



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	32.22	29.19	38.5	PASS
		MCH	32.38	29.24	38.5	PASS
		HCH	32.38	29.22	38.5	PASS
	GSM/TM2	LCH	26.17	23.18	38.5	PASS
		MCH	26.3	23.24	38.5	PASS
		HCH	26.3	23.31	38.5	PASS
WCDMA850	UMTS/TM1	LCH	22.96	19.86	38.5	PASS
		MCH	23.05	20.11	38.5	PASS
		HCH	23.01	19.78	38.5	PASS

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	29.6	28.94	33	PASS
		MCH	29.53	29.17	33	PASS

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
	GSM/TM2	HCH	29.52	28.86	33	PASS
		LCH	25.77	25.45	33	PASS
		MCH	25.72	25.06	33	PASS
		HCH	25.73	25.22	33	PASS

Note1:

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

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

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

b, SGP=Signal Generator Level

Note2:

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

$$\text{SET RBW} = 1\% \text{ of the OBW, not to exceed } 1\text{MHz}$$

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

SET Sweep time=auto-couple.

Detector:RMS

2Appendix_B: Peak-to-Average Ratio

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
GSM850	GSM/TM1	LCH	0.23	13	PASS
		MCH	0.24	13	PASS
		HCH	0.23	13	PASS
	GSM/TM2	LCH	3.05	13	PASS
		MCH	2.98	13	PASS
		HCH	2.91	13	PASS
GSM1900	GSM/TM1	LCH	0.25	13	PASS
		MCH	0.23	13	PASS
		HCH	0.22	13	PASS
	GSM/TM2	LCH	2.72	13	PASS
		MCH	2.8	13	PASS
		HCH	2.89	13	PASS
Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA850	UMTS/TM1	LCH	2.88	13	PASS
		MCH	2.76	13	PASS
		HCH	3.05	13	PASS

3Appendix_C: Modulation Characteristics

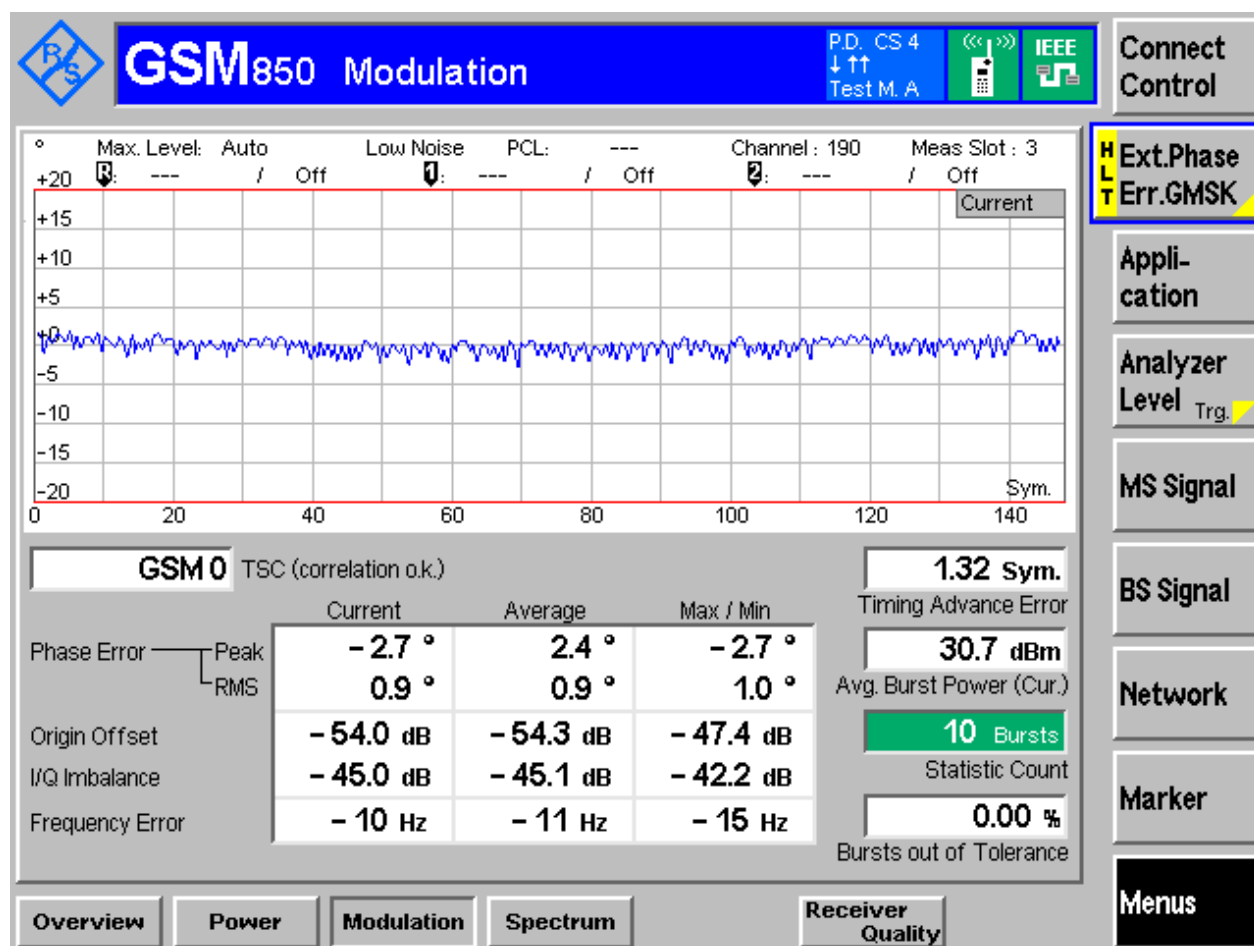
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

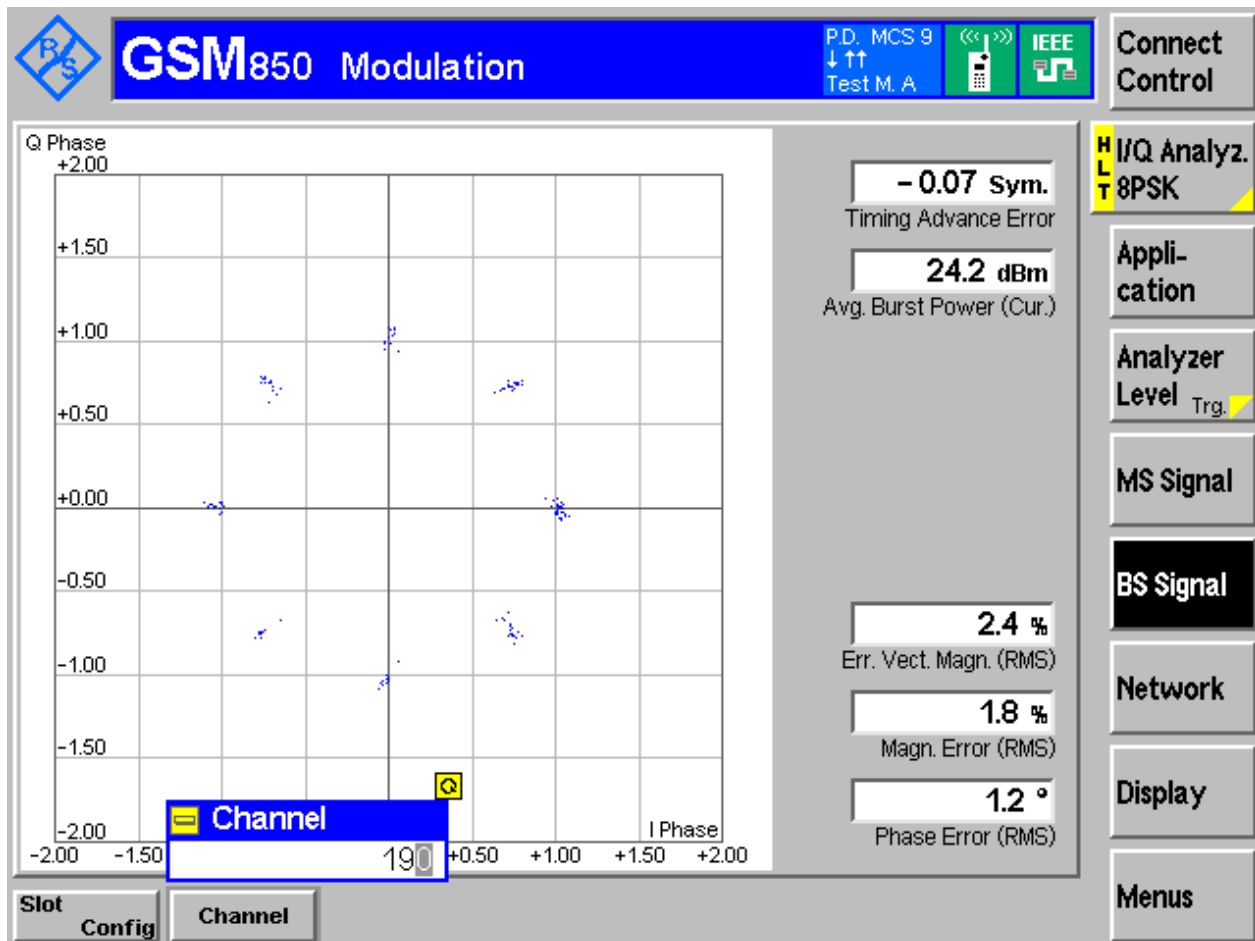
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

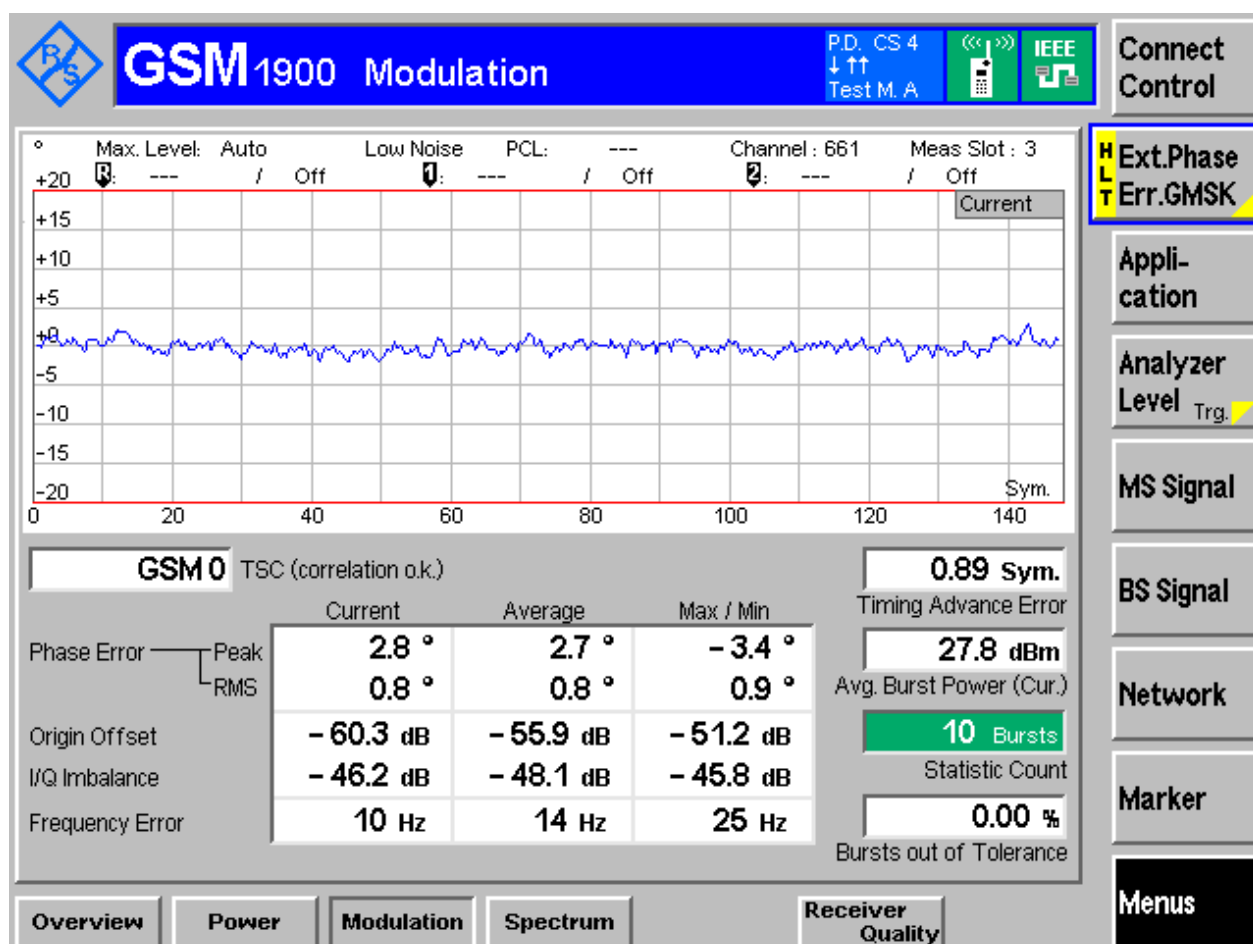
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

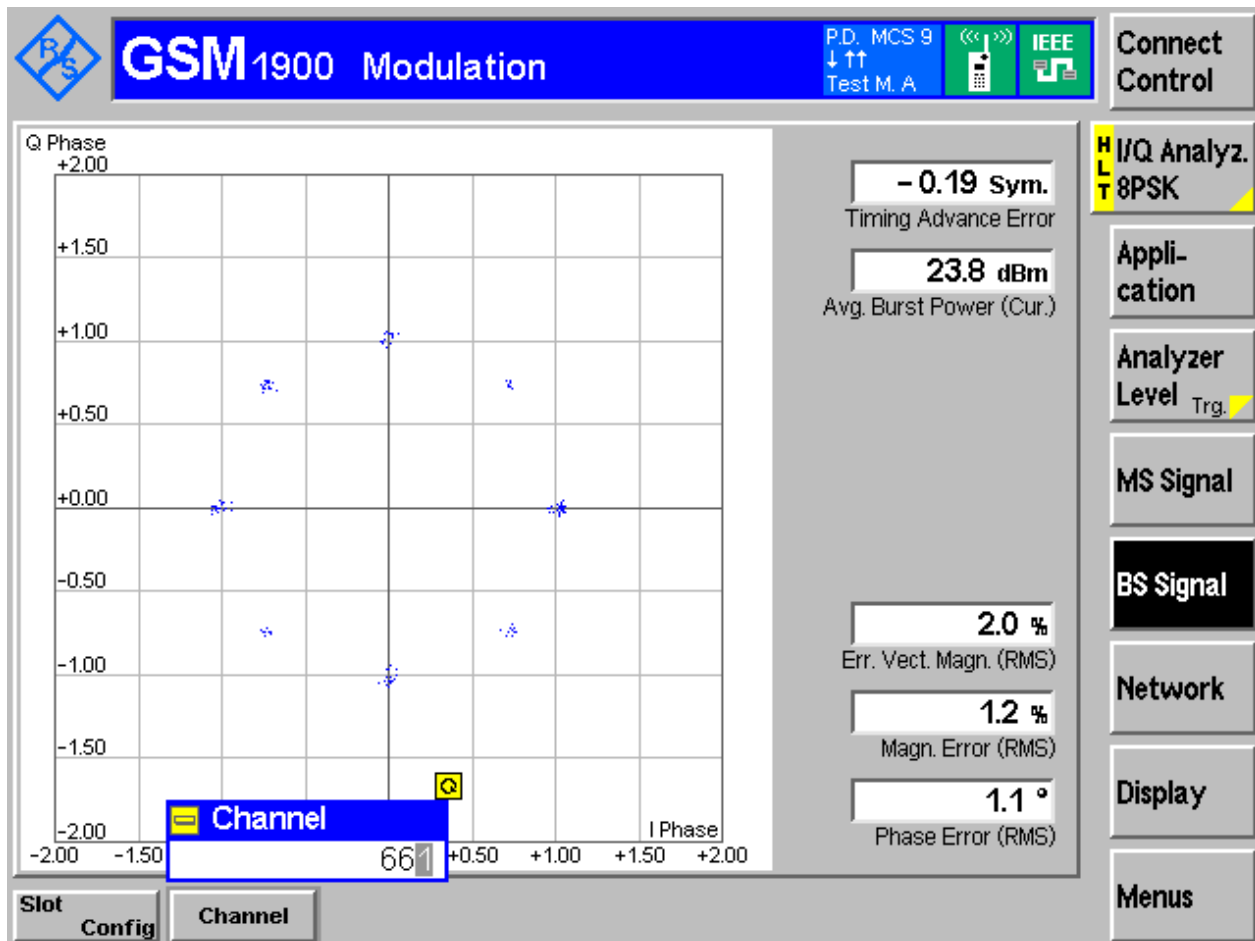
3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH



3.1.2.2 Test Mode = GSM/TM2

3.1.2.2.1 Test Channel = MCH

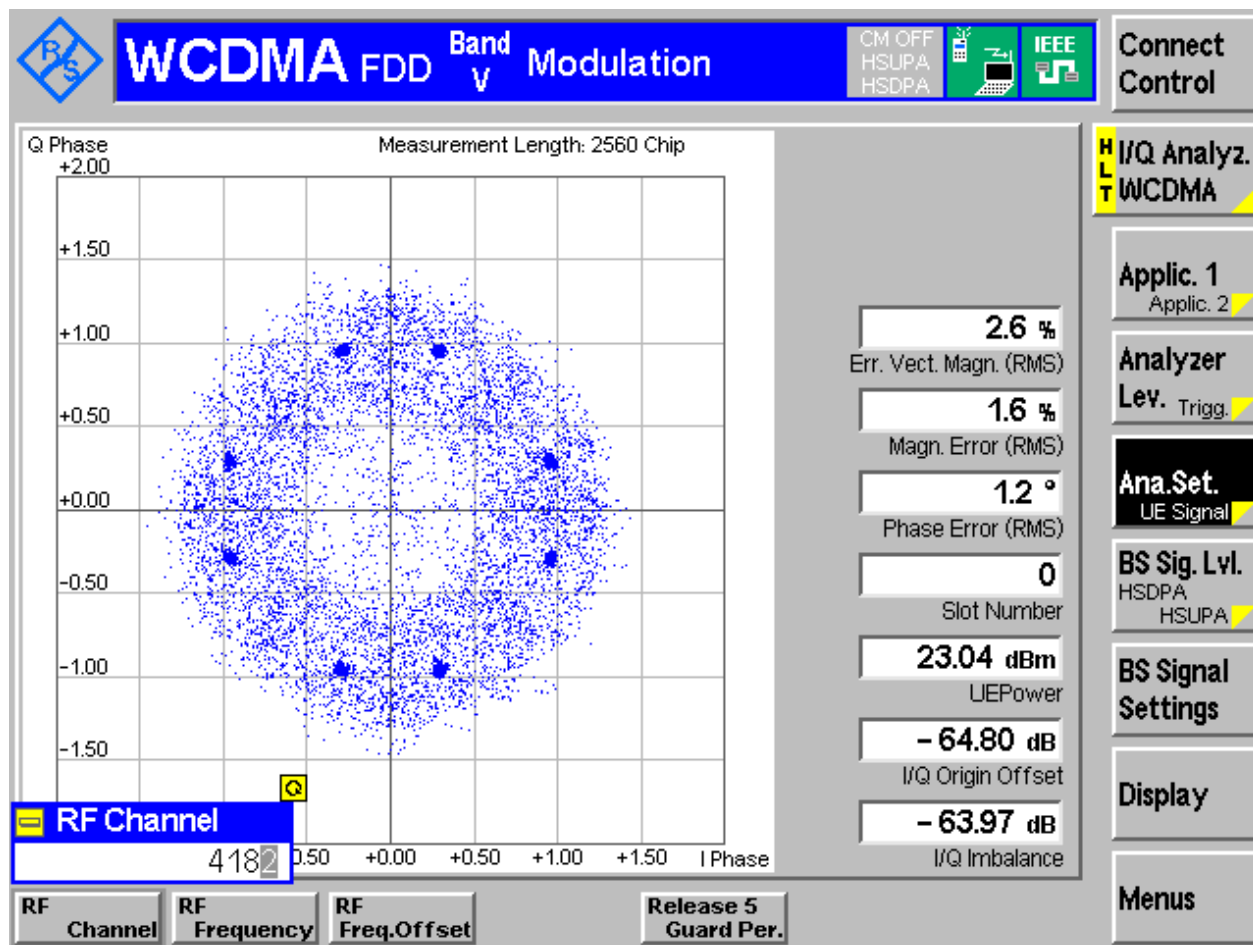


3.2 For UMTS

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	241.19	308.64	Pass
		MCH	242.27	309.26	Pass
		HCH	241.75	309.05	Pass
	GSM/TM2	LCH	250.55	314.06	Pass
		MCH	250.67	315.97	Pass
		HCH	250.04	317.59	Pass
GSM1900	GSM/TM1	LCH	244.83	314.30	Pass
		MCH	245.98	312.91	Pass
		HCH	247.05	314.87	Pass
	GSM/TM2	LCH	247.87	318.11	Pass
		MCH	246.96	315.71	Pass
		HCH	247.86	313.74	Pass
Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA850	UMTS/TM1	LCH	4.15	4.71	Pass
		MCH	4.15	4.73	Pass
		HCH	4.15	4.72	Pass

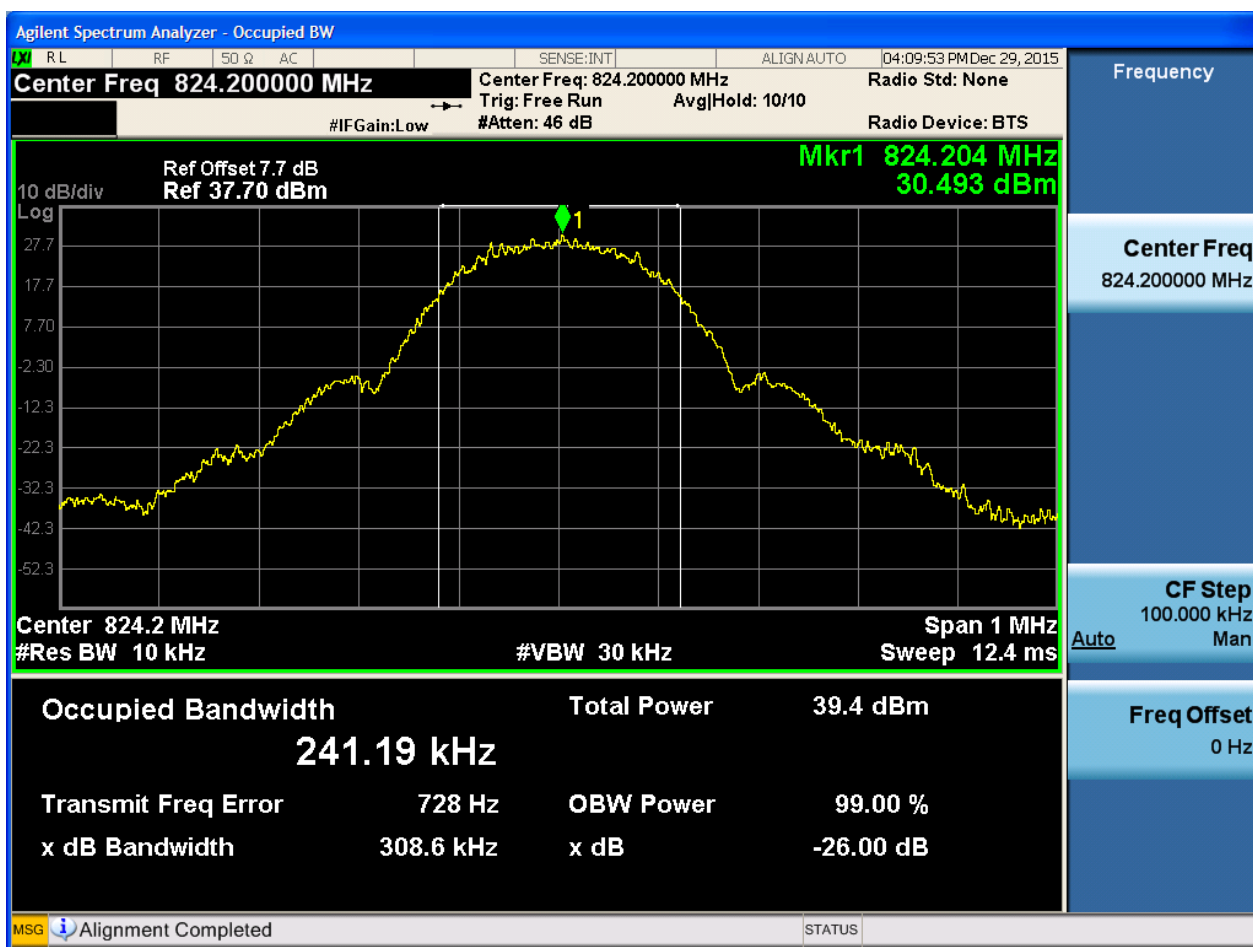
Part II - Test Plots

4.1 For GSM

4.1.1 Test Band = GSM850

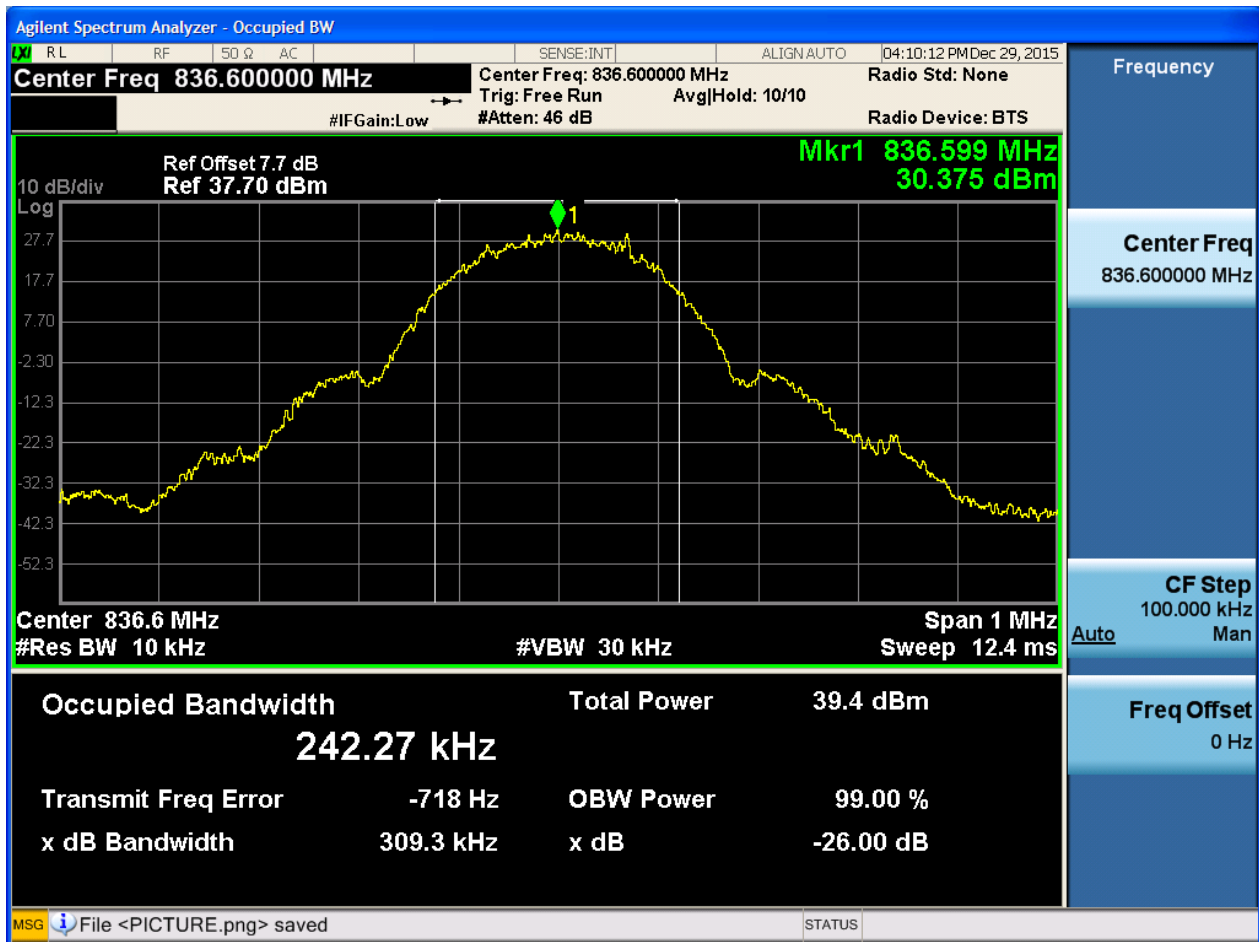
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH



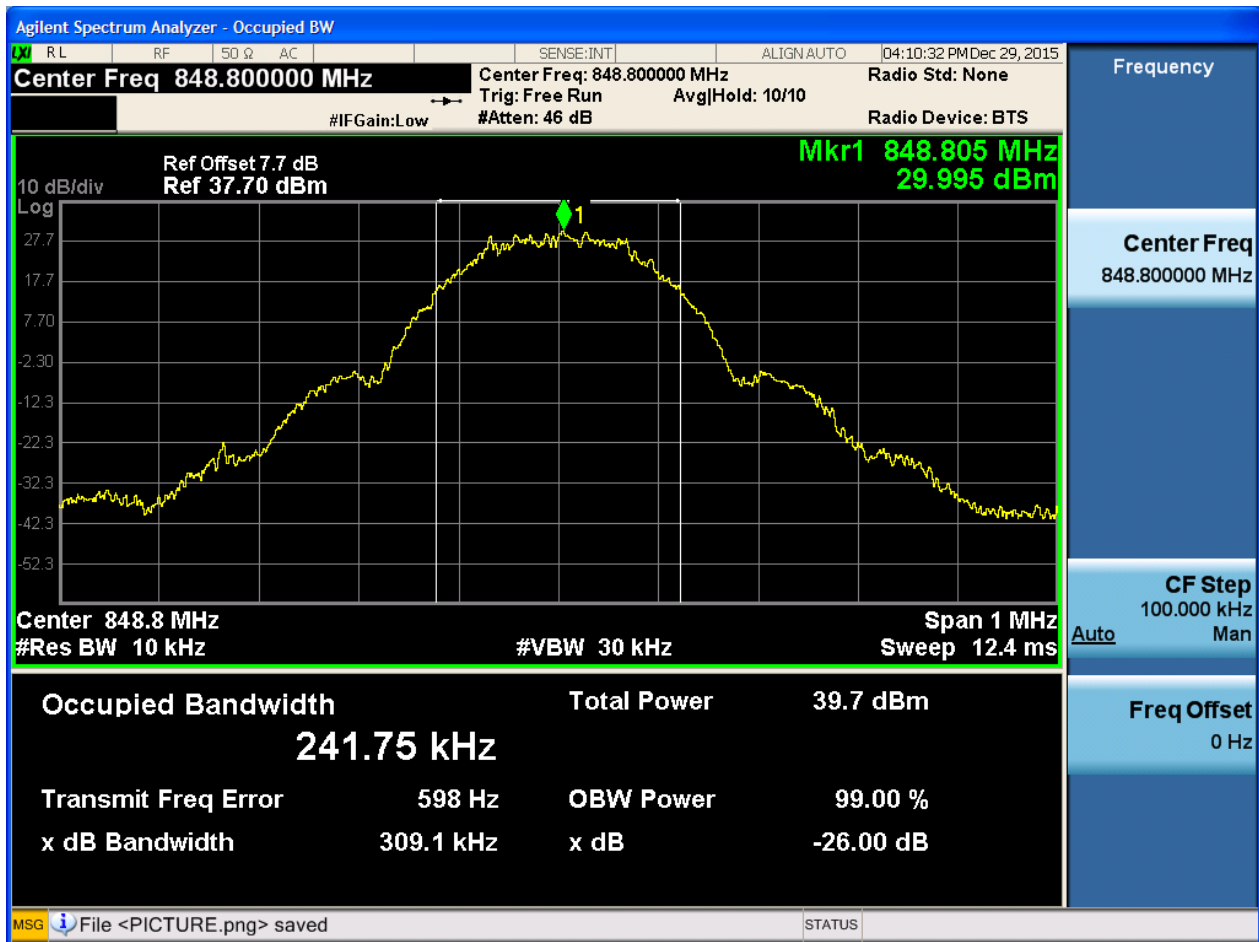


4.1.1.1.2 Test Channel = MCH





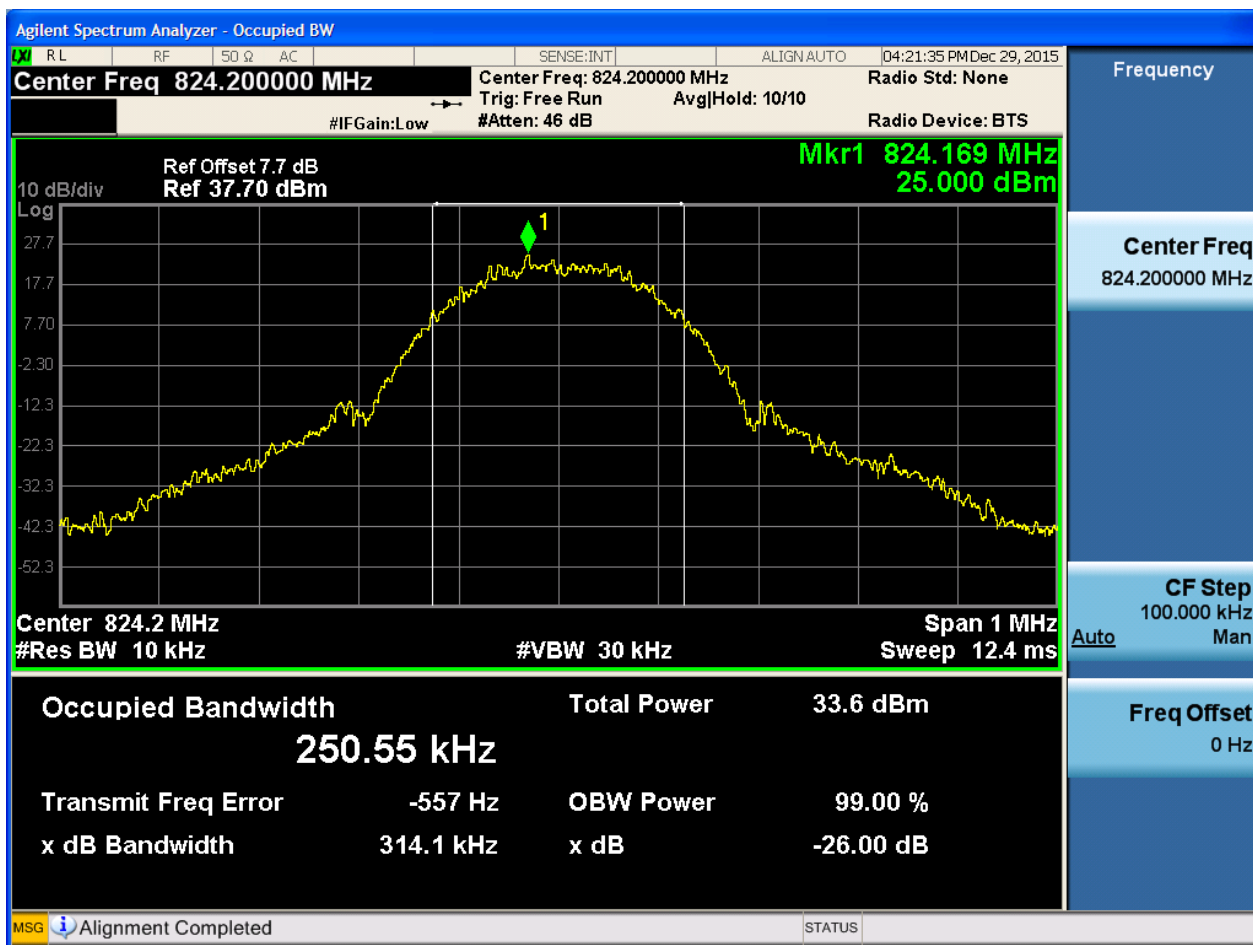
4.1.1.1.3 Test Channel = HCH





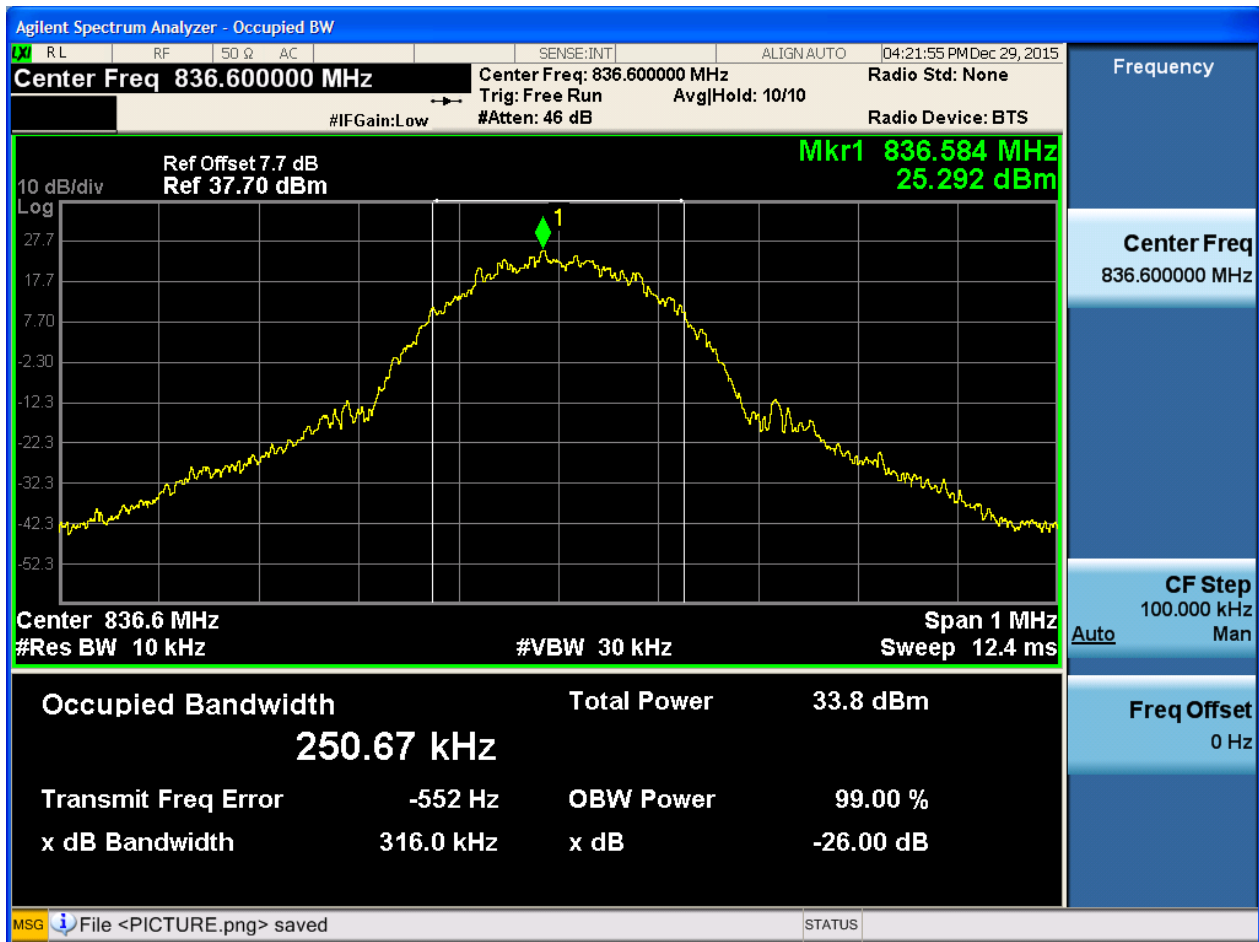
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH



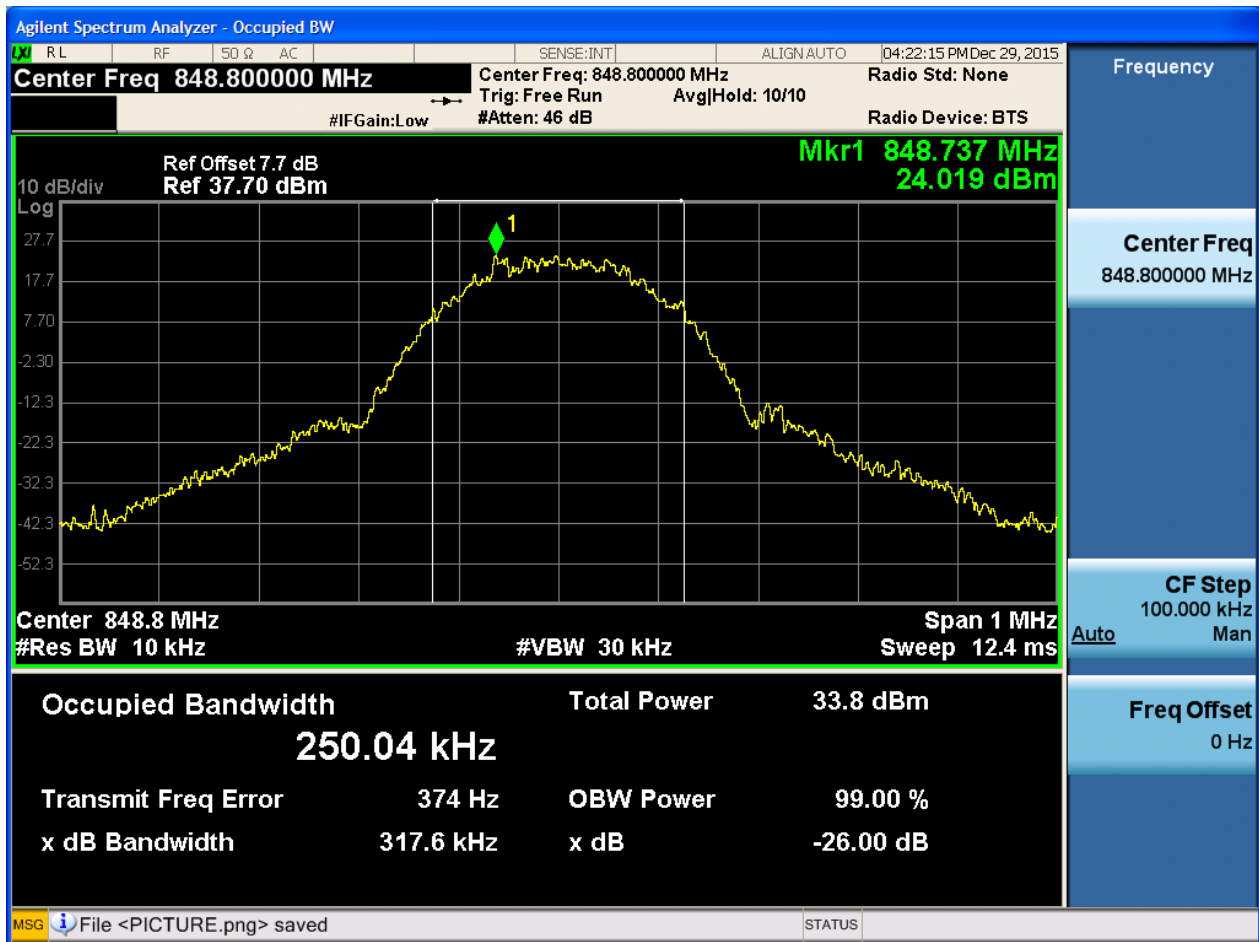


4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH

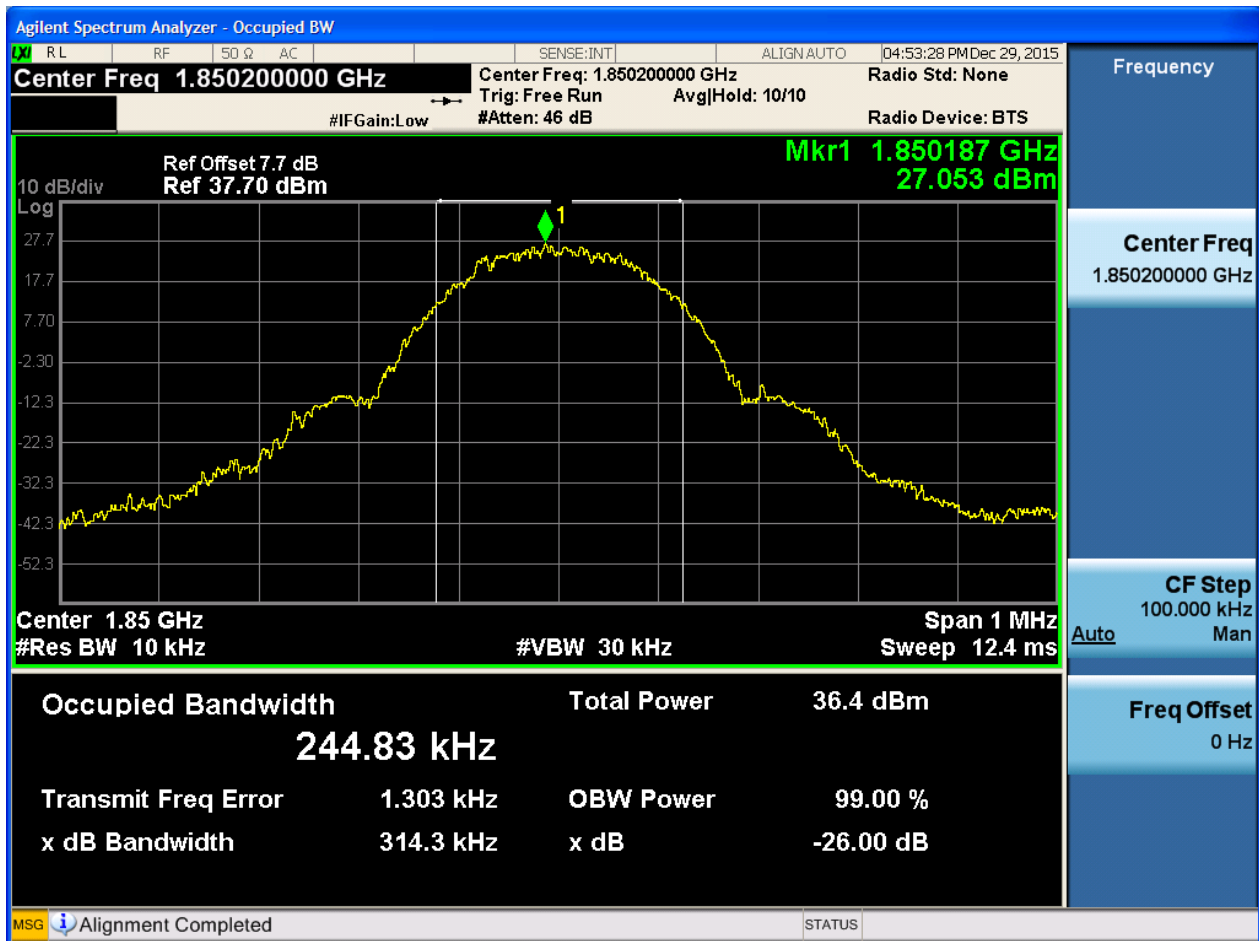




4.1.2 Test Band = GSM1900

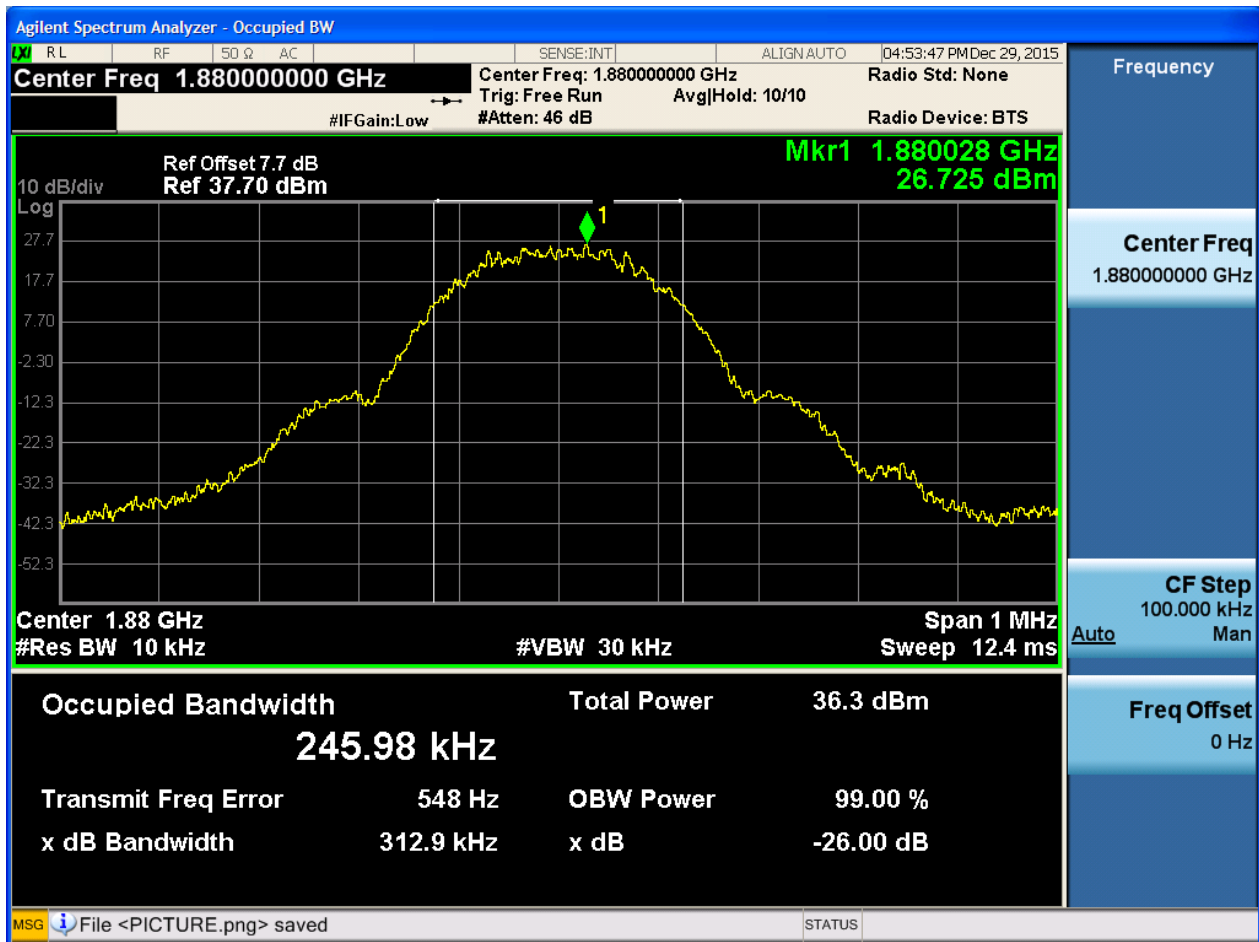
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



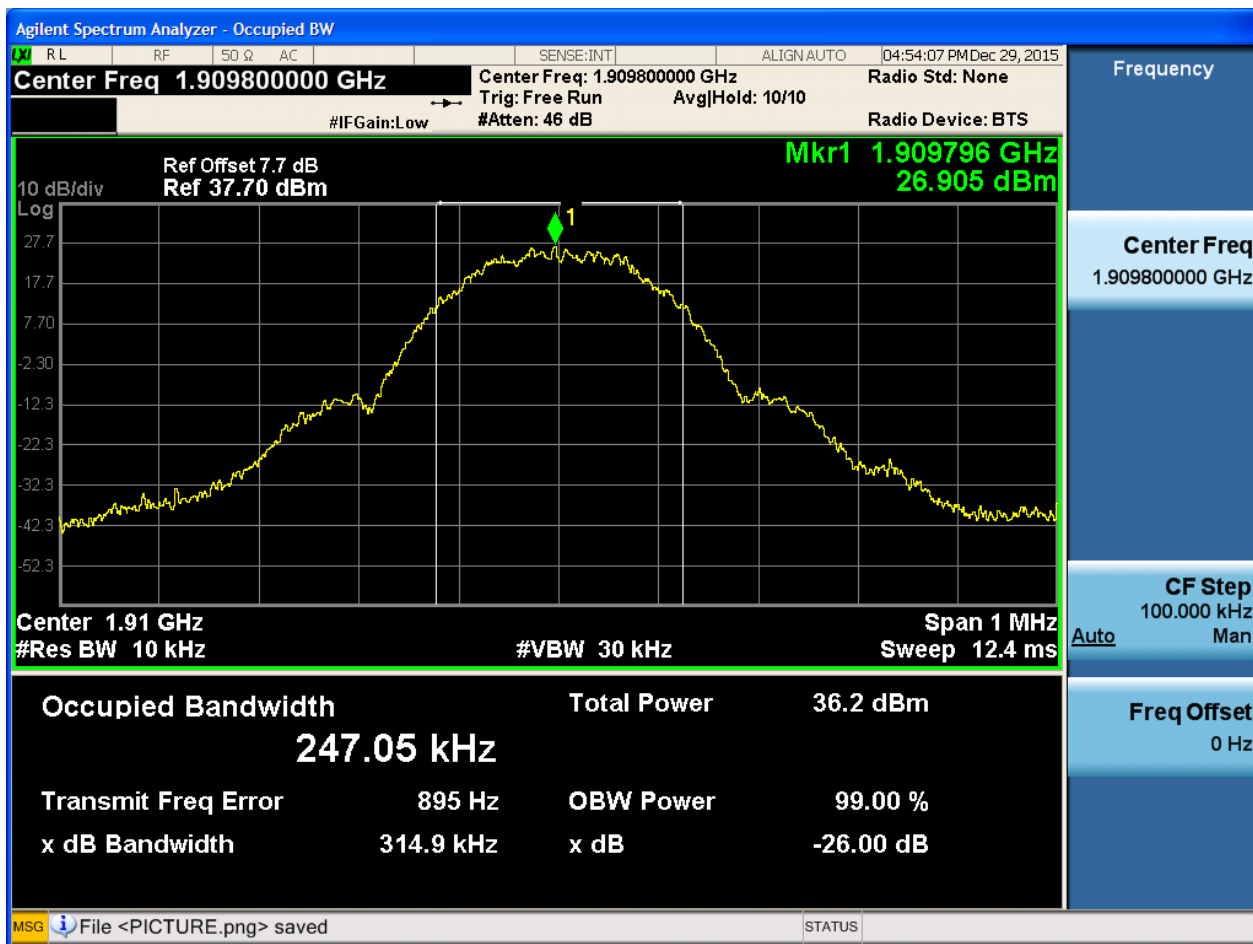


4.1.2.1.2 Test Channel = MCH





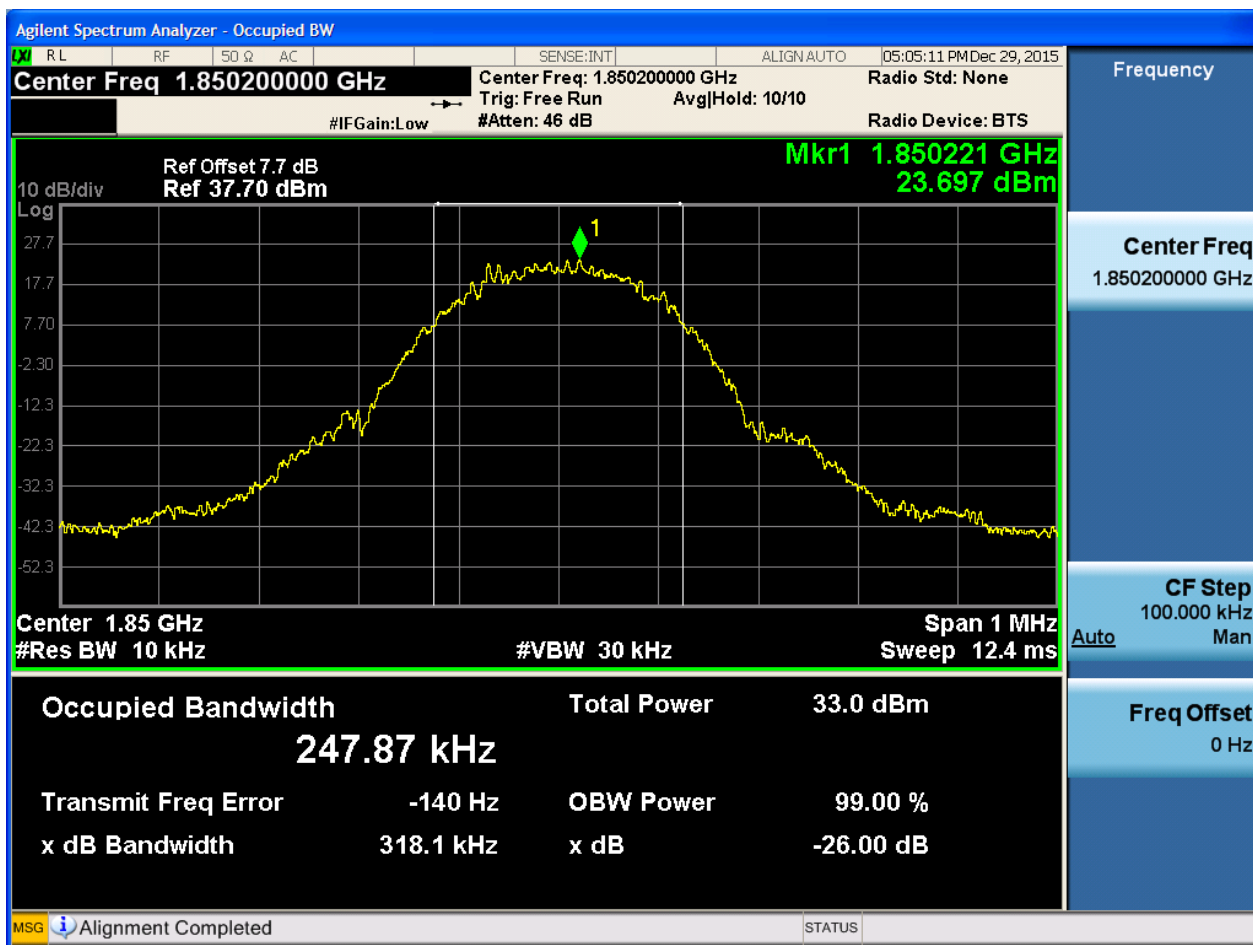
4.1.2.1.3 Test Channel = HCH





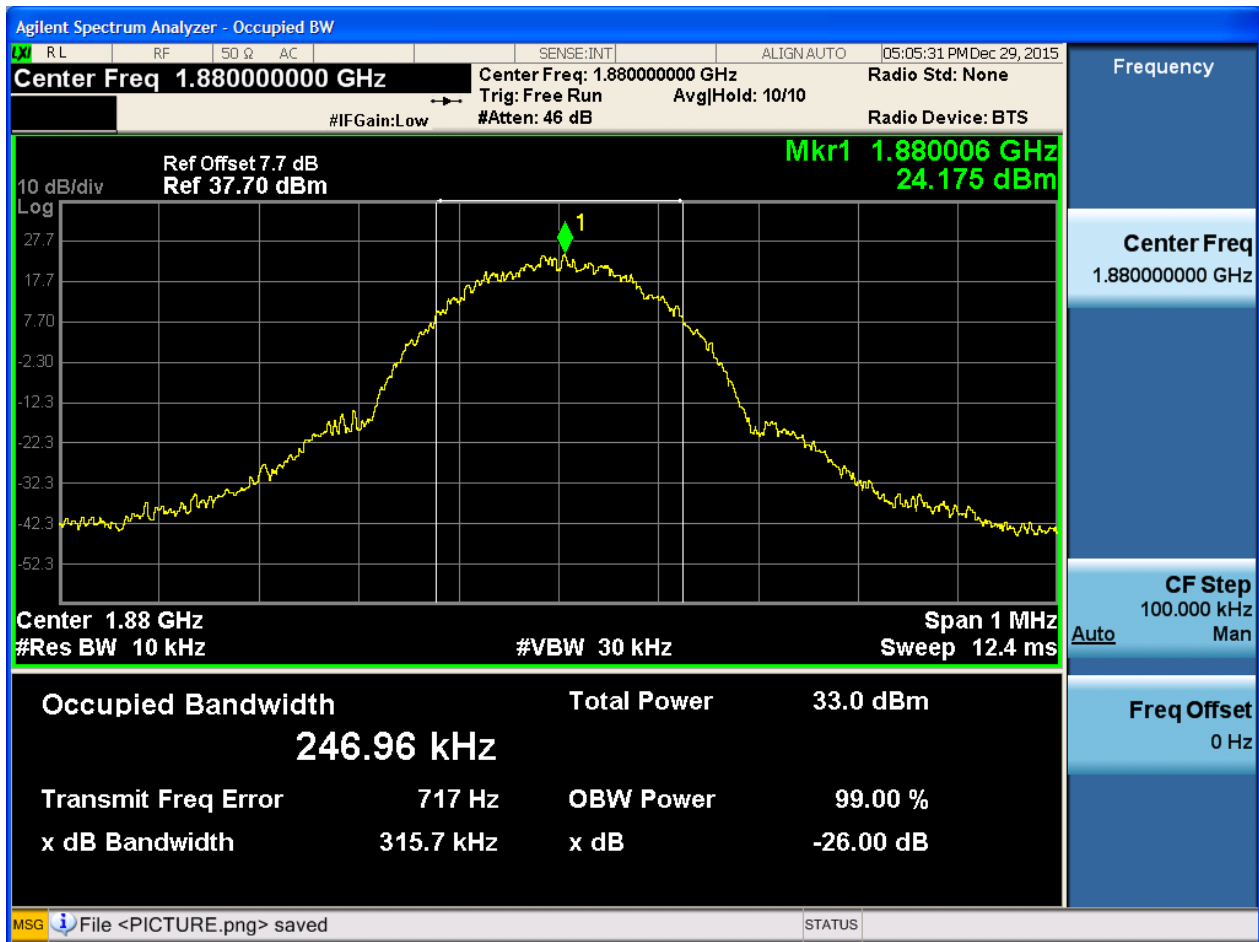
4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



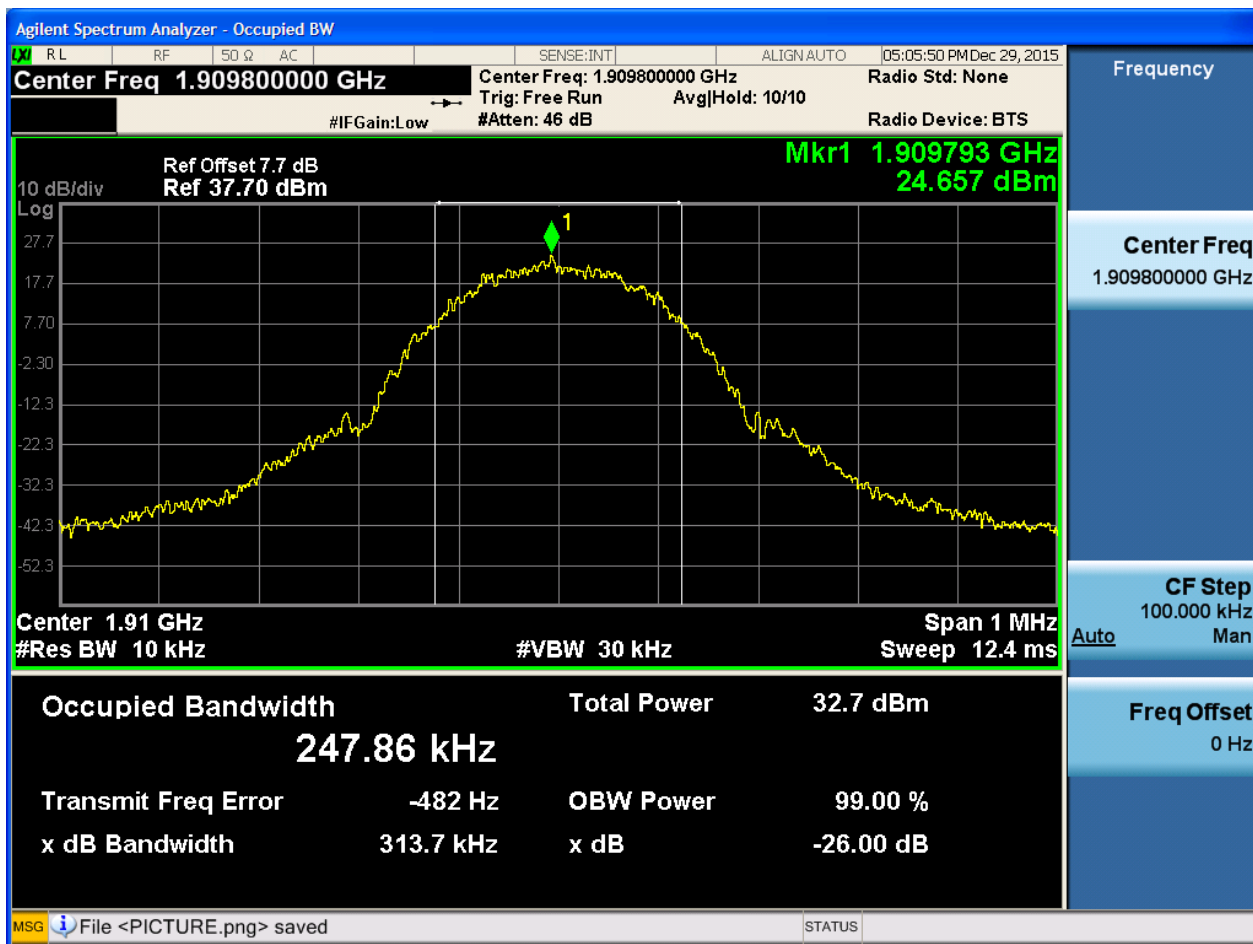


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH



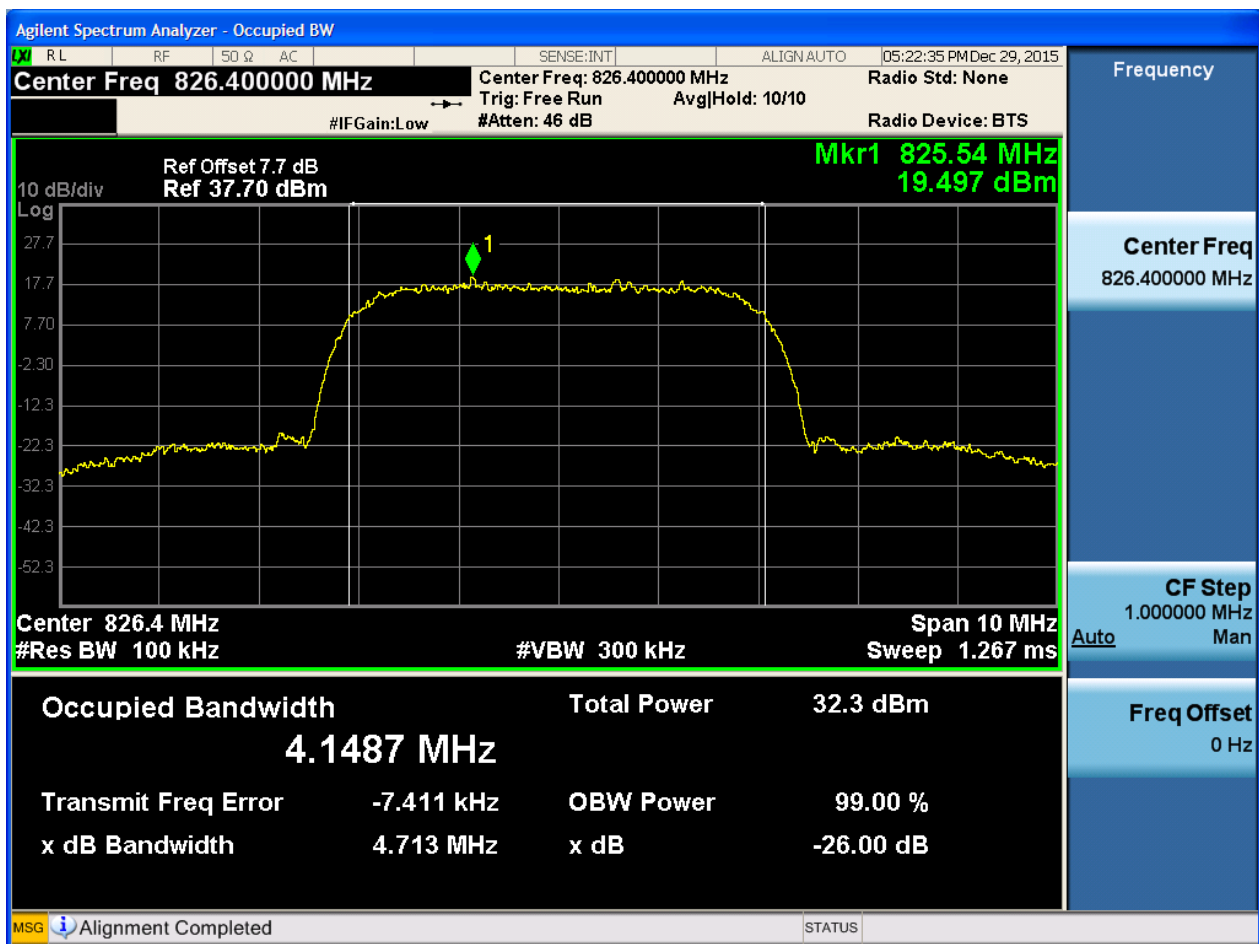


4.2 For UMTS

4.2.1 Test Band = WCDMA850

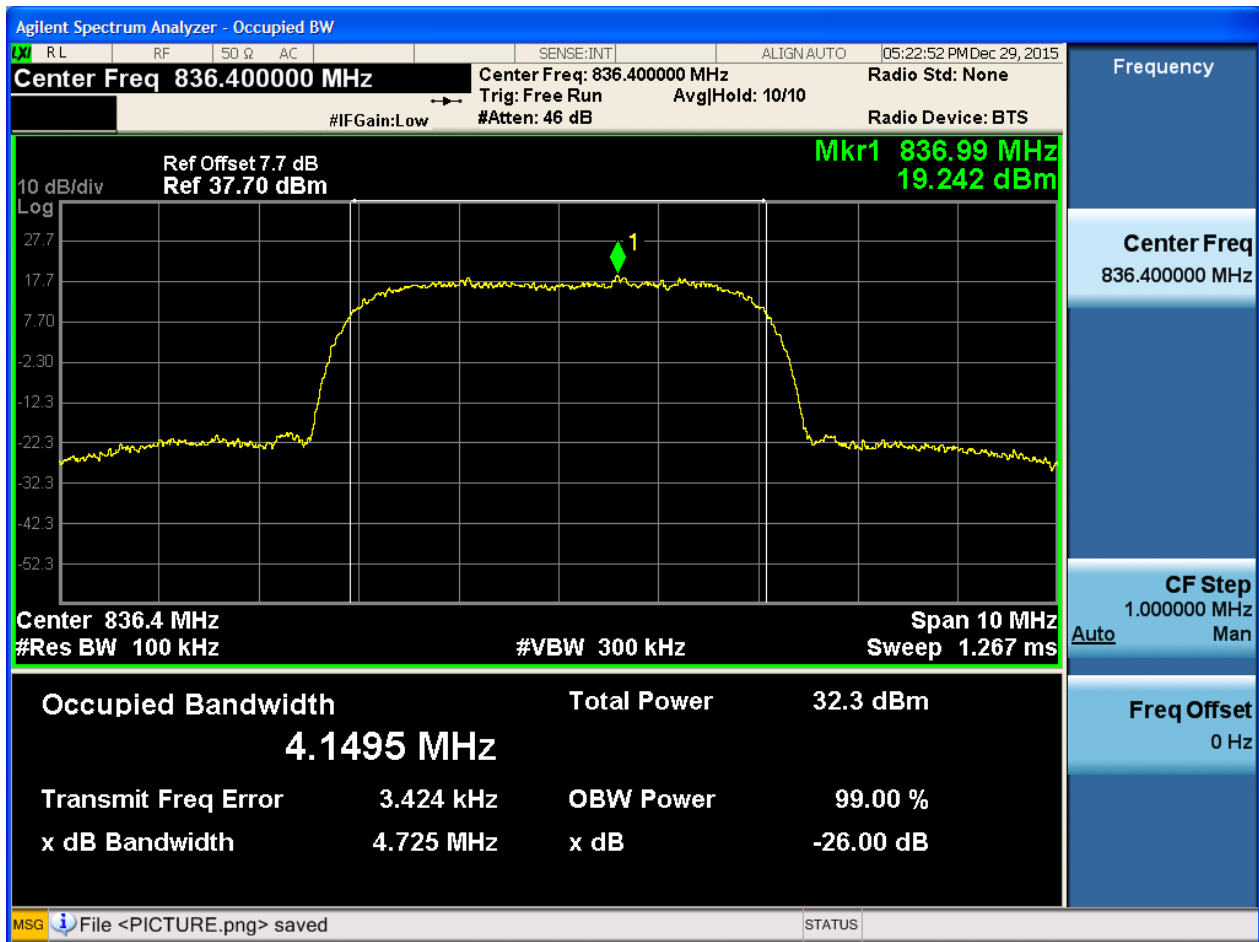
4.2.1.1 Test Mode = UMTS/TM1

4.2.1.1.1 Test Channel = LCH



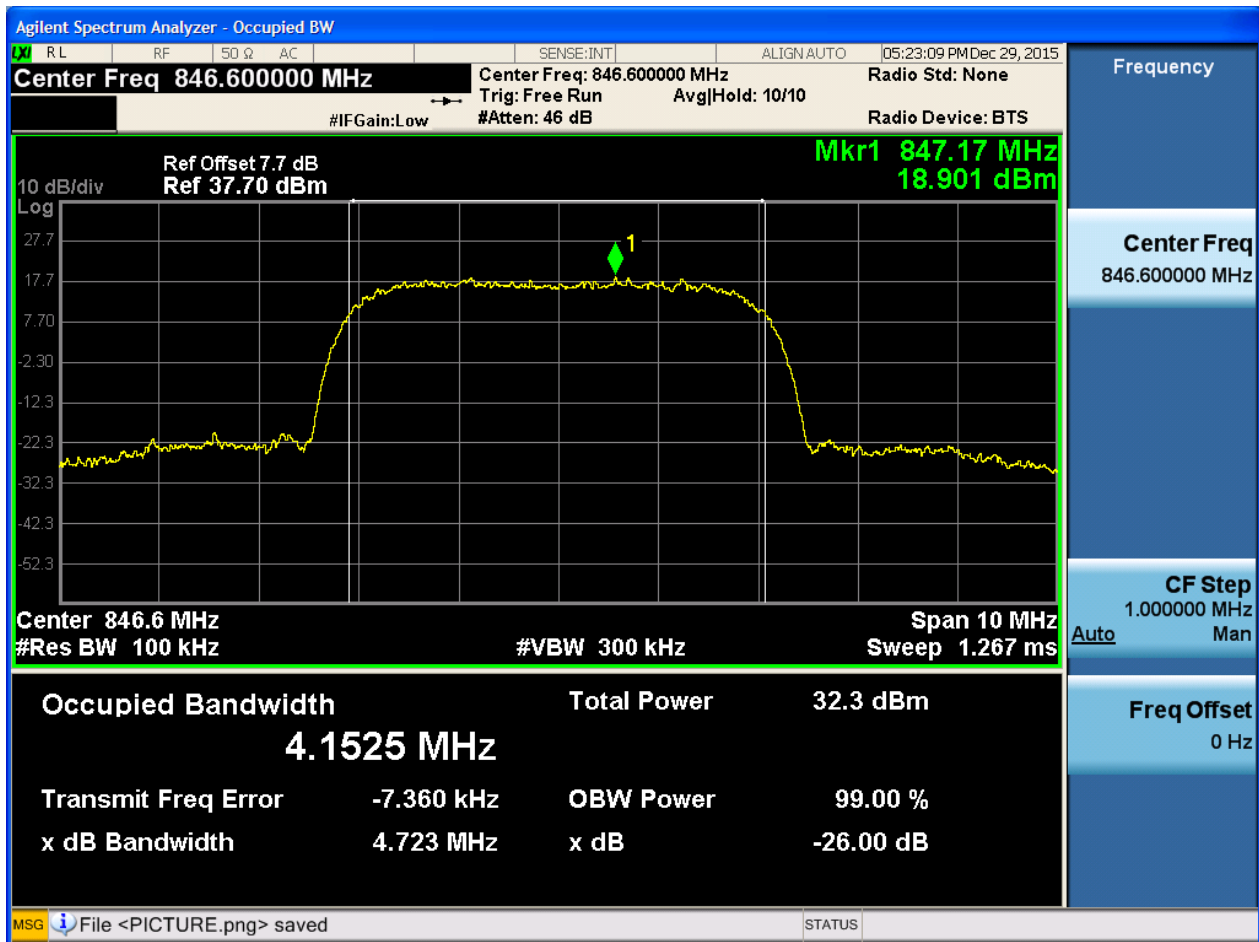


4.2.1.1.2 Test Channel = MCH





4.2.1.1.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

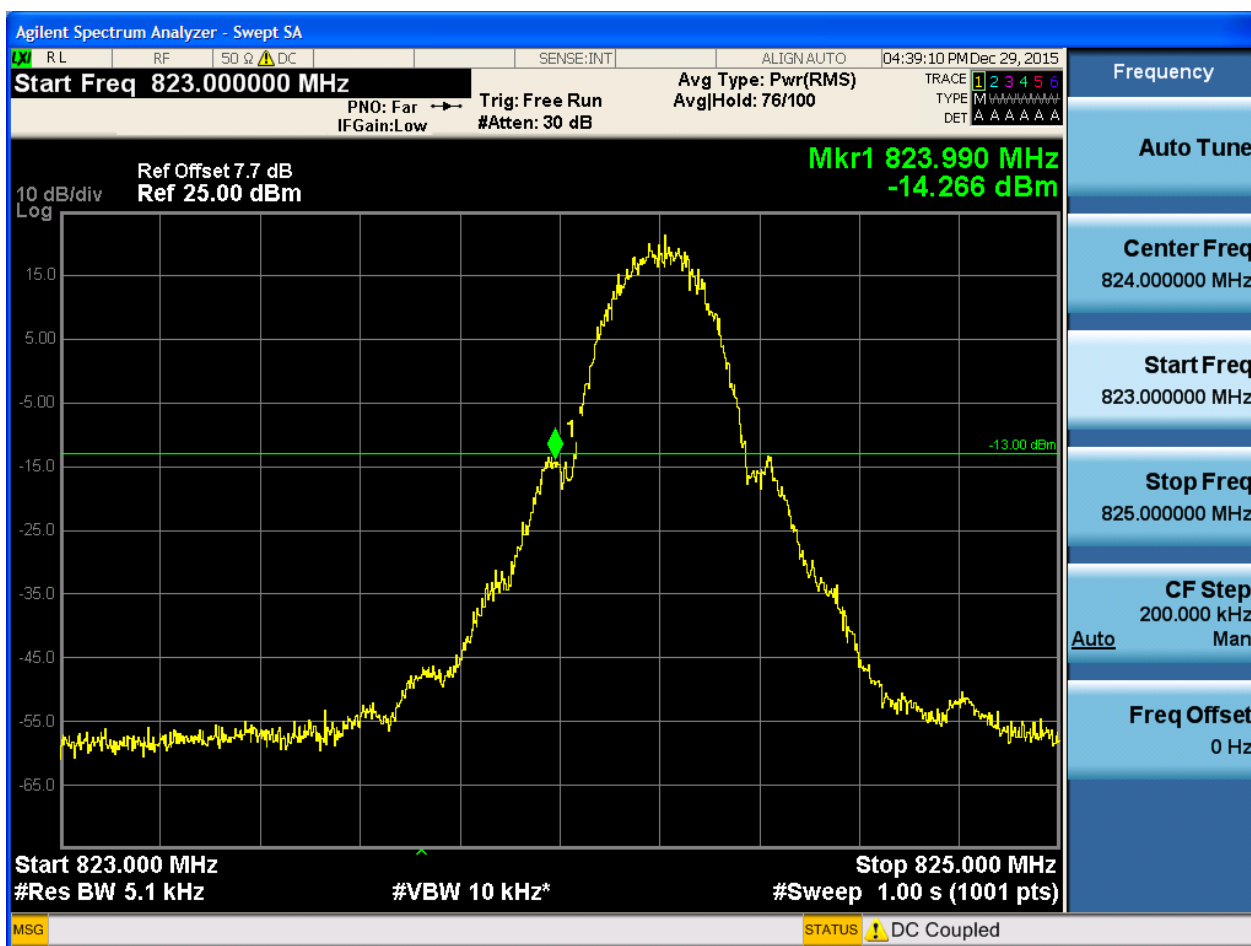
Part I - Test Plots

5.1 For GSM

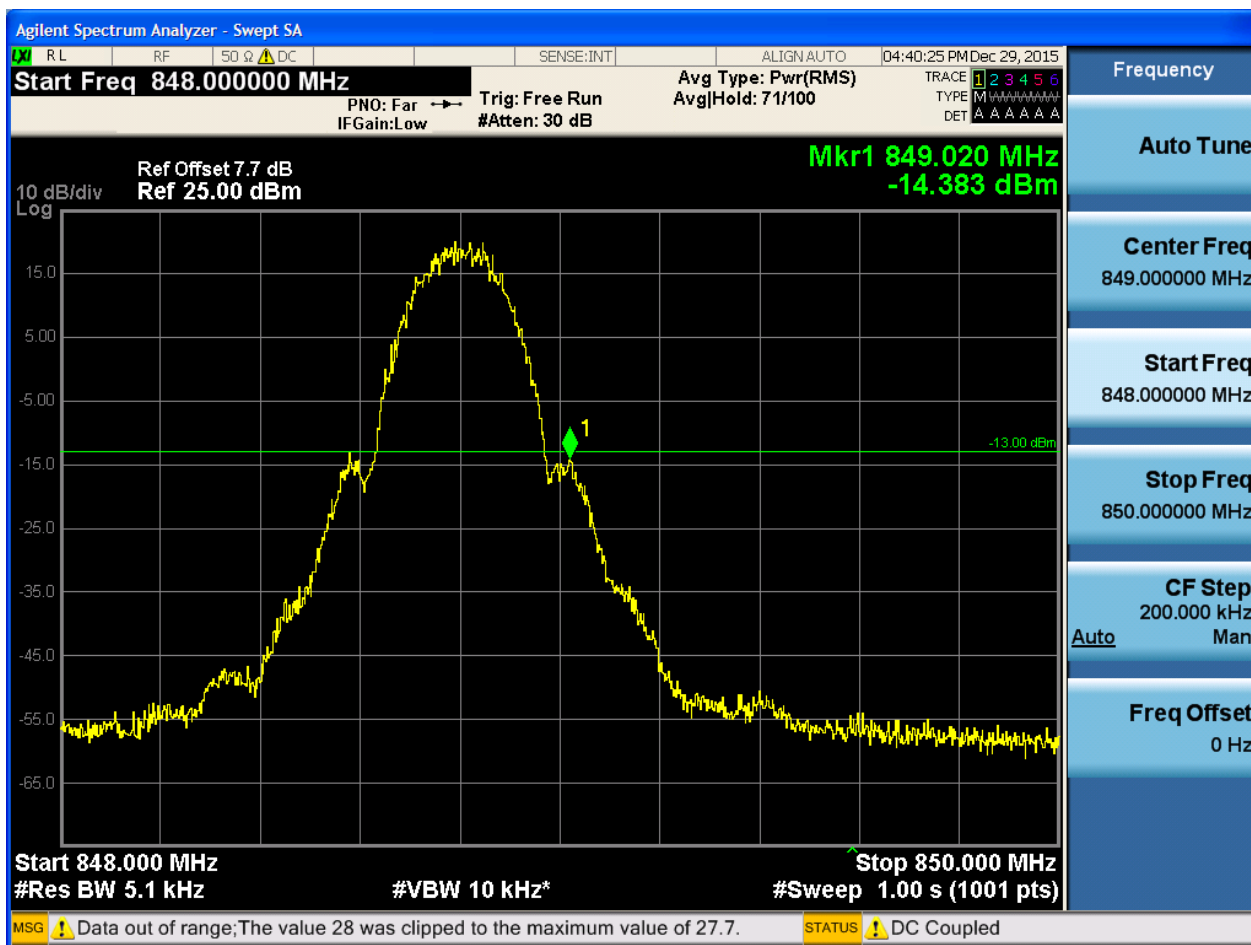
5.1.1 Test Band = GSM850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH

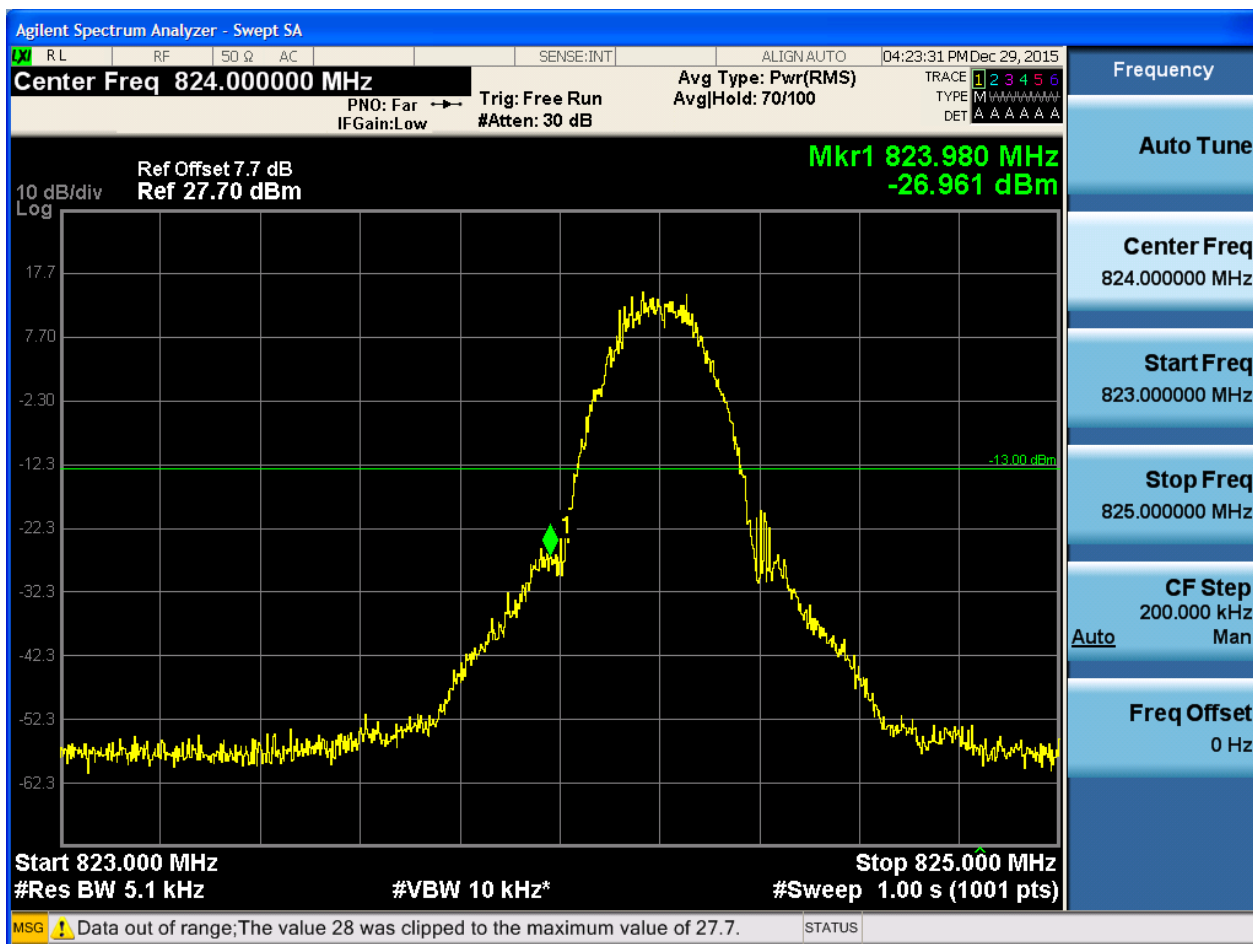


5.1.1.1.2 Test Channel = HCH



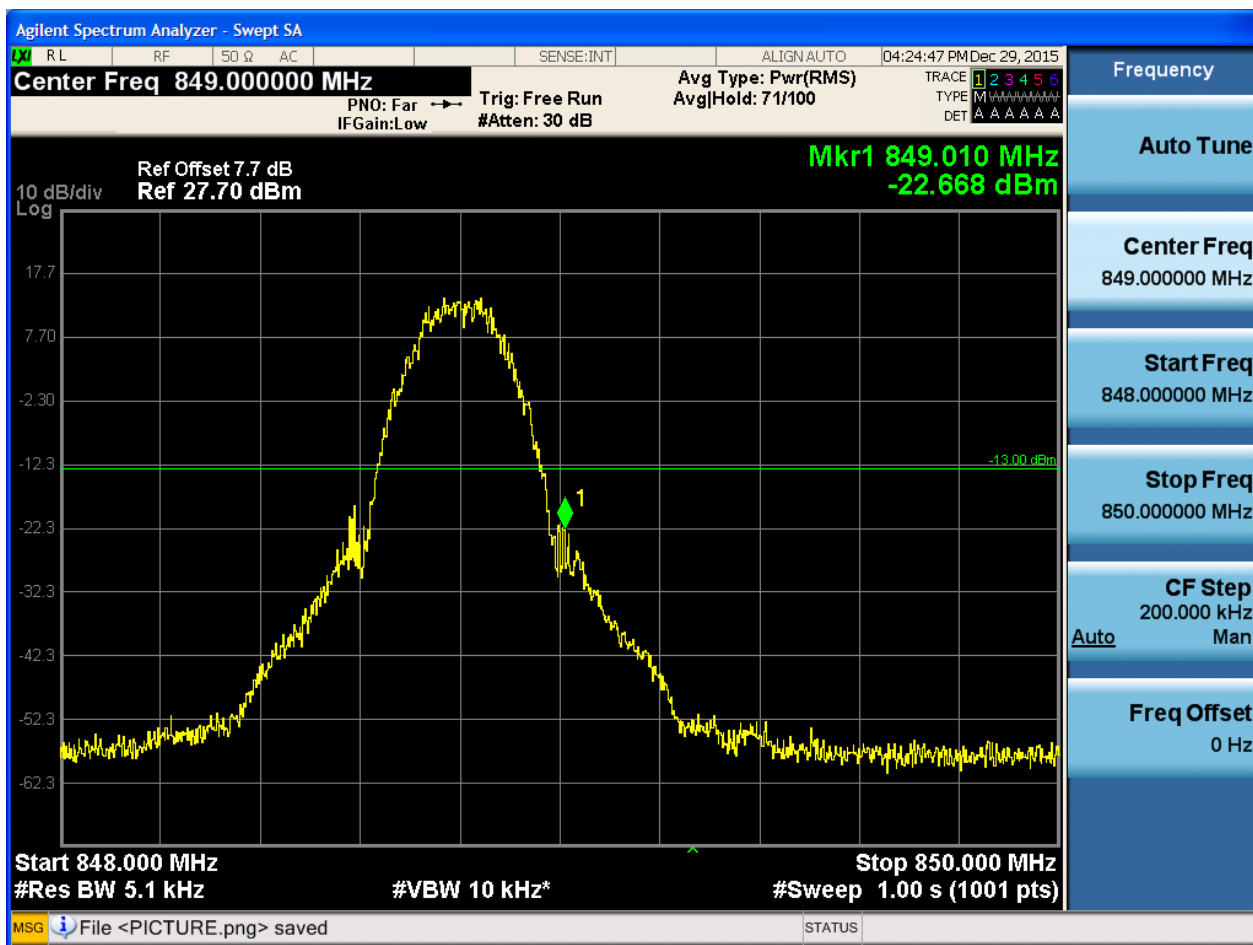
5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH





5.1.1.2.2 Test Channel = HCH

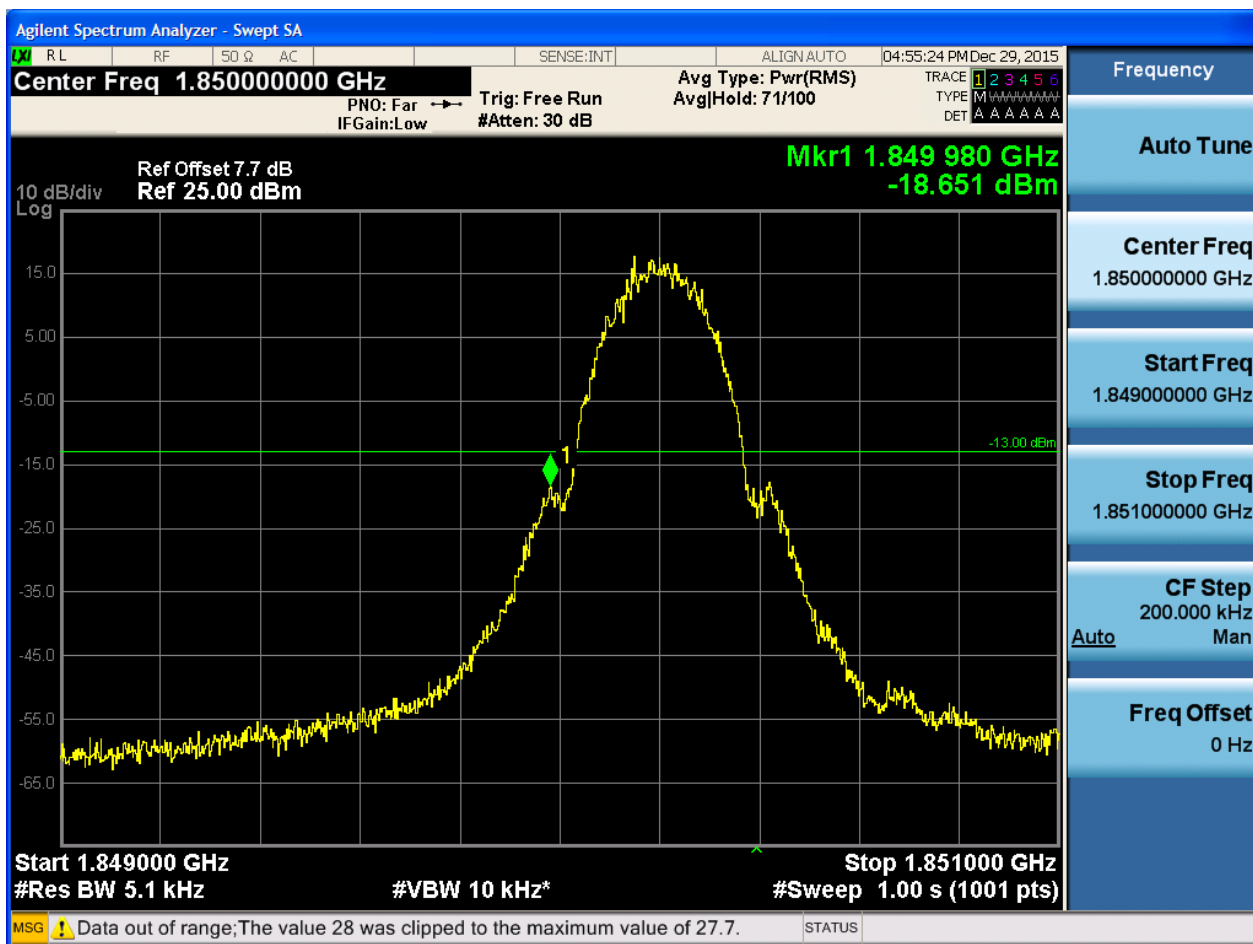




5.1.2 Test Band = GSM1900

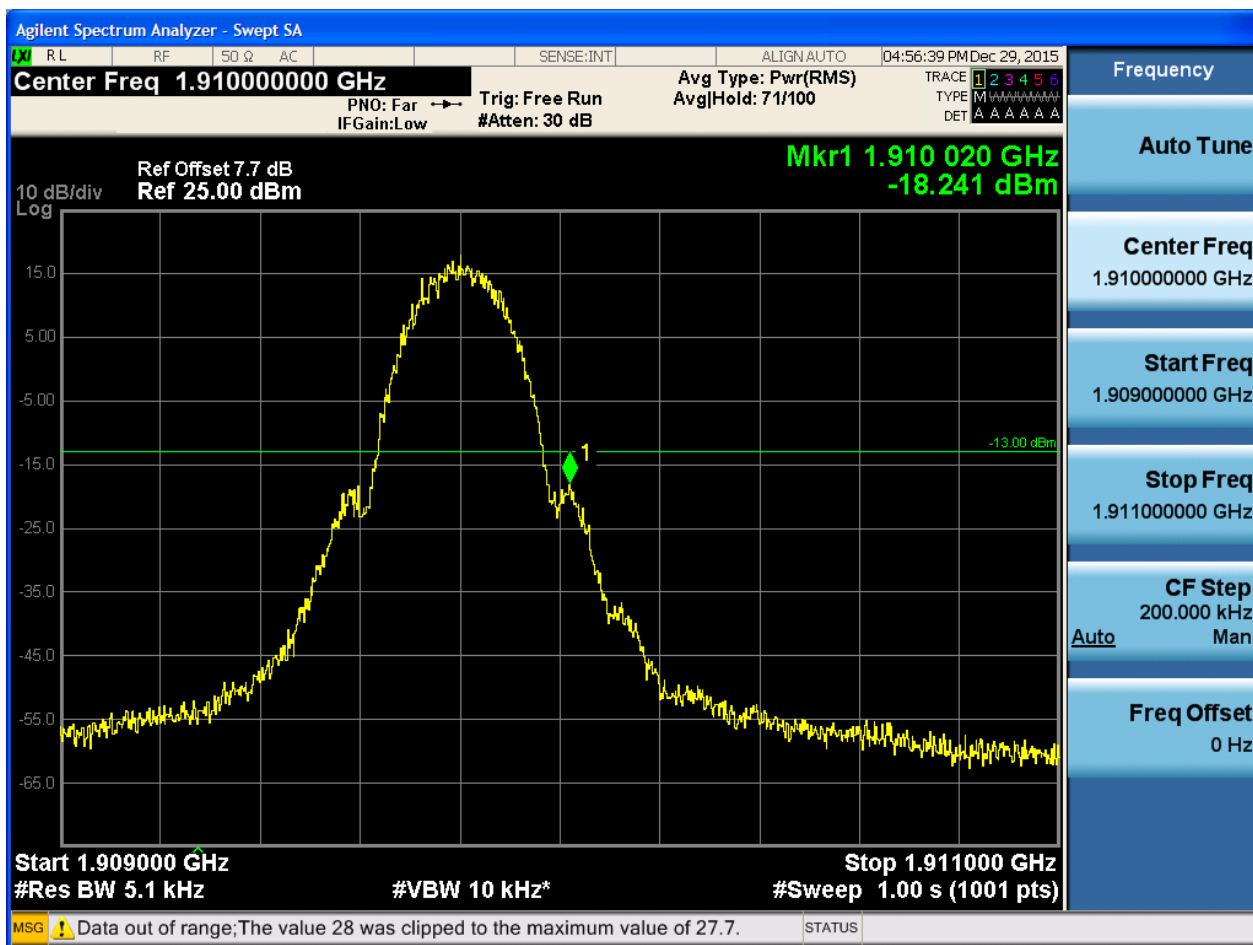
5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH



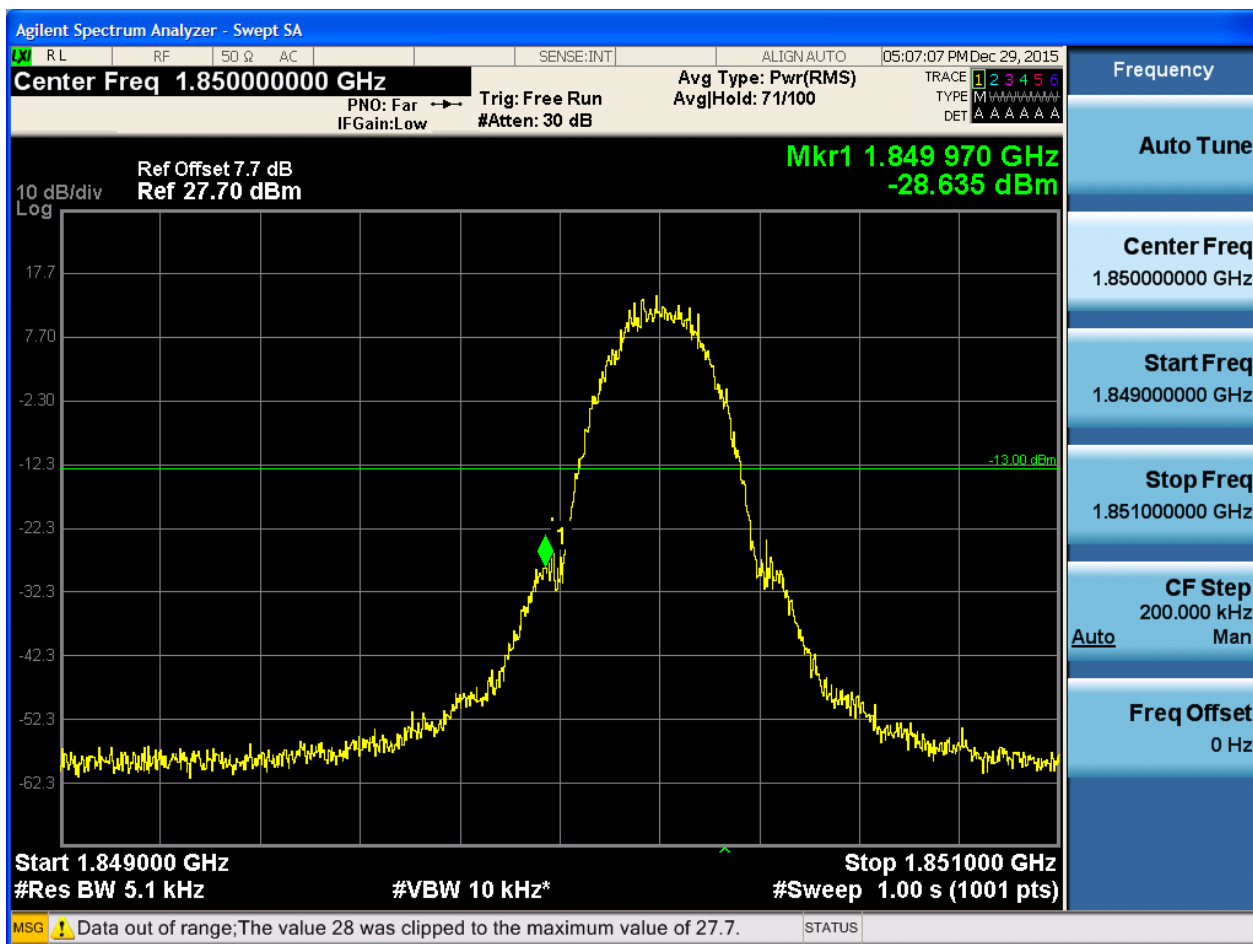


5.1.2.1.2 Test Channel = HCH



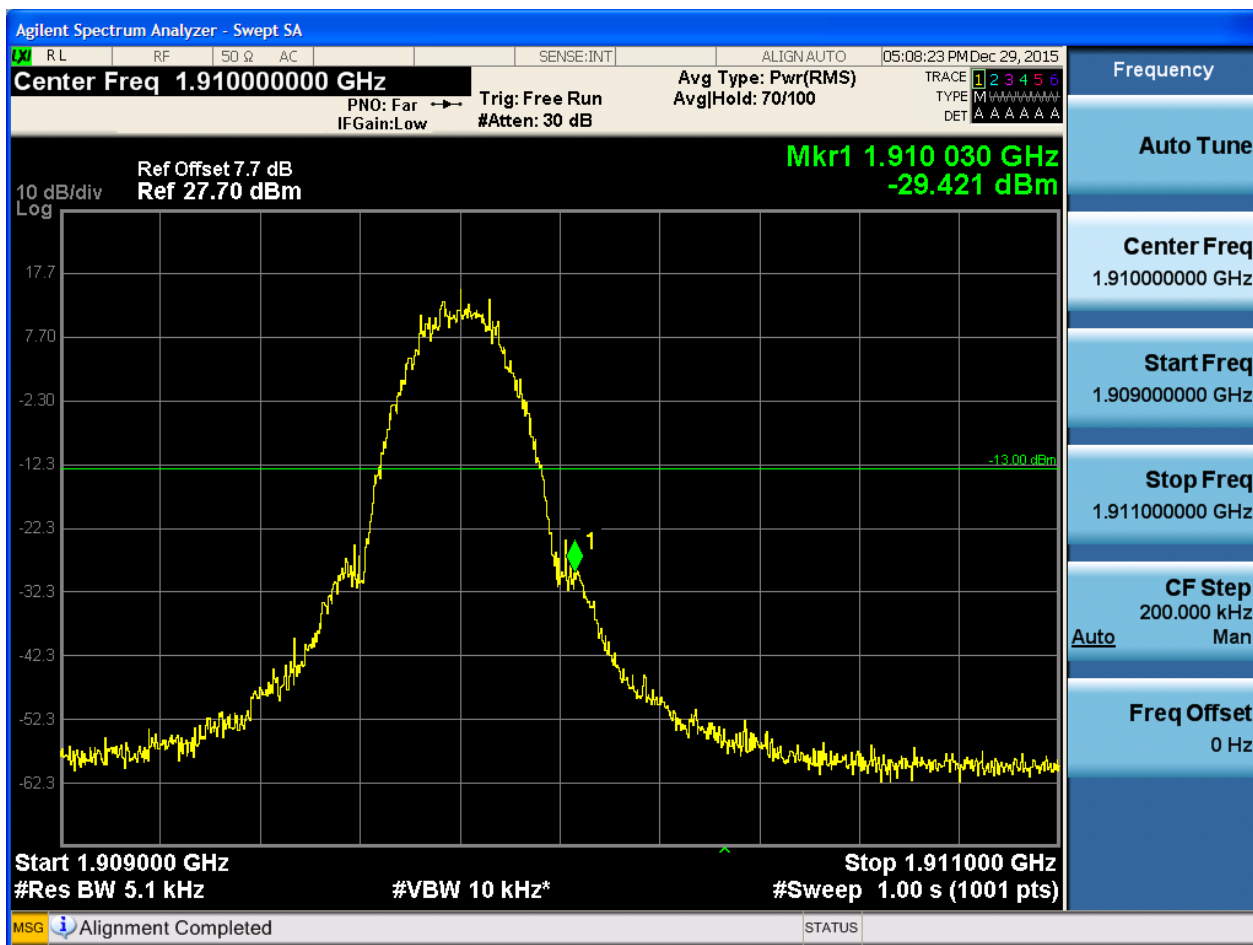
5.1.2.2 Test Mode = GSM/TM2

5.1.2.2.1 Test Channel = LCH





5.1.2.2.2 Test Channel = HCH

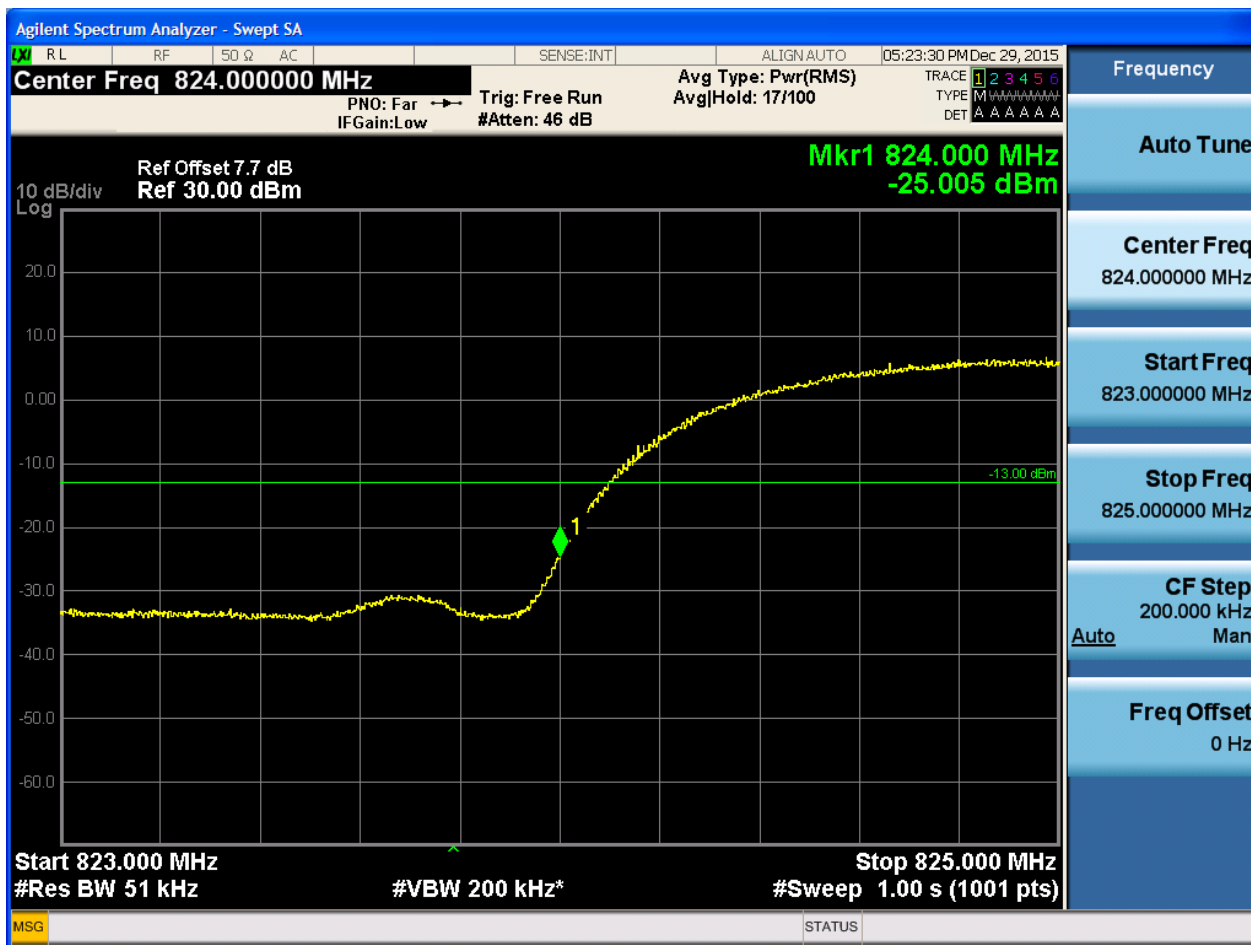


5.2 For UMTS

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.

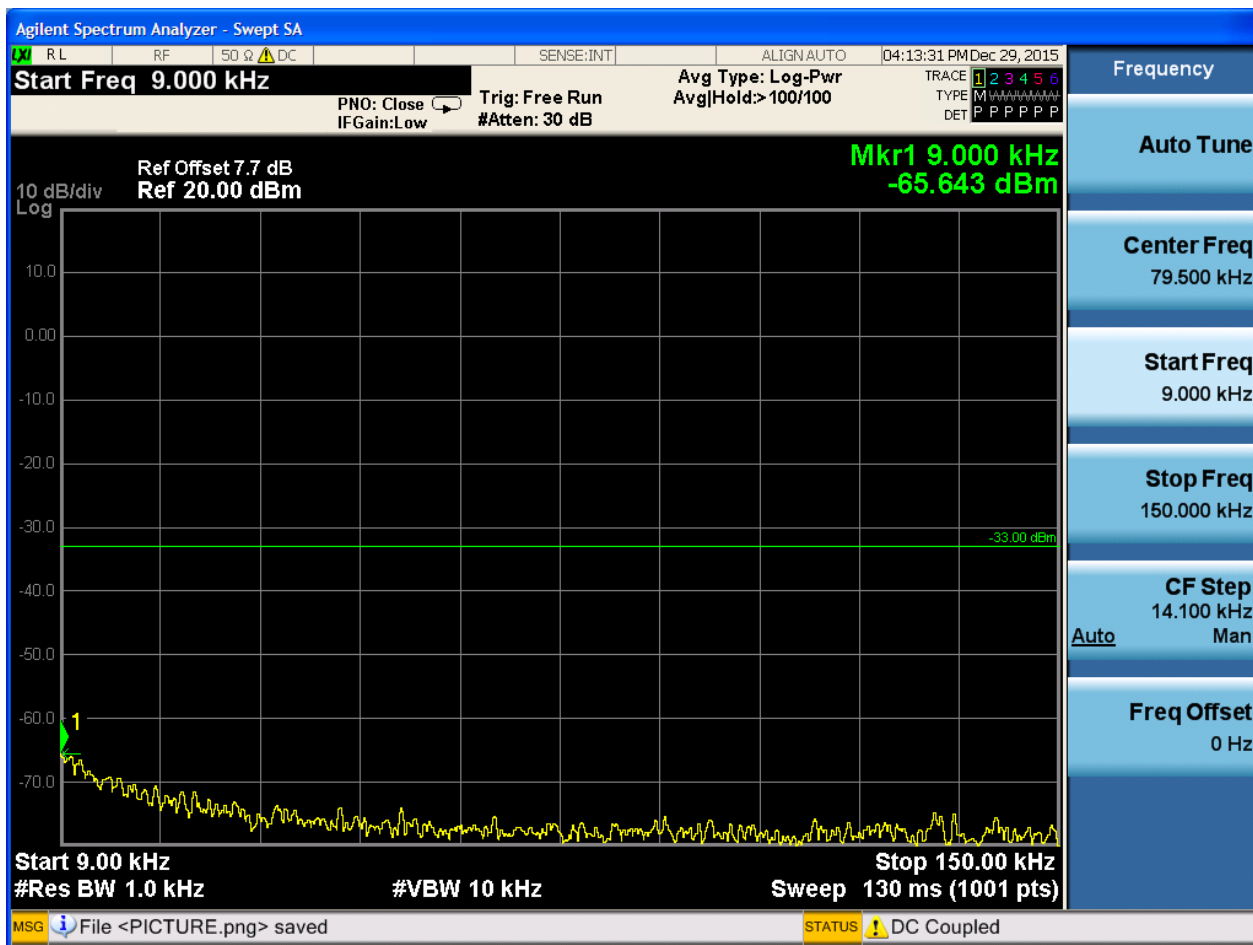
Part I - Test Plots

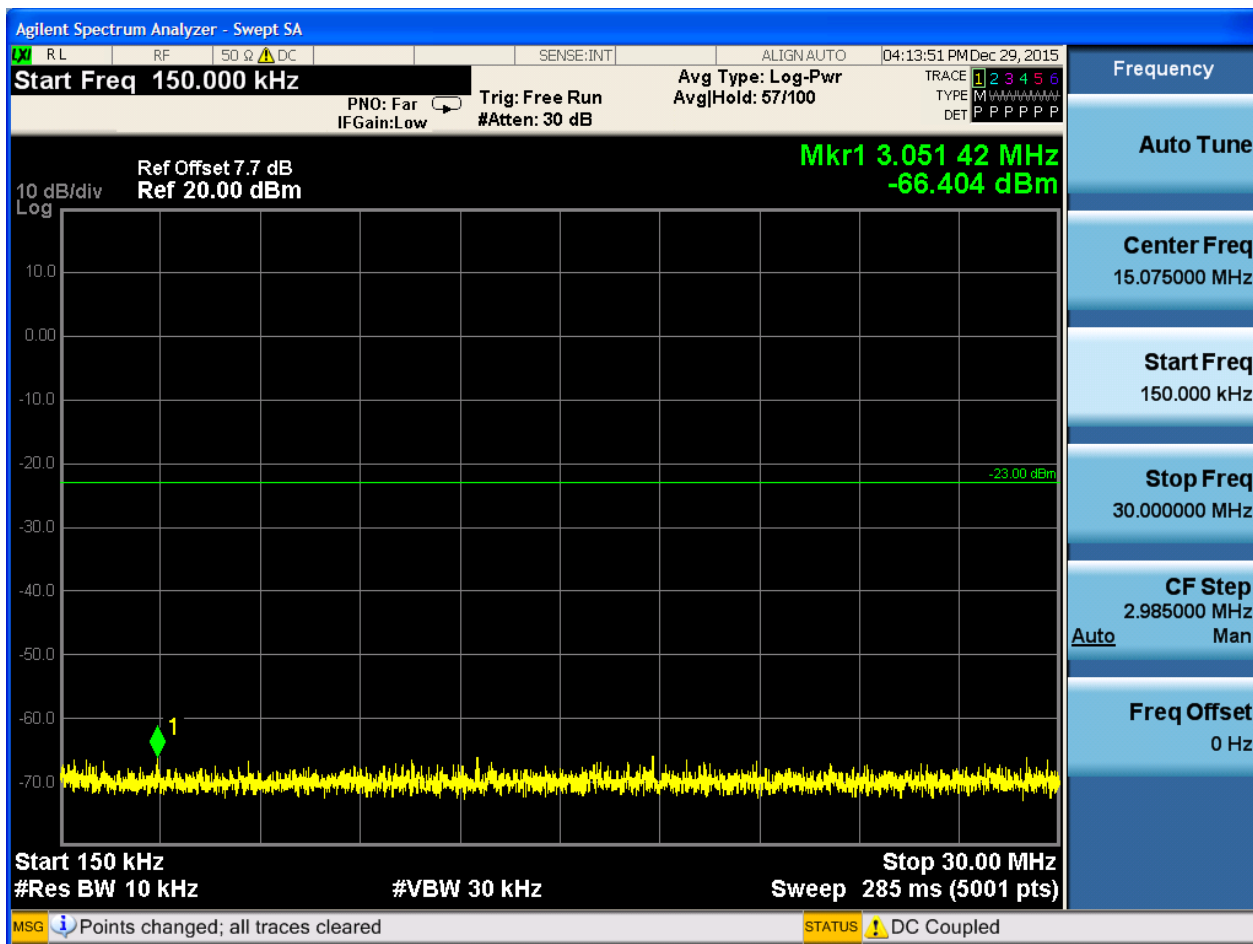
6.1 For GSM

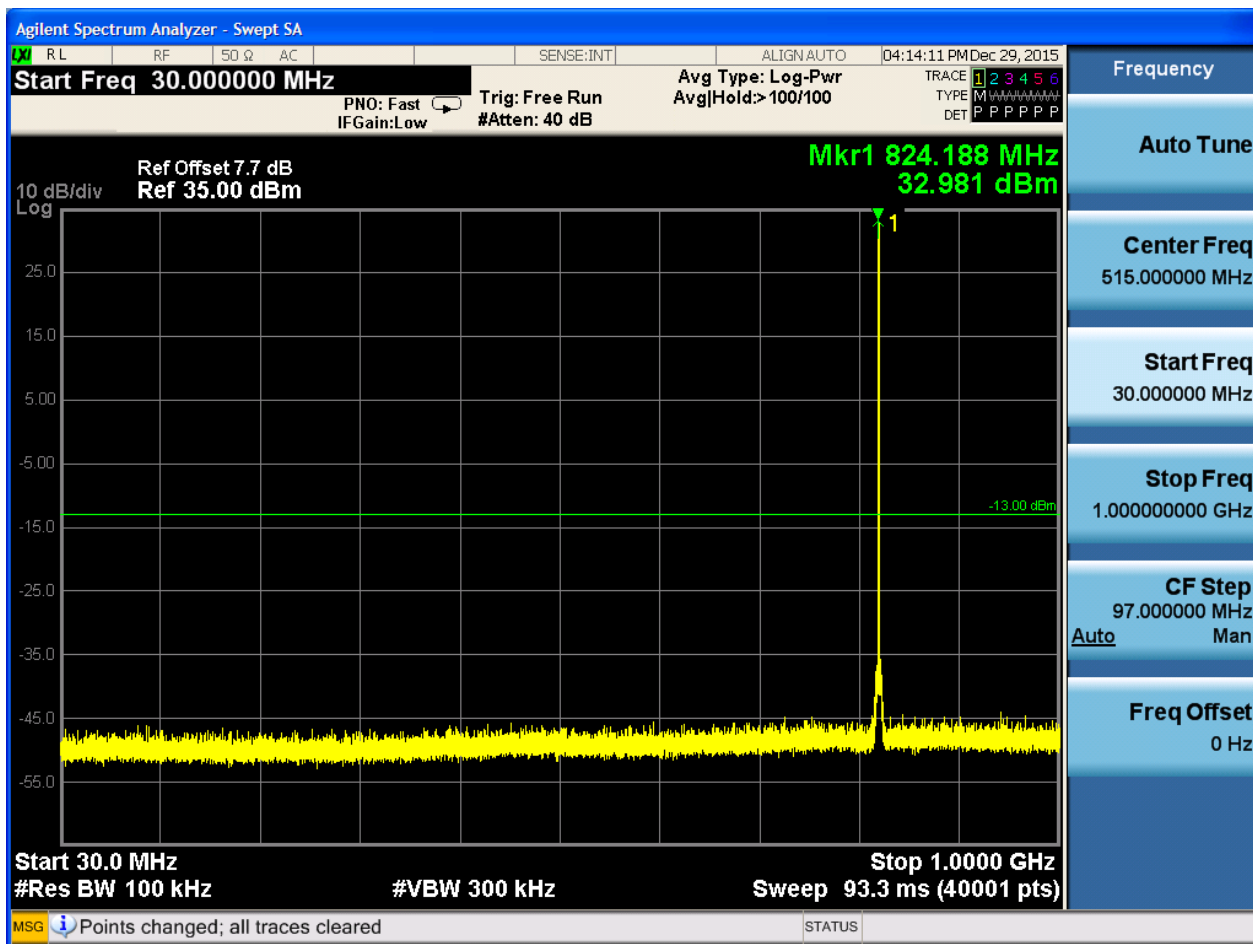
6.1.1 Test Band = GSM850

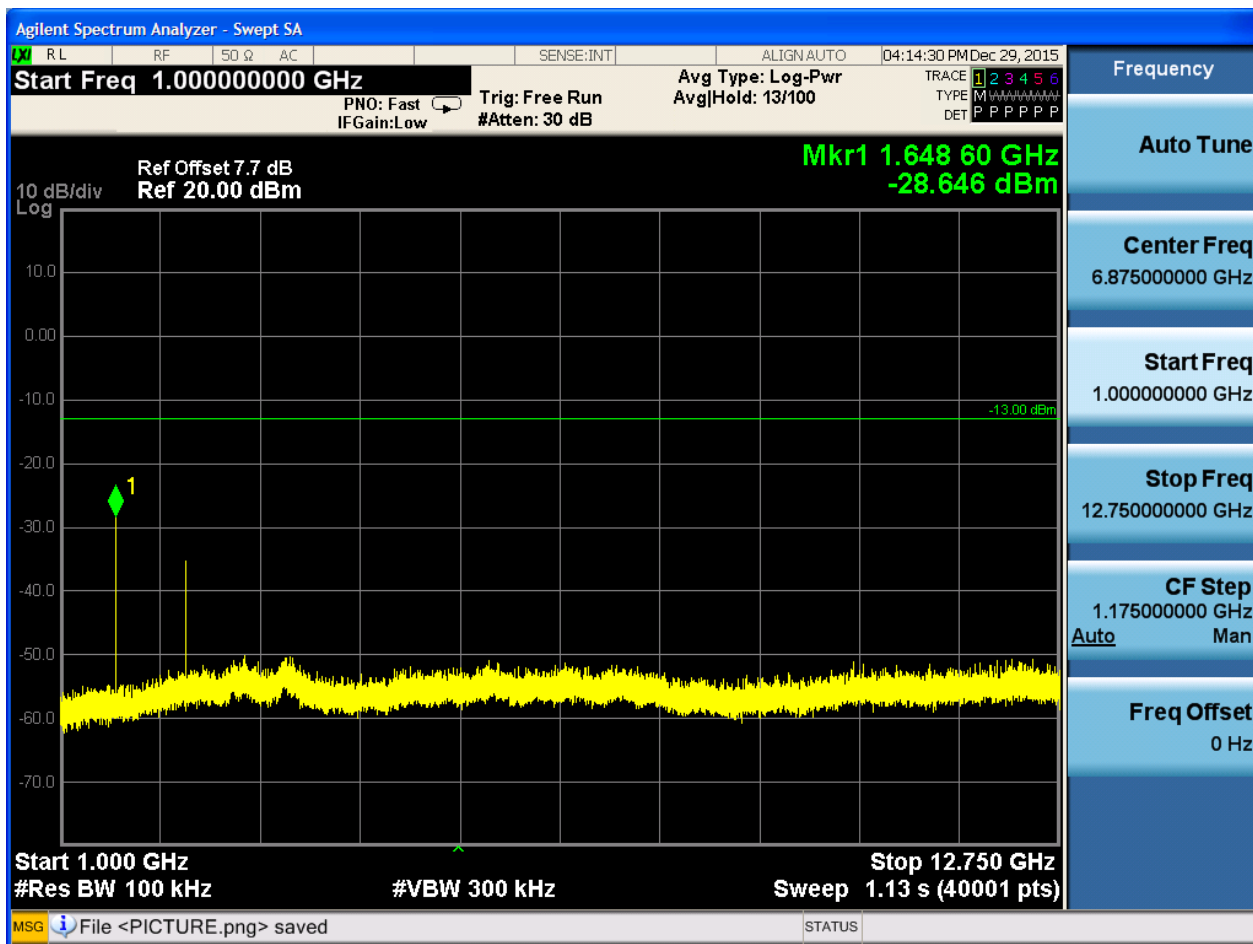
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH



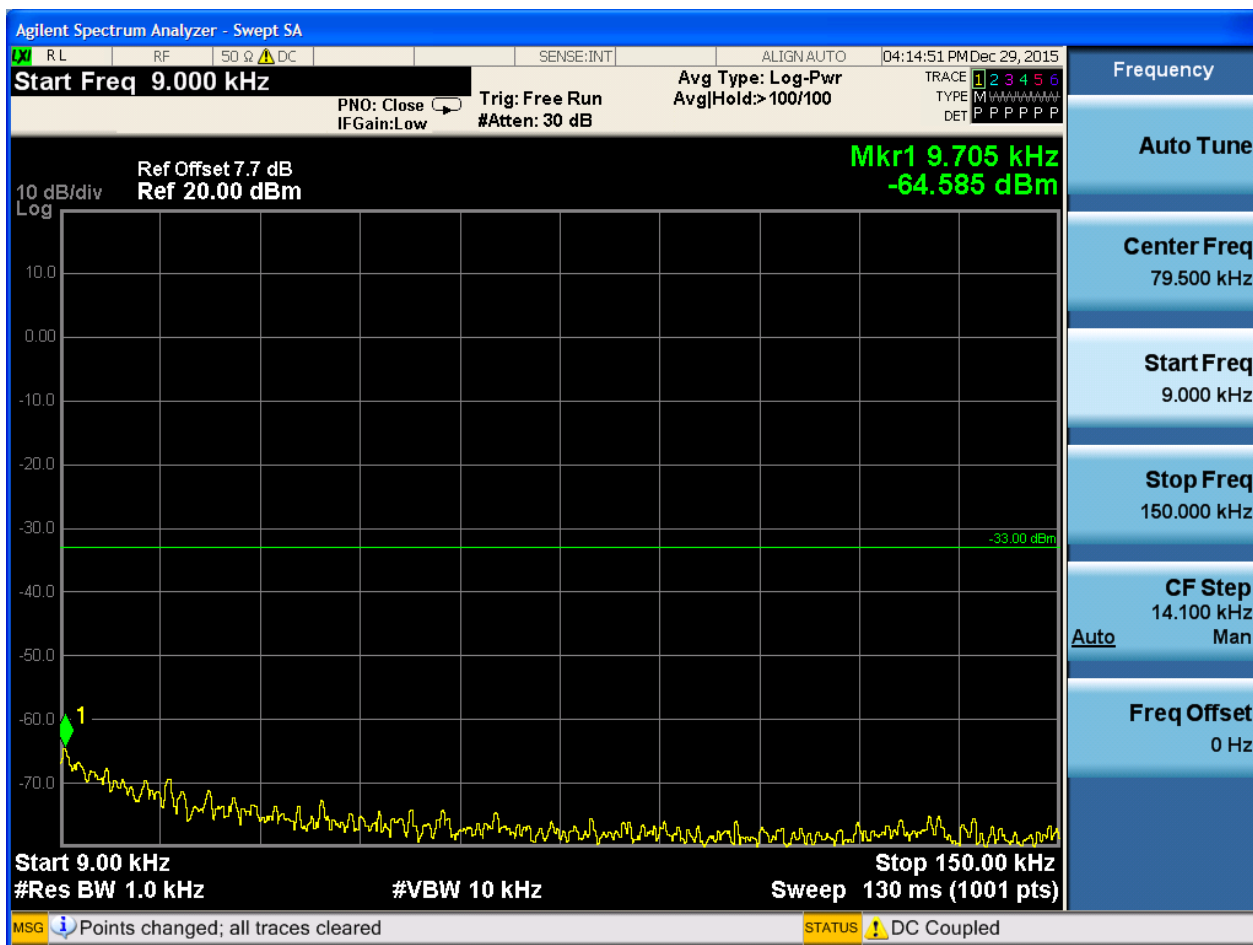


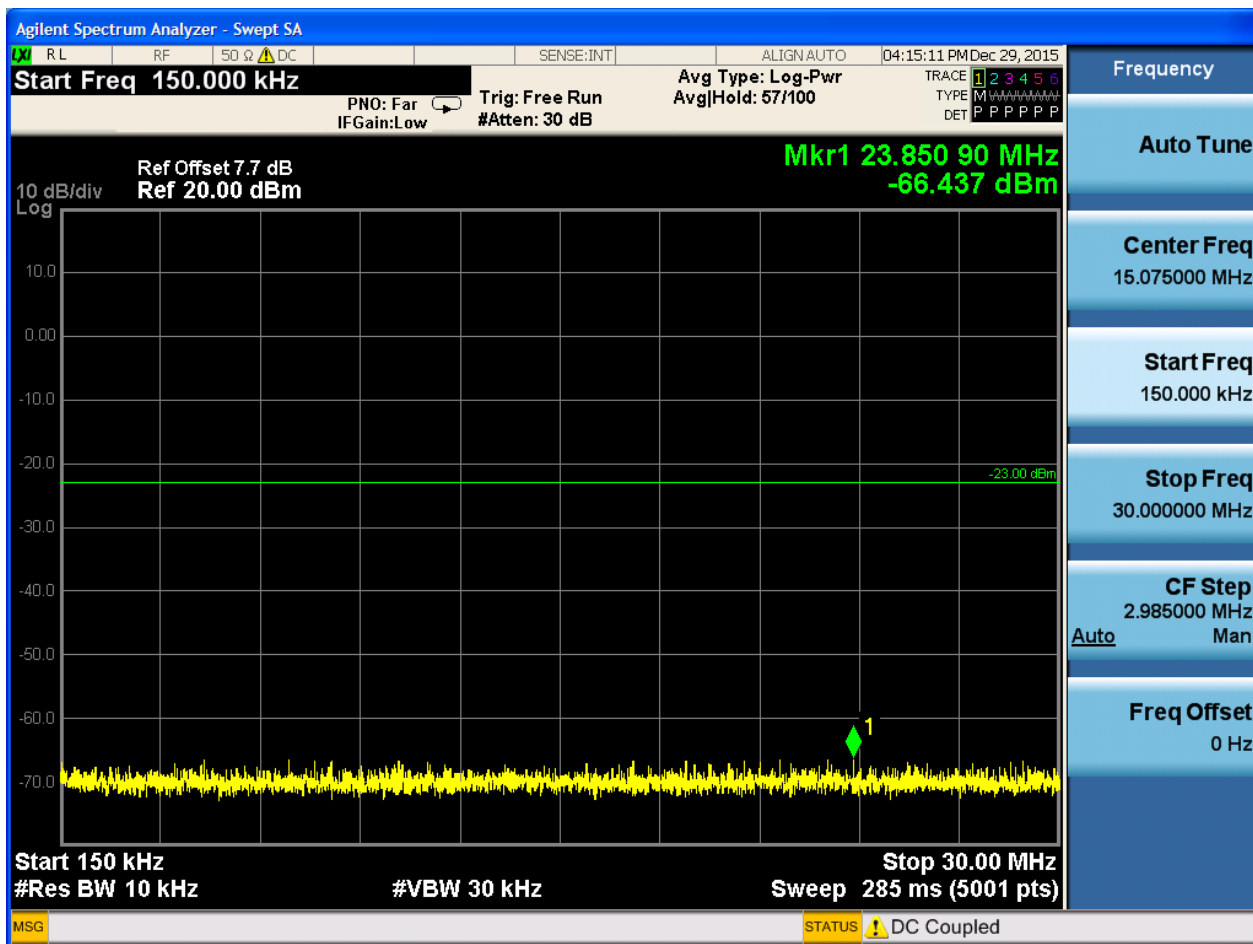


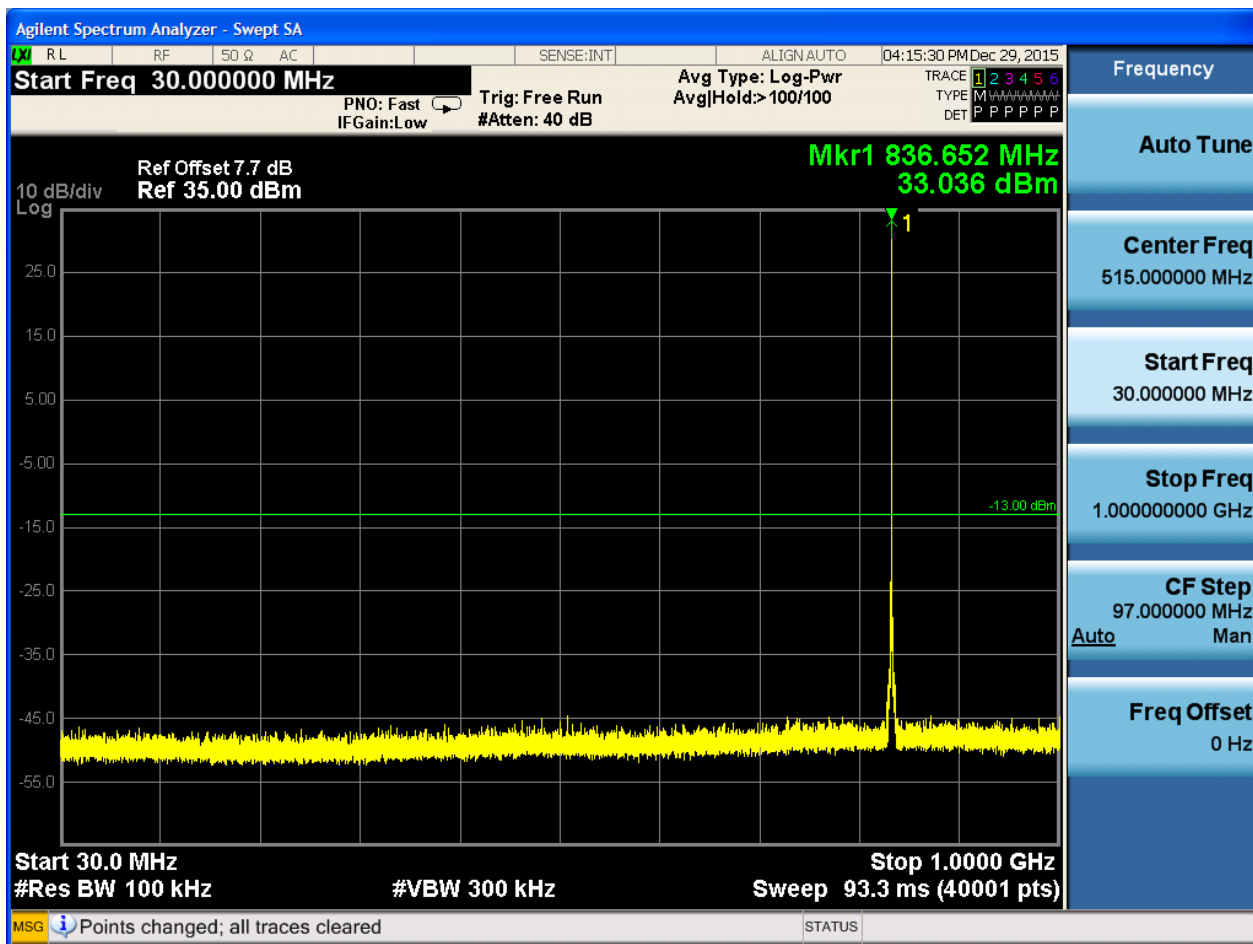


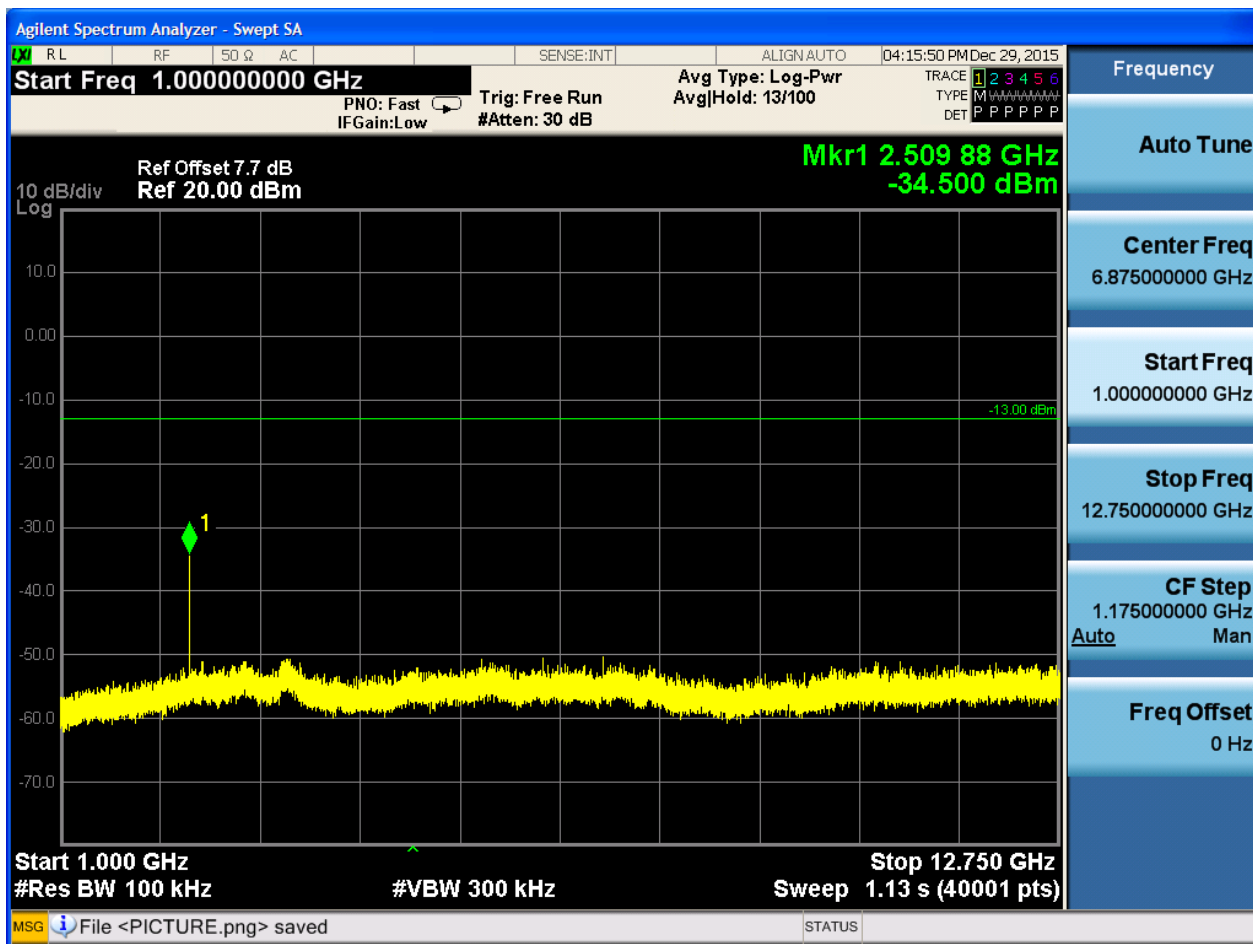


6.1.1.1.2 Test Channel = MCH

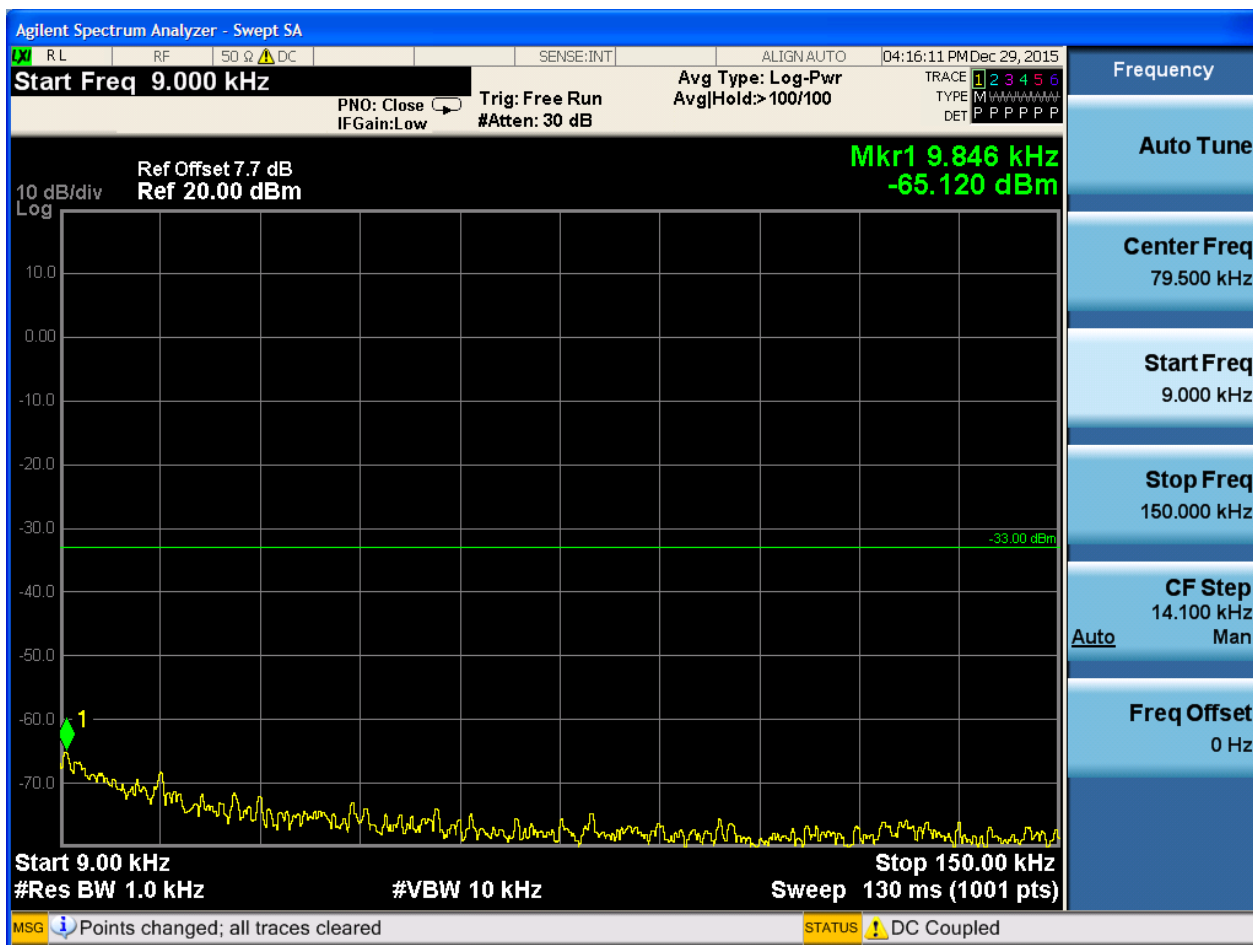


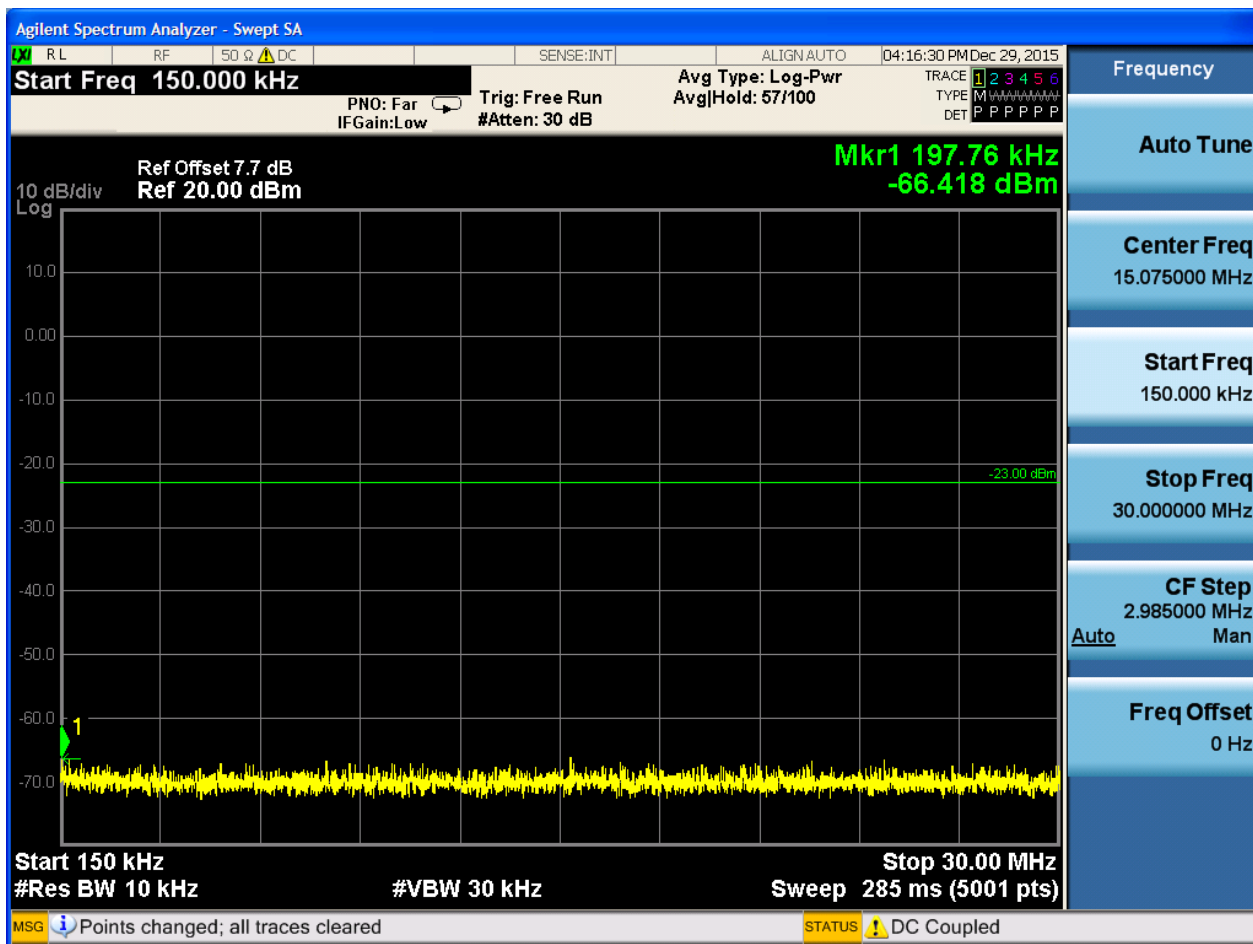


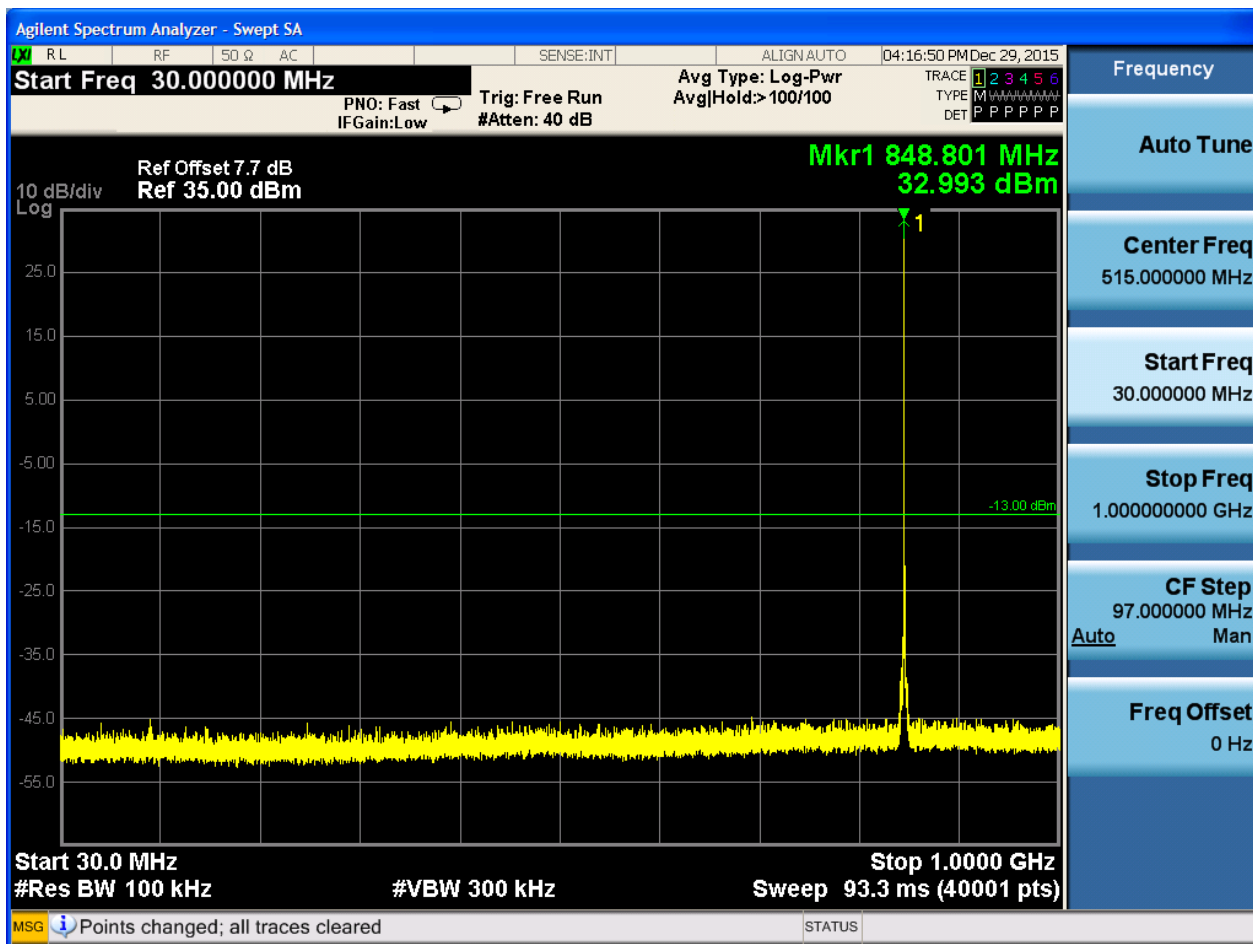


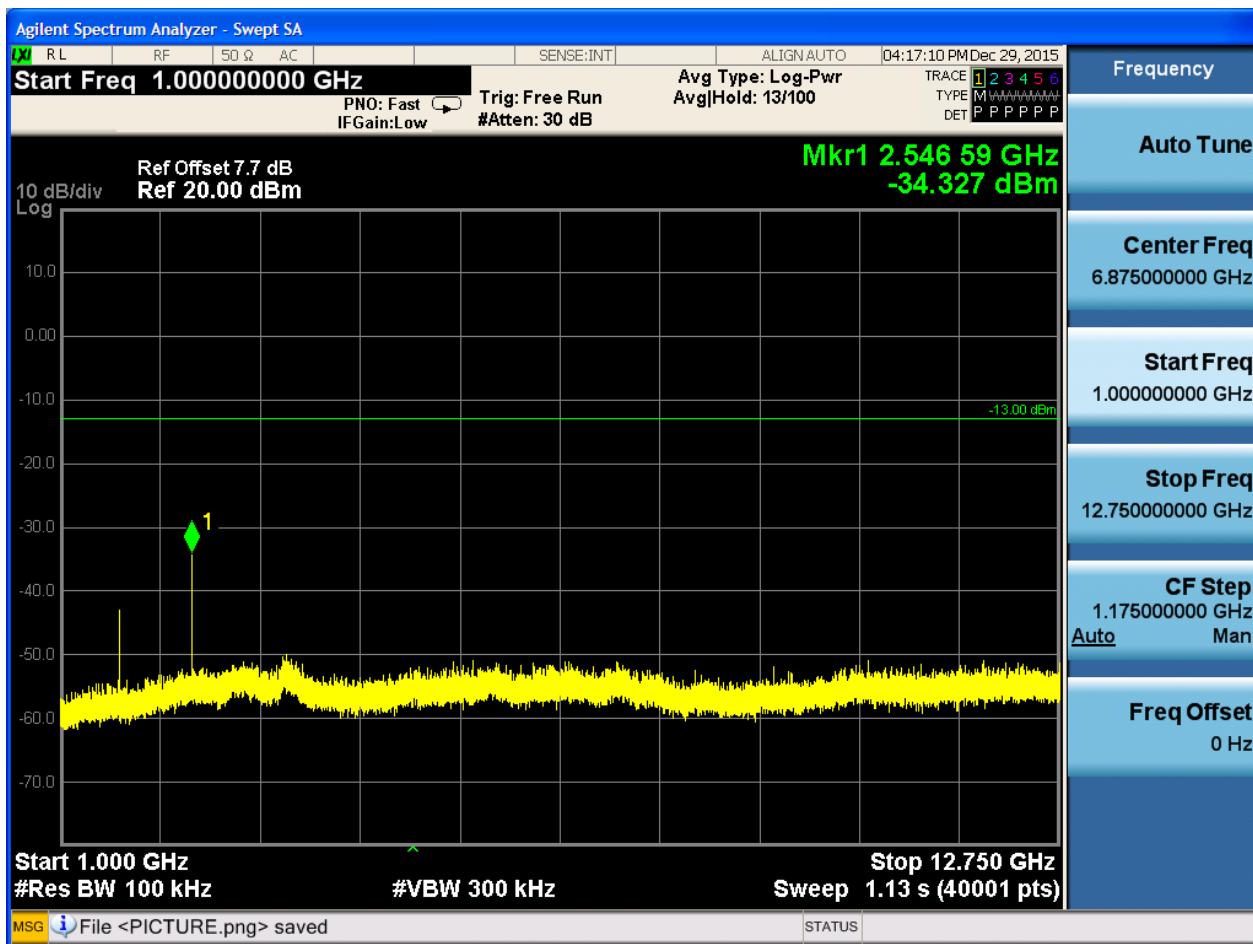


6.1.1.1.3 Test Channel = HCH



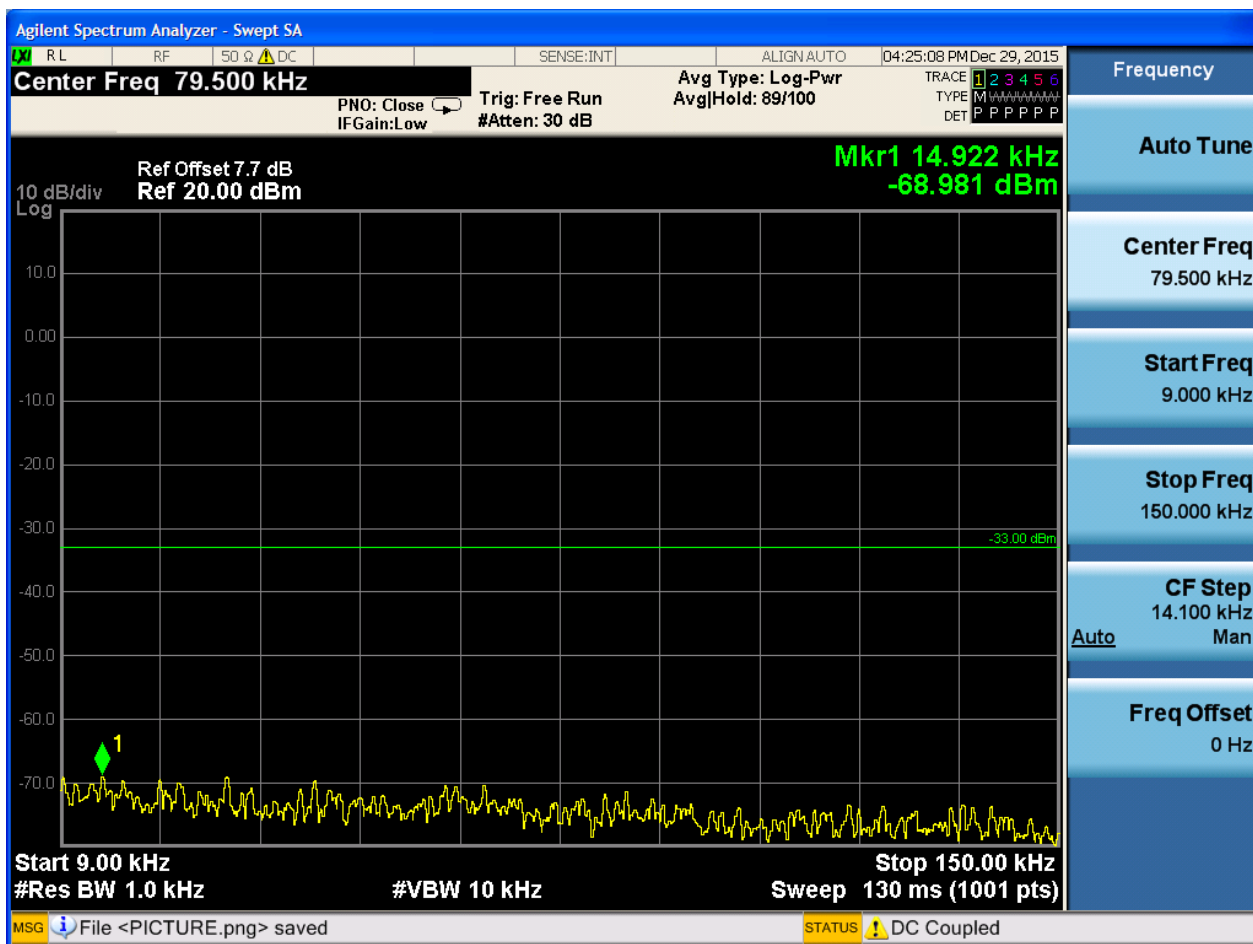


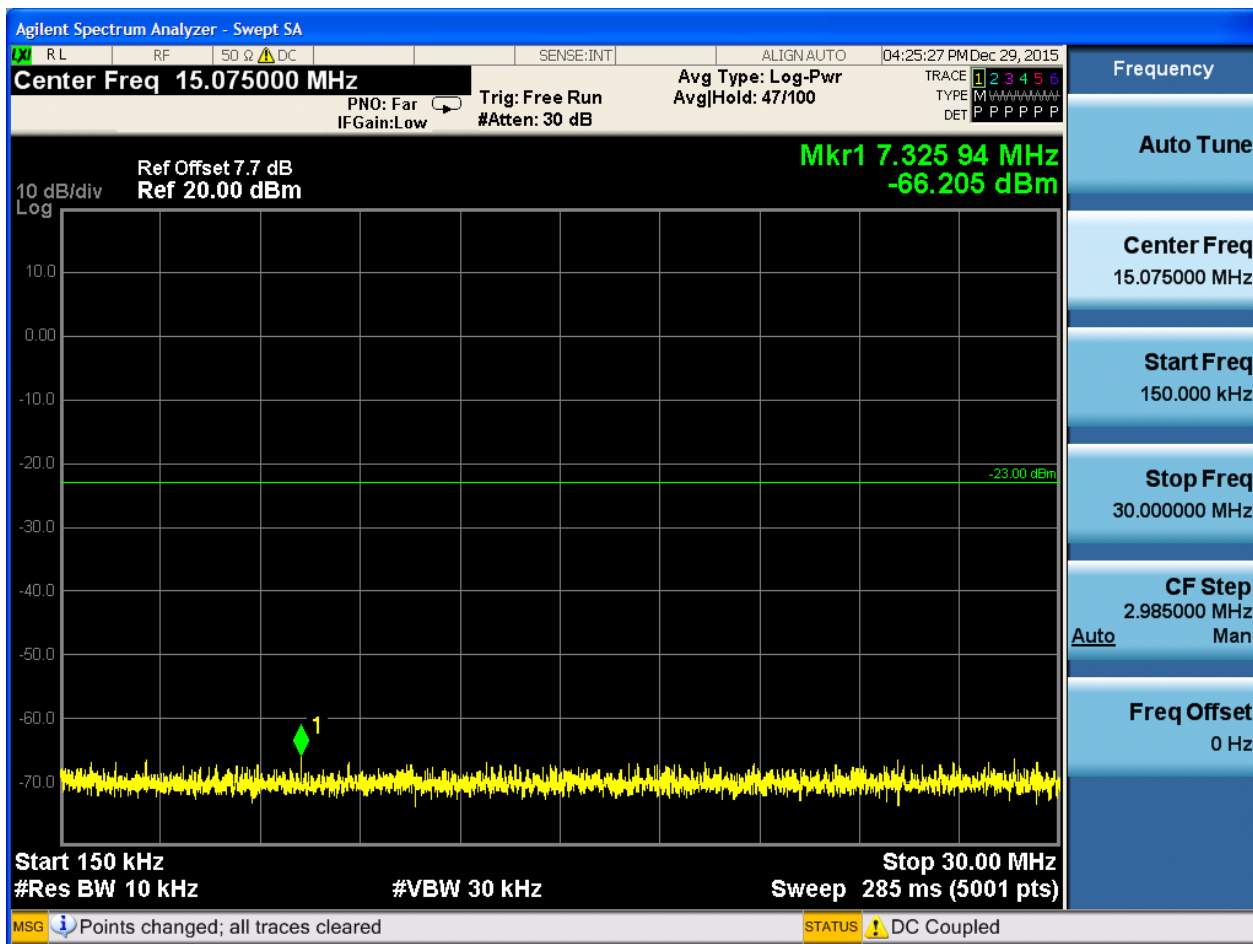


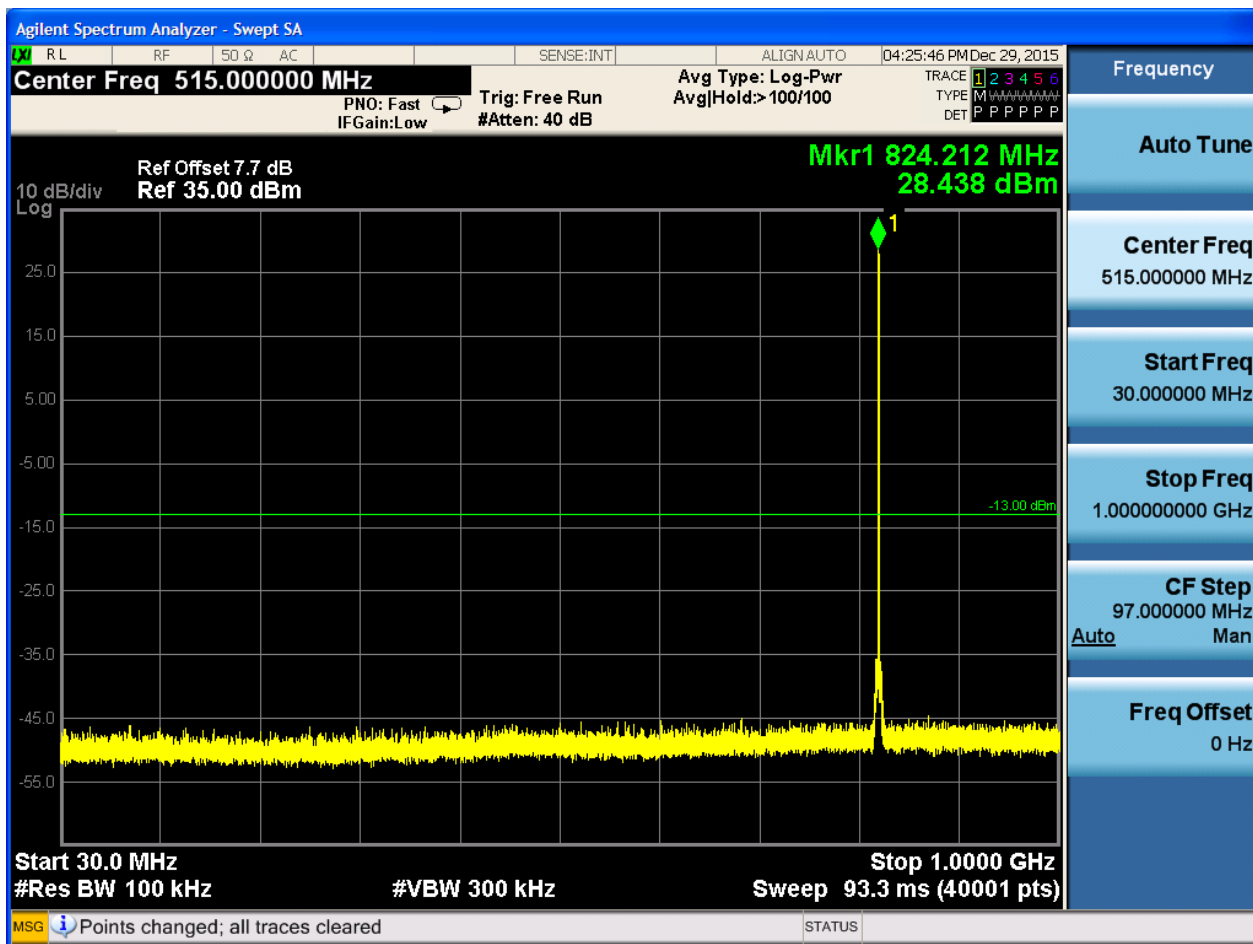


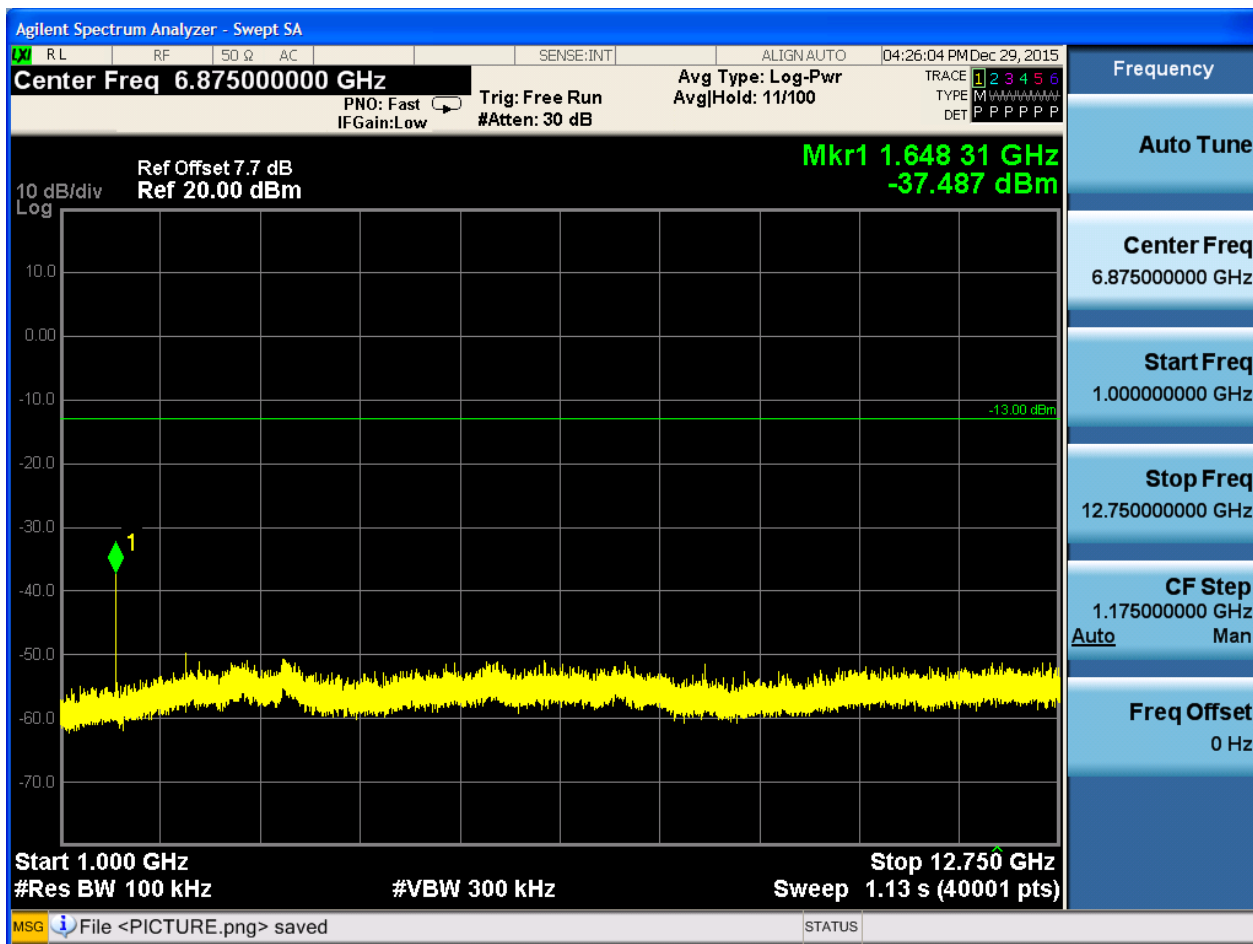
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH



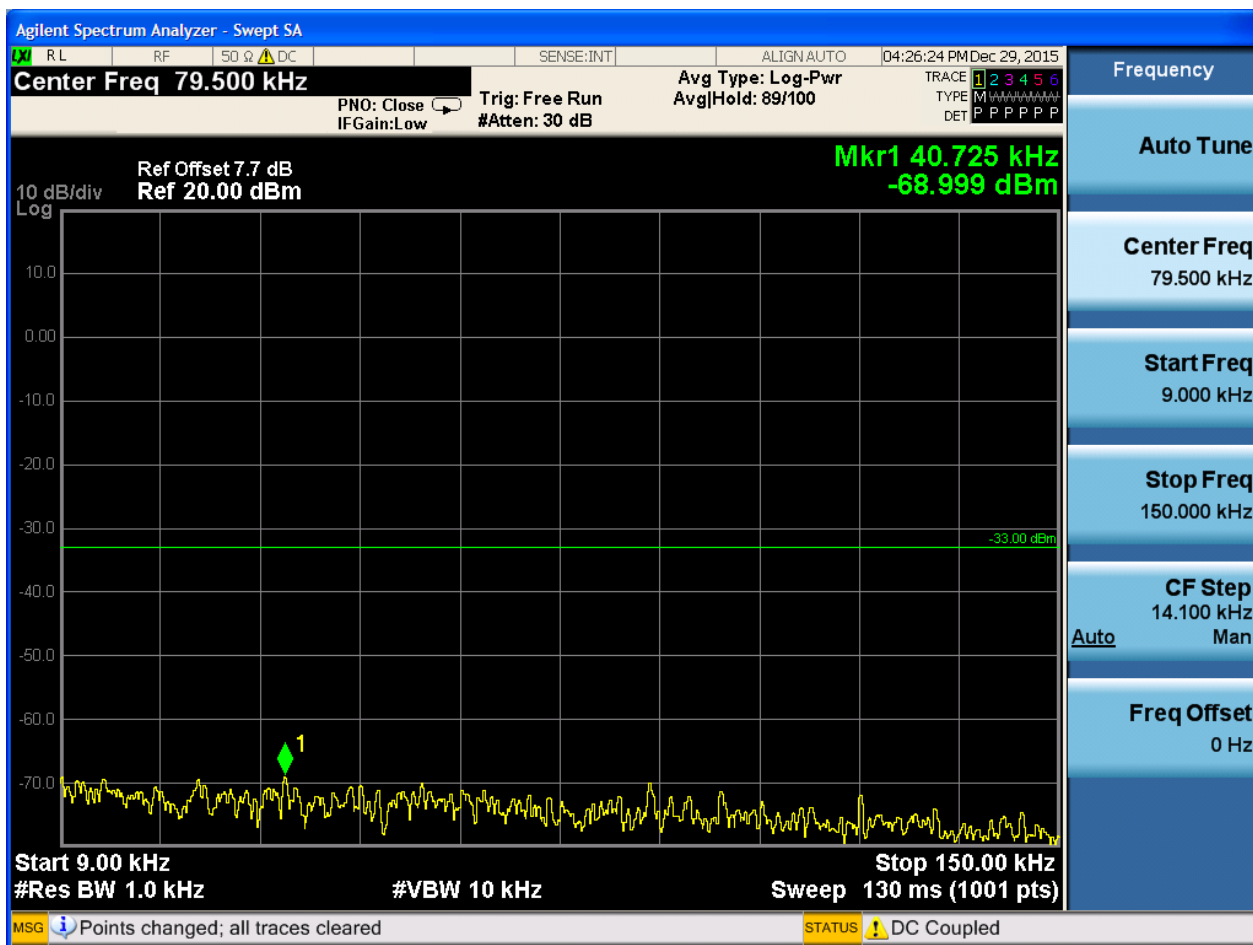


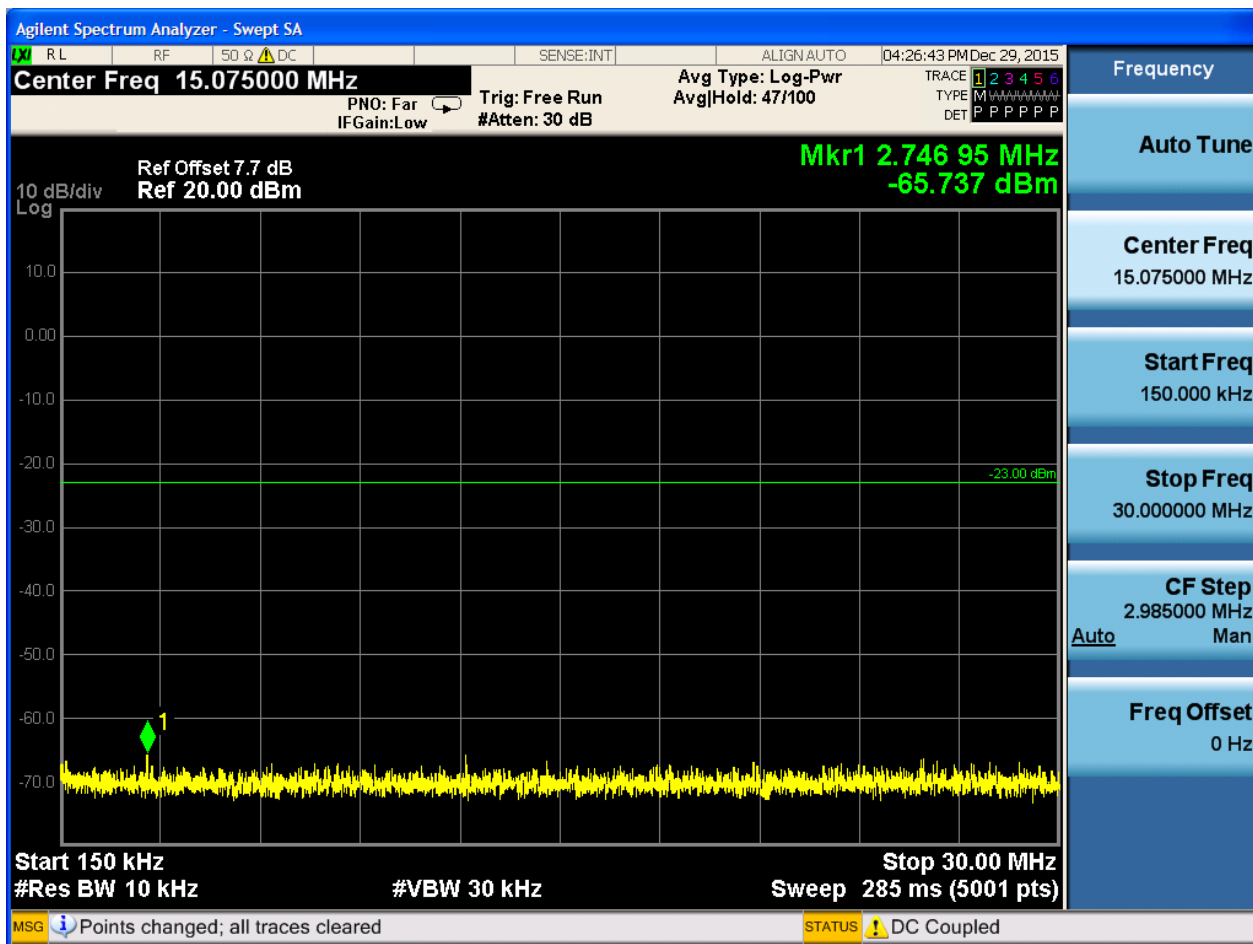


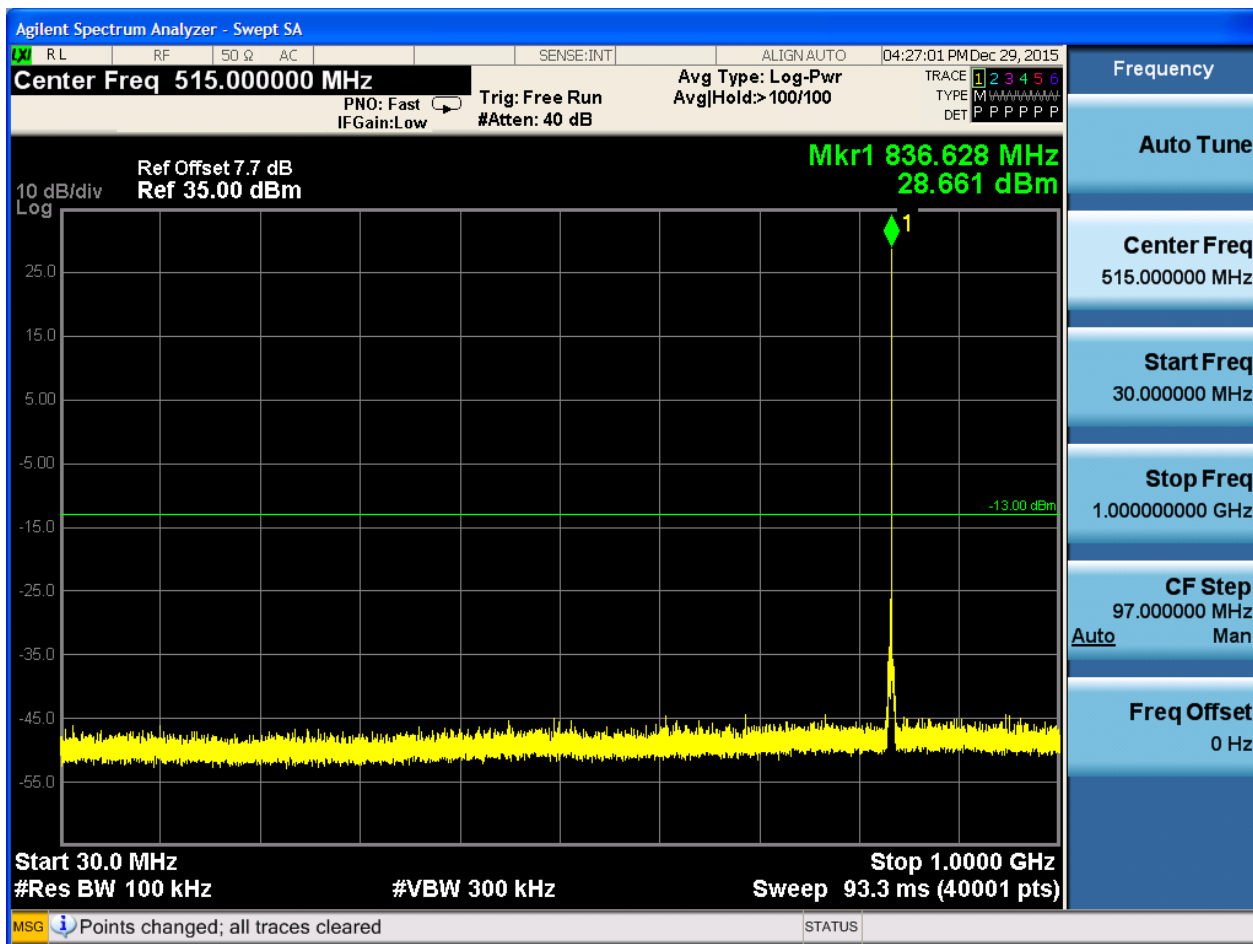


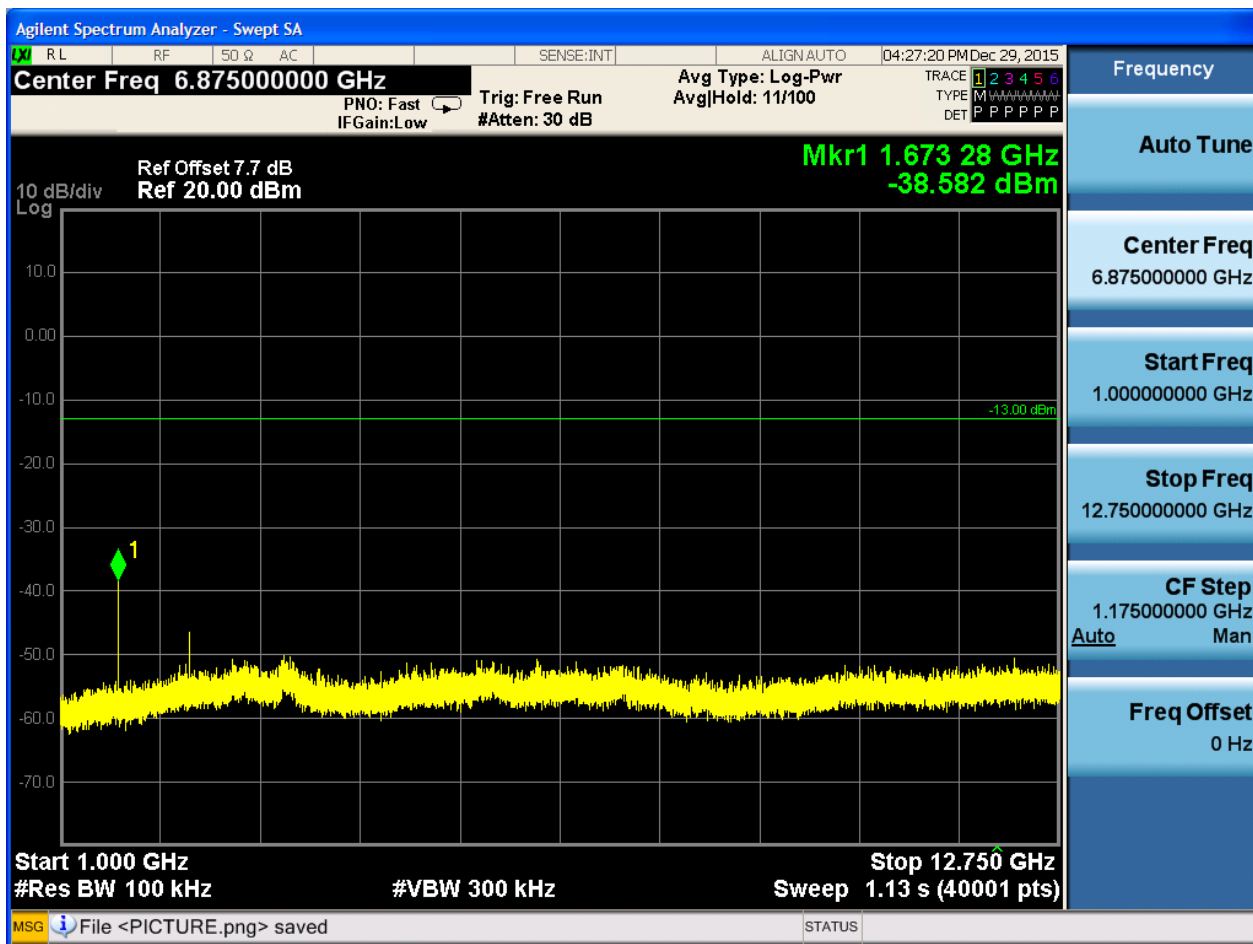


6.1.1.2.2 Test Channel = MCH



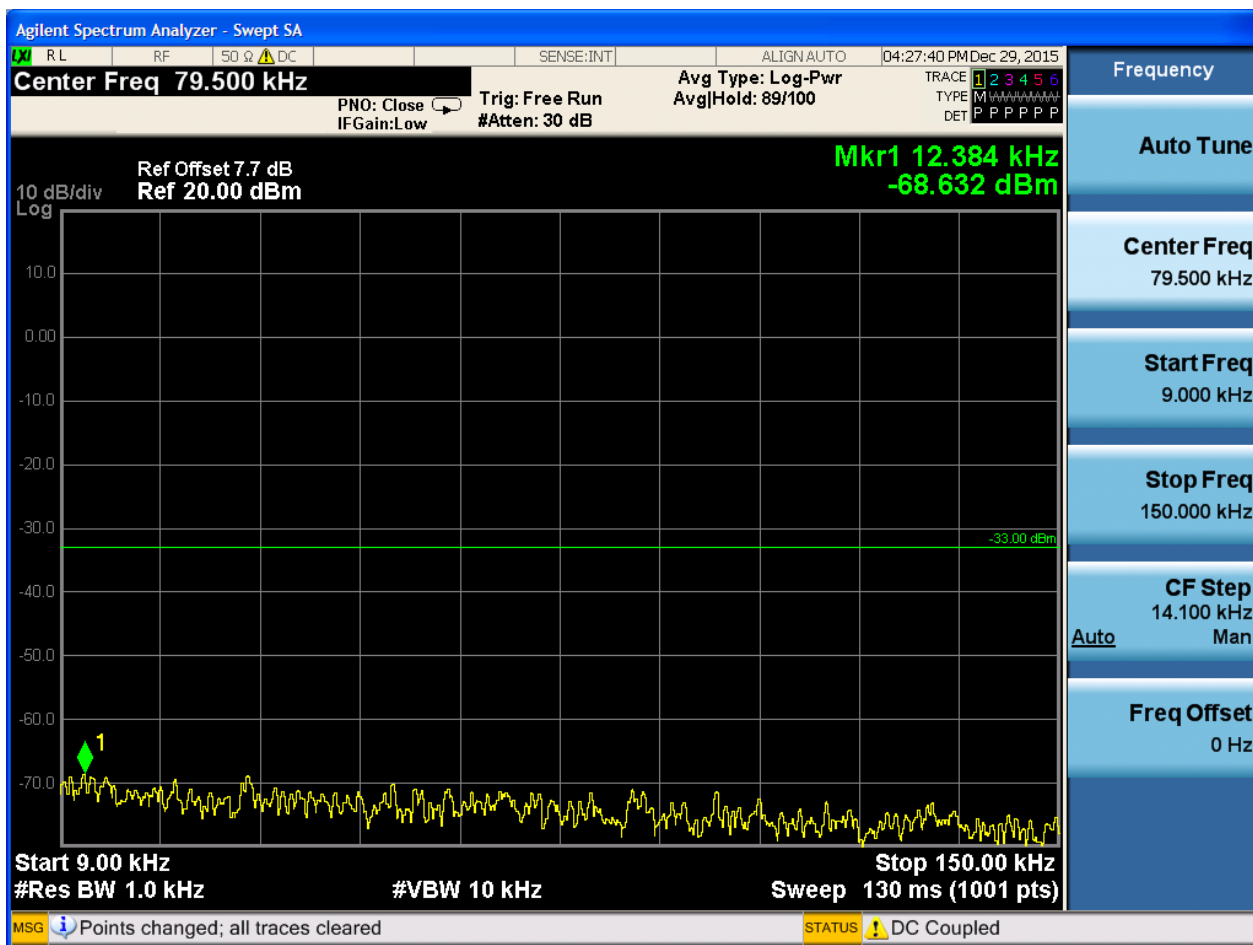


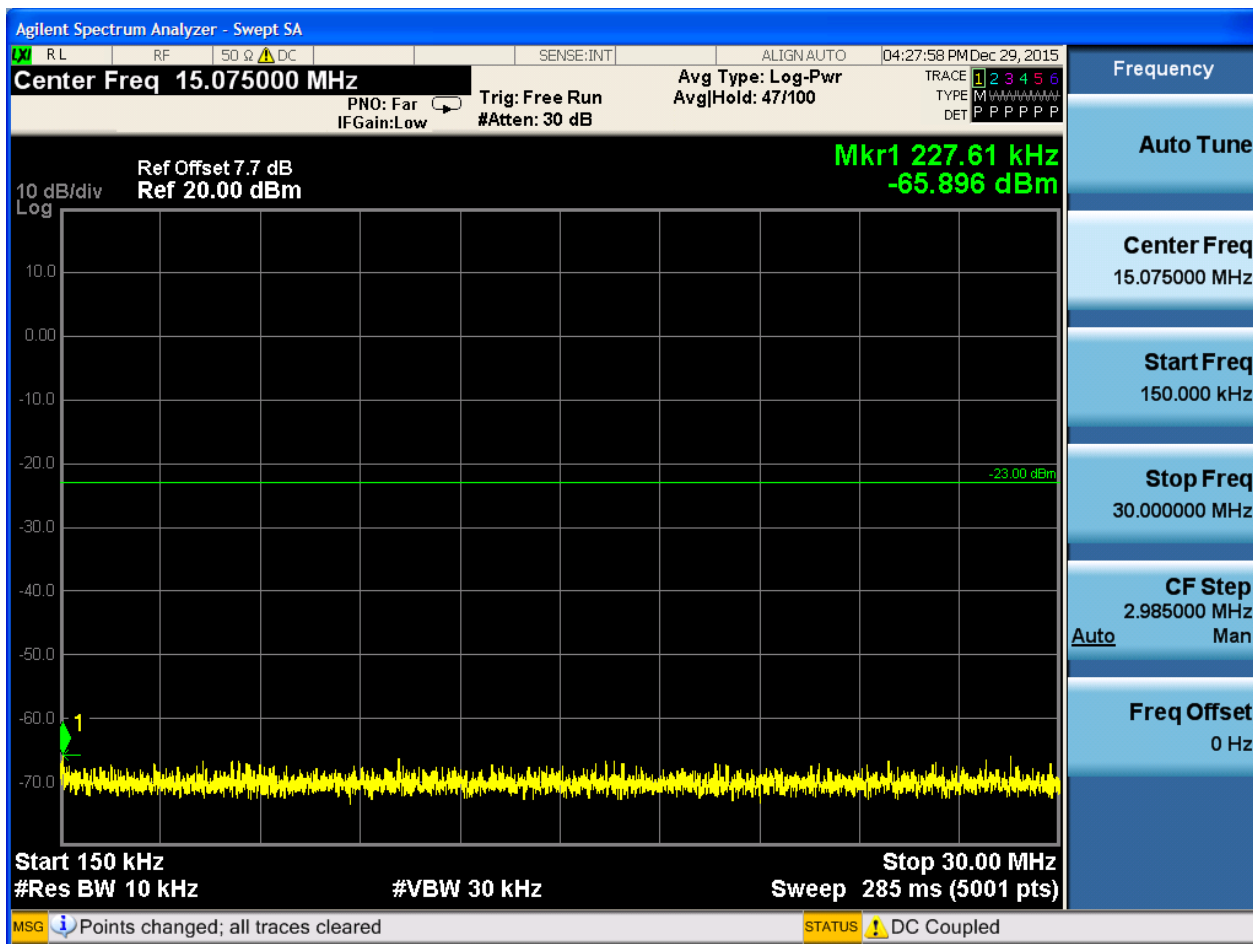


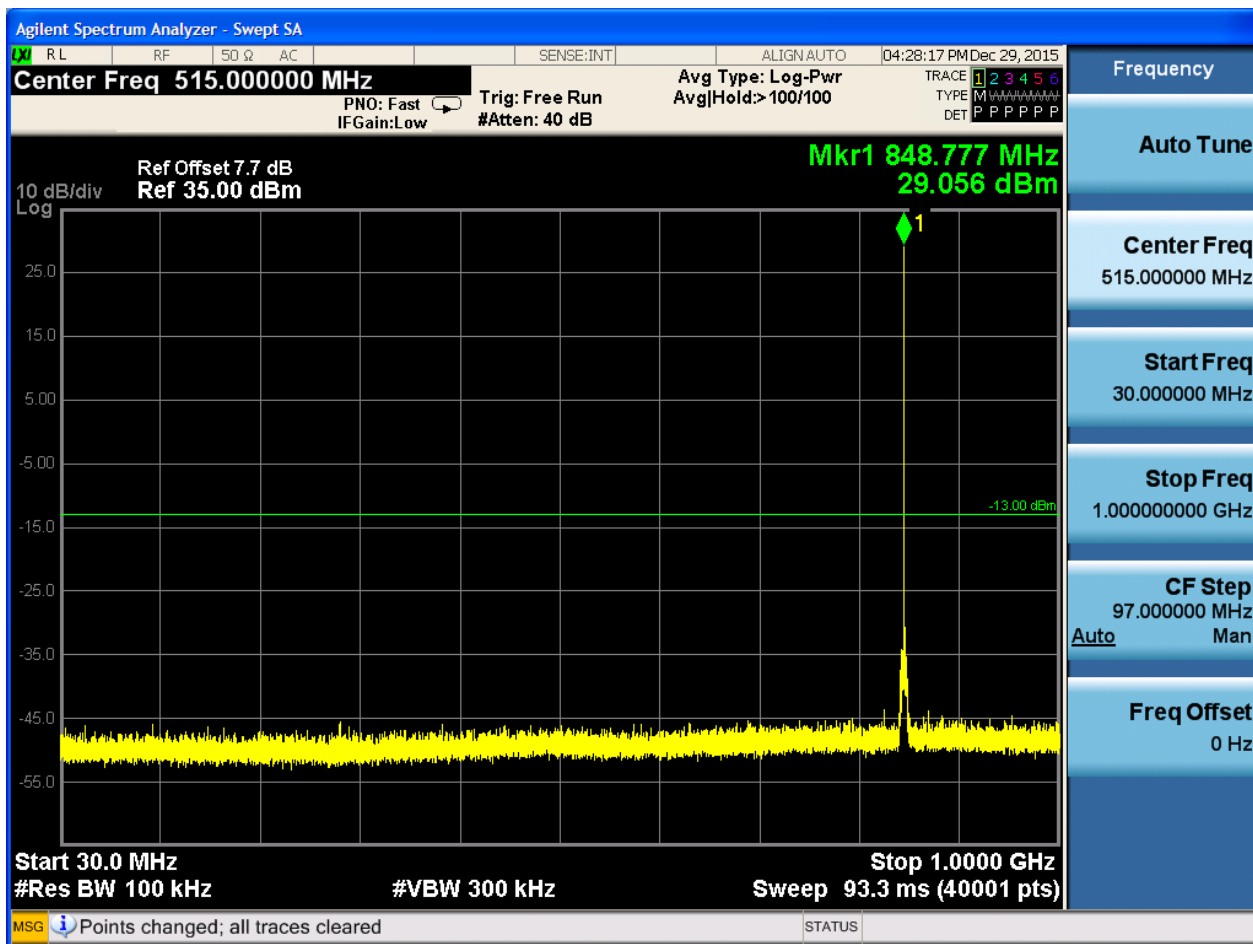


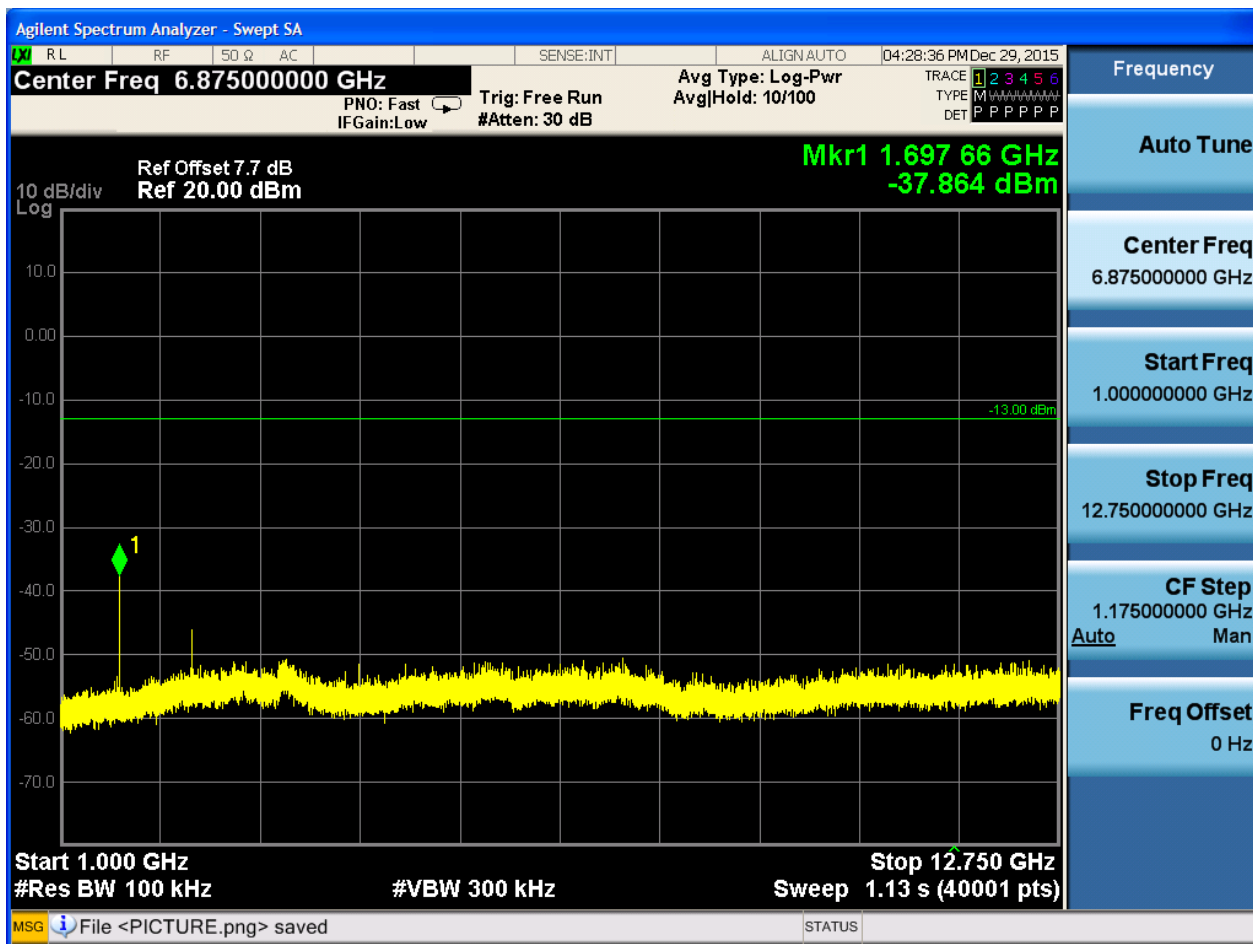


6.1.1.2.3 Test Channel = HCH







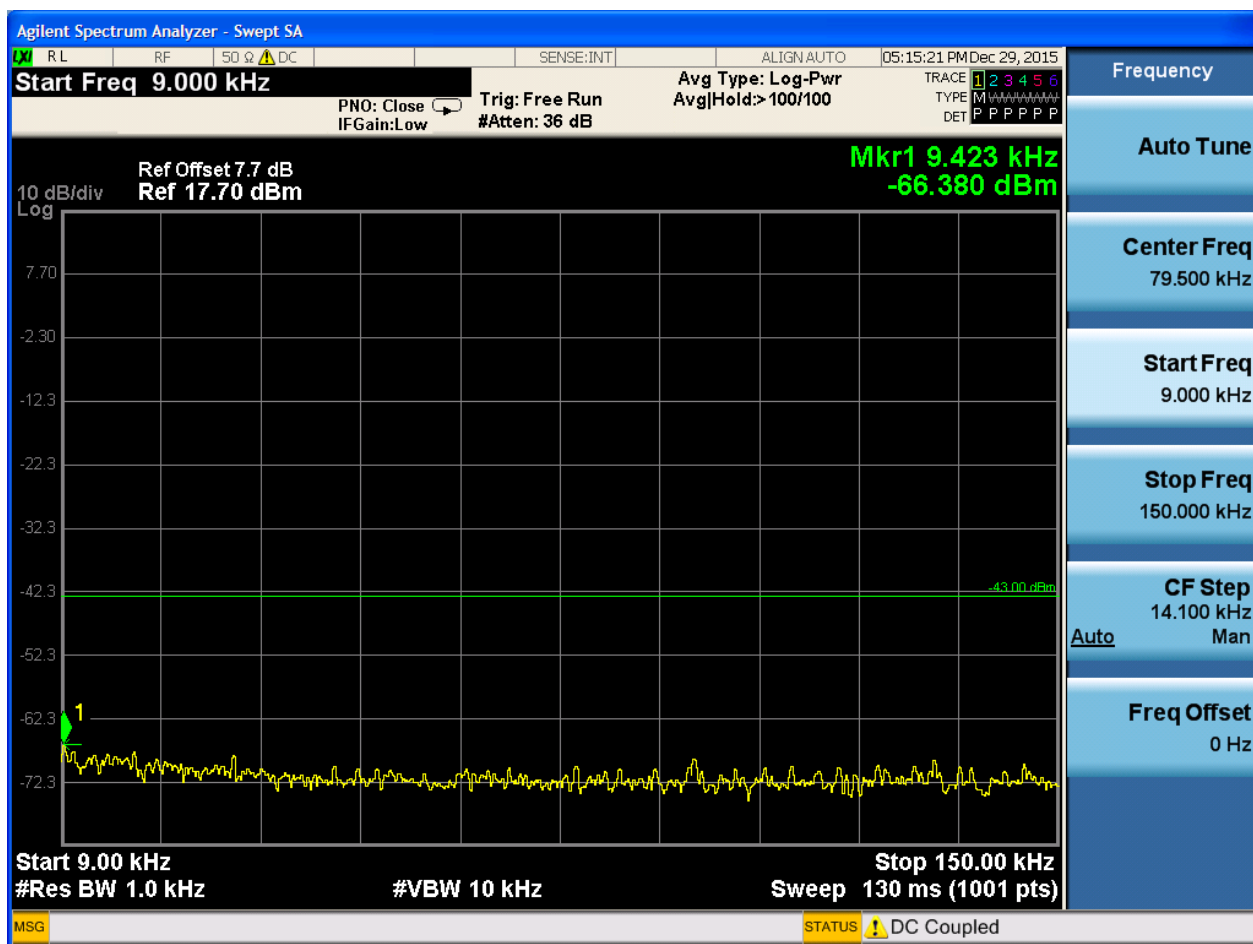


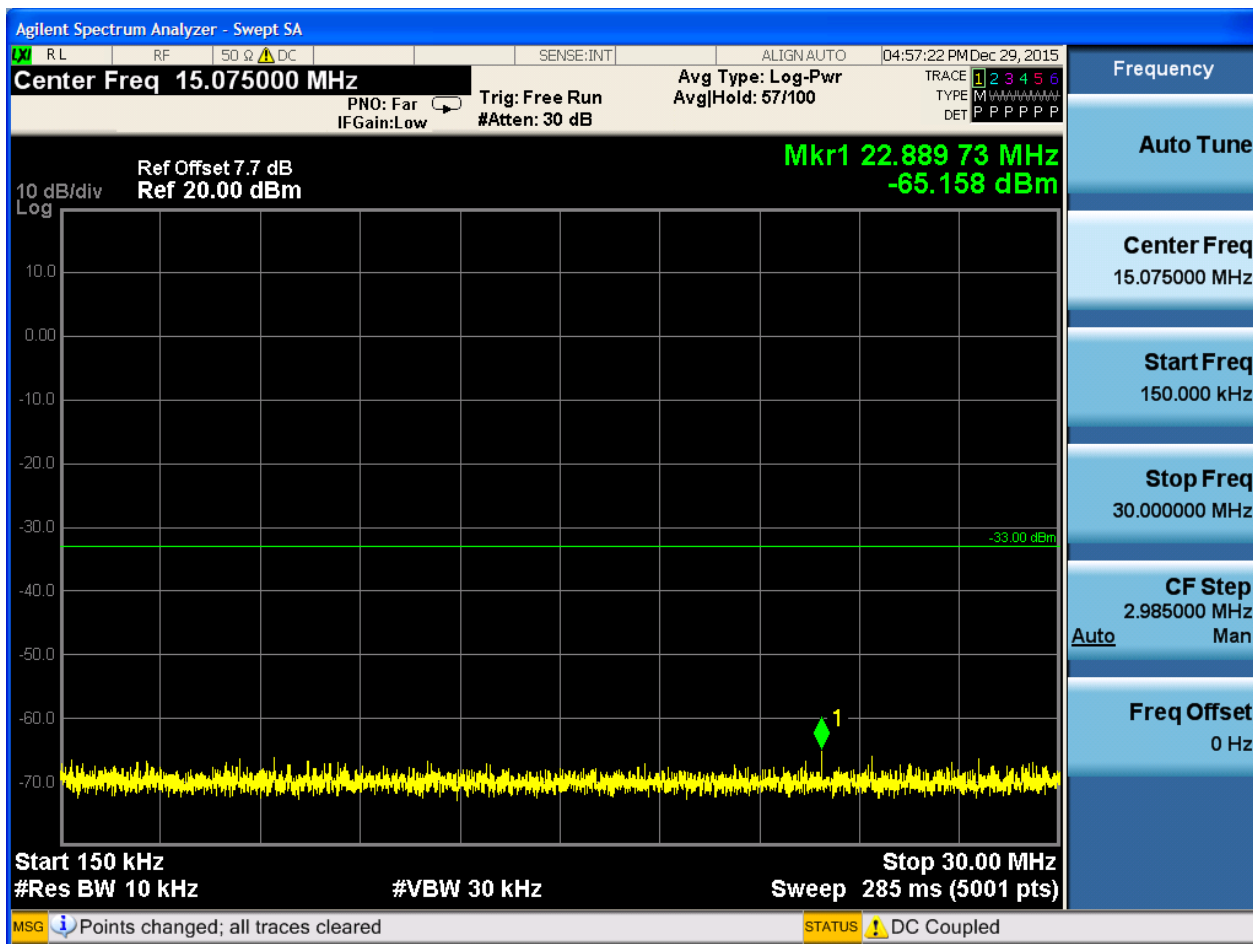


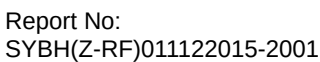
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH

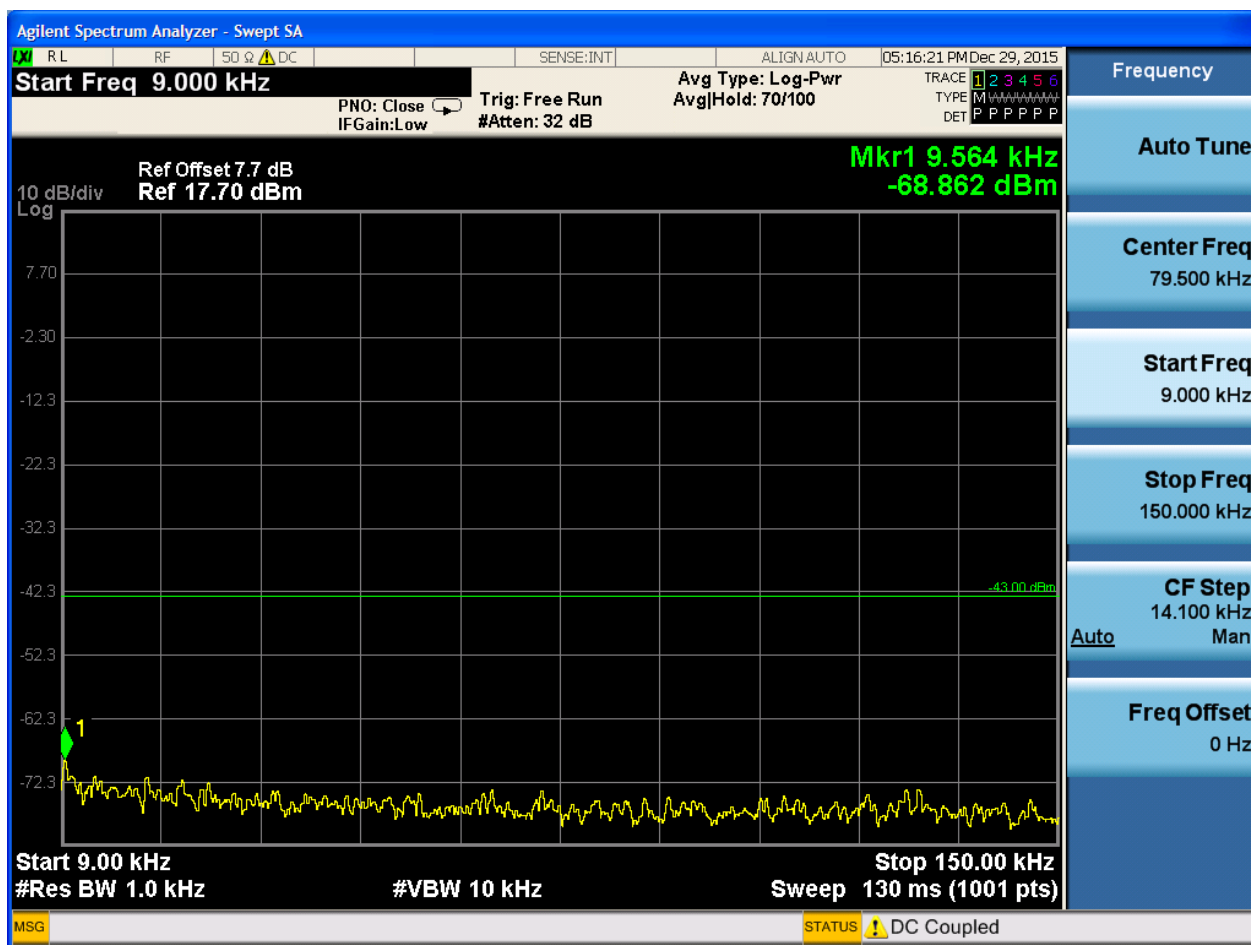


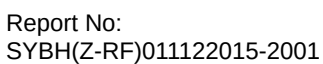


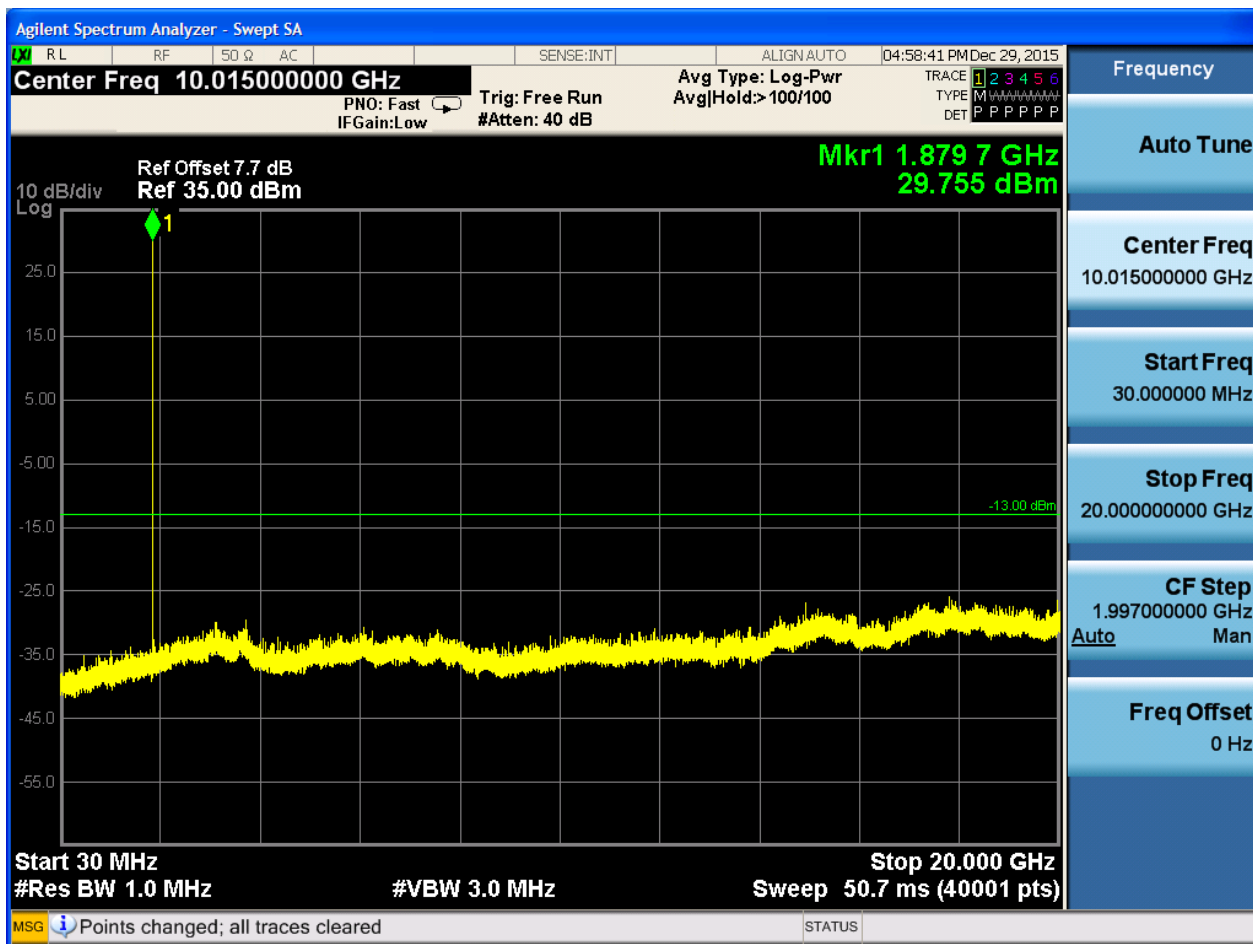




6.1.2.1.2 Test Channel = MCH

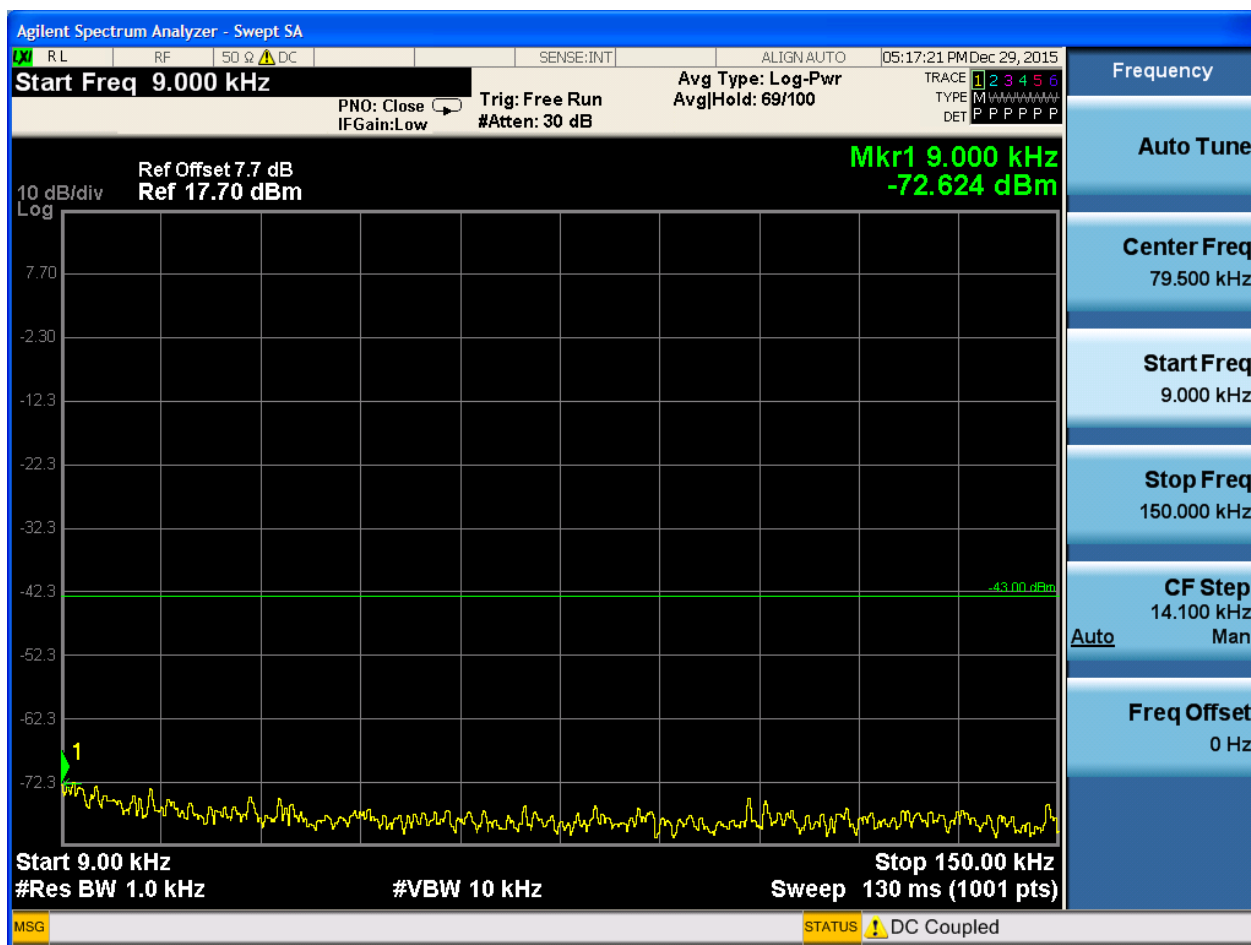


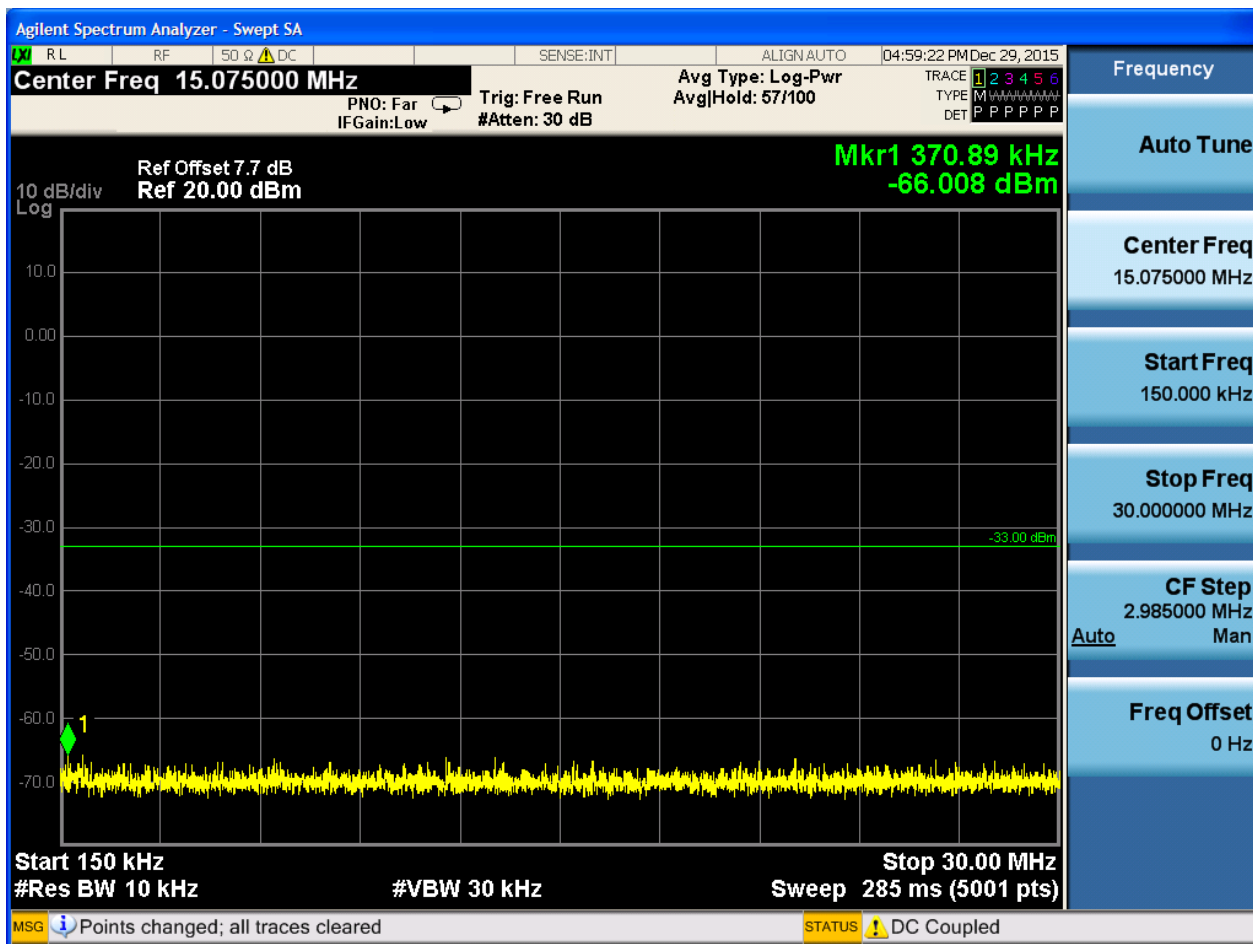






6.1.2.1.3 Test Channel = HCH



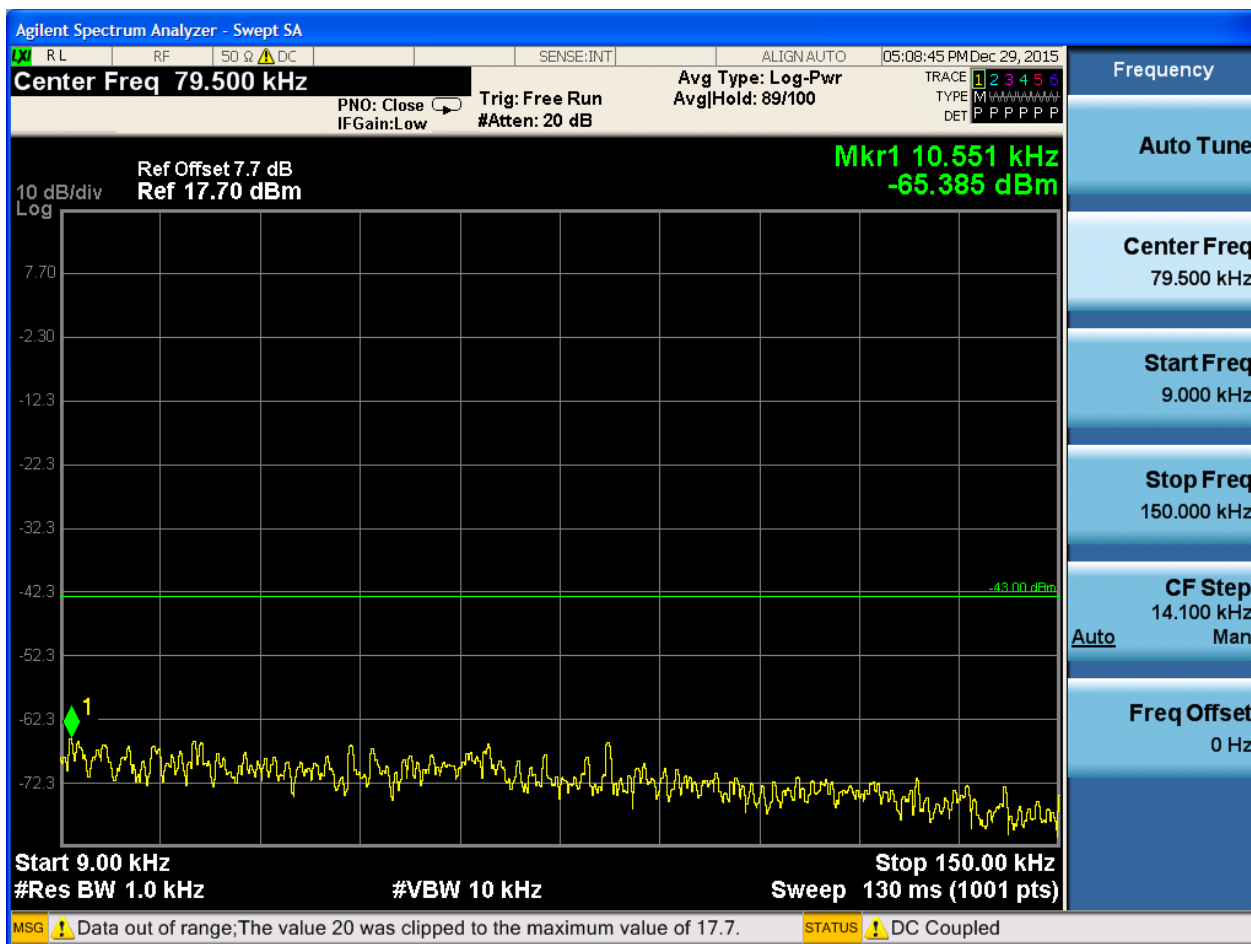


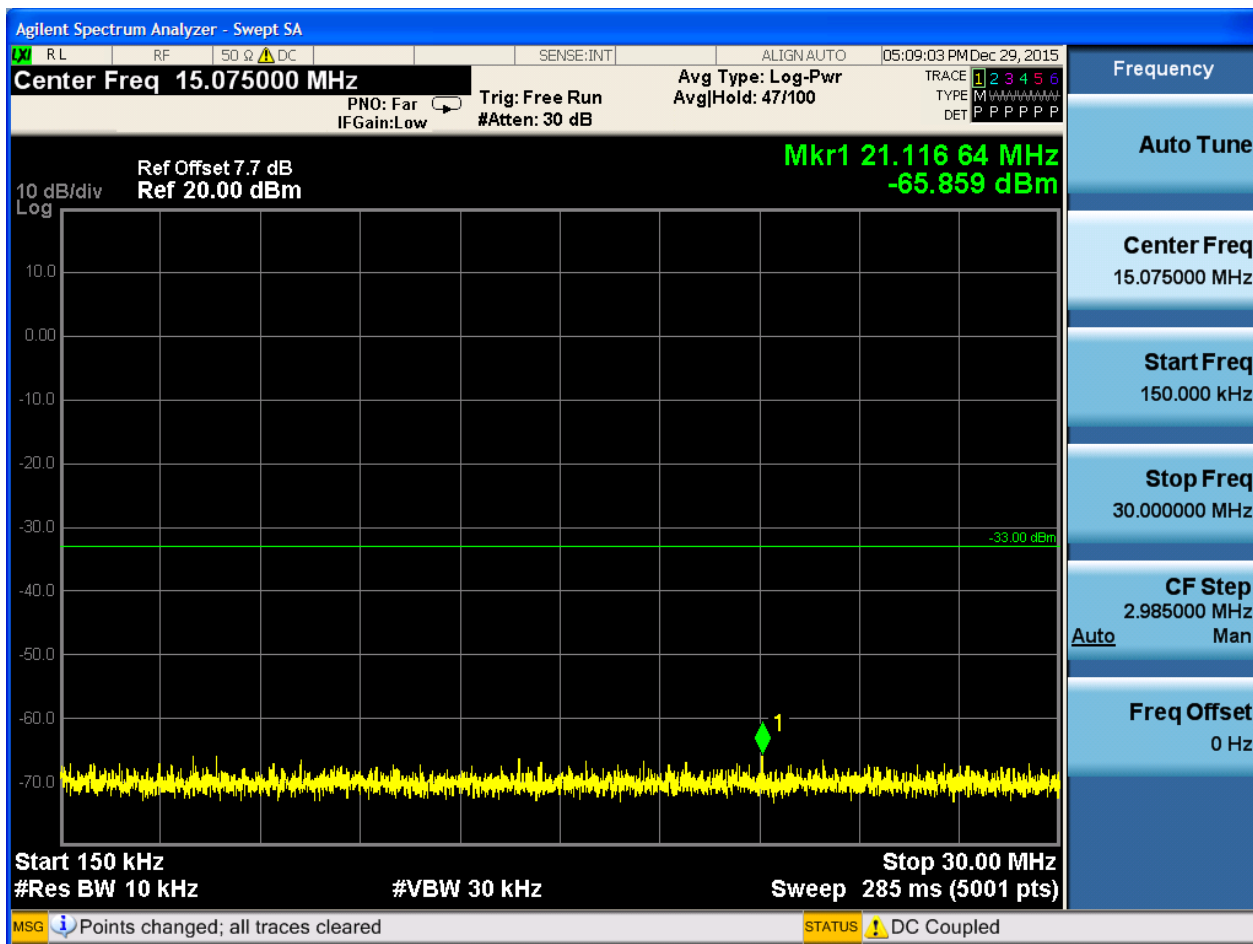


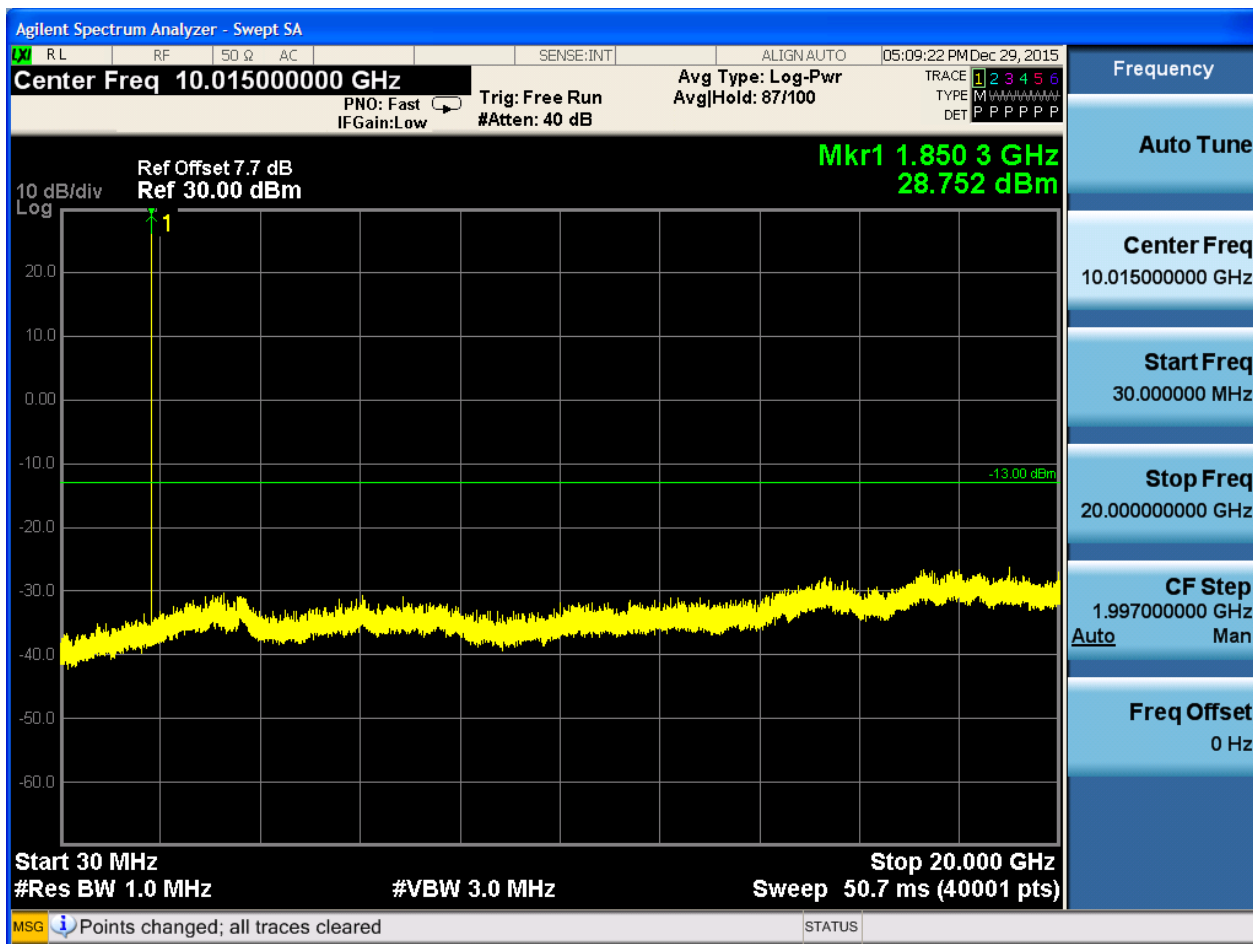


6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

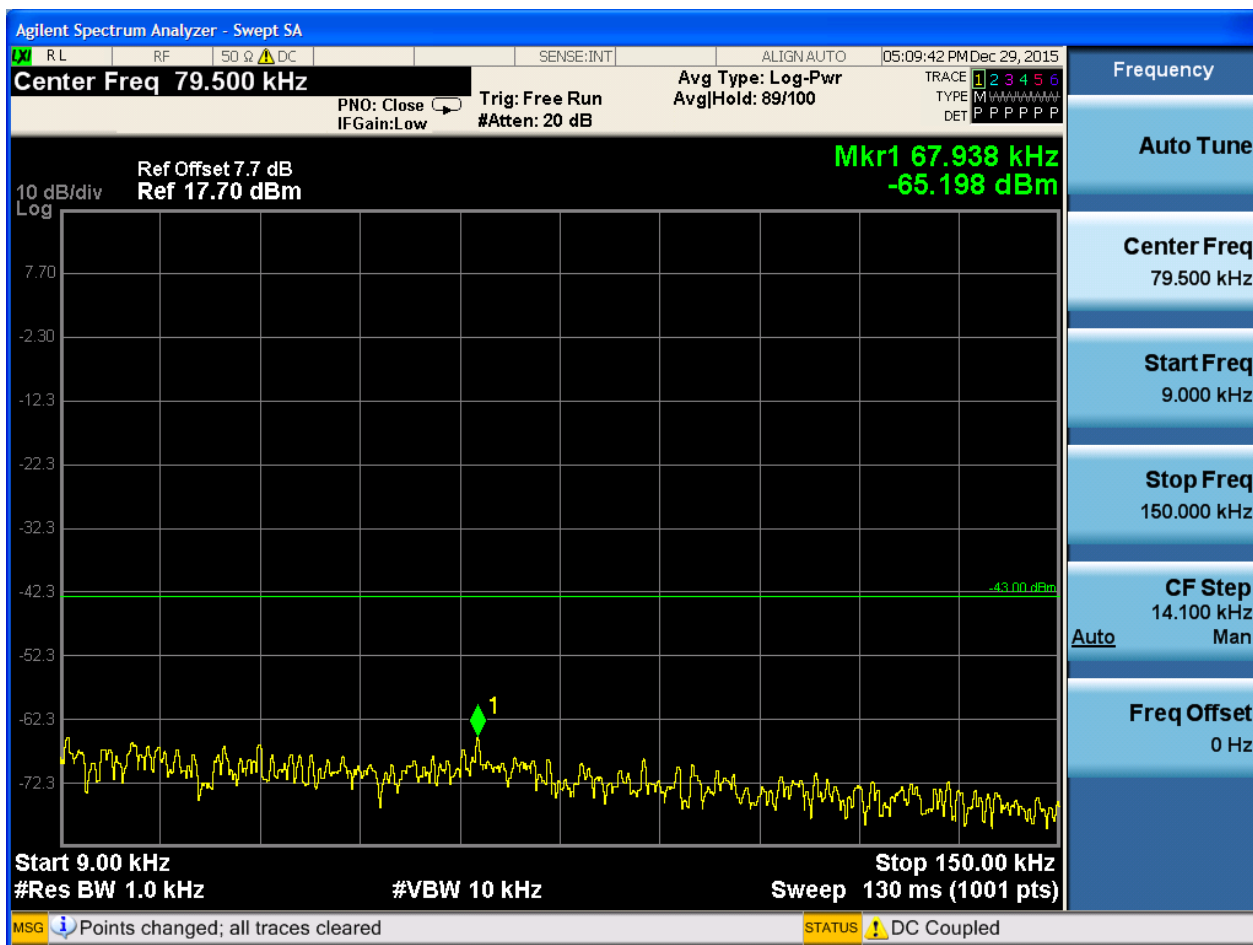


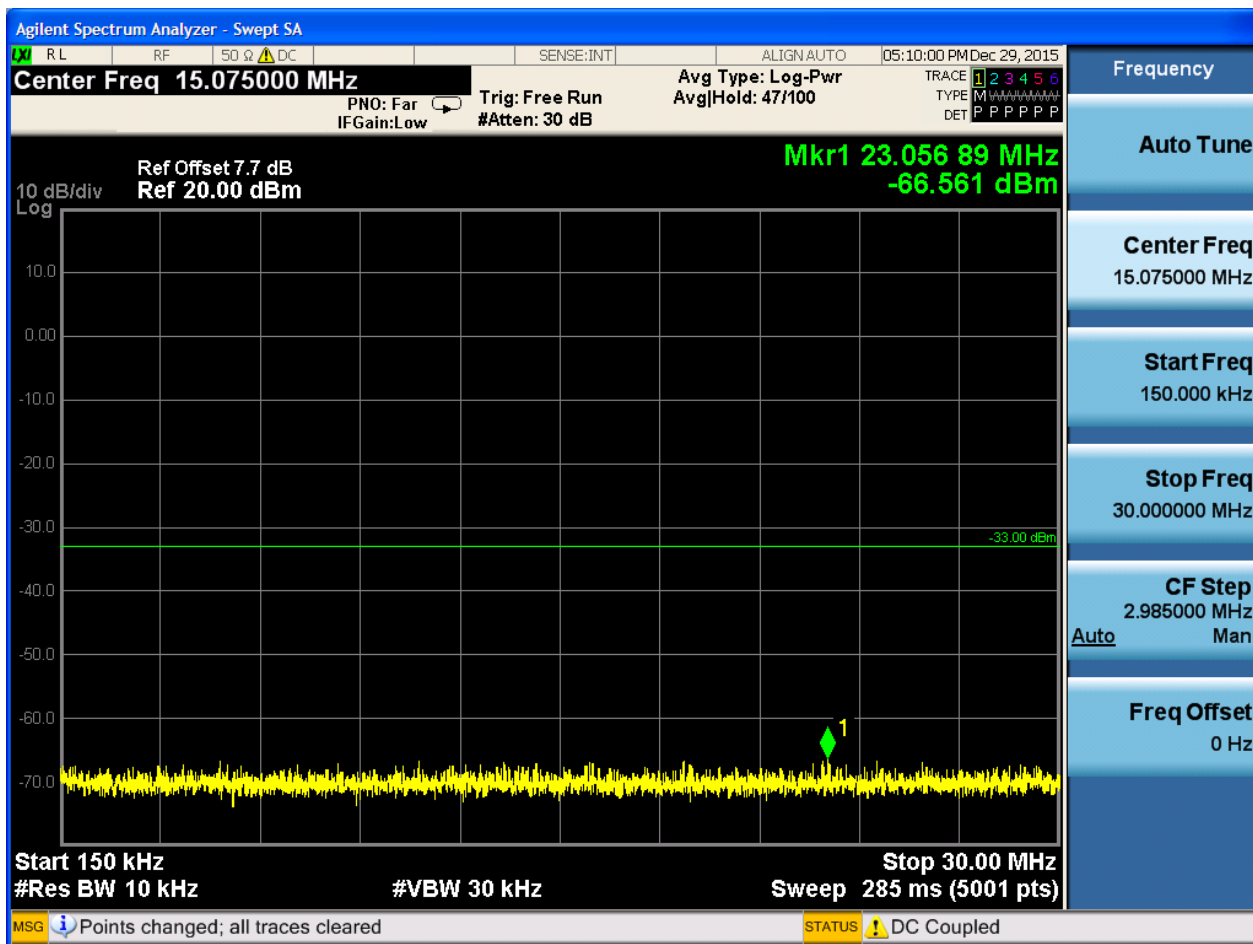


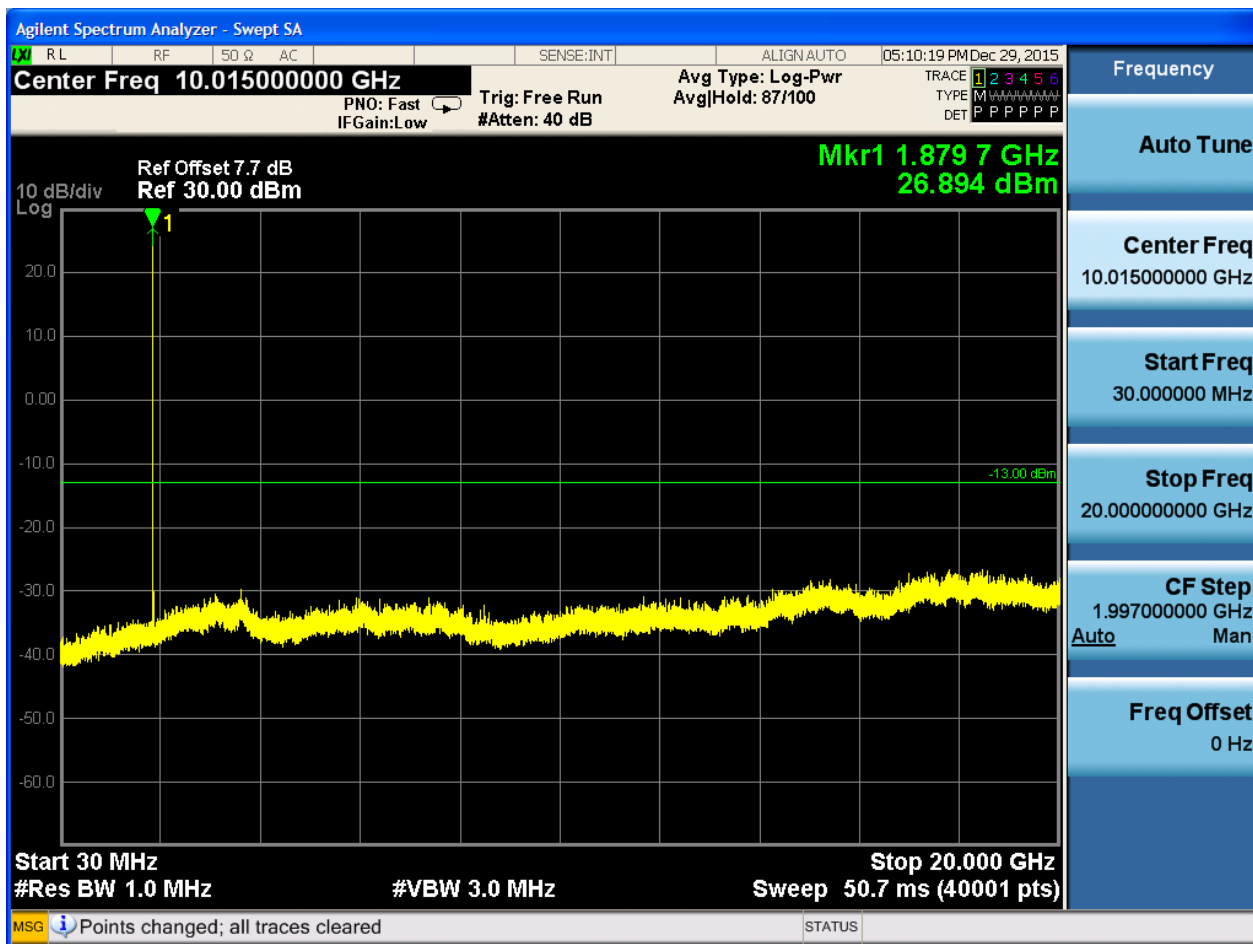




6.1.2.2.2 Test Channel = MCH

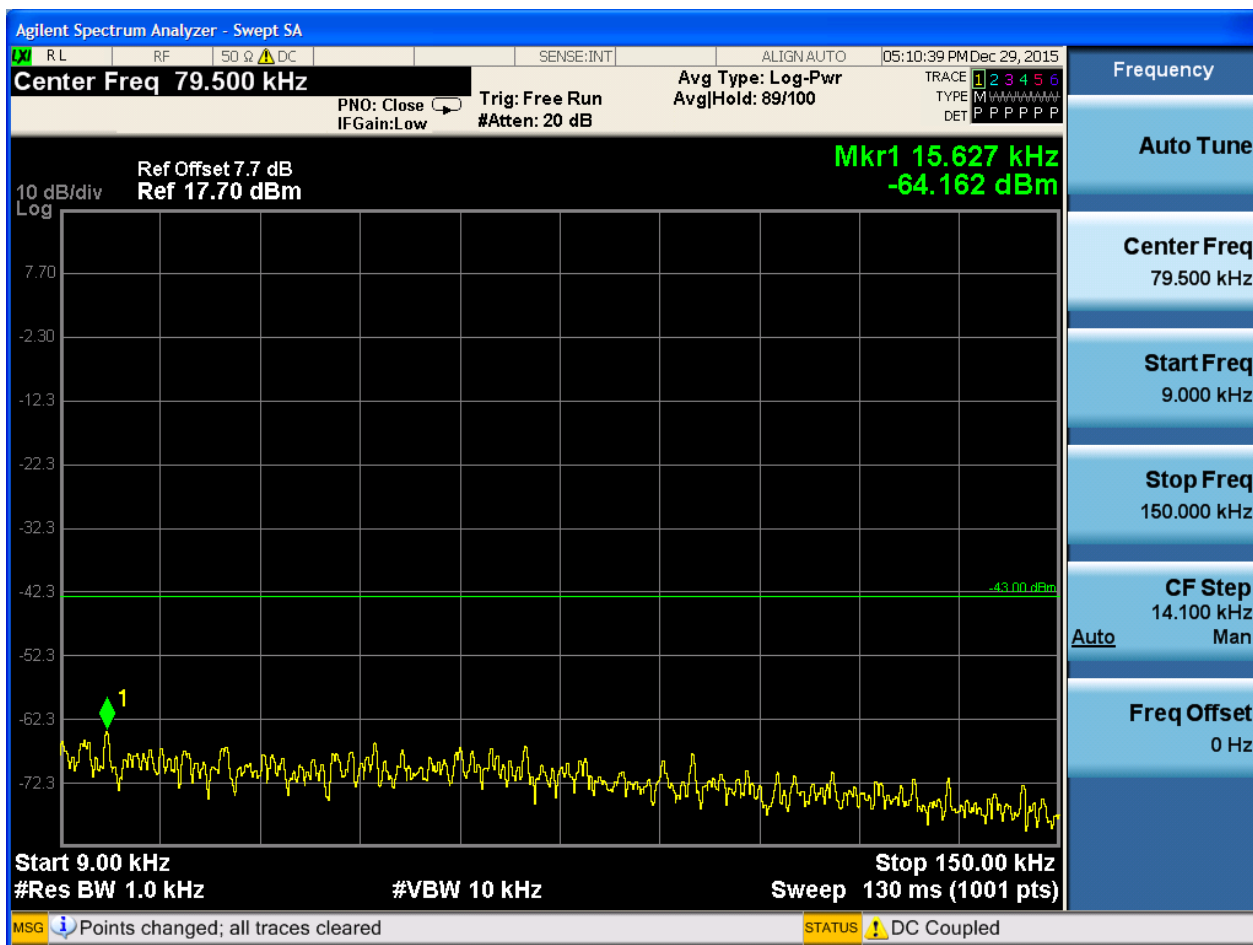


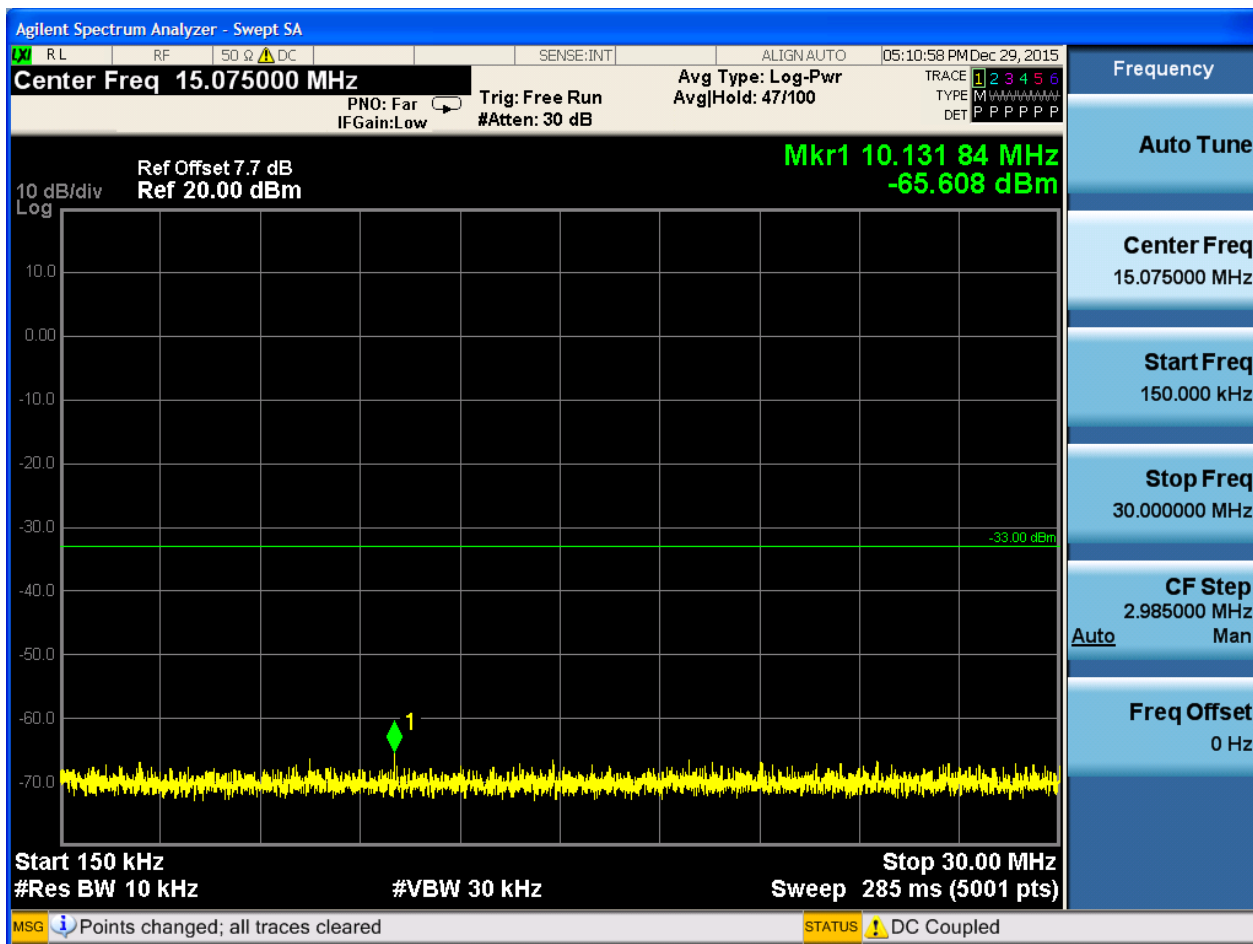


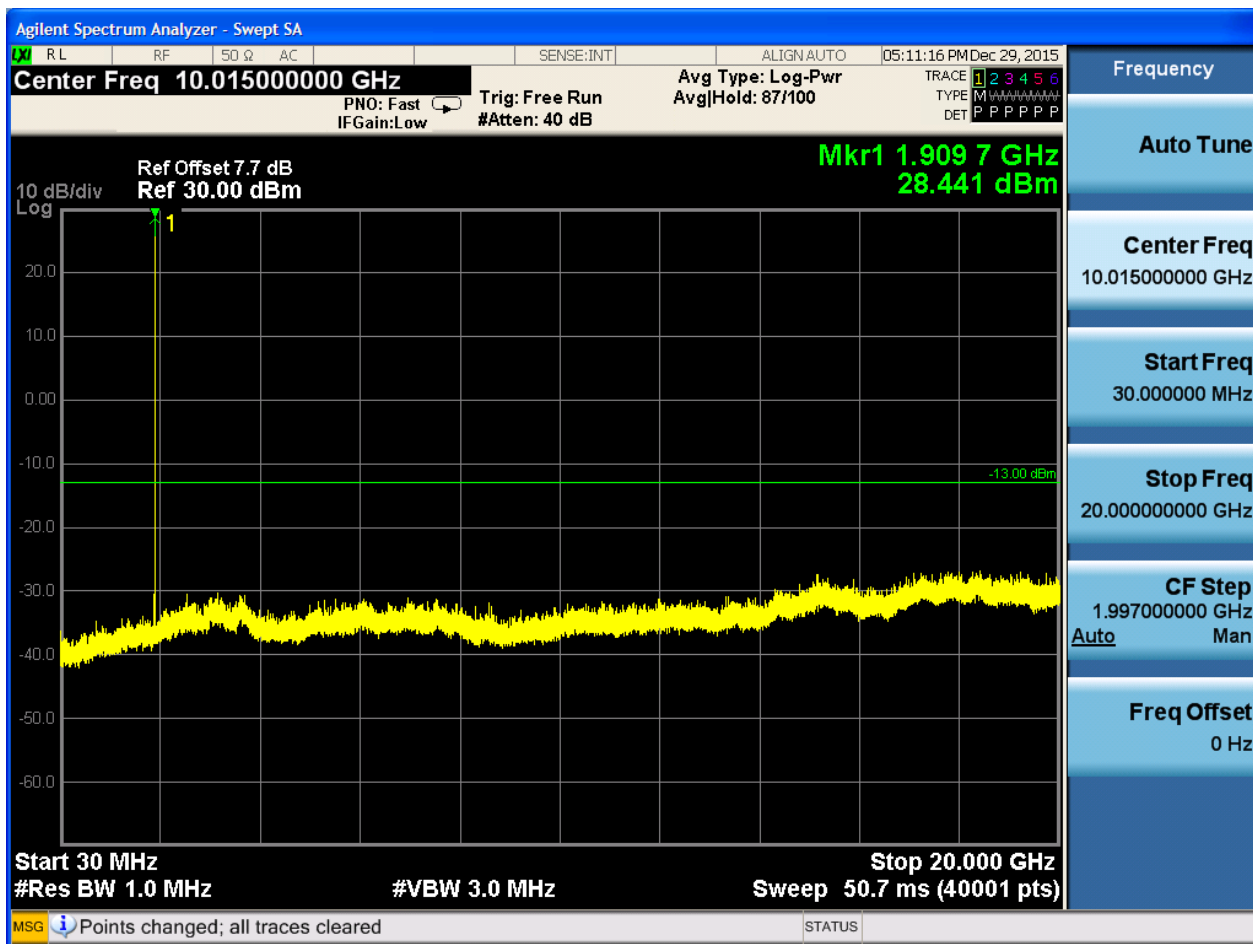




6.1.2.2.3 Test Channel = HCH







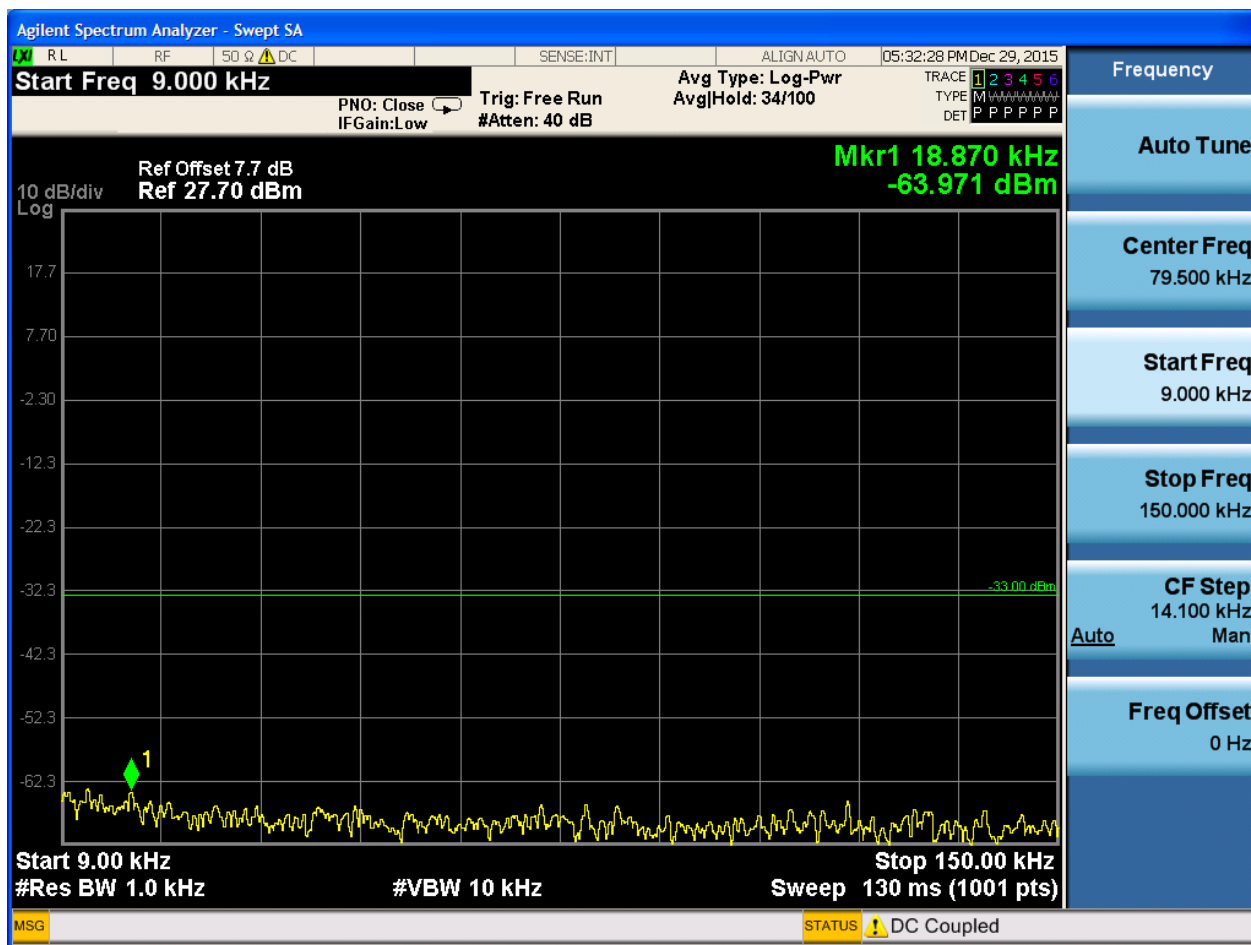


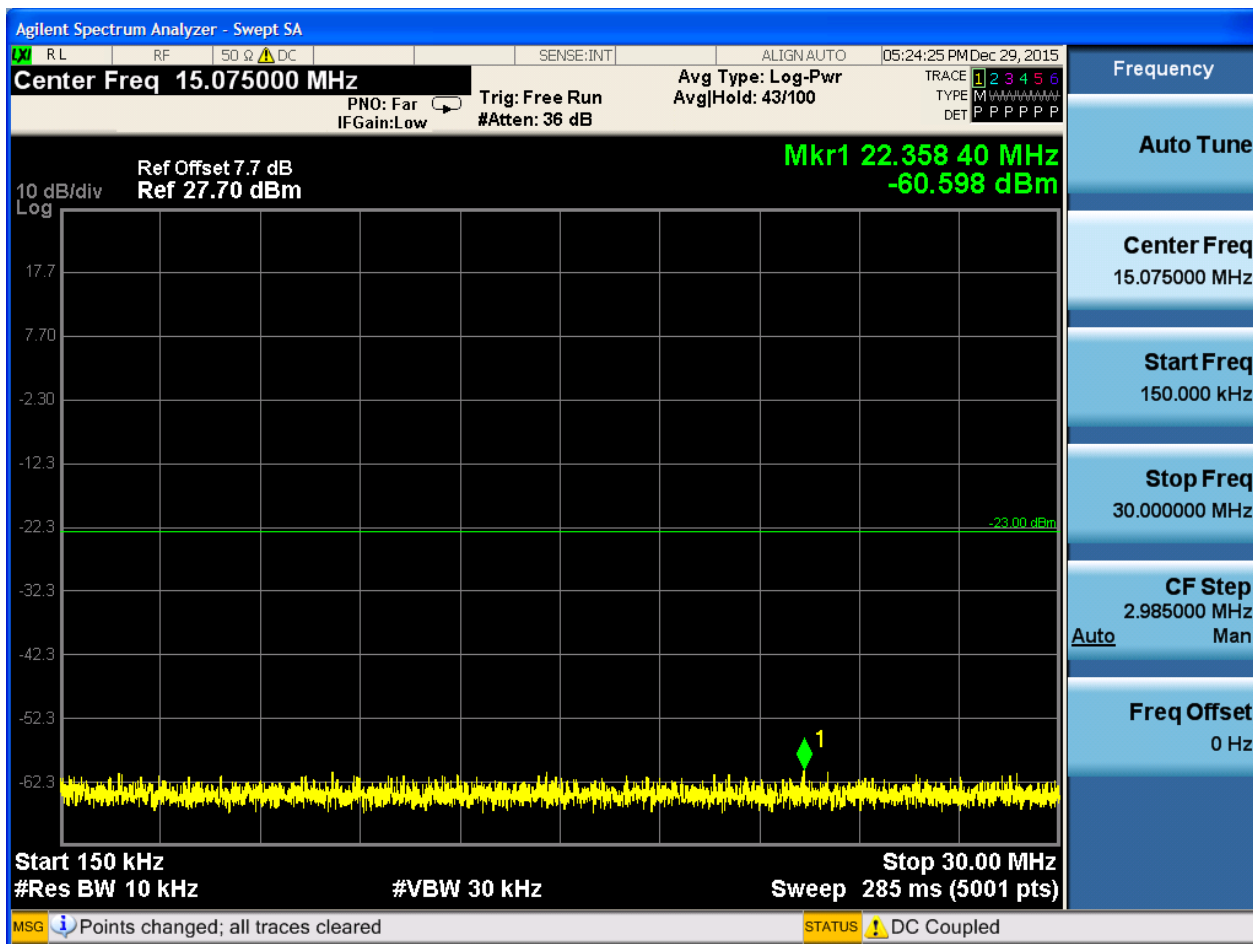
6.2 For UMTS

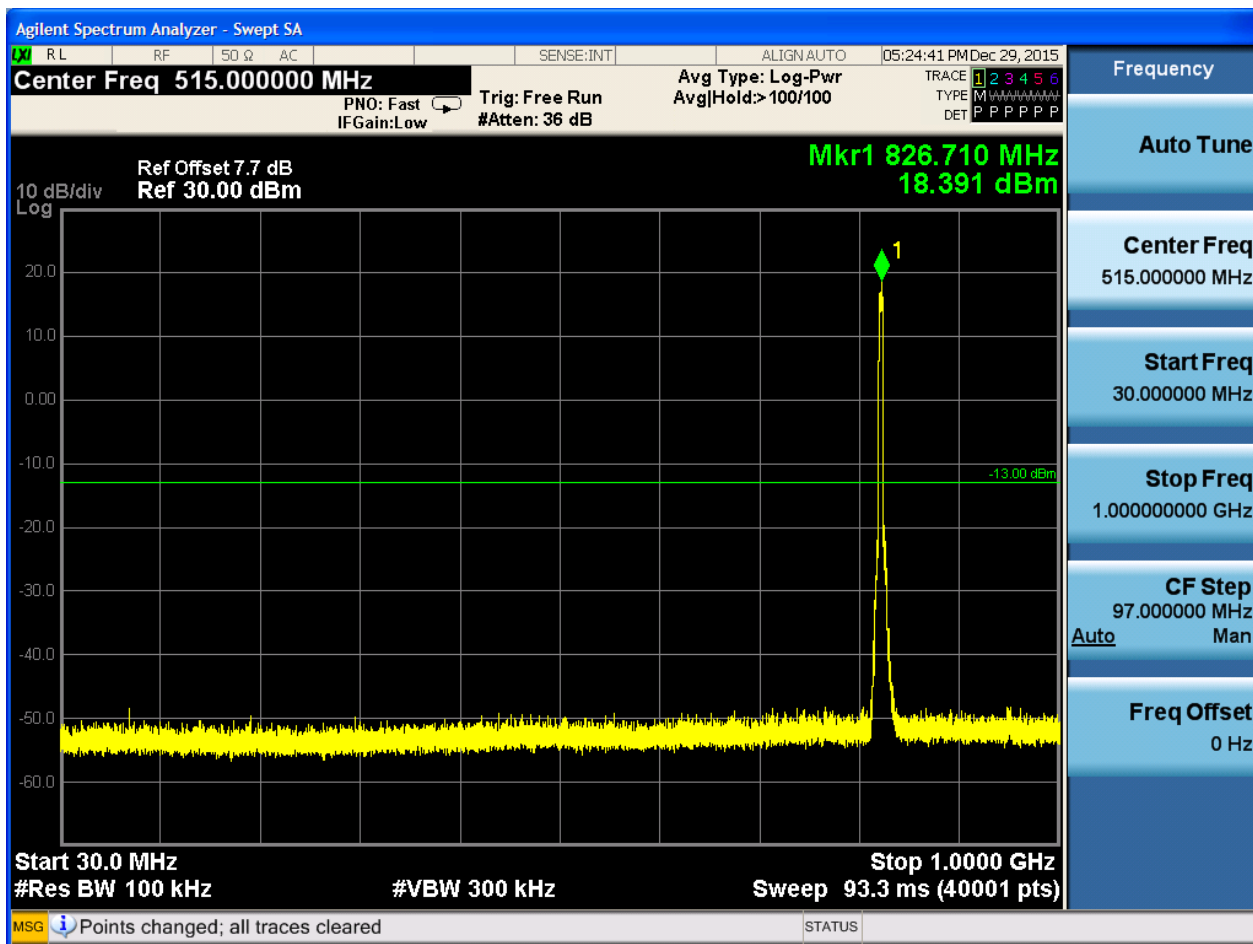
6.2.1 Test Band = WCDMA850

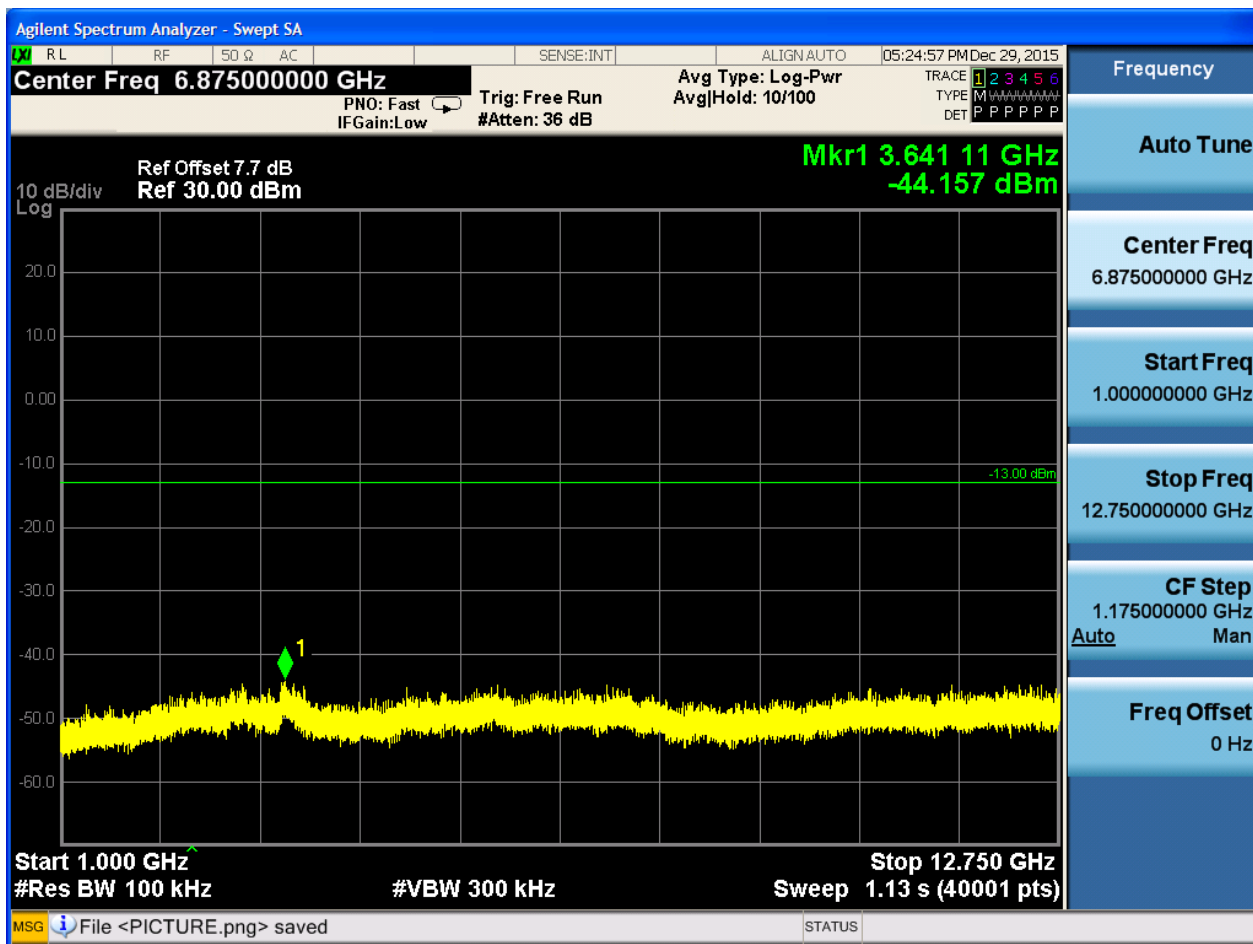
6.2.1.1 Test Mode = UMTS/TM1

6.2.1.1.1 Test Channel = LCH



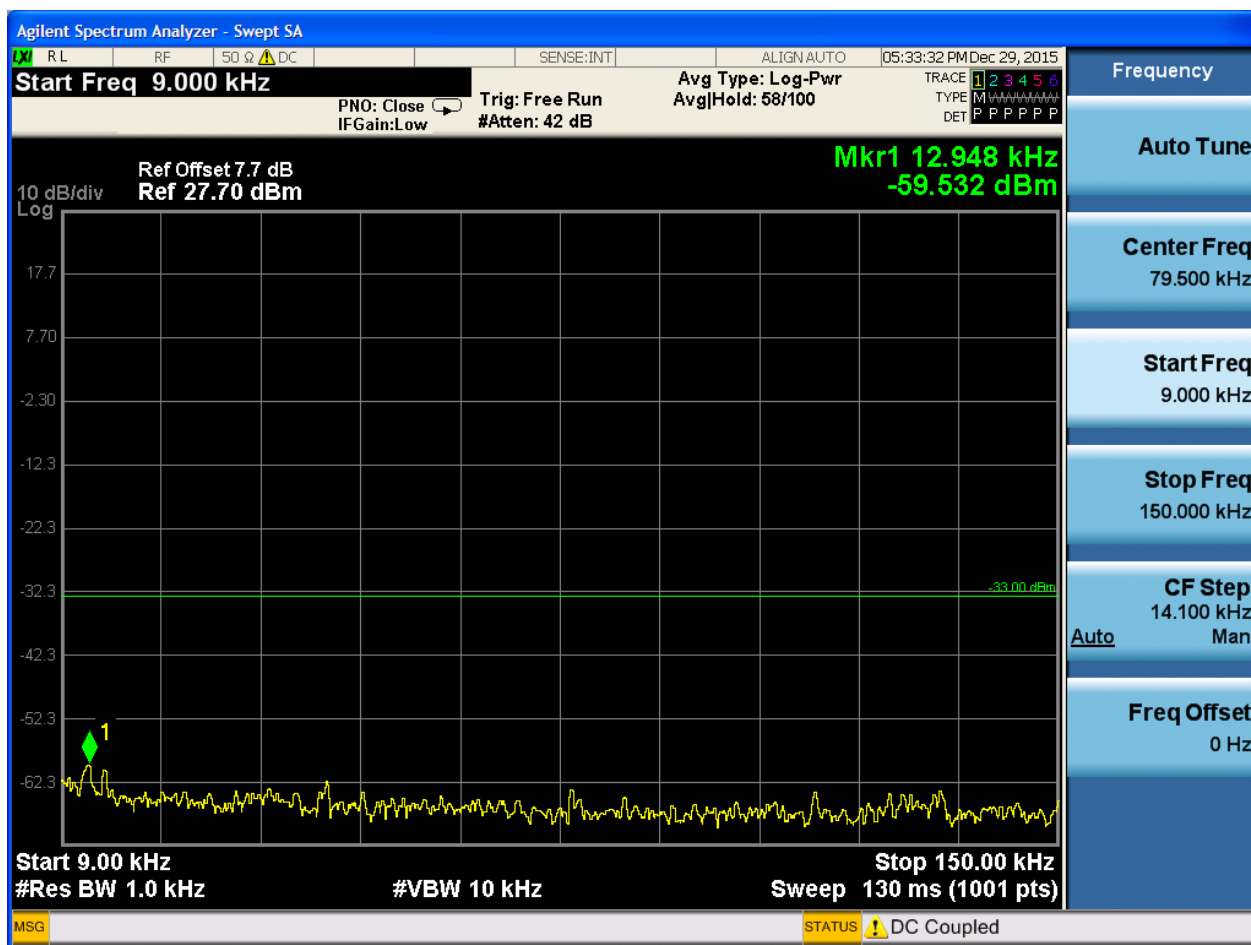


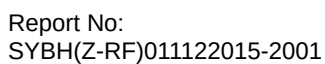


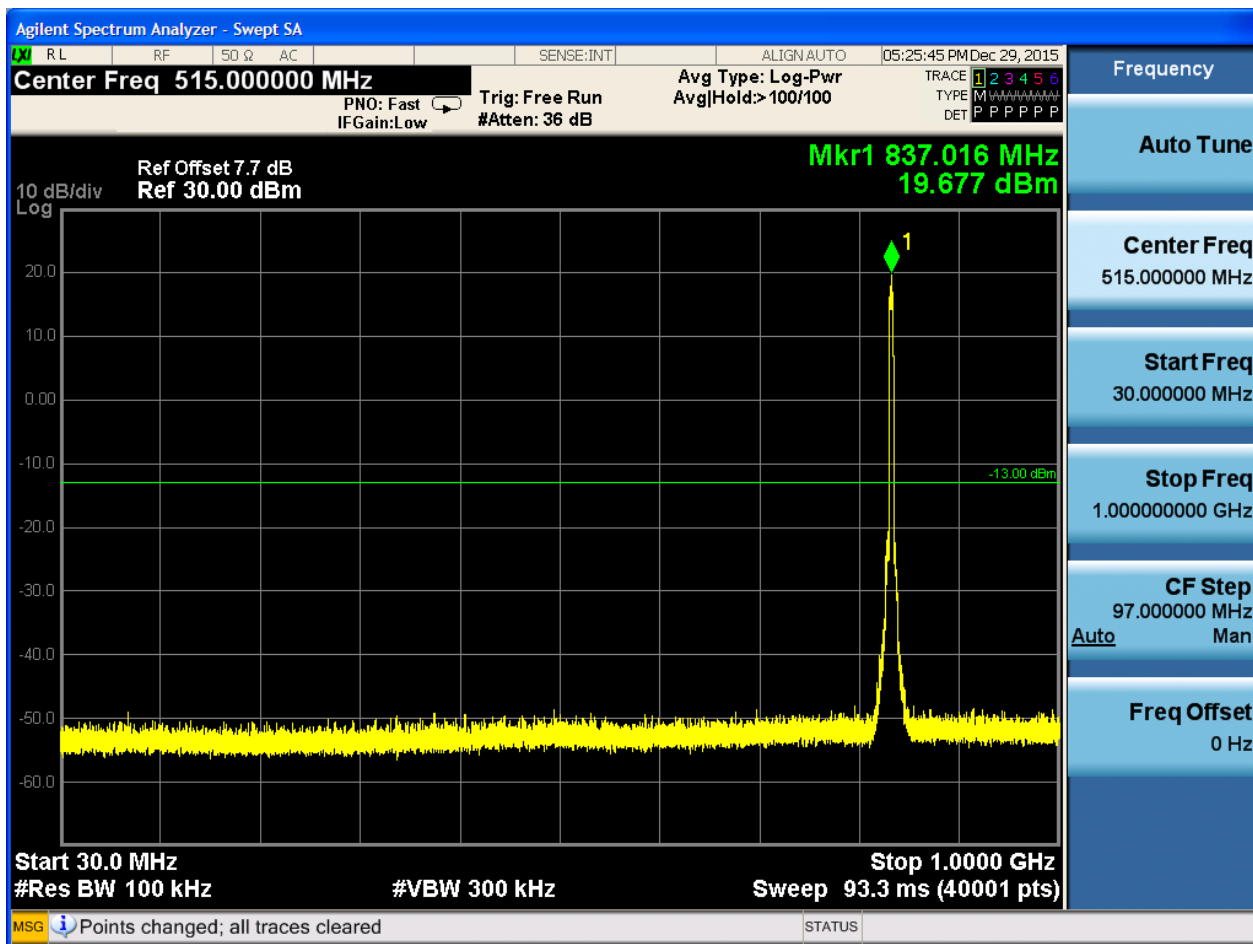


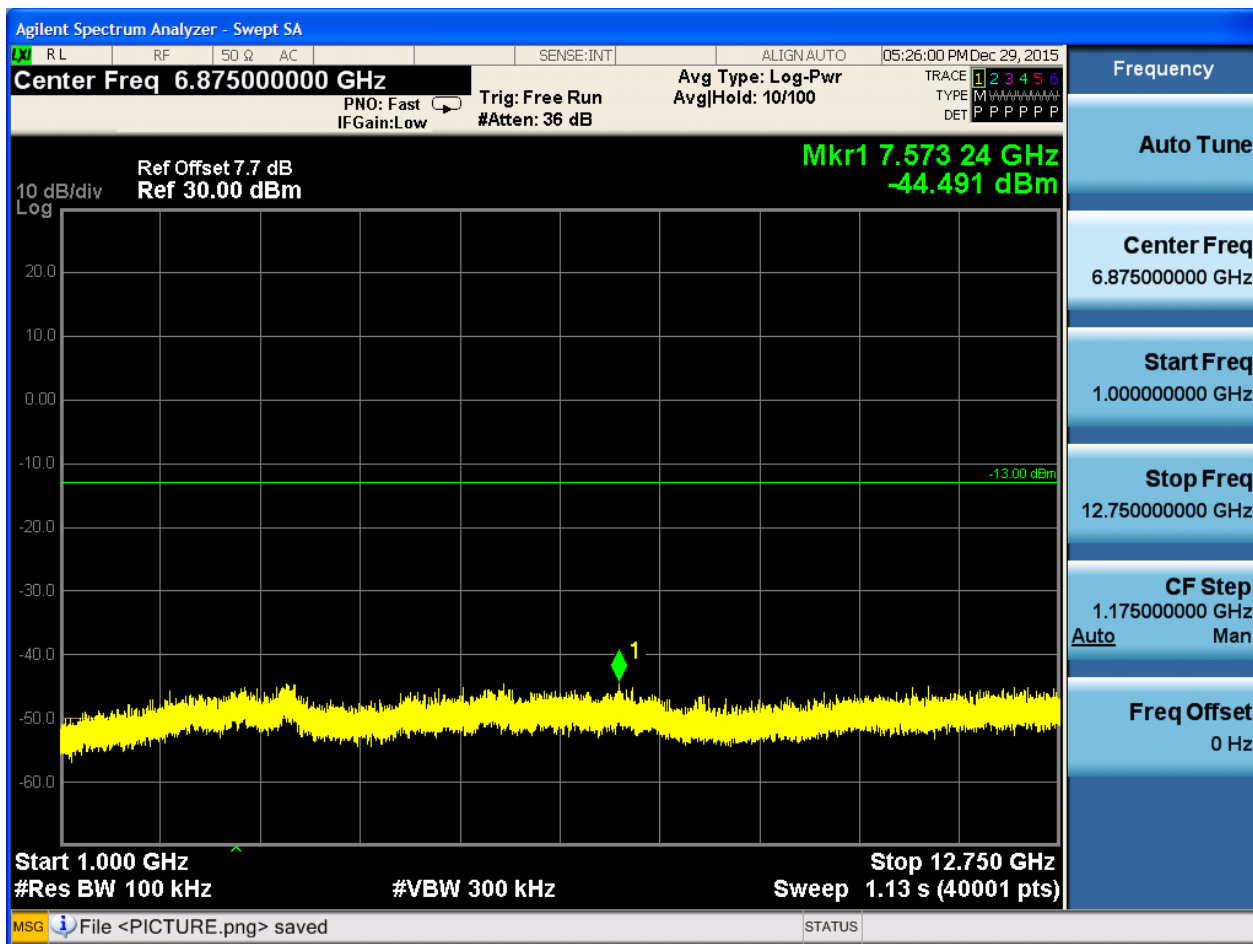


6.2.1.1.2 Test Channel = MCH



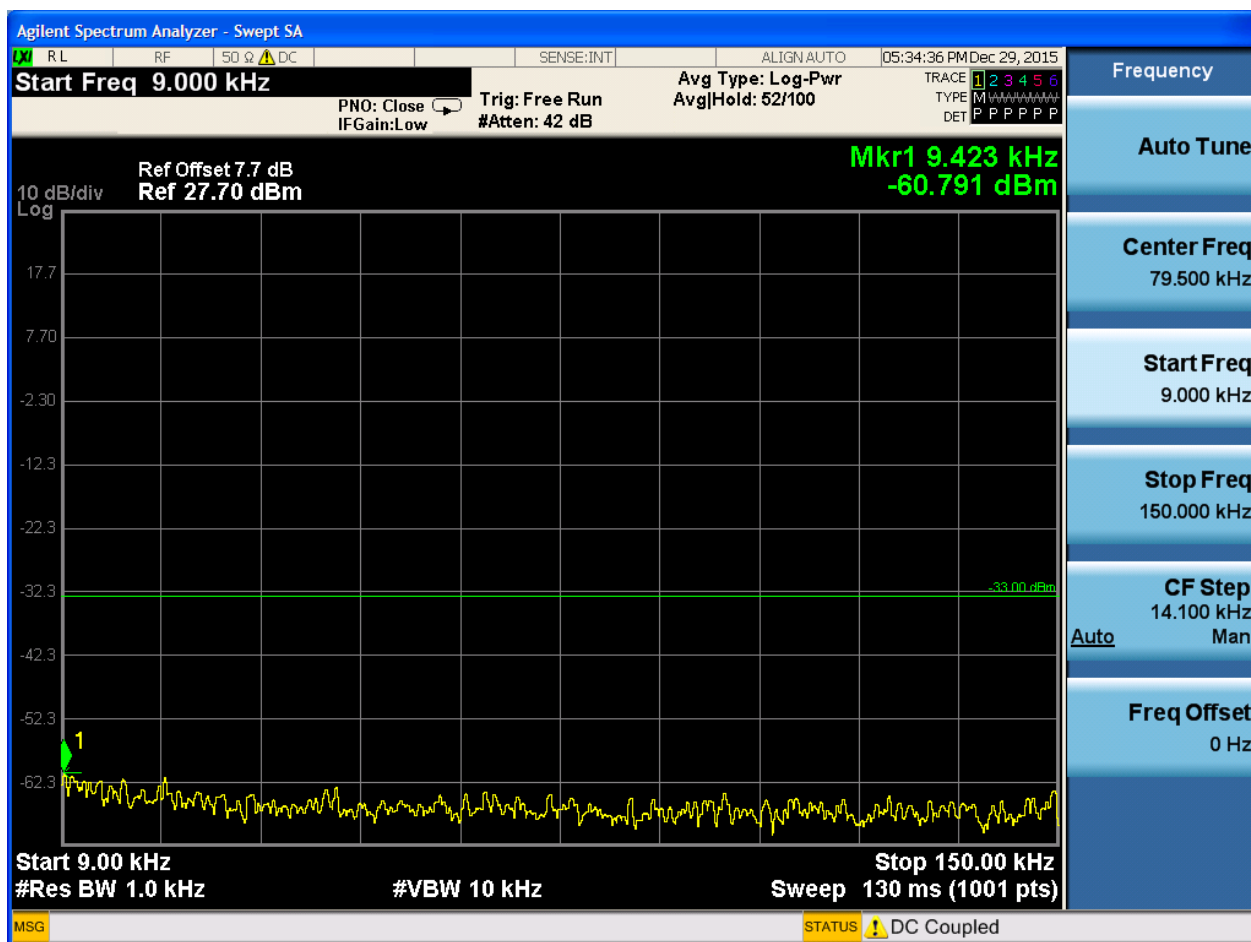


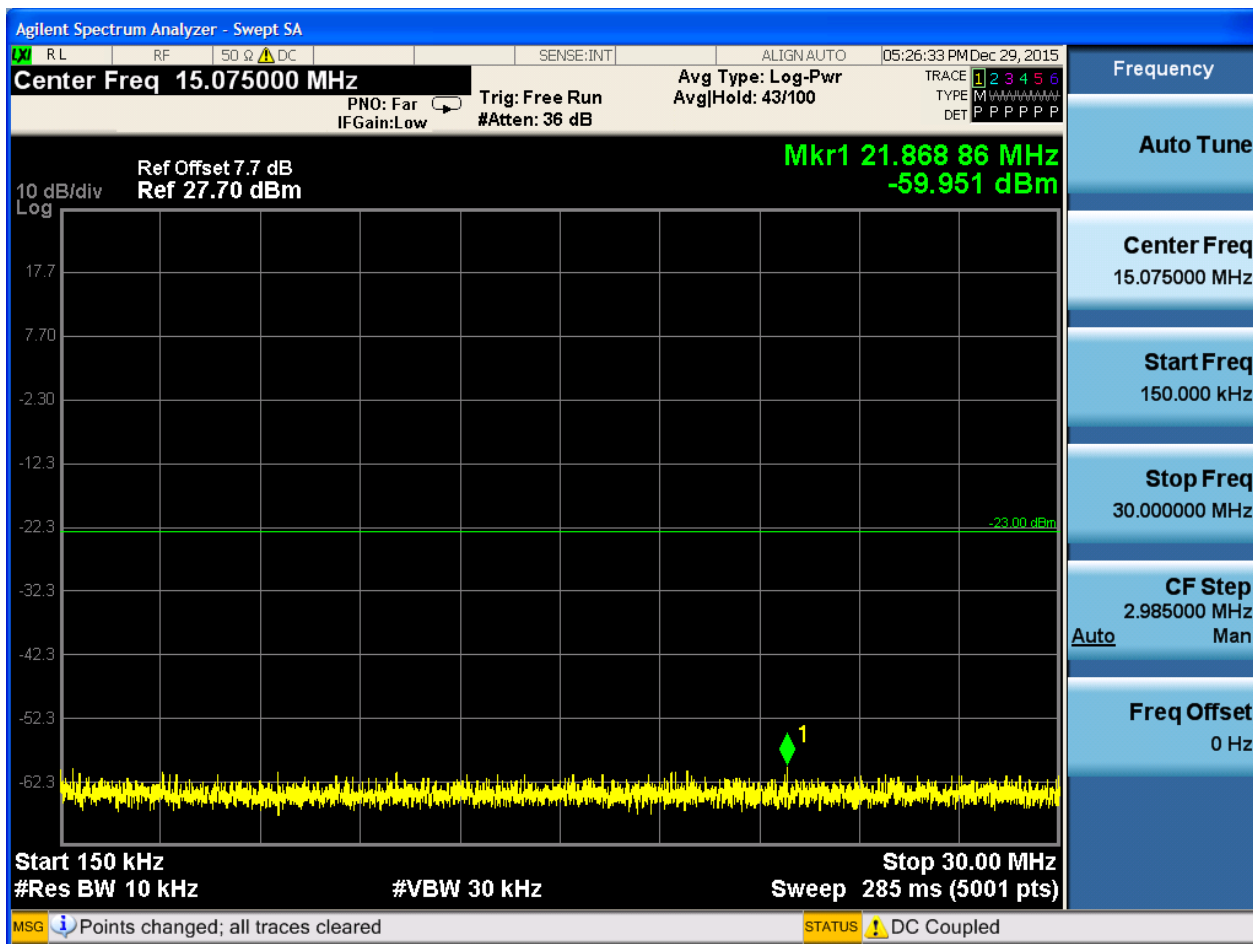


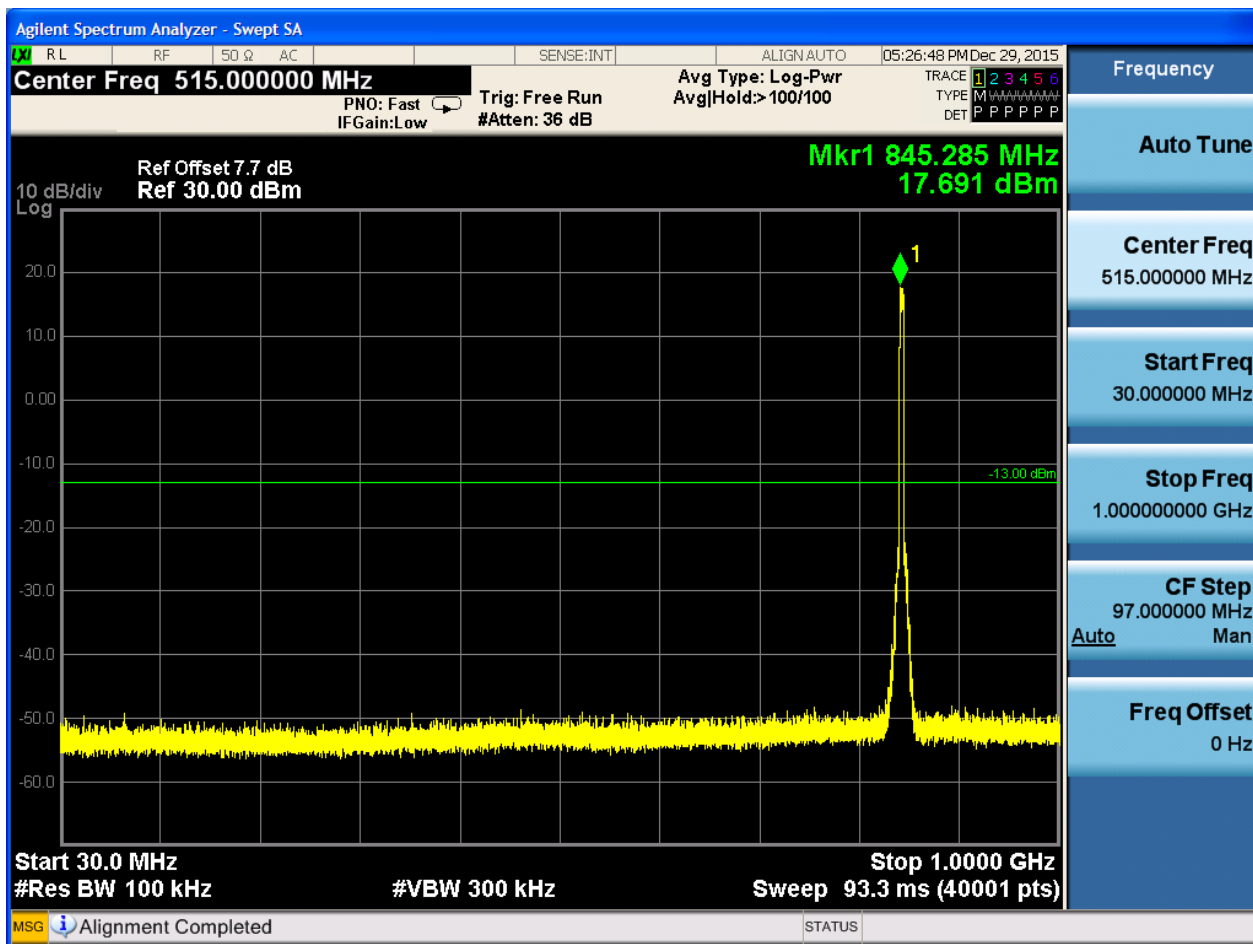


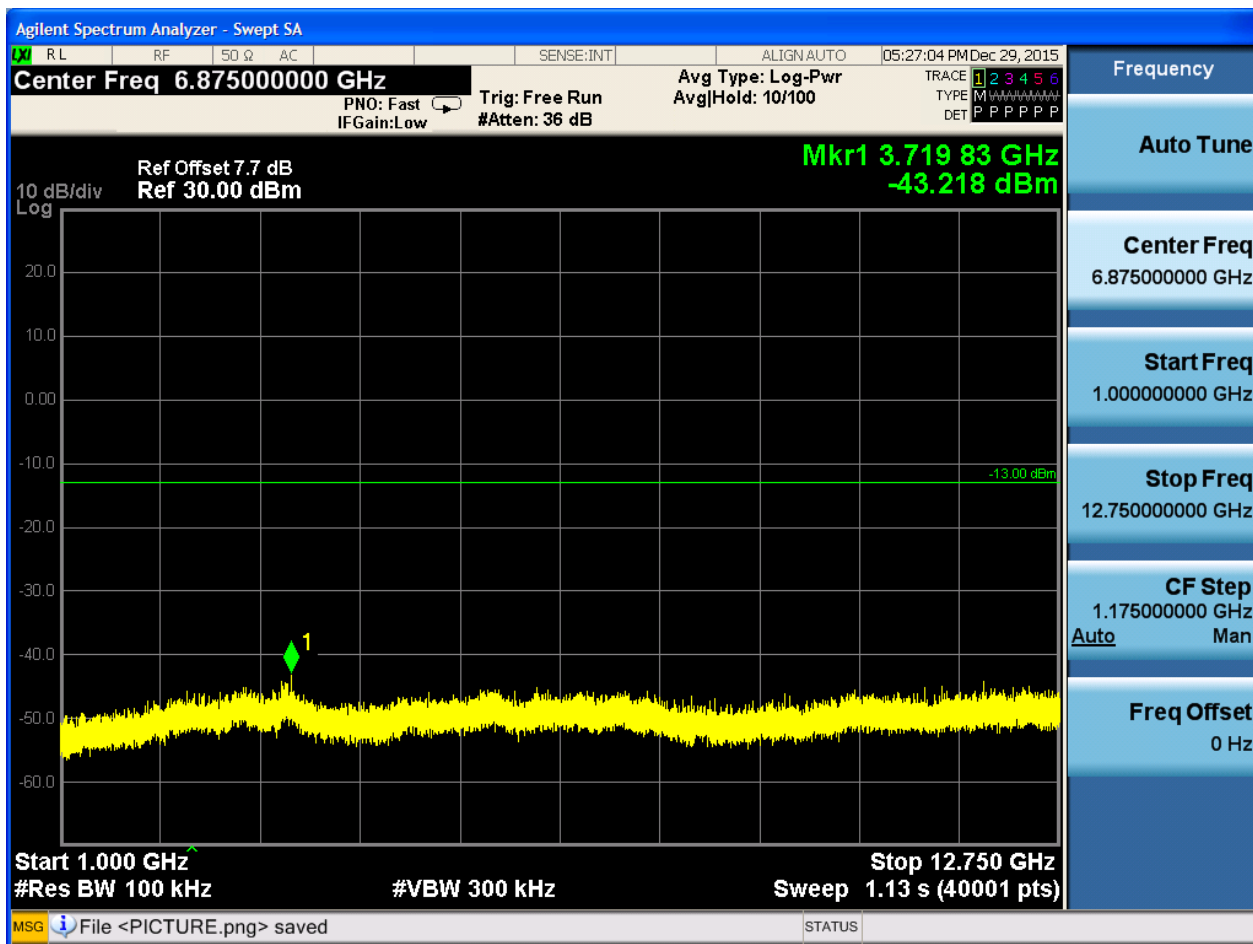


6.2.1.1.3 Test Channel = HCH









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

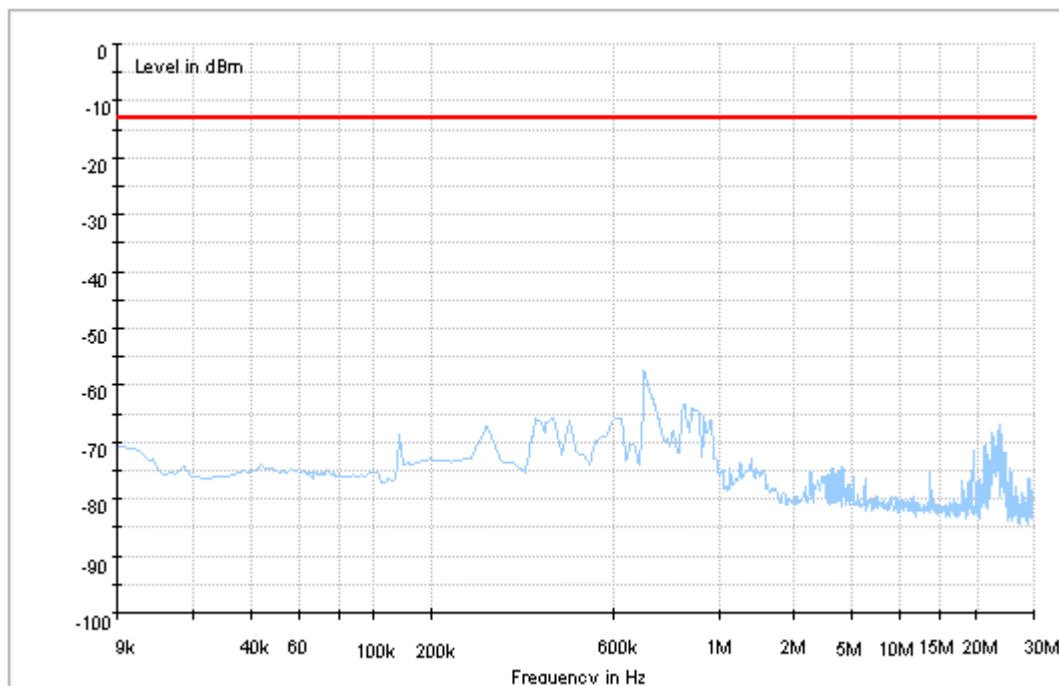
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

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

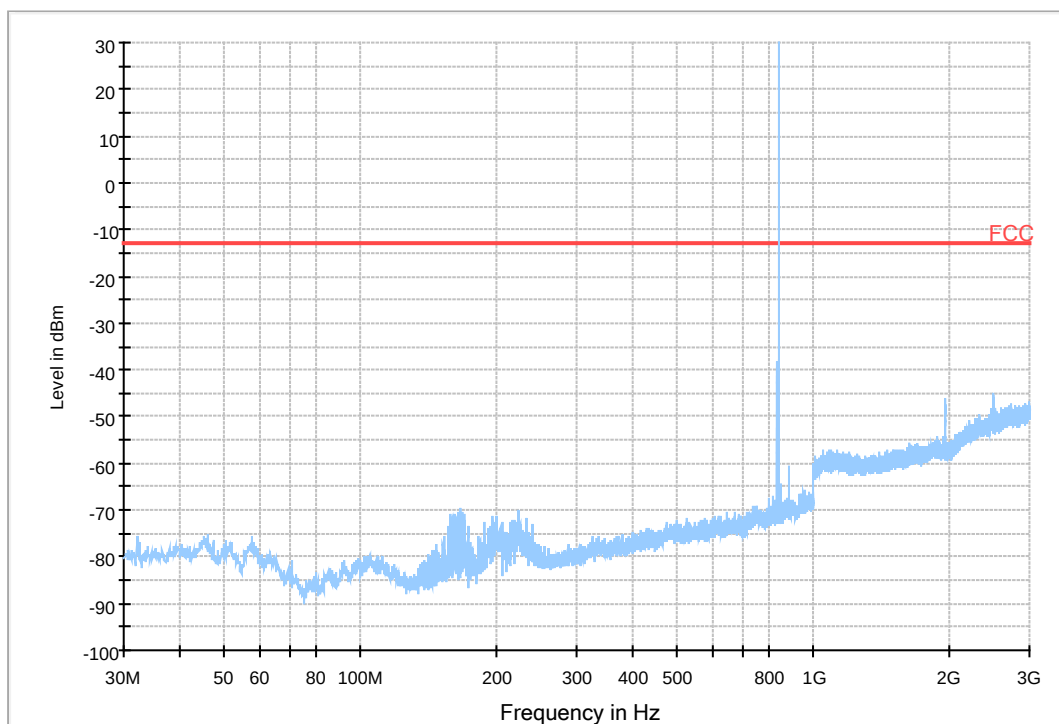
Part I - Test Plots

7.1 For GSM

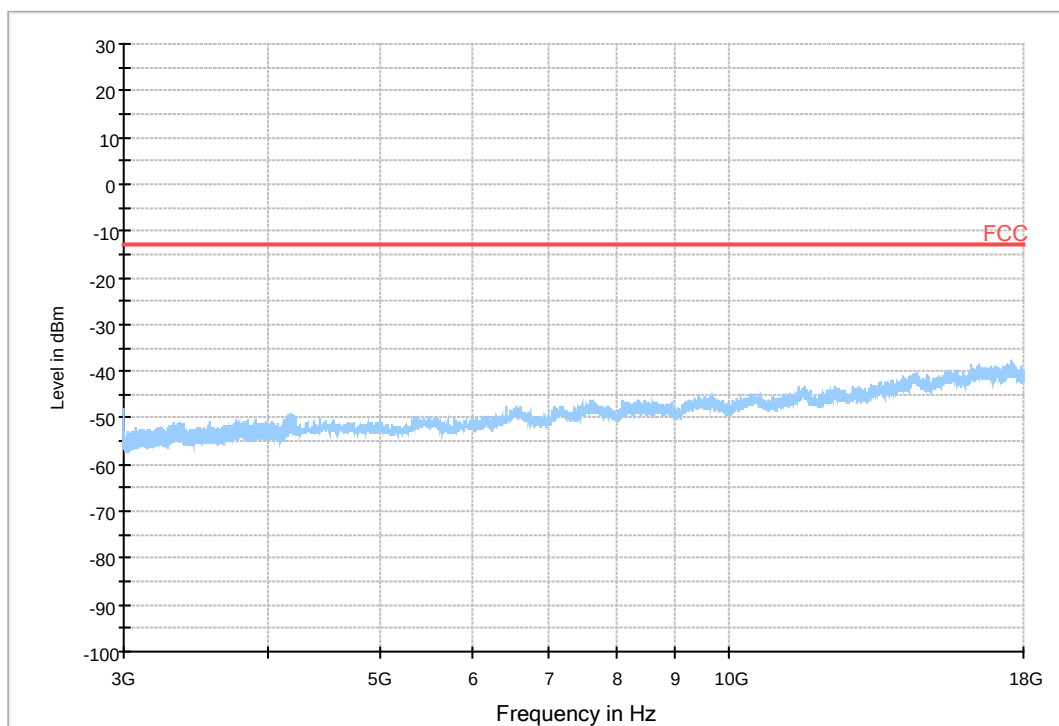
7.1.1 Test Band = GSM850



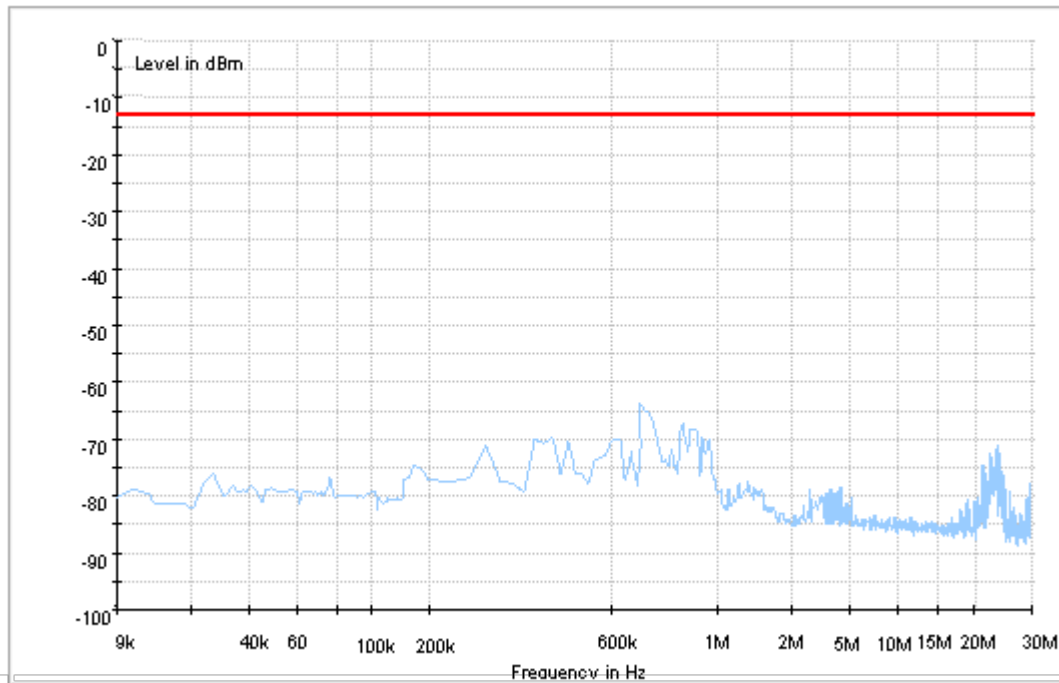
Copy of FCC PART22 GSM850_L



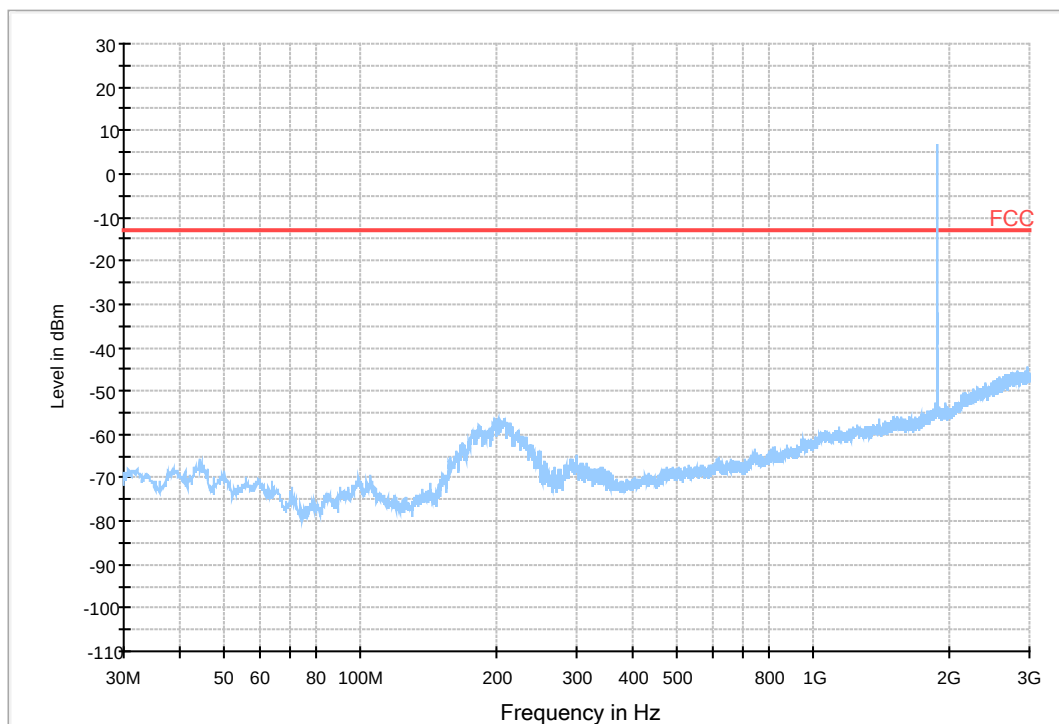
Copy of FCC PART22 GSM850_H



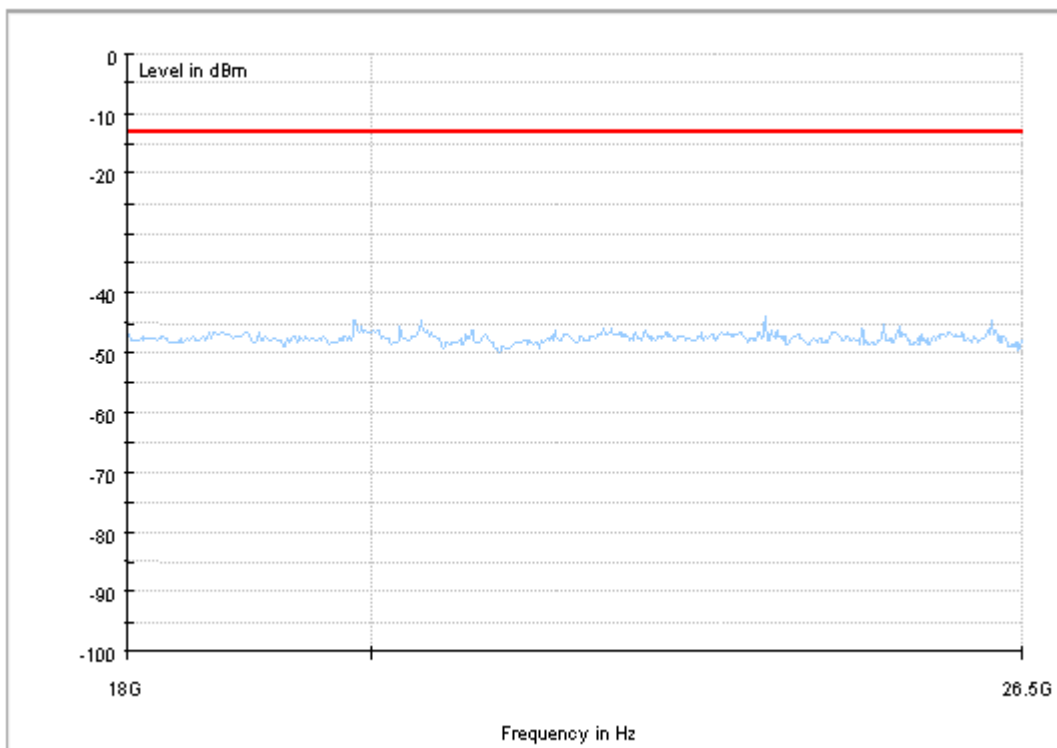
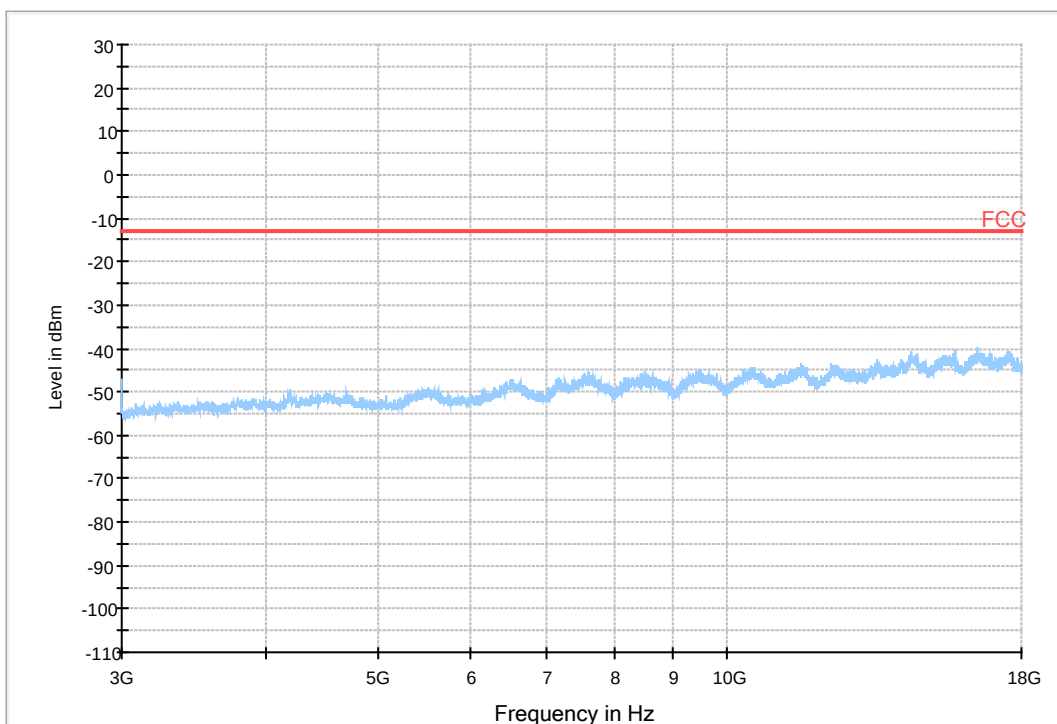
7.1.2 Test Band = GSM1900



Copy of FCC PART24 GSM1900_L



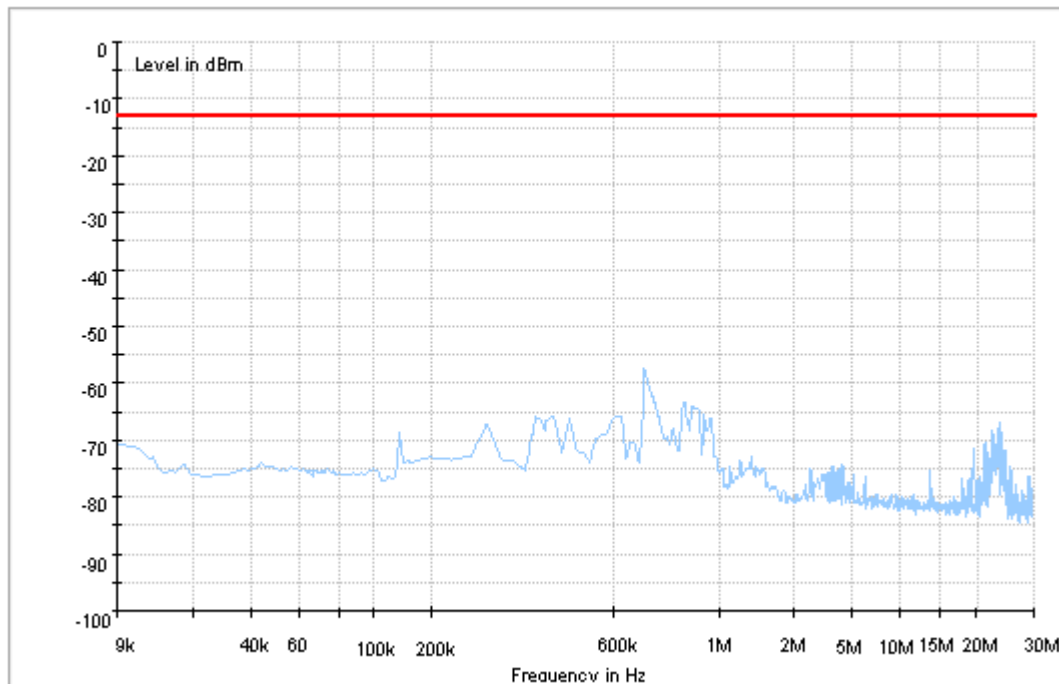
Copy of FCC PART24 GSM1900_H



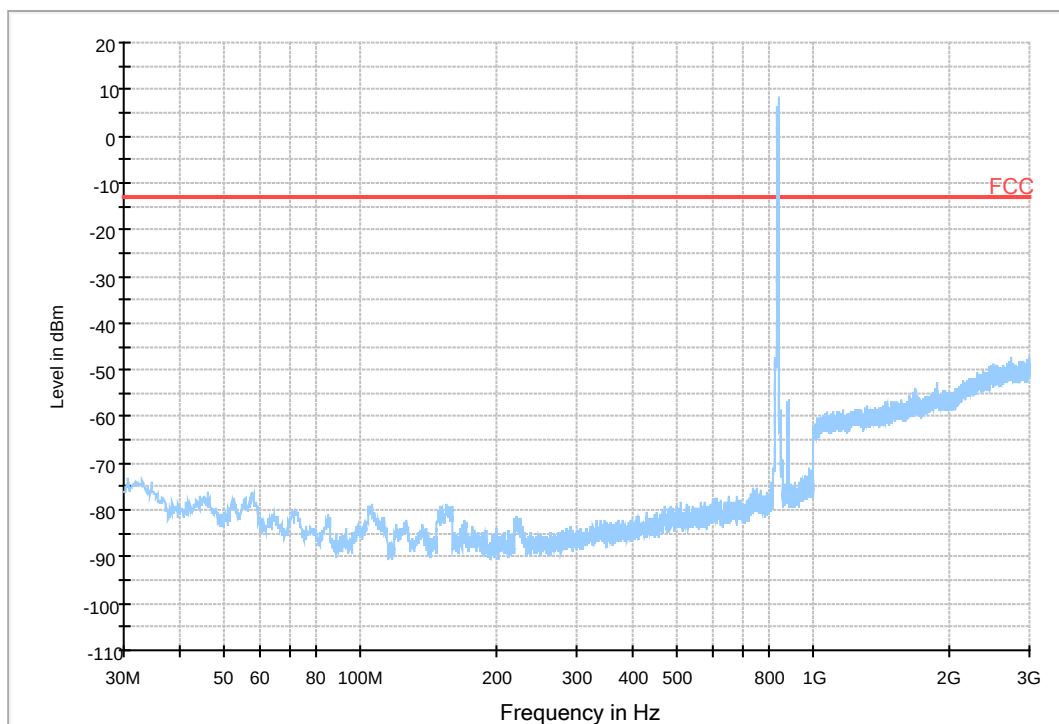
7.2 For UMTS

7.2.1 Test Band = WCDMA850

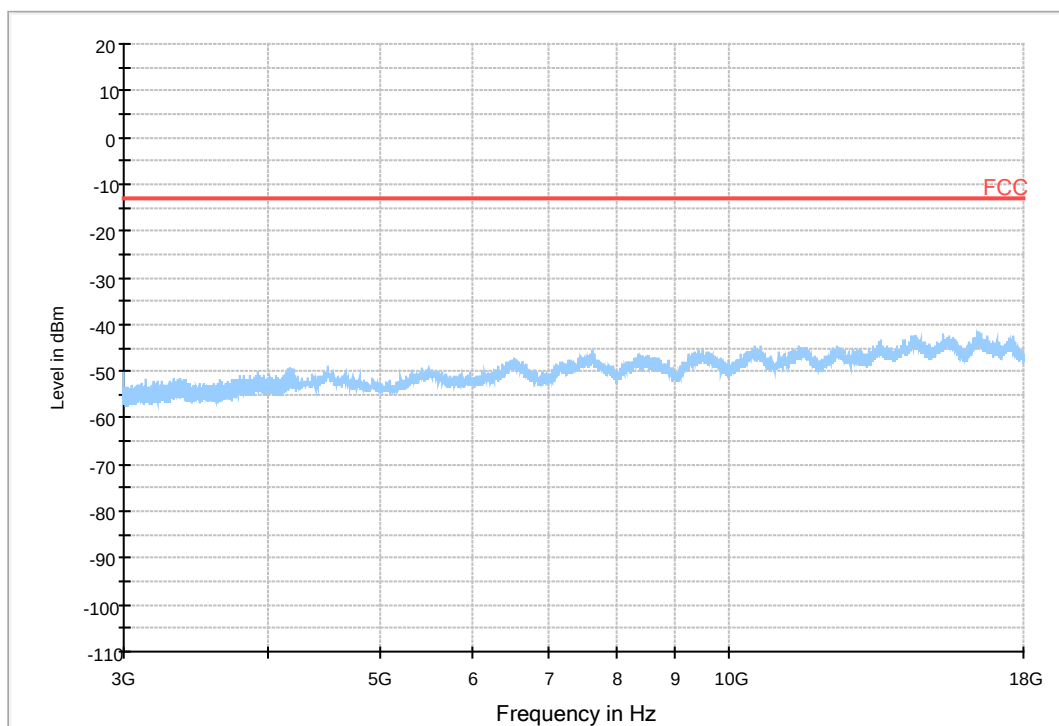
7.2.1.1 Test Mode = UMTS/TM1



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	-11.17	-0.01355	PASS
				VN	-10.78	-0.01308	PASS
				VH	-8.2	-0.00995	PASS
		MCH	TN	VL	-14.4	-0.01721	PASS
				VN	-7.49	-0.00895	PASS
