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	32.03	31.96	38.5	PASS
		MCH	32.25	32.18	38.5	PASS
		HCH	32.18	32.11	38.5	PASS
	GSM/TM2	LCH	25.78	25.71	38.5	PASS
		MCH	25.9	25.83	38.5	PASS
		HCH	25.88	25.81	38.5	PASS
WCDMA850	UMTS/TM1	LCH	22.43	22.36	38.5	PASS
		MCH	22.55	22.48	38.5	PASS
		HCH	22.43	22.36	38.5	PASS
Test Band	**Test Mode**	**Test Channel**	**Conducted Power [dBm]**	**EIRP[dBm]**	**Limit [dBm]**	**Verdict**
GSM1900	GSM/TM1	LCH	29.36	32.88	33	PASS
		MCH	29.01	32.53	33	PASS
		HCH	29	32.52	33	PASS
	GSM/TM2	LCH	24.79	28.31	33	PASS
		MCH	24.66	28.18	33	PASS
		HCH	24.54	28.06	33	PASS
WCDMA1900	UMTS/TM1	LCH	22.86	26.38	33	PASS
		MCH	22.24	25.76	33	PASS
		HCH	22.64	26.16	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,

ERP [dBm] = SGP [dBm] - Cable Loss [dB] + Gain [dBd]

EIRP [dBm] = SGP [dBm] - Cable Loss [dB] + 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	0.14	13	PASS
		MCH	0.15	13	PASS
		HCH	0.13	13	PASS
	GSM/TM2	LCH	3.09	13	PASS
		MCH	3.13	13	PASS
		HCH	3.18	13	PASS
Test Band	**Test Mode**	**Test Channel**	**Measured[dB]**	**Limit [dB]**	**Verdict**
WCDMA1900	UMTS/TM1	LCH	2.59	13	PASS
		MCH	2.97	13	PASS
		HCH	2.8	13	PASS

3Appendix_C: Modulation Characteristics

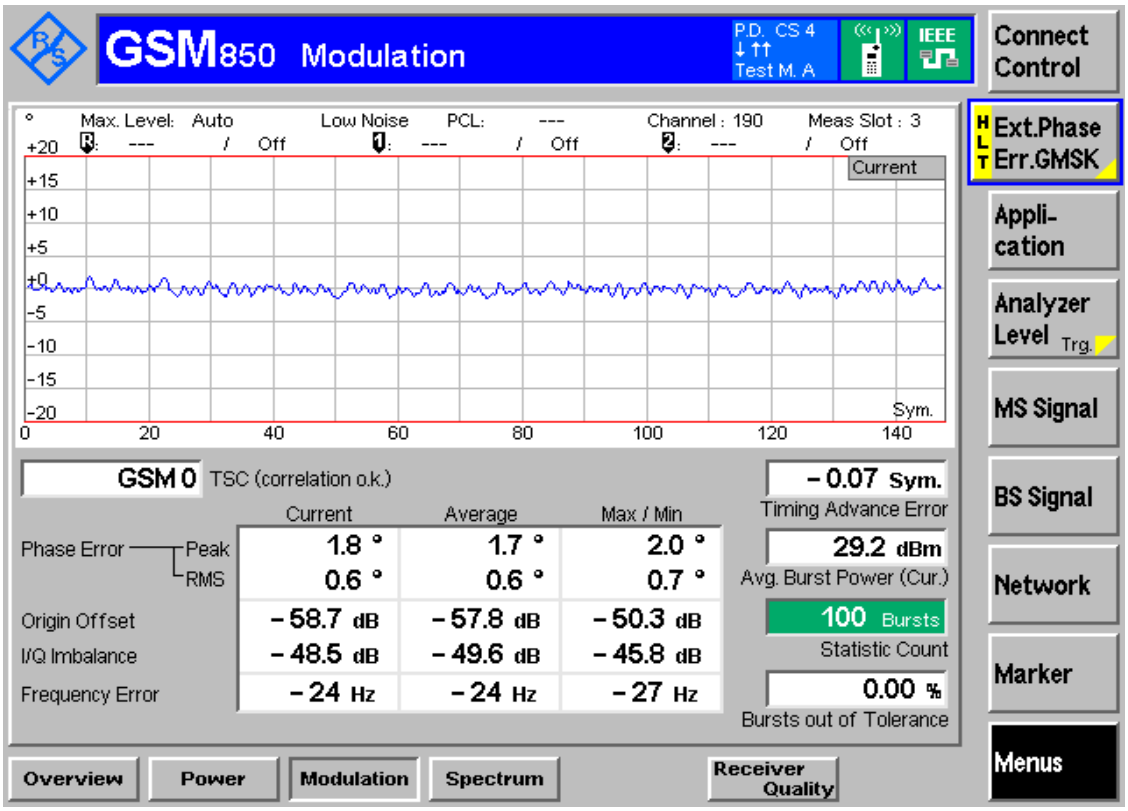
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

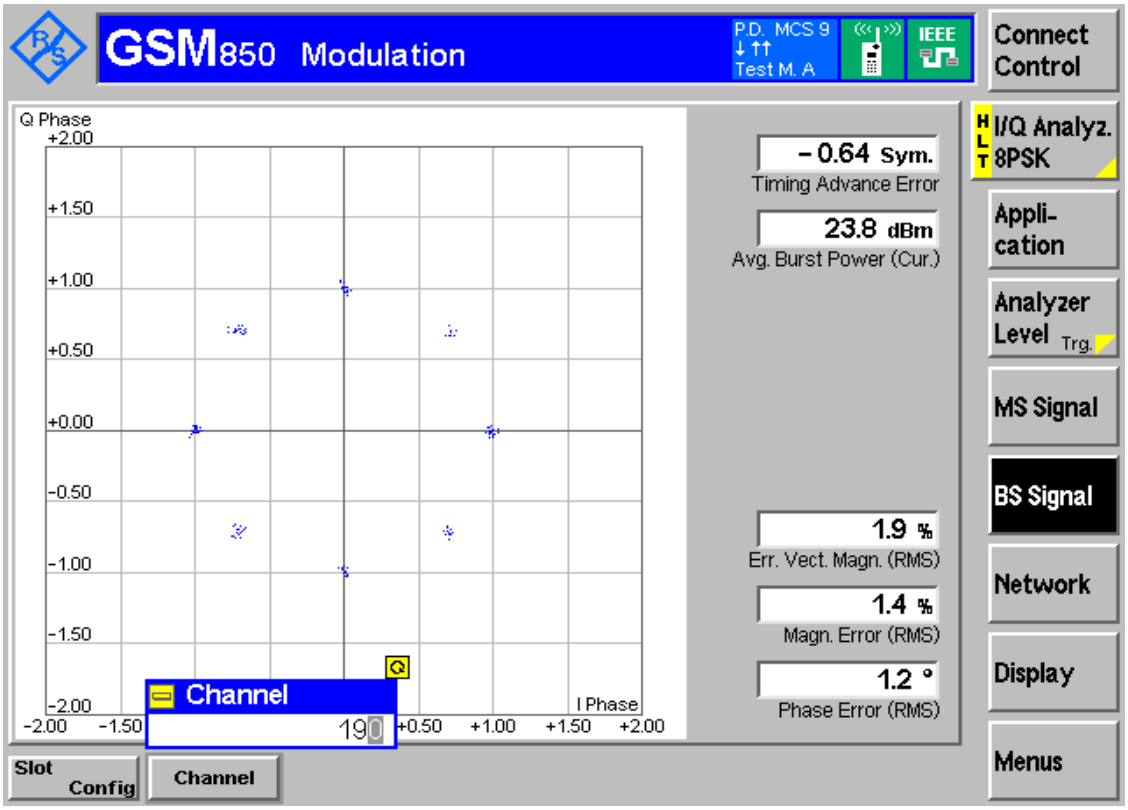
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

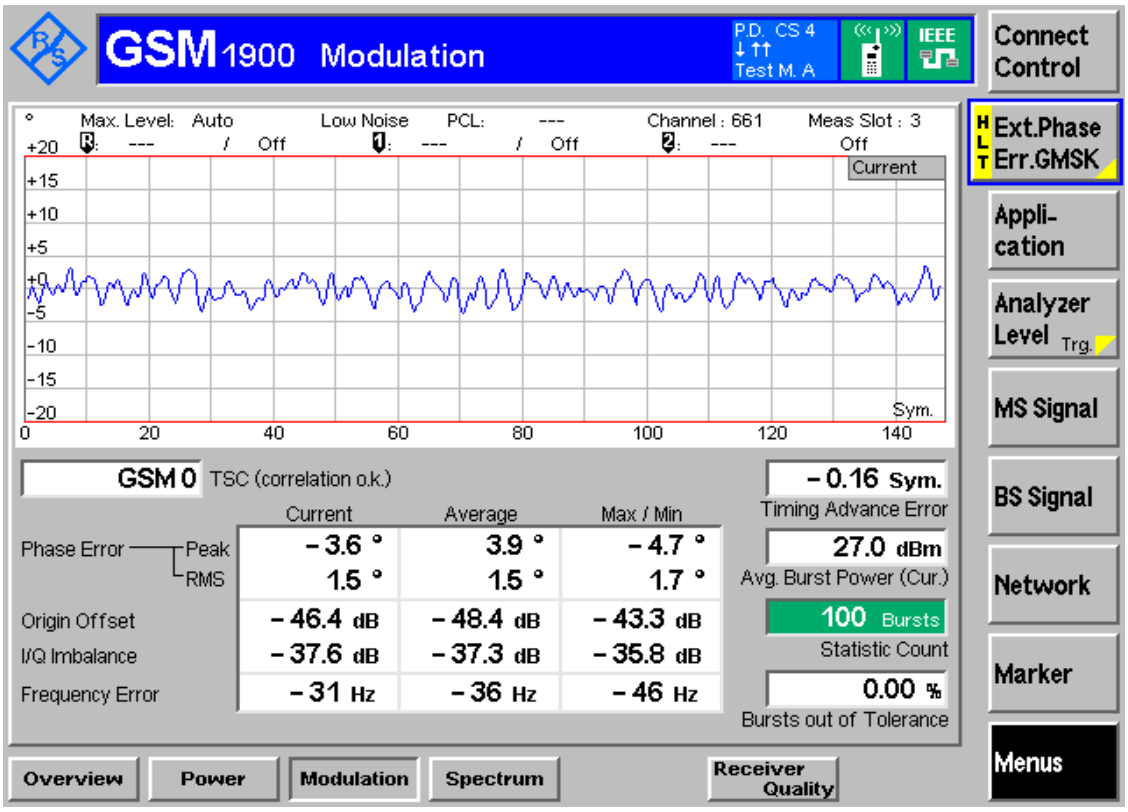
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

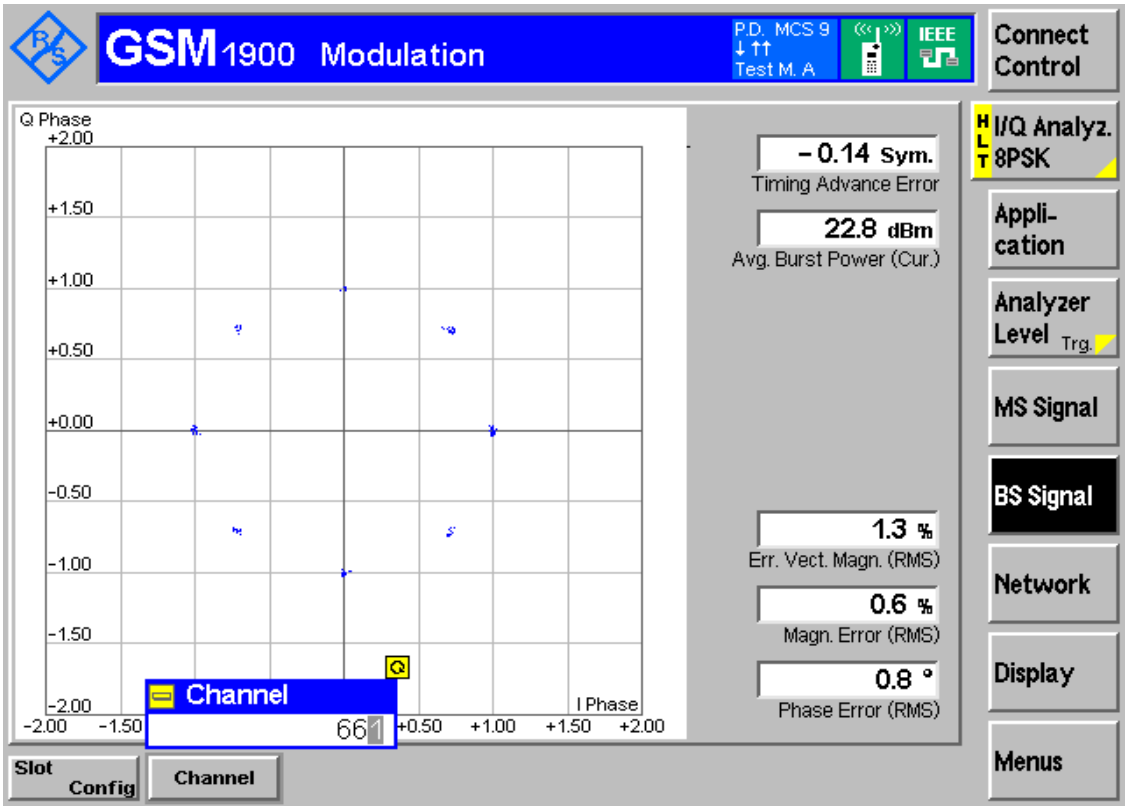
3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH



3.1.2.2 Test Mode = GSM/TM2

3.1.2.2.1 Test Channel = MCH

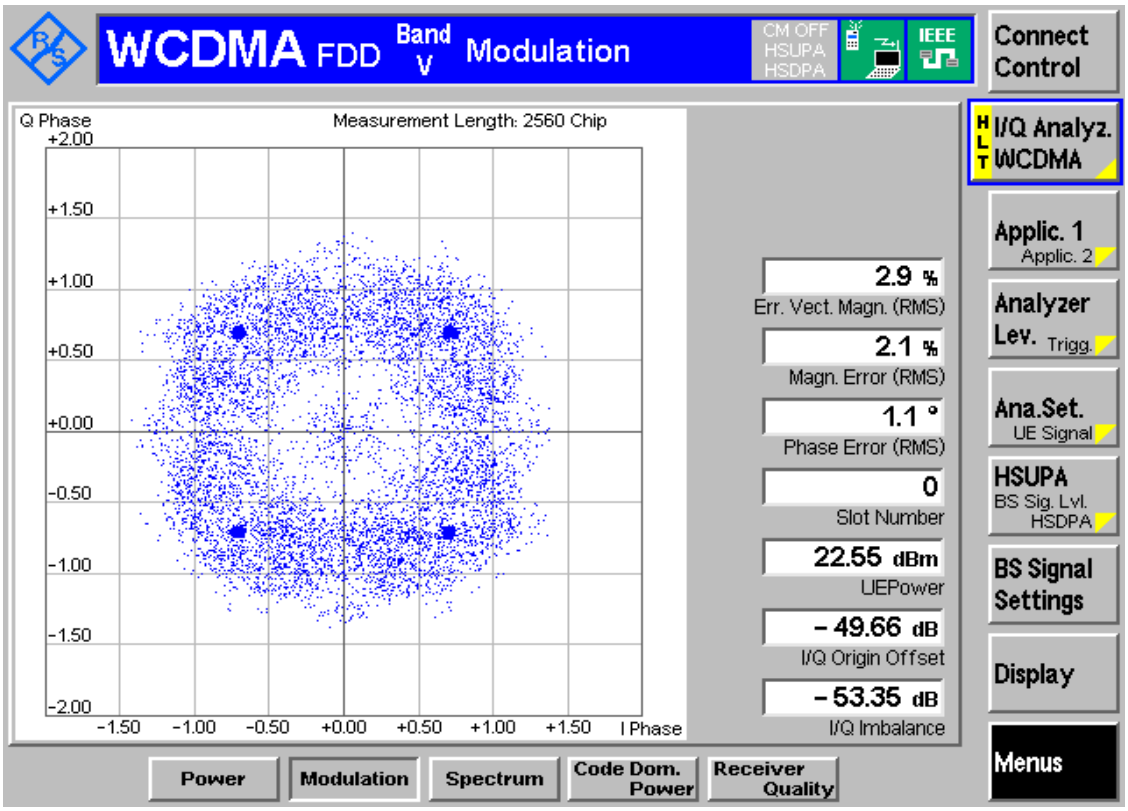


3.2 For UMTS

3.2.1 Test Band = WCDMA850

3.2.1.1 Test Mode = UMTS/TM1

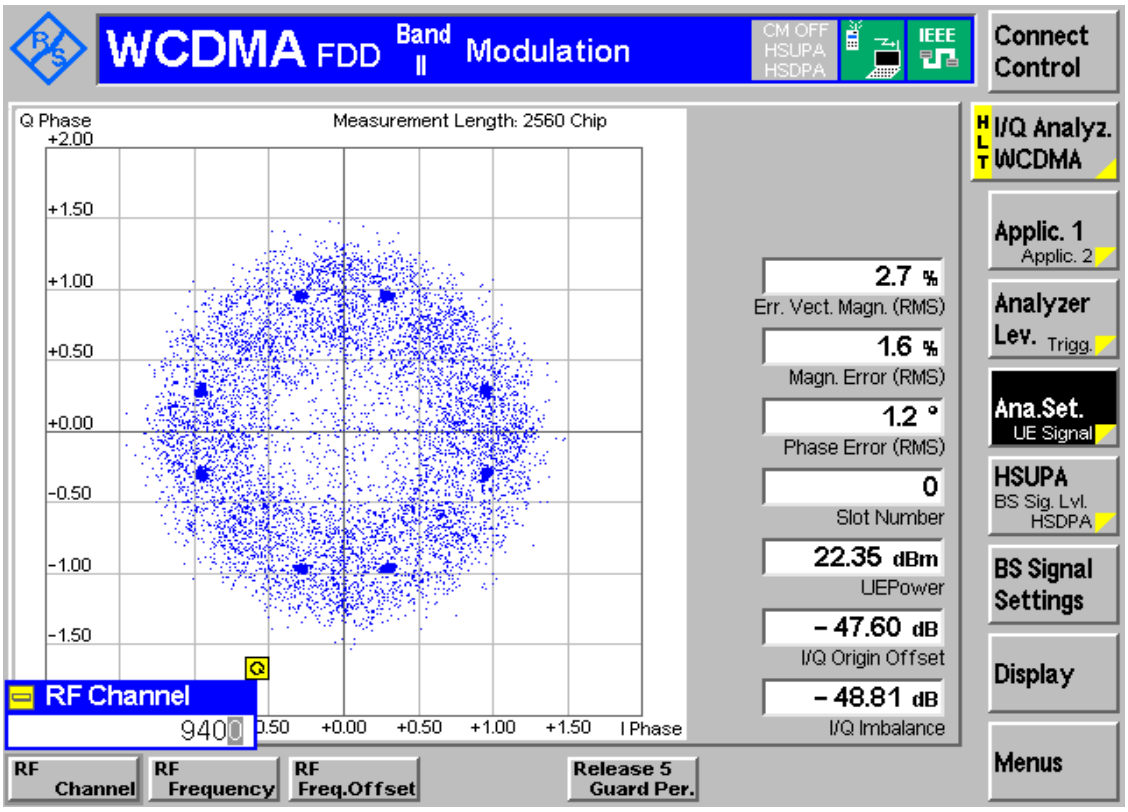
3.2.1.1.1 Test Channel = MCH



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	245.26	314.67	Pass
		MCH	243.35	312.16	Pass
		HCH	241.35	310.82	Pass
	GSM/TM2	LCH	237.09	306.40	Pass
		MCH	238.43	286.12	Pass
		HCH	237.07	299.05	Pass
GSM1900	GSM/TM1	LCH	242.30	313.47	Pass
		MCH	244.72	311.74	Pass
		HCH	244.93	317.22	Pass
	GSM/TM2	LCH	245.91	306.42	Pass
		MCH	247.20	320.91	Pass
		HCH	247.00	314.63	Pass

Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA850	UMTS/TM1	LCH	4.16	4.72	Pass
		MCH	4.16	4.73	Pass
		HCH	4.17	4.74	Pass
WCDMA1900	UMTS/TM1	LCH	4.16	4.75	Pass
		MCH	4.16	4.72	Pass
		HCH	4.17	4.72	Pass

