



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	32.52	27.59	38.5	PASS
		MCH	32.72	27.65	38.5	PASS
		HCH	32.78	27.61	38.5	PASS
	GSM/TM2	LCH	26.34	21.14	38.5	PASS
		MCH	26.32	21.38	38.5	PASS
		HCH	26.26	21.31	38.5	PASS

Test Band	Test Mode	Test Channel	Measured[dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	29.43	30.19	33	PASS
		MCH	29.44	30.25	33	PASS
		HCH	29.46	30.23	33	PASS
	GSM/TM2	LCH	25.42	26.13	33	PASS
		MCH	25.33	25.92	33	PASS
		HCH	25.37	26.11	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:

$$\text{SET Span} = 1.5 * \text{OBW}$$

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

$$\text{SET VBW} \geq 3 * \text{RBW}$$

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	0.17	13	PASS
		MCH	0.17	13	PASS
		HCH	0.18	13	PASS
	GSM/TM2	LCH	2.85	13	PASS
		MCH	2.91	13	PASS
		HCH	2.88	13	PASS
GSM1900	GSM/TM1	LCH	0.32	13	PASS
		MCH	0.3	13	PASS
		HCH	0.28	13	PASS
	GSM/TM2	LCH	3.15	13	PASS
		MCH	3.08	13	PASS
		HCH	2.84	13	PASS

3Appendix_C: Modulation Characteristics

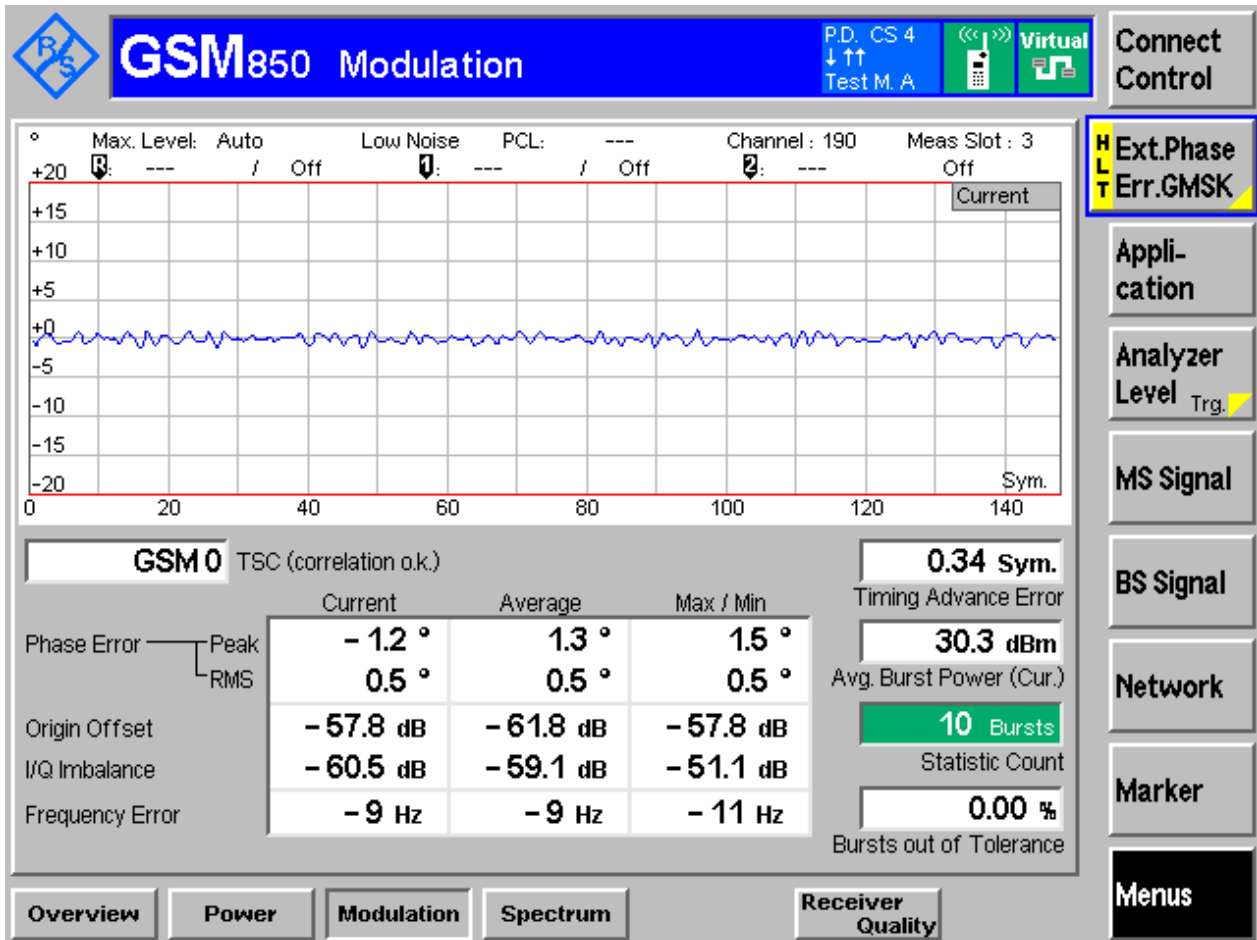
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

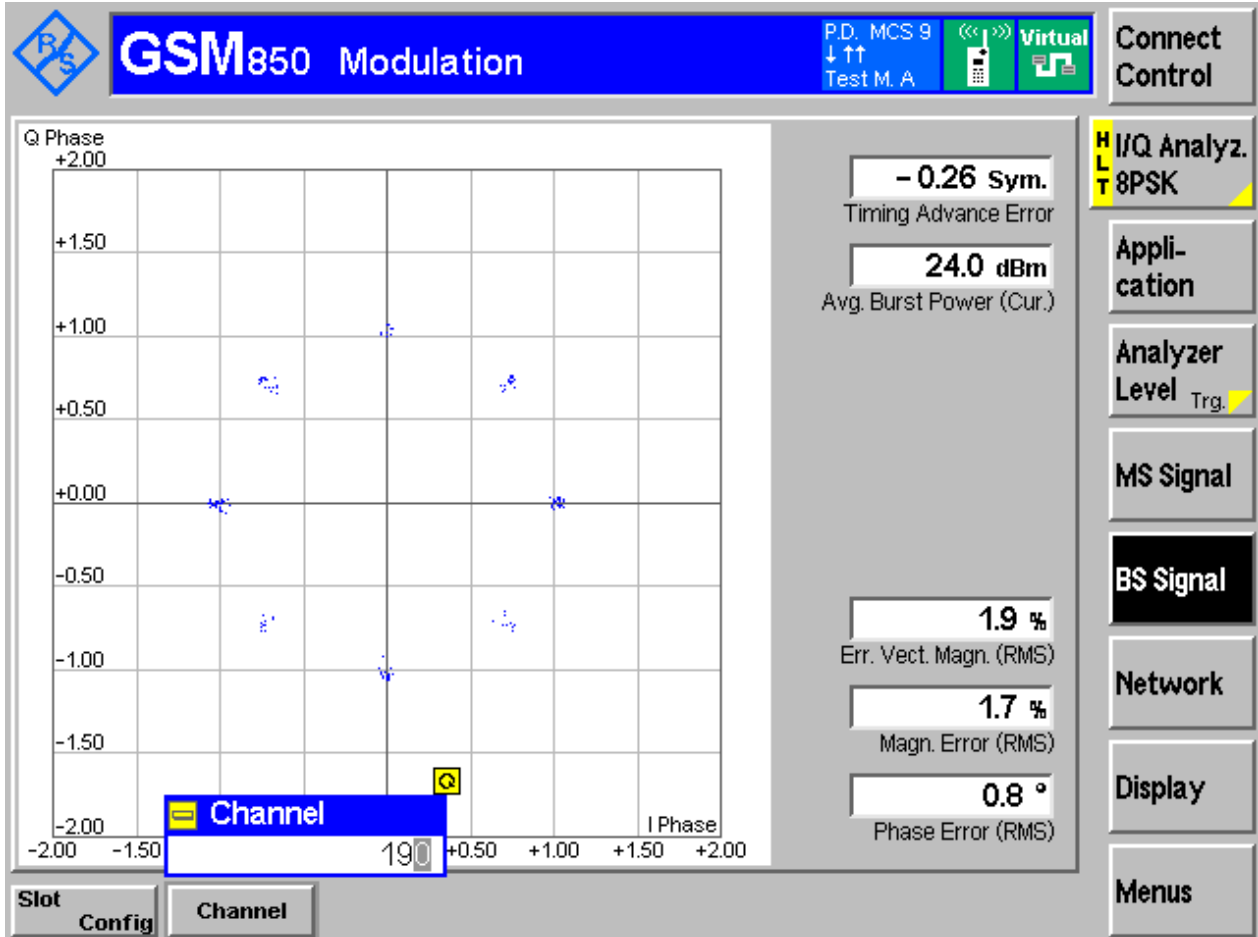
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

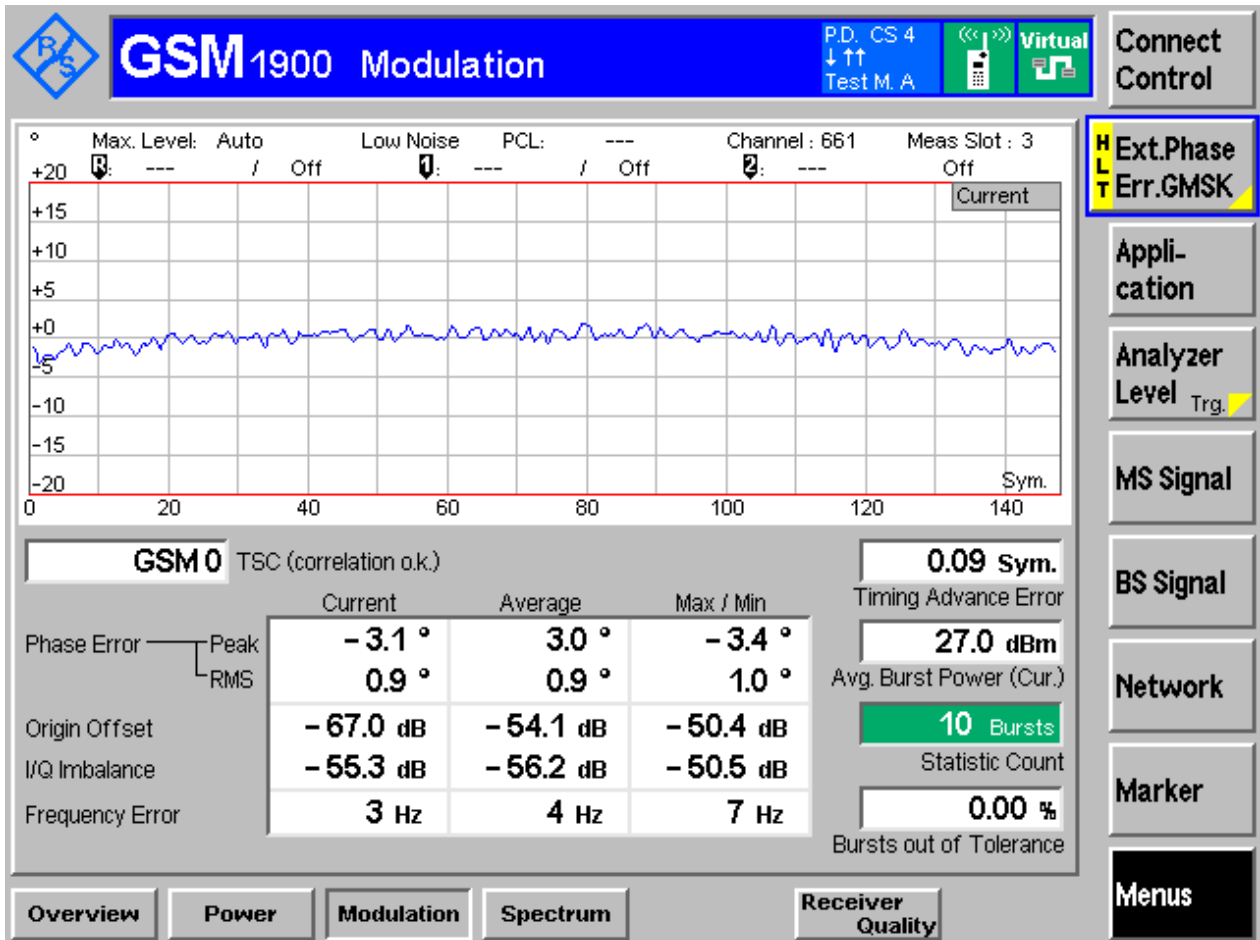
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

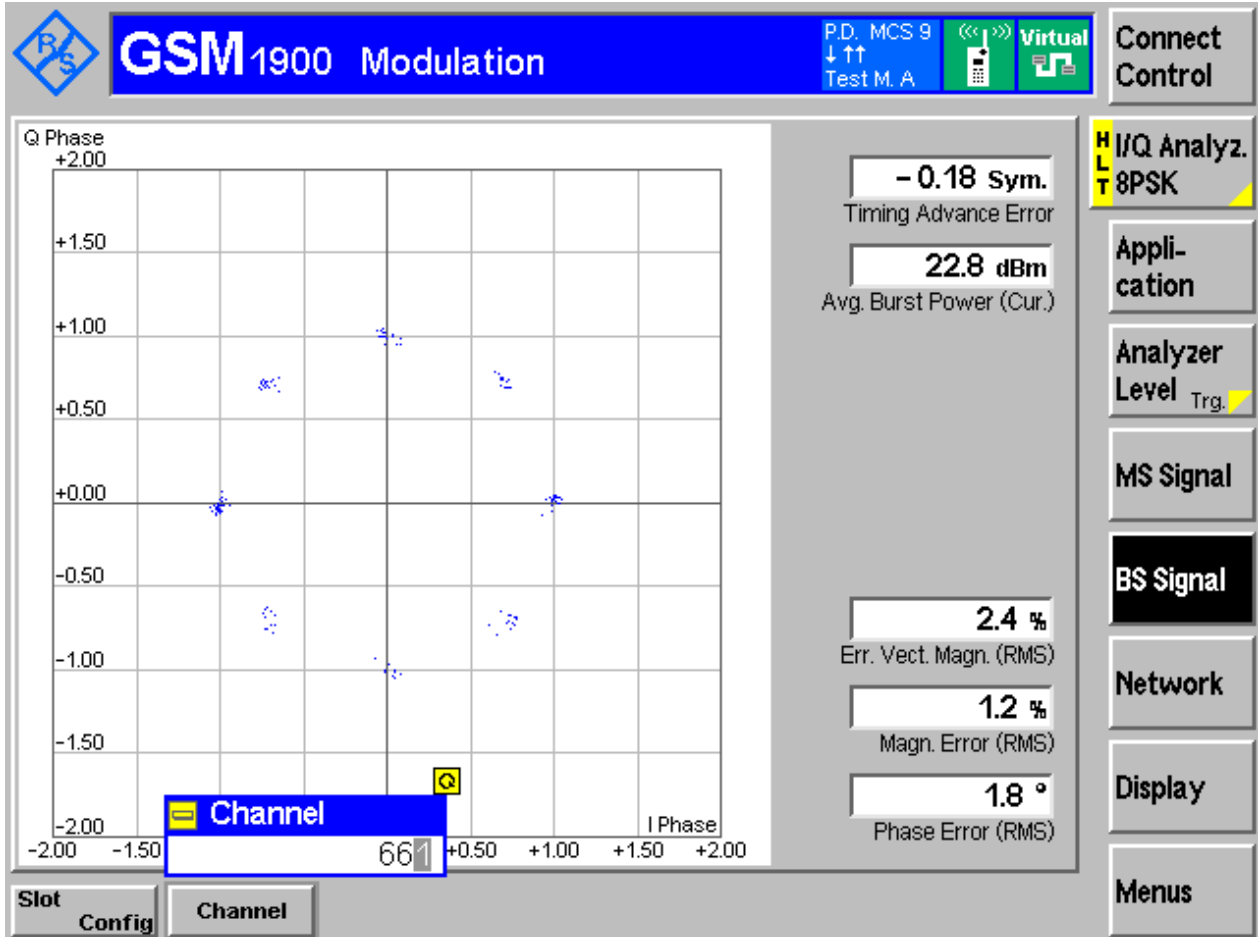
3.1.2.1 Test Mode = GSM/TM1

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	245.27	314.98	Pass
		MCH	243.51	324.70	Pass
		HCH	245.96	324.82	Pass
	GSM/TM2	LCH	252.16	319.92	Pass
		MCH	249.16	323.37	Pass
		HCH	246.86	319.63	Pass
GSM1900	GSM/TM1	LCH	241.45	312.84	Pass
		MCH	240.71	315.77	Pass
		HCH	242.31	314.18	Pass
	GSM/TM2	LCH	252.05	323.39	Pass
		MCH	252.53	322.07	Pass
		HCH	249.88	326.55	Pass

Part II - Test Plots

4.1 For GSM

4.1.1 Test Band = GSM850

4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH





4.1.1.1.2 Test Channel = MCH





4.1.1.1.3 Test Channel = HCH





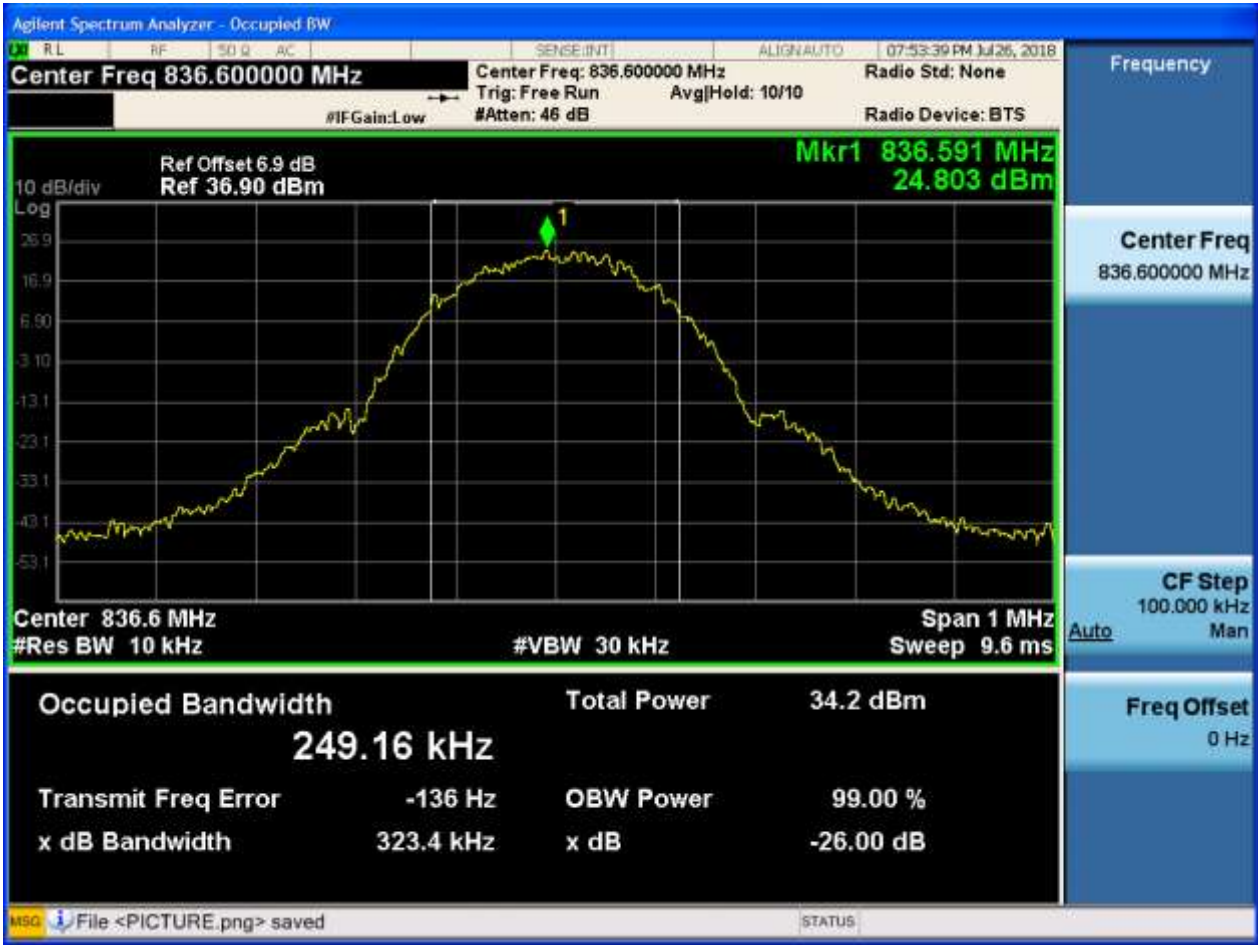
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH





4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH





4.1.2 Test Band = GSM1900

4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



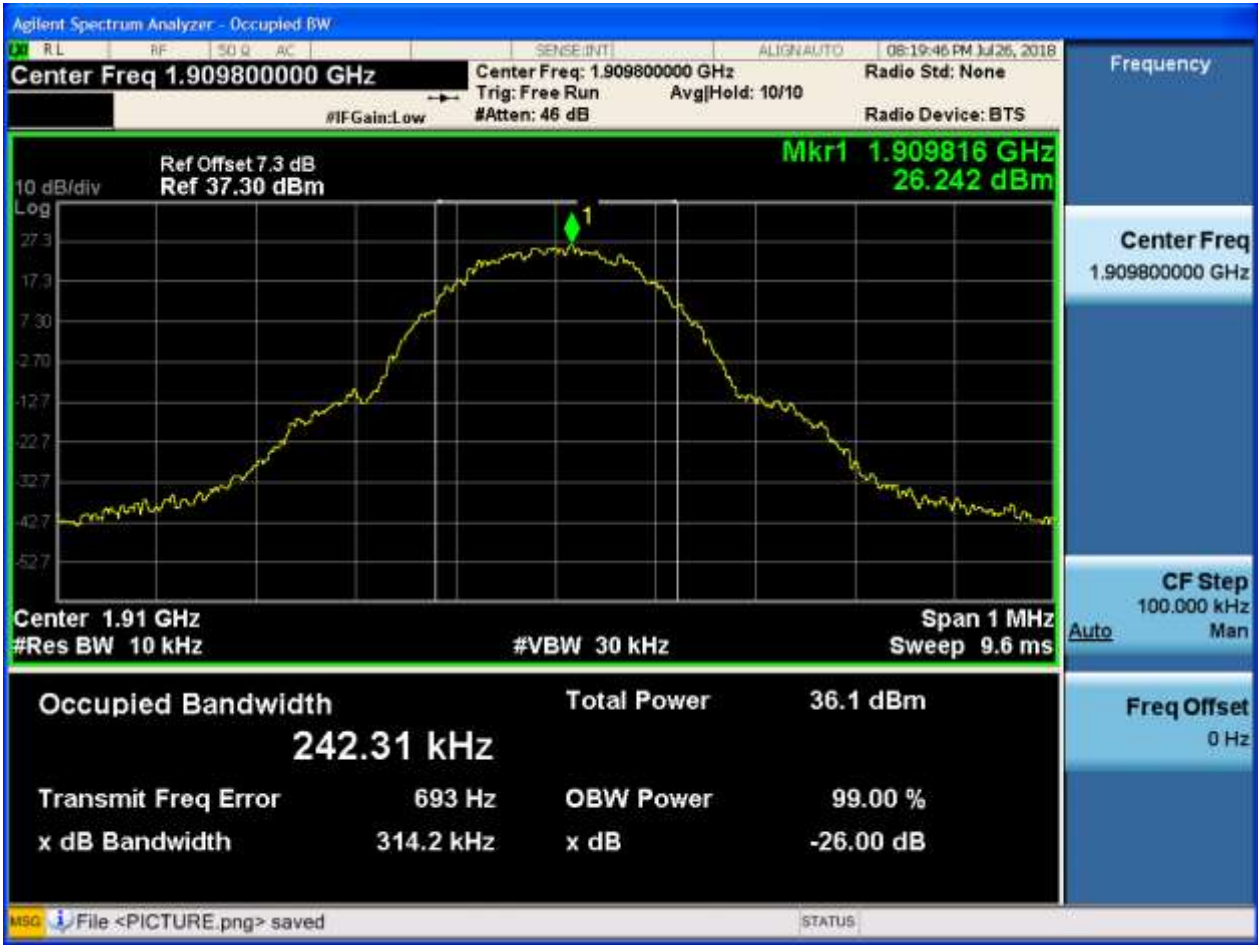


4.1.2.1.2 Test Channel = MCH





4.1.2.1.3 Test Channel = HCH





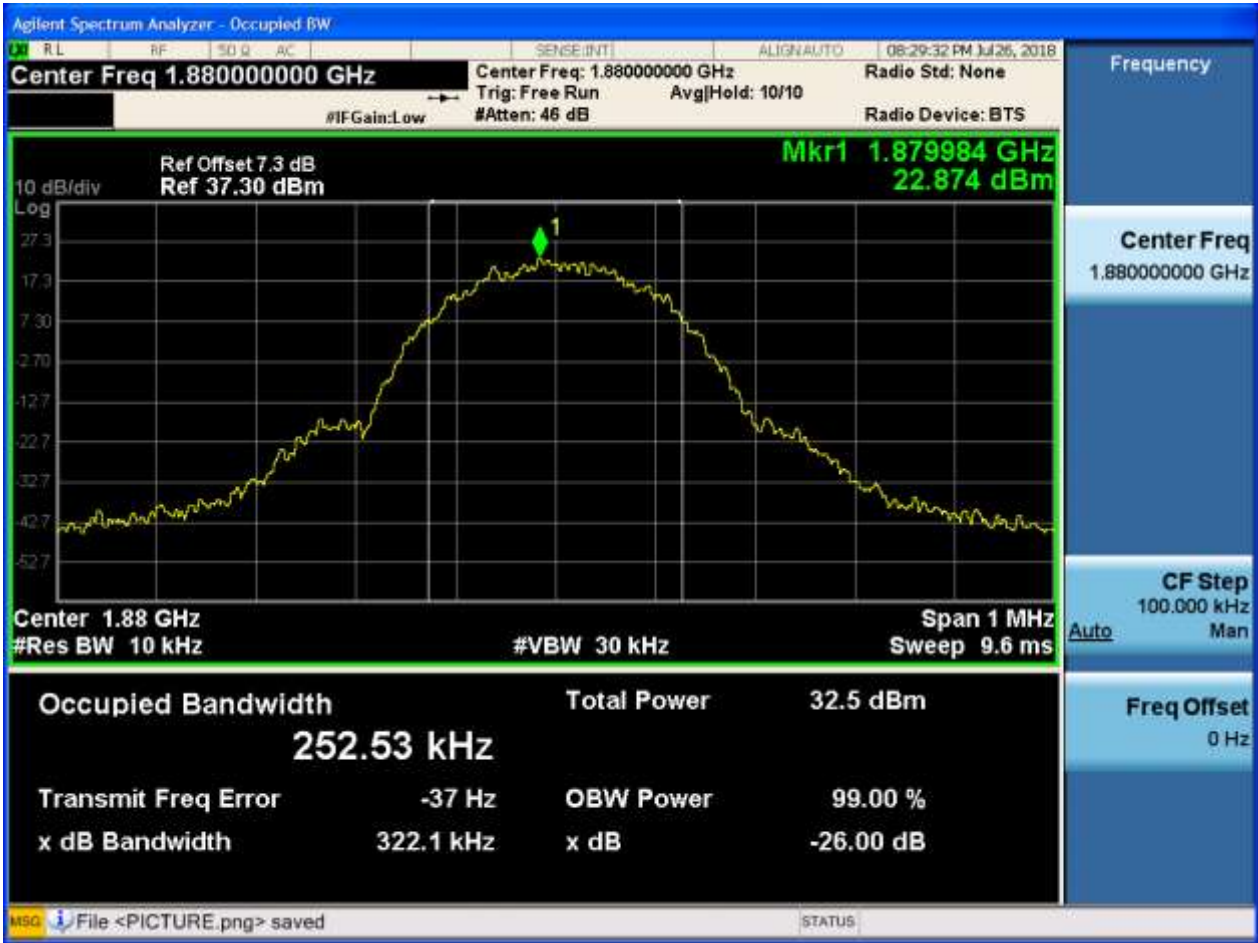
4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



