



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	31.84	28.19	38.5	PASS
		MCH	32.03	28.38	38.5	PASS
		HCH	32.16	28.51	38.5	PASS
	GSM/TM2	LCH	26.26	22.61	38.5	PASS
		MCH	26.17	22.52	38.5	PASS
		HCH	26.11	22.46	38.5	PASS

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	30.11	31.31	33	PASS
		MCH	30.04	31.24	33	PASS
		HCH	30.19	31.39	33	PASS
	GSM/TM2	LCH	25.79	26.99	33	PASS
		MCH	26.04	27.24	33	PASS



Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
		HCH	25.95	27.15	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	0.27	13	PASS
		MCH	0.25	13	PASS
		HCH	0.23	13	PASS
	GSM/TM2	LCH	3.25	13	PASS
		MCH	3.33	13	PASS
		HCH	3.17	13	PASS

3Appendix_C: Modulation Characteristics

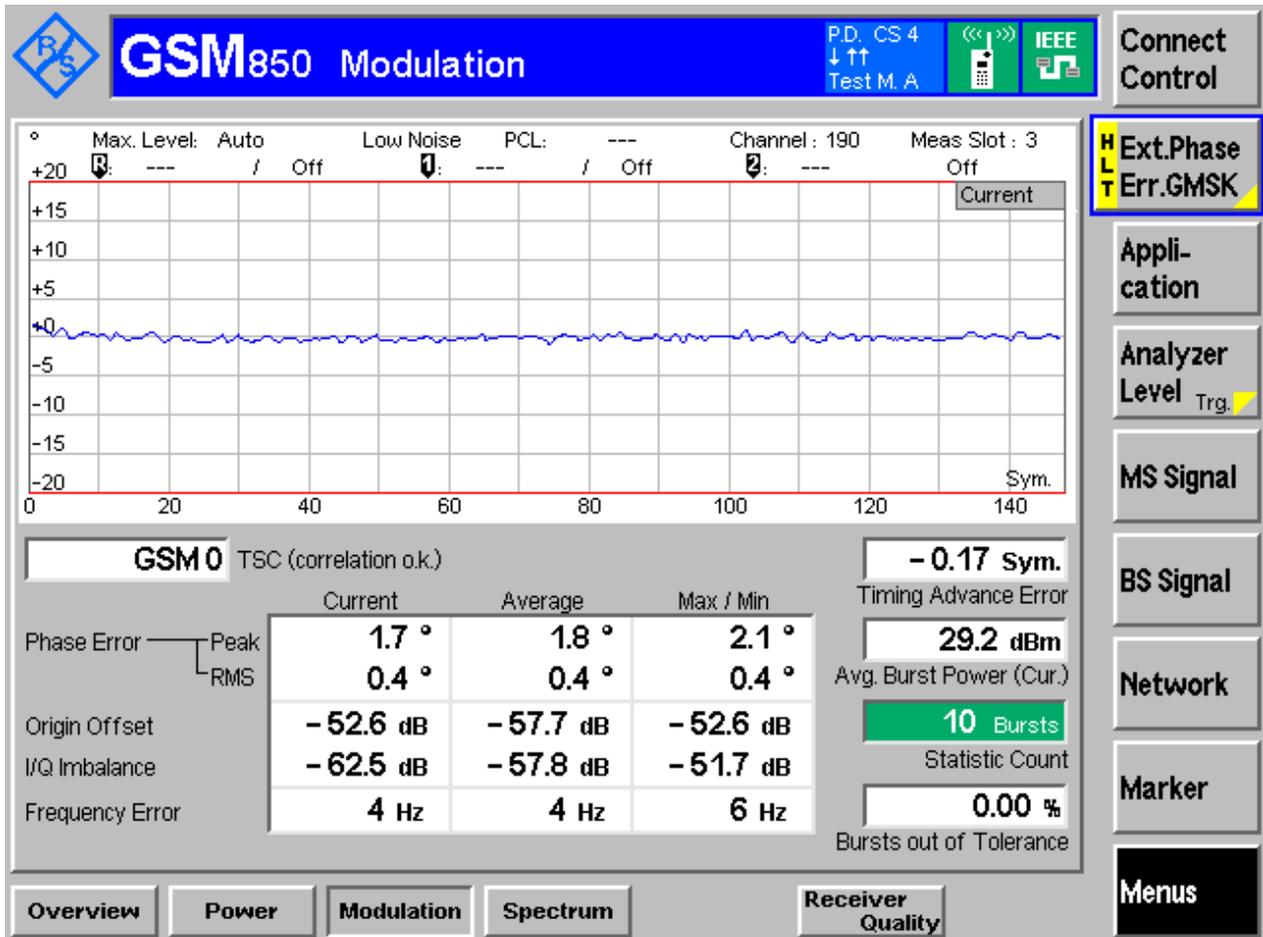
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

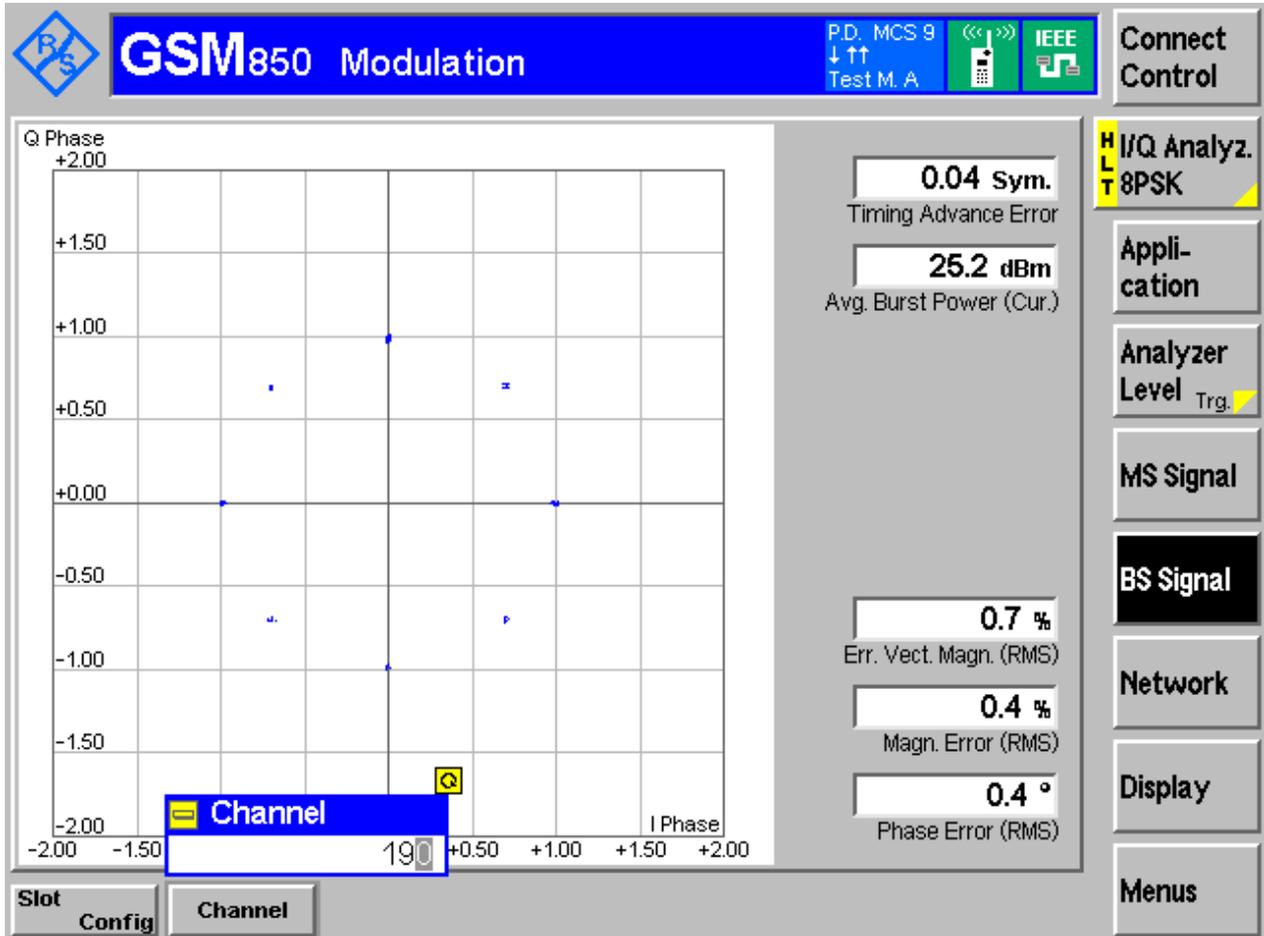
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

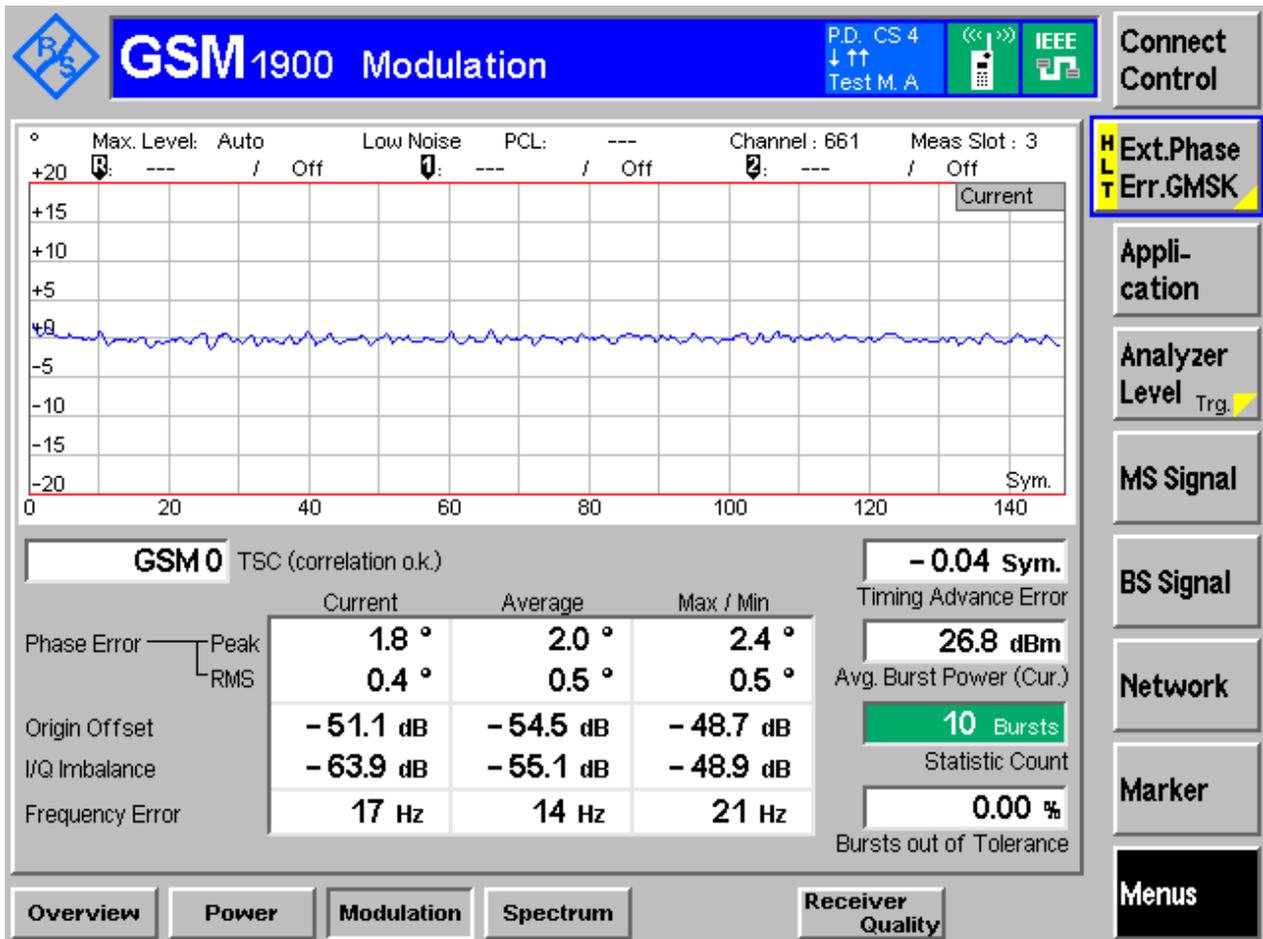
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

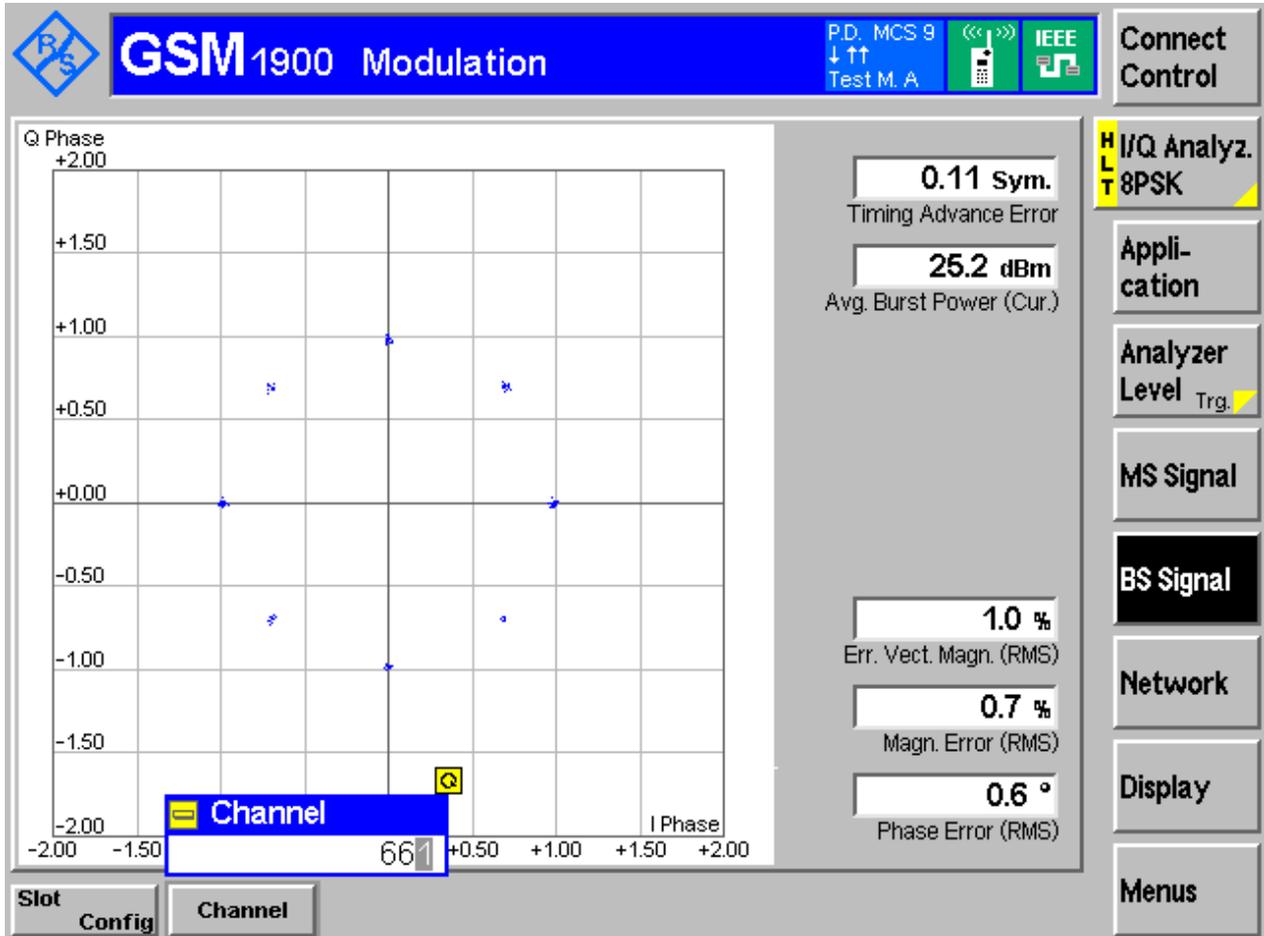
3.1.2.1 Test Mode = GSM/TM1

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	244.77	319.25	Pass
		MCH	245.09	316.35	Pass
		HCH	245.64	317.35	Pass
	GSM/TM2	LCH	243.48	300.35	Pass
		MCH	232.83	304.91	Pass
		HCH	234.89	302.80	Pass
GSM1900	GSM/TM1	LCH	244.43	320.49	Pass
		MCH	245.90	320.40	Pass
		HCH	244.62	314.09	Pass
	GSM/TM2	LCH	243.31	311.90	Pass
		MCH	241.65	308.17	Pass
		HCH	246.27	307.95	Pass



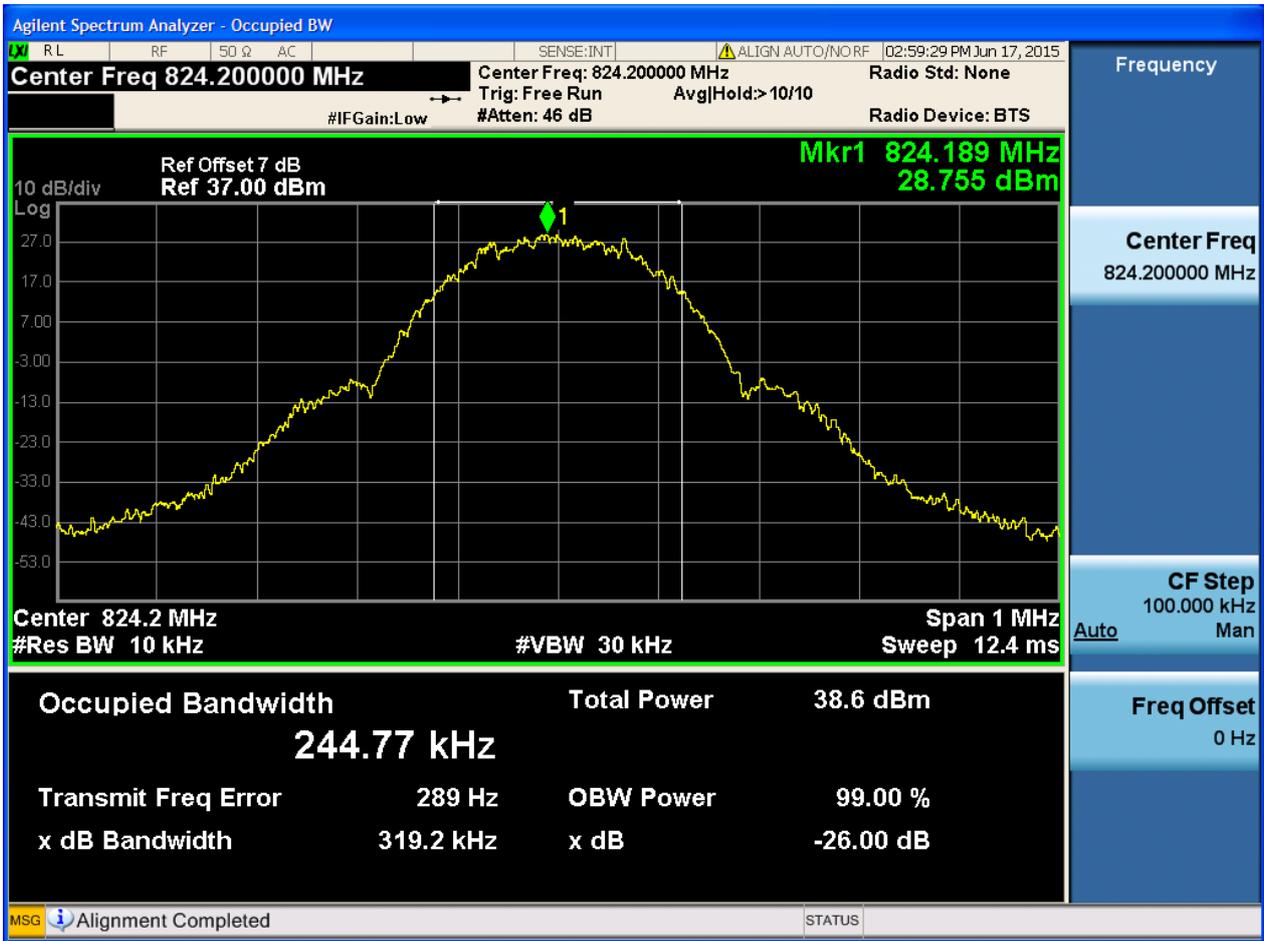
Part II - Test Plots

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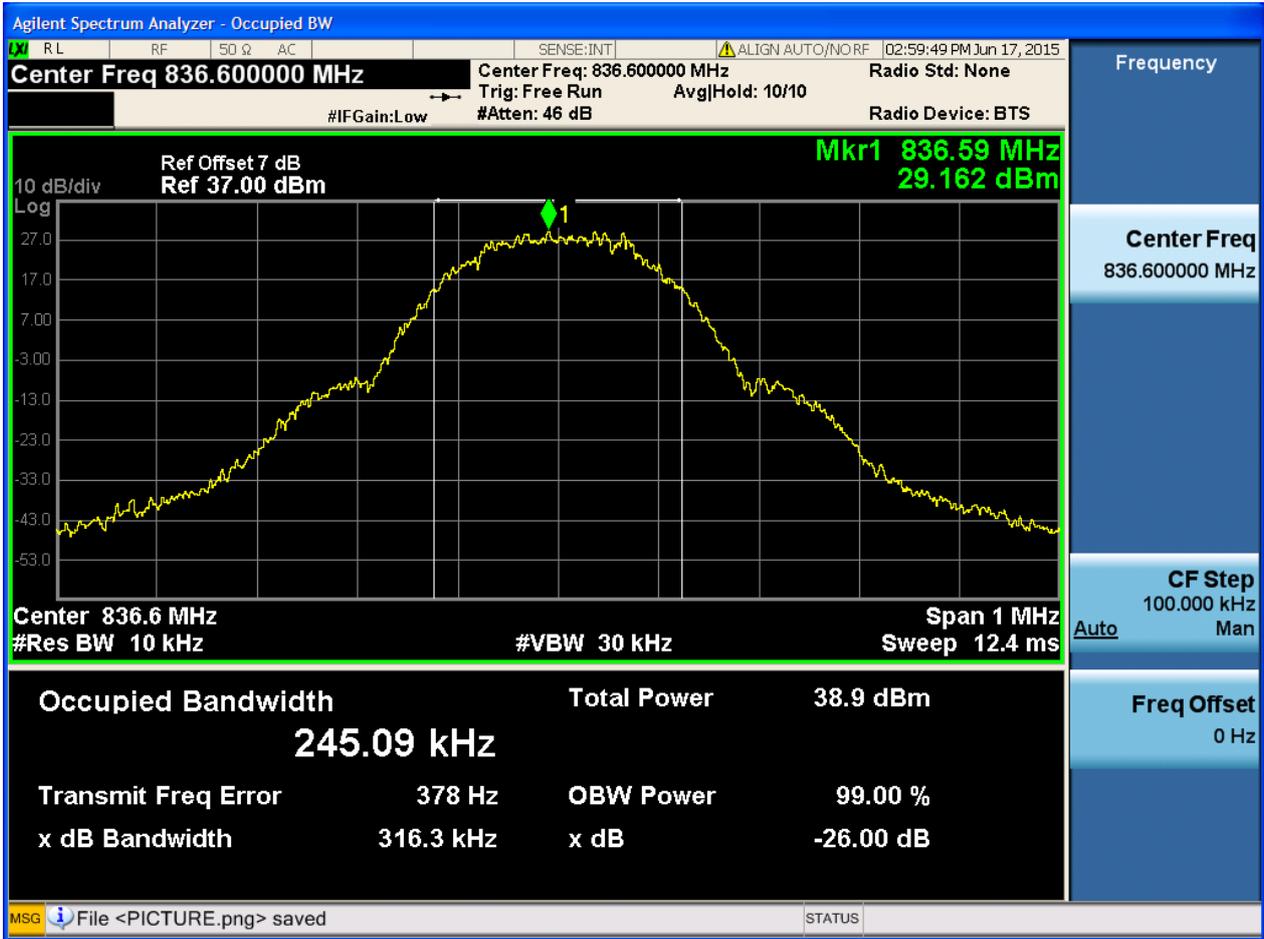
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH



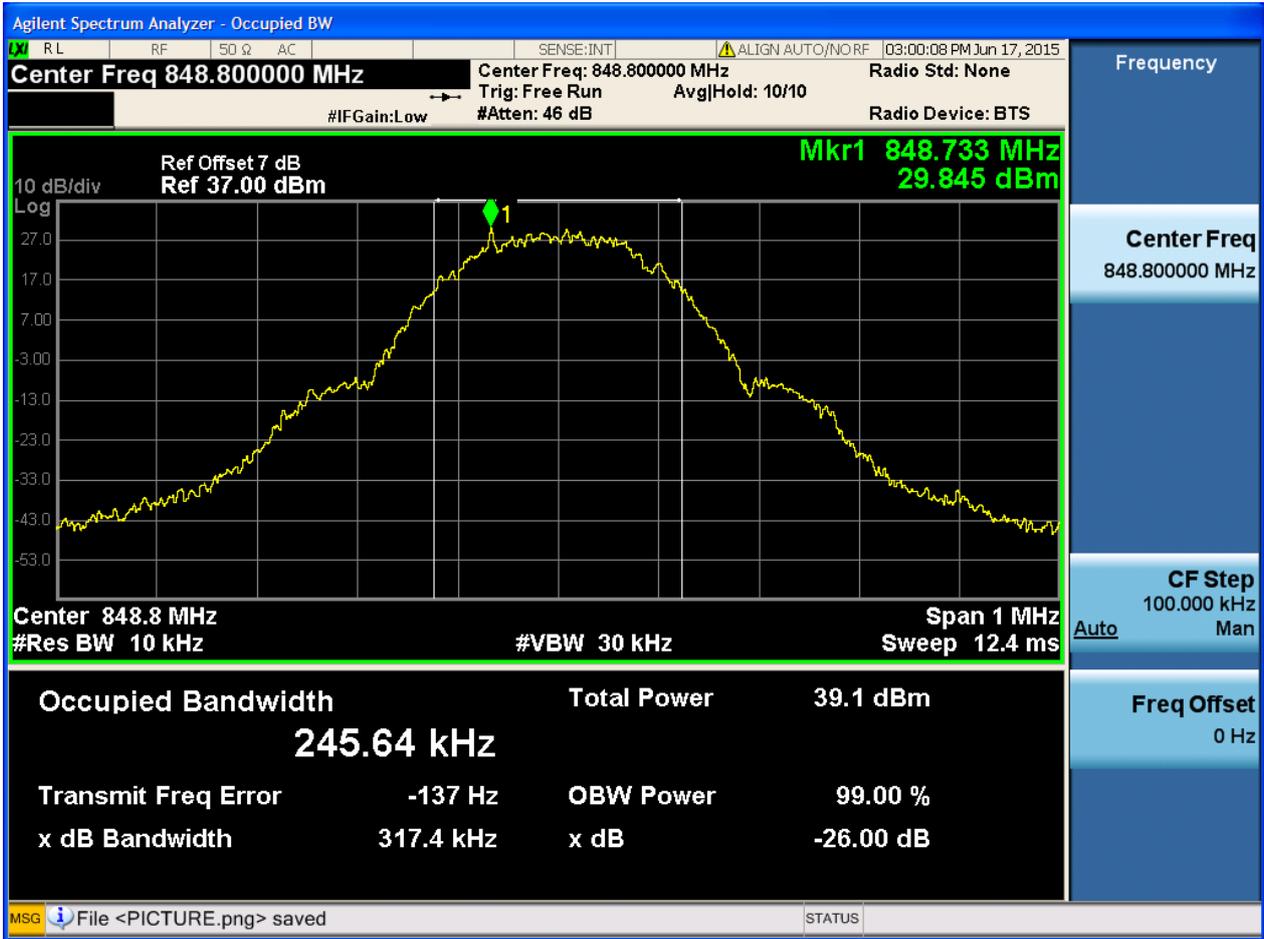


4.1.1.1.2 Test Channel = MCH





4.1.1.1.3 Test Channel = HCH





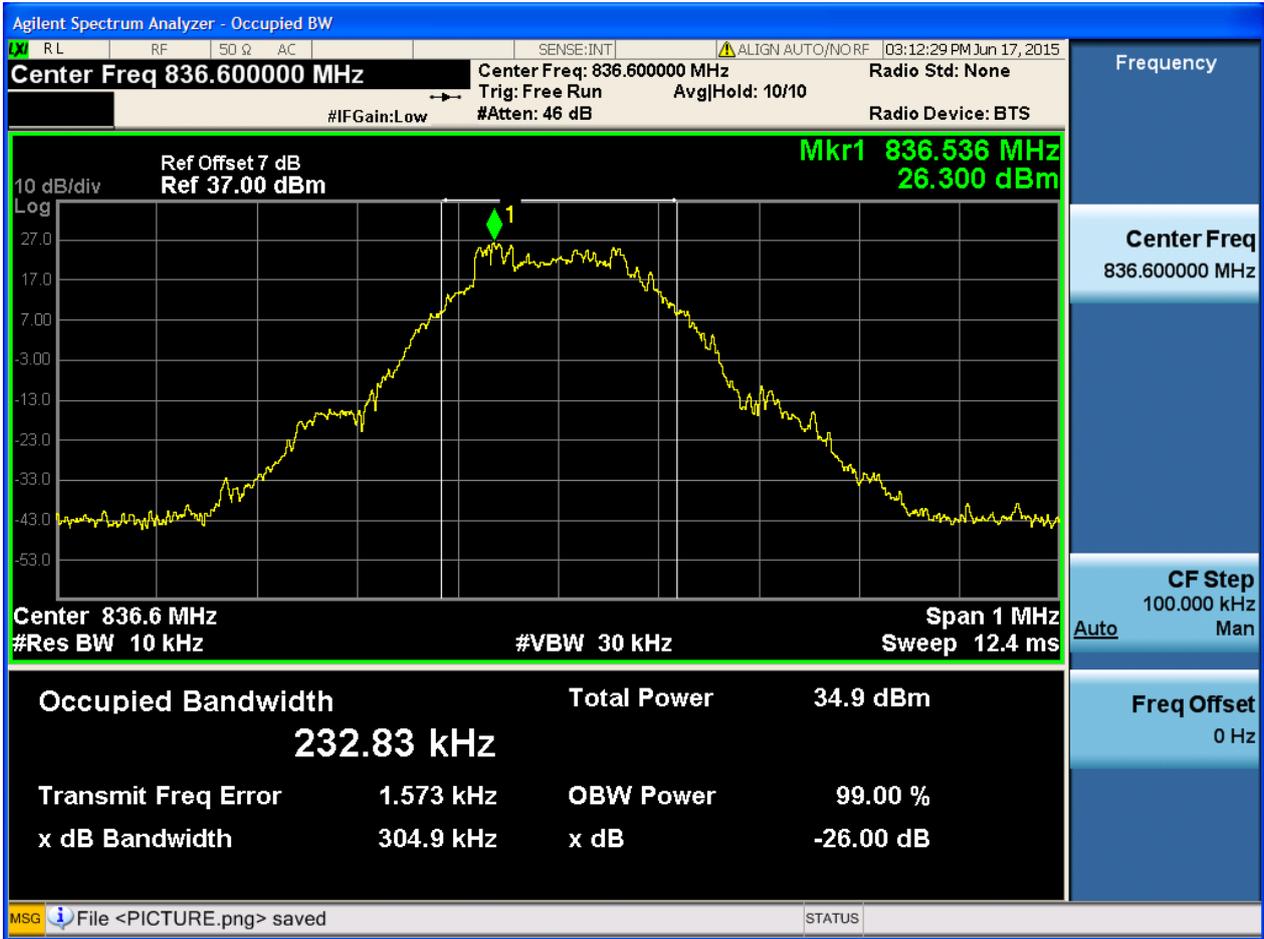
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4.1.1.2.1 Test Channel = LCH



