



Appendix for test report

1Appendix_A: Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dBm]	EIRP/ERP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	30.23	32.39	33	PASS
		MCH	30.03	32.02	33	PASS
		HCH	30.06	32.13	33	PASS
	GSM/TM2	LCH	25.72	27.61	33	PASS
		MCH	25.71	27.52	33	PASS
		HCH	25.71	27.56	33	PASS
GSM850	GSM/TM1	LCH	32.14	27.17	38.5	PASS
		MCH	32.29	27.32	38.5	PASS
		HCH	32.27	27.08	38.5	PASS
	GSM/TM2	LCH	26.54	21.50	38.5	PASS
		MCH	26.5	21.35	38.5	PASS
		HCH	26.53	21.47	38.5	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	0.13	13	PASS
		MCH	0.12	13	PASS
		HCH	0.13	13	PASS
	GSM/TM2	LCH	3.04	13	PASS
		MCH	3.1	13	PASS
		HCH	3.14	13	PASS
GSM1900	GSM/TM1	LCH	0.13	13	PASS
		MCH	0.12	13	PASS
		HCH	0.12	13	PASS
	GSM/TM2	LCH	2.92	13	PASS
		MCH	2.95	13	PASS
		HCH	2.92	13	PASS

3Appendix_C: Modulation Characteristics

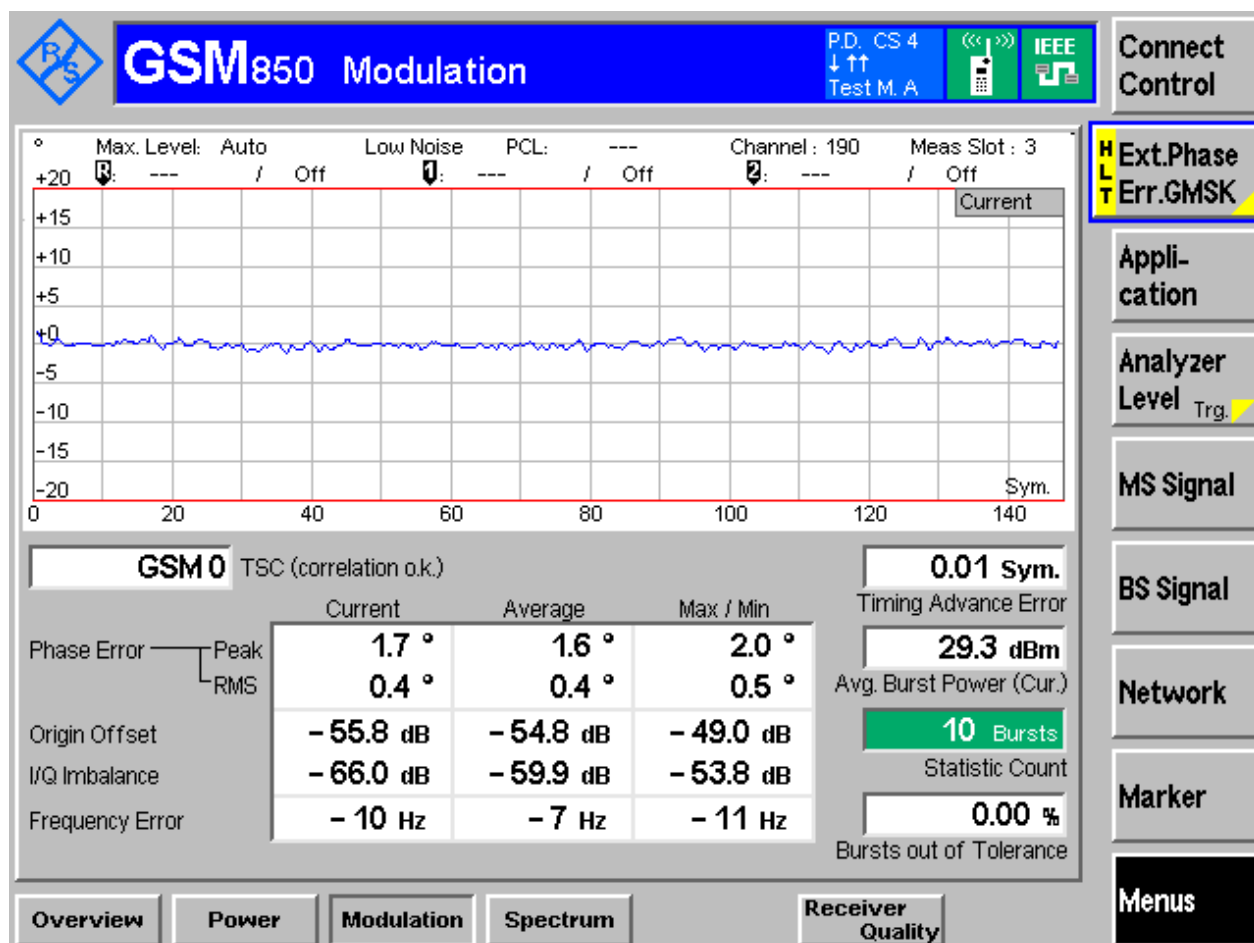
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

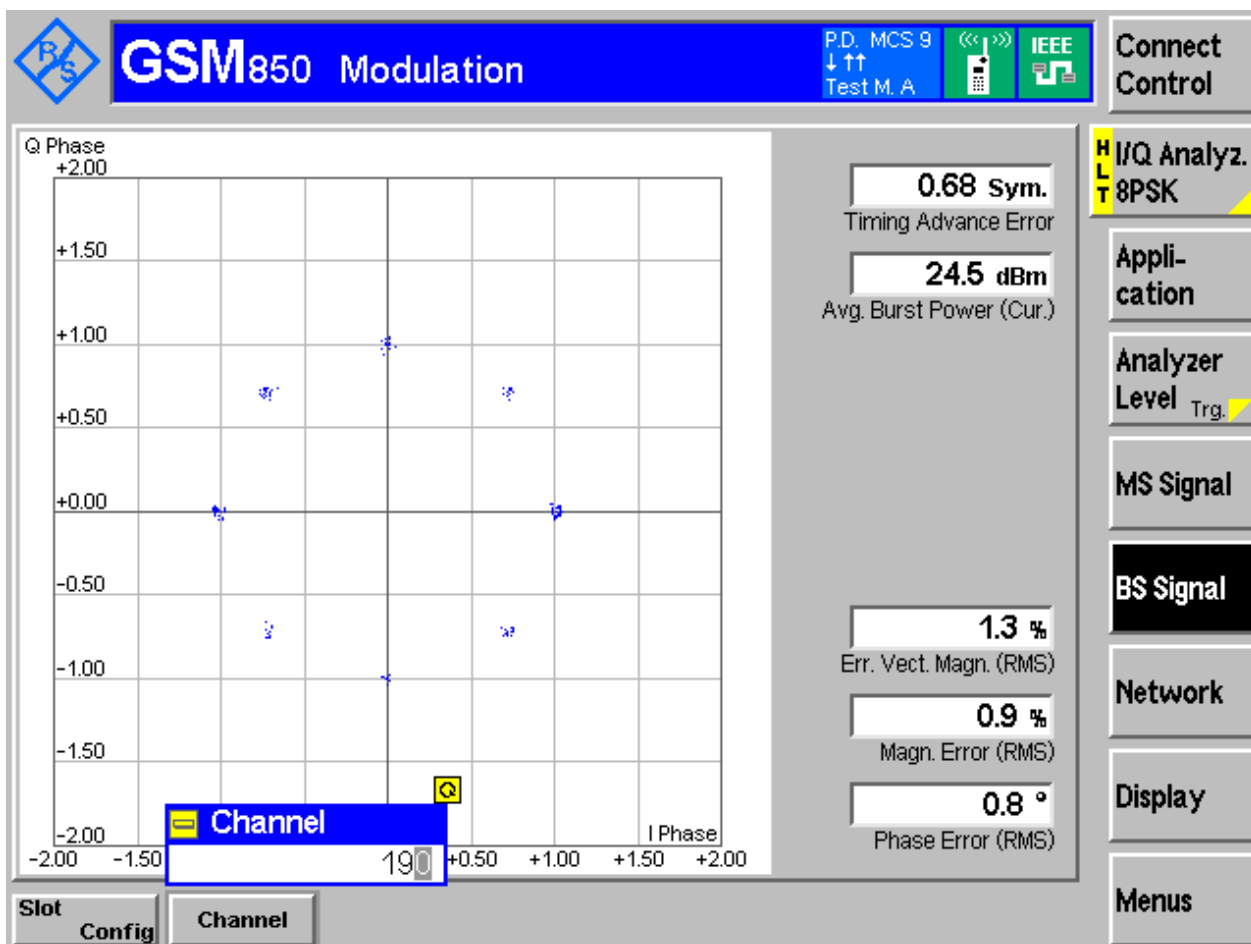
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

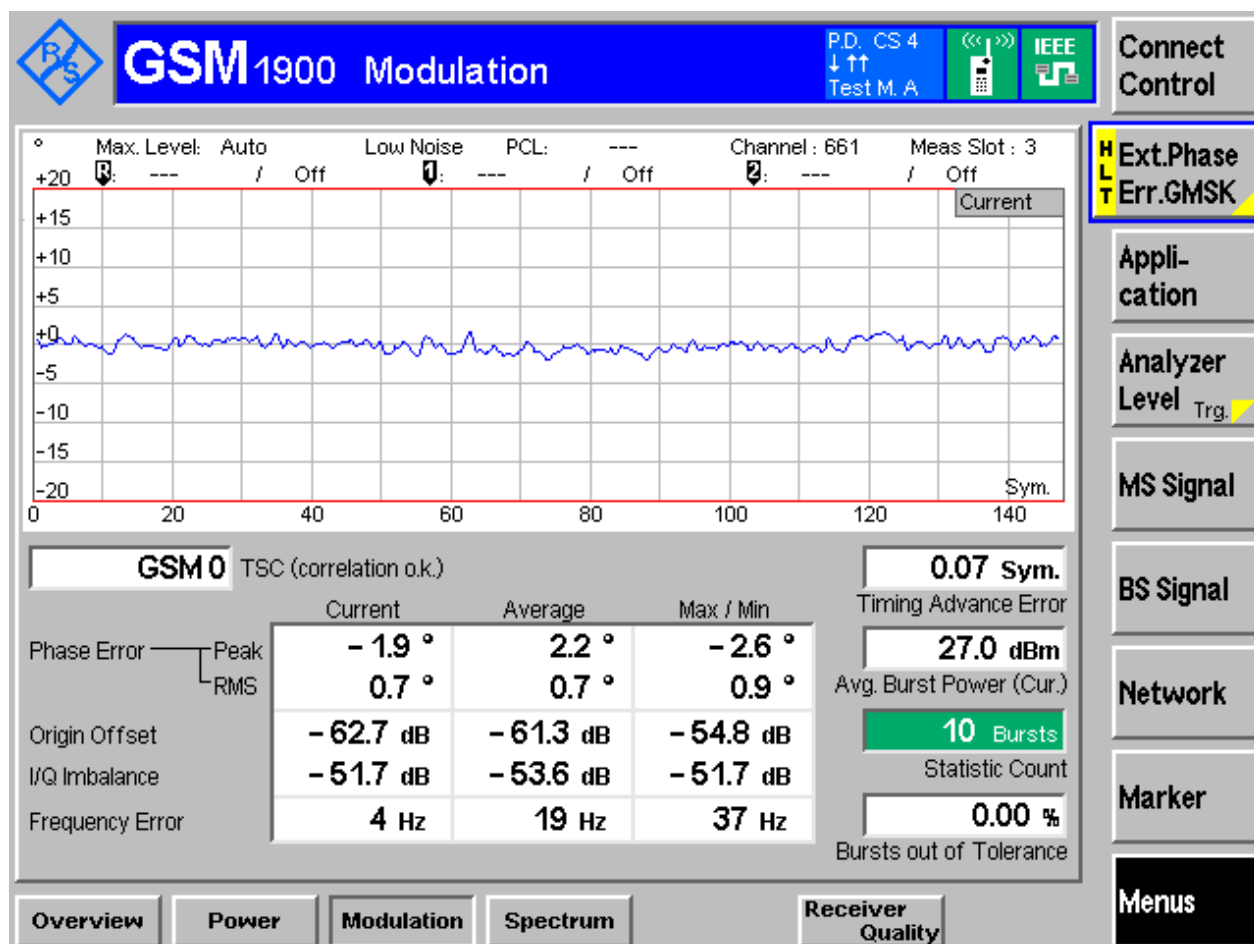
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