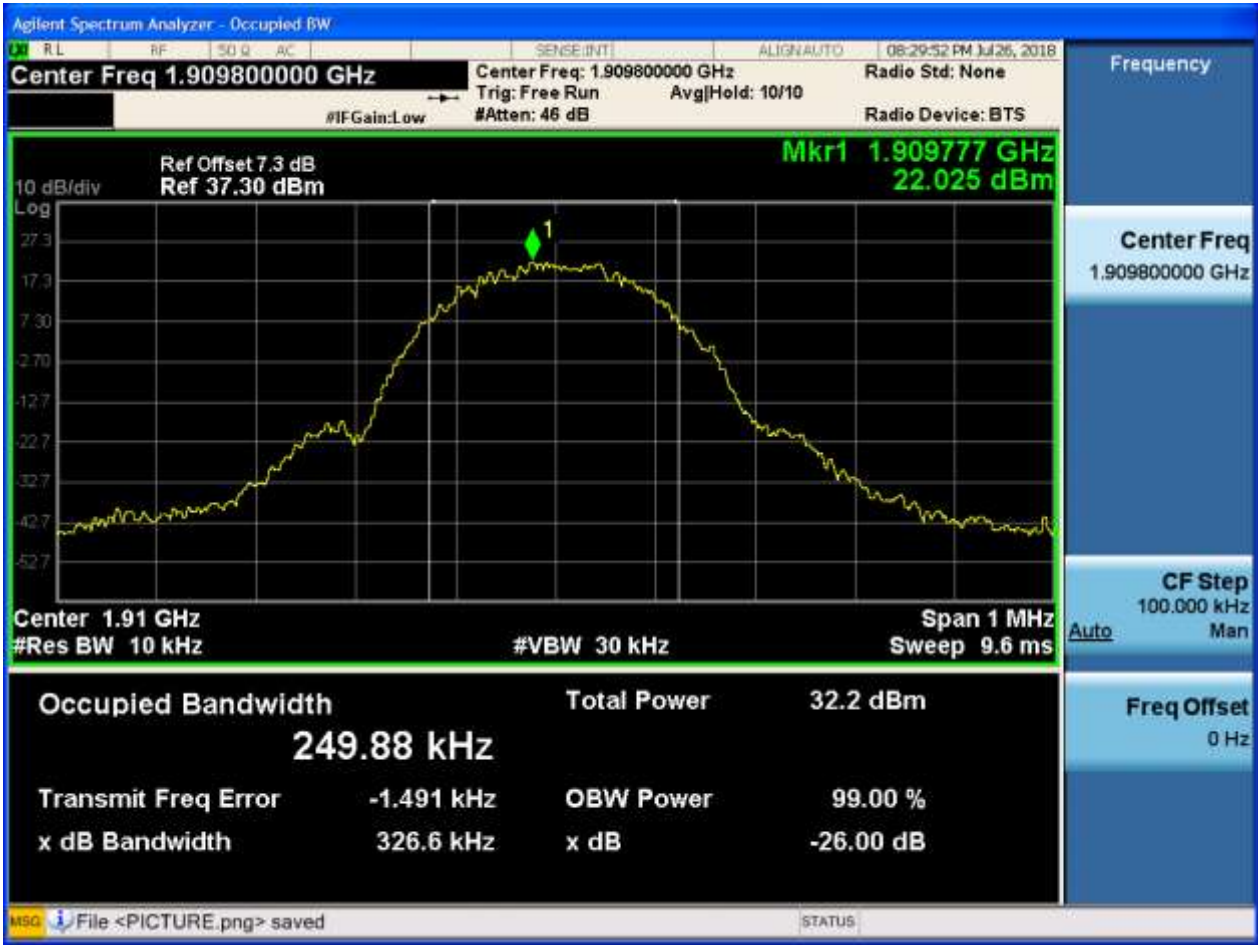


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH





5Appendix_E: Band Edges Compliance

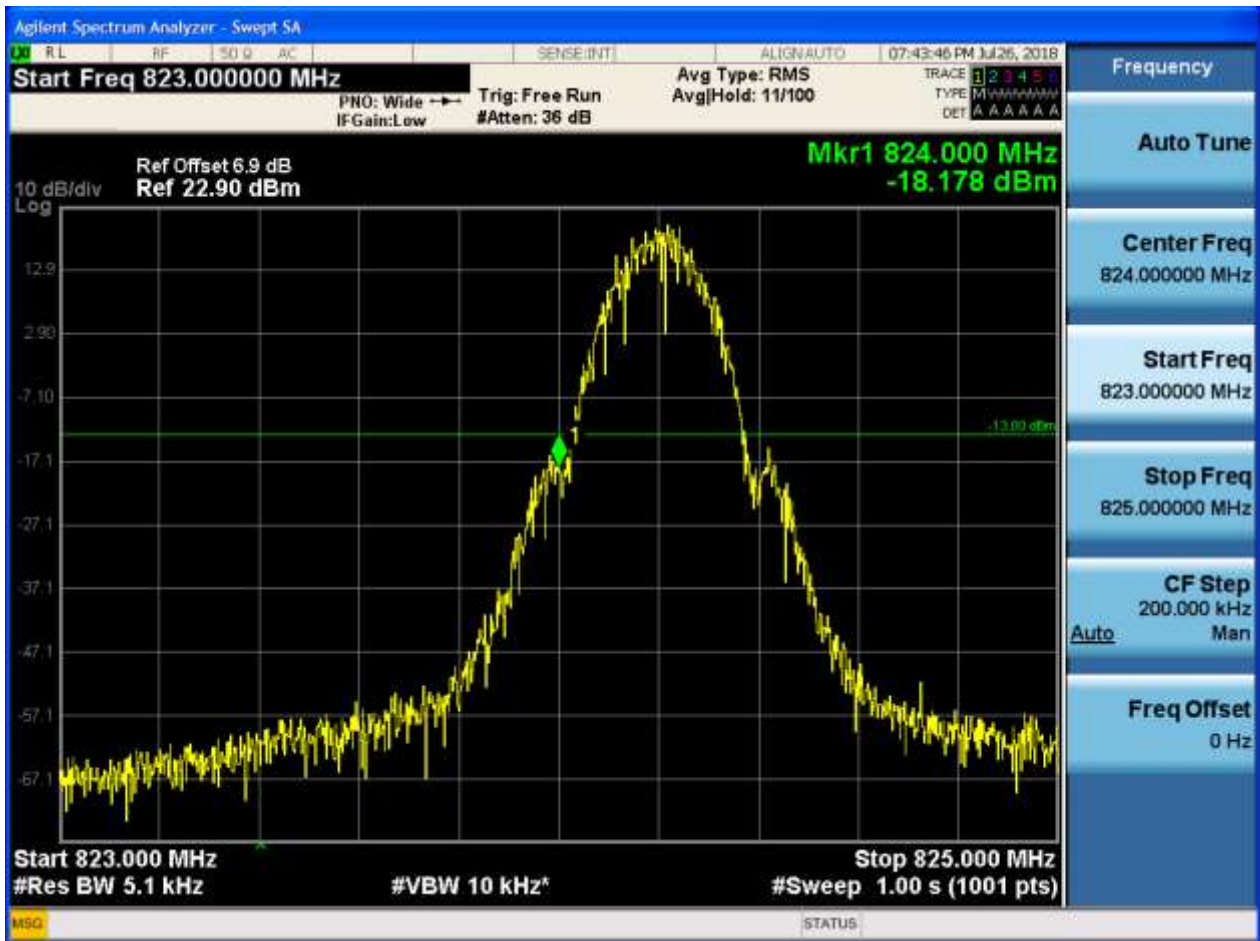
Part I - Test Plots

5.1 For GSM

5.1.1 Test Band = GSM850

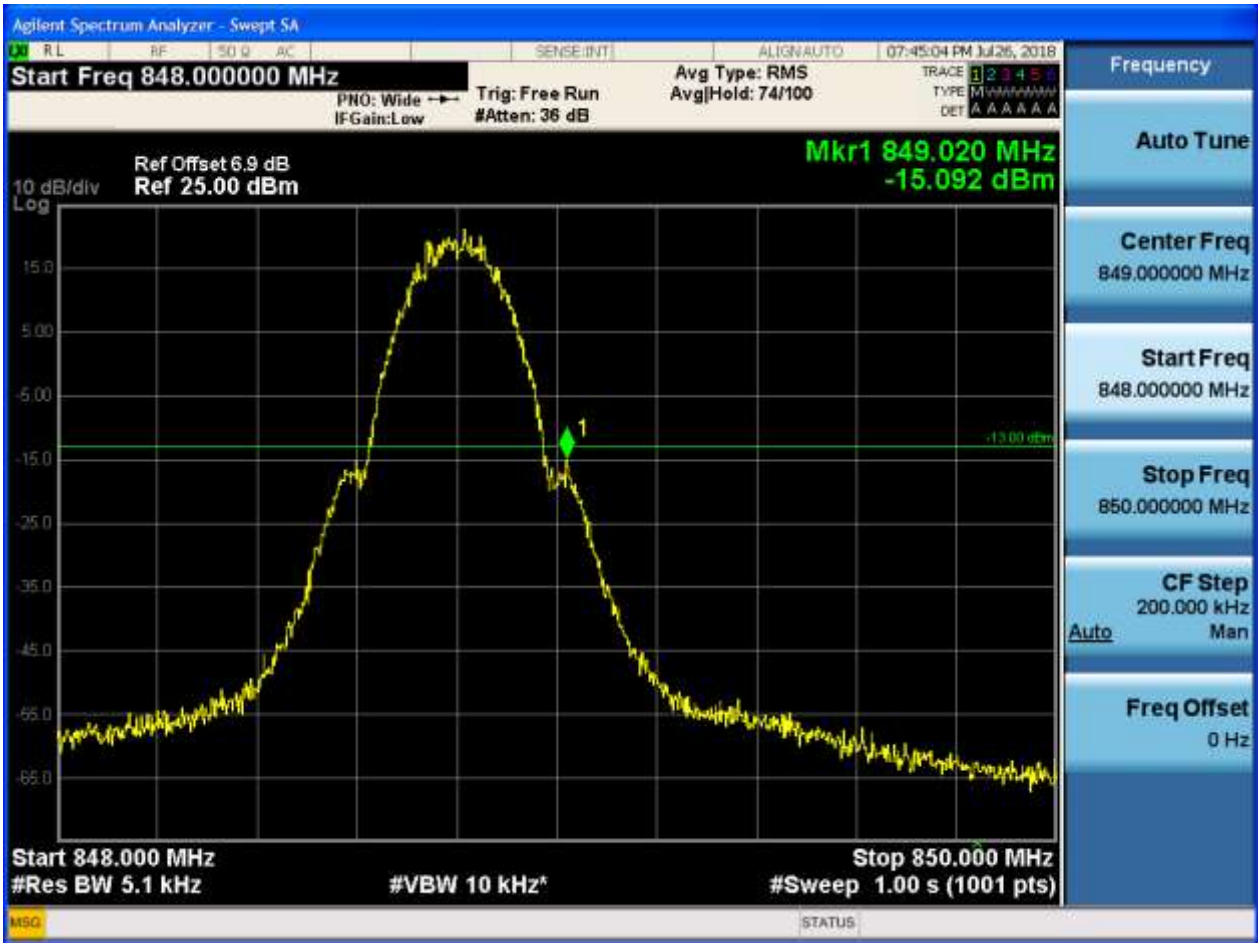
5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH



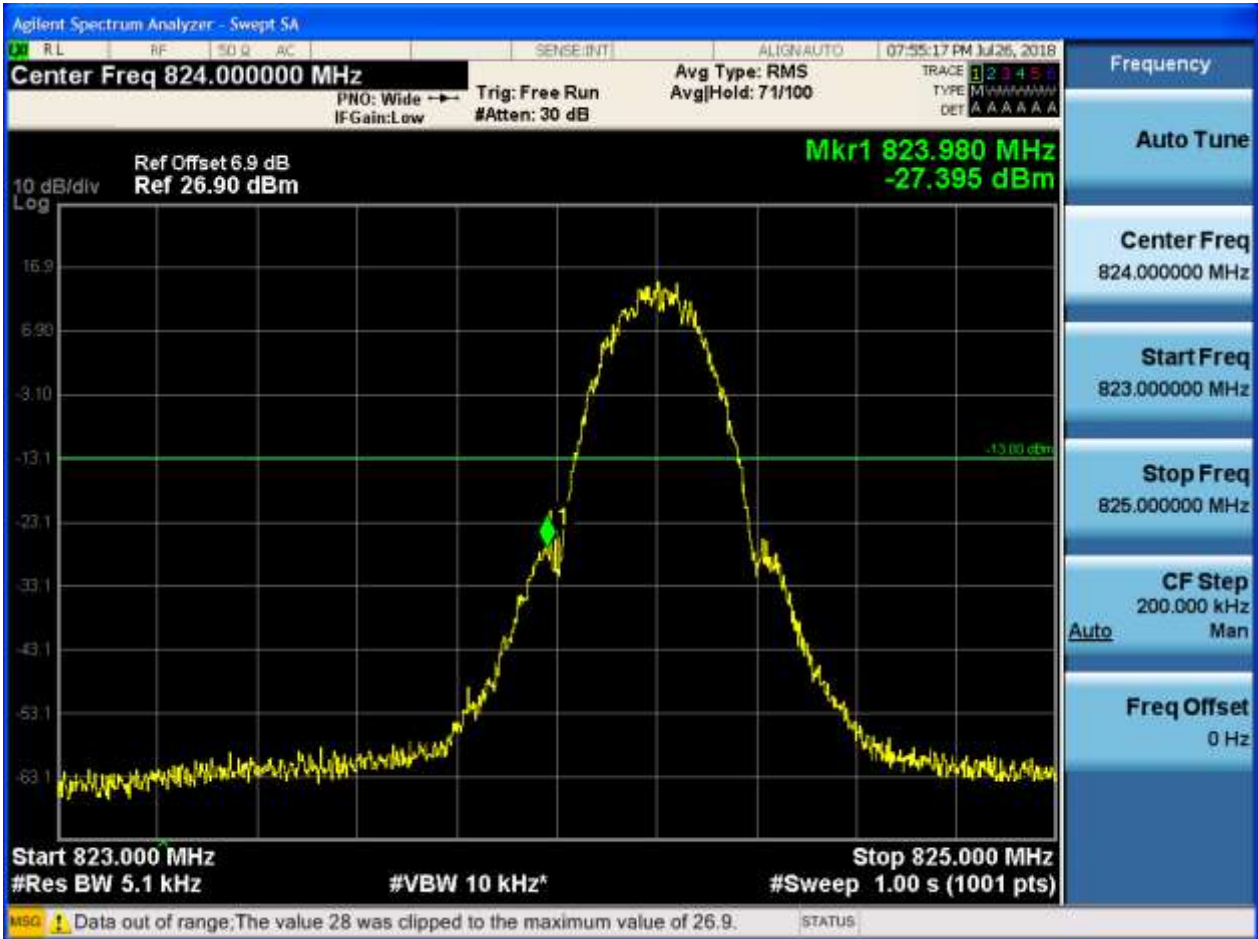


5.1.1.1.2 Test Channel = HCH



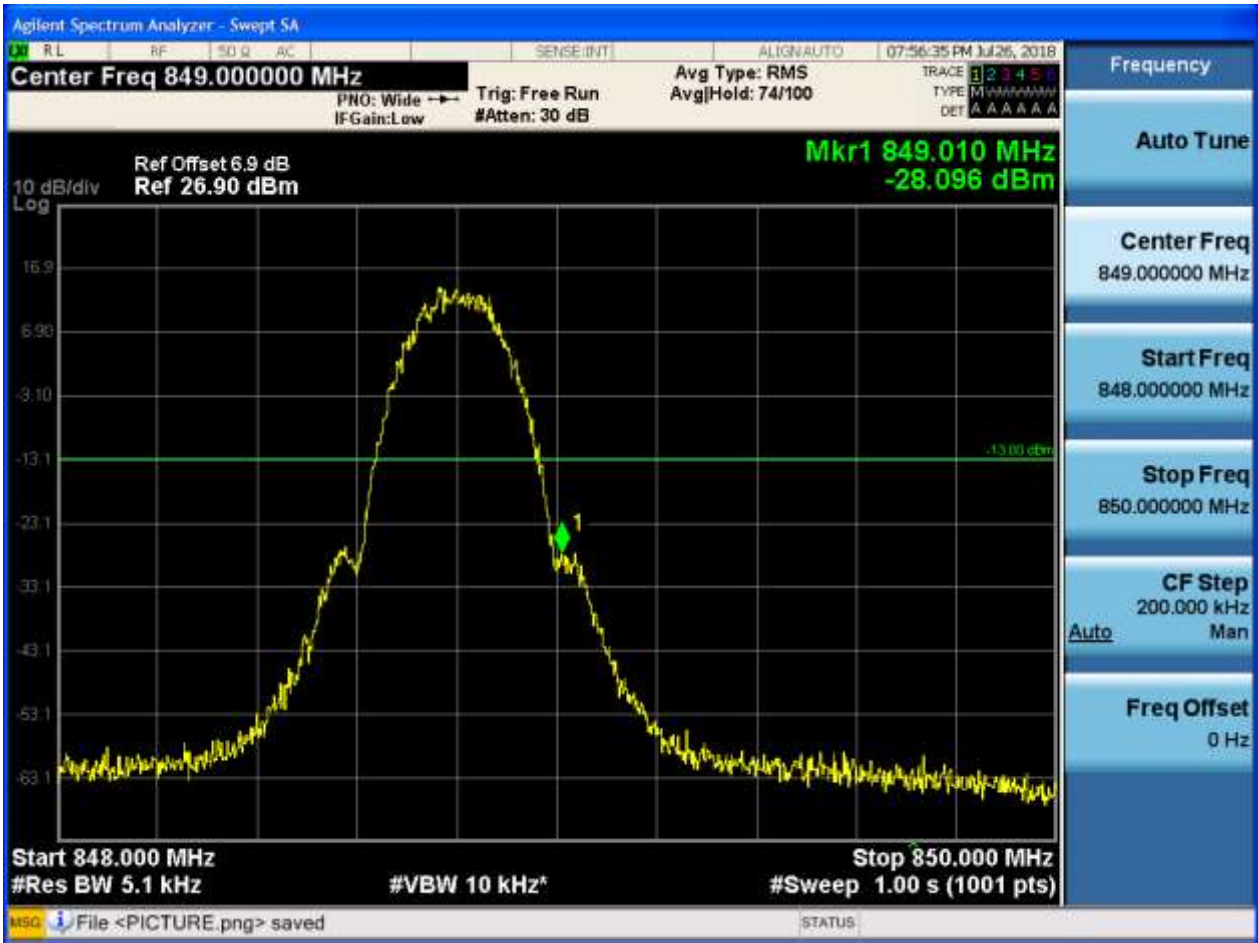
5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH





5.1.1.2.2 Test Channel = HCH

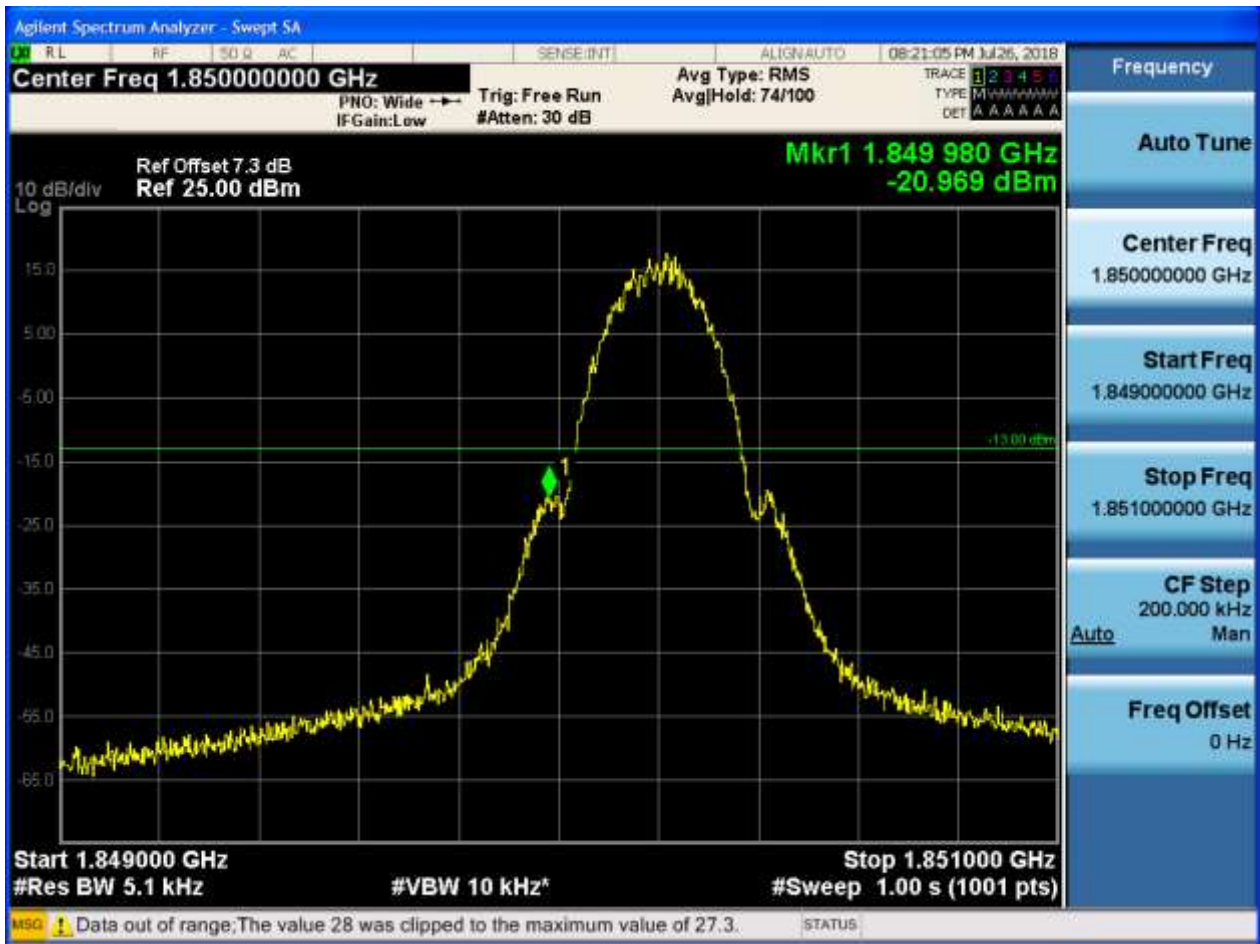




5.1.2 Test Band = GSM1900

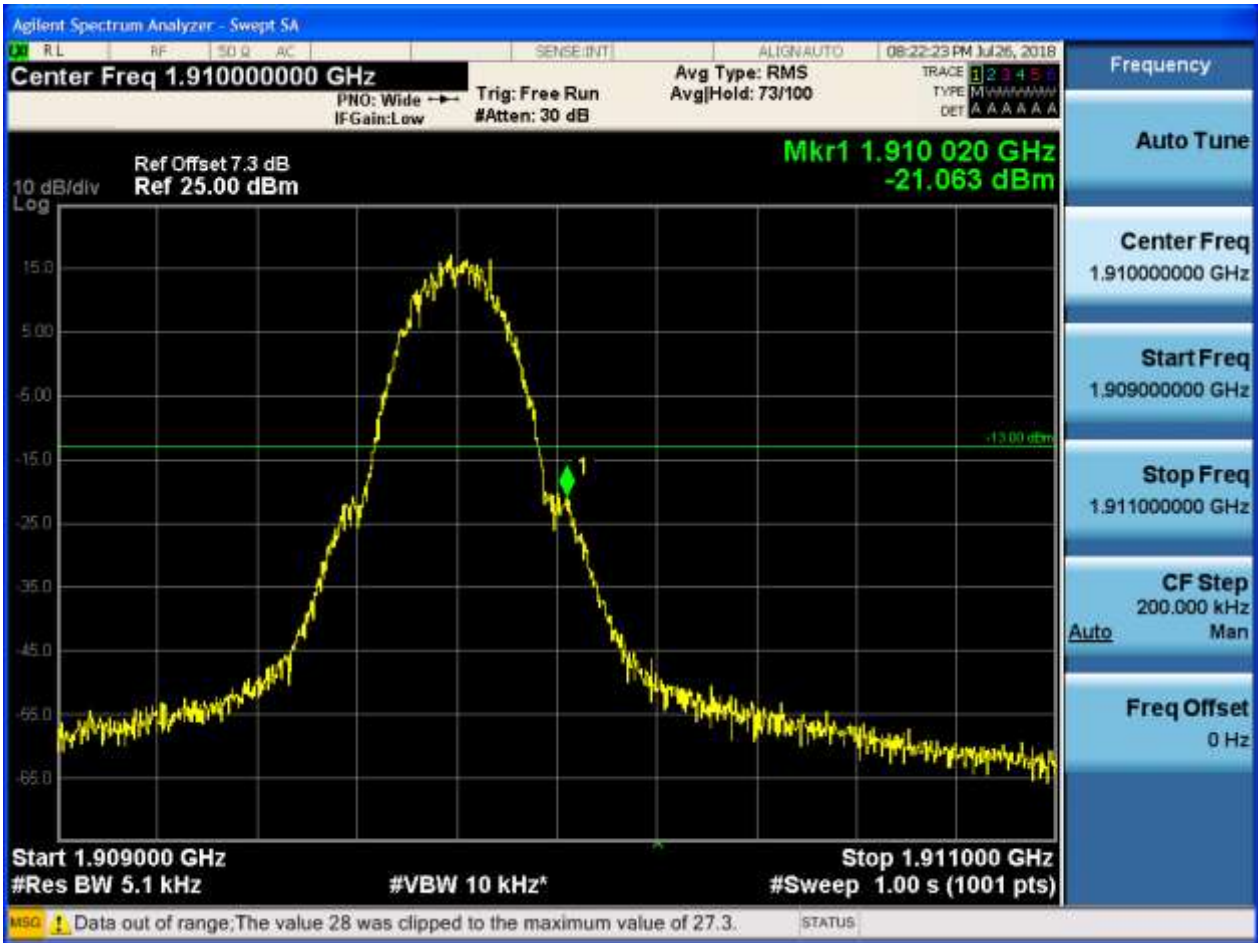
5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH





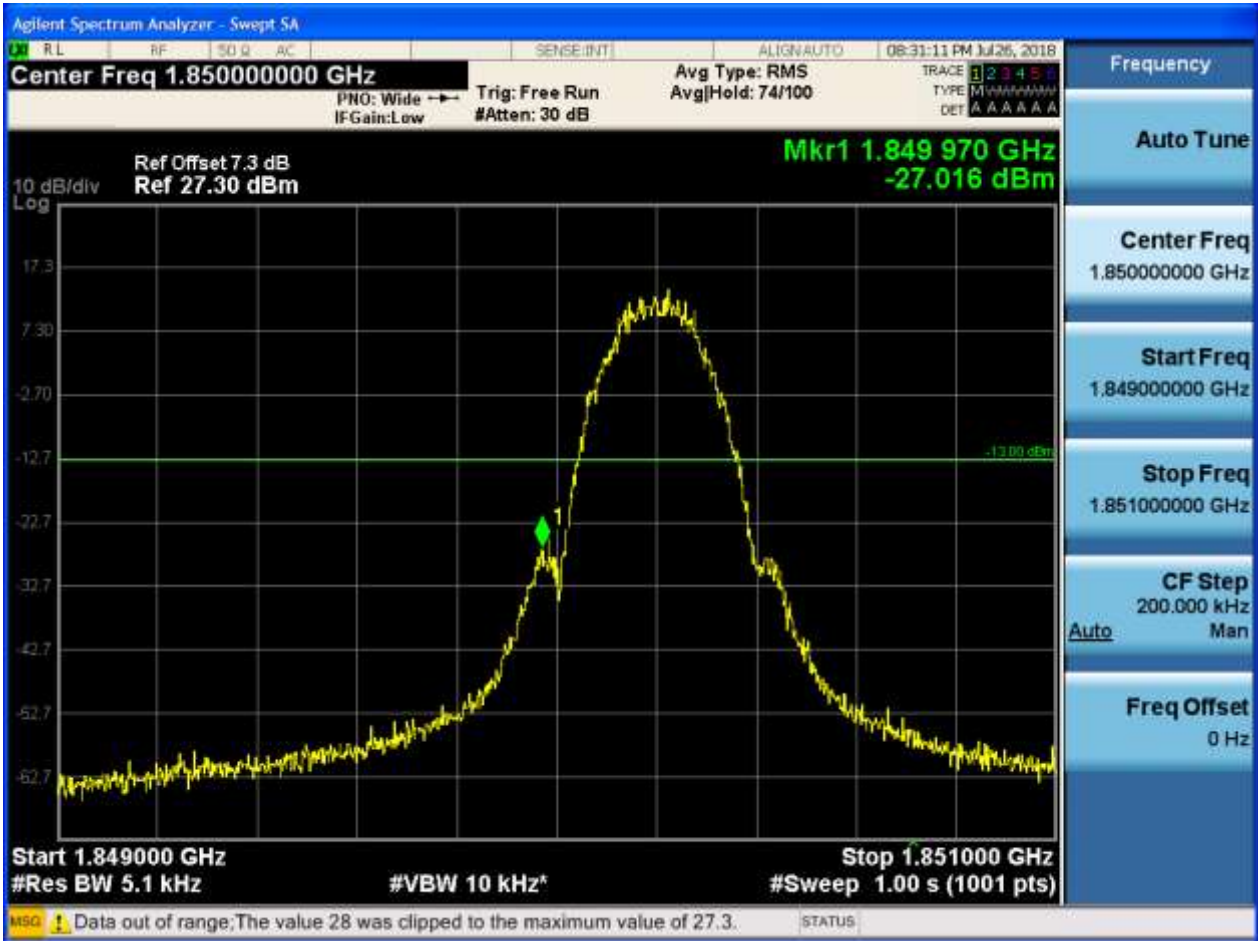
5.1.2.1.2 Test Channel = HCH



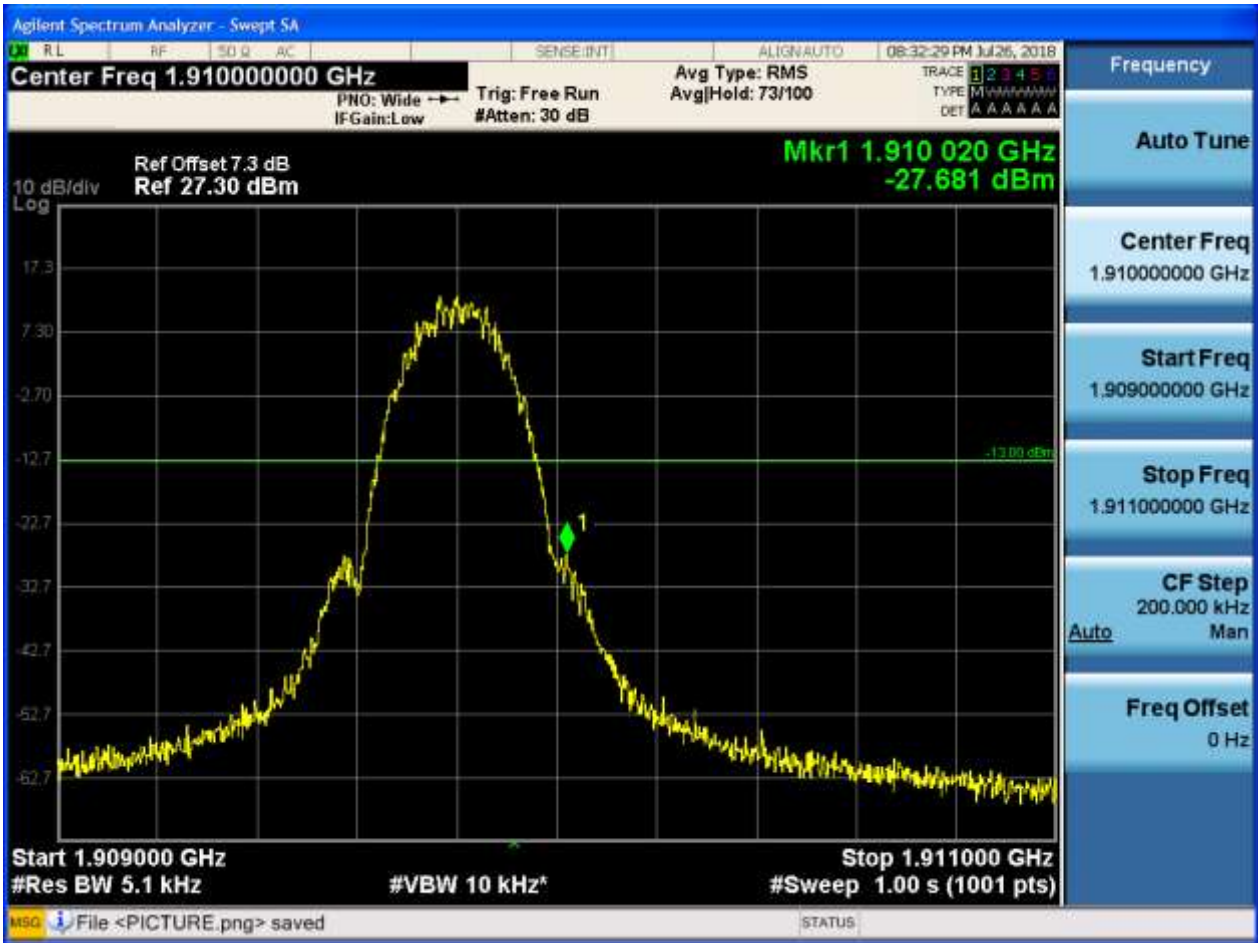


5.1.2.2 Test Mode = GSM/TM2

5.1.2.2.1 Test Channel = LCH



5.1.2.2.2 Test Channel = HCH





6Appendix_F: Spurious Emission at Antenna Terminal

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

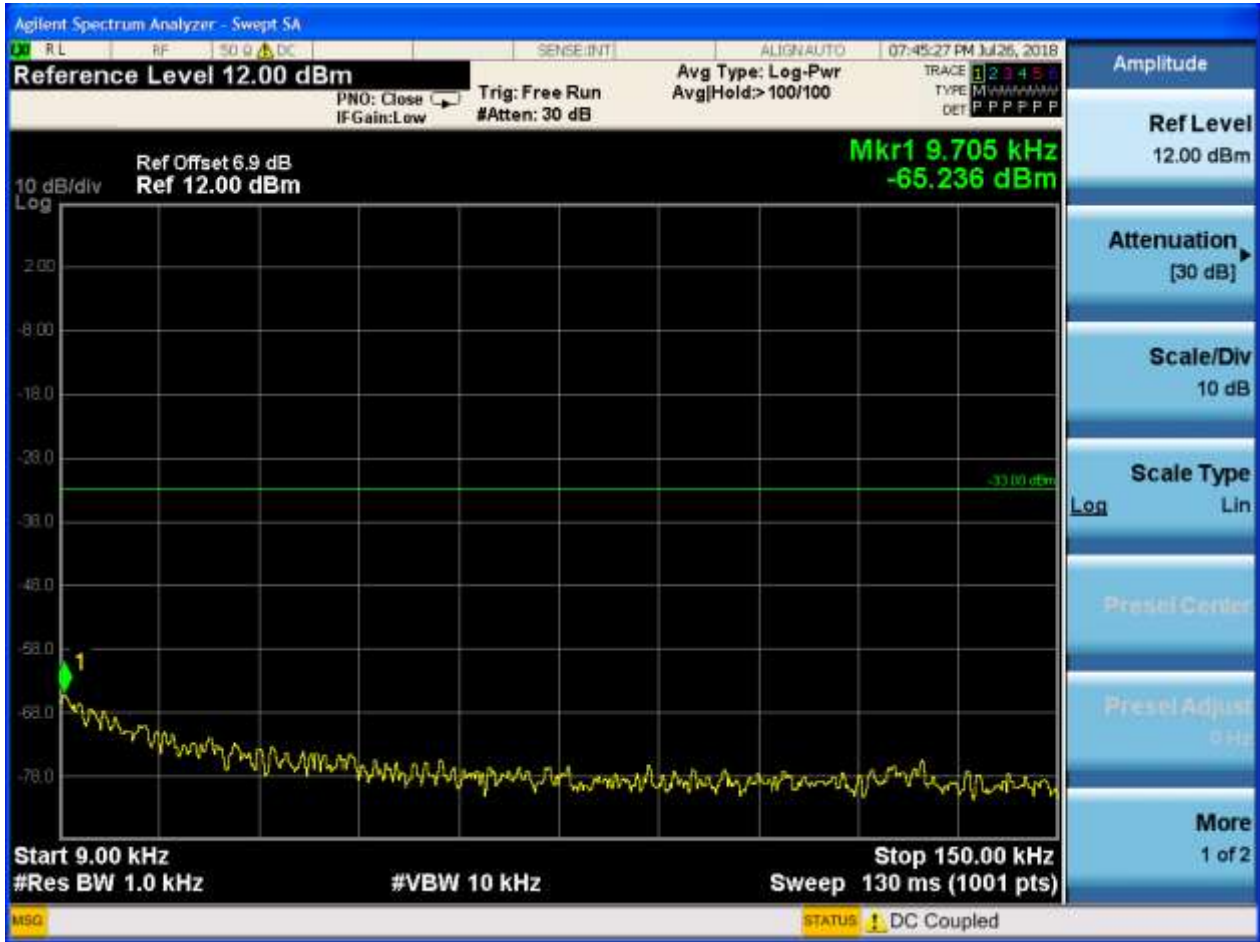
Part I - Test Plots

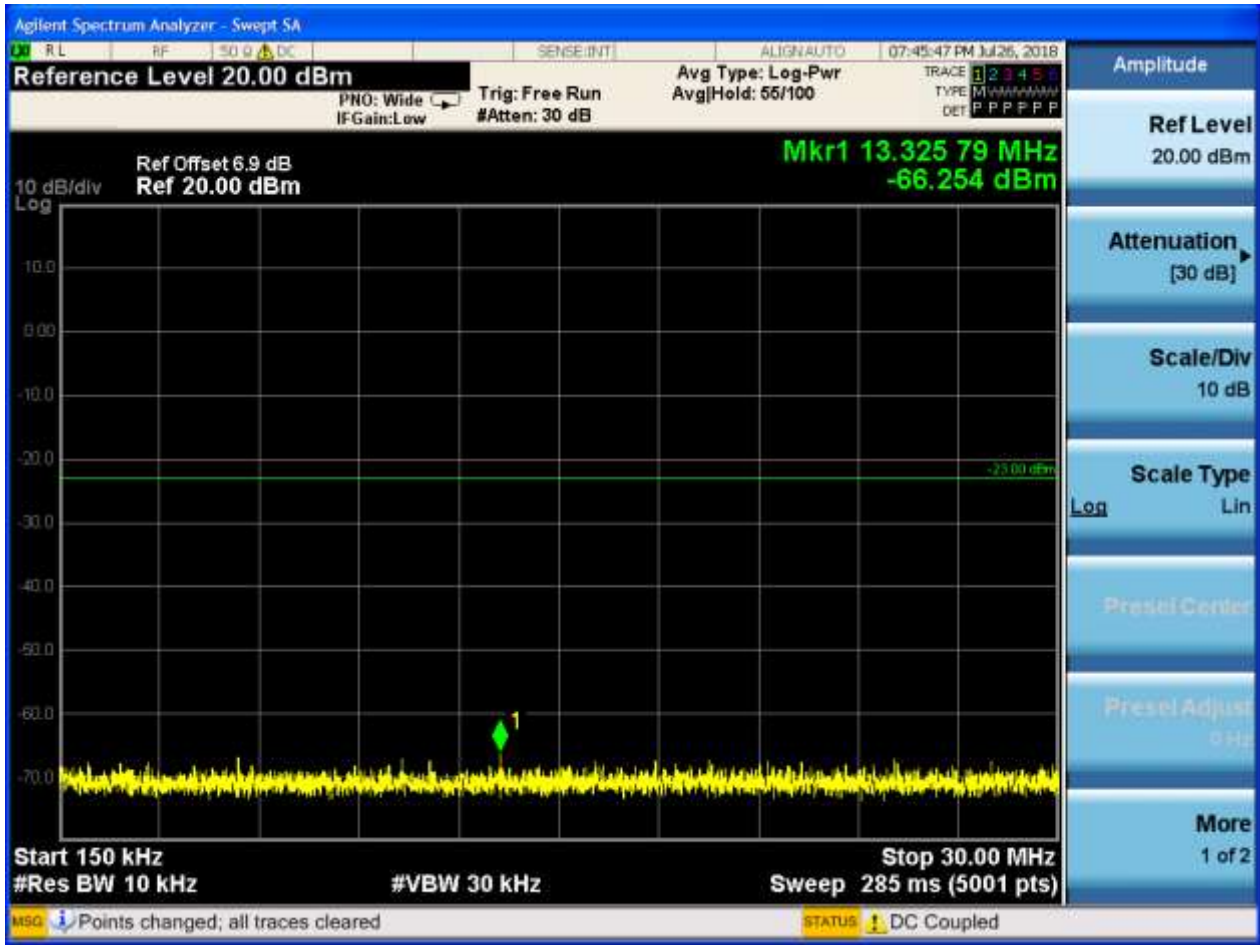
6.1 For GSM

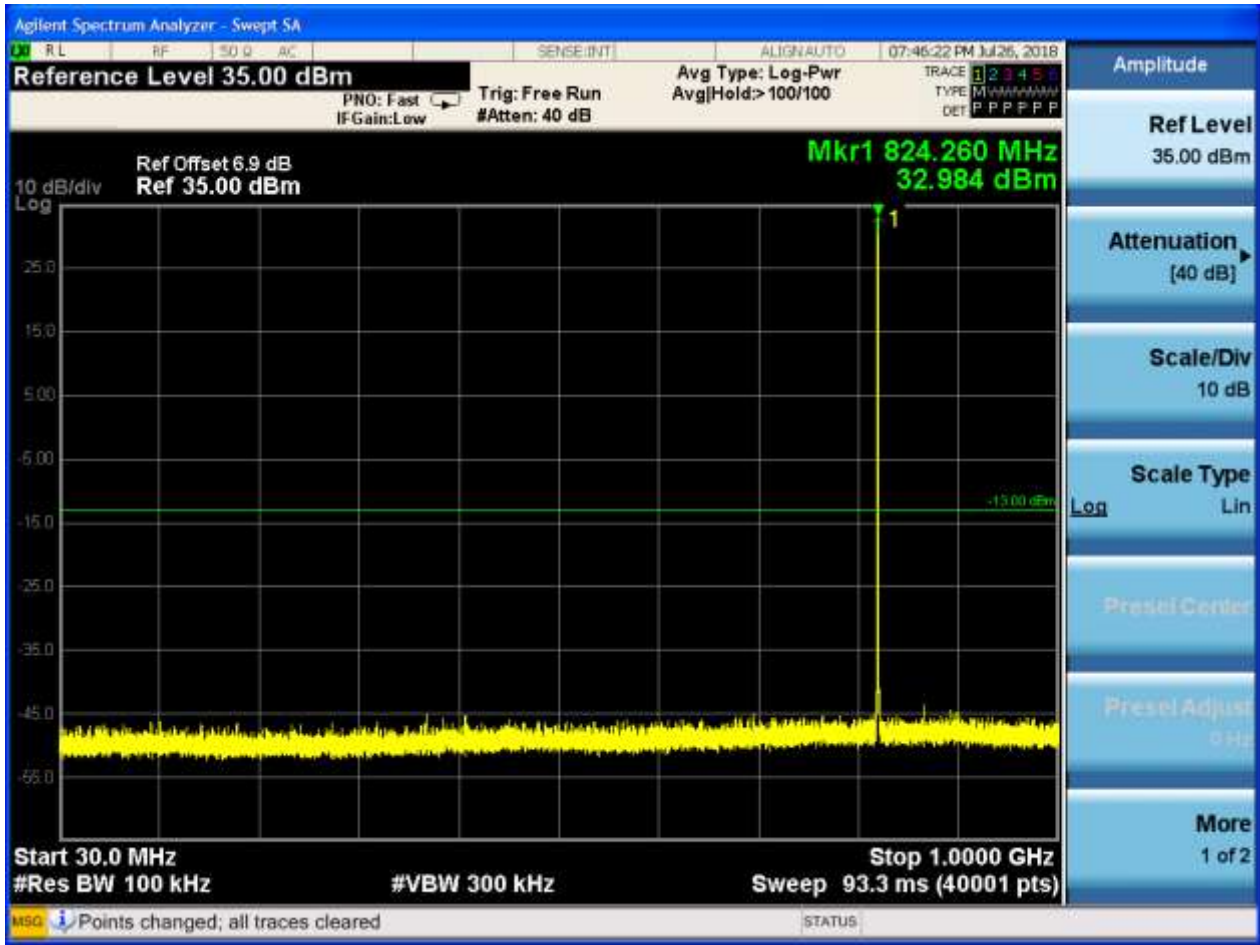
6.1.1 Test Band = GSM850

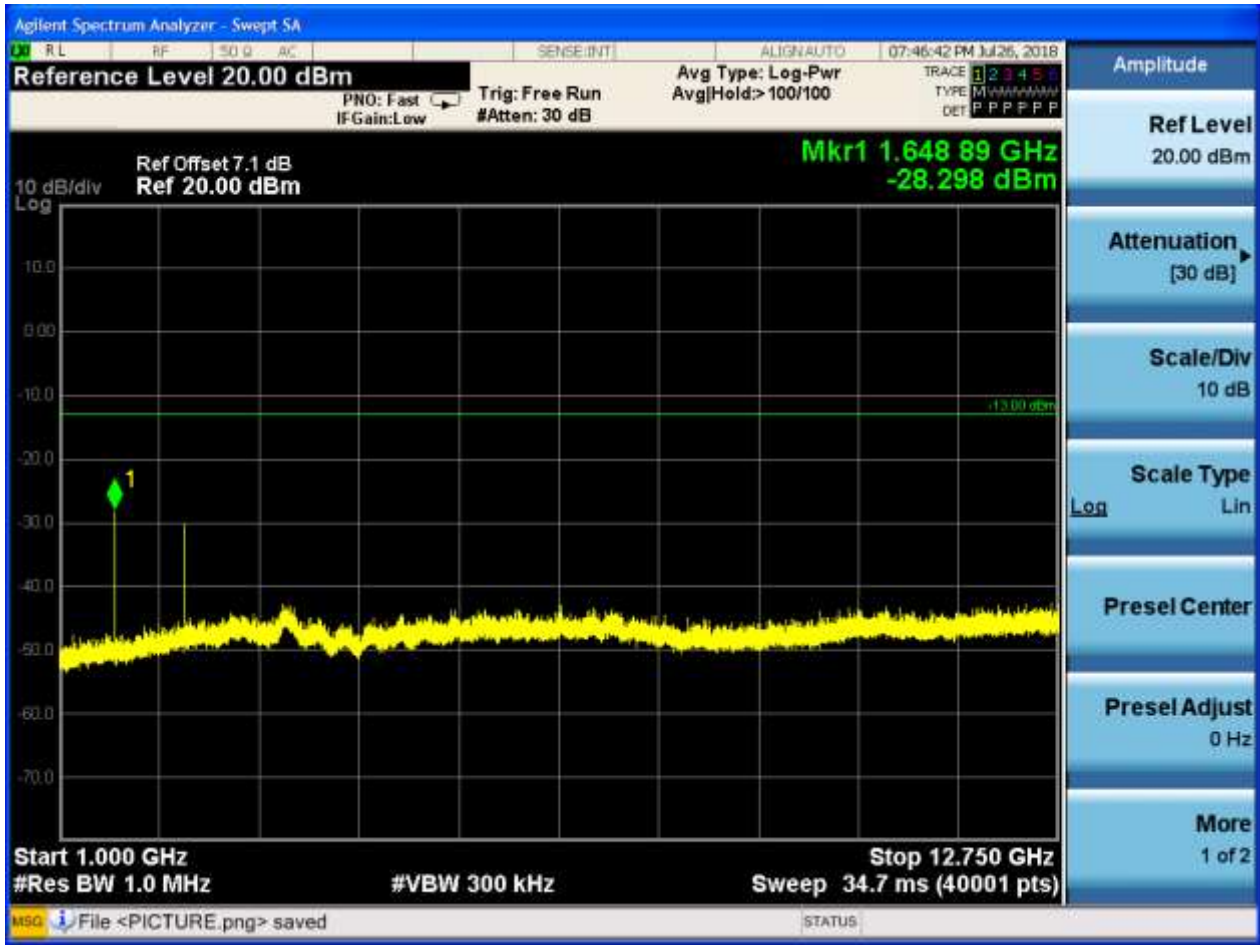
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH

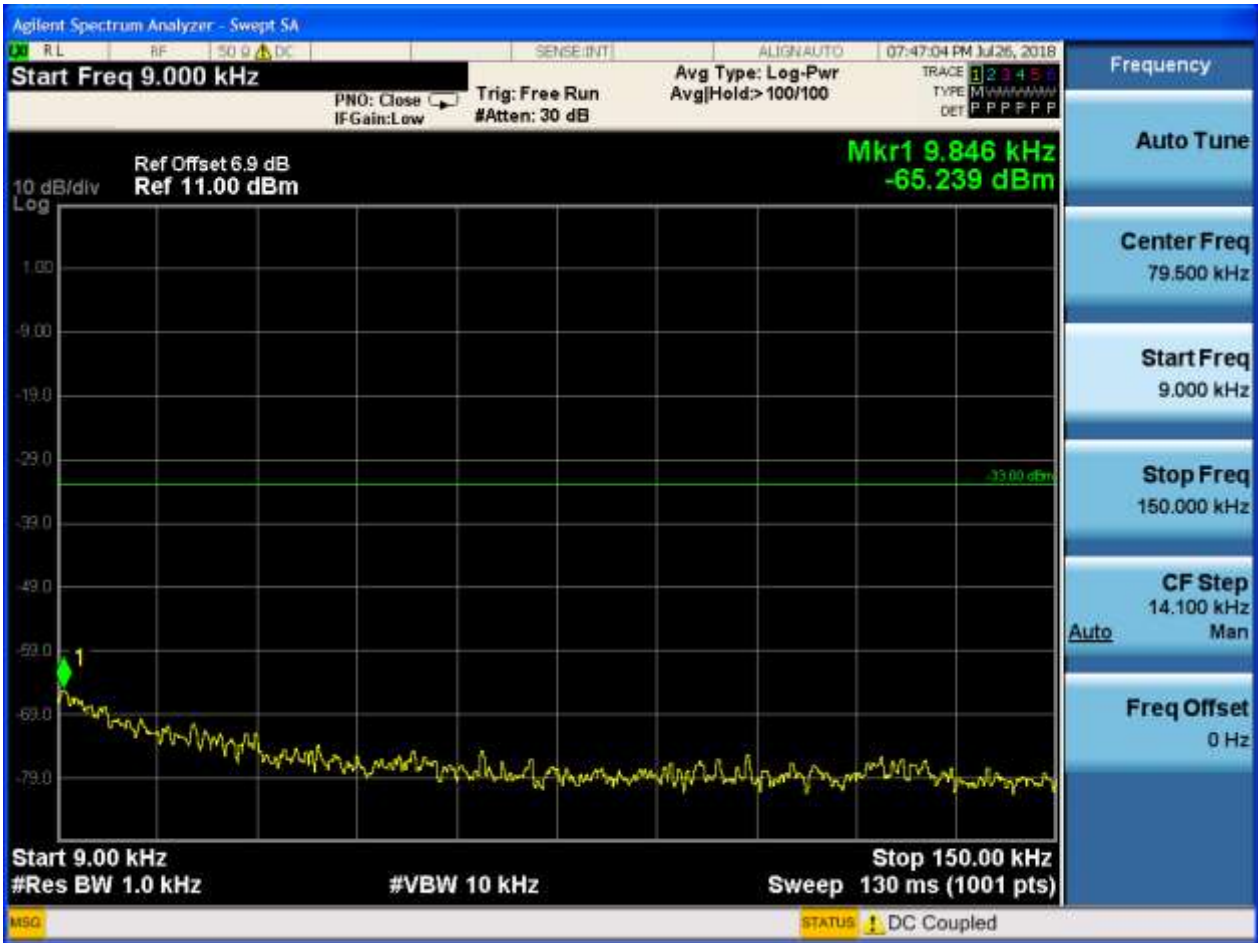


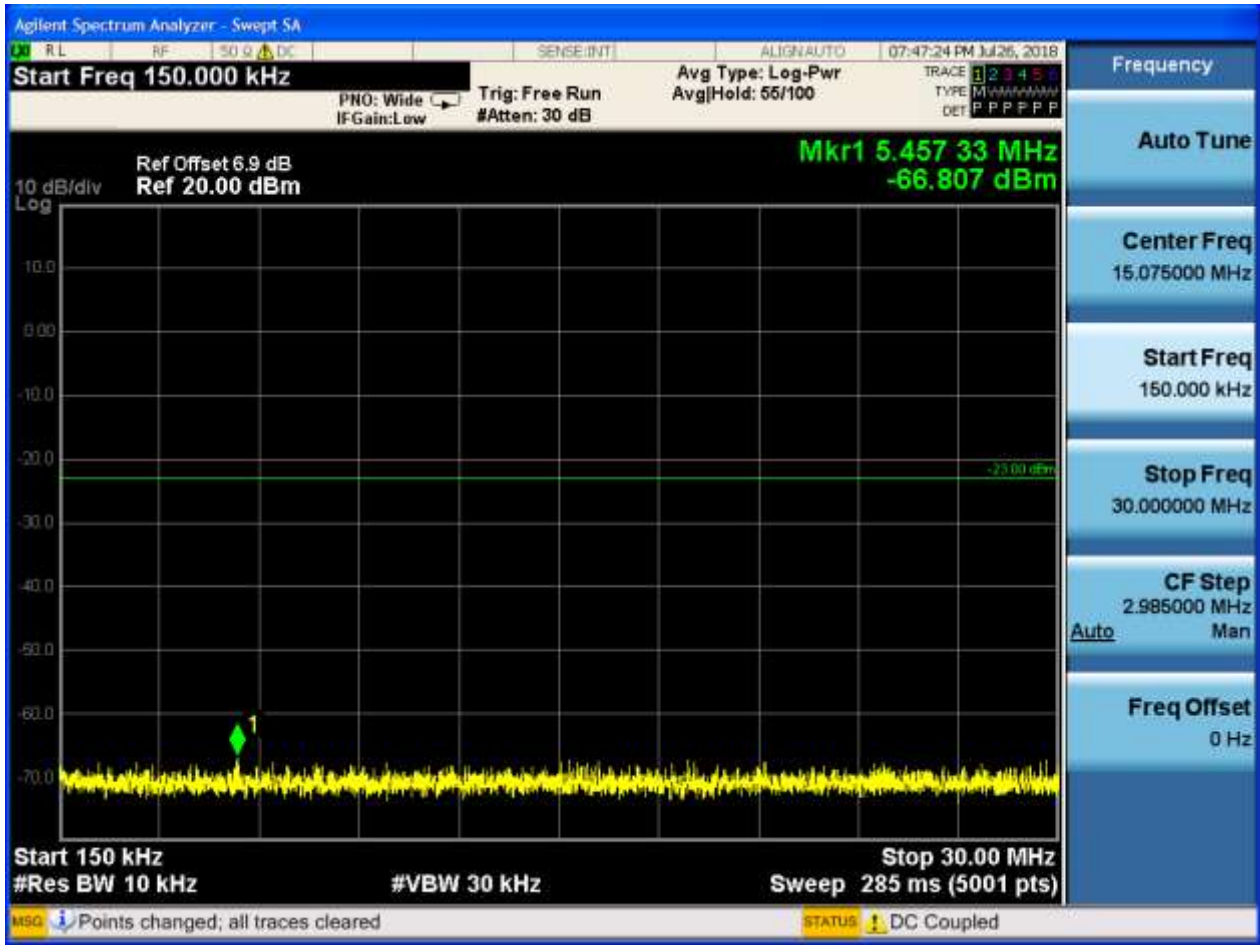


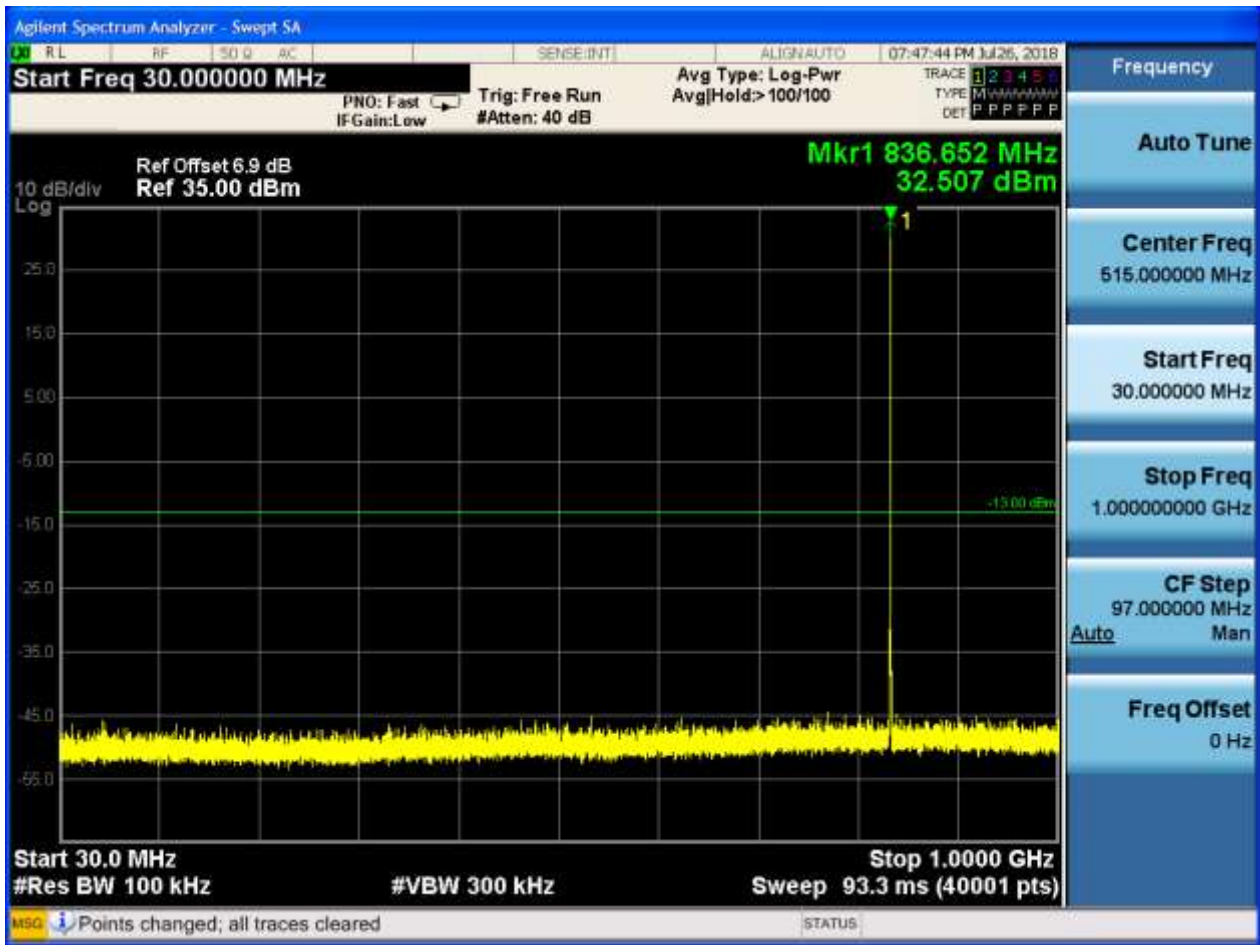


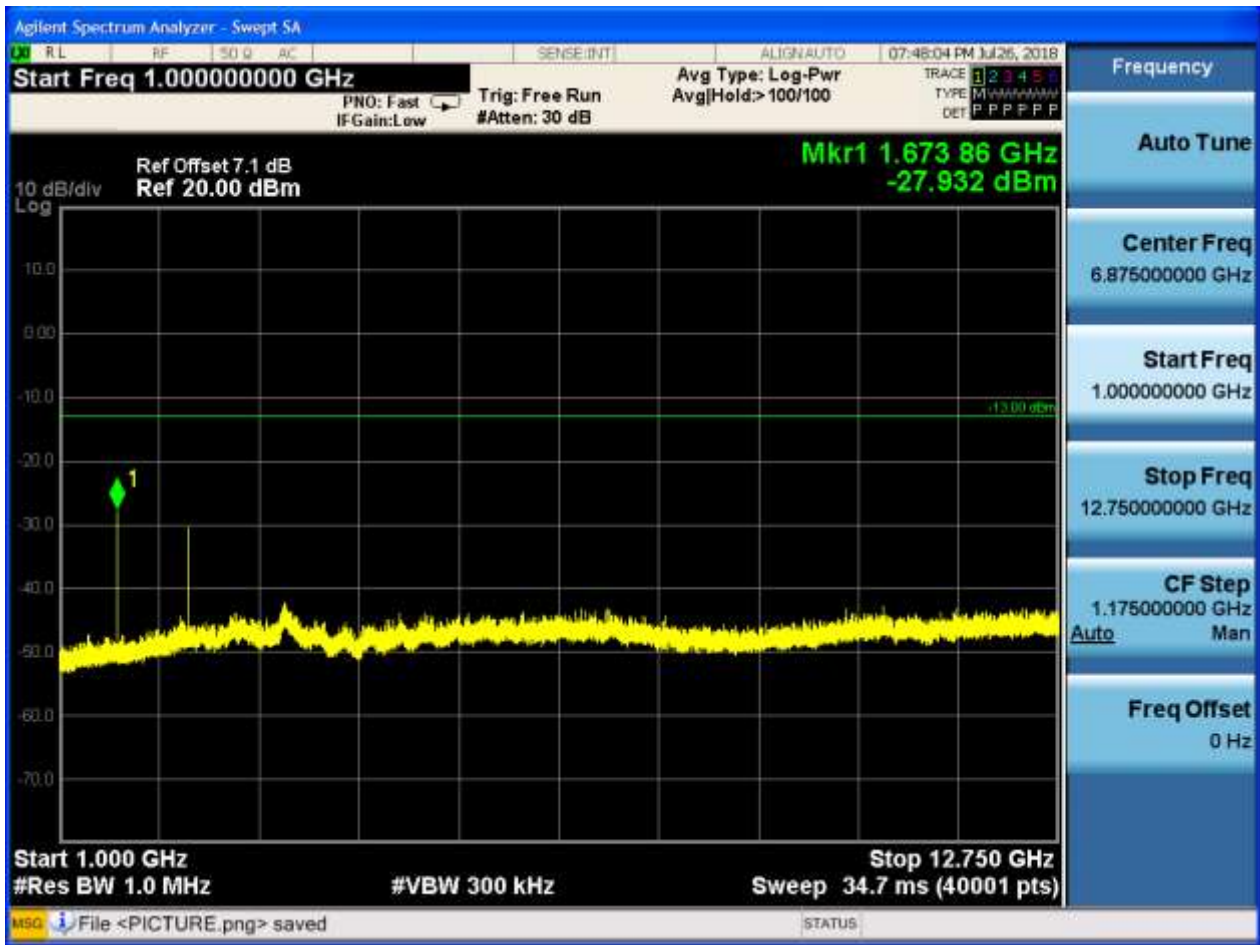


6.1.1.1.2 Test Channel = MCH



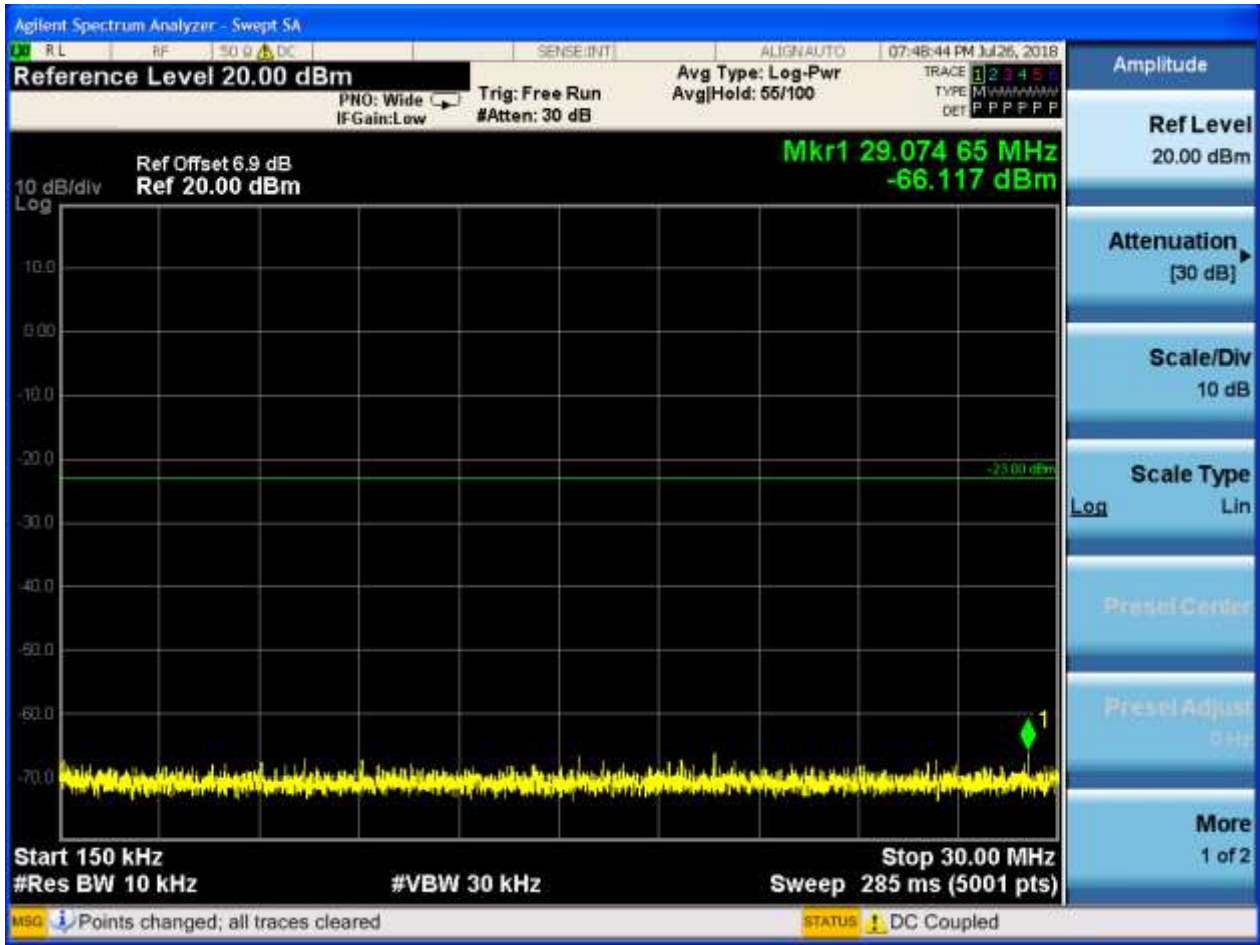


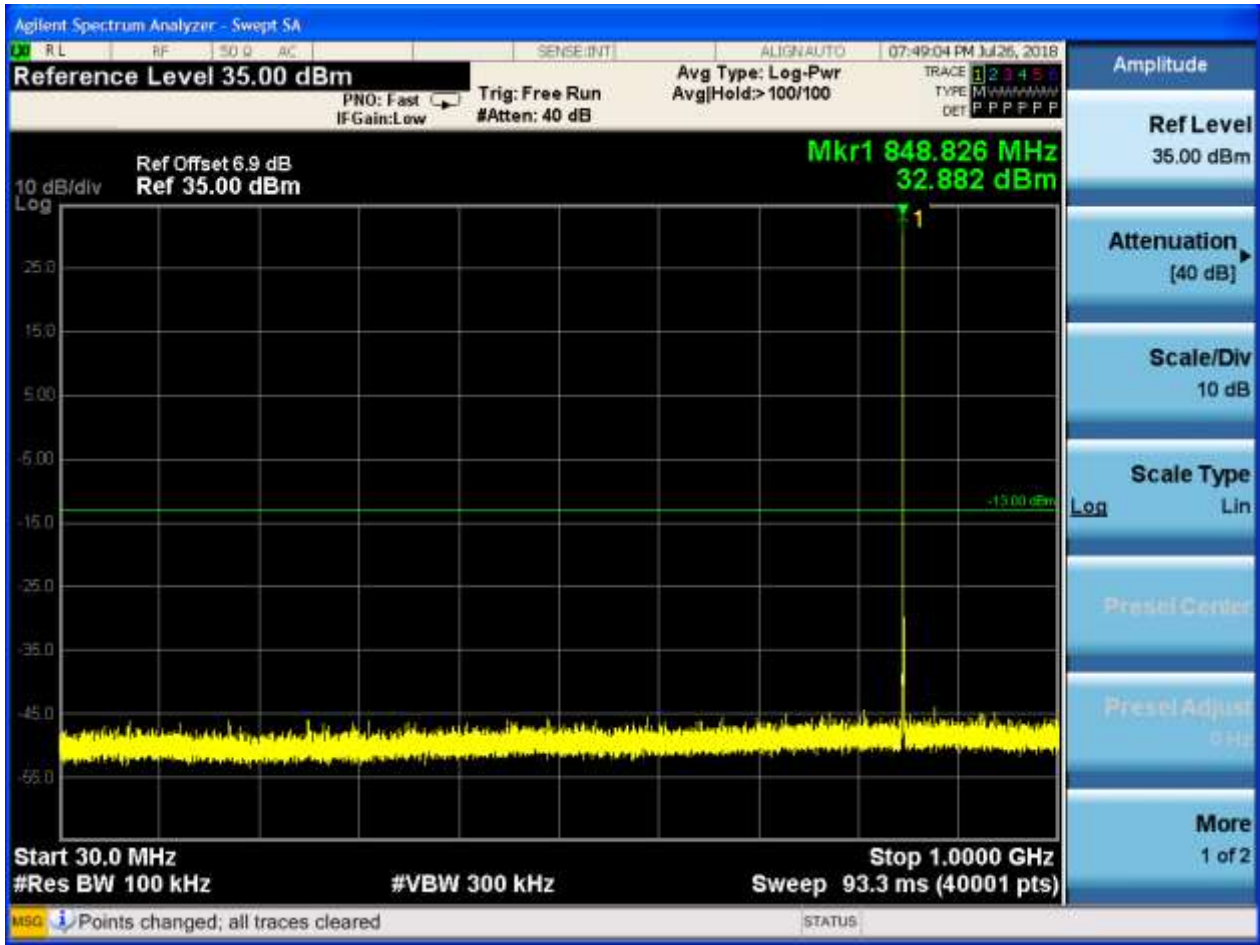




6.1.1.1.3 Test Channel = HCH





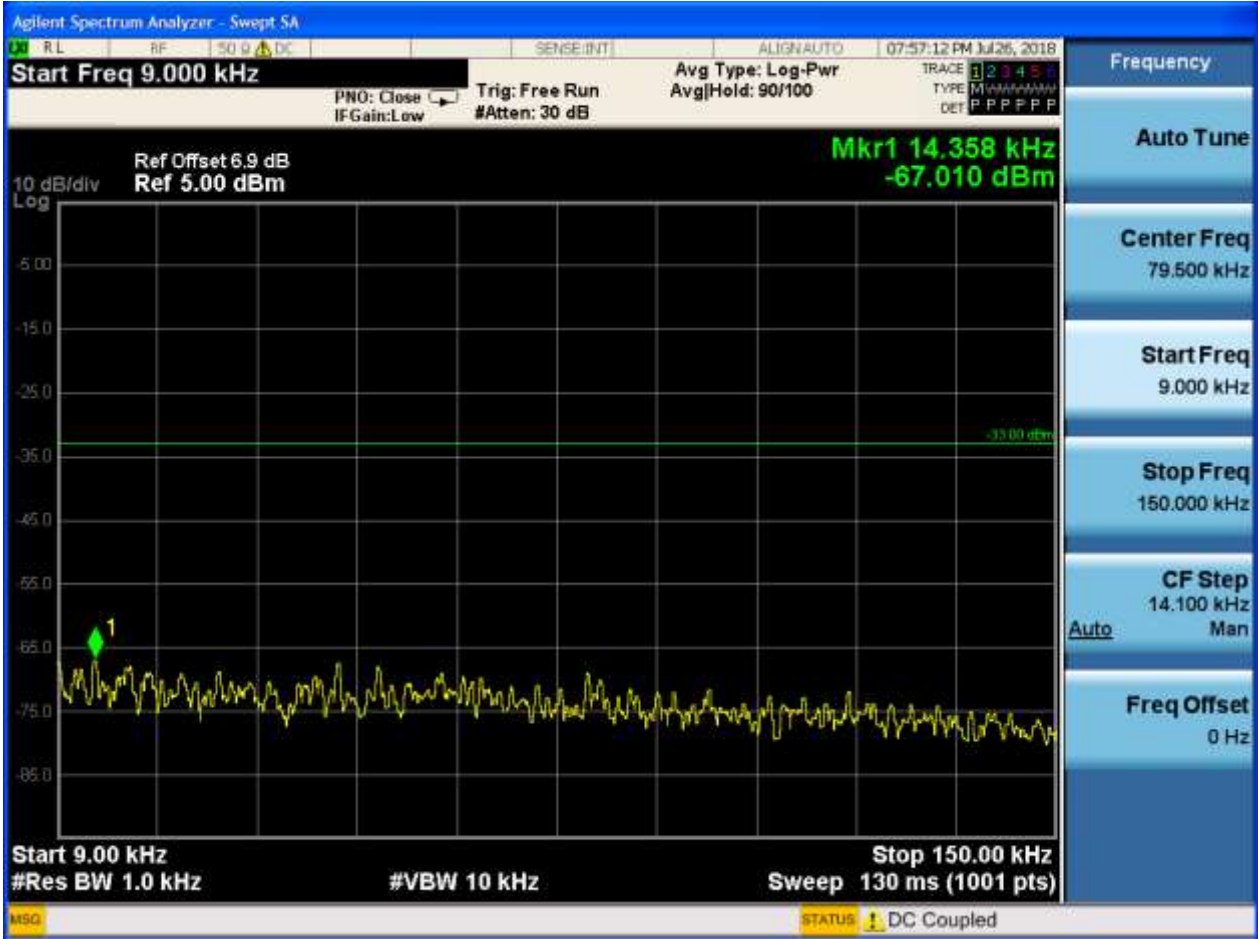


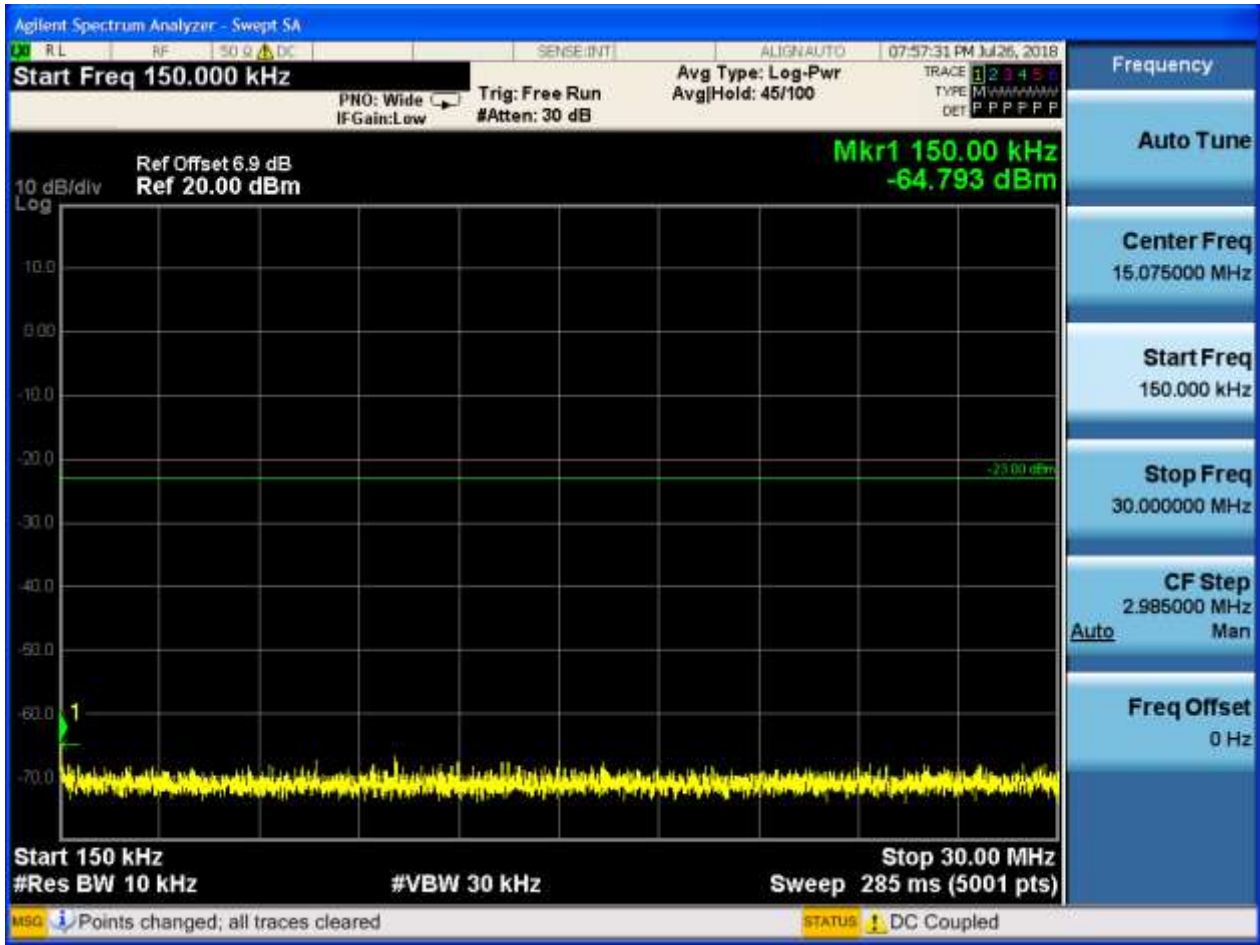


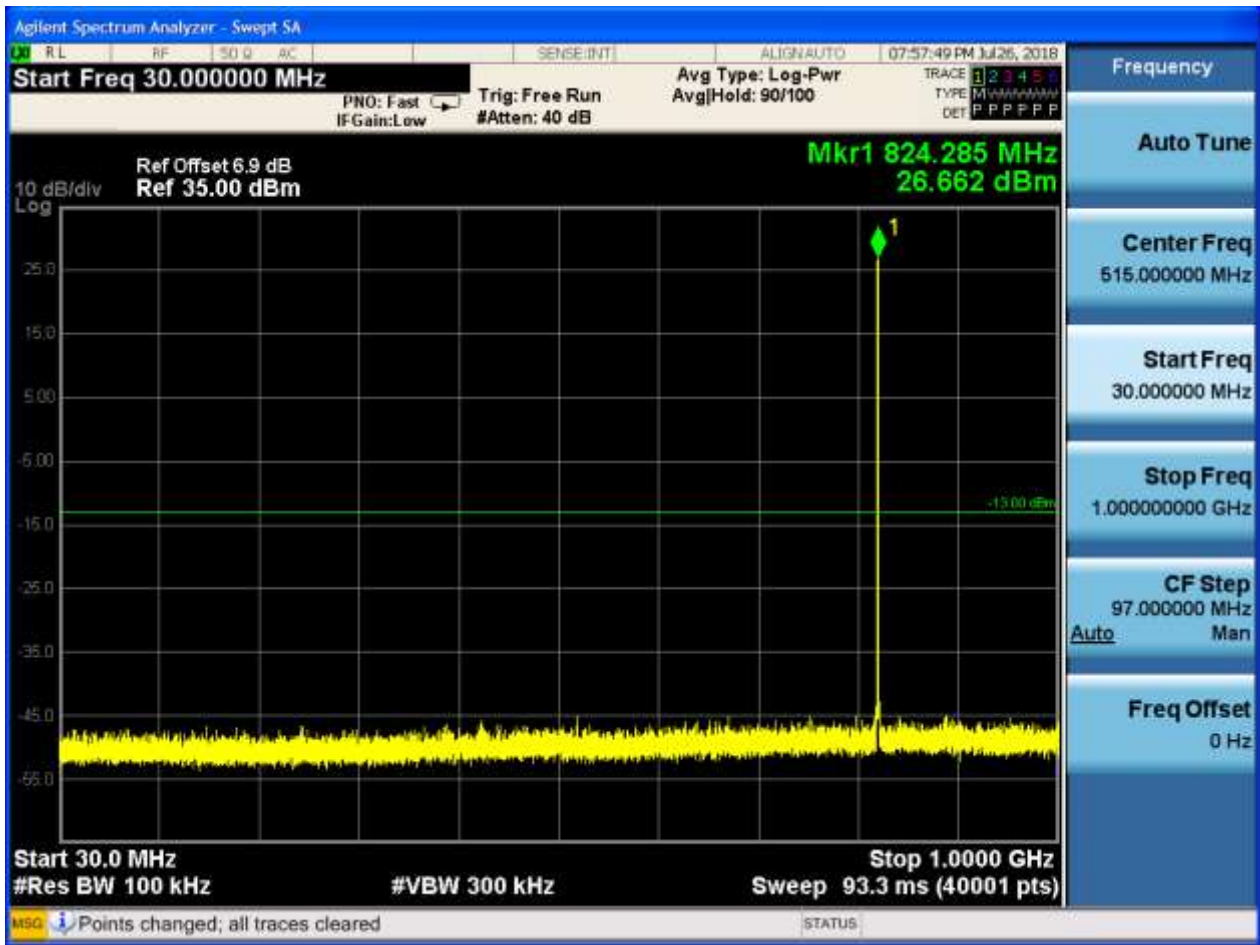


