



Appendix for test report



1 Appendix_A: Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	ERP [dBm]	Limit [dBm]	Verdict
GSM850	GSM/TM1	LCH	32.23	29.79	38.5	PASS
		MCH	32.26	29.85	38.5	PASS
		HCH	32.31	29.73	38.5	PASS
WCDMA850	UMTS/TM1	LCH	23.68	21.43	38.5	PASS
		MCH	23.71	21.27	38.5	PASS
		HCH	23.62	21.19	38.5	PASS
Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	29.72	30.16	33	PASS
		MCH	29.82	30.29	33	PASS
		HCH	29.76	30.23	33	PASS
WCDMA1900	UMTS/TM1	LCH	22.72	23.12	33	PASS
		MCH	22.63	23.01	33	PASS
		HCH	22.54	22.95	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	0.11	13	PASS
		MCH	0.11	13	PASS
		HCH	0.12	13	PASS
Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA1900	UMTS/TM1	LCH	3.08	13	PASS
		MCH	3.18	13	PASS
		HCH	3.26	13	PASS

3Appendix_C: Modulation Characteristics

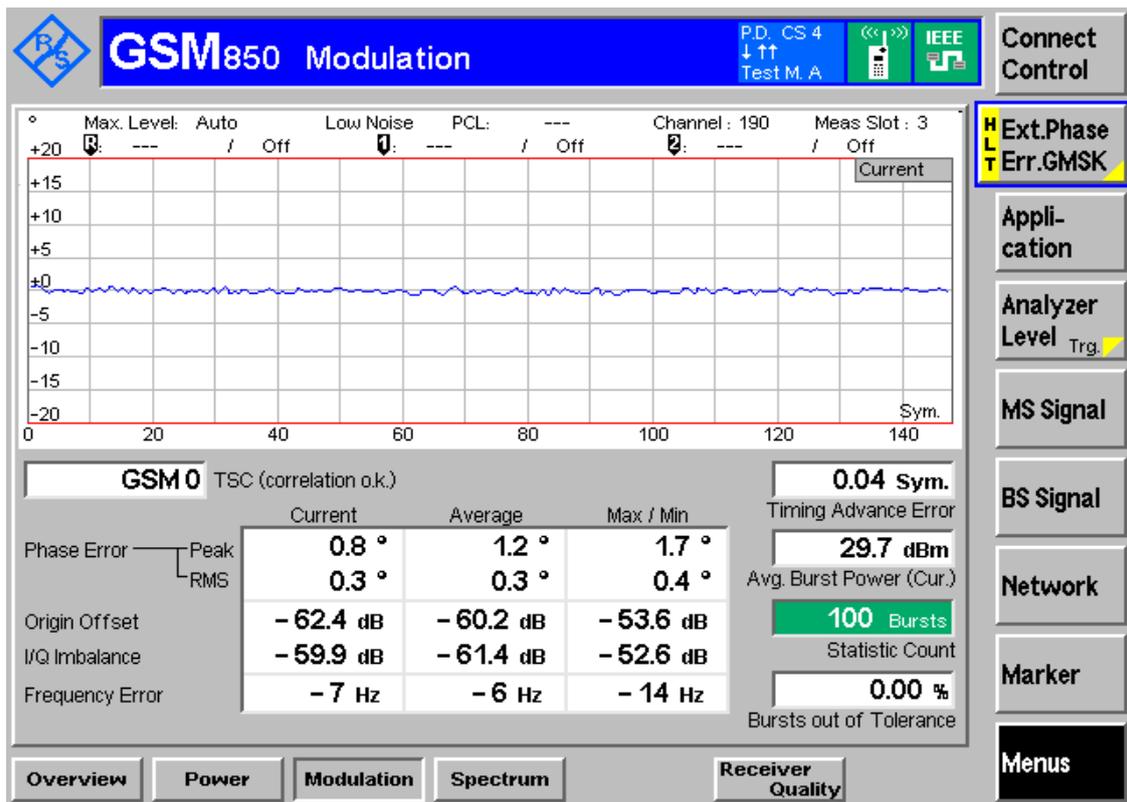
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

3.1.1.1 Test Mode = GSM/TM1

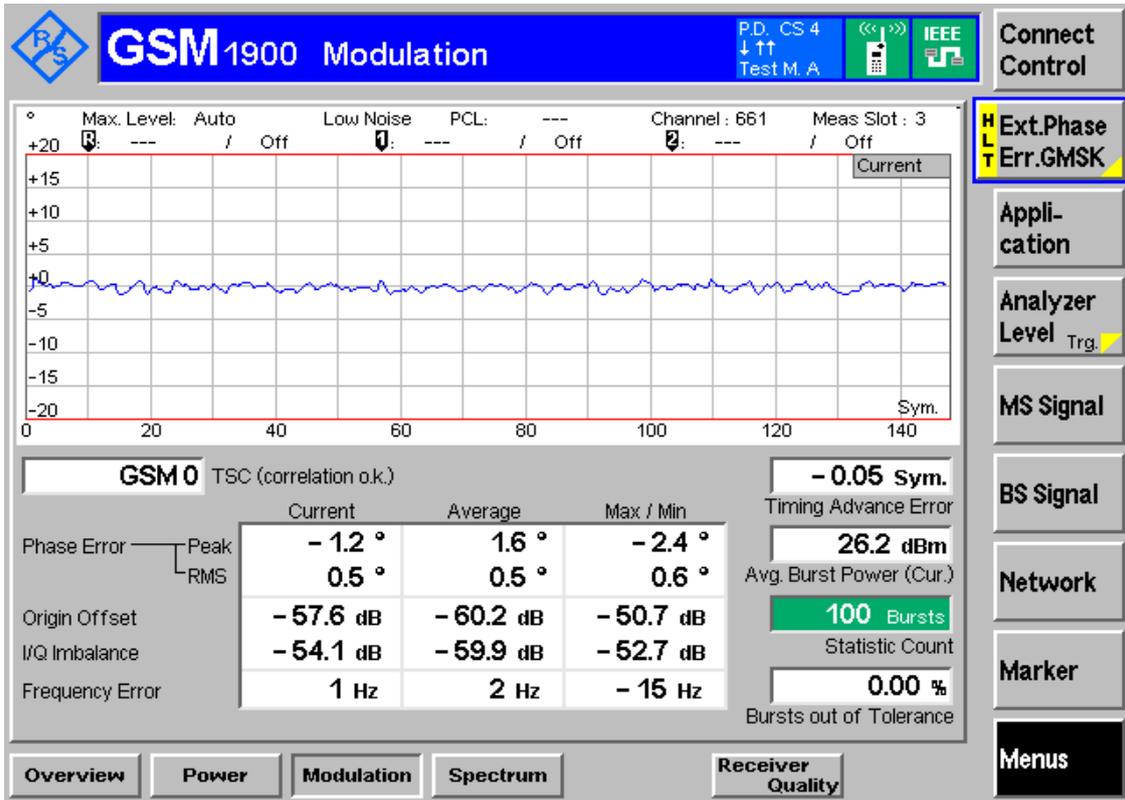
3.1.1.1.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH

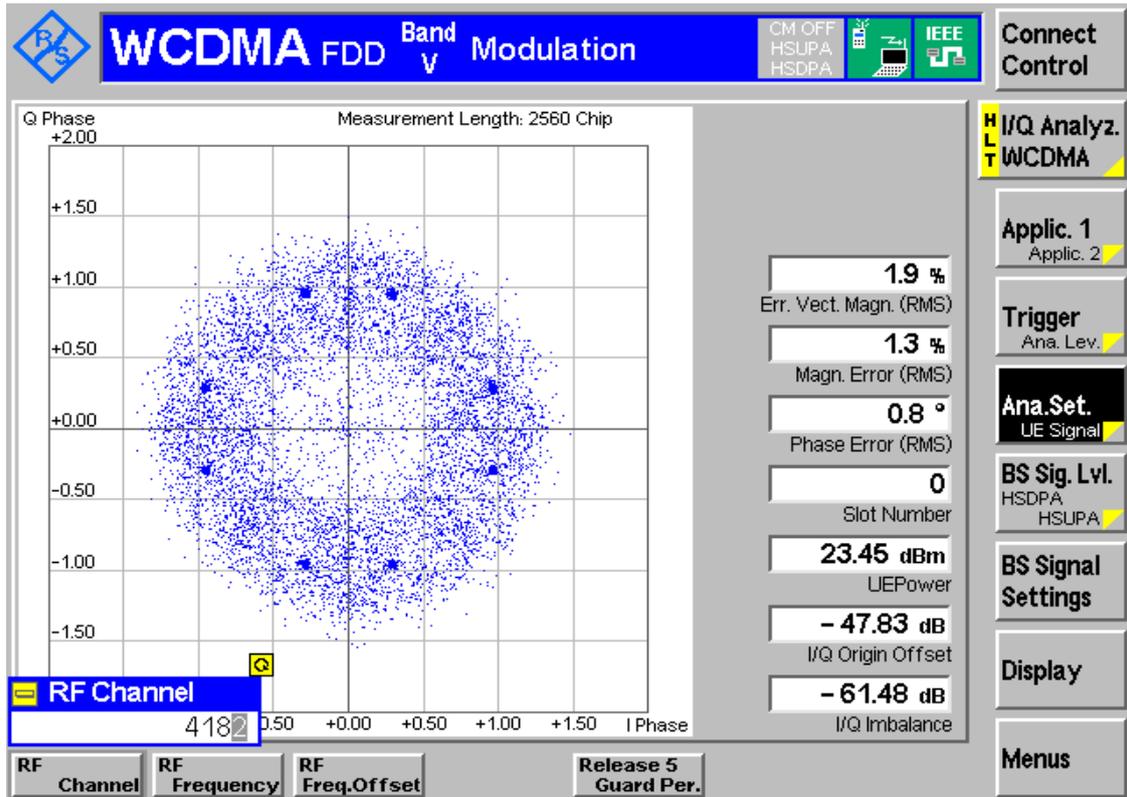


3.2 For UMTS

3.2.1 Test Band = WCDMA850

3.2.1.1 Test Mode = UMTS/TM1

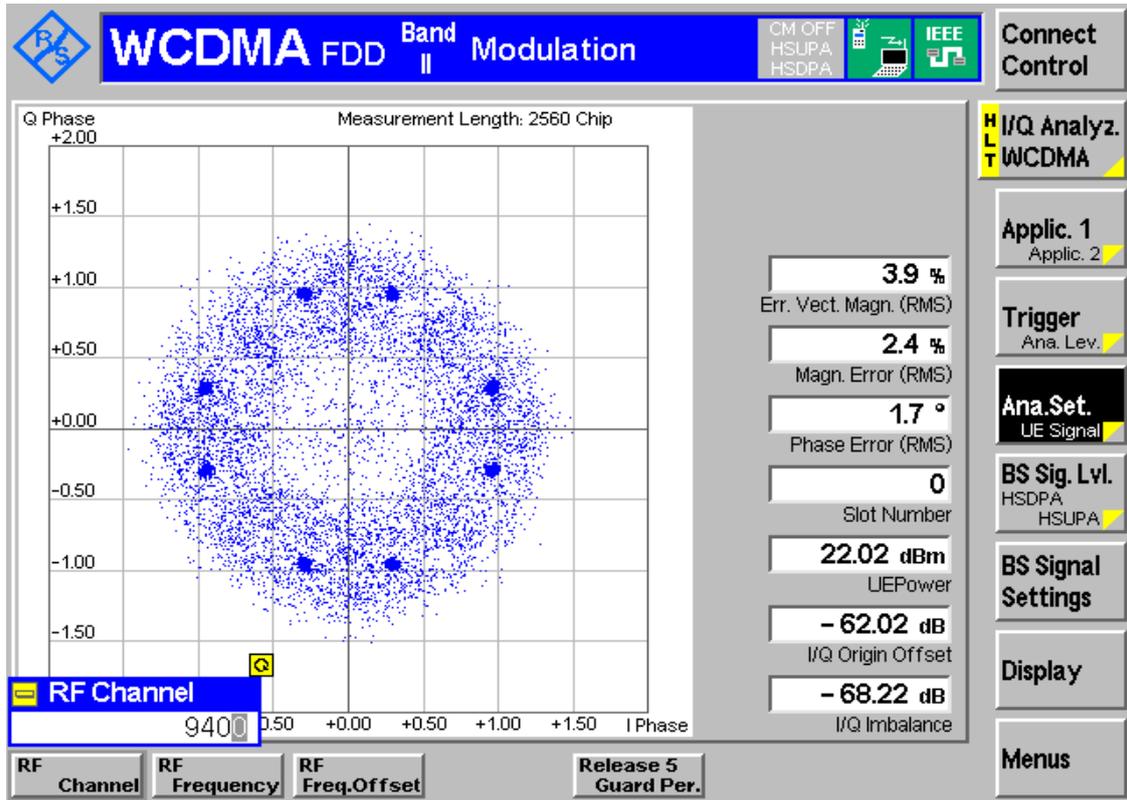
3.2.1.1.1 Test Channel = MCH



3.2.2 Test Band = WCDMA1900

3.2.2.1 Test Mode = UMTS/TM1

3.2.2.1.1 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	245.77	316.95	Pass
		MCH	245.59	318.20	Pass
		HCH	243.31	309.00	Pass
GSM1900	GSM/TM1	LCH	247.69	313.93	Pass
		MCH	243.62	317.17	Pass
		HCH	246.15	322.15	Pass
Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA850	UMTS/TM1	LCH	4.16	4.69	Pass
		MCH	4.14	4.69	Pass
		HCH	4.16	4.69	Pass
WCDMA1900	UMTS/TM1	LCH	4.16	4.69	Pass
		MCH	4.16	4.69	Pass
		HCH	4.16	4.68	Pass

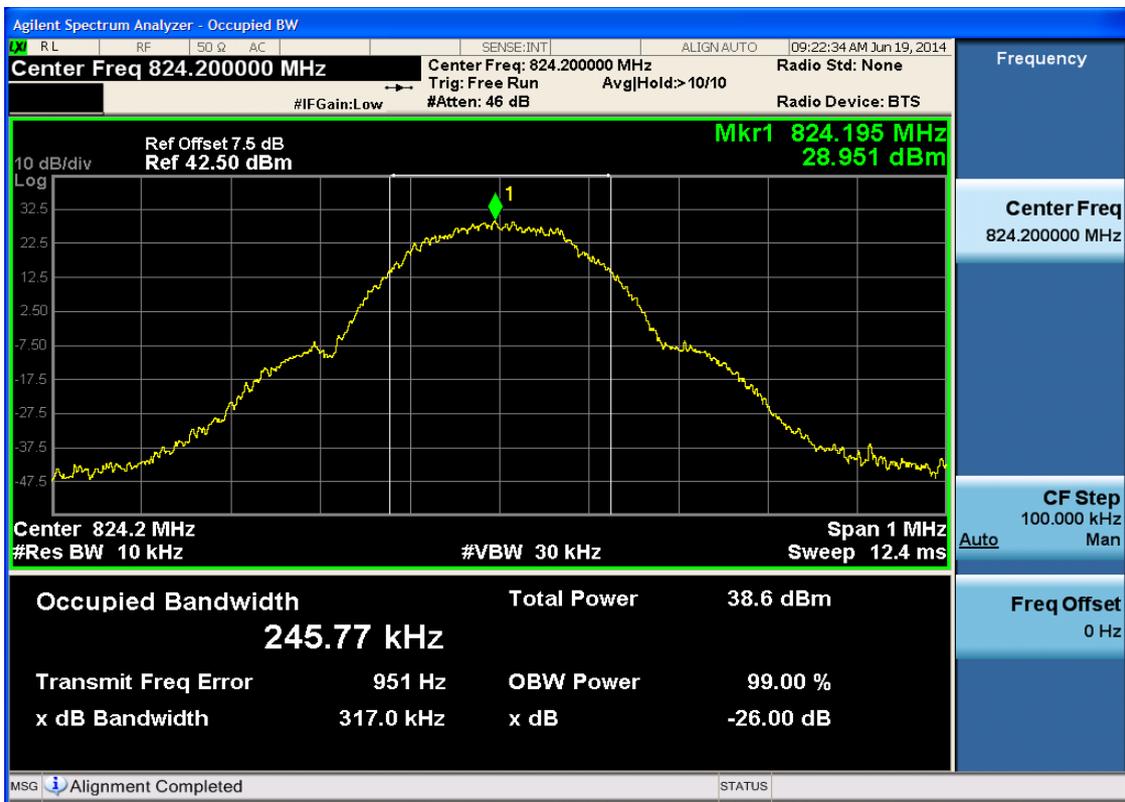
Part II - Test Plots

4.1 For GSM

4.1.1 Test Band = GSM850

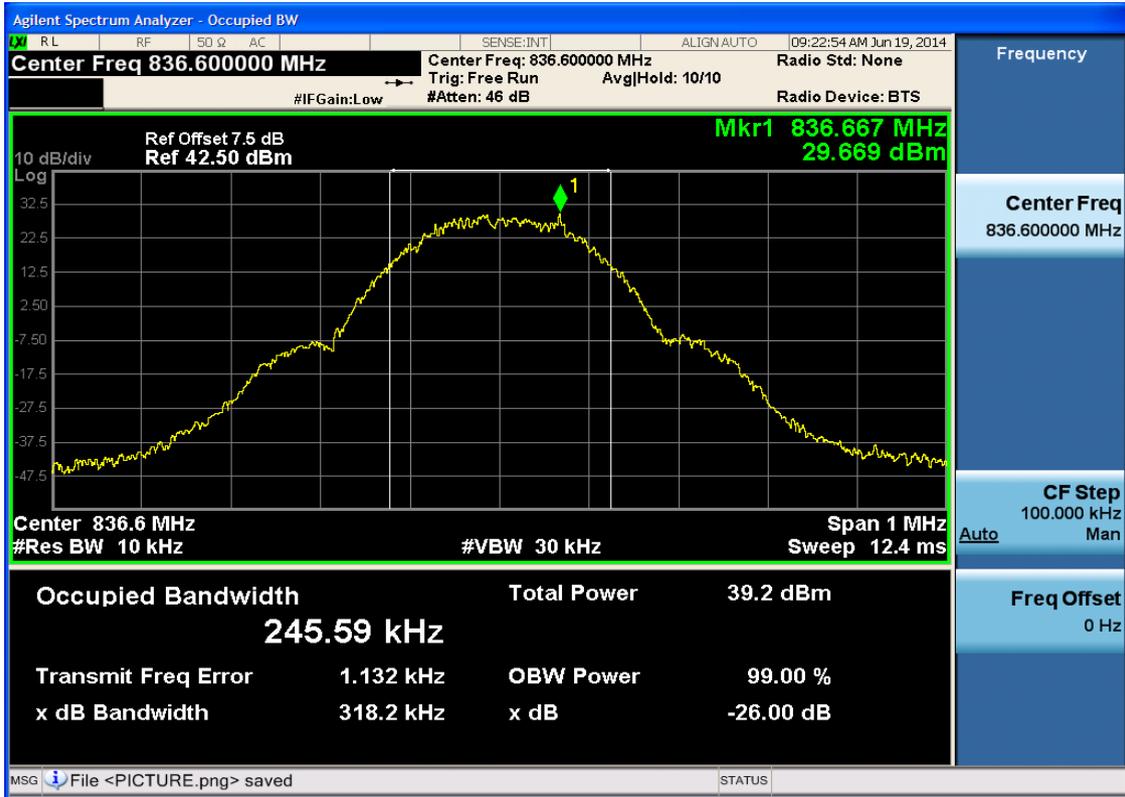
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH



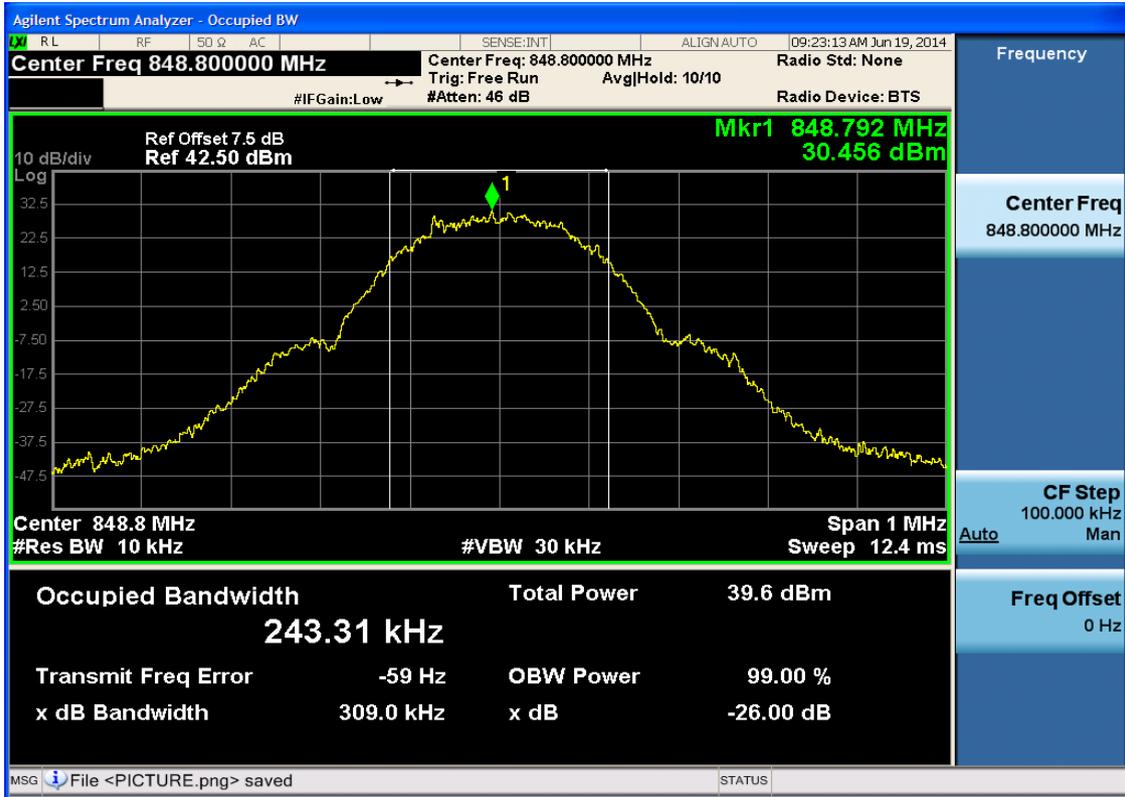


4.1.1.1.2 Test Channel = MCH





4.1.1.1.3 Test Channel = HCH

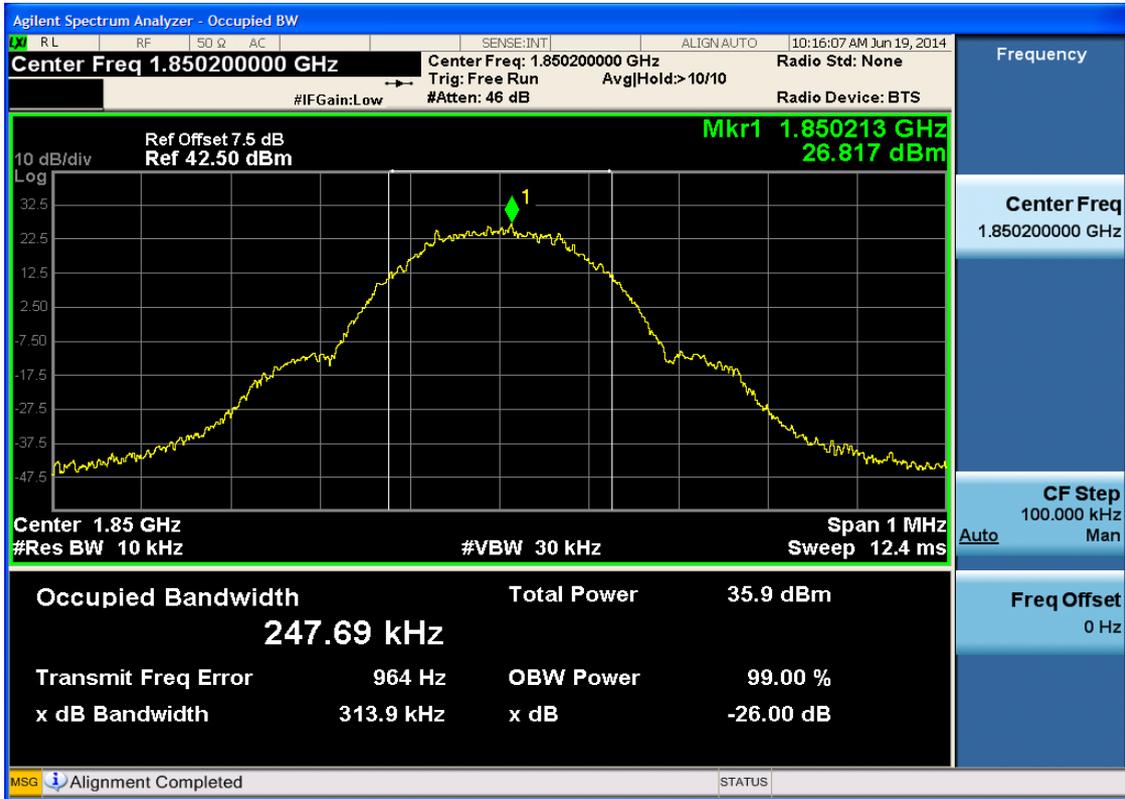




4.1.2 Test Band = GSM1900

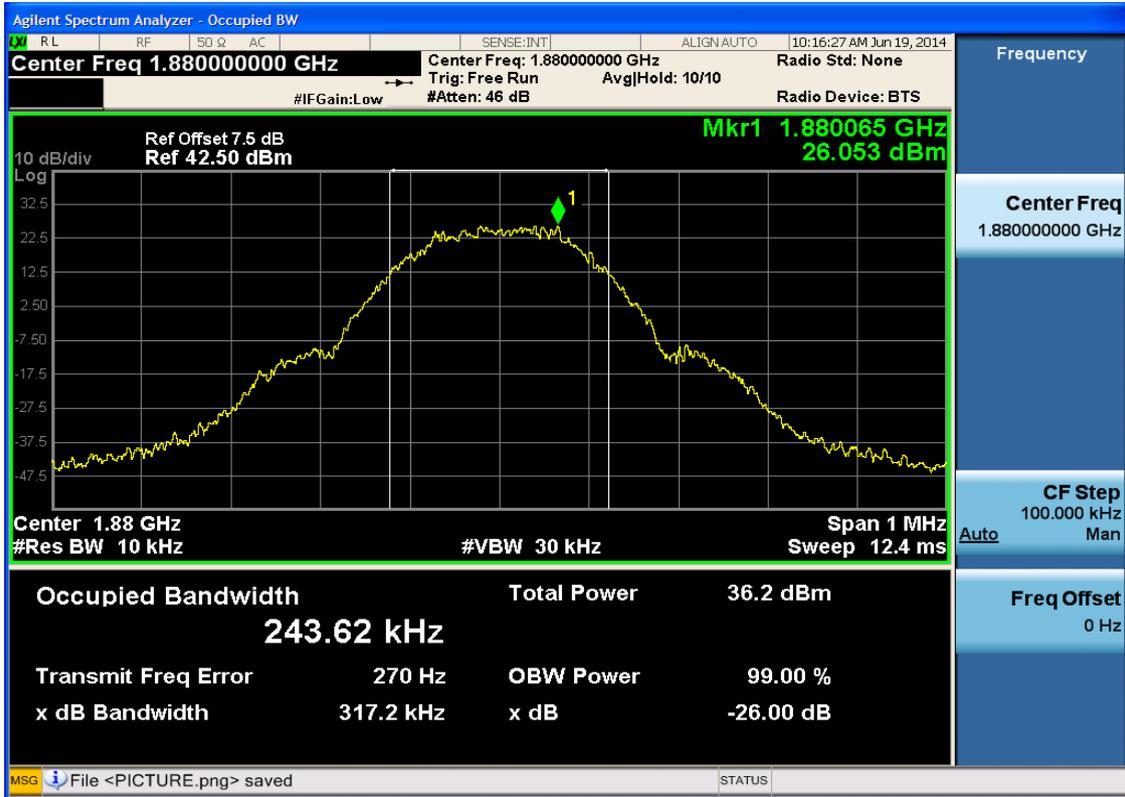
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