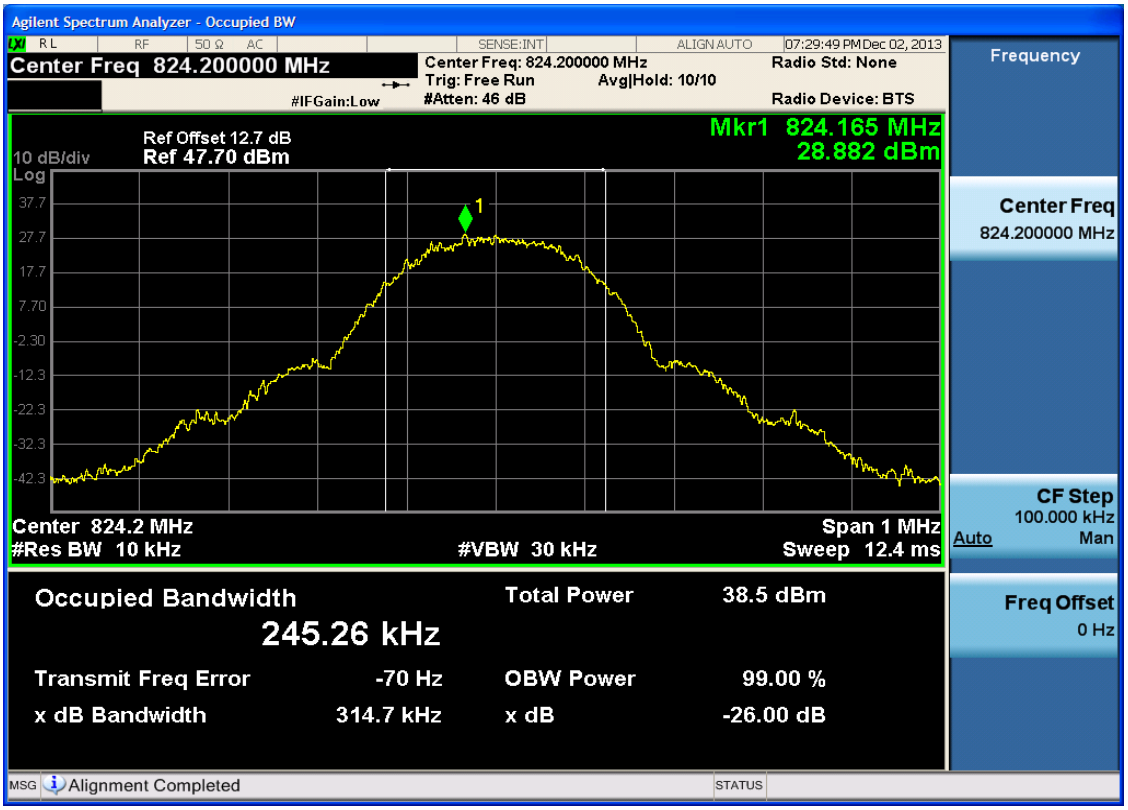
Part II - Test Plots

4.1 For GSM

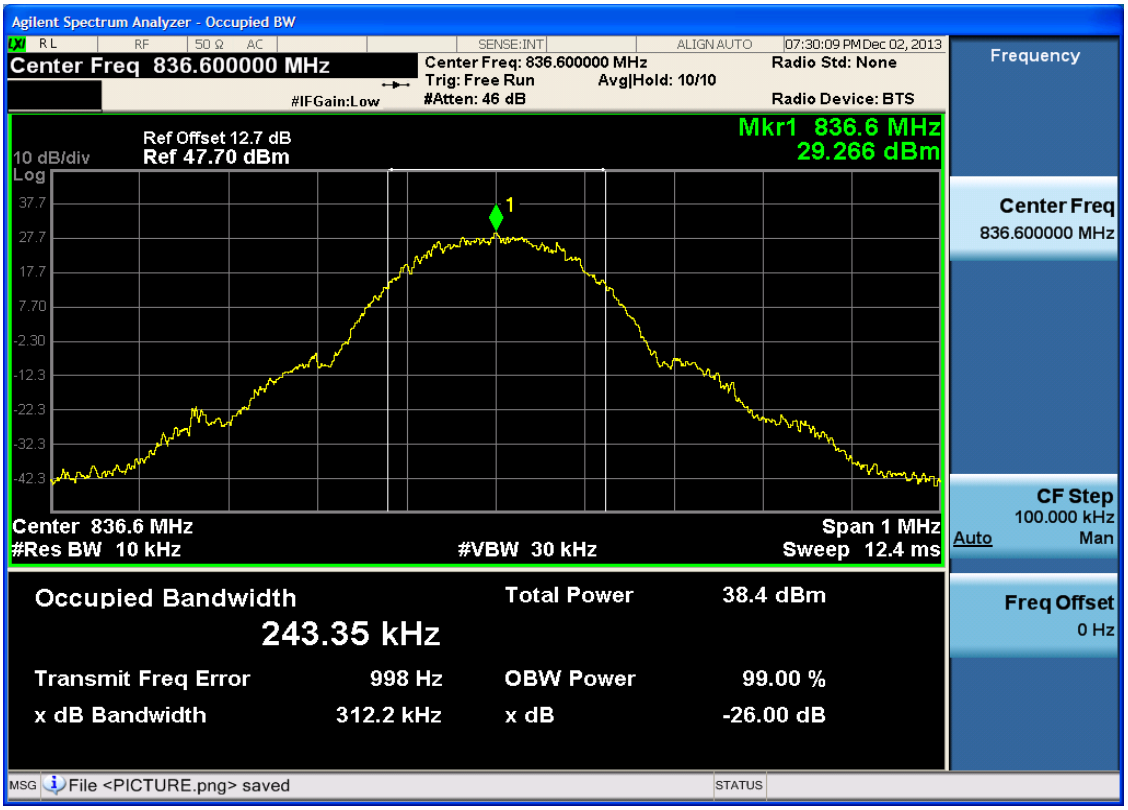
4.1.1 Test Band = GSM850

4.1.1.1 Test Mode = GSM/TM1

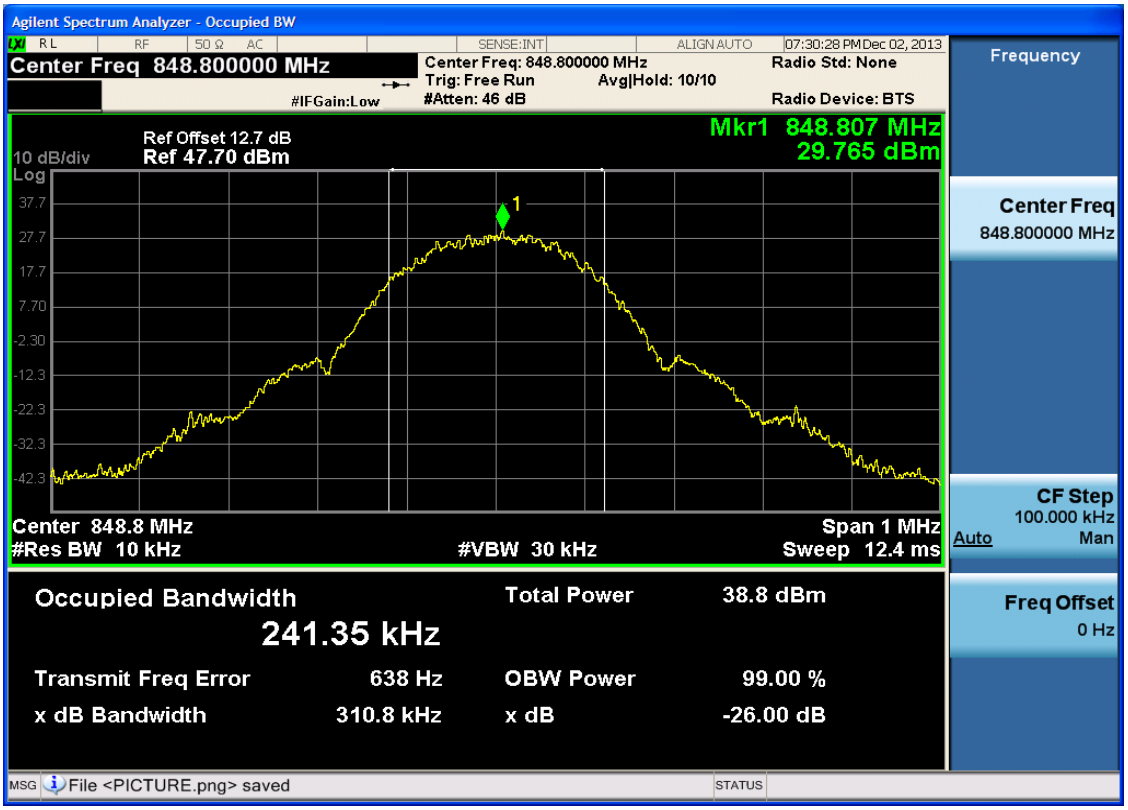
4.1.1.1.1 Test Channel = LCH



4.1.1.1.2 Test Channel = MCH

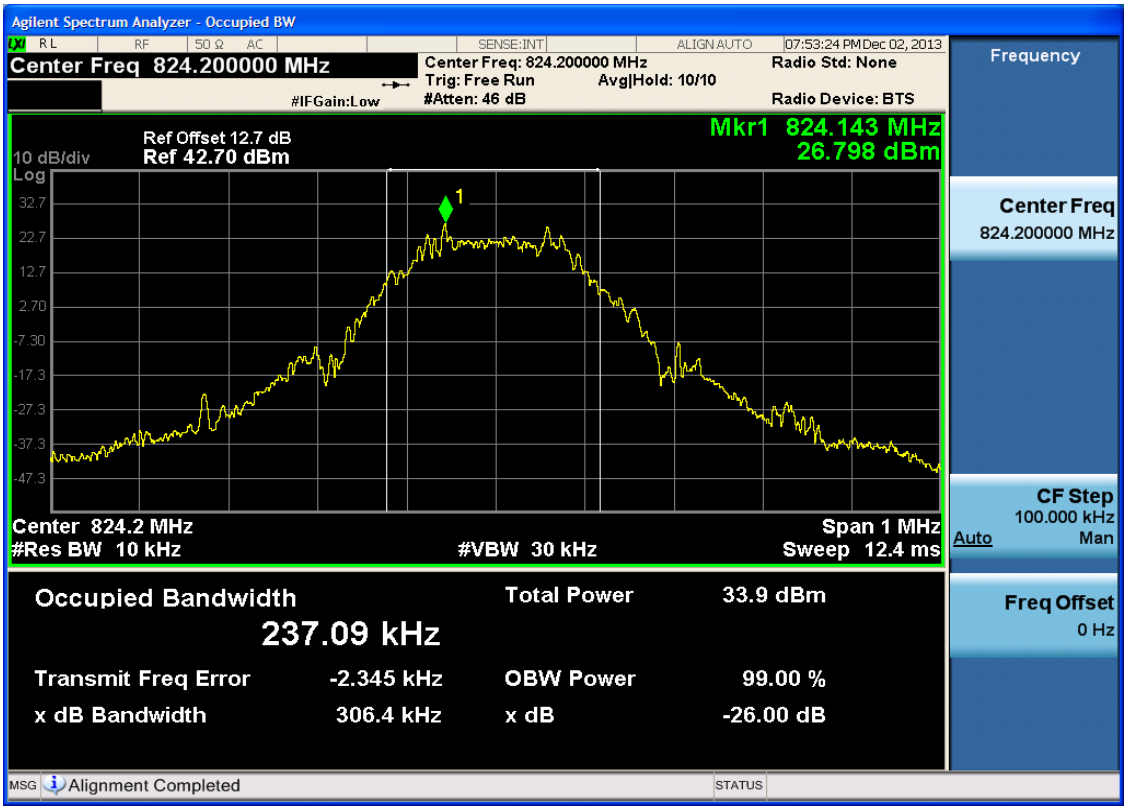


4.1.1.1.3 Test Channel = HCH

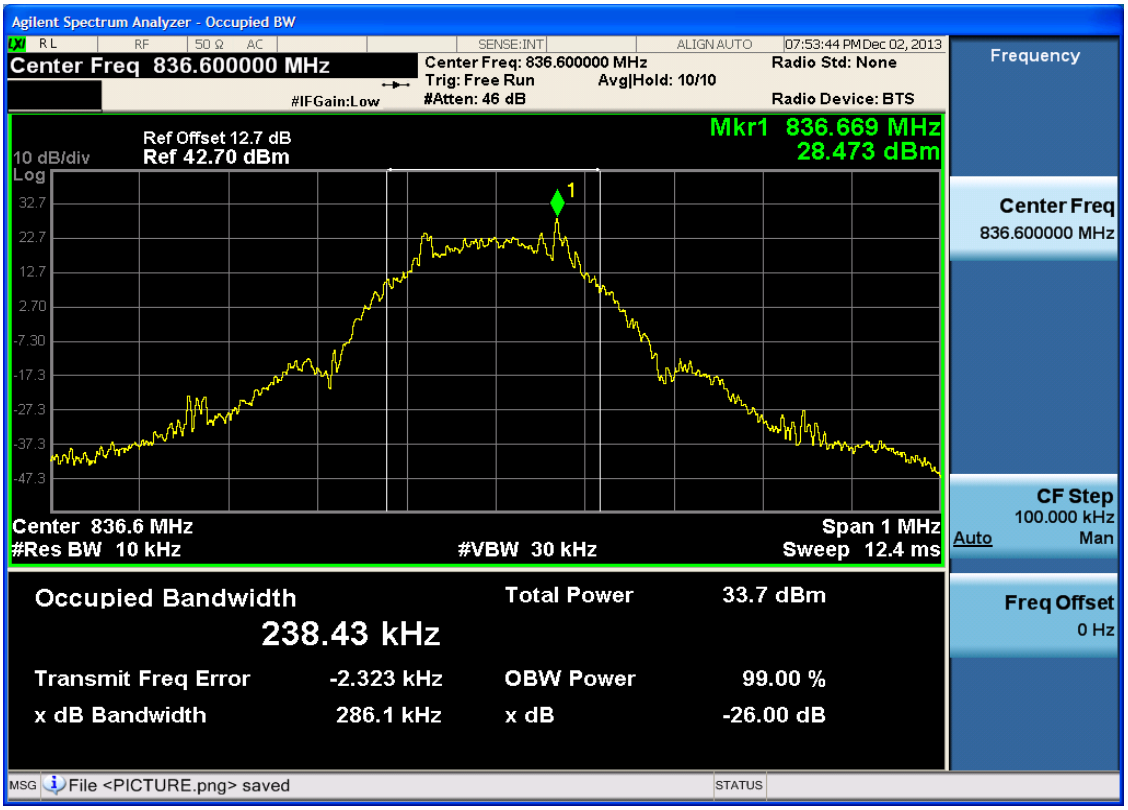


4.1.1.2 Test Mode = GSM/TM2

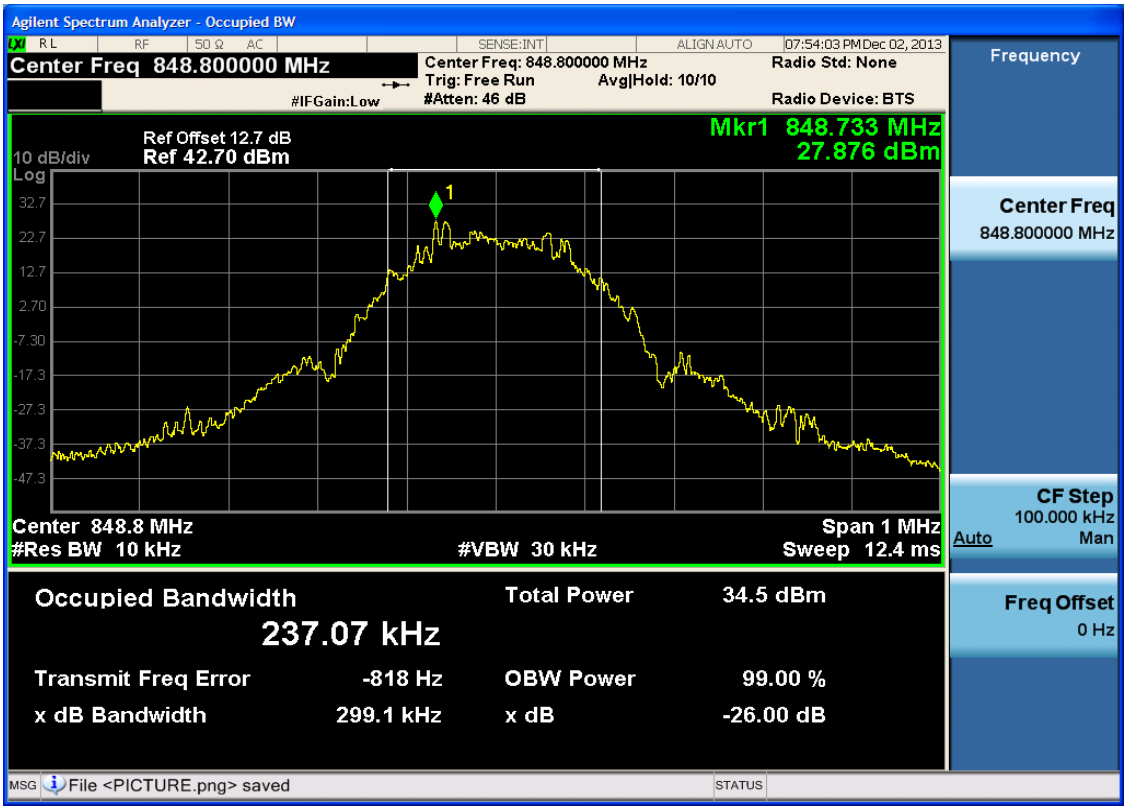
4.1.1.2.1 Test Channel = LCH



4.1.1.2.2 Test Channel = MCH



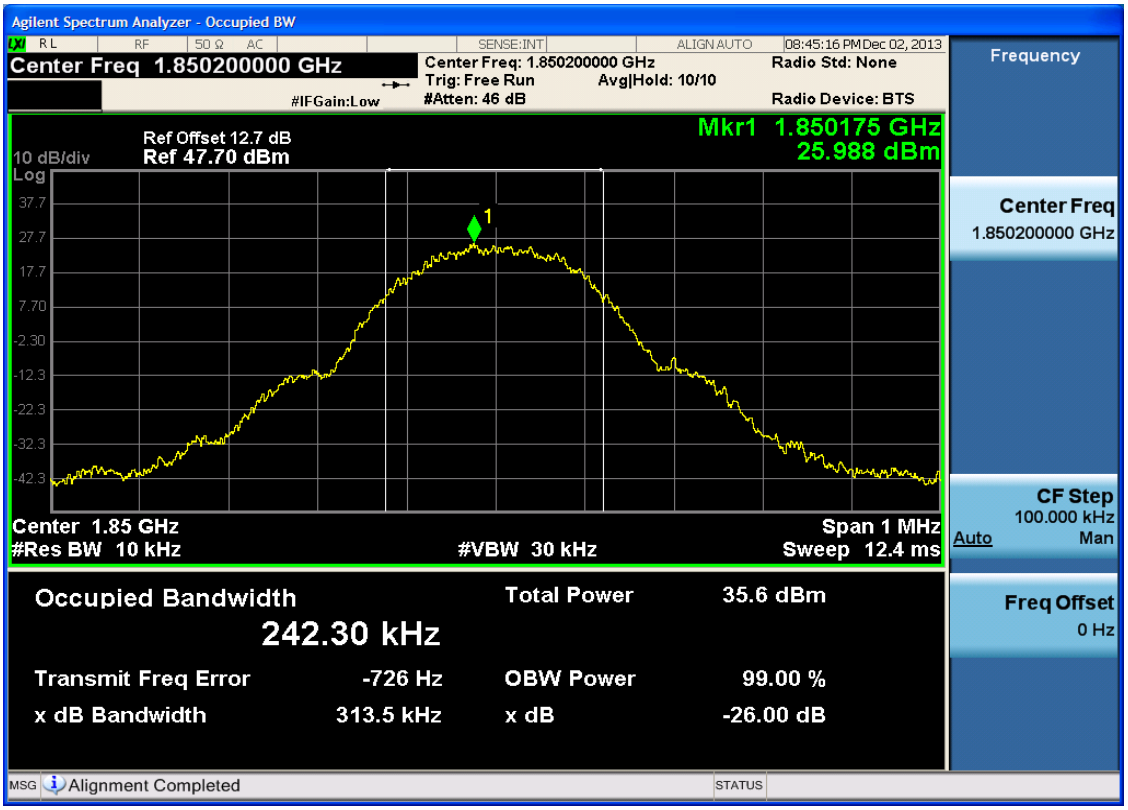
4.1.1.2.3 Test Channel = HCH



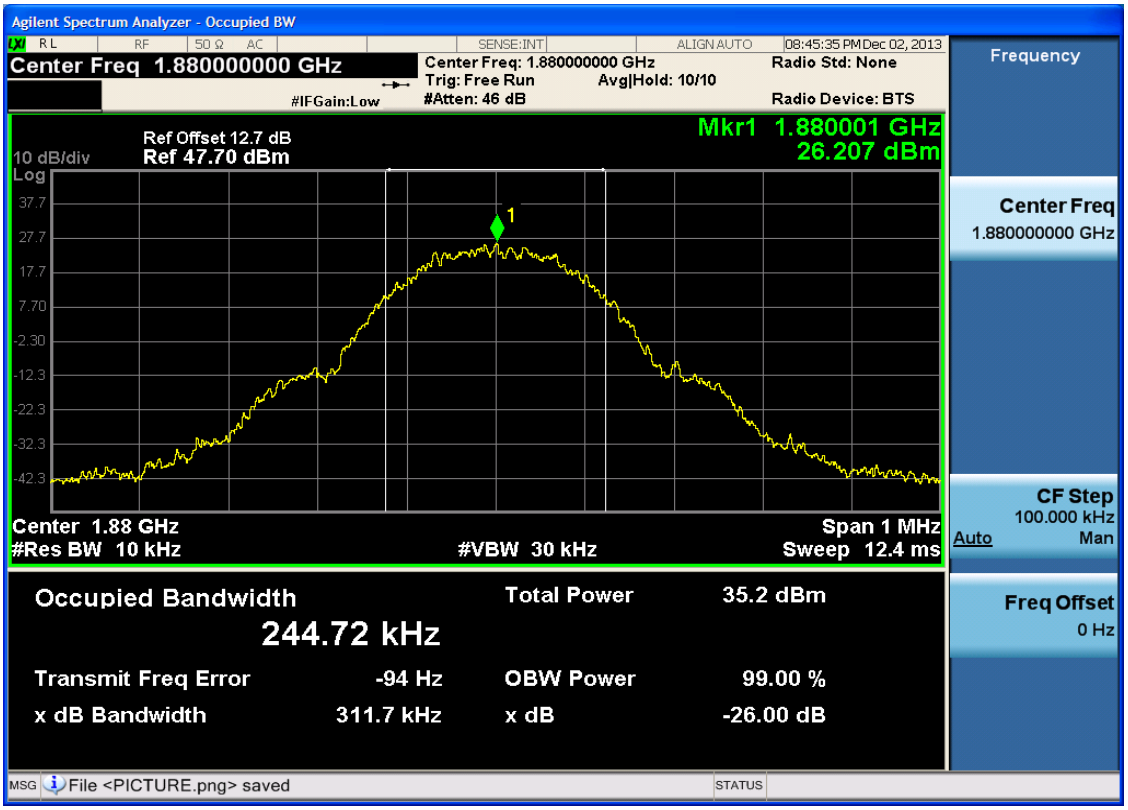
4.1.2 Test Band = GSM1900

4.1.2.1 Test Mode = GSM/TM1

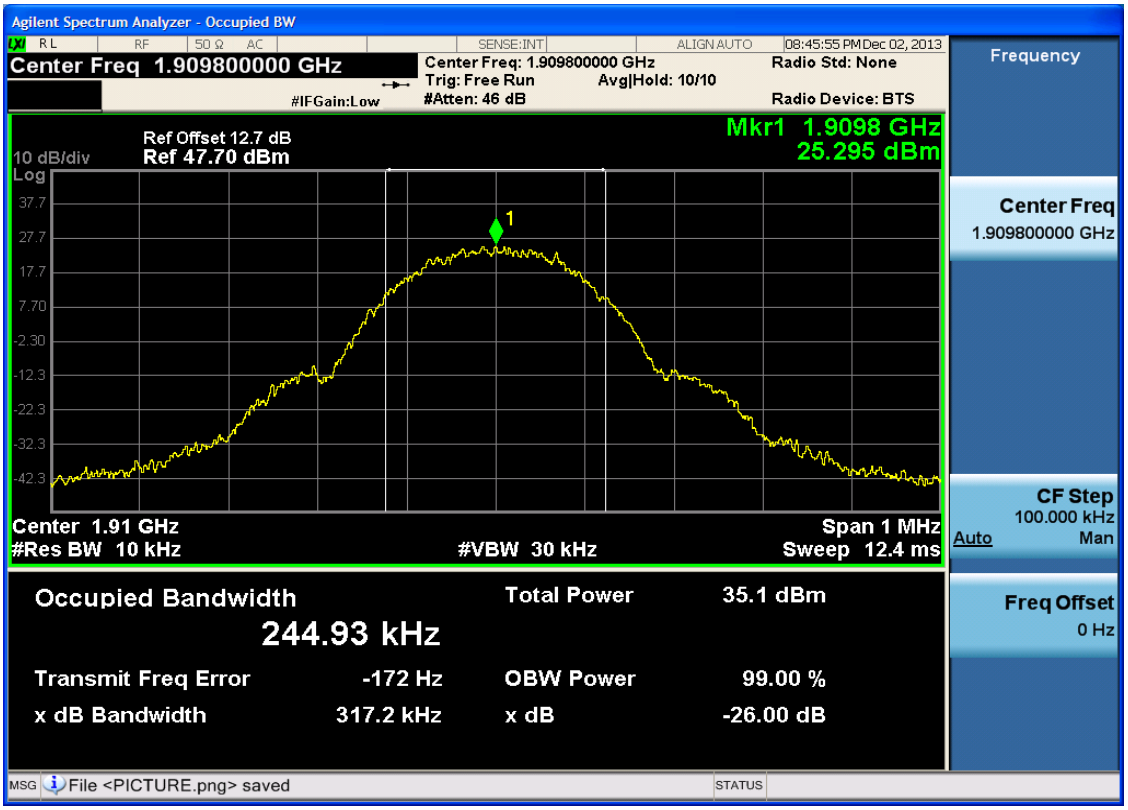
4.1.2.1.1 Test Channel = LCH



4.1.2.1.2 Test Channel = MCH

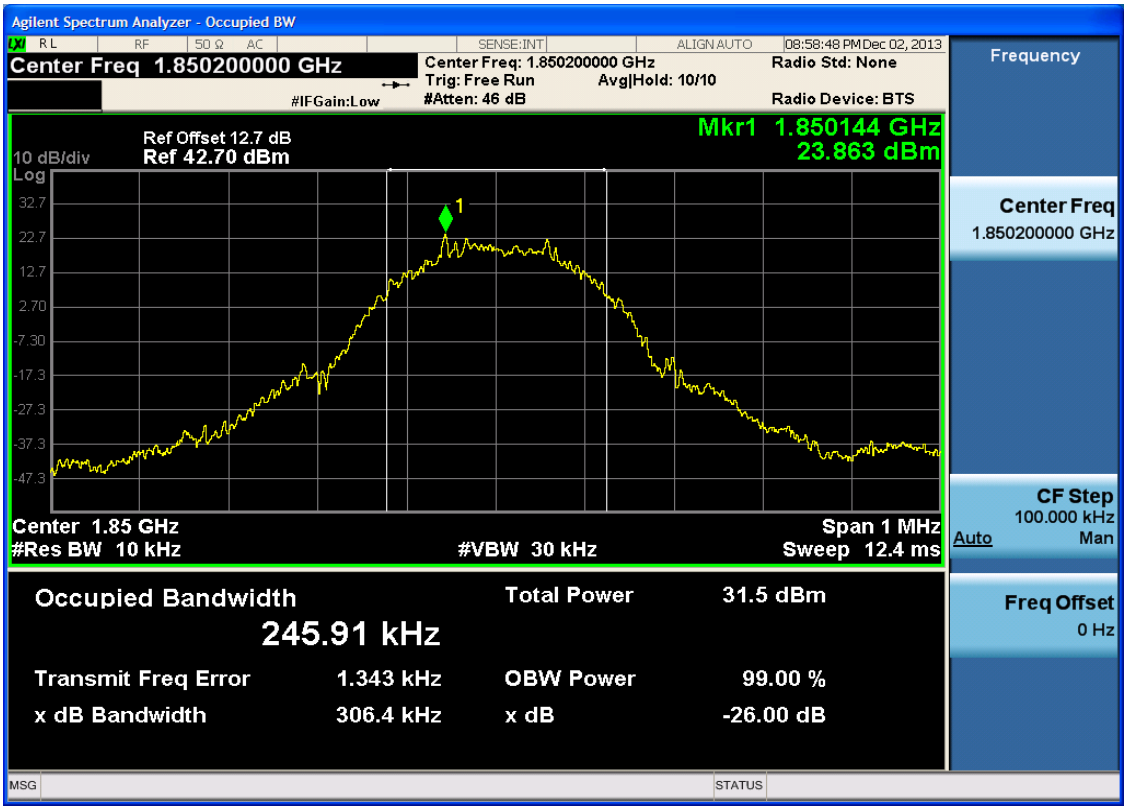


4.1.2.1.3 Test Channel = HCH

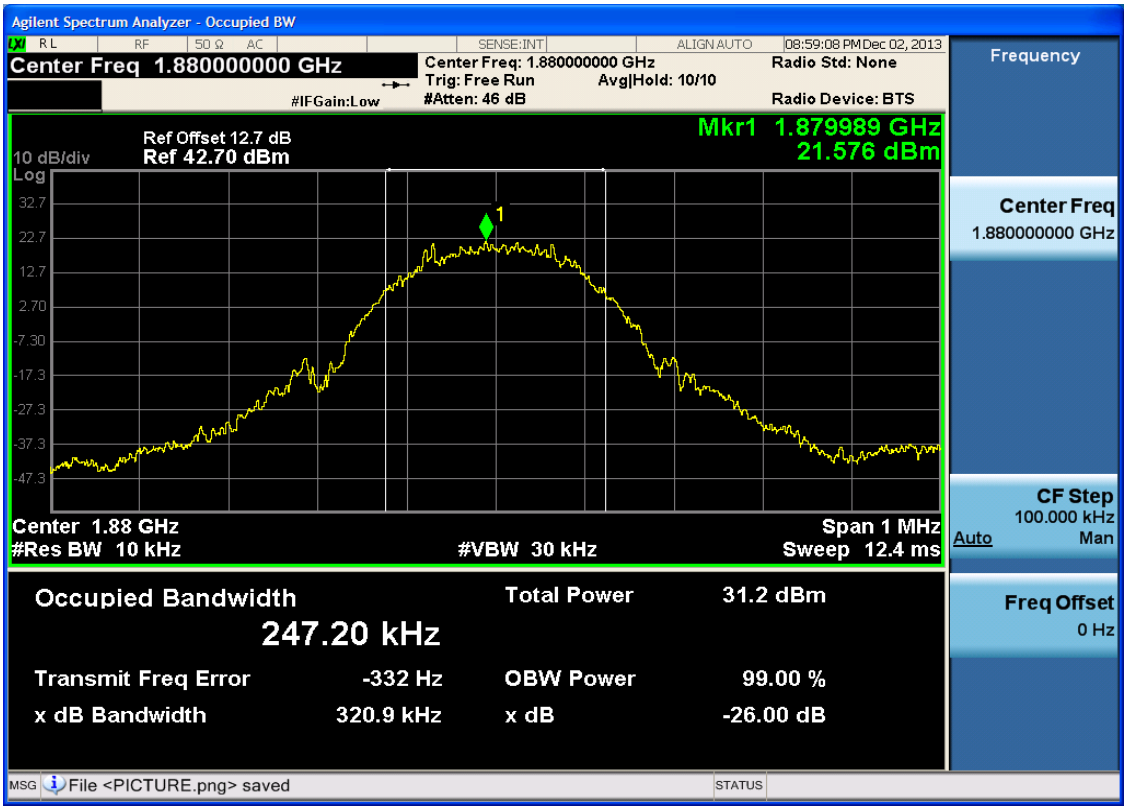


4.1.2.2 Test Mode = GSM/TM2

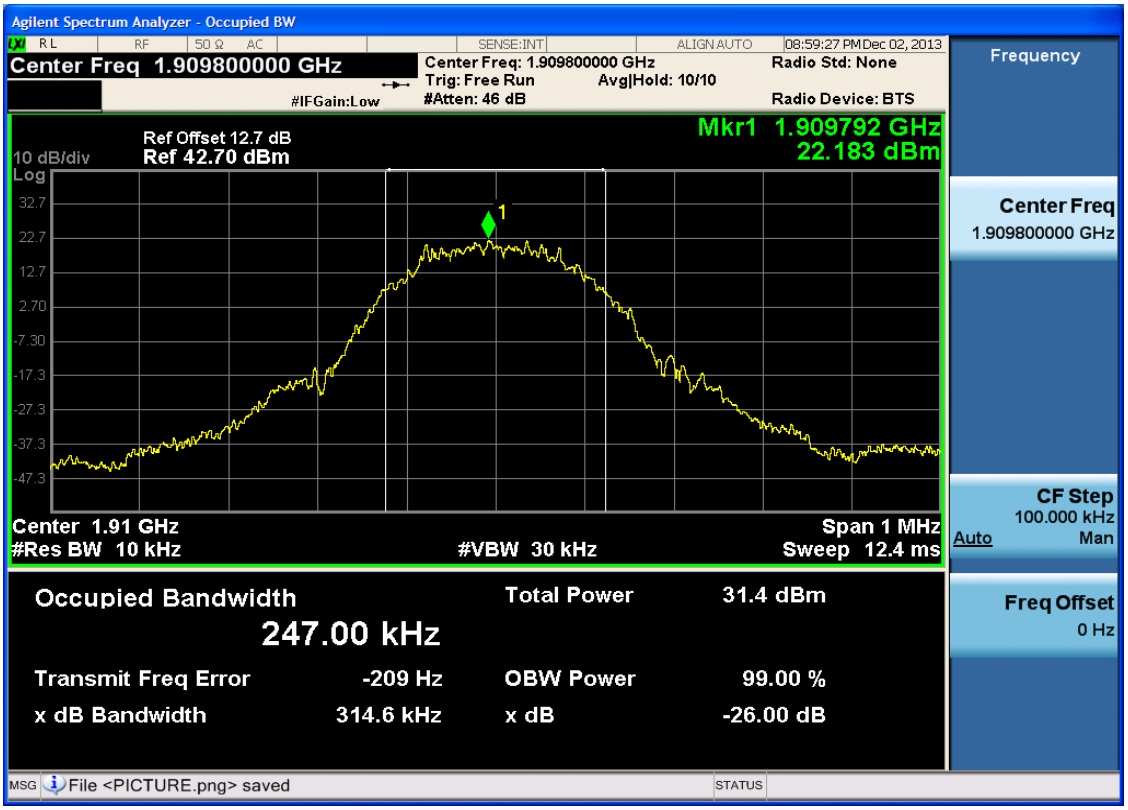
4.1.2.2.1 Test Channel = LCH



4.1.2.2.2 Test Channel = MCH



4.1.2.2.3 Test Channel = HCH

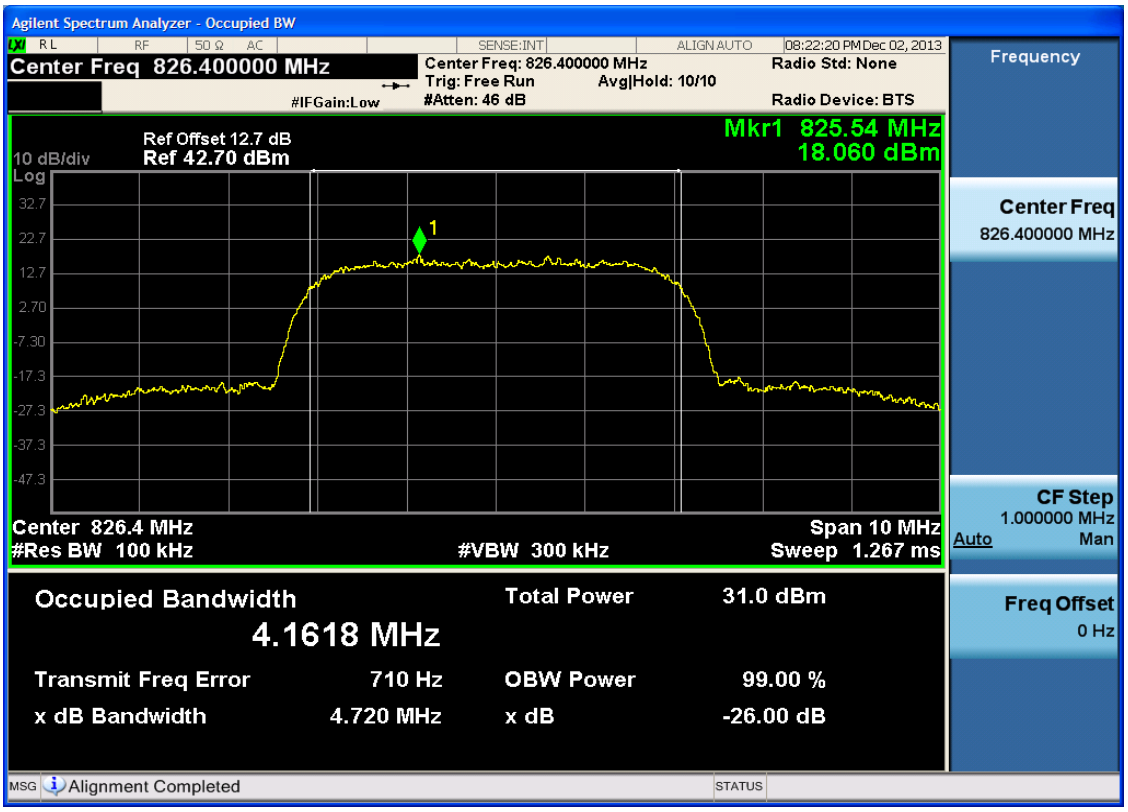


4.2 For UMTS

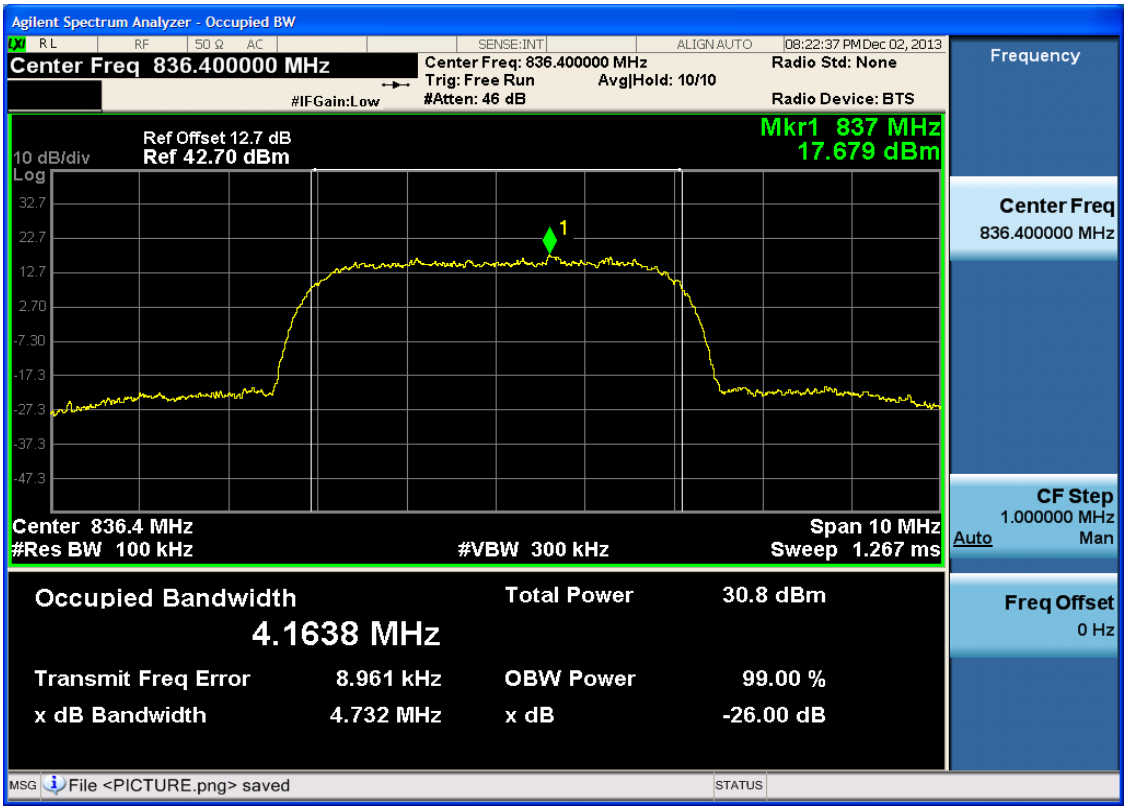
4.2.1 Test Band = WCDMA850

4.2.1.1 Test Mode = UMTS/TM1

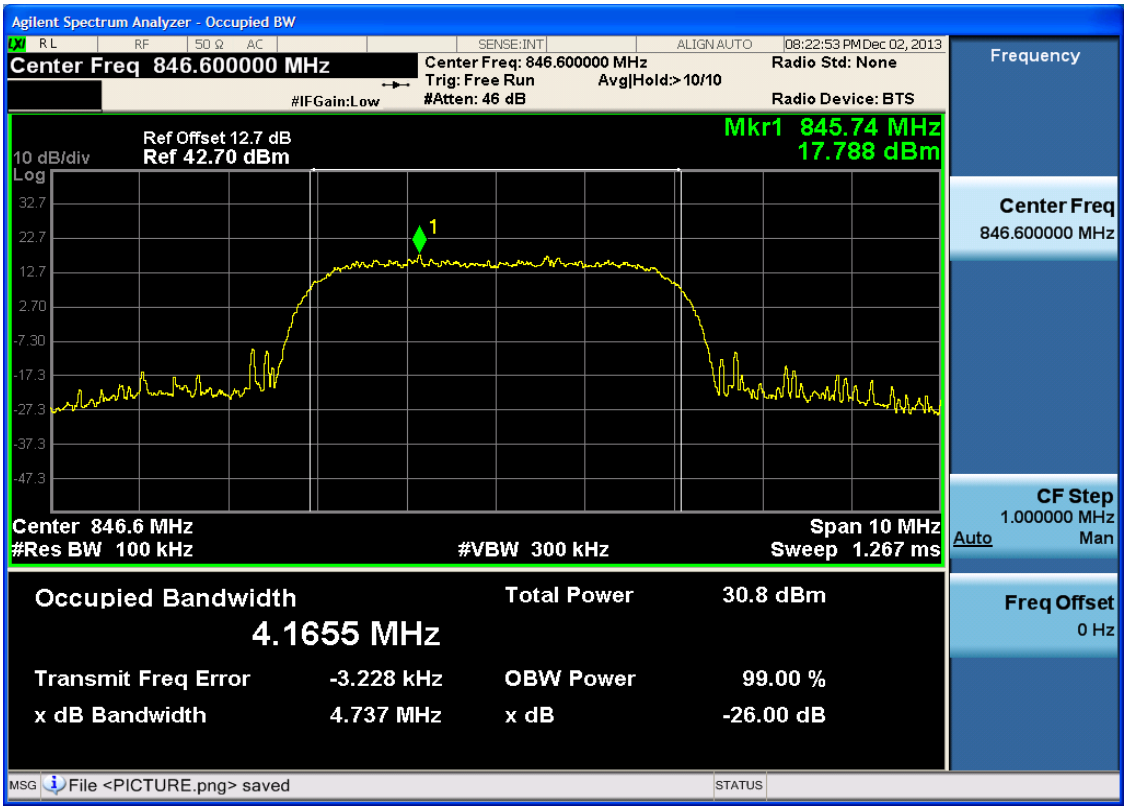
4.2.1.1.1 Test Channel = LCH



4.2.1.1.2 Test Channel = MCH



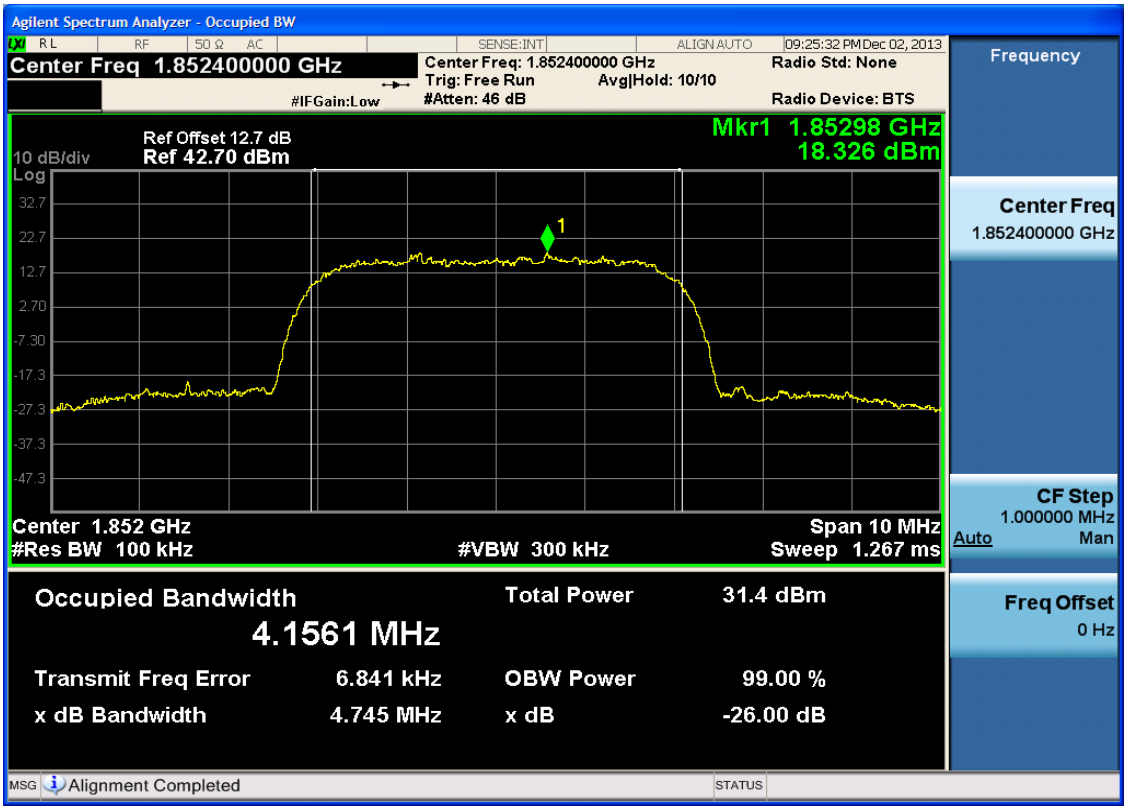
4.2.1.1.3 Test Channel = HCH



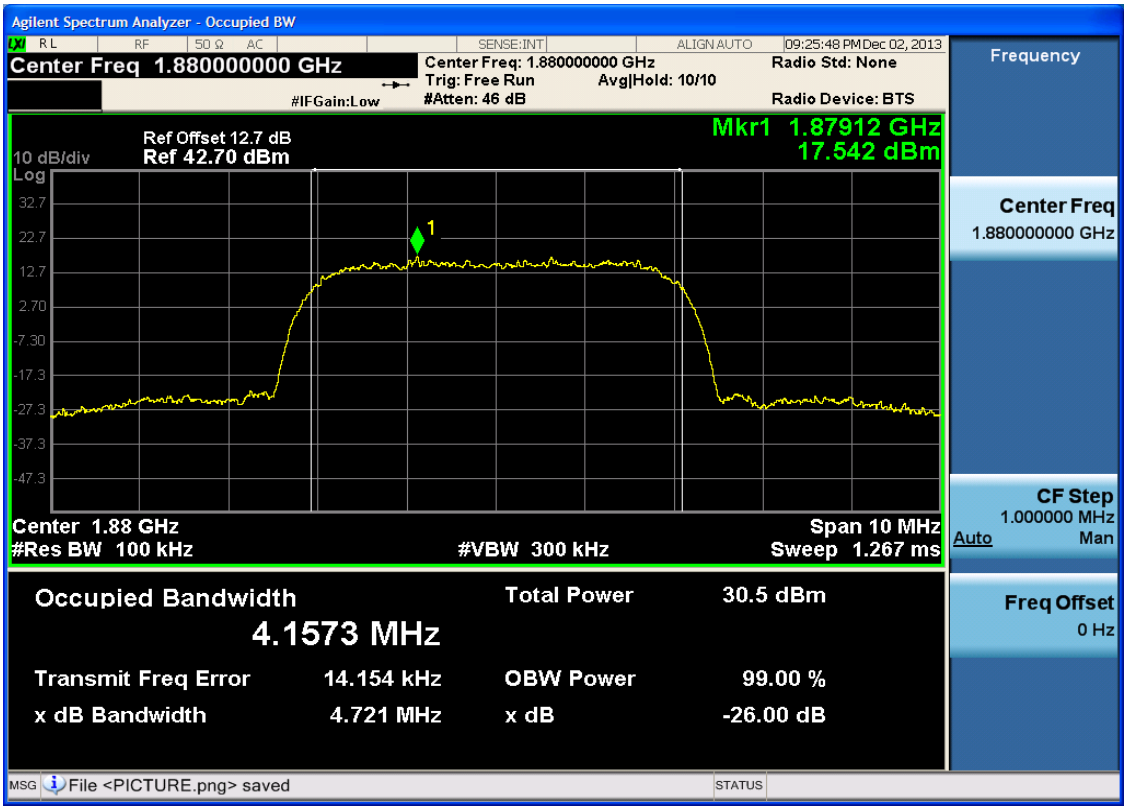
4.2.2 Test Band = WCDMA1900

4.2.2.1 Test Mode = UMTS/TM1

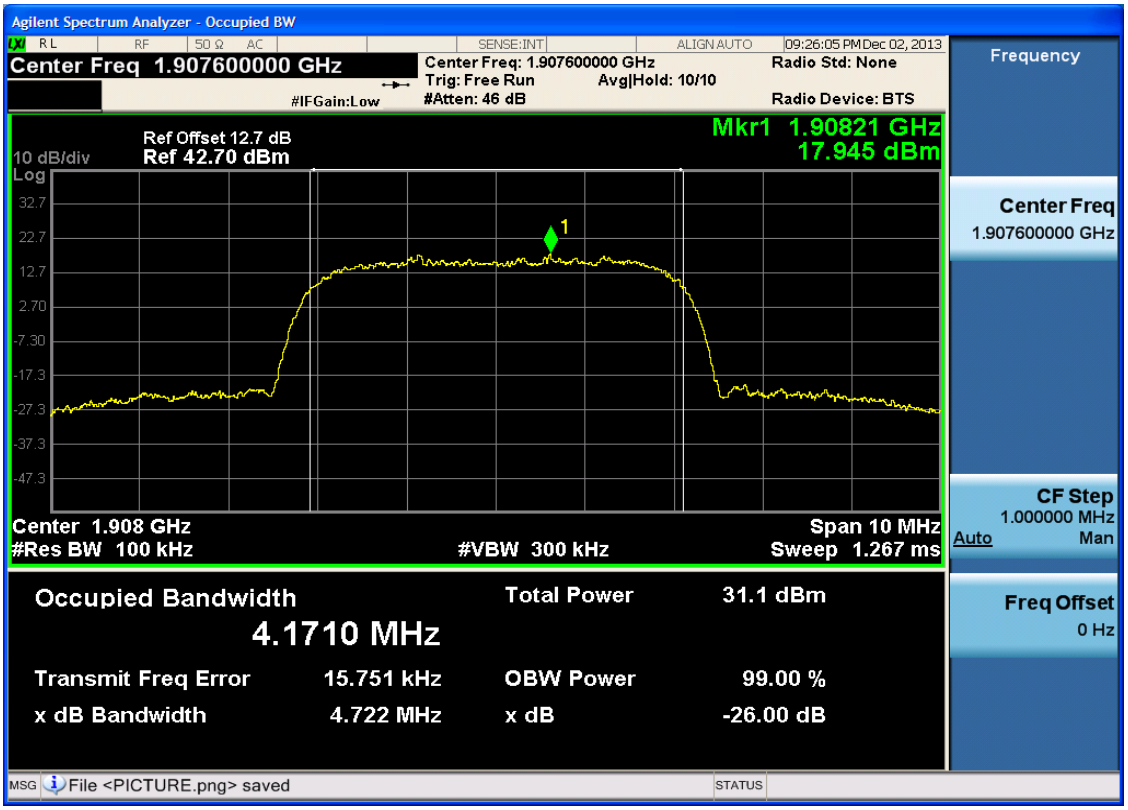
4.2.2.1.1 Test Channel = LCH



4.2.2.1.2 Test Channel = MCH



4.2.2.1.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

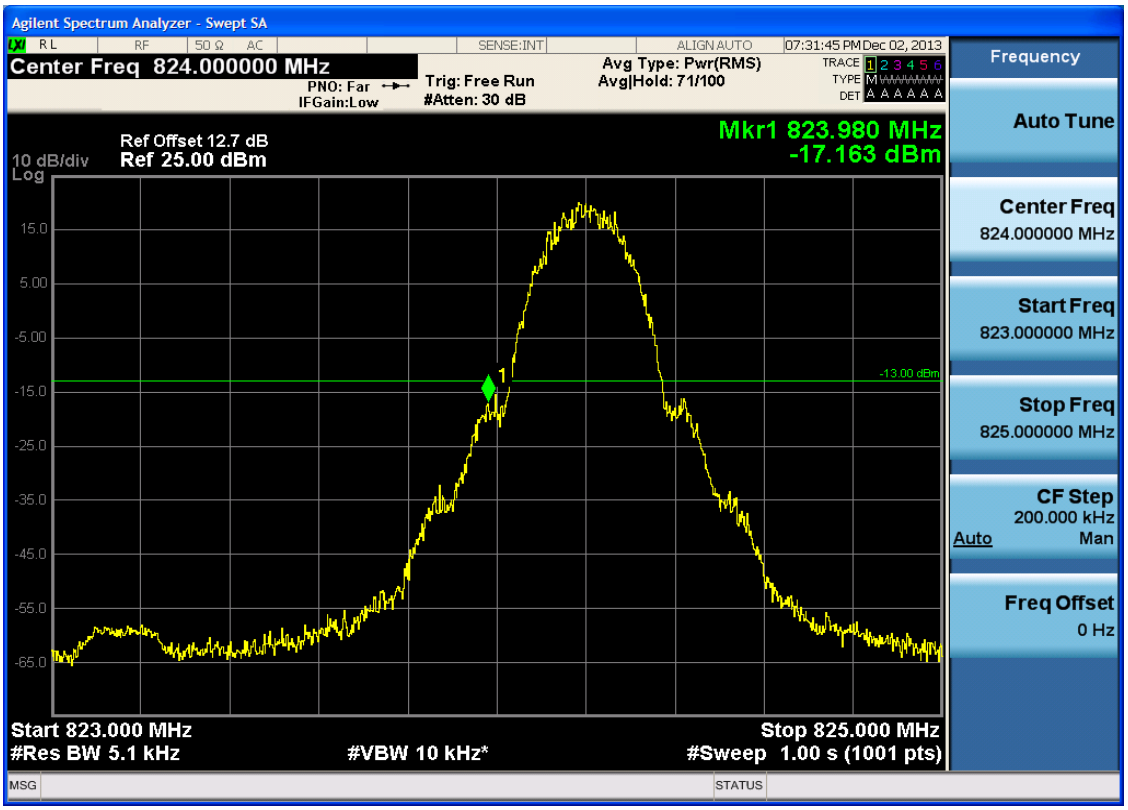
Part I - Test Plots

5.1 For GSM

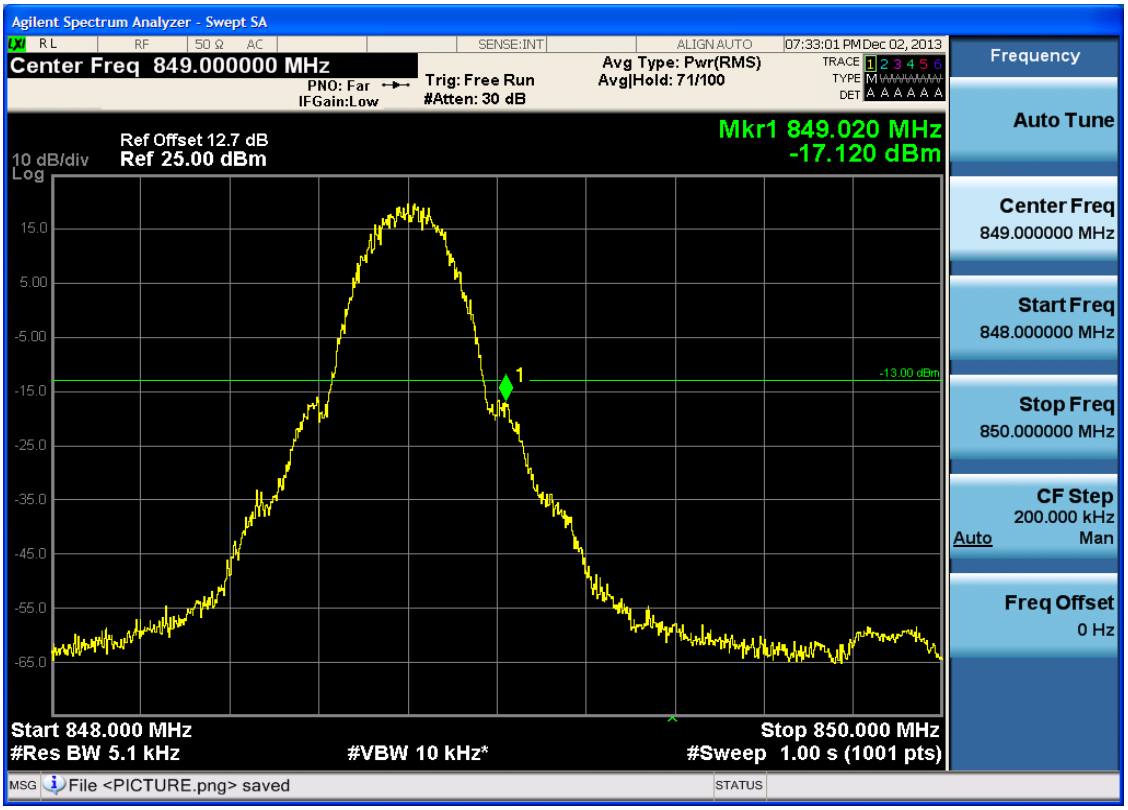
5.1.1 Test Band = GSM850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH



5.1.1.1.2 Test Channel = HCH



5.1.1.2 Test Mode = GSM/TM2

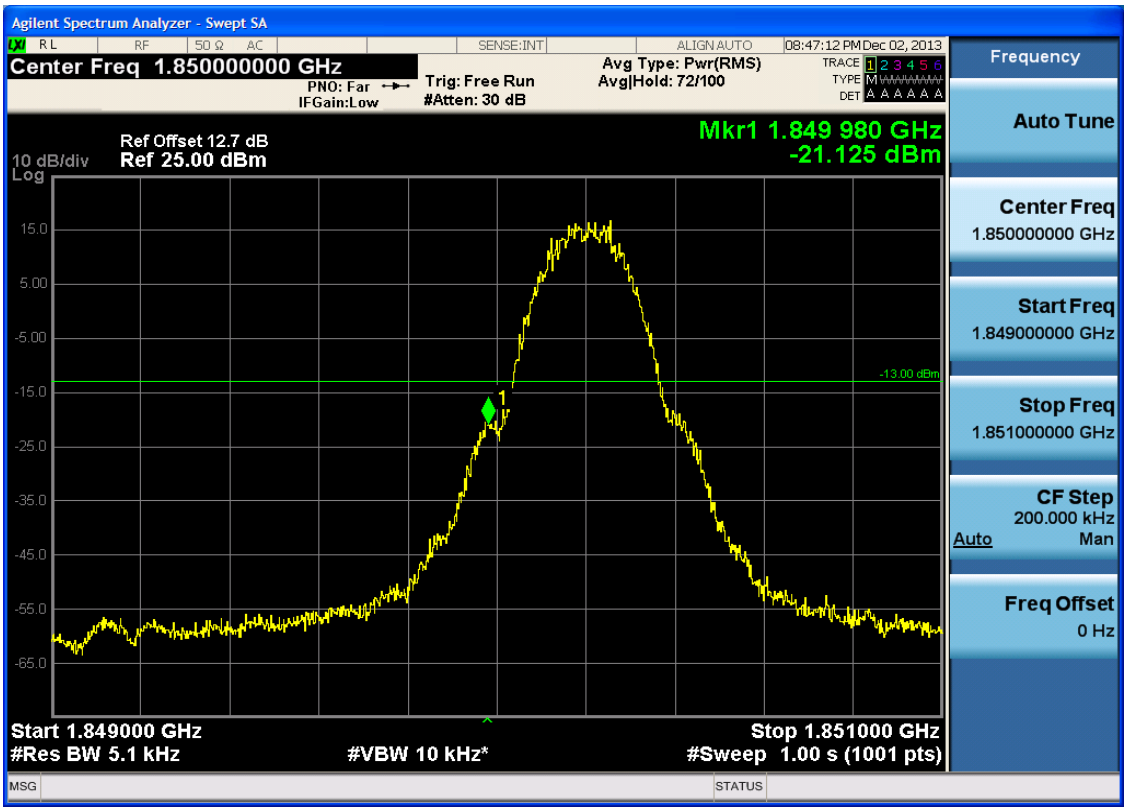
5.1.1.2.1 Test Channel = LCH

5.1.1.2.2 Test Channel = HCH

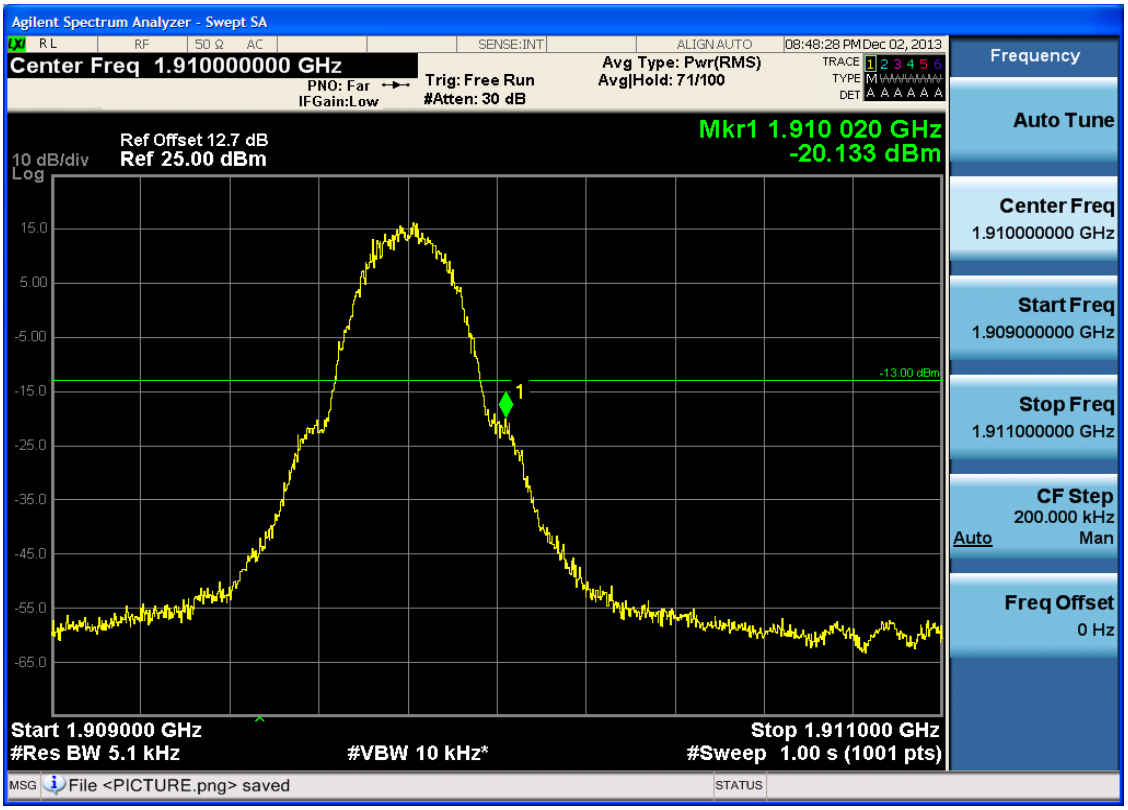
5.1.2 Test Band = GSM1900

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

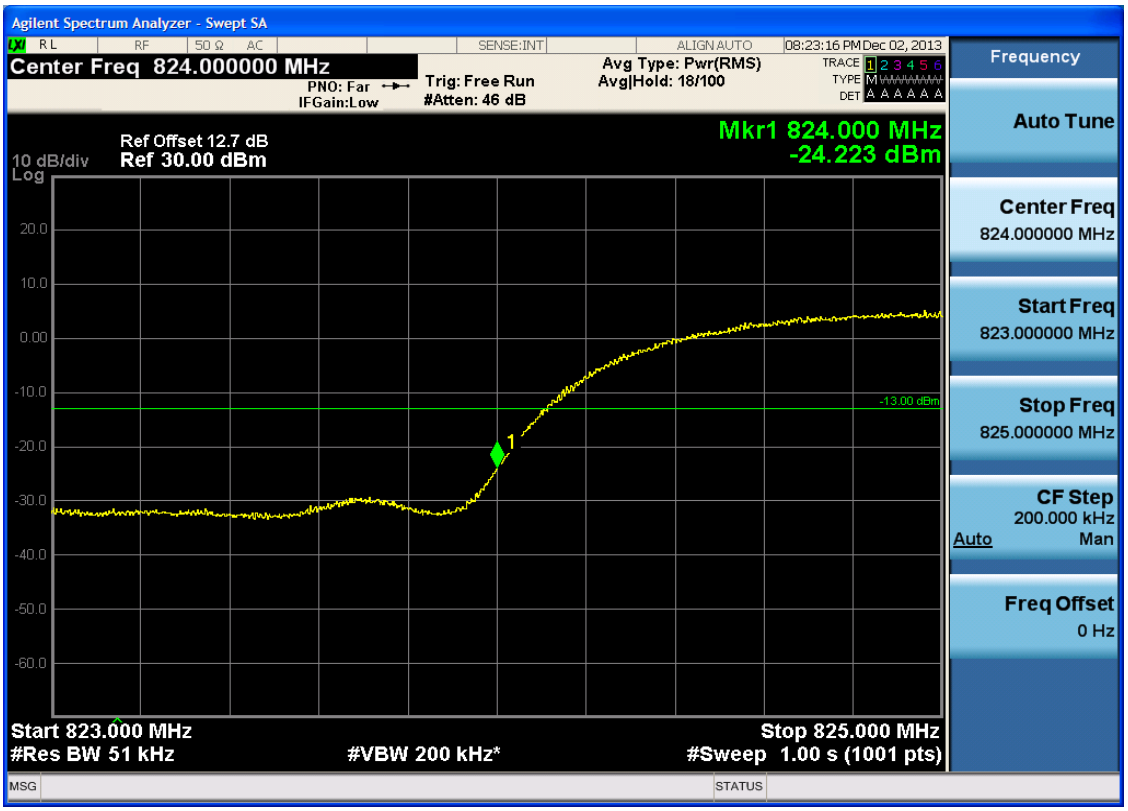
5.1.2.2.2 Test Channel = HCH

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

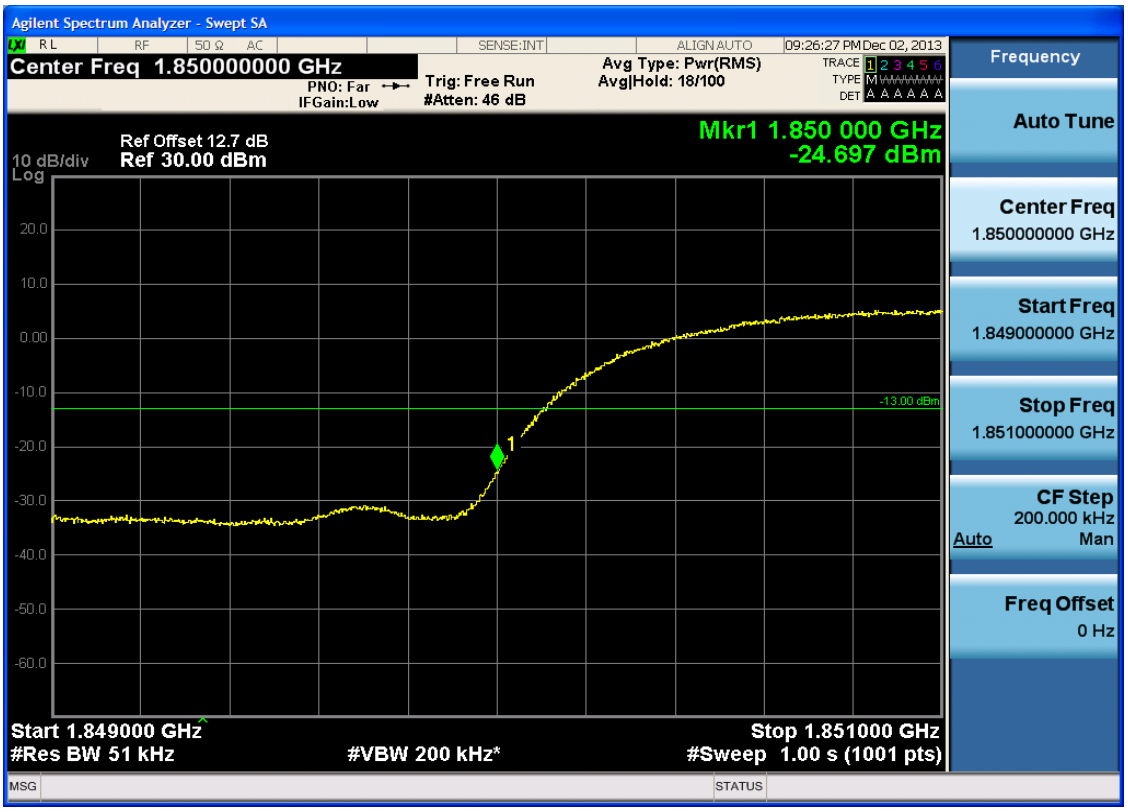


5.2.1.1.2 Test Channel = HCH

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

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.

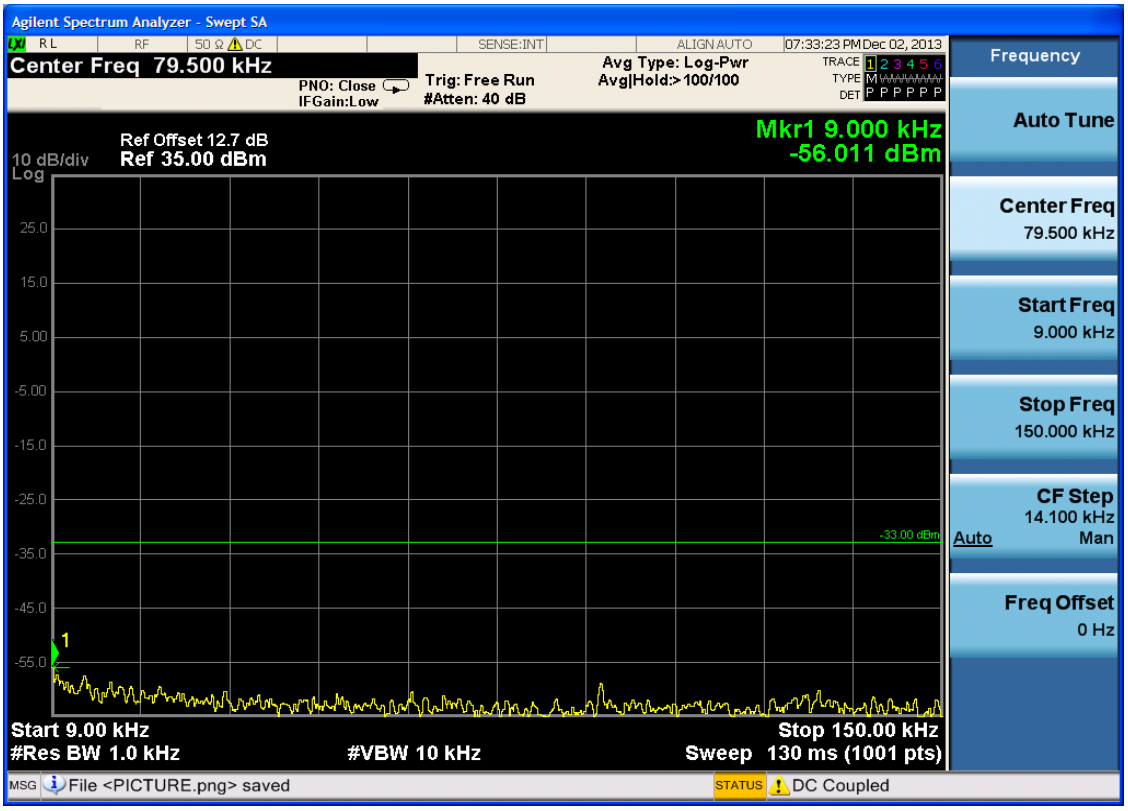
Part I - Test Plots

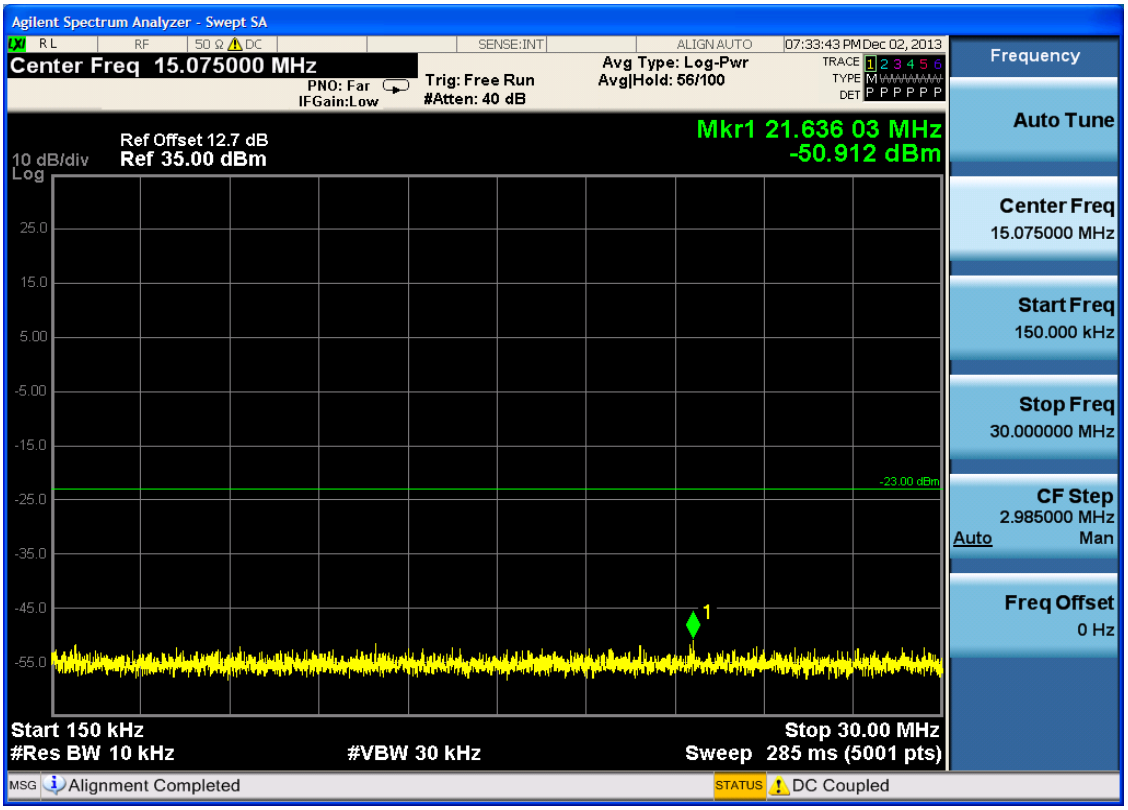
6.1 For GSM

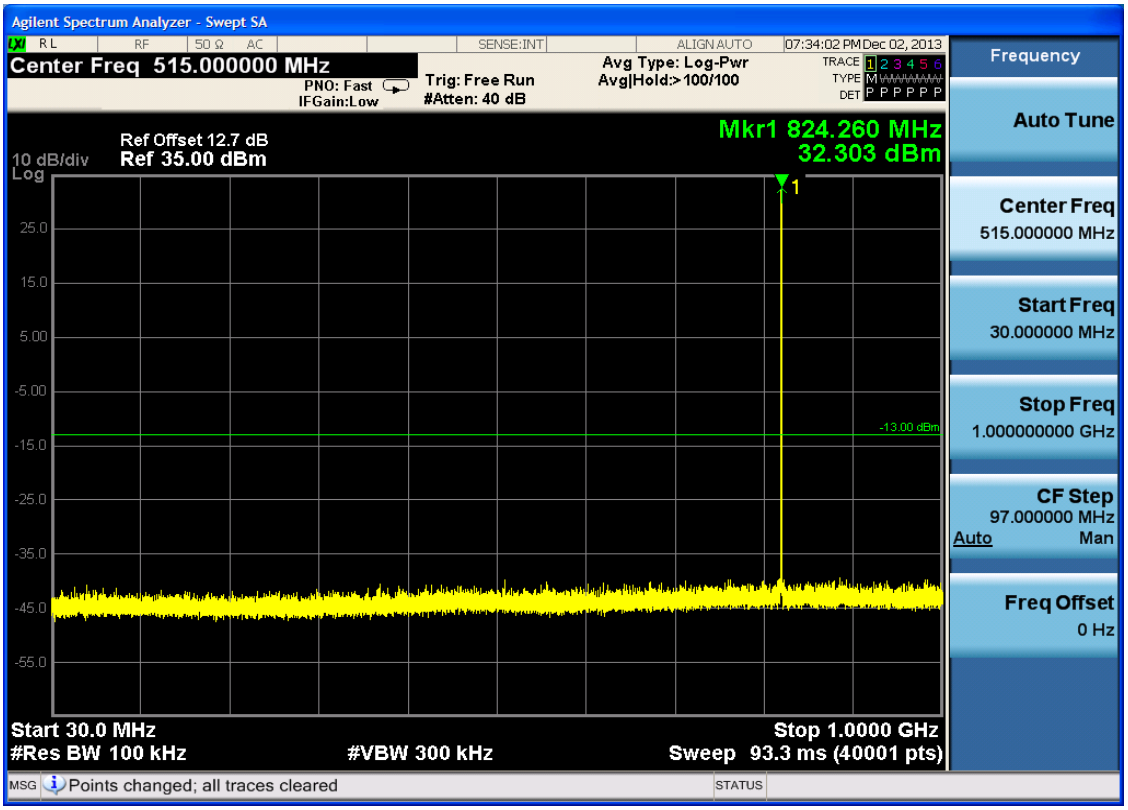
6.1.1 Test Band = GSM850

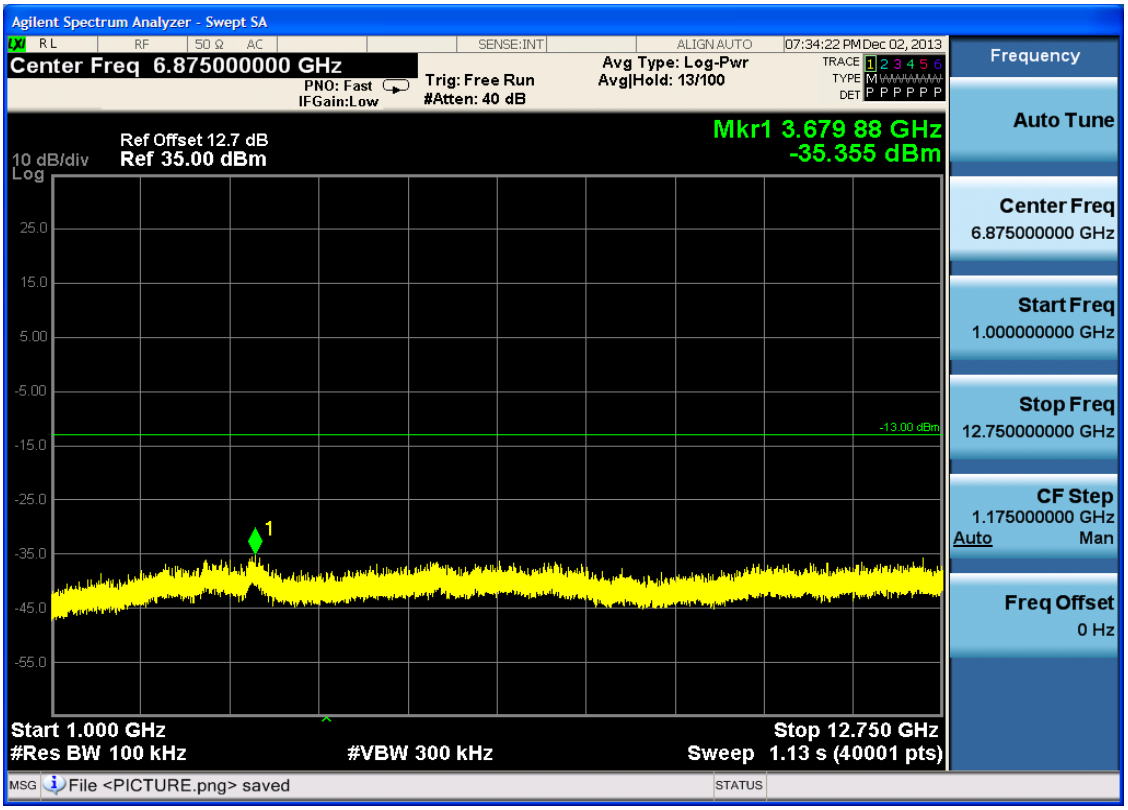
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH

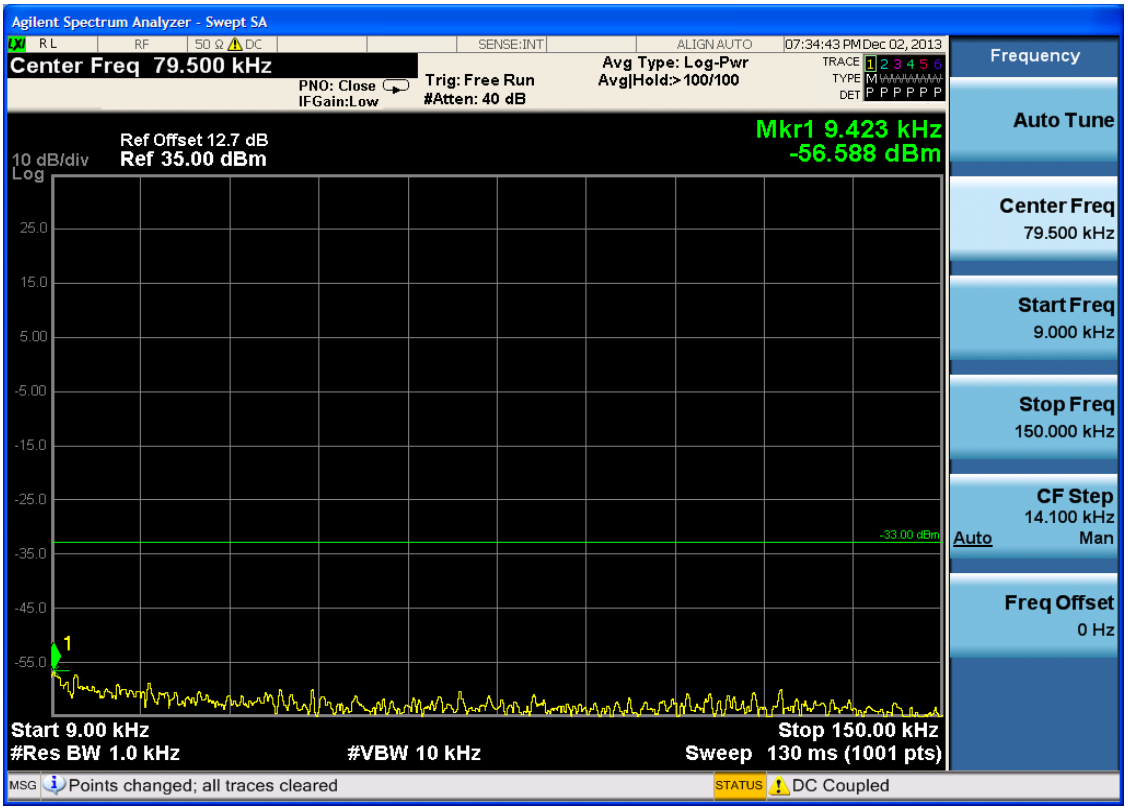


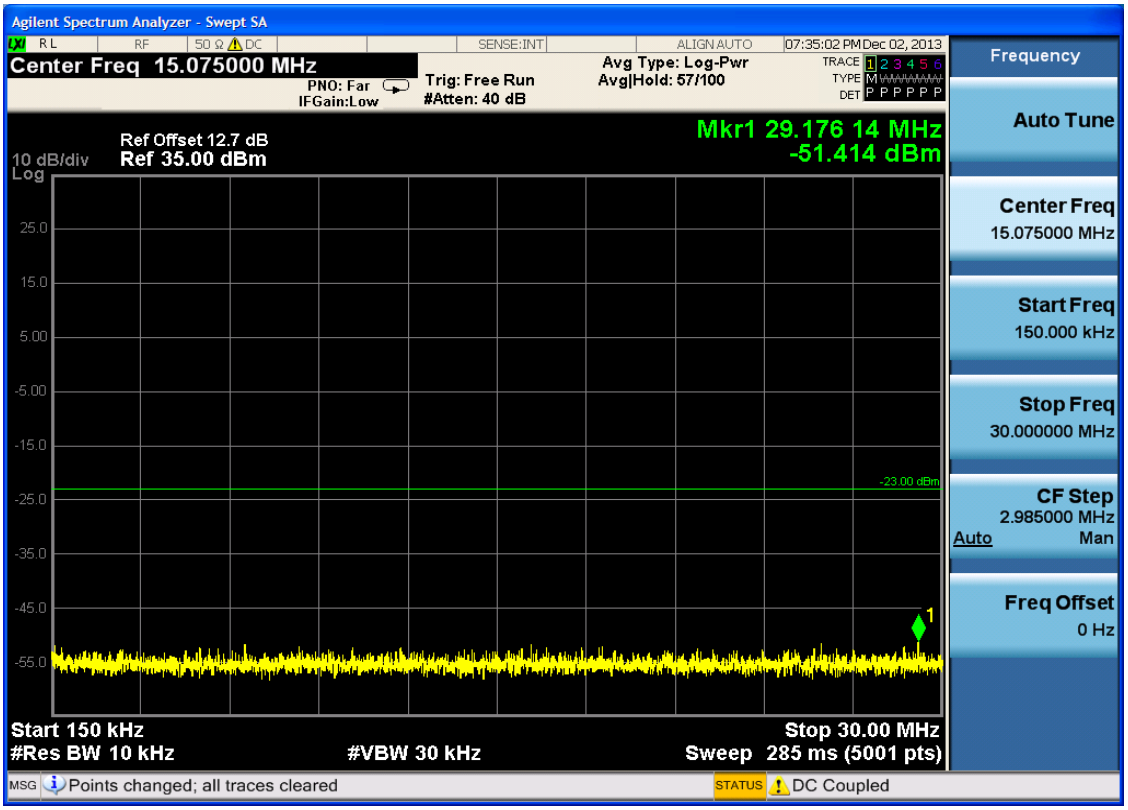


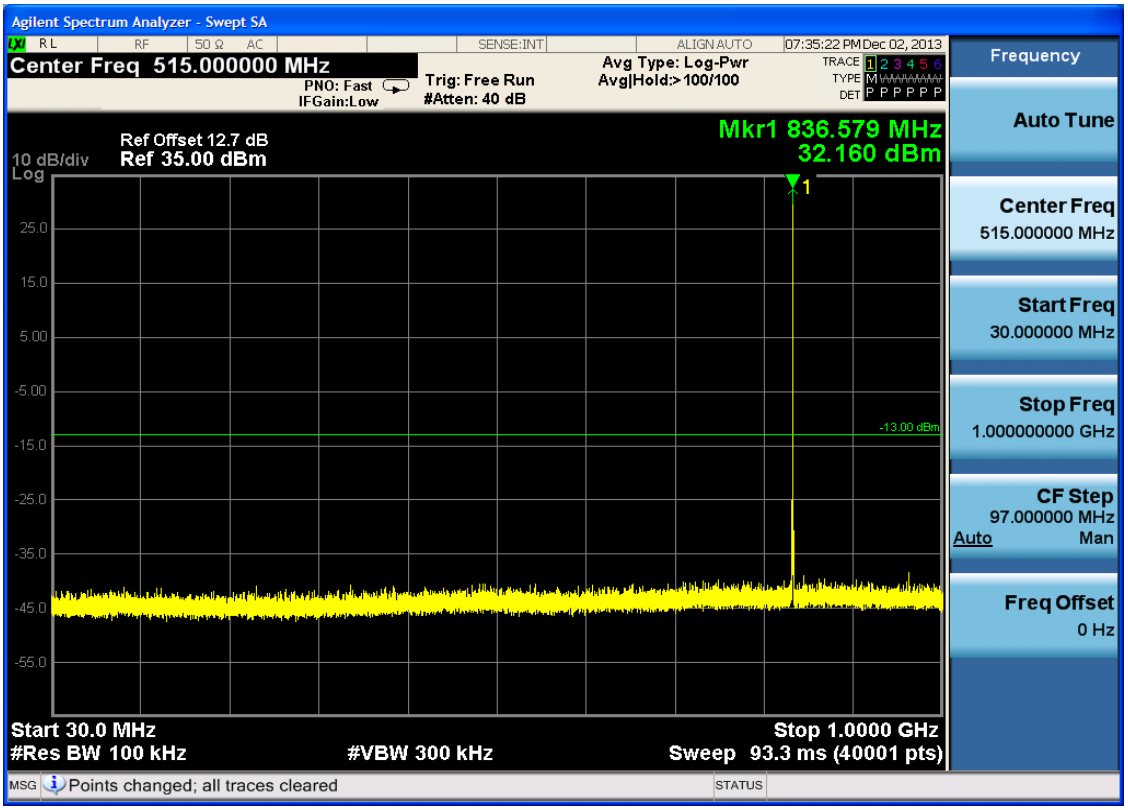


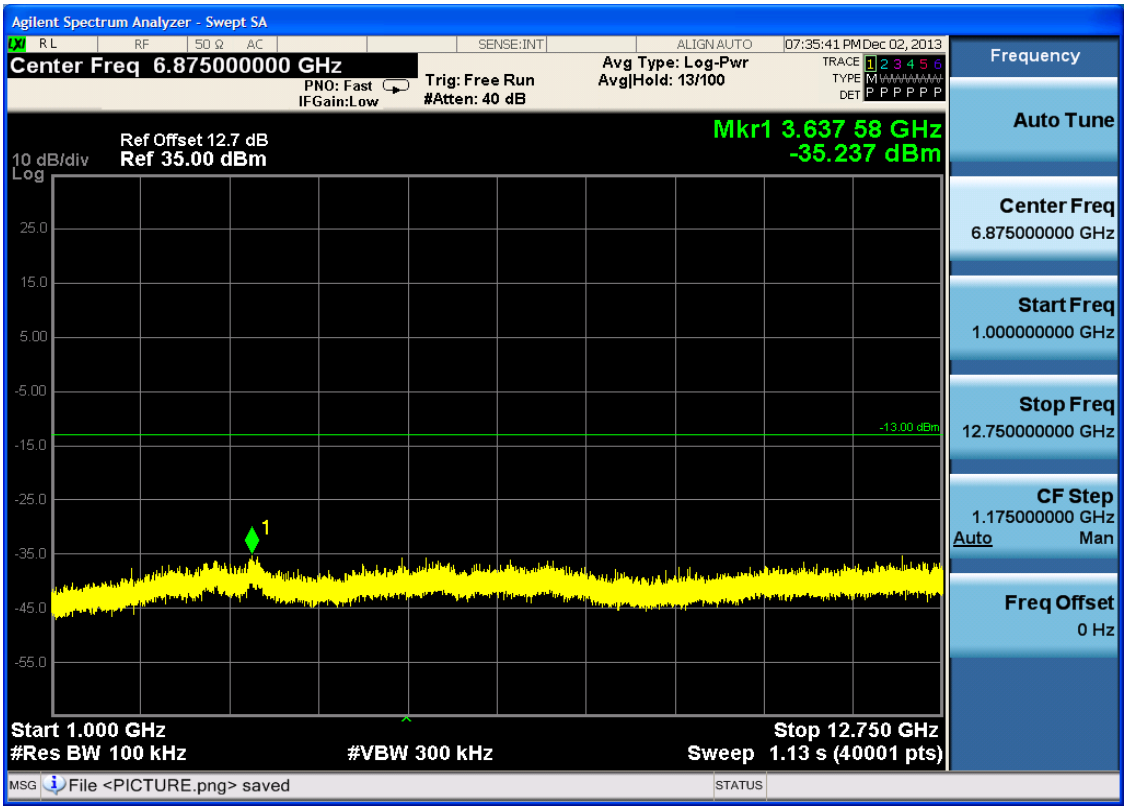


6.1.1.1.2 Test Channel = MCH

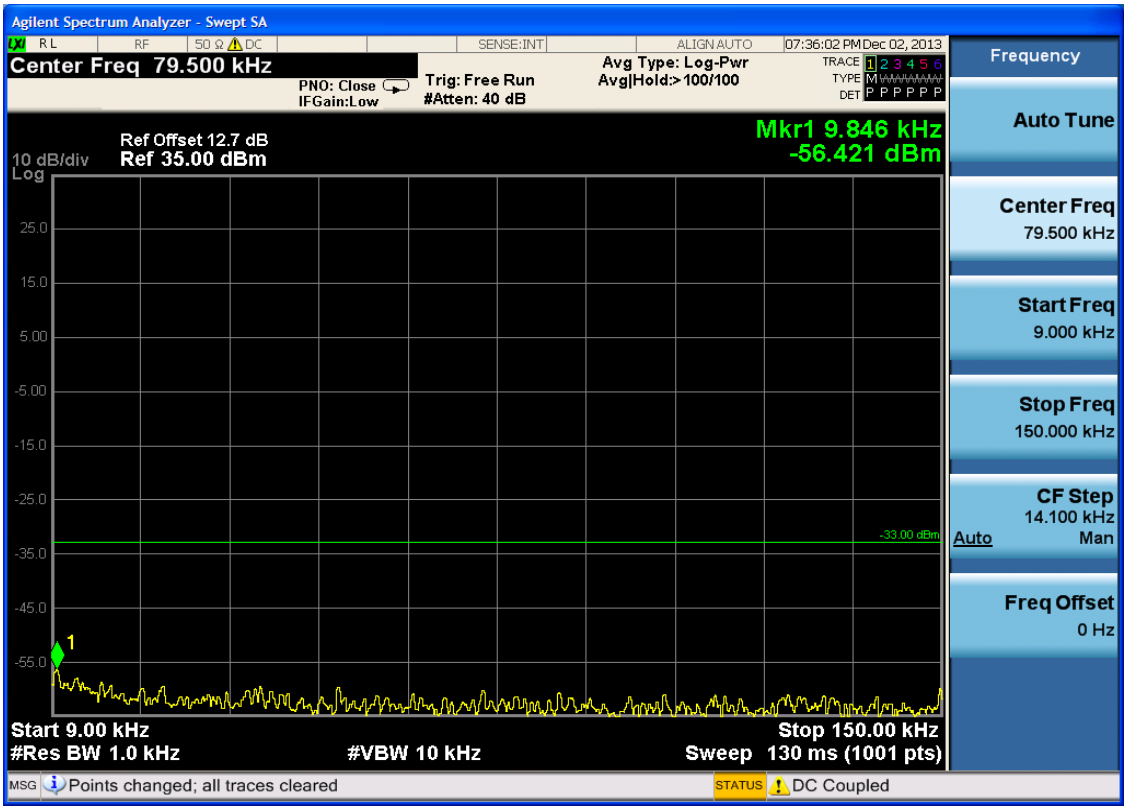


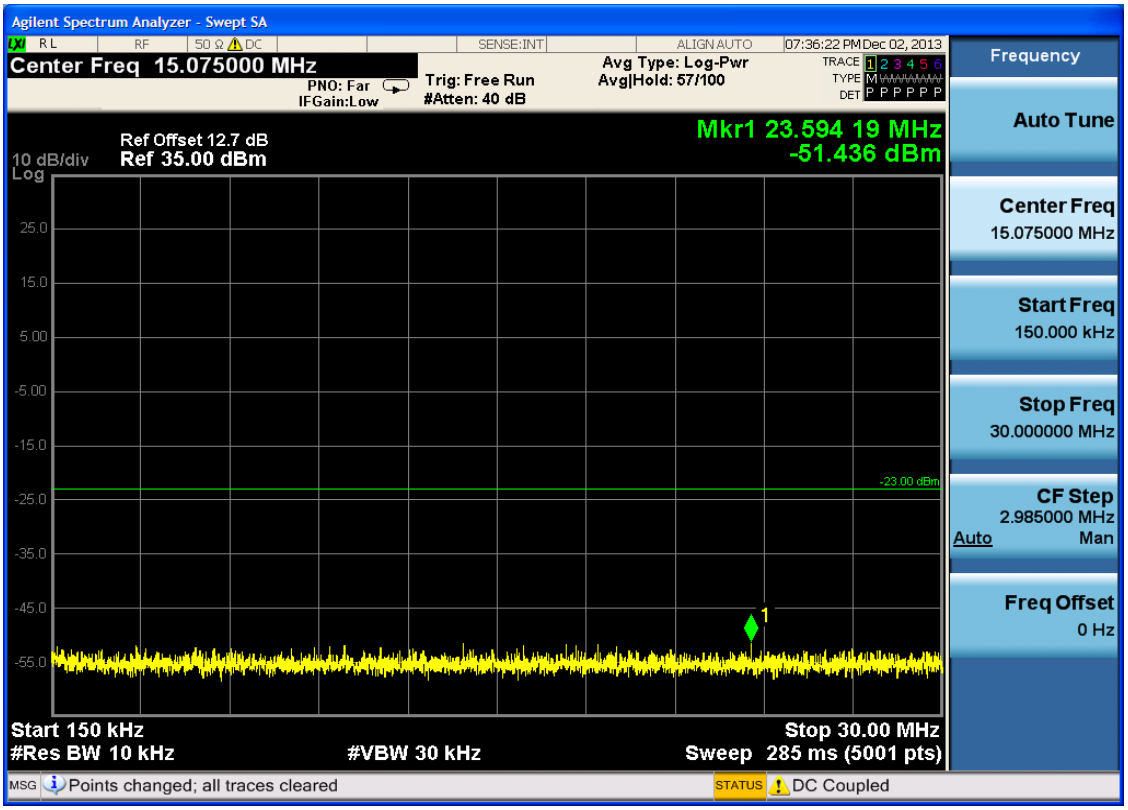


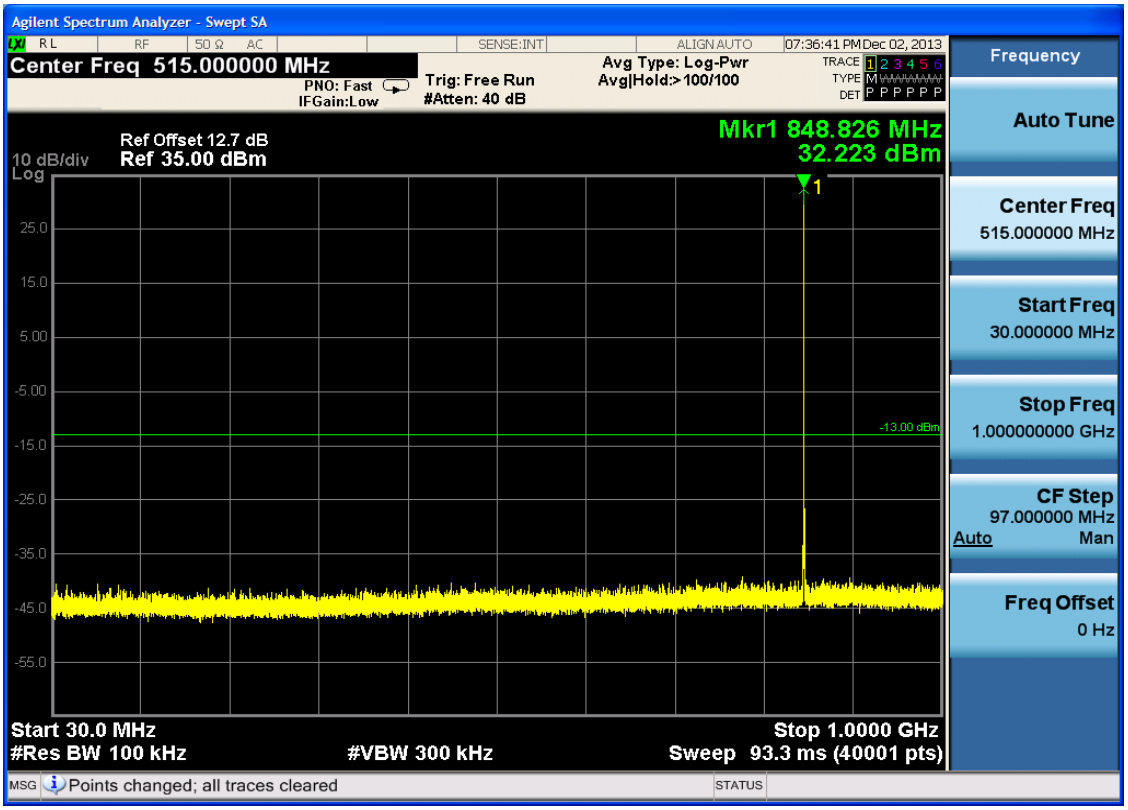


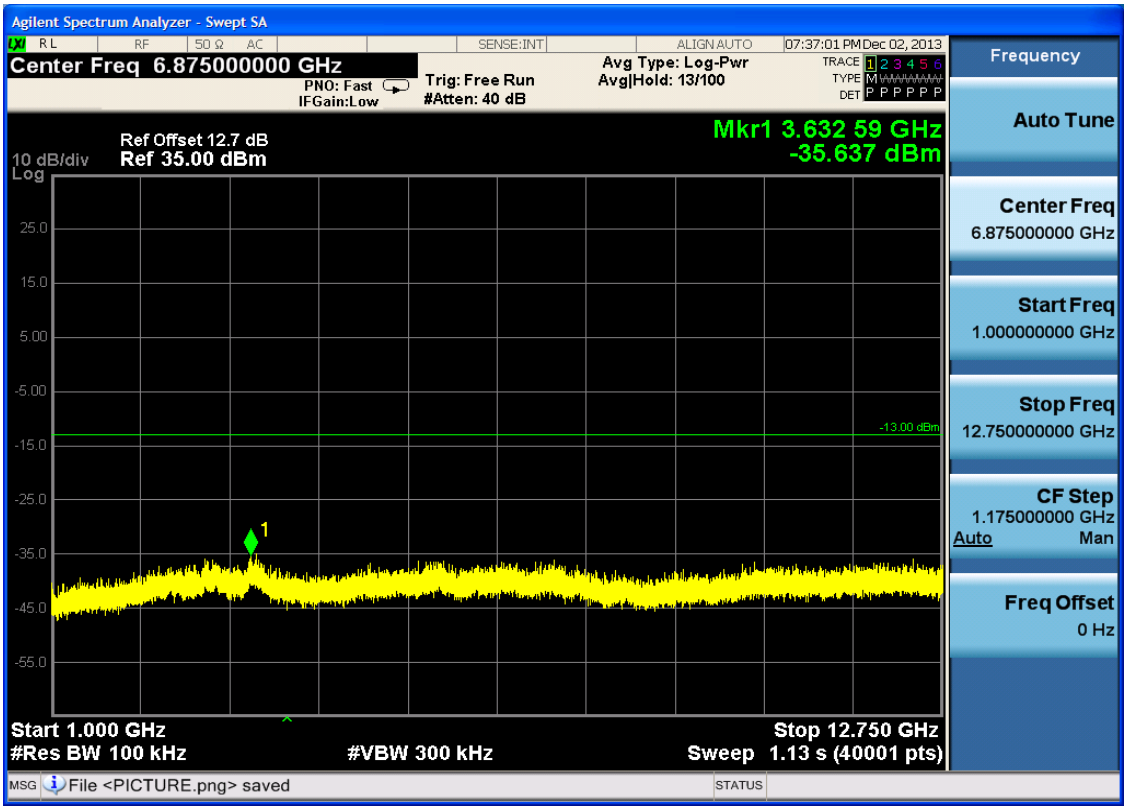


6.1.1.1.3 Test Channel = HCH



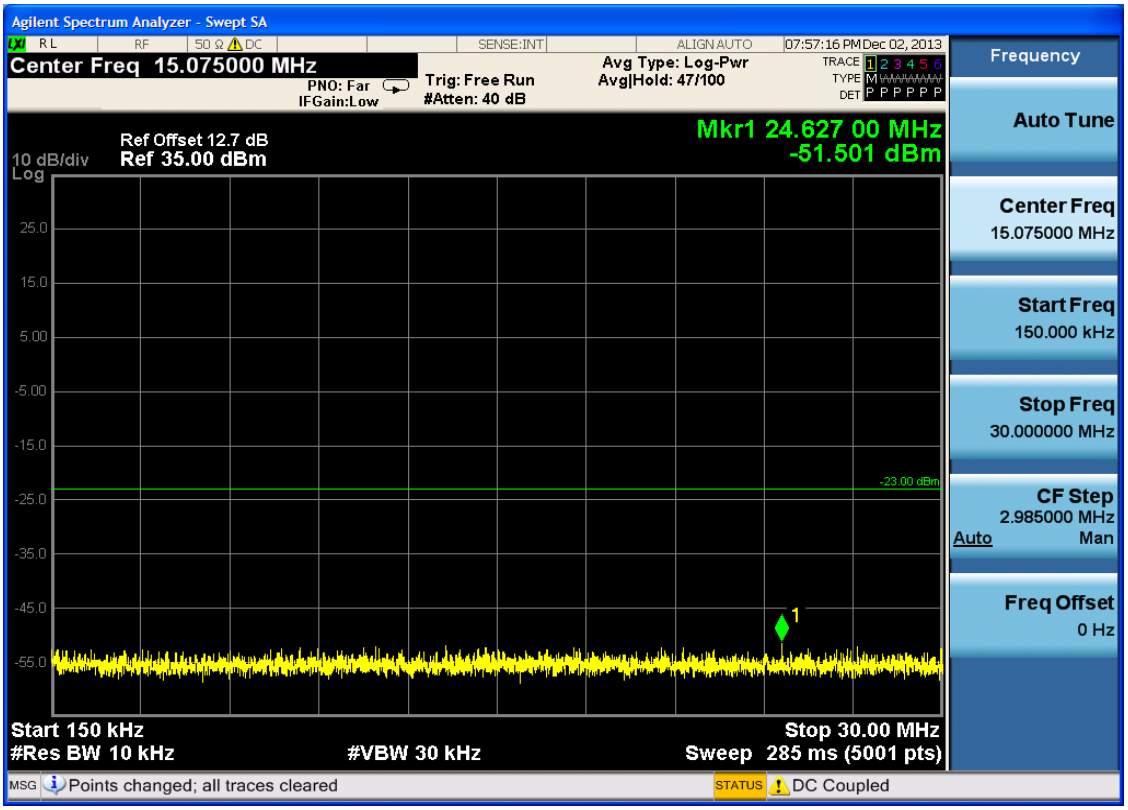


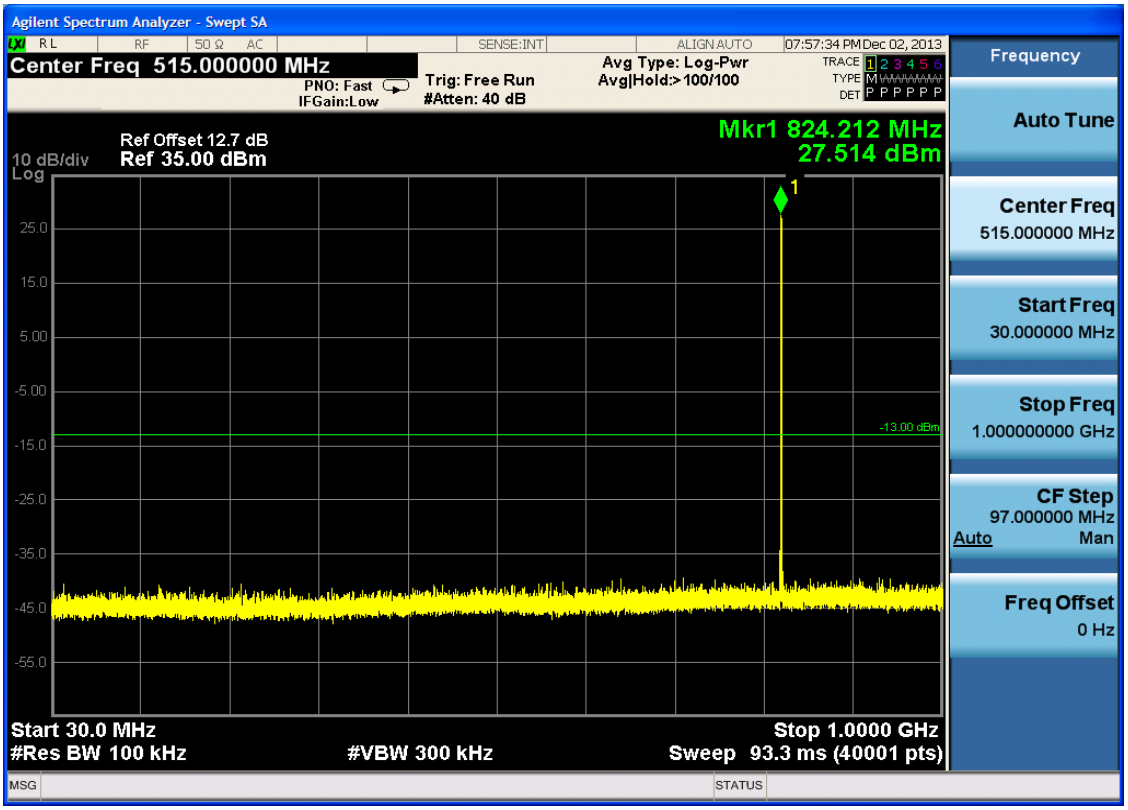


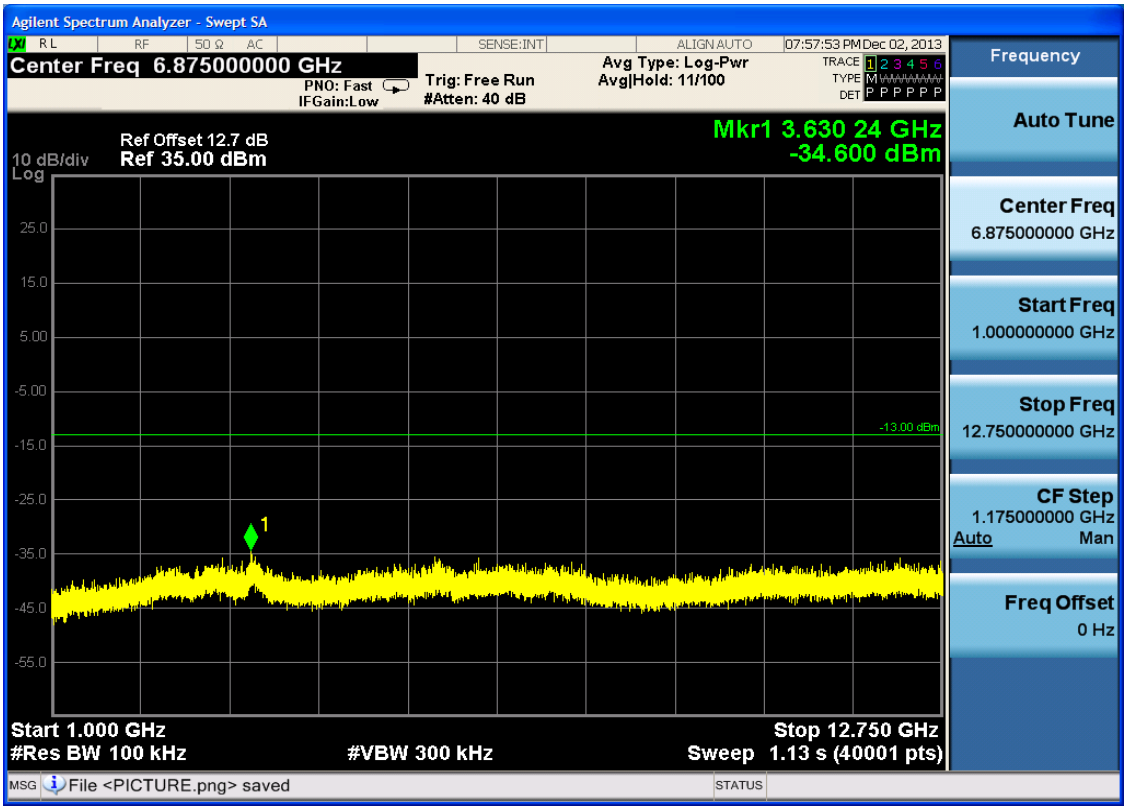


6.1.1.2 Test Mode = GSM/TM2

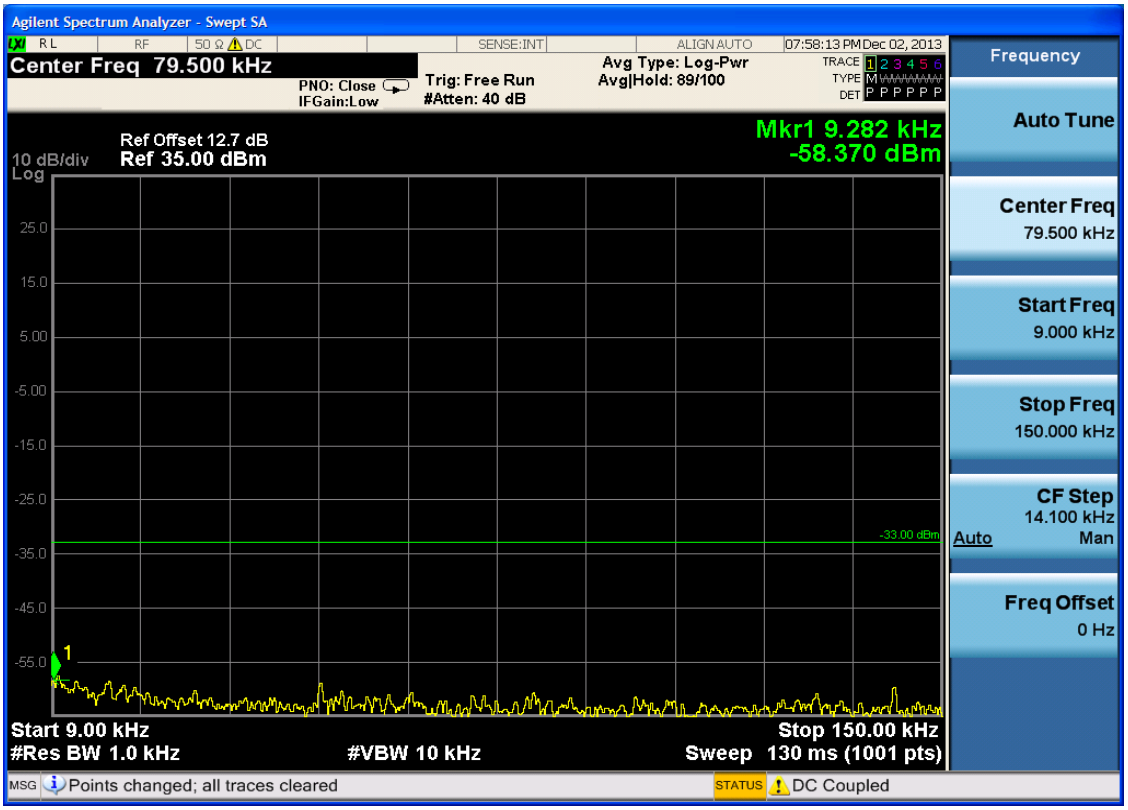
6.1.1.2.1 Test Channel = LCH

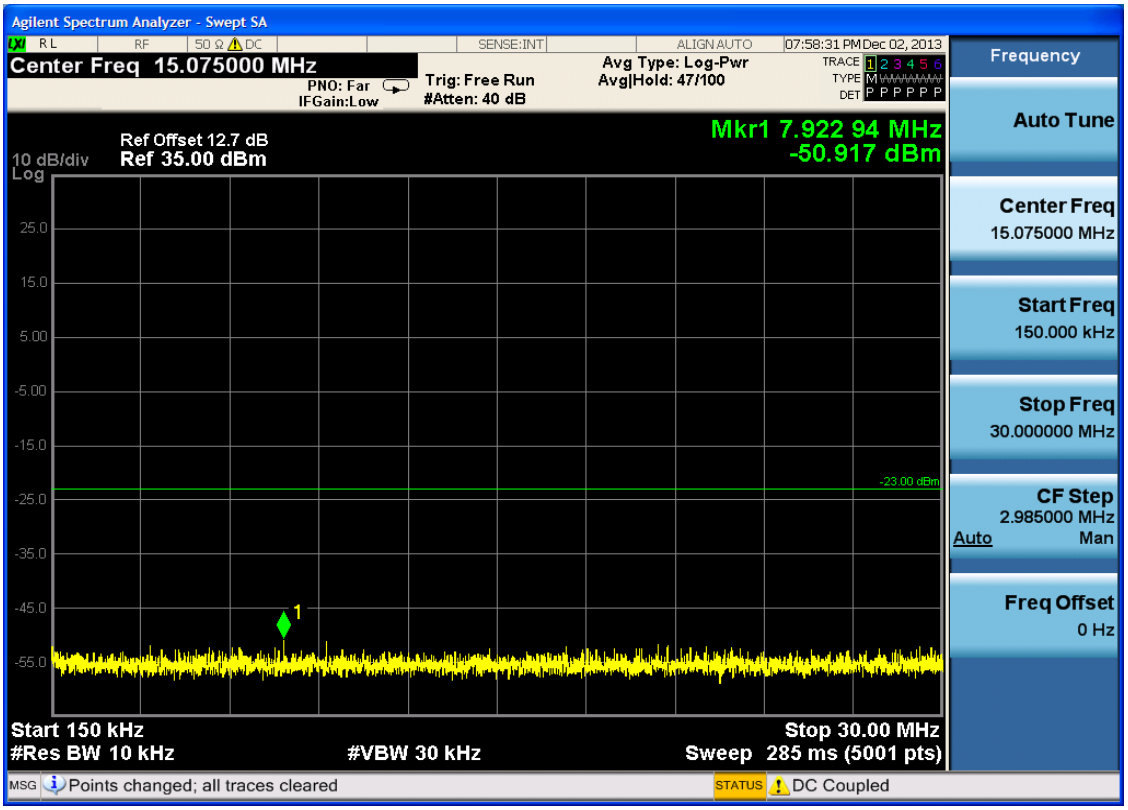


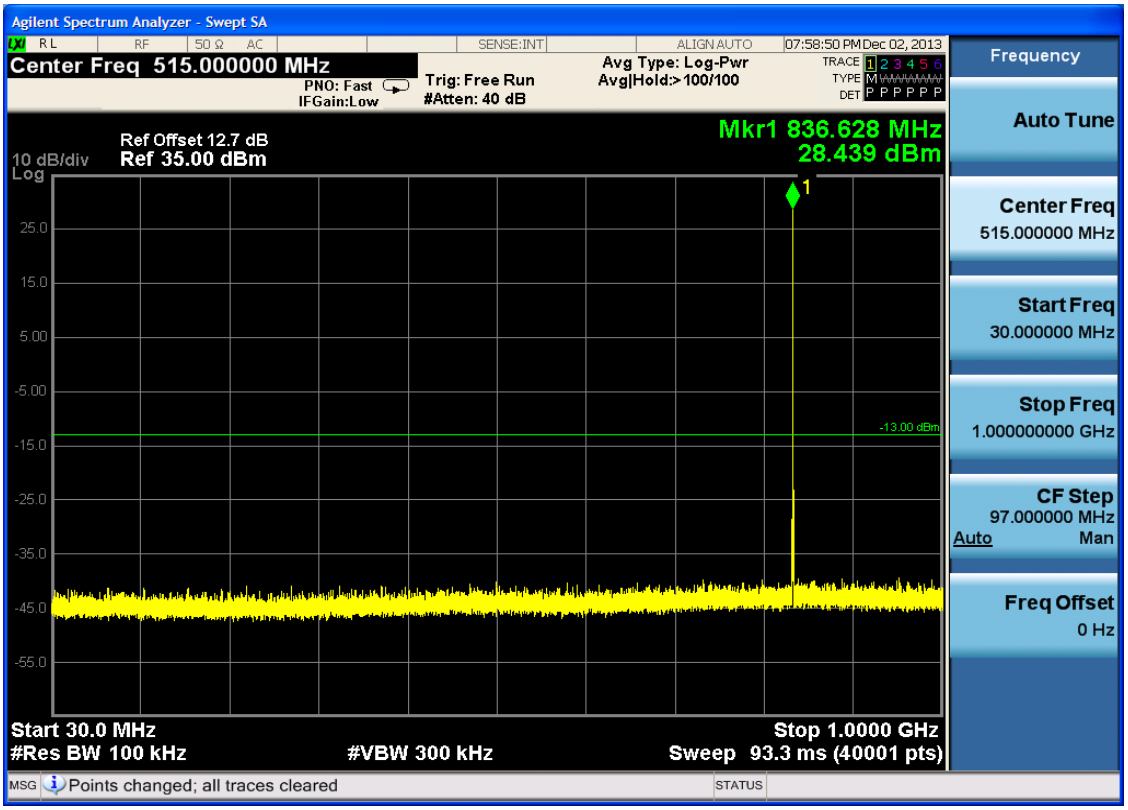


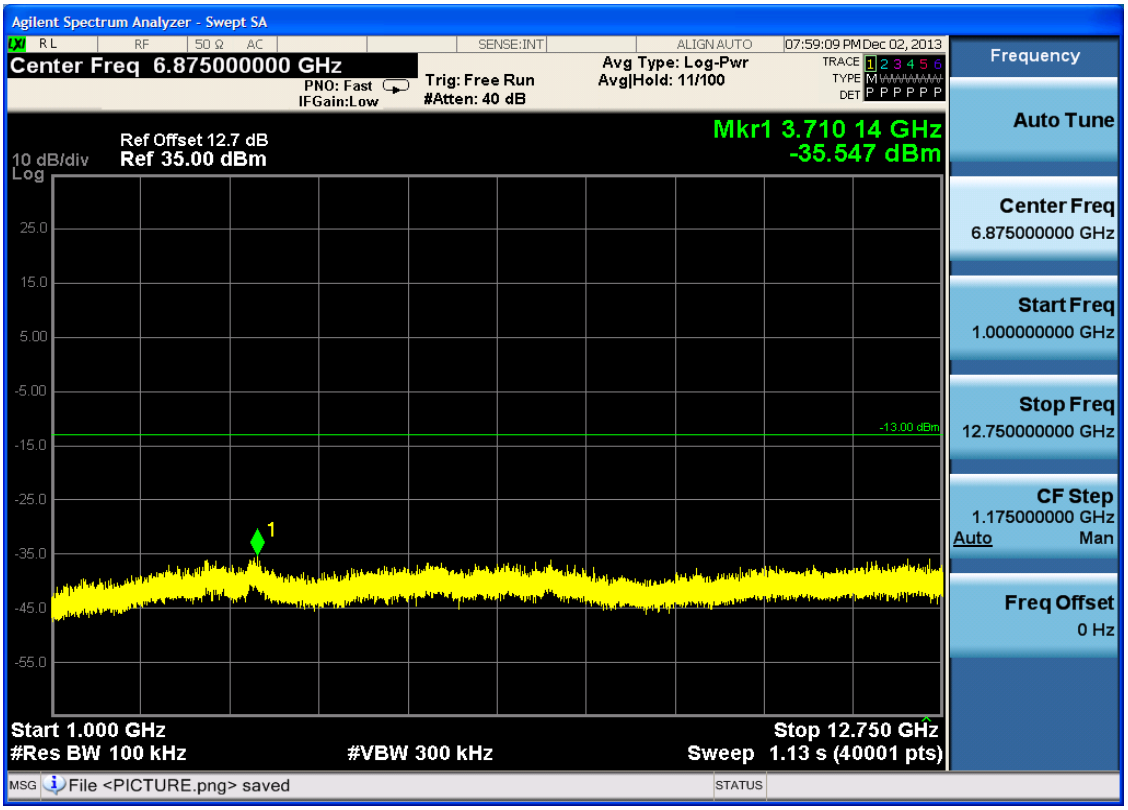


