



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	33.02	30.63	38.5	PASS
		MCH	33.12	30.58	38.5	PASS
		HCH	33.09	30.72	38.5	PASS
	GSM/TM2	LCH	26.41	24.03	38.5	PASS
		MCH	26.55	24.02	38.5	PASS
		HCH	26.54	24.04	38.5	PASS
Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	30.22	31.45	33	PASS
		MCH	30.02	31.29	33	PASS
		HCH	30.11	31.23	33	PASS
	GSM/TM2	LCH	25.75	26.98	33	PASS
		MCH	25.73	26.87	33	PASS
		HCH	25.69	26.75	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	0.31	13	PASS
		HCH	0.33	13	PASS
	GSM/TM2	LCH	3.1	13	PASS
		MCH	3.23	13	PASS
		HCH	3.27	13	PASS

3Appendix_C: Modulation Characteristics

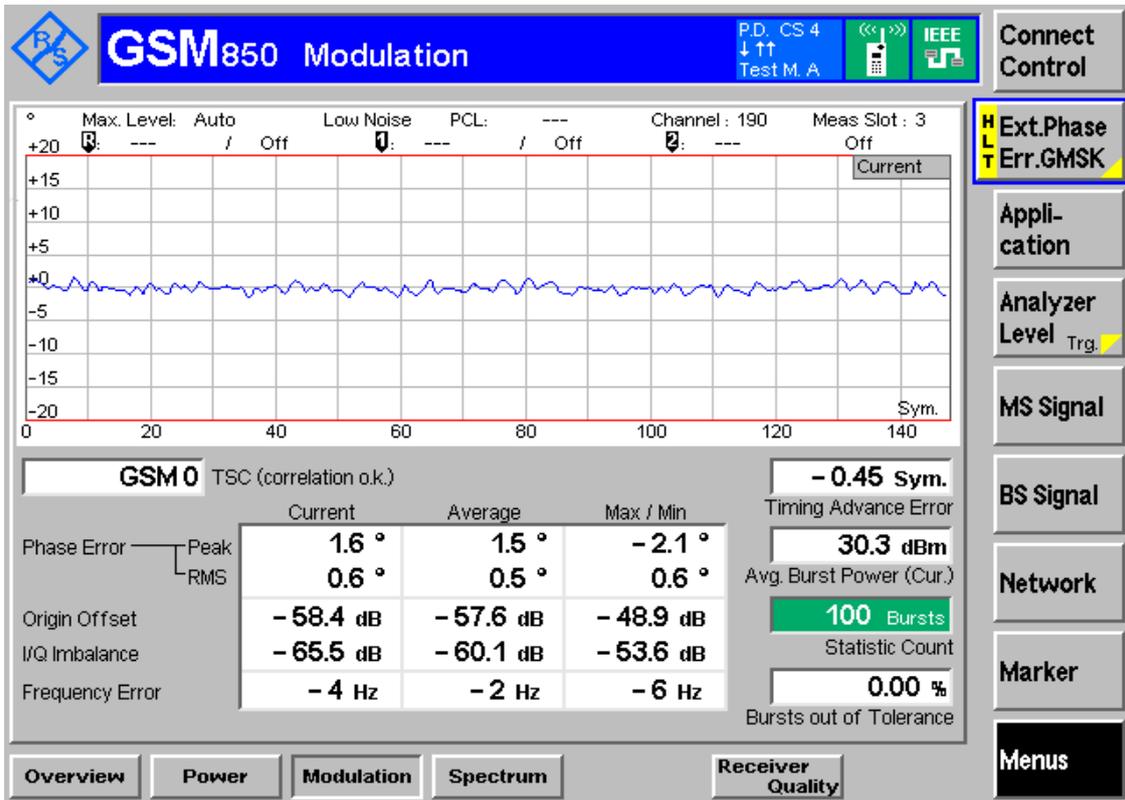
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

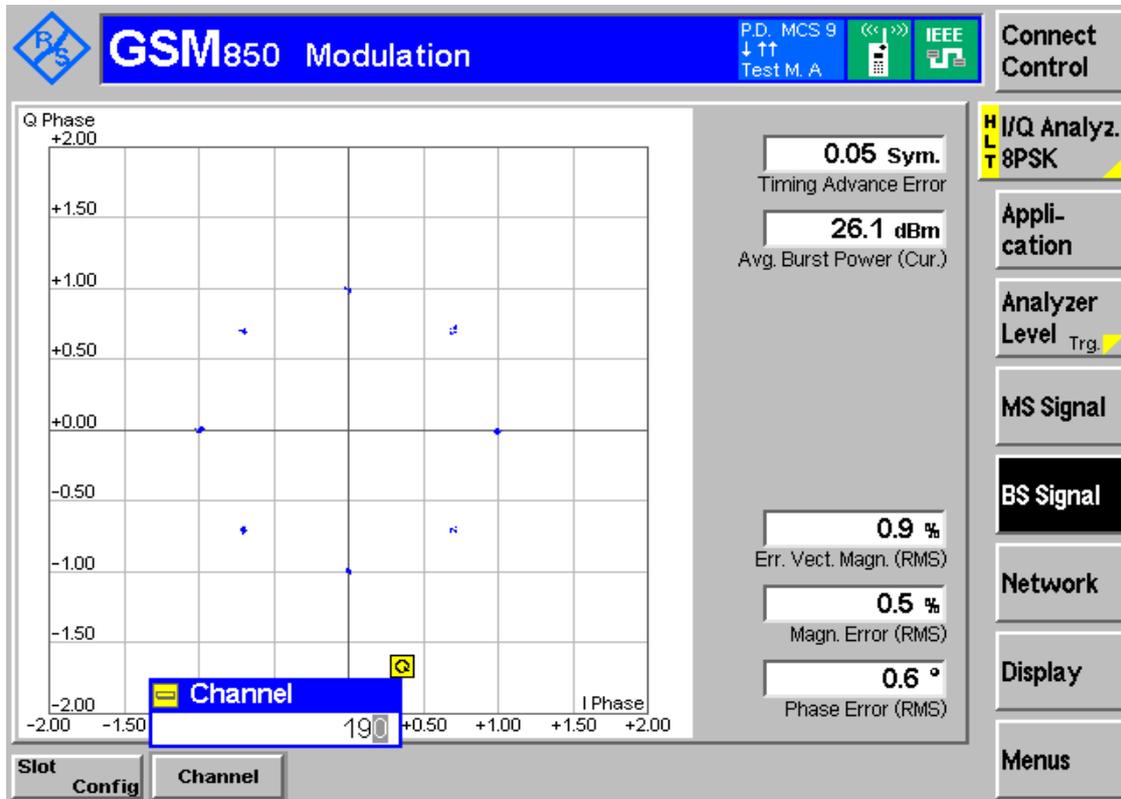
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

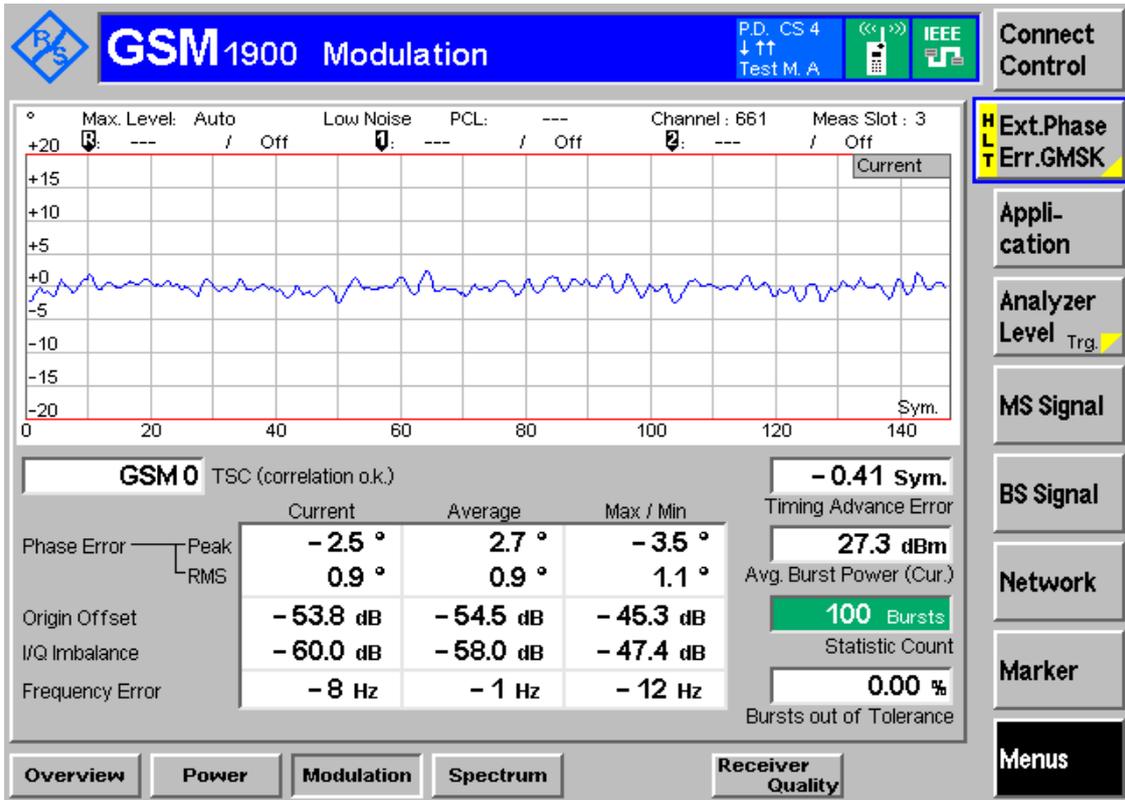
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

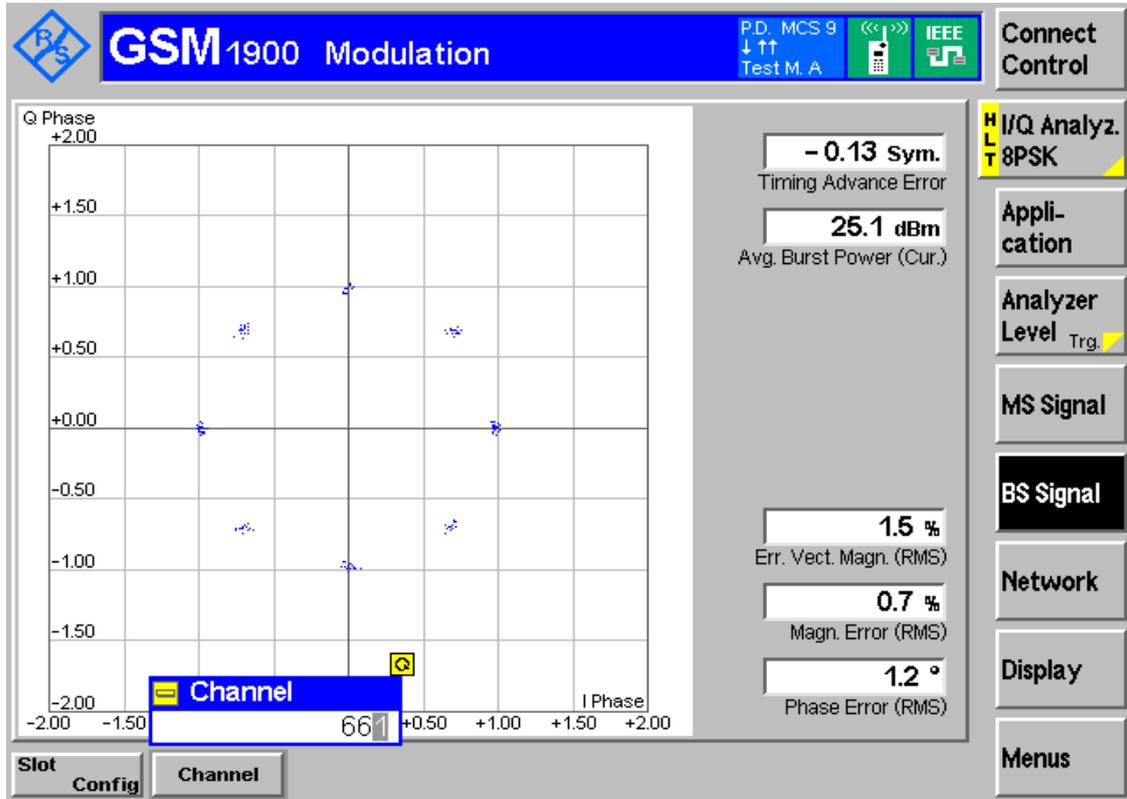
3.1.2.1 Test Mode = GSM/TM1

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	246.79	316.00	Pass
		MCH	247.42	317.86	Pass
		HCH	246.77	323.86	Pass
	GSM/TM2	LCH	248.16	315.06	Pass
		MCH	240.53	311.79	Pass
		HCH	238.12	310.63	Pass
GSM1900	GSM/TM1	LCH	242.45	310.80	Pass
		MCH	242.17	313.87	Pass
		HCH	242.84	318.06	Pass
	GSM/TM2	LCH	235.75	298.93	Pass
		MCH	241.34	302.97	Pass
		HCH	234.36	303.54	Pass



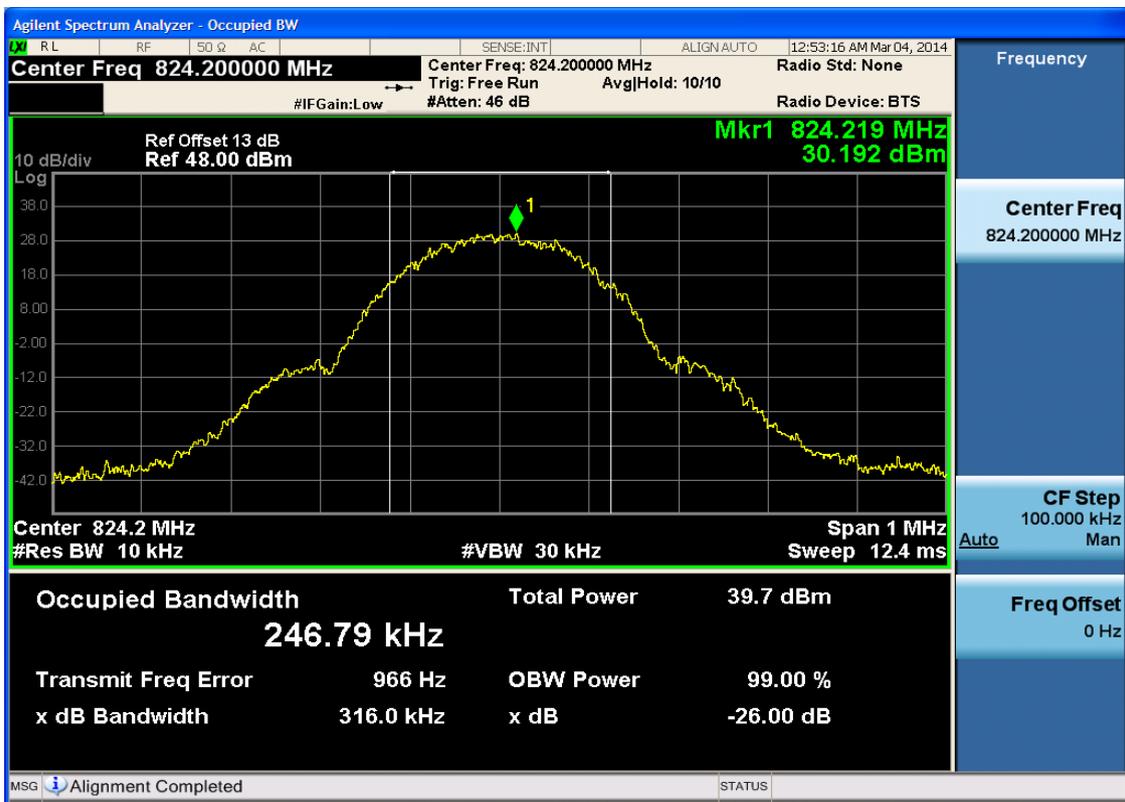
Part II - Test Plots

4.1 For GSM

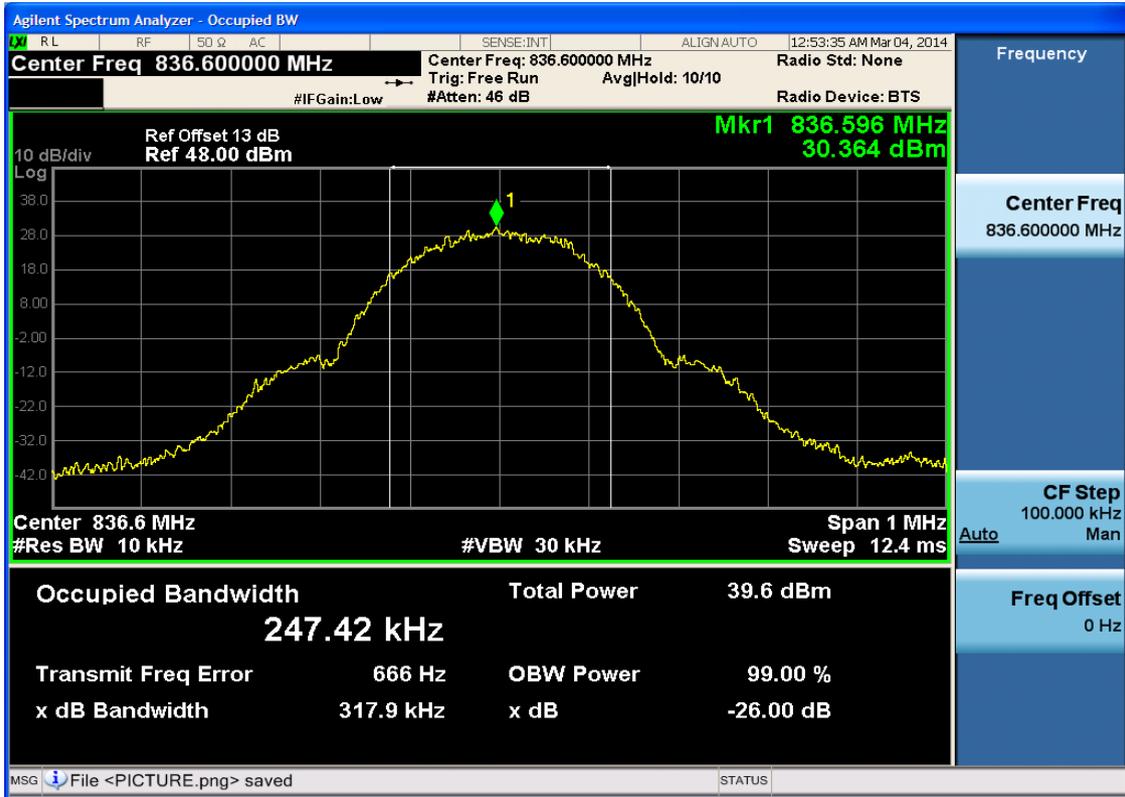
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4.1.1.1 Test Mode = GSM/TM1

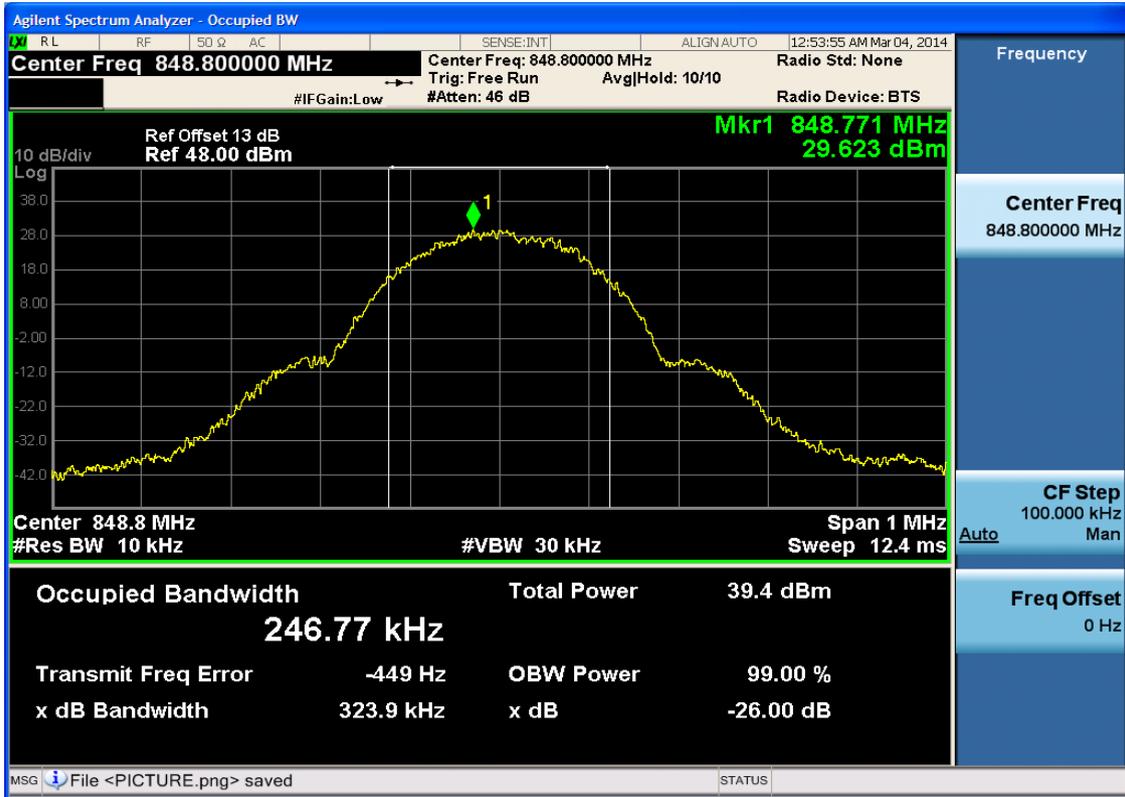
4.1.1.1.1 Test Channel = LCH



4.1.1.1.2 Test Channel = MCH



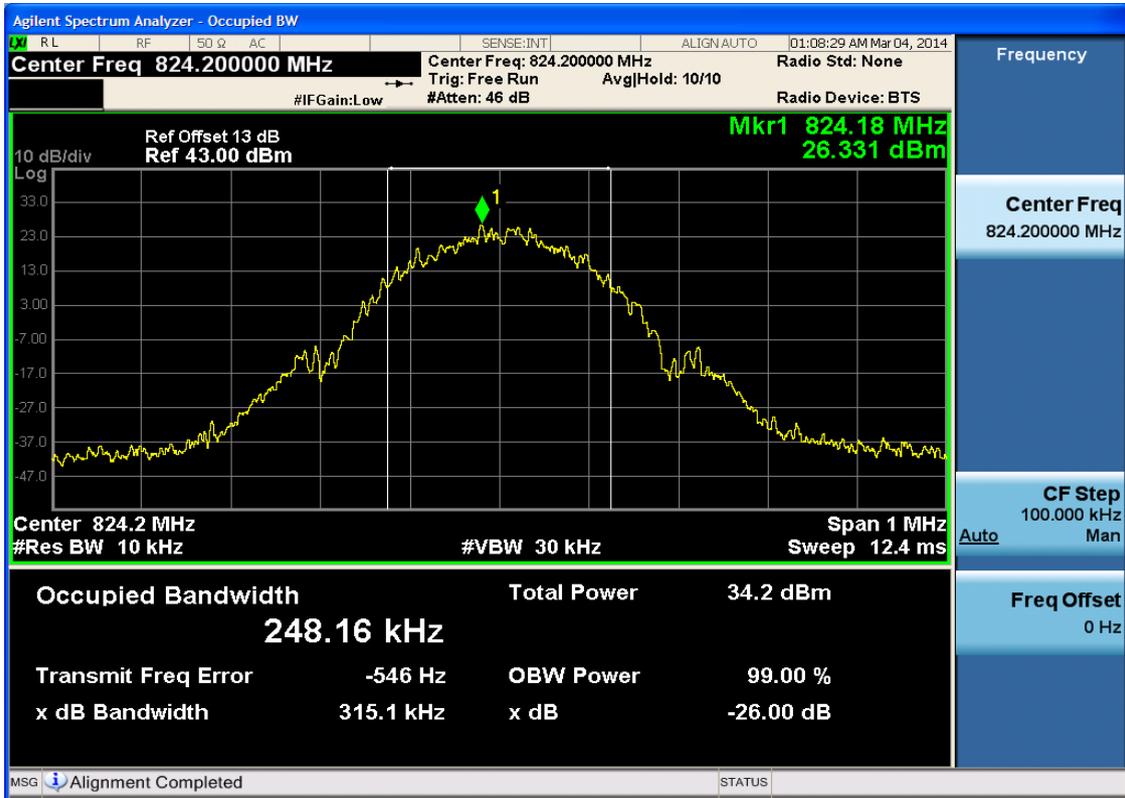
4.1.1.1.3 Test Channel = HCH





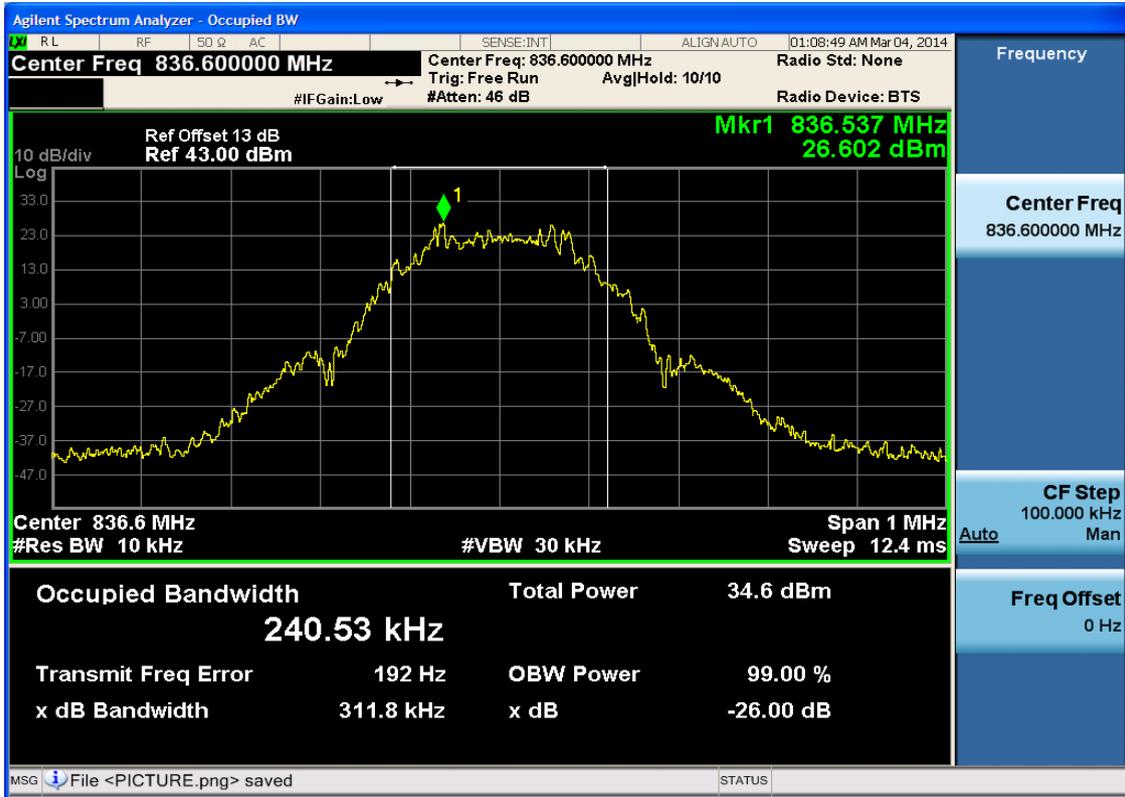
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH