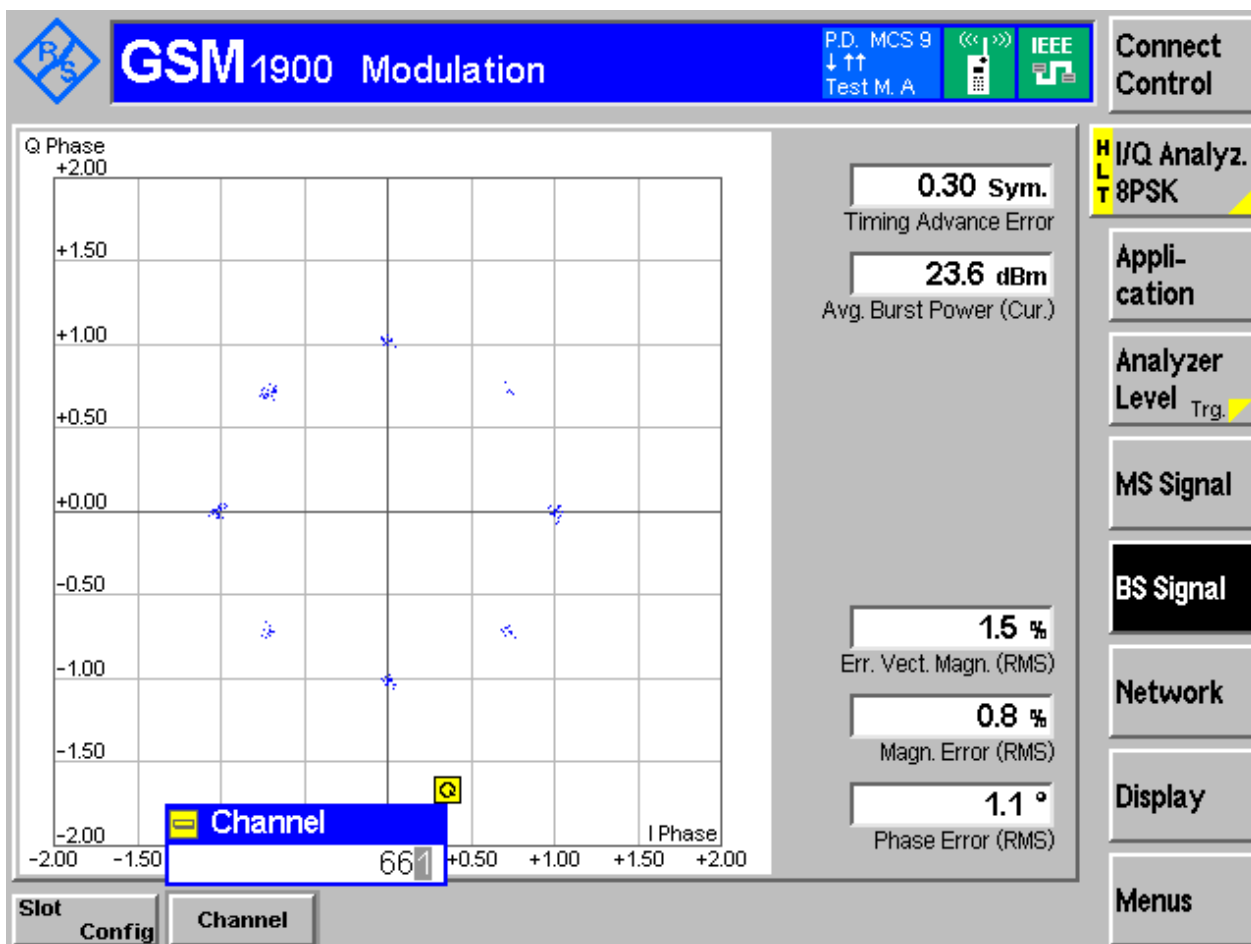
3.1.2.1 Test Mode = GSM/TM1

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	249.78	318.00	Pass
		MCH	244.88	319.67	Pass
		HCH	244.29	317.95	Pass
	GSM/TM2	LCH	250.68	319.55	Pass
		MCH	248.43	315.83	Pass
		HCH	245.76	316.90	Pass
GSM1900	GSM/TM1	LCH	245.97	318.72	Pass
		MCH	247.37	317.93	Pass
		HCH	245.63	313.03	Pass
	GSM/TM2	LCH	252.18	320.79	Pass
		MCH	244.76	321.12	Pass
		HCH	245.31	322.66	Pass



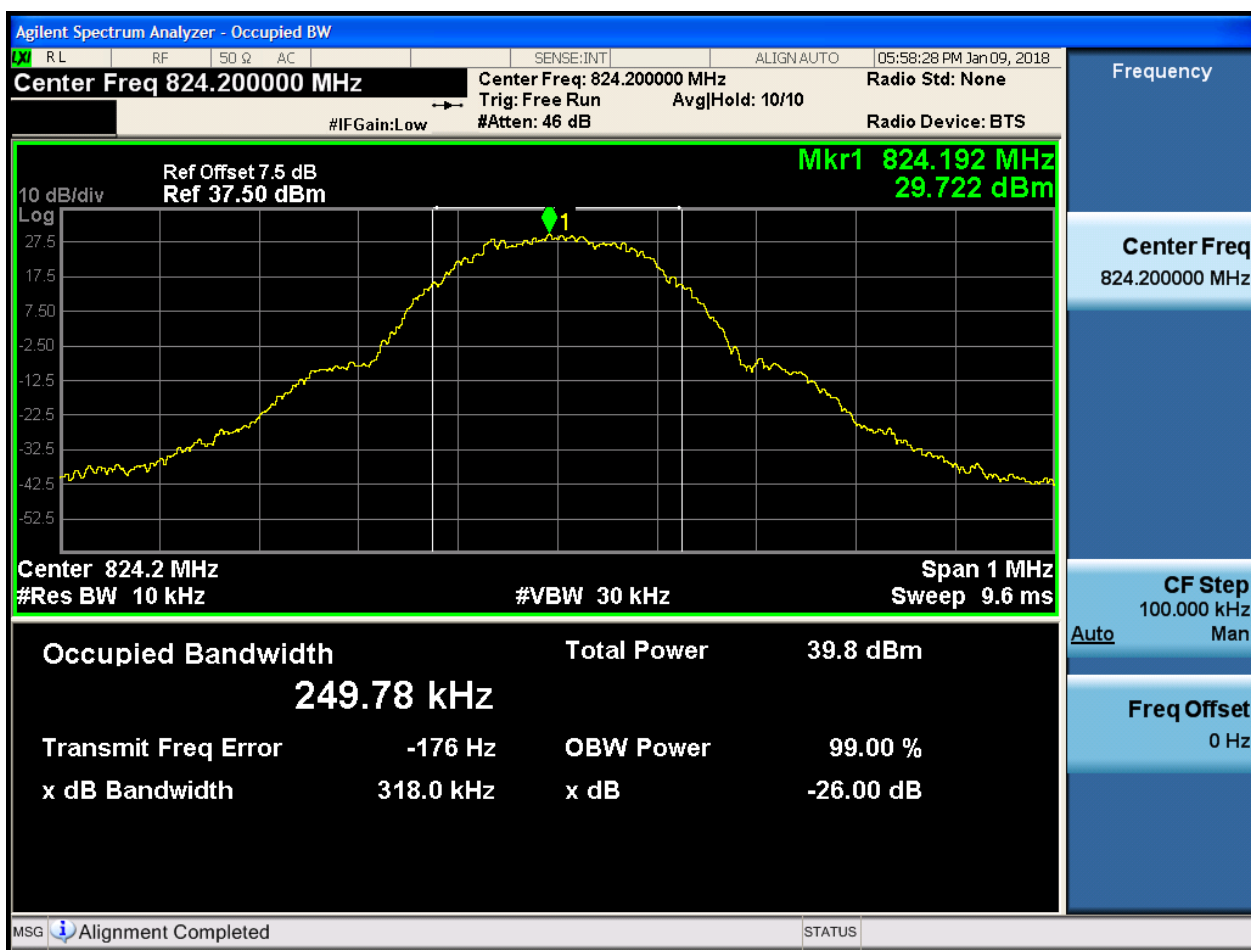
Part II - Test Plots

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





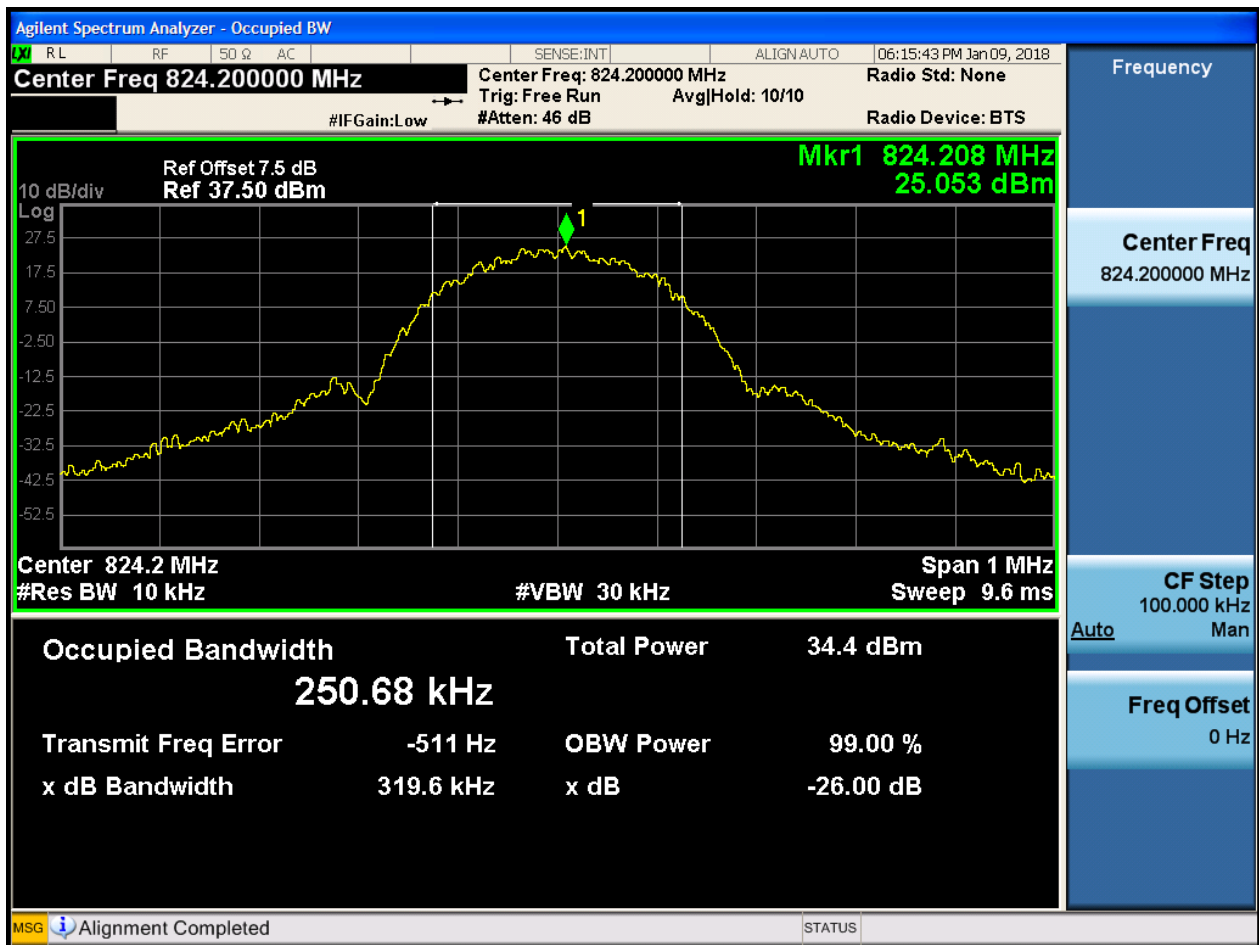
4.1.1.1.3 Test Channel = HCH





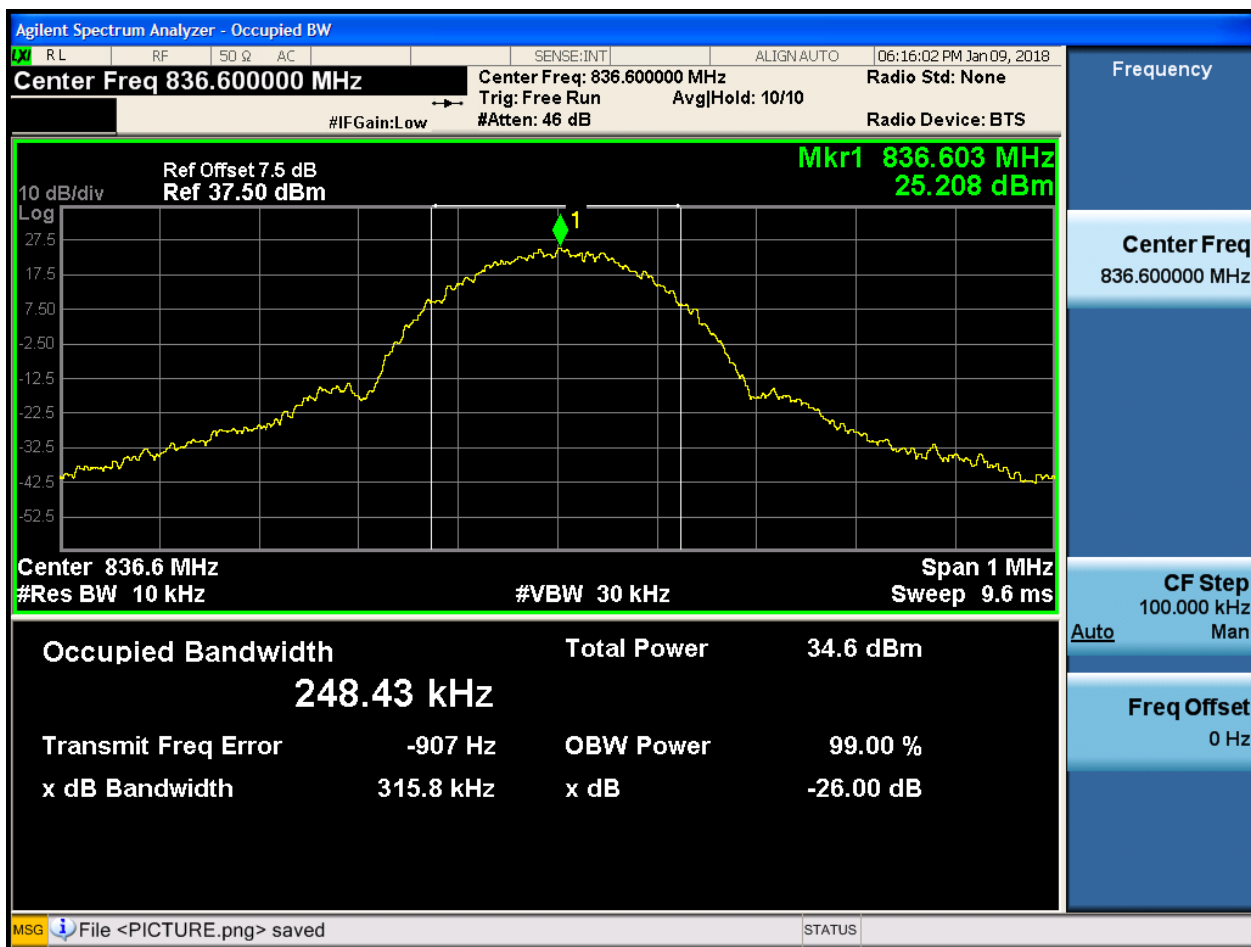
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH



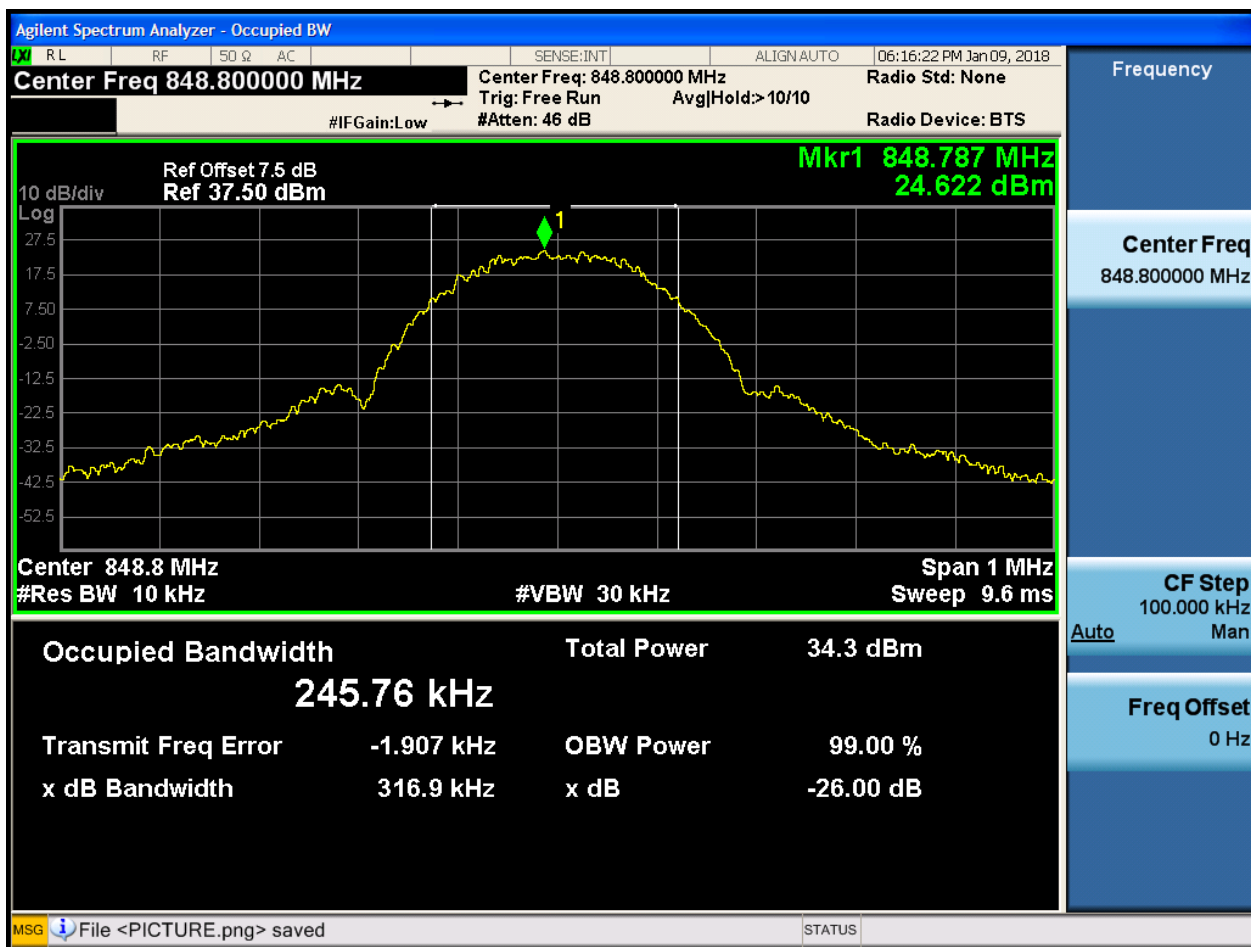


4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH





4.1.2 Test Band = GSM1900

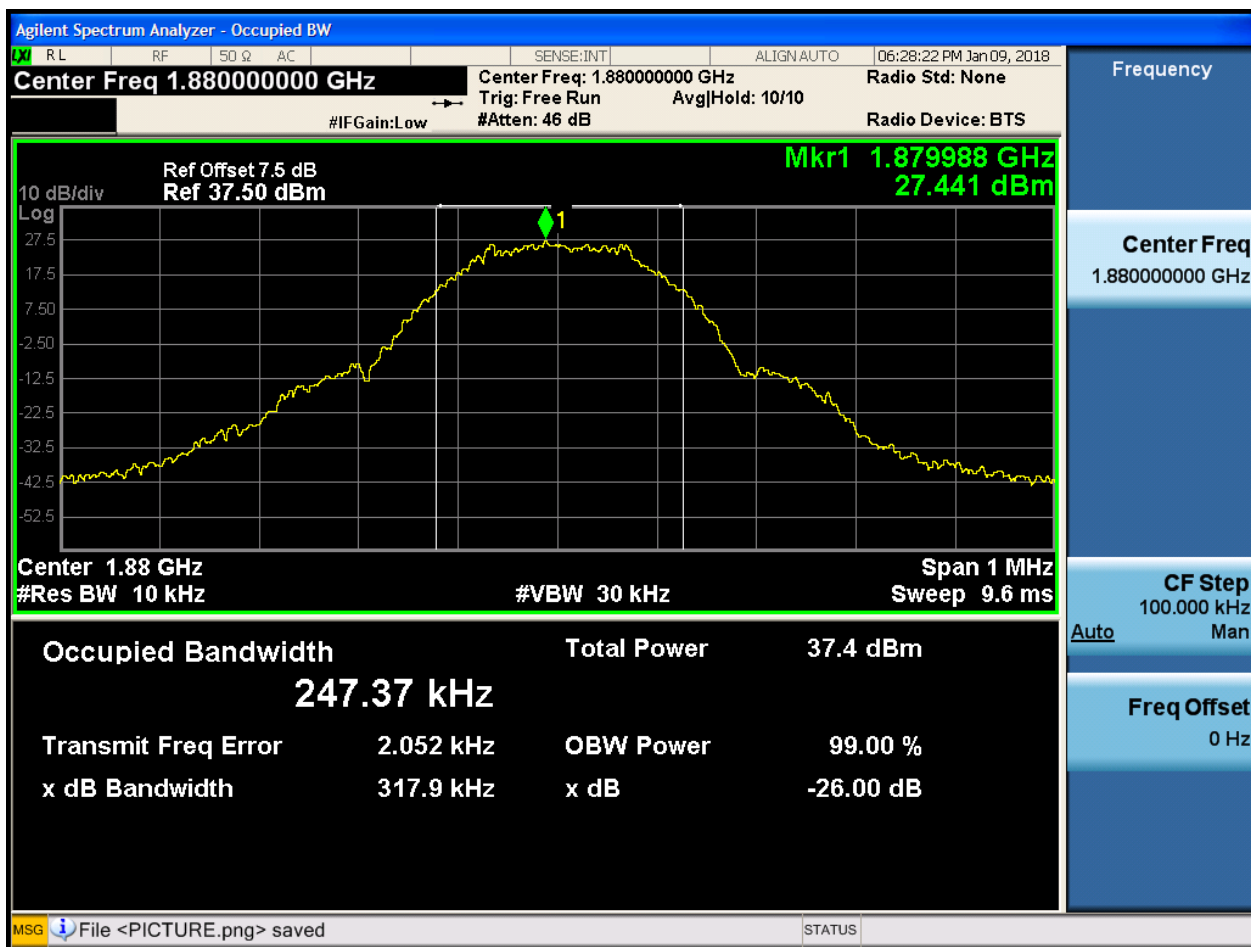
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