6.1.1.2.2 Test Channel = MCH

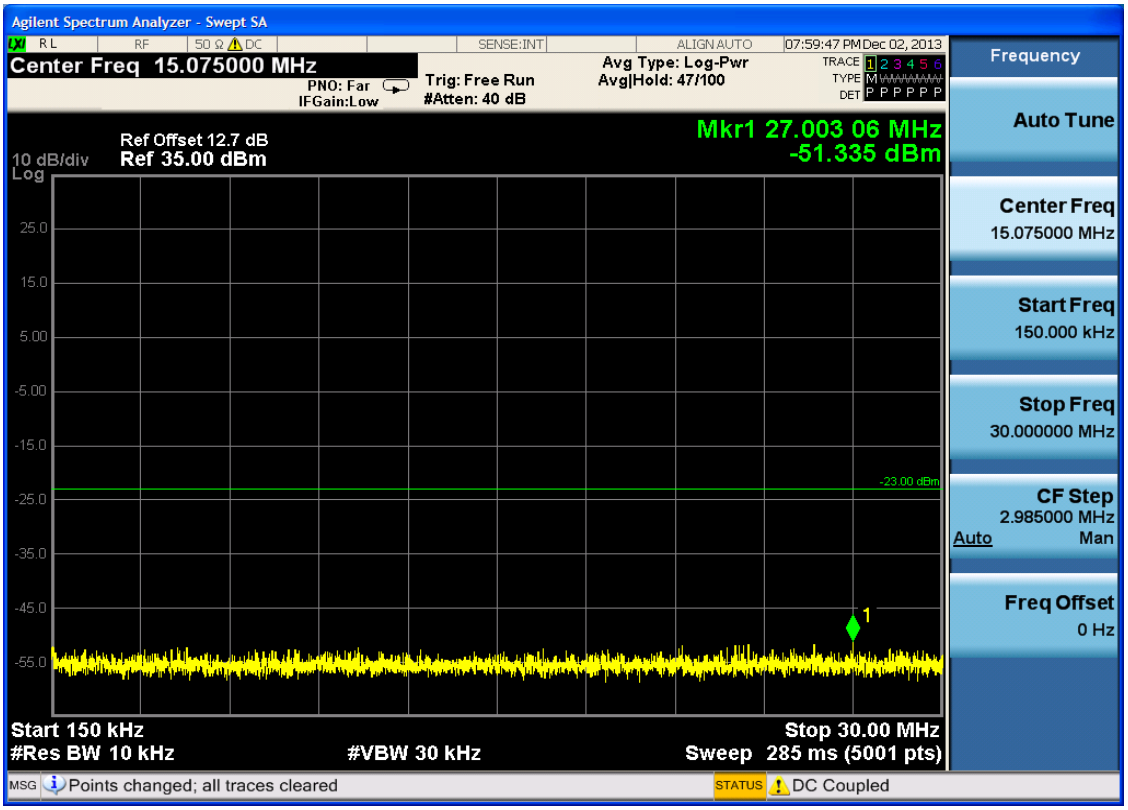


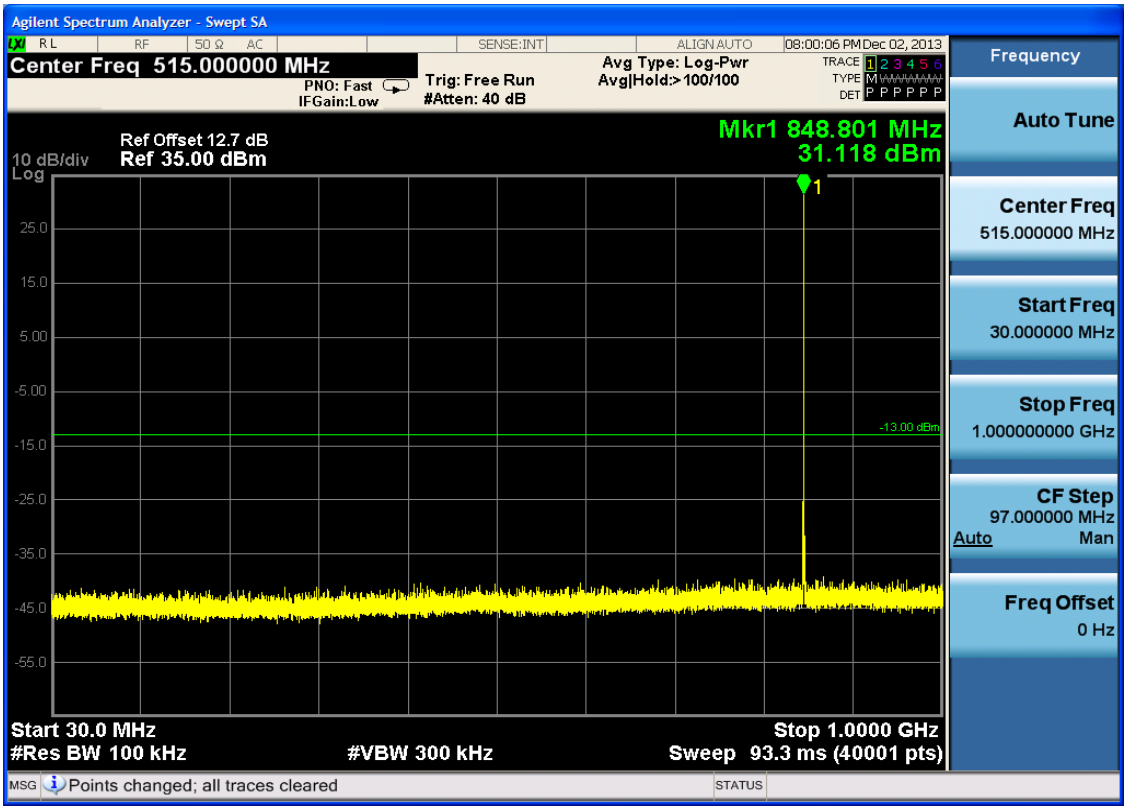


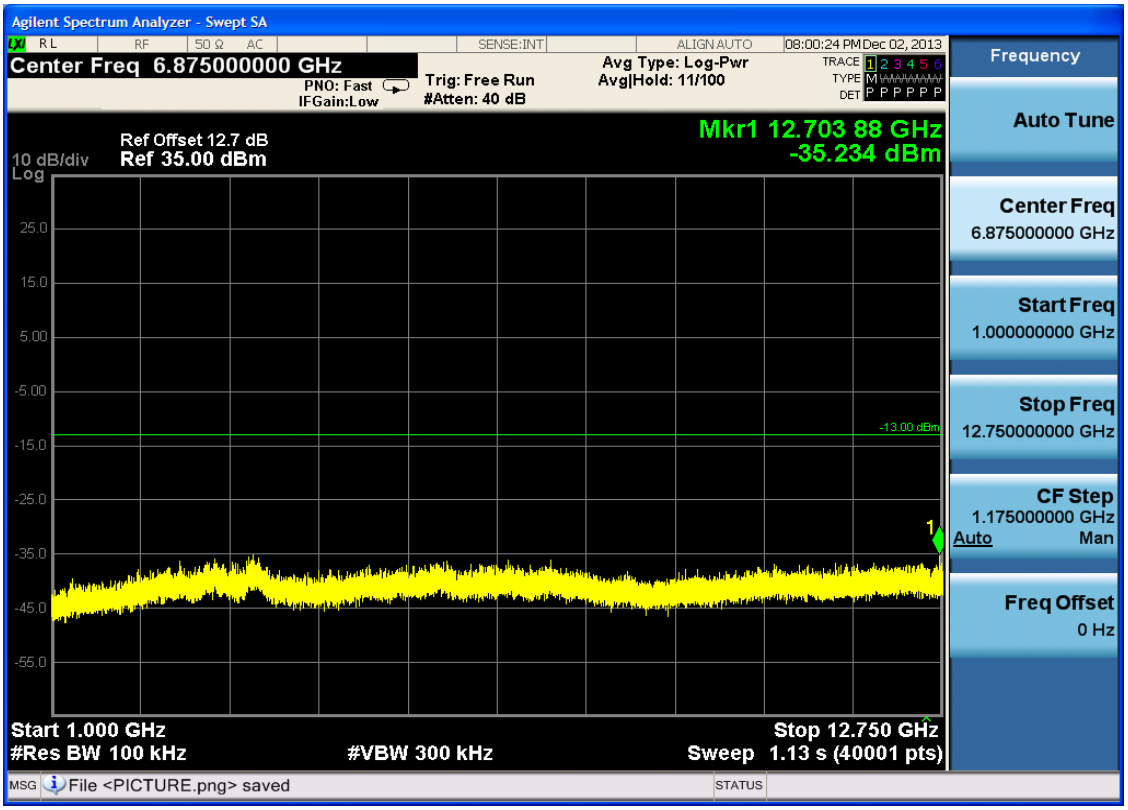




6.1.1.2.3 Test Channel = HCH



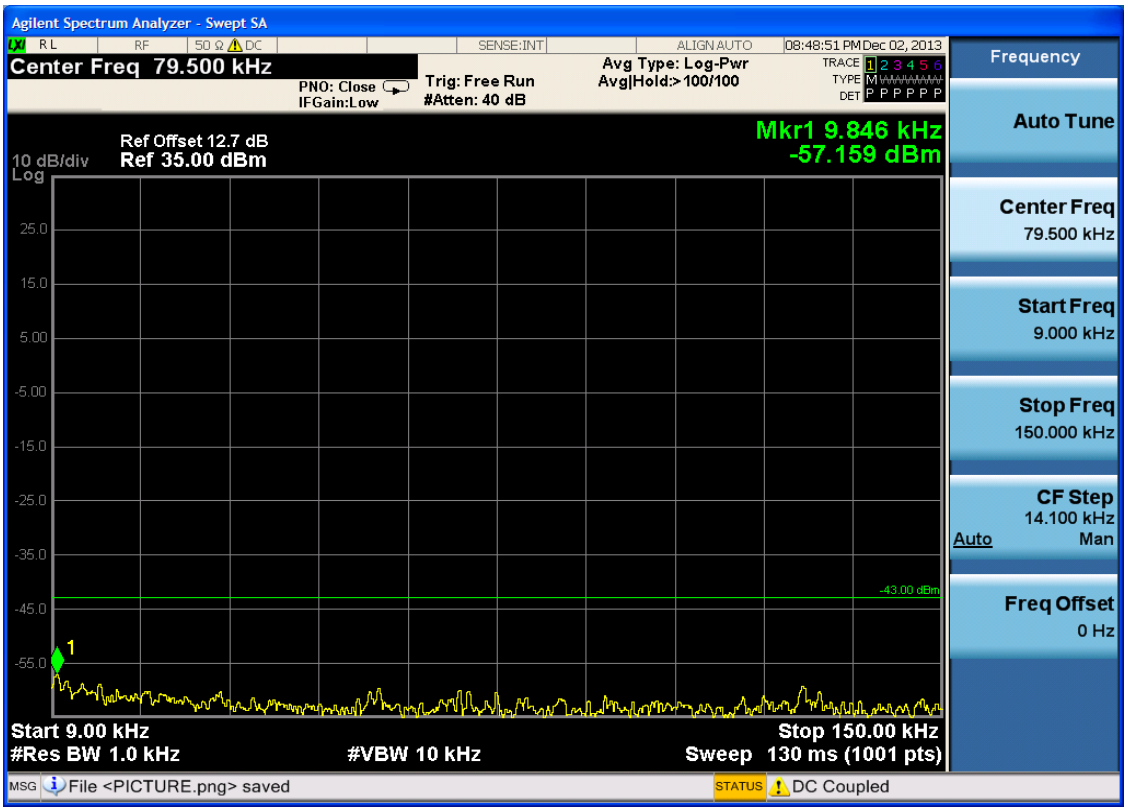


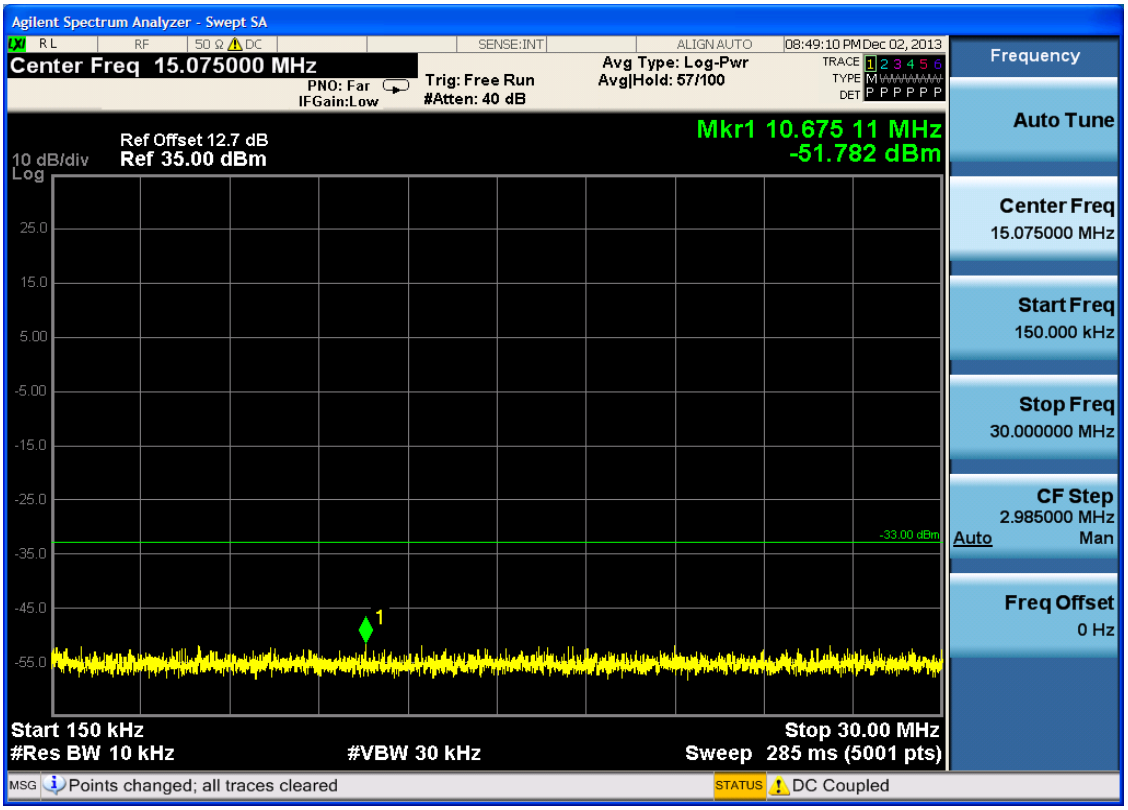


6.1.2 Test Band = GSM1900

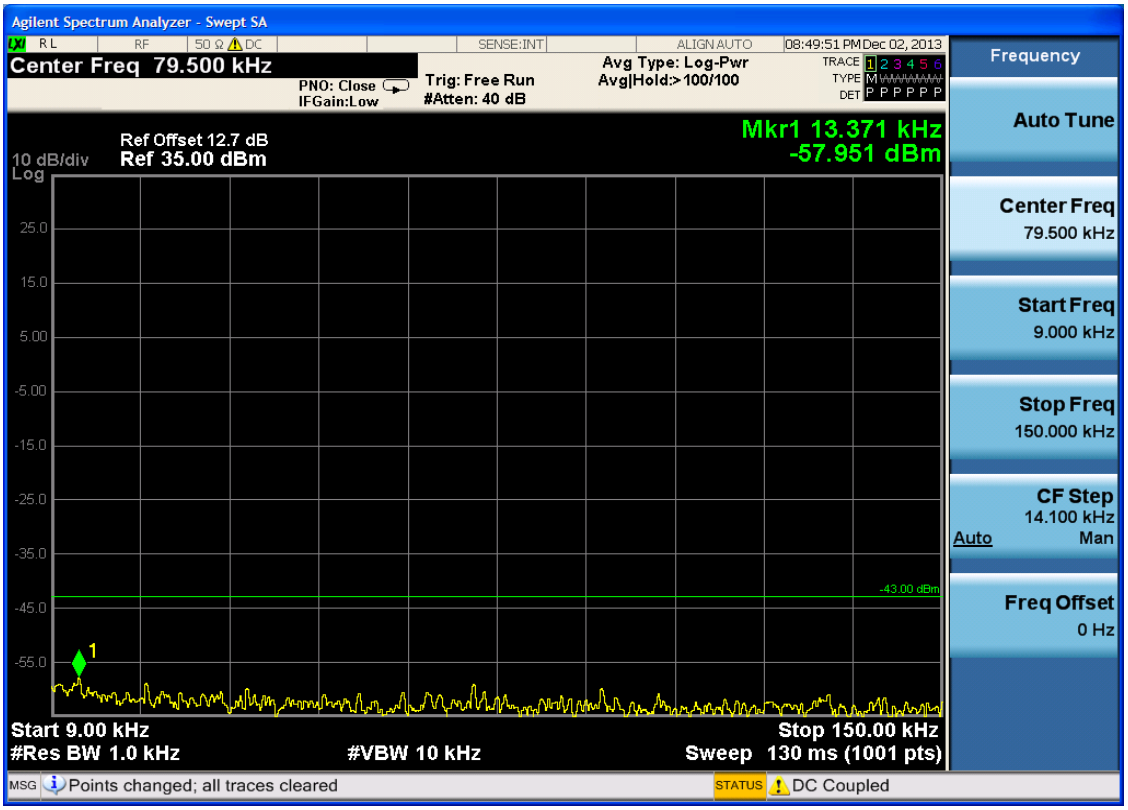
6.1.2.1 Test Mode = GSM/TM1

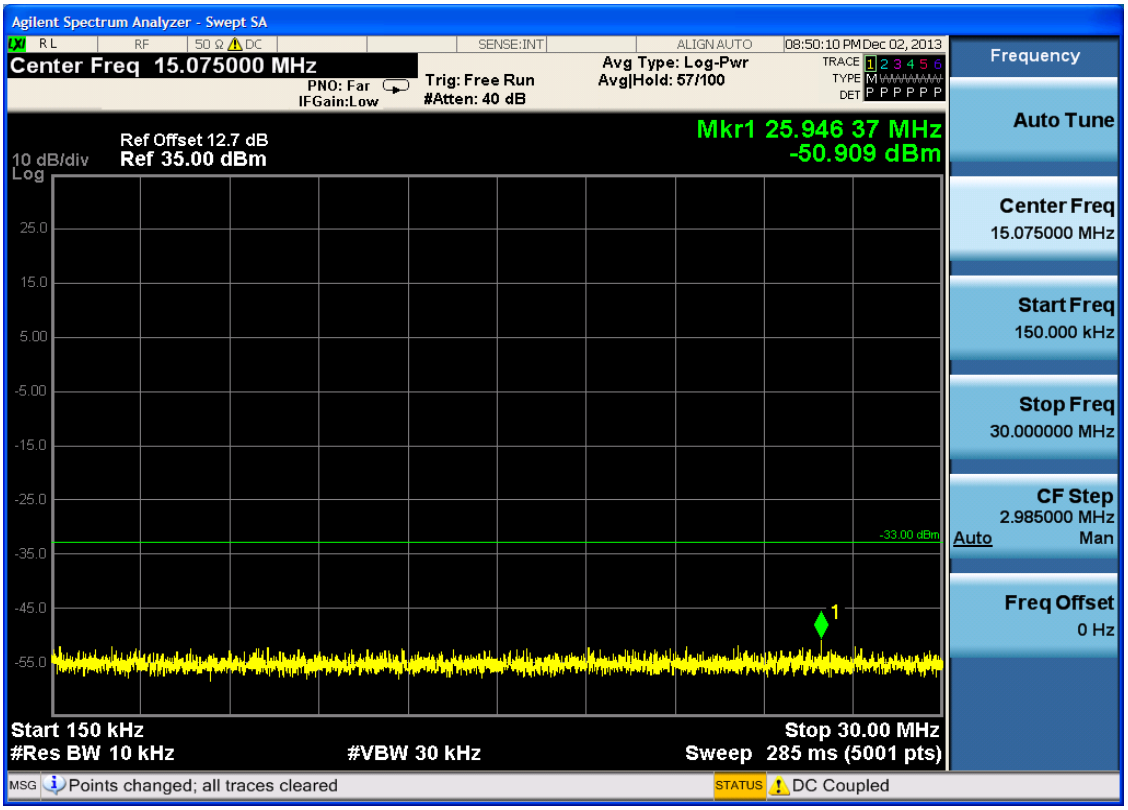
6.1.2.1.1 Test Channel = LCH



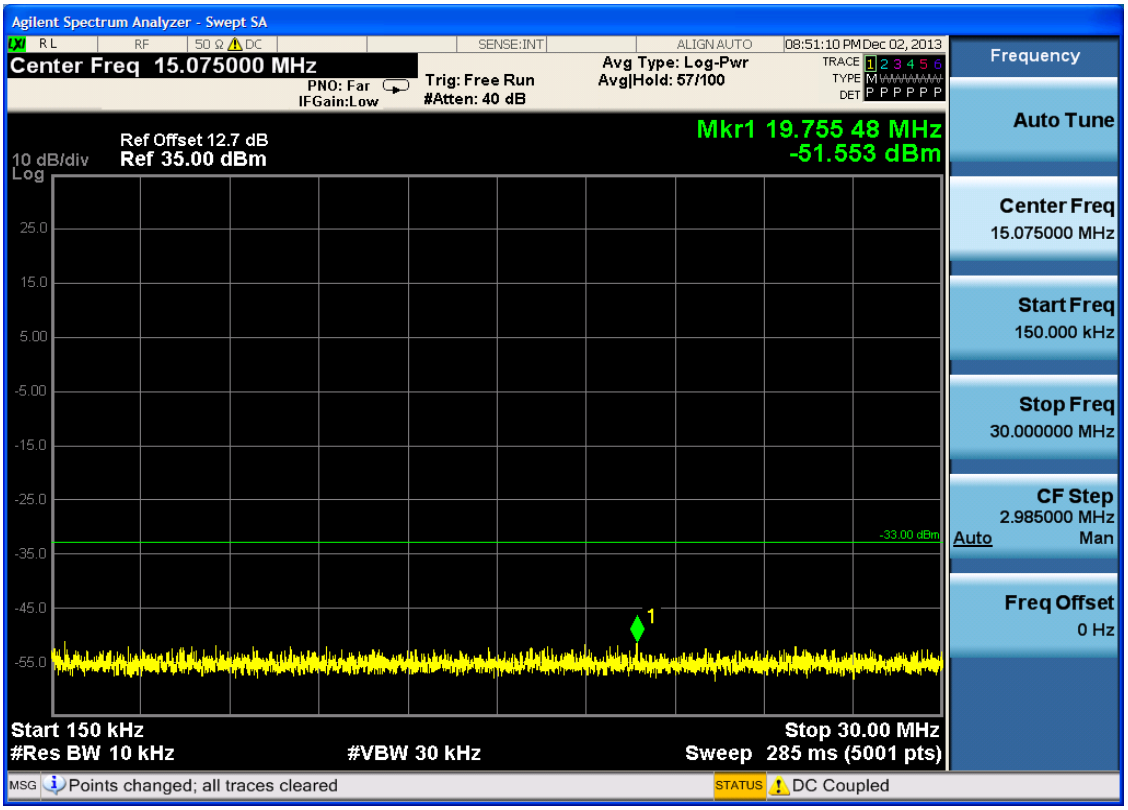


6.1.2.1.2 Test Channel = MCH



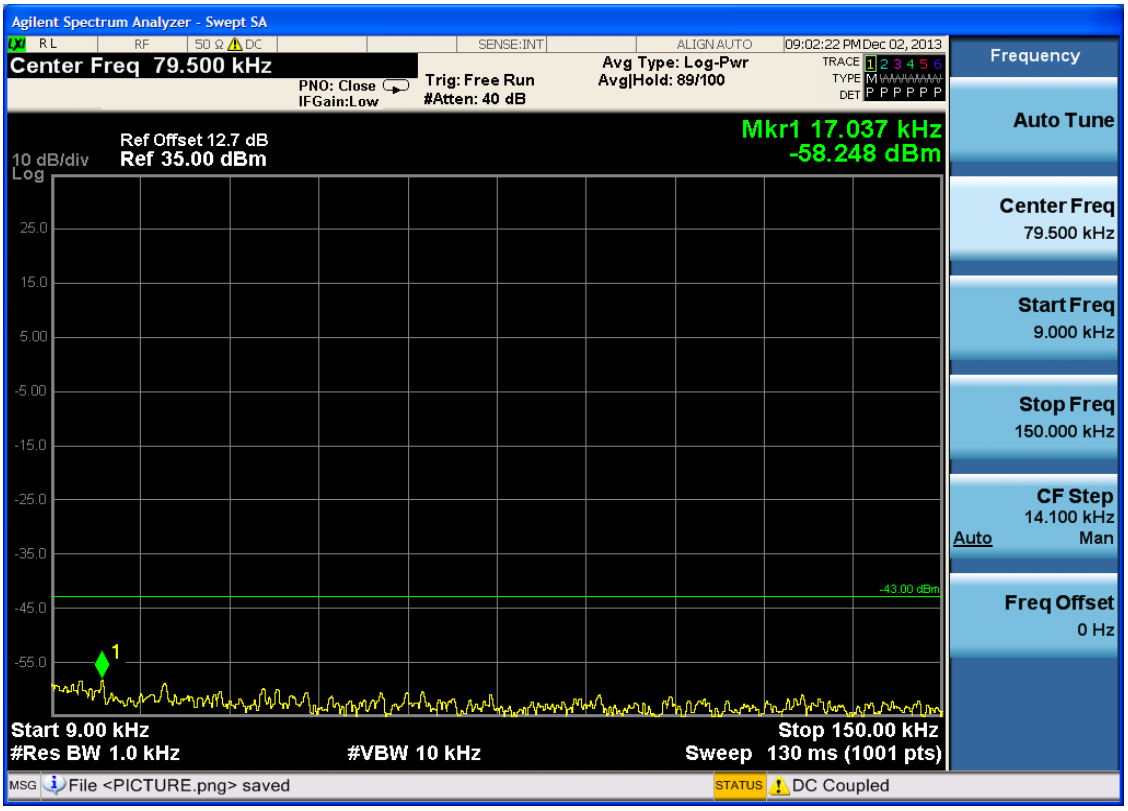


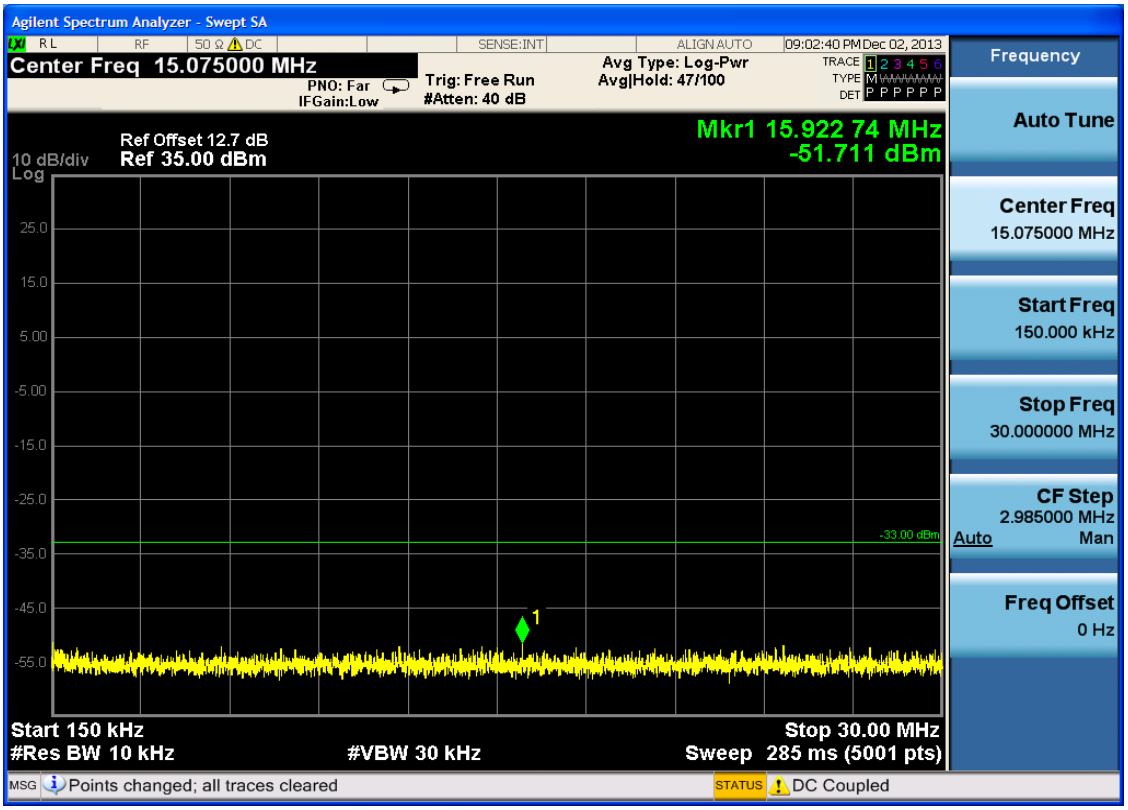
6.1.2.1.3 Test Channel = HCH



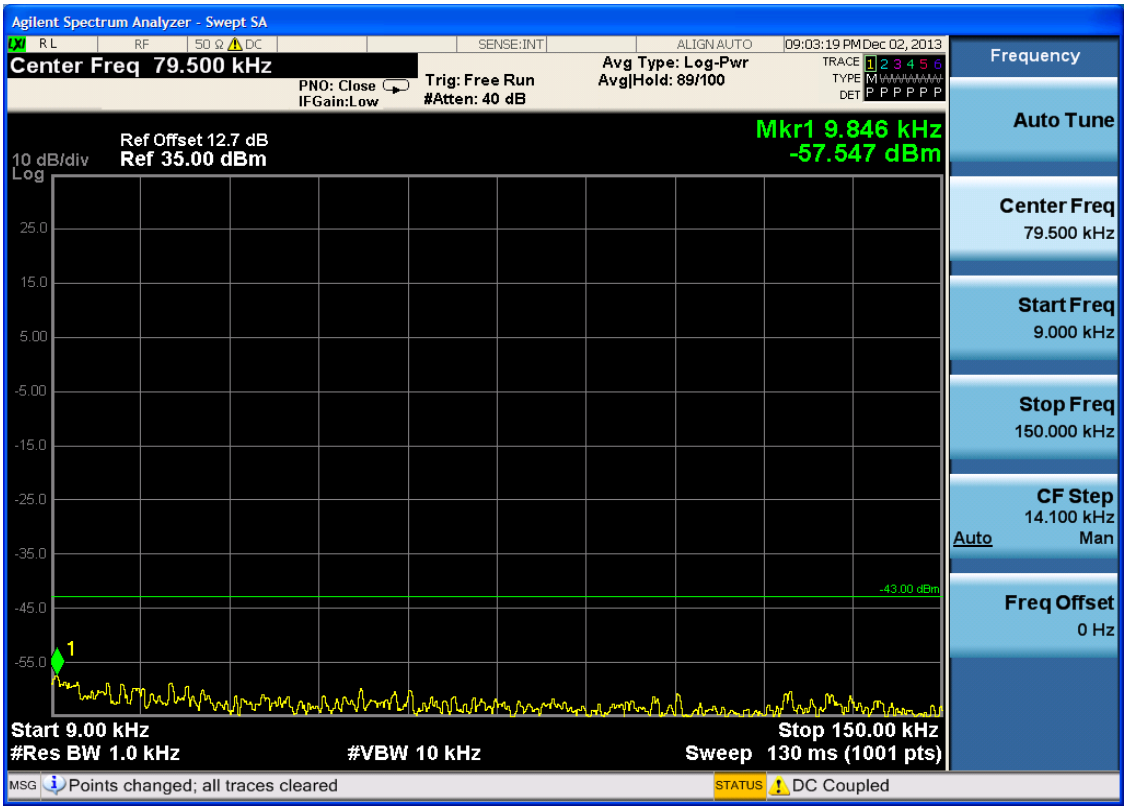
6.1.2.2 Test Mode = GSM/TM2

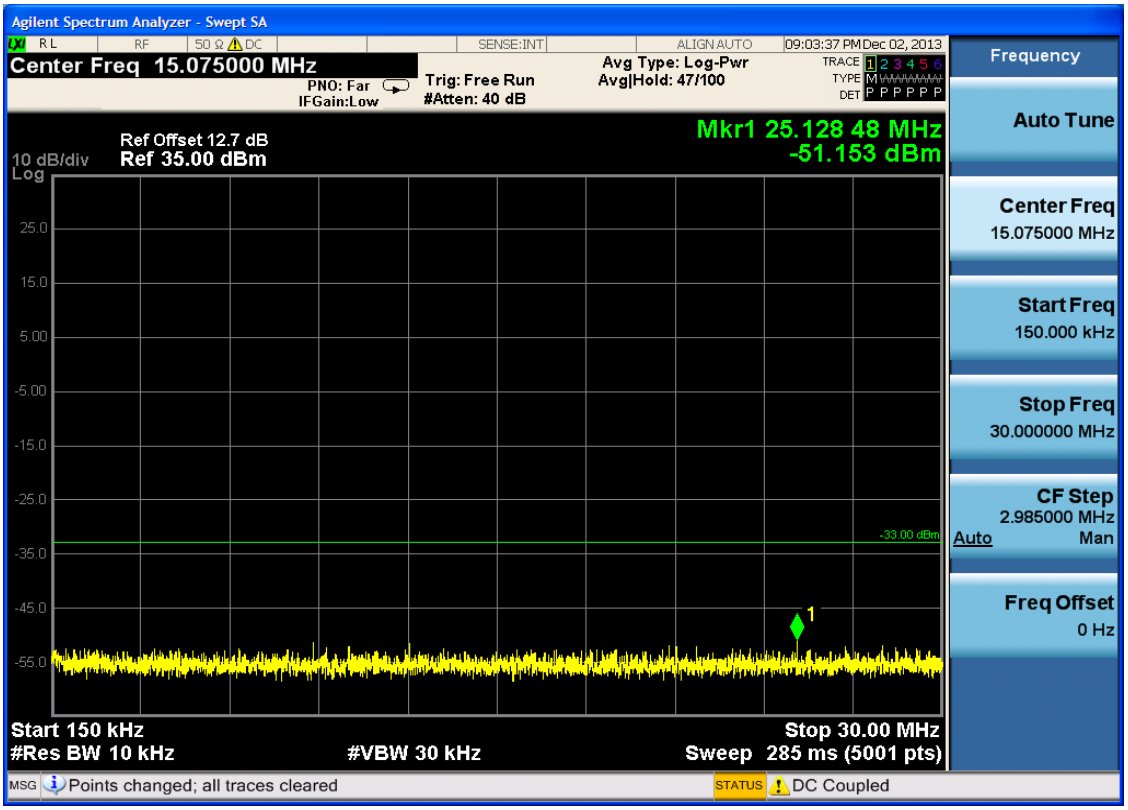