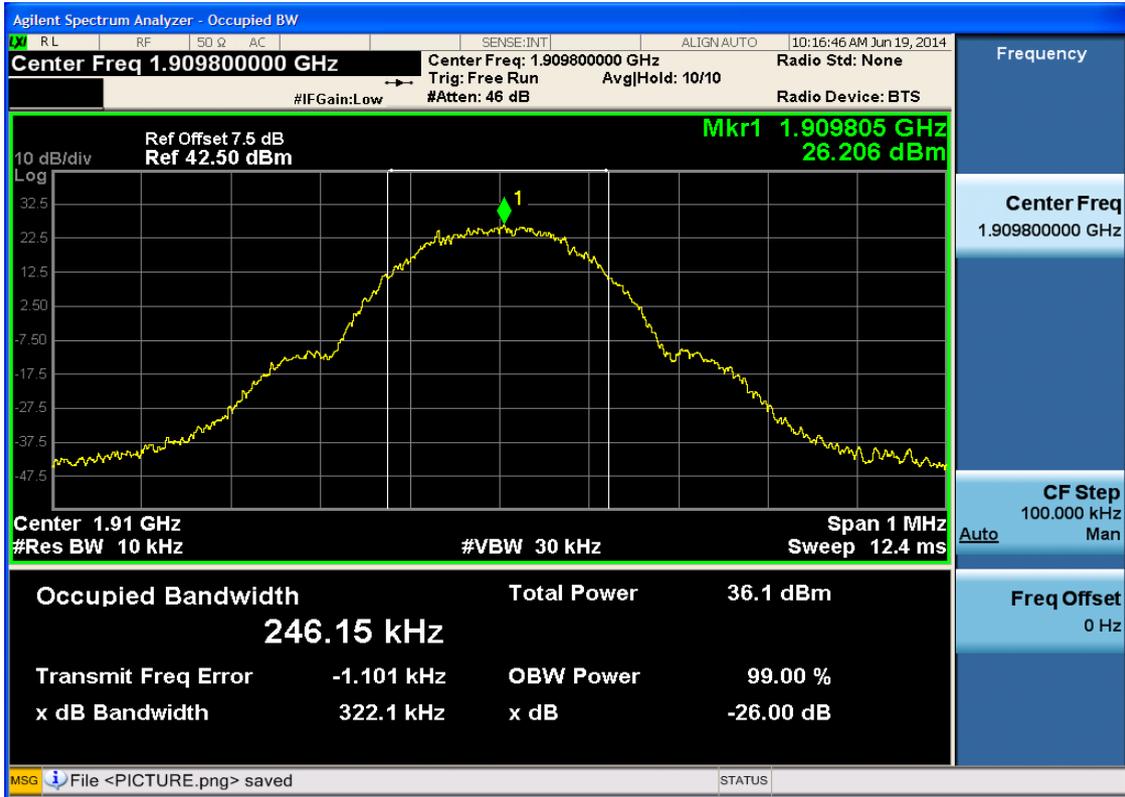


4.1.2.1.2 Test Channel = MCH





4.1.2.1.3 Test Channel = HCH



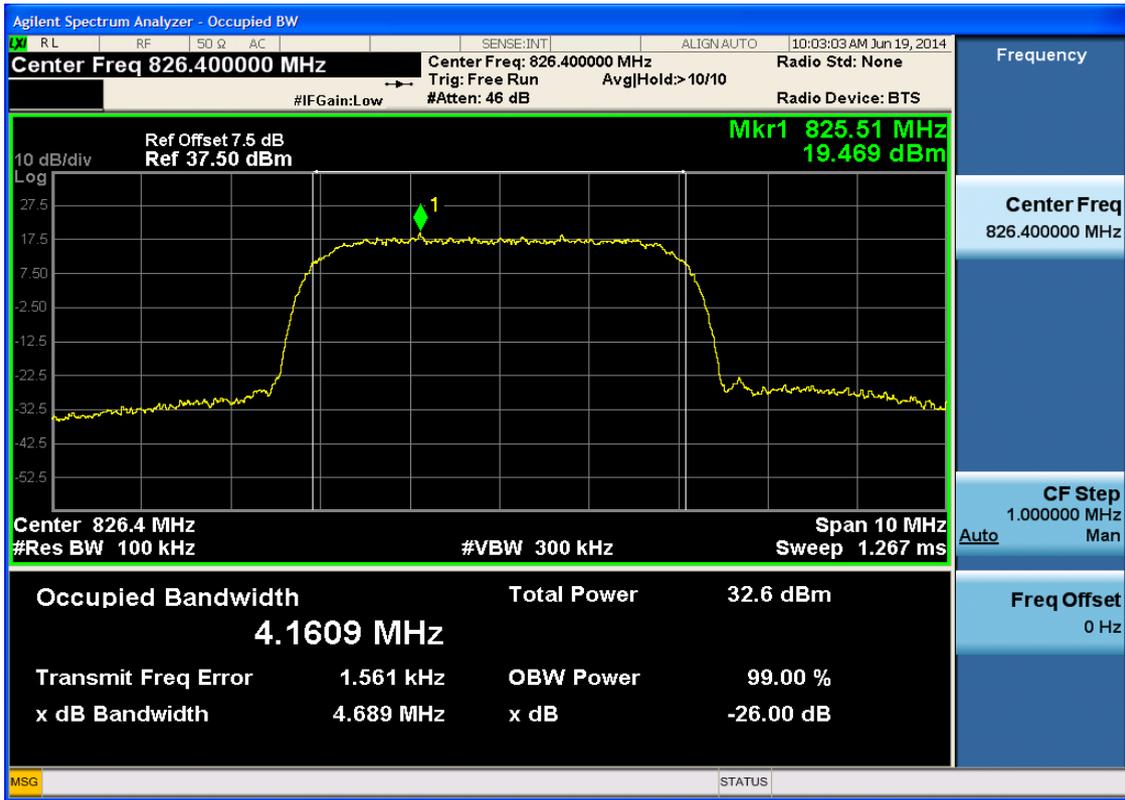


4.2 For UMTS

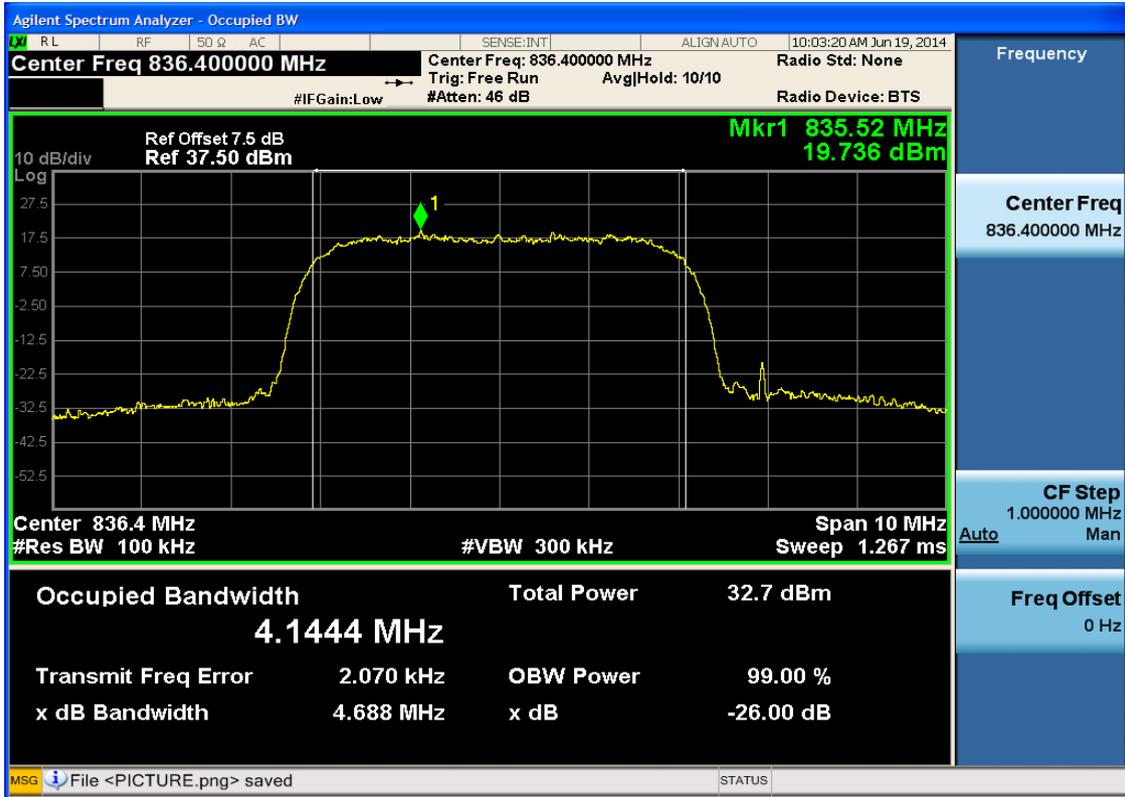
4.2.1 Test Band = WCDMA850

4.2.1.1 Test Mode = UMTS/TM1

4.2.1.1.1 Test Channel = LCH

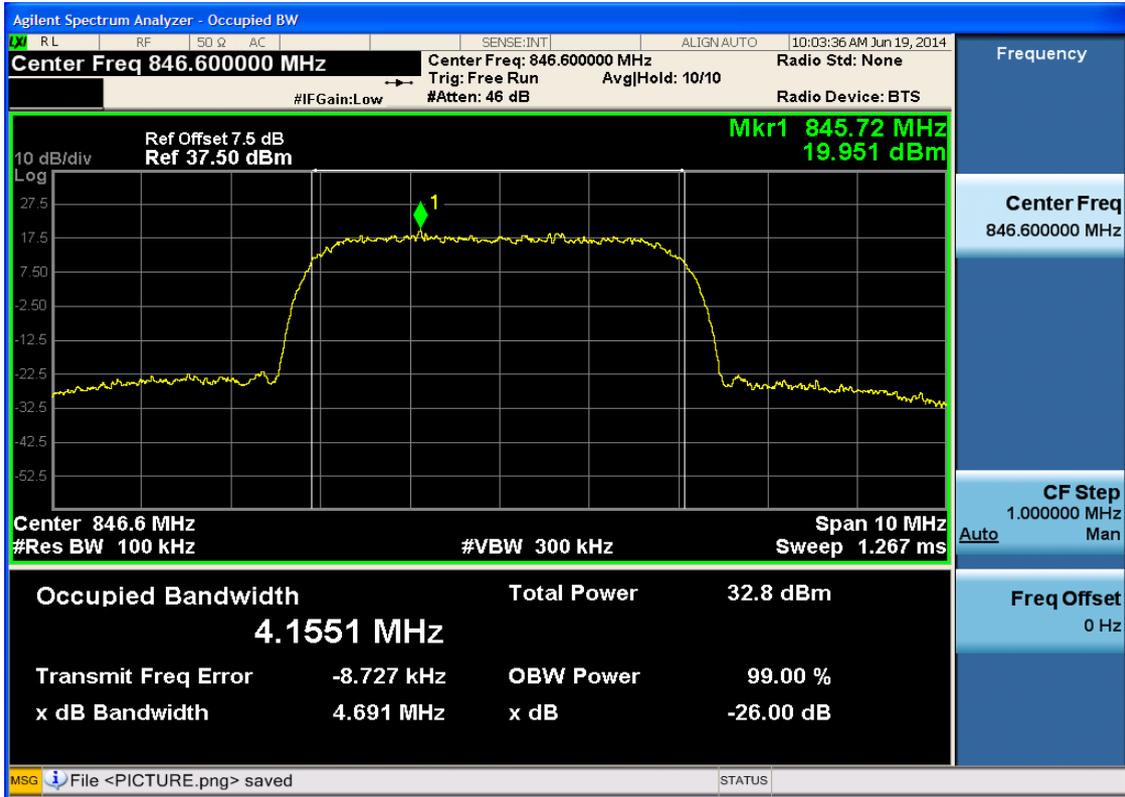


4.2.1.1.2 Test Channel = MCH





4.2.1.1.3 Test Channel = HCH

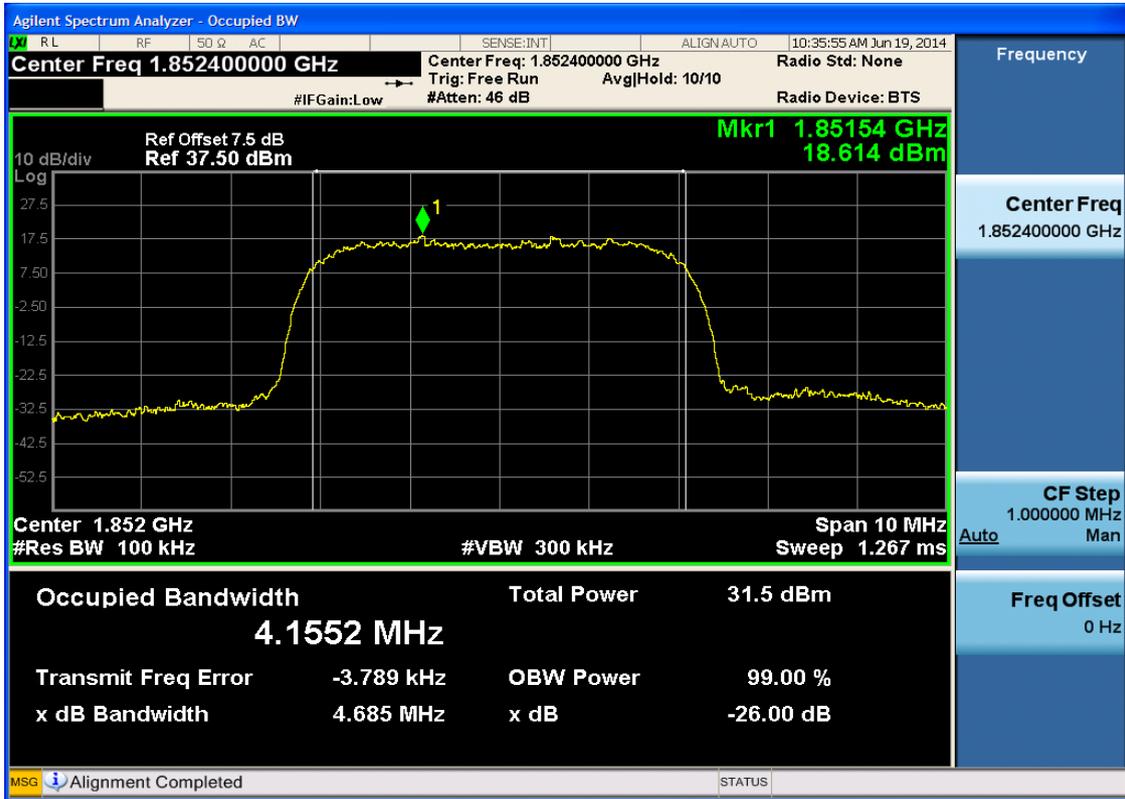




4.2.2 Test Band = WCDMA1900

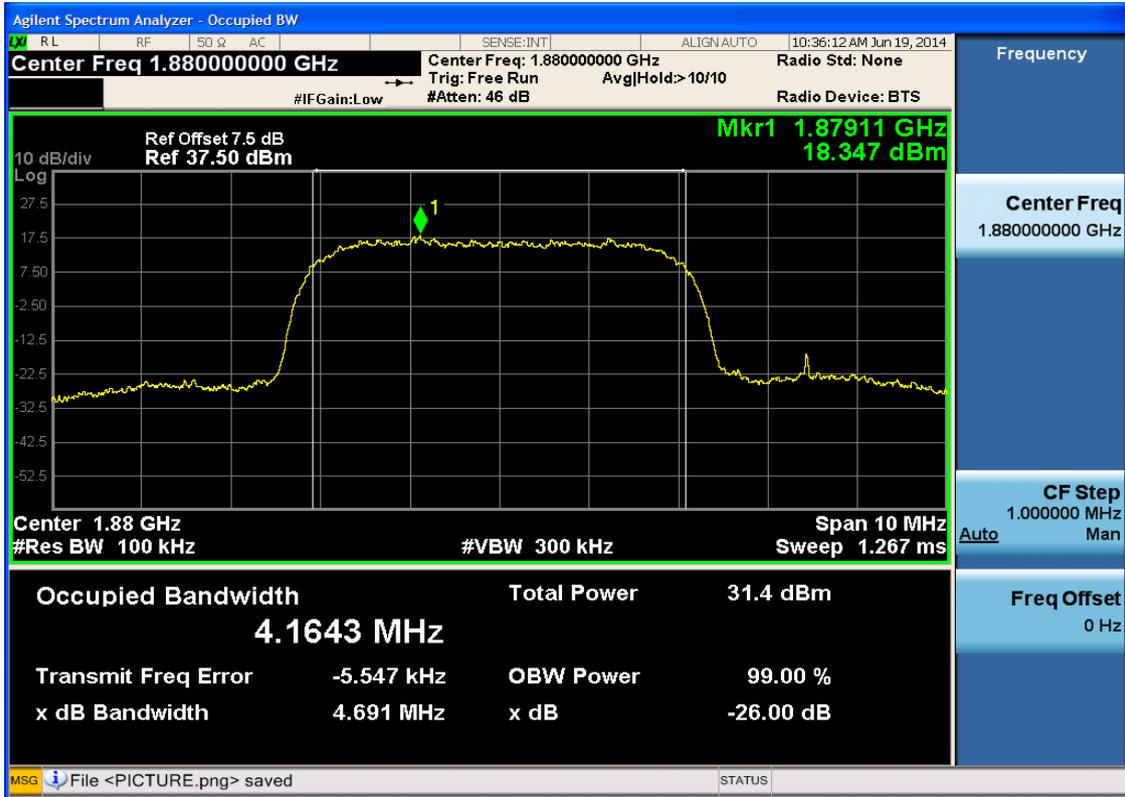
4.2.2.1 Test Mode = UMTS/TM1

4.2.2.1.1 Test Channel = LCH



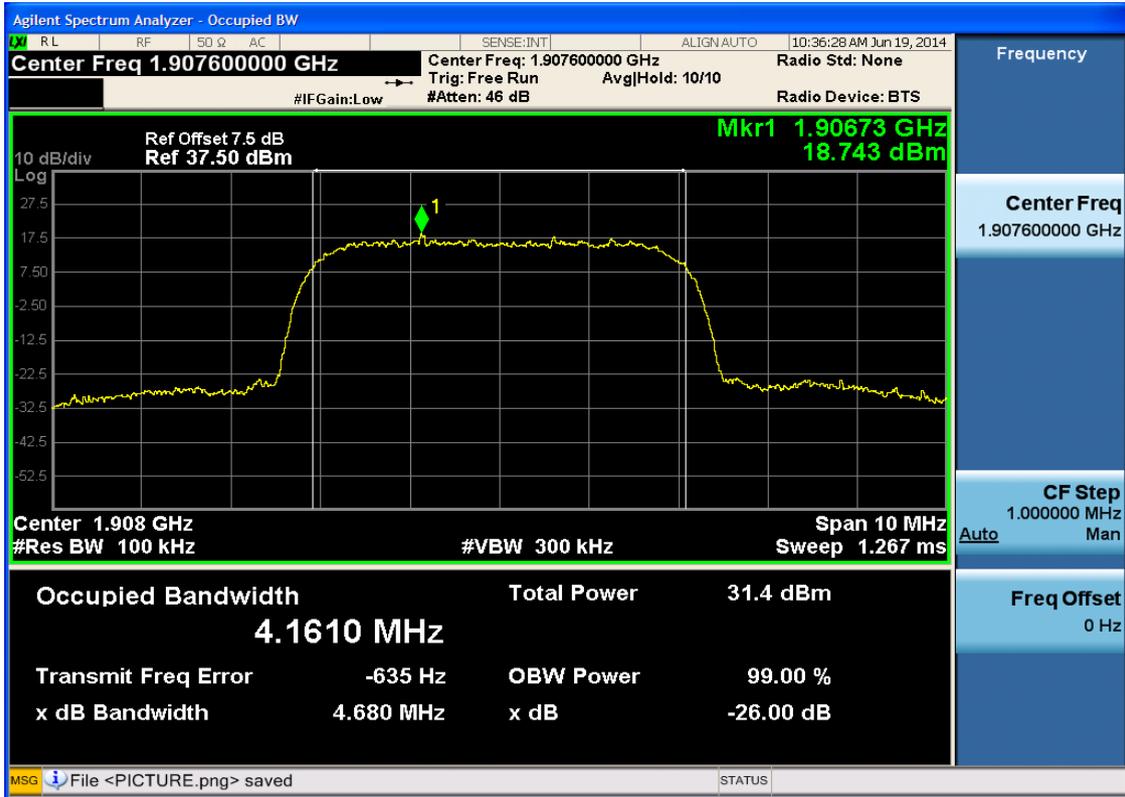


4.2.2.1.2 Test Channel = MCH





4.2.2.1.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

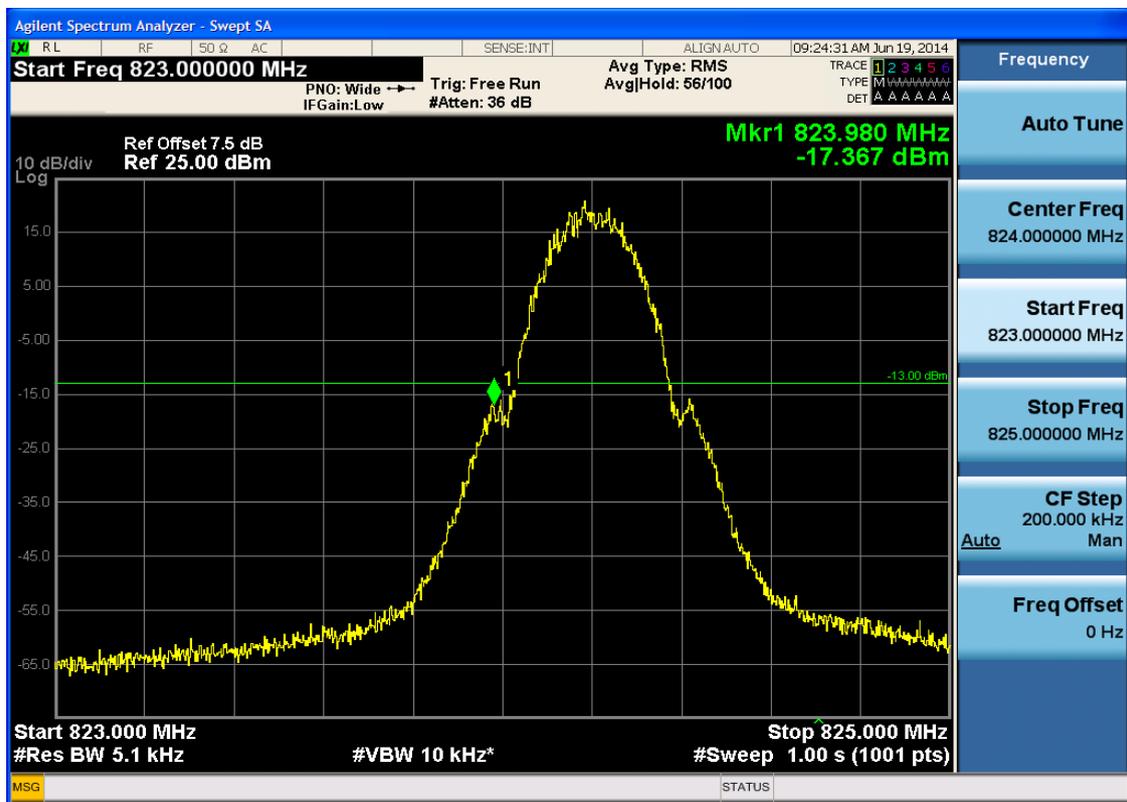
Part I - Test Plots

5.1 For GSM

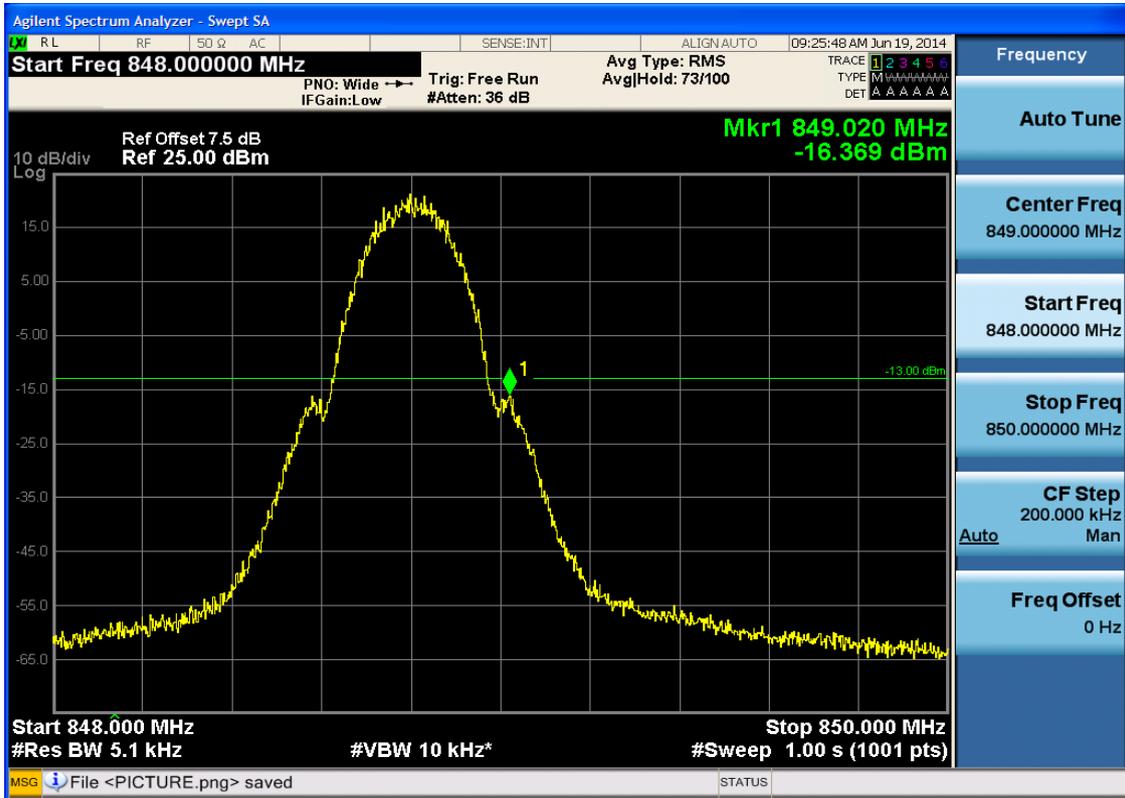
5.1.1 Test Band = GSM850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH



5.1.1.1.2 Test Channel = HCH

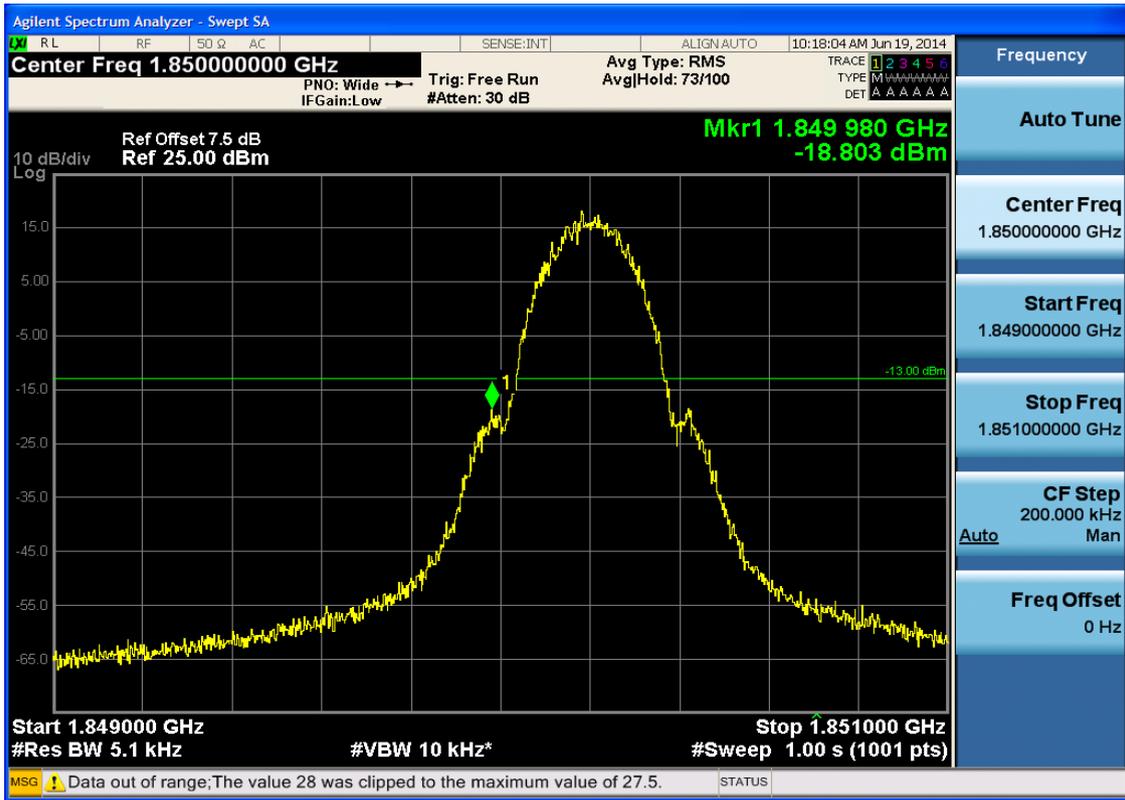




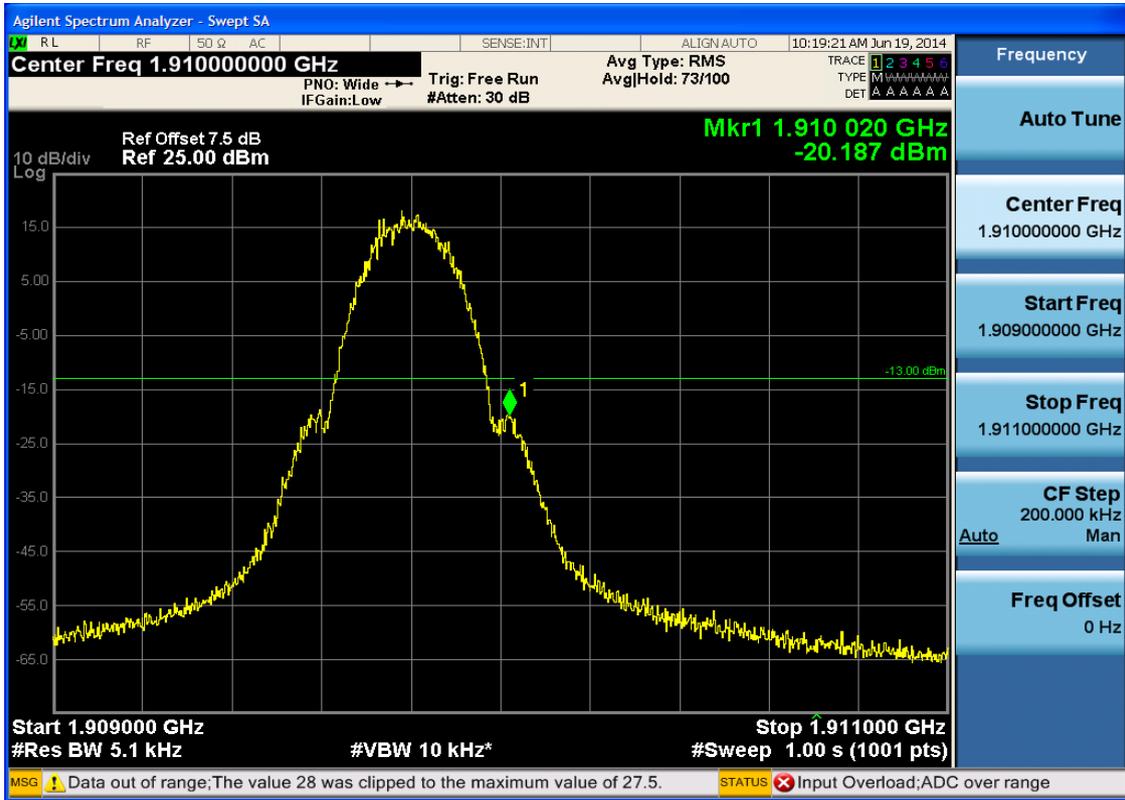
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH