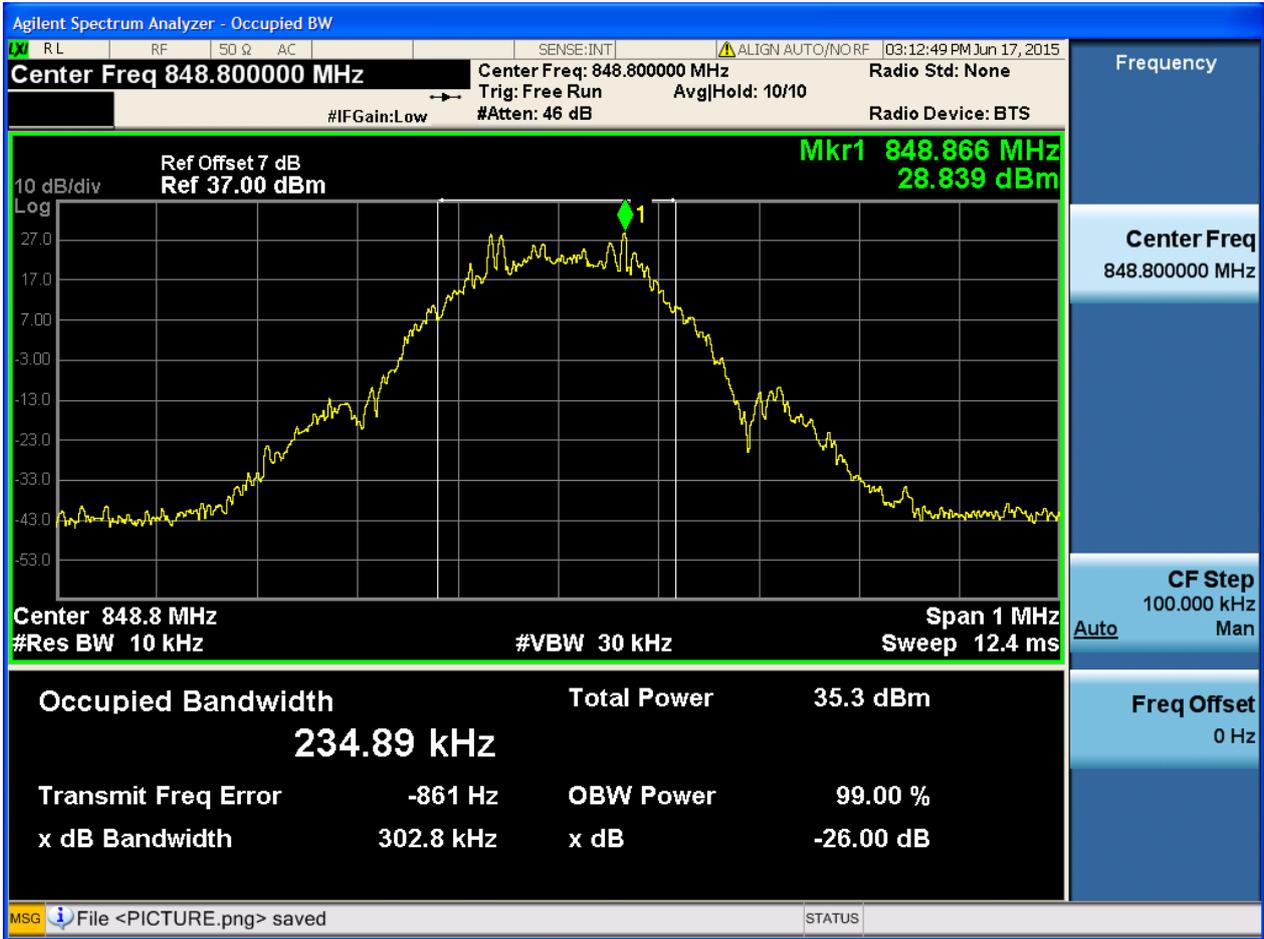


4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH

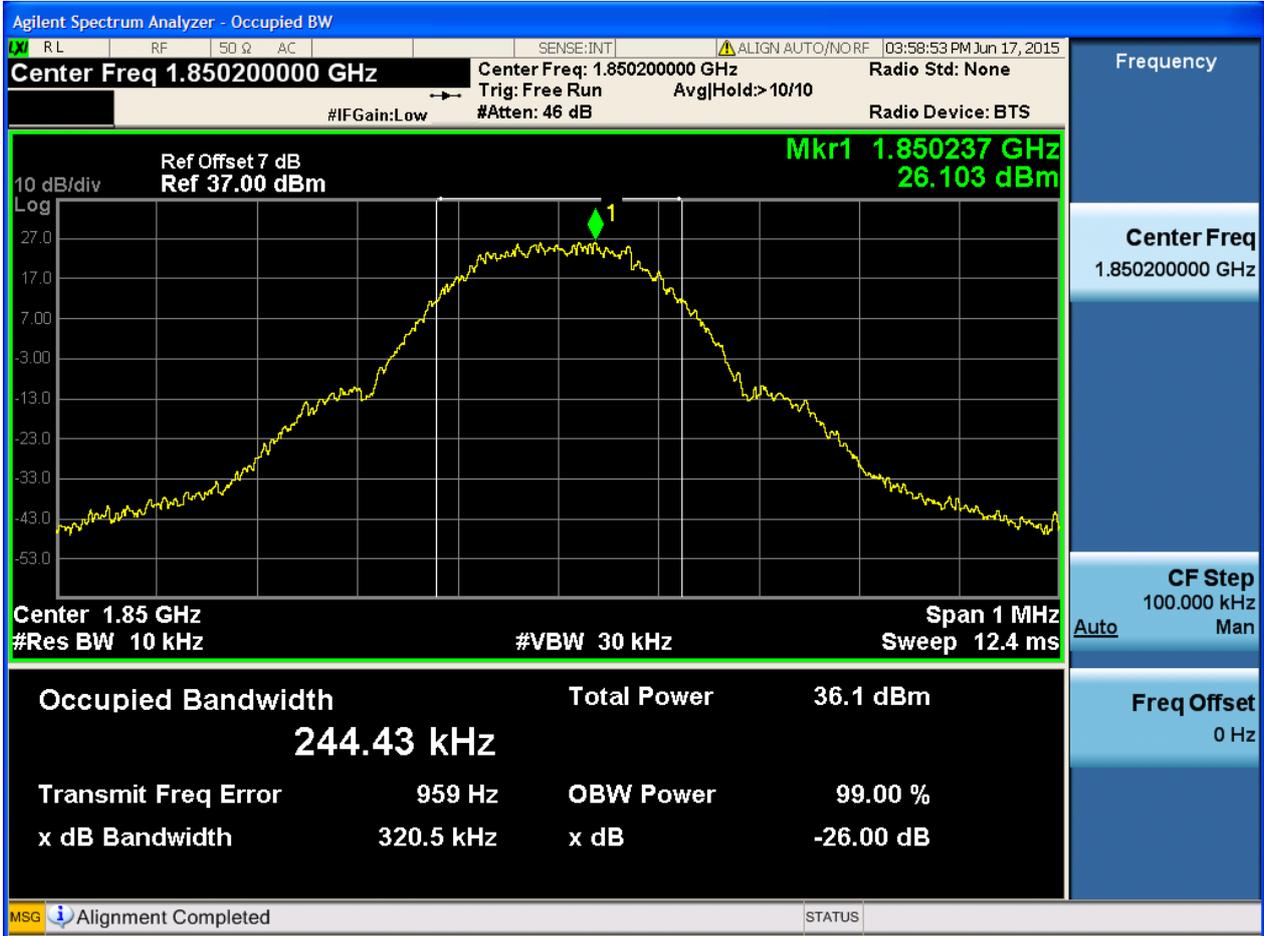




4.1.2 Test Band = GSM1900

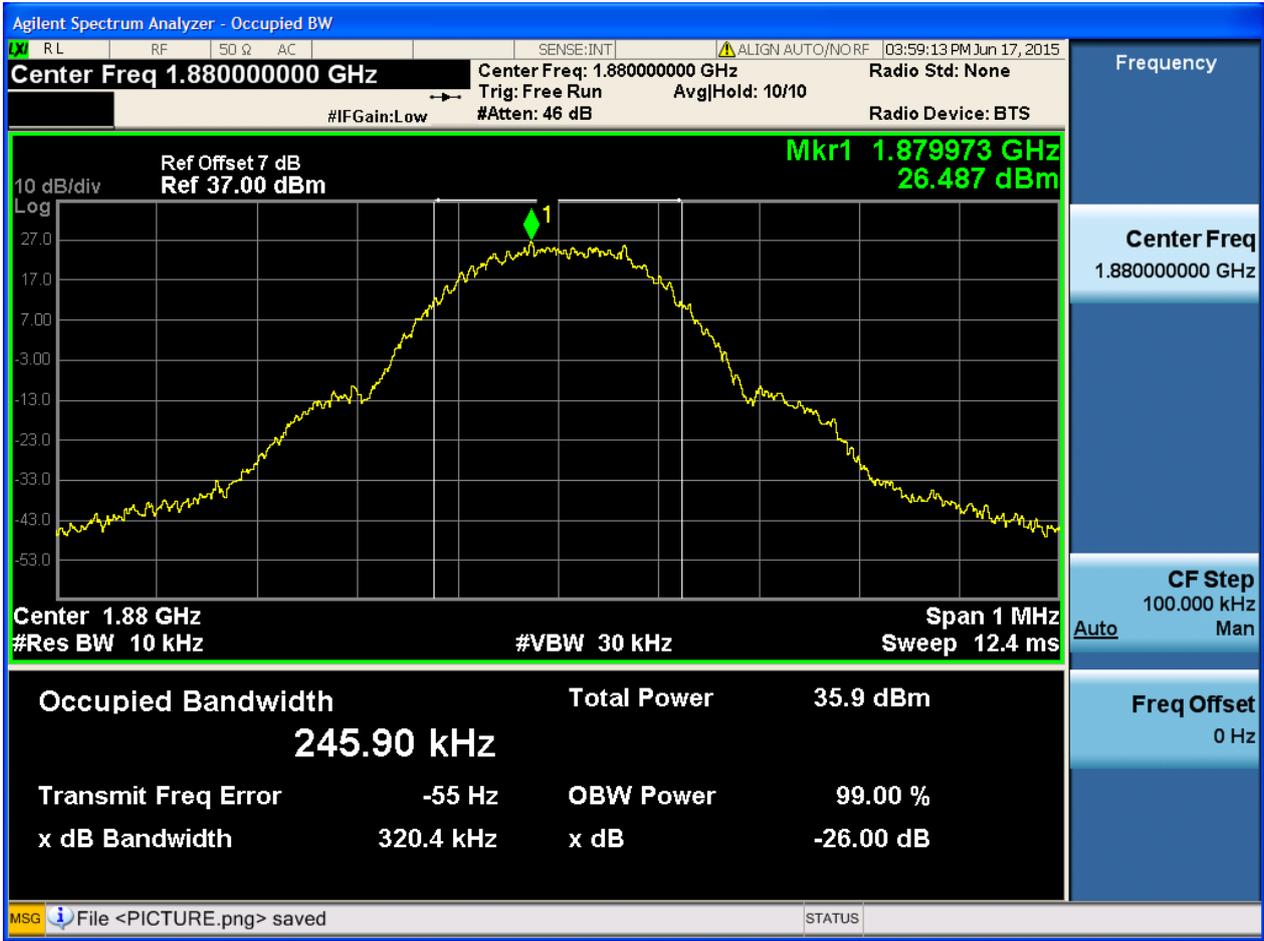
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



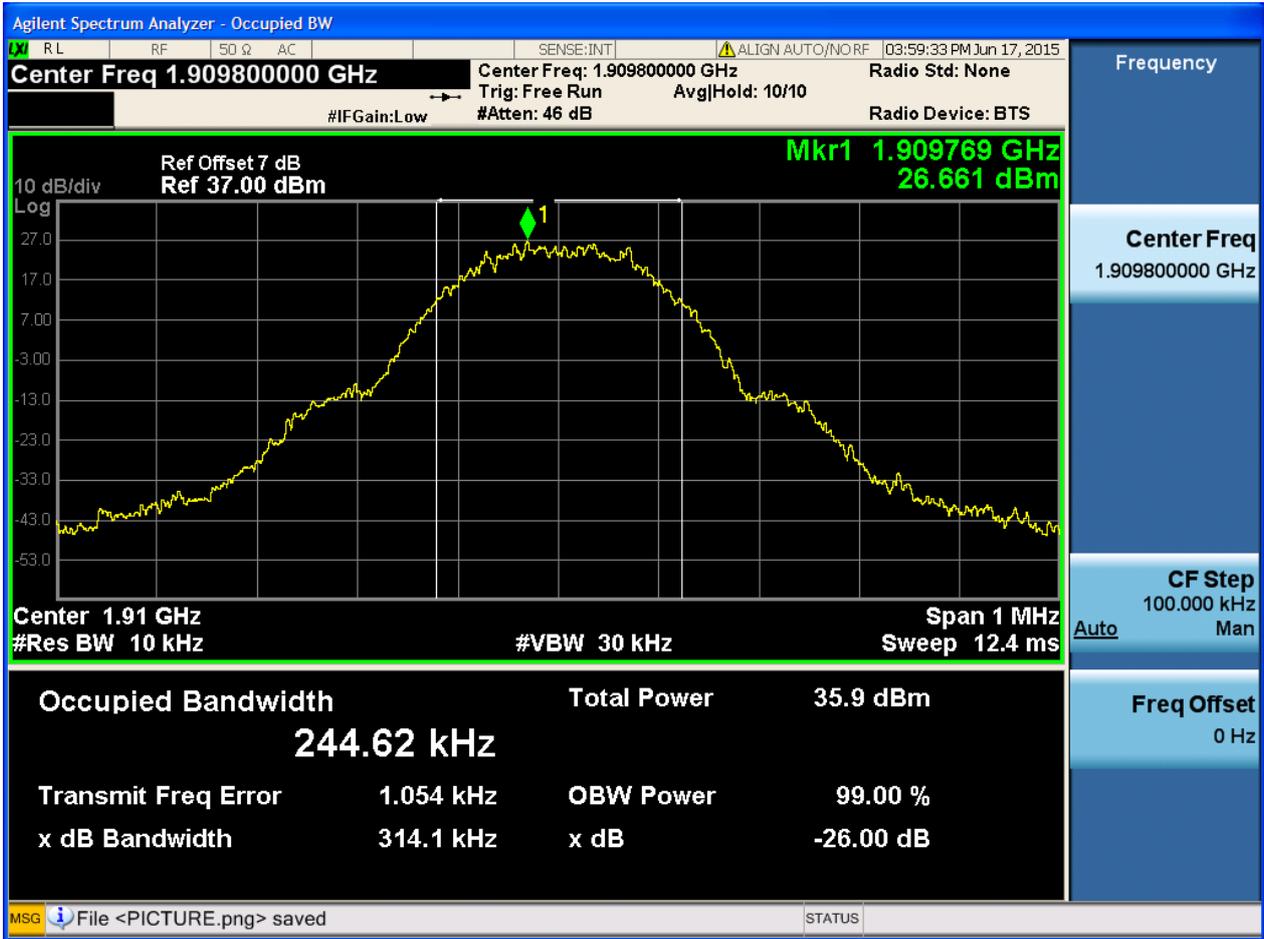


4.1.2.1.2 Test Channel = MCH





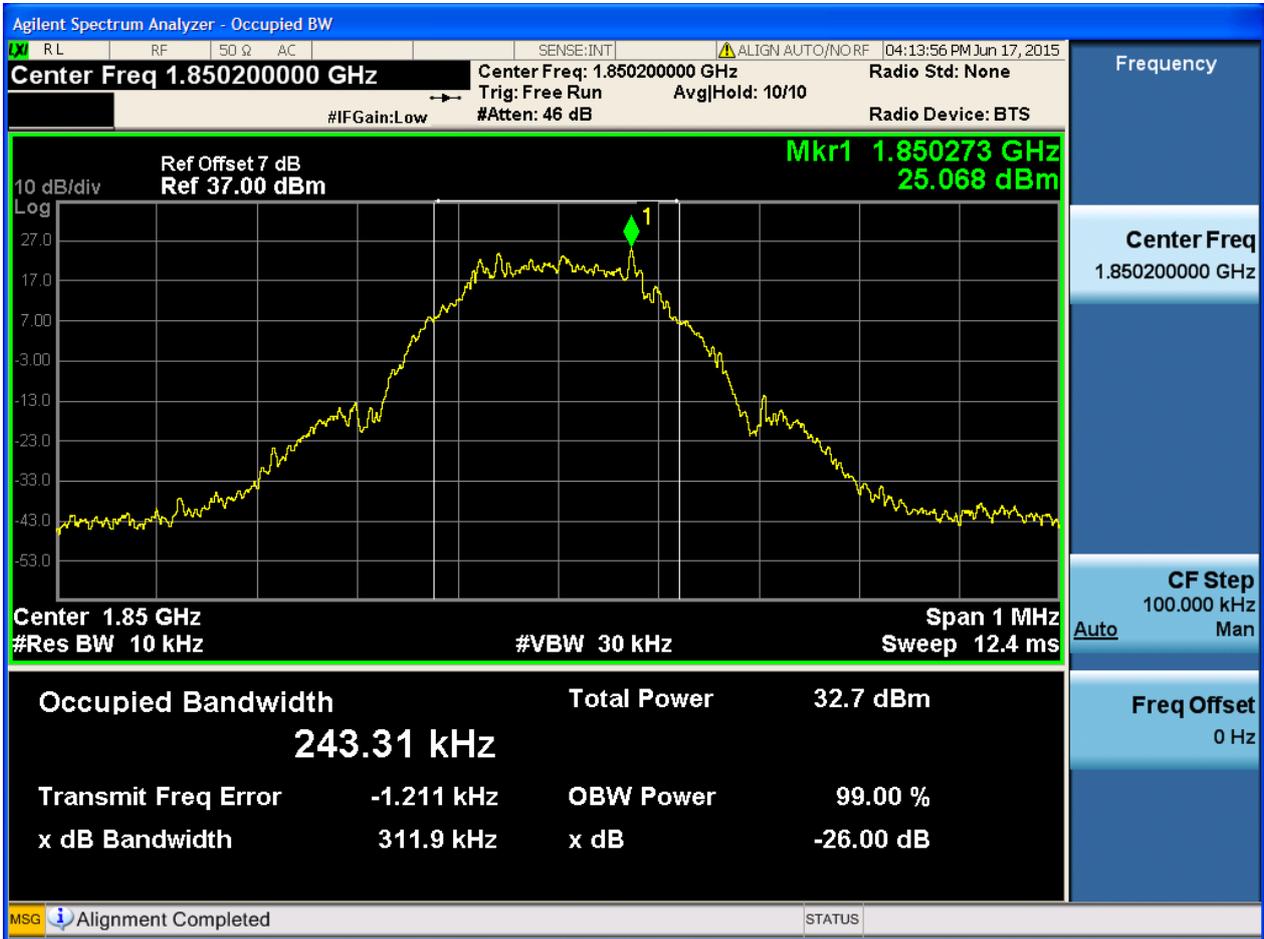
4.1.2.1.3 Test Channel = HCH





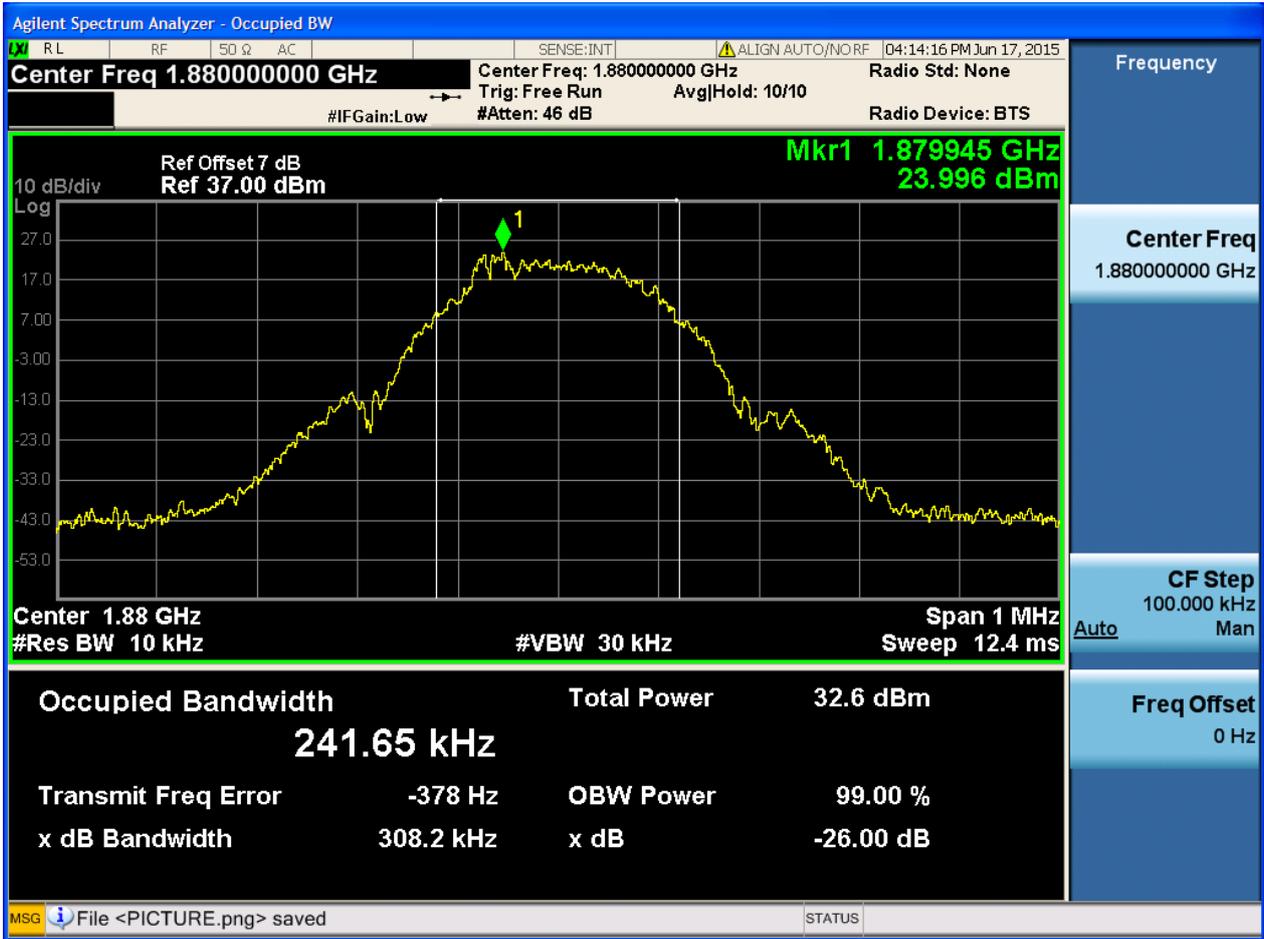
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4.1.2.2.1 Test Channel = LCH



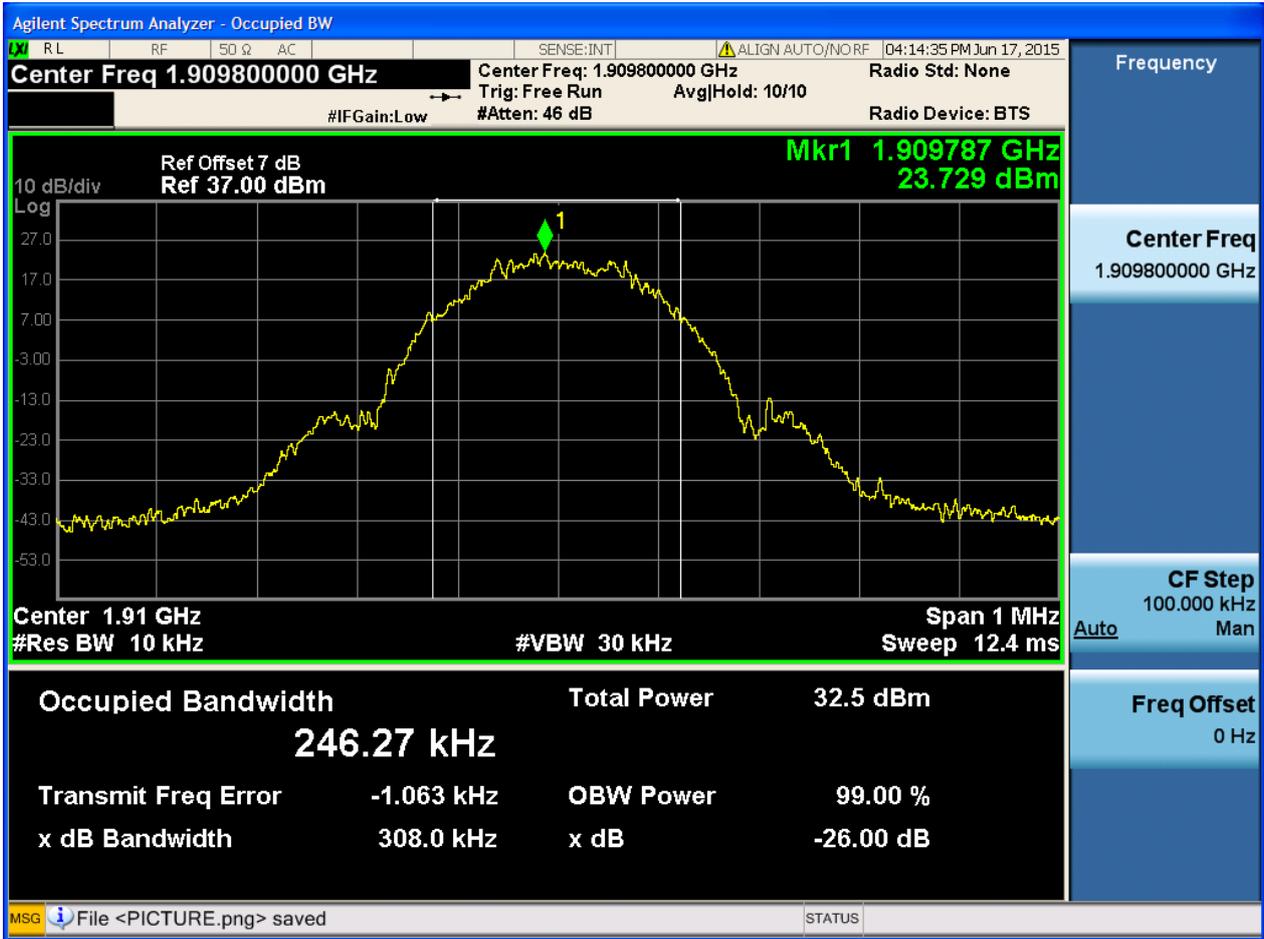


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH





5Appendix_E: Band Edges Compliance

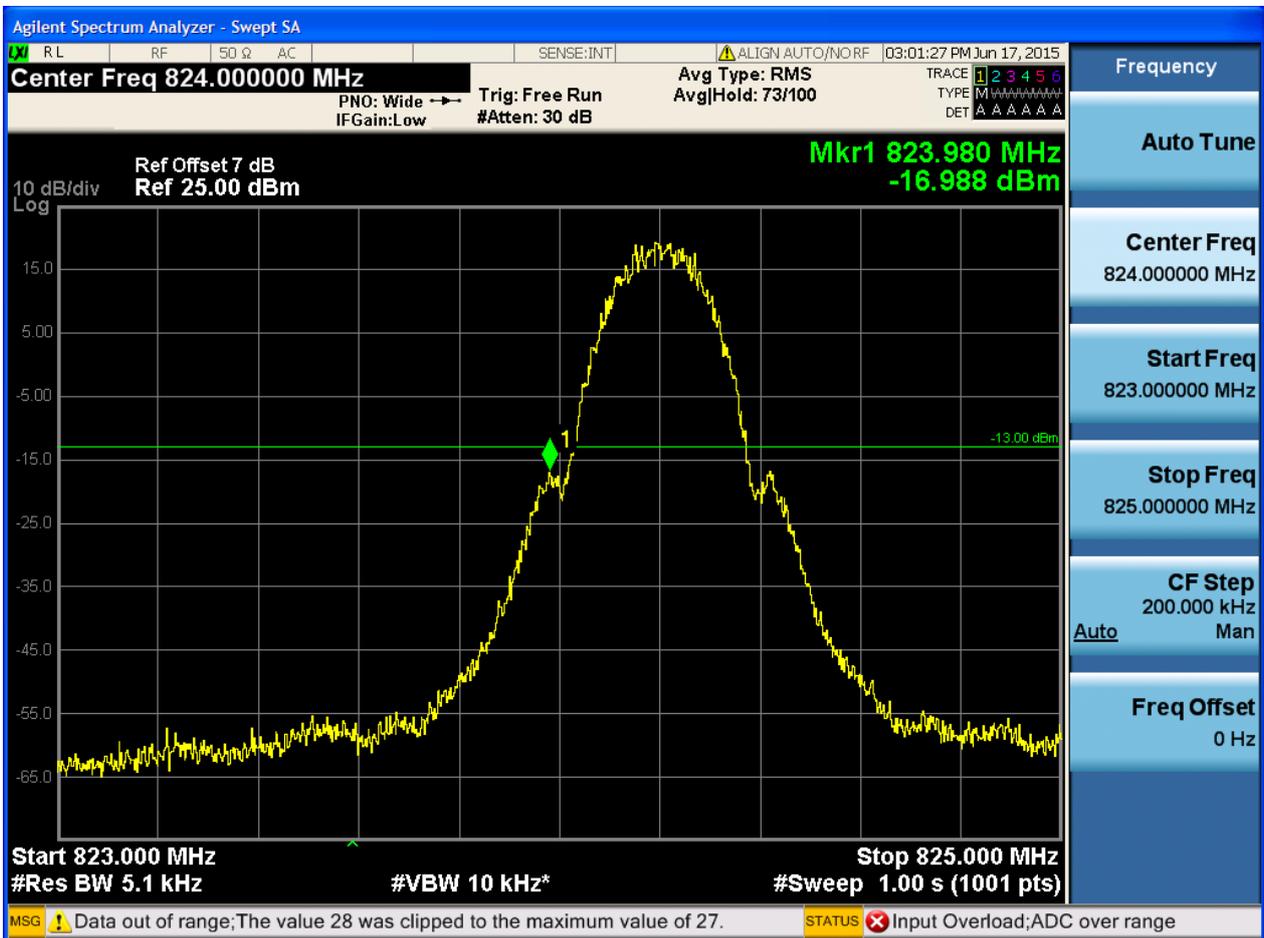
Part I - Test Plots

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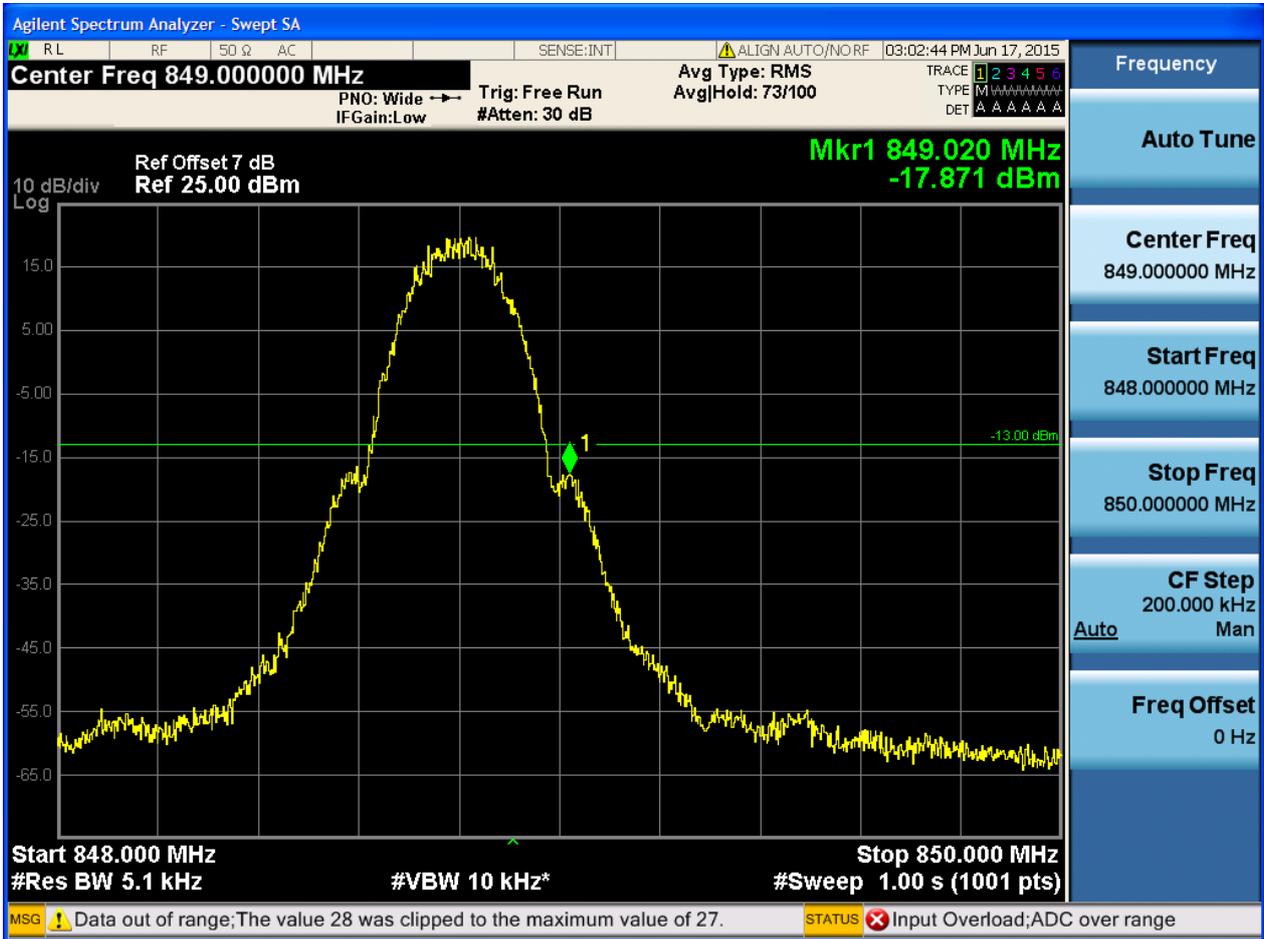
5.1.1 Test Band = GSM850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH

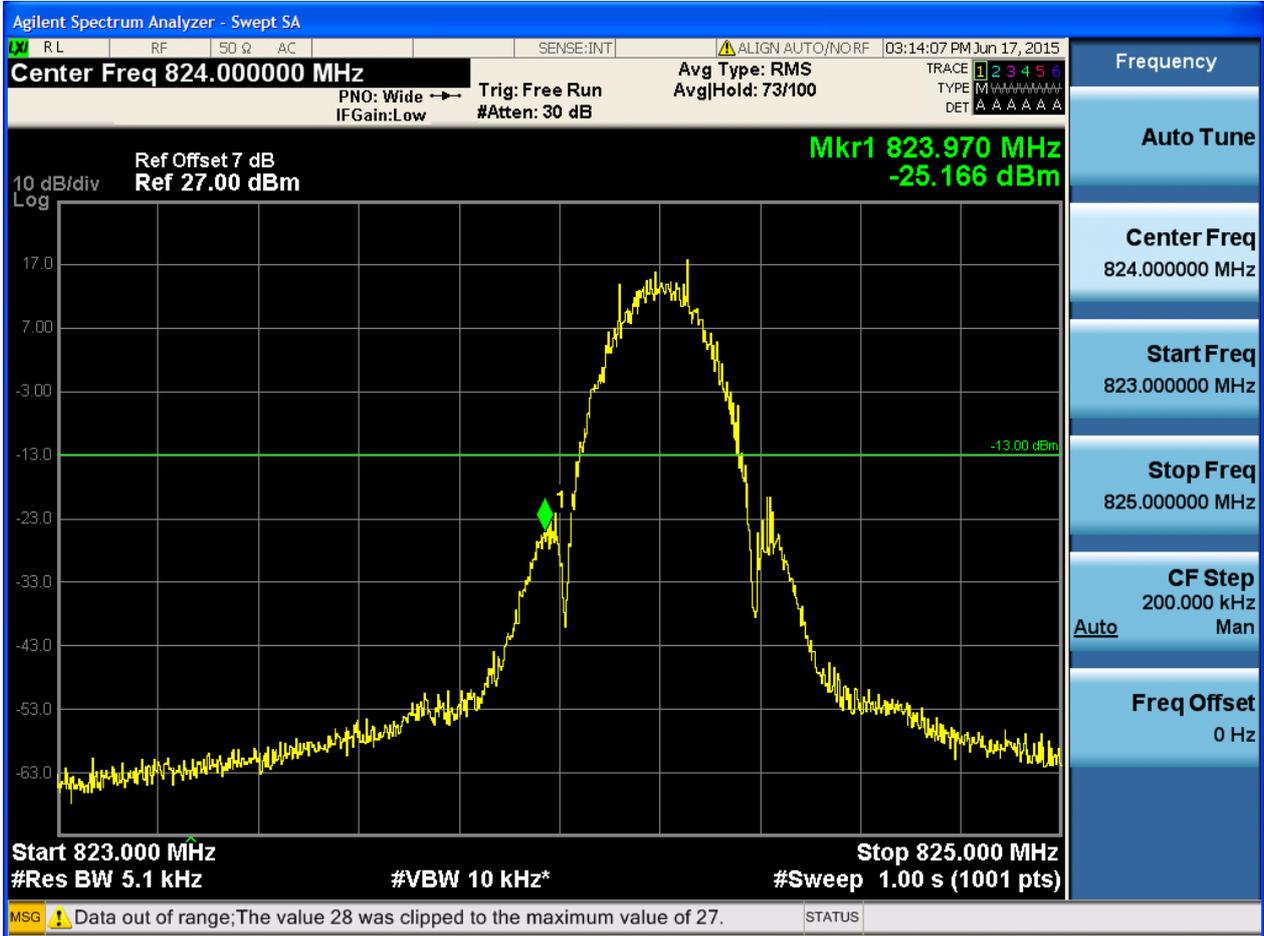


5.1.1.1.2 Test Channel = HCH

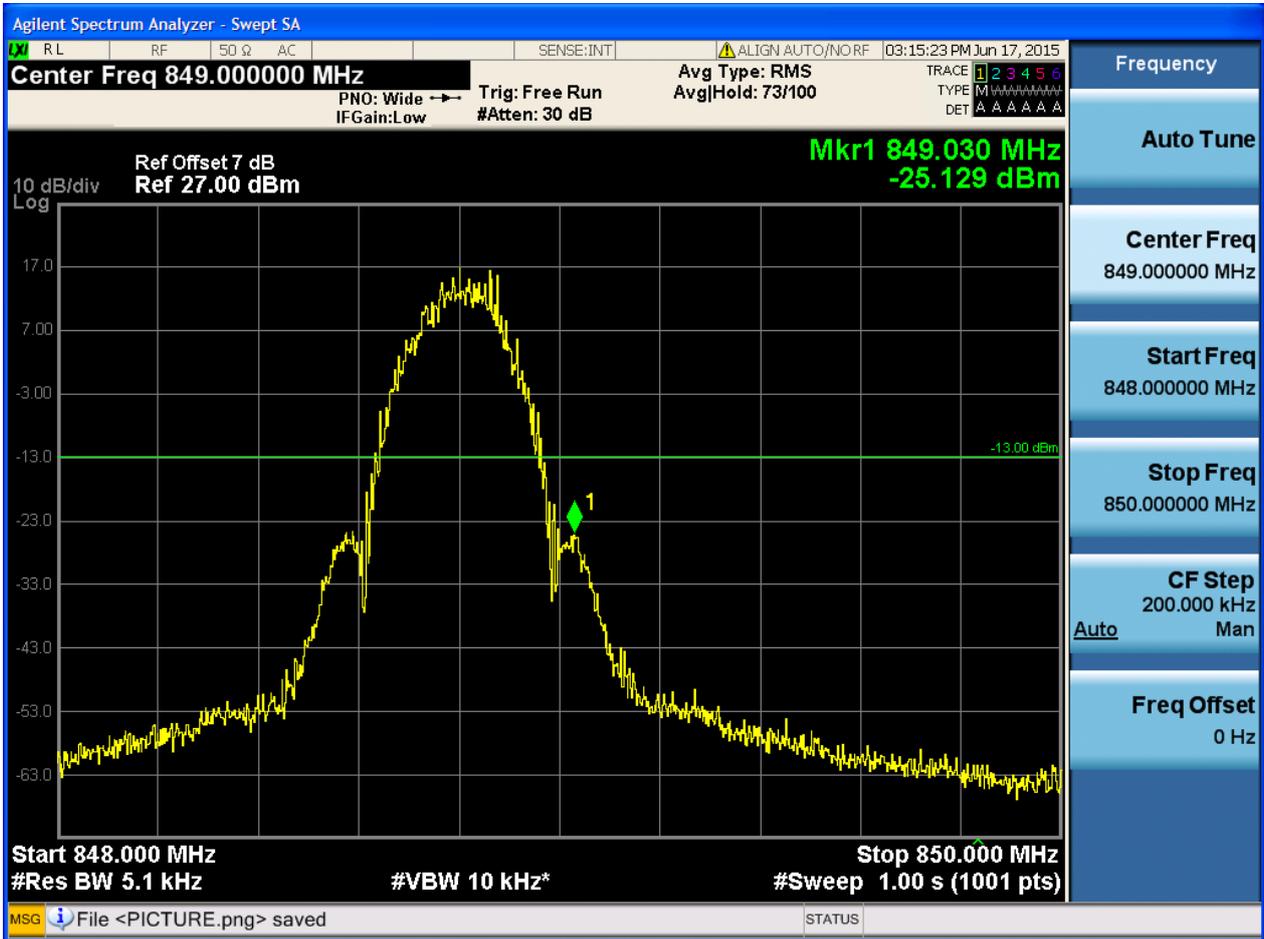


5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



5.1.1.2.2 Test Channel = HCH

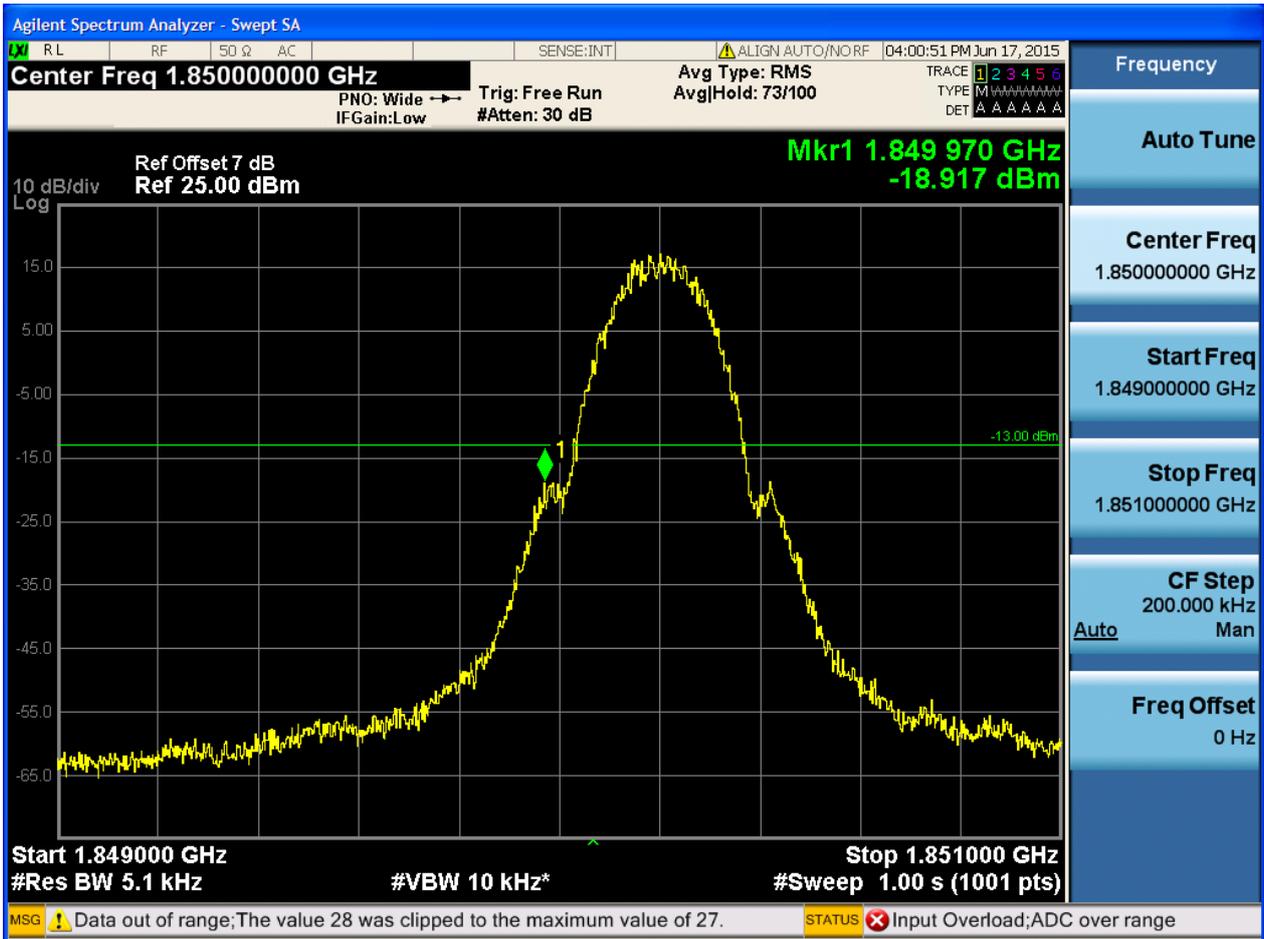




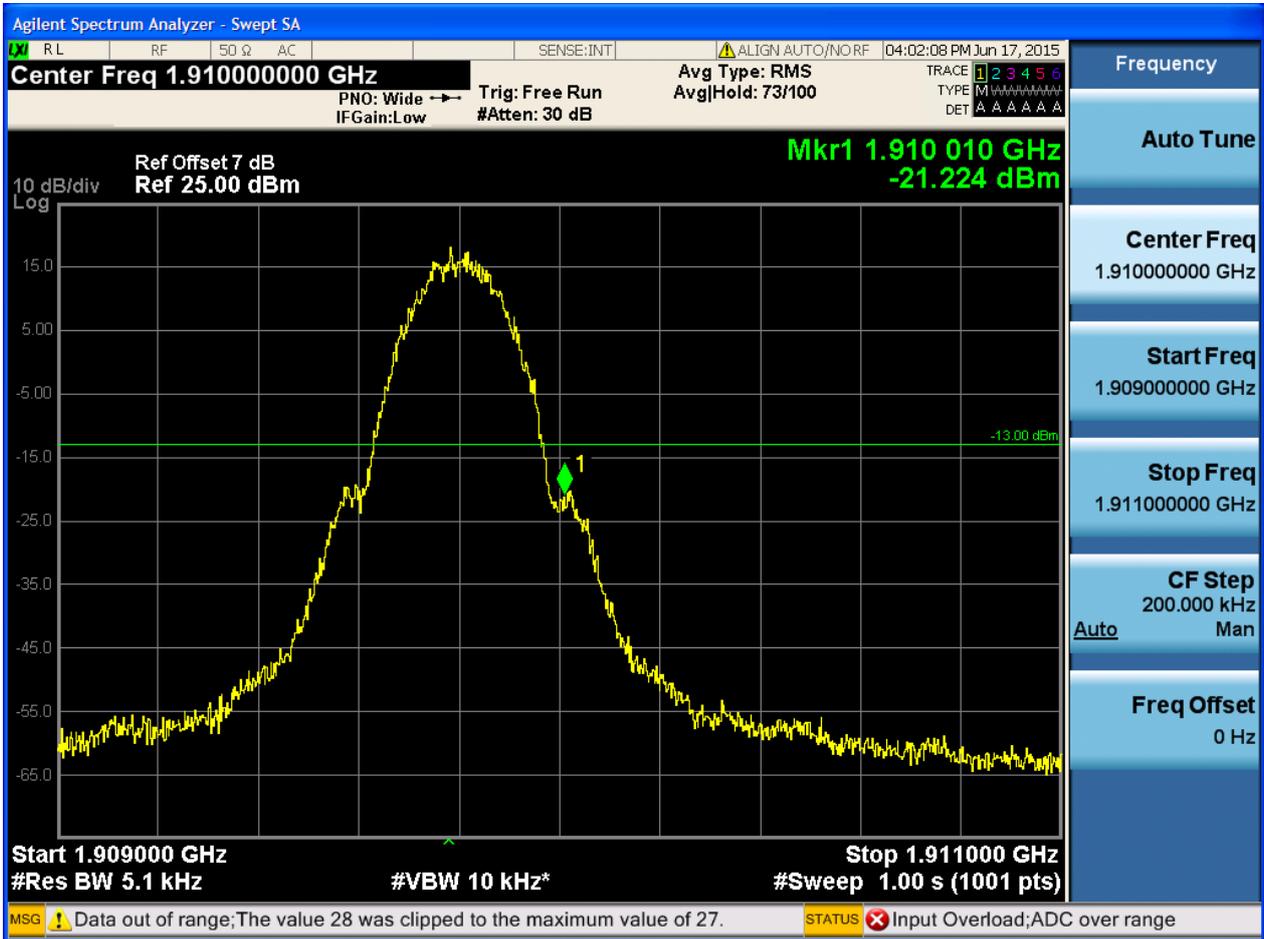
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH



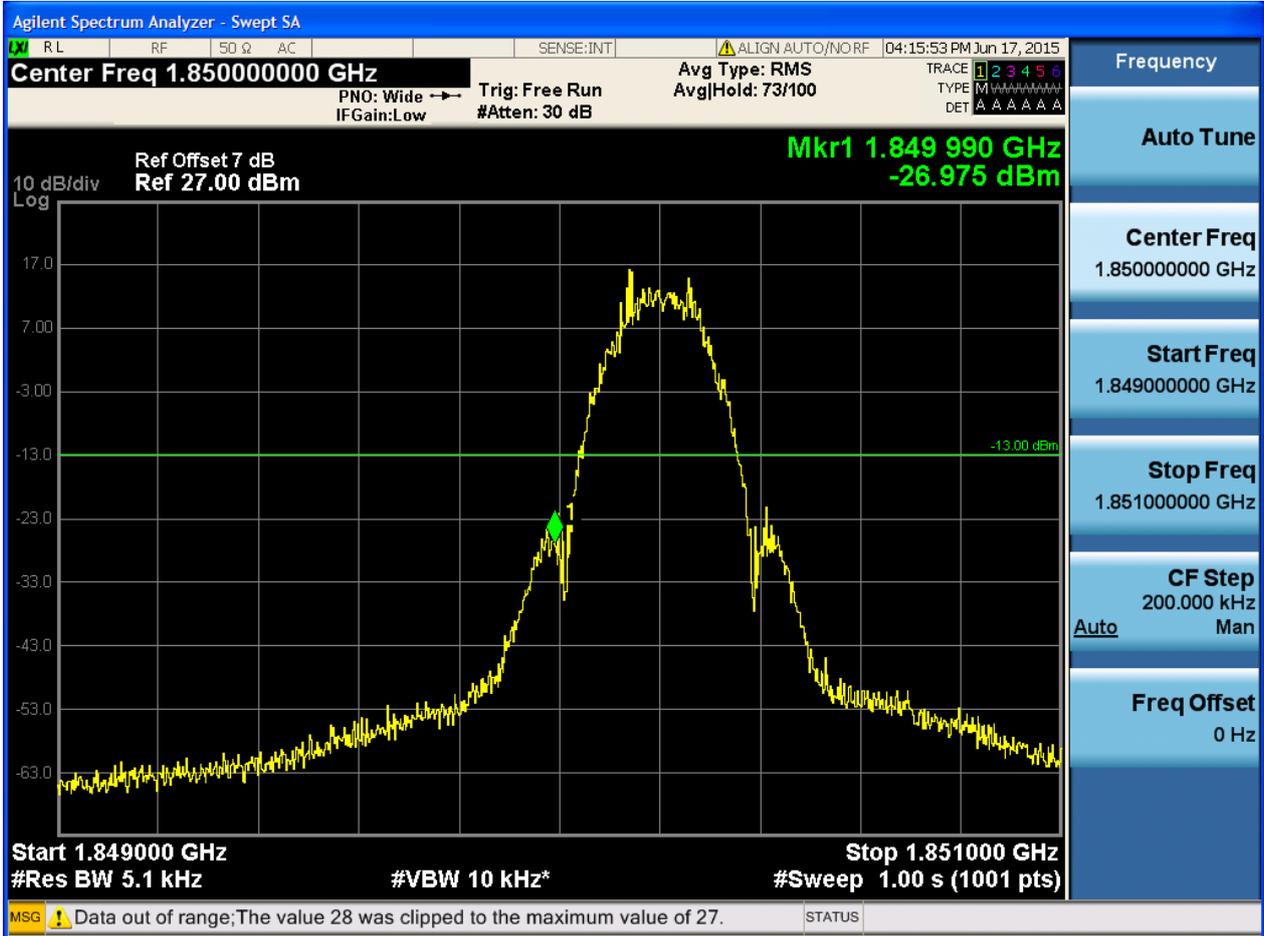
5.1.2.1.2 Test Channel = HCH



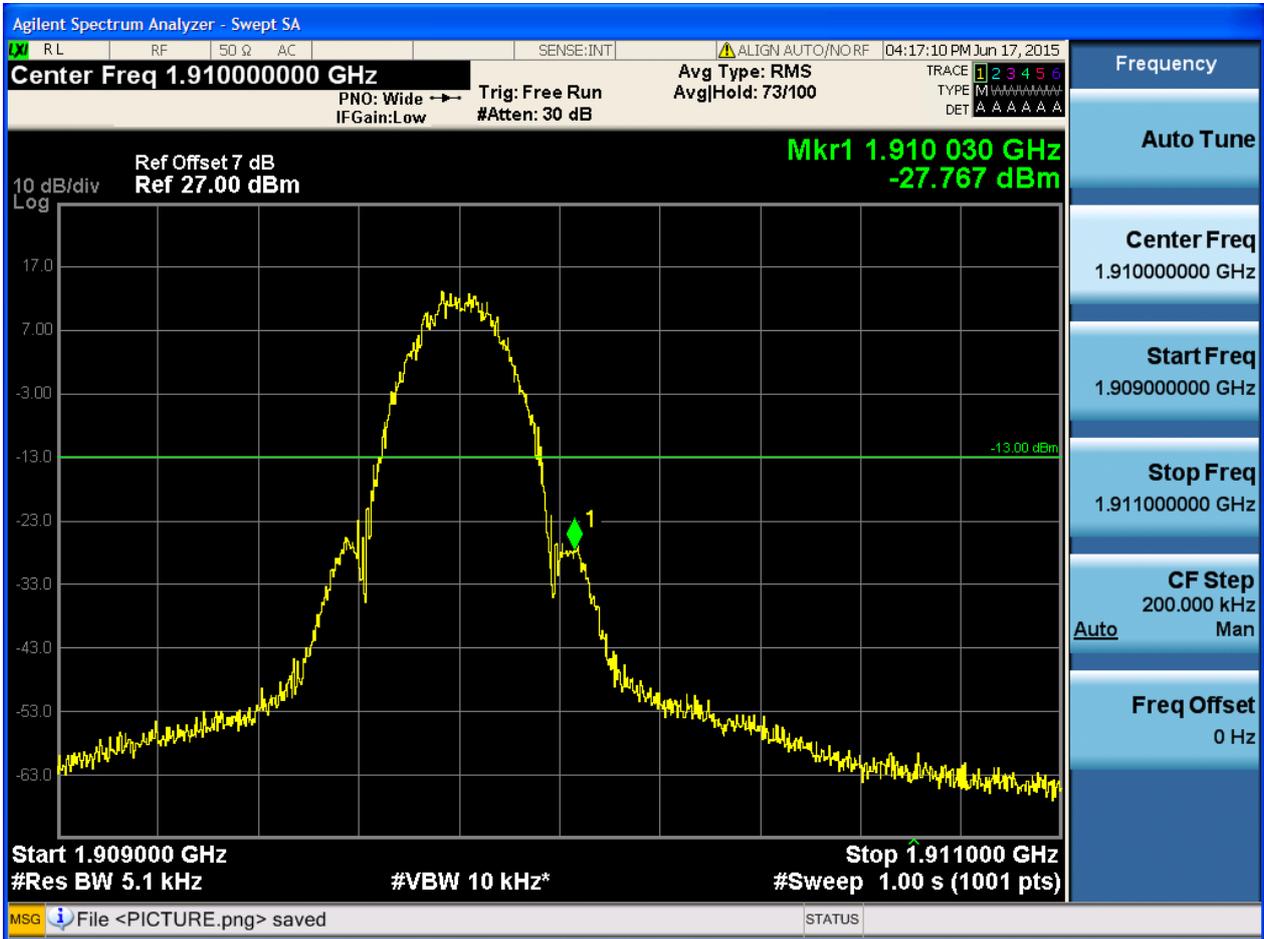


5.1.2.2 Test Mode = GSM/TM2

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.