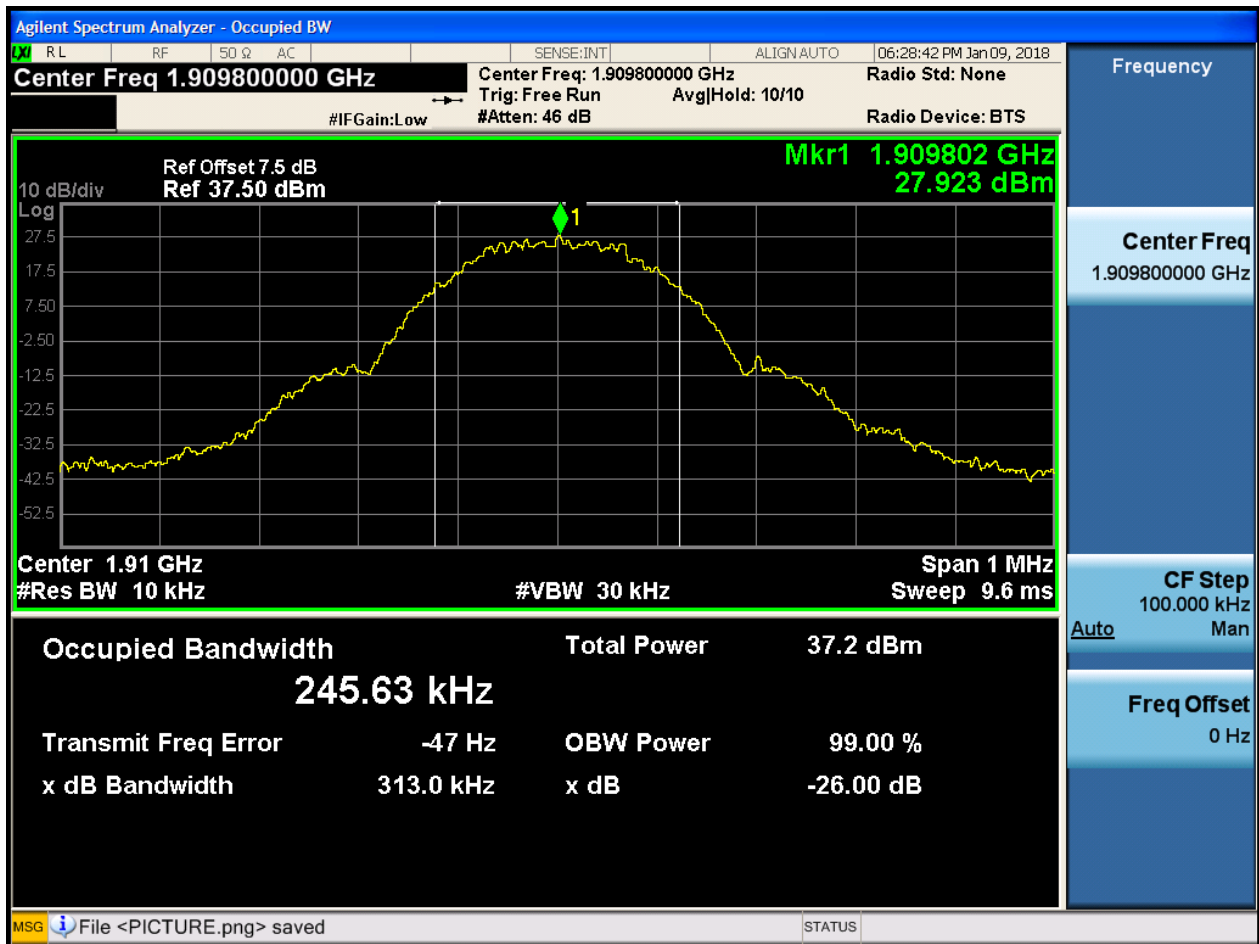


4.1.2.1.2 Test Channel = MCH





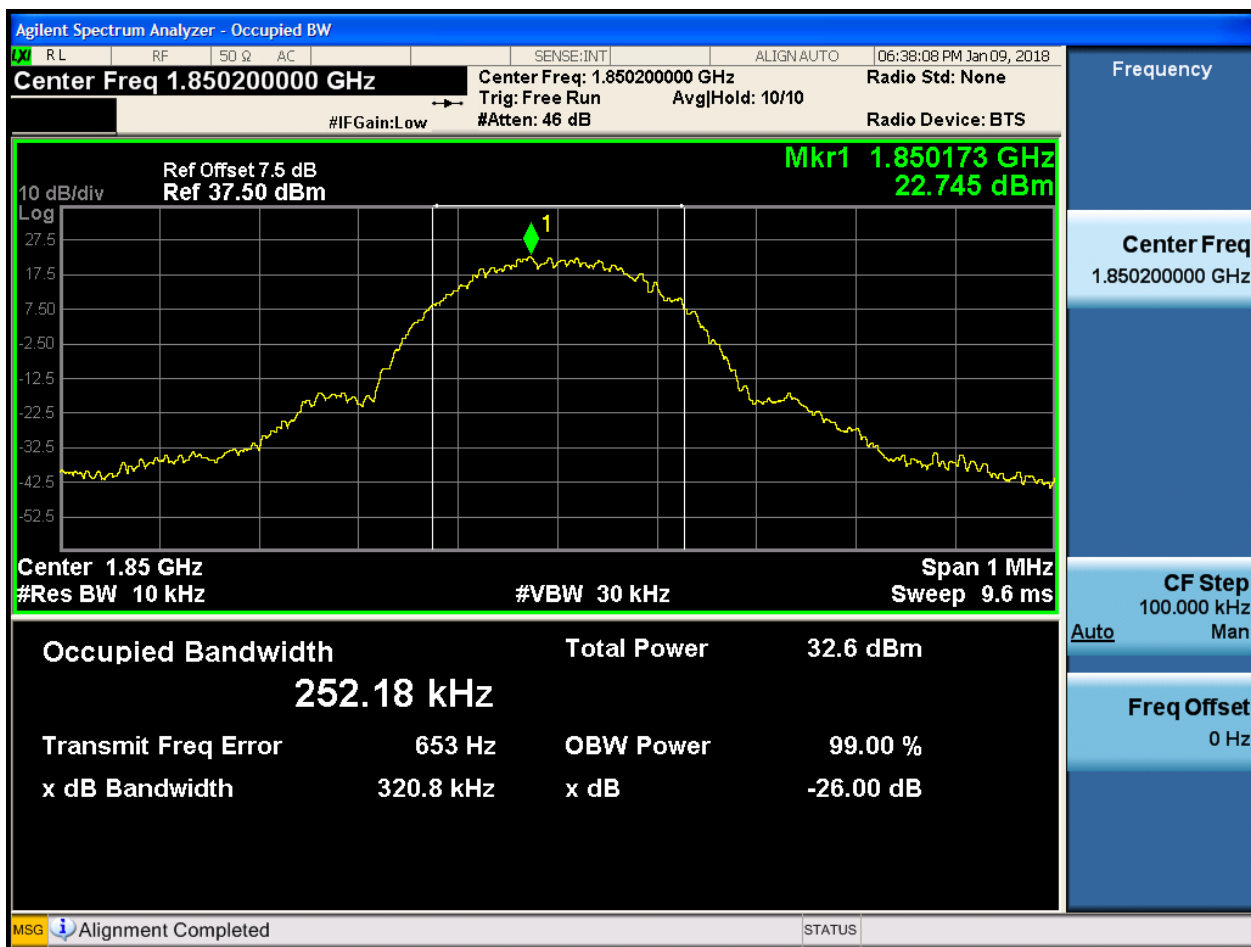
4.1.2.1.3 Test Channel = HCH





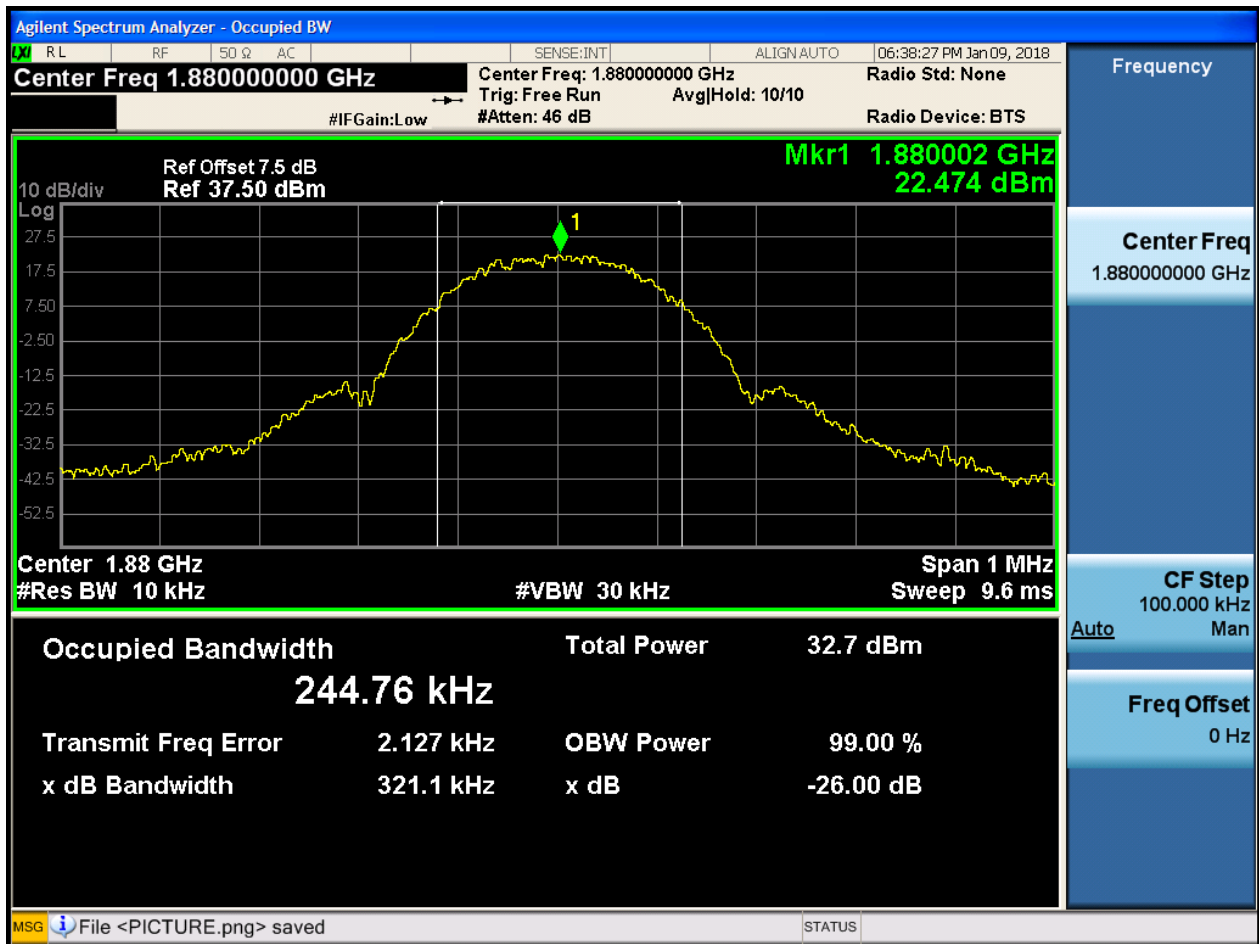
4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