5.1.2.1.2 Test Channel = HCH





5.2 For UMTS

5.2.1 Test Band = WCDMA850

5.2.1.1 Test Mode = UMTS/TM1

5.2.1.1.1 Test Channel = LCH



5.2.1.1.2 Test Channel = HCH





5.2.2 Test Band = WCDMA1900

5.2.2.1 Test Mode = UMTS/TM1

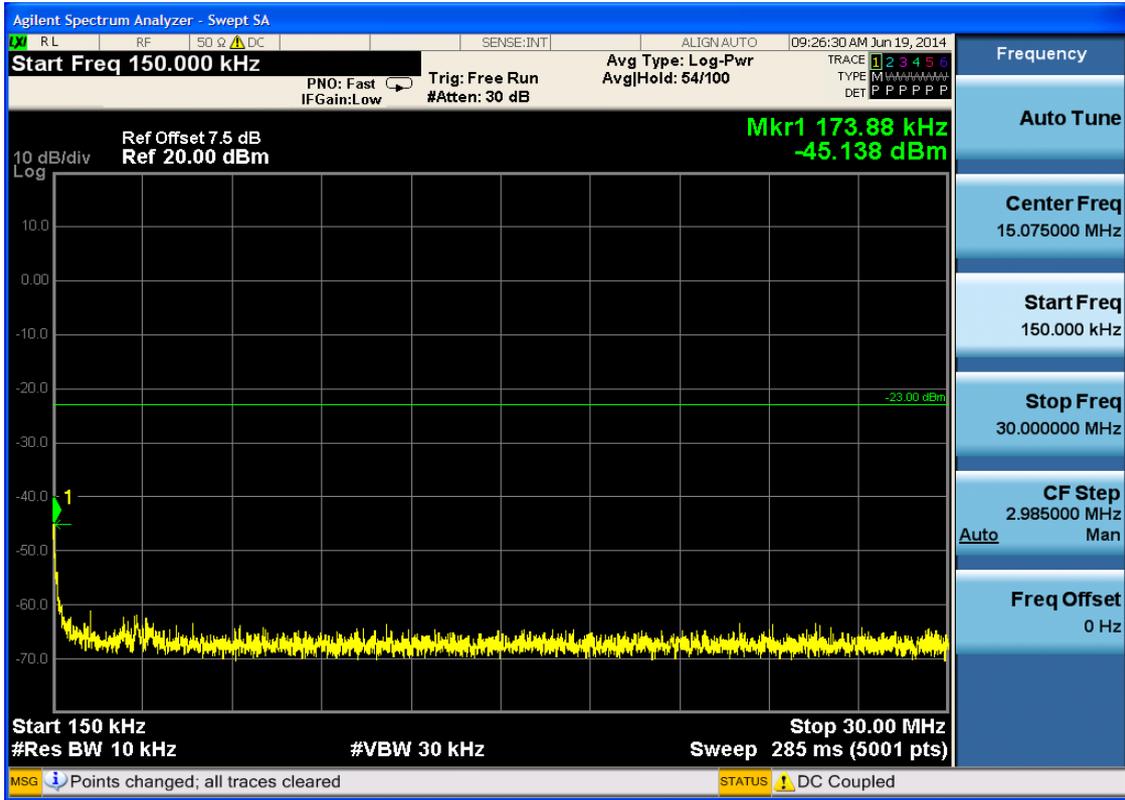
5.2.2.1.1 Test Channel = LCH

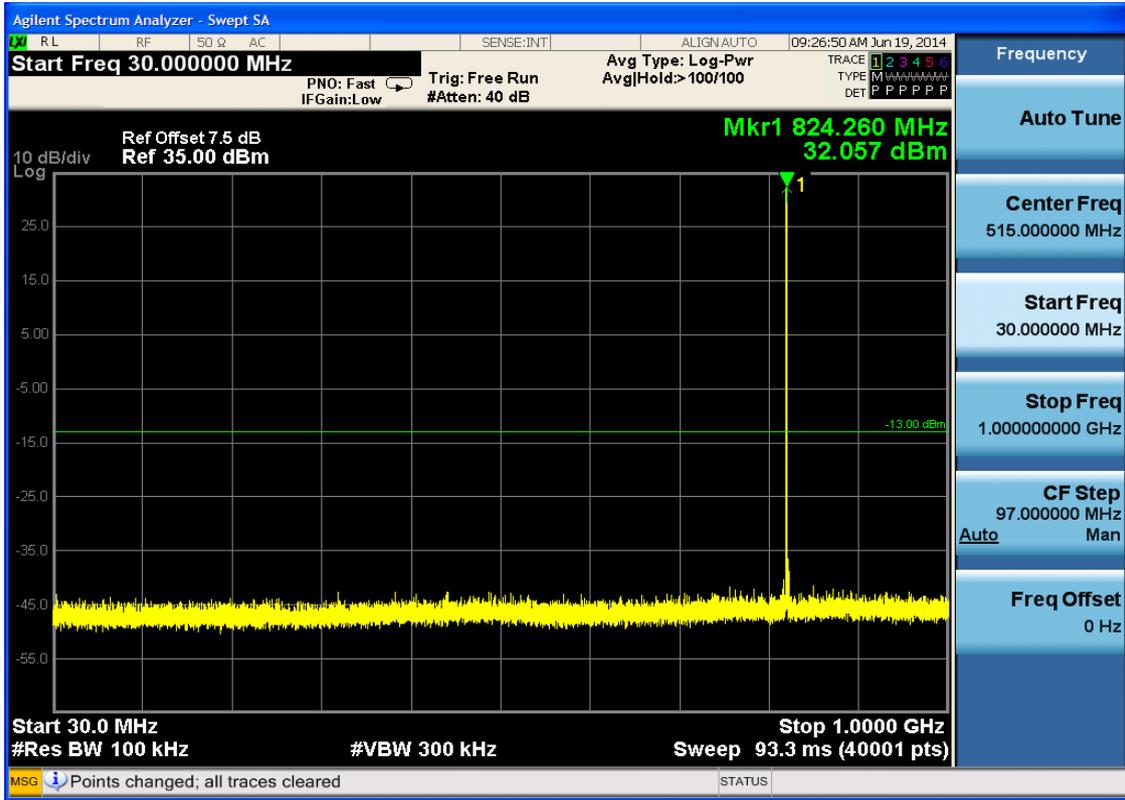


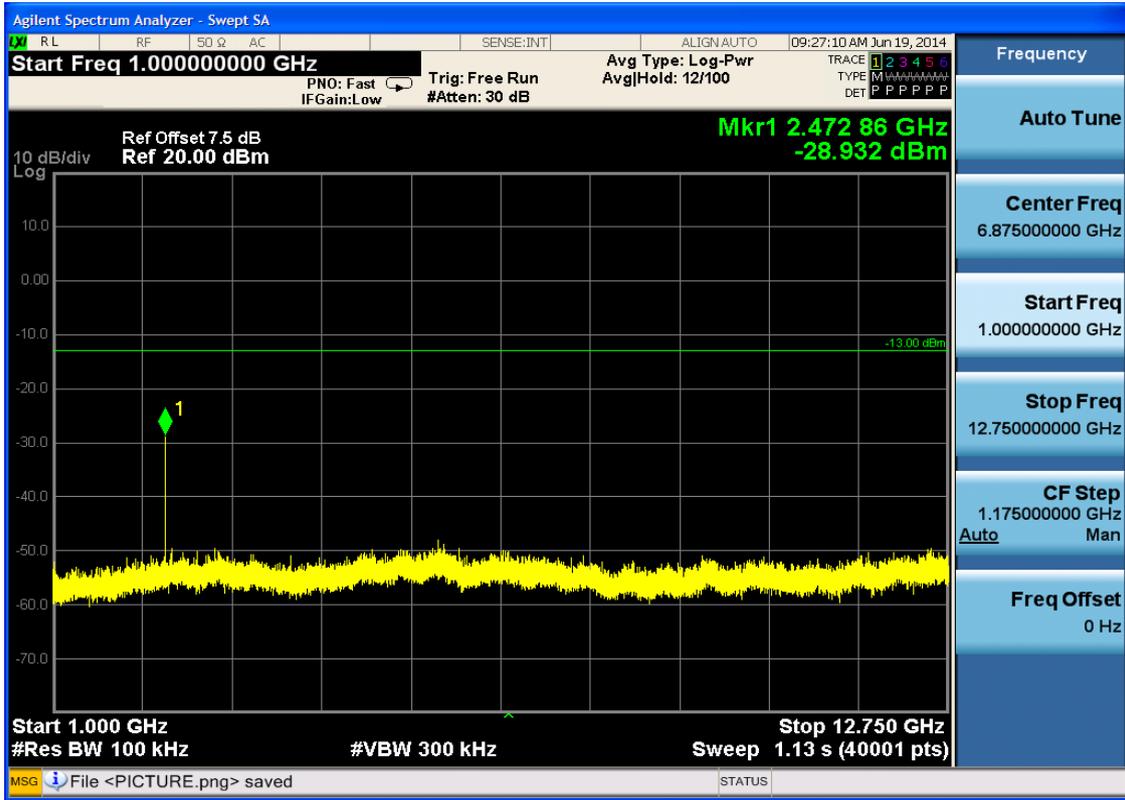


5.2.2.1.2 Test Channel = HCH



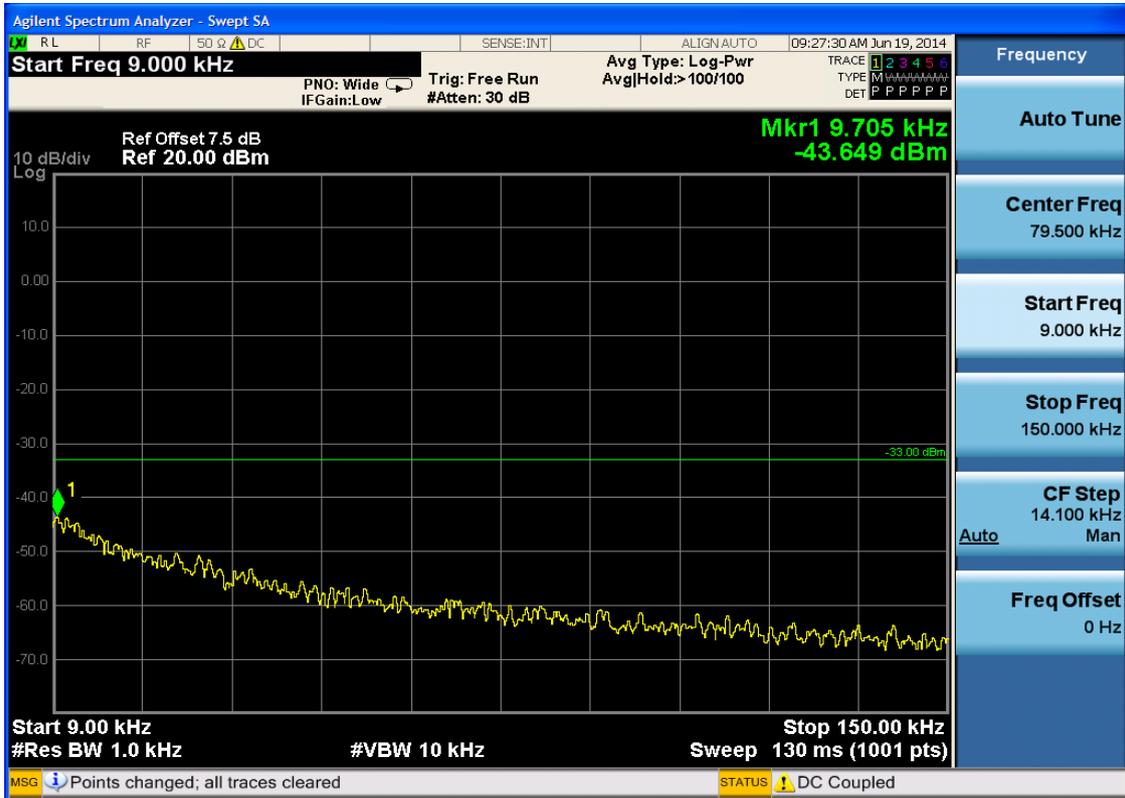


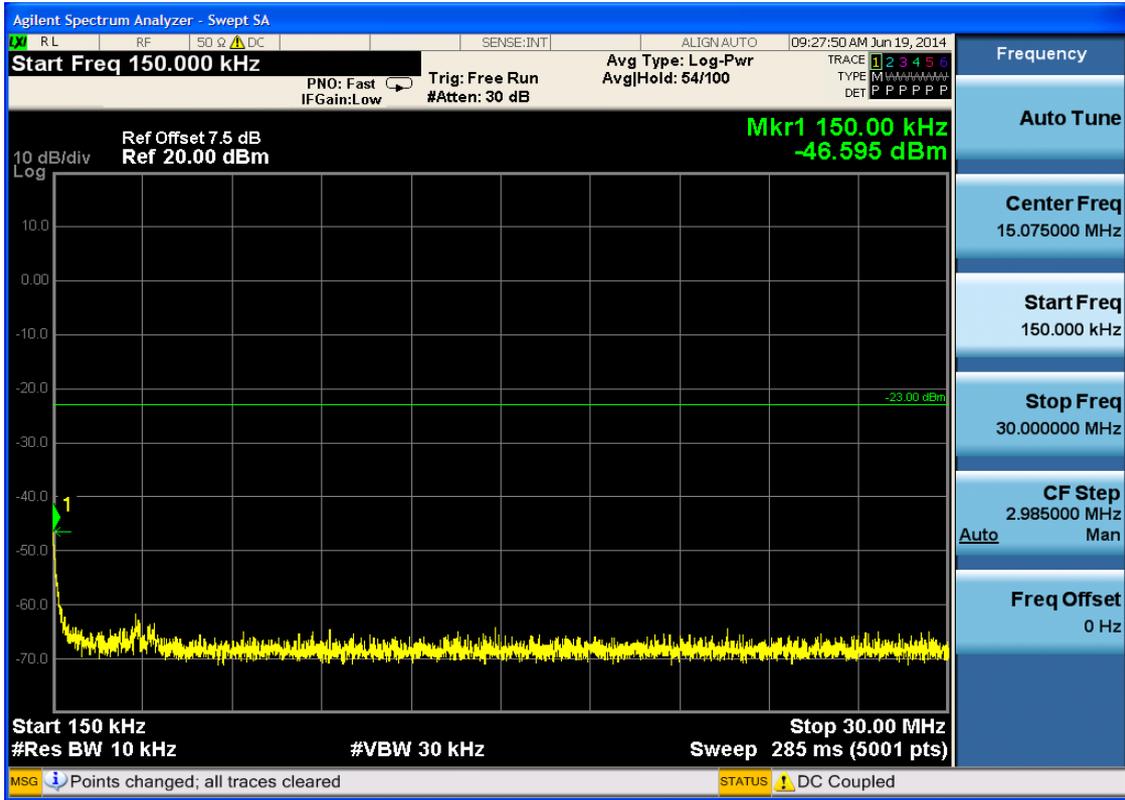


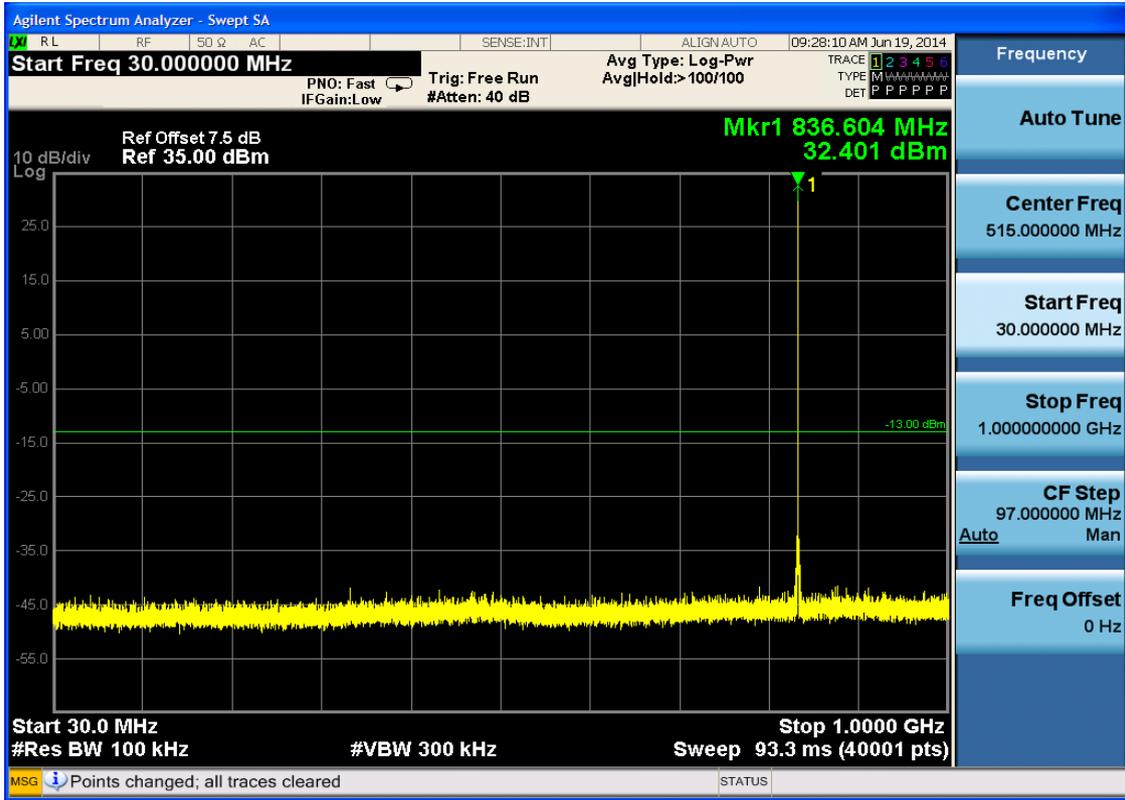


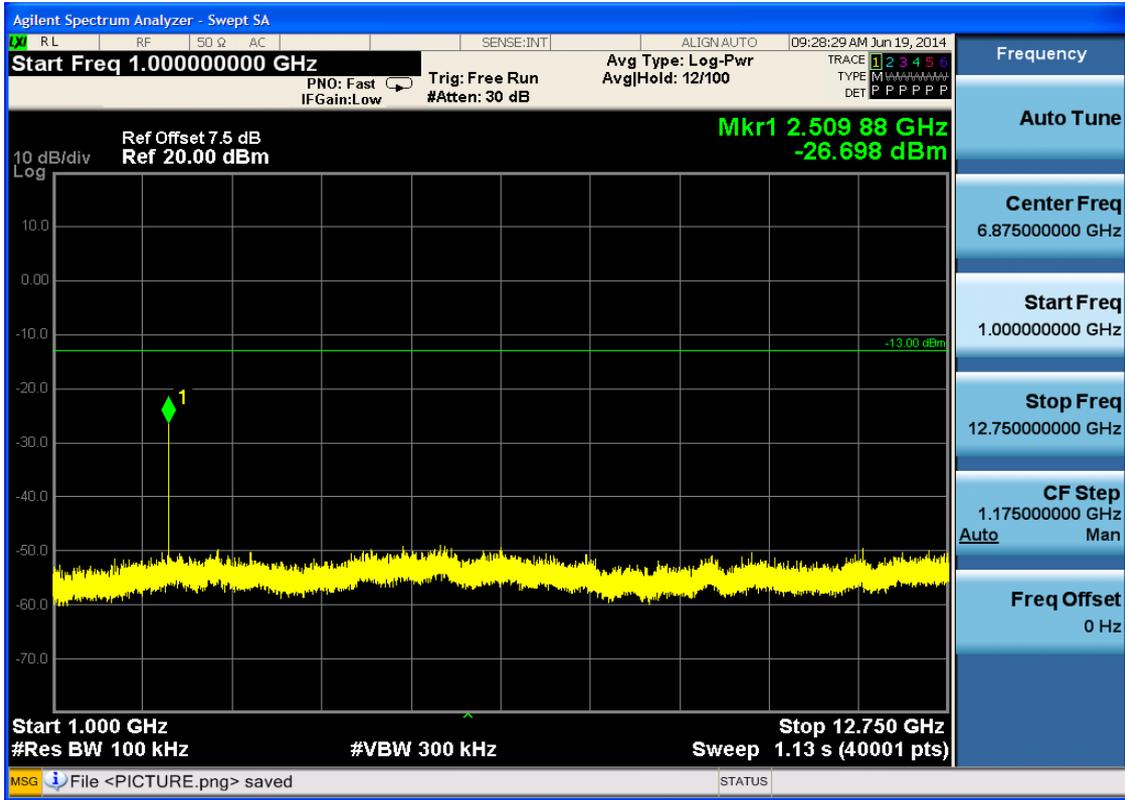


6.1.1.1.2 Test Channel = MCH



