



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	32.5	28.23	38.5	PASS
		MCH	32.72	28.31	38.5	PASS
		HCH	32.79	28.49	38.5	PASS
	GSM/TM2	LCH	26.7	22.29	38.5	PASS
		MCH	26.63	22.25	38.5	PASS
		HCH	26.56	22.20	38.5	PASS

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	29.82	30.07	33	PASS
		MCH	29.85	30.06	33	PASS
		HCH	29.76	29.73	33	PASS
	GSM/TM2	LCH	25.71	25.62	33	PASS
		MCH	25.67	25.90	33	PASS



Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
		HCH	25.62	25.87	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	0.18	13	PASS
		MCH	0.18	13	PASS
		HCH	0.18	13	PASS
	GSM/TM2	LCH	3.28	13	PASS
		MCH	3.17	13	PASS
		HCH	3.14	13	PASS

3Appendix_C: Modulation Characteristics

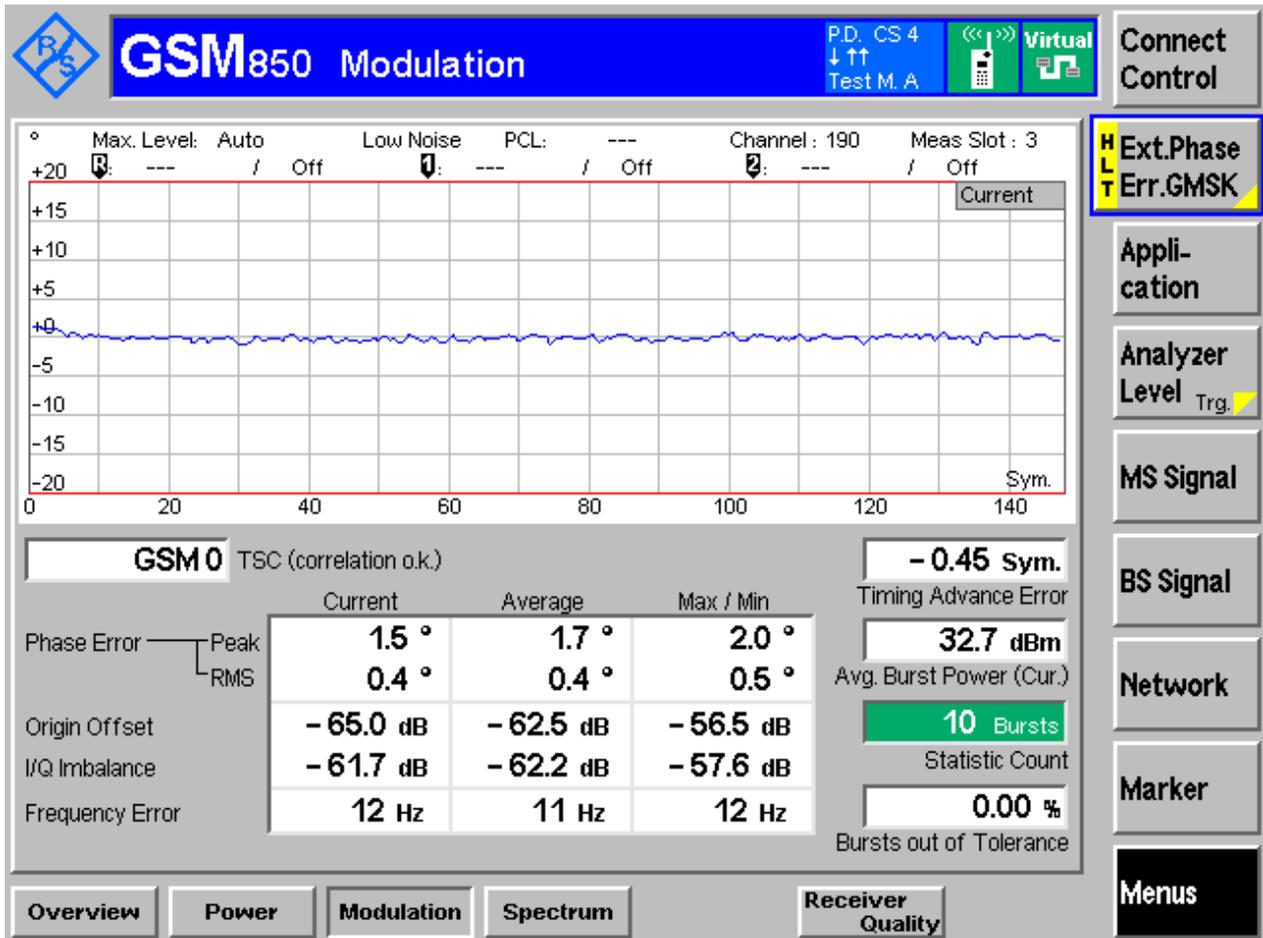
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

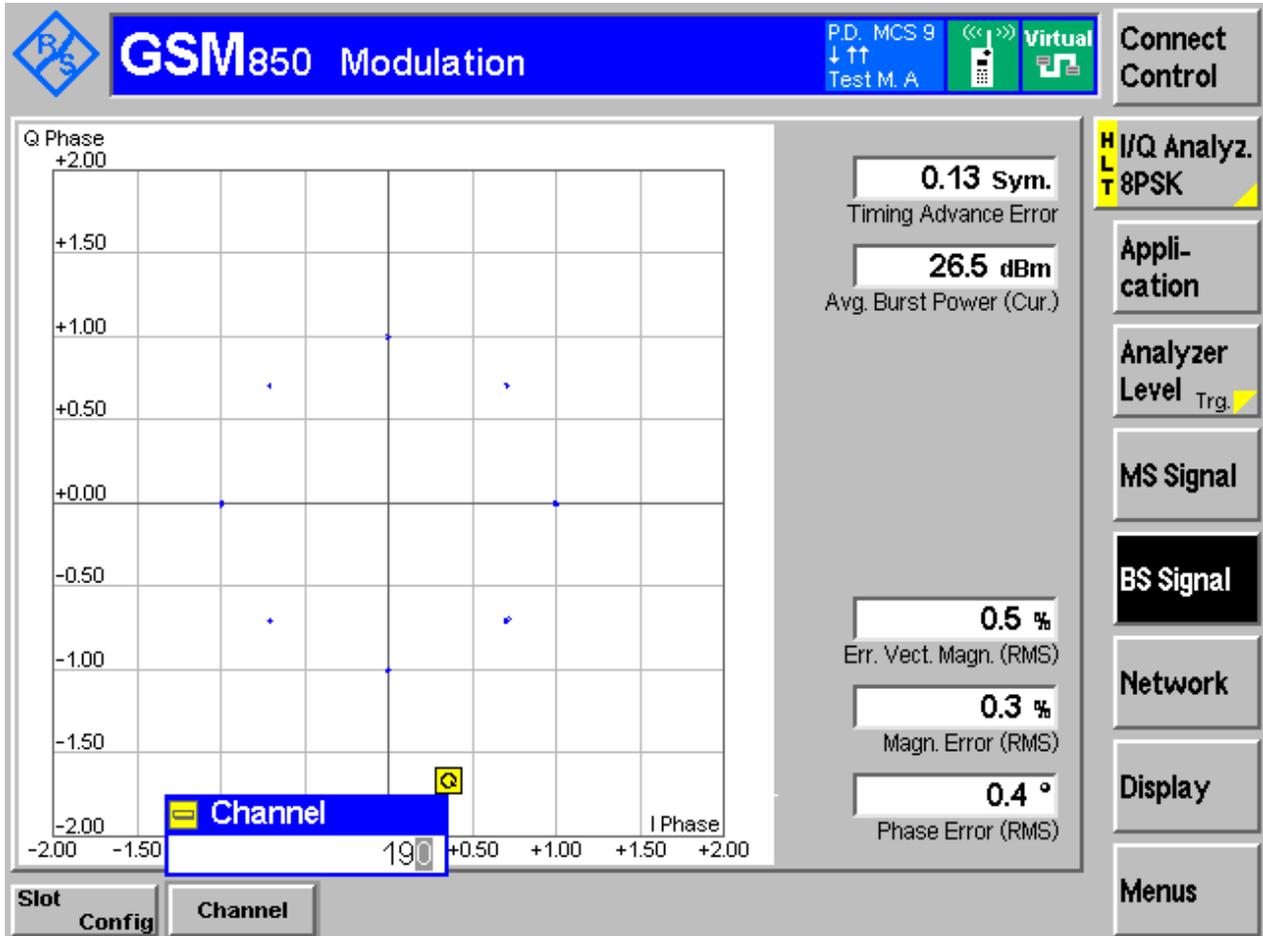
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

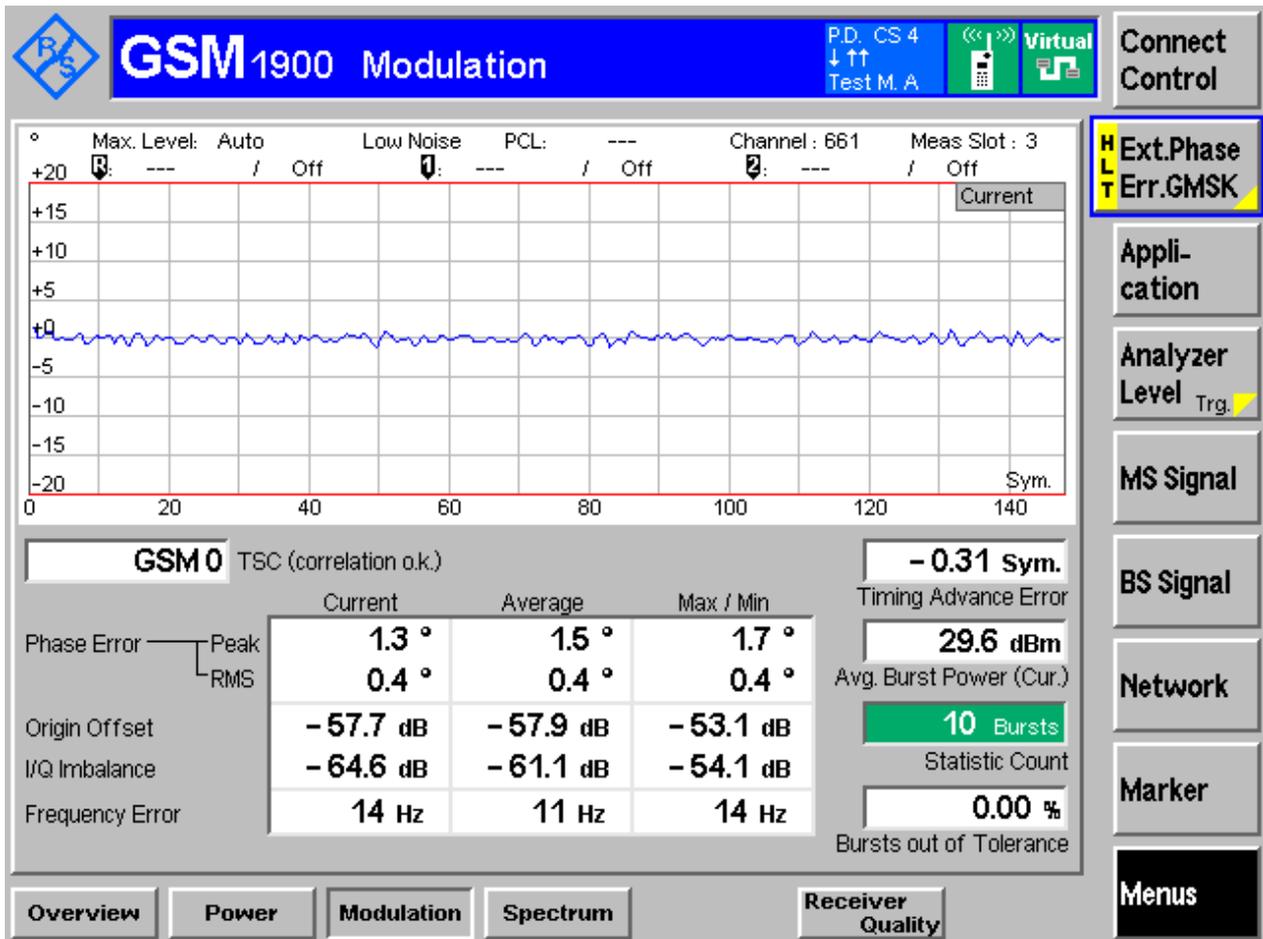
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

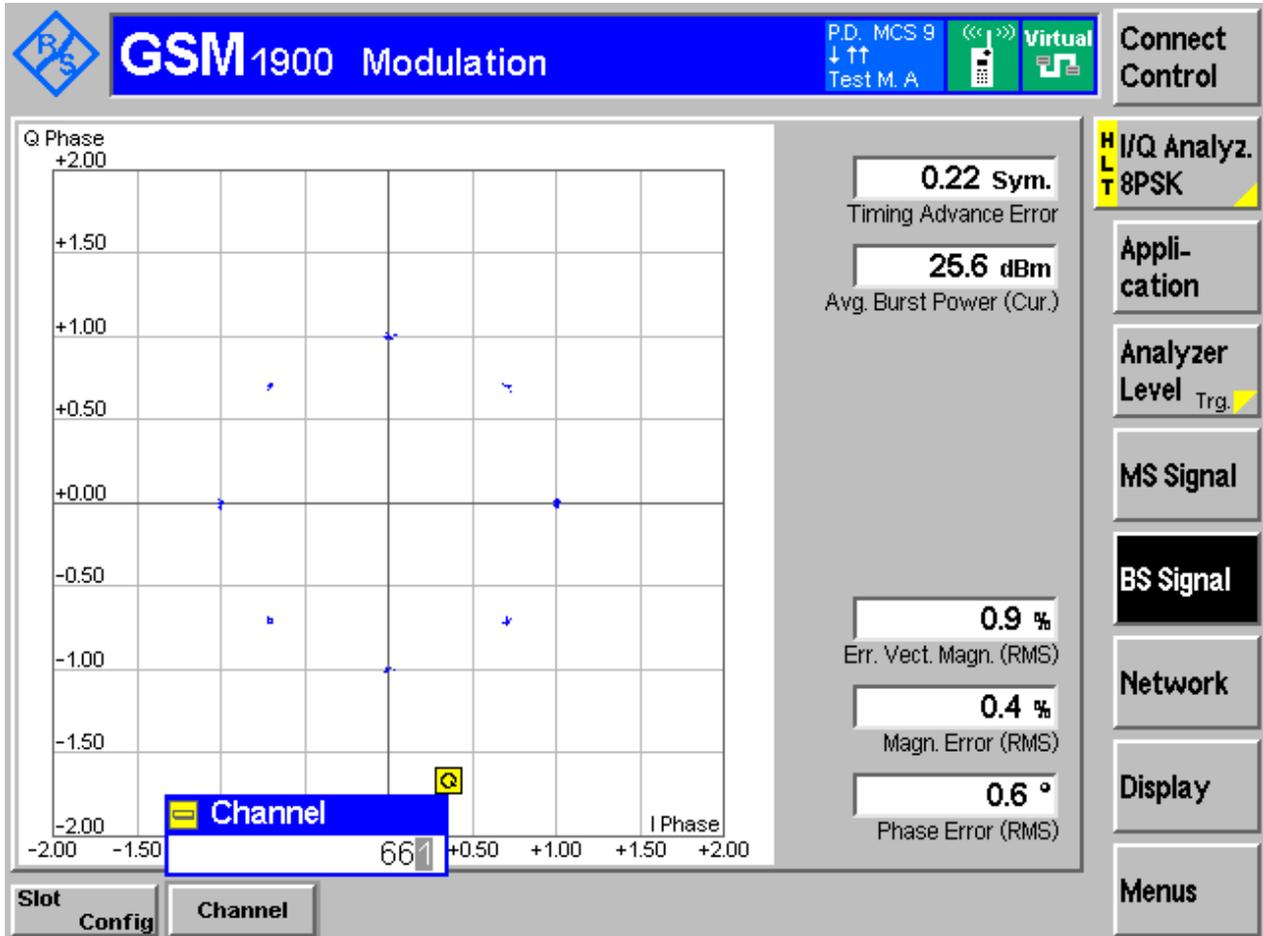
3.1.2.1 Test Mode = GSM/TM1

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	243.73	316.18	Pass
		MCH	241.96	318.55	Pass
		HCH	243.13	318.42	Pass
	GSM/TM2	LCH	243.99	317.12	Pass
		MCH	243.81	312.05	Pass
		HCH	241.76	303.25	Pass
GSM1900	GSM/TM1	LCH	243.22	309.76	Pass
		MCH	246.17	317.29	Pass
		HCH	246.07	316.36	Pass
	GSM/TM2	LCH	244.02	312.19	Pass
		MCH	244.41	308.55	Pass
		HCH	245.20	313.28	Pass



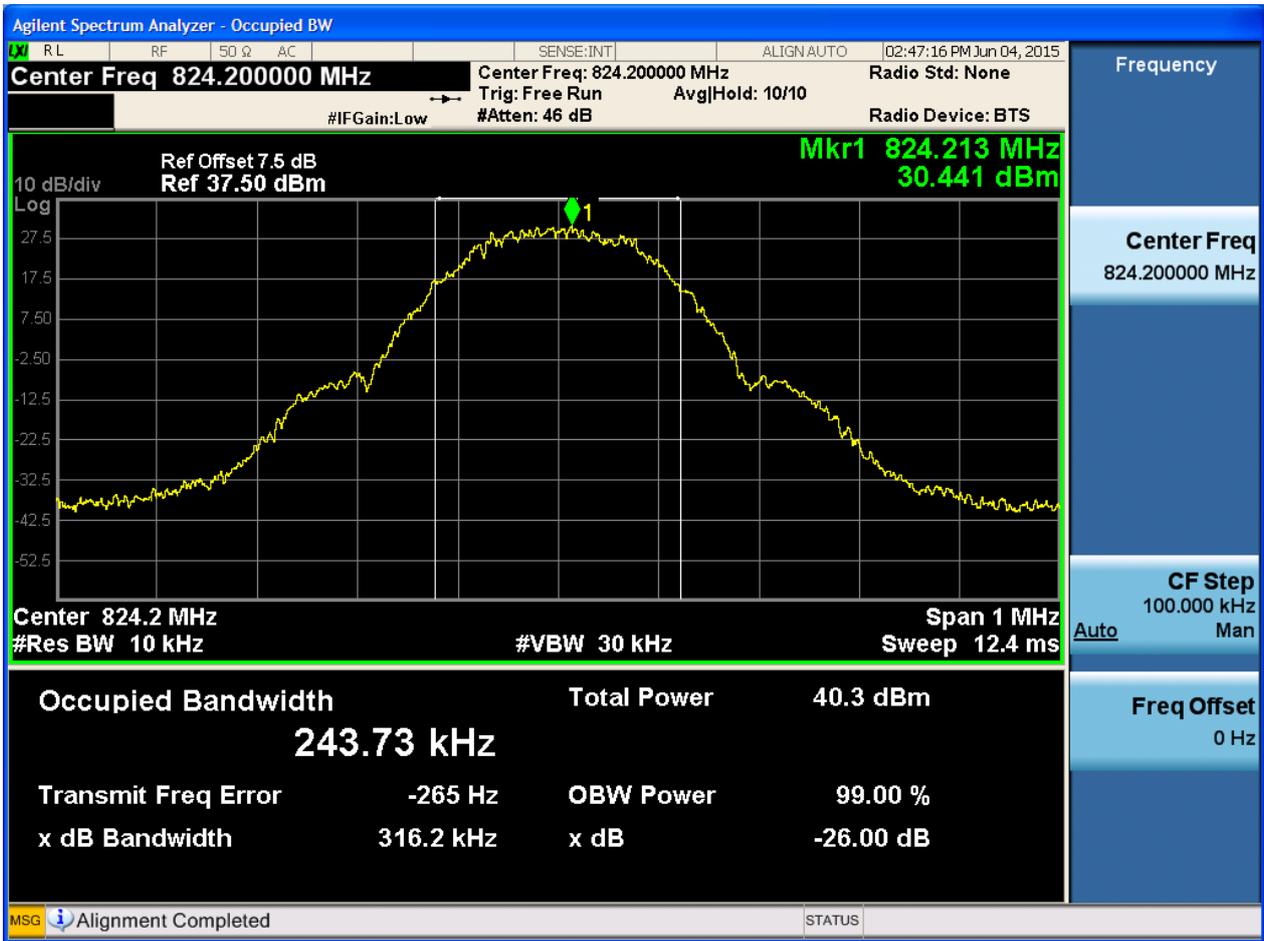
Part II - Test Plots

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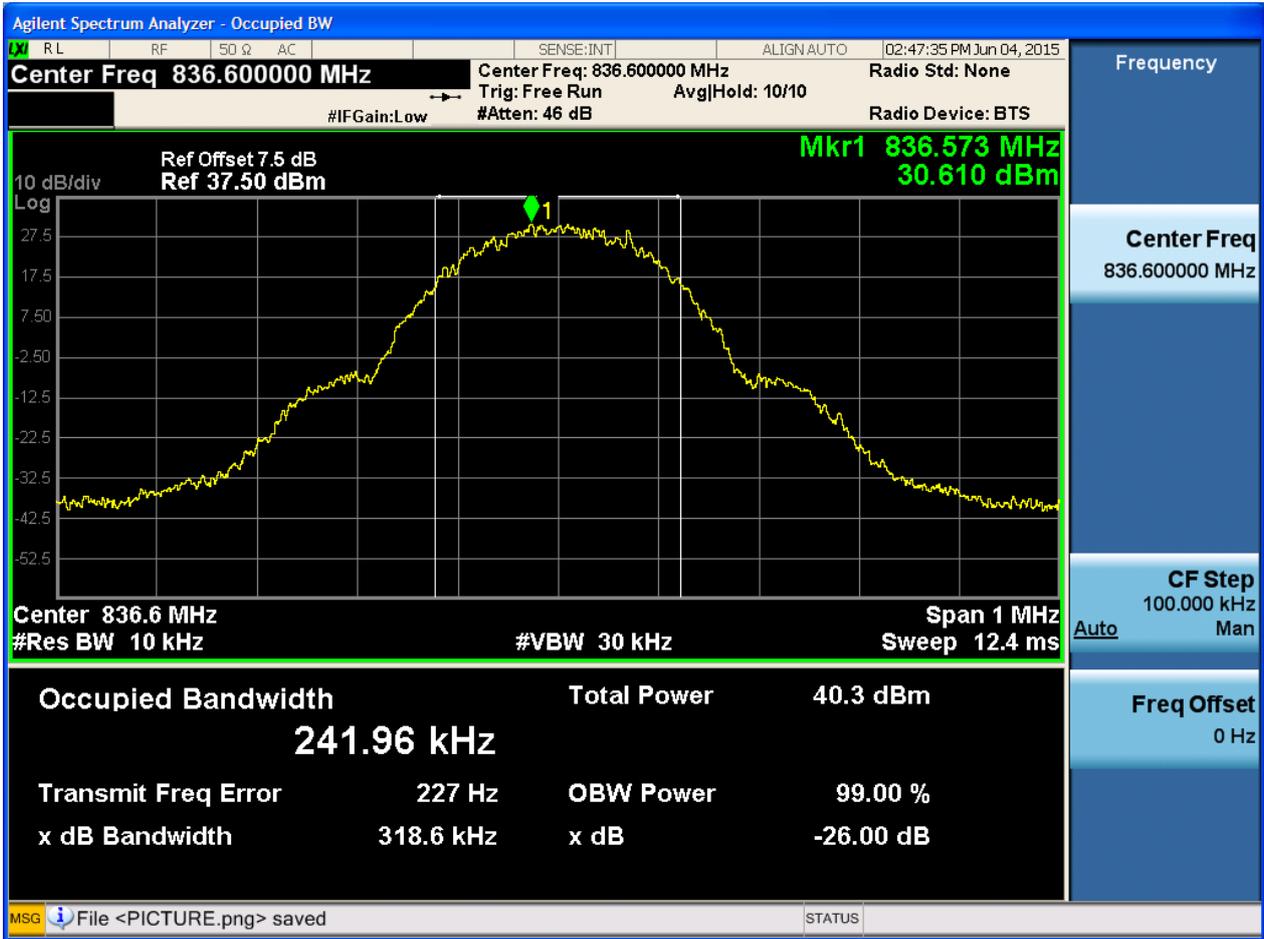
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH

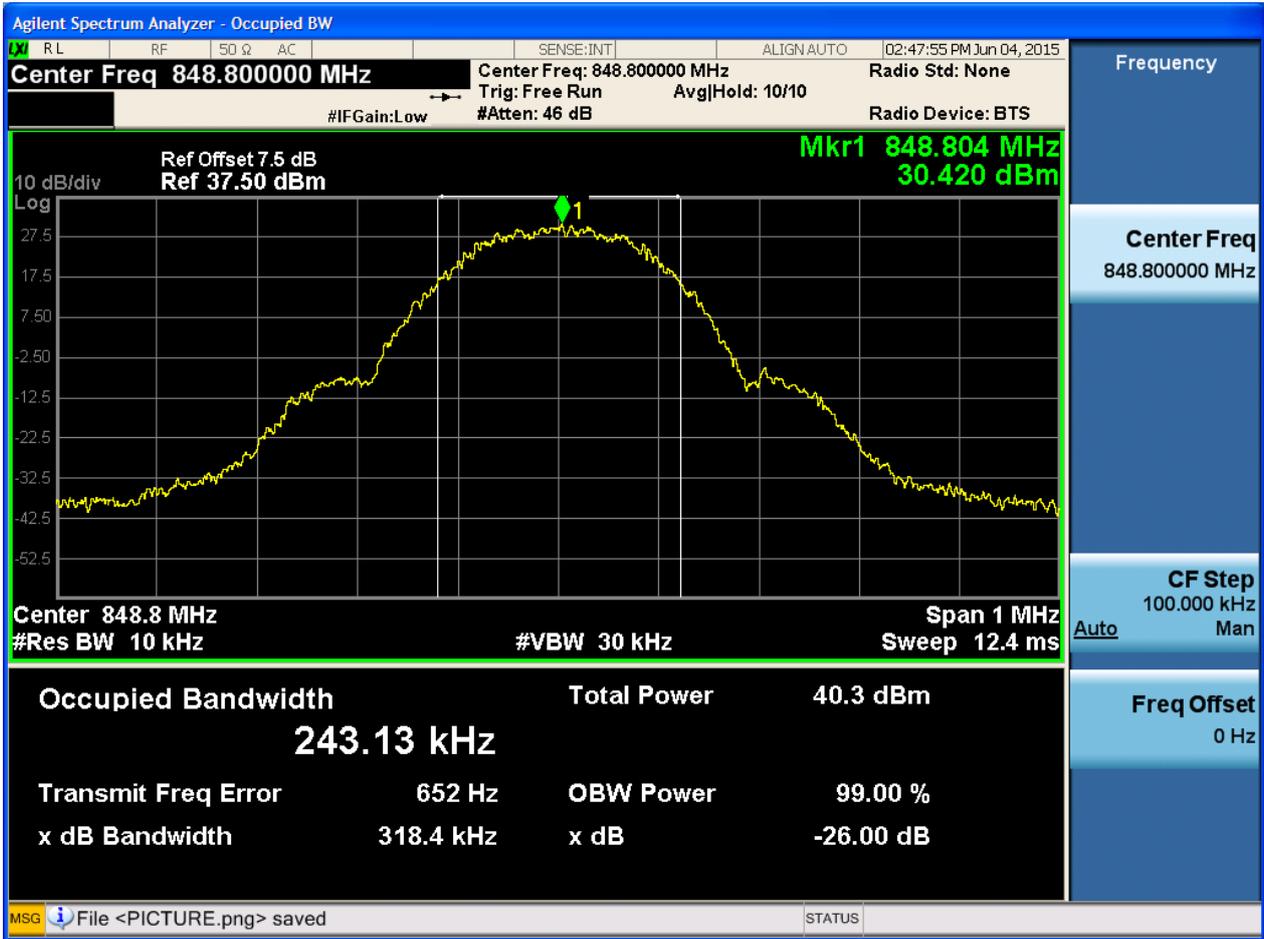




4.1.1.1.2 Test Channel = MCH

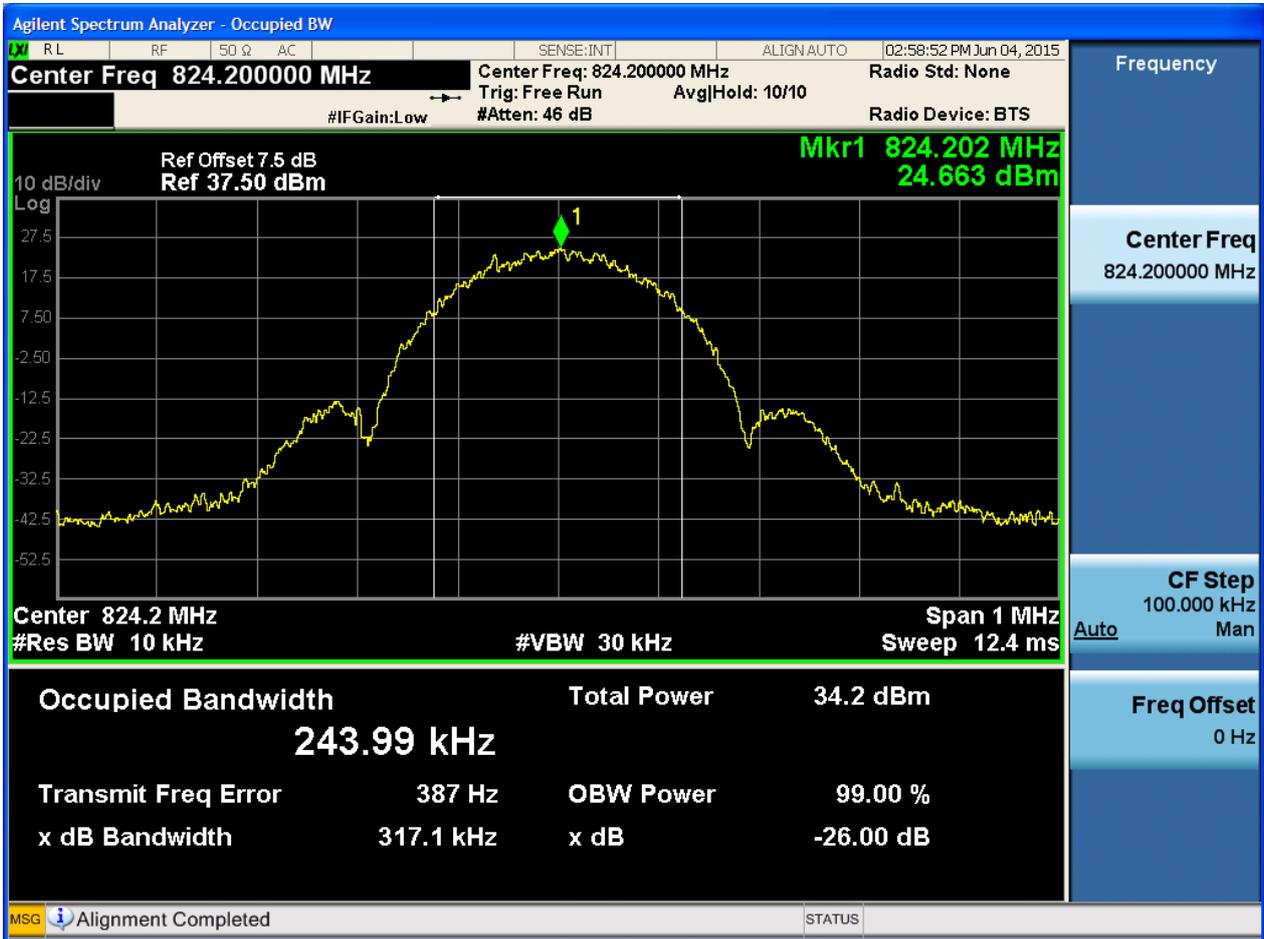


4.1.1.1.3 Test Channel = HCH



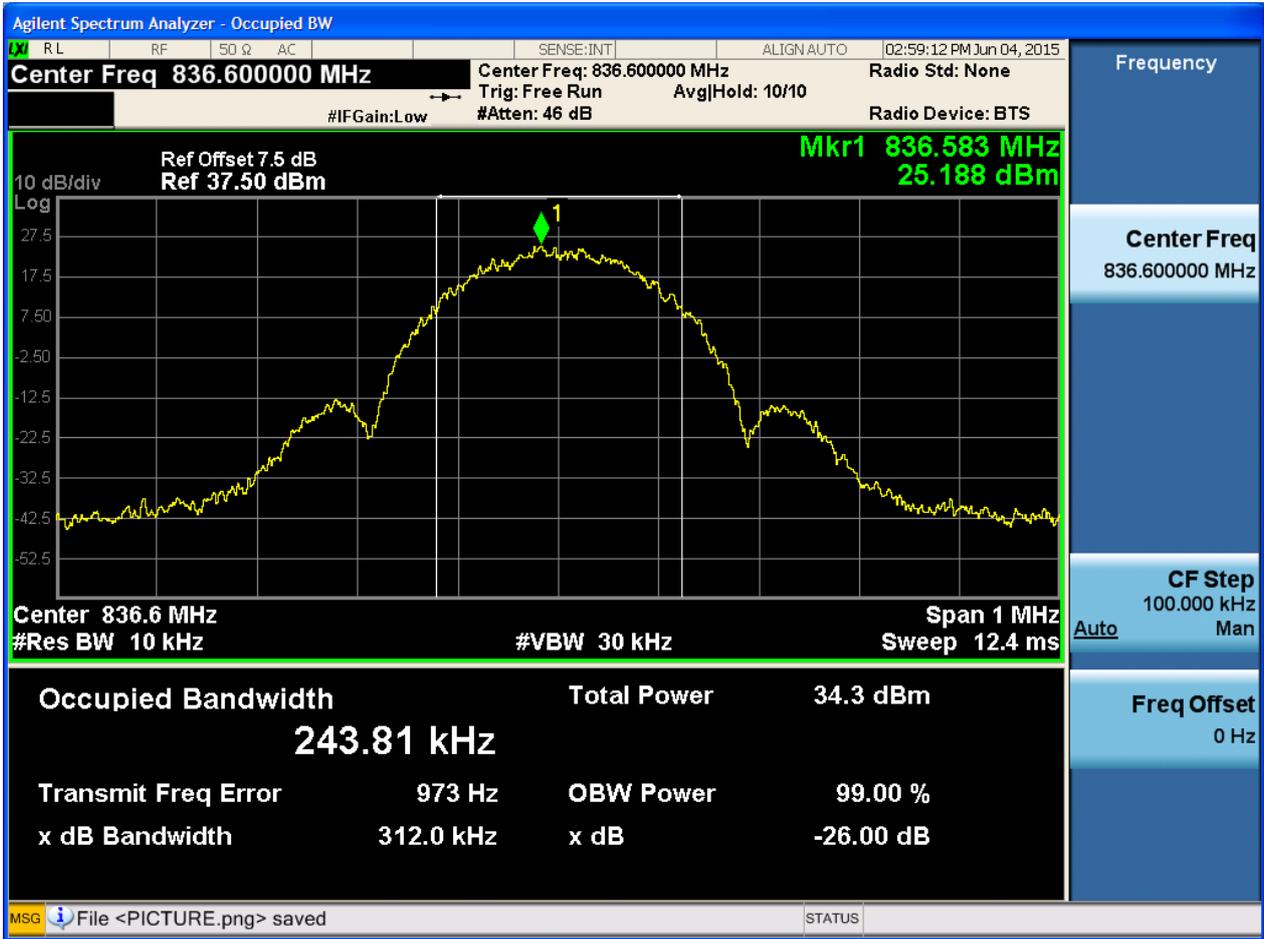
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4.1.1.2.1 Test Channel = LCH



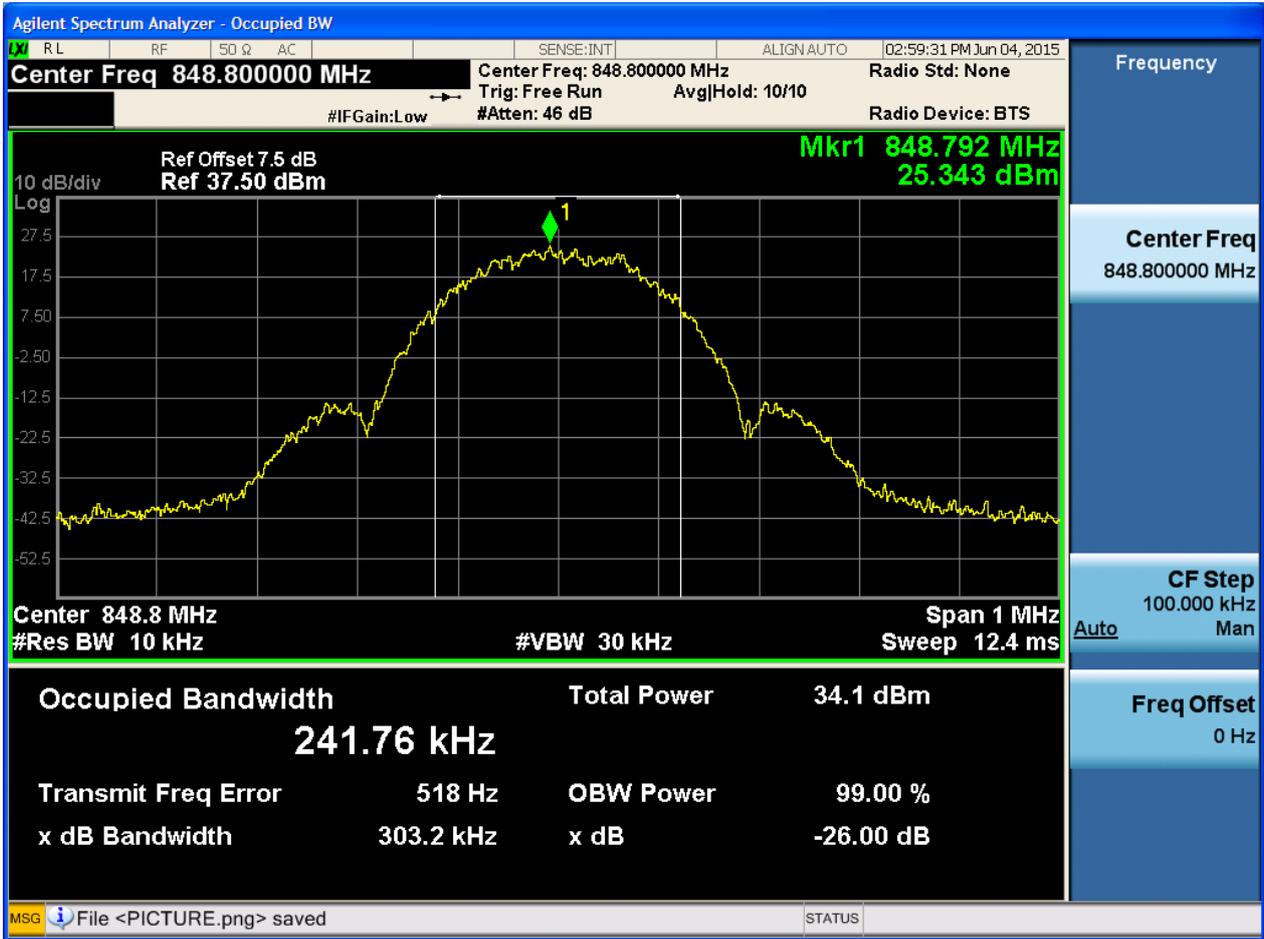


4.1.1.2.2 Test Channel = MCH





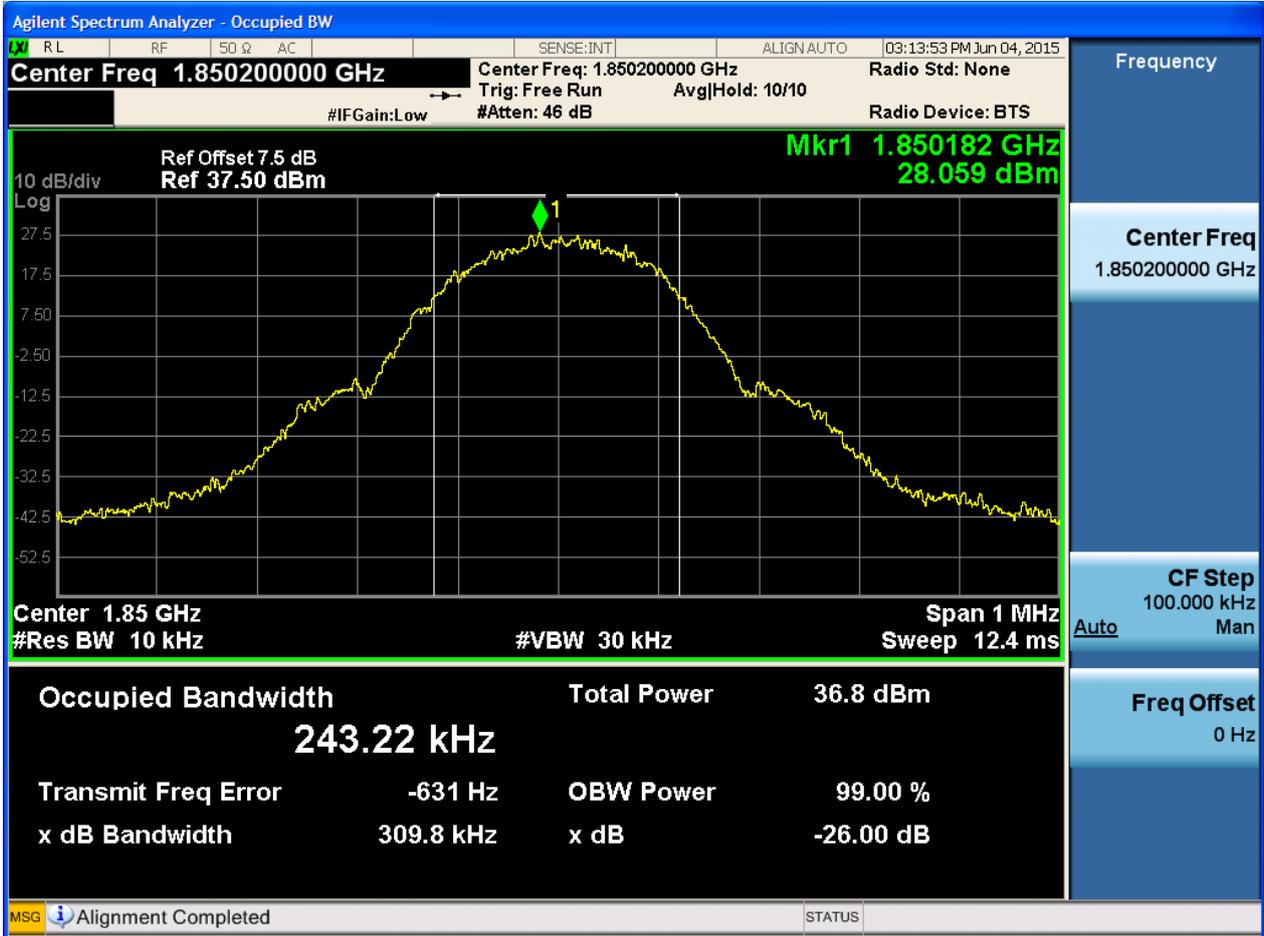
4.1.1.2.3 Test Channel = HCH



4.1.2 Test Band = GSM1900

4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



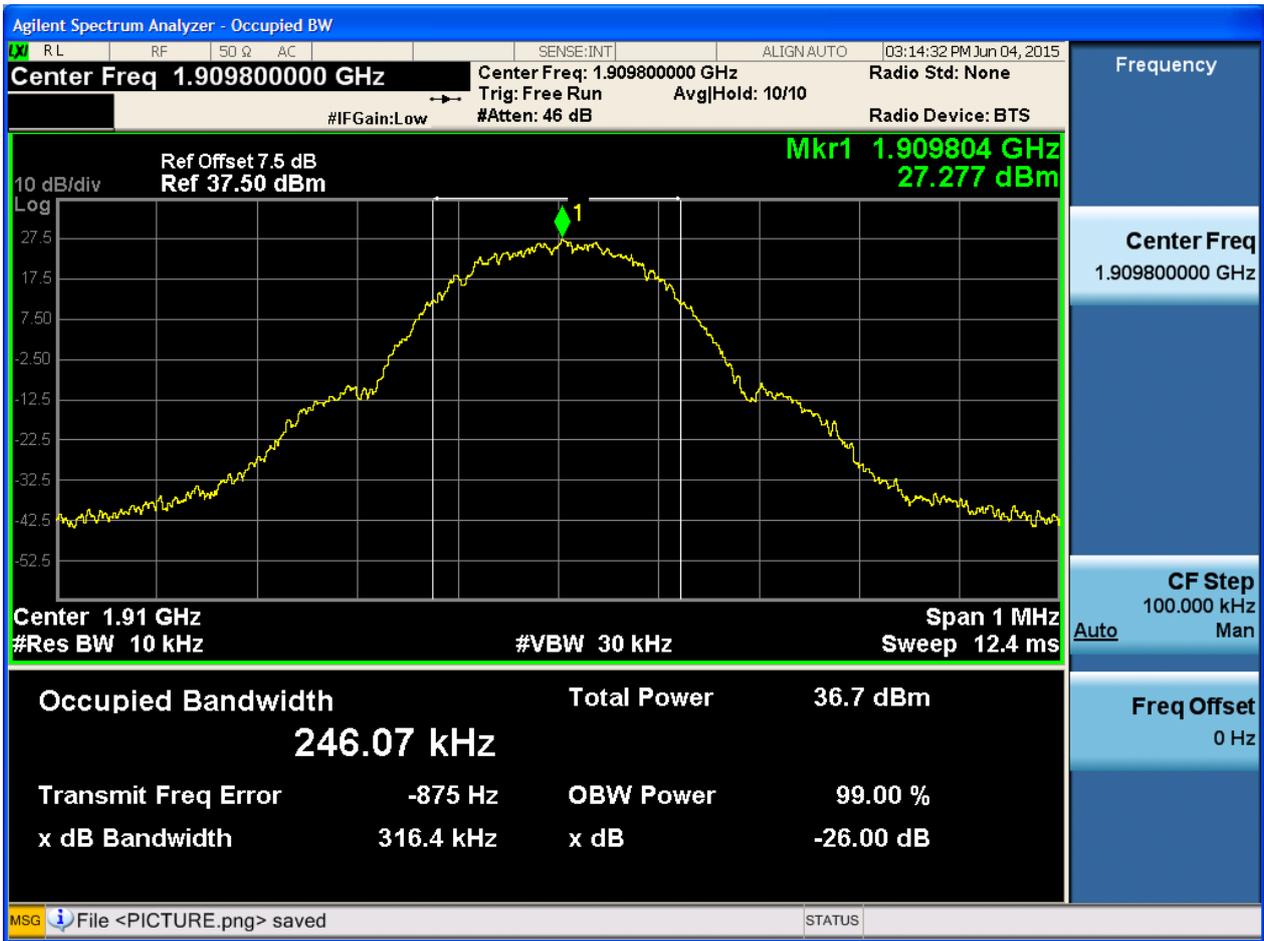


4.1.2.1.2 Test Channel = MCH





4.1.2.1.3 Test Channel = HCH





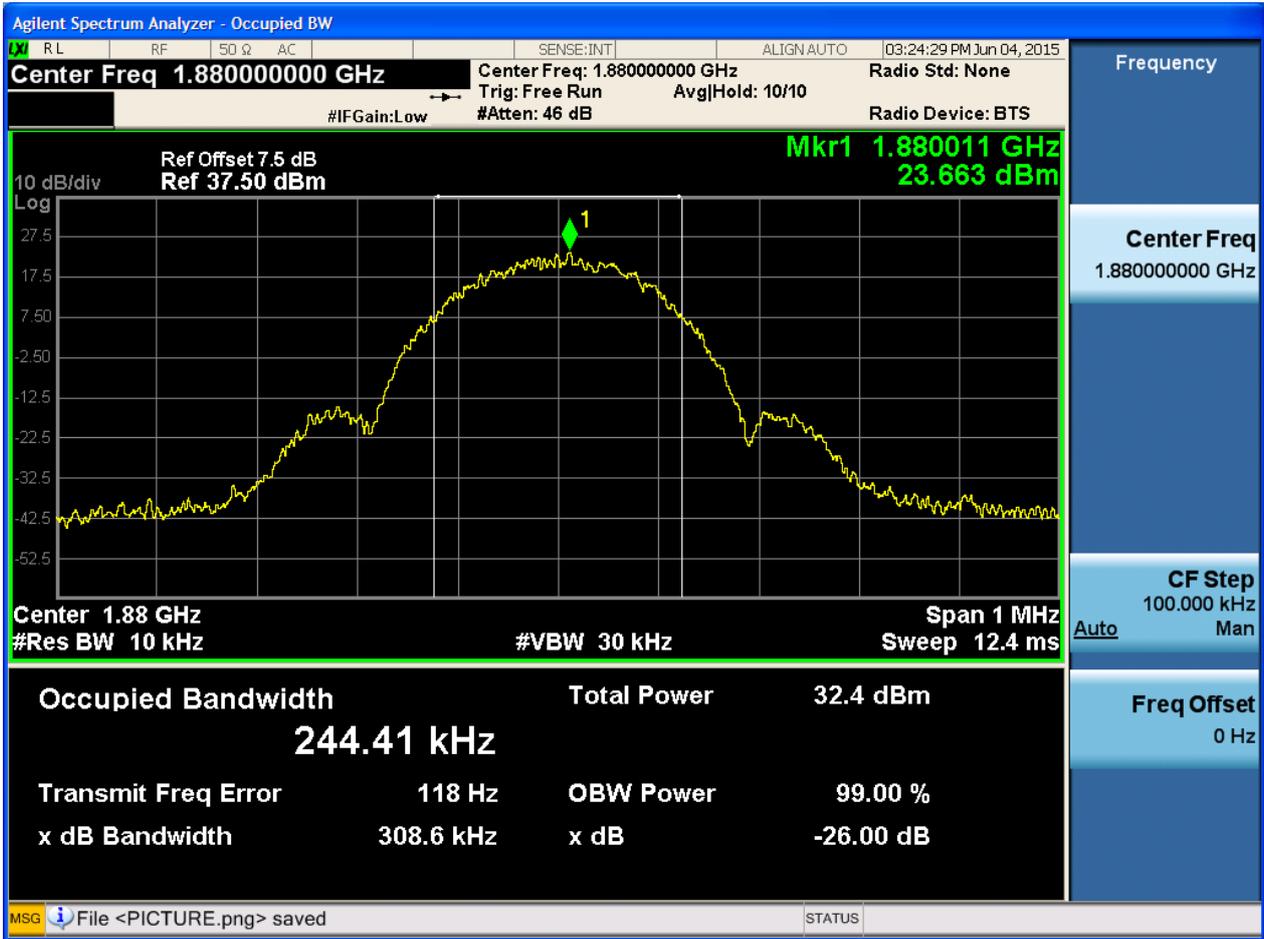
4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



