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/EIRP [dBm]	Limit [dBm]	Verdict
GSM850	GSM/TM1	LCH	31.87	28.54	38.5	PASS
		MCH	31.97	28.64	38.5	PASS
		HCH	31.99	28.66	38.5	PASS
	GSM/TM2	LCH	25.98	22.65	38.5	PASS
		MCH	25.87	22.54	38.5	PASS
		HCH	25.89	22.56	38.5	PASS
GSM1900	GSM/TM1	LCH	29.25	29.43	33	PASS
		MCH	28.98	29.16	33	PASS
		HCH	29.04	29.22	33	PASS
	GSM/TM2	LCH	25.32	25.5	33	PASS
		MCH	25.35	25.53	33	PASS
		HCH	25.35	25.53	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:

SET Span=1.5*OBW

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

SET VBW>= 3*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
GSM1900	GSM/TM1	LCH	0.14	13	PASS
		MCH	0.12	13	PASS
		HCH	0.13	13	PASS
	GSM/TM2	LCH	2.76	13	PASS
		MCH	2.93	13	PASS
		HCH	2.72	13	PASS

3Appendix_C: Modulation Characteristics

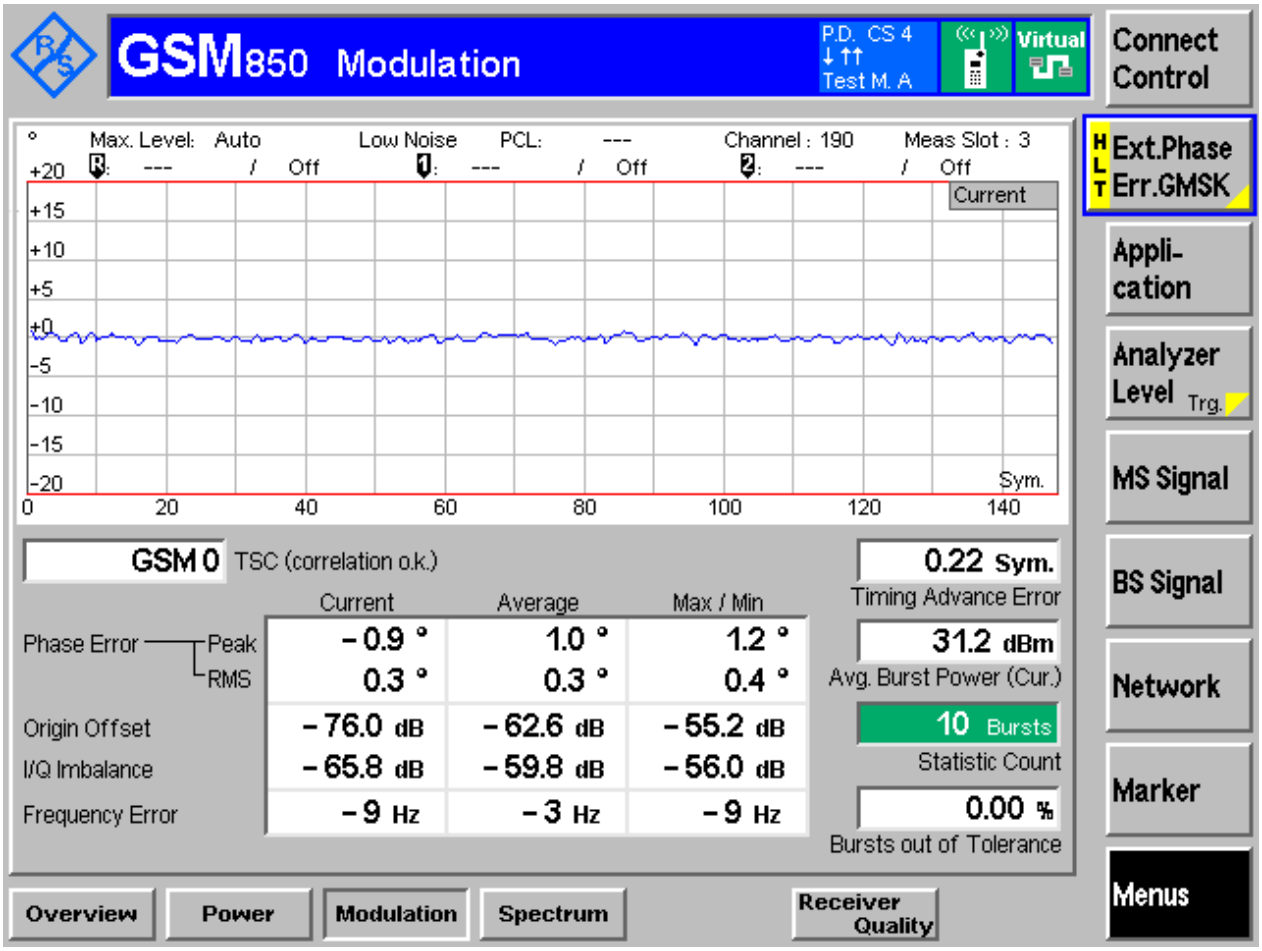
Part I - Test Plots

3.1 For GSM

3.1.2 Test Band = GSM850

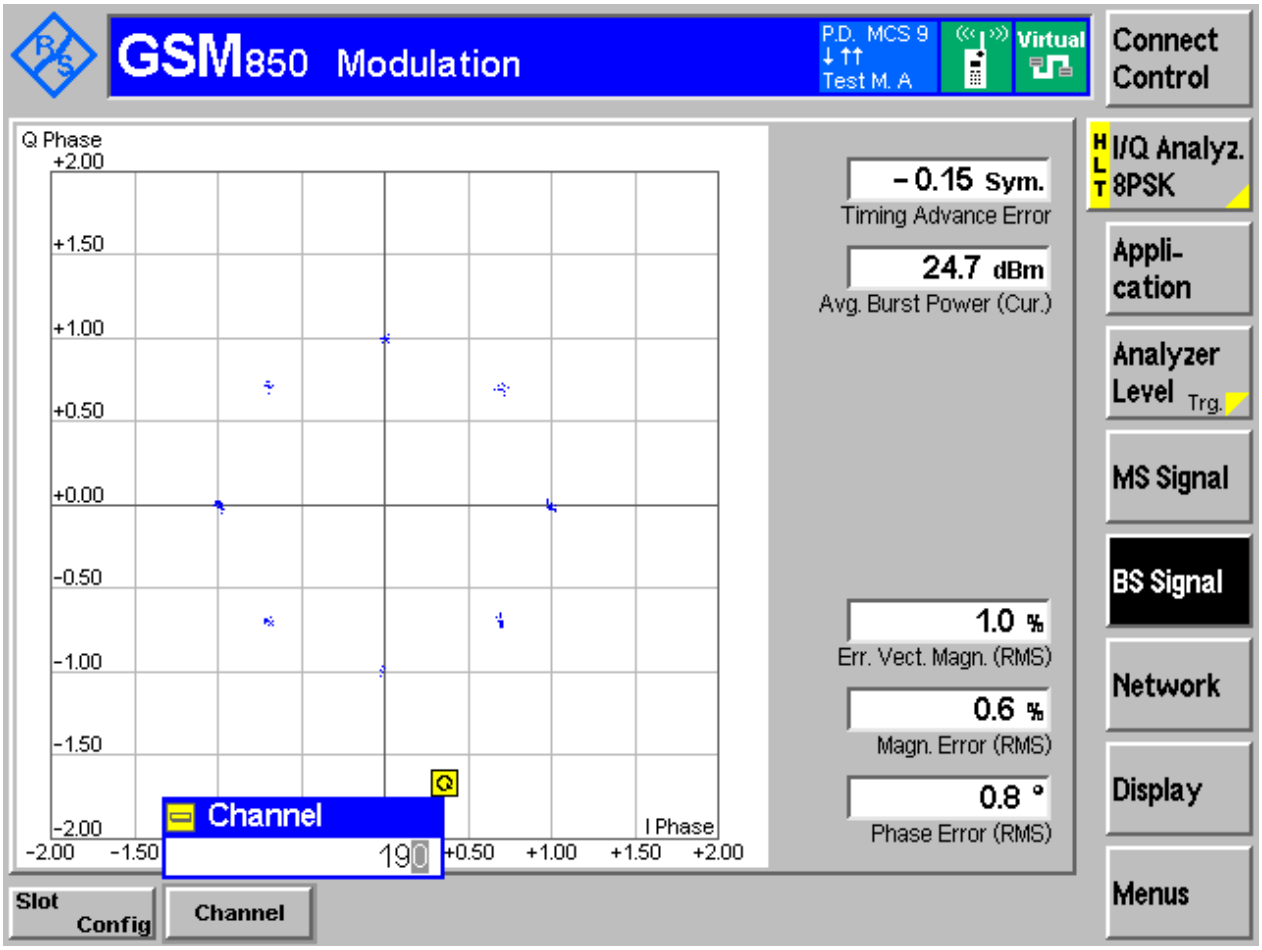
3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH



3.1.2.2 Test Mode = GSM/TM2

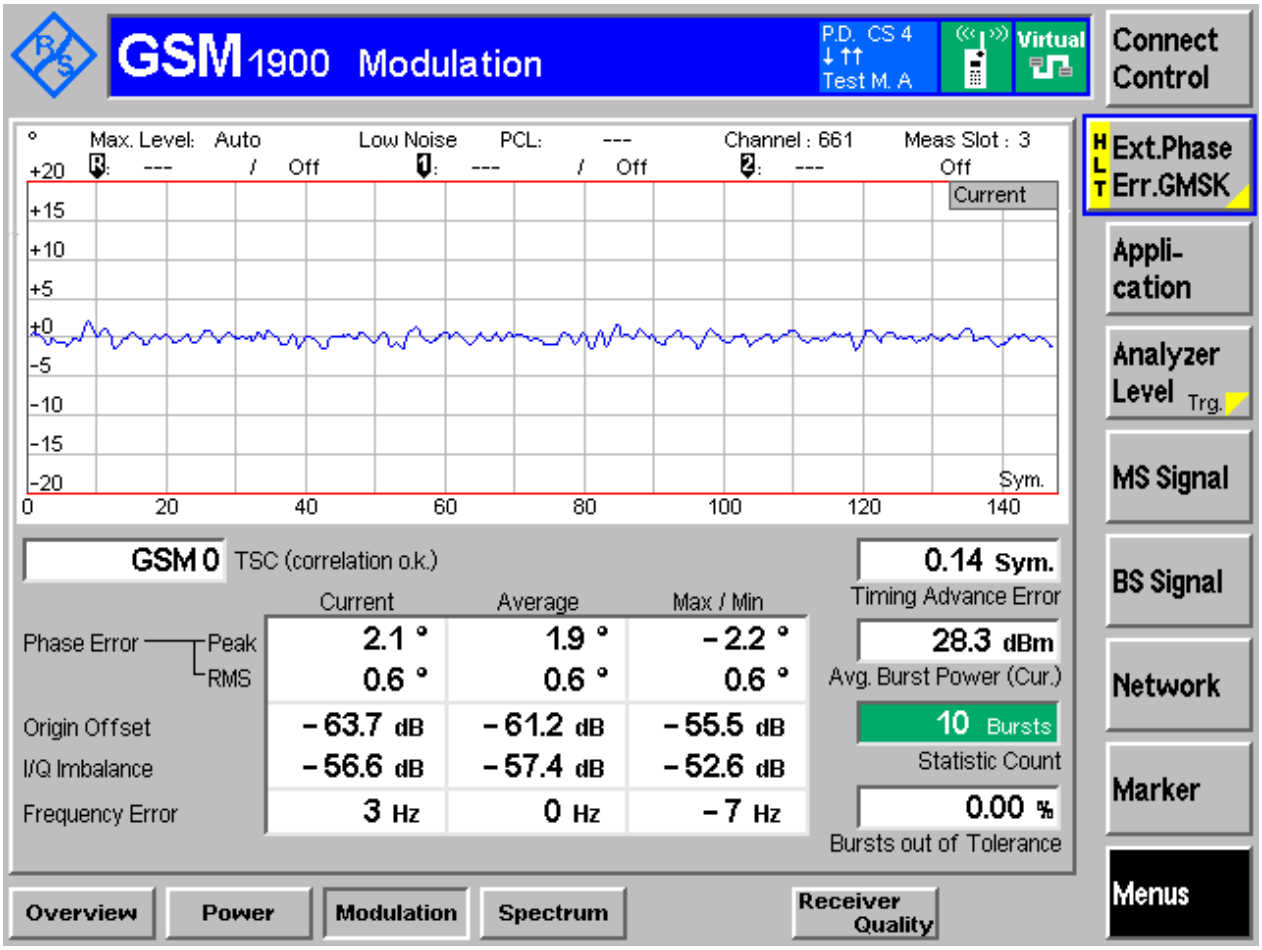
3.1.2.2.1 Test Channel = MCH



3.1.3 Test Band = GSM1900

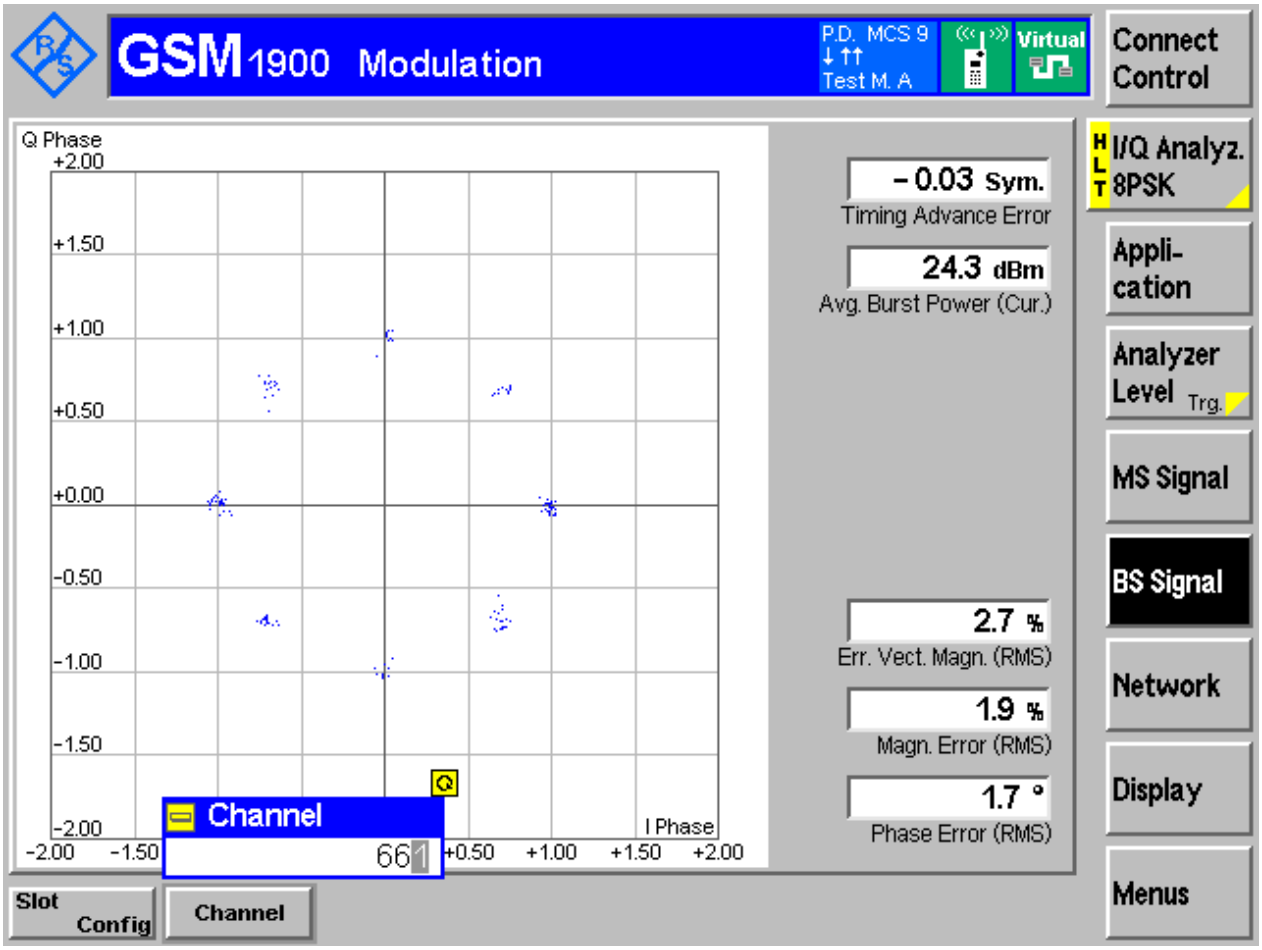
3.1.3.1 Test Mode = GSM/TM1

3.1.3.1.1 Test Channel = MCH



3.1.3.2 Test Mode = GSM/TM2

3.1.3.2.1 Test Channel = MCH



4Appendix_D: Bandwidth

Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
GSM850	GSM/TM1	LCH	244.81	320.02	Pass
		MCH	244.59	312.25	Pass
		HCH	245.82	313.45	Pass
	GSM/TM2	LCH	252.40	311.91	Pass
		MCH	246.65	309.50	Pass
		HCH	246.79	313.38	Pass
GSM1900	GSM/TM1	LCH	244.29	314.66	Pass
		MCH	246.60	317.36	Pass
		HCH	246.08	314.34	Pass
	GSM/TM2	LCH	250.39	320.96	Pass
		MCH	252.95	315.72	Pass
		HCH	252.11	314.87	Pass