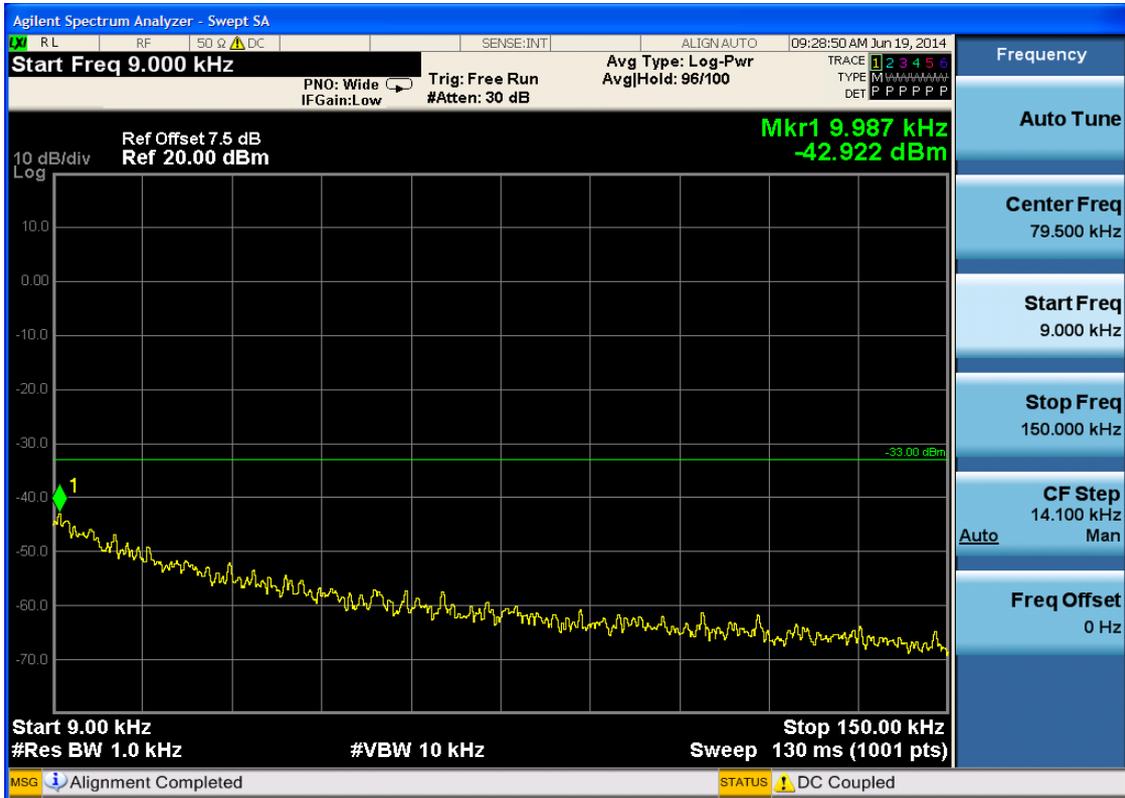


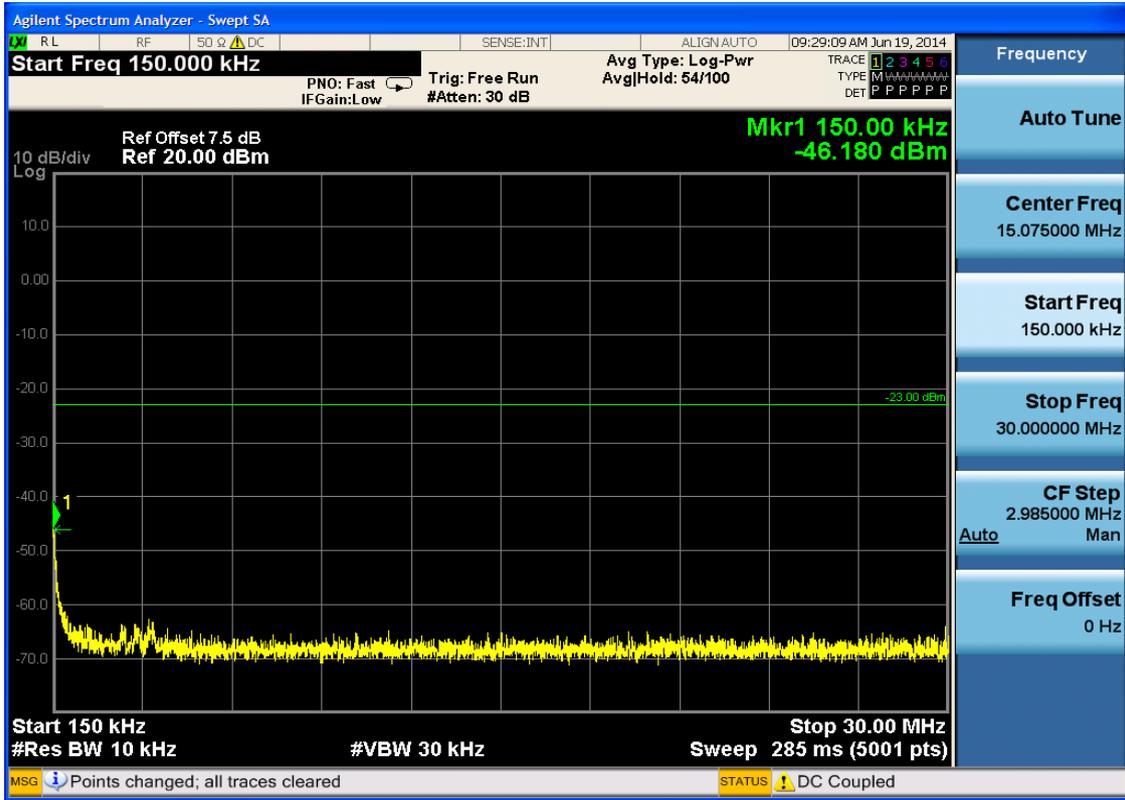


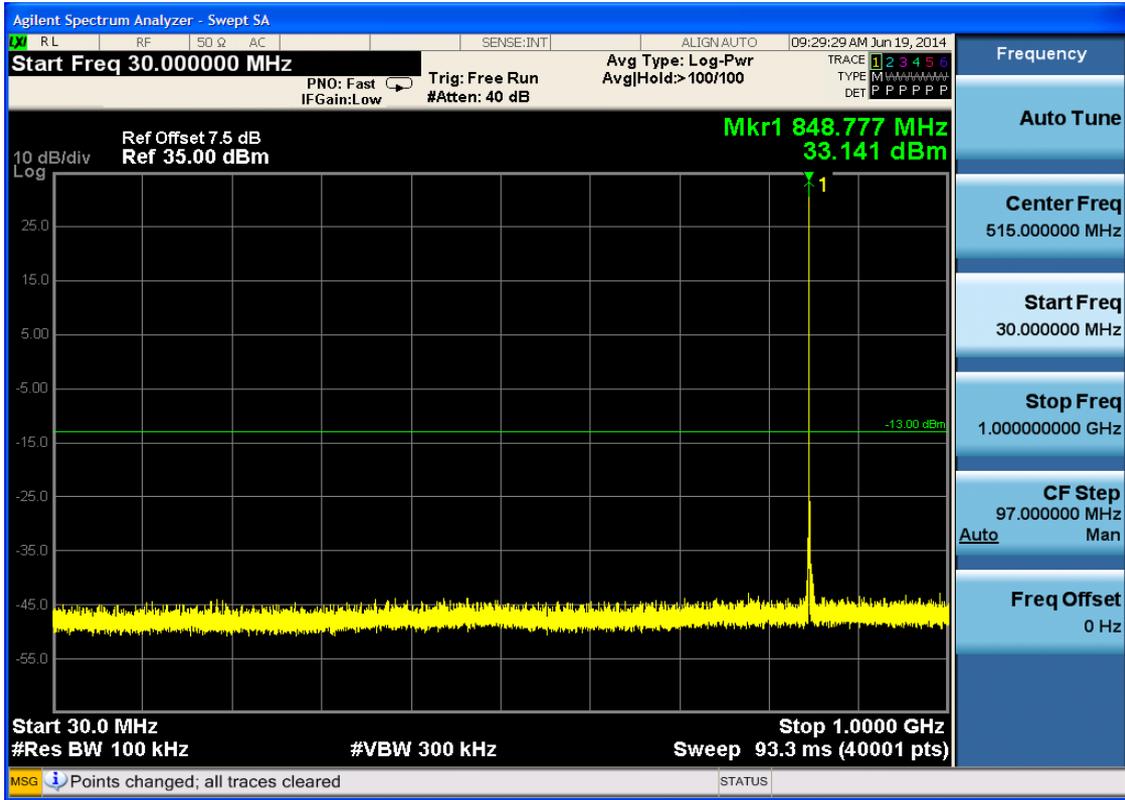


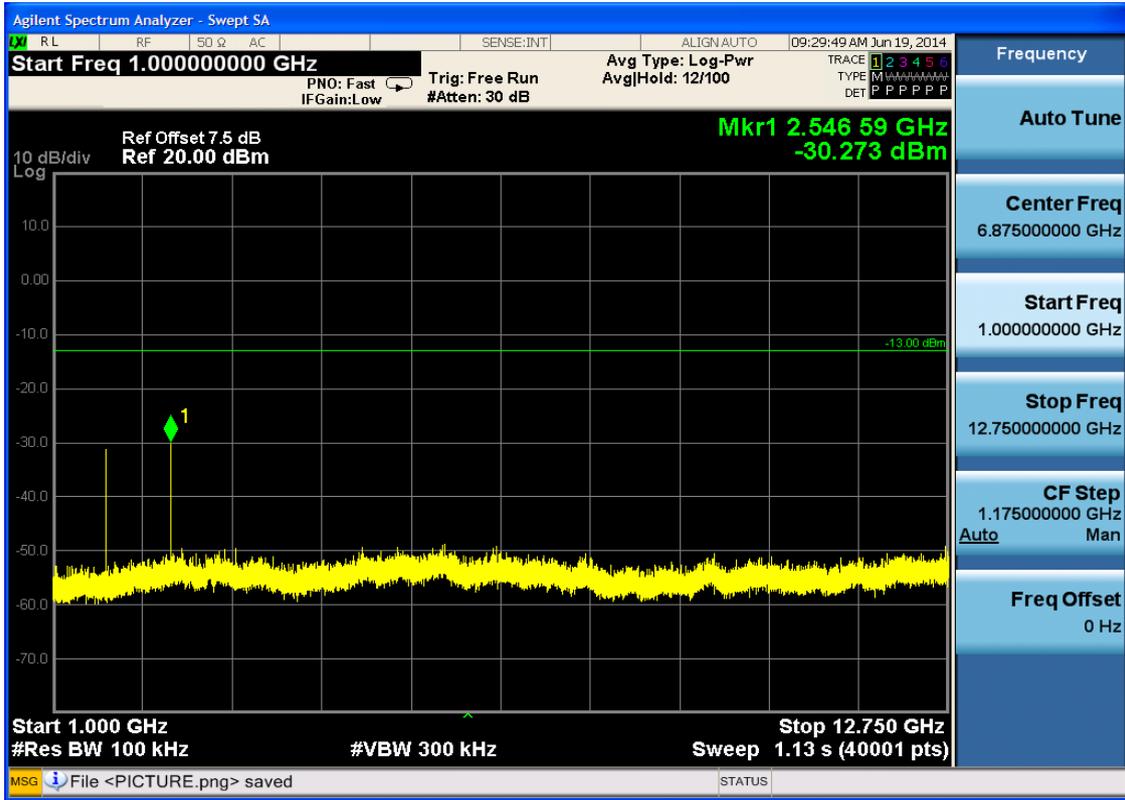


6.1.1.1.3 Test Channel = HCH









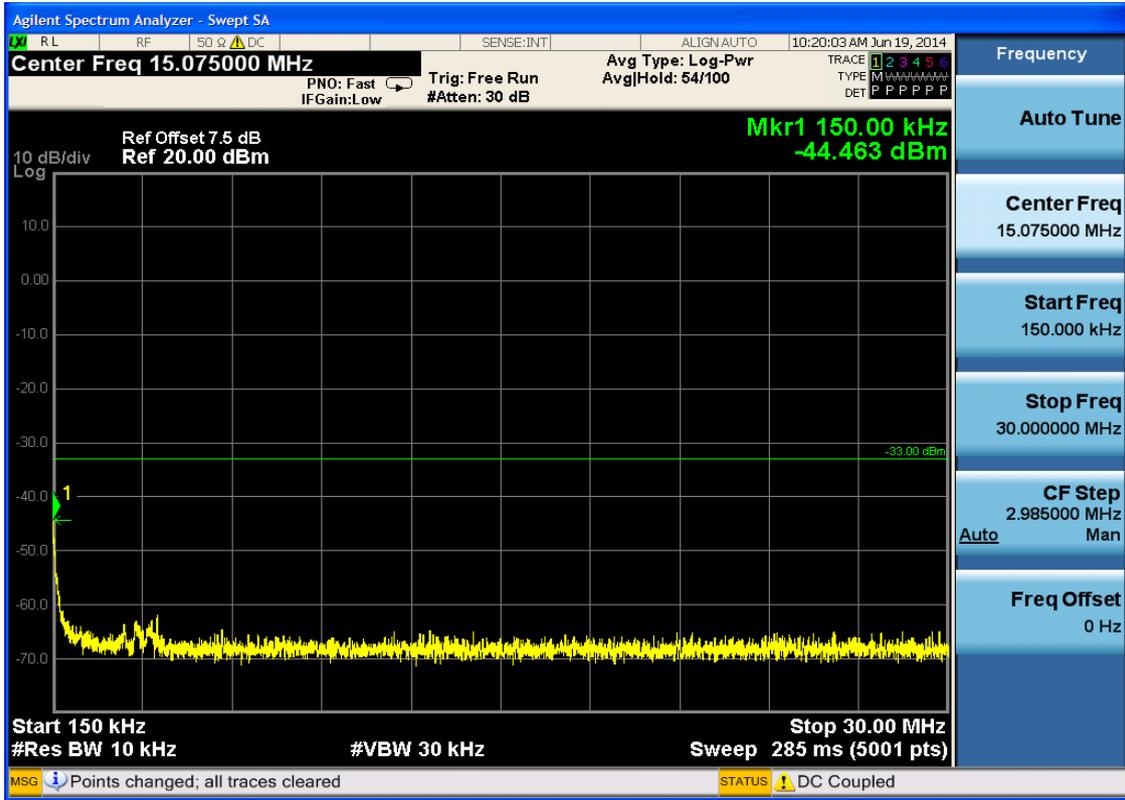


6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH



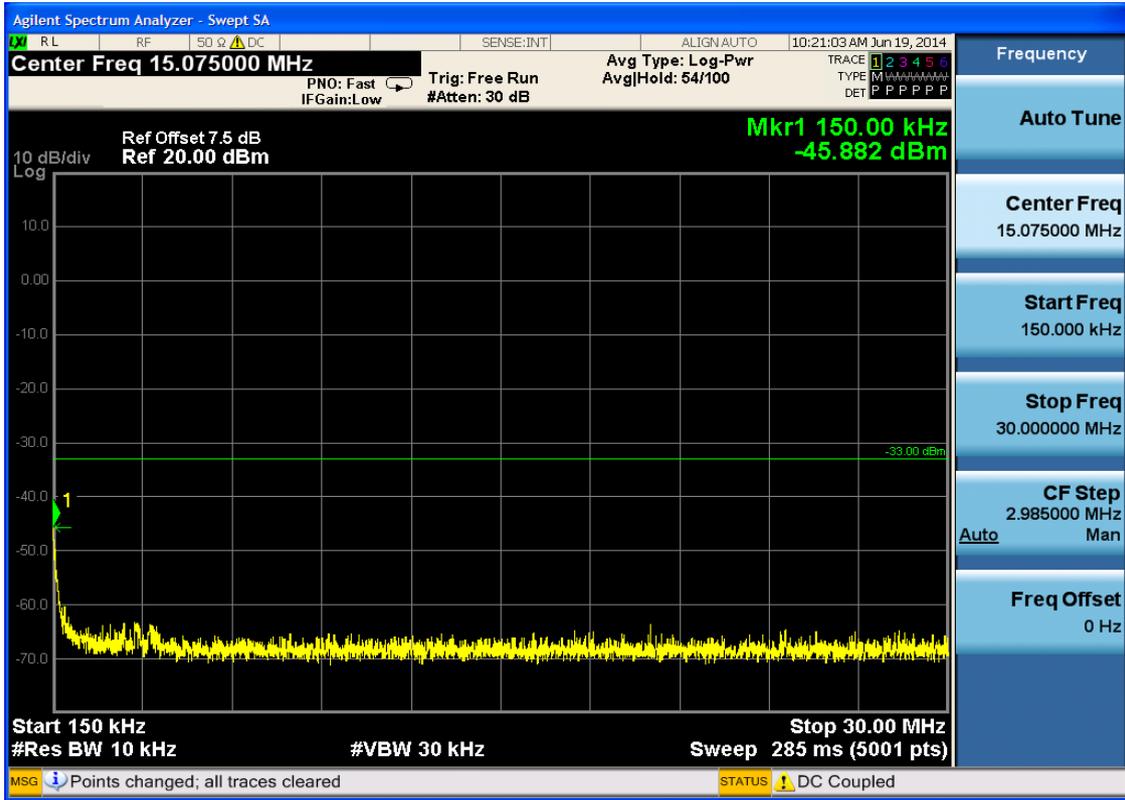


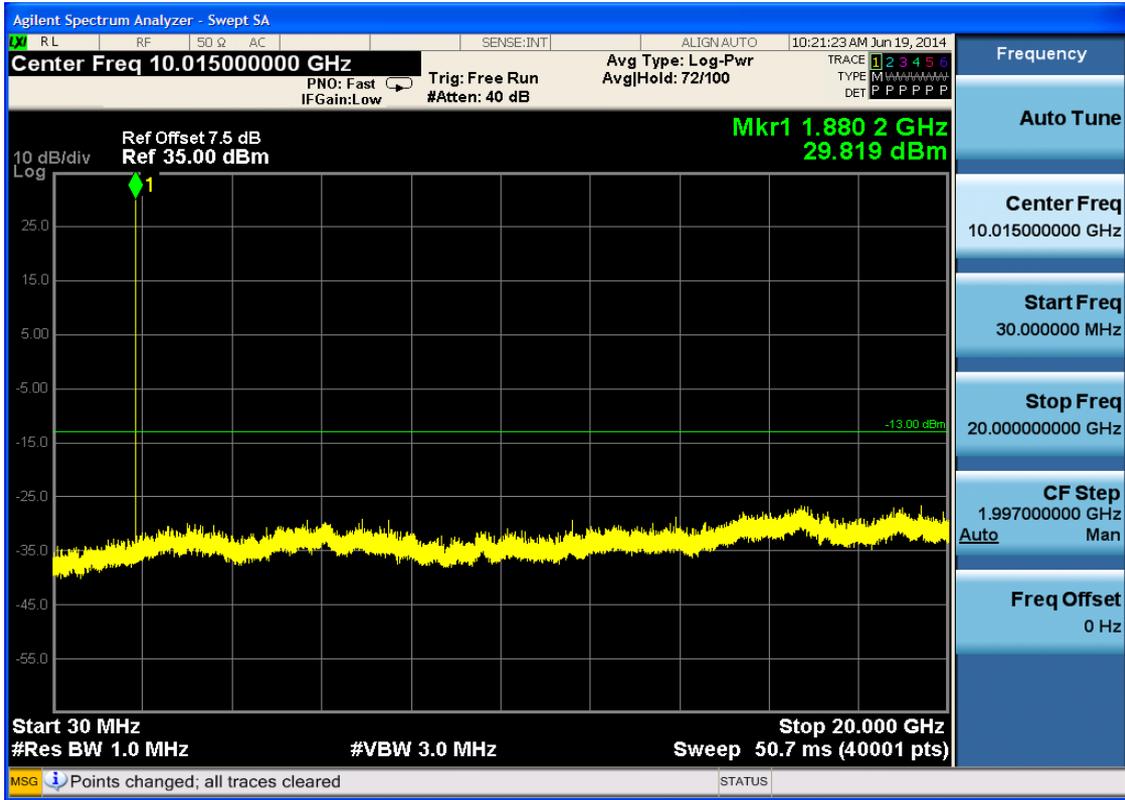




6.1.2.1.2 Test Channel = MCH

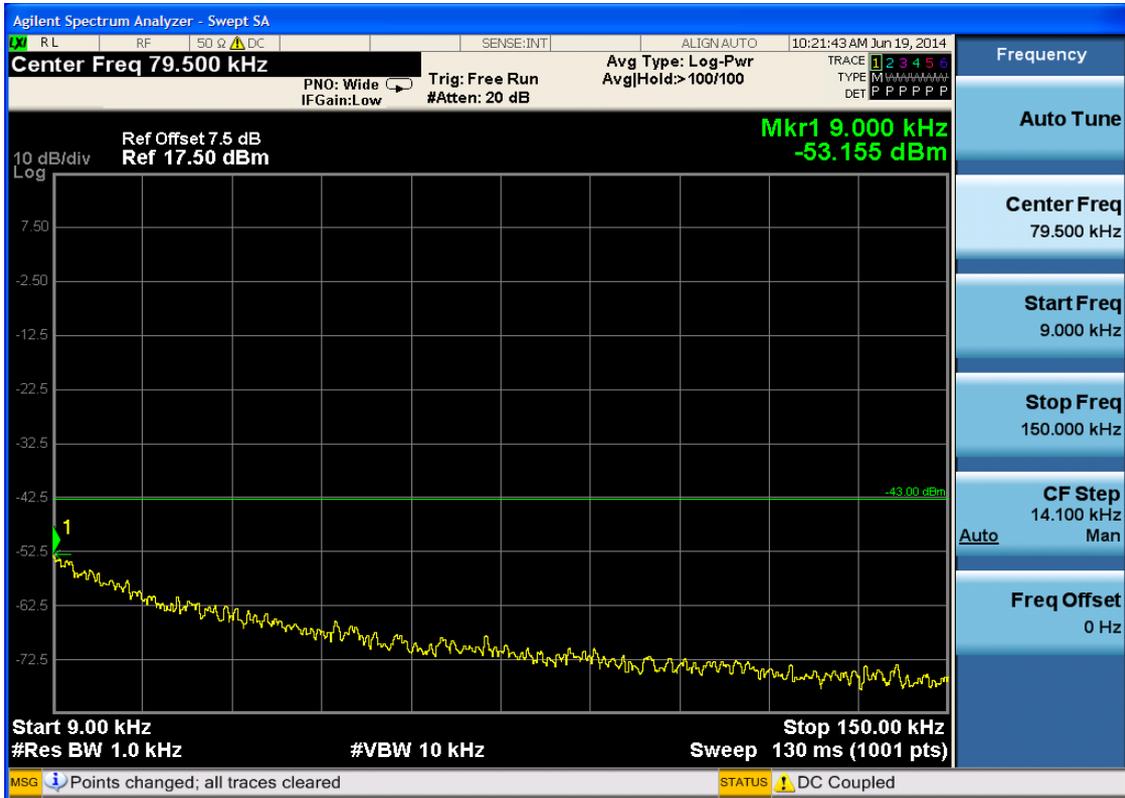


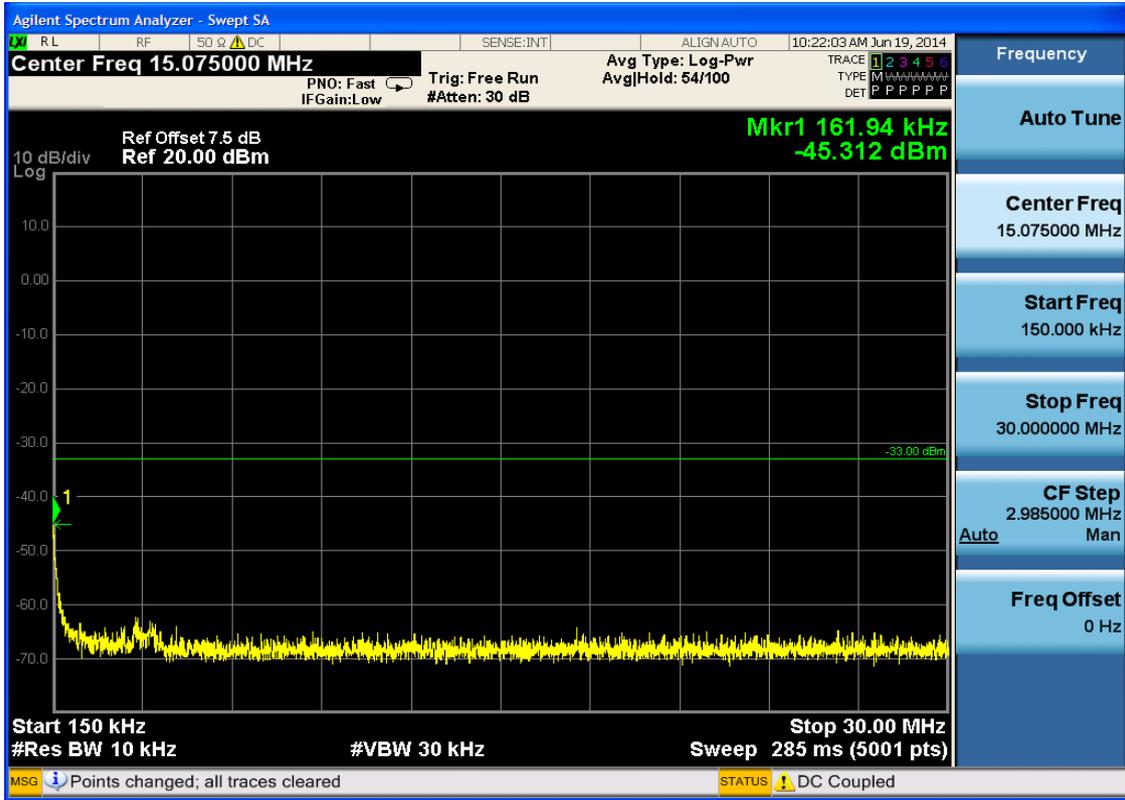






6.1.2.1.3 Test Channel = HCH







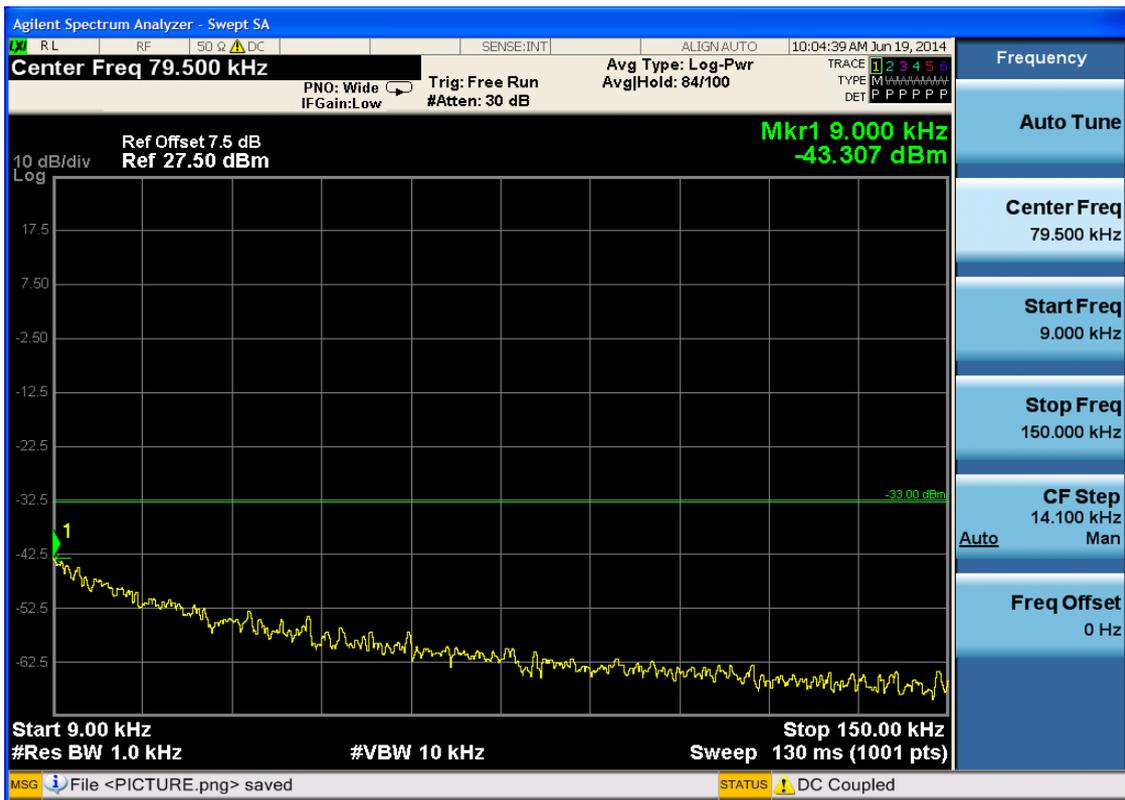


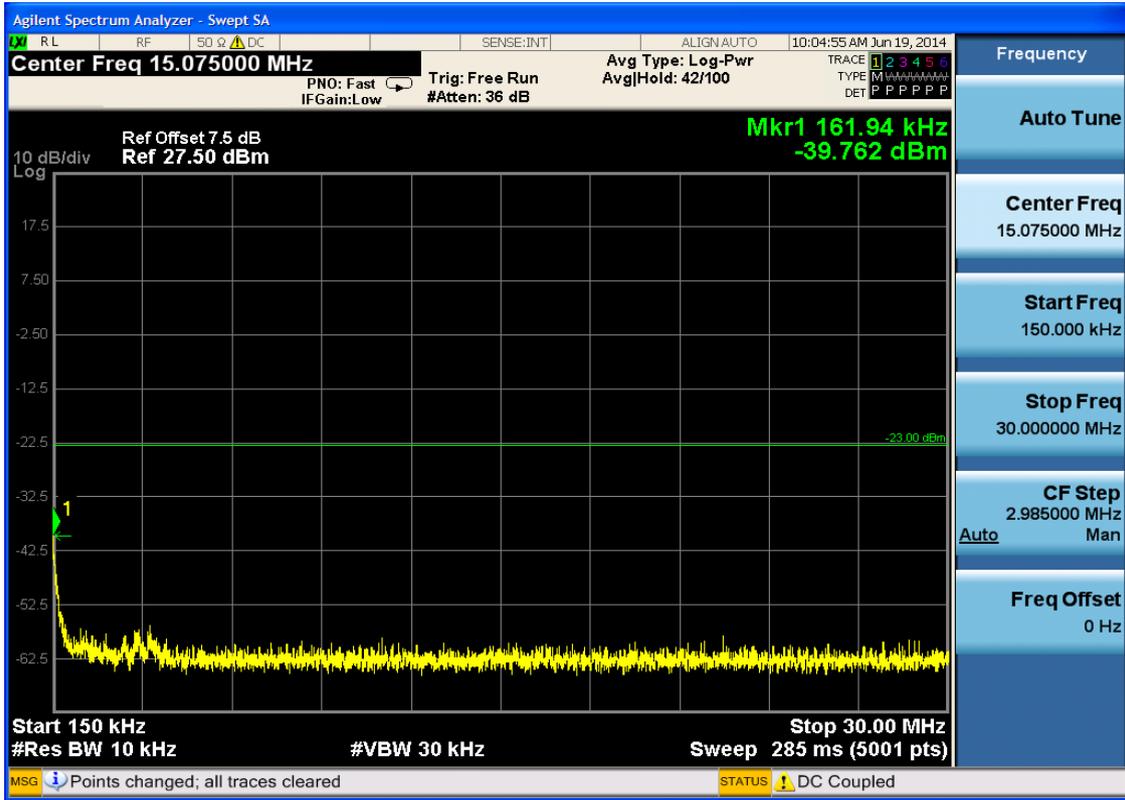
