



Appendix for test report

1Appendix_A: Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dBm]	EIP[dBm]	Limit [dBm]	Verdict
GSM850	GSM/TM1	LCH	32.86	26.33	38.5	PASS
		MCH	32.92	26.39	38.5	PASS
		HCH	32.9	26.37	38.5	PASS
	GSM/TM2	LCH	26.45	19.92	38.5	PASS
		MCH	26.47	19.94	38.5	PASS
		HCH	26.38	19.85	38.5	PASS

Test Band	Test Mode	Test Channel	Measured[dBm]	EIRP[dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	29.74	27.62	33	PASS
		MCH	29.79	27.67	33	PASS
		HCH	29.77	27.65	33	PASS
	GSM/TM2	LCH	25.95	23.83	33	PASS
		MCH	25.95	23.83	33	PASS
		HCH	25.98	23.86	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:

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

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

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

$$\text{SET Sweep time} = \text{auto-couple.}$$

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	0.13	13	PASS
		MCH	0.13	13	PASS
		HCH	0.13	13	PASS
	GSM/TM2	LCH	2.85	13	PASS
		MCH	2.79	13	PASS
		HCH	2.7	13	PASS

3Appendix_C: Modulation Characteristics

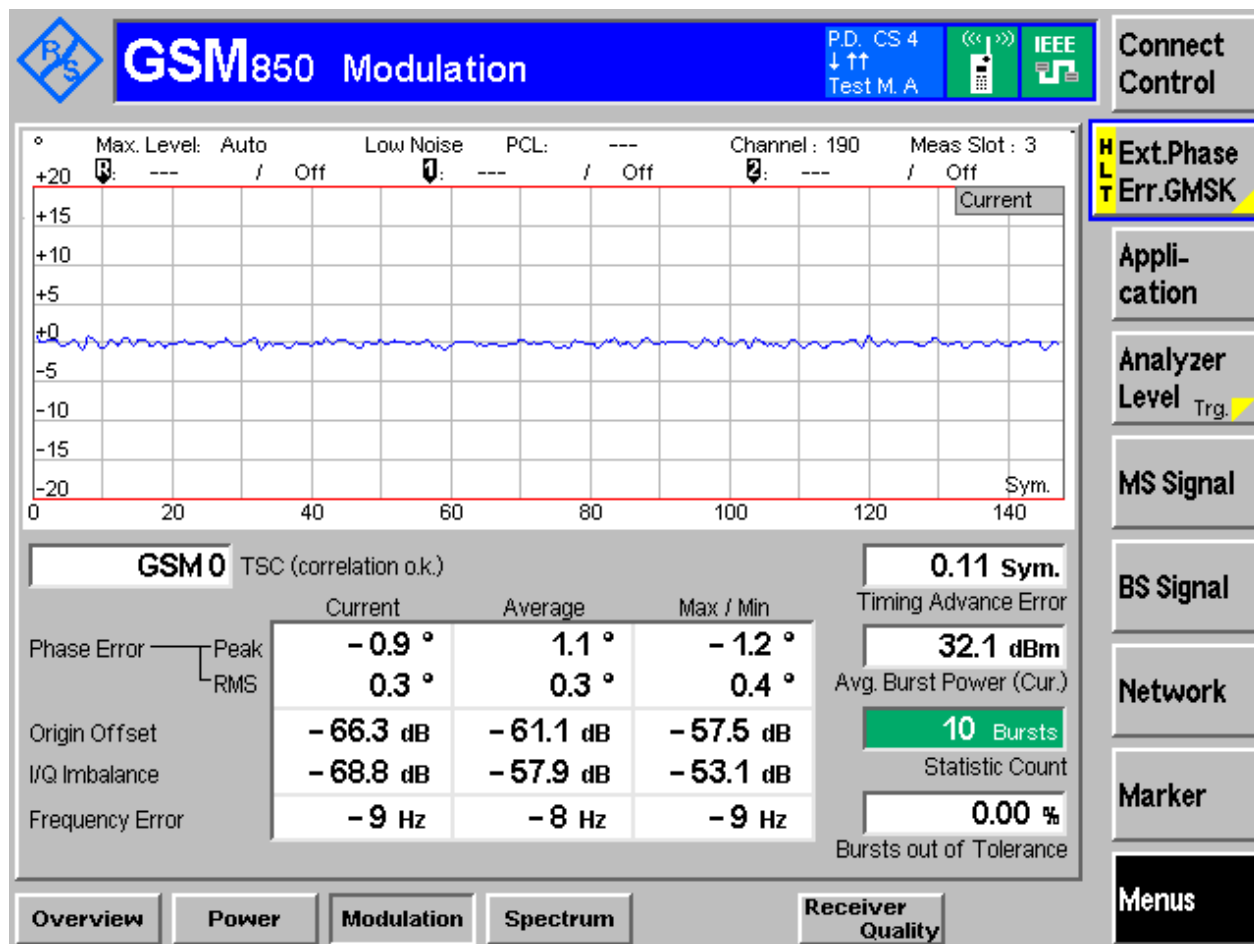
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

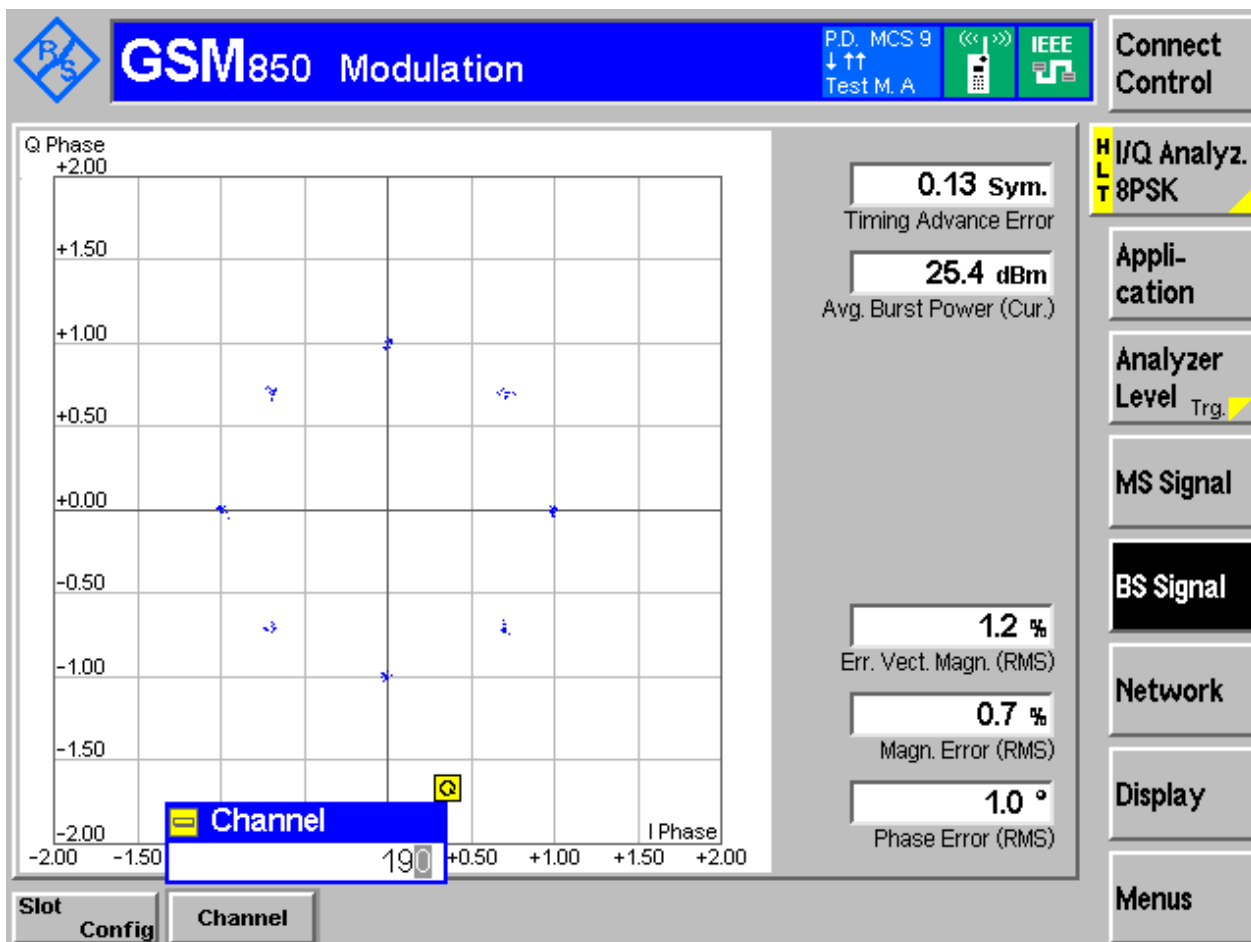
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

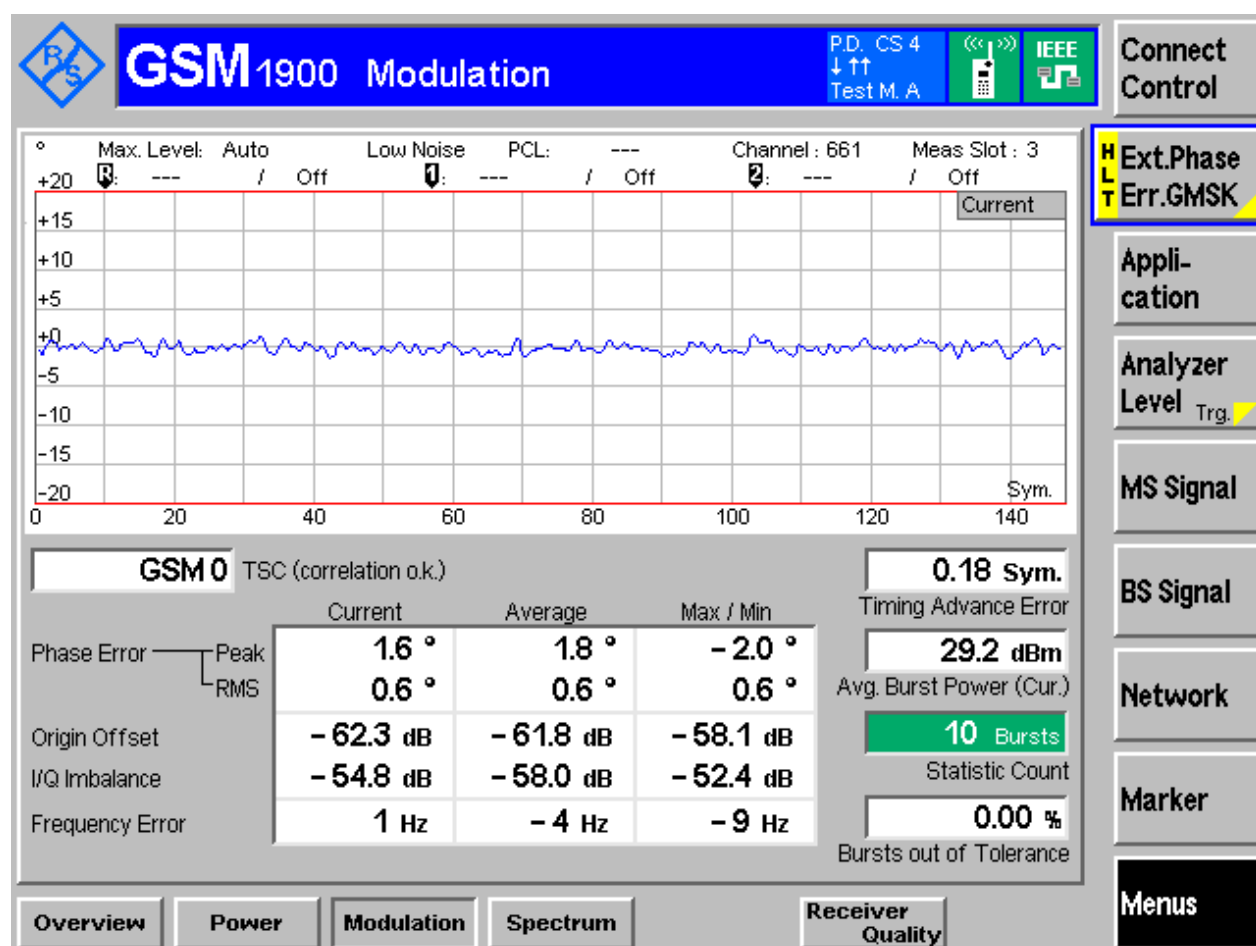
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

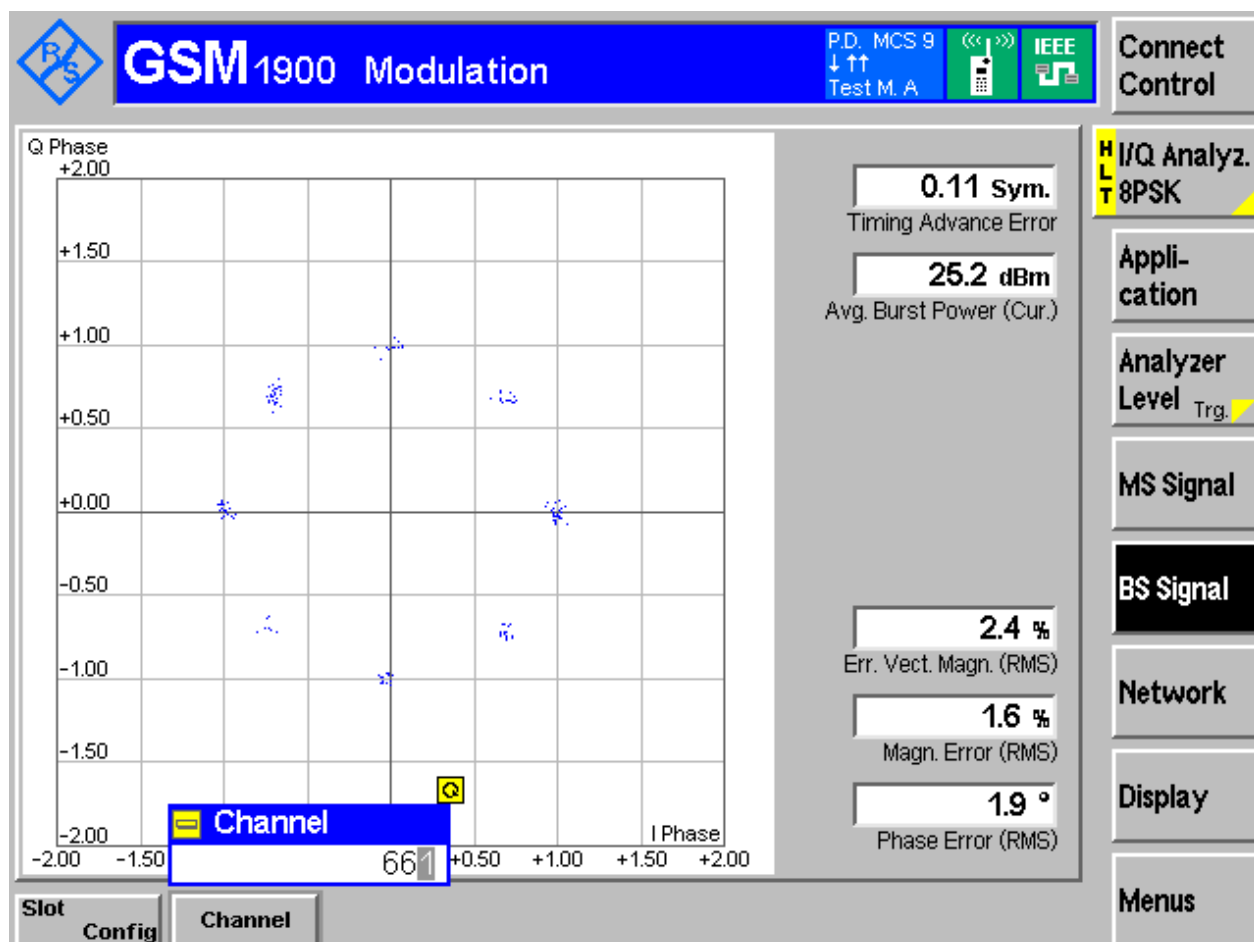
3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH



3.1.2.2 Test Mode = GSM/TM2

3.1.2.2.1 Test Channel = MCH



4Appendix_D: Bandwidth

Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
GSM850	GSM/TM1	LCH	245.58	322.38	Pass
		MCH	247.42	324.38	Pass
		HCH	245.43	316.23	Pass
	GSM/TM2	LCH	251.99	323.23	Pass
		MCH	248.25	323.80	Pass
		HCH	248.84	318.95	Pass
GSM1900	GSM/TM1	LCH	243.12	313.82	Pass
		MCH	240.10	308.12	Pass
		HCH	248.78	313.20	Pass
	GSM/TM2	LCH	248.89	316.83	Pass
		MCH	250.50	330.61	Pass
		HCH	252.01	325.14	Pass



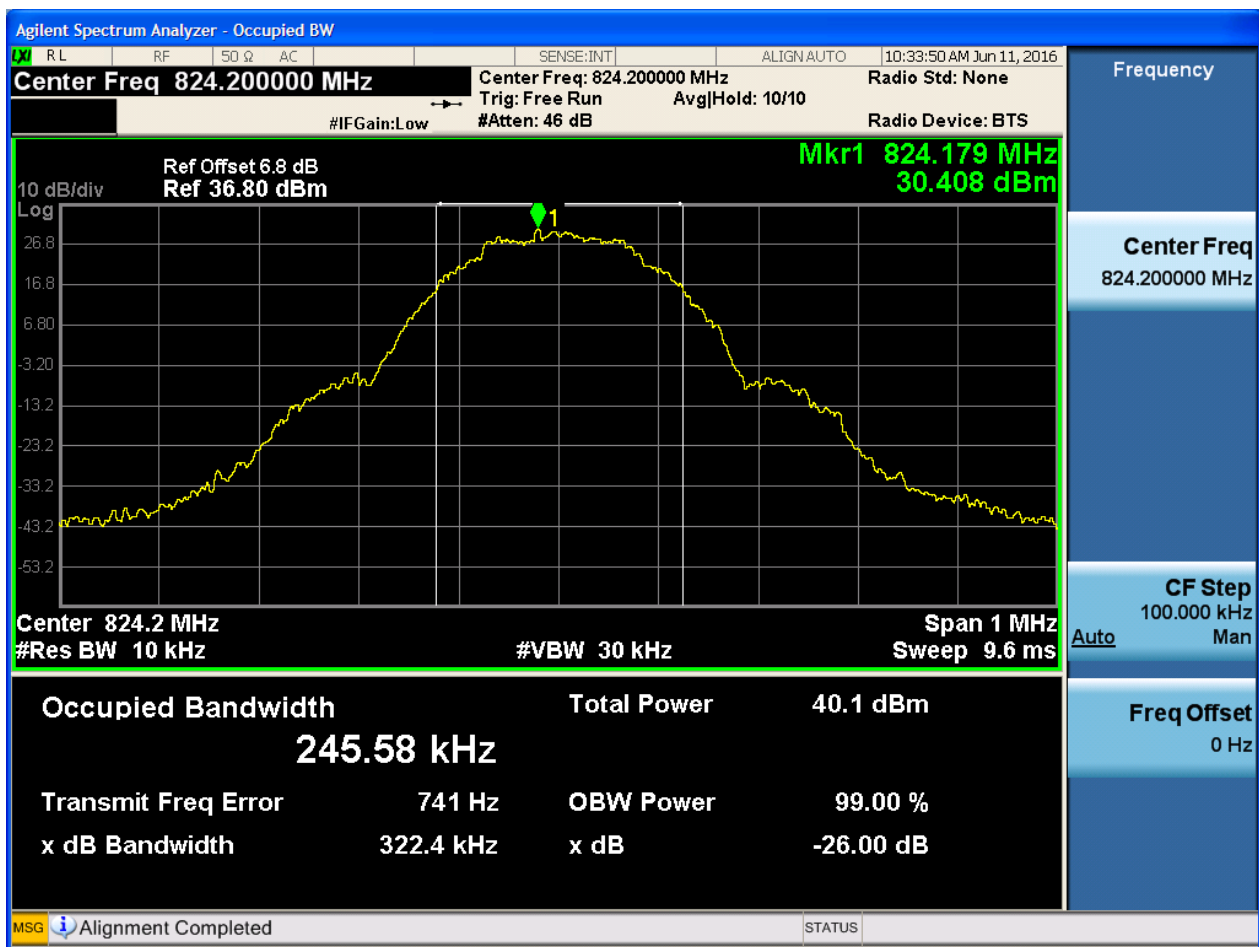
Part II - Test Plots

4.1 For GSM

4.1.1 Test Band = GSM850

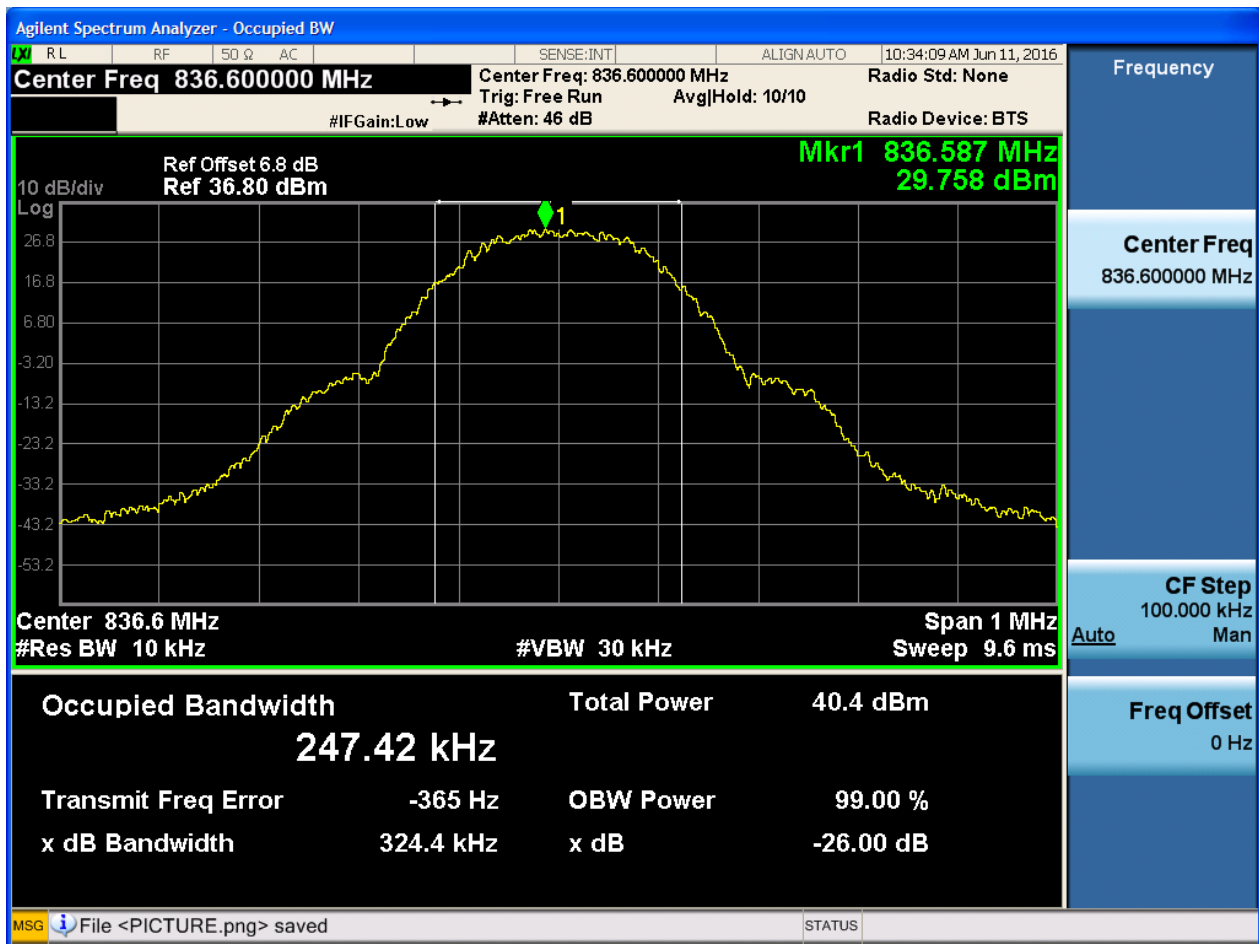
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH



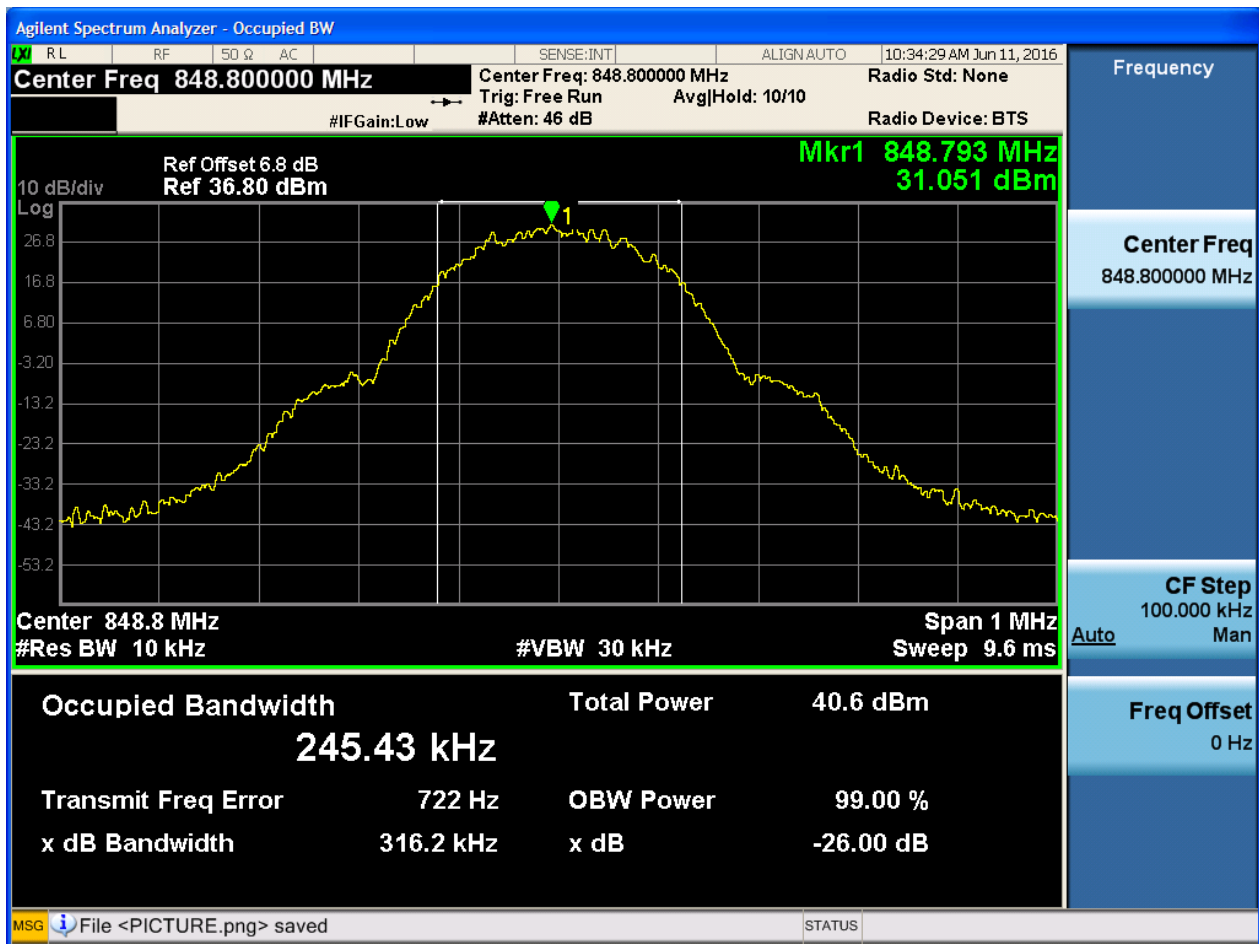


4.1.1.1.2 Test Channel = MCH





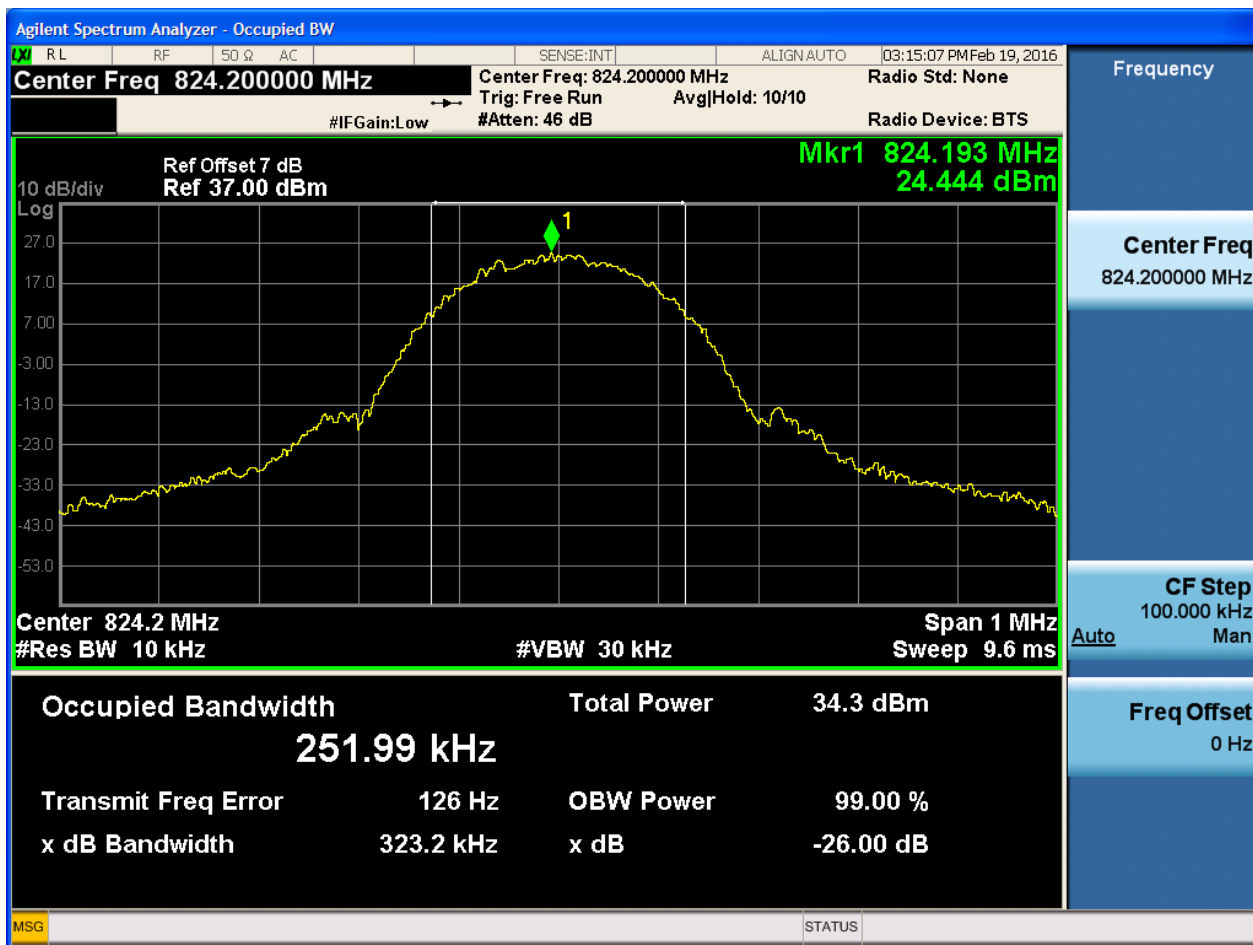
4.1.1.1.3 Test Channel = HCH





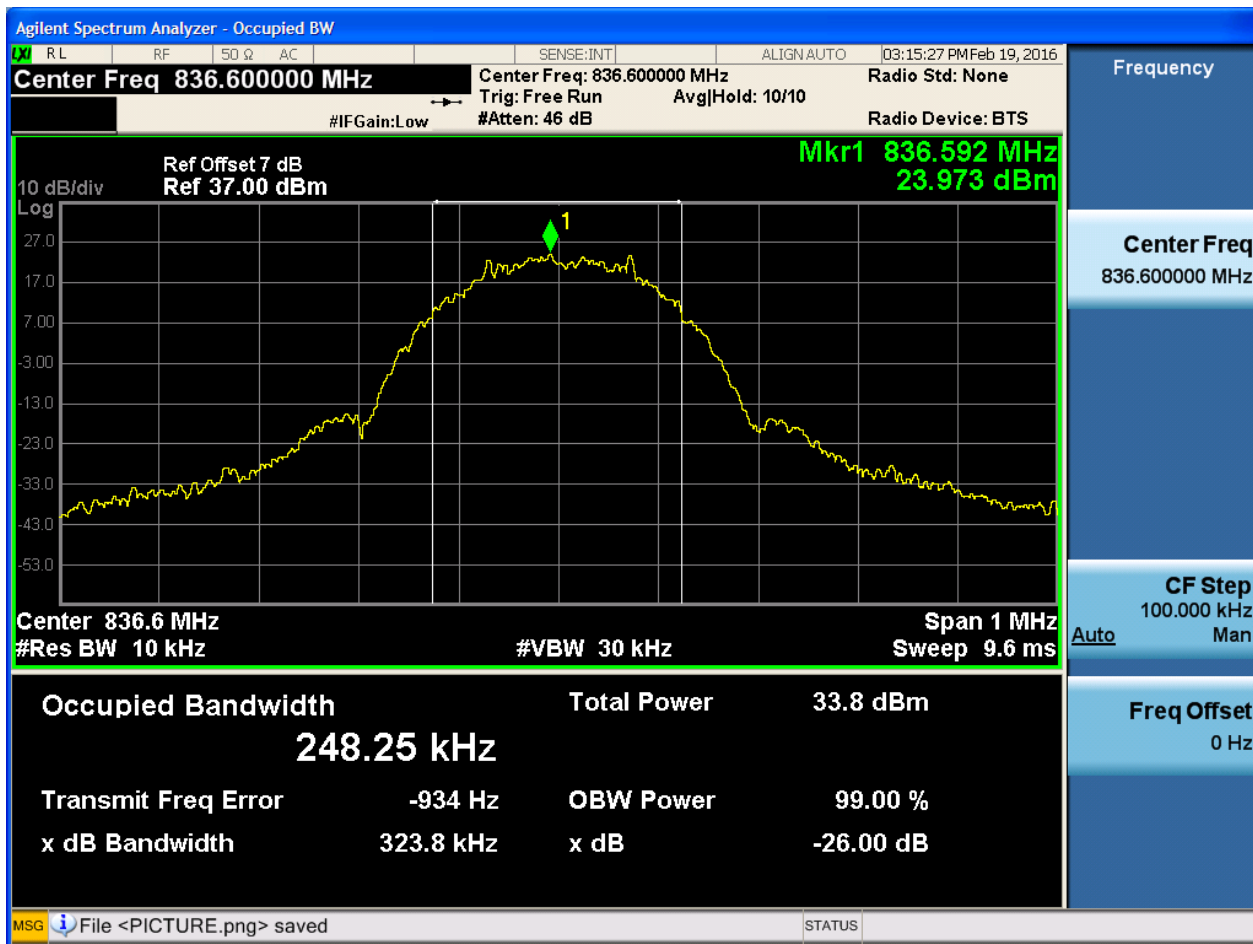
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH



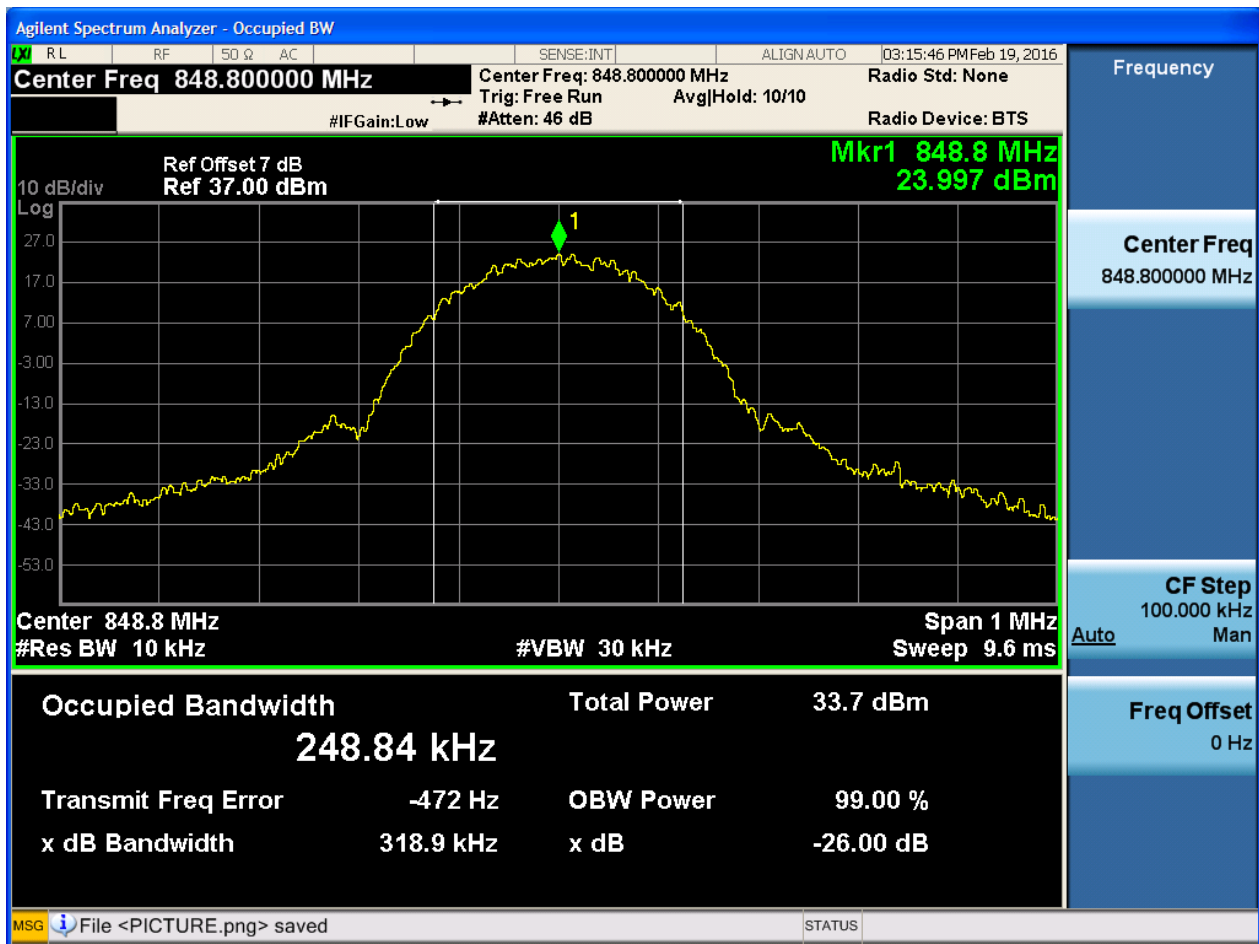


4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH

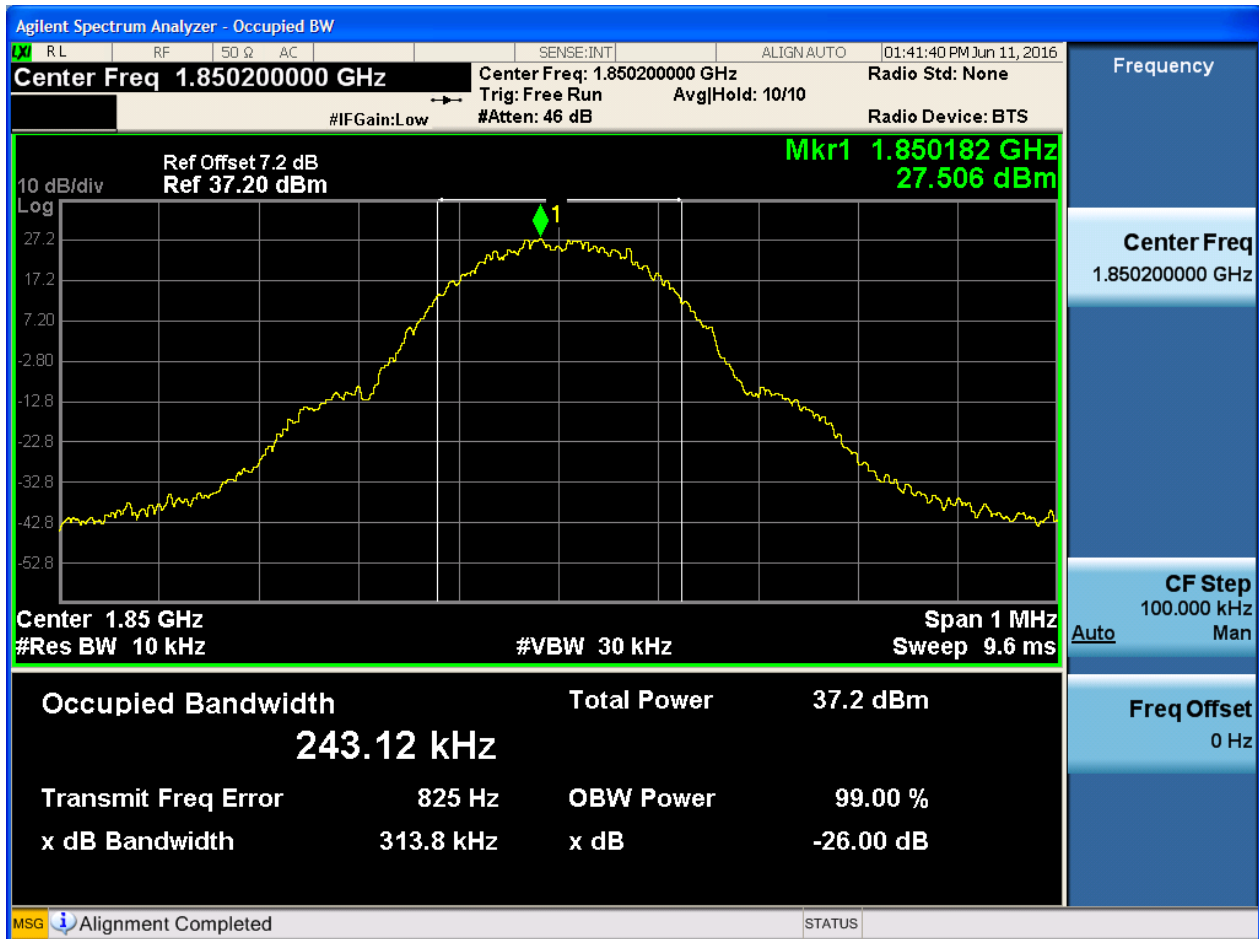




4.1.2 Test Band = GSM1900

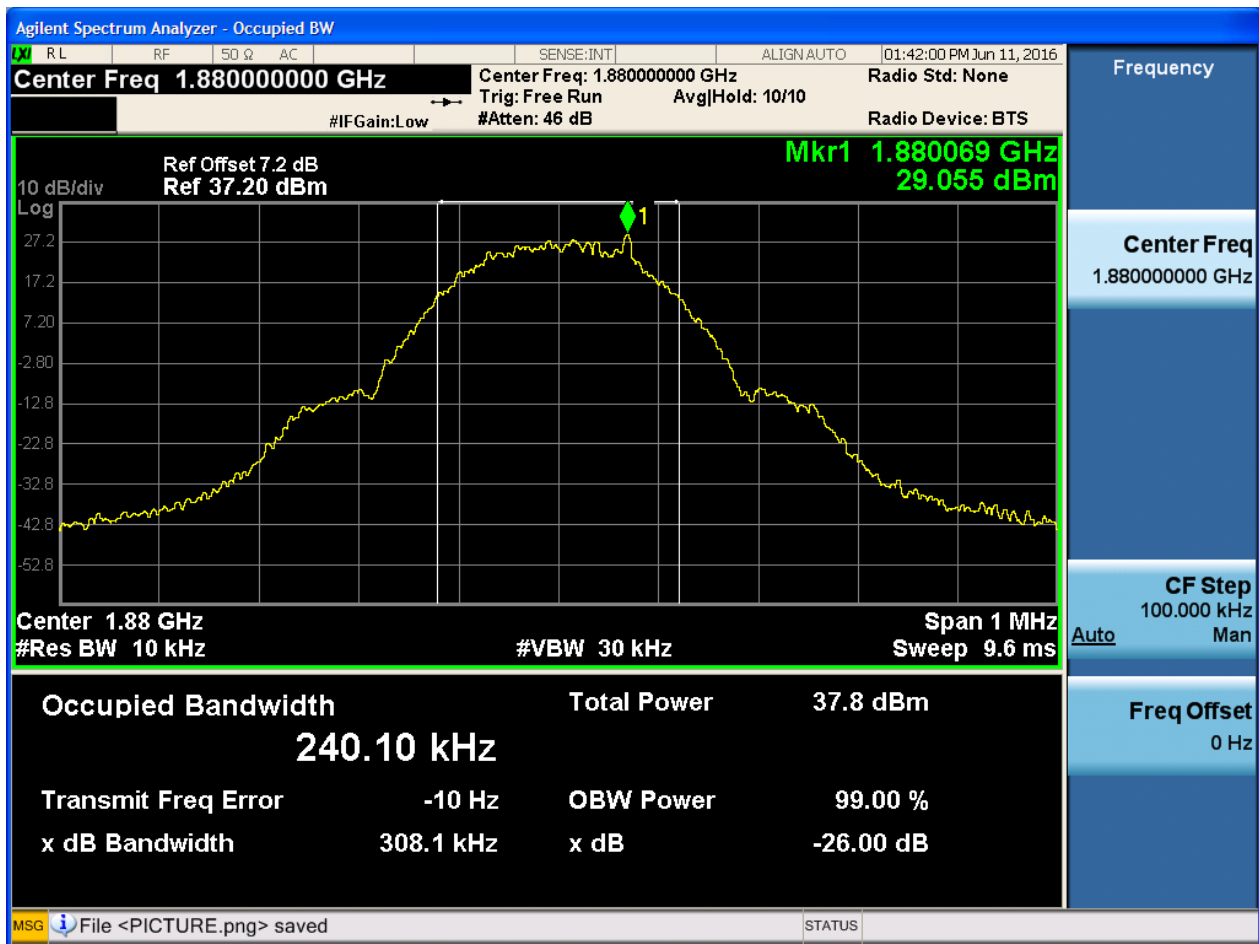
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



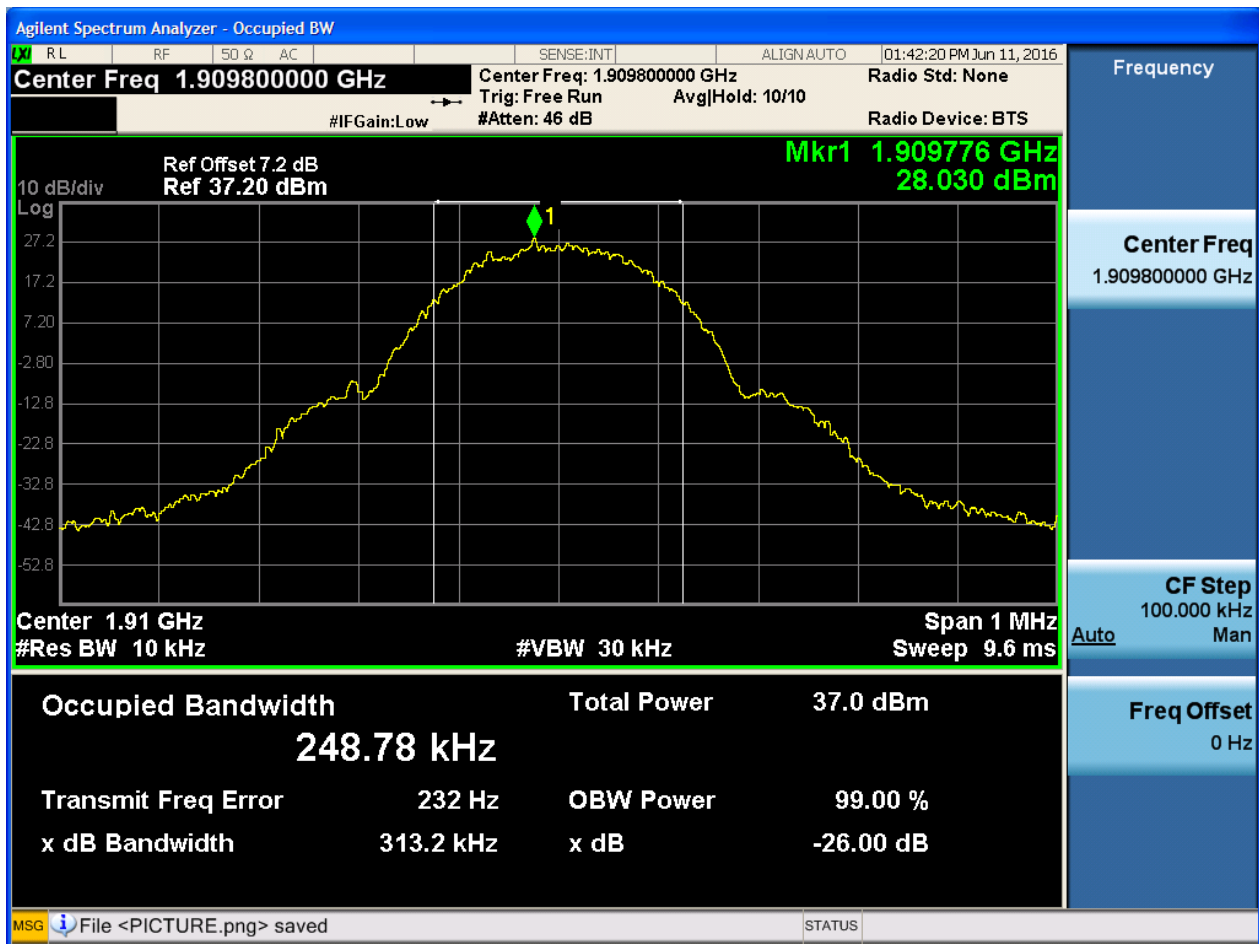


4.1.2.1.2 Test Channel = MCH





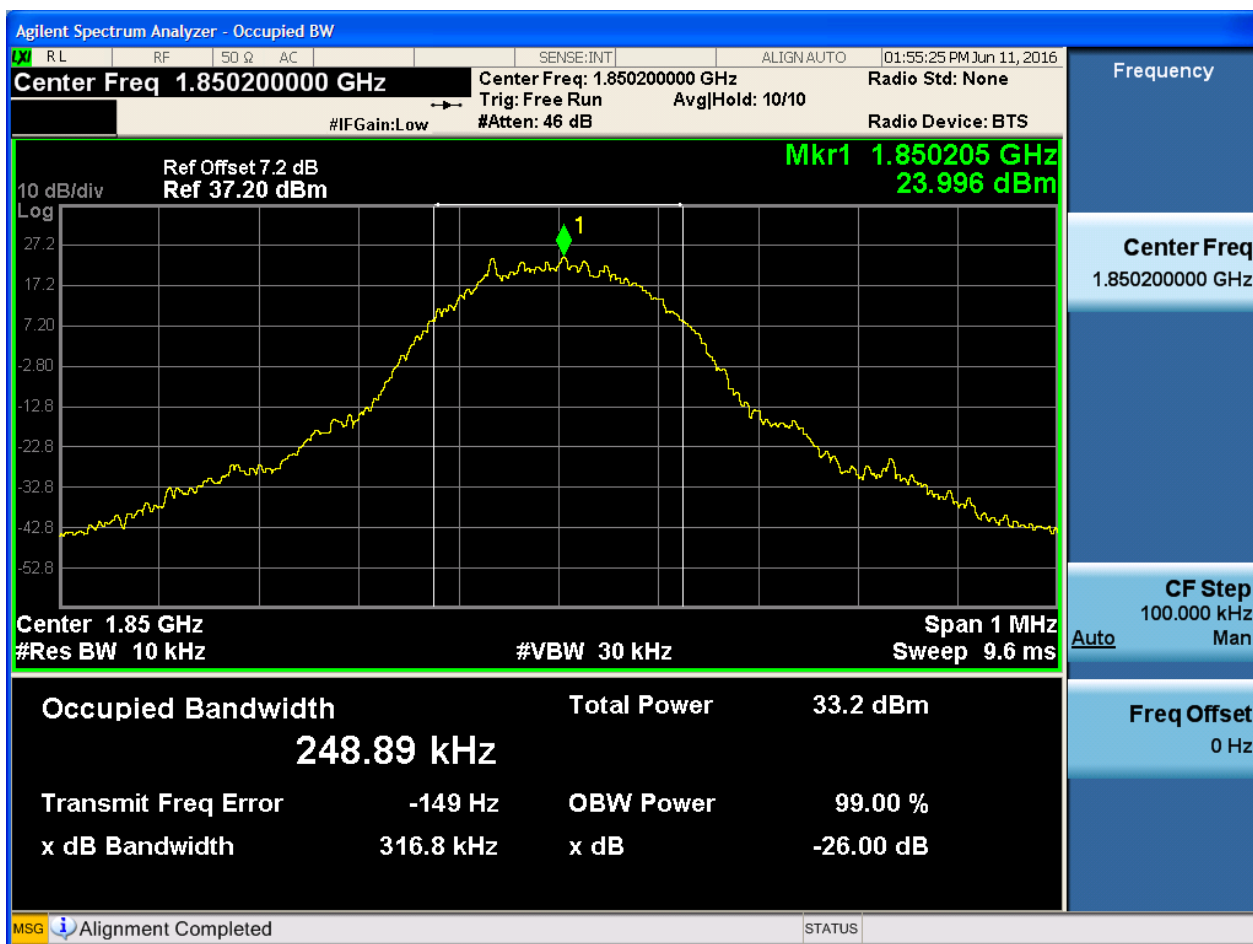
4.1.2.1.3 Test Channel = HCH





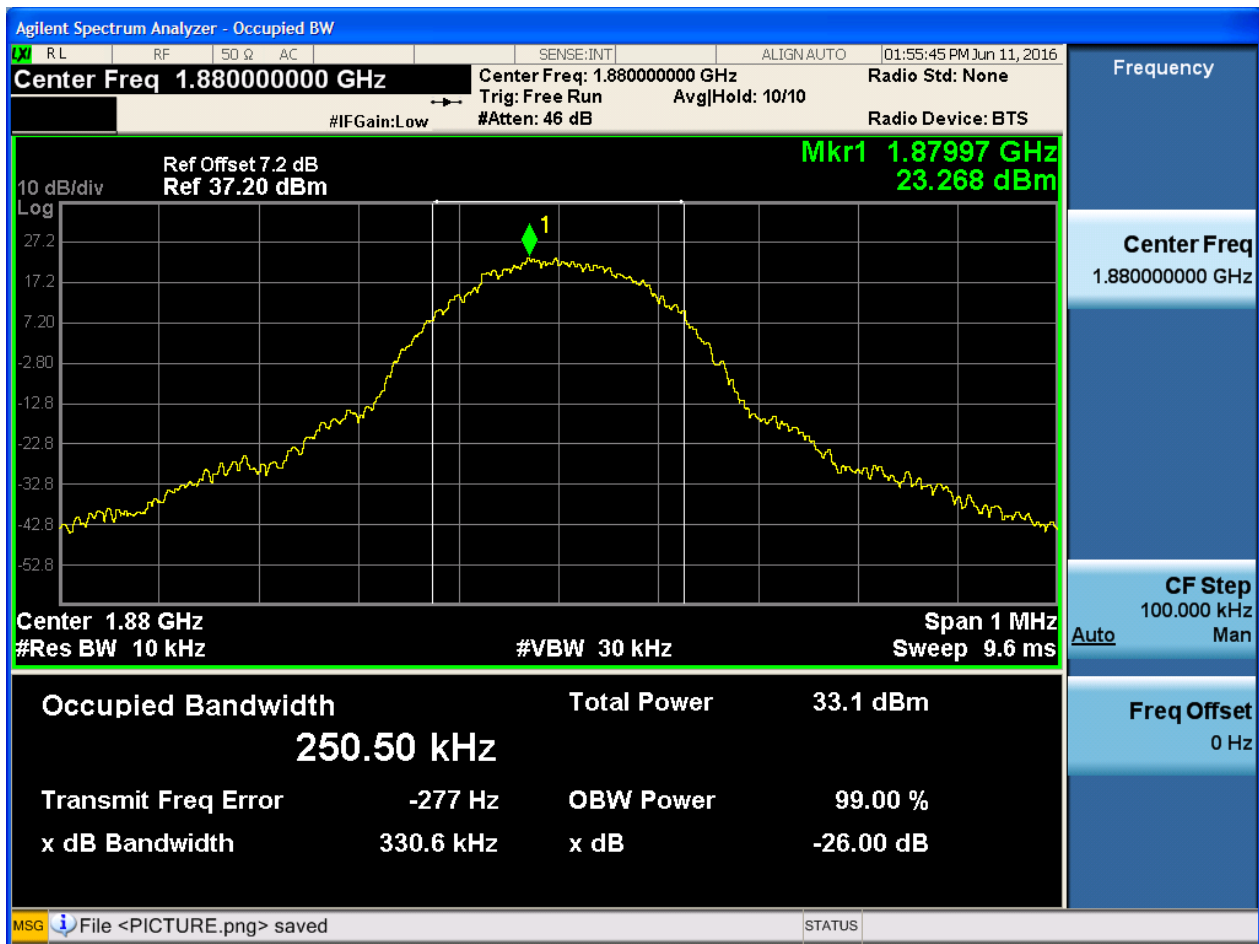
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4.1.2.2.1 Test Channel = LCH