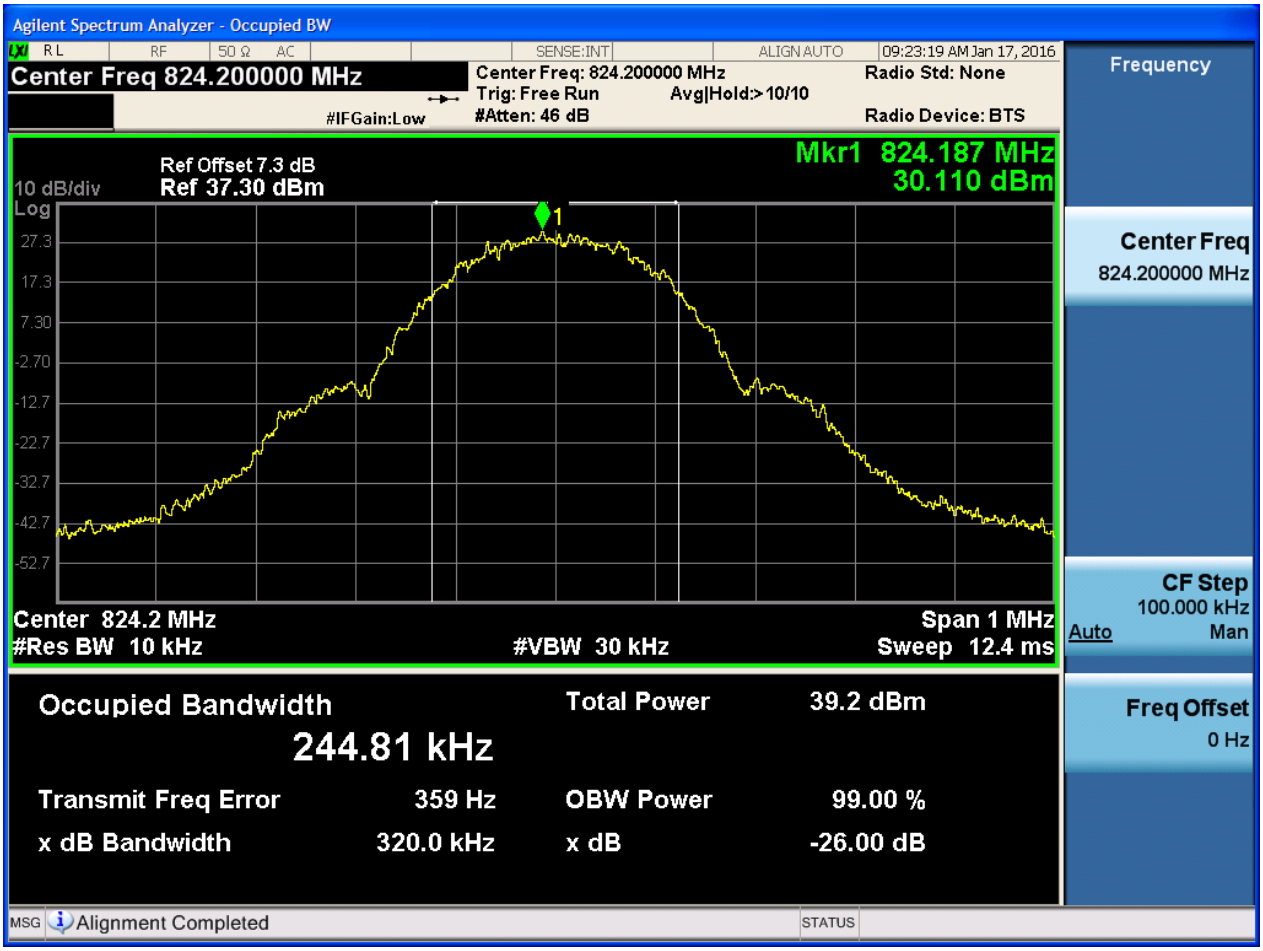
Part II - Test Plots

4.1 For GSM

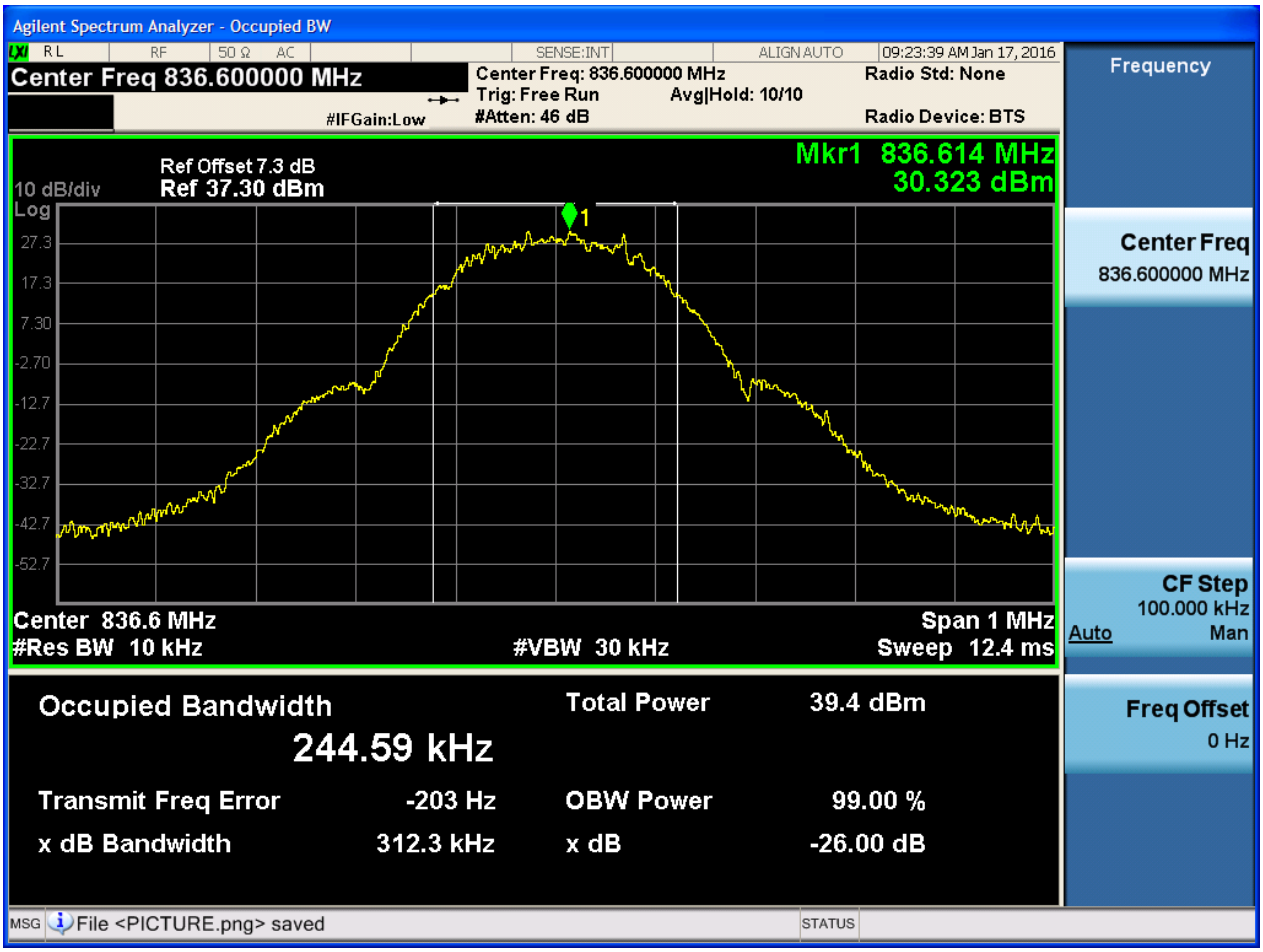
4.1.1 Test Band = GSM850

4.1.1.1 Test Mode = GSM/TM1

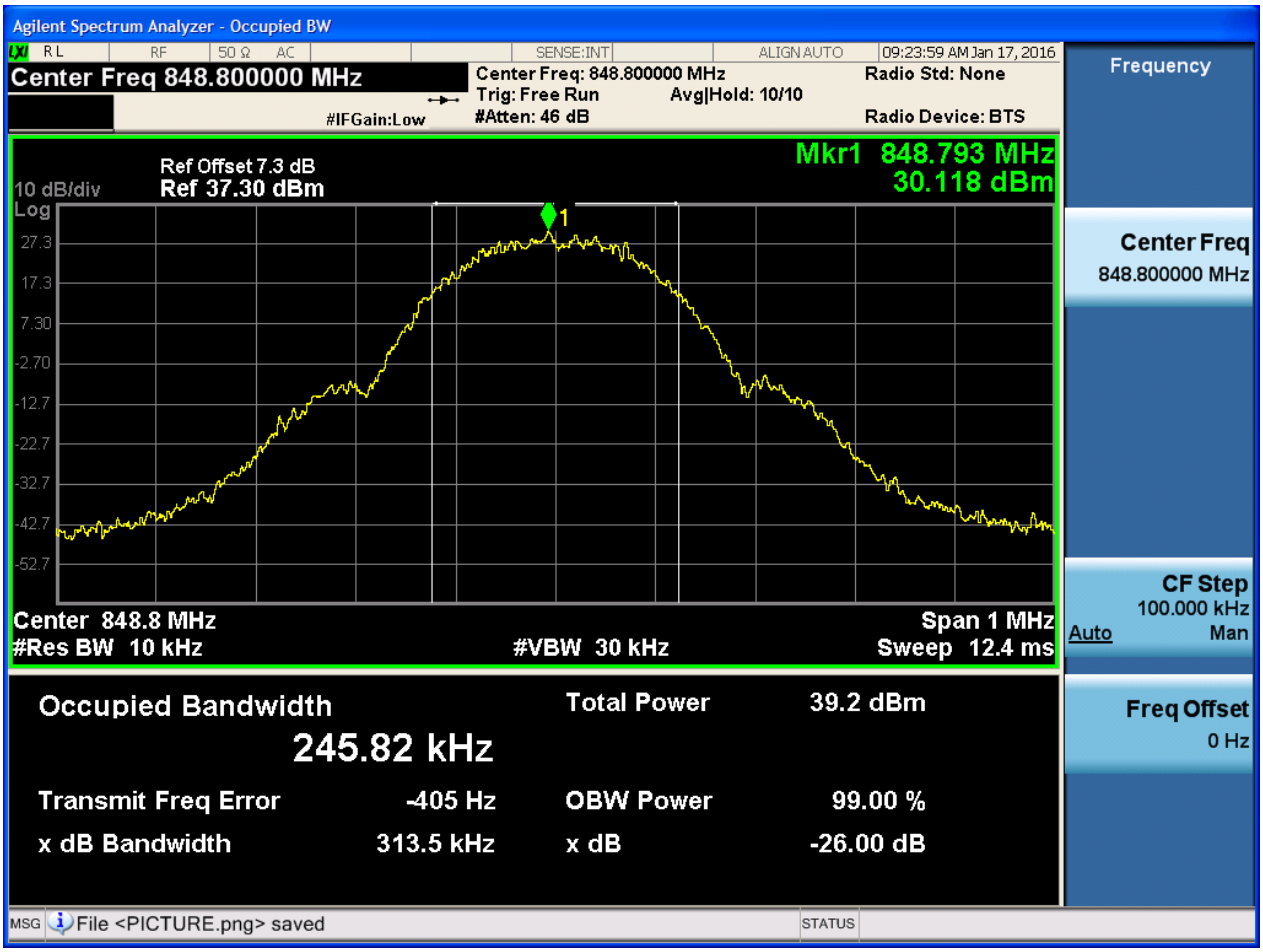
4.1.1.1.1 Test Channel = LCH



4.1.1.1.2 Test Channel = MCH

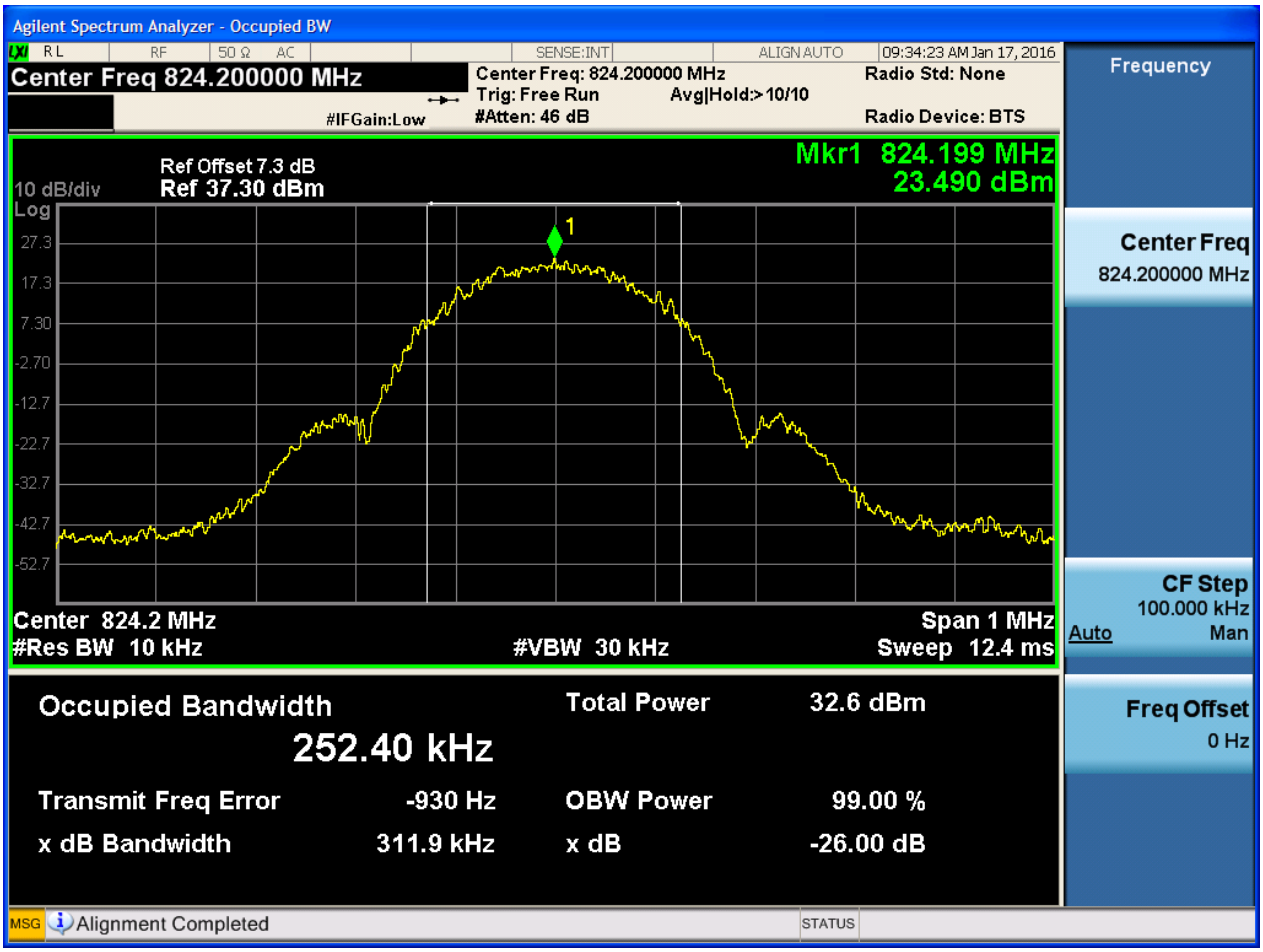


4.1.1.1.3 Test Channel = HCH

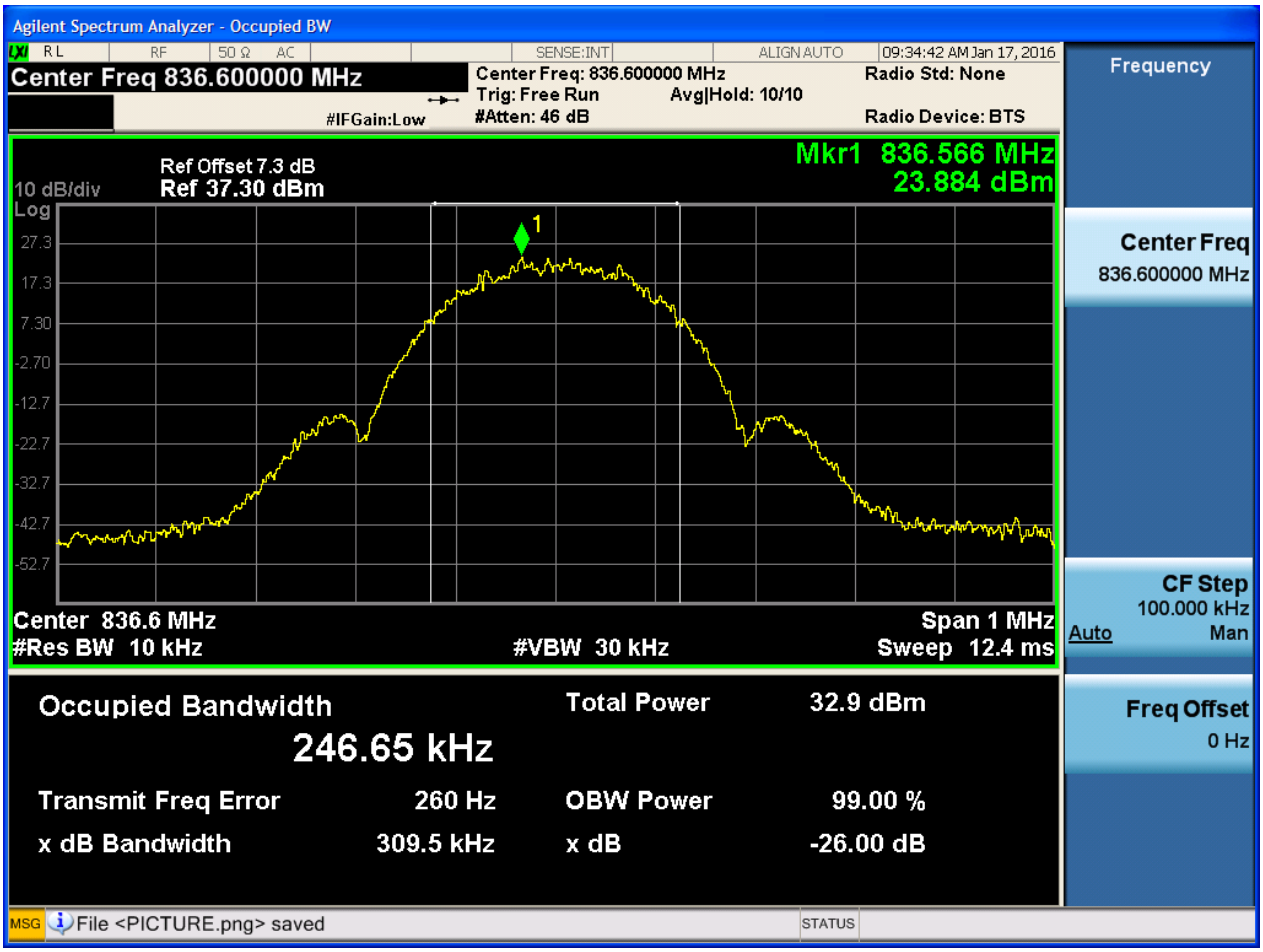


4.1.1.2 Test Mode = GSM/TM2

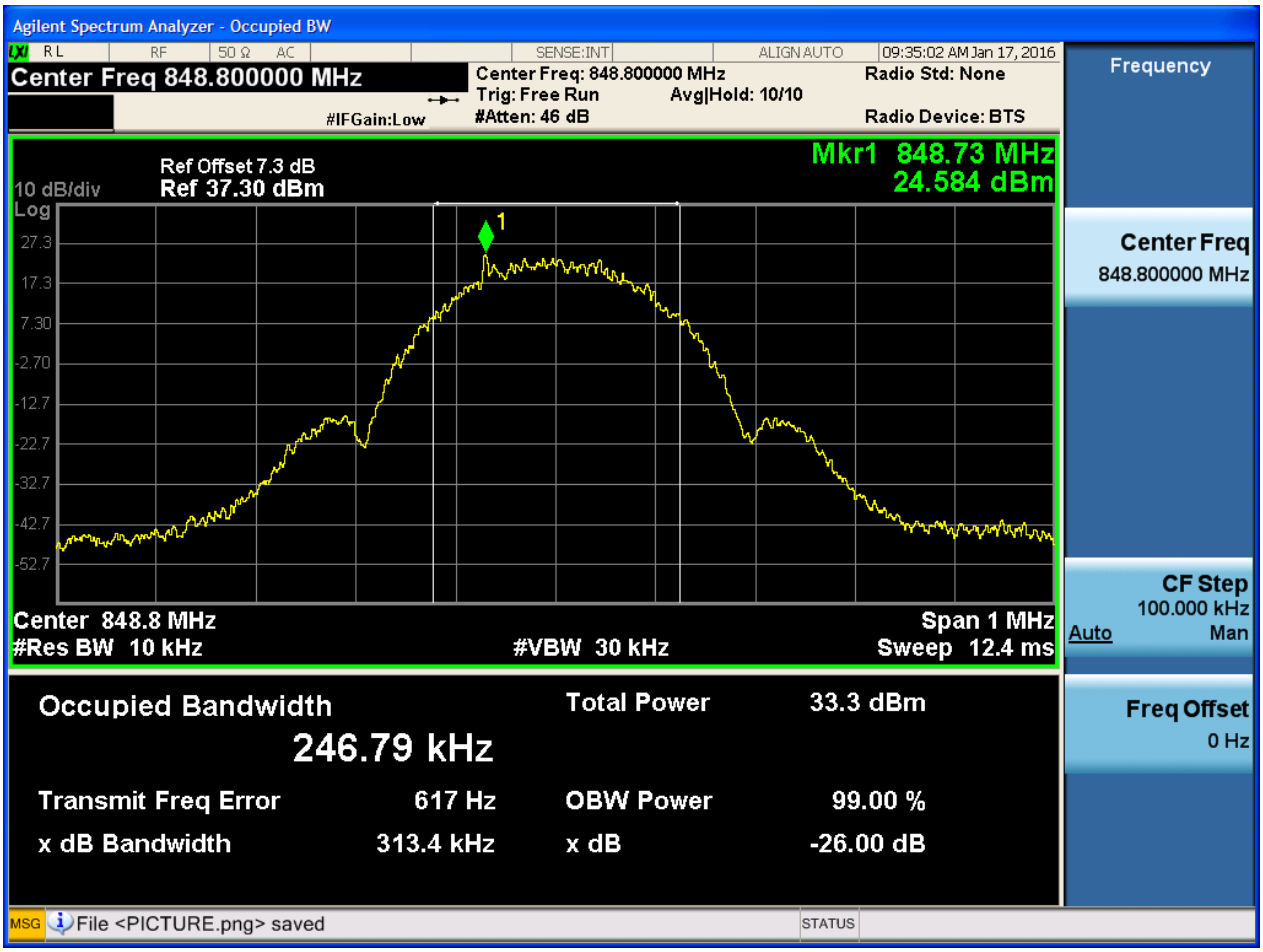
4.1.1.2.1 Test Channel = LCH



4.1.1.2.2 Test Channel = MCH



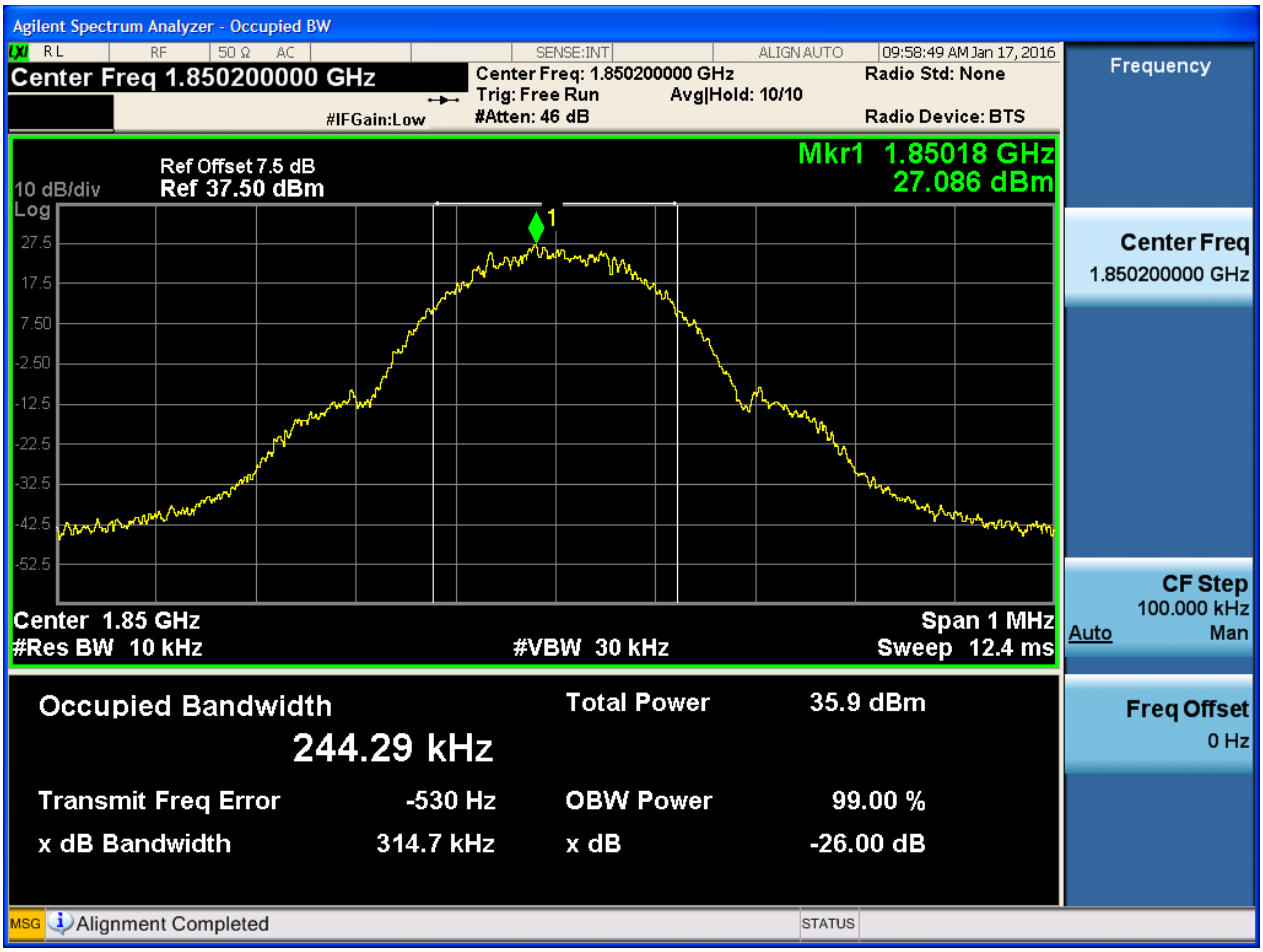
4.1.1.2.3 Test Channel = HCH



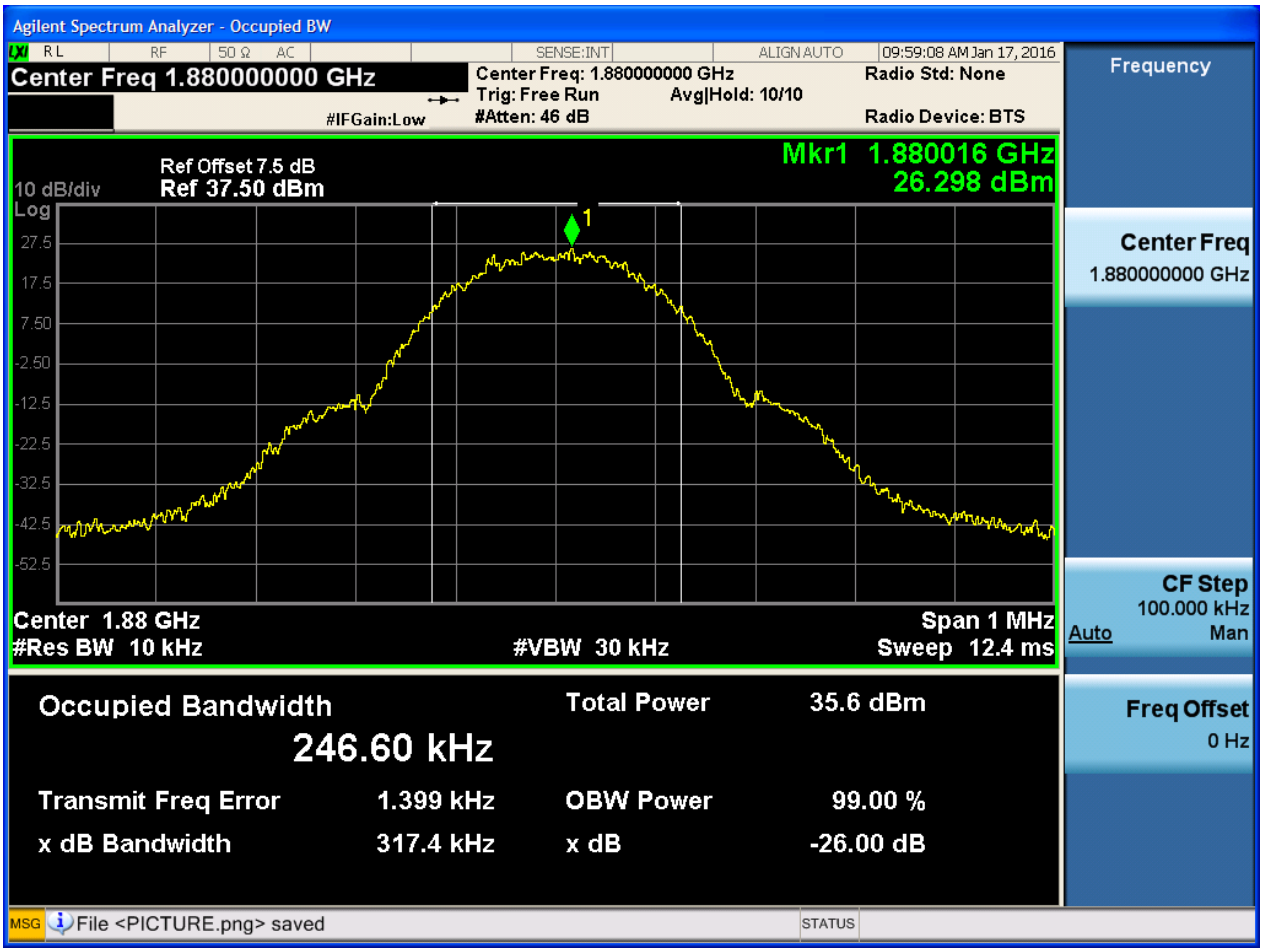
4.1.2 Test Band = GSM1900

4.1.2.1 Test Mode = GSM/TM1

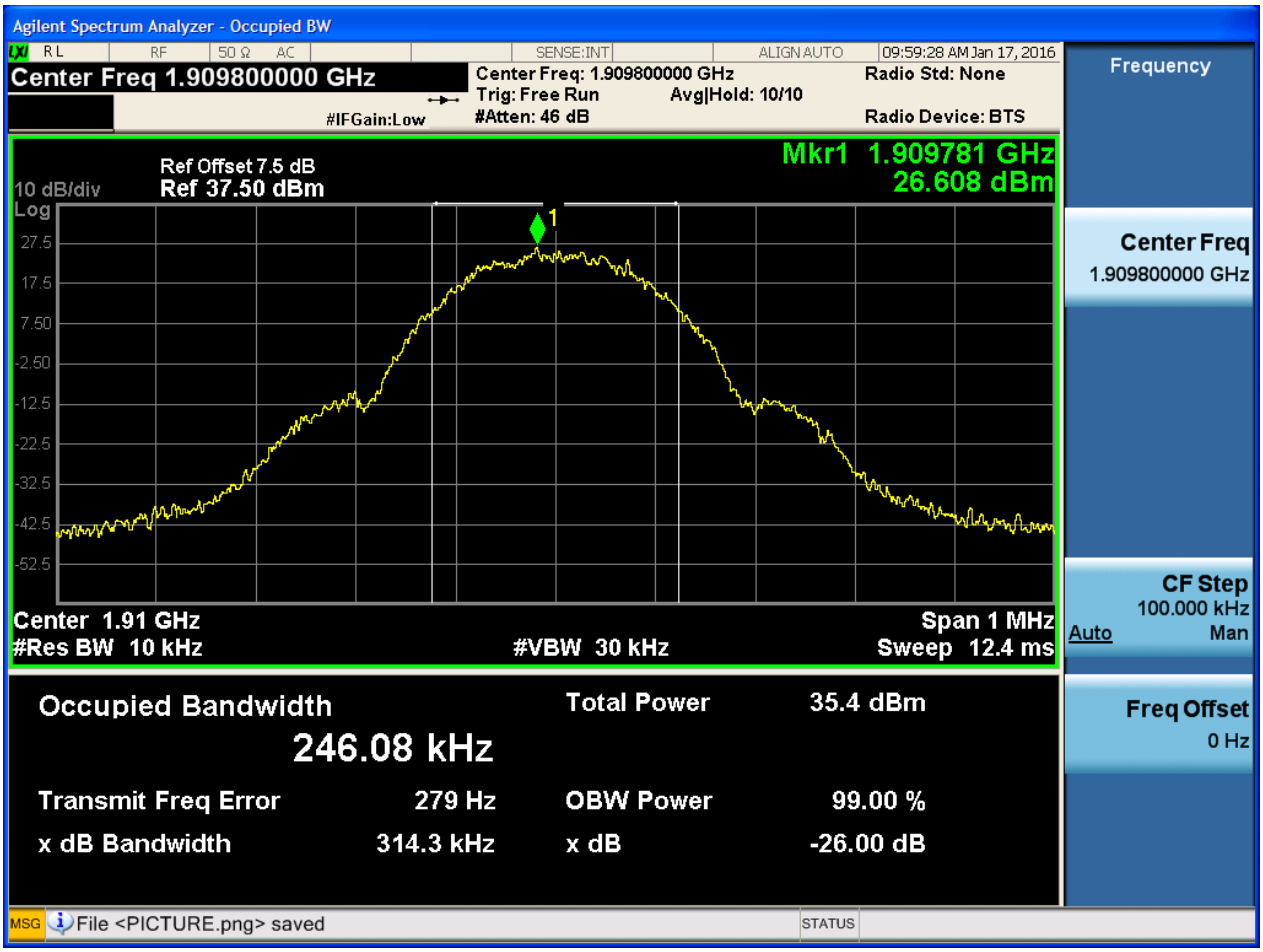
4.1.2.1.1 Test Channel = LCH



4.1.2.1.2 Test Channel = MCH

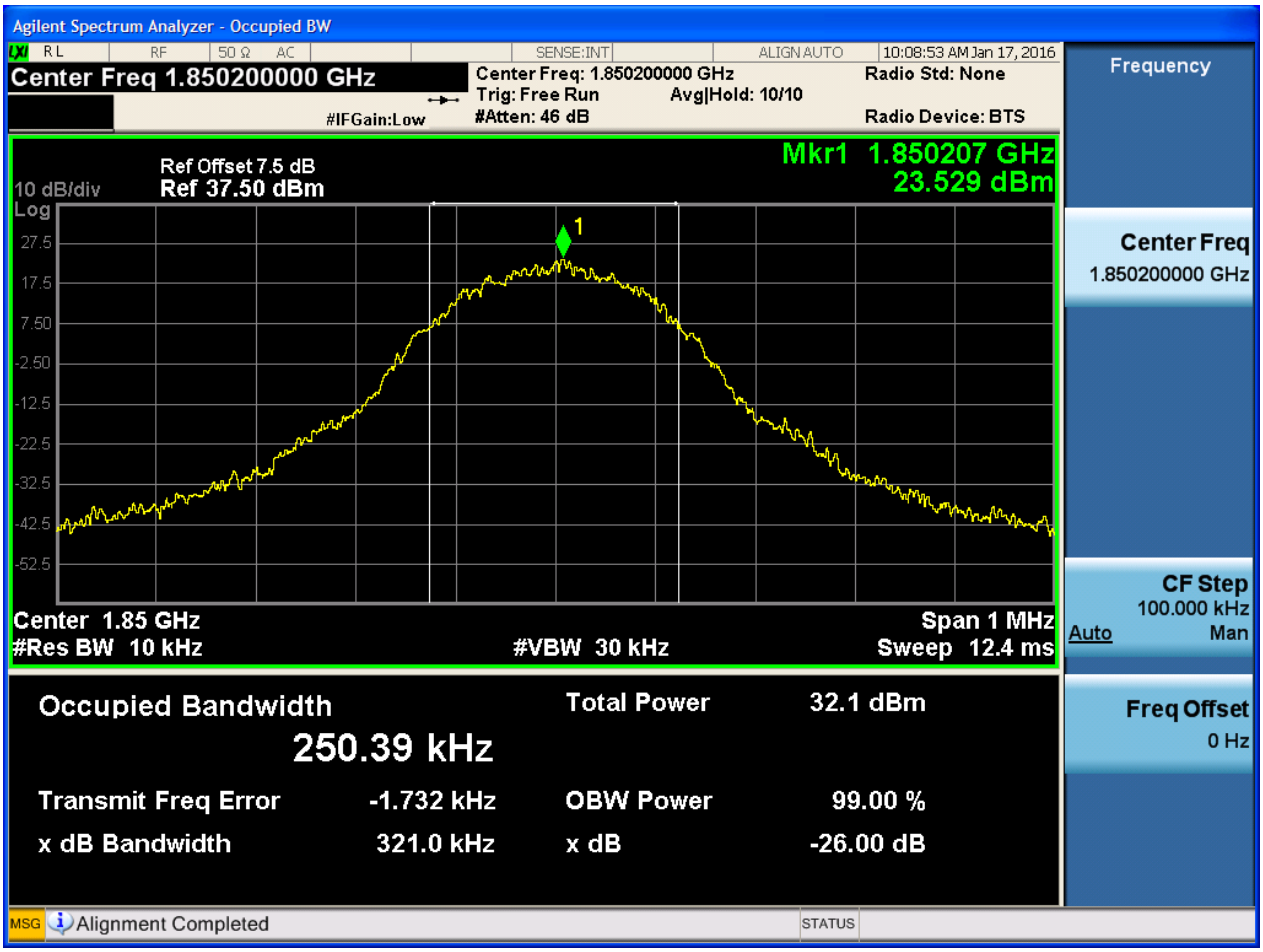


4.1.2.1.3 Test Channel = HCH

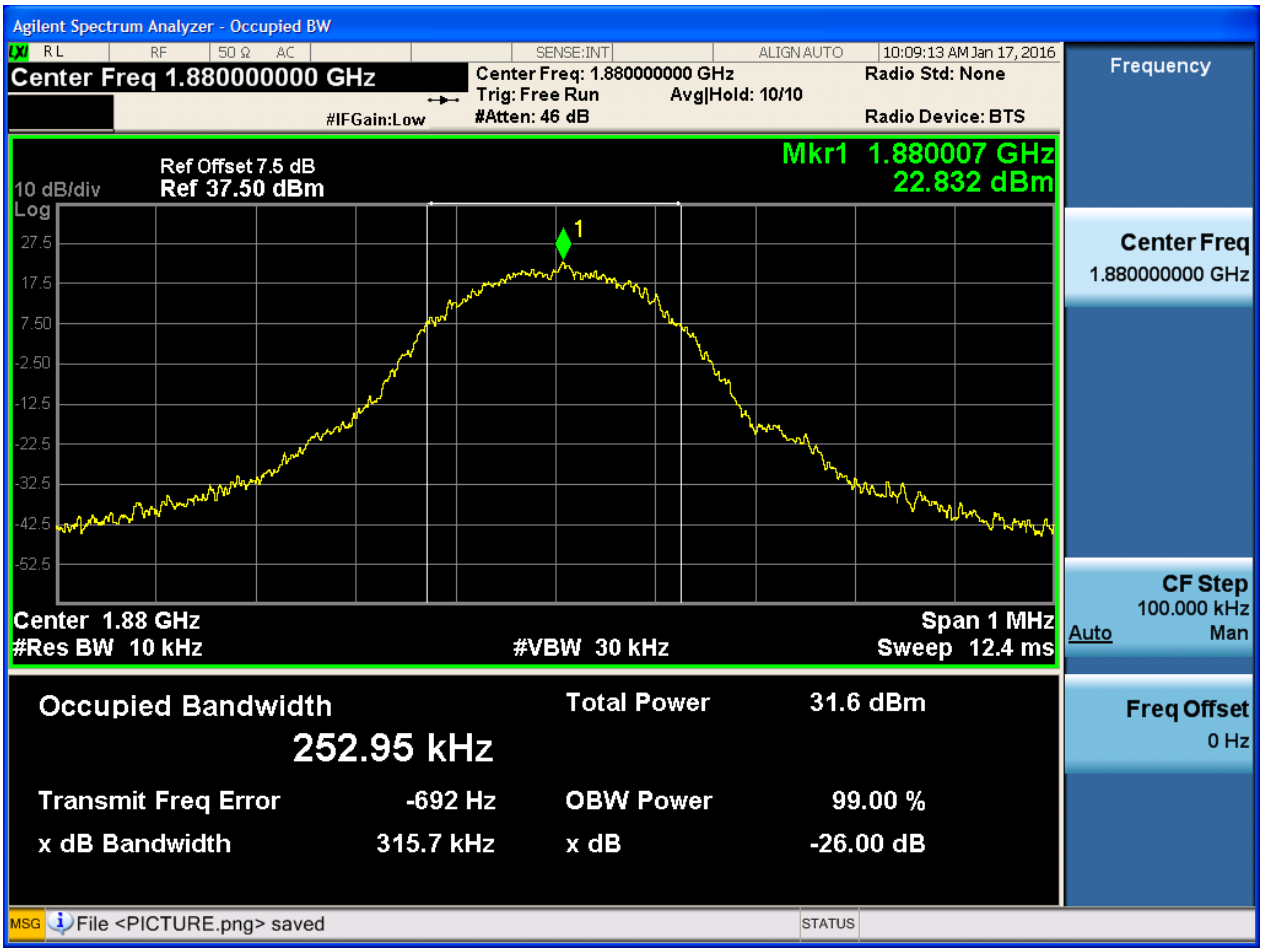


4.1.2.2 Test Mode = GSM/TM2

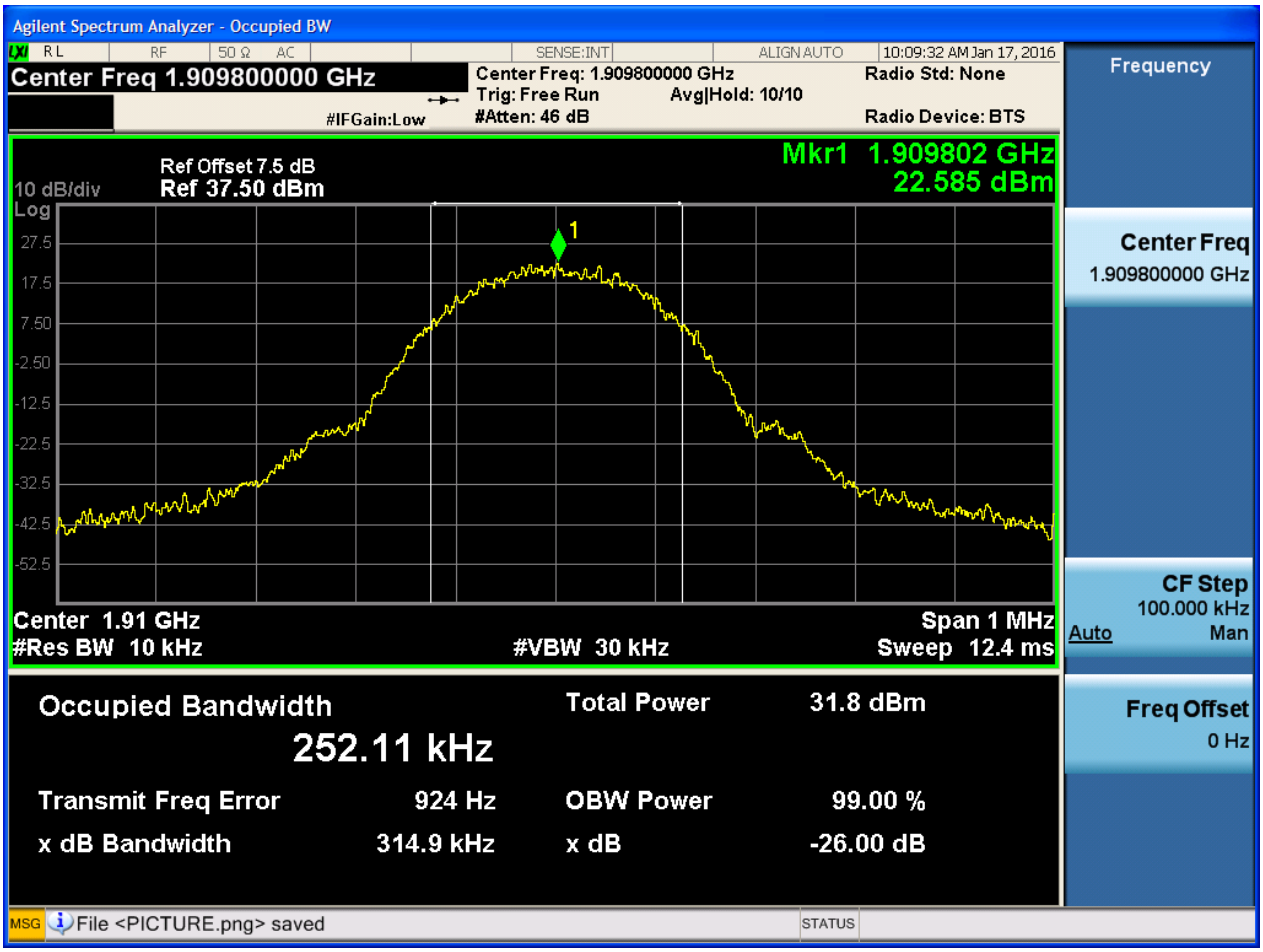
4.1.2.2.1 Test Channel = LCH



4.1.2.2.2 Test Channel = MCH



4.1.2.2.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

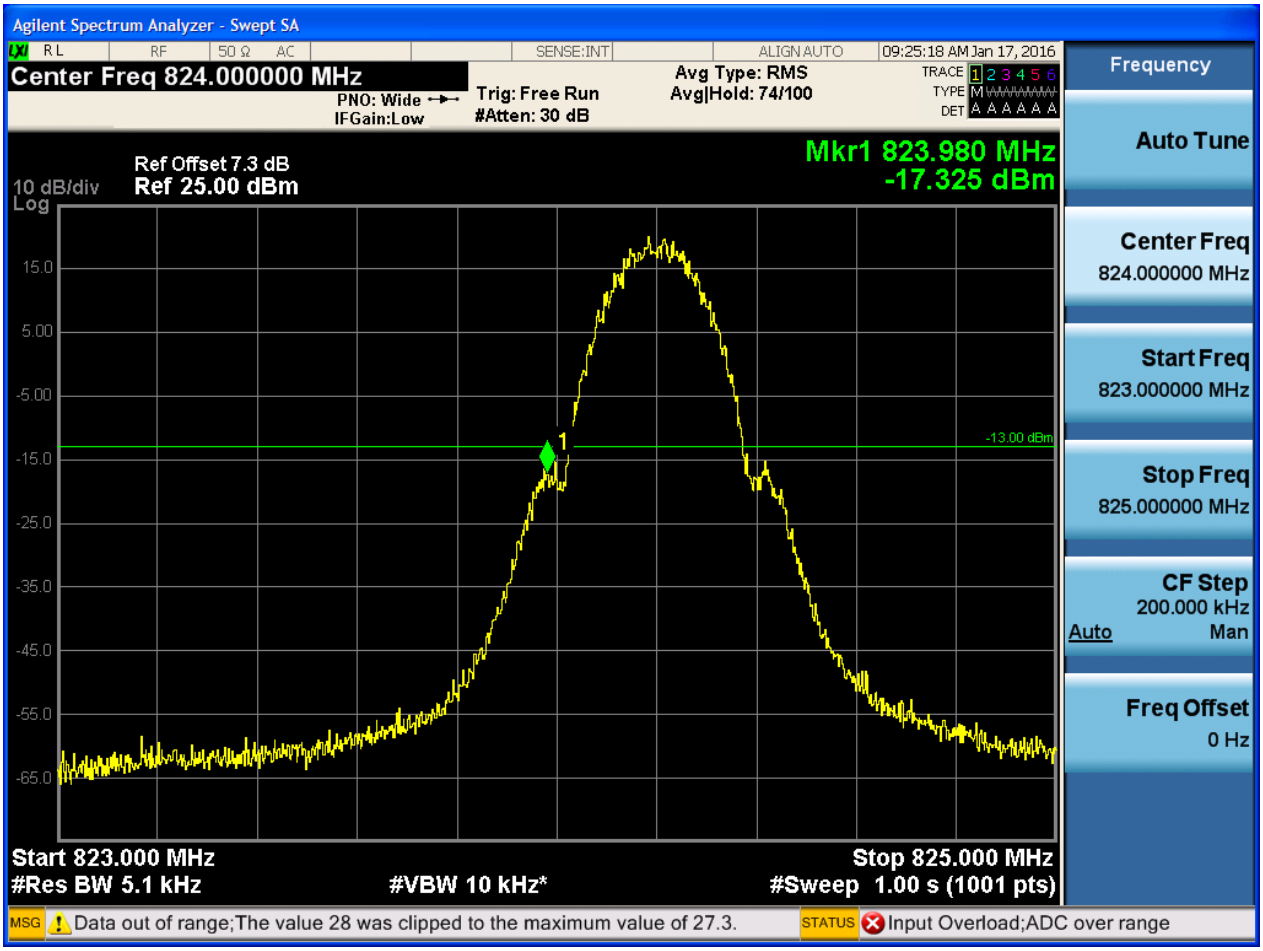
Part I - Test Plots

5.1 For GSM

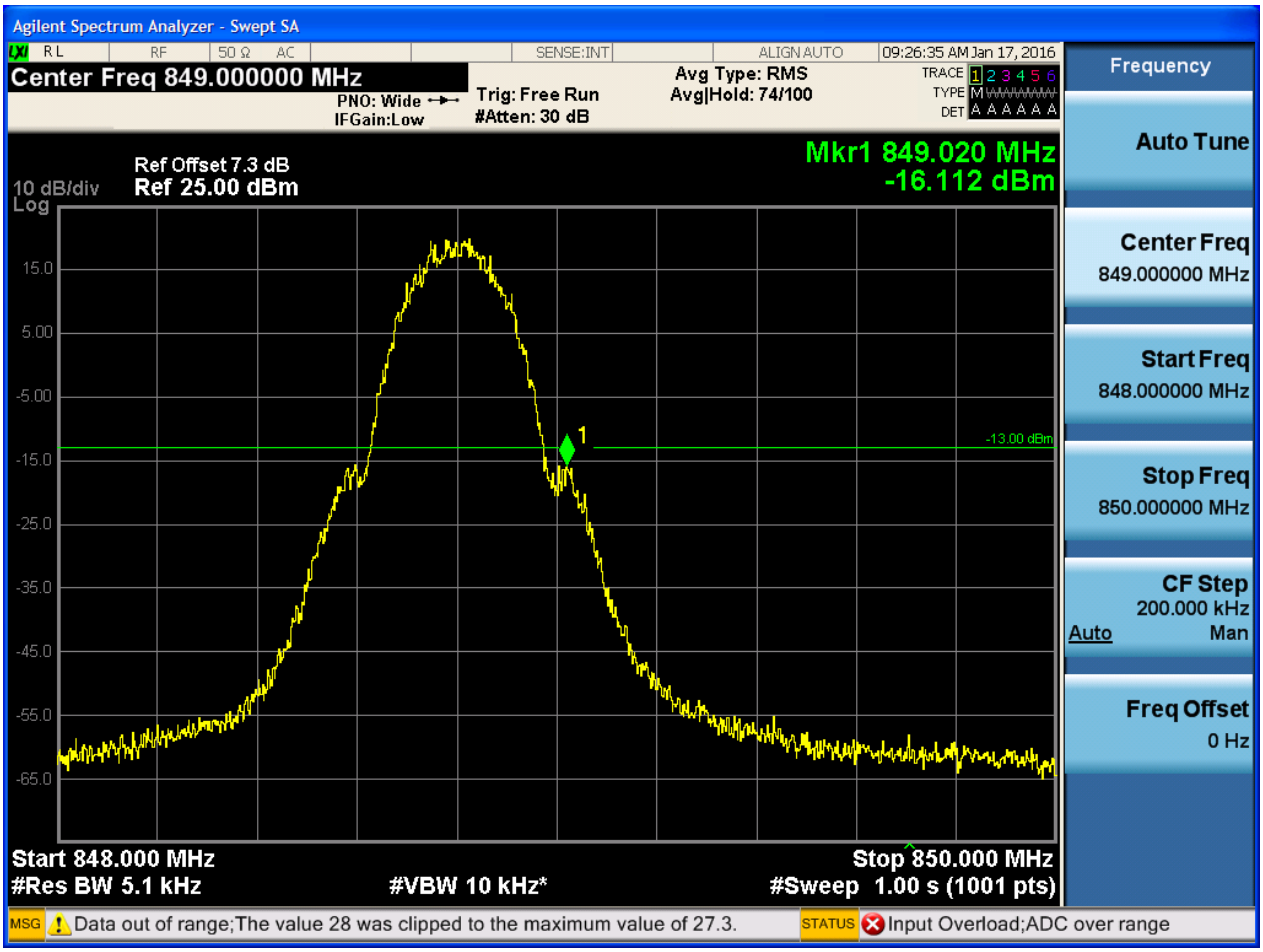
5.1.1 Test Band = GSM850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH

