



Appendix for test report

1Appendix_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	32.03	34.12	38.5	PASS
		MCH	32.05	34.11	38.5	PASS
		HCH	32.11	34.21	38.5	PASS
	GSM/TM2	LCH	25.89	28.02	38.5	PASS
		MCH	25.84	27.97	38.5	PASS
		HCH	25.93	28.02	38.5	PASS
WCDMA850	UMTS/TM1	LCH	22.77	24.89	38.5	PASS
		MCH	22.78	24.88	38.5	PASS
		HCH	22.71	24.85	38.5	PASS
Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	29.02	31.12	33	PASS
		MCH	28.96	31.11	33	PASS
		HCH	28.83	30.99	33	PASS
	GSM/TM2	LCH	25.11	27.26	33	PASS
		MCH	25.15	27.27	33	PASS
		HCH	25.14	27.28	33	PASS

Note1:

a, For getting the ERP (Efficient Radiated Power) or EIRP (Efficient Isotropic Radiated Power) in substitution method, the following formula should be taken to calculate it,

$$\text{ERP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBd]}$$

$$\text{EIRP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBi]}$$

b, SGP=Signal Generator Level

Note2: 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
GSM850	GSM/TM1	LCH	0.57	13	PASS
		MCH	0.6	13	PASS
		HCH	0.52	13	PASS
	GSM/TM2	LCH	2.95	13	PASS
		MCH	3.19	13	PASS
		HCH	3.08	13	PASS
GSM1900	GSM/TM1	LCH	0.49	13	PASS
		MCH	0.51	13	PASS
		HCH	0.48	13	PASS
	GSM/TM2	LCH	3.05	13	PASS
		MCH	3.03	13	PASS
		HCH	3.04	13	PASS
Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA850	UMTS/TM1	LCH	2.66	13	PASS
		MCH	2.87	13	PASS
		HCH	2.58	13	PASS

3Appendix_C: Modulation Characteristics

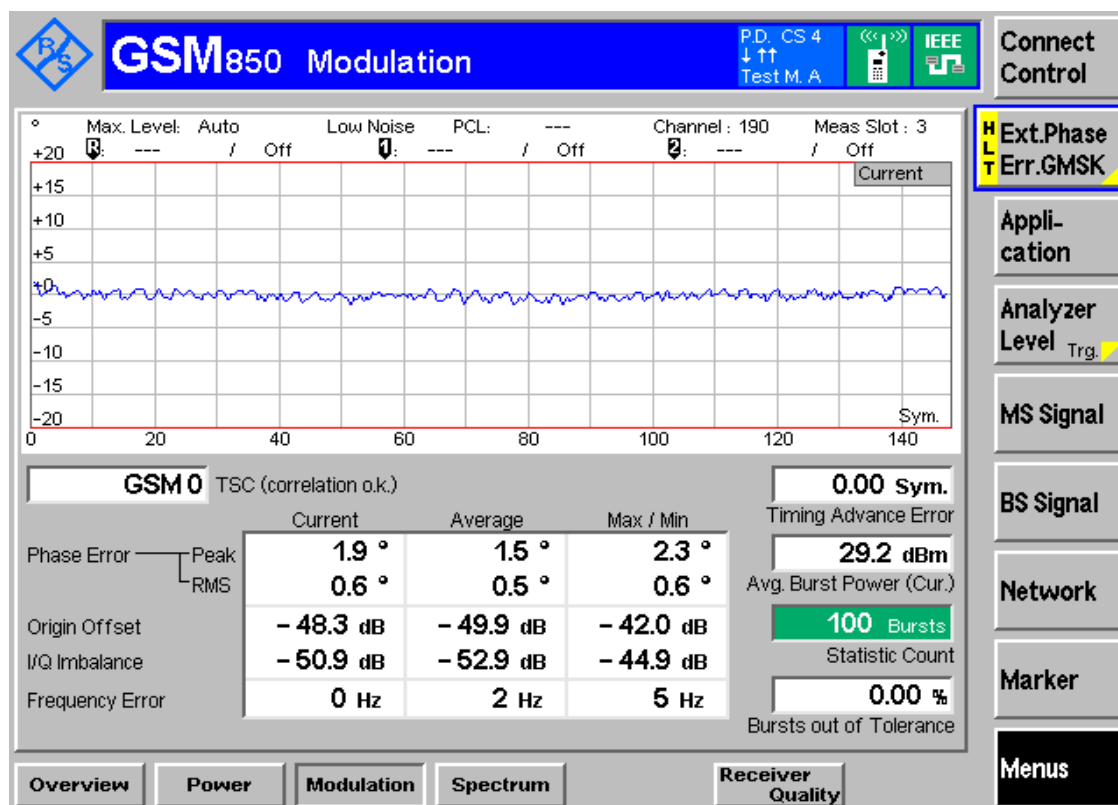
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

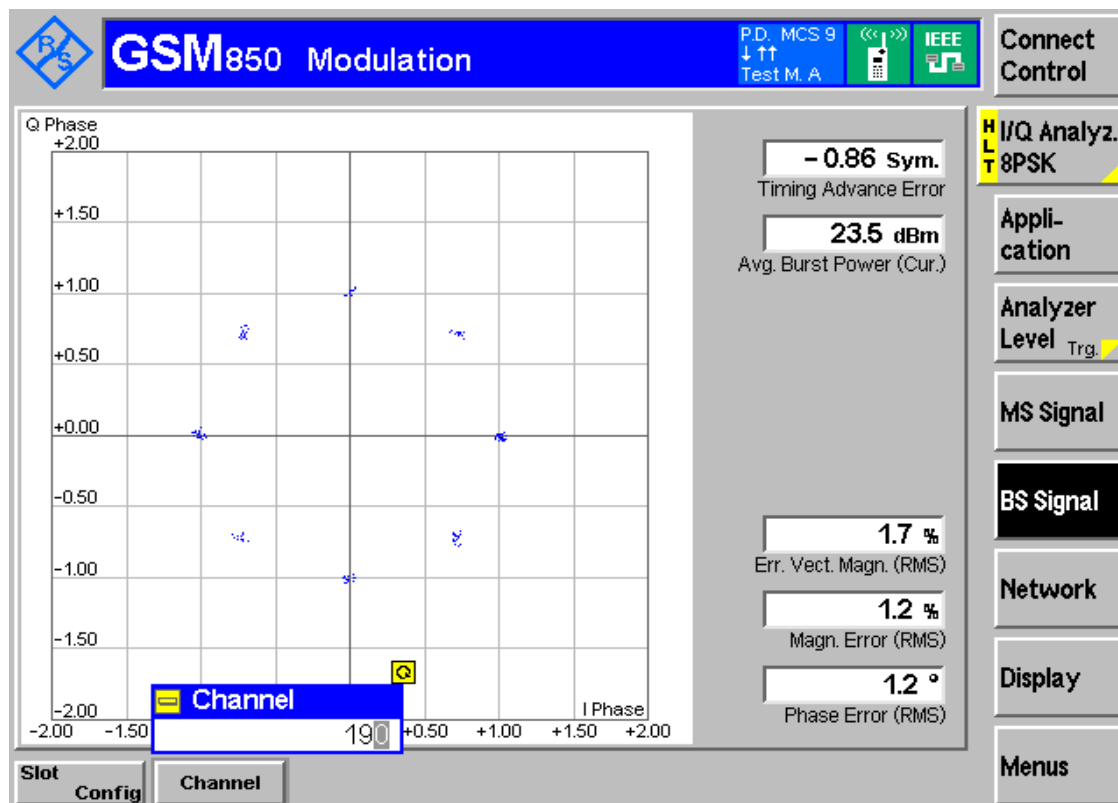
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

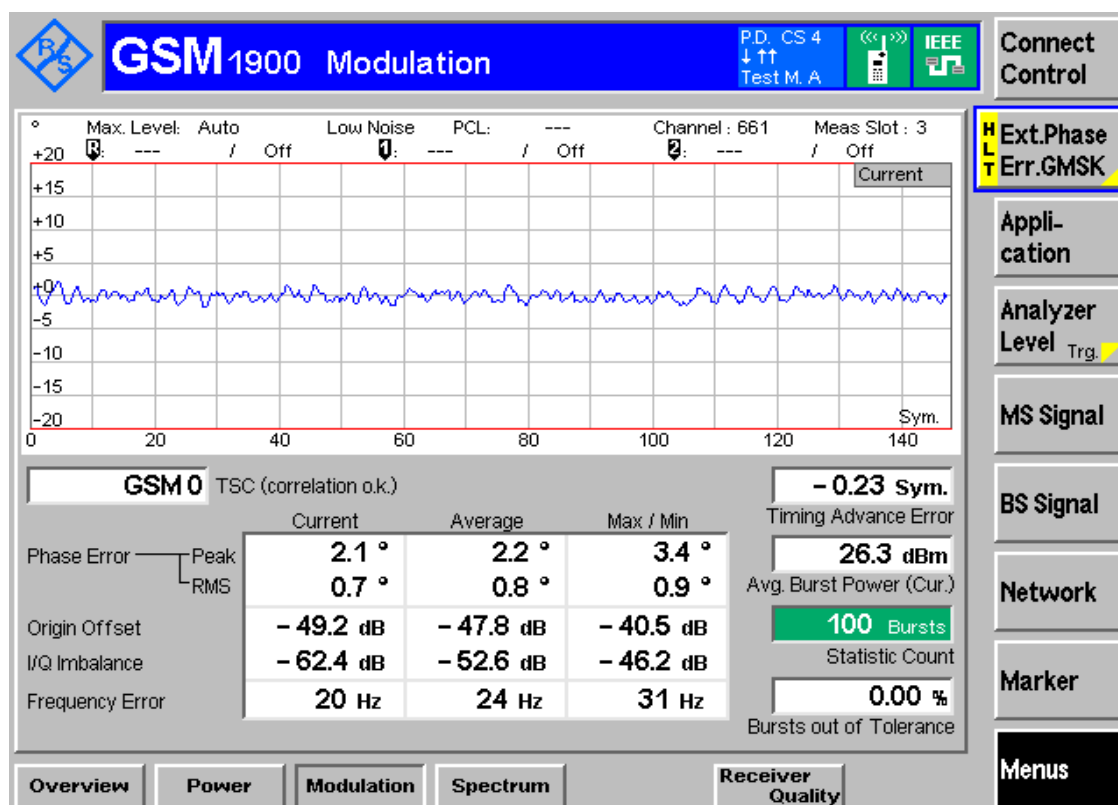
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

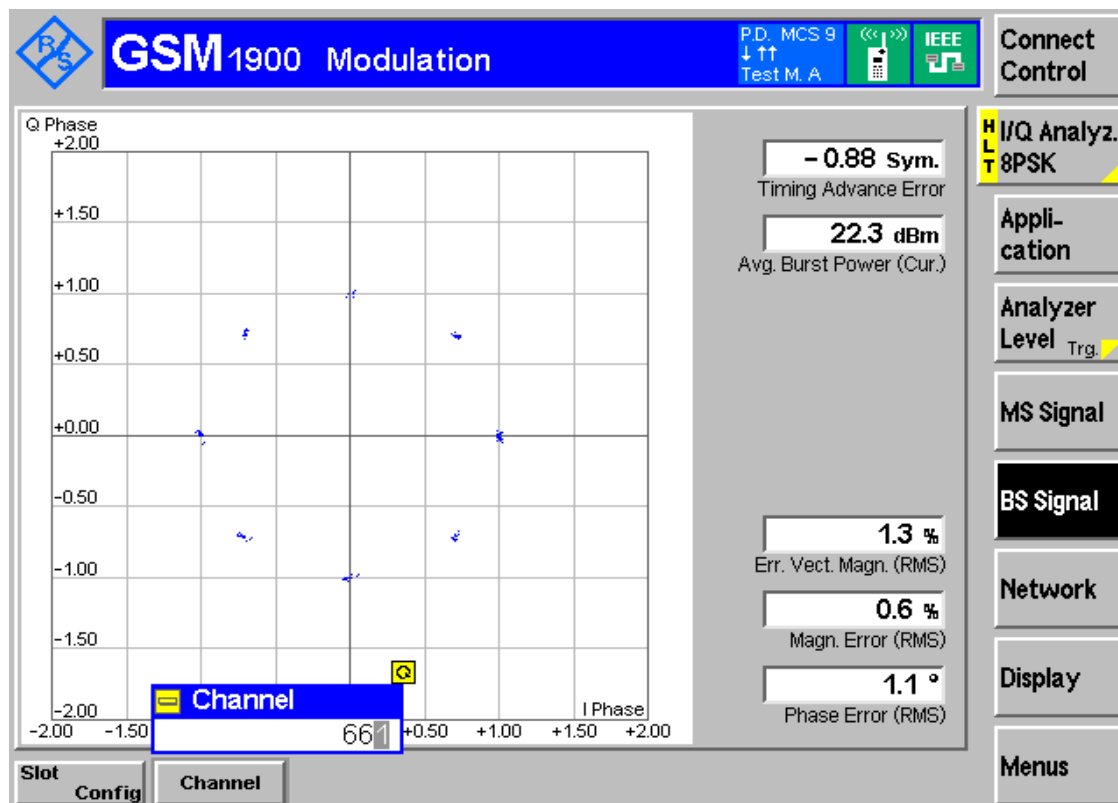
3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH



3.1.2.2 Test Mode = GSM/TM2

3.1.2.2.1 Test Channel = MCH

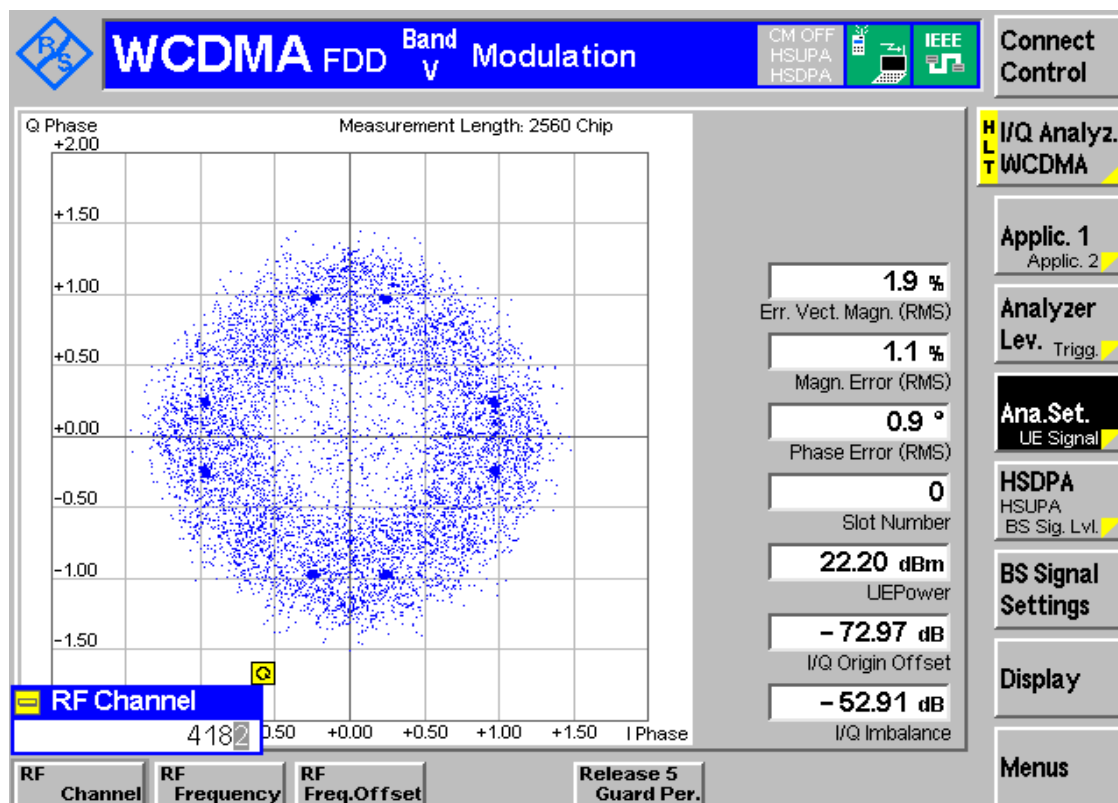


3.2 For UMTS

3.2.1 Test Band = WCDMA850

3.2.1.1 Test Mode = UMTS/TM1

3.2.1.1.1 Test Channel = MCH



4Appendix_D: Bandwidth

Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
GSM850	GSM/TM1	LCH	245.79	315.90	Pass
		MCH	245.61	314.10	Pass
		HCH	241.43	320.59	Pass
	GSM/TM2	LCH	245.82	321.92	Pass
		MCH	236.40	299.96	Pass
		HCH	247.34	310.65	Pass
GSM1900	GSM/TM1	LCH	242.12	307.13	Pass
		MCH	243.16	314.71	Pass
		HCH	242.36	323.60	Pass
	GSM/TM2	LCH	243.23	311.32	Pass
		MCH	240.62	320.70	Pass
		HCH	244.10	307.77	Pass
Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA850	UMTS/TM1	LCH	4.16	4.74	Pass
		MCH	4.17	4.72	Pass
		HCH	4.16	4.73	Pass

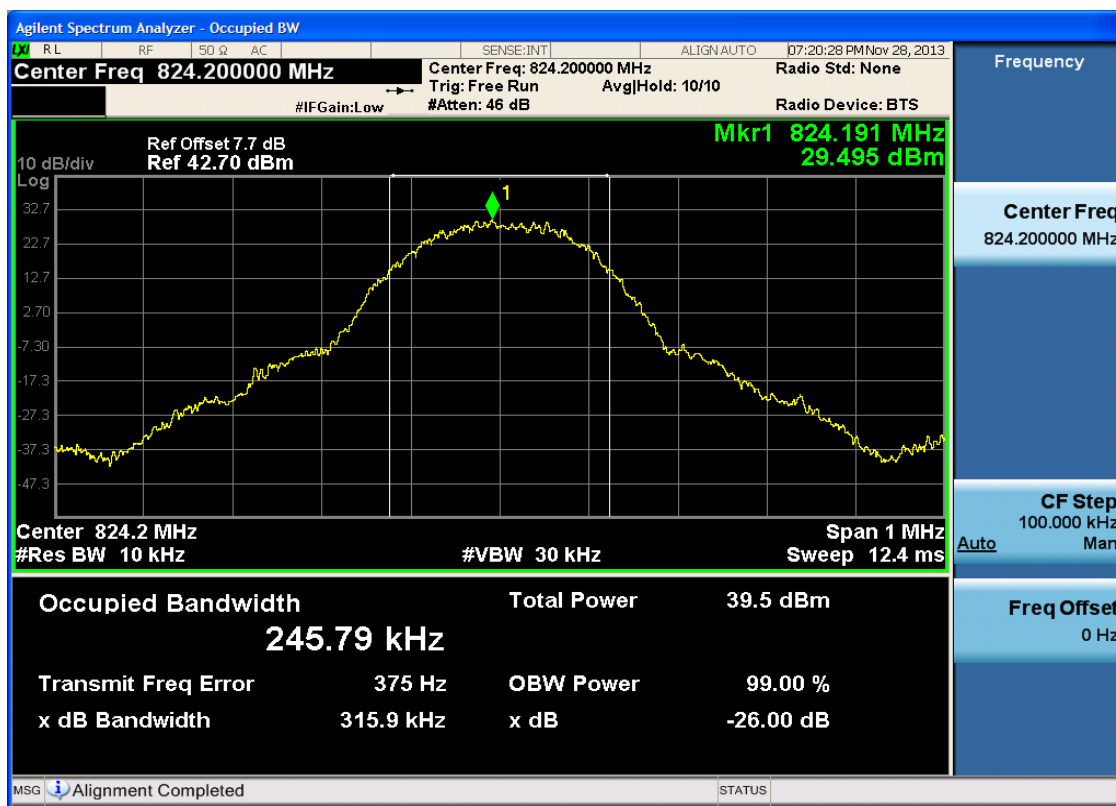
Part II - Test Plots

4.1 For GSM

4.1.1 Test Band = GSM850

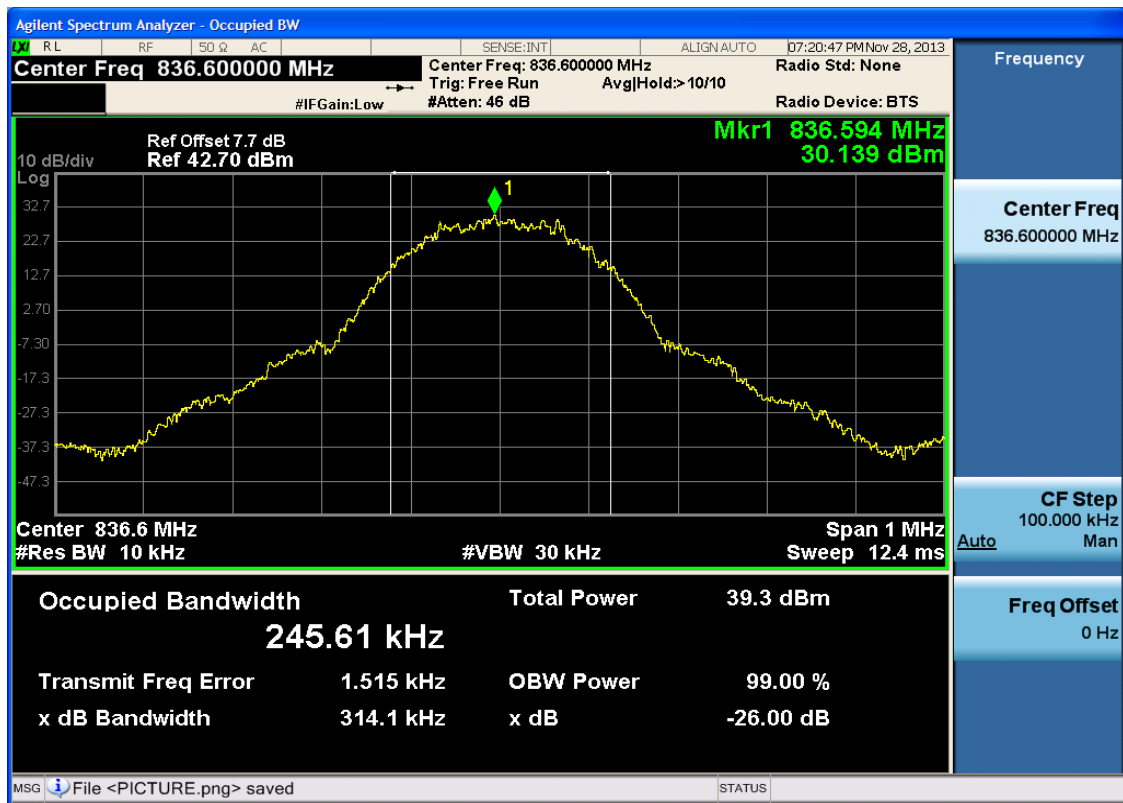
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH



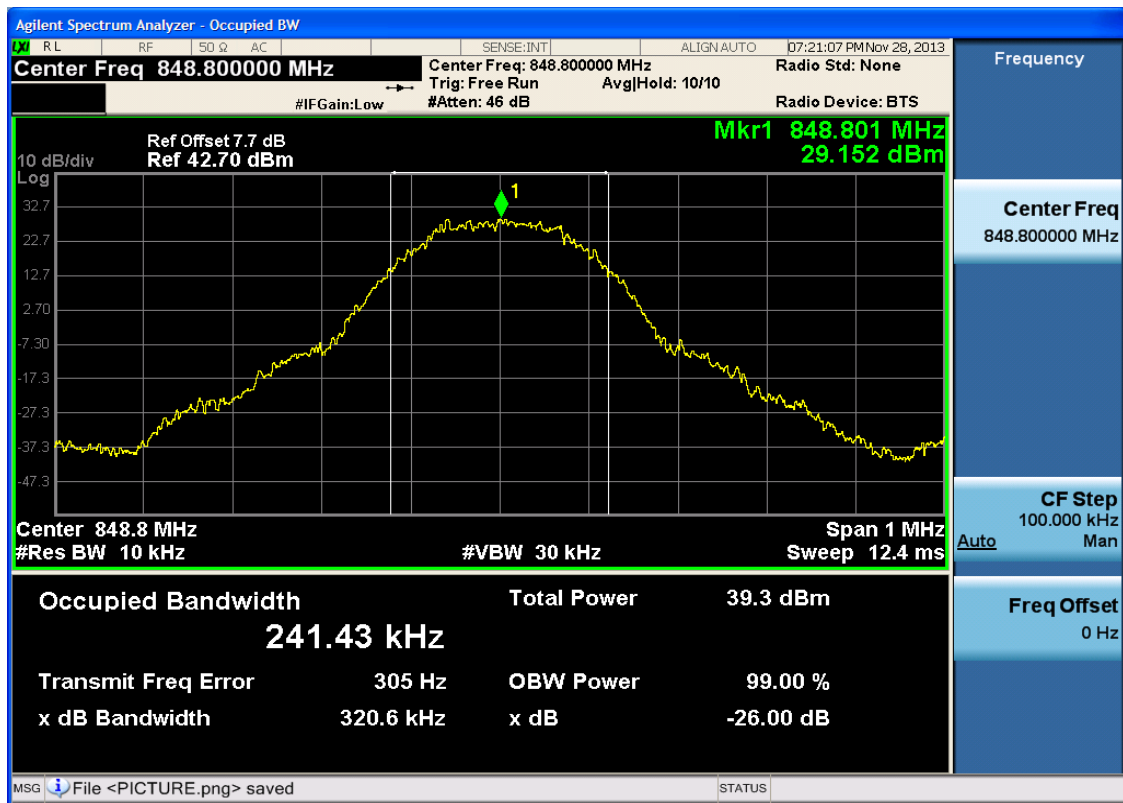


4.1.1.1.2 Test Channel = MCH





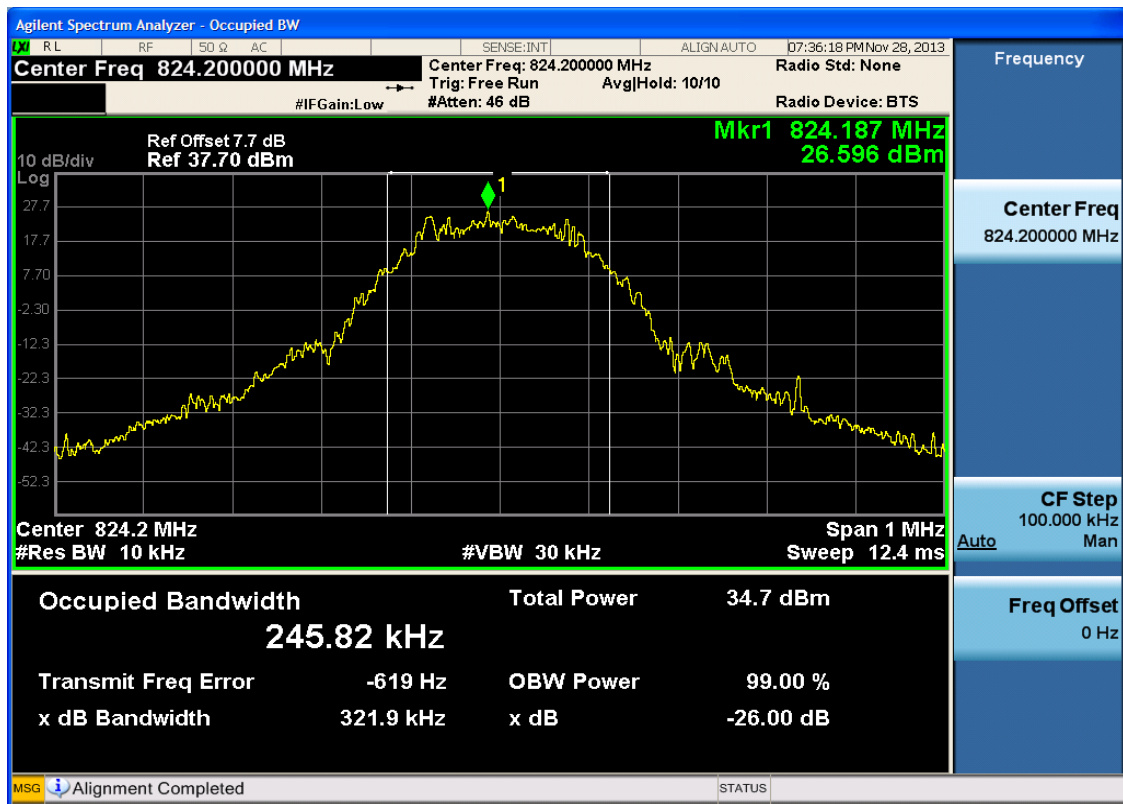
4.1.1.1.3 Test Channel = HCH





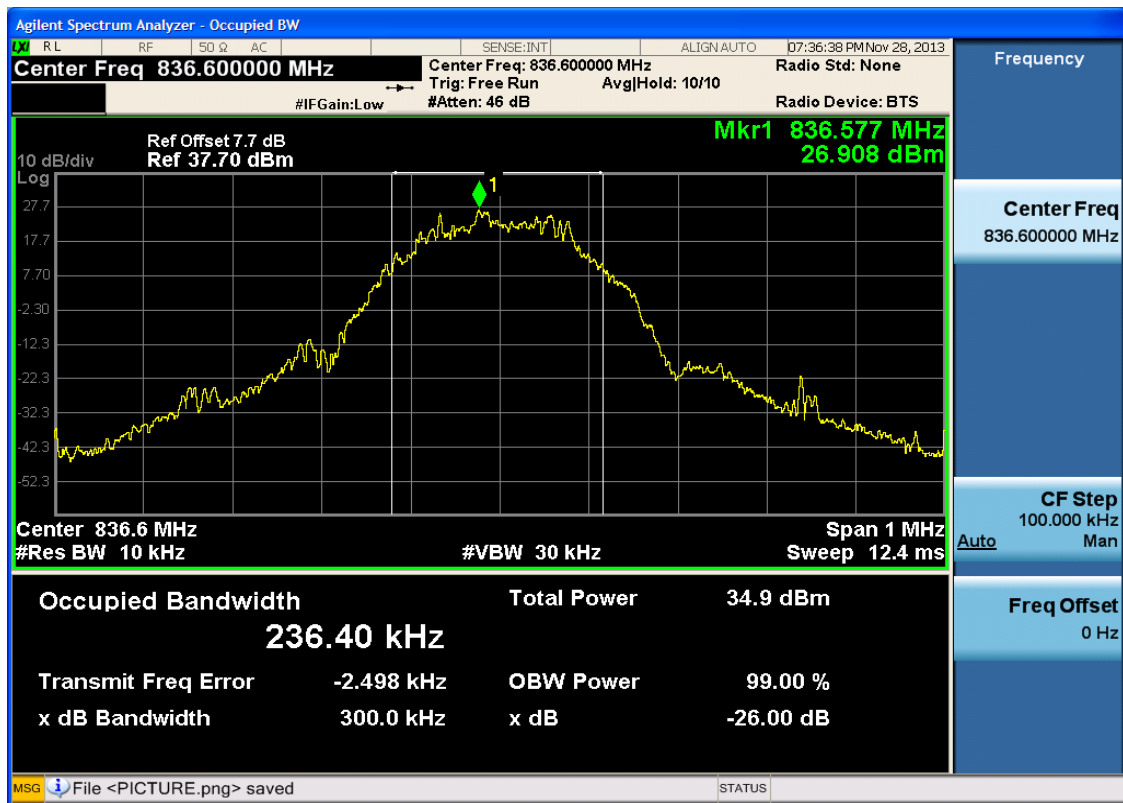
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH



