



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/EIRP [dBm]	Limit [dBm]	Verdict
GSM850	GSM/TM1	LCH	32.56	29.41	38.5	PASS
		MCH	32.68	29.53	38.5	PASS
		HCH	32.7	29.55	38.5	PASS
	GSM/TM2	LCH	25.98	22.83	38.5	PASS
		MCH	25.92	22.77	38.5	PASS
		HCH	25.9	22.75	38.5	PASS
GSM1900	GSM/TM1	LCH	31.04	31.55	33	PASS
		MCH	30.84	31.35	33	PASS
		HCH	30.74	31.25	33	PASS
	GSM/TM2	LCH	25.56	26.07	33	PASS
		MCH	25.5	26.01	33	PASS
		HCH	25.52	26.03	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	0.26	13	PASS
		MCH	0.27	13	PASS
		HCH	0.24	13	PASS
	GSM/TM2	LCH	3.26	13	PASS
		MCH	3.22	13	PASS
		HCH	3.17	13	PASS

3Appendix_C: Modulation Characteristics

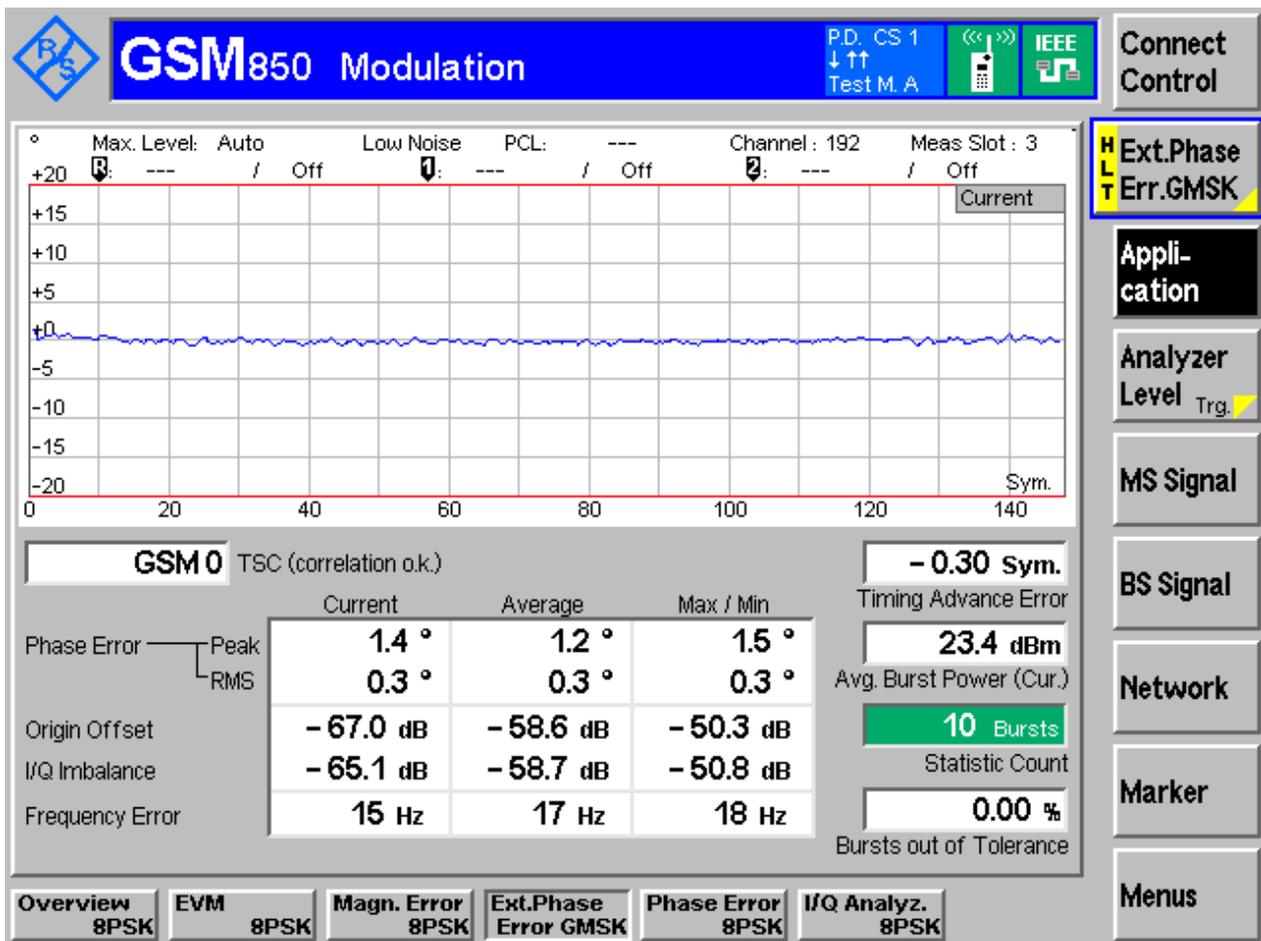
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

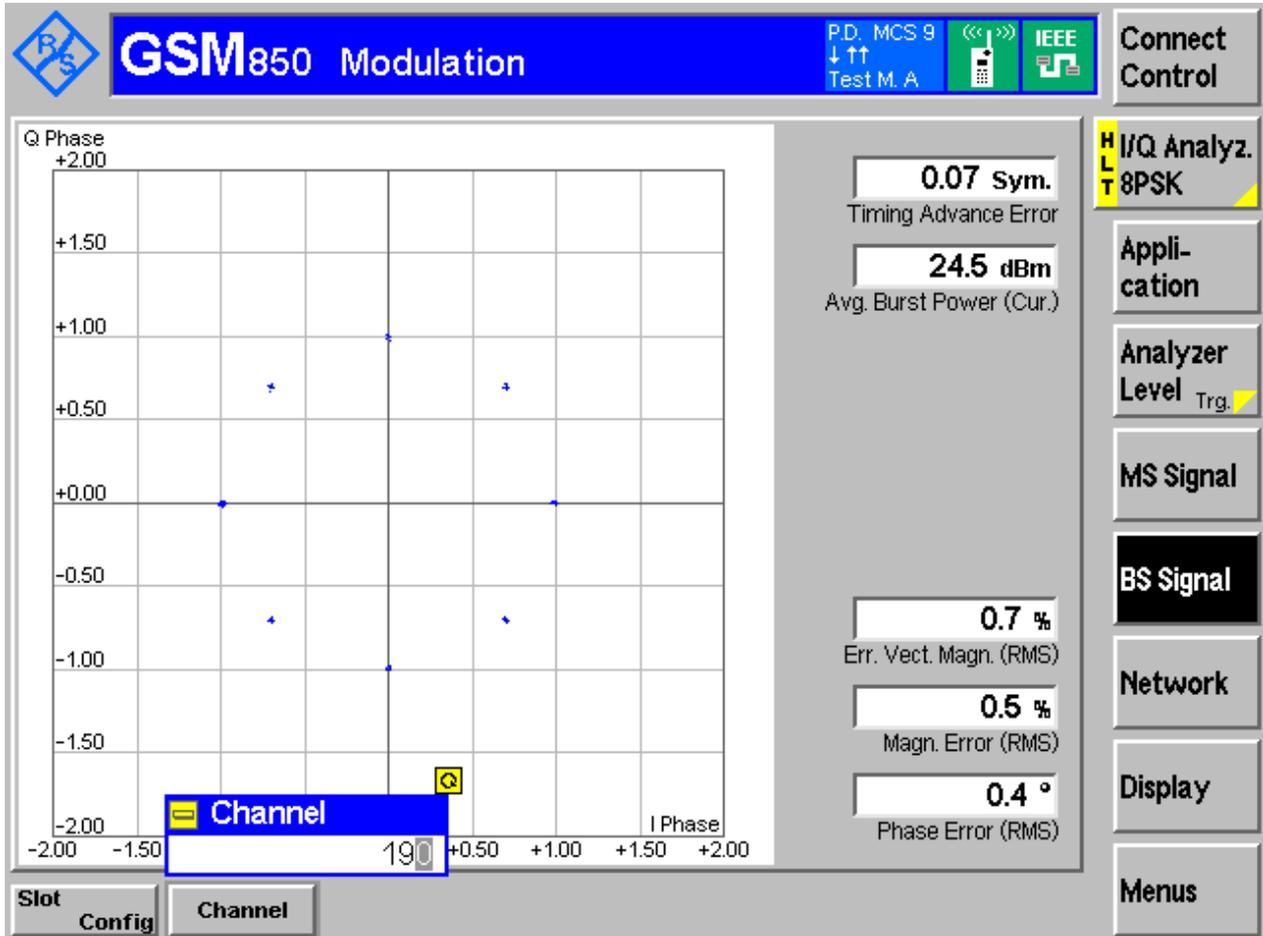
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

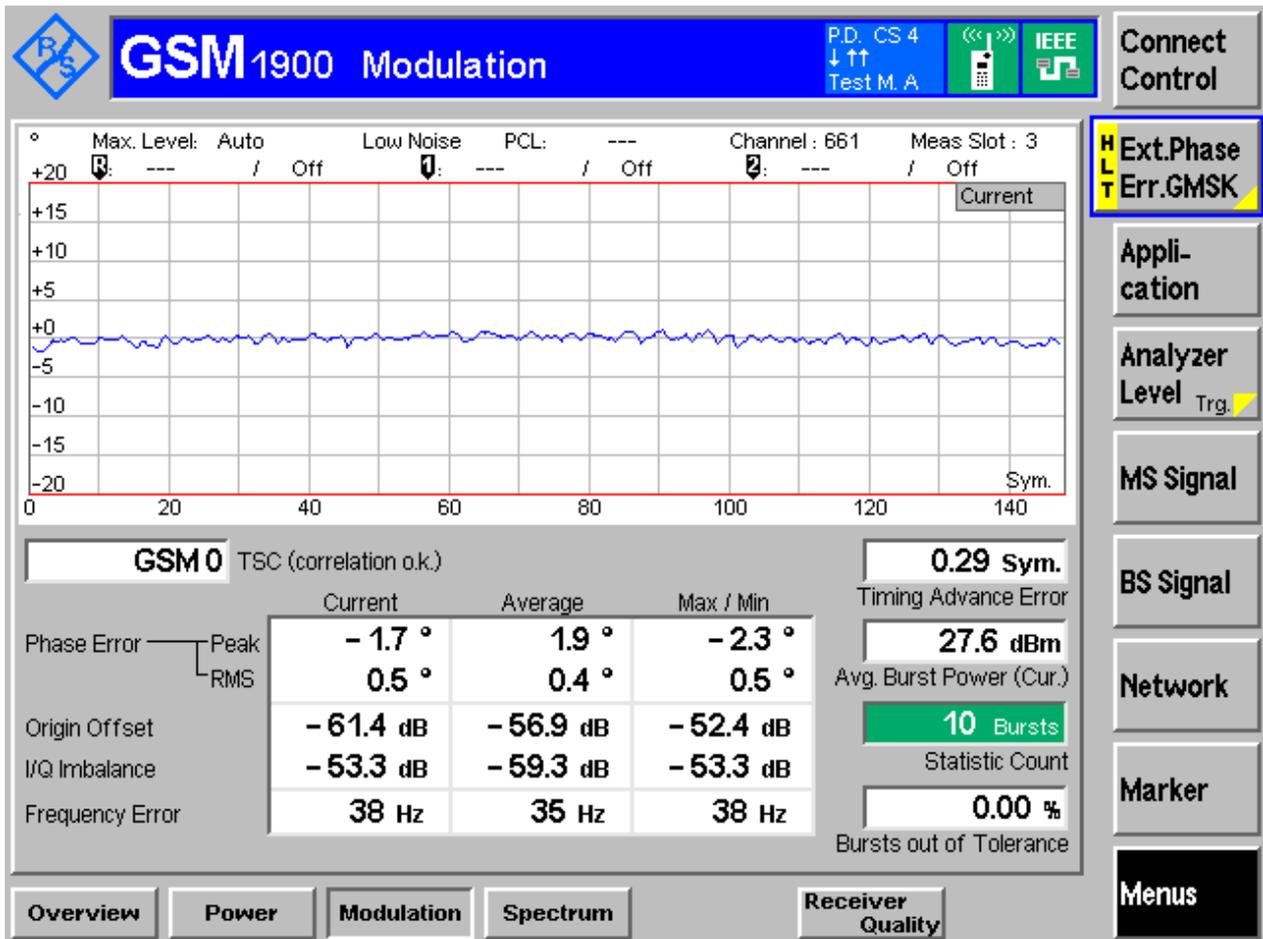
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

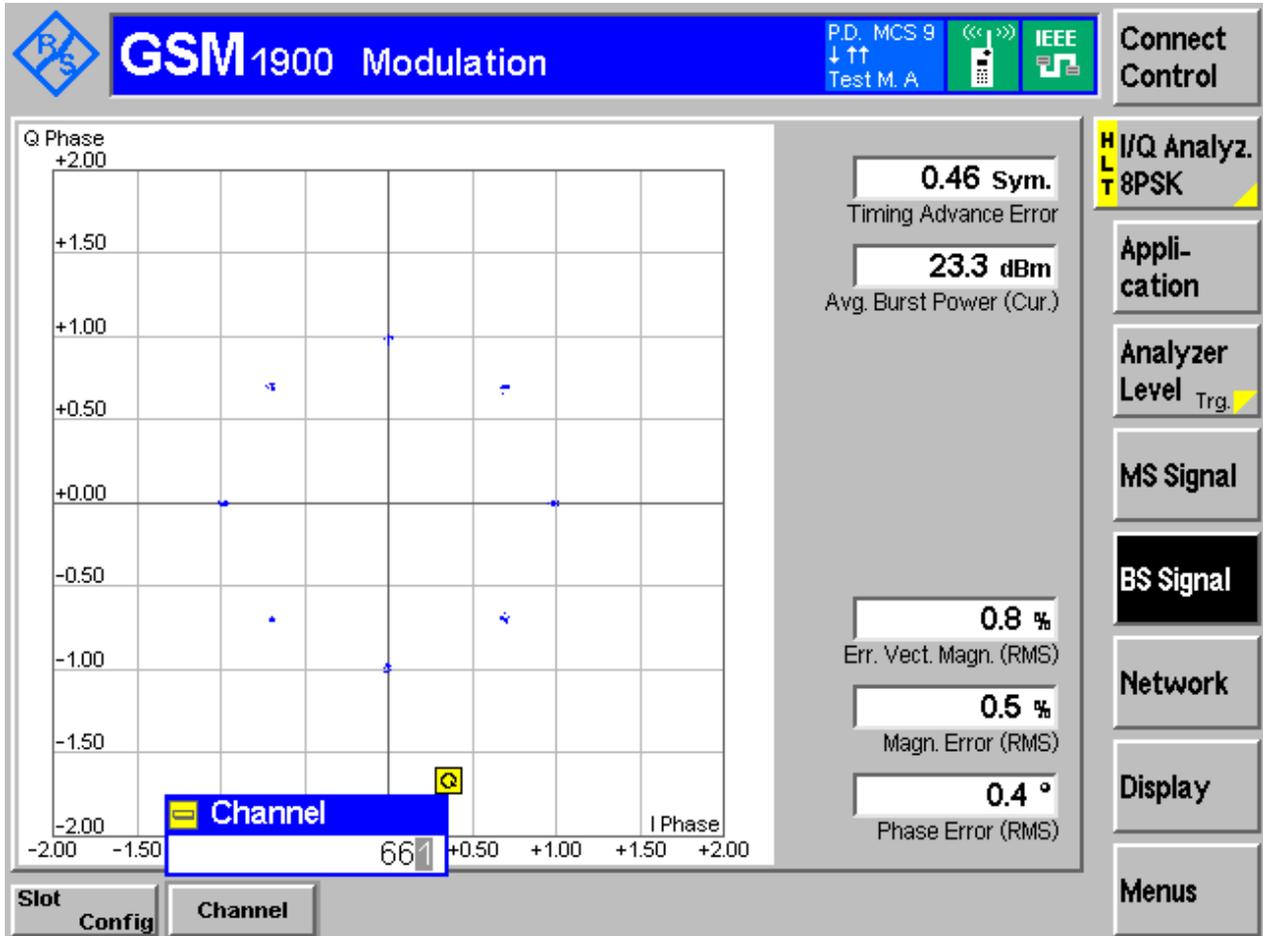
3.1.2.1 Test Mode = GSM/TM1

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	241.69	315.38	Pass
		MCH	244.27	315.97	Pass
		HCH	243.74	319.89	Pass
	GSM/TM2	LCH	247.25	311.15	Pass
		MCH	241.67	312.58	Pass
		HCH	237.23	287.40	Pass
GSM1900	GSM/TM1	LCH	247.68	319.91	Pass
		MCH	245.40	317.29	Pass
		HCH	246.68	320.06	Pass
	GSM/TM2	LCH	244.78	311.31	Pass
		MCH	242.23	311.10	Pass
		HCH	242.97	304.35	Pass



Part II - Test Plots

4.1 For GSM

4.1.1 Test Band = GSM850

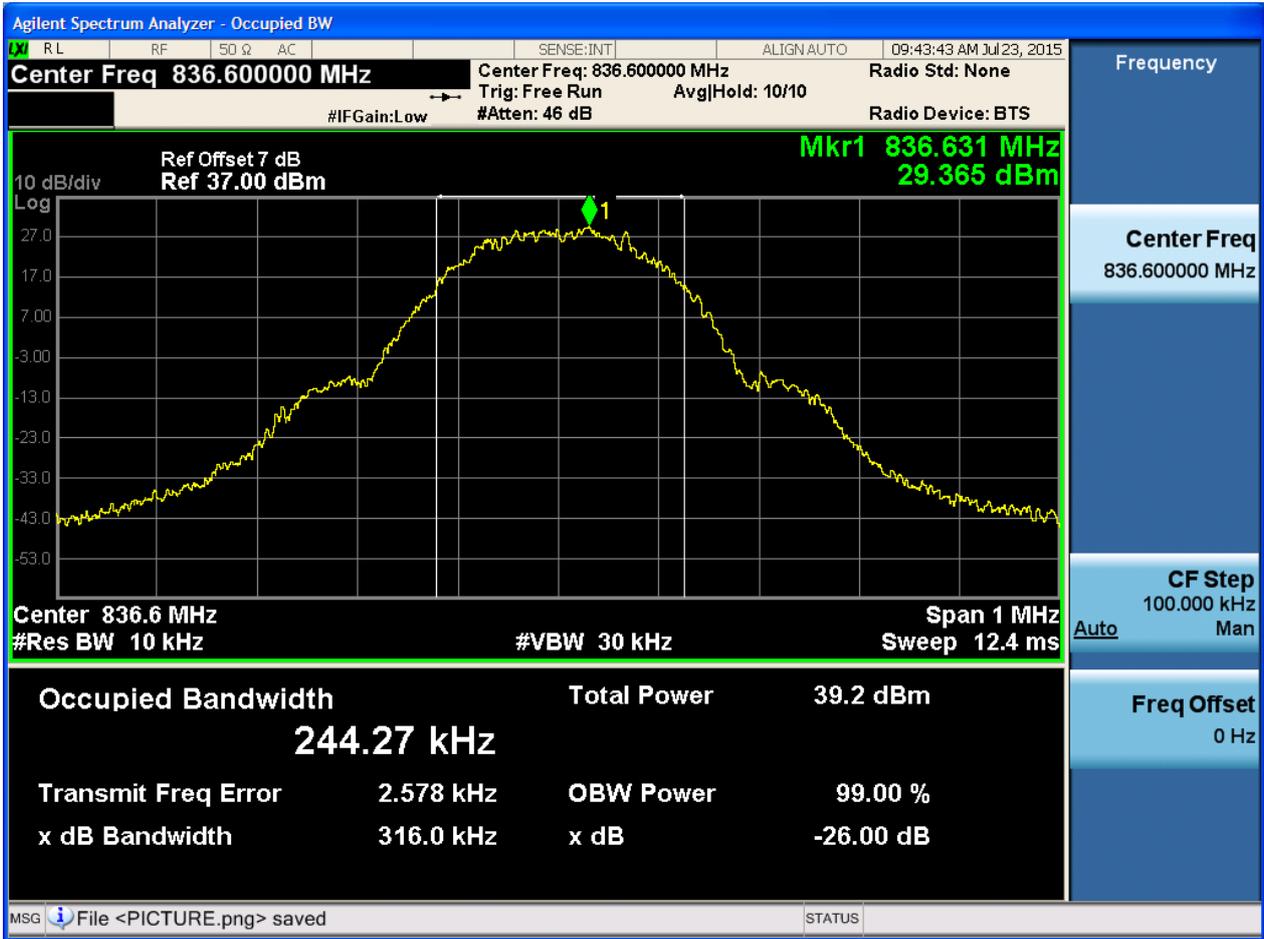
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH



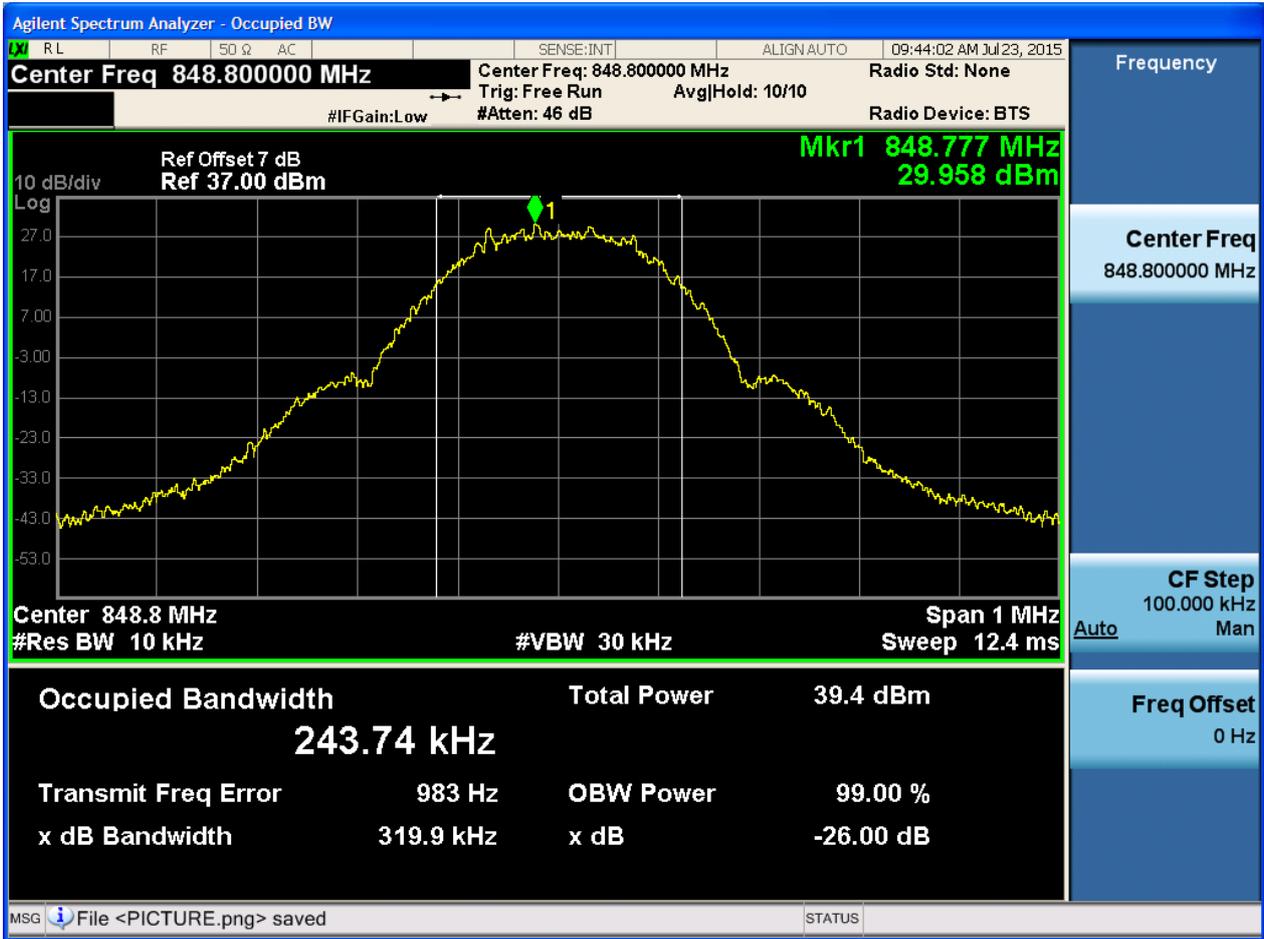


4.1.1.1.2 Test Channel = MCH





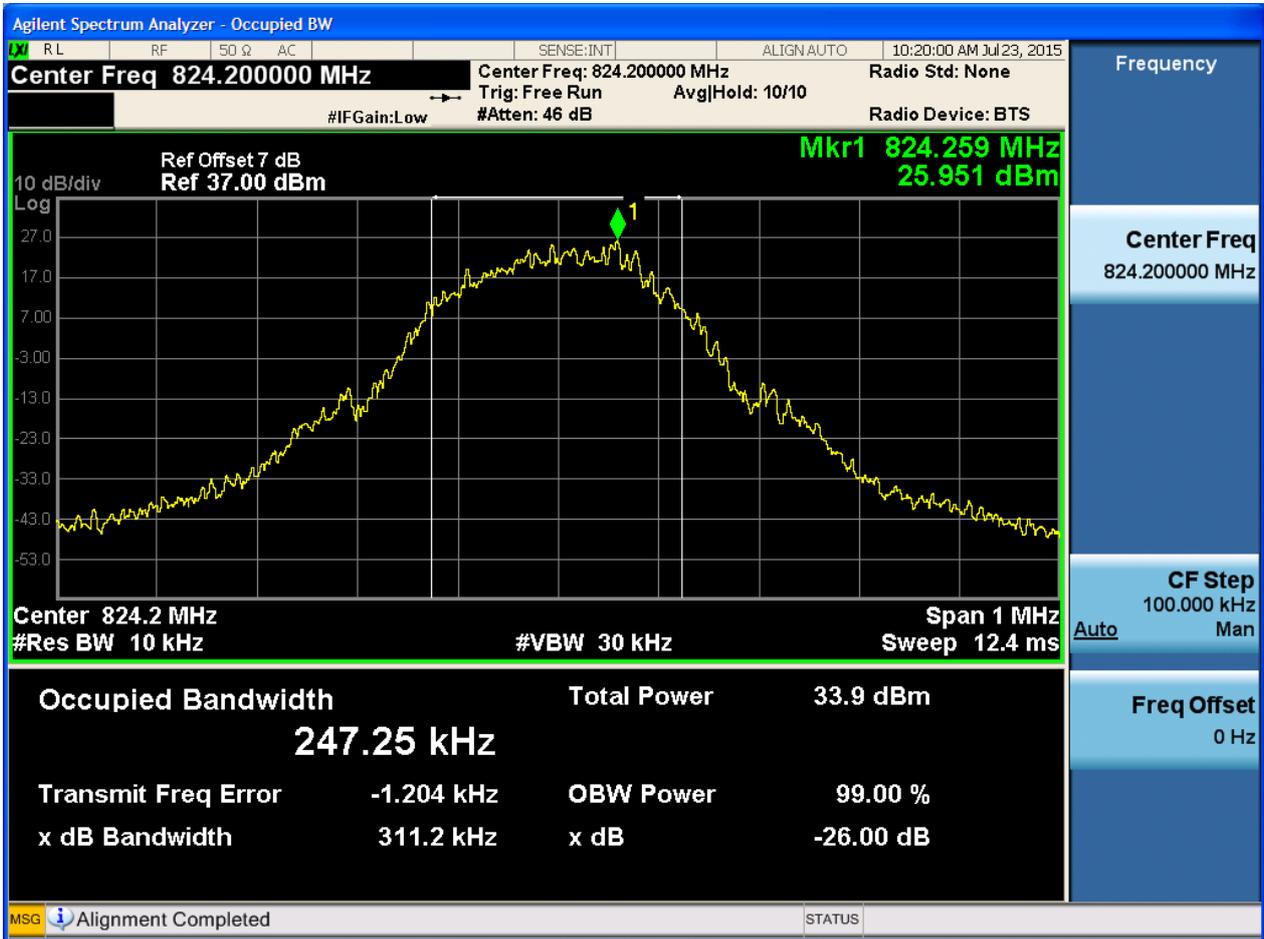
4.1.1.1.3 Test Channel = HCH





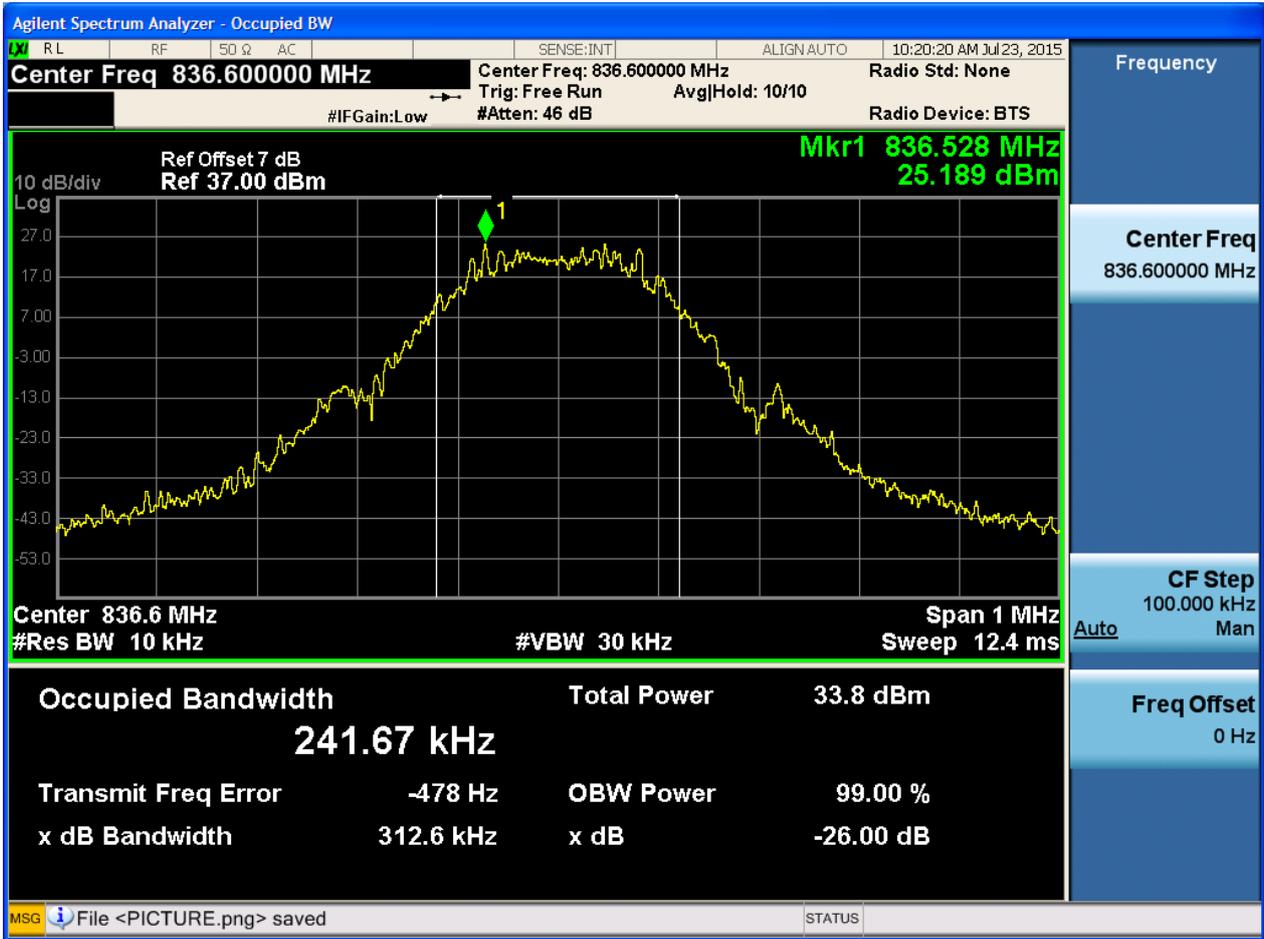
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH



