



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	31.48	27.83	38.5	PASS
		MCH	31.66	28.01	38.5	PASS
		HCH	32.23	28.58	38.5	PASS
	GSM/TM2	LCH	25.67	22.02	38.5	PASS
		MCH	25.86	22.21	38.5	PASS
		HCH	25.79	22.14	38.5	PASS
GSM1900	GSM/TM1	LCH	28.65	29.78	33	PASS
		MCH	28.73	29.86	33	PASS
		HCH	28.89	30.02	33	PASS
	GSM/TM2	LCH	25.11	26.24	33	PASS
		MCH	25.05	26.18	33	PASS
		HCH	24.95	26.08	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	0.35	13	PASS
		MCH	0.35	13	PASS
		HCH	0.32	13	PASS
	GSM/TM2	LCH	3.48	13	PASS
		MCH	3.51	13	PASS
		HCH	3.57	13	PASS

3Appendix_C: Modulation Characteristics

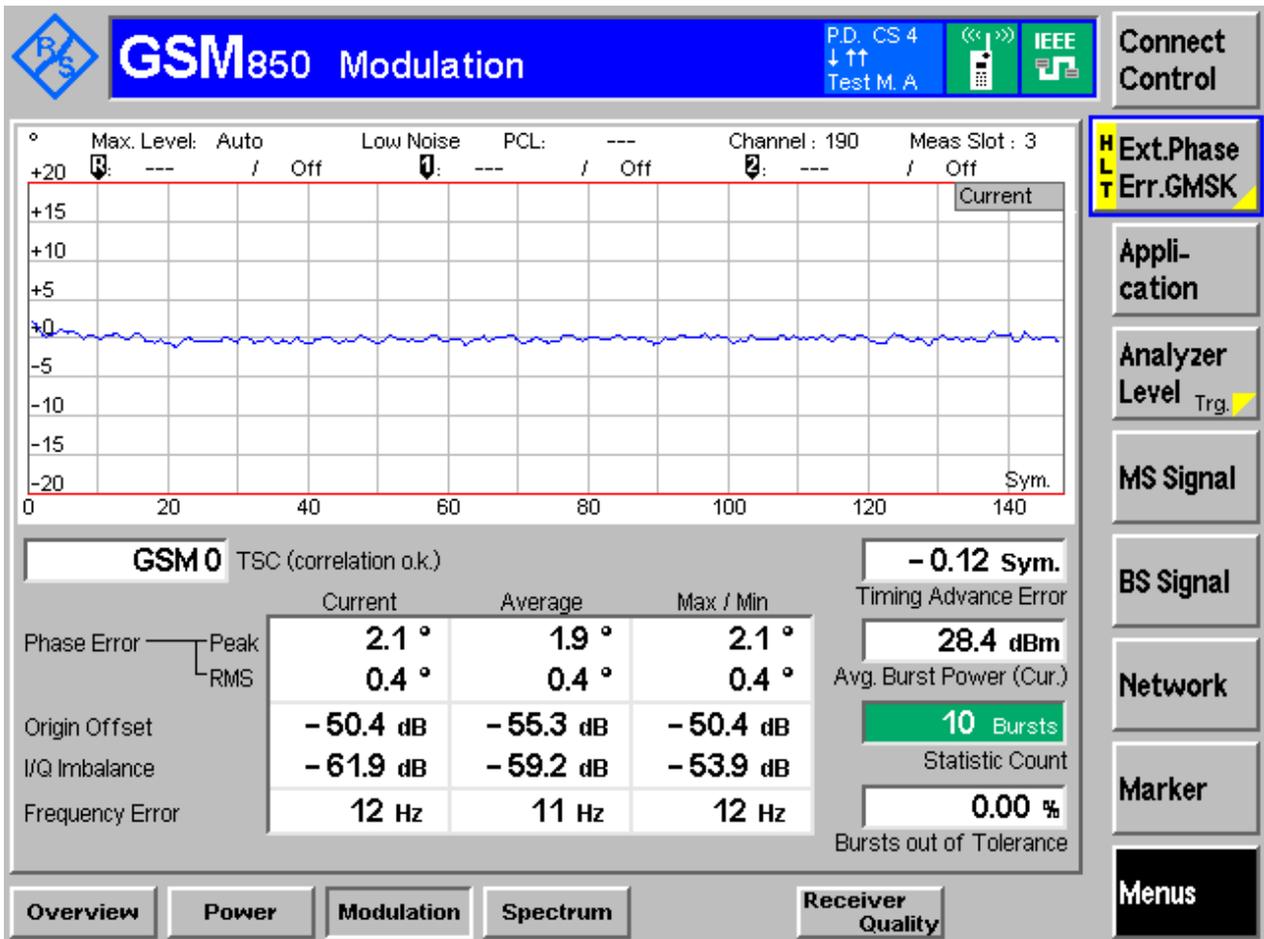
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

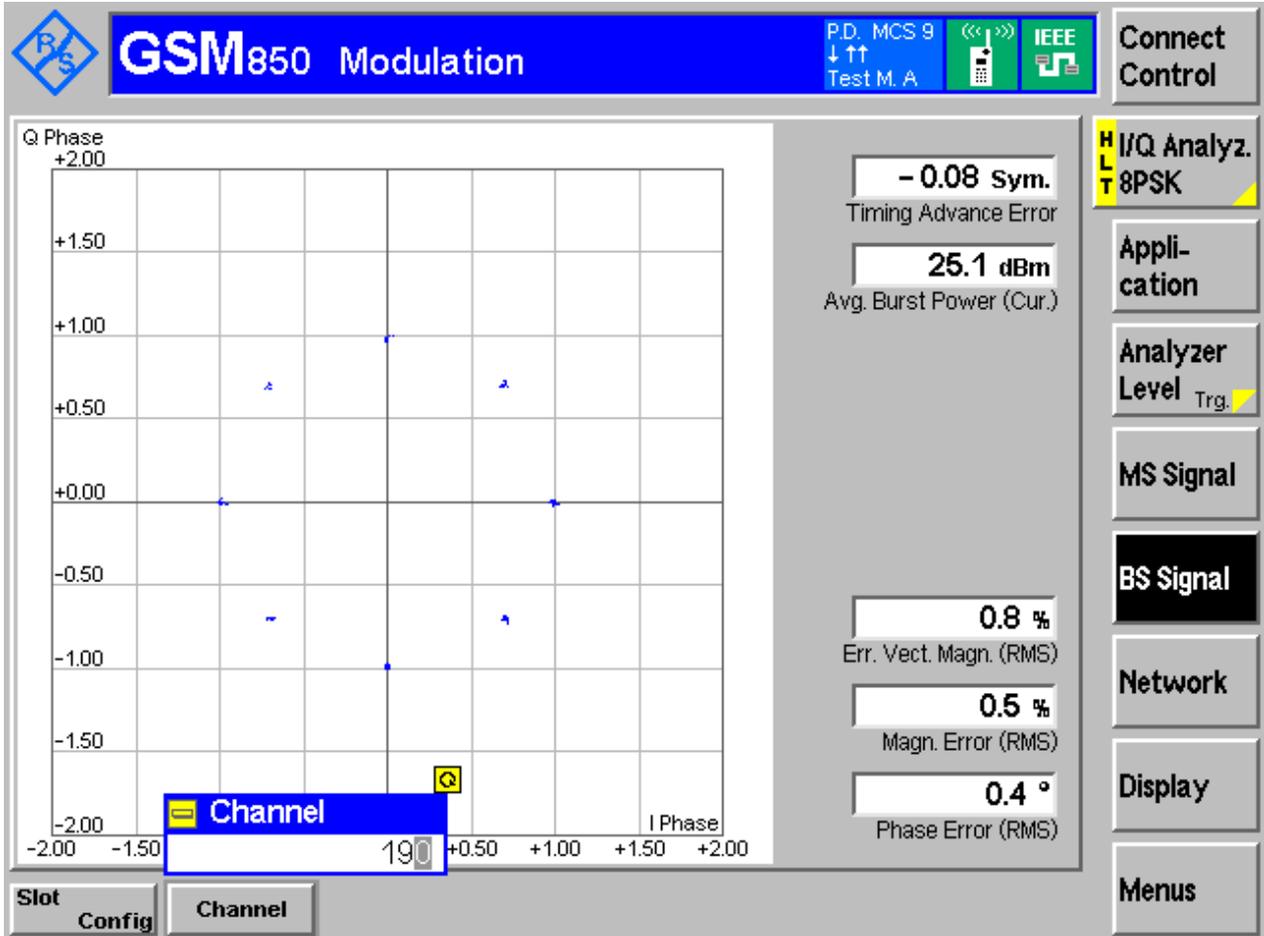
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

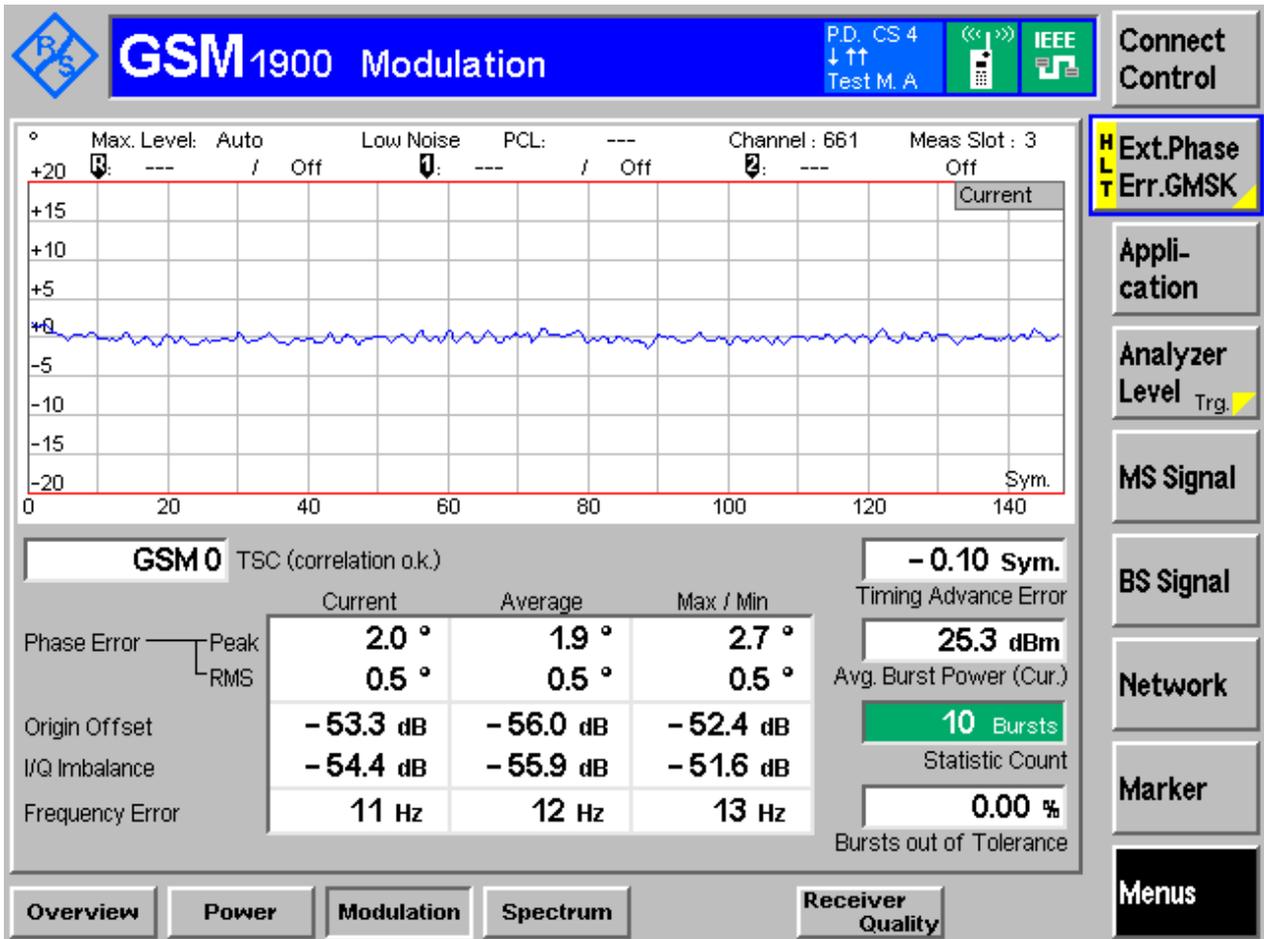
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

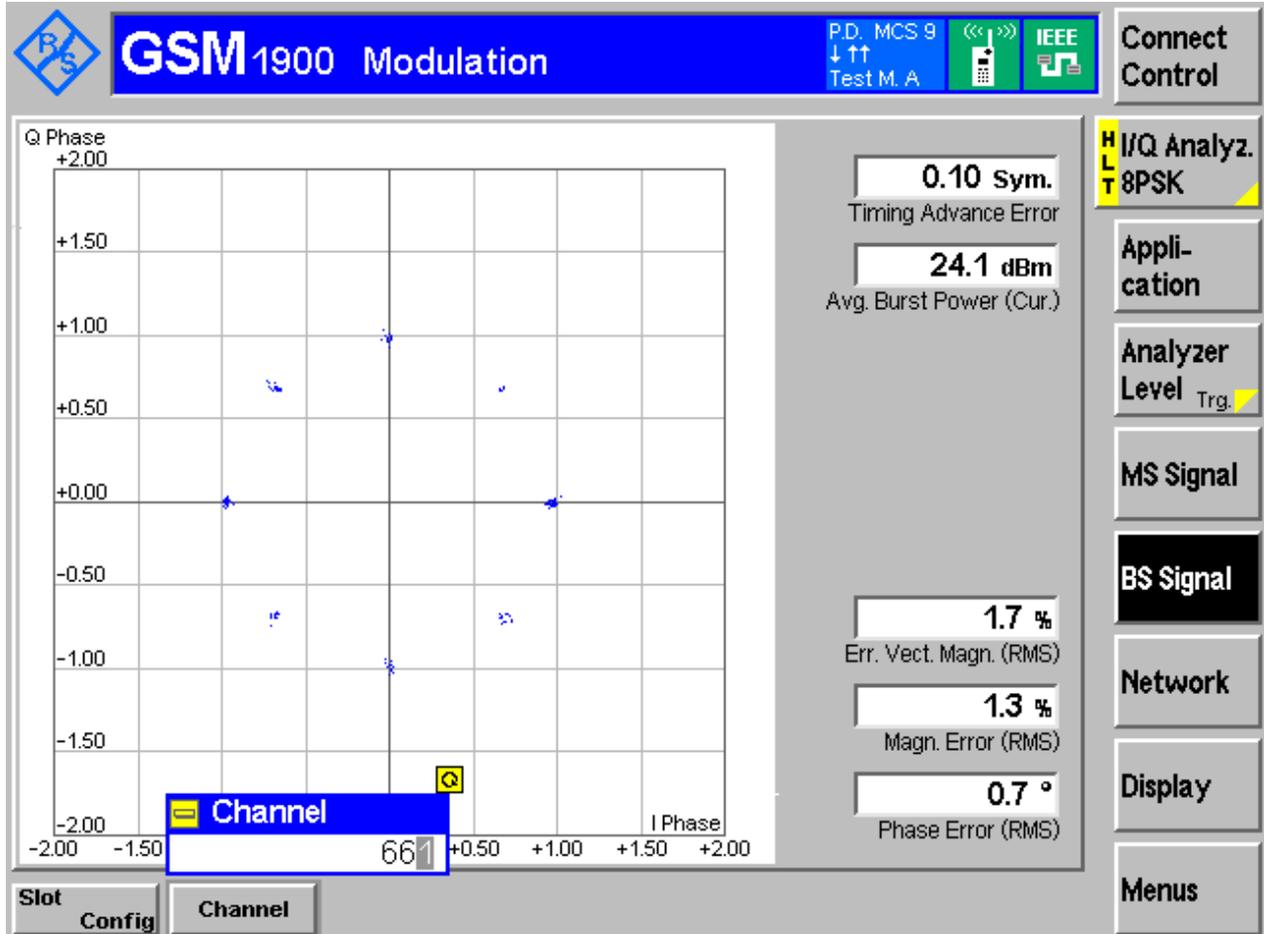
3.1.2.1 Test Mode = GSM/TM1

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	247.95	319.48	Pass
		MCH	241.83	316.63	Pass
		HCH	243.99	314.46	Pass
	GSM/TM2	LCH	237.44	315.43	Pass
		MCH	236.68	299.01	Pass
		HCH	248.58	322.98	Pass
GSM1900	GSM/TM1	LCH	244.31	315.17	Pass
		MCH	244.81	316.25	Pass
		HCH	244.95	316.92	Pass
	GSM/TM2	LCH	245.95	314.63	Pass
		MCH	244.82	317.07	Pass
		HCH	238.31	308.18	Pass



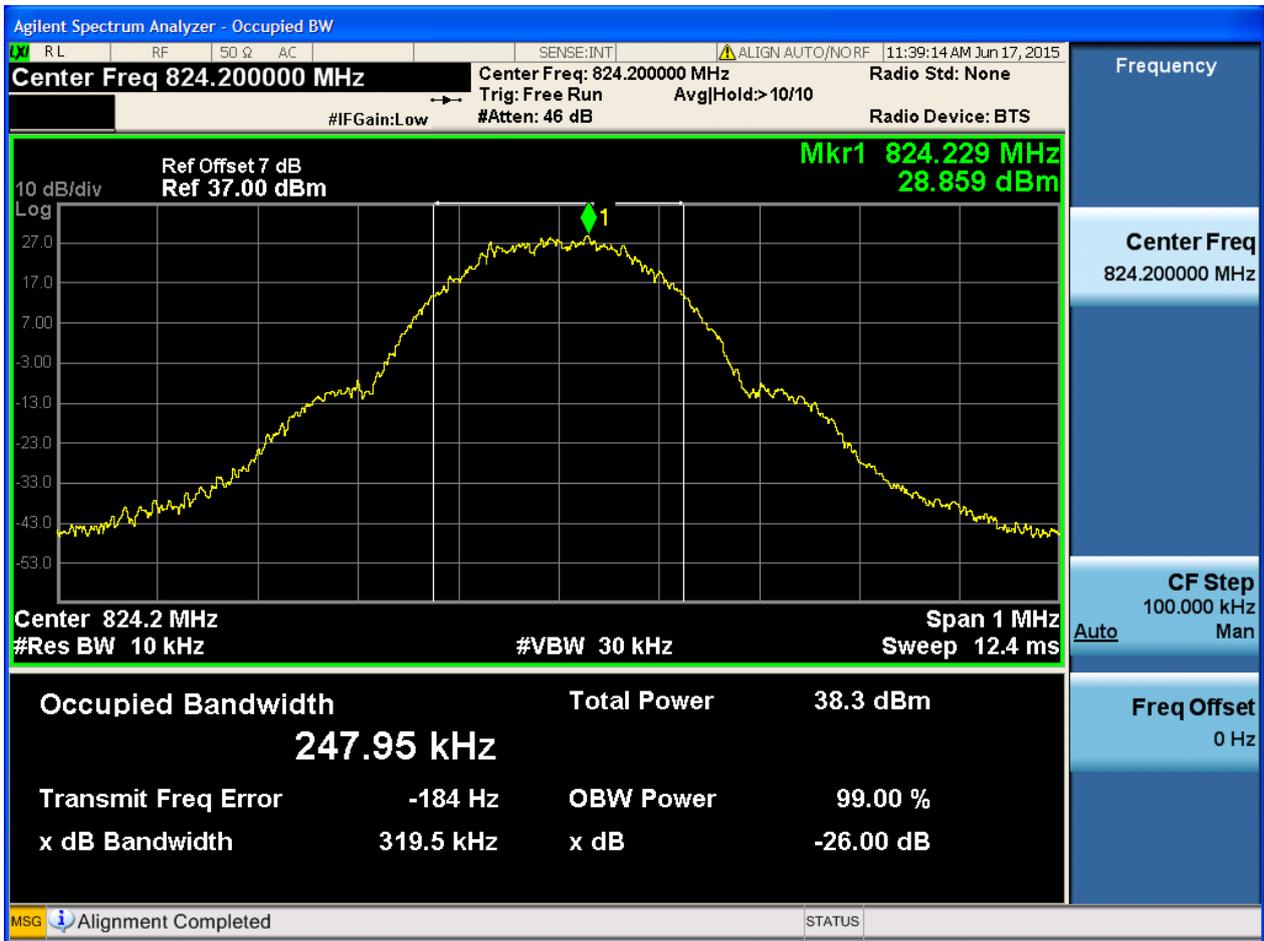
Part II - Test Plots

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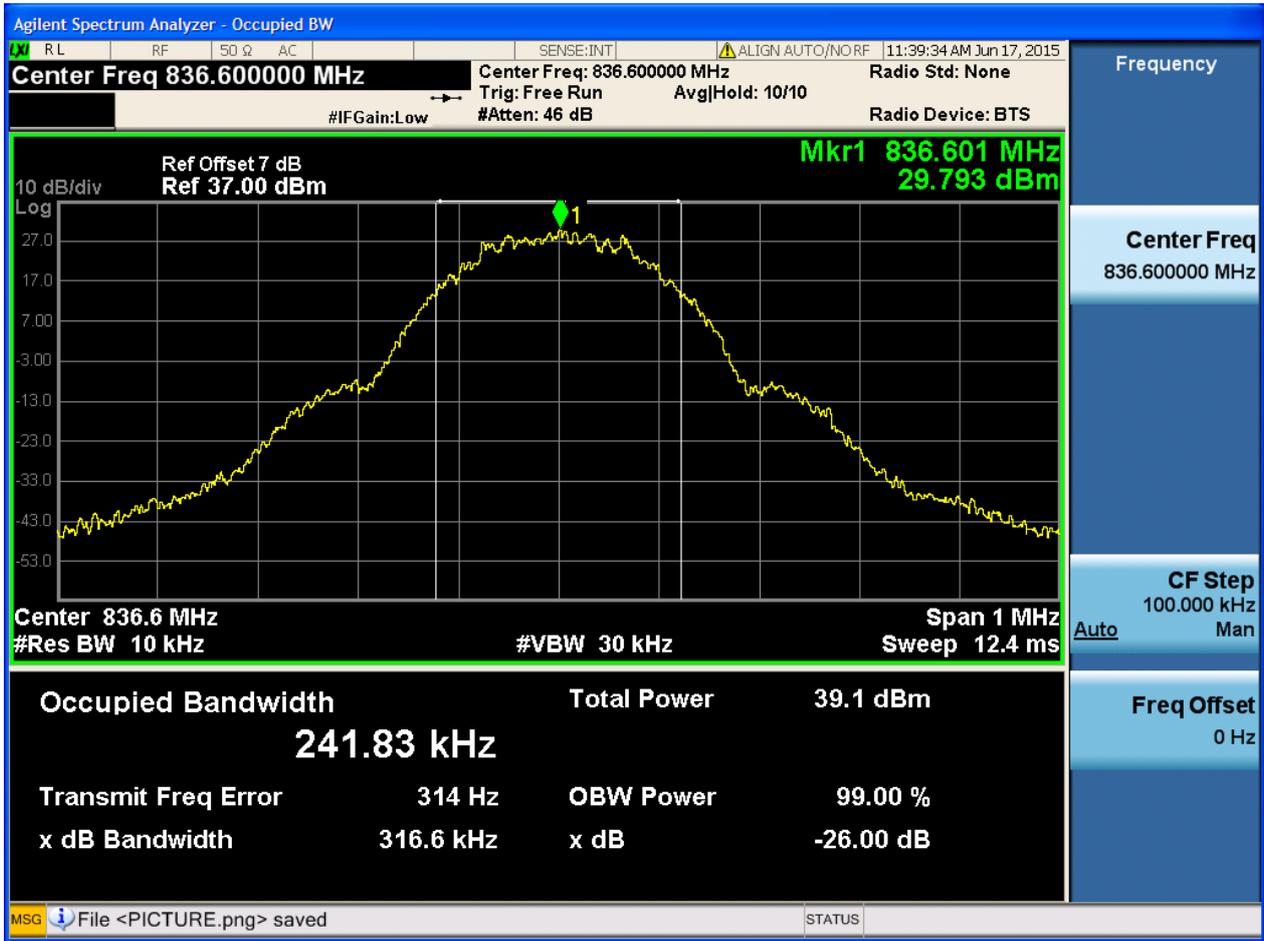
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH





4.1.1.1.2 Test Channel = MCH





4.1.1.1.3 Test Channel = HCH





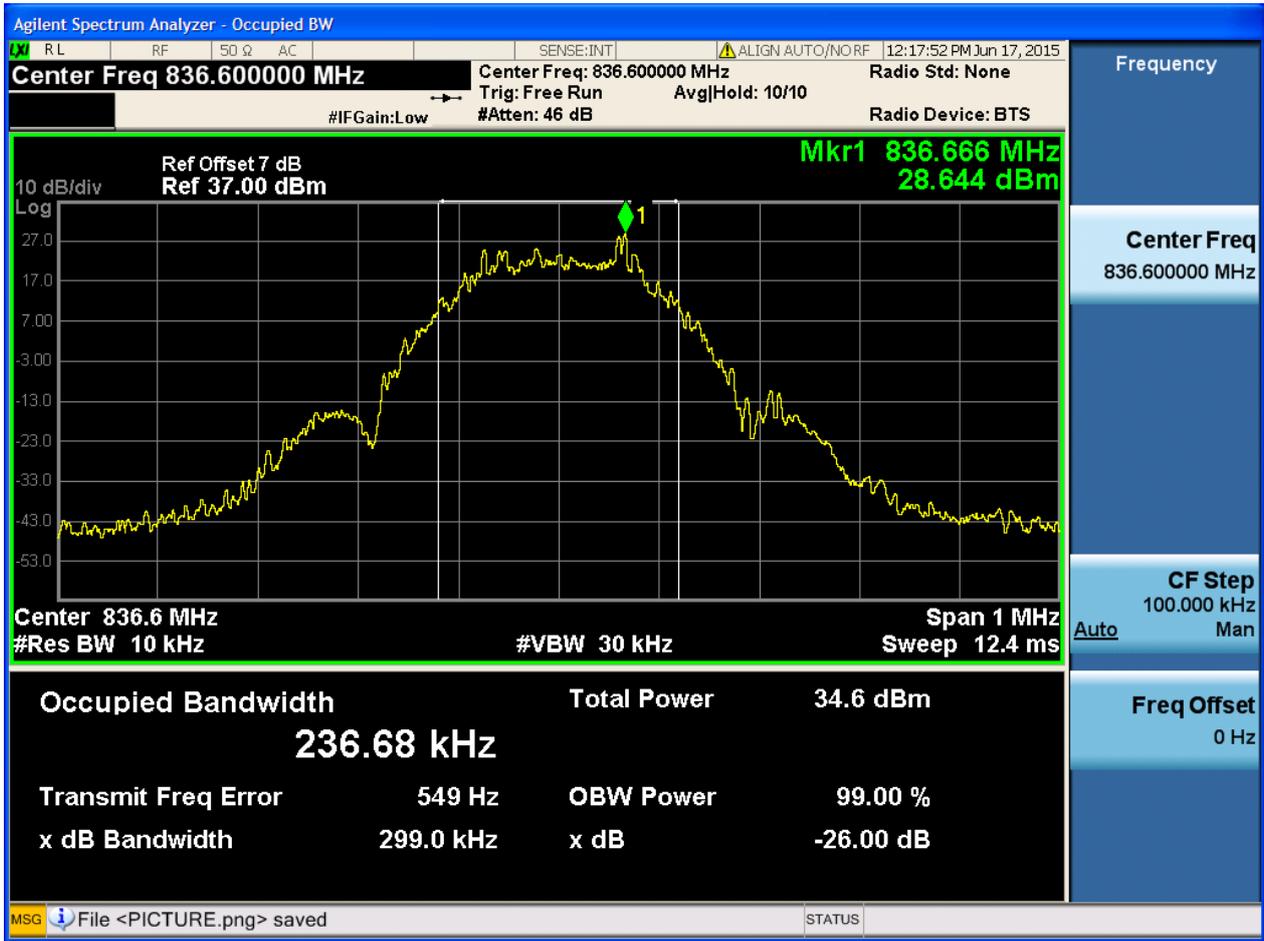
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH