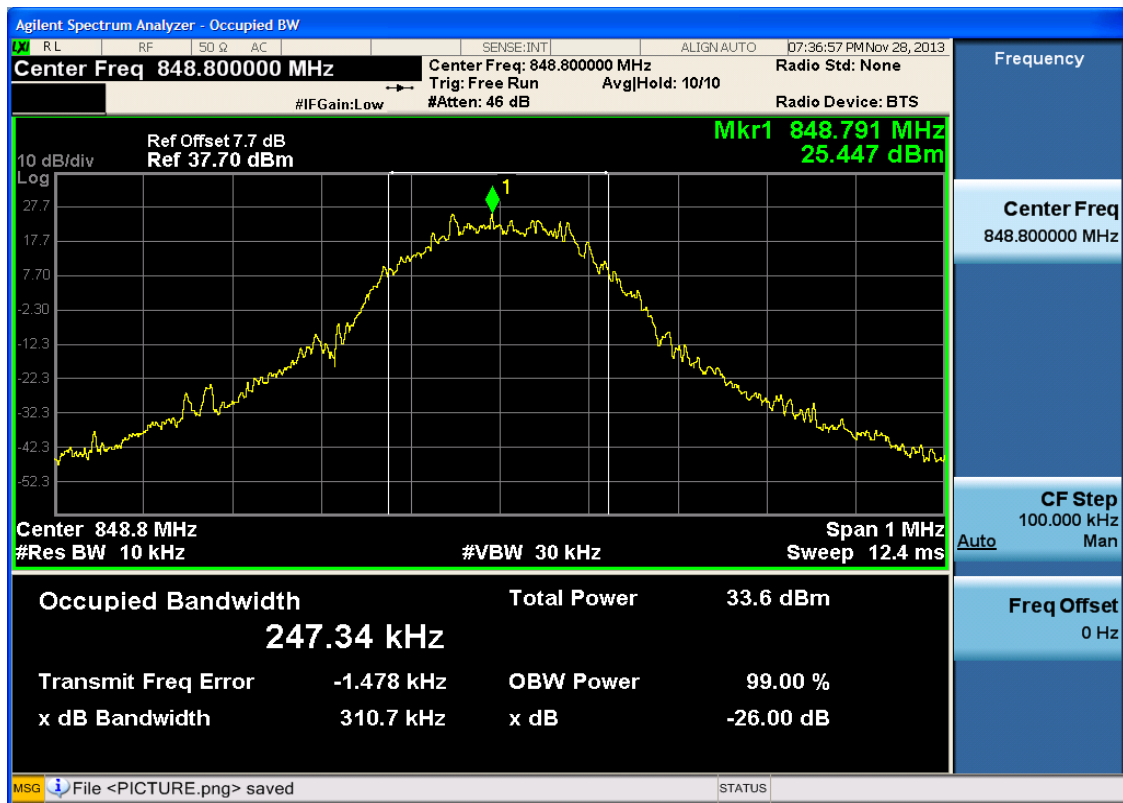


4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH

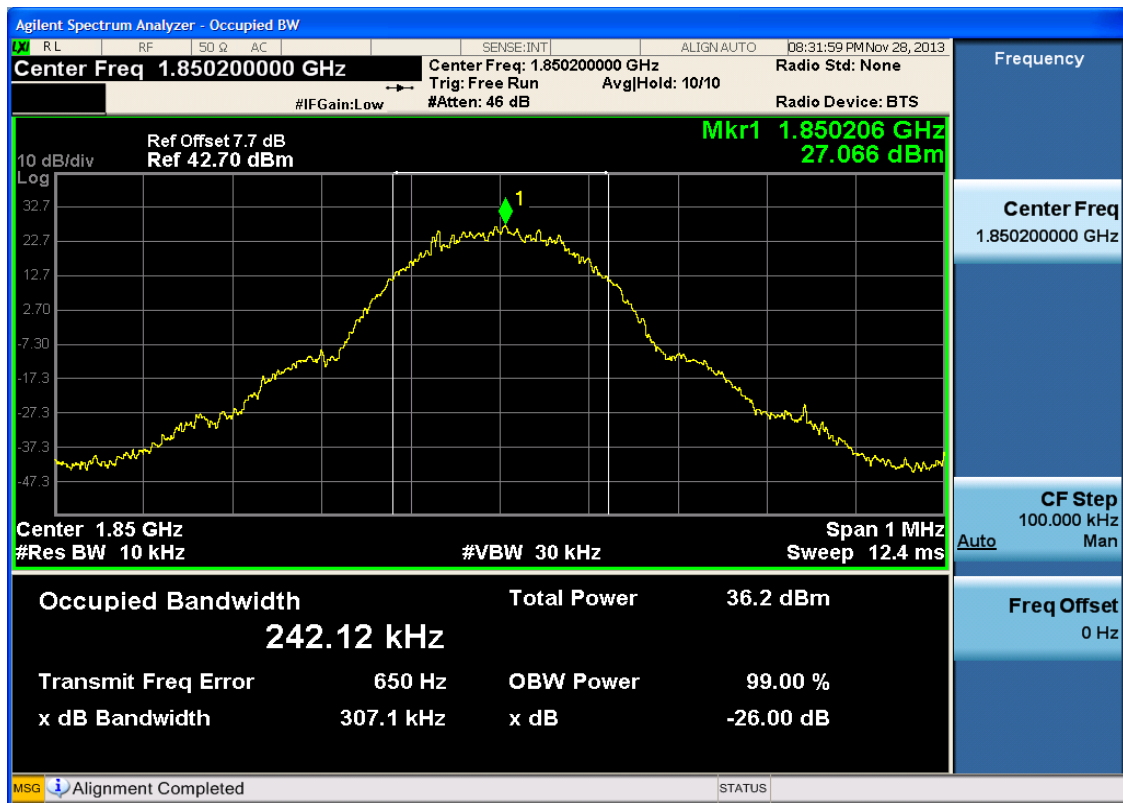




4.1.2 Test Band = GSM1900

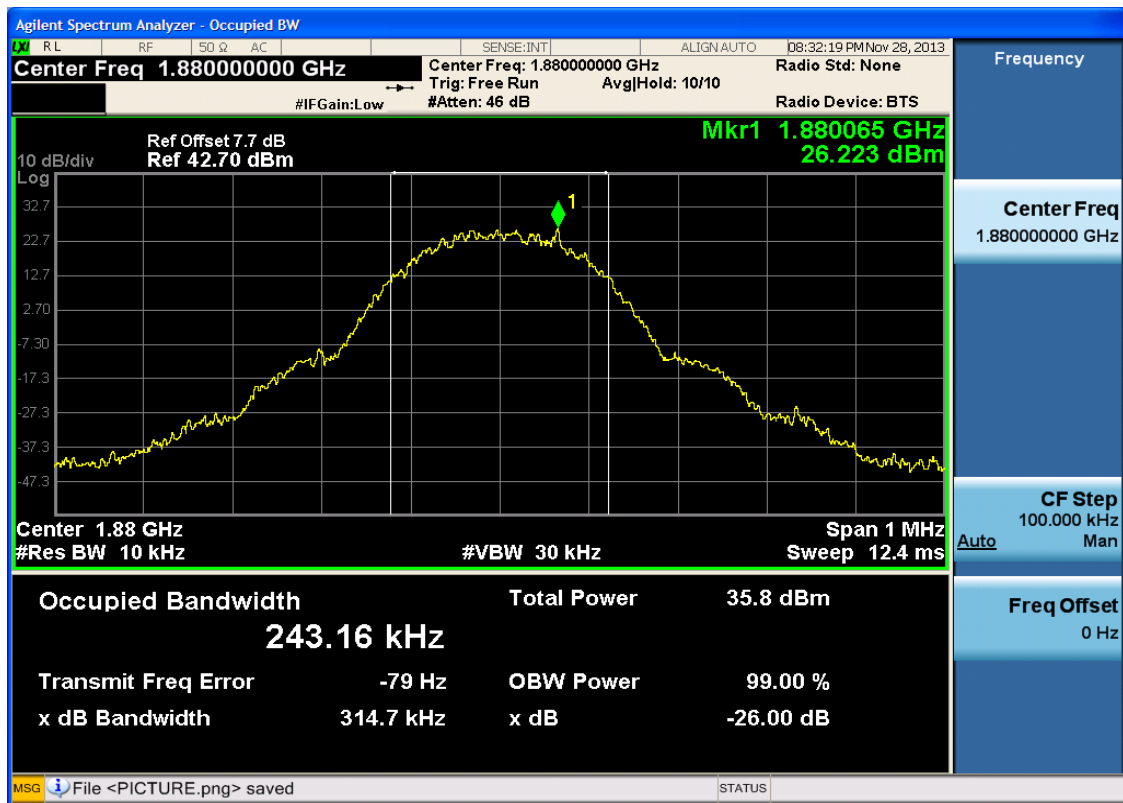
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



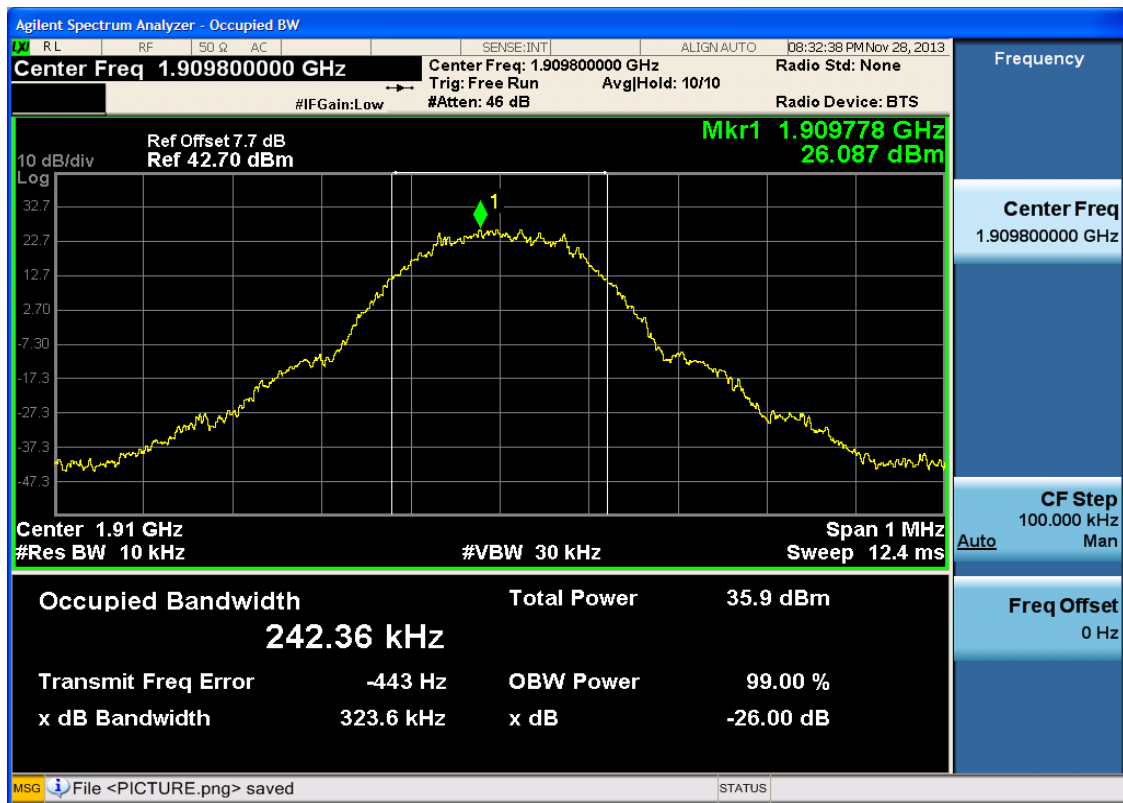


4.1.2.1.2 Test Channel = MCH





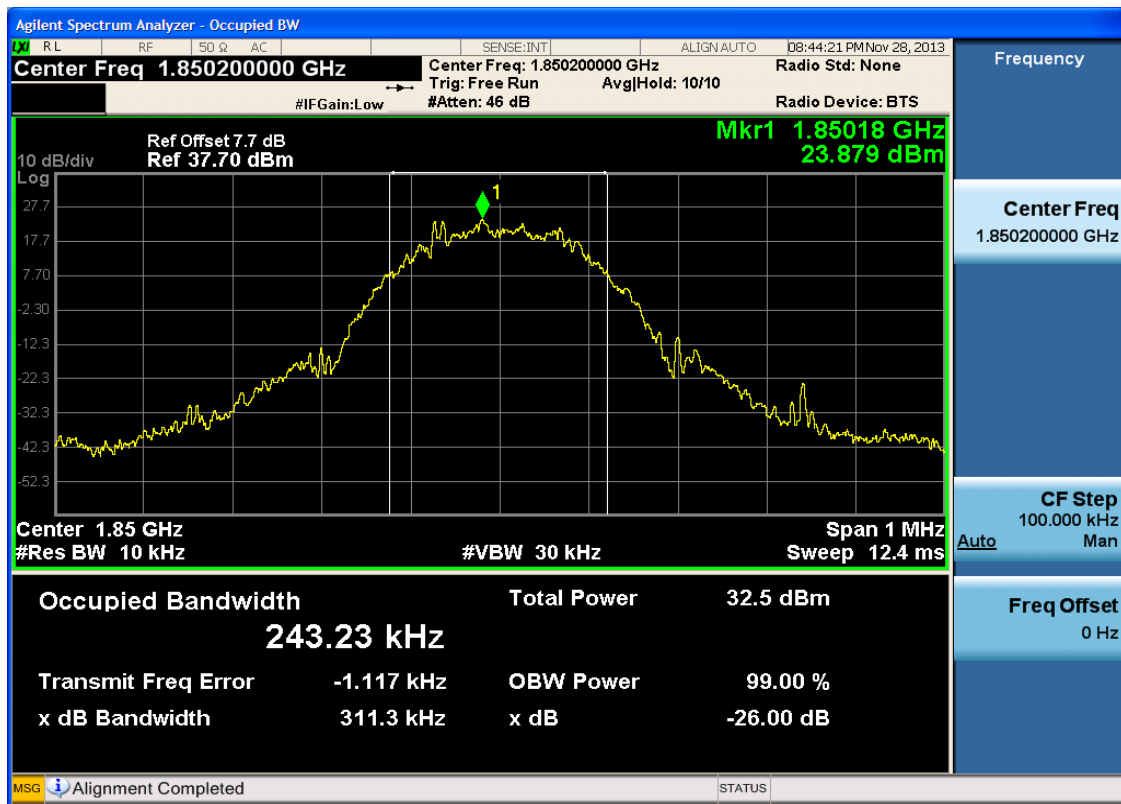
4.1.2.1.3 Test Channel = HCH





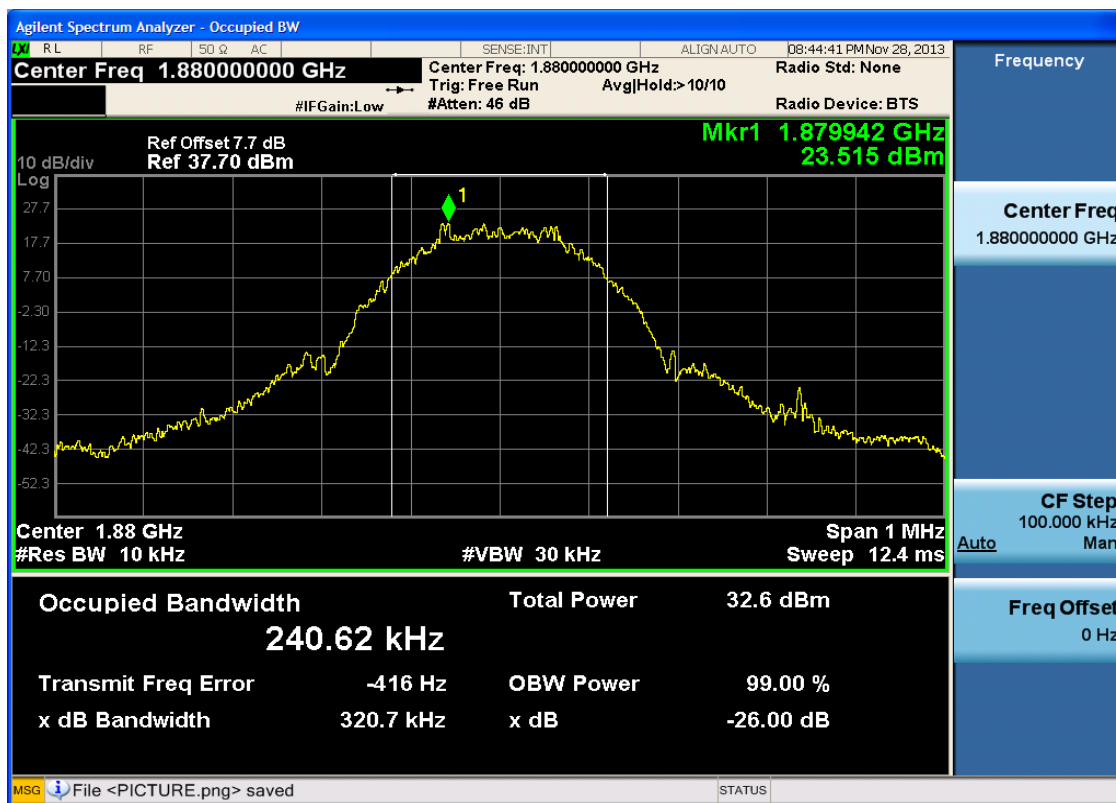
4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



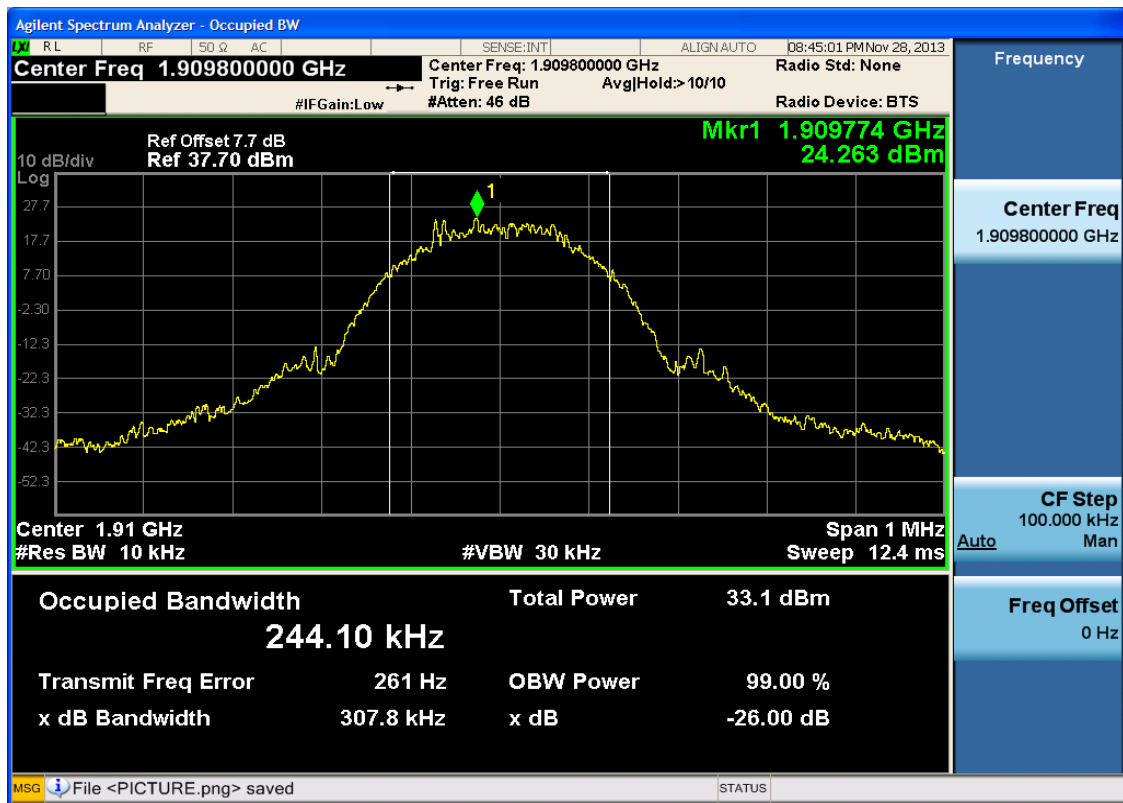


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH

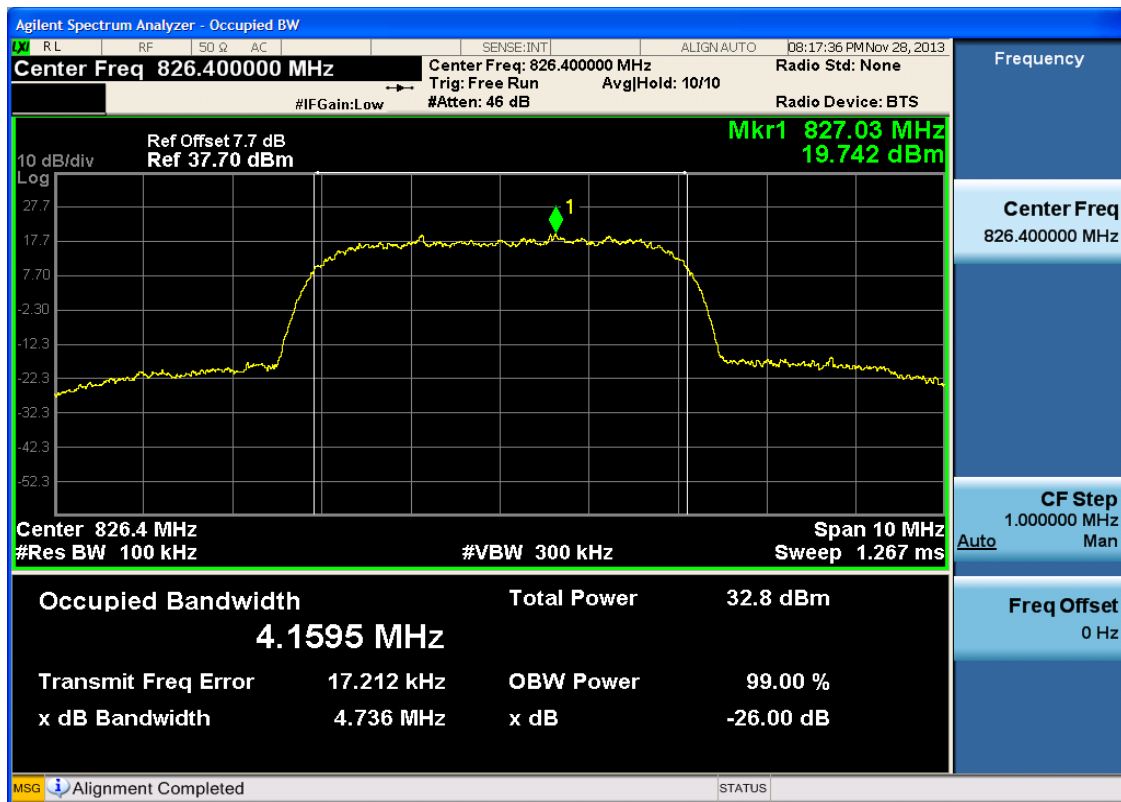


4.2 For UMTS

4.2.1 Test Band = WCDMA850

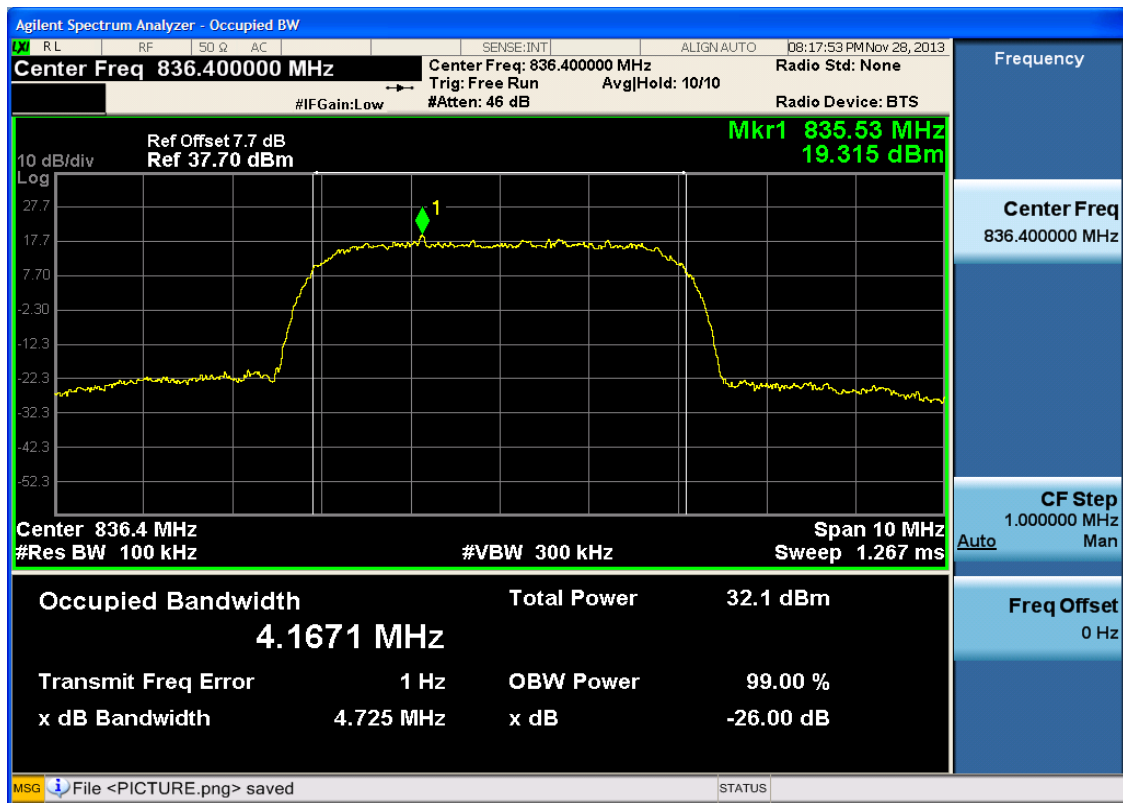
4.2.1.1 Test Mode = UMTS/TM1

4.2.1.1.1 Test Channel = LCH



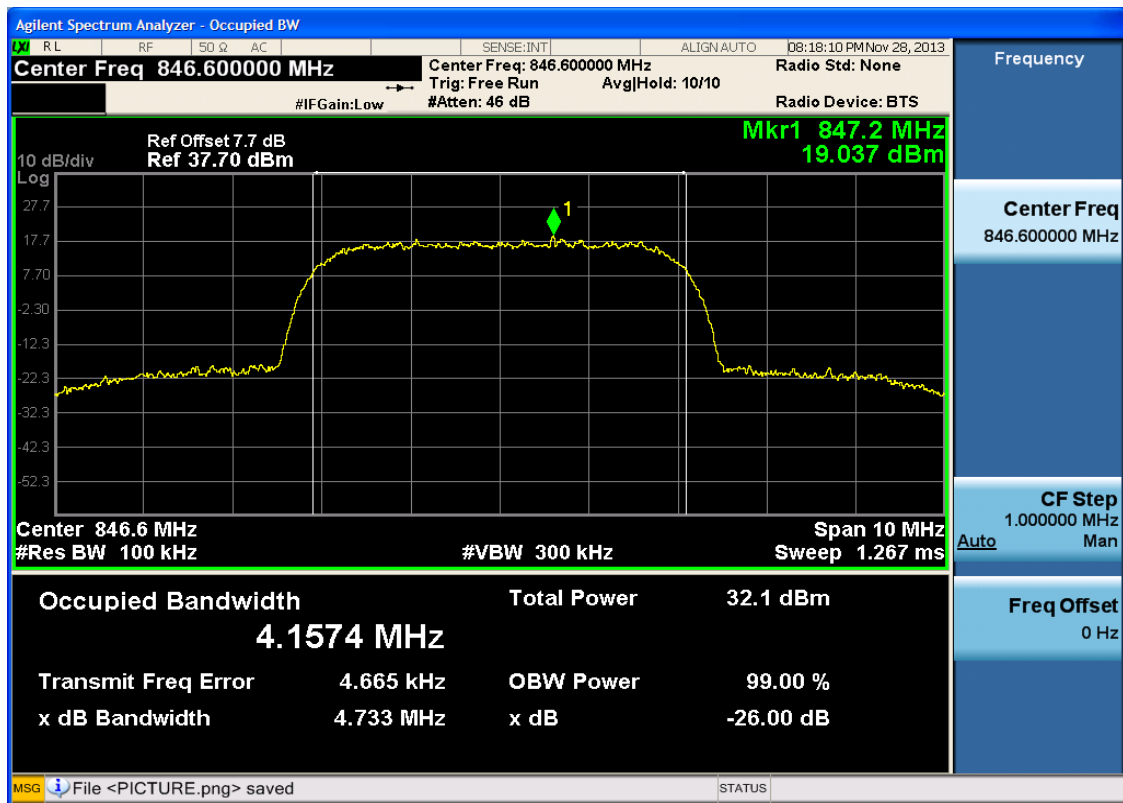


4.2.1.1.2 Test Channel = MCH





4.2.1.1.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

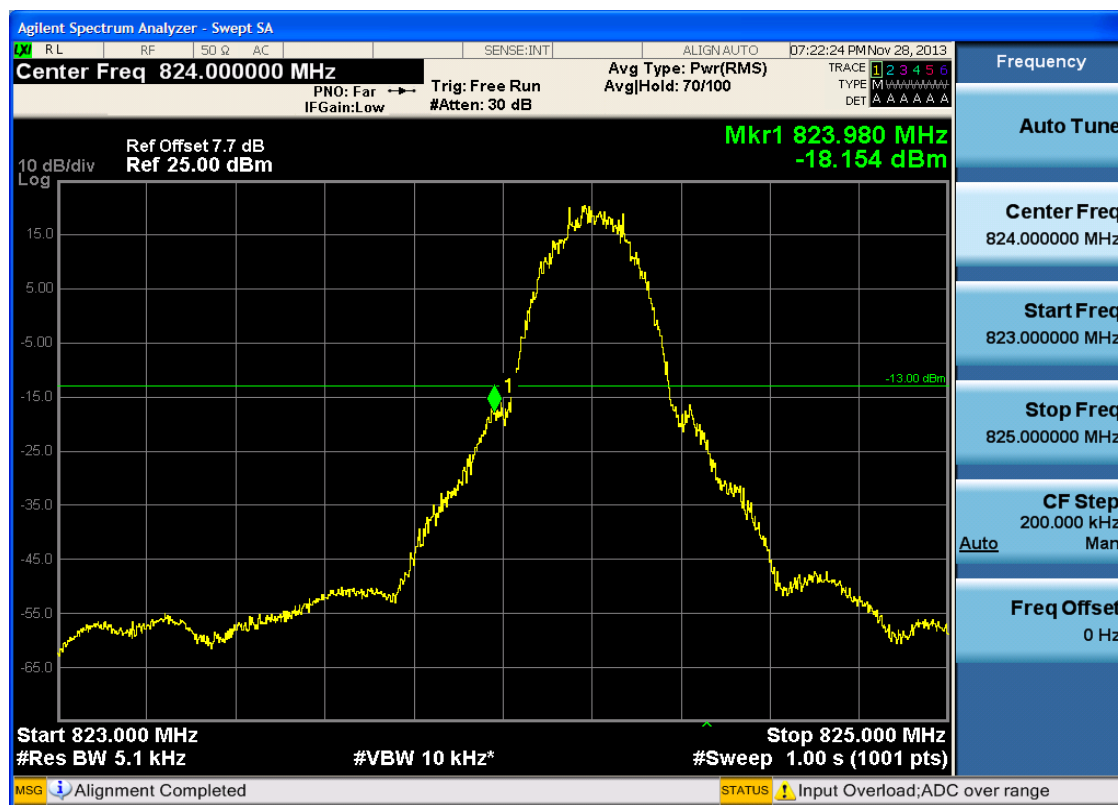
Part I - Test Plots

5.1 For GSM

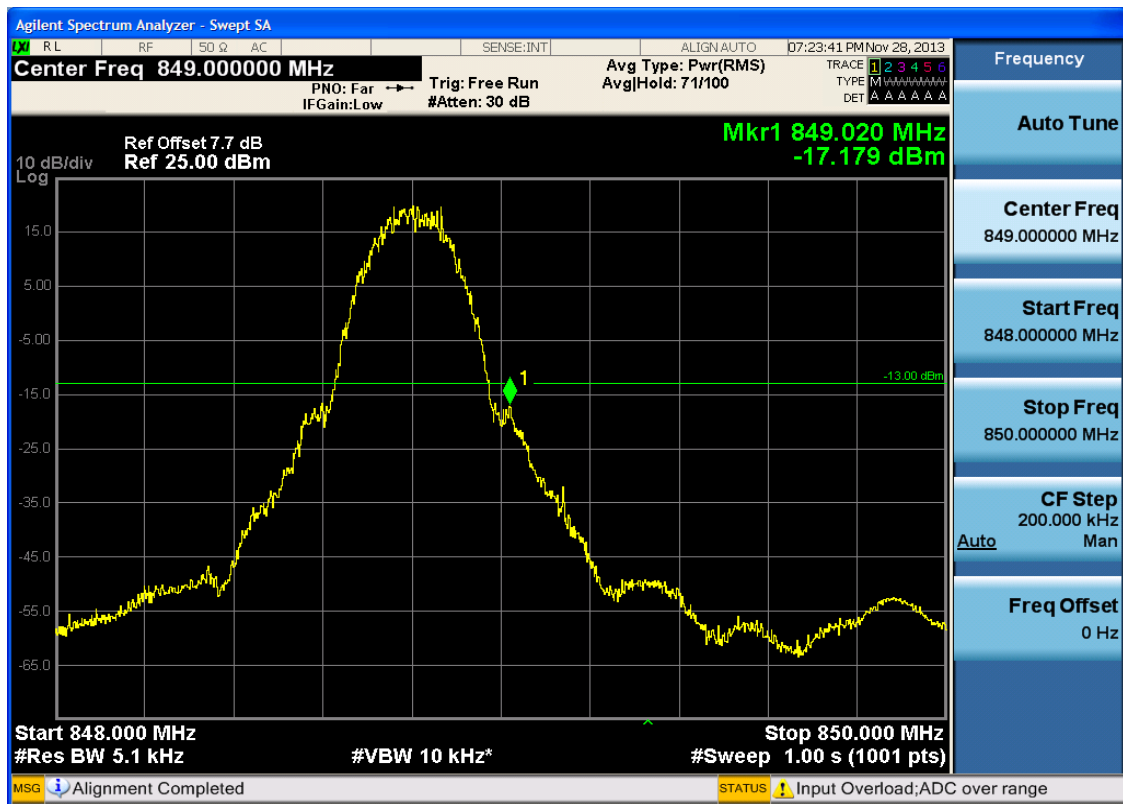
5.1.1 Test Band = GSM850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH

