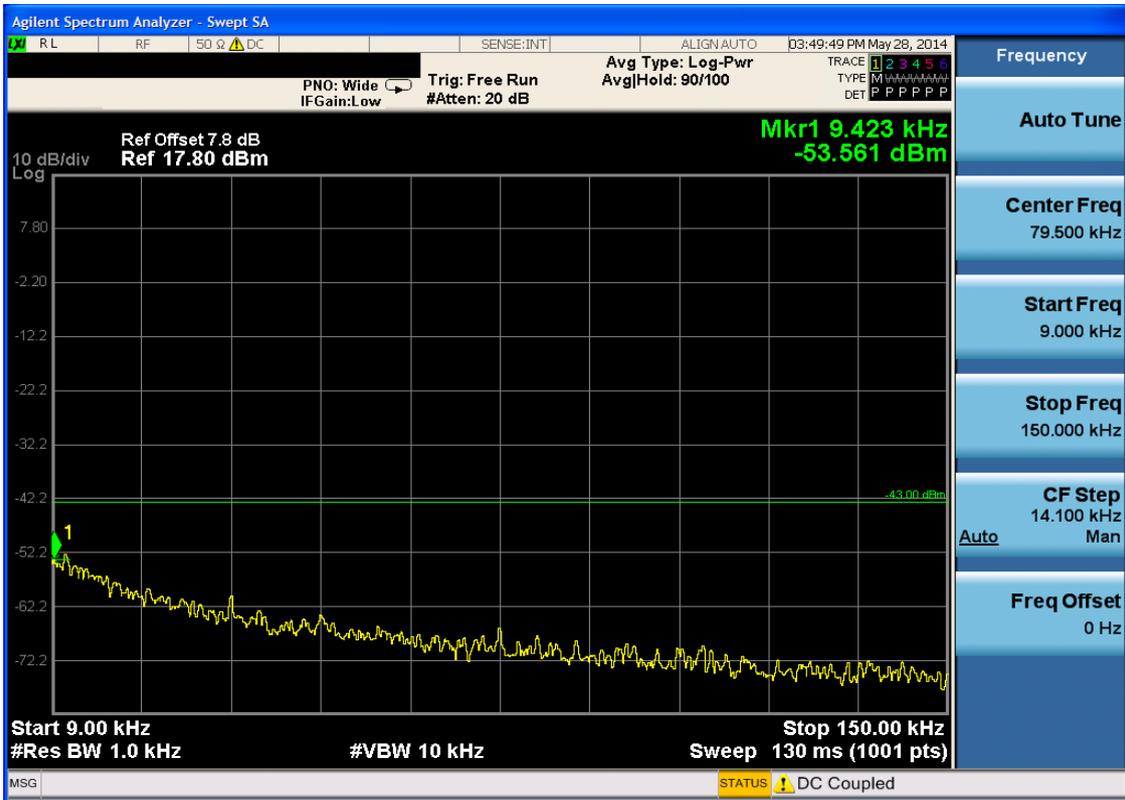


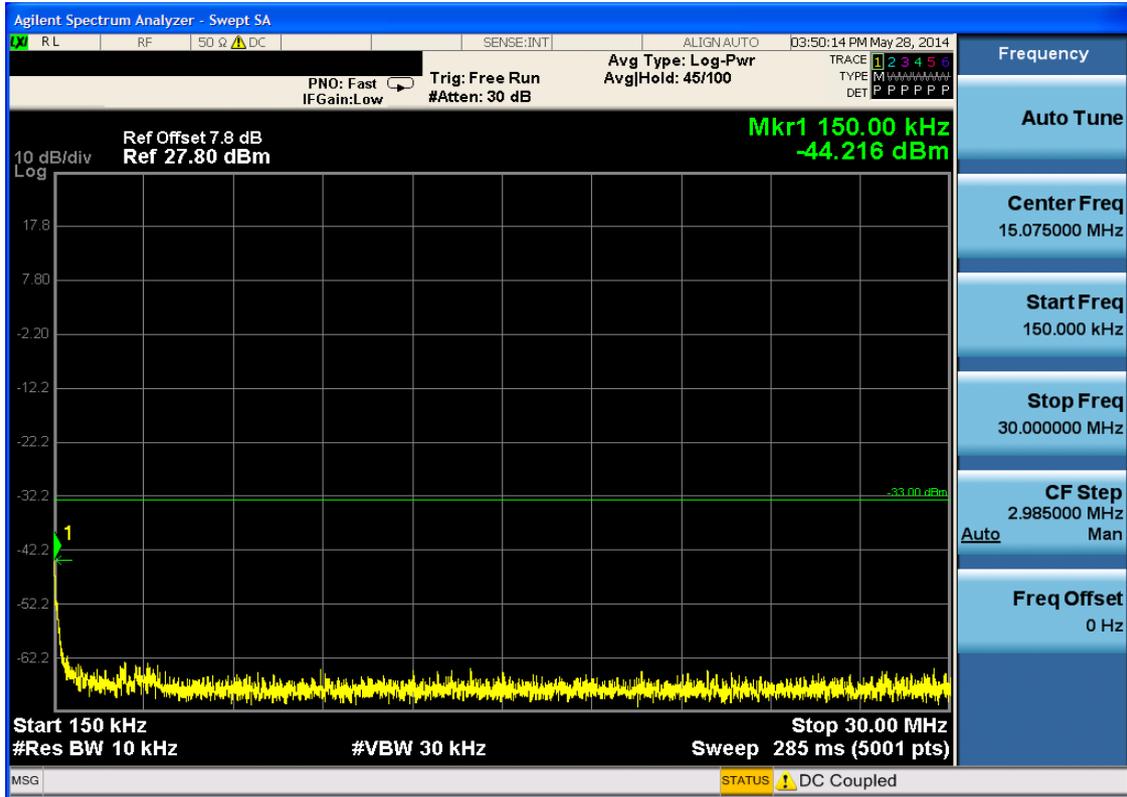


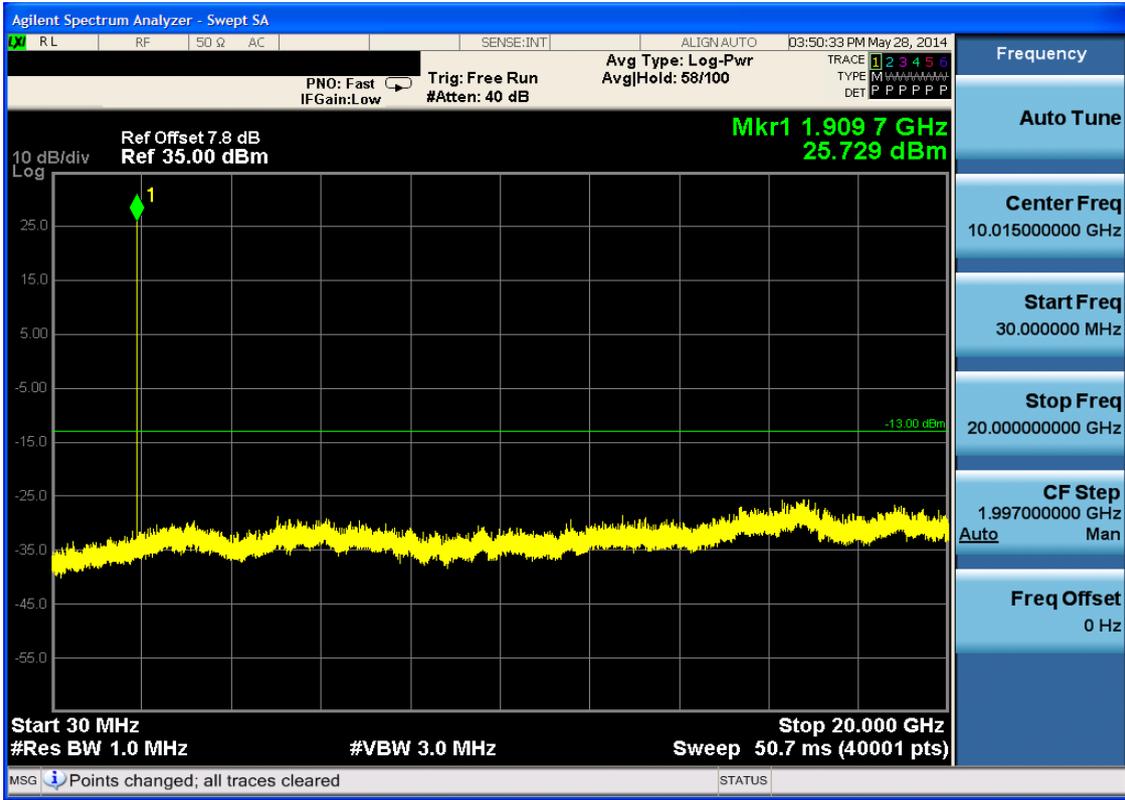




6.1.2.2.2 Test Channel = MCH



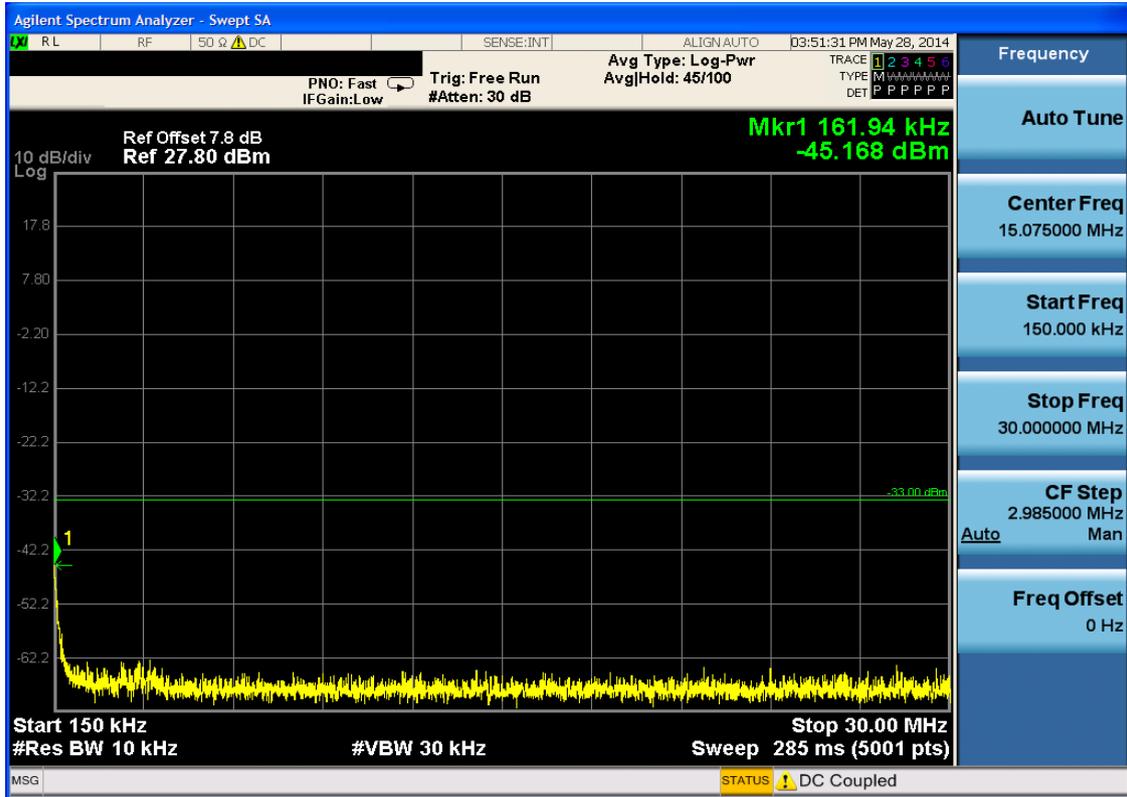


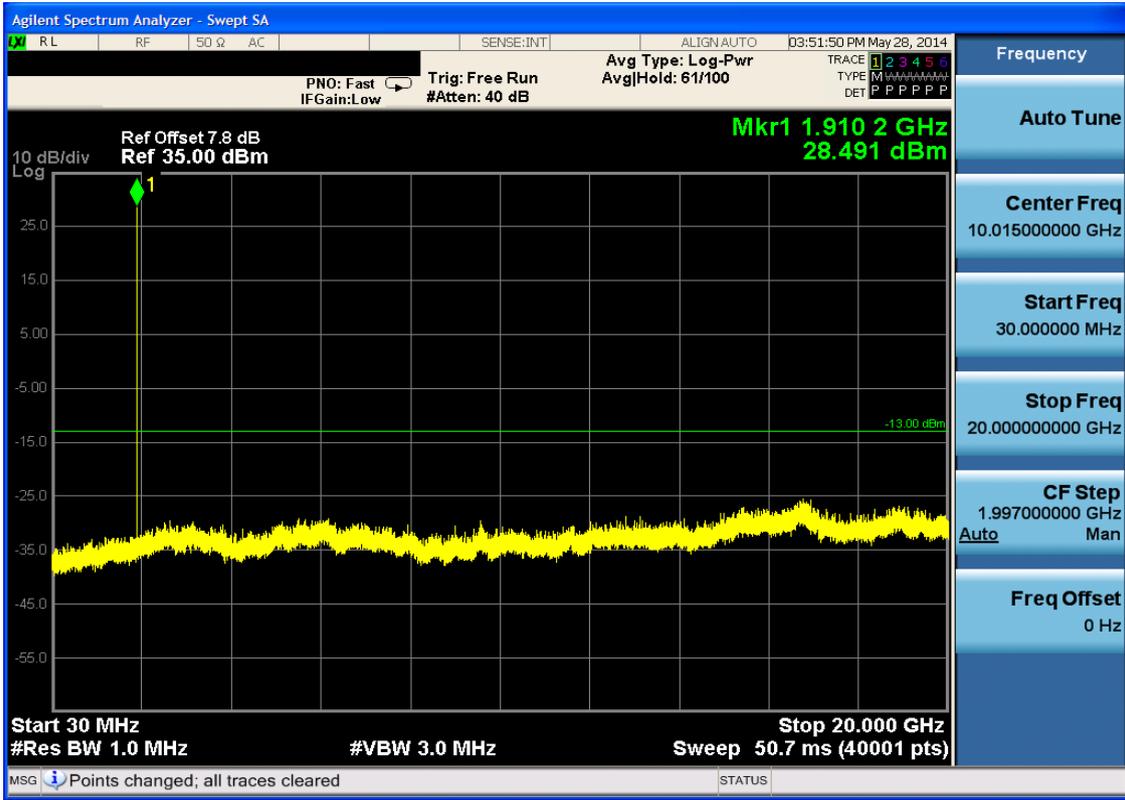




6.1.2.2.3 Test Channel = HCH









