



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 [dBm]	Limit [dBm]	Verdict
GSM850	GSM/TM1	LCH	32.87	28.41	38.5	PASS
		MCH	33.11	28.65	38.5	PASS
		HCH	33.19	28.73	38.5	PASS
	GSM/TM2	LCH	26.73	22.27	38.5	PASS
		MCH	26.75	22.29	38.5	PASS
		HCH	26.78	22.32	38.5	PASS
Test Band	Test Mode	Test Channel	Measured [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	30.43	28.75	33	PASS
		MCH	30.33	28.65	33	PASS
		HCH	30.21	28.53	33	PASS
	GSM/TM2	LCH	25.99	24.31	33	PASS
		MCH	25.99	24.31	33	PASS
		HCH	25.96	24.28	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:

SET Span=1.5*OBW

SET RBW=1%of the OBW,not to wxceed 1MHz

SET VBW>= 3*RBW

SET Sweep time=auto-couple.

Detector:RMS

2Appendix_B: Peak-to-Average Ratio

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
GSM850	GSM/TM1	LCH	0.23	13	PASS
		MCH	0.23	13	PASS
		HCH	0.22	13	PASS
	GSM/TM2	LCH	2.89	13	PASS
		MCH	2.84	13	PASS
		HCH	2.85	13	PASS
GSM1900	GSM/TM1	LCH	0.28	13	PASS
		MCH	0.29	13	PASS
		HCH	0.30	13	PASS
	GSM/TM2	LCH	2.93	13	PASS
		MCH	2.92	13	PASS
		HCH	2.87	13	PASS

3Appendix_C: Modulation Characteristics

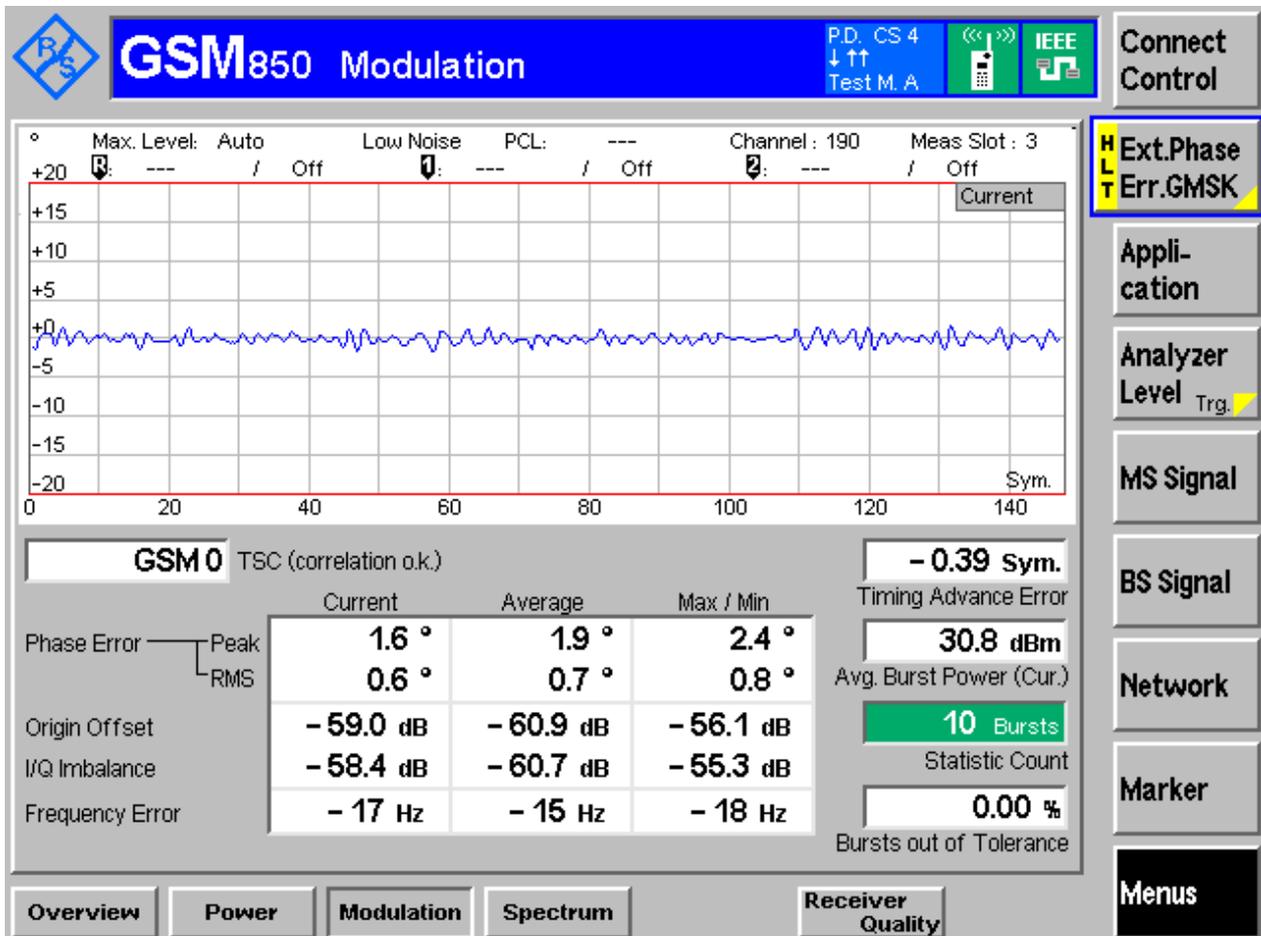
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

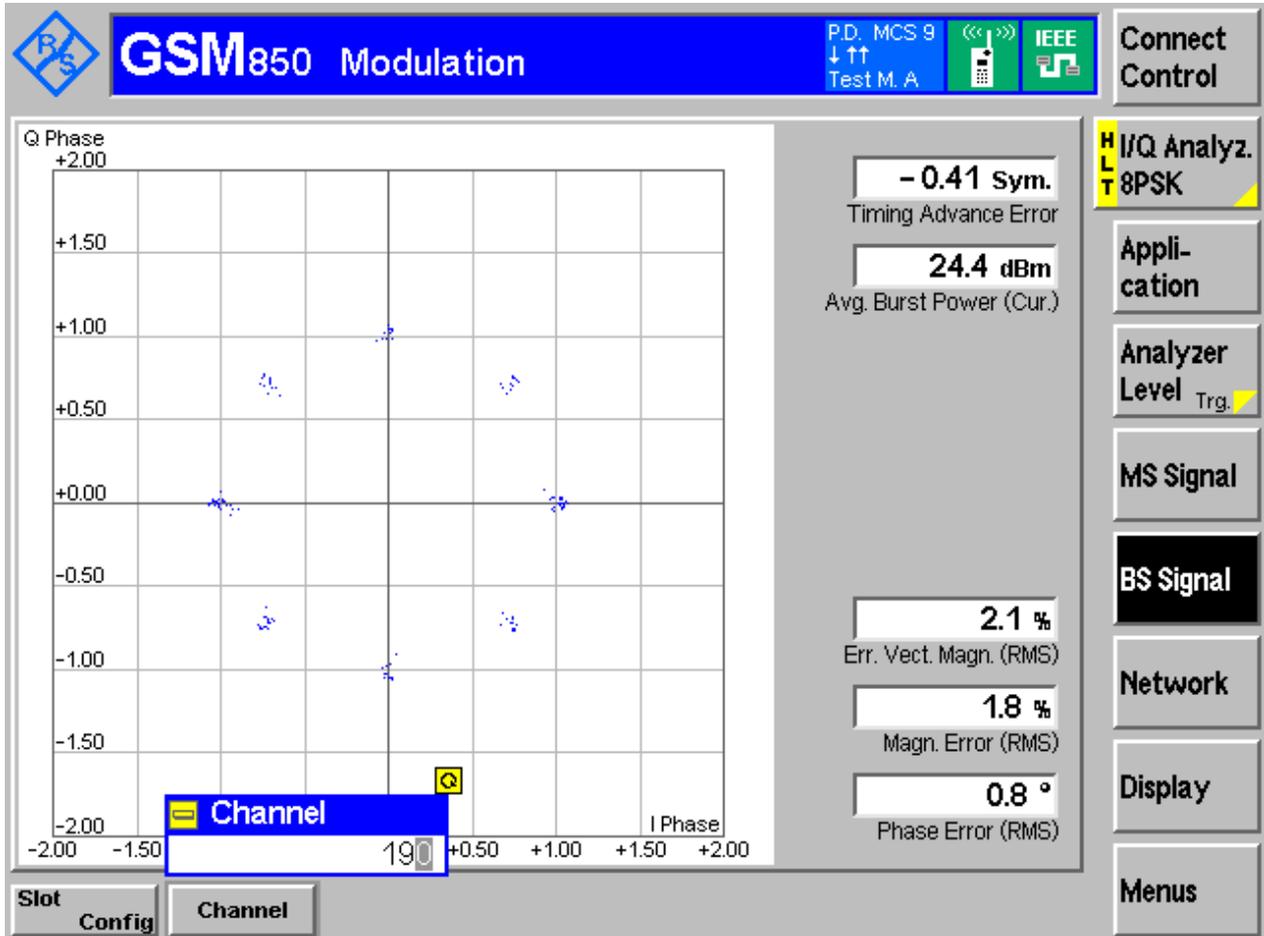
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

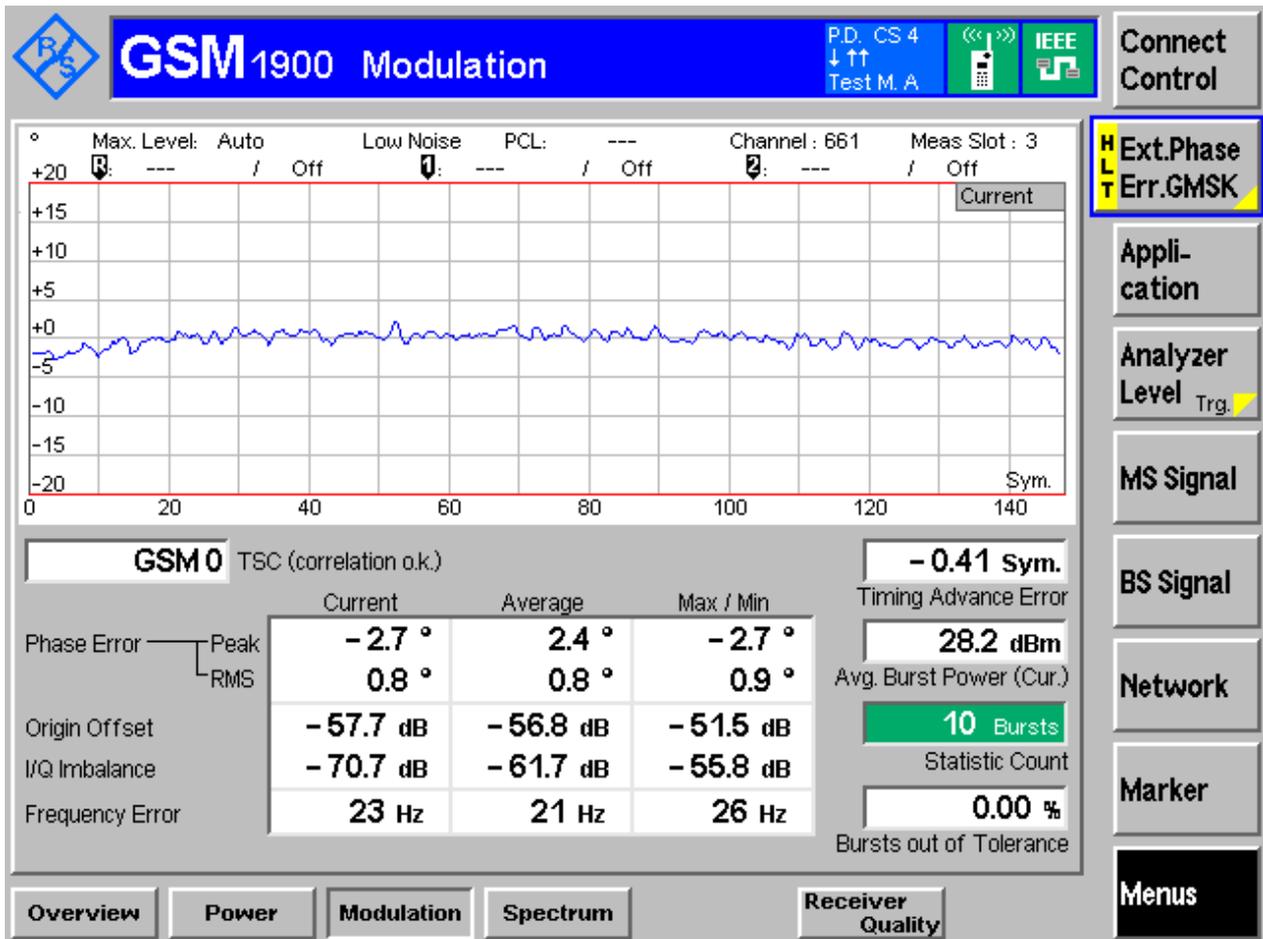
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

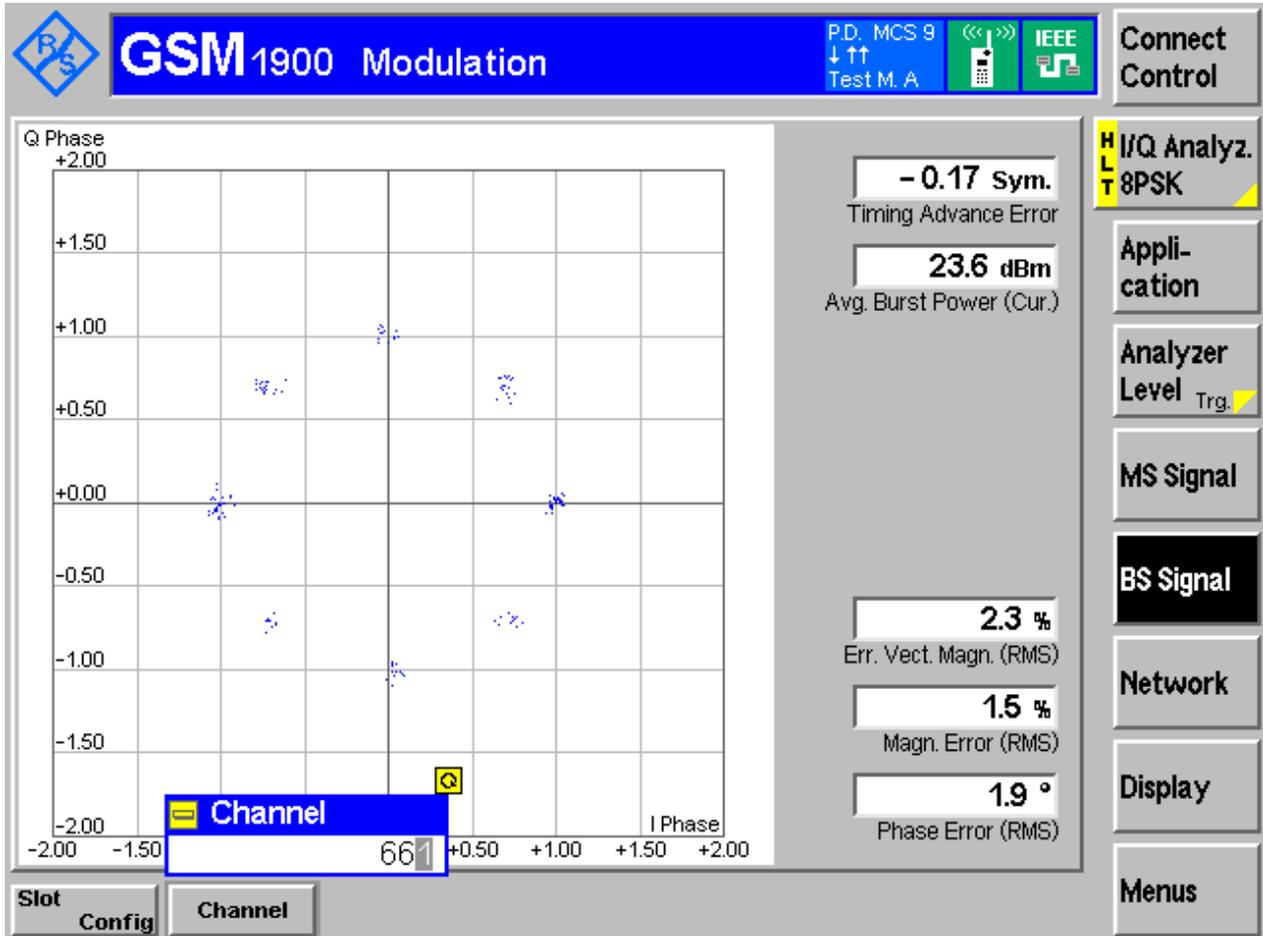
3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH



3.1.2.2 Test Mode = GSM/TM2

3.1.2.2.1 Test Channel = MCH



4Appendix_D: Bandwidth

Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
GSM850	GSM/TM1	LCH	246.10	320.07	Pass
		MCH	246.80	318.60	Pass
		HCH	247.91	314.87	Pass
	GSM/TM2	LCH	255.81	321.73	Pass
		MCH	253.17	323.13	Pass
		HCH	254.15	322.94	Pass
GSM1900	GSM/TM1	LCH	245.94	316.99	Pass
		MCH	243.27	320.22	Pass
		HCH	243.61	320.83	Pass
	GSM/TM2	LCH	251.34	327.7	Pass
		MCH	254.34	325.8	Pass
		HCH	259.95	321.8	Pass