6.2 For UMTS

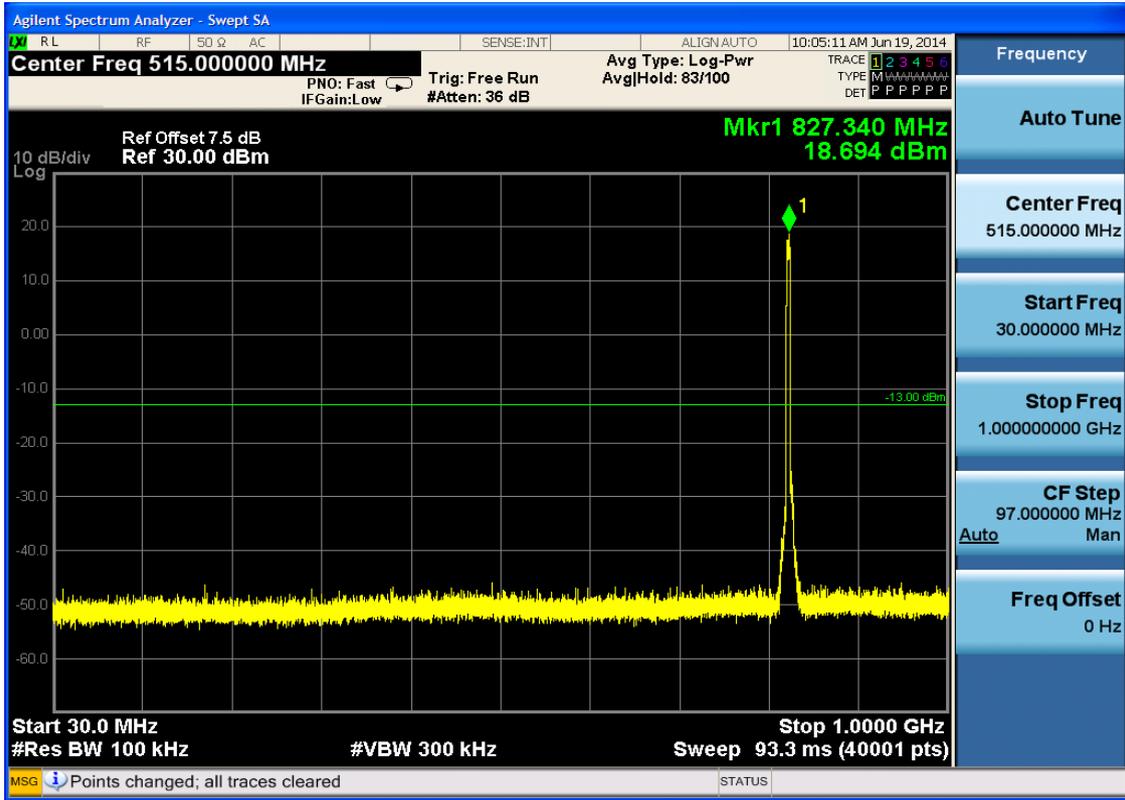
6.2.1 Test Band = WCDMA850

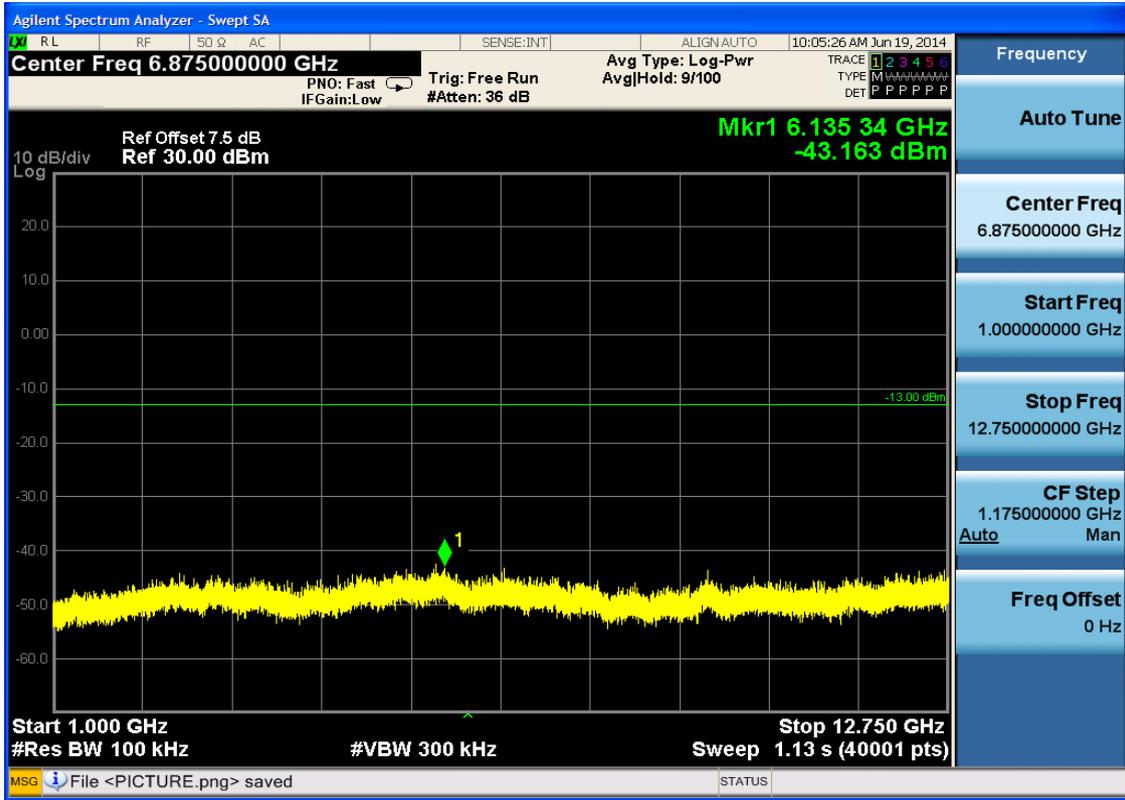
6.2.1.1 Test Mode = UMTS/TM1

6.2.1.1.1 Test Channel = LCH



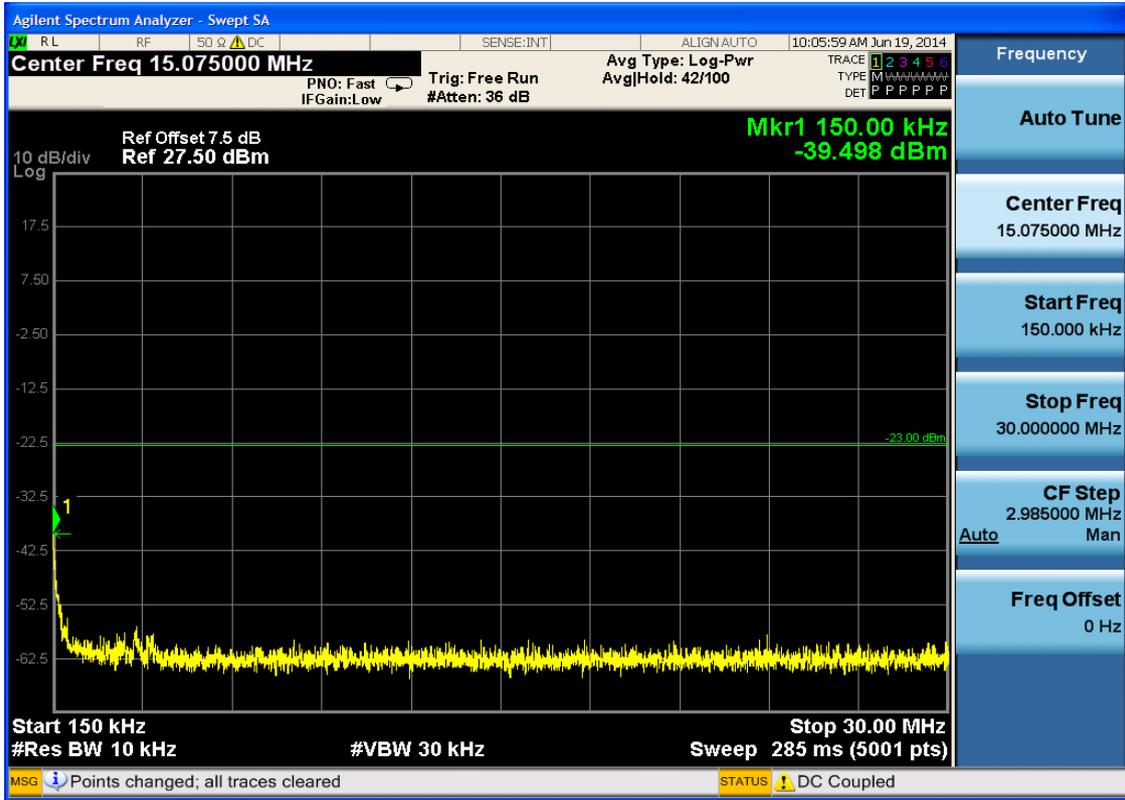


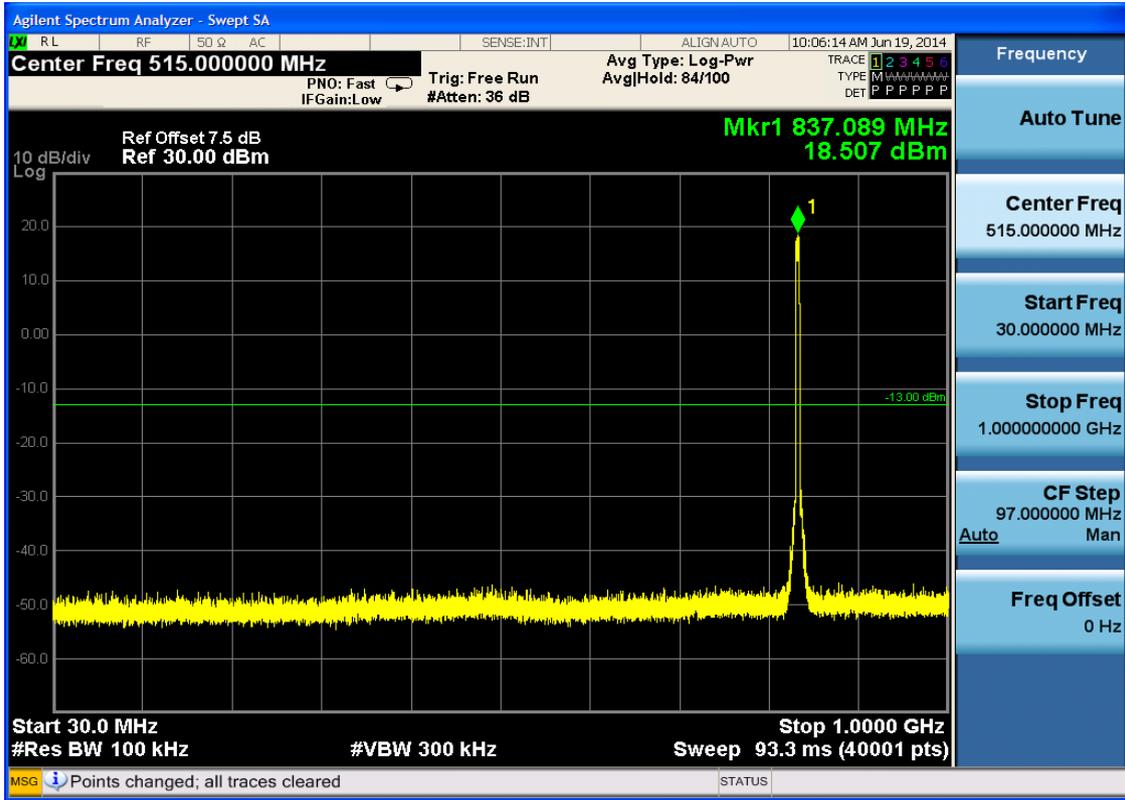


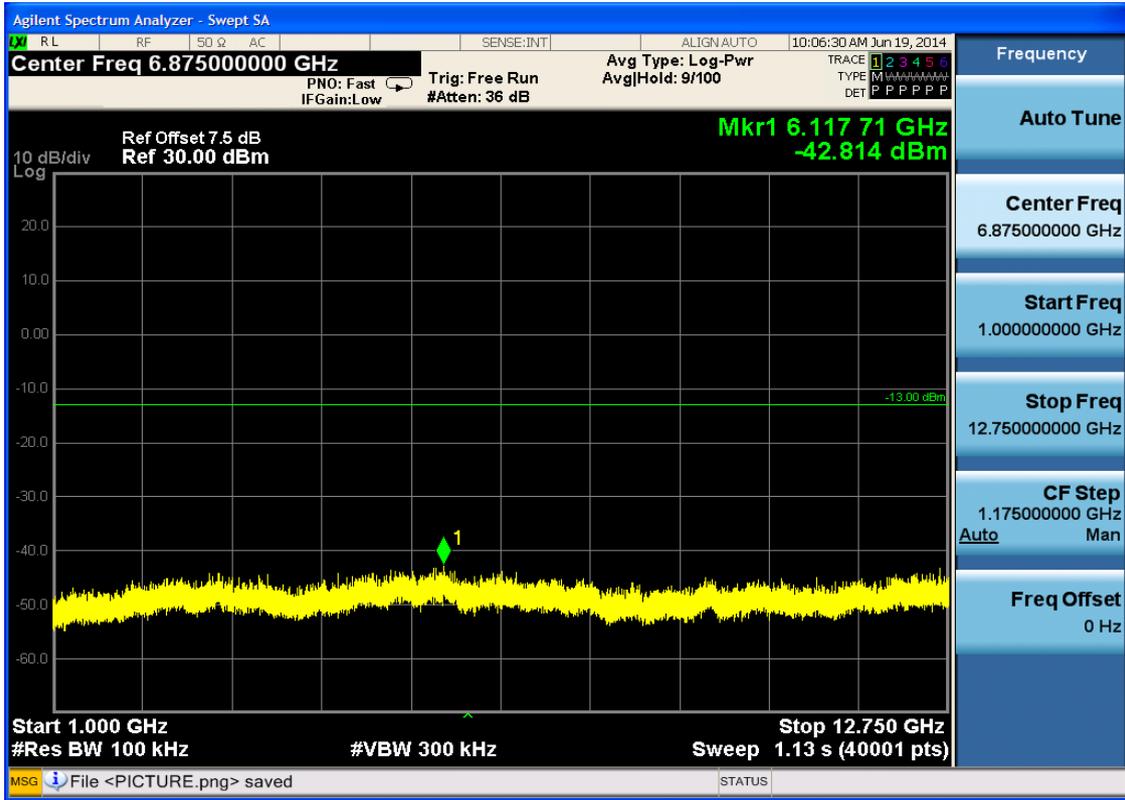


6.2.1.1.2 Test Channel = MCH



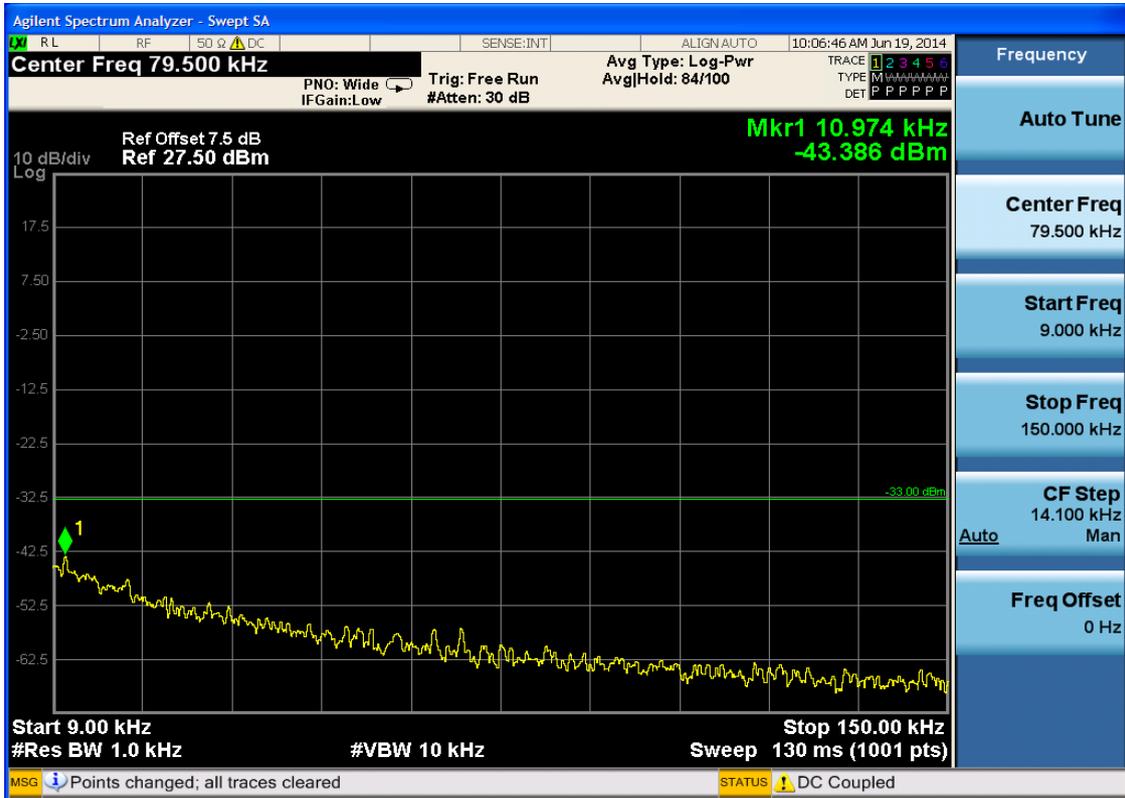


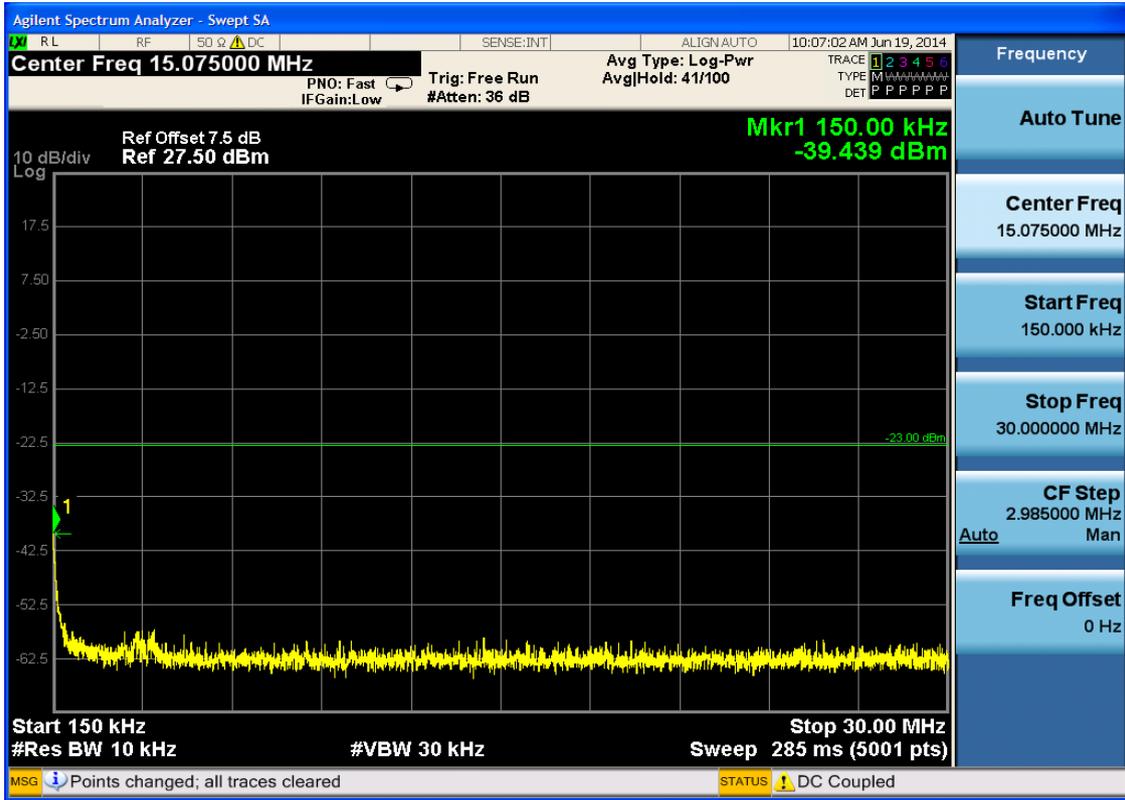


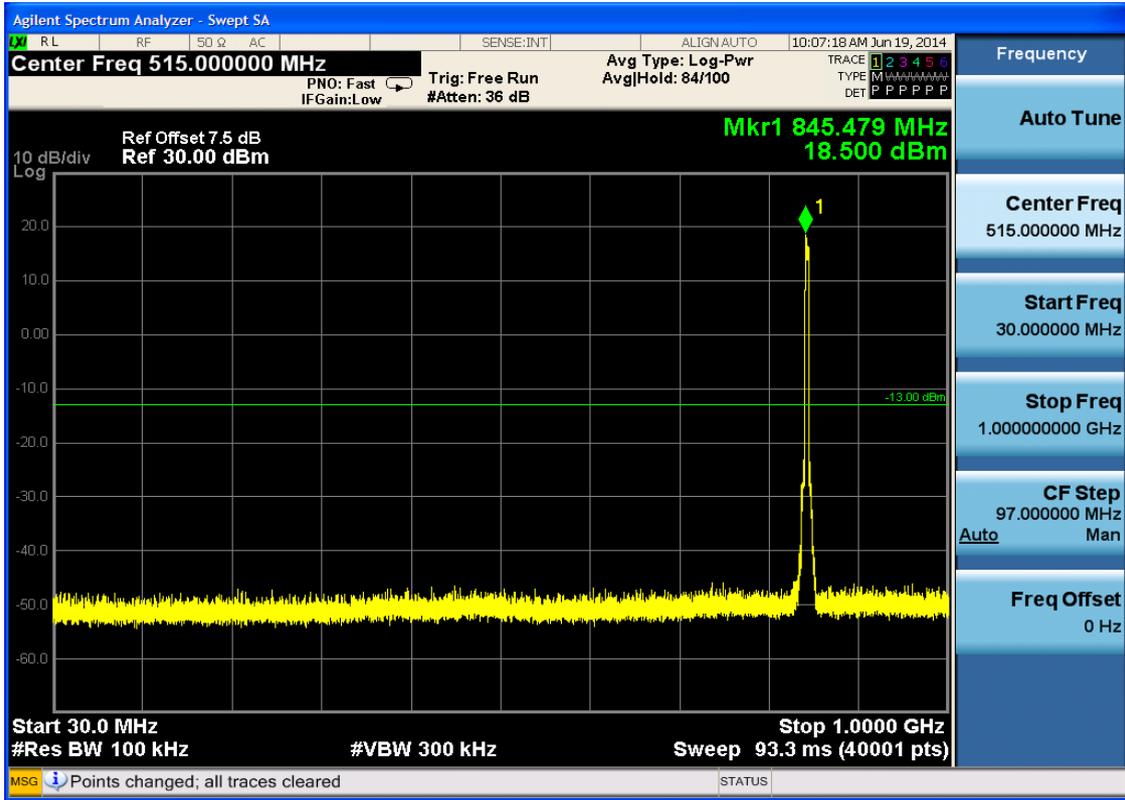


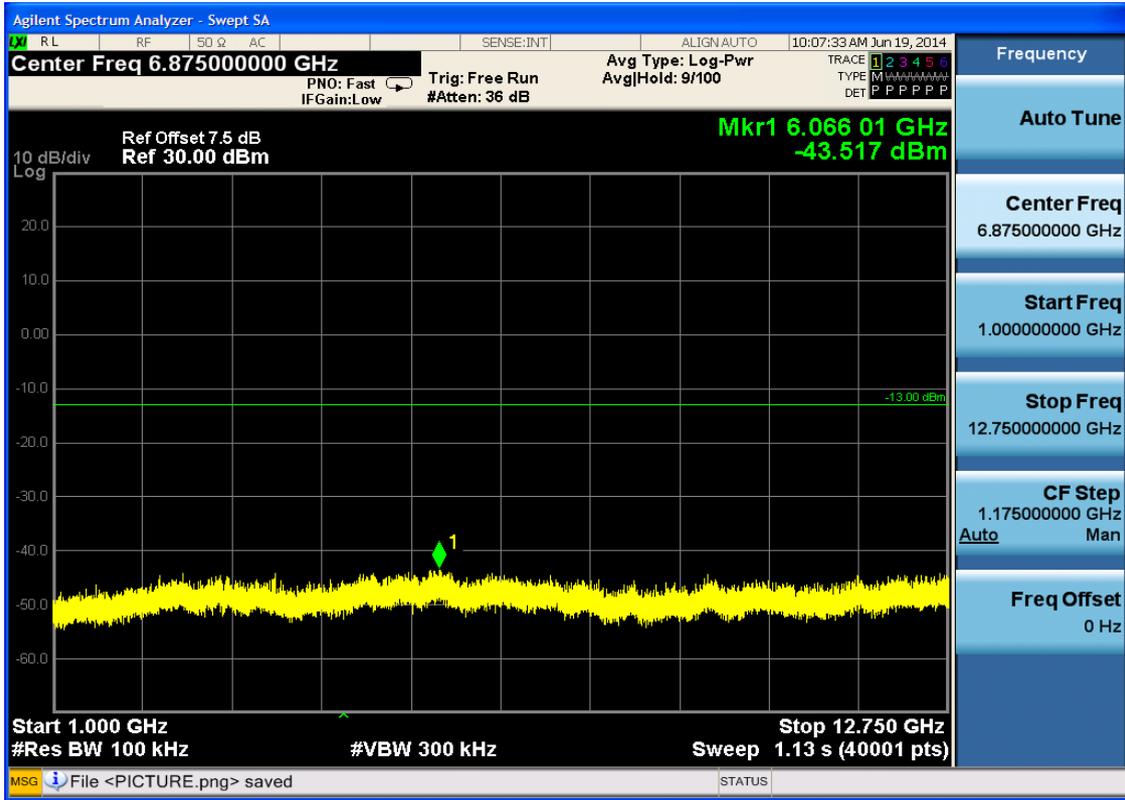


6.2.1.1.3 Test Channel = HCH







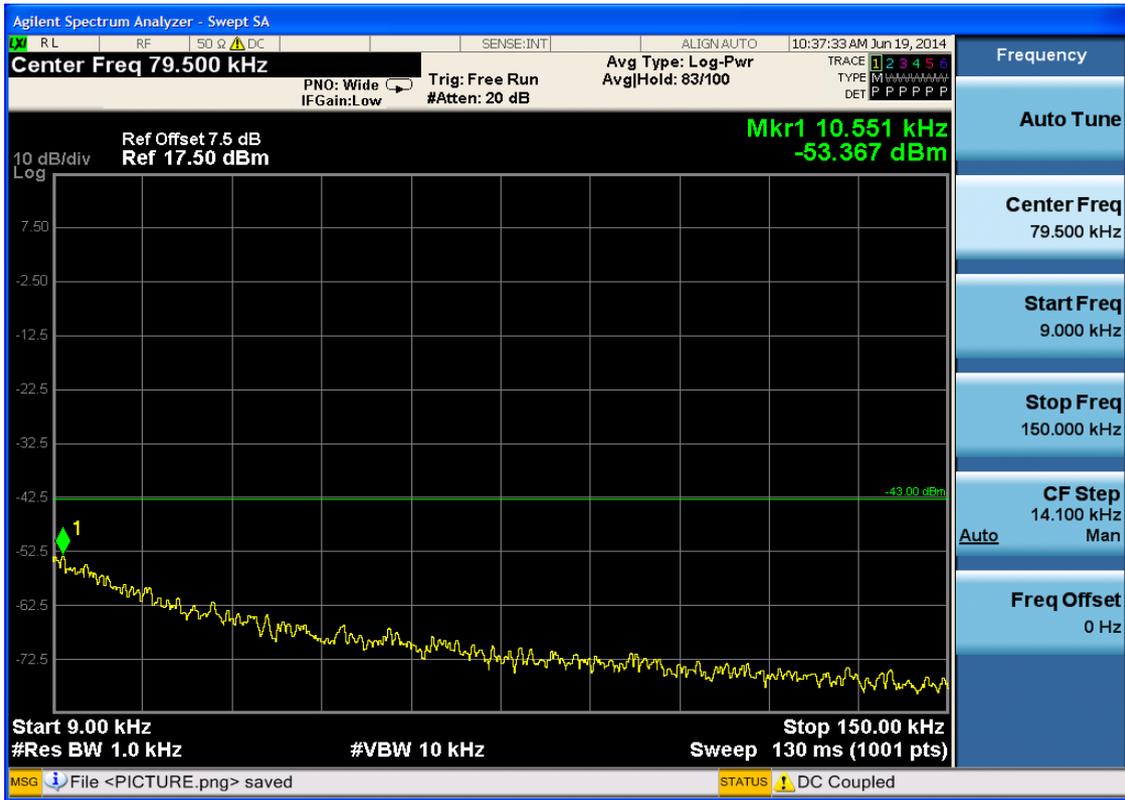