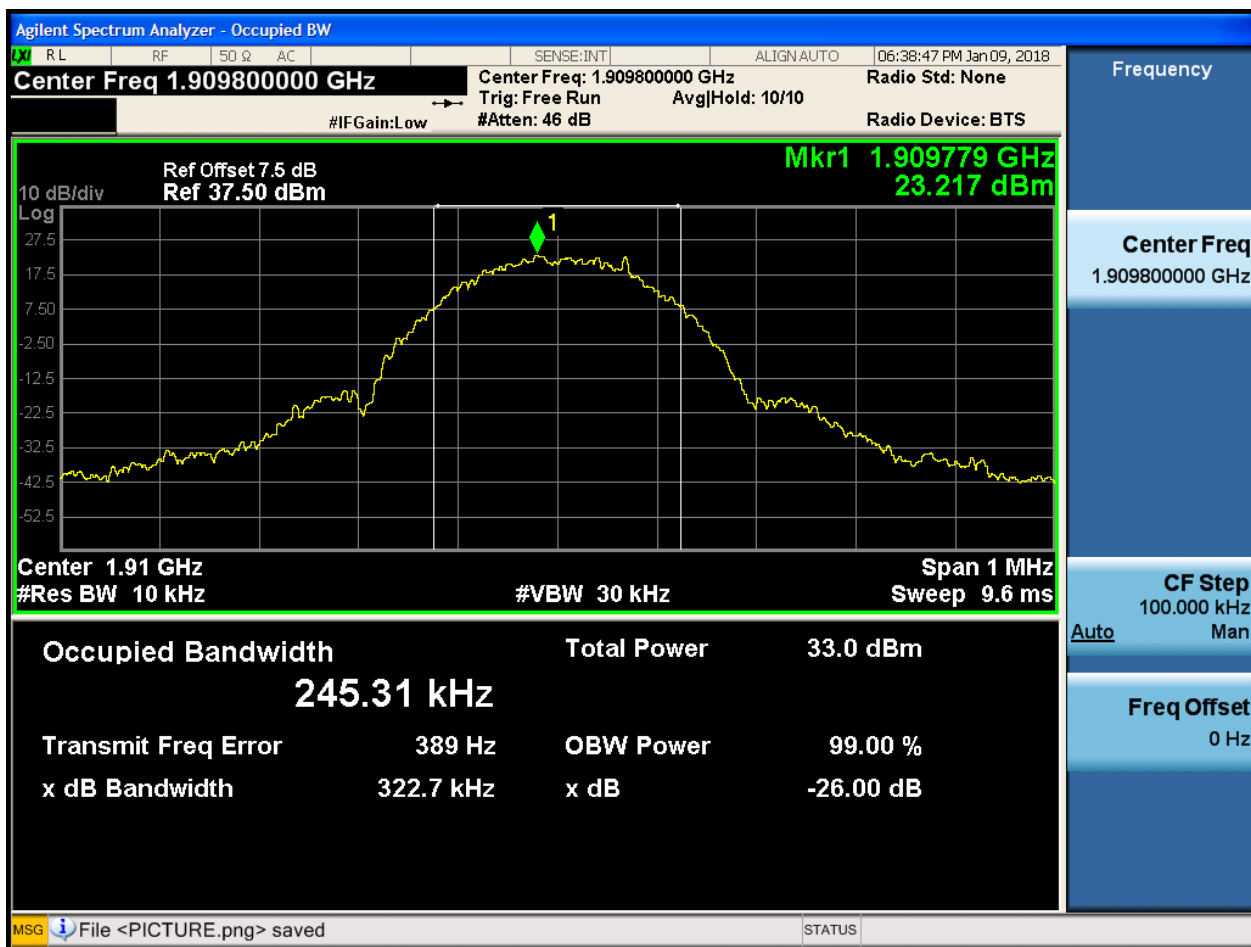


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH





5Appendix_E: Band Edges Compliance

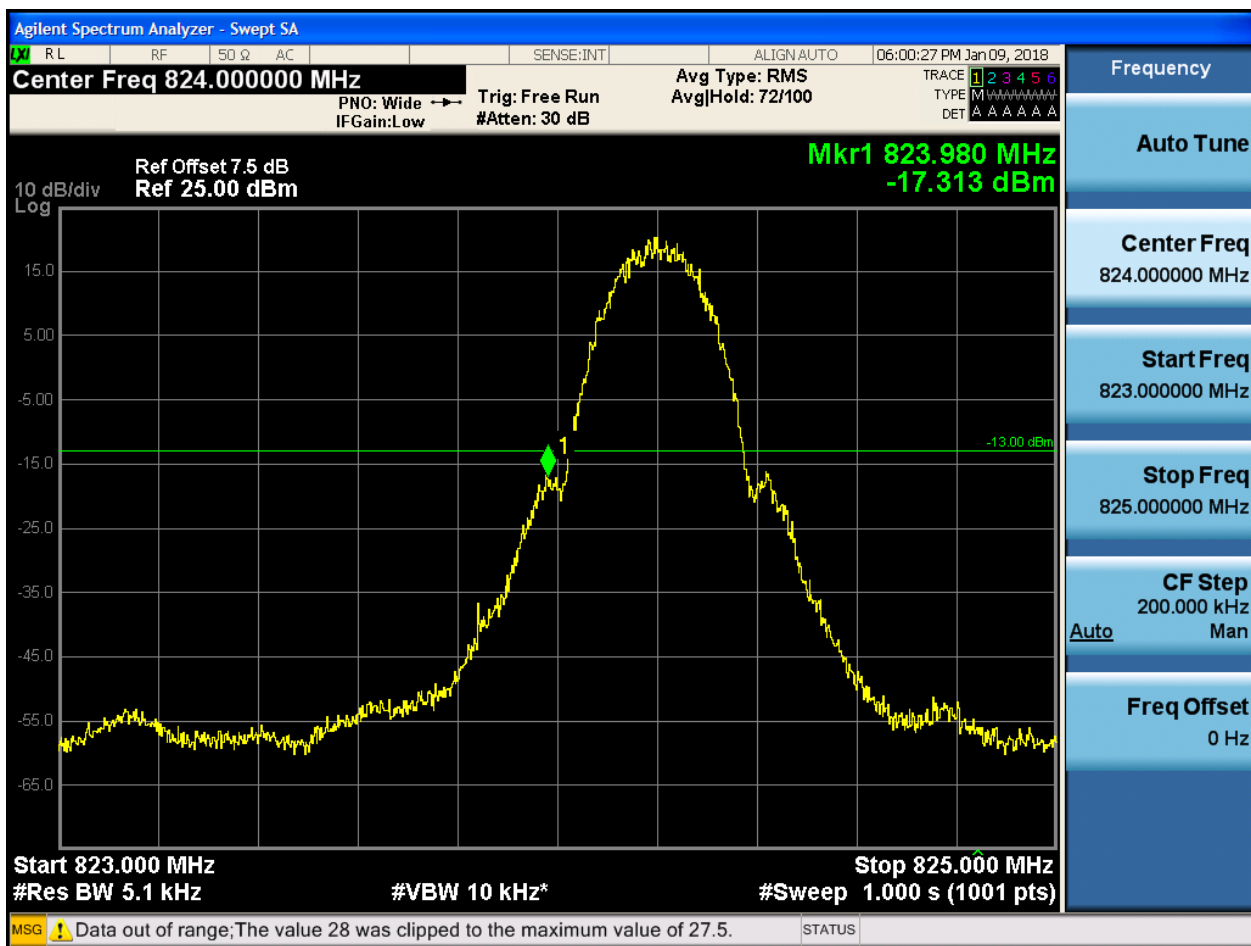
Part I - Test Plots

5.1 For GSM

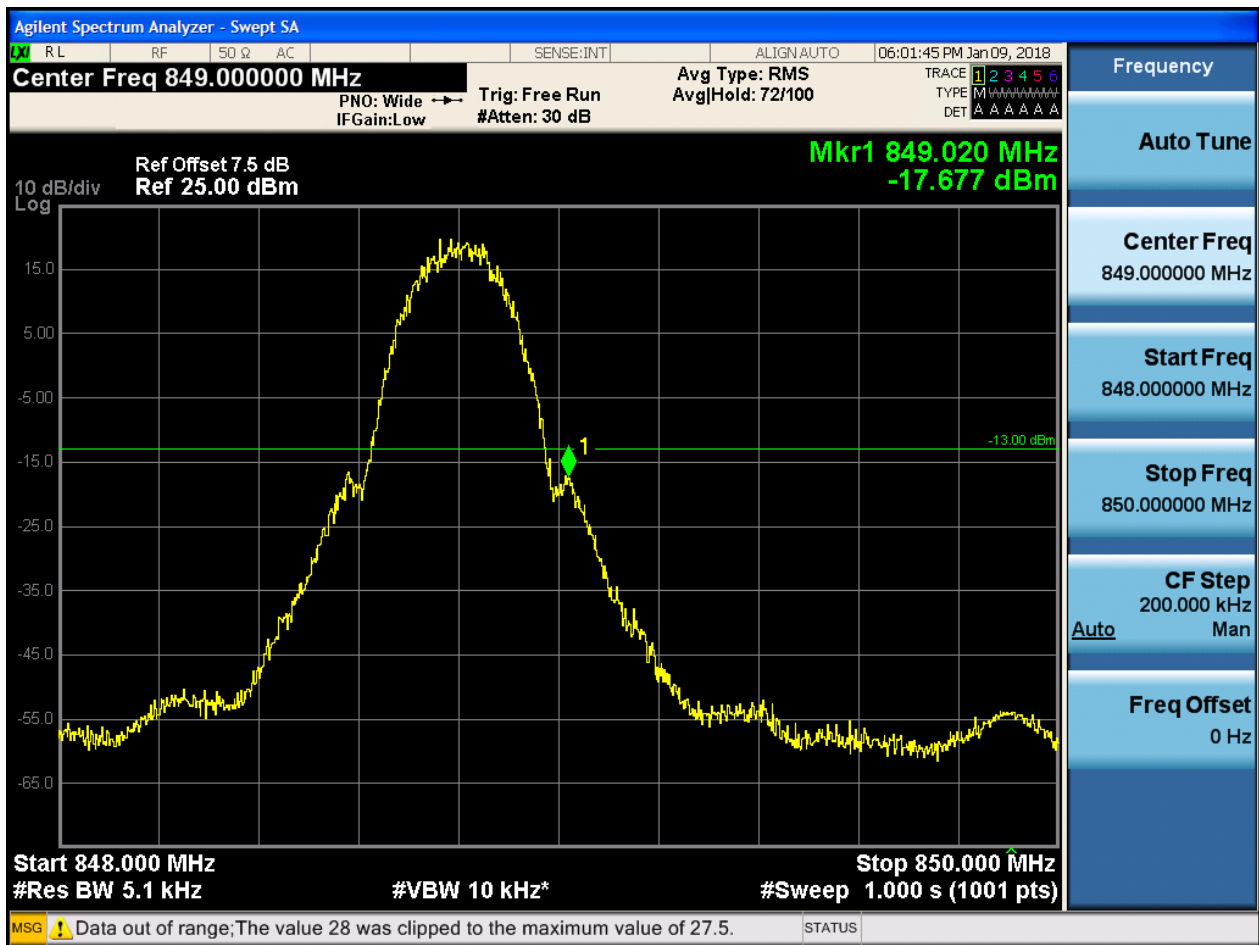
5.1.1 Test Band = GSM850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH



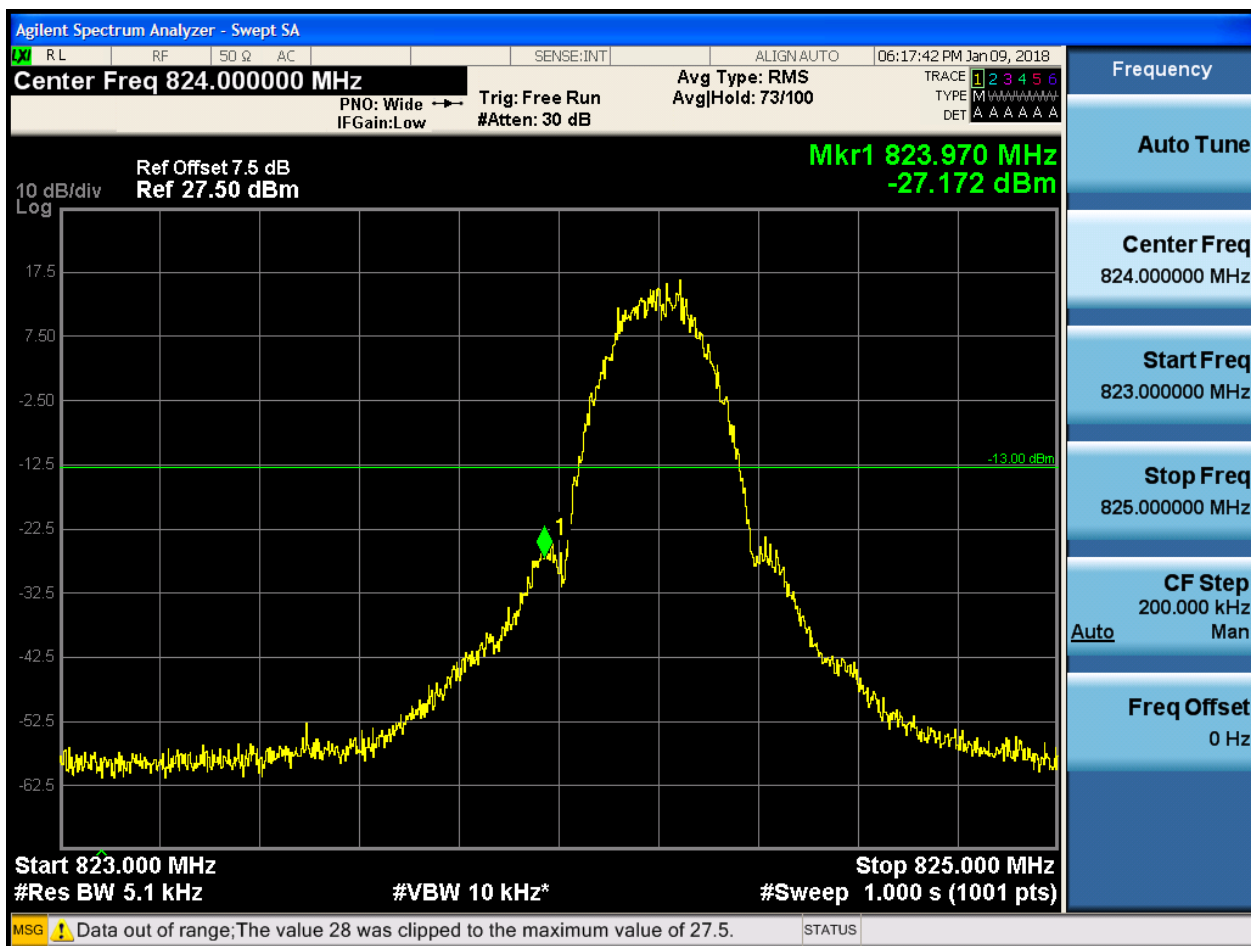
5.1.1.1.2 Test Channel = HCH



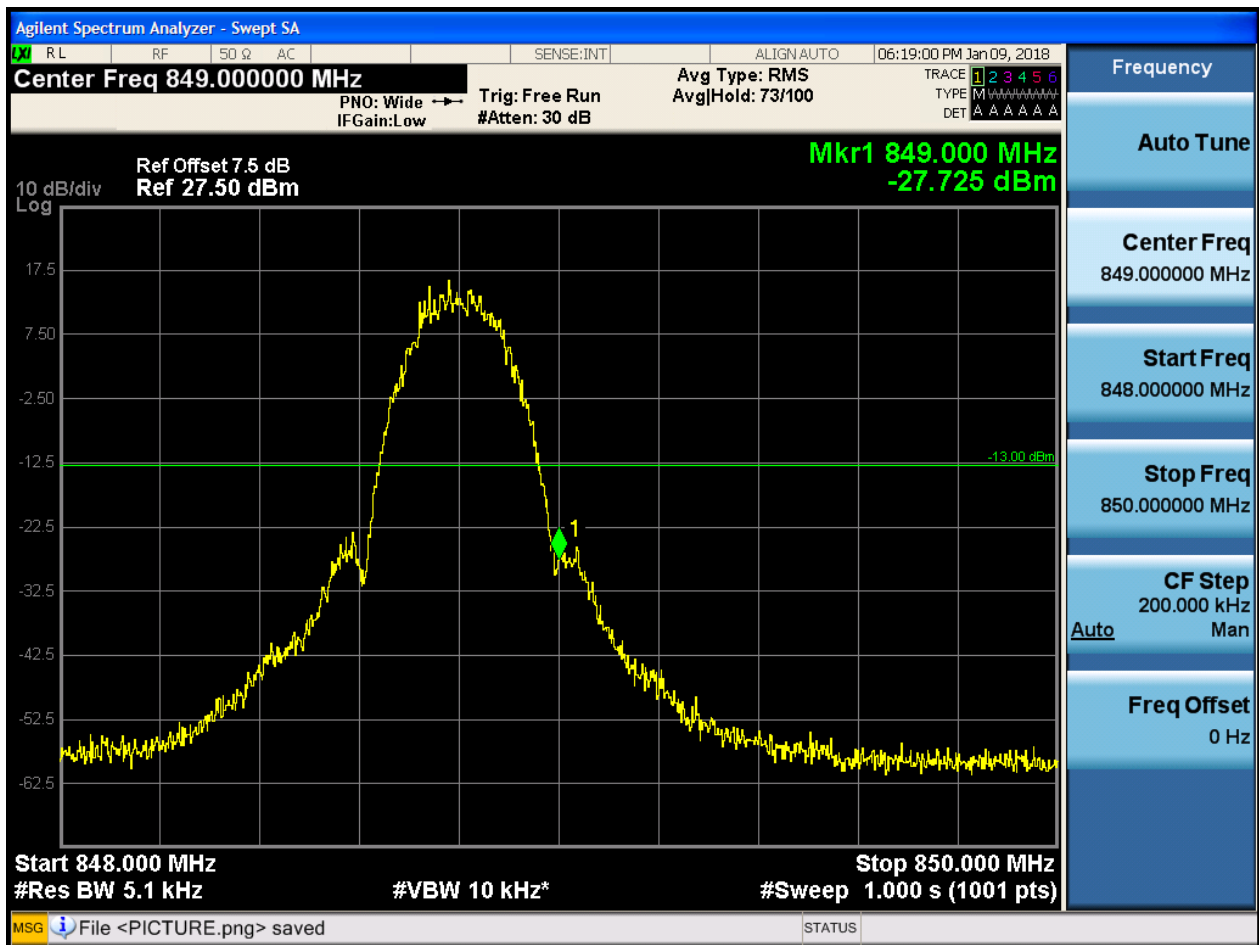


5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



5.1.1.2.2 Test Channel = HCH

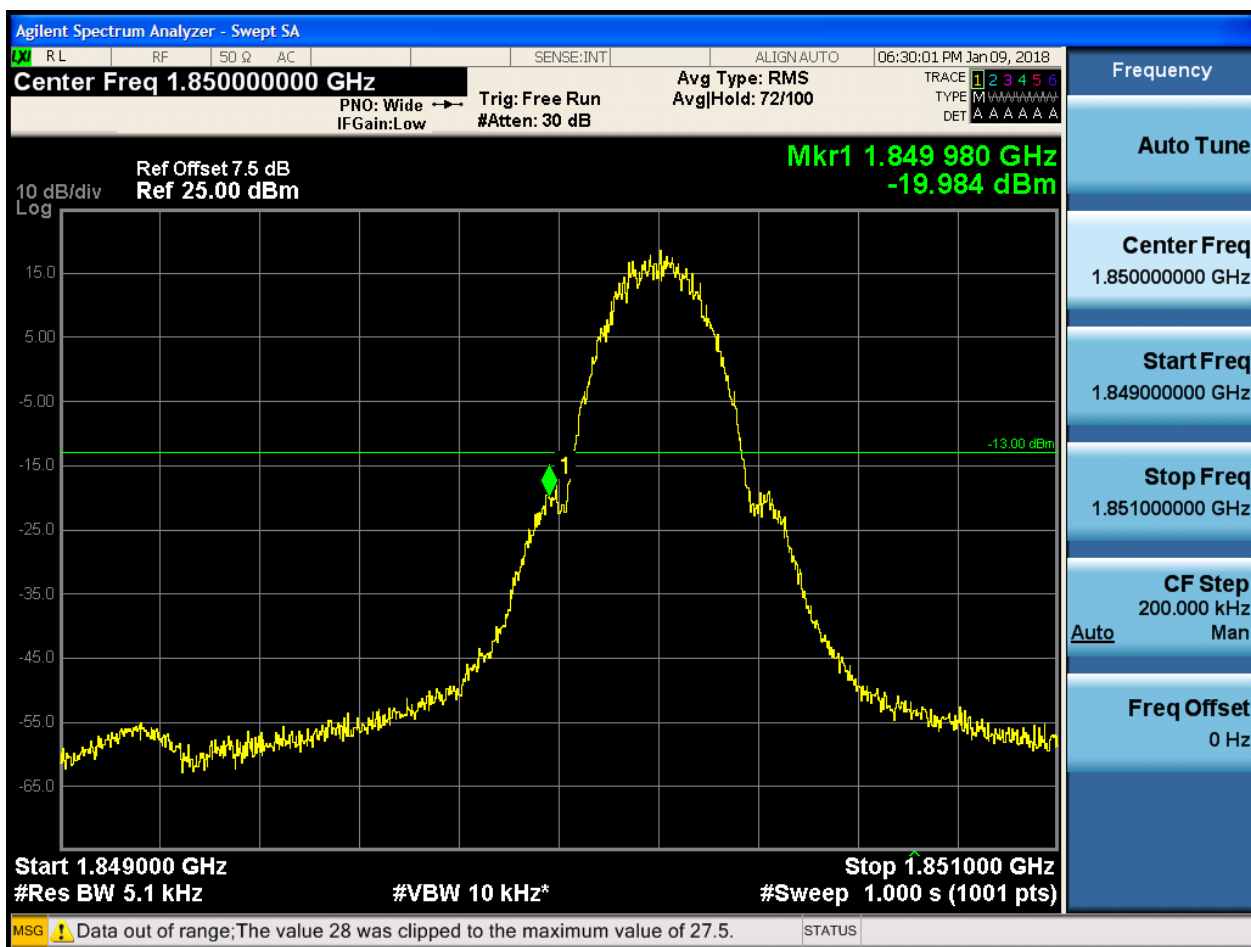




5.1.2 Test Band = GSM1900

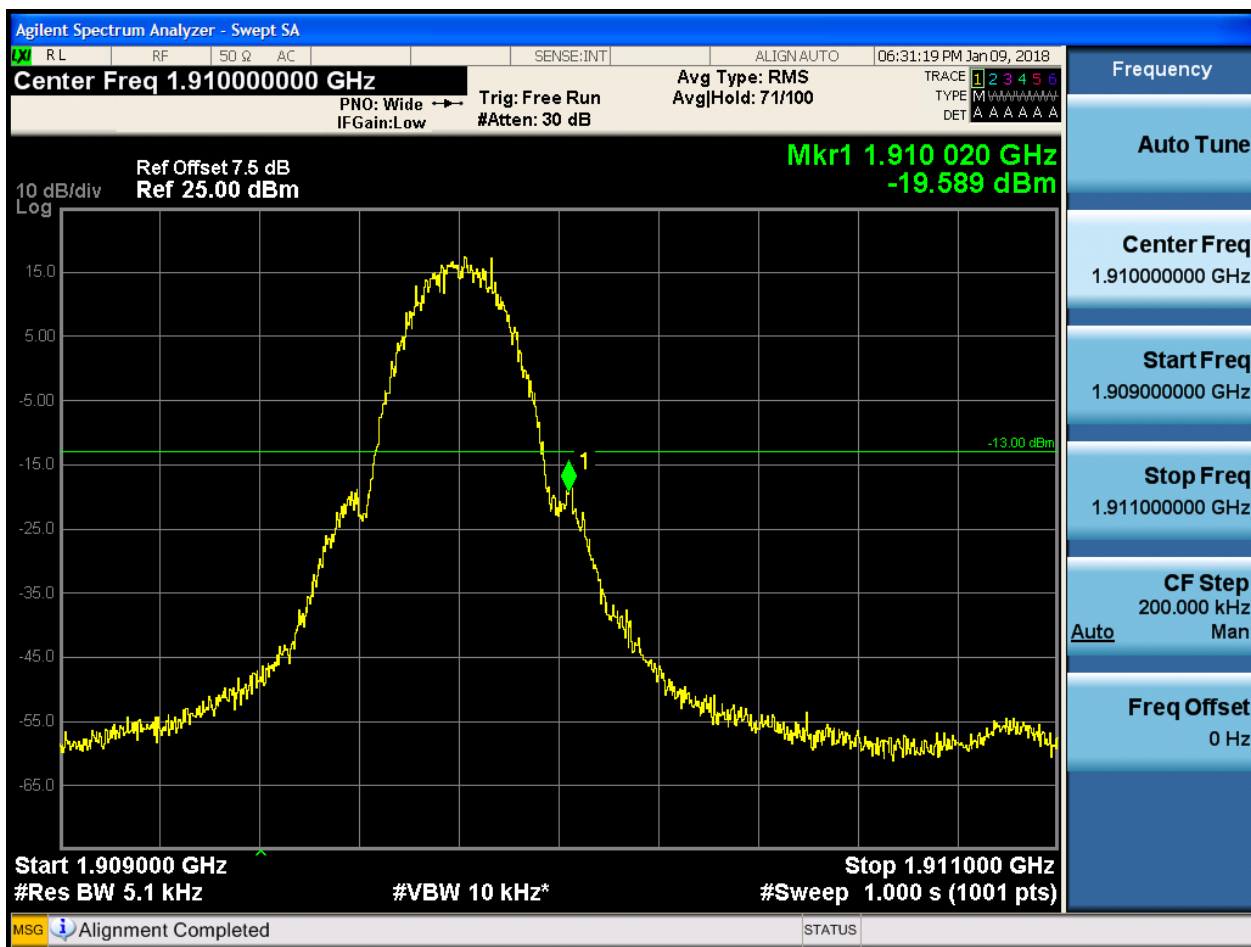
5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH



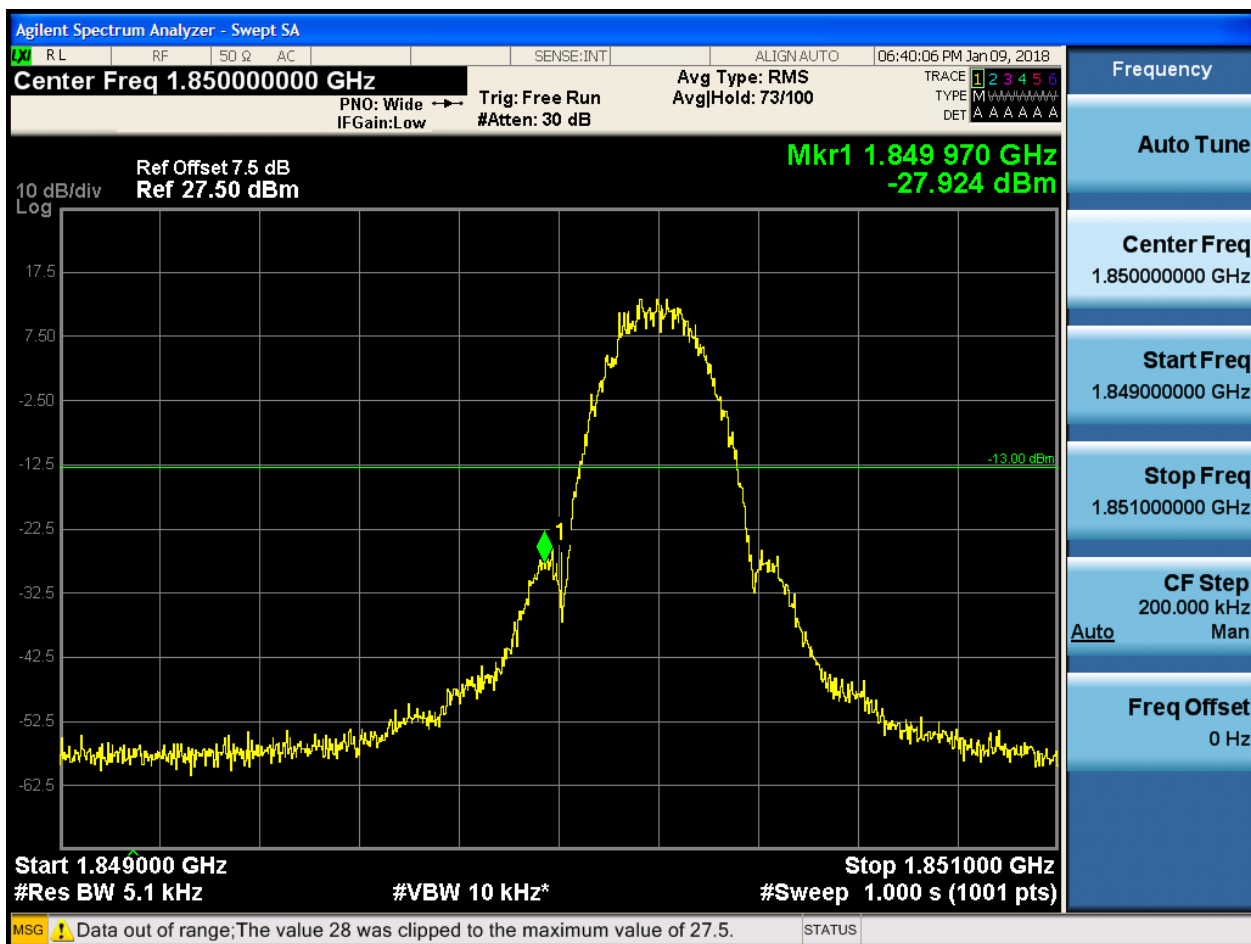


5.1.2.1.2 Test Channel = HCH



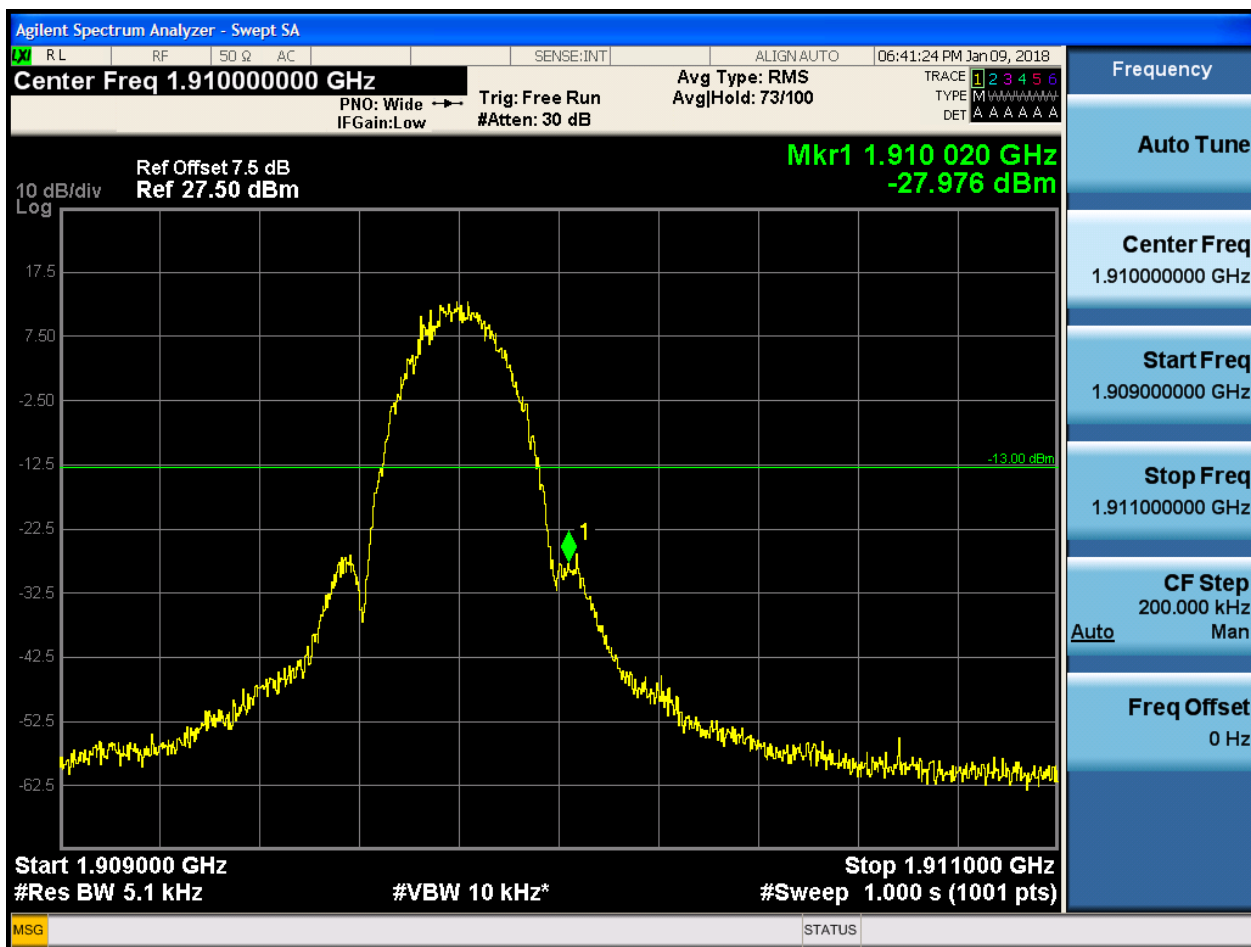
5.1.2.2 Test Mode = GSM/TM2

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.