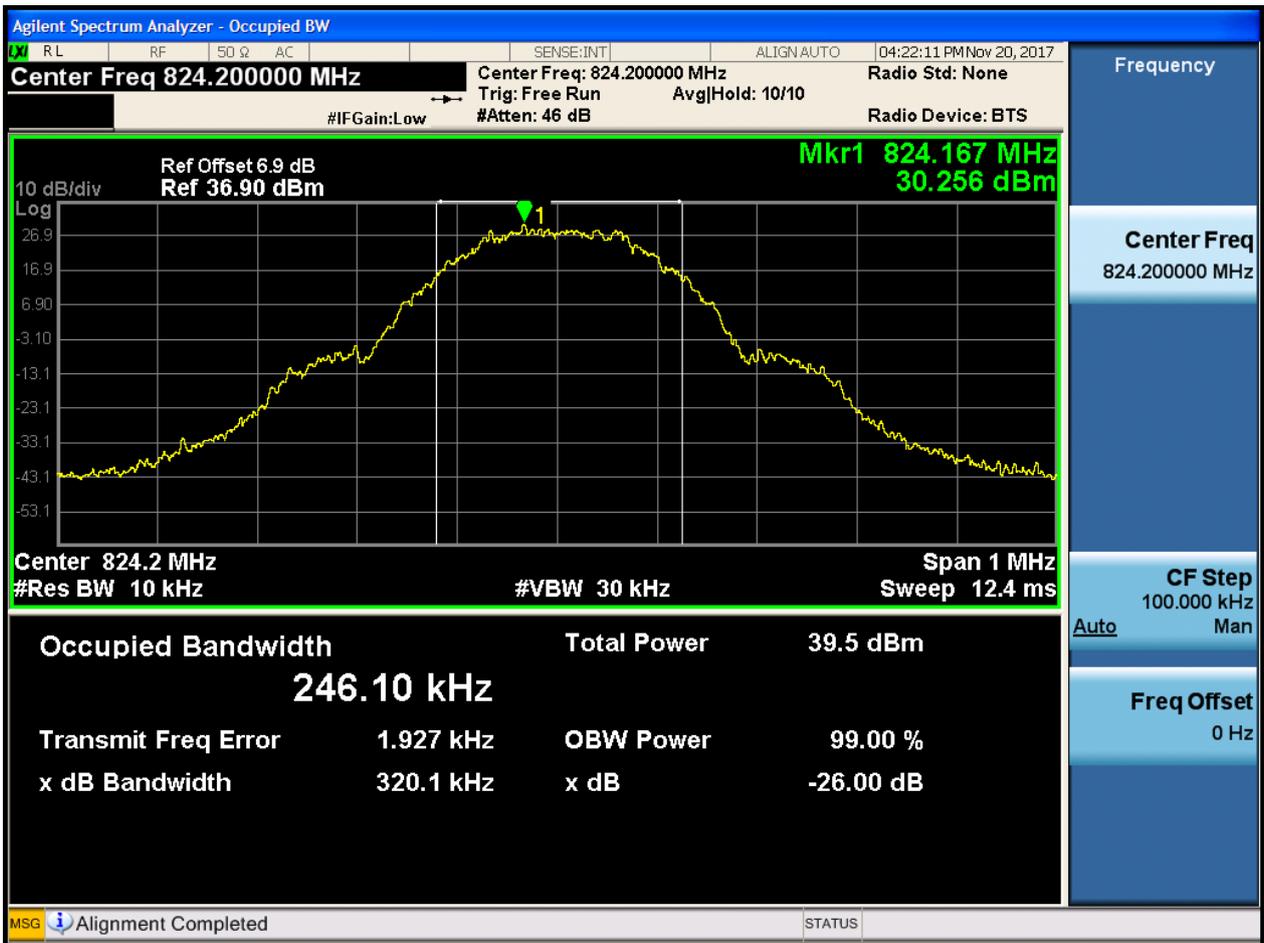
Part II - Test Plots

4.1 For GSM

4.1.4 Test Band = GSM850

4.1.4.1 Test Mode = GSM/TM1

4.1.4.1.1 Test Channel = LCH





4.1.4.1.2 Test Channel = MCH





4.1.4.1.3 Test Channel = HCH





4.1.4.2 Test Mode = GSM/TM2

4.1.4.2.1 Test Channel = LCH





4.1.4.2.2 Test Channel = MCH





4.1.4.2.3 Test Channel = HCH

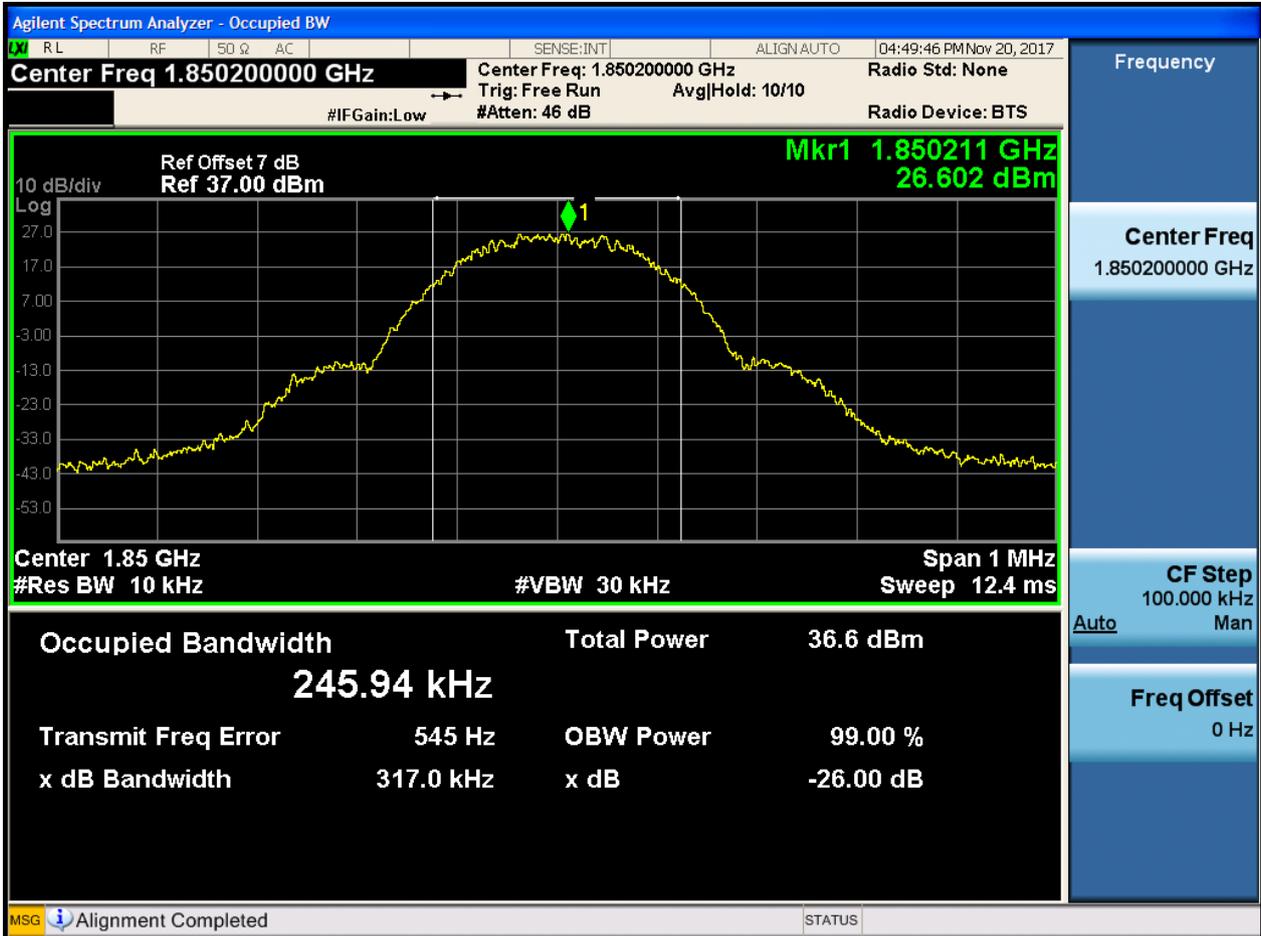




4.1.5 Test Band = GSM1900

4.1.5.1 Test Mode = GSM/TM1

4.1.5.1.1 Test Channel = LCH





4.1.5.1.2 Test Channel = MCH





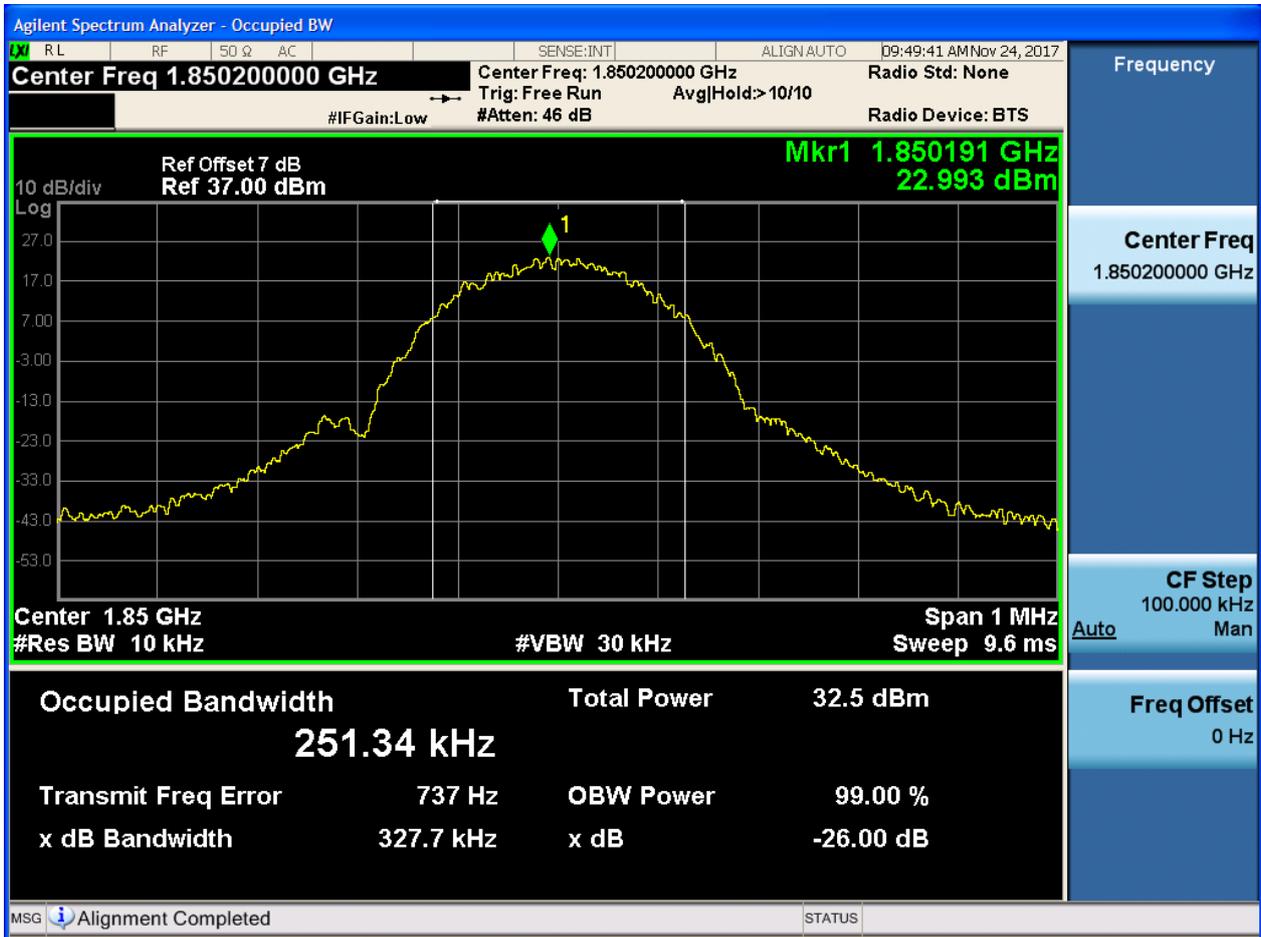
4.1.5.1.3 Test Channel = HCH





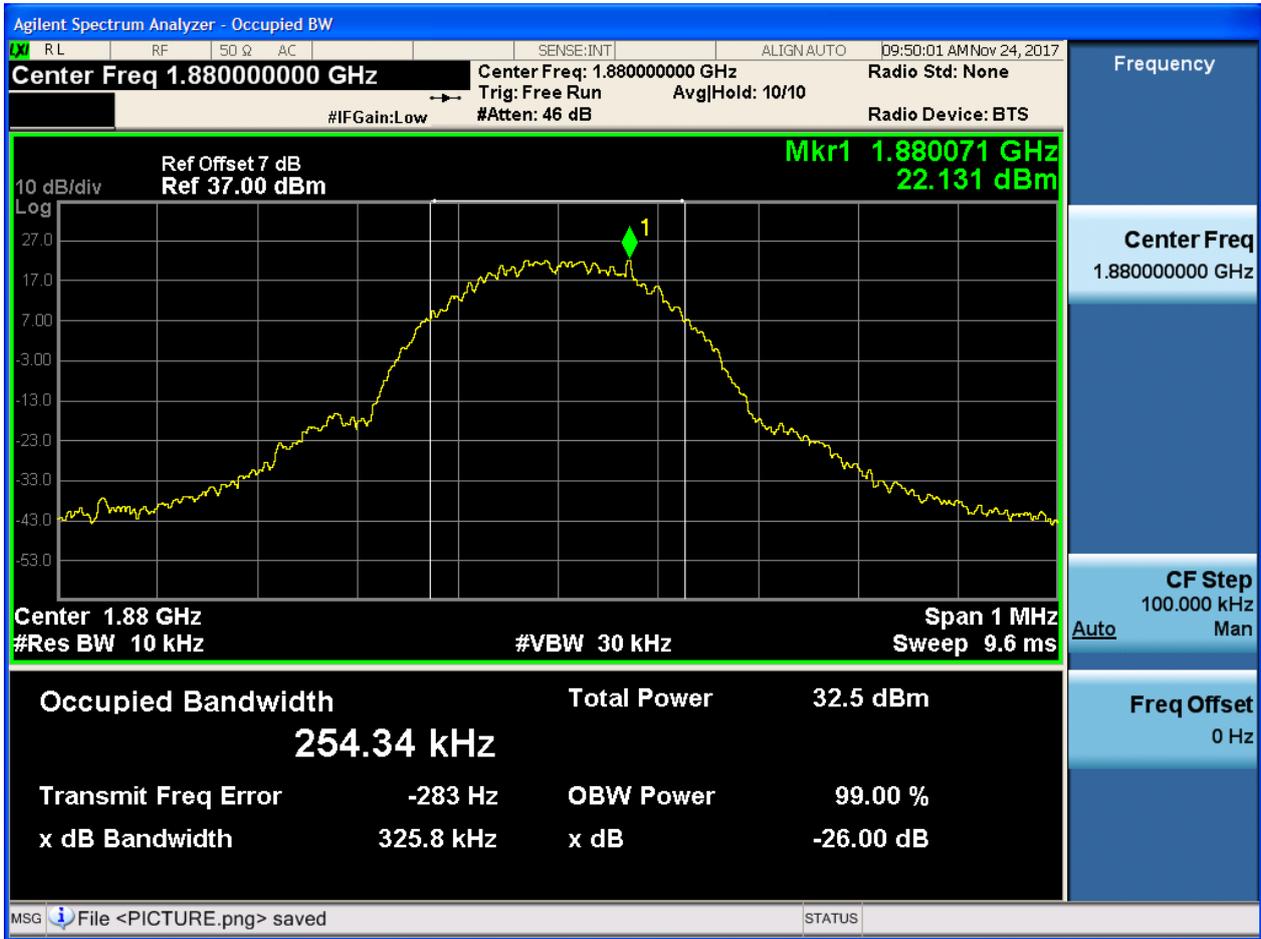
4.1.5.2 Test Mode = GSM/TM2

4.1.5.2.1 Test Channel = LCH





4.1.5.2.2 Test Channel = MCH





4.1.5.2.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

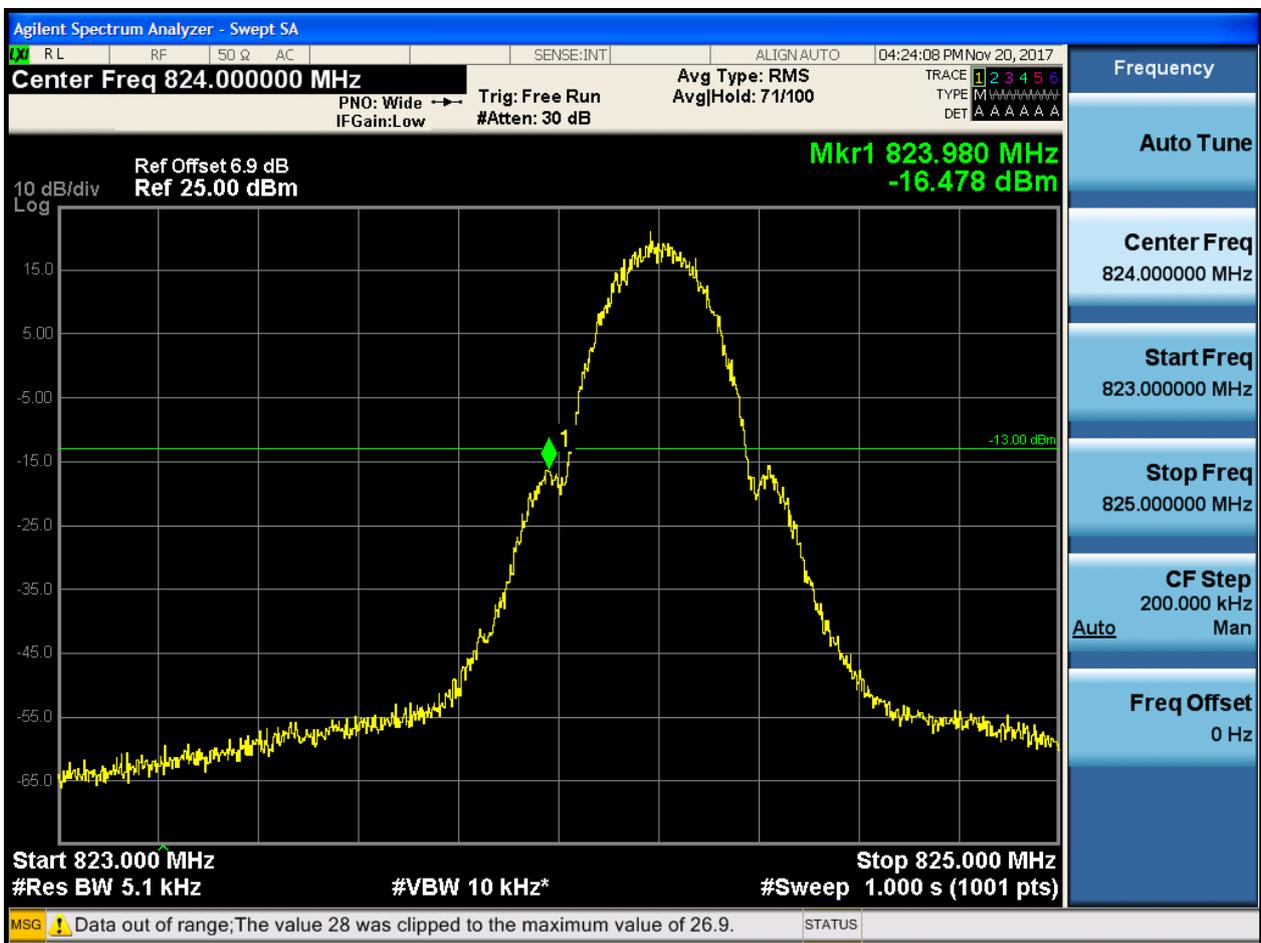
Part I - Test Plots

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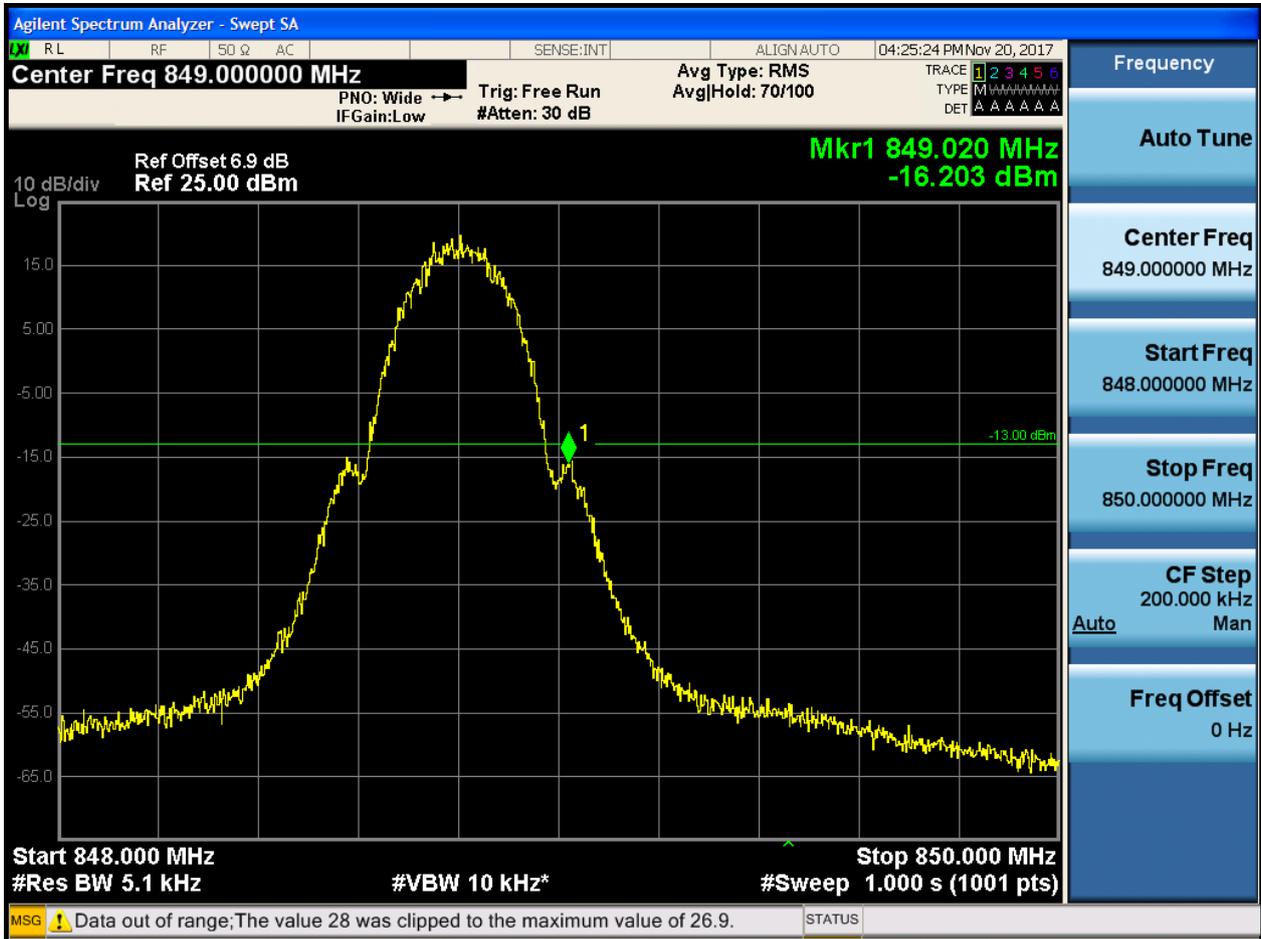
5.1.3 Test Band = GSM850