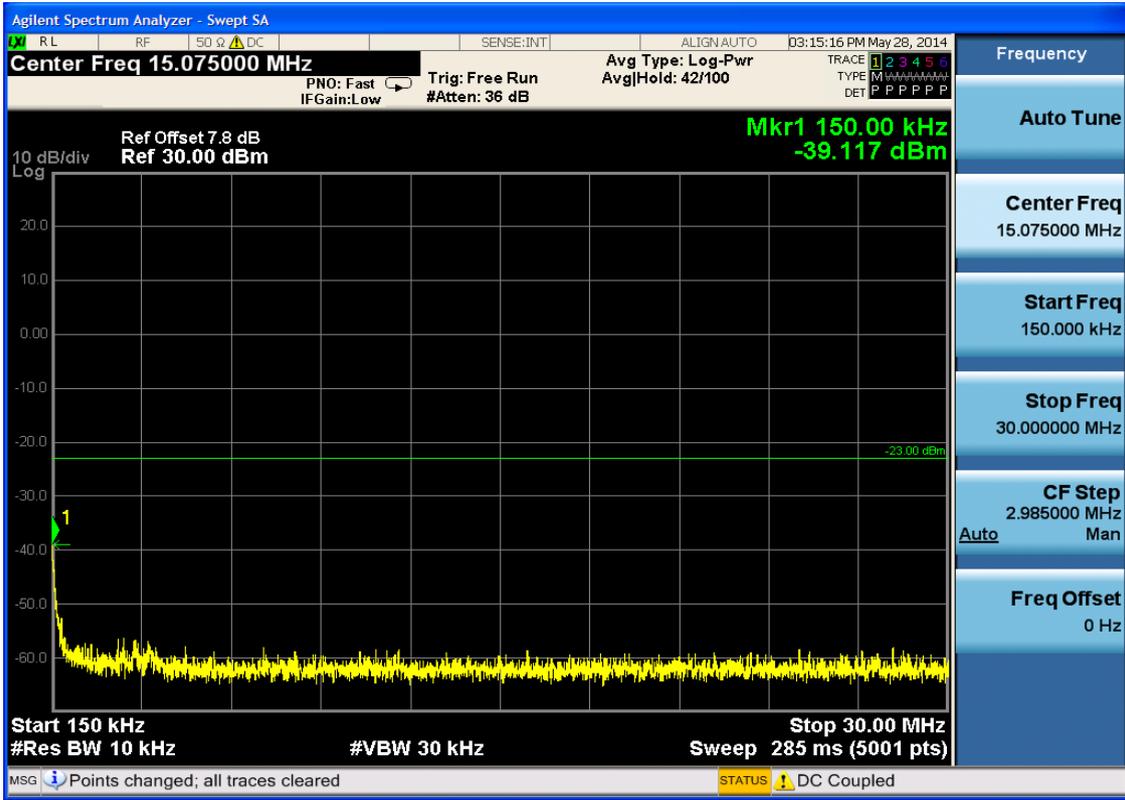
6.2 For UMTS

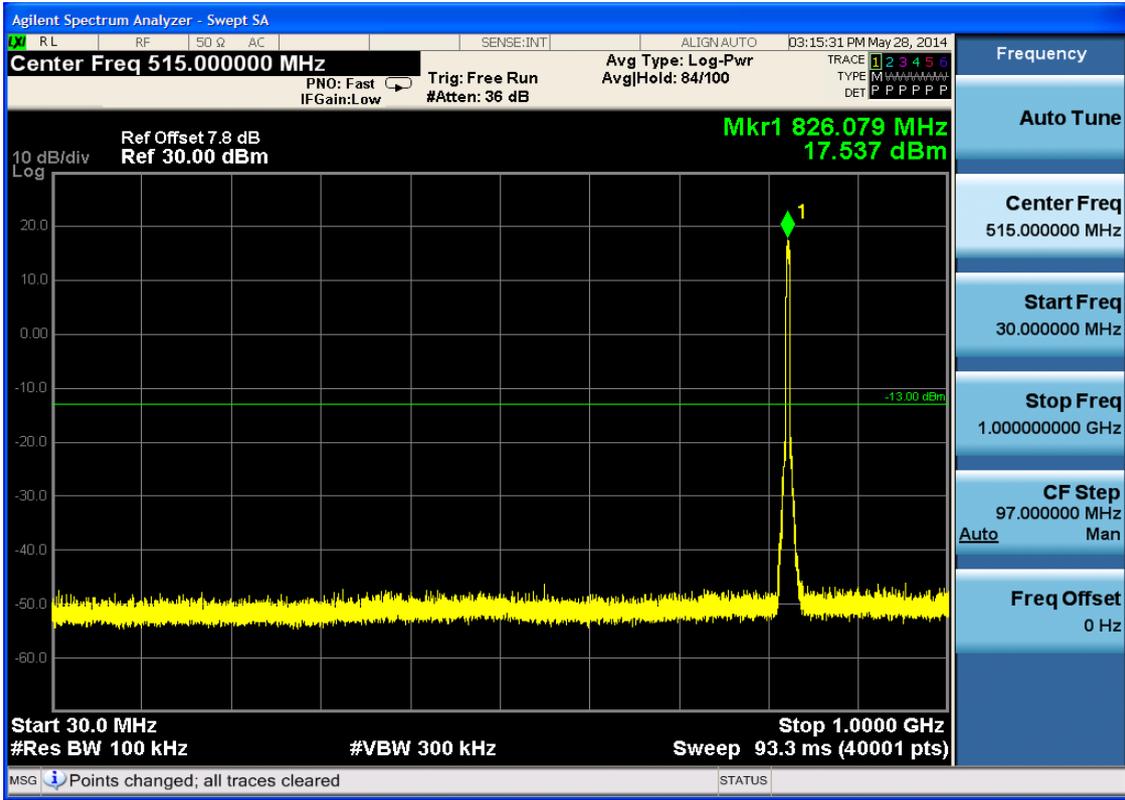
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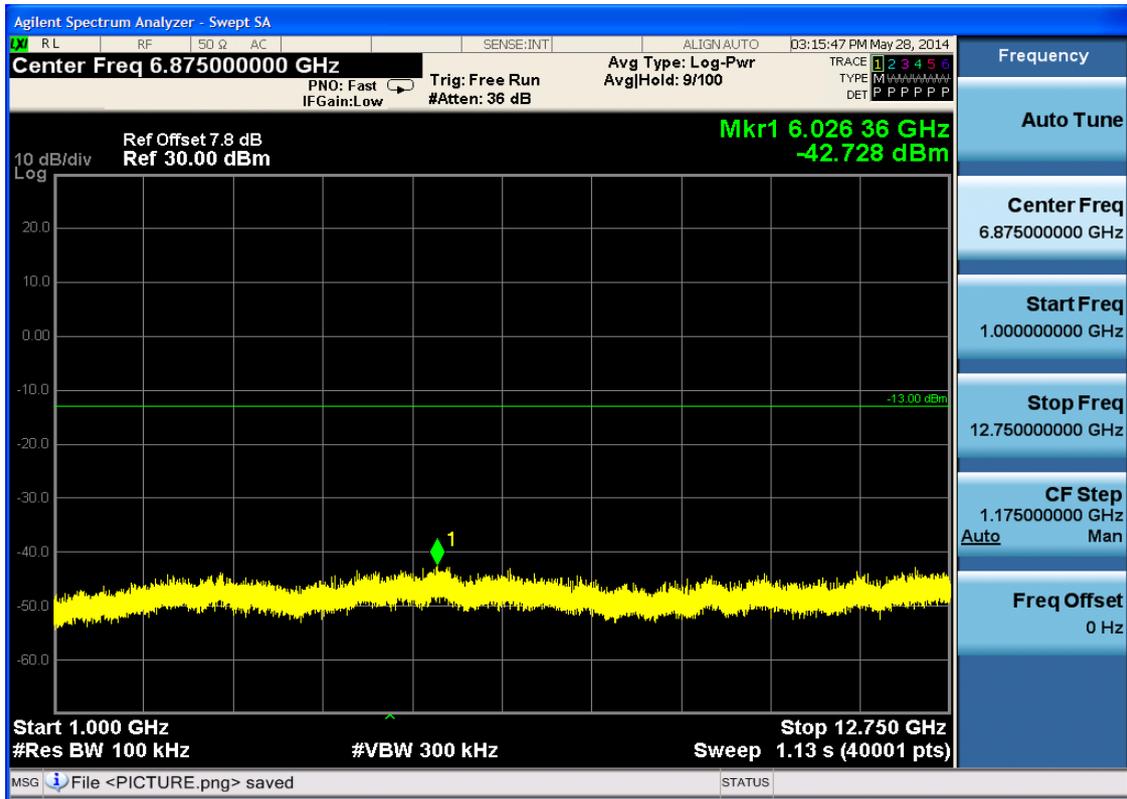
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6.2.1.1.1 Test Channel = LCH