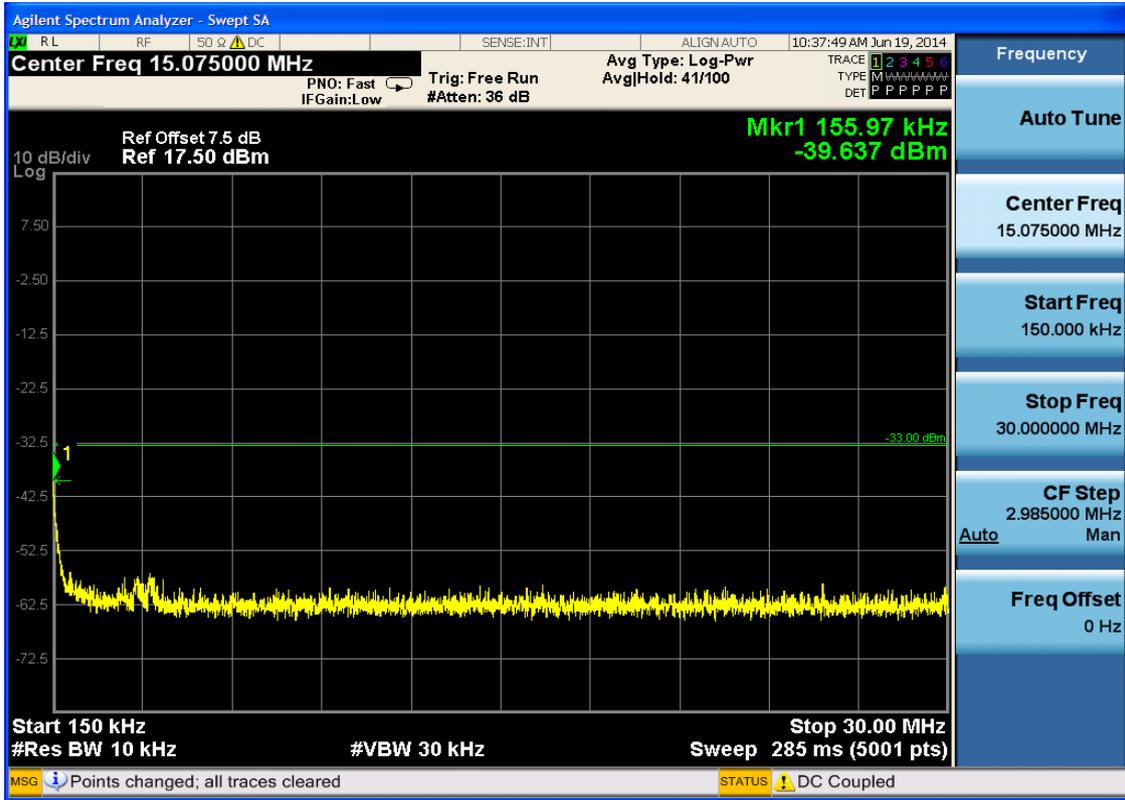


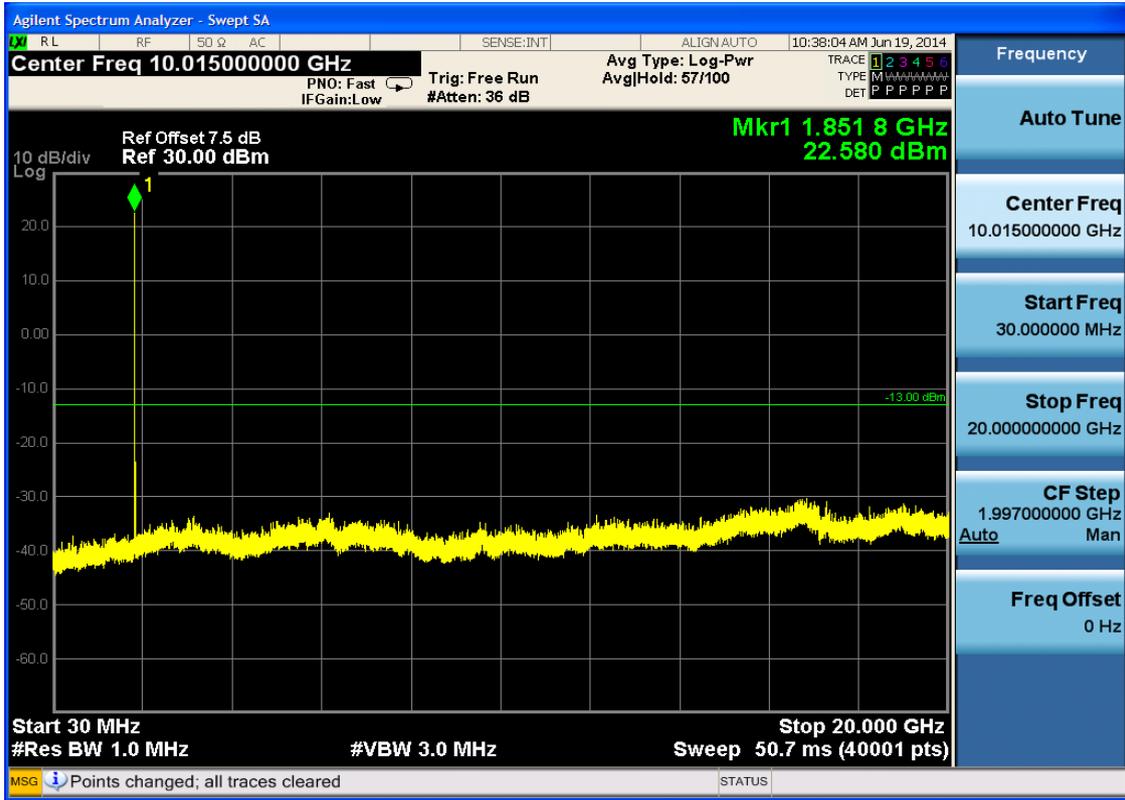
6.2.2 Test Band = WCDMA1900

6.2.2.1 Test Mode = UMTS/TM1

6.2.2.1.1 Test Channel = LCH

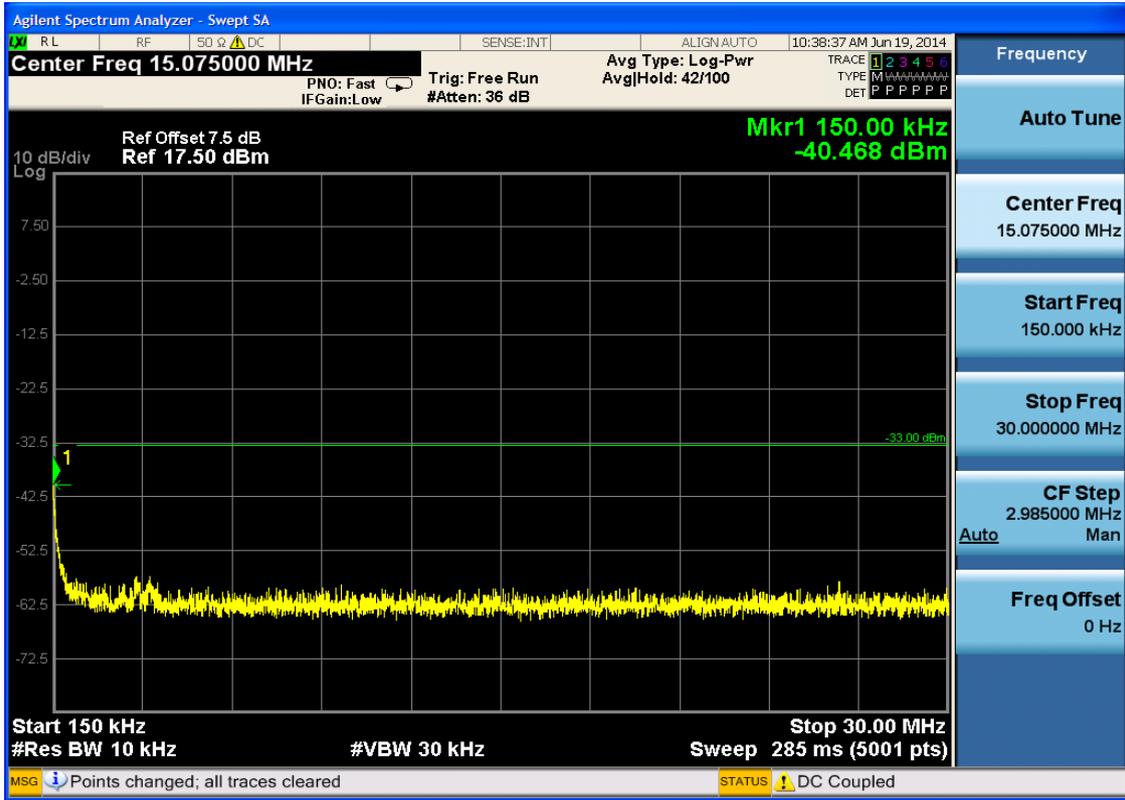






6.2.2.1.2 Test Channel = MCH



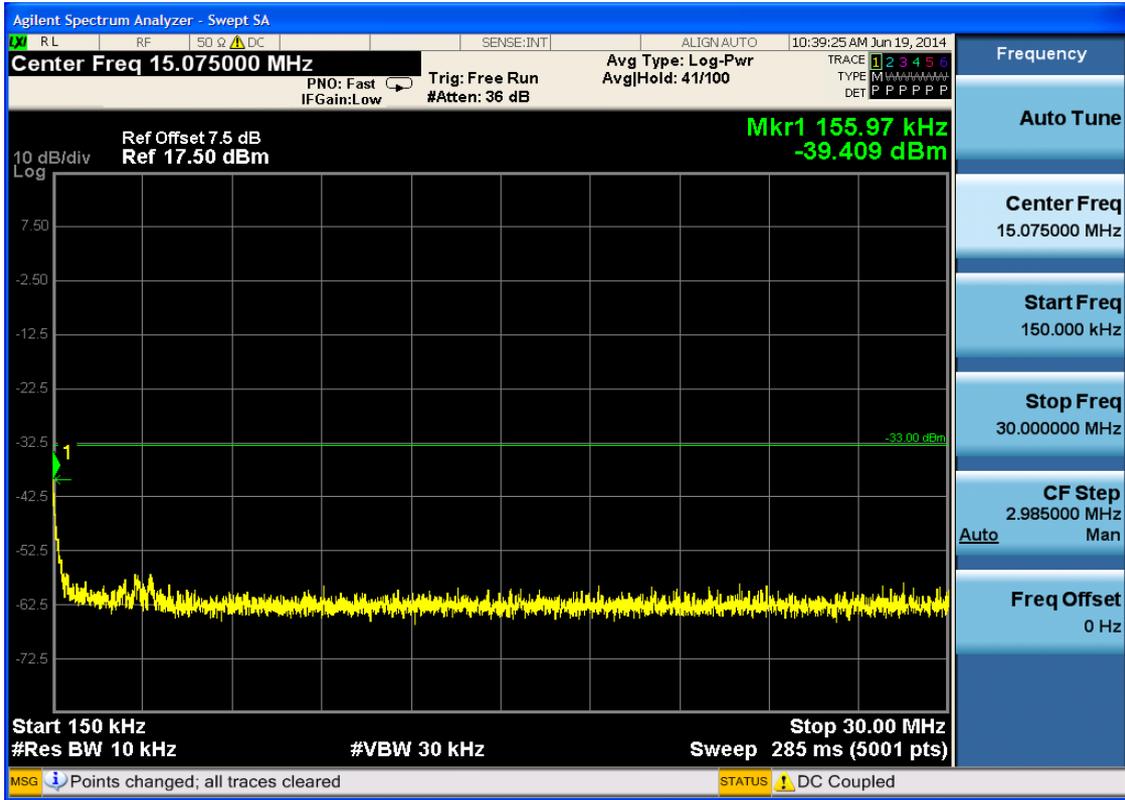


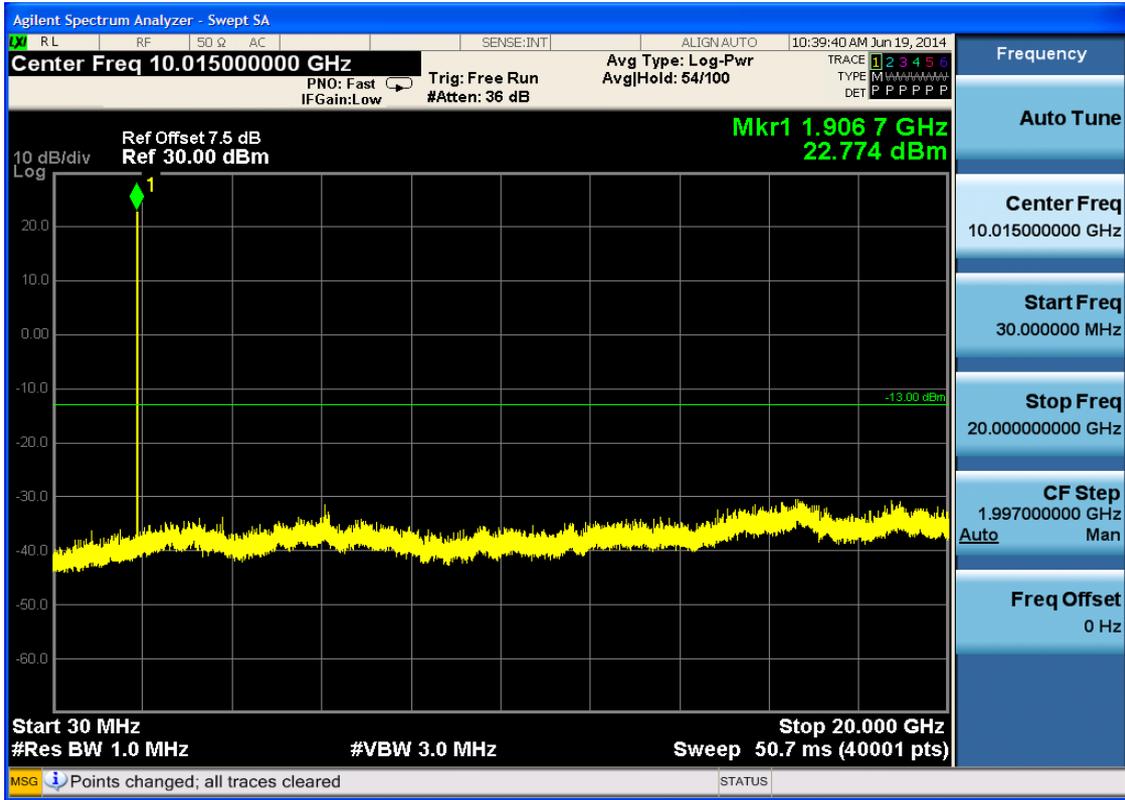




6.2.2.1.3 Test Channel = HCH









7Appendix_G: Field Strength of Spurious Radiation

Note:

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

150kHz~30MHz, VBW = 9kHz, VBW = 30k Hz, Detector: PK

30MHz~1GHz, RBW = 100 kHz, VBW = 300 kHz. Detector: PK

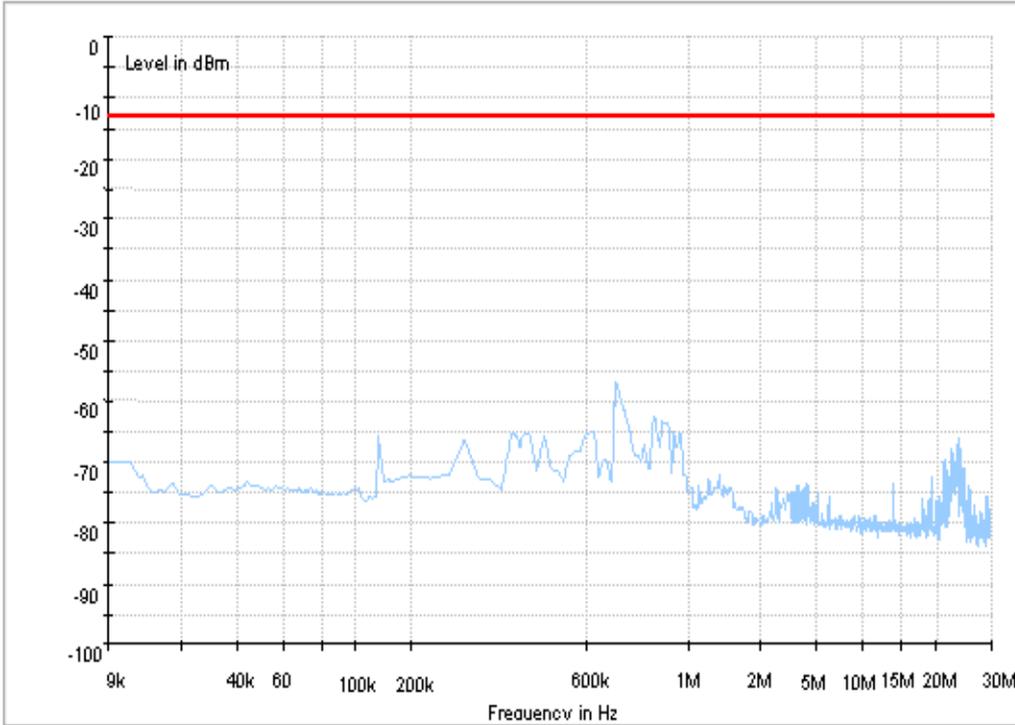