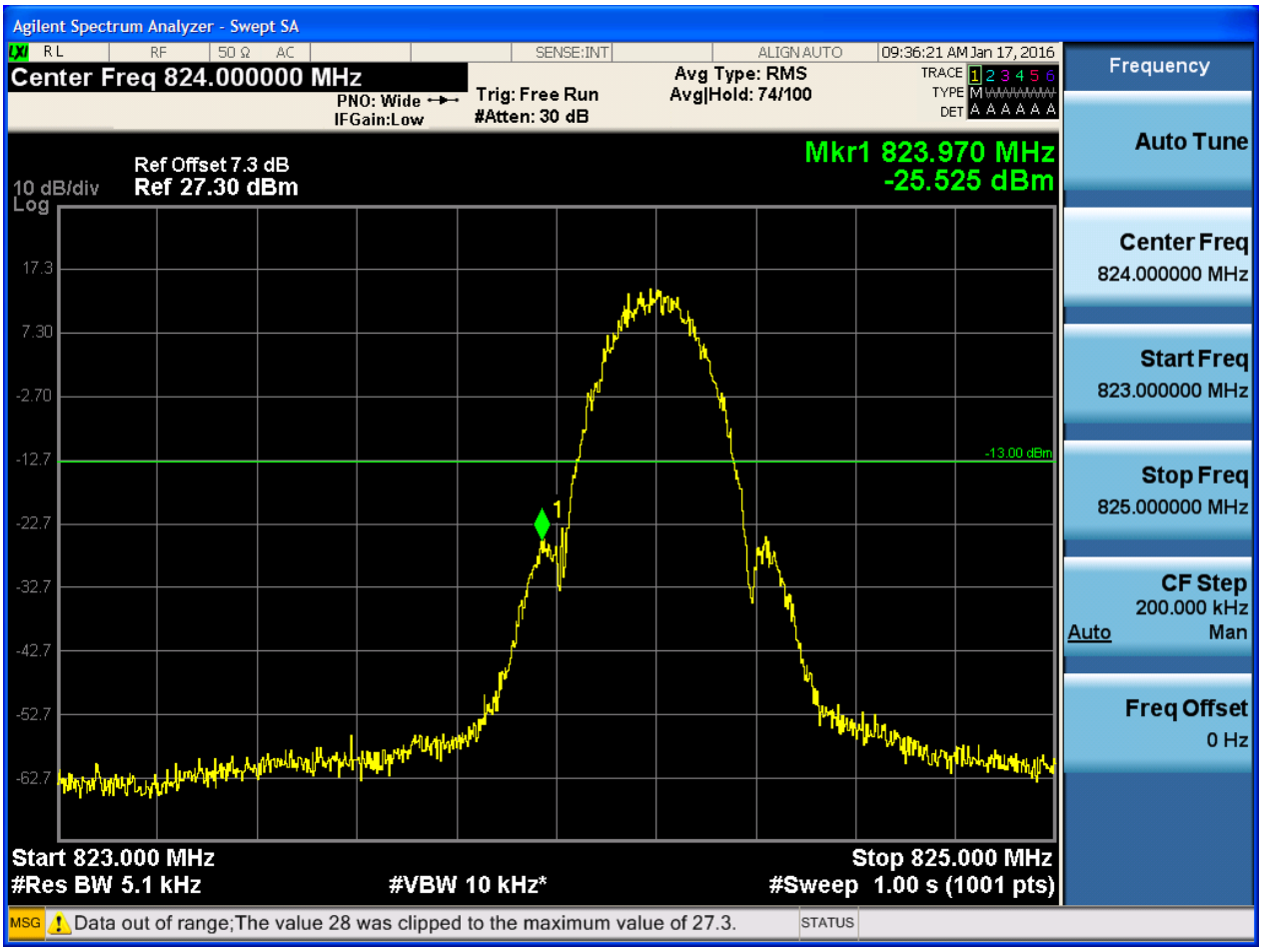


5.1.1.1.2 Test Channel = HCH

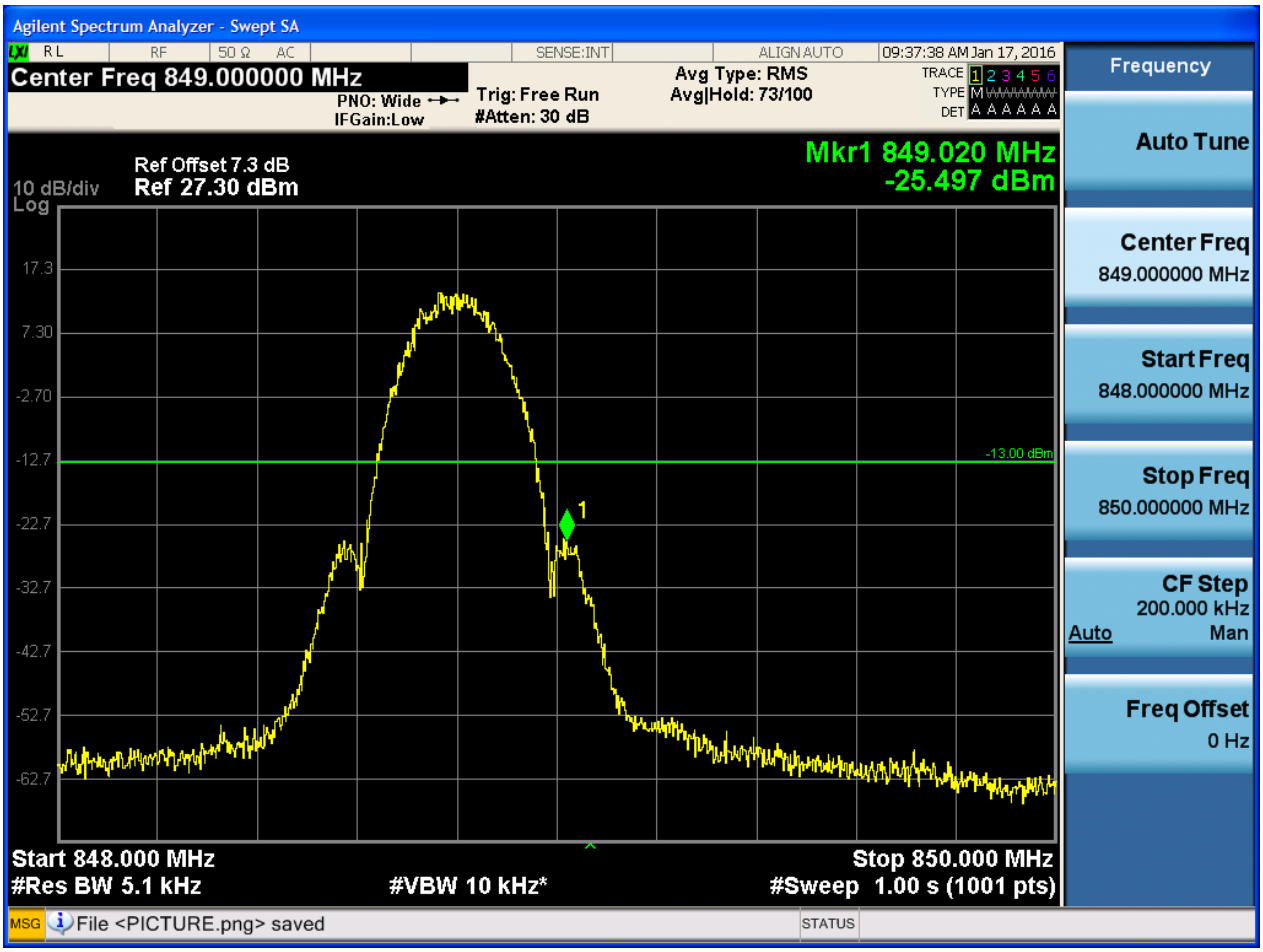


5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



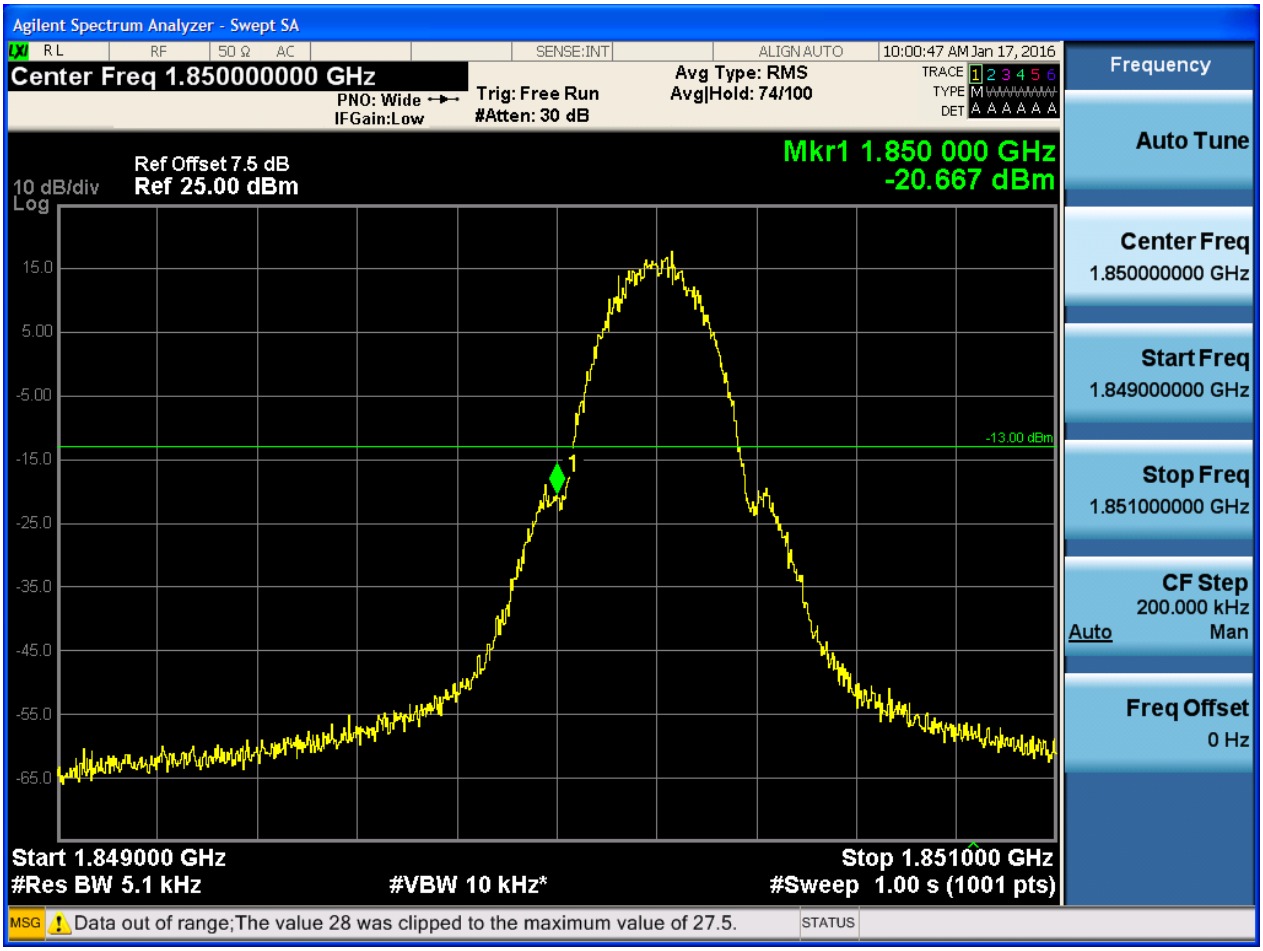
5.1.1.2.2 Test Channel = HCH



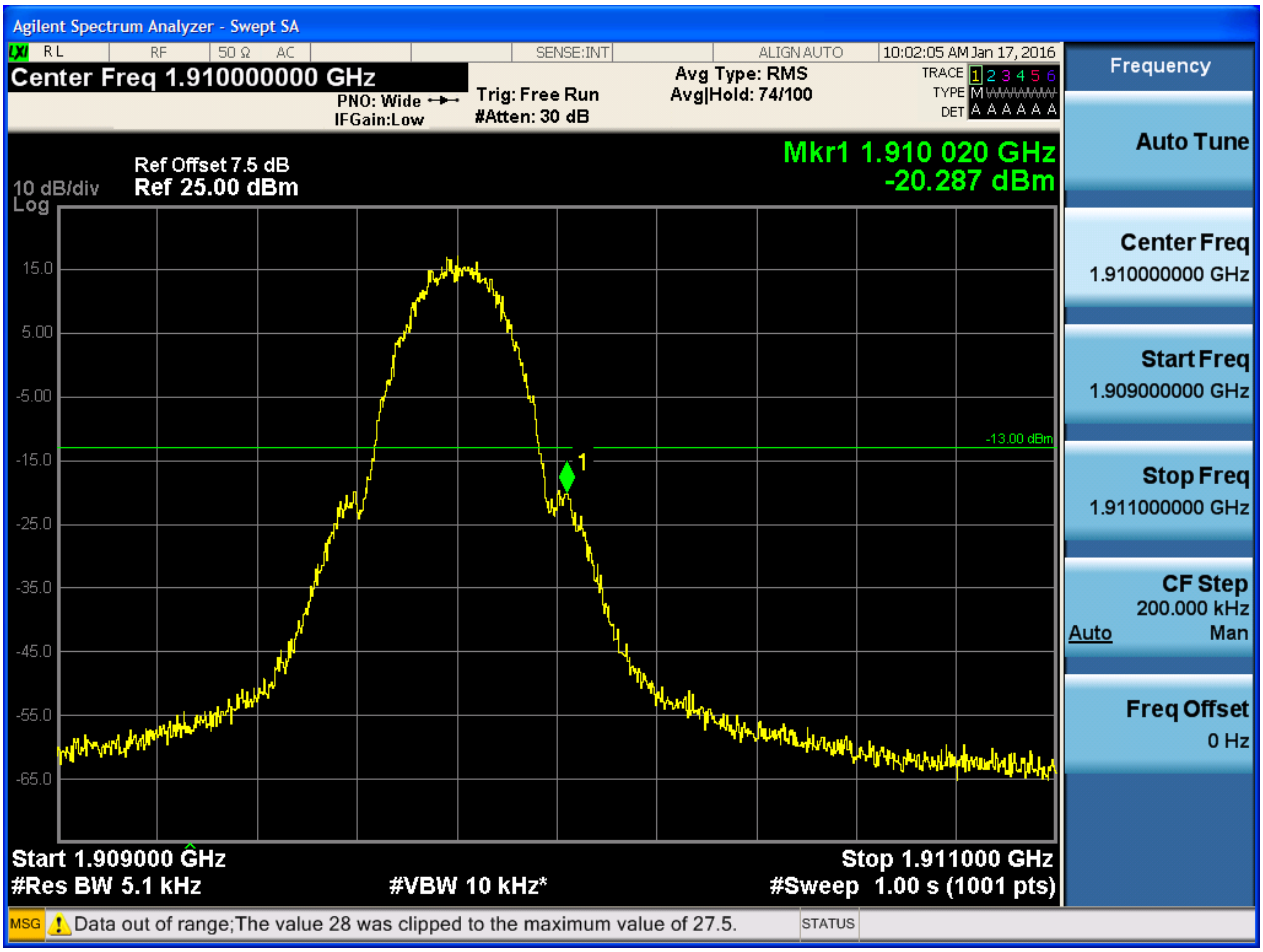
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH

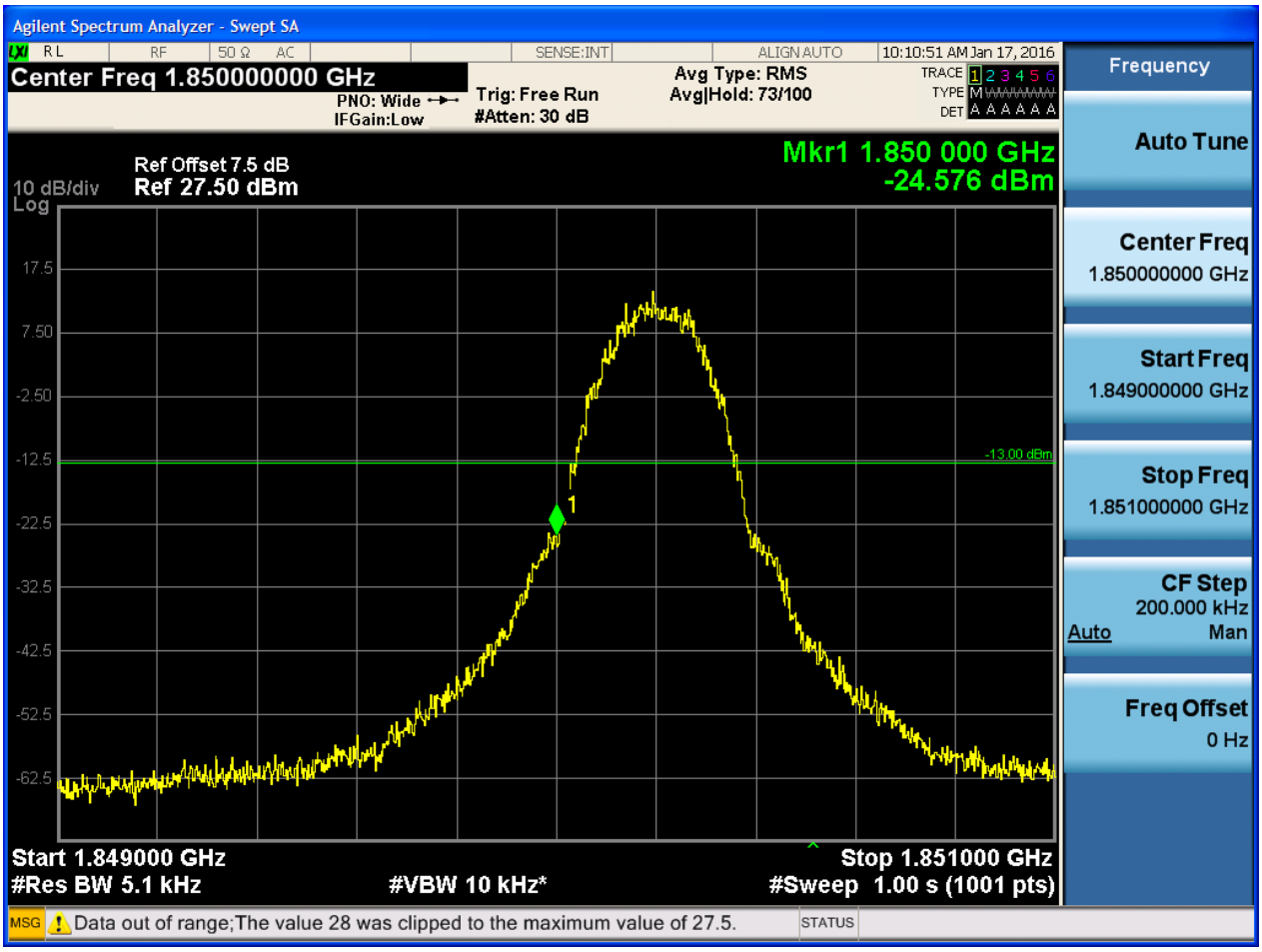


5.1.2.1.2 Test Channel = HCH

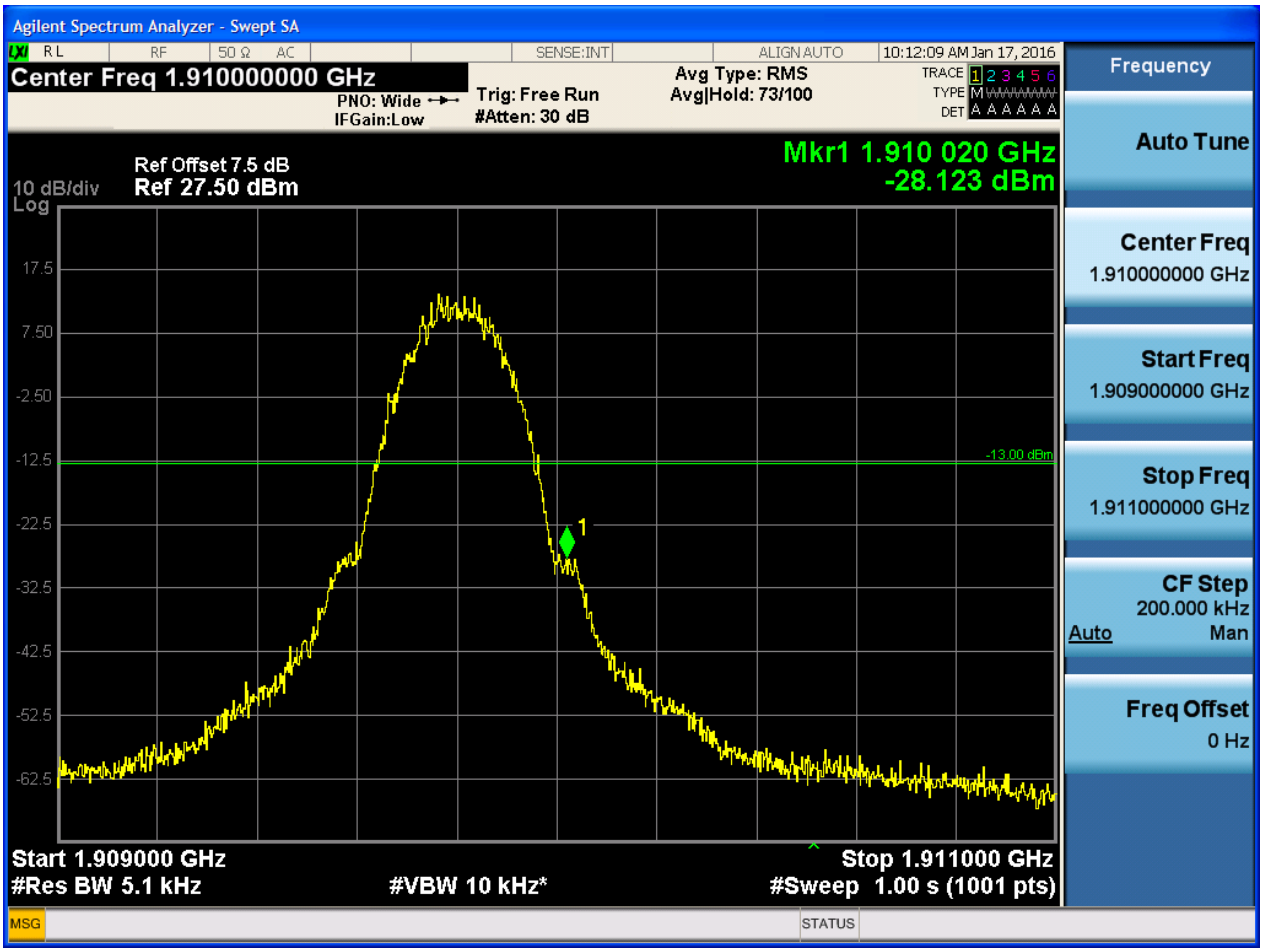


5.1.2.2 Test Mode = GSM/TM2

5.1.2.2.1 Test Channel = LCH



5.1.2.2.2 Test Channel = HCH



6Appendix_F: Spurious Emission at Antenna Terminal

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

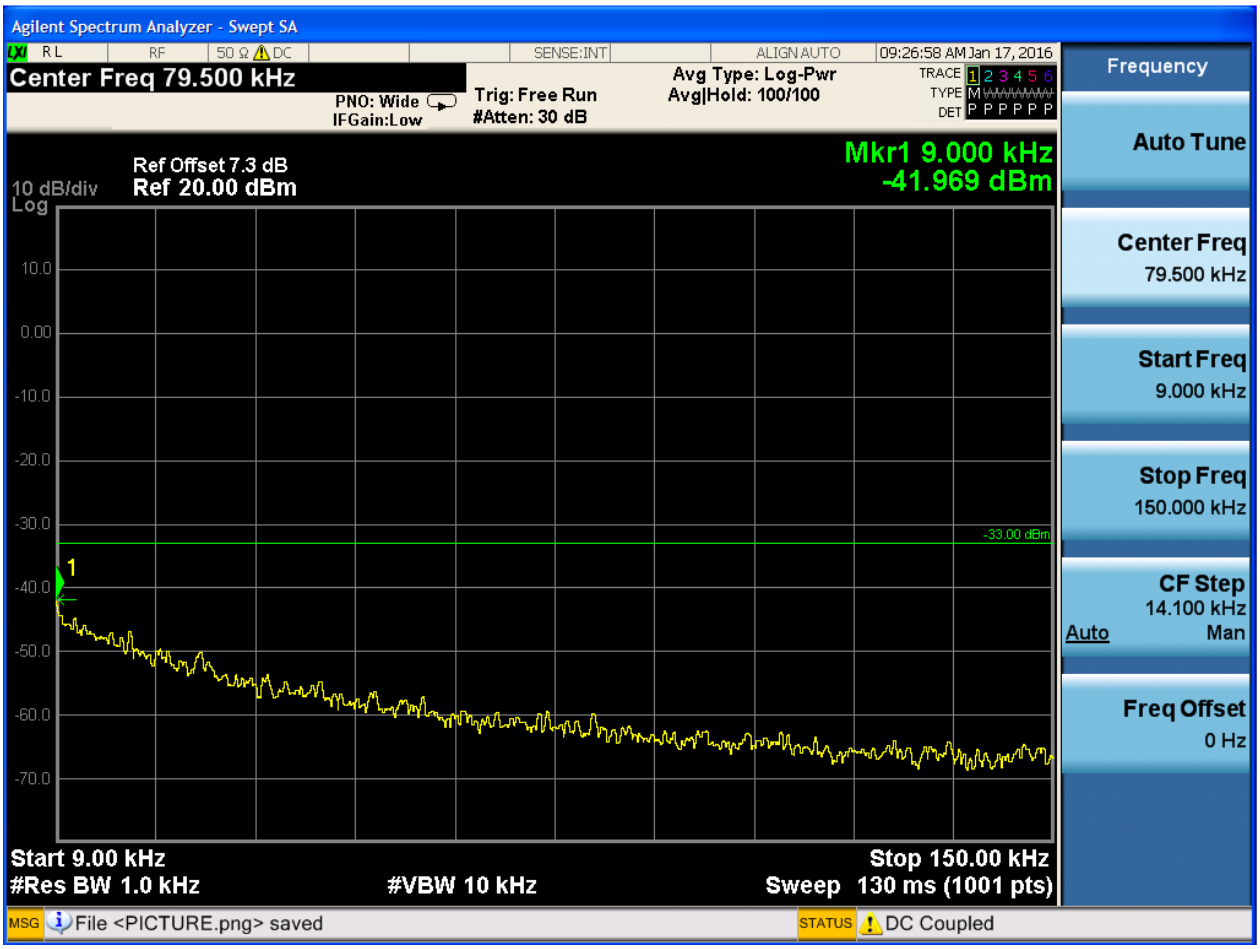
Part I - Test Plots

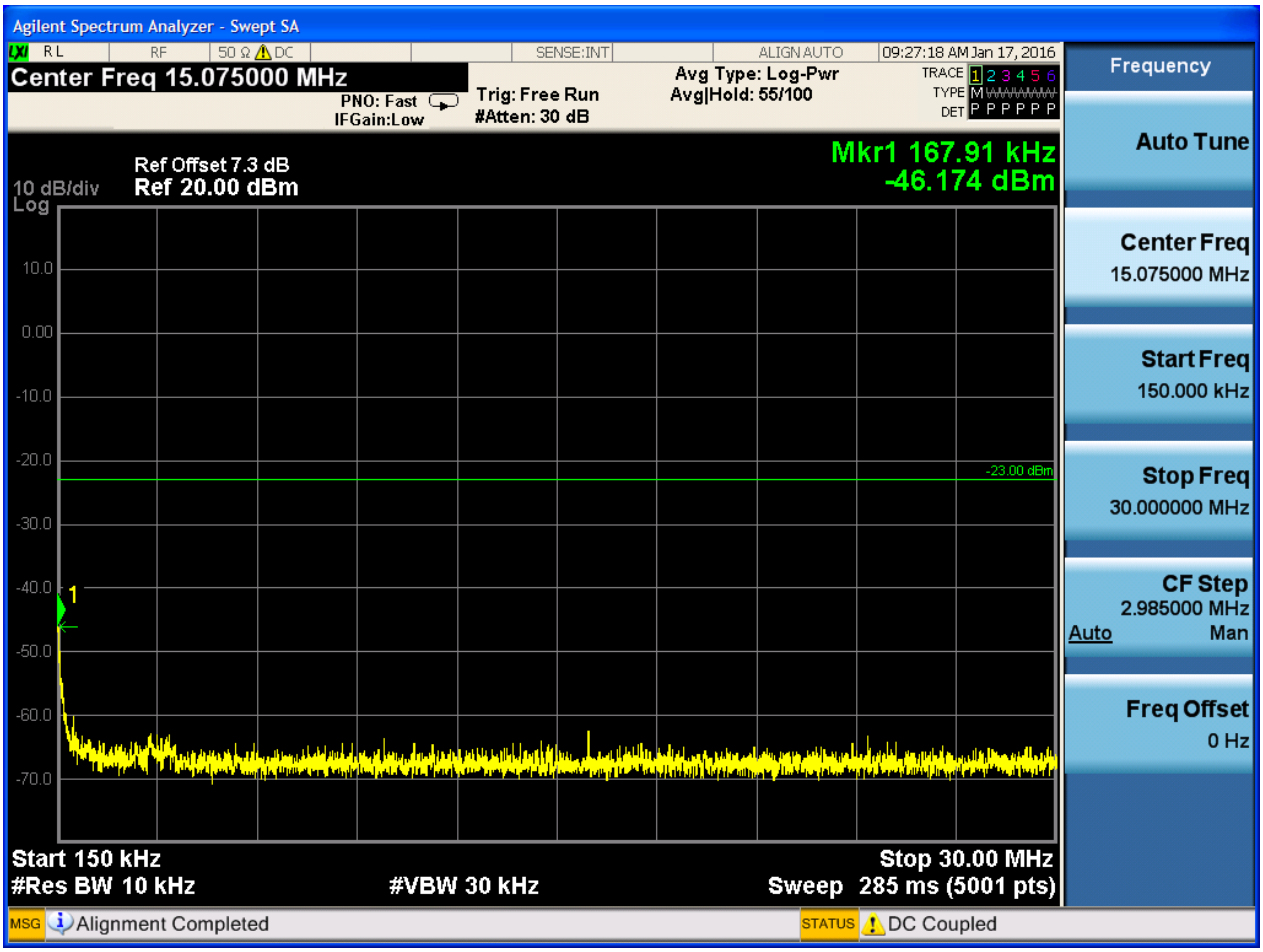
6.1 For GSM

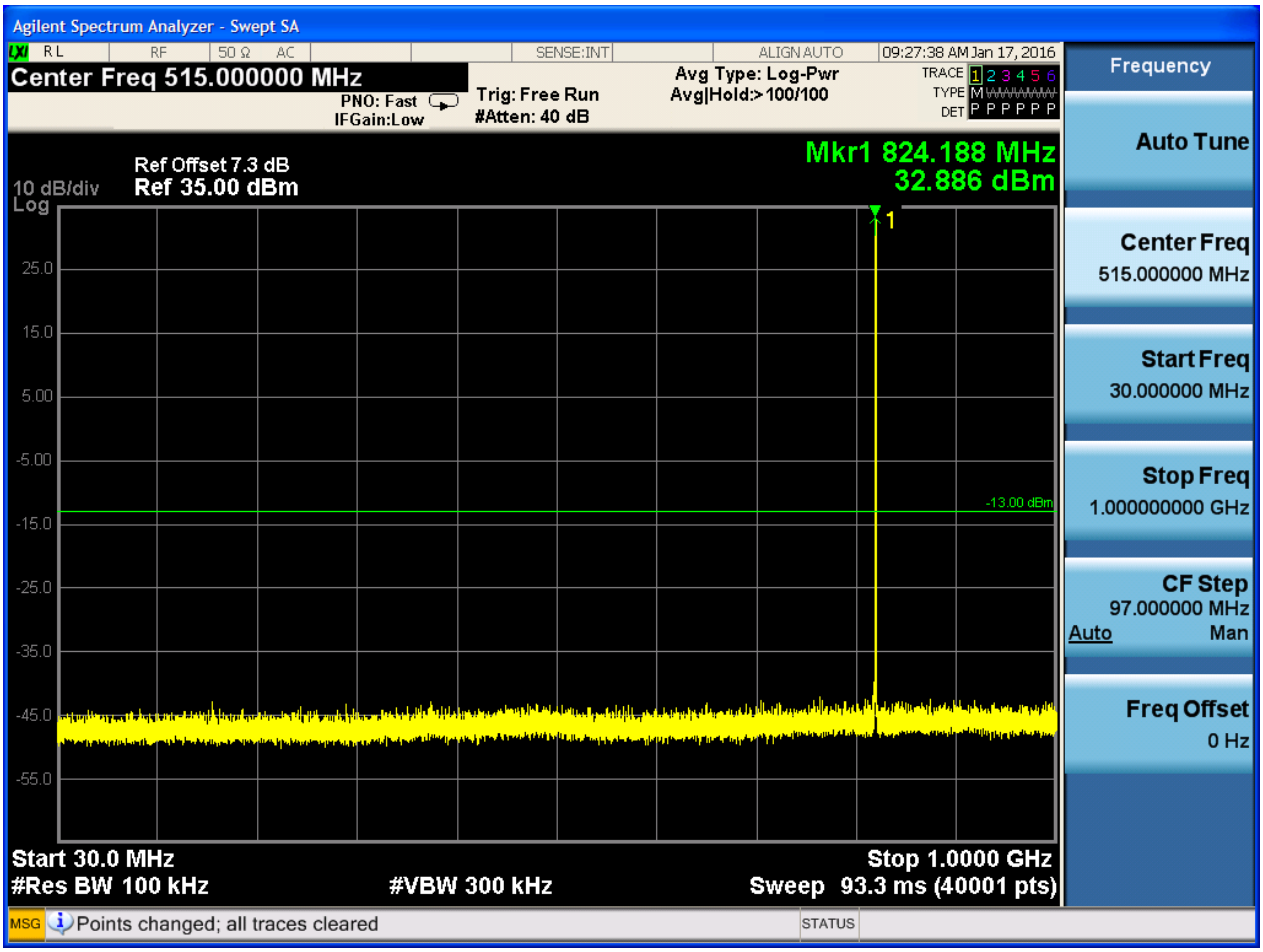
6.1.1 Test Band = GSM850

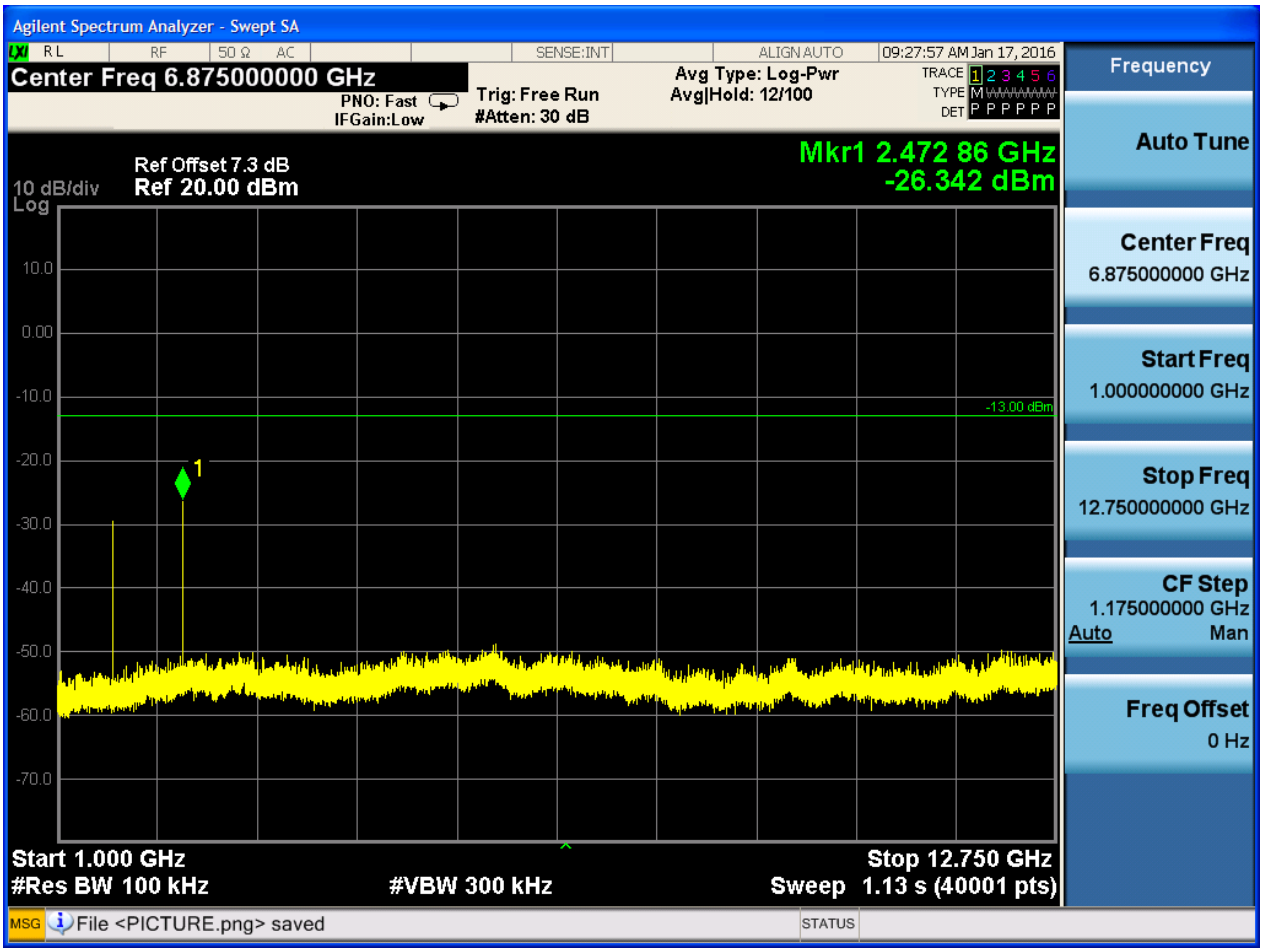
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH

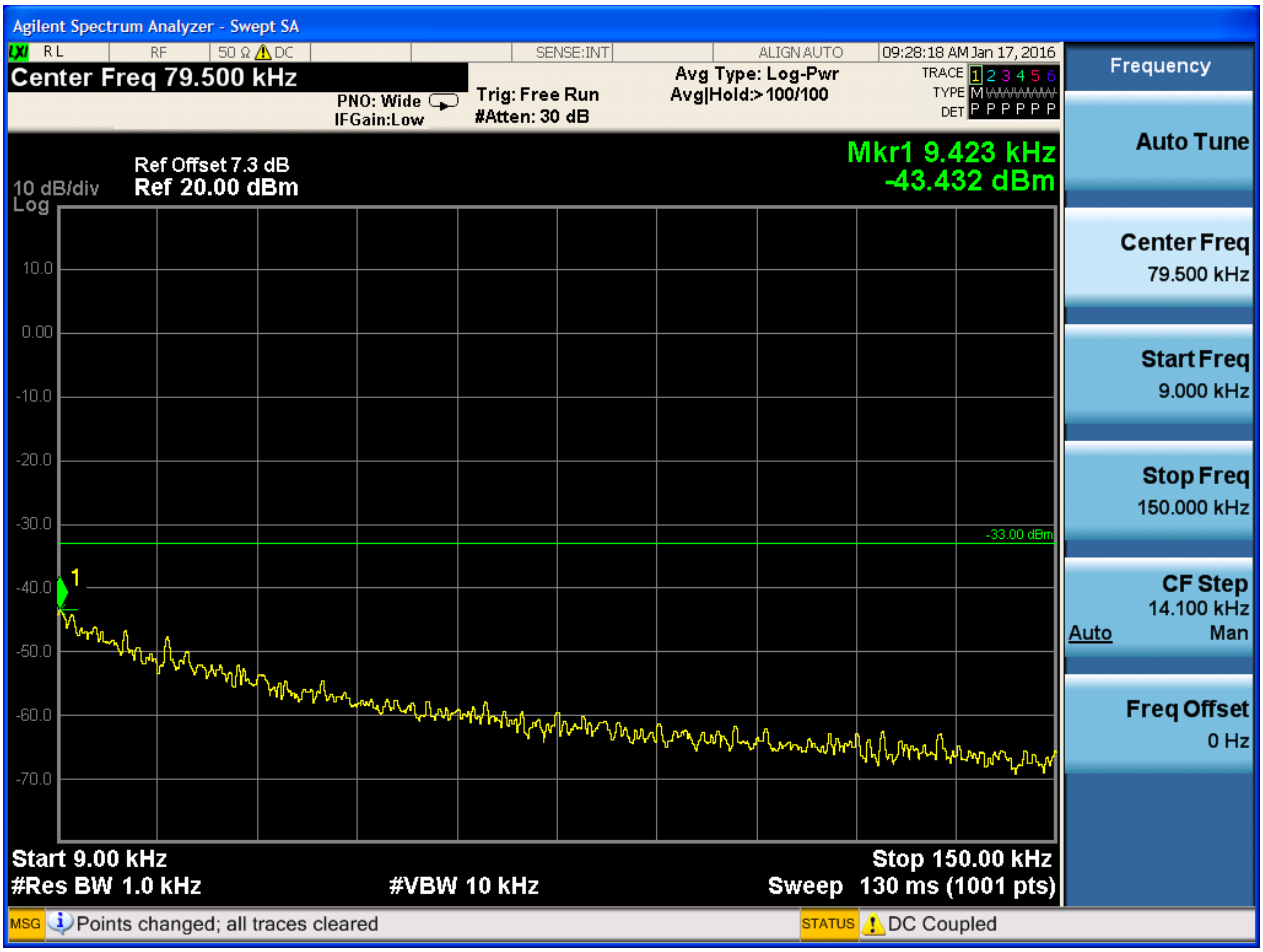


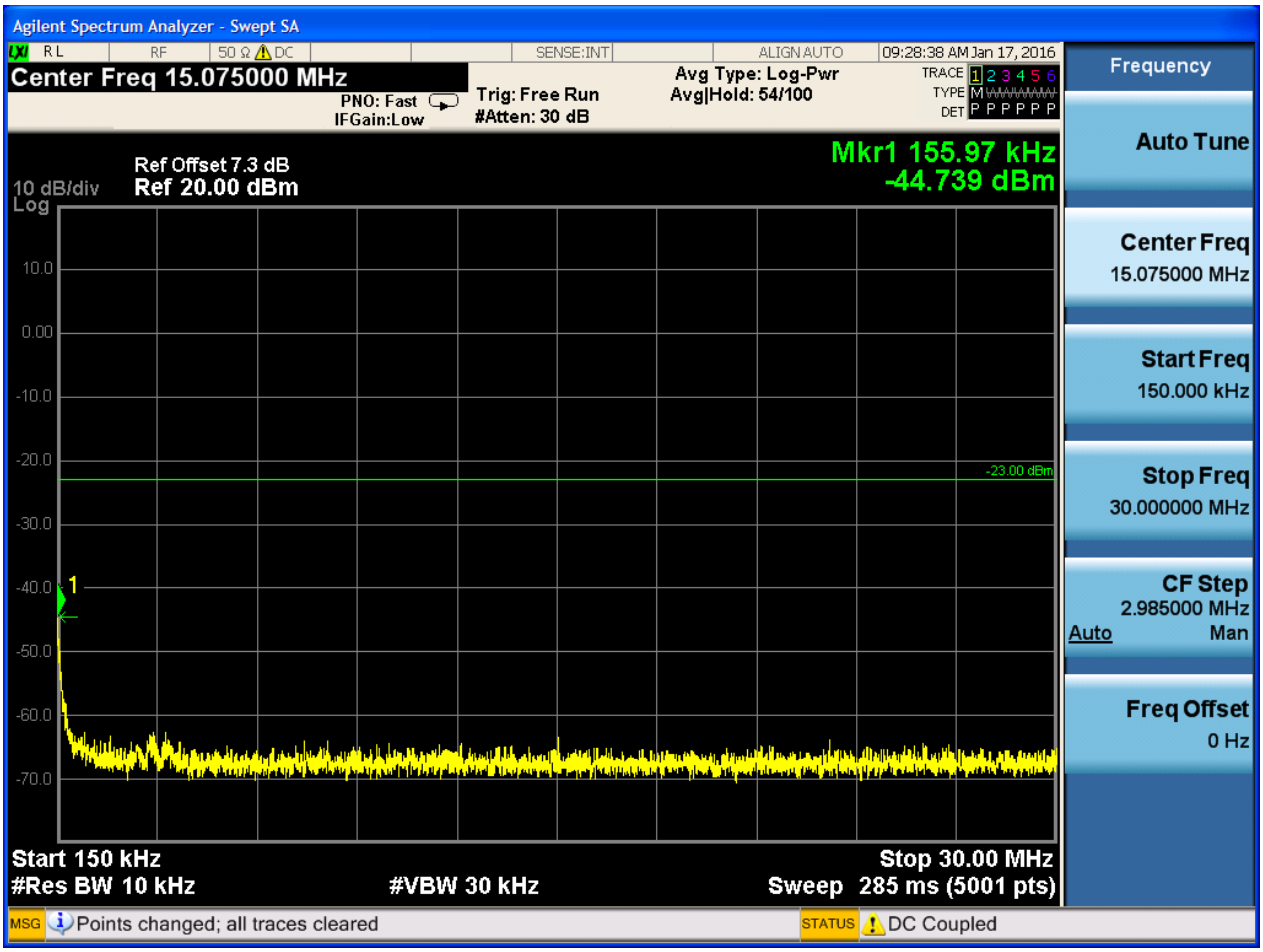


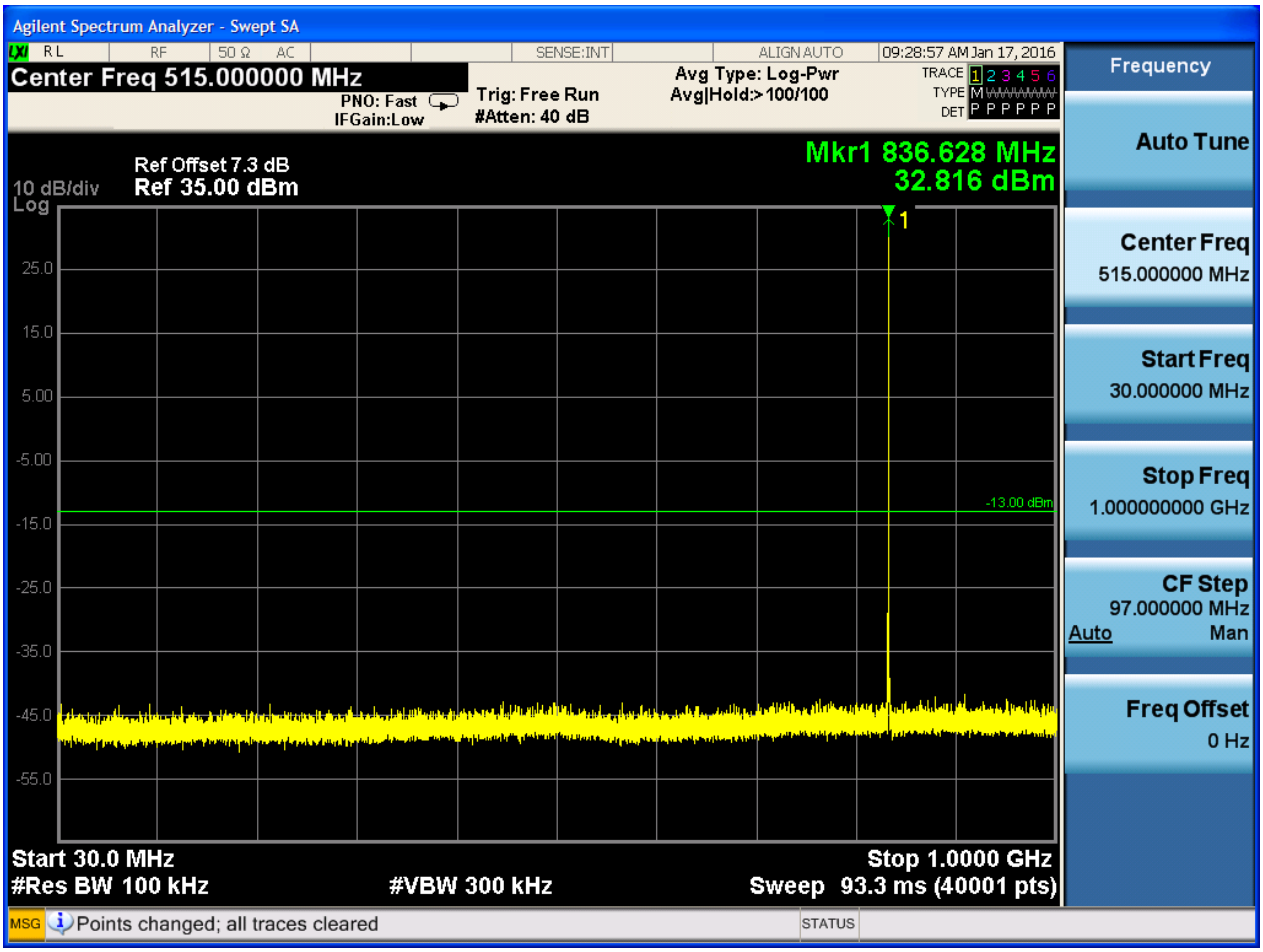


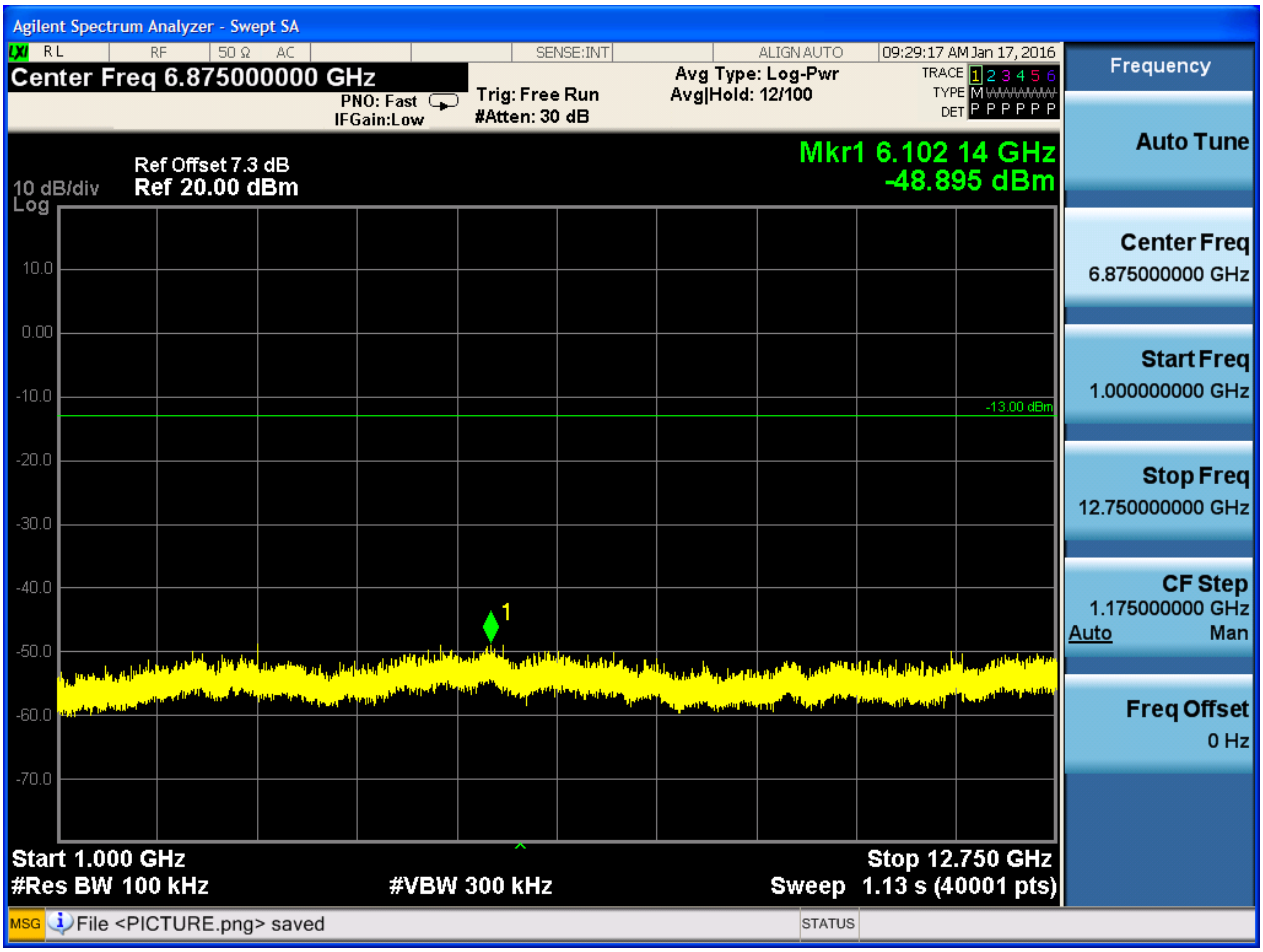


6.1.1.1.2 Test Channel = MCH

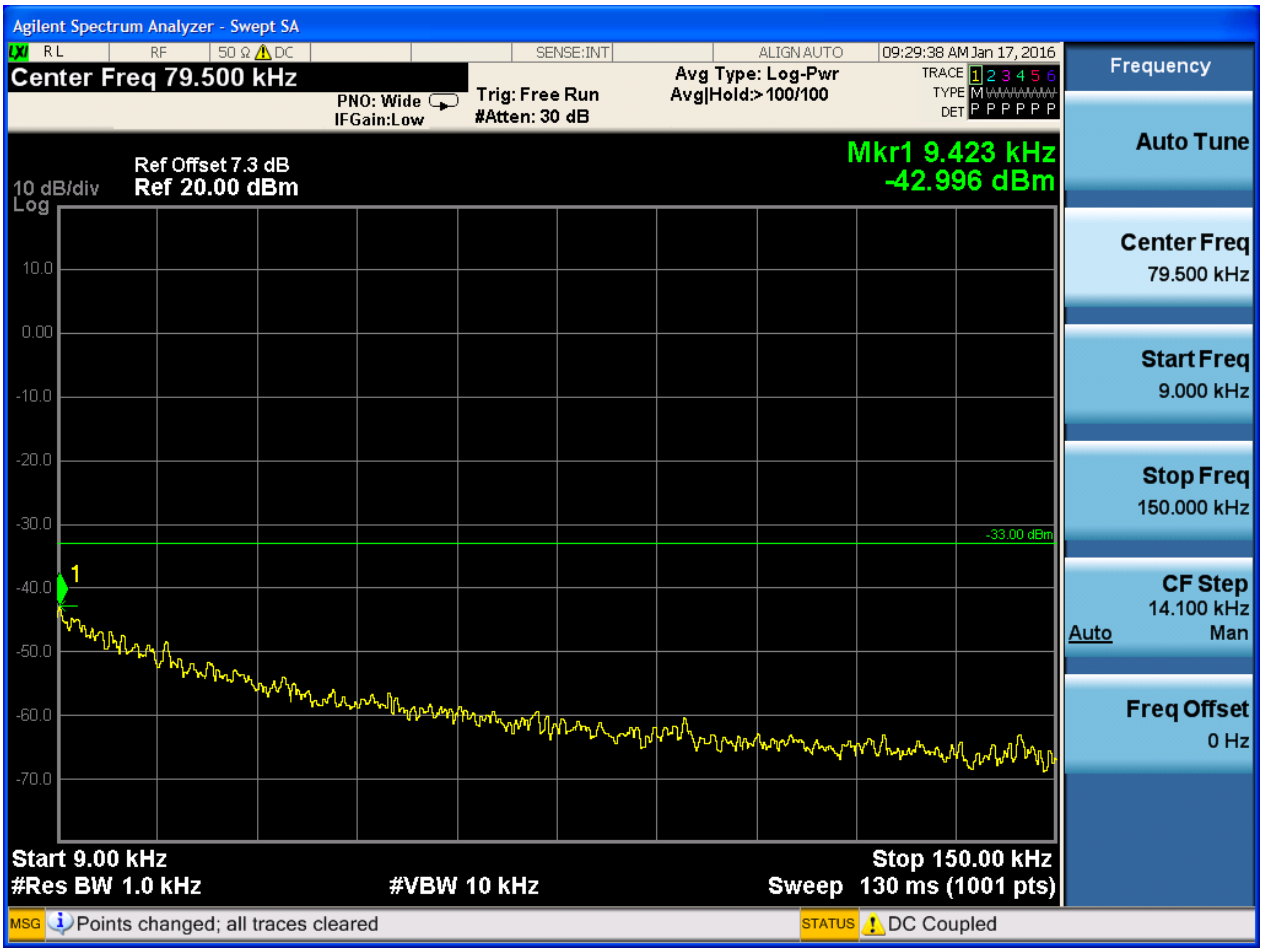


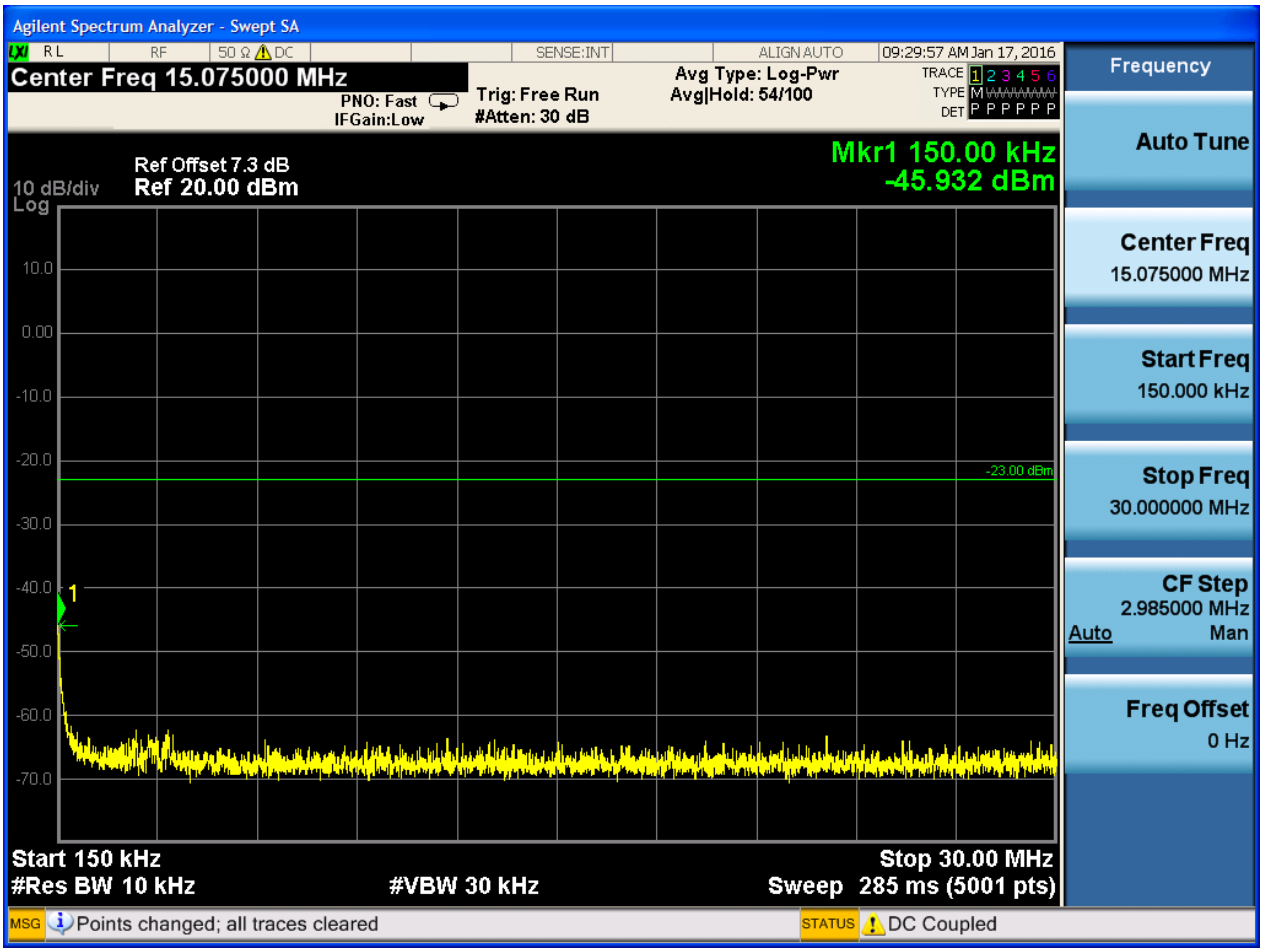


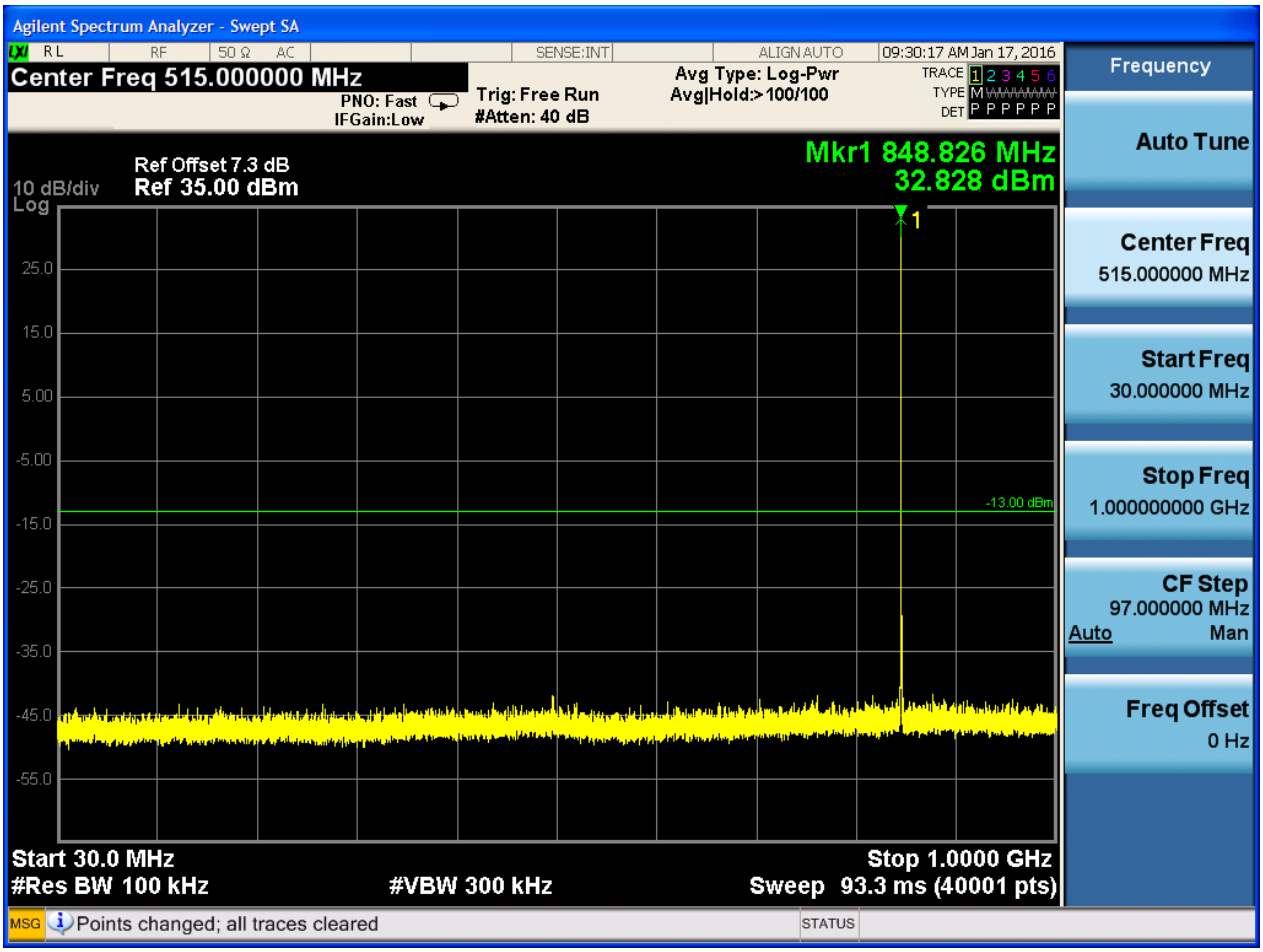


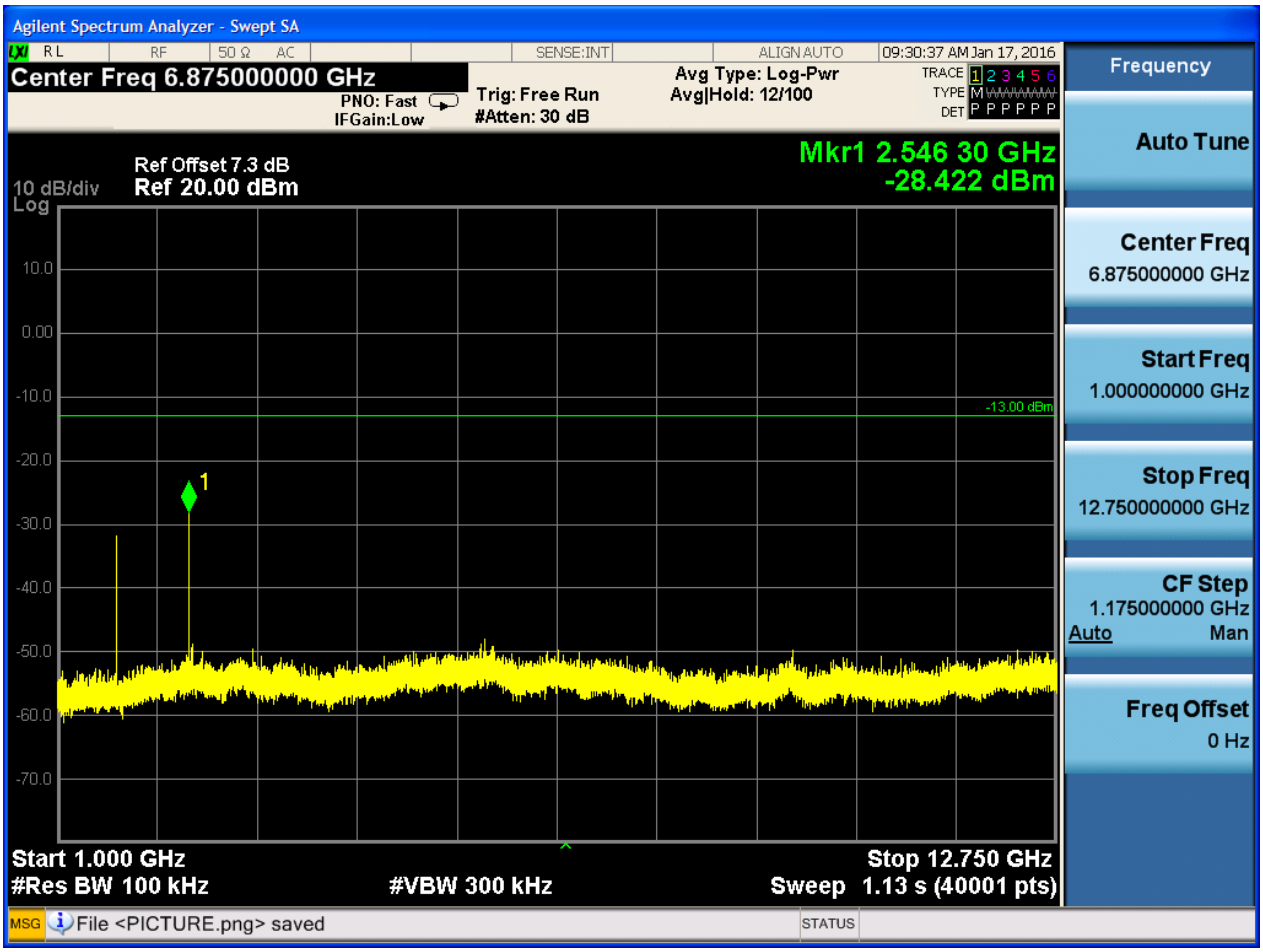


6.1.1.1.3 Test Channel = HCH



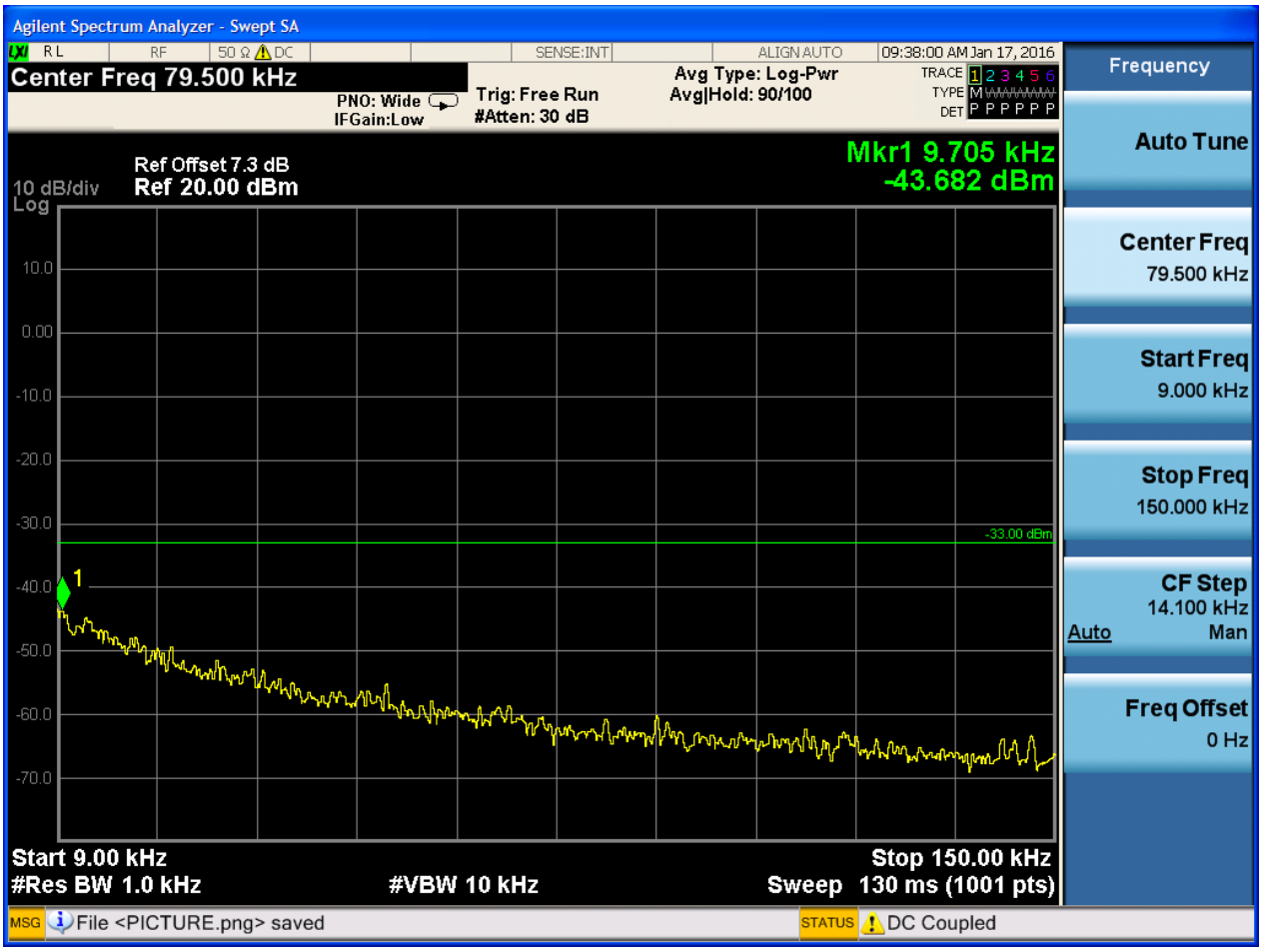


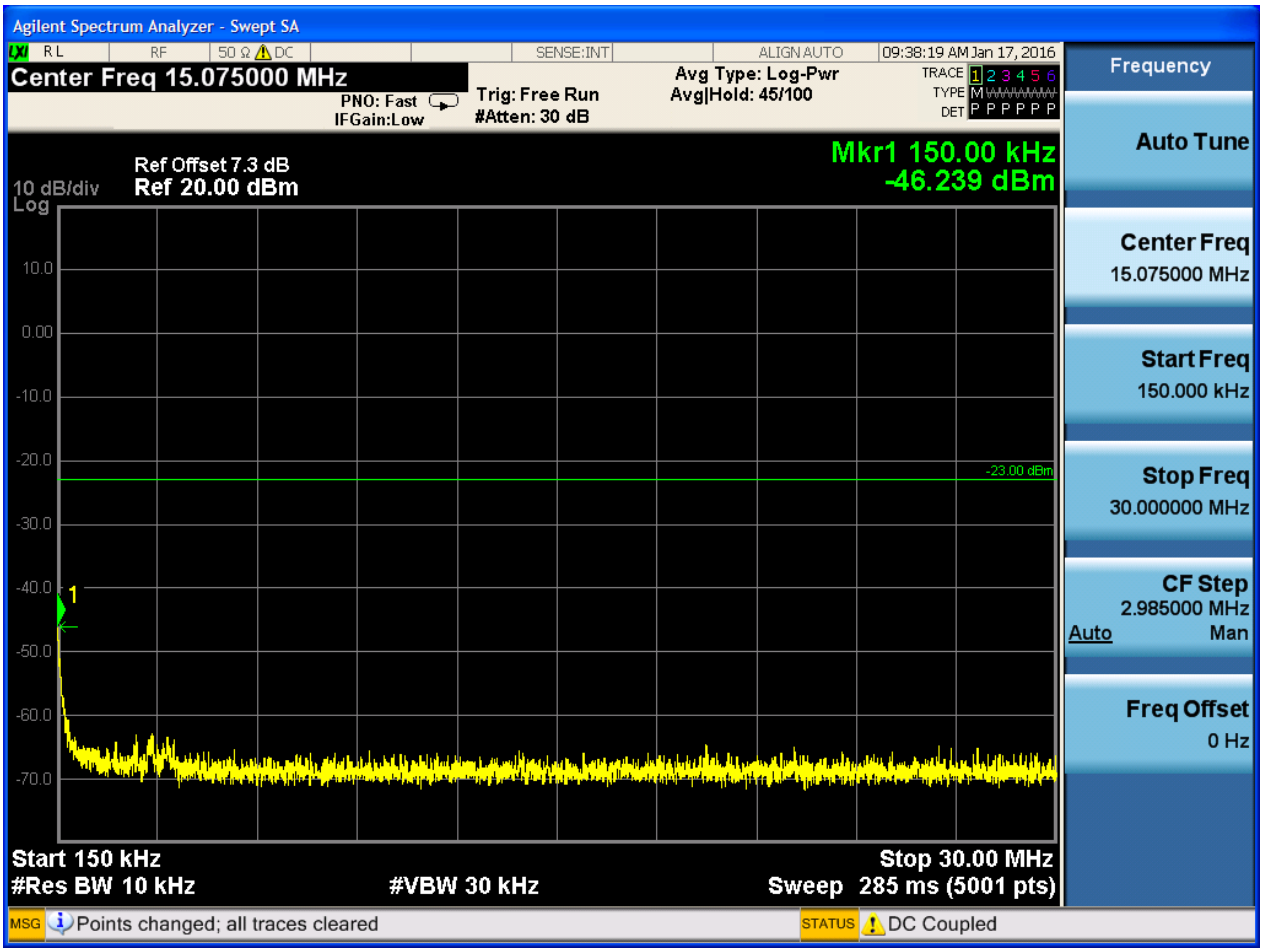


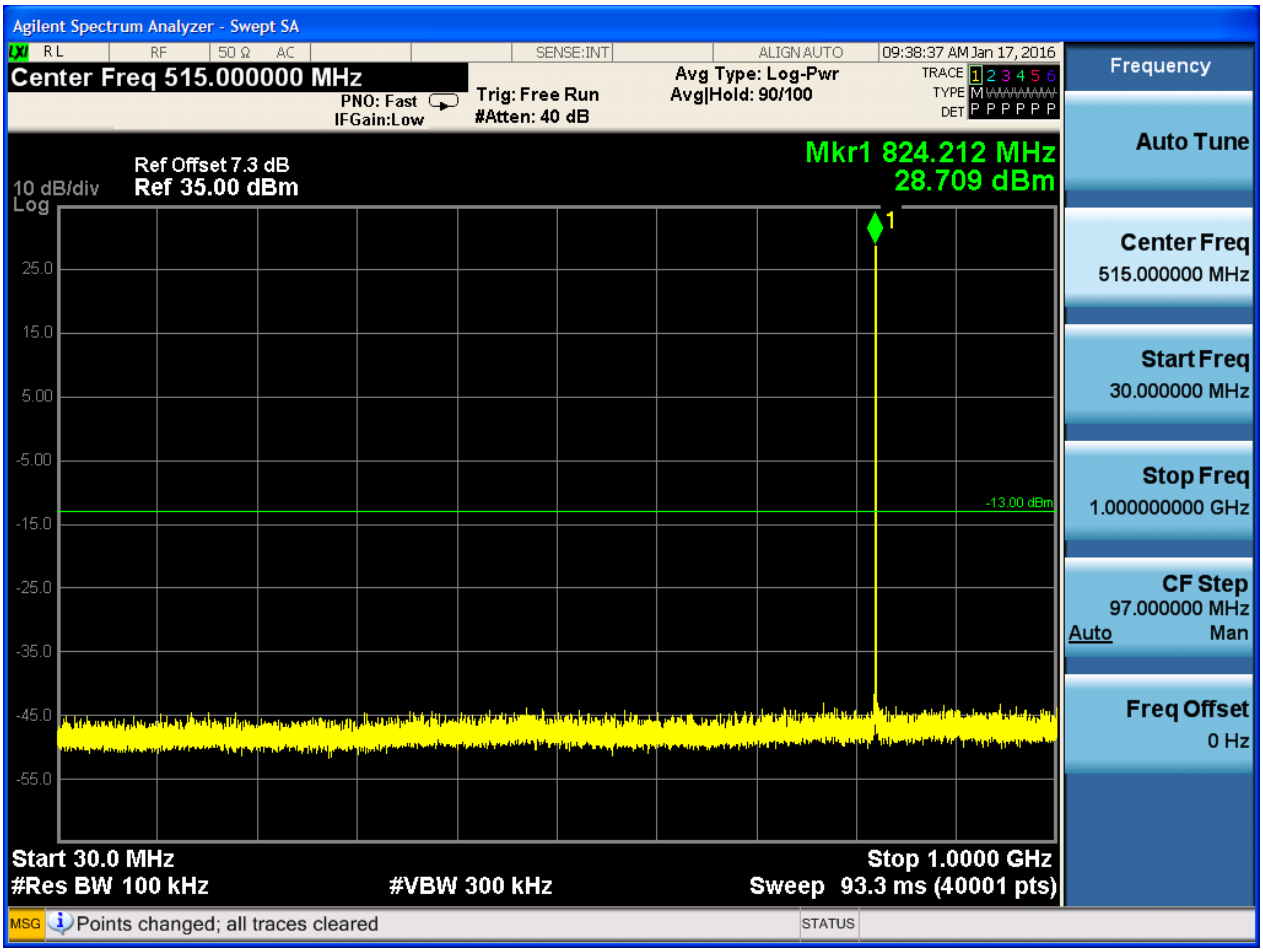


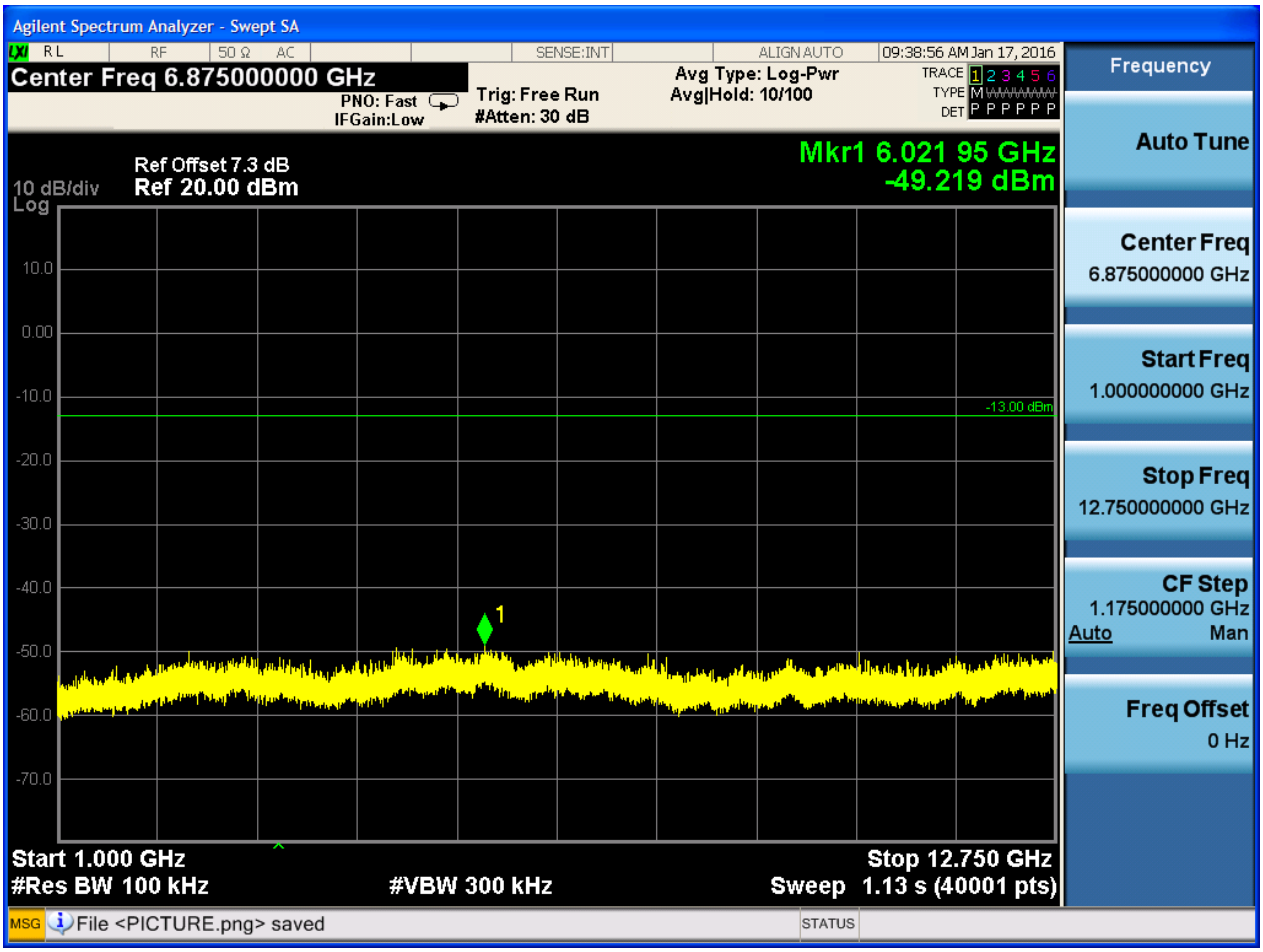
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH

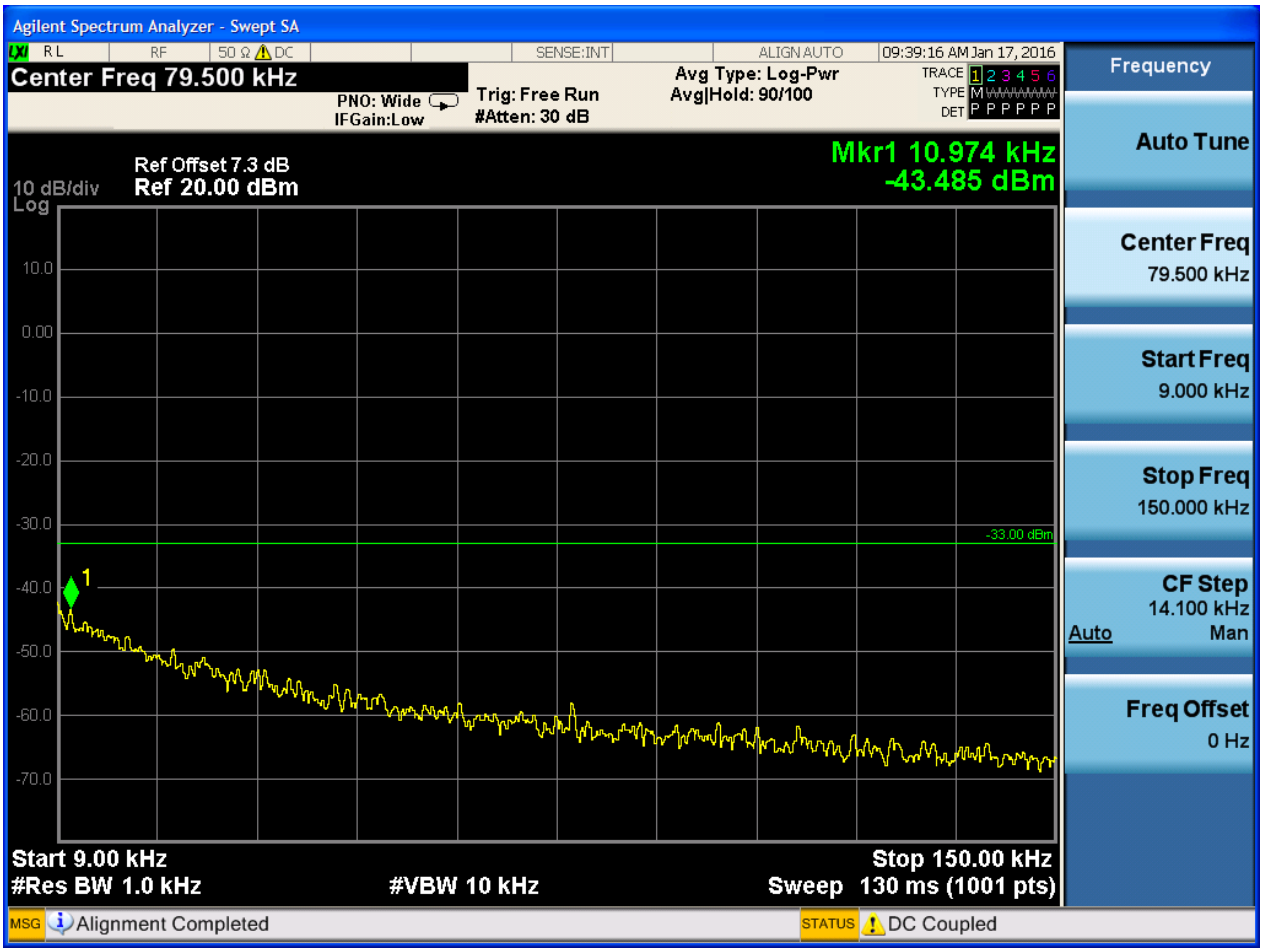


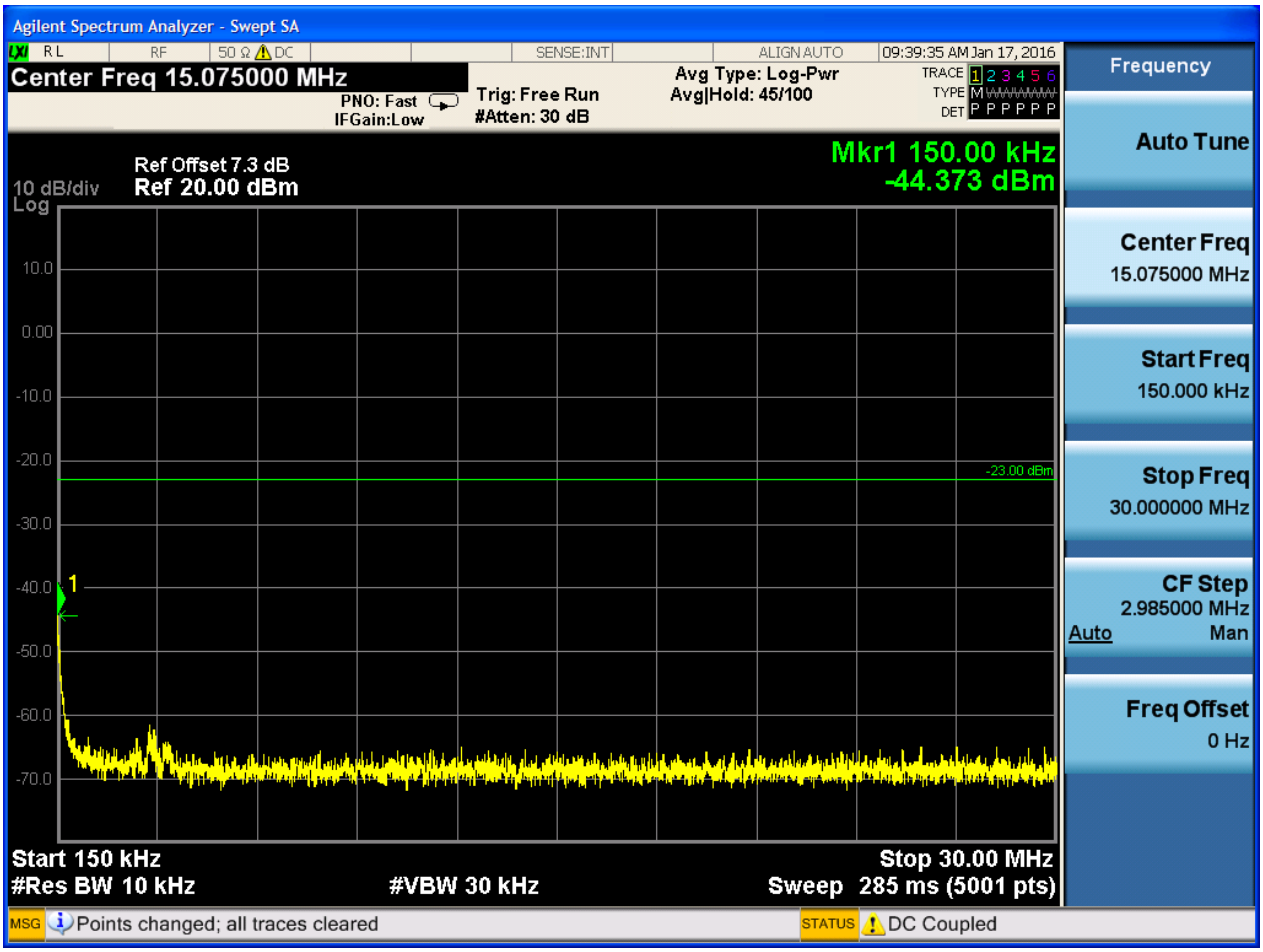


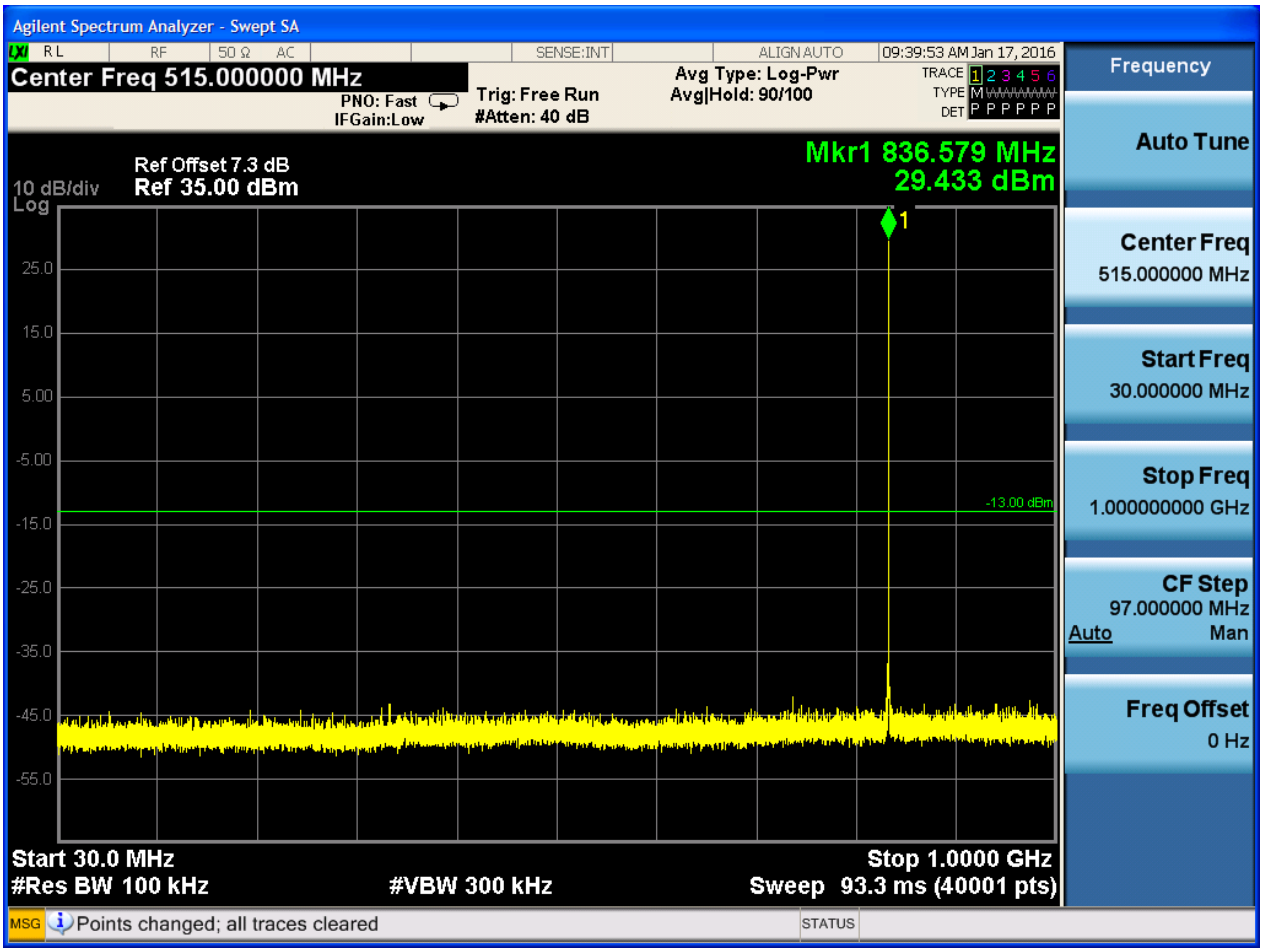


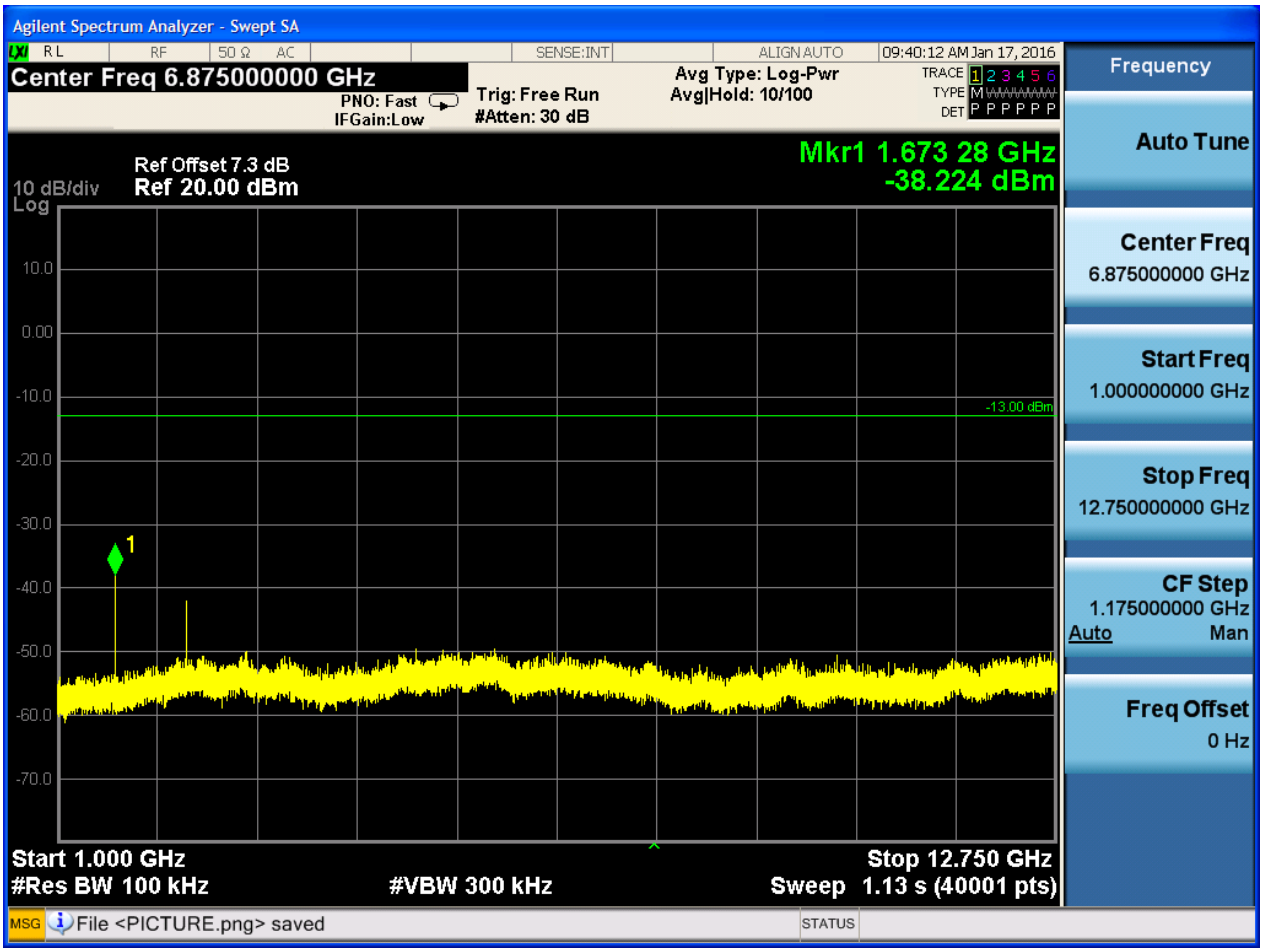


6.1.1.2.2 Test Channel = MCH

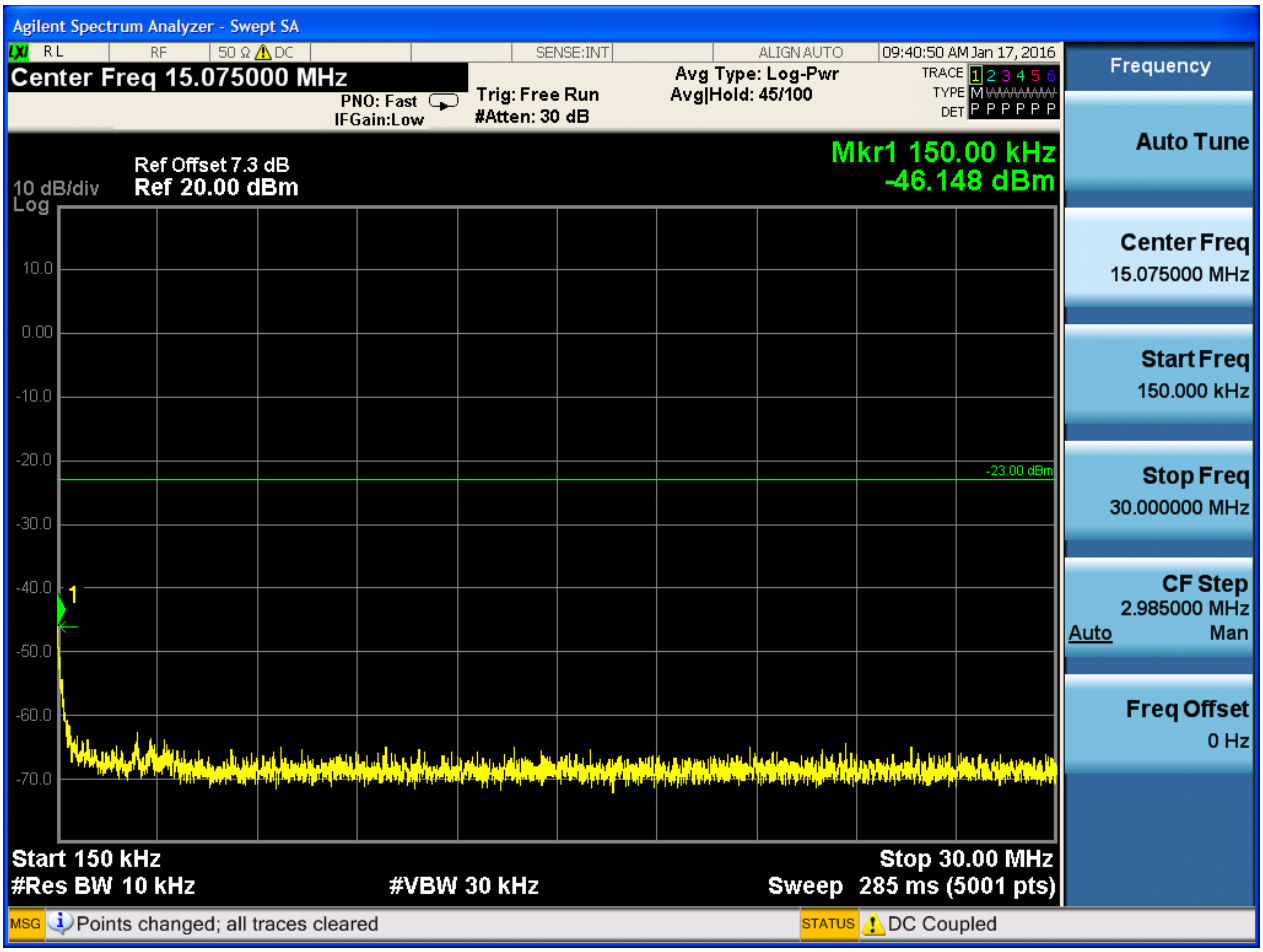


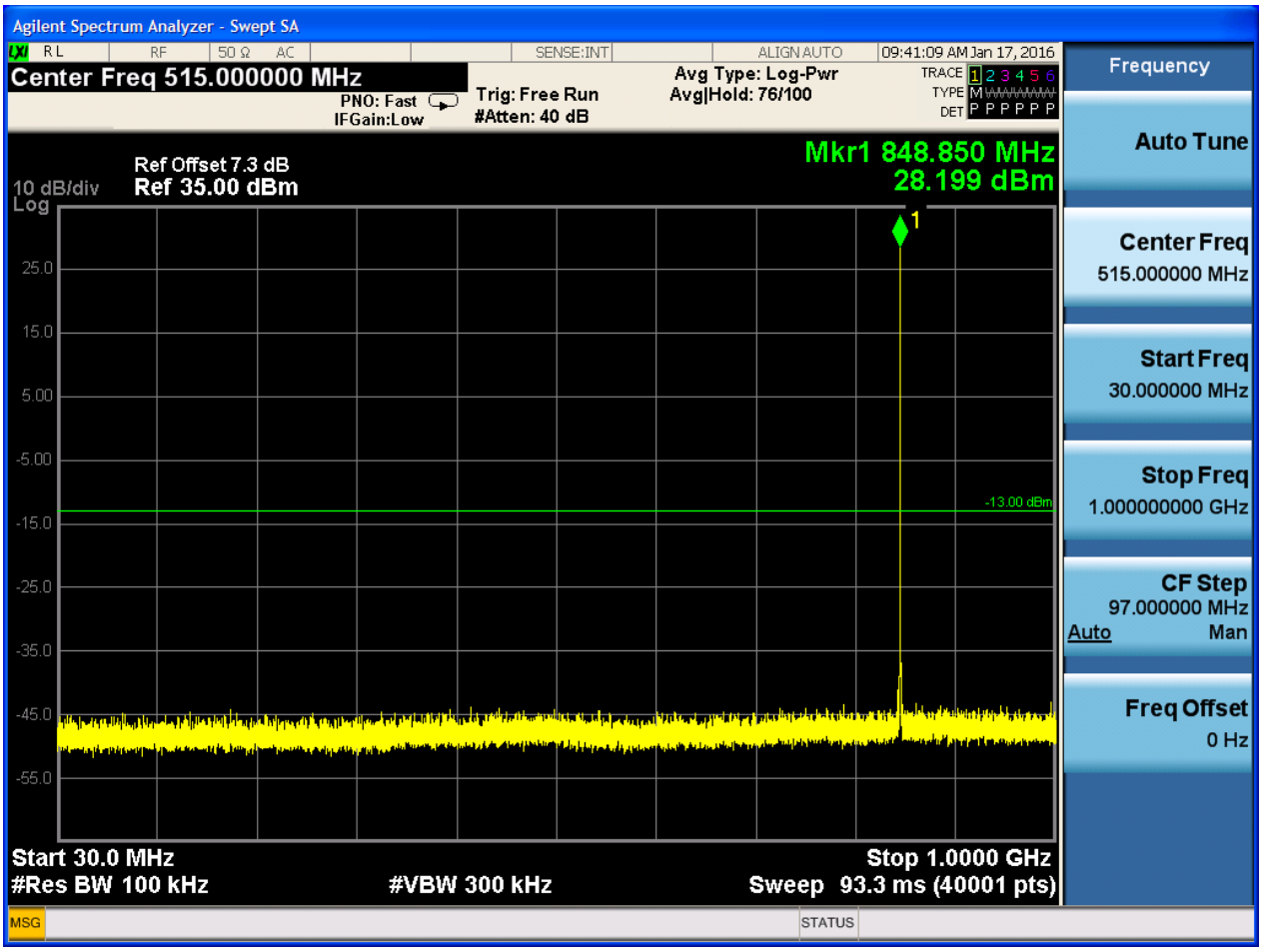


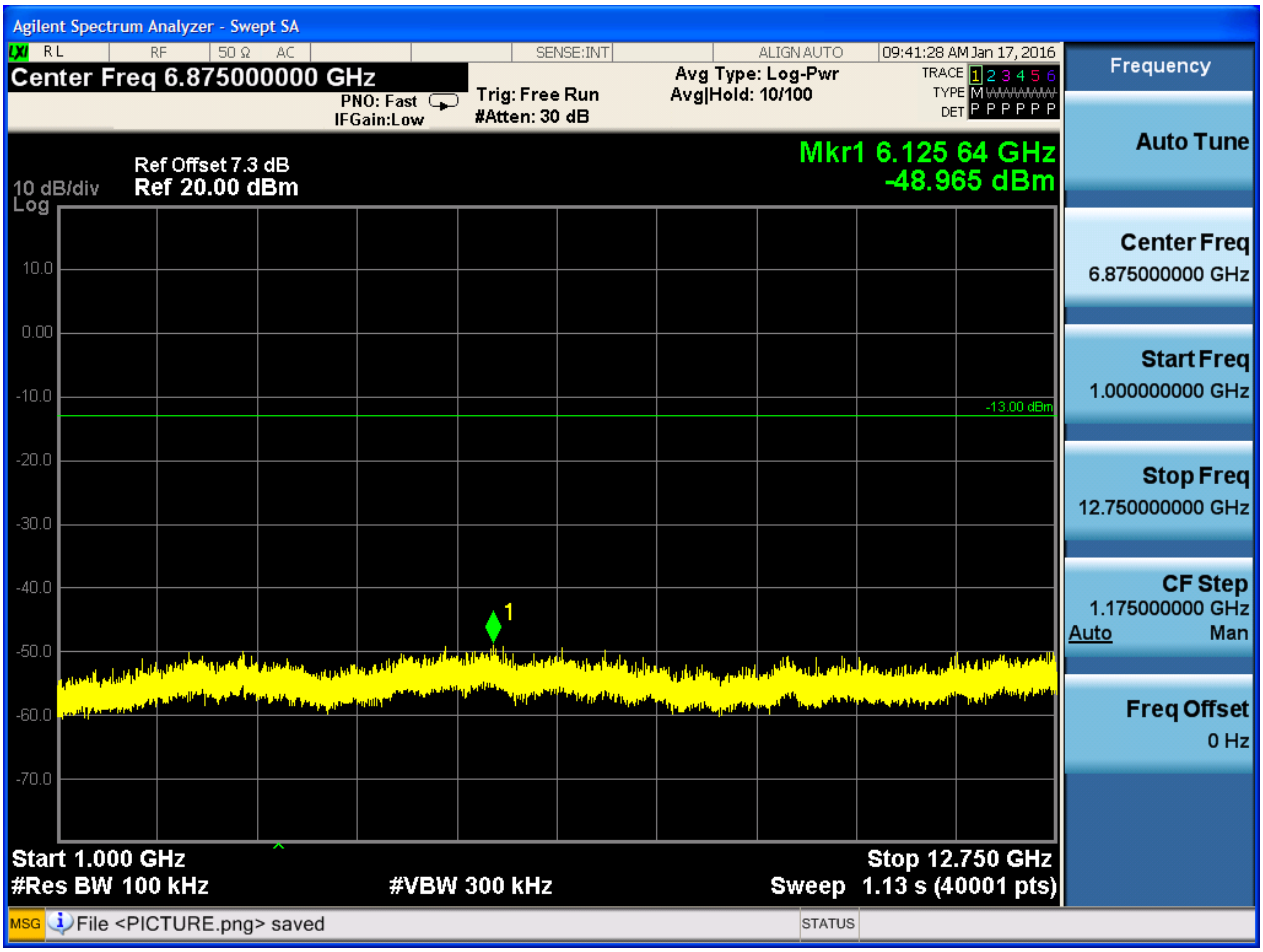




6.1.1.2.3 Test Channel = HCH



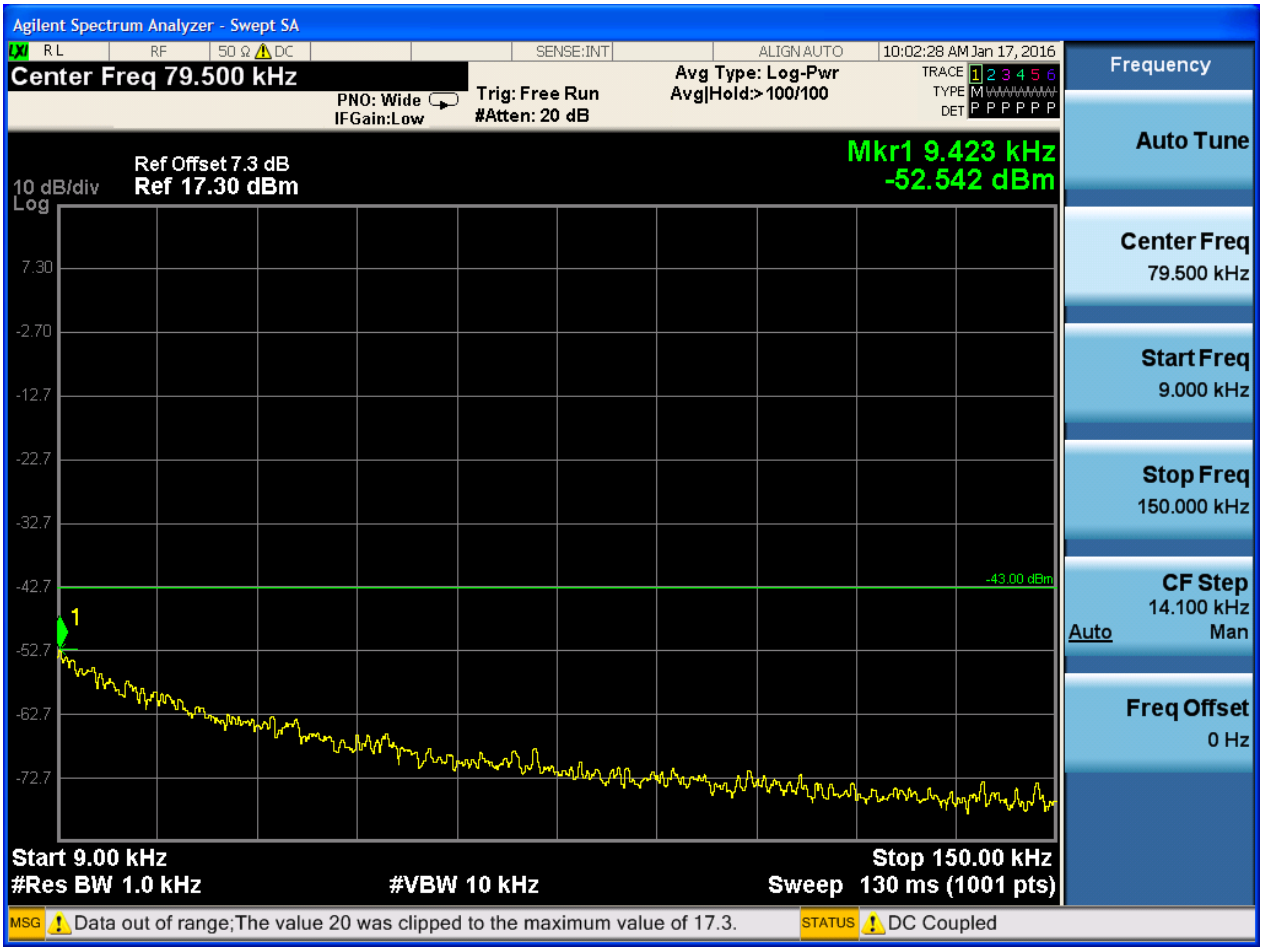


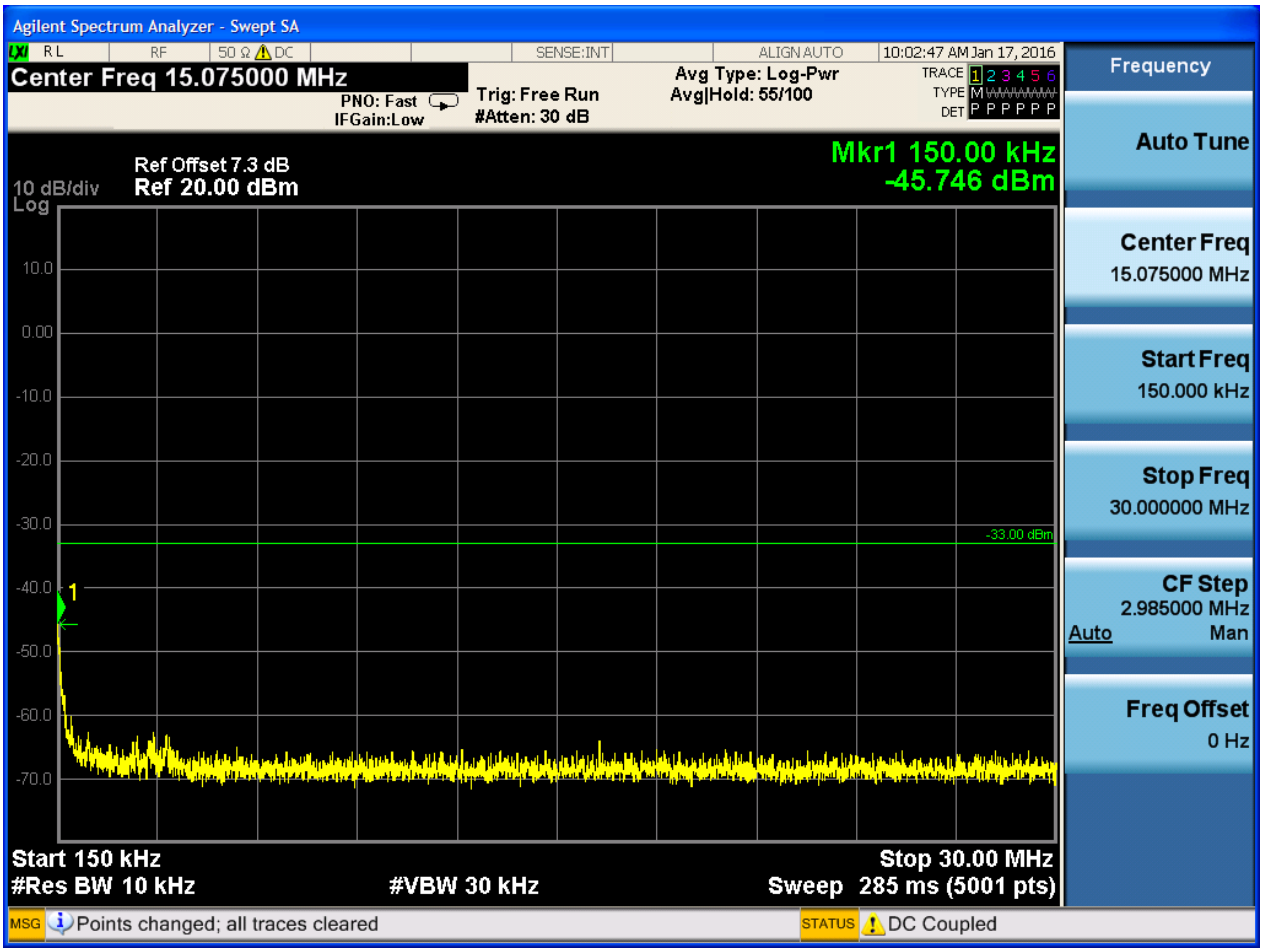


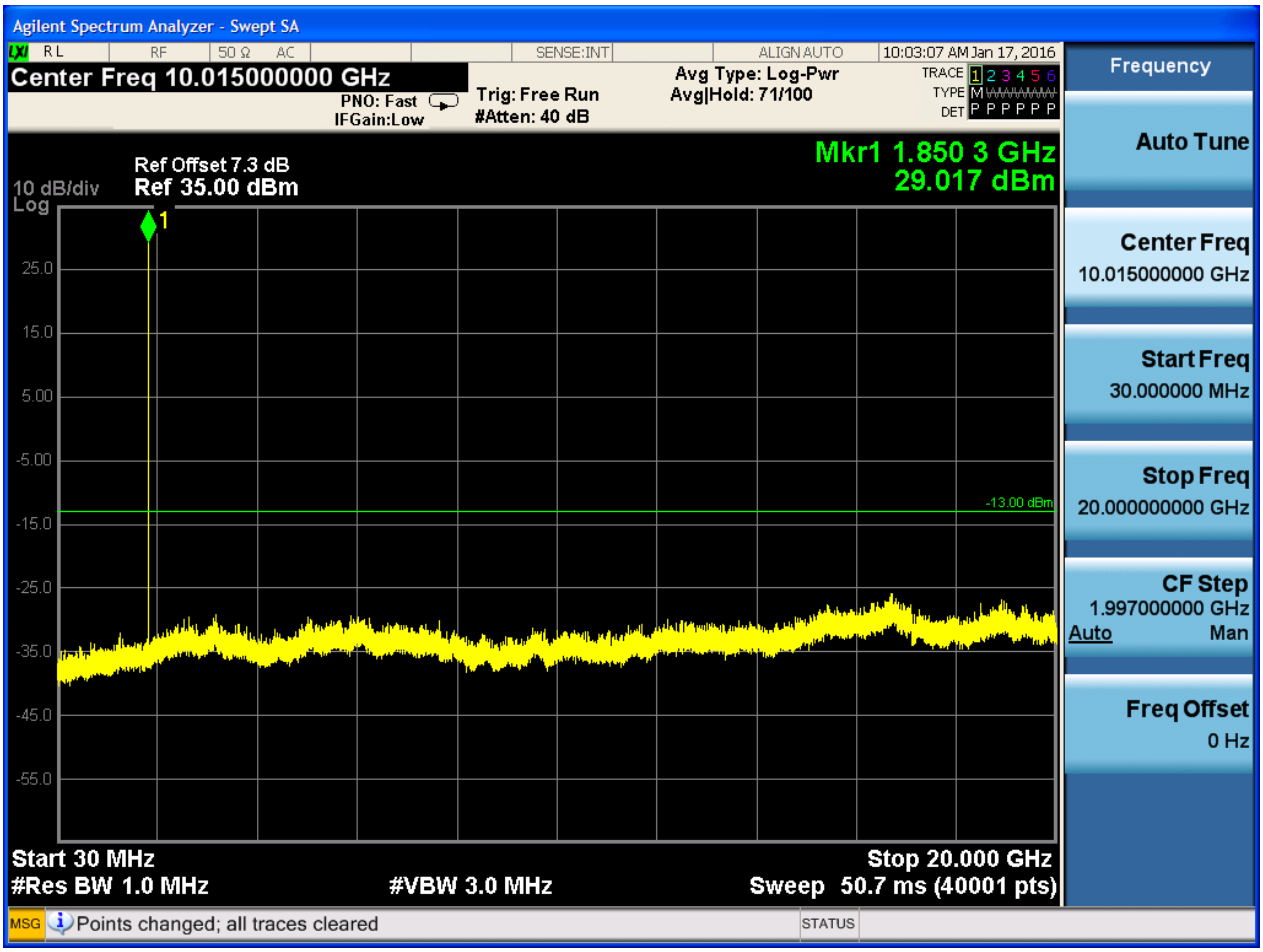
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