4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH

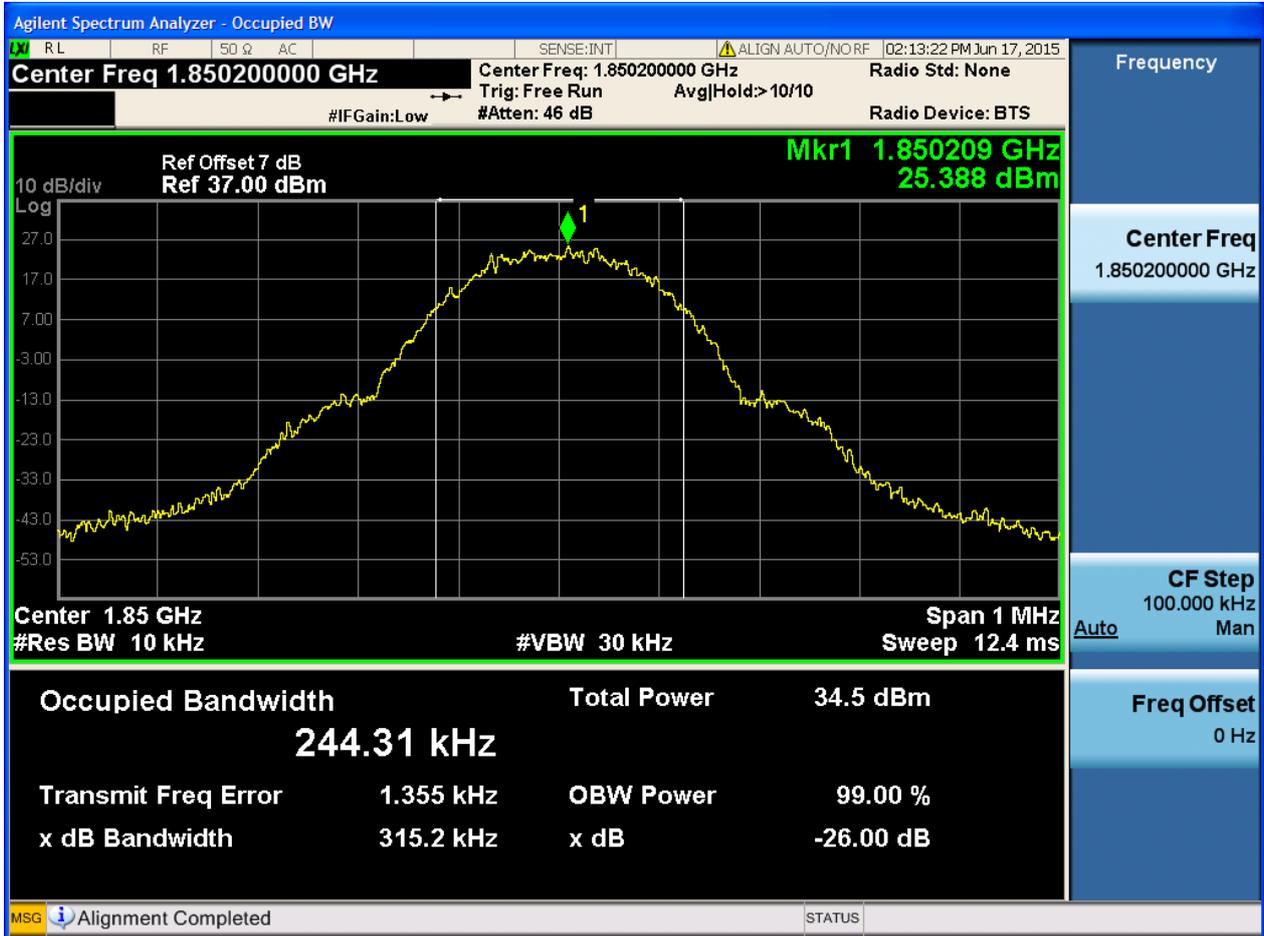




4.1.2 Test Band = GSM1900

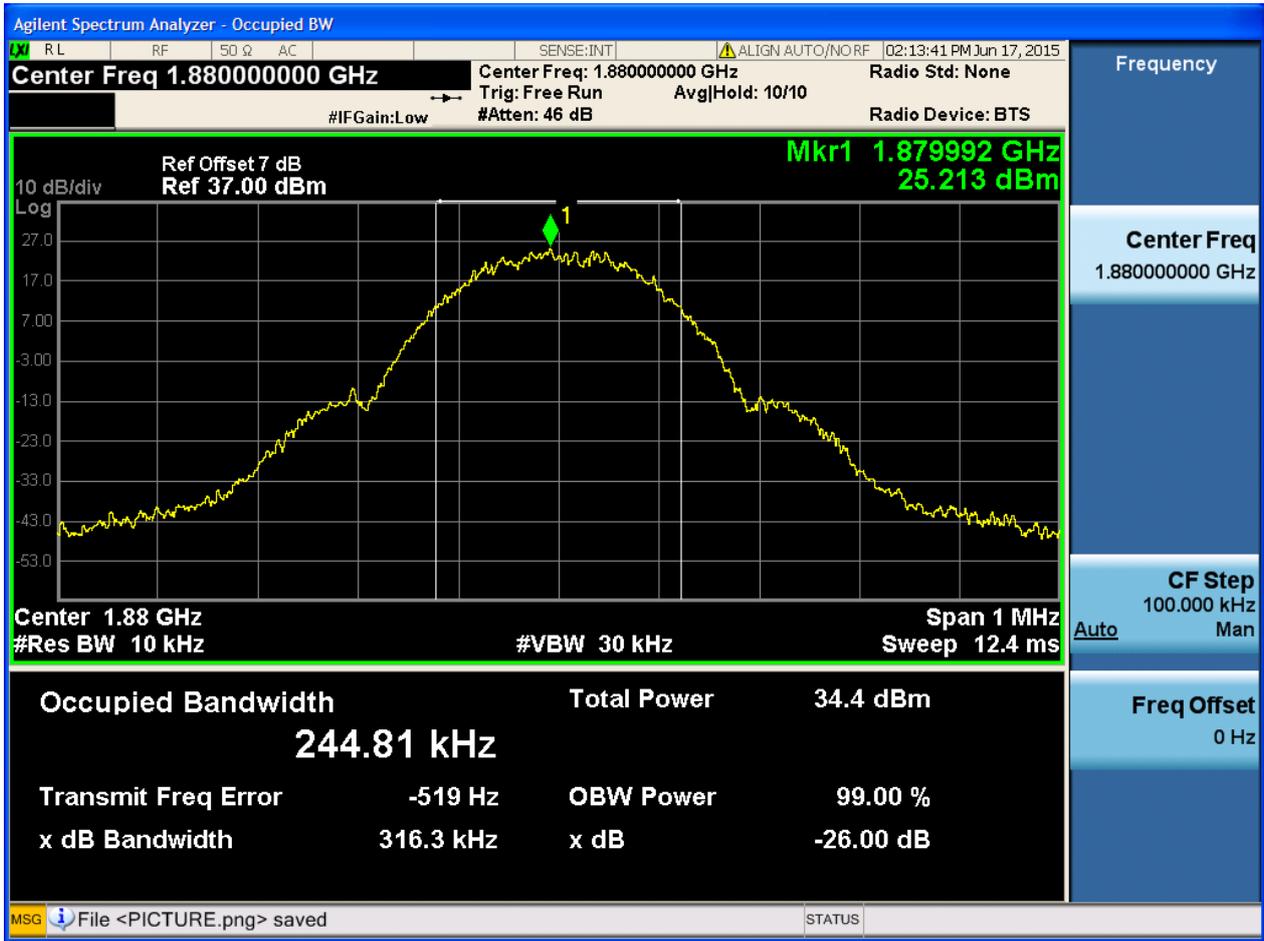
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4.1.2.1.1 Test Channel = LCH



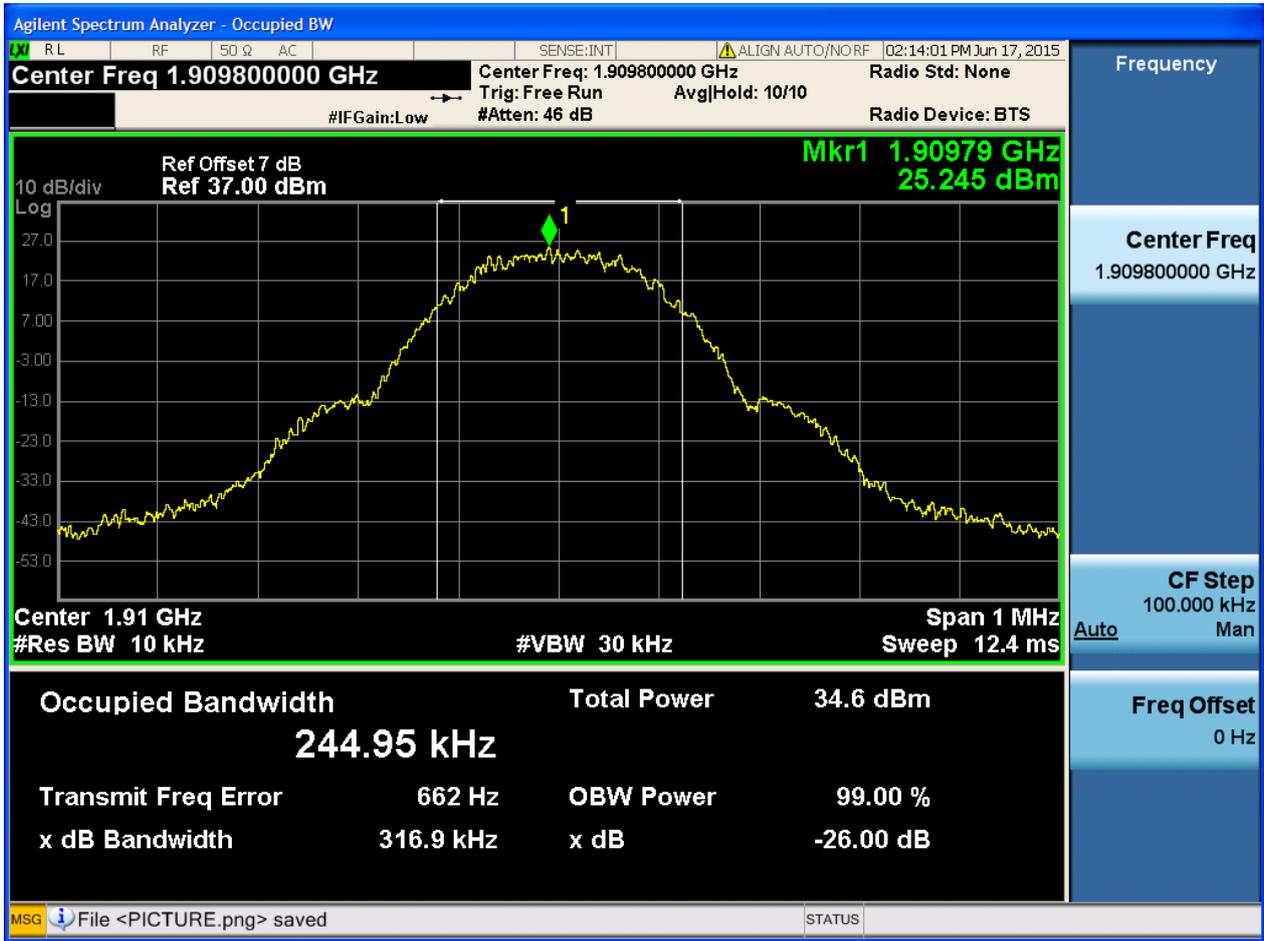


4.1.2.1.2 Test Channel = MCH





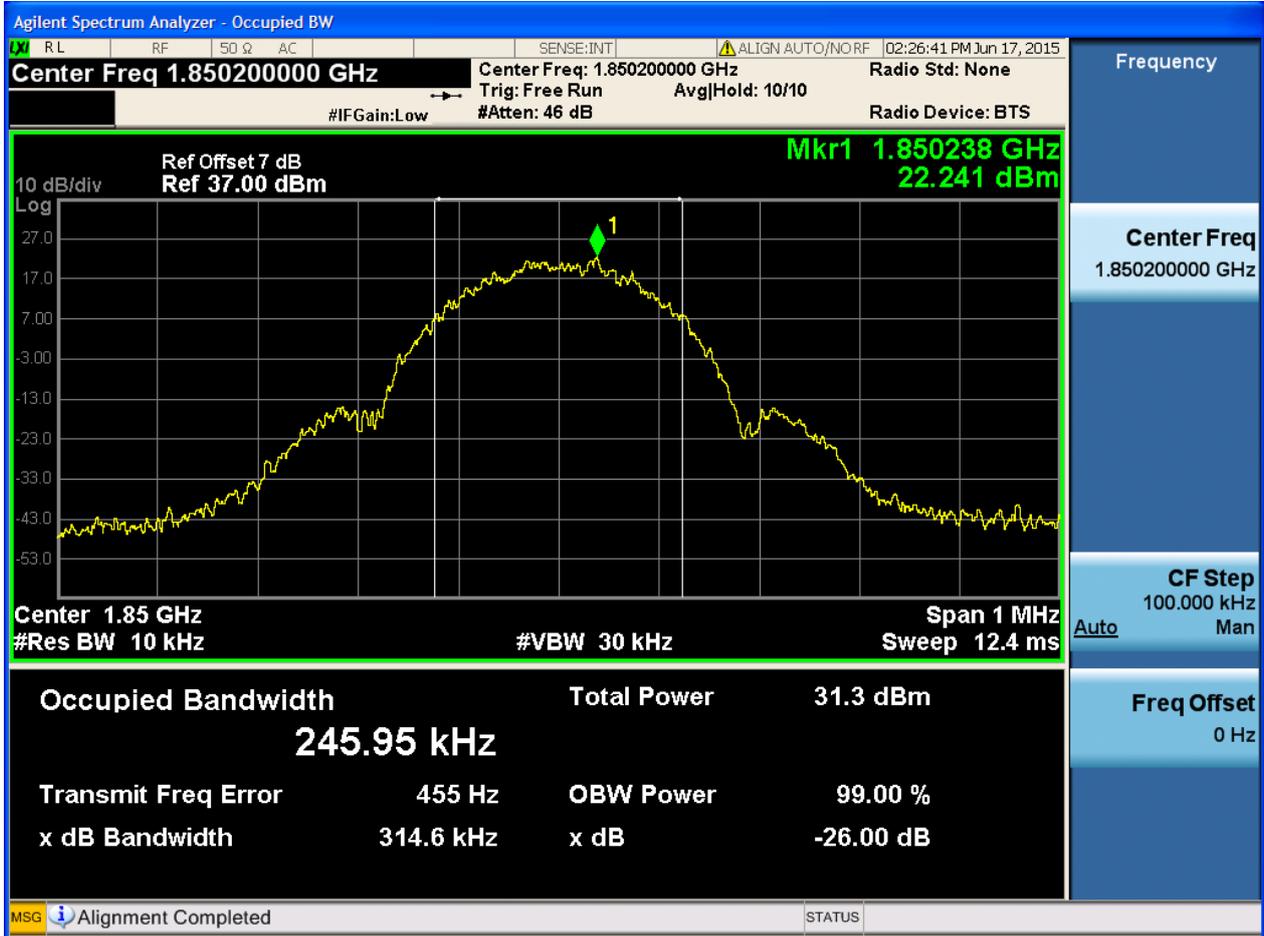
4.1.2.1.3 Test Channel = HCH





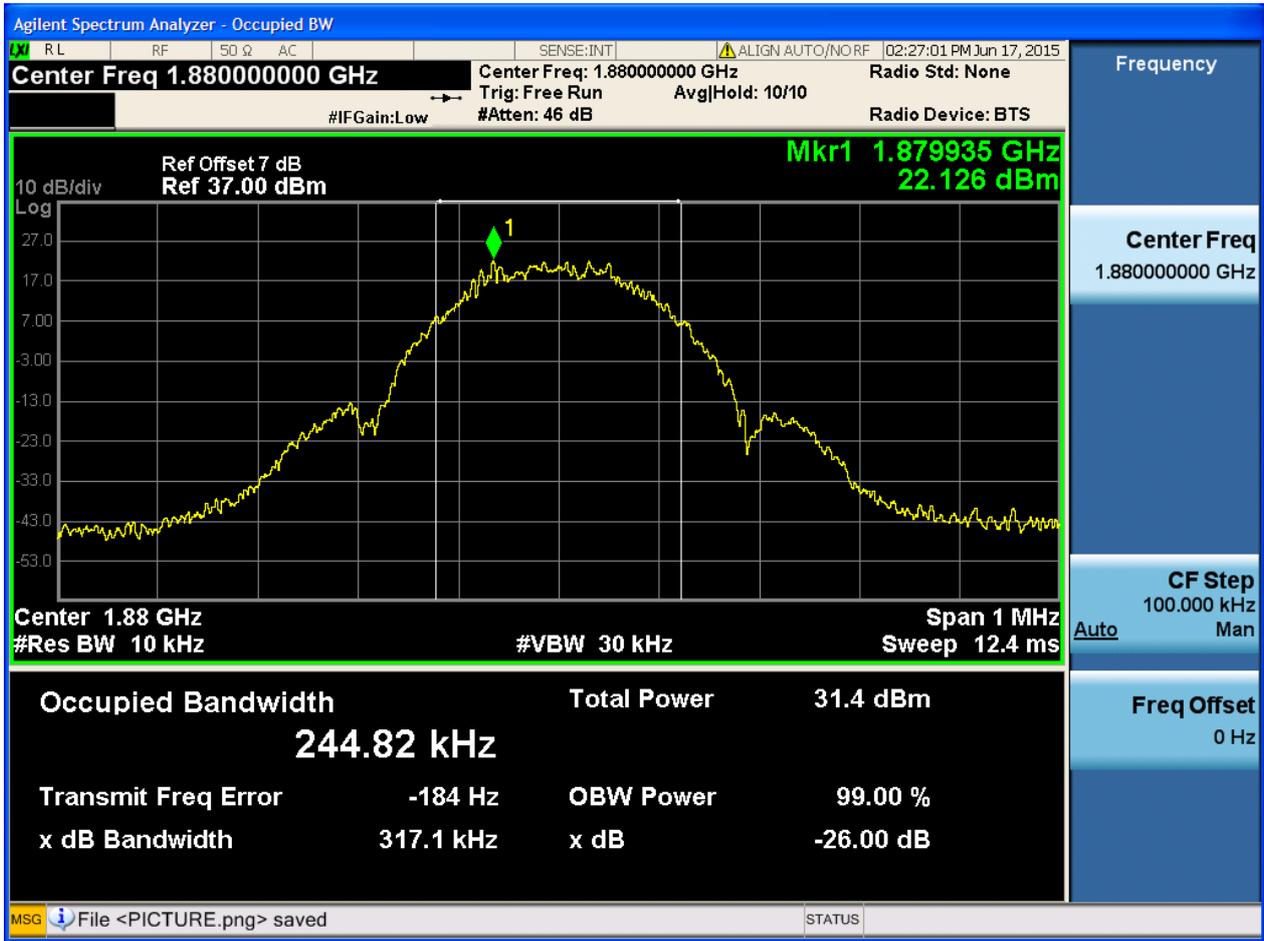
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4.1.2.2.1 Test Channel = LCH



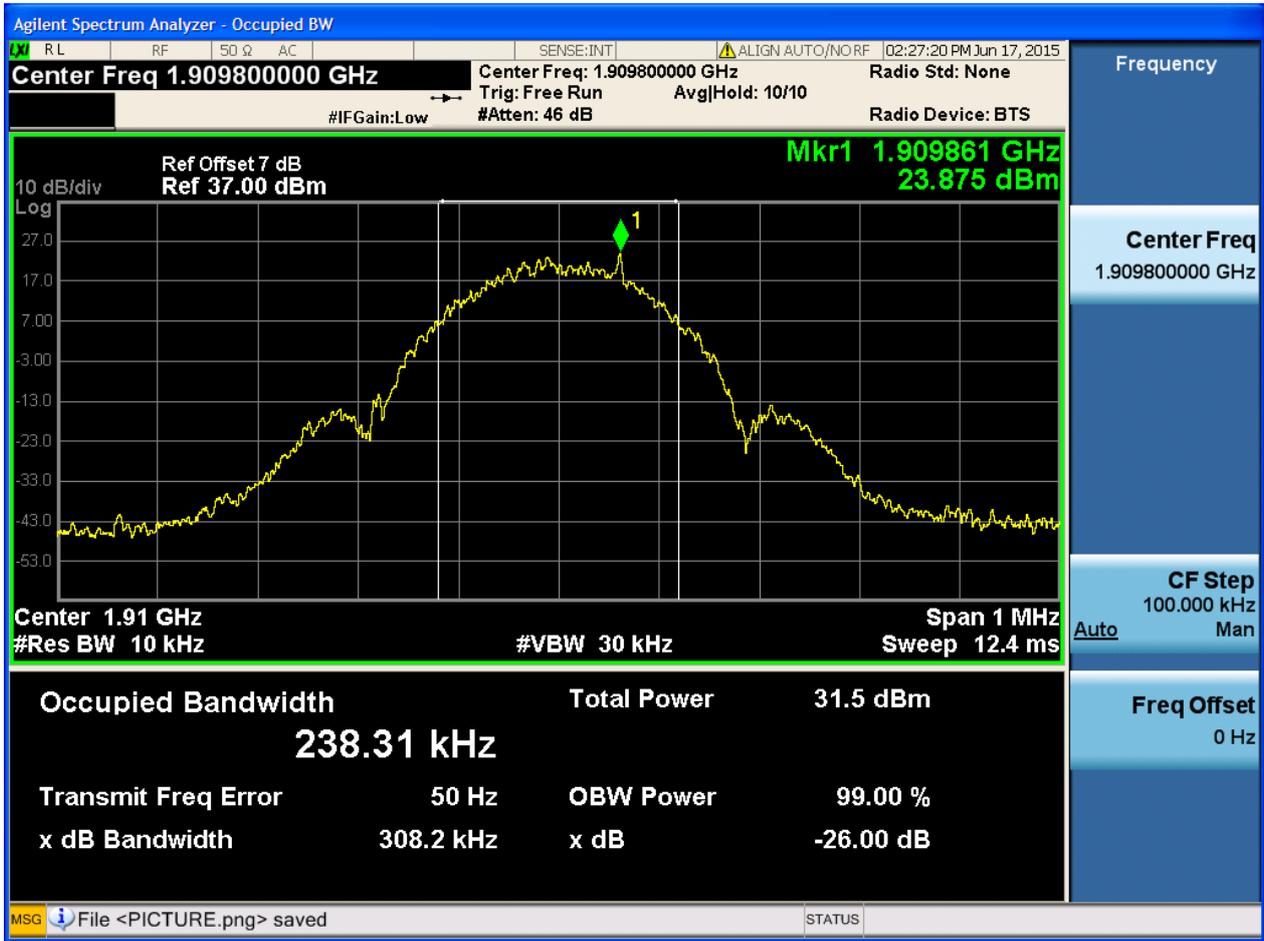


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH





5Appendix_E: Band Edges Compliance

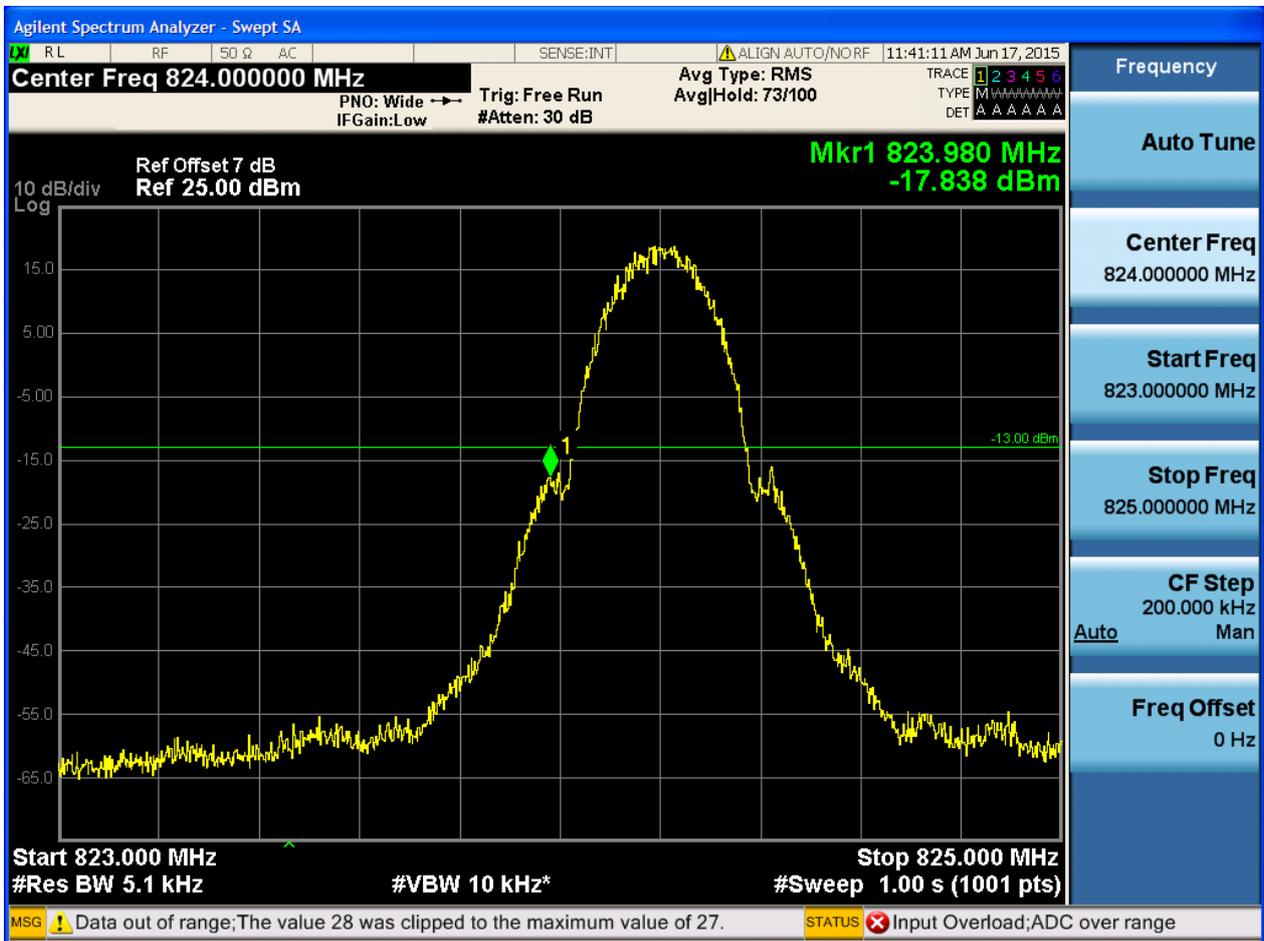
Part I - Test Plots

5.1 For GSM

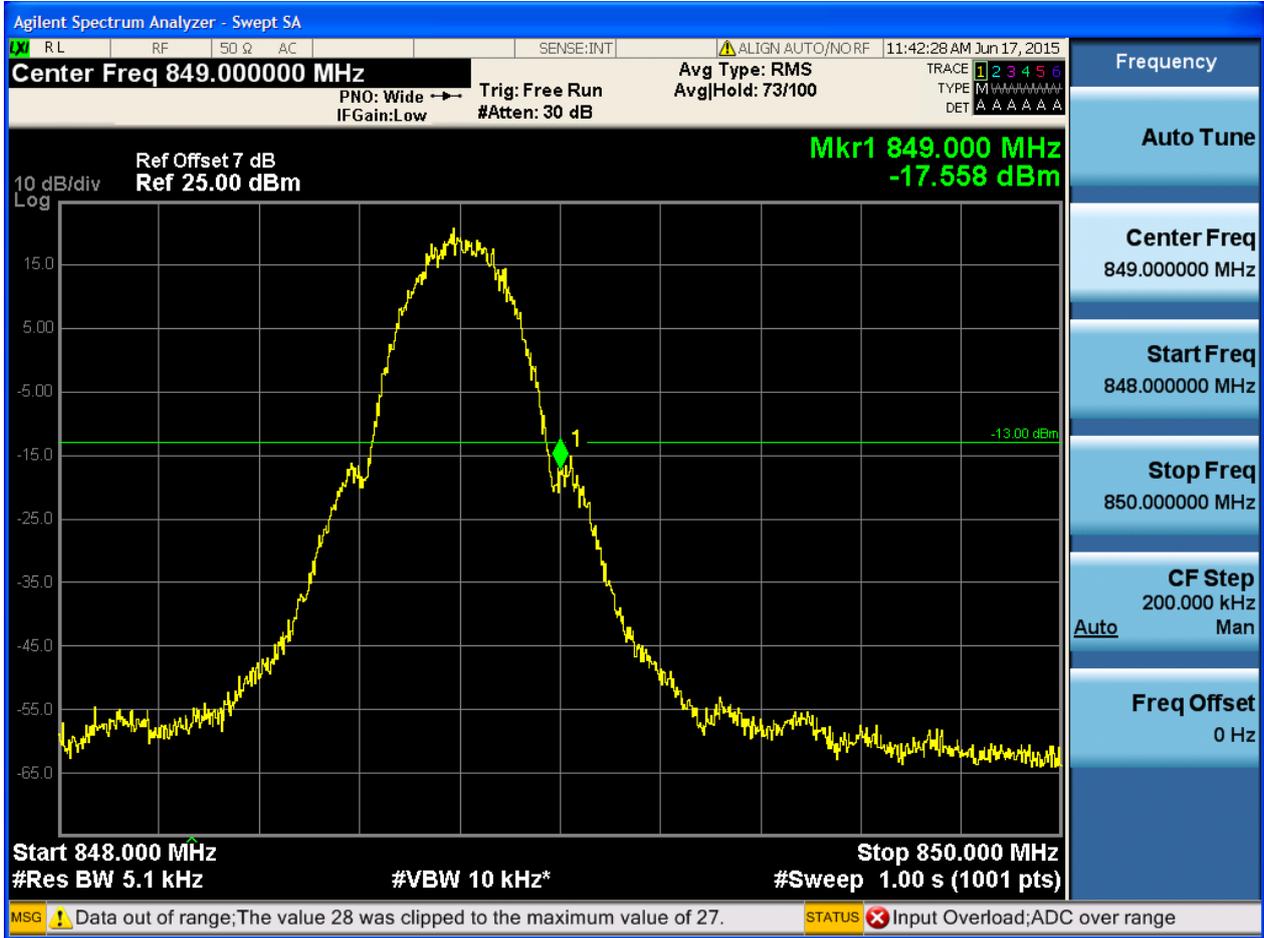
5.1.1 Test Band = GSM850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH



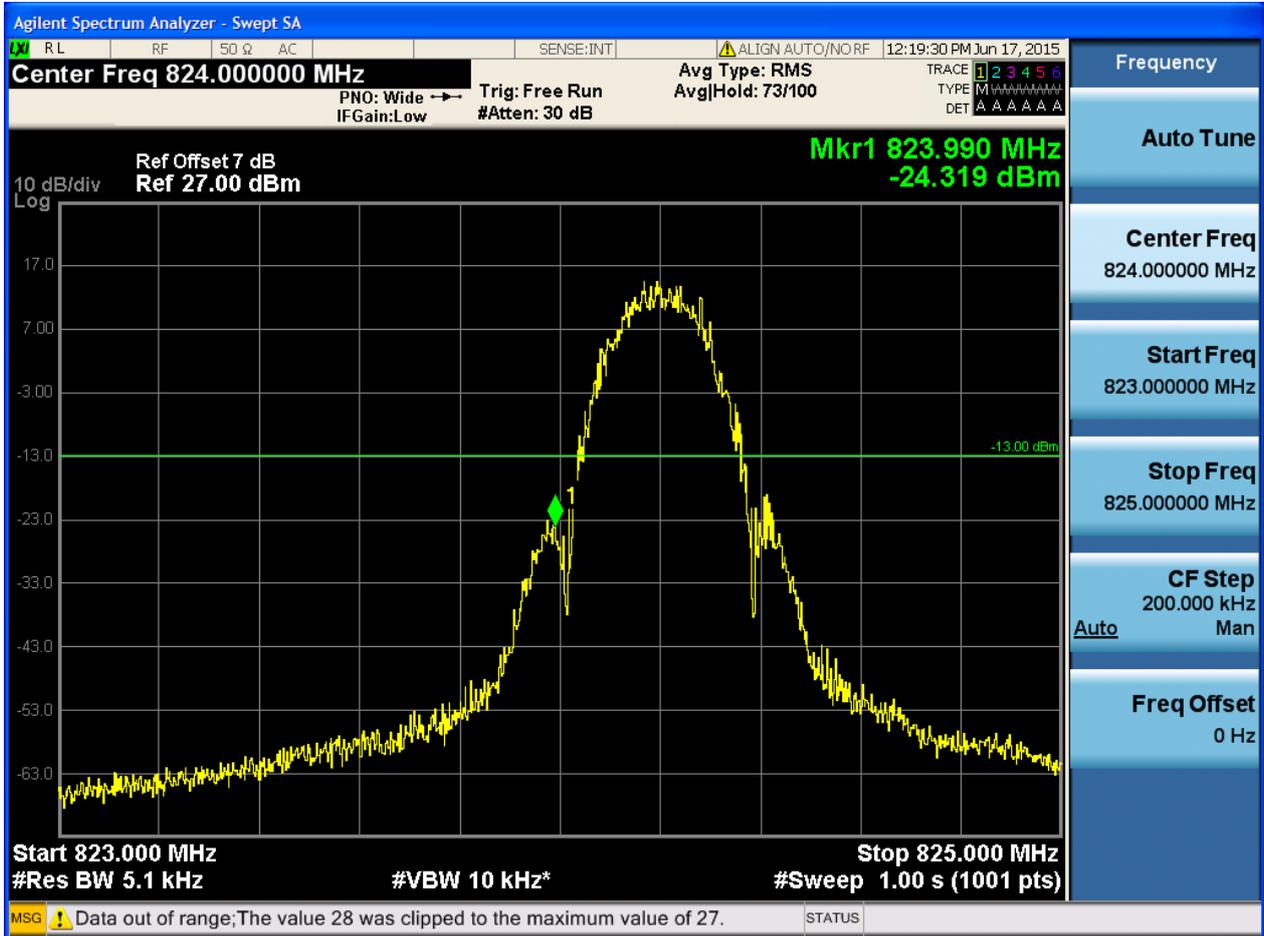
5.1.1.1.2 Test Channel = HCH





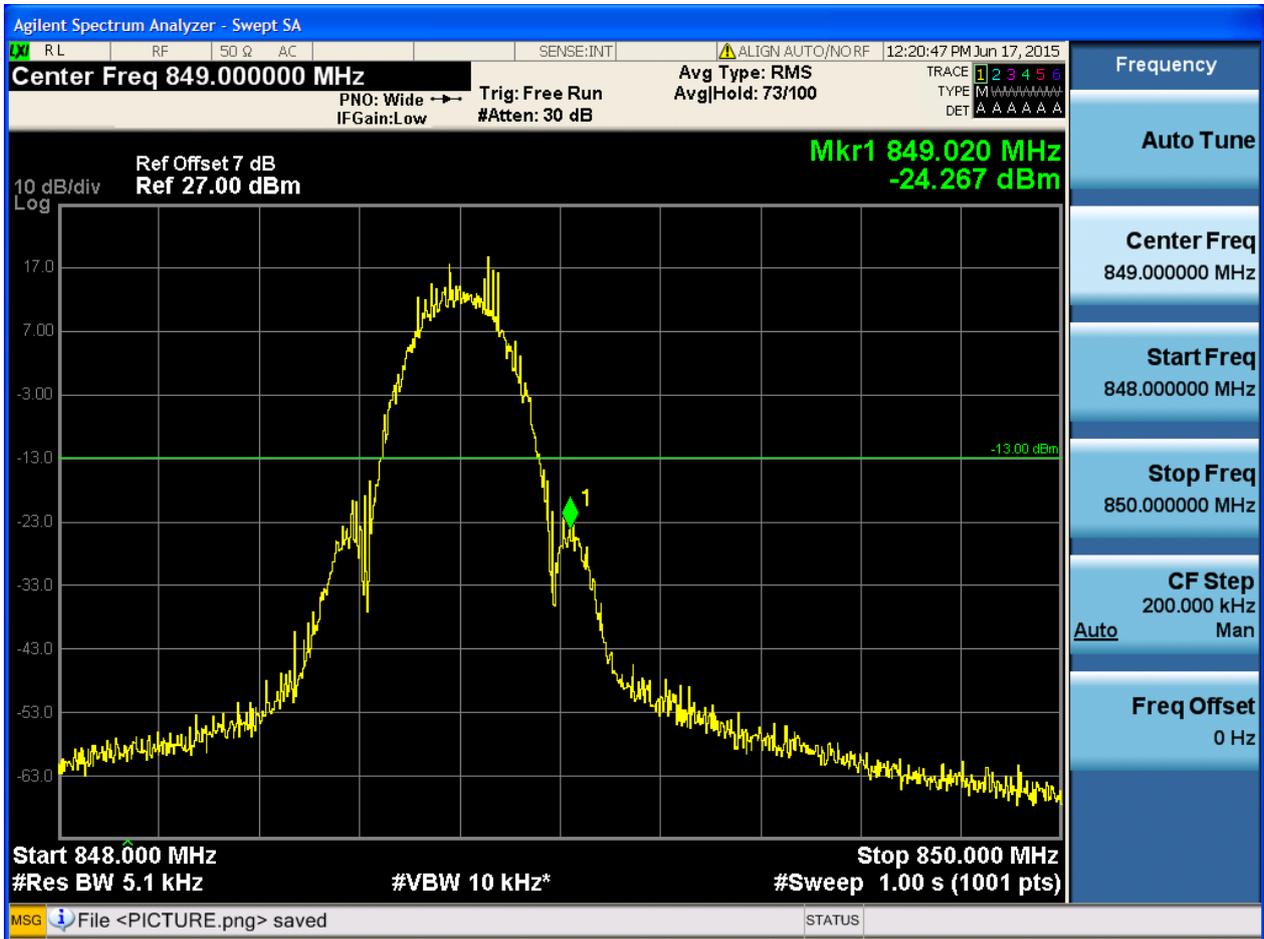
5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH