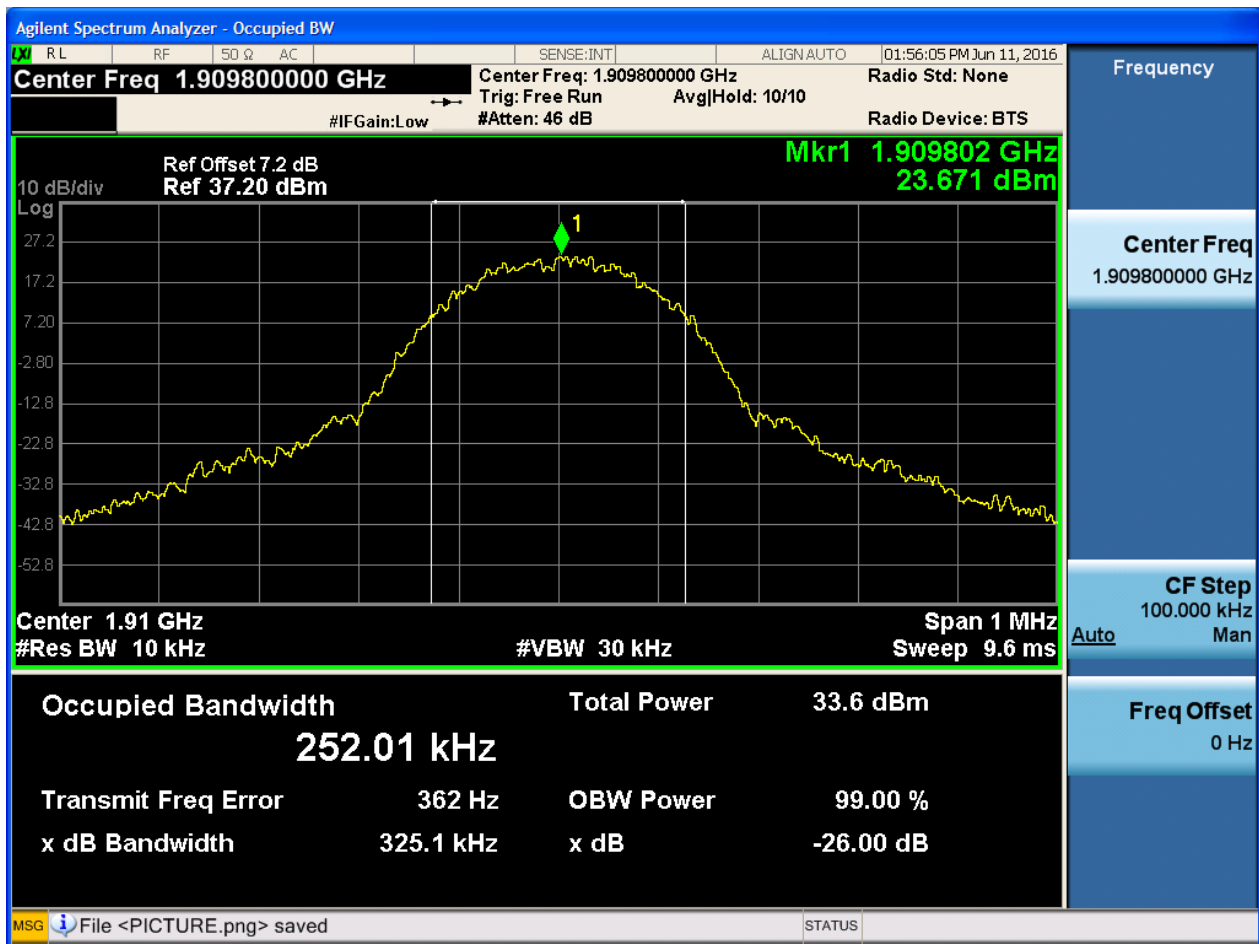


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH





5Appendix_E: Band Edges Compliance

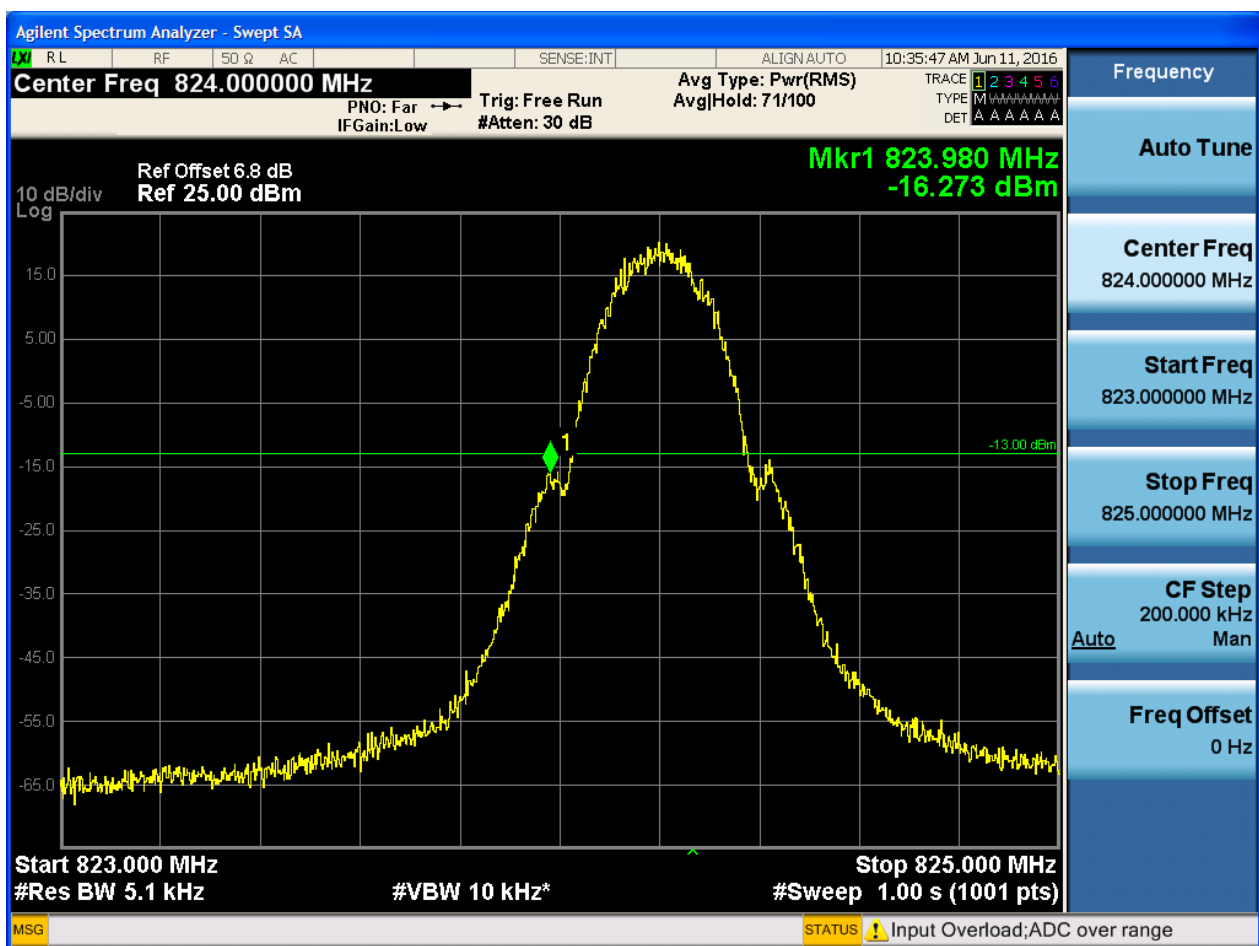
Part I - Test Plots

5.1 For GSM

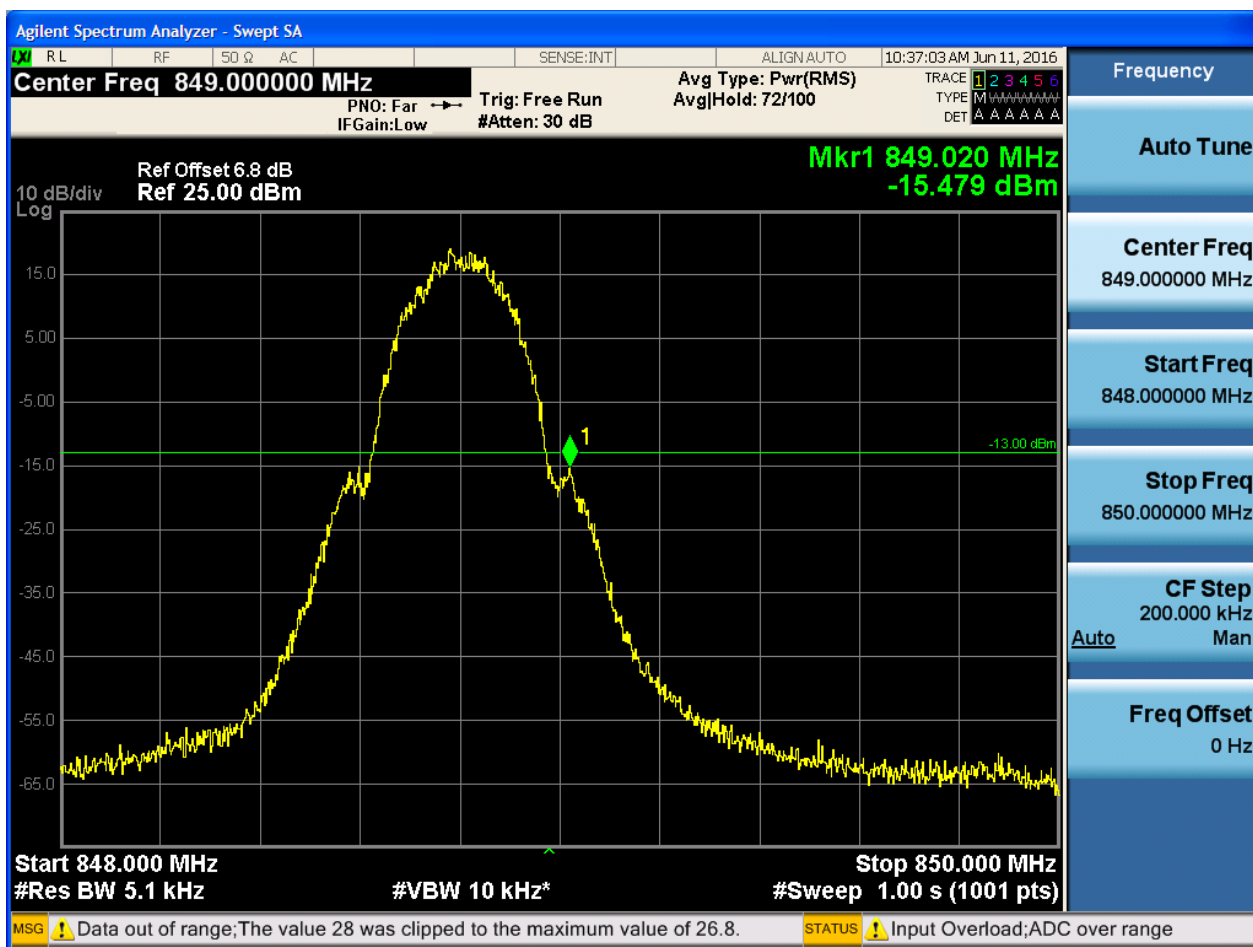
5.1.1 Test Band = GSM850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH

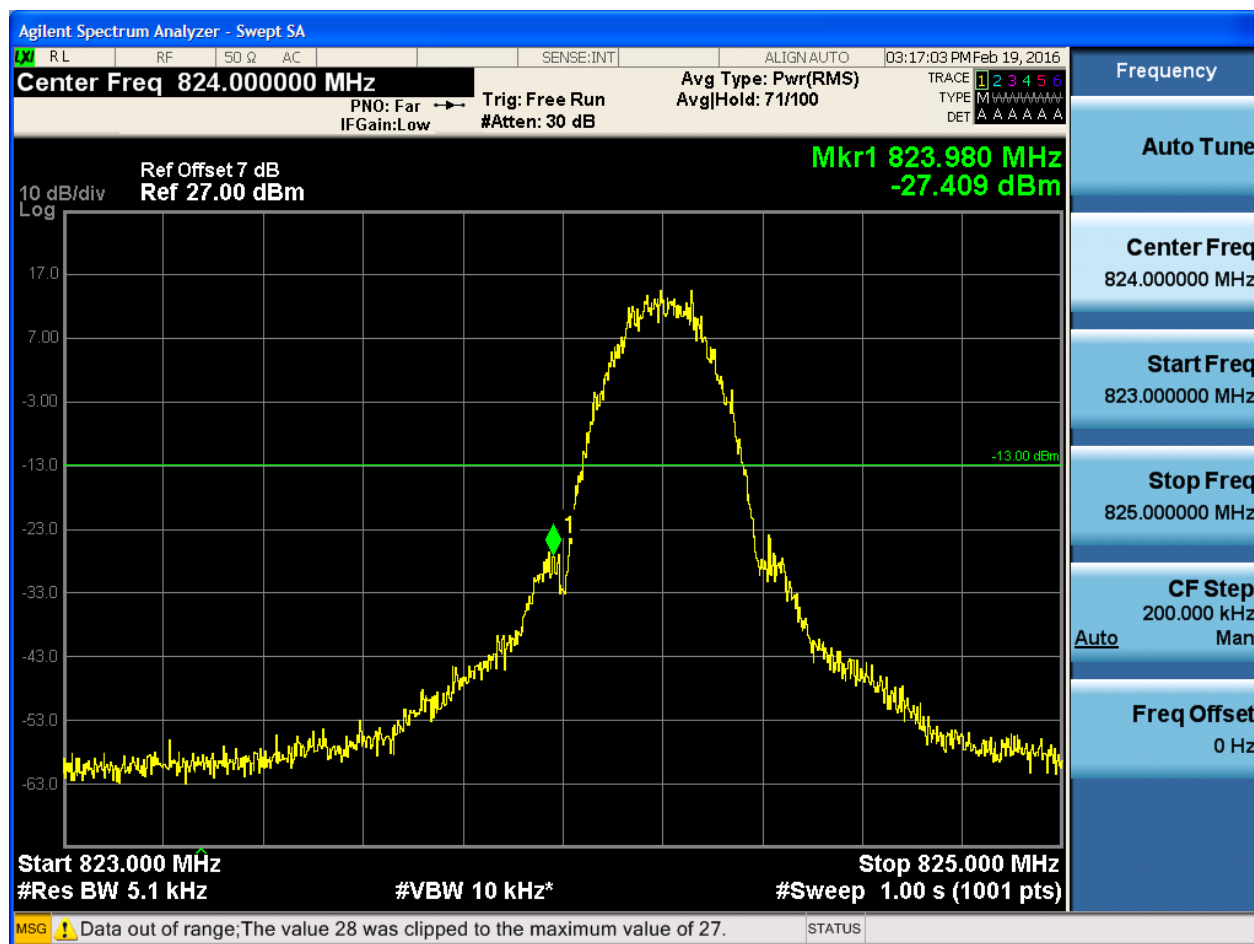


5.1.1.1.2 Test Channel = HCH

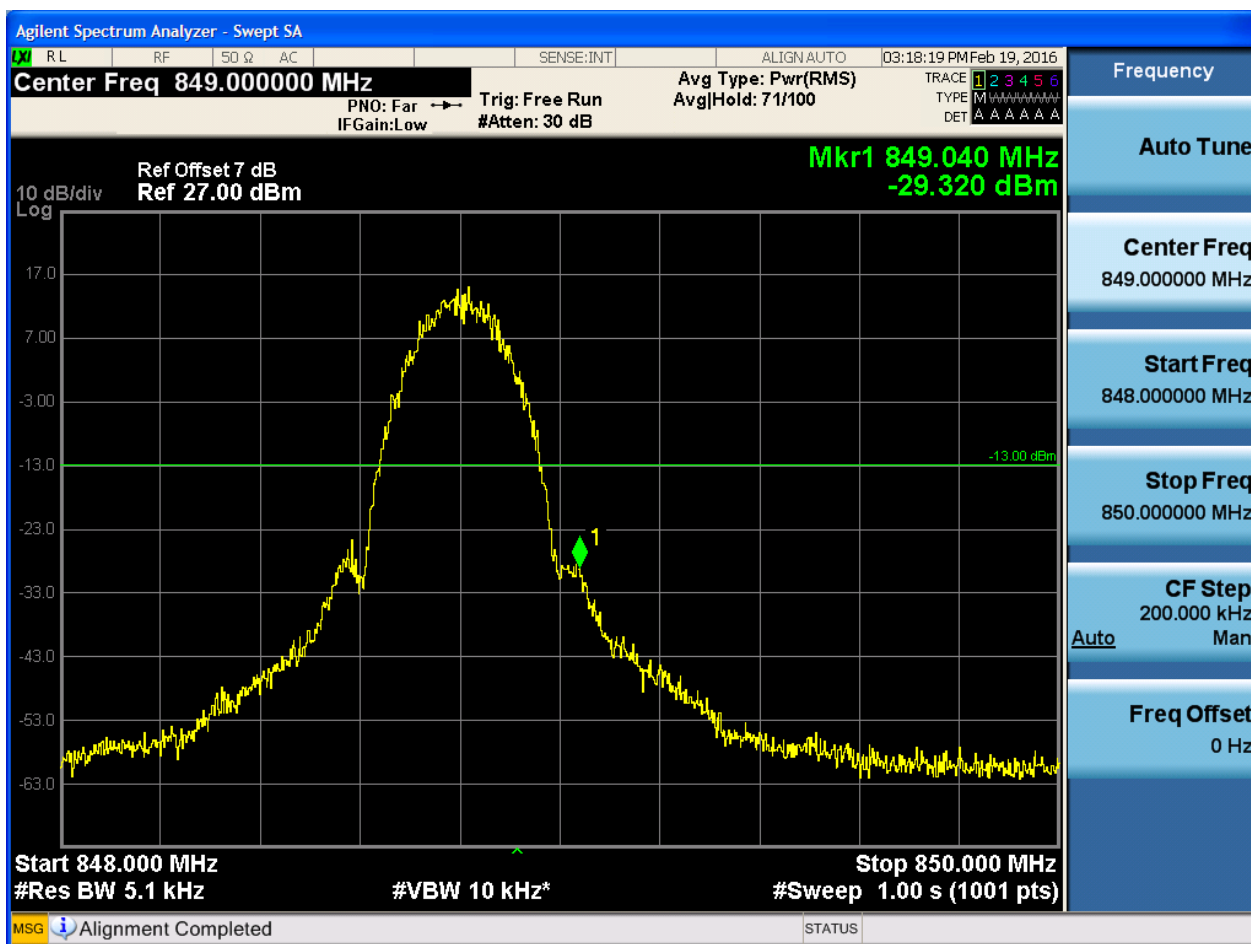


5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



5.1.1.2.2 Test Channel = HCH

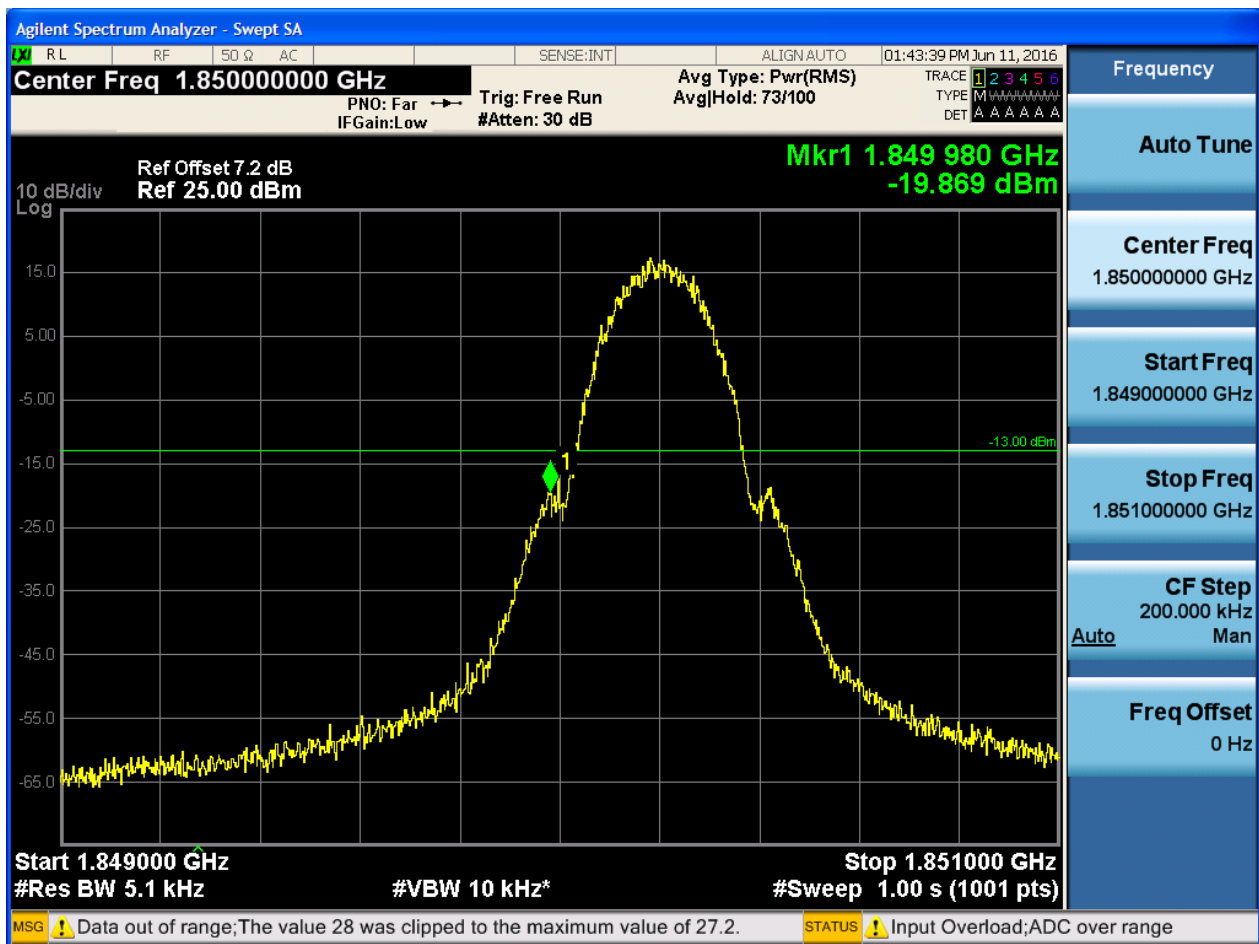




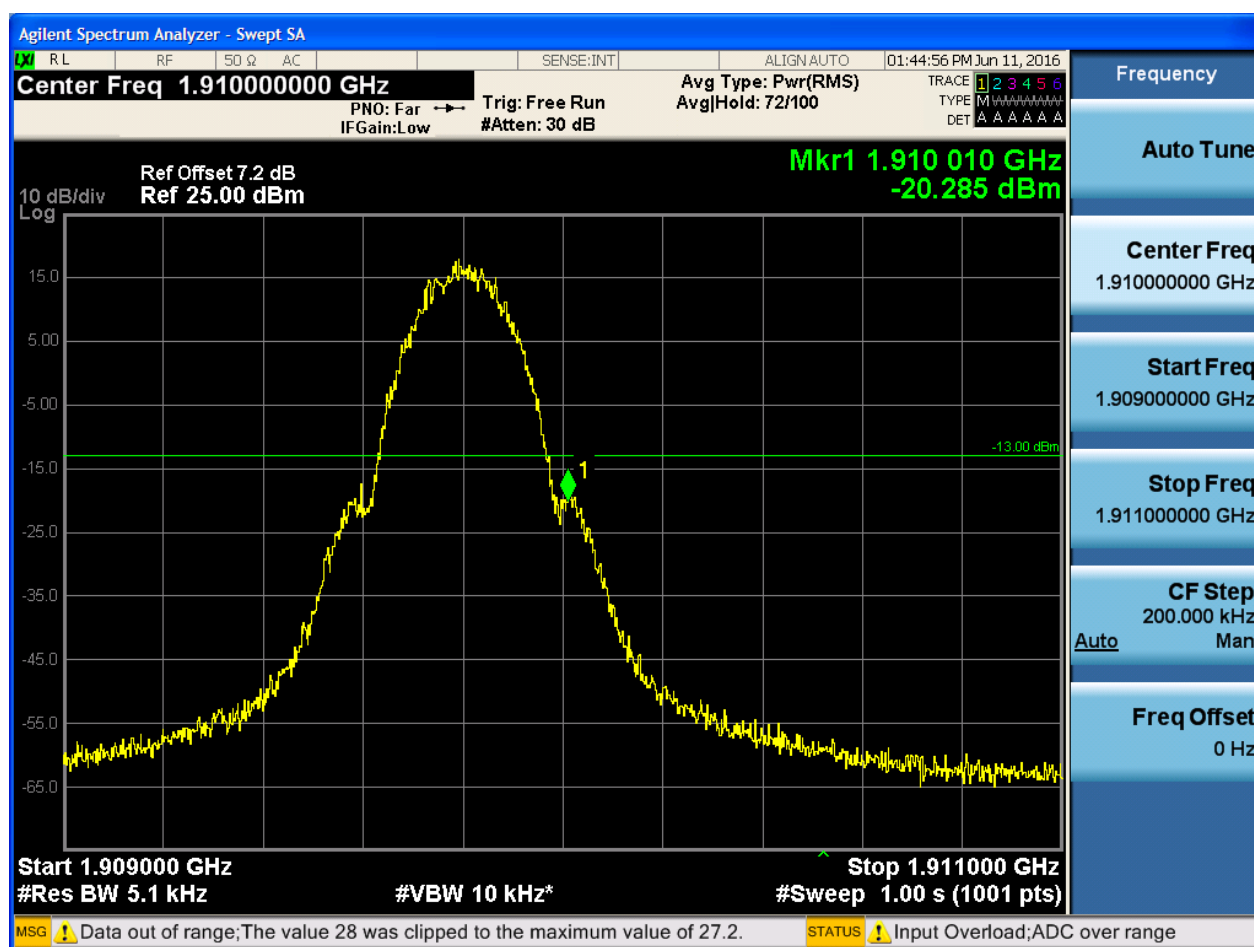
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH

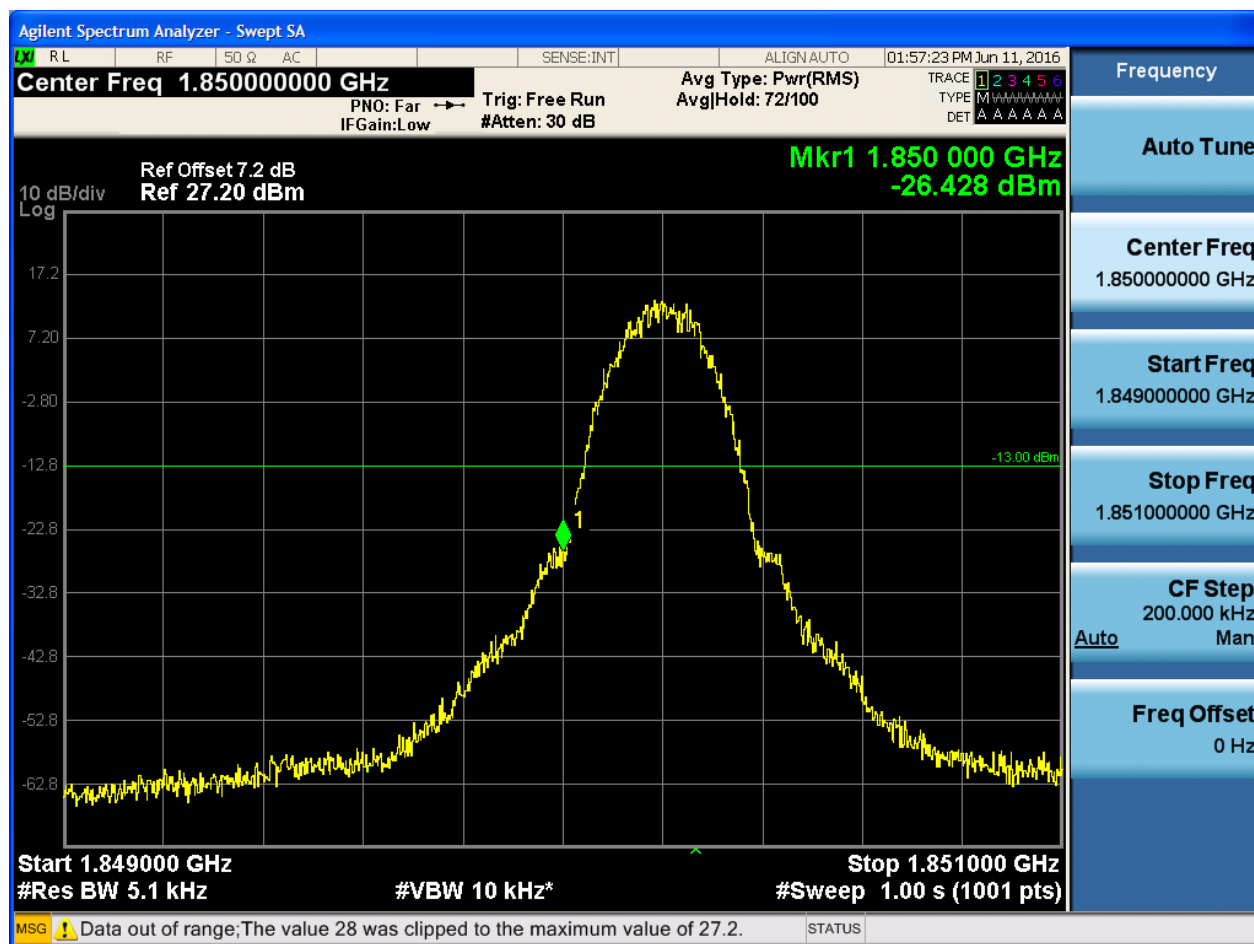


5.1.2.1.2 Test Channel = HCH

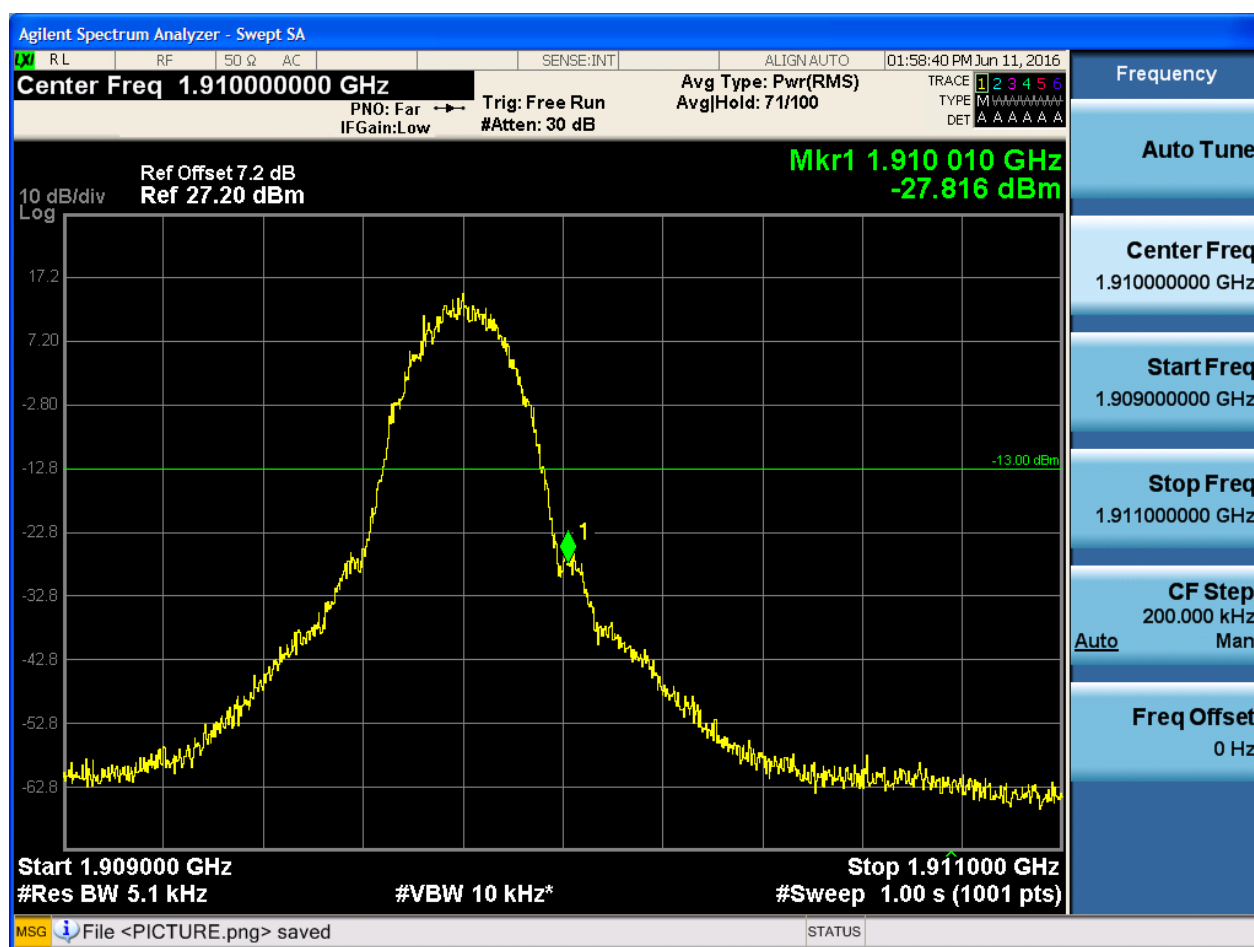


5.1.2.2 Test Mode = GSM/TM2

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.