6.1.2.2.1 Test Channel = LCH



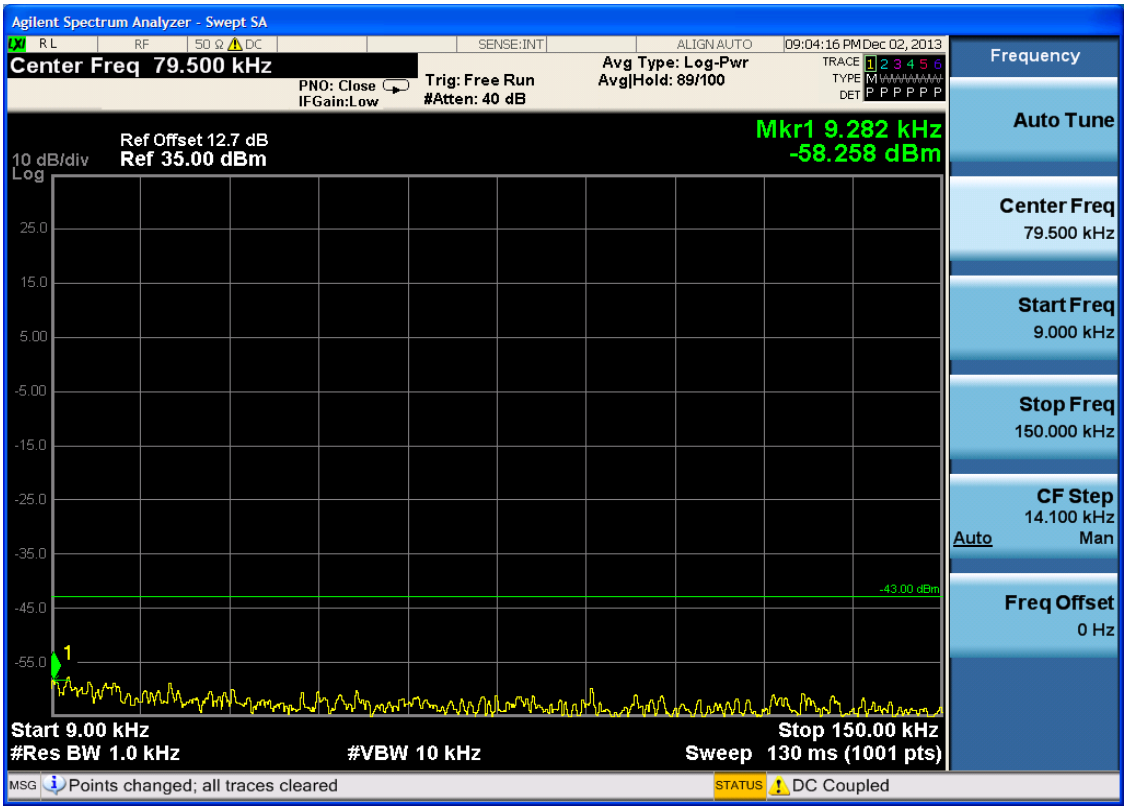


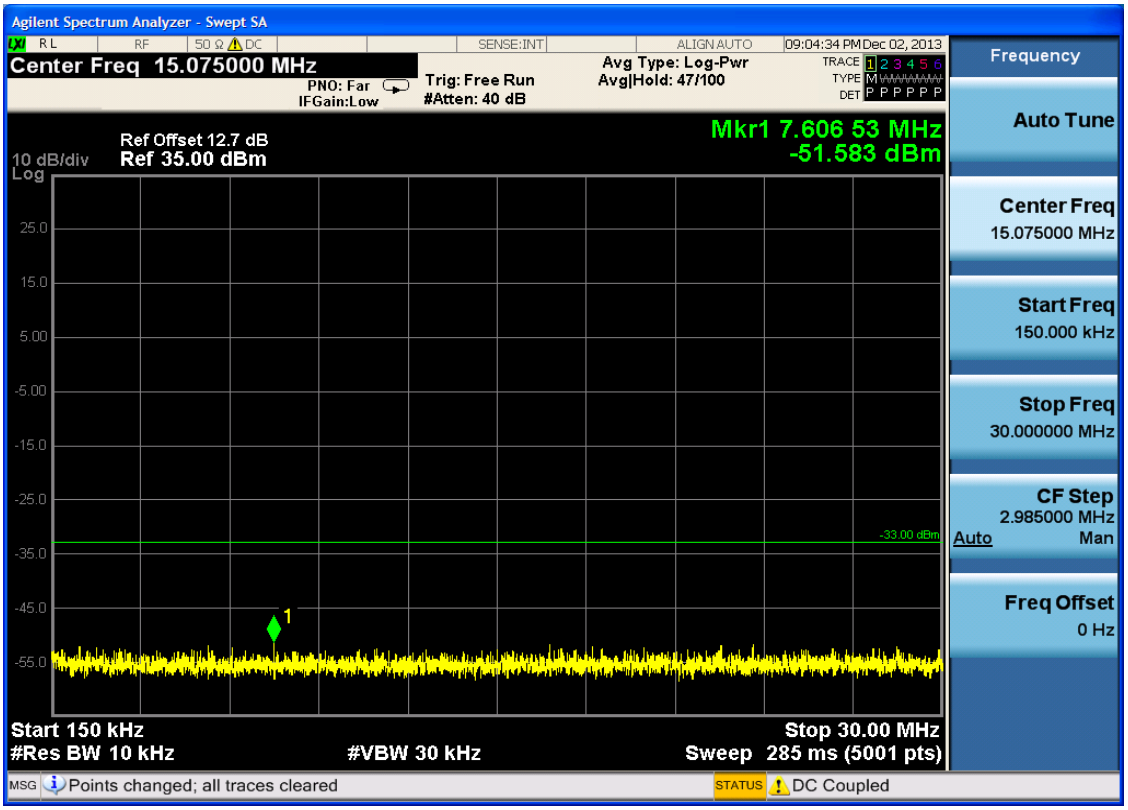
6.1.2.2.2 Test Channel = MCH





6.1.2.2.3 Test Channel = HCH



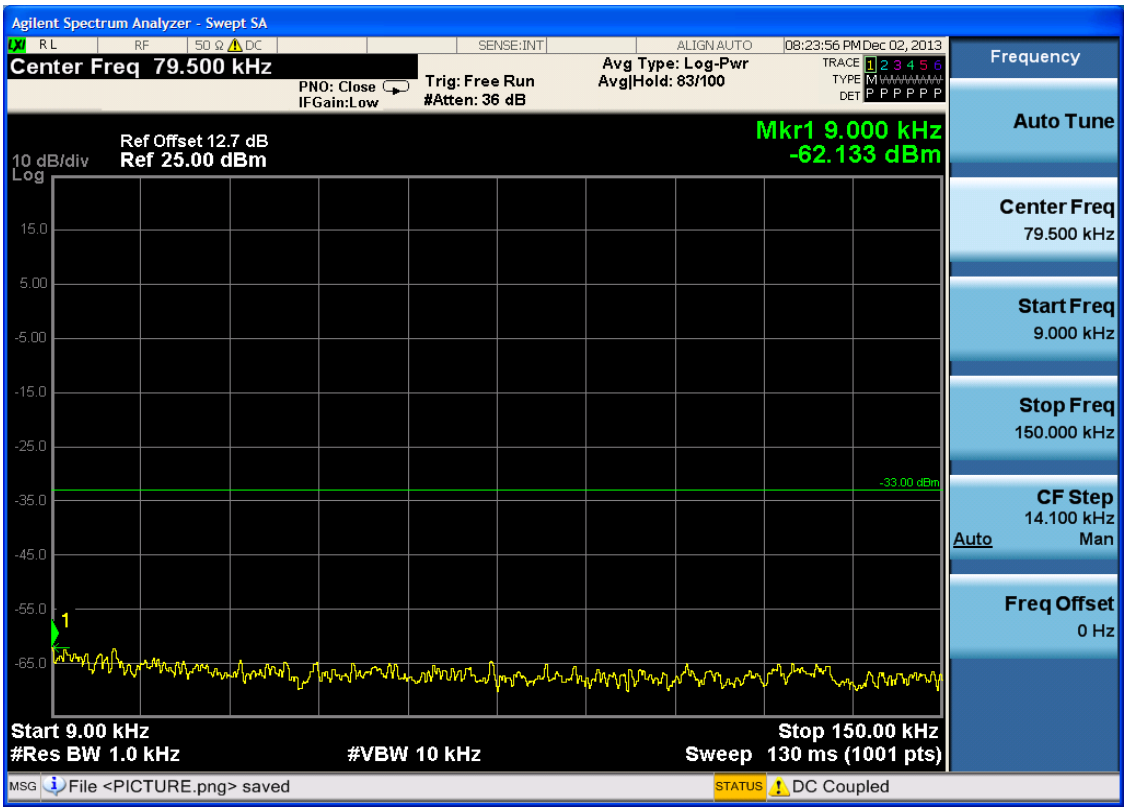


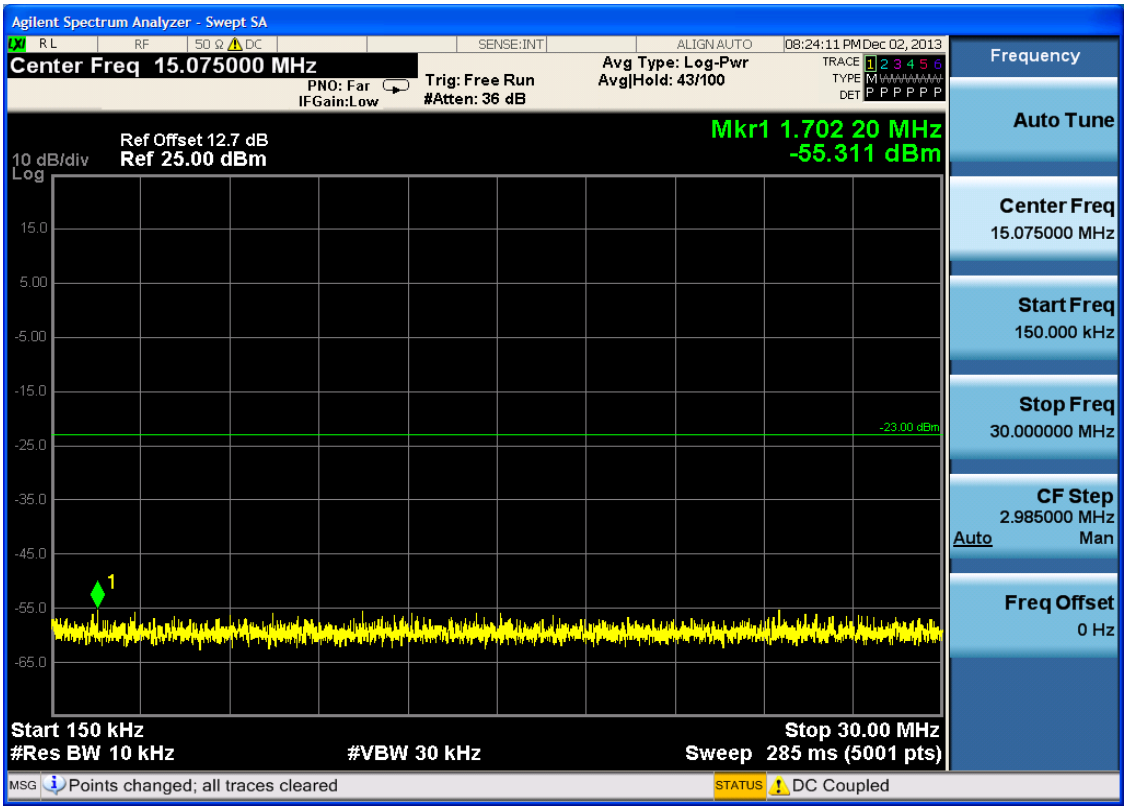
6.2 For UMTS

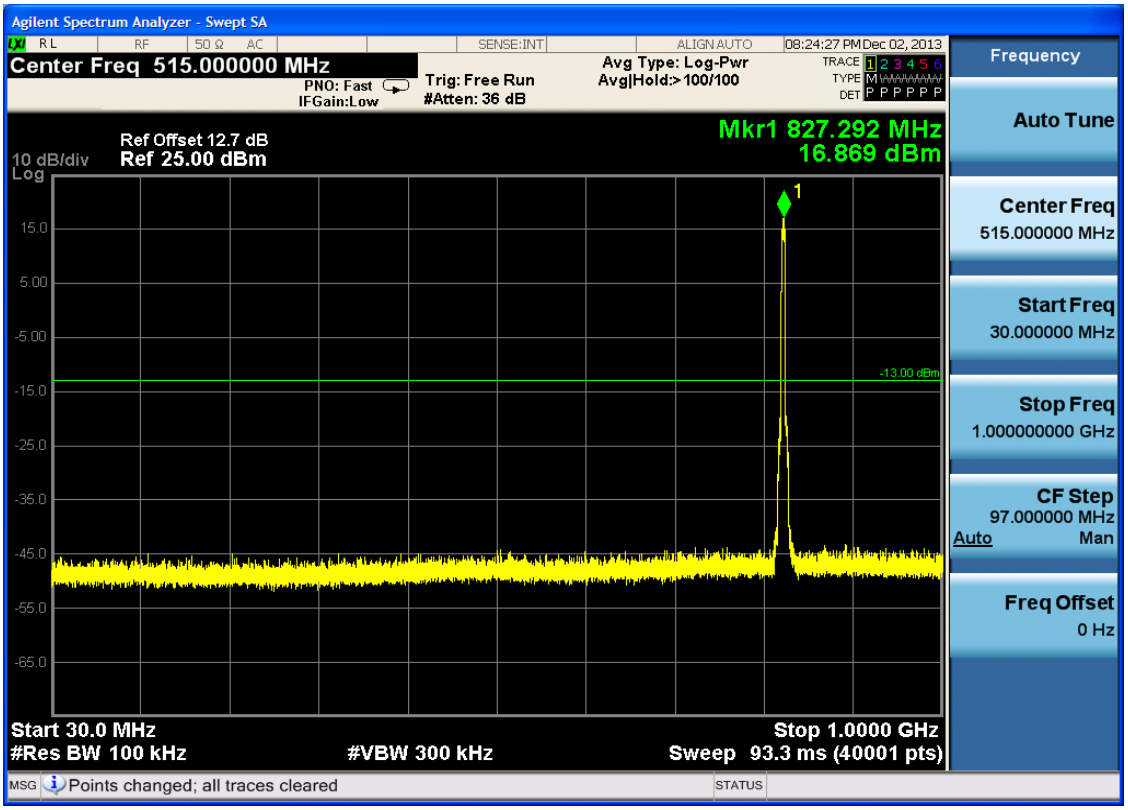
6.2.1 Test Band = WCDMA850

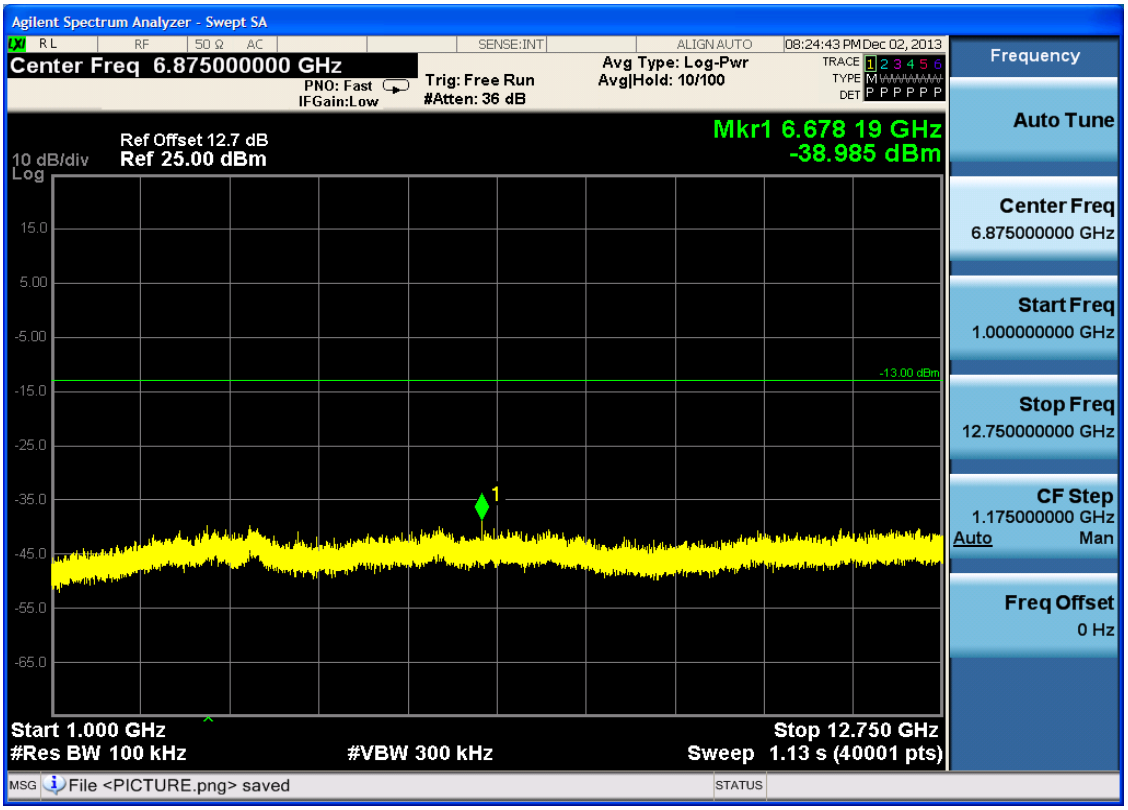
6.2.1.1 Test Mode = UMTS/TM1

6.2.1.1.1 Test Channel = LCH

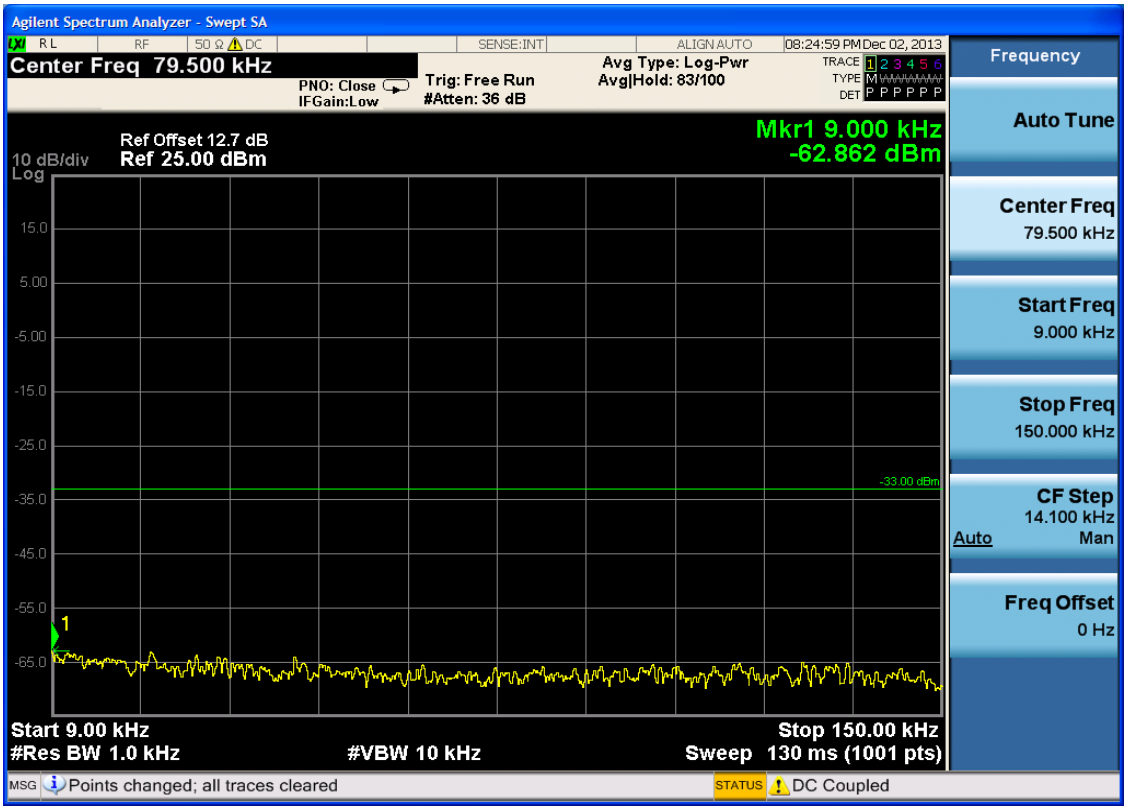


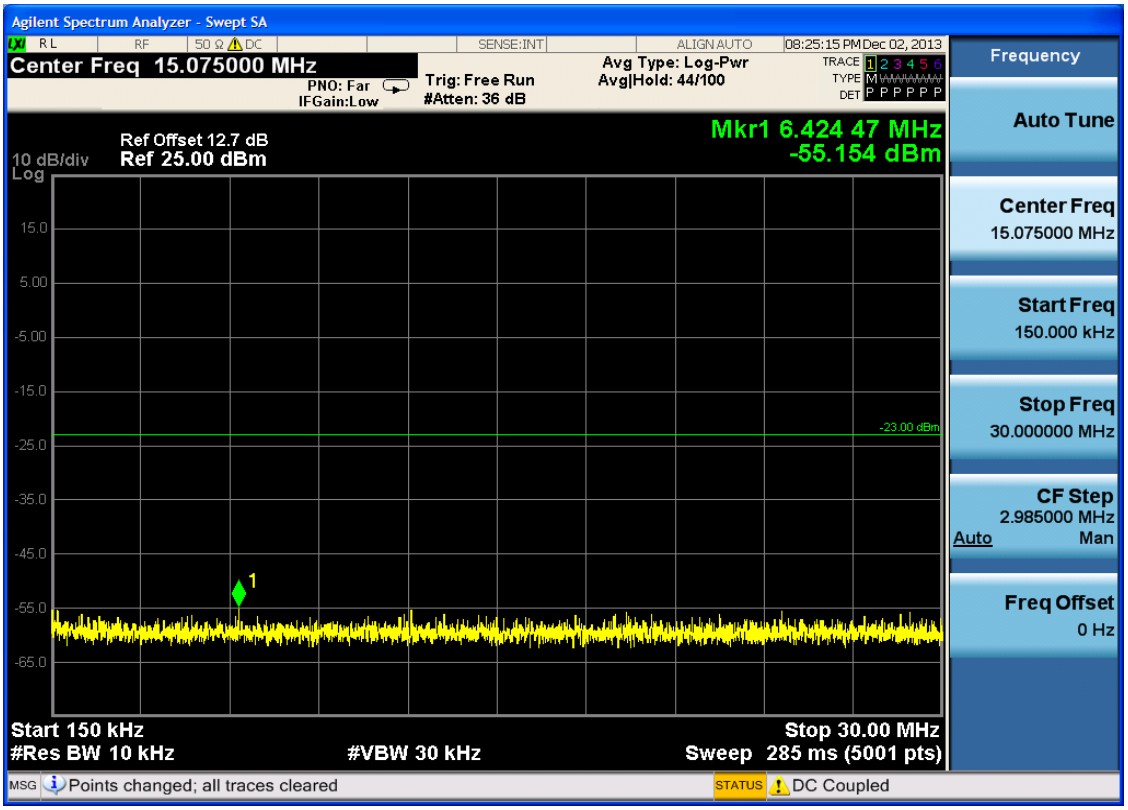


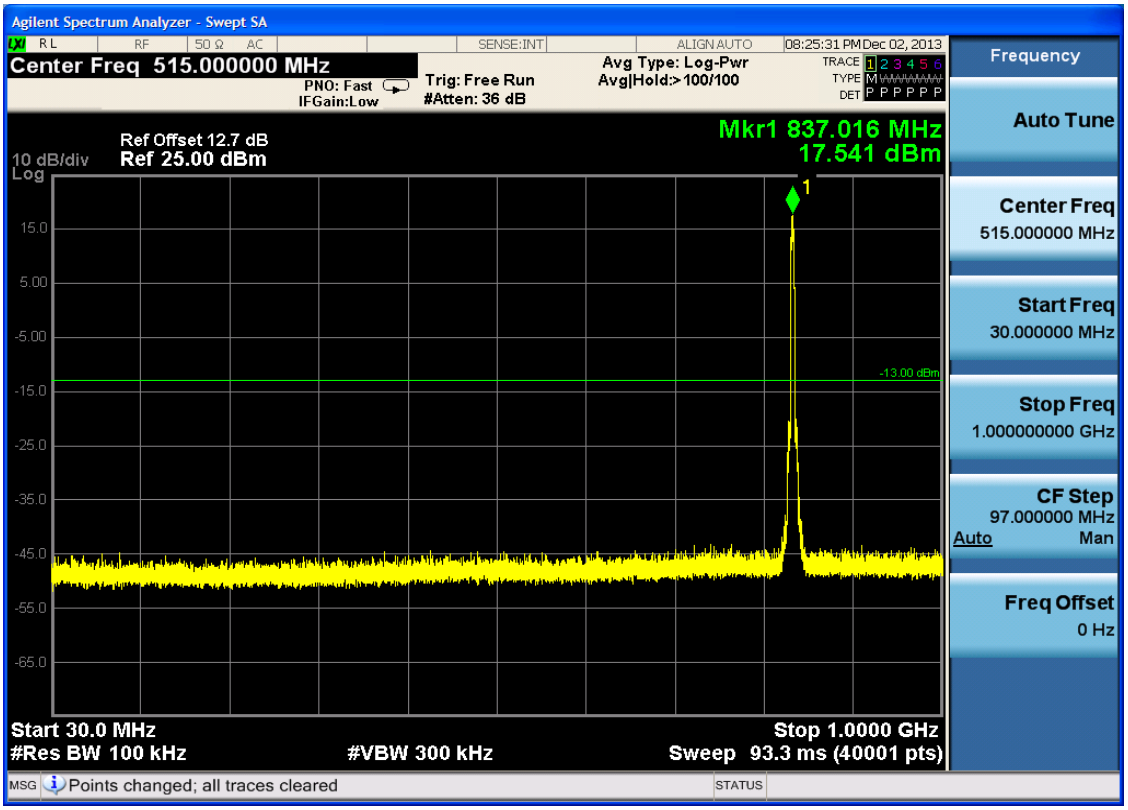


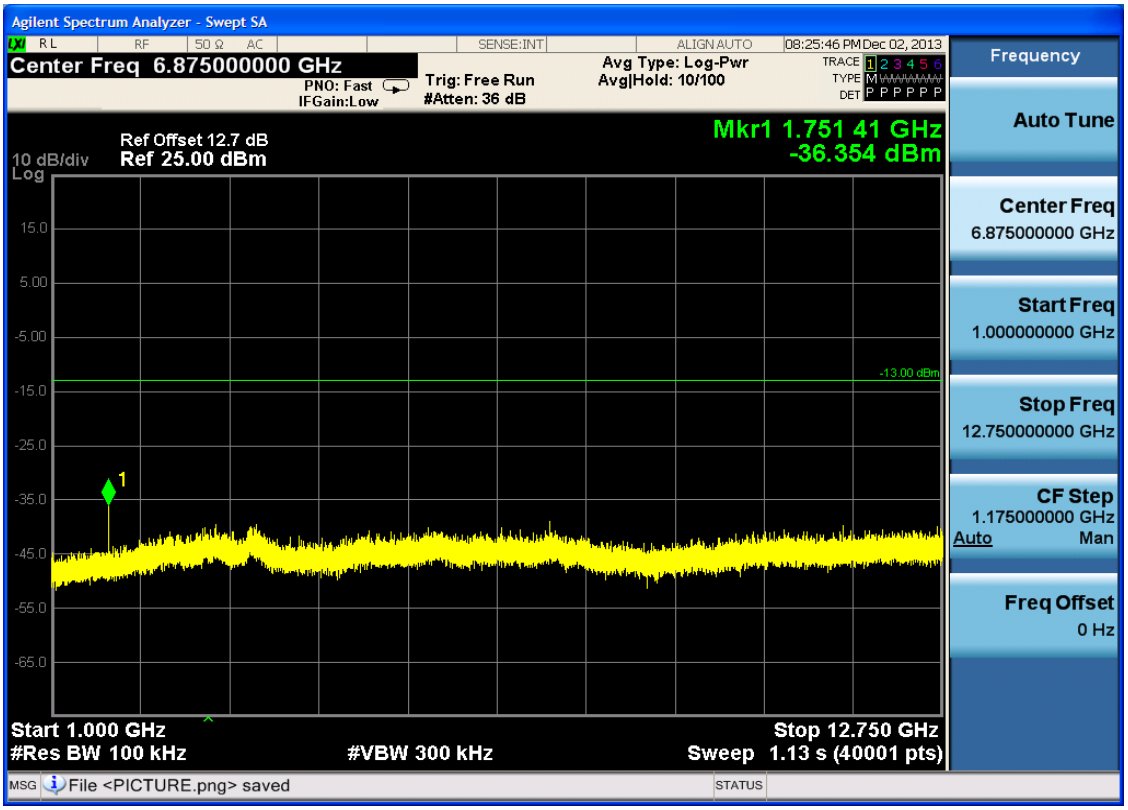


6.2.1.1.2 Test Channel = MCH

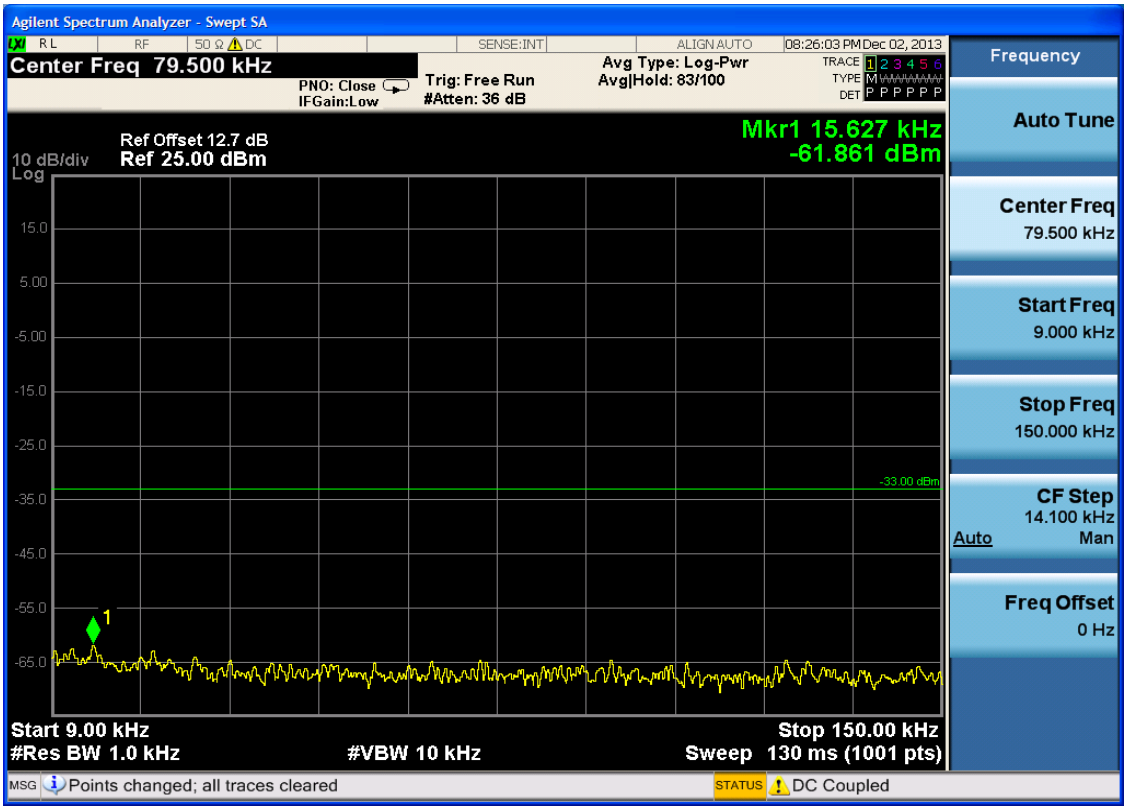


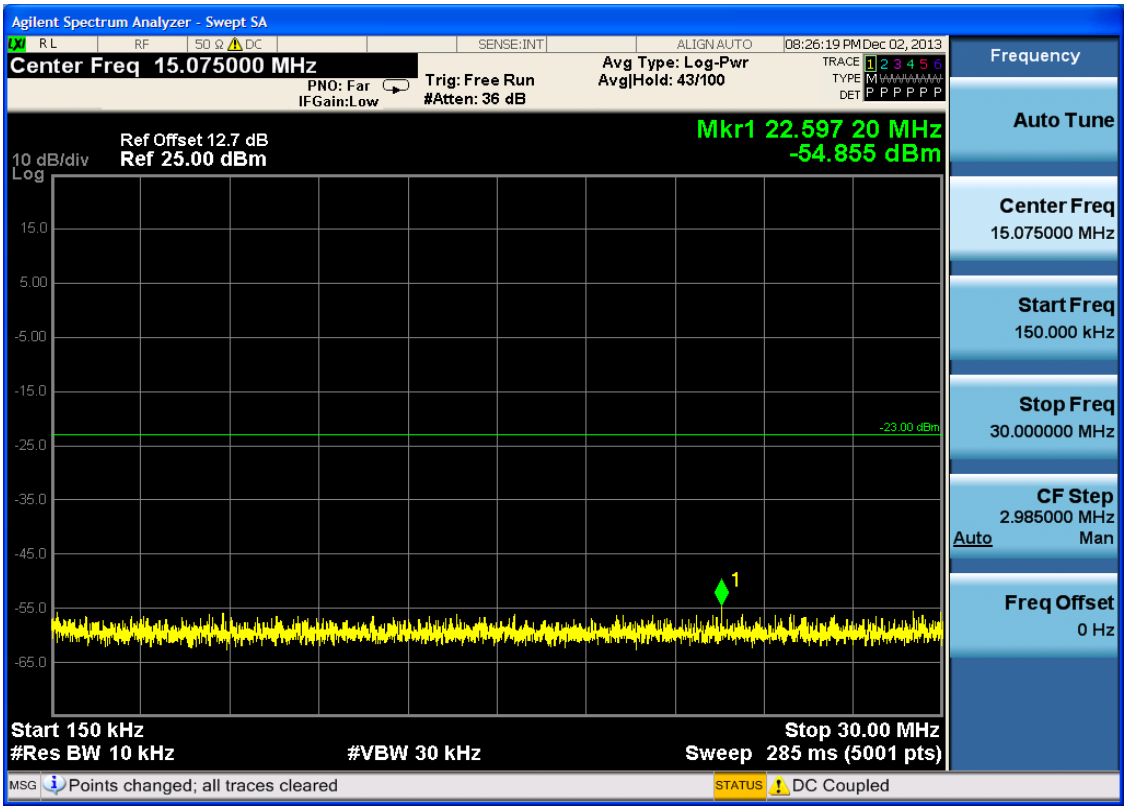