6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH



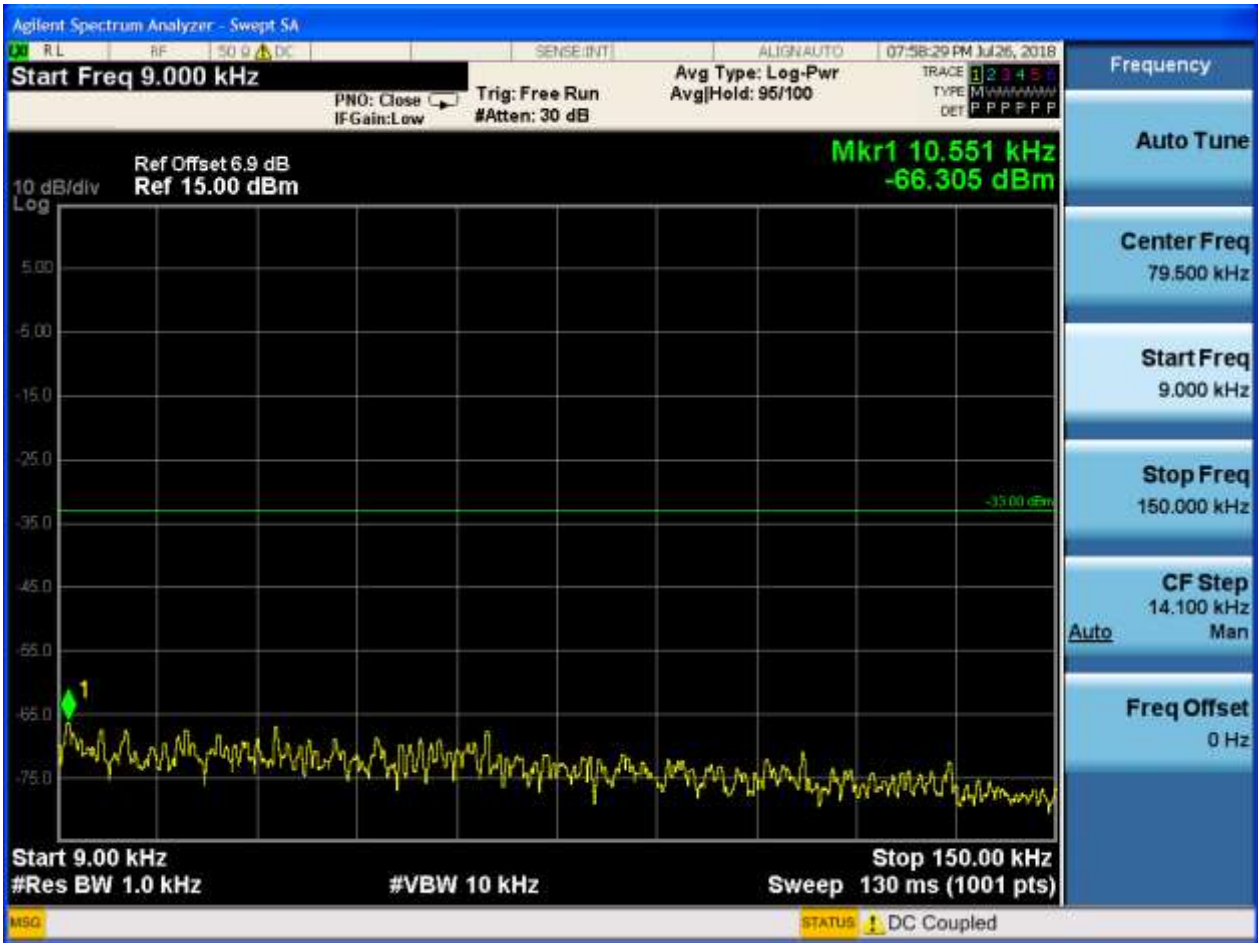


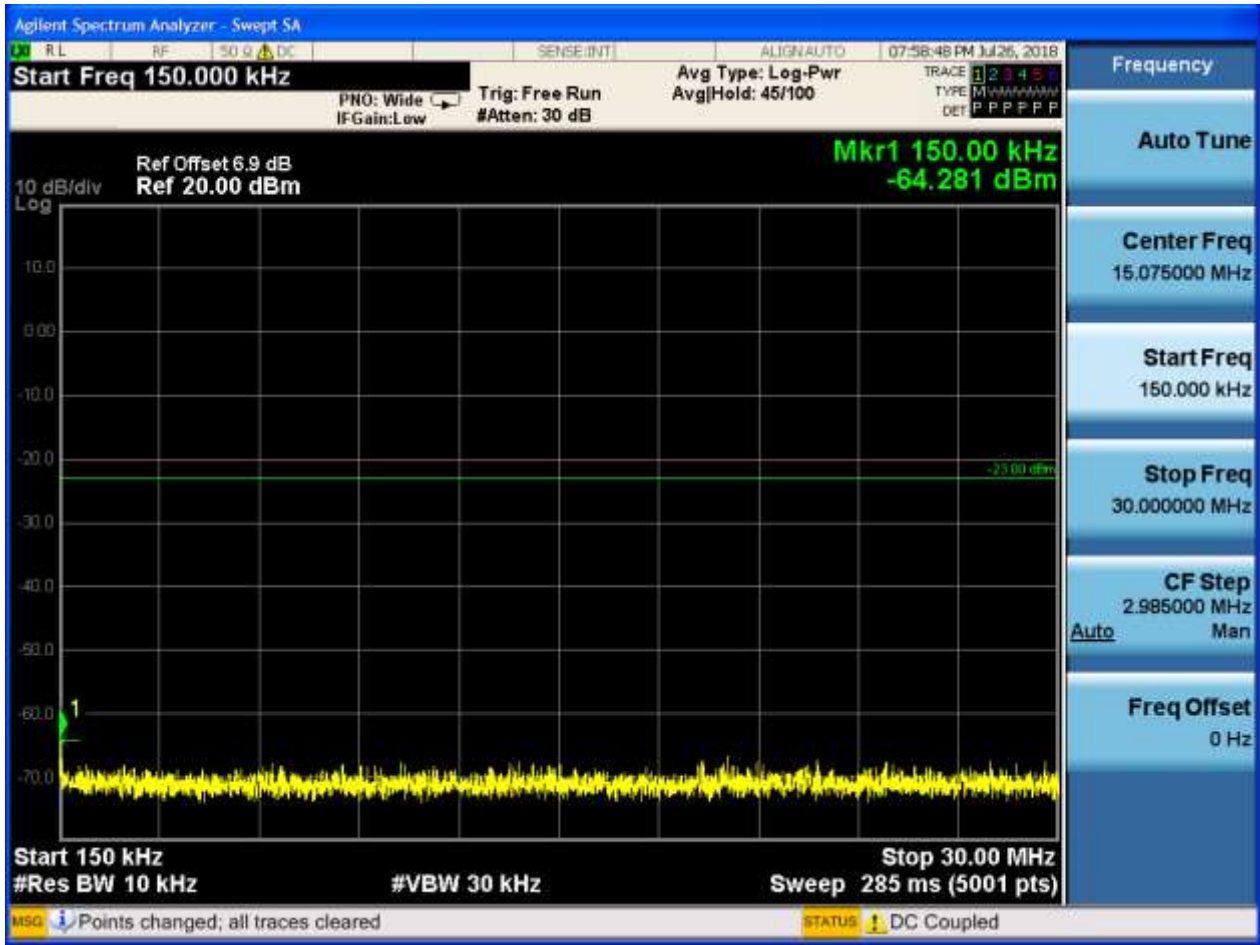


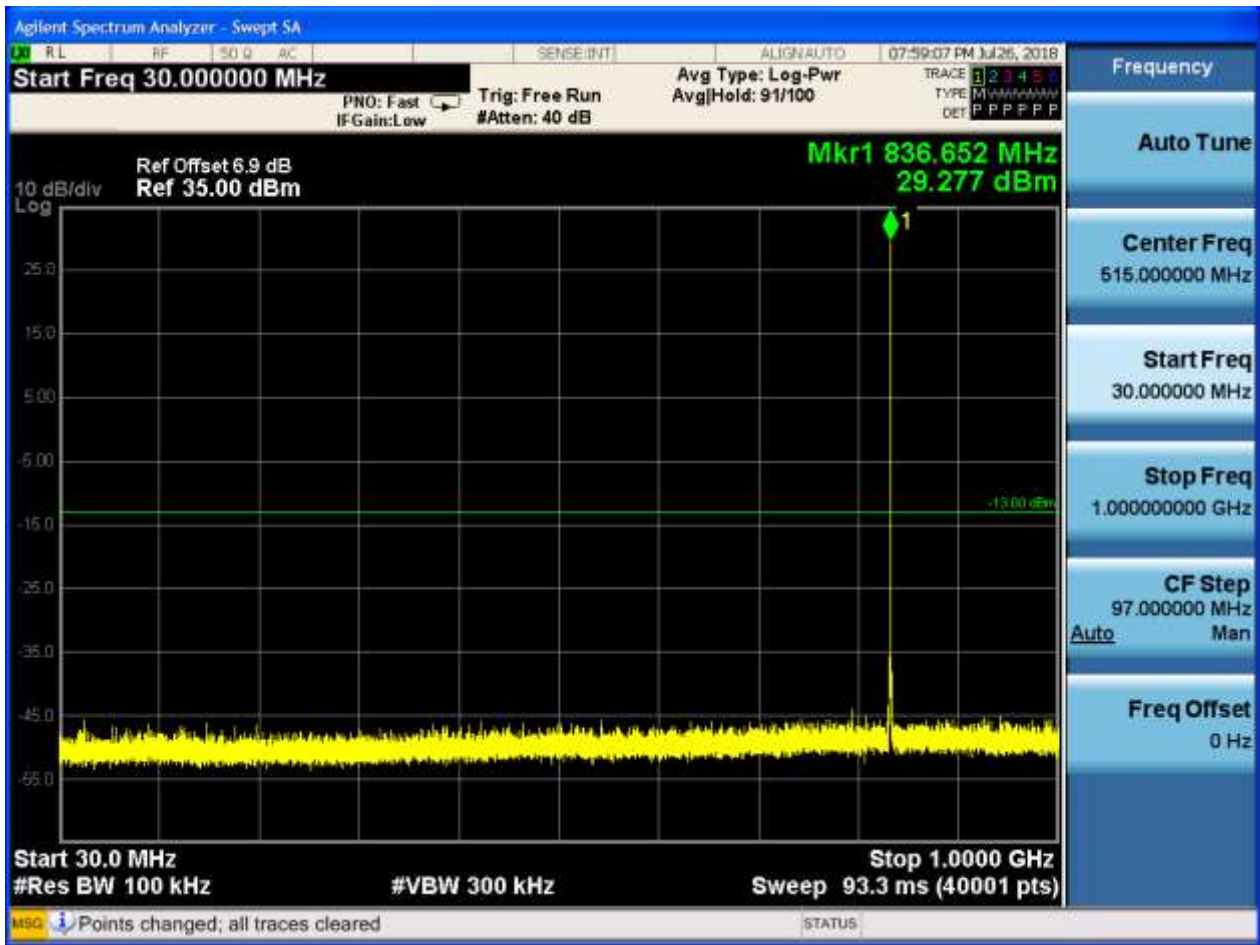


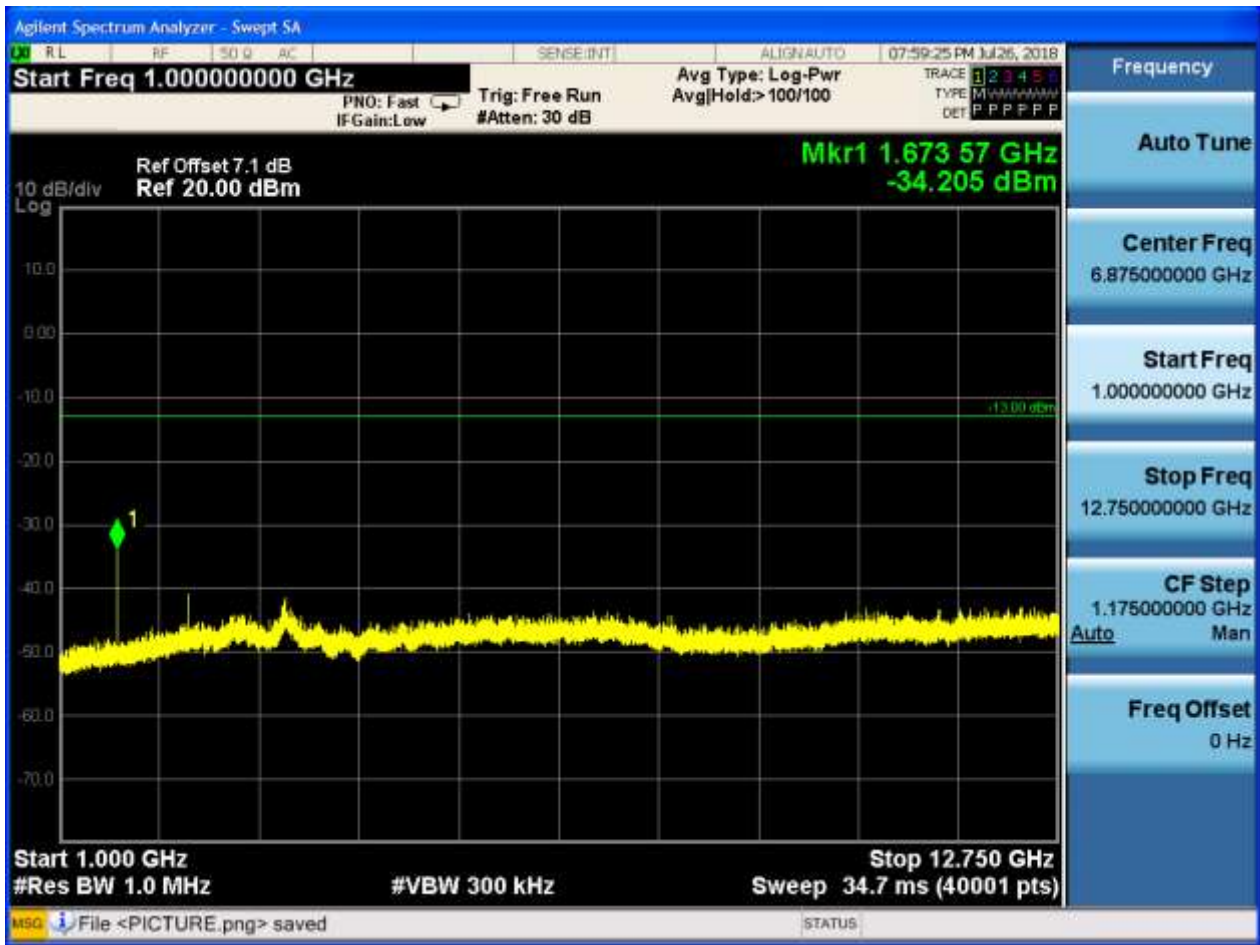


6.1.1.2.2 Test Channel = MCH



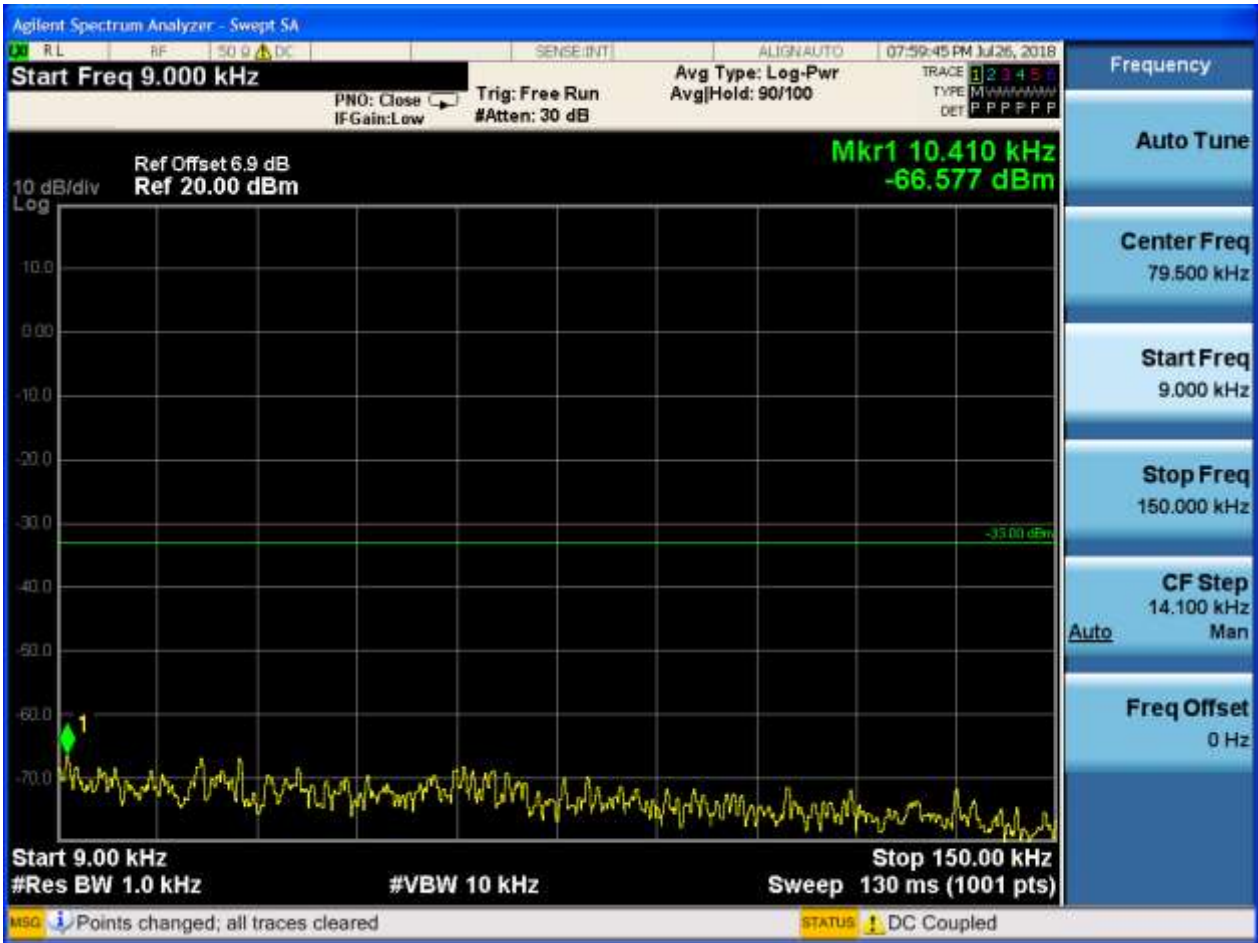


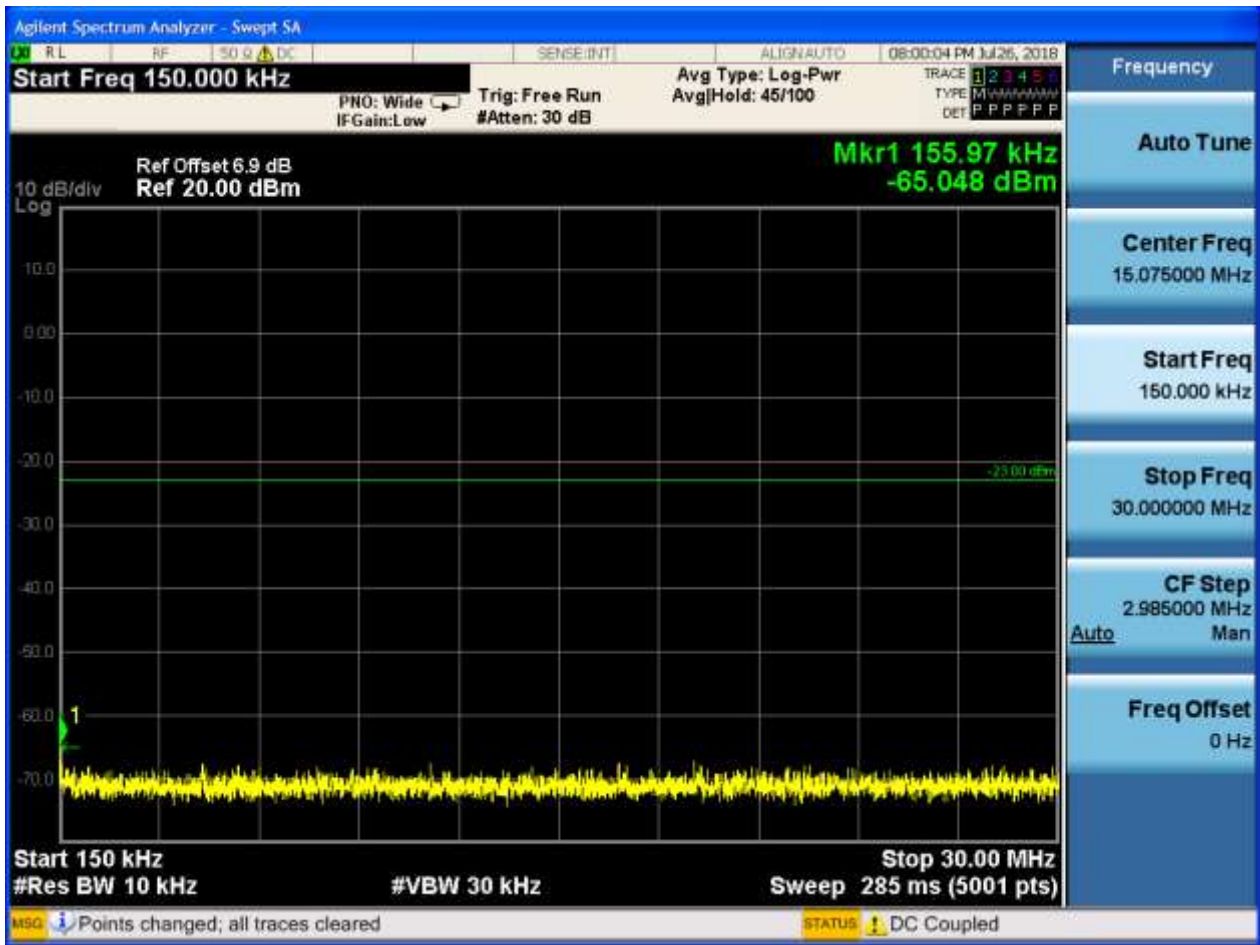


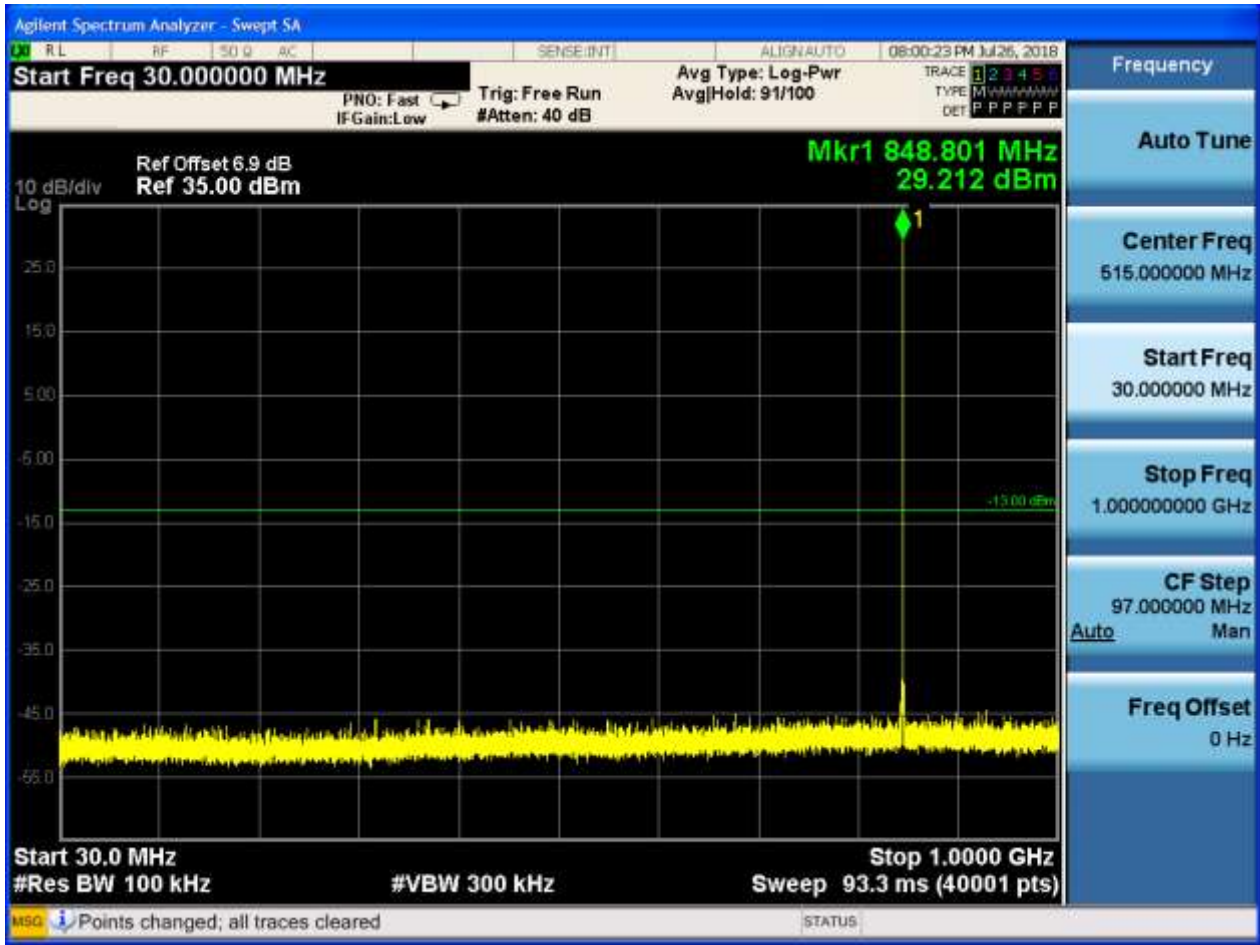




6.1.1.2.3 Test Channel = HCH