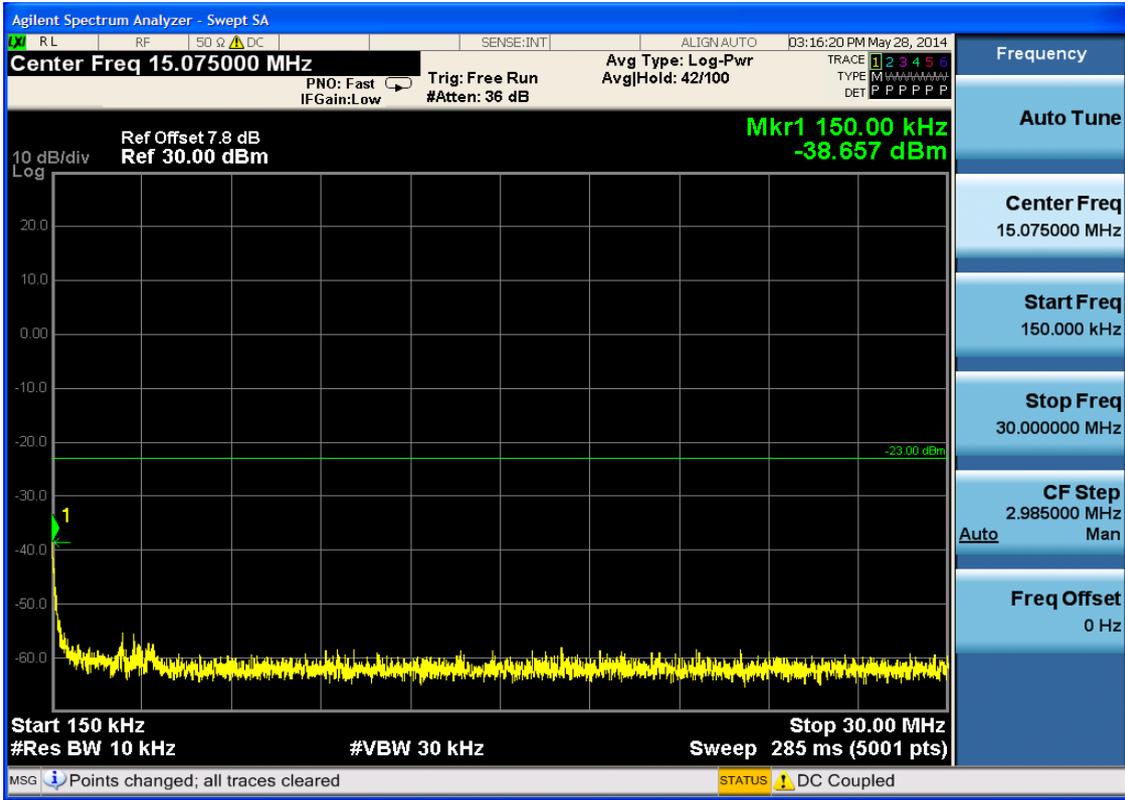


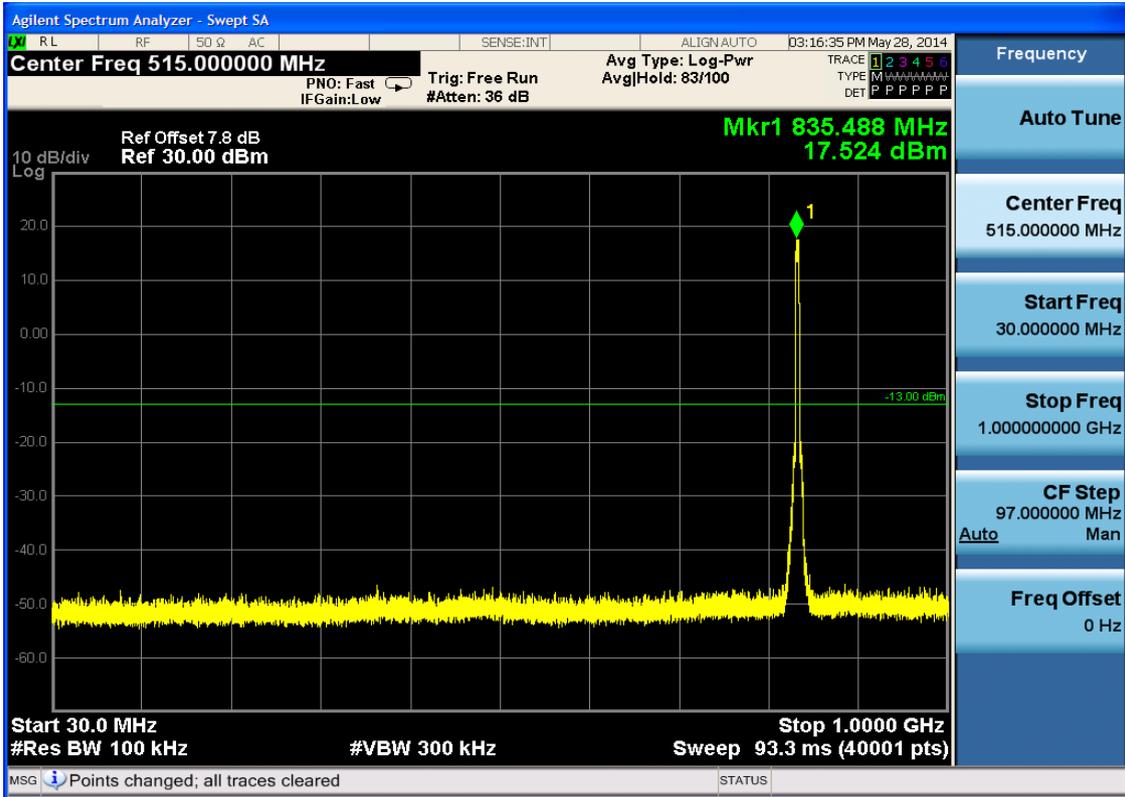


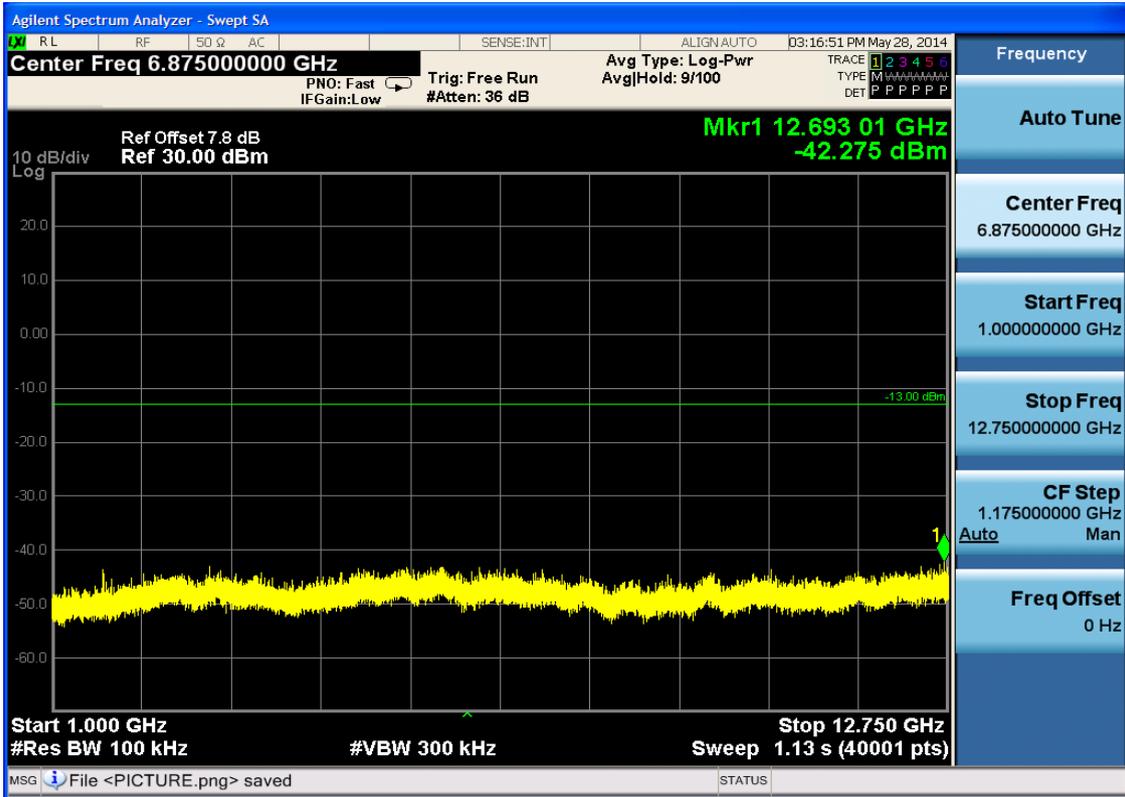


6.2.1.1.2 Test Channel = MCH



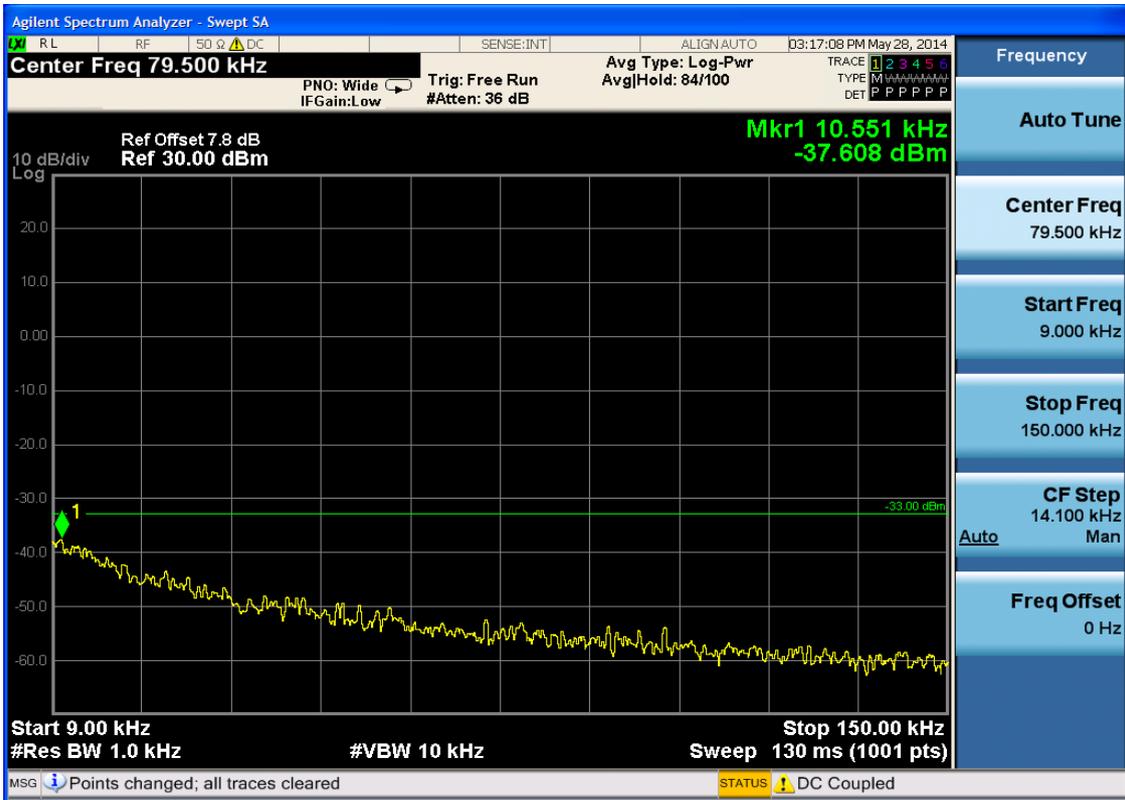


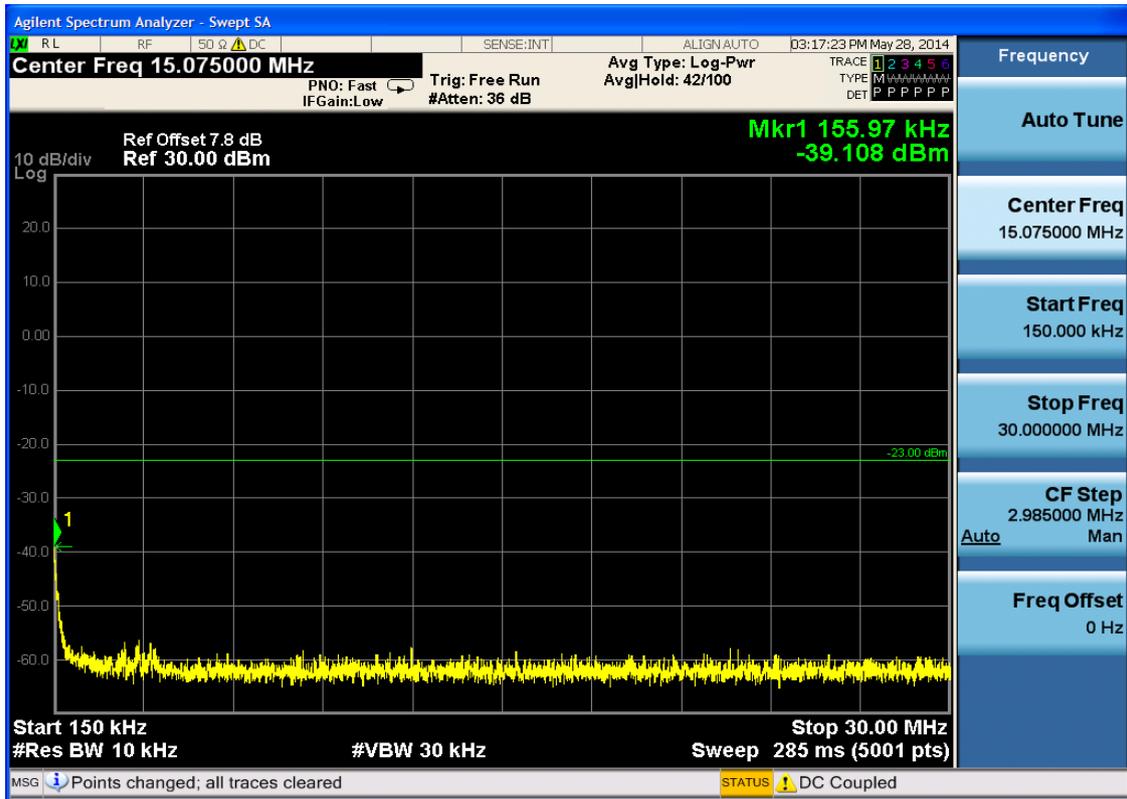