5.1.3.1 Test Mode = GSM/TM1

5.1.3.1.1 Test Channel = LCH

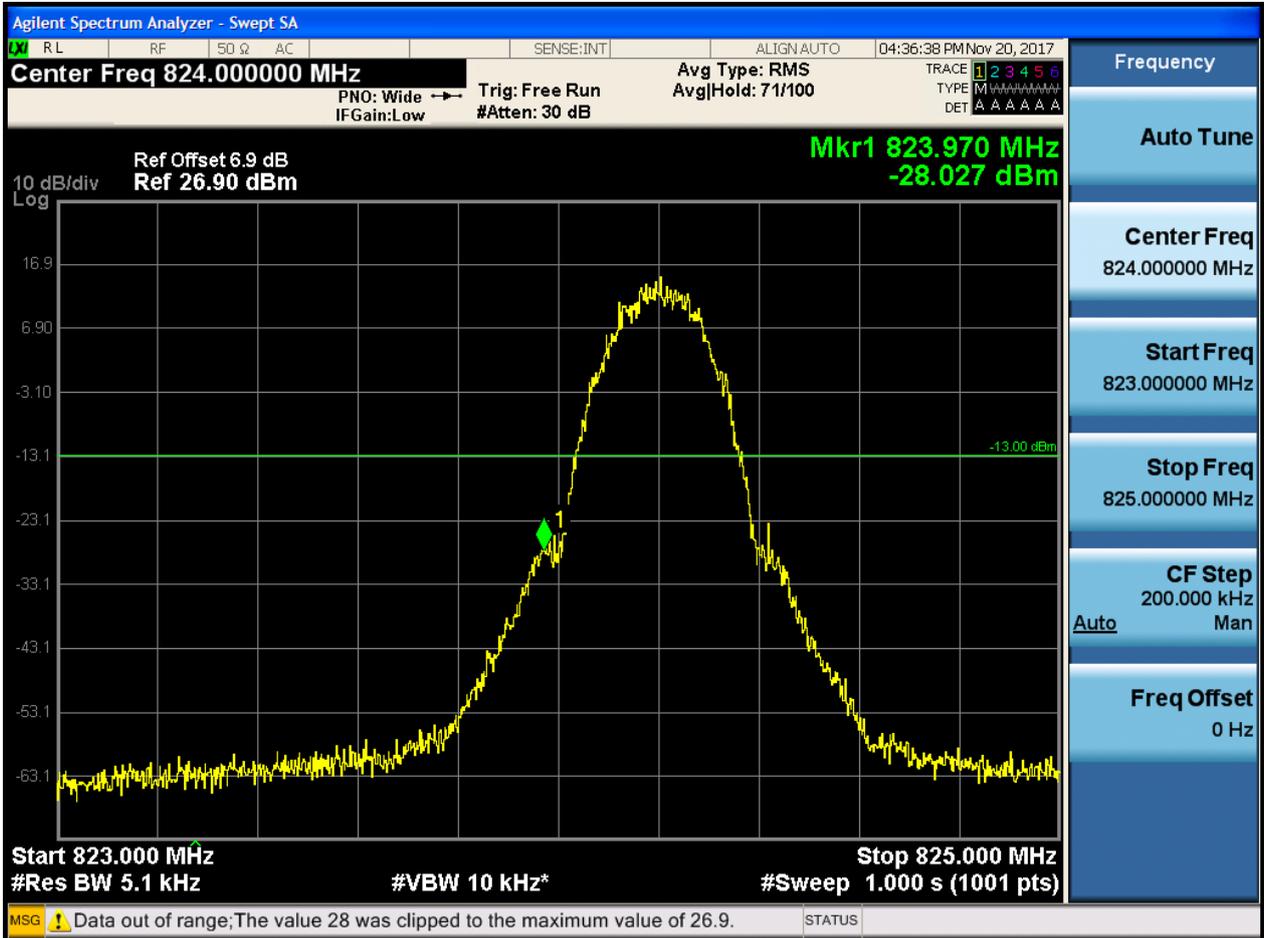


5.1.3.1.2 Test Channel = HCH

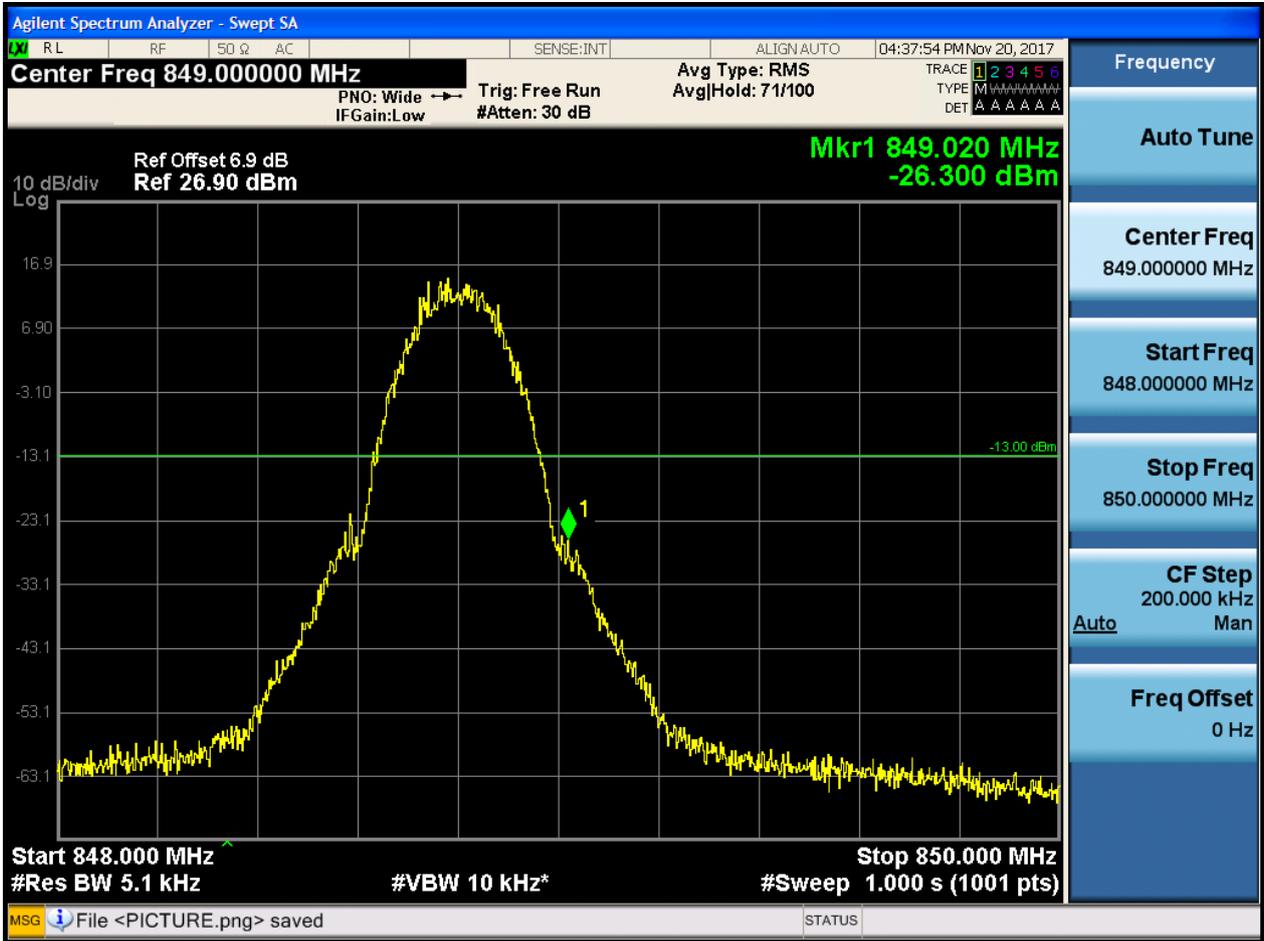


5.1.3.2 Test Mode = GSM/TM2

5.1.3.2.1 Test Channel = LCH



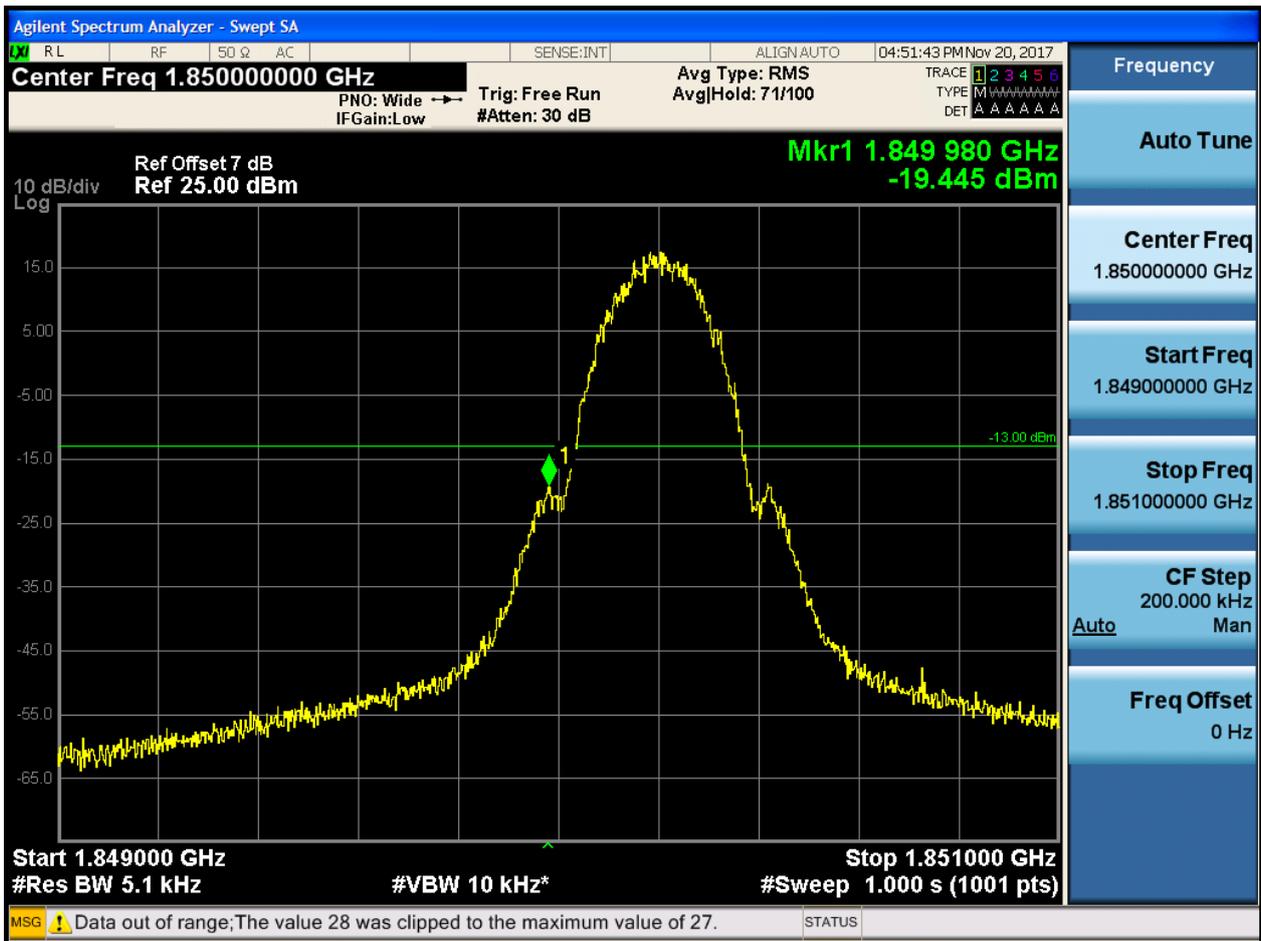
5.1.3.2.2 Test Channel = HCH



5.1.4 Test Band = GSM1900

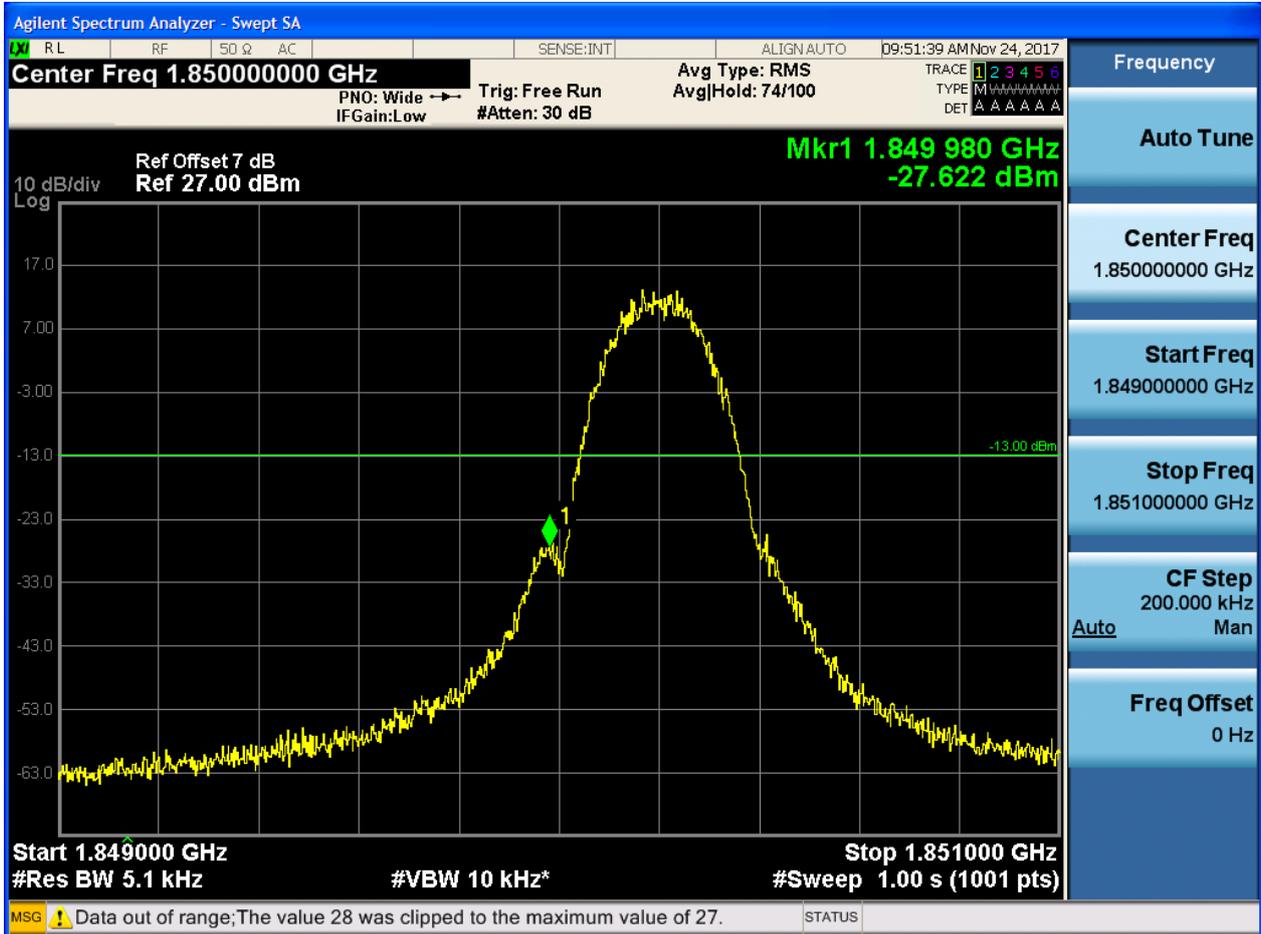
5.1.4.1 Test Mode = GSM/TM1

5.1.4.1.1 Test Channel = LCH

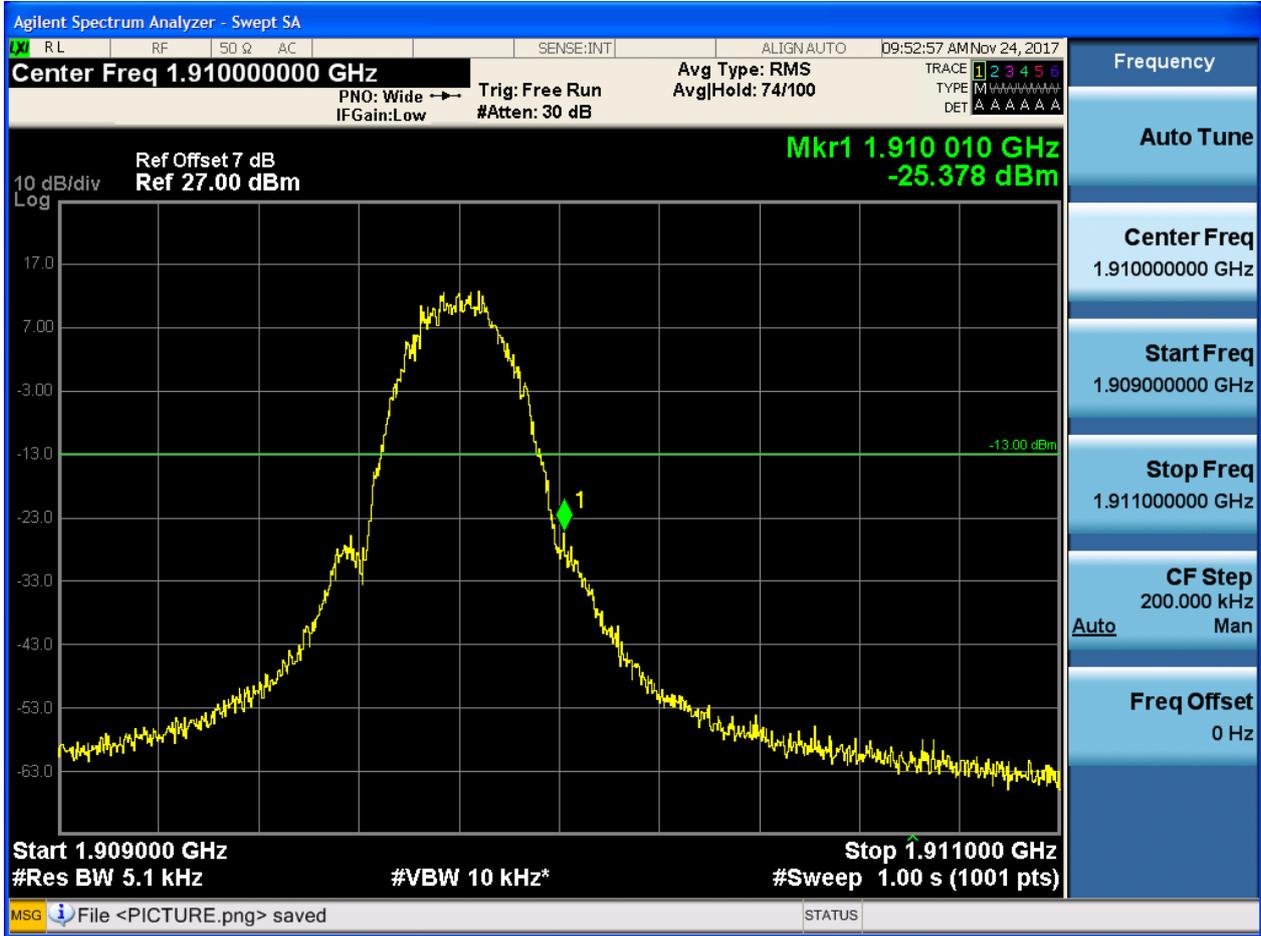


5.1.4.2 Test Mode = GSM/TM2

5.1.4.2.1 Test Channel = LCH



5.1.4.2.2 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.