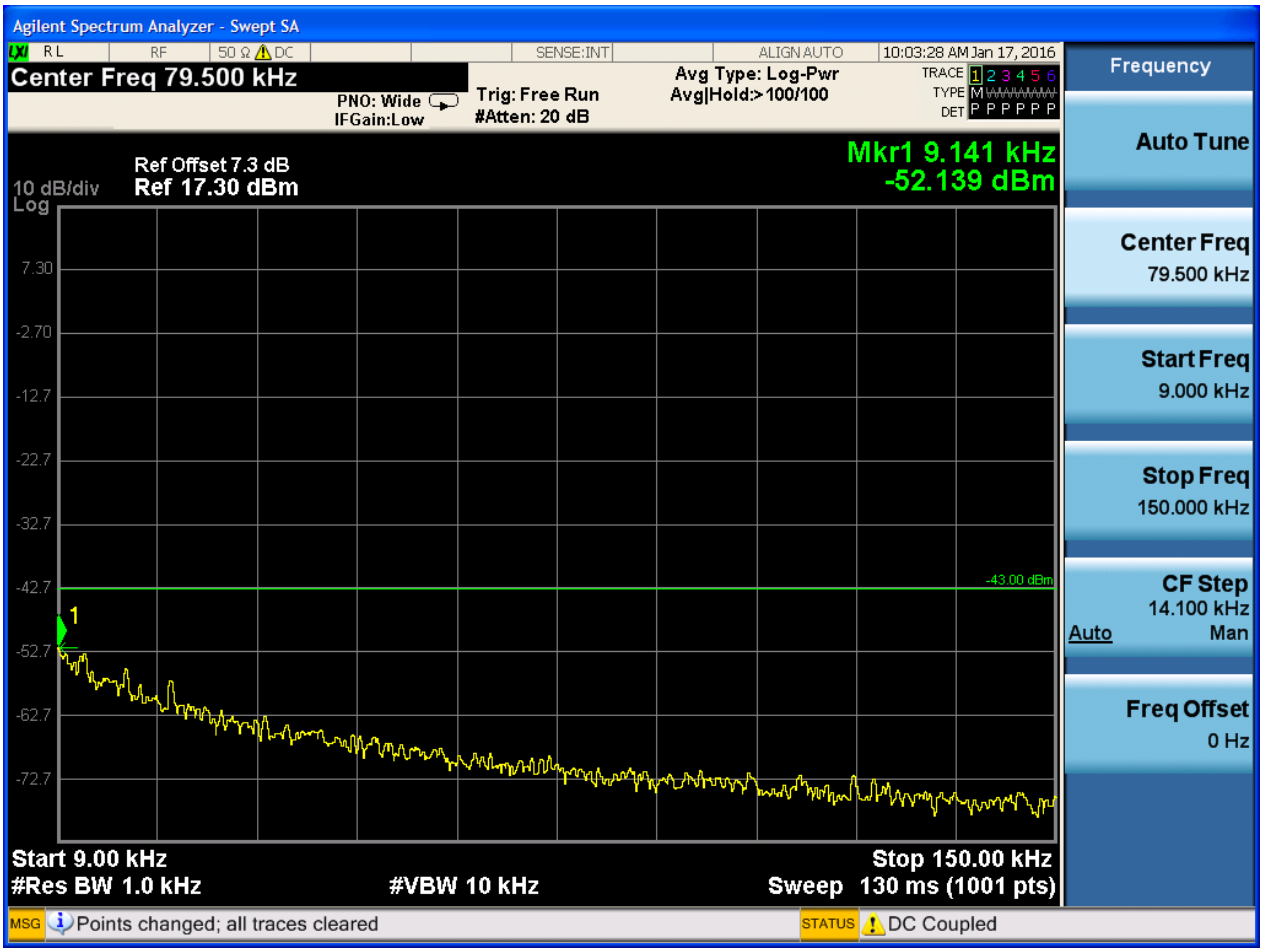
6.1.2.1.1 Test Channel = LCH

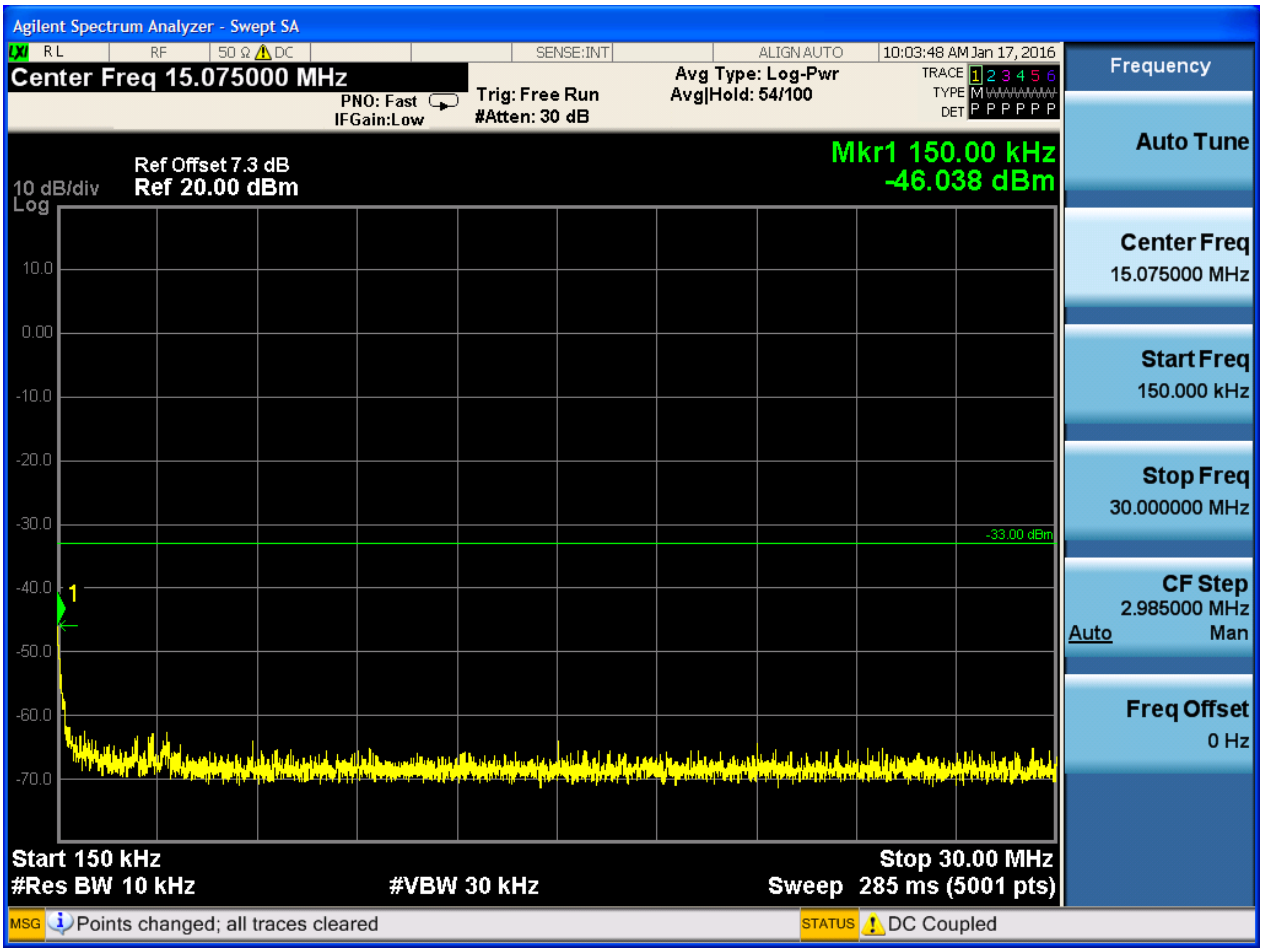


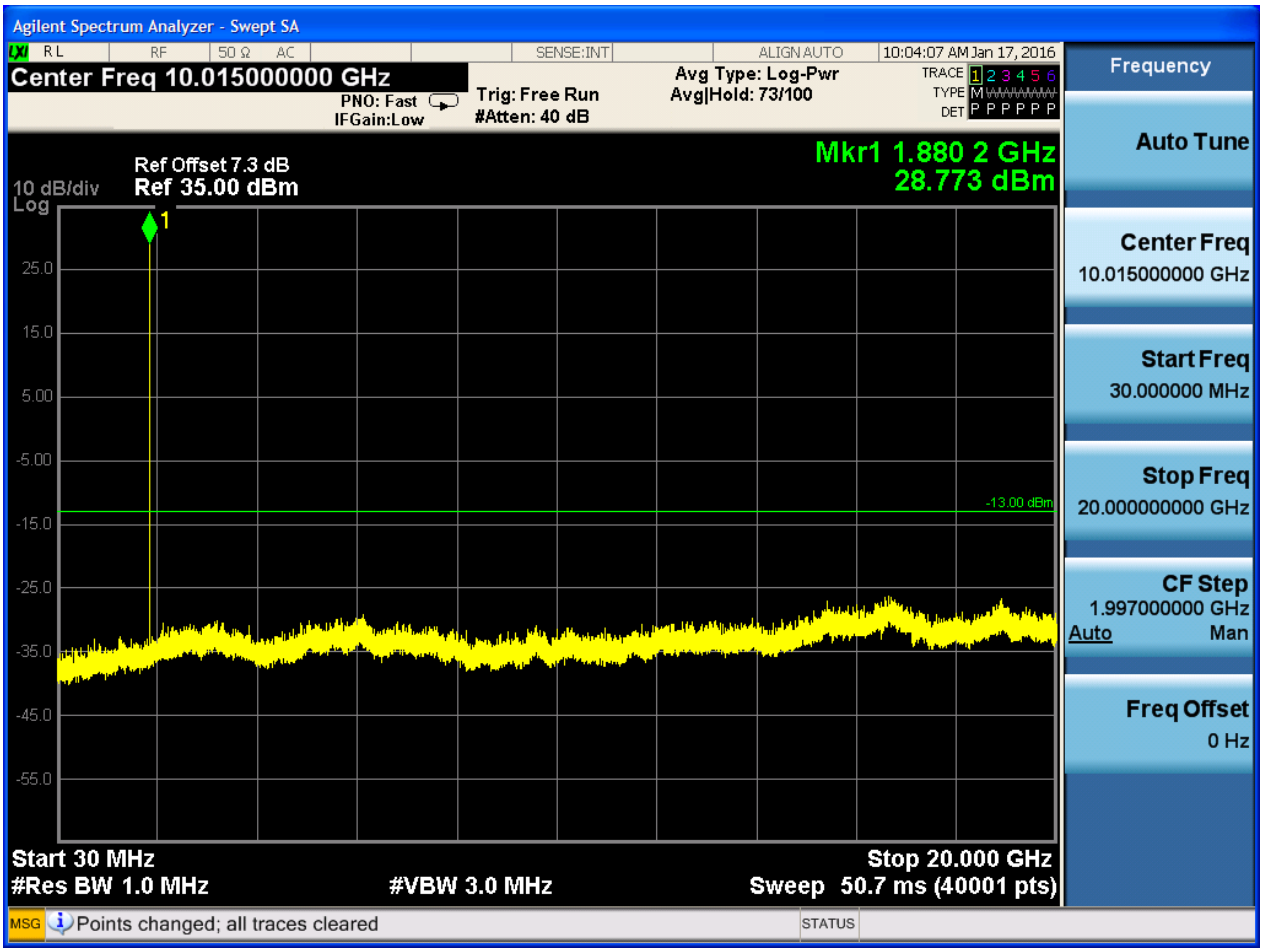




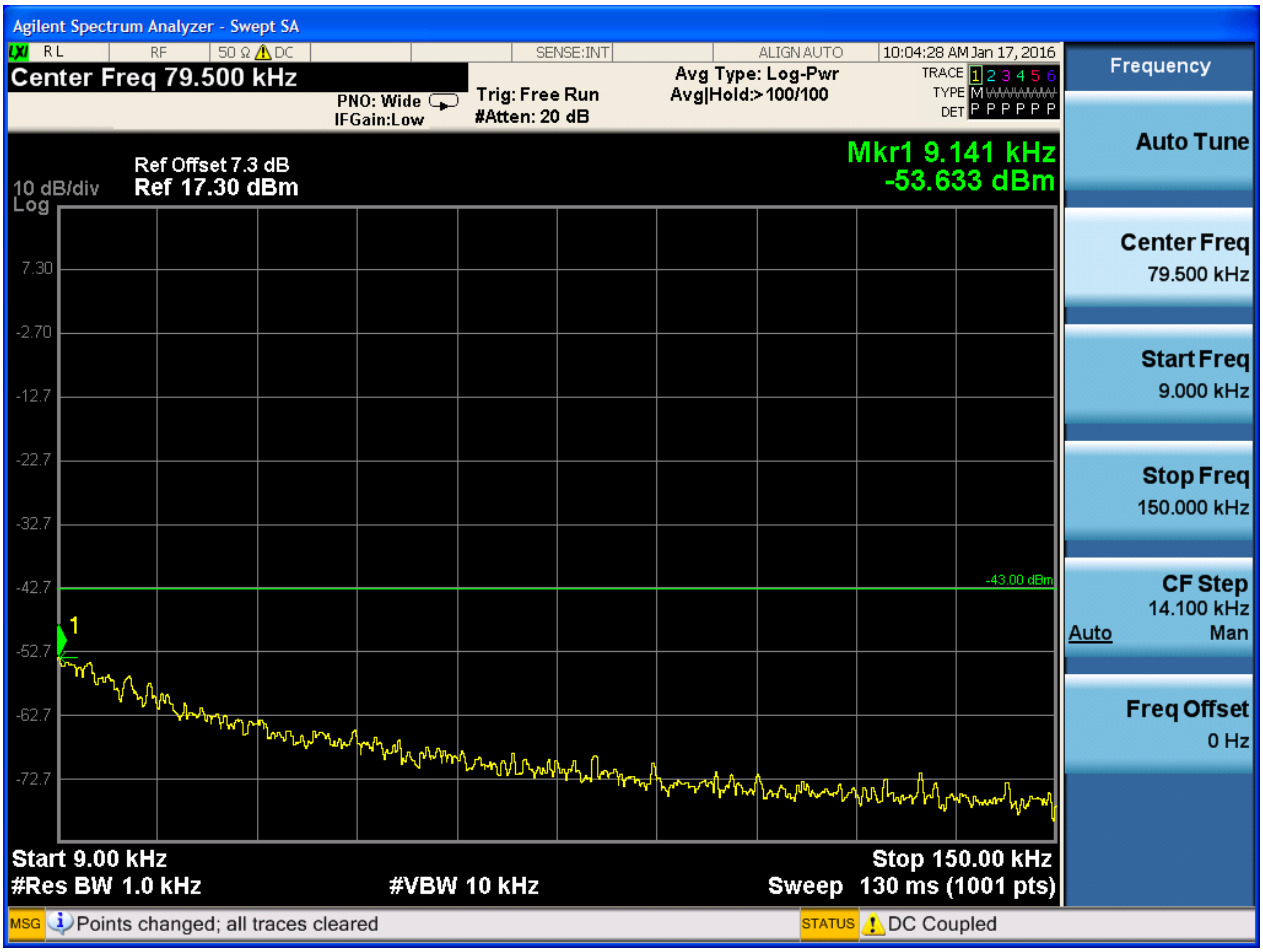
6.1.2.1.2 Test Channel = MCH

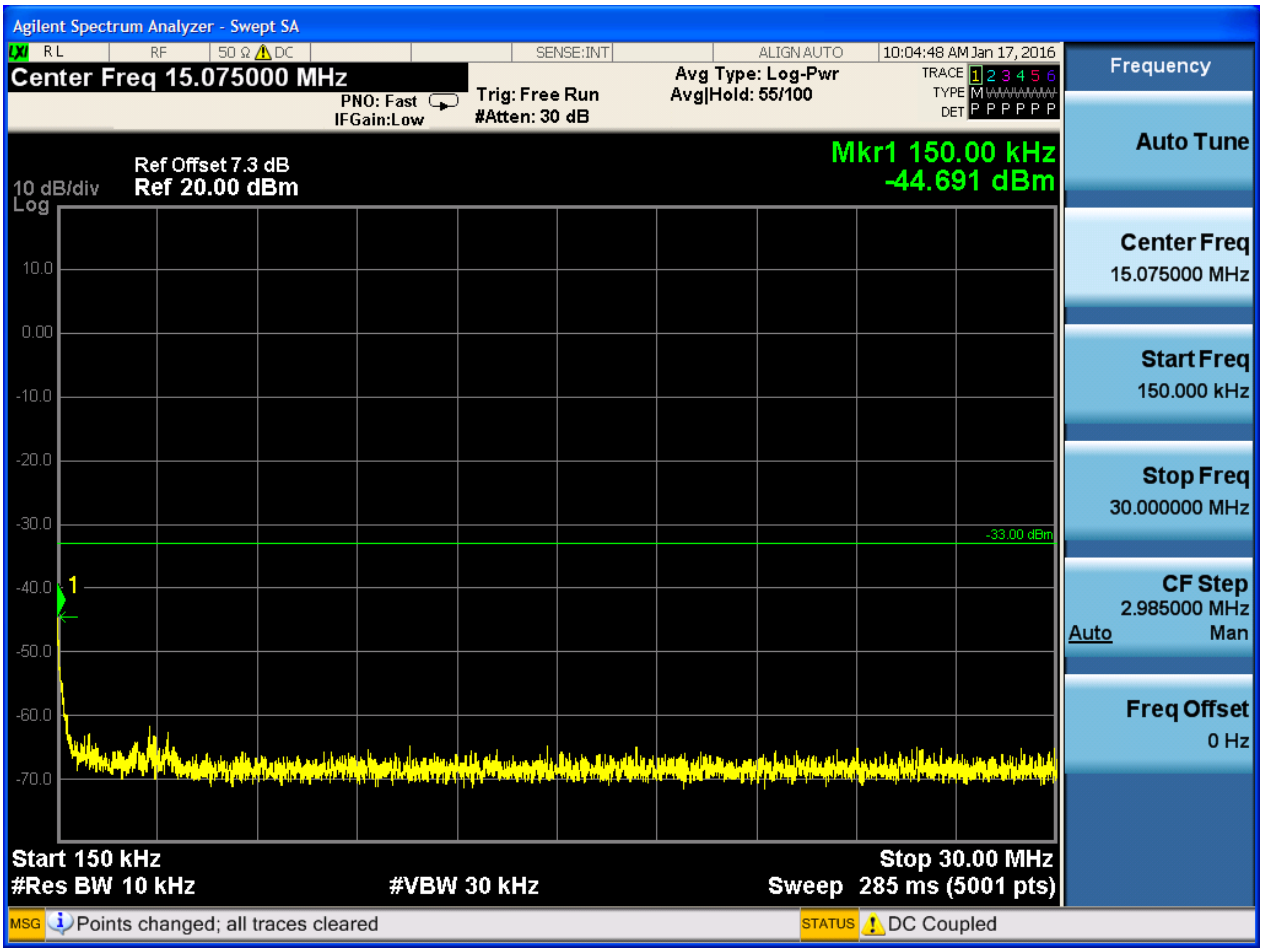


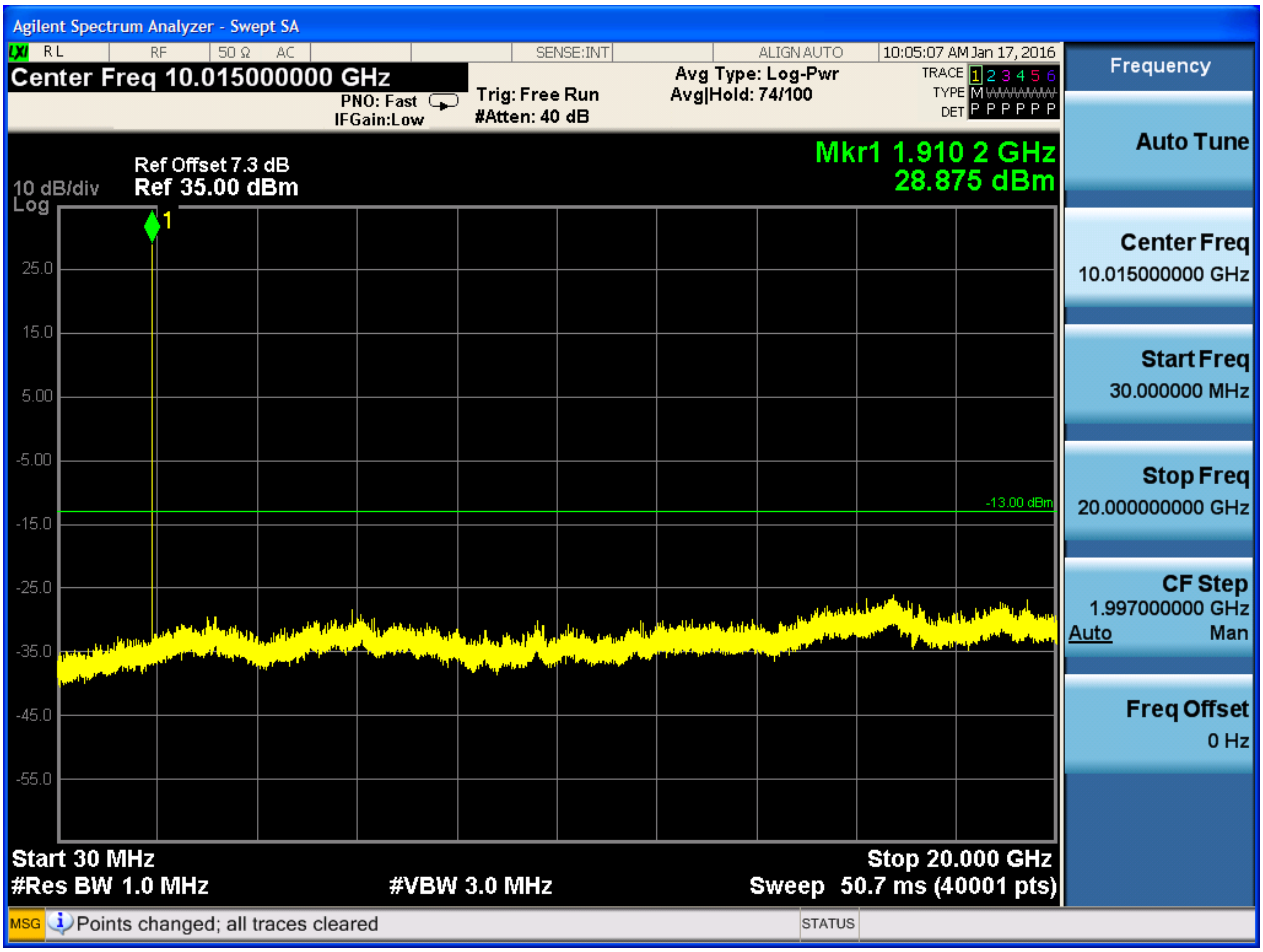




6.1.2.1.3 Test Channel = HCH

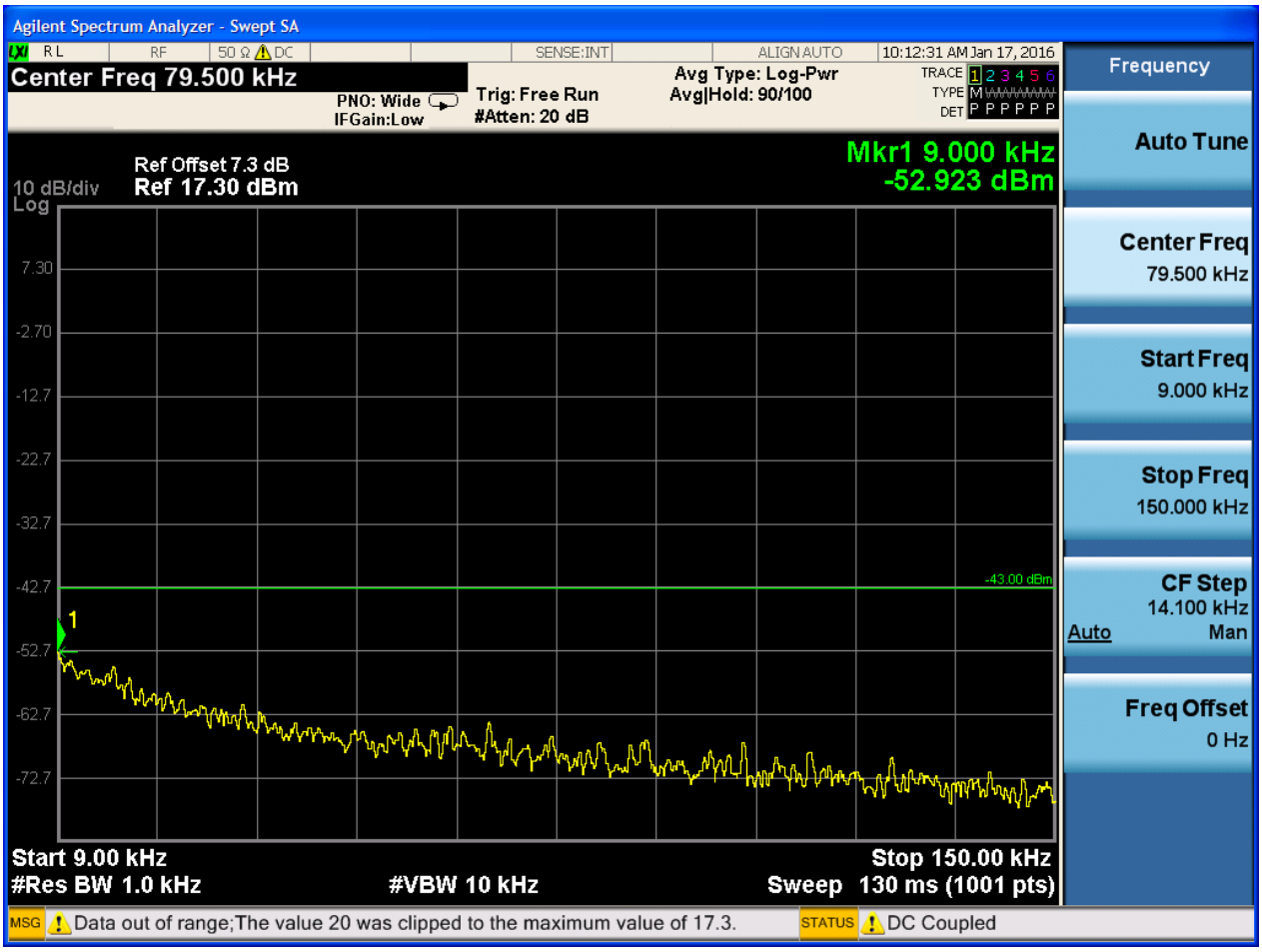


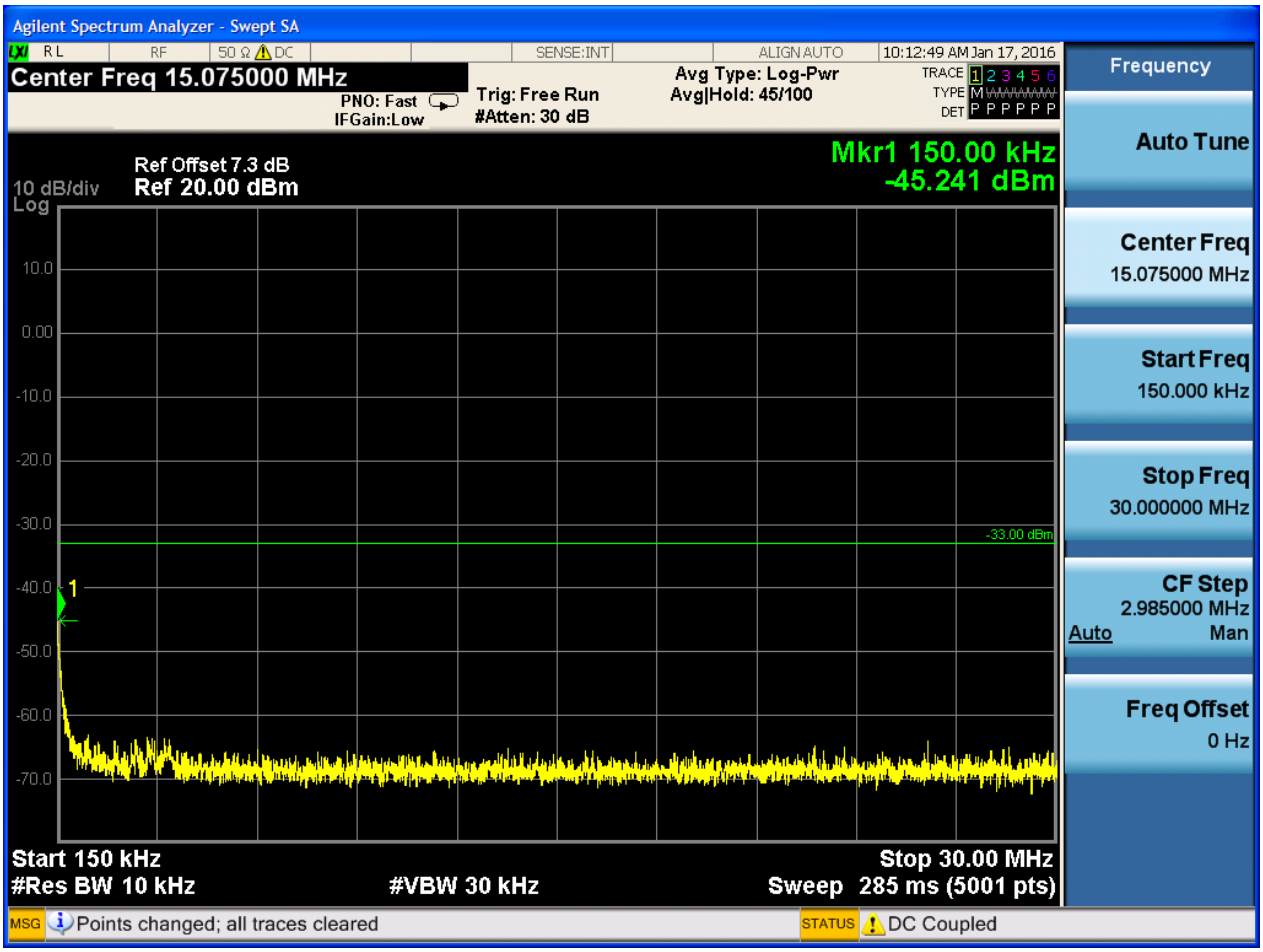


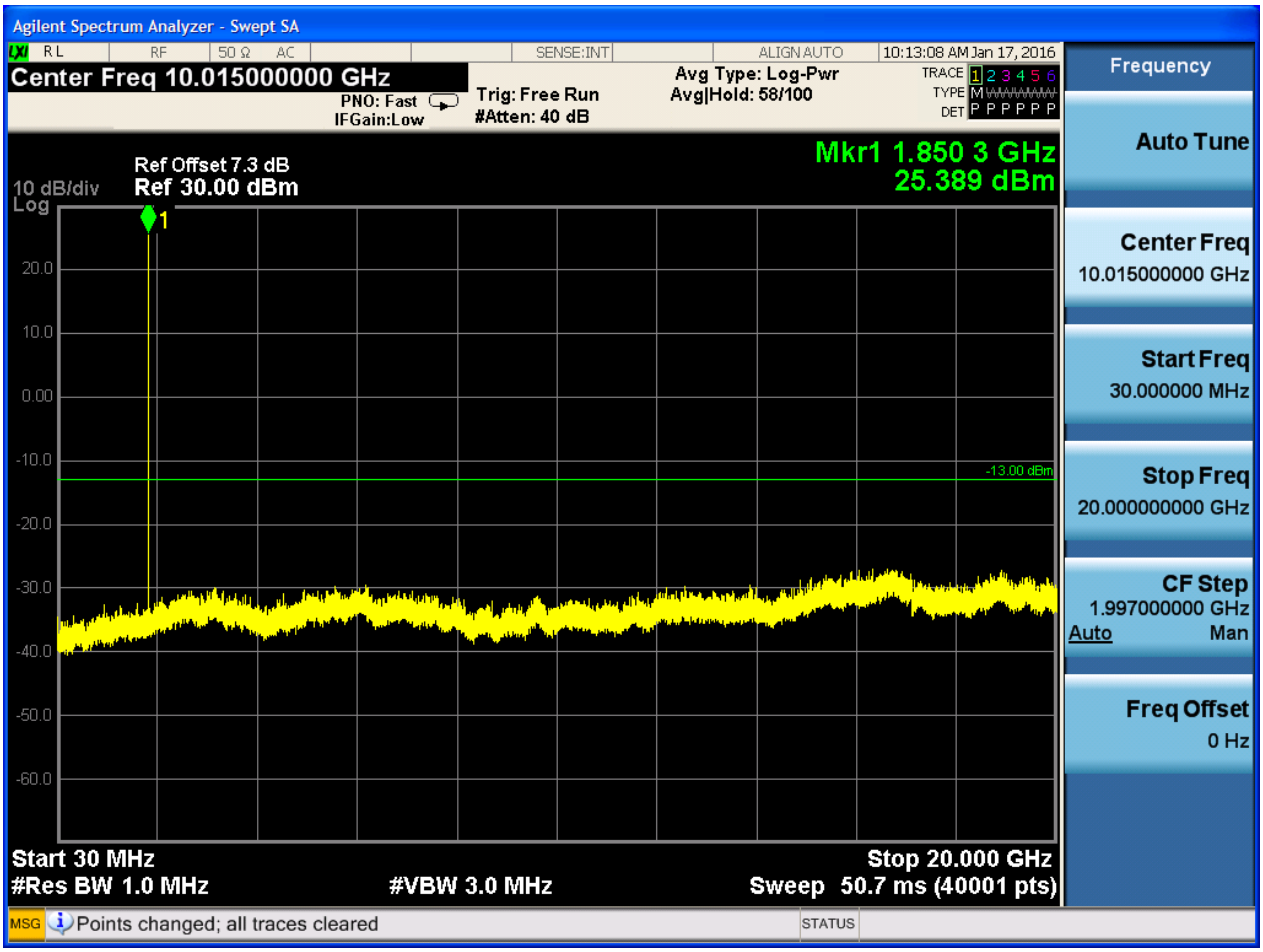


6.1.2.2 Test Mode = GSM/TM2

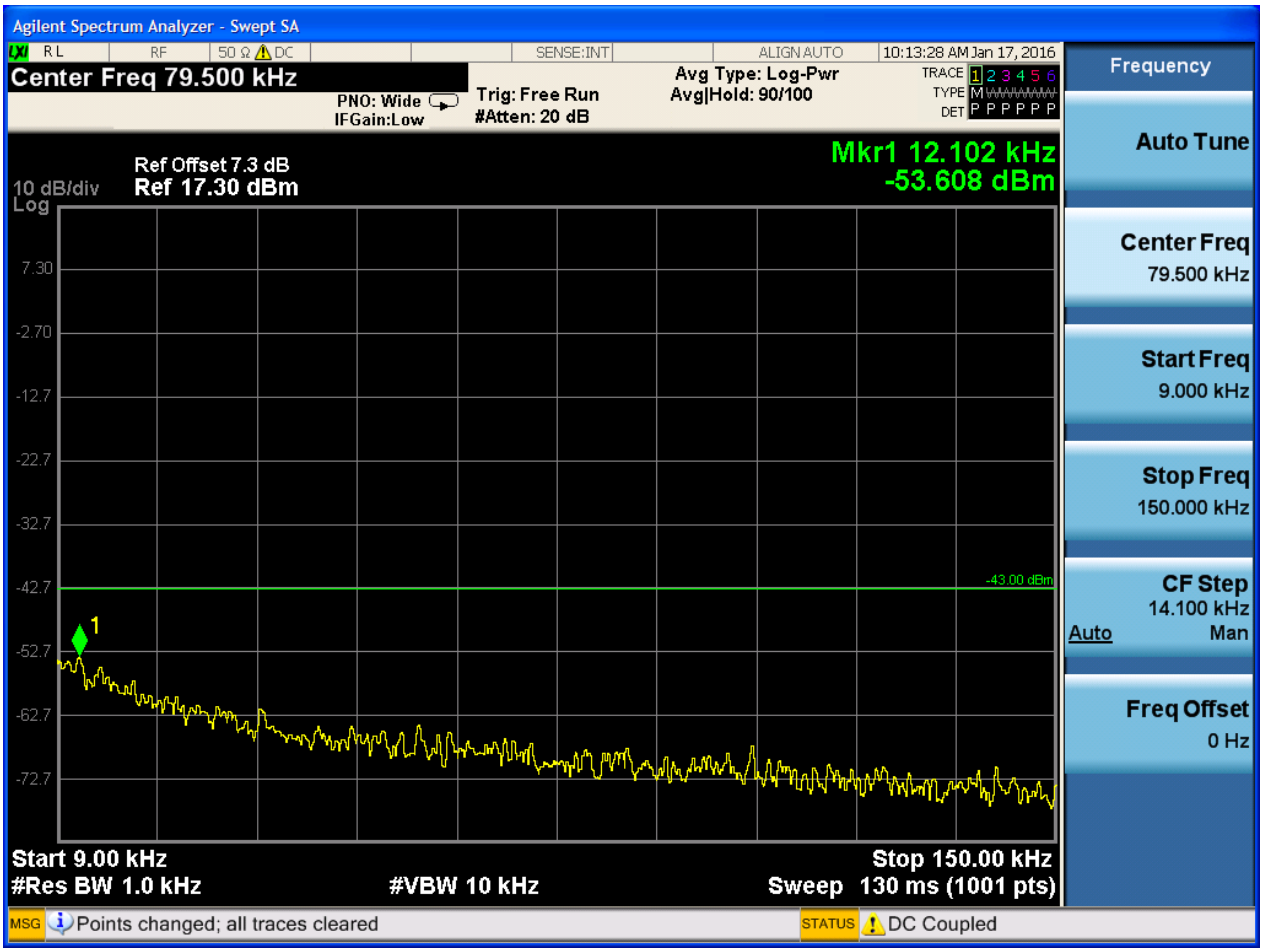
6.1.2.2.1 Test Channel = LCH

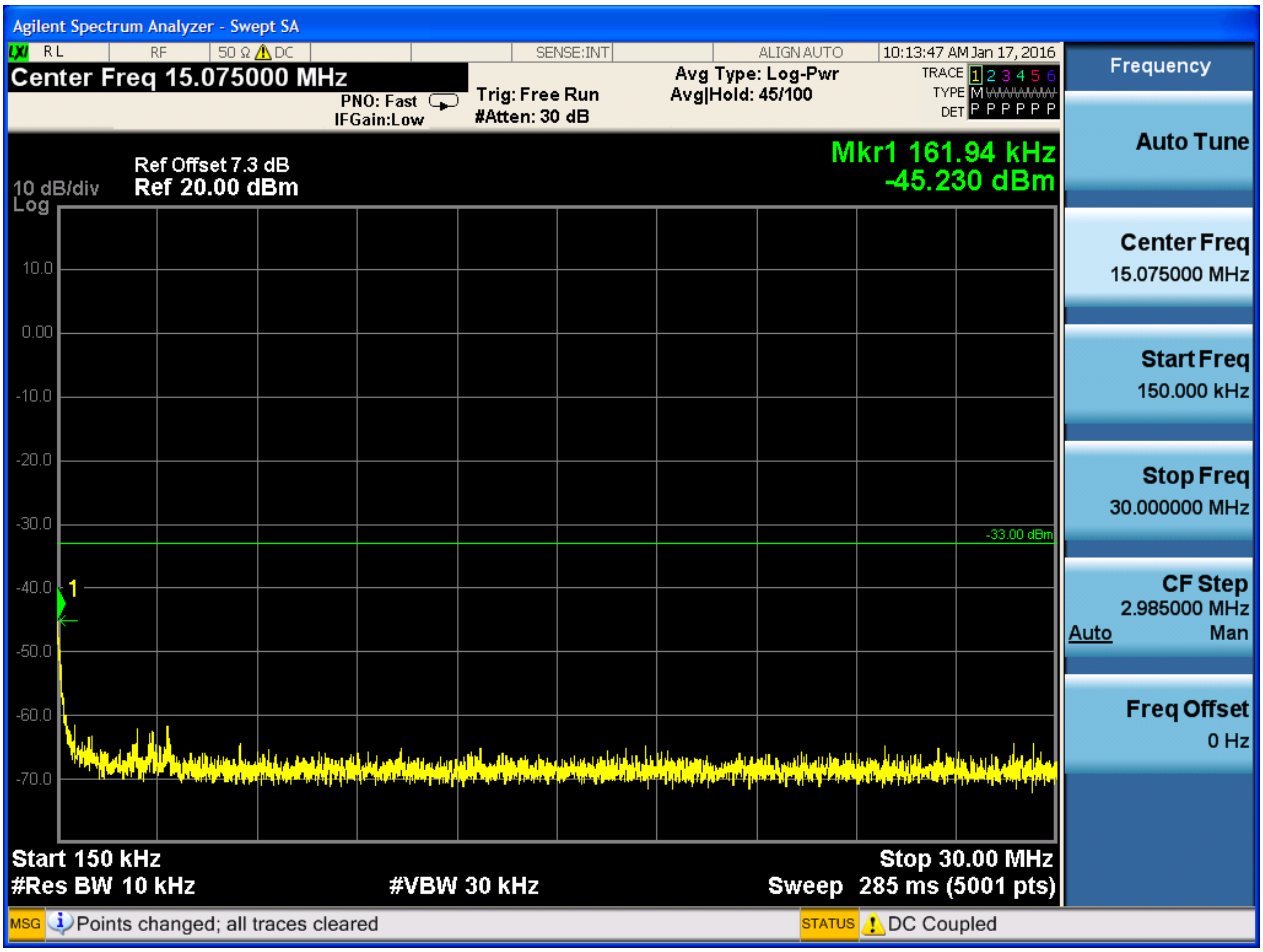


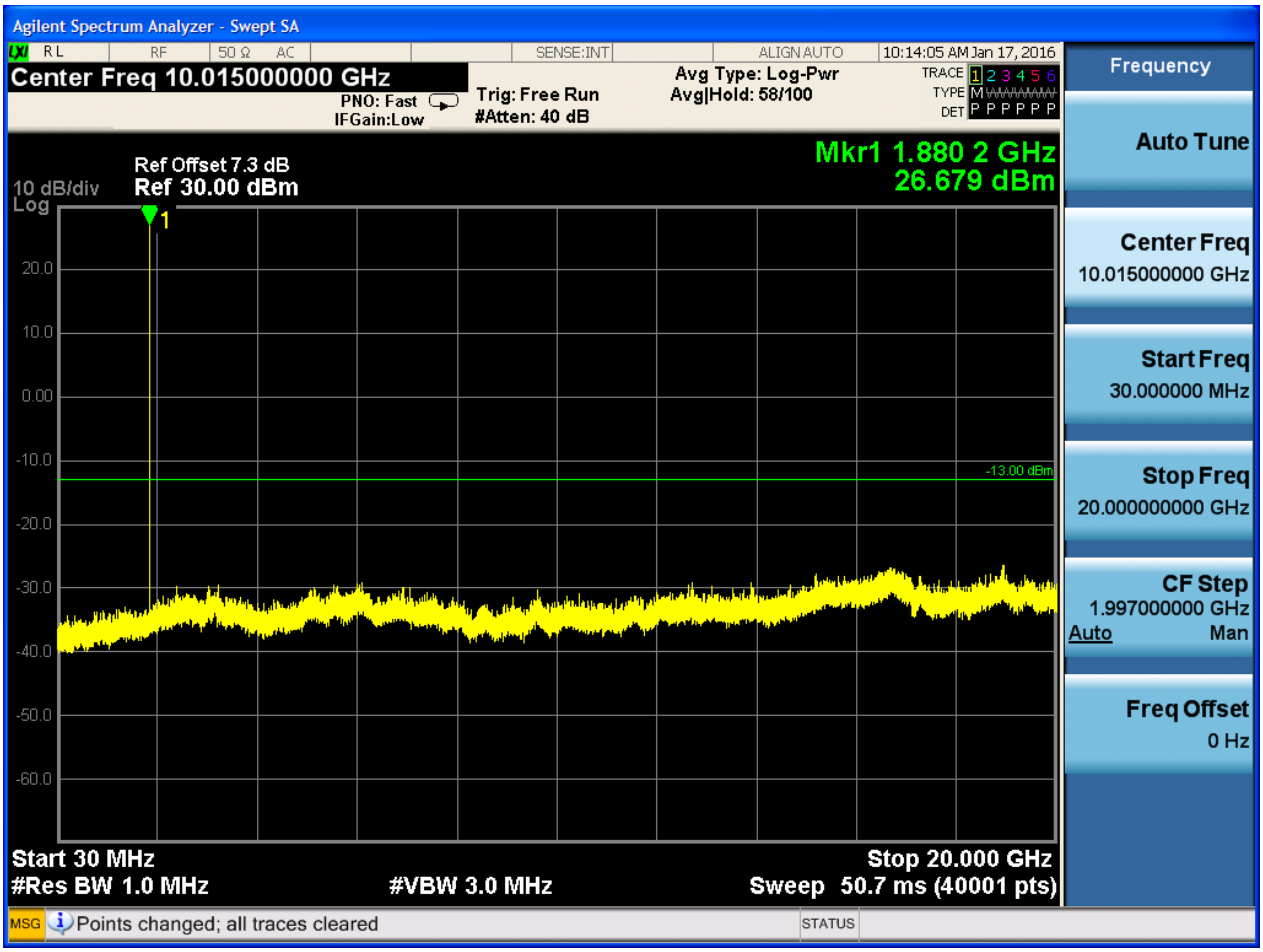




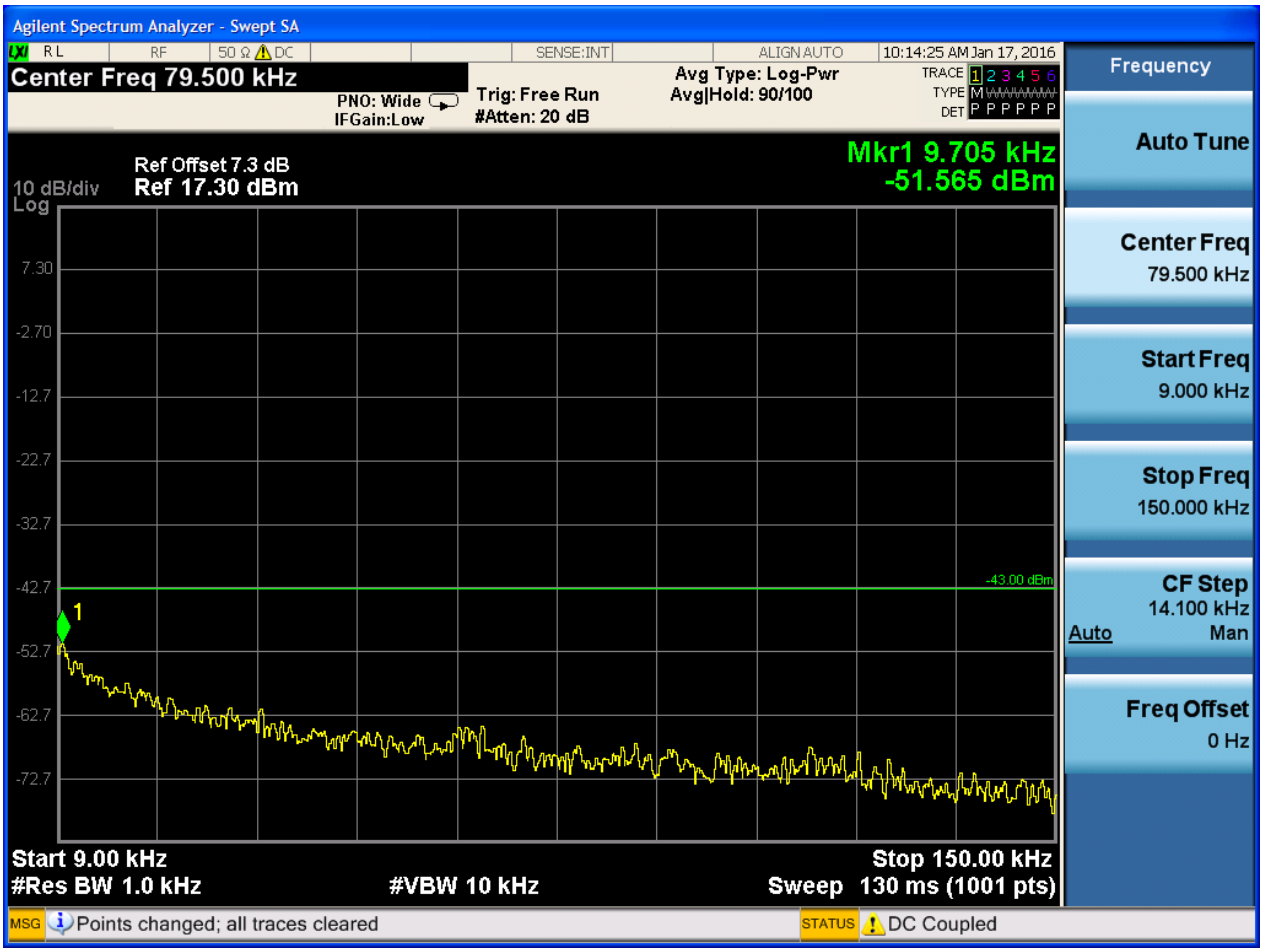
6.1.2.2.2 Test Channel = MCH

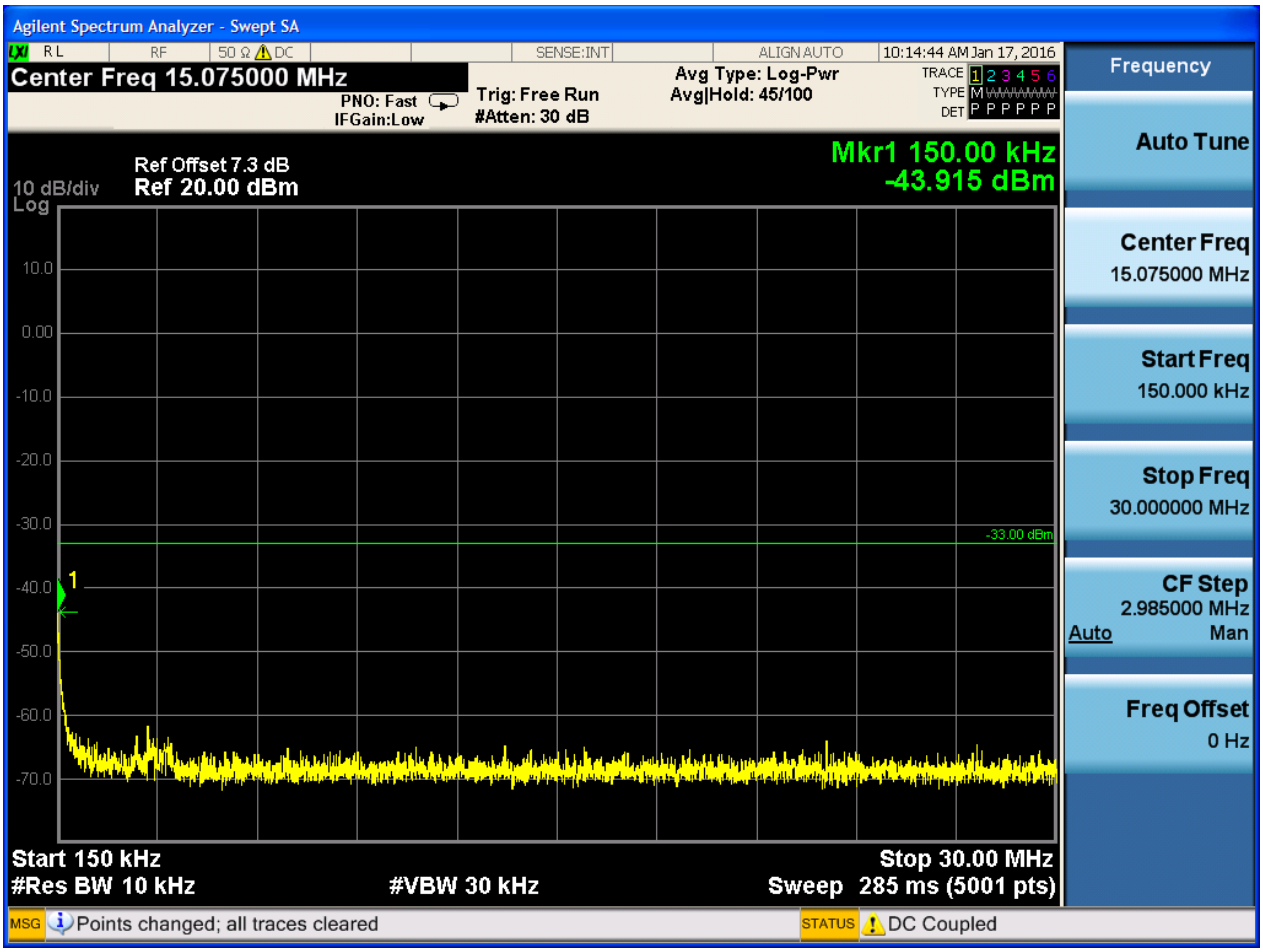


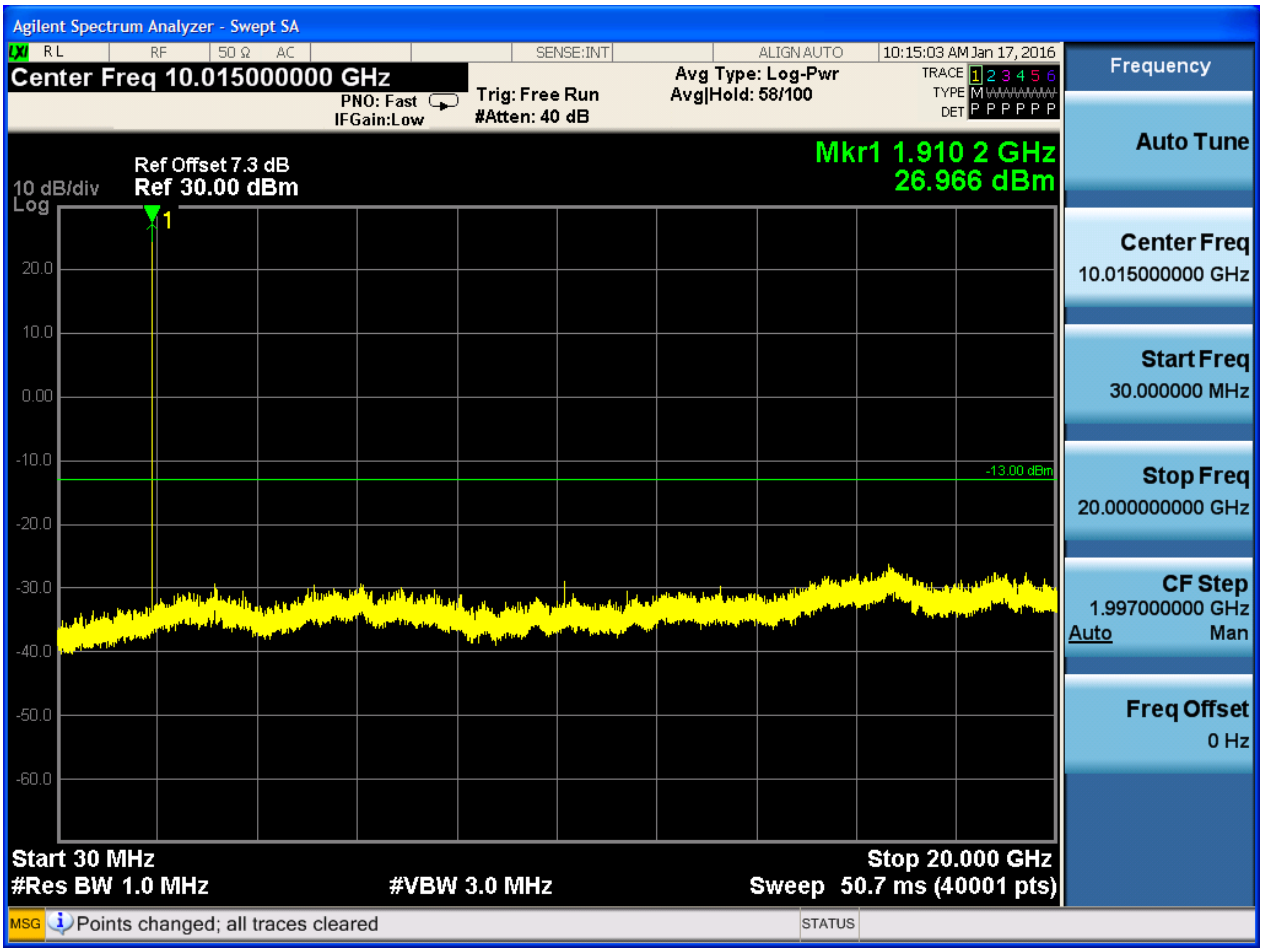




6.1.2.2.3 Test Channel = HCH







7Appendix_G: Field Strength of Spurious Radiation

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

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

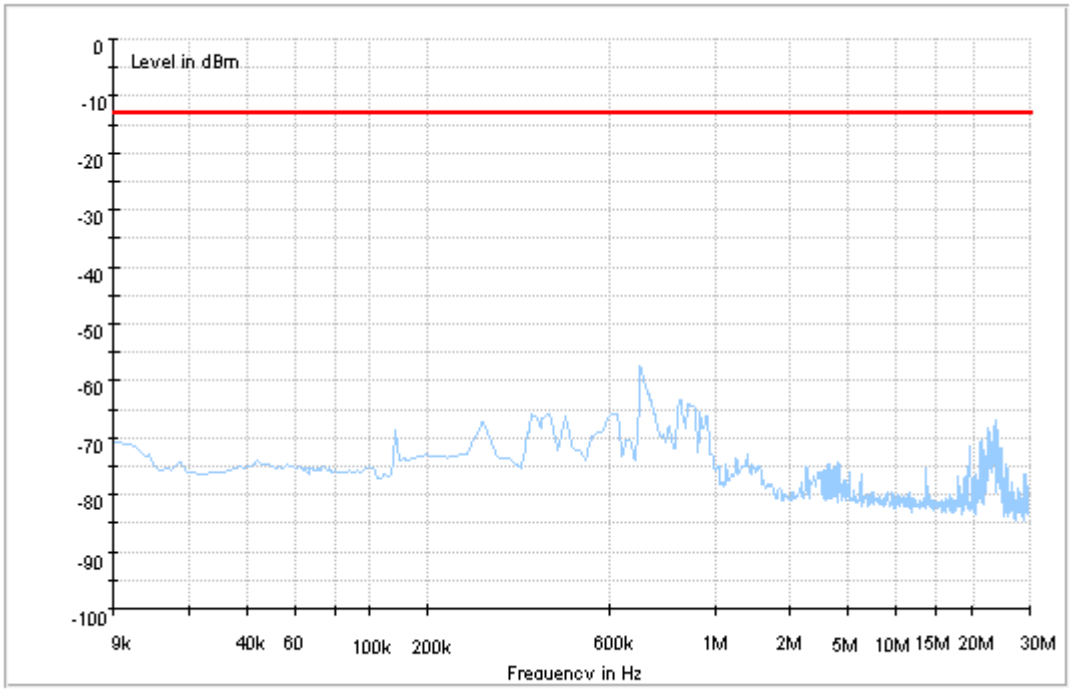
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

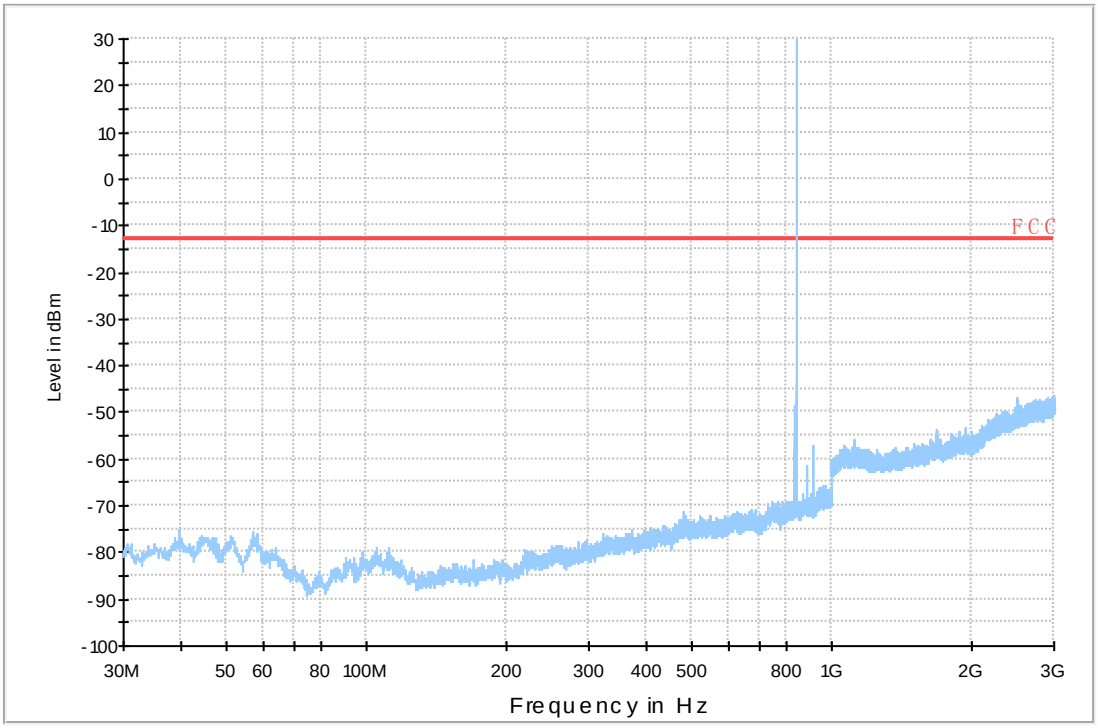
7.1 For GSM

7.1.1 Test Band = GSM850

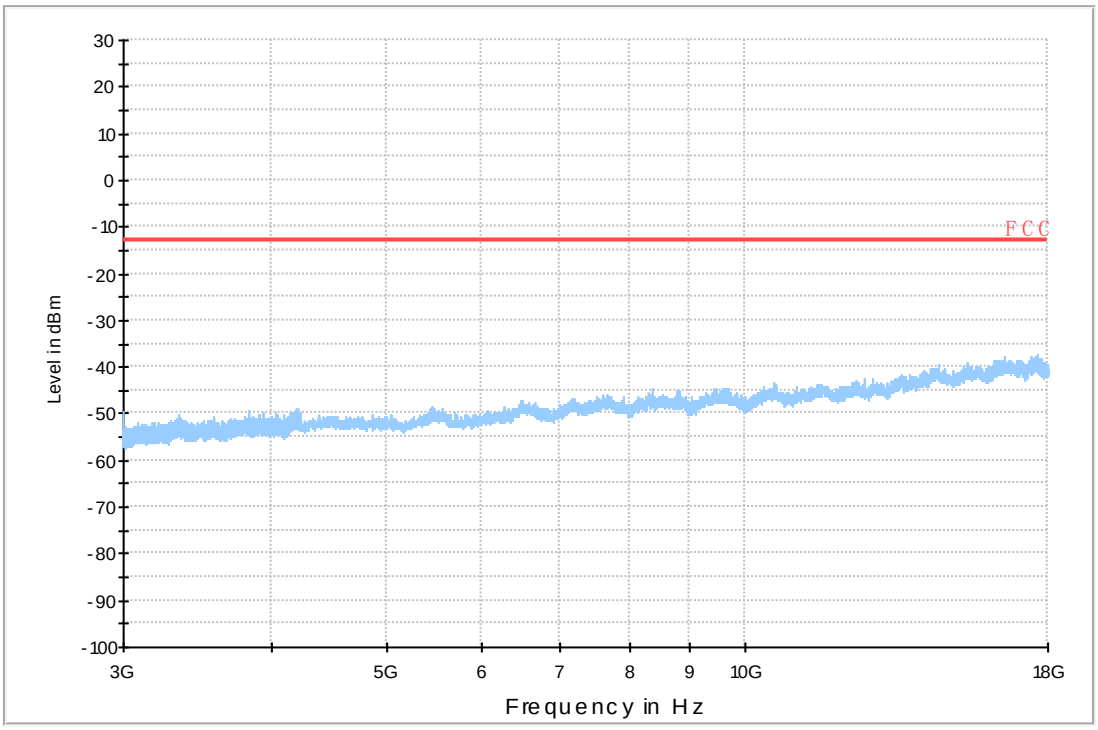
7.1.1.1 Test Mode = GSM/TM1



Copy of FCC PART22 GSM850_L

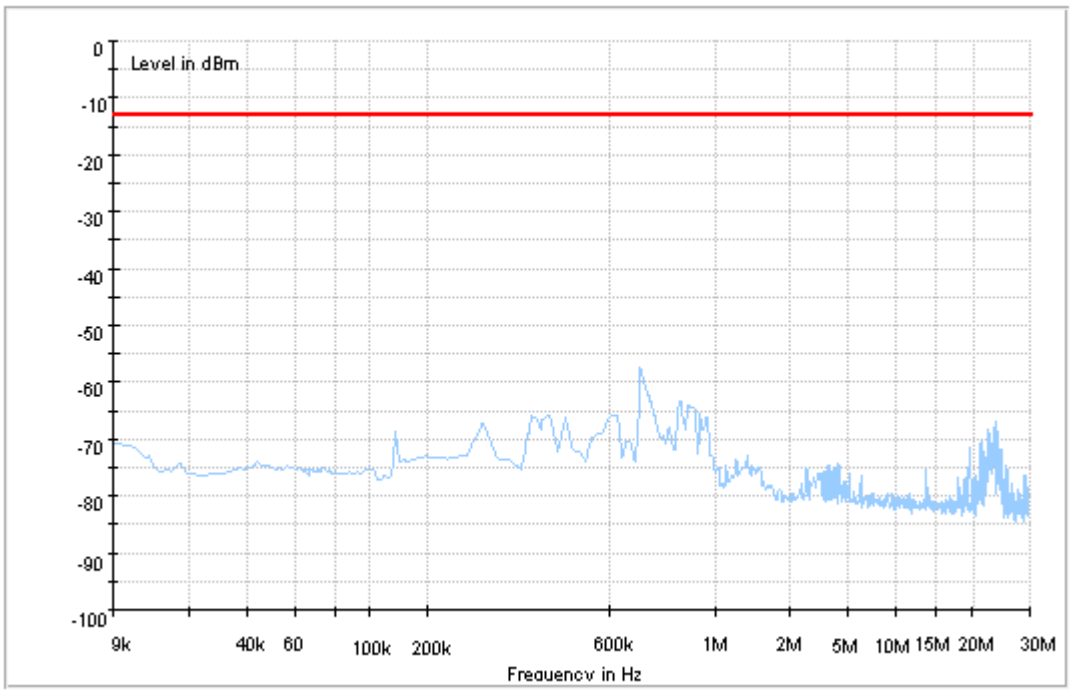


Copy of FCC PART22 GSM850_H

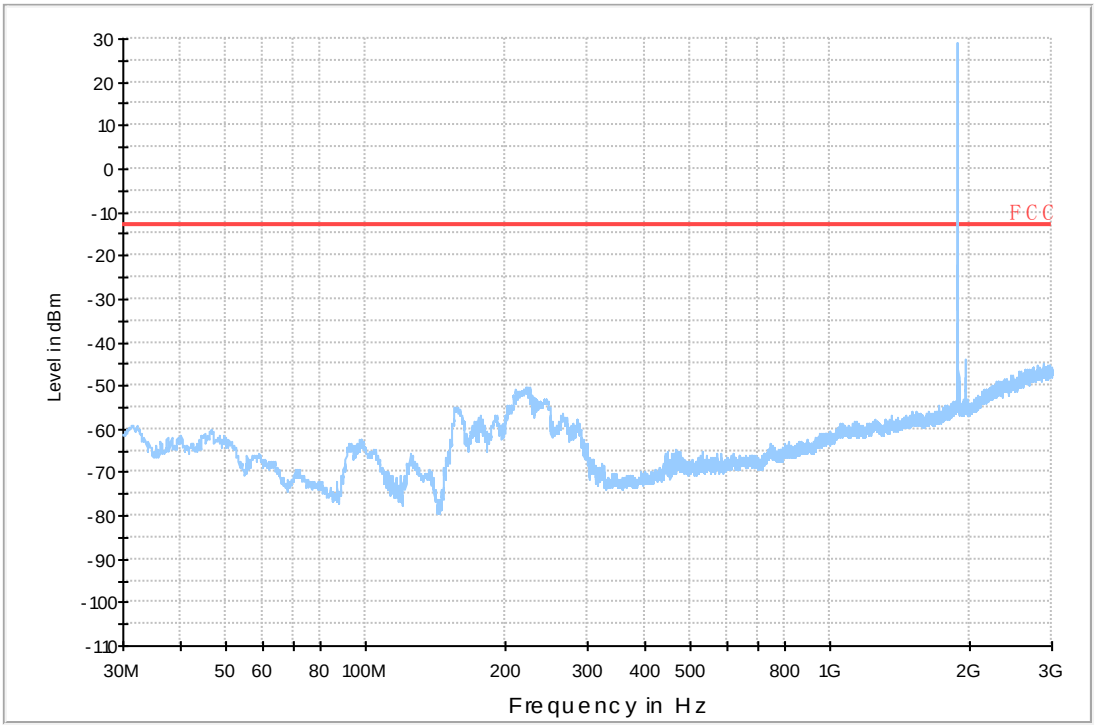


7.1.2 Test Band = GSM1900

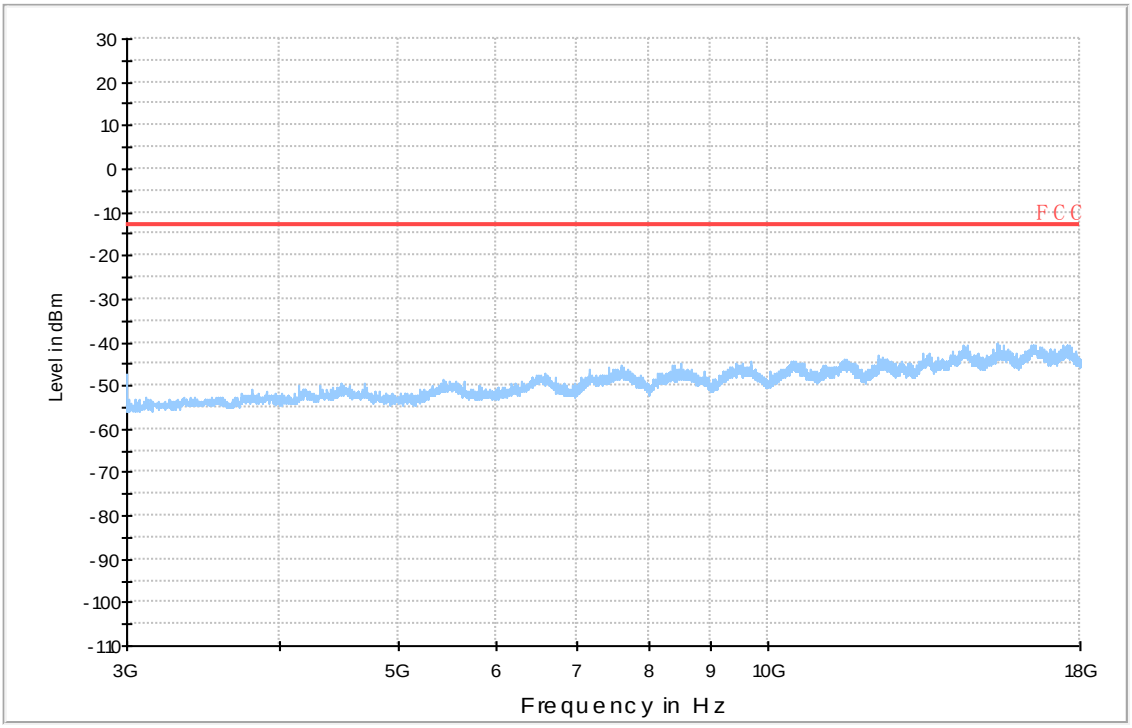
7.1.2.1 Test Mode = GSM/TM1

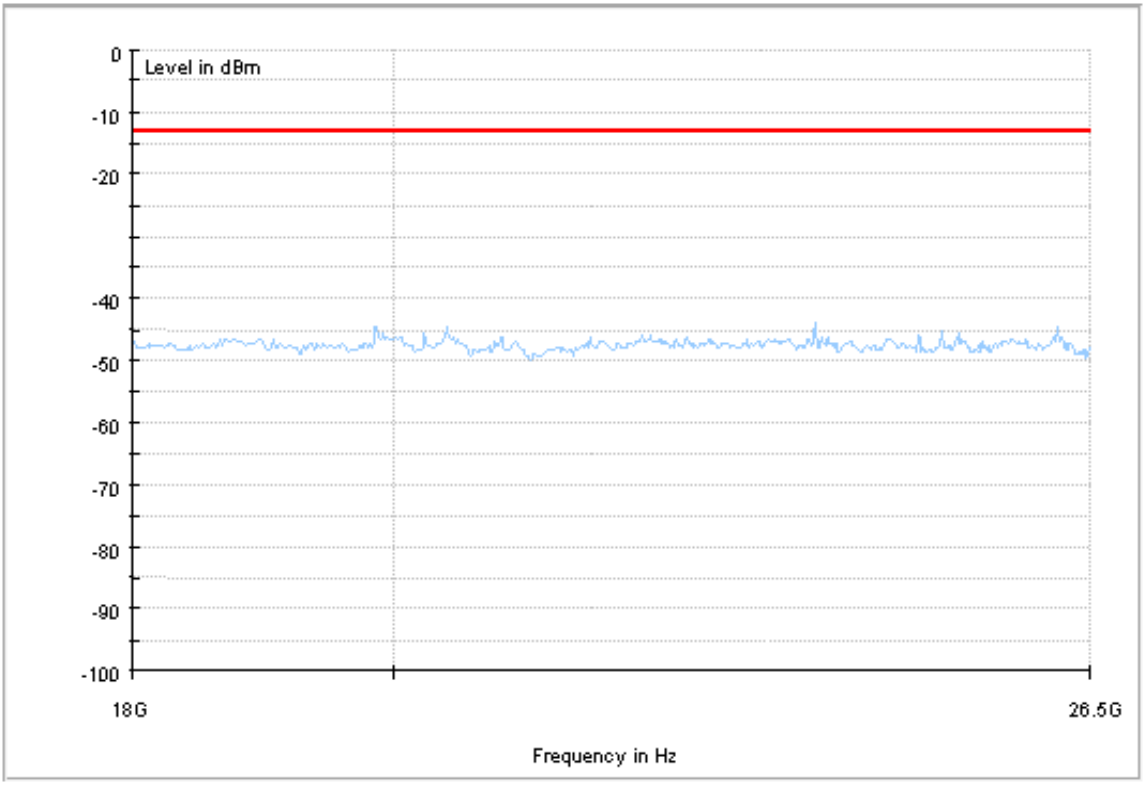


Copy of FCC PART24 GSM1900_L



Copy of FCC PART24 GSM1900_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	-0.65	-0.00079	PASS
				VN	-3.49	-0.00423	PASS
				VH	-1.42	-0.00172	PASS
		MCH	TN	VL	2.13	0.00255	PASS
				VN	-1.55	-0.00185	PASS
				VH	-4.97	-0.00594	PASS
		HCH	TN	VL	-1.61	-0.0019	PASS
				VN	0.26	0.00031	PASS
				VH	0.26	0.00031	PASS
	GSM/TM2	LCH	TN	VL	3.42	0.00415	PASS
				VN	1.81	0.0022	PASS
				VH	4.00	0.00485	PASS
		MCH	TN	VL	3.07	0.00367	PASS
				VN	0.68	0.00081	PASS
				VH	7.10	0.00849	PASS
		HCH	TN	VL	2.03	0.00239	PASS
				VN	9.88	0.01164	PASS
				VH	-1.10	-0.0013	PASS
GSM1900	GSM/TM1	LCH	TN	VL	4.65	0.00251	PASS
				VN	6.13	0.00331	PASS
				VH	9.94	0.00537	PASS
		MCH	TN	VL	-4.84	-0.00257	PASS
				VN	3.42	0.00182	PASS
				VH	3.94	0.0021	PASS
		HCH	TN	VL	4.84	0.00253	PASS
				VN	3.36	0.00176	PASS
				VH	9.94	0.0052	PASS
	GSM/TM2	LCH	TN	VL	9.65	0.00522	PASS
				VN	13.79	0.00745	PASS
				VH	10.62	0.00574	PASS
		MCH	TN	VL	2.71	0.00144	PASS
				VN	9.40	0.005	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VH	12.33	0.00656	PASS
		HCH	TN	VL	4.97	0.0026	PASS
				VN	5.42	0.00284	PASS
				VH	9.65	0.00505	PASS

8.1.2Frequency Error vs. Temperature

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
GSM850	GSM/TM1	LCH	VN	-30	-2.91	-0.00353	PASS
				-20	1.16	0.00141	PASS
				-10	-0.71	-0.00086	PASS