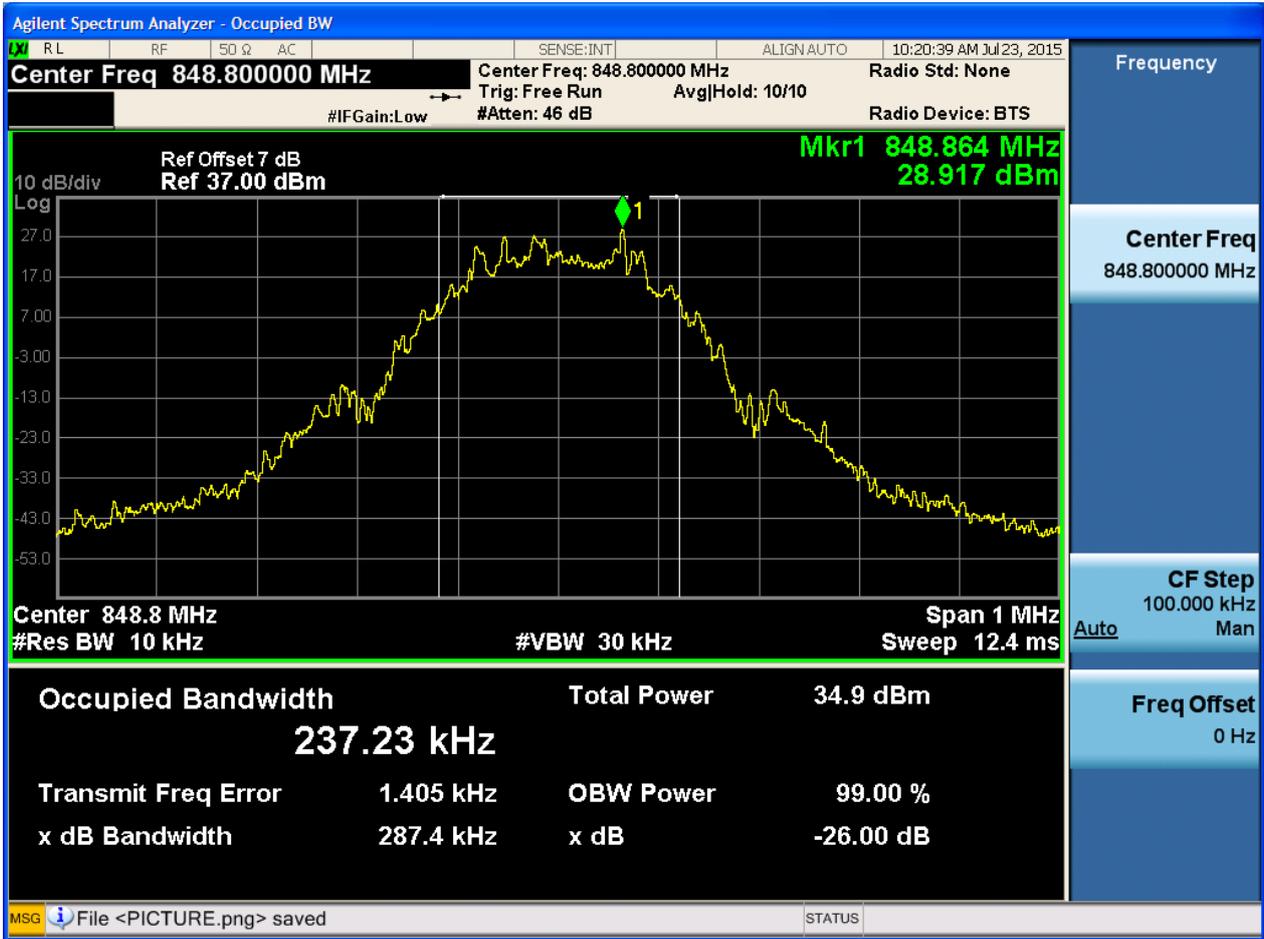


4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH





4.1.2 Test Band = GSM1900

4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



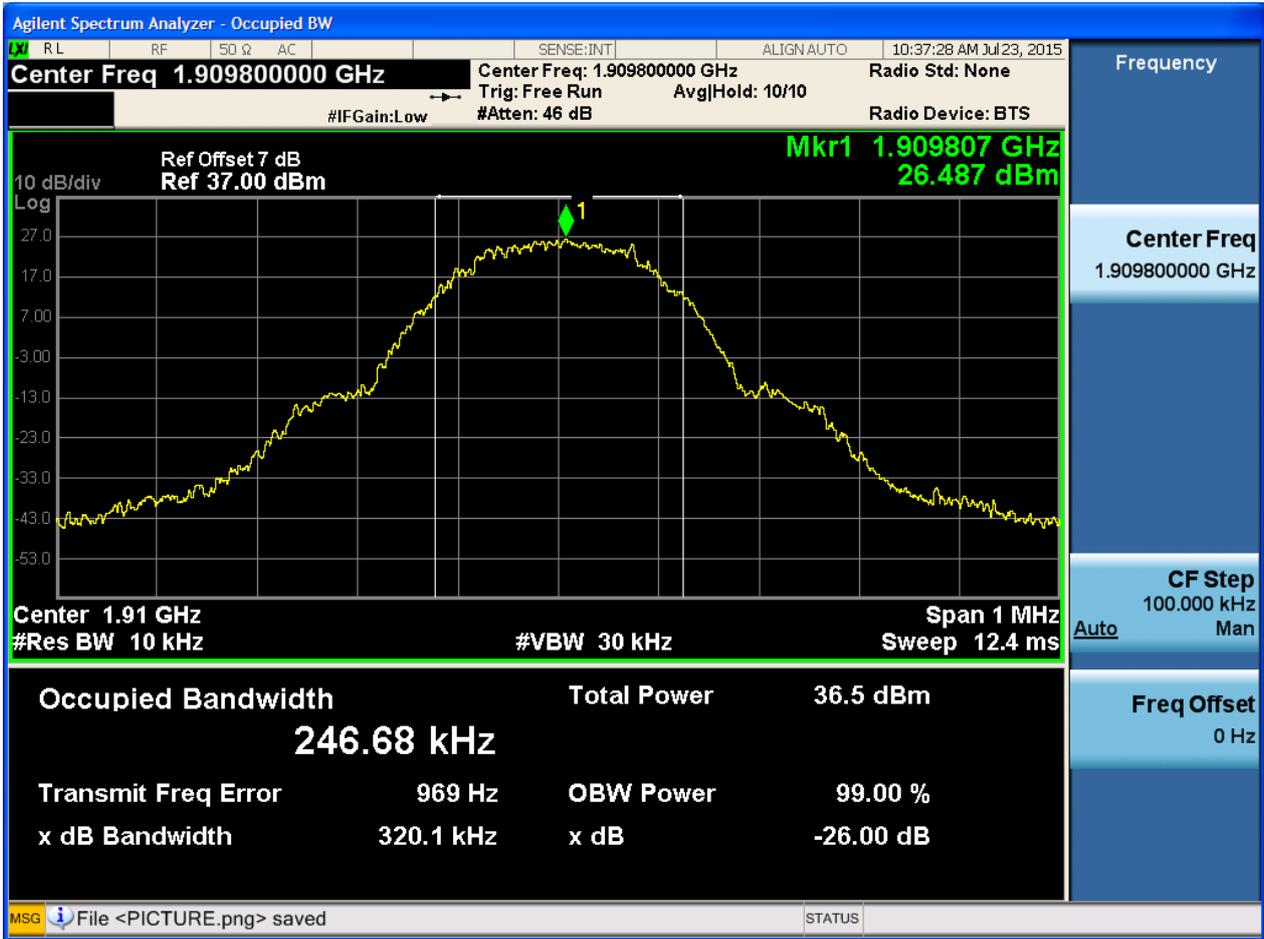


4.1.2.1.2 Test Channel = MCH





4.1.2.1.3 Test Channel = HCH





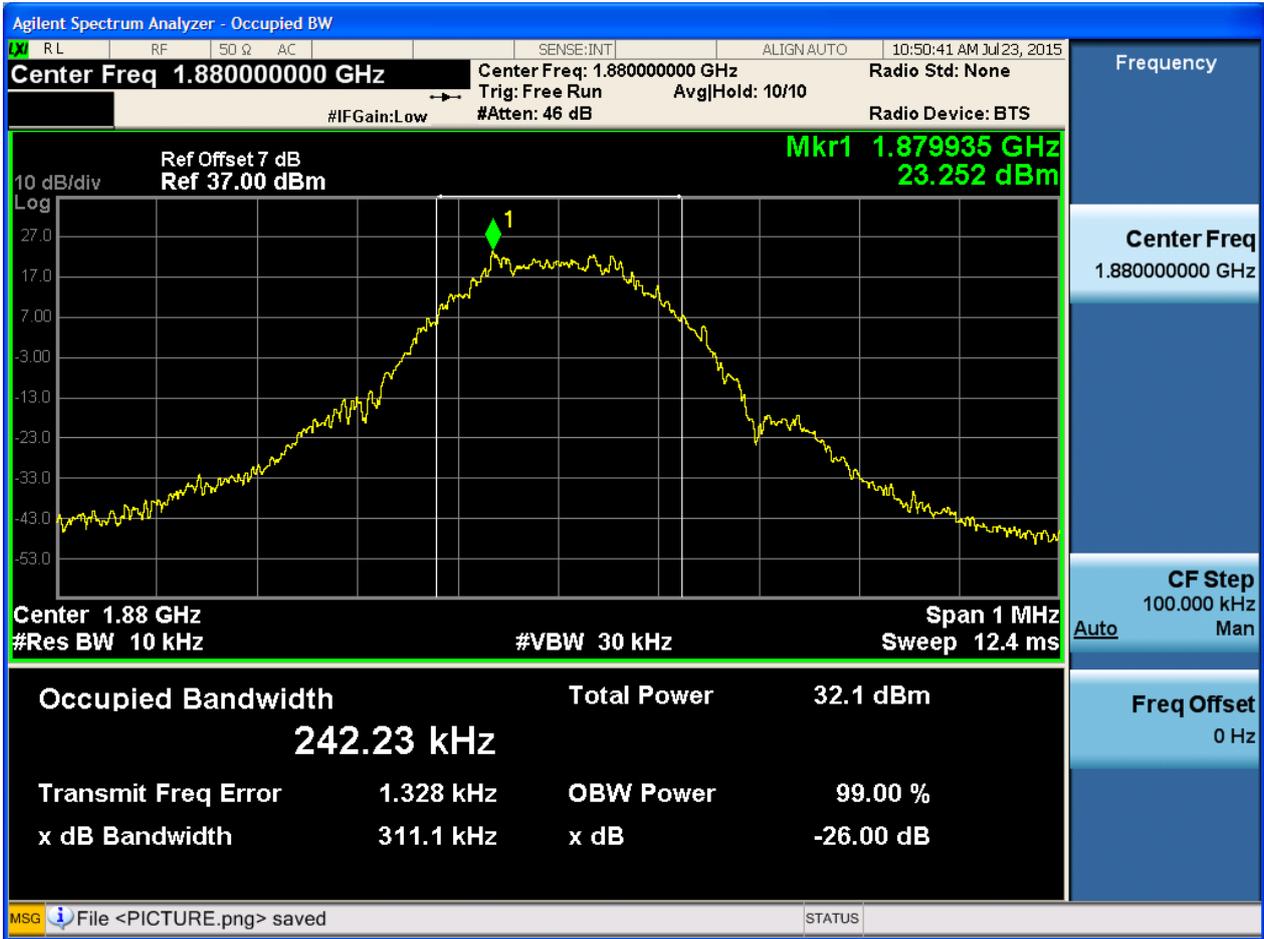
4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



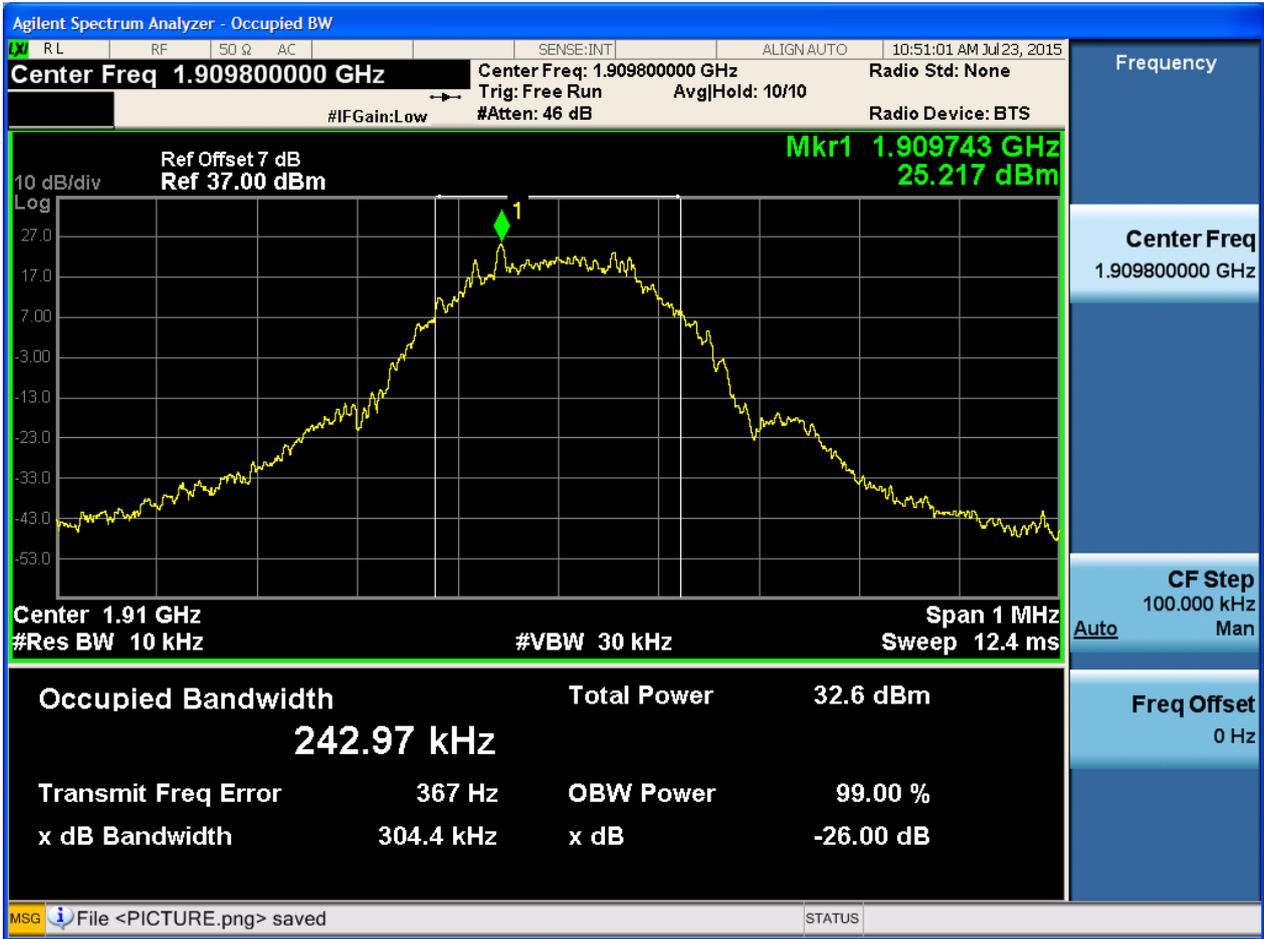


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH





5Appendix_E: Band Edges Compliance

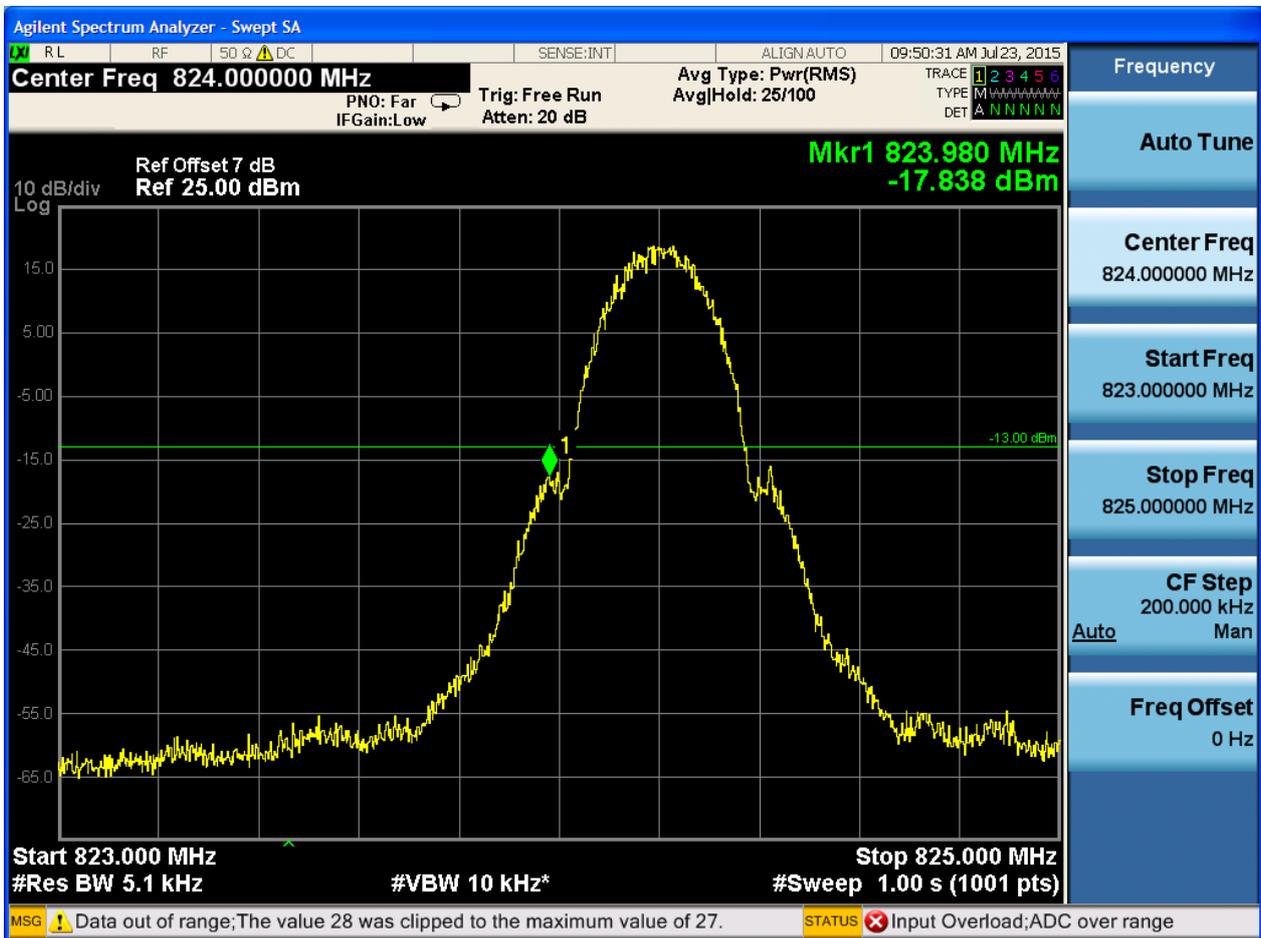
Part I - Test Plots

5.1 For GSM

5.1.1 Test Band = GSM850

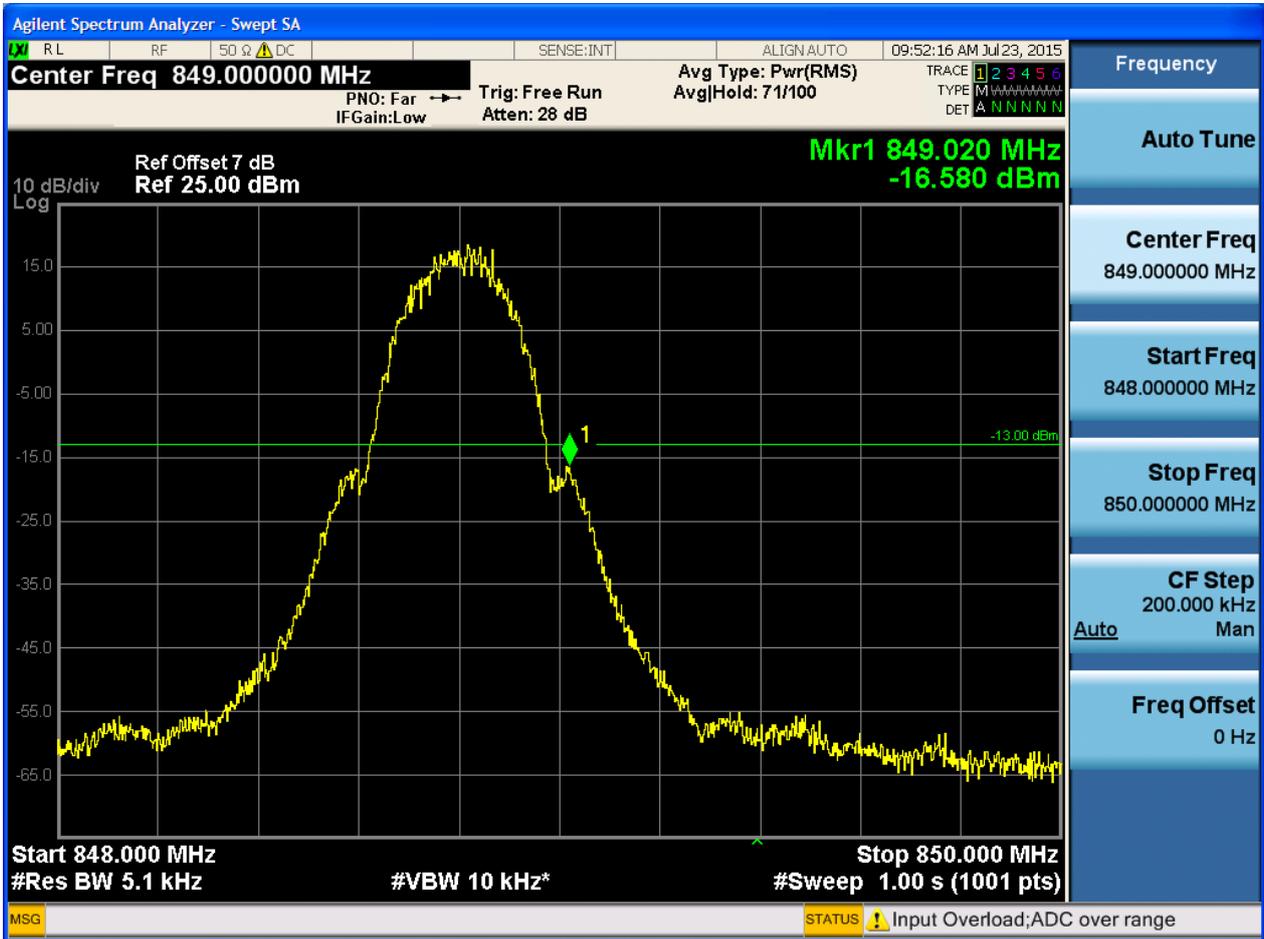
5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH





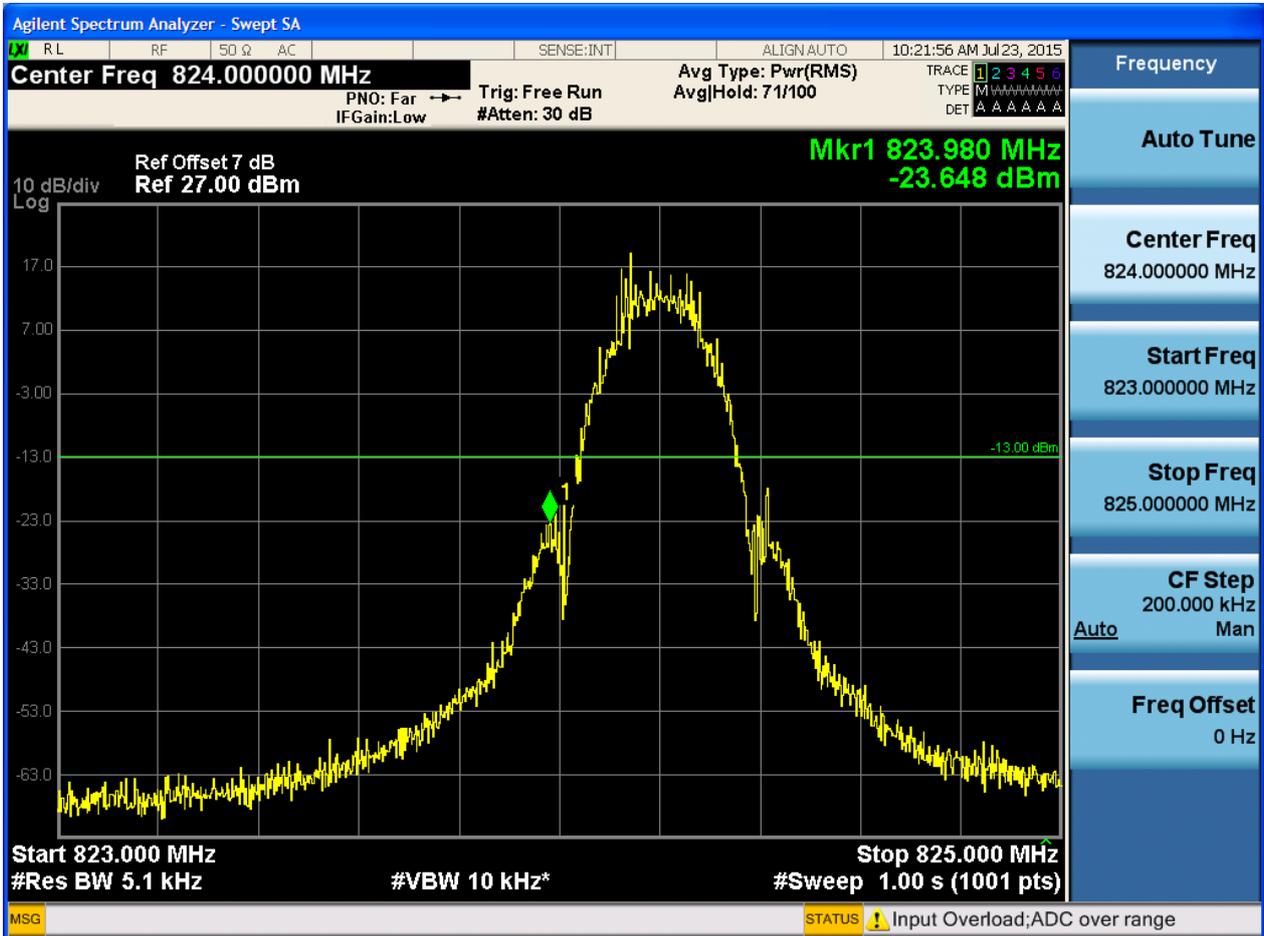
5.1.1.1.2 Test Channel = HCH



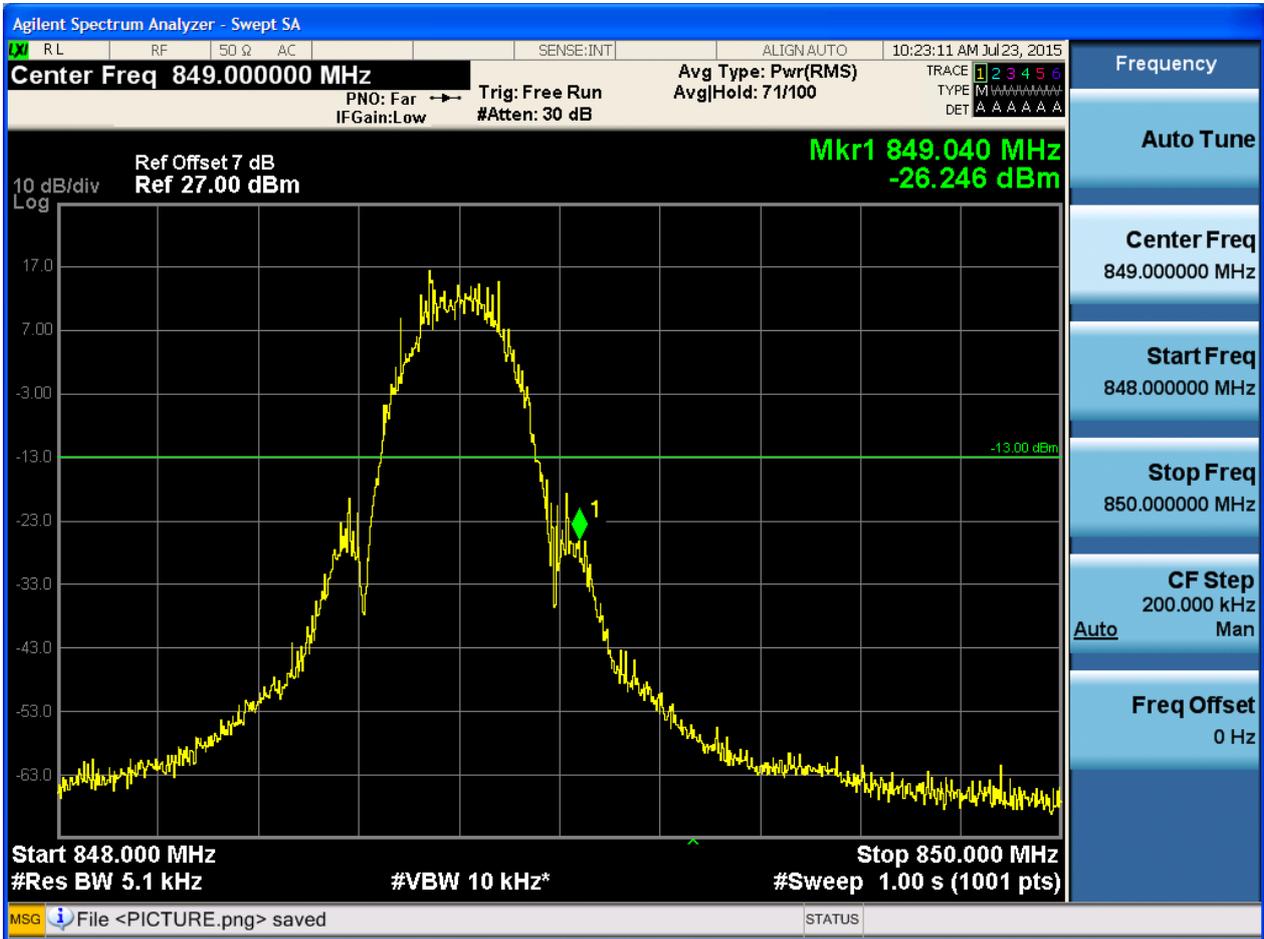


5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



5.1.1.2.2 Test Channel = HCH

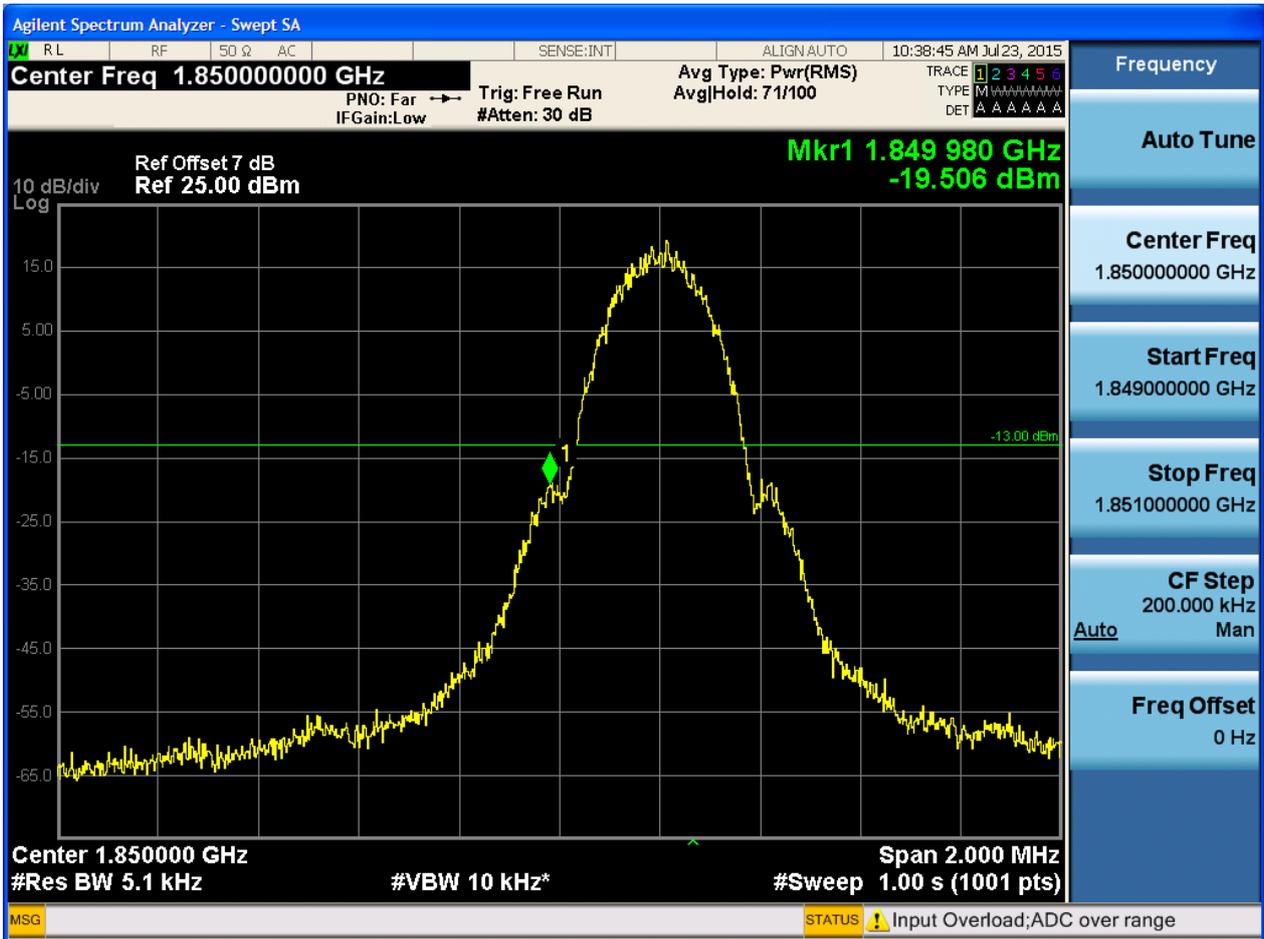




5.1.2 Test Band = GSM1900

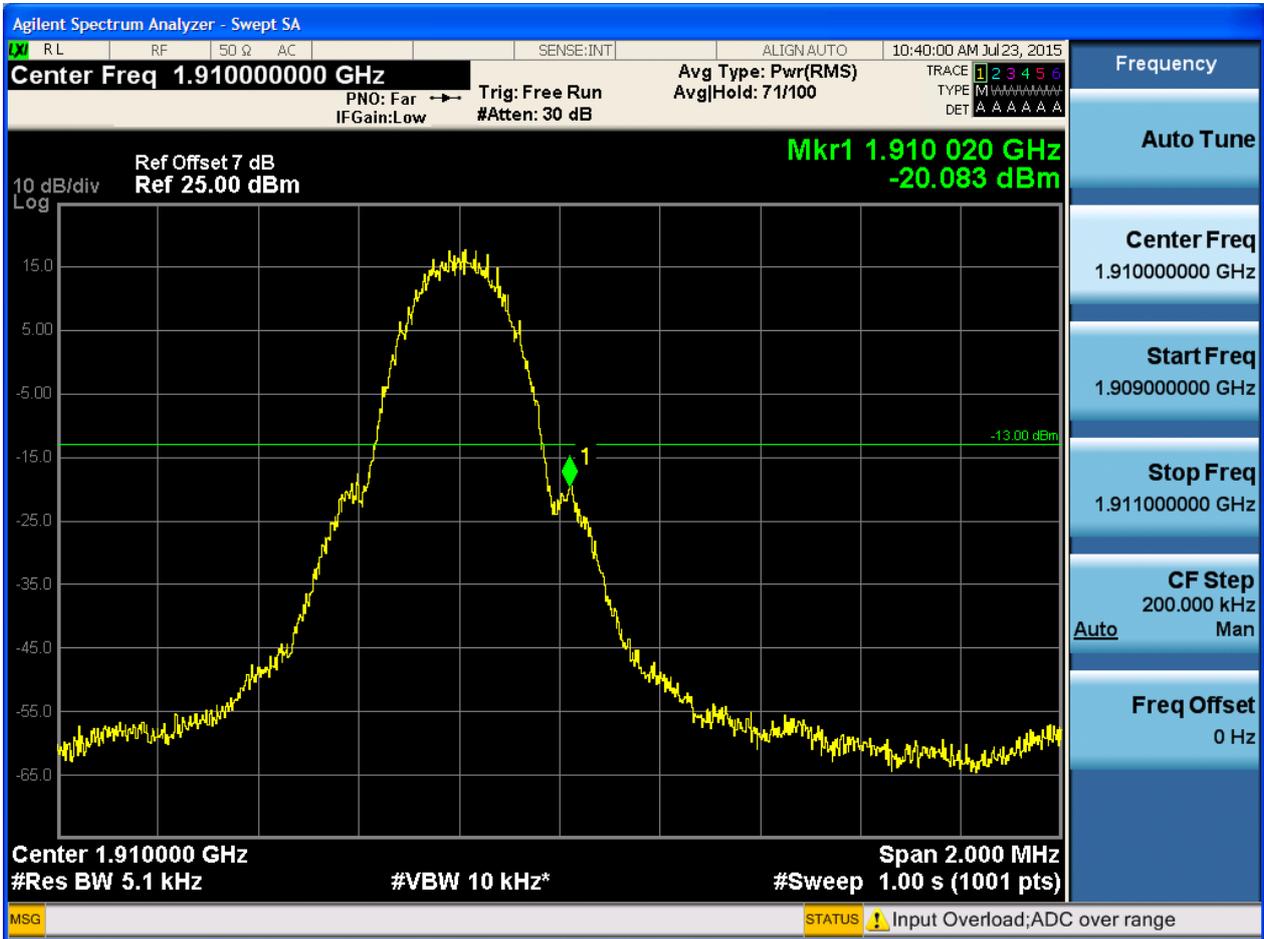
5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH



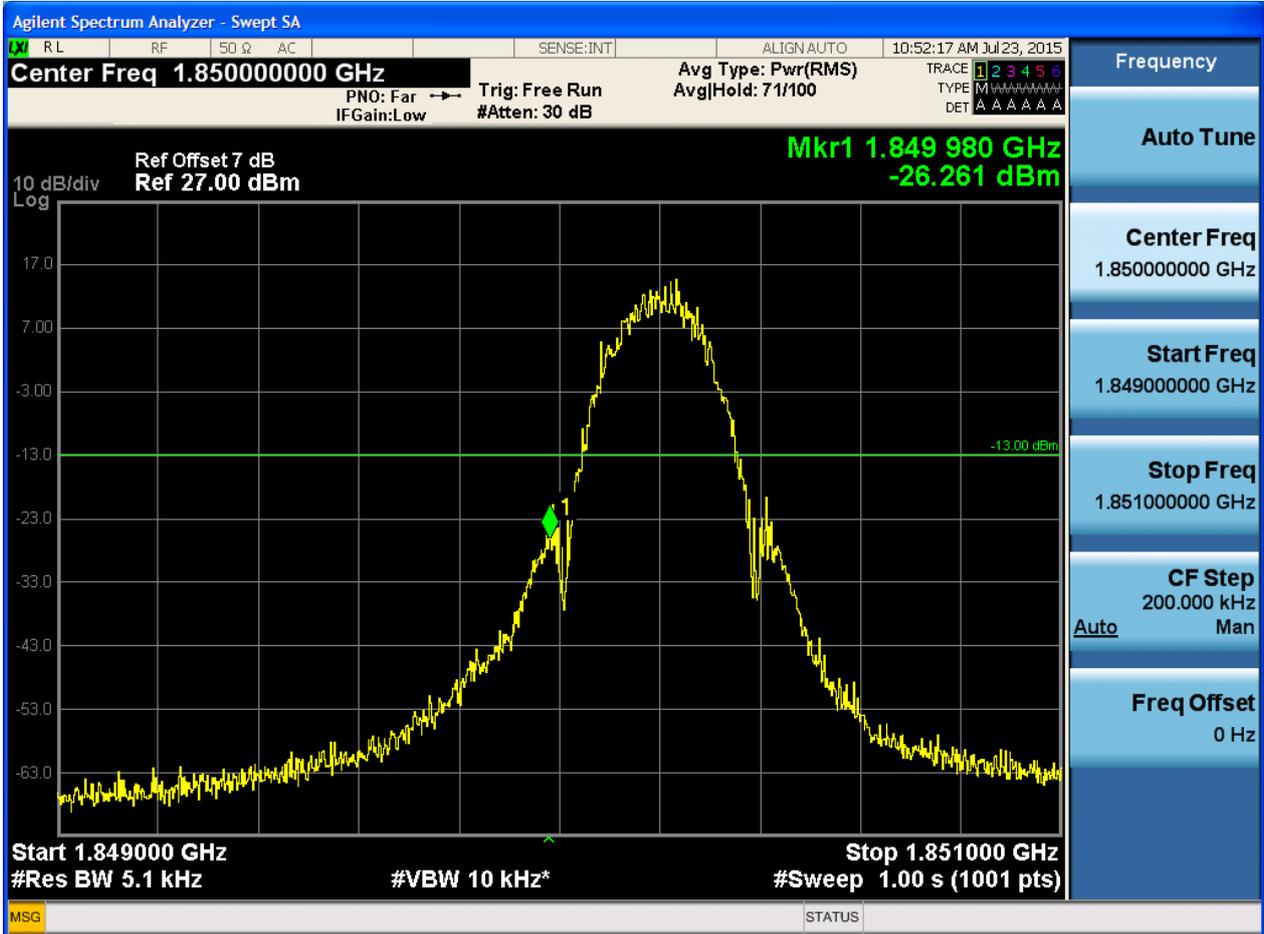


5.1.2.1.2 Test Channel = HCH

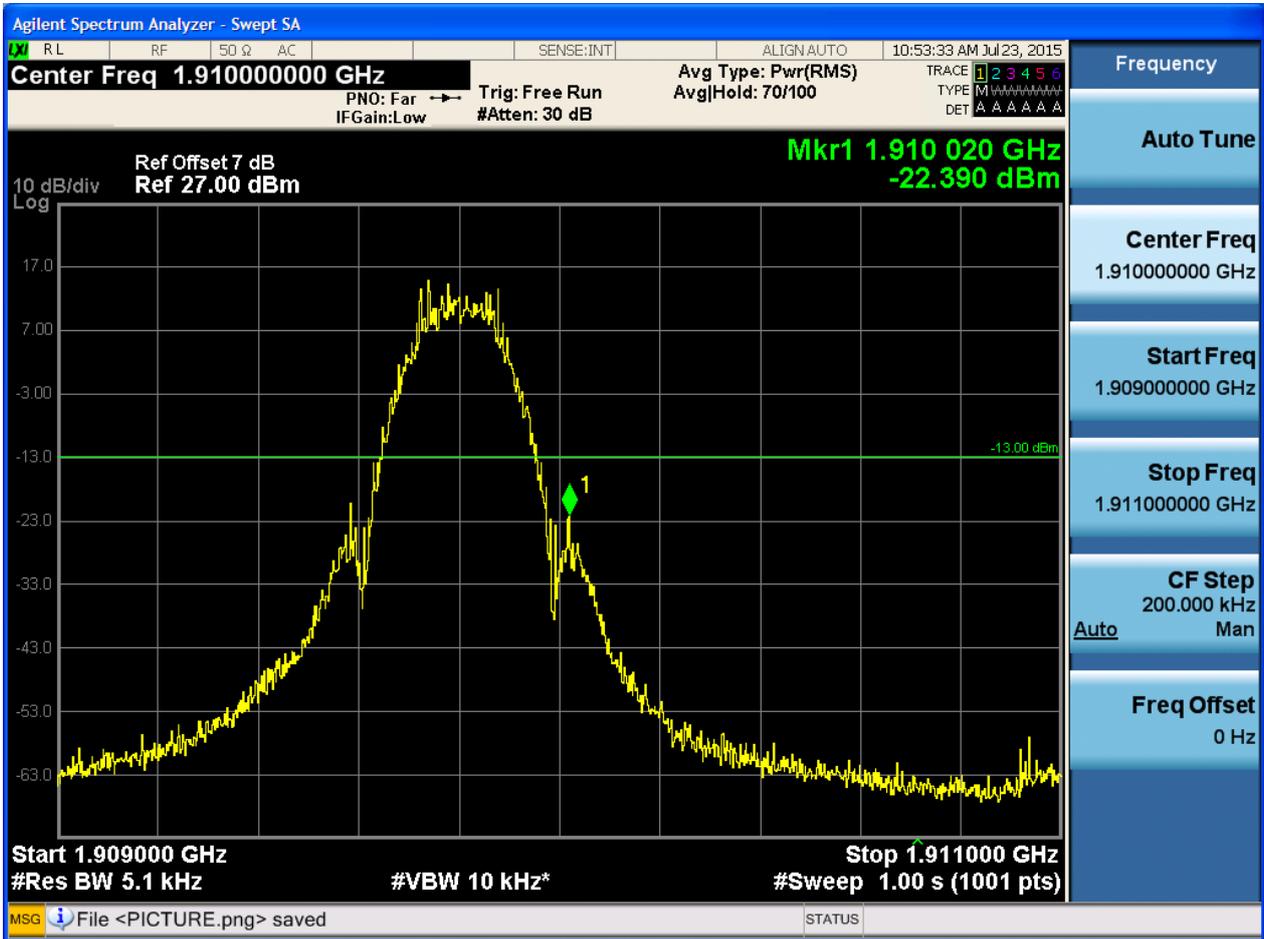


5.1.2.2 Test Mode = GSM/TM2

5.1.2.2.1 Test Channel = LCH



5.1.2.2.2 Test Channel = HCH





6Appendix_F: Spurious Emission at Antenna Terminal

NOTE: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of $< RBW/2$ so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = $k * (Span / RBW)$ " with k between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

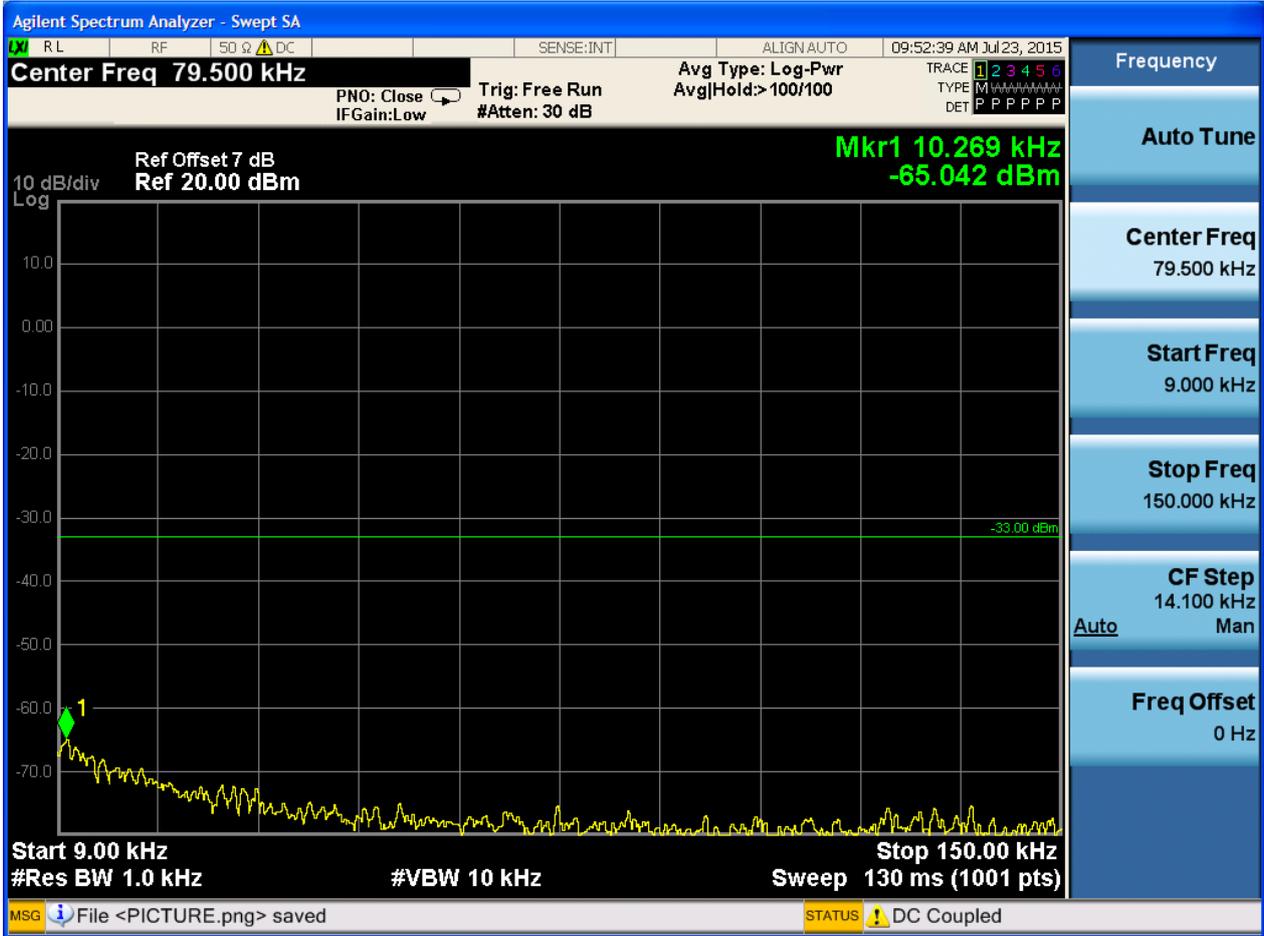
Part I - Test Plots

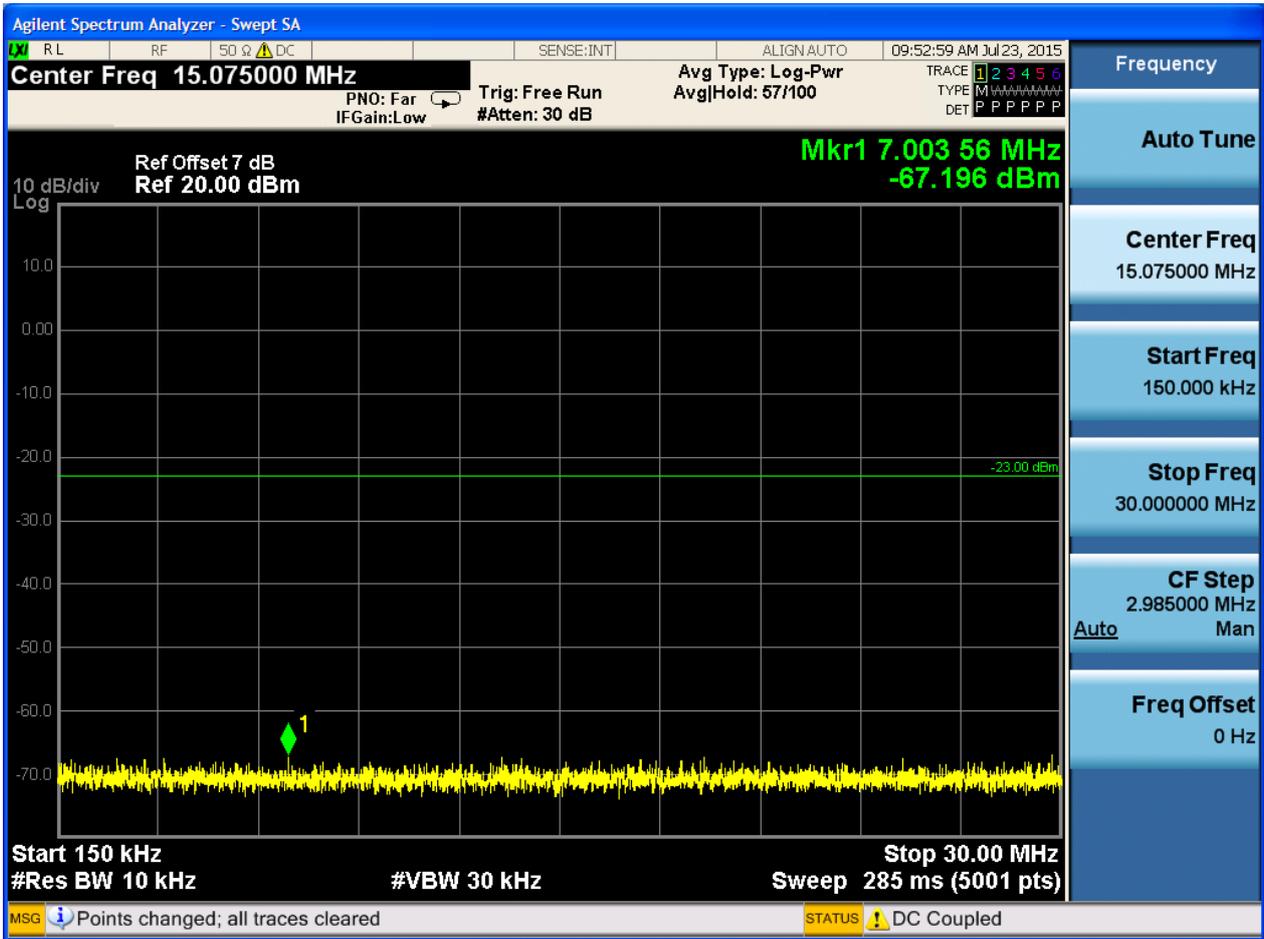
6.1 For GSM

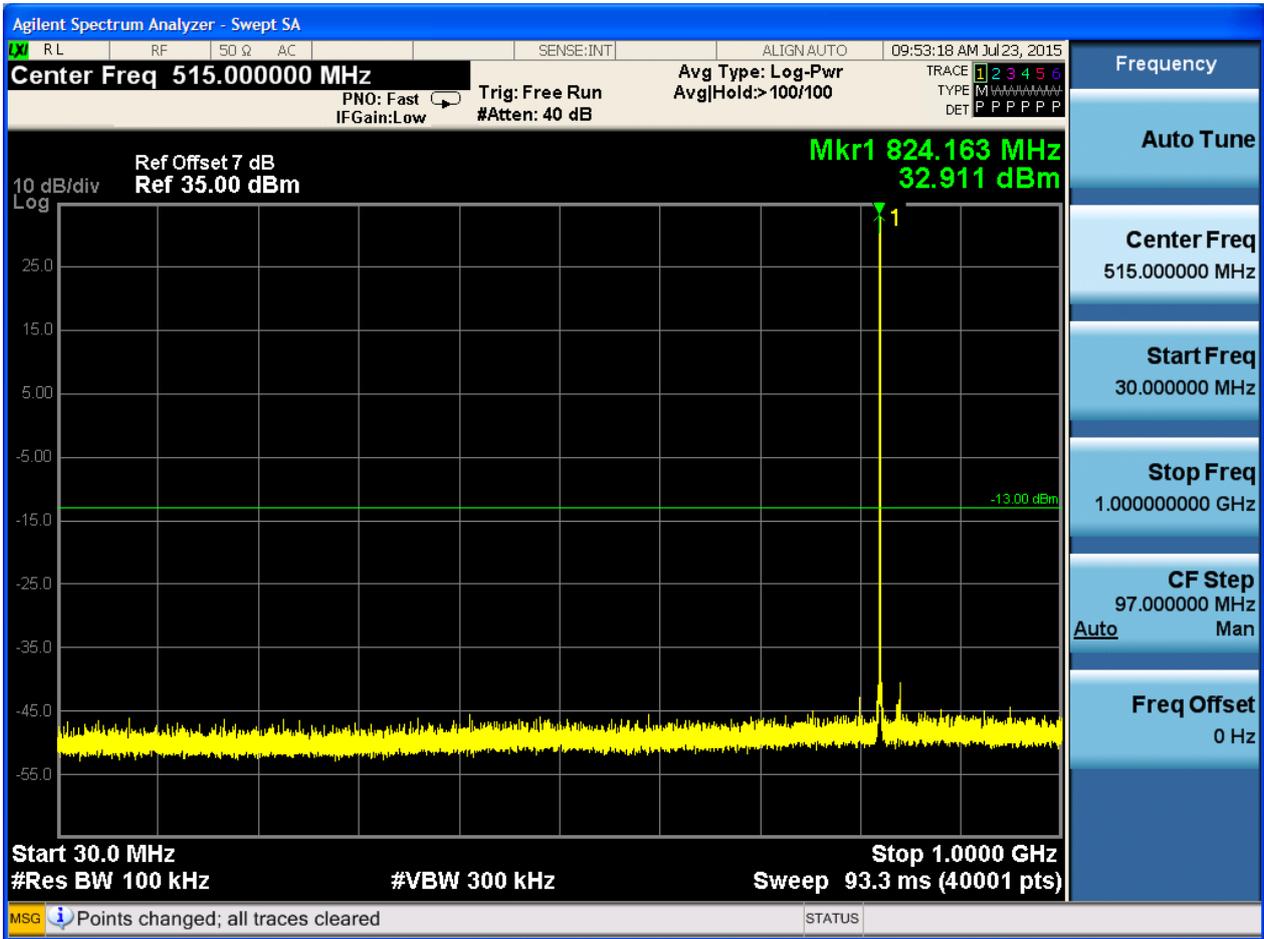
6.1.1 Test Band = GSM850

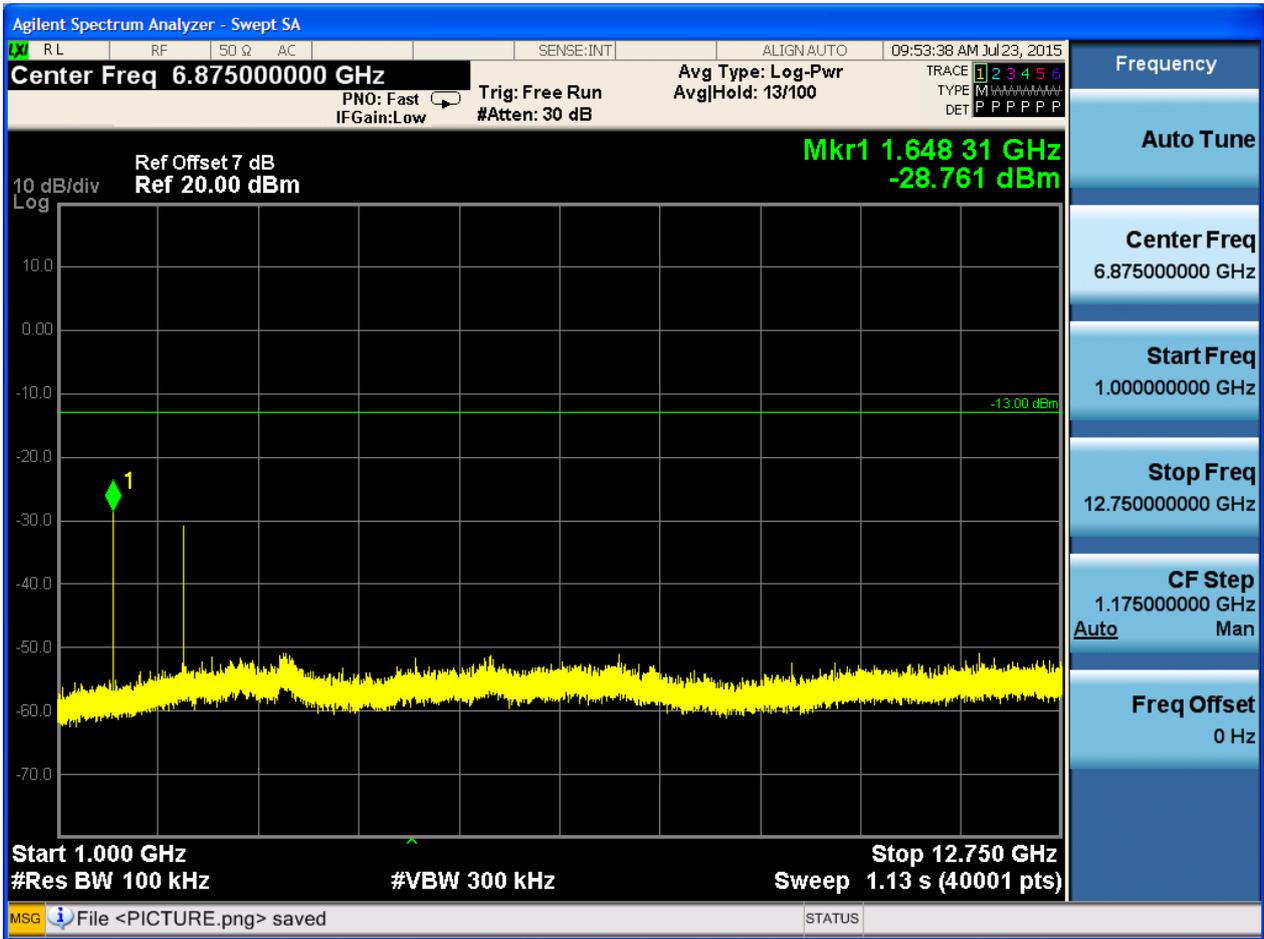
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH

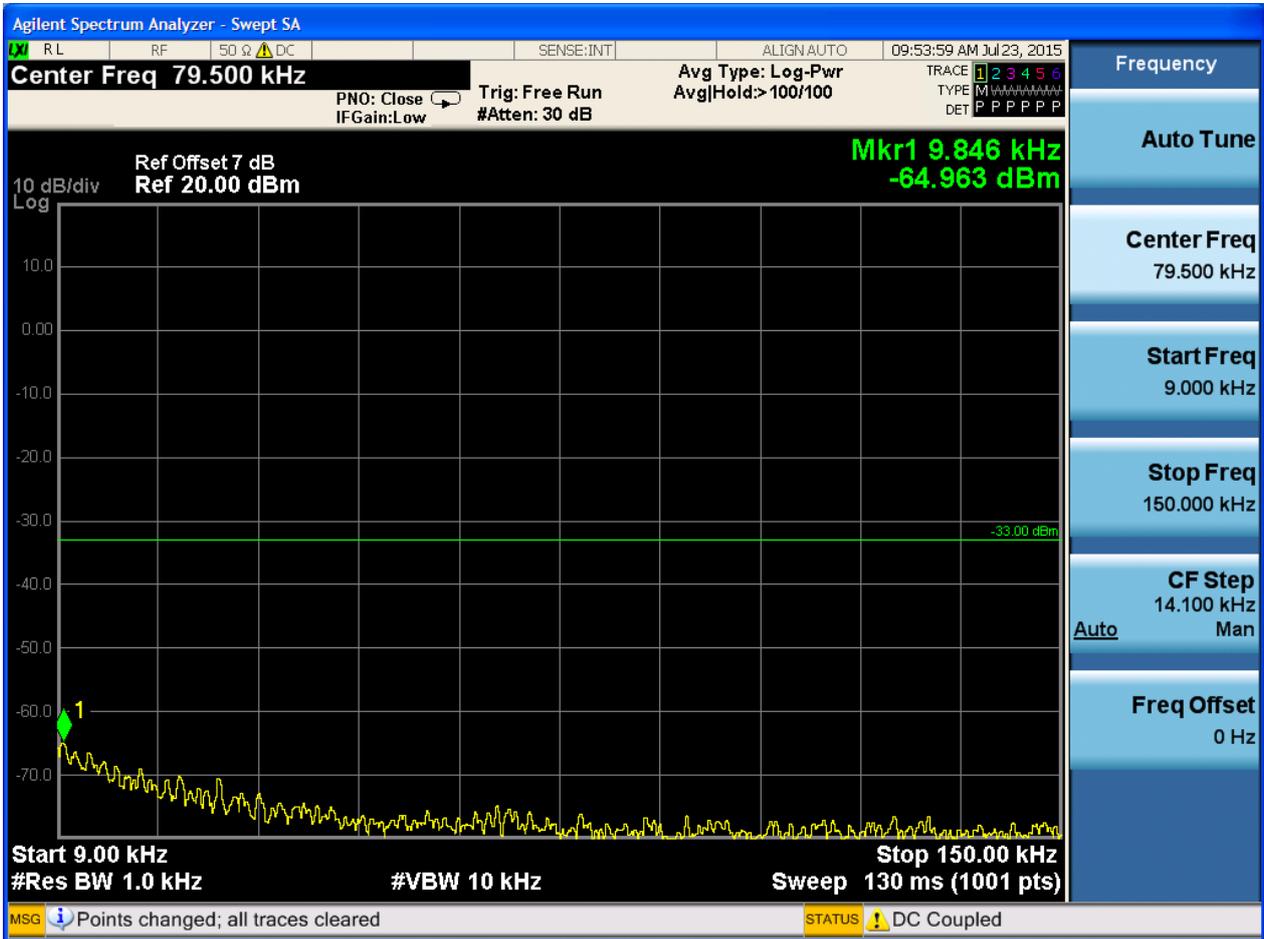


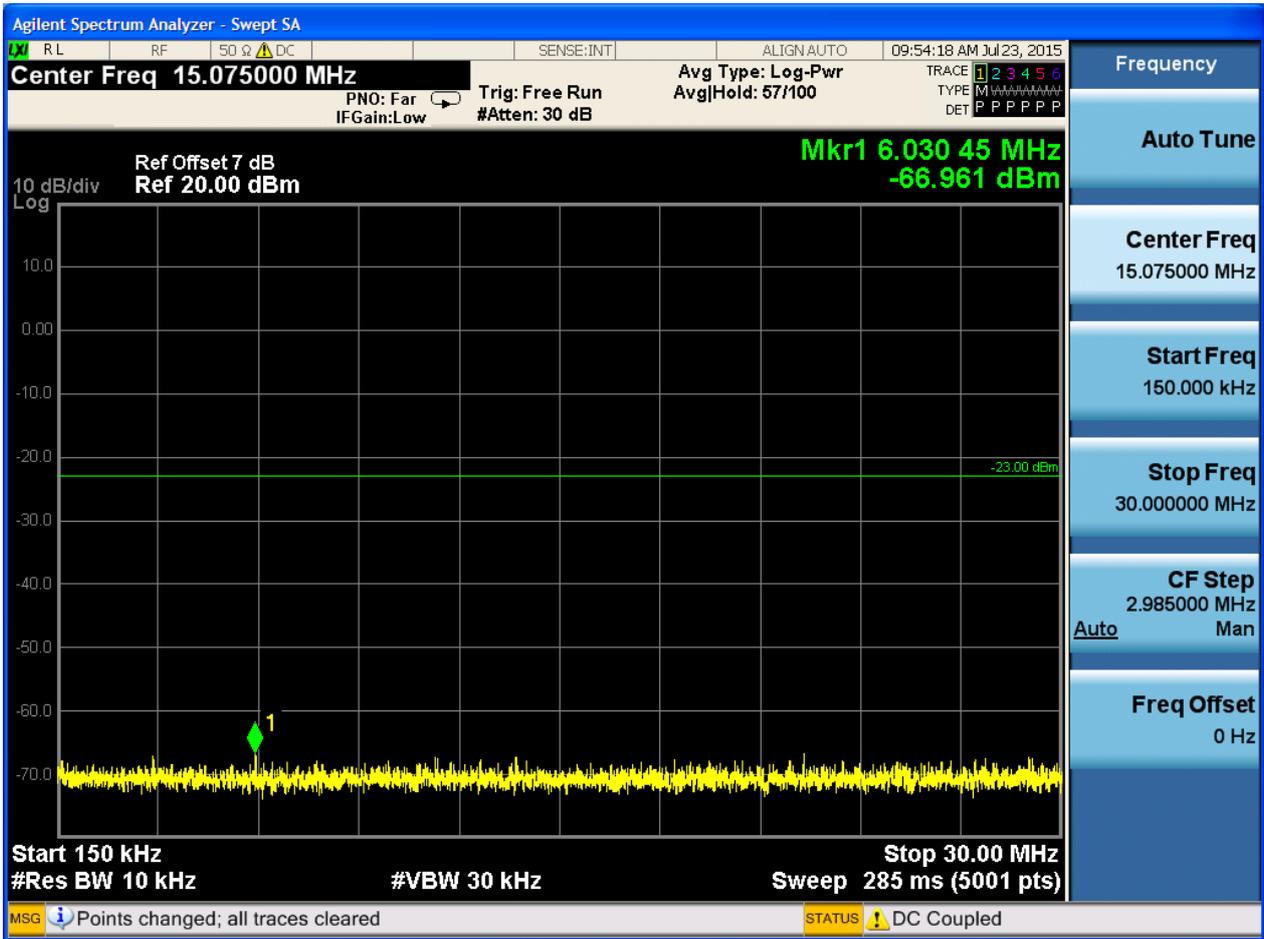


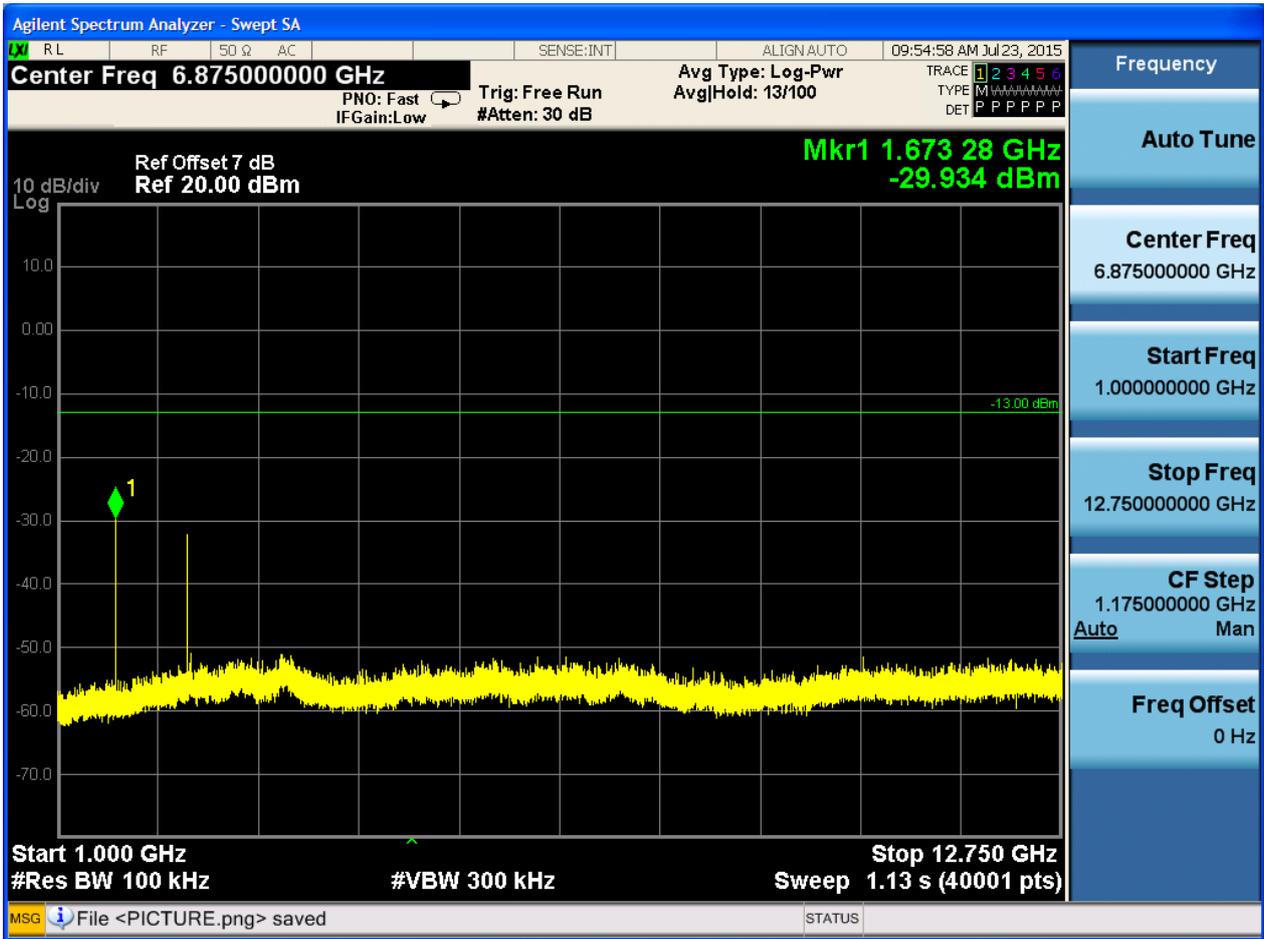




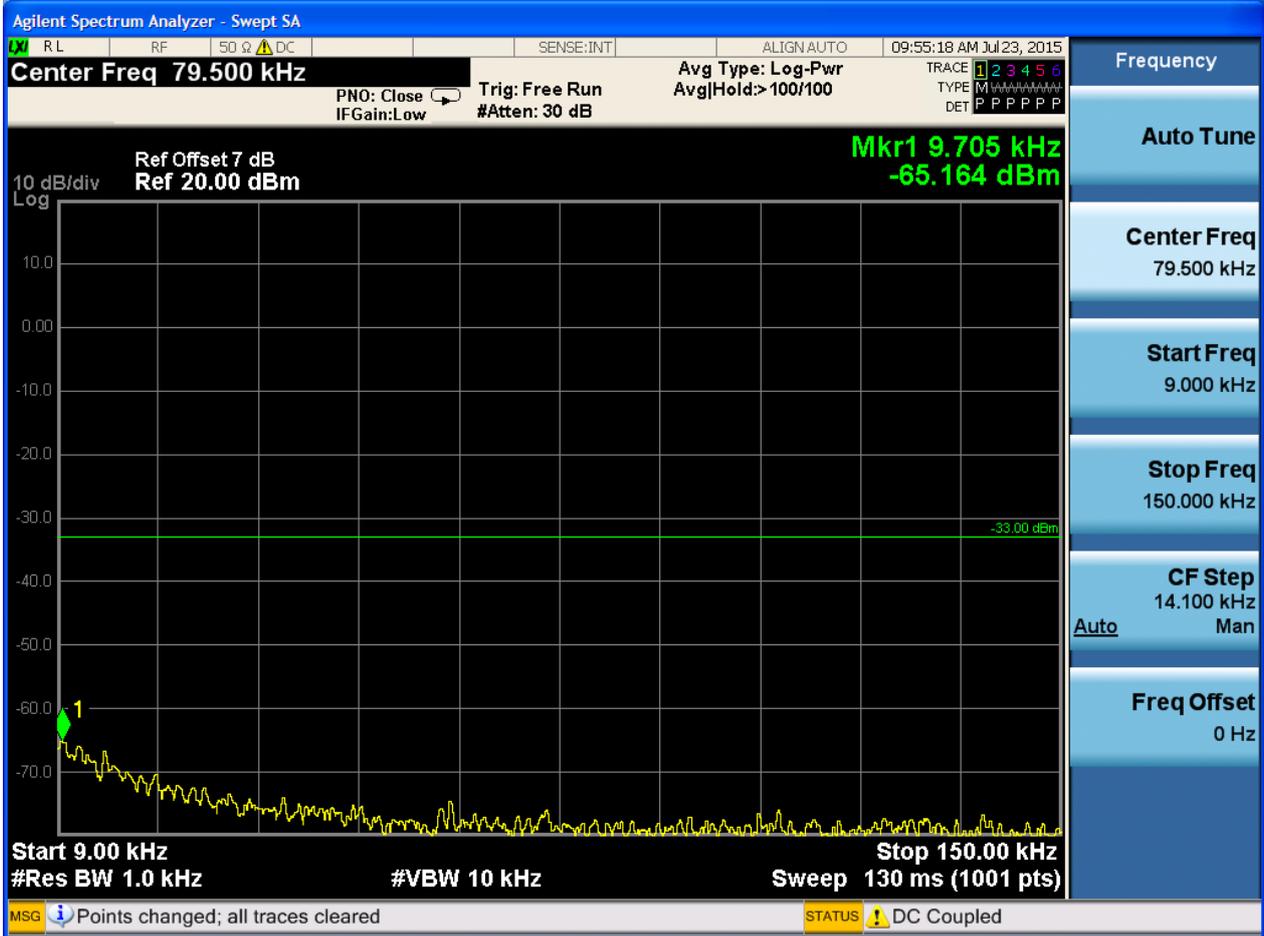
6.1.1.1.2 Test Channel = MCH

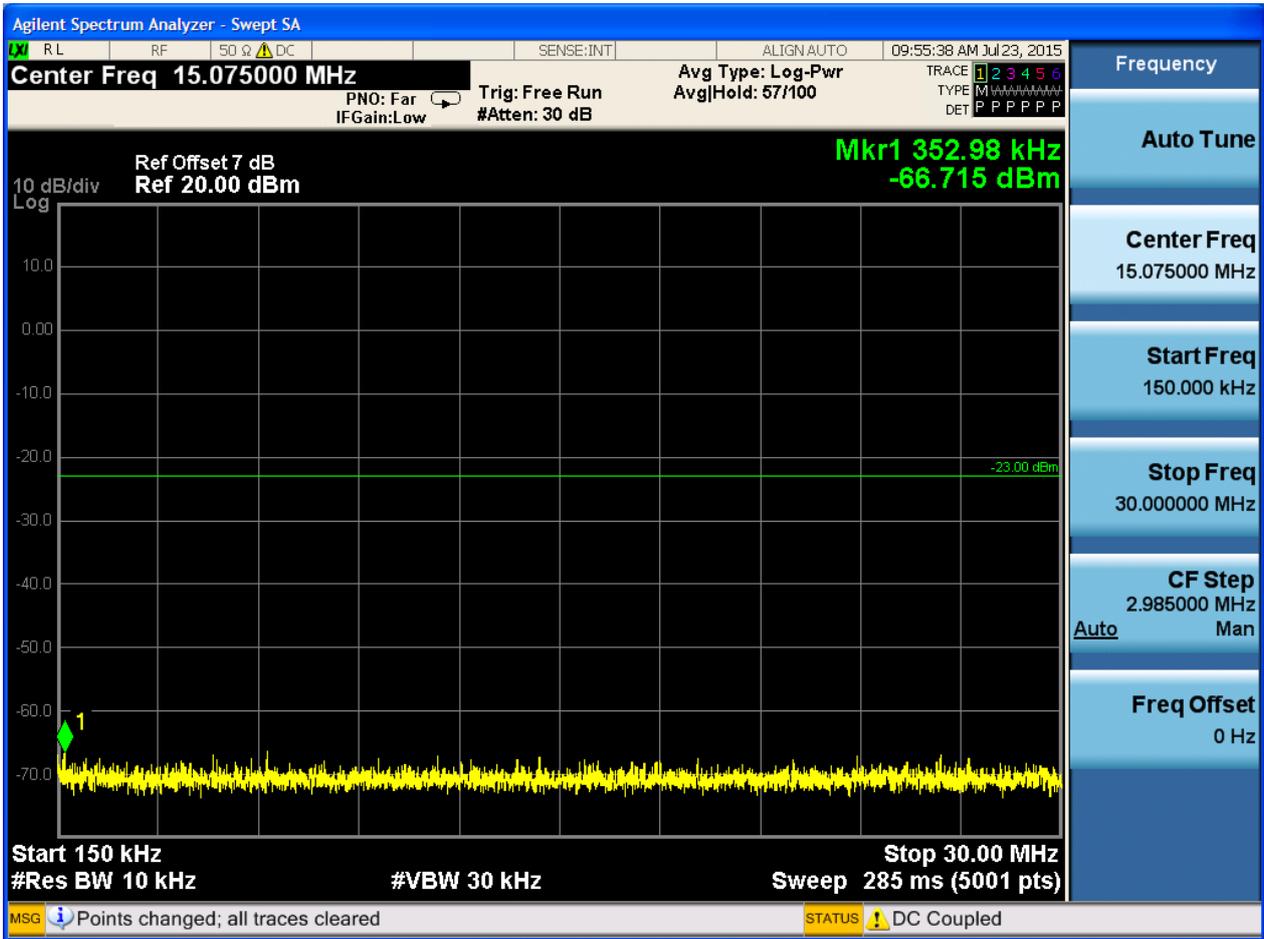


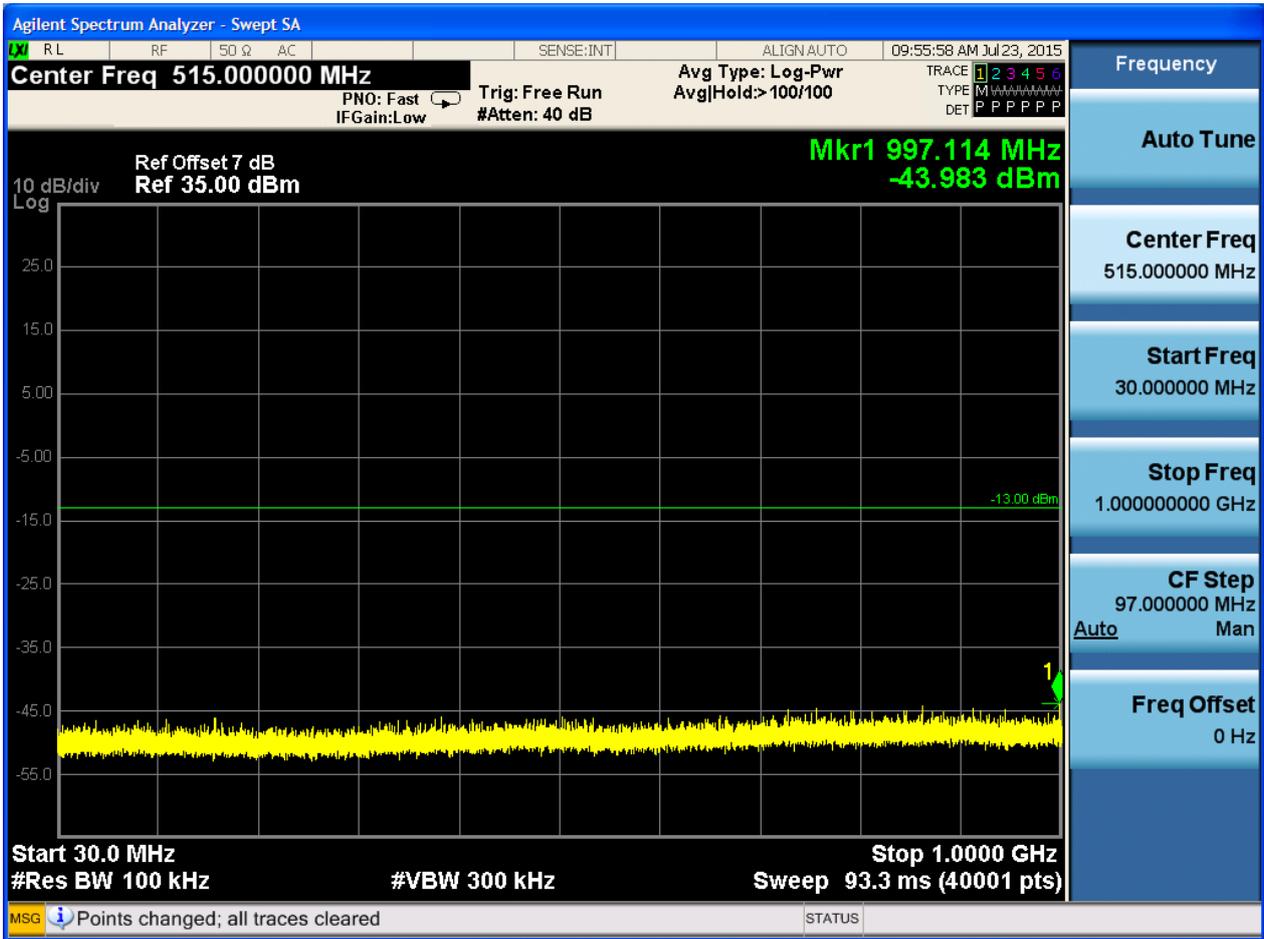


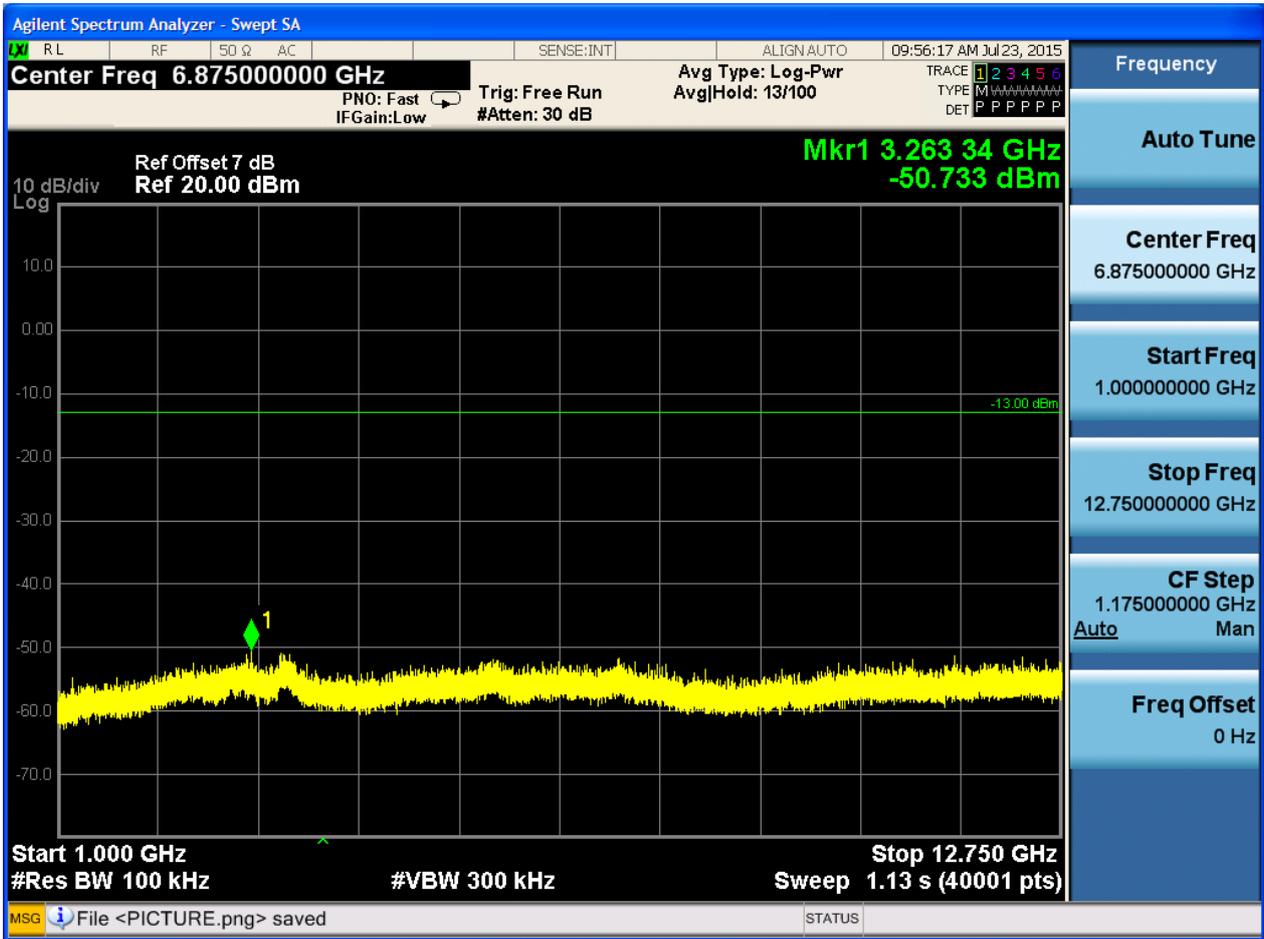


6.1.1.1.3 Test Channel = HCH





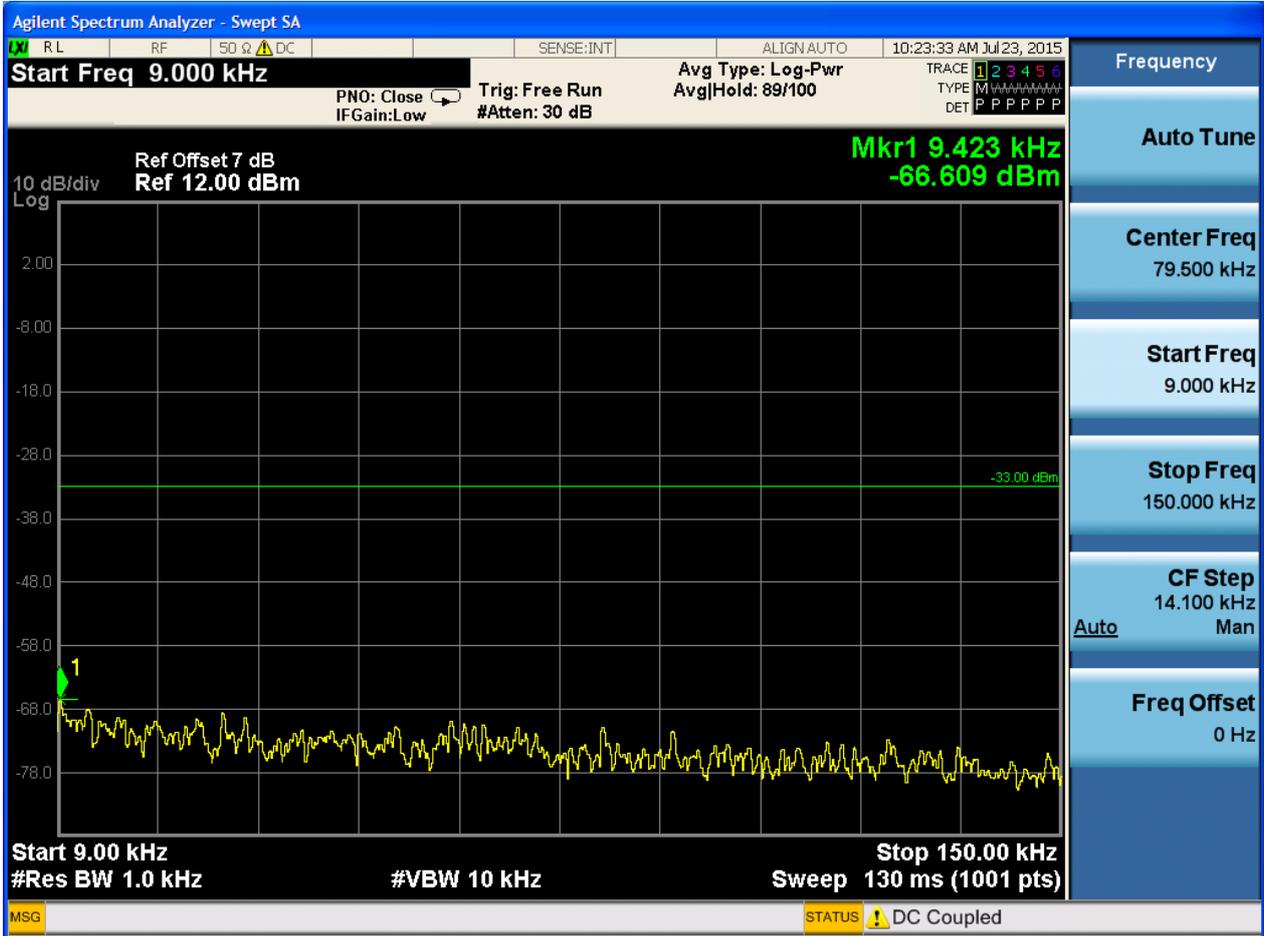


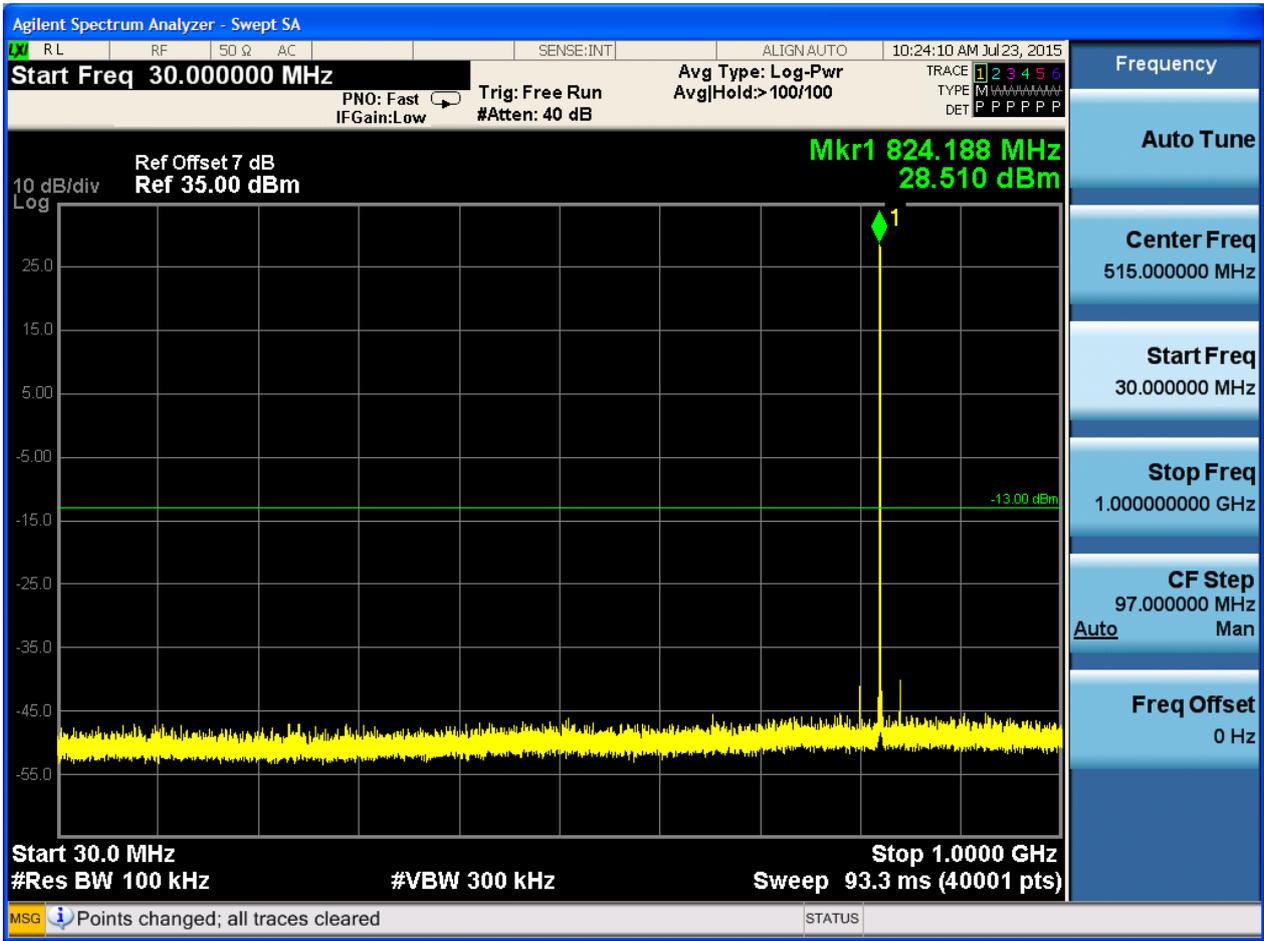


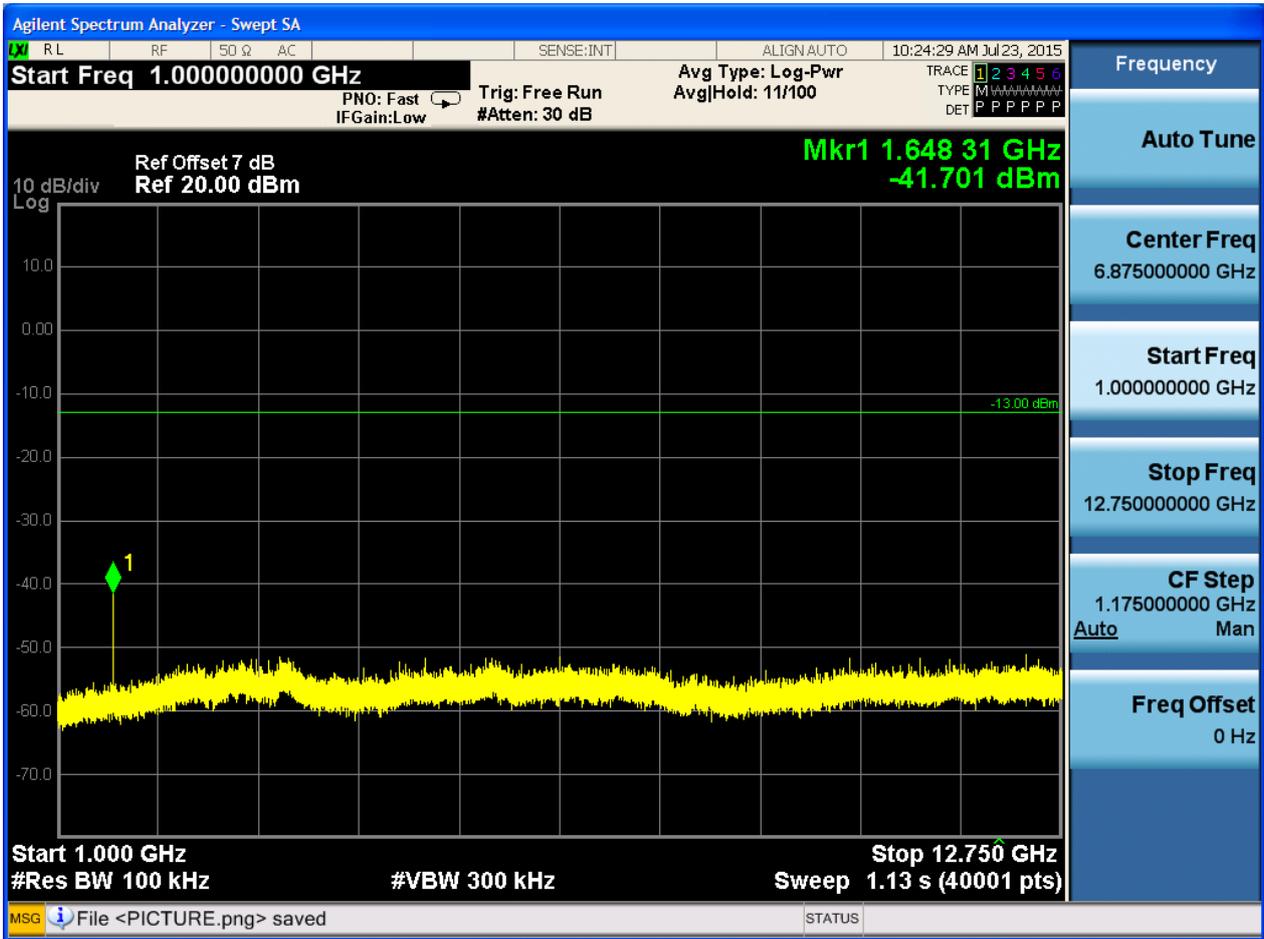


6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH

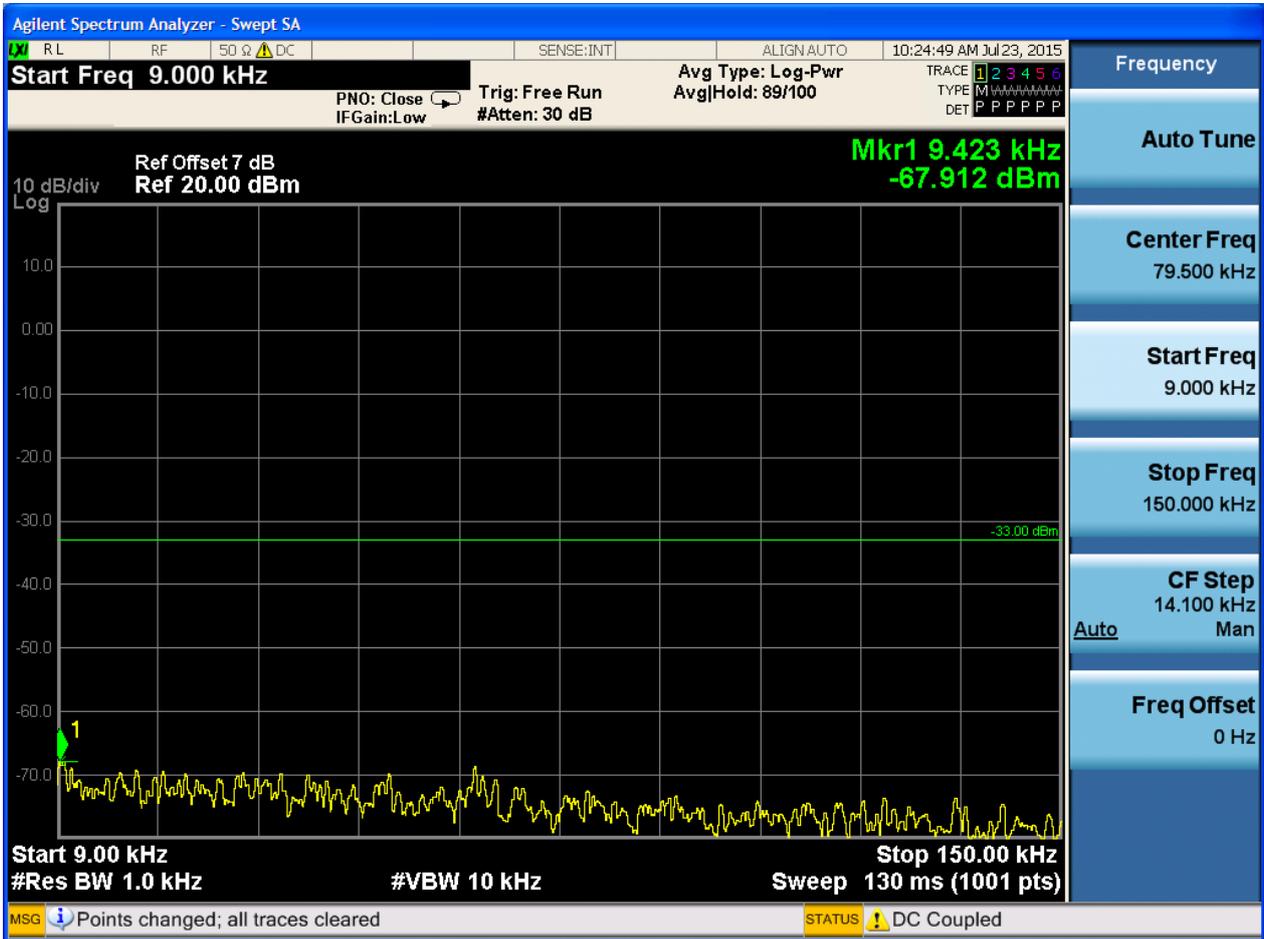


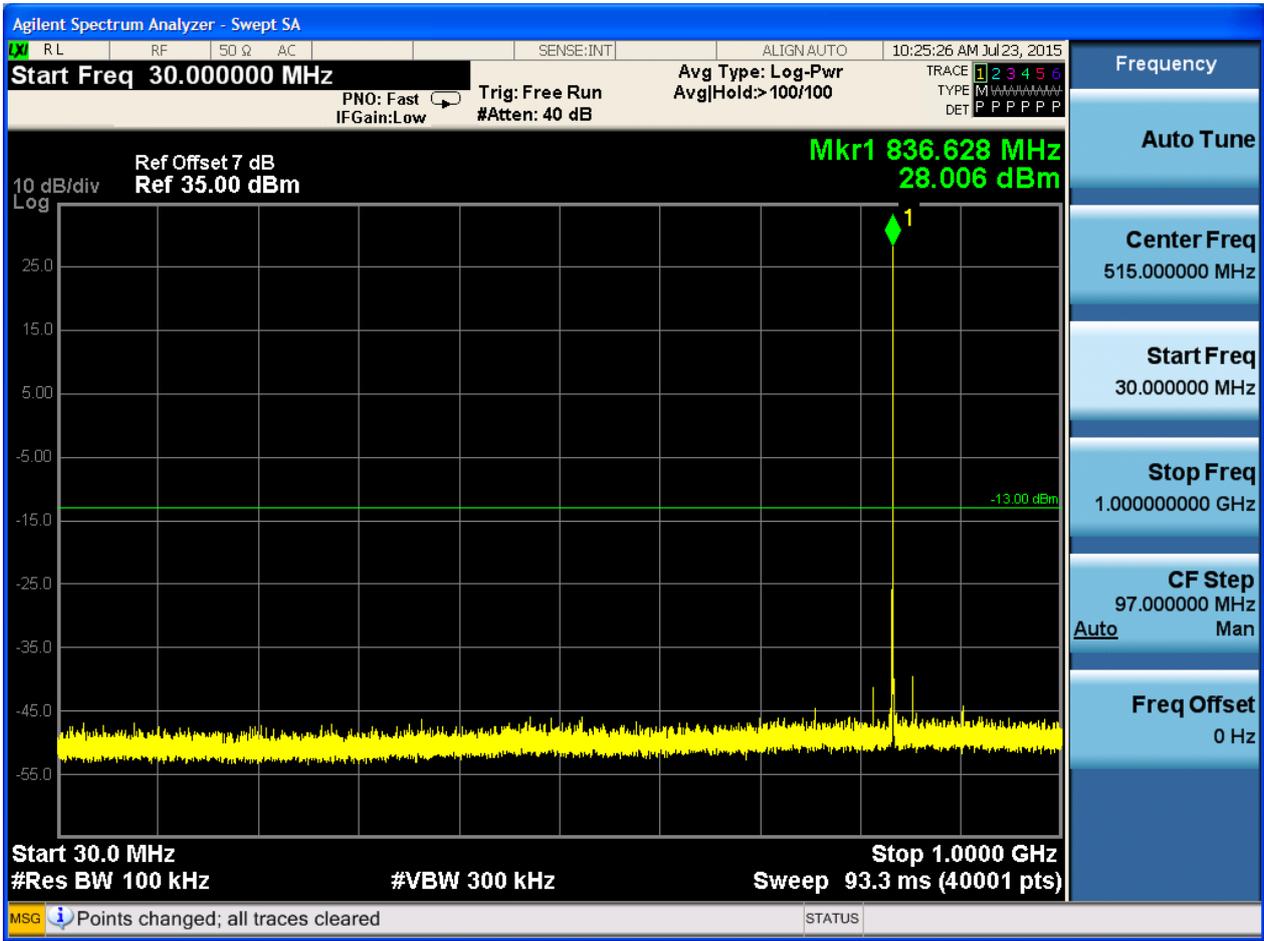


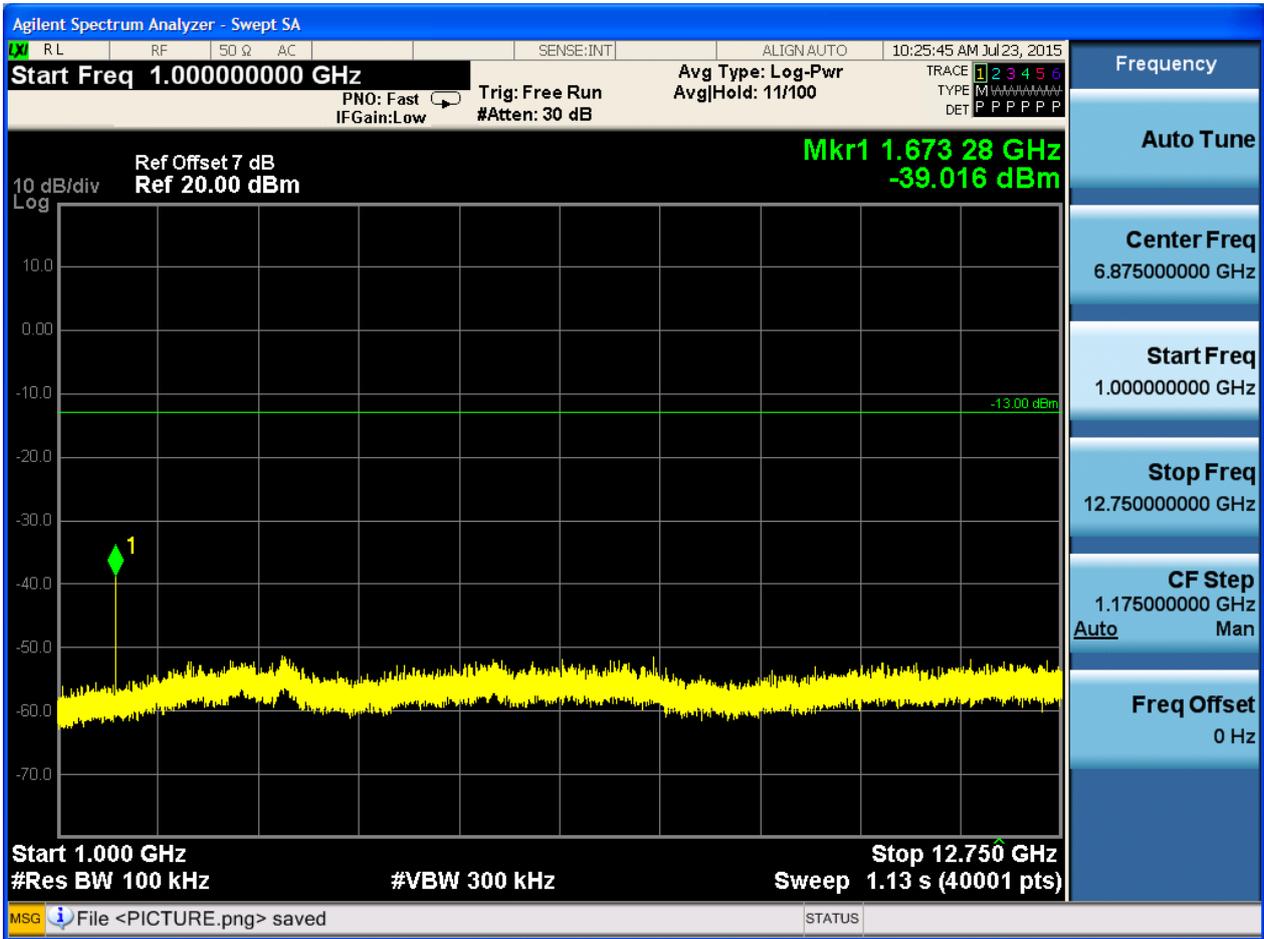




6.1.1.2.2 Test Channel = MCH

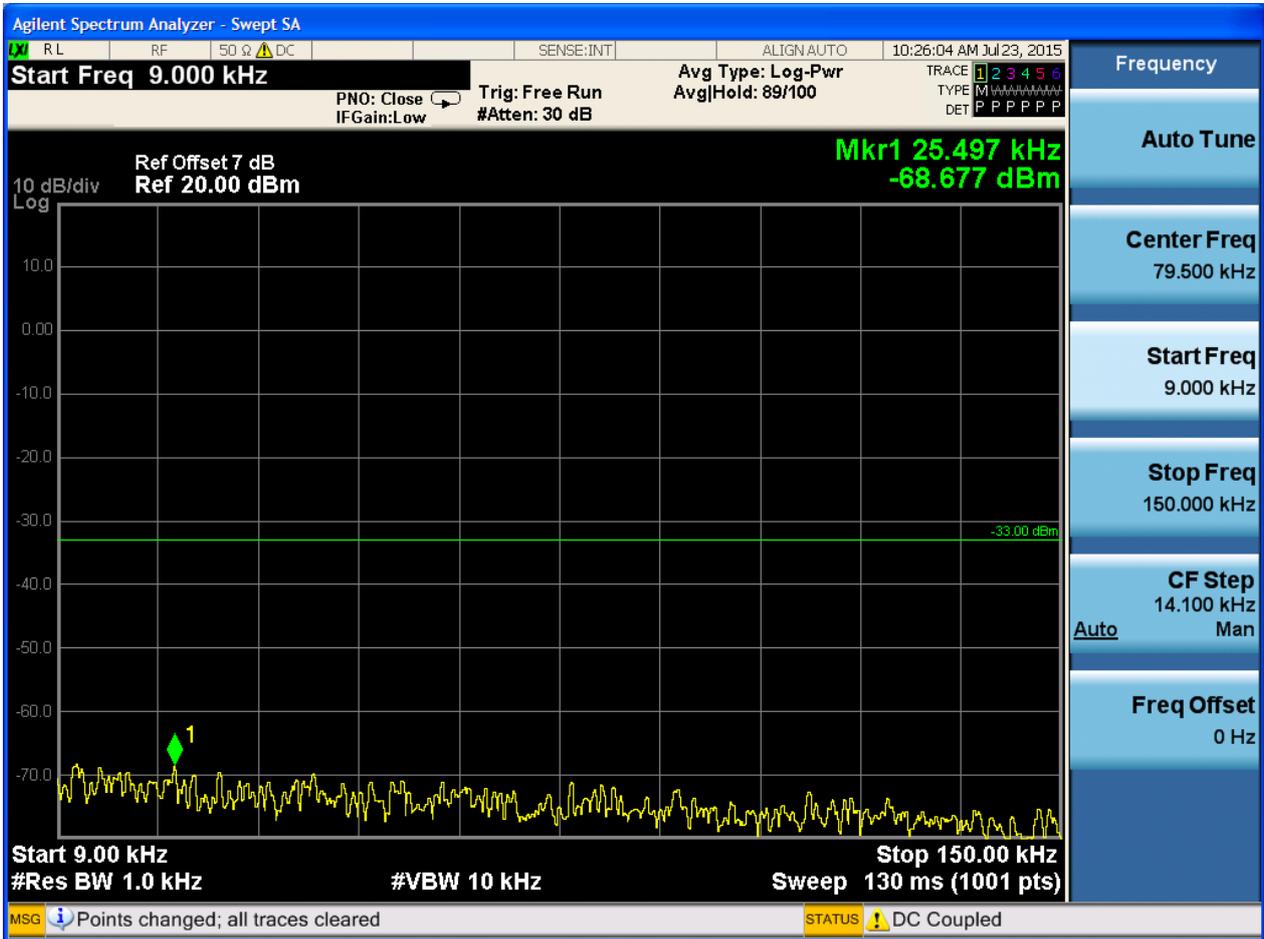


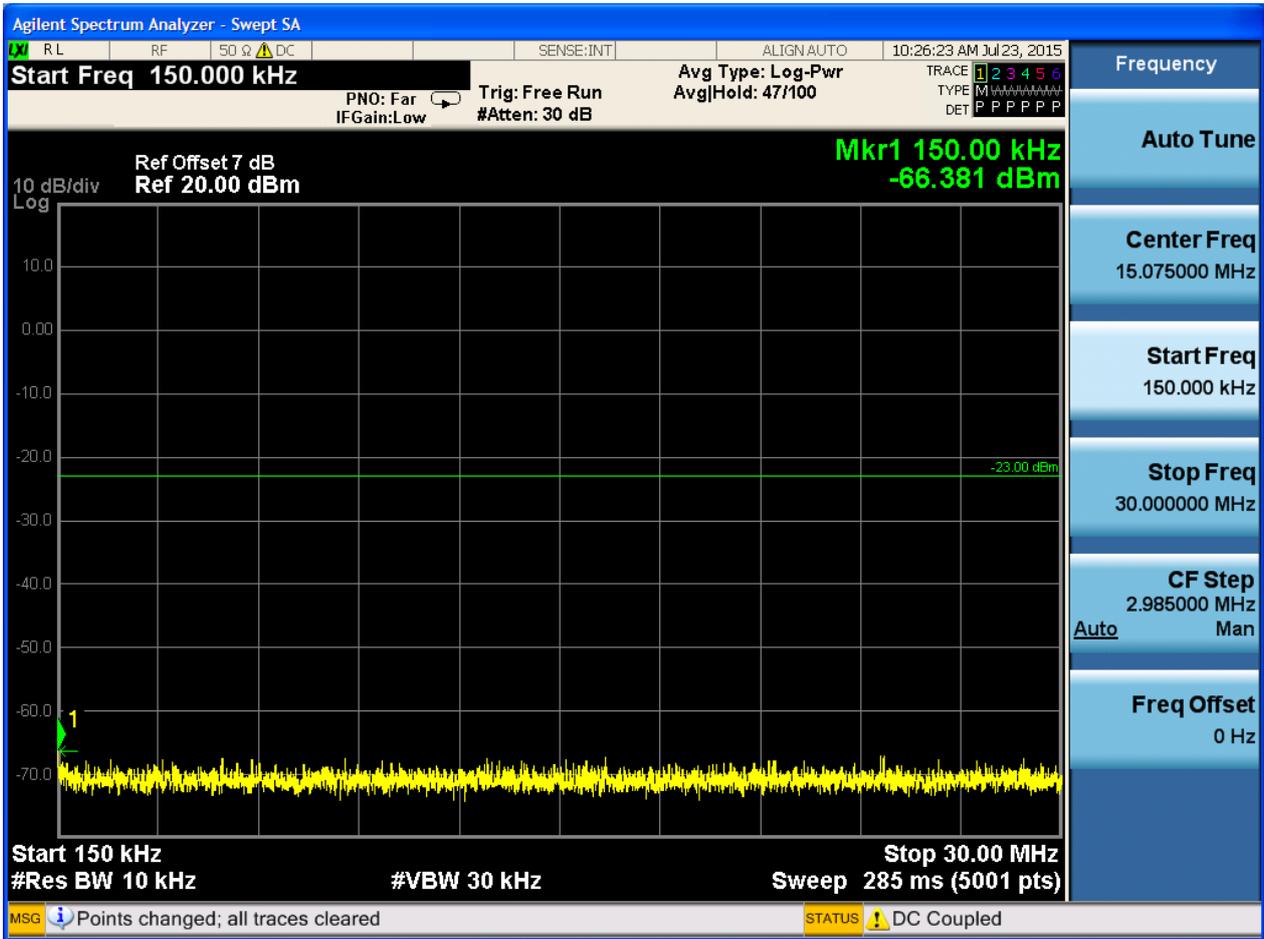


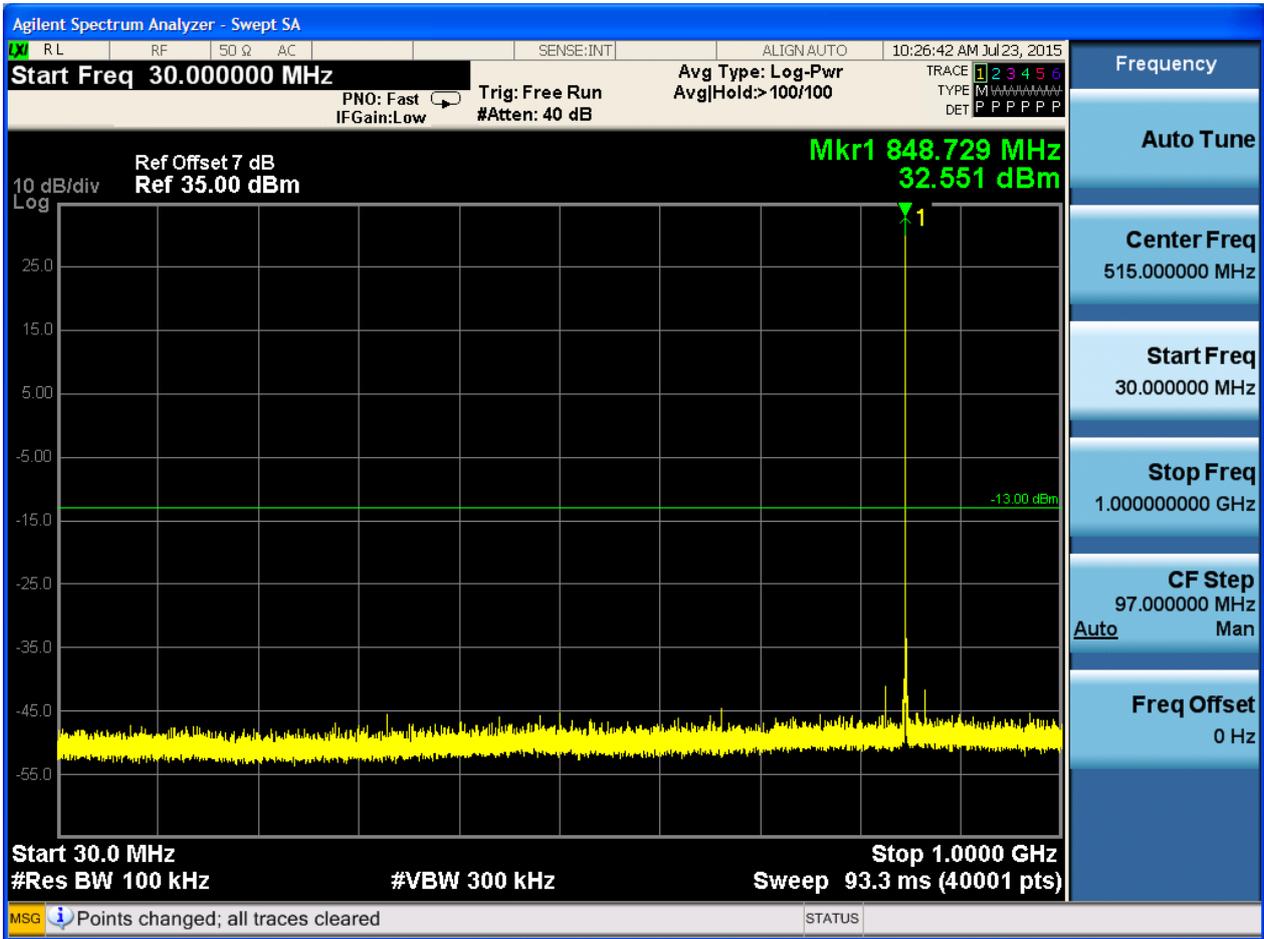


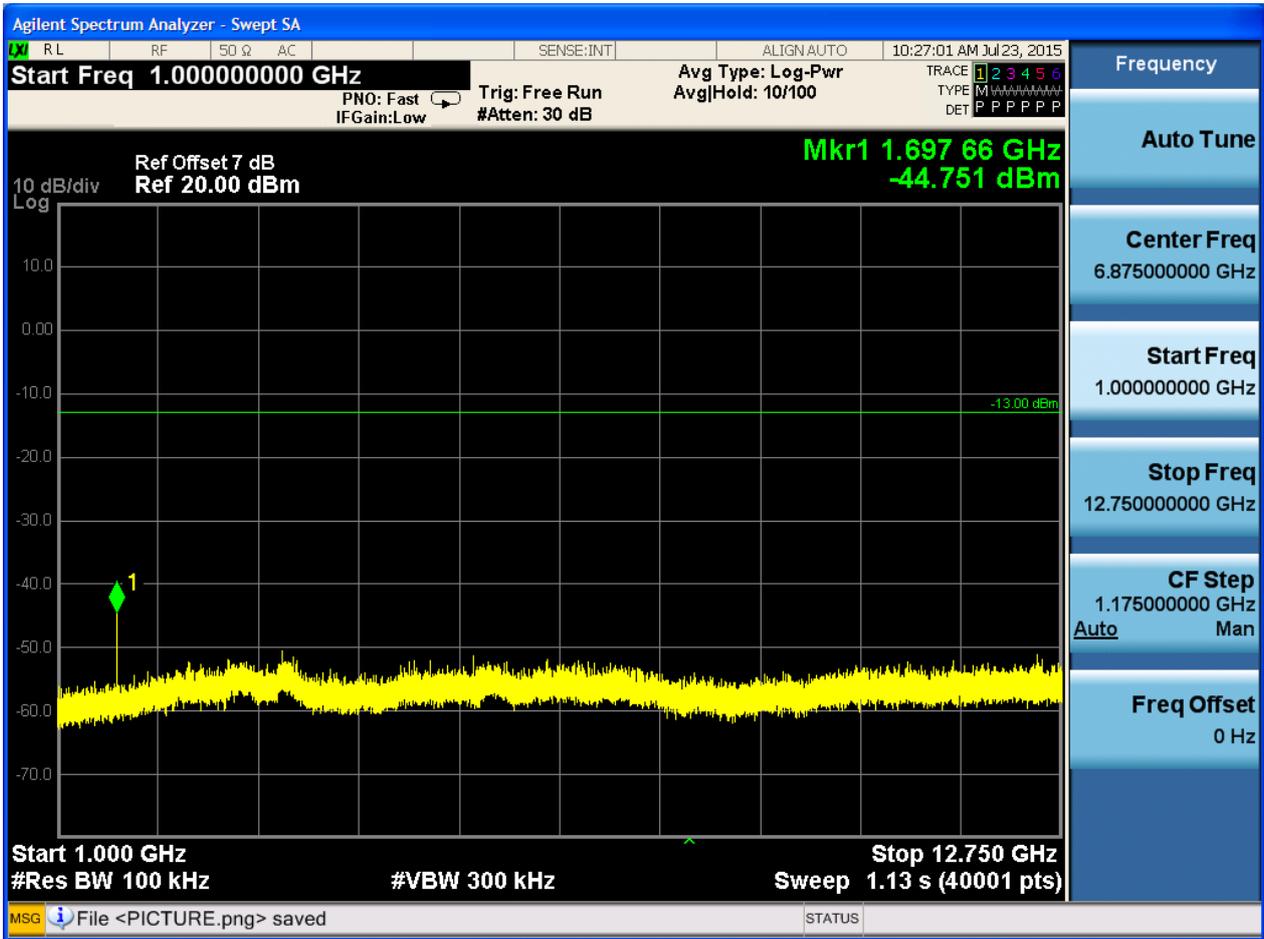


6.1.1.2.3 Test Channel = HCH









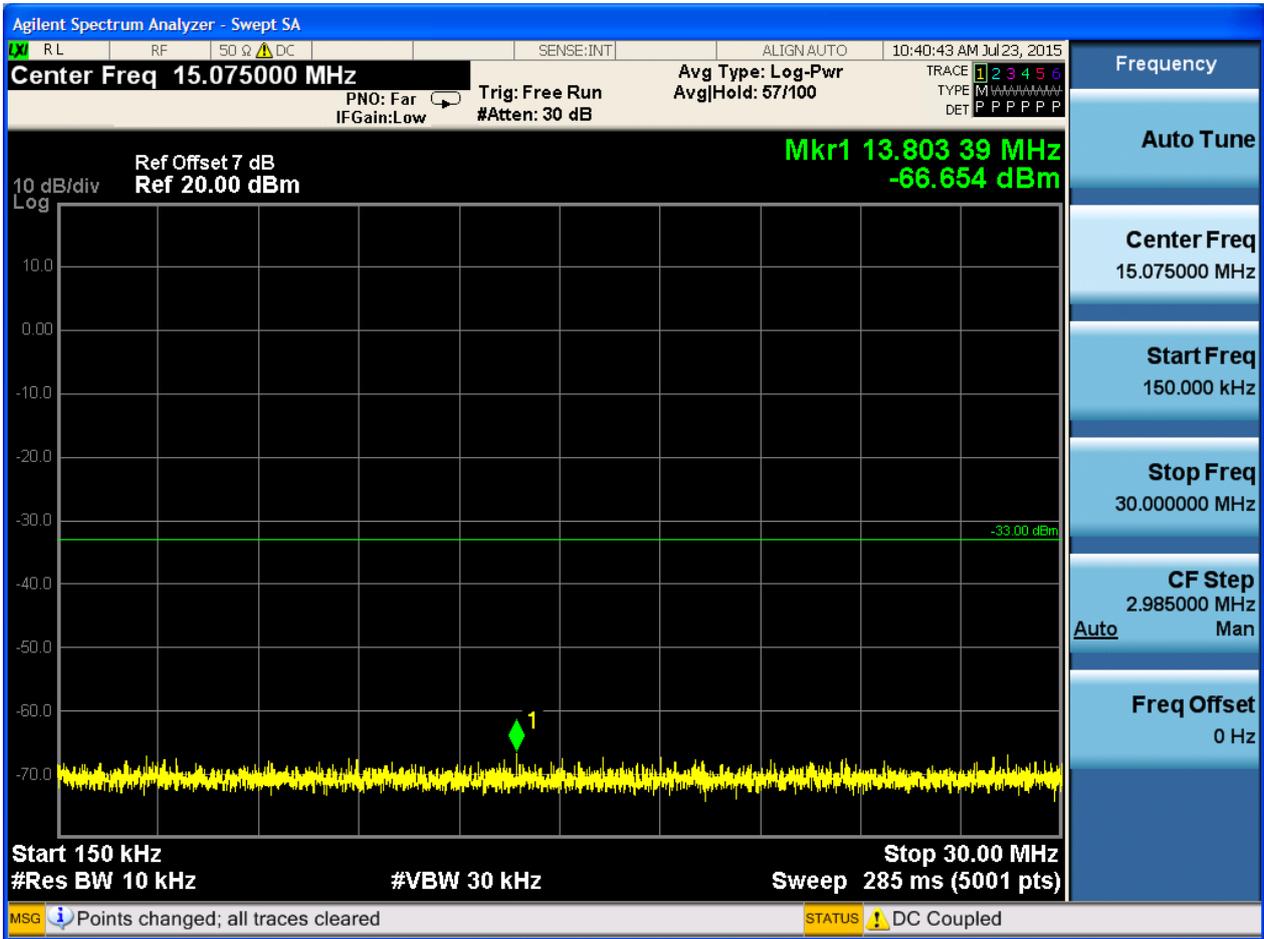


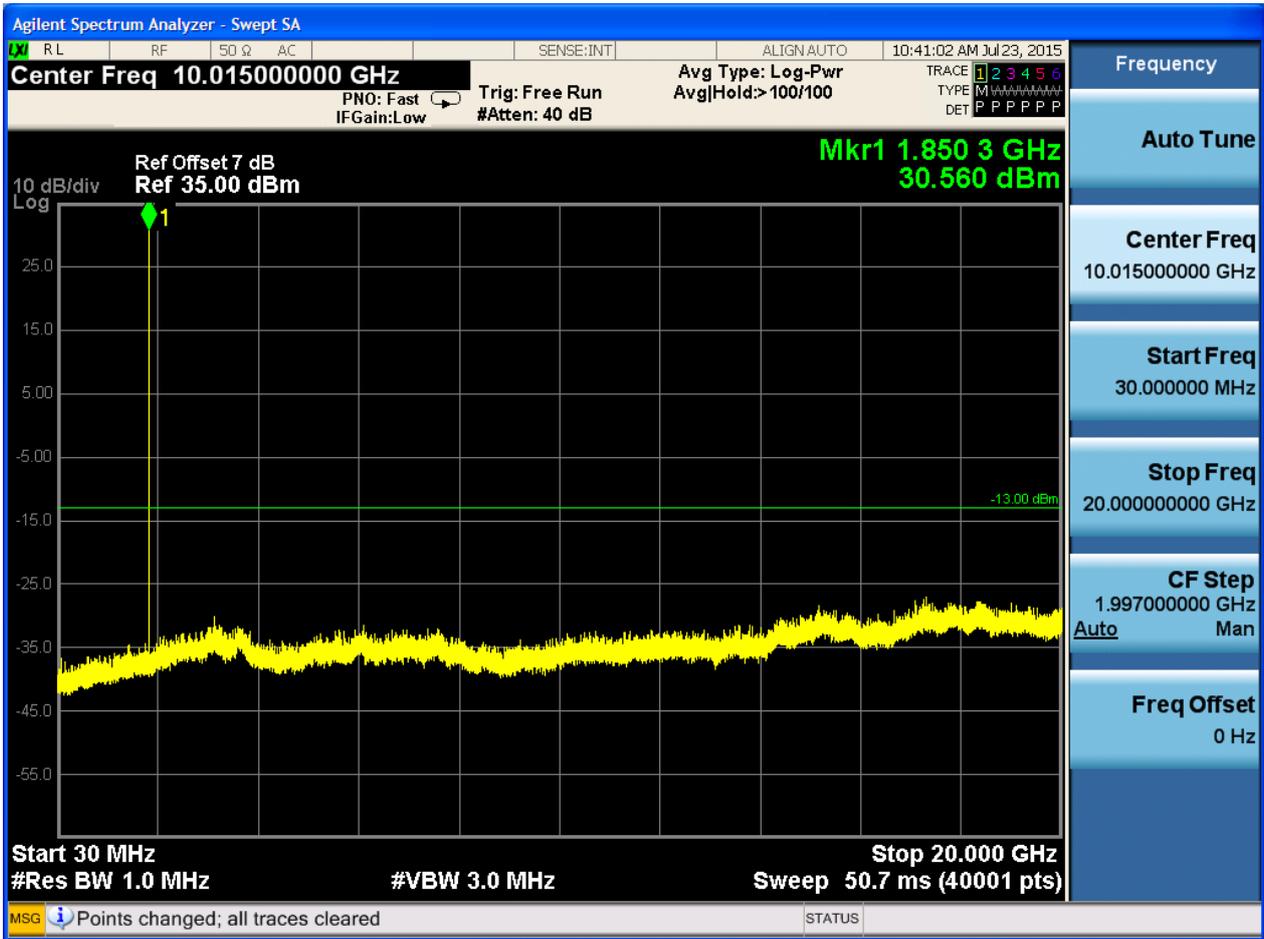
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH

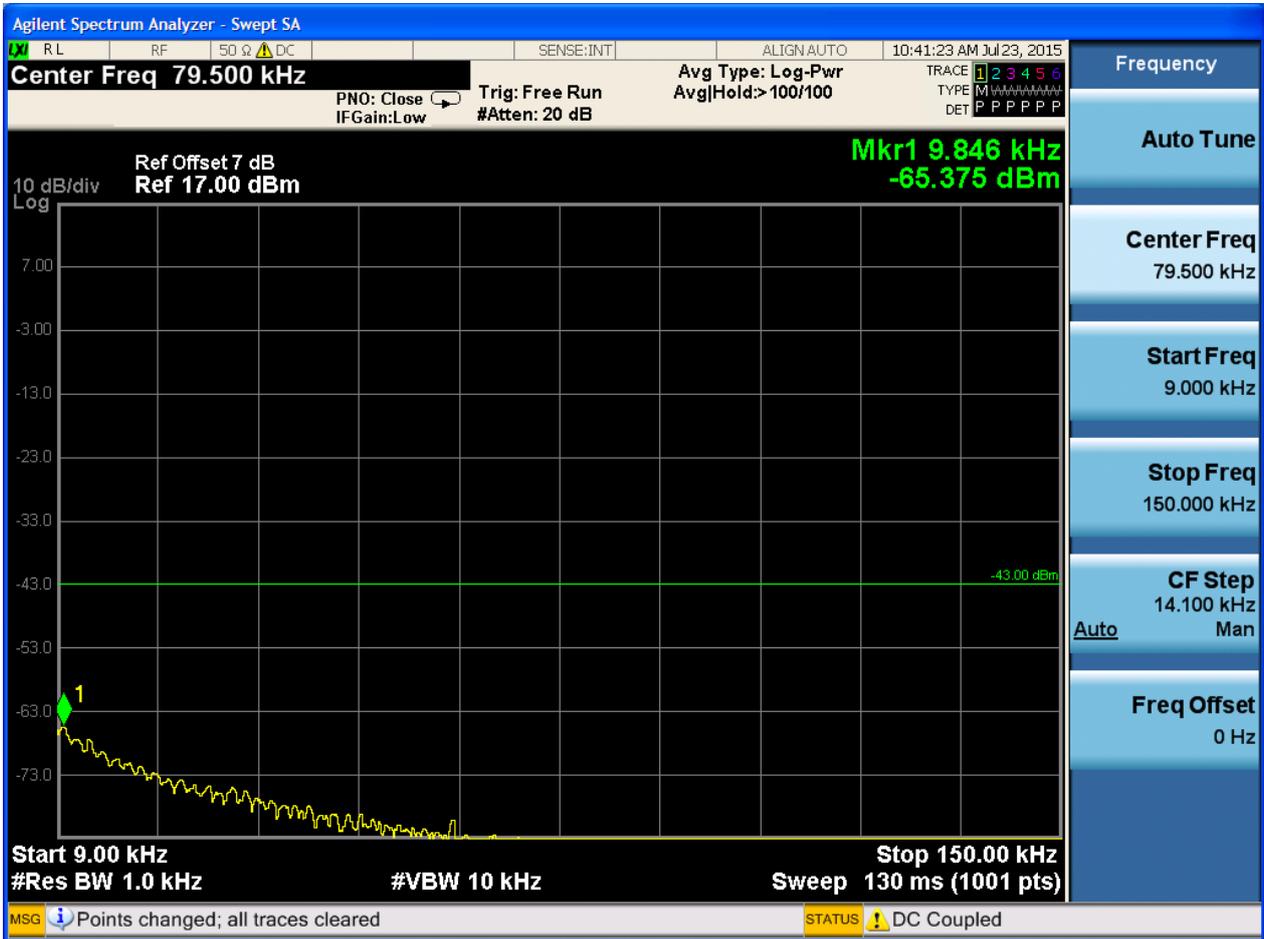


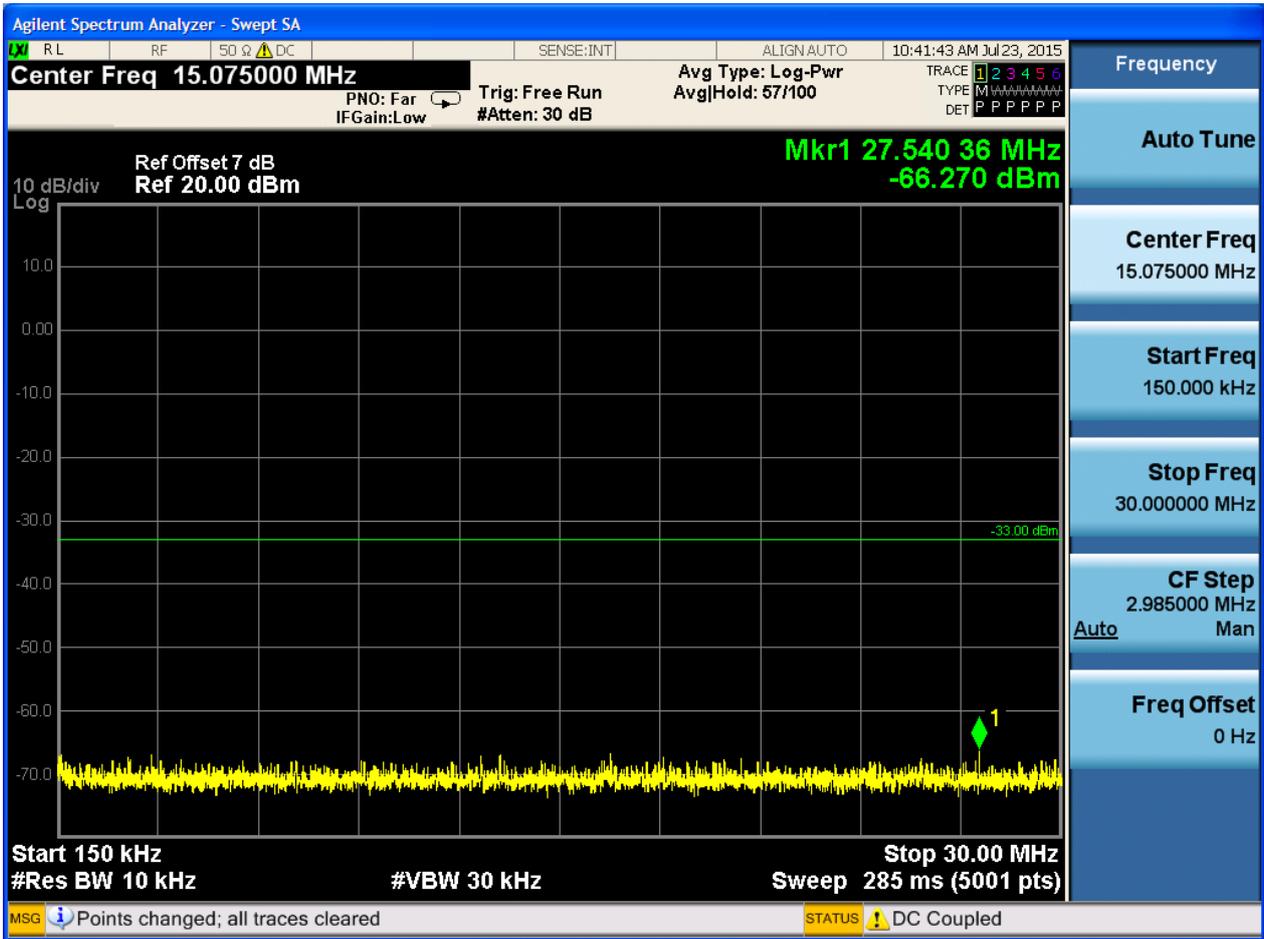


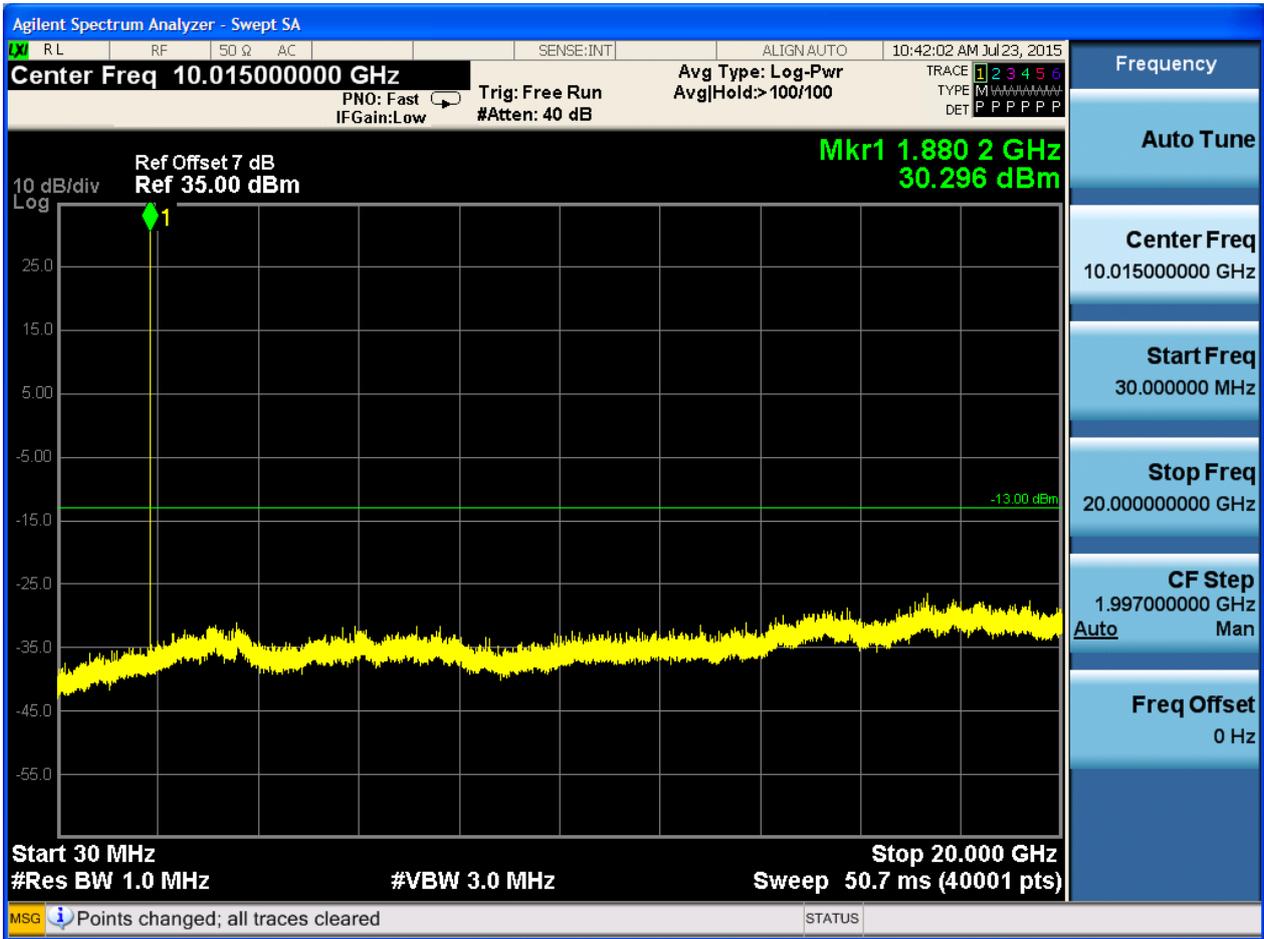




6.1.2.1.2 Test Channel = MCH

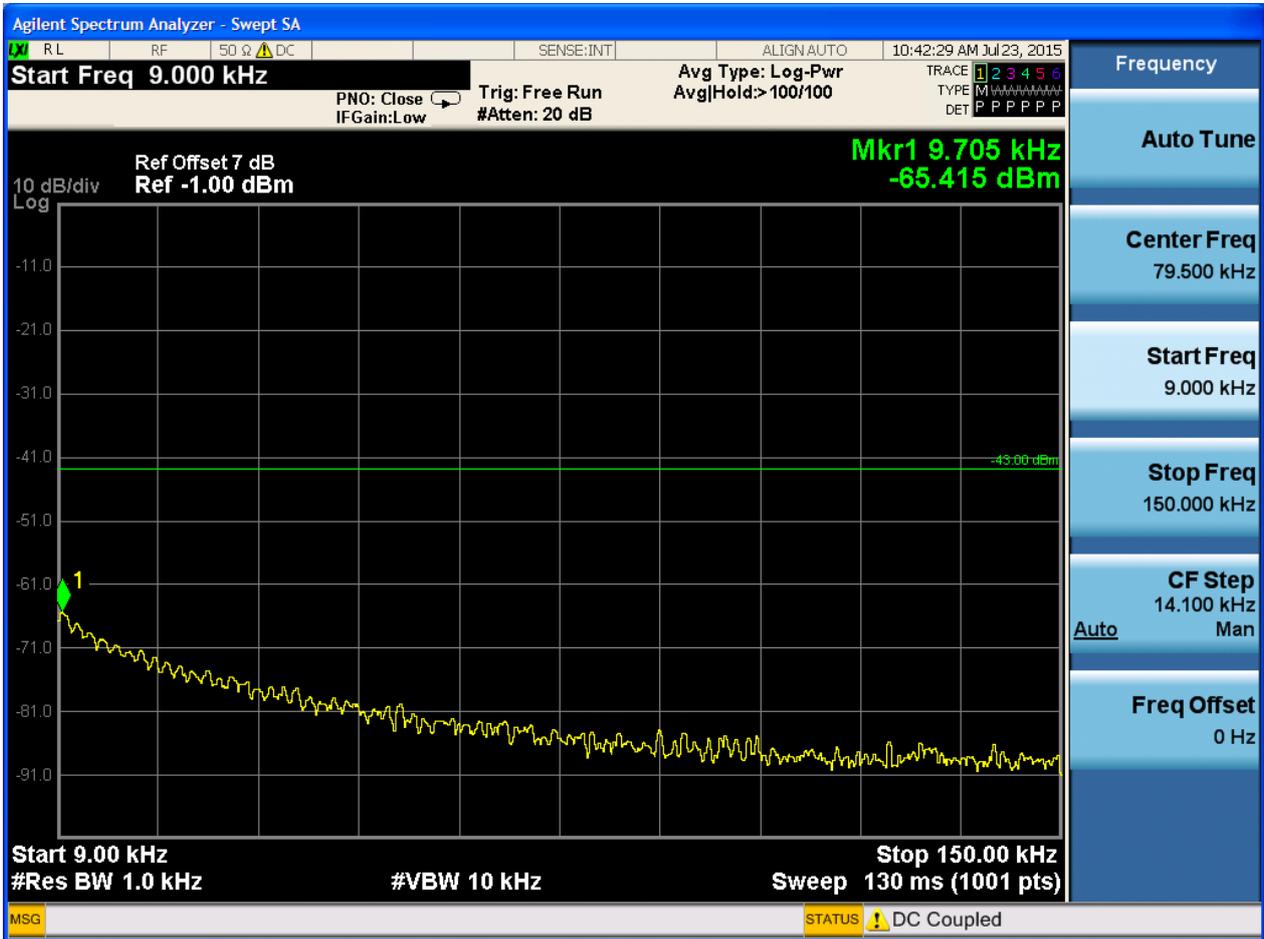


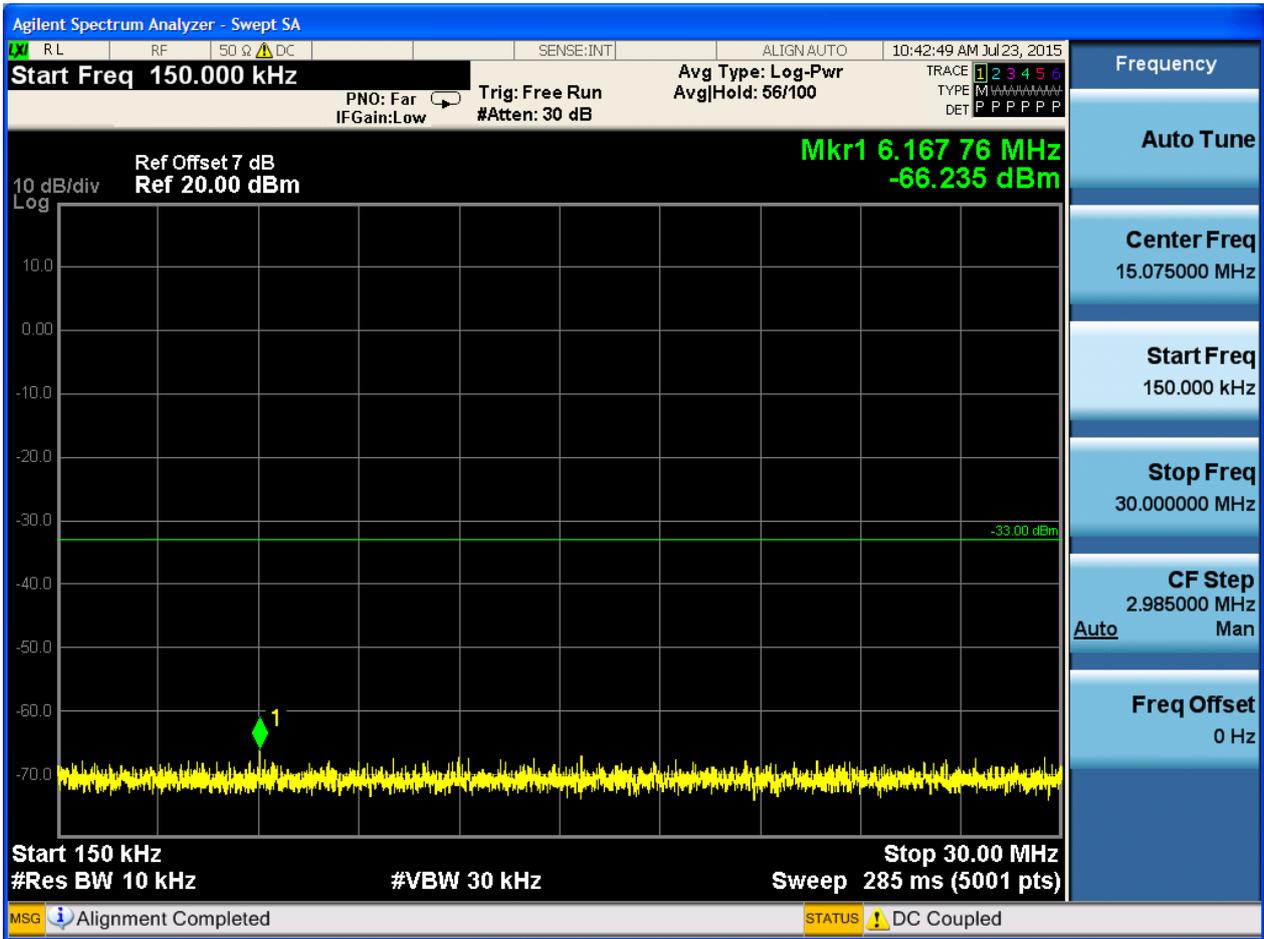


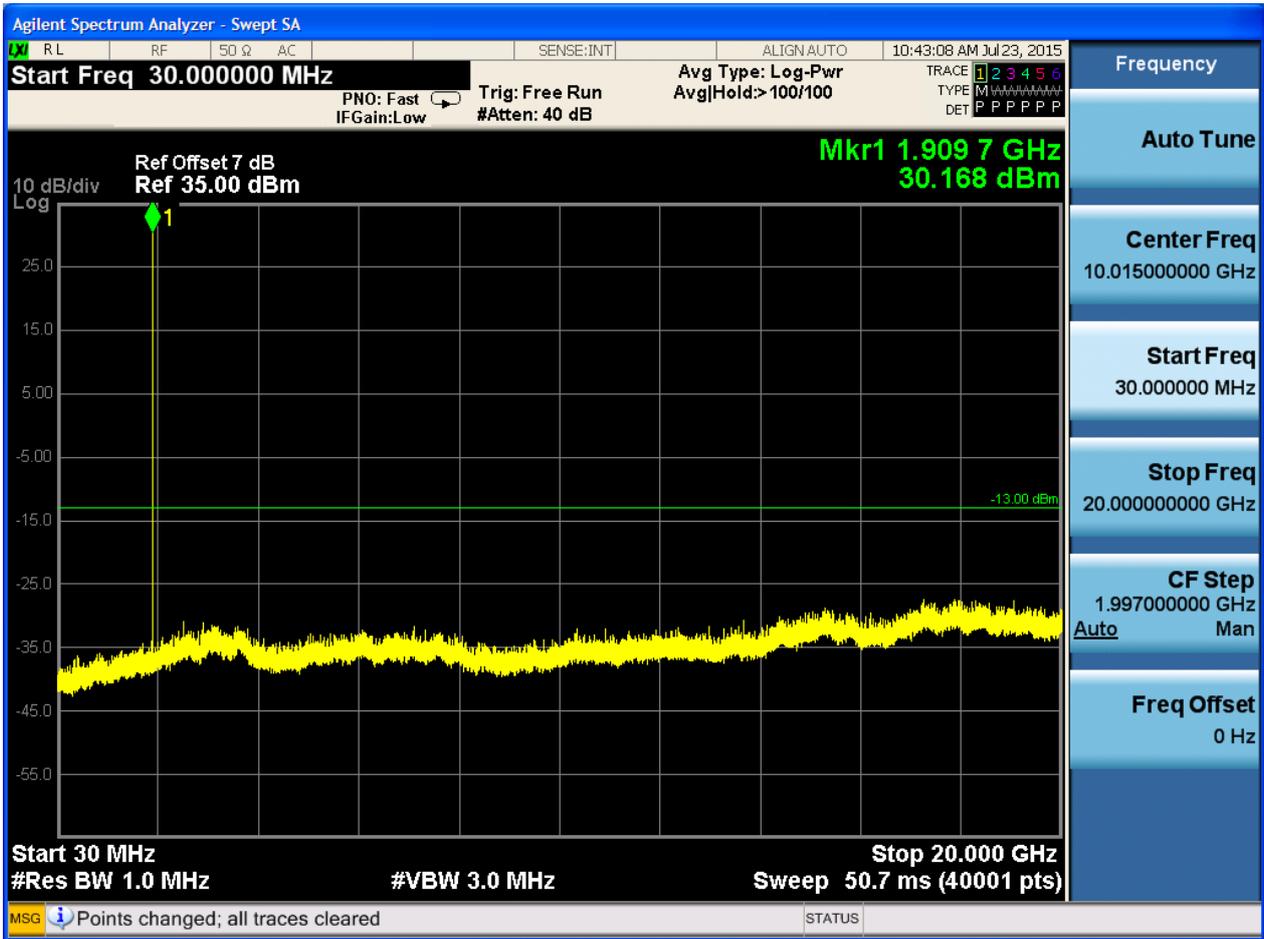




6.1.2.1.3 Test Channel = HCH



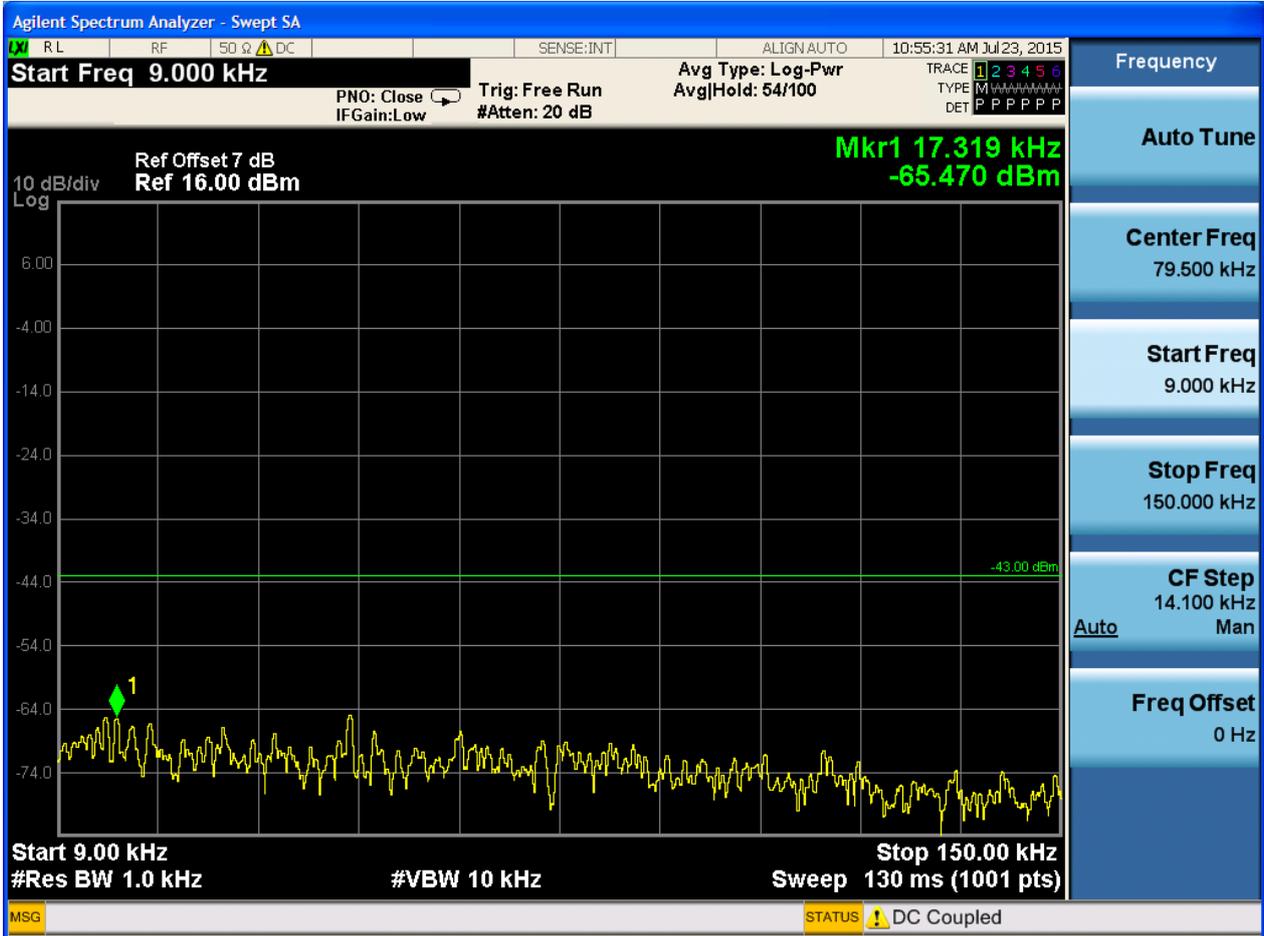


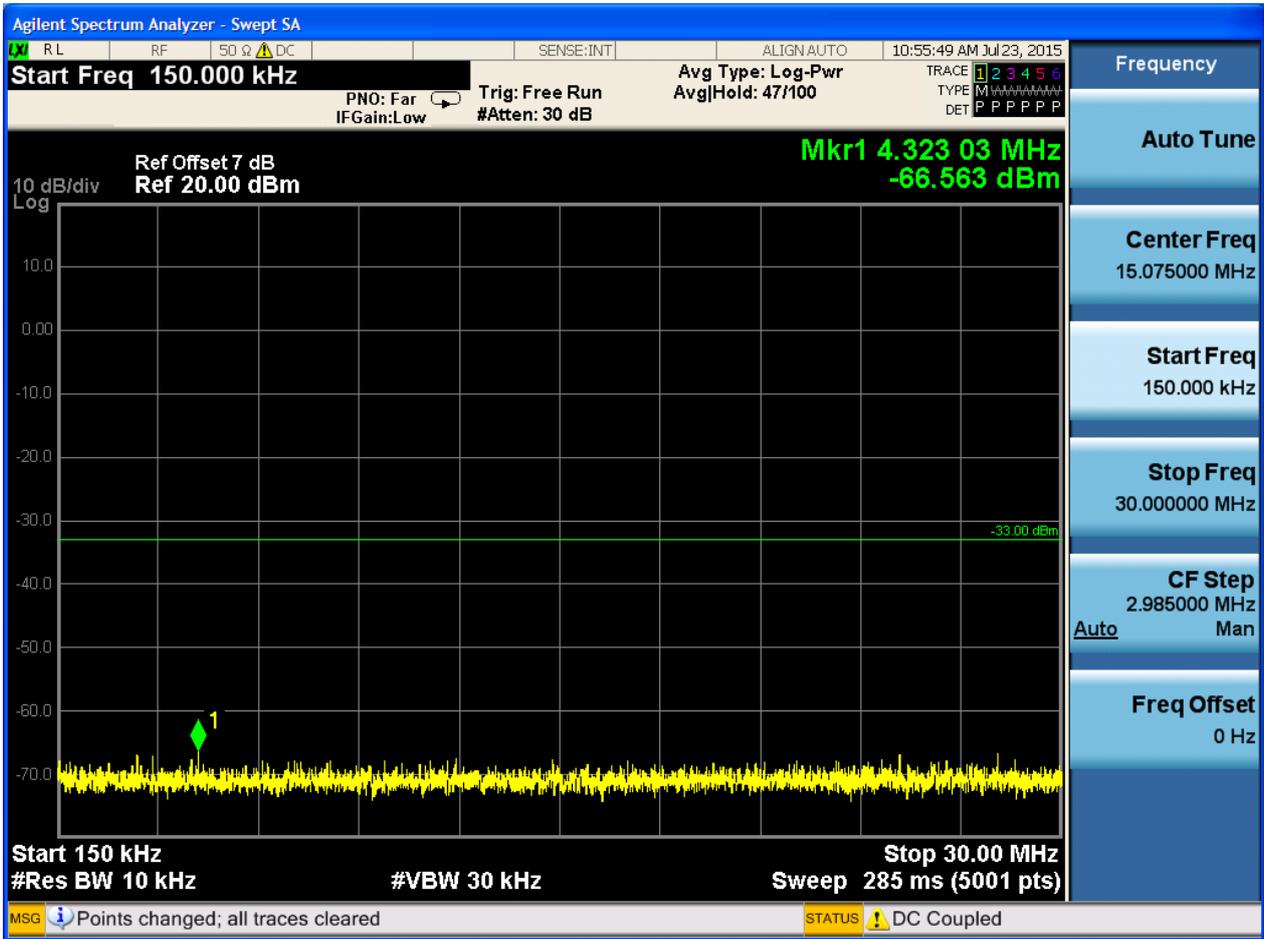


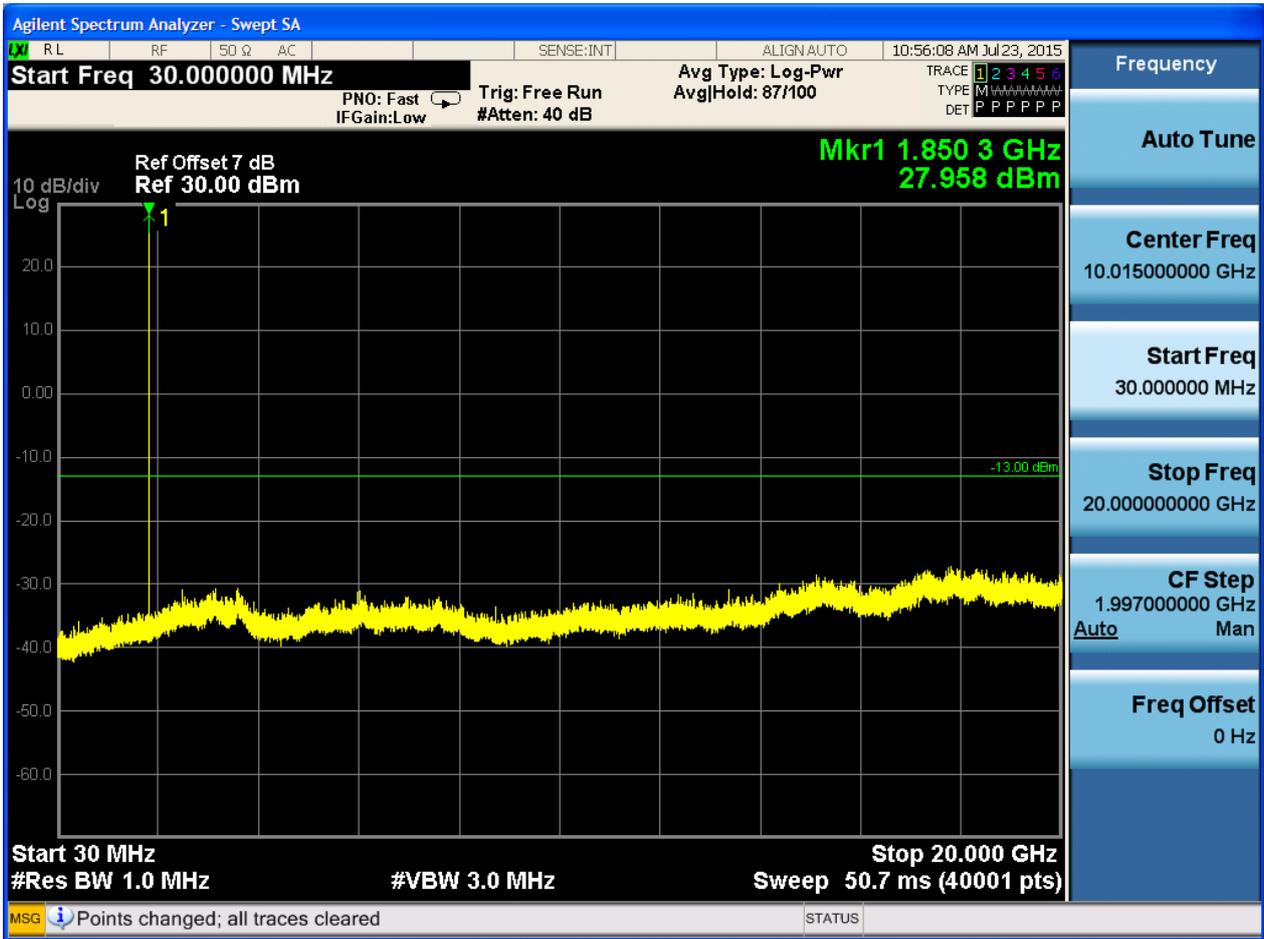


6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

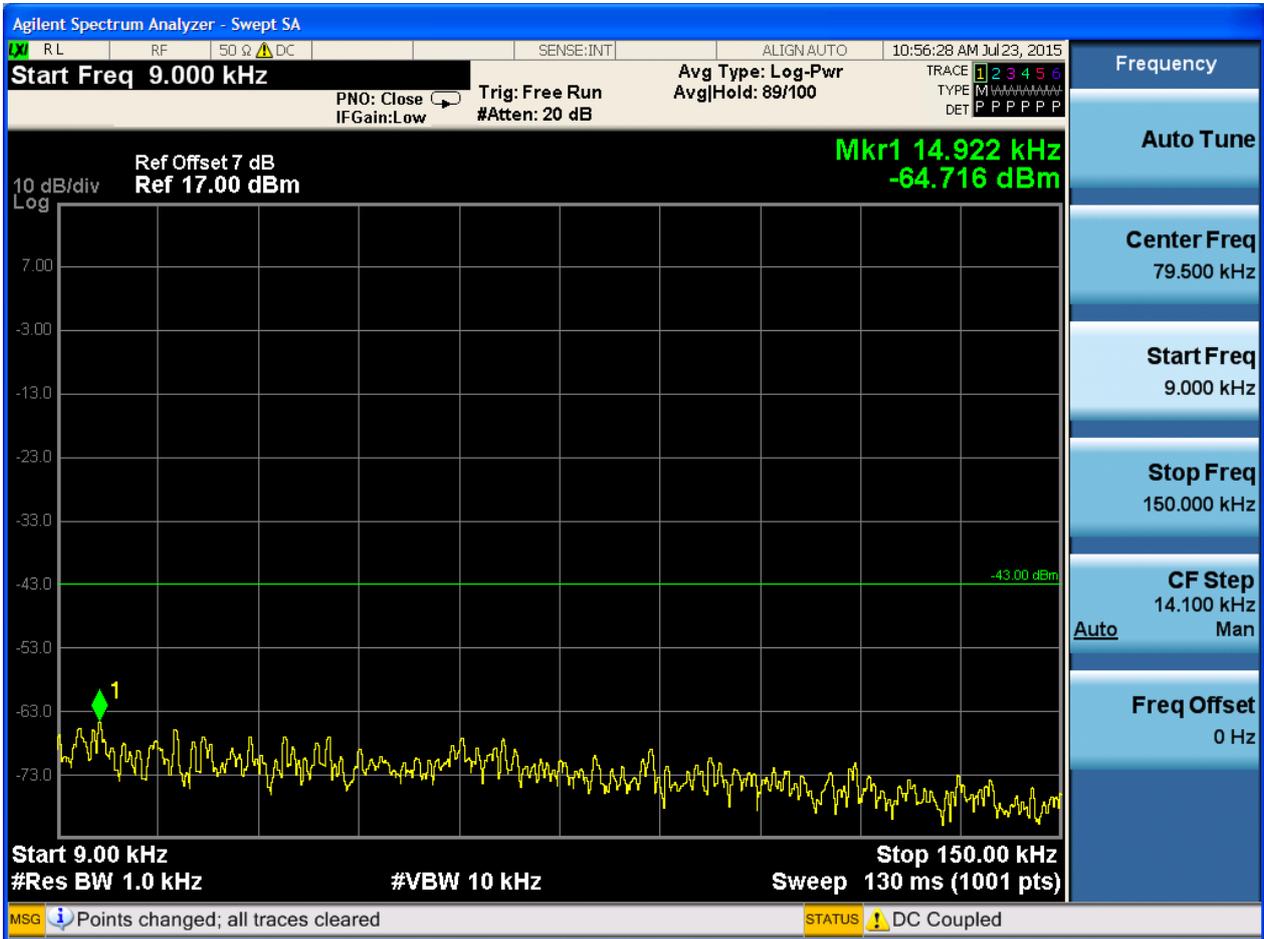


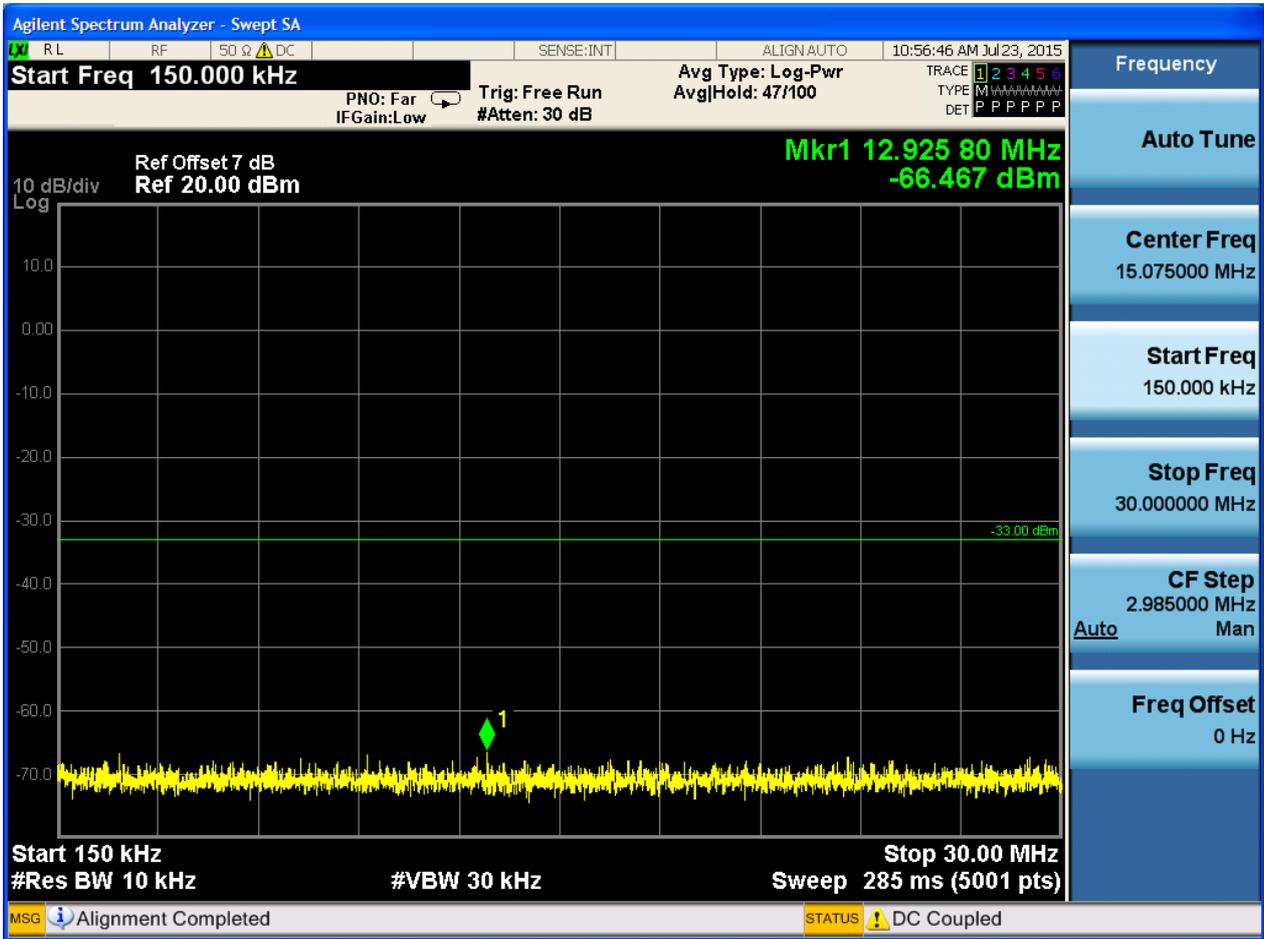


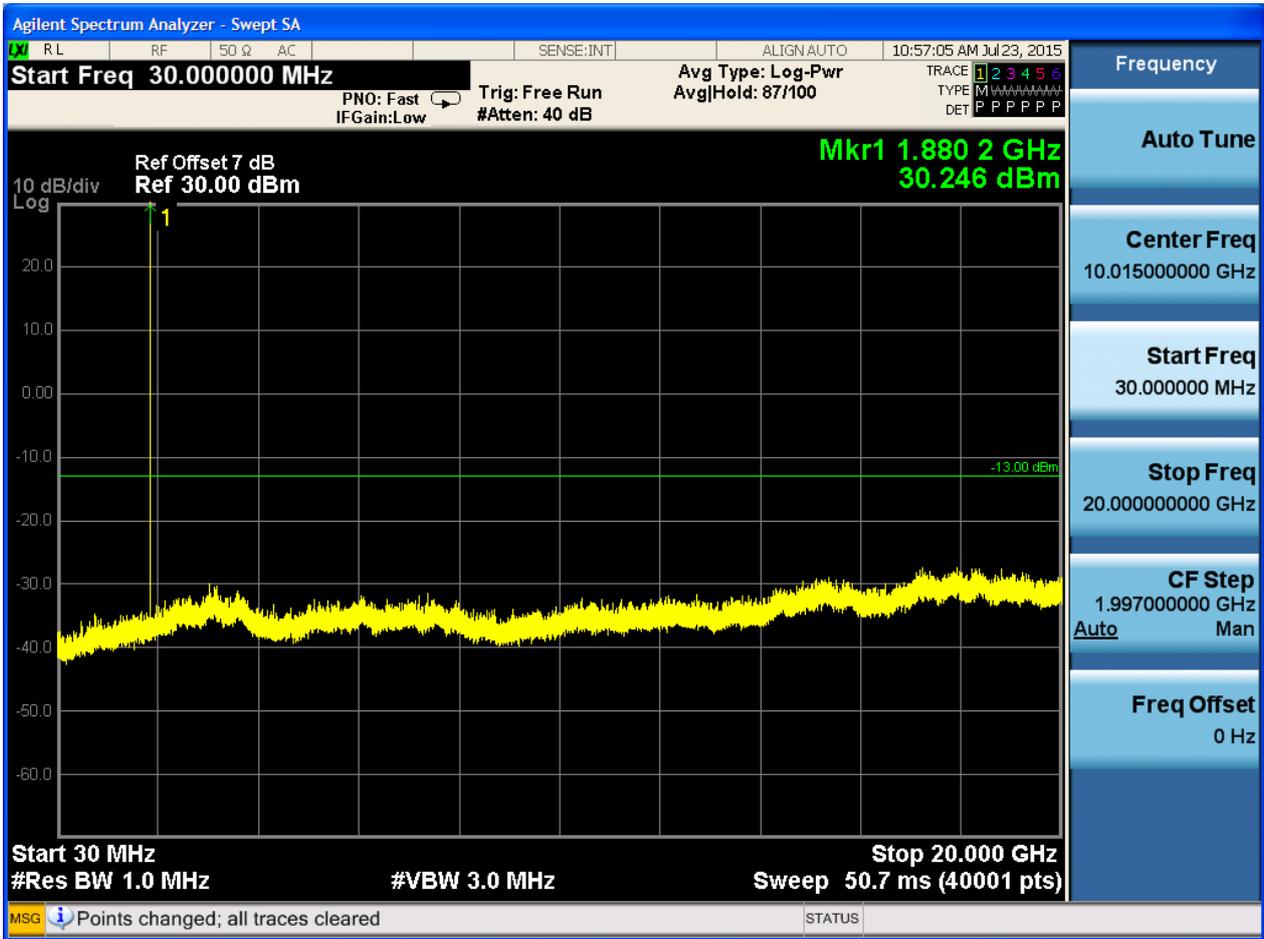




6.1.2.2.2 Test Channel = MCH

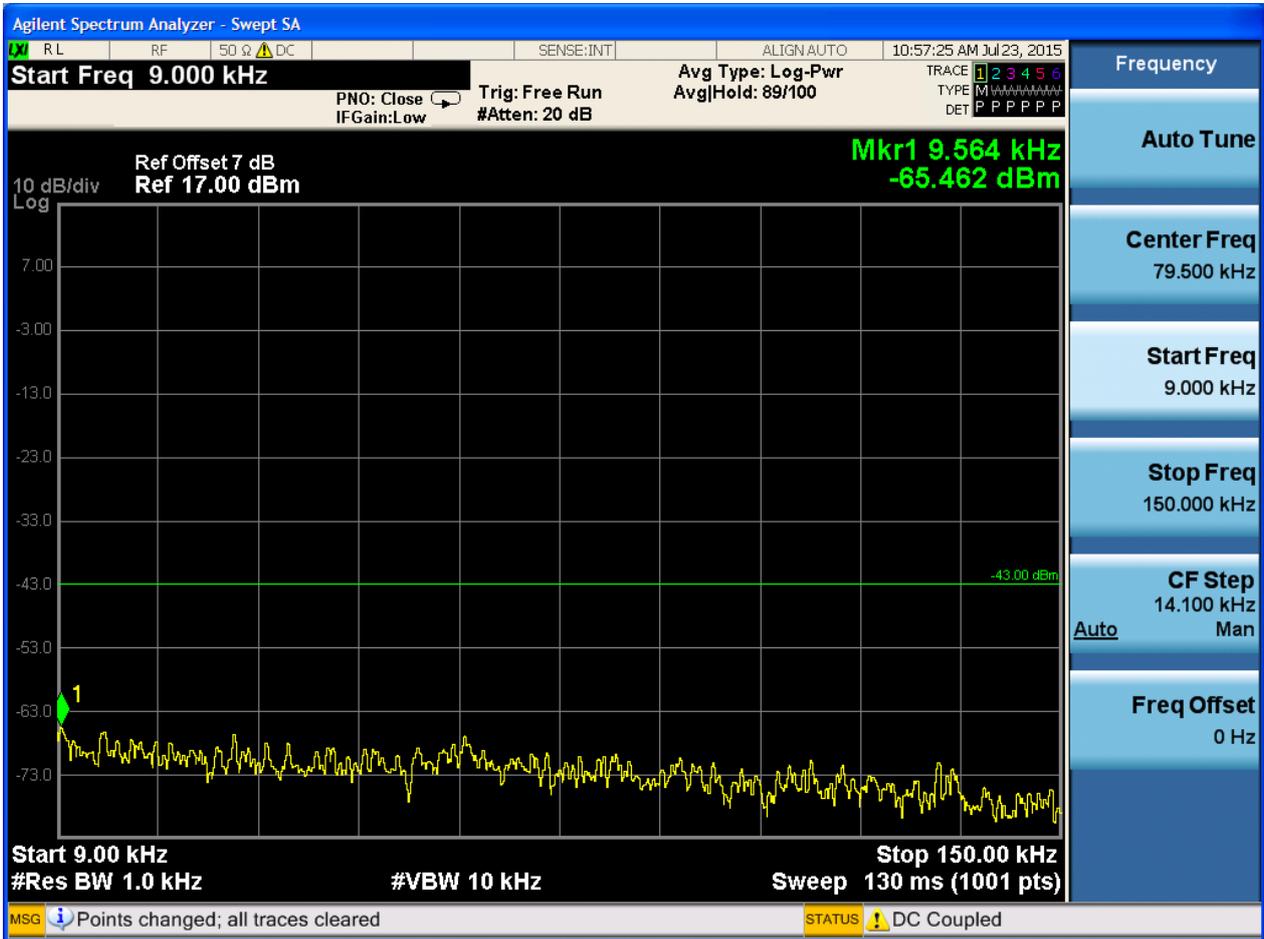


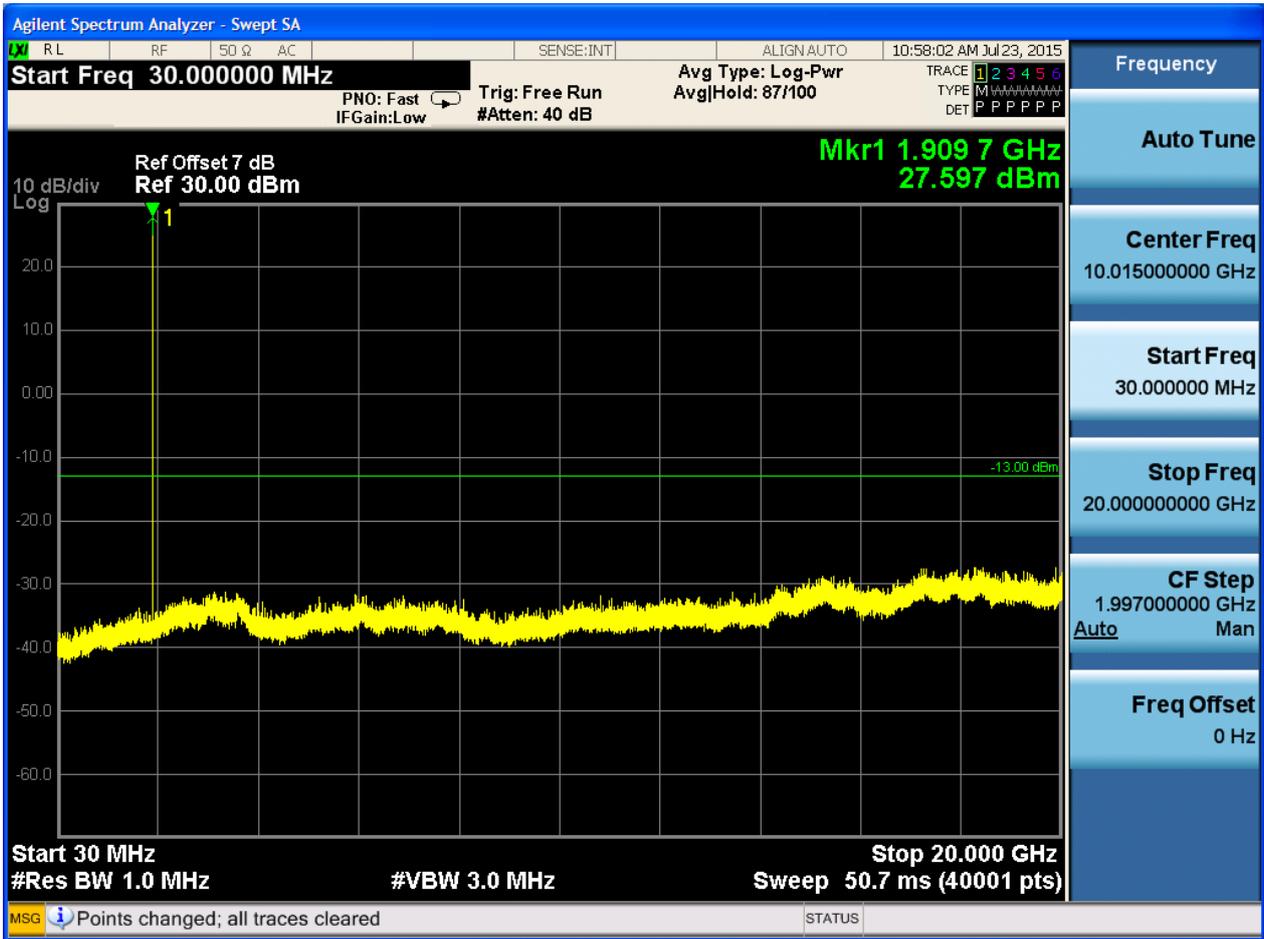






6.1.2.2.3 Test Channel = HCH





7Appendix_G: Field Strength of Spurious Radiation

Note:

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

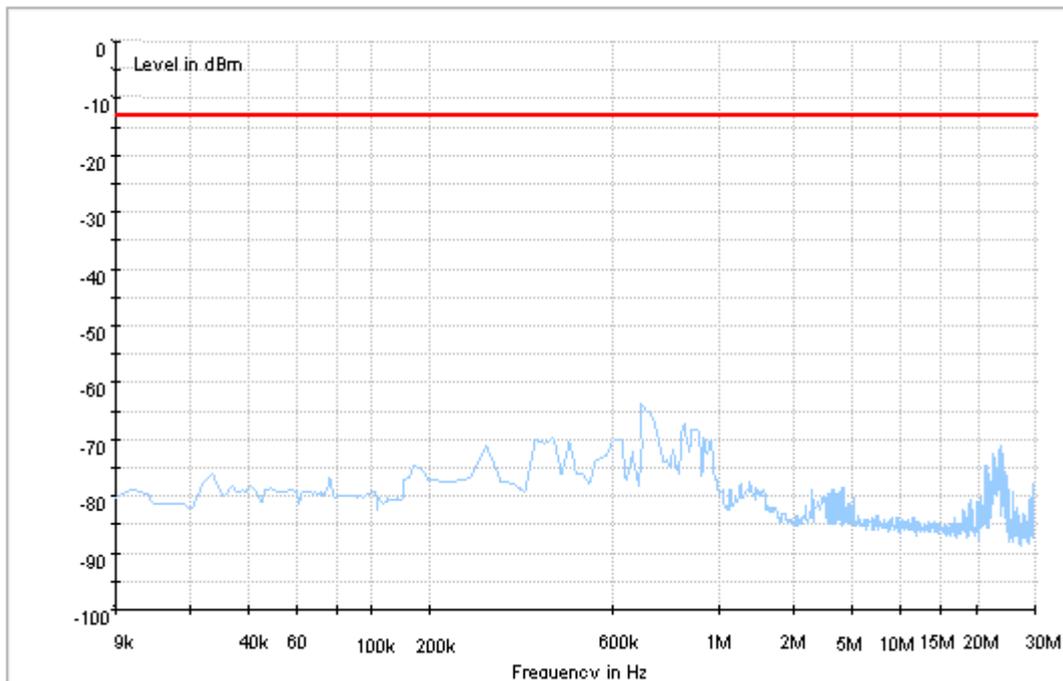
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

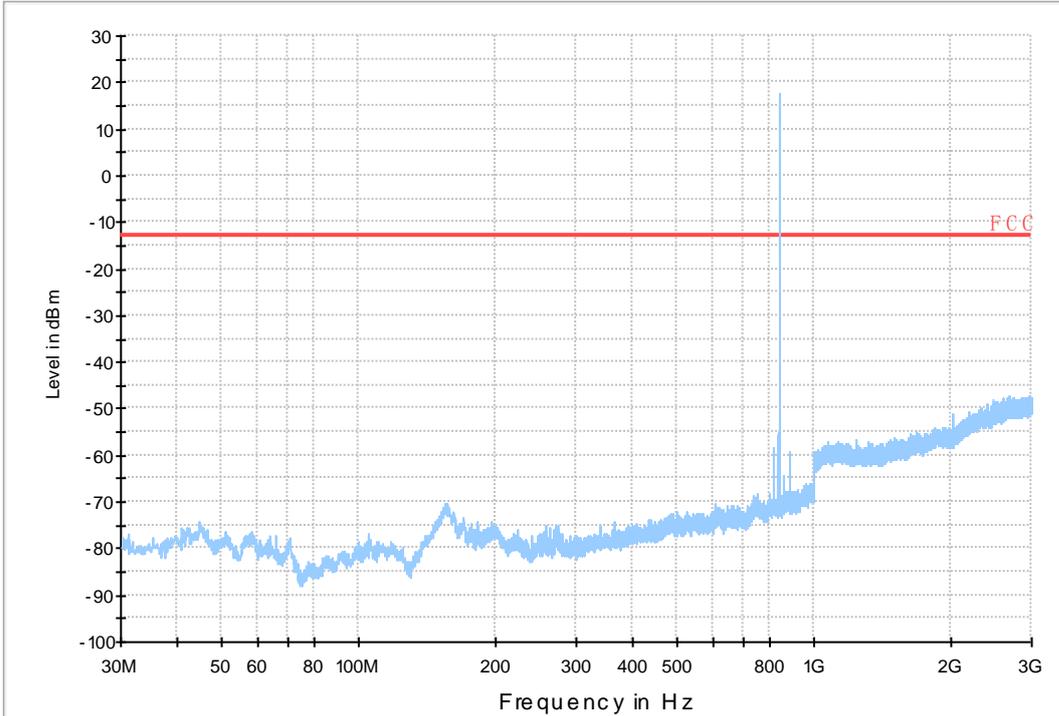
7.1 For GSM

7.1.1 Test Band = GSM850

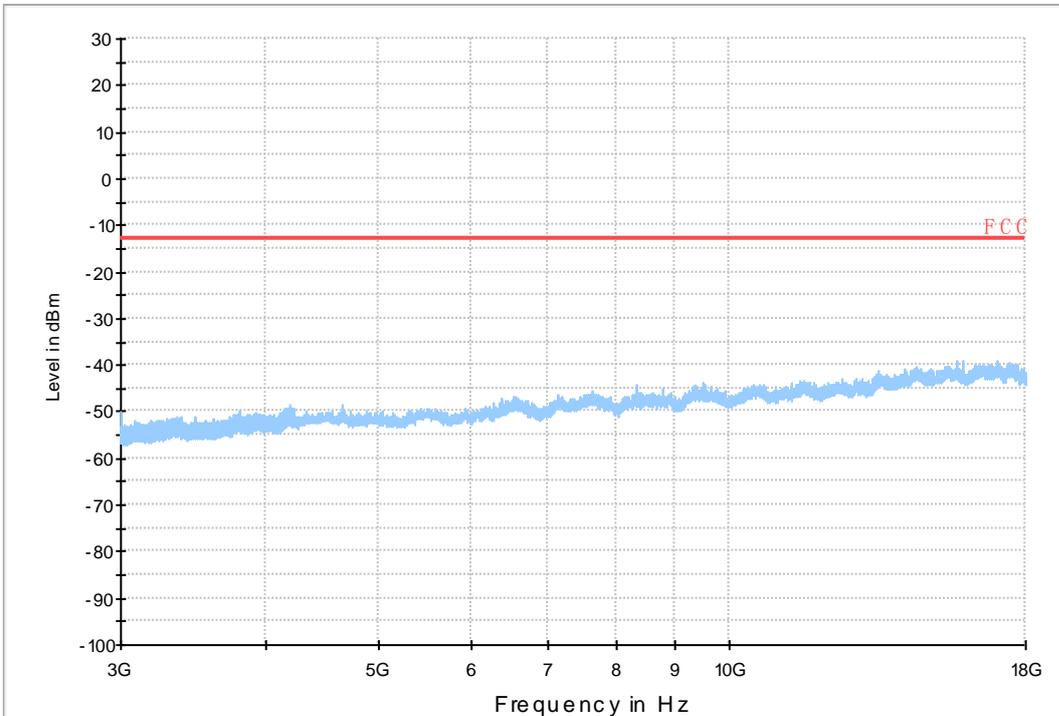
7.1.1.1 Test Mode = GSM/TM1



Copy of FCC PART22 GSM850_L

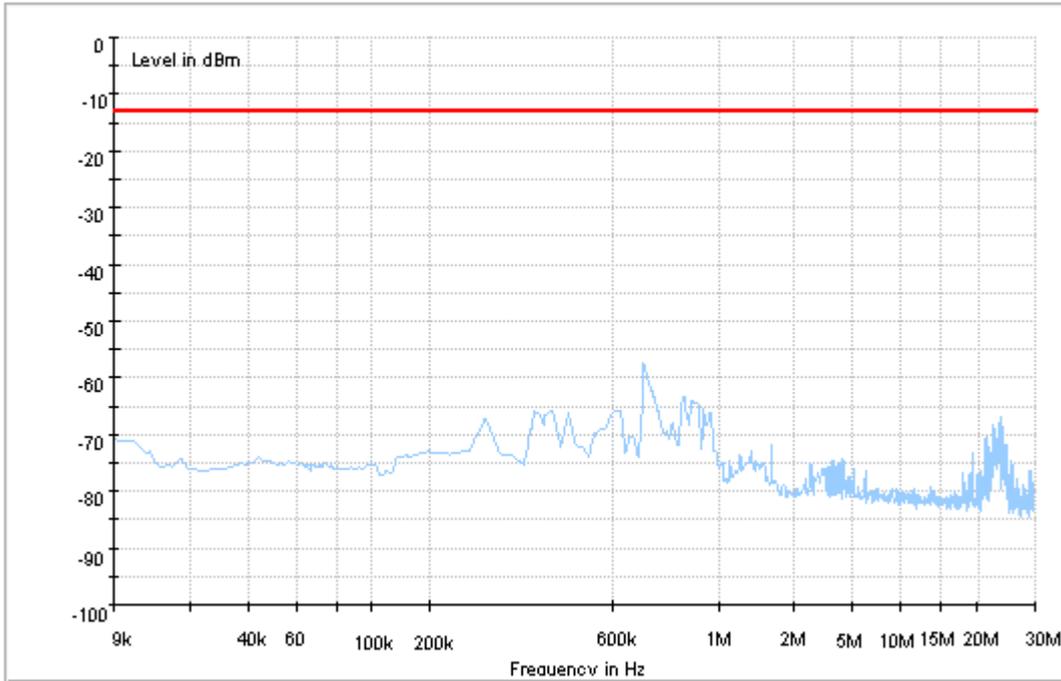


Copy of FCC PART22 GSM850_H

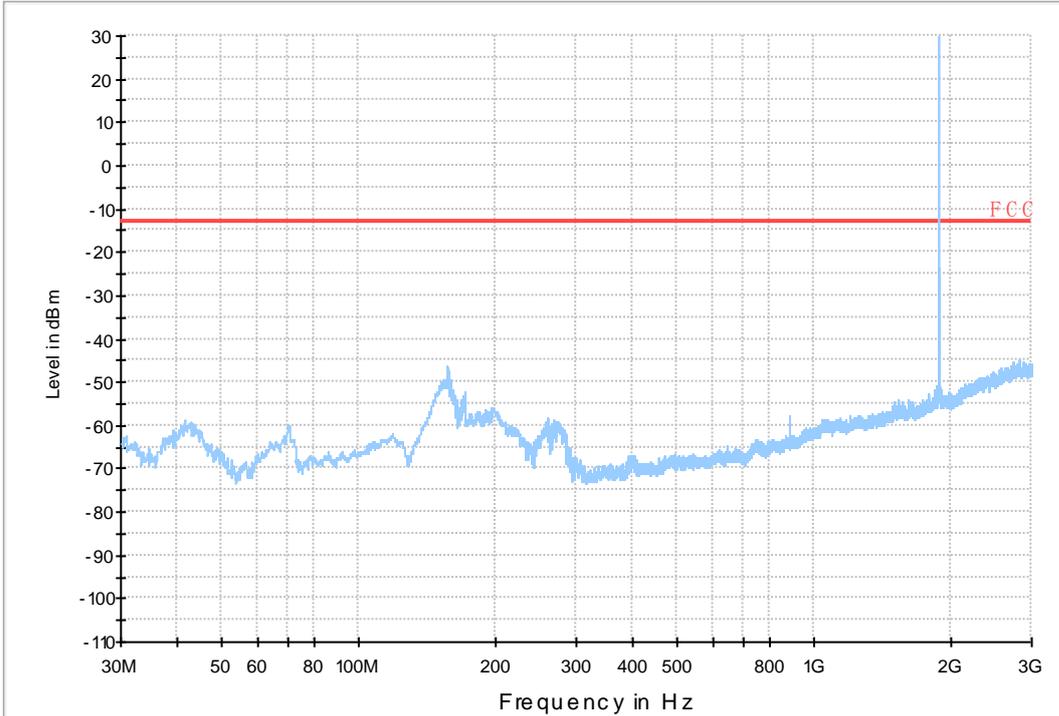


7.1.2 Test Band = GSM1900

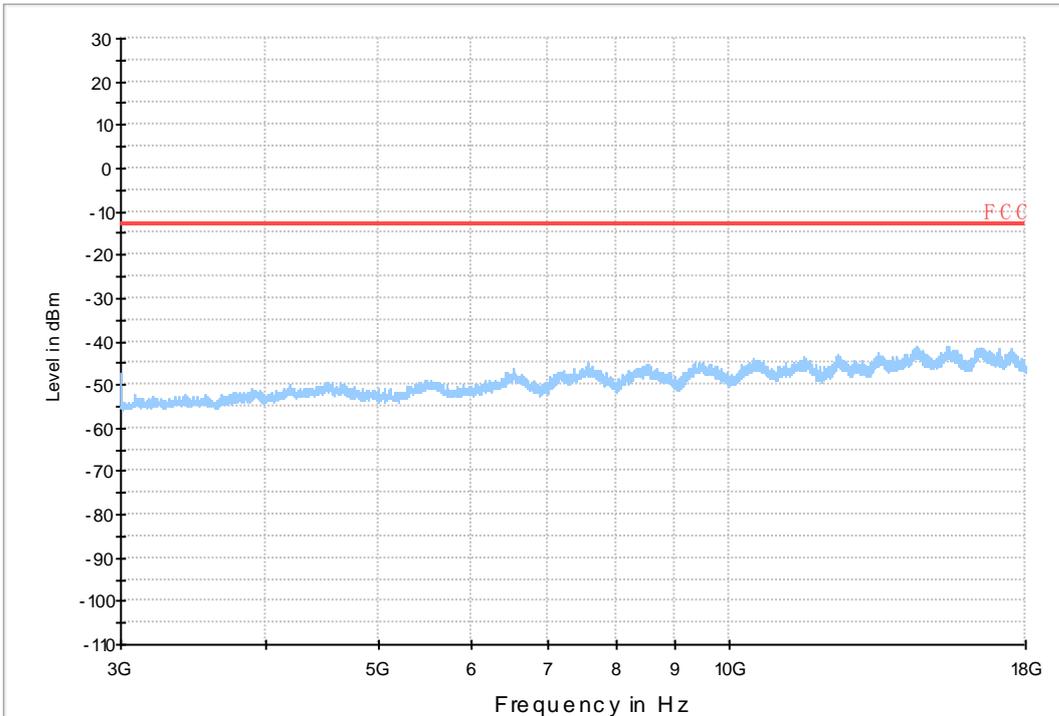
7.1.2.1 Test Mode = GSM/TM1

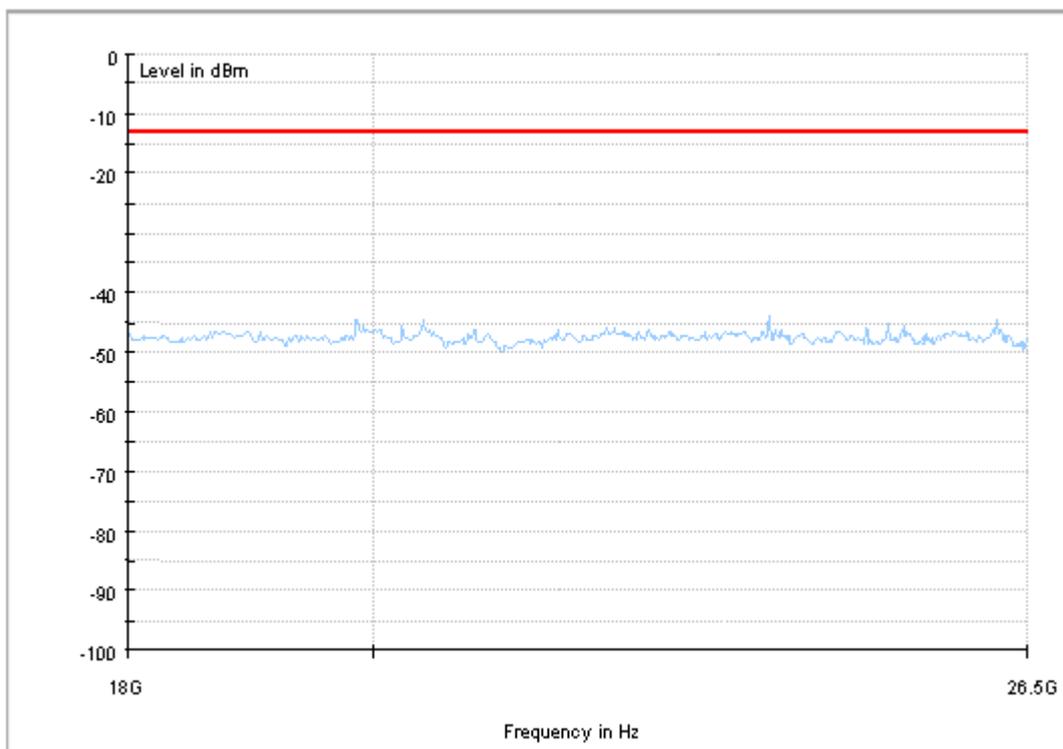


Copy of FCC PART24 GSM 1900_L



Copy of FCC PART24 GSM 1900_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	11.62	0.0141	PASS
				VN	3.94	0.00478	PASS
				VH	10.2	0.01238	PASS
		MCH	TN	VL	10.07	0.01204	PASS
				VN	8.14	0.00973	PASS
				VH	9.23	0.01103	PASS
		HCH	TN	VL	5.42	0.00639	PASS
				VN	7.49	0.00882	PASS
				VH	6.01	0.00708	PASS
	GSM/TM2	LCH	TN	VL	11.91	0.01445	PASS
				VN	12.3	0.01492	PASS
				VH	11.04	0.01339	PASS
		MCH	TN	VL	14.69	0.01756	PASS
				VN	15.59	0.01863	PASS
				VH	17.85	0.02134	PASS
HCH	TN	VL	12.01	0.01415	PASS		
		VN	8.36	0.00985	PASS		