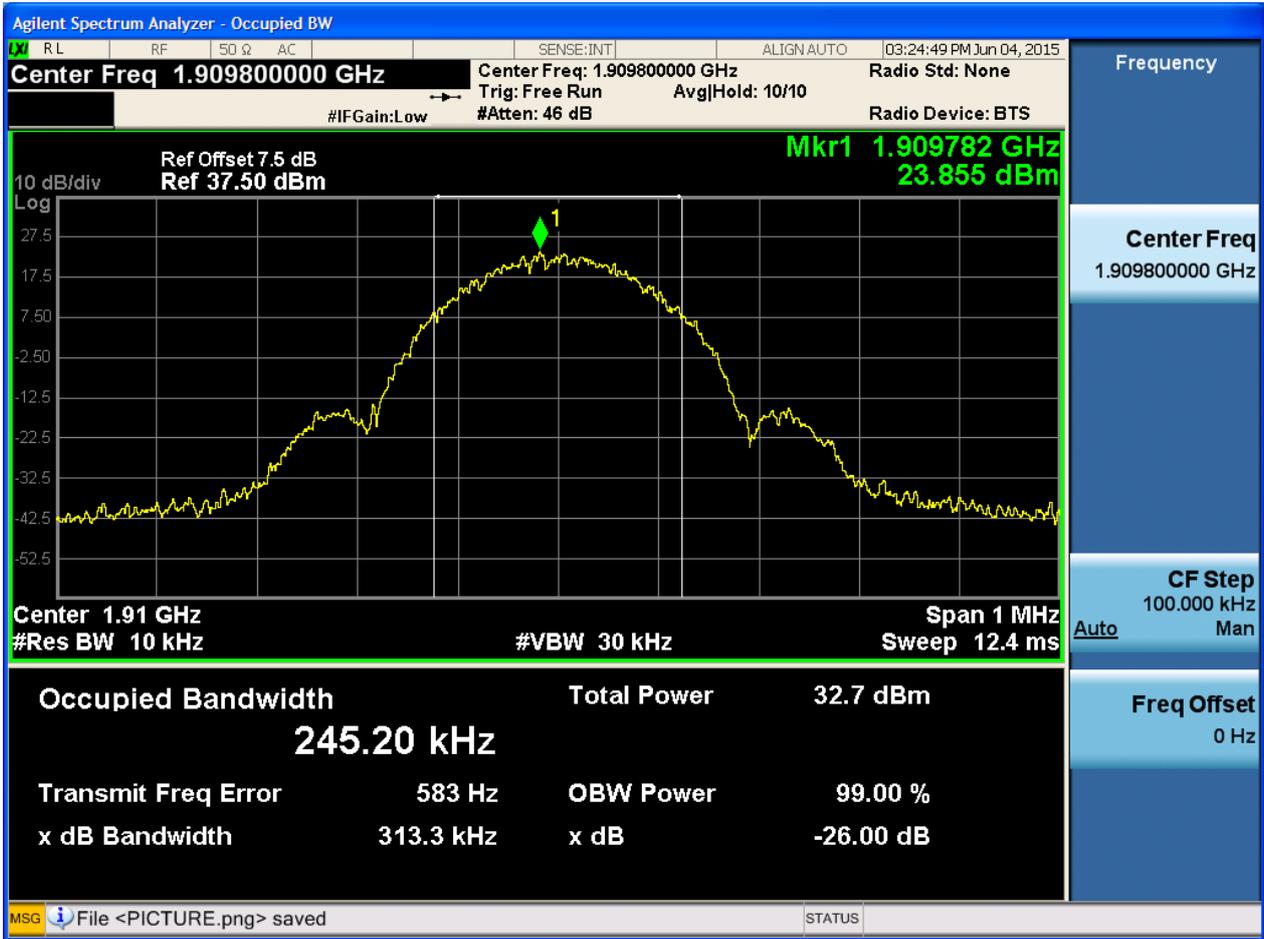


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH





5Appendix_E: Band Edges Compliance

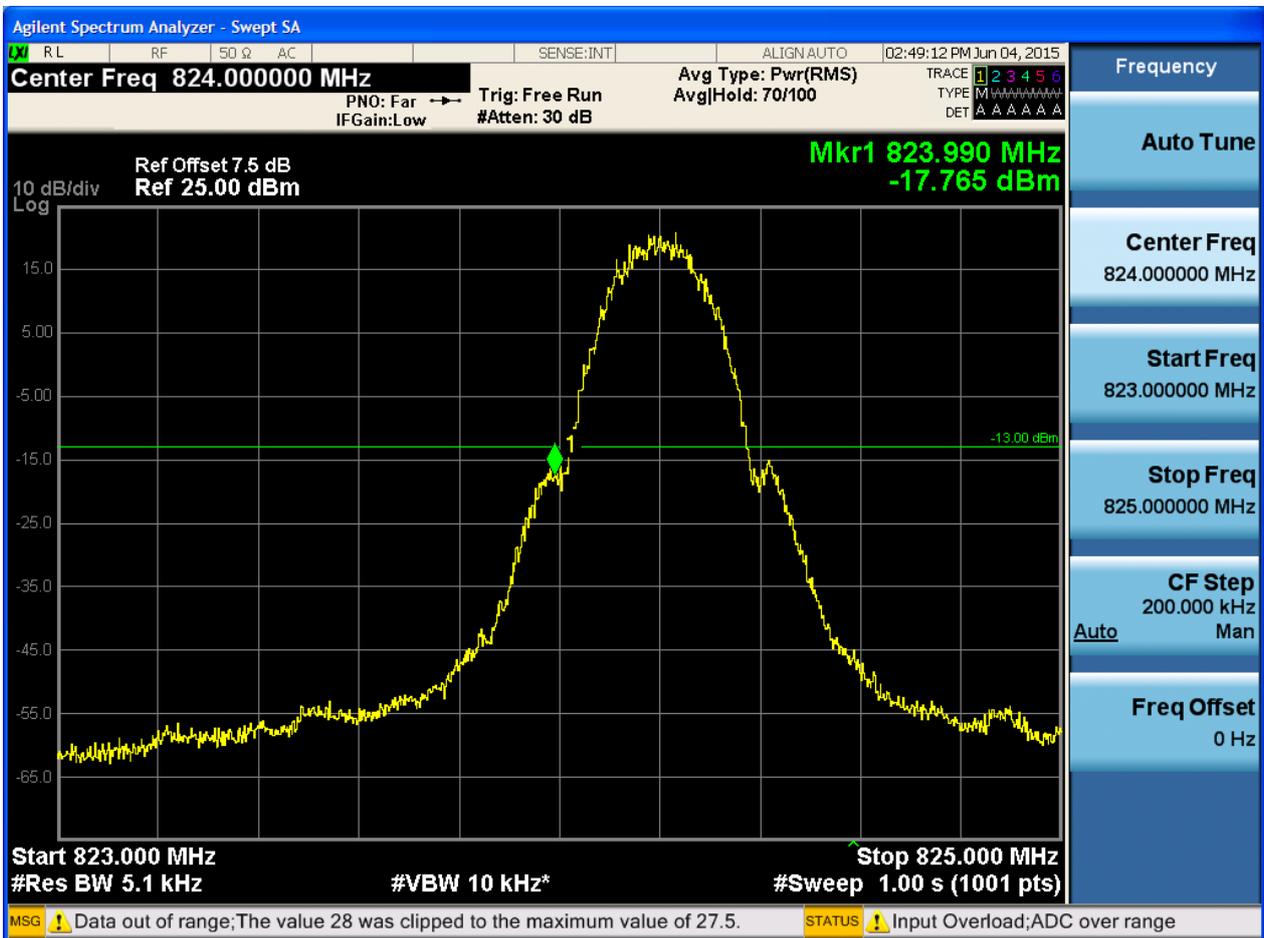
Part I - Test Plots

5.1 For GSM

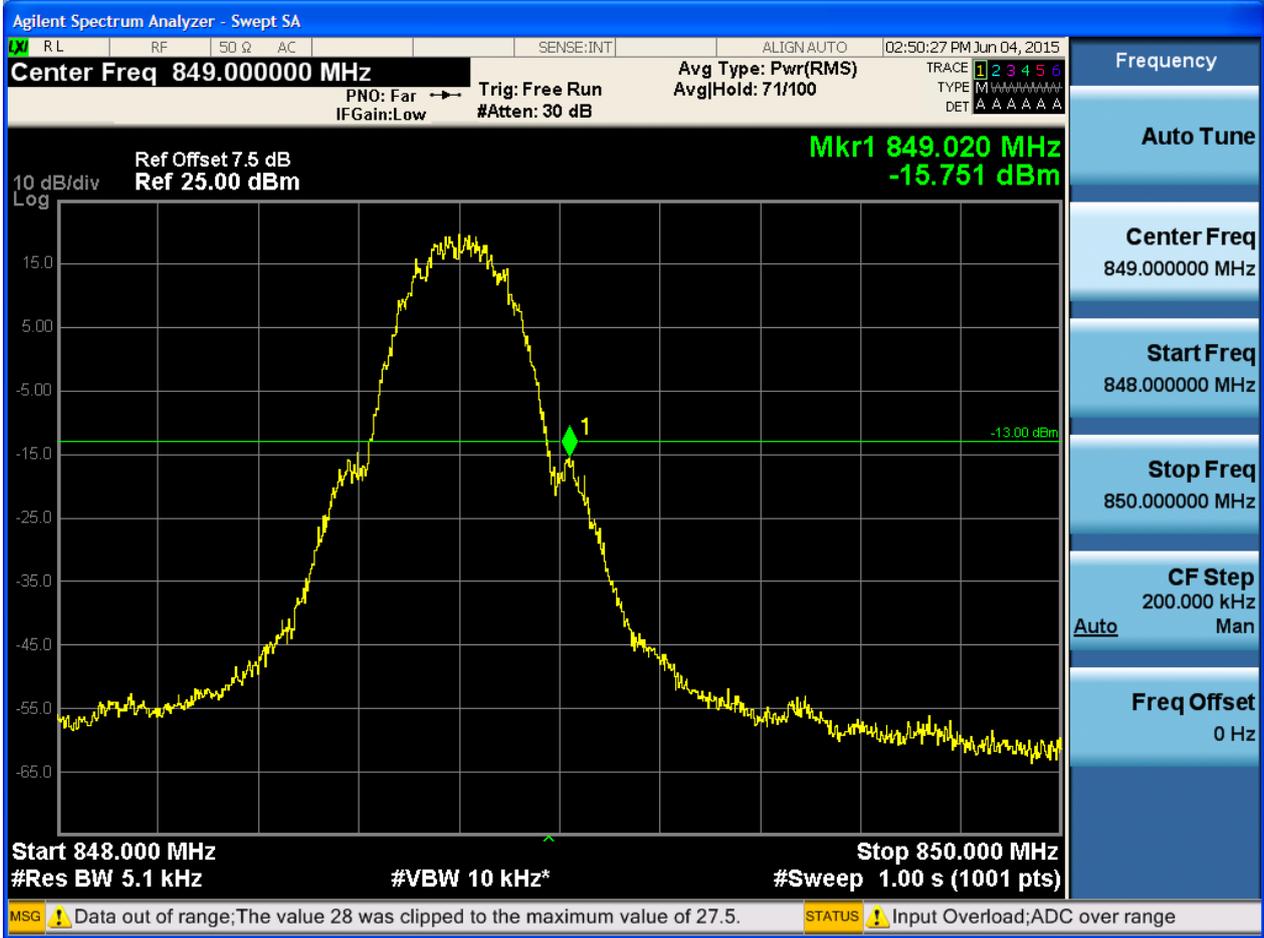
5.1.1 Test Band = GSM850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH

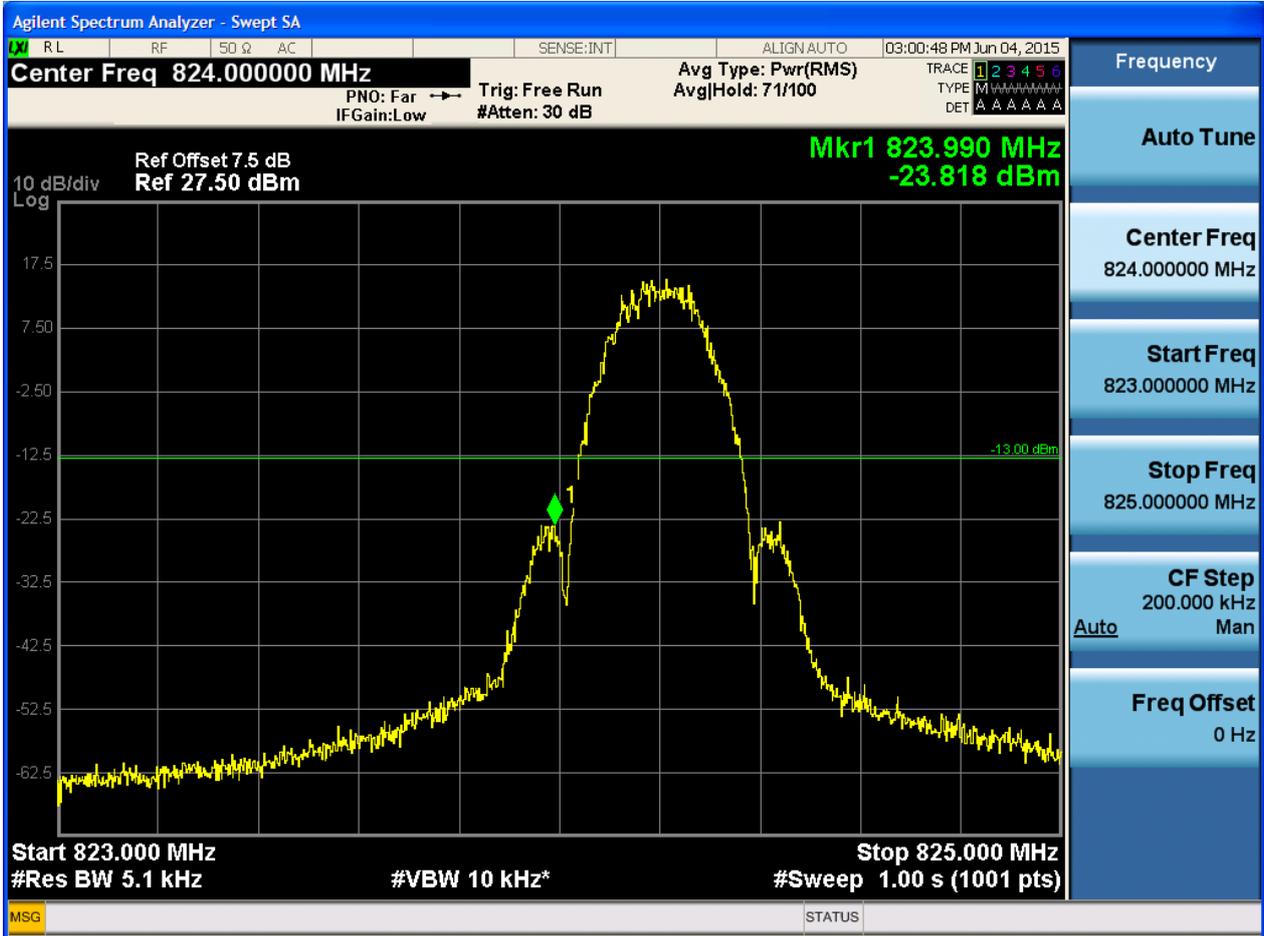


5.1.1.1.2 Test Channel = HCH

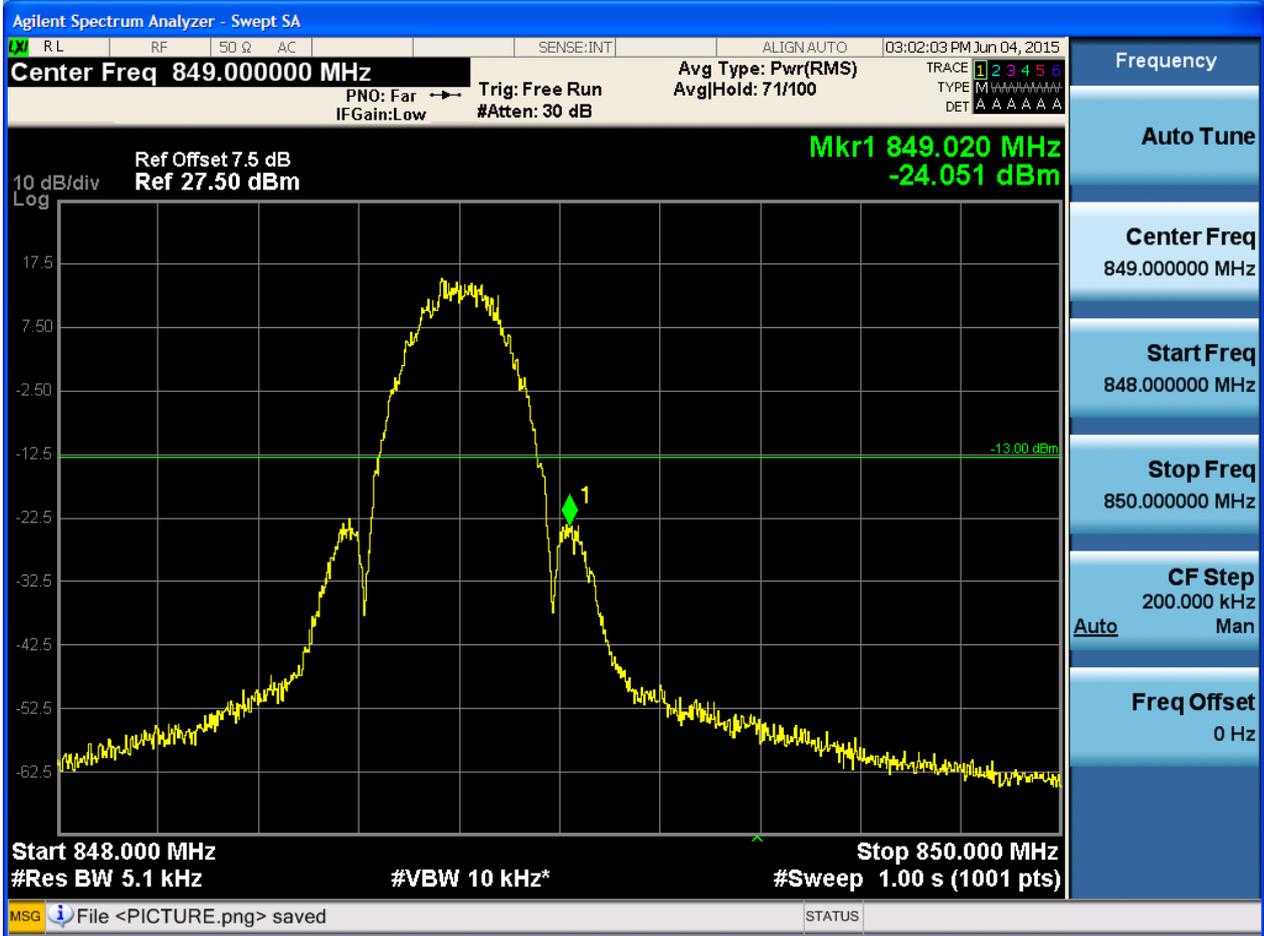


5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



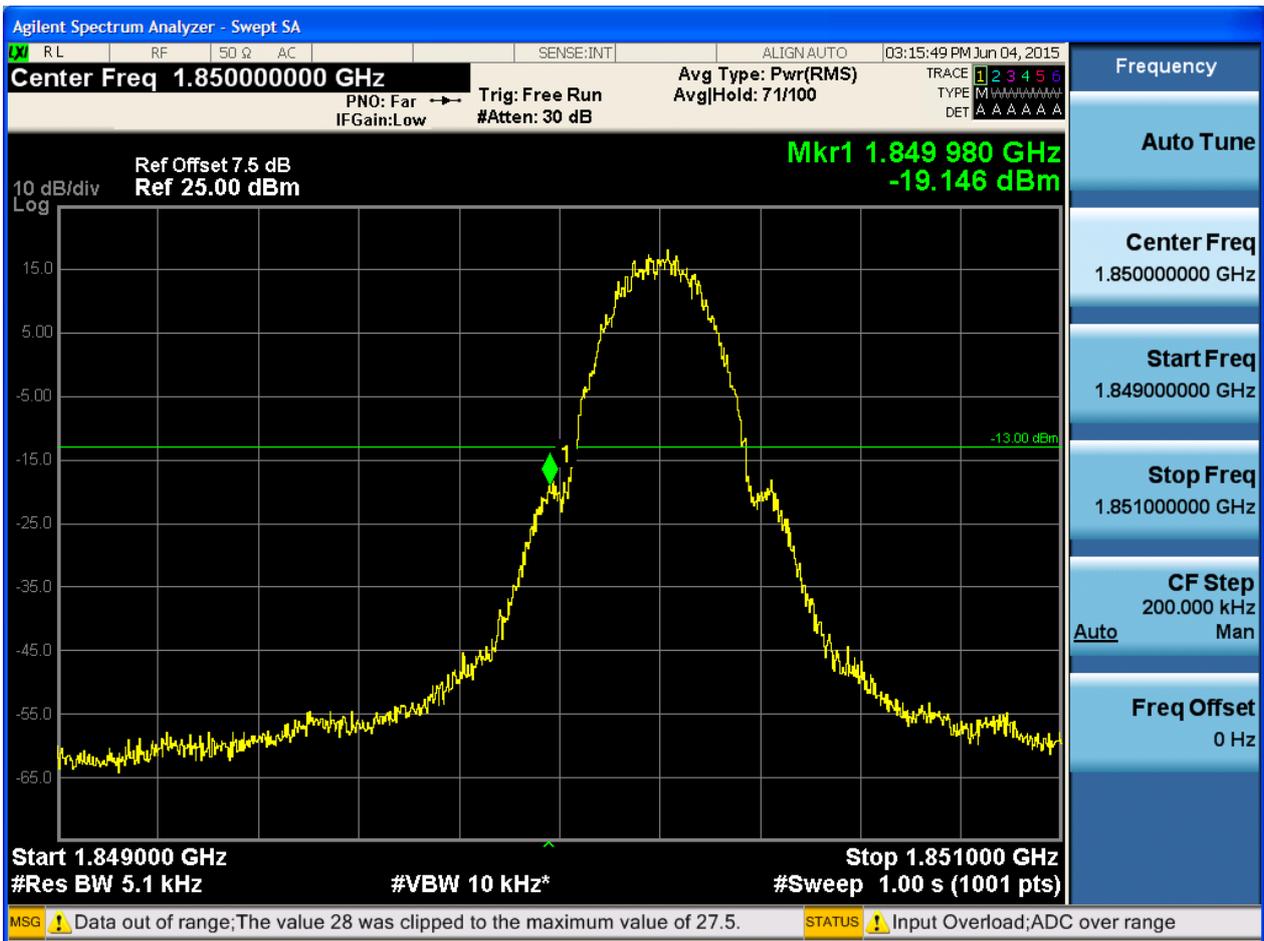
5.1.1.2.2 Test Channel = HCH



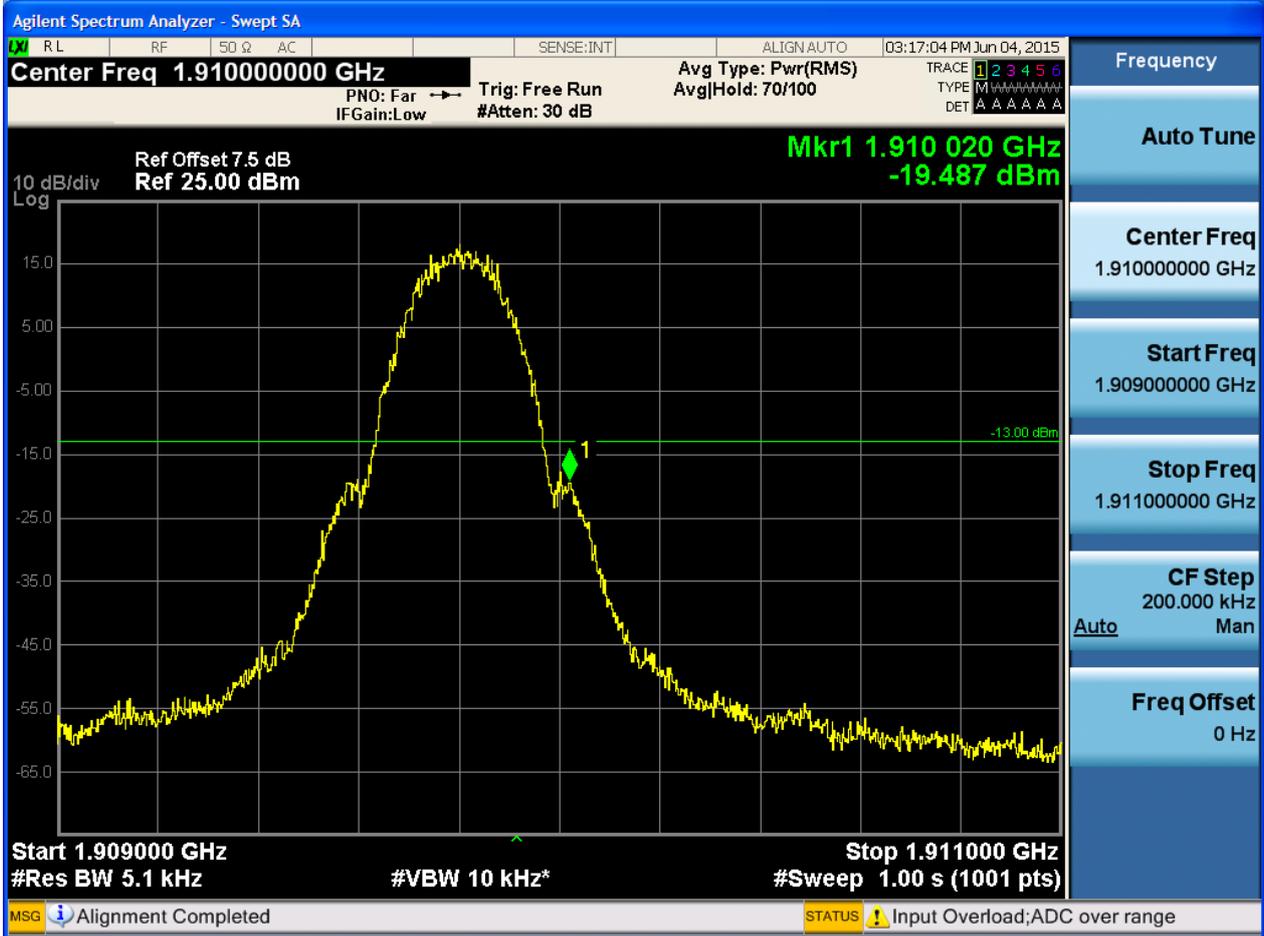
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH

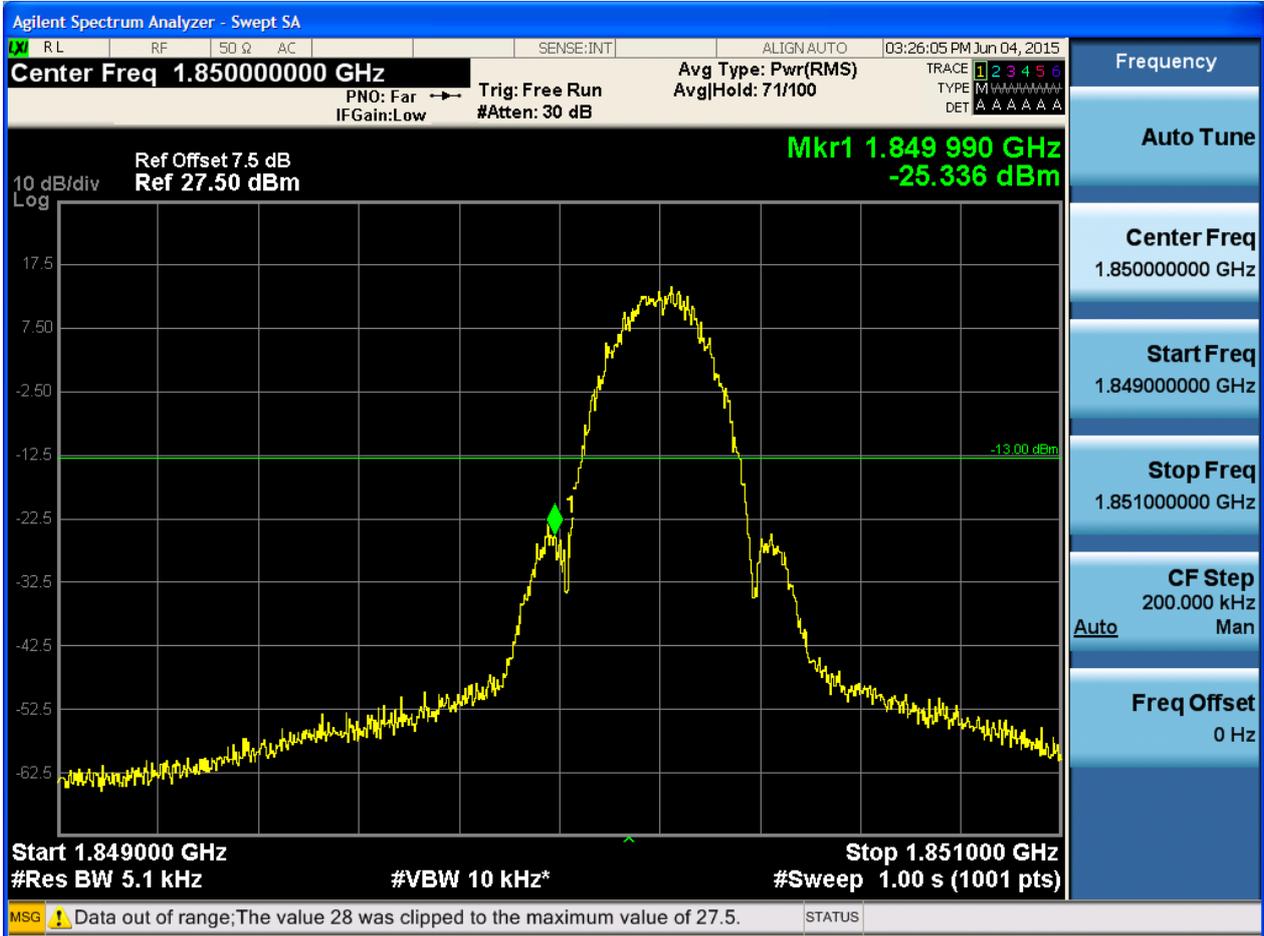


5.1.2.1.2 Test Channel = HCH

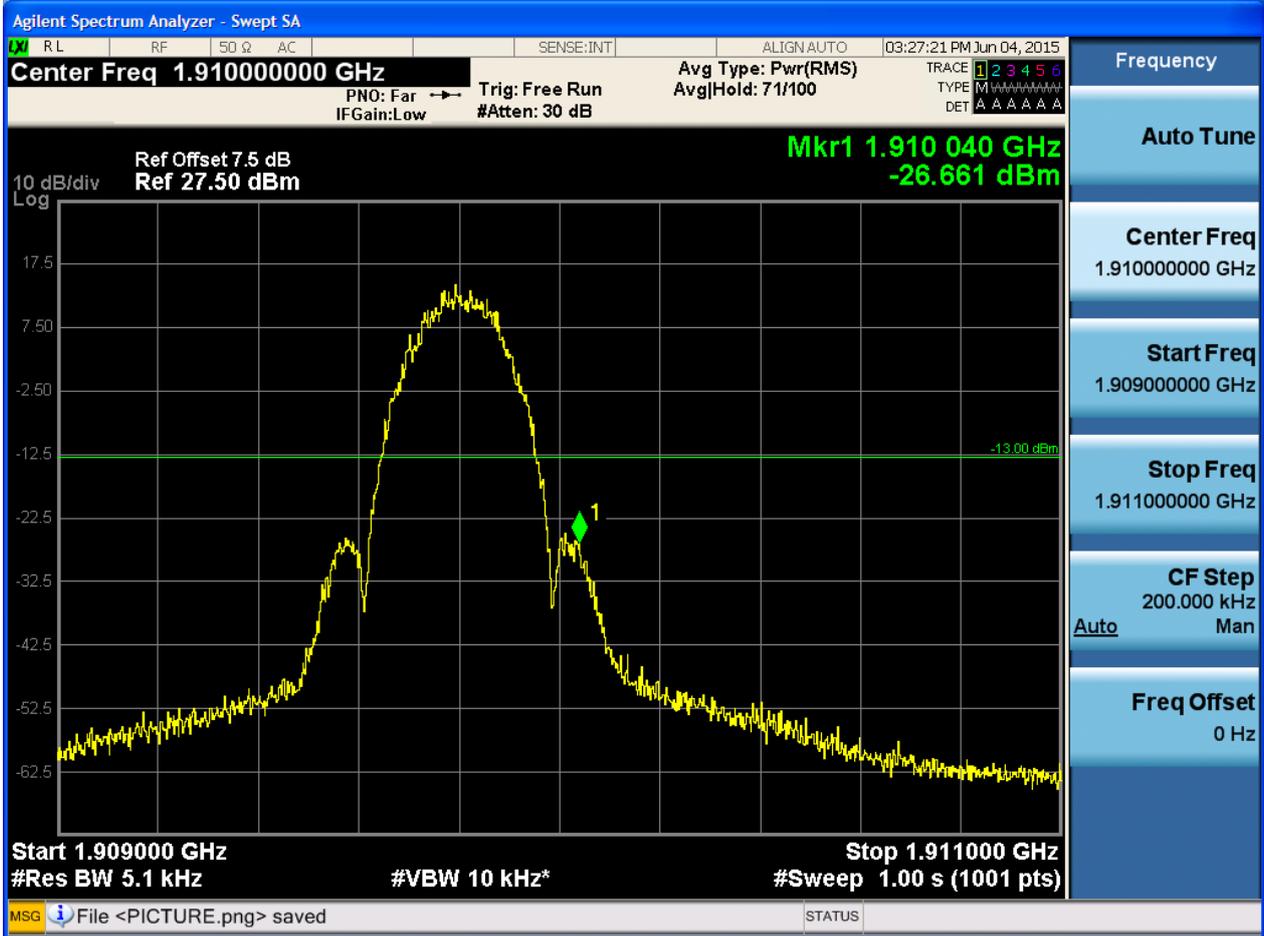


5.1.2.2 Test Mode = GSM/TM2

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.

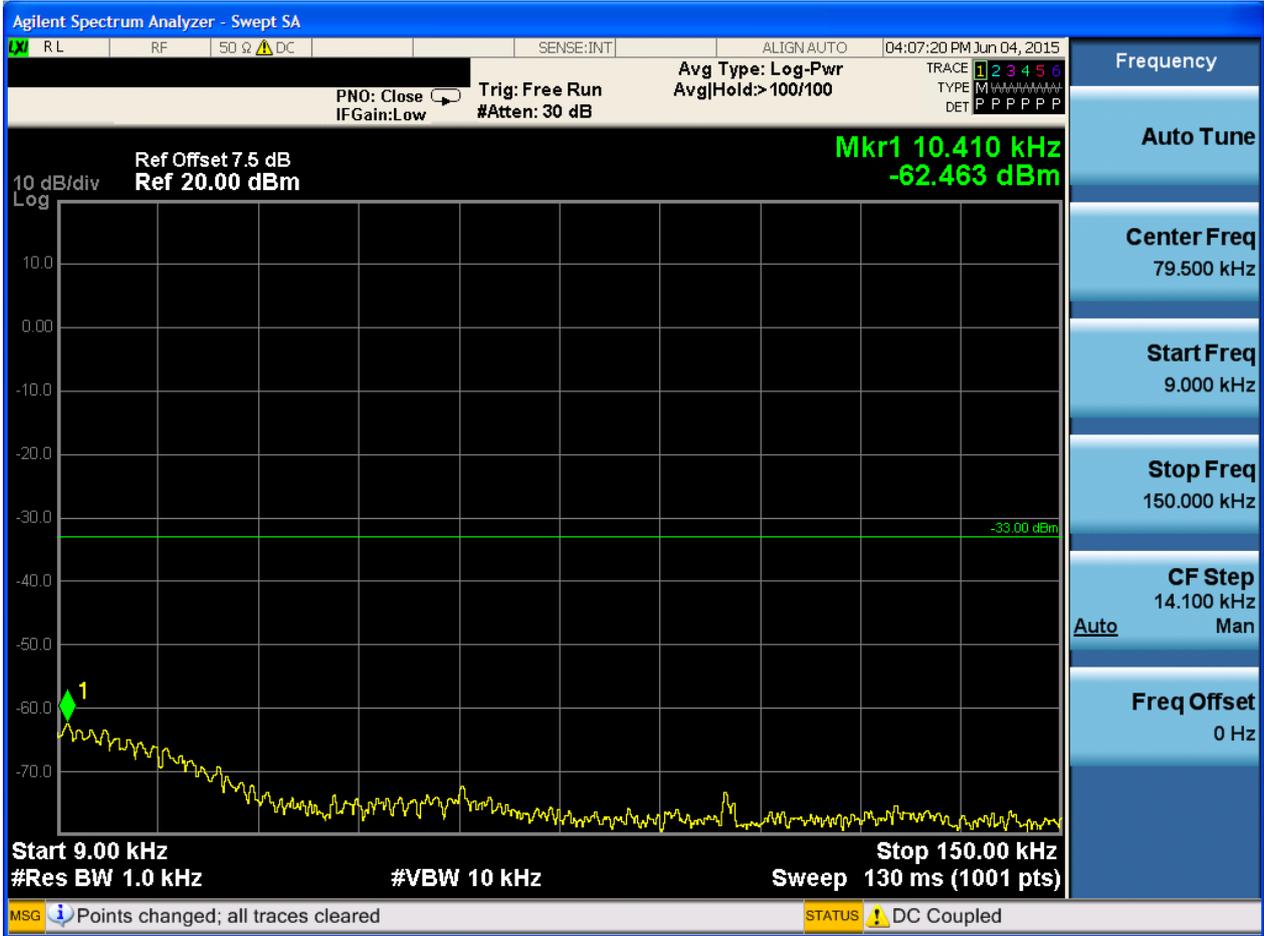
Part I - Test Plots

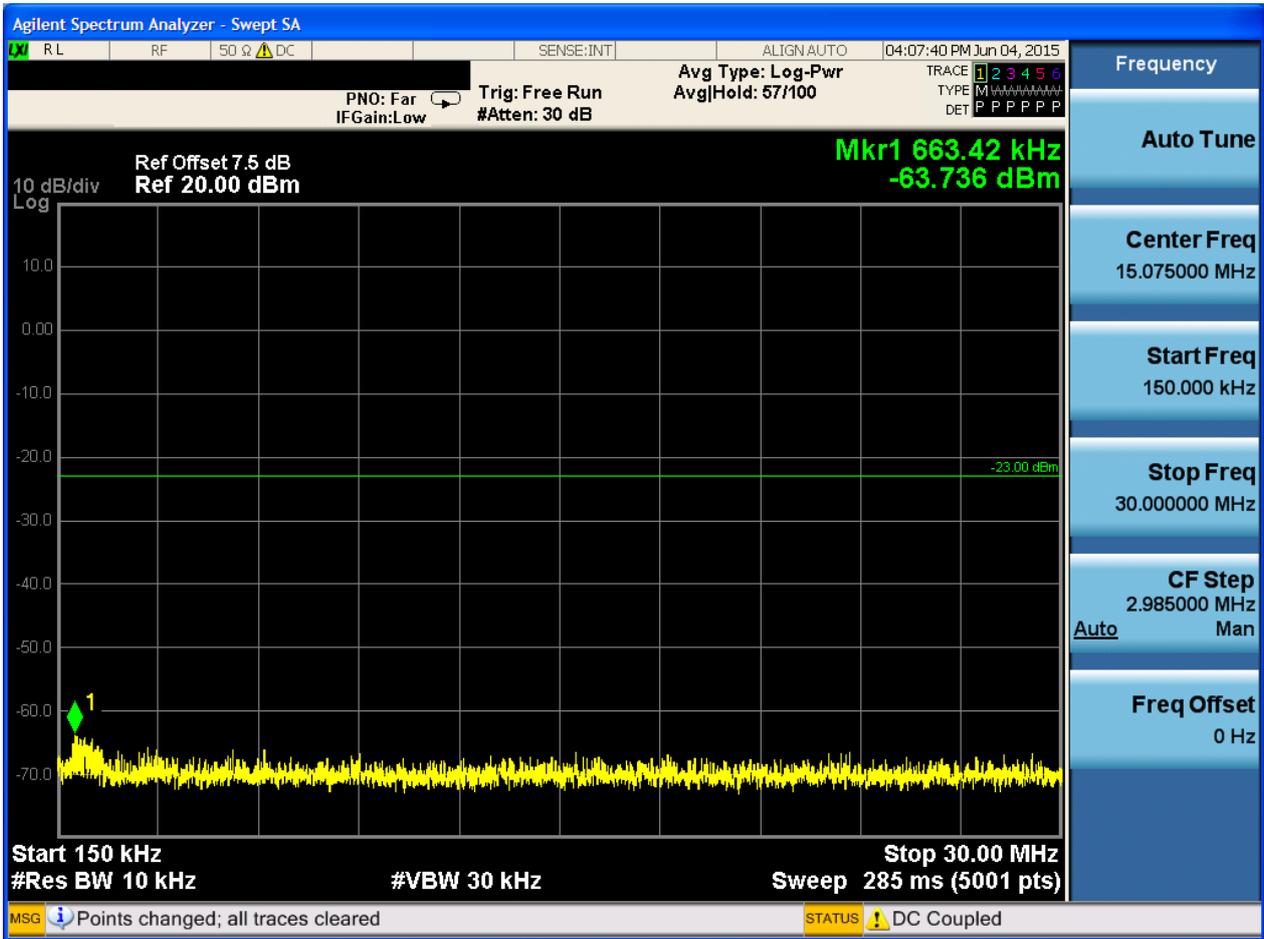
6.1 For GSM

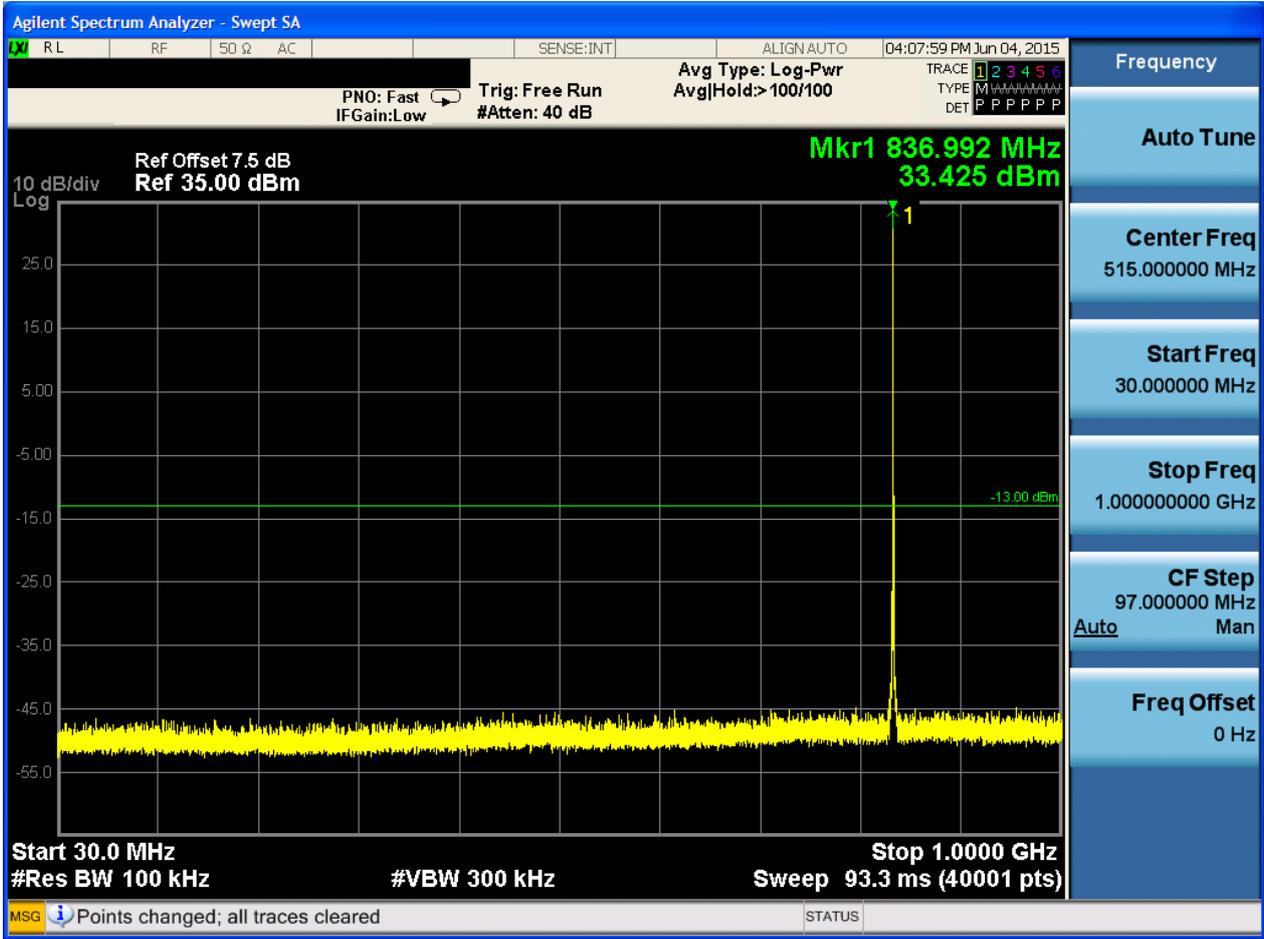
6.1.1 Test Band = GSM850

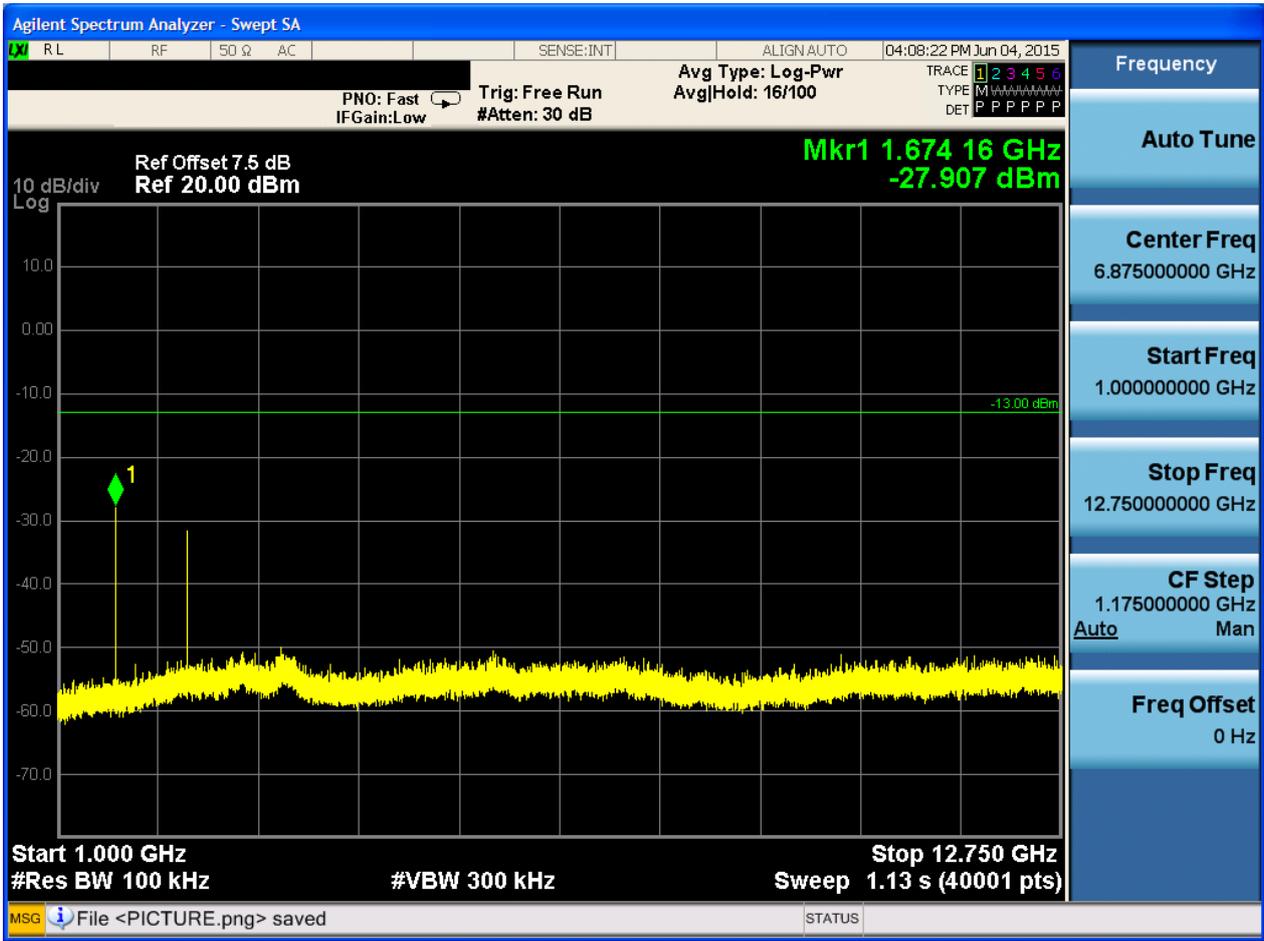
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH

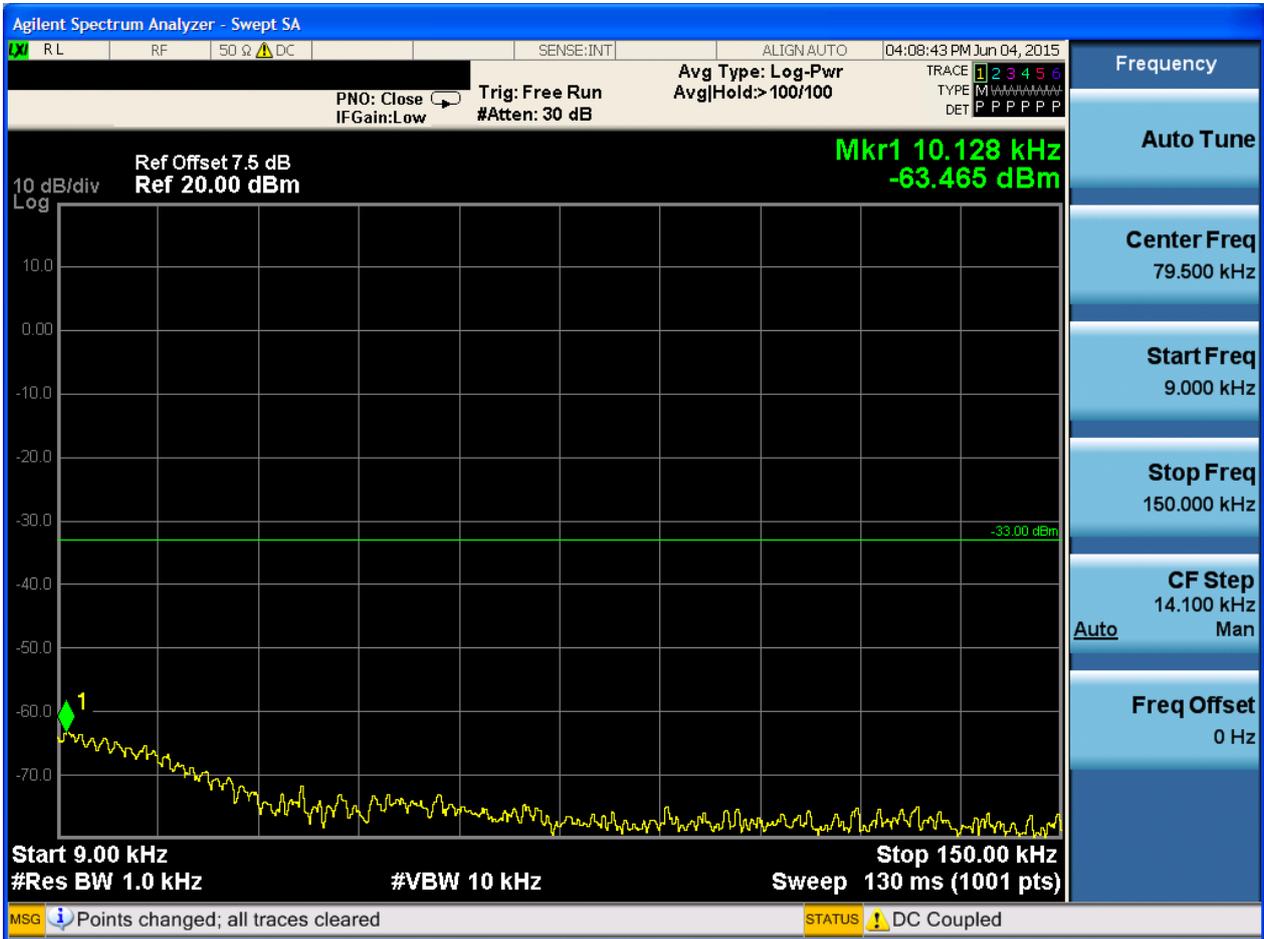


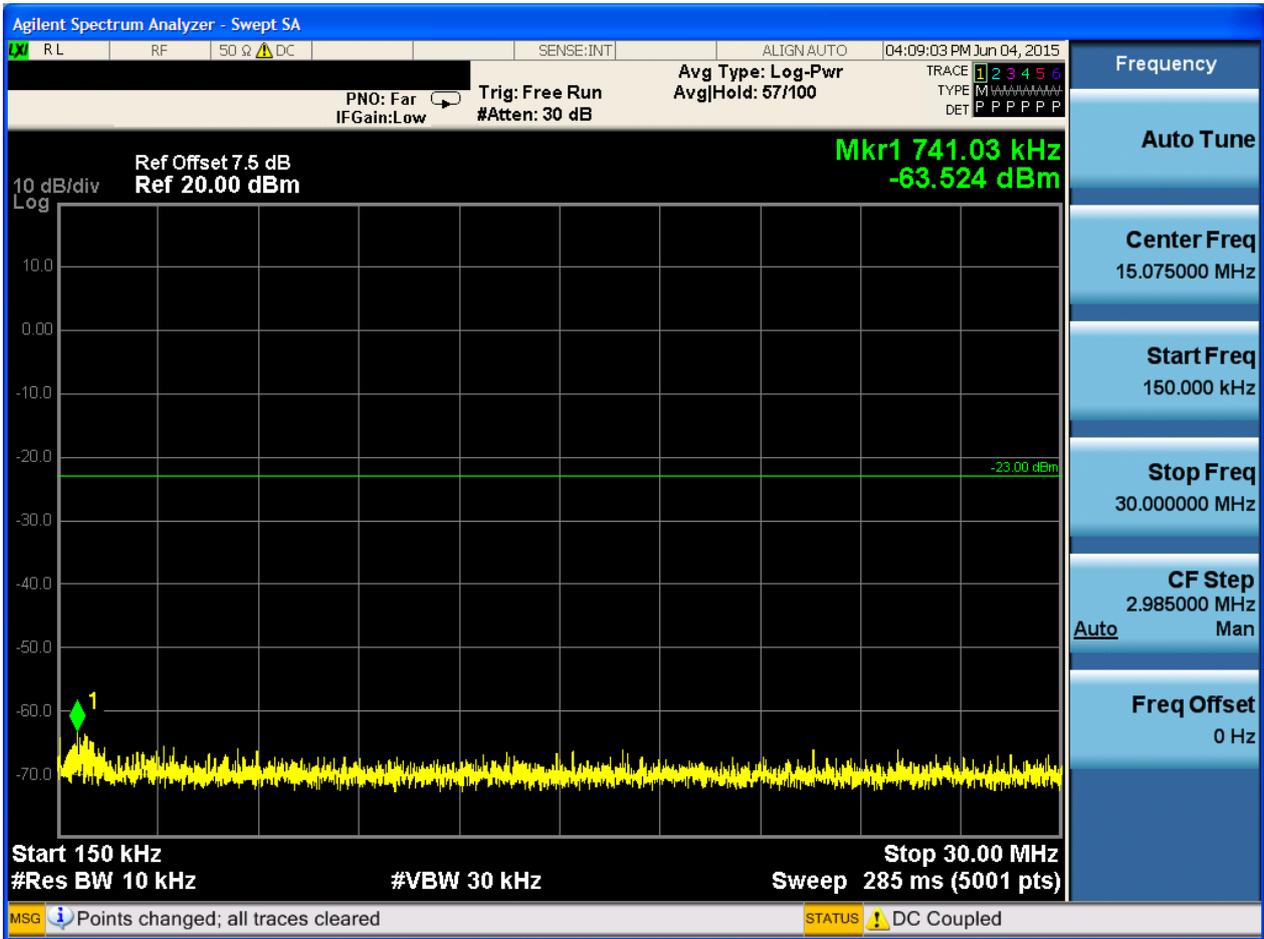


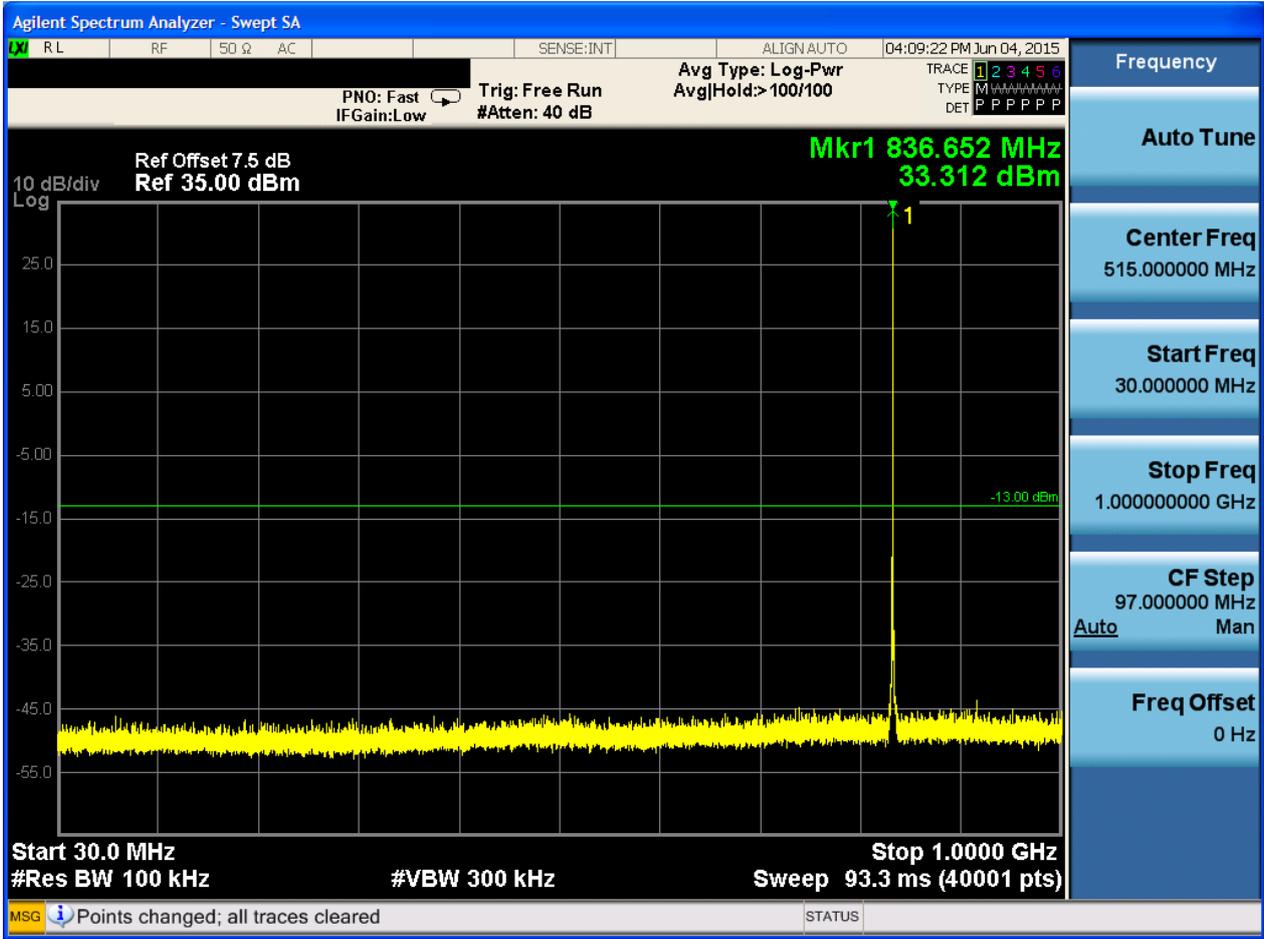




6.1.1.1.2 Test Channel = MCH

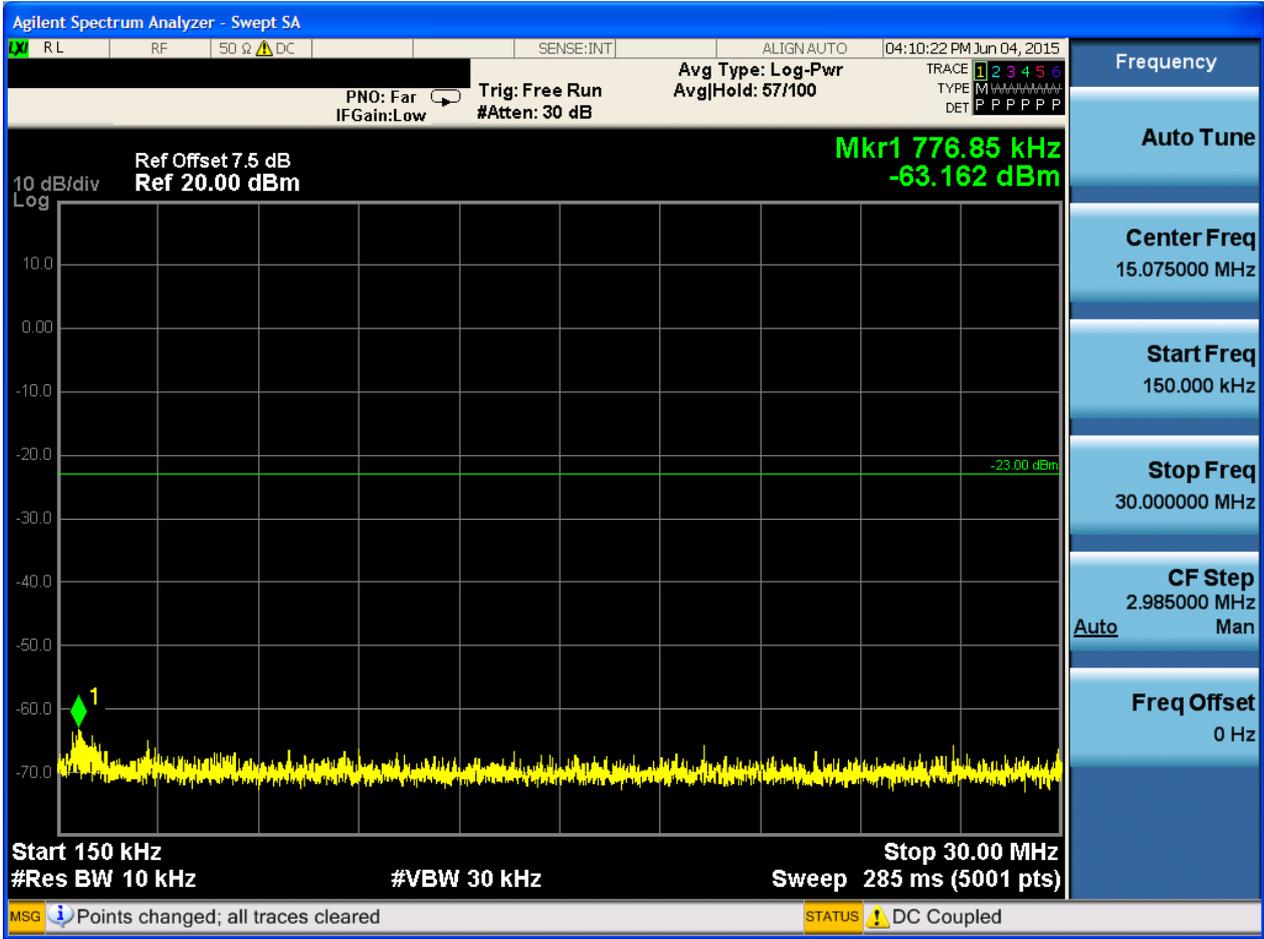


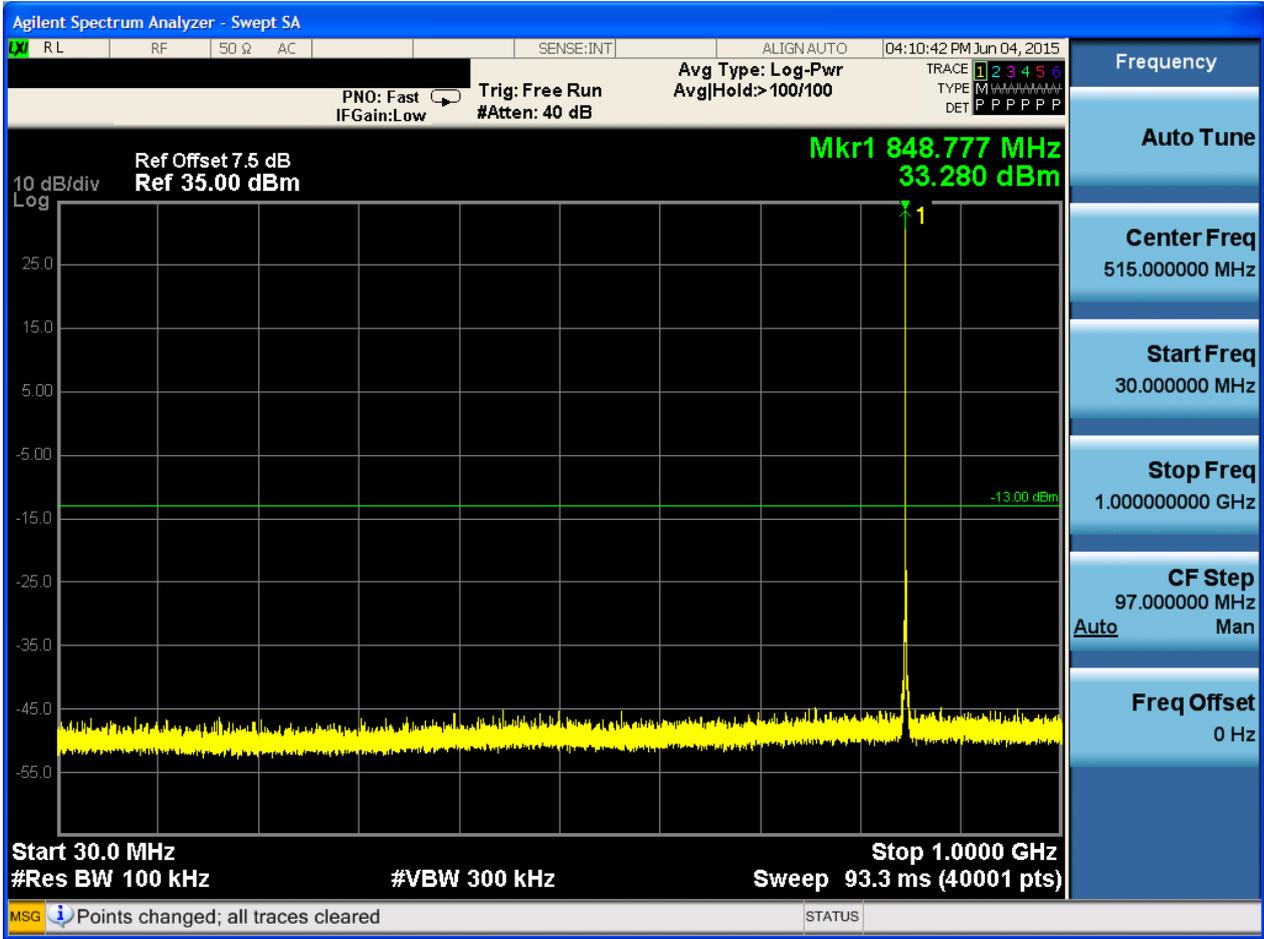


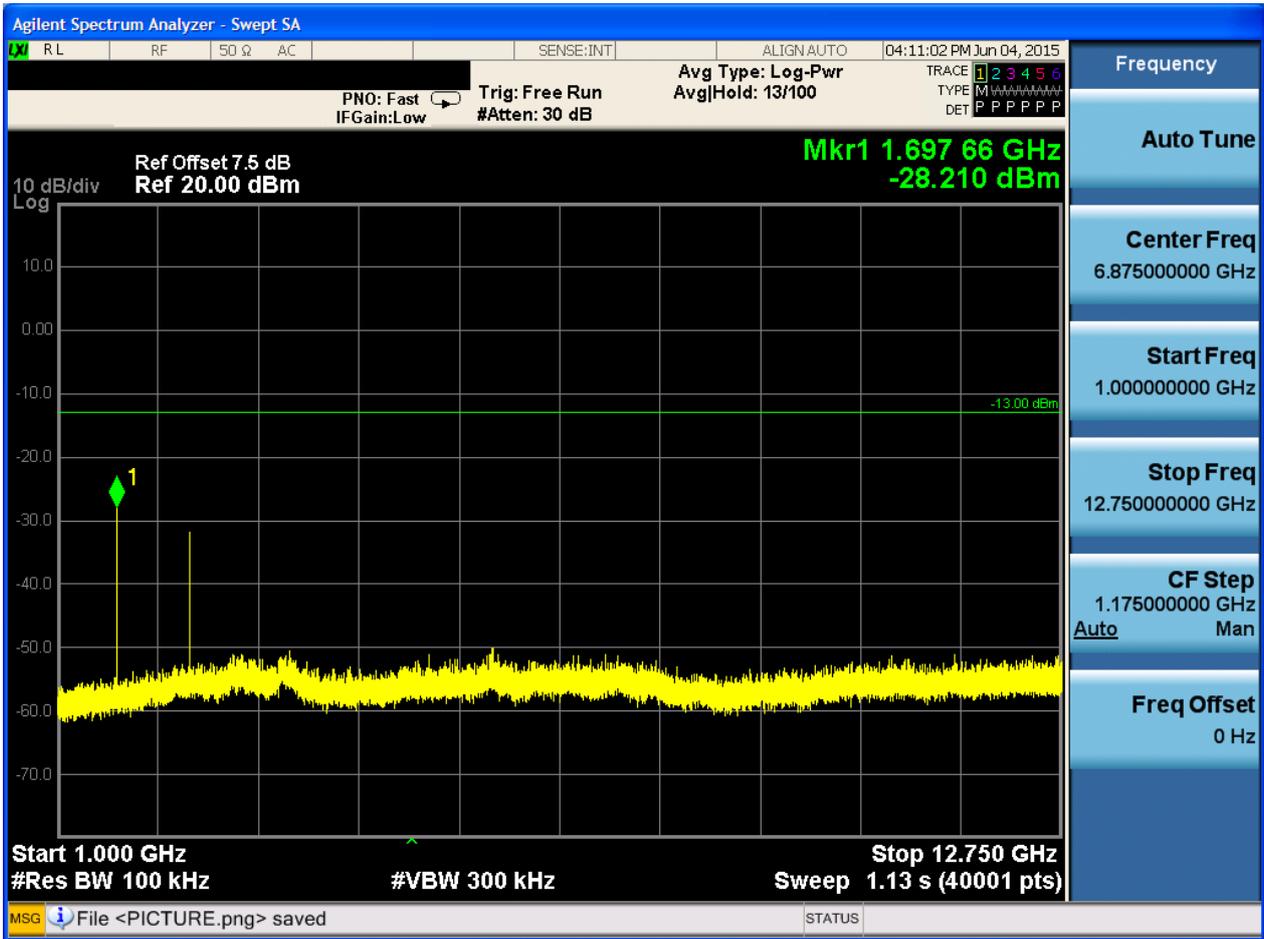


6.1.1.1.3 Test Channel = HCH





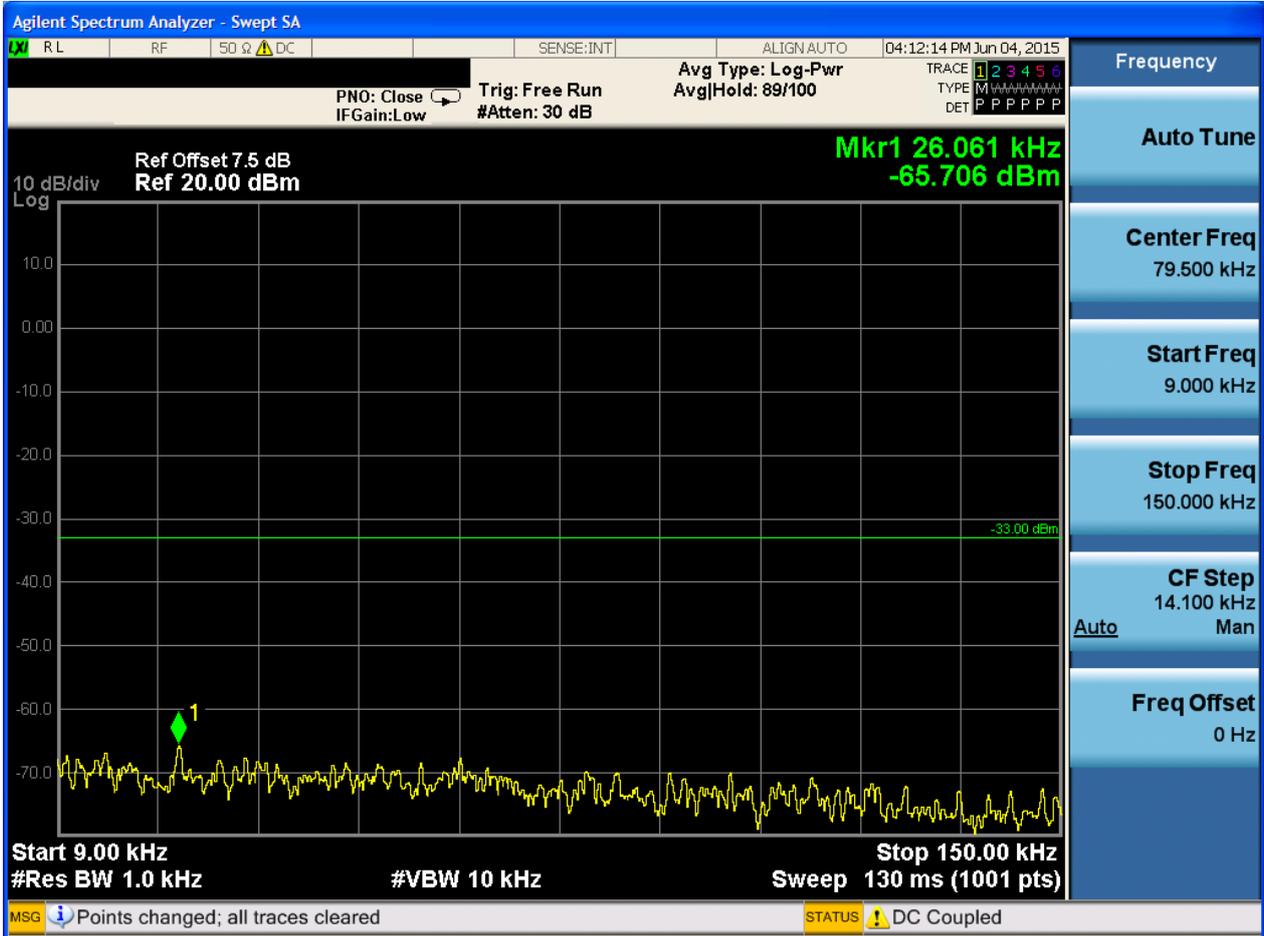


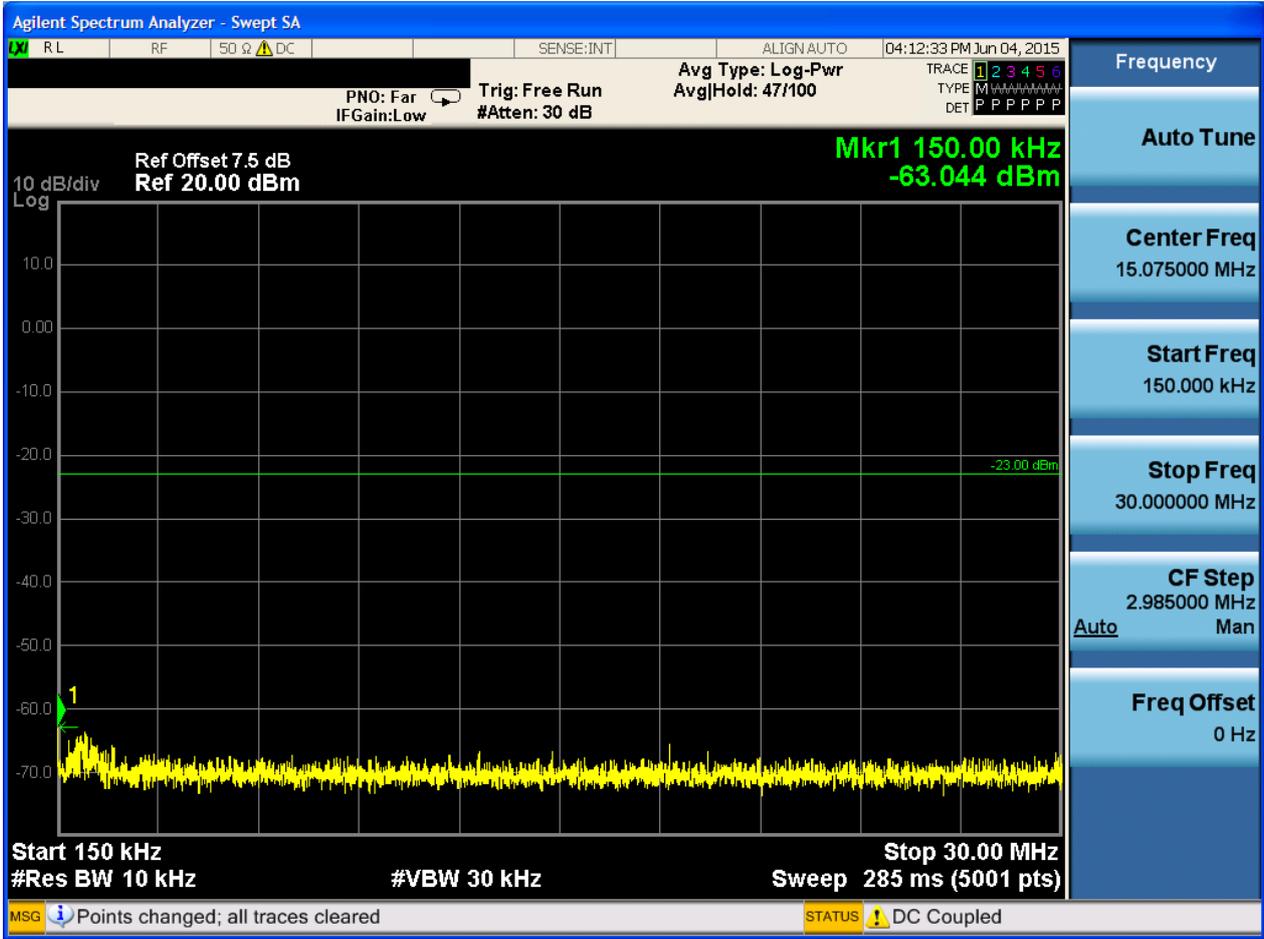


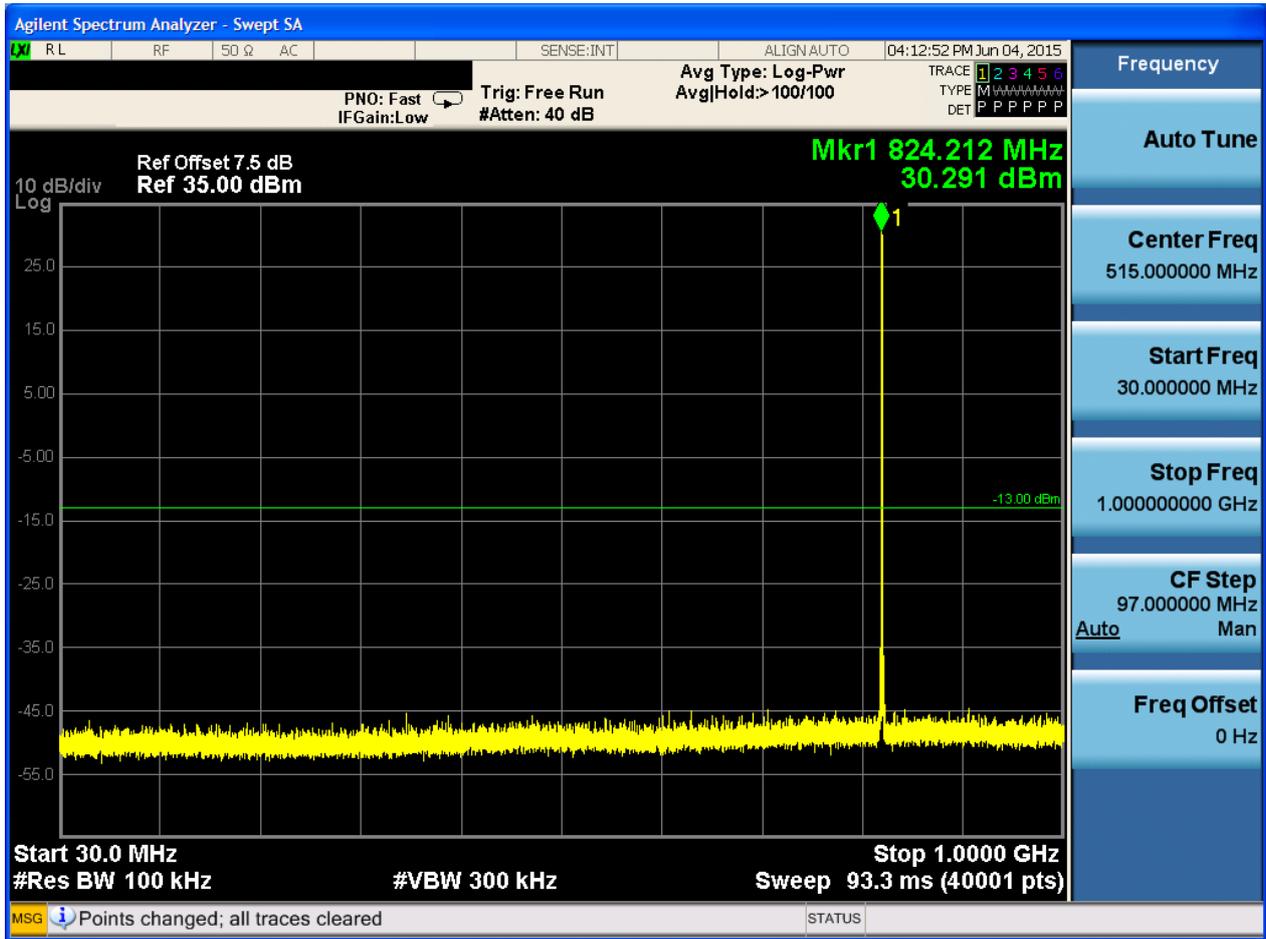


6.1.1.2 Test Mode = GSM/TM2

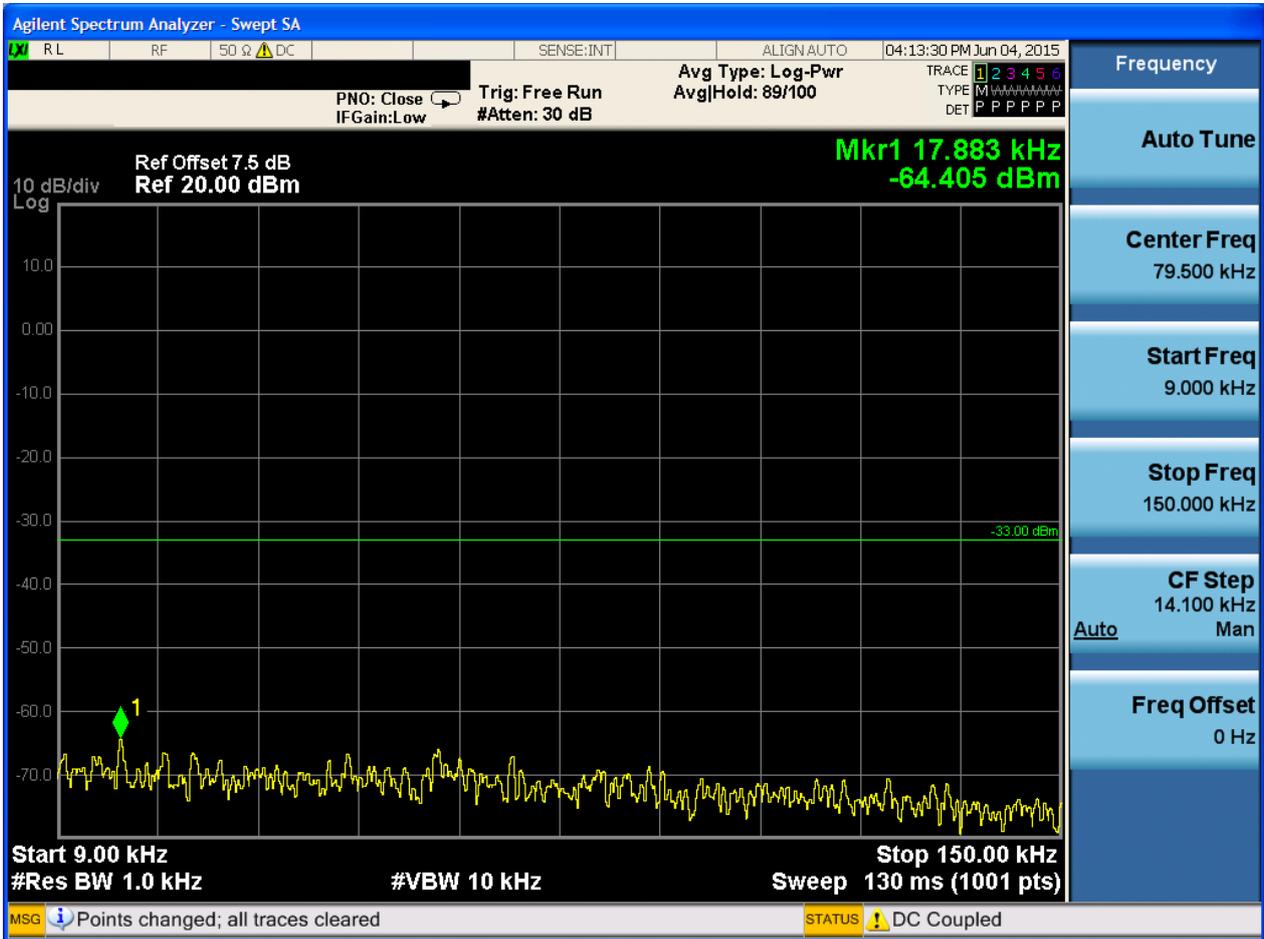
6.1.1.2.1 Test Channel = LCH

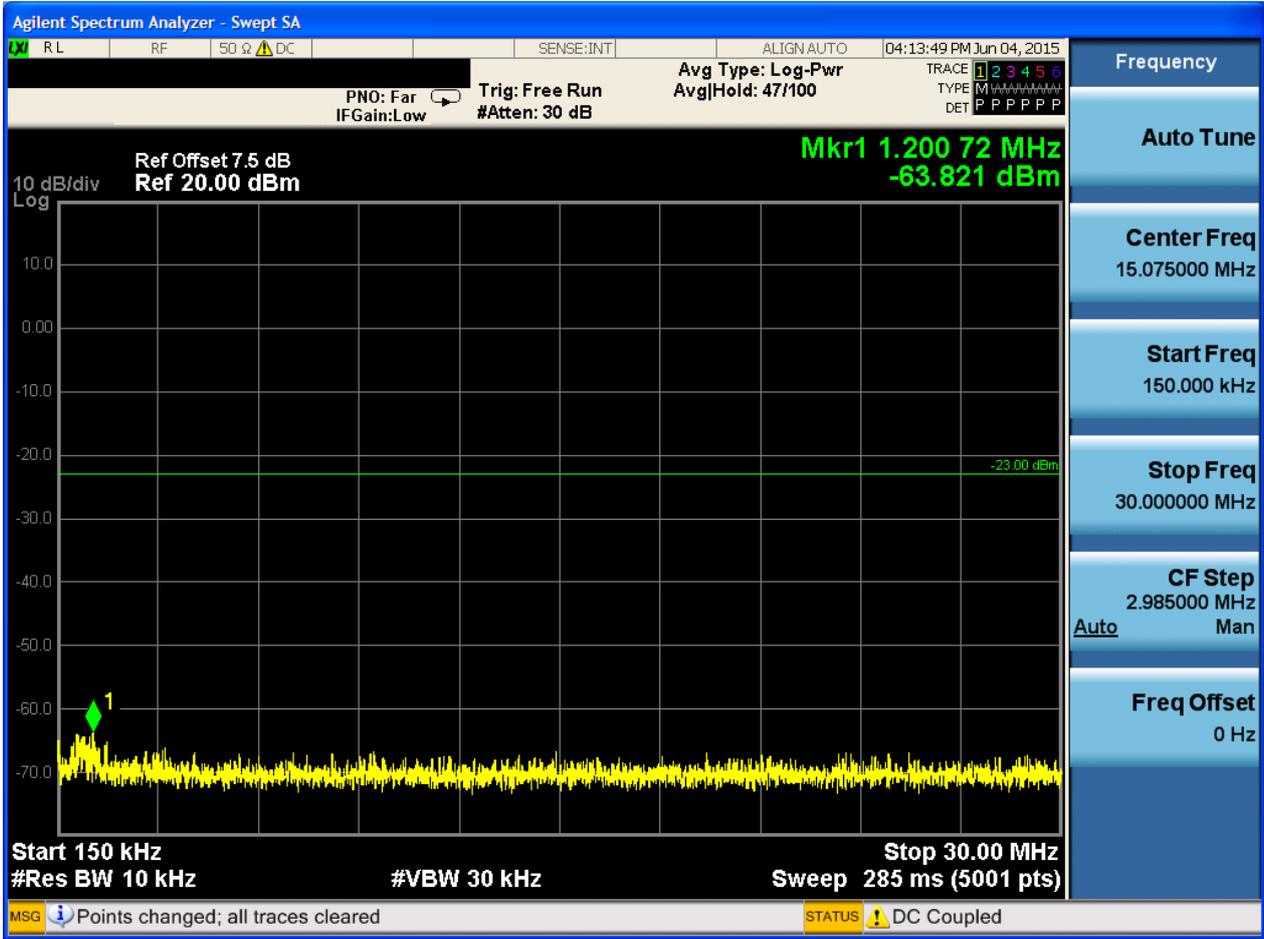


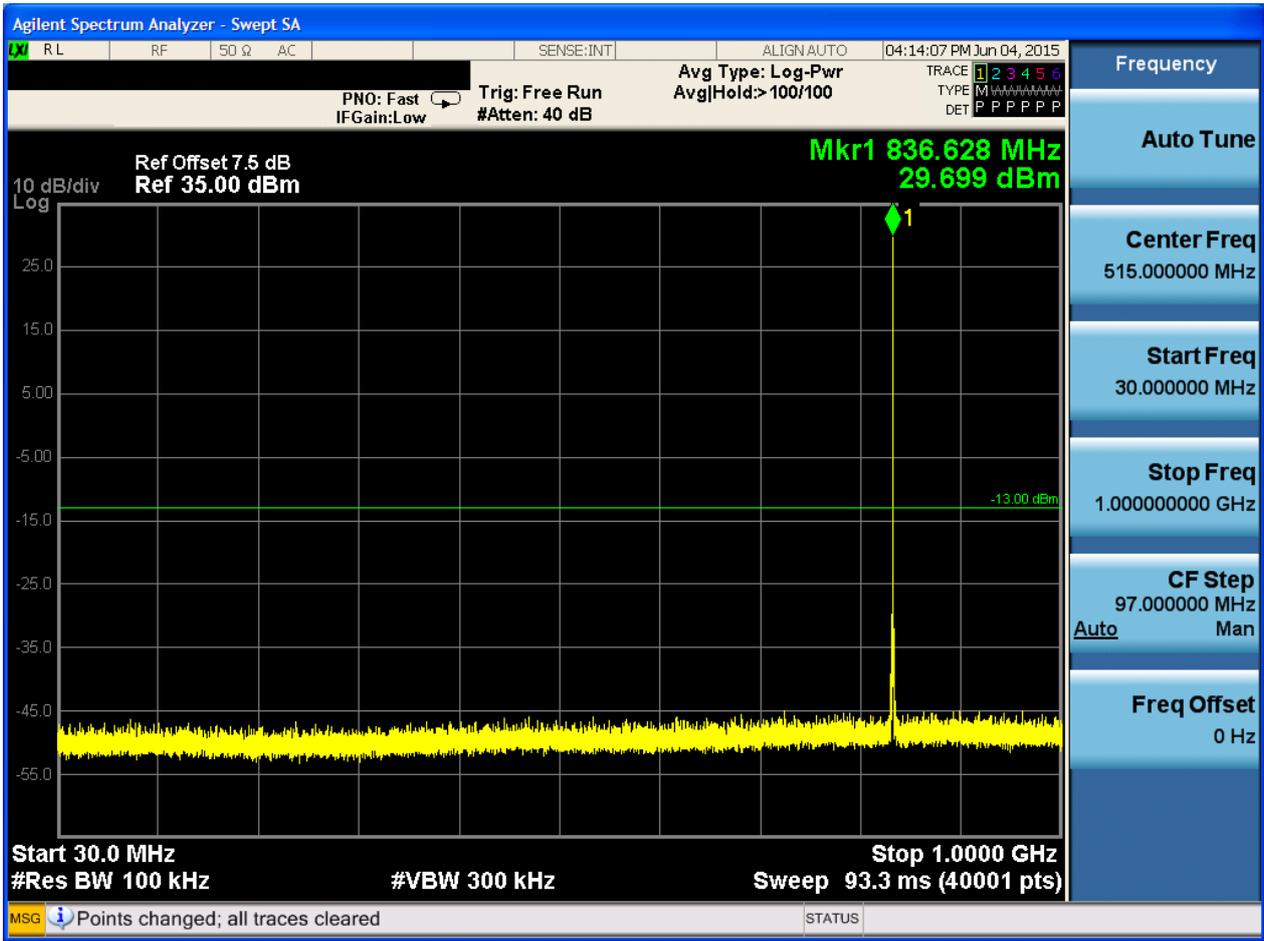