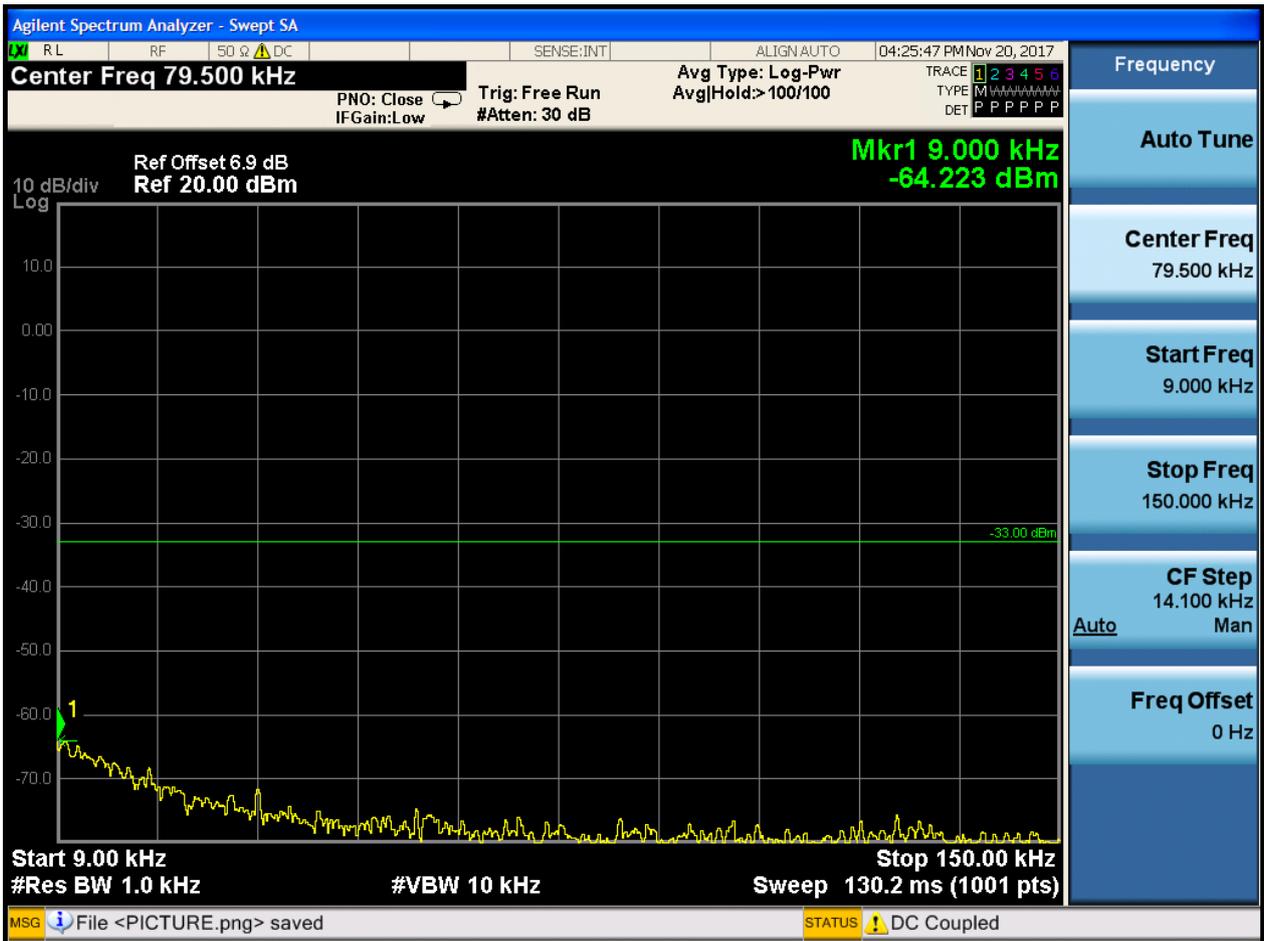
Part I - Test Plots

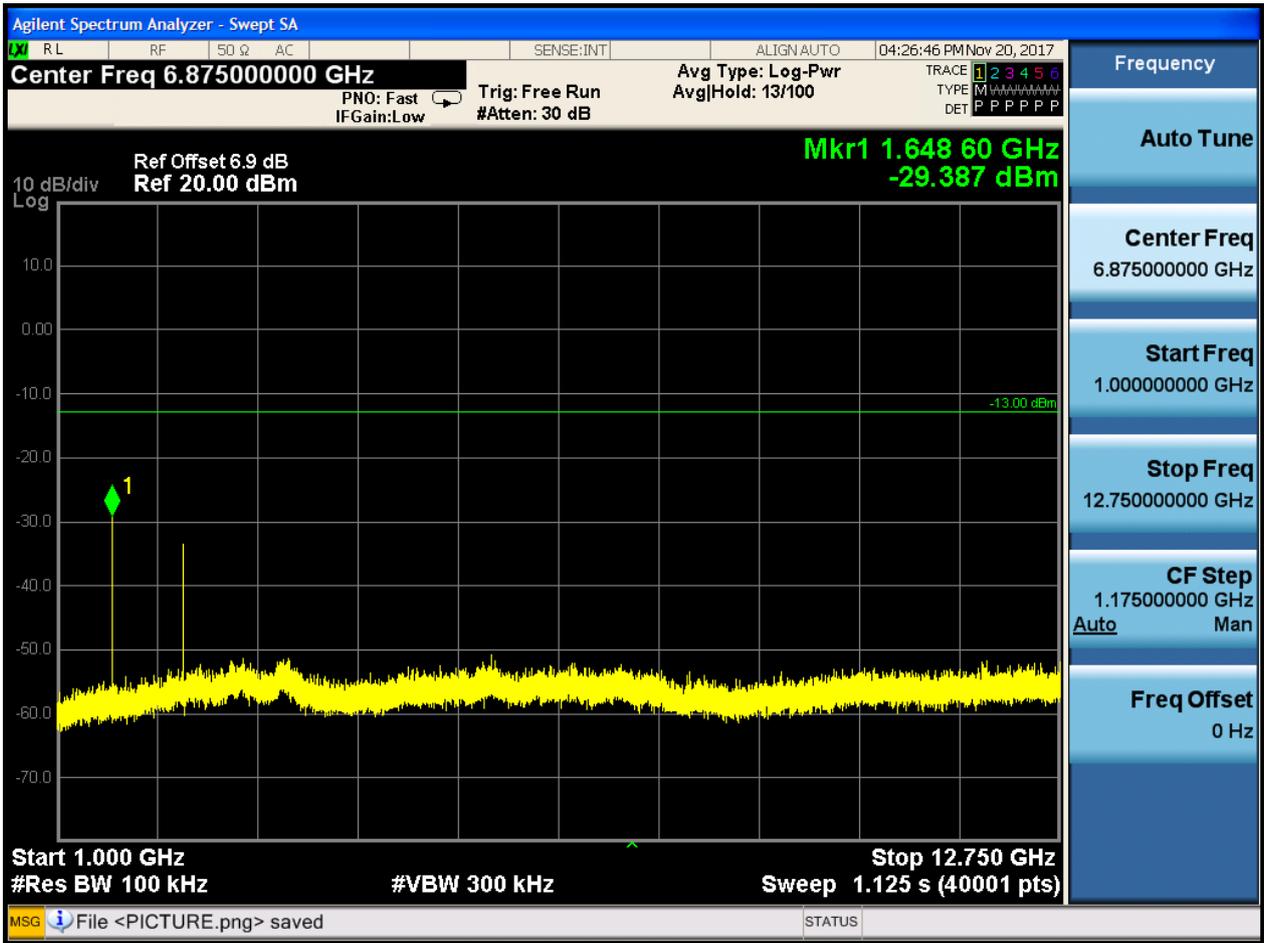
6.1 For GSM

6.1.2 Test Band = GSM850

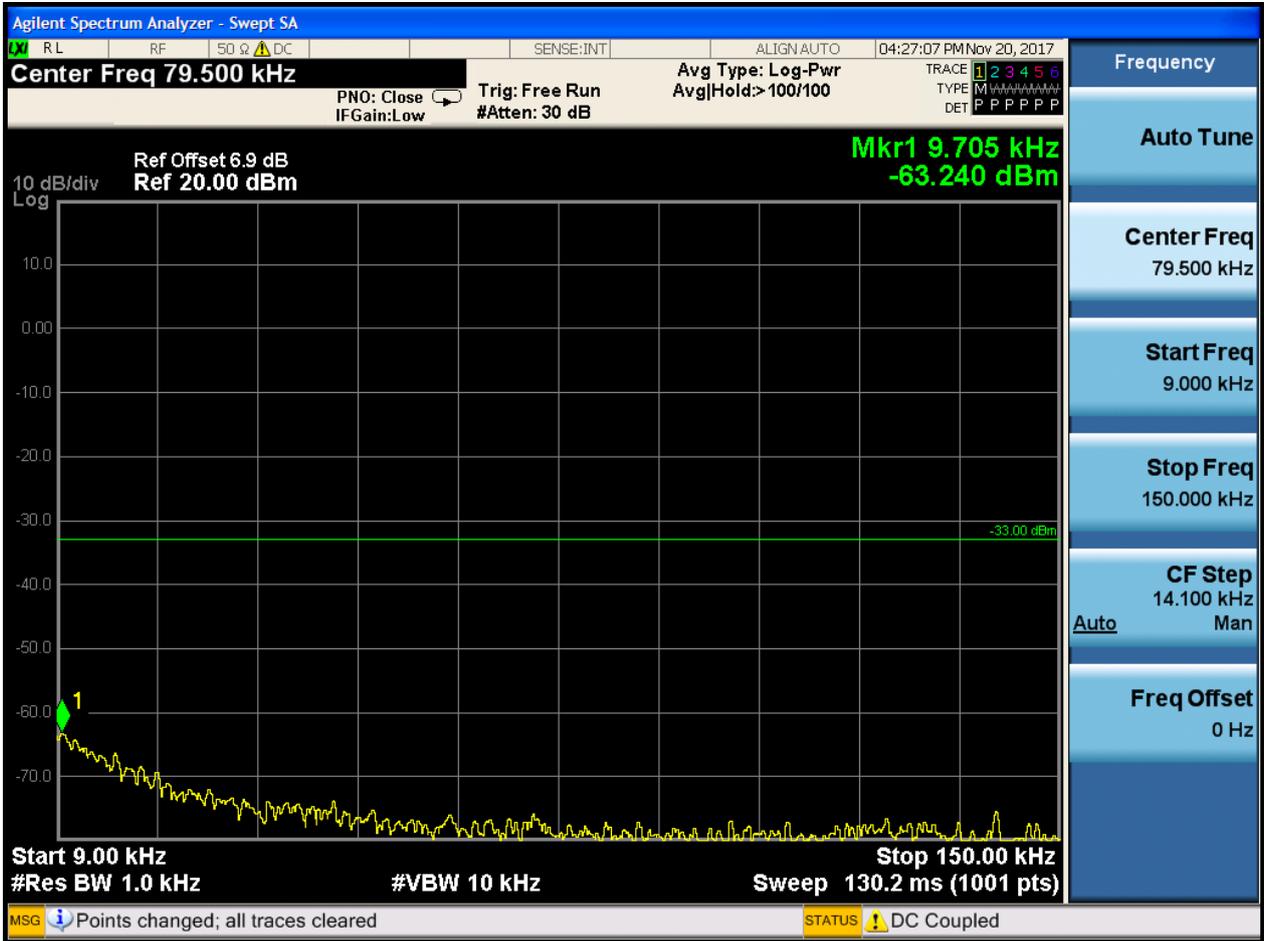
6.1.2.1 Test Mode = GSM/TM1

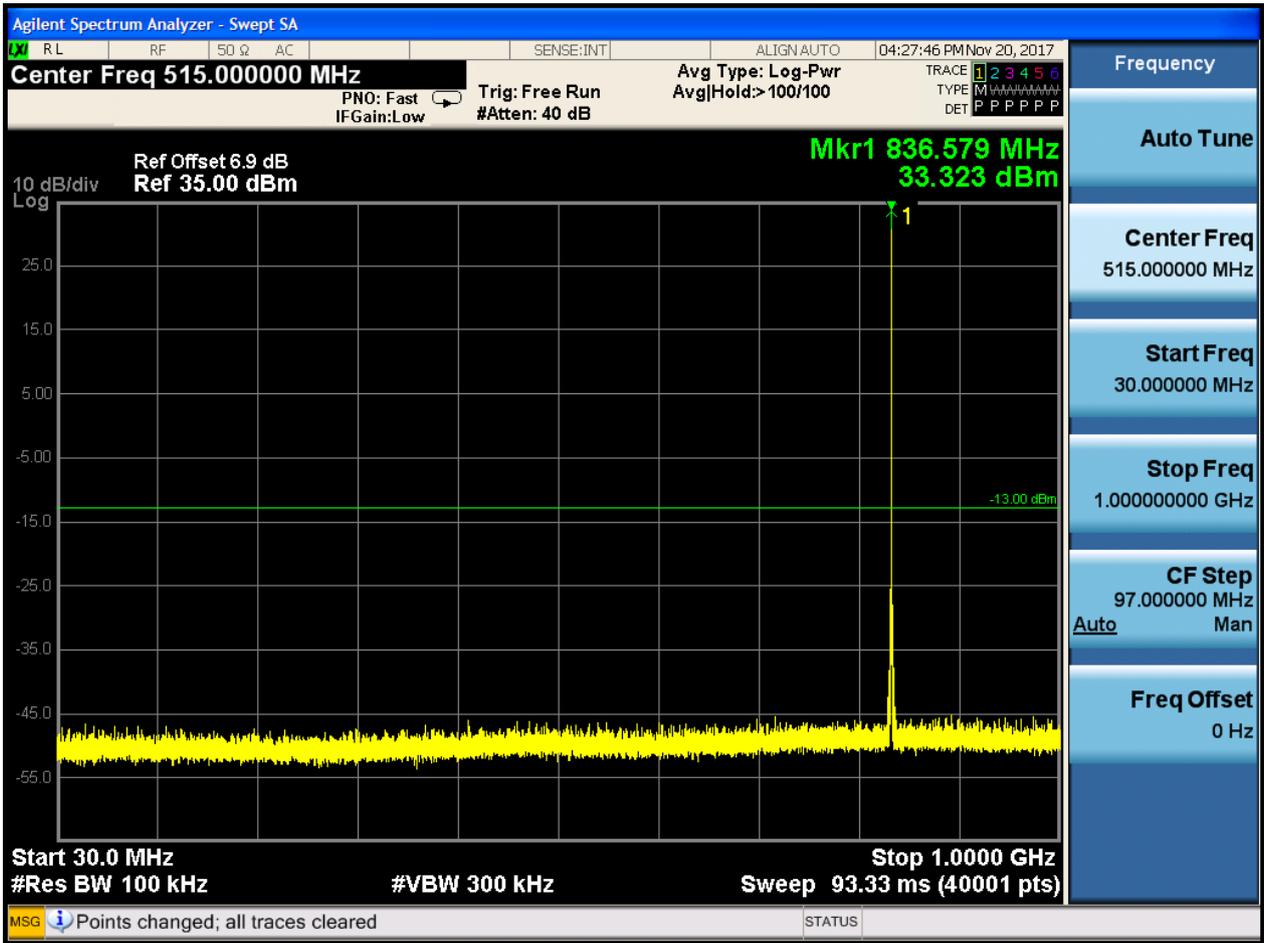
6.1.2.1.1 Test Channel = LCH

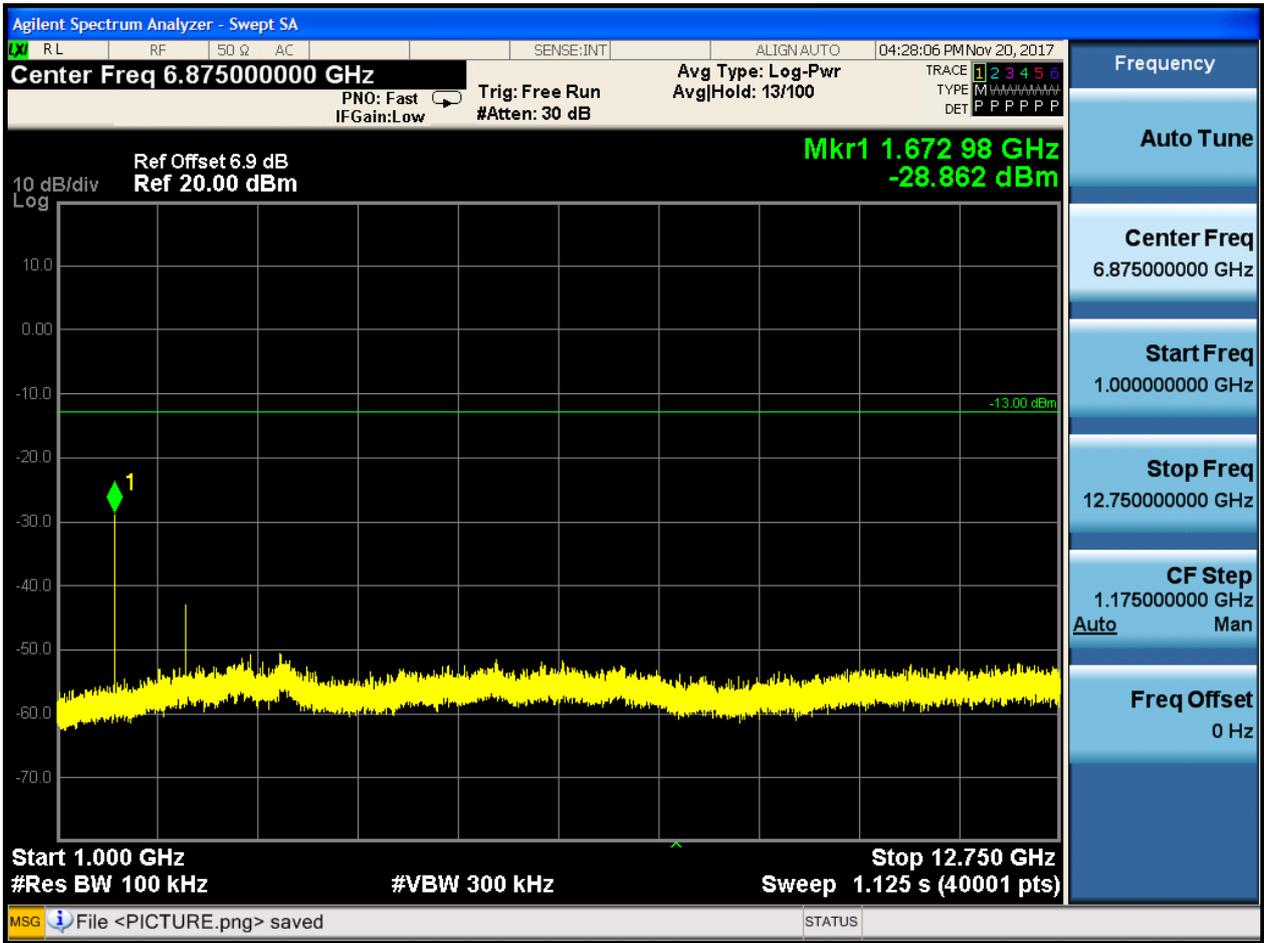




6.1.2.1.2 Test Channel = MCH

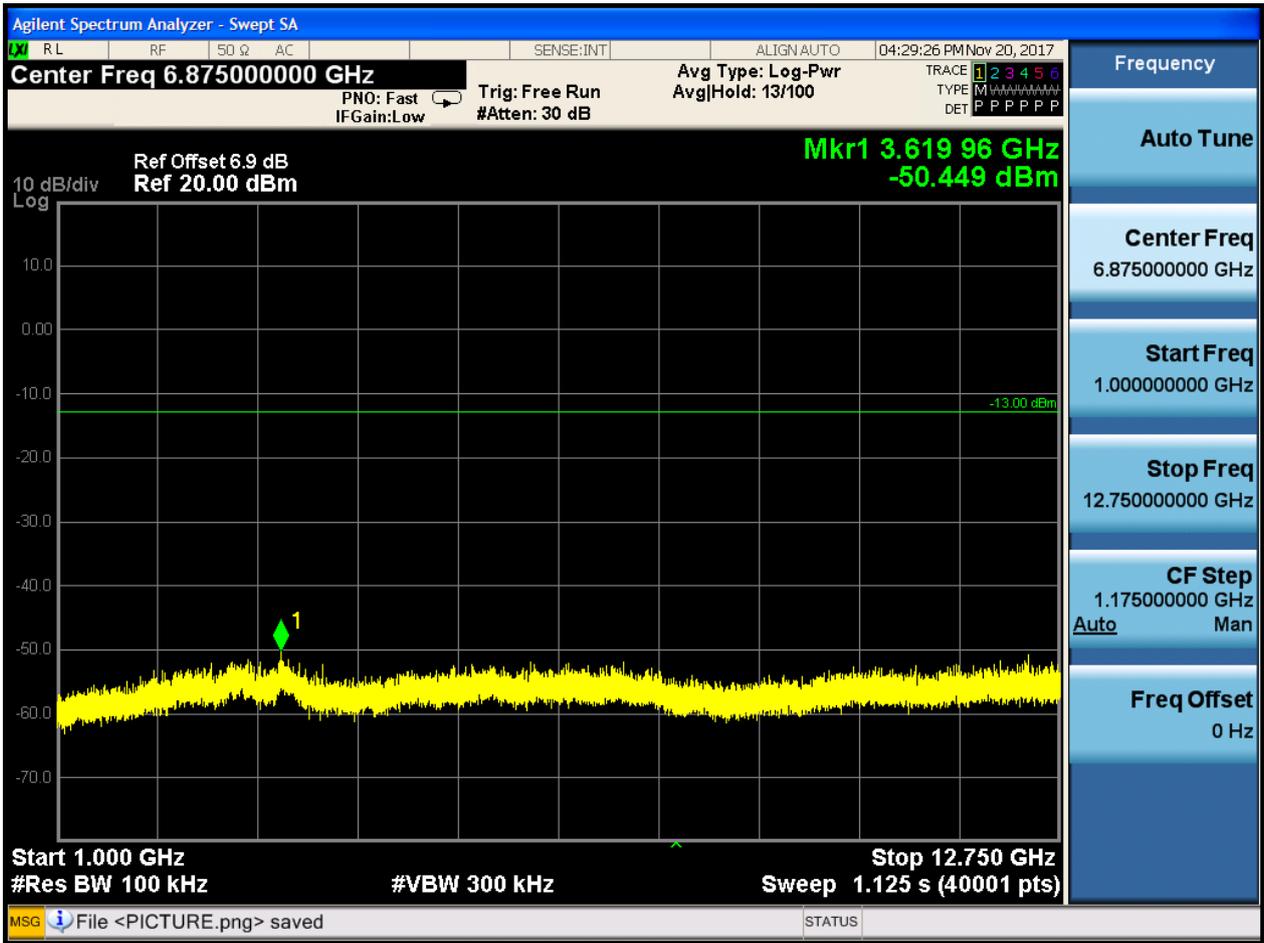






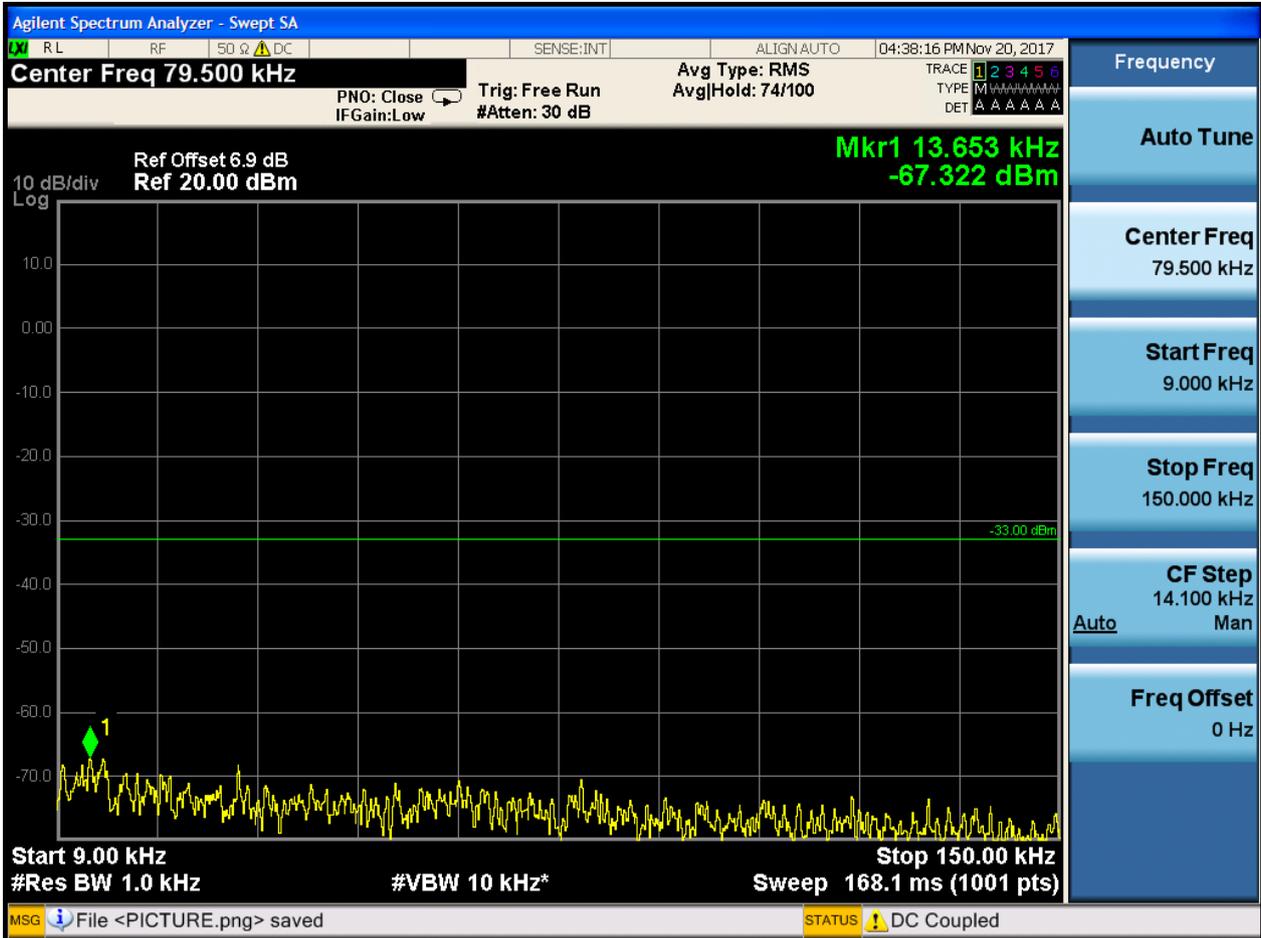
6.1.2.1.3 Test Channel = HCH

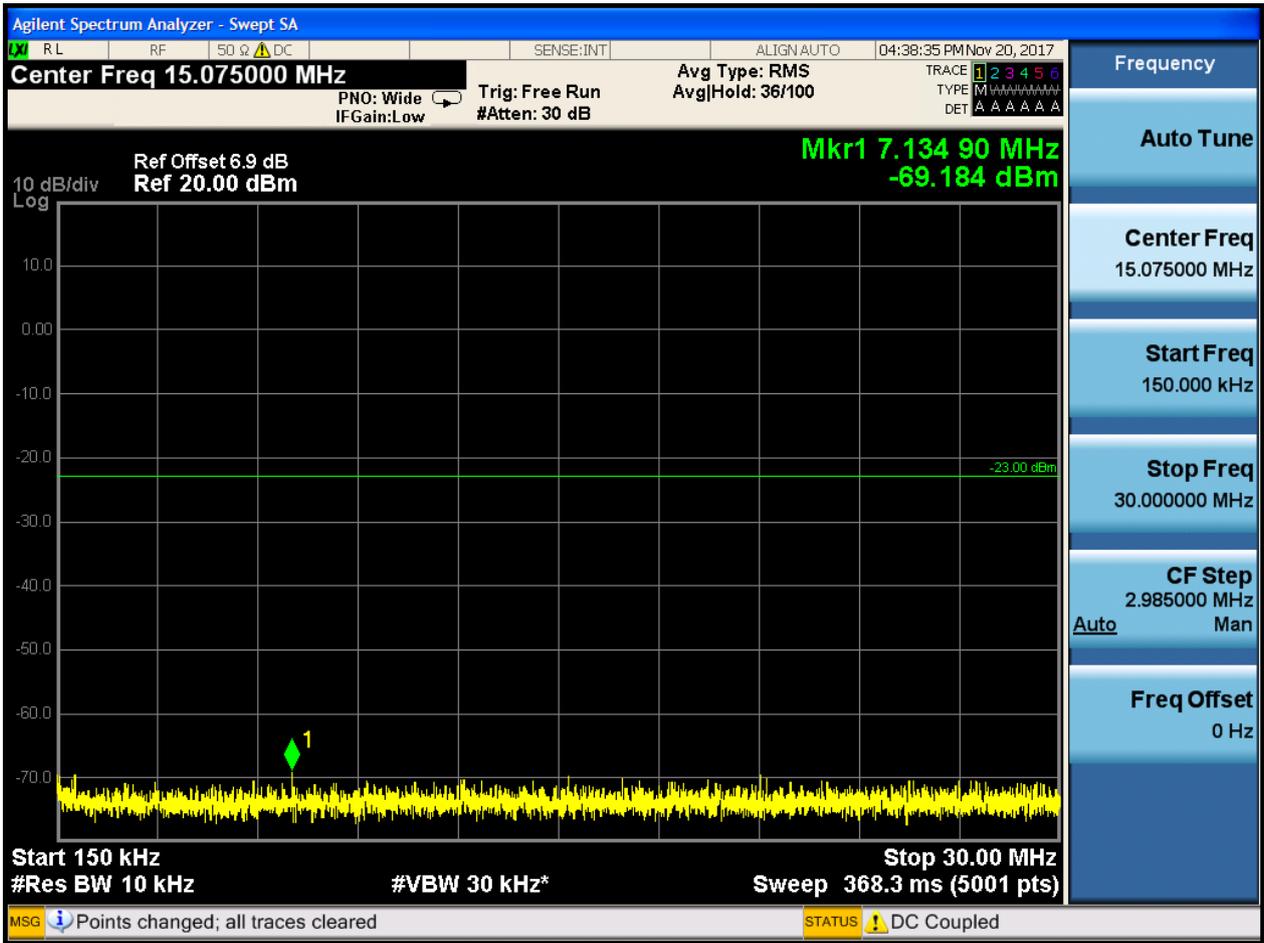


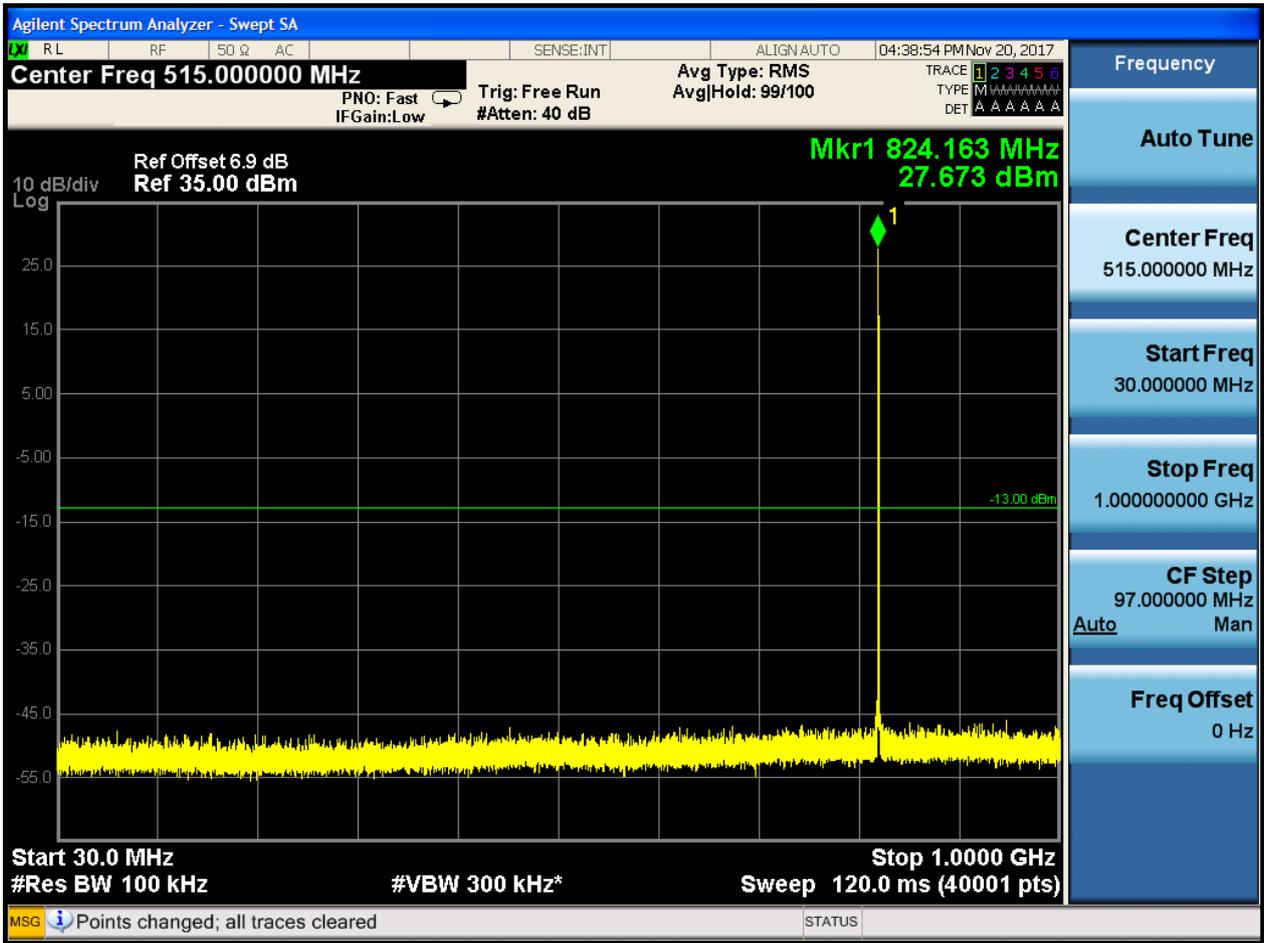


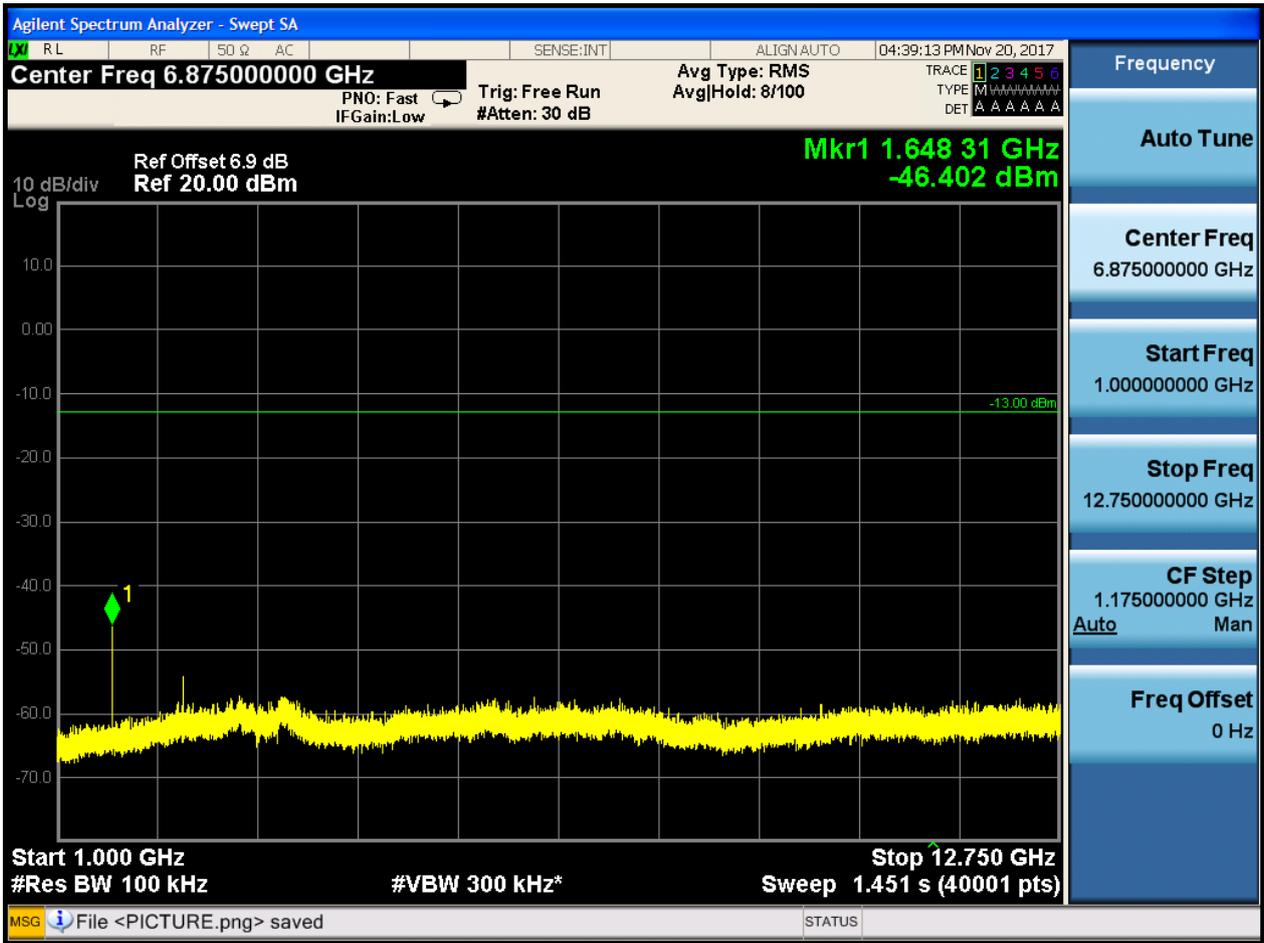