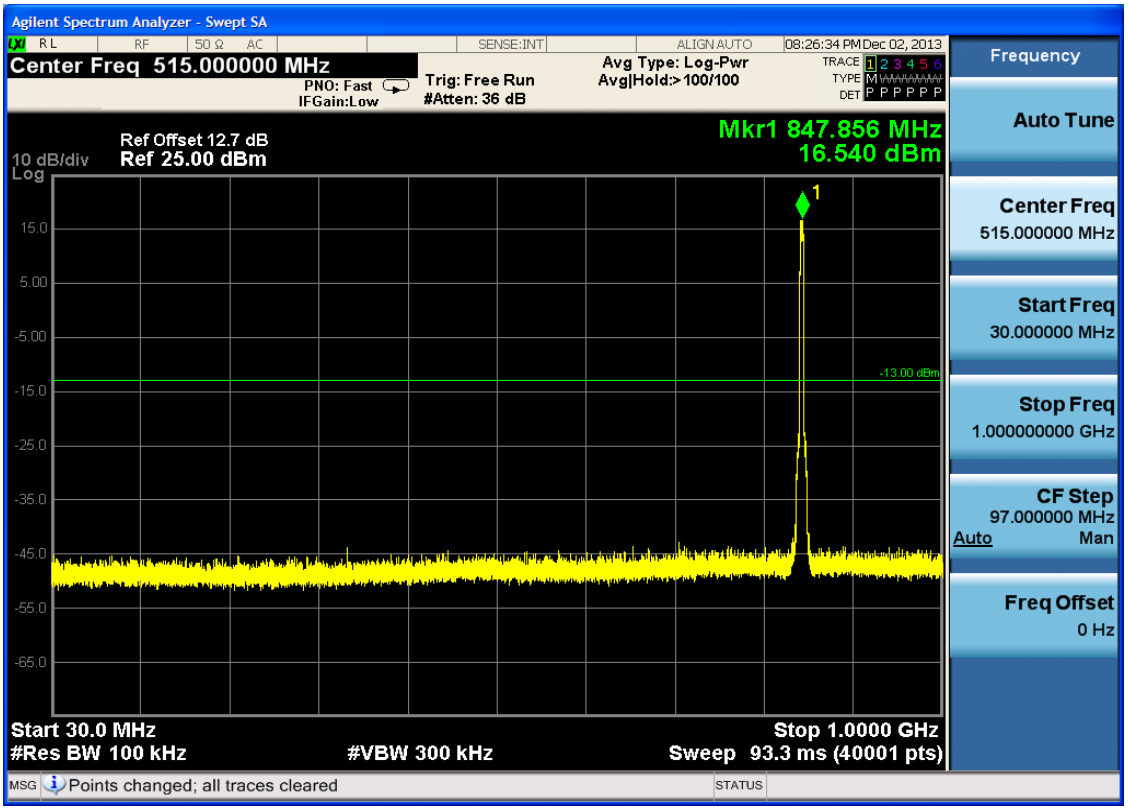


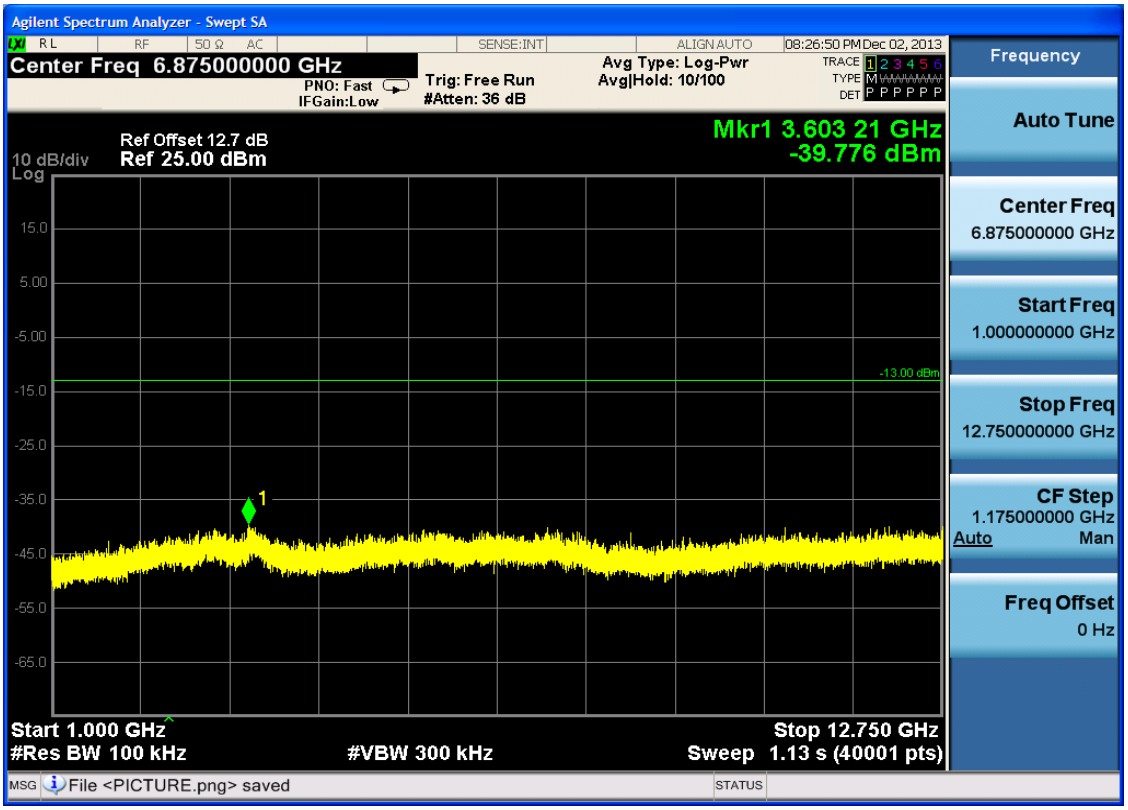


6.2.1.1.3 Test Channel = HCH





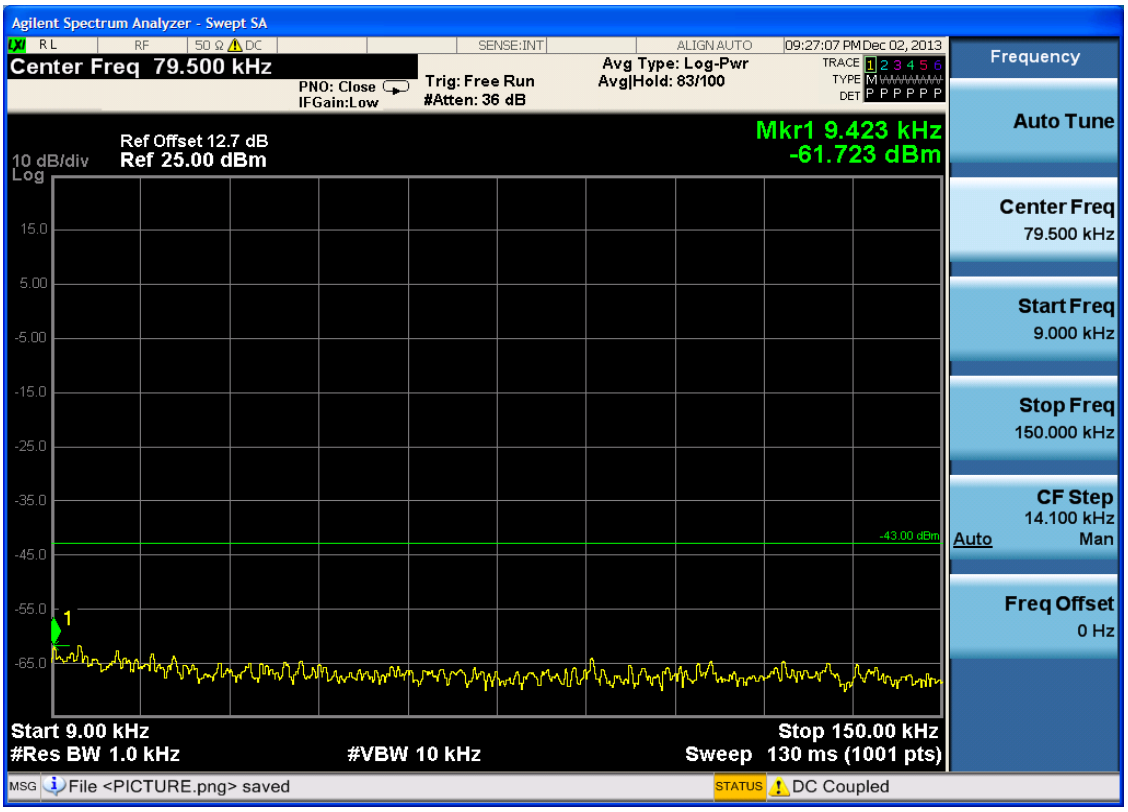


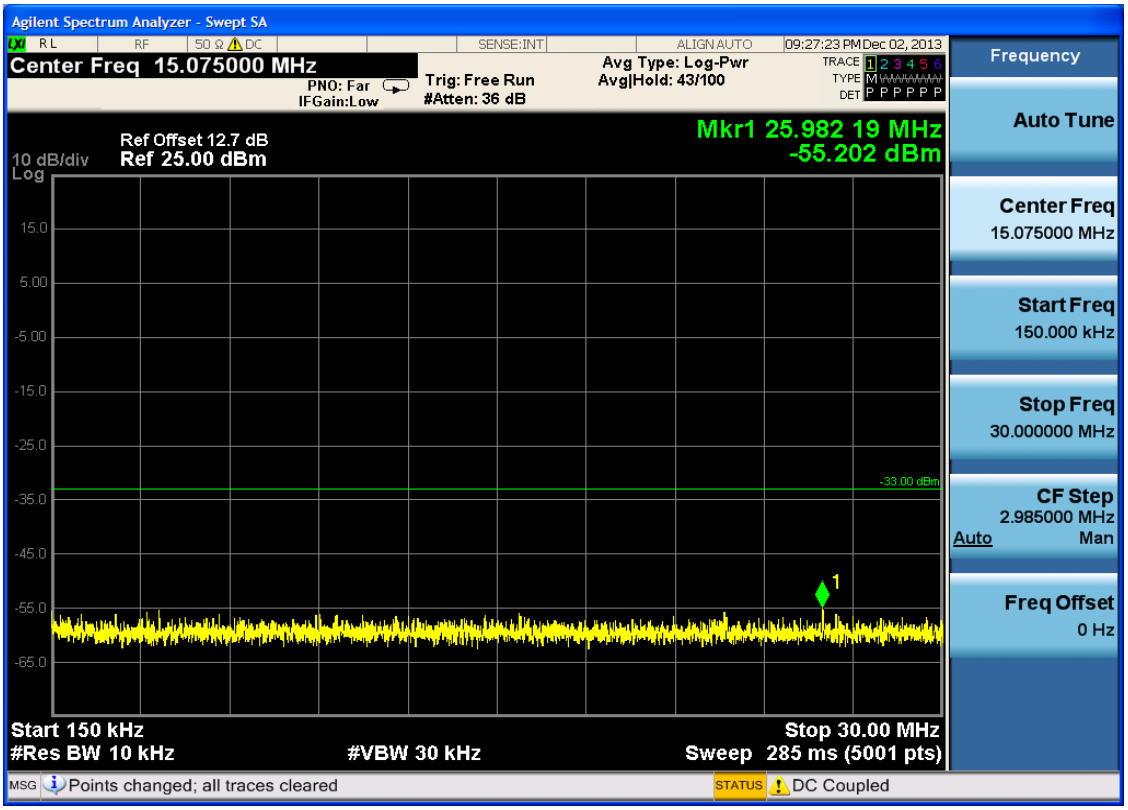


6.2.2 Test Band = WCDMA1900

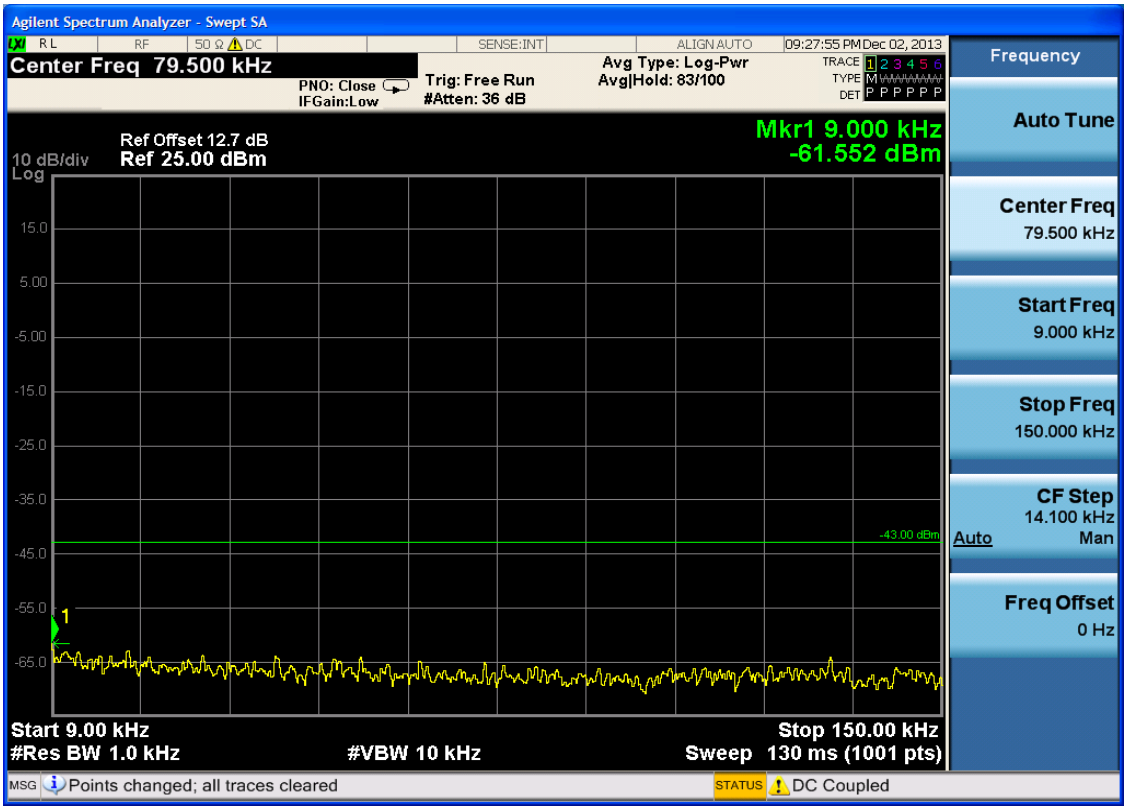
6.2.2.1 Test Mode = UMTS/TM1

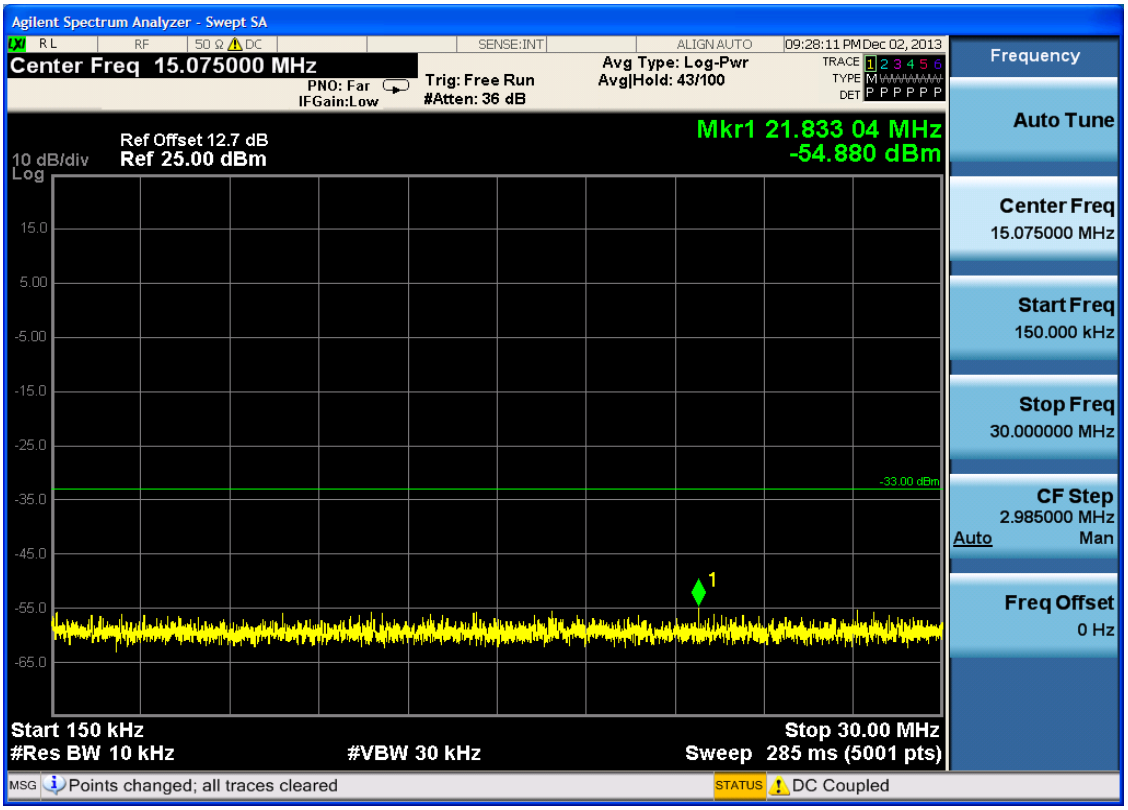
6.2.2.1.1 Test Channel = LCH

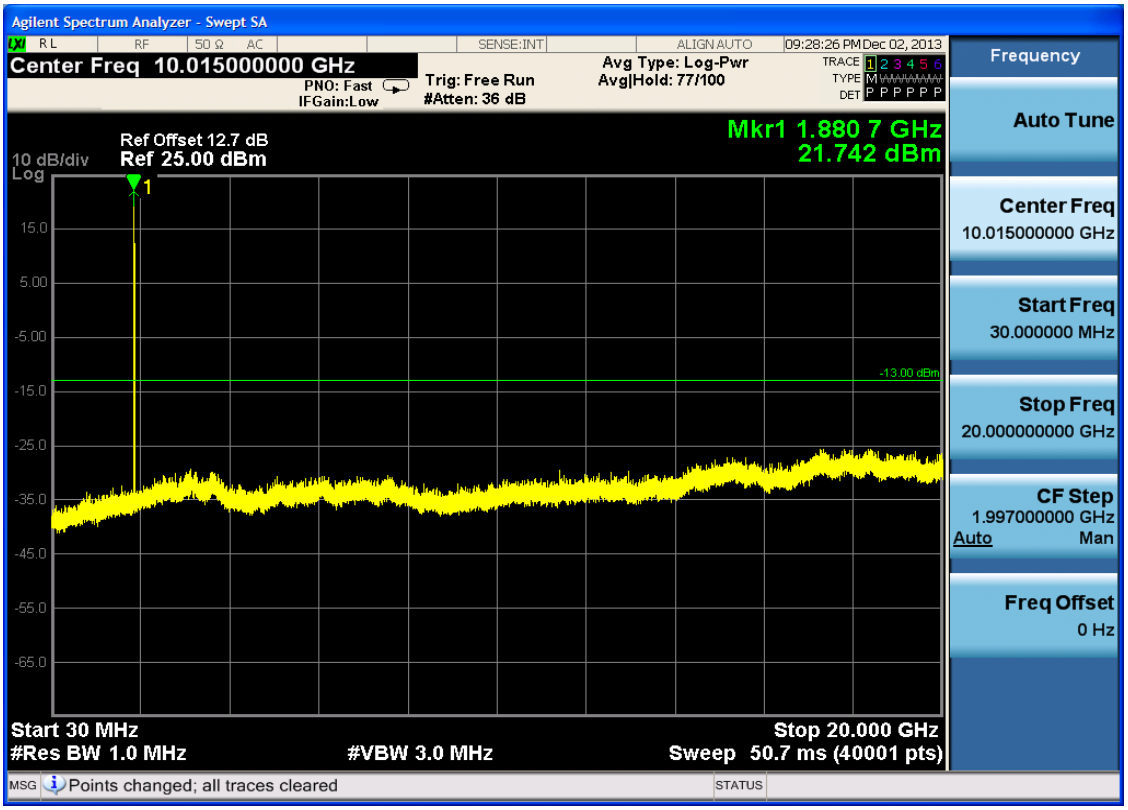




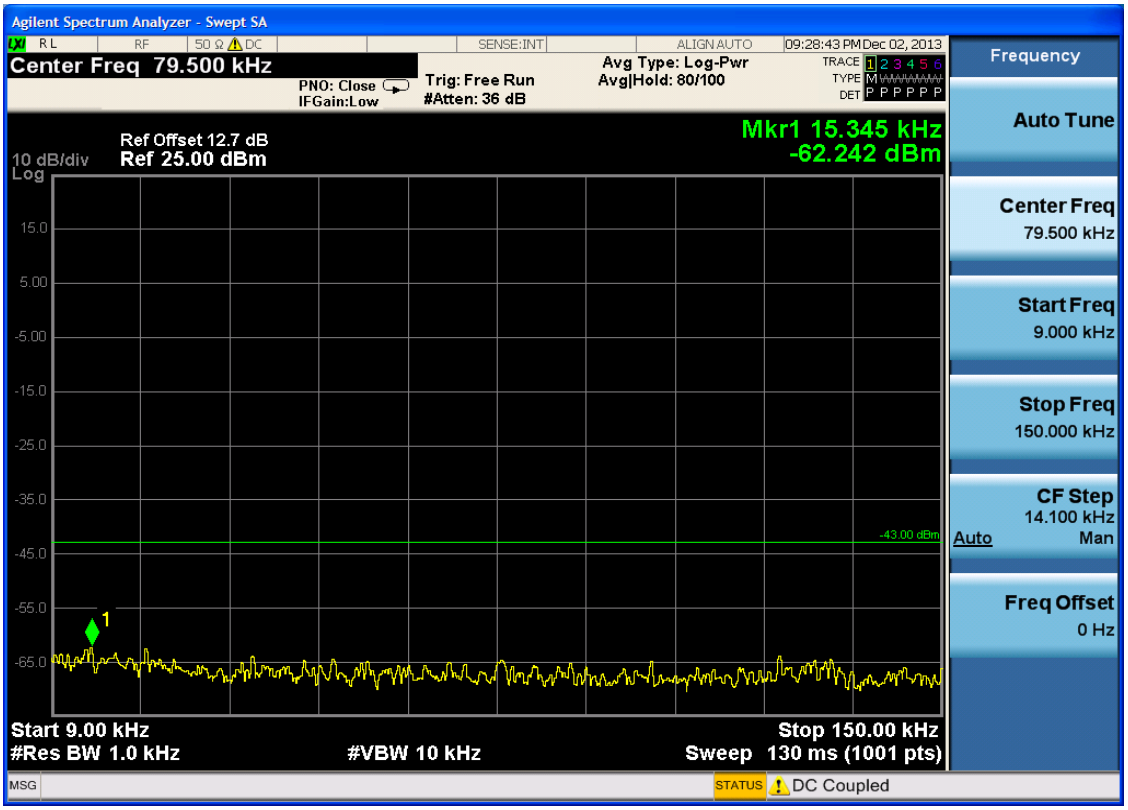
6.2.2.1.2 Test Channel = MCH

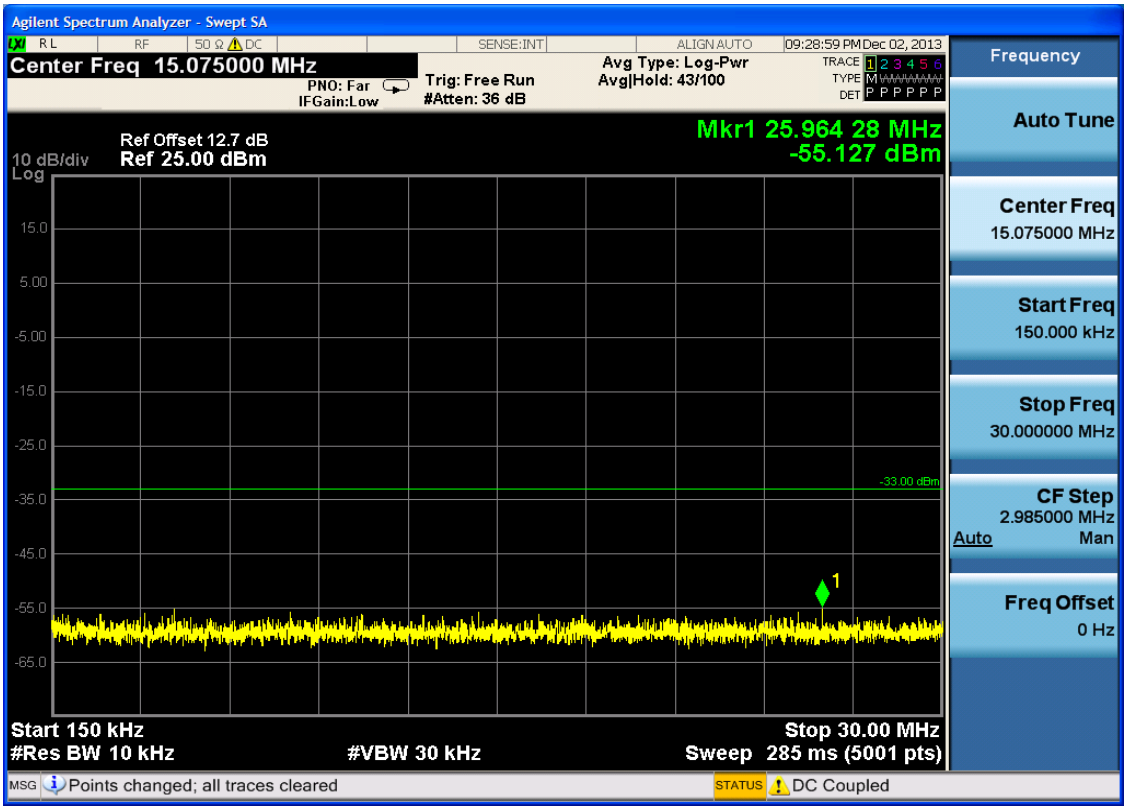


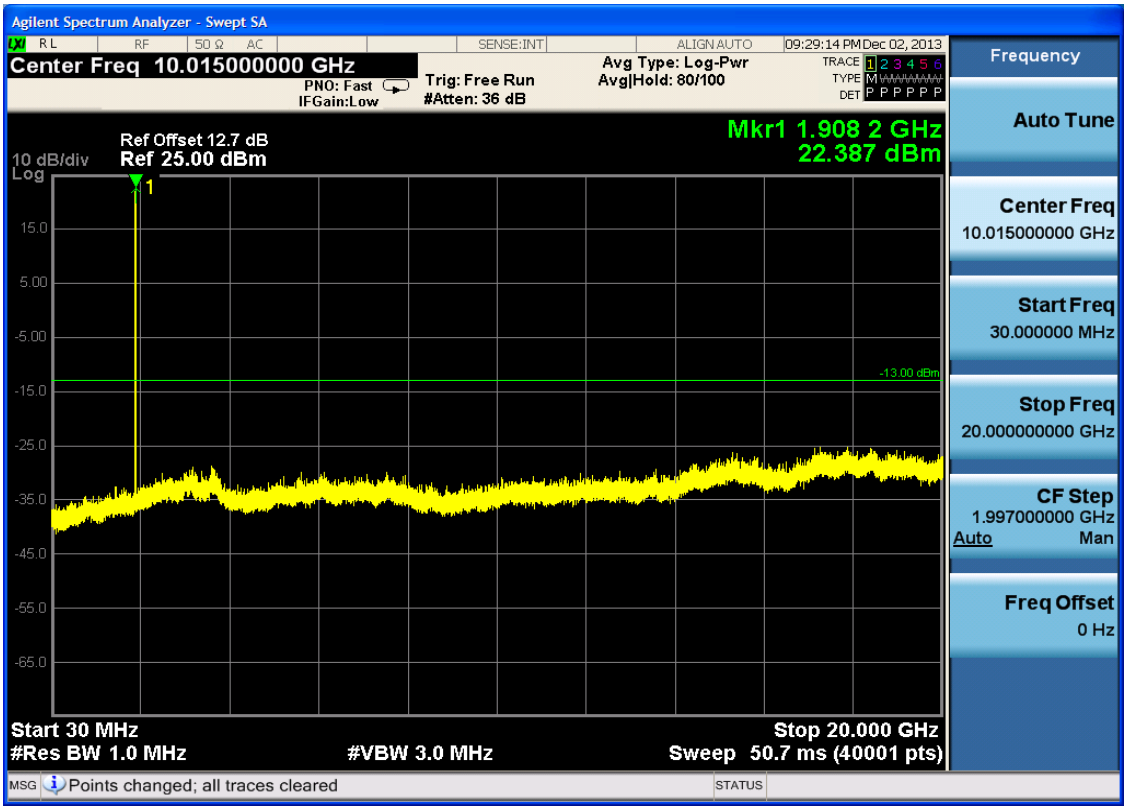




6.2.2.1.3 Test Channel = HCH







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

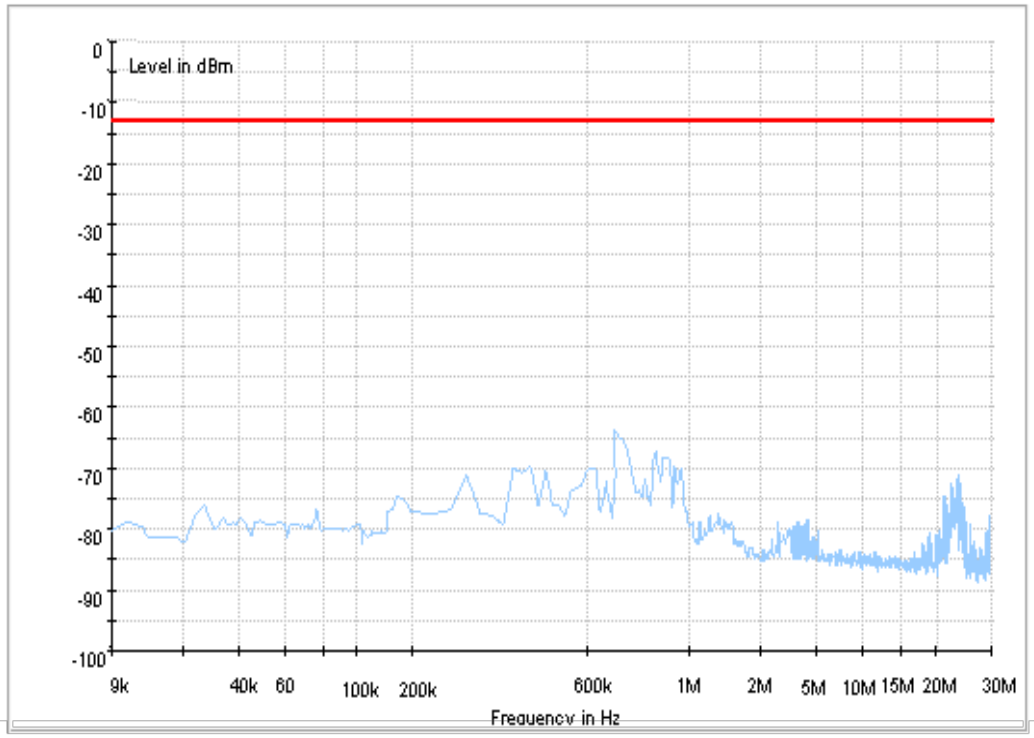
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