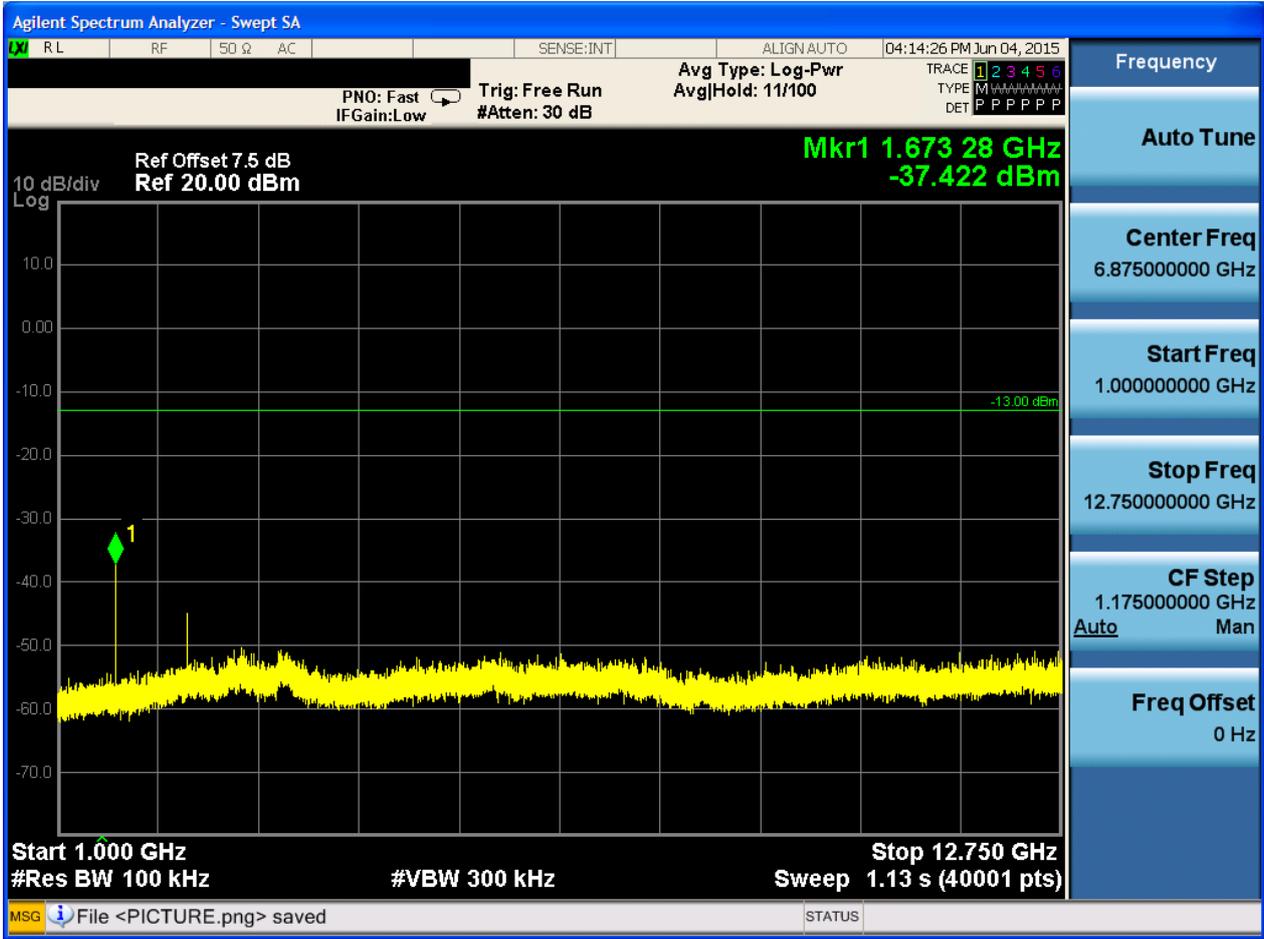


6.1.1.2.2 Test Channel = MCH

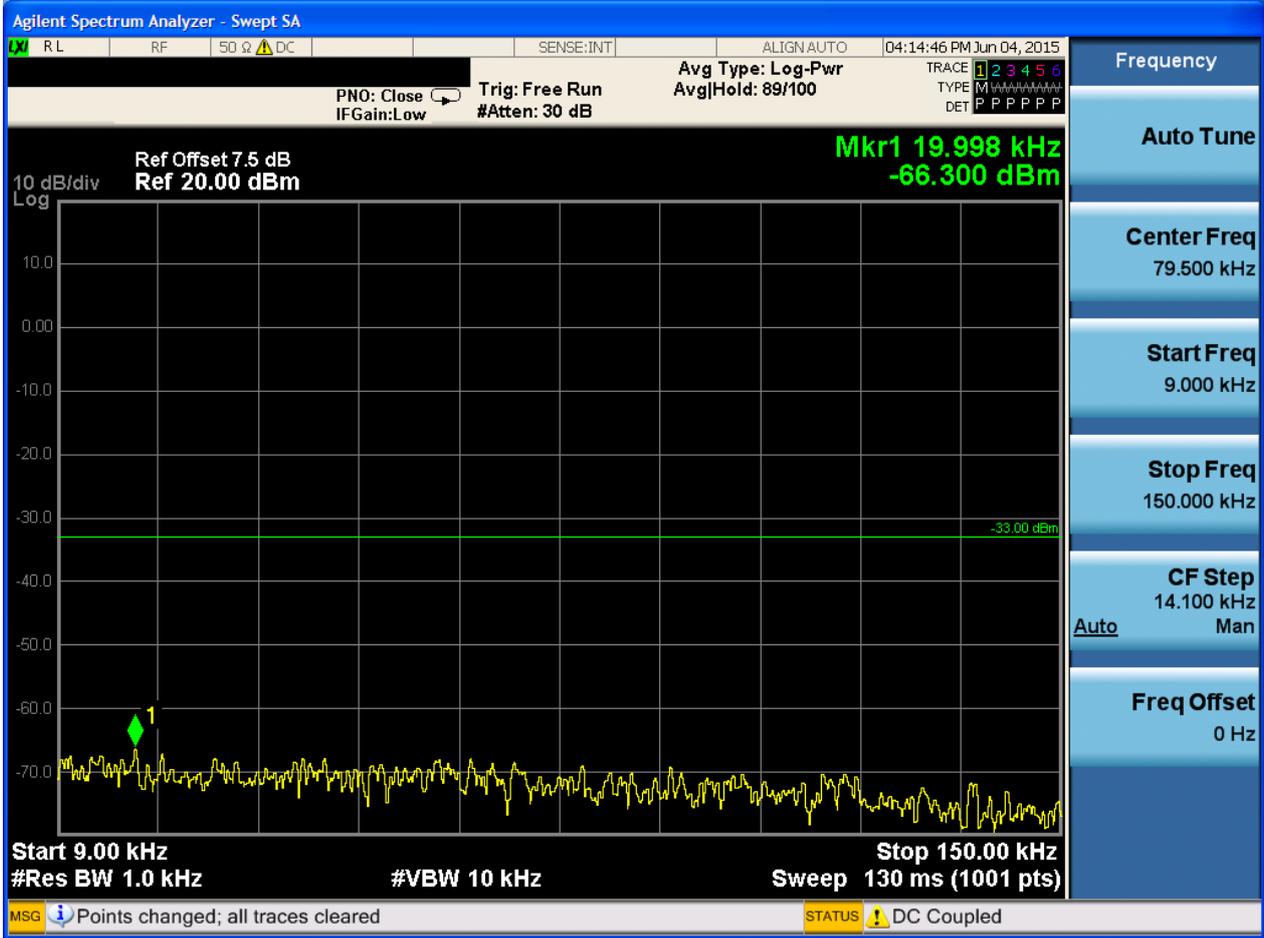


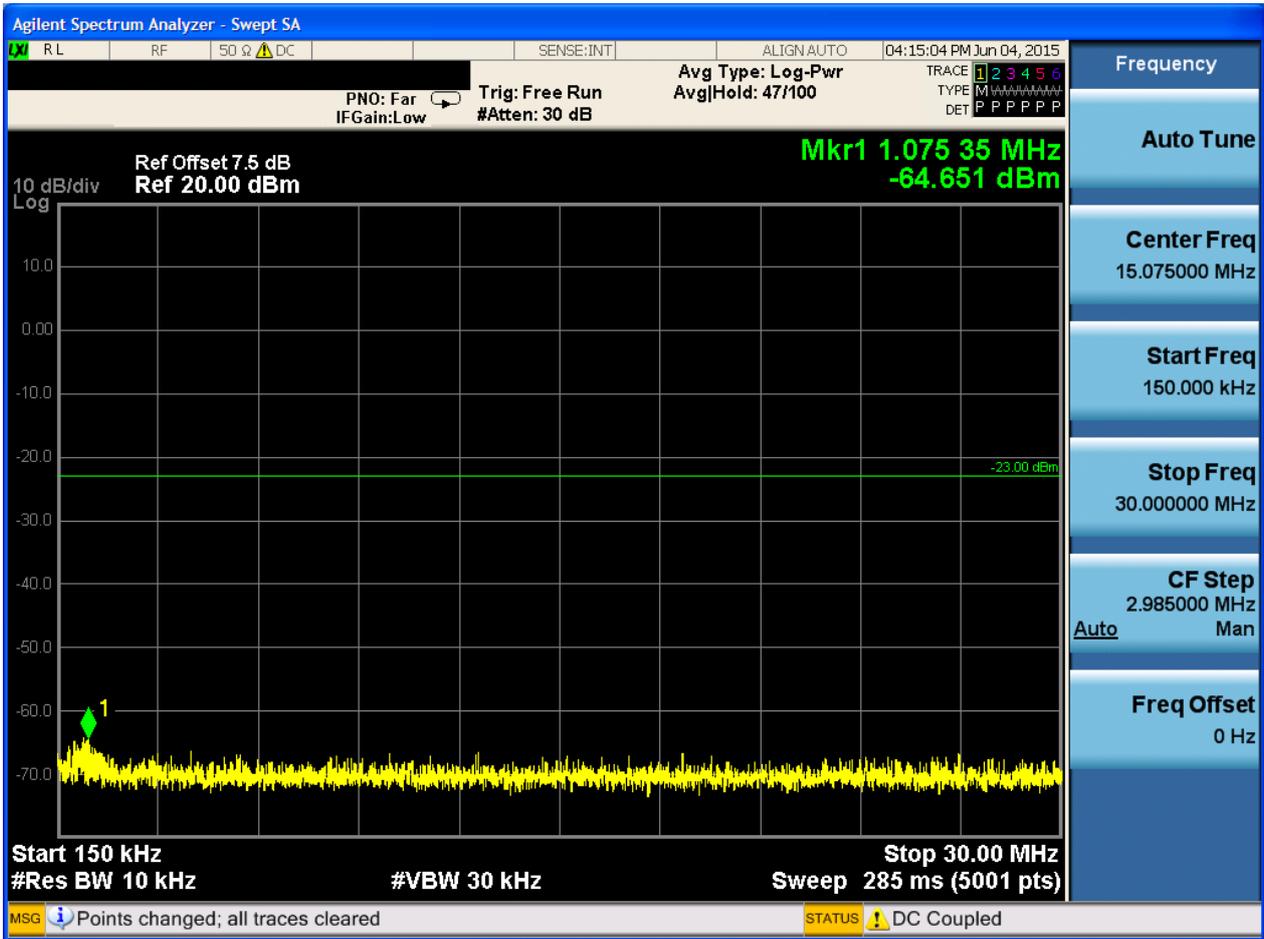


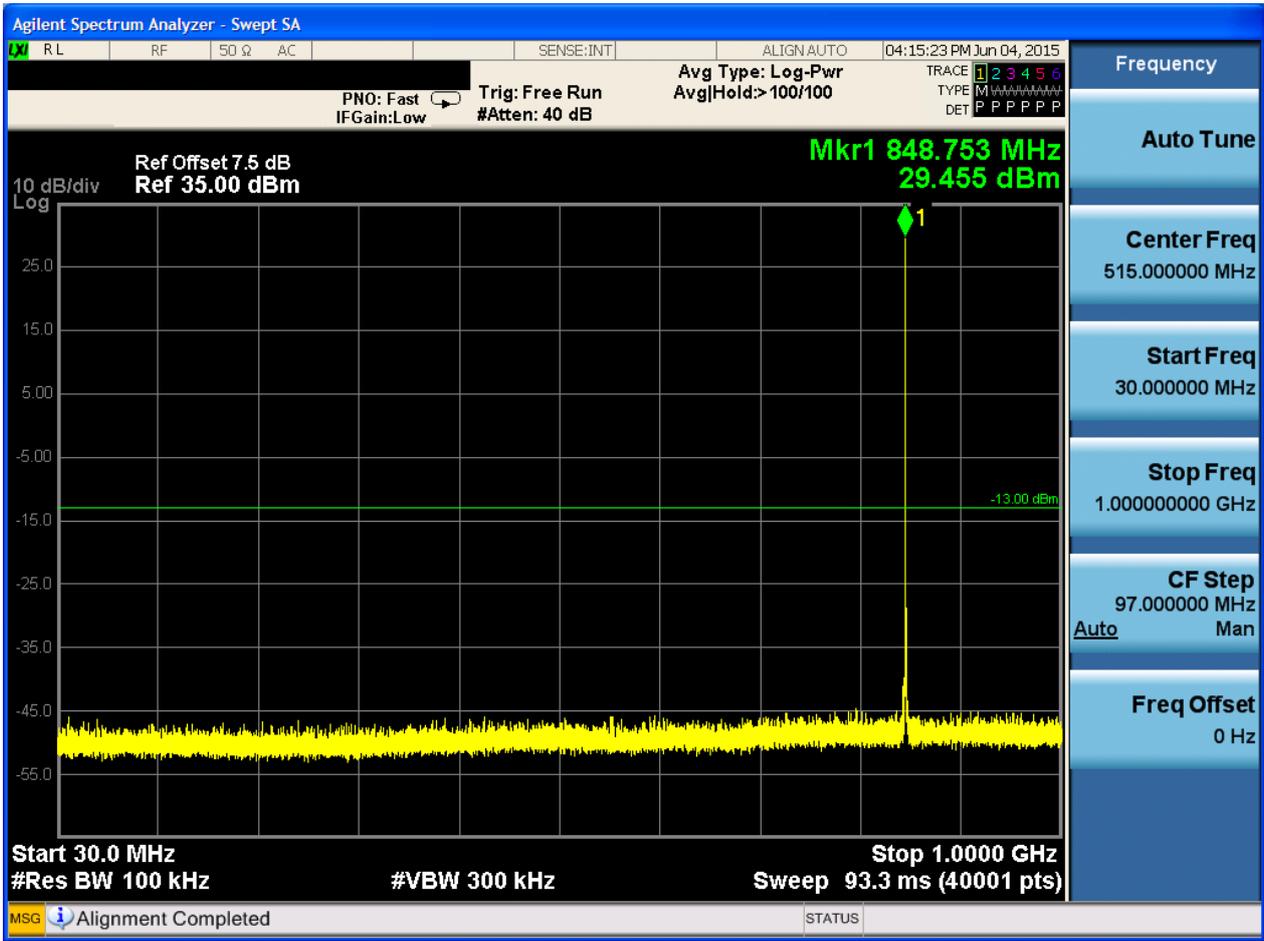


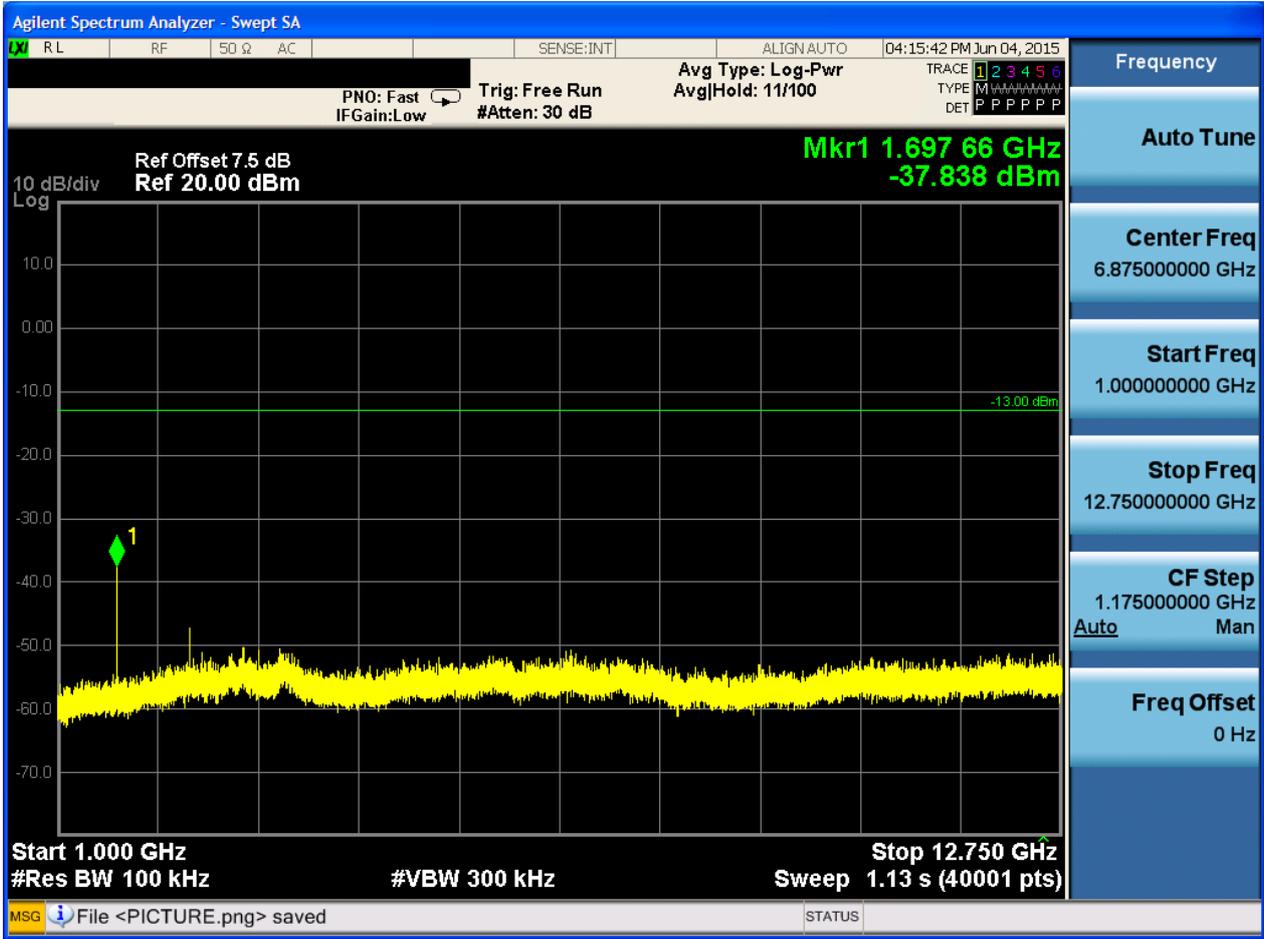


6.1.1.2.3 Test Channel = HCH







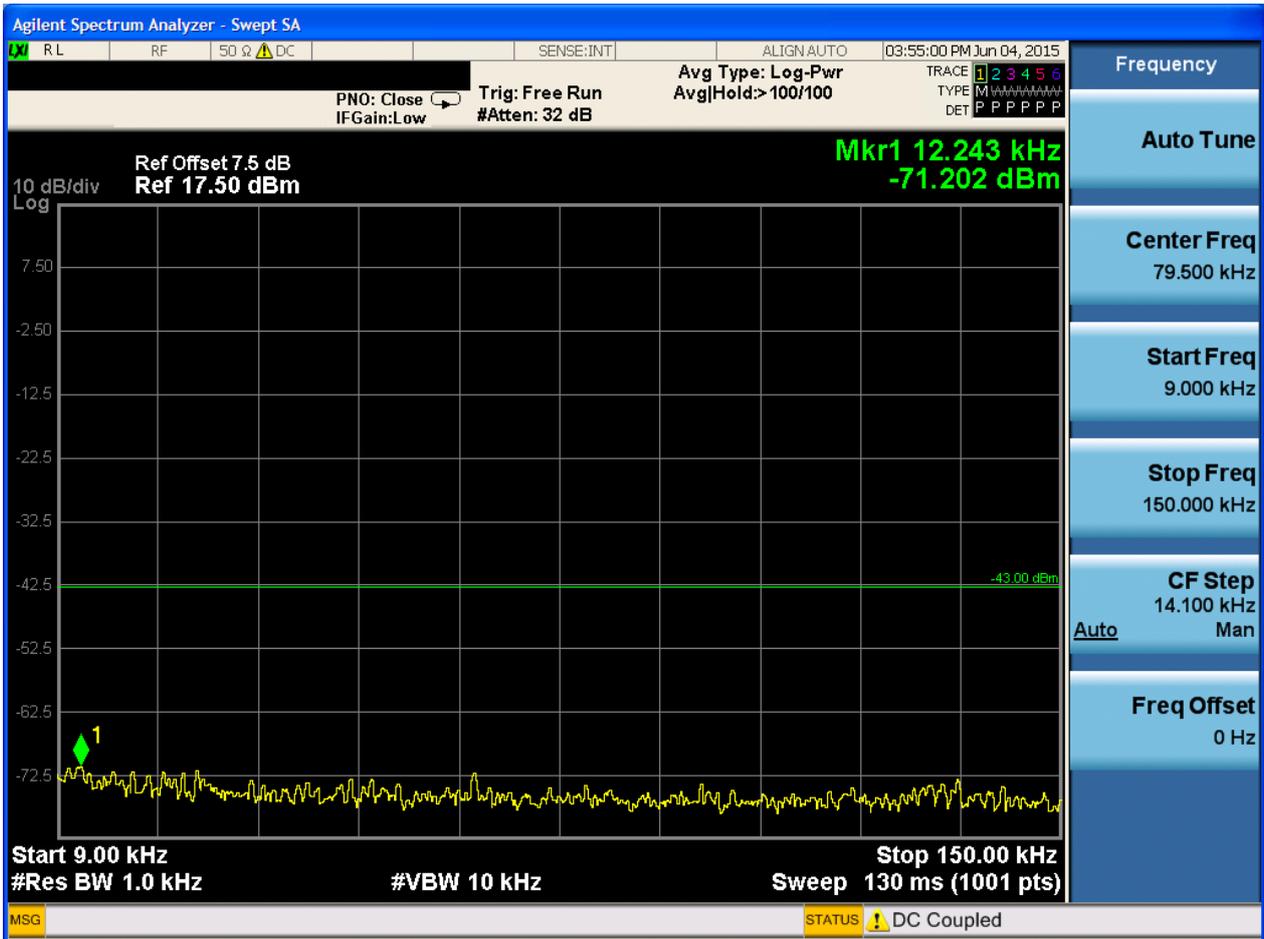


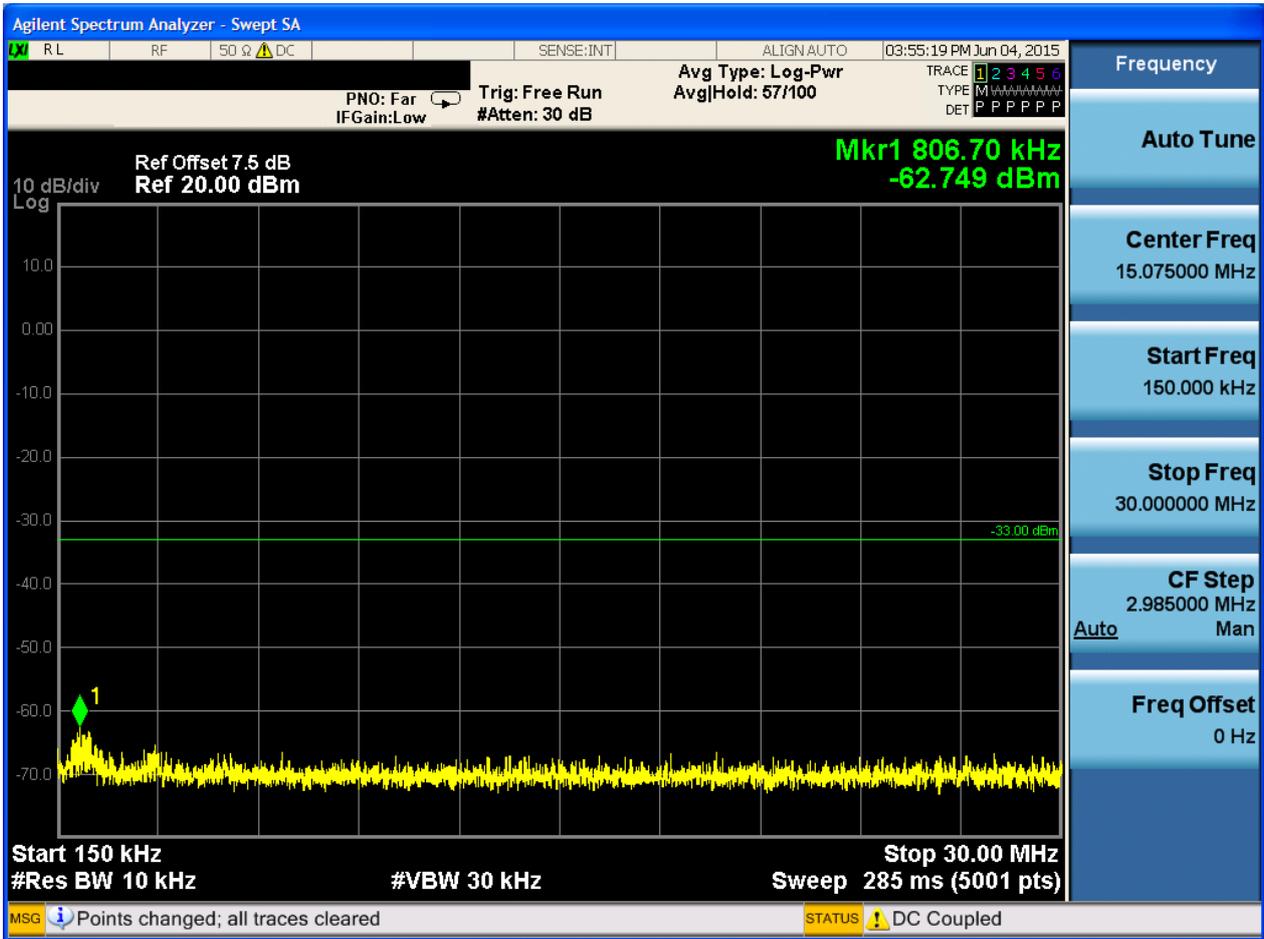


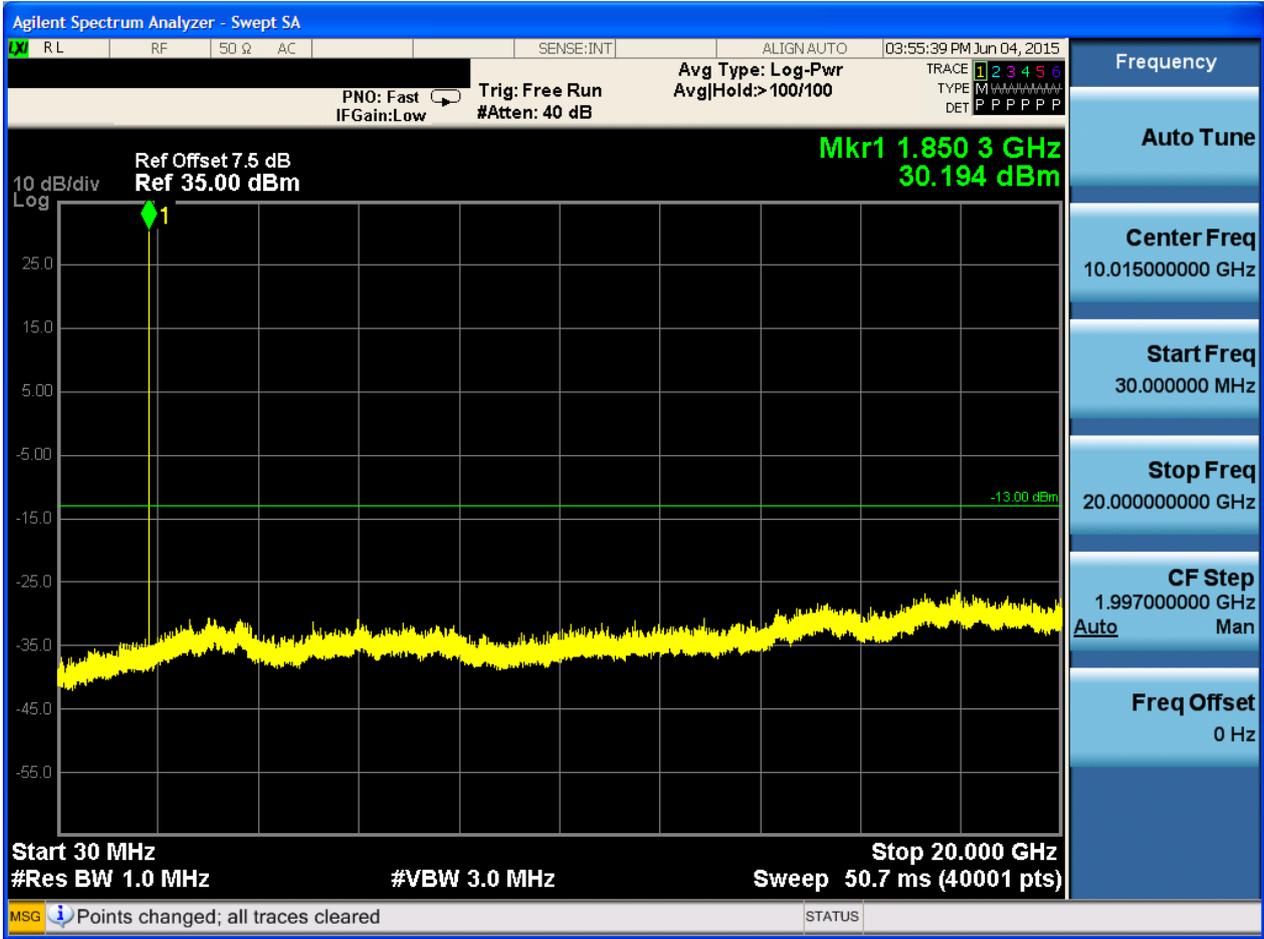
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

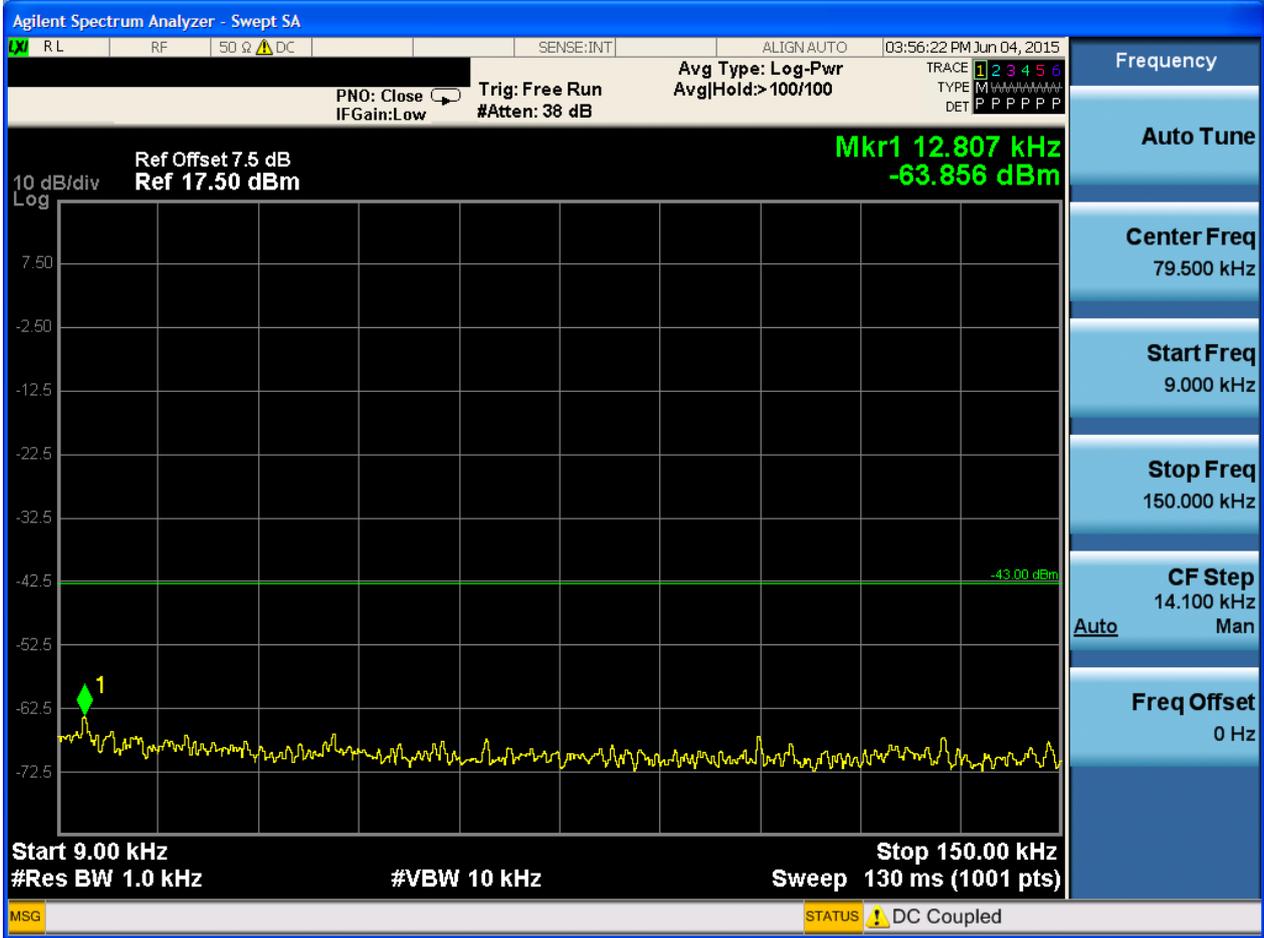
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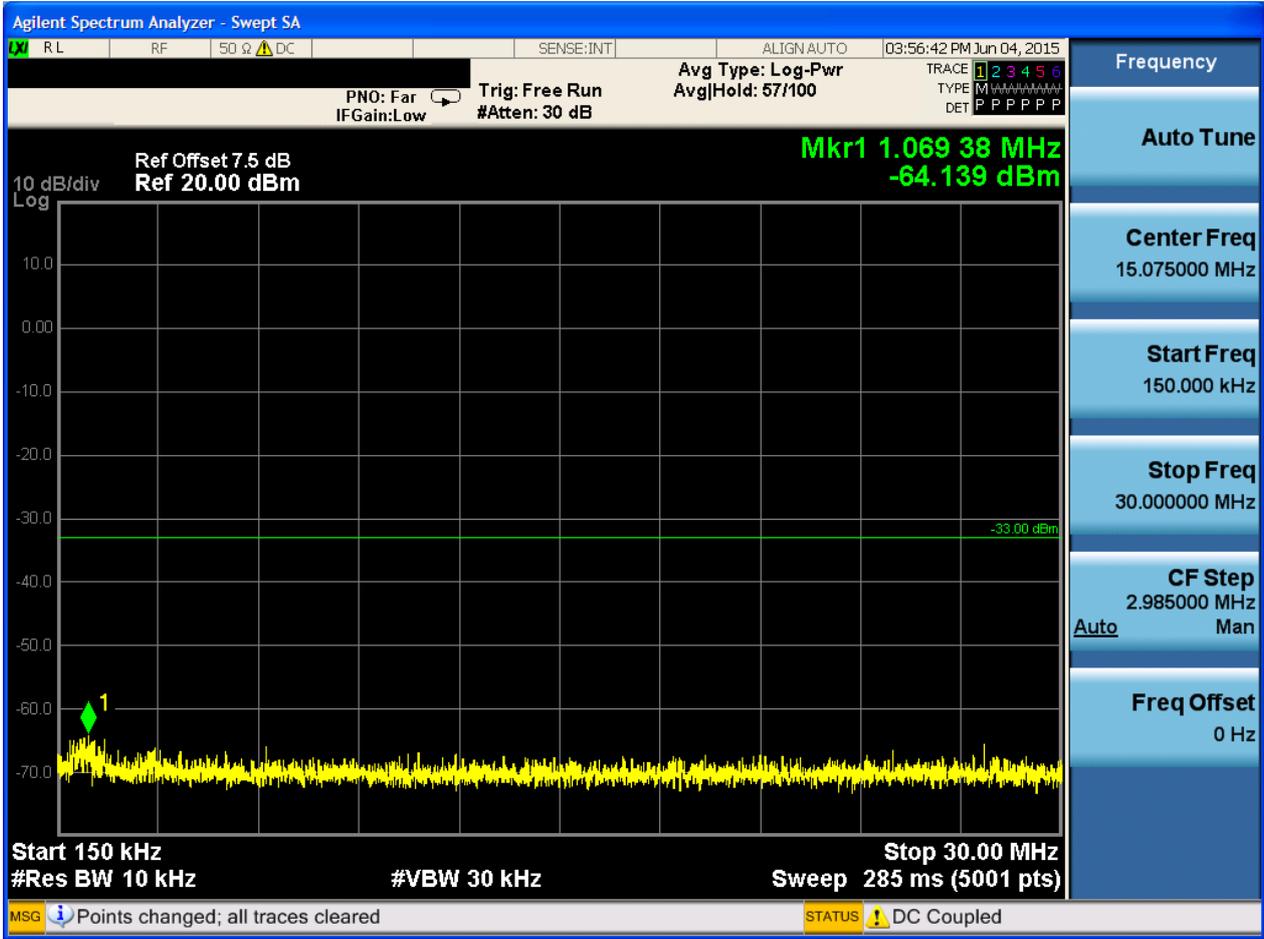