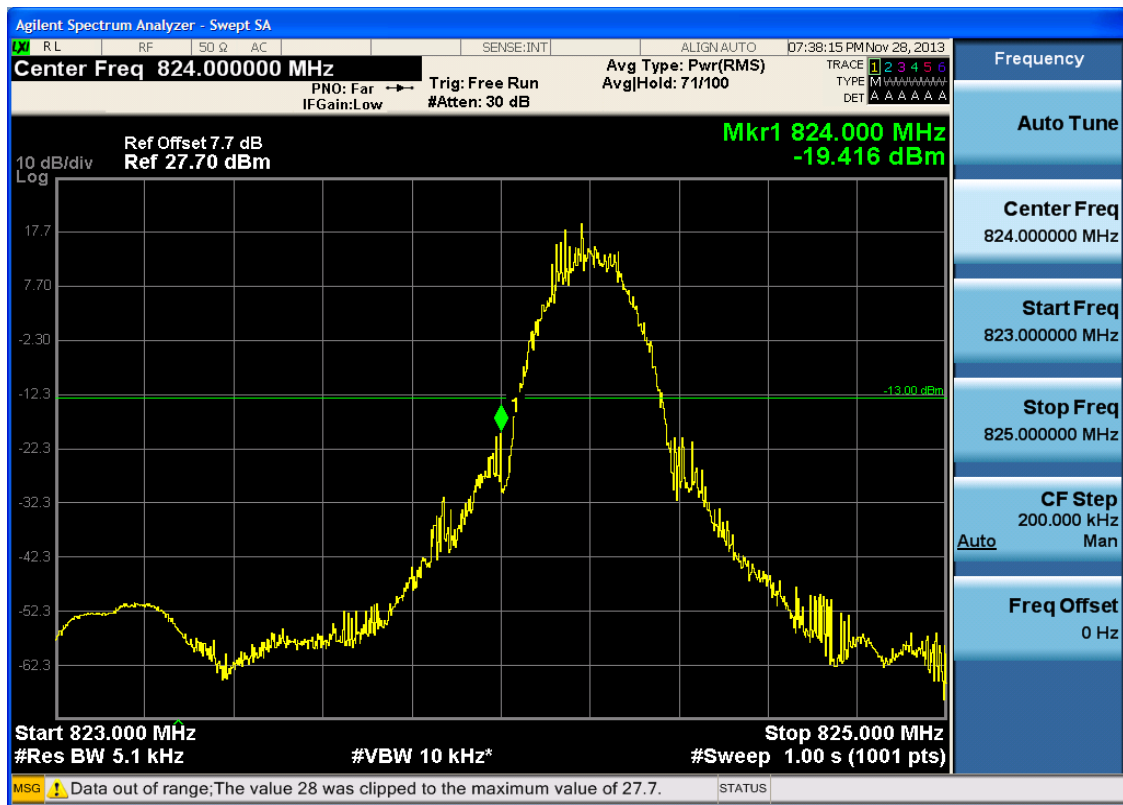


5.1.1.1.2 Test Channel = HCH



5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH





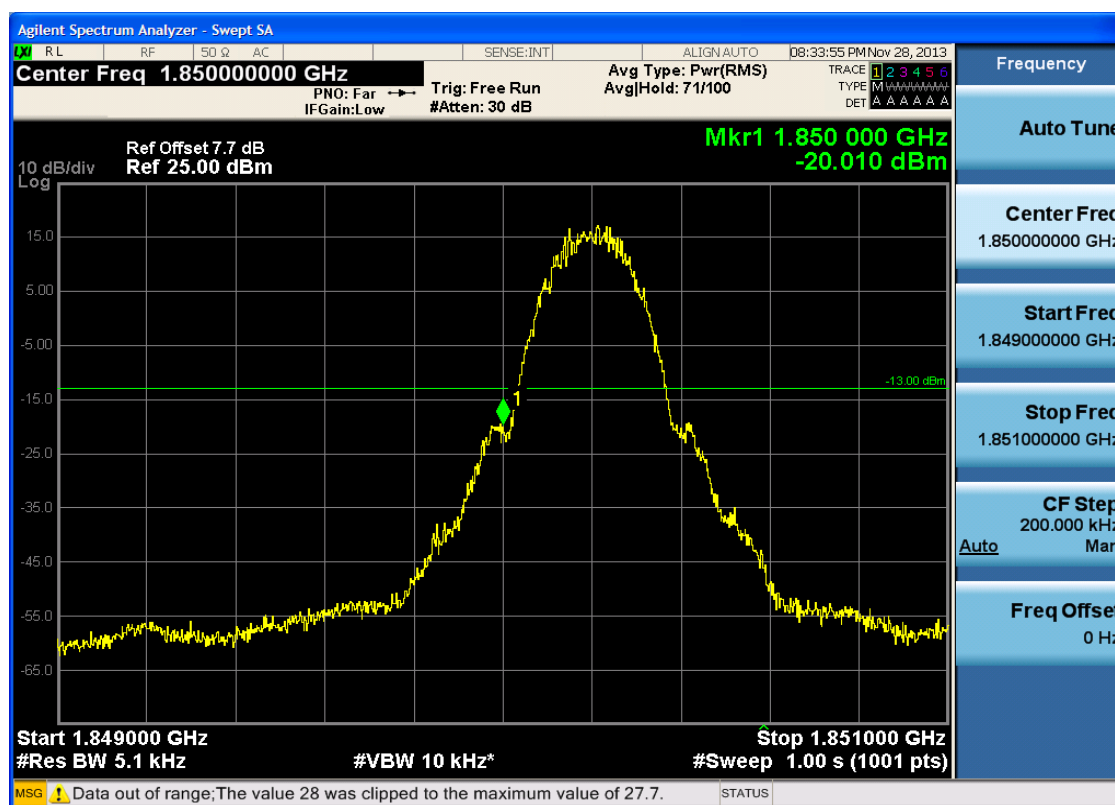
5.1.1.2.2 Test Channel = HCH



5.1.2 Test Band = GSM1900

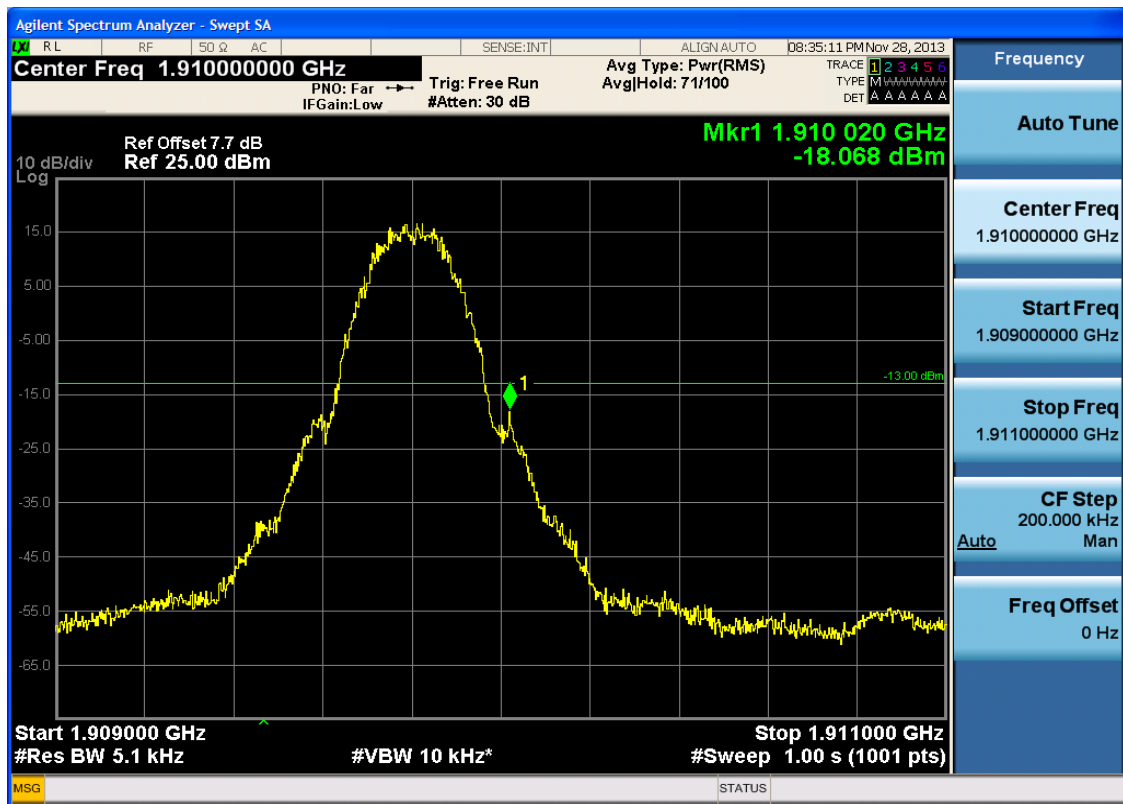
5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH



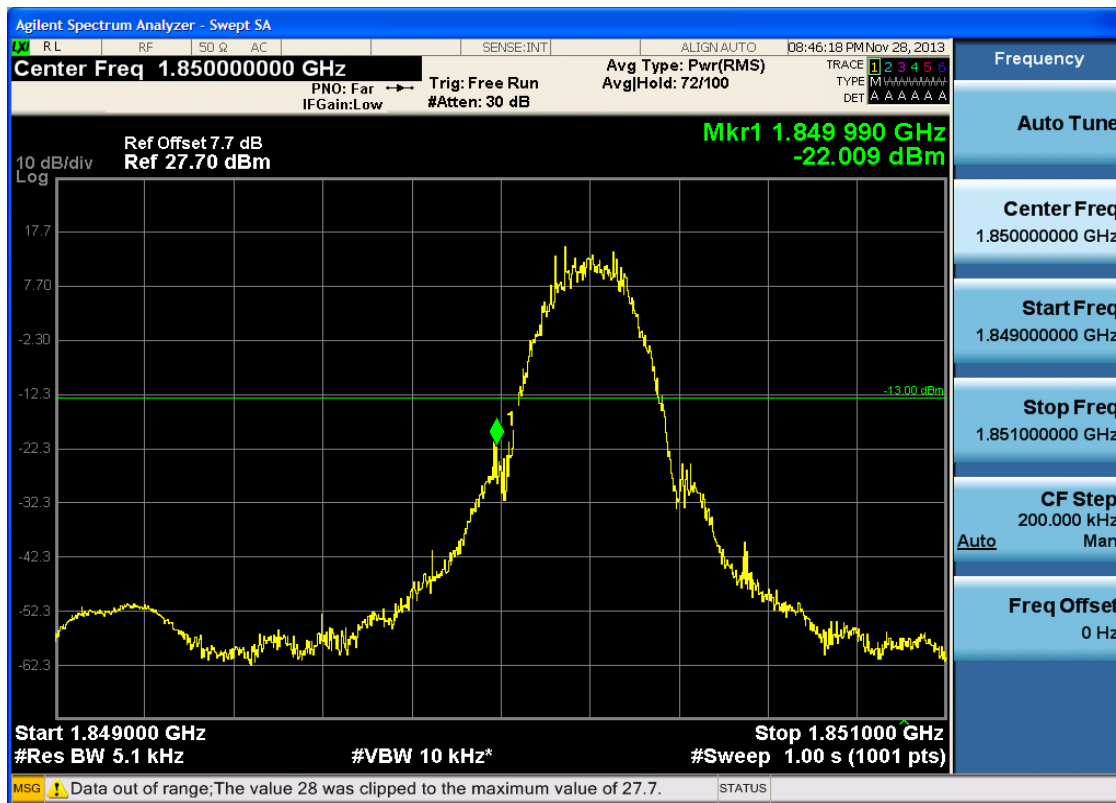


5.1.2.1.2 Test Channel = HCH



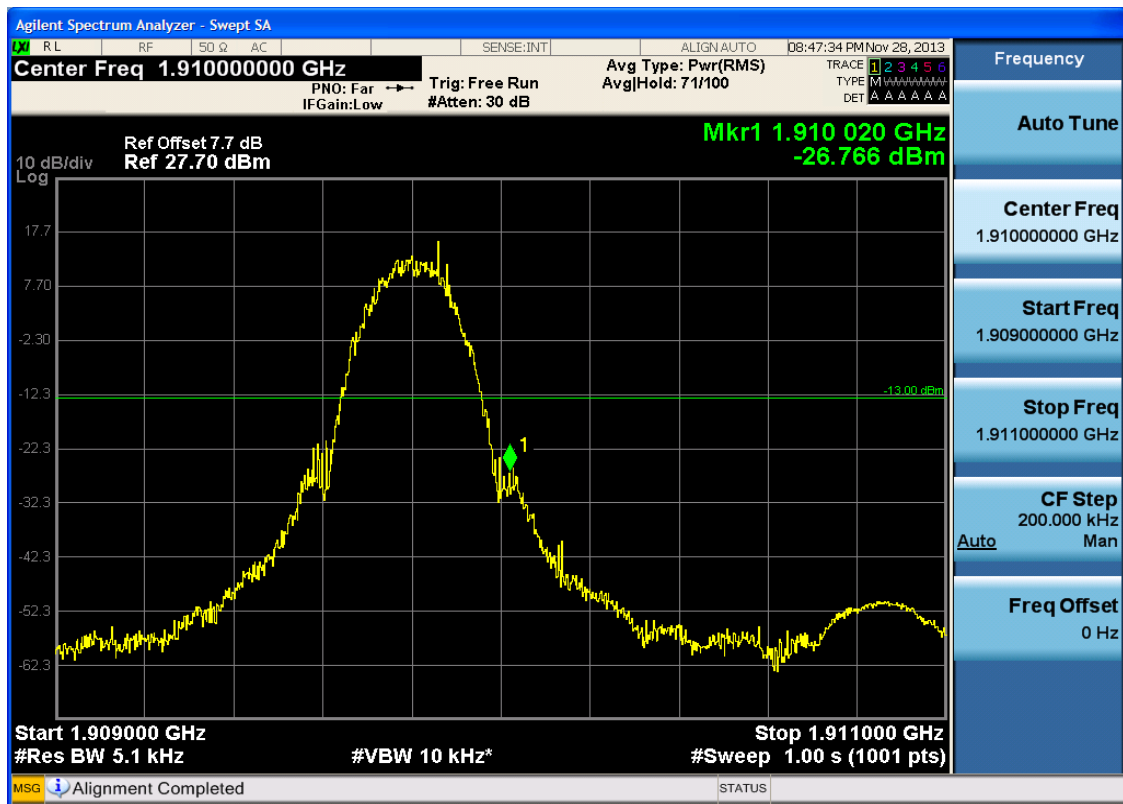
5.1.2.2 Test Mode = GSM/TM2

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



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.

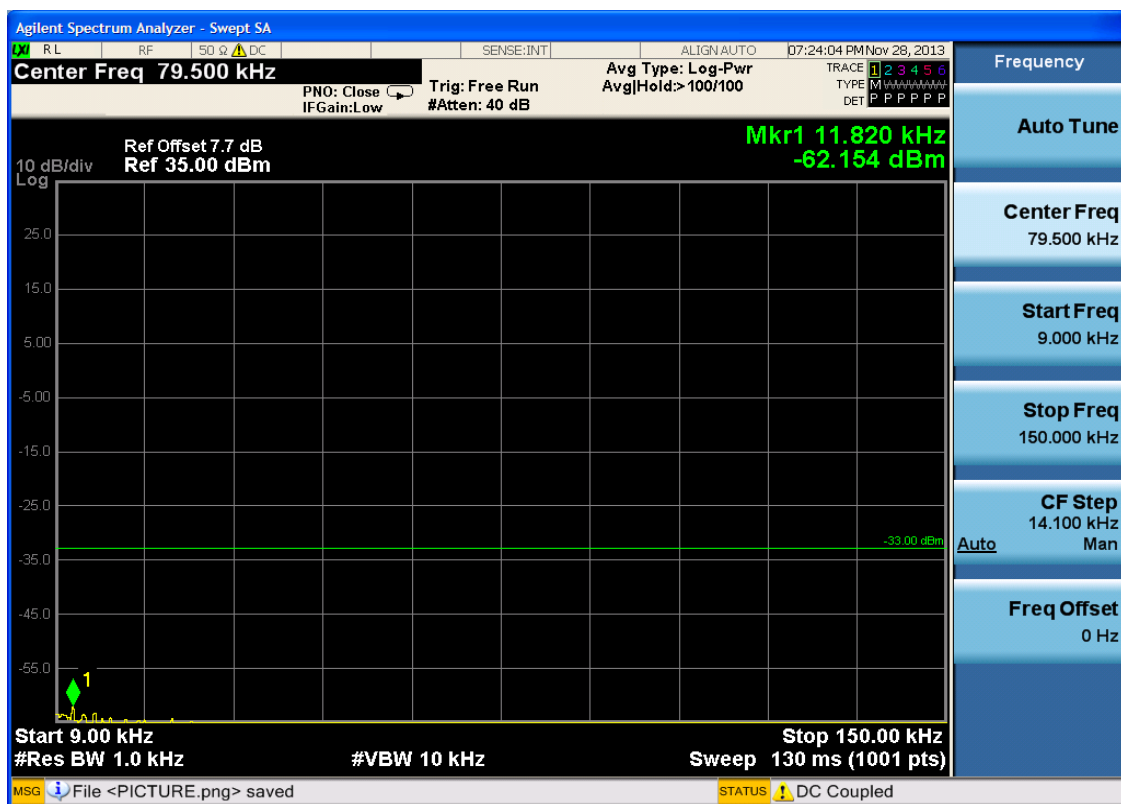
Part I - Test Plots

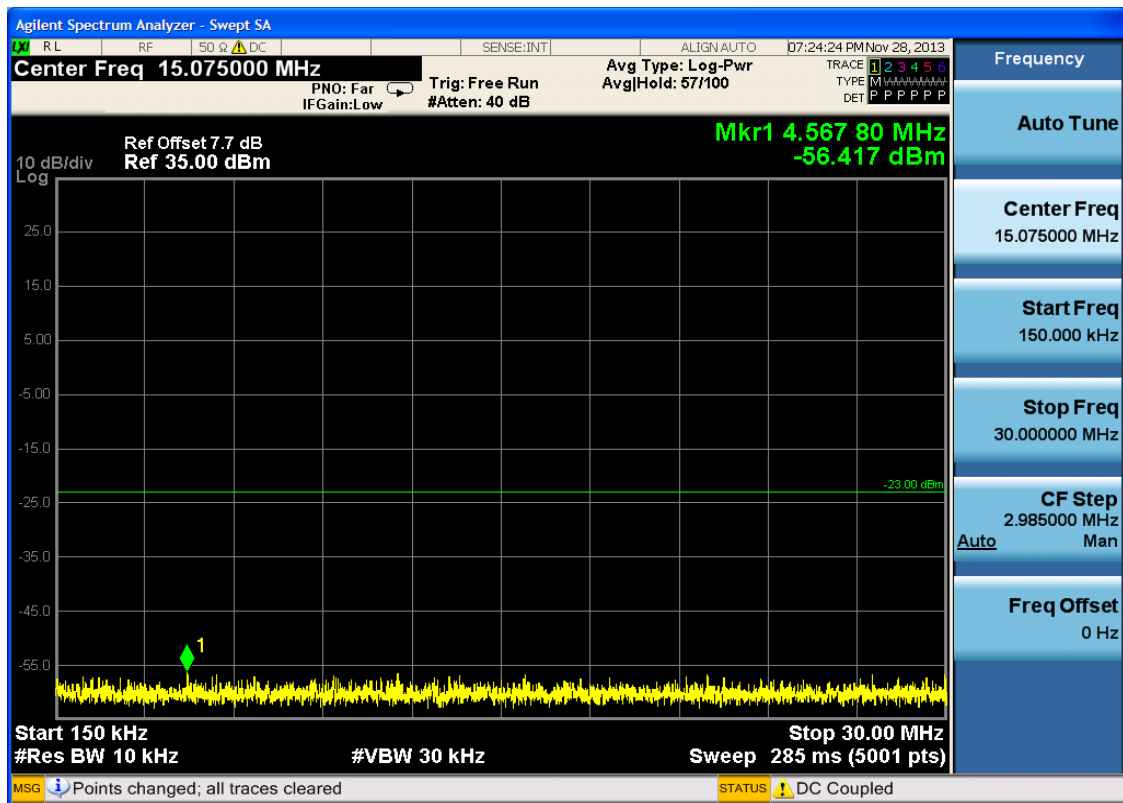
6.1 For GSM

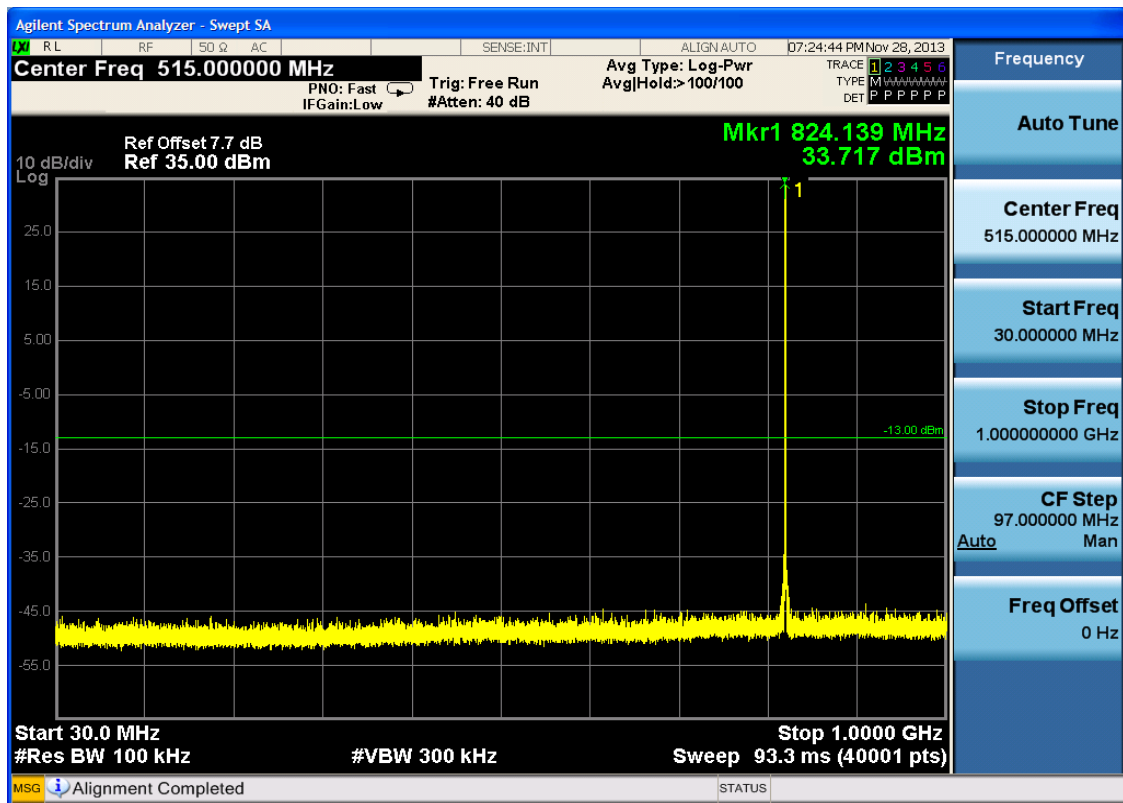
6.1.1 Test Band = GSM850

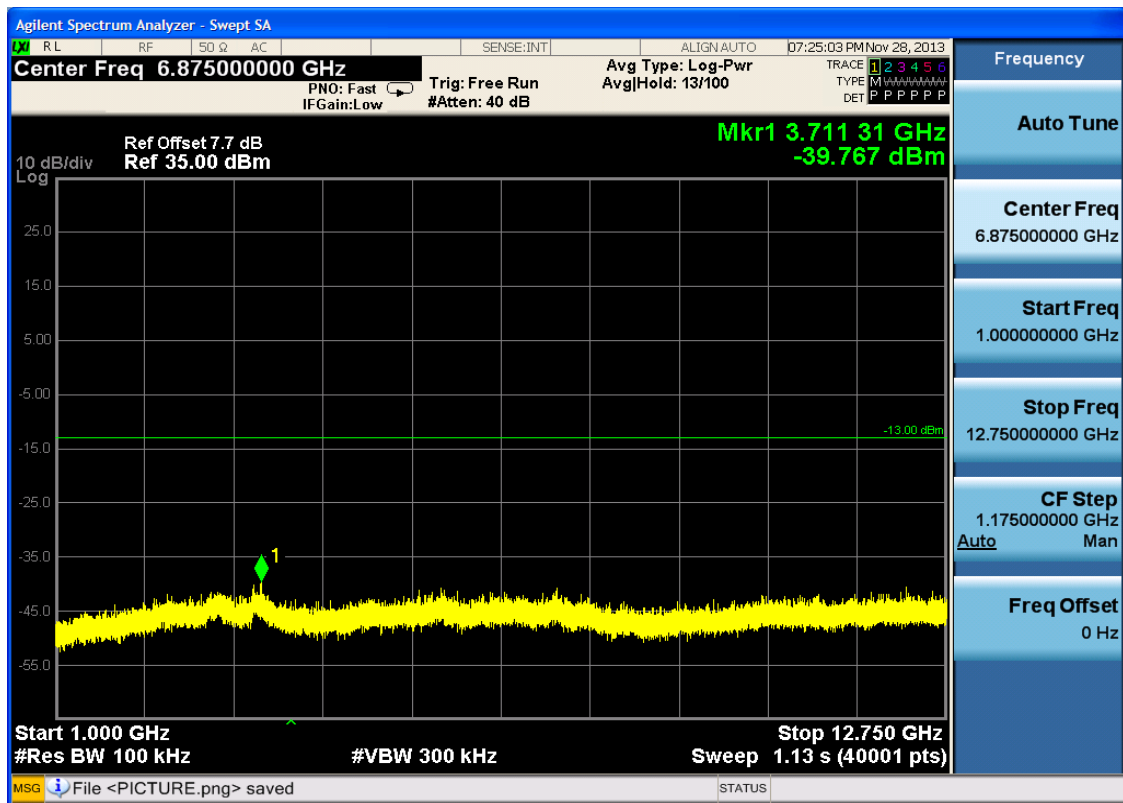
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH



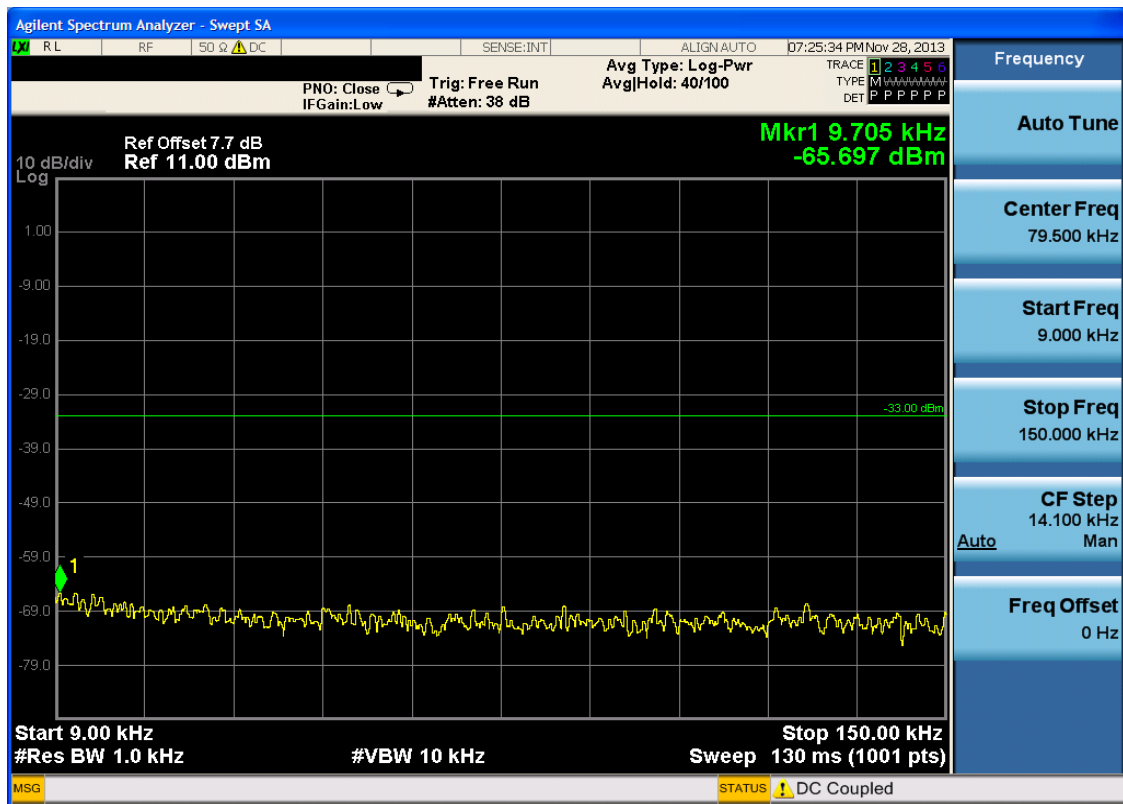


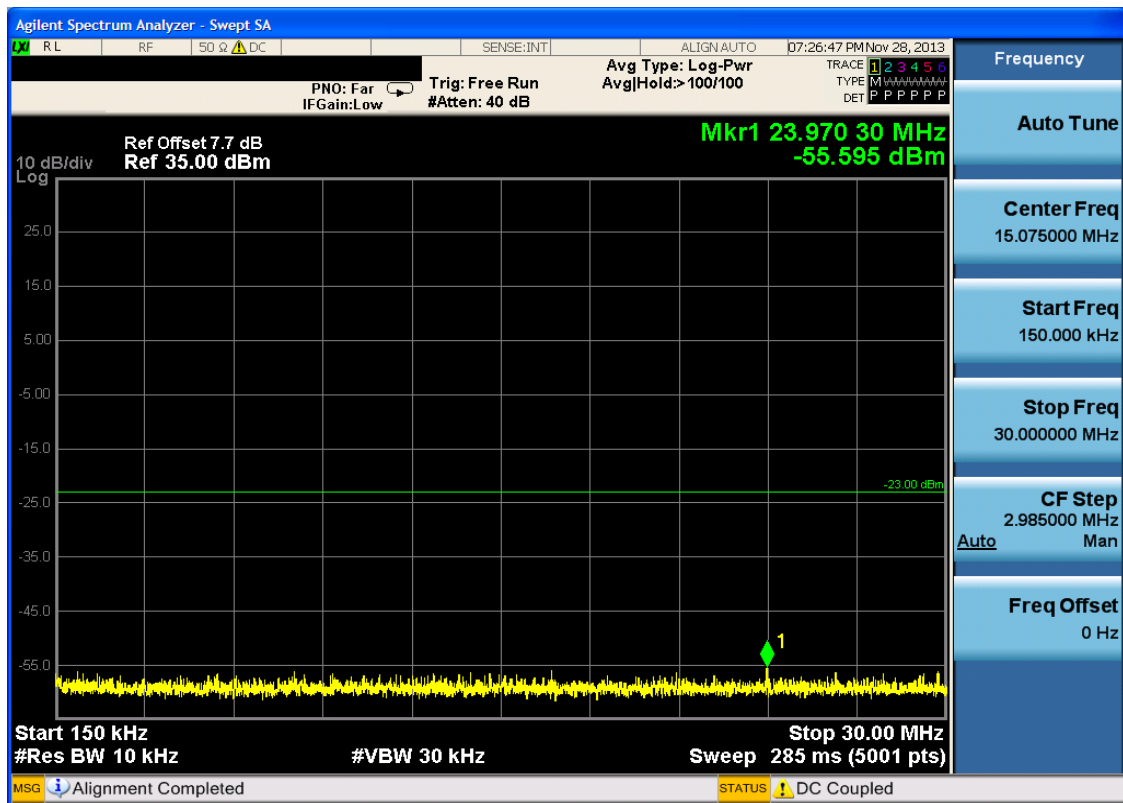


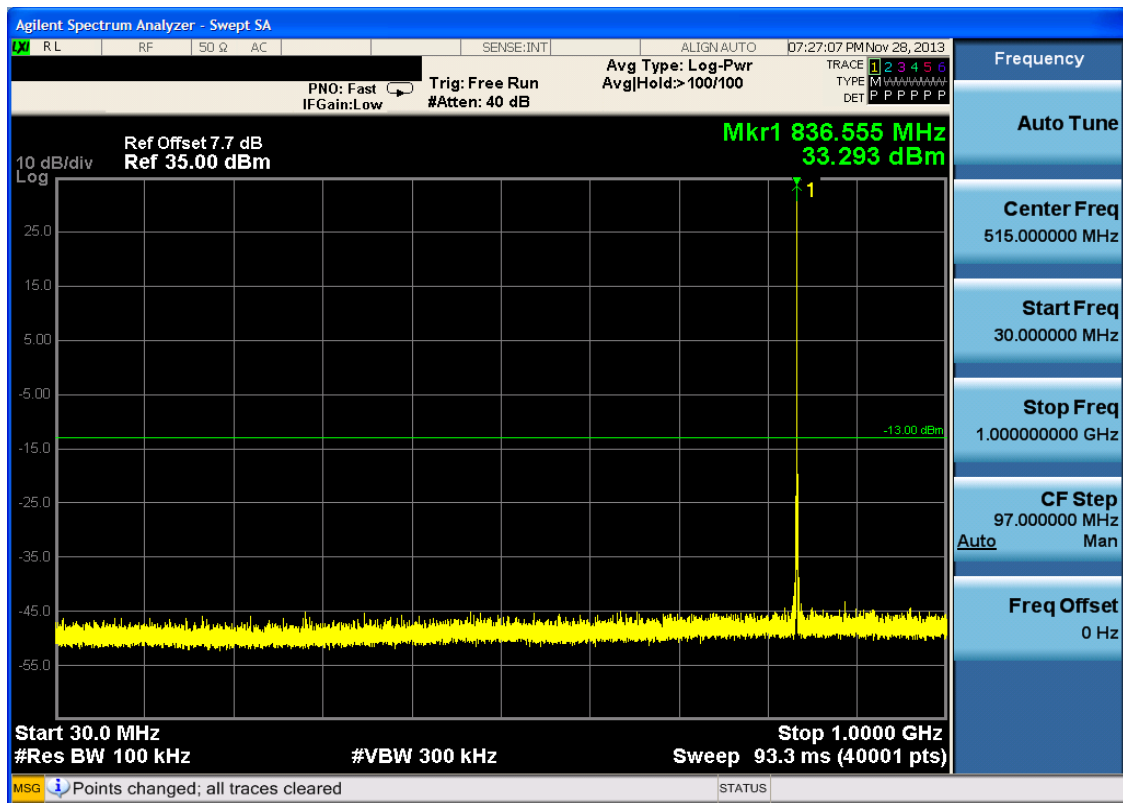


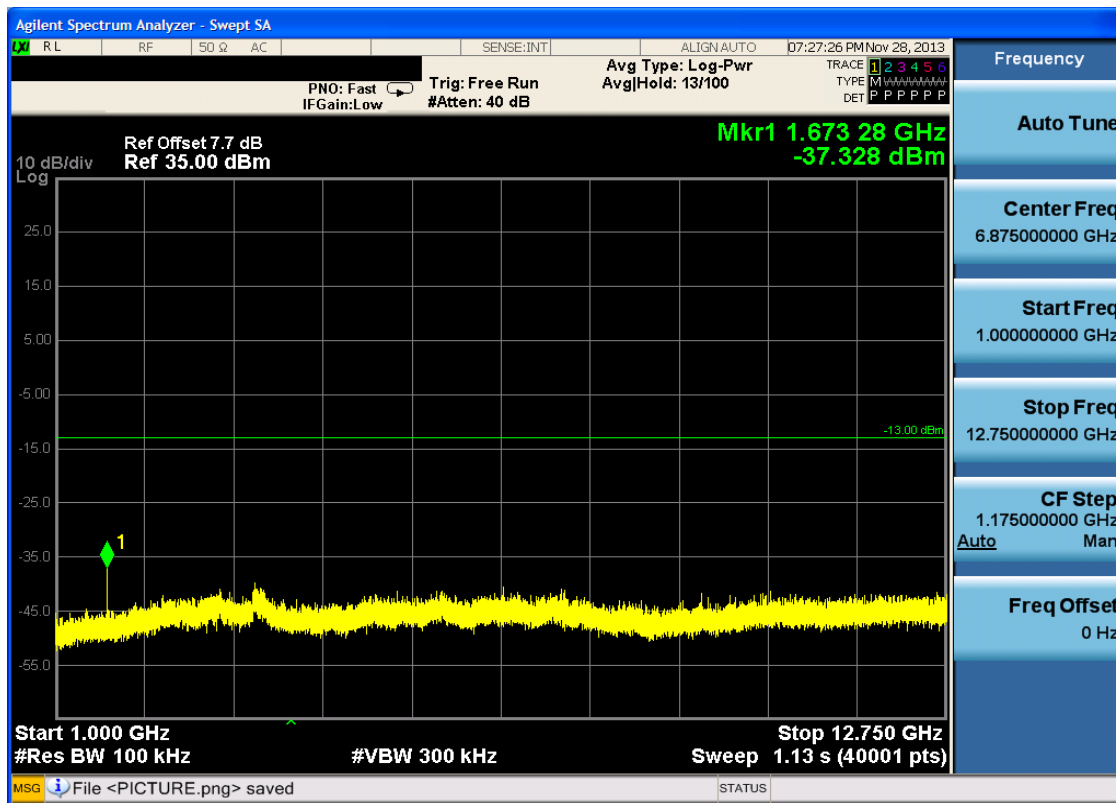


6.1.1.1.2 Test Channel = MCH



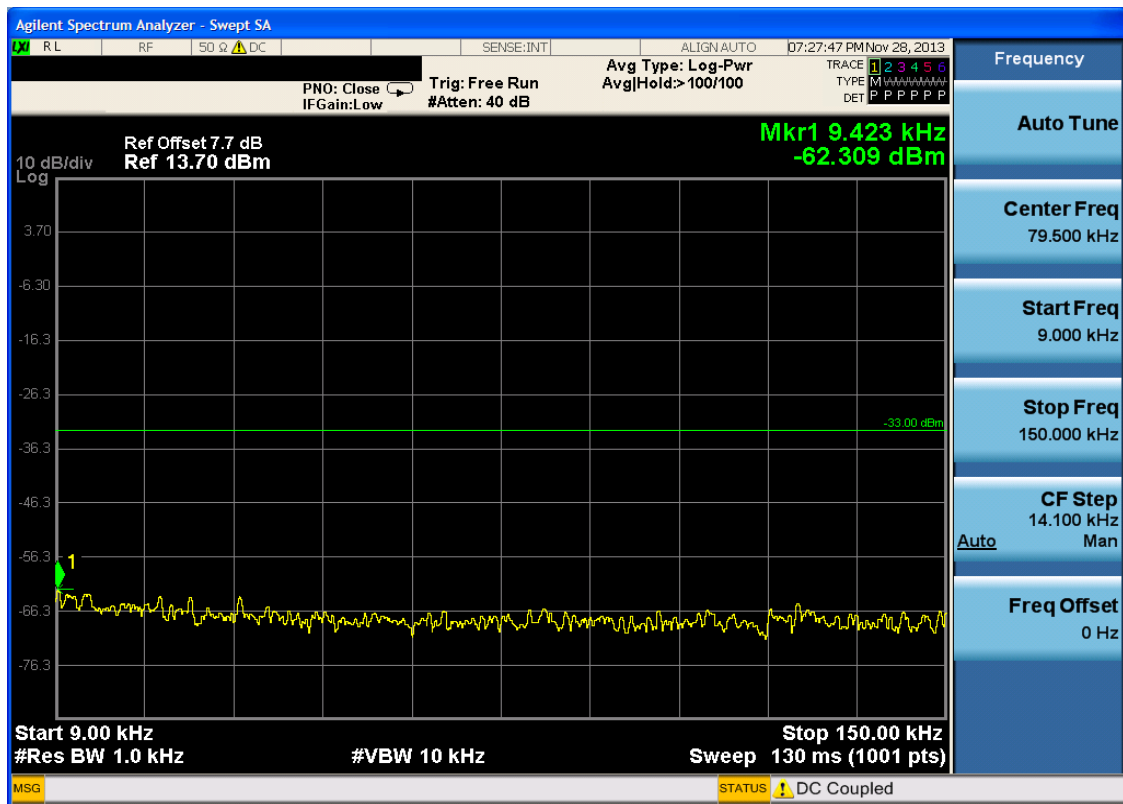


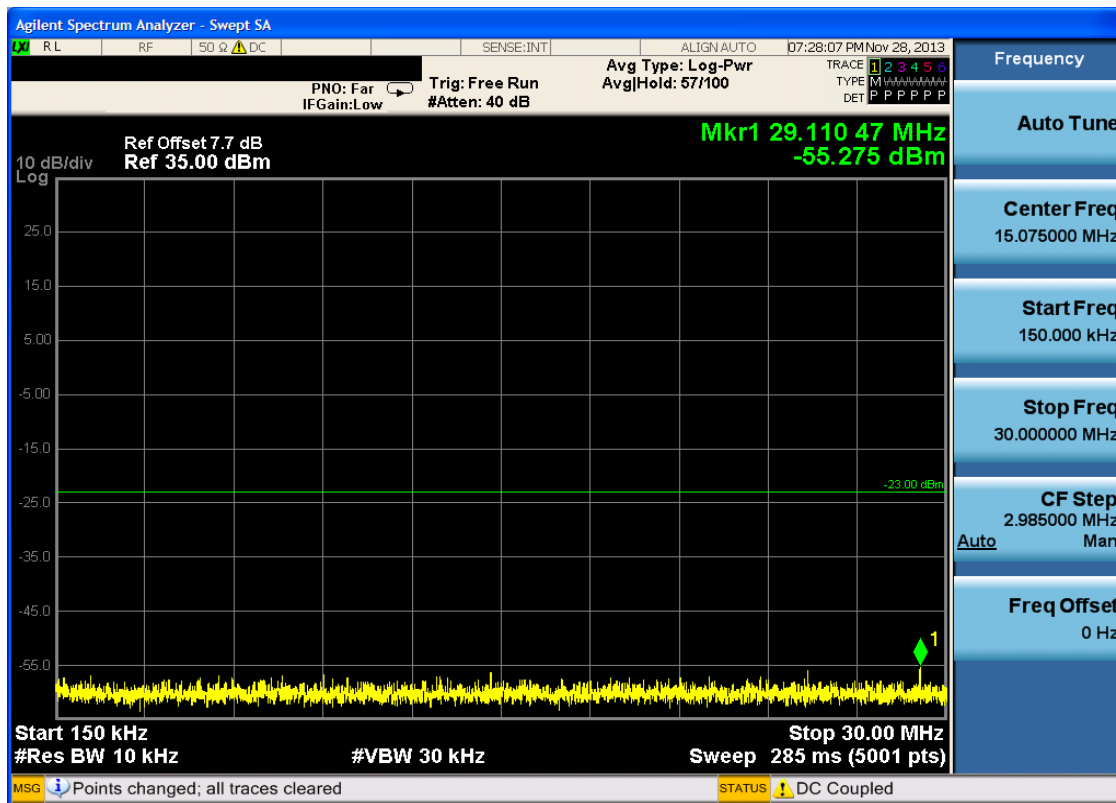


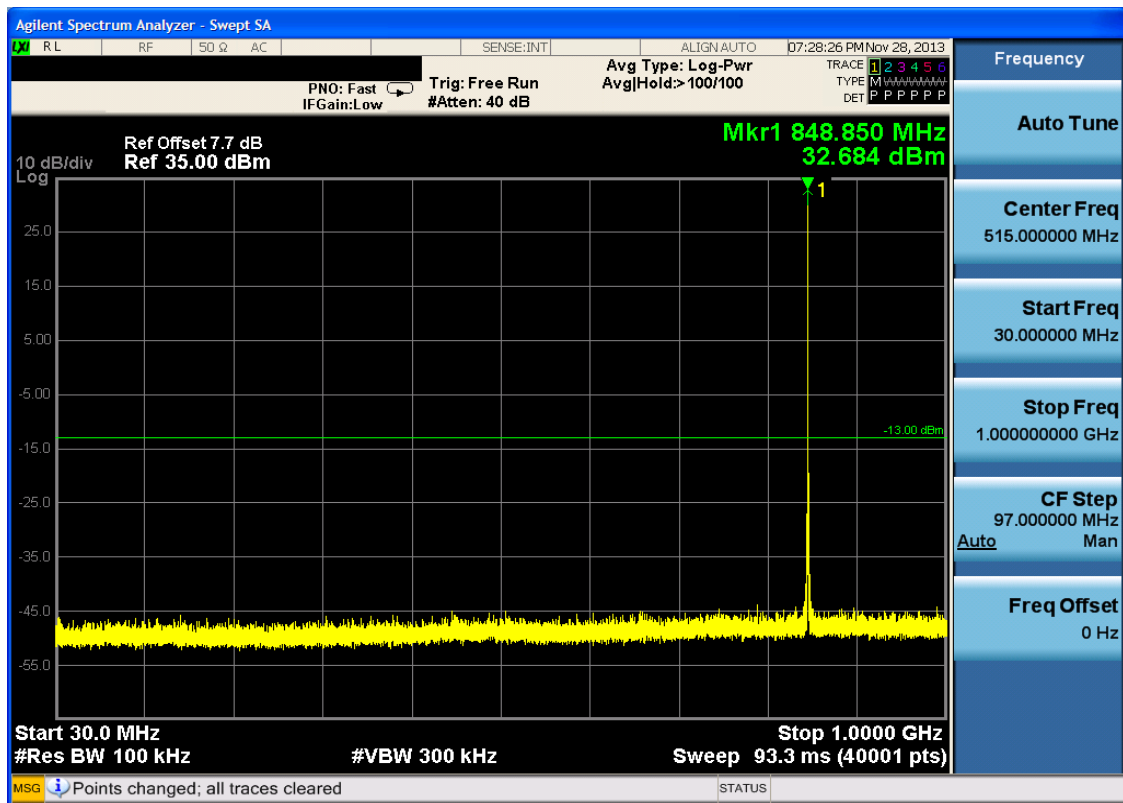


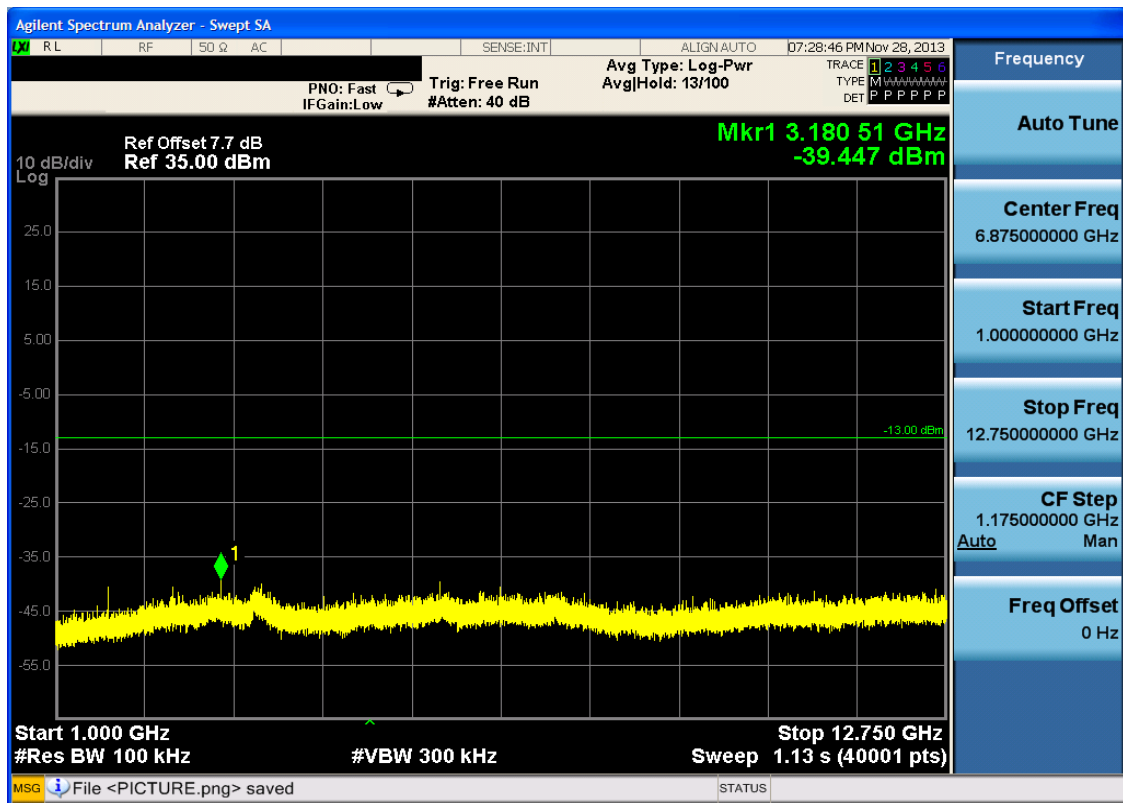


6.1.1.1.3 Test Channel = HCH



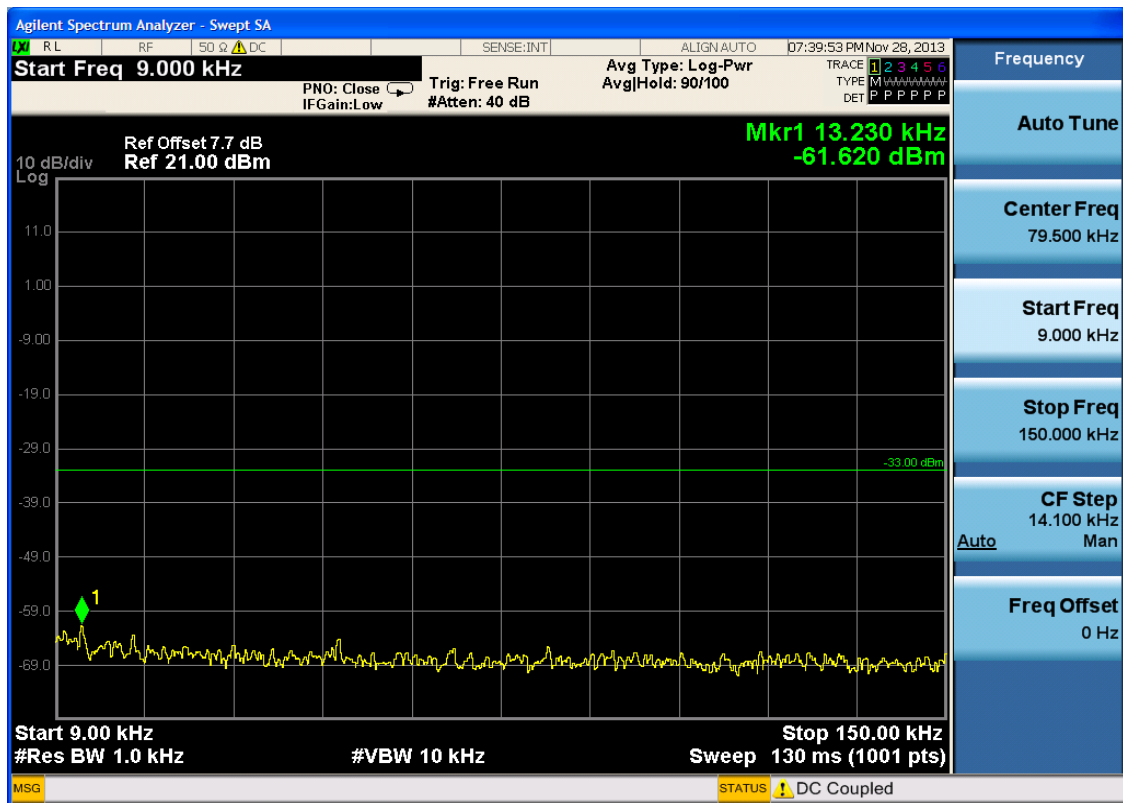


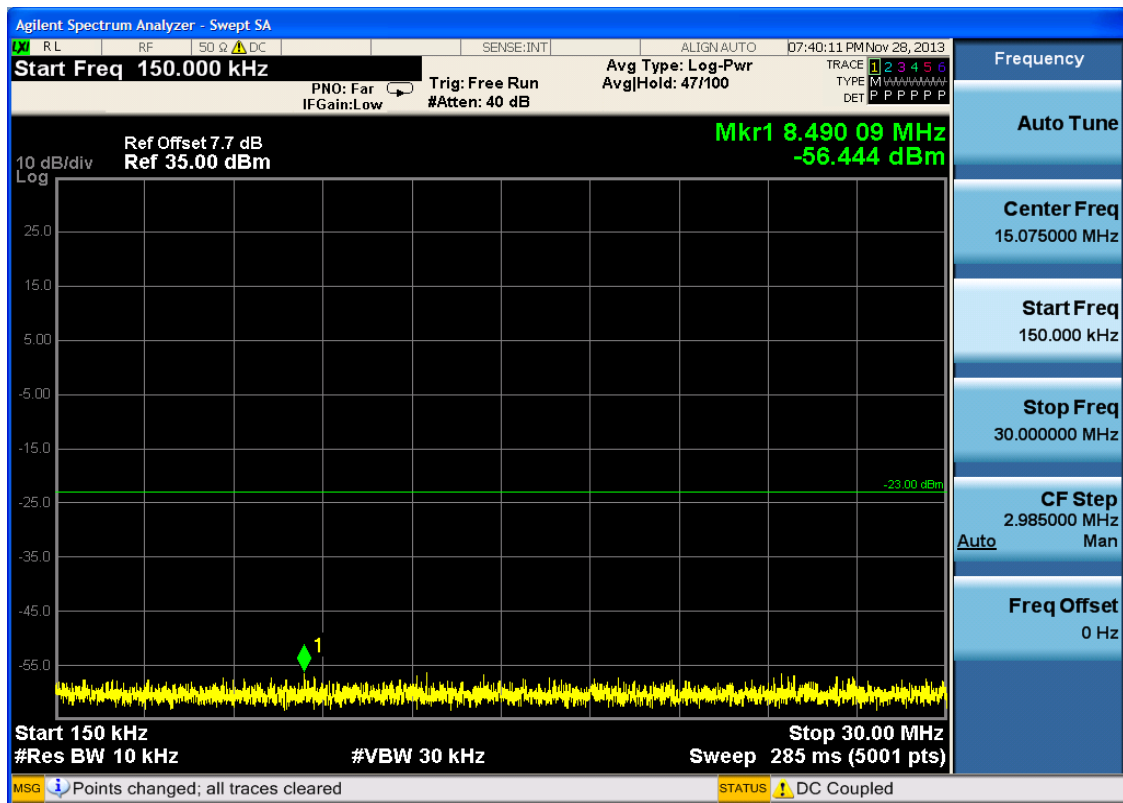


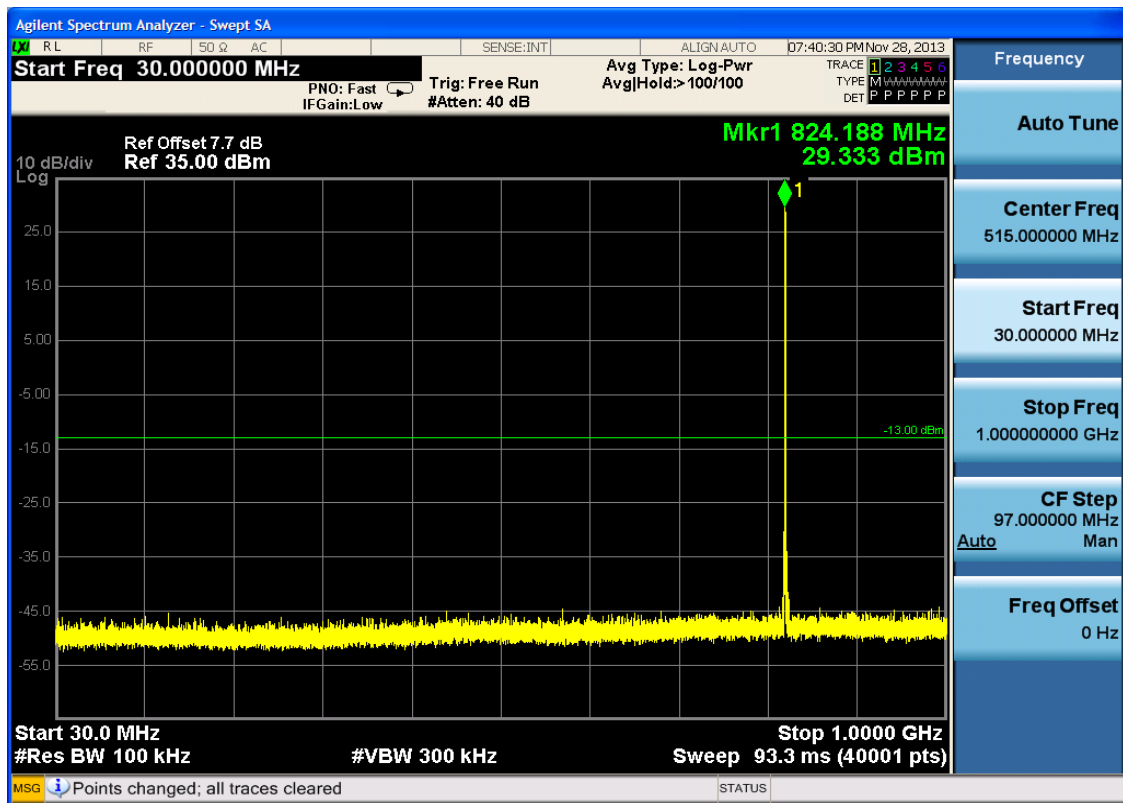


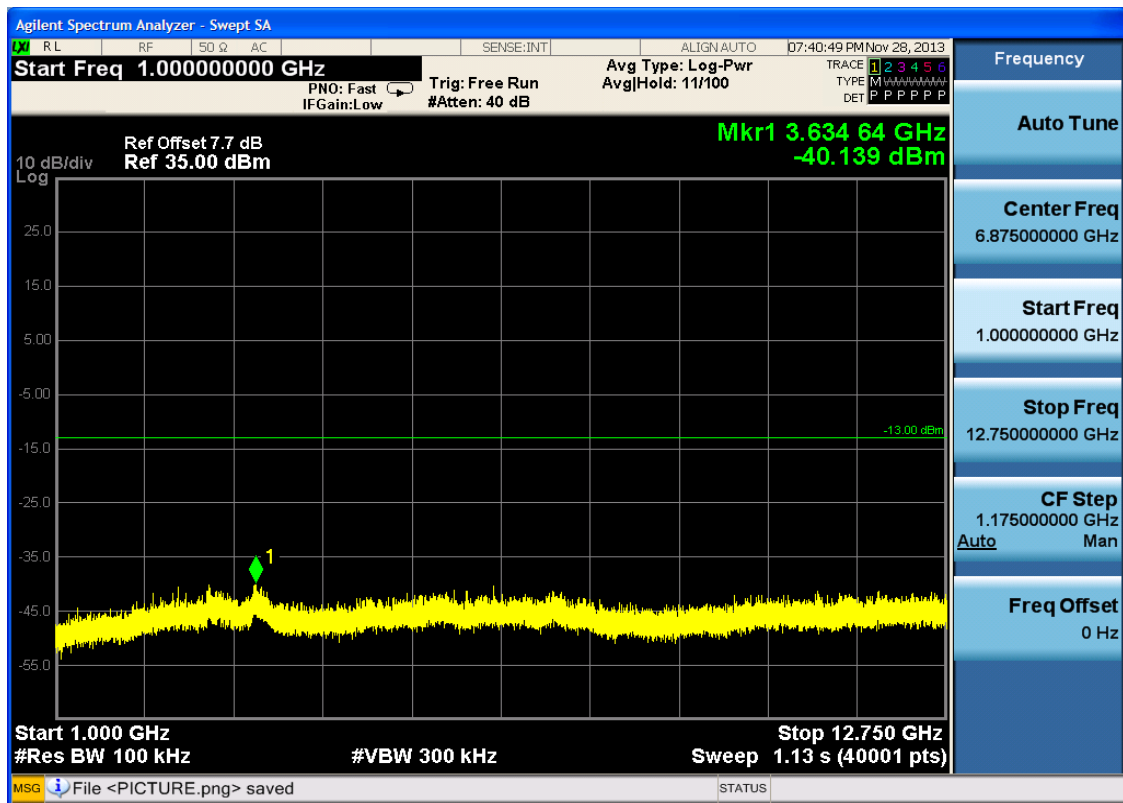
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH



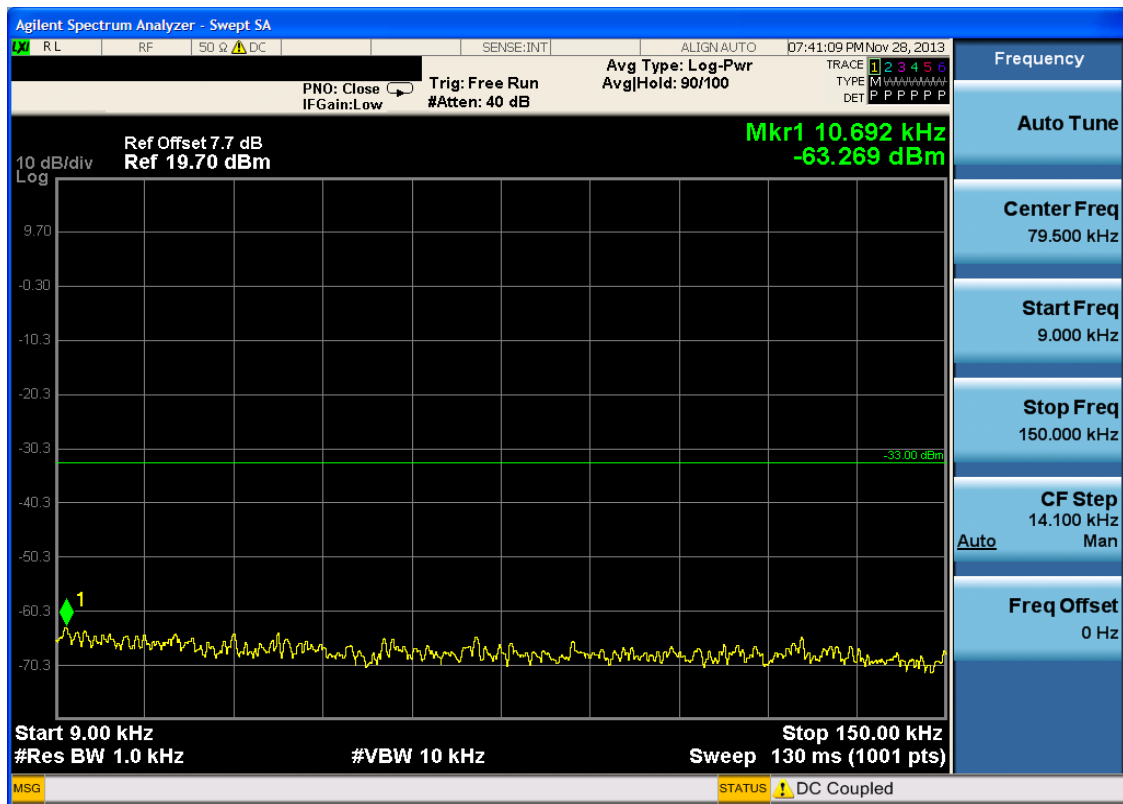


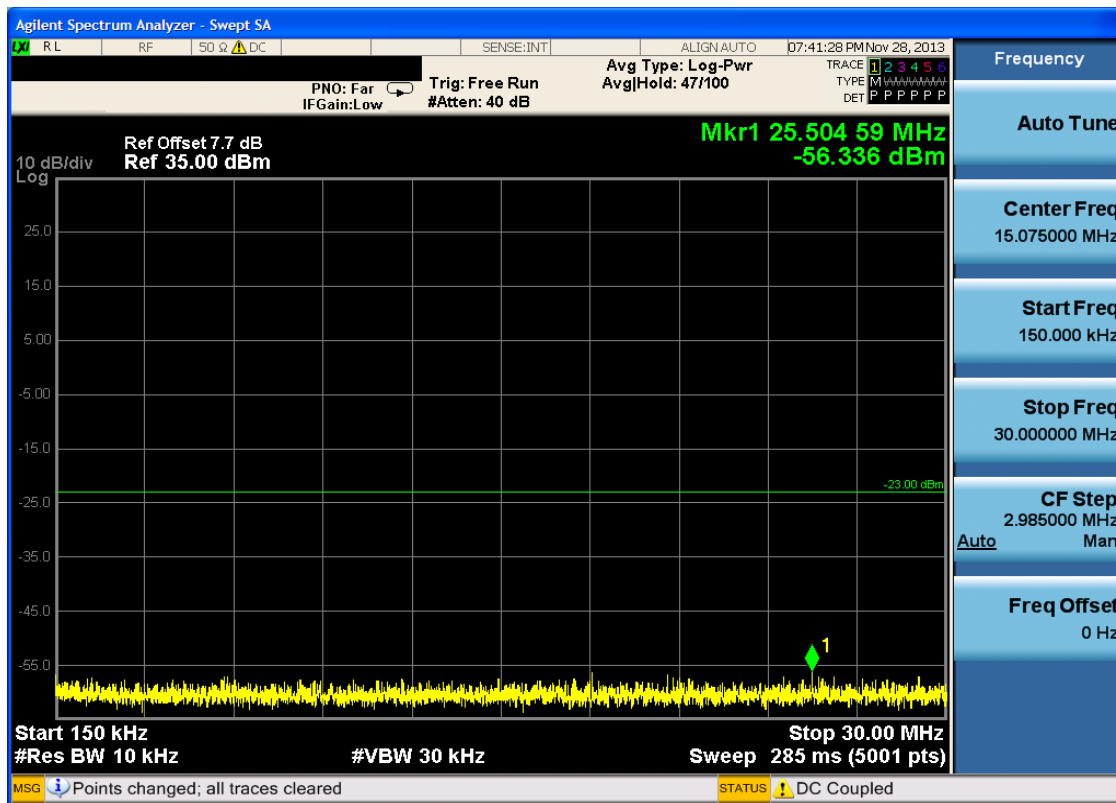


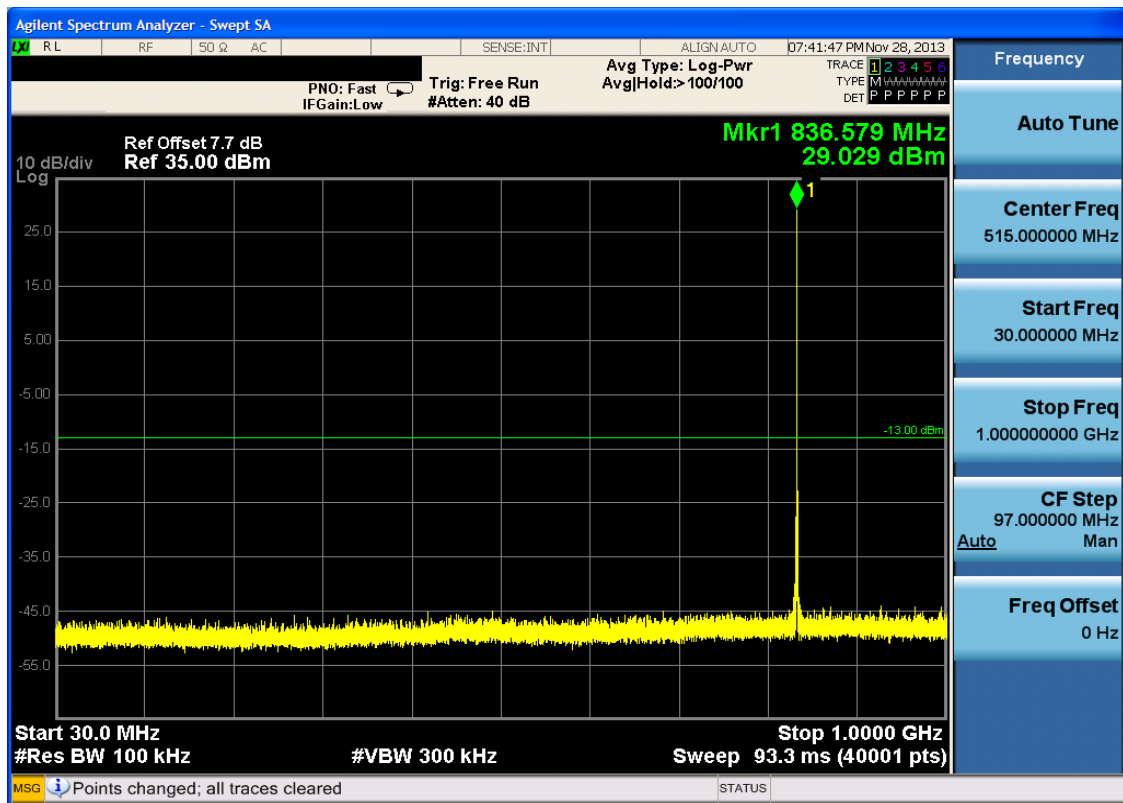


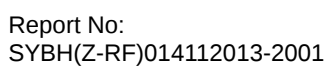


6.1.1.2.2 Test Channel = MCH



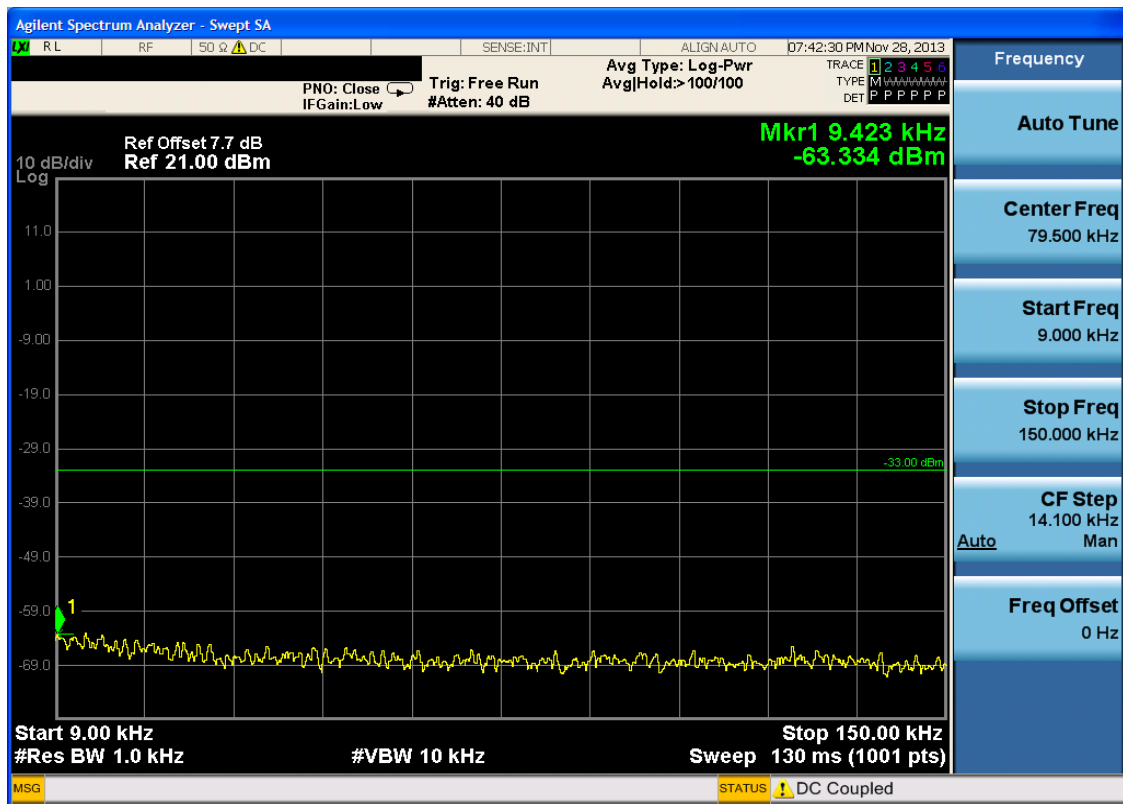


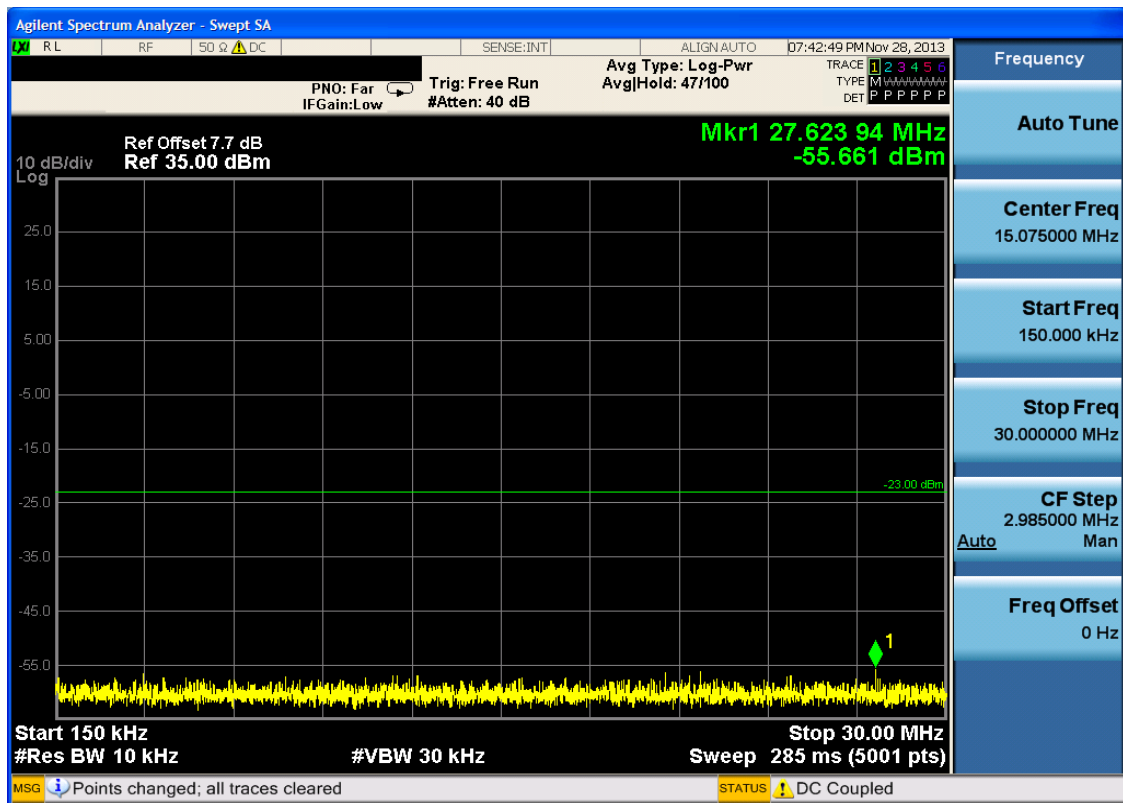


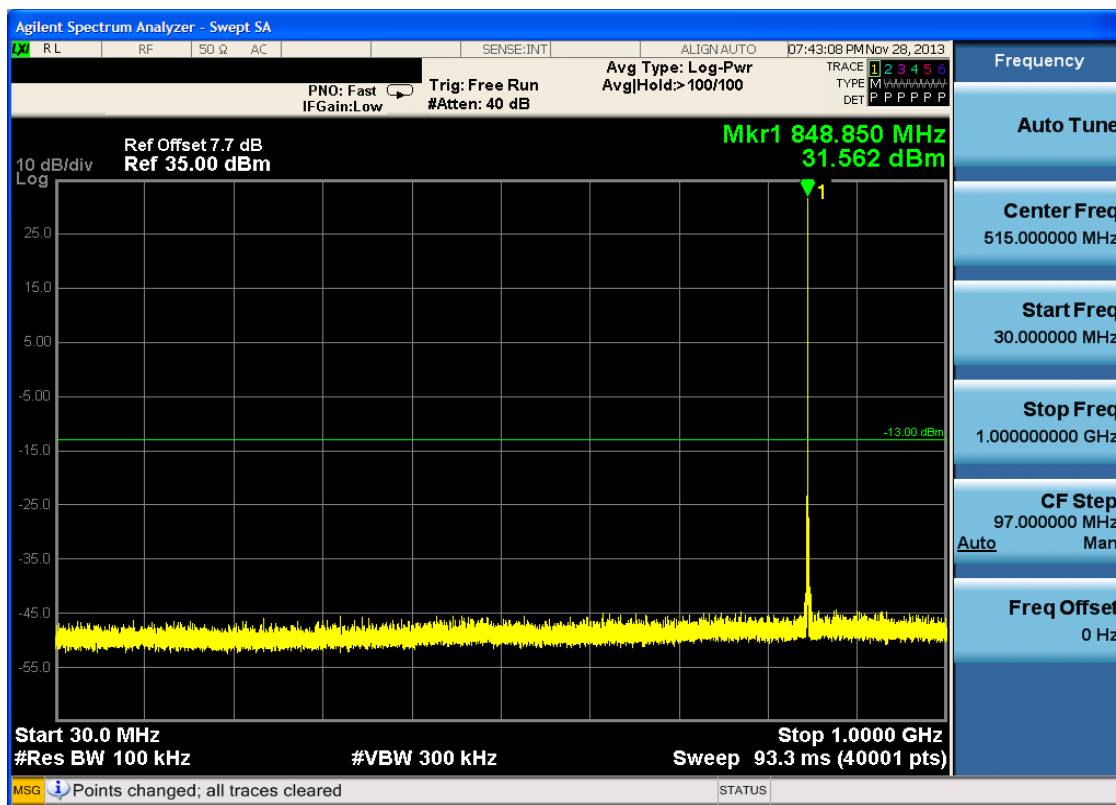


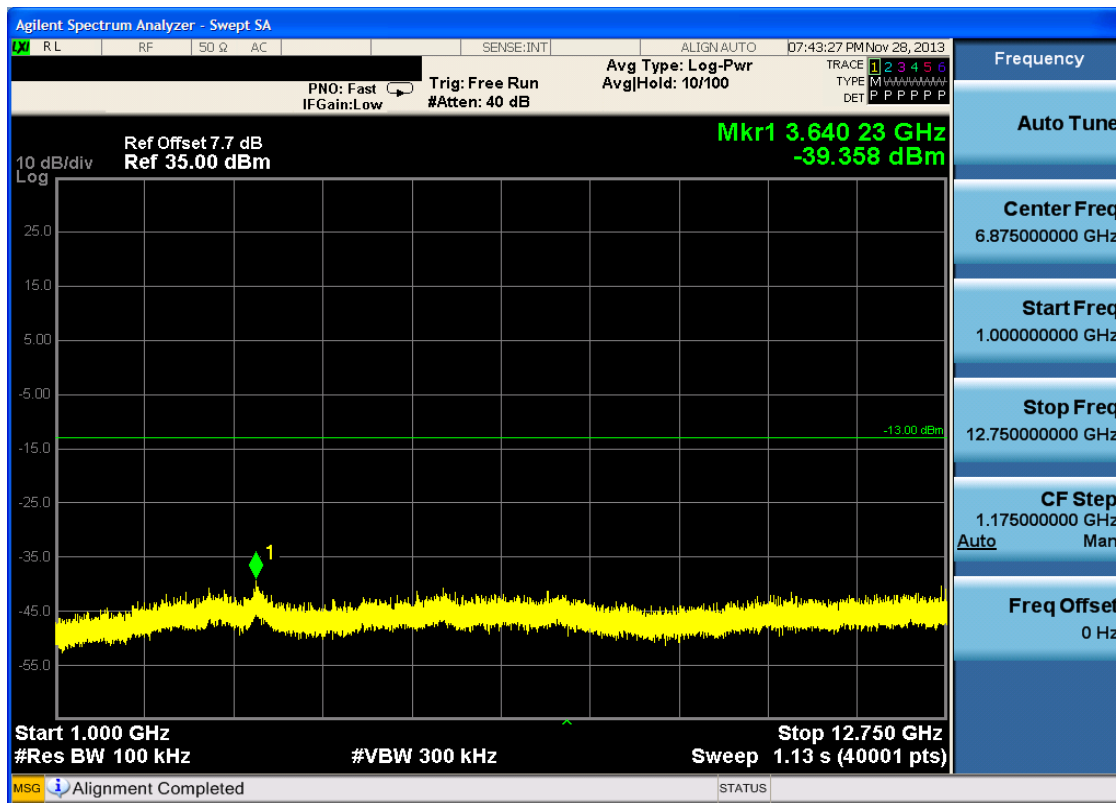


6.1.1.2.3 Test Channel = HCH







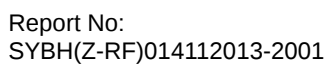


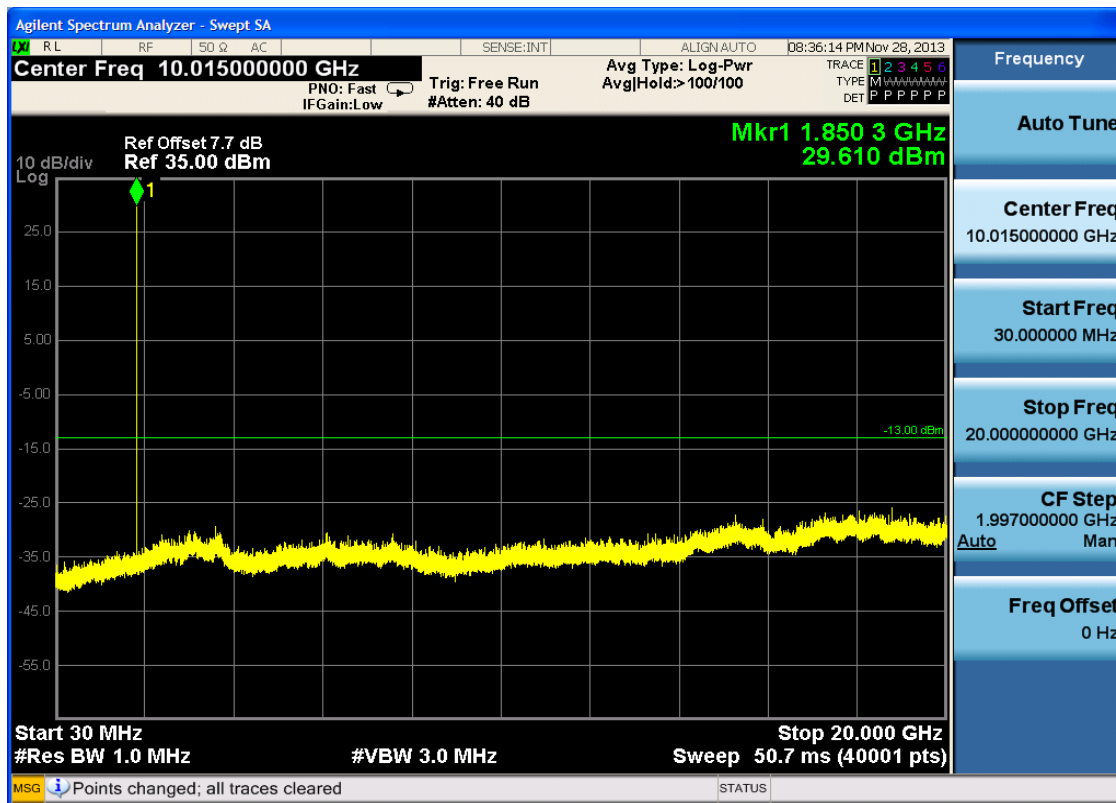
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH

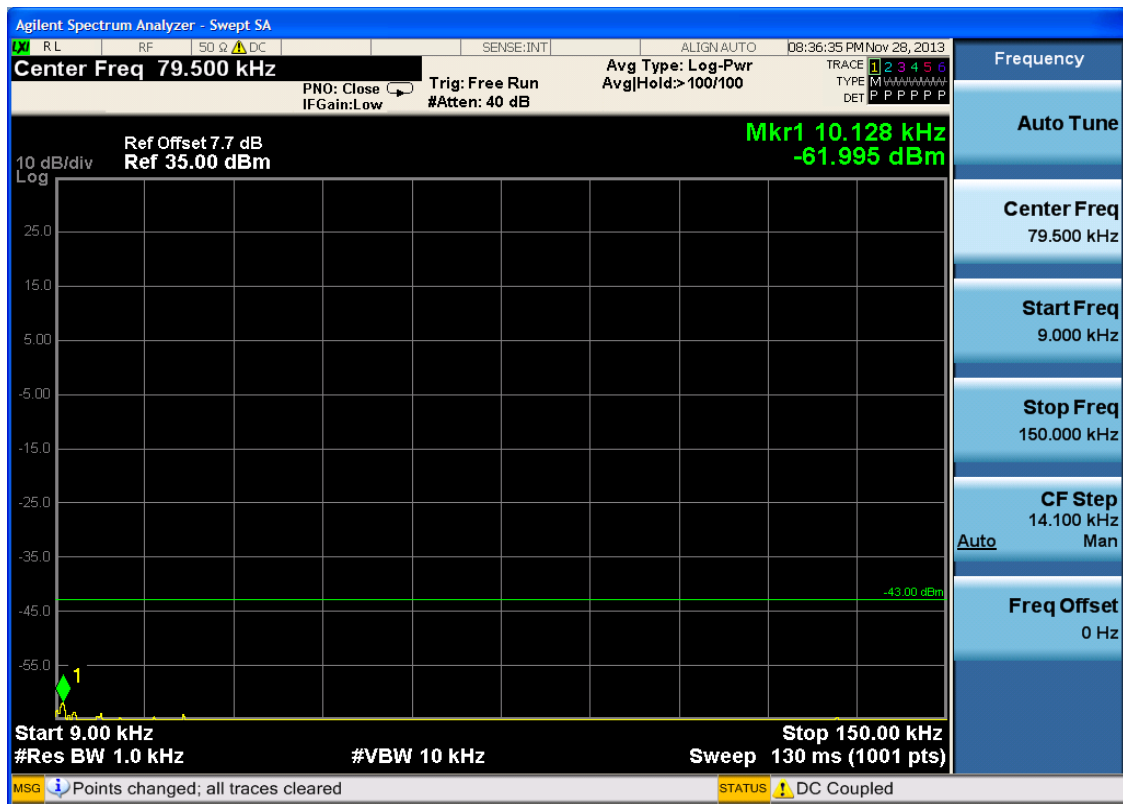


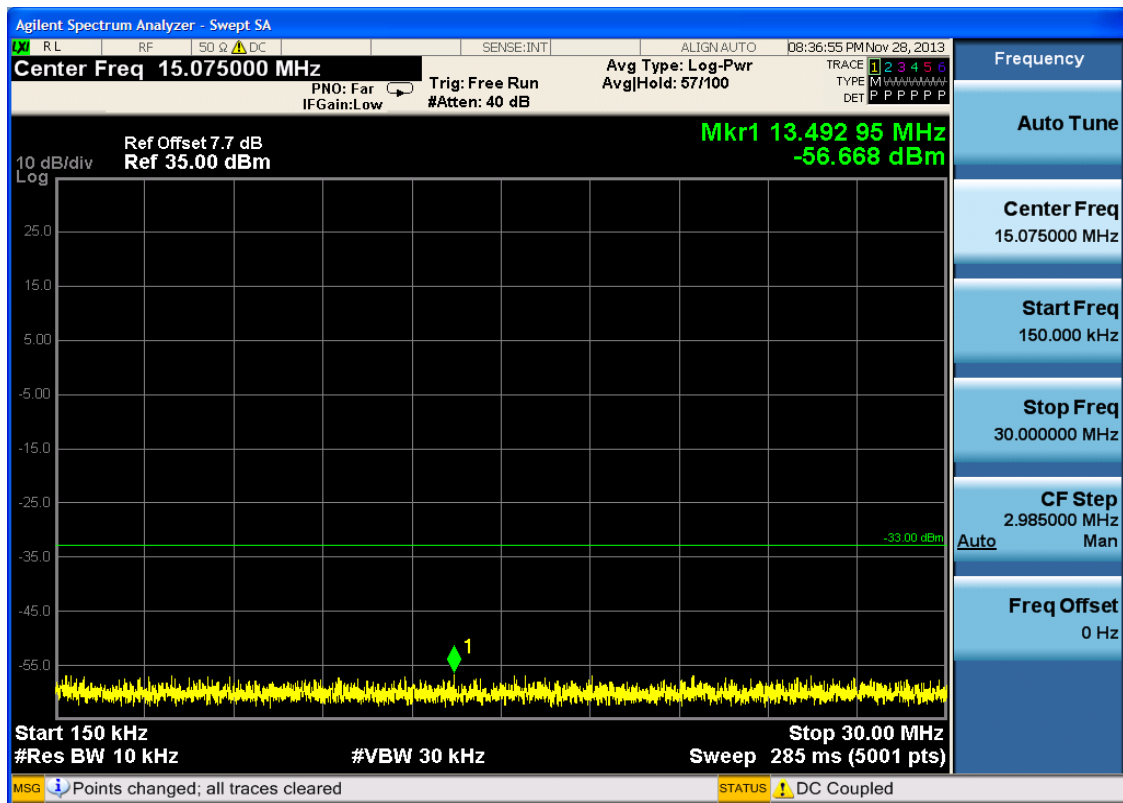


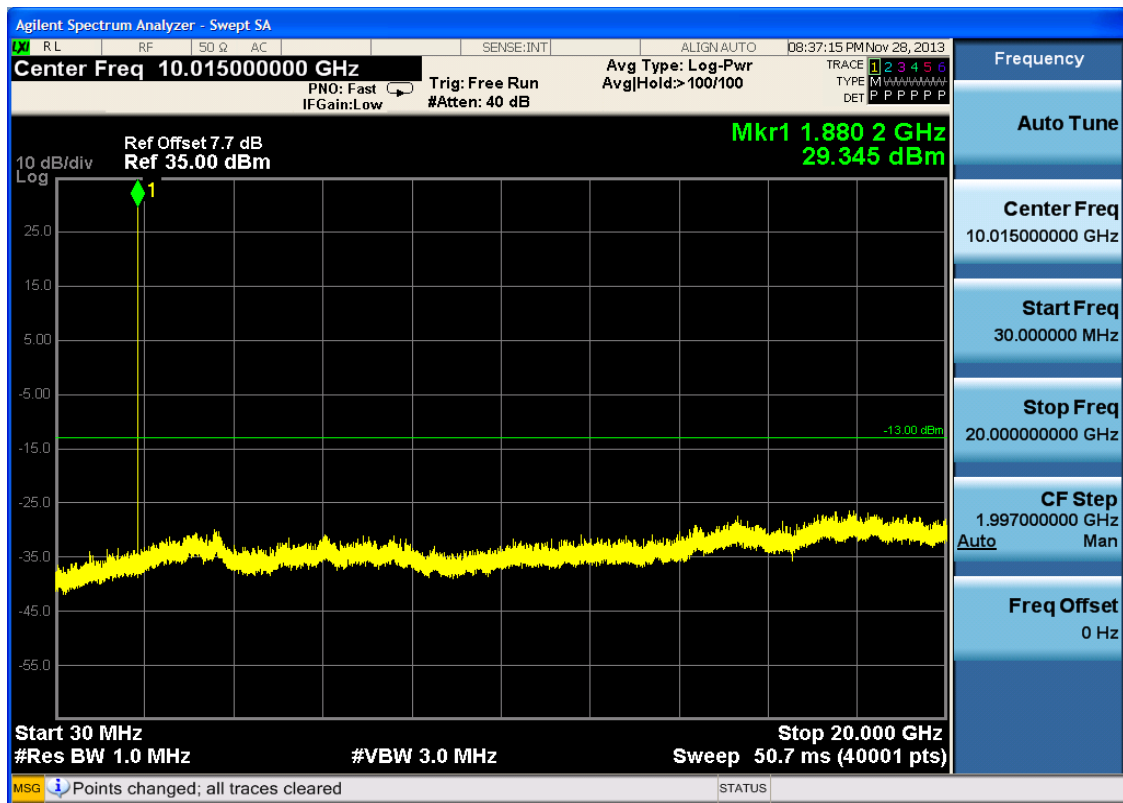




6.1.2.1.2 Test Channel = MCH

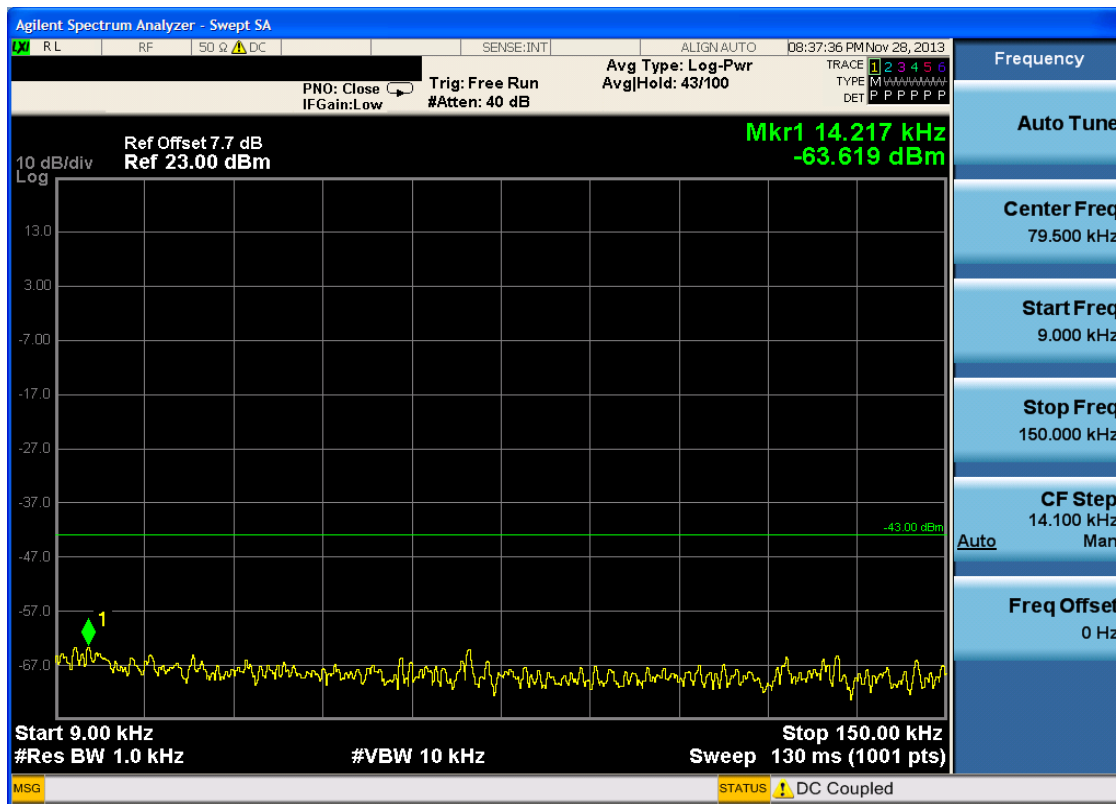


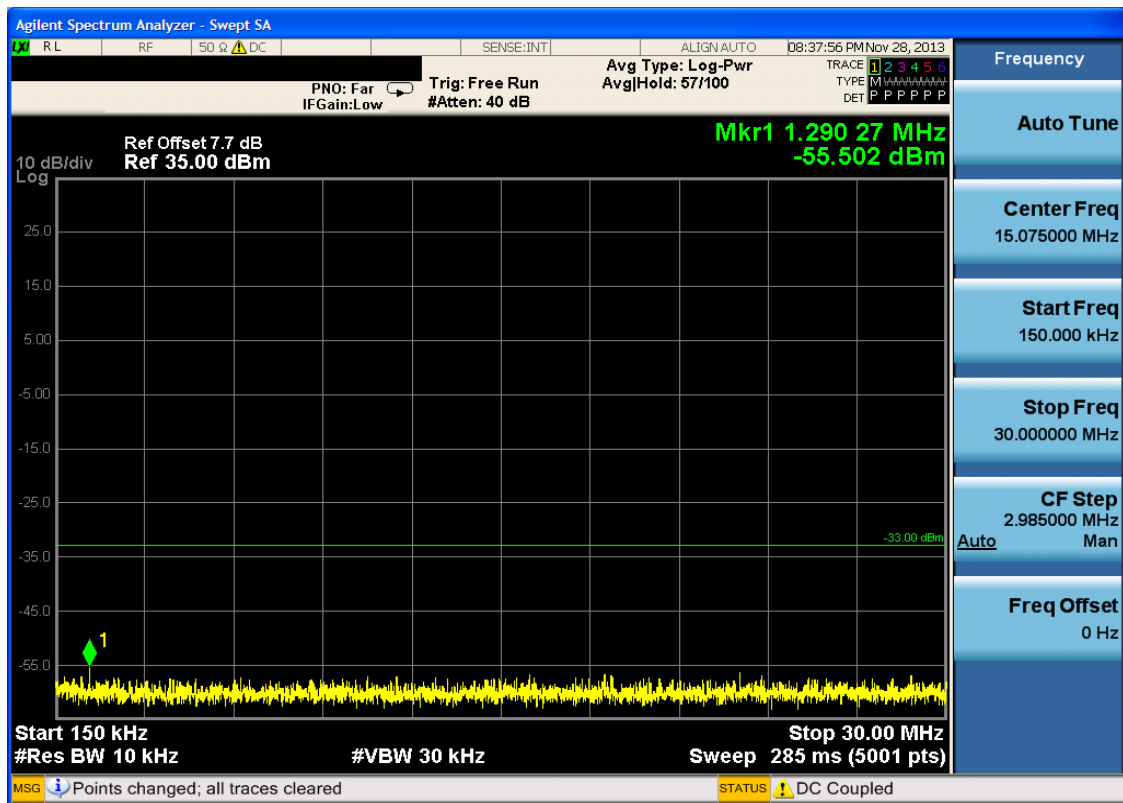


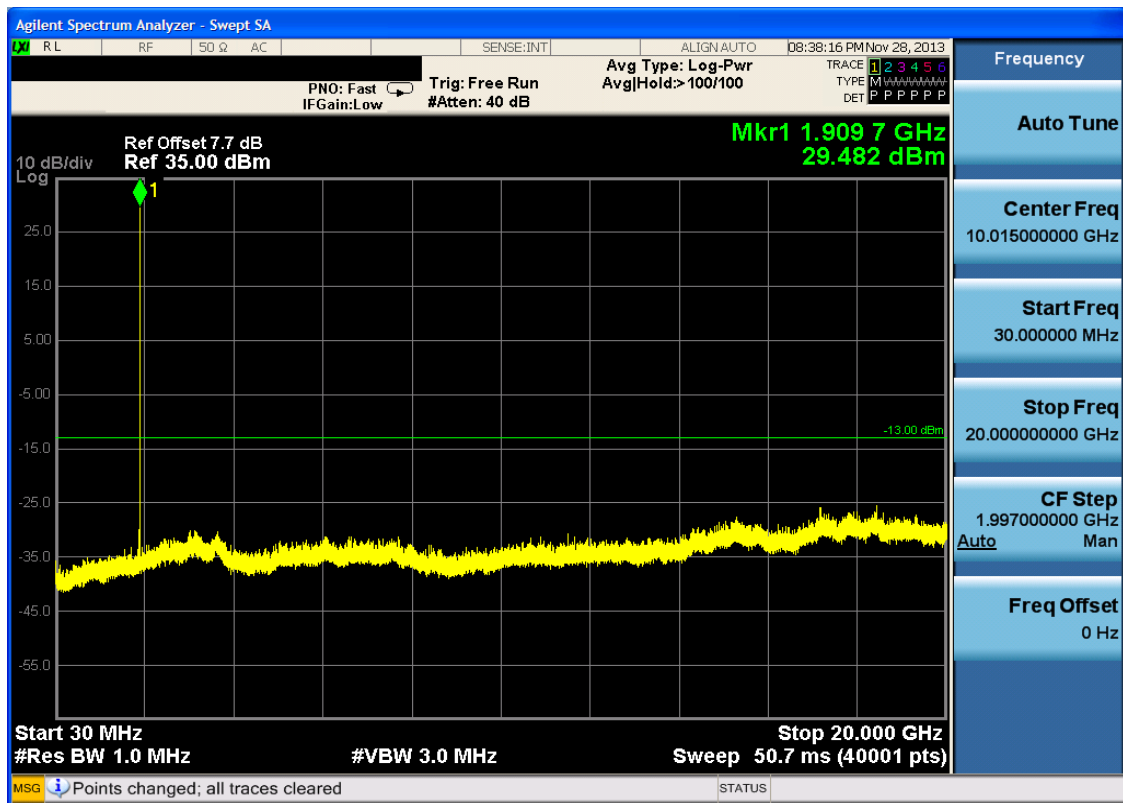




6.1.2.1.3 Test Channel = HCH

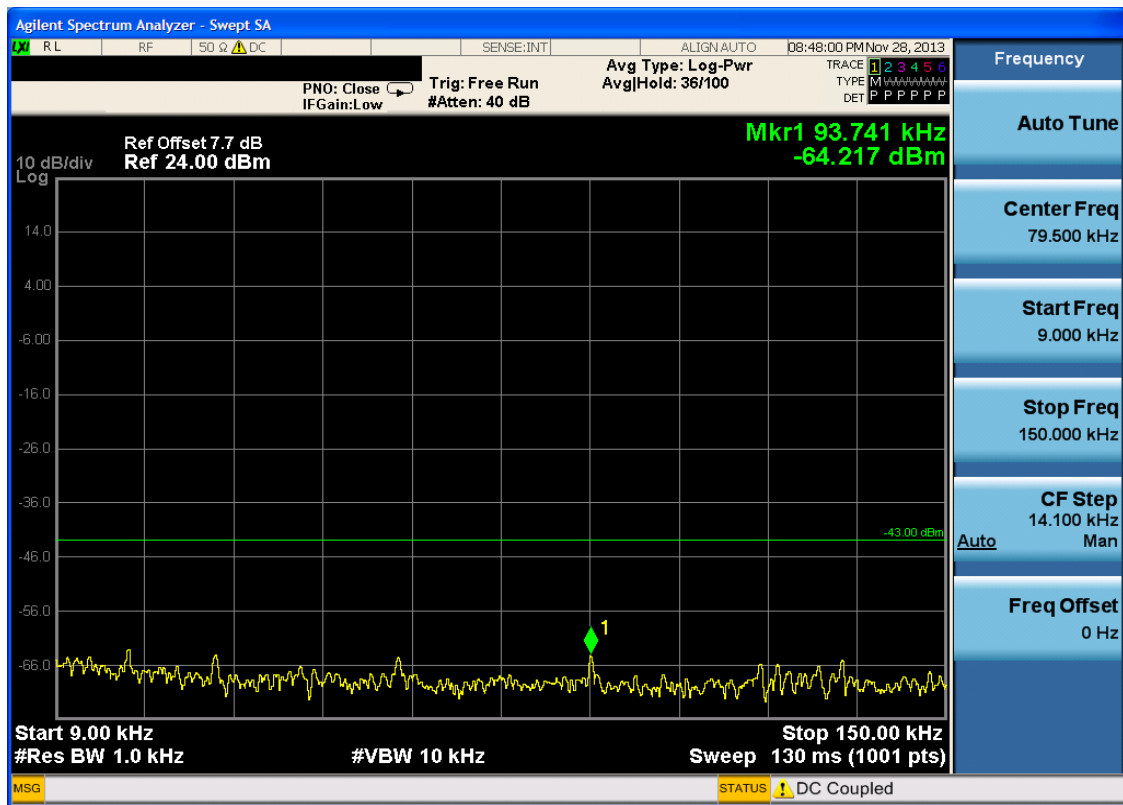


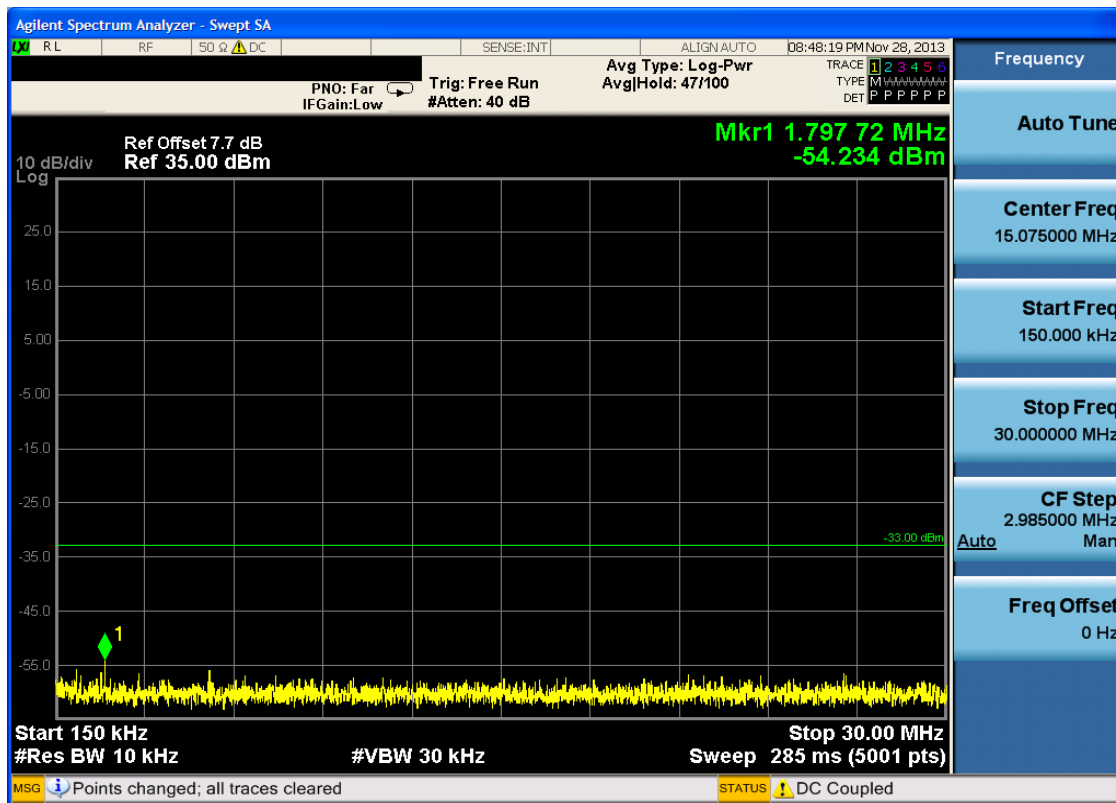


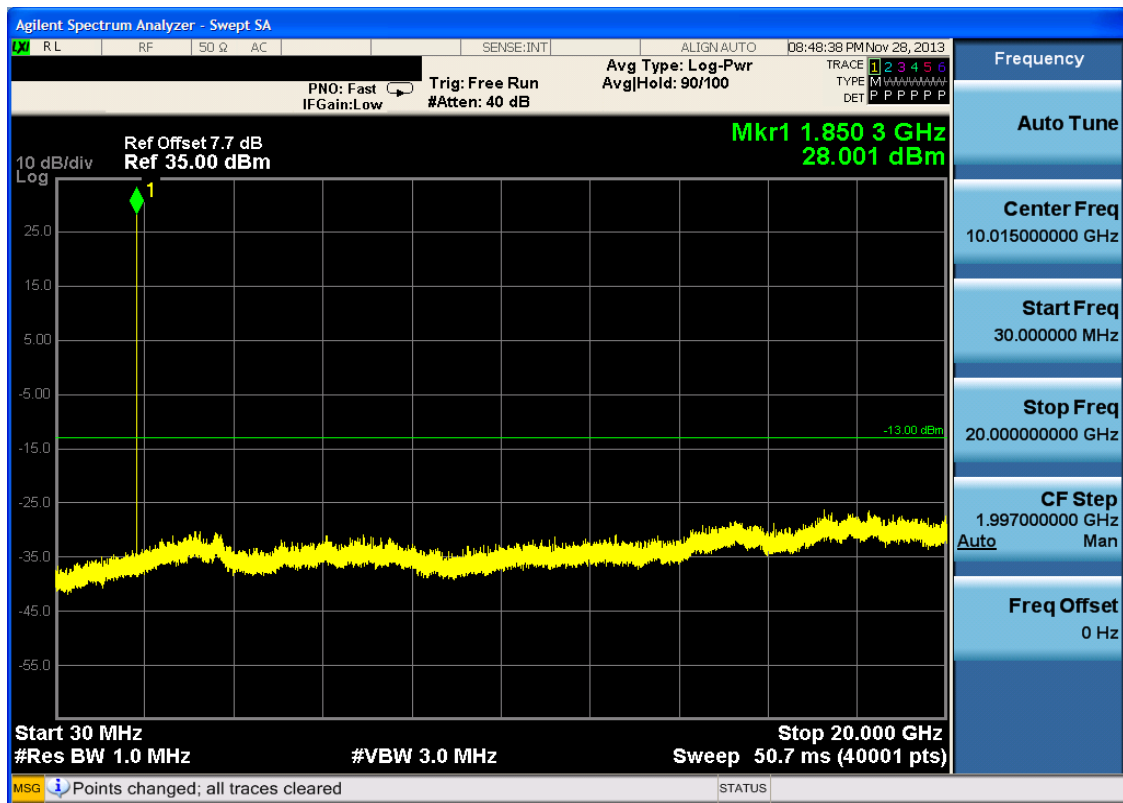


6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

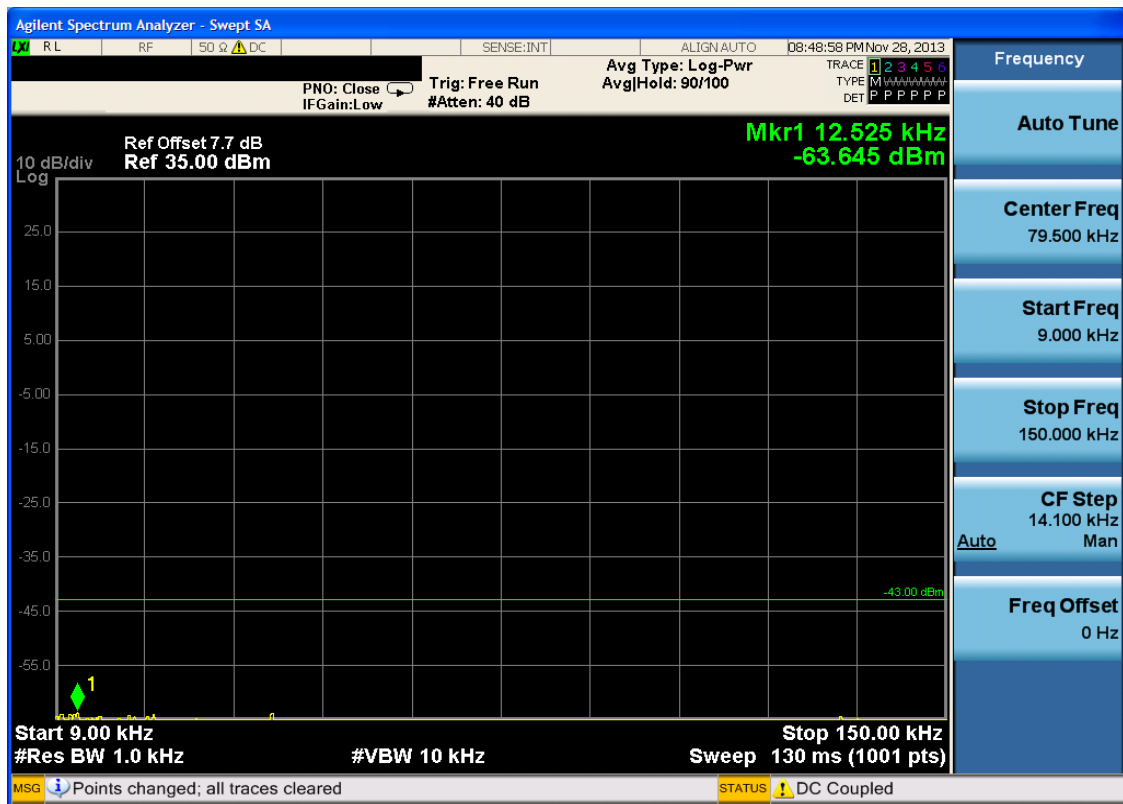




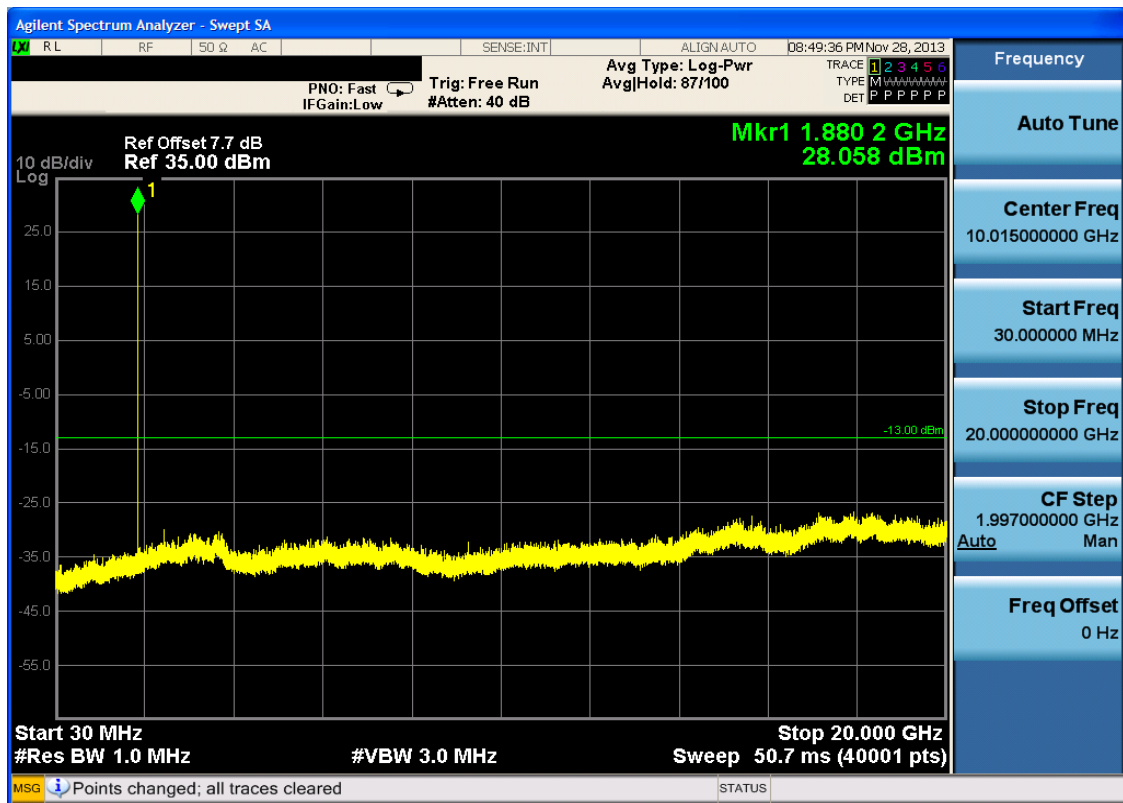




6.1.2.2.2 Test Channel = MCH

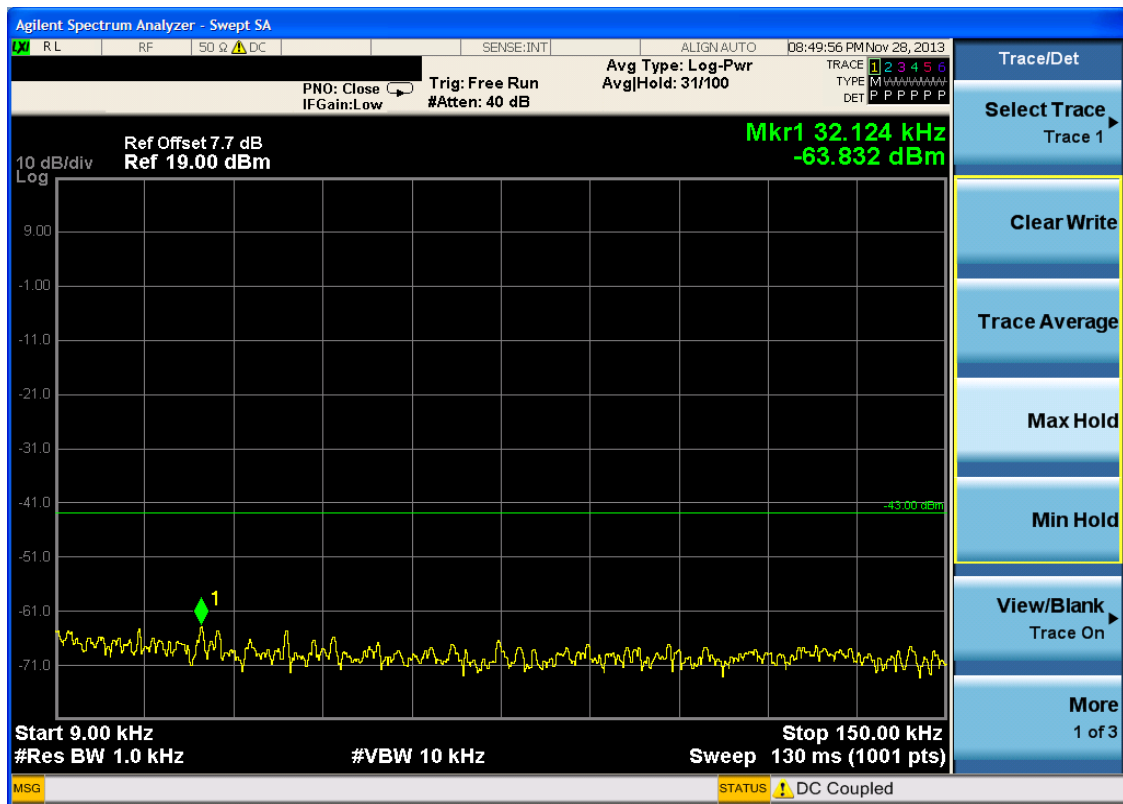


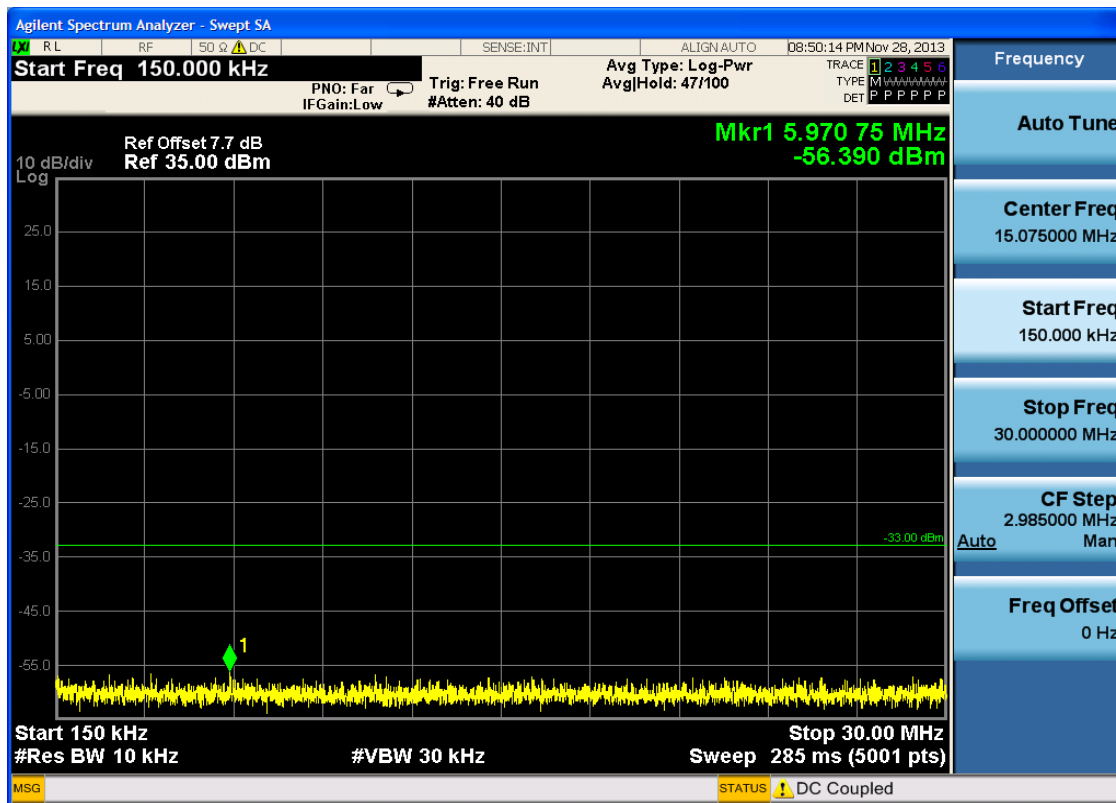


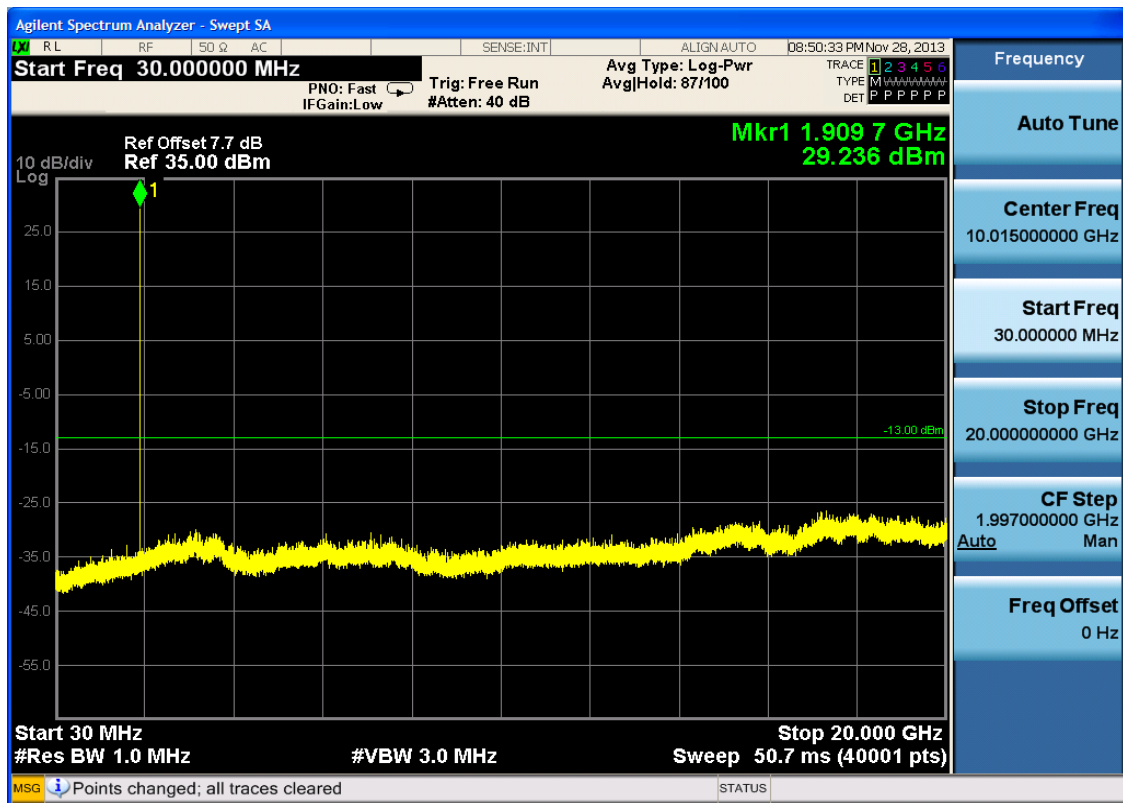




6.1.2.2.3 Test Channel = HCH