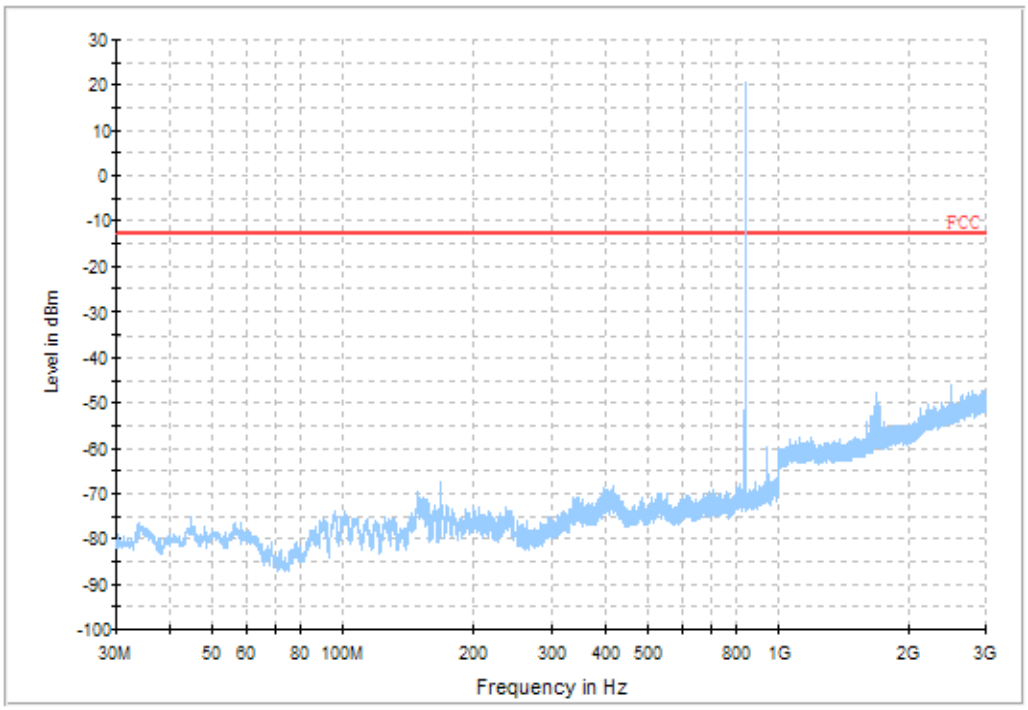
7.1 For GSM

7.1.1 Test Band = GSM850

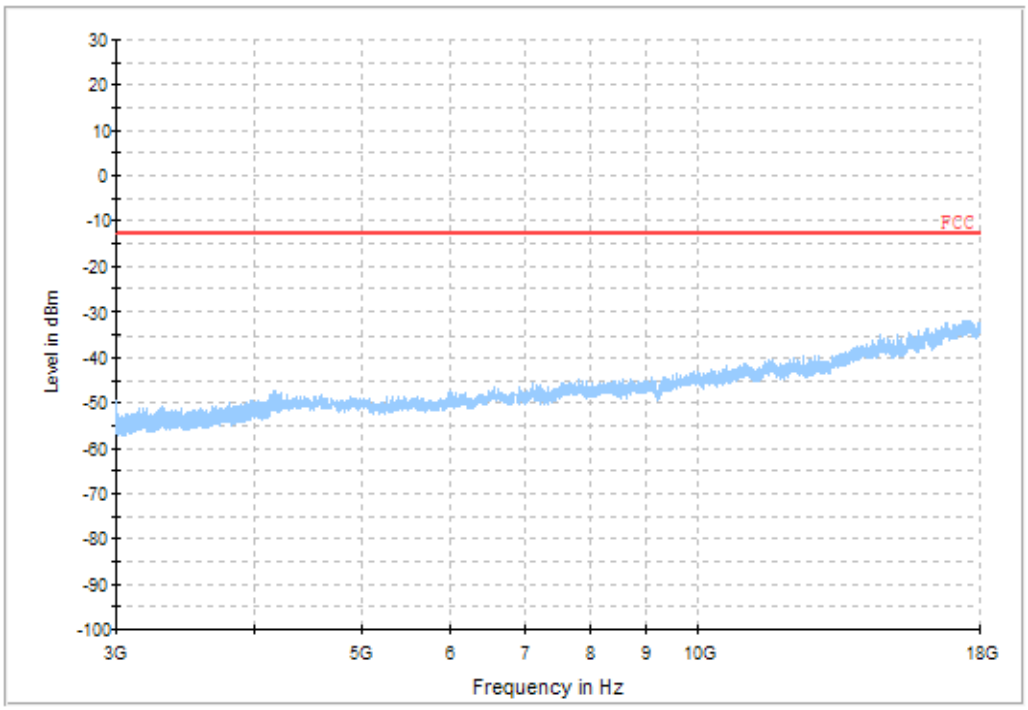
7.1.1.1 Test Mode = GSM/TM1



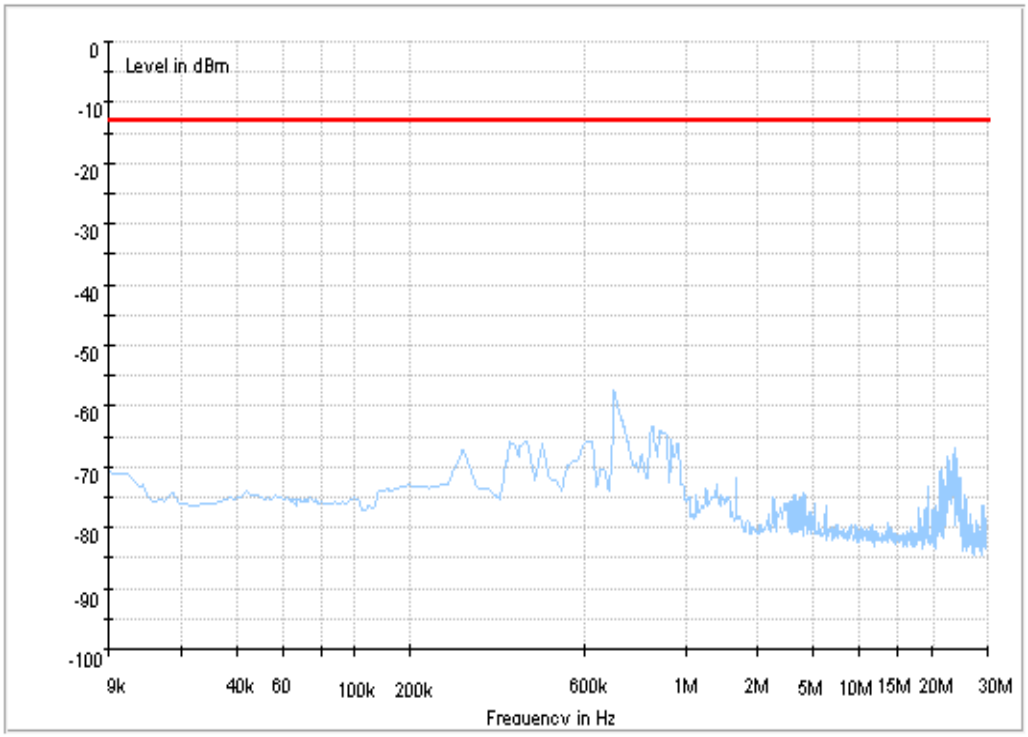
Copy of FCC PART22 GSM850_L



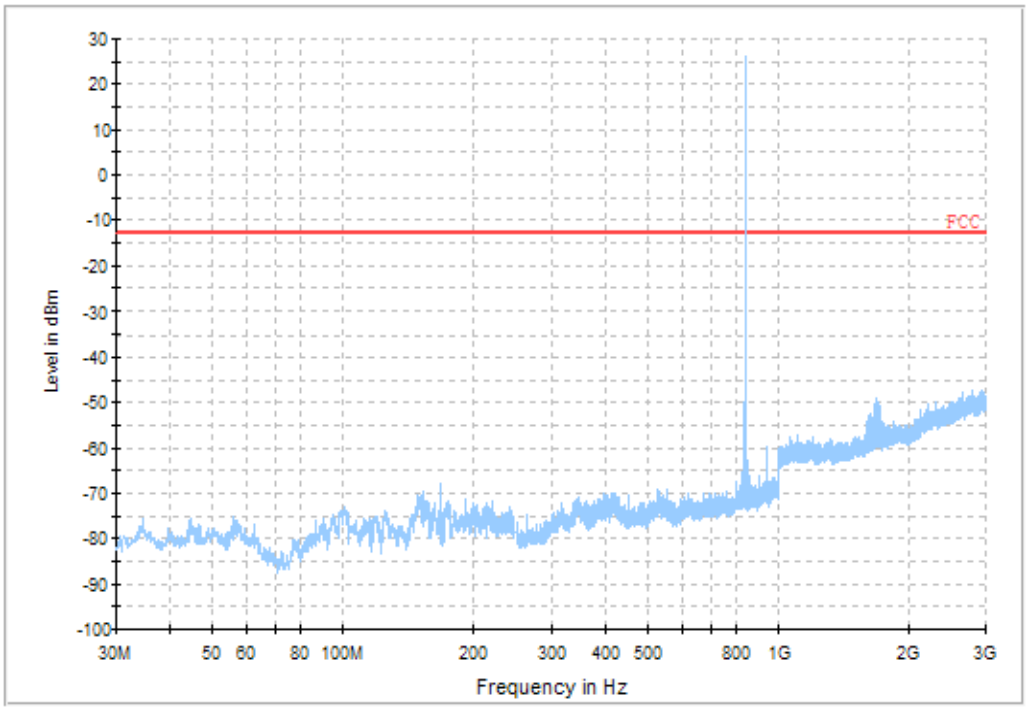
Copy of FCC PART22 GSM850_H

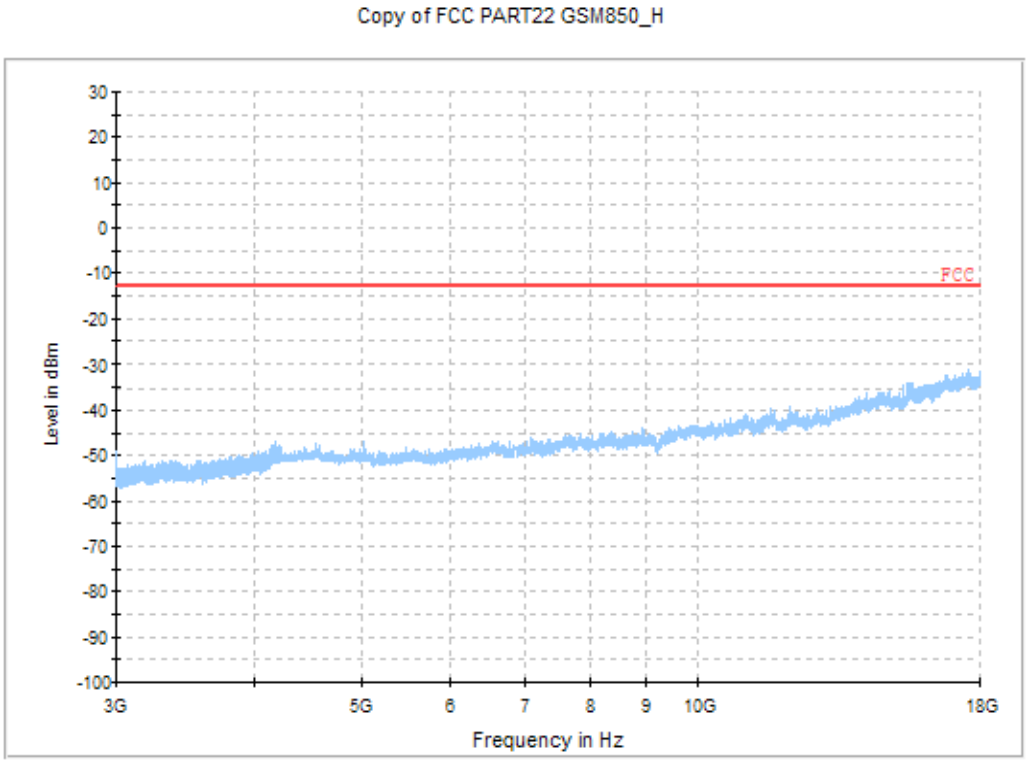


7.1.1.2 Test Mode = GSM/TM2



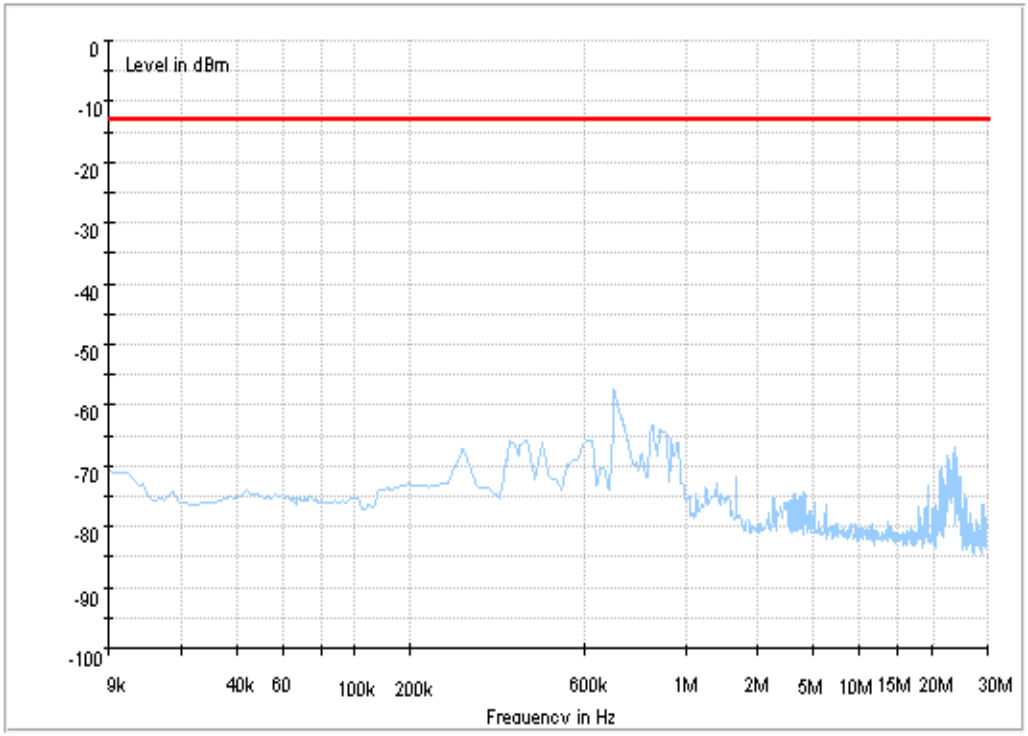
Copy of FCC PART22 GSM850_L



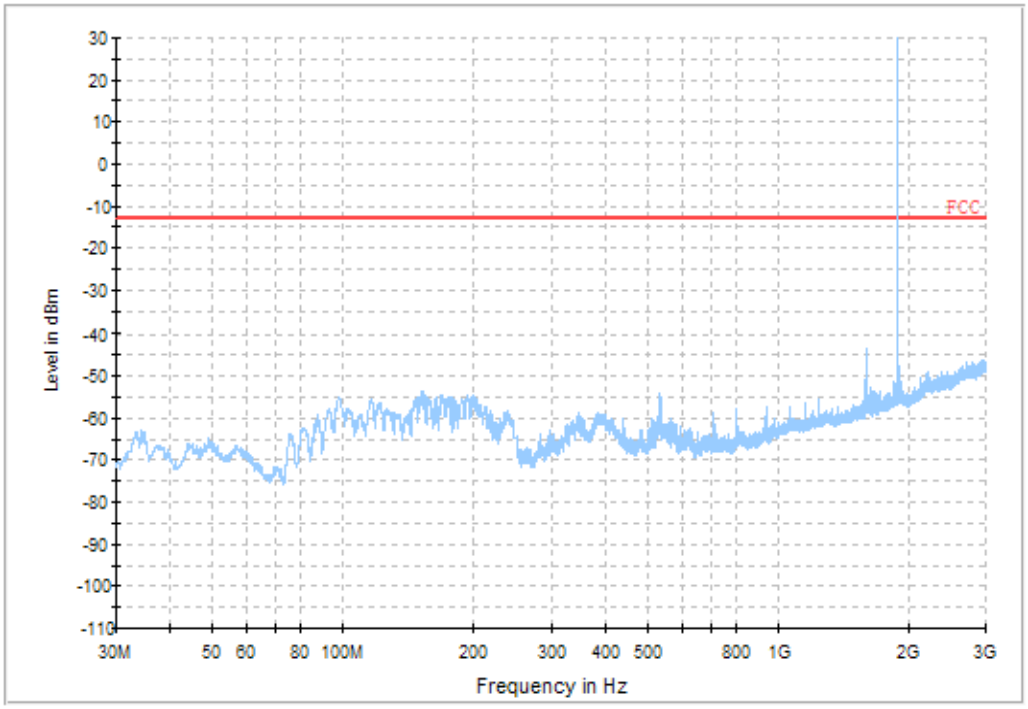


7.1.2 Test Band = GSM1900

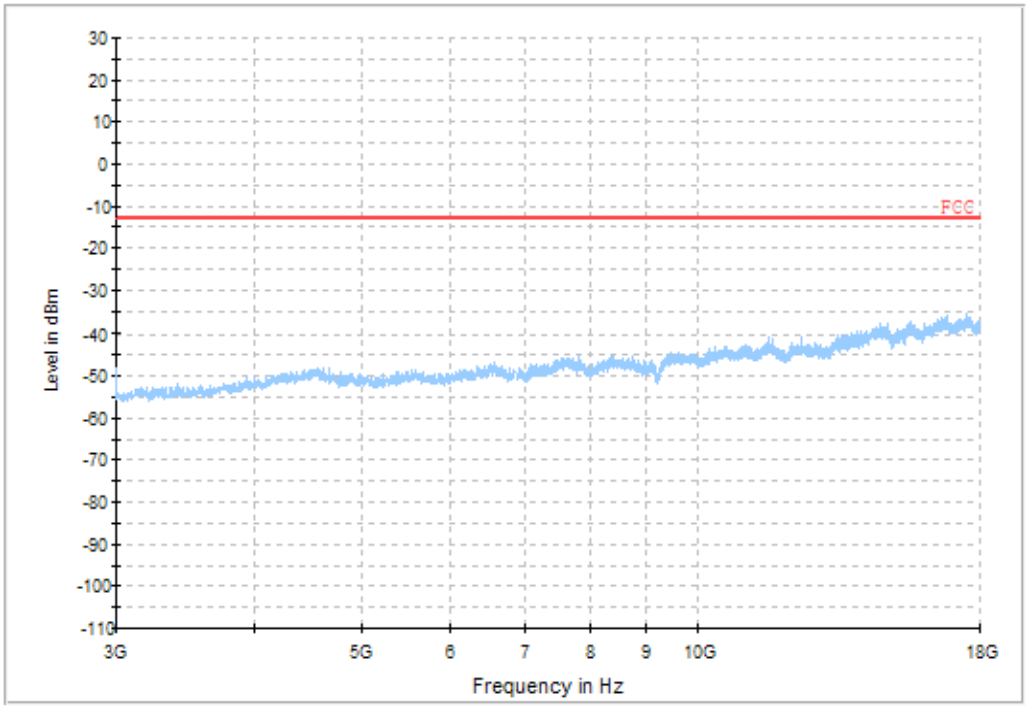
7.1.2.1 Test Mode = GSM/TM1

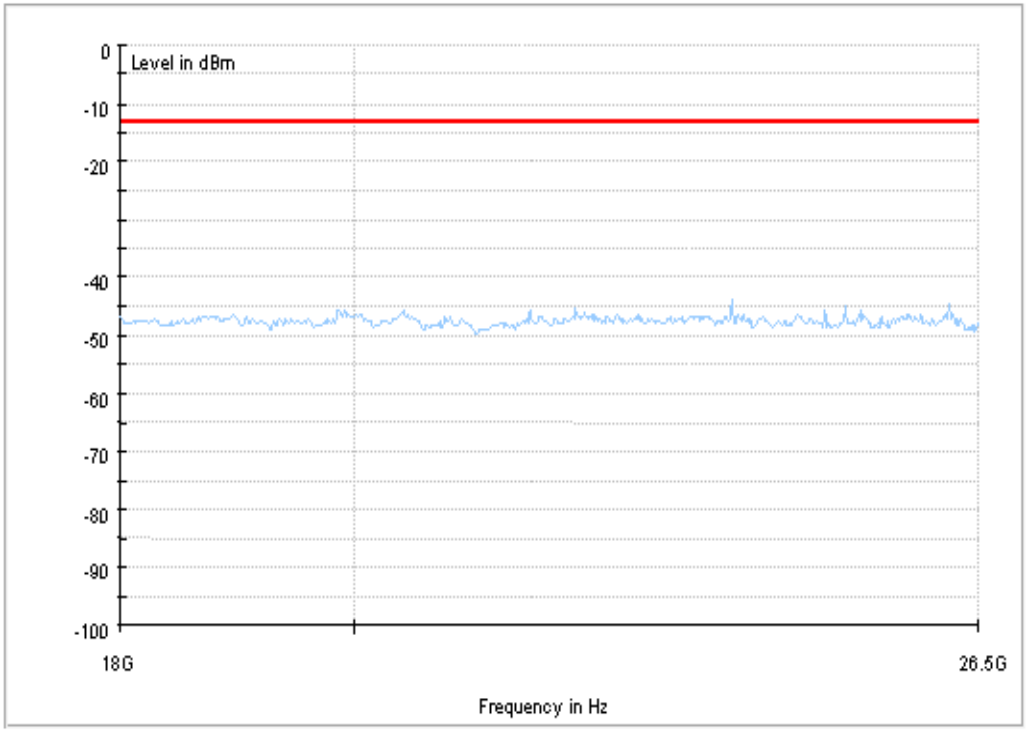


Copy of FCC PART24 GSM1900_L

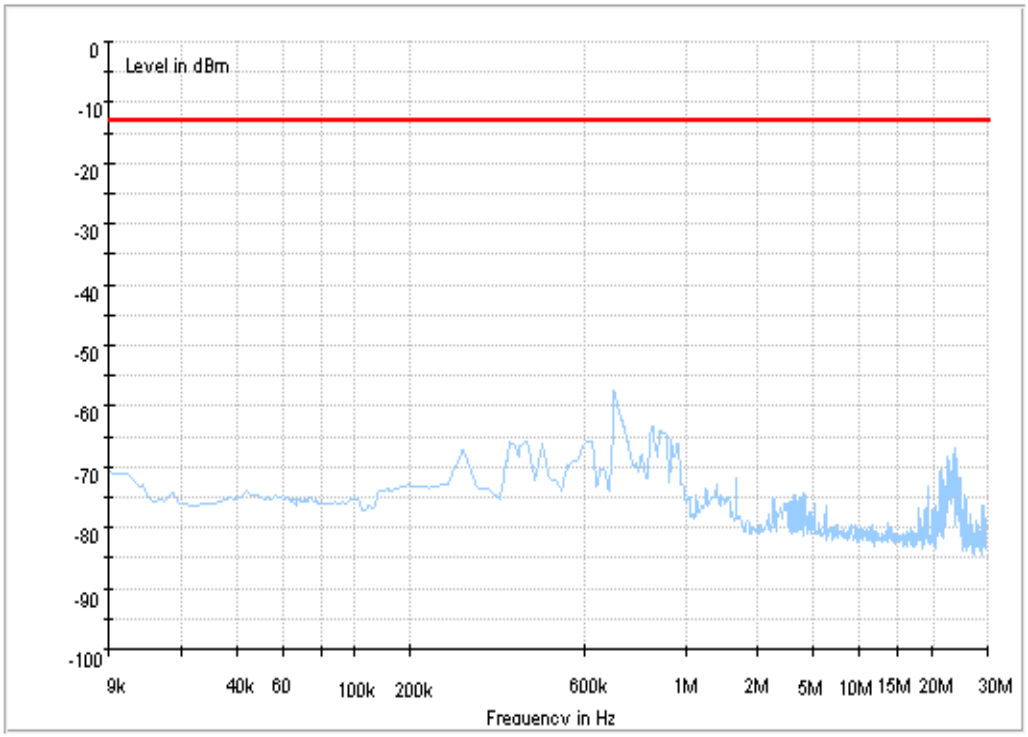


Copy of FCC PART24 GSM1900_H

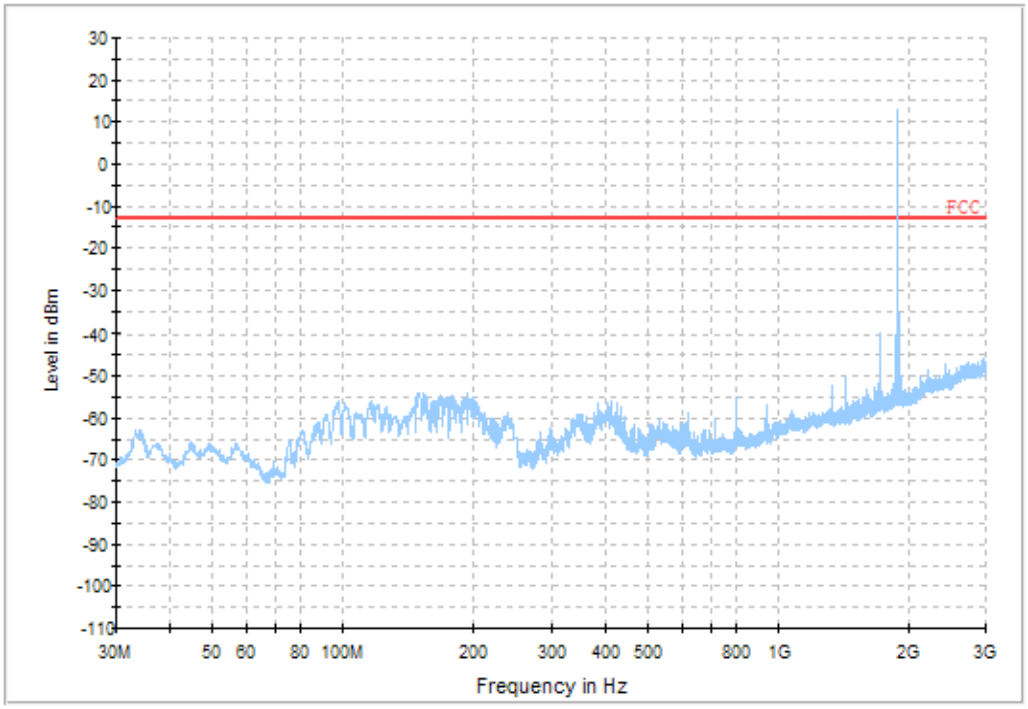




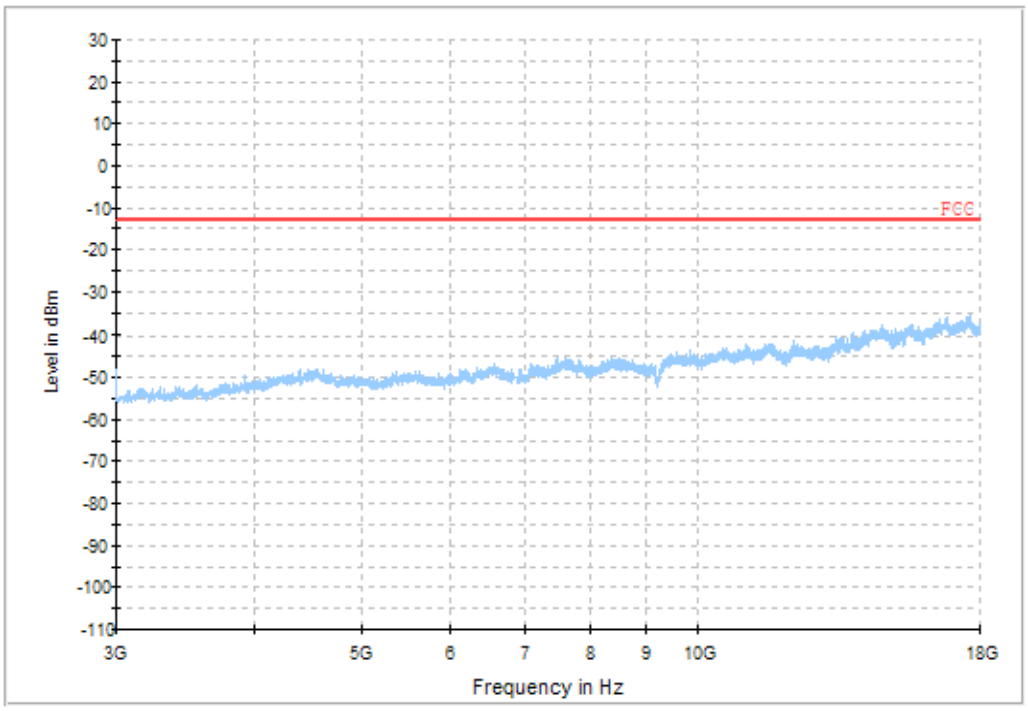
7.1.2.2 Test Mode = GSM/TM2

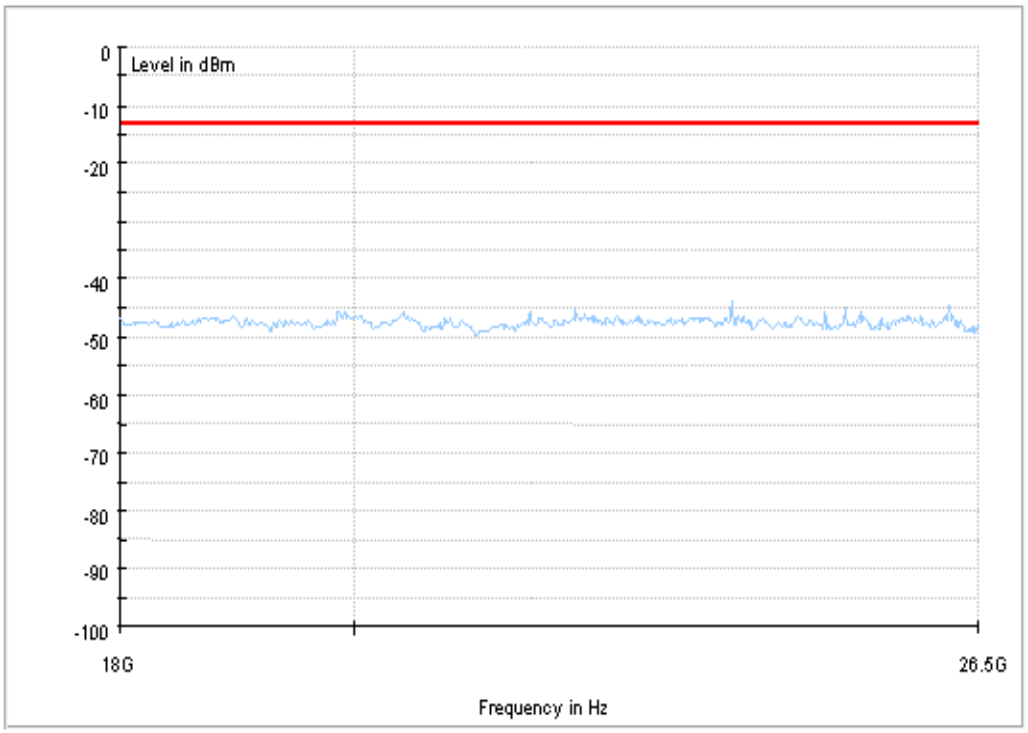


Copy of FCC PART24 GSM1900_L



Copy of FCC PART24 GSM1900_H

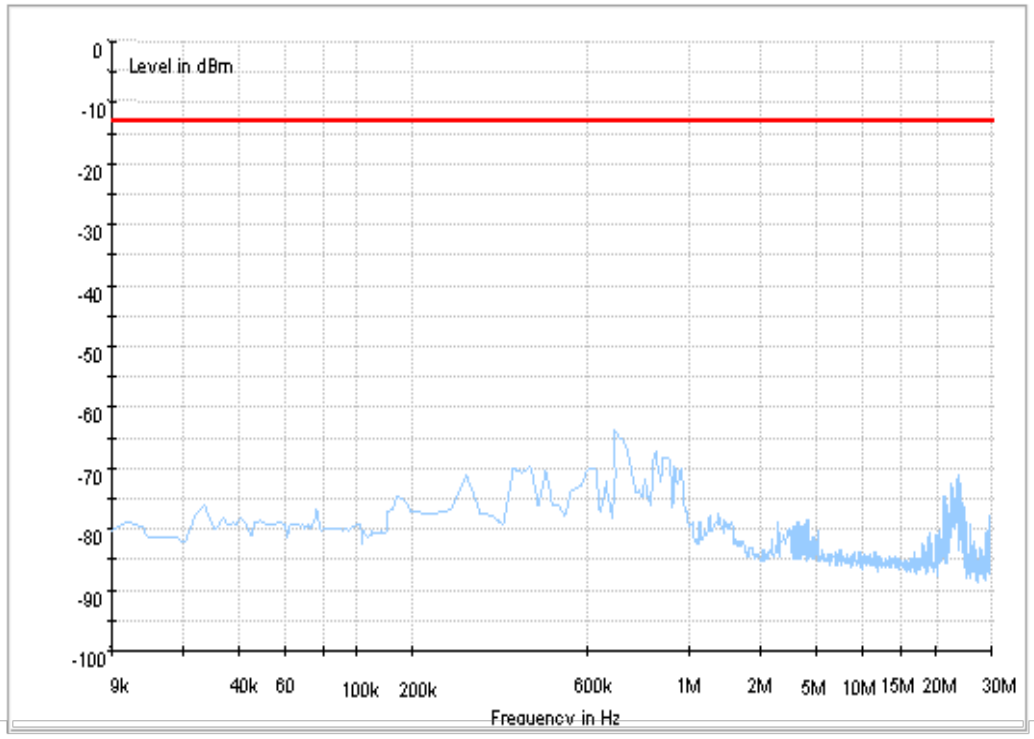




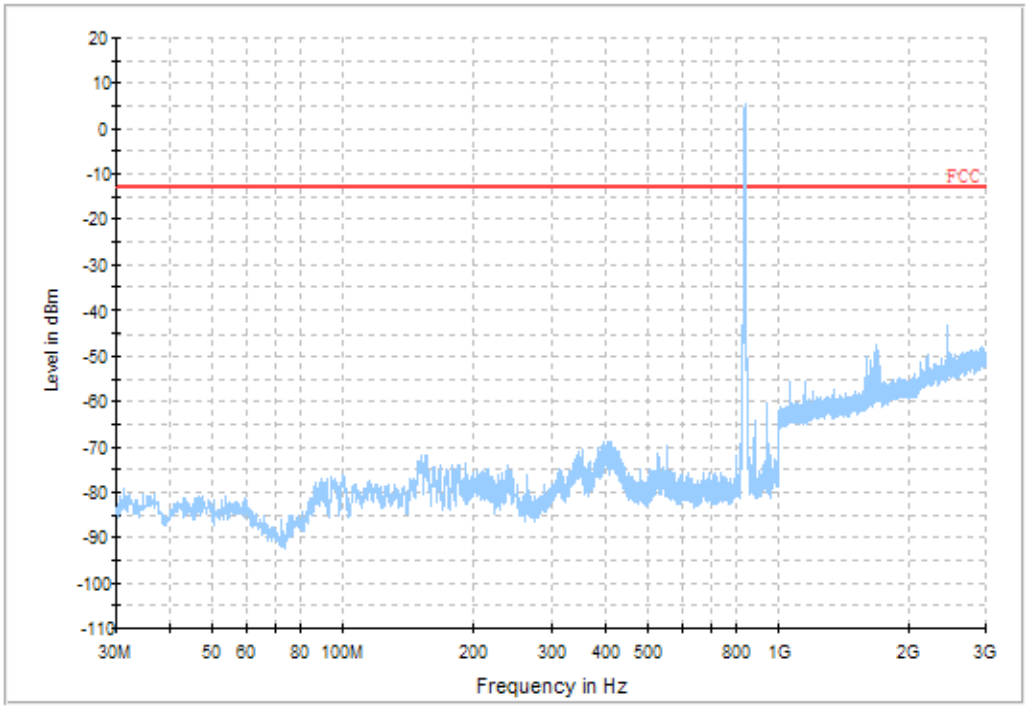
7.2 For UMTS

7.2.1 Test Band = WCDMA850

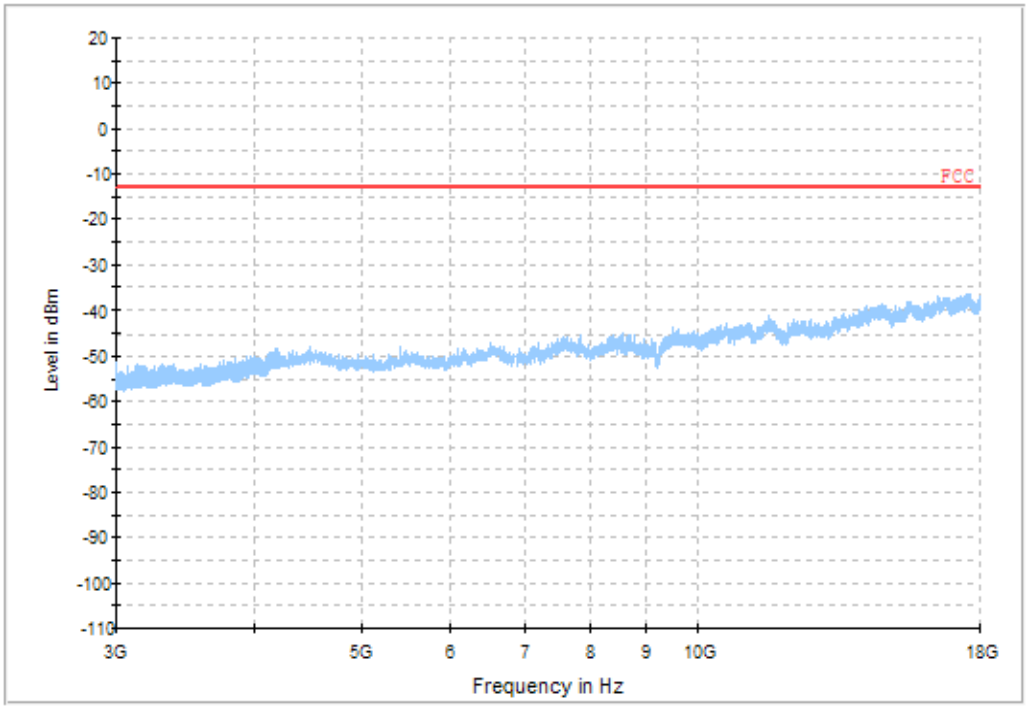
7.2.1.1 Test Mode = UMTS/TM1



Copy of FCC PART22 WCDMA850_L

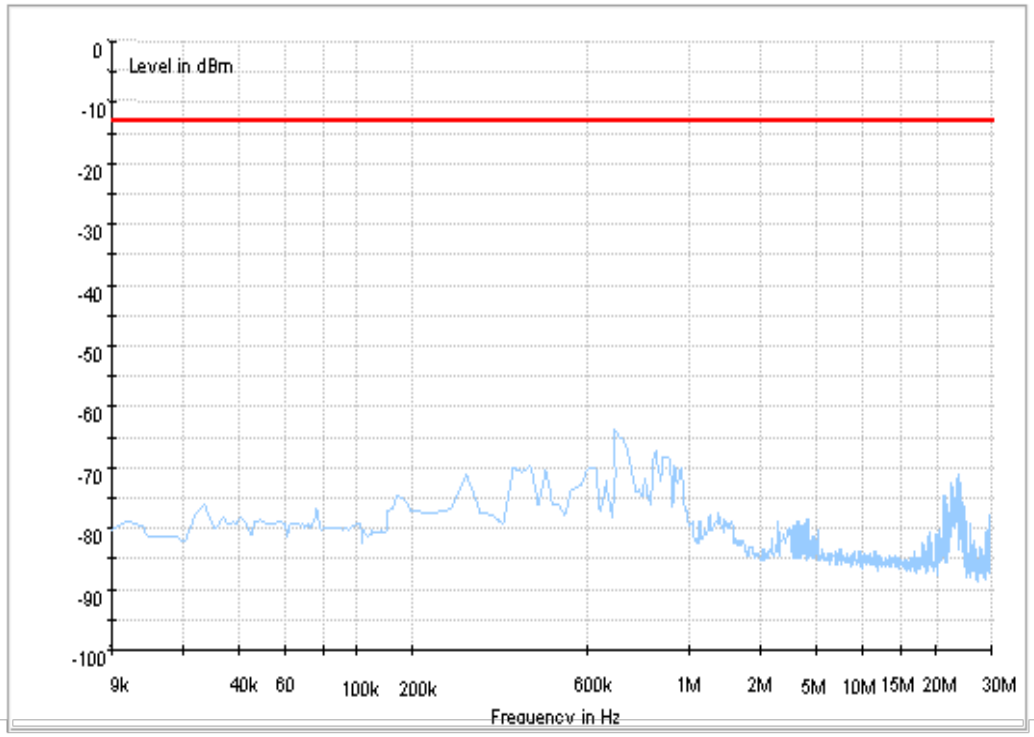


Copy of FCC PART22 WCDMA850_H

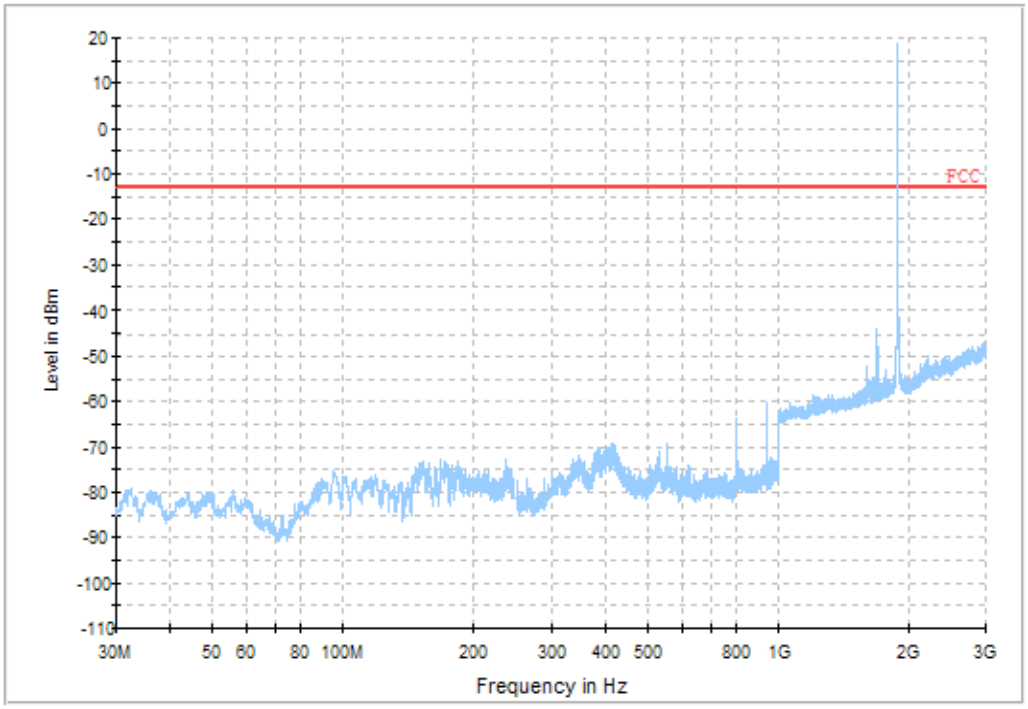


7.2.2 Test Band = WCDMA1900

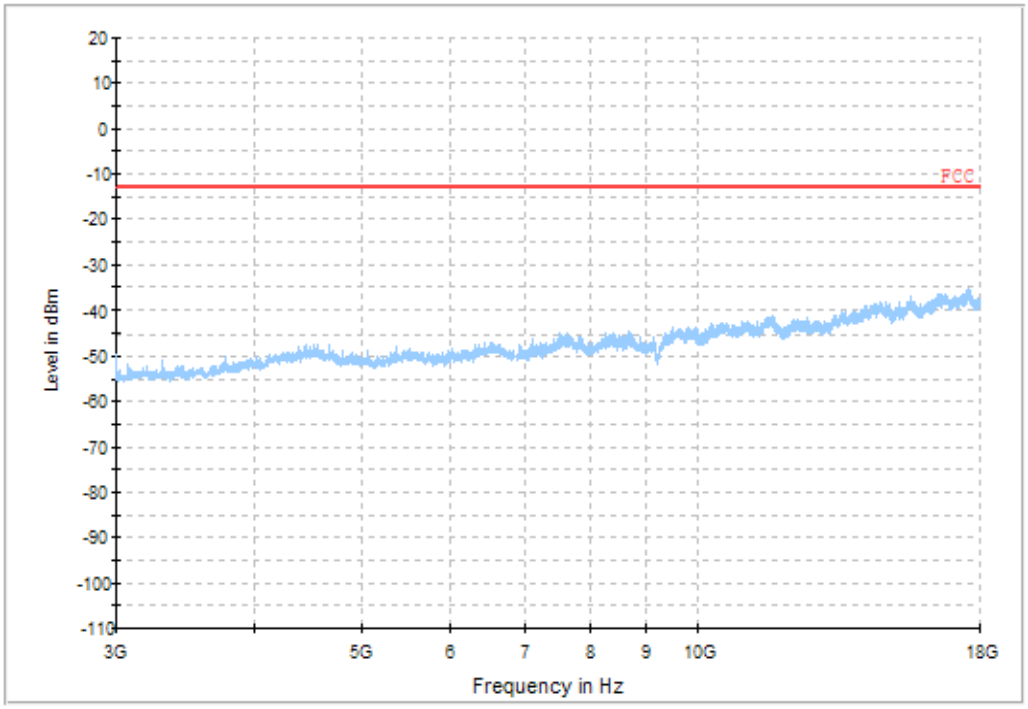
7.2.2.1 Test Mode = UMTS/TM1

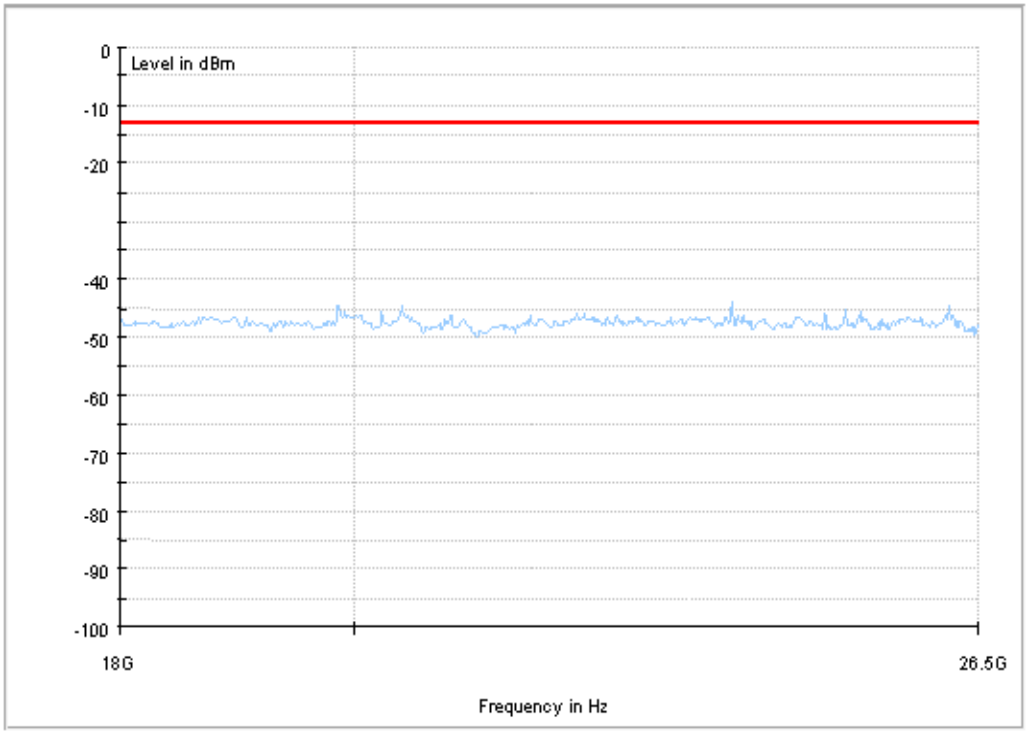


Copy of FCC PART24 WCDMA1900_L



Copy of FCC PART24 WCDMA1900_H





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	-22.66	-0.02749	PASS
				VN	-26.93	-0.03267	PASS
				VH	-25.44	-0.03087	PASS
		MCH	TN	VL	-22.47	-0.02686	PASS
				VN	-40.62	-0.04855	PASS
				VH	-19.63	-0.02346	PASS
		HCH	TN	VL	-28.99	-0.03415	PASS
				VN	-24.67	-0.02906	PASS
				VH	-25.70	-0.03028	PASS
	GSM/TM2	LCH	TN	VL	-33.13	-0.0402	PASS
				VN	-26.25	-0.03185	PASS
				VH	-25.41	-0.03083	PASS
		MCH	TN	VL	-40.55	-0.04847	PASS
				VN	-19.50	-0.02331	PASS
				VH	-30.38	-0.03631	PASS
		HCH	TN	VL	-34.71	-0.04089	PASS
				VN	-22.60	-0.02663	PASS
				VH	-21.15	-0.02492	PASS
GSM1900	GSM/TM1	LCH	TN	VL	-73.42	-0.03968	PASS
				VN	-63.28	-0.0342	PASS
				VH	-60.57	-0.03274	PASS
		MCH	TN	VL	-37.00	-0.01968	PASS
				VN	-38.42	-0.02044	PASS
				VH	-32.93	-0.01752	PASS
		HCH	TN	VL	-50.69	-0.02654	PASS
				VN	-48.56	-0.02543	PASS
				VH	-52.88	-0.02769	PASS
	GSM/TM2	LCH	TN	VL	-80.59	-0.04356	PASS
				VN	-66.02	-0.03568	PASS
				VH	-81.46	-0.04403	PASS
		MCH	TN	VL	-35.42	-0.01884	PASS
				VN	-40.58	-0.02159	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VH	-41.75	-0.02221	PASS
		HCH	TN	VL	-60.47	-0.03166	PASS
				VN	-52.98	-0.02774	PASS
				VH	-44.49	-0.0233	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	-24.99	-0.03032	PASS
				-20	-24.60	-0.02985	PASS
				-10	-24.21	-0.02937	PASS
				0	-28.86	-0.03502	PASS
				10	-28.09	-0.03408	PASS
				20	-26.28	-0.03189	PASS
				30	-26.22	-0.03181	PASS
				40	-26.47	-0.03212	PASS
				50	-26.02	-0.03157	PASS
		MCH	VN	-30	-27.57	-0.03295	PASS
				-20	-24.15	-0.02887	PASS
				-10	-24.60	-0.0294	PASS
				0	-23.31	-0.02786	PASS
				10	-21.50	-0.0257	PASS
				20	-24.67	-0.02949	PASS
				30	-25.44	-0.03041	PASS
				40	-23.76	-0.0284	PASS
				50	-24.34	-0.02909	PASS
		HCH	VN	-30	-28.80	-0.03393	PASS
				-20	-28.15	-0.03316	PASS
				-10	-23.89	-0.02815	PASS
				0	-23.57	-0.02777	PASS
				10	-25.70	-0.03028	PASS
				20	-25.51	-0.03005	PASS
				30	-27.25	-0.0321	PASS
				40	-20.86	-0.02458	PASS
				50	-28.86	-0.034	PASS
	GSM/TM2	LCH	VN	-30	-33.80	-0.04101	PASS
				-20	-32.16	-0.03902	PASS
				-10	-34.22	-0.04152	PASS
				0	-37.10	-0.04501	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				10	-20.99	-0.02547	PASS
				20	-29.51	-0.0358	PASS
				30	-36.77	-0.04461	PASS
				40	-33.96	-0.0412	PASS
				50	-32.41	-0.03932	PASS
		MCH	VN	-30	-33.42	-0.03995	PASS
				-20	-35.90	-0.04291	PASS
				-10	-33.74	-0.04033	PASS
				0	-28.38	-0.03392	PASS
				10	-39.16	-0.04681	PASS
				20	-31.80	-0.03801	PASS
				30	-28.51	-0.03408	PASS
				40	-30.64	-0.03662	PASS
				50	-22.28	-0.02663	PASS
		HCH	VN	-30	-26.44	-0.03115	PASS
				-20	-30.03	-0.03538	PASS
				-10	-24.31	-0.02864	PASS
				0	-22.96	-0.02705	PASS
				10	-30.28	-0.03567	PASS
				20	-31.16	-0.03671	PASS
				30	-32.25	-0.03799	PASS
				40	-11.30	-0.01331	PASS
				50	-33.74	-0.03975	PASS
GSM1900	GSM/TM1	LCH	VN	-30	-59.15	-0.03197	PASS
				-20	-60.63	-0.03277	PASS
				-10	-60.96	-0.03295	PASS
				0	-61.34	-0.03315	PASS
				10	-57.60	-0.03113	PASS
				20	-56.56	-0.03057	PASS
				30	-58.31	-0.03152	PASS
				40	-61.67	-0.03333	PASS
				50	-60.31	-0.0326	PASS
		MCH	VN	-30	-52.56	-0.02796	PASS
				-20	-30.99	-0.01648	PASS
				-10	-42.10	-0.02239	PASS
				0	-31.19	-0.01659	PASS
				10	-30.74	-0.01635	PASS
				20	-36.61	-0.01947	PASS
				30	-26.67	-0.01419	PASS
				40	-33.45	-0.01779	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				50	-39.13	-0.02081	PASS
		HCH	VN	-30	-53.01	-0.02776	PASS
				-20	-39.32	-0.02059	PASS
				-10	-52.69	-0.02759	PASS
				0	-43.59	-0.02282	PASS
				10	-45.98	-0.02408	PASS
				20	-43.39	-0.02272	PASS
				30	-46.36	-0.02427	PASS
				40	-47.98	-0.02512	PASS
				50	-49.72	-0.02603	PASS
	GSM/TM2	LCH	VN	-30	-63.31	-0.03422	PASS
				-20	-78.42	-0.04238	PASS
				-10	-66.61	-0.036	PASS
				0	-61.21	-0.03308	PASS
				10	-66.28	-0.03582	PASS
				20	-62.93	-0.03401	PASS
				30	-67.57	-0.03652	PASS
				40	-61.60	-0.03329	PASS
				50	-61.57	-0.03328	PASS
		MCH	VN	-30	-39.61	-0.02107	PASS
				-20	-47.01	-0.02501	PASS
				-10	-51.66	-0.02748	PASS
				0	-57.02	-0.03033	PASS
				10	-53.63	-0.02853	PASS
				20	-49.27	-0.02621	PASS
				30	-48.75	-0.02593	PASS
				40	-41.33	-0.02198	PASS
				50	-52.27	-0.0278	PASS
		HCH	VN	-30	-60.31	-0.03158	PASS
				-20	-56.79	-0.02974	PASS
				-10	-51.98	-0.02722	PASS
				0	-52.63	-0.02756	PASS
				10	-66.73	-0.03494	PASS
				20	-49.07	-0.02569	PASS
				30	-55.50	-0.02906	PASS
				40	-62.41	-0.03268	PASS
				50	-63.73	-0.03337	PASS

8.2 For UMTS

8.2.1Frequency 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	-3.75	-0.00454	PASS
				VN	6.07	0.00735	PASS
				VH	6.62	0.00801	PASS
		MCH	TN	VL	-7.66	-0.00916	PASS
				VN	-3.94	-0.00471	PASS
				VH	-2.85	-0.00341	PASS
		HCH	TN	VL	7.81	0.00923	PASS
				VN	-0.96	-0.00113	PASS
				VH	-15.88	-0.01876	PASS
WCDMA1900	UMTS/TM1	LCH	TN	VL	-6.65	-0.00359	PASS
				VN	-4.55	-0.00246	PASS
				VH	2.17	0.00117	PASS
		MCH	TN	VL	-0.14	-0.00007	PASS
				VN	-2.43	-0.00129	PASS
				VH	2.50	0.00133	PASS
		HCH	TN	VL	-3.75	-0.00197	PASS
				VN	-8.53	-0.00447	PASS
				VH	4.85	0.00254	PASS

8.2.2Frequency 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	3.75	0.00454	PASS
				-20	-16.56	-0.02004	PASS
				-10	-8.33	-0.01008	PASS
				0	-4.09	-0.00495	PASS
				10	-8.65	-0.01047	PASS
				20	-15.88	-0.01922	PASS
				30	3.60	0.00436	PASS
				40	4.32	0.00523	PASS
				50	23.57	0.02852	PASS
		MCH	VN	-30	-16.51	-0.01974	PASS
				-20	-5.11	-0.00611	PASS
				-10	-17.09	-0.02043	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				0	8.79	0.01051	PASS
				10	-24.77	-0.02962	PASS
				20	1.85	0.00221	PASS
				30	9.75	0.01166	PASS
				40	-22.89	-0.02737	PASS
				50	-9.25	-0.01106	PASS
		HCH	VN	-30	-24.75	-0.02923	PASS
				-20	12.36	0.0146	PASS
				-10	-4.97	-0.00587	PASS
				0	-5.71	-0.00674	PASS
				10	-8.87	-0.01048	PASS
				20	-4.39	-0.00519	PASS
				30	7.45	0.0088	PASS
				40	6.52	0.0077	PASS
				50	11.89	0.01404	PASS
WCDMA1900	UMTS/TM1	LCH	VN	-30	-3.25	-0.00175	PASS
				-20	1.37	0.00074	PASS
				-10	6.50	0.00351	PASS
				0	2.49	0.00134	PASS
				10	-6.33	-0.00342	PASS
				20	-4.39	-0.00237	PASS
				30	-5.83	-0.00315	PASS
				40	-0.34	-0.00018	PASS
				50	-0.26	-0.00014	PASS
		MCH	VN	-30	-2.06	-0.0011	PASS
				-20	0.50	0.00027	PASS
				-10	-0.81	-0.00043	PASS
				0	-7.61	-0.00405	PASS
				10	-3.04	-0.00162	PASS
				20	-5.00	-0.00266	PASS
				30	-9.05	-0.00481	PASS
				40	-7.58	-0.00403	PASS
				50	-2.37	-0.00126	PASS
		HCH	VN	-30	-3.08	-0.00161	PASS
				-20	-2.91	-0.00153	PASS
				-10	1.66	0.00087	PASS
				0	-1.39	-0.00073	PASS
				10	-4.94	-0.00259	PASS
				20	0.41	0.00021	PASS
				30	-0.61	-0.00032	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				40	2.30	0.00121	PASS
				50	-6.70	-0.00351	PASS

END