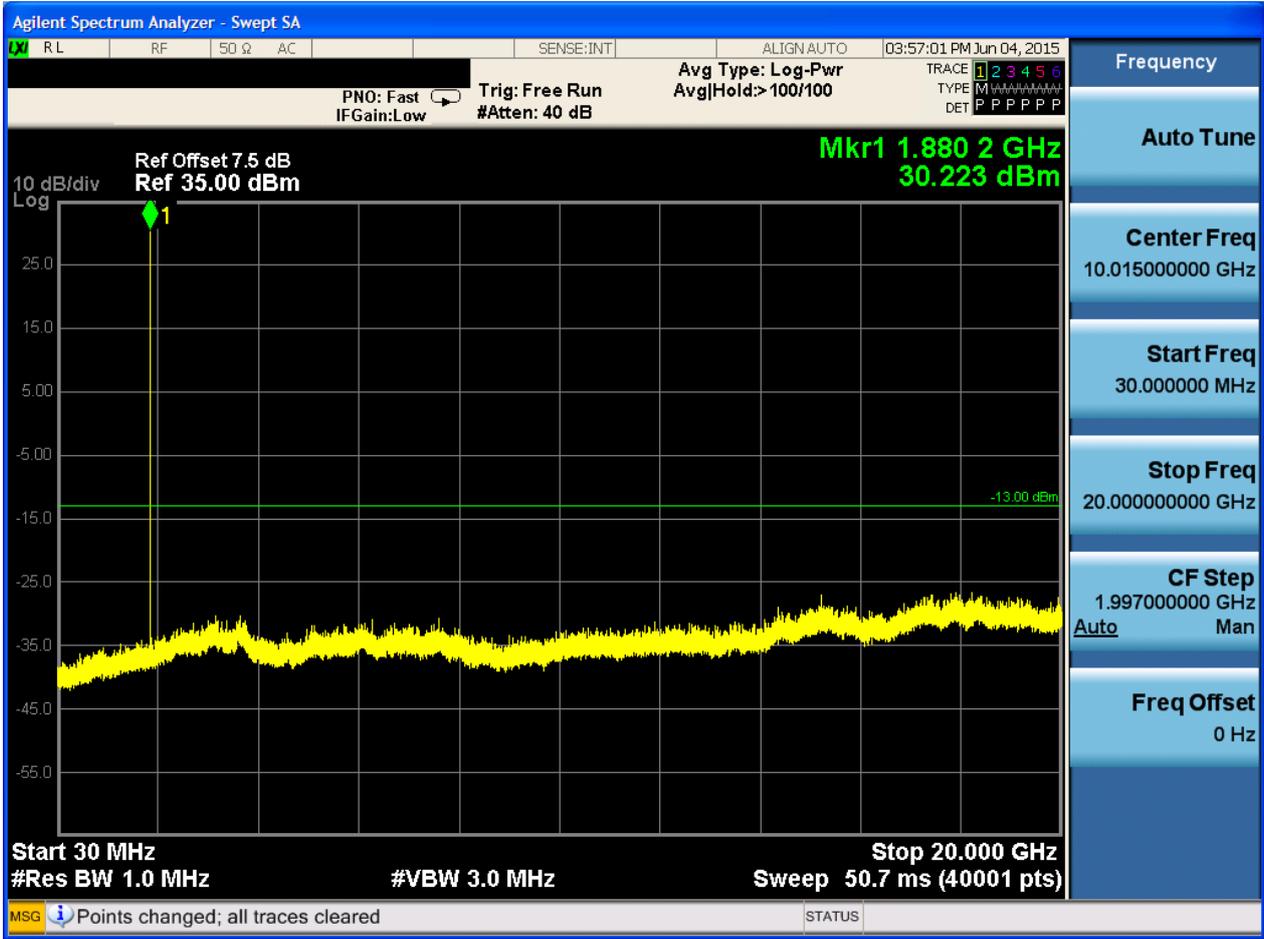


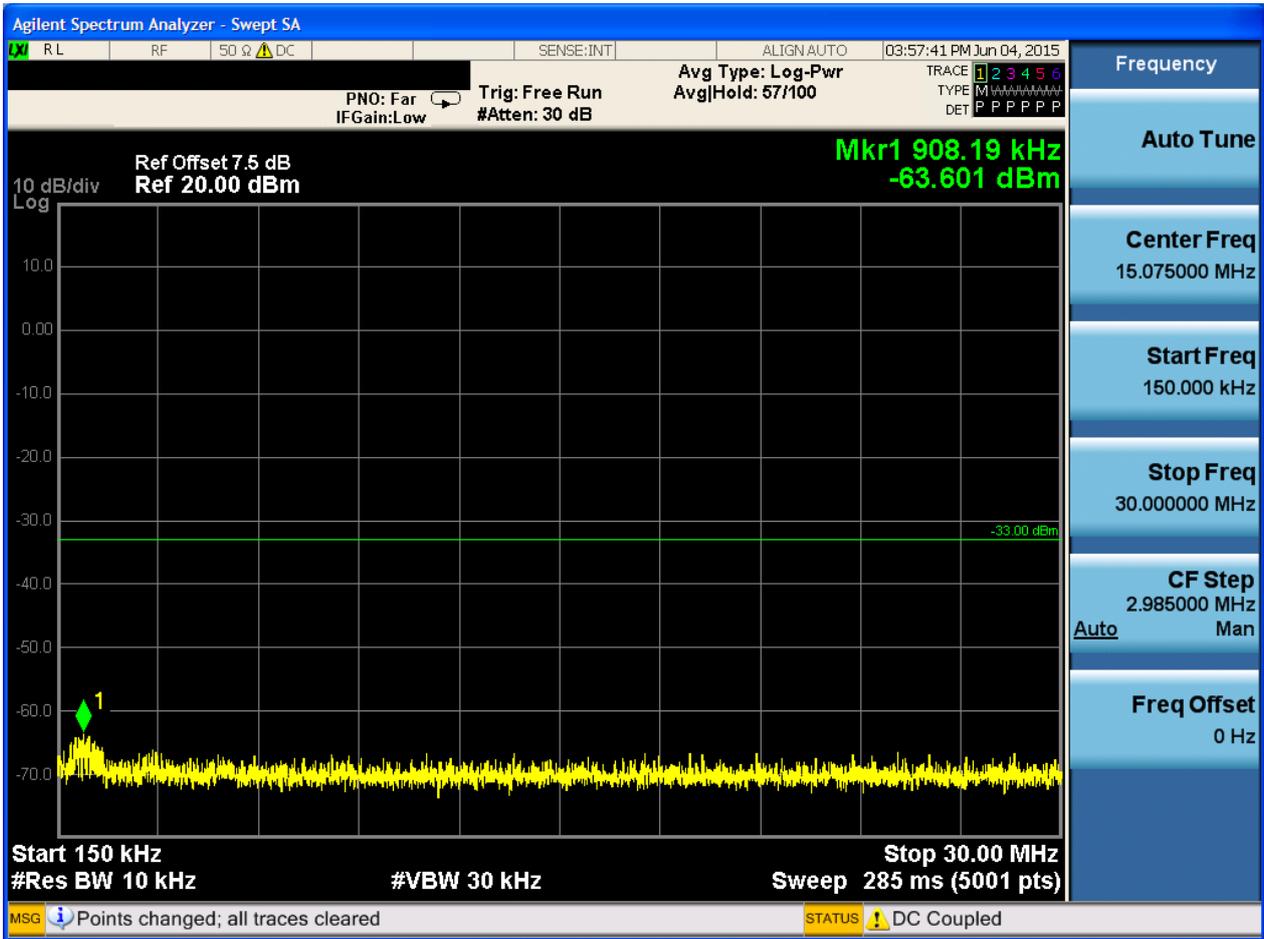


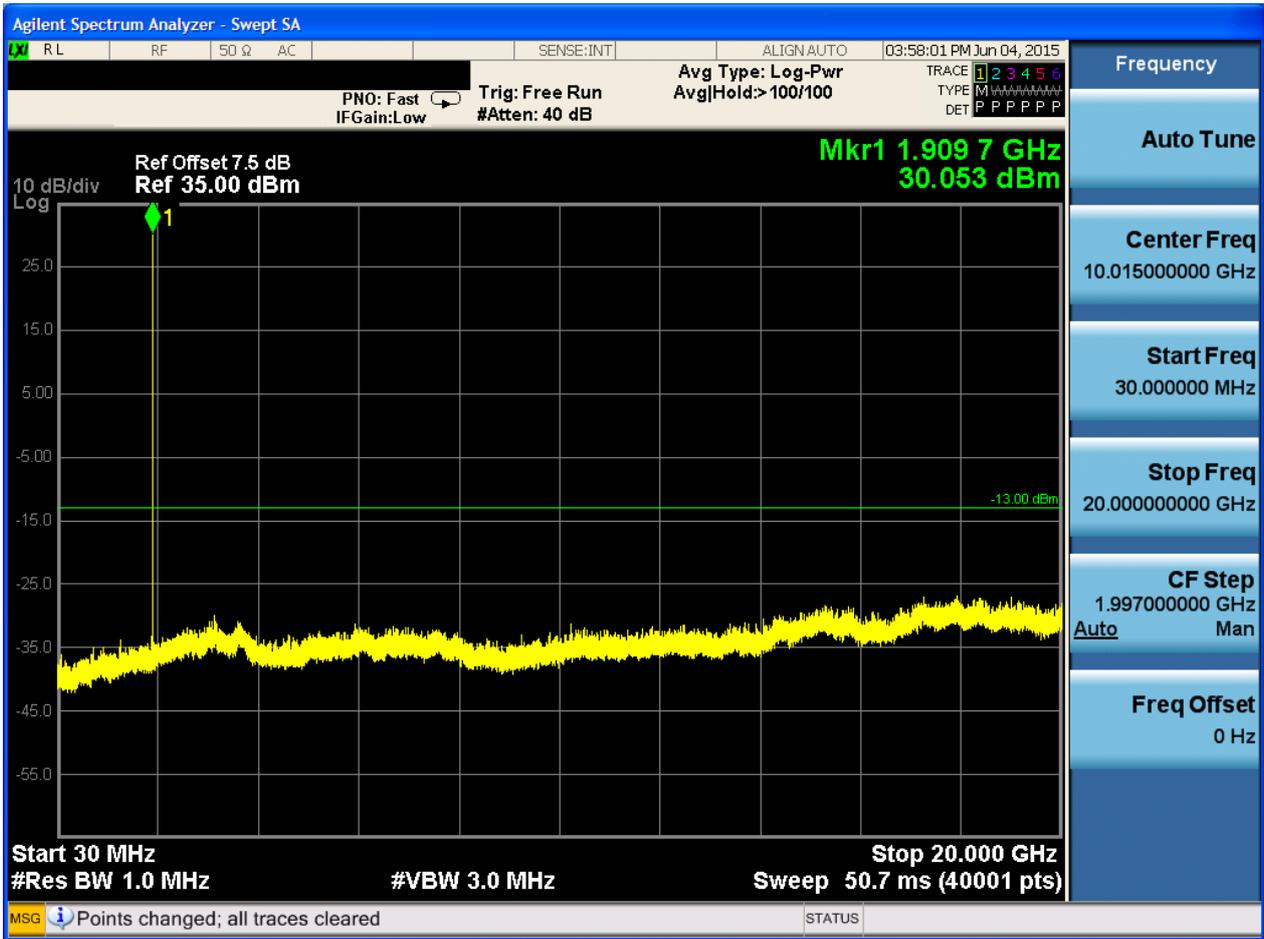
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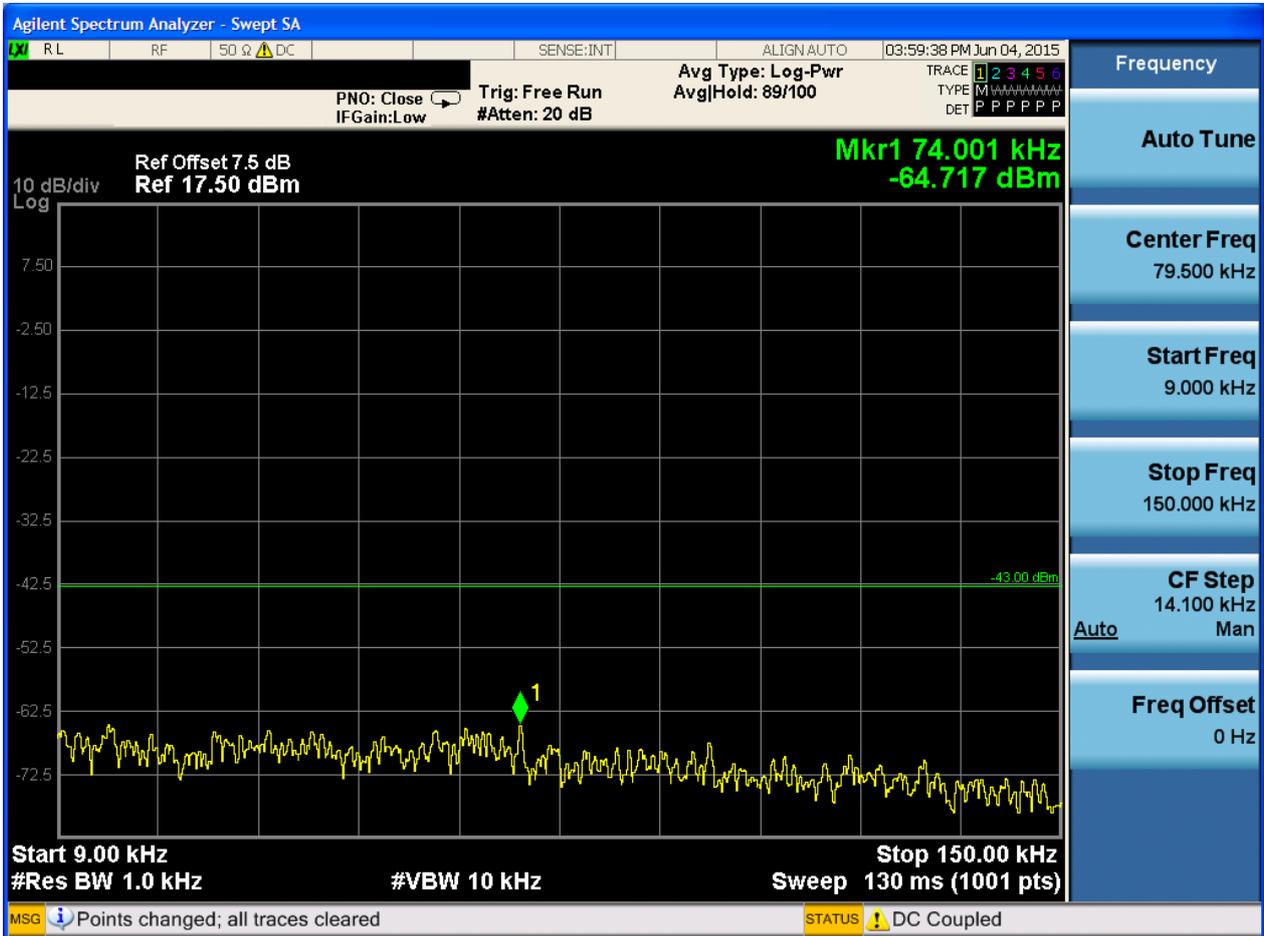






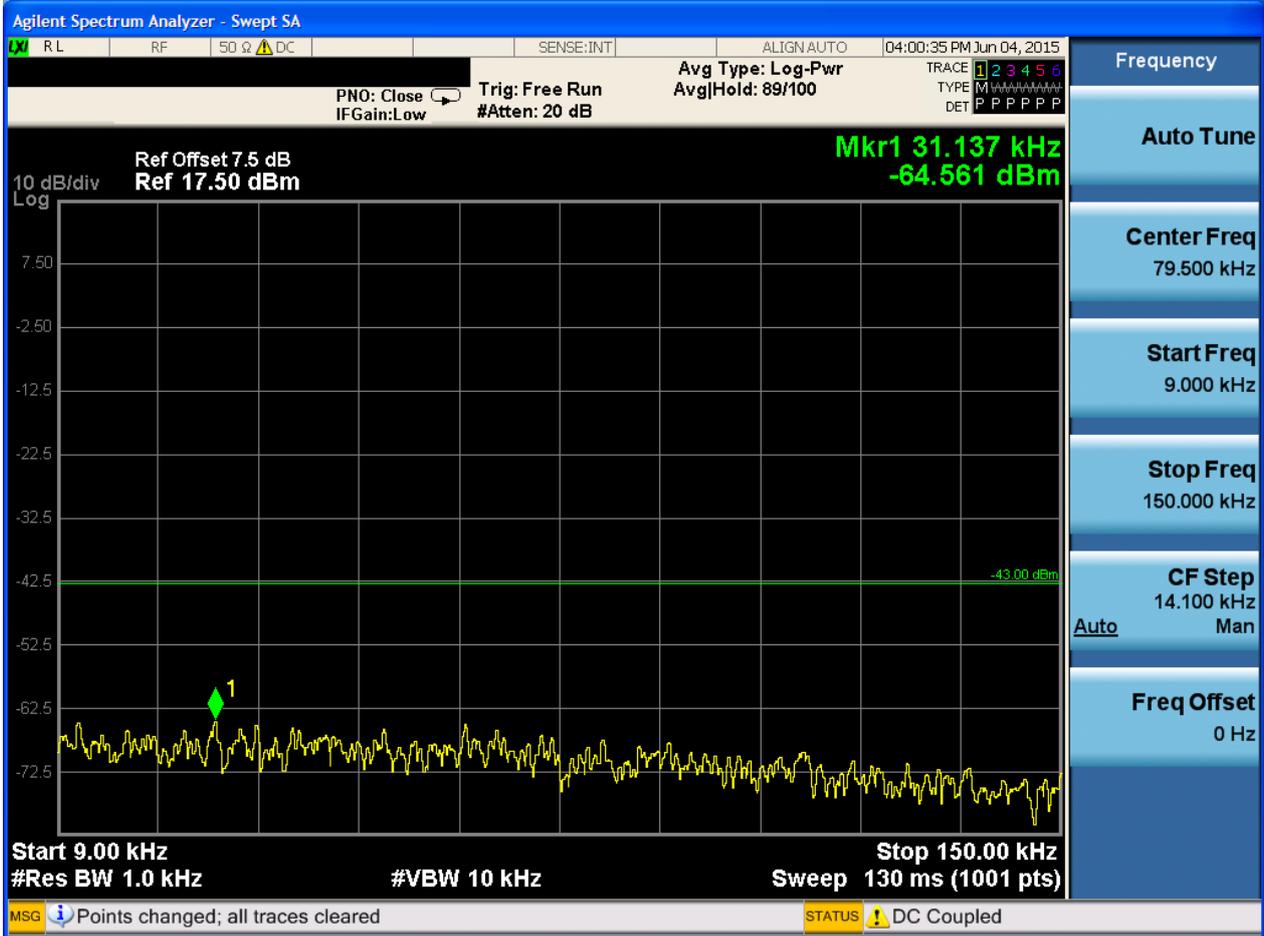
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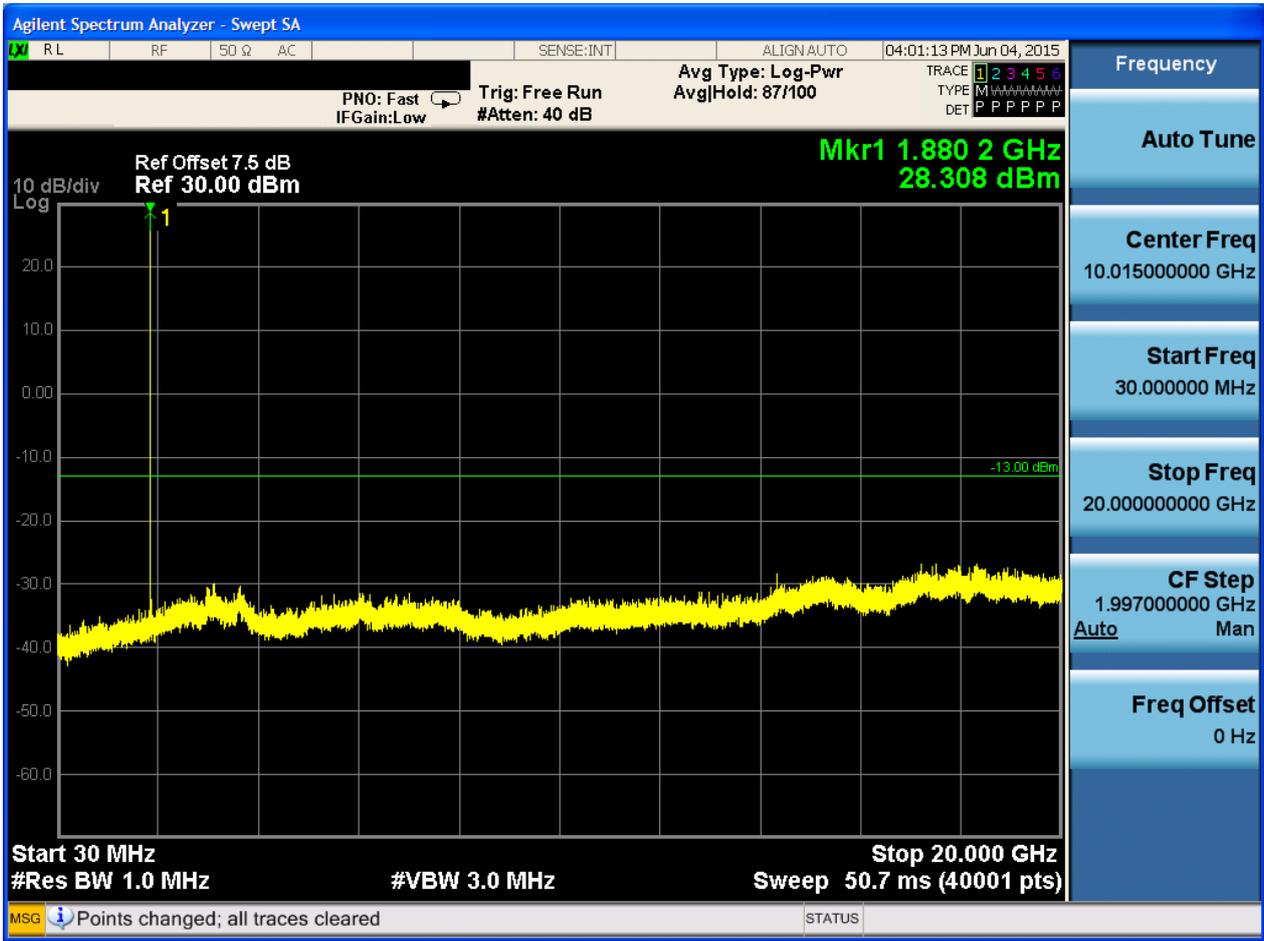
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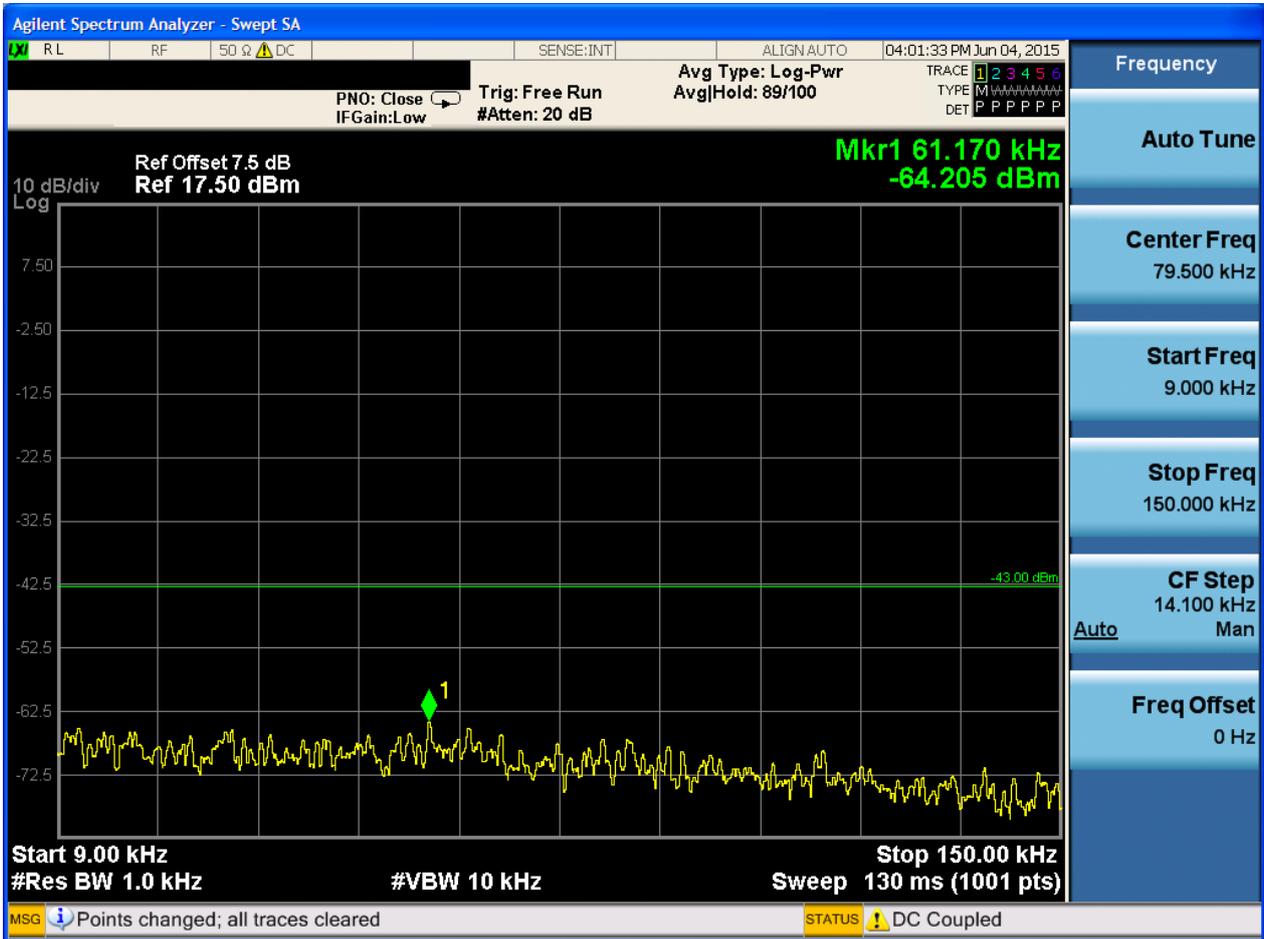
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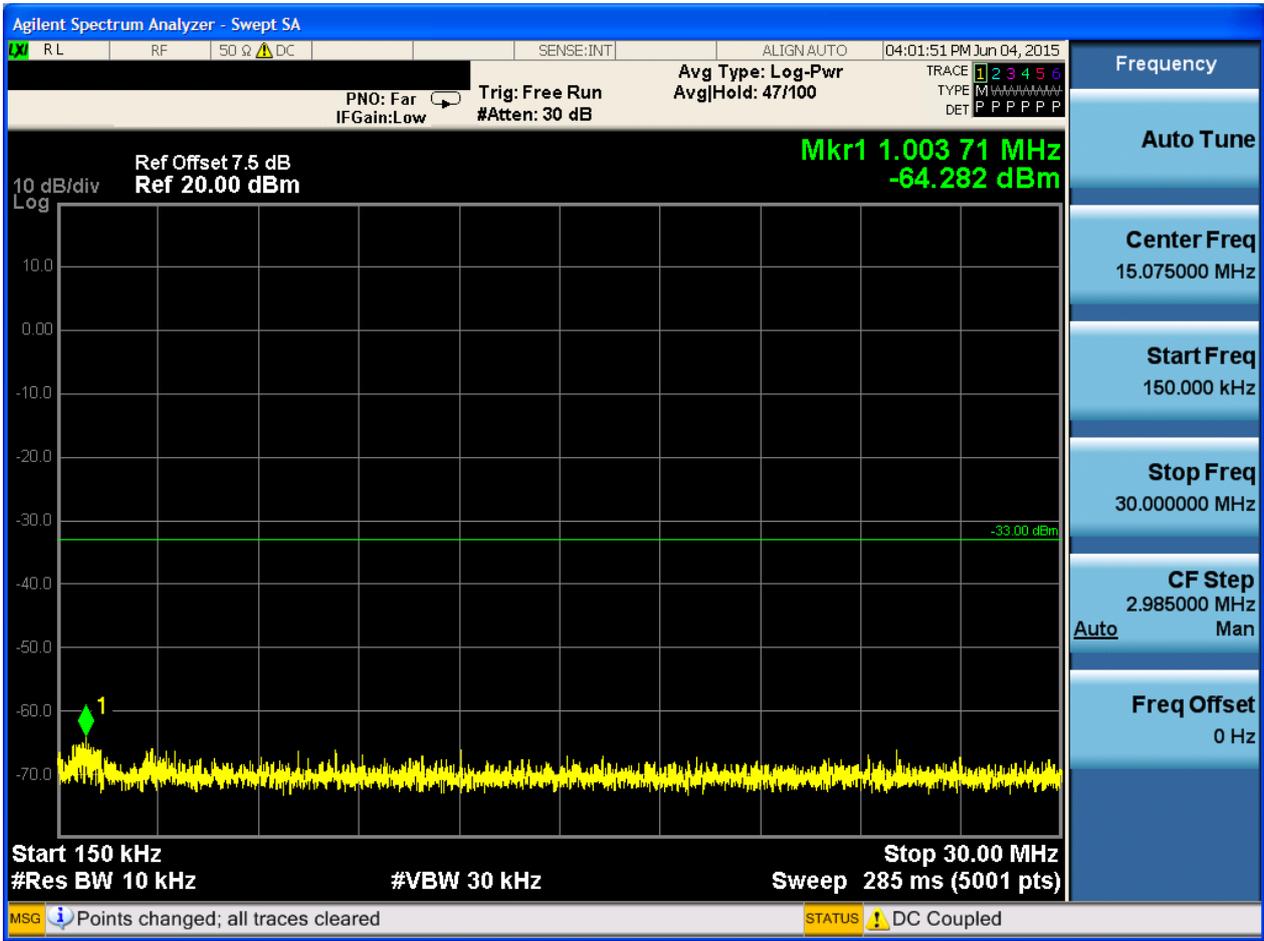


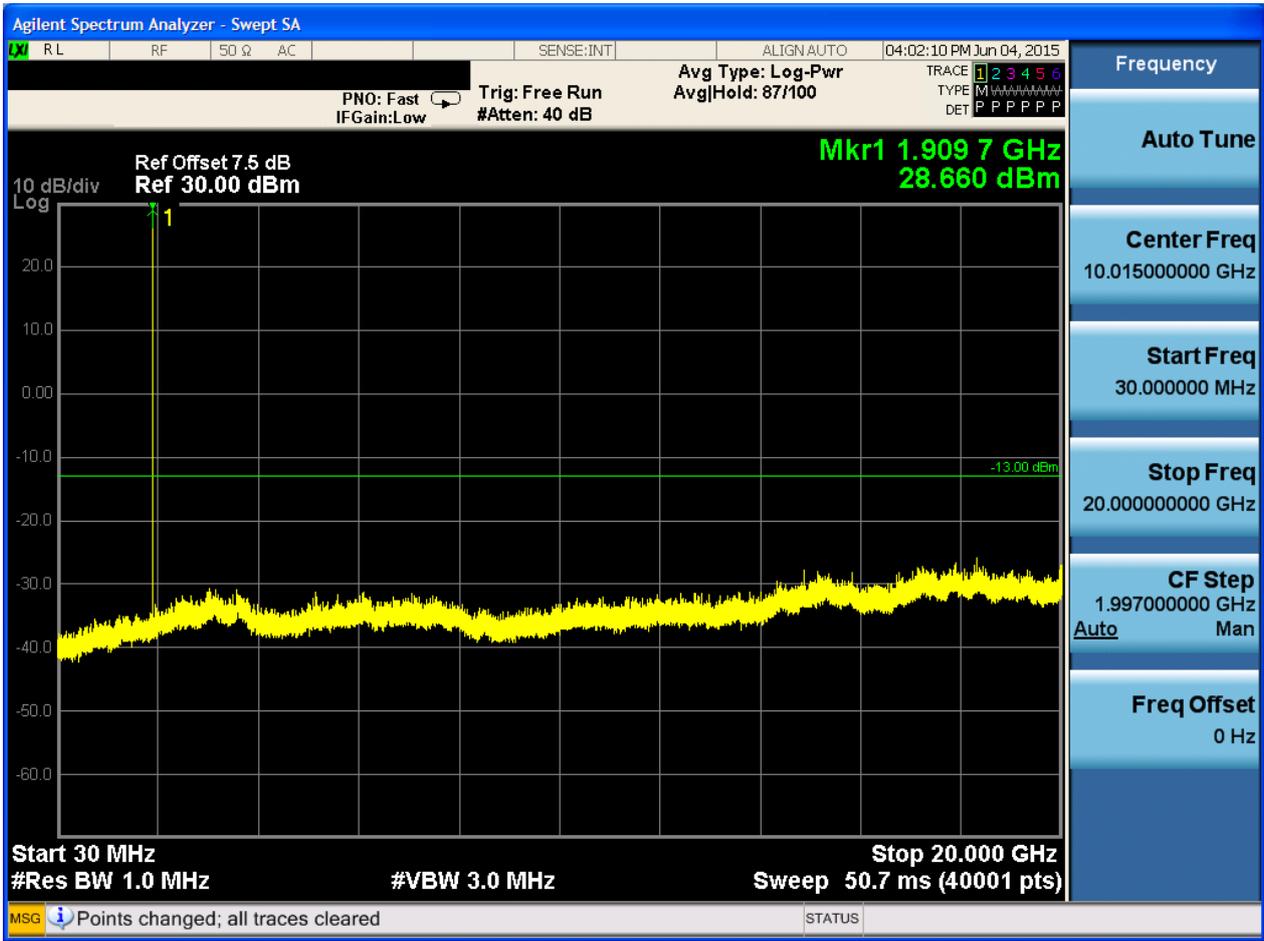




6.1.2.2.3 Test Channel = HCH





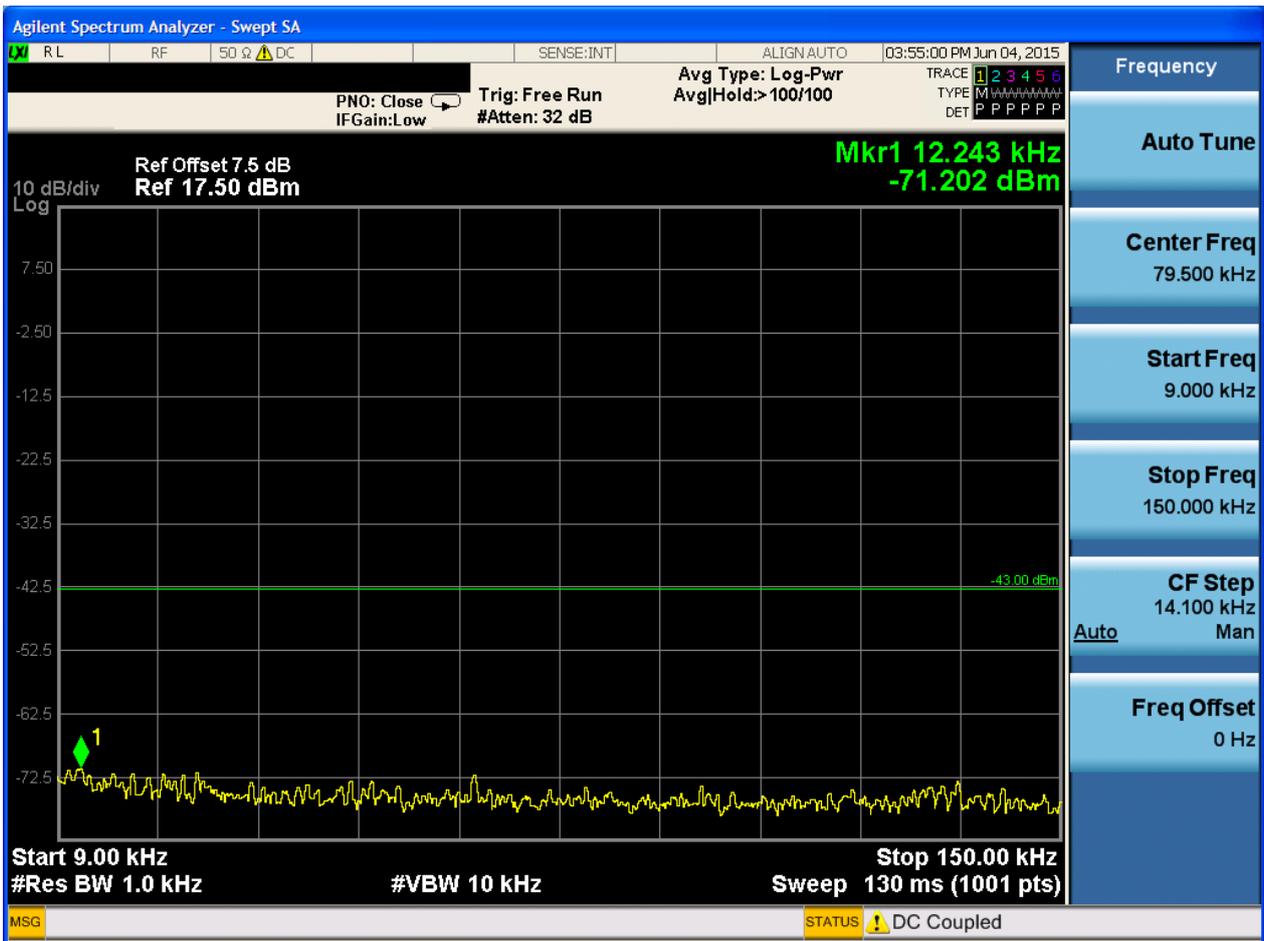


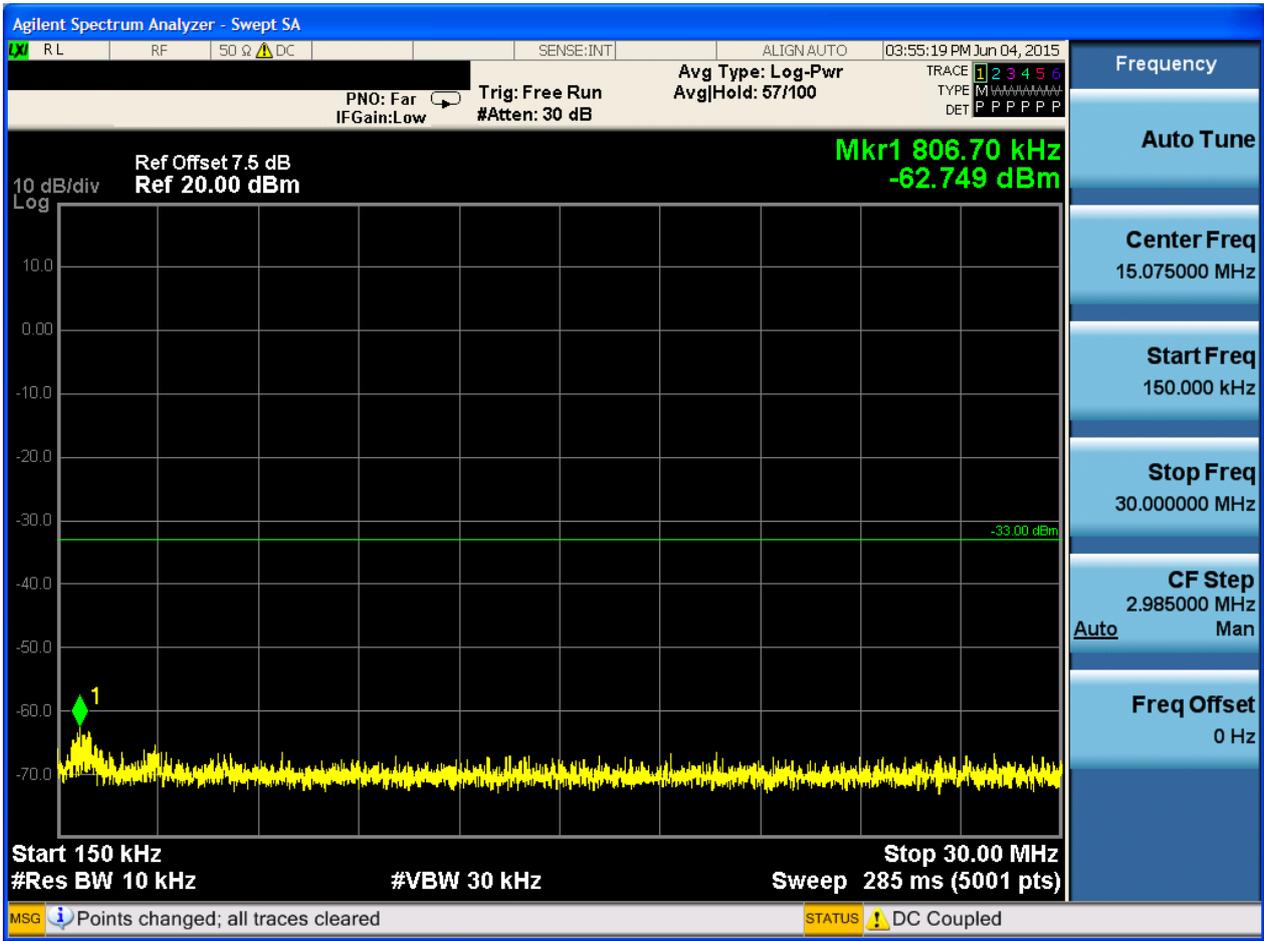


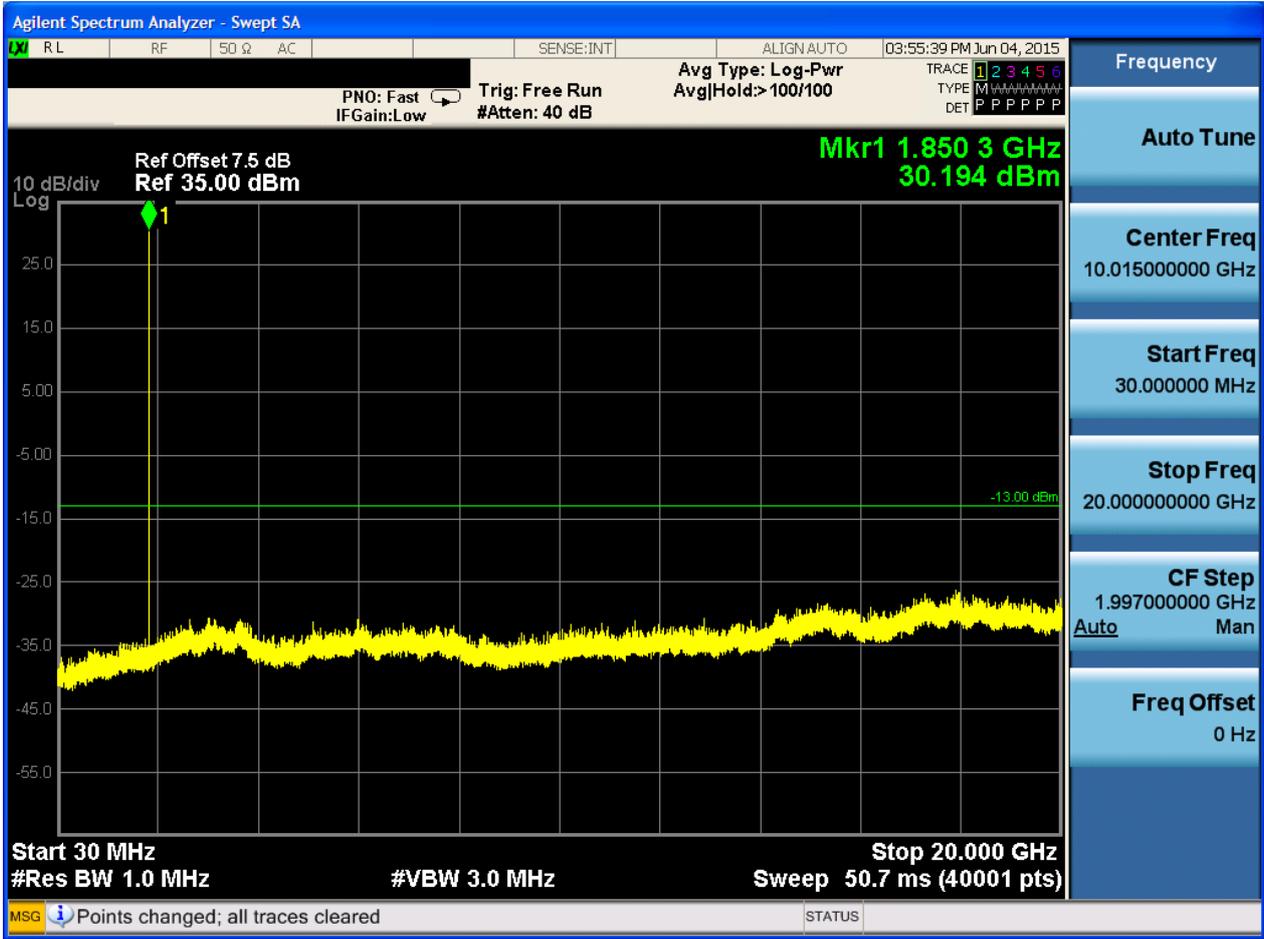
6.1.3 Test Band = GSM1900

6.1.3.1 Test Mode = GSM/TM1

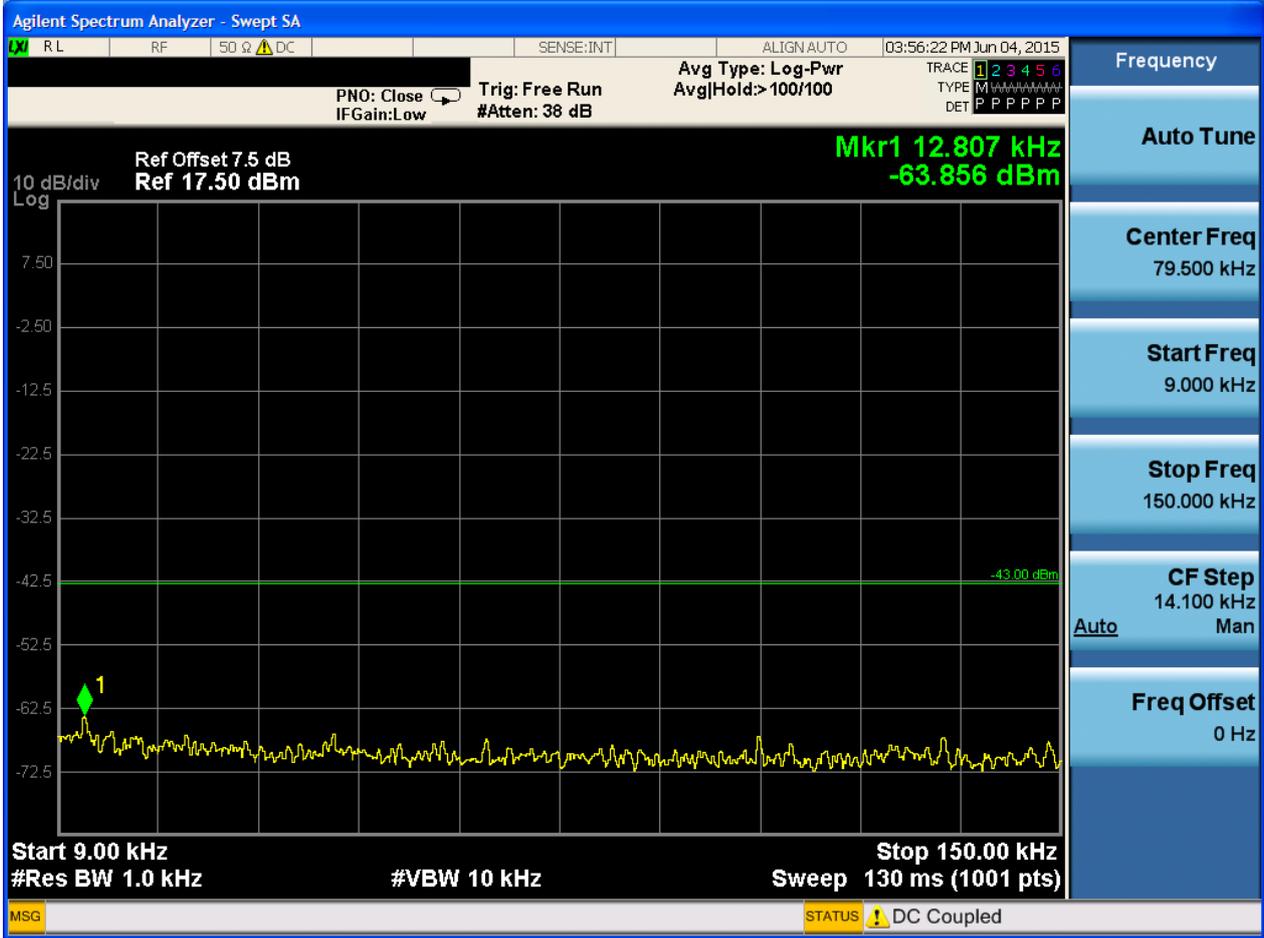
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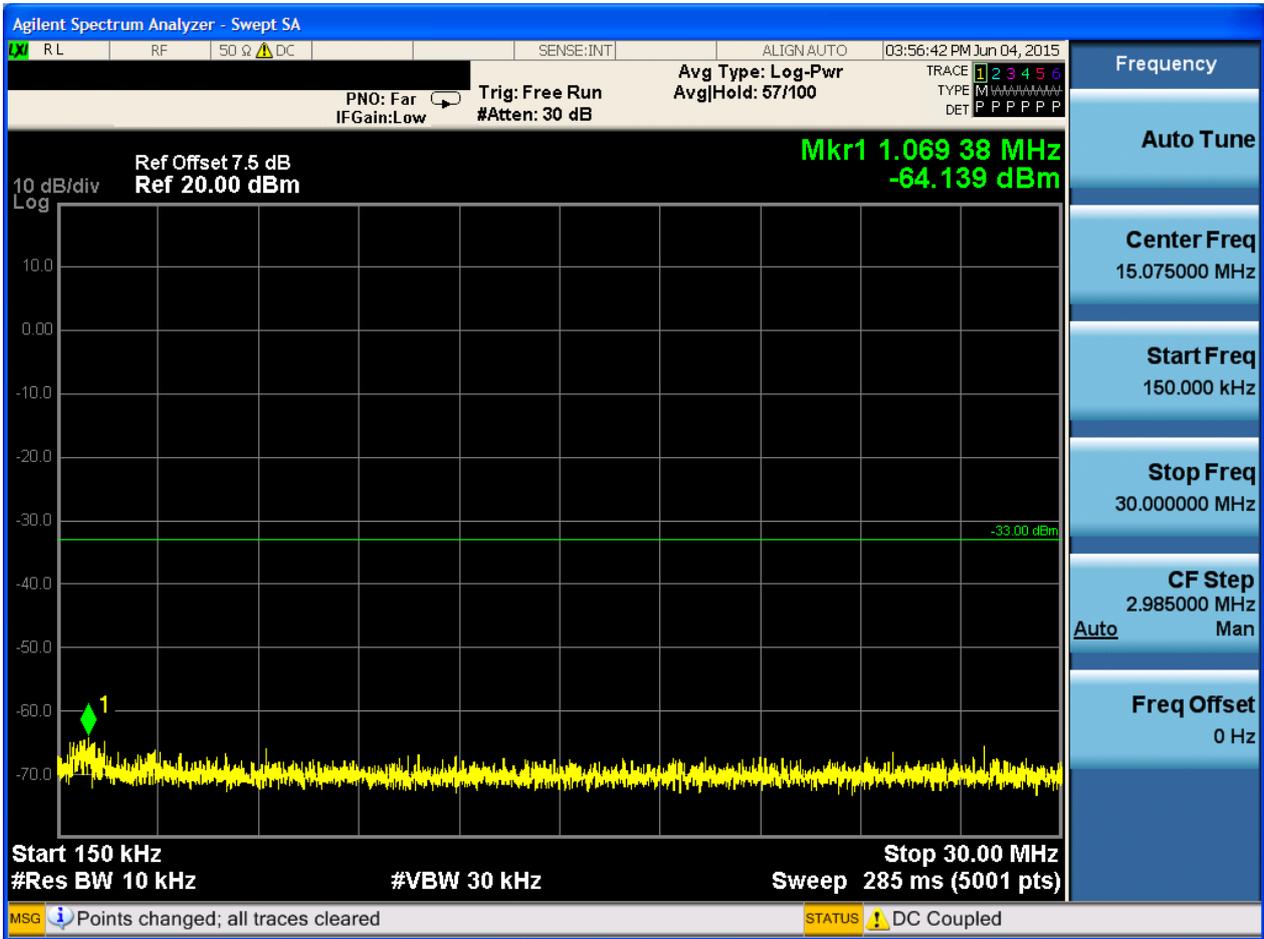