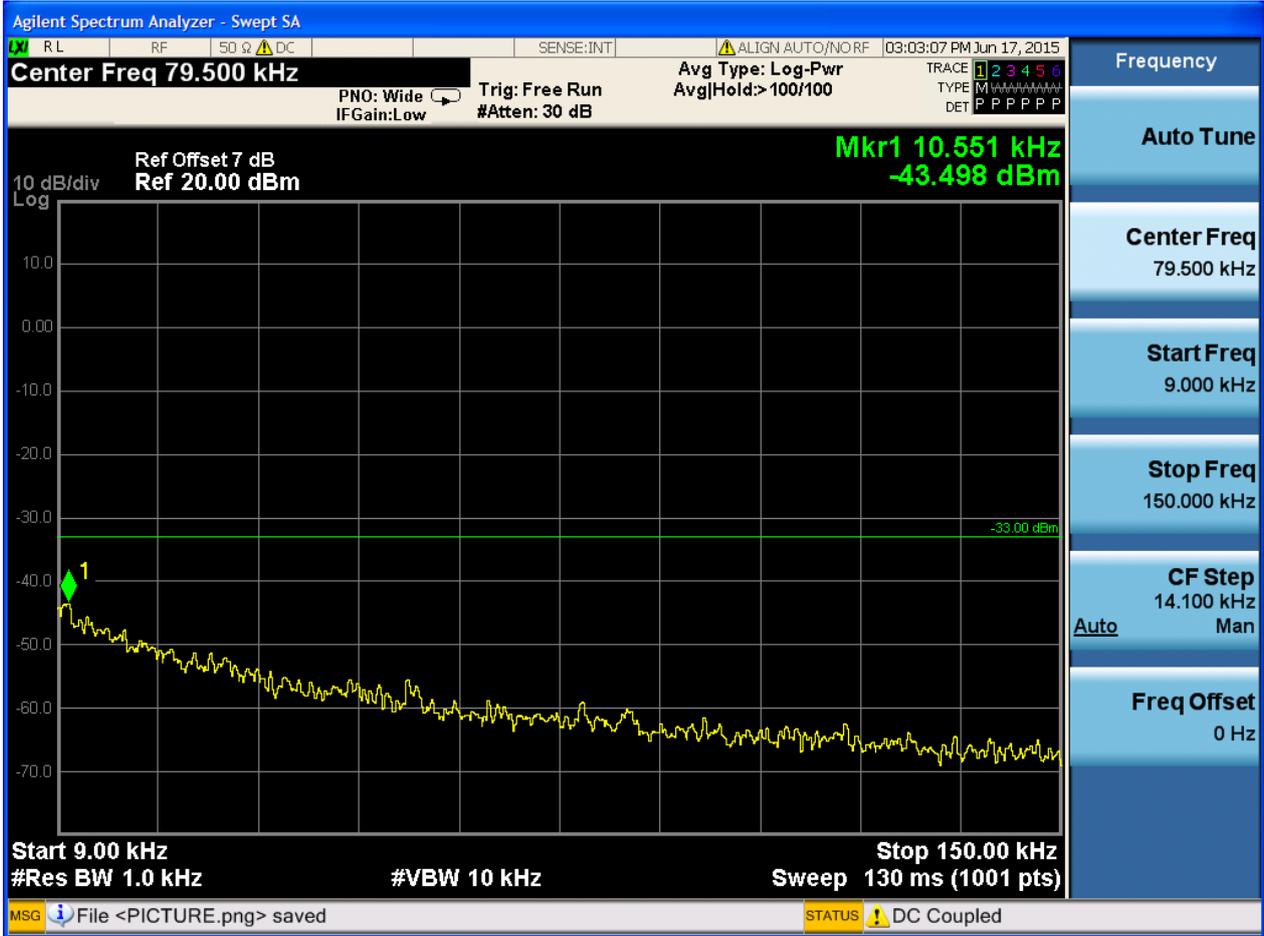
Part I - Test Plots

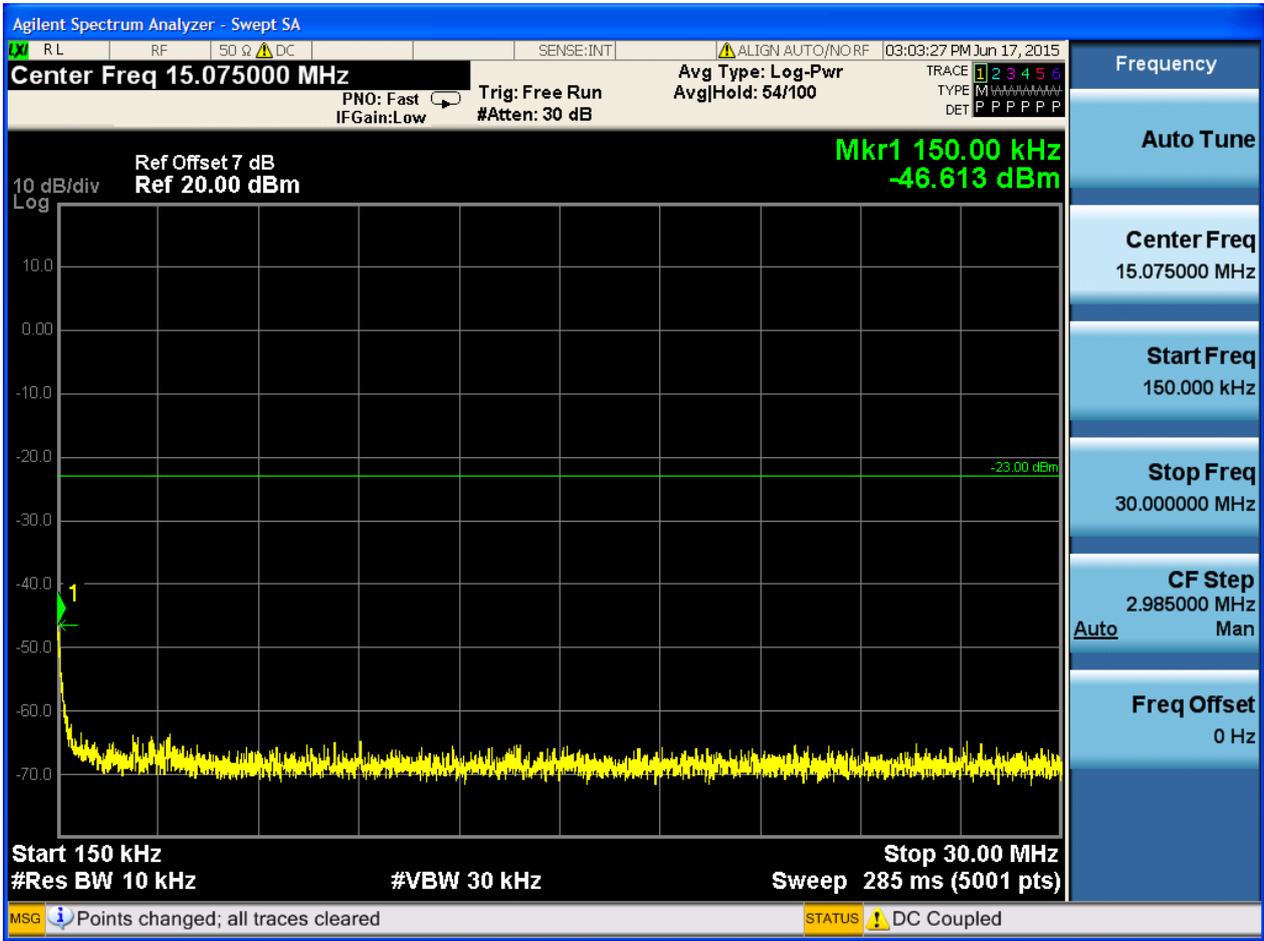
6.1 For GSM

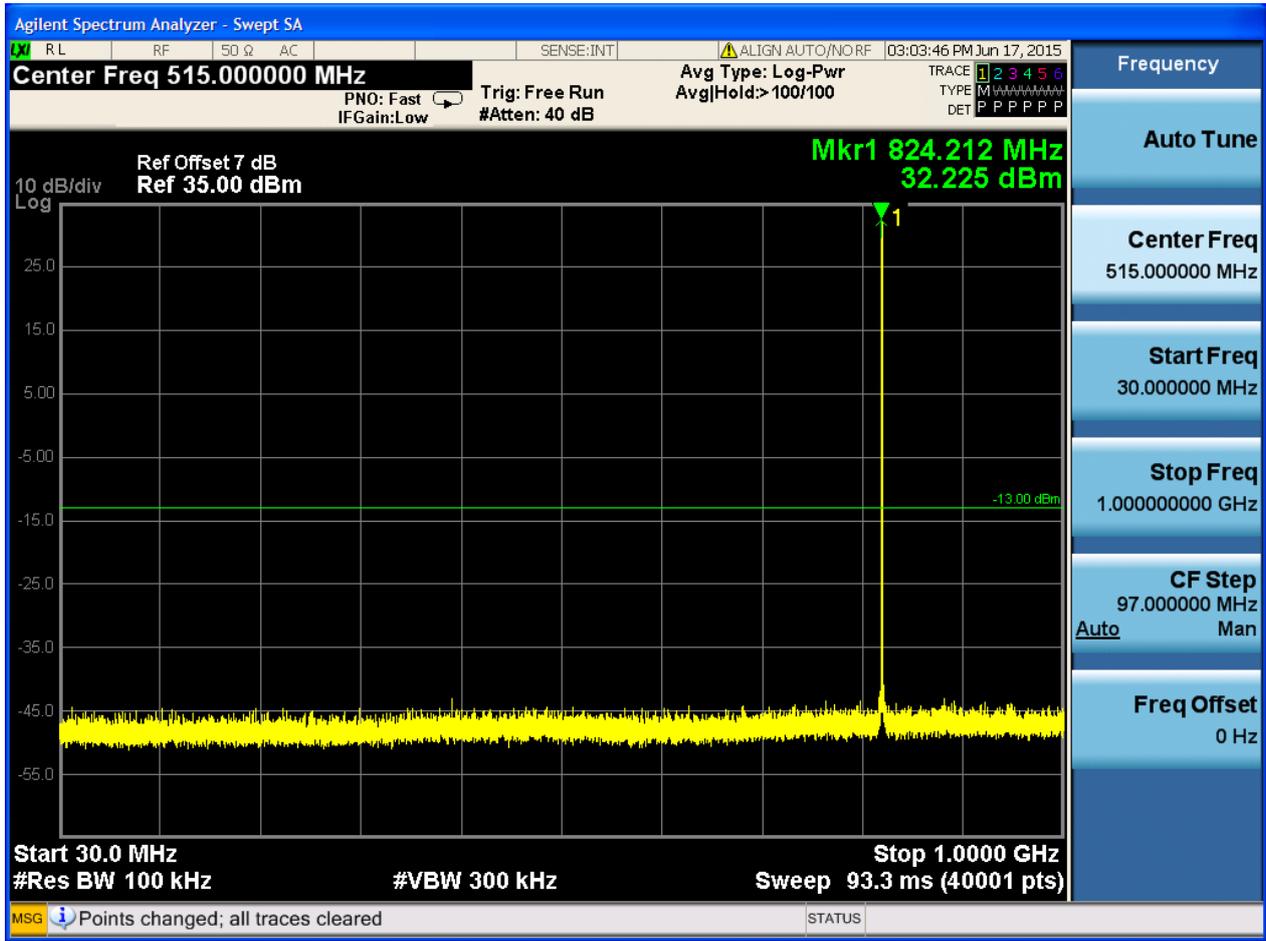
6.1.1 Test Band = GSM850

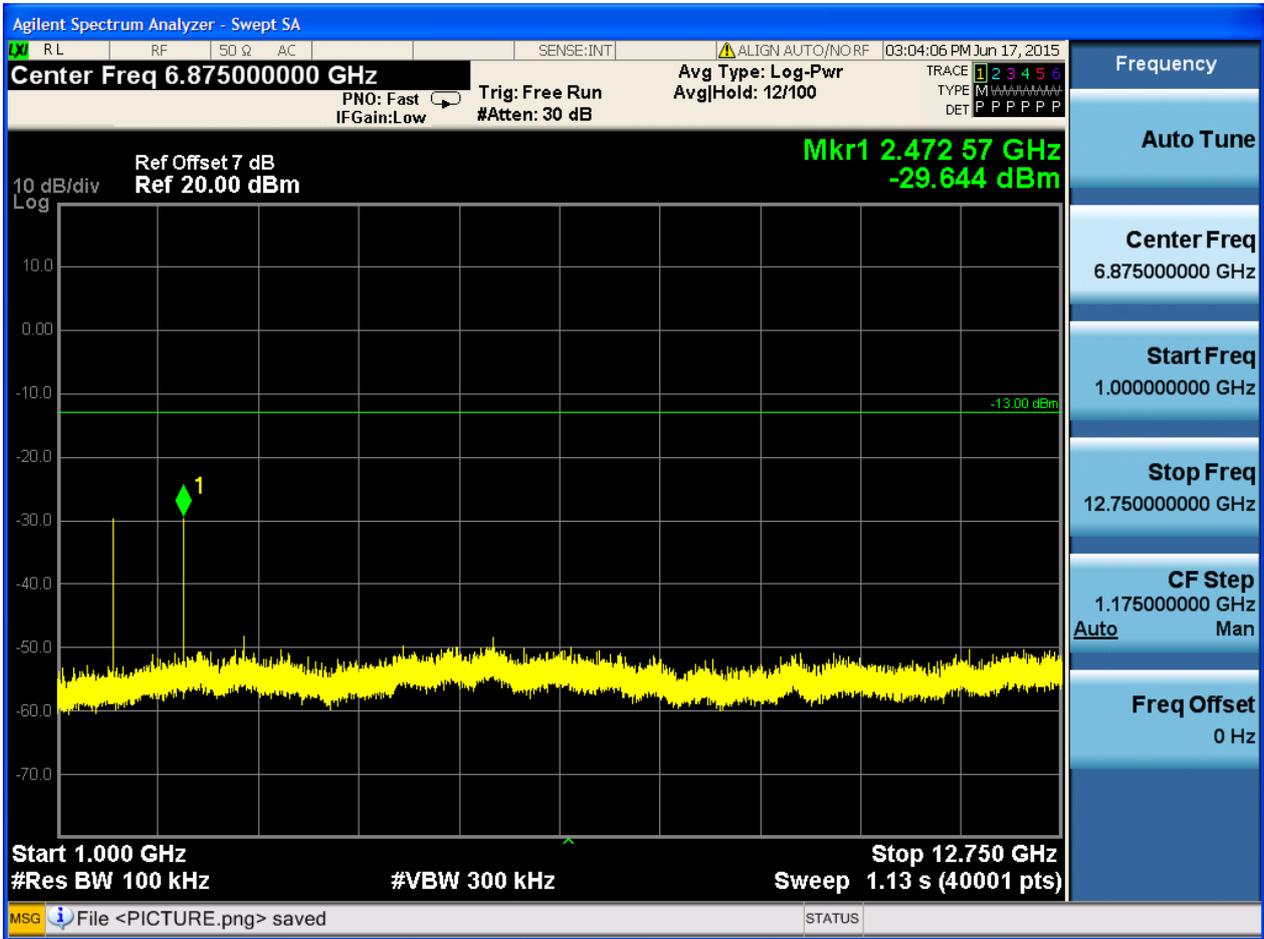
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH

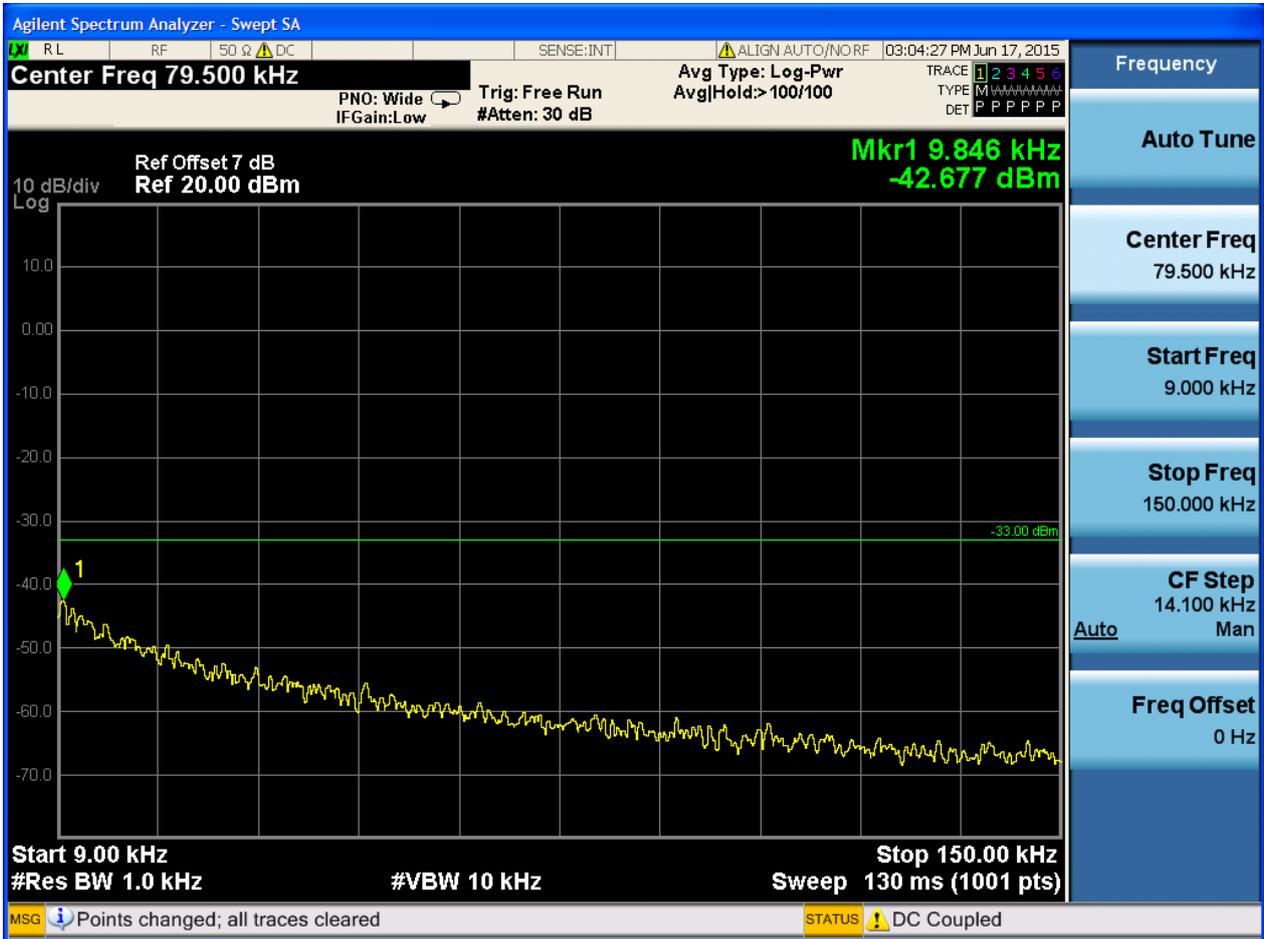


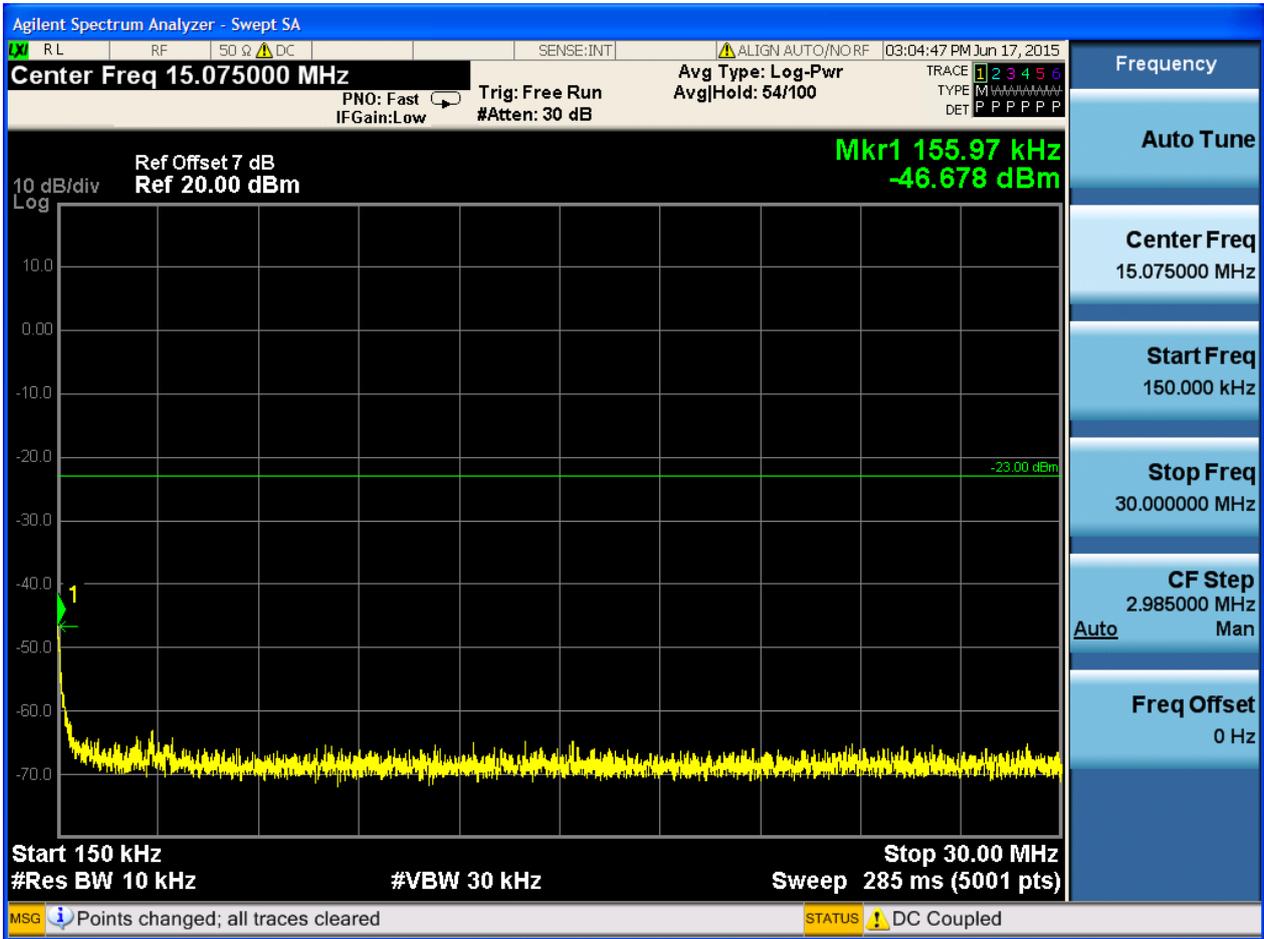


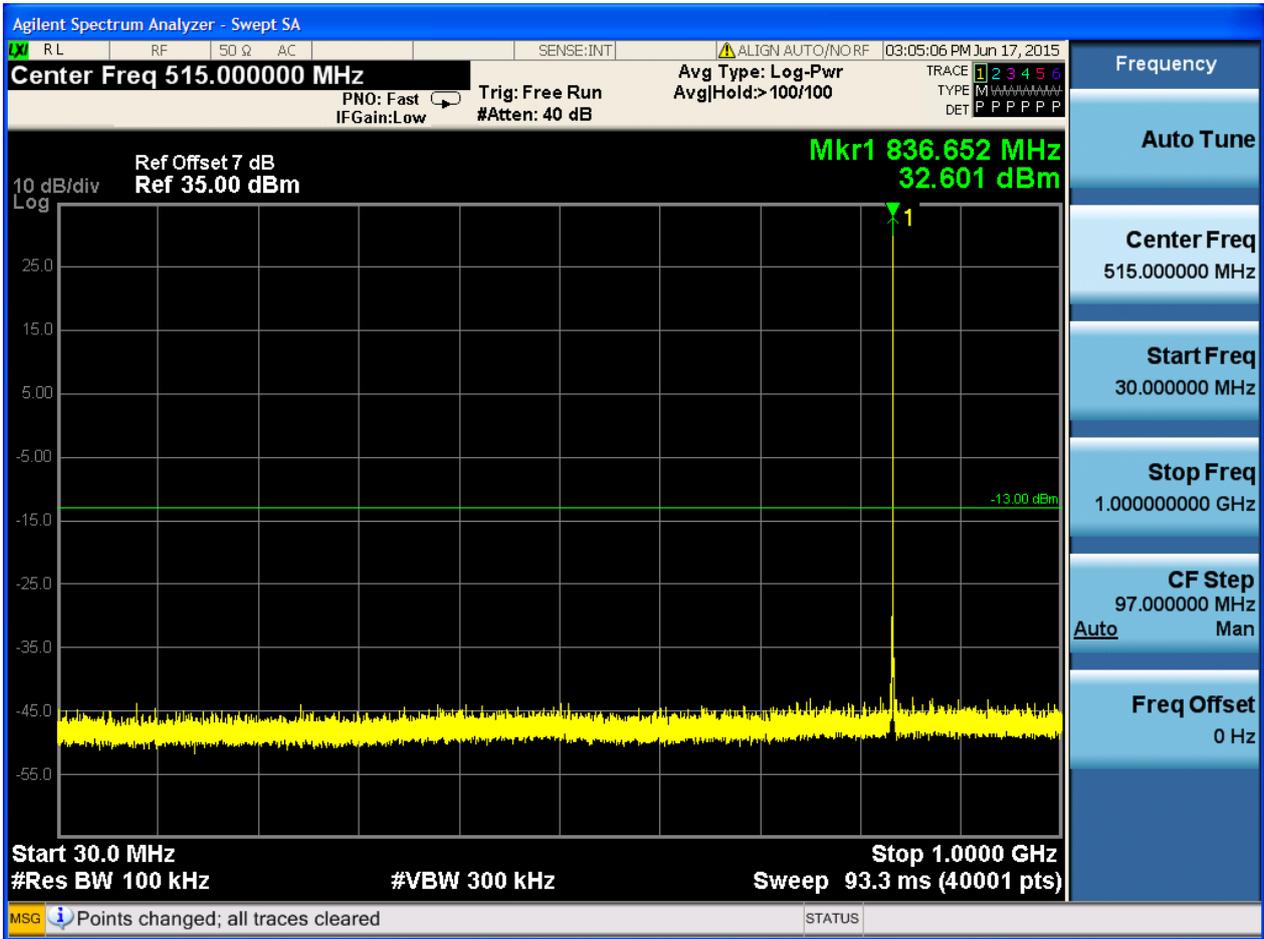


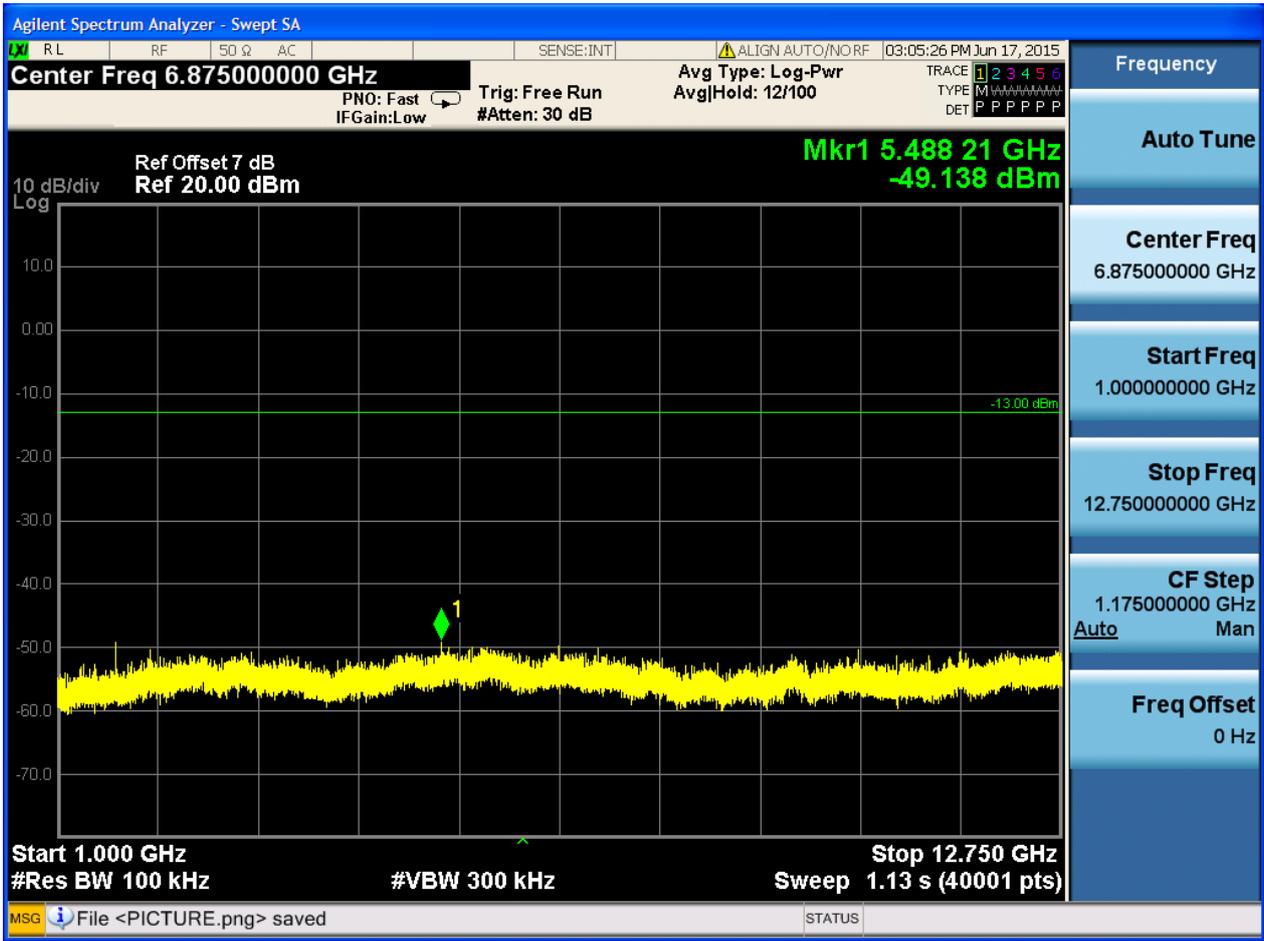


6.1.1.1.2 Test Channel = MCH



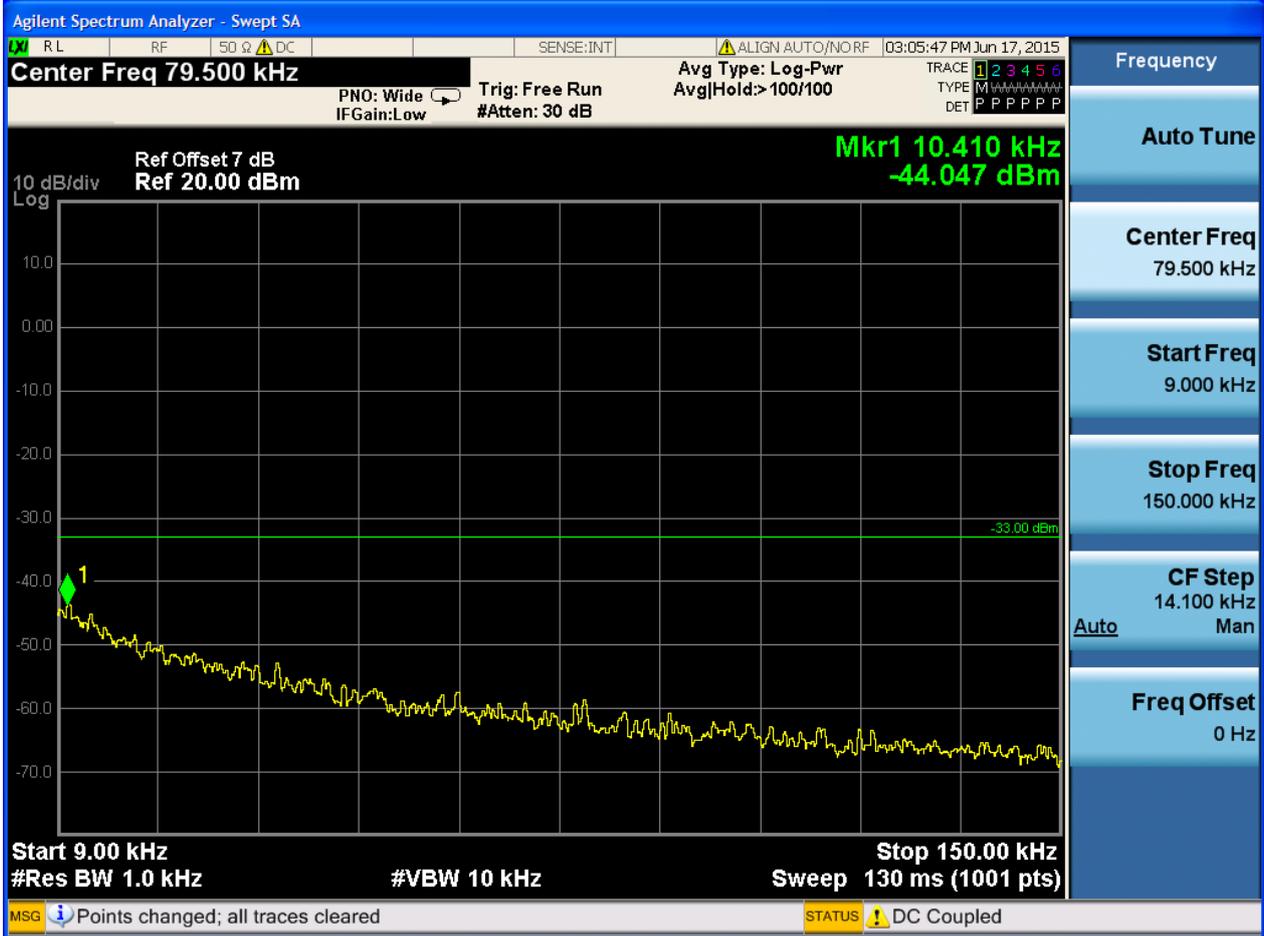


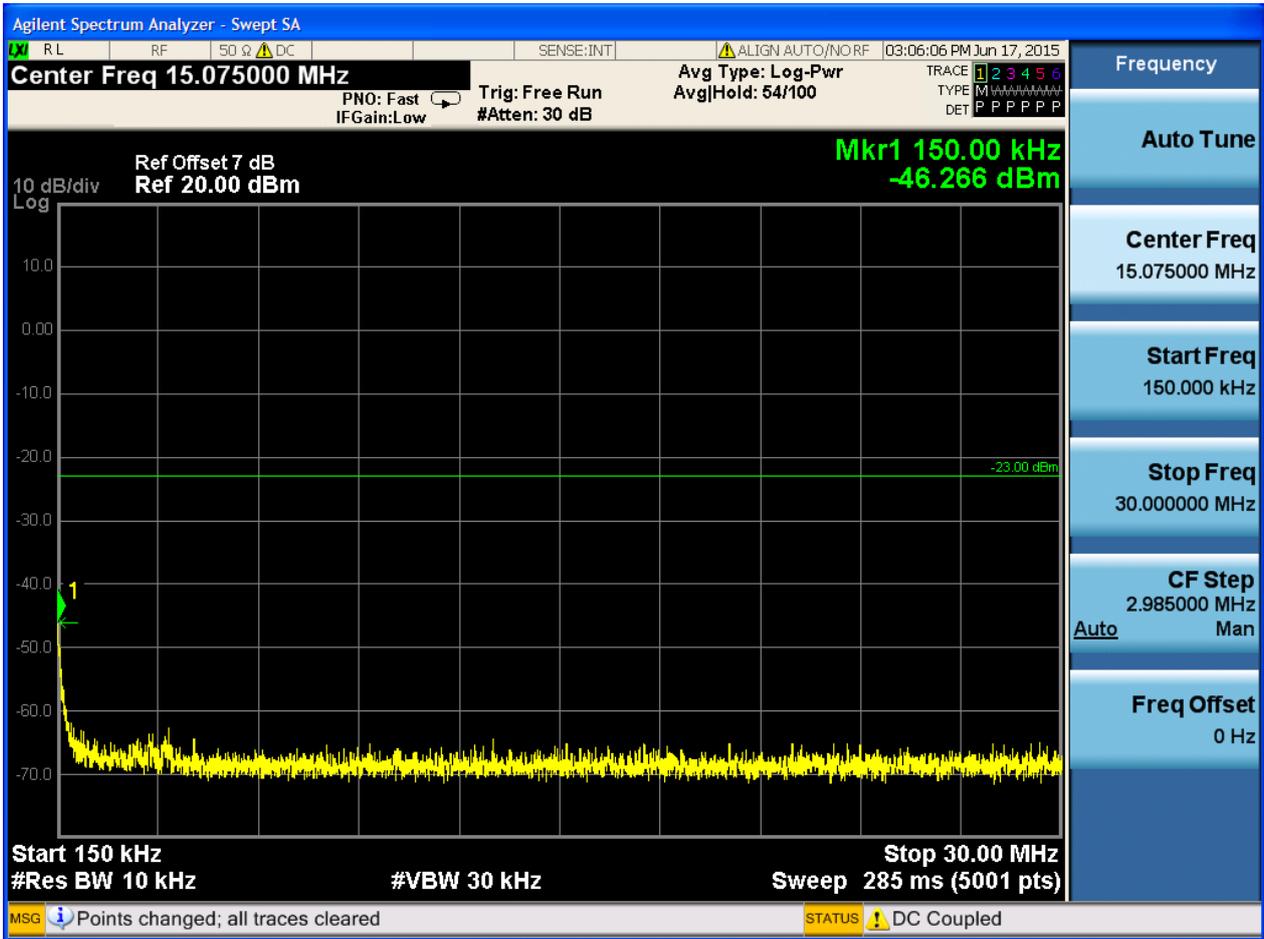


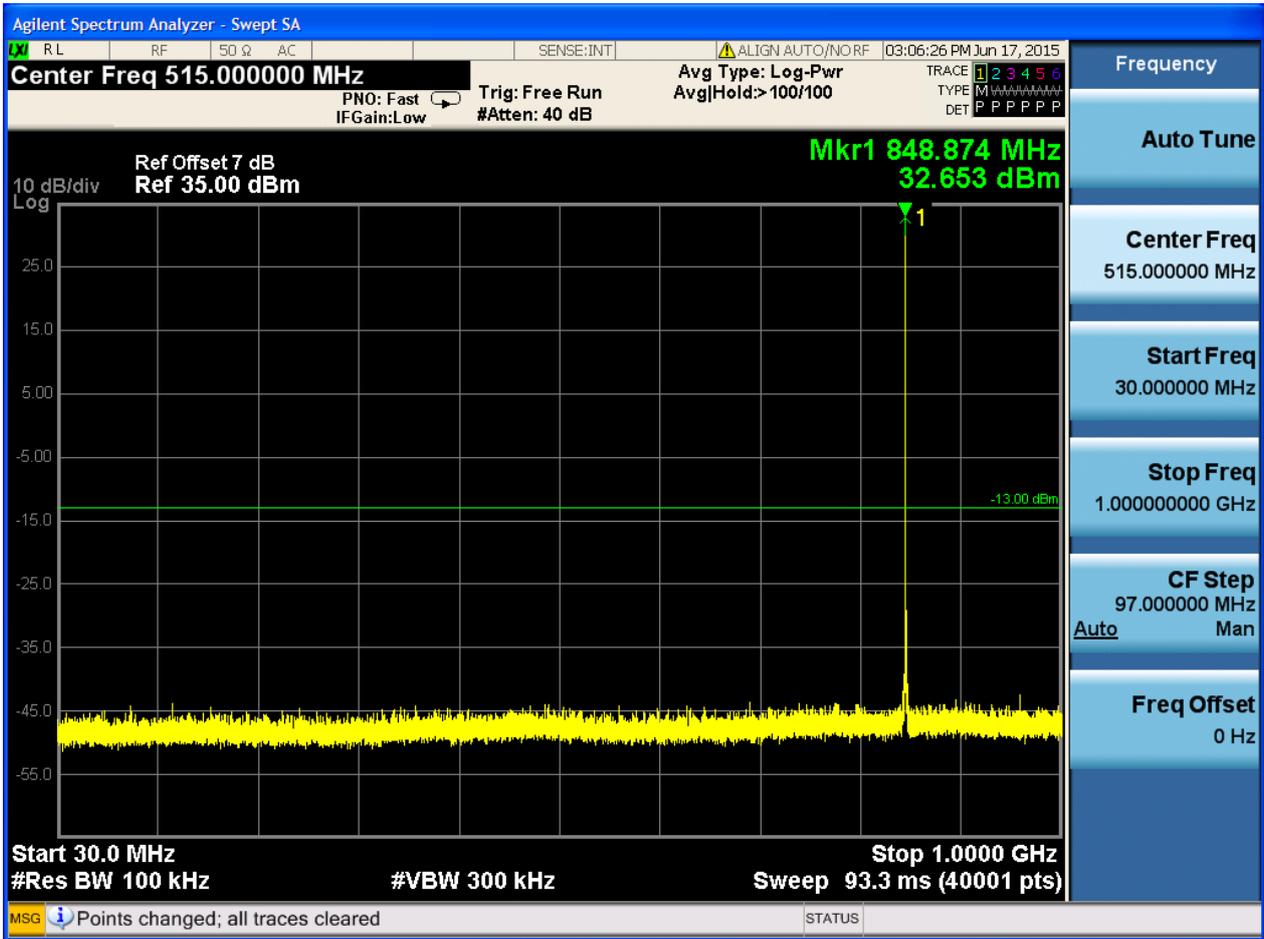


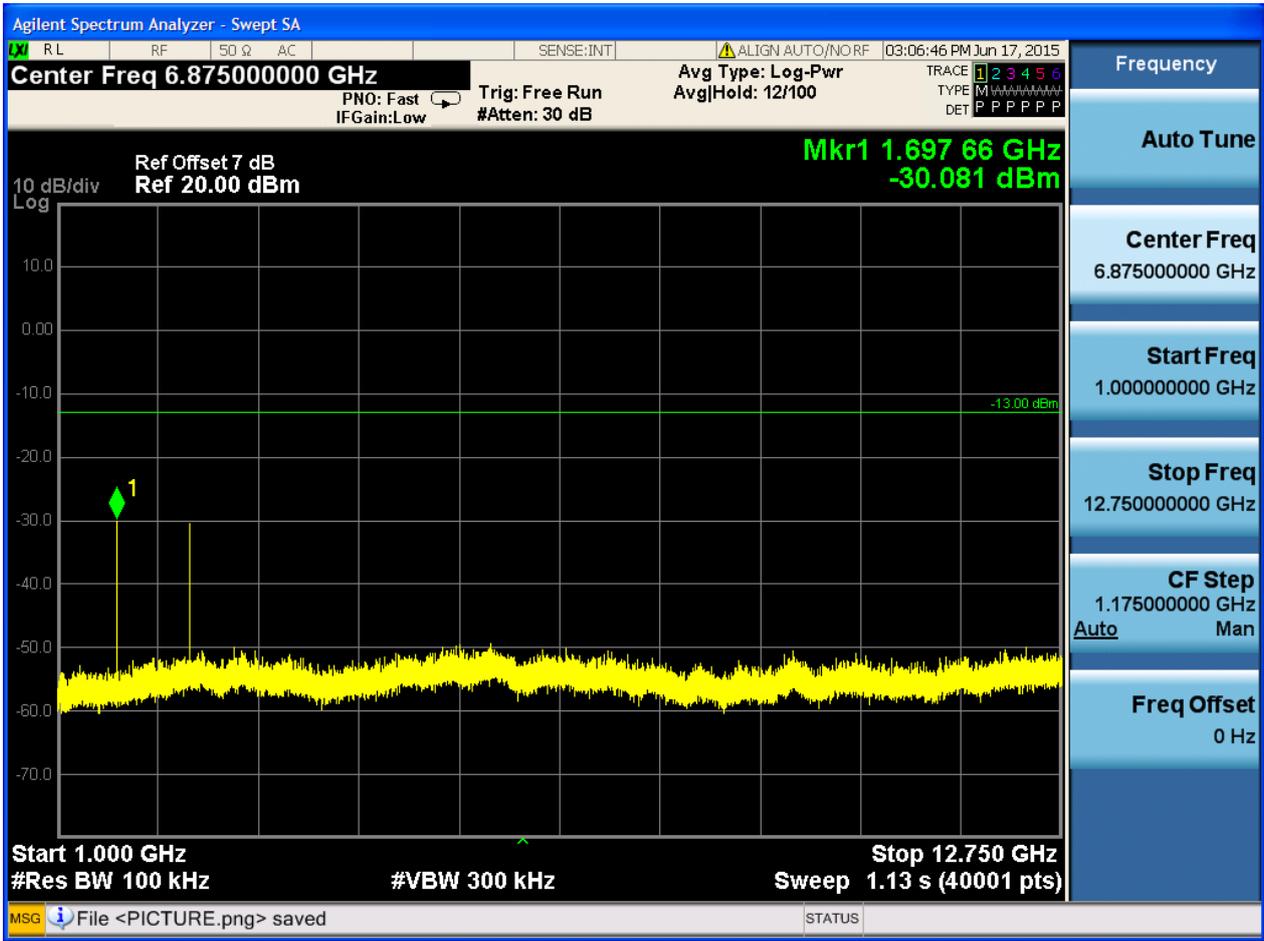


6.1.1.1.3 Test Channel = HCH





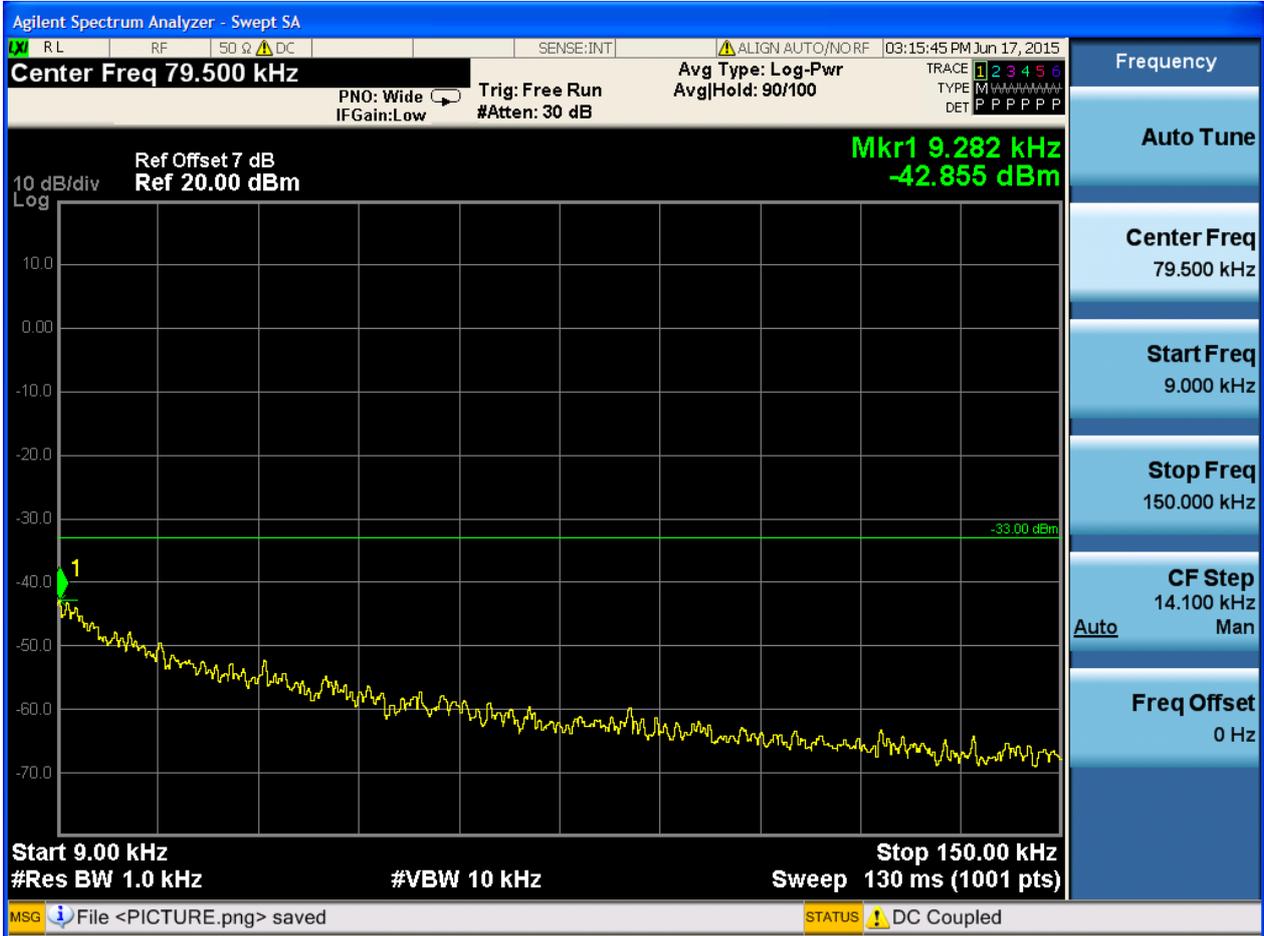


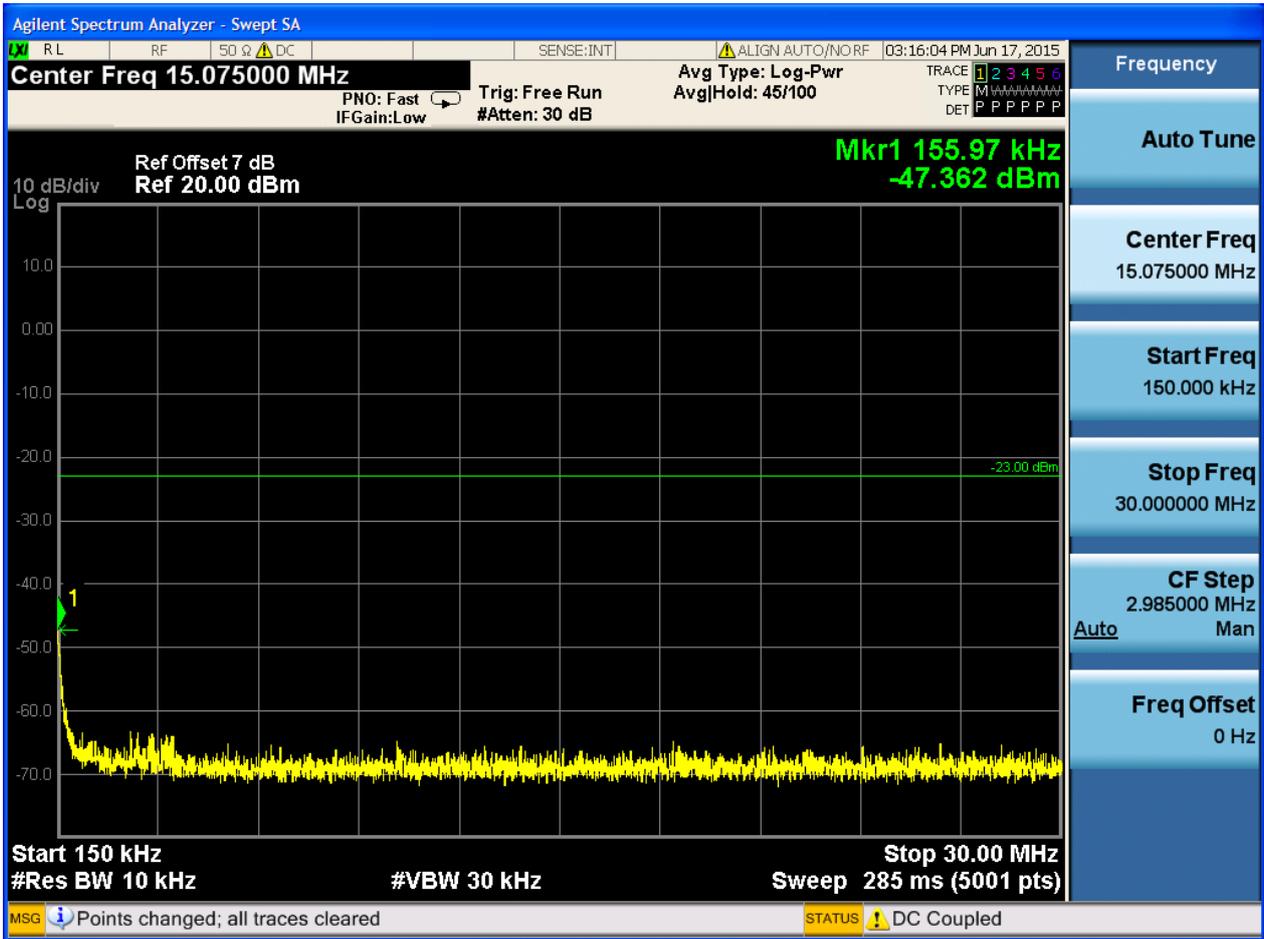


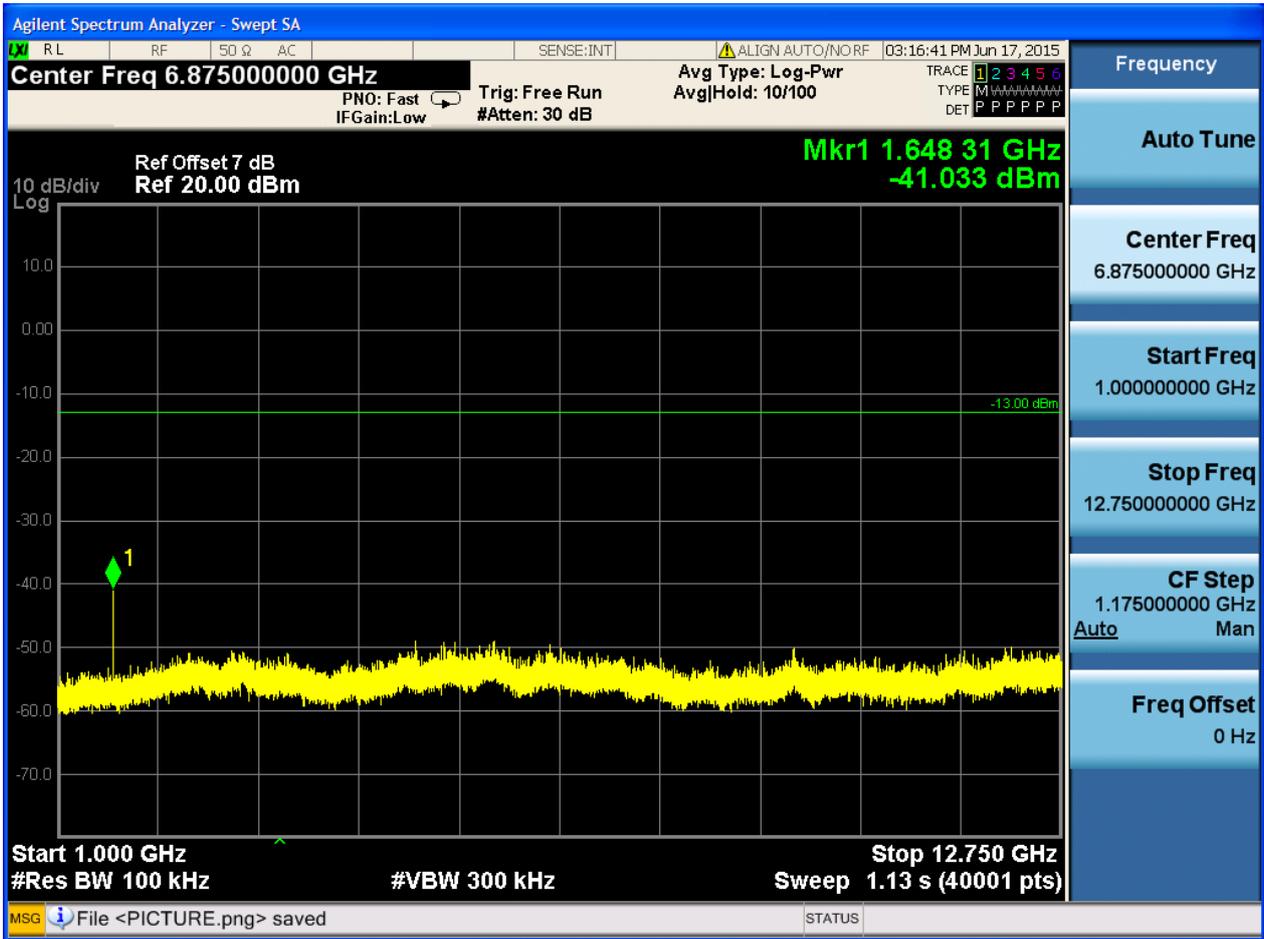


6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH

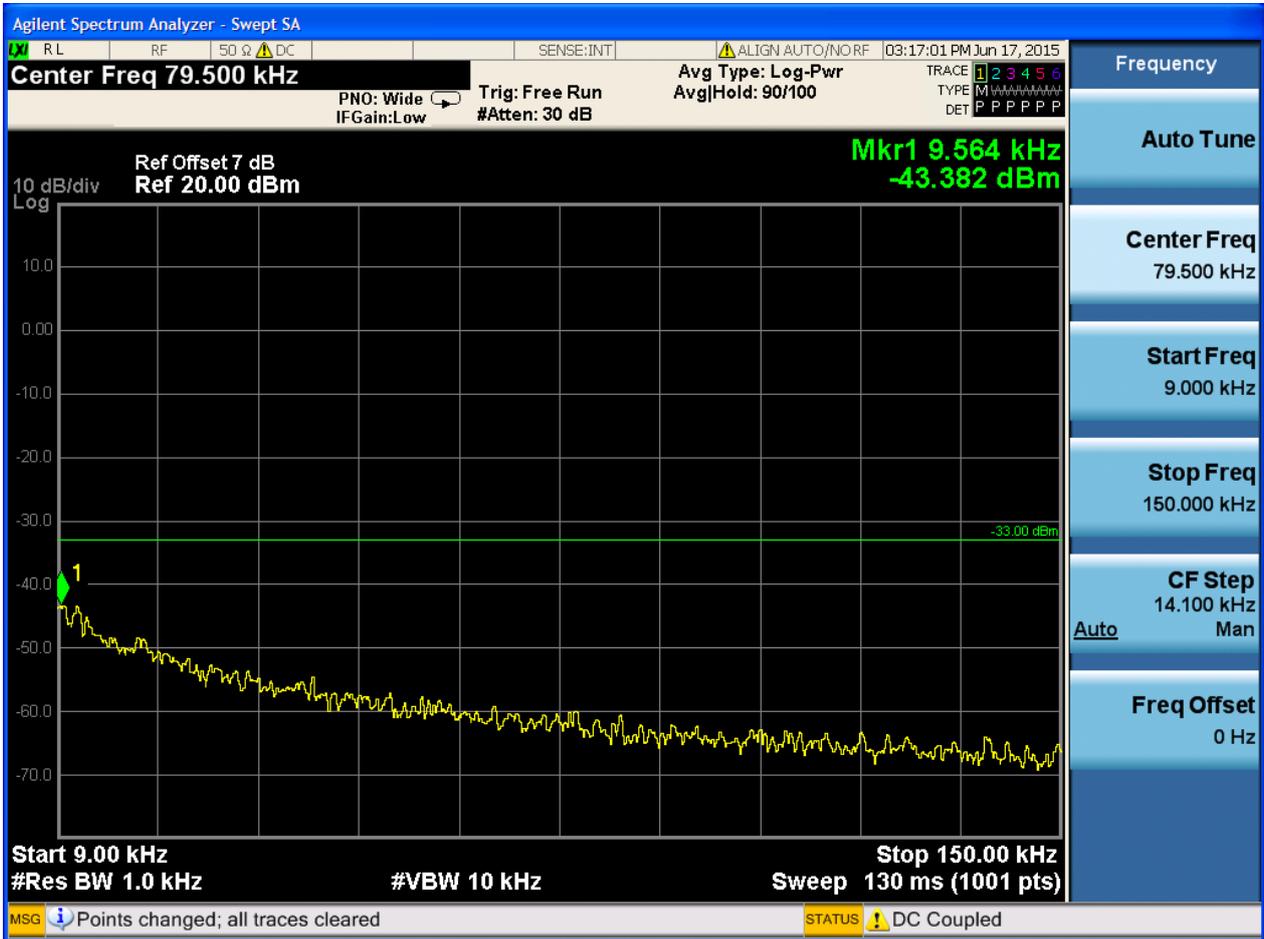