5.1.1.2.2 Test Channel = HCH

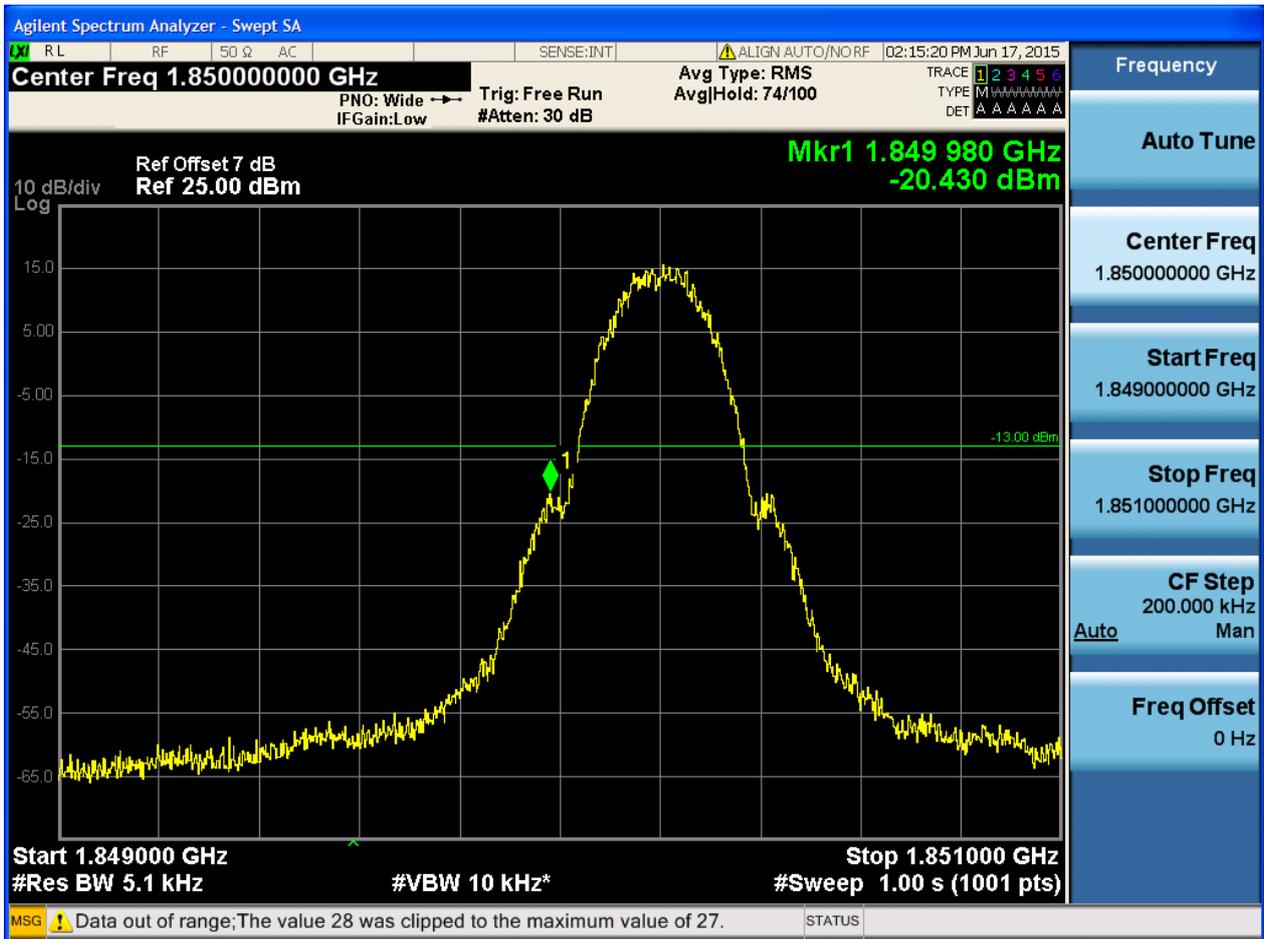




5.1.2 Test Band = GSM1900

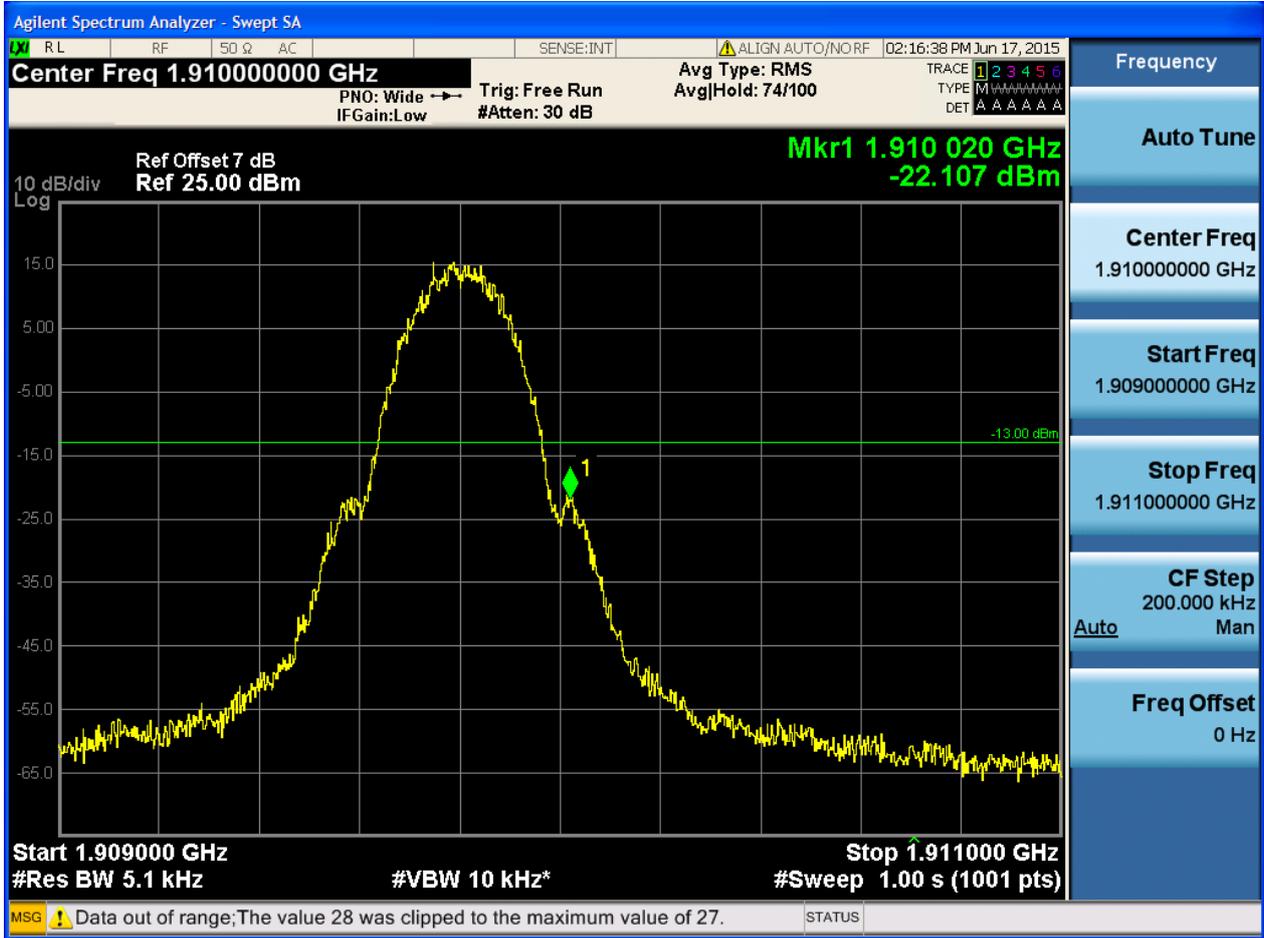
5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH





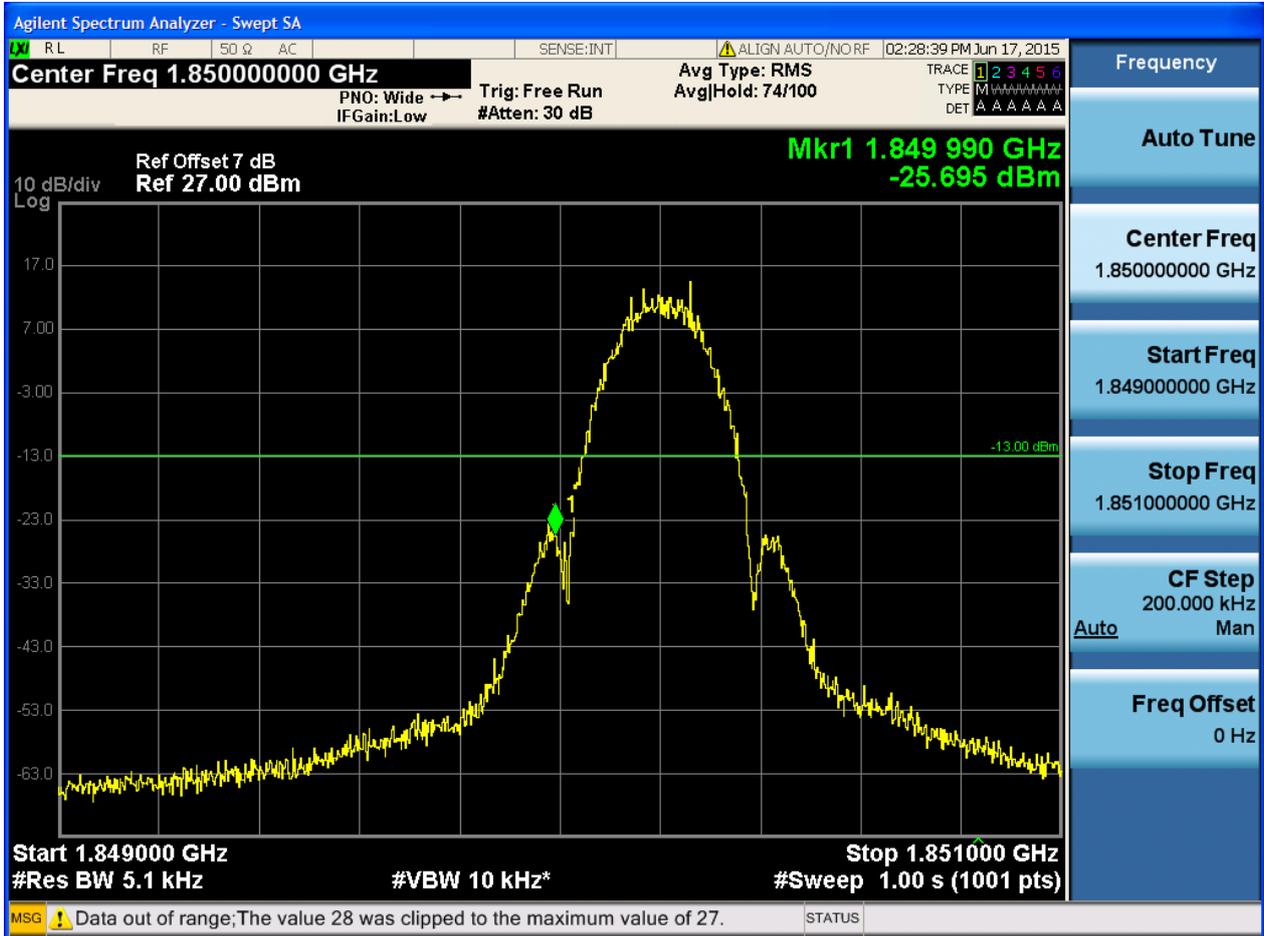
5.1.2.1.2 Test Channel = HCH



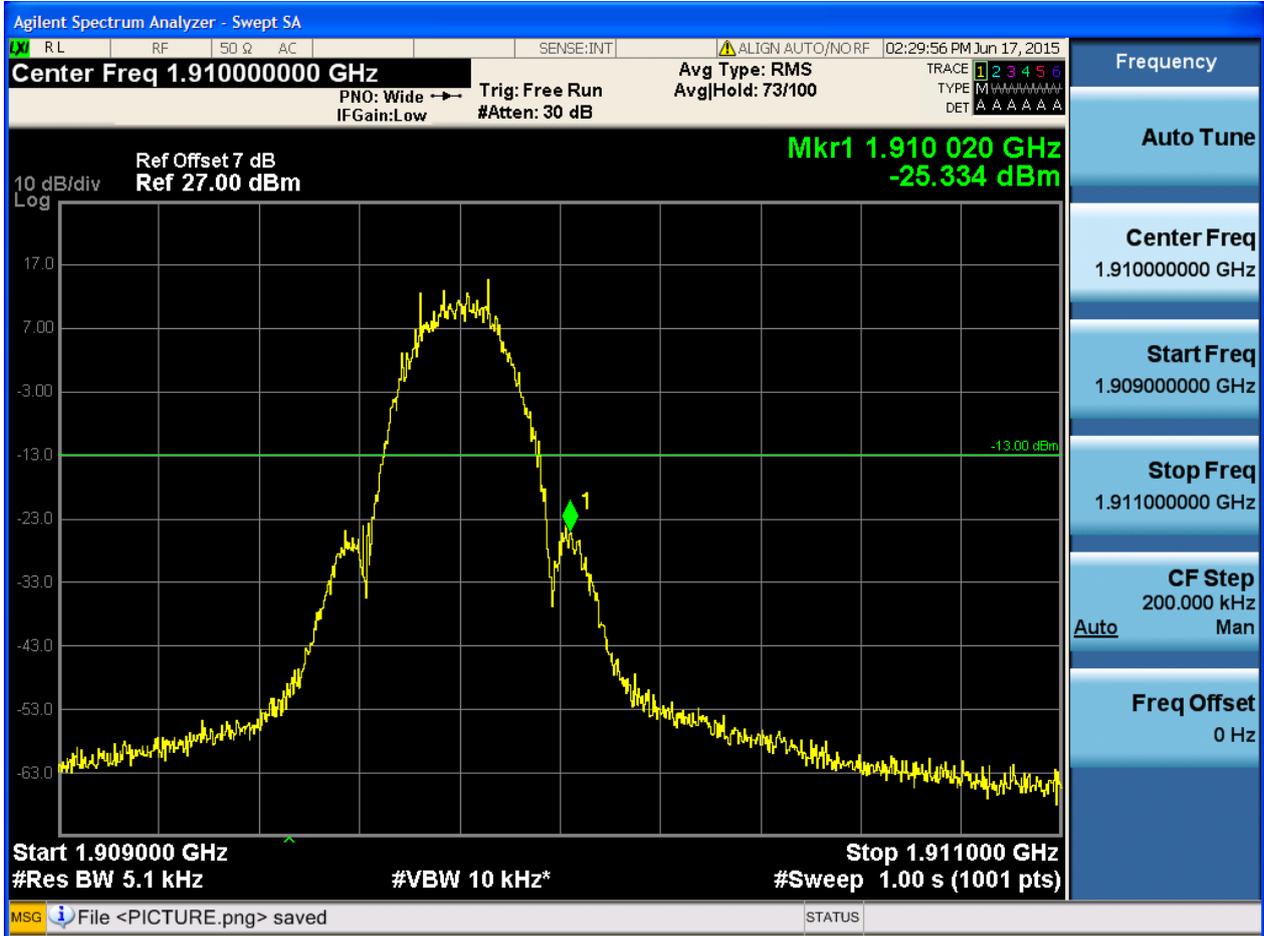


5.1.2.2 Test Mode = GSM/TM2

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.

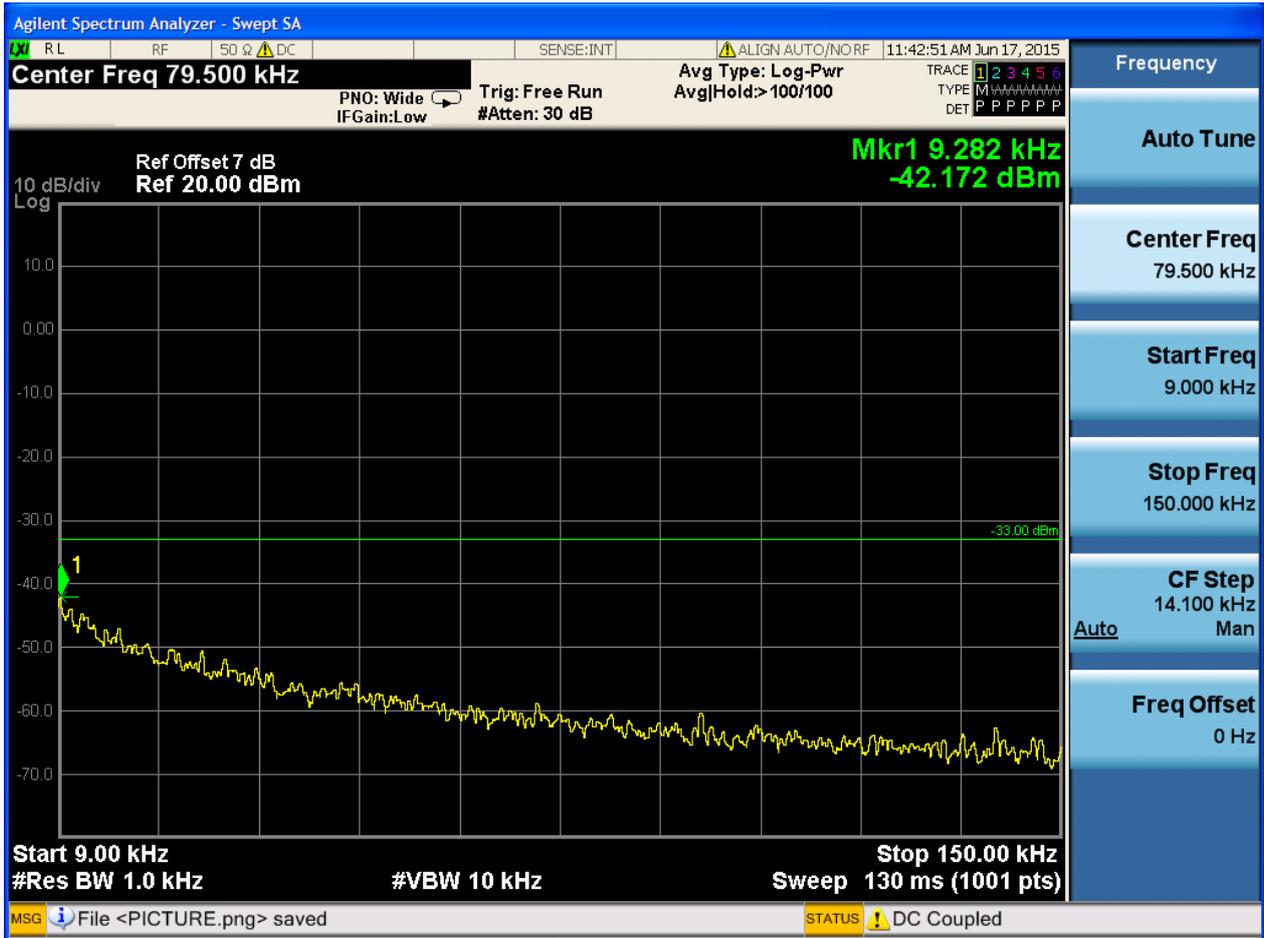
Part I - Test Plots

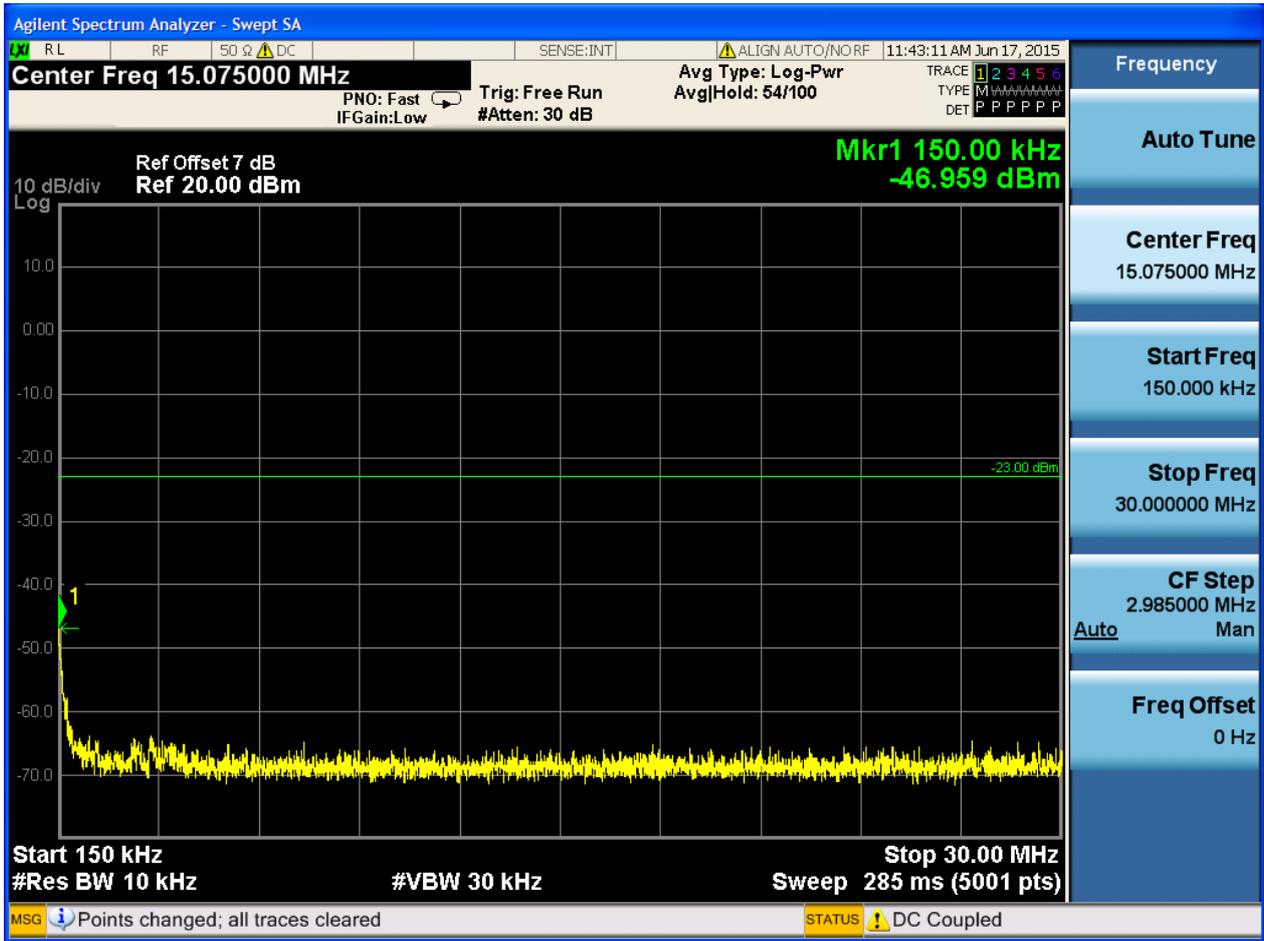
6.1 For GSM

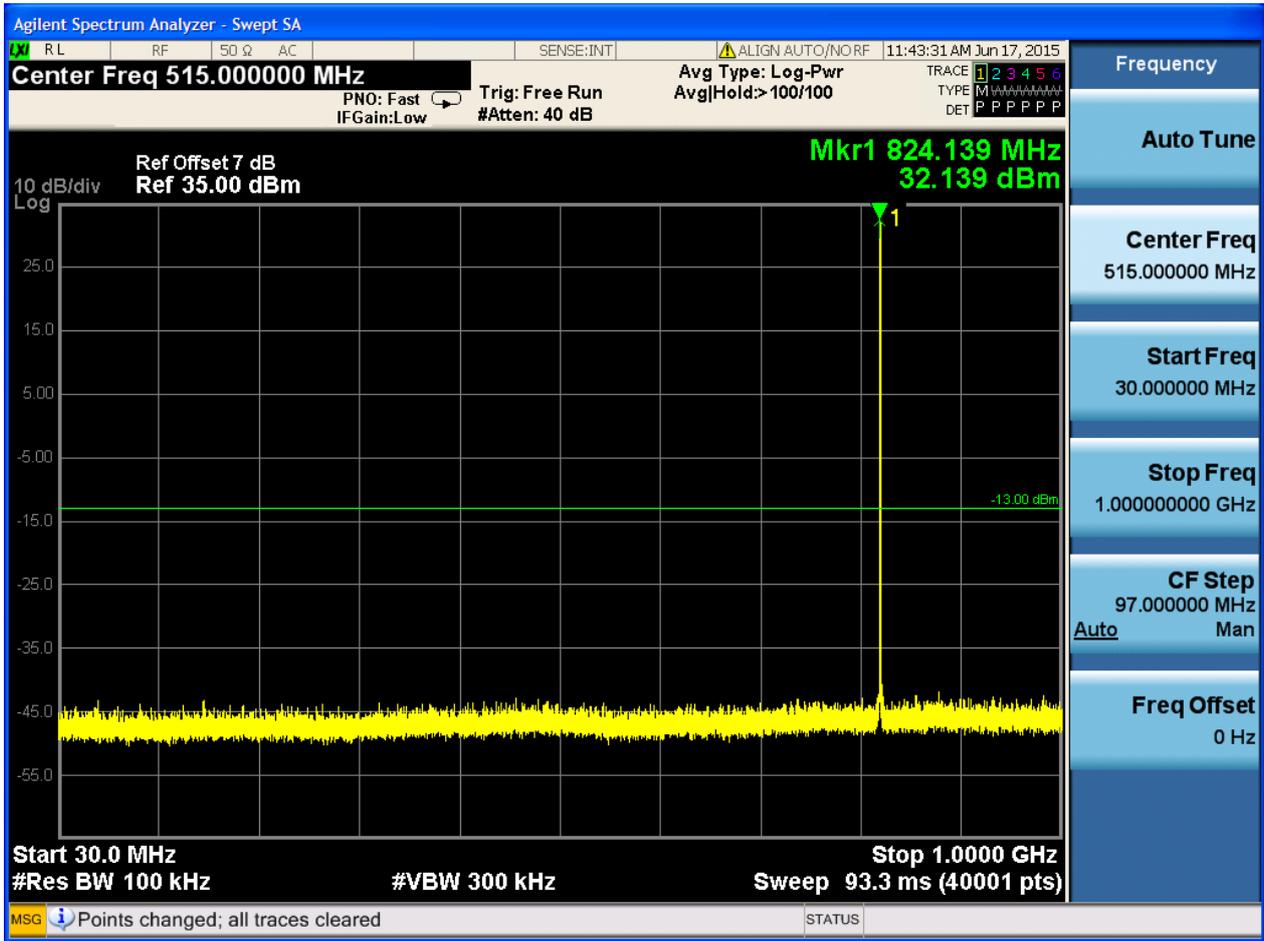
6.1.1 Test Band = GSM850

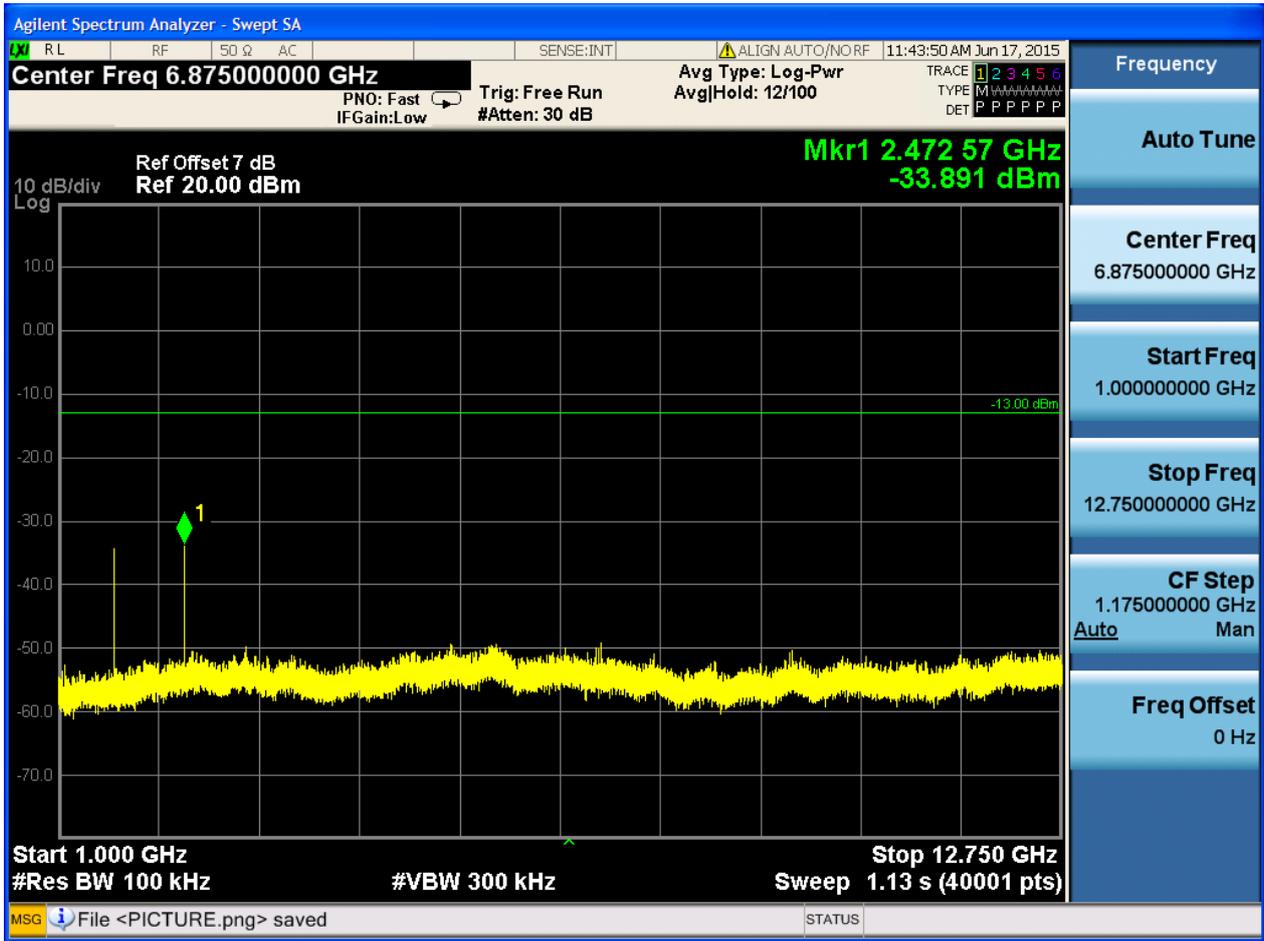
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH



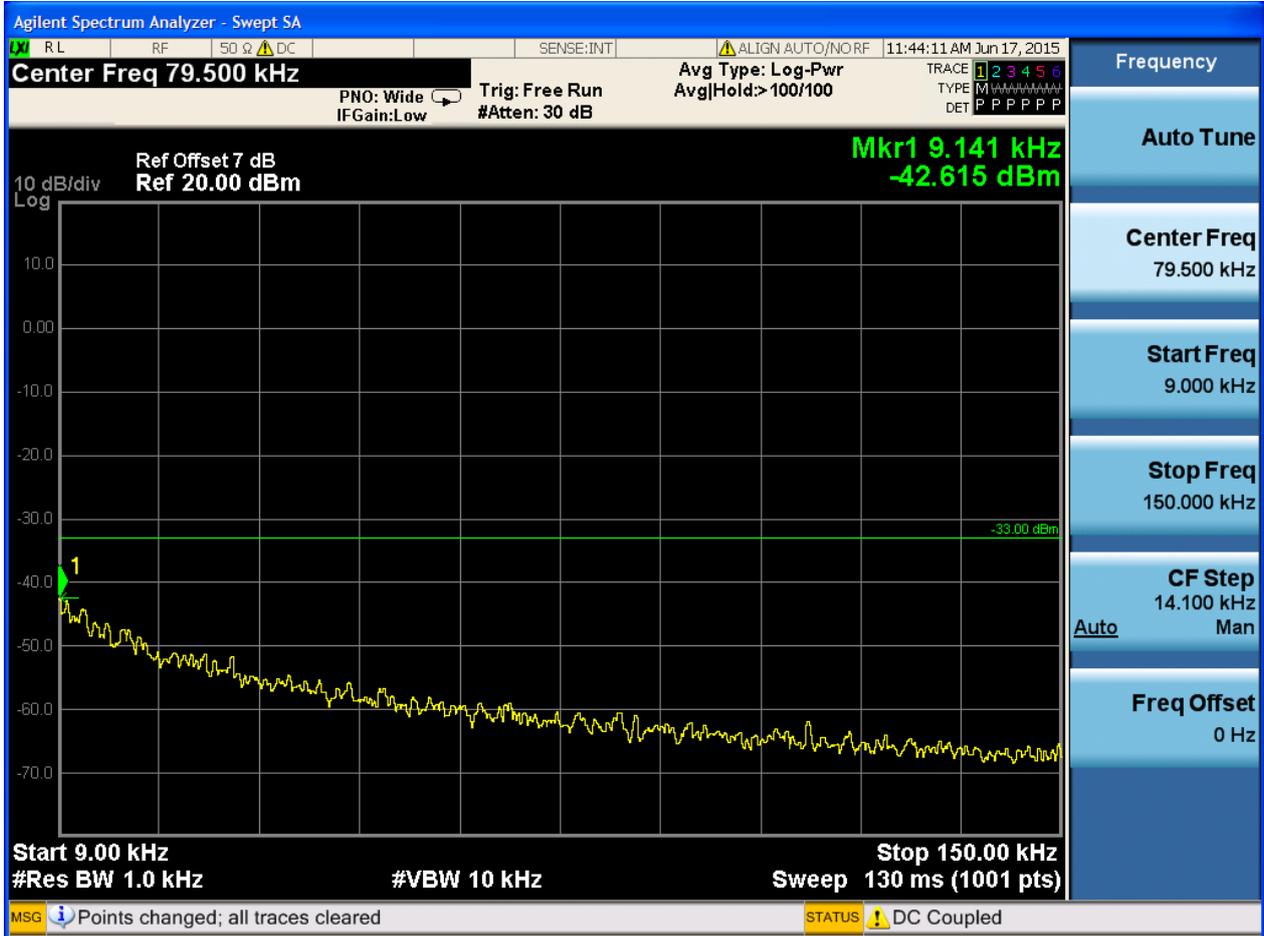


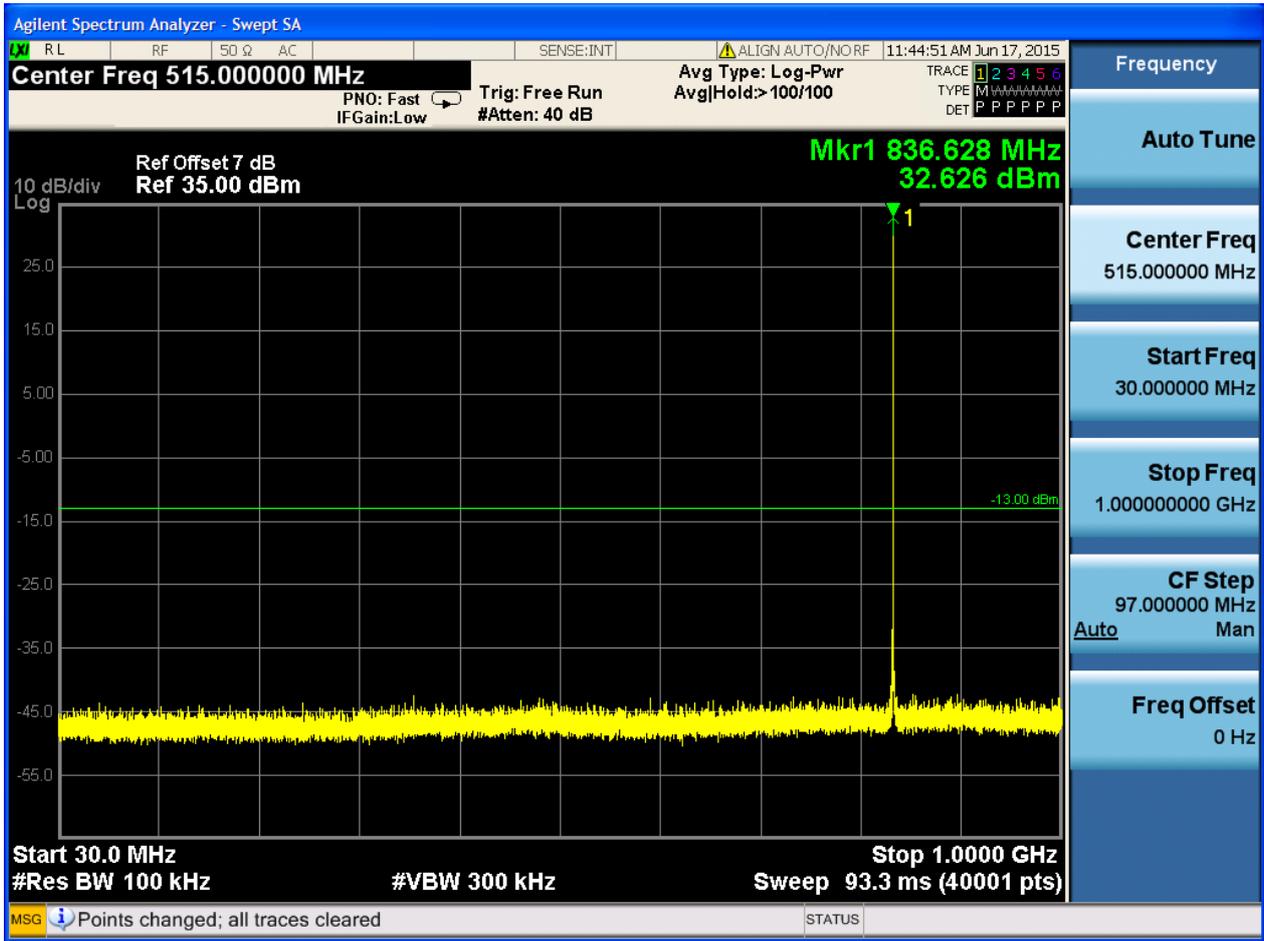


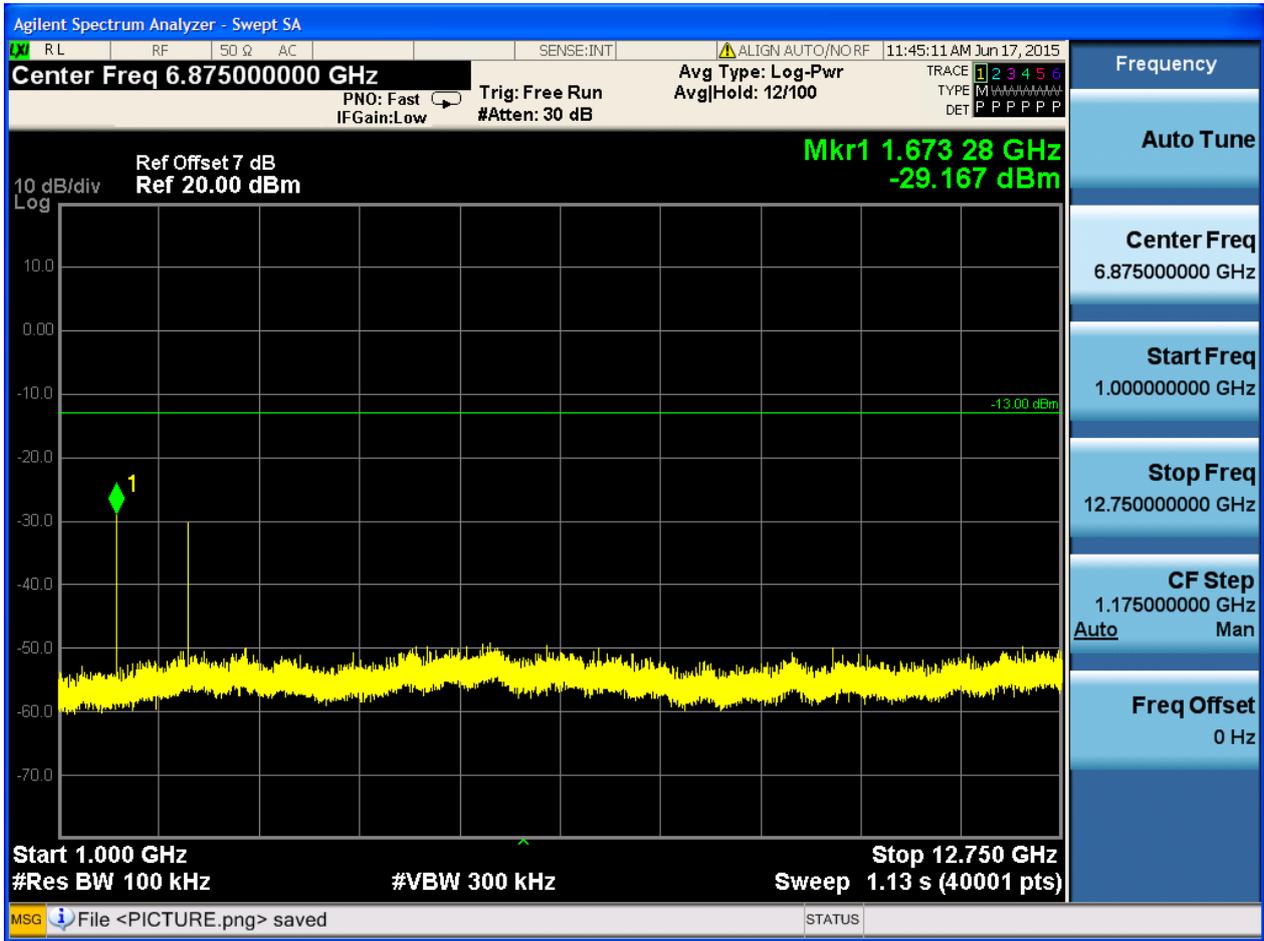




6.1.1.1.2 Test Channel = MCH



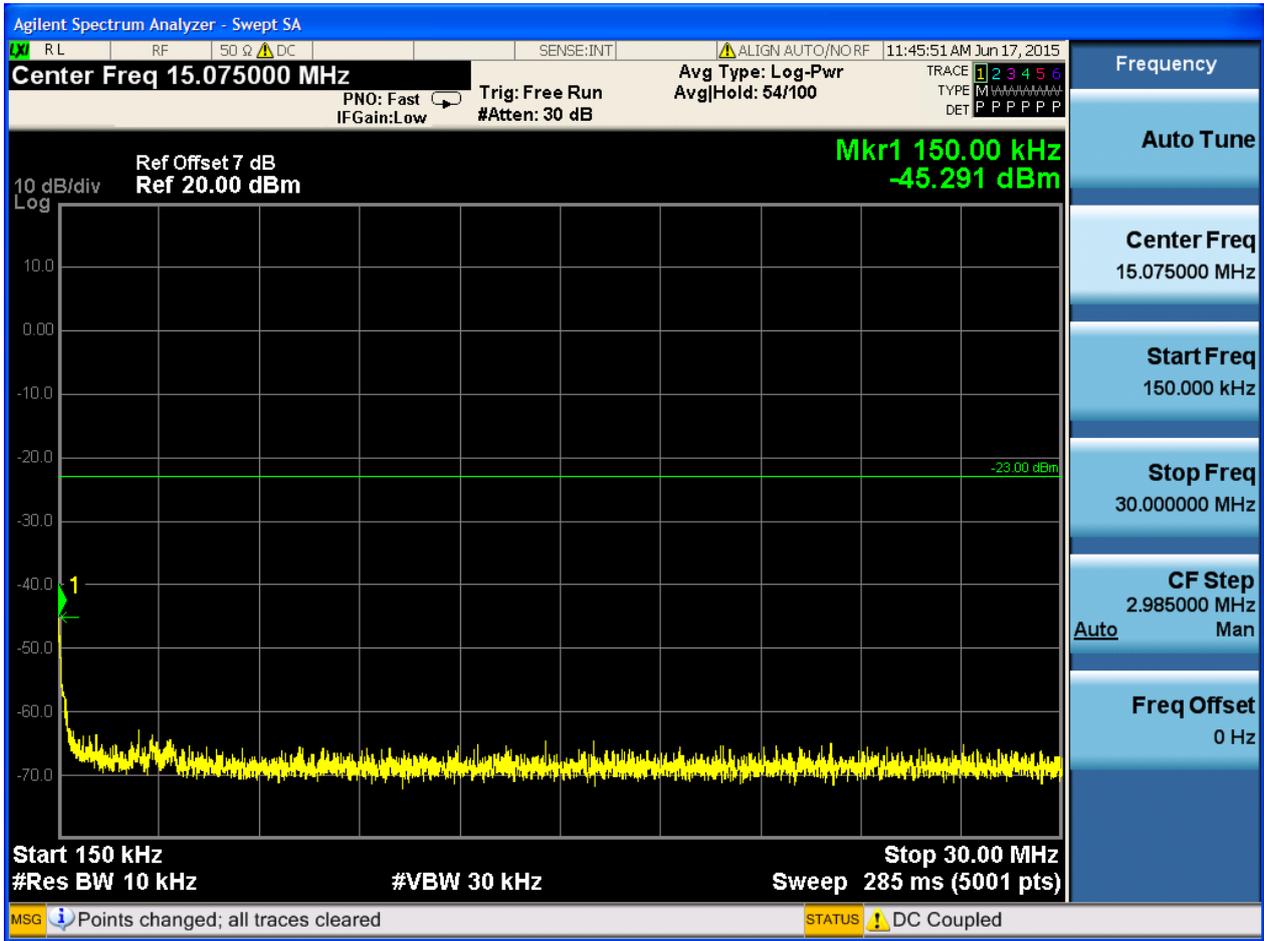


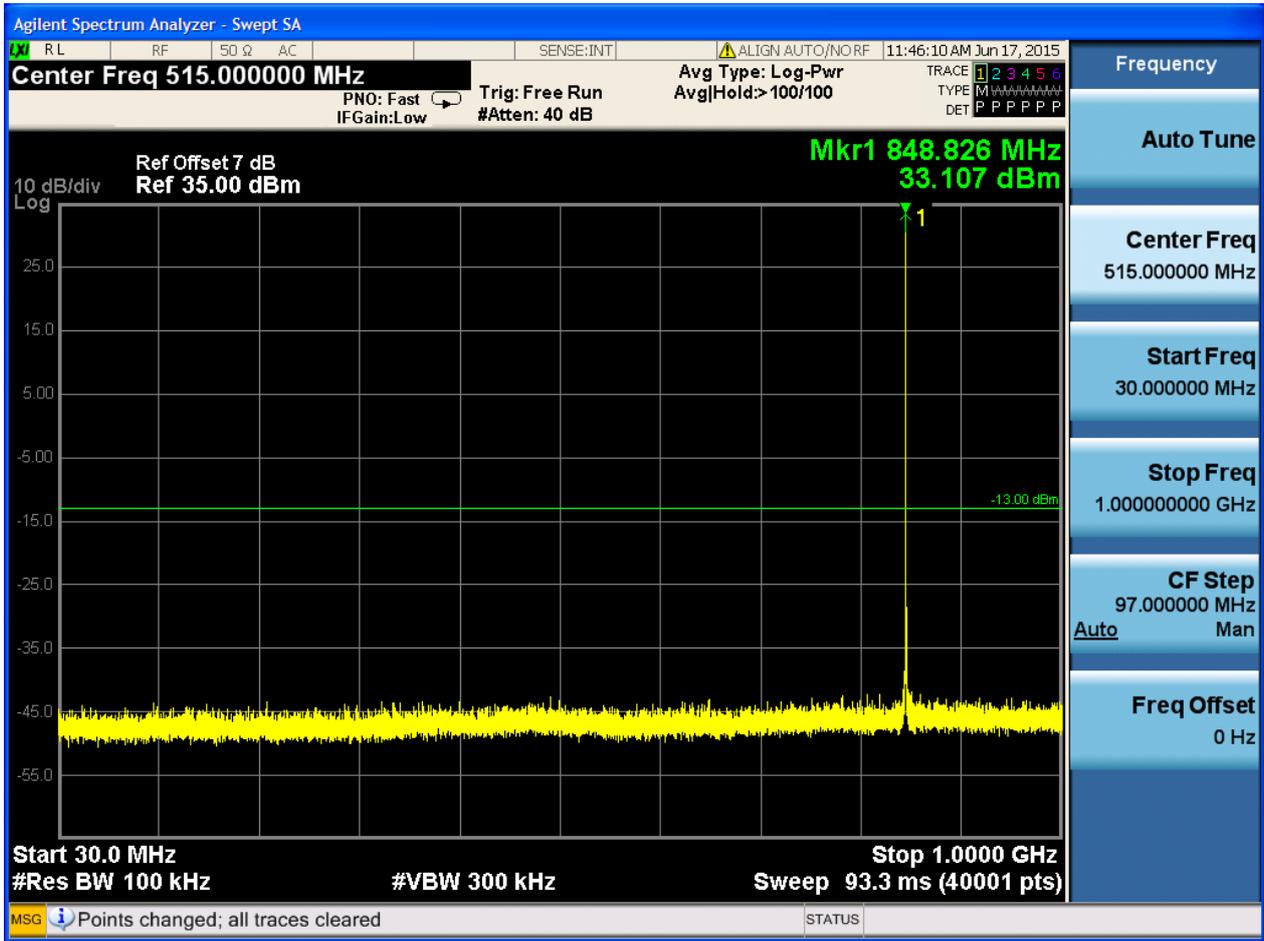


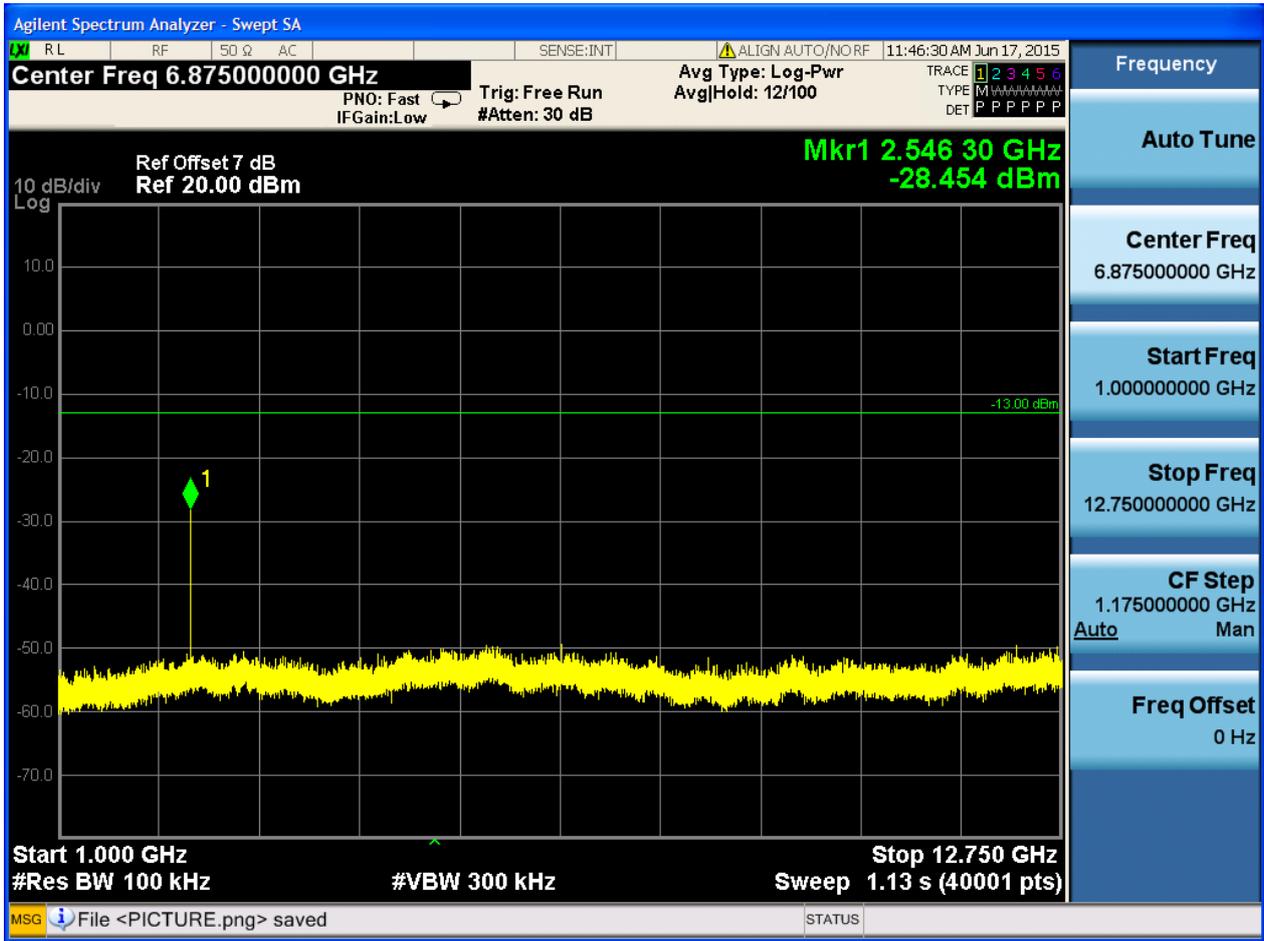


6.1.1.1.3 Test Channel = HCH





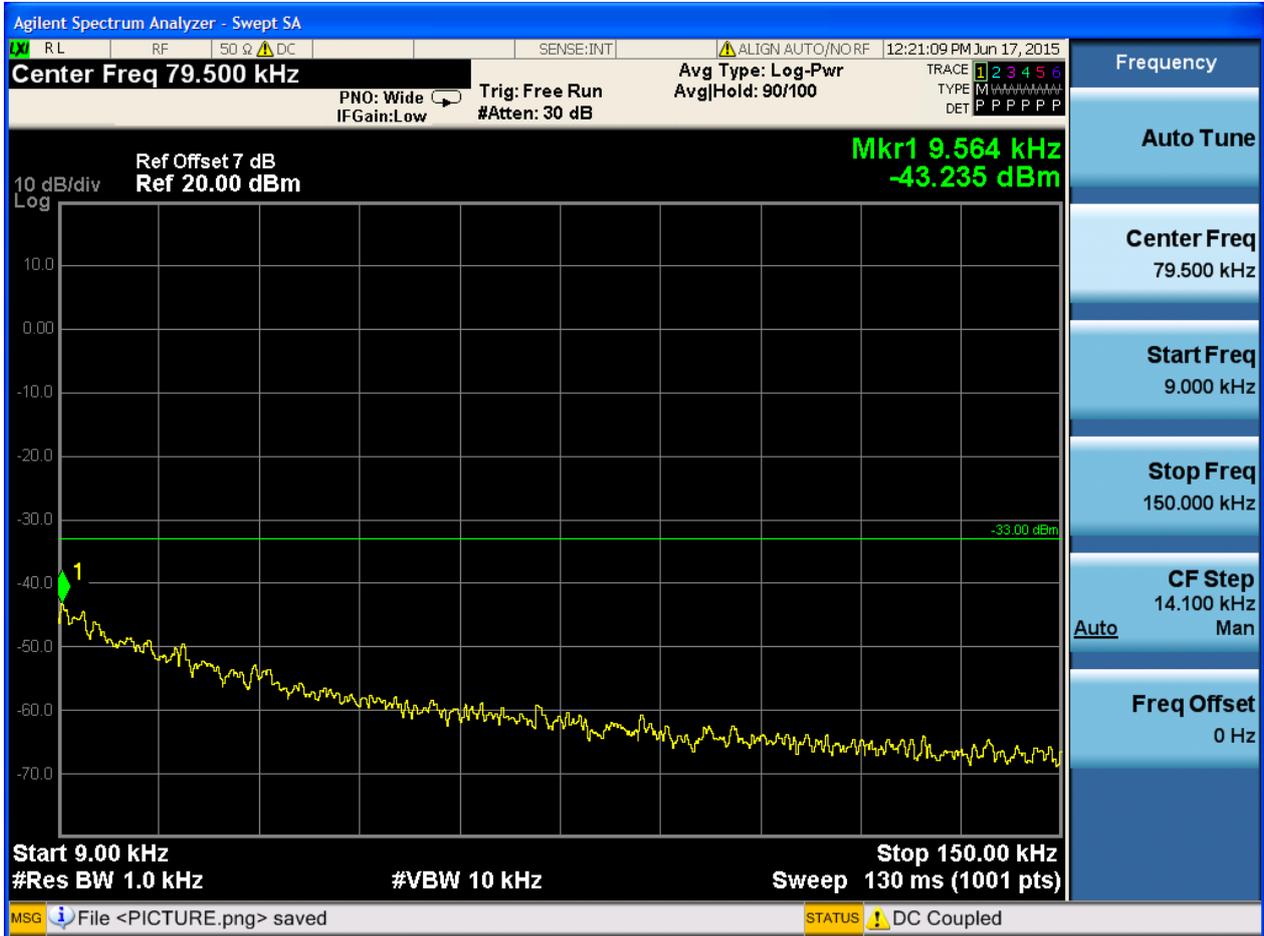


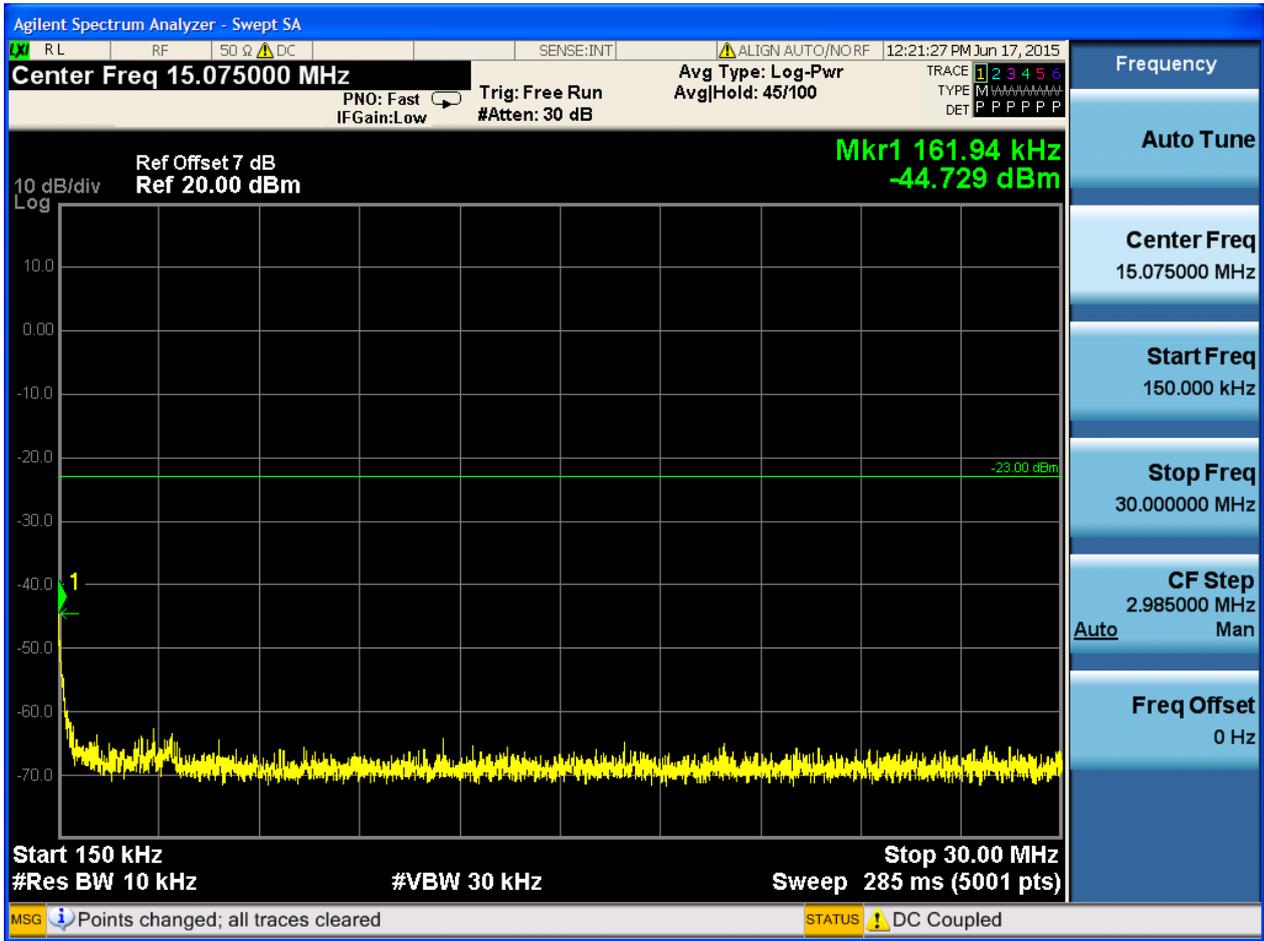


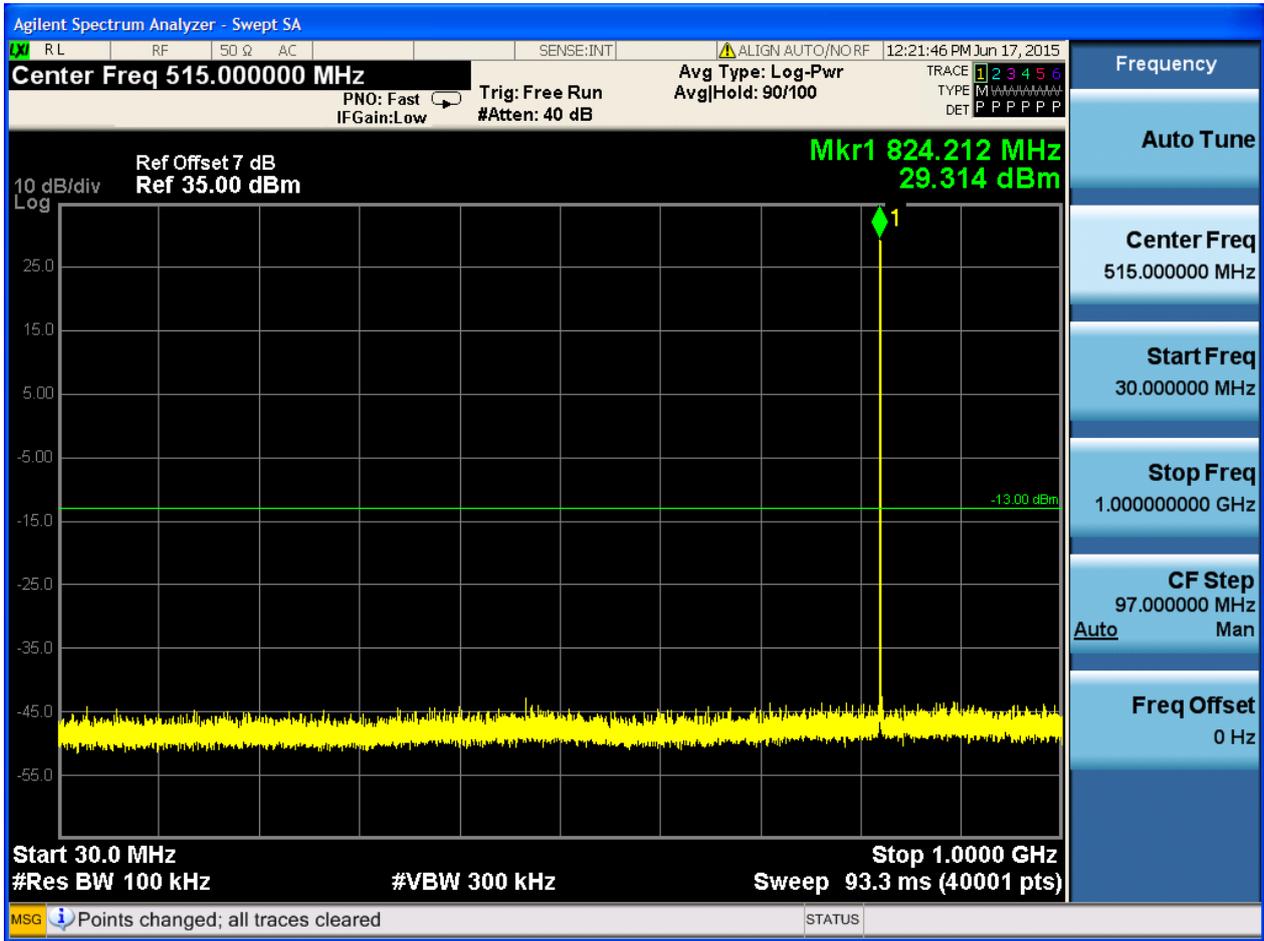


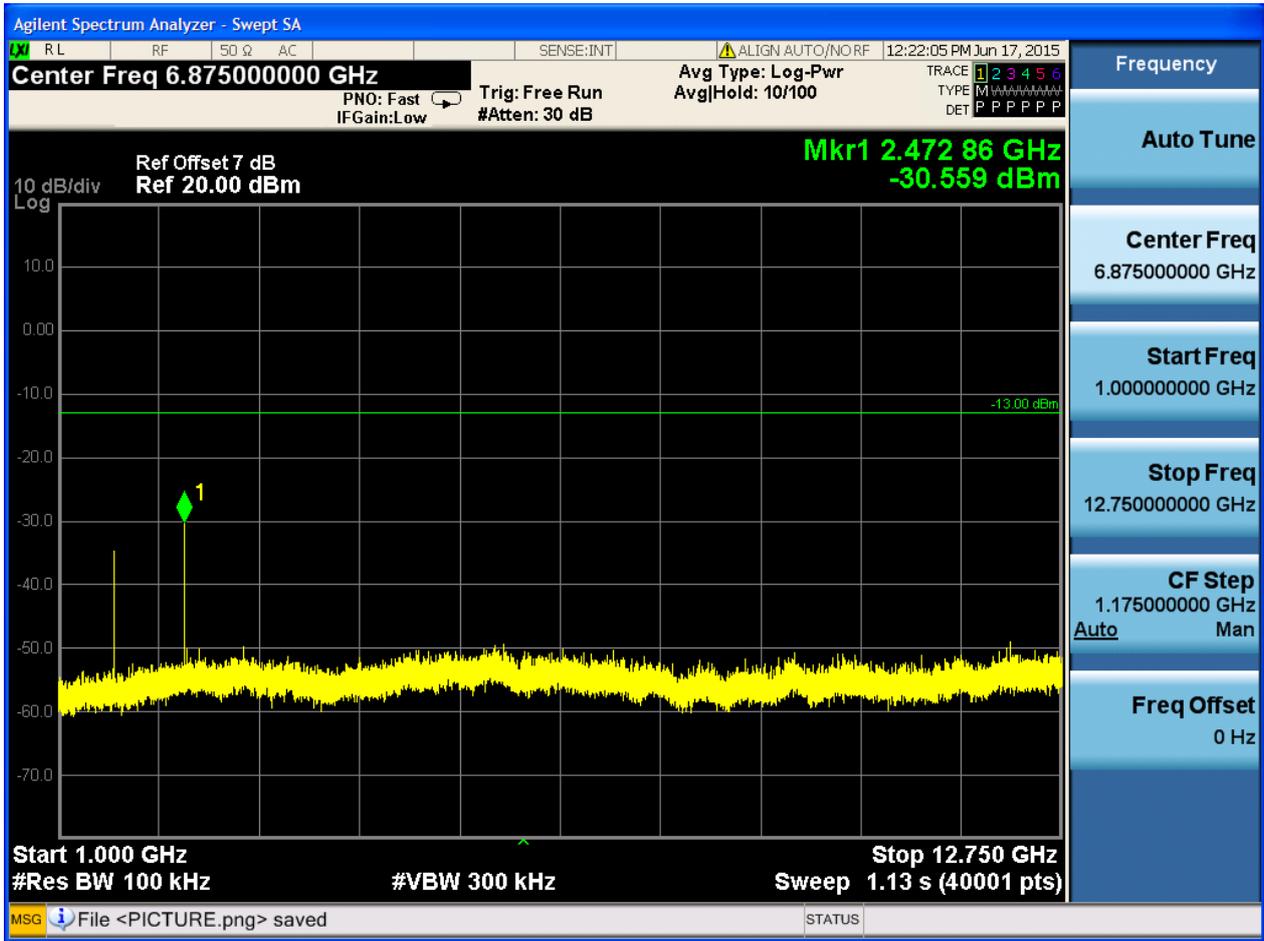
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH

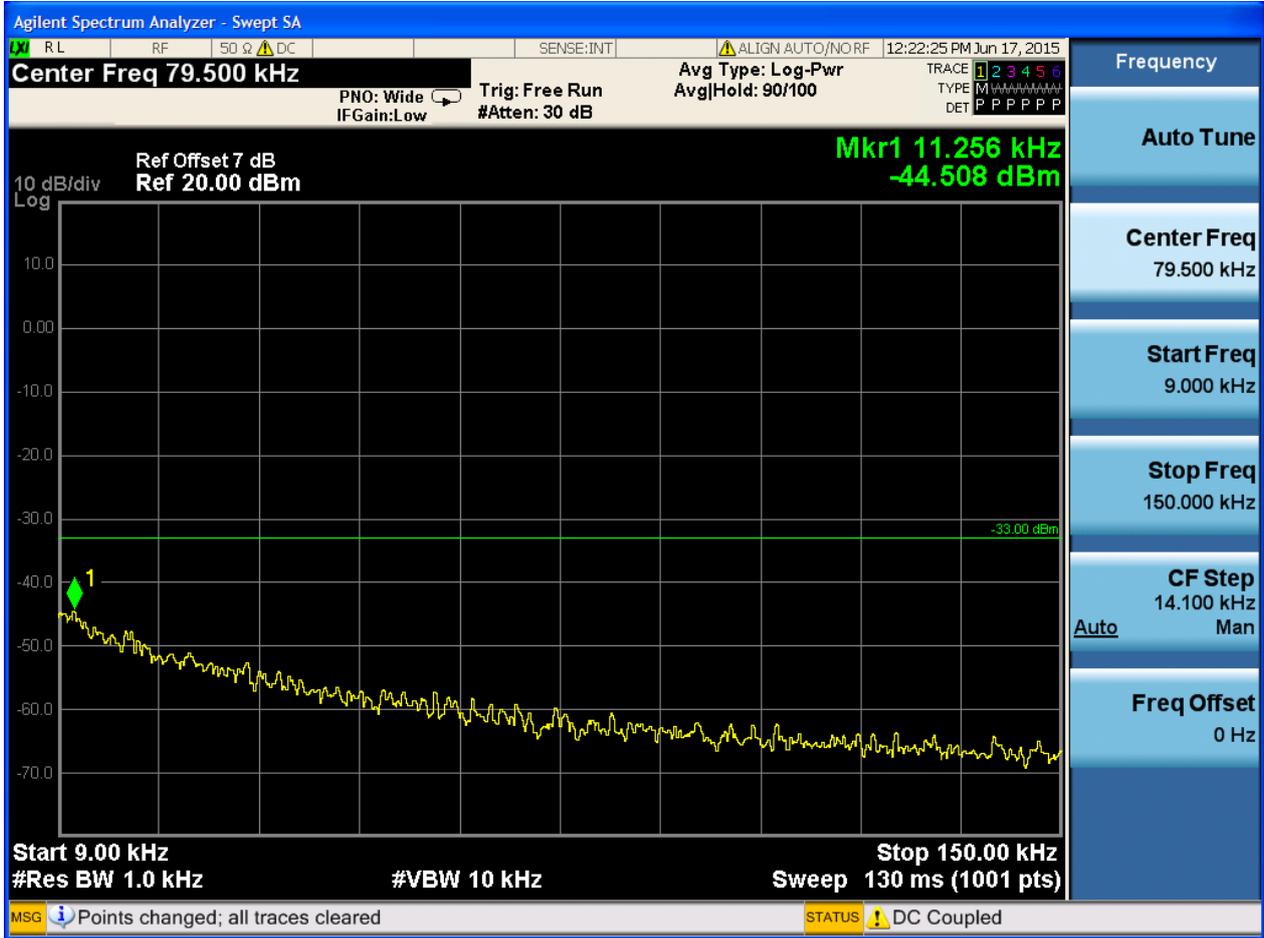


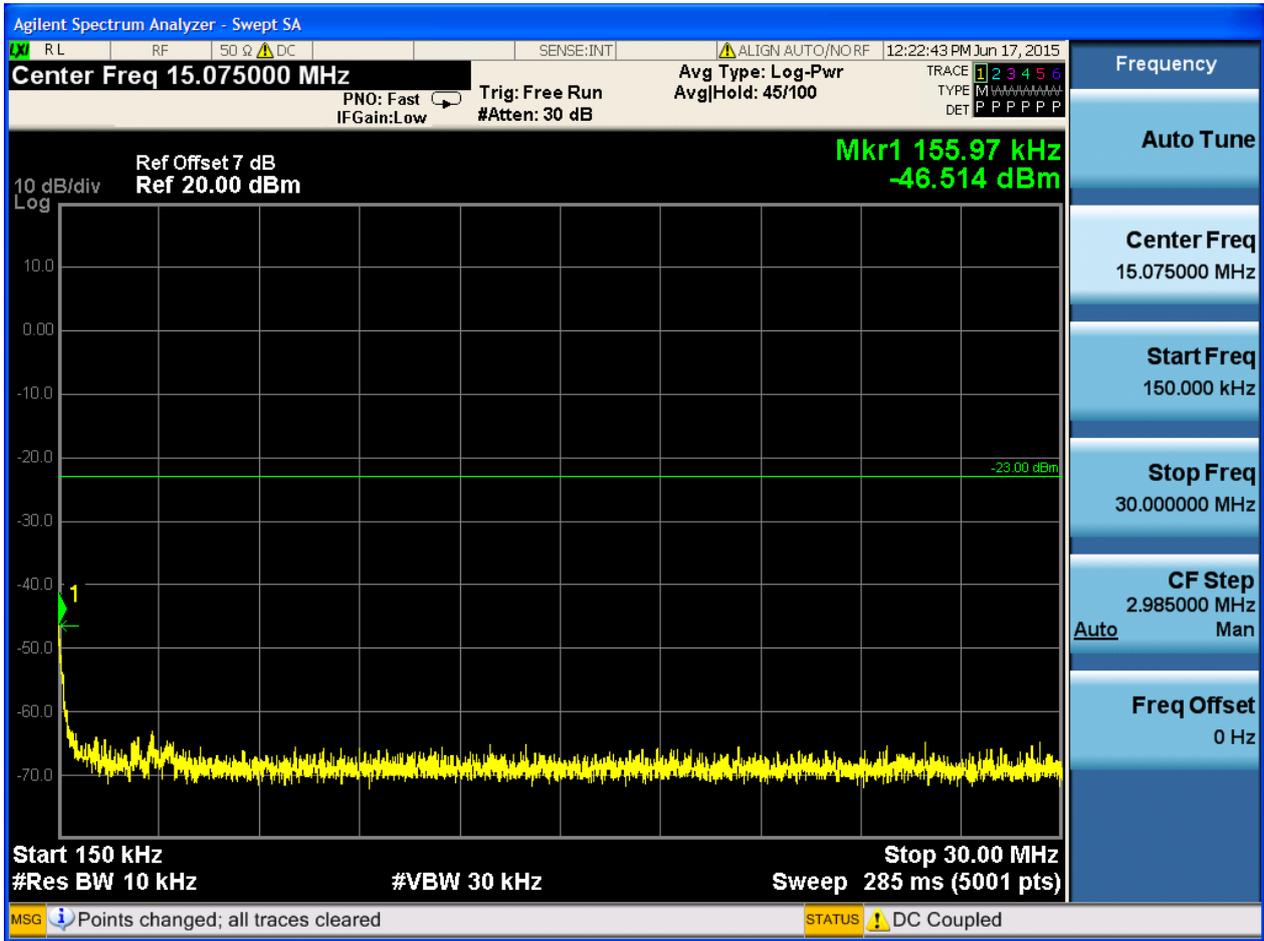


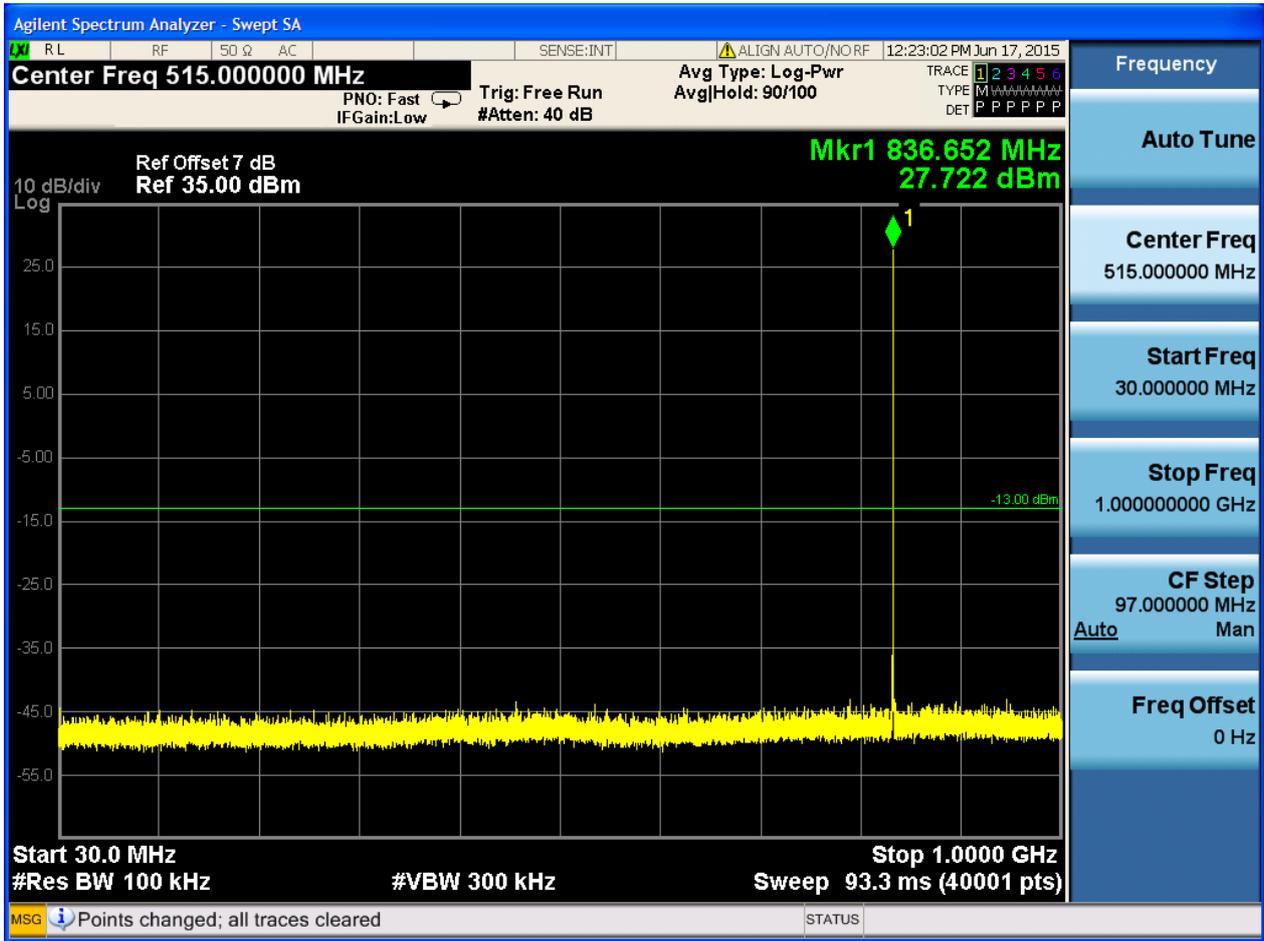


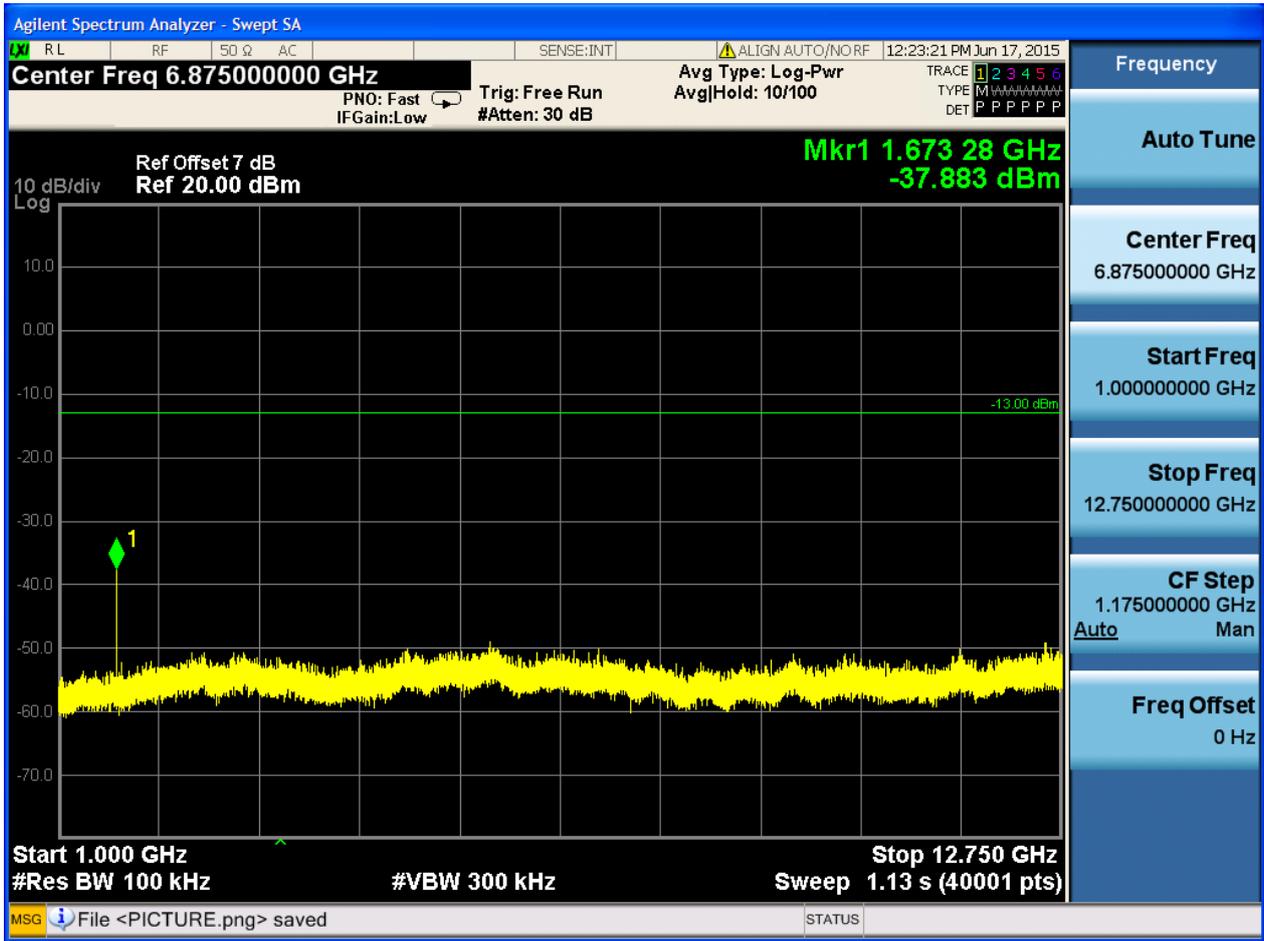


6.1.1.2.2 Test Channel = MCH

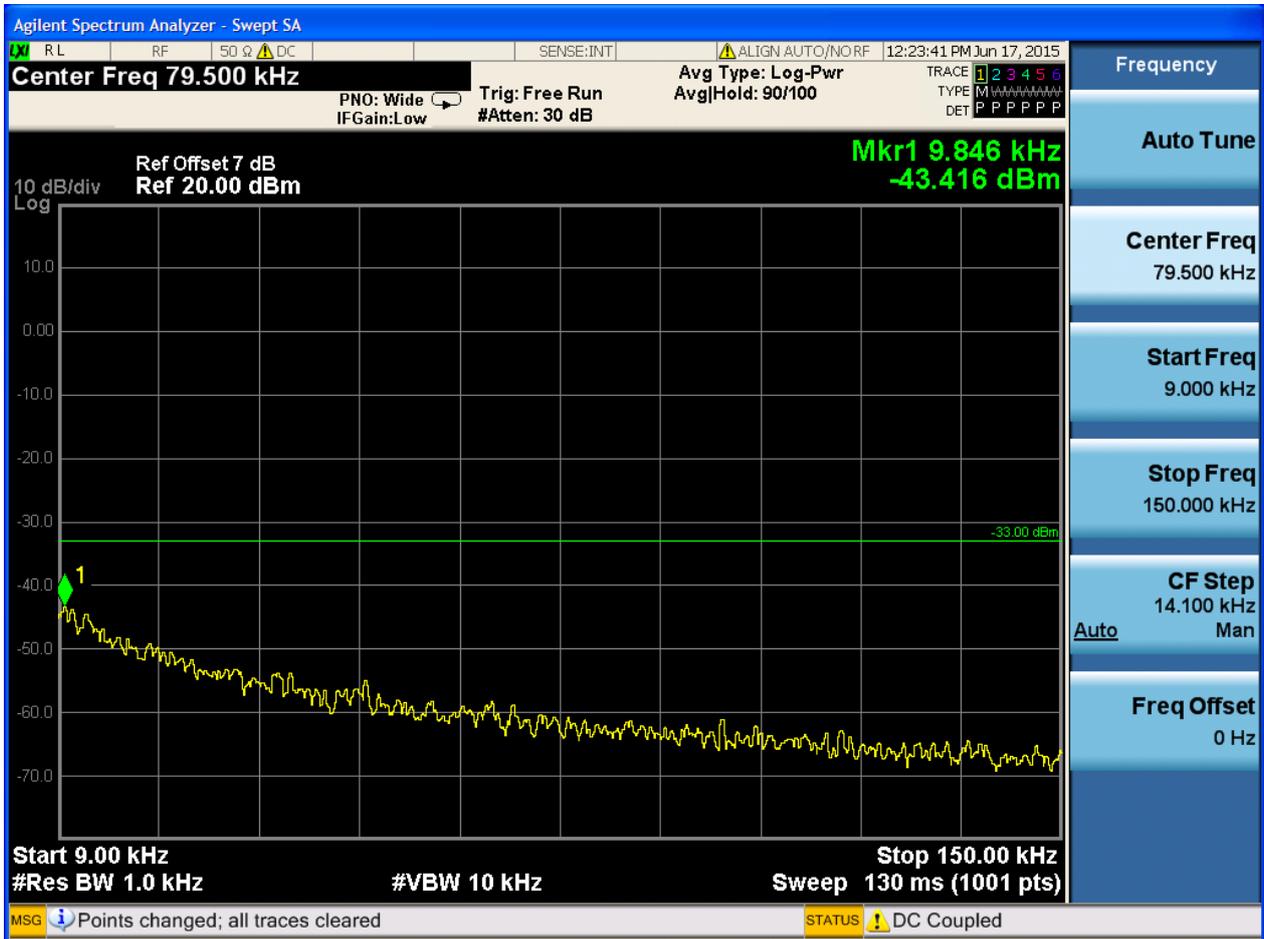


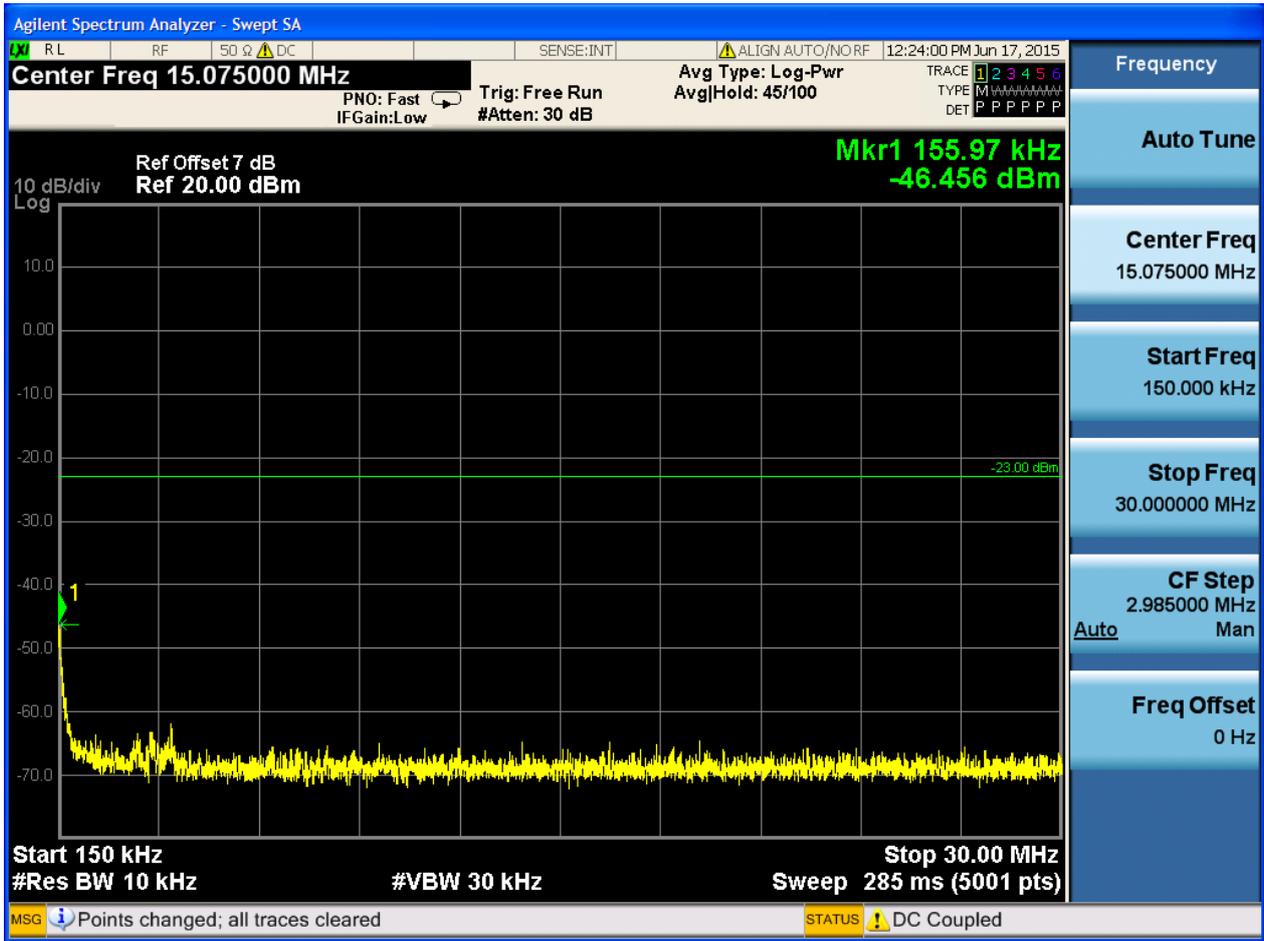


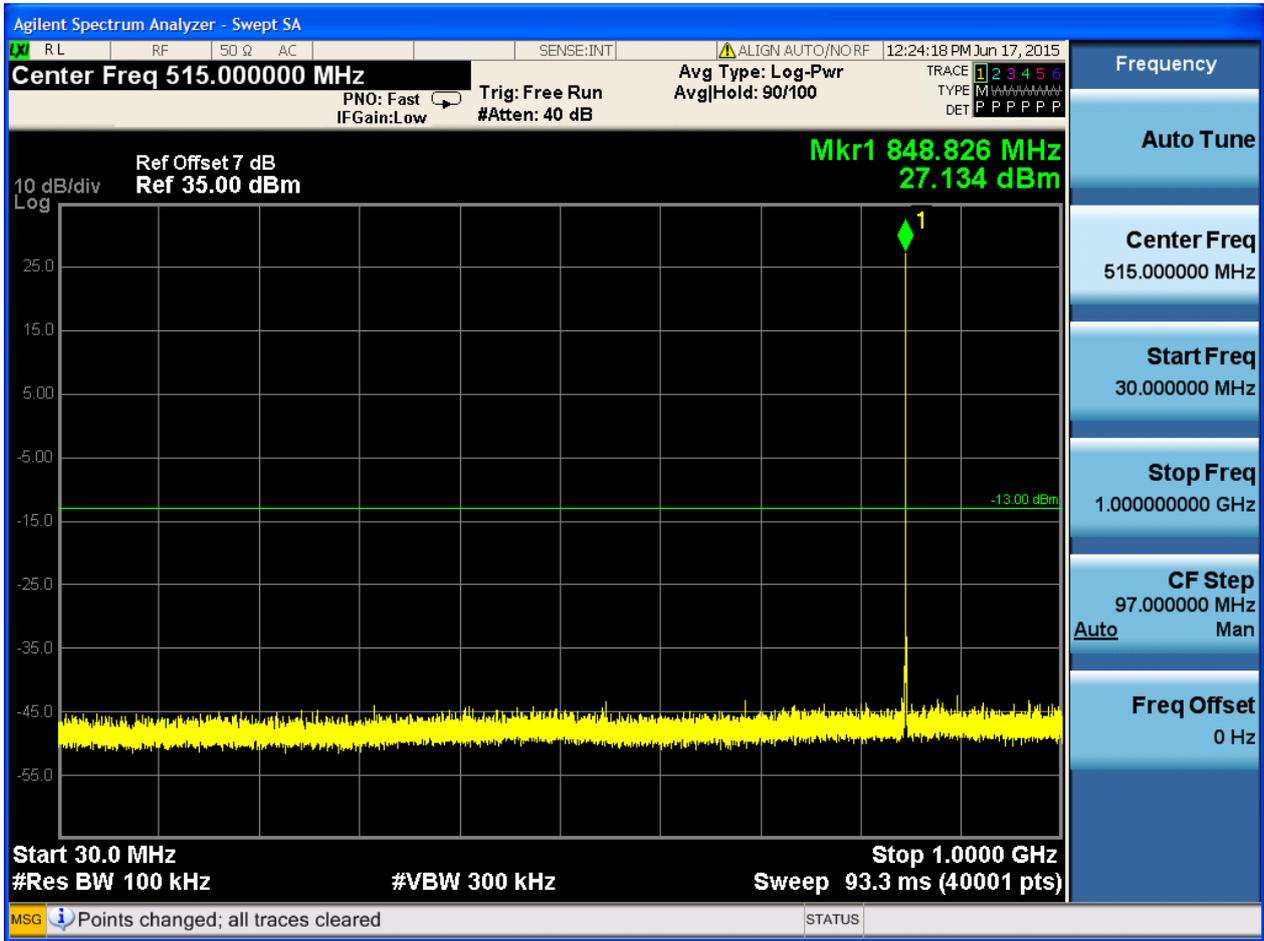


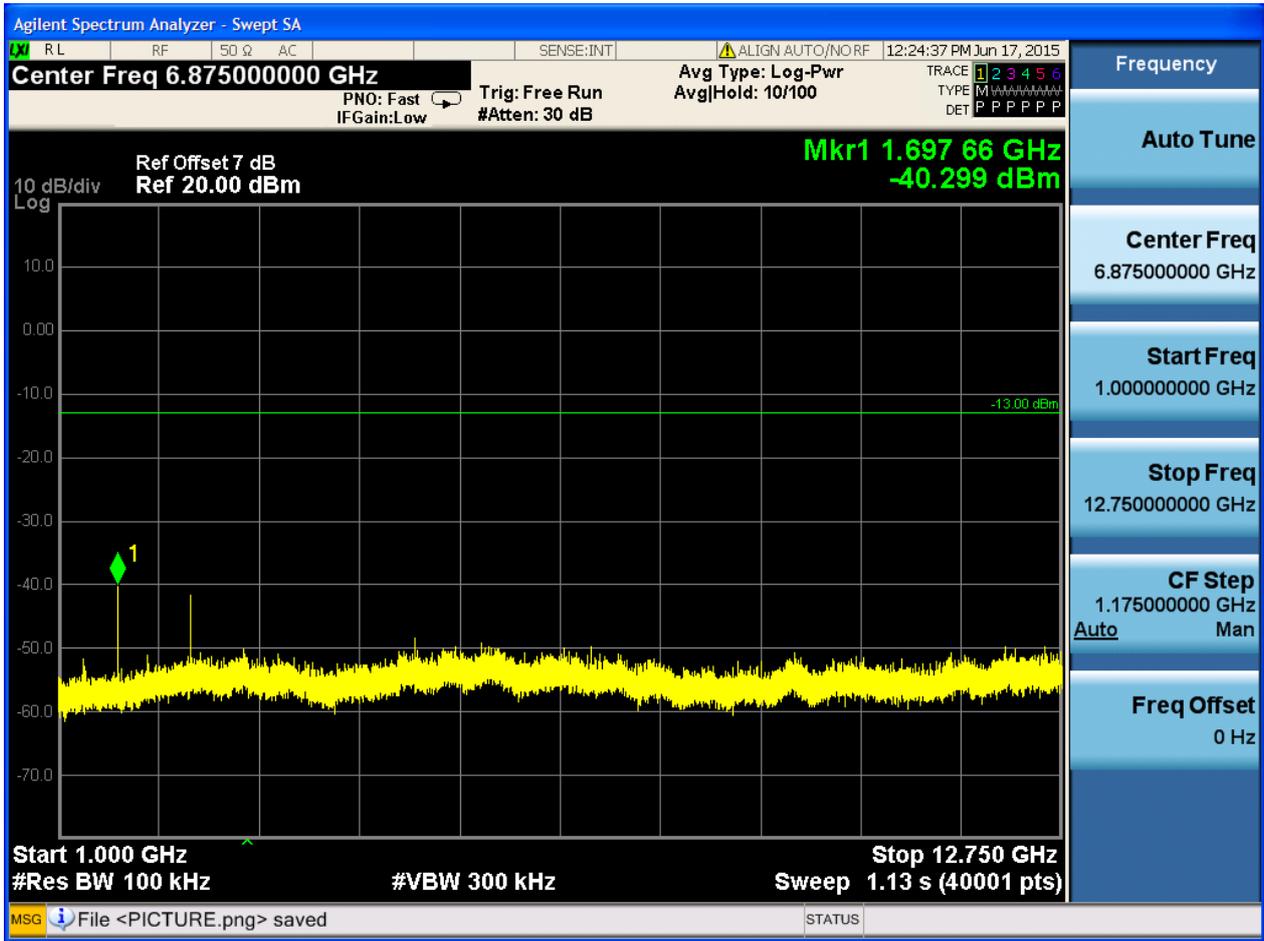


6.1.1.2.3 Test Channel = HCH









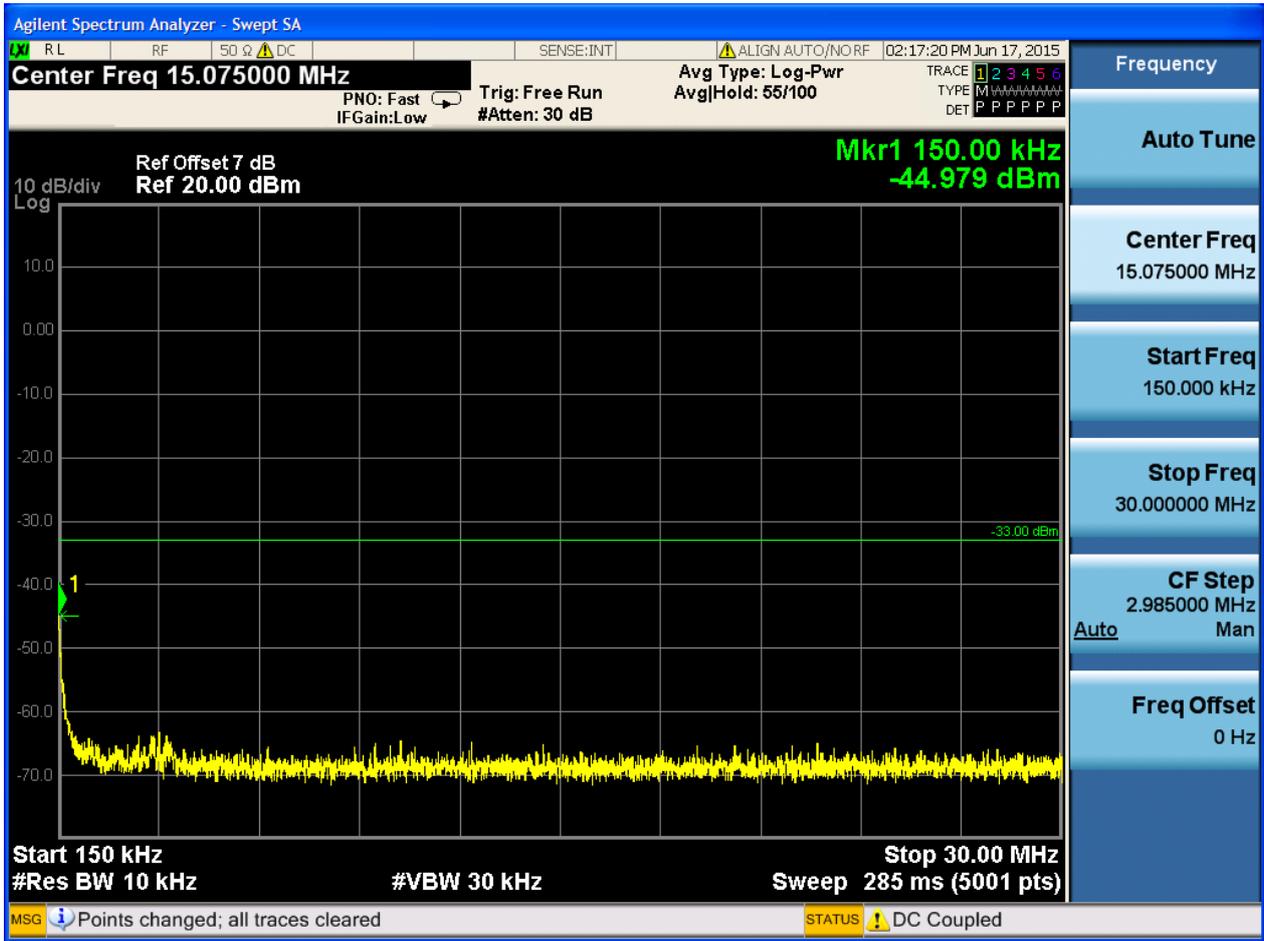


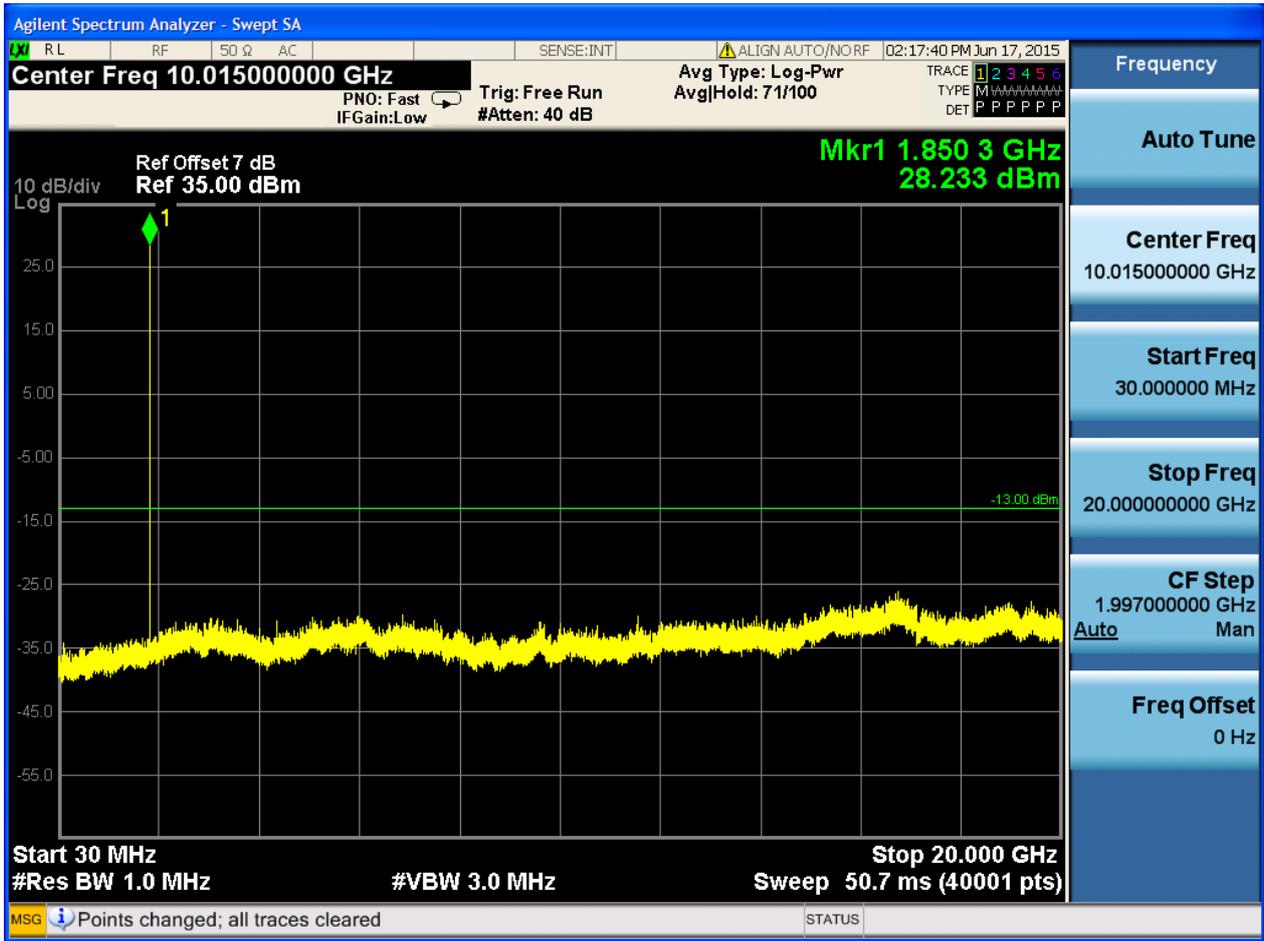
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH

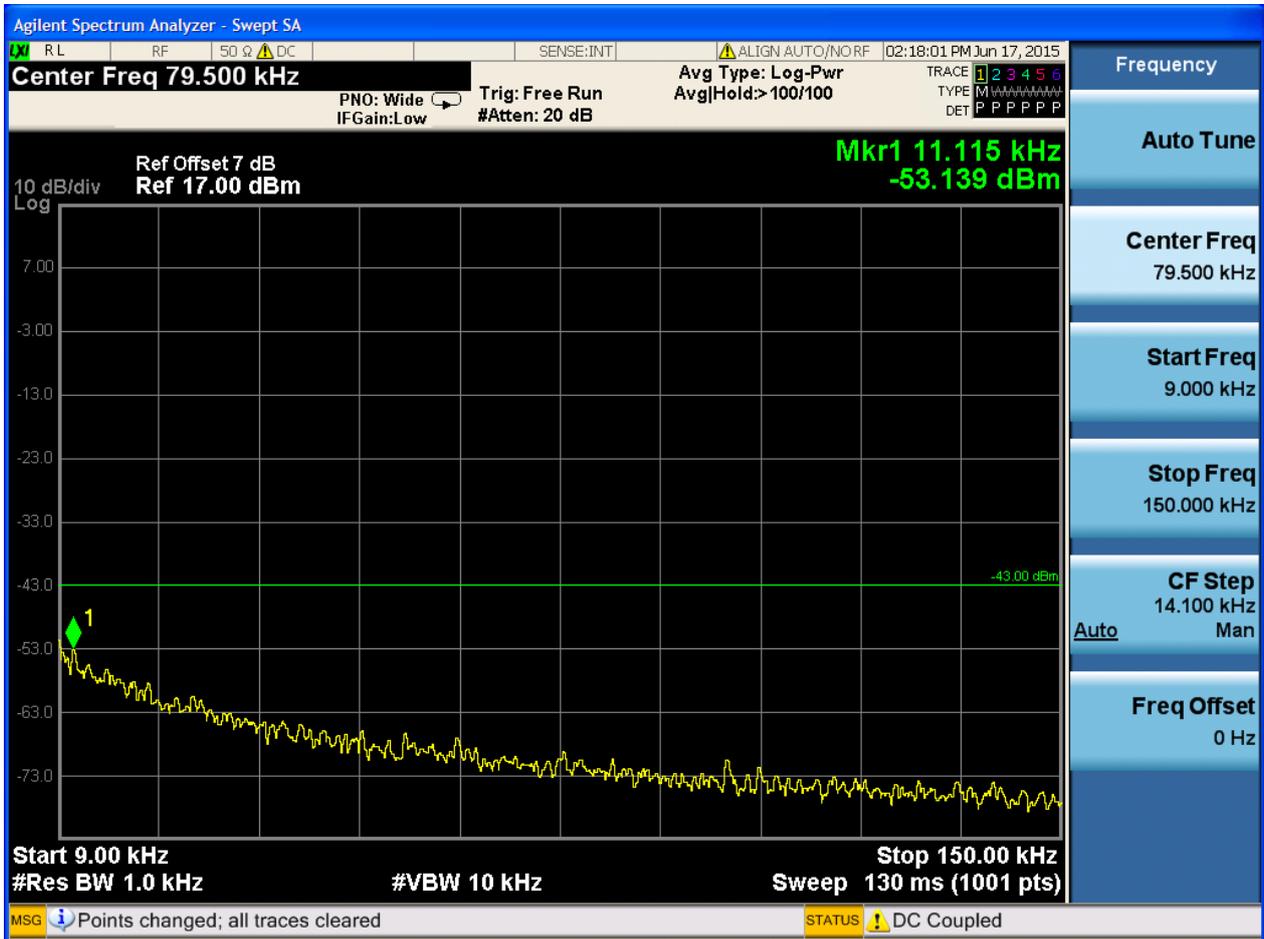


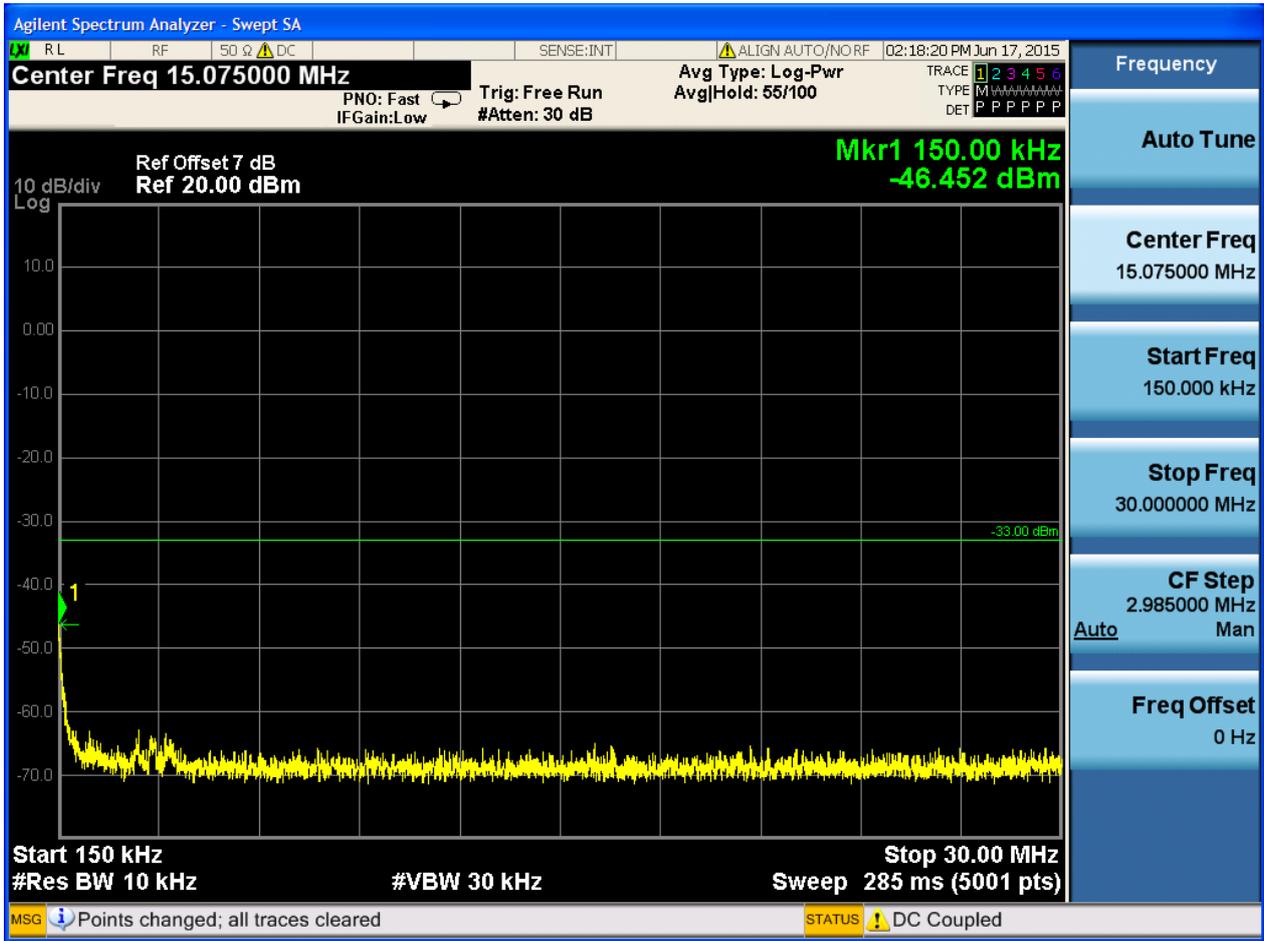


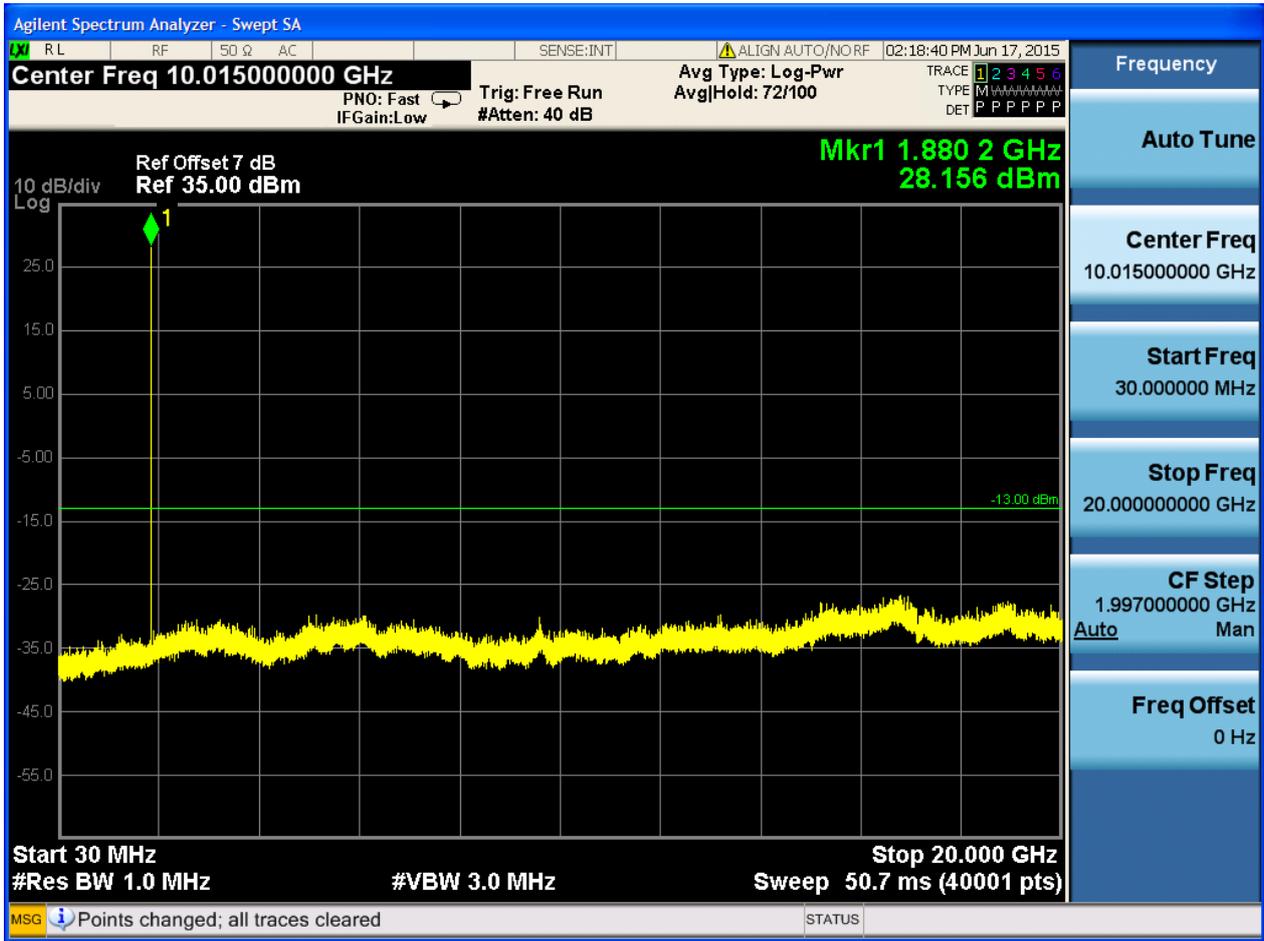




6.1.2.1.2 Test Channel = MCH

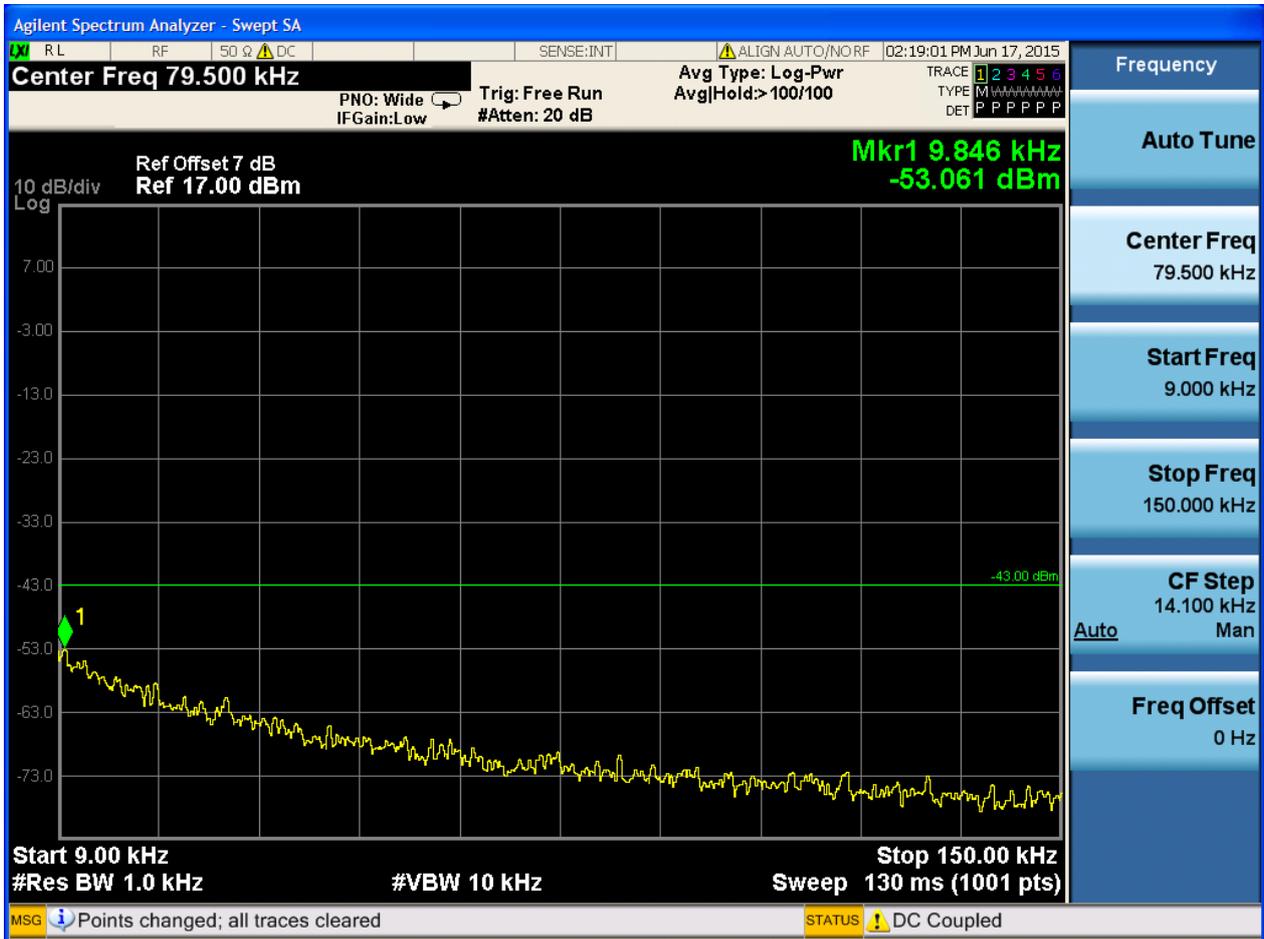


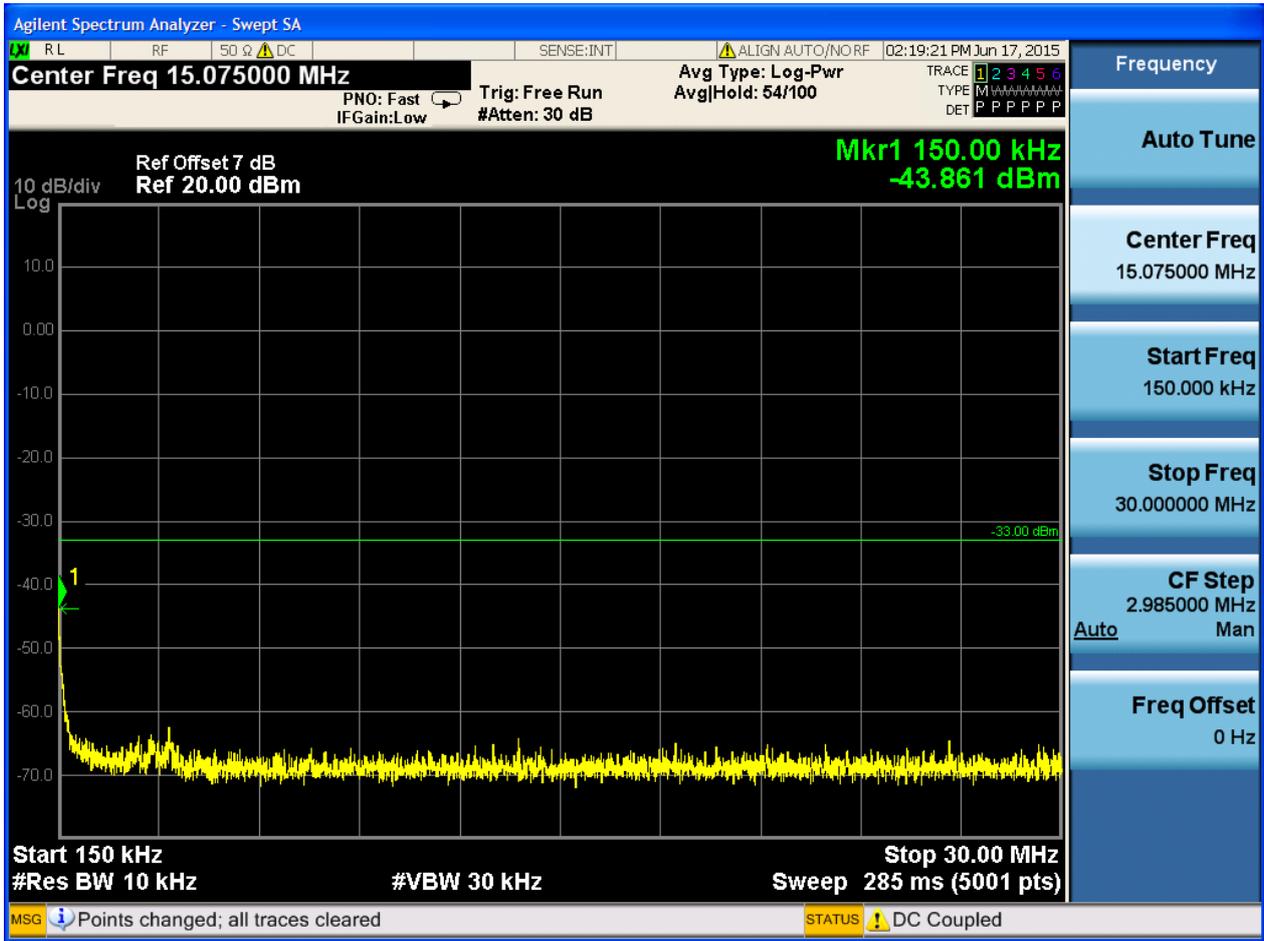


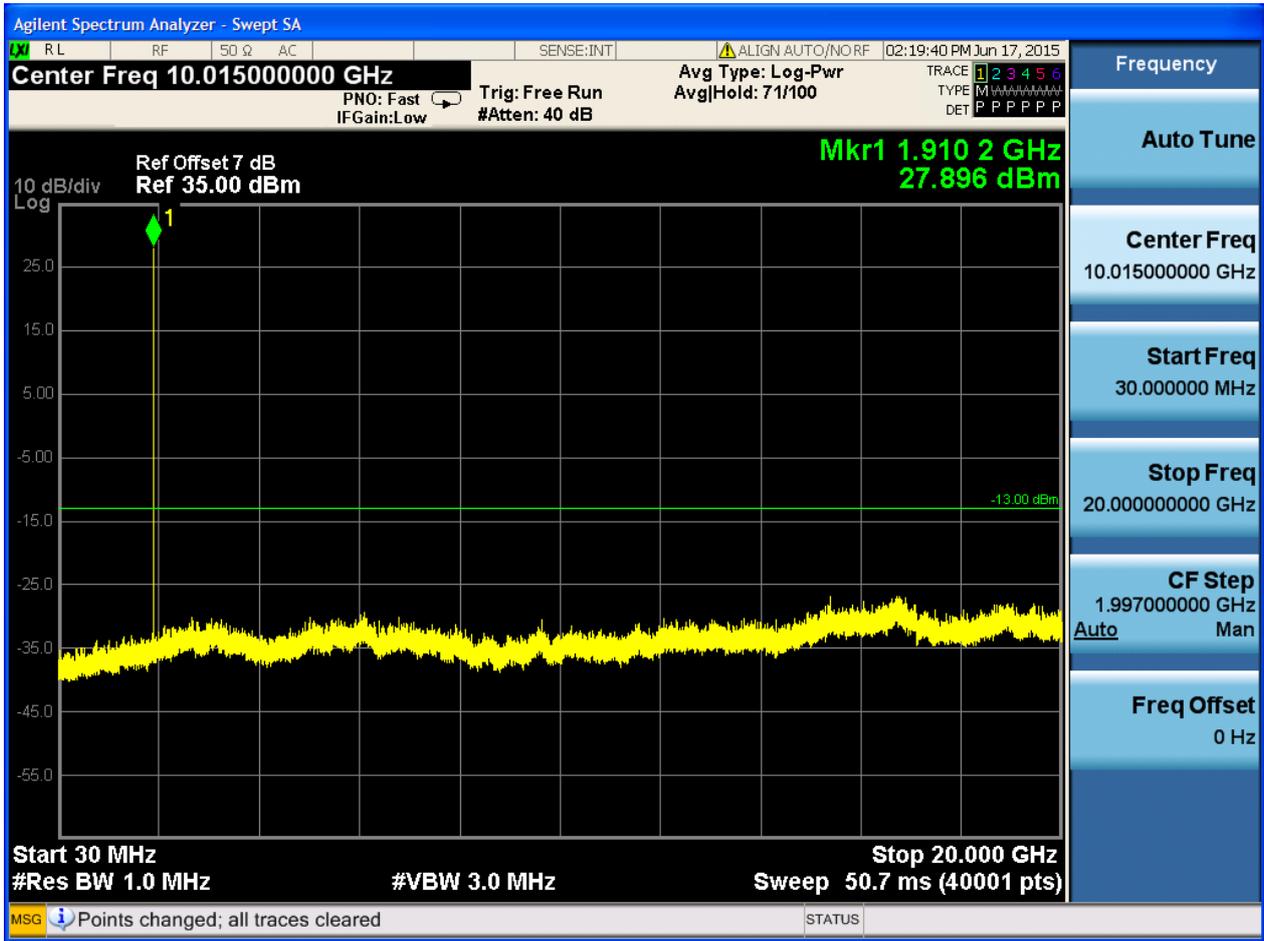




6.1.2.1.3 Test Channel = HCH



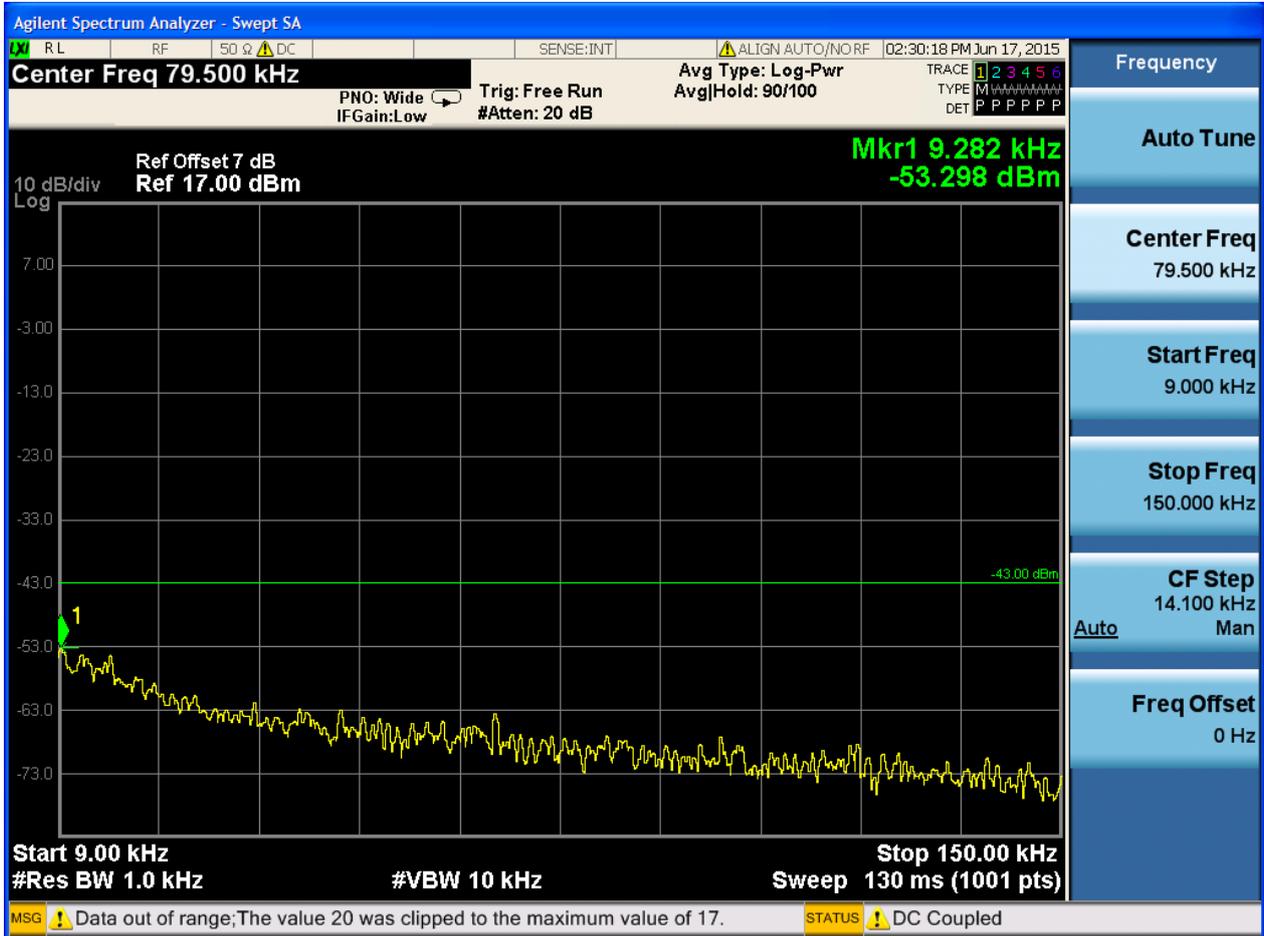


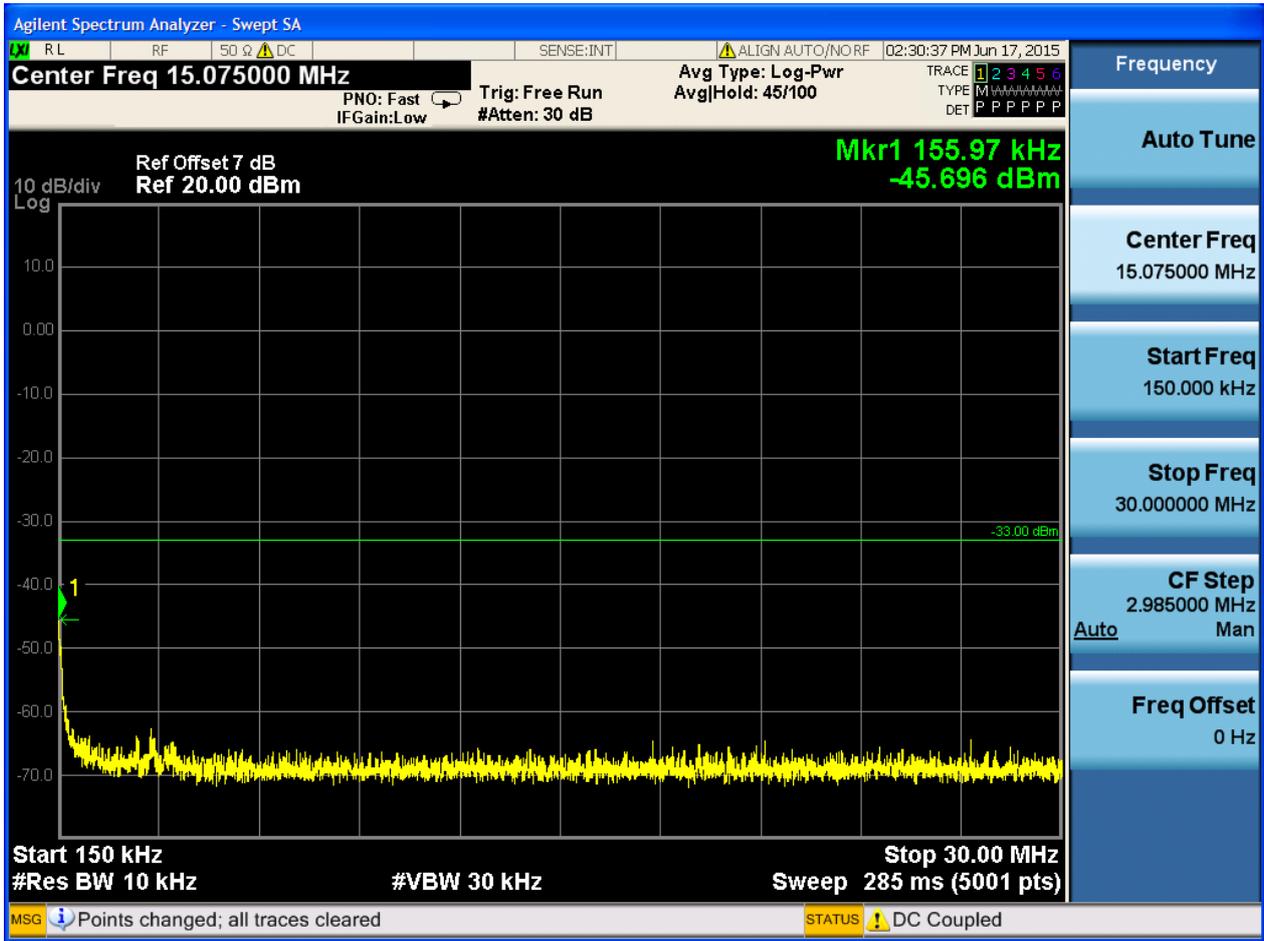


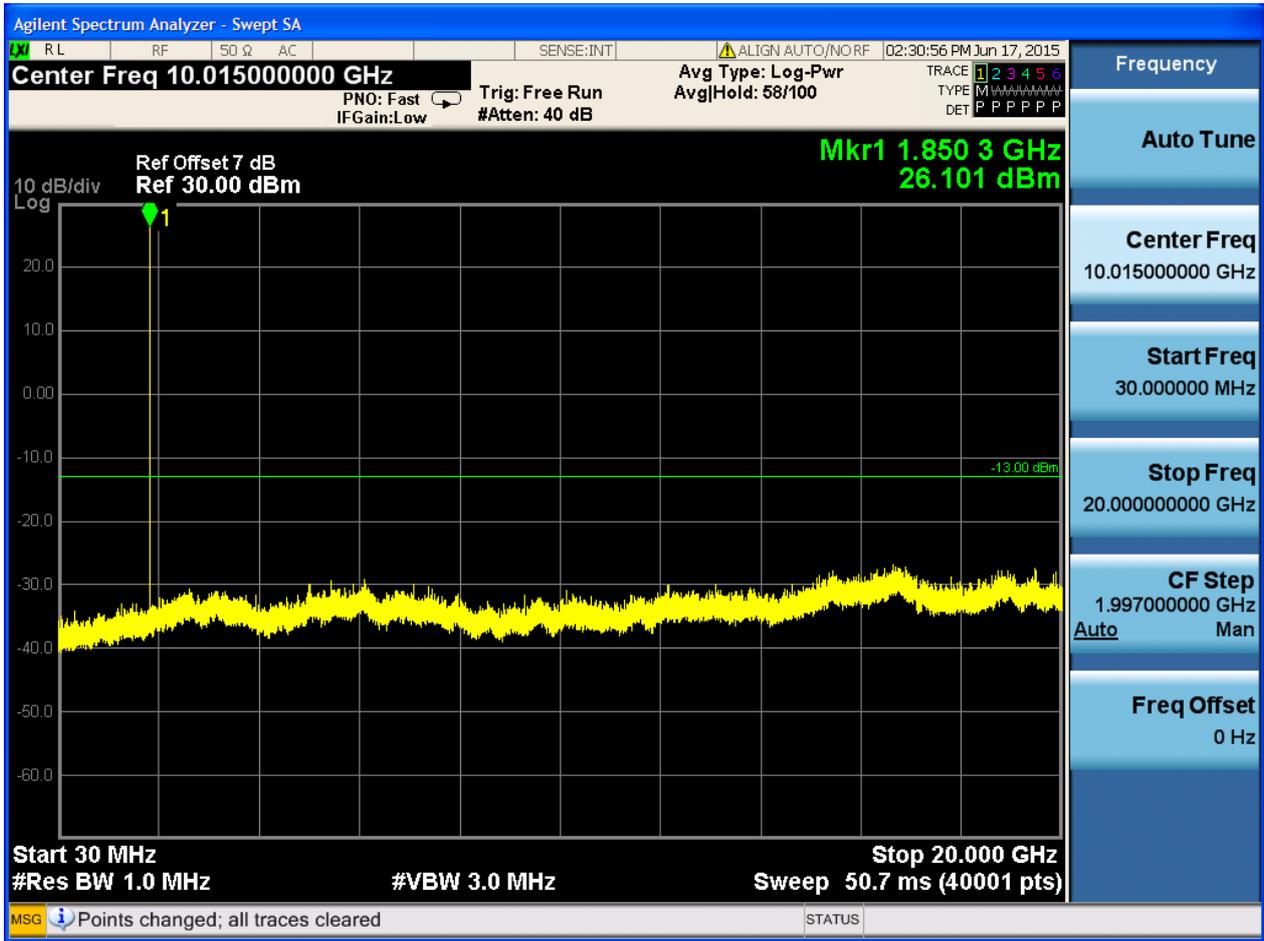


6.1.2.2 Test Mode = GSM/TM2

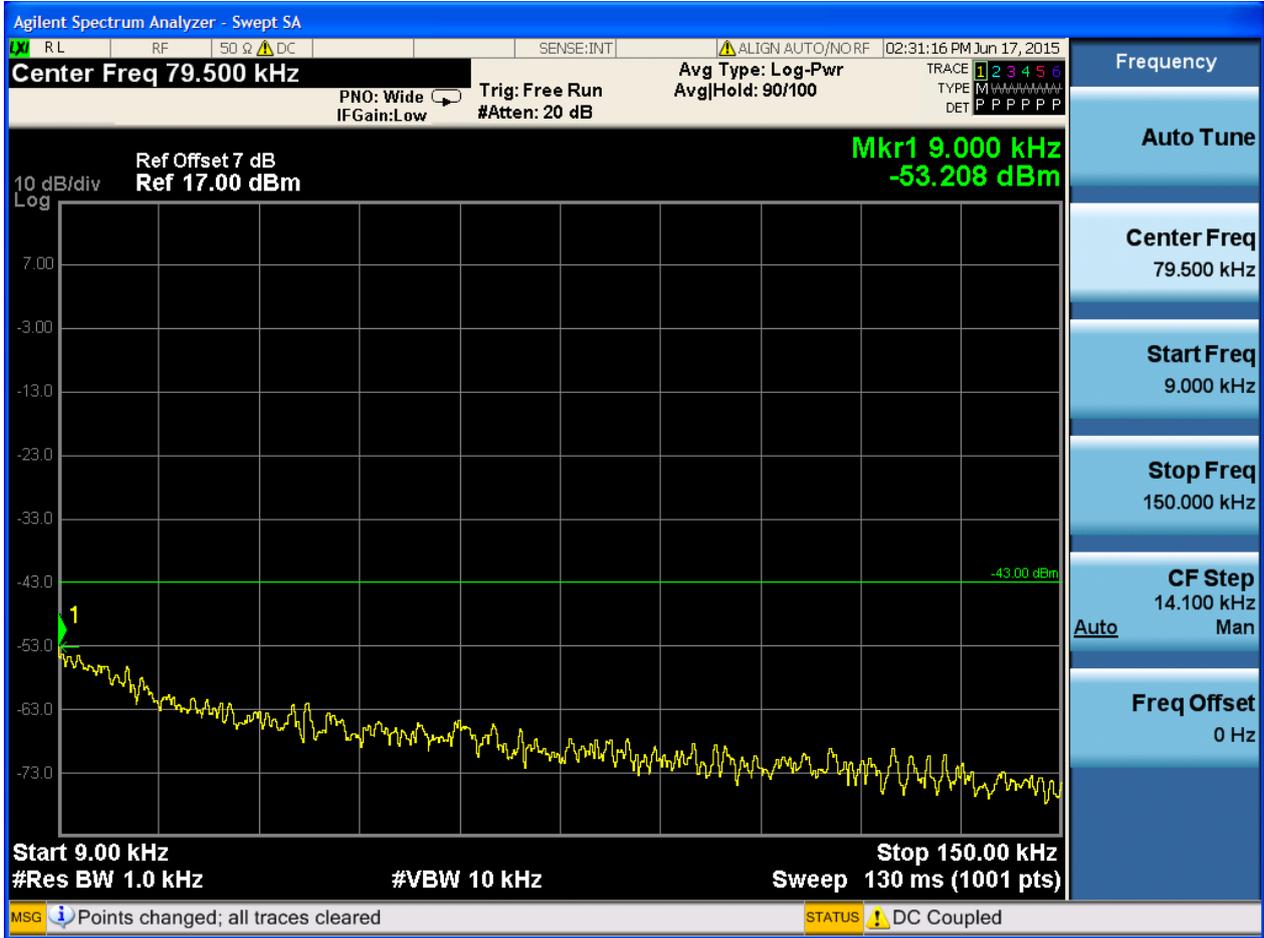
6.1.2.2.1 Test Channel = LCH

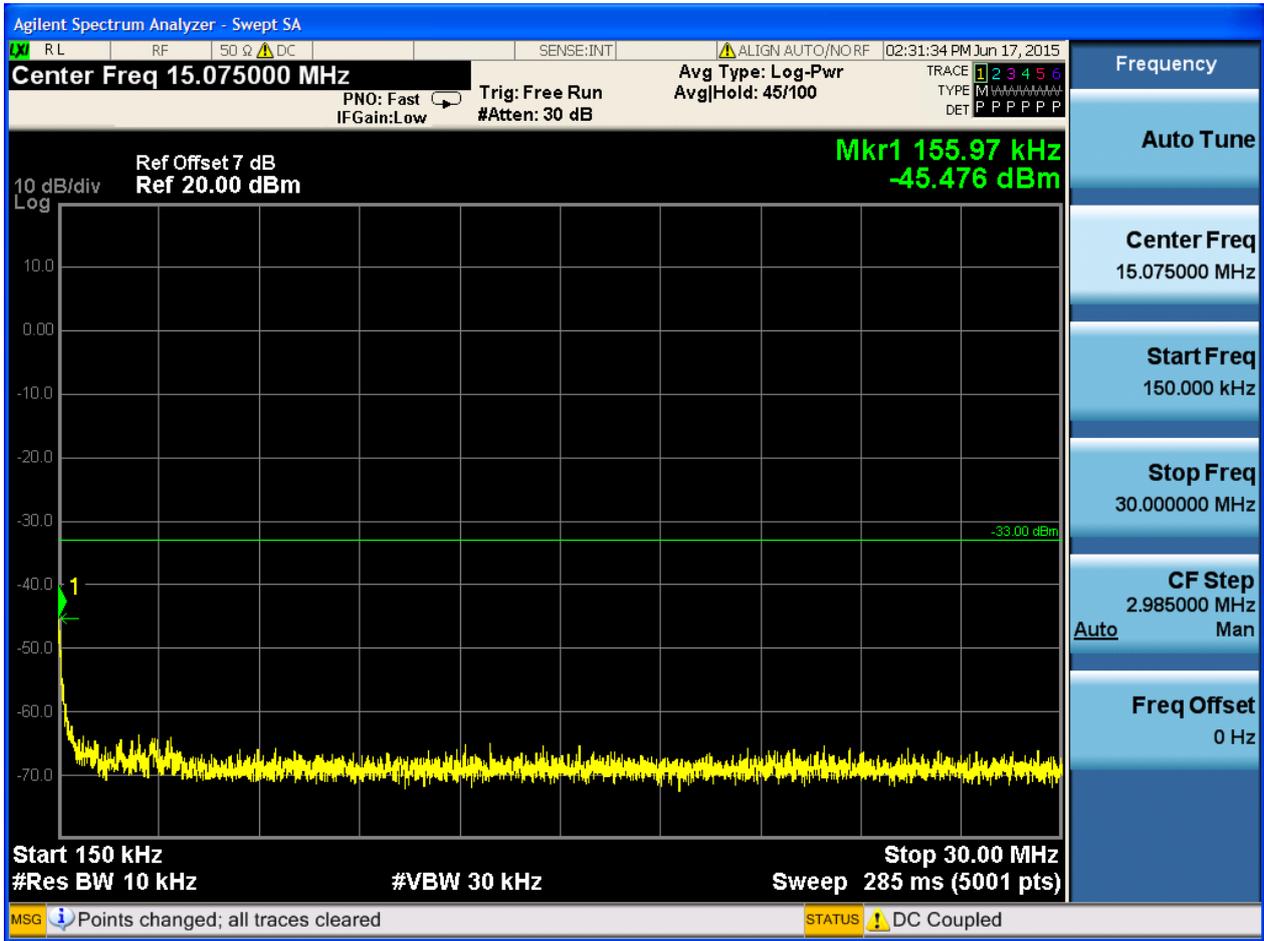


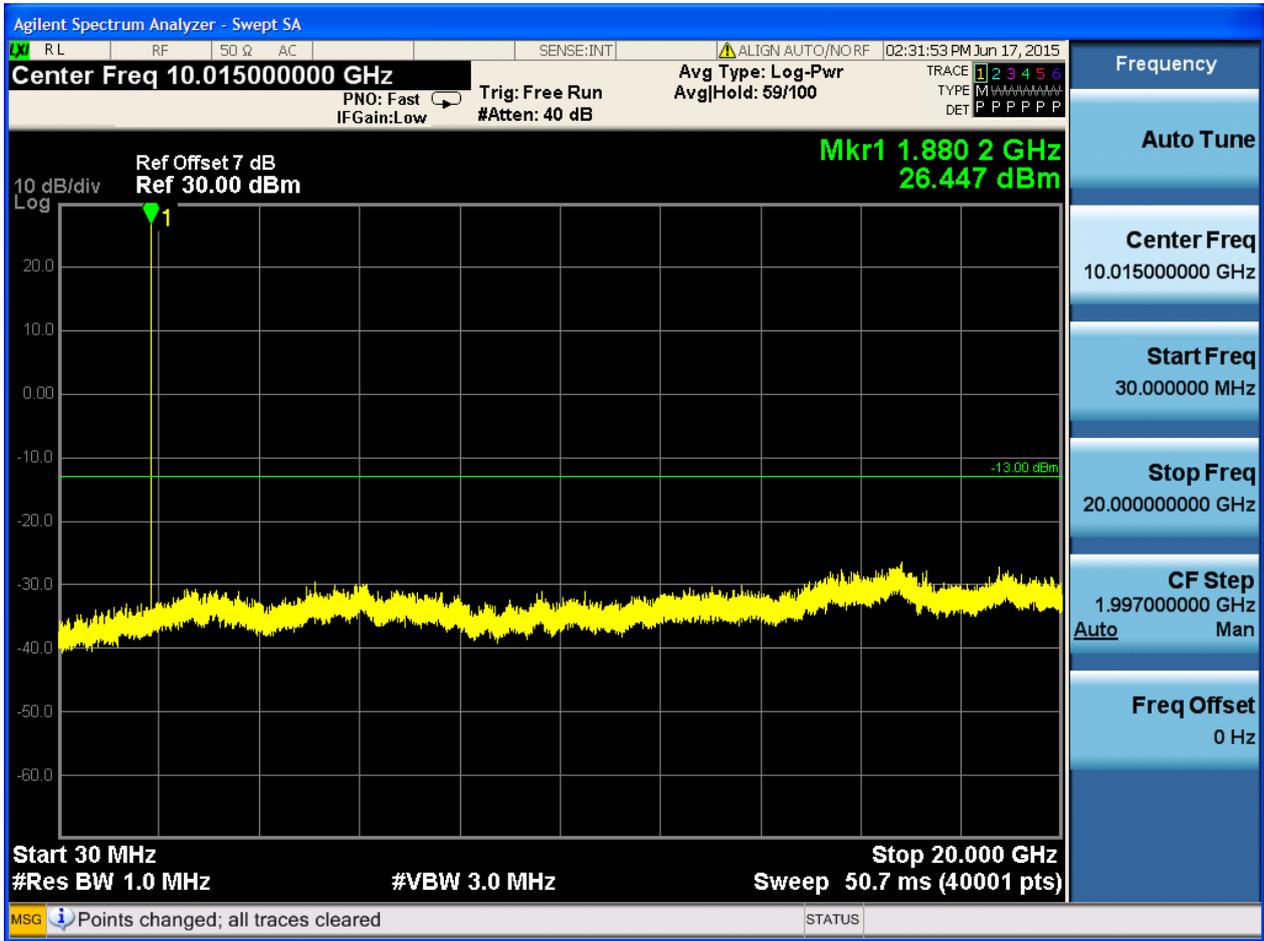




6.1.2.2.2 Test Channel = MCH

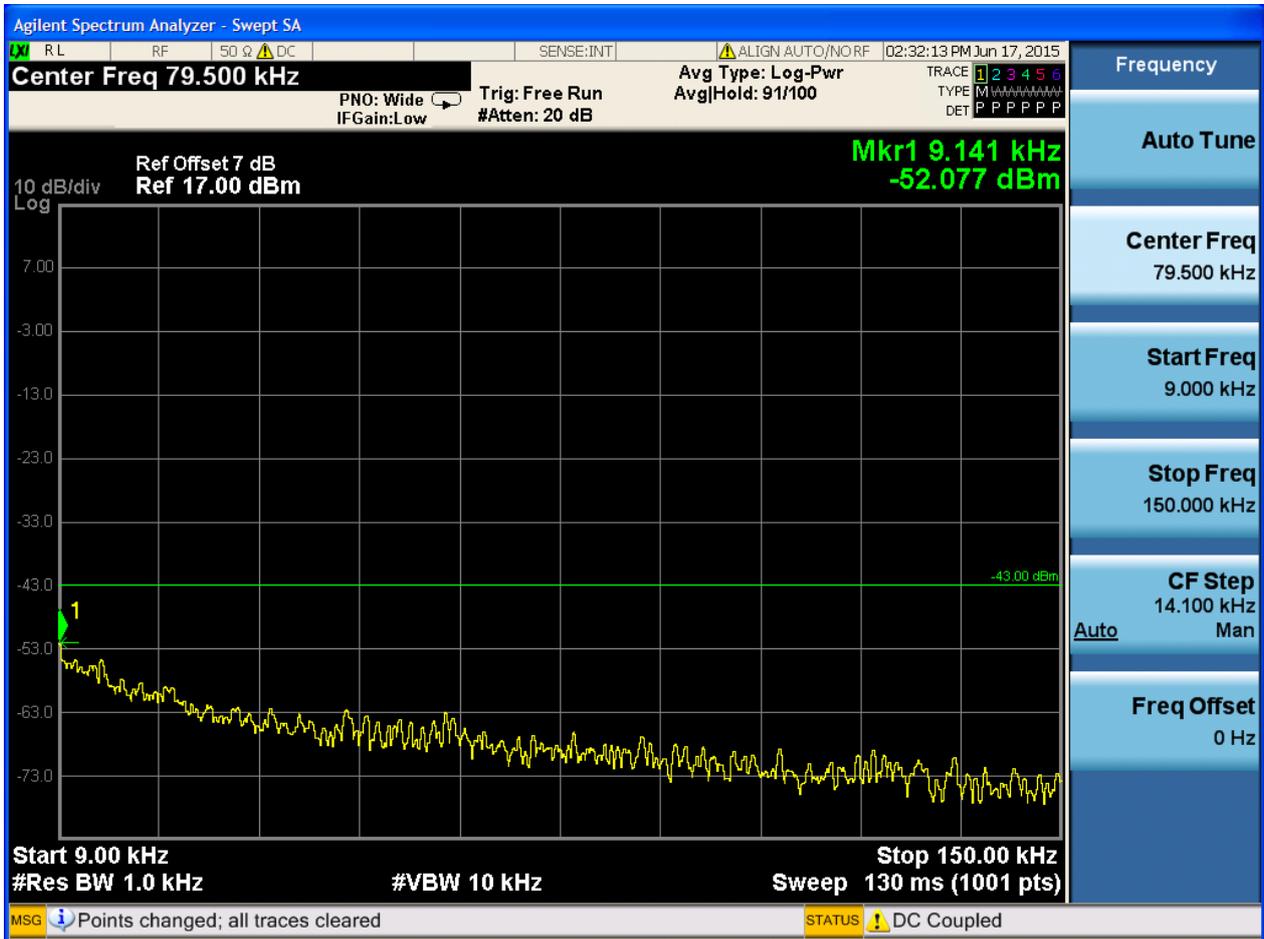


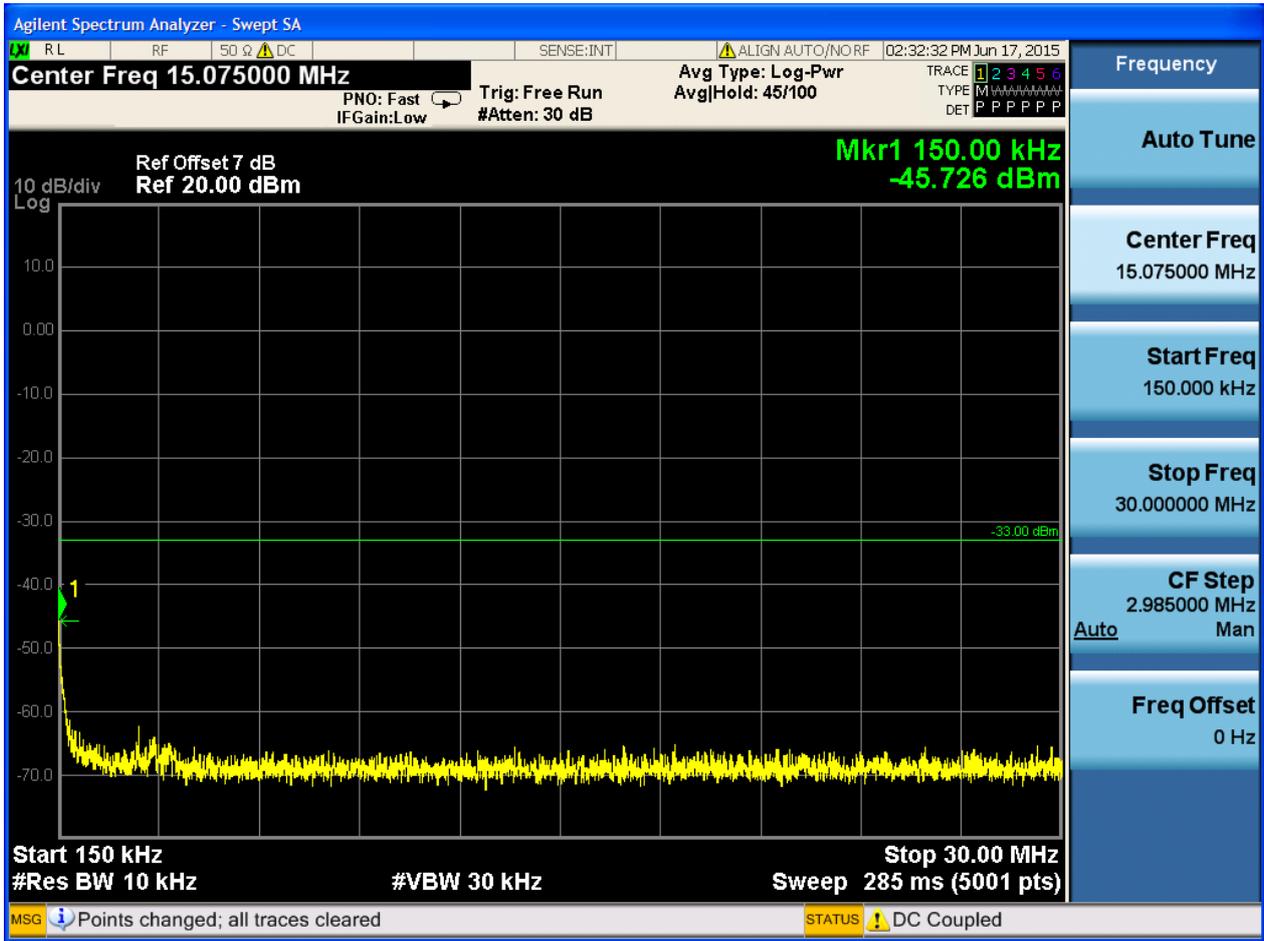


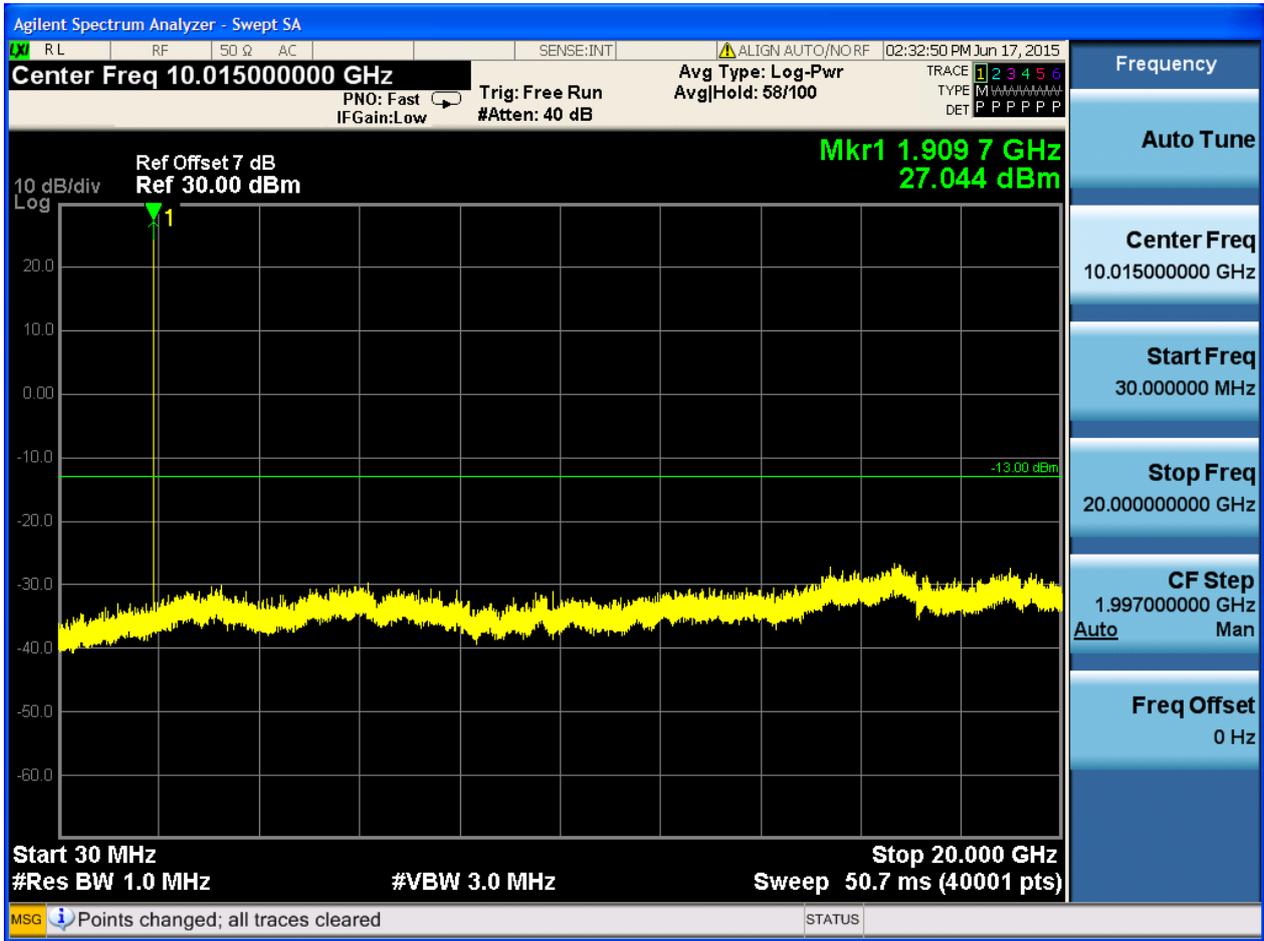




6.1.2.2.3 Test Channel = HCH







7Appendix_G: Field Strength of Spurious Radiation

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

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

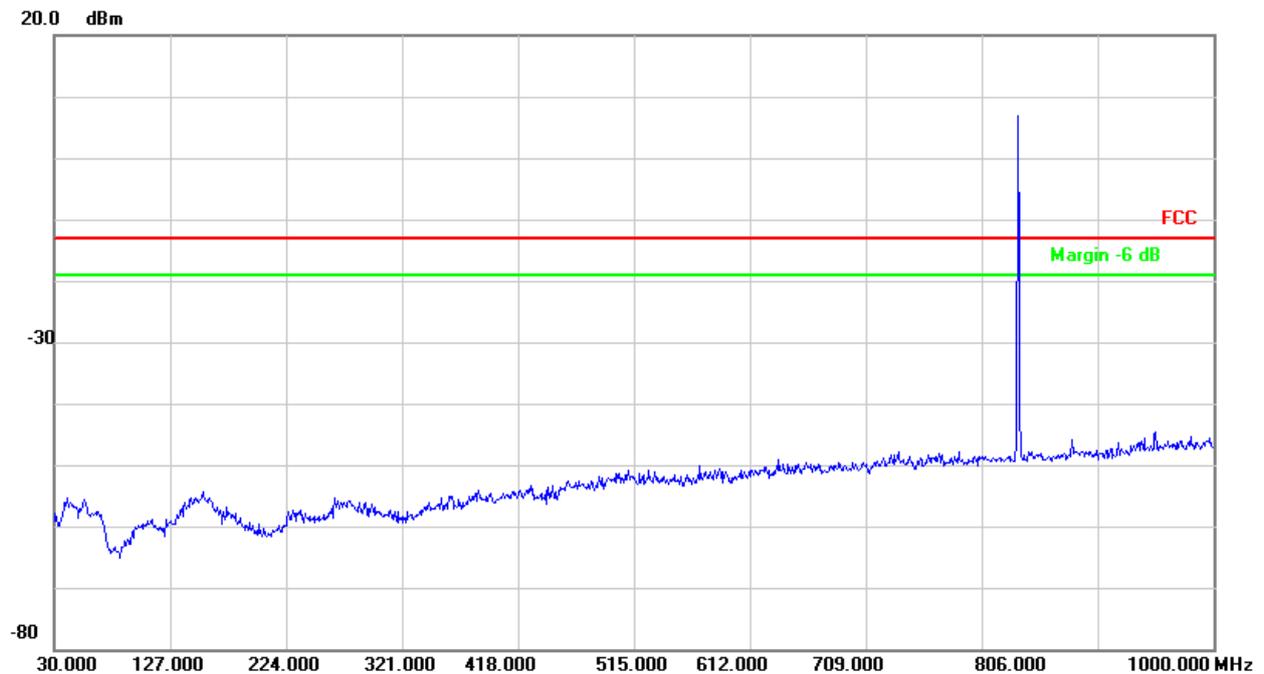
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

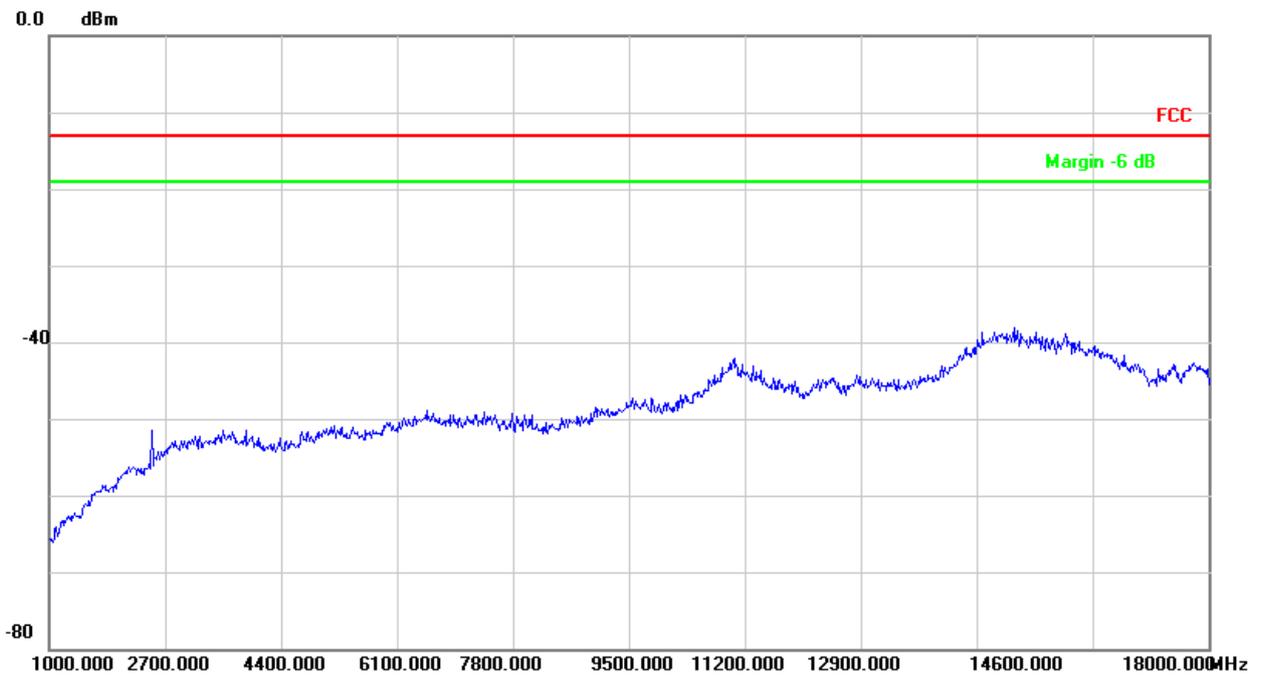
Part I - Test Plots

7.1 For GSM

7.1.1 Test Band = GSM850

7.1.1.1 Test Mode = GSM/TM1

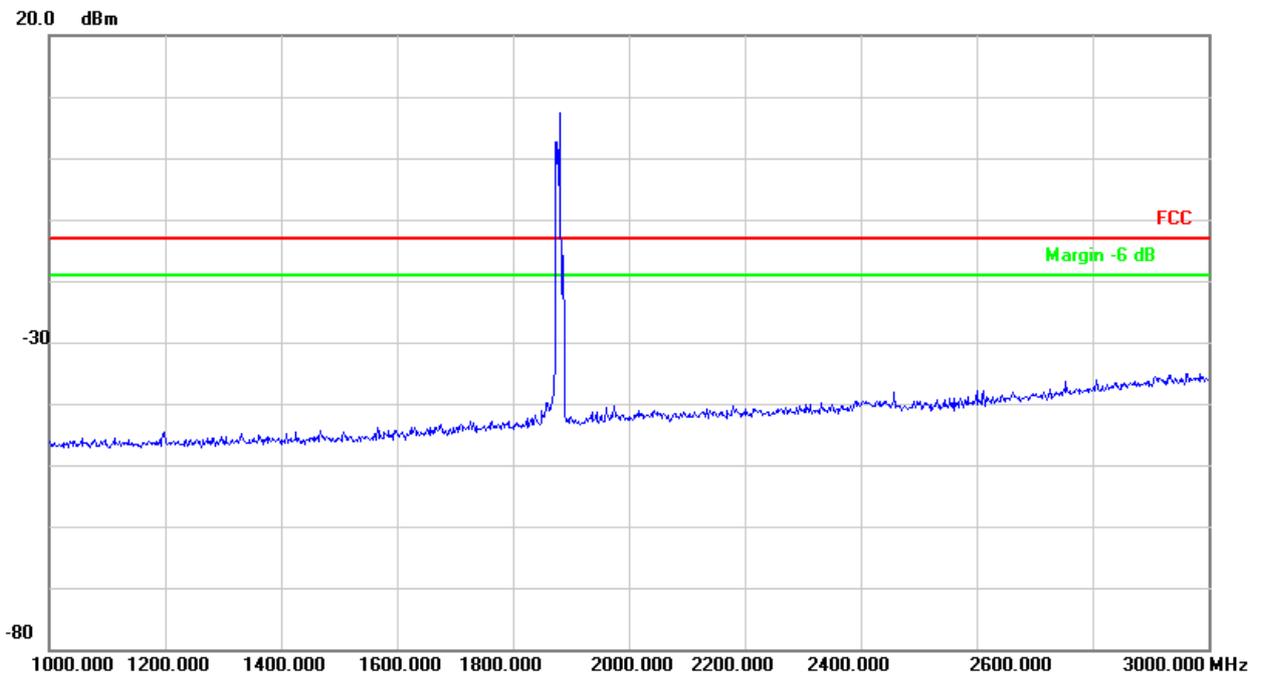
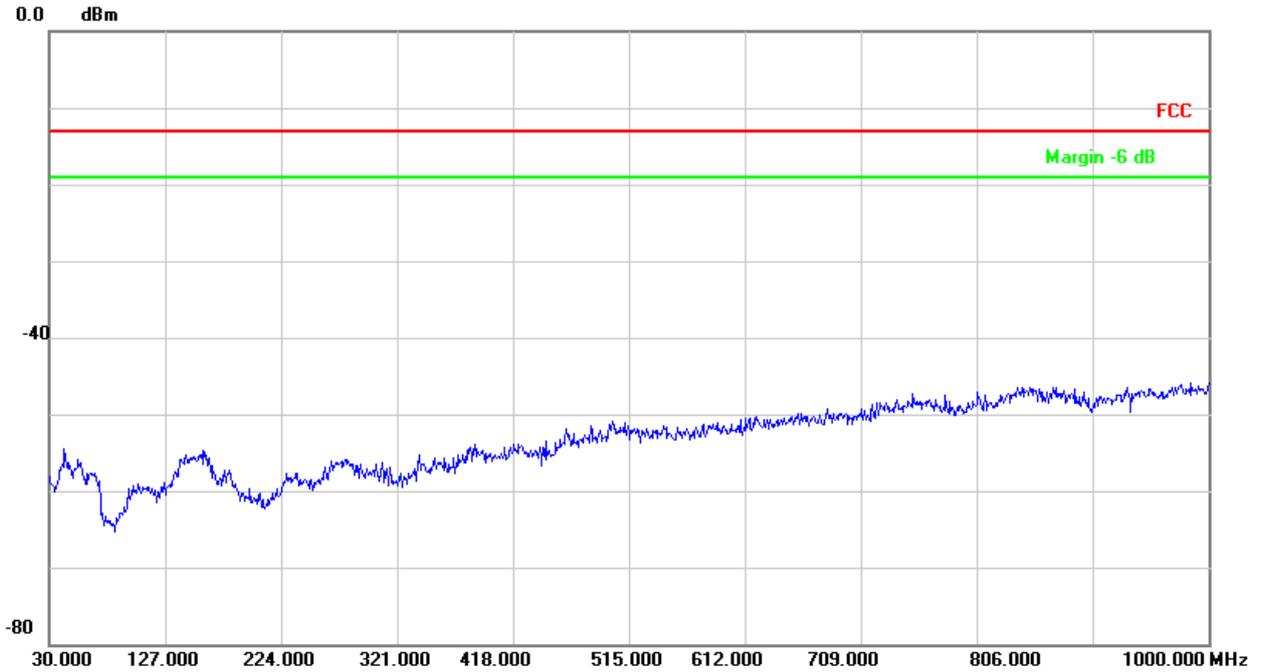


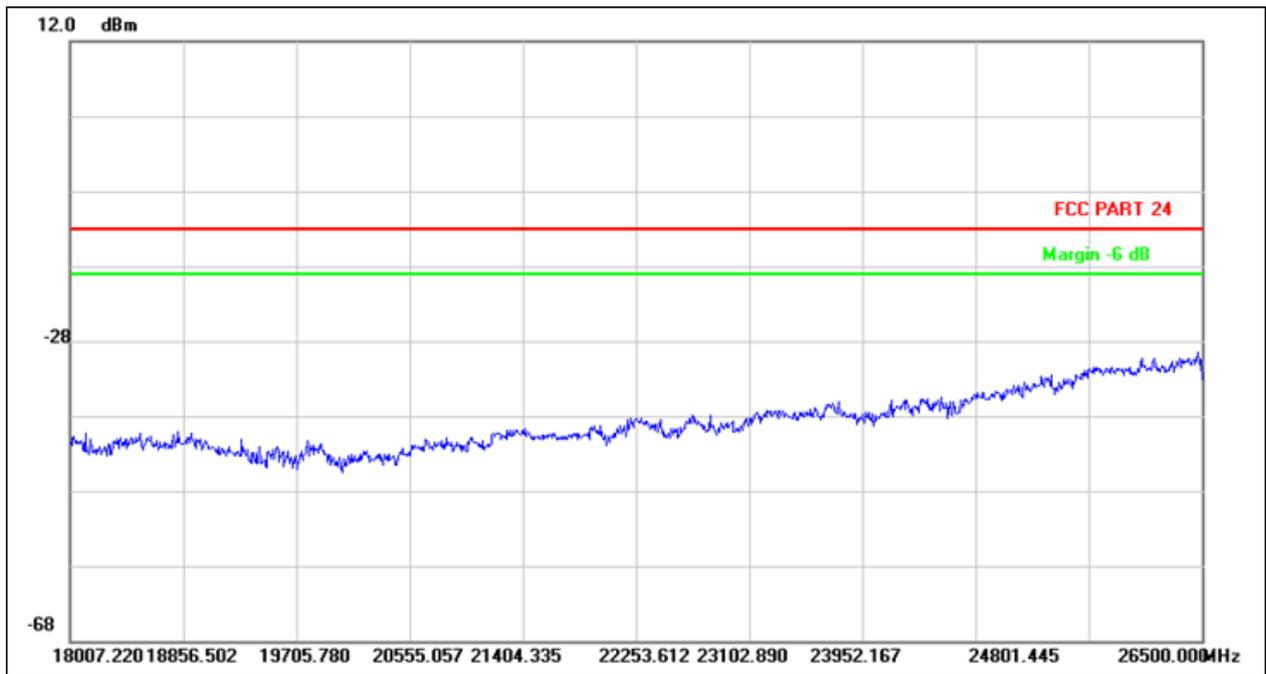
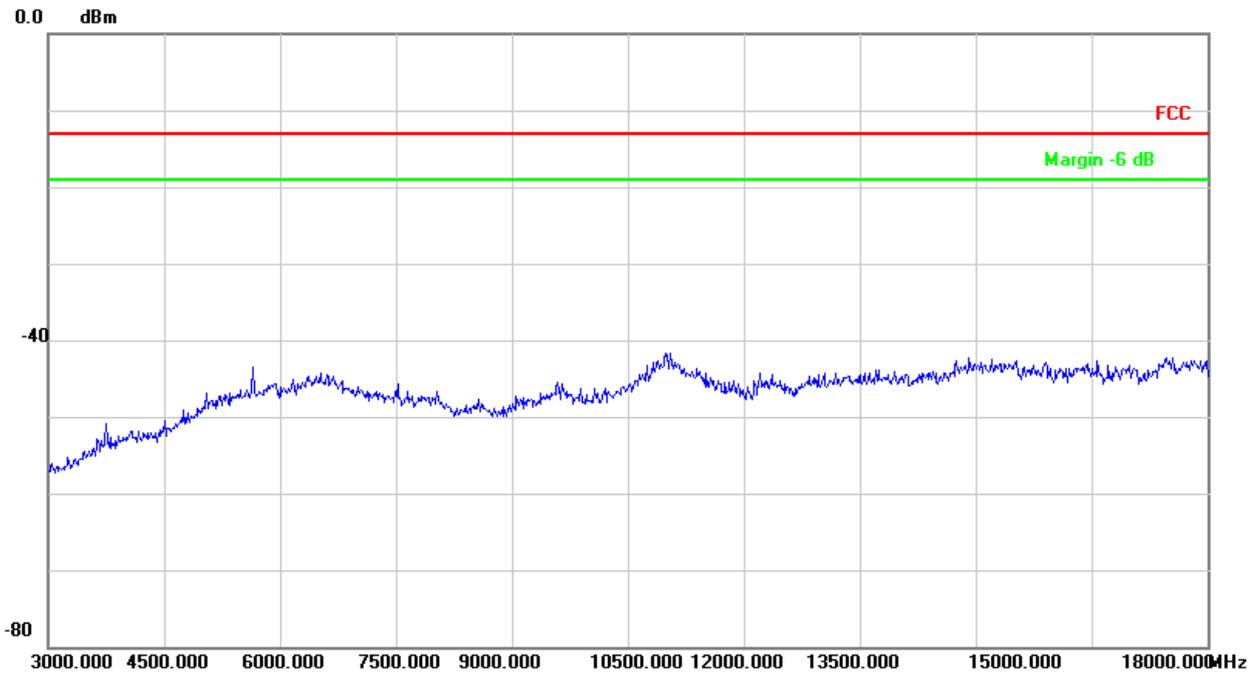




7.1.2 Test Band = GSM1900

7.1.2.1 Test Mode = GSM/TM1







8Appendix_H: Frequency Stability

8.1 For GSM

8.1.1Frequency 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	7.1	0.00861	PASS
				VN	3.68	0.00446	PASS
				VH	6.78	0.00823	PASS
		MCH	TN	VL	2.32	0.00277	PASS
				VN	-3.87	-0.00463	PASS
				VH	-3.42	-0.00409	PASS
		HCH	TN	VL	3.49	0.00411	PASS
				VN	5.88	0.00693	PASS
				VH	3.16	0.00372	PASS
	GSM/TM2	LCH	TN	VL	0.58	0.0007	PASS
				VN	8.88	0.01077	PASS
				VH	2.49	0.00302	PASS
		MCH	TN	VL	5.2	0.00622	PASS
				VN	8.52	0.01018	PASS
				VH	10.88	0.01301	PASS