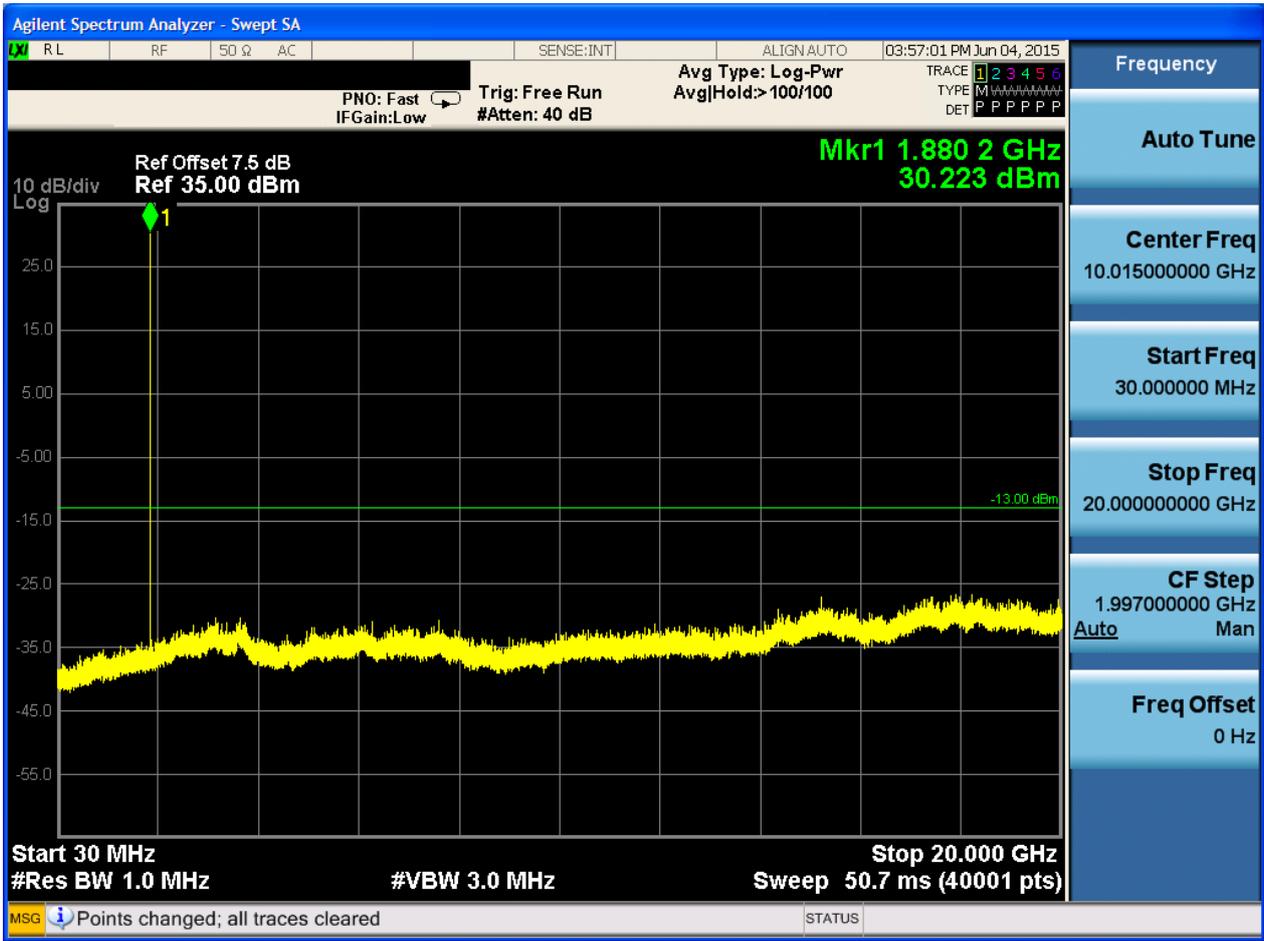




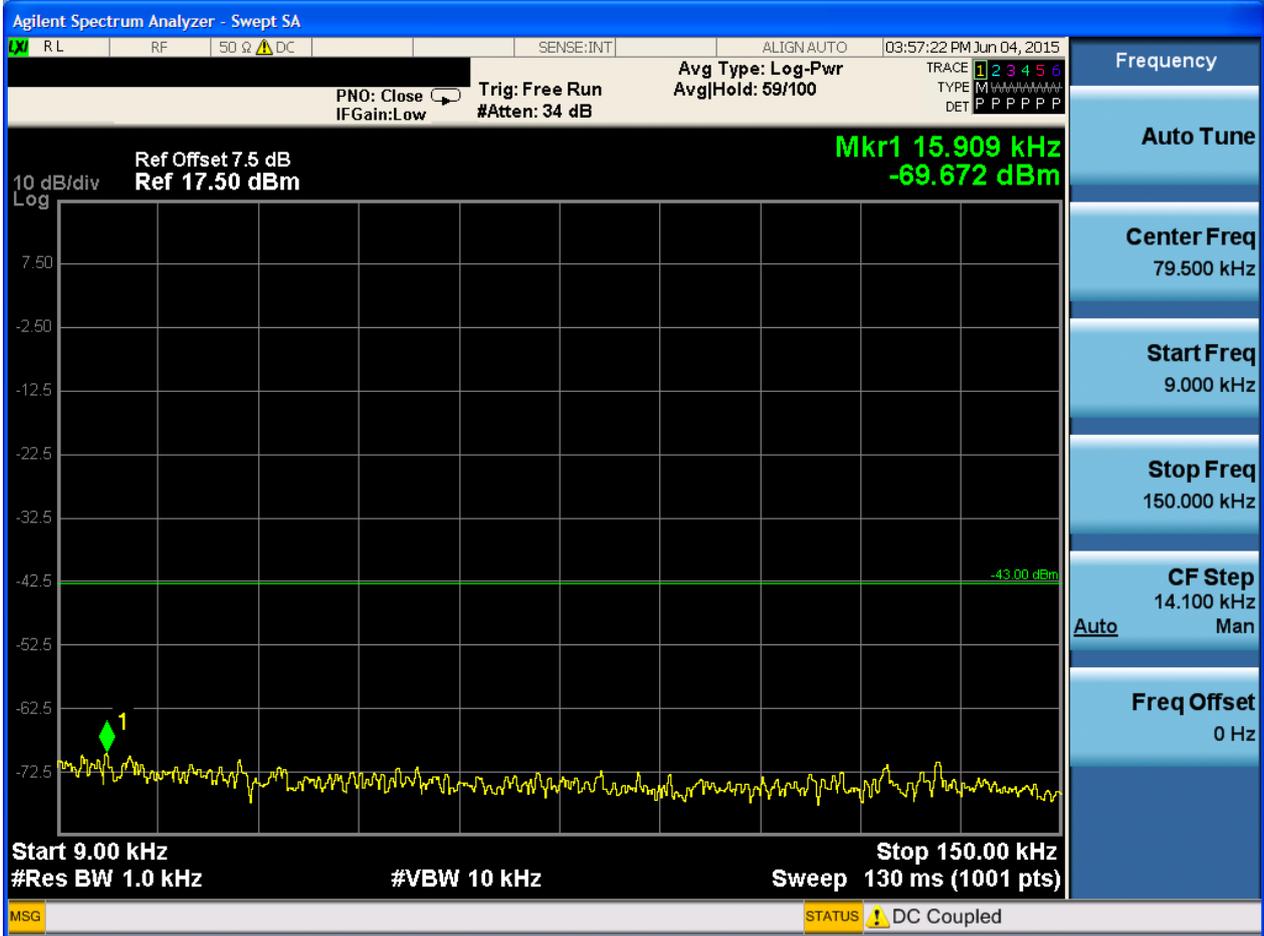
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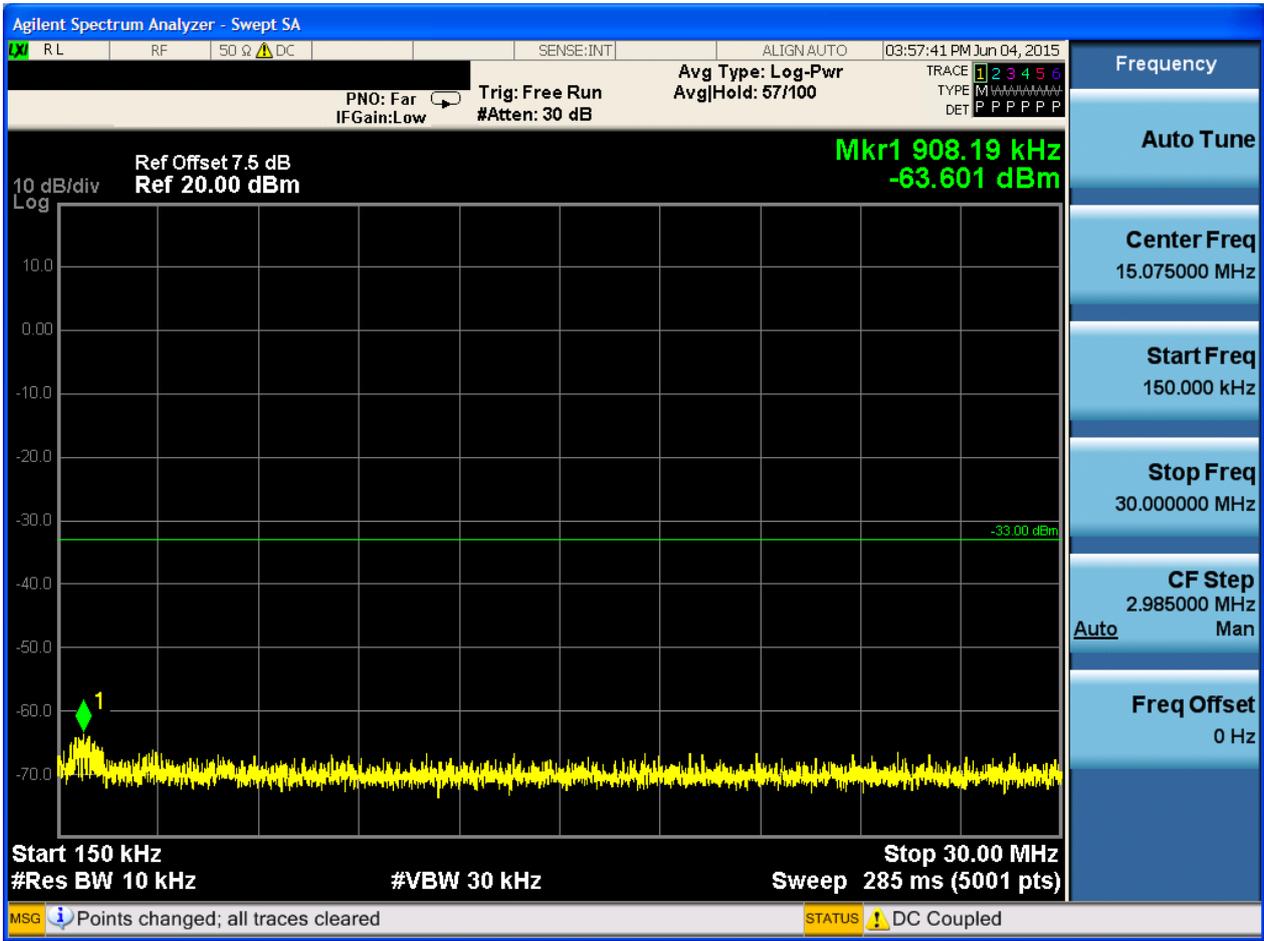