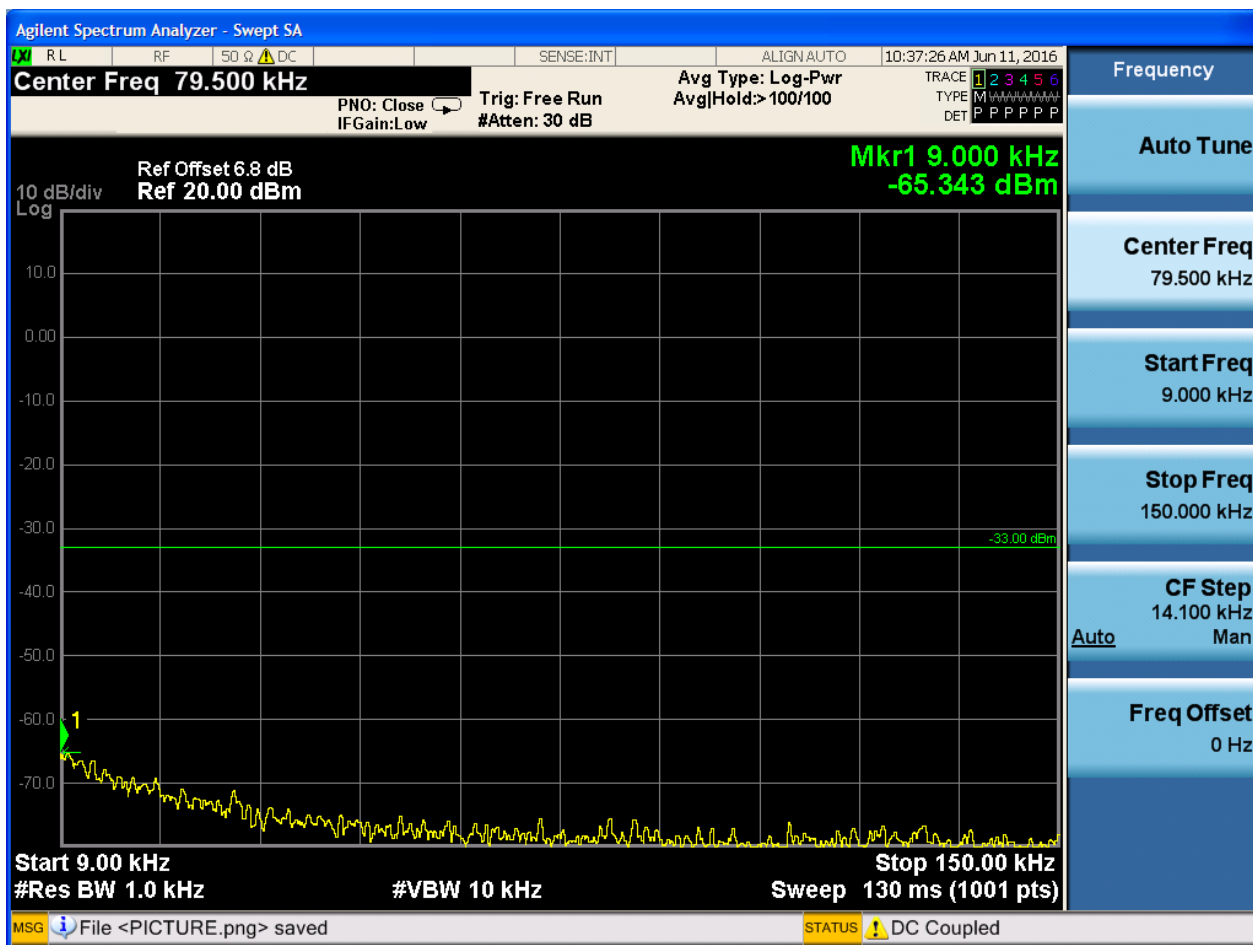
Part I - Test Plots

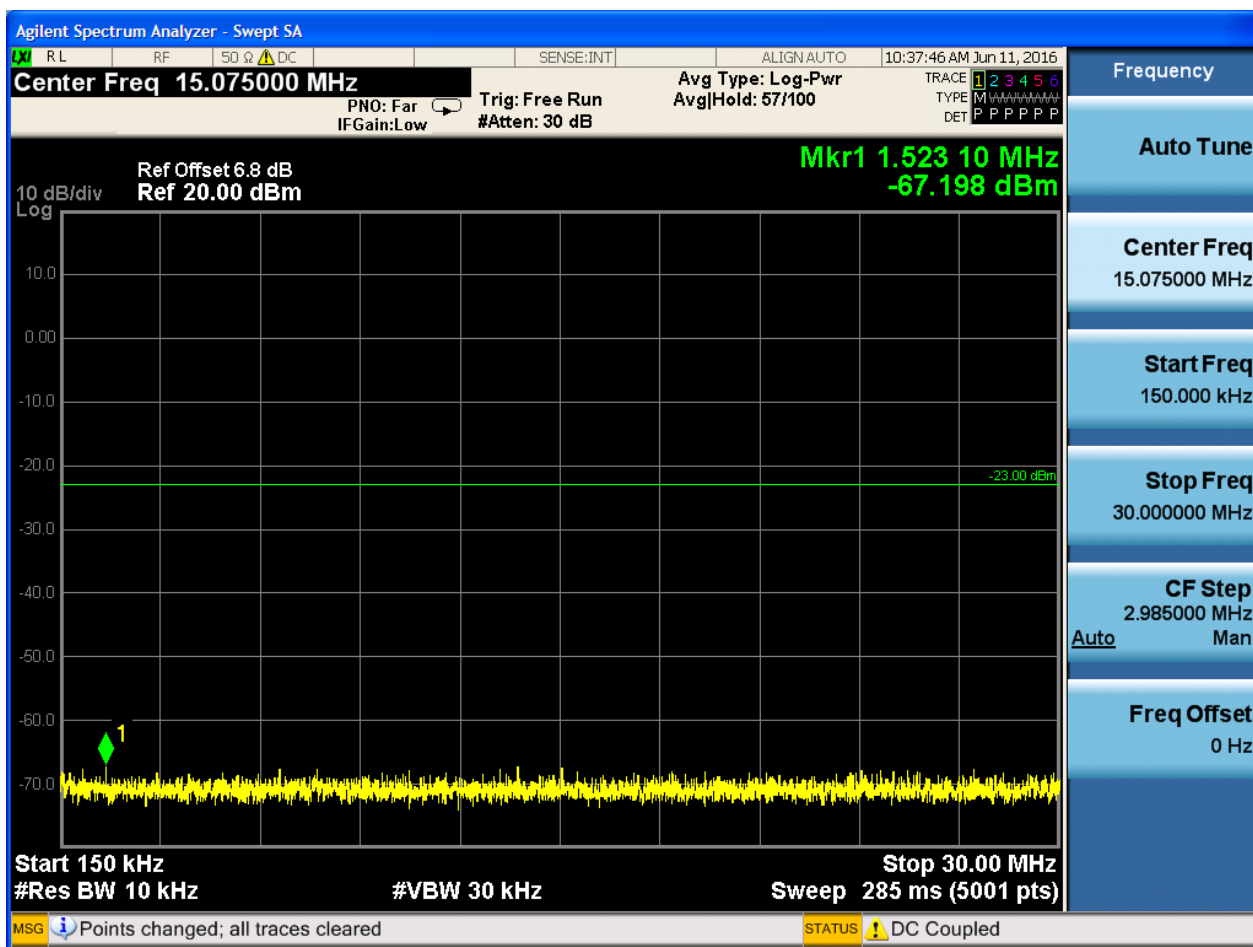
6.1 For GSM

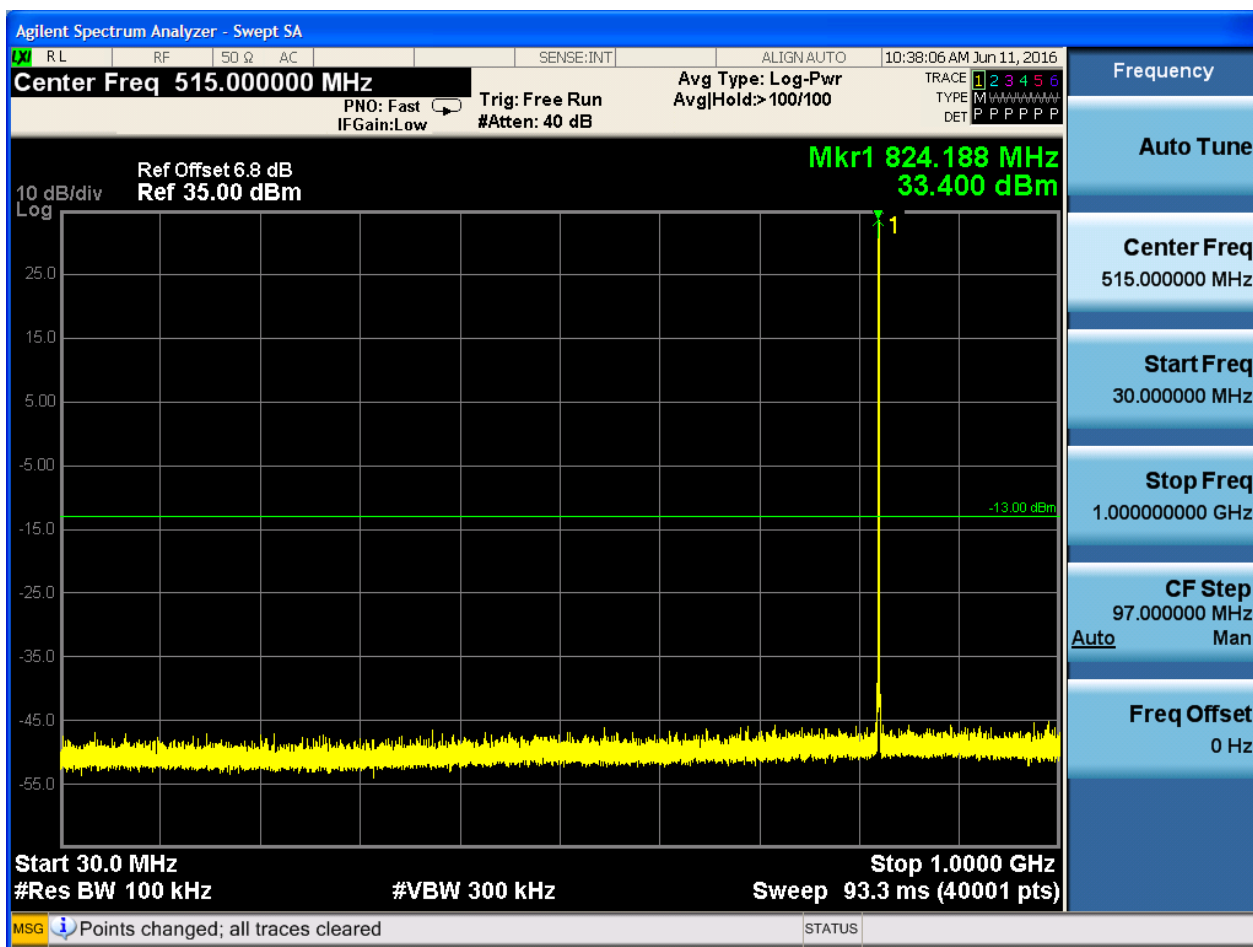
6.1.1 Test Band = GSM850

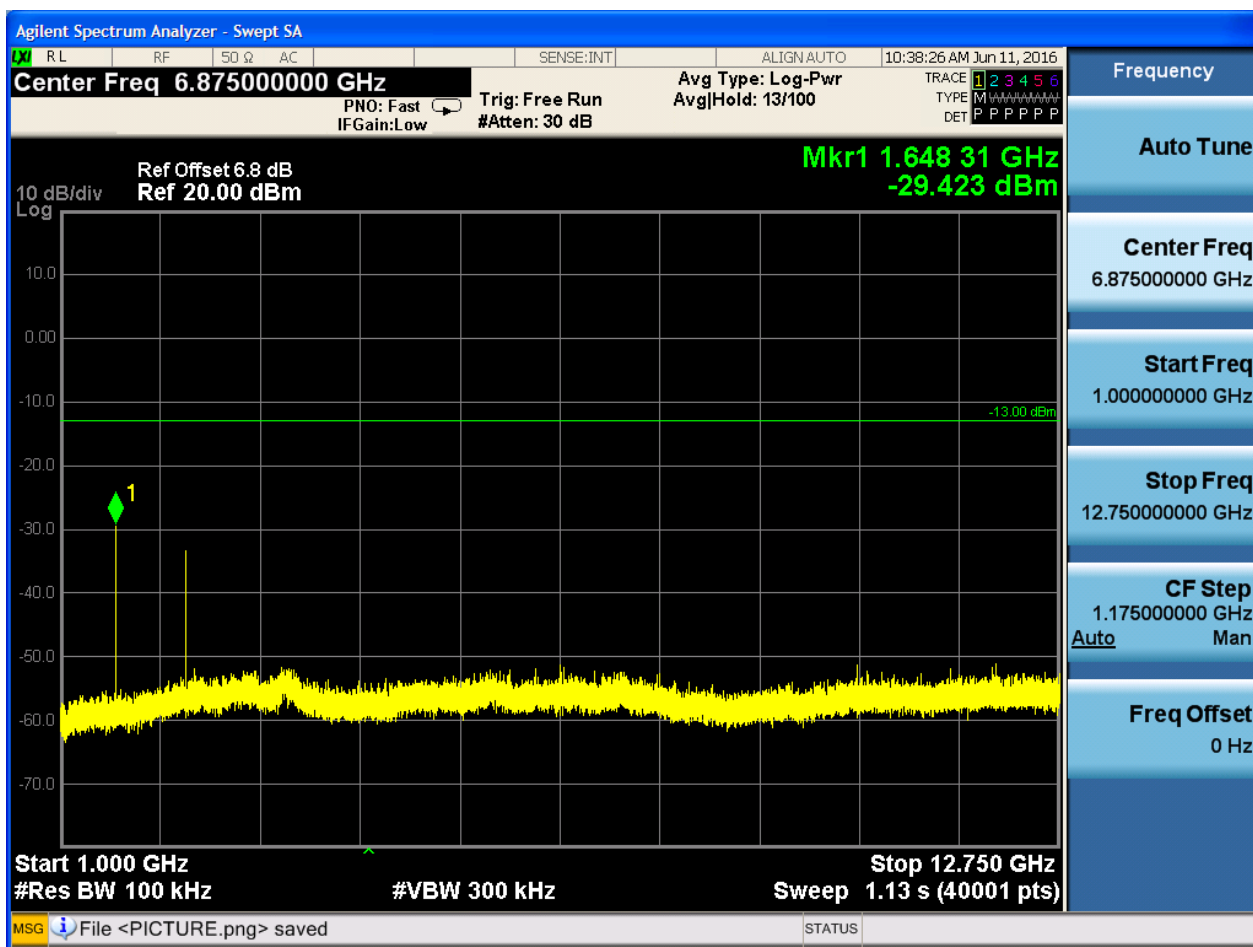
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH

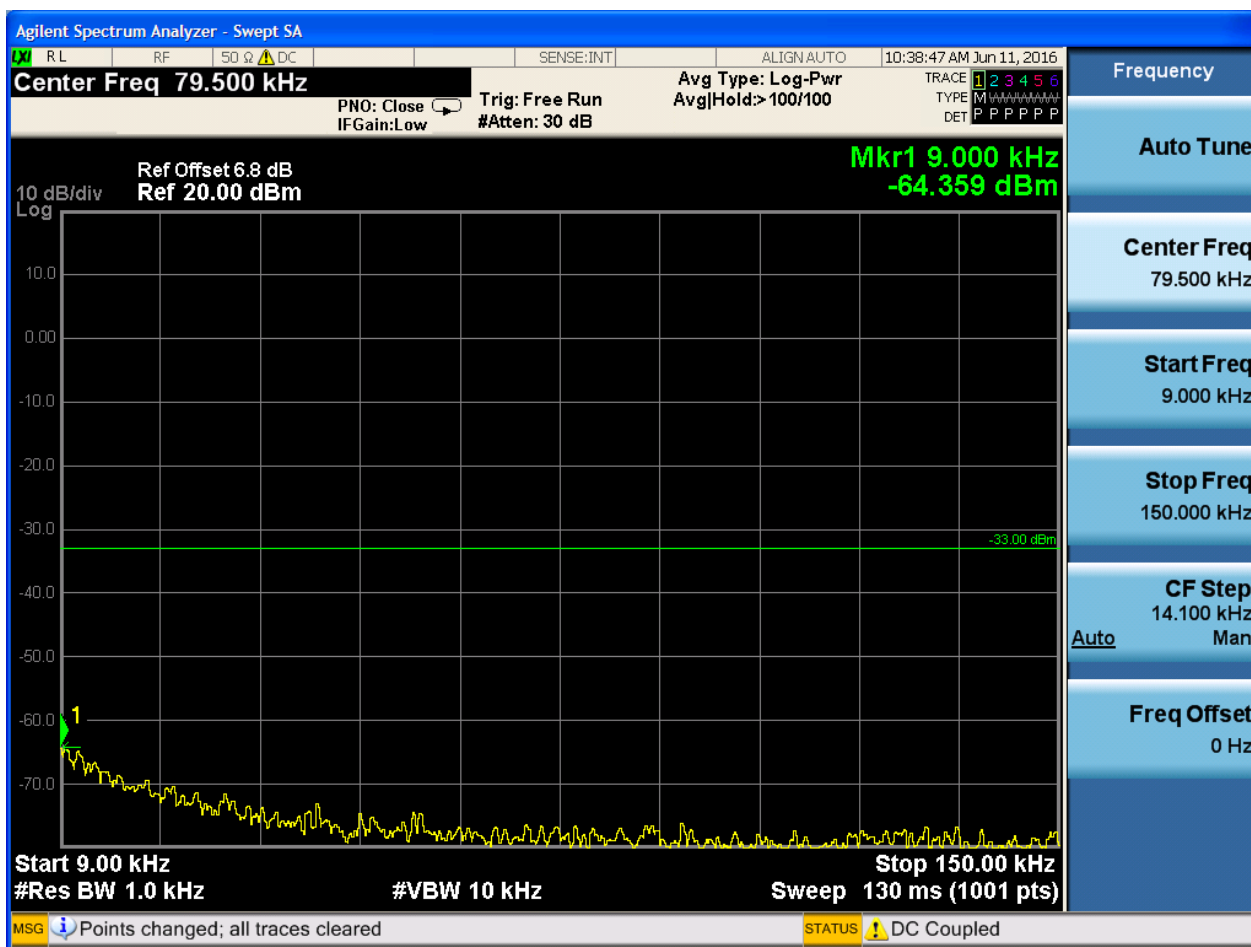


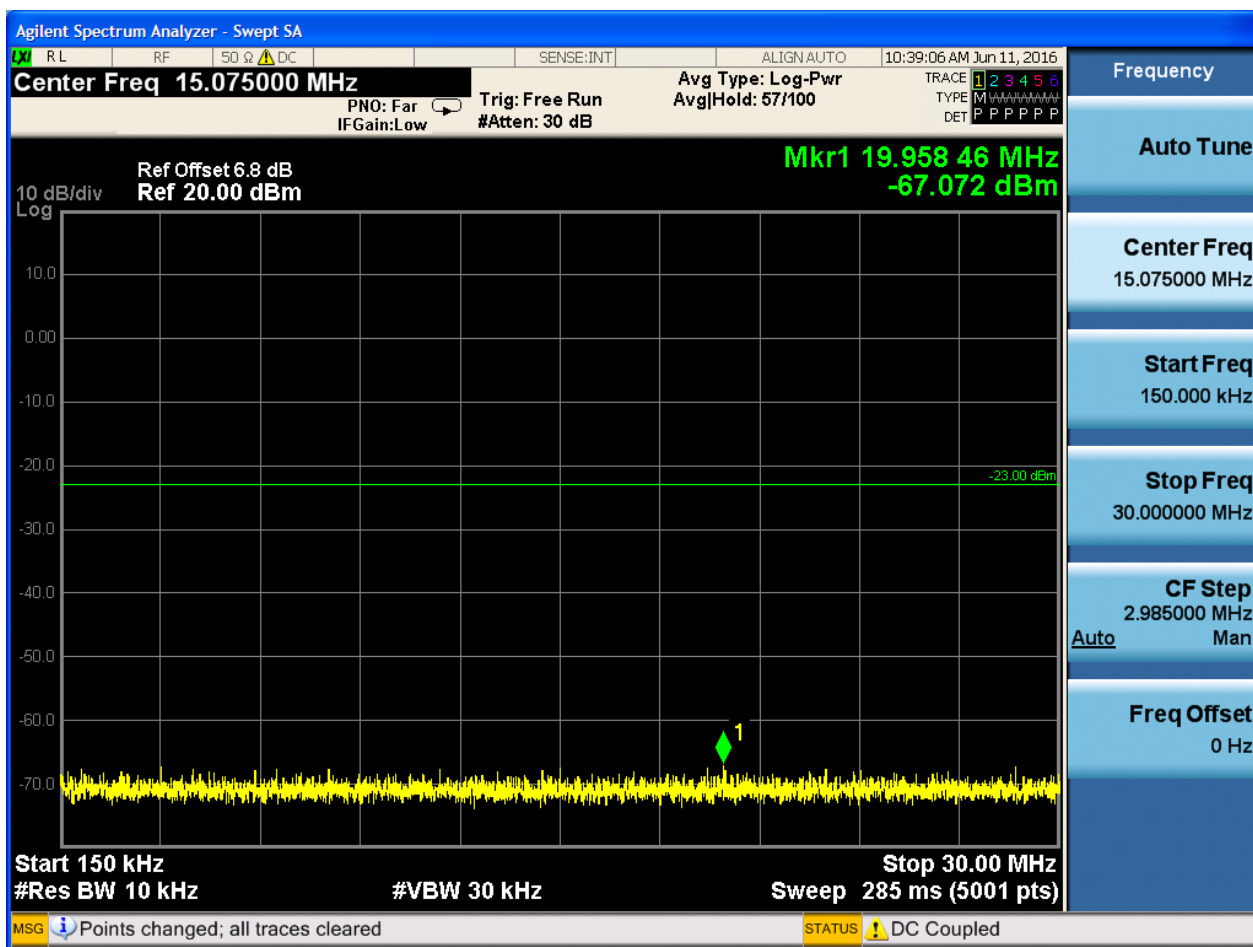


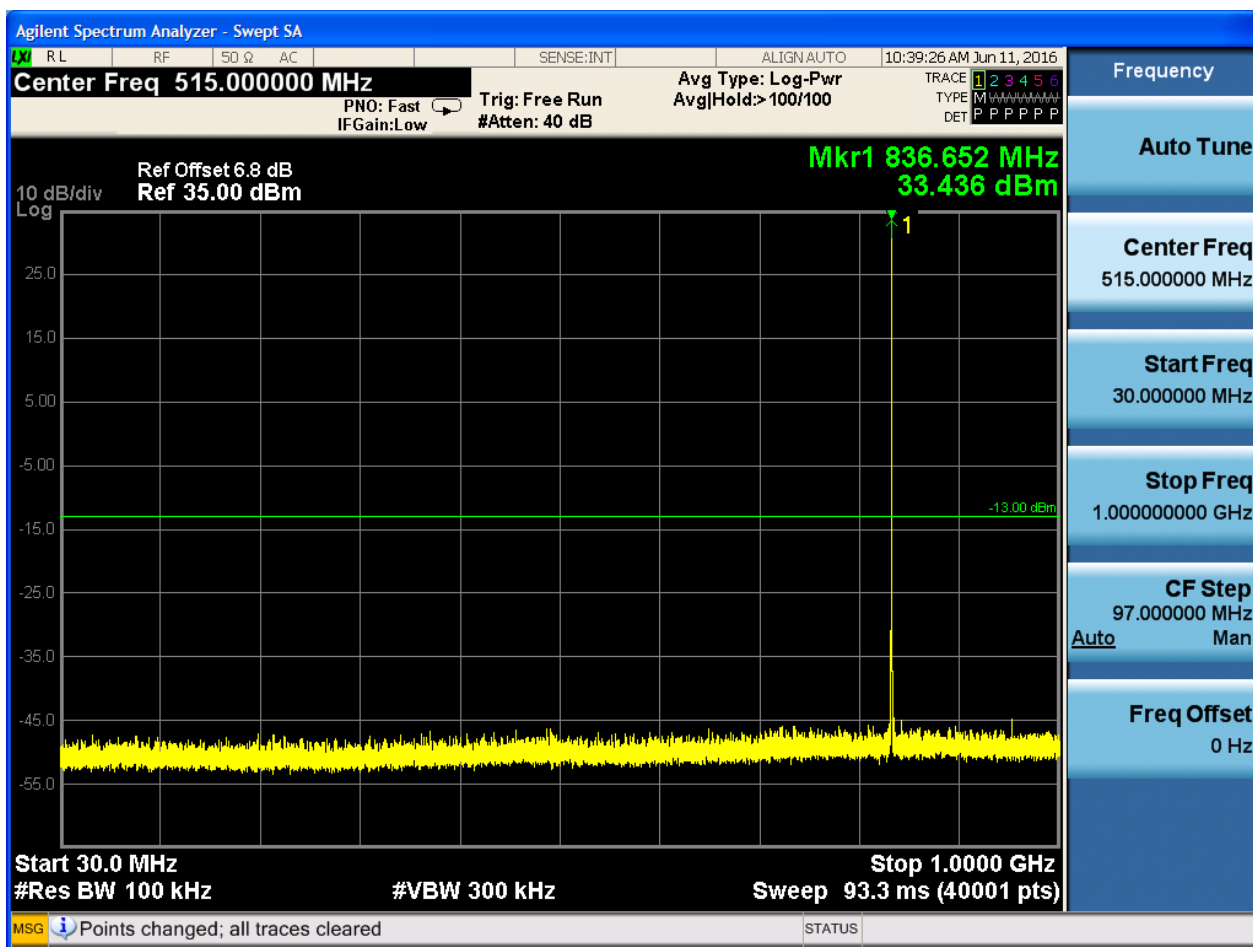


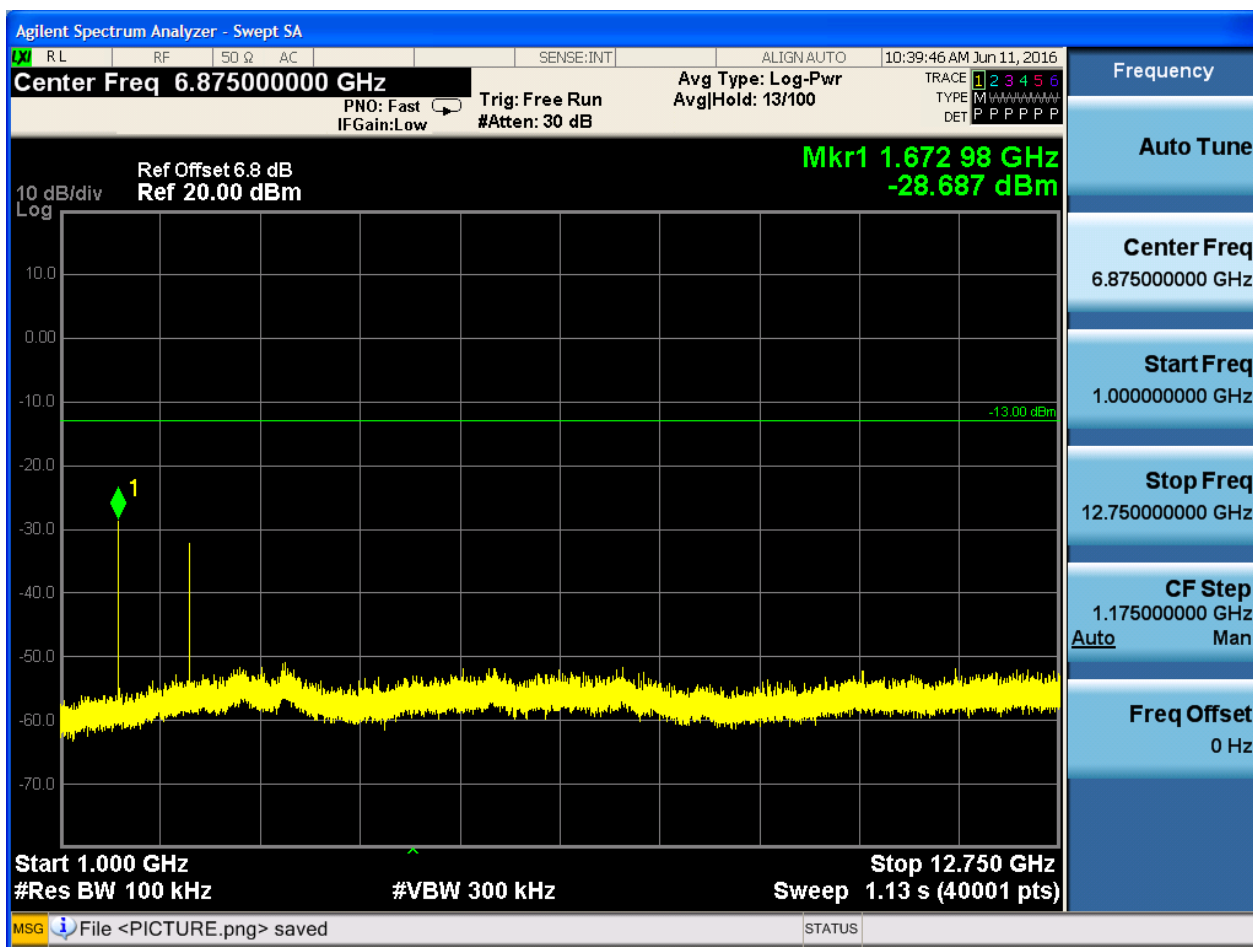


6.1.1.1.2 Test Channel = MCH

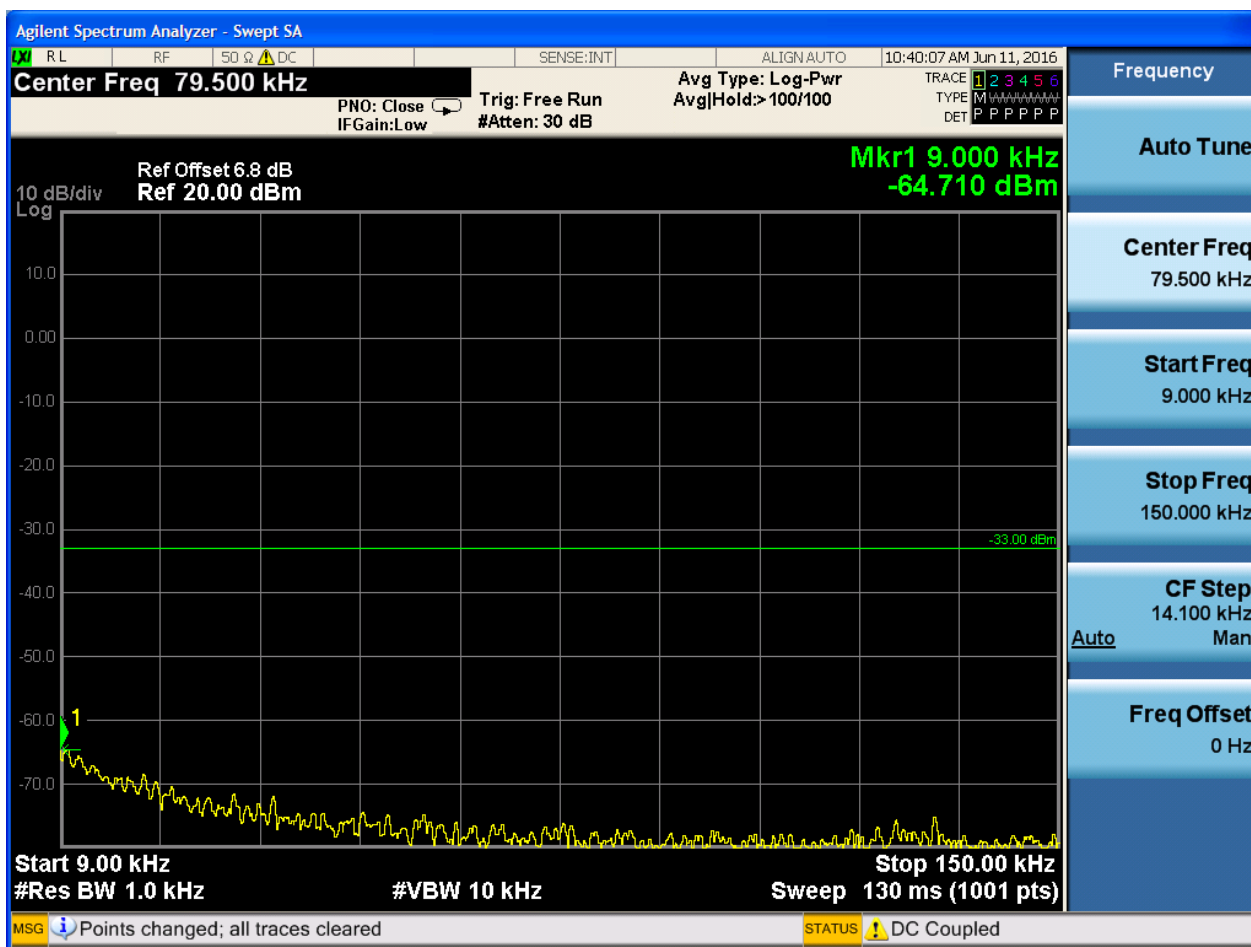


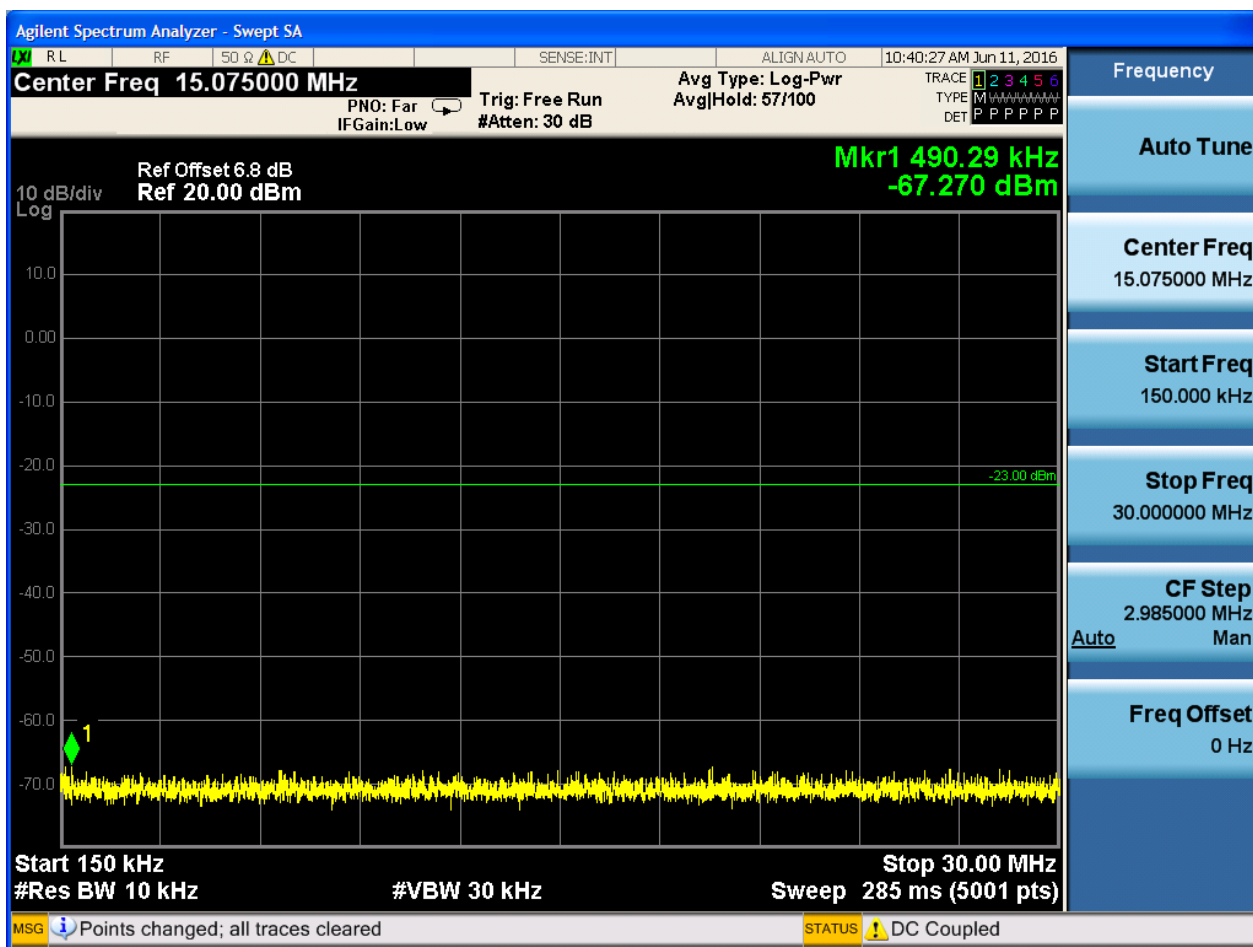


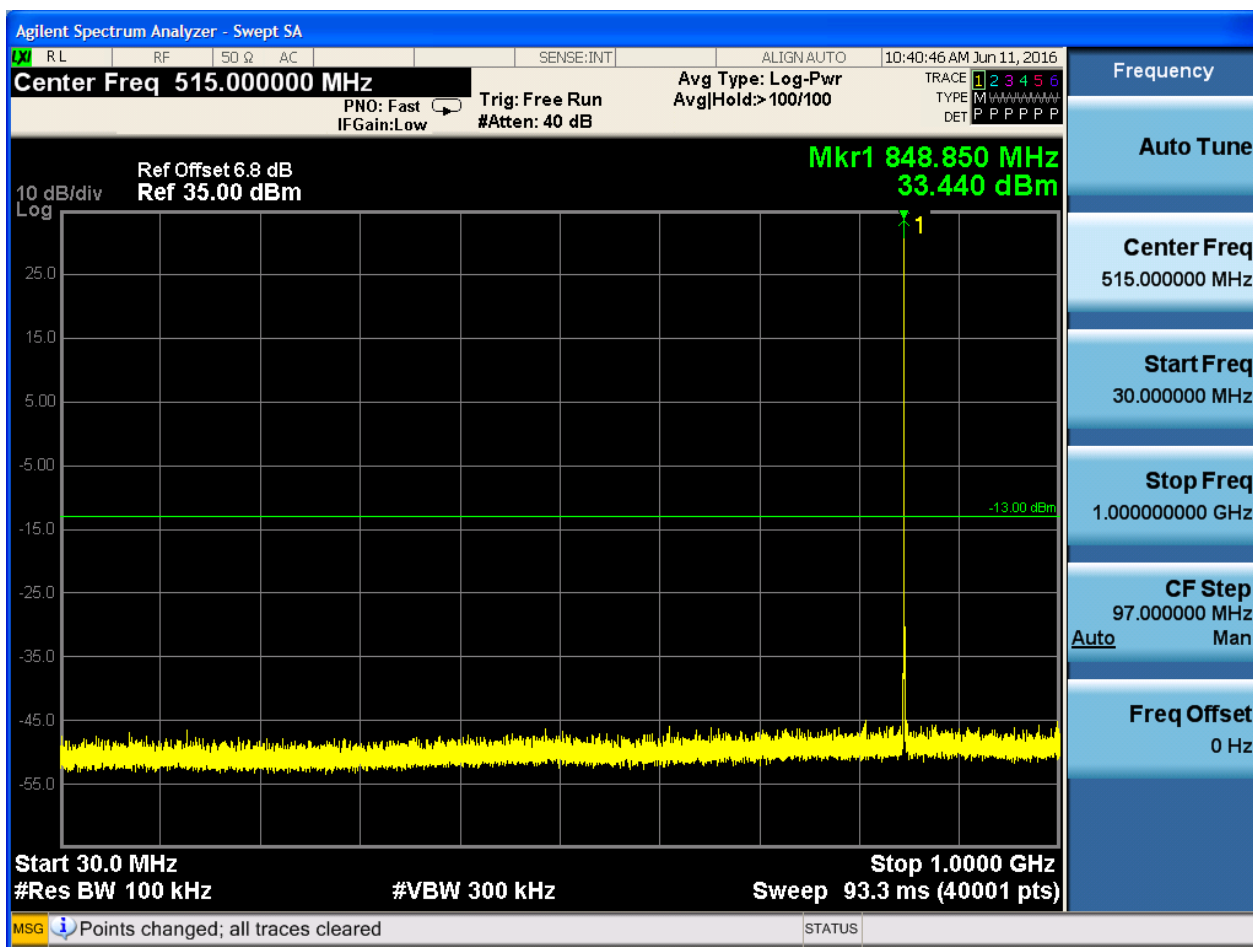


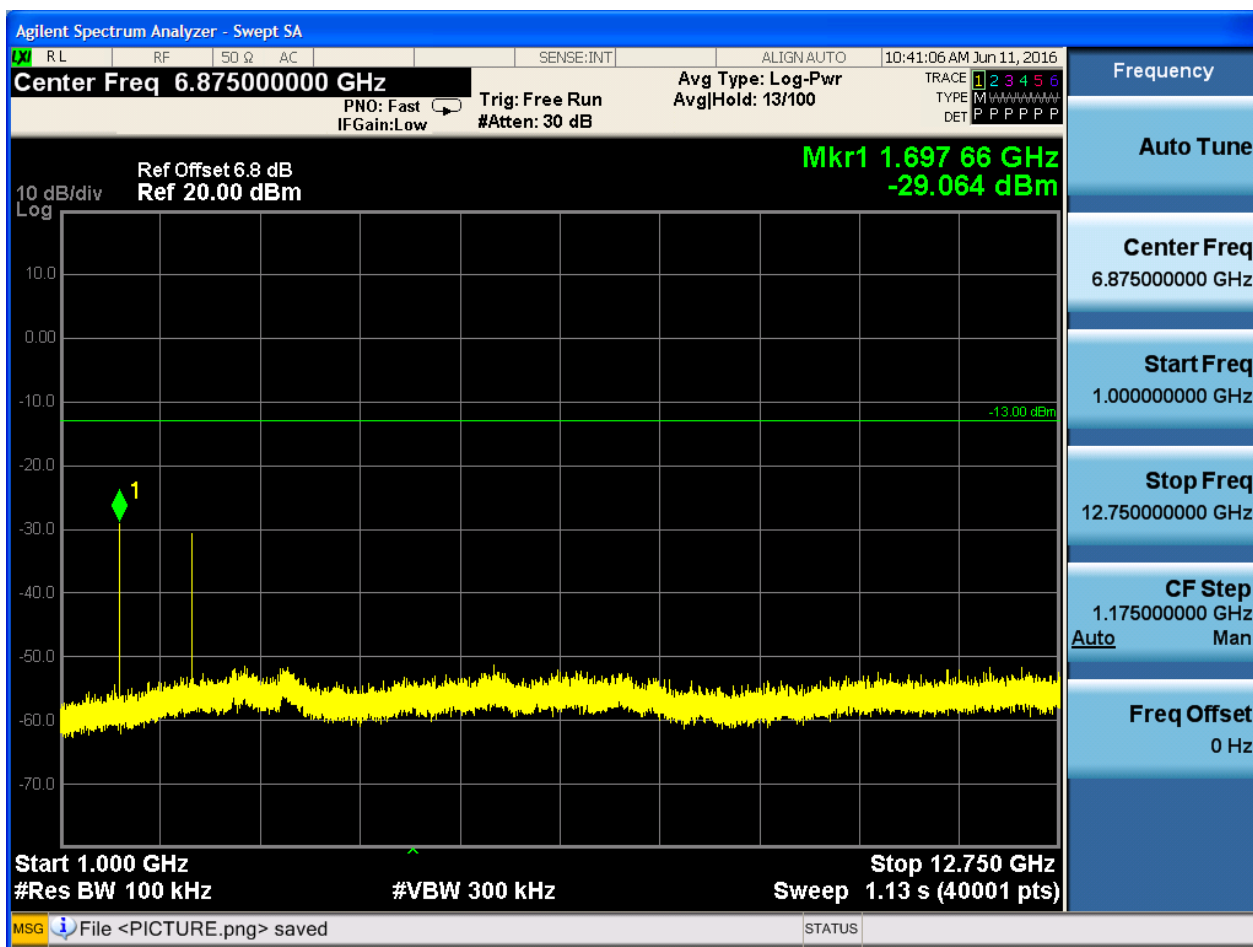


6.1.1.1.3 Test Channel = HCH





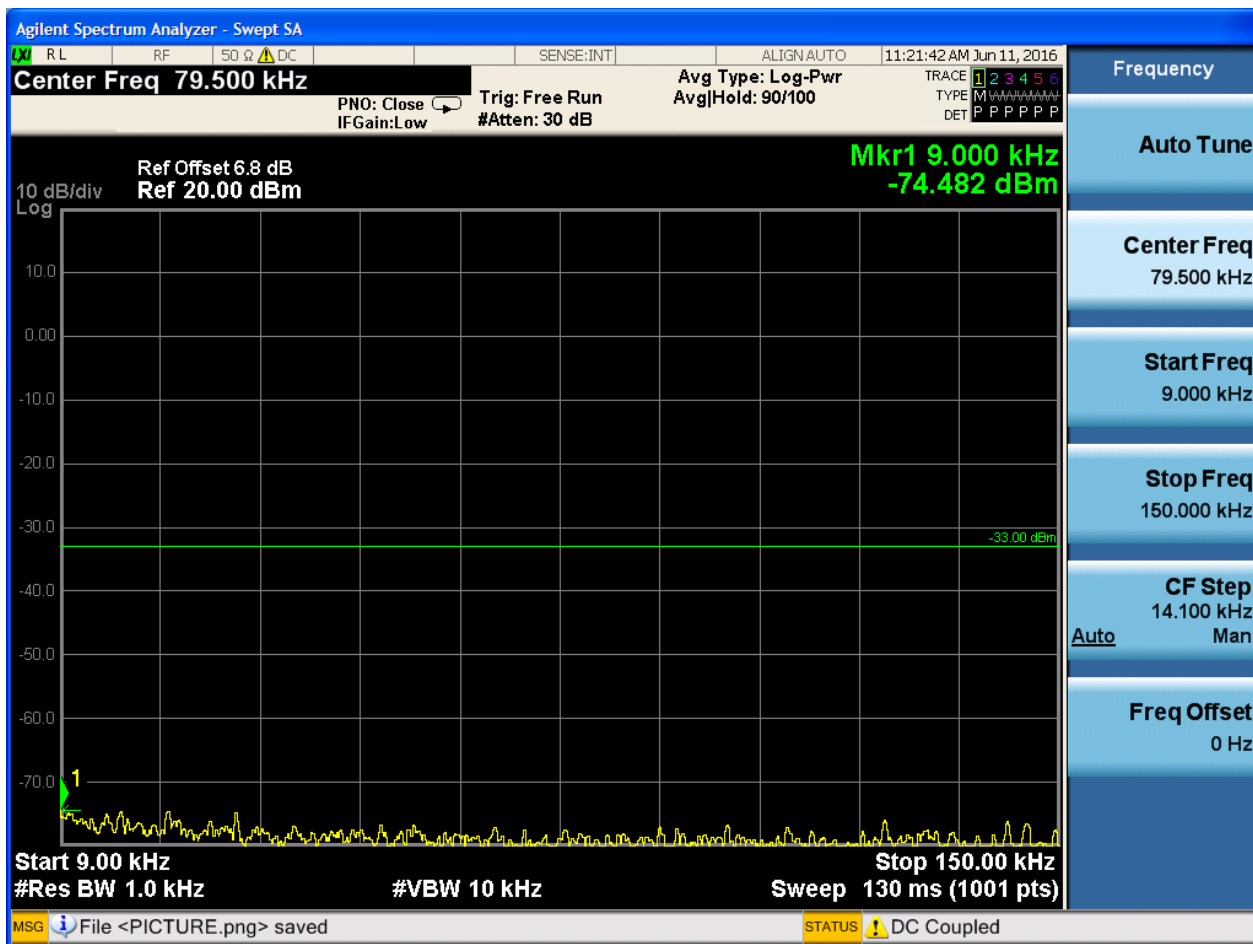


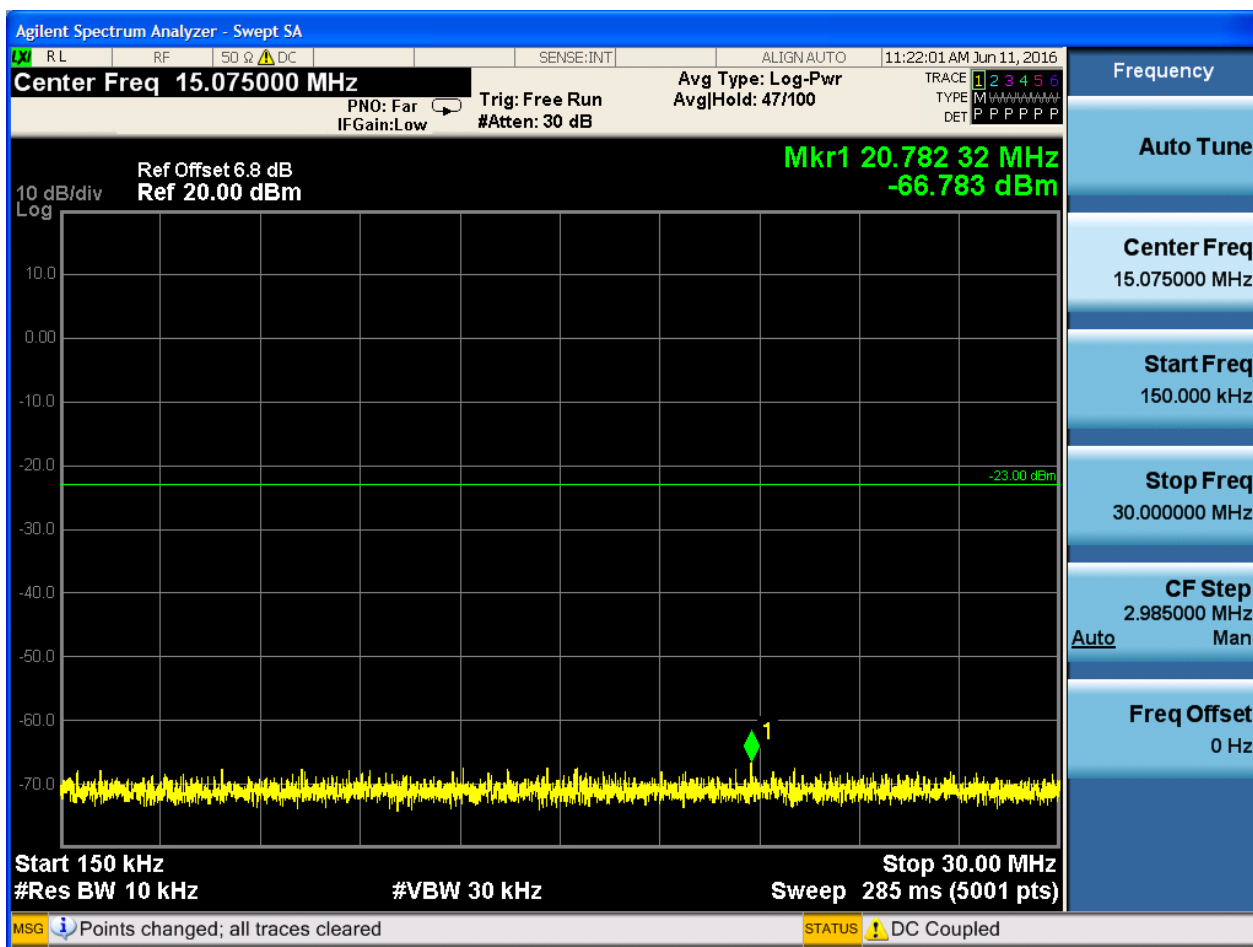


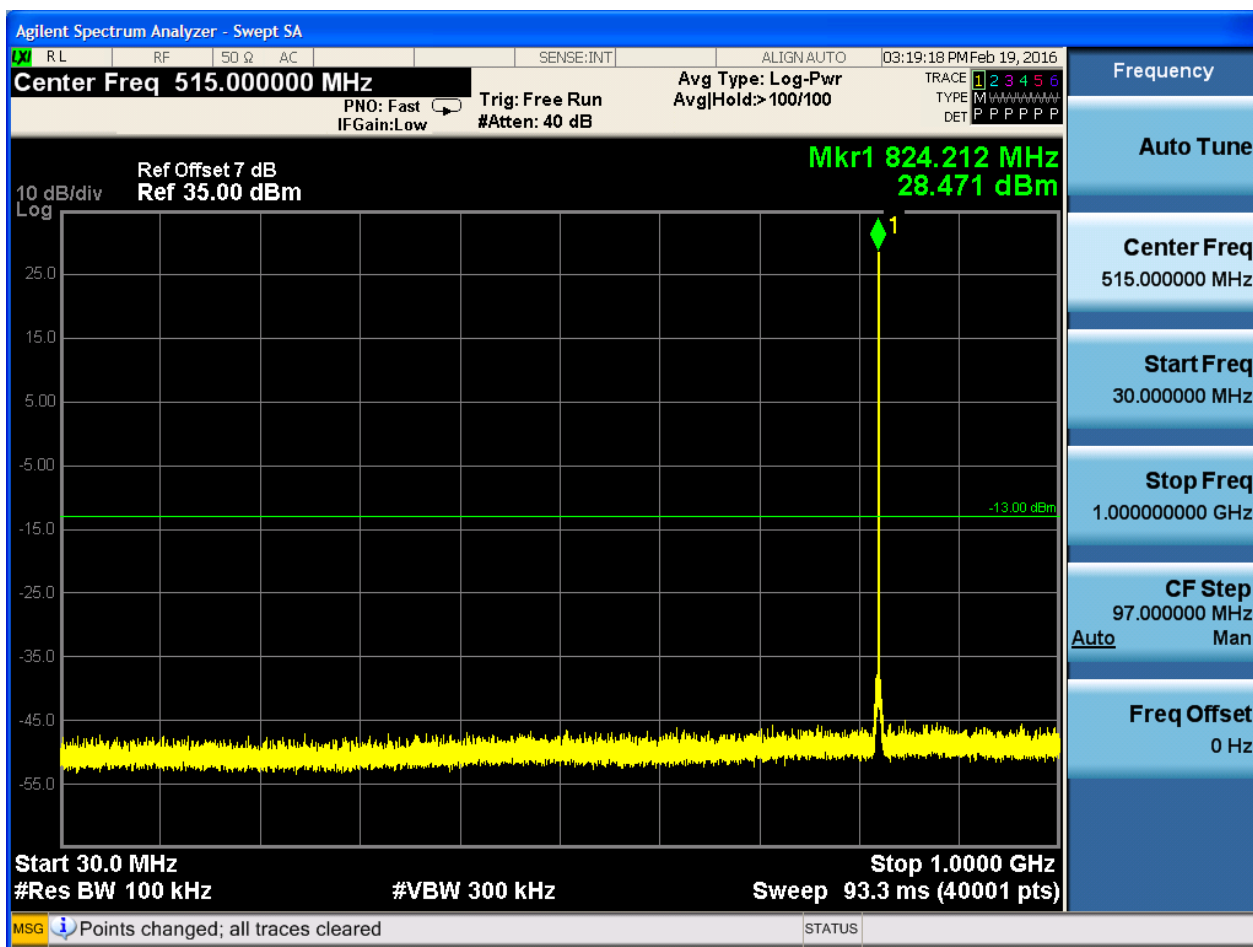


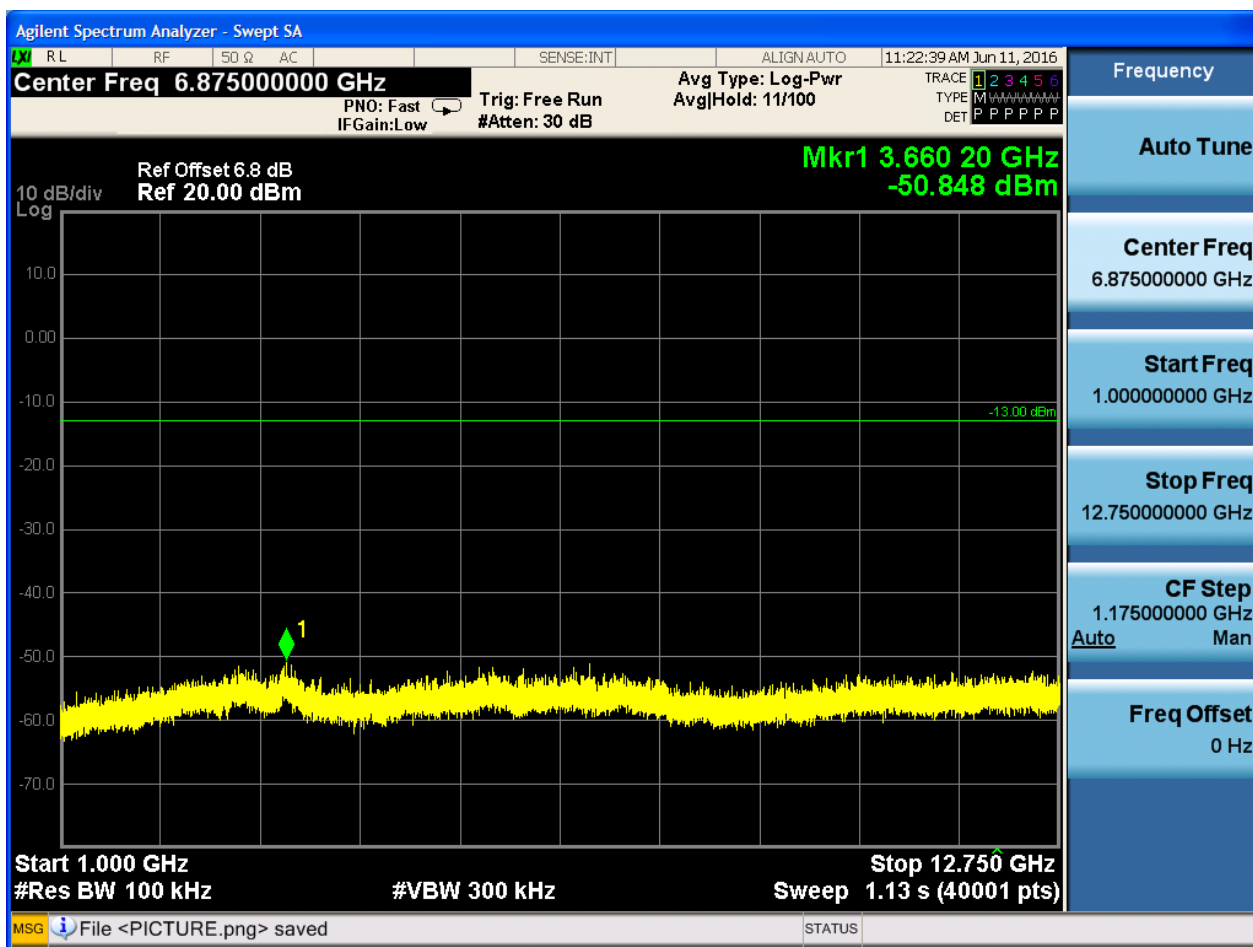
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH



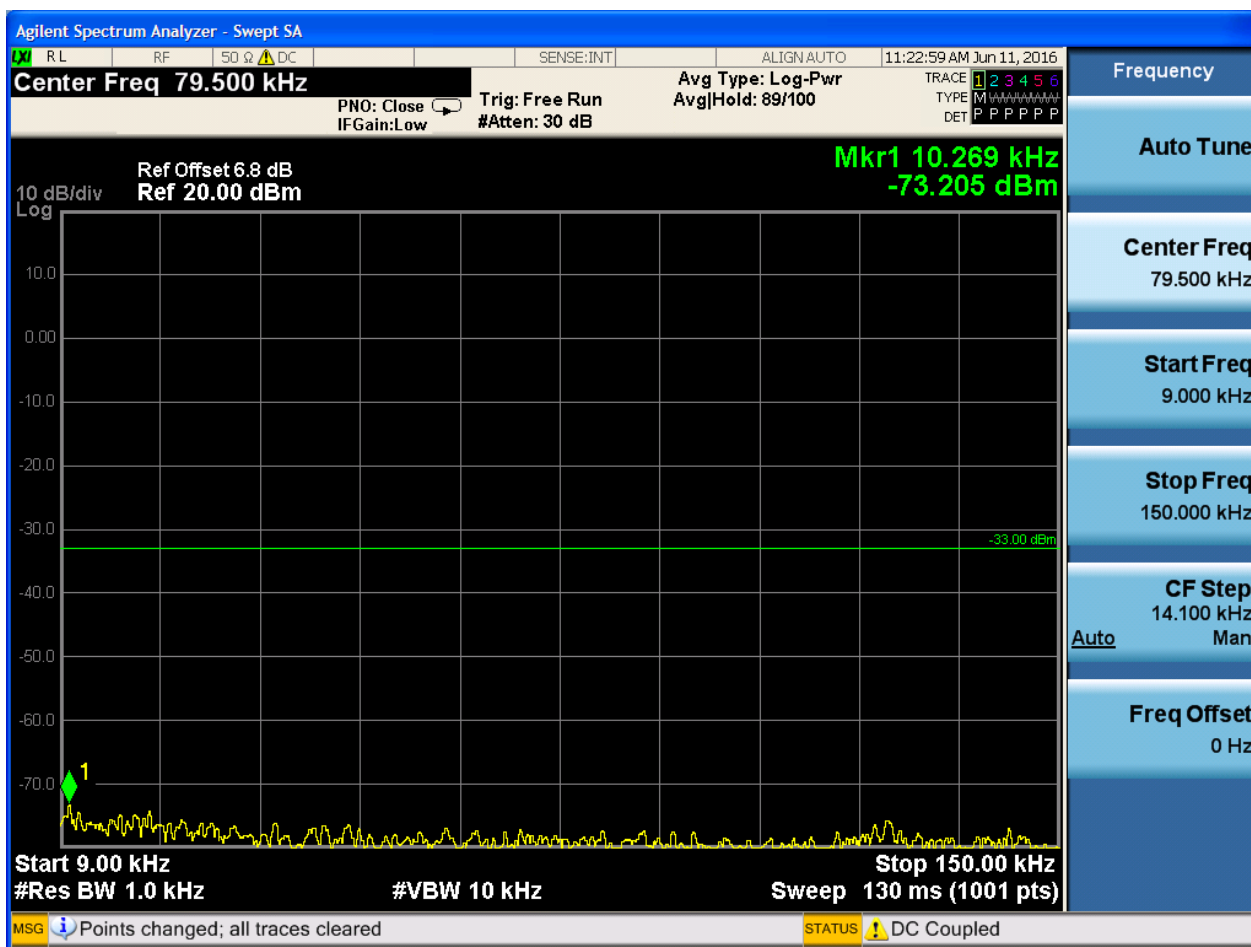


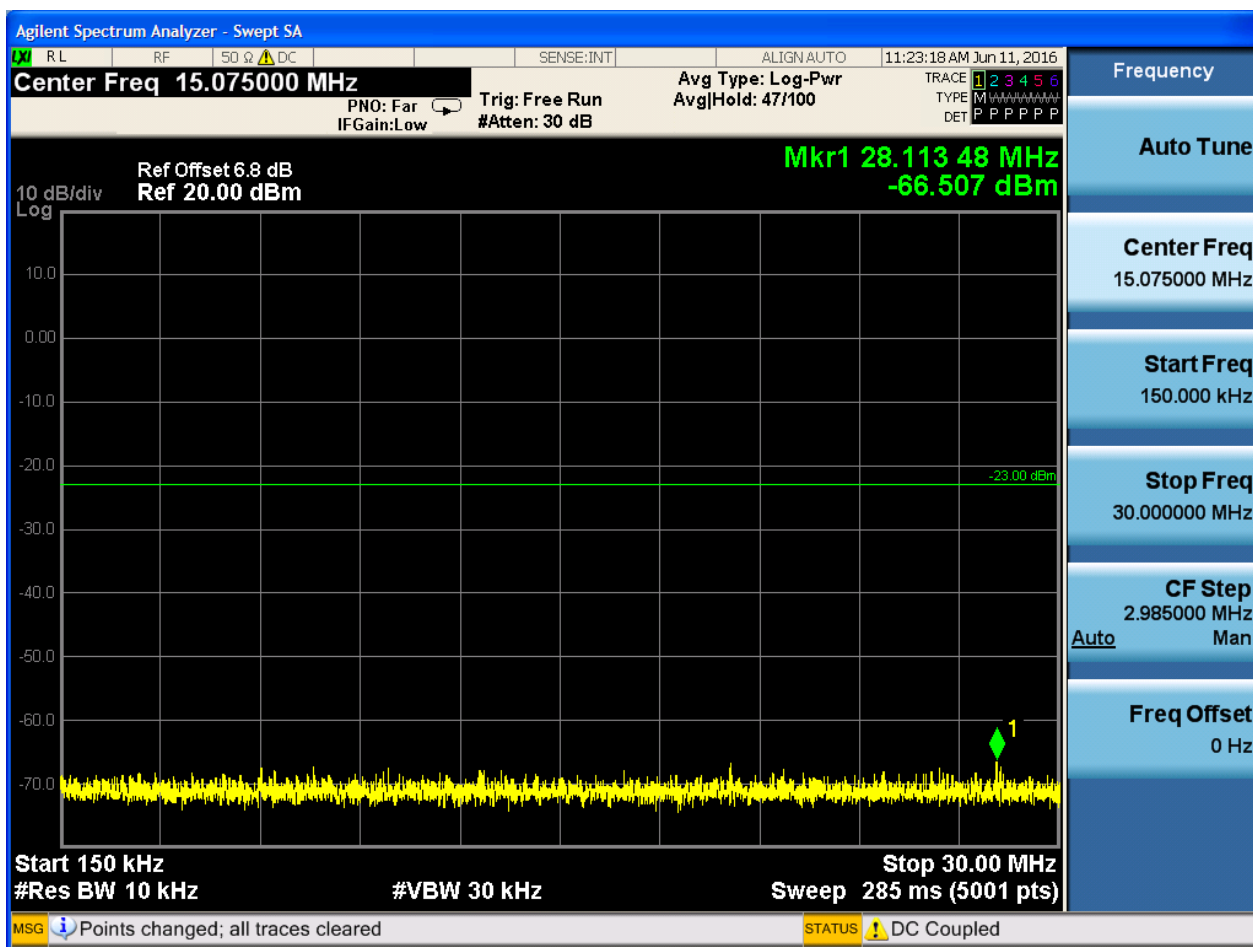


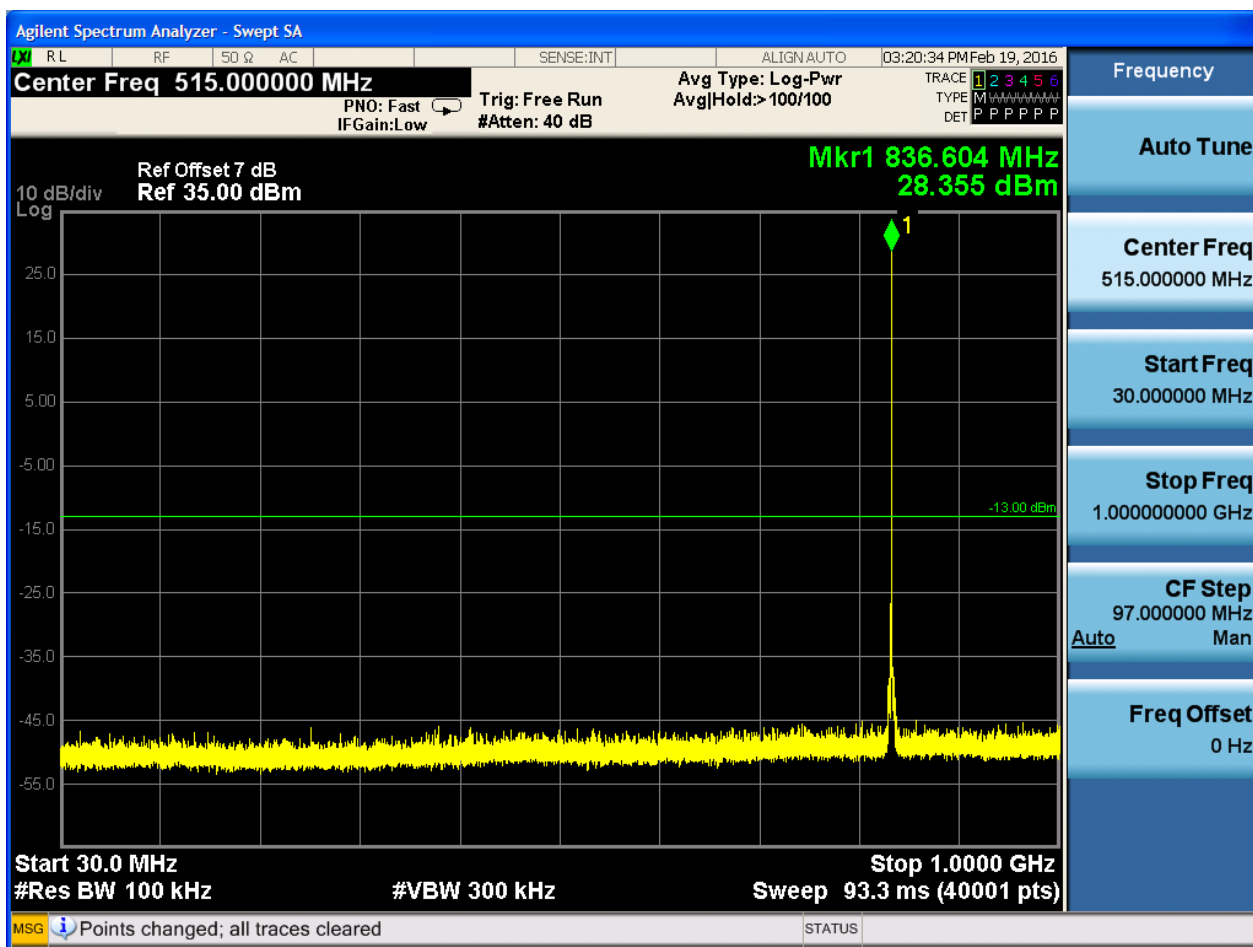


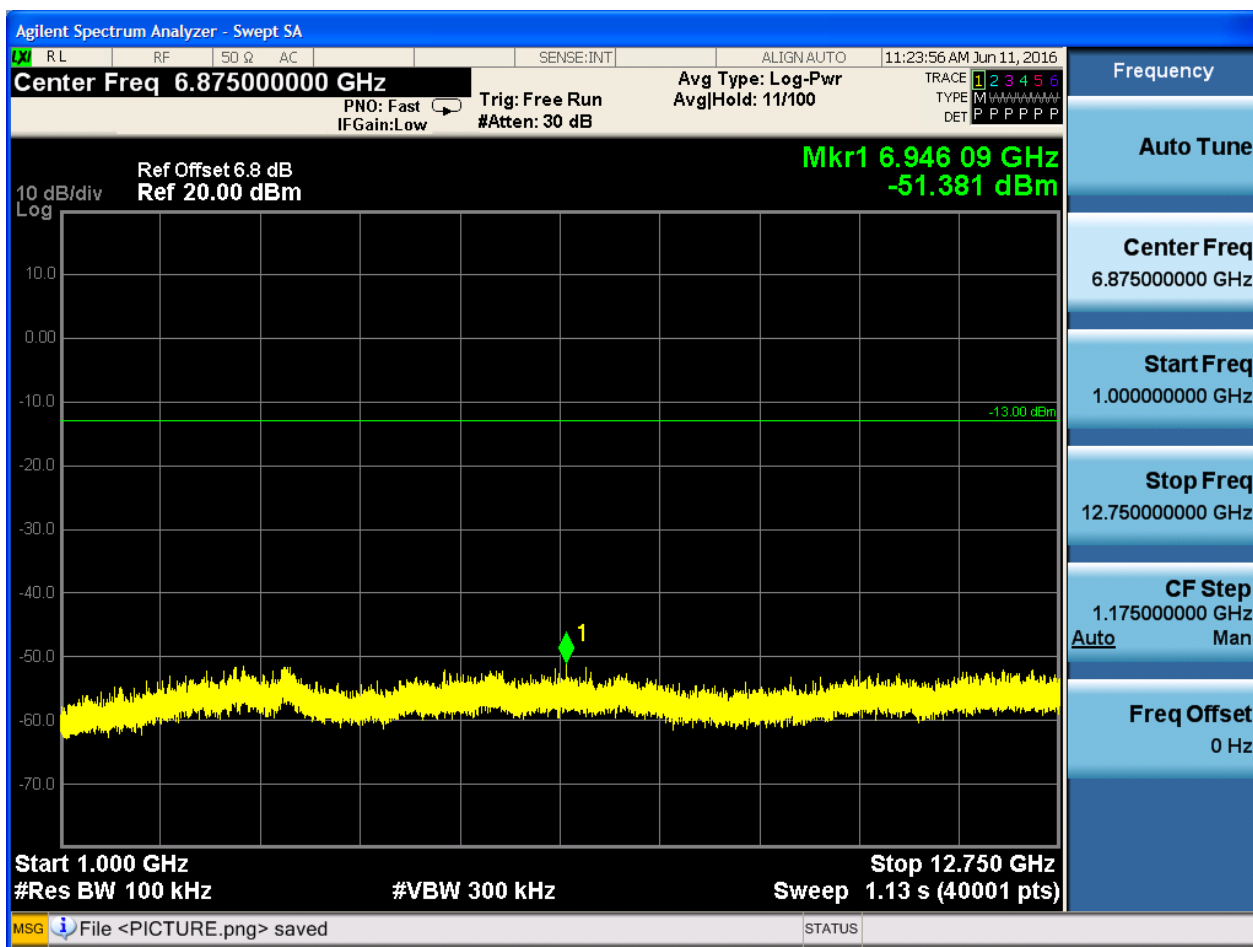


6.1.1.2.2 Test Channel = MCH





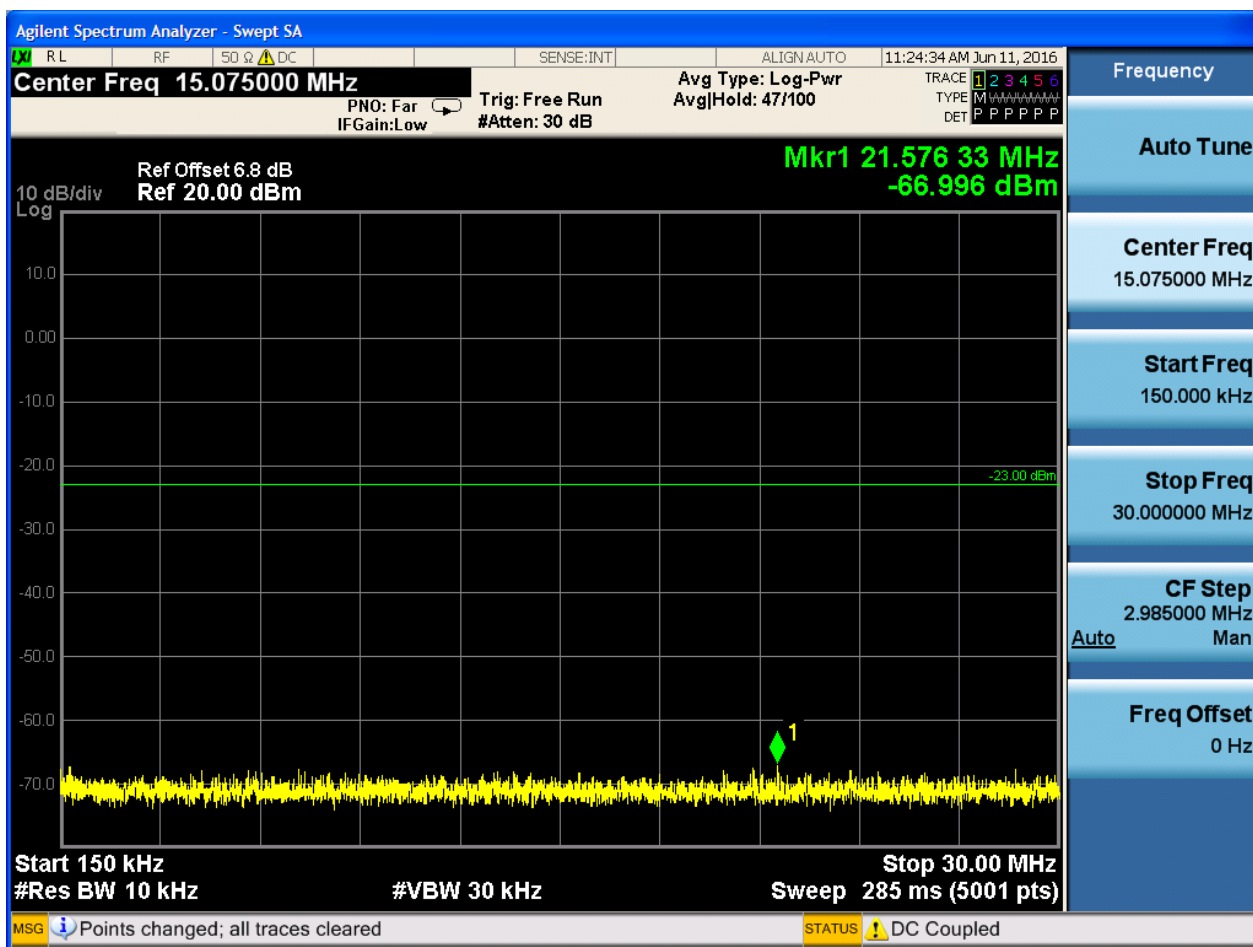


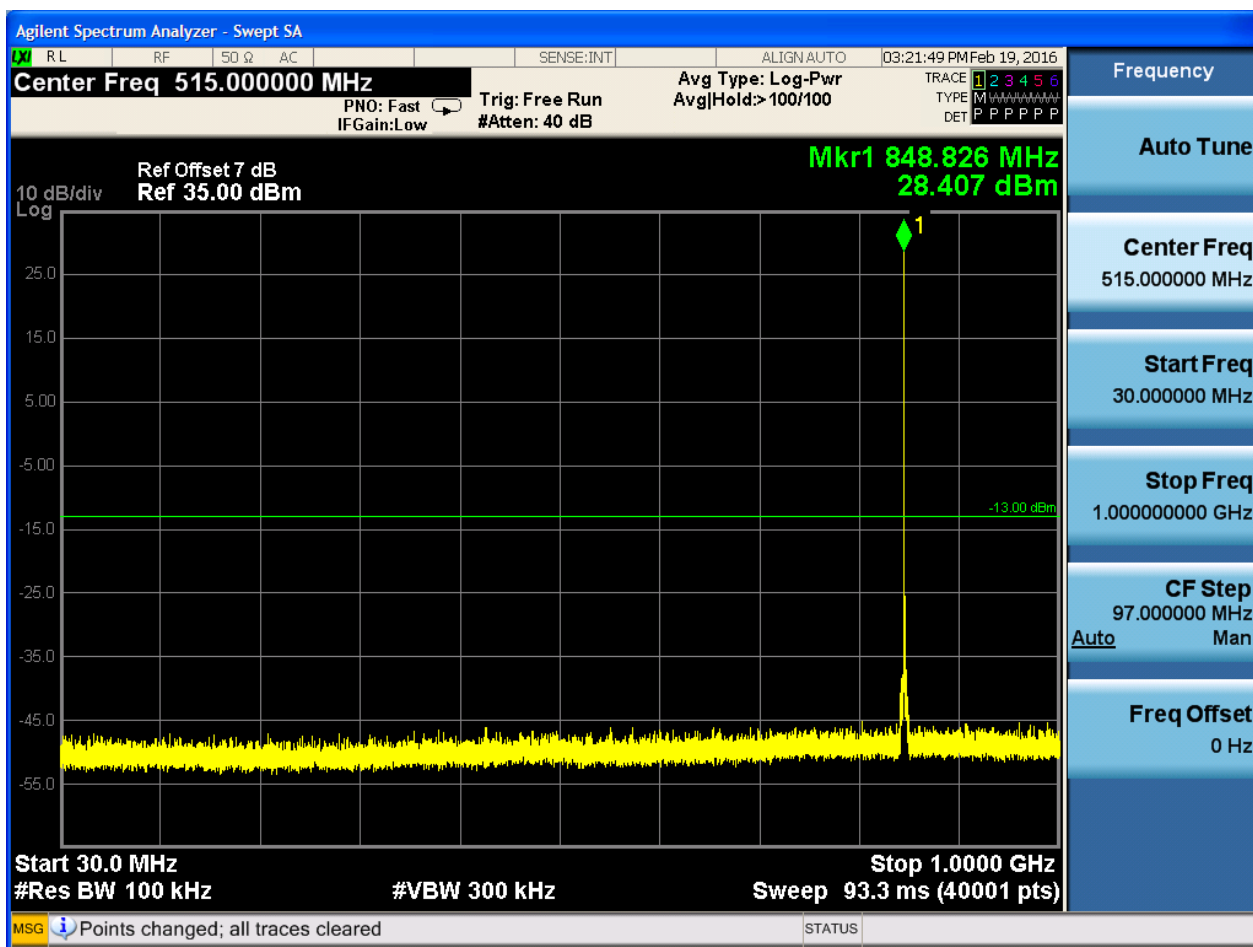


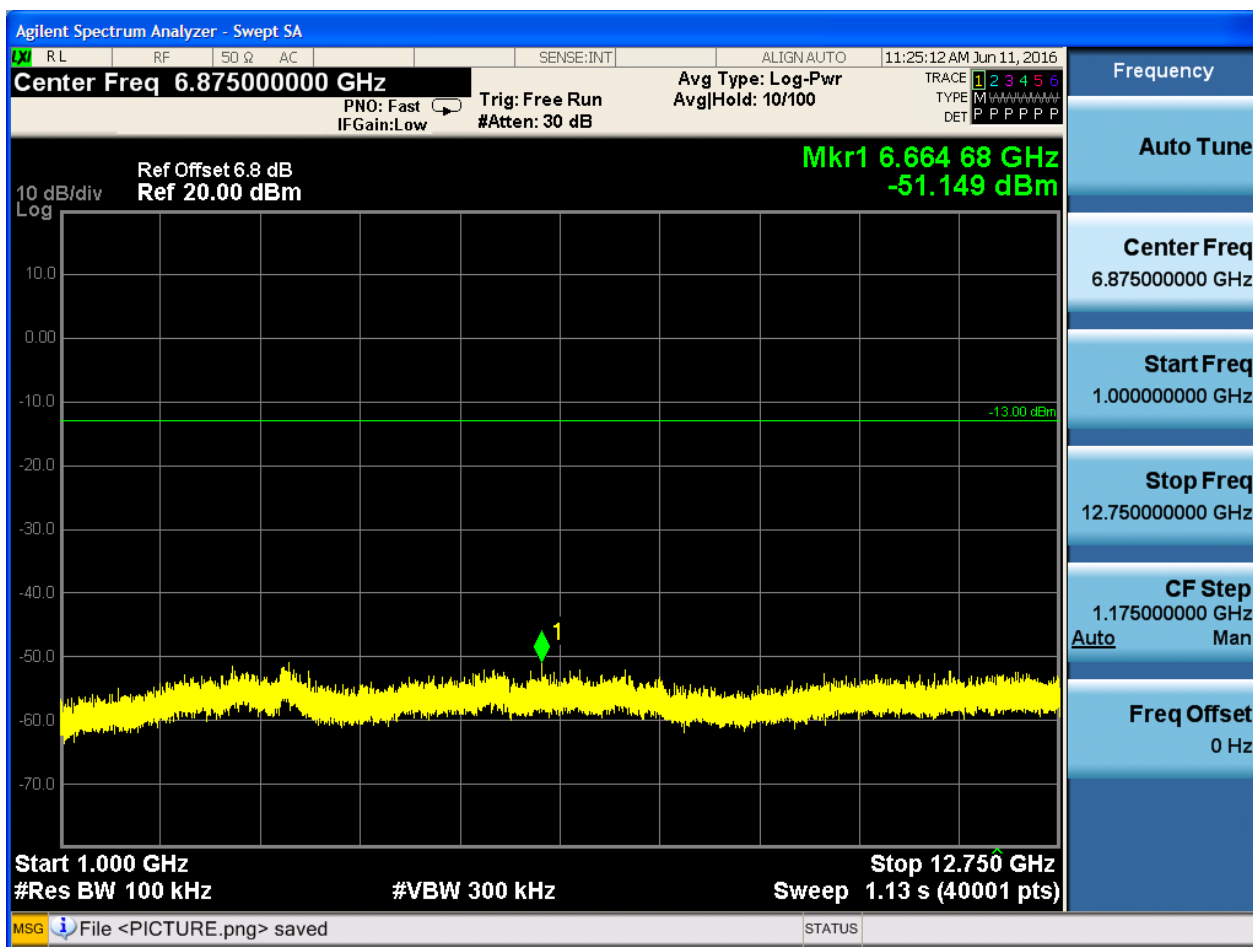


6.1.1.2.3 Test Channel = HCH







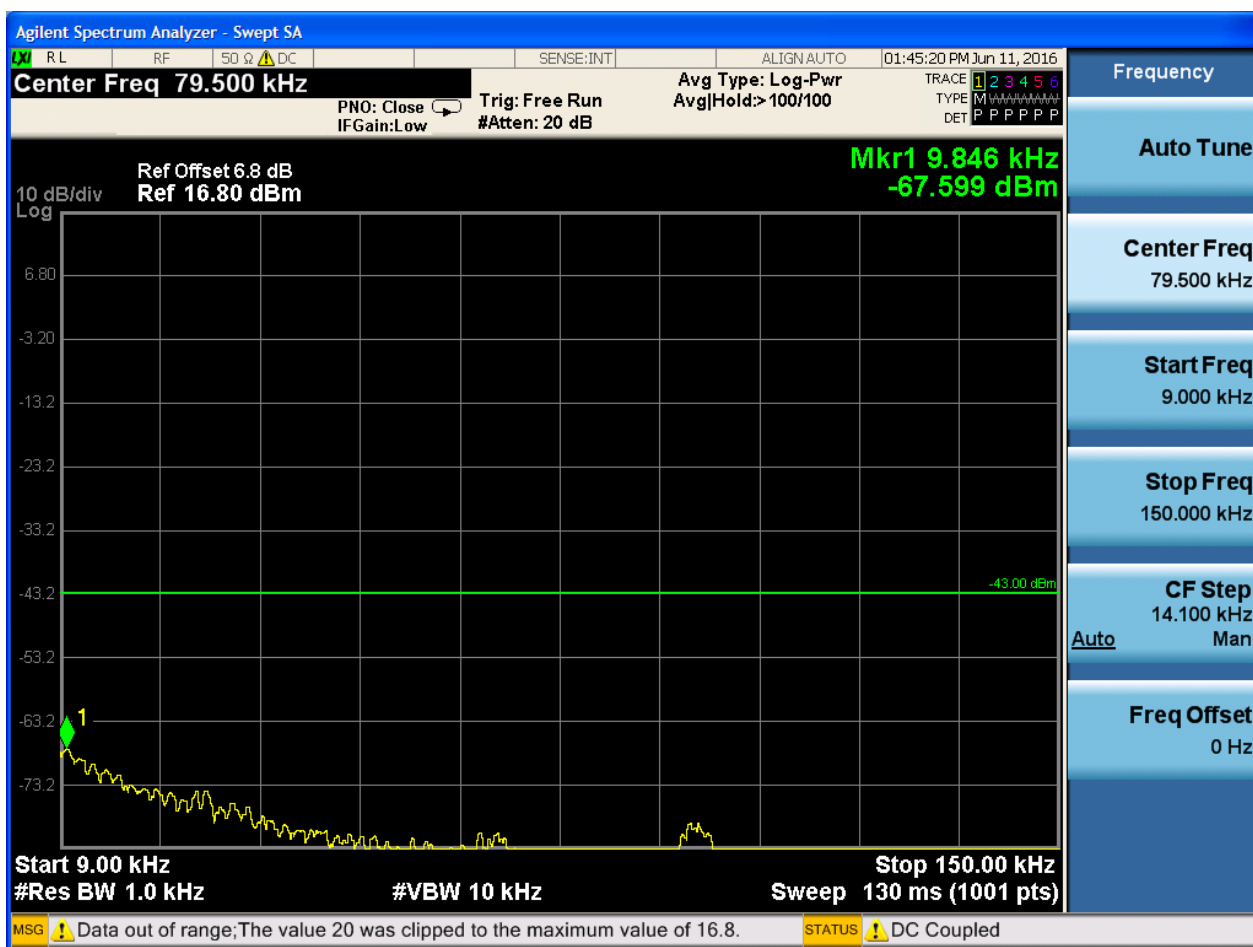


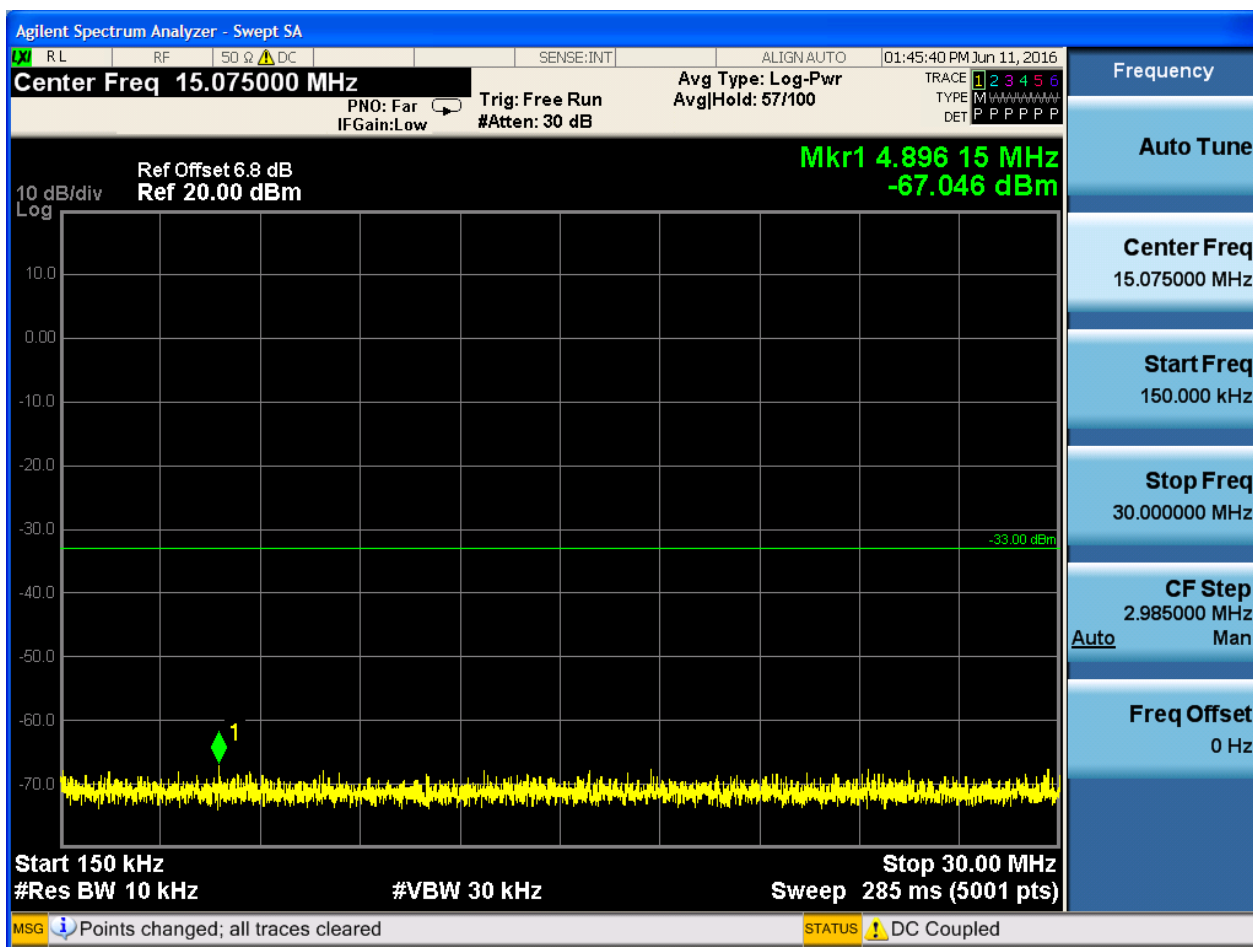


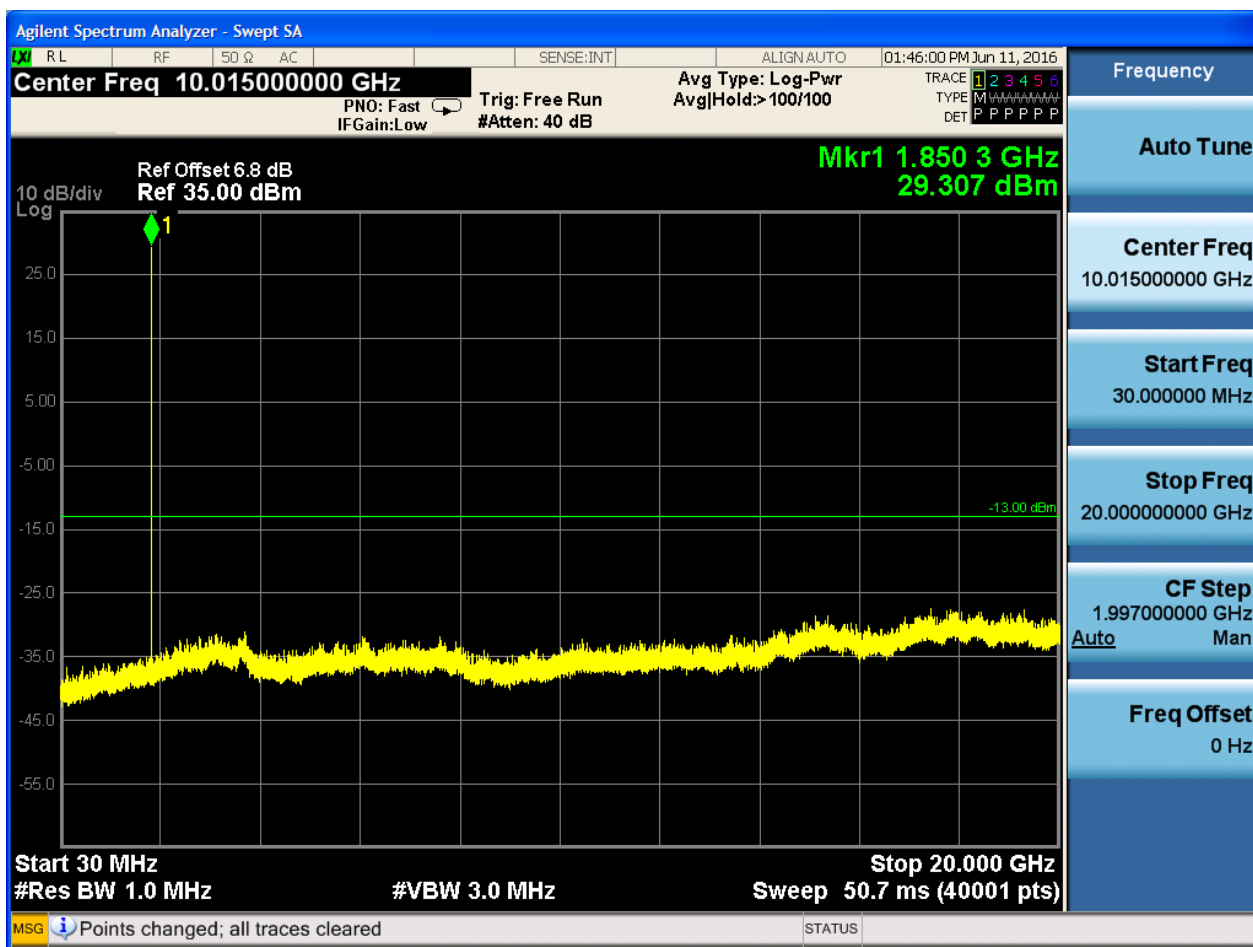
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH

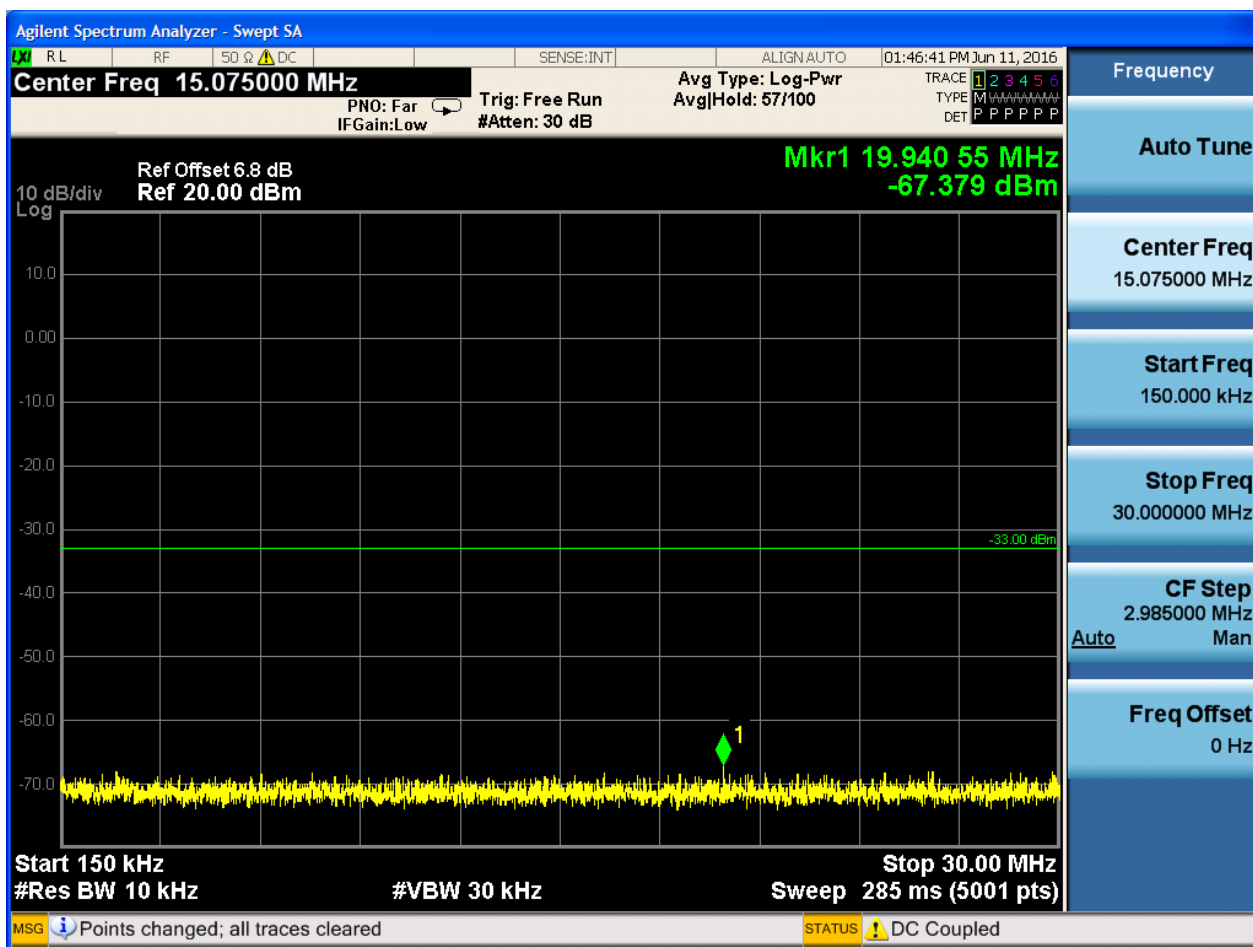


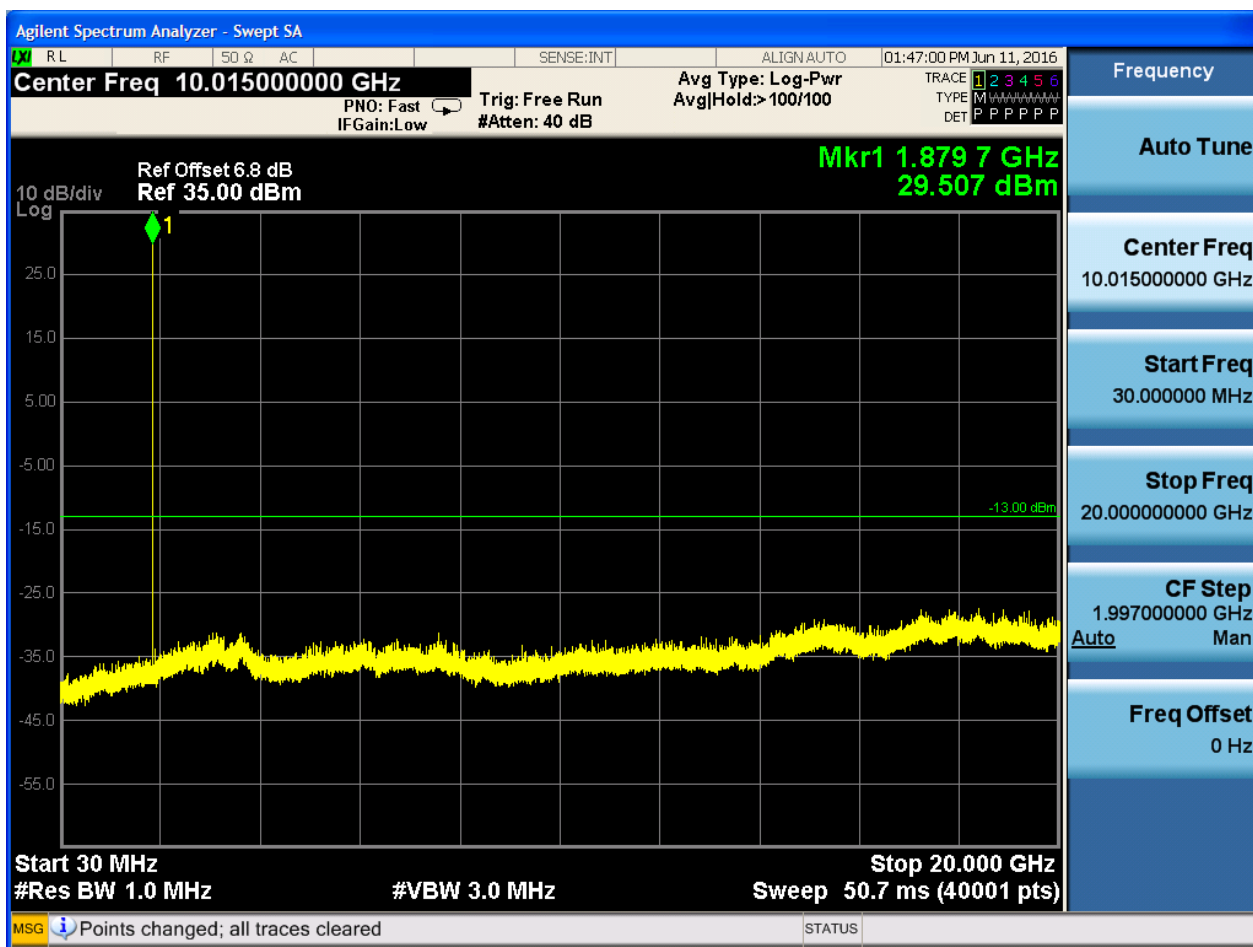




6.1.2.1.2 Test Channel = MCH

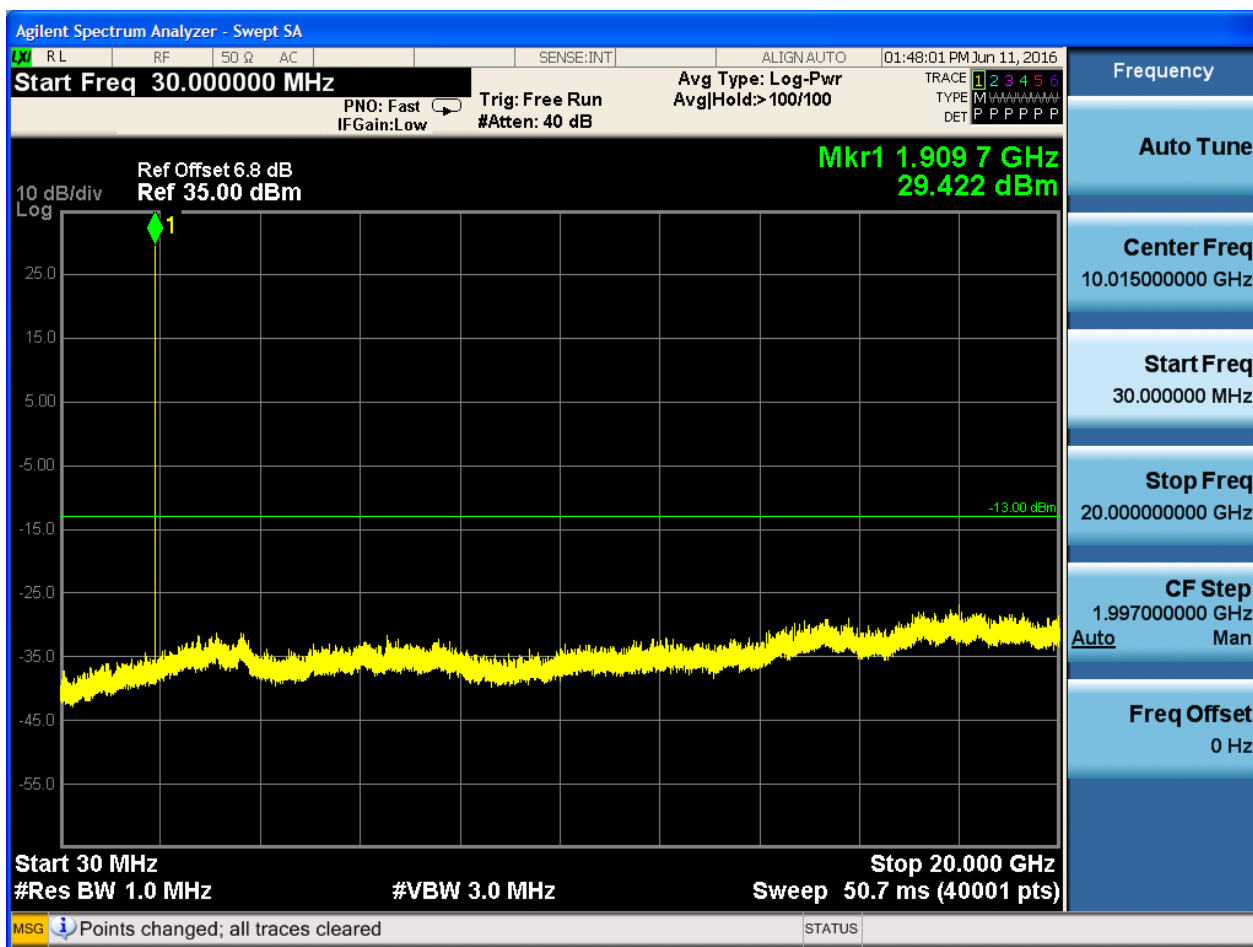






6.1.2.1.3 Test Channel = HCH

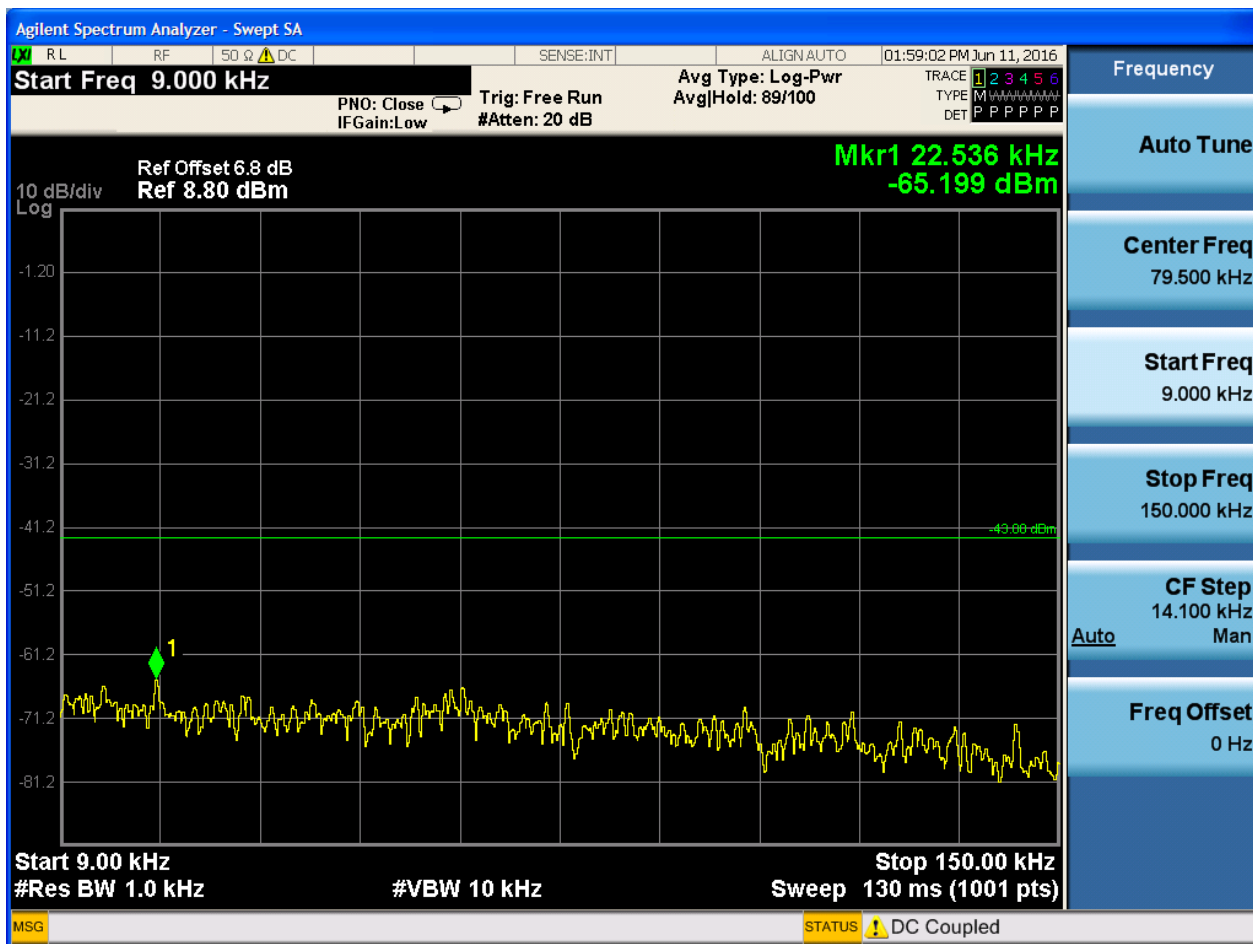


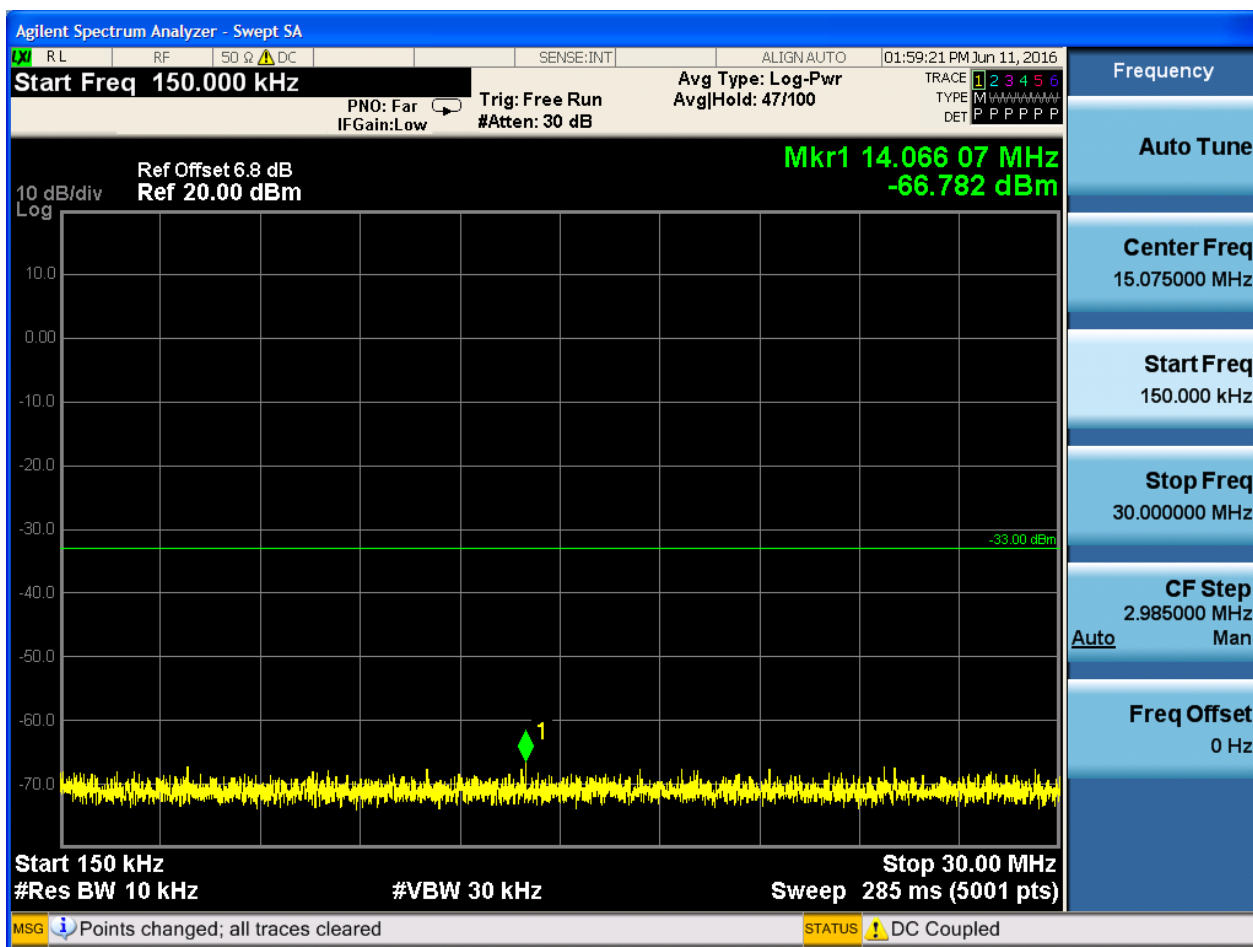


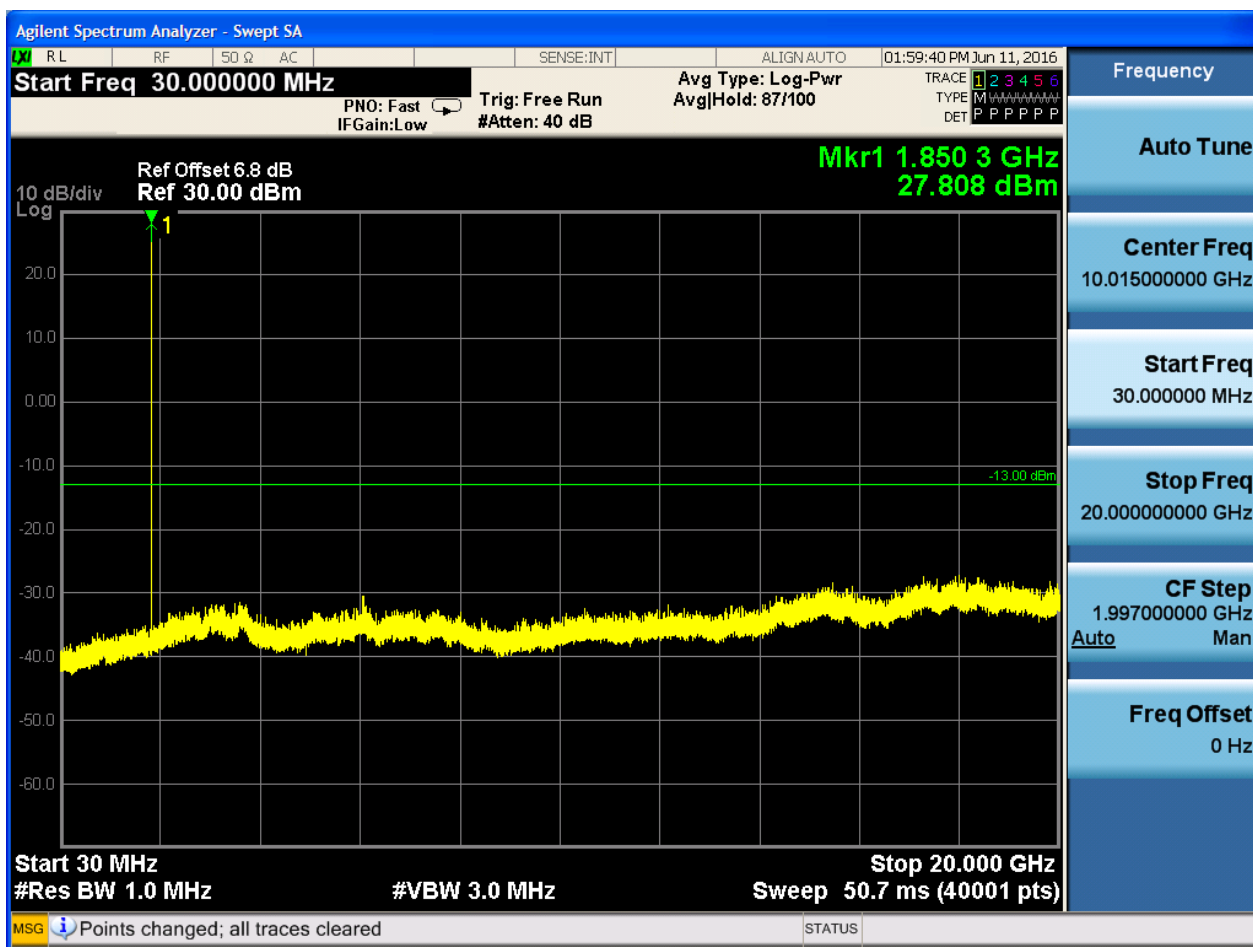


6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

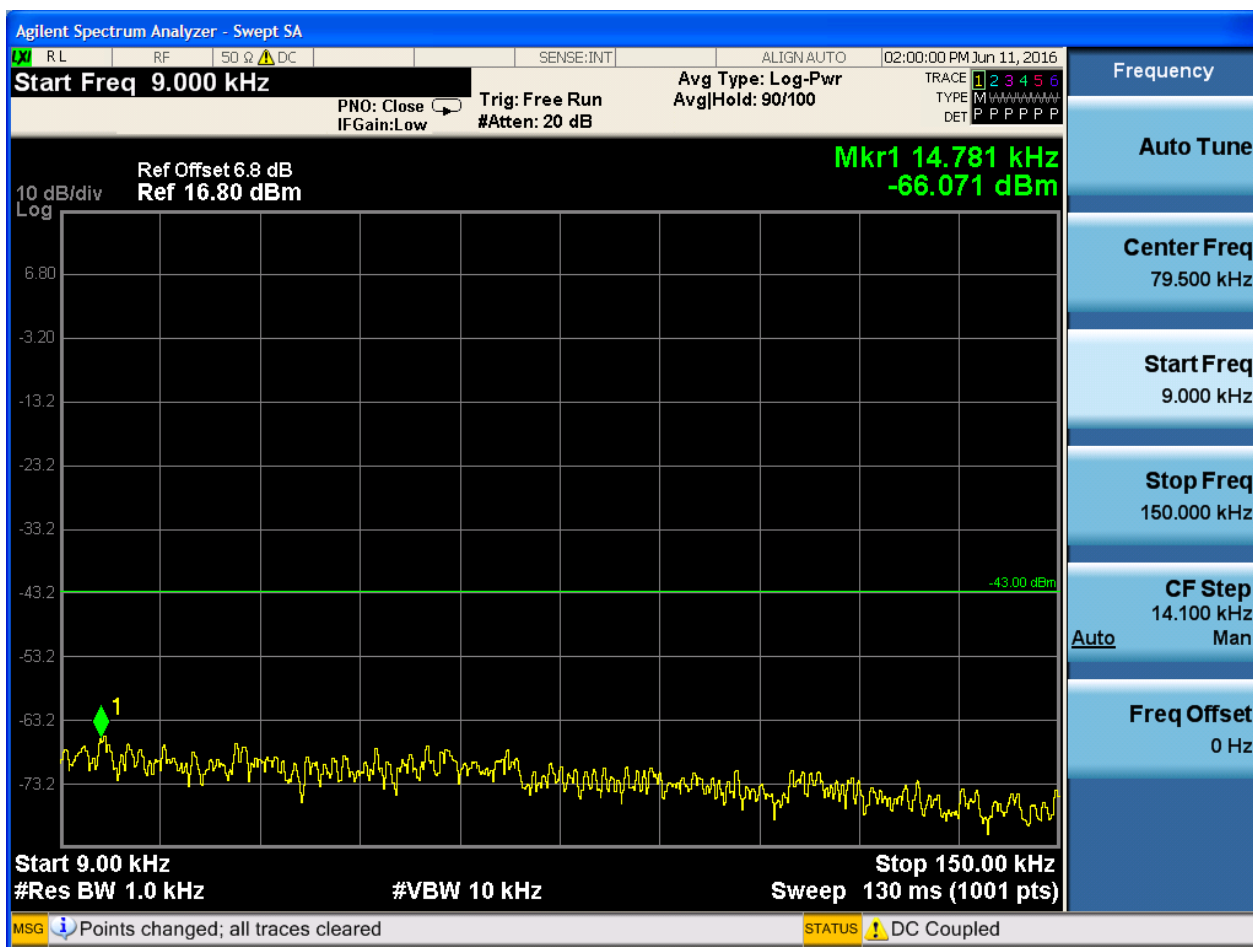


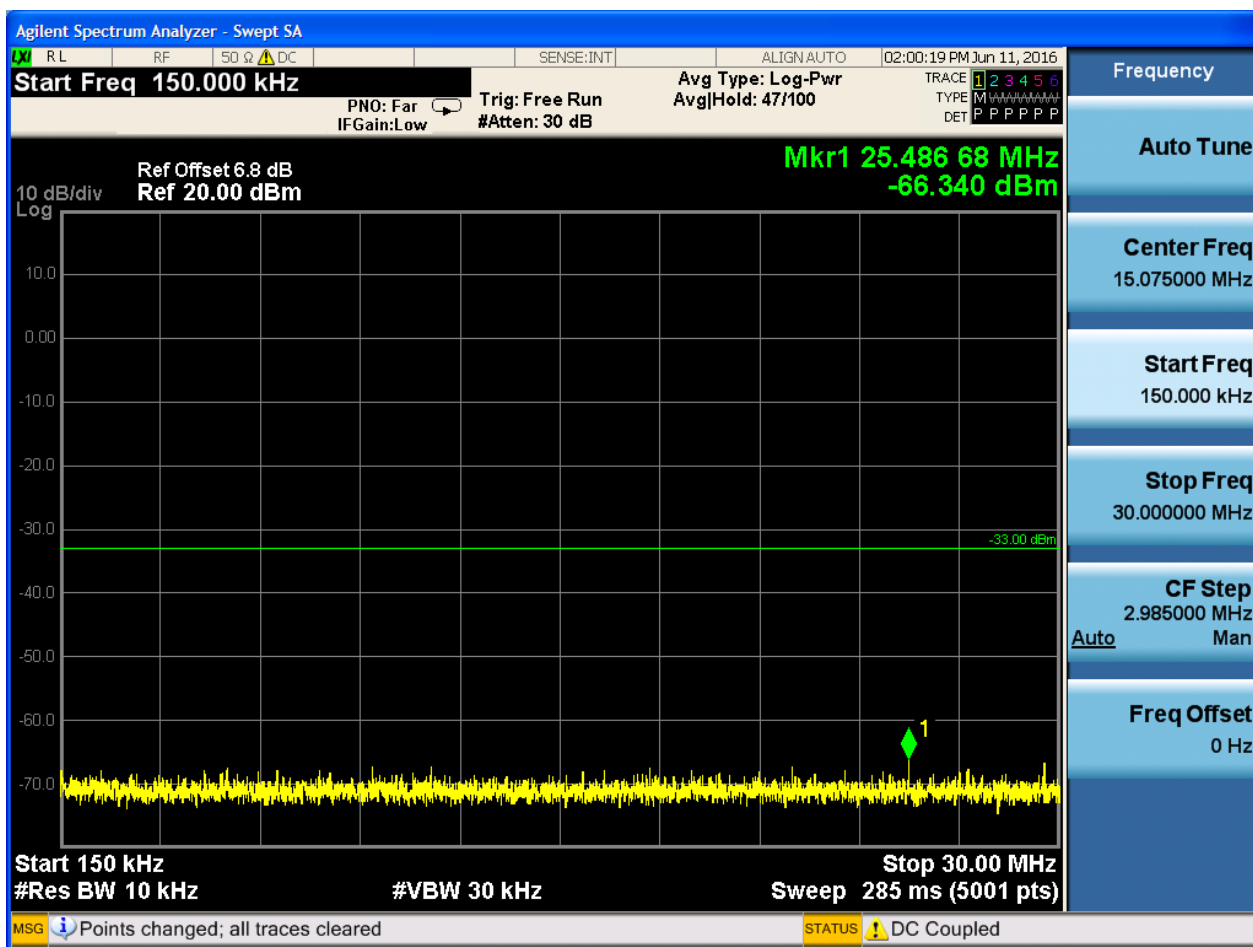


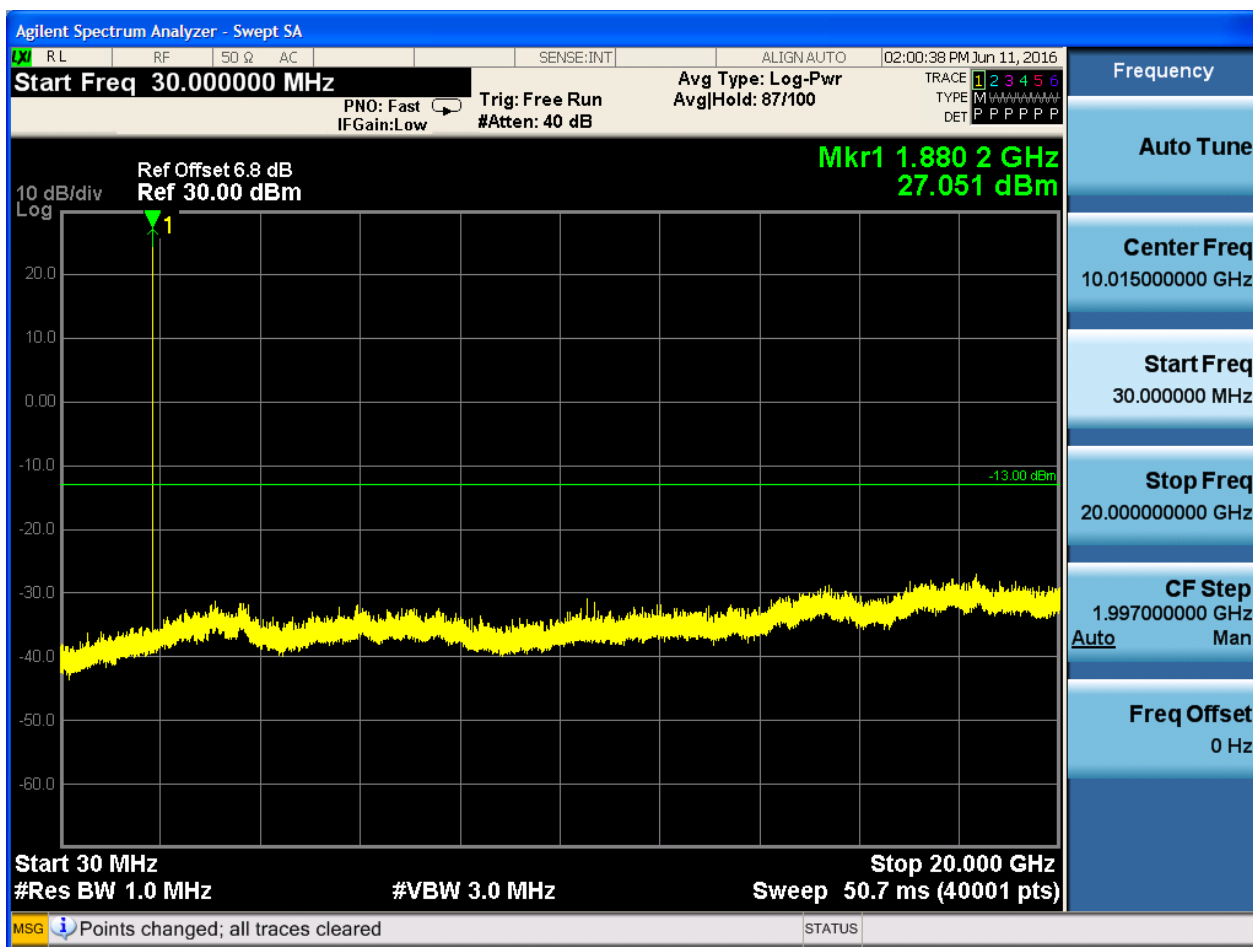




6.1.2.2.2 Test Channel = MCH

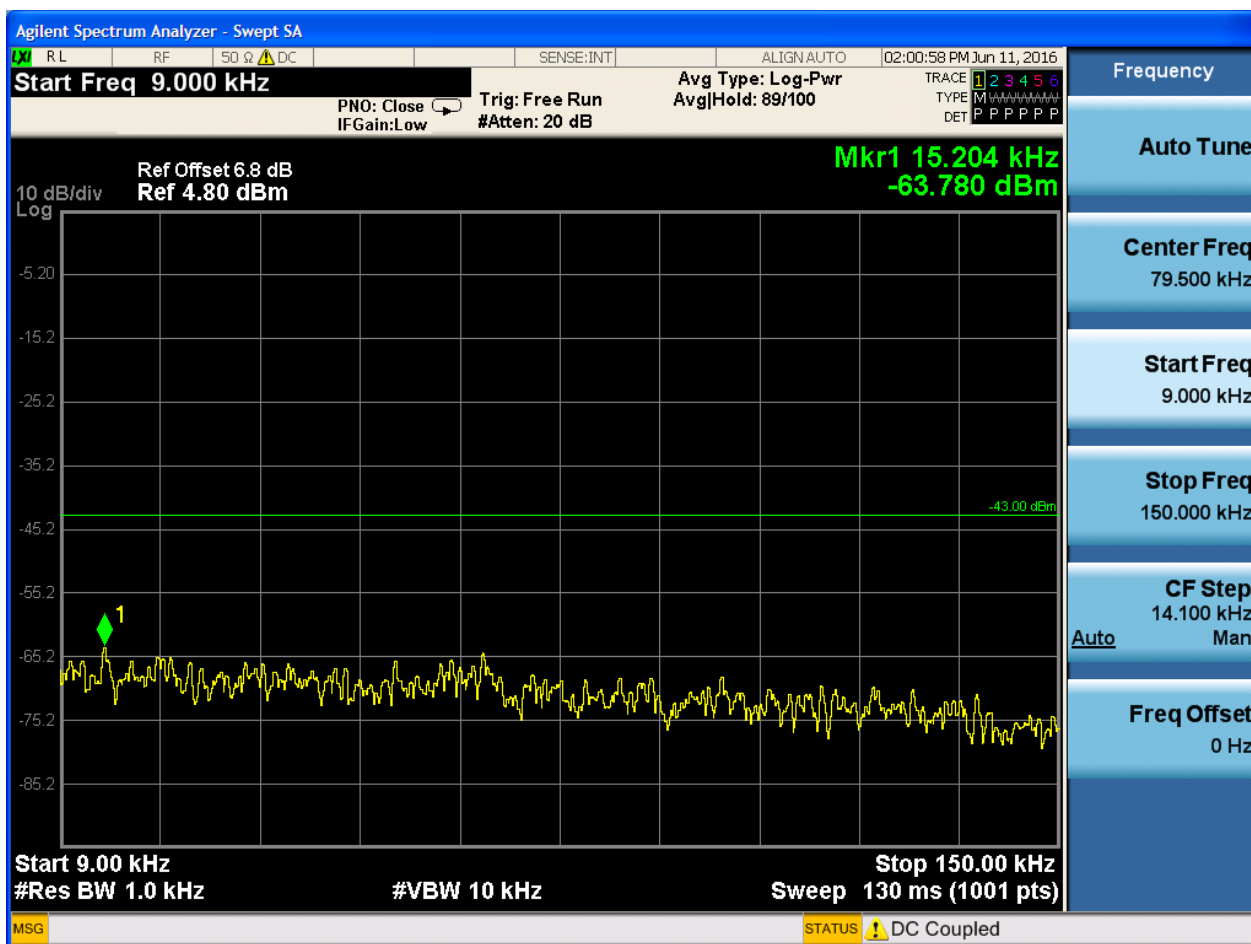


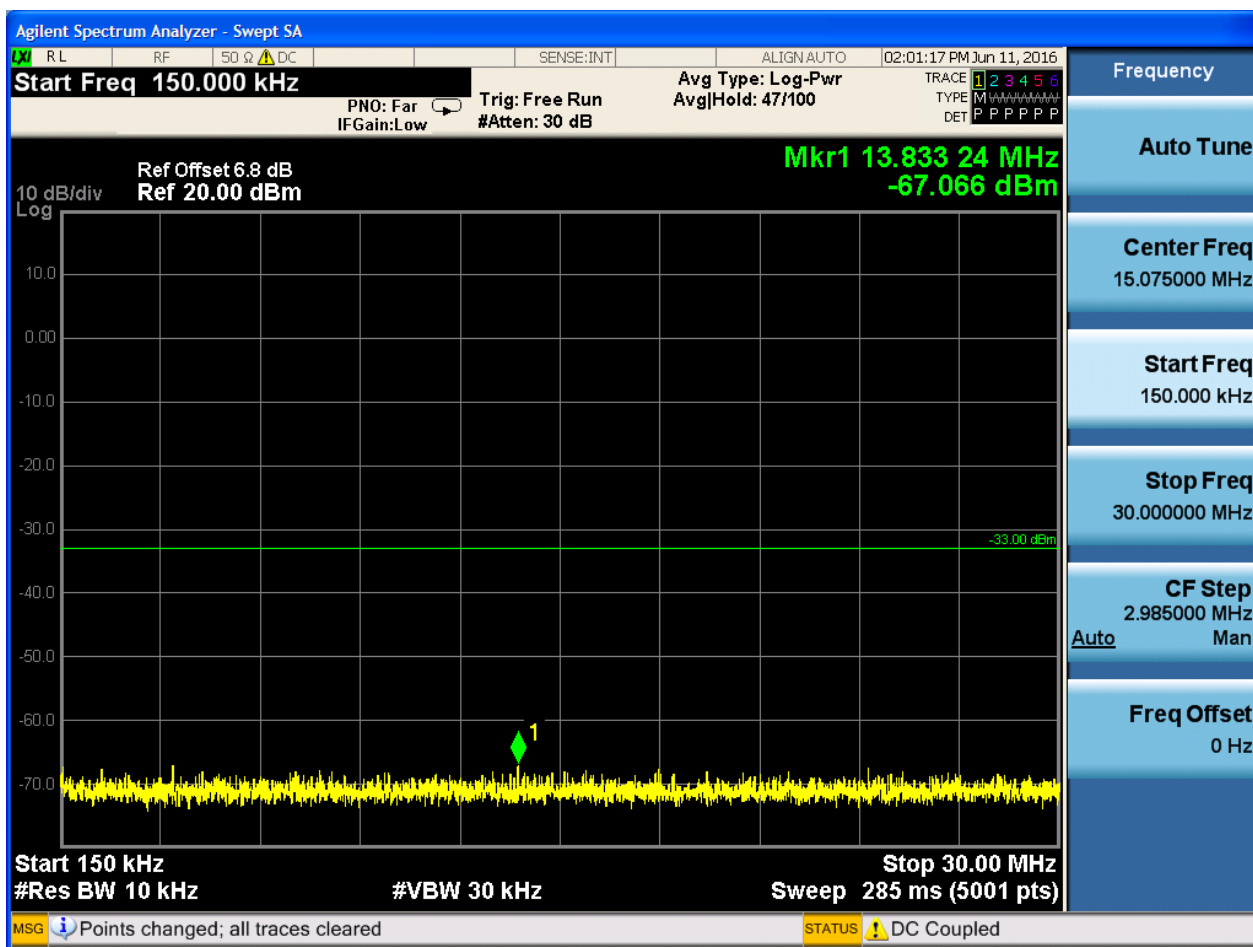


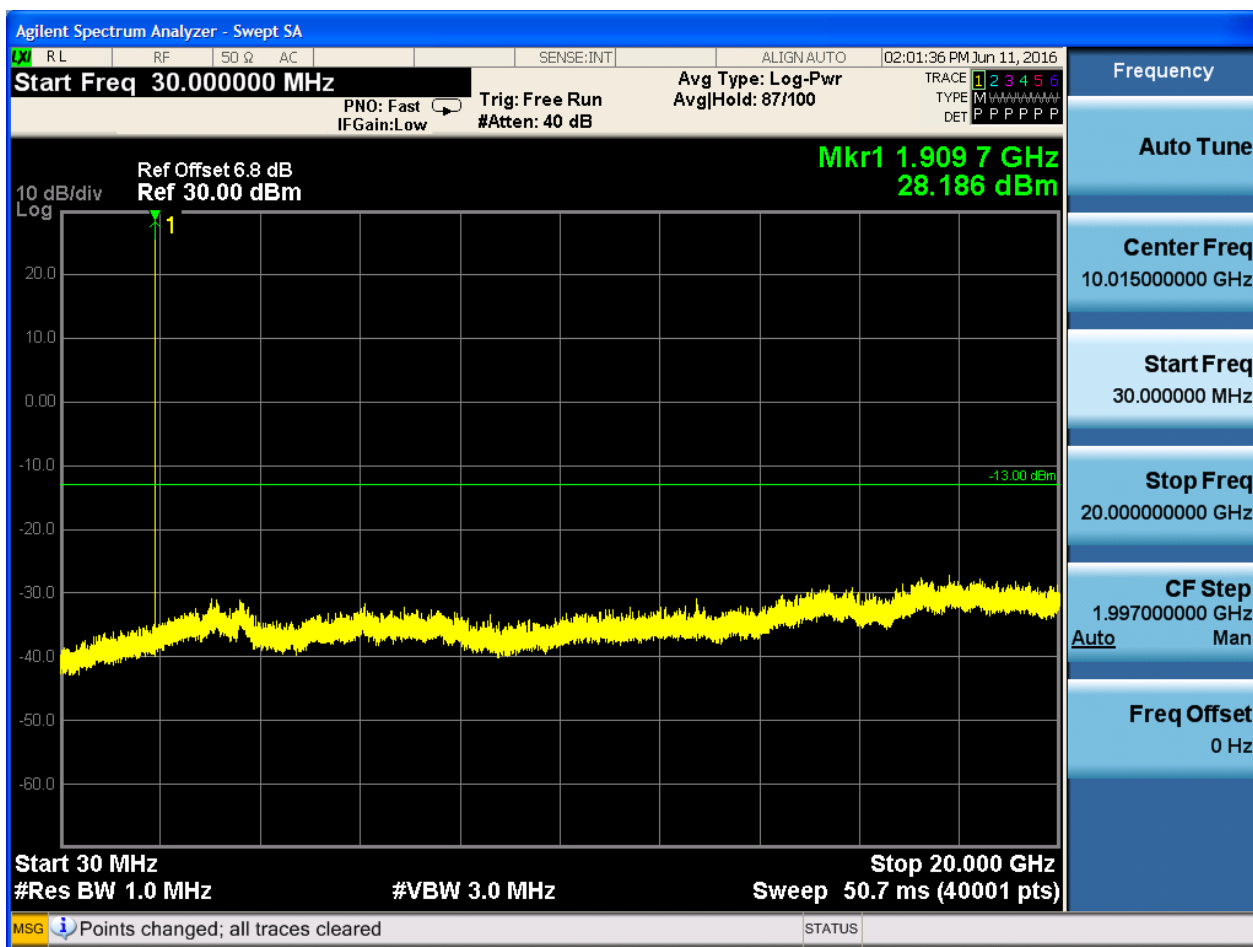




6.1.2.2.3 Test Channel = HCH







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

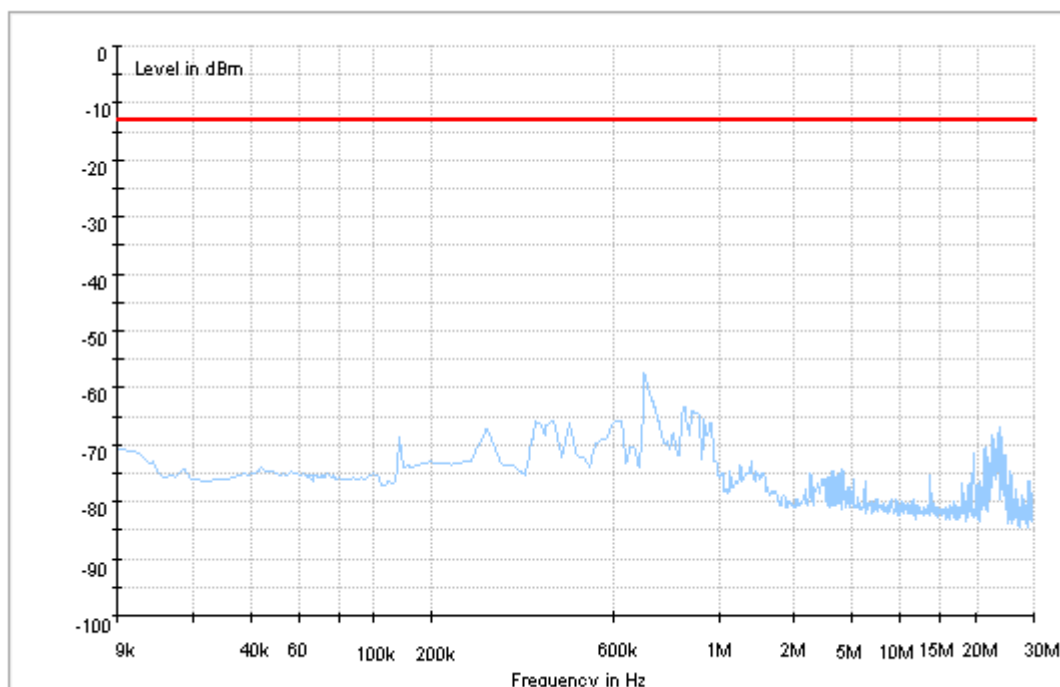
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

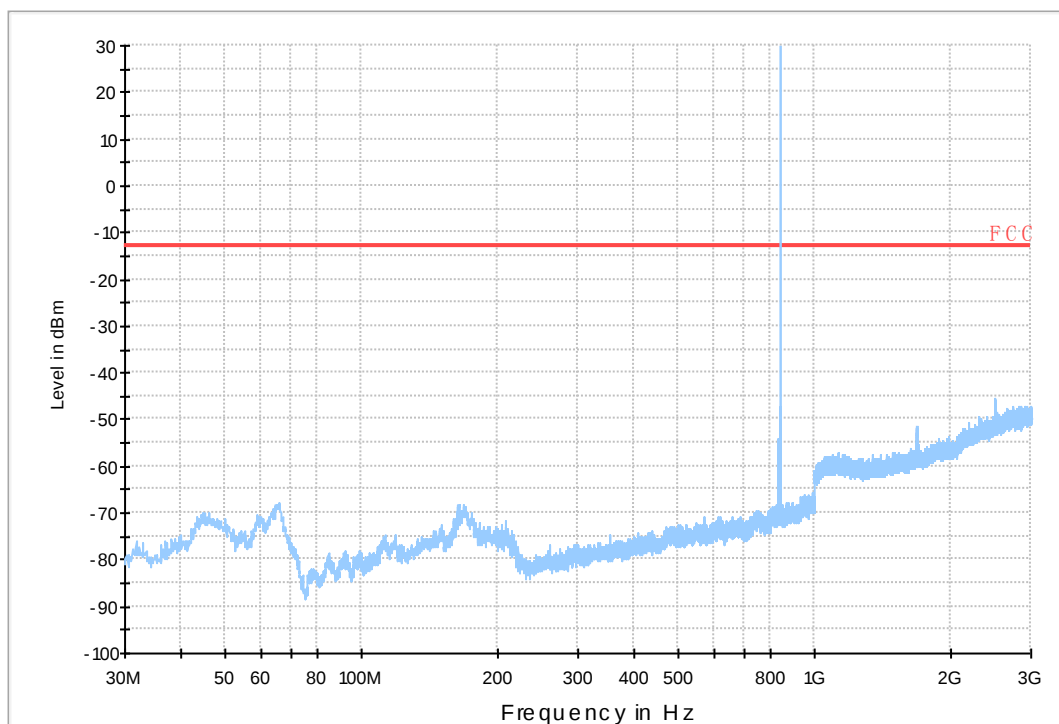
7.1 For GSM

7.1.1 Test Band = GSM850

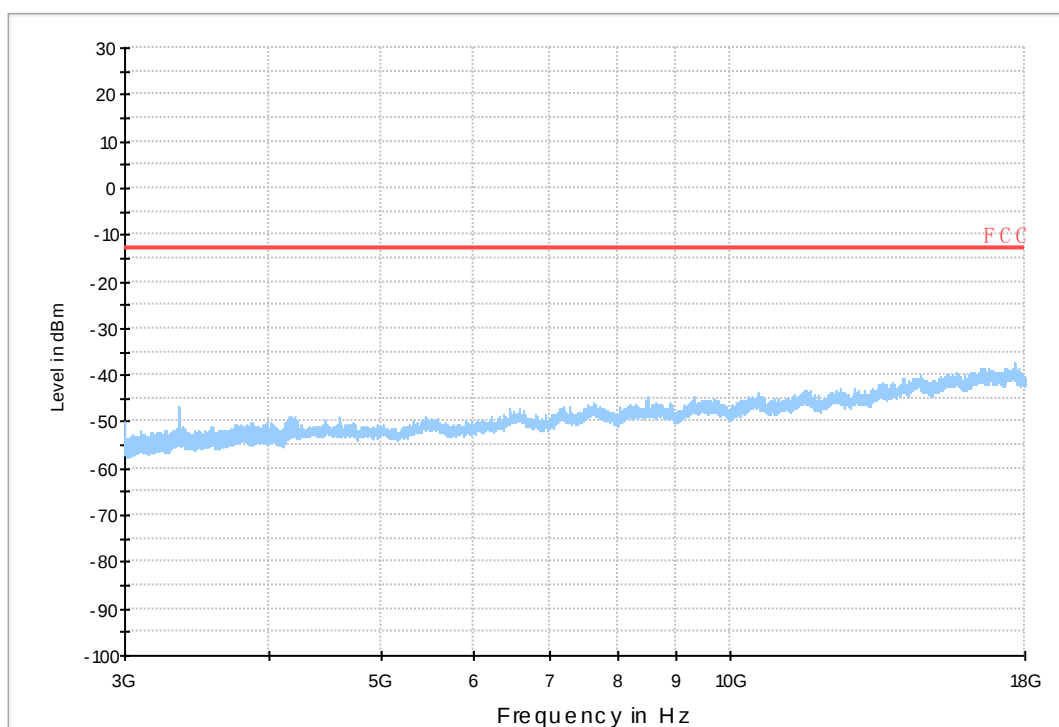
7.1.1.1 Test Mode = GSM/TM1



Copy of FCC PART22 G SM850_L

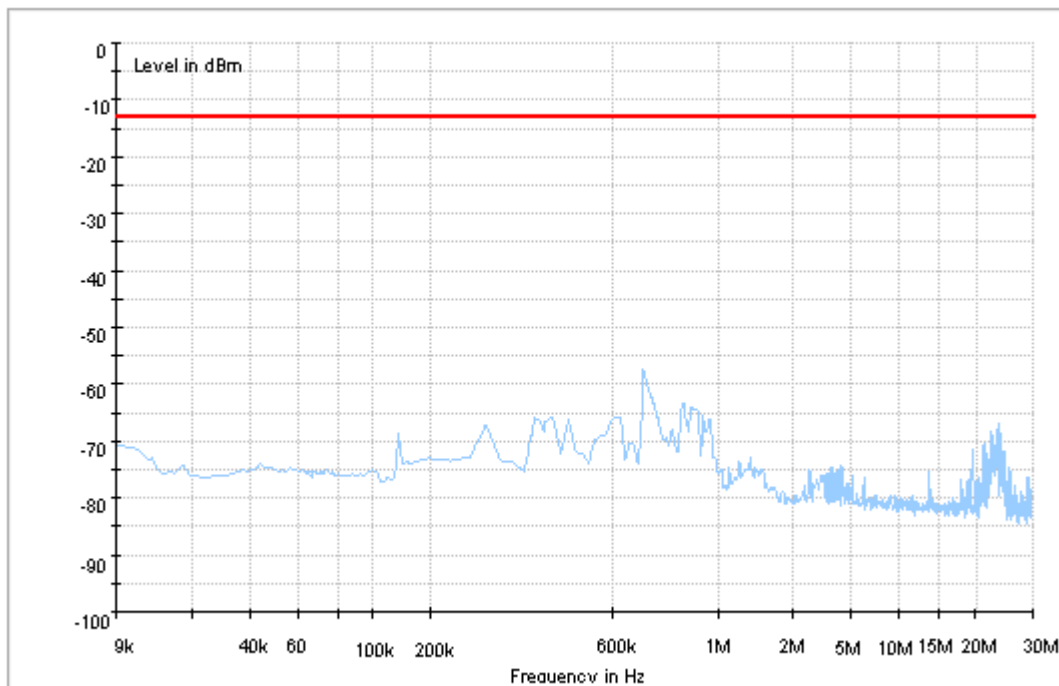


Copy of FCC PART22 G SM850_H

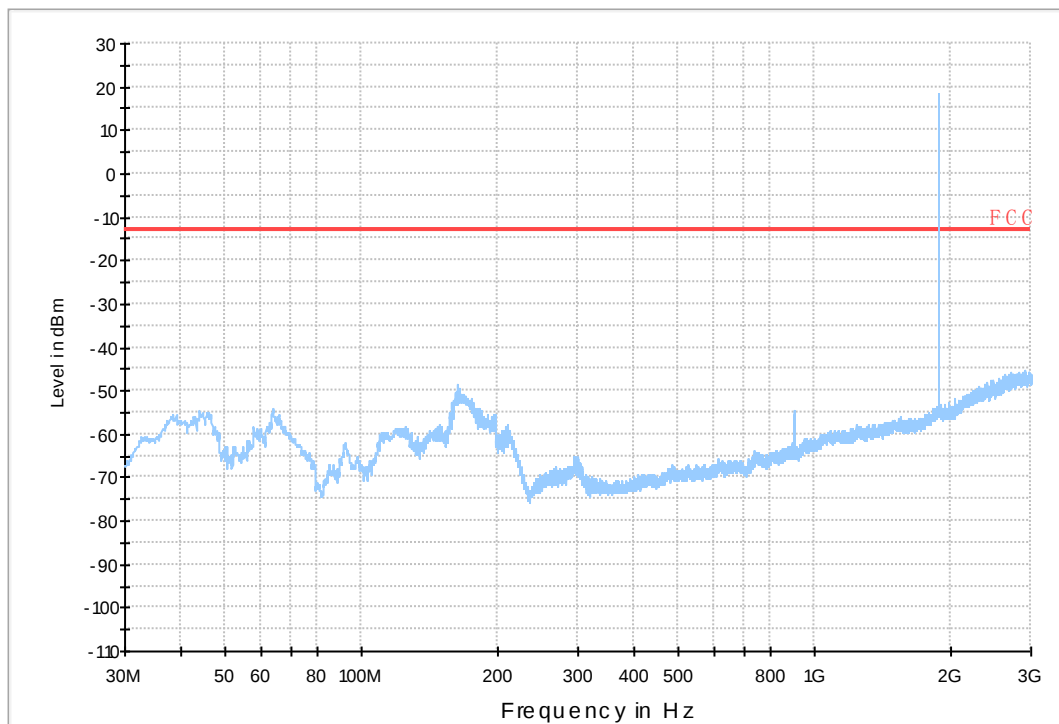


7.1.2 Test Band = GSM1900

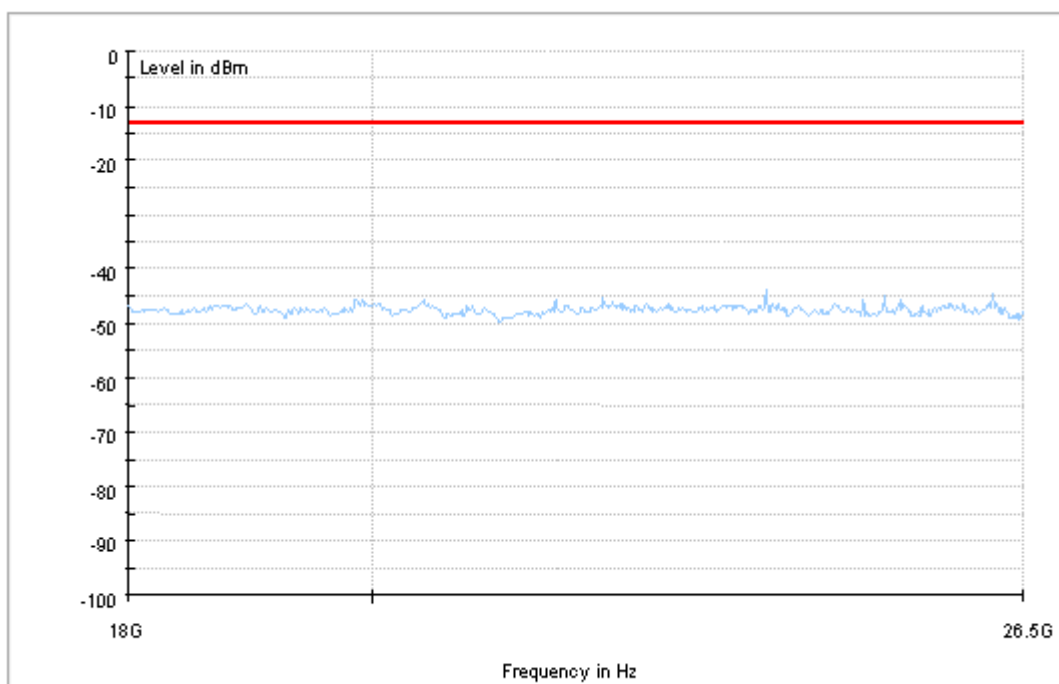
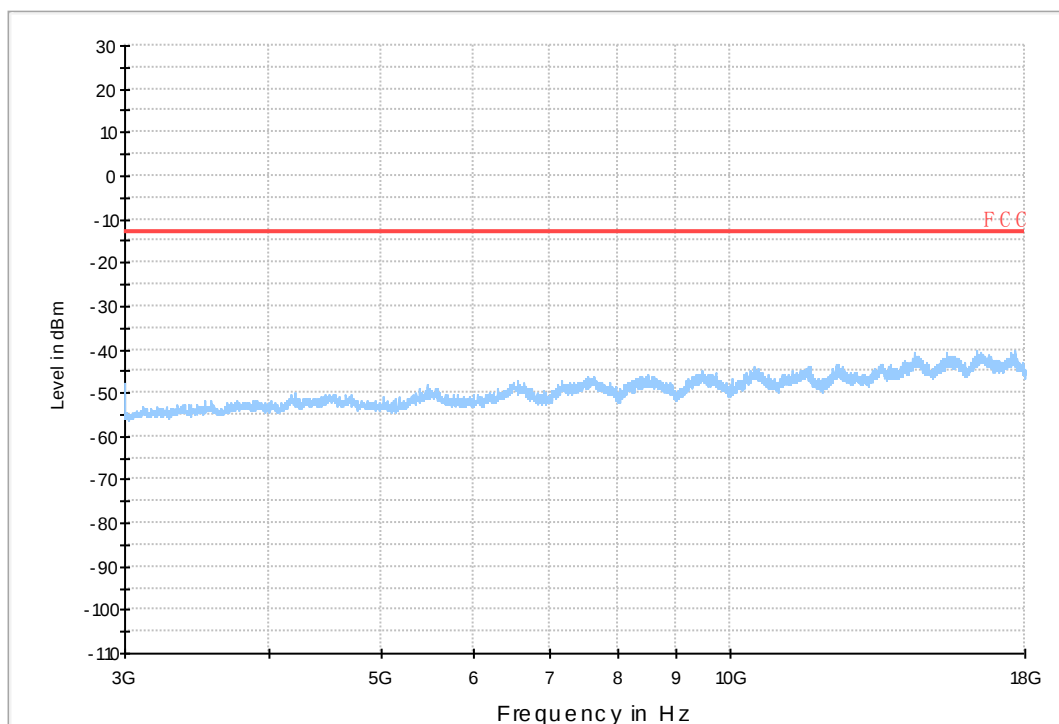
7.1.2.1 Test Mode = GSM/TM1



Copy of FCC PART 24 GSM 1900_L



Copy of FCC PART24 GSM 1900_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	-3.49	-0.00423	PASS
				VN	-3.87	-0.0047	PASS
				VH	0.00	0	PASS
		MCH	TN	VL	-1.42	-0.0017	PASS
				VN	1.36	0.00163	PASS
				VH	-0.32	-0.00038	PASS
		HCH	TN	VL	-1.16	-0.00137	PASS
				VN	-0.84	-0.00099	PASS
				VH	-5.94	-0.007	PASS
	GSM/TM2	LCH	TN	VL	12.72	0.01543	PASS
				VN	-2.49	-0.00302	PASS
				VH	4.36	0.00529	PASS
		MCH	TN	VL	1.87	0.00224	PASS
				VN	1.74	0.00208	PASS
				VH	-2.13	-0.00255	PASS
		HCH	TN	VL	-1.45	-0.00171	PASS
				VN	5.10	0.00601	PASS
				VH	3.45	0.00406	PASS
GSM1900	GSM/TM1	LCH	TN	VL	4.65	0.00251	PASS
				VN	2.07	0.00112	PASS
				VH	2.20	0.00119	PASS
		MCH	TN	VL	-1.03	-0.00055	PASS
				VN	6.46	0.00344	PASS
				VH	2.13	0.00113	PASS
		HCH	TN	VL	5.29	0.00277	PASS
				VN	1.23	0.00064	PASS
				VH	3.68	0.00193	PASS
	GSM/TM2	LCH	TN	VL	9.75	0.00527	PASS
				VN	6.65	0.00359	PASS
				VH	9.30	0.00503	PASS
		MCH	TN	VL	4.33	0.0023	PASS
				VN	6.07	0.00323	PASS
				VH	6.20	0.0033	PASS
		HCH	TN	VL	4.36	0.00228	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VN	2.84	0.00149	PASS
				VH	4.42	0.00231	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	-3.29	-0.00399	PASS
				-20	-8.85	-0.01074	PASS
				-10	-1.61	-0.00195	PASS
				0	-0.13	-0.00016	PASS
				10	-2.45	-0.00297	PASS
				20	-1.94	-0.00235	PASS
				30	-2.20	-0.00267	PASS
				40	-6.20	-0.00752	PASS
				50	-6.72	-0.00815	PASS