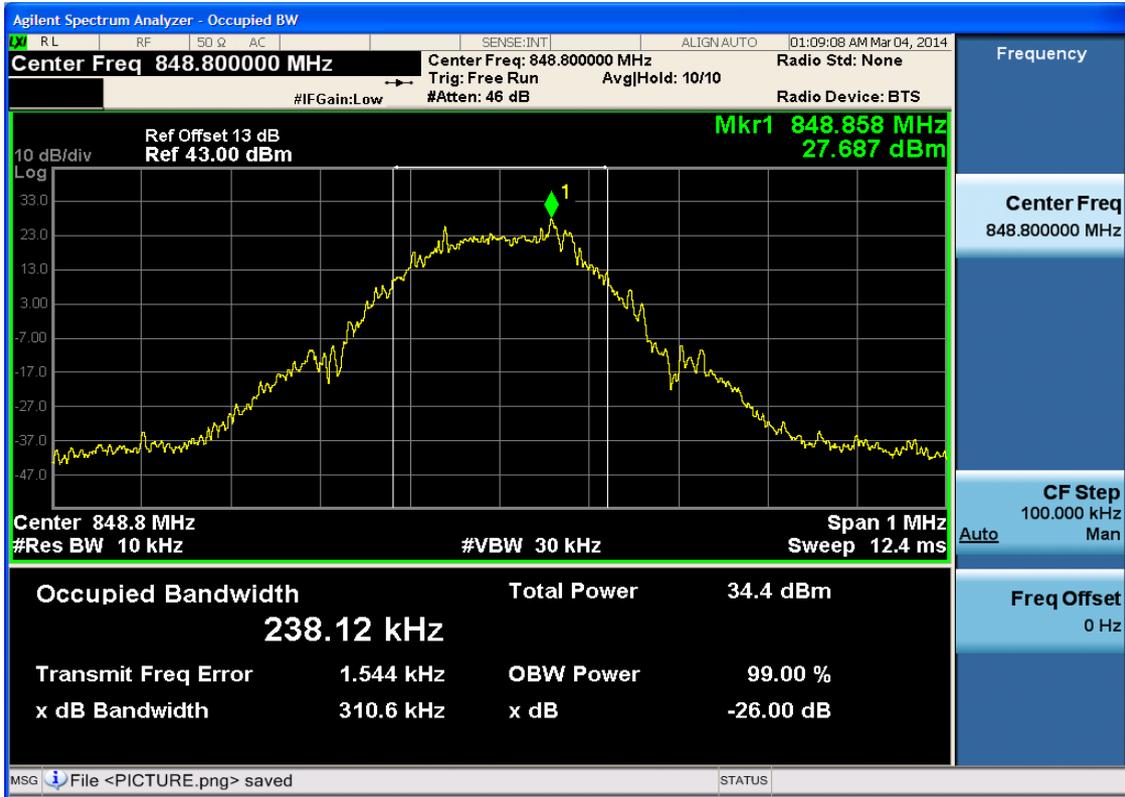


4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH

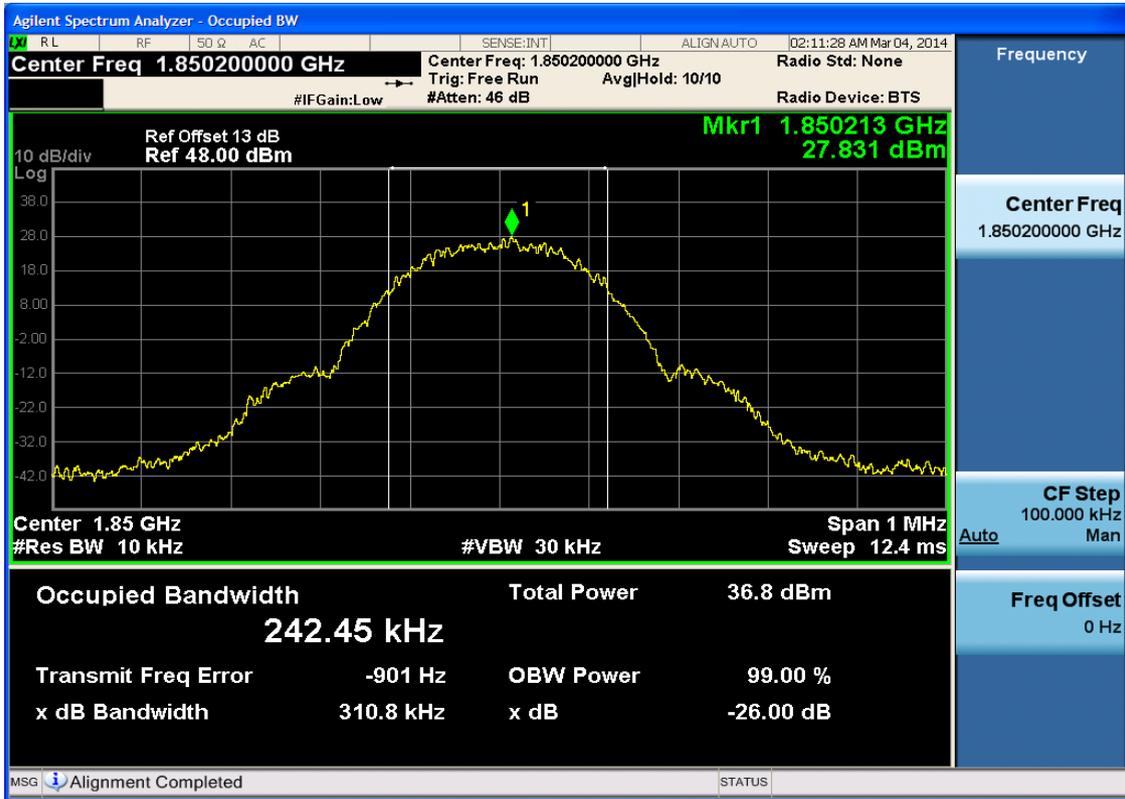




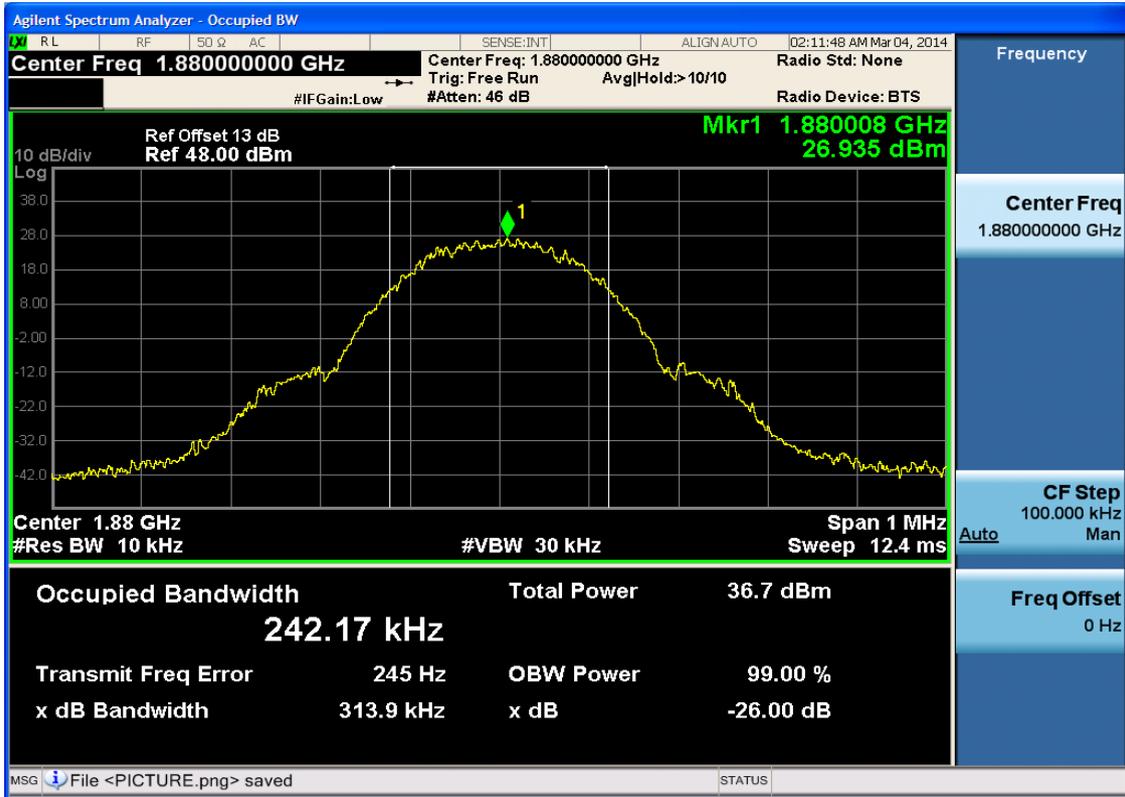
4.1.2 Test Band = GSM1900

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





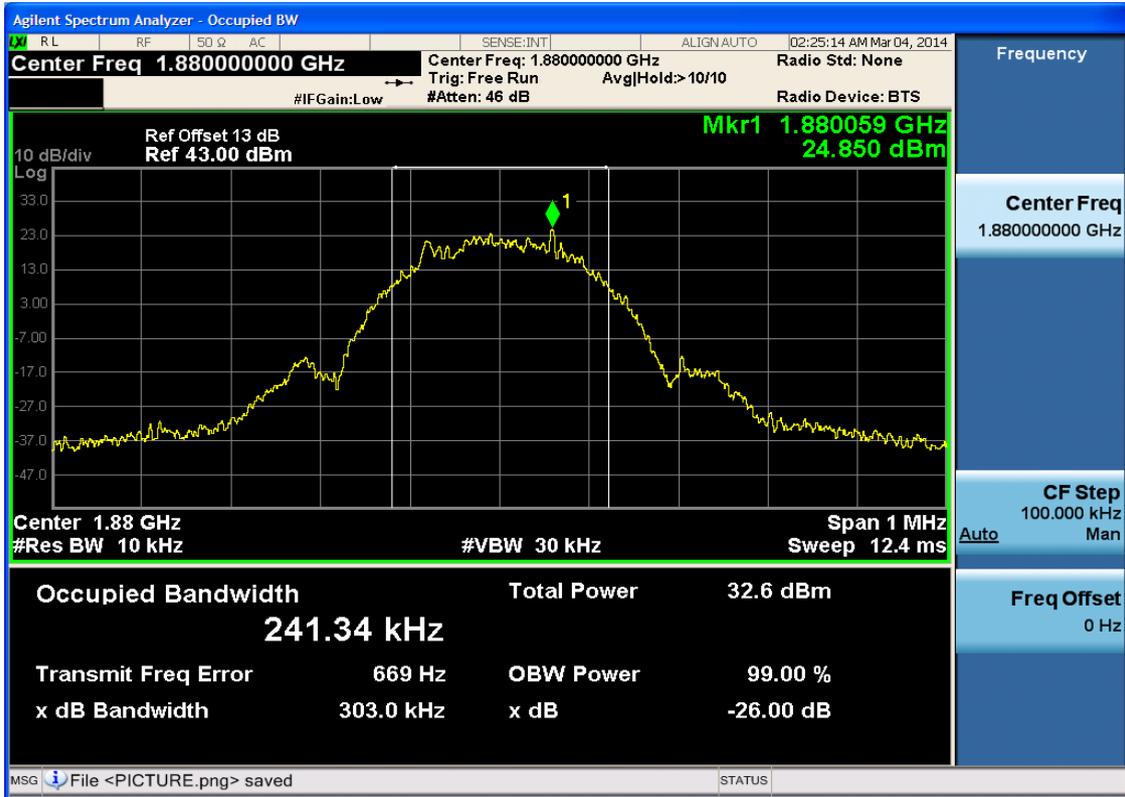
4.1.2.2 Test Mode = GSM/TM2

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

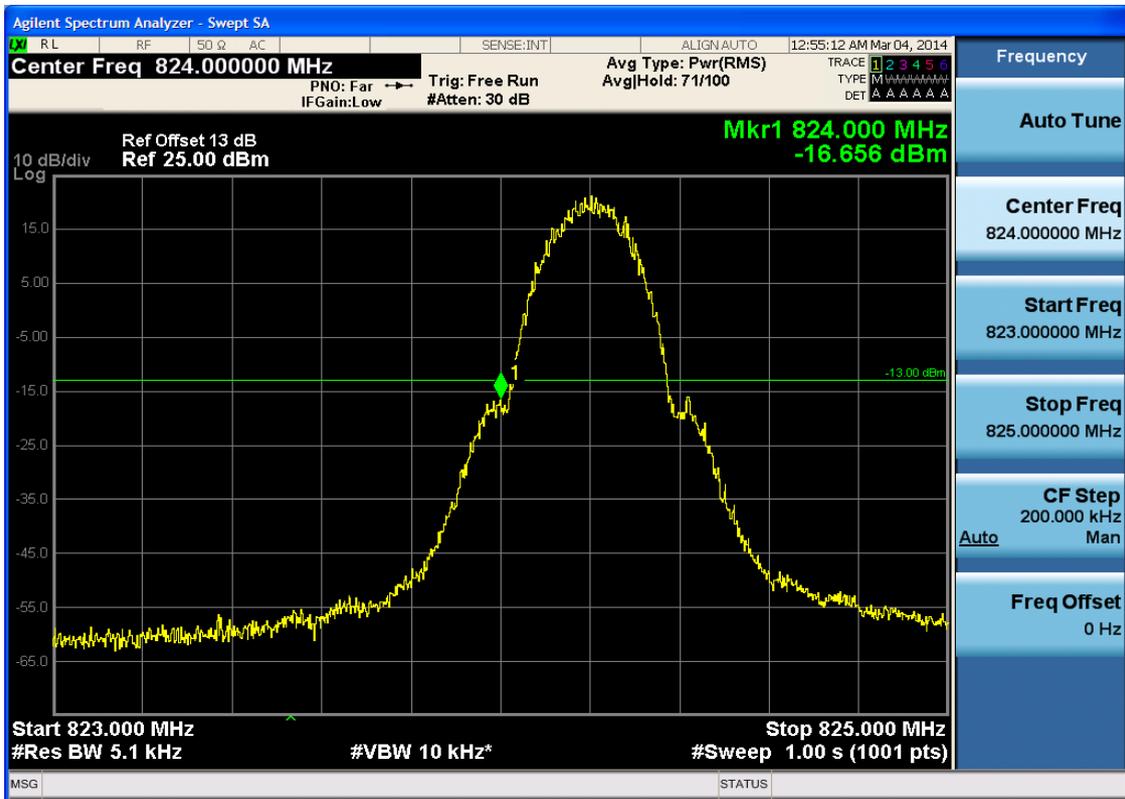
Part I - Test Plots

5.1 For GSM

5.1.1 Test Band = GSM850

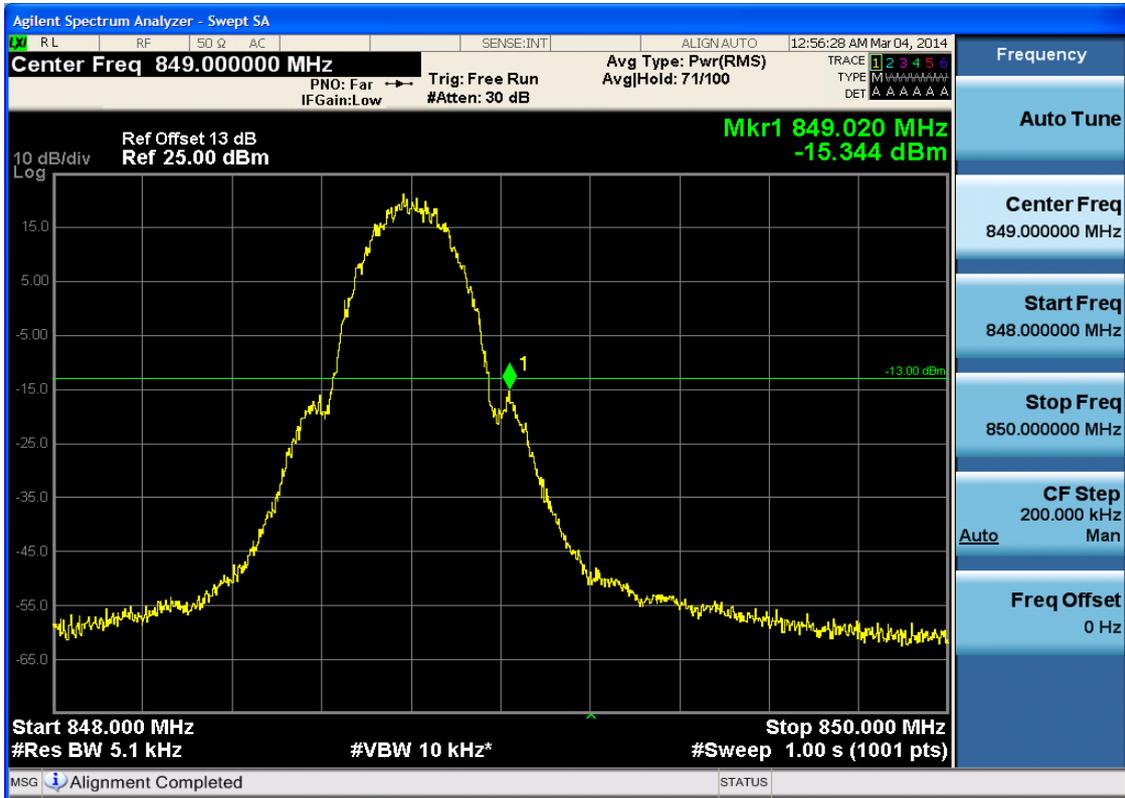
5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH