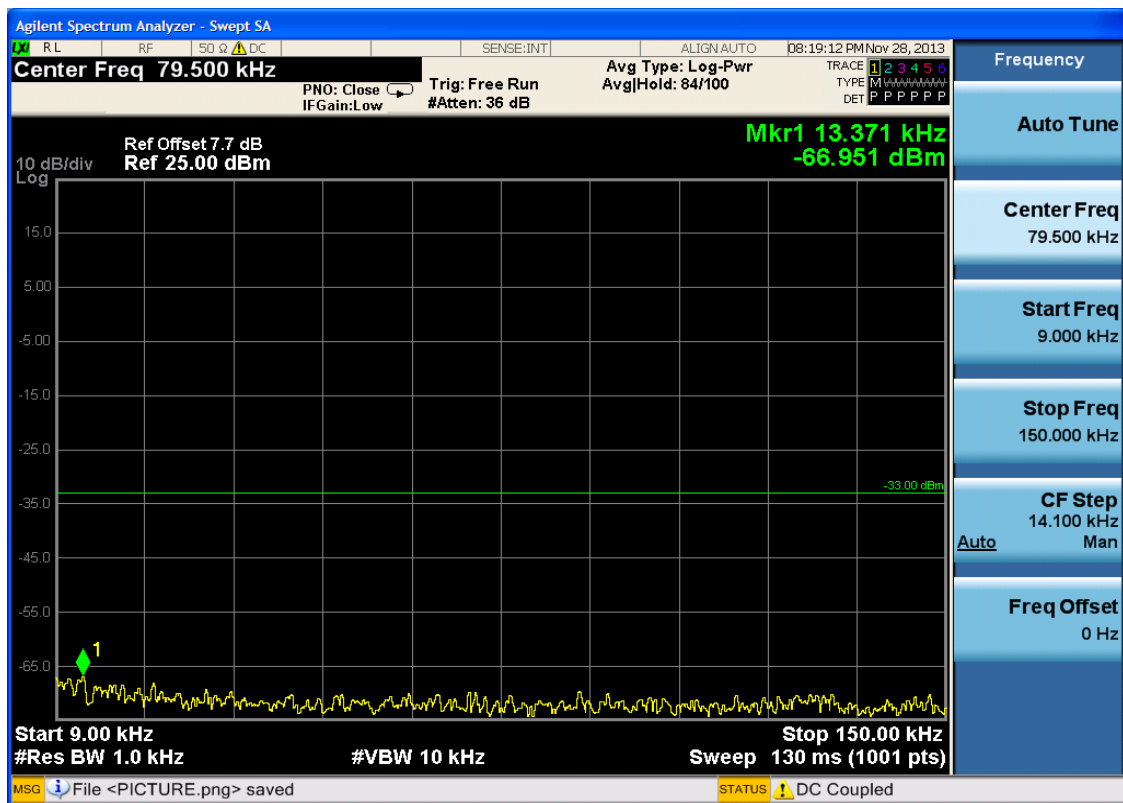


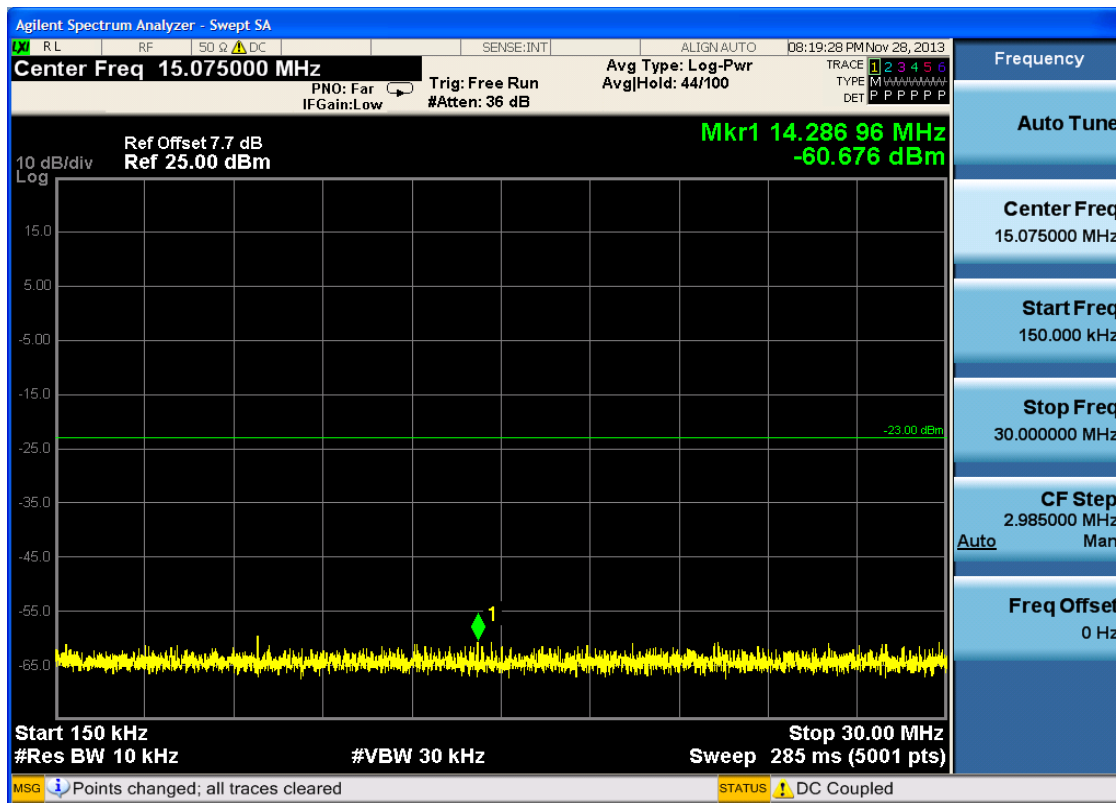
6.2 For UMTS

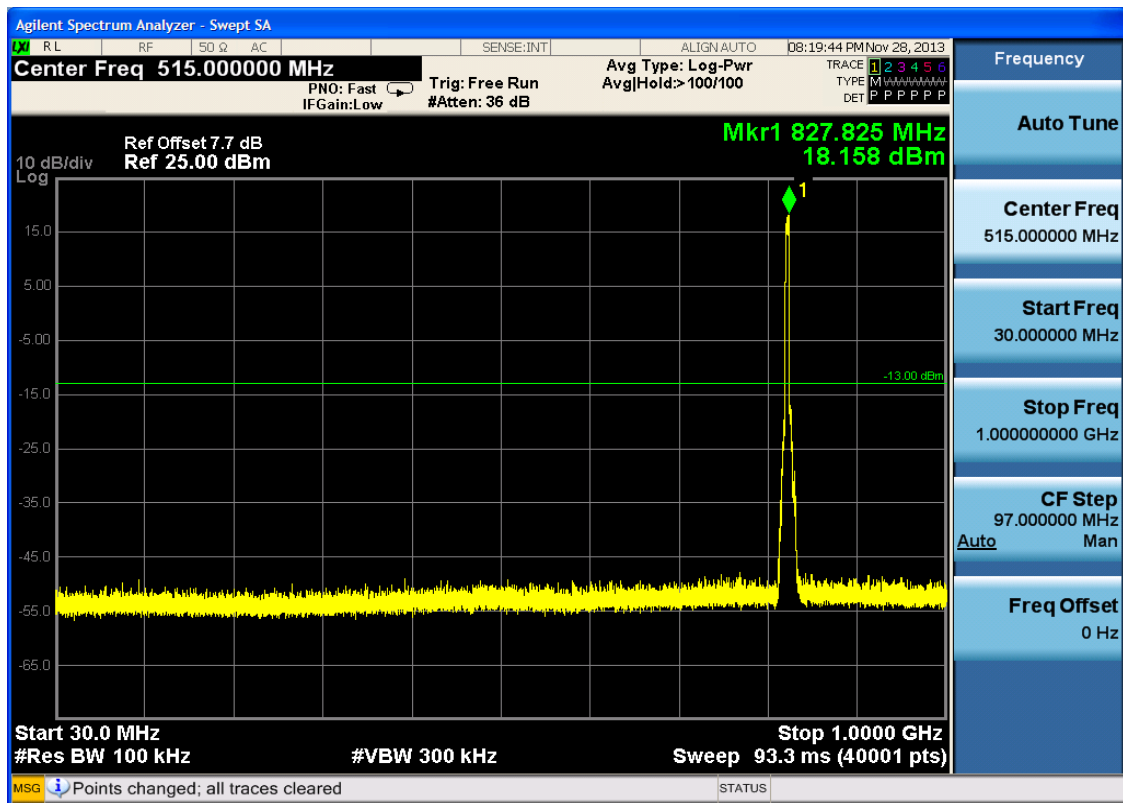
6.2.1 Test Band = WCDMA850

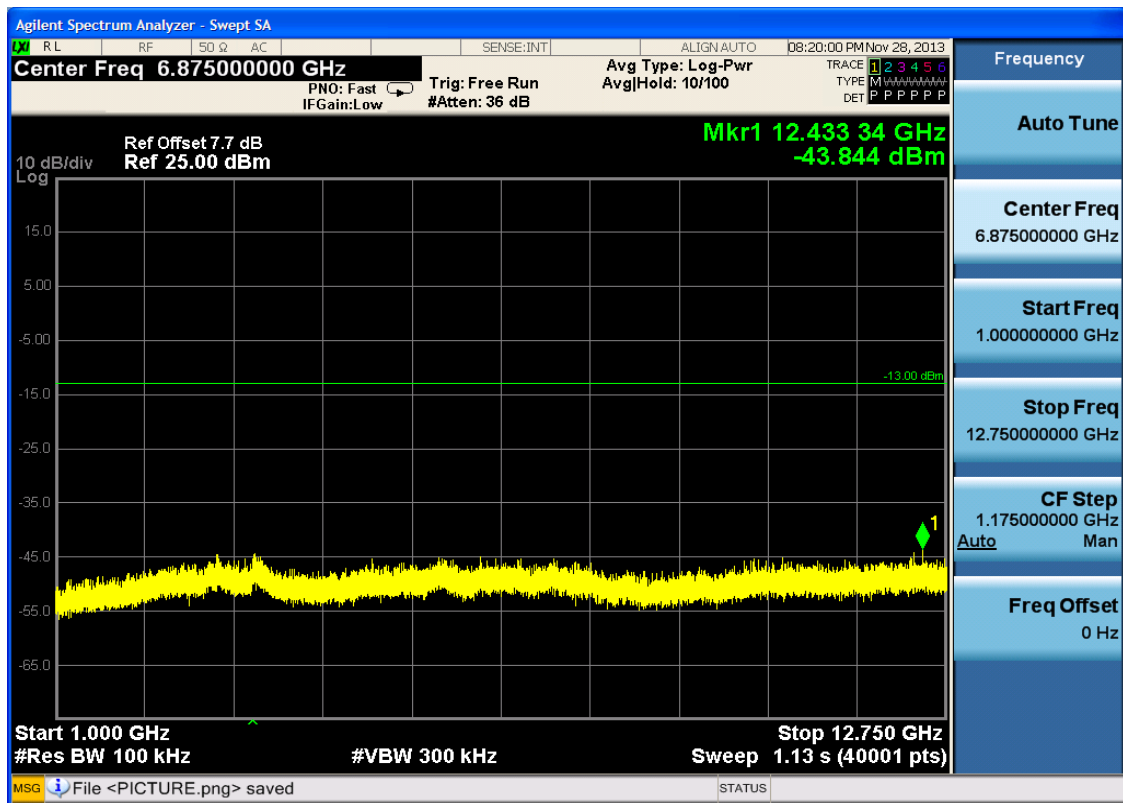
6.2.1.1 Test Mode = UMTS/TM1

6.2.1.1.1 Test Channel = LCH



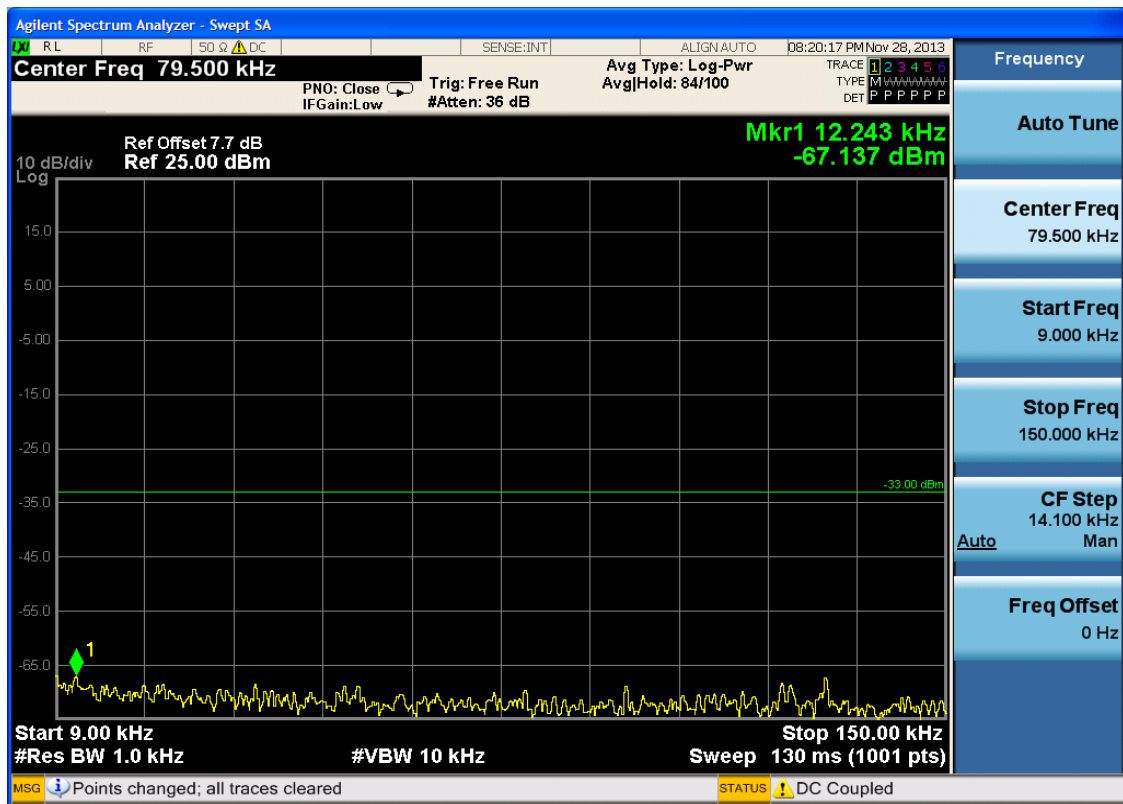


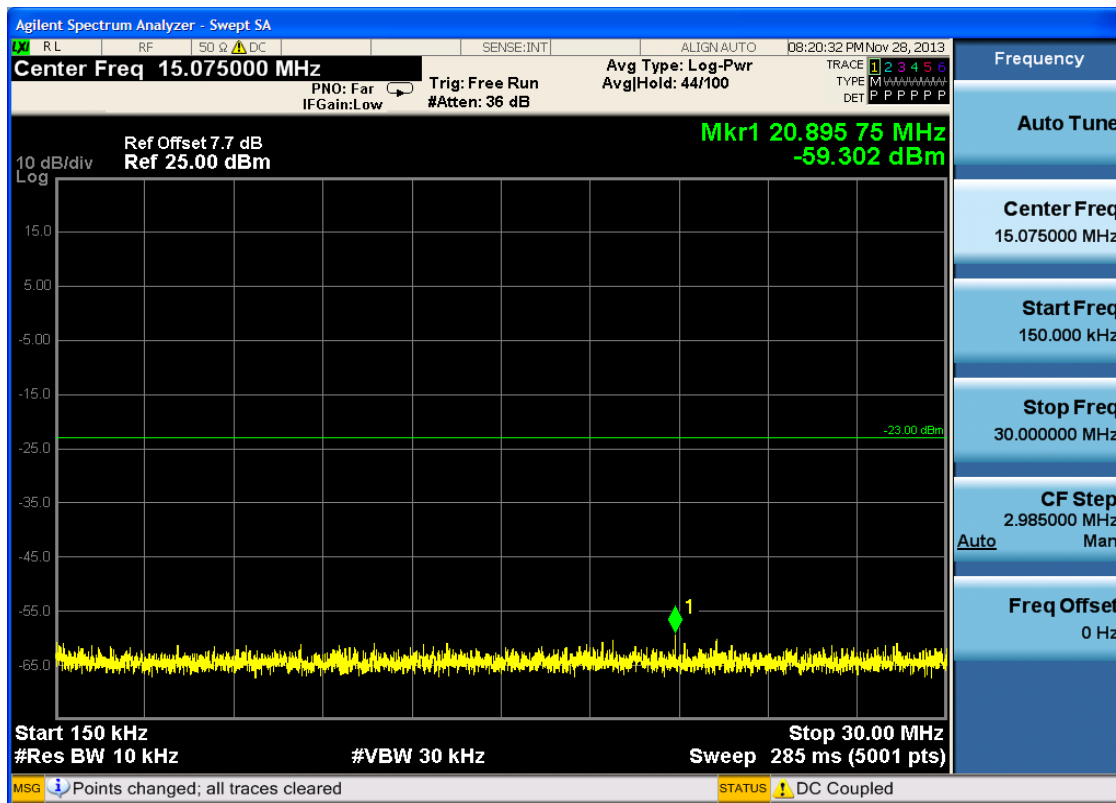


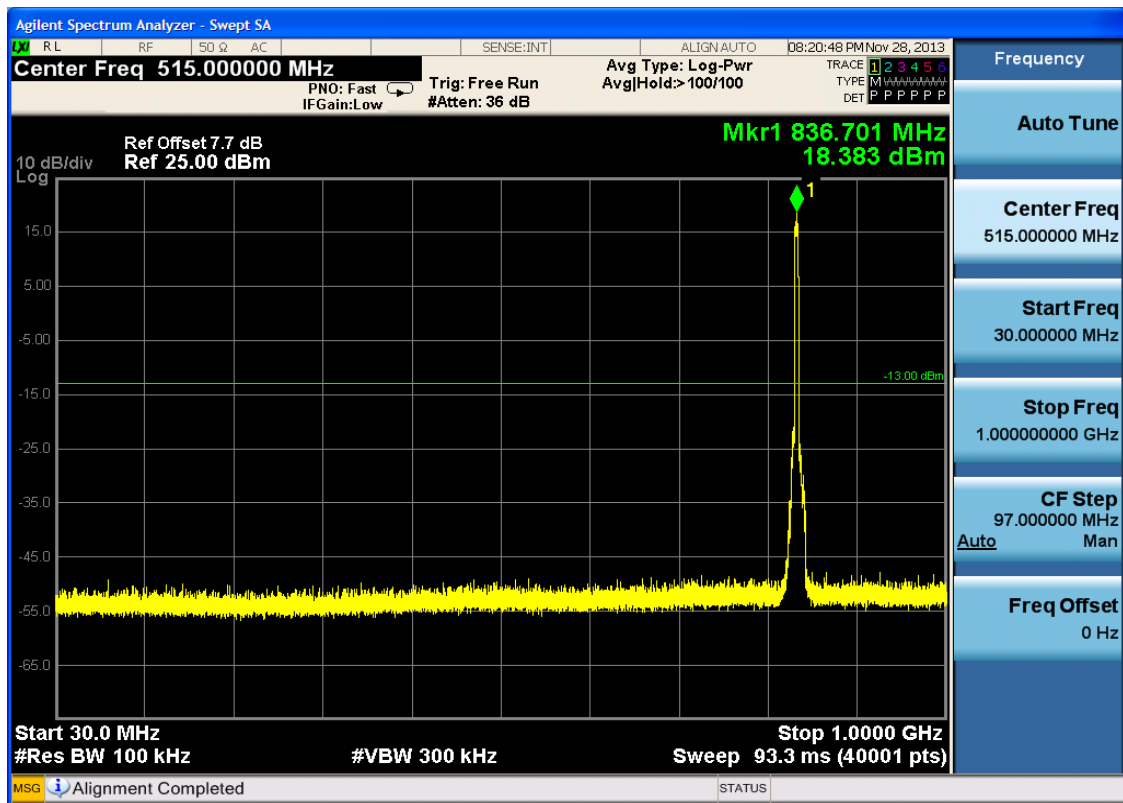


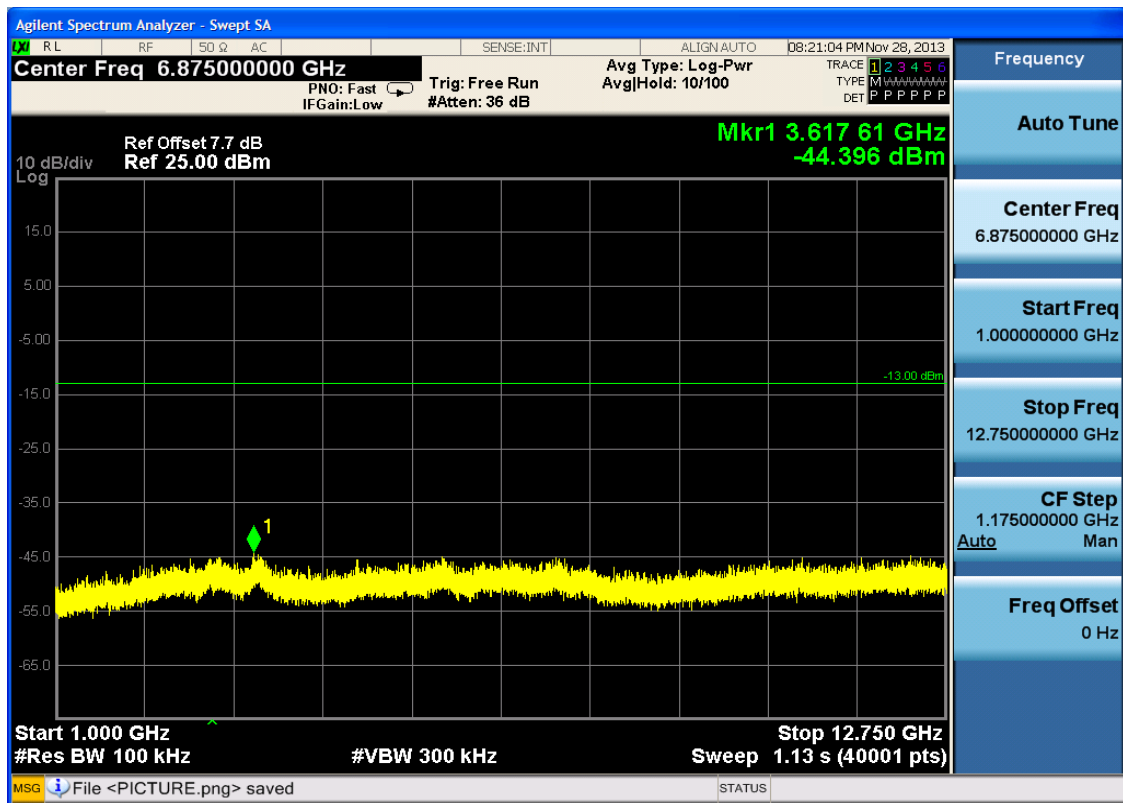


6.2.1.1.2 Test Channel = MCH

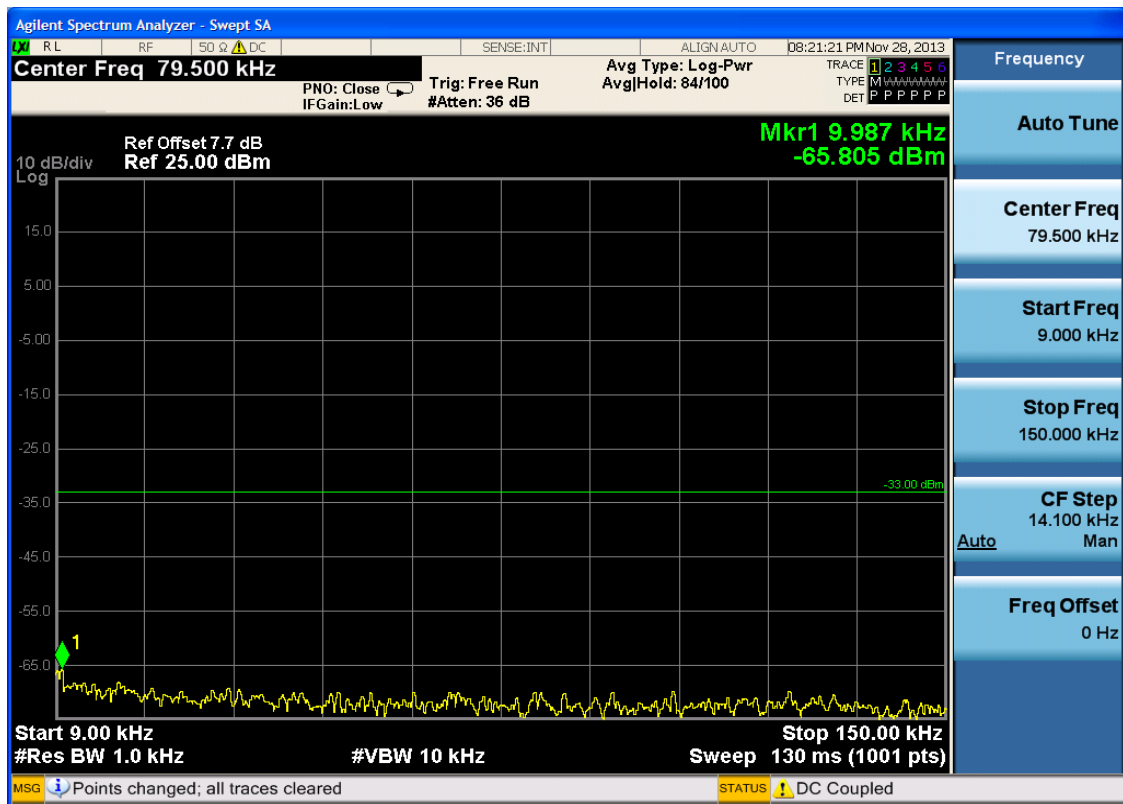


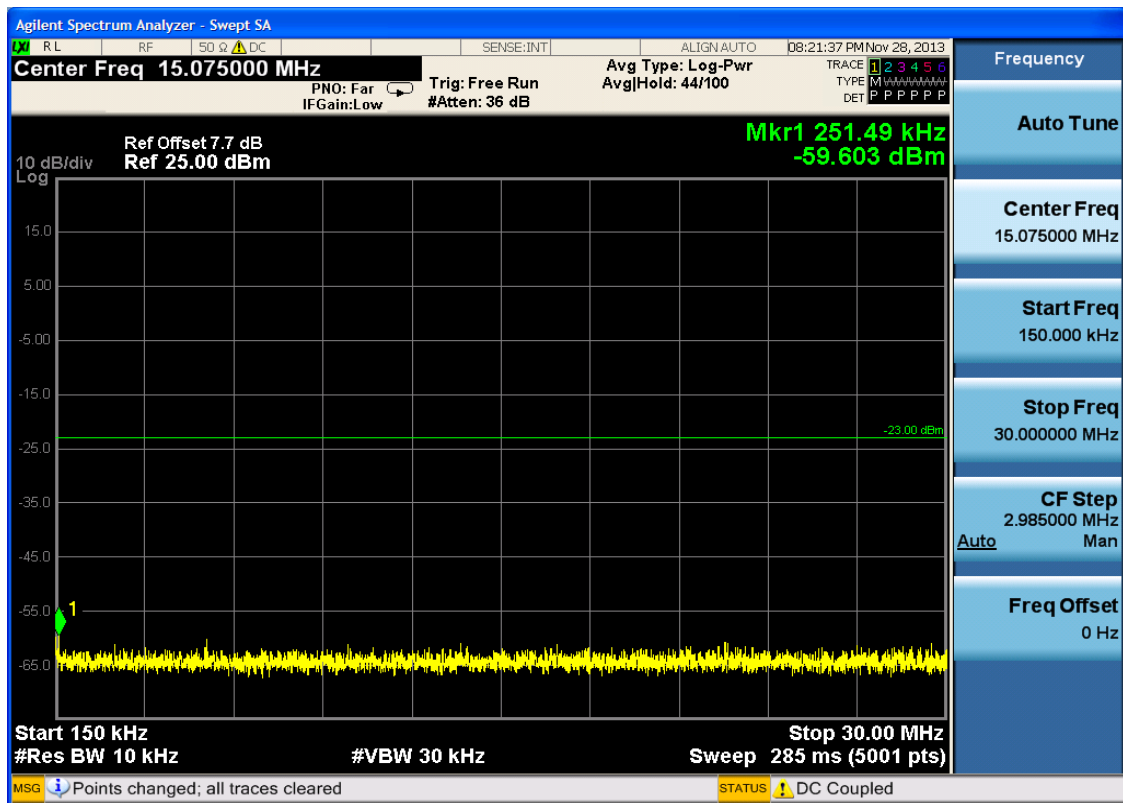


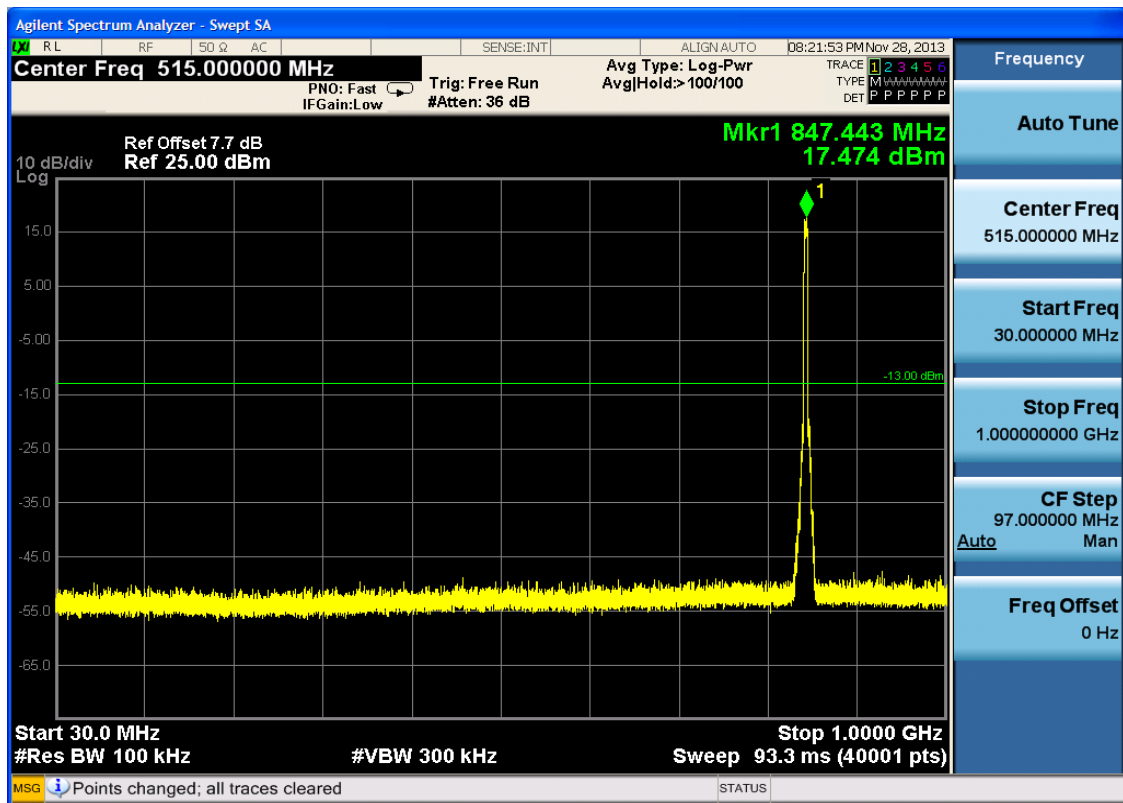


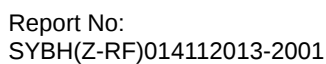


6.2.1.1.3 Test Channel = HCH









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

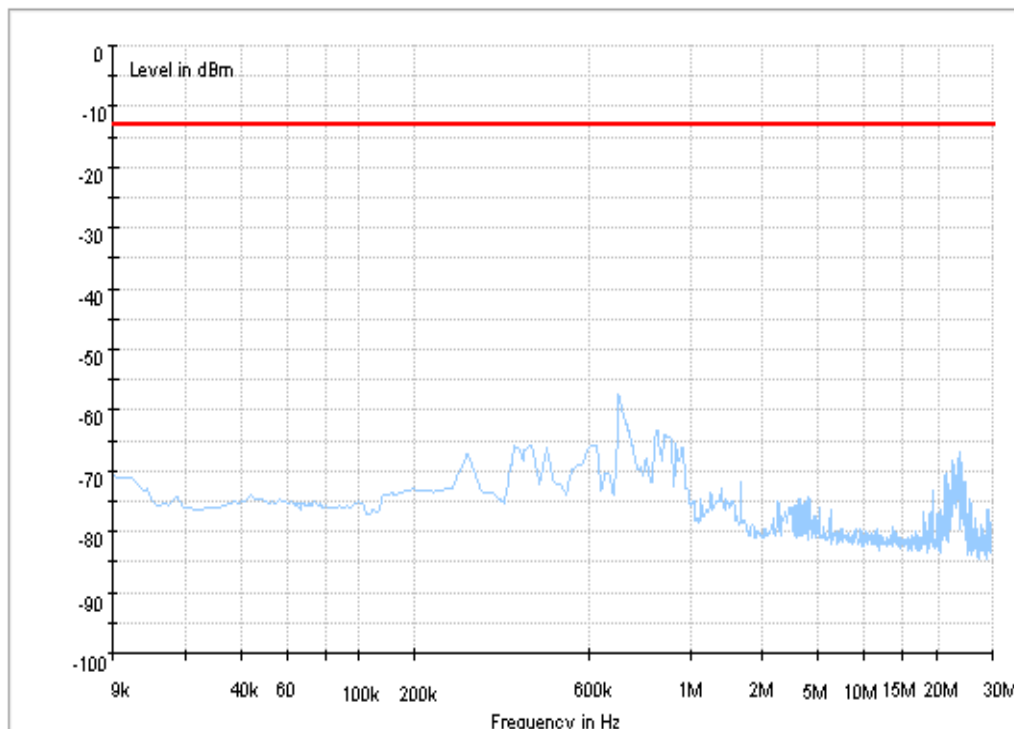
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