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

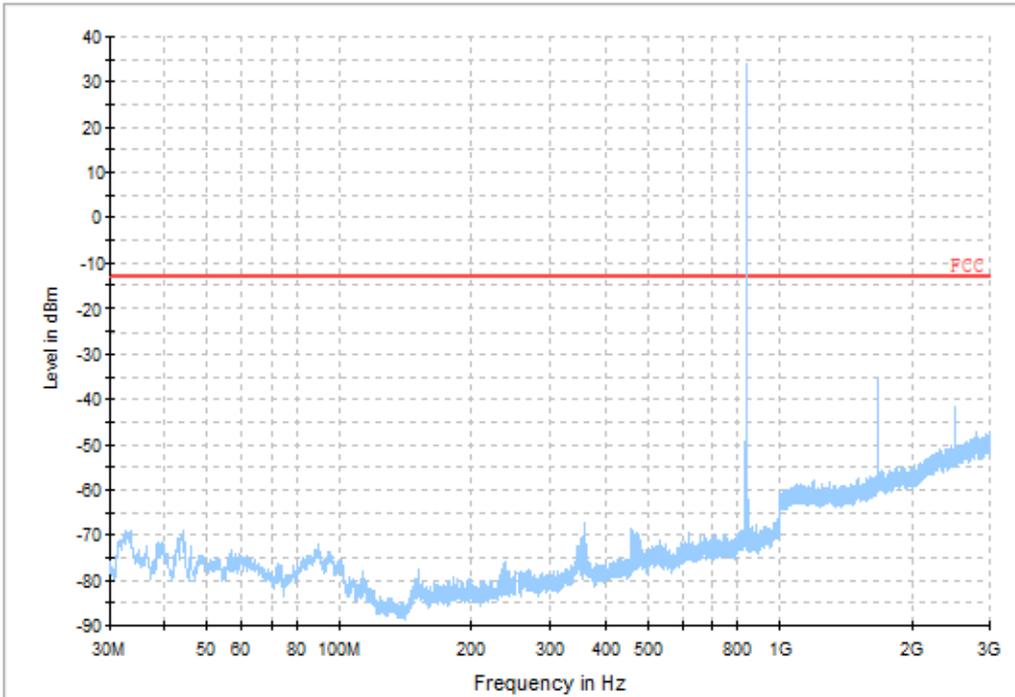
7.1 For GSM

7.1.1 Test Band = GSM850

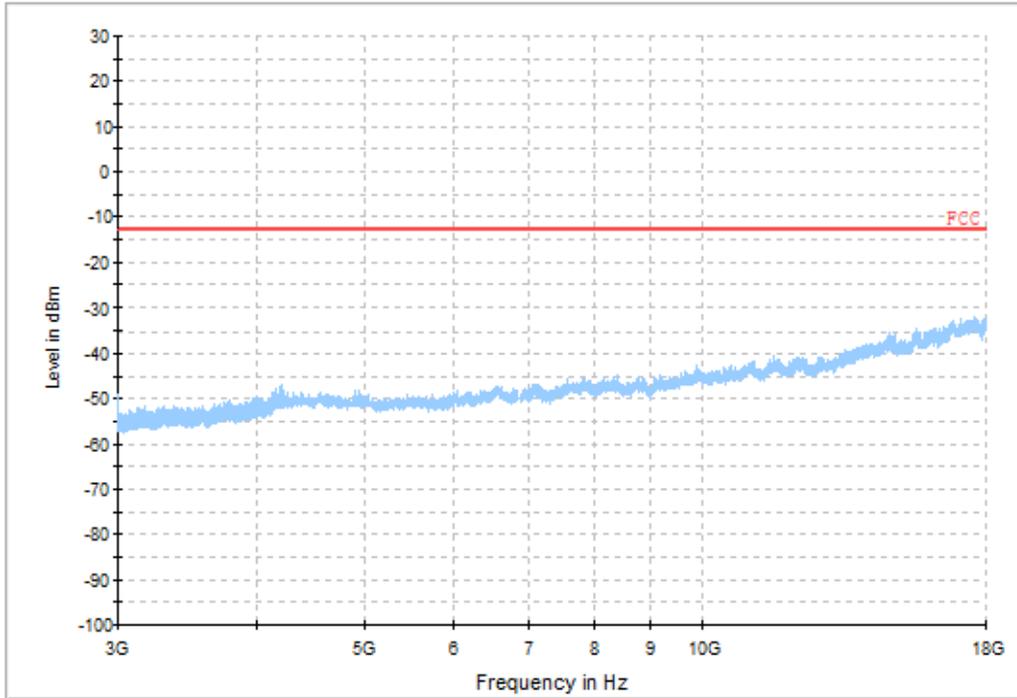
7.1.1.1 Test Mode = GSM/TM1



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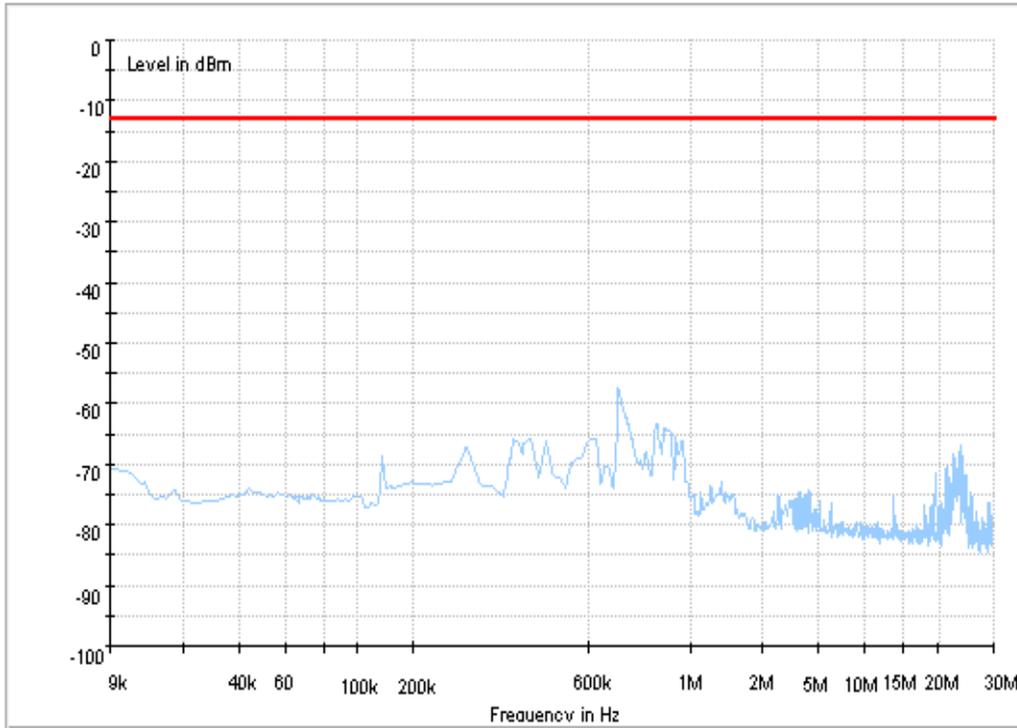


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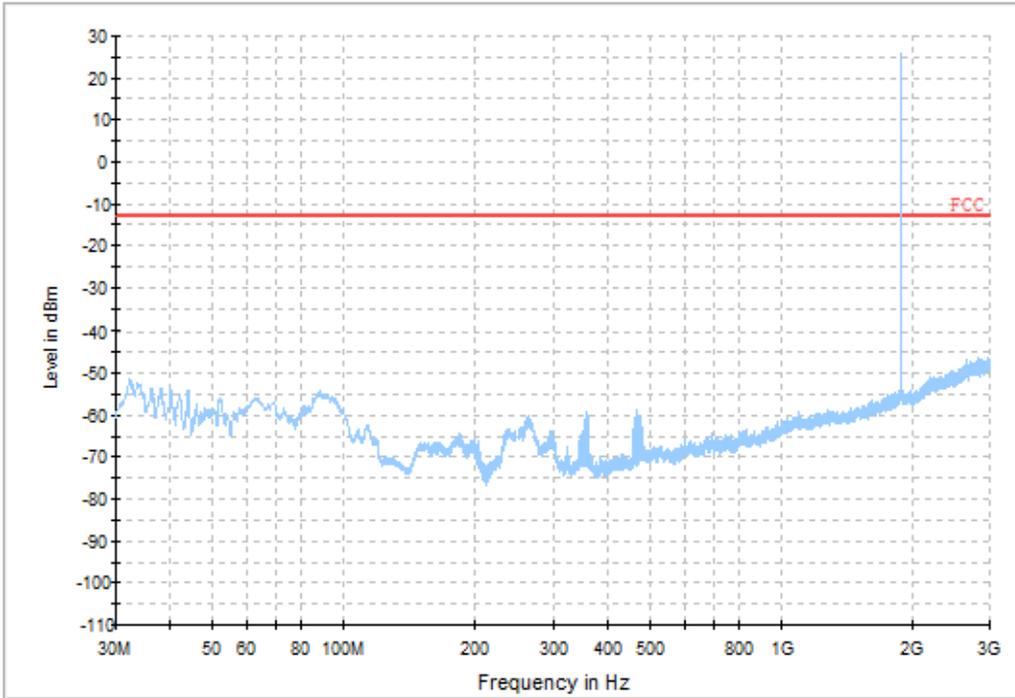


7.1.2 Test Band = GSM1900

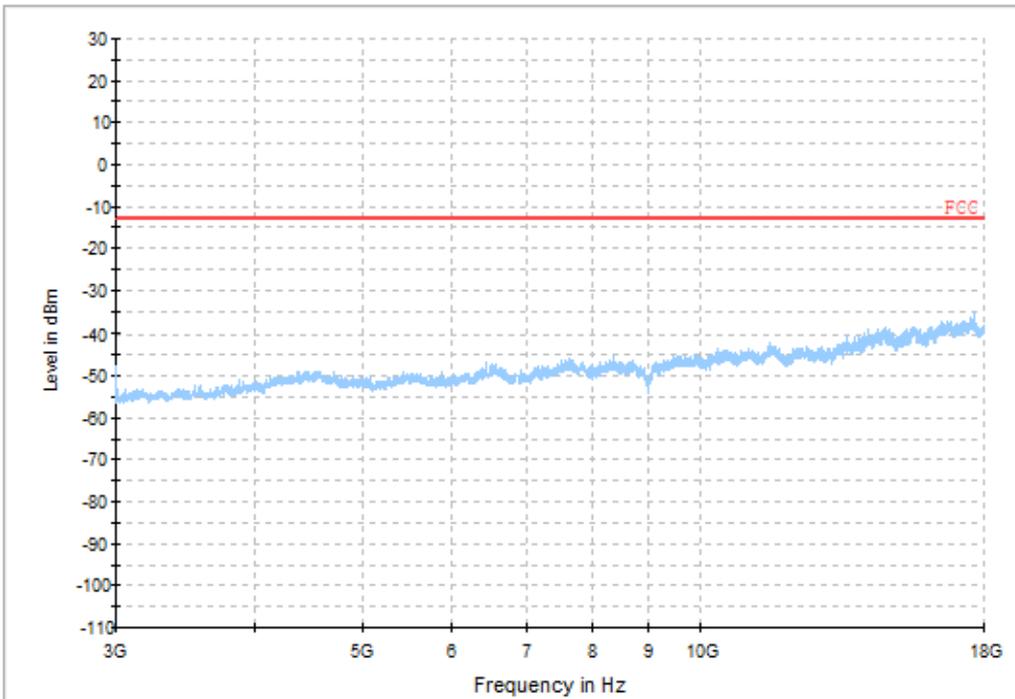
7.1.2.1 Test Mode = GSM/TM1

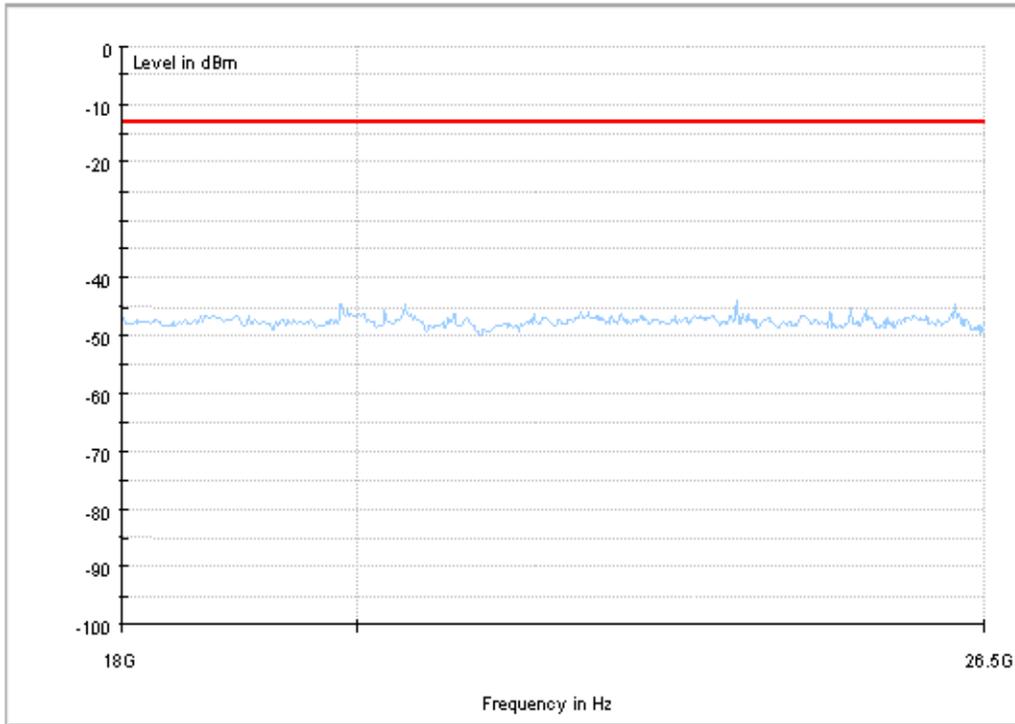


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Copy of FCC PART24 GSM1900_H