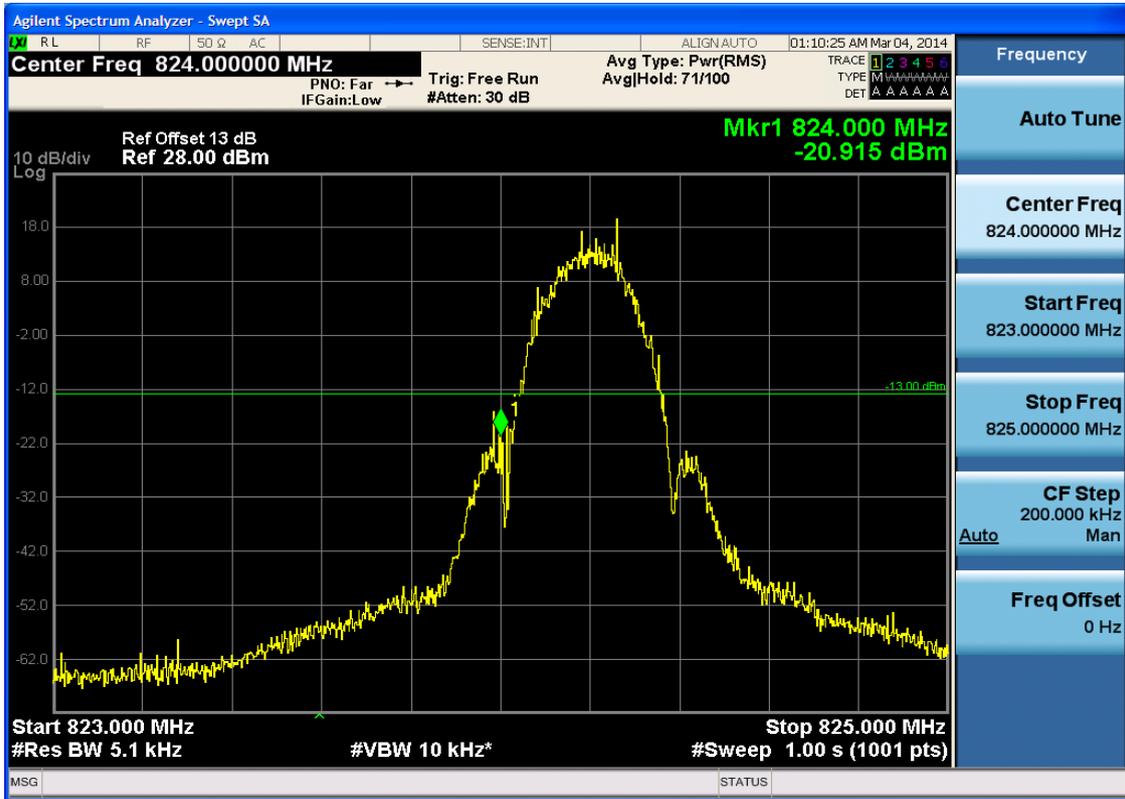


5.1.1.1.2 Test Channel = HCH

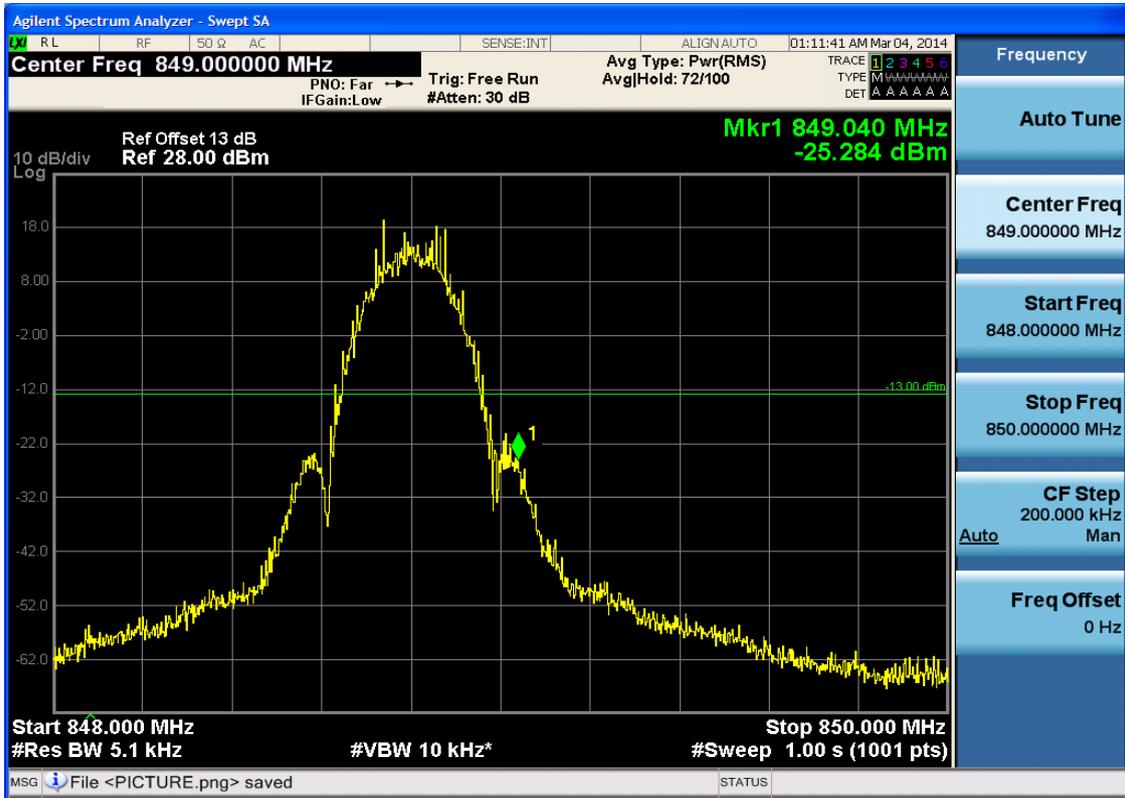


5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



5.1.1.2.2 Test Channel = HCH

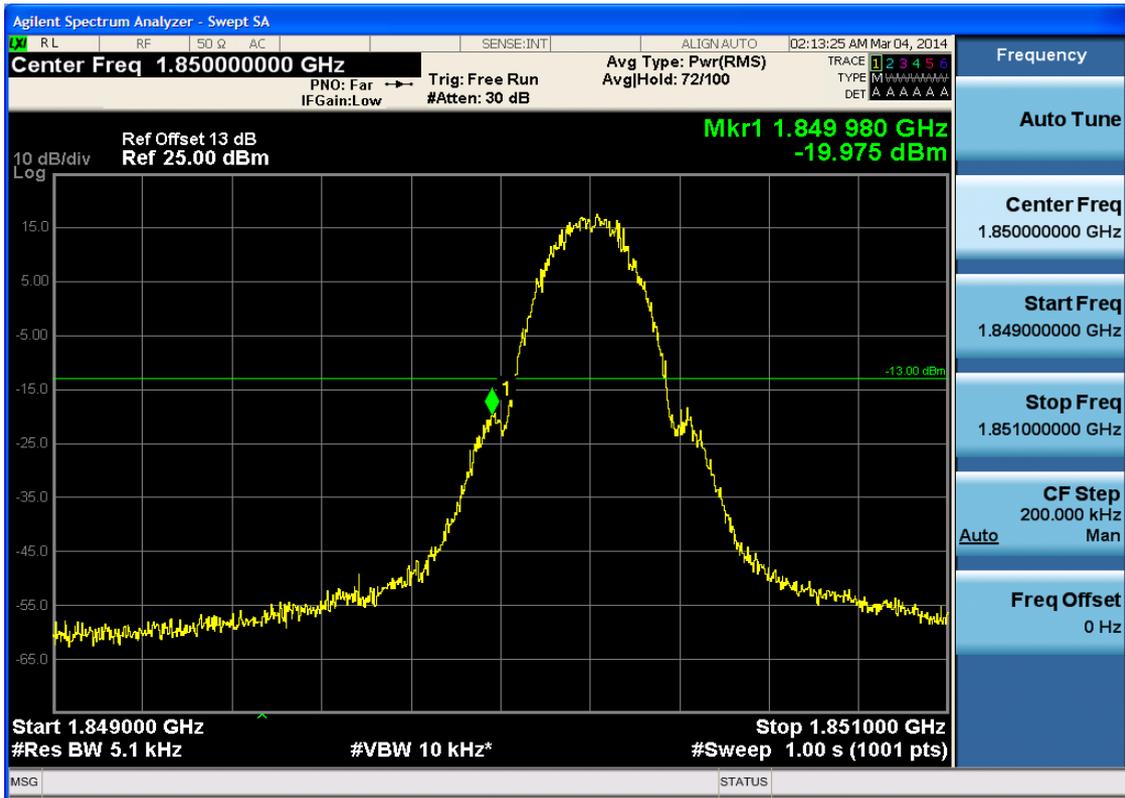




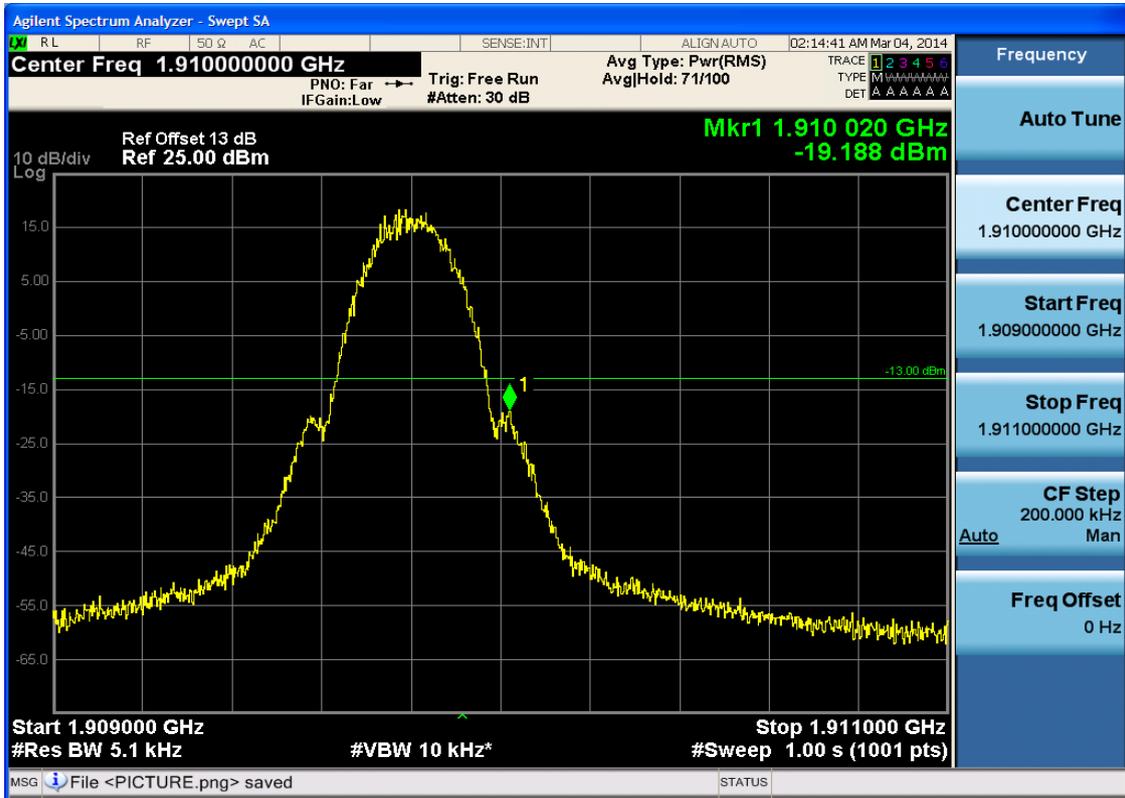
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH

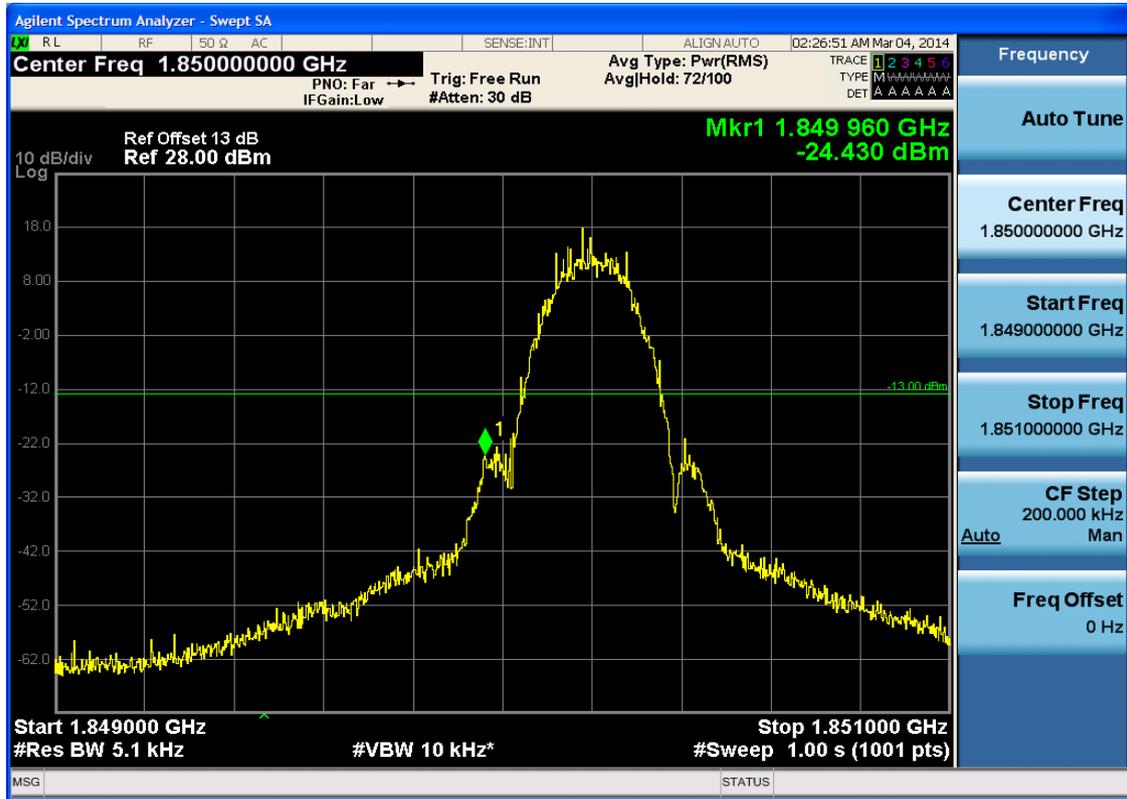


5.1.2.1.2 Test Channel = HCH

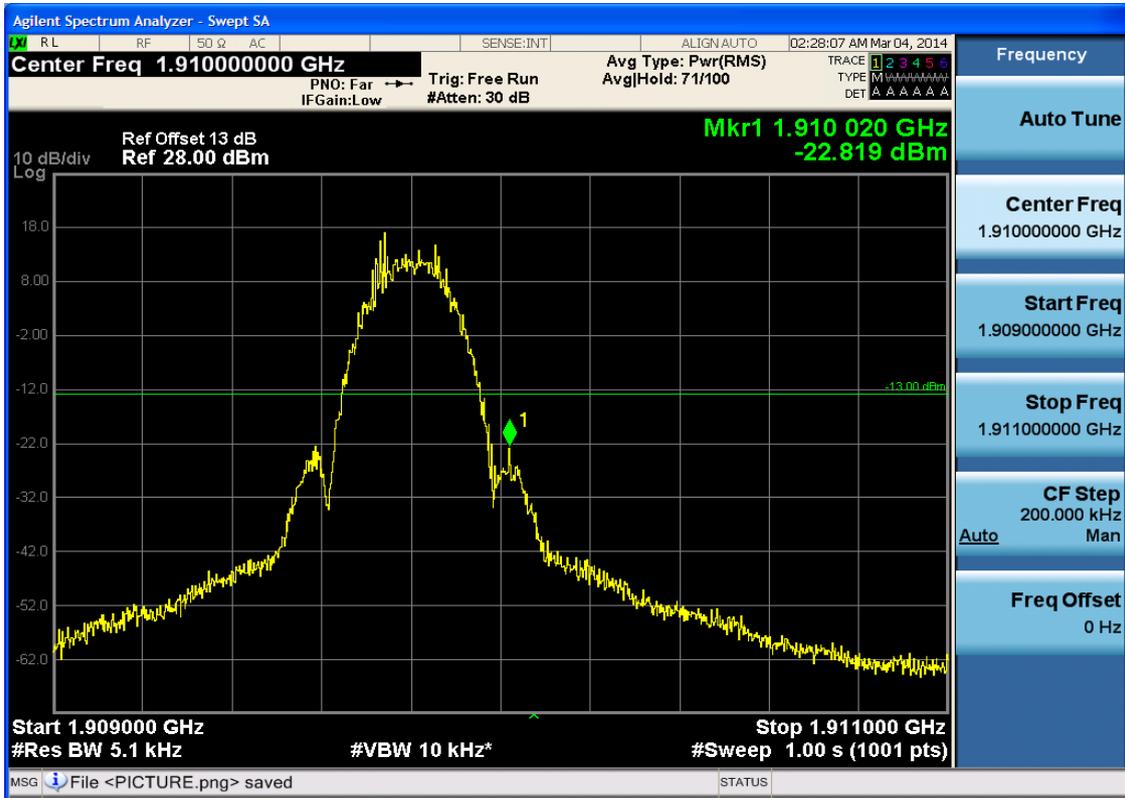


5.1.2.2 Test Mode = GSM/TM2

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.

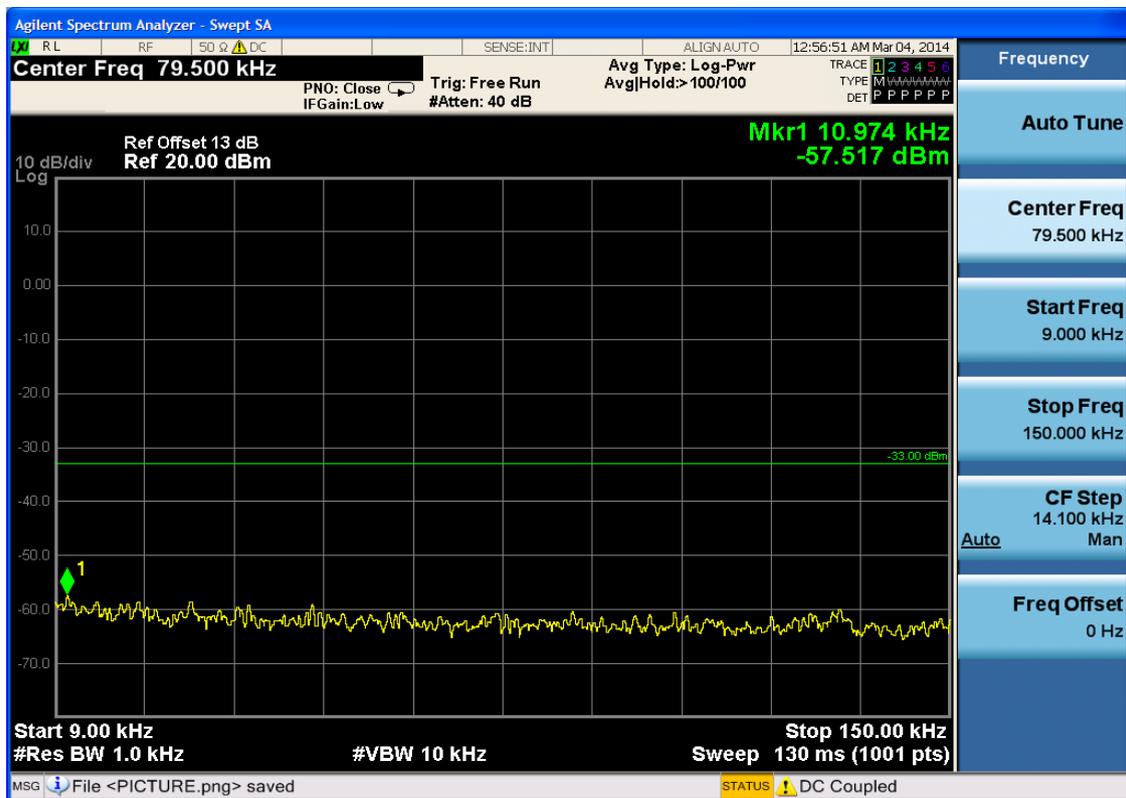
Part I - Test Plots

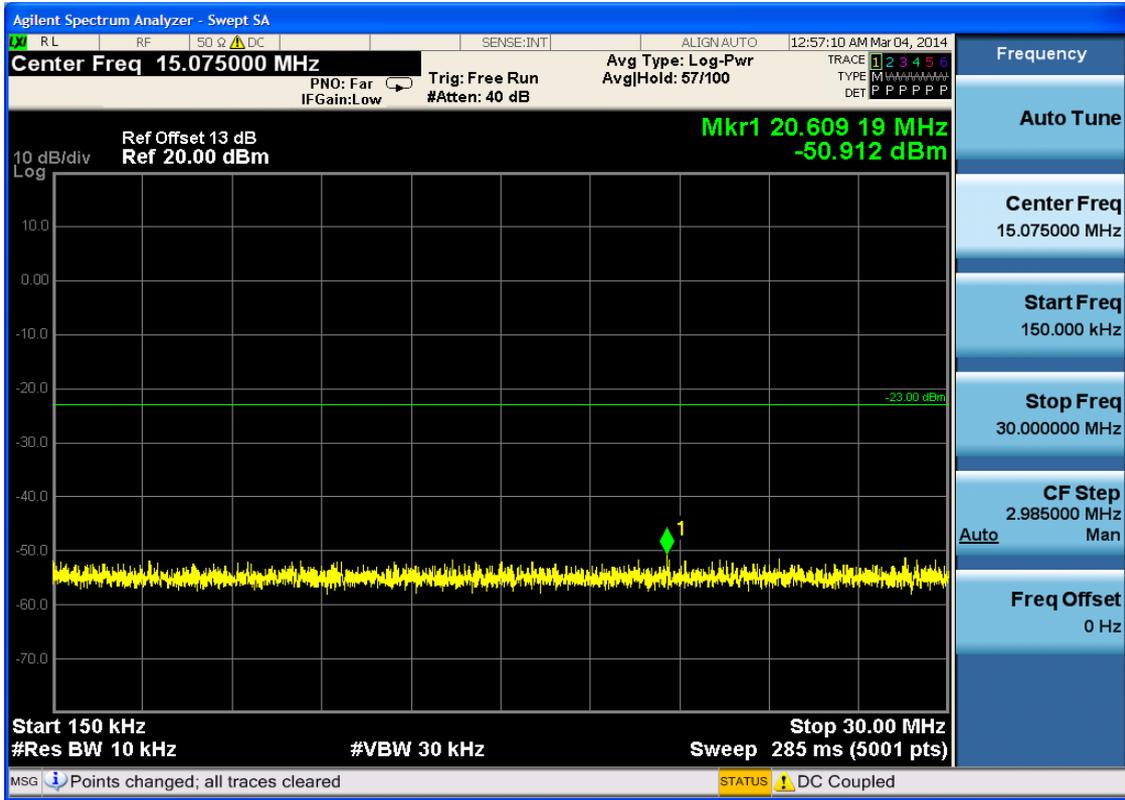
6.1 For GSM

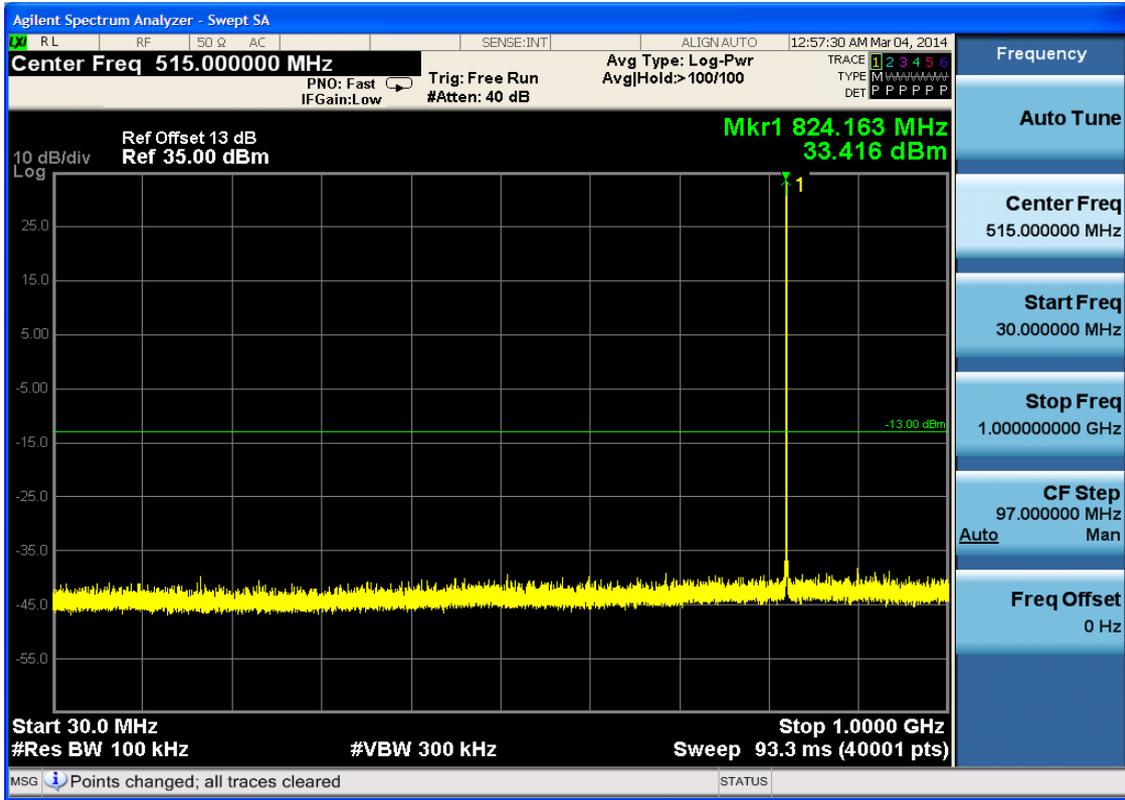
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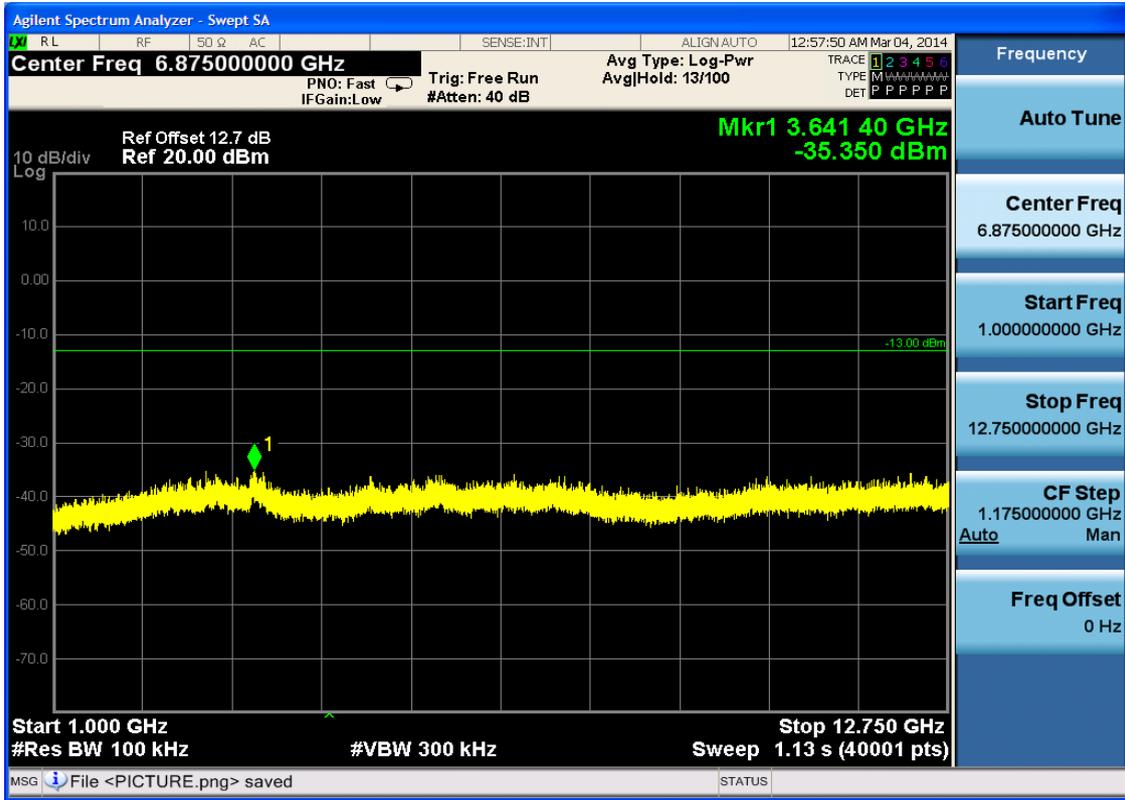
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH

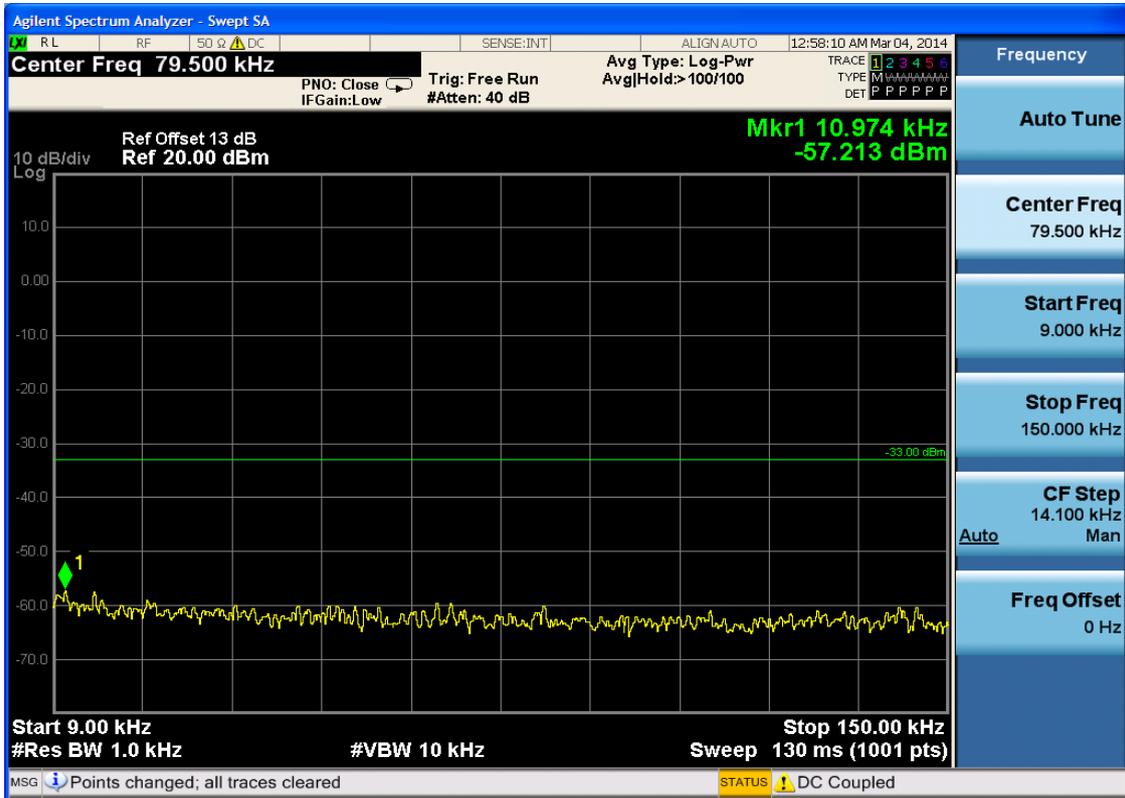


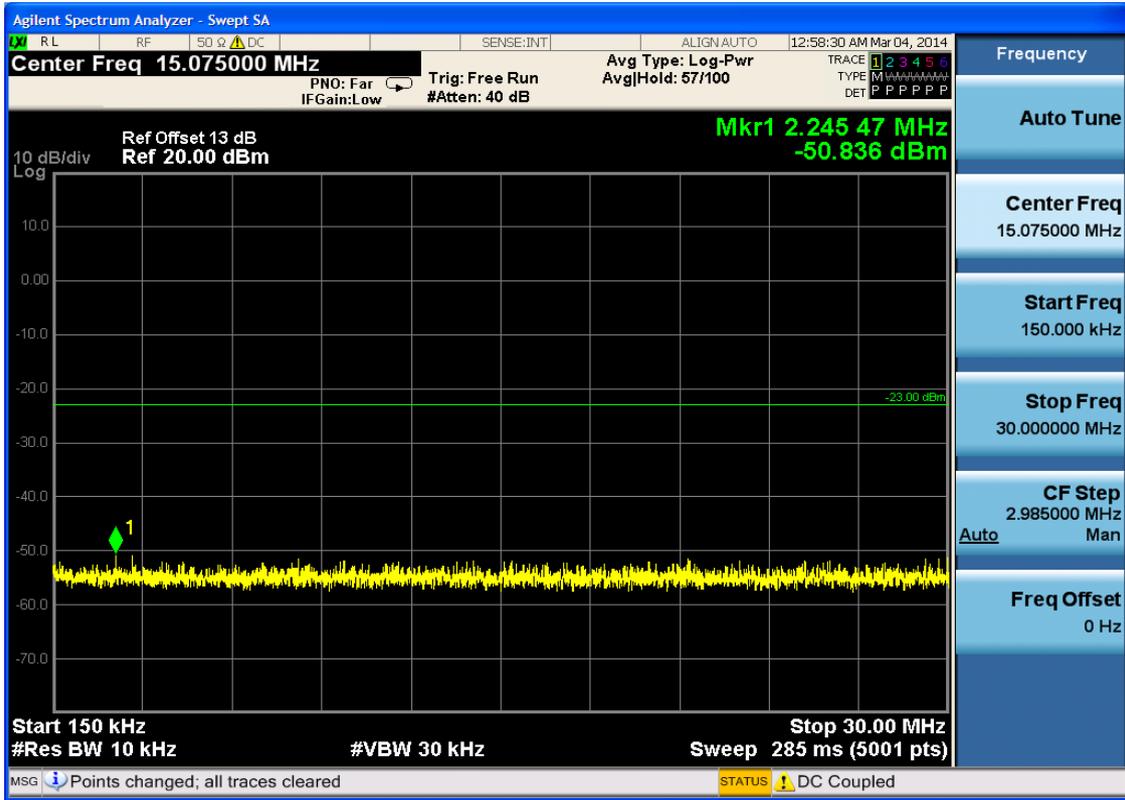


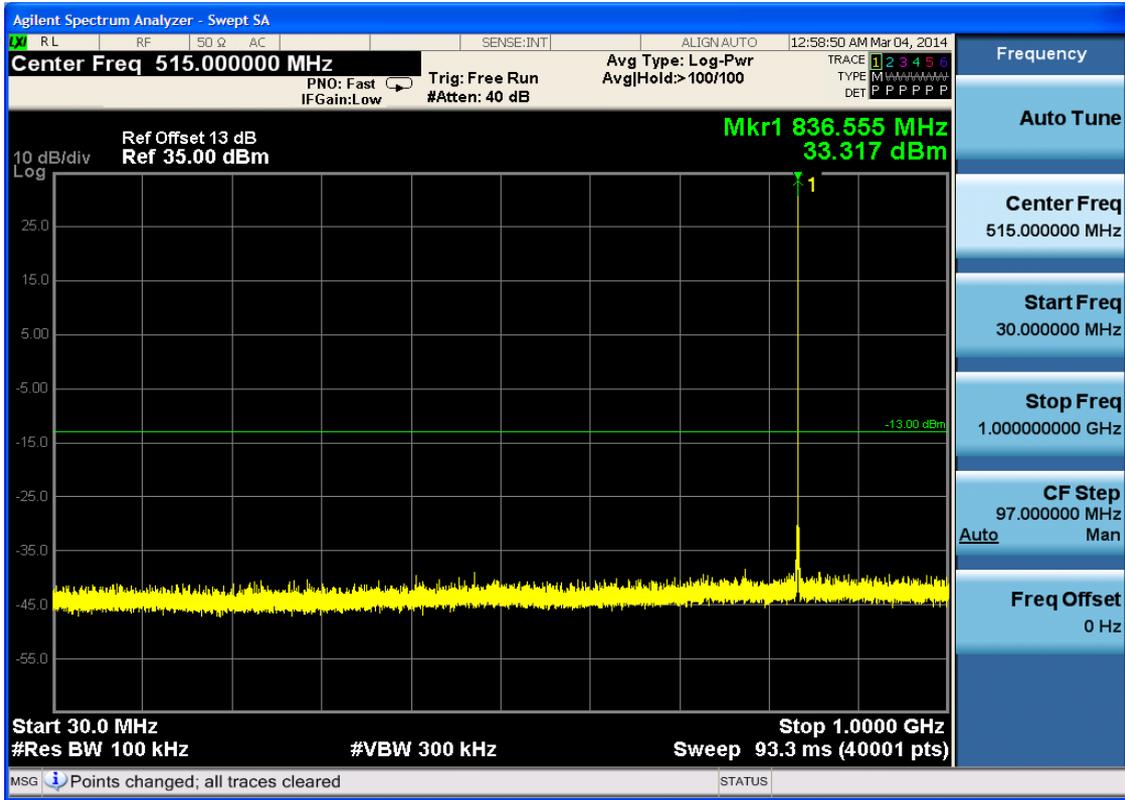


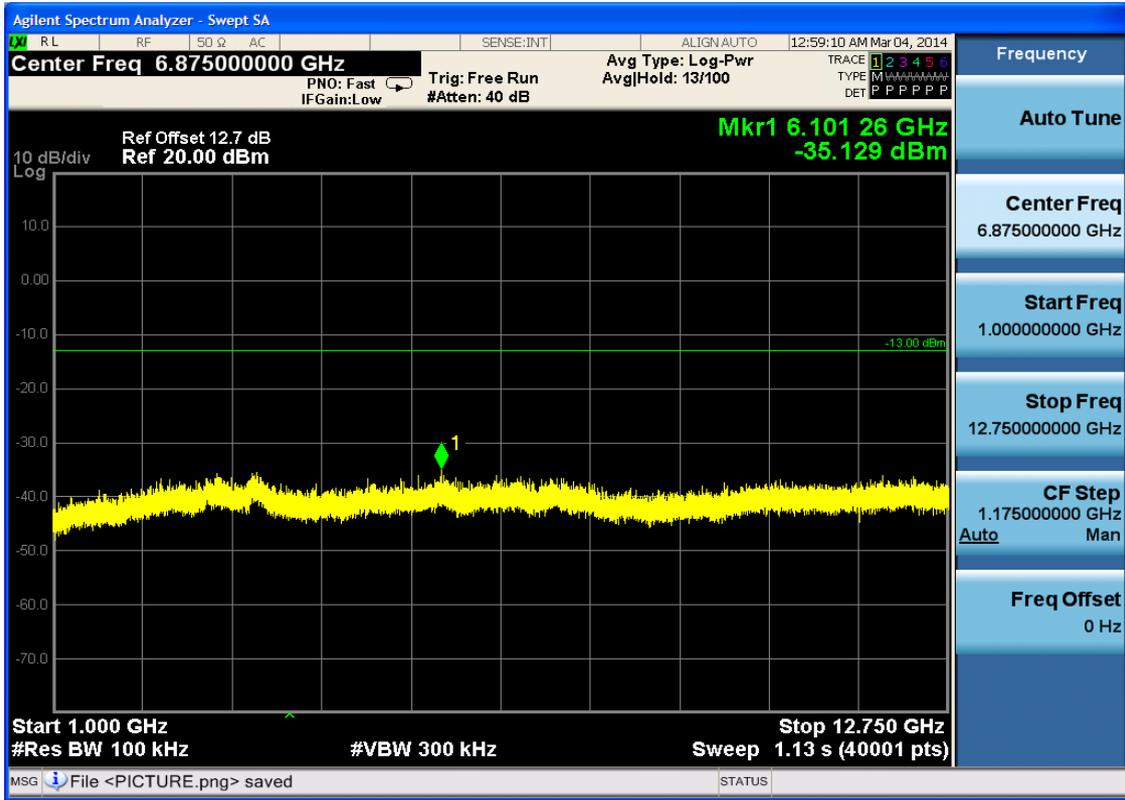


6.1.1.1.2 Test Channel = MCH



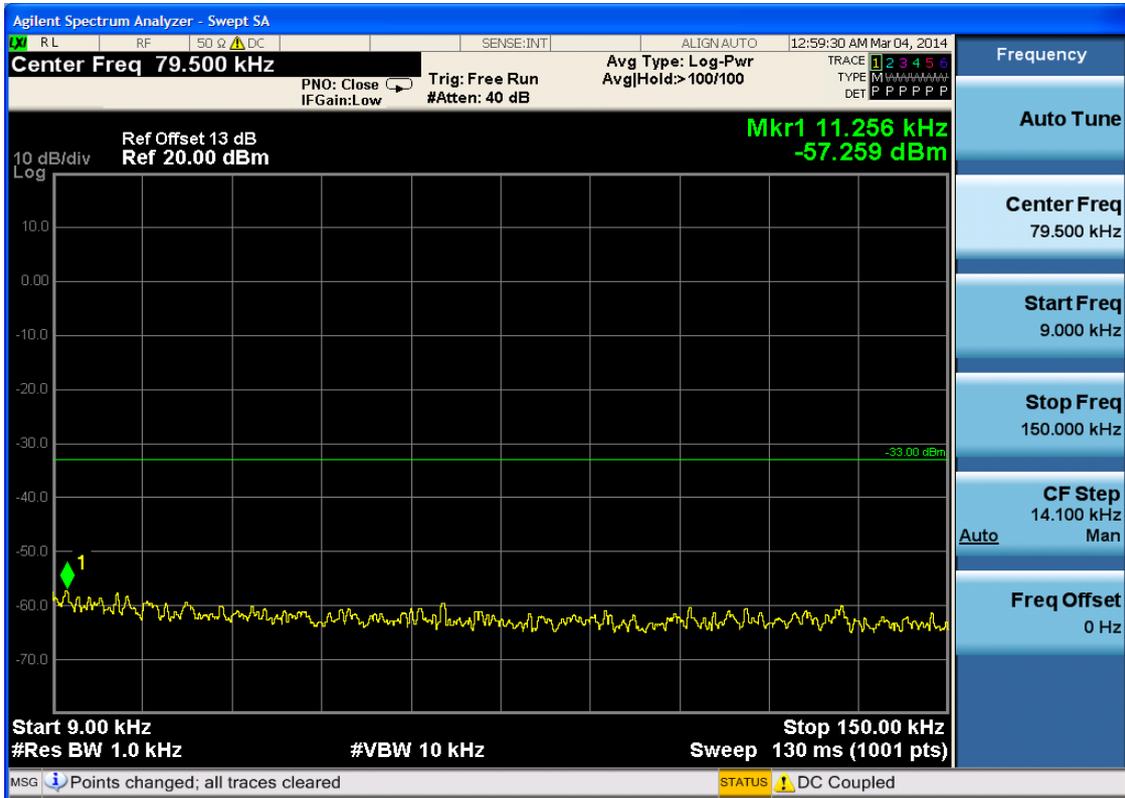


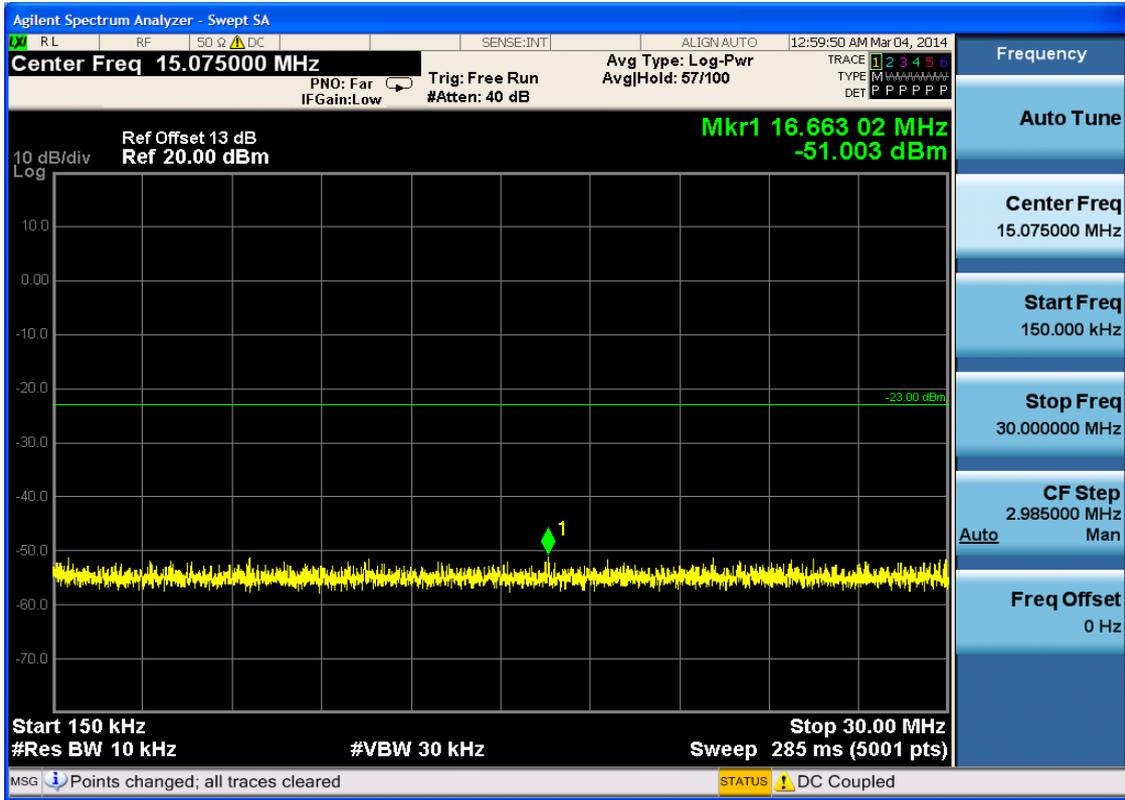


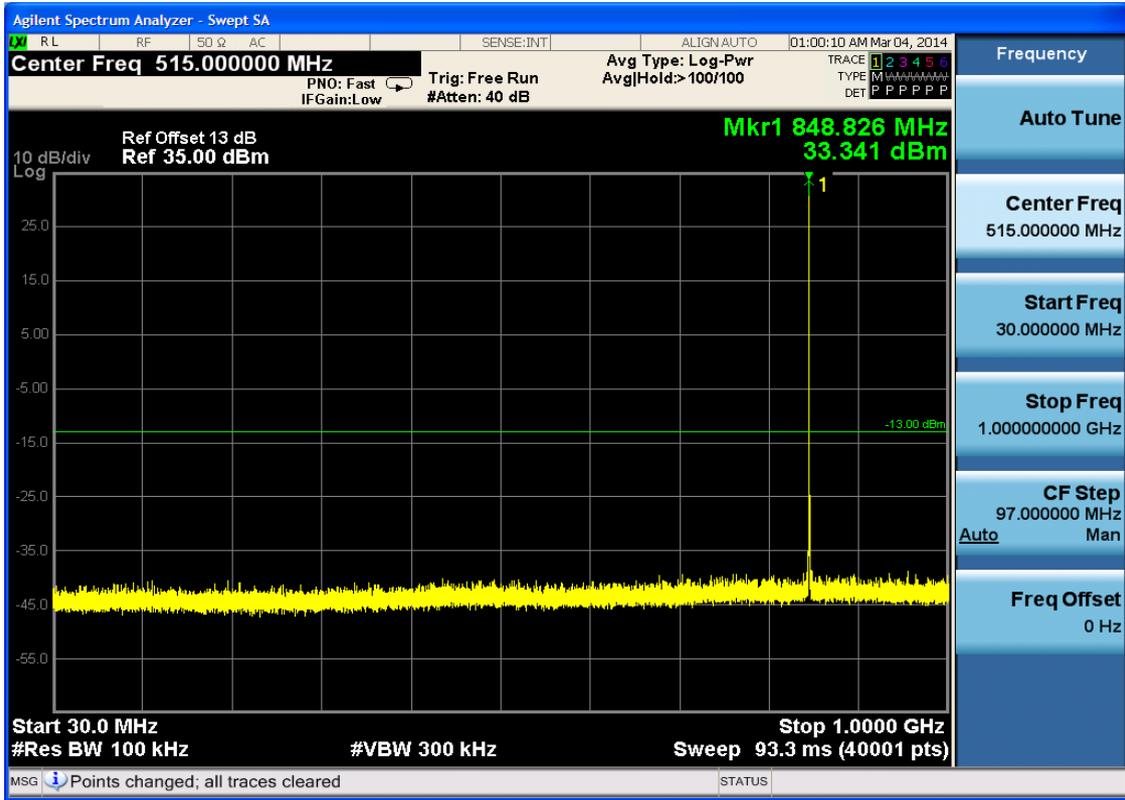


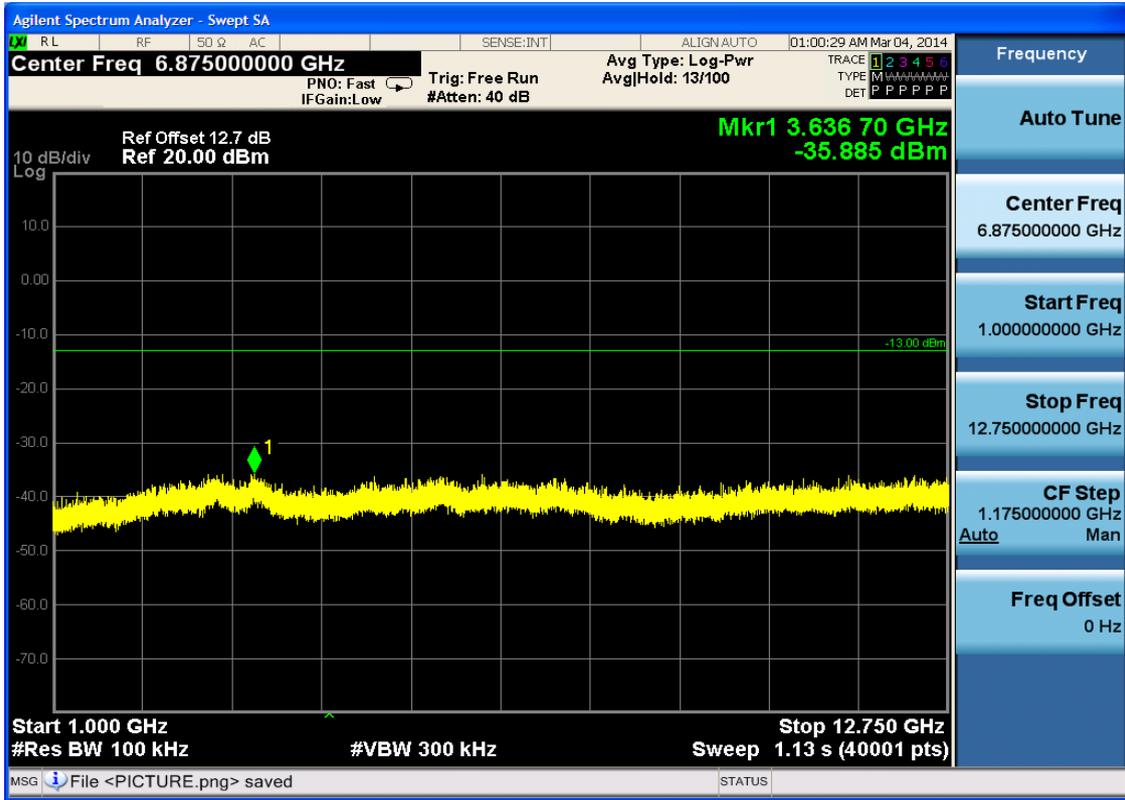


6.1.1.1.3 Test Channel = HCH



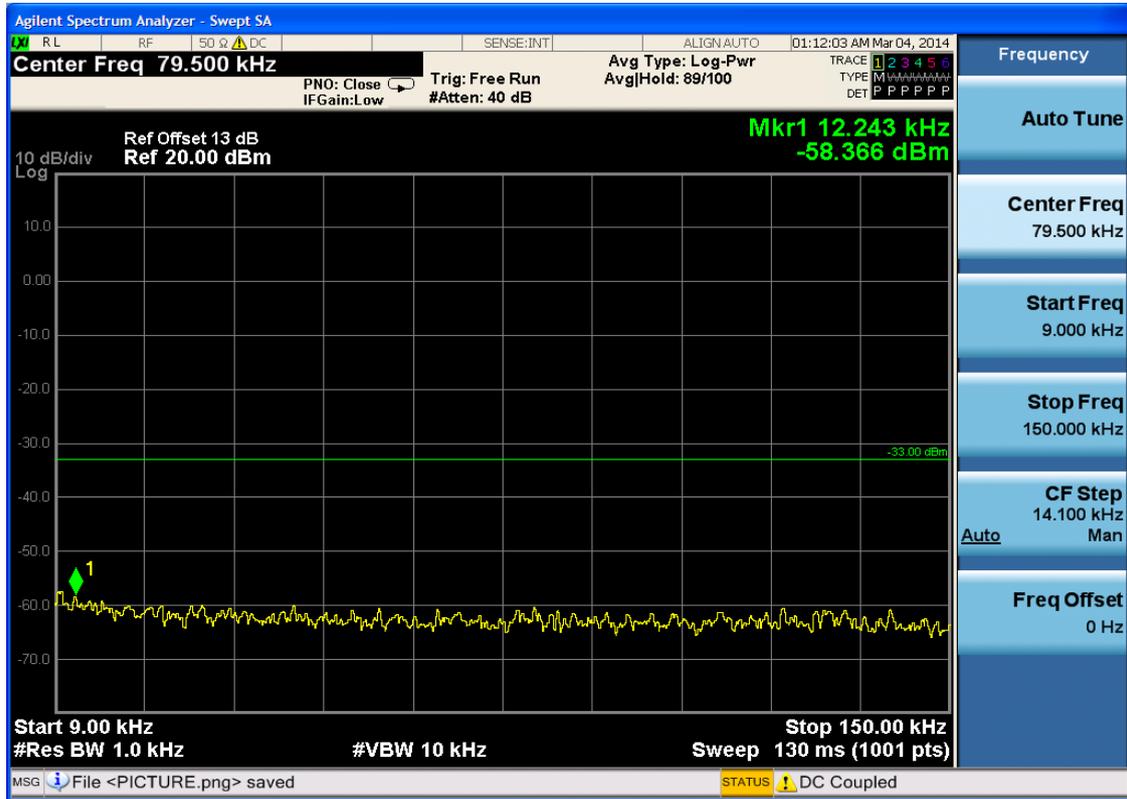


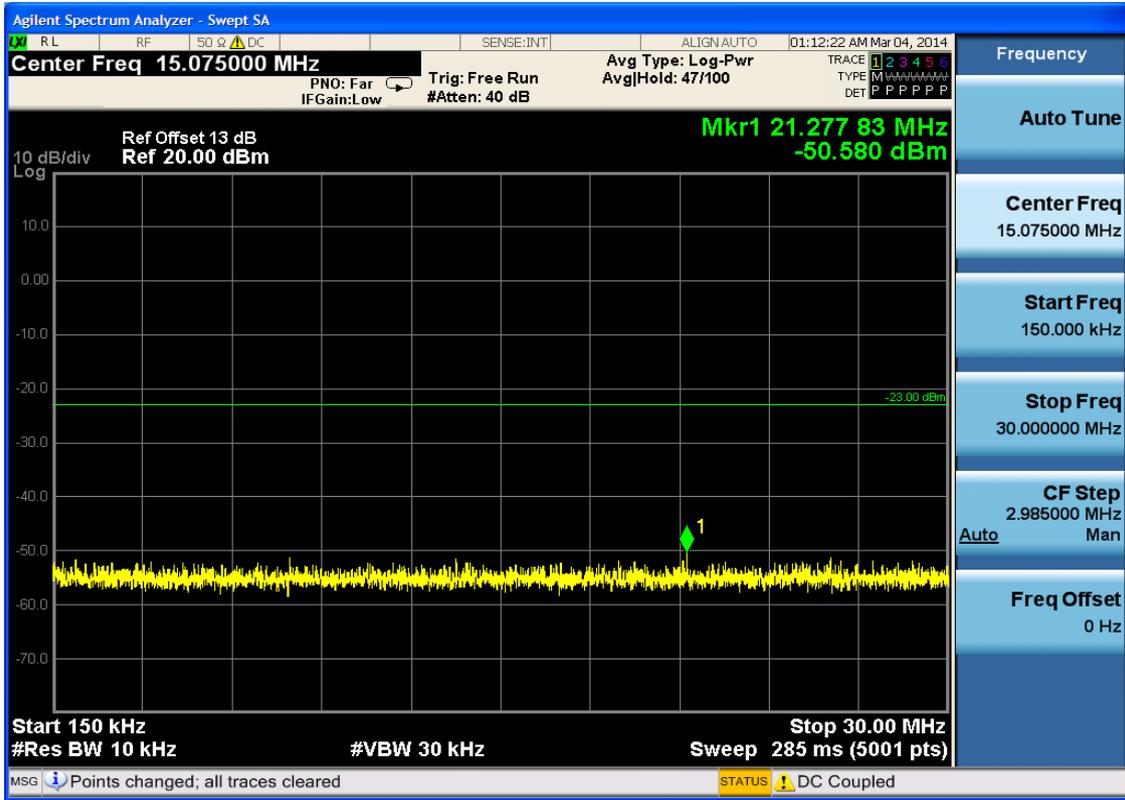


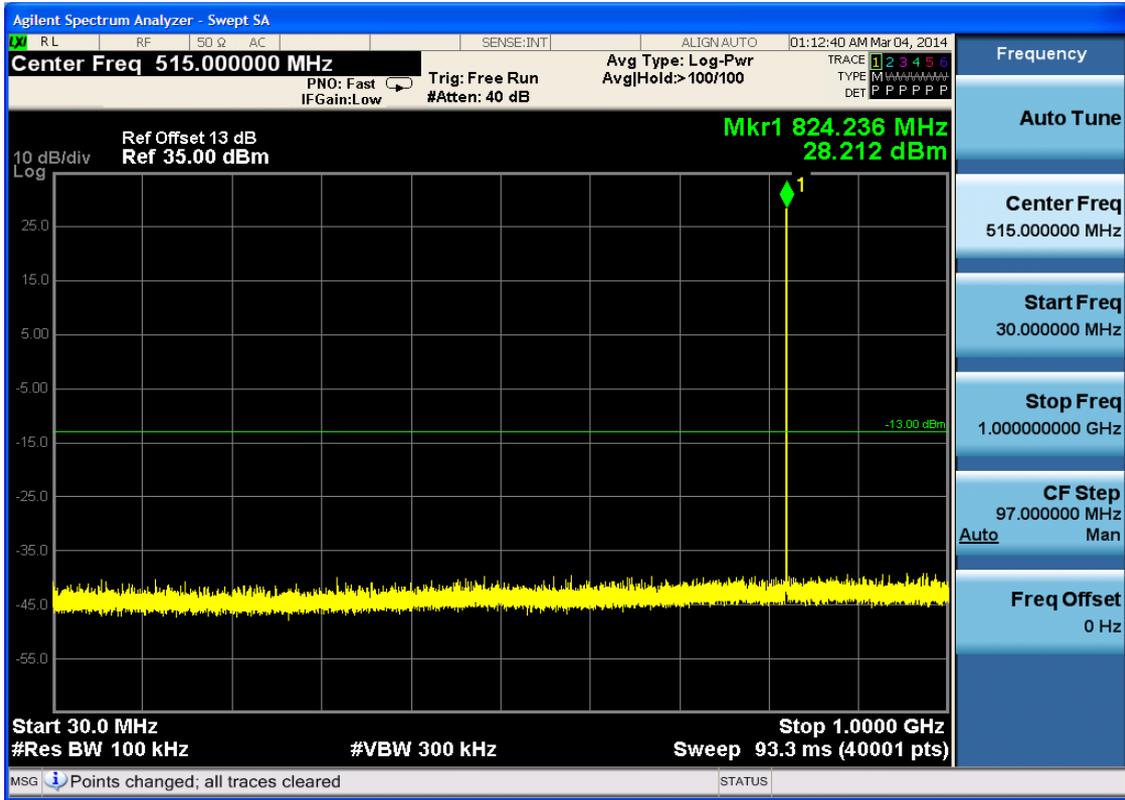


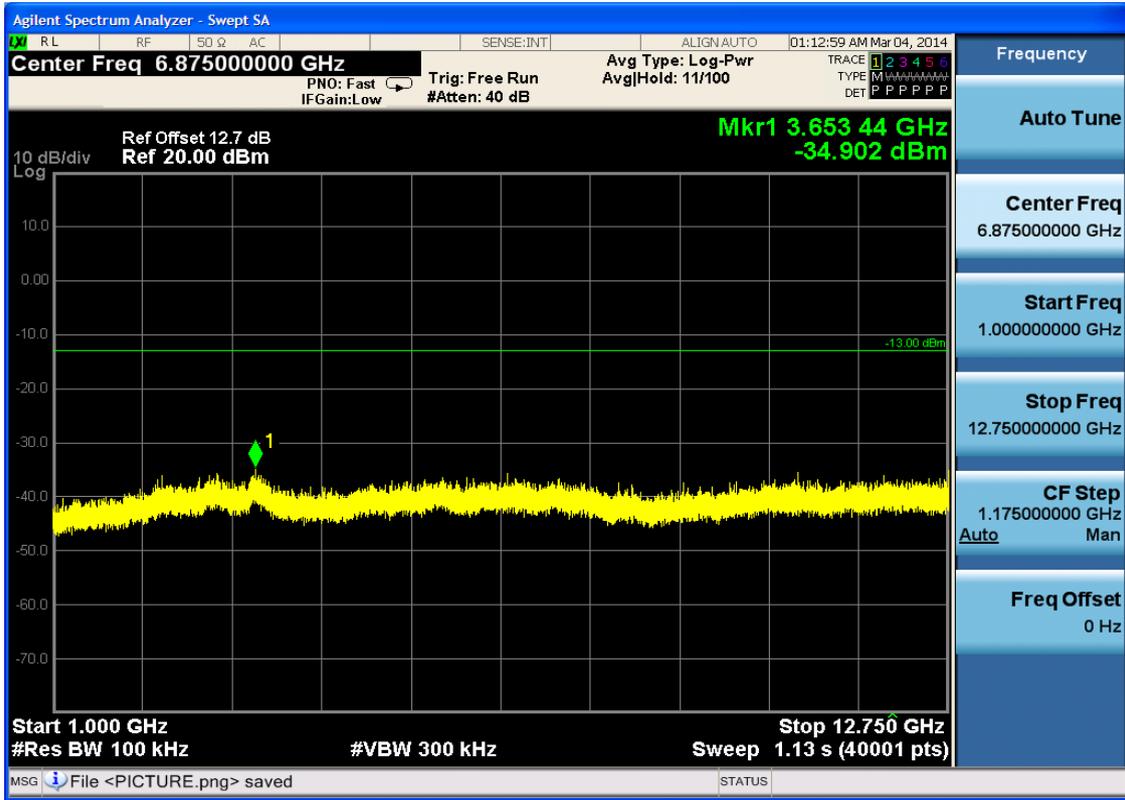
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH



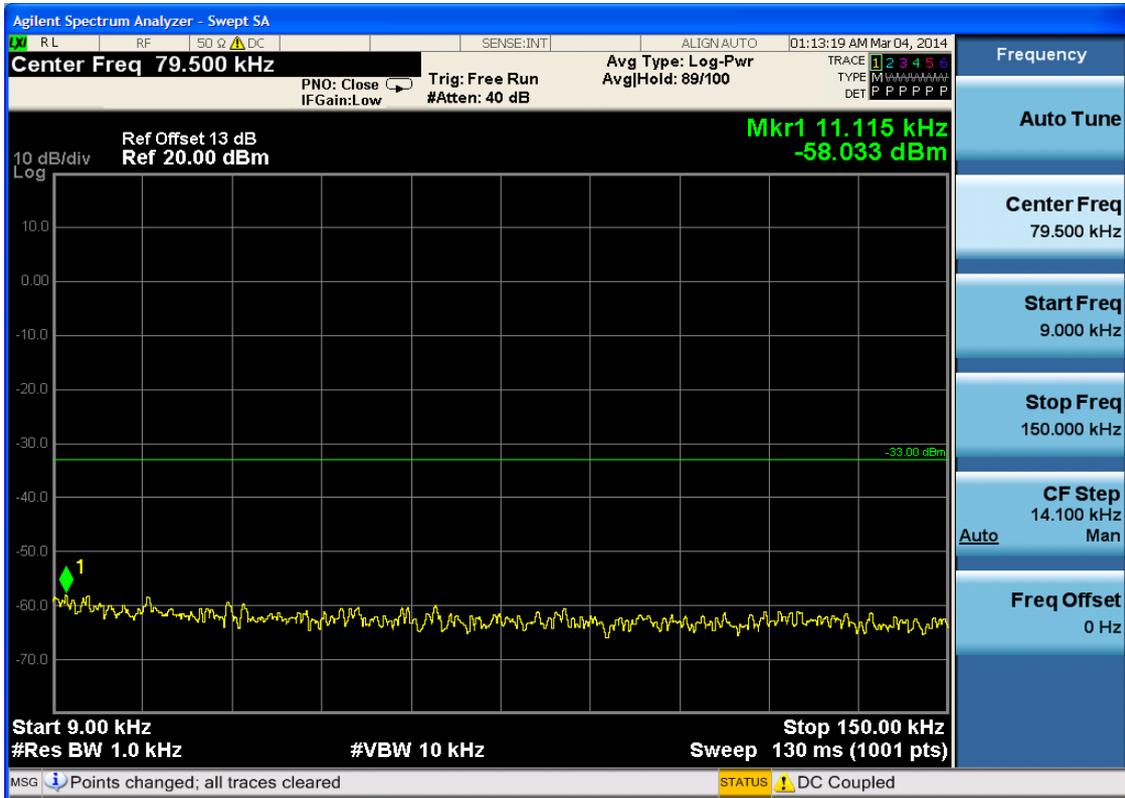


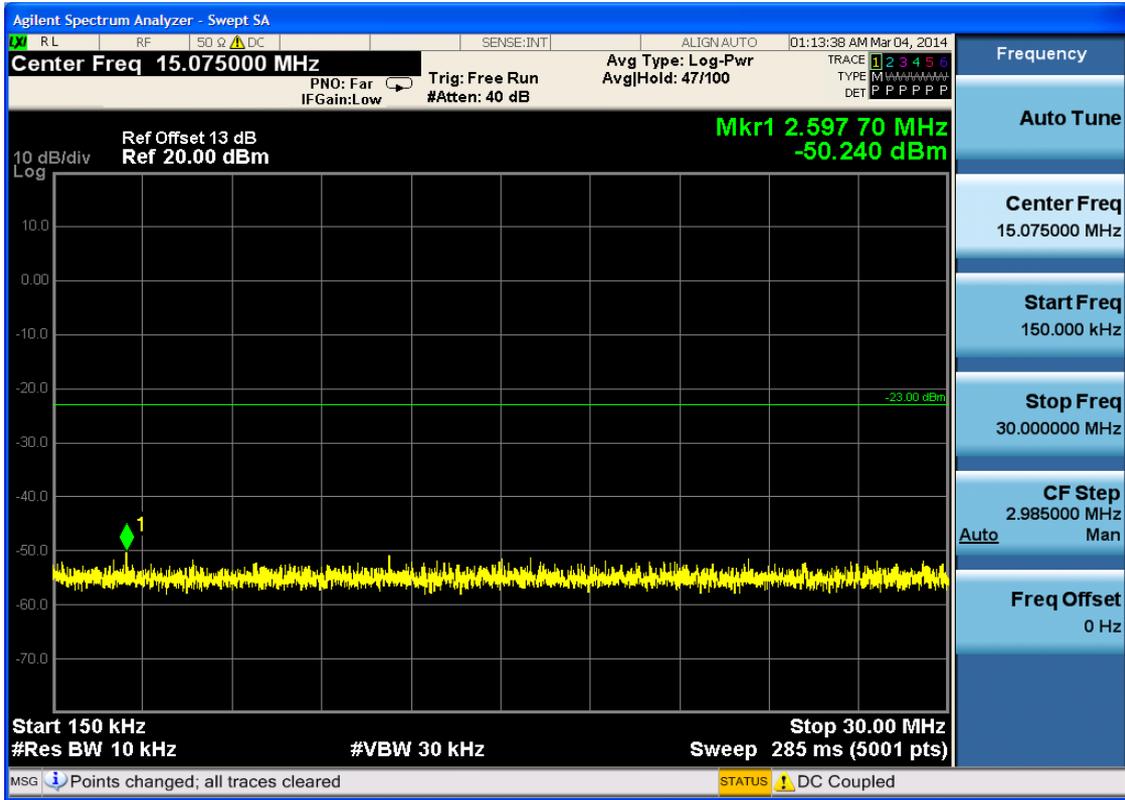


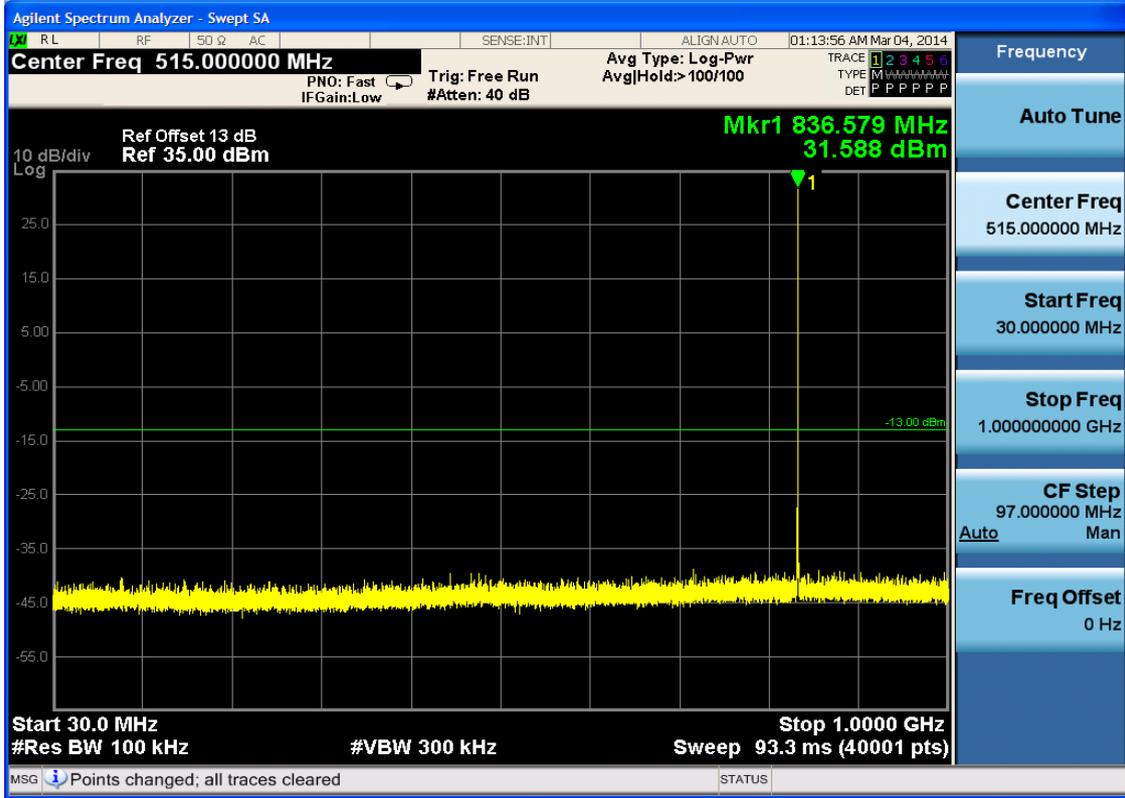


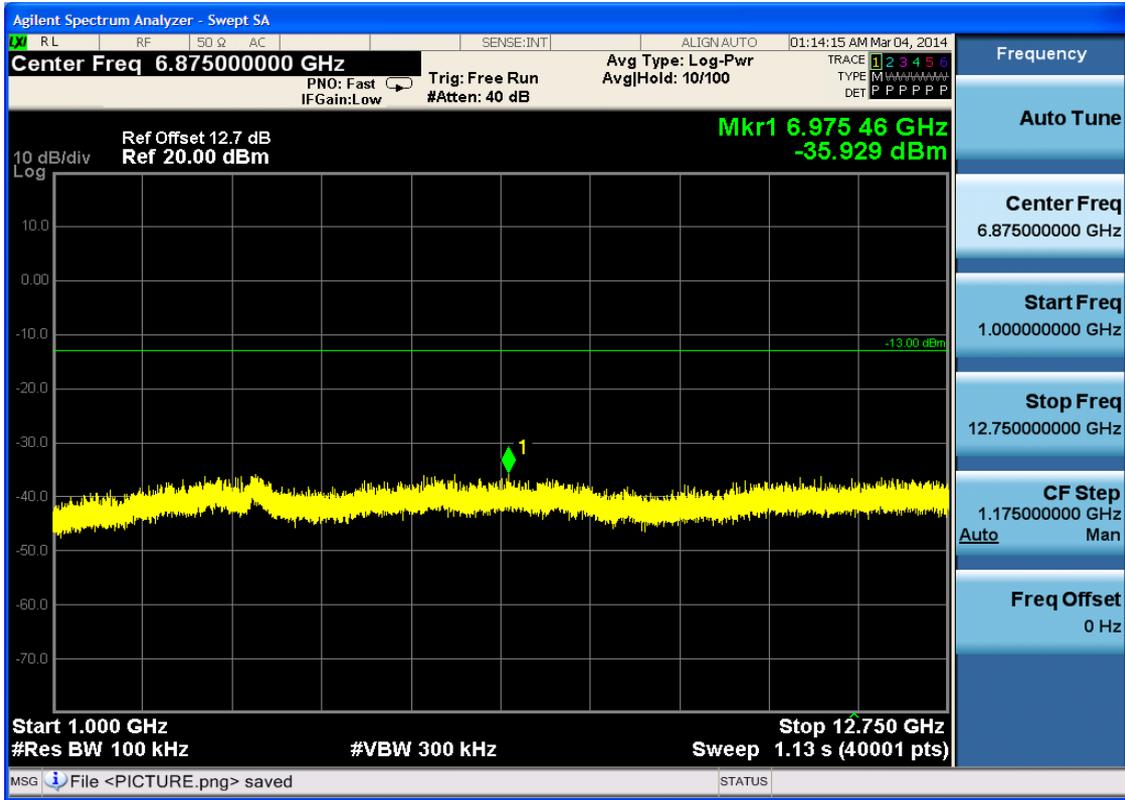


6.1.1.2.2 Test Channel = MCH



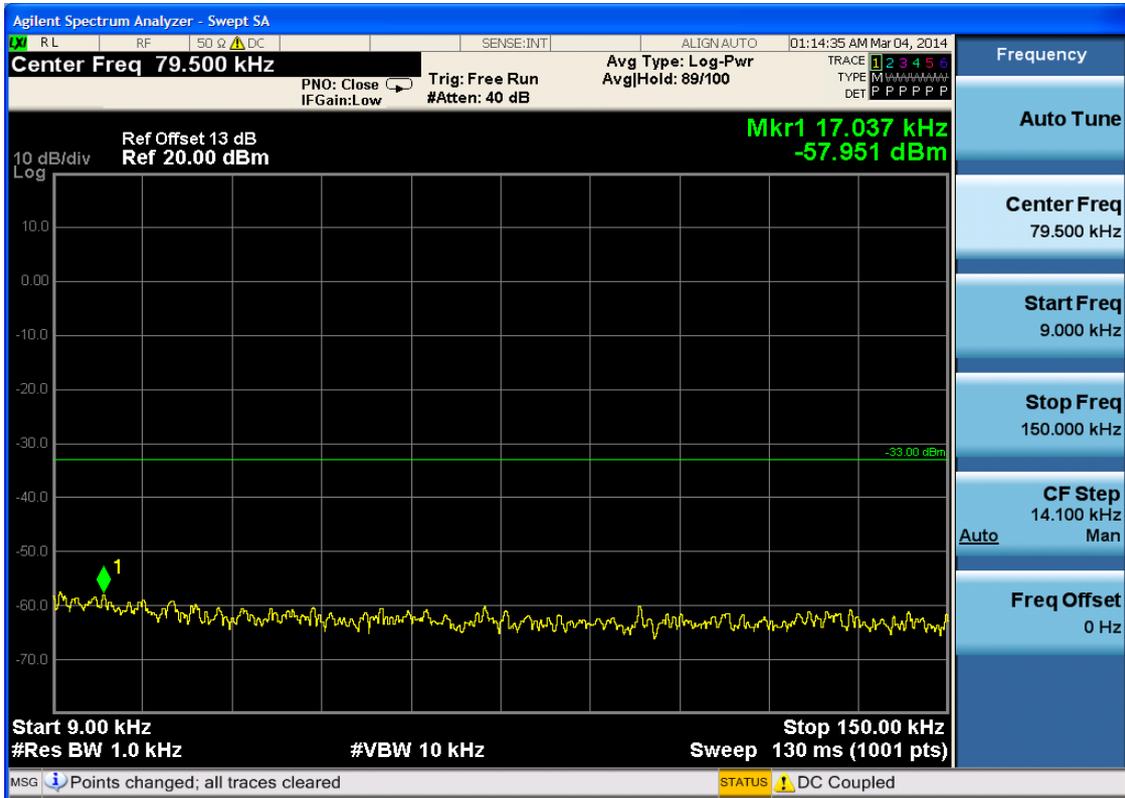


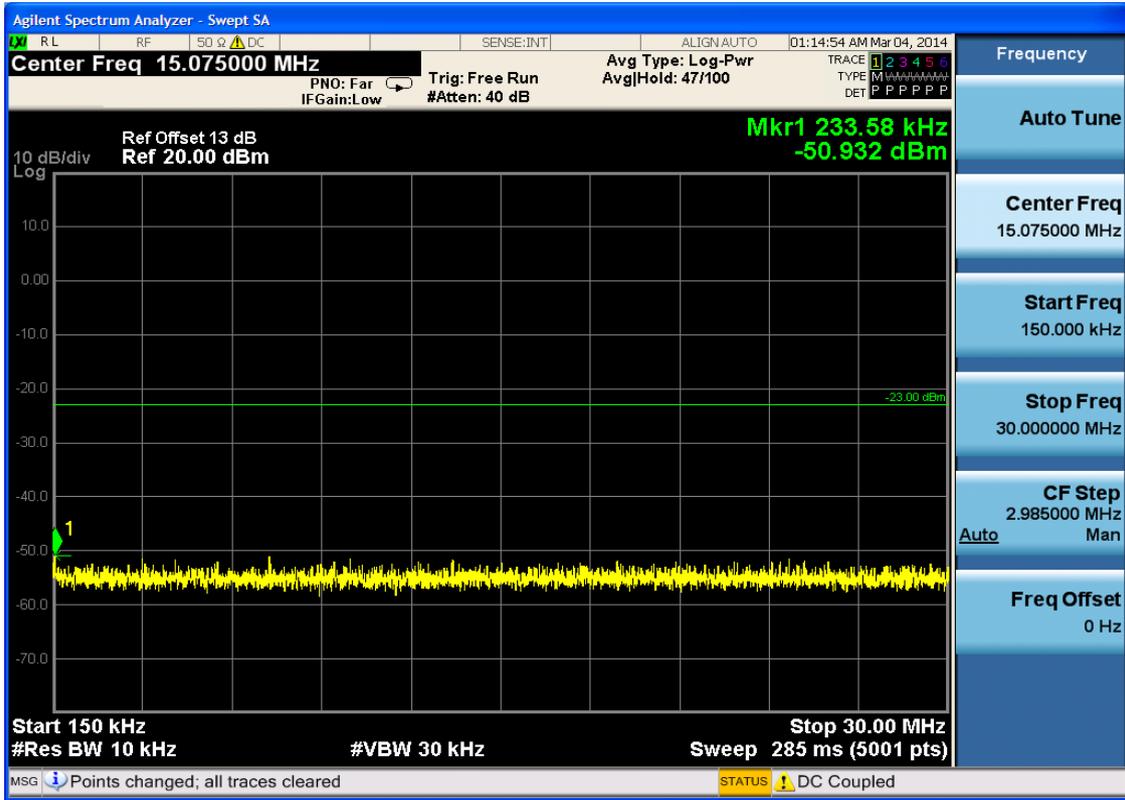


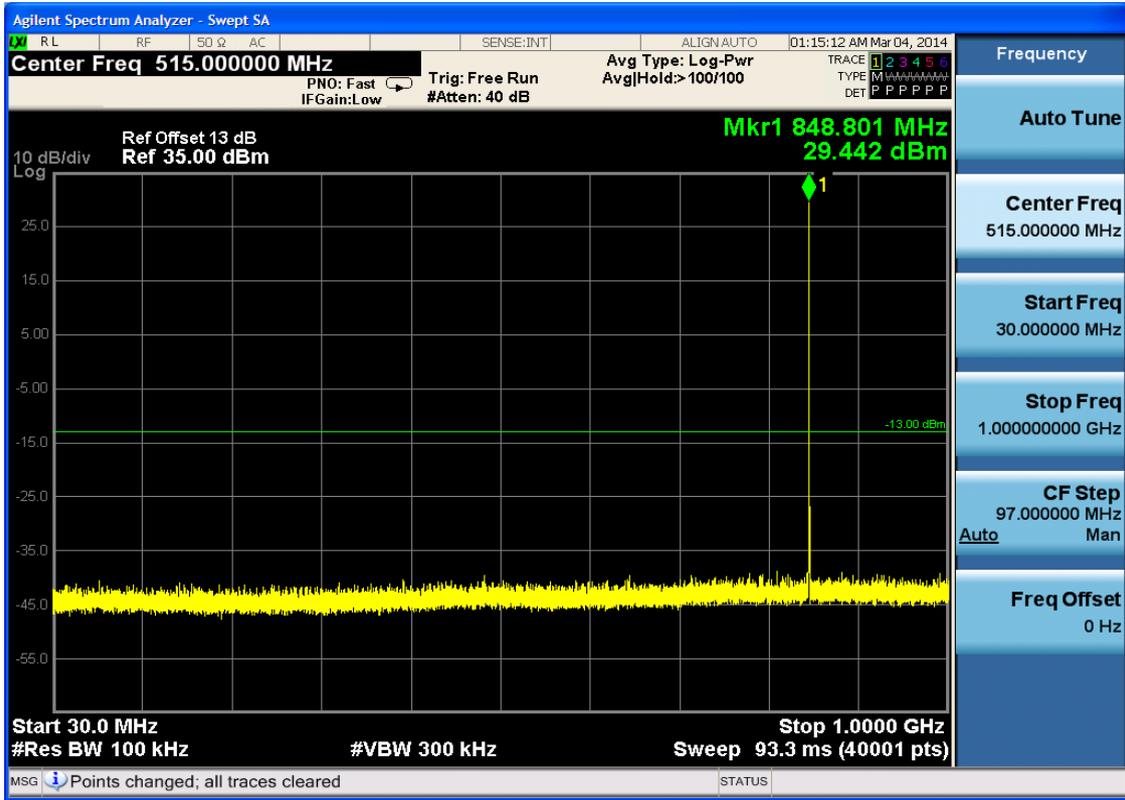


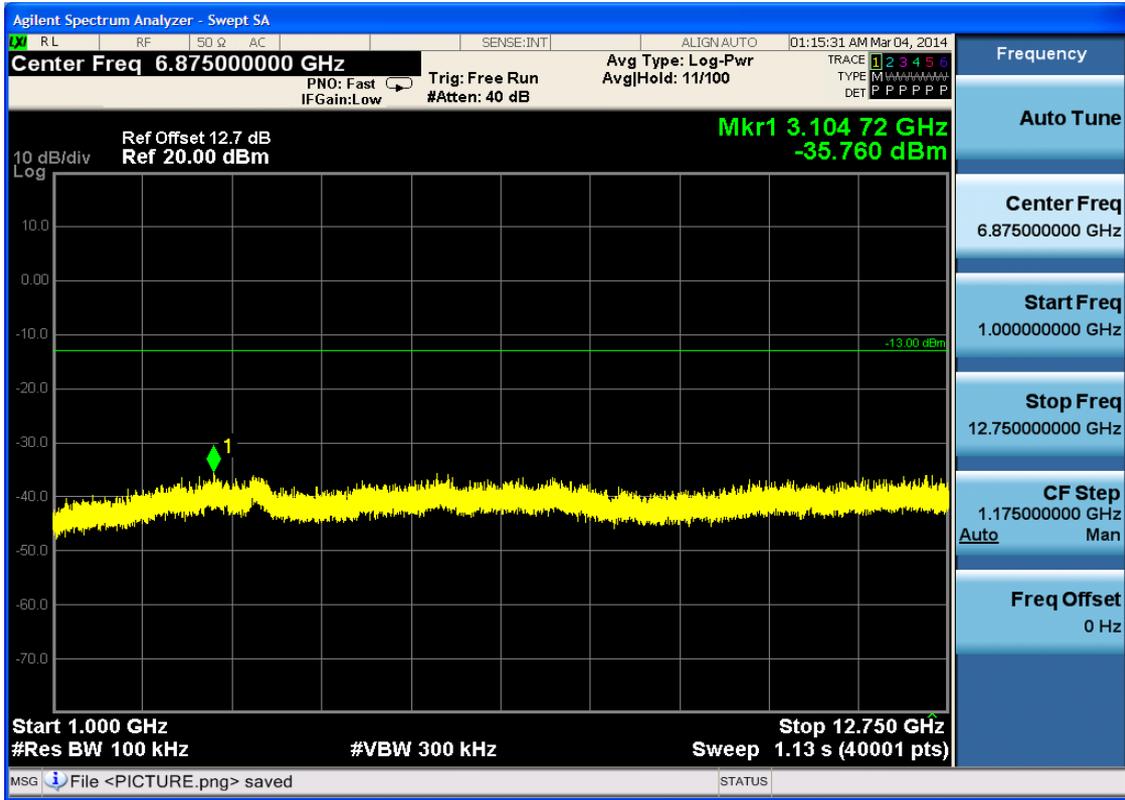


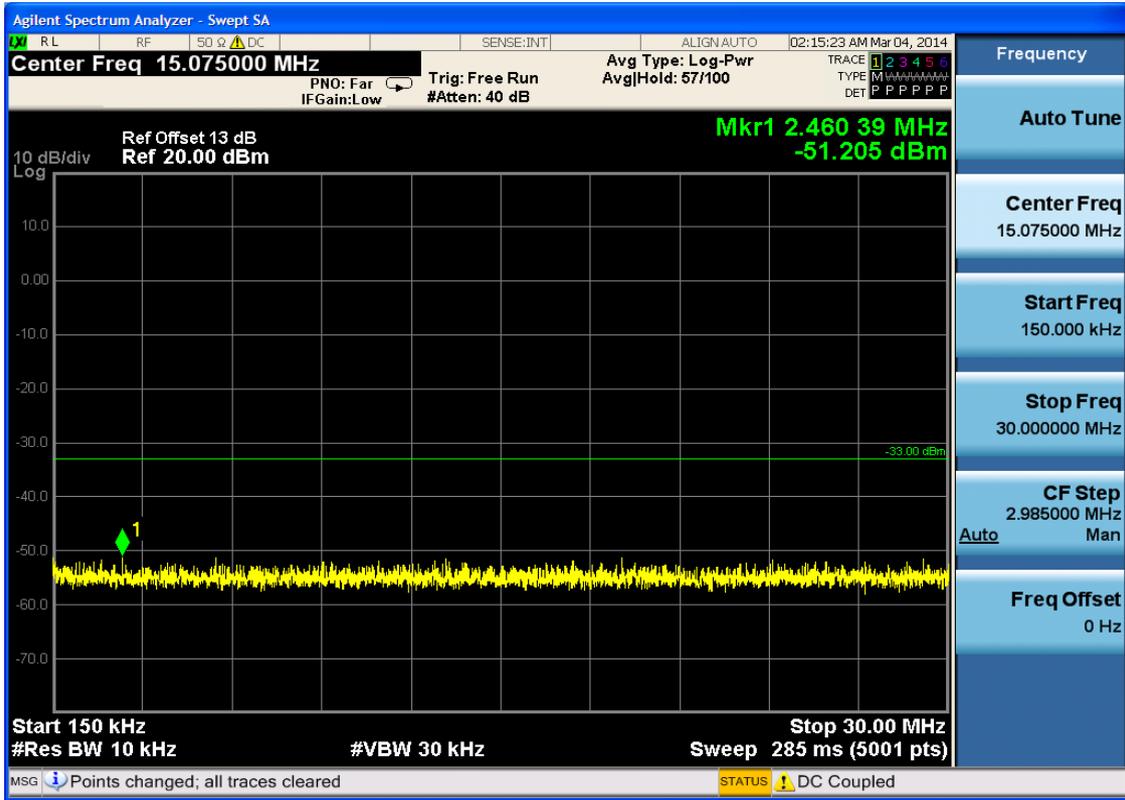
6.1.1.2.3 Test Channel = HCH





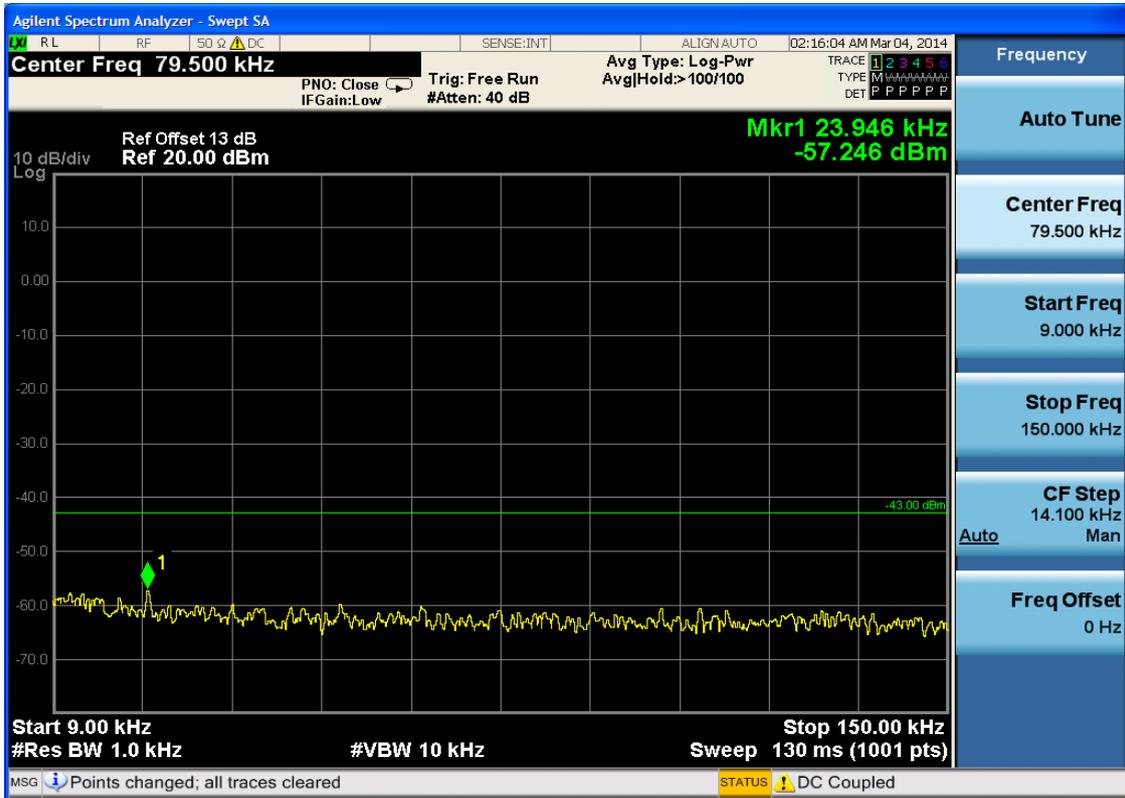


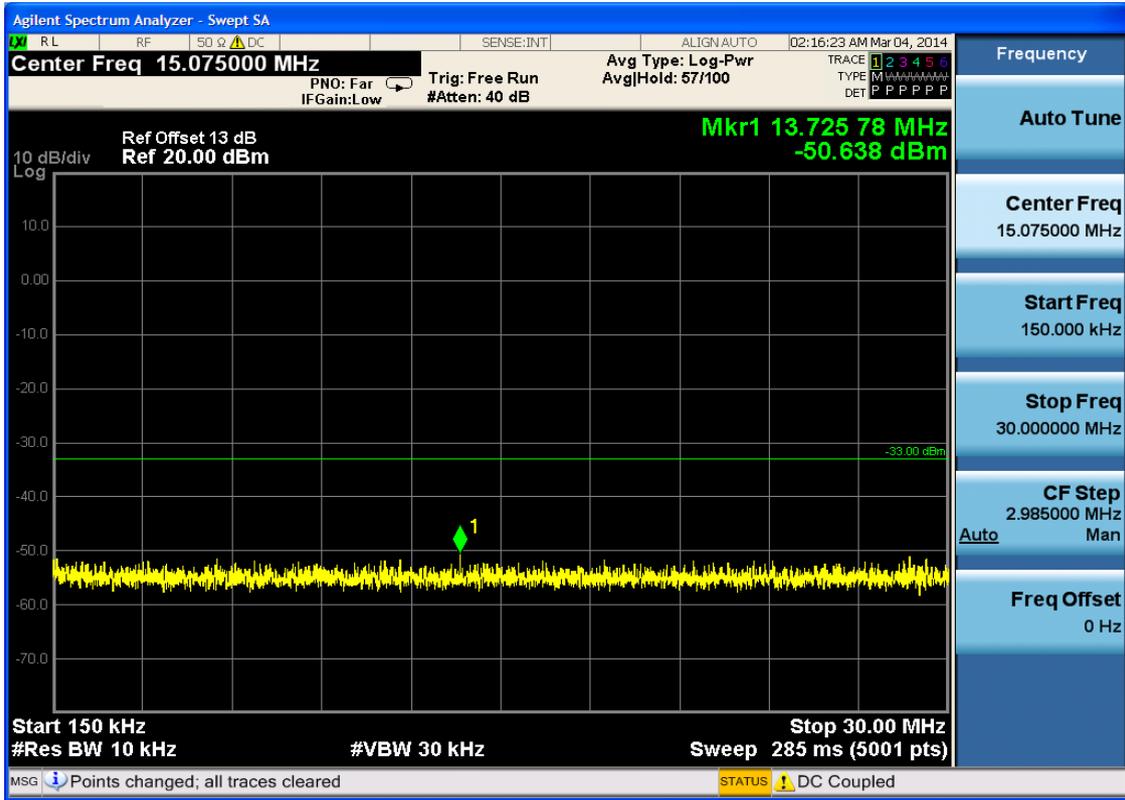






6.1.2.1.2 Test Channel = MCH