		MCH	VN	-30	-1.29	-0.00154	PASS
				-20	-3.10	-0.00371	PASS
				-10	-2.52	-0.00301	PASS
				0	-6.13	-0.00733	PASS
				10	-2.07	-0.00247	PASS
				20	1.16	0.00139	PASS
				30	2.26	0.0027	PASS
				40	2.26	0.0027	PASS
				50	-0.45	-0.00054	PASS
		HCH	VN	-30	-4.07	-0.0048	PASS
				-20	-1.61	-0.0019	PASS
				-10	1.49	0.00176	PASS
				0	-2.78	-0.00328	PASS
				10	-0.13	-0.00015	PASS
				20	-1.16	-0.00137	PASS
				30	0.58	0.00068	PASS
				40	0.77	0.00091	PASS
				50	0.90	0.00106	PASS
	GSM/TM2	LCH	VN	-30	3.94	0.00478	PASS
				-20	5.29	0.00642	PASS
				-10	0.03	0.00004	PASS
				0	6.04	0.00733	PASS
				10	1.55	0.00188	PASS
				20	3.29	0.00399	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	2.91	0.00353	PASS
				40	4.84	0.00587	PASS
				50	-0.94	-0.00114	PASS
		MCH	VN	-30	1.55	0.00185	PASS
				-20	1.19	0.00142	PASS
				-10	4.20	0.00502	PASS
				0	-1.71	-0.00204	PASS
				10	-1.13	-0.00135	PASS
				20	4.68	0.00559	PASS
				30	0.03	0.00004	PASS
				40	0.61	0.00073	PASS
				50	1.58	0.00189	PASS
		HCH	VN	-30	1.39	0.00164	PASS
				-20	-0.39	-0.00046	PASS
				-10	1.23	0.00145	PASS
				0	2.78	0.00328	PASS
				10	6.75	0.00795	PASS
				20	-2.65	-0.00312	PASS
				30	0.03	0.00004	PASS
				40	-3.75	-0.00442	PASS
				50	0.58	0.00068	PASS
GSM1900	GSM/TM1	LCH	VN	-30	-1.10	-0.00059	PASS
				-20	12.91	0.00698	PASS
				-10	1.61	0.00087	PASS
				0	2.58	0.00139	PASS
				10	4.71	0.00255	PASS
				20	3.81	0.00206	PASS
				30	2.07	0.00112	PASS
				40	3.10	0.00168	PASS
				50	1.61	0.00087	PASS
		MCH	VN	-30	2.45	0.0013	PASS
				-20	2.26	0.0012	PASS
				-10	4.13	0.0022	PASS
				0	5.42	0.00288	PASS
				10	9.69	0.00515	PASS
				20	7.68	0.00409	PASS
				30	5.88	0.00313	PASS
				40	5.62	0.00299	PASS
				50	4.97	0.00264	PASS
		HCH	VN	-30	-1.68	-0.00088	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-20	1.03	0.00054	PASS
				-10	4.46	0.00234	PASS
				0	8.65	0.00453	PASS
				10	10.78	0.00564	PASS
				20	5.88	0.00308	PASS
				30	-4.97	-0.0026	PASS
				40	-0.65	-0.00034	PASS
				50	-0.45	-0.00024	PASS
	GSM/TM2	LCH	VN	-30	4.20	0.00227	PASS
				-20	3.58	0.00193	PASS
				-10	9.20	0.00497	PASS
				0	7.65	0.00413	PASS
				10	7.52	0.00406	PASS
				20	8.59	0.00464	PASS
				30	8.56	0.00463	PASS
				40	2.87	0.00155	PASS
				50	3.49	0.00189	PASS
		MCH	VN	-30	2.10	0.00112	PASS
				-20	3.29	0.00175	PASS
				-10	4.00	0.00213	PASS
				0	3.26	0.00173	PASS
				10	6.46	0.00344	PASS
				20	17.11	0.0091	PASS
				30	4.46	0.00237	PASS
				40	5.52	0.00294	PASS
				50	5.00	0.00266	PASS
		HCH	VN	-30	1.71	0.0009	PASS
				-20	8.27	0.00433	PASS
				-10	0.81	0.00042	PASS
				0	4.39	0.0023	PASS
				10	-3.36	-0.00176	PASS
				20	-2.58	-0.00135	PASS
				30	0.16	0.00008	PASS
				40	-0.81	-0.00042	PASS
				50	6.78	0.00355	PASS

END