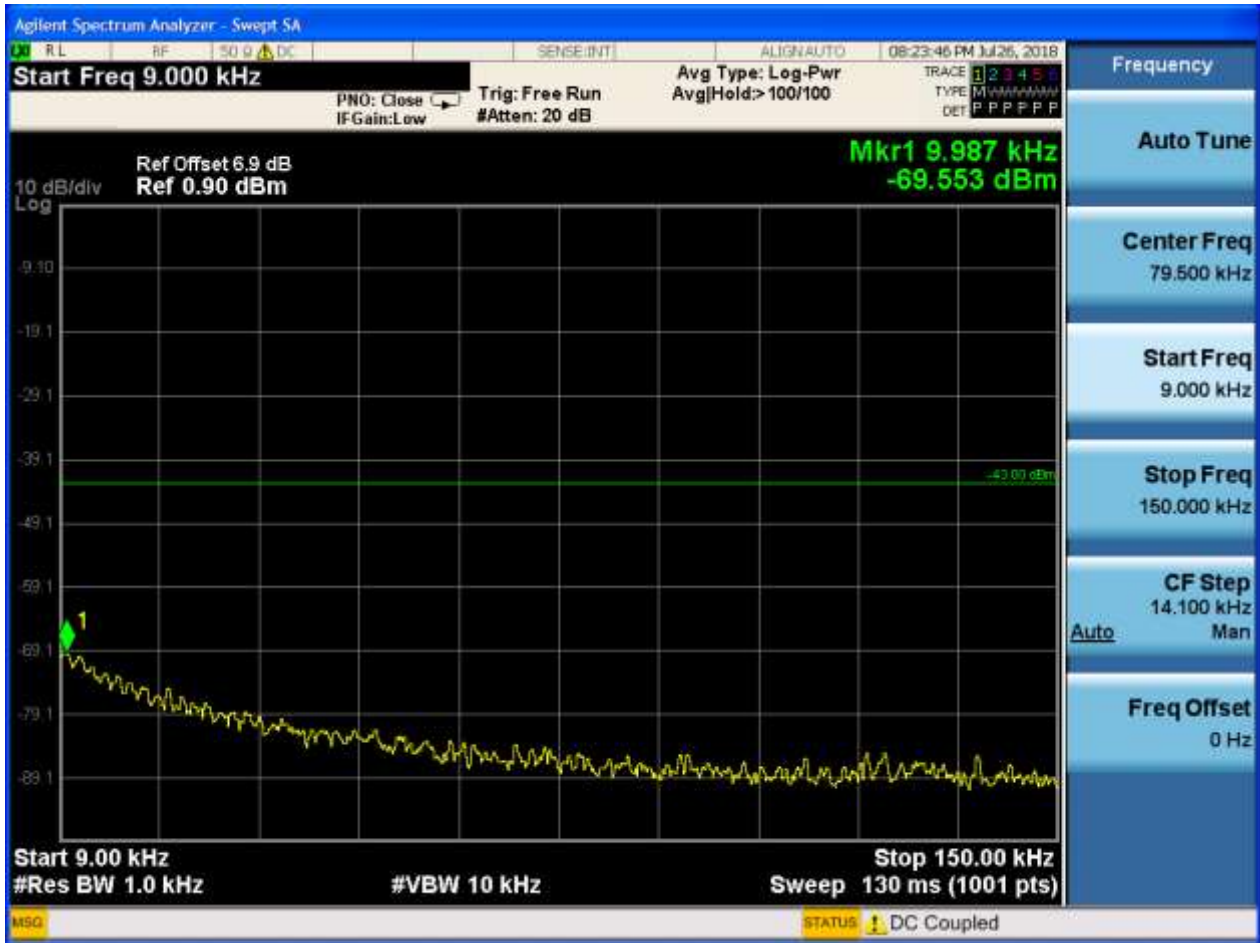


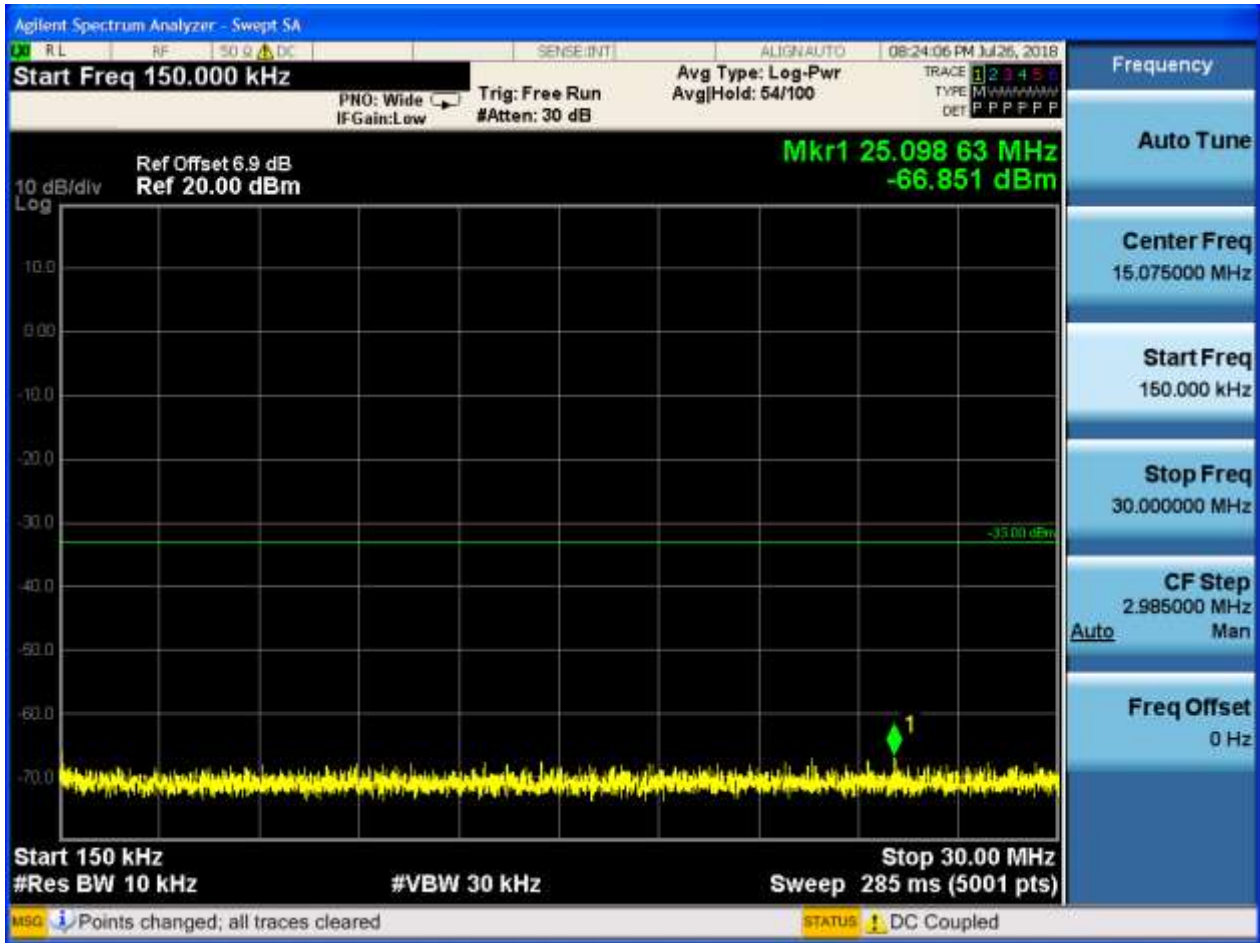






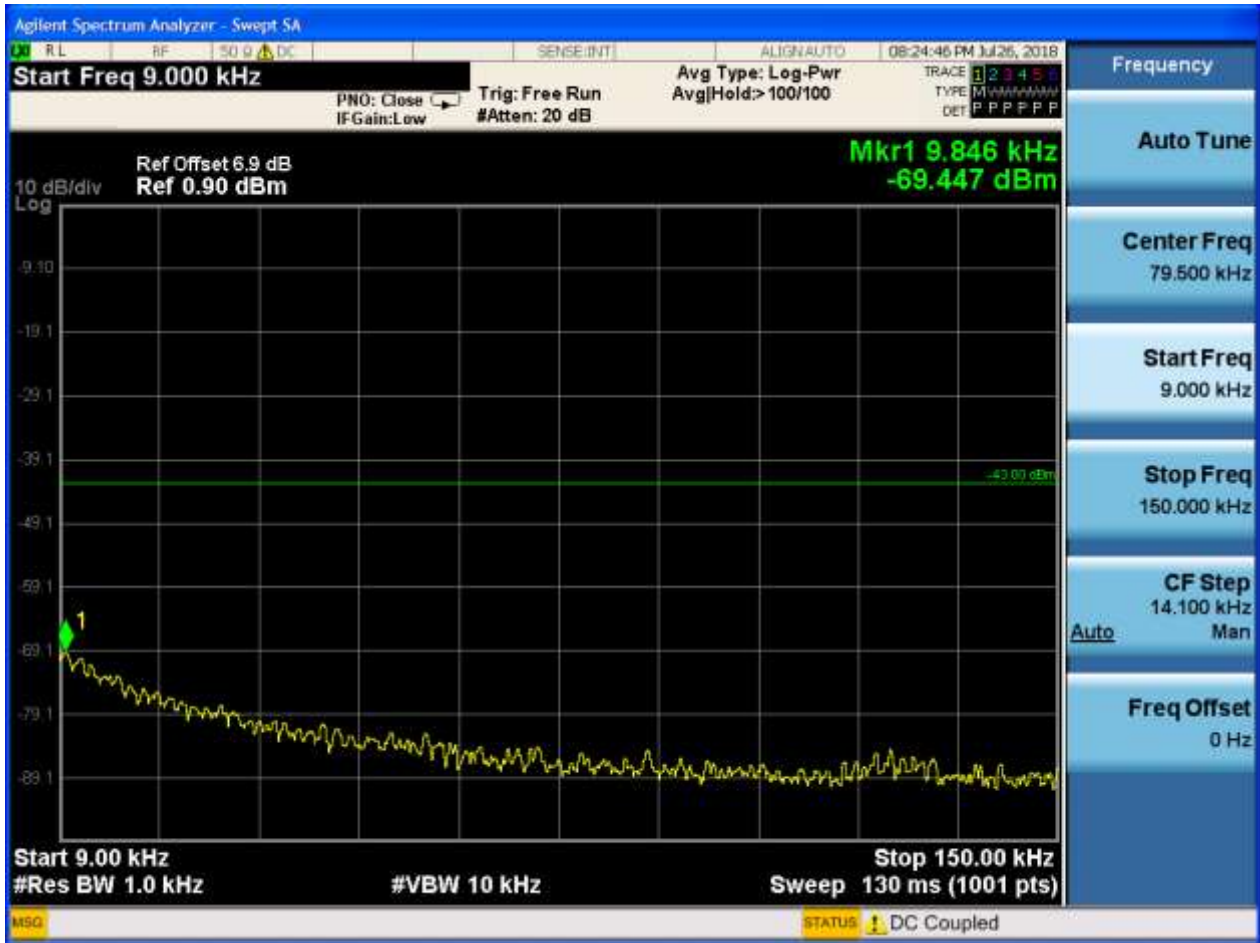
6.1.2.1.2 Test Channel = MCH

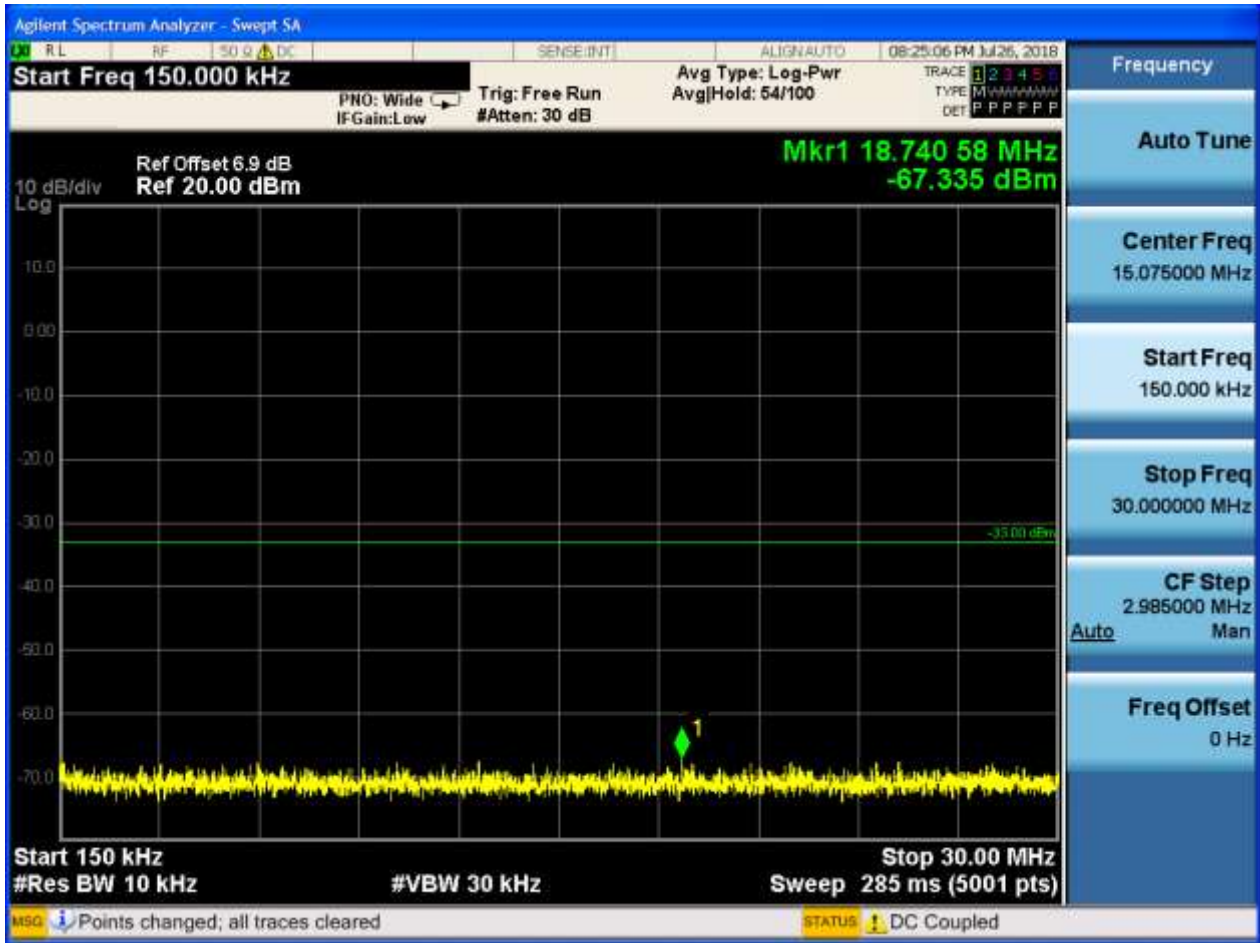






6.1.2.1.3 Test Channel = HCH

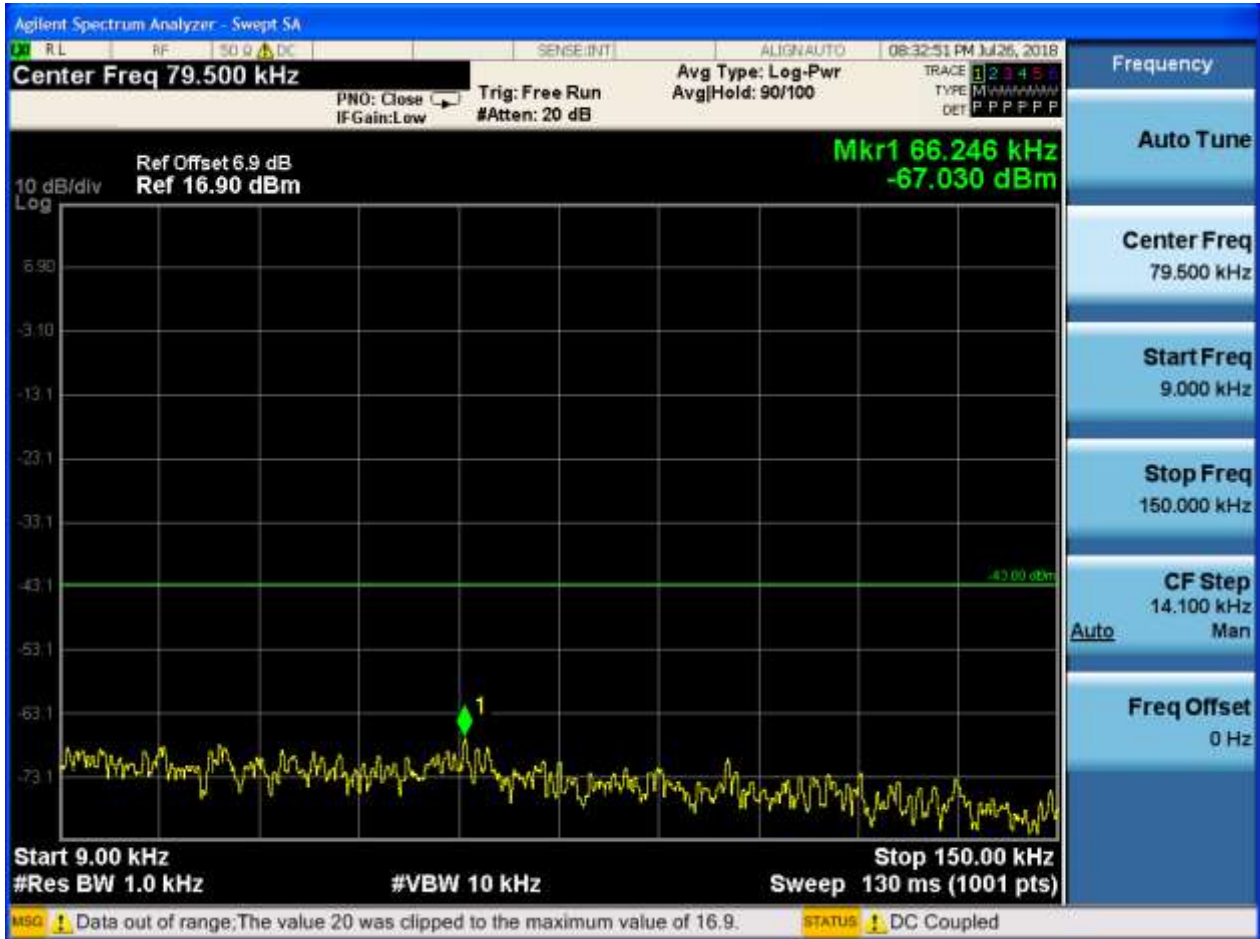


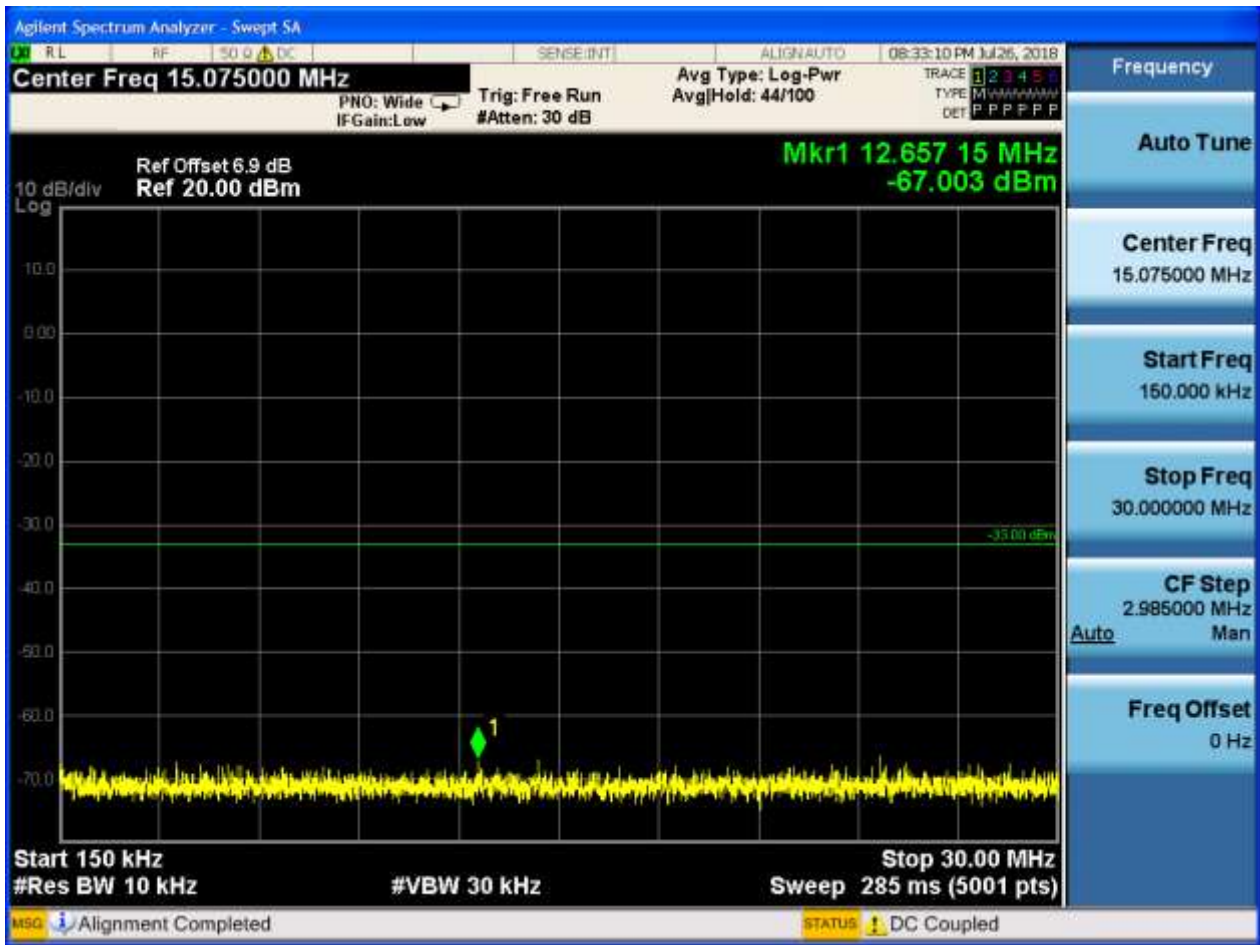




6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

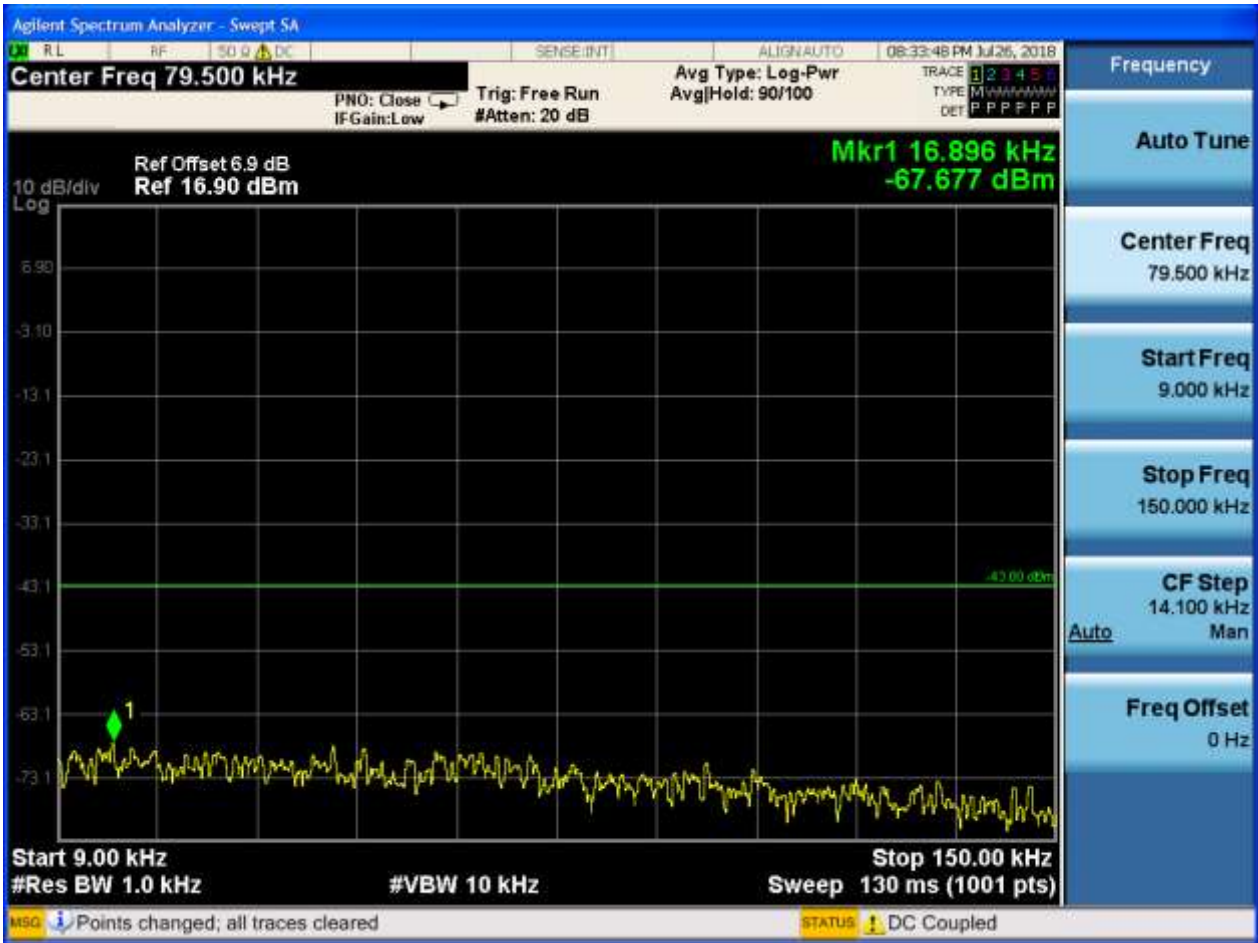


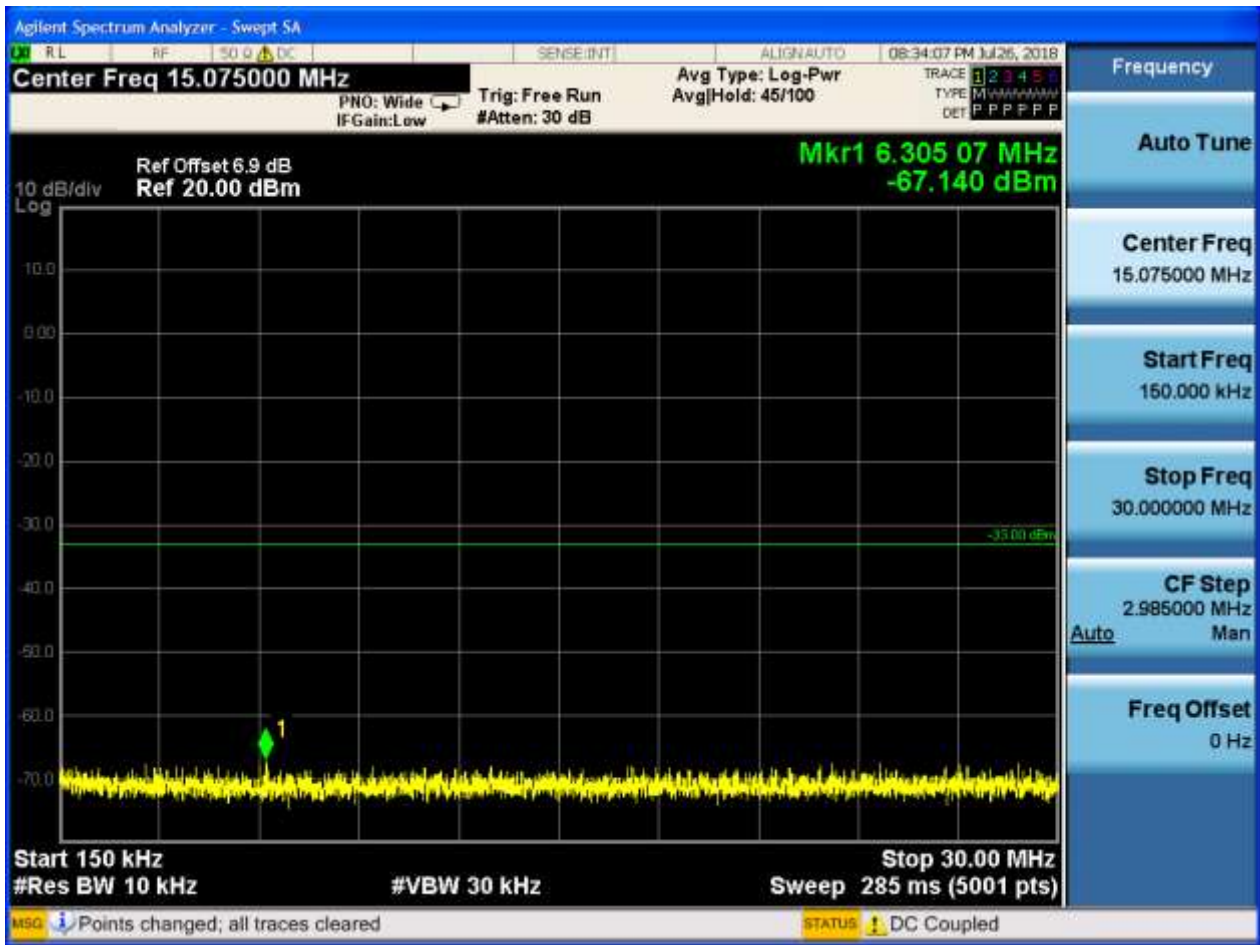