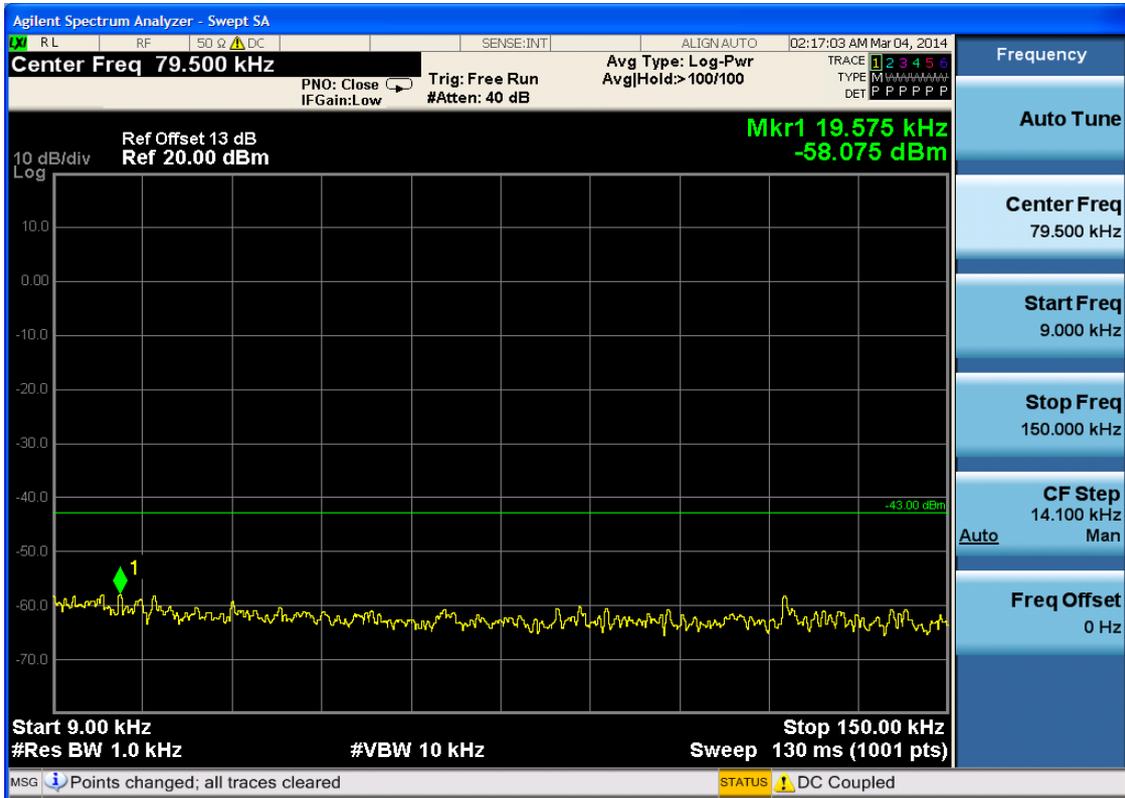


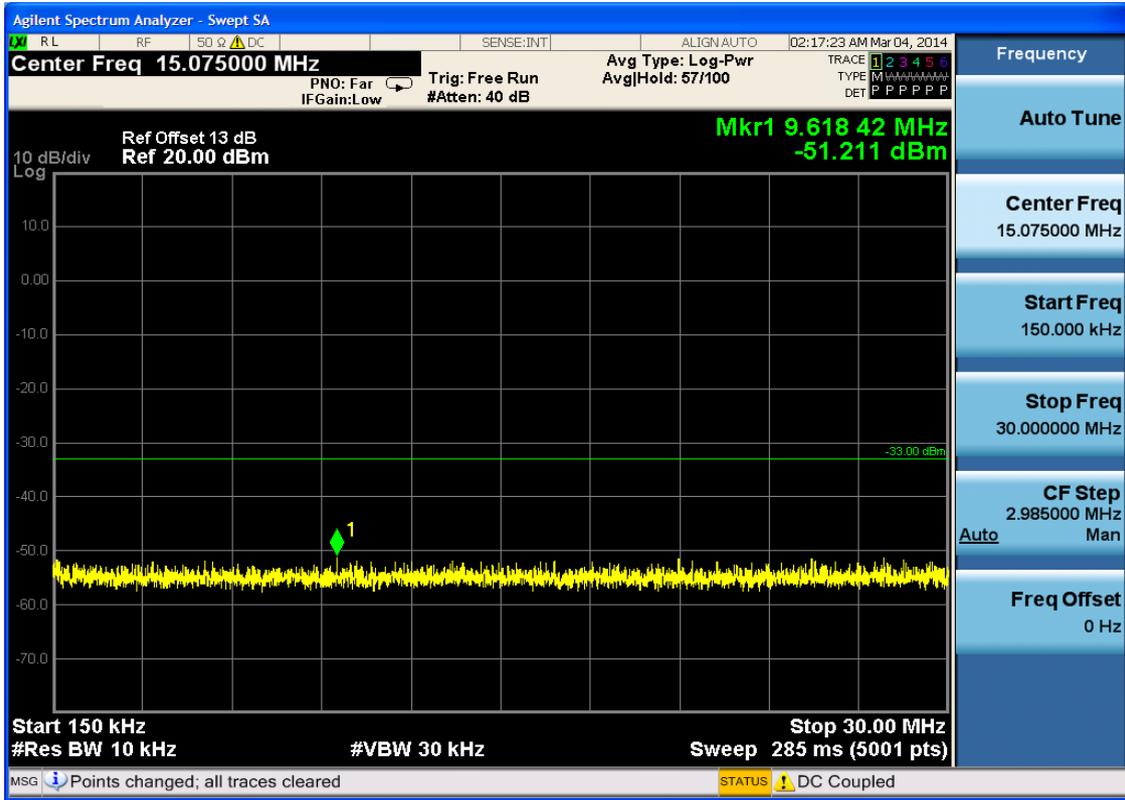






6.1.2.1.3 Test Channel = HCH



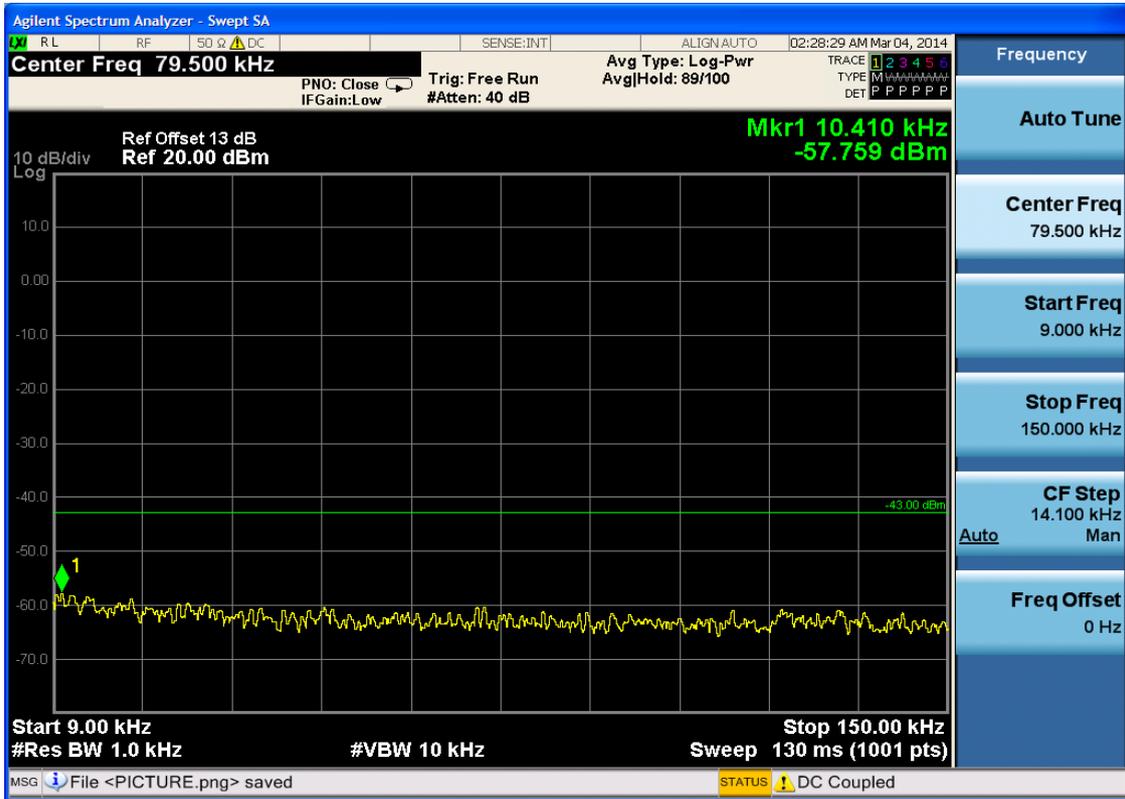


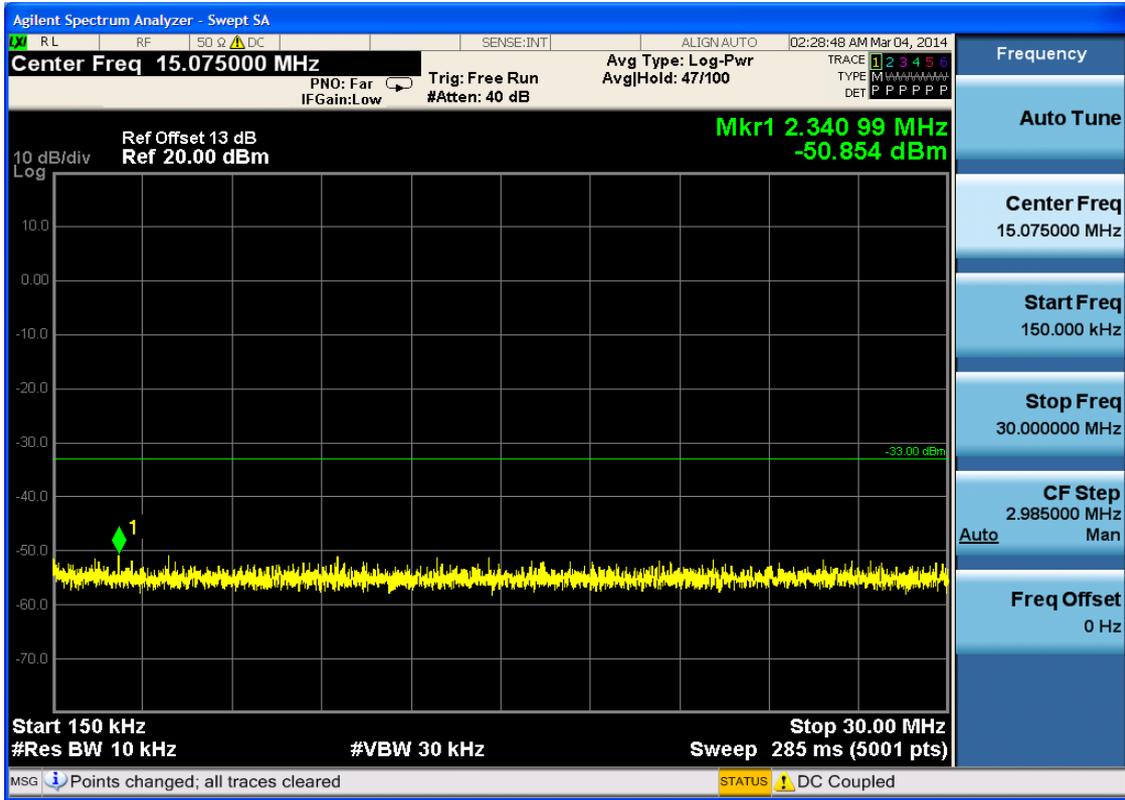




6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

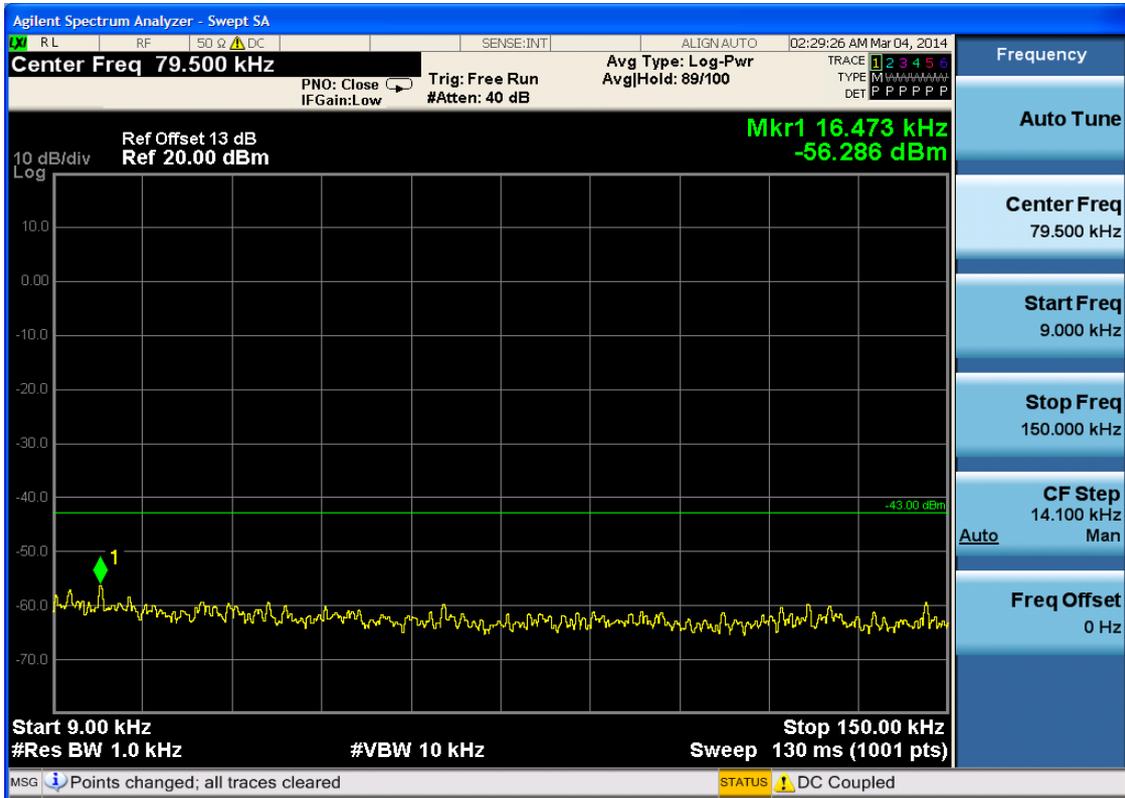


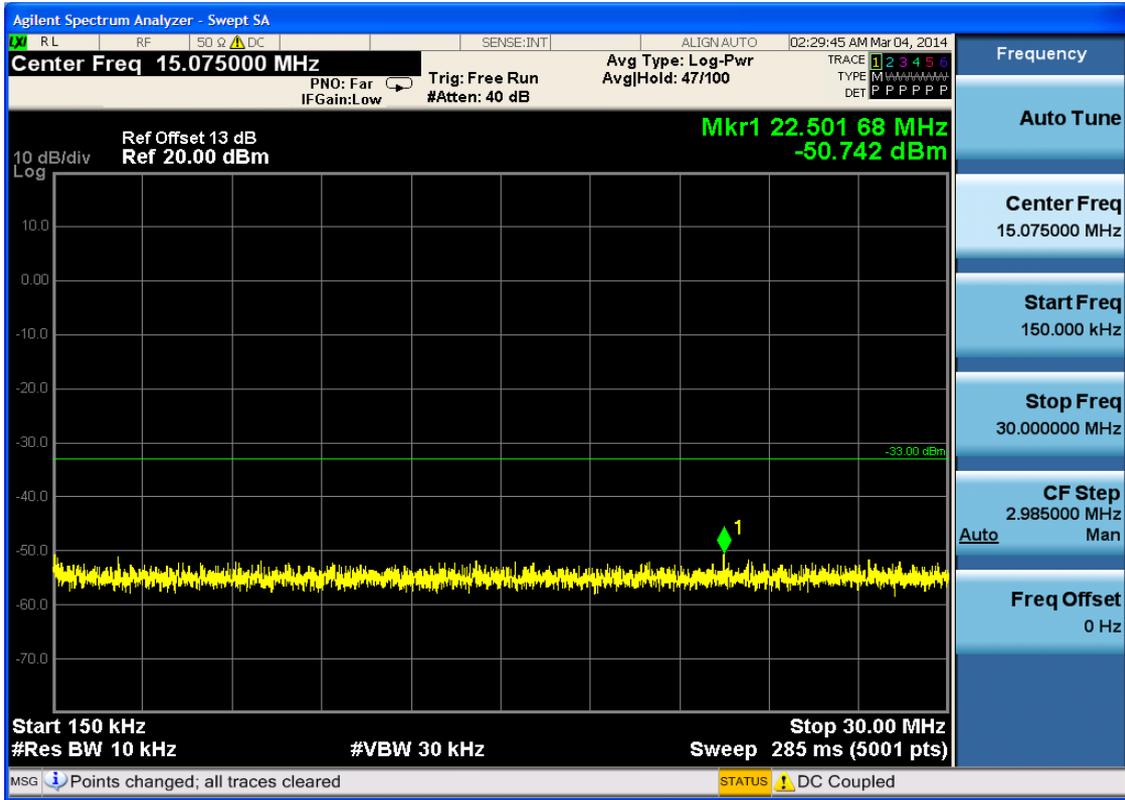






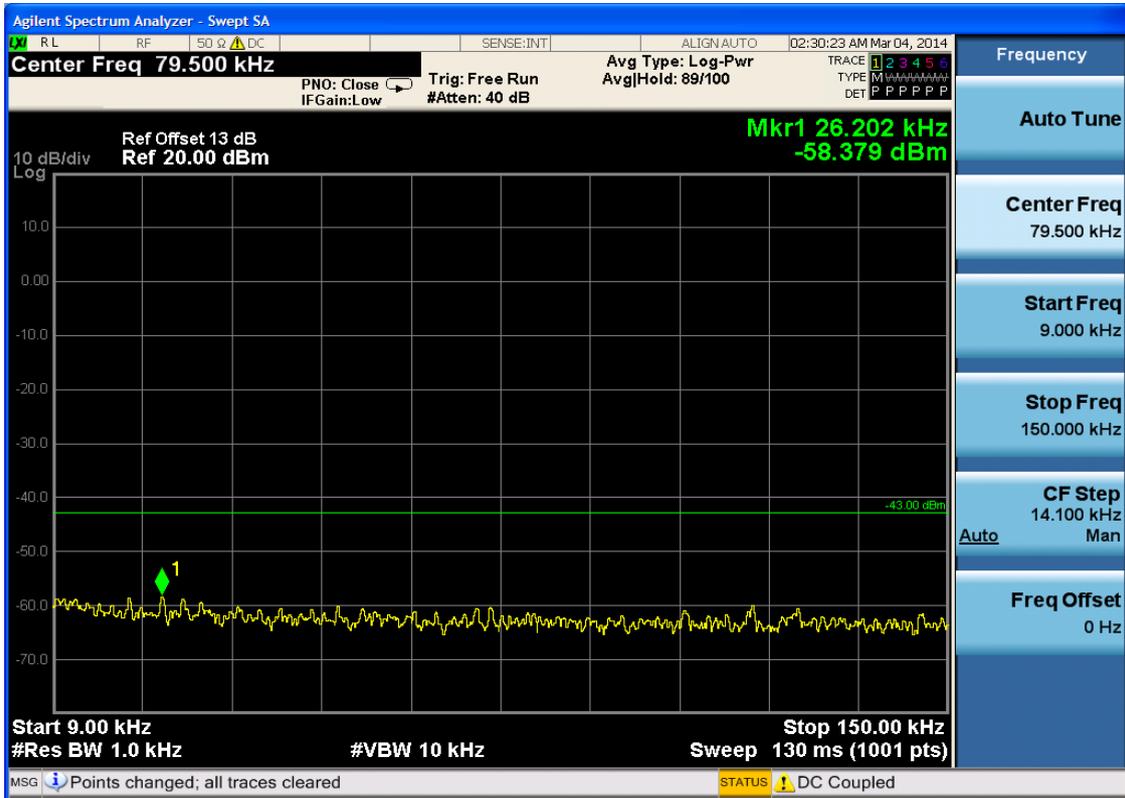
6.1.2.2.2 Test Channel = MCH

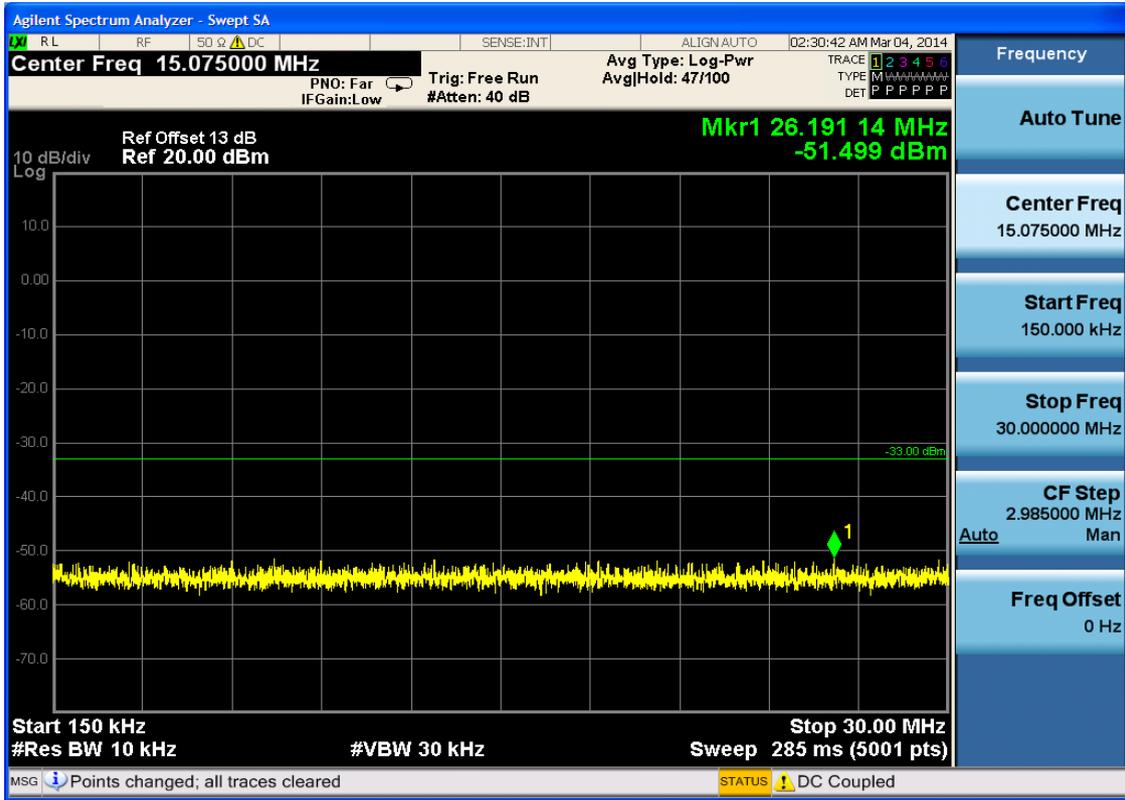






6.1.2.2.3 Test Channel = HCH









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