HCH		TN	VL	2.97	0.0035	PASS	
			VN	6.07	0.00715	PASS	
			VH	9.2	0.01084	PASS	
GSM1900	GSM/TM1	LCH	TN	VL	20.34	0.01099	PASS
				VN	11.17	0.00604	PASS
				VH	10.46	0.00565	PASS
		MCH	TN	VL	12.14	0.00646	PASS
				VN	12.91	0.00687	PASS
				VH	9.49	0.00505	PASS
		HCH	TN	VL	2.45	0.00128	PASS
				VN	-0.19	-0.0001	PASS
				VH	2.91	0.00152	PASS
	GSM/TM2	LCH	TN	VL	12.4	0.0067	PASS
				VN	17.76	0.0096	PASS
				VH	10.88	0.00588	PASS



Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		MCH	TN	VL	14.79	0.00787	PASS
				VN	19.69	0.01047	PASS
				VH	17.85	0.00949	PASS
		HCH	TN	VL	3.07	0.00161	PASS
				VN	3.23	0.00169	PASS
				VH	4.23	0.00221	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	2.65	0.00322	PASS	
				-20	-0.06	-0.00007	PASS	
				-10	3.1	0.00376	PASS	
				0	-0.71	-0.00086	PASS	
				10	3.1	0.00376	PASS	
				20	2.71	0.00329	PASS	
				30	-1.16	-0.00141	PASS	
				40	1.49	0.00181	PASS	
				50	4.2	0.0051	PASS	
		MCH	VN	-30	-0.39	-0.00047	PASS	
				-20	0.52	0.00062	PASS	
				-10	1.03	0.00123	PASS	
				0	1.23	0.00147	PASS	
				10	3.81	0.00455	PASS	
				20	1.81	0.00216	PASS	
				30	4.07	0.00486	PASS	
				40	-1.49	-0.00178	PASS	
				50	1.74	0.00208	PASS	
		HCH	VN	-30	9.49	0.01118	PASS	
				-20	7.81	0.0092	PASS	
				-10	3.03	0.00357	PASS	
				0	5.23	0.00616	PASS	
				10	3.94	0.00464	PASS	
				20	1.94	0.00229	PASS	
				30	11.24	0.01324	PASS	
				40	7.1	0.00836	PASS	
				50	3.49	0.00411	PASS	
		GSM/TM2	LCH	VN	-30	2.65	0.00322	PASS
					-20	12.04	0.01461	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict		
				-10	7.39	0.00897	PASS		
				0	10.49	0.01273	PASS		
				10	2.07	0.00251	PASS		
				20	11.11	0.01348	PASS		
				30	1.19	0.00144	PASS		
				40	10.11	0.01227	PASS		
				50	0.45	0.00055	PASS		
		MCH	VN	-30	4	0.00478	PASS		
				-20	9.98	0.01193	PASS		
				-10	2.2	0.00263	PASS		
				0	11.62	0.01389	PASS		
				10	14.17	0.01694	PASS		
				20	10.2	0.01219	PASS		
				30	12.01	0.01436	PASS		
				40	6.13	0.00733	PASS		
				50	1.13	0.00135	PASS		