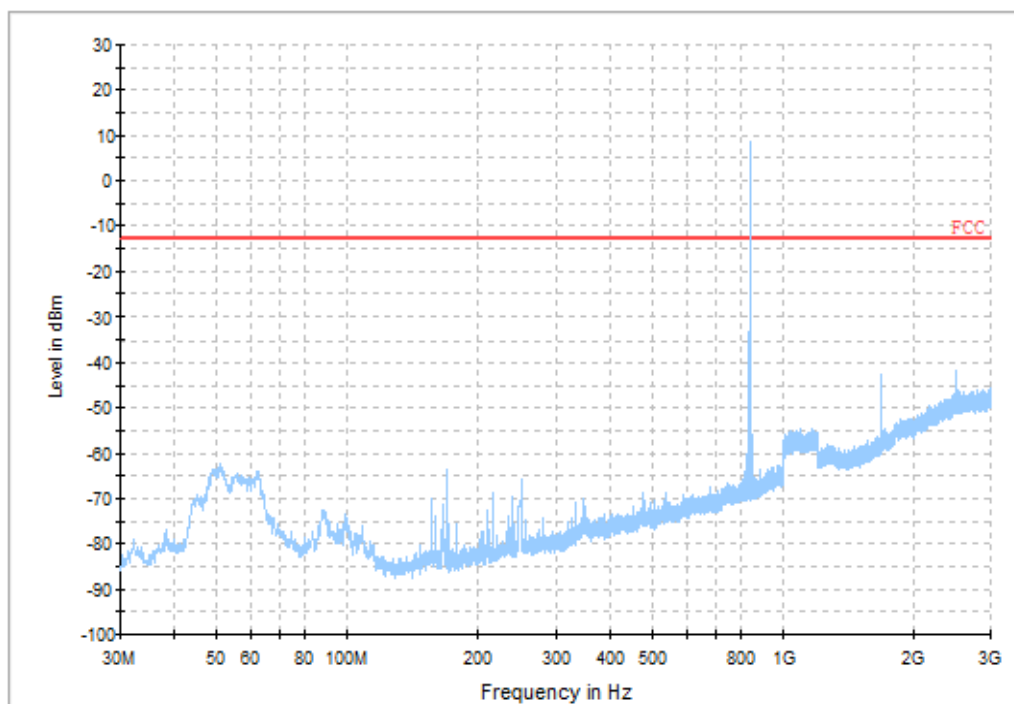
7.1 For GSM

7.1.1 Test Band = GSM850

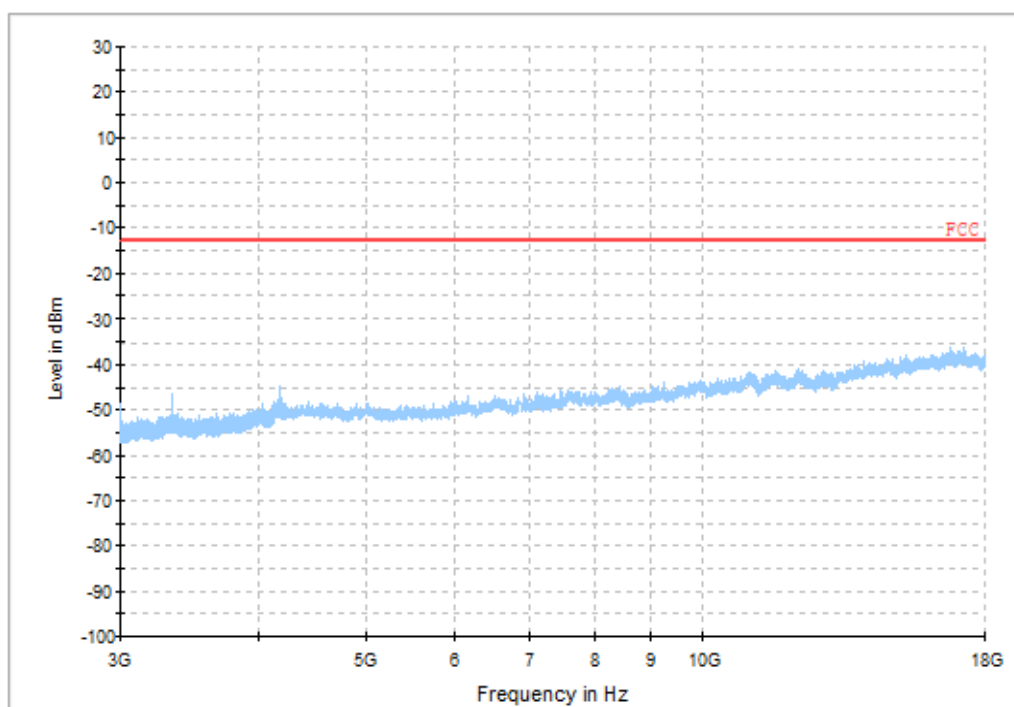
7.1.1.1 Test Mode = GSM/TM1



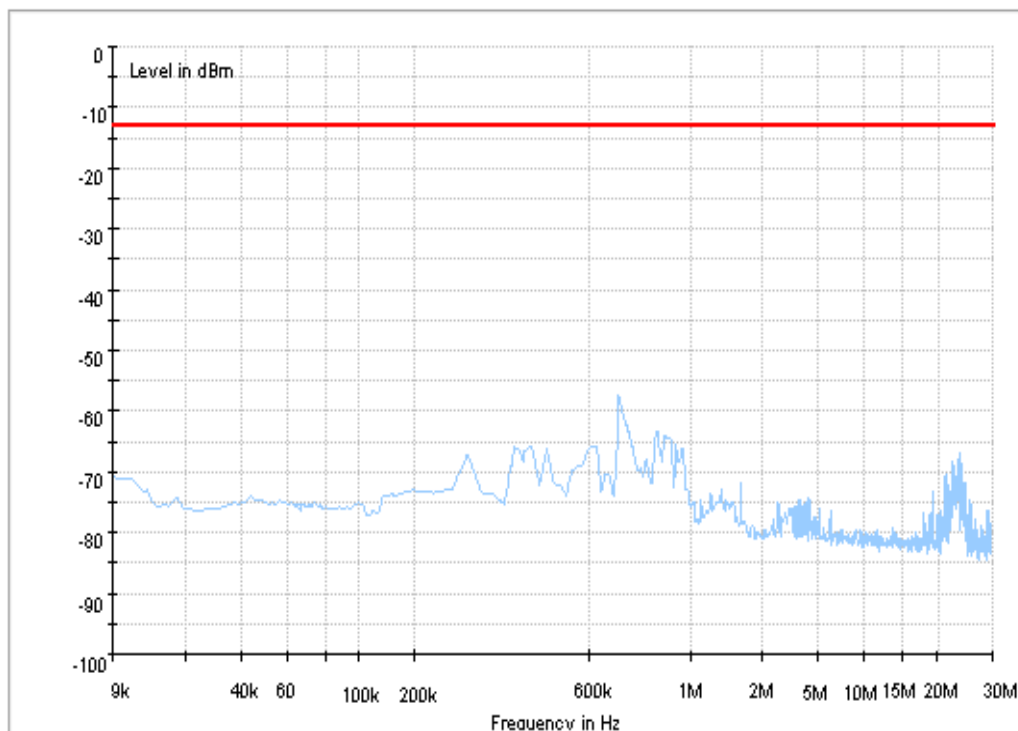
Copy of FCC PART22 GSM850_L



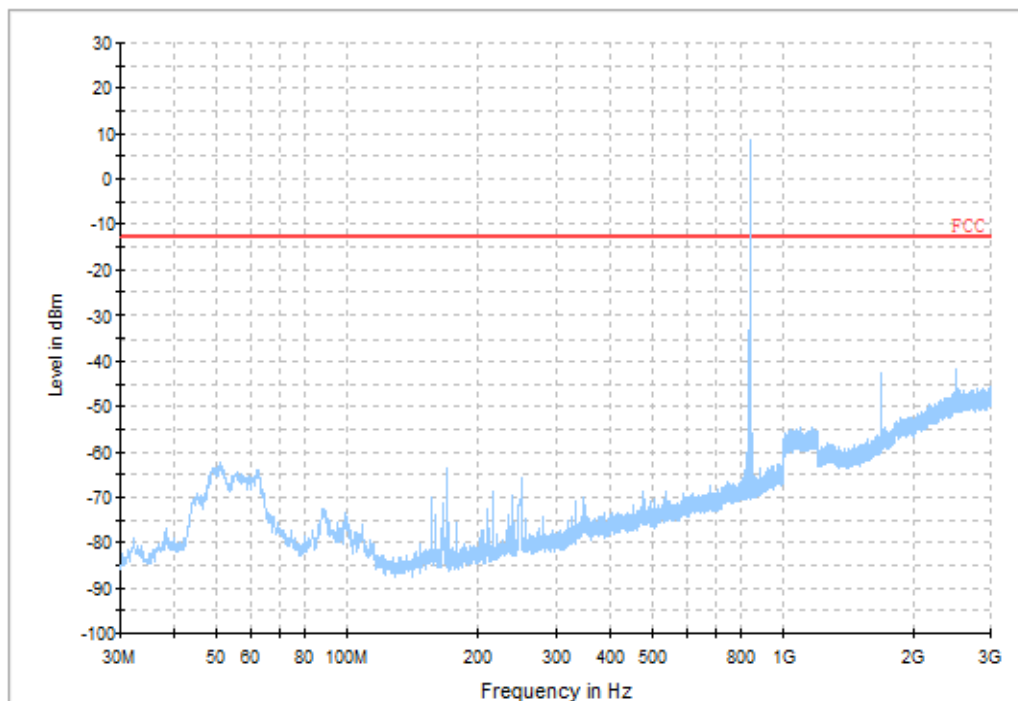
Copy of FCC PART22 GSM850_H



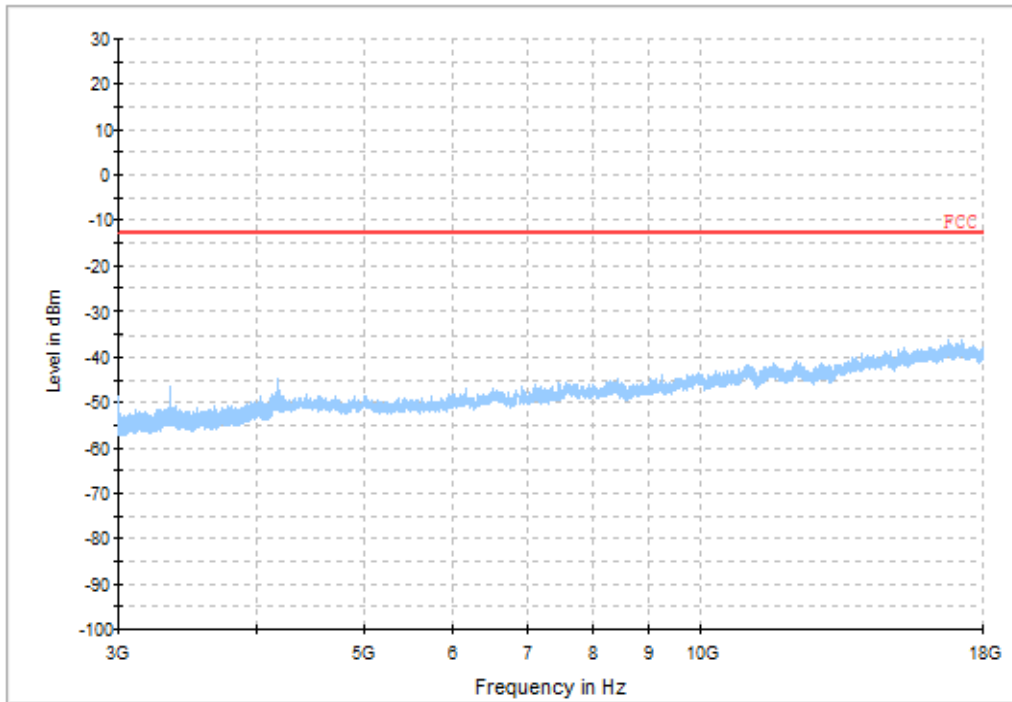
7.1.1.2 Test Mode = GSM/TM2



Copy of FCC PART22 GSM850_L

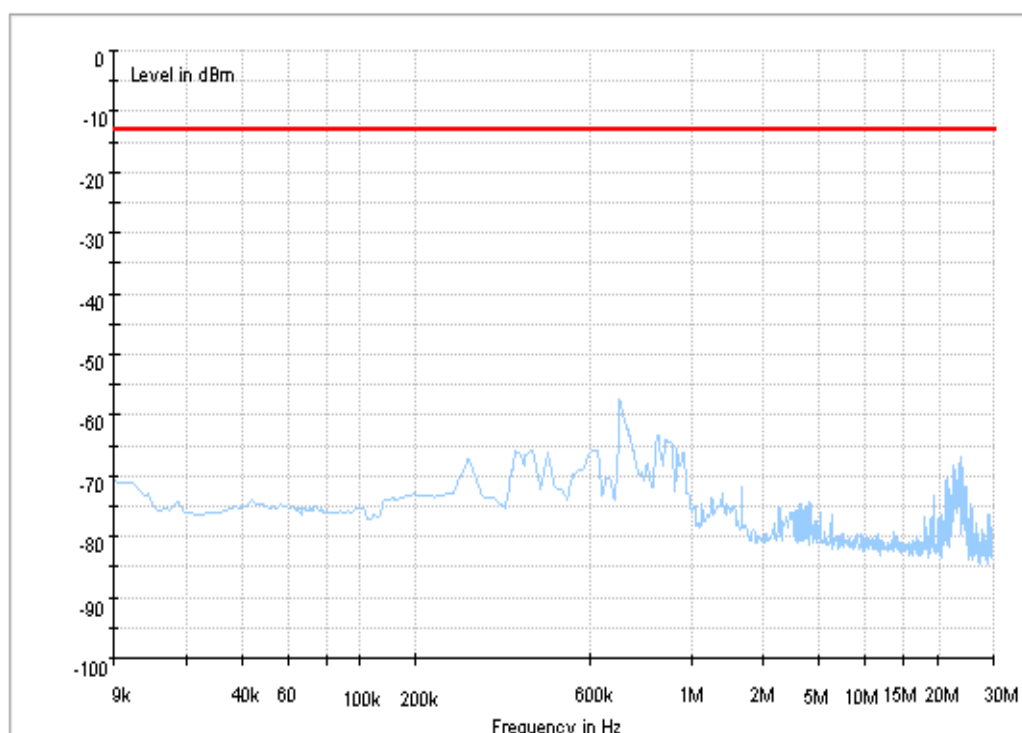


Copy of FCC PART22 GSM850_H

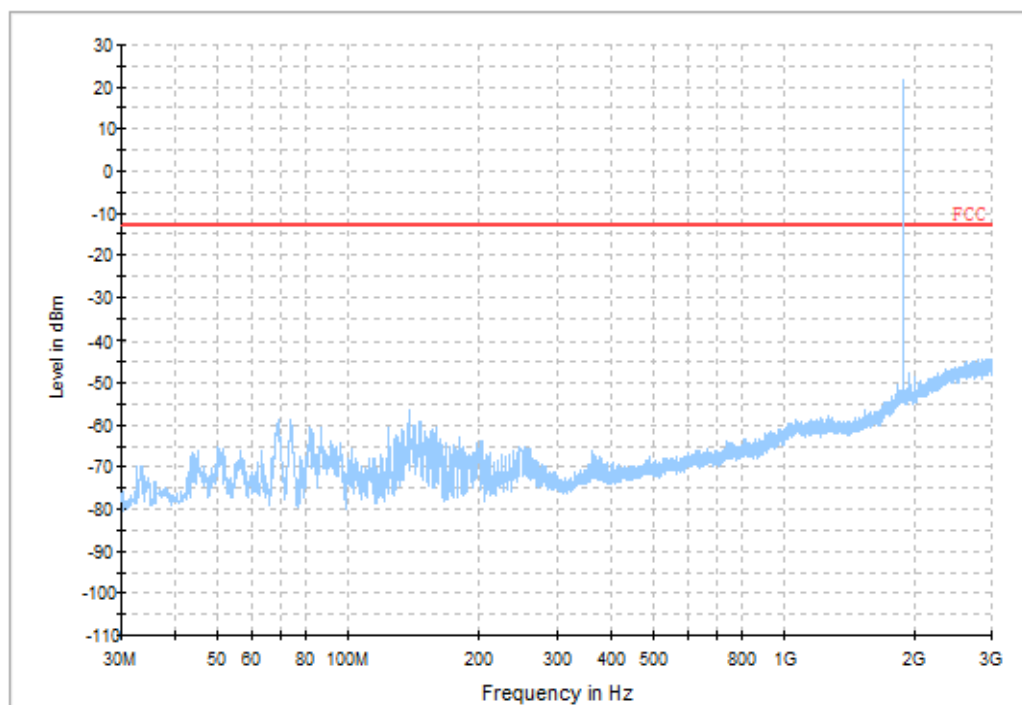


7.1.2 Test Band = GSM1900

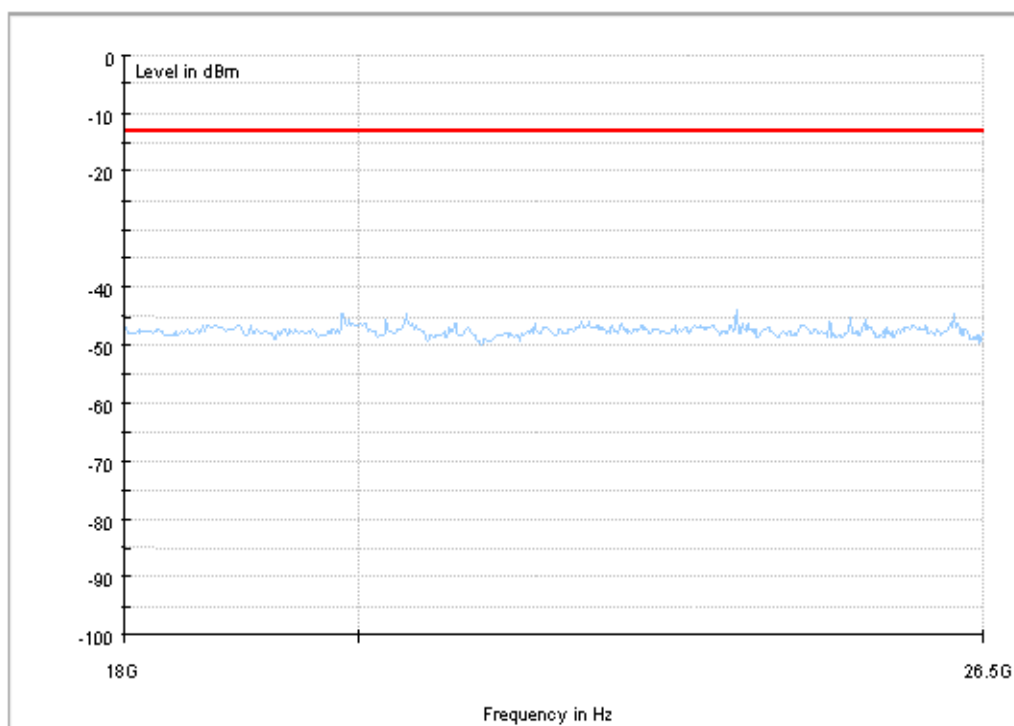
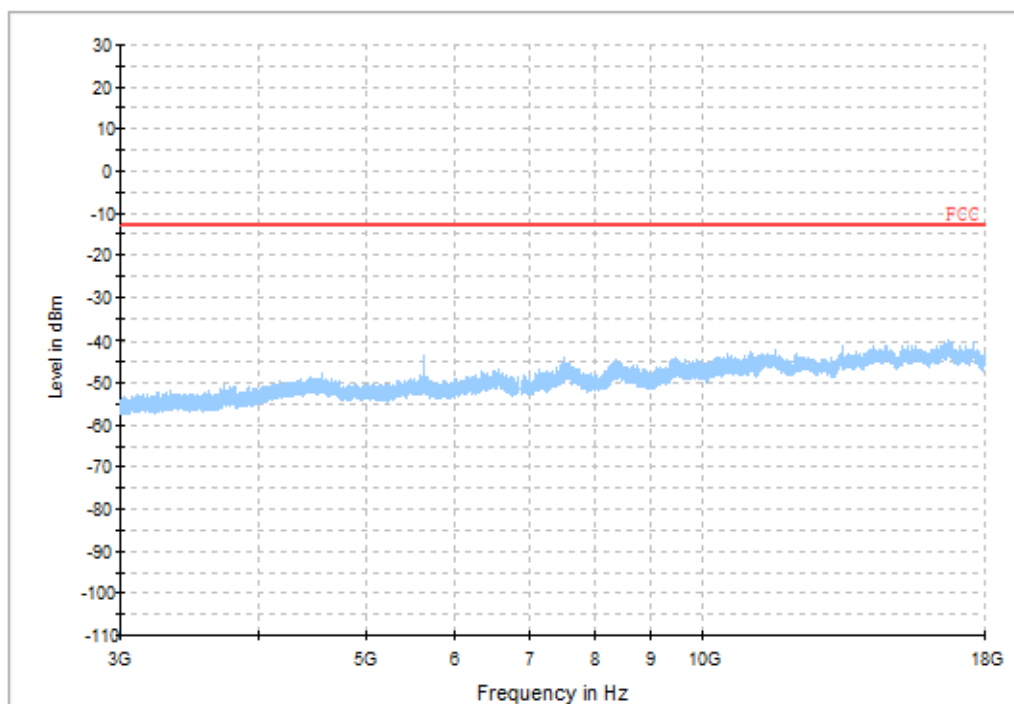
7.1.2.1 Test Mode = GSM/TM1



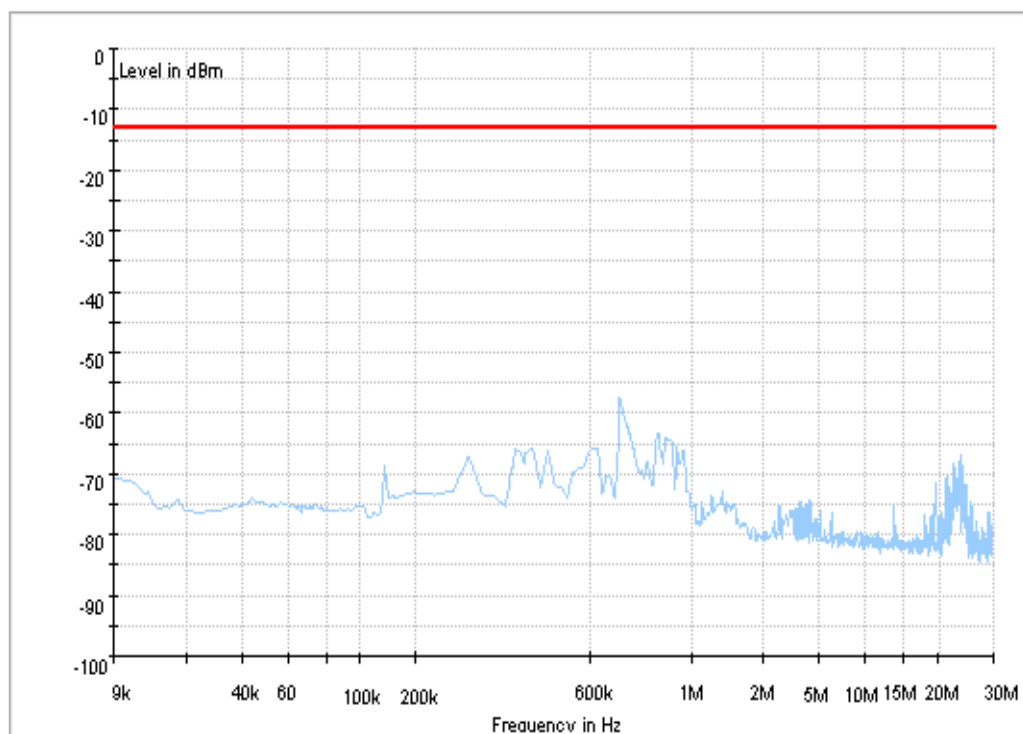
Copy of FCC PART24 GSM1900_L



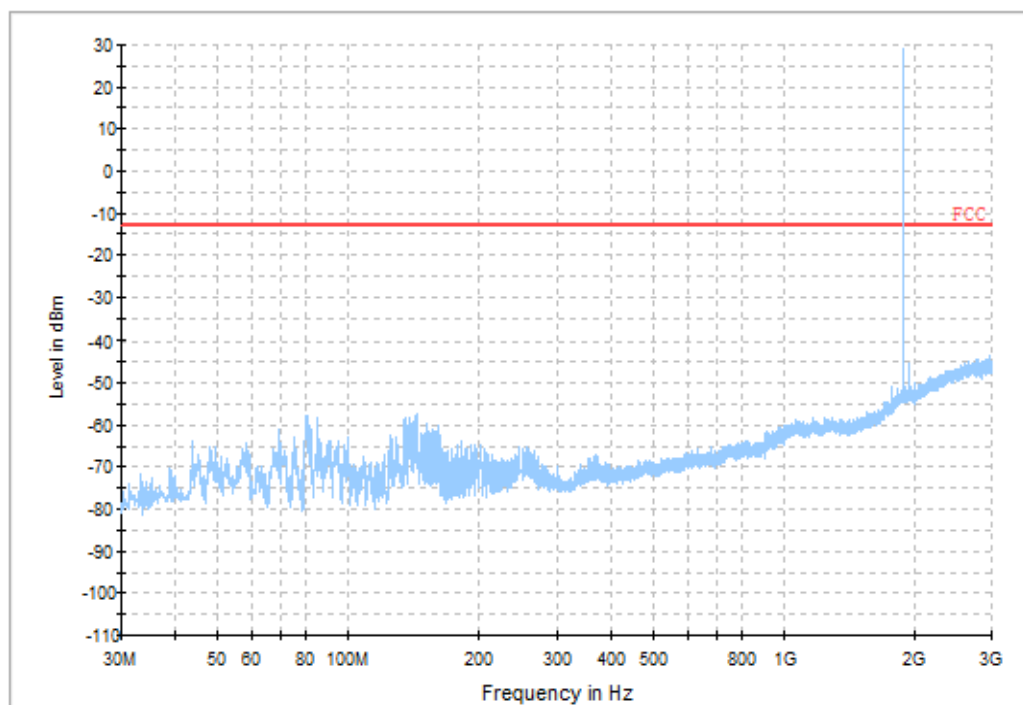
Copy of FCC PART24 GSM1900_H



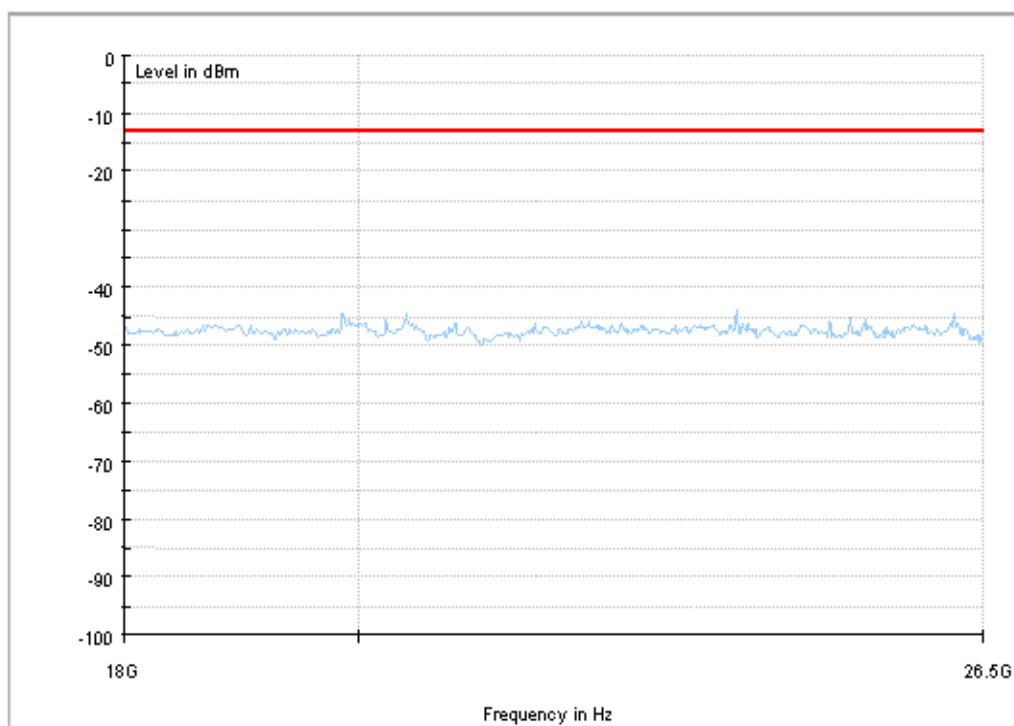
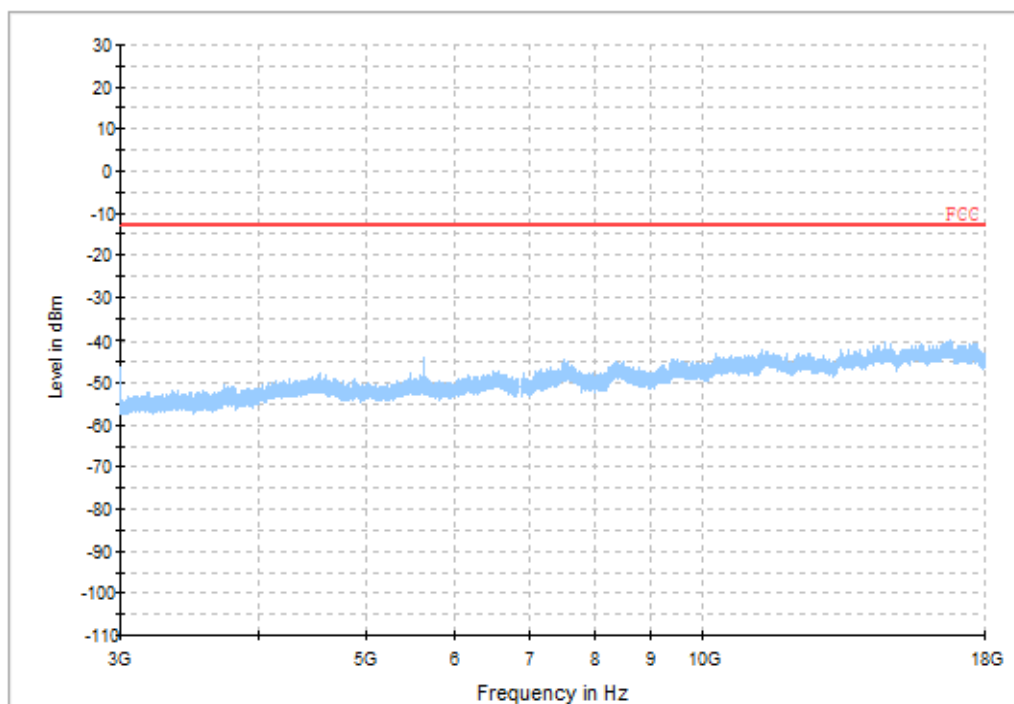
7.1.2.2 Test Mode = GSM/TM2



Copy of FCC PART24 GSM1900_L



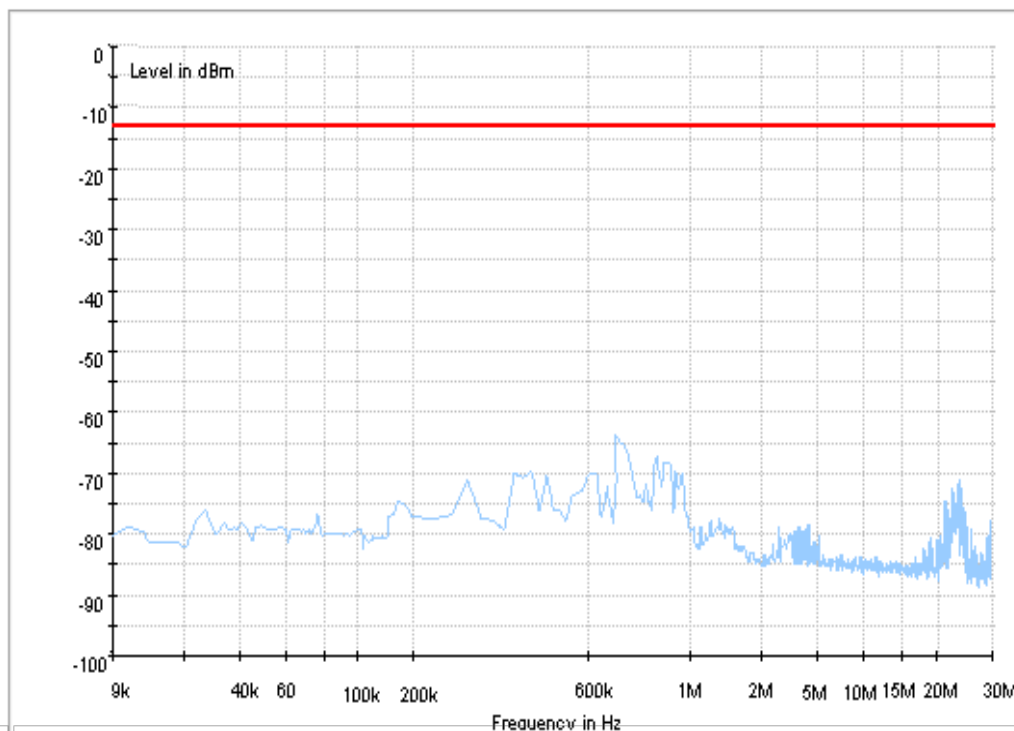
Copy of FCC PART24 GSM1900_H



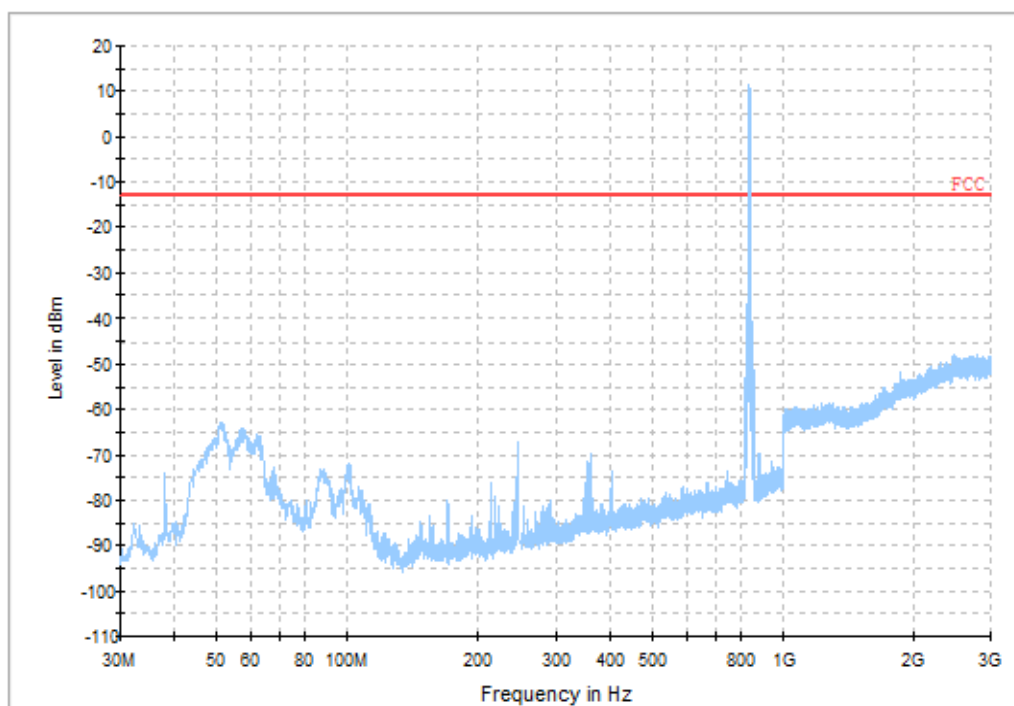
7.2 For UMTS

7.2.1 Test Band = WCDMA850

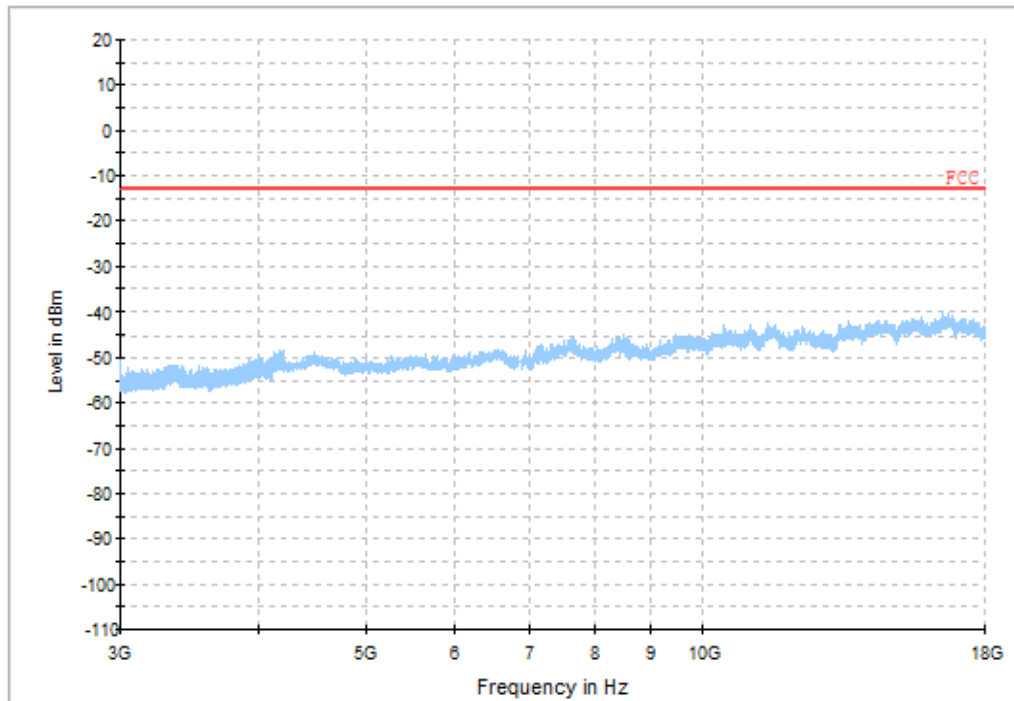
7.2.1.1 Test Mode = UMTS/TM1



Copy of FCC PART22 WCDMA850_L



Copy of FCC PART22 WCDMA850_H



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	-8.85	-0.01074	PASS
				VN	-7.49	-0.00909	PASS
				VH	-7.10	-0.00861	PASS
		MCH	TN	VL	-4.58	-0.00547	PASS
				VN	-2.65	-0.00317	PASS
				VH	-5.75	-0.00687	PASS
		HCH	TN	VL	-8.07	-0.00951	PASS
				VN	-7.62	-0.00898	PASS
				VH	-8.91	-0.0105	PASS
	GSM/TM2	LCH	TN	VL	-4.68	-0.00568	PASS
				VN	-11.91	-0.01445	PASS
				VH	-10.40	-0.01262	PASS
		MCH	TN	VL	-9.56	-0.01143	PASS
				VN	-5.00	-0.00598	PASS
				VH	-3.45	-0.00412	PASS
		HCH	TN	VL	-4.88	-0.00575	PASS
				VN	-7.01	-0.00826	PASS
				VH	-10.53	-0.01241	PASS
GSM1900	GSM/TM1	LCH	TN	VL	5.36	0.0029	PASS
				VN	1.49	0.00081	PASS
				VH	-4.97	-0.00269	PASS
		MCH	TN	VL	22.99	0.01223	PASS
				VN	18.85	0.01003	PASS
				VH	26.86	0.01429	PASS
		HCH	TN	VL	15.63	0.00818	PASS
				VN	22.41	0.01173	PASS
				VH	17.76	0.0093	PASS
	GSM/TM2	LCH	TN	VL	-9.33	-0.00504	PASS
				VN	-15.14	-0.00818	PASS
				VH	-11.75	-0.00635	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		MCH	TN	VL	20.05	0.01066	PASS
				VN	16.95	0.00902	PASS
				VH	13.56	0.00721	PASS
		HCH	TN	VL	2.36	0.00124	PASS
				VN	4.39	0.0023	PASS
				VH	7.52	0.00394	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	-6.01	-0.00729	PASS
				-20	-7.04	-0.00854	PASS
				-10	-7.17	-0.0087	PASS
				0	-9.49	-0.01151	PASS
				10	-4.71	-0.00571	PASS
				20	-6.33	-0.00768	PASS
				30	-5.29	-0.00642	PASS
				40	-9.49	-0.01151	PASS
				50	-8.65	-0.0105	PASS
		MCH	VN	-30	-5.42	-0.00648	PASS
				-20	-2.84	-0.00339	PASS
				-10	-4.20	-0.00502	PASS
				0	-4.91	-0.00587	PASS
				10	-3.81	-0.00455	PASS
				20	-2.84	-0.00339	PASS
				30	-1.68	-0.00201	PASS
				40	-3.42	-0.00409	PASS
				50	-2.84	-0.00339	PASS
		HCH	VN	-30	-8.85	-0.01043	PASS
				-20	-7.68	-0.00905	PASS
				-10	-9.23	-0.01087	PASS
				0	-8.33	-0.00981	PASS
				10	-11.17	-0.01316	PASS
				20	-6.91	-0.00814	PASS
				30	-8.91	-0.0105	PASS
				40	-6.65	-0.00783	PASS
				50	-6.46	-0.00761	PASS
	GSM/TM2	LCH	VN	-30	-7.39	-0.00897	PASS
				-20	-8.20	-0.00995	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-10	-9.94	-0.01206	PASS
				0	-14.08	-0.01708	PASS
				10	-13.33	-0.01617	PASS
				20	-12.85	-0.01559	PASS
				30	-15.56	-0.01888	PASS
				40	-12.88	-0.01563	PASS
				50	-8.68	-0.01053	PASS
		MCH	VN	-30	-2.42	-0.00289	PASS
				-20	-5.17	-0.00618	PASS
				-10	-0.16	-0.00019	PASS
				0	-5.81	-0.00694	PASS
				10	-8.04	-0.00961	PASS
				20	-3.65	-0.00436	PASS
				30	-6.49	-0.00776	PASS
				40	-3.68	-0.0044	PASS
				50	-11.49	-0.01373	PASS
		HCH	VN	-30	-6.91	-0.00814	PASS
				-20	-4.52	-0.00533	PASS
				-10	-0.94	-0.00111	PASS
				0	-0.26	-0.00031	PASS
				10	-7.68	-0.00905	PASS
				20	-6.46	-0.00761	PASS
				30	-4.07	-0.0048	PASS
				40	-8.43	-0.00993	PASS
				50	-10.59	-0.01248	PASS
GSM1900	GSM/TM1	LCH	VN	-30	4.58	0.00248	PASS
				-20	5.17	0.00279	PASS
				-10	3.62	0.00196	PASS
				0	-0.45	-0.00024	PASS
				10	2.71	0.00146	PASS
				20	4.33	0.00234	PASS
				30	1.23	0.00066	PASS
				40	4.00	0.00216	PASS
				50	10.14	0.00548	PASS
		MCH	VN	-30	19.05	0.01013	PASS
				-20	25.57	0.0136	PASS
				-10	19.50	0.01037	PASS
				0	18.60	0.00989	PASS
				10	25.83	0.01374	PASS
				20	23.18	0.01233	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	25.44	0.01353	PASS
				40	21.24	0.0113	PASS
				50	21.83	0.01161	PASS
		HCH	VN	-30	12.27	0.00642	PASS
				-20	15.37	0.00805	PASS
				-10	15.50	0.00812	PASS
				0	12.85	0.00673	PASS
				10	15.05	0.00788	PASS
				20	12.01	0.00629	PASS
				30	12.91	0.00676	PASS
				40	6.39	0.00335	PASS
				50	8.65	0.00453	PASS
	GSM/TM2	LCH	VN	-30	-12.56	-0.00679	PASS
				-20	1.29	0.0007	PASS
				-10	-8.65	-0.00468	PASS
				0	-11.69	-0.00632	PASS
				10	-3.87	-0.00209	PASS
				20	-11.85	-0.0064	PASS
				30	-7.01	-0.00379	PASS
				40	-6.84	-0.0037	PASS
				50	-0.74	-0.0004	PASS
		MCH	VN	-30	12.66	0.00673	PASS
				-20	12.72	0.00677	PASS
				-10	14.30	0.00761	PASS
				0	18.85	0.01003	PASS
				10	11.72	0.00623	PASS
				20	21.21	0.01128	PASS
				30	22.18	0.0118	PASS
				40	12.11	0.00644	PASS
				50	19.63	0.01044	PASS
		HCH	VN	-30	4.10	0.00215	PASS
				-20	-0.36	-0.00019	PASS
				-10	11.82	0.00619	PASS
				0	5.91	0.00309	PASS
				10	-0.61	-0.00032	PASS
				20	9.98	0.00523	PASS
				30	8.46	0.00443	PASS
				40	6.62	0.00347	PASS
				50	4.65	0.00243	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	2.87	0.00347	PASS
				VN	-2.79	-0.00338	PASS
				VH	0.20	0.00024	PASS
		MCH	TN	VL	1.72	0.00206	PASS
				VN	2.64	0.00316	PASS
				VH	1.82	0.00218	PASS
		HCH	TN	VL	2.35	0.00278	PASS
				VN	-0.26	-0.00031	PASS
				VH	3.25	0.00384	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	-3.69	-0.00447	PASS
				-20	0.81	0.00098	PASS
				-10	-2.40	-0.0029	PASS
				0	-4.21	-0.00509	PASS
				10	-1.10	-0.00133	PASS
				20	-2.27	-0.00275	PASS
				30	6.03	0.0073	PASS
				40	2.82	0.00341	PASS
				50	-0.12	-0.00015	PASS
		MCH	VN	-30	1.77	0.00212	PASS
				-20	0.87	0.00104	PASS
				-10	-3.88	-0.00464	PASS
				0	4.99	0.00597	PASS
				10	-3.02	-0.00361	PASS
				20	-2.99	-0.00357	PASS
				30	7.23	0.00864	PASS
				40	7.05	0.00843	PASS
				50	-2.49	-0.00298	PASS
		HCH	VN	-30	4.43	0.00523	PASS
				-20	-0.20	-0.00024	PASS
				-10	0.34	0.0004	PASS
				0	1.04	0.00123	PASS
				10	-0.23	-0.00027	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				20	6.85	0.00809	PASS
				30	1.60	0.00189	PASS
				40	2.06	0.00243	PASS
				50	-3.31	-0.00391	PASS

END