6.1.2.2.2 Test Channel = MCH

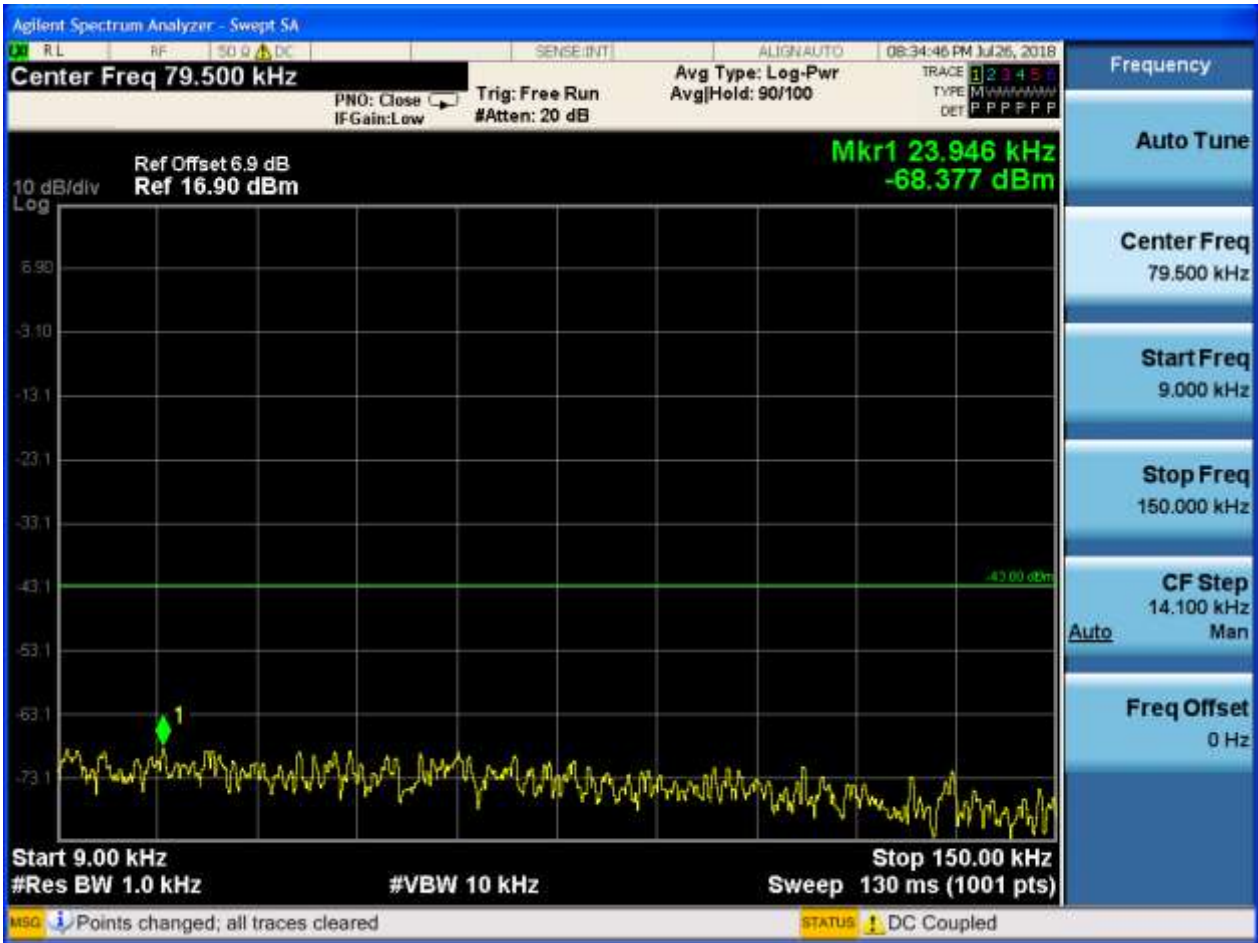


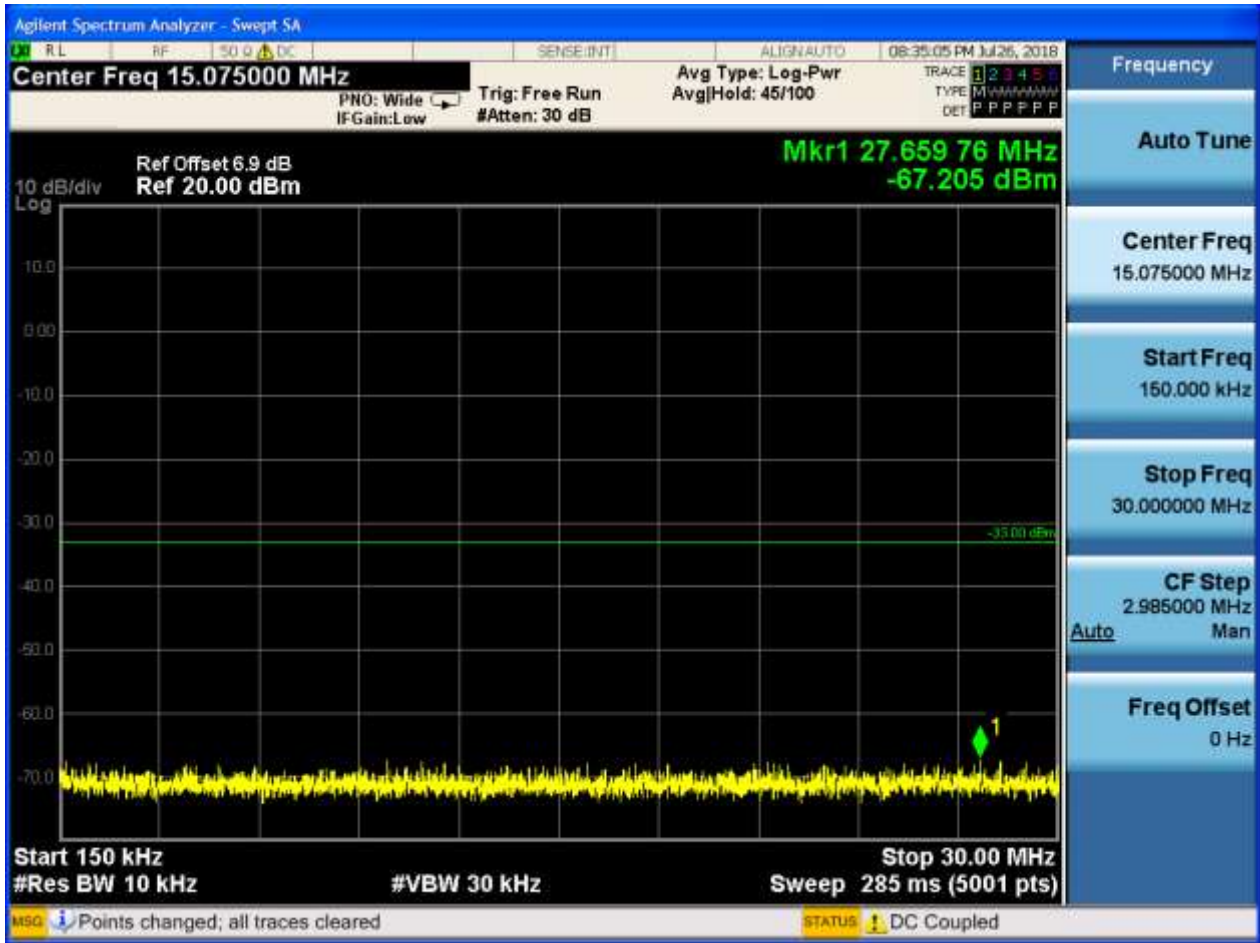






6.1.2.2.3 Test Channel = HCH









7Appendix_G: Field Strength of Spurious Radiation

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

9kHz~150kHz, 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

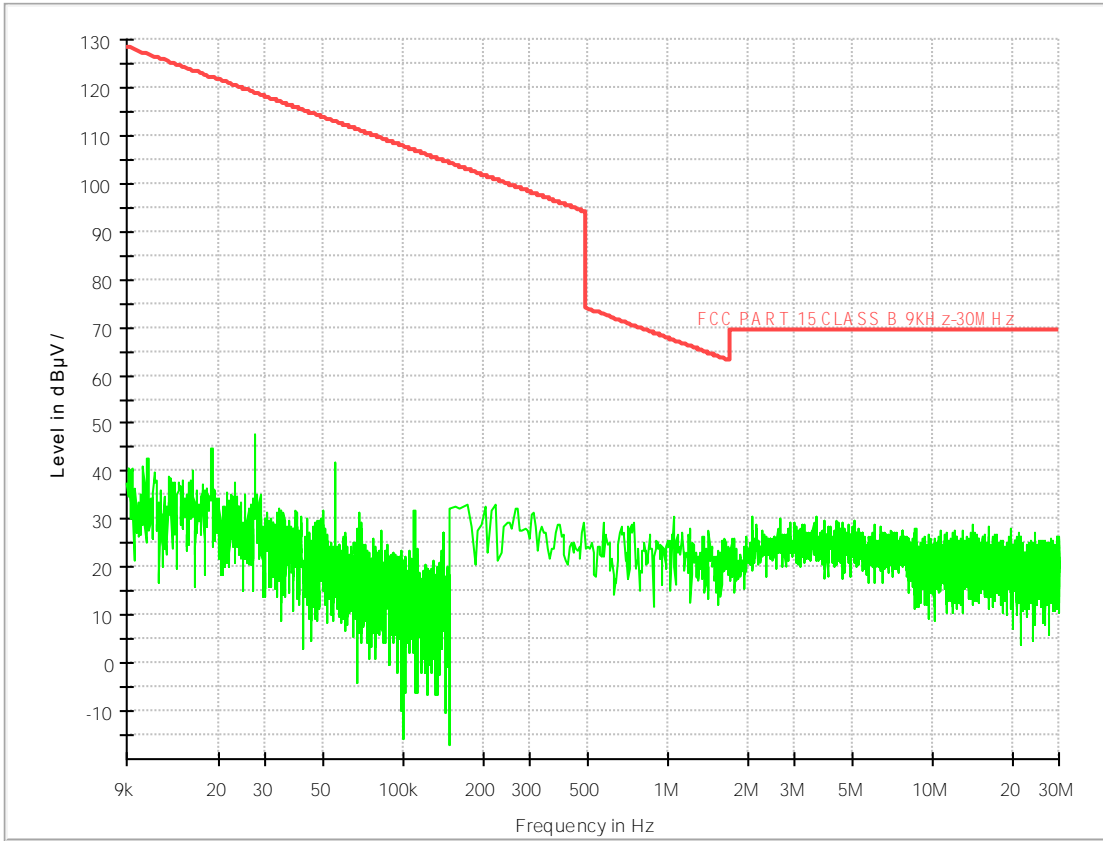
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