6.1.2.2 Test Mode = GSM/TM2

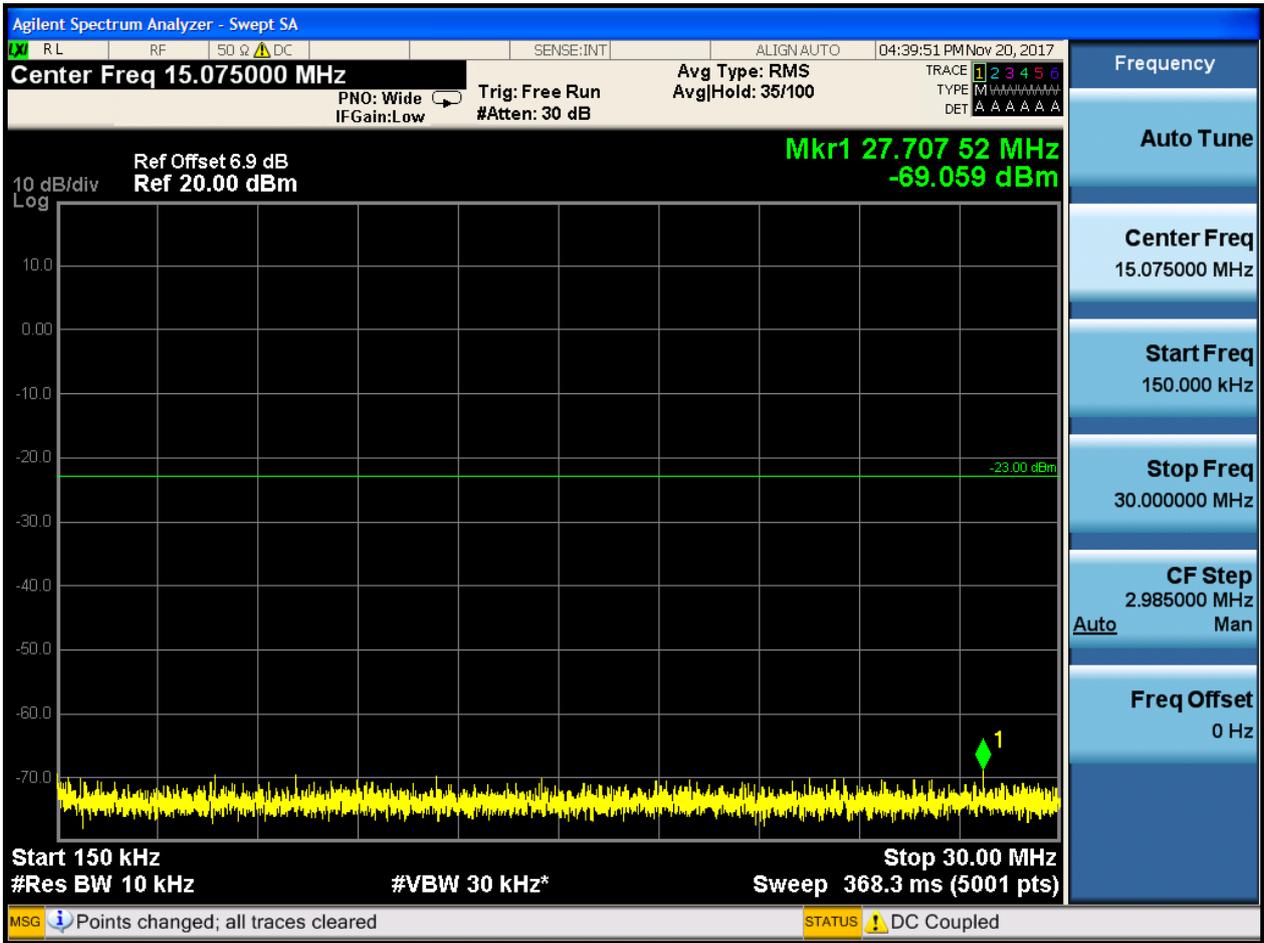
6.1.2.2.1 Test Channel = LCH

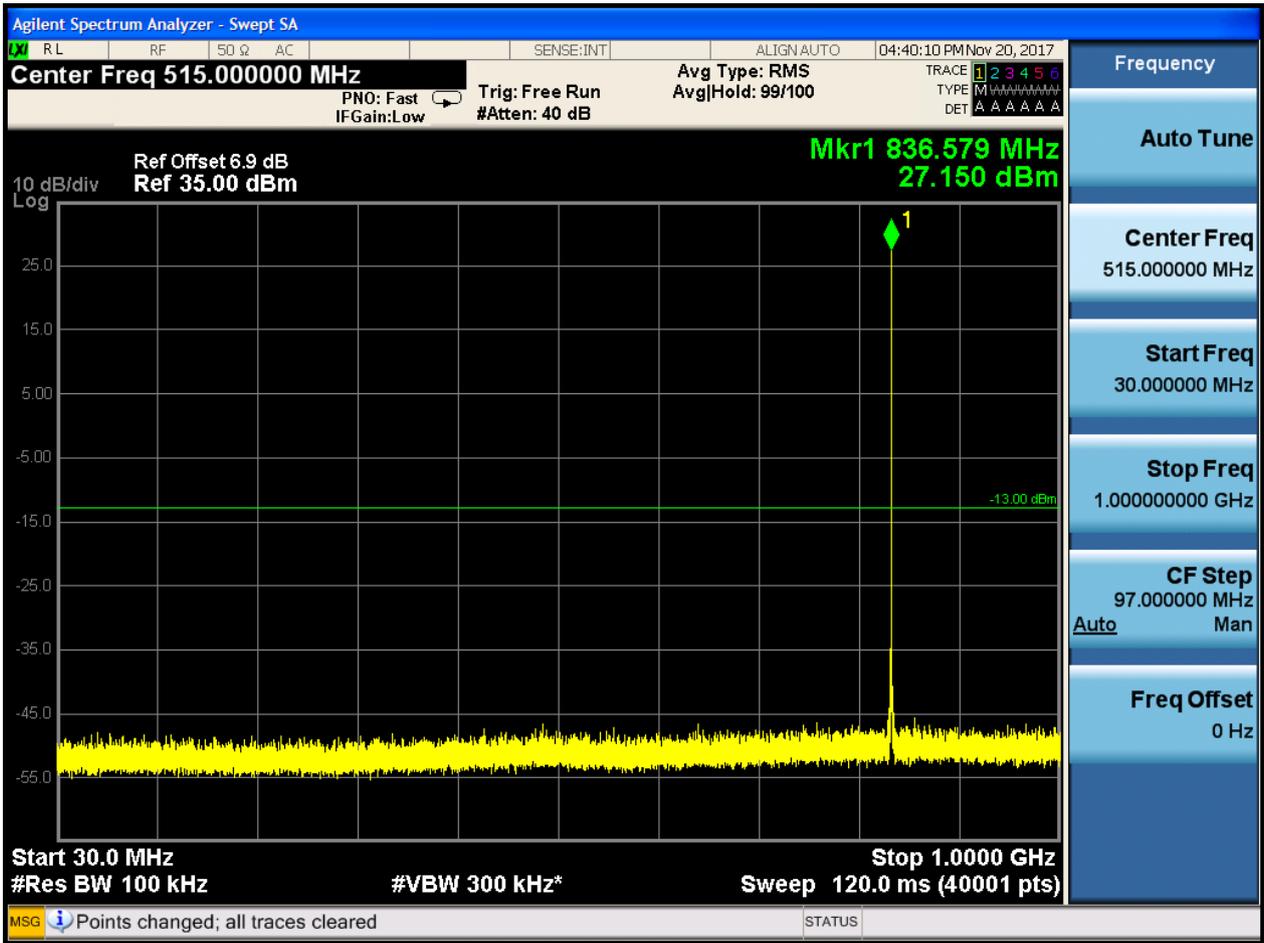


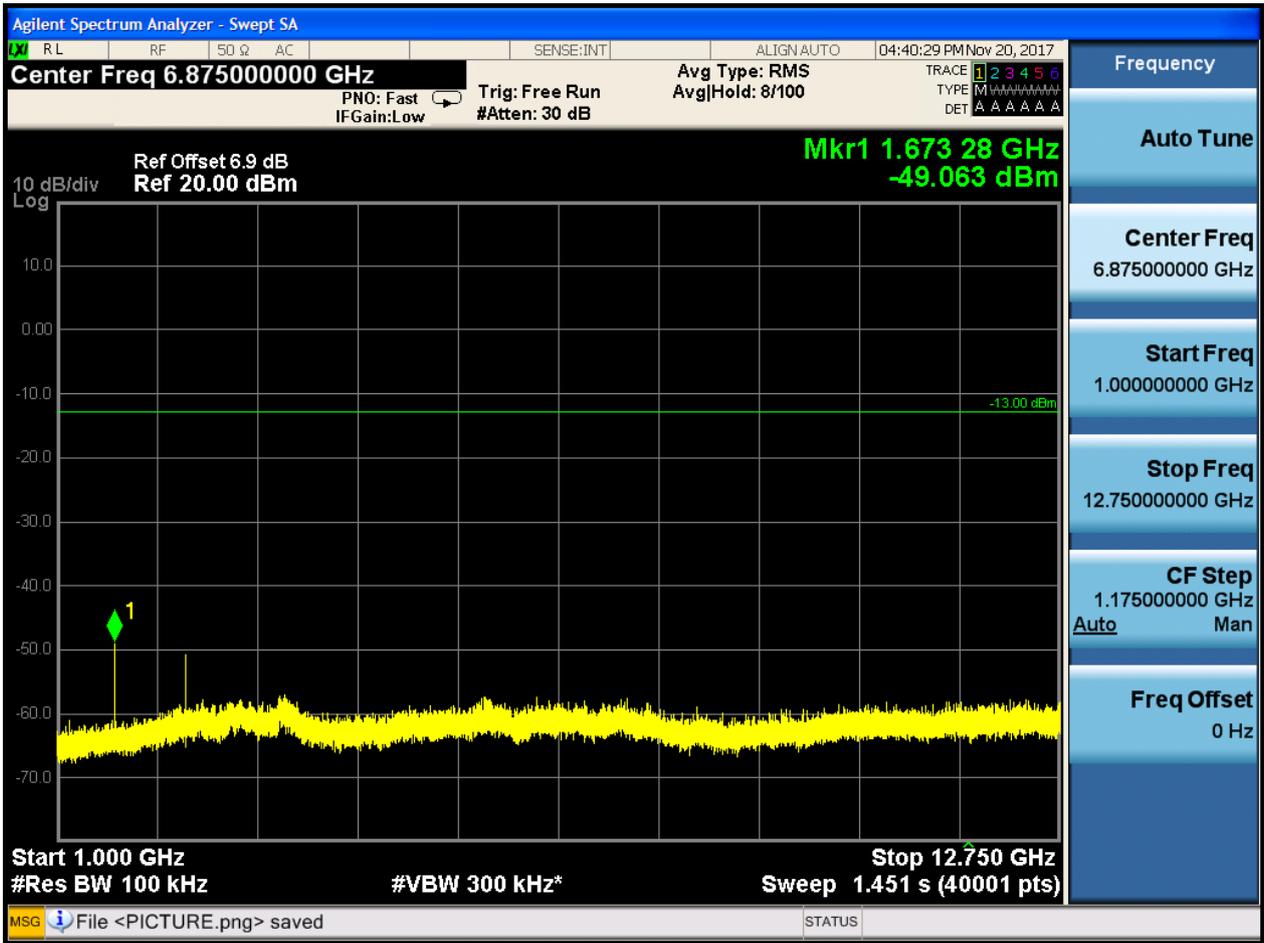




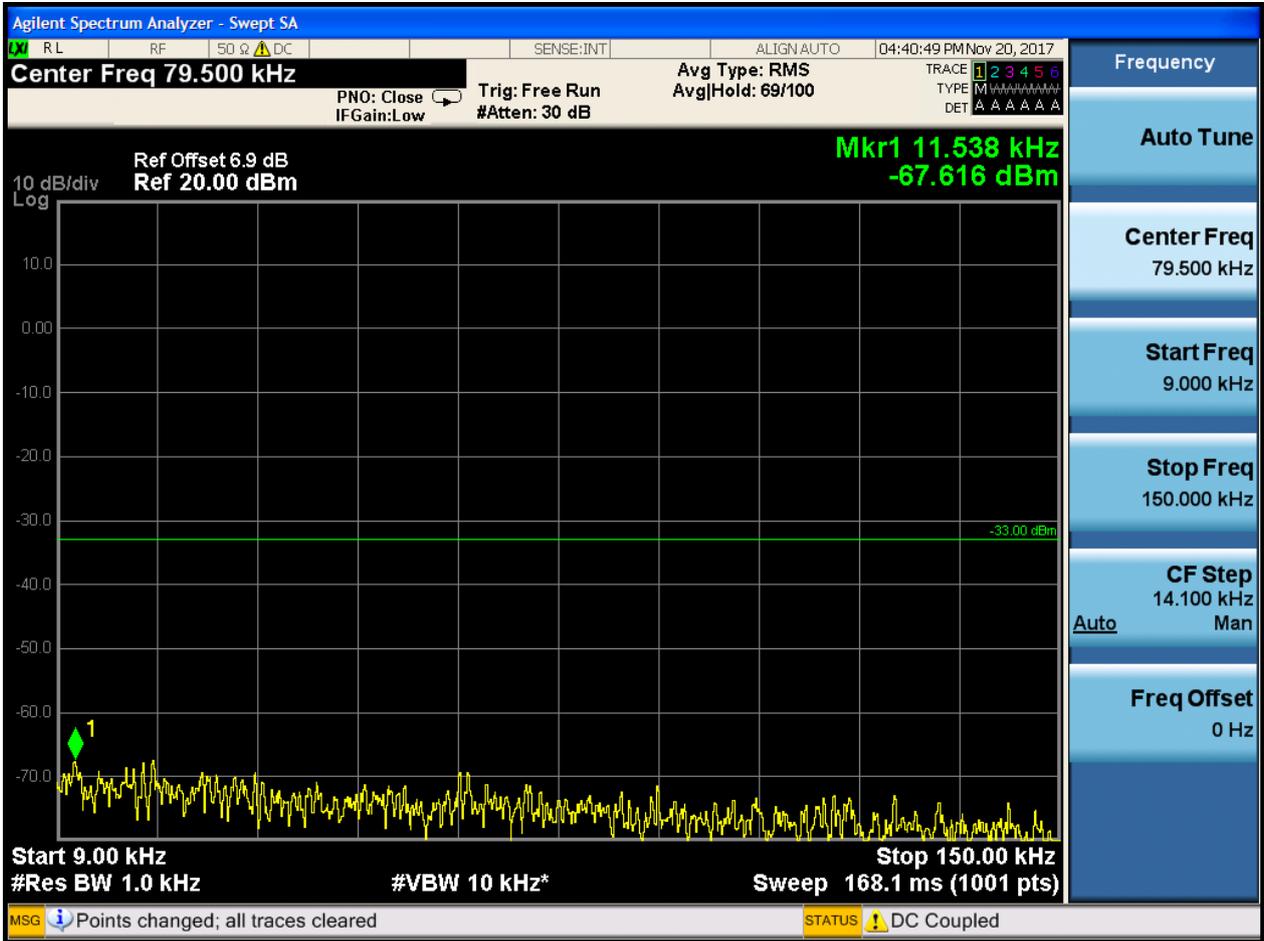


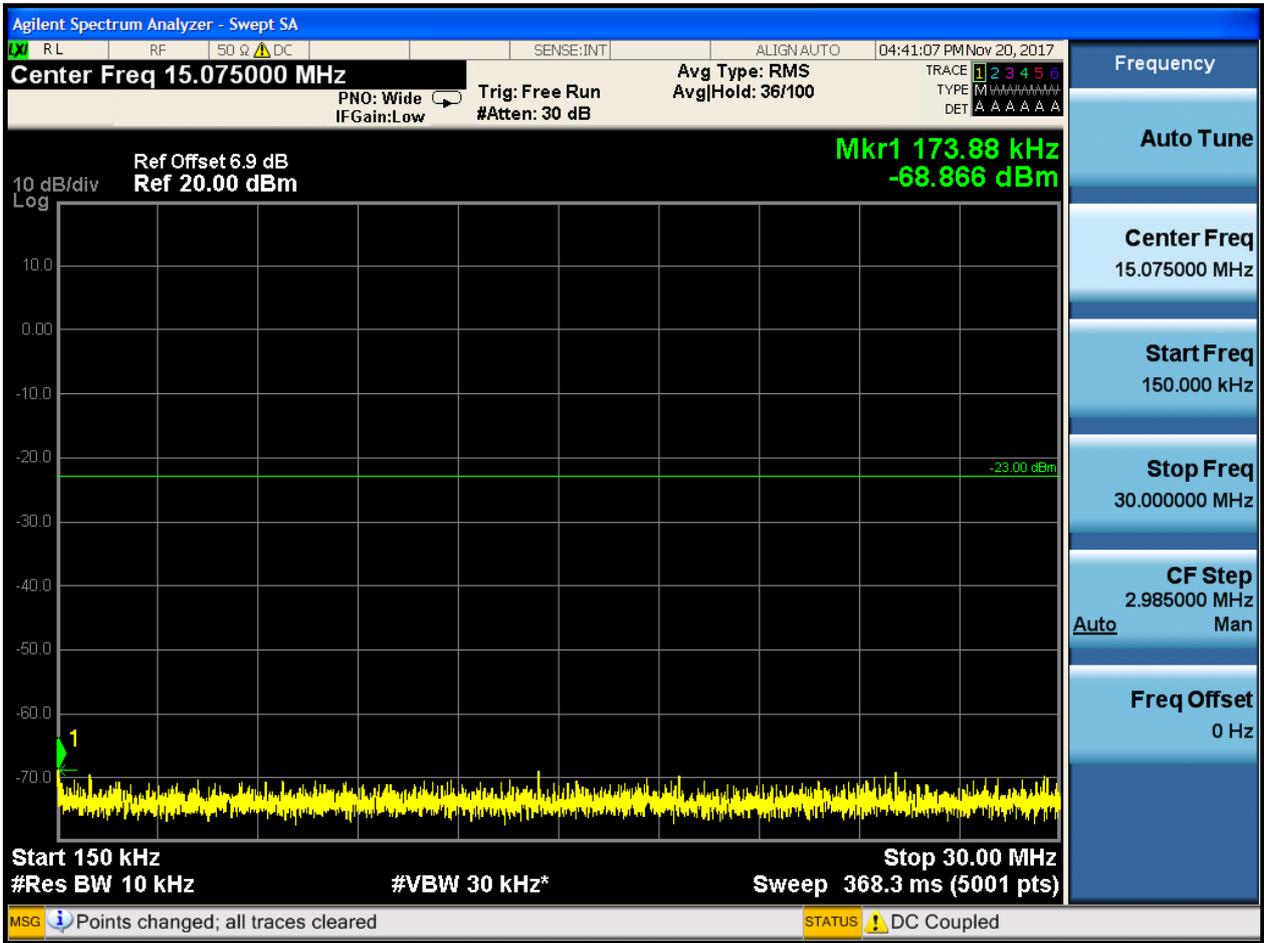


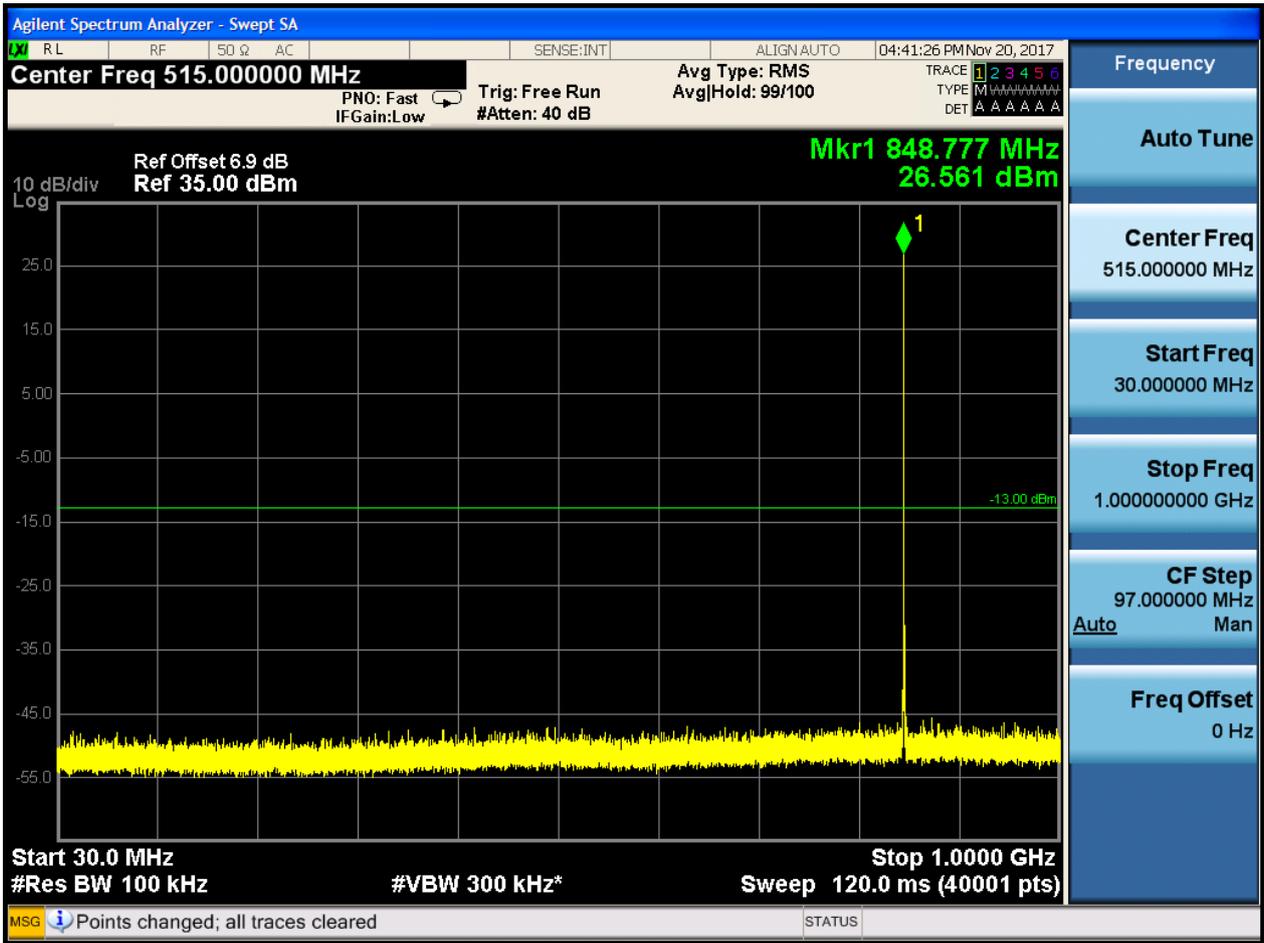


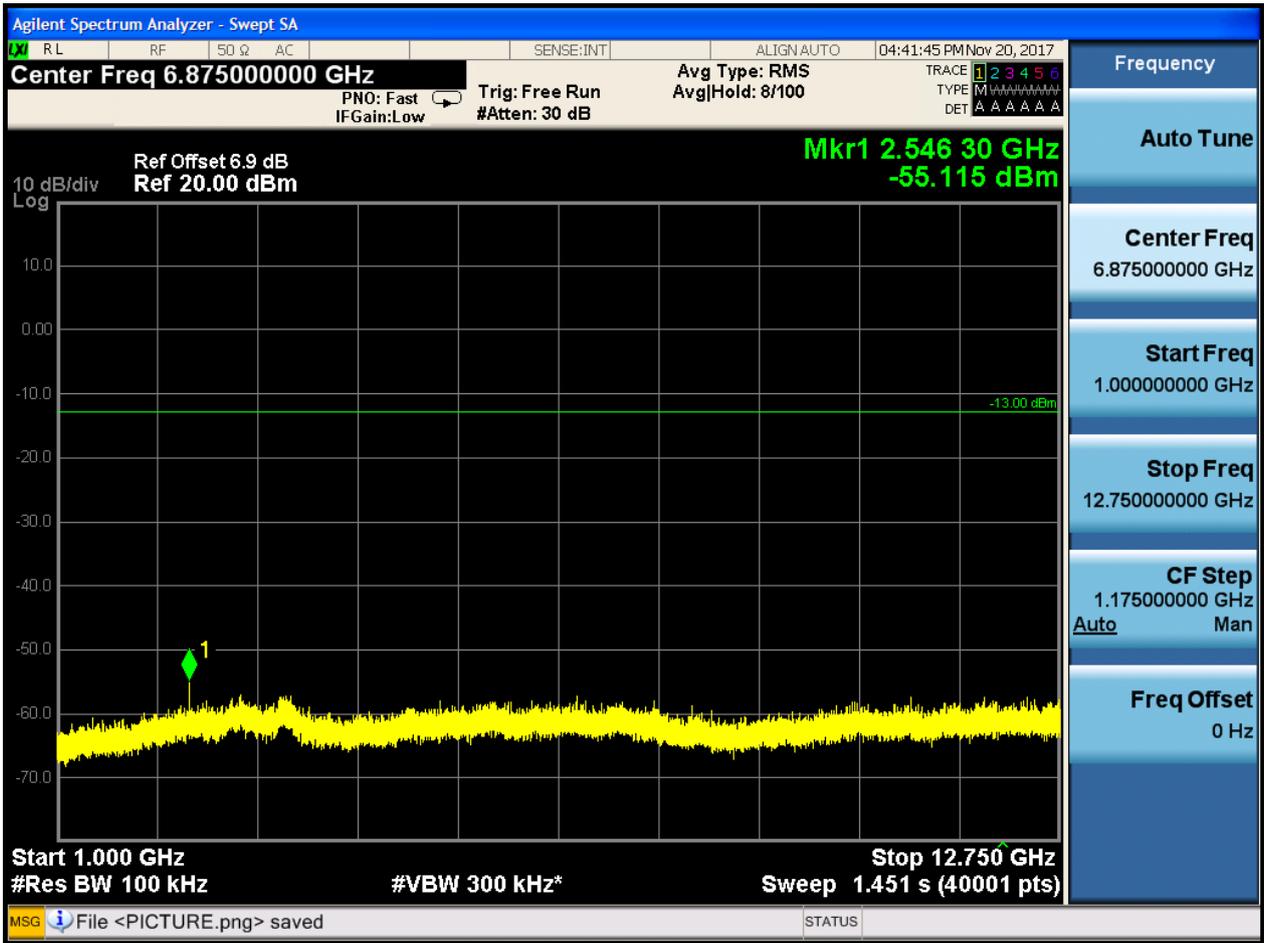


6.1.2.2.3 Test Channel = HCH







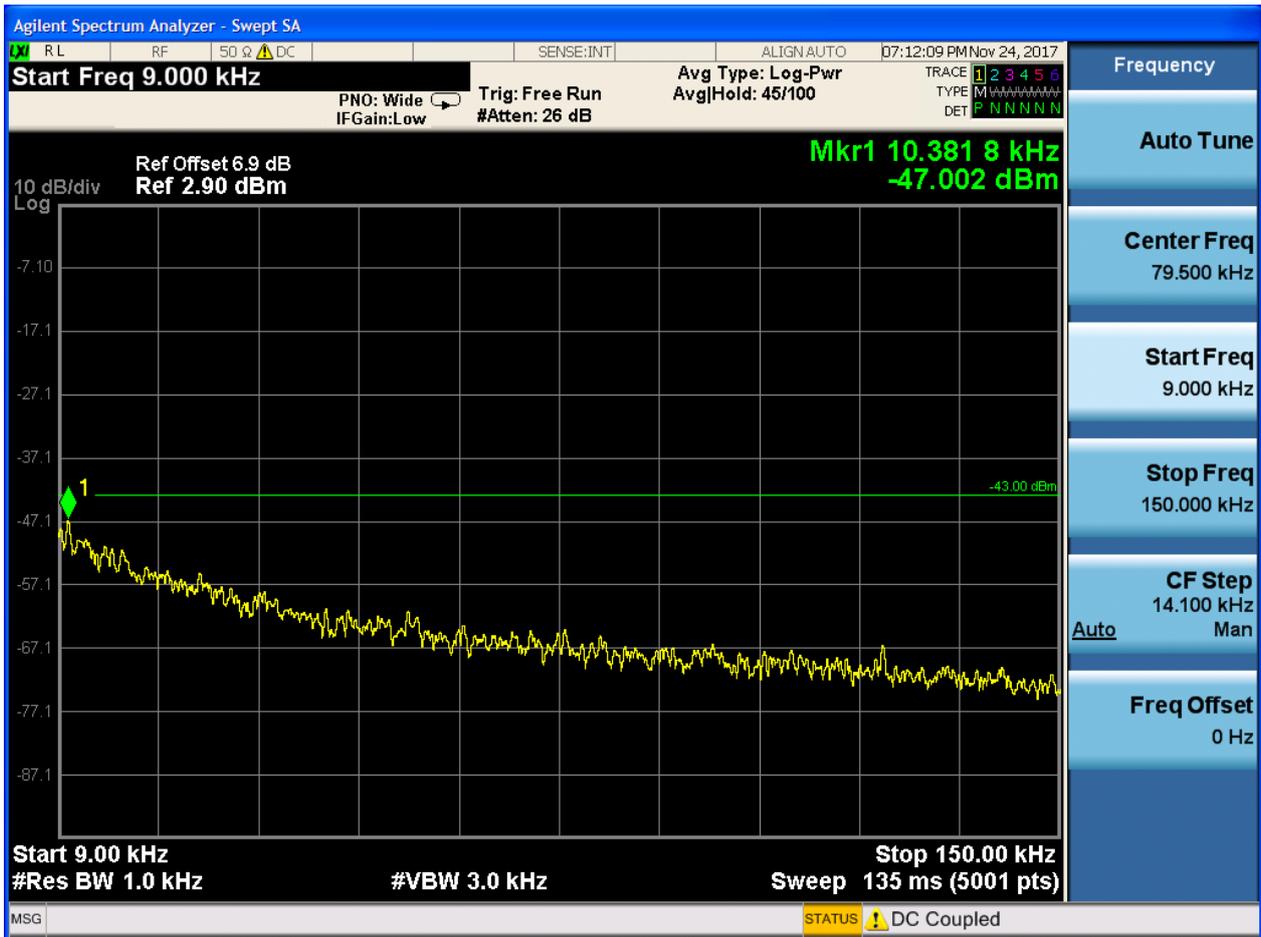


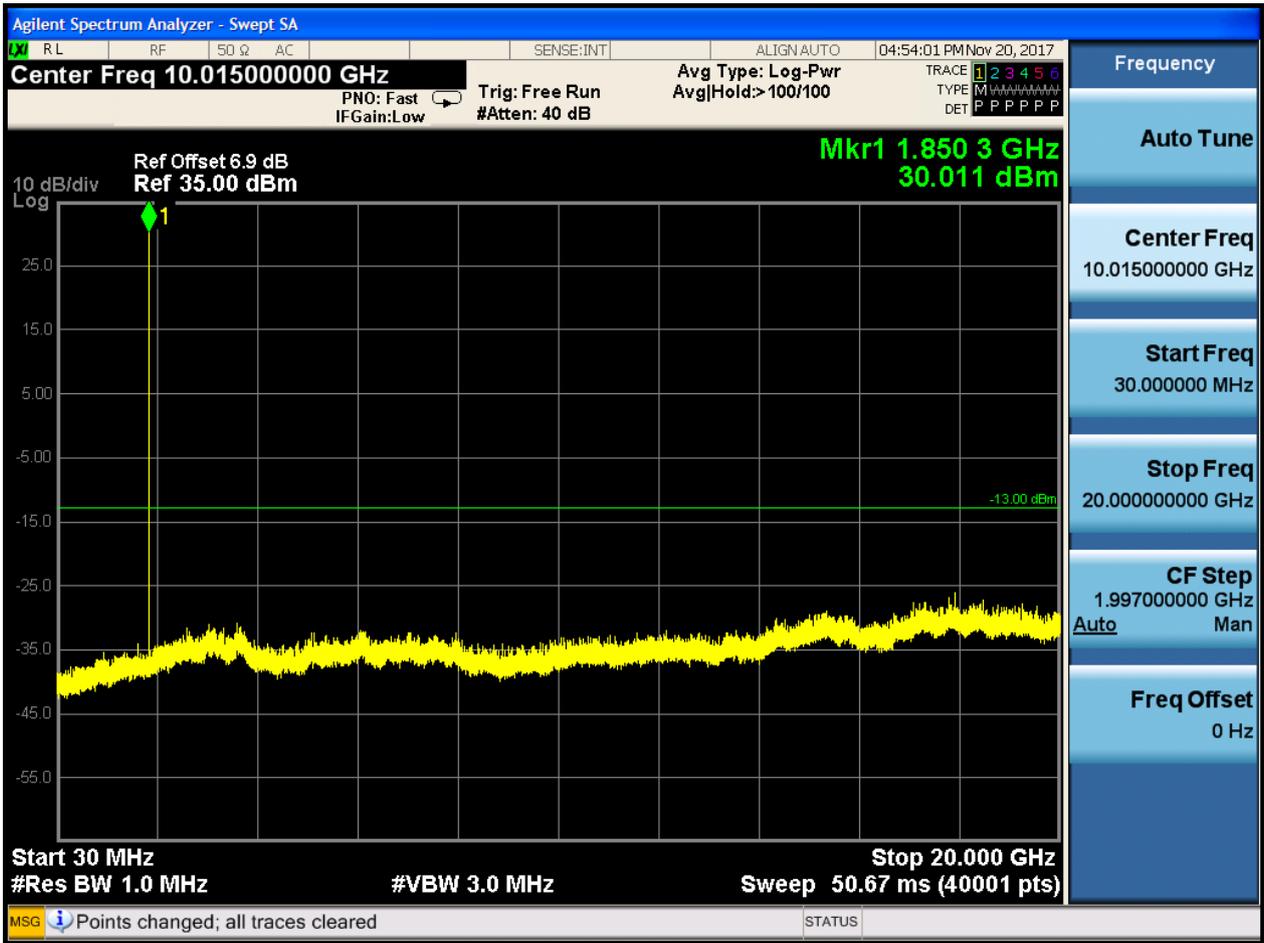


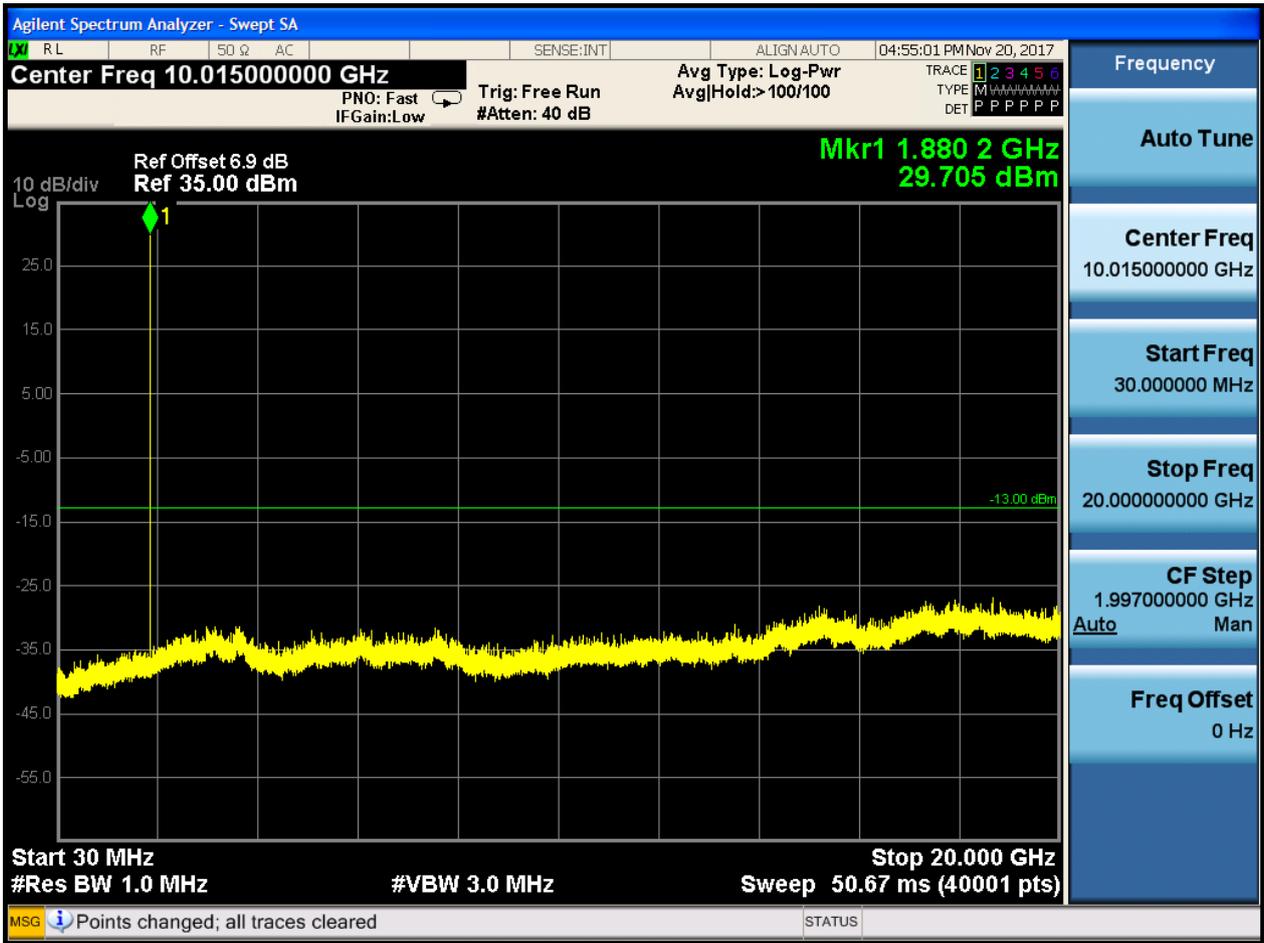
6.1.3 Test Band = GSM1900

6.1.3.1 Test Mode = GSM/TM1

6.1.3.1.1 Test Channel = LCH