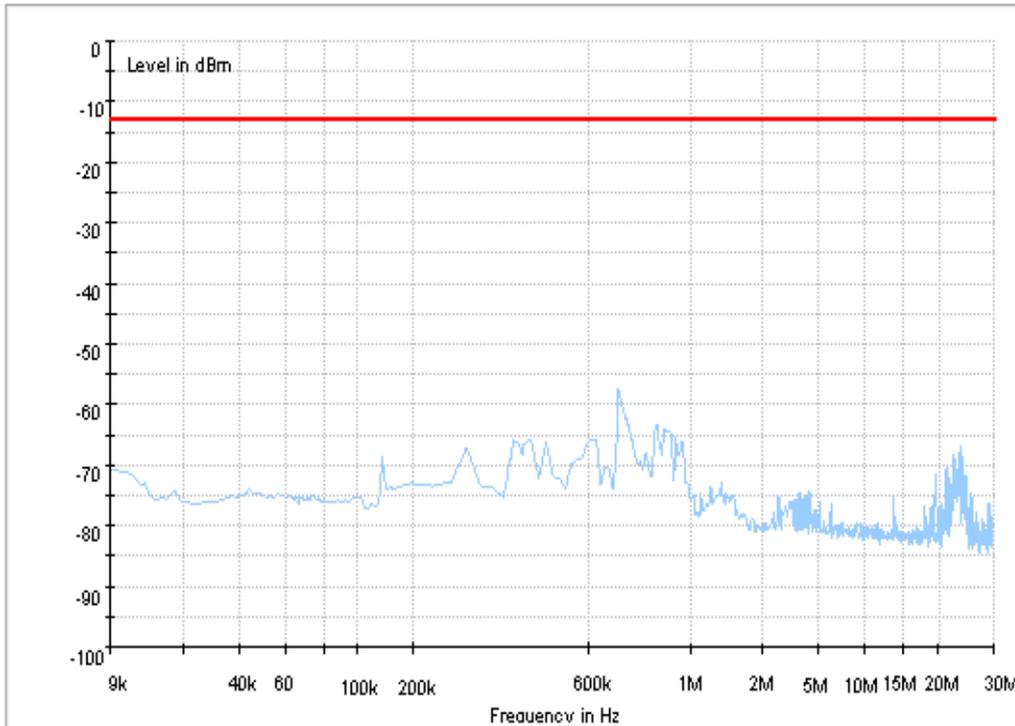




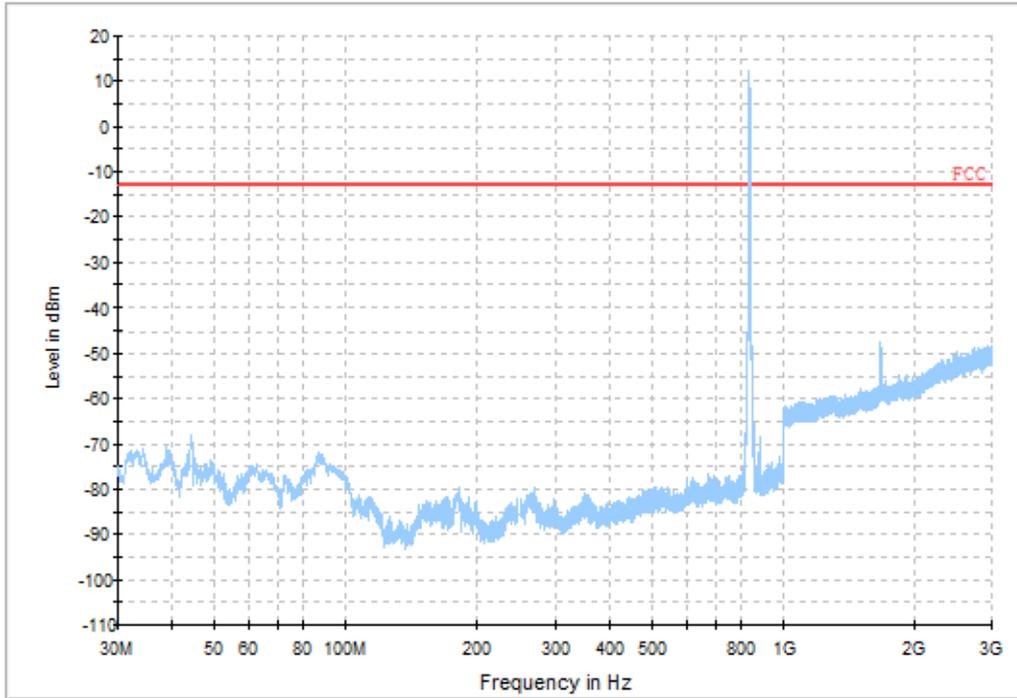
7.2 For UMTS

7.2.1 Test Band = WCDMA850

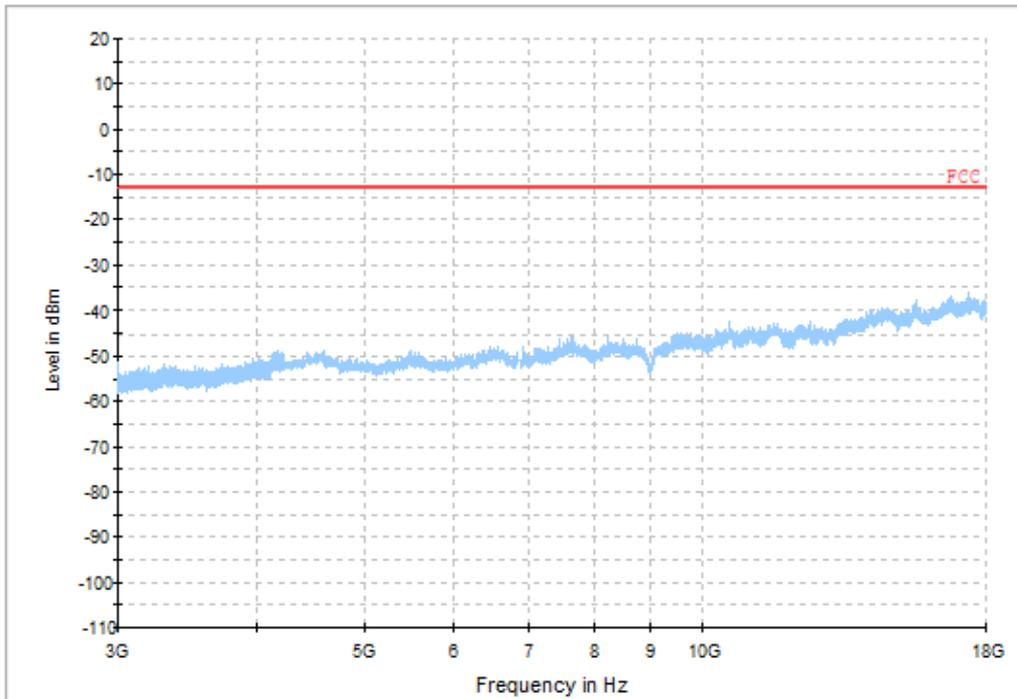
7.2.1.1 Test Mode = UMTS/TM1



Copy of FCC PART22 WCDMA850_L

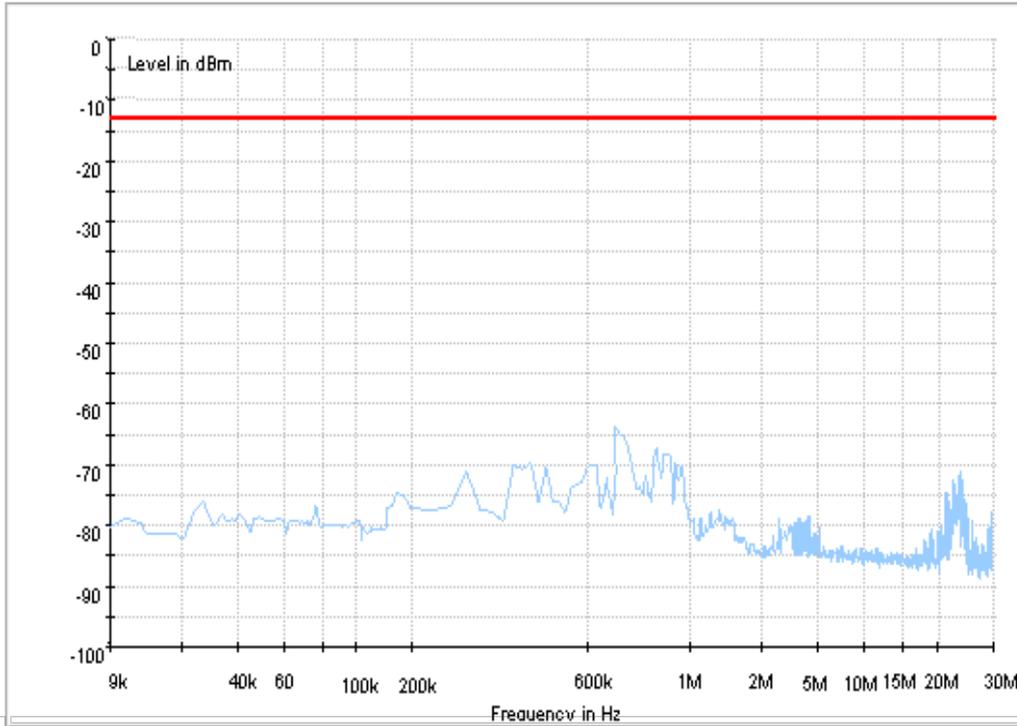


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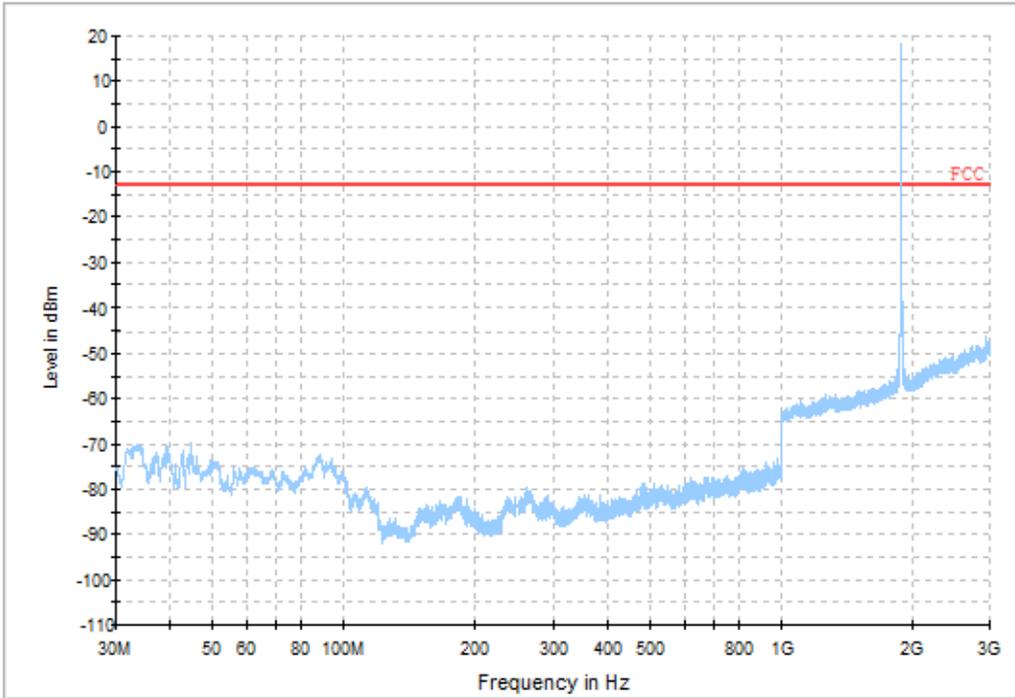


7.2.2 Test Band = WCDMA1900

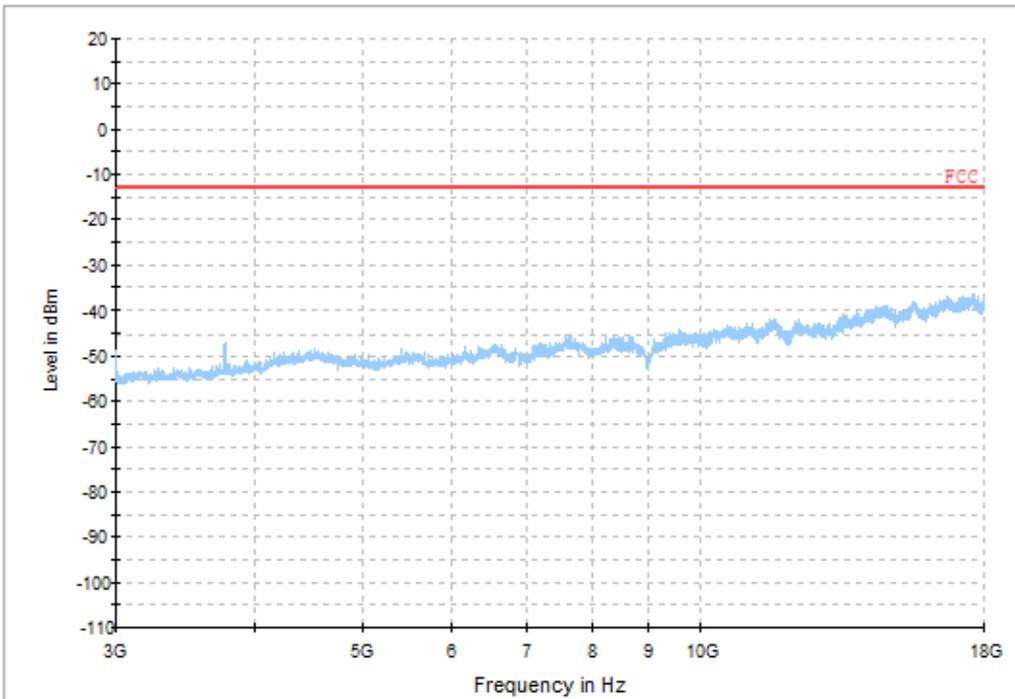
7.2.2.1 Test Mode = UMTS/TM1

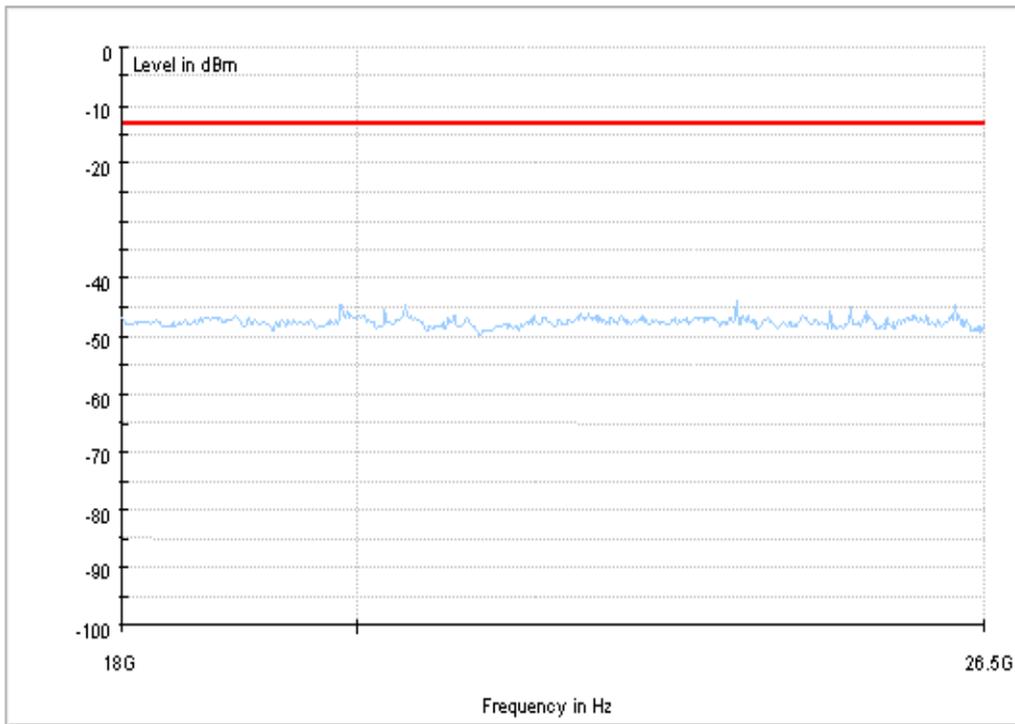


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8Appendix_H: Frequency Stability

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	-4.39	-0.00533	PASS
				VN	4.91	0.00596	PASS
				VH	10.07	0.01222	PASS
		MCH	TN	VL	0.45	0.00054	PASS
				VN	5.42	0.00648	PASS
				VH	2.84	0.00339	PASS
		HCH	TN	VL	1.81	0.00213	PASS
				VN	4.58	0.0054	PASS
				VH	-0.77	-0.00091	PASS
GSM1900	GSM/TM1	LCH	TN	VL	27.77	0.01501	PASS
				VN	25.51	0.01379	PASS
				VH	25.89	0.01399	PASS
		MCH	TN	VL	17.31	0.00921	PASS
				VN	22.66	0.01205	PASS
				VH	32.09	0.01707	PASS
		HCH	TN	VL	19.82	0.01038	PASS
				VN	25.70	0.01346	PASS
				VH	24.34	0.01274	PASS

8.1.2Frequency 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	2.45	0.00297	PASS
				-20	5.17	0.00627	PASS
				-10	0.77	0.00093	PASS
				0	-1.81	-0.0022	PASS
				10	6.97	0.00846	PASS
				20	-1.81	-0.0022	PASS
				30	-4.84	-0.00587	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				40	4.20	0.0051	PASS
				50	1.55	0.00188	PASS
		MCH	VN	-30	9.43	0.01127	PASS
				-20	8.46	0.01011	PASS
				-10	-2.65	-0.00317	PASS
				0	5.29	0.00632	PASS
				10	4.39	0.00525	PASS
				20	3.62	0.00433	PASS
				30	5.49	0.00656	PASS
				40	3.10	0.00371	PASS
				50	5.42	0.00648	PASS
				HCH	VN	-30	4.13
		-20	7.23			0.00852	PASS
		-10	-0.52			-0.00061	PASS
		0	6.33			0.00746	PASS
		10	-1.23			-0.00145	PASS
		20	-1.55			-0.00183	PASS
		30	5.81			0.00684	PASS
		40	-3.36			-0.00396	PASS
		50	10.01	0.01179	PASS		
GSM1900	GSM/TM1	LCH	VN	-30	17.31	0.00936	PASS
				-20	18.40	0.00994	PASS
				-10	23.31	0.0126	PASS
				0	8.91	0.00482	PASS
				10	10.01	0.00541	PASS
				20	13.62	0.00736	PASS
				30	19.69	0.01064	PASS
				40	22.34	0.01207	PASS
				50	6.59	0.00356	PASS
		MCH	VN	-30	19.57	0.01041	PASS
				-20	18.73	0.00996	PASS
				-10	3.29	0.00175	PASS
				0	7.88	0.00419	PASS
				10	29.12	0.01549	PASS
				20	8.27	0.0044	PASS
				30	27.38	0.01456	PASS
		40	15.82	0.00841	PASS		
		50	16.59	0.00882	PASS		
		HCH	VN	-30	14.72	0.00771	PASS
				-20	12.59	0.00659	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-10	19.69	0.01031	PASS
				0	17.37	0.0091	PASS
				10	20.73	0.01085	PASS
				20	20.34	0.01065	PASS
				30	18.40	0.00963	PASS
				40	22.60	0.01183	PASS
				50	23.96	0.01255	PASS

8.2 For UMTS

8.2.1 Frequency Error vs. Voltage:

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA850	UMTS/TM1	LCH	TN	VL	1.83	0.00221	PASS
				VN	0.61	0.00074	PASS
				VH	-2.15	-0.0026	PASS
		MCH	TN	VL	0.20	0.00024	PASS
				VN	0.37	0.00044	PASS
				VH	4.56	0.00545	PASS
		HCH	TN	VL	3.52	0.00416	PASS
				VN	2.90	0.00343	PASS
				VH	1.34	0.00158	PASS
WCDMA1900	UMTS/TM1	LCH	TN	VL	7.40	0.00399	PASS
				VN	6.61	0.00357	PASS
				VH	6.71	0.00362	PASS
		MCH	TN	VL	4.32	0.0023	PASS
				VN	5.31	0.00282	PASS
				VH	7.52	0.004	PASS
		HCH	TN	VL	11.28	0.00591	PASS
				VN	7.02	0.00368	PASS
				VH	6.20	0.00325	PASS

8.2.2 Frequency Error vs. Temperature:

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA850	UMTS/TM1	LCH	VN	-30	0.06	0.00007	PASS
				-20	0.58	0.0007	PASS
				-10	0.02	0.00002	PASS
				0	-0.34	-0.00041	PASS
				10	0.41	0.0005	PASS
				20	1.45	0.00175	PASS
				30	0.44	0.00053	PASS
				40	-1.01	-0.00122	PASS
				50	1.48	0.00179	PASS
		MCH	VN	-30	1.86	0.00222	PASS
		-20	2.14	0.00256	PASS		



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict				
				-10	2.56	0.00306	PASS				
				0	1.33	0.00159	PASS				
				10	1.92	0.0023	PASS				
				20	-2.17	-0.00259	PASS				
				30	-0.85	-0.00102	PASS				
				40	2.21	0.00264	PASS				
				50	1.91	0.00228	PASS				
		HCH	VN	-30	0.75	0.00089	PASS				
				-20	3.04	0.00359	PASS				
				-10	-0.92	-0.00109	PASS				
				0	2.33	0.00275	PASS				
				10	3.04	0.00359	PASS				
				20	4.04	0.00477	PASS				
				30	1.75	0.00207	PASS				
				40	1.16	0.00137	PASS				
				50	6.77	0.008	PASS				
				WCDMA1900	UMTS/TM1	LCH	VN	-30	11.08	0.00598	PASS
								-20	6.27	0.00338	PASS
-10	5.92	0.0032	PASS								
0	8.71	0.0047	PASS								
10	-1.25	-0.00067	PASS								
20	2.15	0.00116	PASS								
30	5.77	0.00311	PASS								
40	9.08	0.0049	PASS								
50	10.15	0.00548	PASS								
MCH	VN	-30	3.54			0.00188	PASS				
		-20	5.92			0.00315	PASS				
		-10	1.83			0.00097	PASS				
		0	2.43			0.00129	PASS				
		10	2.44			0.0013	PASS				
		20	6.90			0.00367	PASS				
		30	6.59			0.00351	PASS				
		40	9.02			0.0048	PASS				
		50	4.17			0.00222	PASS				
HCH	VN	-30	6.29			0.0033	PASS				
		-20	7.26			0.00381	PASS				
		-10	7.13			0.00374	PASS				
		0	4.91			0.00257	PASS				
		10	4.71			0.00247	PASS				
		20	7.55			0.00396	PASS				



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	6.90	0.00362	PASS
				40	11.96	0.00627	PASS
				50	8.06	0.00423	PASS

END