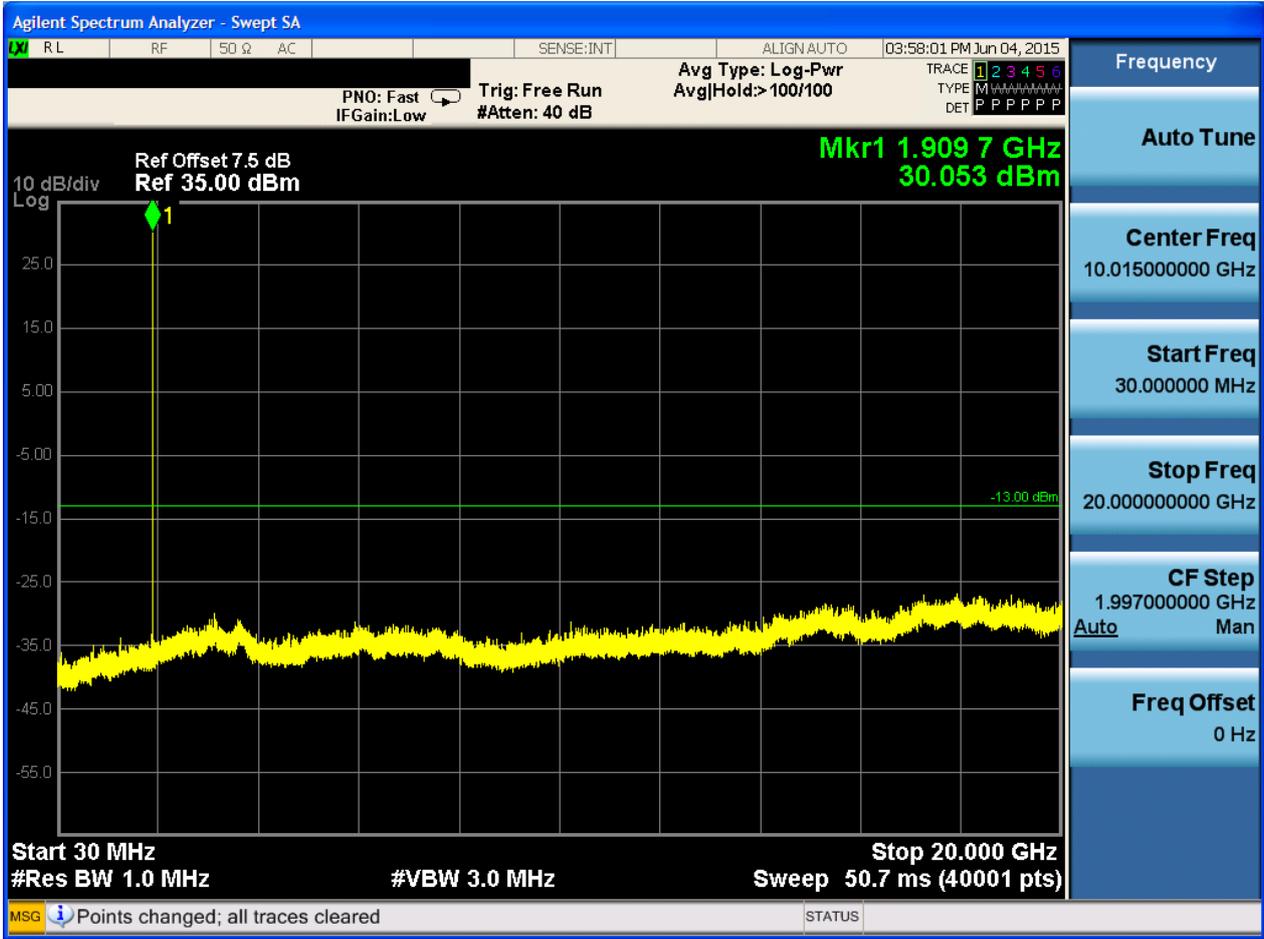




6.1.3.1.3 Test Channel = HCH

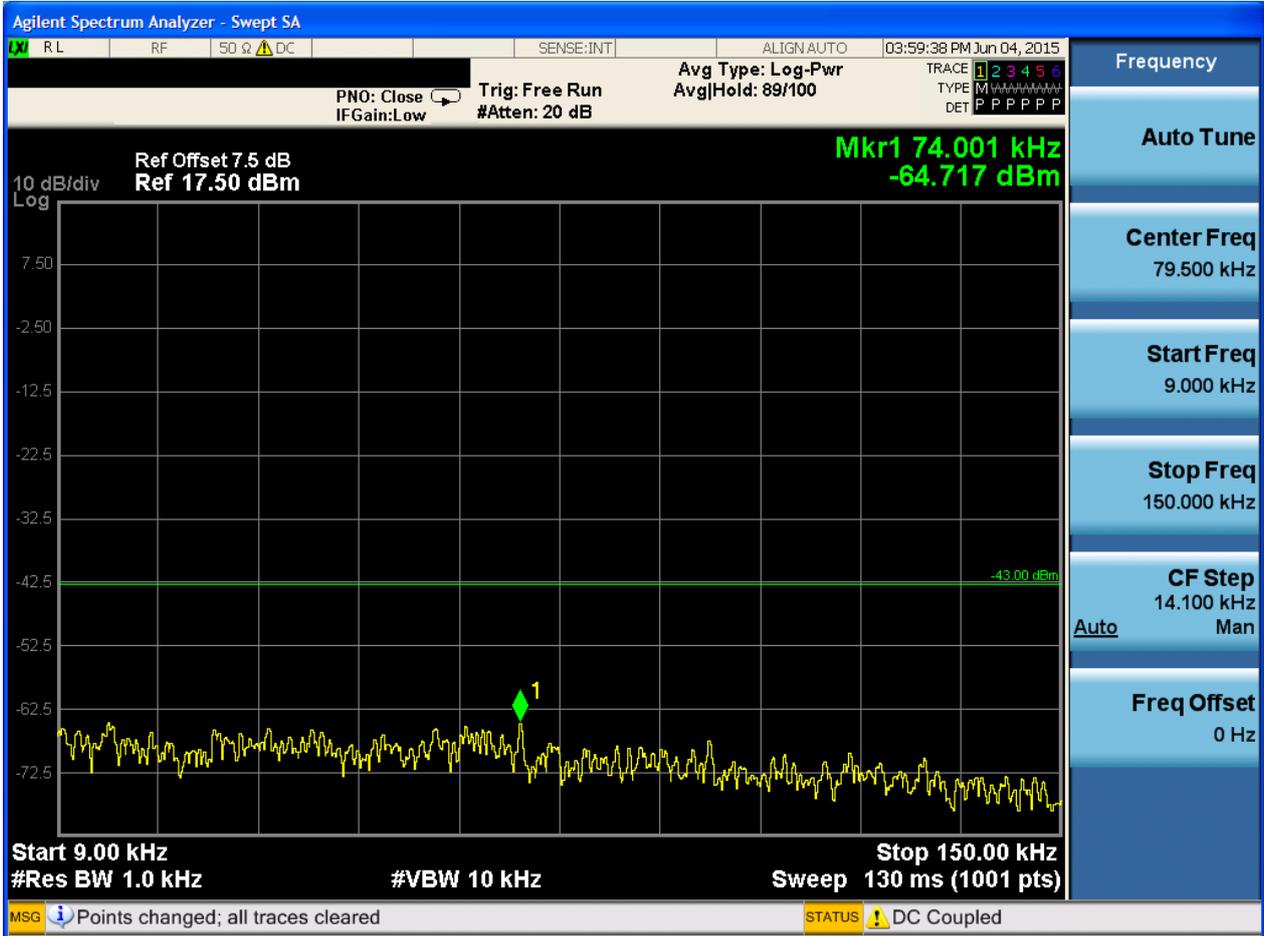




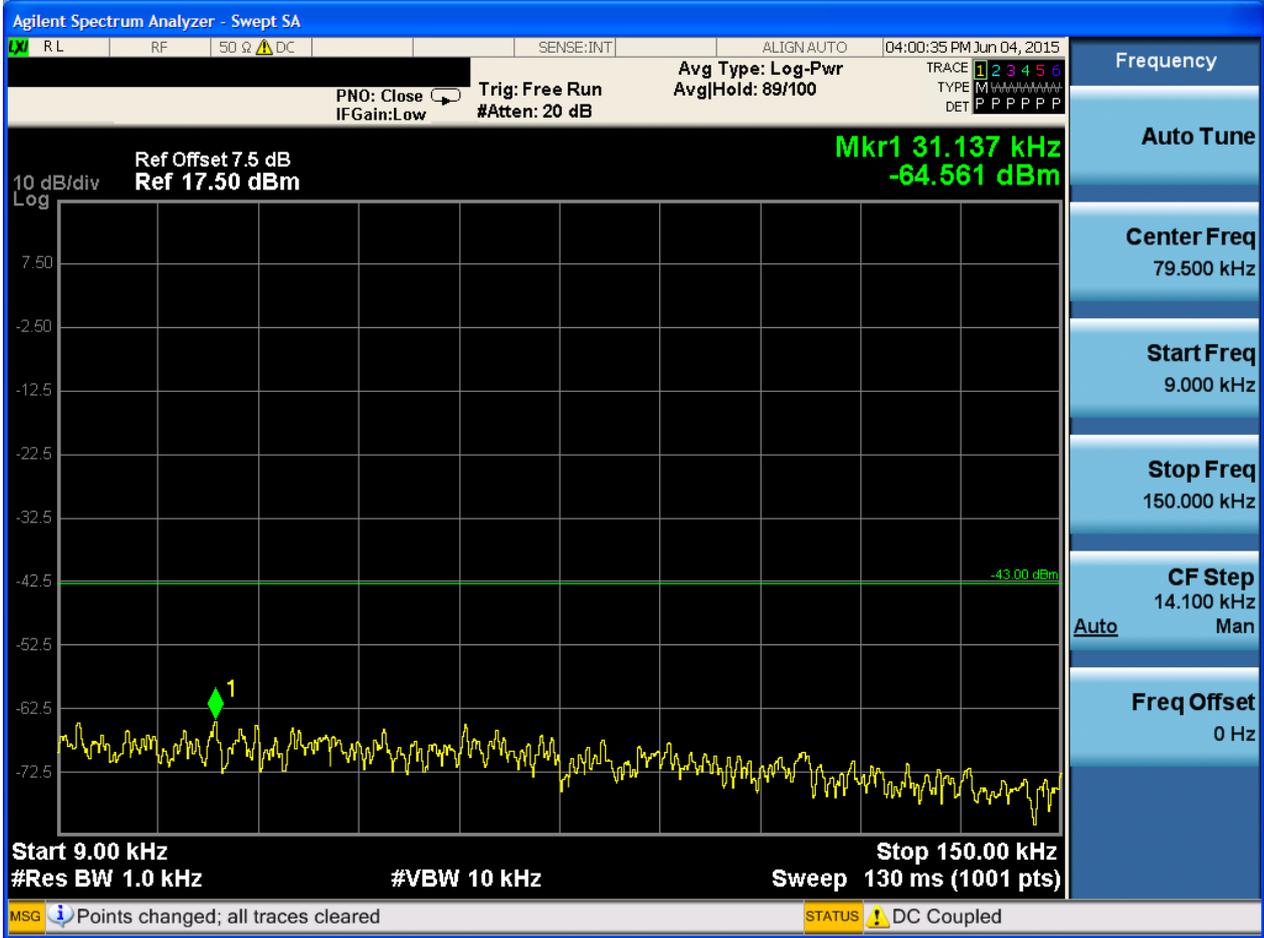


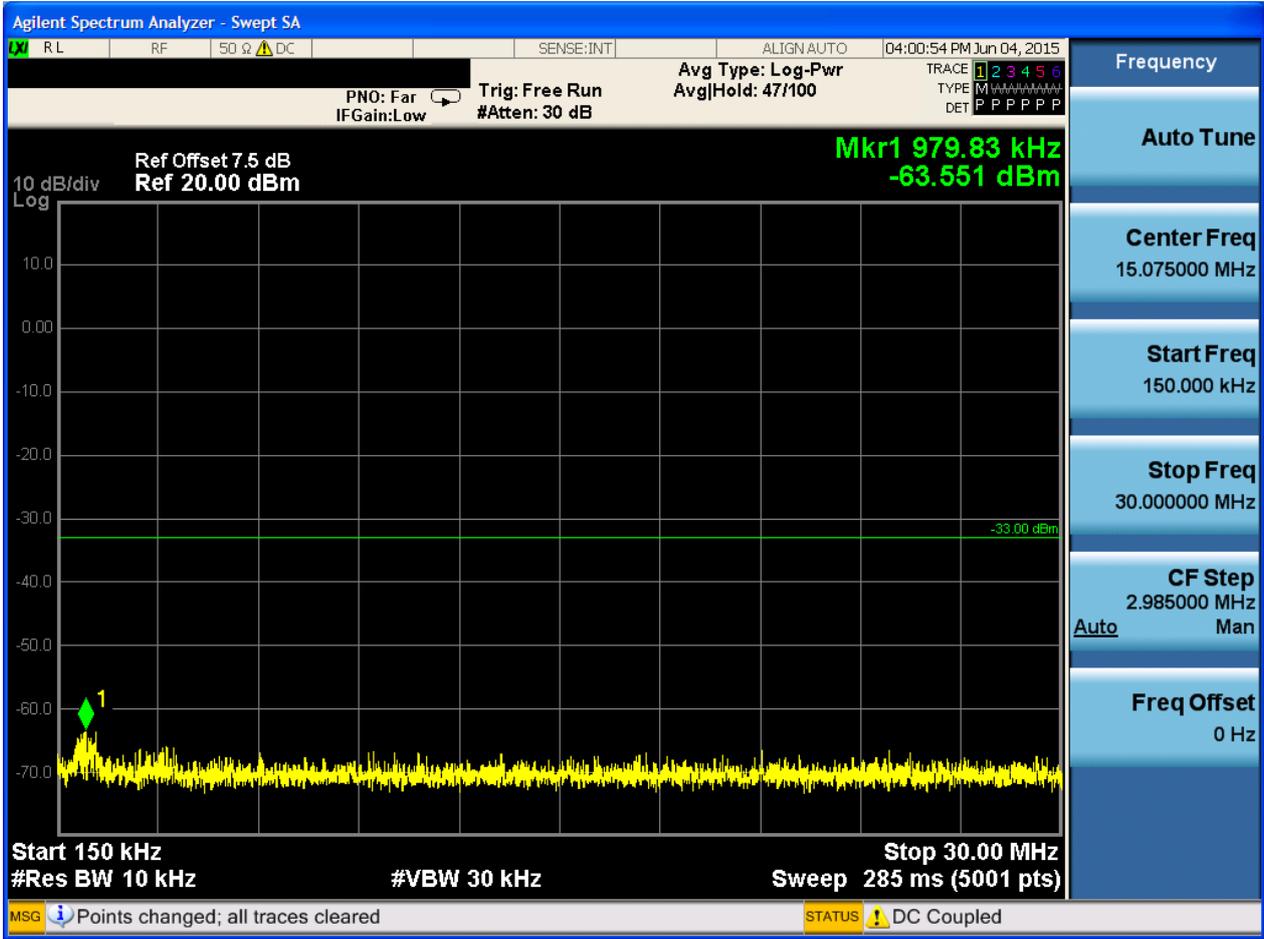
6.1.3.2 Test Mode = GSM/TM2

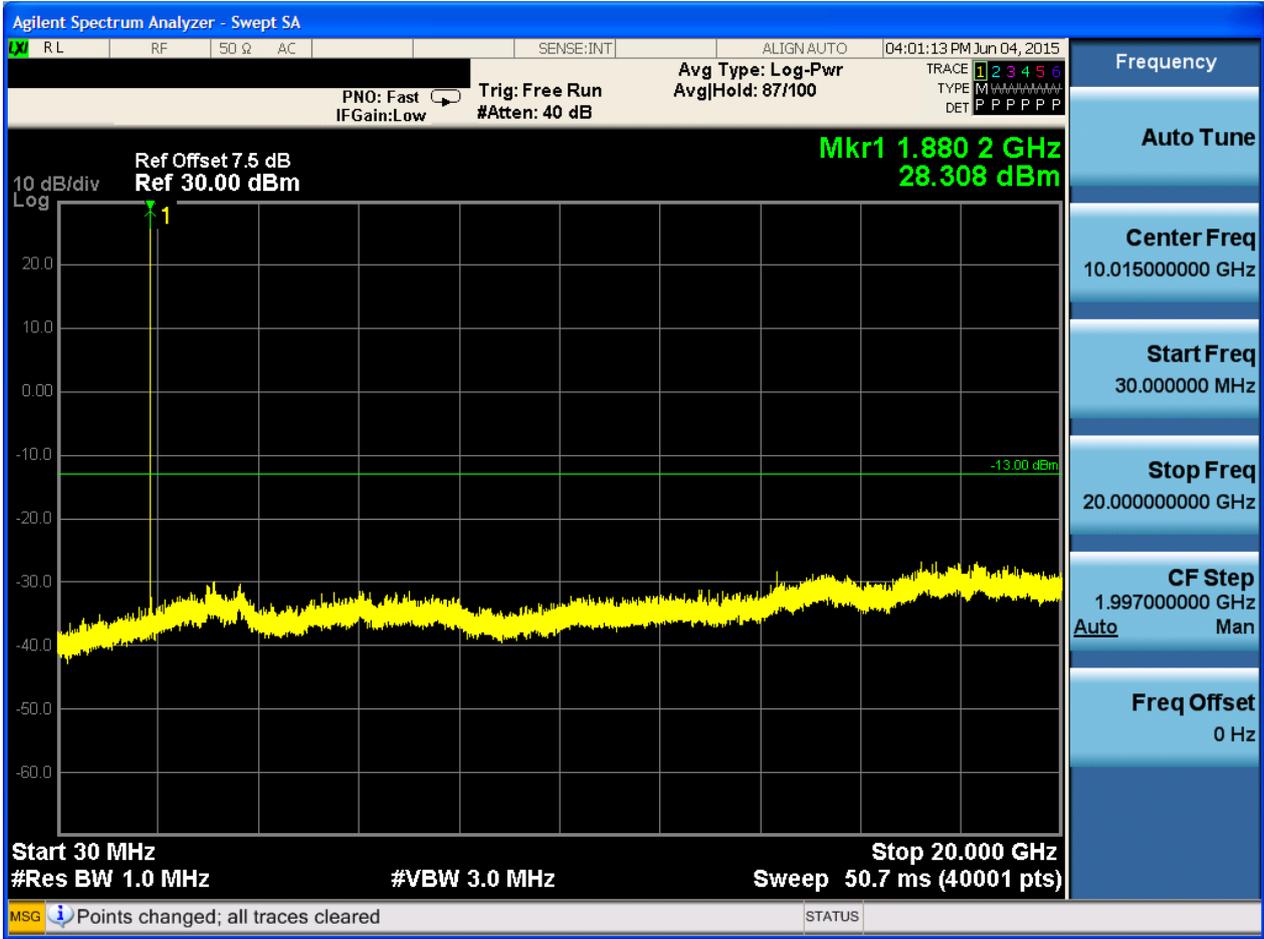
6.1.3.2.1 Test Channel = LCH



6.1.3.2.2 Test Channel = MCH

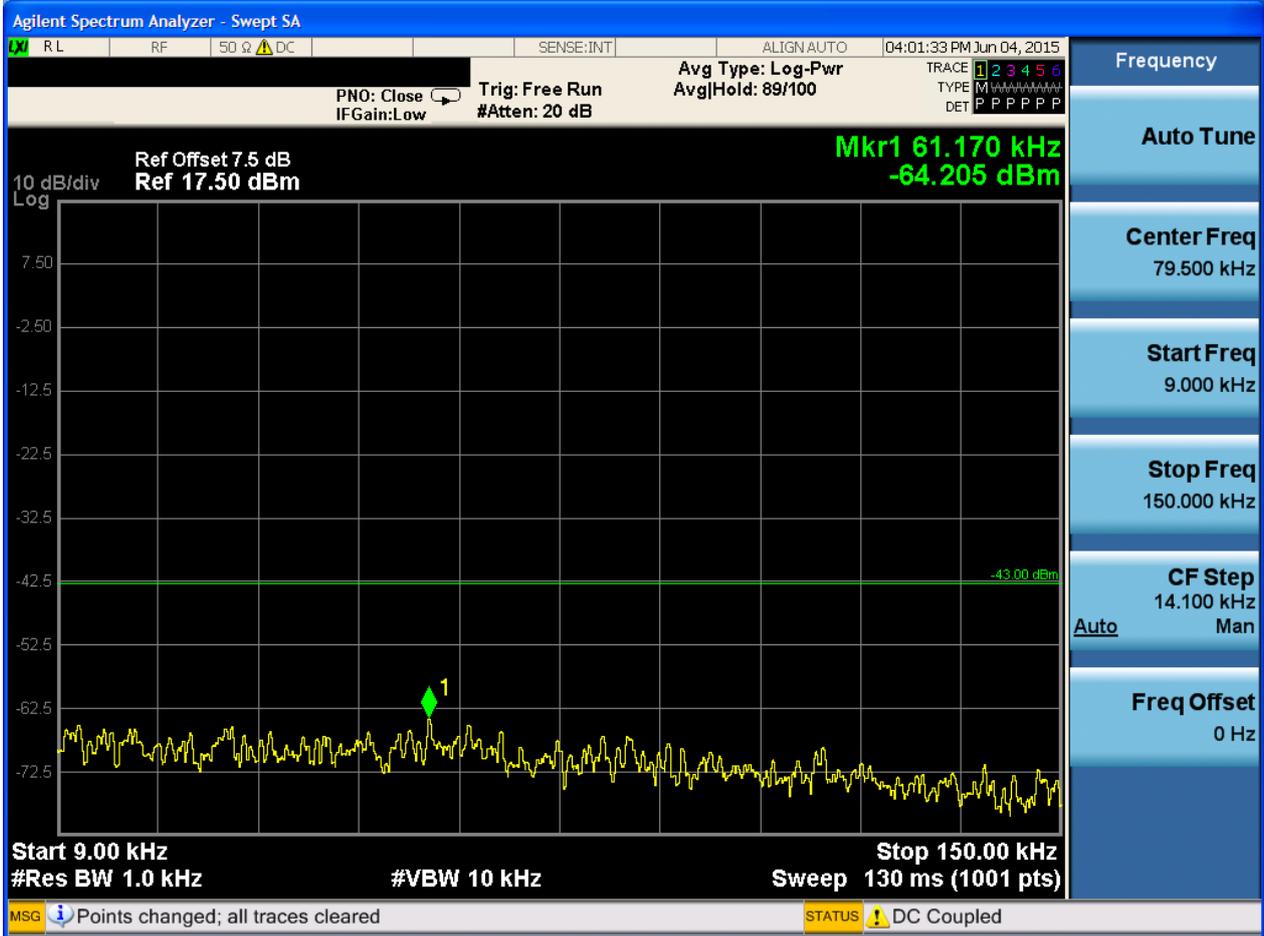


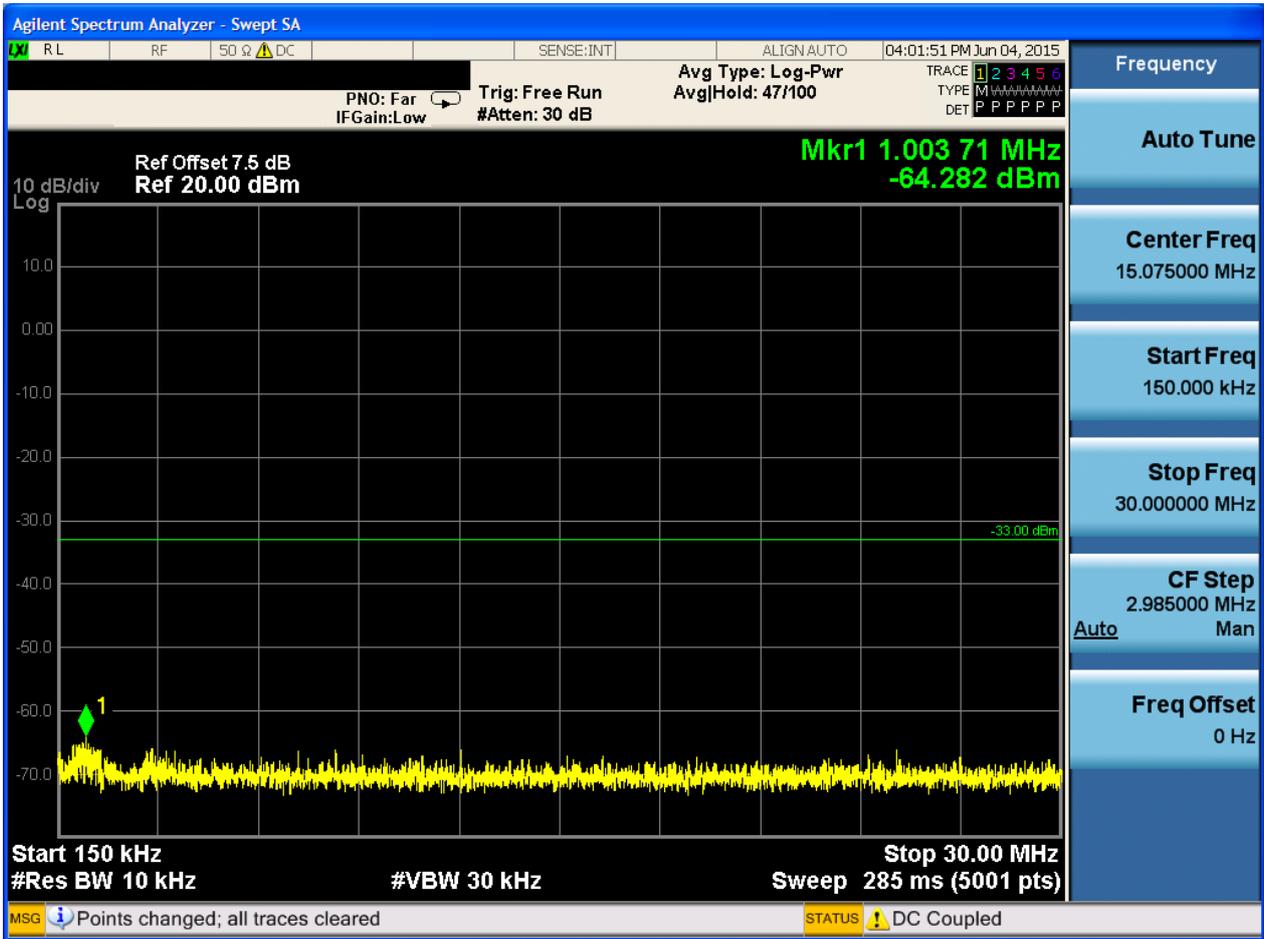






6.1.3.2.3 Test Channel = HCH





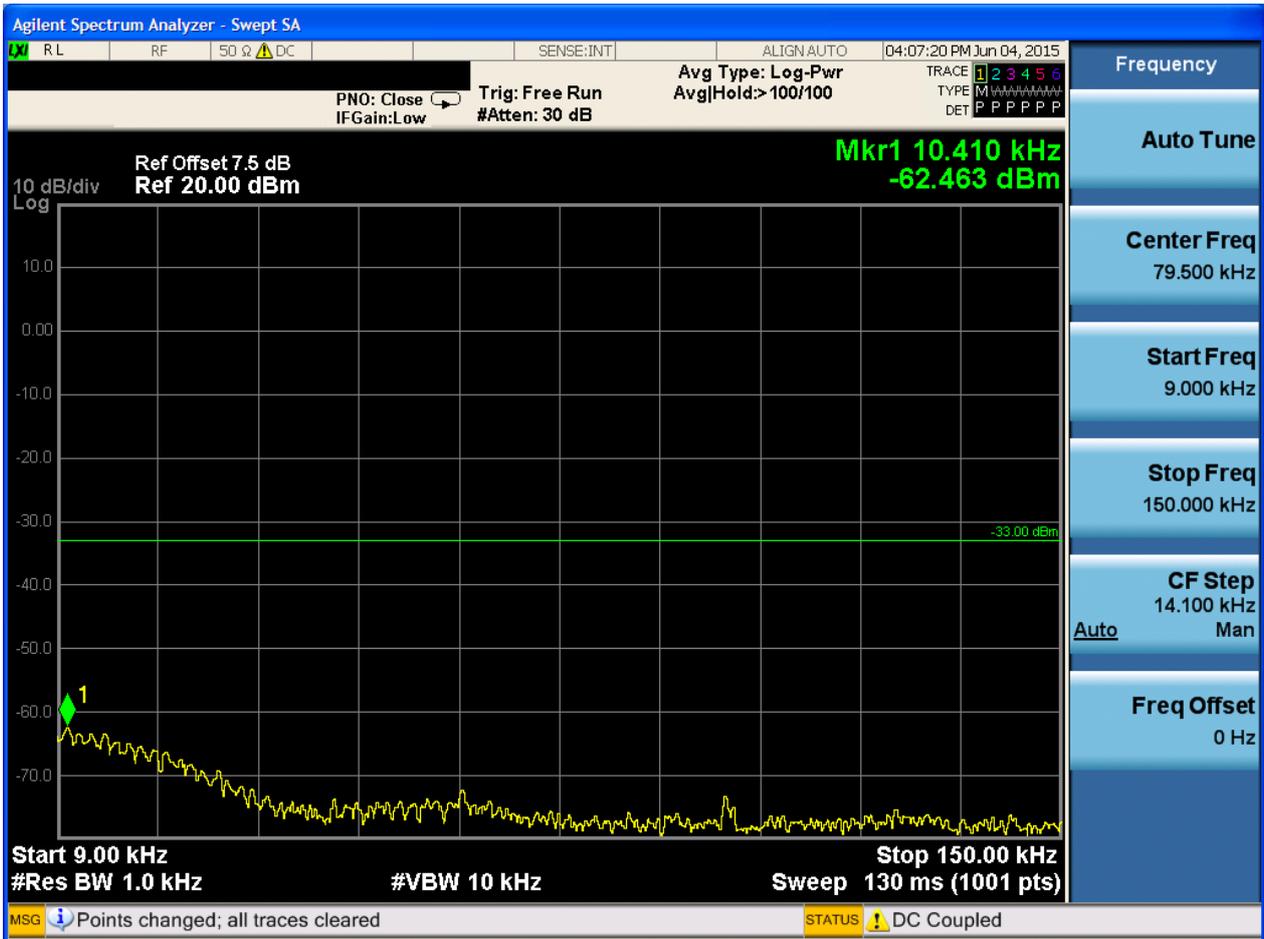


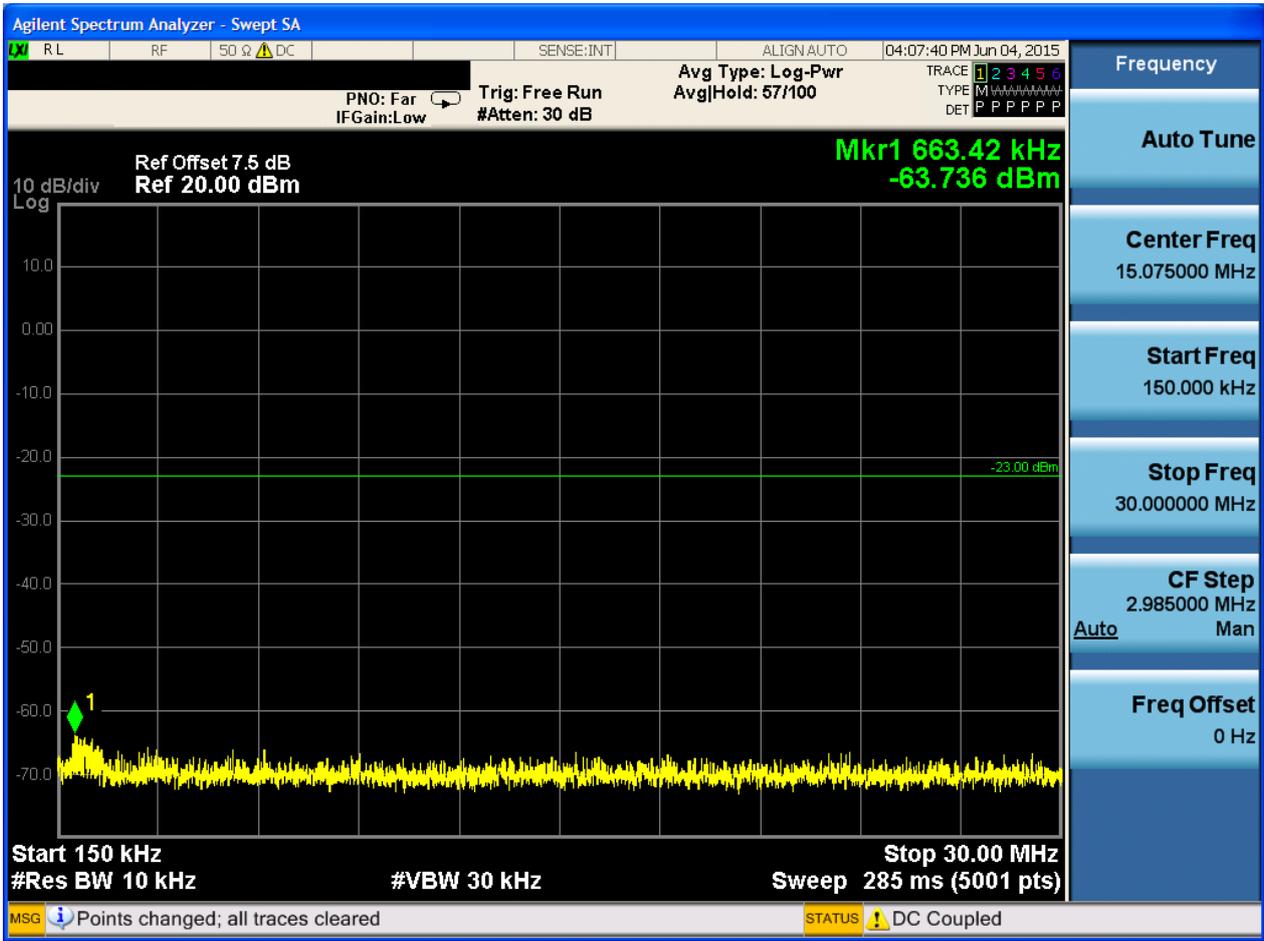


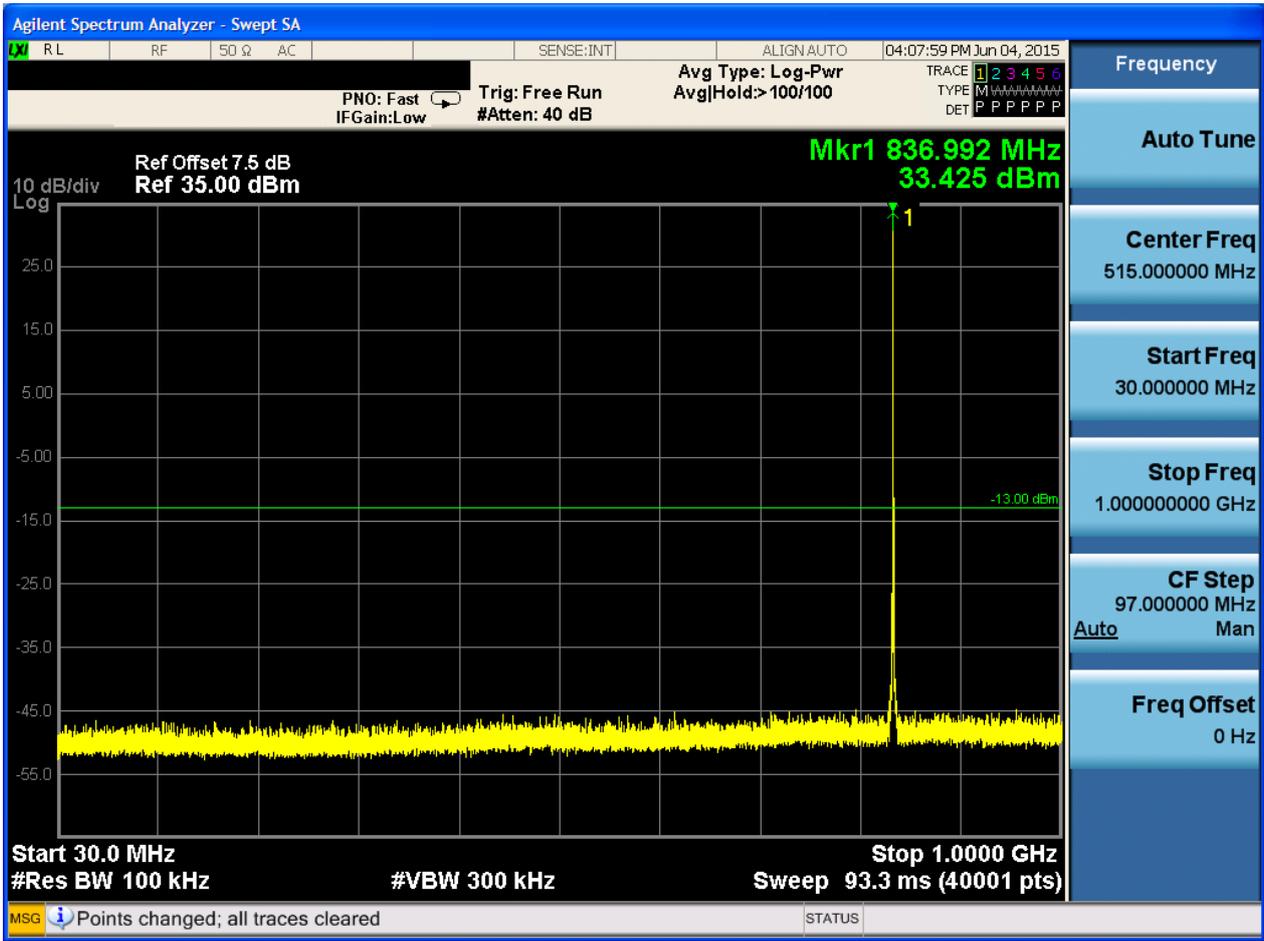
6.1.4 Test Band = GSM850

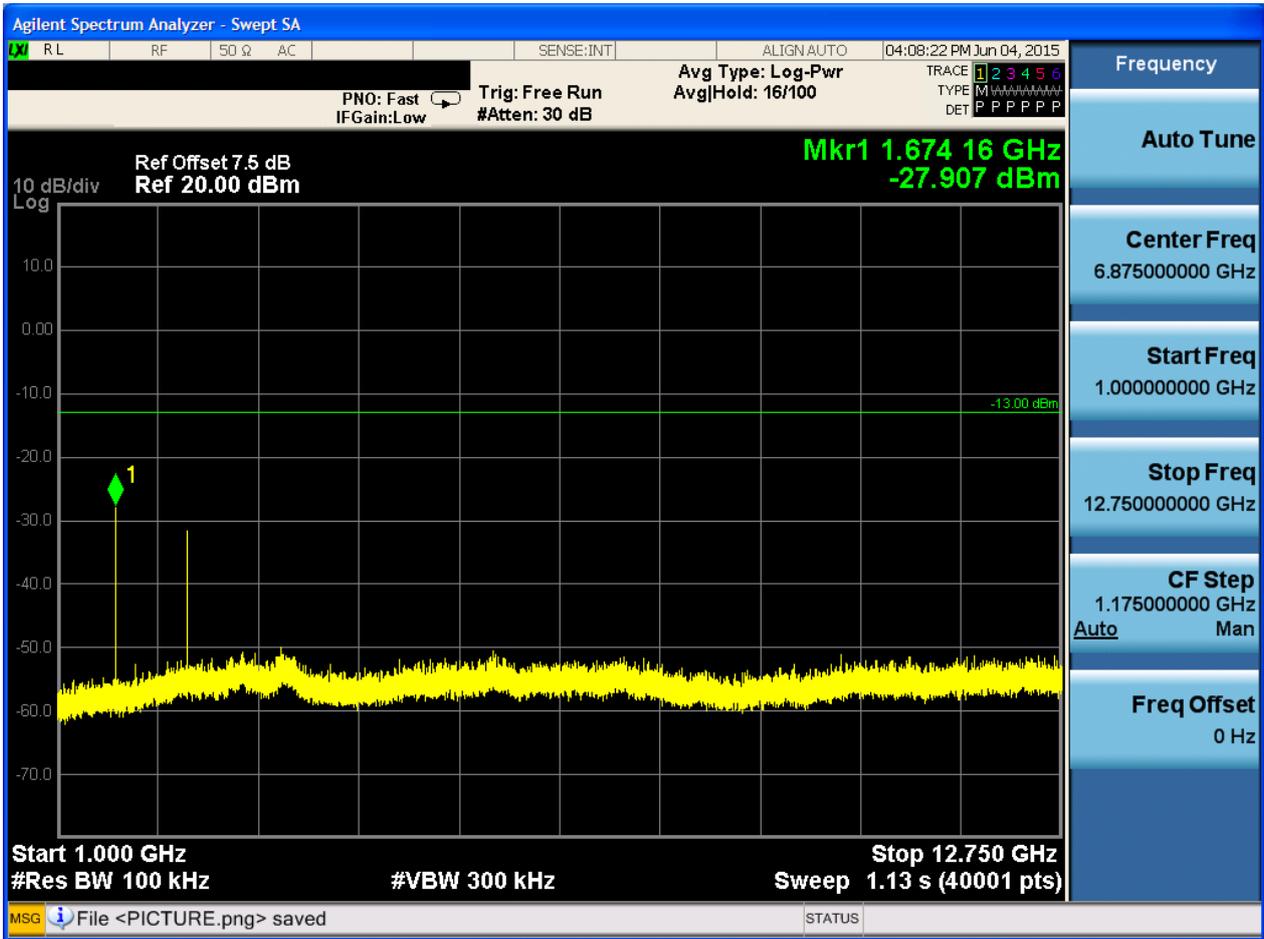
6.1.4.1 Test Mode = GSM/TM1

6.1.4.1.1 Test Channel = LCH



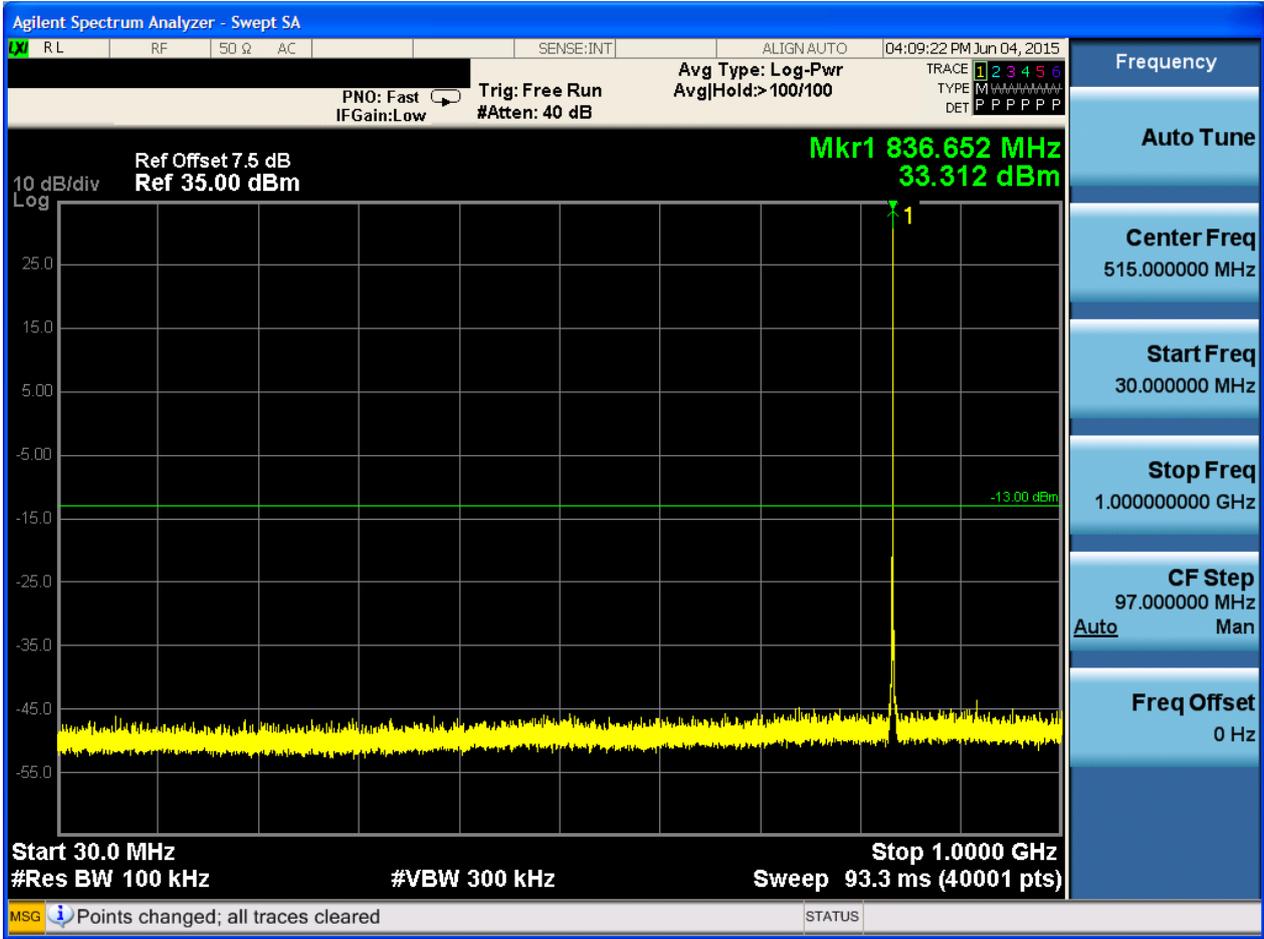


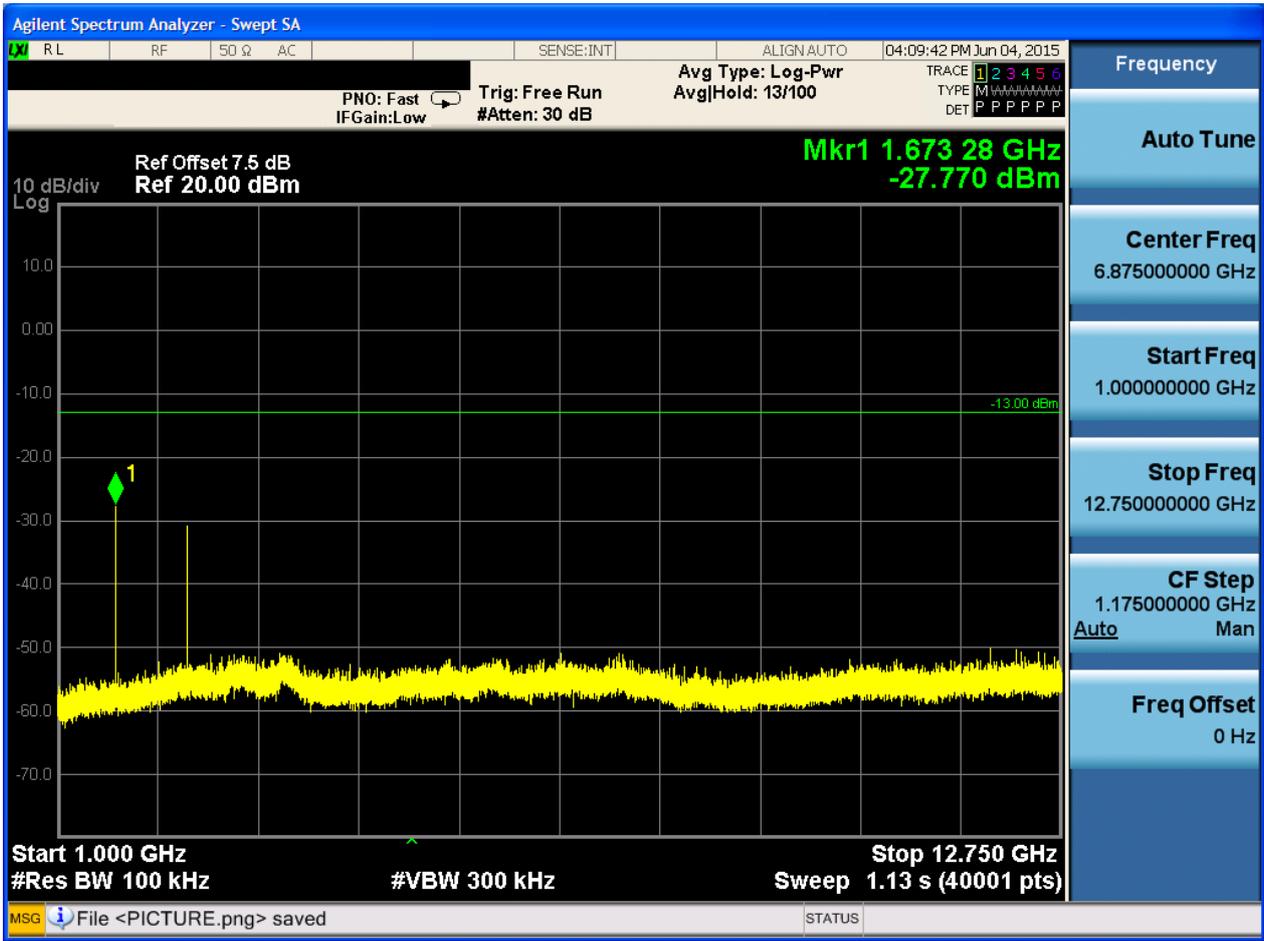




6.1.4.1.2 Test Channel = MCH

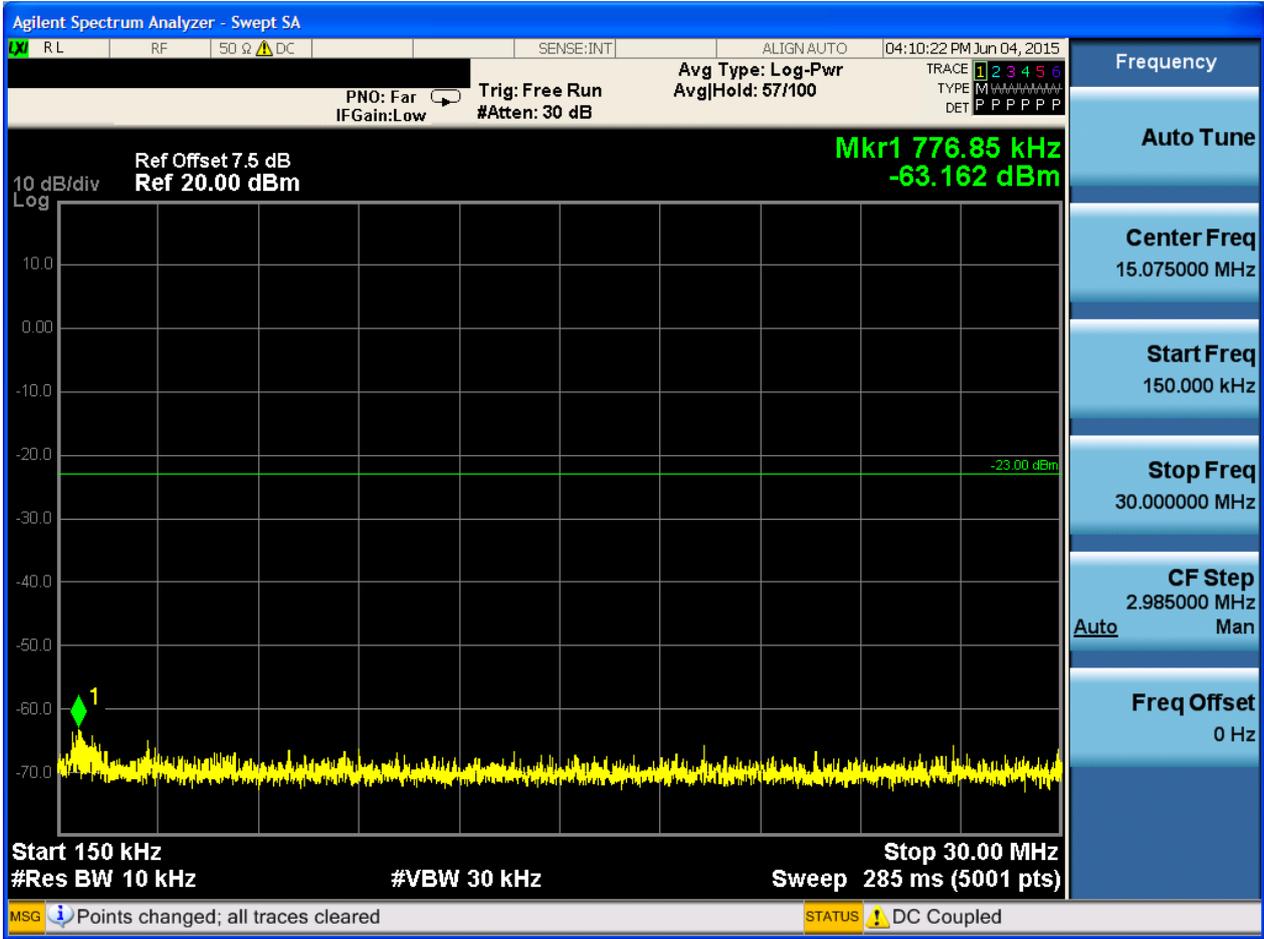


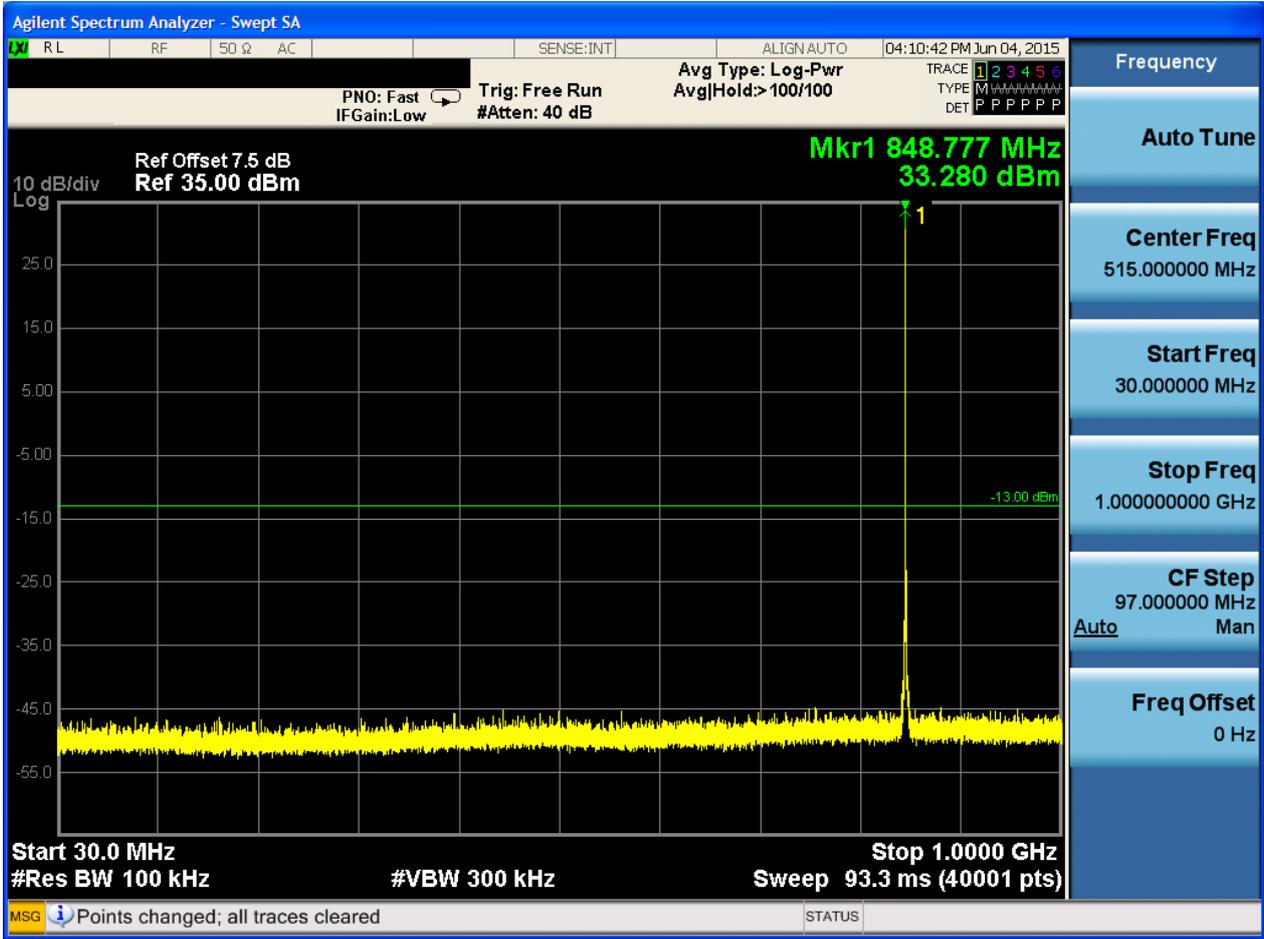


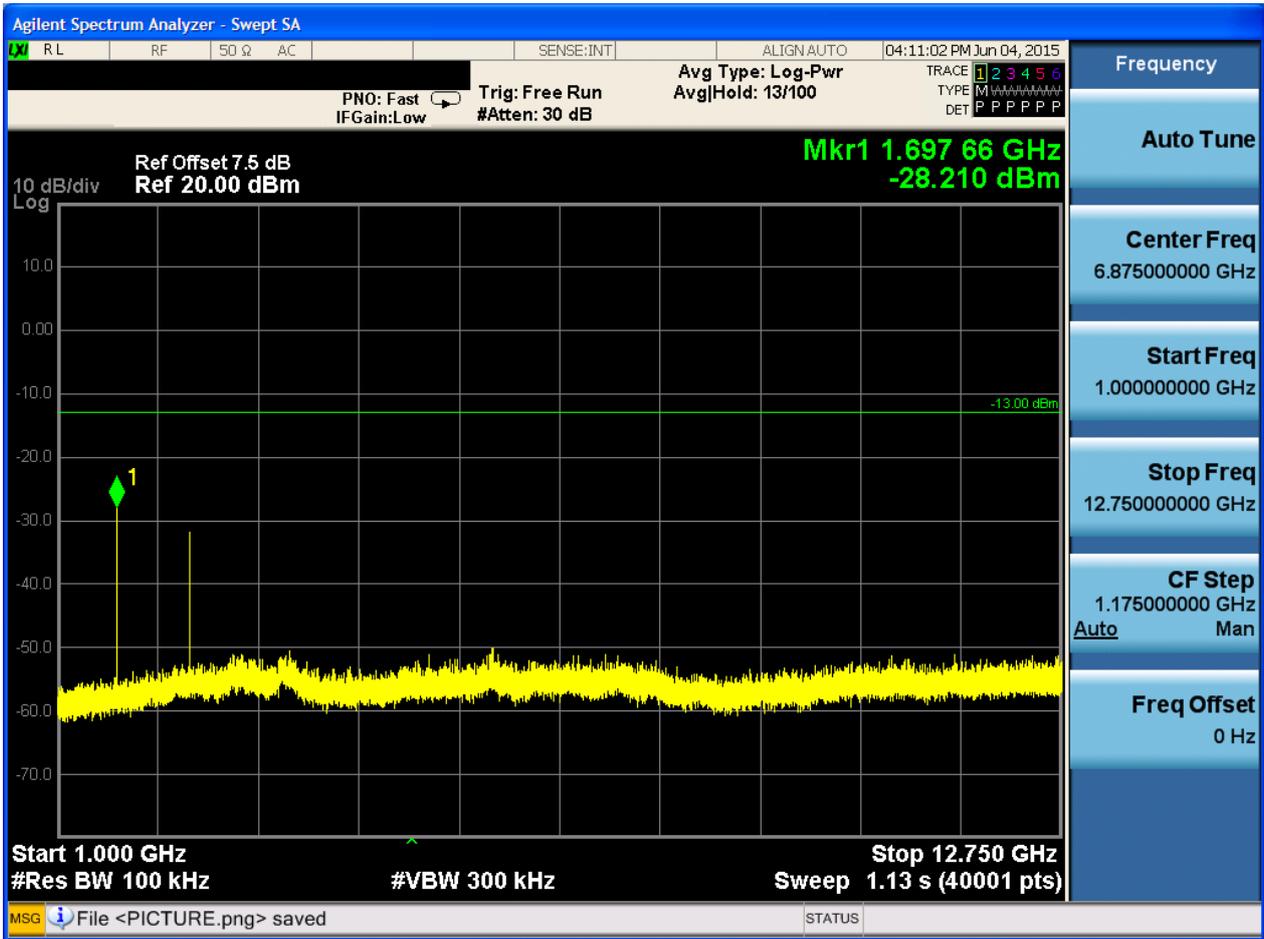


6.1.4.1.3 Test Channel = HCH



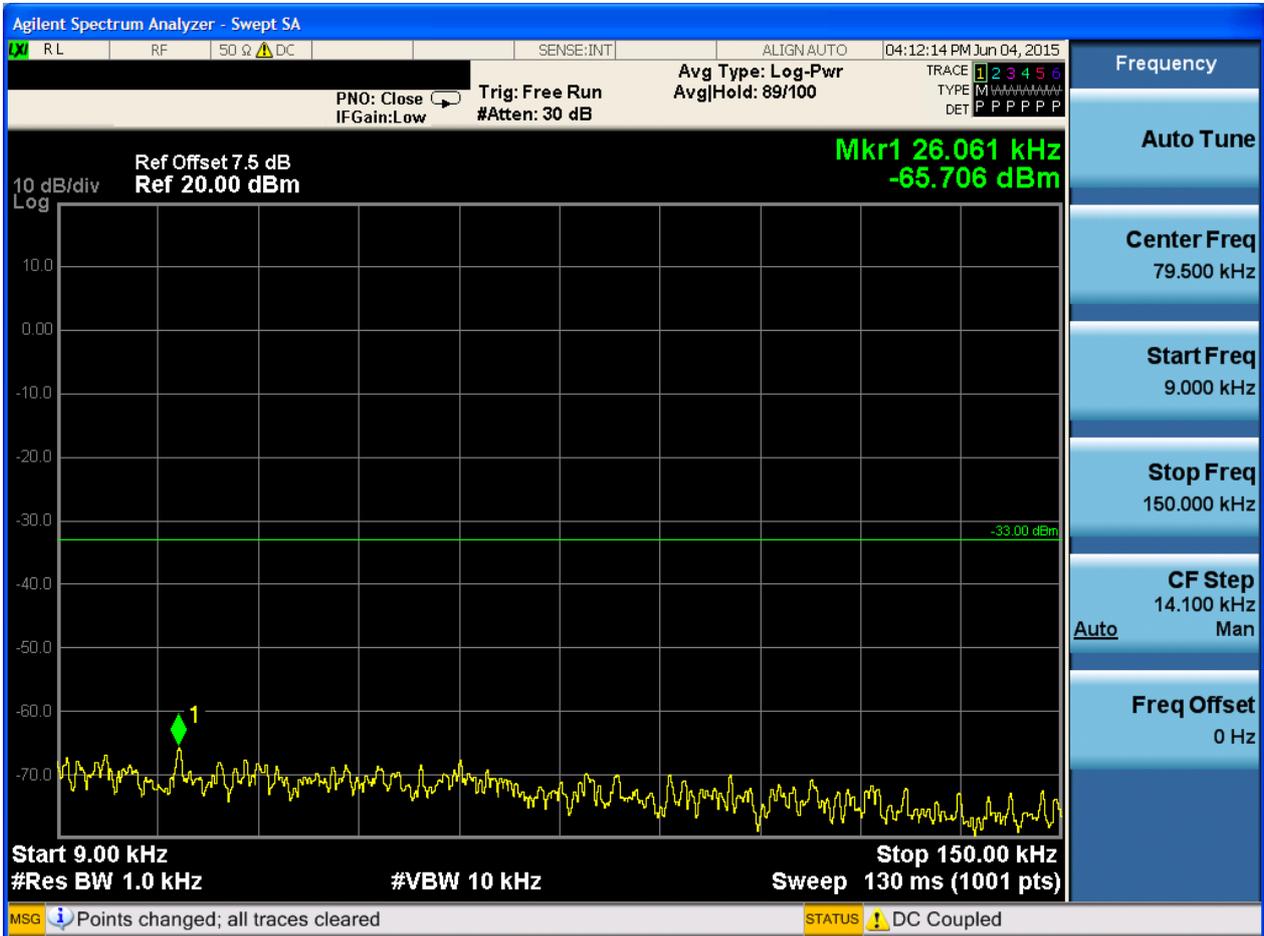


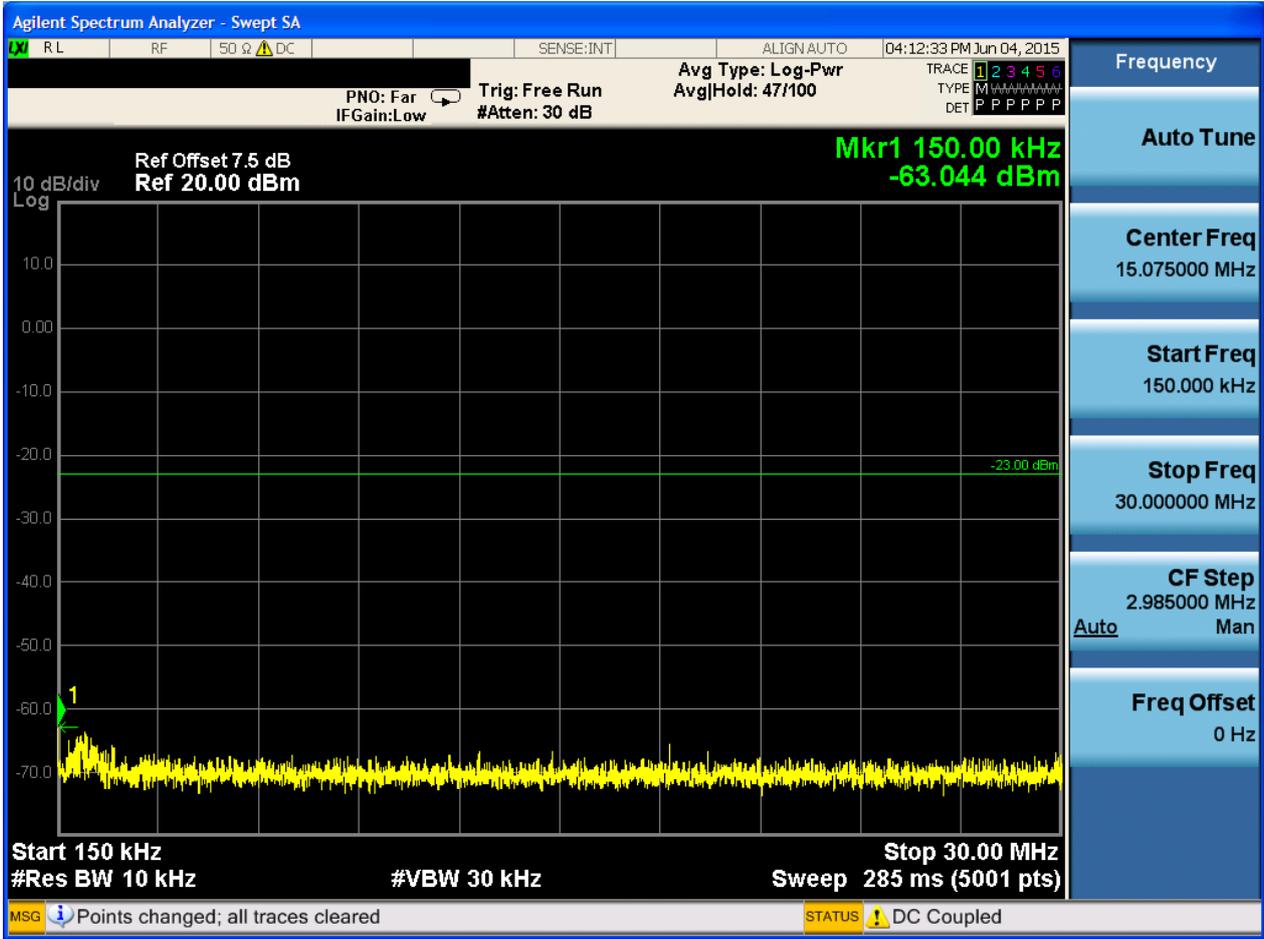


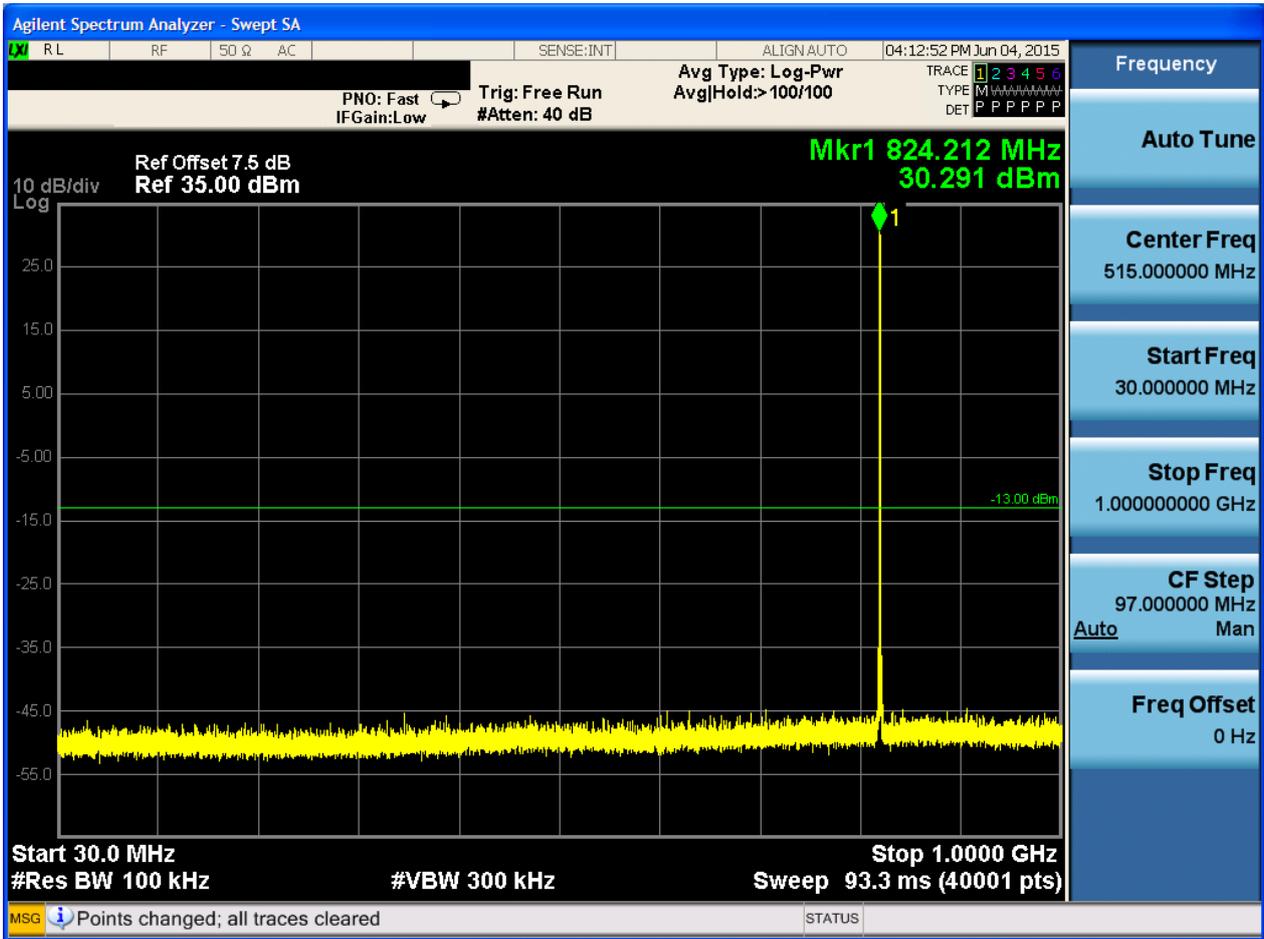


6.1.4.2 Test Mode = GSM/TM2

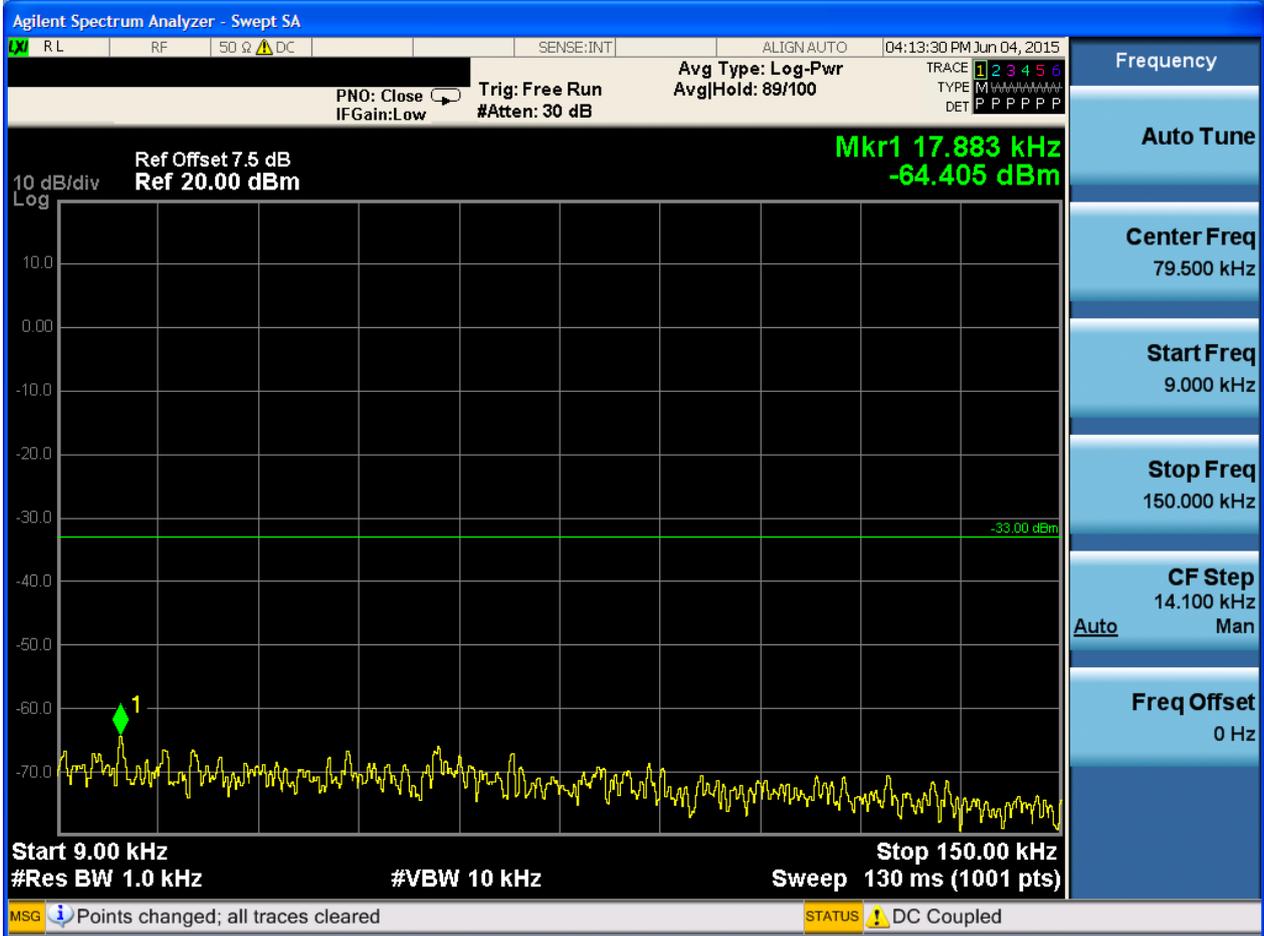
6.1.4.2.1 Test Channel = LCH

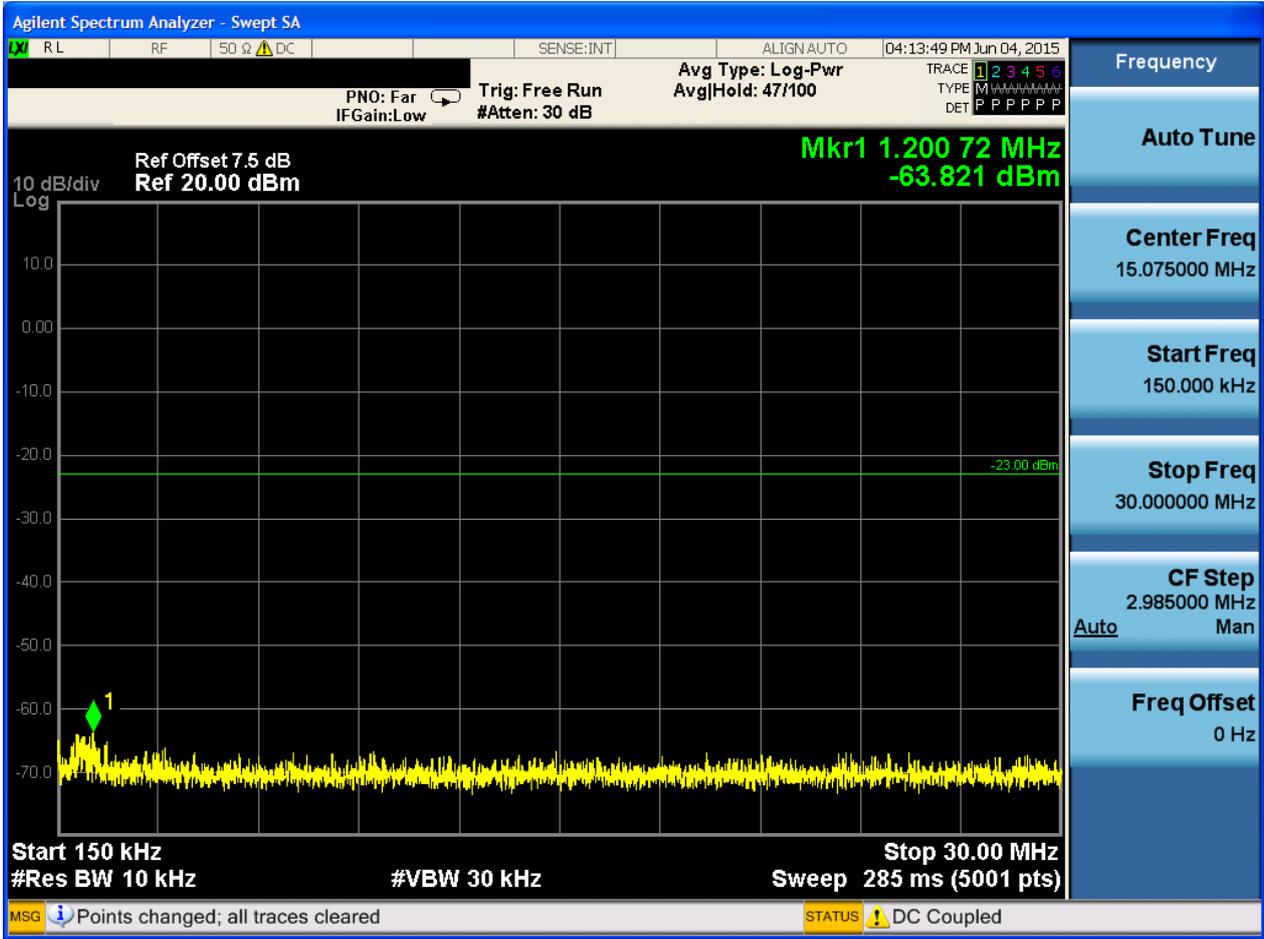


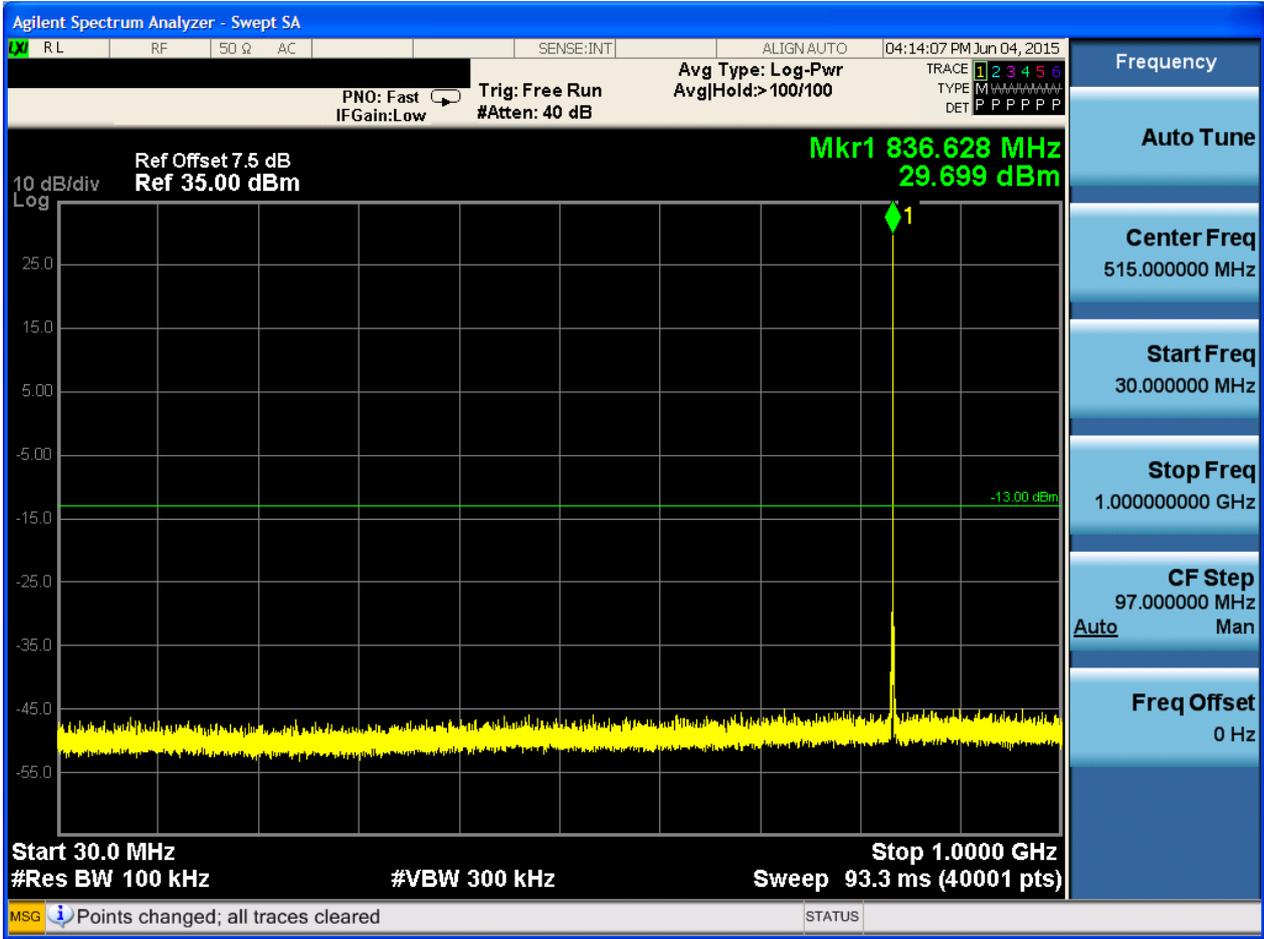


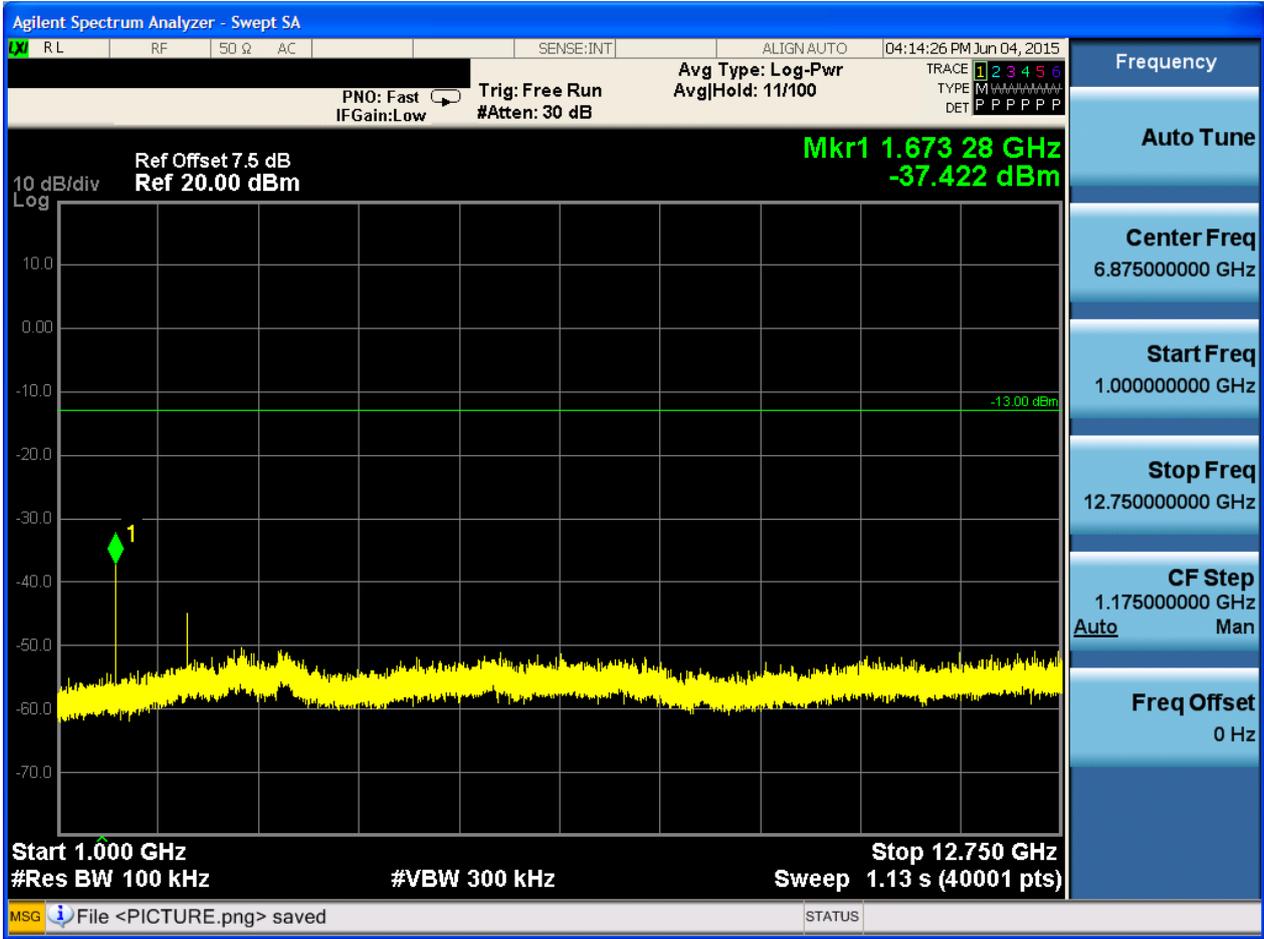


6.1.4.2.2 Test Channel = MCH

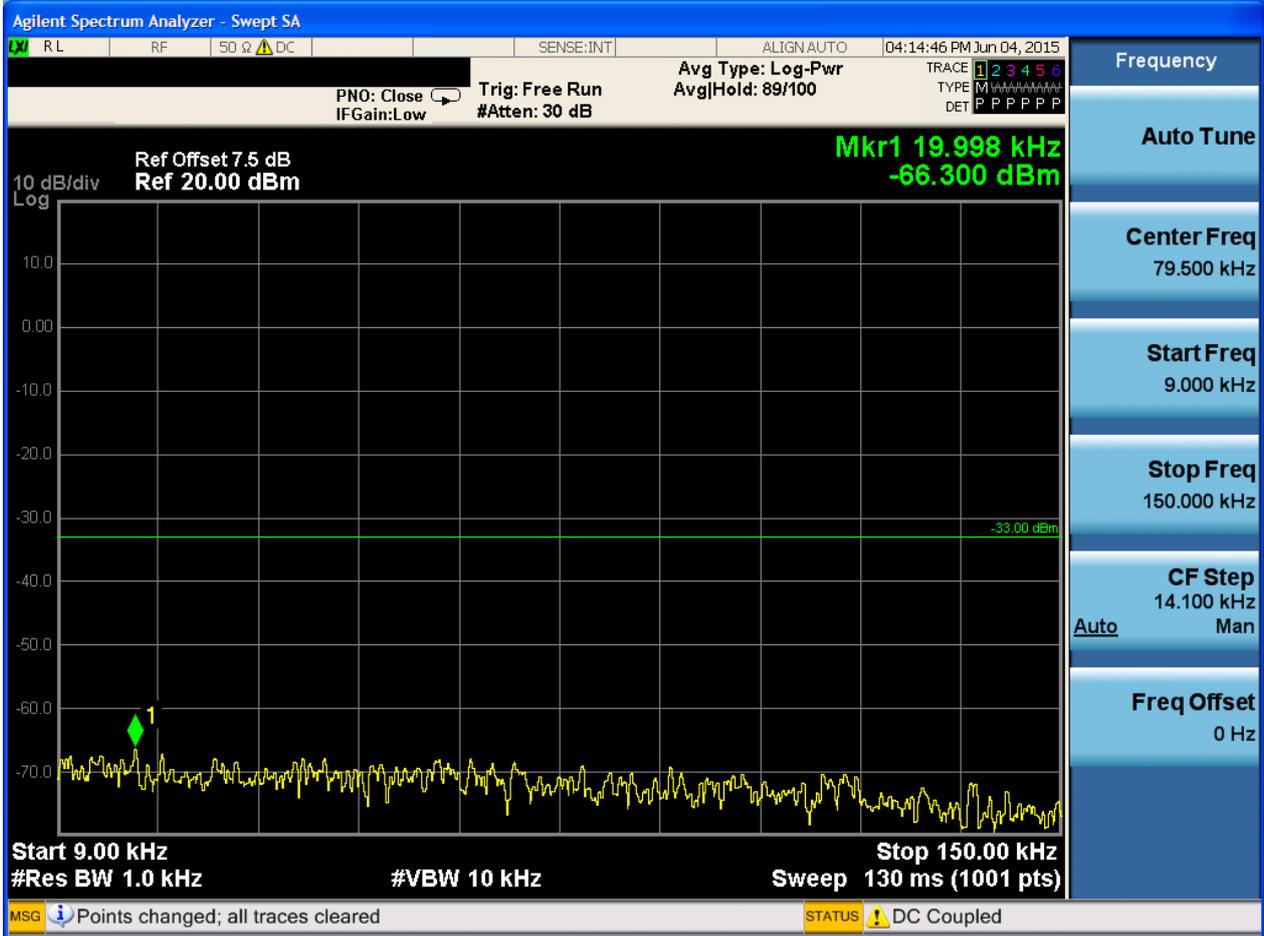


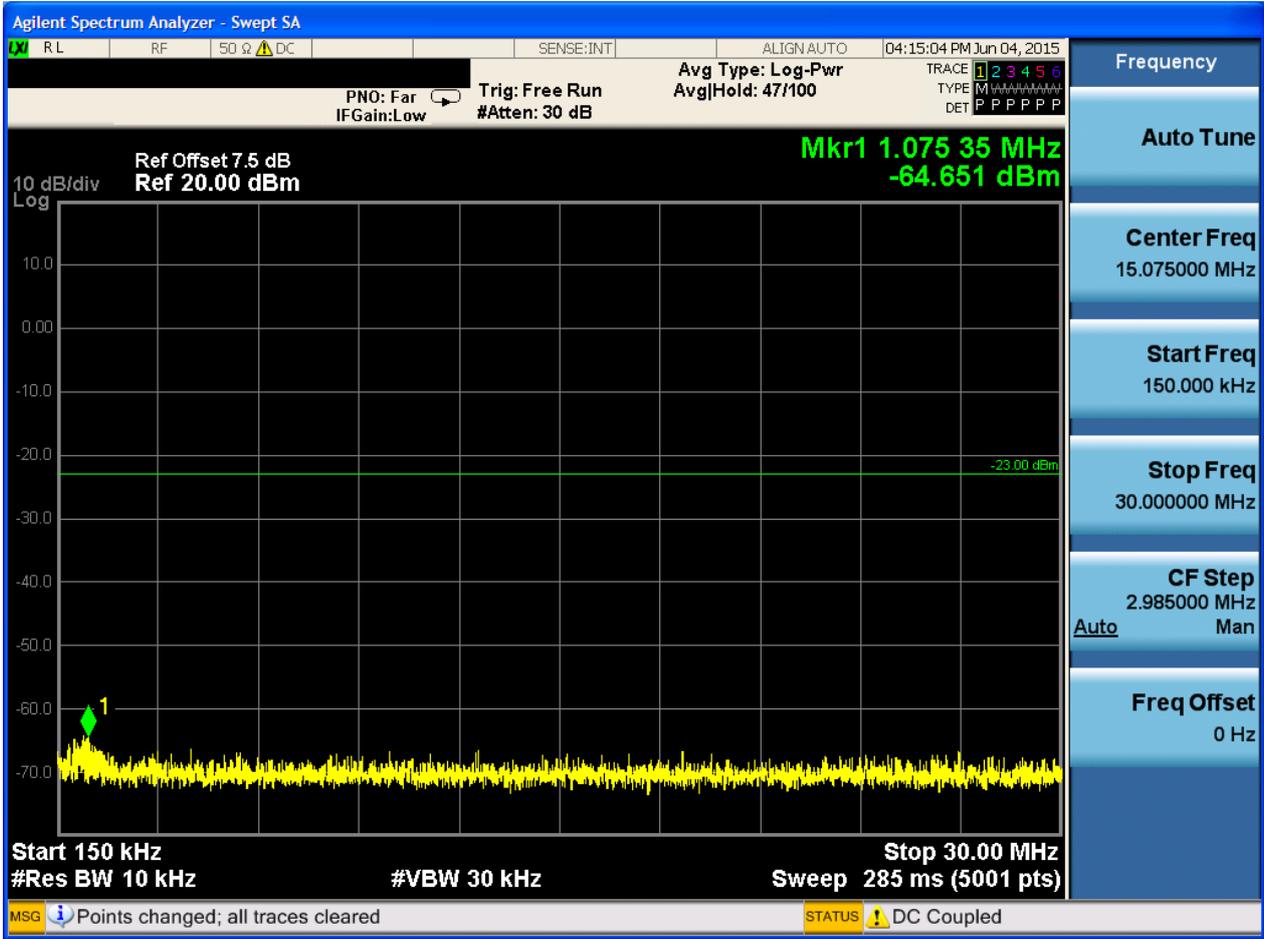


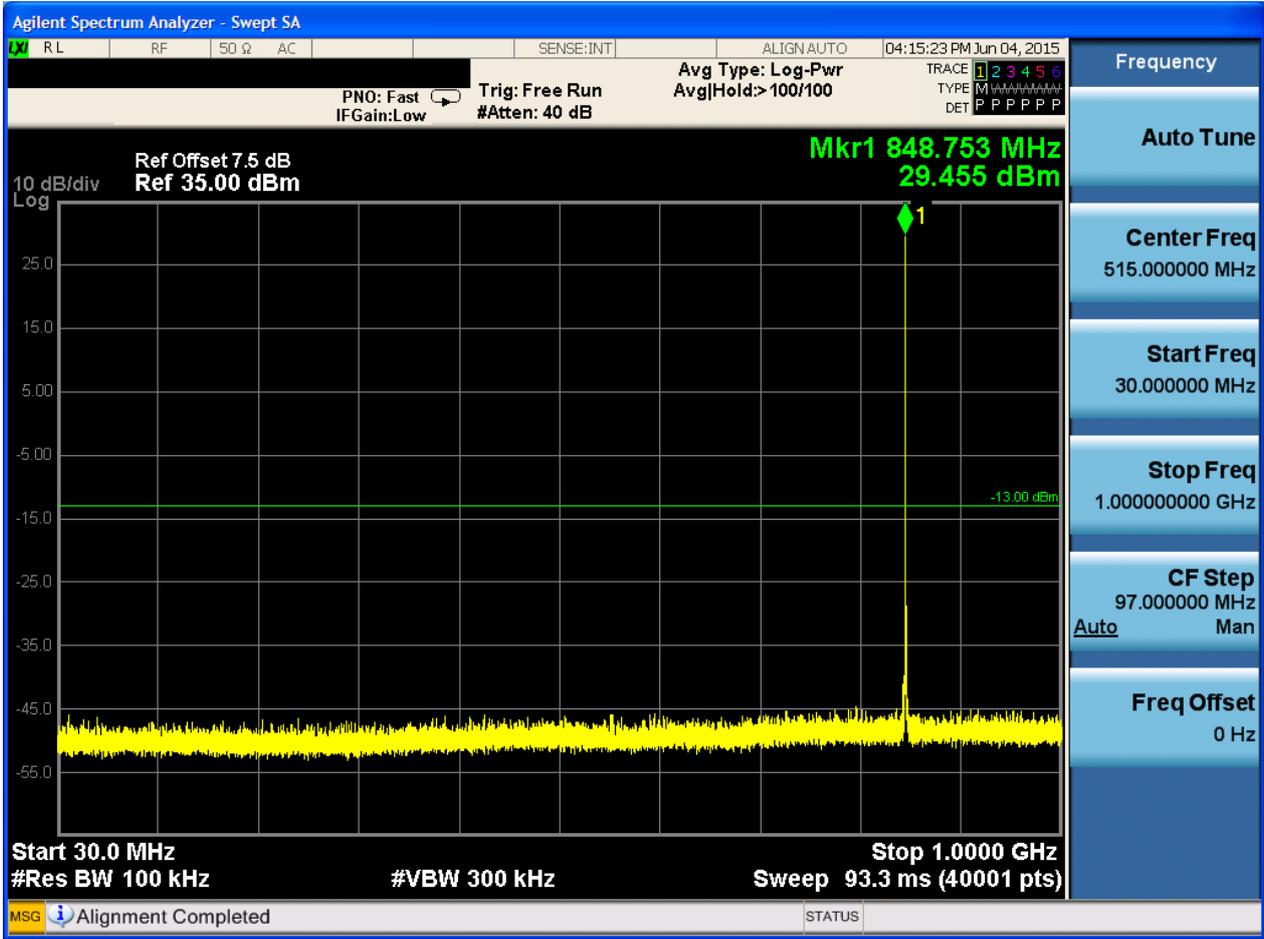


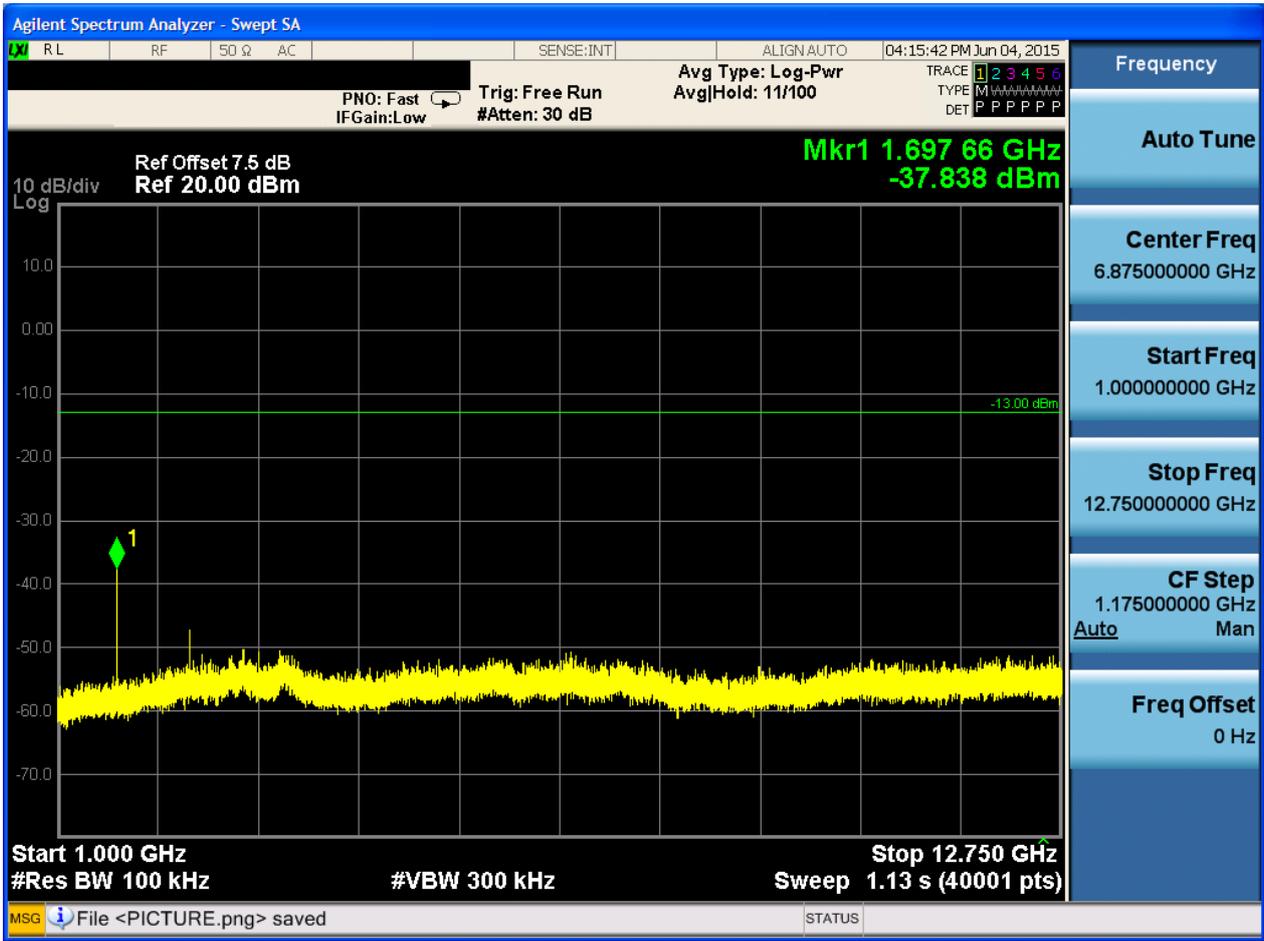


6.1.4.2.3 Test Channel = HCH









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

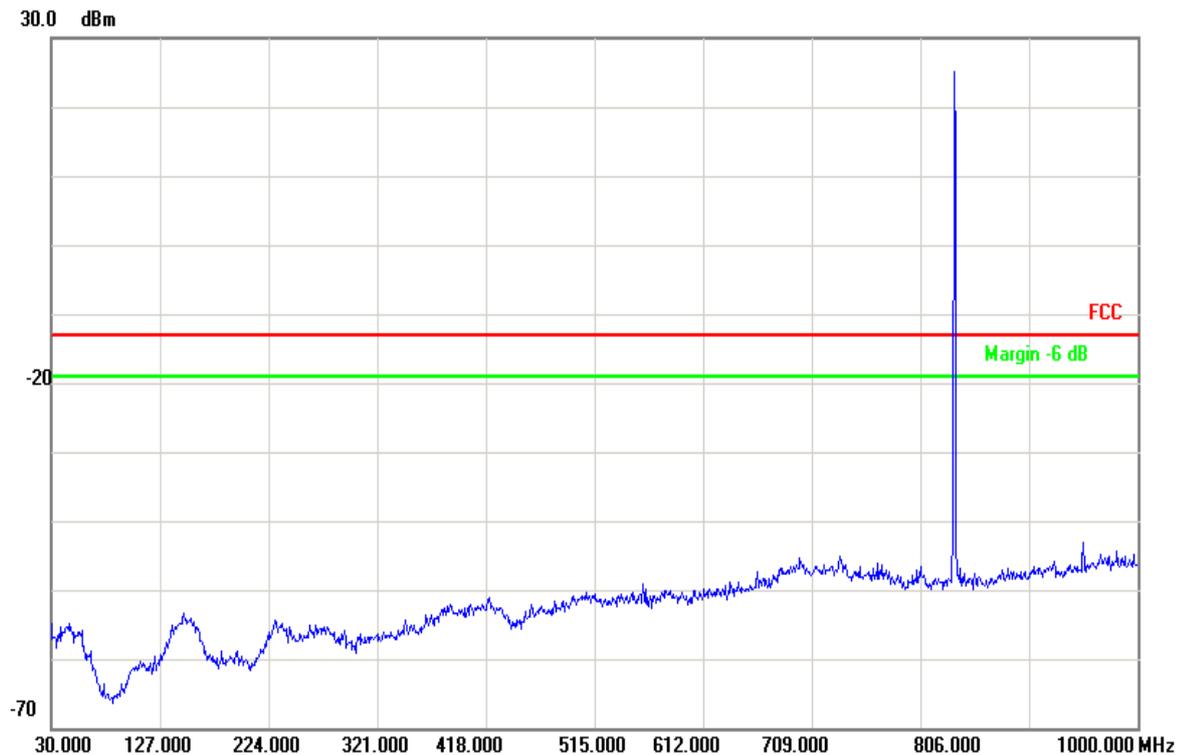
NOTE1: No peak found in the Test Range of “9 kHz to 30MHz”

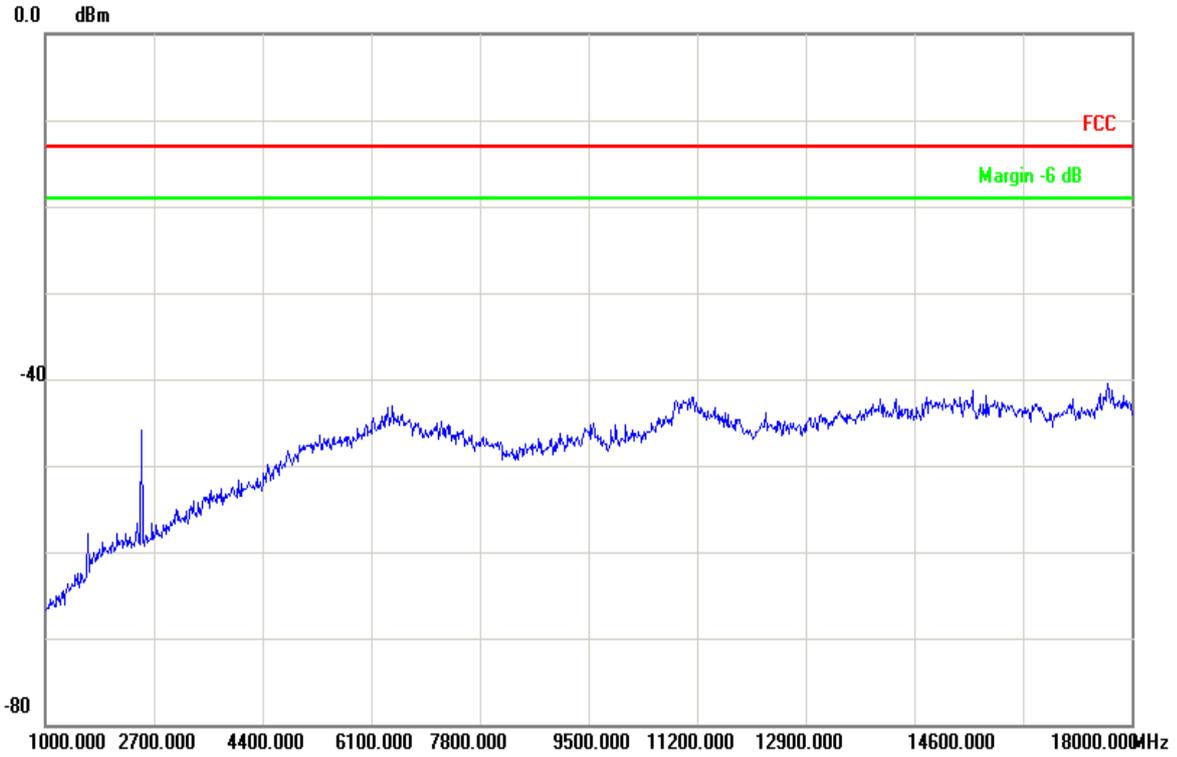
NOTE2: We tested all modes, but the data presented below is the worst case.

Part I - Test Plots

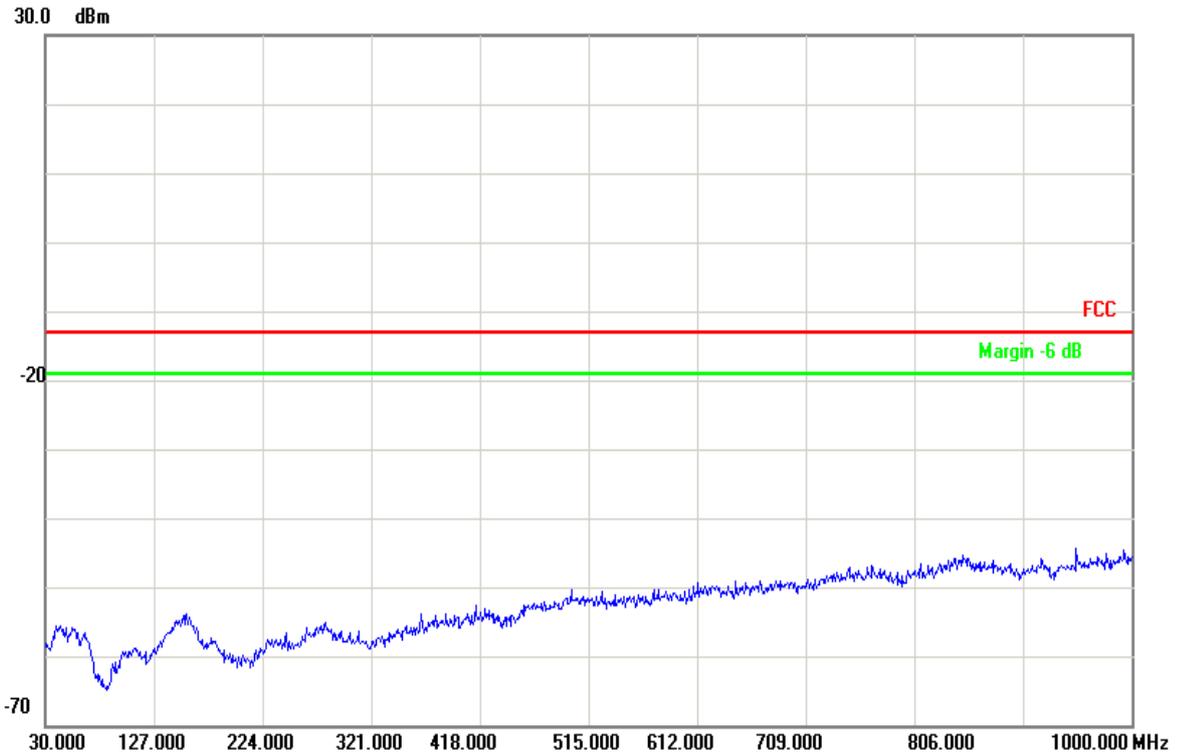
7.1 For GSM

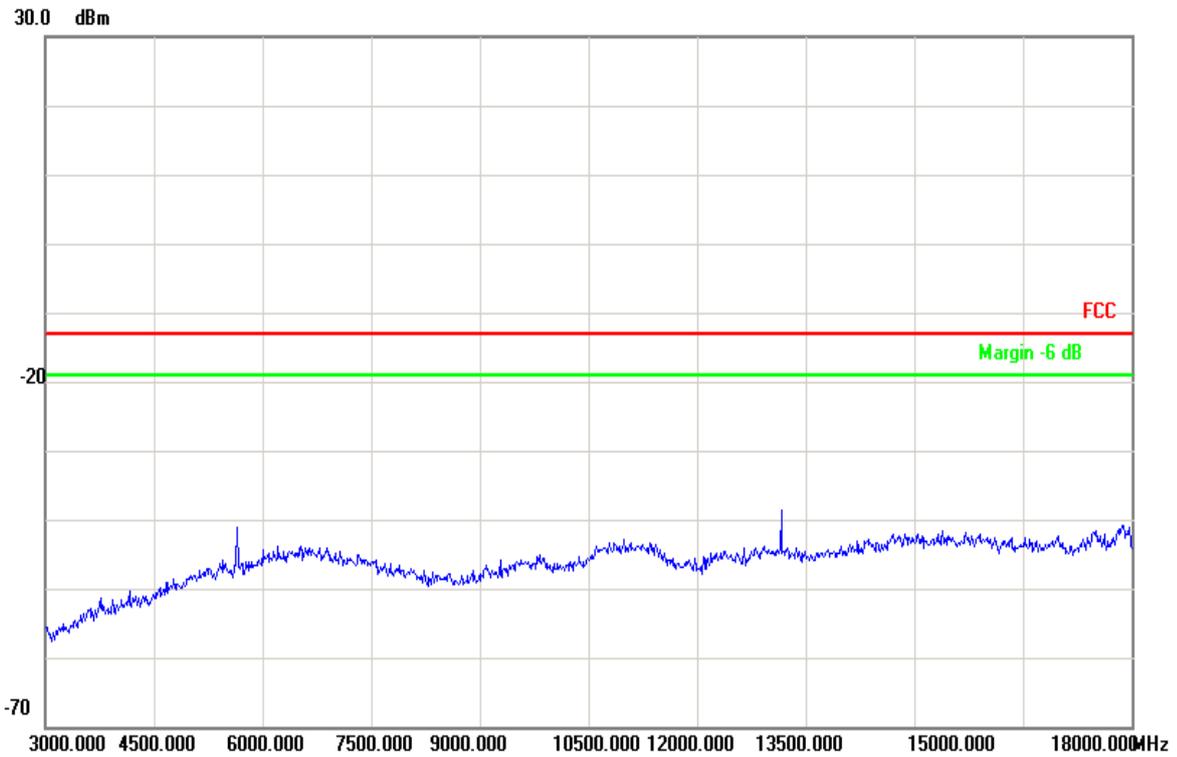
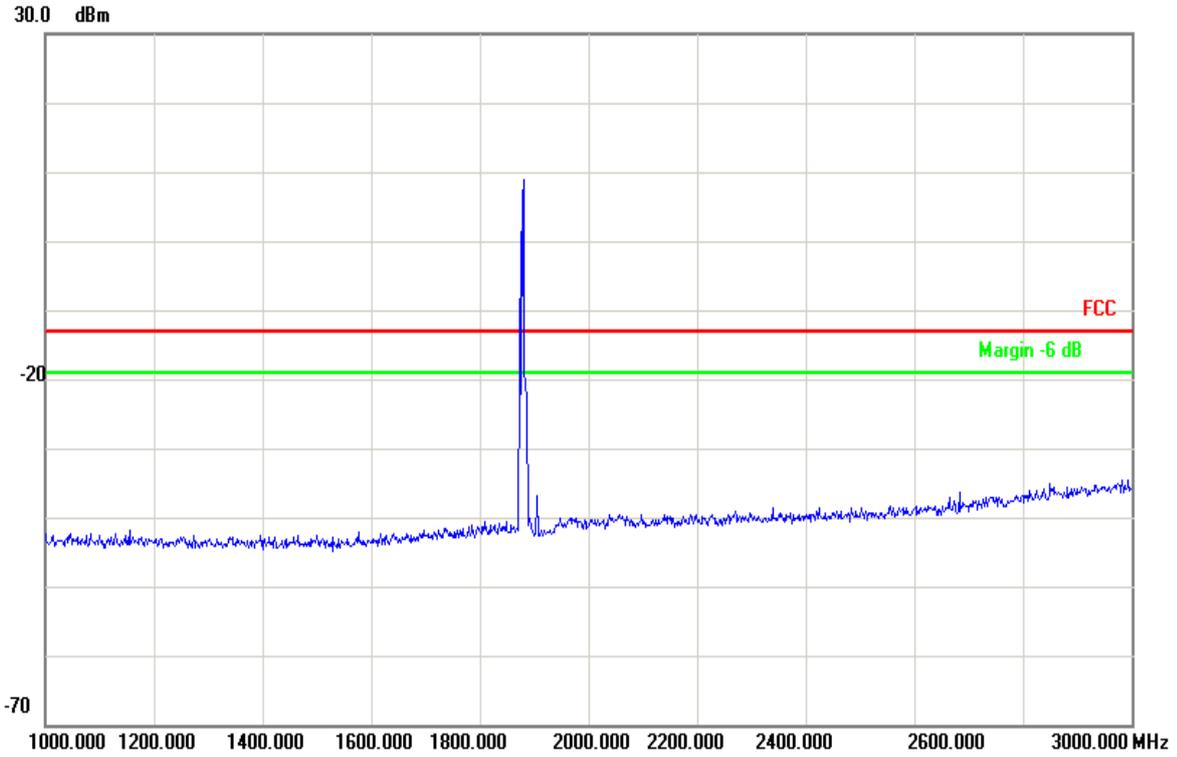
7.1.1 Test Band = GSM850

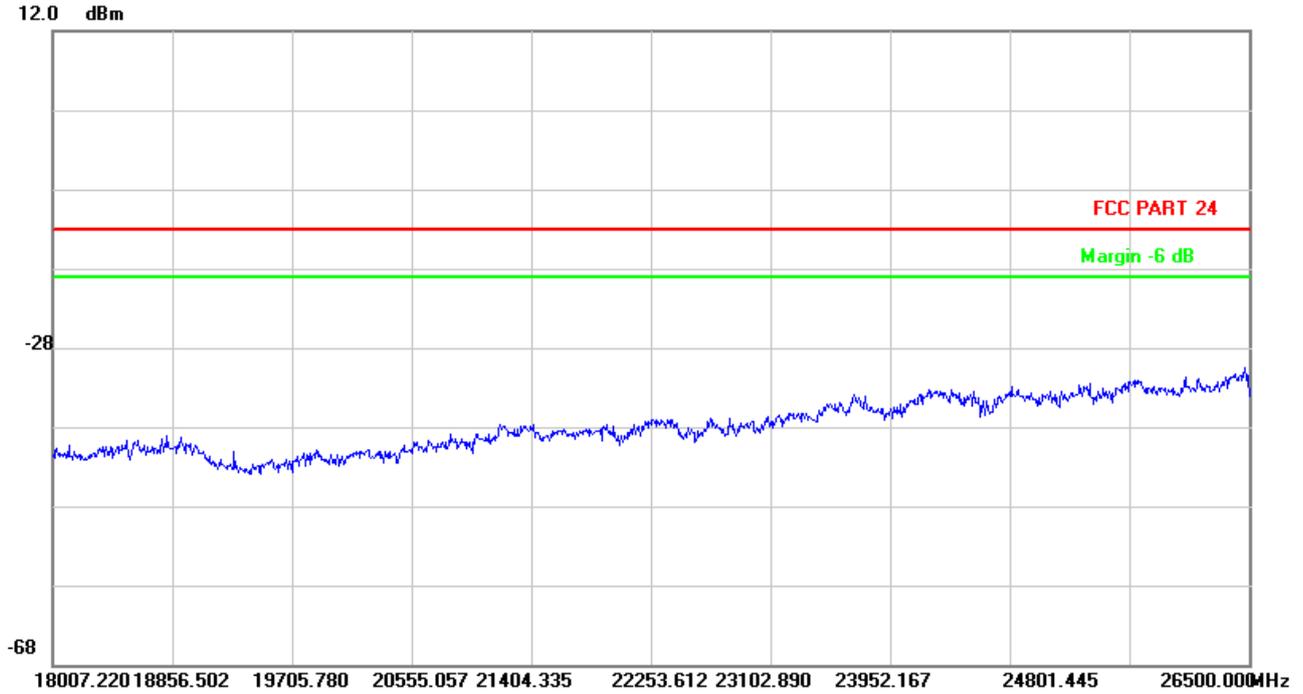




7.1.2 Test Band = GSM1900







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	15.37	0.01865	PASS
				VN	15.43	0.01872	PASS
				VH	14.33	0.01739	PASS
		MCH	TN	VL	0.65	0.00078	PASS
				VN	9.75	0.01165	PASS
				VH	1.81	0.00216	PASS
	HCH	TN	VL	5.17	0.00609	PASS	
			VN	7.49	0.00882	PASS	
			VH	7.04	0.00829	PASS	
	GSM/TM2	LCH	TN	VL	12.14	0.01473	PASS
				VN	12.85	0.01559	PASS
				VH	9.91	0.01202	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		MCH	TN	VL	10.4	0.01243	PASS
				VN	9.3	0.01112	PASS
				VH	10.85	0.01297	PASS
		HCH	TN	VL	14.79	0.01742	PASS
				VN	11.98	0.01411	PASS
				VH	13.46	0.01586	PASS
GSM1900	GSM/TM1	LCH	TN	VL	-2.2	-0.00119	PASS
				VN	-4.07	-0.0022	PASS
				VH	0.26	0.00014	PASS
		MCH	TN	VL	7.36	0.00391	PASS
				VN	5.36	0.00285	PASS
				VH	5.75	0.00306	PASS
		HCH	TN	VL	-10.59	-0.00555	PASS
				VN	9.1	0.00476	PASS
				VH	-4.65	-0.00243	PASS
	GSM/TM2	LCH	TN	VL	2.42	0.00131	PASS
				VN	1.36	0.00074	PASS
				VH	4.29	0.00232	PASS
		MCH	TN	VL	7.3	0.00388	PASS
				VN	4.55	0.00242	PASS
				VH	7.43	0.00395	PASS