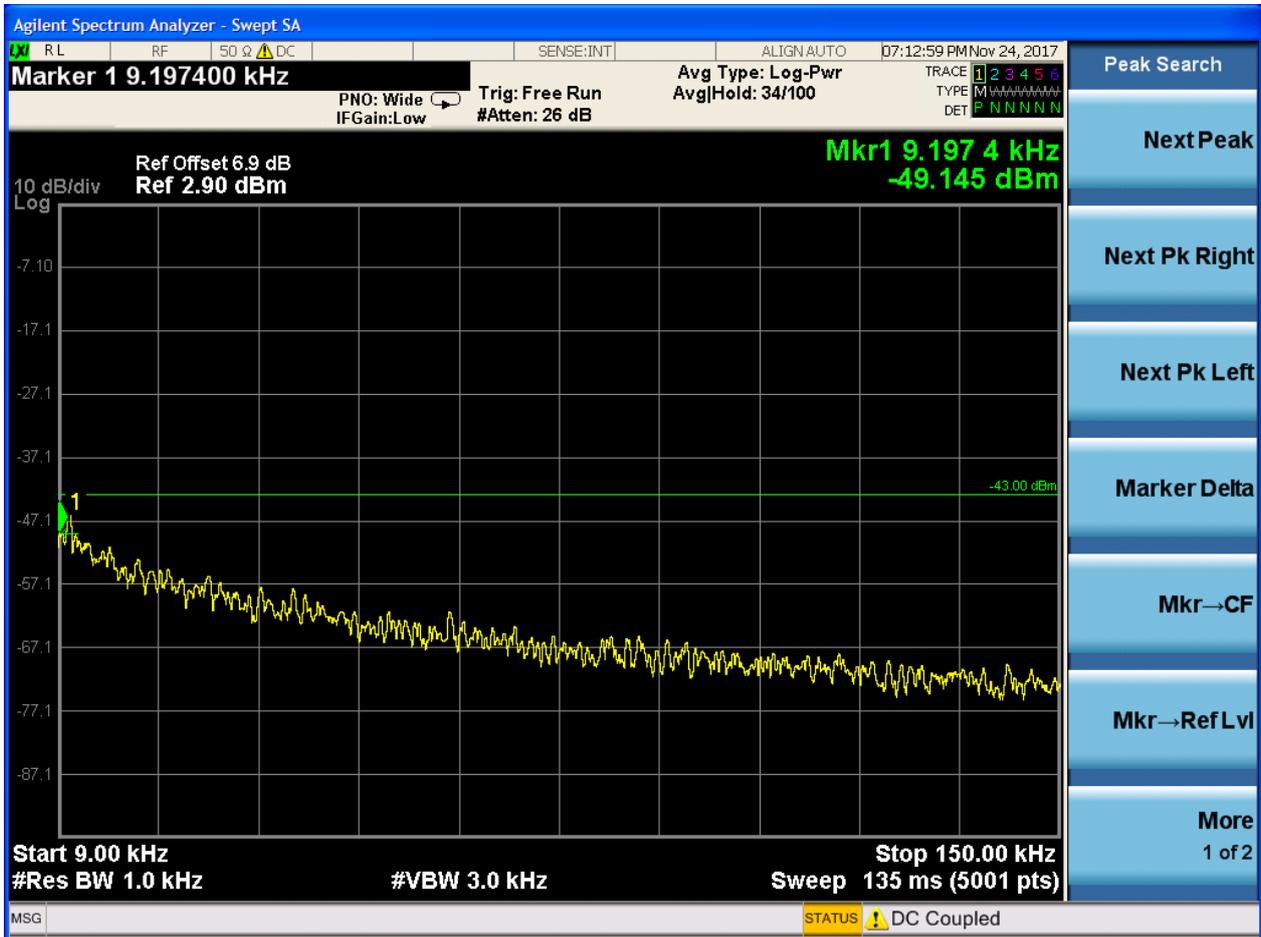








6.1.3.1.3 Test Channel = HCH

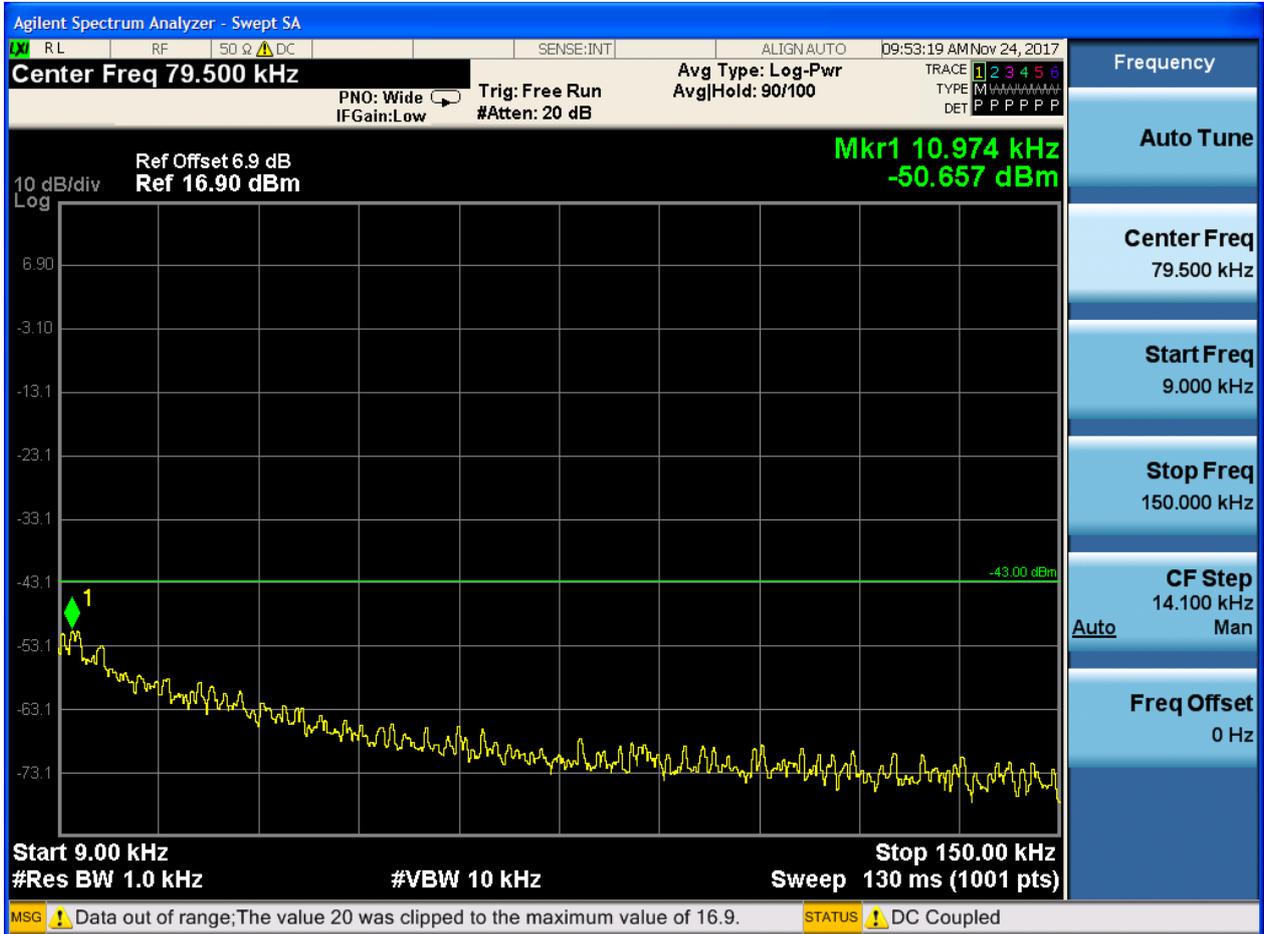


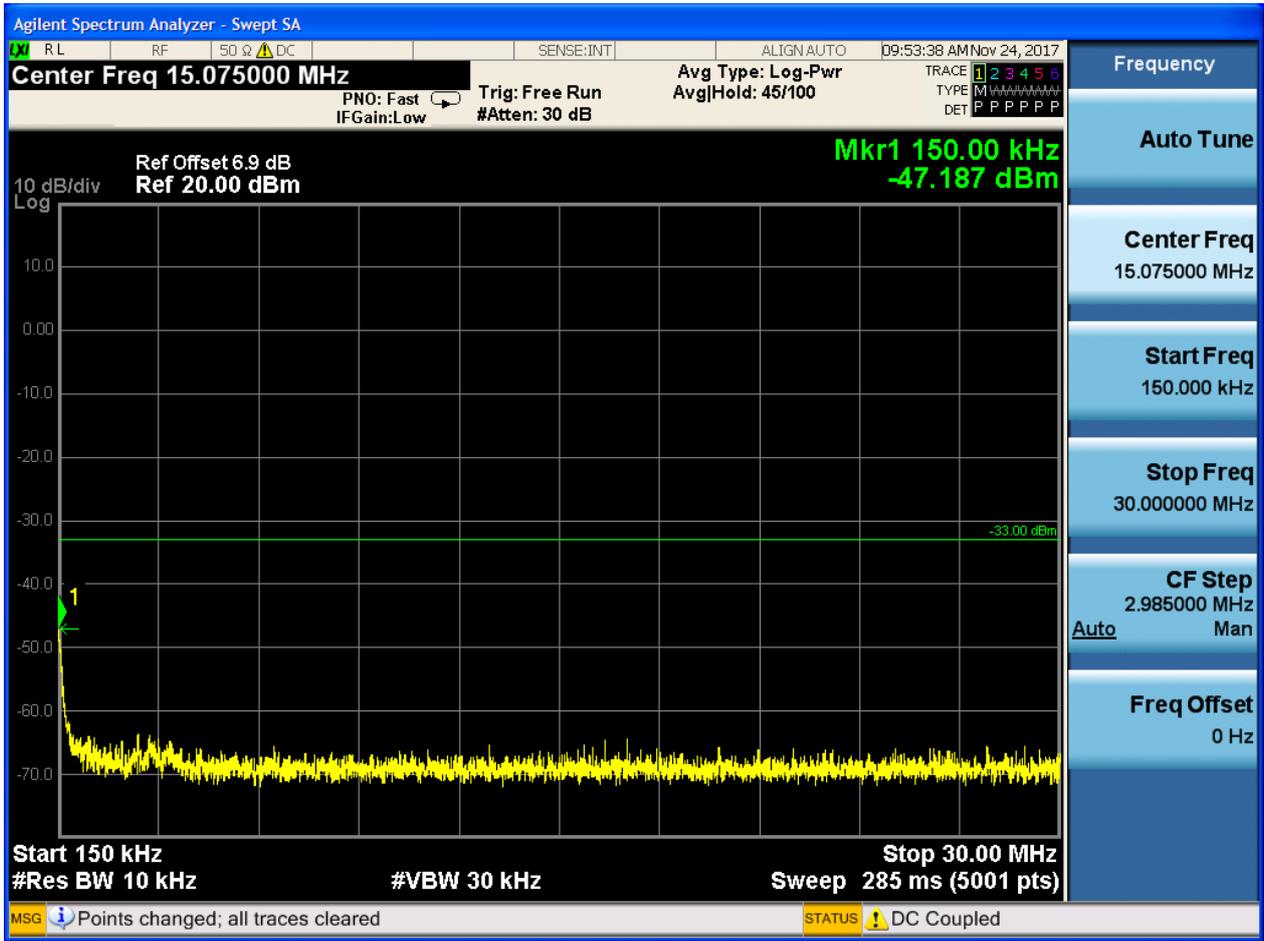


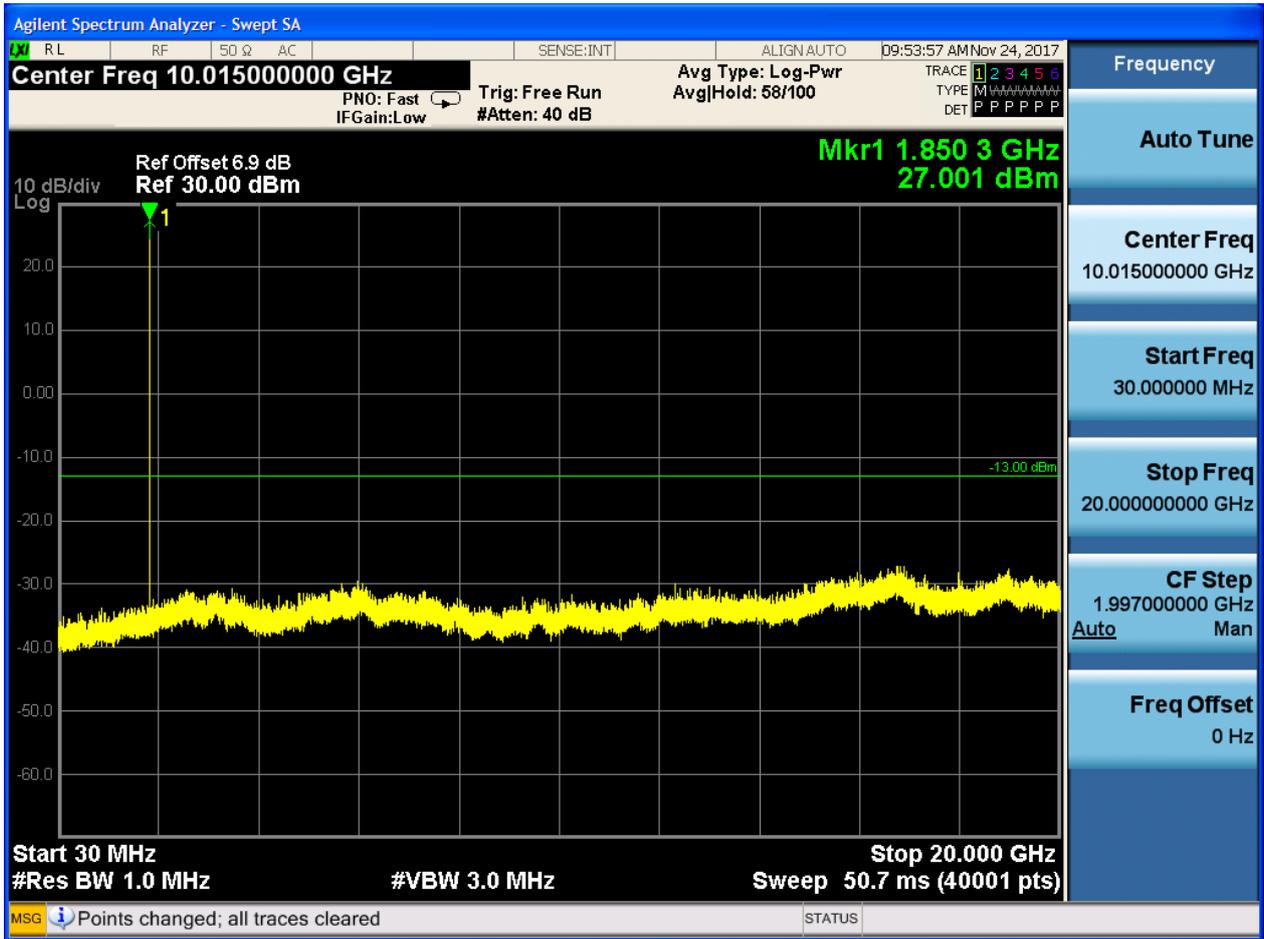


6.1.3.2 Test Mode = GSM/TM2

6.1.3.2.1 Test Channel = LCH

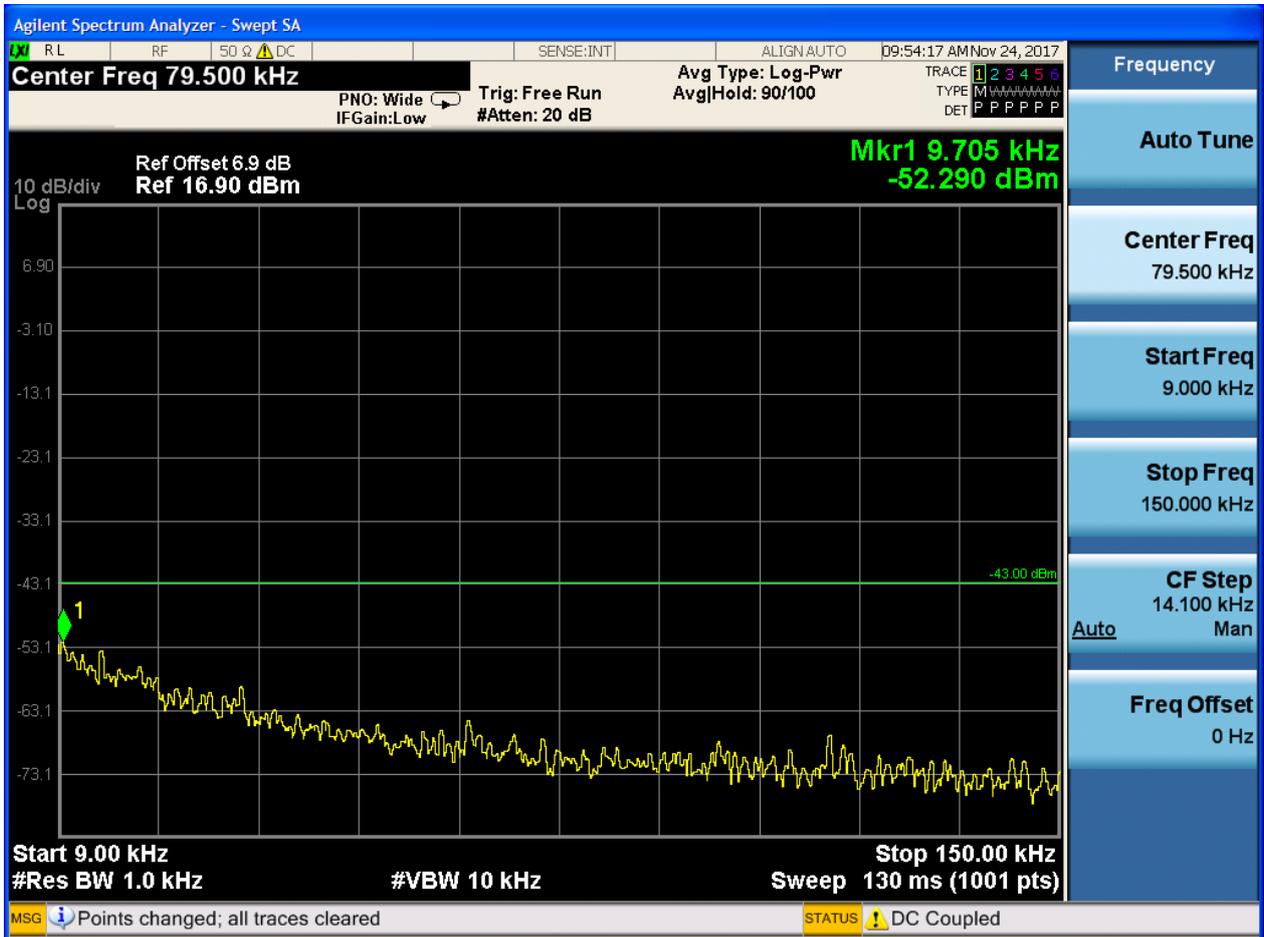


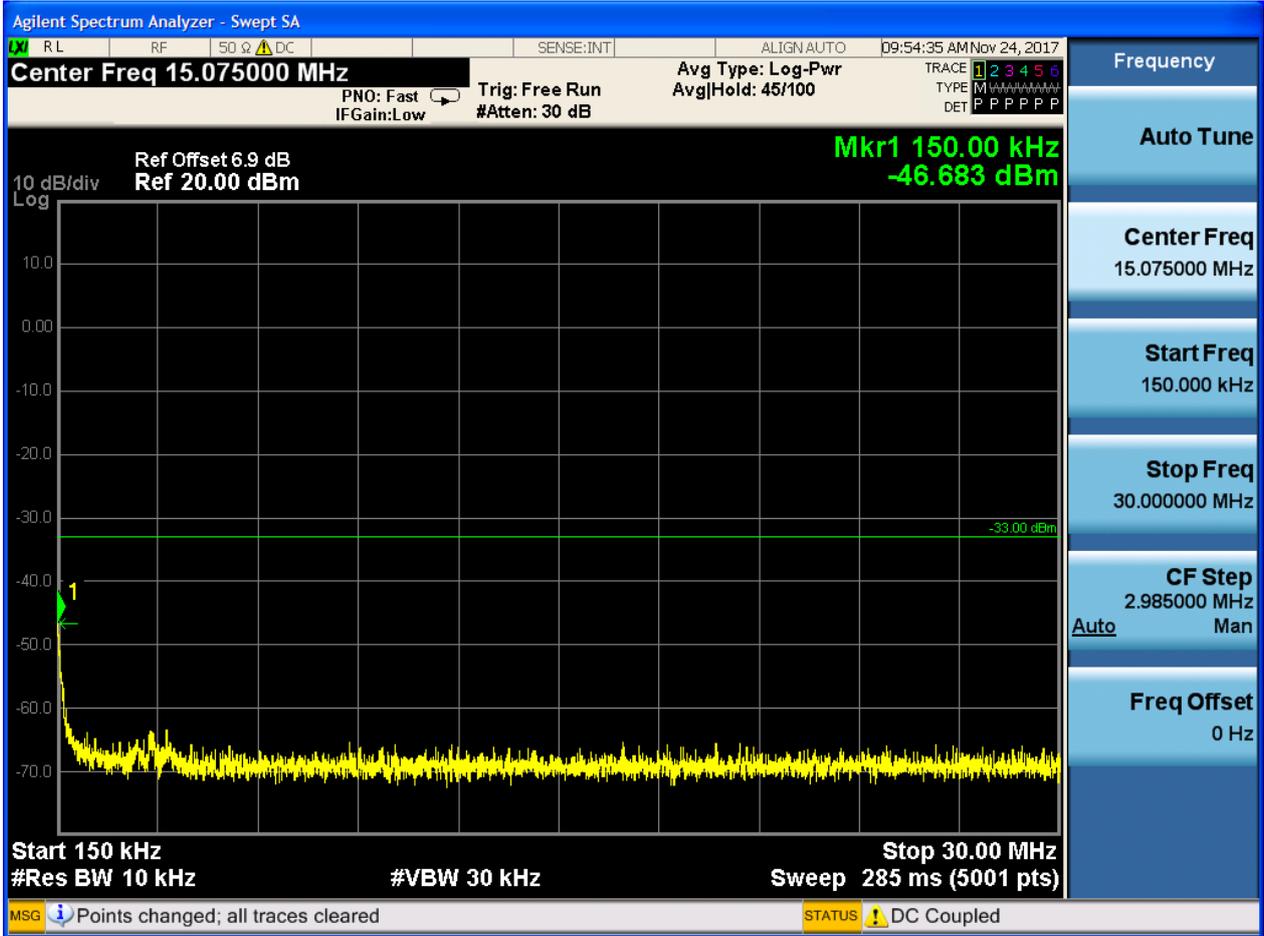






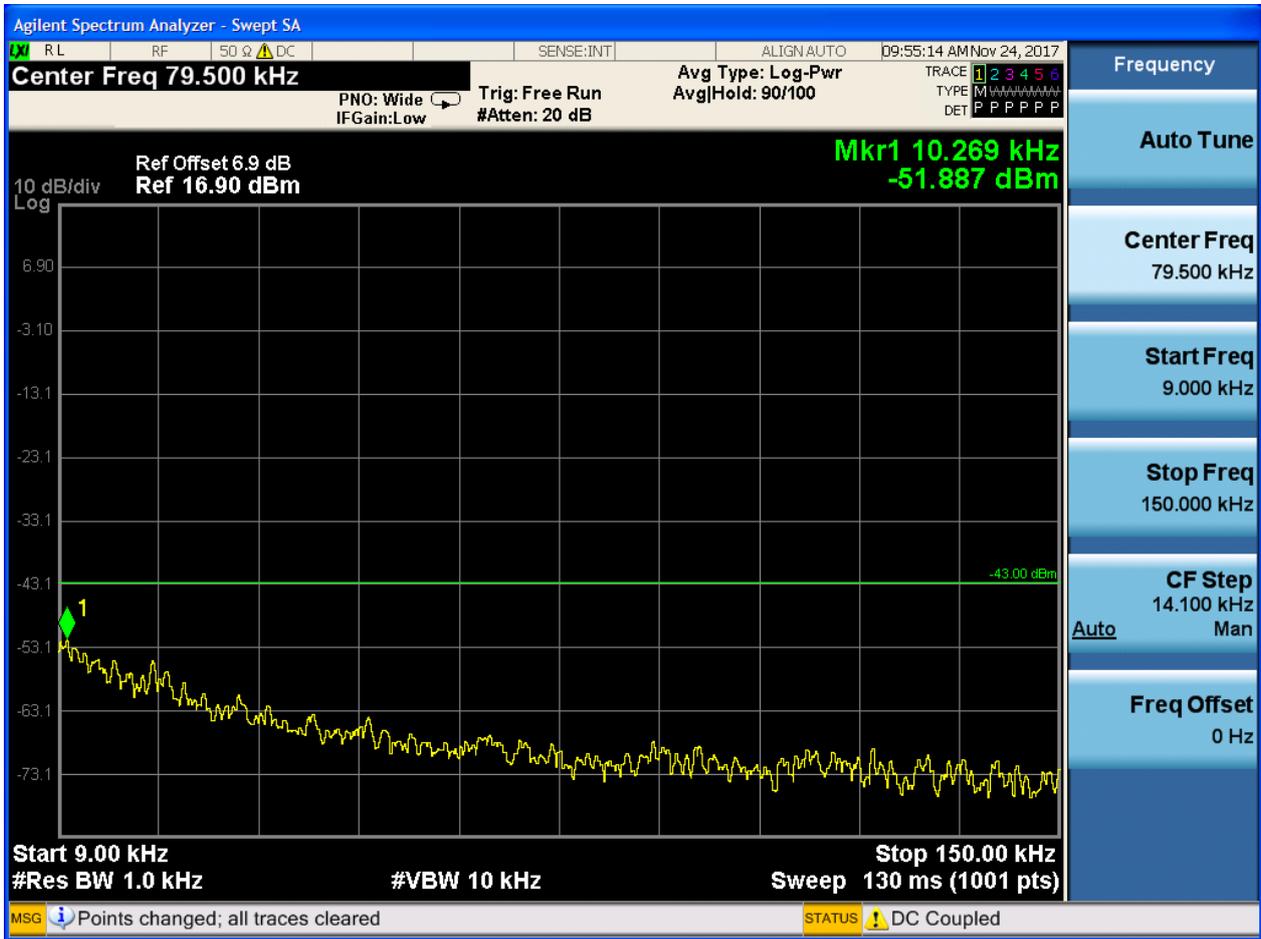
6.1.3.2.2 Test Channel = MCH

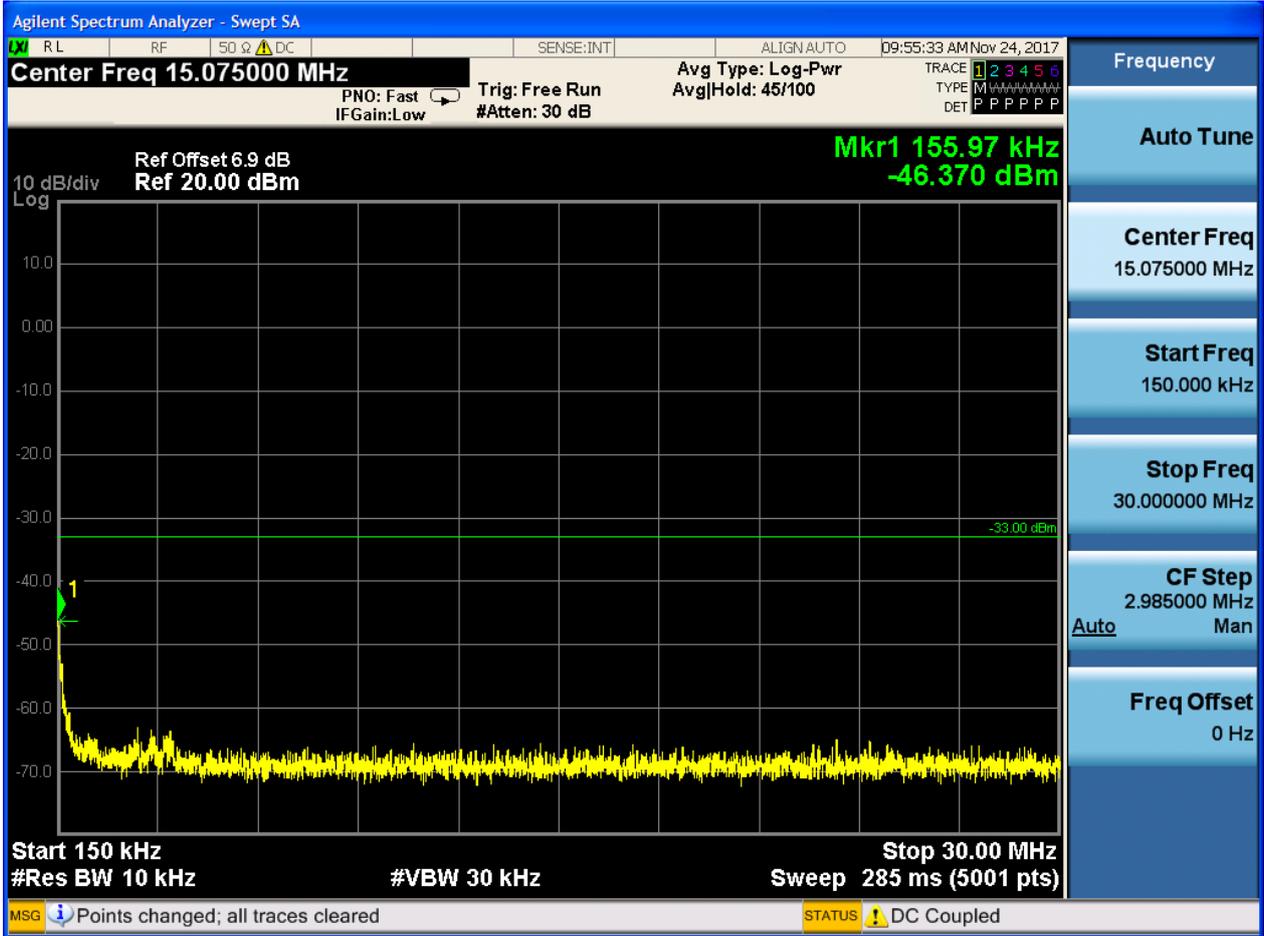


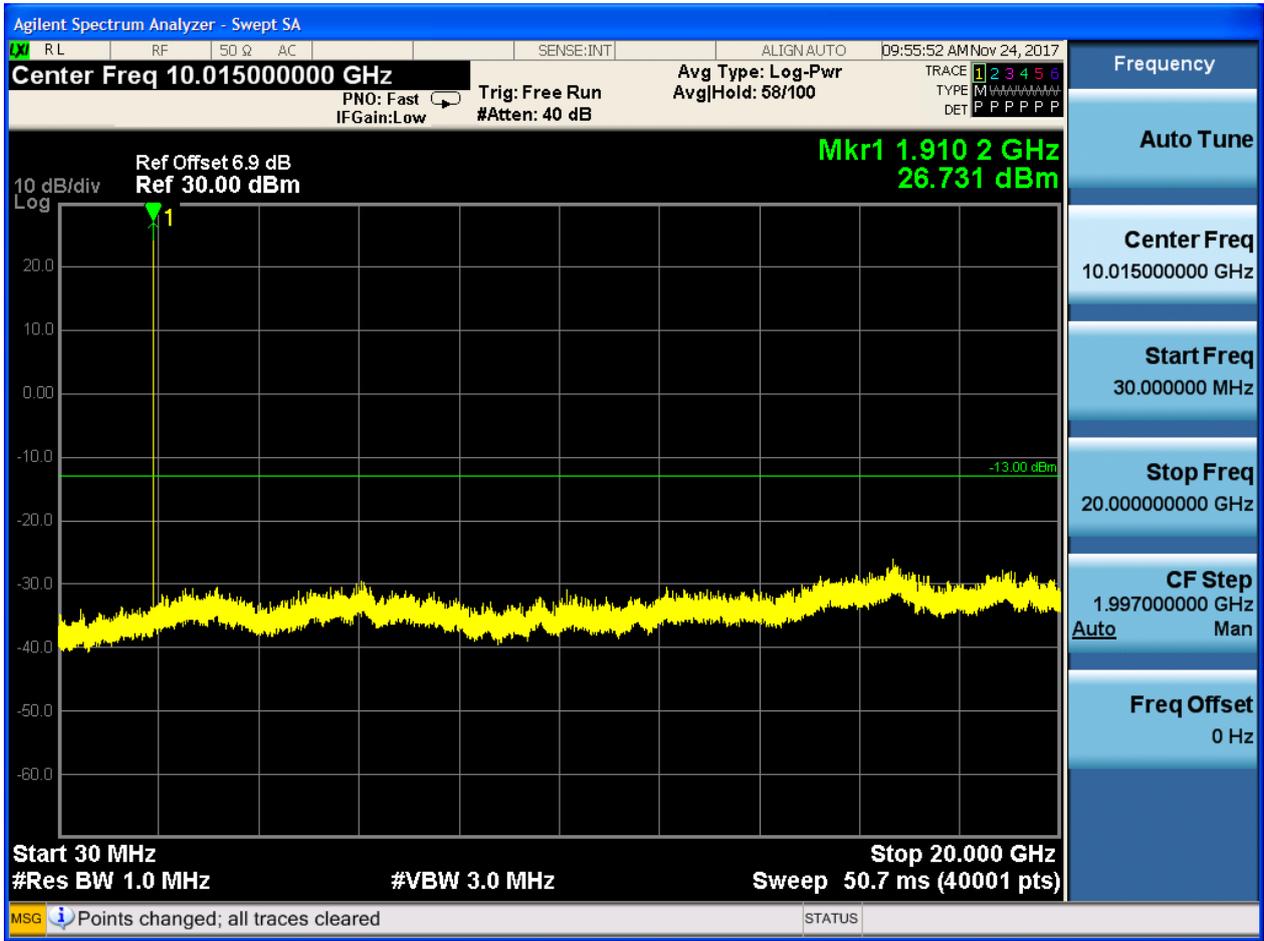




6.1.3.2.3 Test Channel = HCH







7Appendix_G: Field Strength of Spurious Radiation