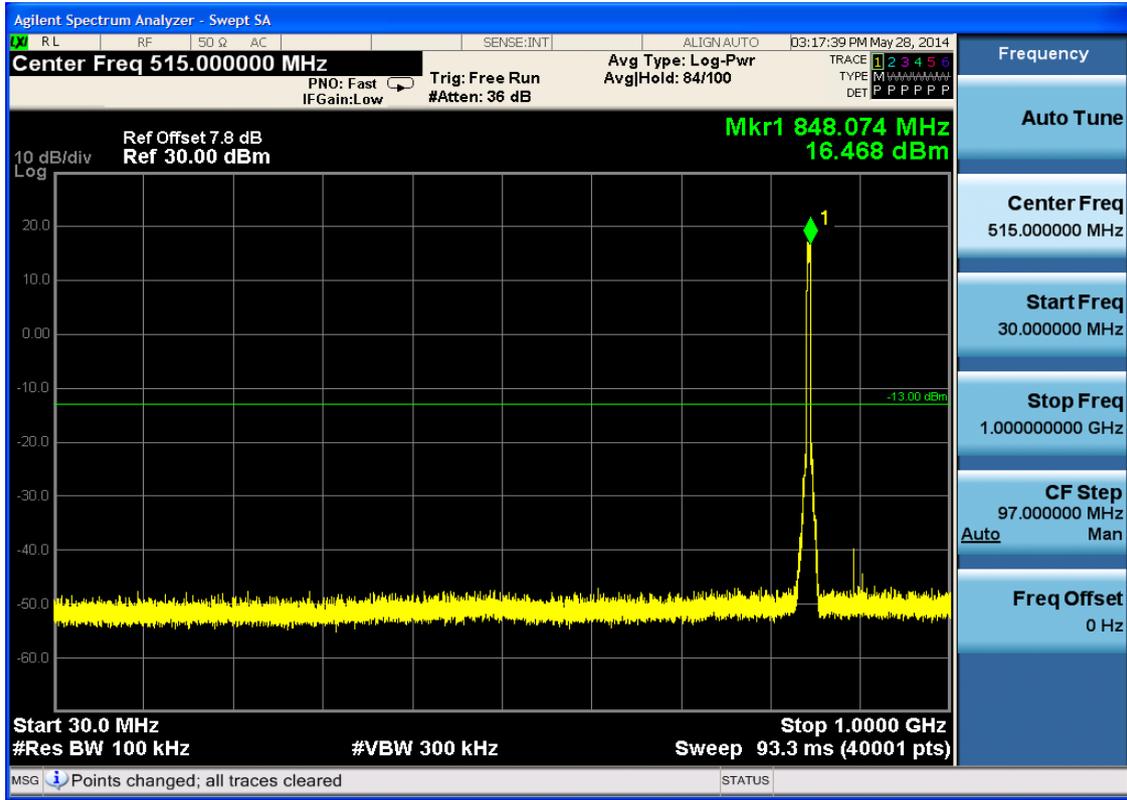


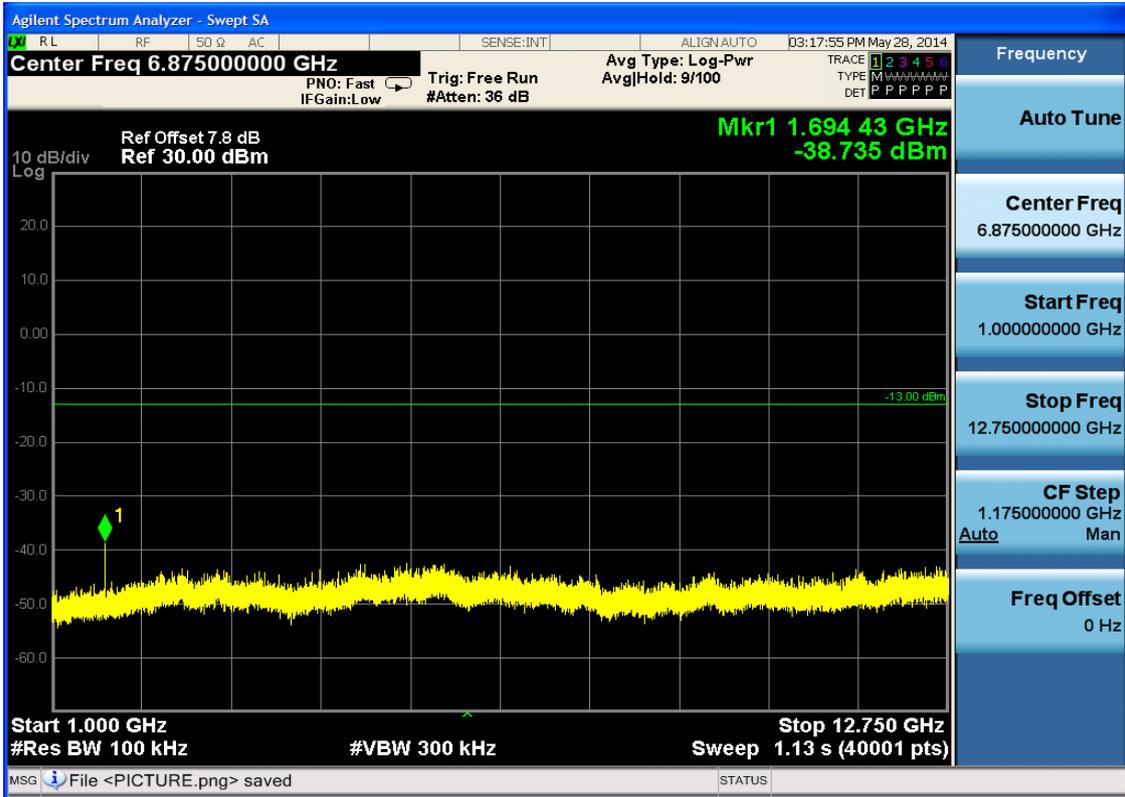


6.2.1.1.3 Test Channel = HCH









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

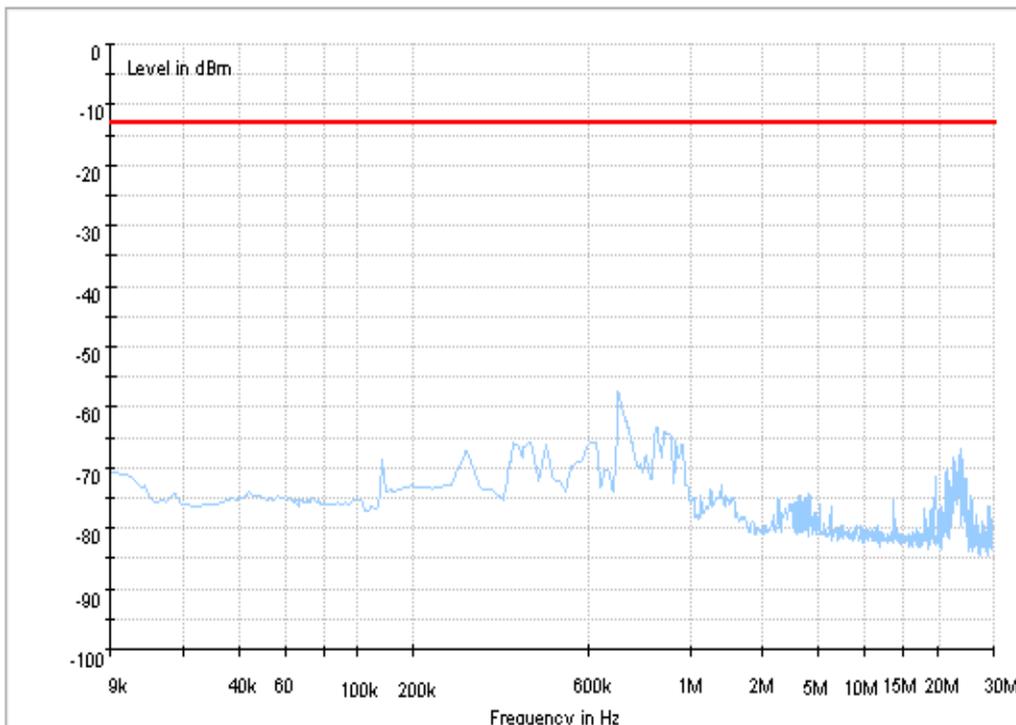
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