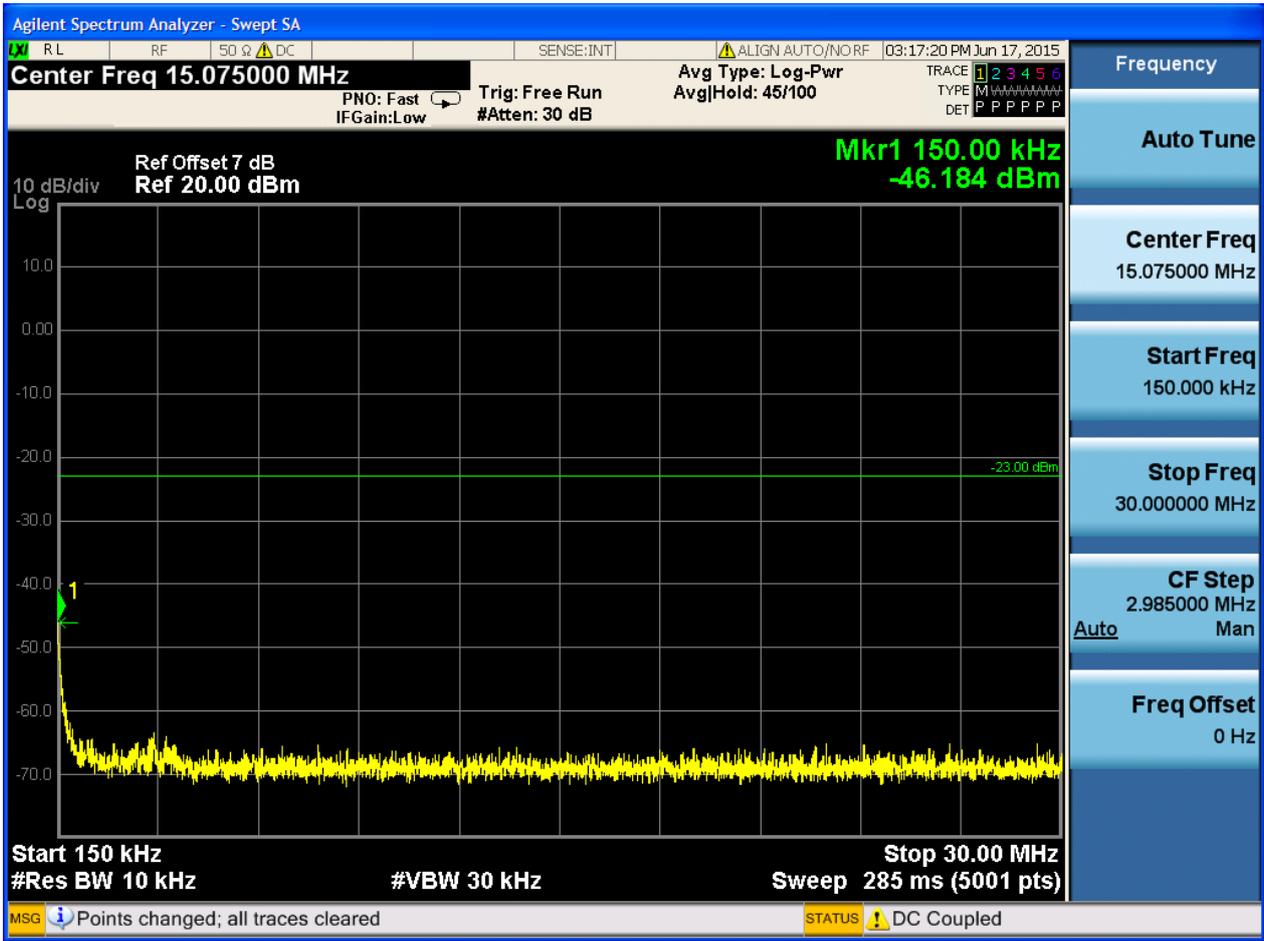


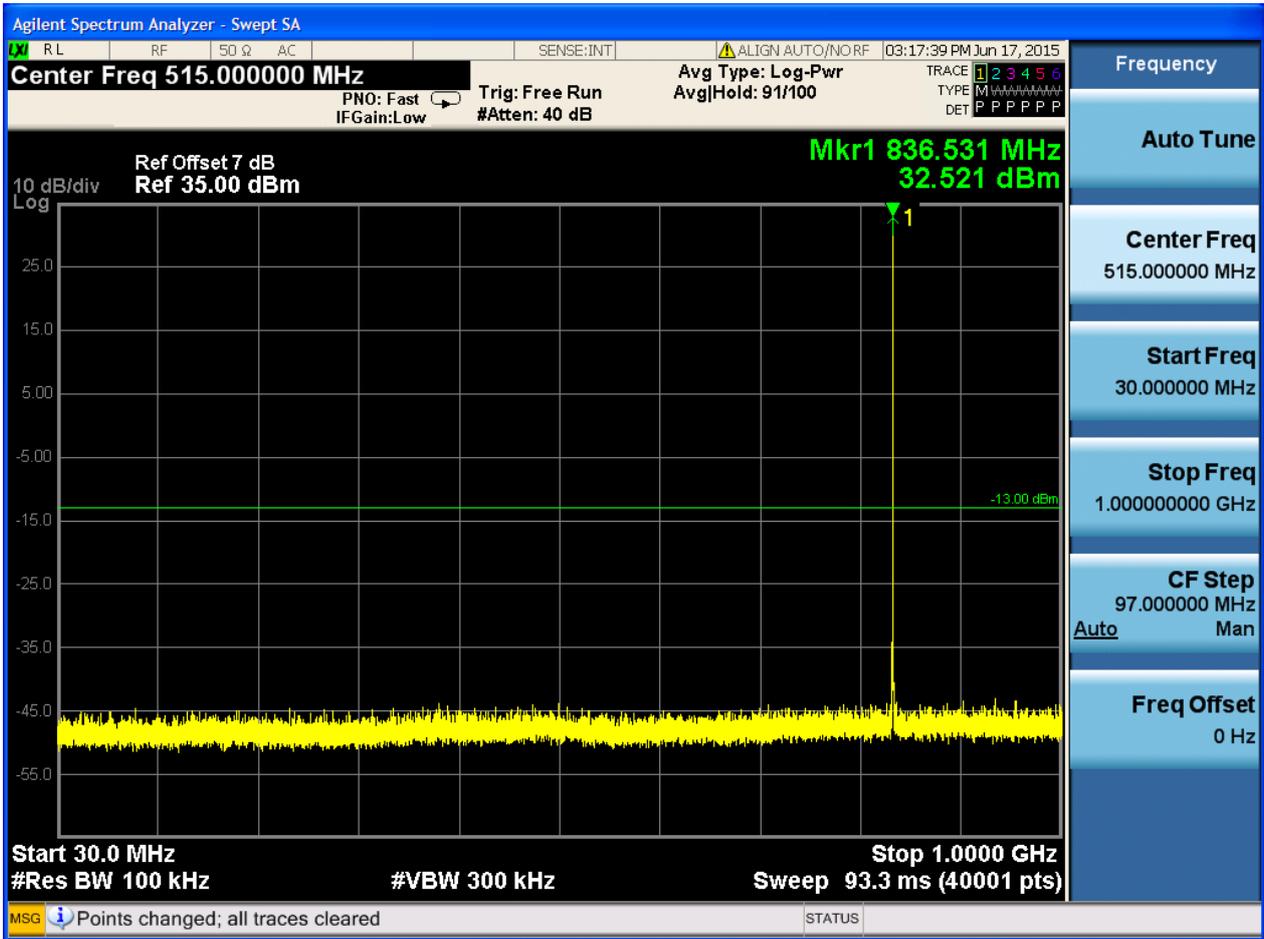


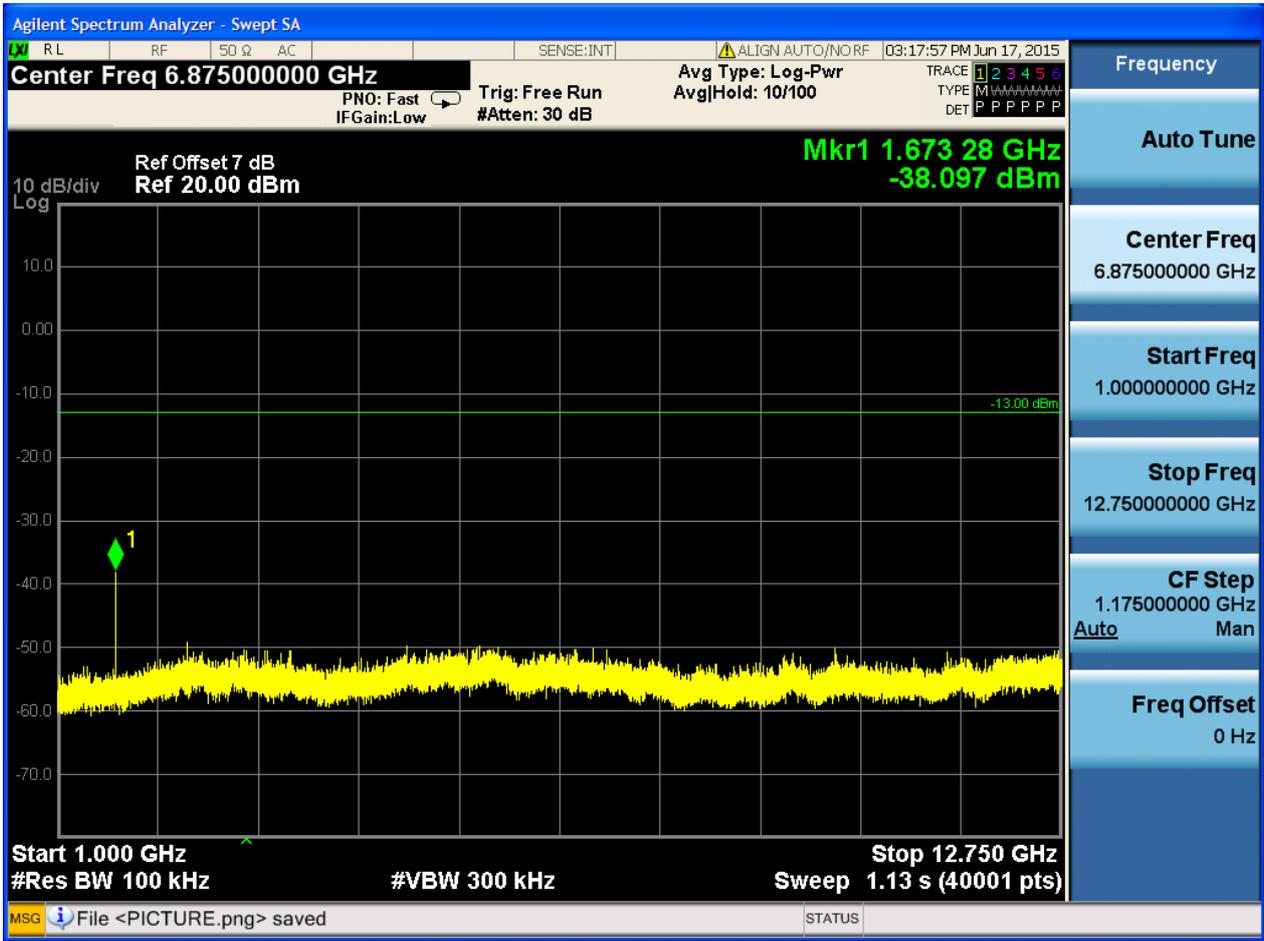


6.1.1.2.2 Test Channel = MCH



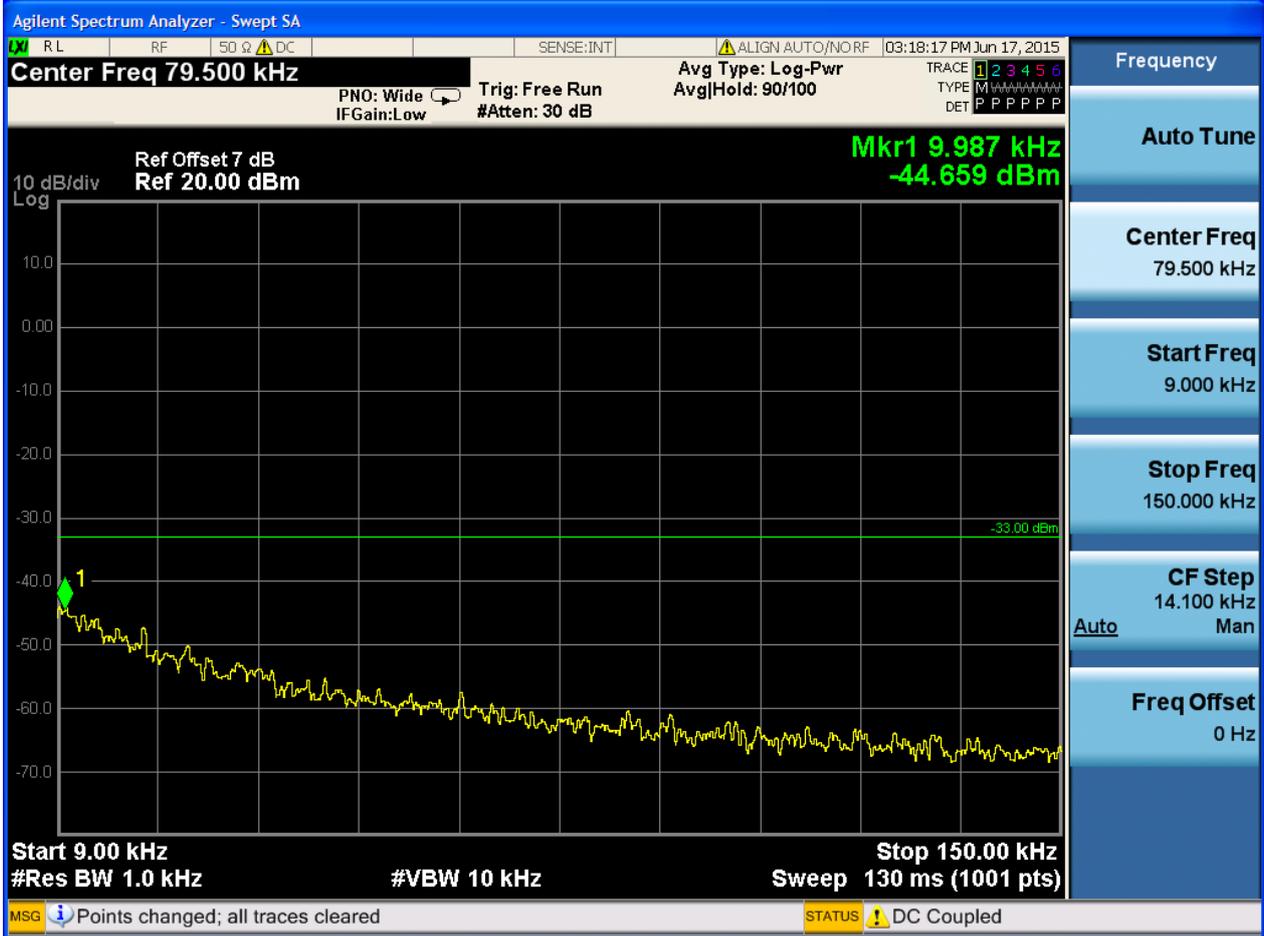


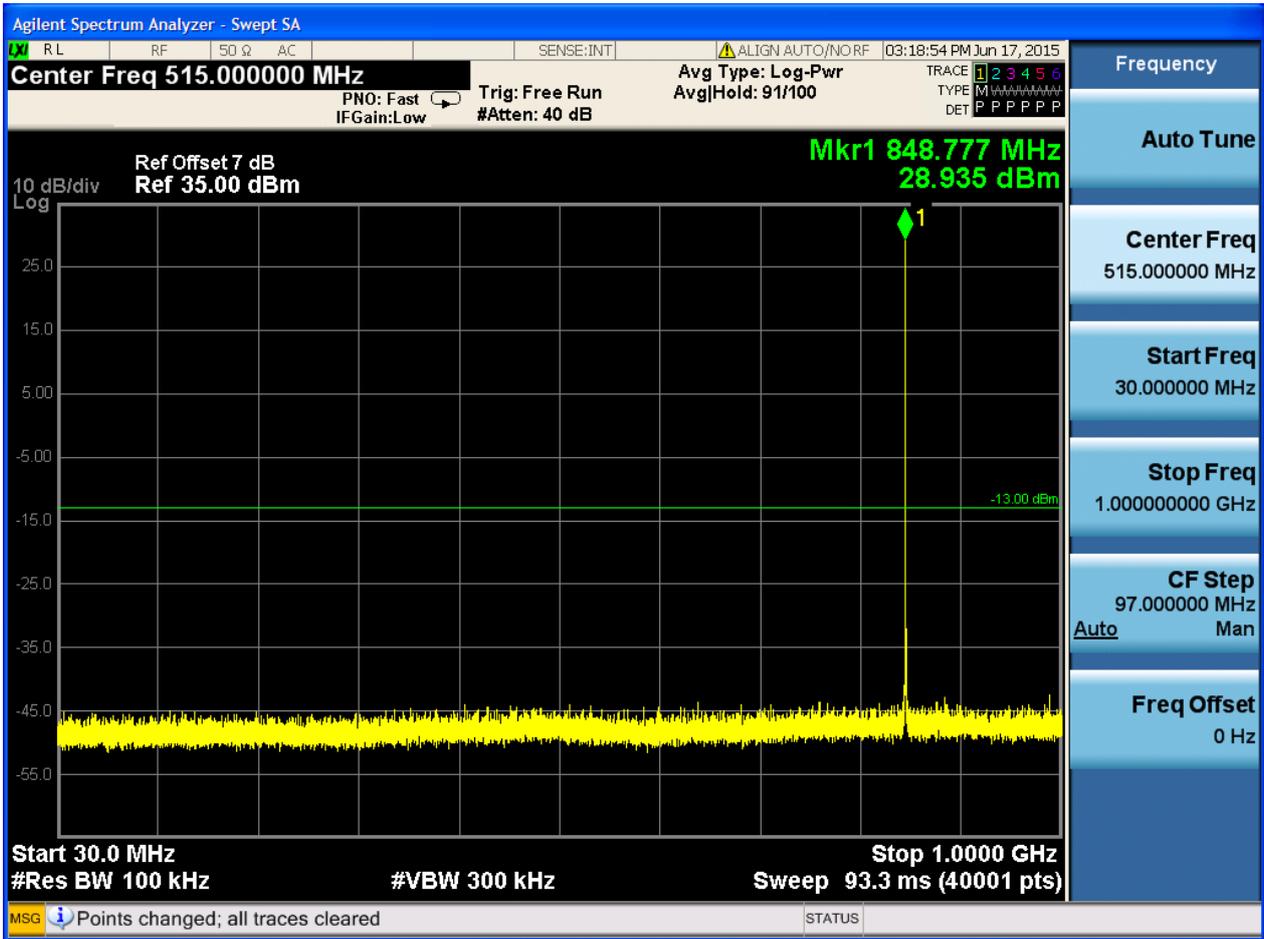


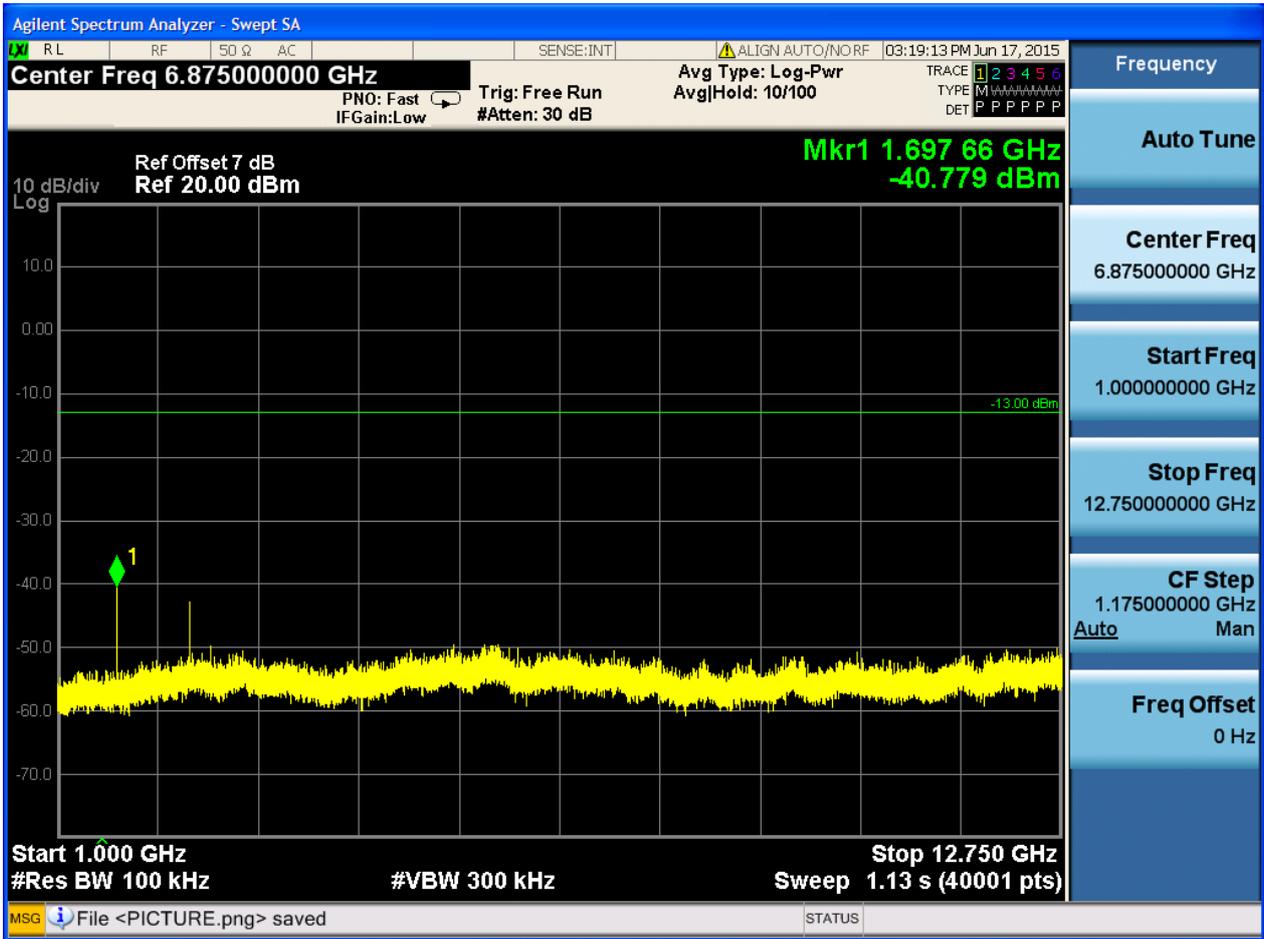




6.1.1.2.3 Test Channel = HCH





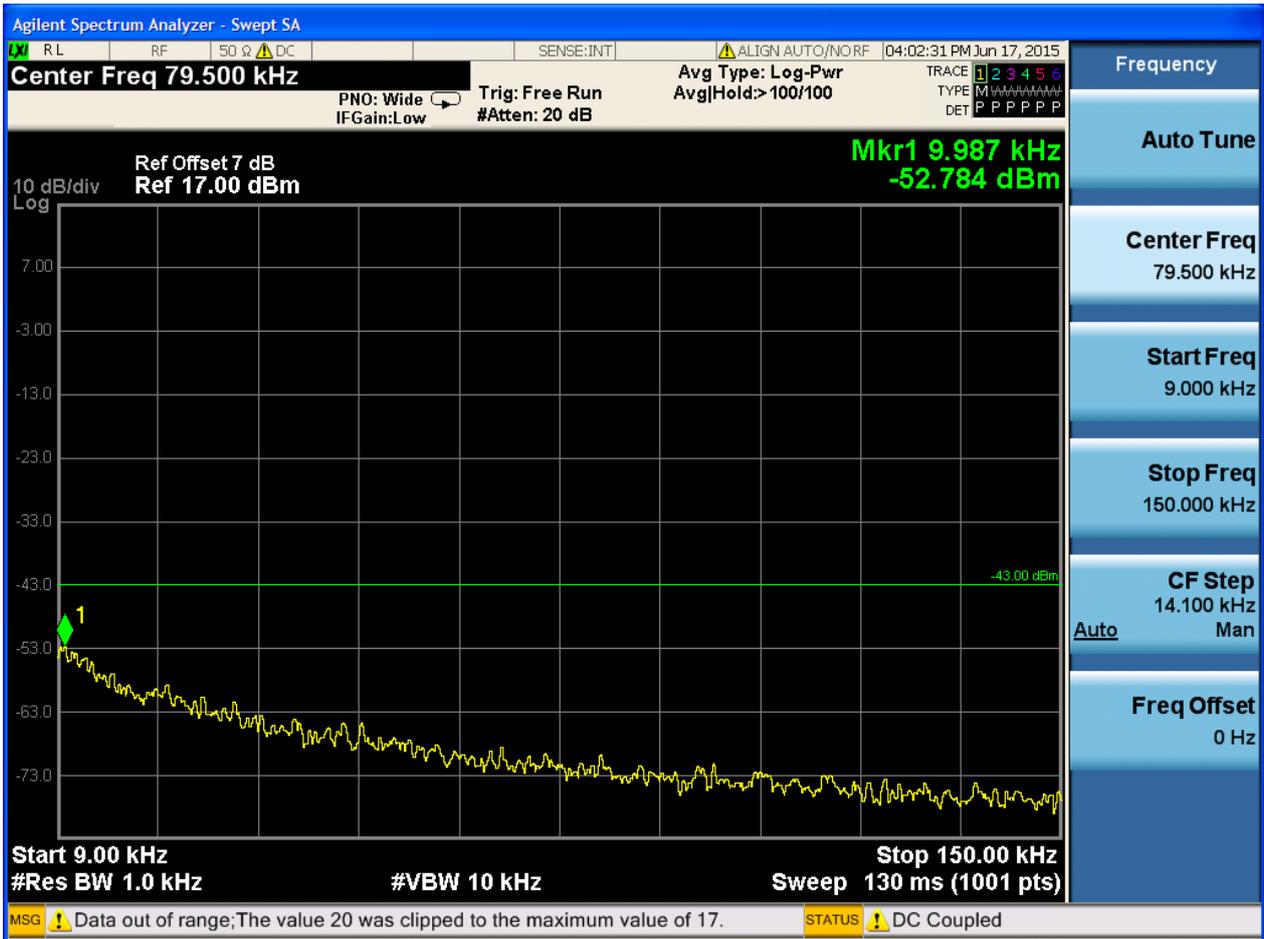


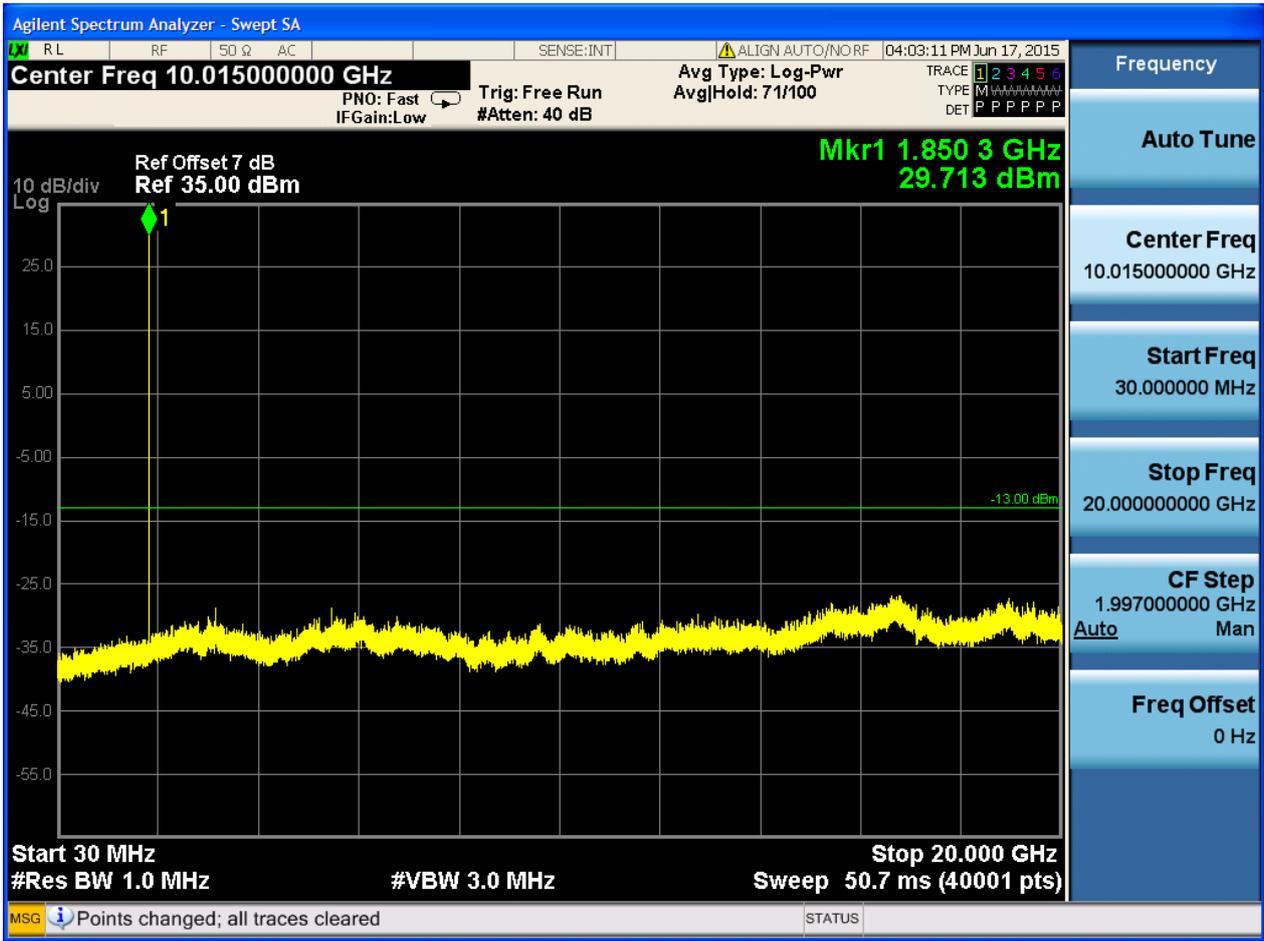


6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

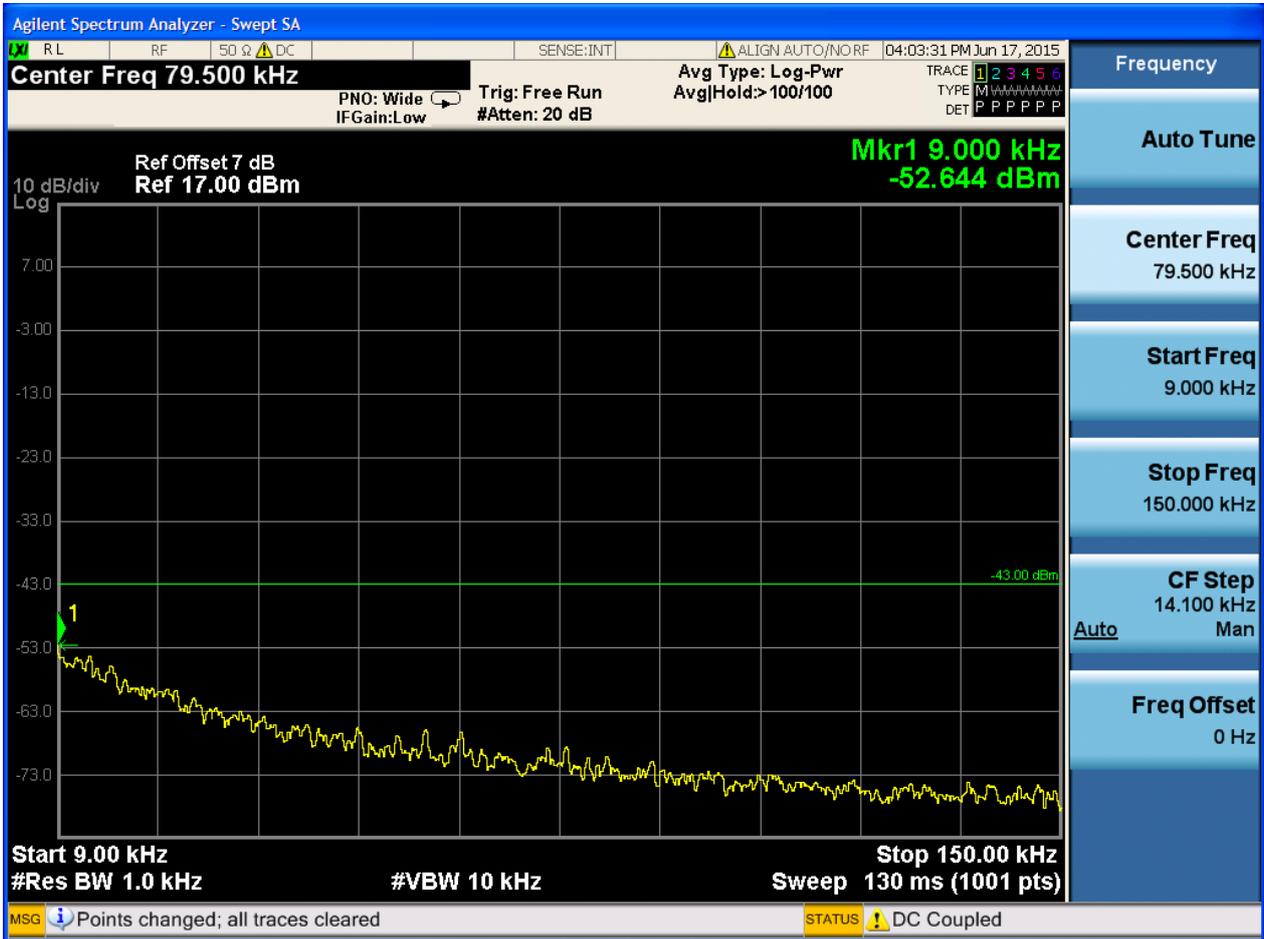
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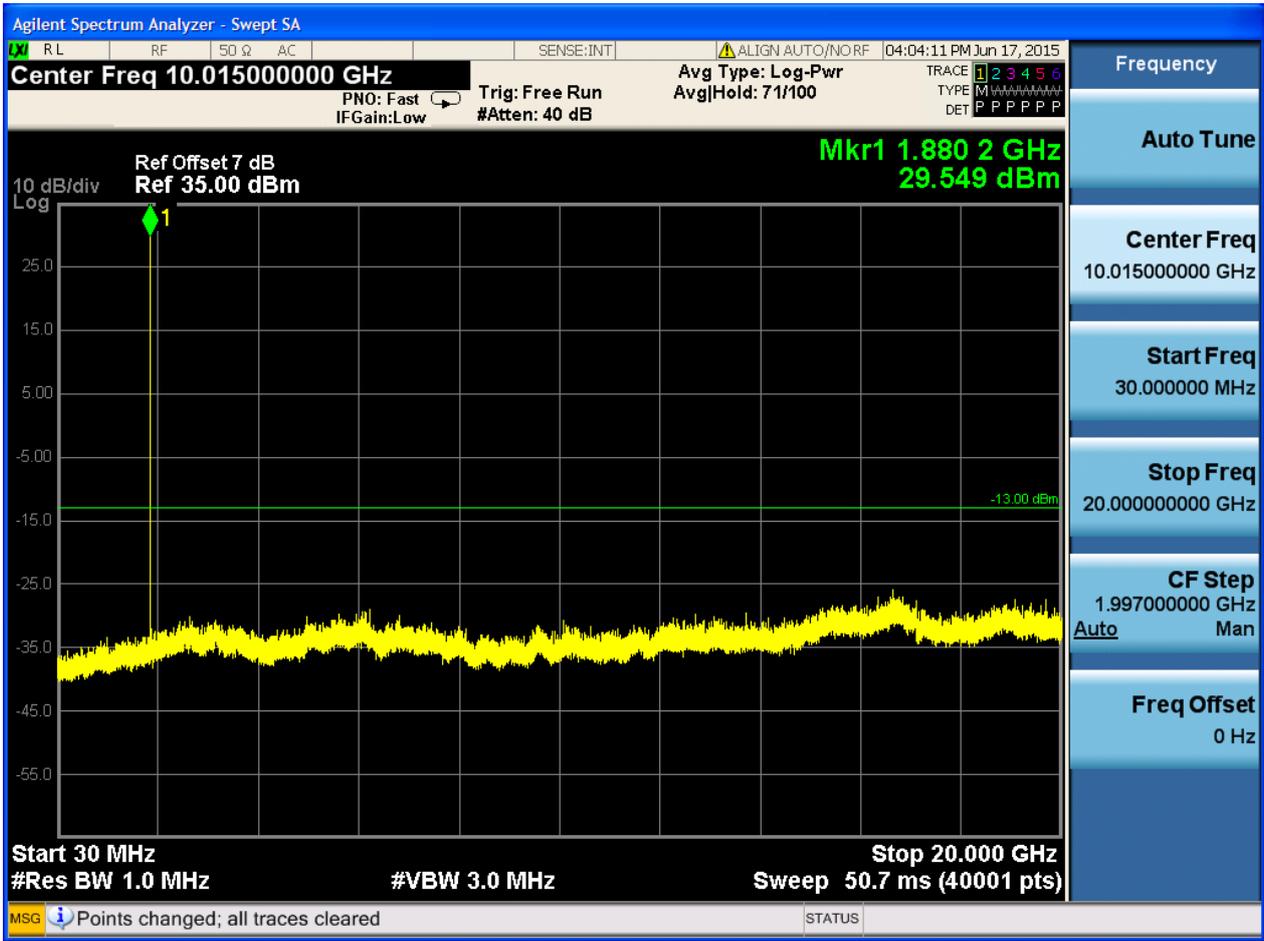