		HCH	VN	-30	1.07	0.00126	PASS		
				-20	6.97	0.00821	PASS		
				-10	2.97	0.0035	PASS		
				0	1.29	0.00152	PASS		
				10	2.97	0.0035	PASS		
				20	10.14	0.01195	PASS		
				30	3.33	0.00392	PASS		
				40	7.39	0.00871	PASS		
				50	4.2	0.00495	PASS		
		GSM1900	GSM/TM1	LCH	VN	-30	13.24	0.00716	PASS
						-20	10.33	0.00558	PASS
-10	17.56					0.00949	PASS		
0	10.85					0.00586	PASS		
10	7.88					0.00426	PASS		
20	14.14					0.00764	PASS		
30	15.37					0.00831	PASS		
40	8.27					0.00447	PASS		
50	14.72					0.00796	PASS		
MCH	VN			-30	17.76	0.00945	PASS		
				-20	11.56	0.00615	PASS		
				-10	10.14	0.00539	PASS		
				0	14.92	0.00794	PASS		
				10	17.89	0.00952	PASS		
				20	12.85	0.00684	PASS		



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict				
				30	15.76	0.00838	PASS				
				40	17.63	0.00938	PASS				
				50	15.5	0.00824	PASS				
		HCH	VN	-30	1.49	0.00078	PASS				
				-20	3.23	0.00169	PASS				
				-10	-1.55	-0.00081	PASS				
				0	1.81	0.00095	PASS				
				10	-0.71	-0.00037	PASS				
				20	2.13	0.00112	PASS				
				30	5.17	0.00271	PASS				
				40	-3.75	-0.00196	PASS				
				50	0.58	0.0003	PASS				
				GSM/TM2		LCH	VN	-30	18.6	0.01005	PASS
								-20	17.31	0.00936	PASS
								-10	14.72	0.00796	PASS
	0	15.63	0.00845					PASS			
	10	18.89	0.01021					PASS			
	20	19.05	0.0103					PASS			
	30	12.72	0.00687					PASS			
	40	8.56	0.00463					PASS			
	50	14.21	0.00768					PASS			
	MCH	VN	-30			19.95	0.01061	PASS			
			-20			19.11	0.01016	PASS			
			-10			19.37	0.0103	PASS			
			0			17.37	0.00924	PASS			
			10			15.27	0.00812	PASS			
			20			13.66	0.00727	PASS			
	HCH	VN	30	18.27	0.00972	PASS					
			40	14.11	0.00751	PASS					
			50	15.5	0.00824	PASS					
			-30	4.49	0.00235	PASS					
			-20	1.74	0.00091	PASS					
			-10	4.49	0.00235	PASS					
			0	-1.45	-0.00076	PASS					
			10	12.27	0.00642	PASS					
			20	10.75	0.00563	PASS					
	30	5.84	0.00306	PASS							
	40	3.33	0.00174	PASS							
	50	3.68	0.00193	PASS							



END