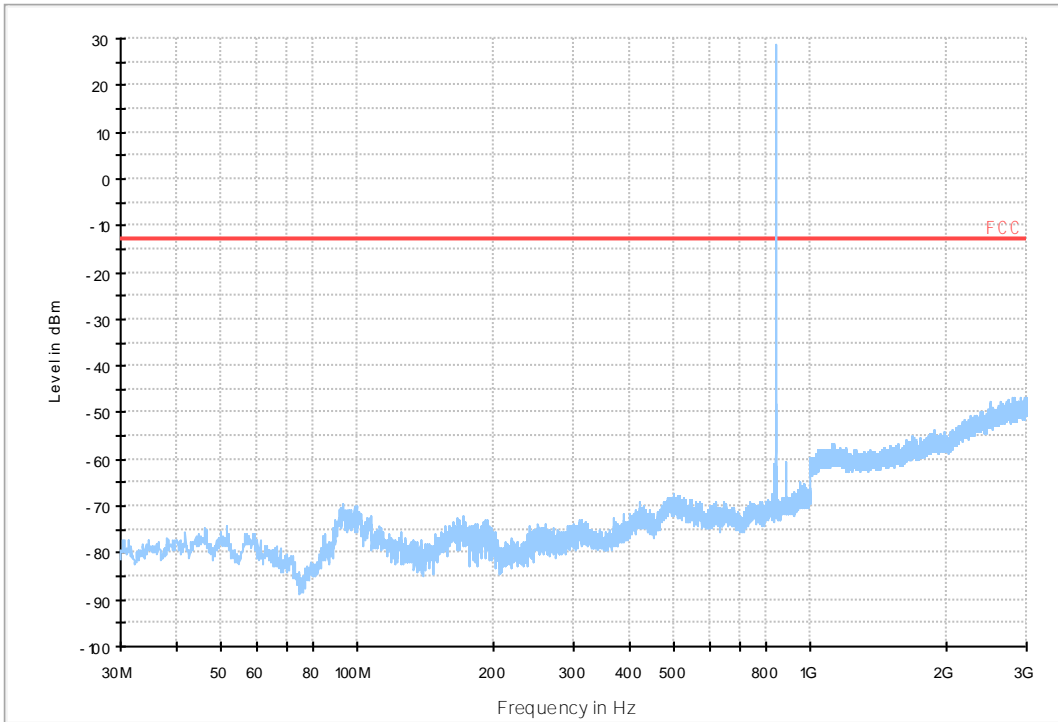
7.1 For GSM

7.1.1 est Band = GSM850-Ant1

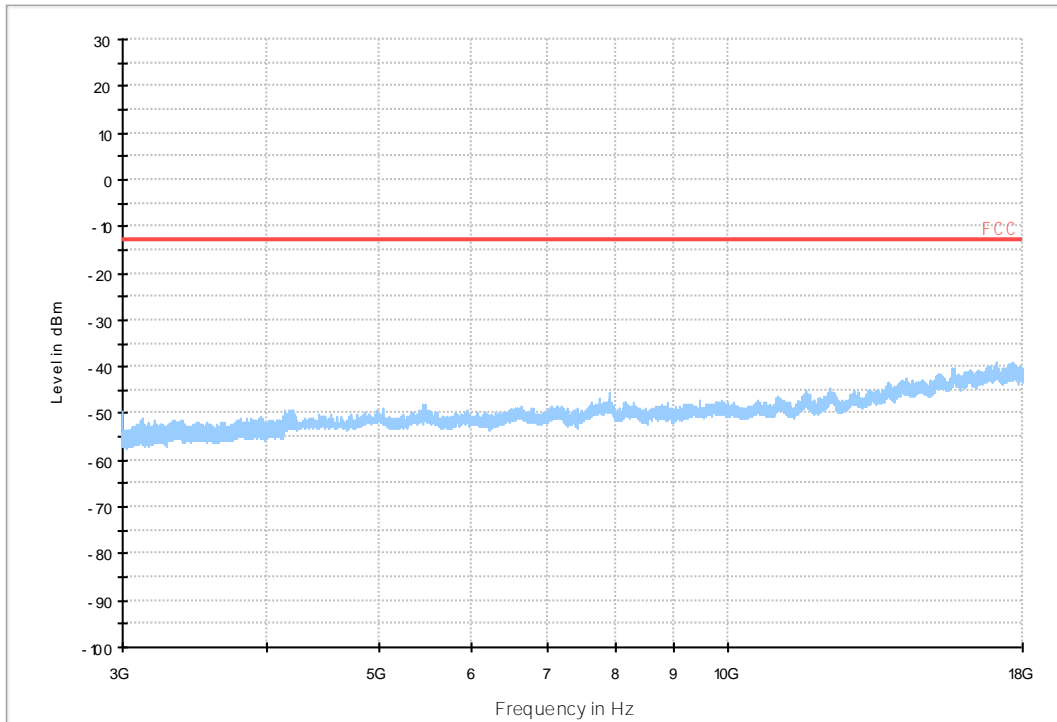
7.1.1.1 Test Mode = GSM/TM1



04 FCC PART 22 GSM850_L

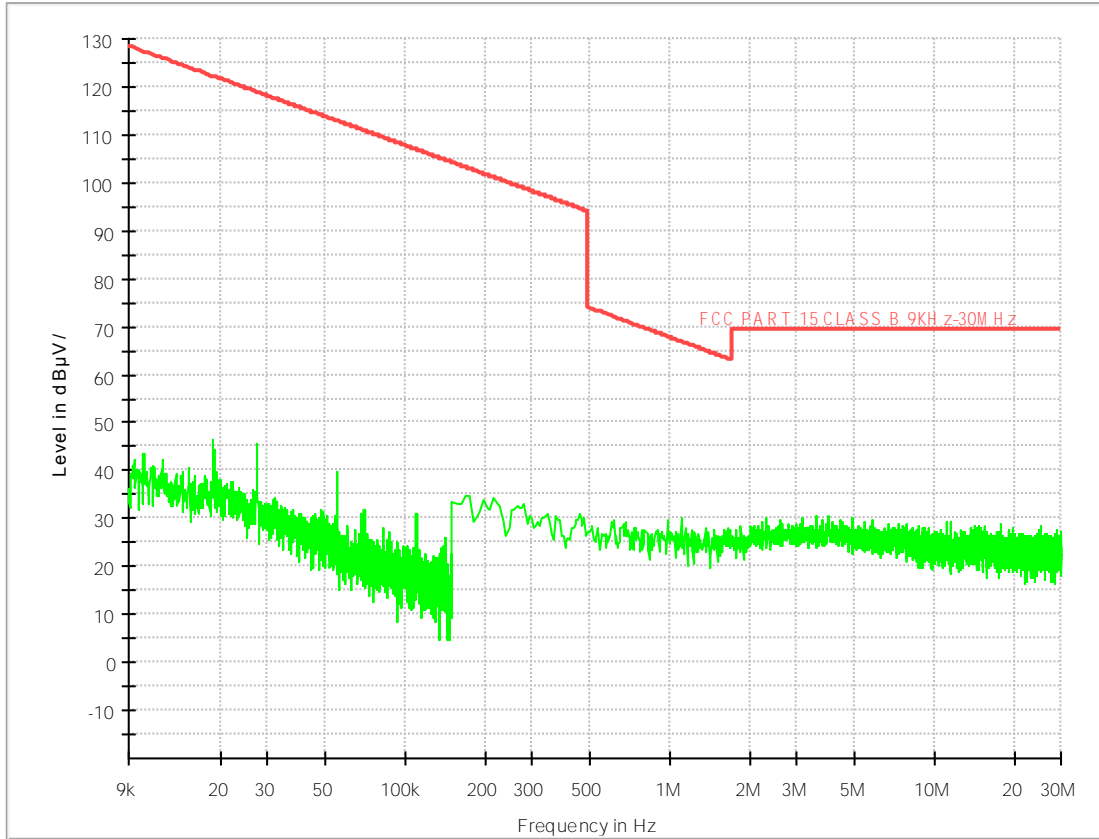


03 FCC PART 22 GSM850_H

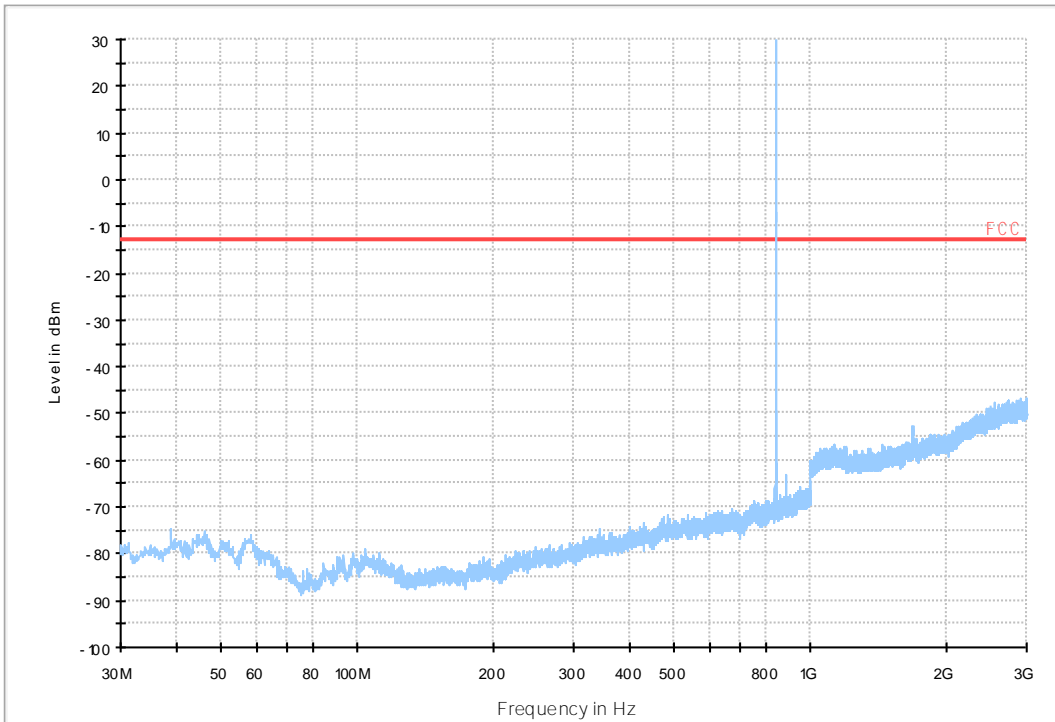


7.1.2 Test Band = GSM850-Ant2

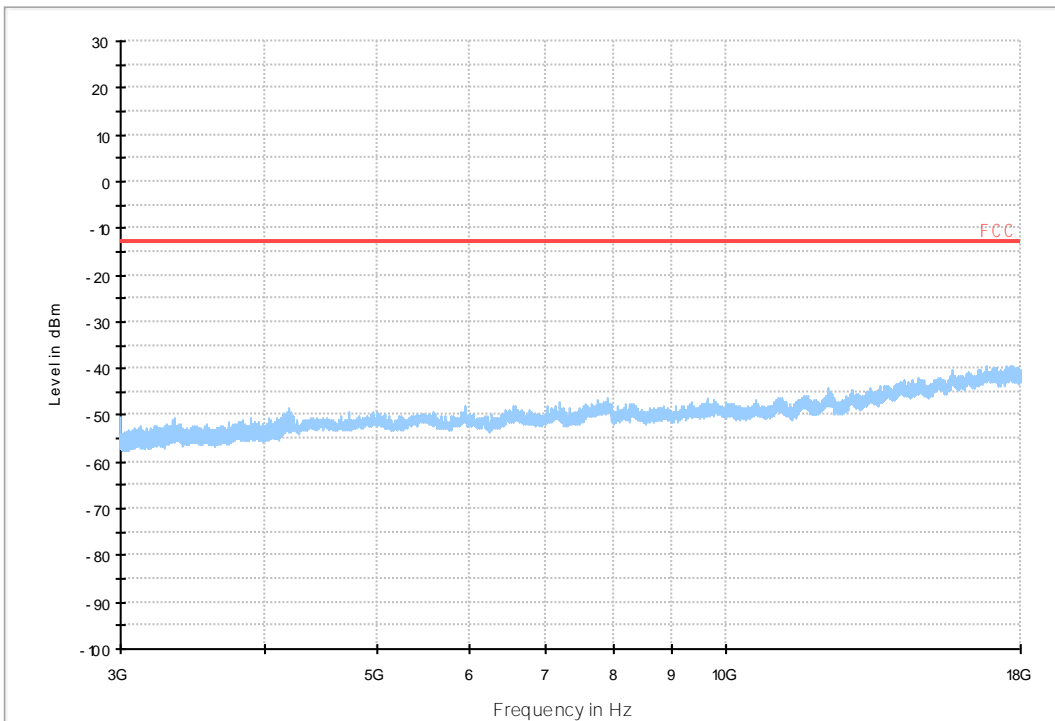
7.1.2.1 Test Mode = GSM/TM1



04 FCC PART 22 GSM850_L



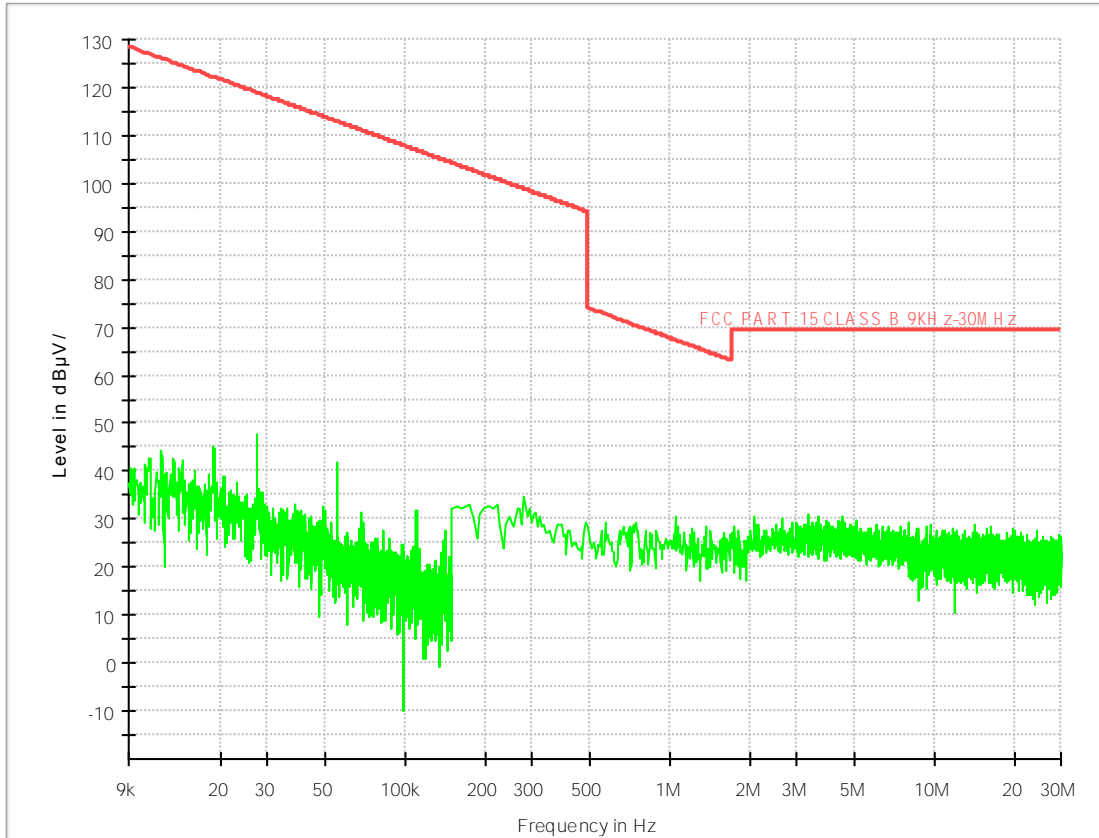
03 FCC PART 22 GSM850_H



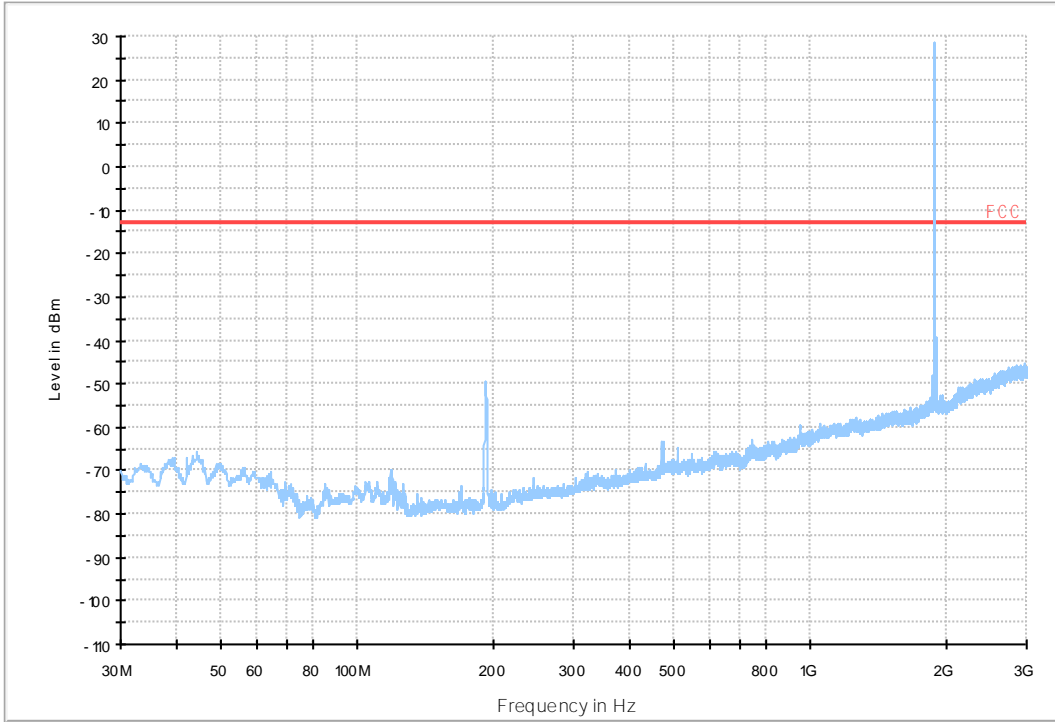


7.1.3 Test Band = GSM1900

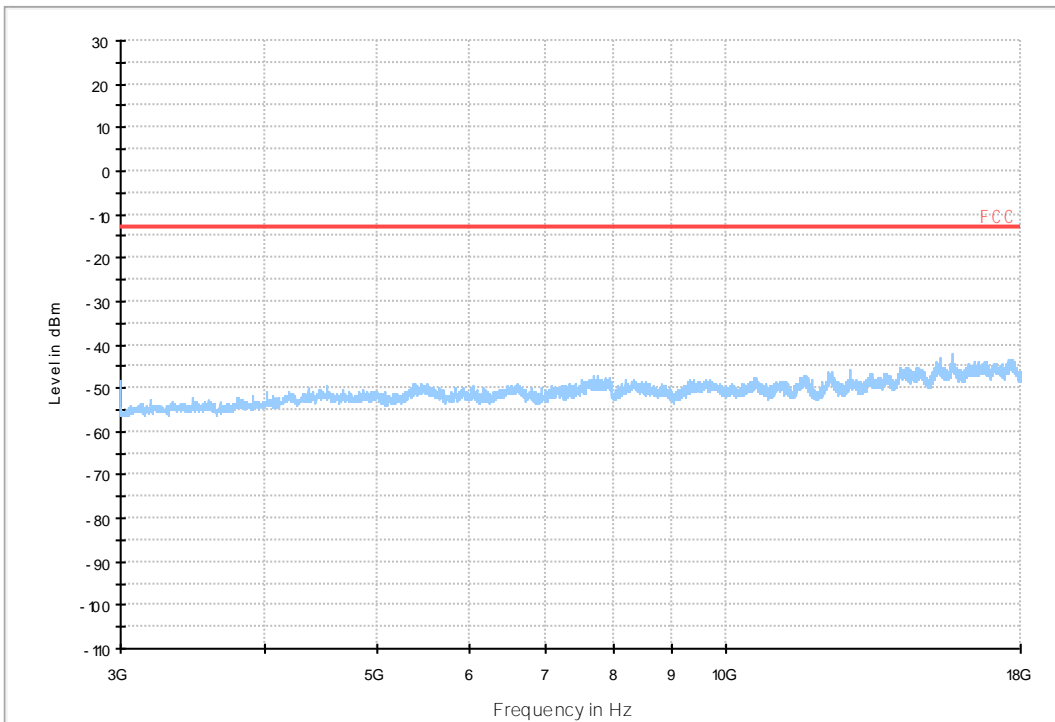
7.1.3.1 Test Mode = GSM/TM1



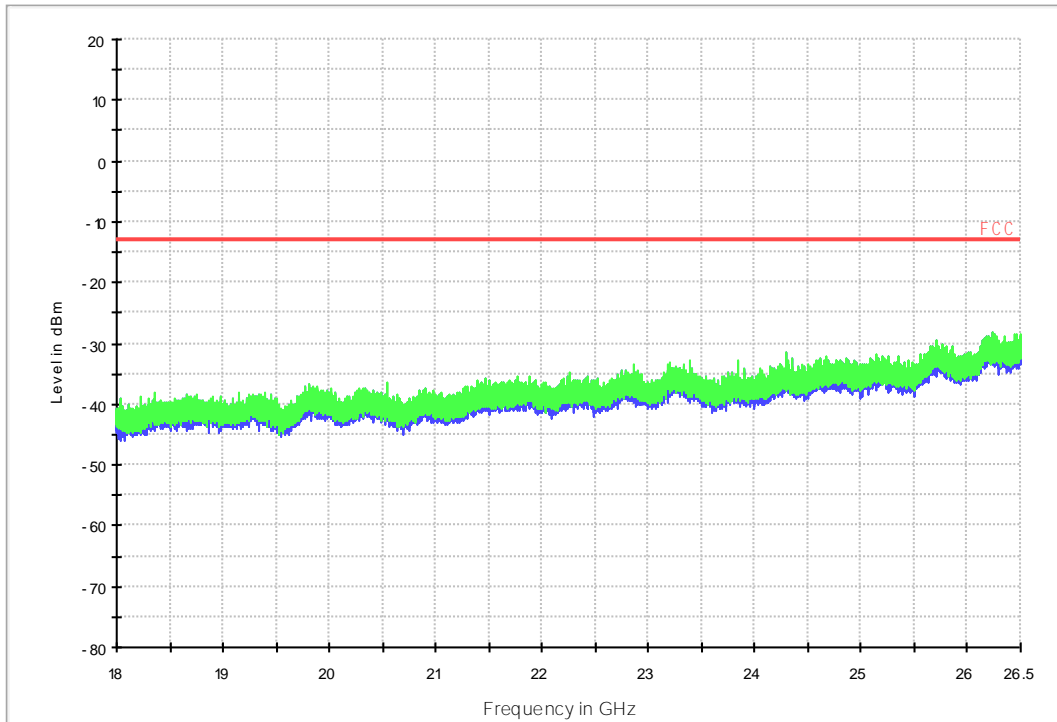
10 FCC PART 24 GSM1900_L



09 FCC PART 24 GSM1900_H

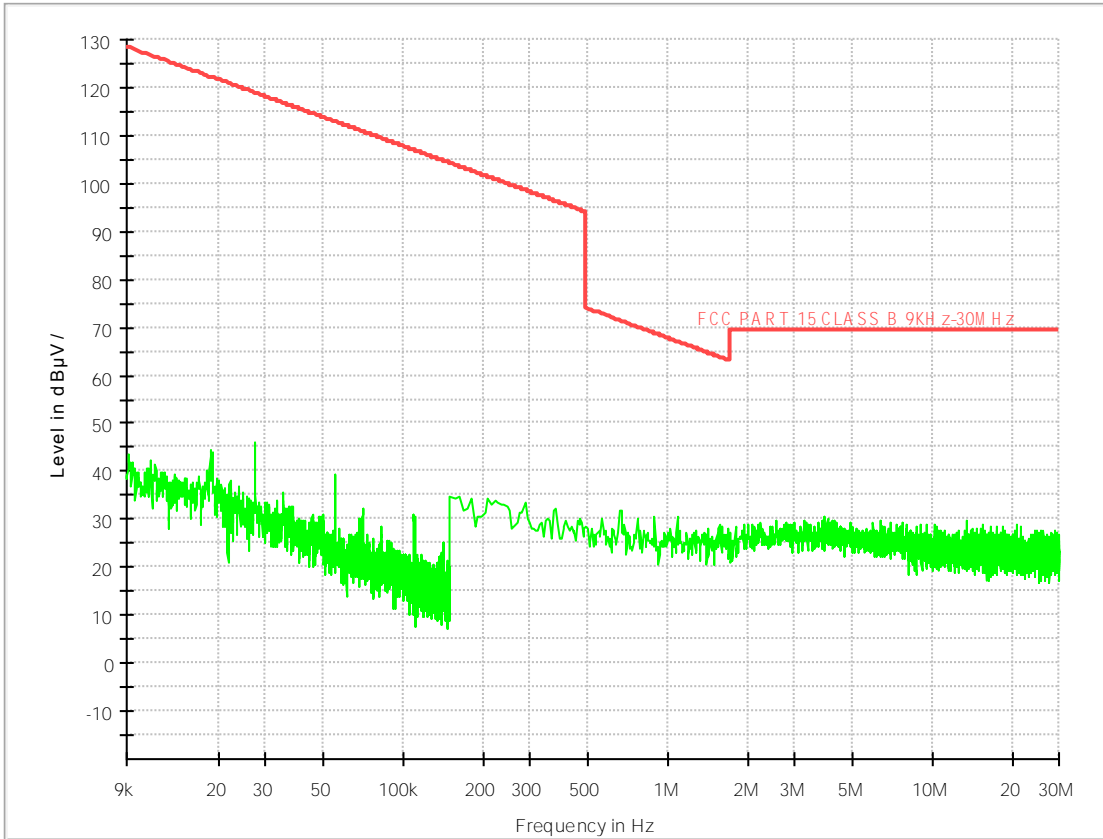


18G~26.5G RSE-TX-DIRECT OR ABOVE 1.5G PK

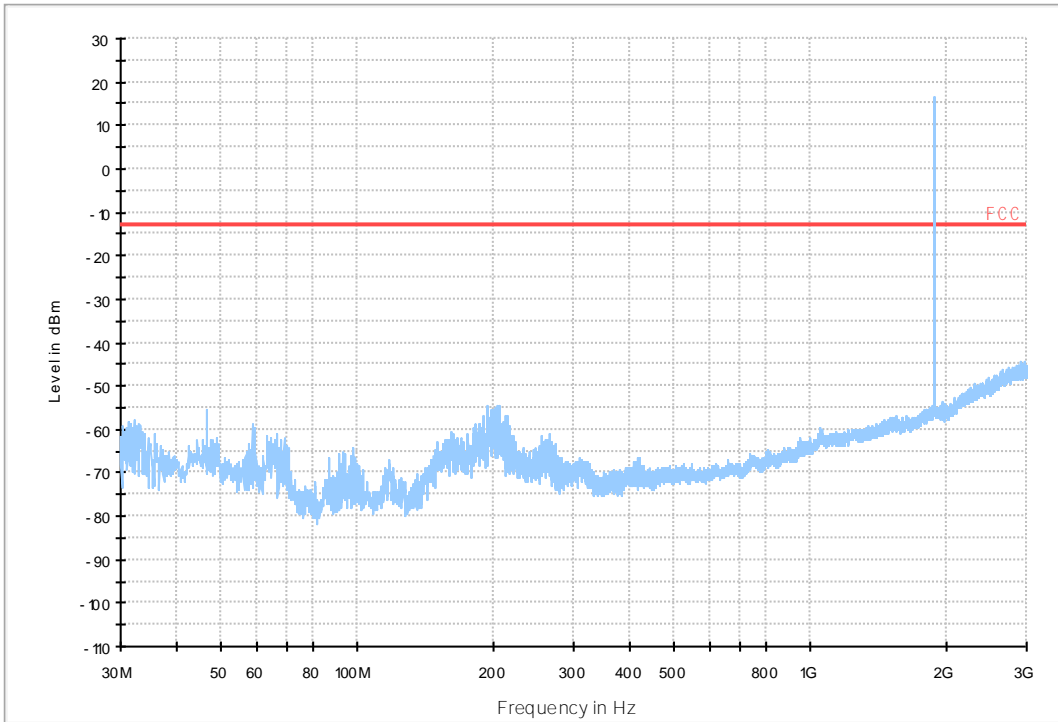


7.1.4 Test Band = GSM1900-Ant2

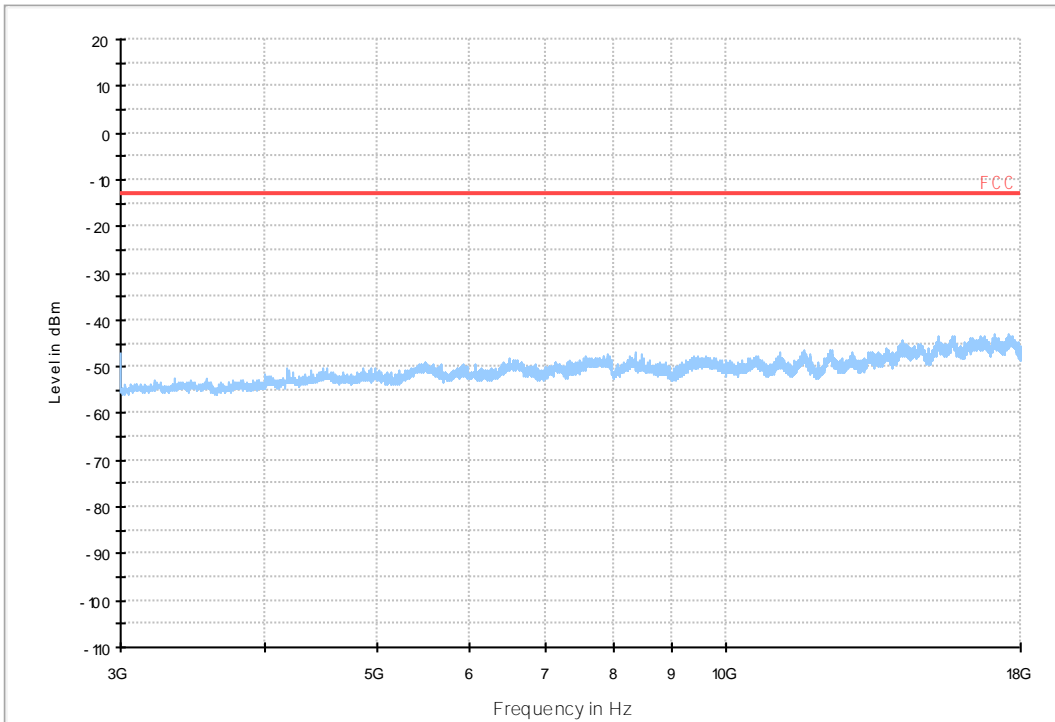
7.1.4.1 Test Mode = GSM/TM1



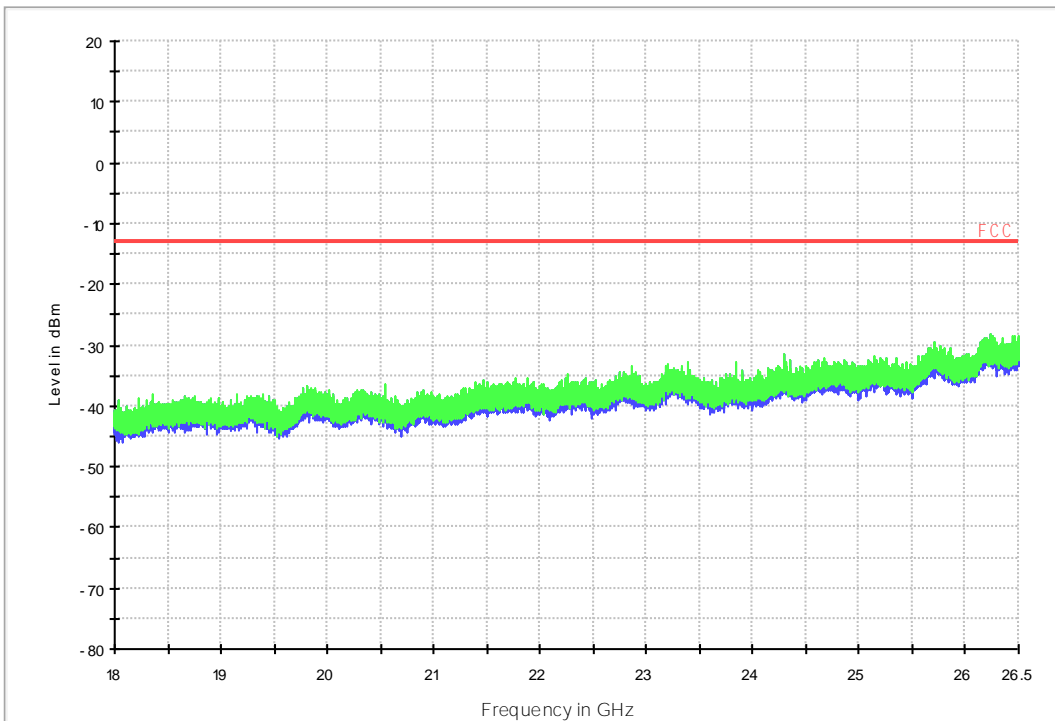
10 FCC PART 24 GSM1900_L



11 FCC PART 24 WCDMA1900_H



18G-26.5G R SE-TX-DIRECT OR ABOVE 1.5G PK





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	-21.57	-0.02617	PASS
				VN	-22.60	-0.02742	PASS
				VH	-18.08	-0.02194	PASS
		MCH	TN	VL	-11.11	-0.01328	PASS
				VN	-10.33	-0.01235	PASS
				VH	-9.69	-0.01158	PASS
		HCH	TN	VL	-10.85	-0.01278	PASS
				VN	-9.75	-0.01149	PASS
				VH	-13.30	-0.01567	PASS
	GSM/TM2	LCH	TN	VL	-13.69	-0.01661	PASS
				VN	-14.37	-0.01744	PASS
				VH	-11.36	-0.01378	PASS
		MCH	TN	VL	-5.04	-0.00602	PASS
				VN	-6.46	-0.00772	PASS
				VH	-3.84	-0.00459	PASS
		HCH	TN	VL	-5.00	-0.00589	PASS
				VN	-3.81	-0.00449	PASS
				VH	-5.20	-0.00613	PASS
GSM1900	GSM/TM1	LCH	TN	VL	6.59	0.00356	PASS
				VN	10.40	0.00562	PASS
				VH	5.36	0.0029	PASS
		MCH	TN	VL	-0.97	-0.00052	PASS
				VN	-1.74	-0.00093	PASS
				VH	1.49	0.00079	PASS
		HCH	TN	VL	13.69	0.00717	PASS
				VN	12.66	0.00663	PASS
				VH	10.20	0.00534	PASS
	GSM/TM2	LCH	TN	VL	30.32	0.01639	PASS
				VN	23.54	0.01272	PASS
				VH	17.05	0.00922	PASS
		MCH	TN	VL	14.50	0.00771	PASS
				VN	17.98	0.00956	PASS
				VH	16.34	0.00869	PASS



Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		HCH	TN	VL	28.41	0.01488	PASS
				VN	28.83	0.0151	PASS
				VH	24.28	0.01271	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	-19.24	-0.02334	PASS
				-20	-19.63	-0.02382	PASS
				-10	-19.76	-0.02397	PASS
				0	-17.69	-0.02146	PASS
				10	-20.34	-0.02468	PASS
				20	-19.69	-0.02389	PASS
				30	-20.60	-0.02499	PASS
				40	-19.76	-0.02397	PASS
		50	-19.82	-0.02405	PASS		
		MCH	VN	-30	-10.59	-0.01266	PASS
				-20	-11.24	-0.01344	PASS
				-10	-10.53	-0.01259	PASS
				0	-9.88	-0.01181	PASS
				10	-7.62	-0.00911	PASS
				20	-9.10	-0.01088	PASS
				30	-9.81	-0.01173	PASS
				40	-10.27	-0.01228	PASS
		50	-12.14	-0.01451	PASS		
		HCH	VN	-30	-6.13	-0.00722	PASS
				-20	-10.53	-0.01241	PASS
				-10	-6.59	-0.00776	PASS
				0	-8.33	-0.00981	PASS
				10	-8.85	-0.01043	PASS
				20	-8.98	-0.01058	PASS
	30			-11.04	-0.01301	PASS	
	40			-8.98	-0.01058	PASS	
	50	-8.14	-0.00959	PASS			
	GSM/TM2	LCH	VN	-30	-11.30	-0.01371	PASS
				-20	-7.20	-0.00874	PASS
				-10	-13.92	-0.01689	PASS
0				-11.85	-0.01438	PASS	
10				-11.56	-0.01403	PASS	



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict						
				20	-16.85	-0.02044	PASS						
				30	-4.39	-0.00533	PASS						
				40	-11.33	-0.01375	PASS						
				50	-13.56	-0.01645	PASS						
		MCH	VN			-30	1.45	0.00173	PASS				
						-20	-2.62	-0.00313	PASS				
						-10	-1.23	-0.00147	PASS				
						0	-6.39	-0.00764	PASS				
						10	-3.20	-0.00383	PASS				
						20	-6.04	-0.00722	PASS				
						30	-1.61	-0.00192	PASS				
						40	0.45	0.00054	PASS				
		HCH	VN			50	-4.26	-0.00509	PASS				
						-30	-5.17	-0.00609	PASS				
						-20	-6.01	-0.00708	PASS				
						-10	-5.46	-0.00643	PASS				
						0	-2.32	-0.00273	PASS				
						10	3.20	0.00377	PASS				
						20	-6.30	-0.00742	PASS				
						30	0.52	0.00061	PASS				
		GSM1900	GSM/TM1	LCH	VN					40	-1.45	-0.00171	PASS
										50	-8.36	-0.00985	PASS
										-30	13.69	0.0074	PASS
										-20	8.01	0.00433	PASS
-10	7.81									0.00422	PASS		
0	9.10									0.00492	PASS		
10	7.94									0.00429	PASS		
20	5.94									0.00321	PASS		
MCH	VN									30	4.07	0.0022	PASS
										40	4.39	0.00237	PASS
										50	4.07	0.0022	PASS
										-30	6.91	0.00368	PASS
										-20	-0.32	-0.00017	PASS
										-10	5.17	0.00275	PASS
										0	1.74	0.00093	PASS
										10	-5.10	-0.00271	PASS
								20	9.10	0.00484	PASS		
								30	-1.29	-0.00069	PASS		
								40	-0.39	-0.00021	PASS		



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		HCH	VN	50	2.45	0.0013	PASS
				-30	13.69	0.00717	PASS
				-20	16.92	0.00886	PASS
				-10	6.59	0.00345	PASS
				0	13.30	0.00696	PASS
				10	18.21	0.00954	PASS
				20	14.14	0.0074	PASS
				30	2.13	0.00112	PASS
				40	16.27	0.00852	PASS
				50	13.11	0.00686	PASS
	GSM/TM2	LCH	VN	-30	24.70	0.01335	PASS
				-20	27.18	0.01469	PASS
				-10	25.18	0.01361	PASS
				0	13.50	0.0073	PASS
				10	25.67	0.01387	PASS
				20	25.93	0.01401	PASS
				30	25.09	0.01356	PASS
				40	15.63	0.00845	PASS
				50	30.70	0.01659	PASS
				MCH	VN	-30	10.69
		-20	25.67			0.01365	PASS
		-10	21.53			0.01145	PASS
		0	16.82			0.00895	PASS
		10	22.12			0.01177	PASS
		20	19.60			0.01043	PASS
		30	23.15			0.01231	PASS
		40	24.60			0.01309	PASS
		50	14.08			0.00749	PASS
		HCH	VN			-30	32.77
				-20	22.89	0.01199	PASS
				-10	28.77	0.01506	PASS
				0	26.22	0.01373	PASS
				10	34.13	0.01787	PASS
				20	29.15	0.01526	PASS
				30	32.96	0.01726	PASS
				40	32.83	0.01719	PASS
50	29.93	0.01567	PASS				

END