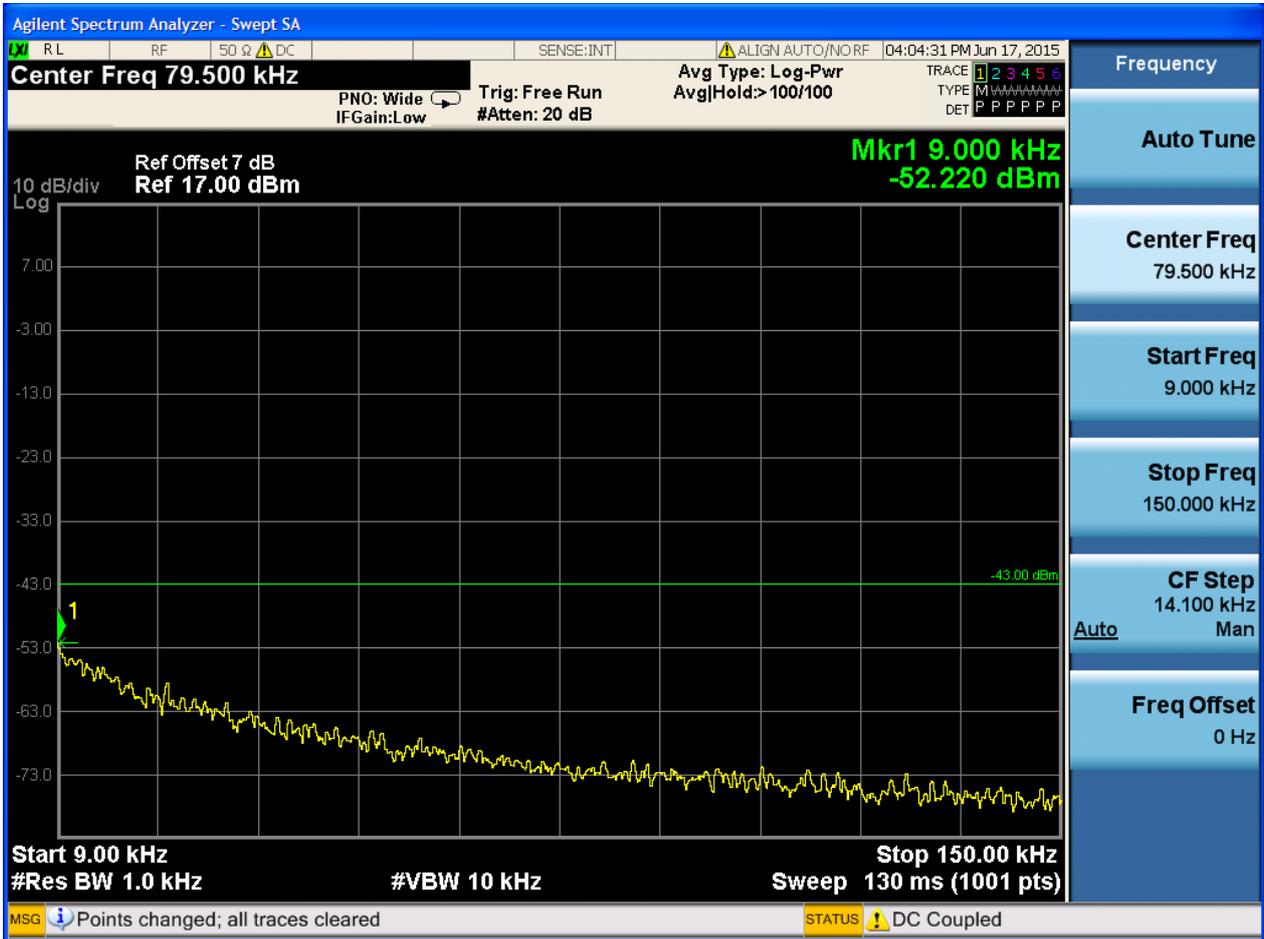
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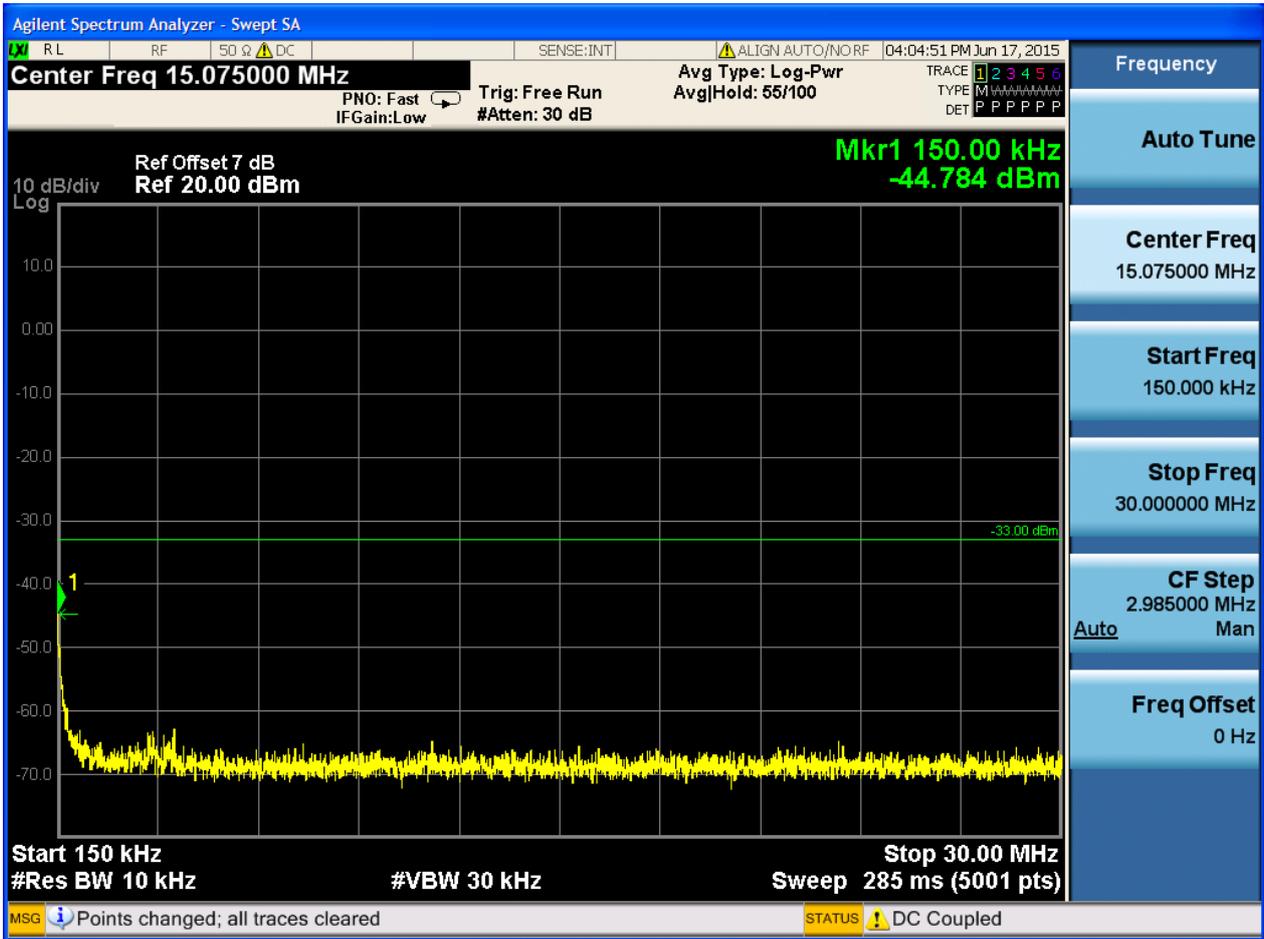