		VH	8.2	0.00966	PASS		
GSM1900	GSM/TM1	LCH	TN	VL	24.6	0.0133	PASS
				VN	45.65	0.02467	PASS
				VH	24.86	0.01344	PASS
		MCH	TN	VL	32.48	0.01728	PASS
				VN	32.87	0.01748	PASS
				VH	35	0.01862	PASS
		HCH	TN	VL	20.4	0.01068	PASS
				VN	18.92	0.00991	PASS
				VH	19.37	0.01014	PASS
	GSM/TM2	LCH	TN	VL	19.98	0.0108	PASS
				VN	22.02	0.0119	PASS
				VH	43.1	0.02329	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		MCH	TN	VL	44.97	0.02392	PASS
				VN	32.83	0.01746	PASS
				VH	27.35	0.01455	PASS
		HCH	TN	VL	26.15	0.01369	PASS
				VN	45.07	0.0236	PASS
				VH	16.18	0.00847	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	6.91	0.00838	PASS	
				-20	10.78	0.01308	PASS	
				-10	9.23	0.0112	PASS	
				0	9.94	0.01206	PASS	
				10	7.3	0.00886	PASS	
				20	8.33	0.01011	PASS	
				30	11.11	0.01348	PASS	
				40	12.98	0.01575	PASS	
				50	11.04	0.01339	PASS	
		MCH	VN	-30	13.62	0.01628	PASS	
				-20	10.85	0.01297	PASS	
				-10	9.17	0.01096	PASS	
				0	13.3	0.0159	PASS	
				10	13.75	0.01644	PASS	
				20	9.56	0.01143	PASS	
				30	13.17	0.01574	PASS	
				40	14.14	0.0169	PASS	
				50	8.07	0.00965	PASS	
		HCH	VN	-30	2.07	0.00244	PASS	
				-20	3.55	0.00418	PASS	
				-10	14.27	0.01681	PASS	
				0	6.59	0.00776	PASS	
				10	3.68	0.00434	PASS	
				20	4.78	0.00563	PASS	
				30	4.39	0.00517	PASS	
				40	13.82	0.01628	PASS	
				50	15.37	0.01811	PASS	
		GSM/TM2	LCH	VN	-30	11.43	0.01387	PASS
					-20	14.85	0.01802	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict						
				-10	10.46	0.01269	PASS						
				0	11.17	0.01355	PASS						
				10	11.62	0.0141	PASS						
				20	13.5	0.01638	PASS						
				30	10.46	0.01269	PASS						
				40	12.3	0.01492	PASS						
				50	12.4	0.01504	PASS						
		MCH	VN			-30	18.4	0.02199	PASS				
						-20	17.76	0.02123	PASS				
						-10	14.85	0.01775	PASS				
						0	18.05	0.02158	PASS				
						10	14.92	0.01783	PASS				
						20	15.5	0.01853	PASS				
						30	18.31	0.02189	PASS				
						40	11.33	0.01354	PASS				
						50	15.56	0.0186	PASS				