		HCH	TN	VL	-5.68	-0.00297	PASS
				VN	-4.91	-0.00257	PASS
				VH	-4.84	-0.00253	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	13.04	0.01582	PASS
				-20	14.08	0.01708	PASS
				-10	13.5	0.01638	PASS
				0	11.11	0.01348	PASS
				10	10.4	0.01262	PASS
				20	12.59	0.01528	PASS
				30	15.17	0.01841	PASS
				40	9.56	0.0116	PASS
				50	13.24	0.01606	PASS
		MCH	VN	-30	2.91	0.00348	PASS
				-20	3.81	0.00455	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict	
				-10	3.03	0.00362	PASS	
				0	4.26	0.00509	PASS	
				10	5.75	0.00687	PASS	
				20	9.23	0.01103	PASS	
				30	5.81	0.00694	PASS	
				40	6.33	0.00757	PASS	
		50	2.91	0.00348	PASS			
		HCH	VN	-30	7.43	0.00875	PASS	
				-20	6.07	0.00715	PASS	
				-10	5.17	0.00609	PASS	
				0	4.07	0.0048	PASS	
				10	5.49	0.00647	PASS	
				20	7.49	0.00882	PASS	
		LCH	VN	30	6.07	0.00715	PASS	
				40	8.07	0.00951	PASS	
				50	6.84	0.00806	PASS	
				-30	11.07	0.01343	PASS	
				-20	10.3	0.0125	PASS	
	-10			10.33	0.01253	PASS		
	GSM/TM2	LCH	VN	0	8.14	0.00988	PASS	
				10	11.62	0.0141	PASS	
				20	8.01	0.00972	PASS	
				30	10.04	0.01218	PASS	
				40	9.59	0.01164	PASS	
				50	11.59	0.01406	PASS	
		MCH	VN	-30	8.62	0.0103	PASS	
				-20	7.55	0.00902	PASS	
				-10	6.23	0.00745	PASS	
				0	6.59	0.00788	PASS	
				10	7.59	0.00907	PASS	
				20	7.52	0.00899	PASS	
		HCH	VN	30	8.52	0.01018	PASS	
				40	7.85	0.00938	PASS	
				50	8.65	0.01034	PASS	
				-30	11.46	0.0135	PASS	
				-20	13.2	0.01555	PASS	
				-10	5.26	0.0062	PASS	
					0	14.04	0.01654	PASS
					10	12.62	0.01487	PASS
					20	11.4	0.01343	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	12.07	0.01422	PASS
				40	15.82	0.01864	PASS
				50	15.59	0.01837	PASS
GSM1900	GSM/TM1	LCH	VN	-30	-1.74	-0.00094	PASS
				-20	-1.87	-0.00101	PASS
				-10	-0.45	-0.00024	PASS
				0	-2.84	-0.00153	PASS
				10	-4.2	-0.00227	PASS
				20	-7.81	-0.00422	PASS
				30	13.43	0.00726	PASS
				40	-2.26	-0.00122	PASS
				50	-1.23	-0.00066	PASS
		MCH	VN	-30	5.88	0.00313	PASS
				-20	10.72	0.0057	PASS
				-10	8.01	0.00426	PASS
				0	6.59	0.00351	PASS
				10	10.07	0.00536	PASS
				20	7.3	0.00388	PASS
	30			8.33	0.00443	PASS	
	40			9.3	0.00495	PASS	
	HCH	VN	-30	8.46	0.00443	PASS	
			-20	11.88	0.00622	PASS	
			-10	8.46	0.00443	PASS	
			0	-7.75	-0.00406	PASS	
			10	8.2	0.00429	PASS	
			20	12.66	0.00663	PASS	
			30	-7.17	-0.00375	PASS	
			40	-5.68	-0.00297	PASS	
			50	15.05	0.00788	PASS	
	GSM/TM2	LCH	VN	-30	1.9	0.00103	PASS
				-20	3.62	0.00196	PASS
				-10	6.46	0.00349	PASS
				0	2.13	0.00115	PASS
				10	2.62	0.00142	PASS
				20	-1.23	-0.00066	PASS
				30	-1.32	-0.00071	PASS
40				-0.81	-0.00044	PASS	
50				4.55	0.00246	PASS	
MCH		VN	-30	7.88	0.00419	PASS	



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-20	5.91	0.00314	PASS
				-10	9.27	0.00493	PASS
				0	9.65	0.00513	PASS
				10	14.4	0.00766	PASS
				20	13.88	0.00738	PASS
				30	11.75	0.00625	PASS
				40	11.3	0.00601	PASS
				50	11.95	0.00636	PASS
		HCH	VN	-30	19.15	0.01003	PASS
				-20	19.11	0.01001	PASS
				-10	-2	-0.00105	PASS
				0	15.4	0.00806	PASS
				10	15.11	0.00791	PASS
				20	19.6	0.01026	PASS
				30	11.27	0.0059	PASS
				40	19.27	0.01009	PASS
				50	13.2	0.00691	PASS



END