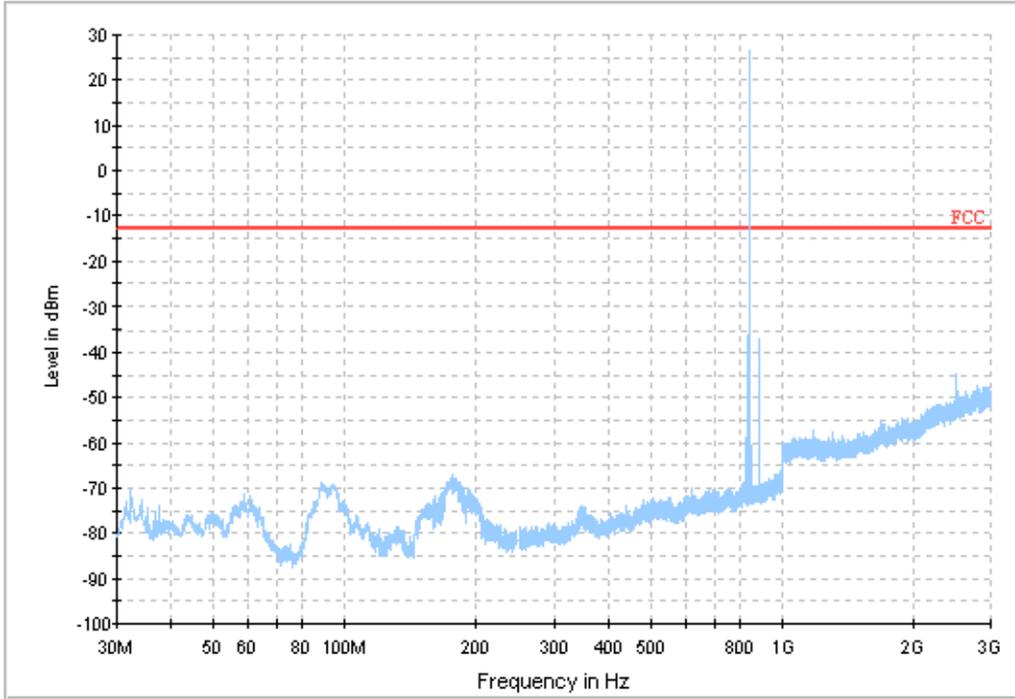
7.1 For GSM

7.1.1 Test Band = GSM850

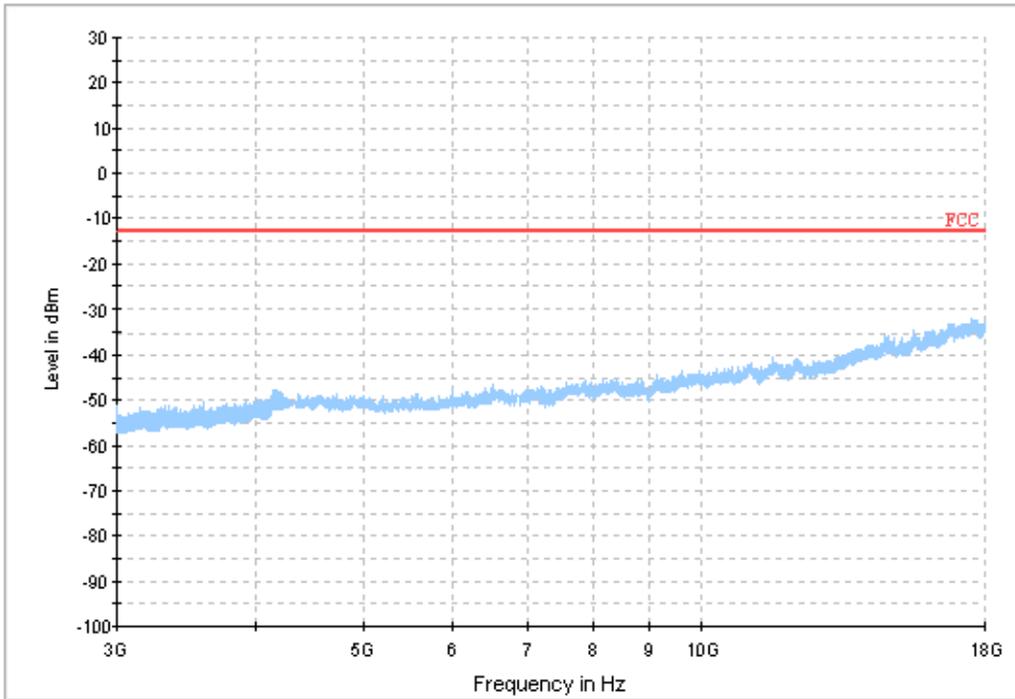
7.1.1.1 Test Mode = GSM/TM1



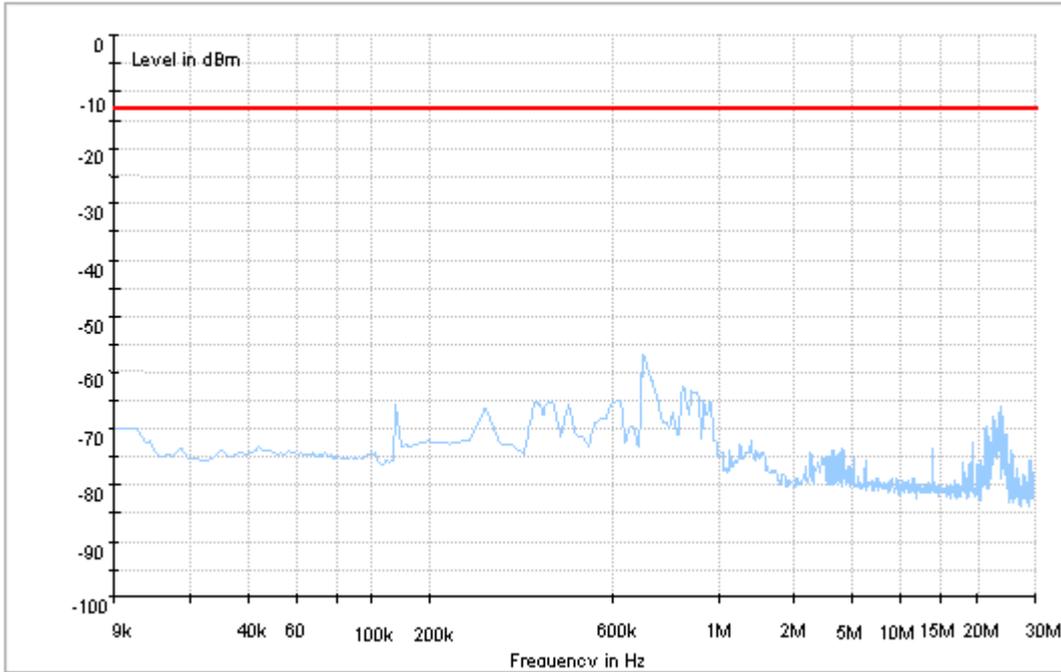
Copy of FCC PART22 GSM850_L



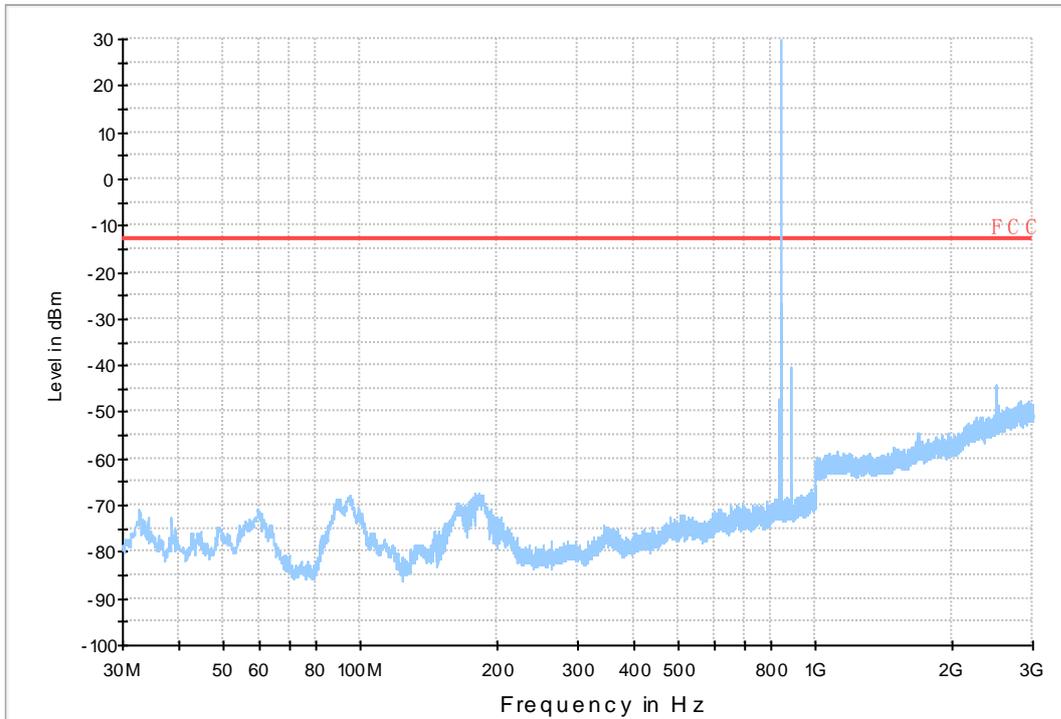
Copy of FCC PART22 GSM850_H



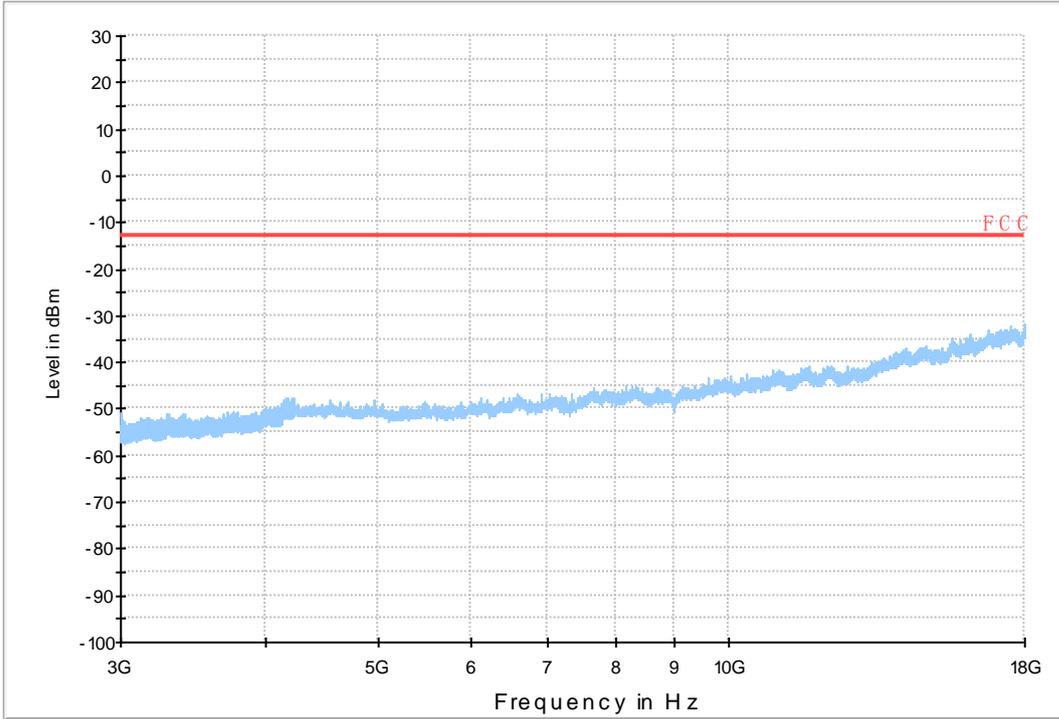