		HCH	VN			-30	10.53	0.01241	PASS				
						-20	14.14	0.01666	PASS				
						-10	12.07	0.01422	PASS				
						0	13.3	0.01567	PASS				
						10	10.04	0.01183	PASS				
						20	16.3	0.0192	PASS				
						30	10.94	0.01289	PASS				
						40	9.36	0.01103	PASS				
						50	12.11	0.01427	PASS				
		GSM1900	GSM/TM1	LCH	VN					-30	41.13	0.02223	PASS
										-20	19.31	0.01044	PASS
-10	45.2									0.02443	PASS		
0	41.97									0.02268	PASS		
10	19.82									0.01071	PASS		
20	18.85									0.01019	PASS		
30	24.6									0.0133	PASS		
40	19.82									0.01071	PASS		
50	50.3									0.02719	PASS		
MCH	VN									-30	35.32	0.01879	PASS
										-20	35	0.01862	PASS
										-10	37.65	0.02003	PASS
										0	34.8	0.01851	PASS
										10	32.8	0.01745	PASS
										20	32.61	0.01735	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict			
				30	34.09	0.01813	PASS			
				40	28.22	0.01501	PASS			
				50	28.35	0.01508	PASS			
		HCH	VN	-30	23.37	0.01224	PASS			
				-20	26.86	0.01406	PASS			
				-10	18.14	0.0095	PASS			
				0	20.99	0.01099	PASS			
				10	18.92	0.00991	PASS			
				20	19.57	0.01025	PASS			
				30	18.08	0.00947	PASS			
				40	16.79	0.00879	PASS			
				50	22.28	0.01167	PASS			
				GSM/TM2	LCH	VN	-30	51.5	0.02783	PASS
							-20	29.77	0.01609	PASS
							-10	48.62	0.02628	PASS
	0	47.78	0.02582				PASS			
	10	25.57	0.01382				PASS			
	20	50.17	0.02712				PASS			
	30	26.6	0.01438				PASS			
	40	22.15	0.01197				PASS			
	50	19.02	0.01028				PASS			
	MCH	VN	-30		36.19	0.01925	PASS			
			-20		36.74	0.01954	PASS			
			-10		31.96	0.017	PASS			
			0		36.84	0.0196	PASS			
			10		33.74	0.01795	PASS			
			20		32.93	0.01752	PASS			
			30	35	0.01862	PASS				
			40	45.04	0.02396	PASS				
			50	37.77	0.02009	PASS				
	HCH	VN	-30	33.84	0.01772	PASS				
			-20	29.51	0.01545	PASS				
			-10	27.77	0.01454	PASS				
			0	19.31	0.01011	PASS				
			10	31.25	0.01636	PASS				
			20	31.35	0.01642	PASS				
			30	24.25	0.0127	PASS				
			40	21.24	0.01112	PASS				
			50	29.22	0.0153	PASS				



END