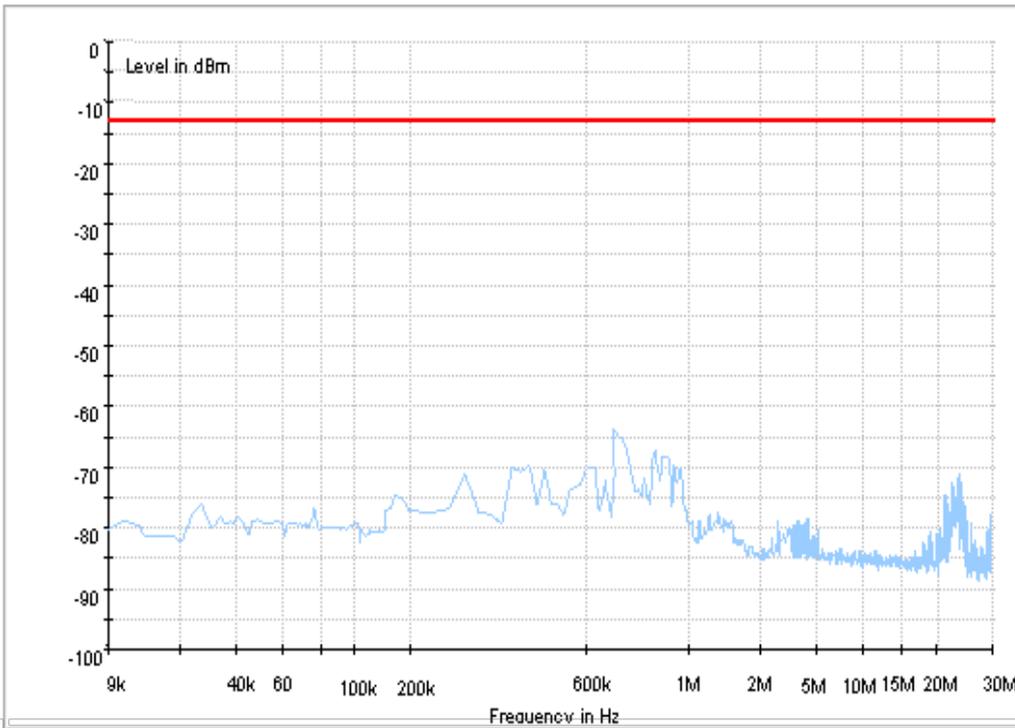
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

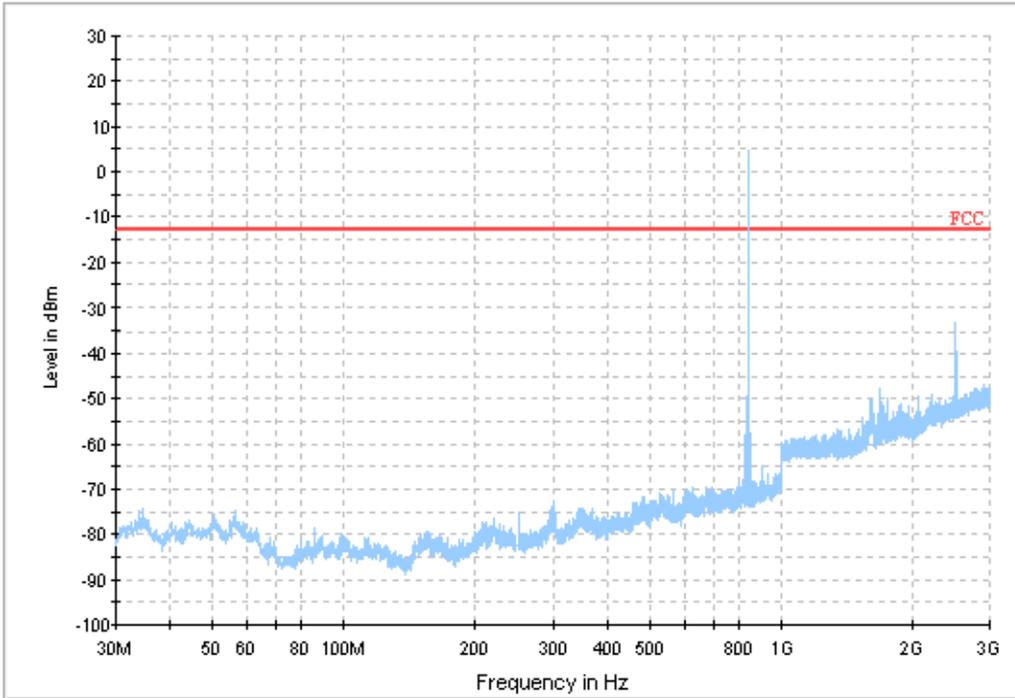
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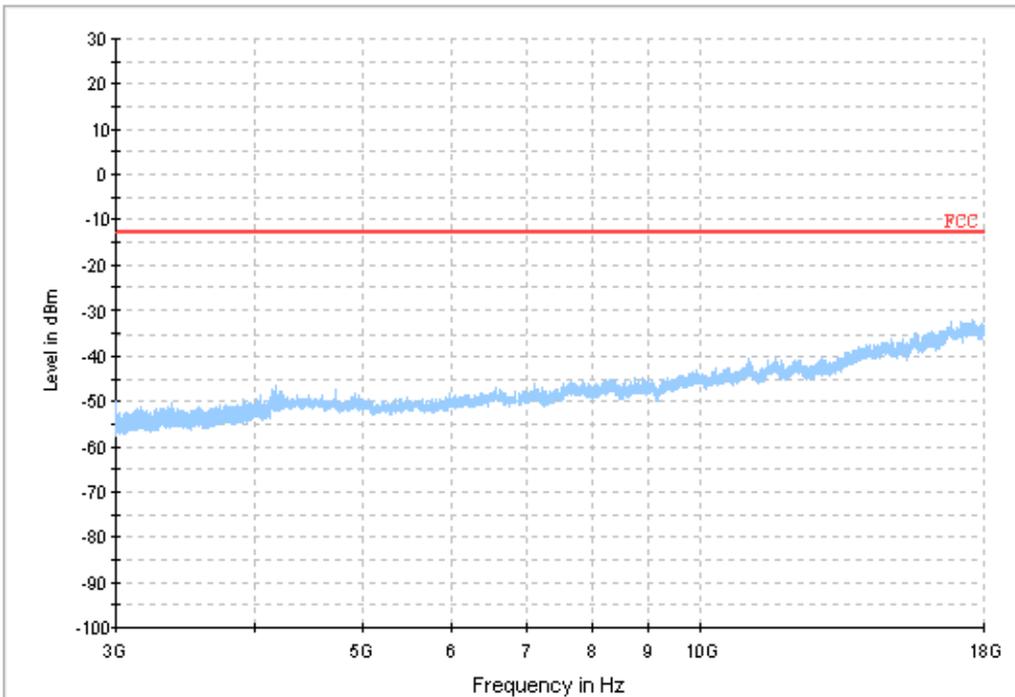
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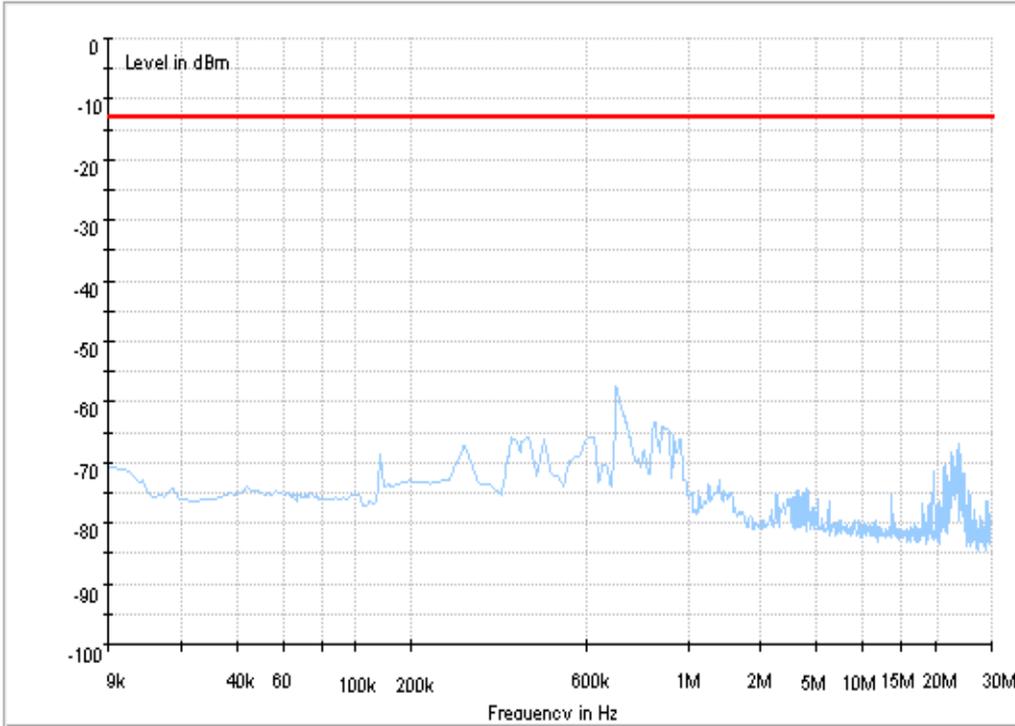
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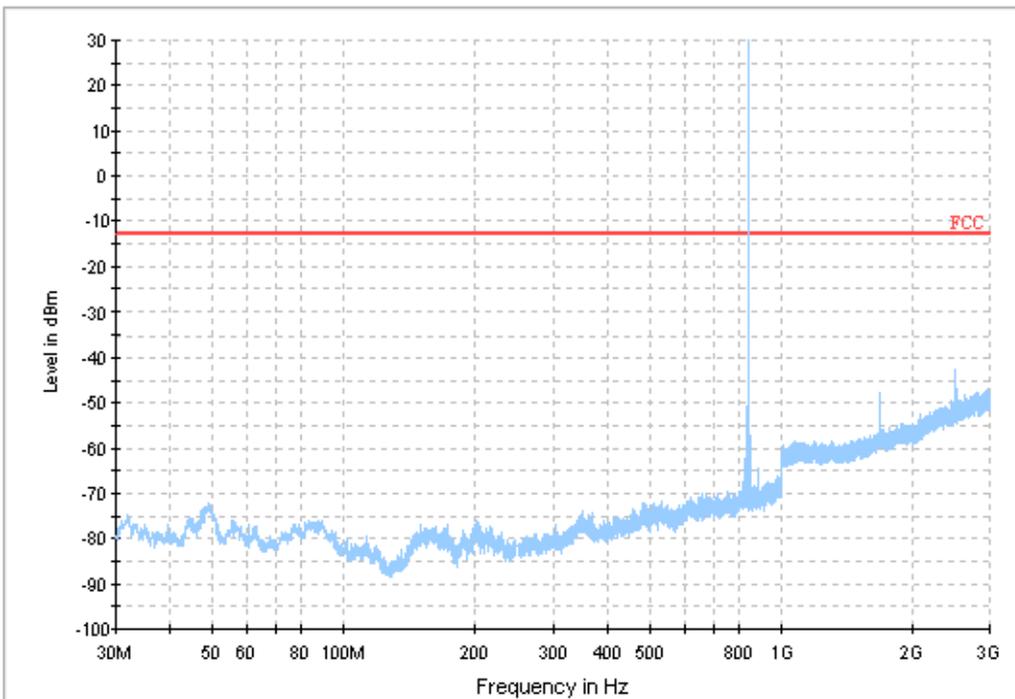
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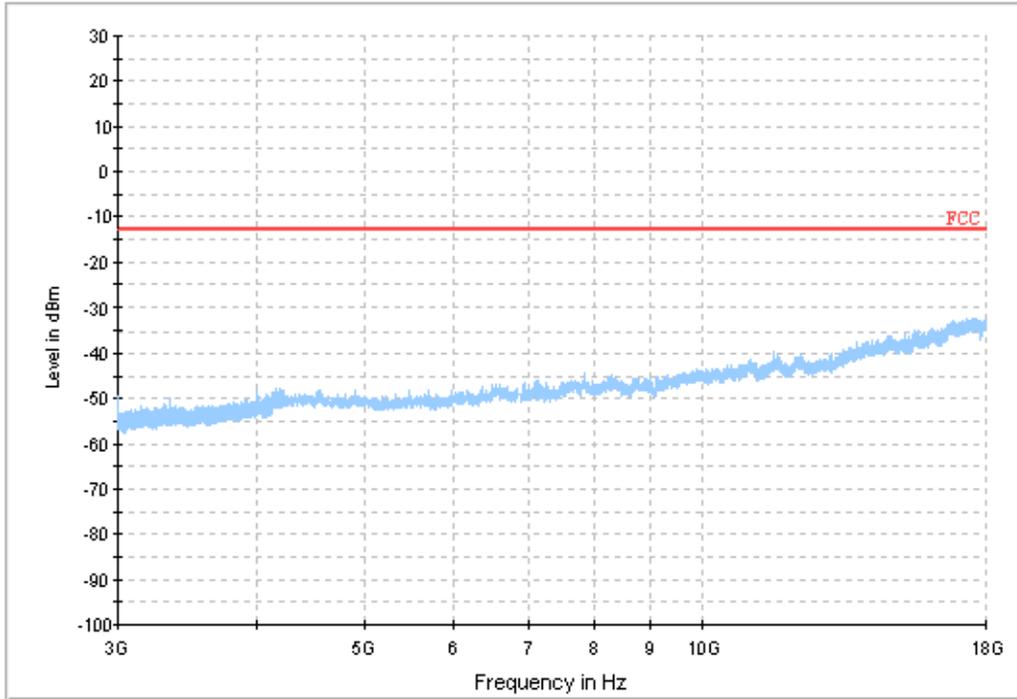
7.1.1.2 Test Mode = GSM/TM2