7.1.1.2 Test Mode = GSM/TM2



Copy of FCC PART22 GSM850_L

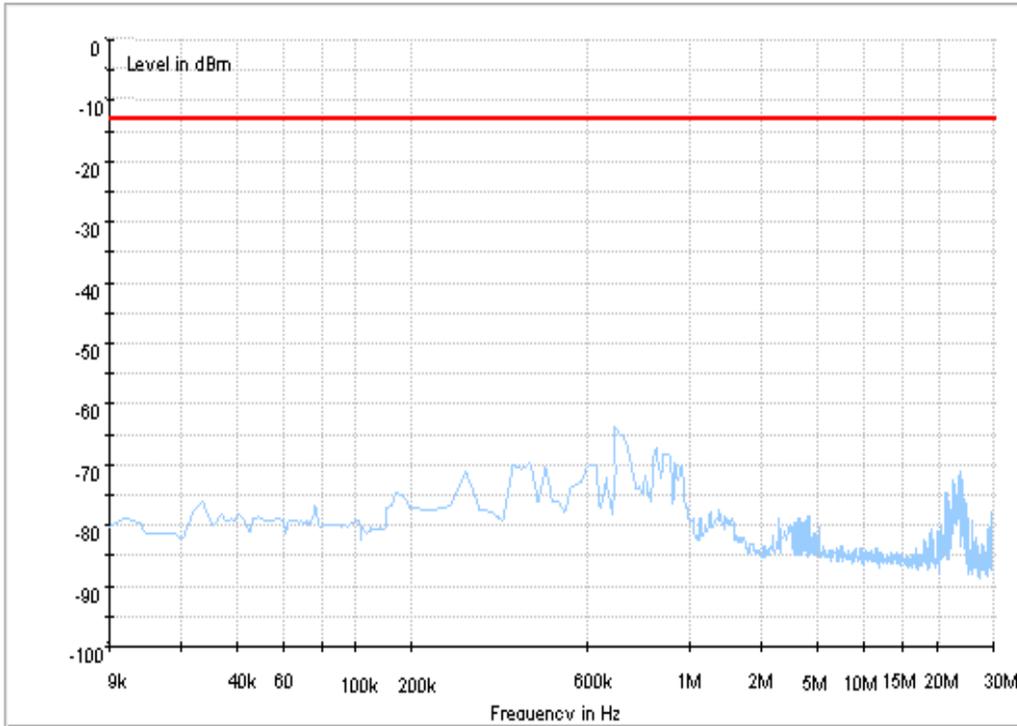


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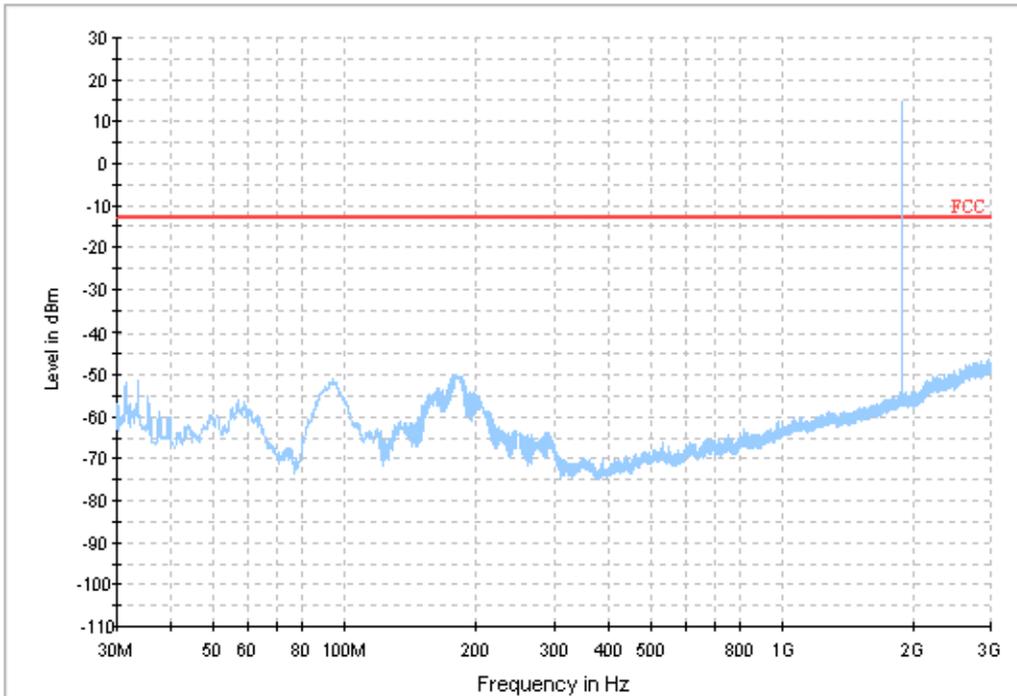


7.1.2 Test Band = GSM1900

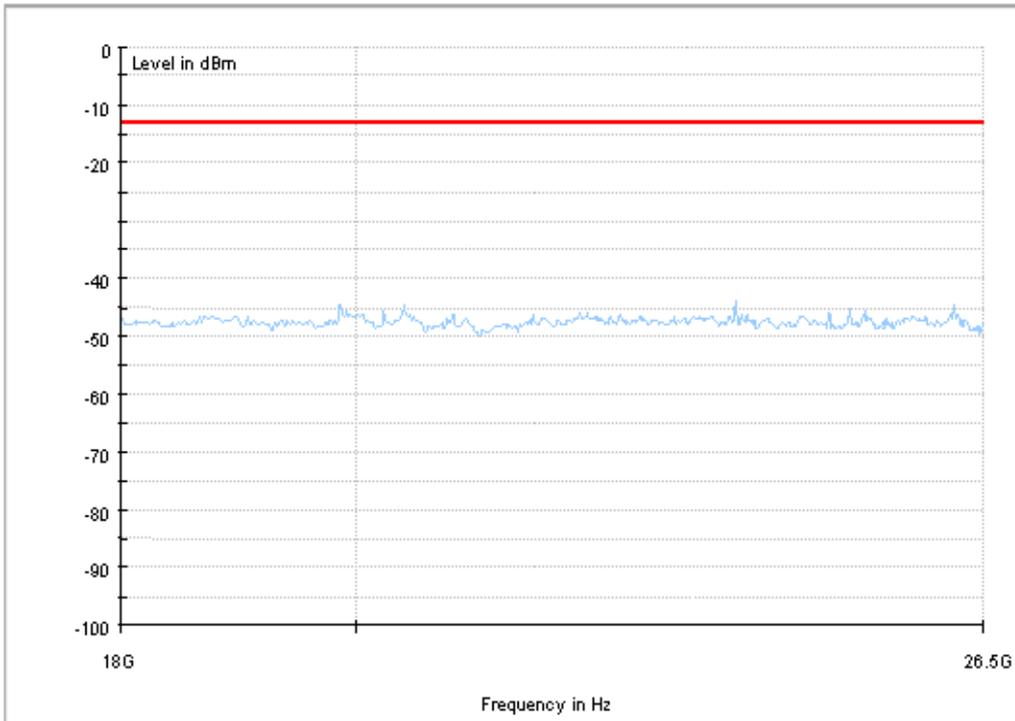
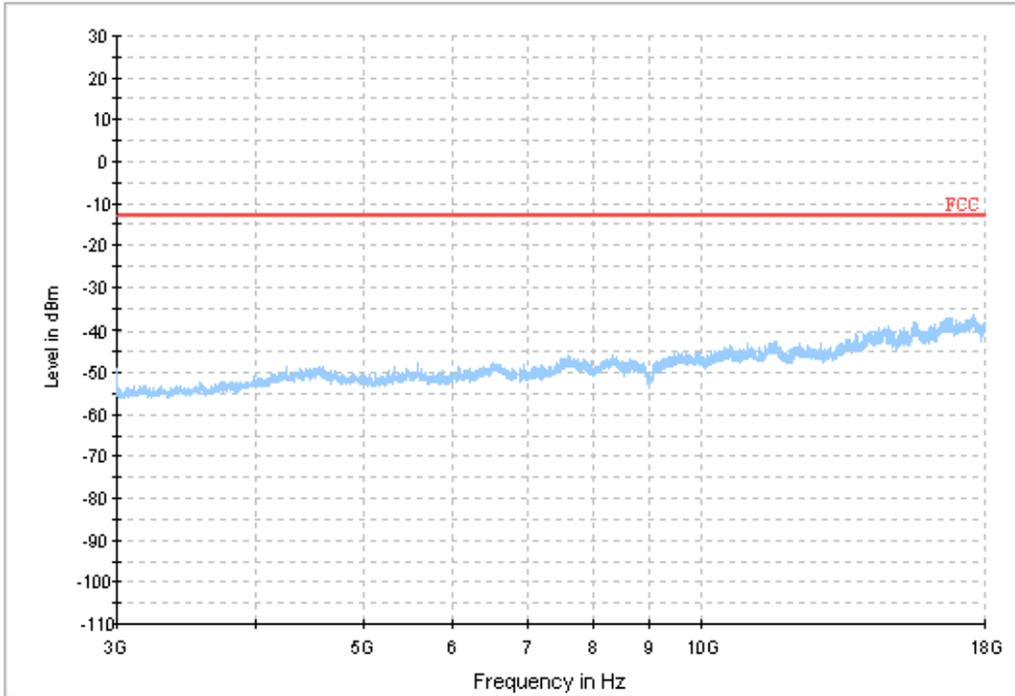
7.1.2.1 Test Mode = GSM/TM1