Note:

9kHz~150kHz, RBW = 200Hz, VBW = 600 Hz, Detector: PK

150kHz~30MHz, RBW = 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

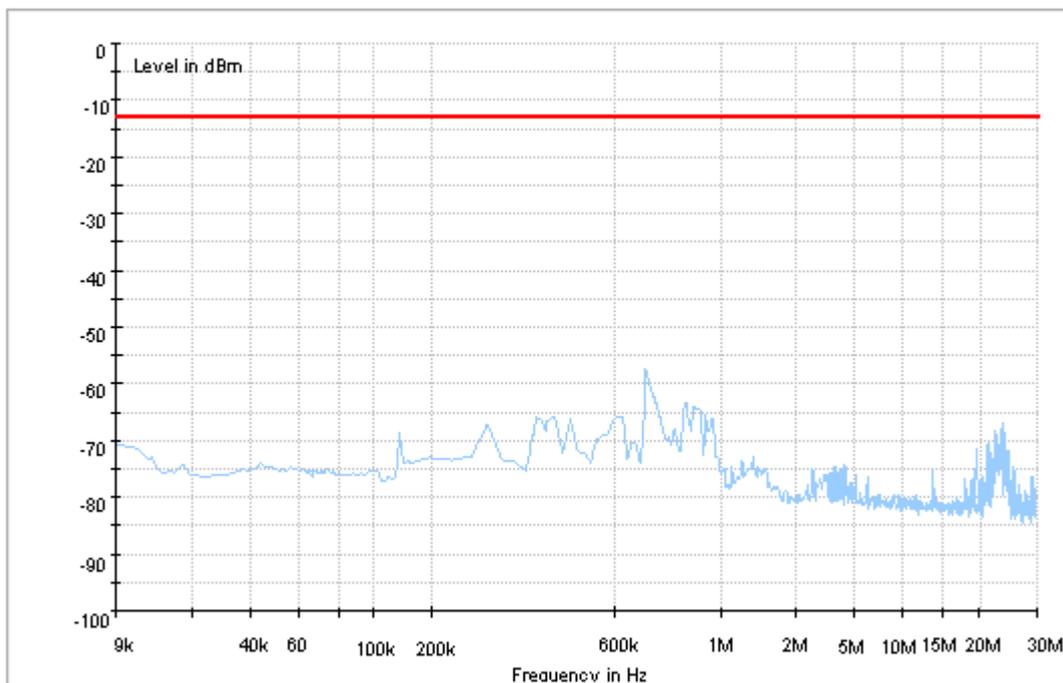
We tested all modes, but the data presented below is the worst case.

Part I - Test Plots

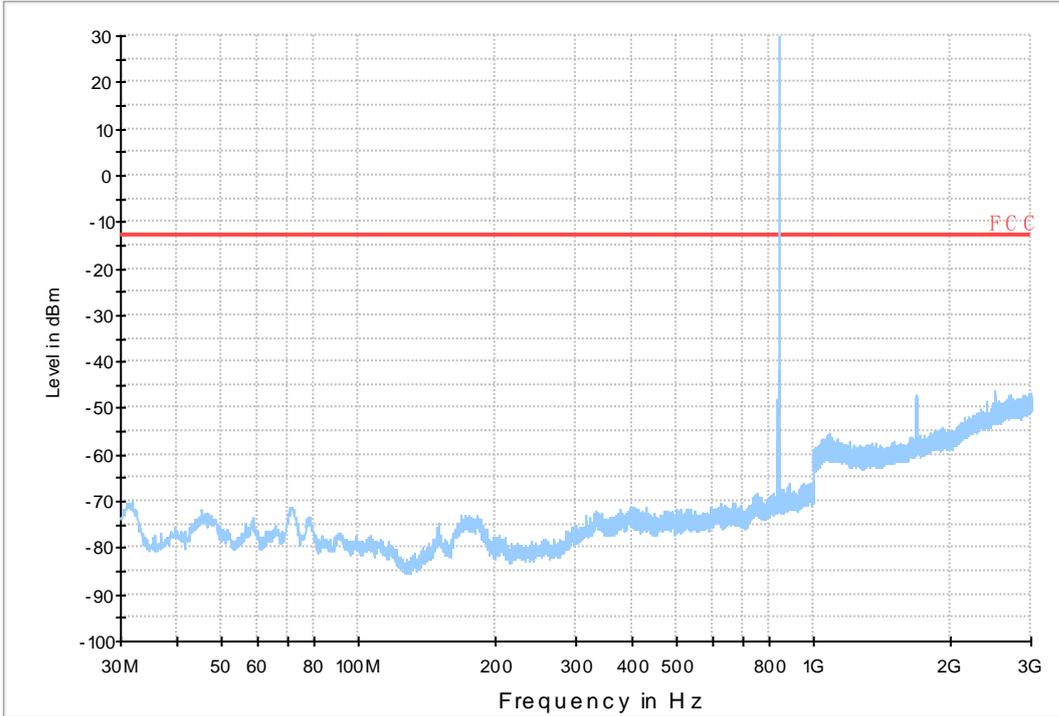
7.1 For GSM

7.1.1 Test Band = GSM850-Ant1

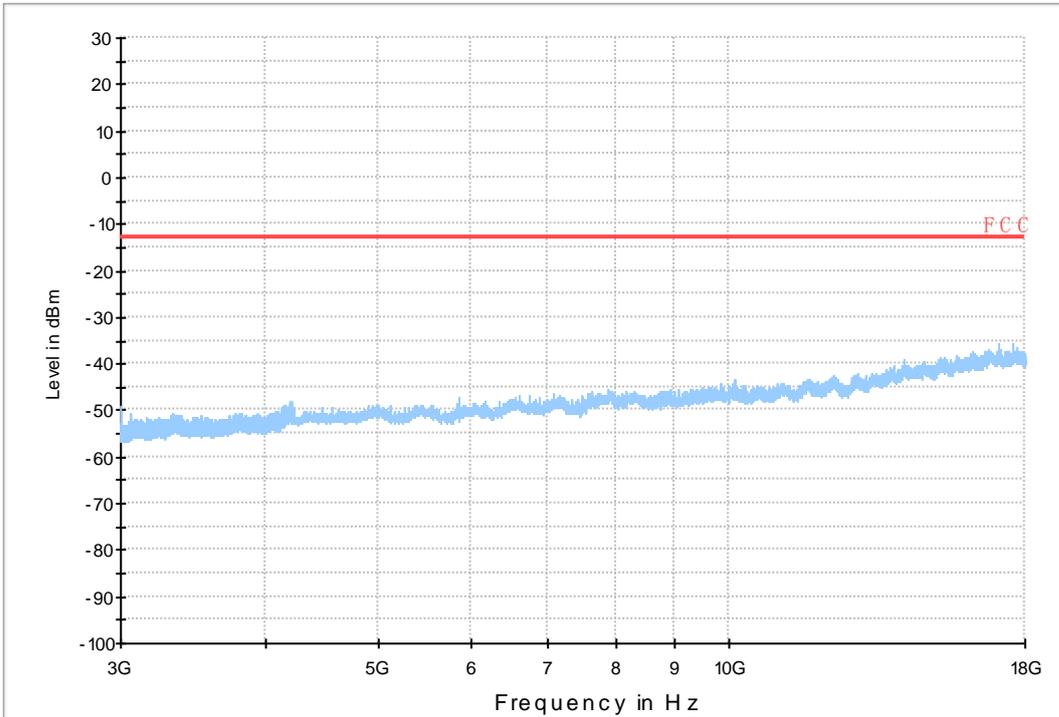
7.1.1.1 Test Mode = GSM/TM1



Copy of FCC PART22 GSM850_L

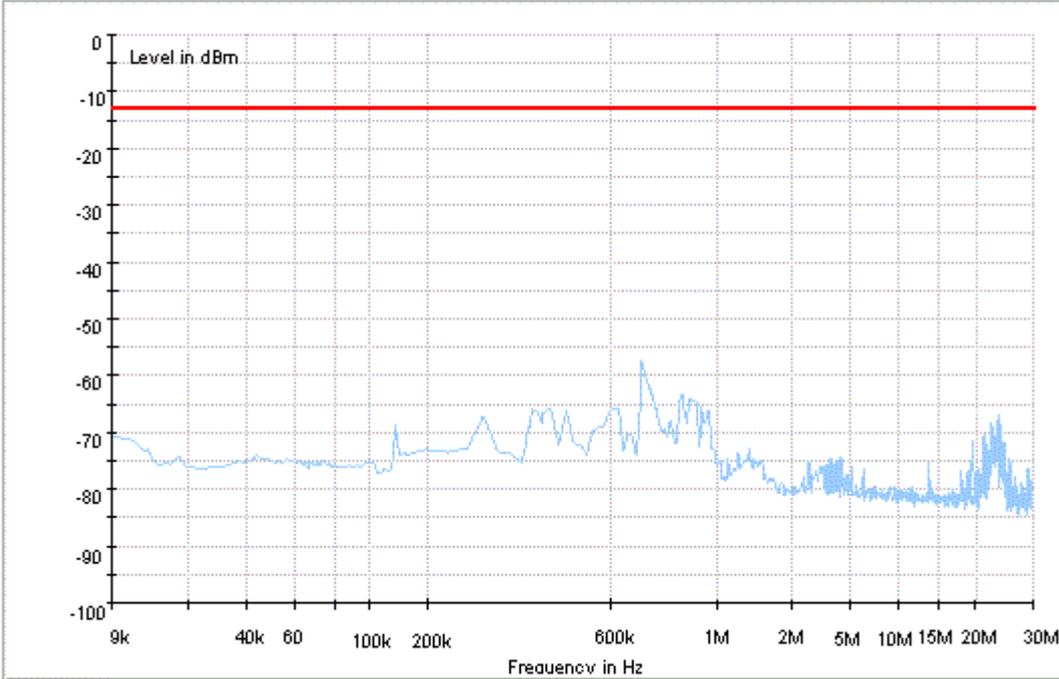


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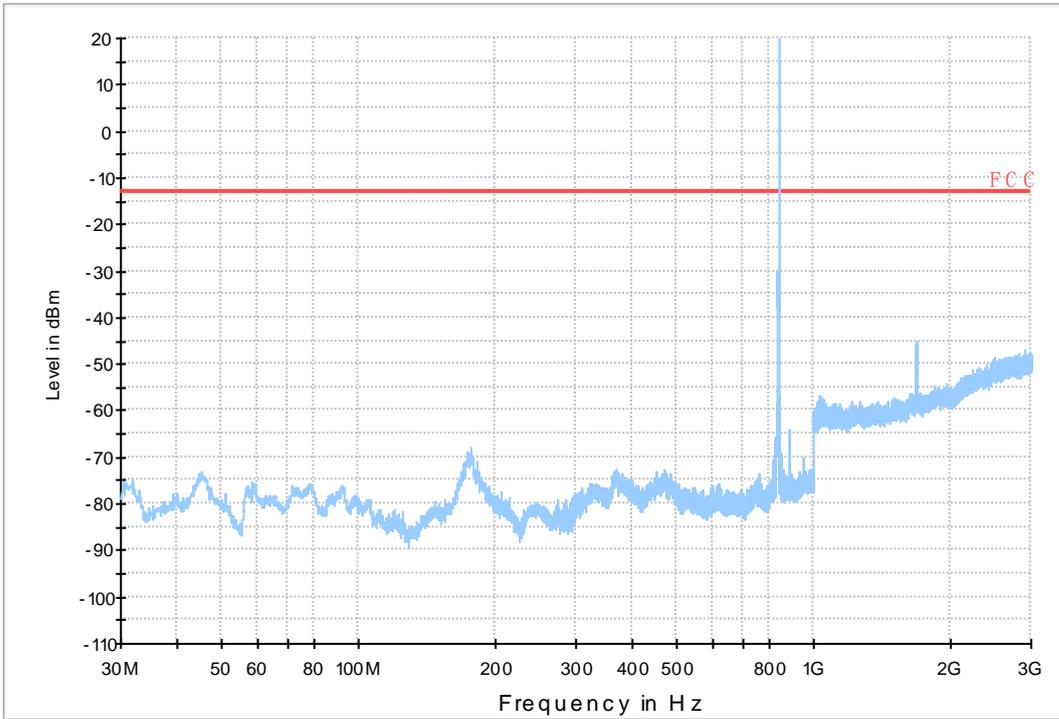