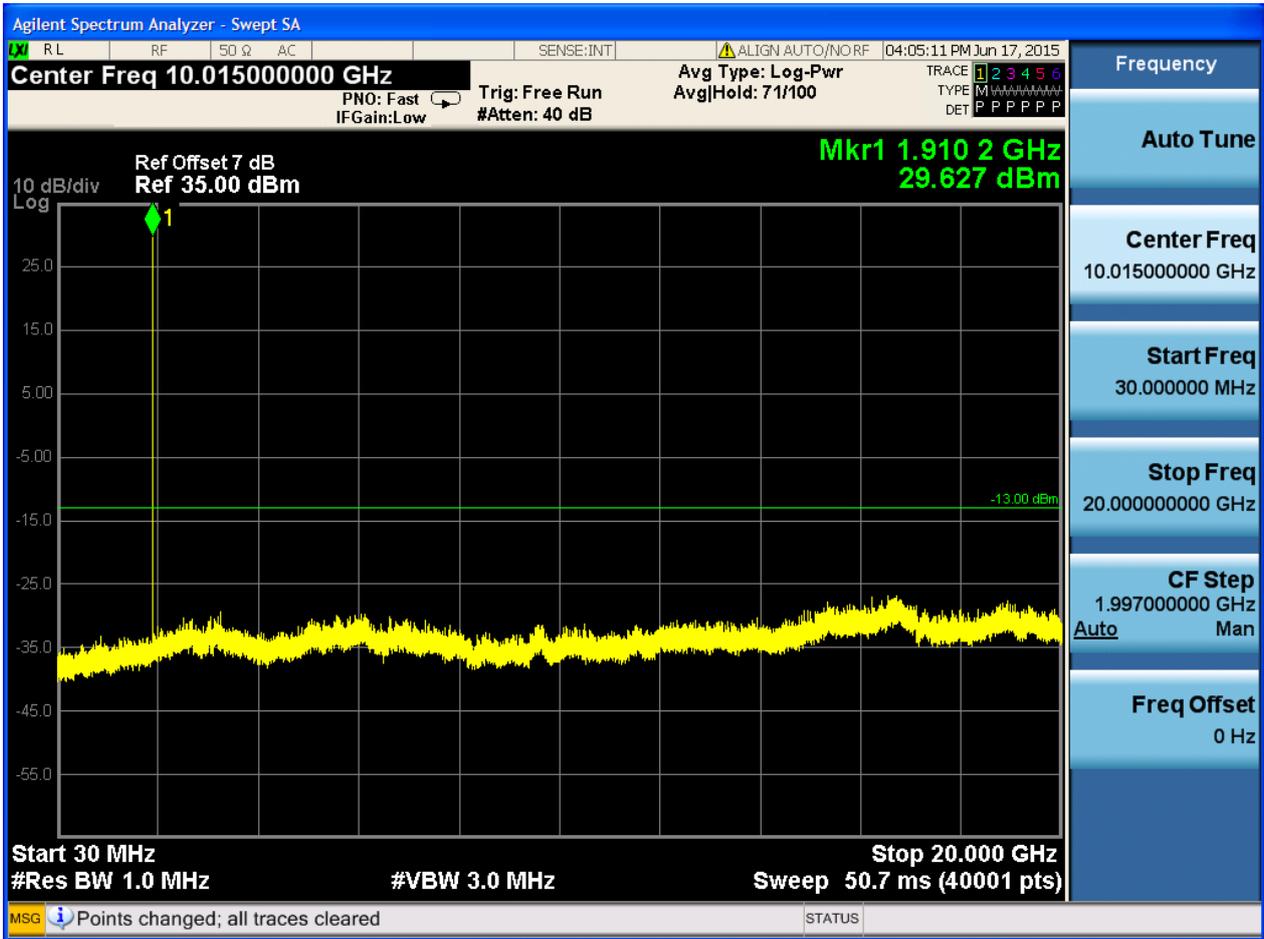




6.1.2.1.3 Test Channel = HCH



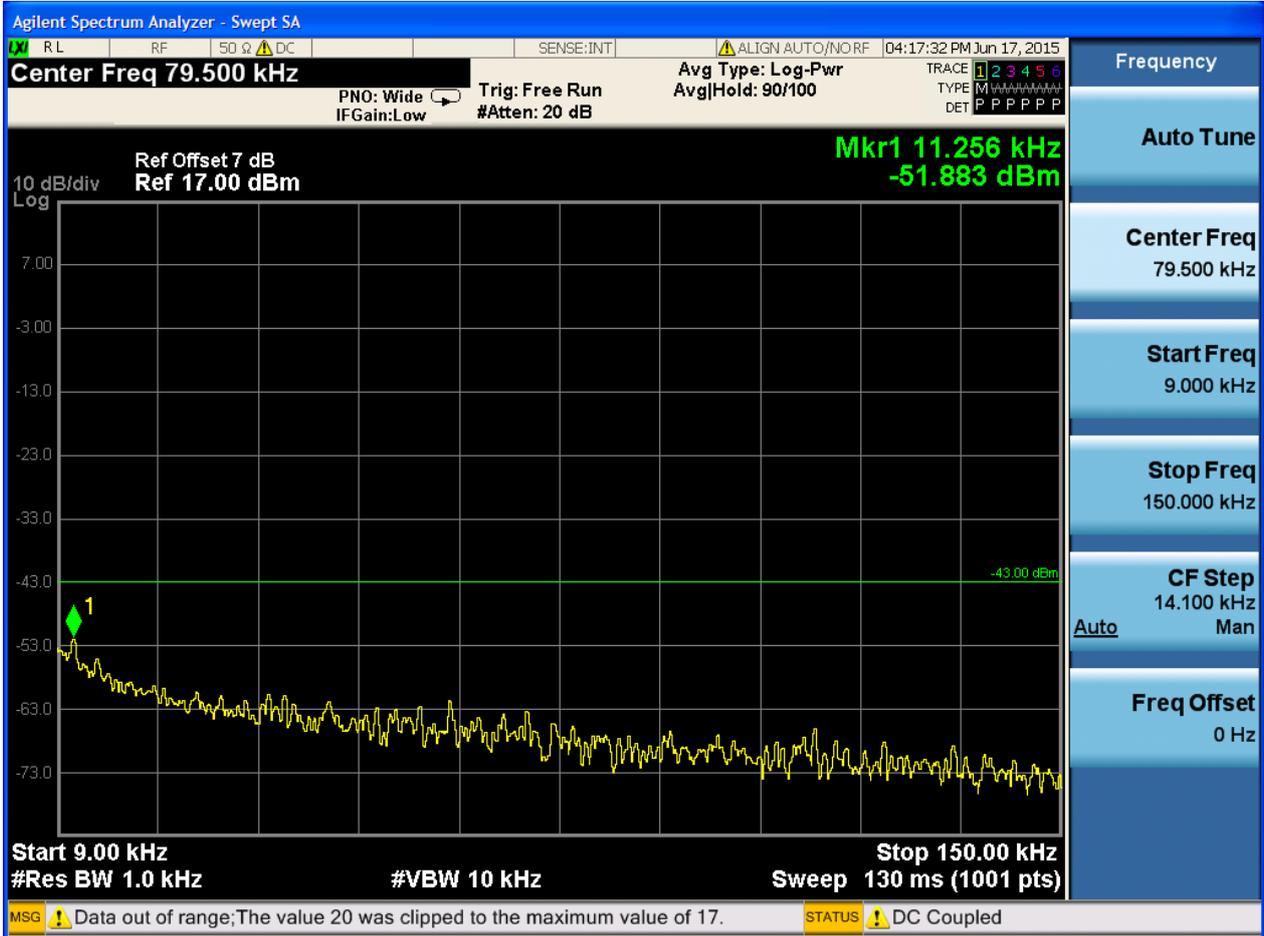


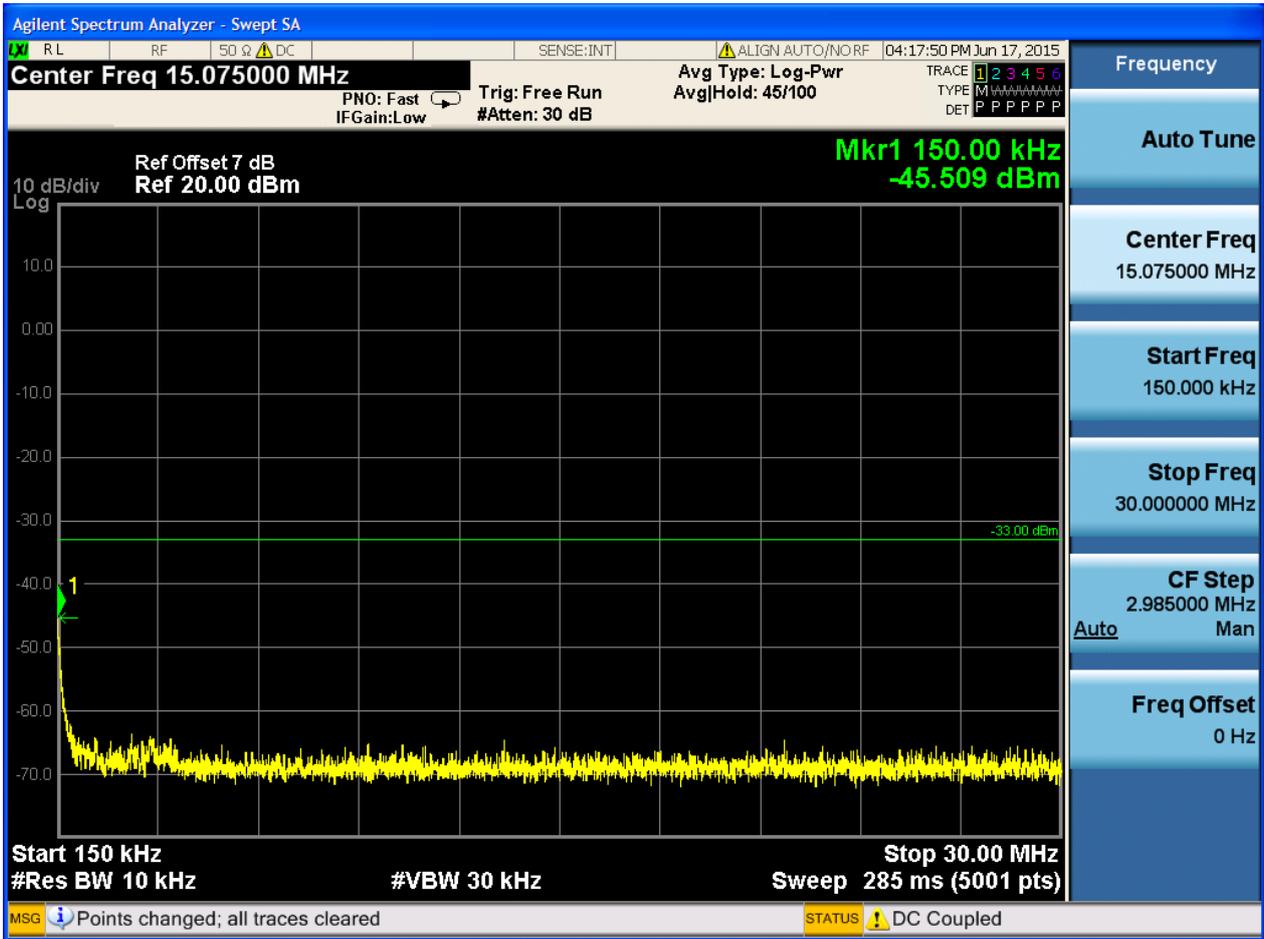




6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

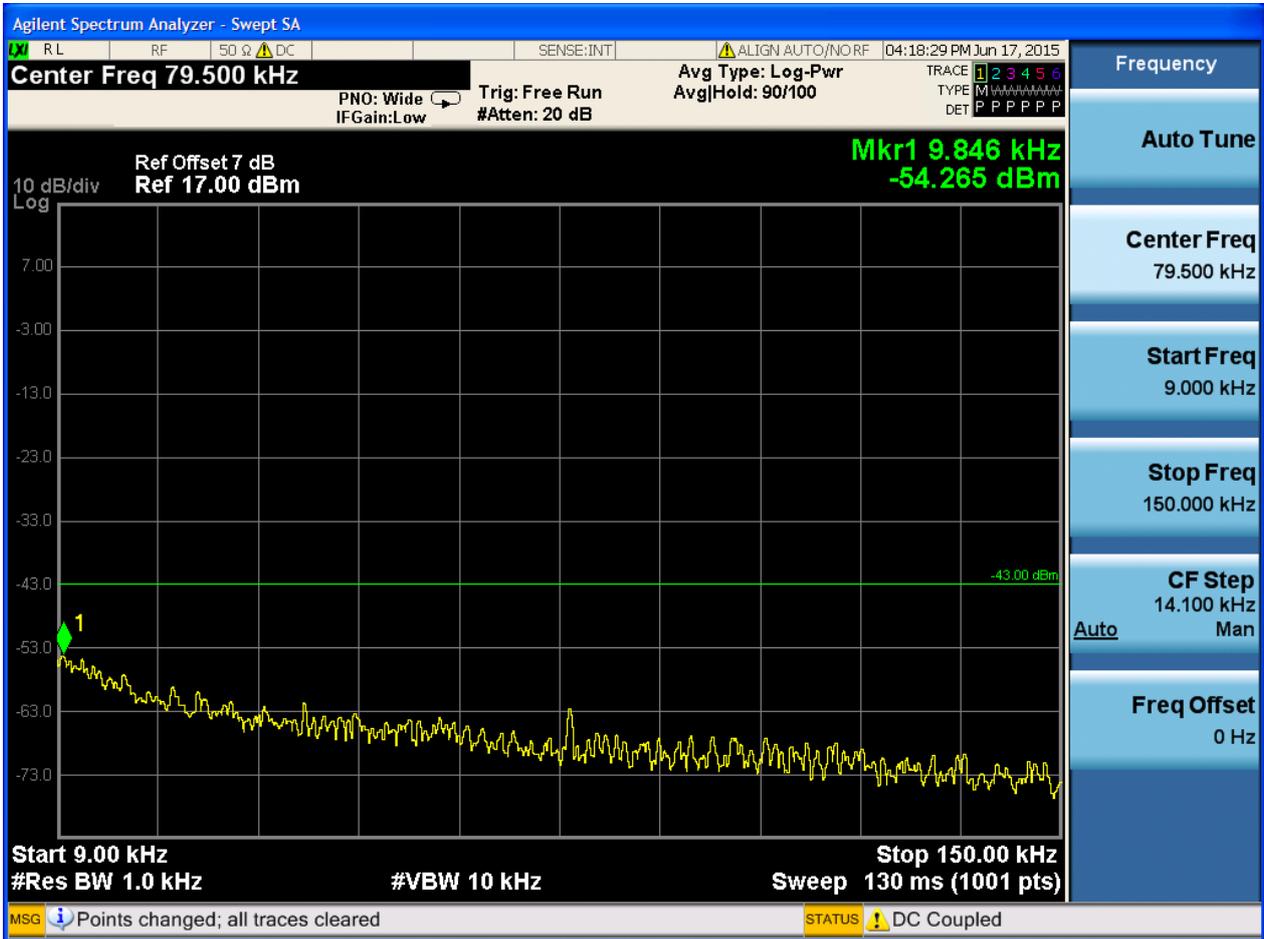


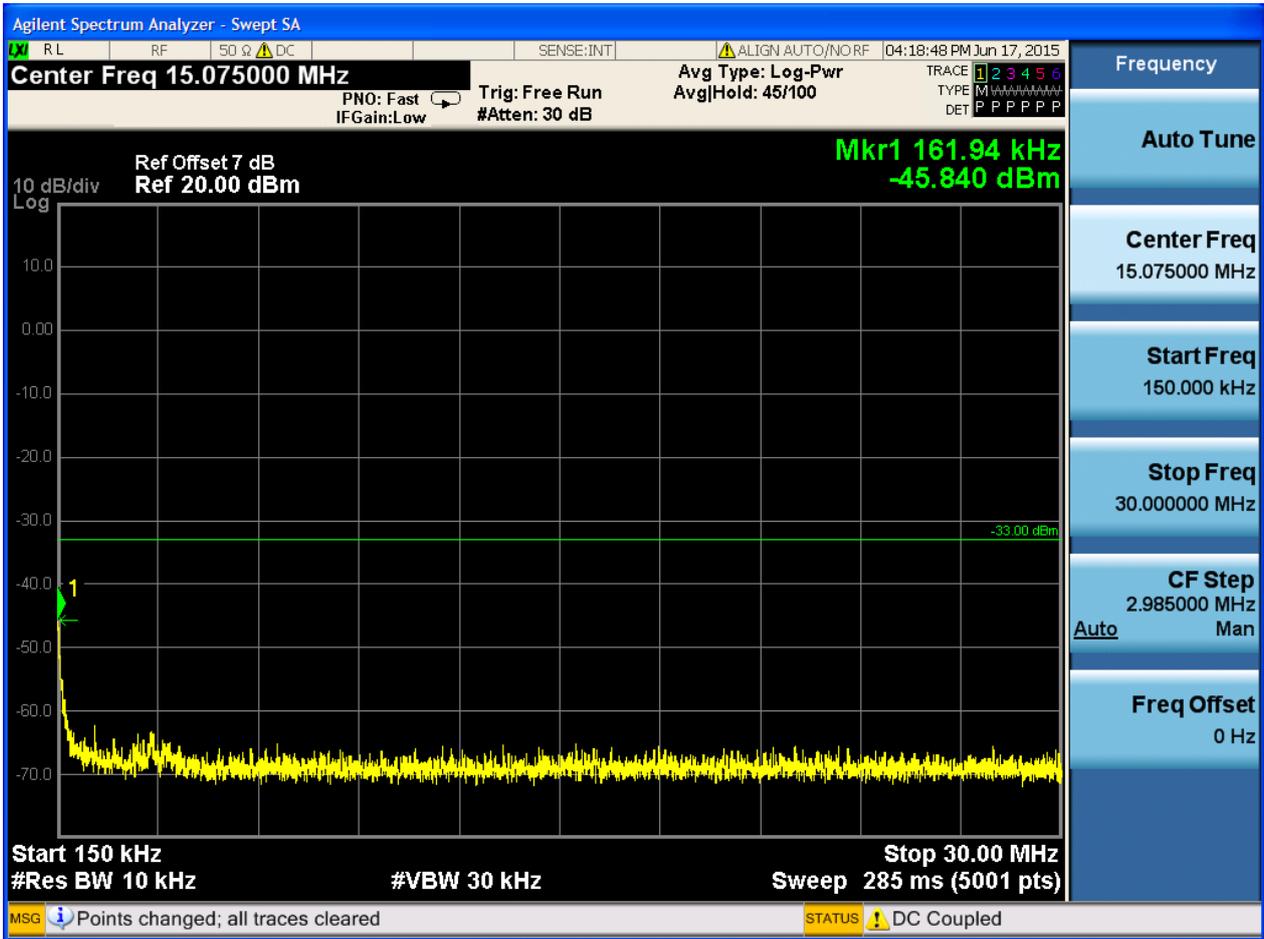






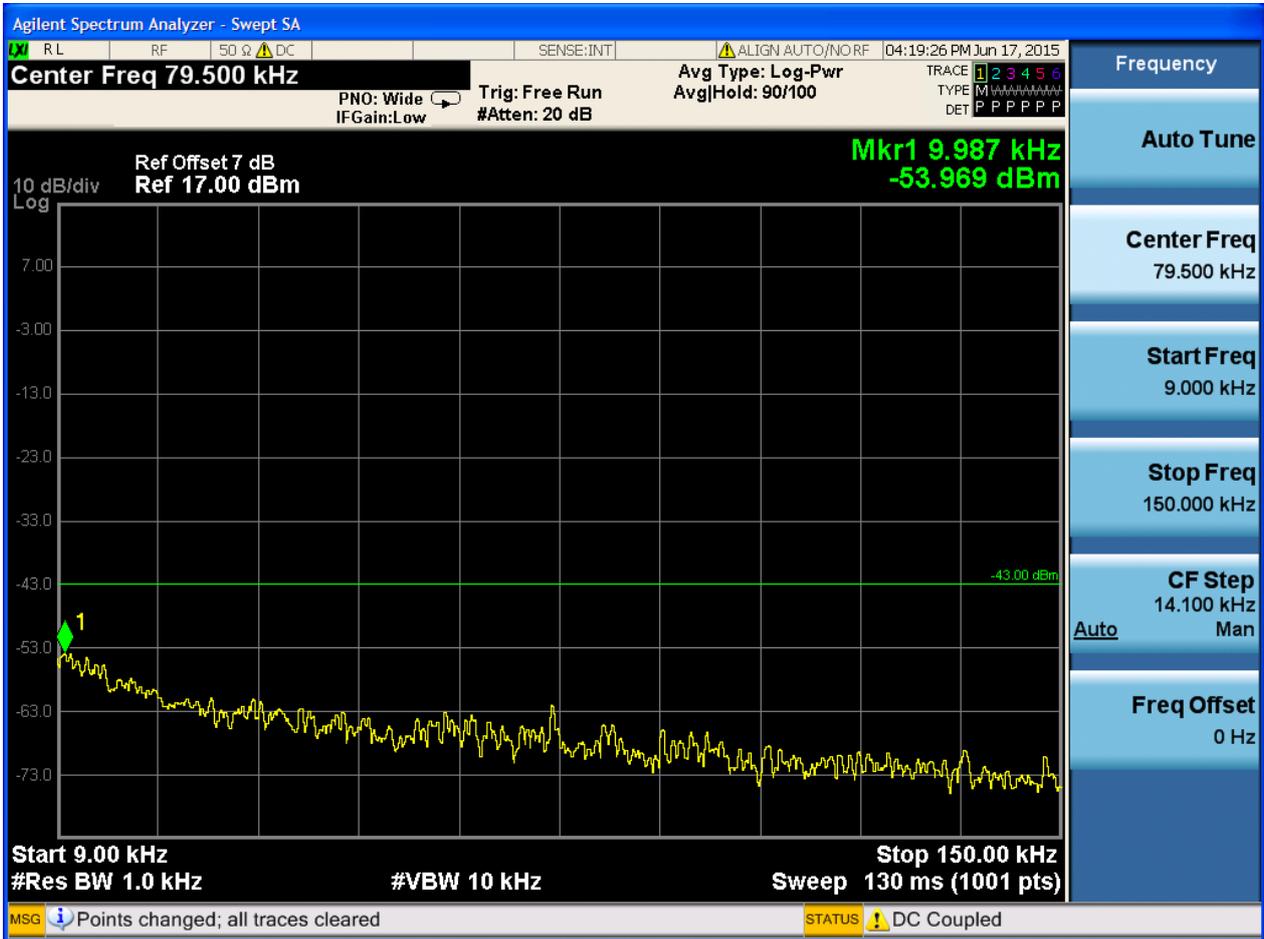
6.1.2.2.2 Test Channel = MCH

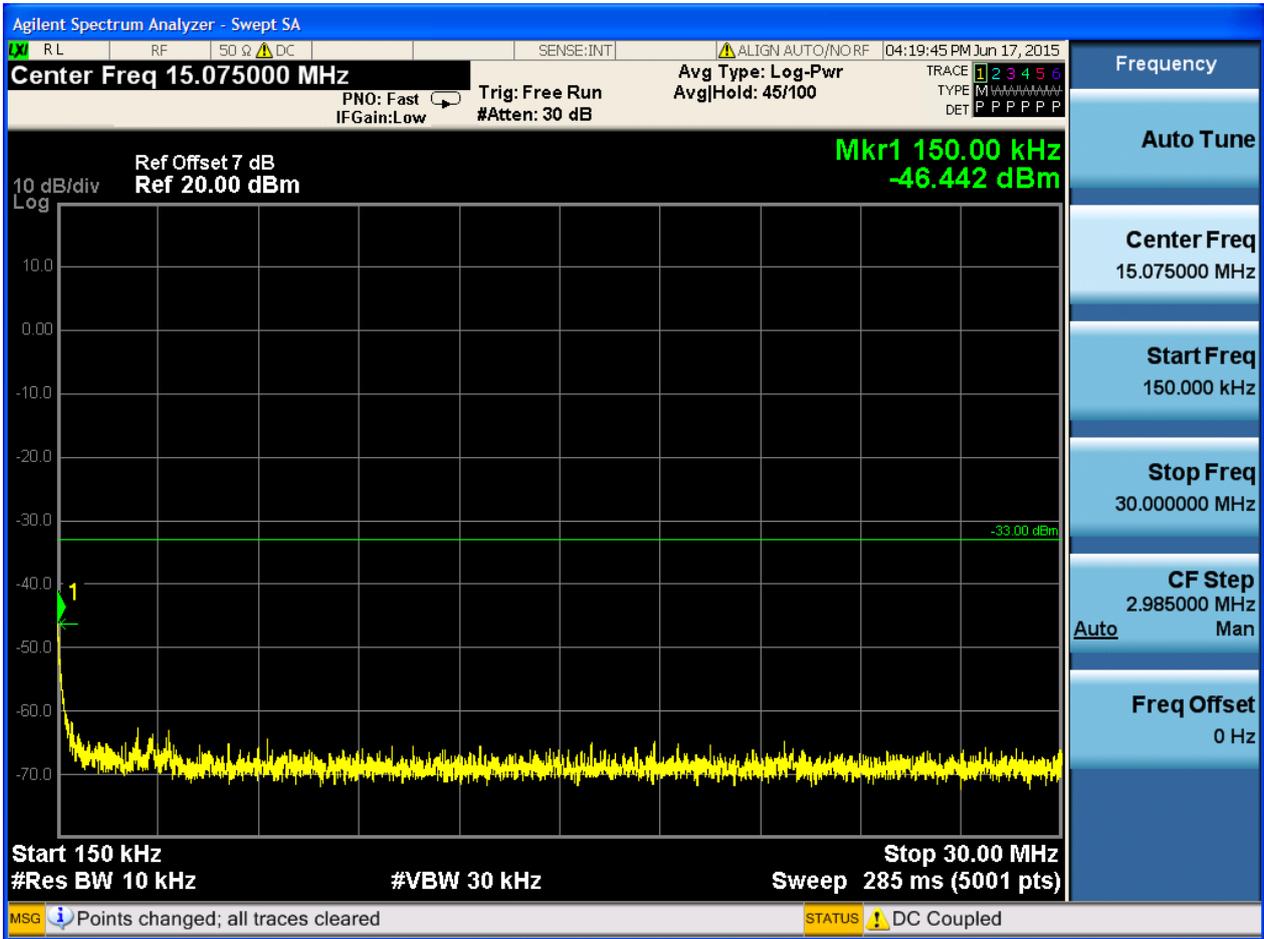


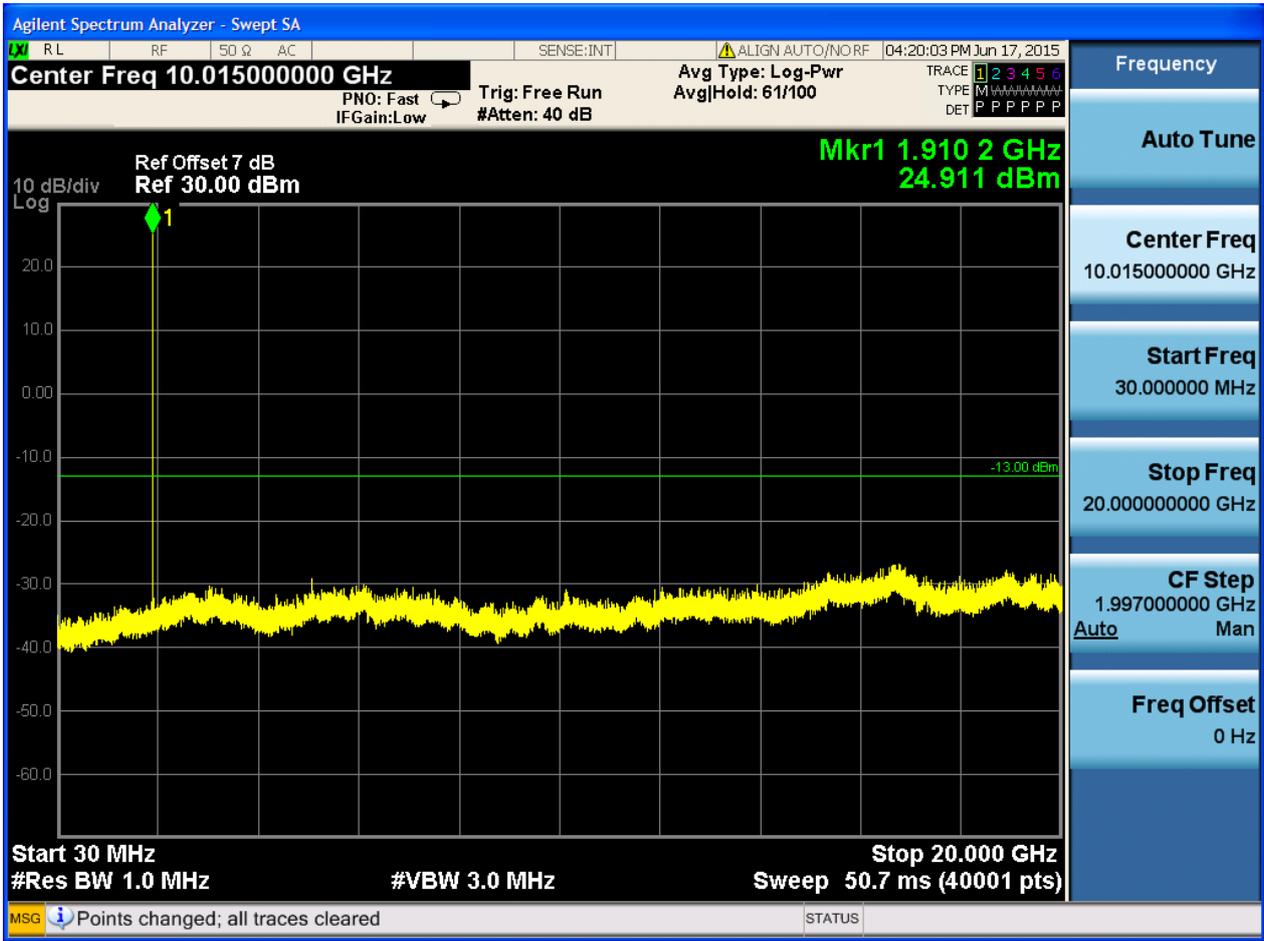




6.1.2.2.3 Test Channel = HCH









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

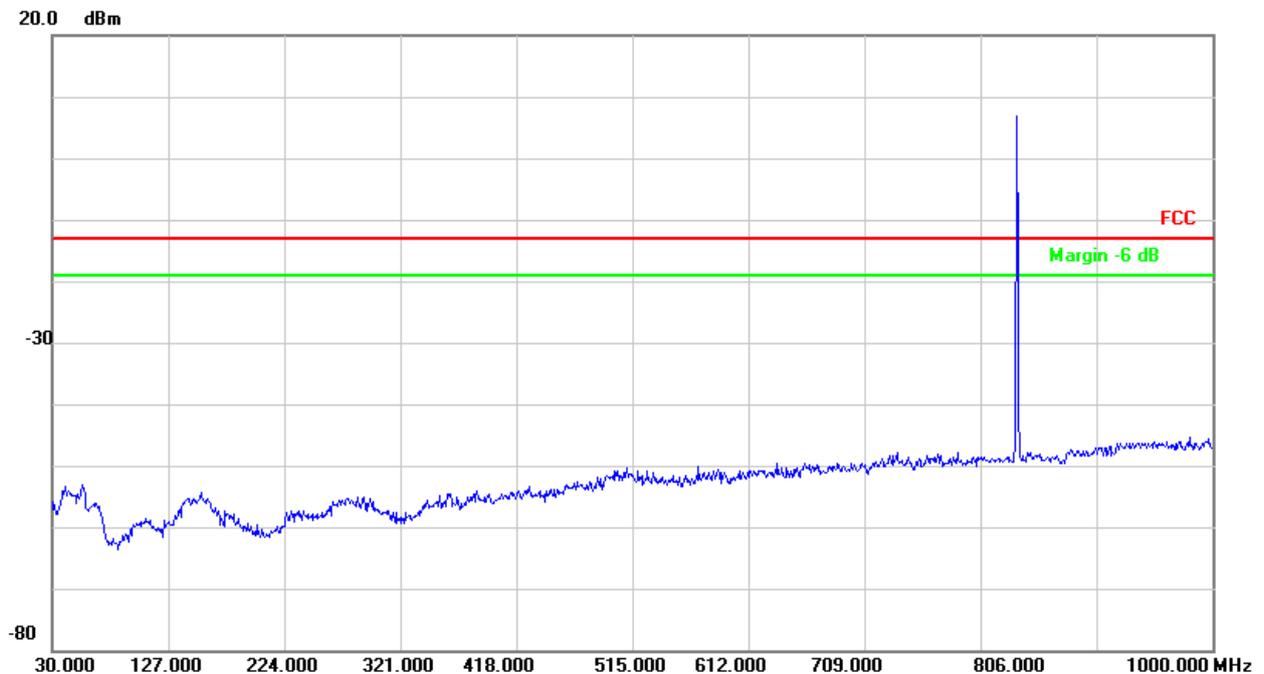
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

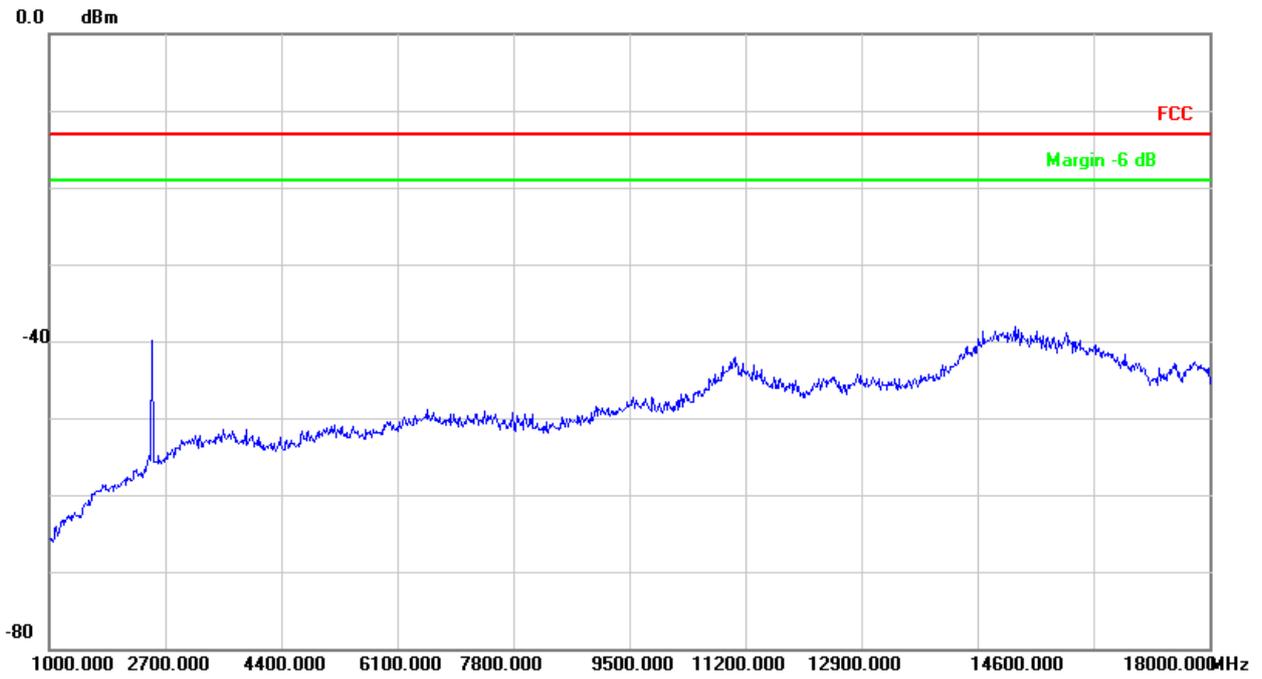
Part I - Test Plots

7.1 For GSM

7.1.1 Test Band = GSM850

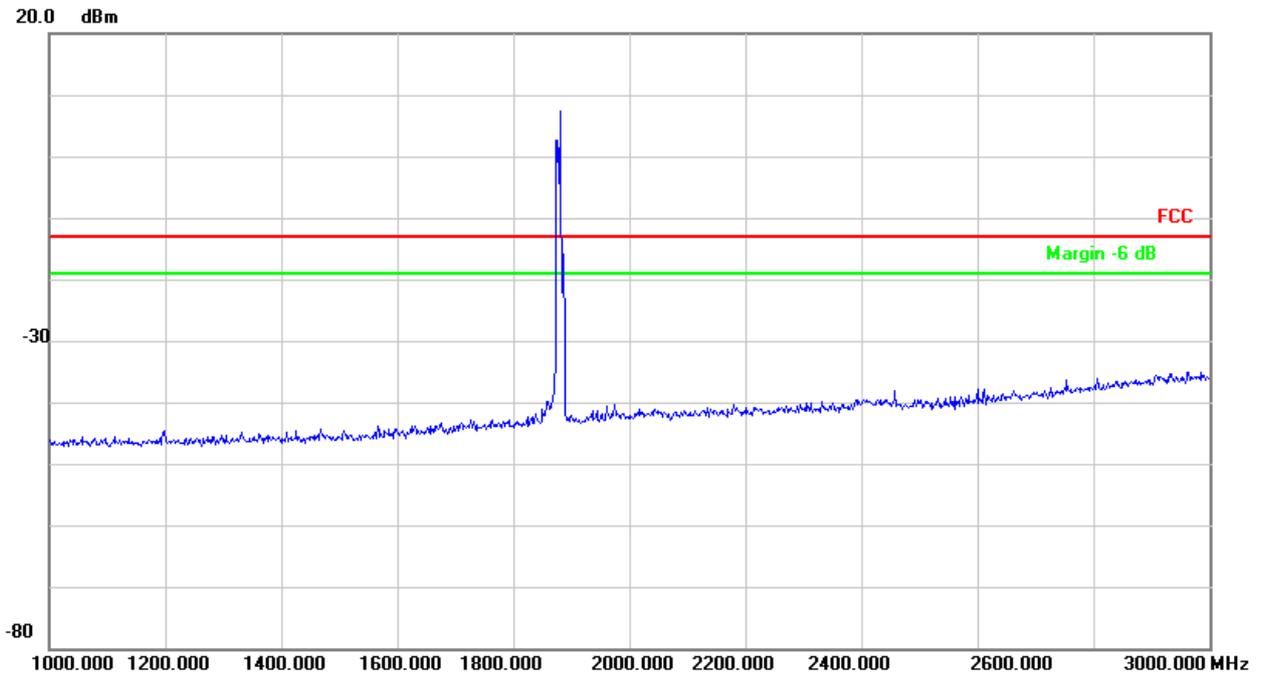
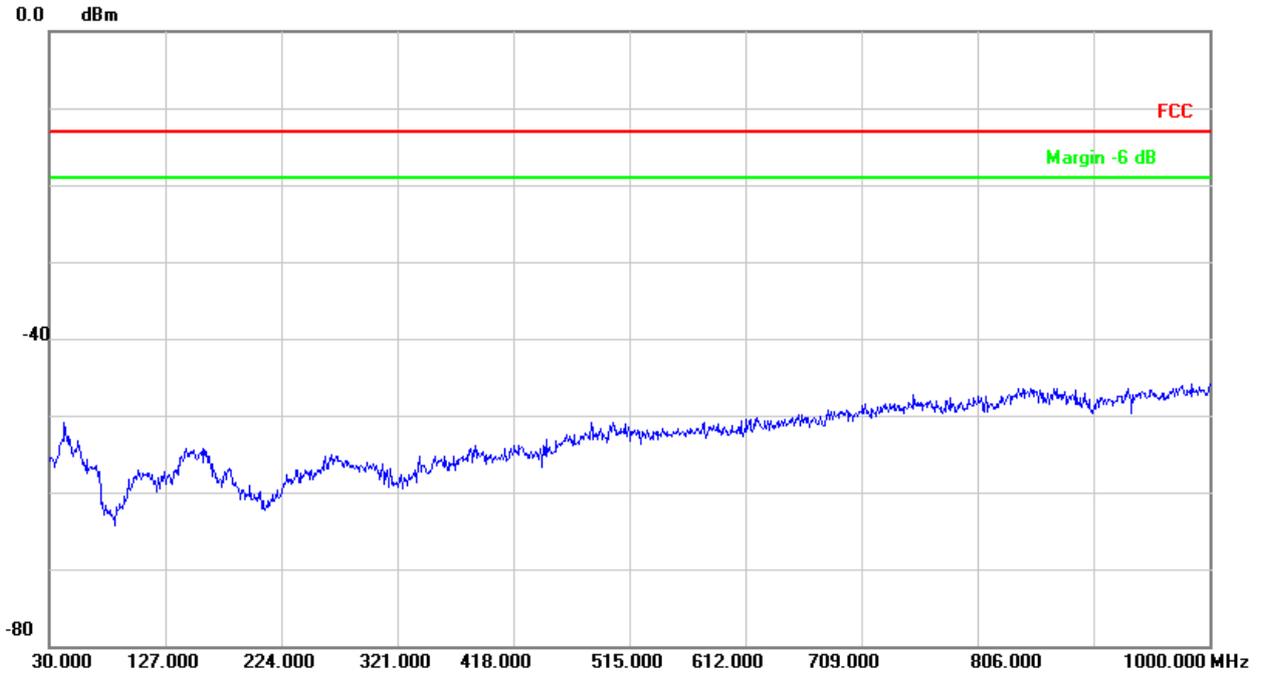
7.1.1.1 Test Mode = GSM/TM1

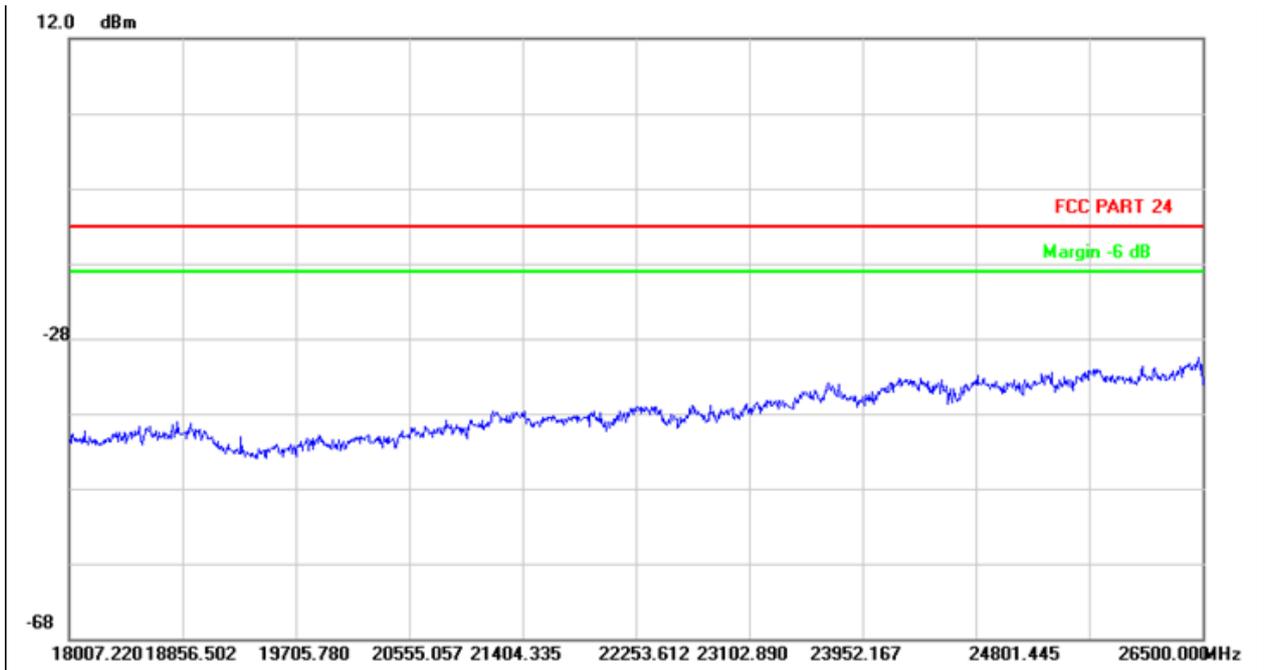
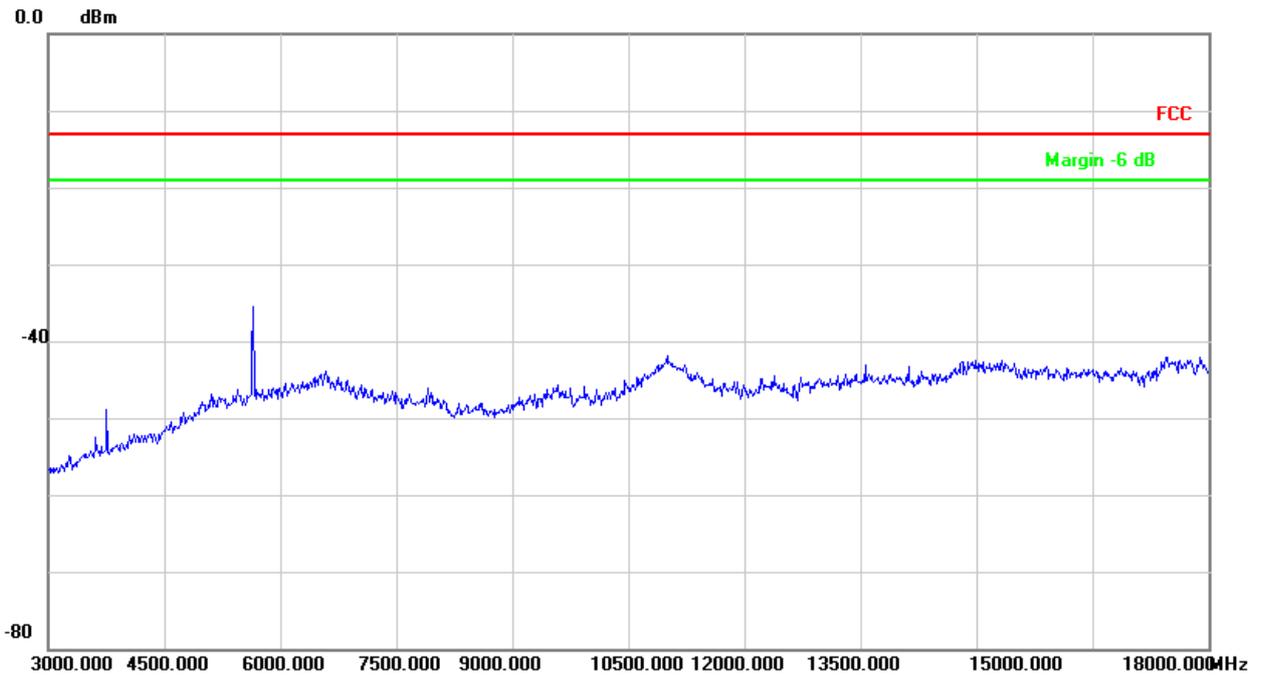




7.1.2 Test Band = GSM1900

7.1.2.1 Test Mode = GSM/TM1





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	1.49	0.00181	PASS
				VN	-1.87	-0.00227	PASS
				VH	-0.26	-0.00032	PASS
		MCH	TN	VL	1.36	0.00163	PASS
				VN	3.03	0.00362	PASS
				VH	1.16	0.00139	PASS
		HCH	TN	VL	4.78	0.00563	PASS
				VN	4.78	0.00563	PASS
				VH	4.46	0.00525	PASS
	GSM/TM2	LCH	TN	VL	8.46	0.01026	PASS
				VN	7.72	0.00937	PASS
				VH	6.2	0.00752	PASS
		MCH	TN	VL	6.01	0.00718	PASS
				VN	9.17	0.01096	PASS
				VH	1.16	0.00139	PASS
		HCH	TN	VL	4.26	0.00502	PASS
				VN	11.62	0.01369	PASS
				VH	9.49	0.01118	PASS
GSM1900	GSM/TM1	LCH	TN	VL	19.37	0.01047	PASS
				VN	9.3	0.00503	PASS
				VH	10.78	0.00583	PASS
		MCH	TN	VL	21.76	0.01157	PASS
				VN	13.88	0.00738	PASS
				VH	19.18	0.0102	PASS
		HCH	TN	VL	-4	-0.00209	PASS
				VN	0.06	0.00003	PASS
				VH	15.69	0.00822	PASS
	GSM/TM2	LCH	TN	VL	19.08	0.01031	PASS
				VN	17.11	0.00925	PASS
				VH	14.53	0.00785	PASS
		MCH	TN	VL	21.02	0.01118	PASS
				VN	21.76	0.01157	PASS
				VH			

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VH	20.34	0.01082	PASS
		HCH	TN	VL	22.21	0.01163	PASS
				VN	-4.78	-0.0025	PASS
				VH	-2.65	-0.00139	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	0.58	0.0007	PASS
				-20	-0.32	-0.00039	PASS
				-10	-0.84	-0.00102	PASS
				0	-4.58	-0.00556	PASS
				10	-3.55	-0.00431	PASS
				20	-1.81	-0.0022	PASS
				30	-2.52	-0.00306	PASS
				40	-5.1	-0.00619	PASS
		50	-1.1	-0.00133	PASS		
		MCH	VN	-30	2.2	0.00263	PASS
				-20	2.26	0.0027	PASS
				-10	1.42	0.0017	PASS
				0	-0.45	-0.00054	PASS
				10	0.71	0.00085	PASS
				20	2.52	0.00301	PASS
				30	3.03	0.00362	PASS
				40	1.29	0.00154	PASS
		50	1.68	0.00201	PASS		
		HCH	VN	-30	-0.06	-0.00007	PASS
				-20	3.16	0.00372	PASS
				-10	4.39	0.00517	PASS
				0	2.97	0.0035	PASS
				10	5.04	0.00594	PASS
				20	2.84	0.00335	PASS
	30			-0.97	-0.00114	PASS	
	40			3.16	0.00372	PASS	
	50	3.87	0.00456	PASS			
	GSM/TM2	LCH	VN	-30	6.81	0.00826	PASS
				-20	9.04	0.01097	PASS
				-10	6.36	0.00772	PASS
				0	8.17	0.00991	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict		
				10	6.68	0.0081	PASS		
				20	9.72	0.01179	PASS		
				30	8.33	0.01011	PASS		
				40	10.94	0.01327	PASS		
				50	7.62	0.00925	PASS		
		MCH	VN	-30	4.62	0.00552	PASS		
				-20	2.07	0.00247	PASS		
				-10	8.98	0.01073	PASS		
				0	2.81	0.00336	PASS		
				10	4	0.00478	PASS		
				20	12.4	0.01482	PASS		
				30	1.97	0.00235	PASS		
				40	10.75	0.01285	PASS		
				50	7.07	0.00845	PASS		
				HCH	VN	-30	8.88	0.01046	PASS
		-20	12.46			0.01468	PASS		
		-10	5.23			0.00616	PASS		
		0	1.9			0.00224	PASS		
		10	11.56			0.01362	PASS		
		20	2.58			0.00304	PASS		
		30	0.03			0.00004	PASS		
		40	-1.45			-0.00171	PASS		
		GSM1900	GSM/TM1	LCH	VN	-30	7.1	0.00384	PASS
						-20	9.17	0.00496	PASS
-10	9.1					0.00492	PASS		
0	7.94					0.00429	PASS		
10	14.85					0.00803	PASS		
20	10.4					0.00562	PASS		
30	10.91					0.0059	PASS		
40	9.81					0.0053	PASS		
50	14.01					0.00757	PASS		
MCH	VN					-30	16.47	0.00876	PASS
				-20	17.89	0.00952	PASS		
				-10	16.53	0.00879	PASS		
				0	15.37	0.00818	PASS		
				10	14.59	0.00776	PASS		
				20	13.3	0.00707	PASS		
				30	12.53	0.00666	PASS		
				40	7.81	0.00415	PASS		



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		HCH	VN	50	12.66	0.00673	PASS
				-30	-4.26	-0.00223	PASS
				-20	14.33	0.0075	PASS
				-10	-5.49	-0.00287	PASS
				0	14.53	0.00761	PASS
				10	-6.13	-0.00321	PASS
				20	-3.75	-0.00196	PASS
				30	-0.97	-0.00051	PASS
				40	-3.94	-0.00206	PASS
				50	-5.49	-0.00287	PASS
	GSM/TM2	LCH	VN	-30	12.95	0.007	PASS
				-20	11.91	0.00644	PASS
				-10	17.11	0.00925	PASS
				0	16.5	0.00892	PASS
				10	17.27	0.00933	PASS
				20	24.86	0.01344	PASS
				30	18.37	0.00993	PASS
				40	13.56	0.00733	PASS
				50	17.95	0.0097	PASS
				MCH	VN	-30	18.79
		-20	18.27			0.00972	PASS
		-10	18.89			0.01005	PASS
		0	24.34			0.01295	PASS
		10	22.86			0.01216	PASS
		20	18.92			0.01006	PASS
		30	22.44			0.01194	PASS
		40	22.24			0.01183	PASS
		50	20.99			0.01116	PASS
		HCH	VN			-30	6.46
				-20	24.38	0.01277	PASS
				-10	4.26	0.00223	PASS
				0	5.91	0.00309	PASS
				10	0.87	0.00046	PASS
				20	24.96	0.01307	PASS
				30	-0.16	-0.00008	PASS
				40	1.87	0.00098	PASS
				50	4.36	0.00228	PASS

END