				VH	-9.94	-0.01188	PASS
		HCH	TN	VL	-13.62	-0.01605	PASS
				VN	-10.53	-0.01241	PASS
				VH	-8.01	-0.00944	PASS
	GSM/TM2	LCH	TN	VL	-20.95	-0.02542	PASS
				VN	-13.85	-0.0168	PASS
				VH	-15.08	-0.0183	PASS
		MCH	TN	VL	-17.5	-0.02092	PASS
				VN	-15.88	-0.01898	PASS
				VH	-13.66	-0.01633	PASS
		HCH	TN	VL	-12.98	-0.01529	PASS
				VN	-15.11	-0.0178	PASS
				VH	-10.33	-0.01217	PASS
GSM1900	GSM/TM1	LCH	TN	VL	14.79	0.00799	PASS
				VN	12.59	0.0068	PASS
				VH	16.01	0.00865	PASS
		MCH	TN	VL	16.85	0.00896	PASS
				VN	13.04	0.00694	PASS
				VH	15.56	0.00828	PASS
		HCH	TN	VL	16.98	0.00889	PASS
				VN	14.27	0.00747	PASS
				VH	17.82	0.00933	PASS
	GSM/TM2	LCH	TN	VL	6.72	0.00363	PASS
				VN	14.11	0.00763	PASS
				VH	5.46	0.00295	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		MCH	TN	VL	11.33	0.00603	PASS
				VN	7.26	0.00386	PASS
				VH	10.4	0.00553	PASS
		HCH	TN	VL	6.88	0.0036	PASS
				VN	10.94	0.00573	PASS
				VH	1	0.00052	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	-11.62	-0.0141	PASS
				-20	-10.91	-0.01324	PASS
				-10	-7.62	-0.00925	PASS
				0	-6.59	-0.008	PASS
				10	-12.66	-0.01536	PASS
				20	-11.49	-0.01394	PASS
				30	-10.14	-0.0123	PASS
				40	-10.53	-0.01278	PASS
				50	-11.95	-0.0145	PASS
		MCH	VN	-30	-10.2	-0.01219	PASS
				-20	-11.82	-0.01413	PASS
				-10	-11.75	-0.01404	PASS
				0	-10.4	-0.01243	PASS
				10	-13.04	-0.01559	PASS
				20	-9.23	-0.01103	PASS
				30	-12.46	-0.01489	PASS
				40	-10.01	-0.01197	PASS
				50	-13.56	-0.01621	PASS
		HCH	VN	-30	-12.98	-0.01529	PASS
				-20	-8.27	-0.00974	PASS
				-10	-11.75	-0.01384	PASS
				0	-6.13	-0.00722	PASS
				10	-11.88	-0.014	PASS
				20	-8.91	-0.0105	PASS
				30	-11.69	-0.01377	PASS
				40	-10.01	-0.01179	PASS
				50	-6.13	-0.00722	PASS
	GSM/TM2	LCH	VN	-30	-18.14	-0.02201	PASS
				-20	-25.51	-0.03095	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-10	-17.24	-0.02092	PASS
				0	-18.69	-0.02268	PASS
				10	-10.91	-0.01324	PASS
				20	-18.82	-0.02283	PASS
				30	-16.24	-0.0197	PASS
				40	-10.82	-0.01313	PASS
				50	-19.69	-0.02389	PASS
		MCH	VN	-30	-11.43	-0.01366	PASS
				-20	-9.07	-0.01084	PASS
				-10	-13.14	-0.01571	PASS
				0	-21.02	-0.02513	PASS
				10	-21.15	-0.02528	PASS
				20	-21.5	-0.0257	PASS
				30	-9.04	-0.01081	PASS
				40	-16.21	-0.01938	PASS
				50	-15.85	-0.01895	PASS
		HCH	VN	-30	-20.31	-0.02393	PASS
				-20	-16.95	-0.01997	PASS
				-10	-15.88	-0.01871	PASS
				0	-14.11	-0.01662	PASS
				10	-14.21	-0.01674	PASS
				20	-13.98	-0.01647	PASS
				30	-16.63	-0.01959	PASS
				40	-14.4	-0.01697	PASS
				50	-13.62	-0.01605	PASS