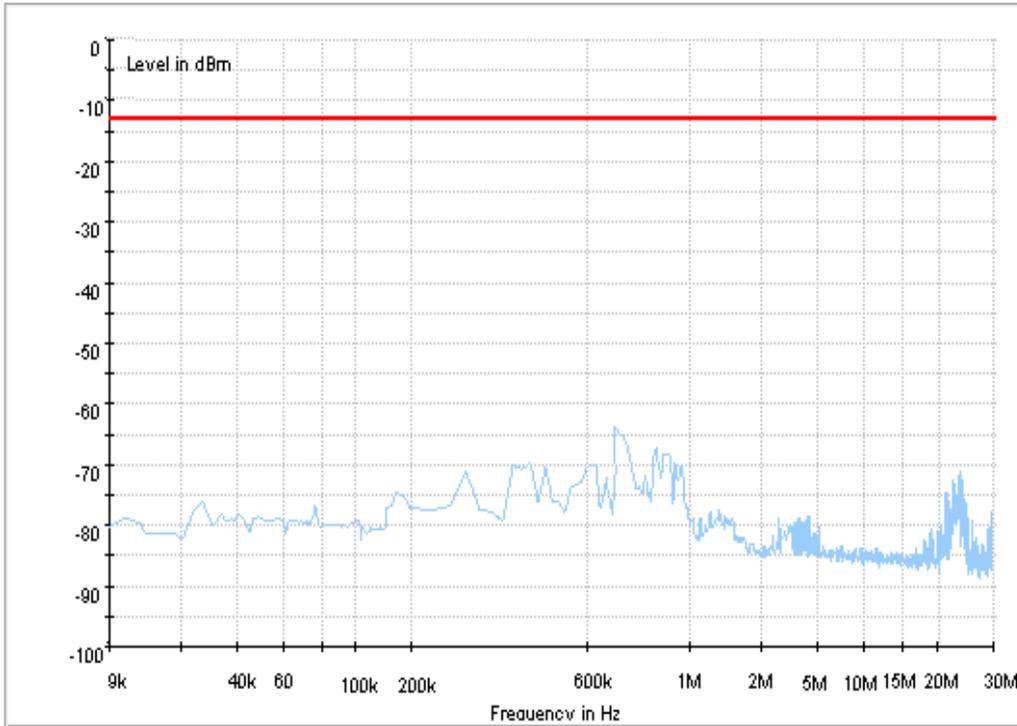
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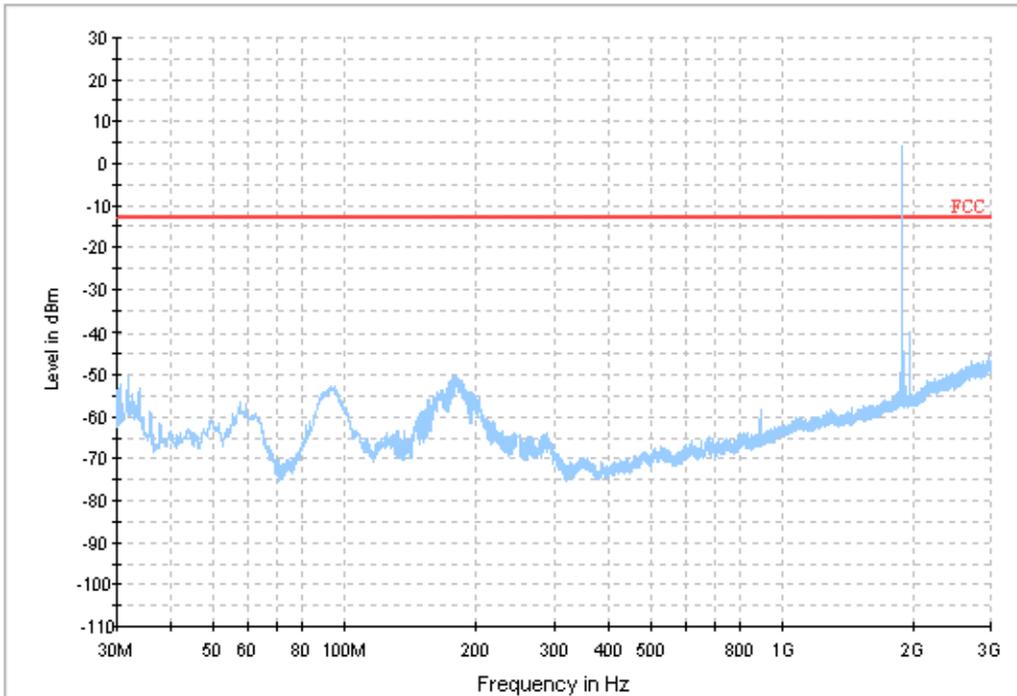
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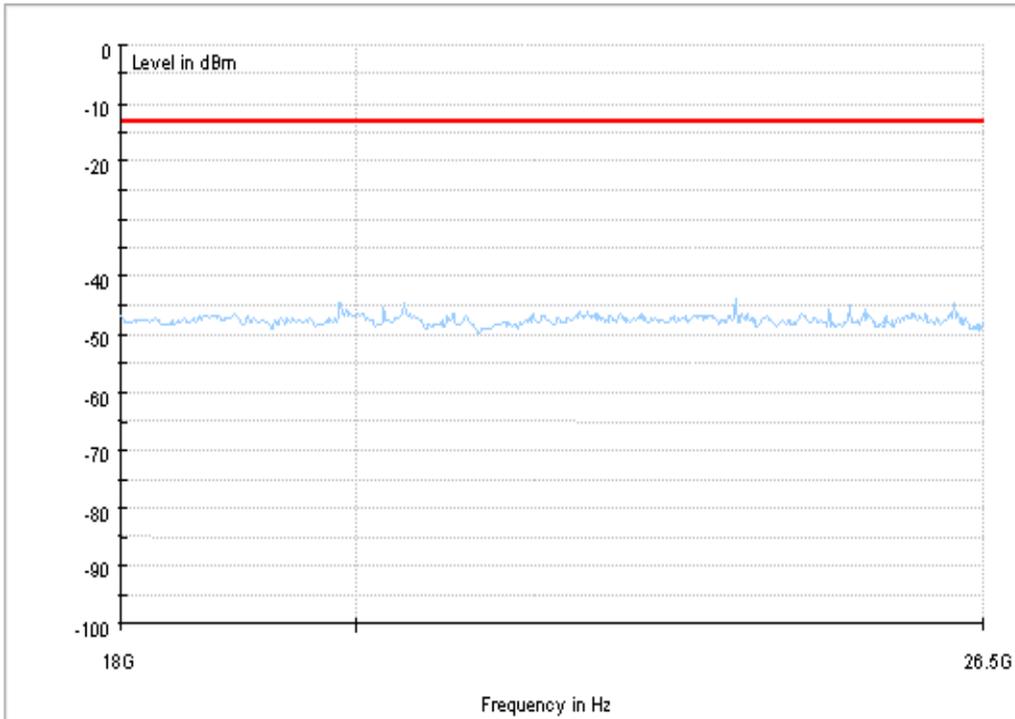
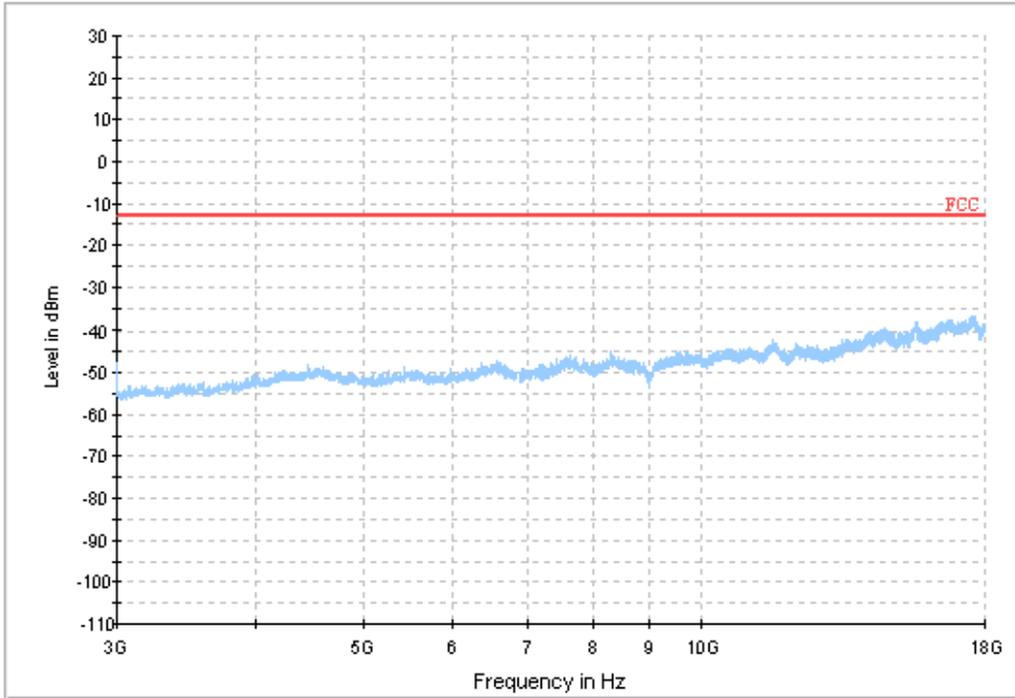
7.1.2.2 Test Mode = GSM/TM2