7.1.2 Test Band = GSM850-Ant2

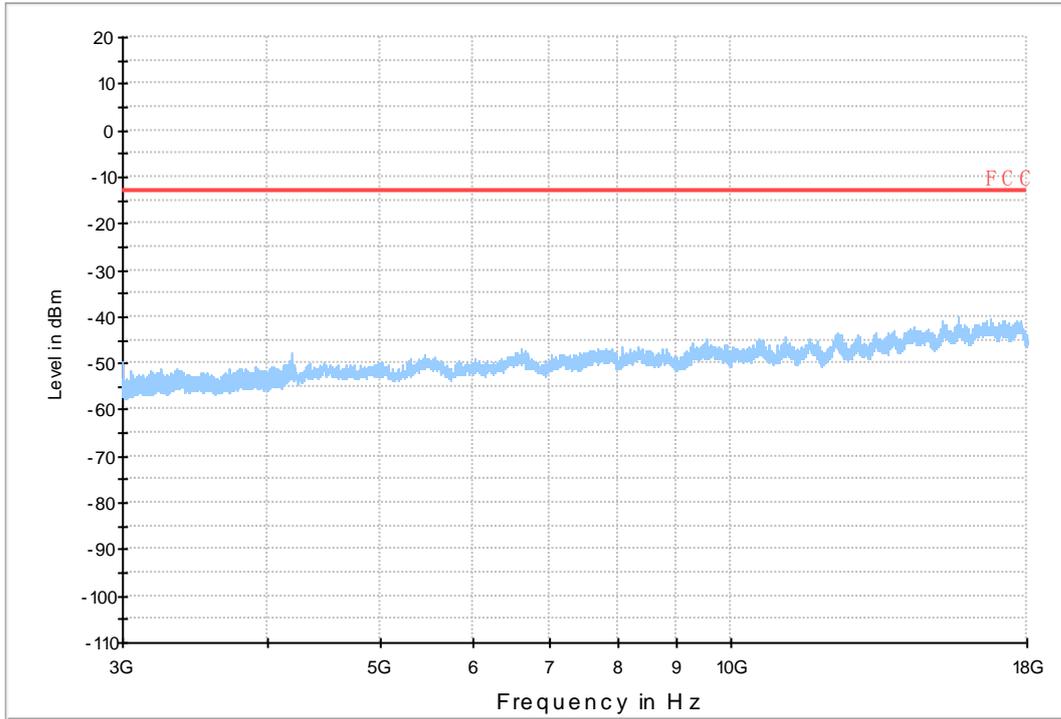
7.1.2.1 Test Mode = GSM/TM1



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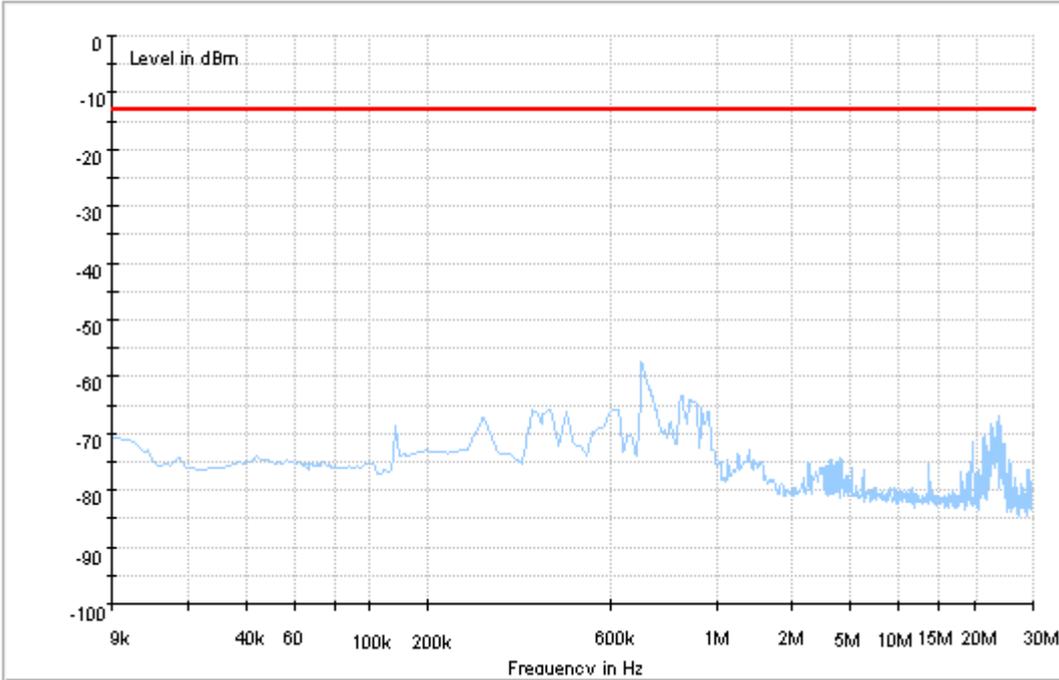


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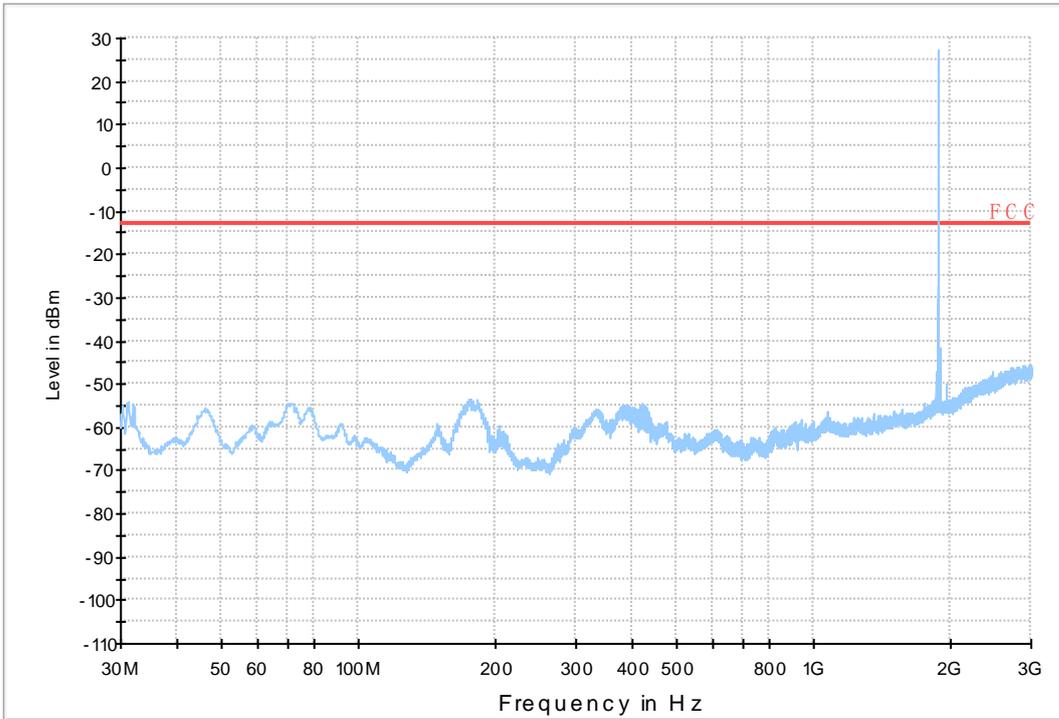


7.1.3 Test Band = GSM1900-Ant1

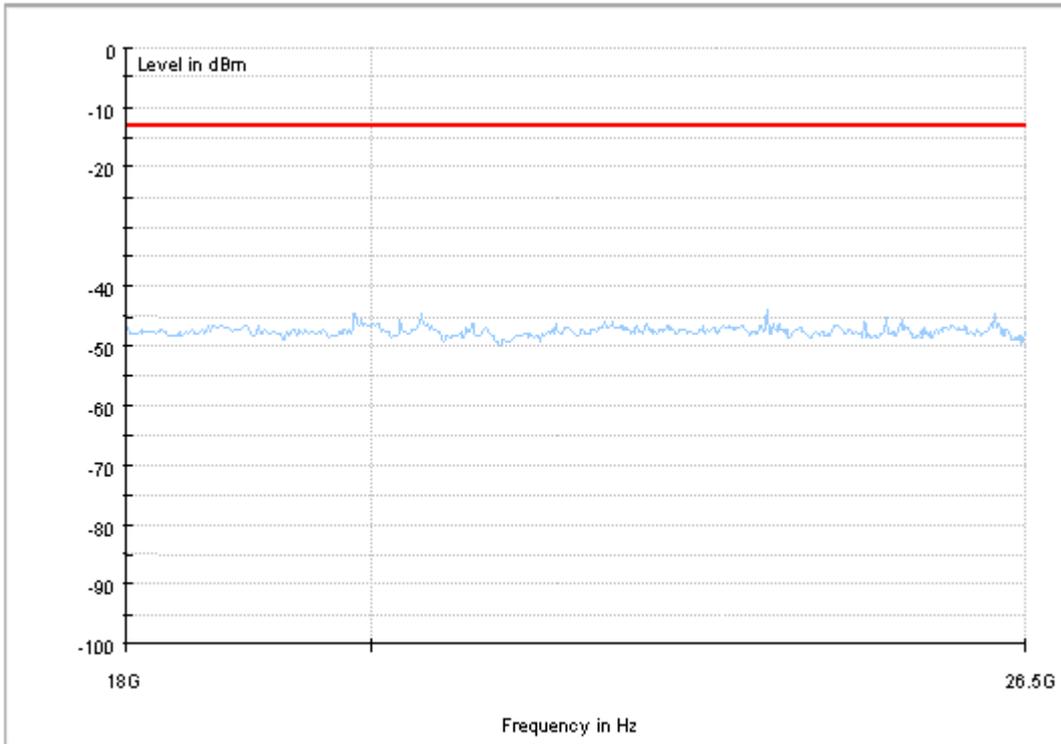
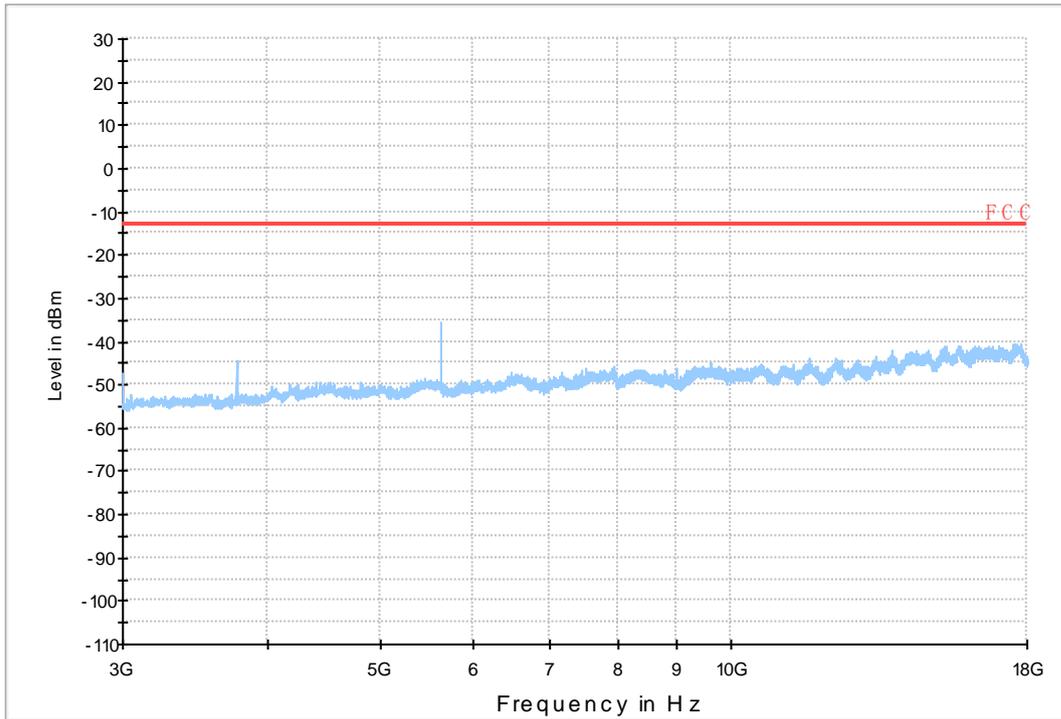
7.1.3.1 Test Mode = GSM/TM1



Copy of FCC PART 24 GSM1900_L

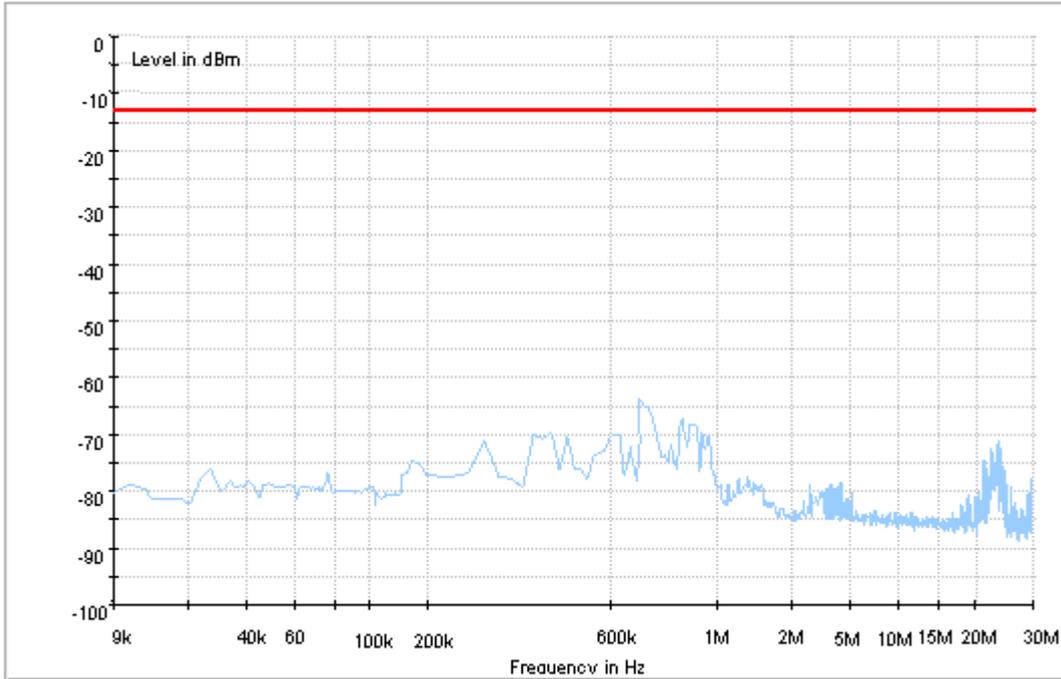


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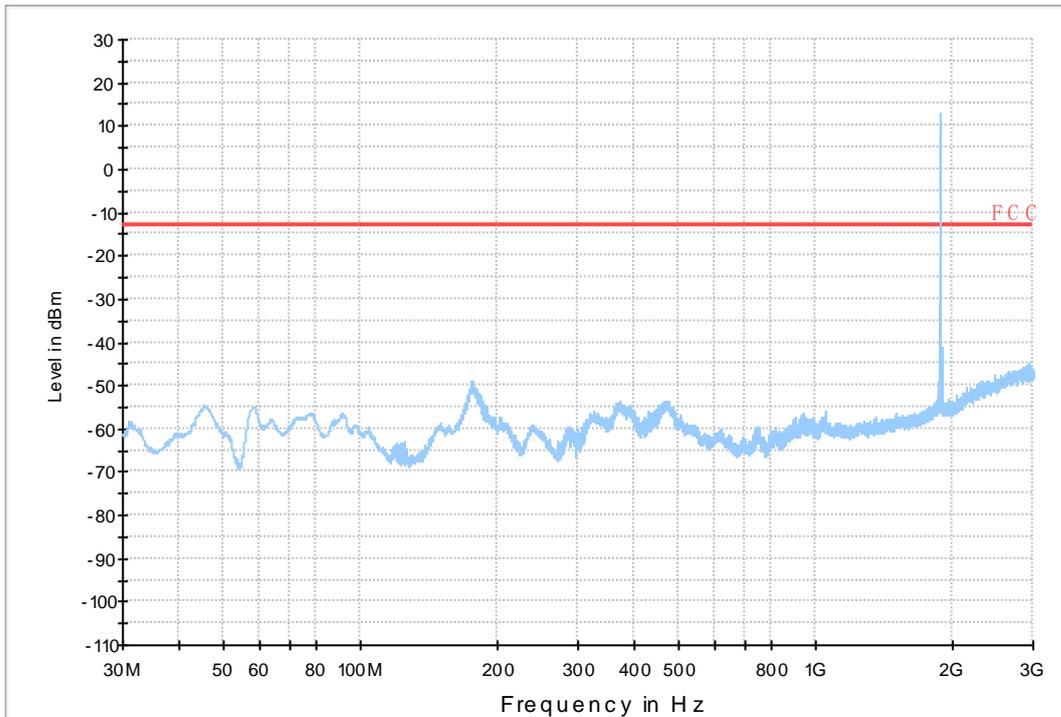


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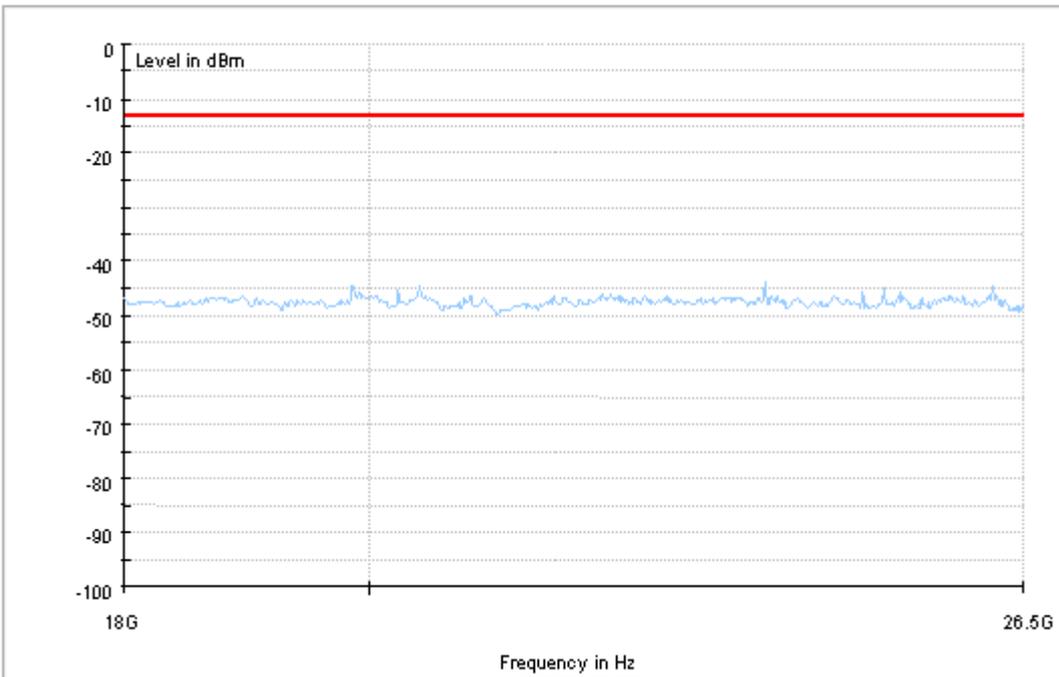
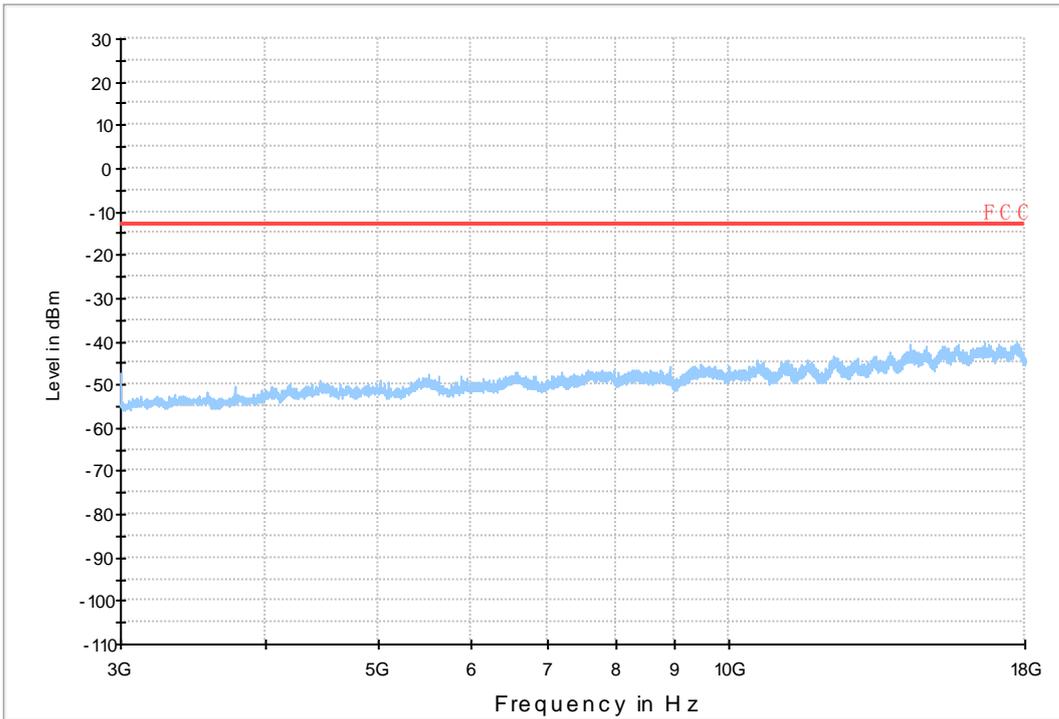
7.1.4.1 Test Mode = GSM/TM1



Copy of FCC PART24 GSM1900_L



Copy of FCC PART24 GSM1900_H



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	-6.20	-0.00752	PASS	
				VN	-7.10	-0.00861	PASS	
				VH	-5.49	-0.00666	PASS	
		MCH	TN	VL	-13.82	-0.01652	PASS	
				VN	-9.94	-0.01188	PASS	
				VH	-14.59	-0.01744	PASS	
		HCH	TN	VL	-3.55	-0.00418	PASS	
				VN	-5.62	-0.00662	PASS	
				VH	-7.62	-0.00898	PASS	
	GSM/TM2	LCH	TN	VL	0.19	0.00023	PASS	
				VN	-2.00	-0.00243	PASS	
				VH	3.36	0.00408	PASS	
		MCH	TN	VL	-8.65	-0.01034	PASS	
				VN	3.45	0.00412	PASS	
				VH	-1.16	-0.00139	PASS	
		HCH	TN	VL	3.78	0.00445	PASS	
				VN	3.62	0.00426	PASS	
				VH	1.61	0.0019	PASS	
	GSM1900	GSM/TM1	LCH	TN	VL	-17.50	-0.00946	PASS
					VN	-15.05	-0.00813	PASS
					VH	-15.24	-0.00824	PASS
			MCH	TN	VL	19.31	0.01027	PASS
					VN	24.54	0.01305	PASS
					VH	27.89	0.01484	PASS
HCH			TN	VL	23.37	0.01224	PASS	
				VN	31.70	0.0166	PASS	
				VH	29.57	0.01548	PASS	
GSM/TM2		LCH	TN	VL	32.51	0.01757	PASS	
				VN	48.40	0.02616	PASS	
				VH	35.61	0.01925	PASS	
		MCH	TN	VL	32.61	0.01735	PASS	
				VN	40.13	0.02135	PASS	
				VH				

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VH	46.91	0.02495	PASS
		HCH	TN	VL	34.13	0.01787	PASS
				VN	47.40	0.02482	PASS
				VH	44.23	0.02316	PASS

8.1.2 Frequency Error vs. Temperature:

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict		
GSM850	GSM/TM1	LCH	VN	-30	-7.36	-0.00893	PASS		
				-20	-8.39	-0.01018	PASS		
				-10	-9.17	-0.01113	PASS		
				0	-8.72	-0.01058	PASS		
				10	-5.94	-0.00721	PASS		
				20	-10.33	-0.01253	PASS		
				30	-6.13	-0.00744	PASS		
				40	-8.14	-0.00988	PASS		
		50	-10.33	-0.01253	PASS				
				MCH	VN	-30	-12.27	-0.01467	PASS
						-20	-13.30	-0.0159	PASS
						-10	-8.72	-0.01042	PASS
						0	-14.98	-0.01791	PASS
						10	-10.46	-0.0125	PASS
						20	-13.24	-0.01583	PASS
						30	-10.98	-0.01312	PASS
						40	-9.88	-0.01181	PASS
				50	-10.98	-0.01312	PASS		
				HCH	VN	-30	-3.55	-0.00418	PASS
						-20	-4.33	-0.0051	PASS
						-10	-3.94	-0.00464	PASS
						0	-5.23	-0.00616	PASS
						10	-4.13	-0.00487	PASS
						20	-4.26	-0.00502	PASS
			30			-1.87	-0.0022	PASS	
			40			-5.49	-0.00647	PASS	
			50	-3.55	-0.00418	PASS			
		GSM/TM2	LCH	VN	-30	-2.81	-0.00341	PASS	
						-20	-1.90	-0.00231	PASS
						-10	-0.84	-0.00102	PASS
						0	-5.13	-0.00622	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict						
				10	2.07	0.00251	PASS						
				20	0.42	0.00051	PASS						
				30	-0.45	-0.00055	PASS						
				40	4.07	0.00494	PASS						
				50	-5.26	-0.00638	PASS						
		MCH	VN			-30	-3.07	-0.00367	PASS				
						-20	-2.91	-0.00348	PASS				
						-10	-4.75	-0.00568	PASS				
						0	-1.00	-0.0012	PASS				
						10	-1.55	-0.00185	PASS				
						20	-7.14	-0.00853	PASS				
						30	2.29	0.00274	PASS				
						40	-2.65	-0.00317	PASS				
						50	-3.07	-0.00367	PASS				
						HCH	VN			-30	2.71	0.00319	PASS
		-20	5.20	0.00613	PASS								
		-10	3.78	0.00445	PASS								
		0	0.94	0.00111	PASS								
		10	-2.16	-0.00254	PASS								
		20	-1.90	-0.00224	PASS								
		30	-3.55	-0.00418	PASS								
		40	-3.45	-0.00406	PASS								
		50	-1.07	-0.00126	PASS								
		GSM1900	GSM/TM1	LCH	VN								
										-30	-13.43	-0.00726	PASS
-20	-10.20									-0.00551	PASS		
-10	-9.56									-0.00517	PASS		
0	-13.11									-0.00709	PASS		
10	-10.72									-0.00579	PASS		
20	-14.01									-0.00757	PASS		
30	-12.72									-0.00687	PASS		
40	-14.72									-0.00796	PASS		
50	-12.72			-0.00687	PASS								
MCH	VN												
										-30	22.73	0.01209	PASS
										-20	21.63	0.01151	PASS
										-10	17.31	0.00921	PASS
										0	22.28	0.01185	PASS
										10	22.86	0.01216	PASS
										20	23.63	0.01257	PASS
										30	22.79	0.01212	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict			
		HCH	VN	40	12.46	0.00663	PASS			
				50	18.79	0.00999	PASS			
				-30	25.44	0.01332	PASS			
				-20	22.54	0.0118	PASS			
				-10	23.05	0.01207	PASS			
				0	27.51	0.0144	PASS			
				10	29.32	0.01535	PASS			
				20	25.51	0.01336	PASS			
				30	24.28	0.01271	PASS			
				40	26.09	0.01366	PASS			
				50	24.86	0.01302	PASS			
				GSM/TM2	LCH	VN	-30	17.98	0.00972	PASS
							-20	11.95	0.00646	PASS
							-10	28.12	0.0152	PASS
							0	21.76	0.01176	PASS
	10	15.98	0.00864				PASS			
	20	18.44	0.00997				PASS			
	30	23.89	0.01291				PASS			
	40	23.92	0.01293				PASS			
	50	11.78	0.00637				PASS			
	MCH	VN	-30				42.84	0.02279	PASS	
			-20				38.61	0.02054	PASS	
			-10				38.58	0.02052	PASS	
			0				35.68	0.01898	PASS	
			10				45.75	0.02434	PASS	
			20				41.16	0.02189	PASS	
			30	40.49	0.02154	PASS				
			40	41.75	0.02221	PASS				
			50	45.75	0.02434	PASS				
			HCH	VN	-30	42.23	0.02211	PASS		
	-20	42.13			0.02206	PASS				
	-10	42.04			0.02201	PASS				
	0	44.43			0.02326	PASS				
	10	51.21			0.02681	PASS				
	20	42.68			0.02235	PASS				
	30	35.71			0.0187	PASS				
	40	47.65			0.02495	PASS				
	50	48.95			0.02563	PASS				

END