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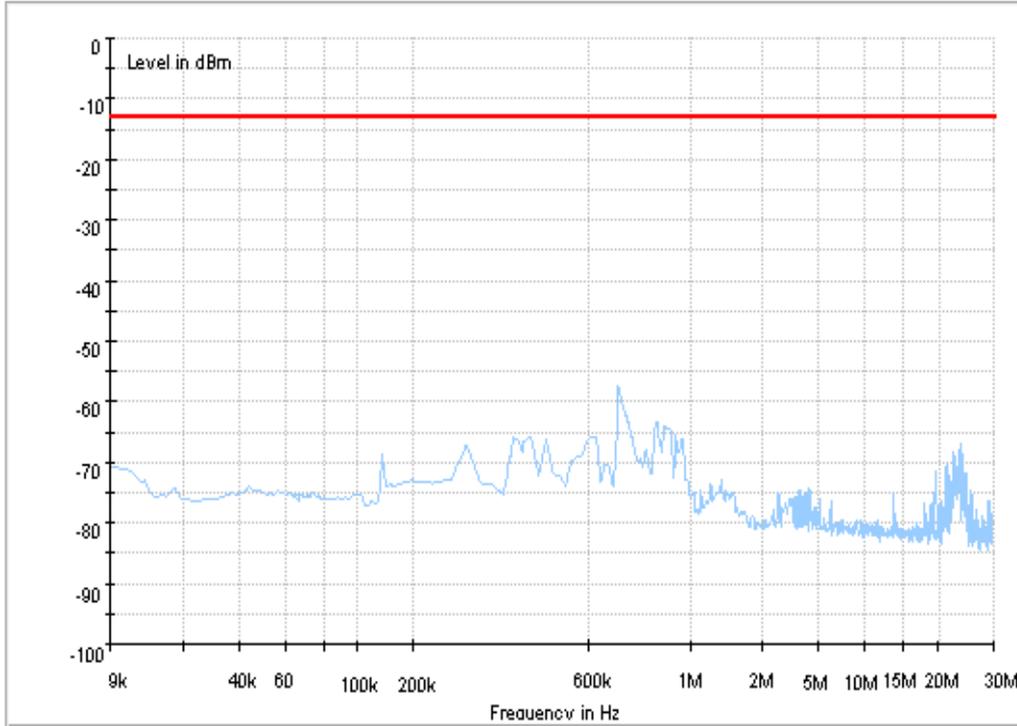


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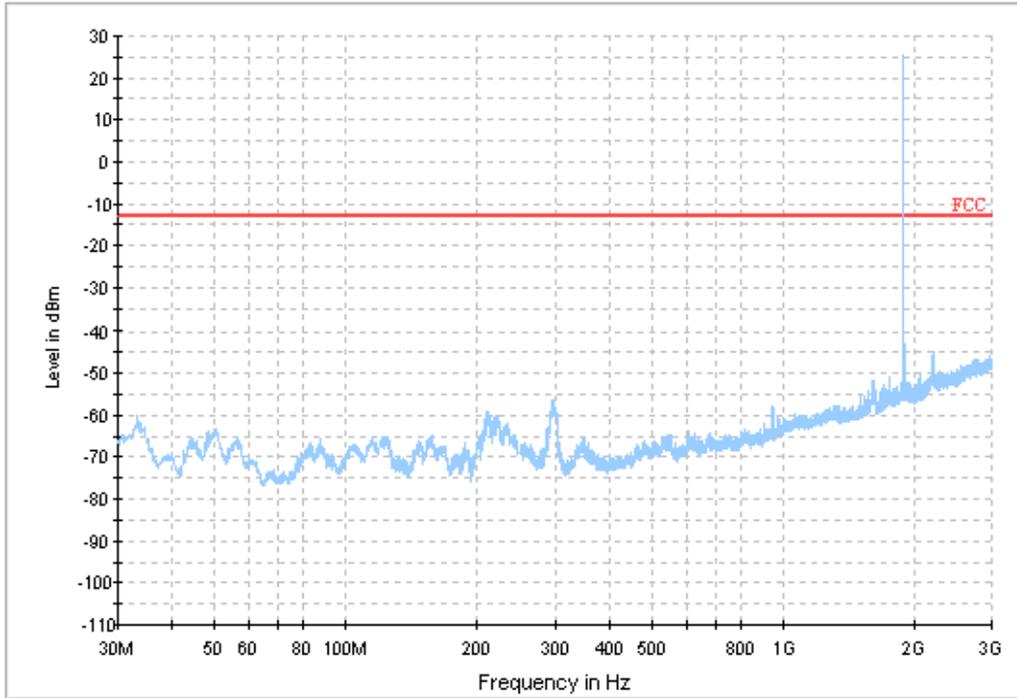


7.1.2 Test Band = GSM1900

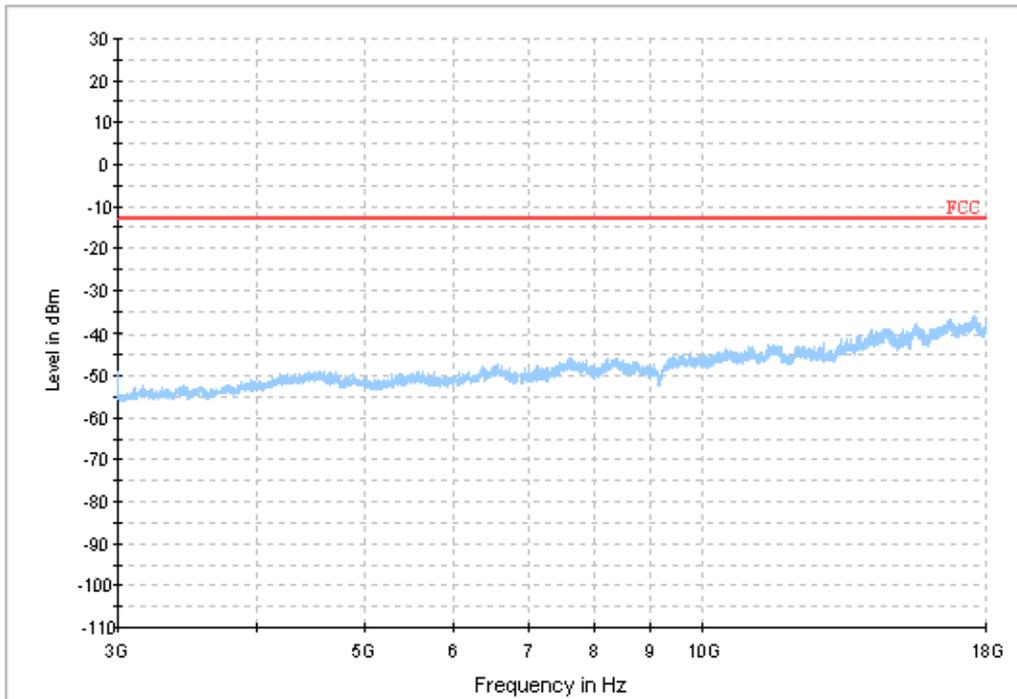
7.1.2.1 Test Mode = GSM/TM1

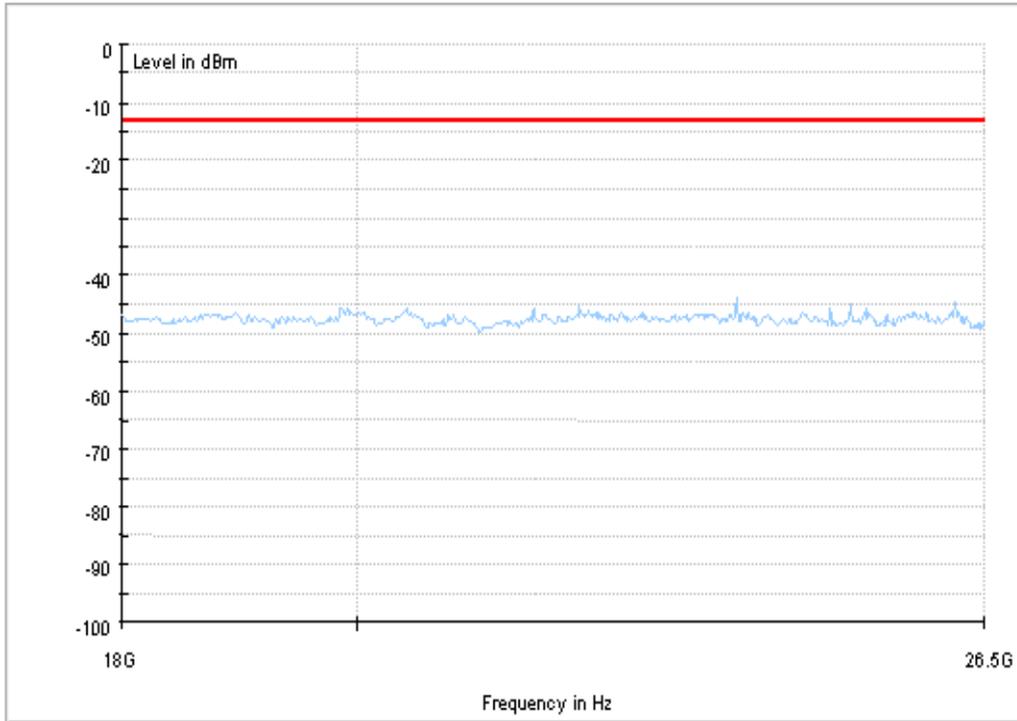


Copy of FCC PART24 GSM1900_L

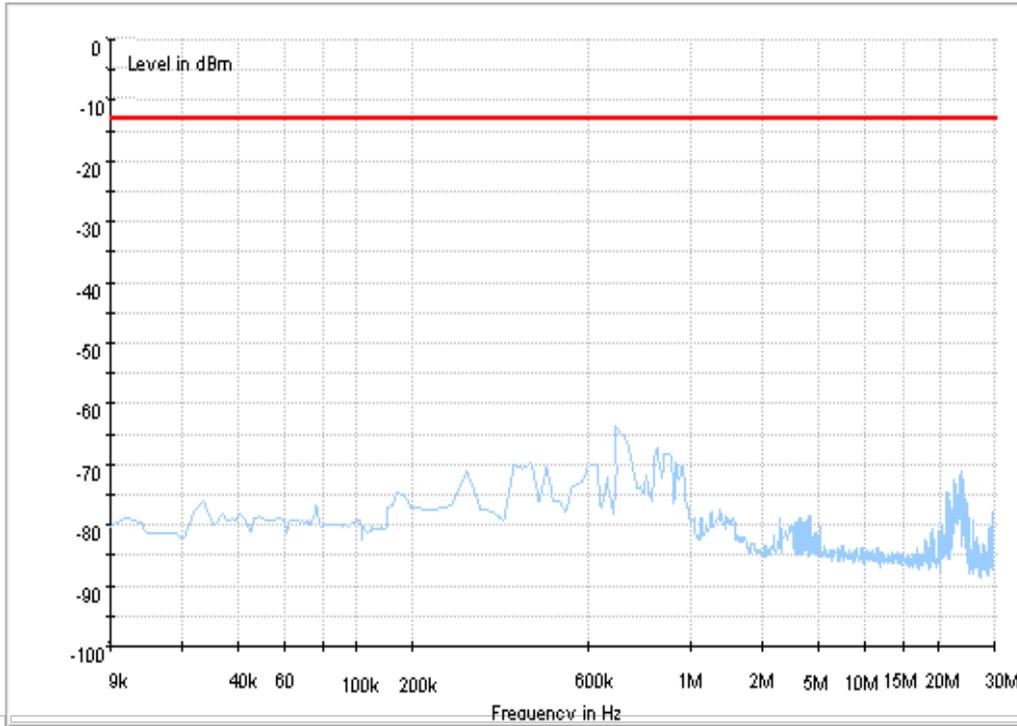


Copy of FCC PART24 GSM1900_H

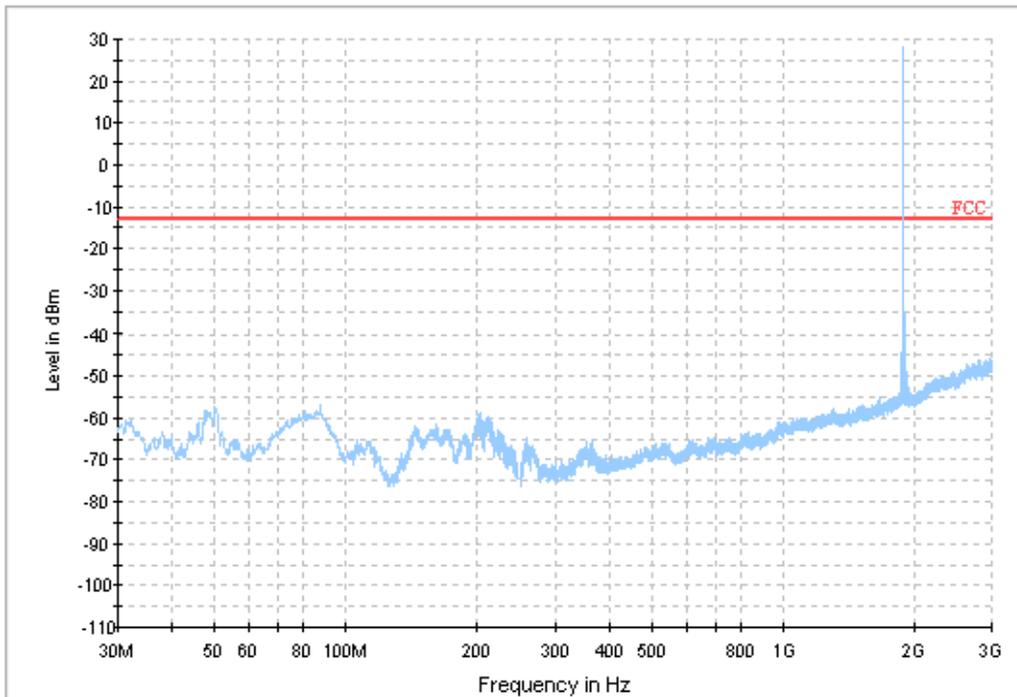




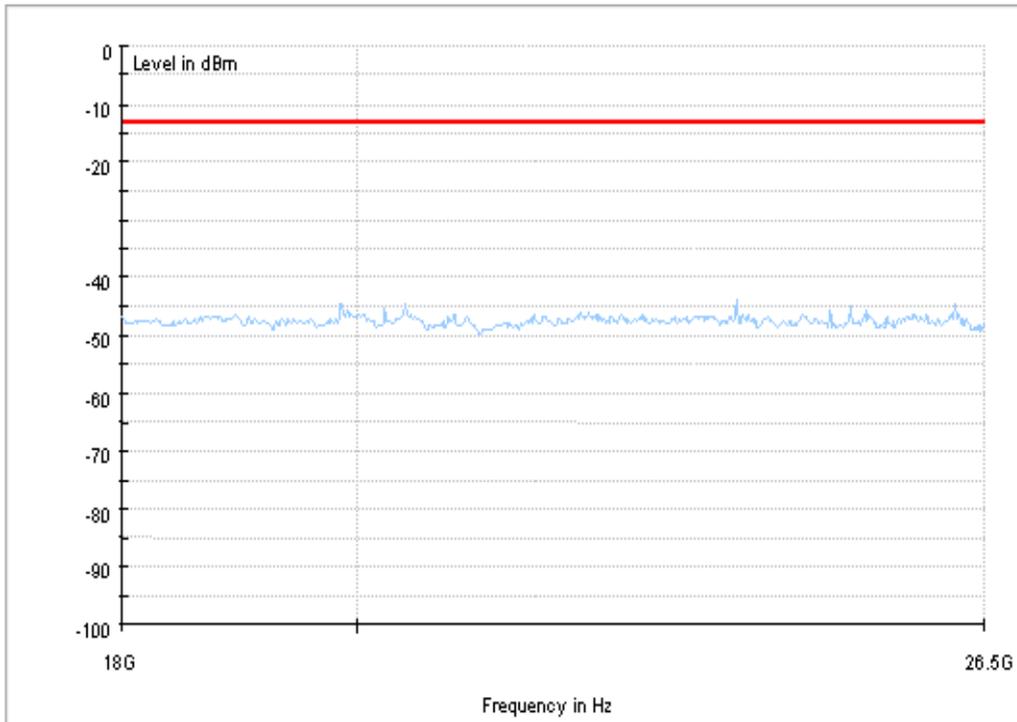
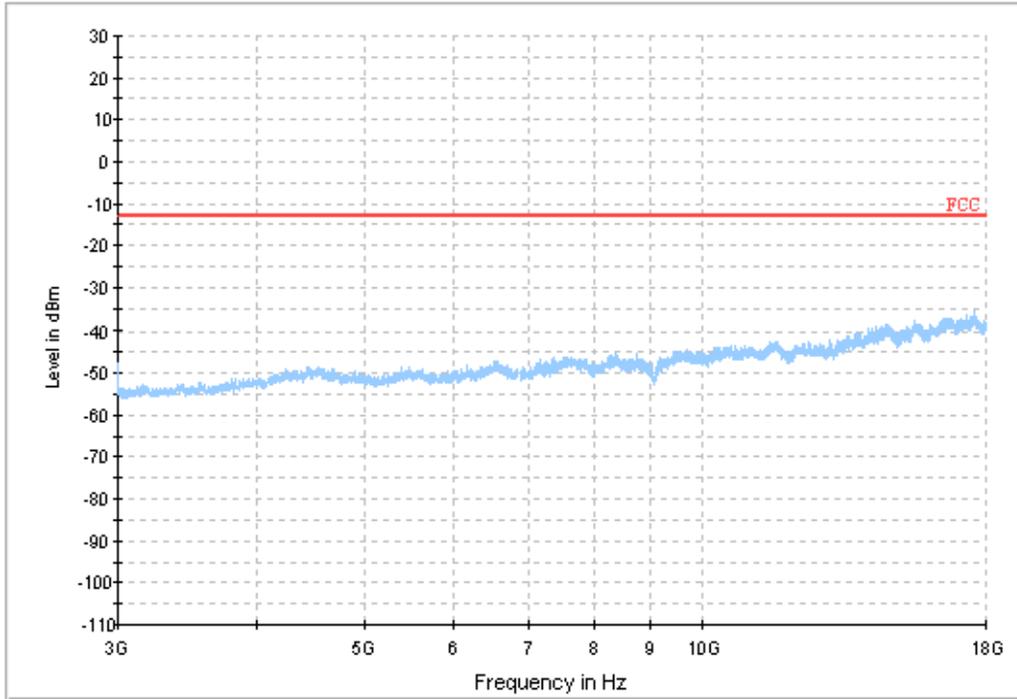
7.1.2.2 Test Mode = GSM/TM2



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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	-4.39	-0.00533	PASS
				VN	-4.46	-0.00541	PASS
				VH	-8.59	-0.01042	PASS
		MCH	TN	VL	0.65	0.00078	PASS
				VN	-0.65	-0.00078	PASS
				VH	-6.97	-0.00833	PASS
		HCH	TN	VL	-5.75	-0.00677	PASS
				VN	-1.74	-0.00205	PASS
				VH	-6.2	-0.0073	PASS
	GSM/TM2	LCH	TN	VL	-3.87	-0.0047	PASS
				VN	-8.75	-0.01062	PASS
				VH	-1.26	-0.00153	PASS
		MCH	TN	VL	-9.4	-0.01124	PASS
				VN	-9.01	-0.01077	PASS
				VH	-8.33	-0.00996	PASS
		HCH	TN	VL	-7.23	-0.00852	PASS
				VN	-7.26	-0.00855	PASS
				VH	-0.55	-0.00065	PASS
GSM1900	GSM/TM1	LCH	TN	VL	1.1	0.00059	PASS
				VN	-9.23	-0.00499	PASS
				VH	-3.1	-0.00168	PASS
		MCH	TN	VL	-4.58	-0.00244	PASS
				VN	-6.84	-0.00364	PASS
				VH	-13.75	-0.00731	PASS
		HCH	TN	VL	2.97	0.00156	PASS
				VN	5.94	0.00311	PASS
				VH	1.68	0.00088	PASS
	GSM/TM2	LCH	TN	VL	-9.75	-0.00527	PASS
				VN	2.03	0.0011	PASS
				VH	-15.79	-0.00853	PASS
		MCH	TN	VL	-7.88	-0.00419	PASS
				VN	-2.62	-0.00139	PASS
				VH	1.03	0.00055	PASS
		HCH	TN	VL	-5.91	-0.00309	PASS



Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VN	-0.77	-0.0004	PASS
				VH	-11.24	-0.00589	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	-7.04	-0.00854	PASS
				-20	-6.13	-0.00744	PASS
				-10	-4.33	-0.00525	PASS
				0	-3.49	-0.00423	PASS
				10	-3.62	-0.00439	PASS
				20	-7.43	-0.00901	PASS
				30	-0.58	-0.0007	PASS
				40	-0.39	-0.00047	PASS
		50	10.14	0.0123	PASS		
		MCH	VN	-30	-2.91	-0.00348	PASS
				-20	-5.94	-0.0071	PASS
				-10	-0.13	-0.00016	PASS
				0	-8.78	-0.01049	PASS
				10	-0.19	-0.00023	PASS
				20	2.97	0.00355	PASS
				30	-10.98	-0.01312	PASS
				40	-3.62	-0.00433	PASS
		HCH	VN	-30	2.78	0.00328	PASS
				-20	-2.52	-0.00297	PASS
				-10	-2.26	-0.00266	PASS
				0	-8.78	-0.01034	PASS
				10	-4.26	-0.00502	PASS
				20	6.07	0.00715	PASS
				30	-6.07	-0.00715	PASS
	40			-1.03	-0.00121	PASS	
	50	-2.2	-0.00259	PASS			
	GSM/TM2	LCH	VN	-30	-0.68	-0.00083	PASS
				-20	-6.2	-0.00752	PASS
				-10	-10.98	-0.01332	PASS
				0	-1.97	-0.00239	PASS
				10	-6.52	-0.00791	PASS
				20	-7.46	-0.00905	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict						
				30	-0.97	-0.00118	PASS						
				40	-8.3	-0.01007	PASS						
				50	-3.78	-0.00459	PASS						
		MCH	VN			-30	-3.81	-0.00455	PASS				
						-20	0.23	0.00027	PASS				
						-10	-4.71	-0.00563	PASS				
						0	-9.81	-0.01173	PASS				
						10	-3.55	-0.00424	PASS				
						20	-2.13	-0.00255	PASS				
						30	-8.49	-0.01015	PASS				
						40	-8.56	-0.01023	PASS				
						50	-6.13	-0.00733	PASS				
						HCH	VN			-30	-8.46	-0.00997	PASS
		-20	-3.23	-0.00381	PASS								
		-10	-9.1	-0.01072	PASS								
		0	0.29	0.00034	PASS								
		10	-6.42	-0.00756	PASS								
		20	-9.33	-0.01099	PASS								
		30	4.29	0.00505	PASS								
		40	-9.3	-0.01096	PASS								
		GSM1900	GSM/TM1	LCH	VN					-30	1.03	0.00056	PASS
										-20	-6.26	-0.00338	PASS
										-10	-2.71	-0.00146	PASS
										0	-4.91	-0.00265	PASS
10	-3.55									-0.00192	PASS		
20	-9.88									-0.00534	PASS		
30	-3.55									-0.00192	PASS		
40	-4.65									-0.00251	PASS		
50	-2.39									-0.00129	PASS		
MCH	VN												
				-20	0.71	0.00038	PASS						
				-10	3.62	0.00193	PASS						
				0	8.59	0.00457	PASS						
				10	4.46	0.00237	PASS						
				20	0.65	0.00035	PASS						
				30	2	0.00106	PASS						
				40	9.56	0.00509	PASS						
50	-6.84			-0.00364	PASS								
HCH	VN									-30	-8.91	-0.00467	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict		
				-20	1.94	0.00102	PASS		
				-10	-8.33	-0.00436	PASS		
				0	-11.82	-0.00619	PASS		
				10	2.26	0.00118	PASS		
				20	-8.85	-0.00463	PASS		
				30	-8.27	-0.00433	PASS		
				40	-1.81	-0.00095	PASS		
				50	2.58	0.00135	PASS		
	GSM/TM2	LCH	VN	-30	-5.23	-0.00283	PASS		
				-20	-10.14	-0.00548	PASS		
				-10	-1.26	-0.00068	PASS		
				0	4.23	0.00229	PASS		
				10	-5.26	-0.00284	PASS		
				20	-12.46	-0.00673	PASS		
				30	-11.33	-0.00612	PASS		
				40	4.42	0.00239	PASS		
				50	-4.46	-0.00241	PASS		
				MCH	VN	-30	-7.39	-0.00393	PASS
						-20	-13.08	-0.00696	PASS
						-10	-8.46	-0.0045	PASS
		0	-14.33			-0.00762	PASS		
		10	-0.68			-0.00036	PASS		
		20	-9.85			-0.00524	PASS		
		30	-5.42			-0.00288	PASS		
		40	-7.49			-0.00398	PASS		
		HCH	VN	-30	-3.75	-0.00196	PASS		
				-20	-0.19	-0.0001	PASS		
				-10	-7.68	-0.00402	PASS		
				0	-6.97	-0.00365	PASS		
				10	-10.33	-0.00541	PASS		
20				-7.94	-0.00416	PASS			
30				-17.82	-0.00933	PASS			
40	-15.43			-0.00808	PASS				
50	-5.17	-0.00271	PASS						

END