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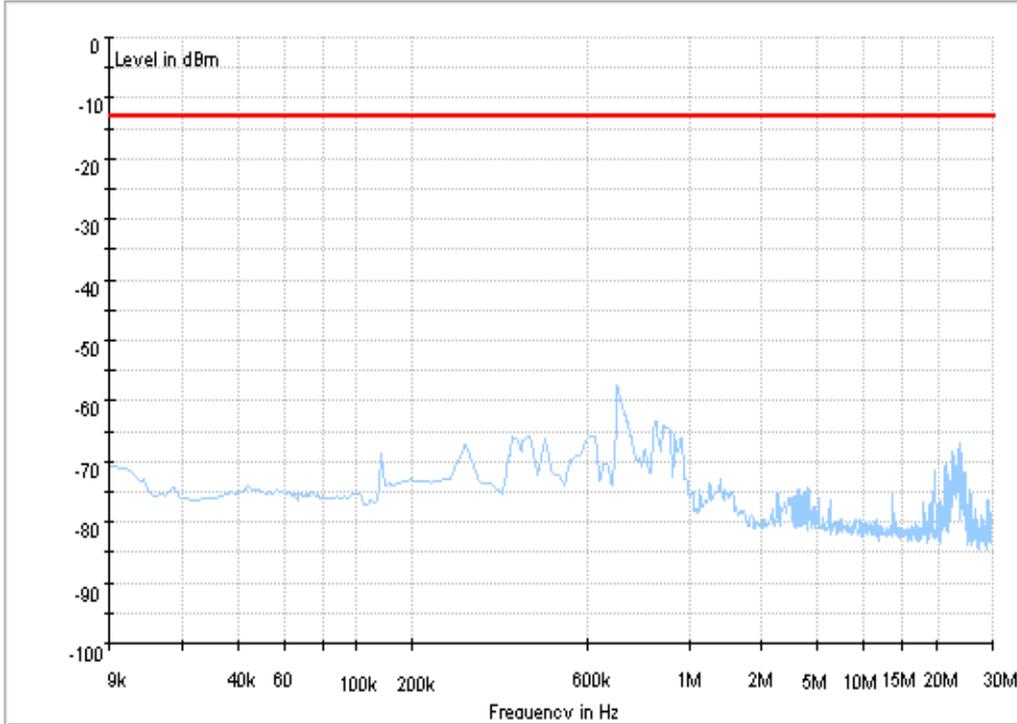
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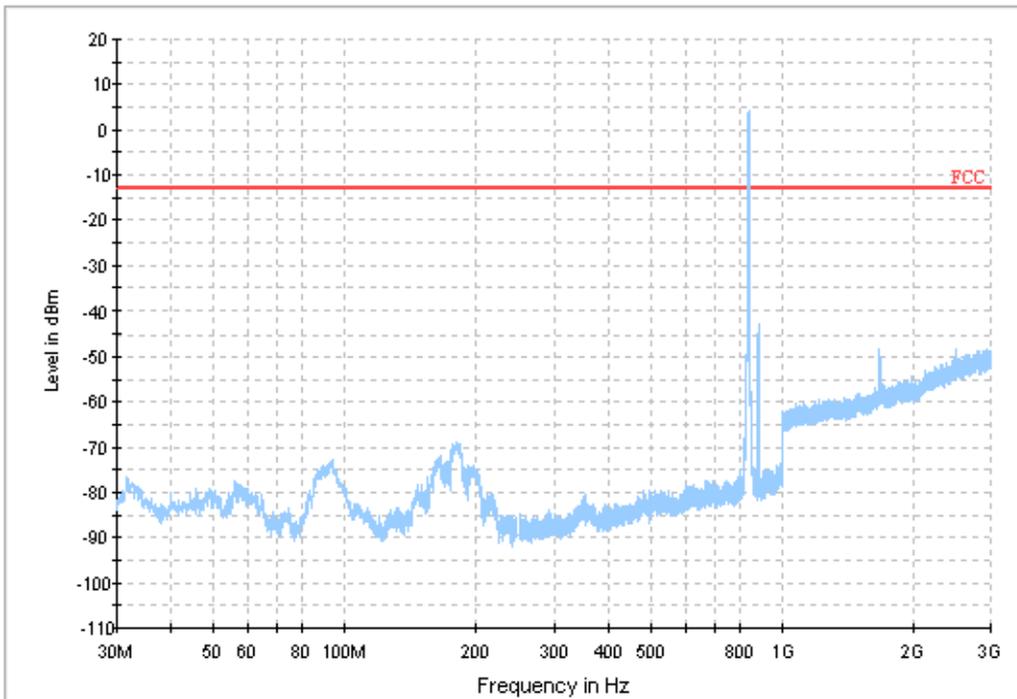
7.2 For UMTS

7.2.1 Test Band = WCDMA850

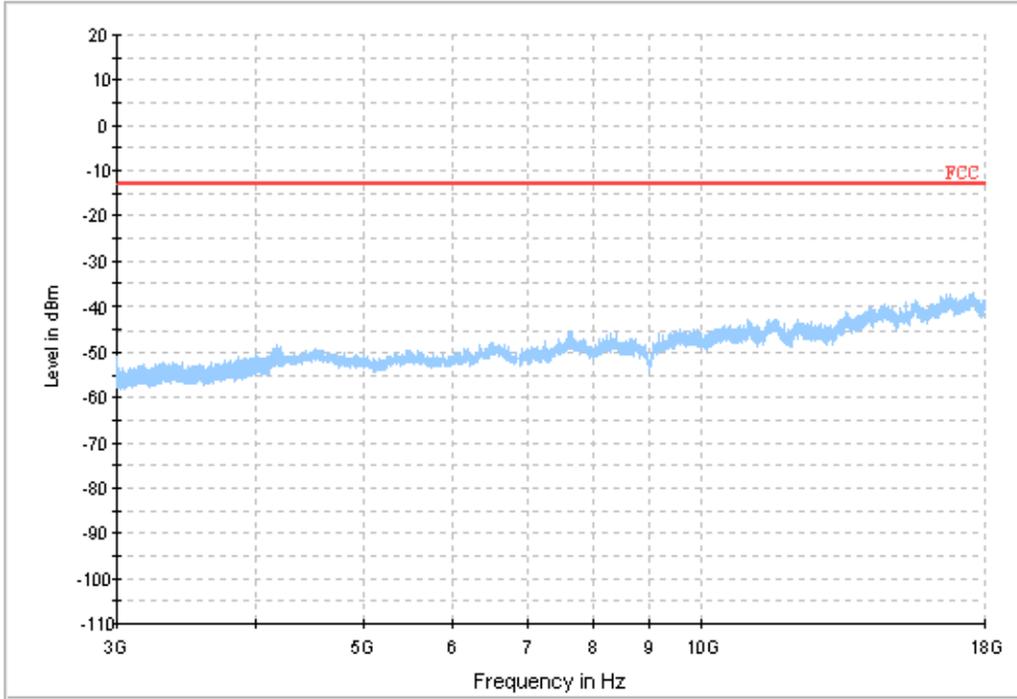
7.2.1.1 Test Mode = UMTS/TM1



Copy of FCC PART22 WCDMA850_L



Copy of FCC PART22 WCDMA850_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	-17.11	-0.02076	PASS
				VN	-20.21	-0.02452	PASS
				VH	-18.27	-0.02217	PASS
		MCH	TN	VL	-19.95	-0.02385	PASS
				VN	-17.31	-0.02069	PASS
				VH	-14.79	-0.01768	PASS
		HCH	TN	VL	-17.43	-0.02053	PASS
				VN	-15.95	-0.01879	PASS
				VH	-13.88	-0.01635	PASS
	GSM/TM2	LCH	TN	VL	-19.5	-0.02366	PASS
				VN	-19.37	-0.0235	PASS
				VH	-16.76	-0.02033	PASS
		MCH	TN	VL	-9.91	-0.01185	PASS
				VN	-7.75	-0.00926	PASS
				VH	-8.39	-0.01003	PASS
		HCH	TN	VL	-12.14	-0.0143	PASS
				VN	-10.62	-0.01251	PASS
				VH	-7.23	-0.00852	PASS
GSM1900	GSM/TM1	LCH	TN	VL	-10.98	-0.00593	PASS
				VN	-17.89	-0.00967	PASS
				VH	-10.65	-0.00576	PASS
		MCH	TN	VL	19.57	0.01041	PASS
				VN	8.98	0.00478	PASS
				VH	8.14	0.00433	PASS
		HCH	TN	VL	7.23	0.00379	PASS
				VN	4.91	0.00257	PASS
				VH	3.29	0.00172	PASS
	GSM/TM2	LCH	TN	VL	1.03	0.00056	PASS
				VN	-8.72	-0.00471	PASS
				VH	-1.19	-0.00064	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		MCH	TN	VL	9.07	0.00482	PASS
				VN	18.6	0.00989	PASS
				VH	25.09	0.01335	PASS
		HCH	TN	VL	7.23	0.00379	PASS
				VN	6.78	0.00355	PASS
				VH	1.1	0.00058	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	-18.34	-0.02225	PASS
				-20	-19.11	-0.02319	PASS
				-10	-19.69	-0.02389	PASS
				0	-20.4	-0.02475	PASS
				10	-20.02	-0.02429	PASS
				20	-21.76	-0.0264	PASS
				30	-23.5	-0.02851	PASS
				40	-20.34	-0.02468	PASS
				50	-20.4	-0.02475	PASS
		MCH	VN	-30	-12.59	-0.01505	PASS
				-20	-14.92	-0.01783	PASS
				-10	-16.72	-0.01999	PASS
				0	-14.21	-0.01699	PASS
				10	-11.62	-0.01389	PASS
				20	-14.98	-0.01791	PASS
				30	-7.81	-0.00934	PASS
				40	-10.78	-0.01289	PASS
				50	-10.53	-0.01259	PASS
		HCH	VN	-30	-19.05	-0.02244	PASS
				-20	-12.4	-0.01461	PASS
				-10	-19.05	-0.02244	PASS
				0	-17.05	-0.02009	PASS
				10	-14.01	-0.01651	PASS
				20	-16.34	-0.01925	PASS
				30	-18.14	-0.02137	PASS
				40	-15.76	-0.01857	PASS
				50	-14.92	-0.01758	PASS
	GSM/TM2	LCH	VN	-30	-14.4	-0.01747	PASS
				-20	-14.5	-0.01759	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict		
				-10	-14.95	-0.01814	PASS		
				0	-15.43	-0.01872	PASS		
				10	-17.56	-0.02131	PASS		
				20	-17.89	-0.02171	PASS		
				30	-16.82	-0.02041	PASS		
				40	-17.27	-0.02095	PASS		
				50	-18.6	-0.02257	PASS		
		MCH	VN			-30	-12.82	-0.01532	PASS
						-20	-13.24	-0.01583	PASS
						-10	-14.3	-0.01709	PASS
						0	-10.88	-0.01301	PASS
						10	-10.3	-0.01231	PASS
						20	-10.62	-0.01269	PASS
						30	-11.88	-0.0142	PASS
						40	-9.94	-0.01188	PASS
		HCH	VN			50	-8.94	-0.01069	PASS
						-30	-11.36	-0.01338	PASS
						-20	-13.82	-0.01628	PASS
						-10	-9.27	-0.01092	PASS
						0	-13.56	-0.01598	PASS
						10	-15.59	-0.01837	PASS
						20	-17.14	-0.02019	PASS
						30	-17.24	-0.02031	PASS
		40	-10.88	-0.01282	PASS				
		50	-10.91	-0.01285	PASS				

8.2 For UMTS

8.2.1 Frequency Error vs. Voltage:

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA850	UMTS/TM1	LCH	TN	VL	1.33	0.00161	PASS
				VN	-6.99	-0.00846	PASS
				VH	4.18	0.00506	PASS
		MCH	TN	VL	-3.4	-0.00407	PASS
				VN	0.27	0.00032	PASS
				VH	-5.89	-0.00704	PASS
		HCH	TN	VL	-2.53	-0.00299	PASS
				VN	1.95	0.0023	PASS



Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VH	4.43	0.00523	PASS

8.2.2 Frequency Error vs. Temperature:

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA850	UMTS/TM1	LCH	VN	-30	-4.7	-0.00569	PASS
				-20	-2.23	-0.0027	PASS
				-10	0.37	0.00045	PASS
				0	0.56	0.00068	PASS
				10	-4.39	-0.00531	PASS
				20	5.11	0.00618	PASS
				30	1.53	0.00185	PASS
				40	1.3	0.00157	PASS
				50	-0.18	-0.00022	PASS
		MCH	VN	-30	1.36	0.00163	PASS
				-20	1.11	0.00133	PASS
				-10	4.93	0.00589	PASS
				0	0.17	0.0002	PASS
				10	-3.77	-0.00451	PASS
				20	0.32	0.00038	PASS
				30	3.97	0.00475	PASS
				40	3.81	0.00456	PASS
				50	0.96	0.00115	PASS
		HCH	VN	-30	-2.41	-0.00285	PASS
				-20	3.56	0.00421	PASS
				-10	0.76	0.0009	PASS
				0	-7.81	-0.00923	PASS
				10	-4.53	-0.00535	PASS
				20	-3.17	-0.00374	PASS
				30	-0.34	-0.0004	PASS
				40	-1.68	-0.00198	PASS
				50	2.98	0.00352	PASS