GSM1900	GSM/TM1	LCH	VN	-30	20.6	0.01113	PASS
				-20	8.27	0.00447	PASS
				-10	12.53	0.00677	PASS
				0	16.14	0.00872	PASS
				10	17.69	0.00956	PASS
				20	9.3	0.00503	PASS
				30	21.63	0.01169	PASS
				40	14.98	0.0081	PASS
				50	17.95	0.0097	PASS
		MCH	VN	-30	28.48	0.01515	PASS
				-20	29.06	0.01546	PASS
				-10	14.46	0.00769	PASS
				0	24.73	0.01315	PASS
				10	11.11	0.00591	PASS
				20	15.76	0.00838	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	23.96	0.01274	PASS
				40	14.01	0.00745	PASS
				50	4.33	0.0023	PASS
		HCH	VN	-30	4.97	0.0026	PASS
				-20	19.31	0.01011	PASS
				-10	20.73	0.01085	PASS
				0	9.1	0.00476	PASS
				10	12.91	0.00676	PASS
				20	22.21	0.01163	PASS
				30	11.49	0.00602	PASS
				40	17.89	0.00937	PASS
				50	27.96	0.01464	PASS
	GSM/TM2	LCH	VN	-30	9.98	0.00539	PASS
				-20	6.23	0.00337	PASS
				-10	-2.07	-0.00112	PASS
				0	18.37	0.00993	PASS
				10	5.65	0.00305	PASS
				20	1.42	0.00077	PASS
				30	12.11	0.00655	PASS
				40	3.23	0.00175	PASS
				50	11.85	0.0064	PASS
		MCH	VN	-30	3.68	0.00196	PASS
				-20	15.63	0.00831	PASS
				-10	9.69	0.00515	PASS
				0	7.33	0.0039	PASS
				10	4.42	0.00235	PASS
				20	15.85	0.00843	PASS
				30	10.07	0.00536	PASS
				40	7.01	0.00373	PASS
				50	7.39	0.00393	PASS
		HCH	VN	-30	-0.52	-0.00027	PASS
				-20	22.73	0.0119	PASS
				-10	15.82	0.00828	PASS
				0	17.37	0.0091	PASS
				10	9.72	0.00509	PASS
				20	-0.94	-0.00049	PASS
				30	14.24	0.00746	PASS
				40	-8.07	-0.00423	PASS
				50	6.52	0.00341	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	4	0.00484	PASS
				VN	0.23	0.00028	PASS
				VH	-4.12	-0.00499	PASS
		MCH	TN	VL	1.24	0.00148	PASS
				VN	0.67	0.0008	PASS
				VH	2.64	0.00316	PASS
		HCH	TN	VL	3.62	0.00428	PASS
				VN	3.13	0.0037	PASS
				VH	5.4	0.00638	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	-5.54	-0.0067	PASS
				-20	2.46	0.00298	PASS
				-10	5.25	0.00635	PASS
				0	5.43	0.00657	PASS
				10	-3.31	-0.00401	PASS
				20	3.36	0.00407	PASS
				30	0.99	0.0012	PASS
				40	5.78	0.00699	PASS
				50	-2.9	-0.00351	PASS
		MCH	VN	-30	4.09	0.00489	PASS
				-20	-3.52	-0.00421	PASS
				-10	6.61	0.0079	PASS
				0	5.34	0.00638	PASS
				10	3.28	0.00392	PASS
				20	1.69	0.00202	PASS
				30	6.45	0.00771	PASS
				40	5.19	0.00621	PASS
				50	-1.51	-0.00181	PASS
		HCH	VN	-30	-2.88	-0.0034	PASS
				-20	3.75	0.00443	PASS
				-10	5.83	0.00689	PASS
				0	-3.39	-0.004	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				10	-1.31	-0.00155	PASS
				20	-0.81	-0.00096	PASS
				30	0.05	0.00006	PASS
				40	9	0.01063	PASS
				50	2.91	0.00344	PASS

END