				0	-2.00	-0.00243	PASS
				10	0.52	0.00063	PASS
				20	-2.84	-0.00345	PASS
				30	-3.03	-0.00368	PASS
				40	-1.36	-0.00165	PASS
				50	-4.52	-0.00548	PASS
		MCH	VN	-30	-0.65	-0.00078	PASS
				-20	-4.65	-0.00556	PASS
				-10	-4.78	-0.00571	PASS
				0	-5.94	-0.0071	PASS
				10	0.52	0.00062	PASS
				20	-0.45	-0.00054	PASS
				30	-1.68	-0.00201	PASS
				40	0.52	0.00062	PASS
				50	-2.58	-0.00308	PASS
		HCH	VN	-30	1.55	0.00183	PASS
				-20	0.06	0.00007	PASS
				-10	-0.13	-0.00015	PASS
				0	1.29	0.00152	PASS
				10	0.13	0.00015	PASS
				20	0.39	0.00046	PASS
				30	-1.74	-0.00205	PASS
				40	1.23	0.00145	PASS
				50	2.13	0.00251	PASS
	GSM/TM2	LCH	VN	-30	2.62	0.00318	PASS
				-20	1.90	0.00231	PASS
				-10	3.23	0.00392	PASS
				0	5.94	0.00721	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				10	1.90	0.00231	PASS
				20	3.58	0.00434	PASS
				30	10.04	0.01218	PASS
				40	1.81	0.0022	PASS
				50	5.88	0.00713	PASS
		MCH	VN	-30	6.52	0.00779	PASS
				-20	4.94	0.0059	PASS
				-10	3.13	0.00374	PASS
				0	2.71	0.00324	PASS
				10	3.84	0.00459	PASS
				20	6.91	0.00826	PASS
				30	5.42	0.00648	PASS
				40	5.36	0.00641	PASS
				50	1.74	0.00208	PASS
		HCH	VN	-30	1.81	0.00213	PASS
				-20	5.65	0.00666	PASS
				-10	2.65	0.00312	PASS
				0	4.46	0.00525	PASS
				10	3.39	0.00399	PASS
				20	1.78	0.0021	PASS
				30	6.10	0.00719	PASS
				40	5.71	0.00673	PASS
				50	2.23	0.00263	PASS
GSM1900	GSM/TM1	LCH	VN	-30	1.74	0.00094	PASS
				-20	0.58	0.00031	PASS
				-10	3.23	0.00175	PASS
				0	0.45	0.00024	PASS
				10	1.94	0.00105	PASS
				20	10.07	0.00544	PASS
				30	-0.13	-0.00007	PASS
				40	6.65	0.00359	PASS
				50	5.04	0.00272	PASS
		MCH	VN	-30	1.29	0.00069	PASS
				-20	1.16	0.00062	PASS
				-10	2.45	0.0013	PASS
				0	1.61	0.00086	PASS
				10	1.61	0.00086	PASS
				20	10.20	0.00543	PASS
				30	0.97	0.00052	PASS
				40	-0.26	-0.00014	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				50	9.04	0.00481	PASS
		HCH	VN	-30	6.33	0.00331	PASS
				-20	3.10	0.00162	PASS
				-10	7.04	0.00369	PASS
				0	2.97	0.00156	PASS
				10	10.33	0.00541	PASS
				20	-1.74	-0.00091	PASS
				30	4.00	0.00209	PASS
				40	2.58	0.00135	PASS
				50	3.68	0.00193	PASS
	GSM/TM2	LCH	VN	-30	2.87	0.00155	PASS
				-20	10.07	0.00544	PASS
				-10	11.27	0.00609	PASS
				0	3.16	0.00171	PASS
				10	9.46	0.00511	PASS
				20	6.17	0.00333	PASS
				30	6.62	0.00358	PASS
				40	-0.87	-0.00047	PASS
				50	5.52	0.00298	PASS
		MCH	VN	-30	-0.03	-0.00002	PASS
				-20	14.11	0.00751	PASS
				-10	14.46	0.00769	PASS
				0	1.84	0.00098	PASS
				10	14.04	0.00747	PASS
				20	4.55	0.00242	PASS
				30	11.36	0.00604	PASS
				40	2.03	0.00108	PASS
				50	3.49	0.00186	PASS
		HCH	VN	-30	10.20	0.00534	PASS
				-20	4.81	0.00252	PASS
				-10	2.52	0.00132	PASS
				0	3.29	0.00172	PASS
				10	4.36	0.00228	PASS
				20	1.65	0.00086	PASS
				30	12.24	0.00641	PASS
				40	12.04	0.0063	PASS
				50	2.39	0.00125	PASS