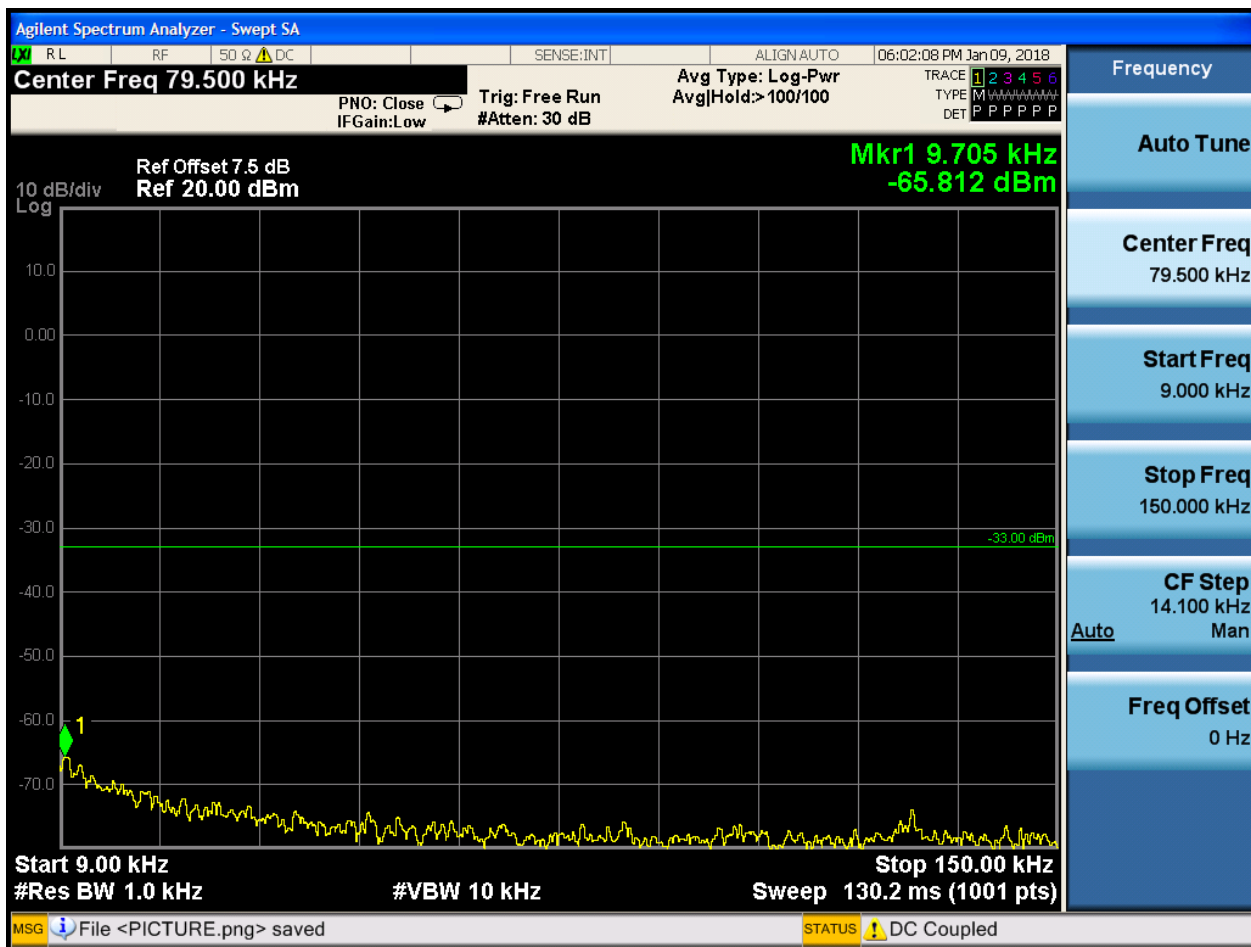
Part I - Test Plots

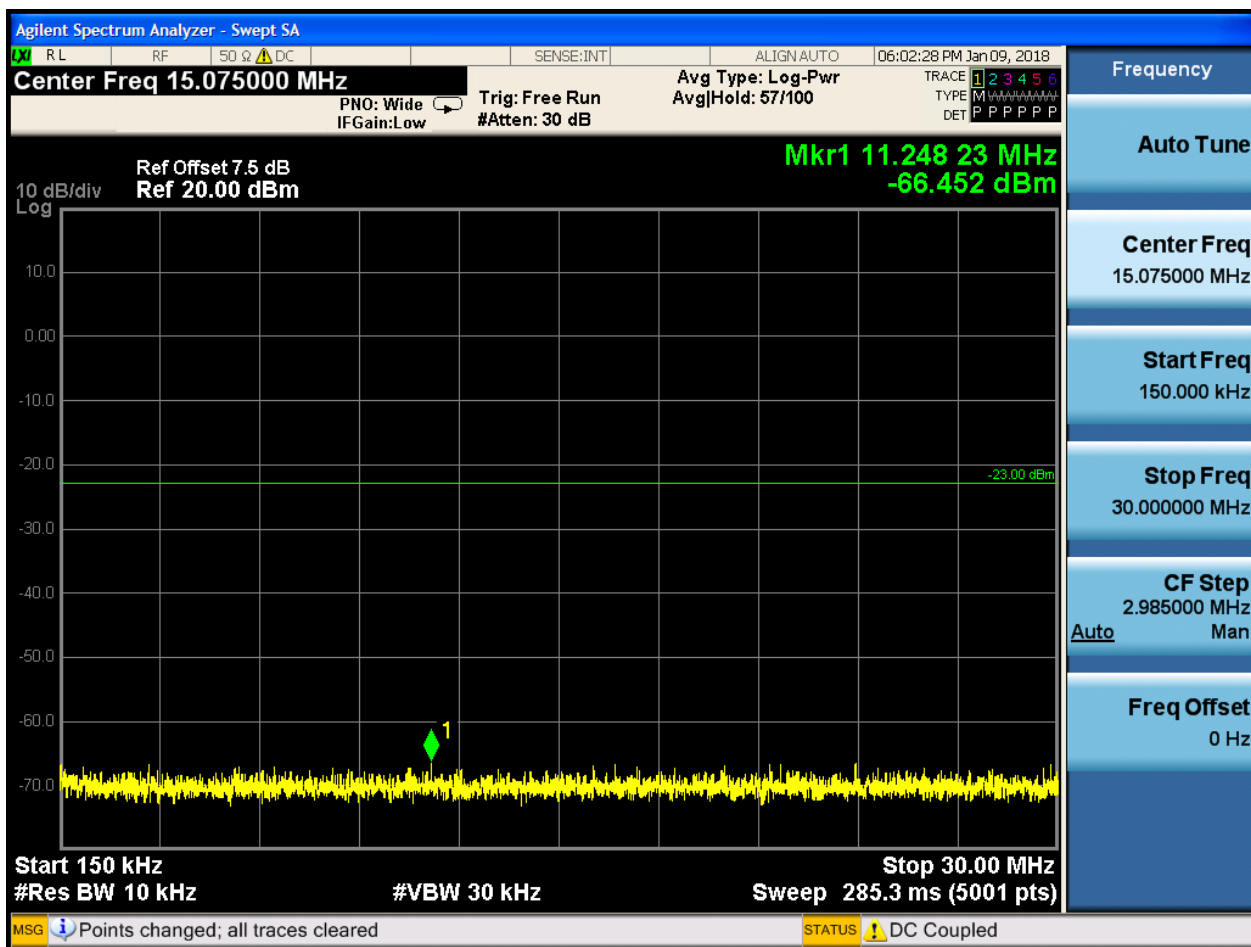
6.1 For GSM

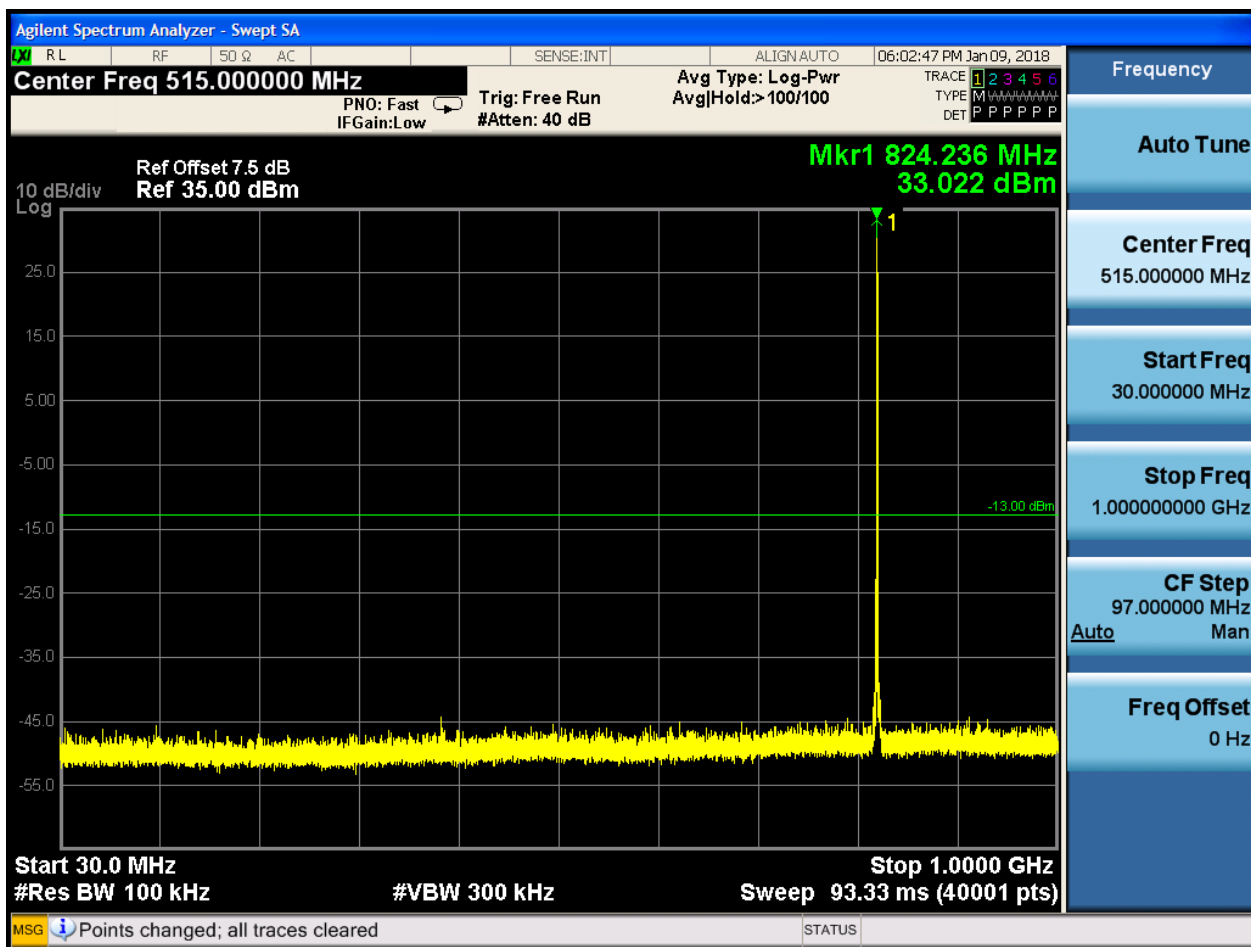
6.1.1 Test Band = GSM850

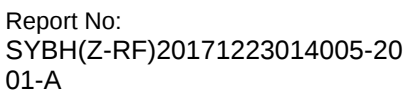
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH



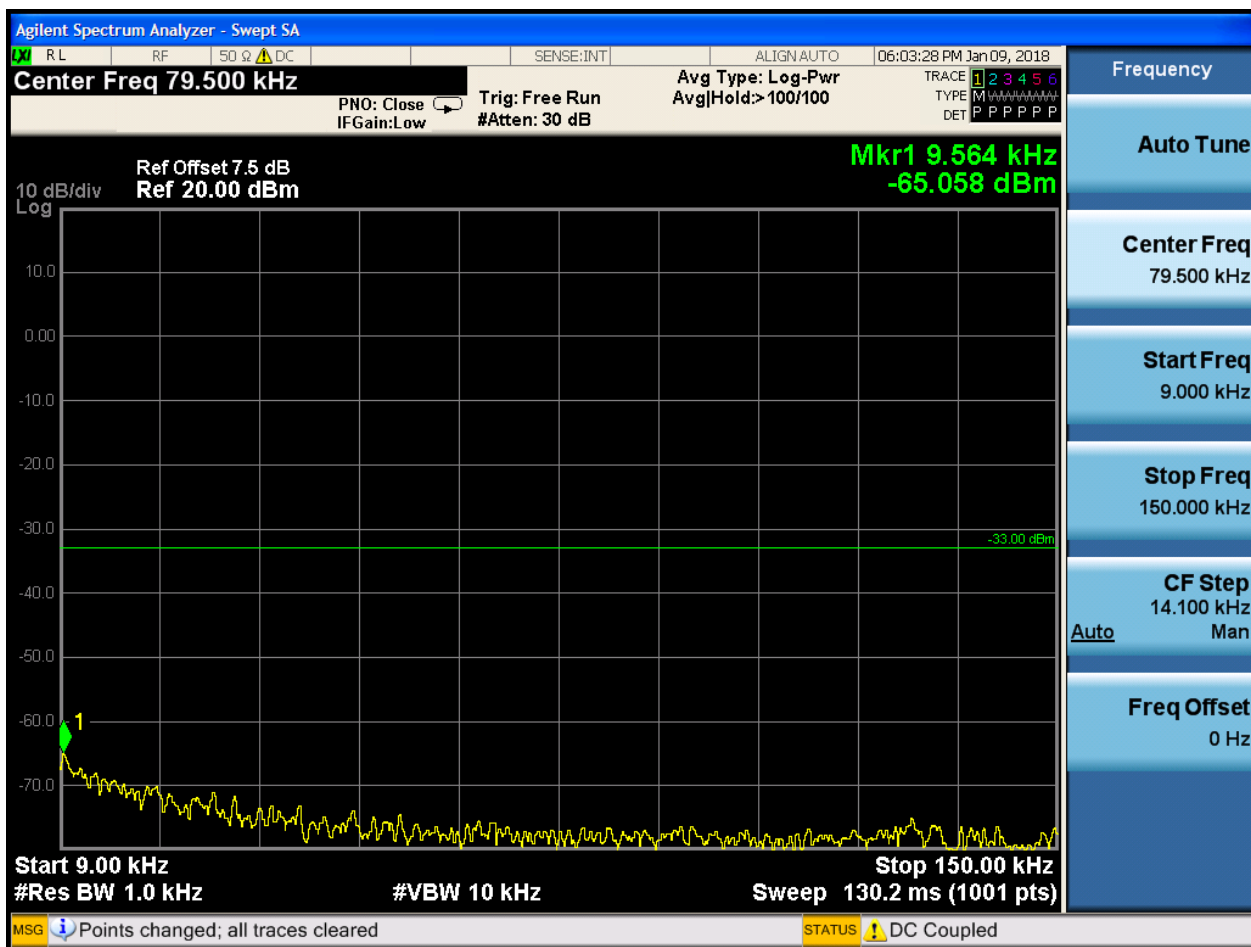


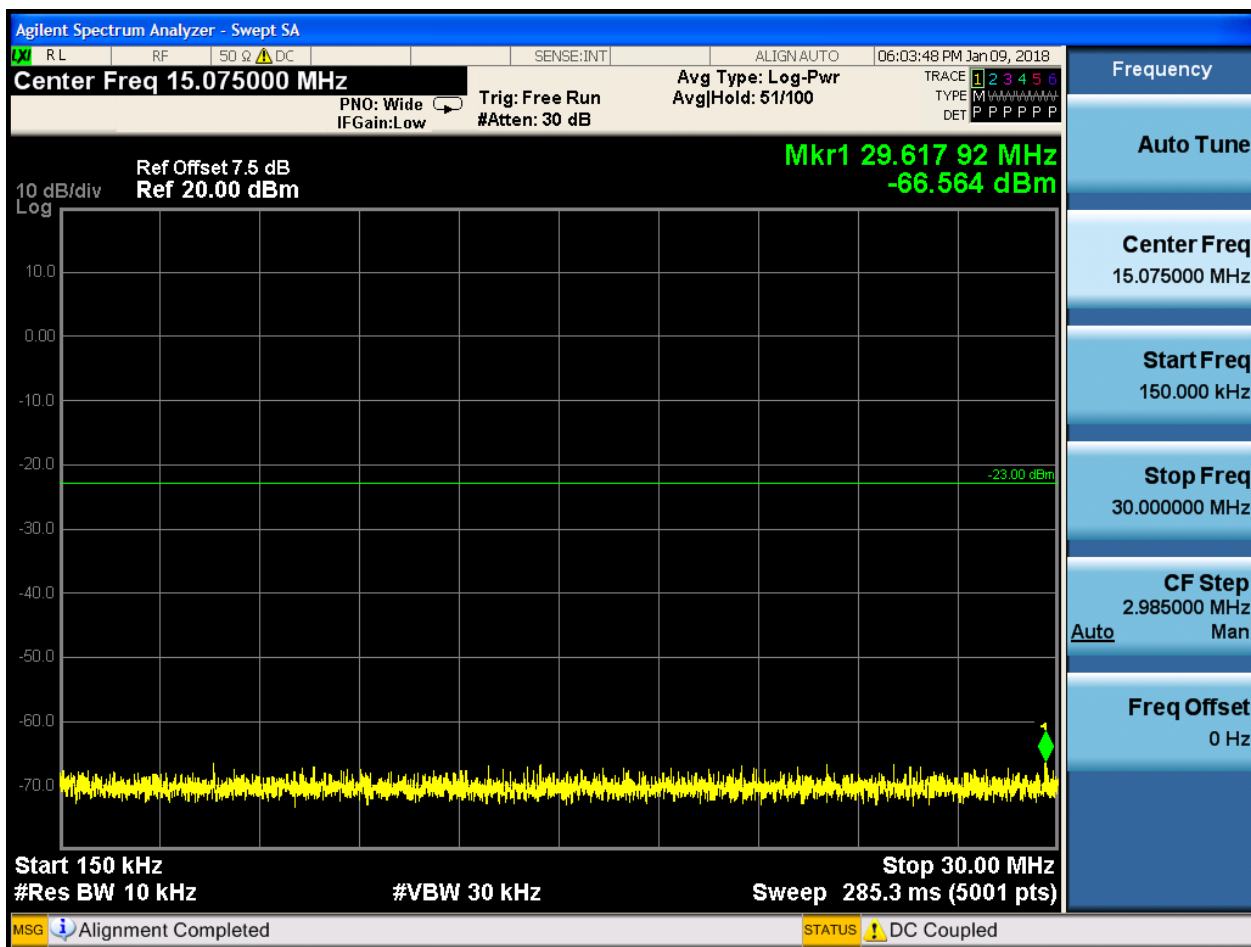


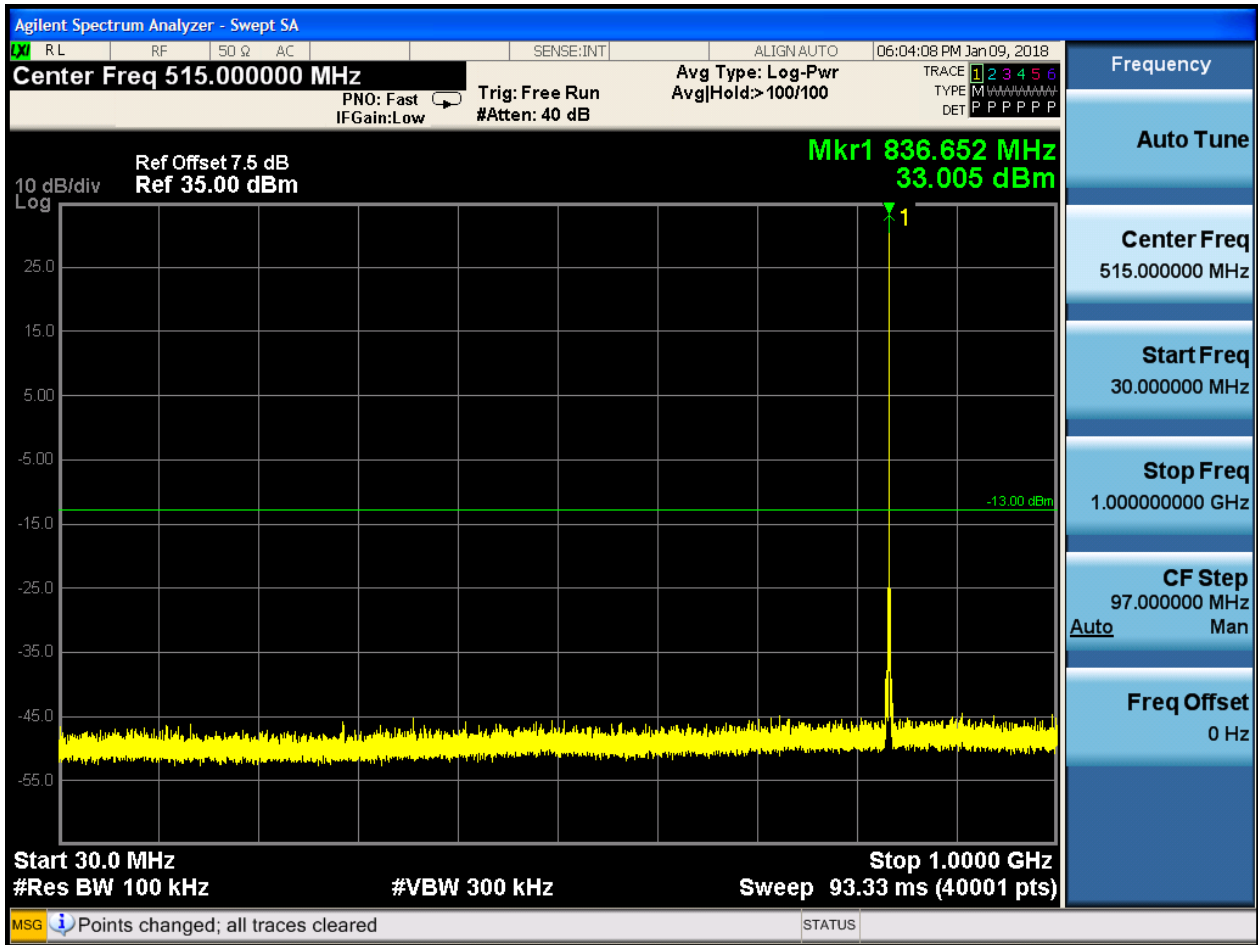


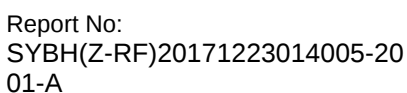


6.1.1.1.2 Test Channel = MCH



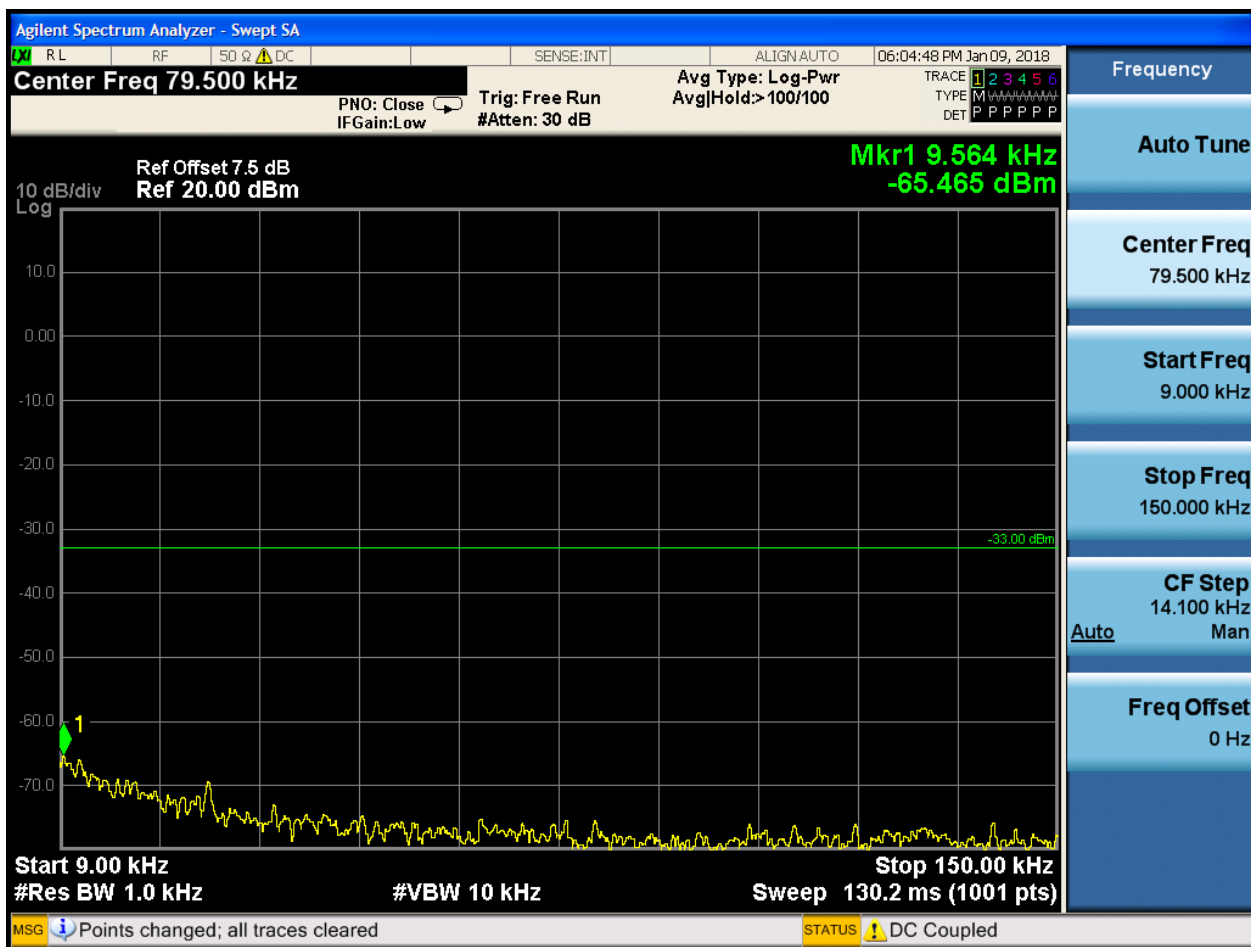


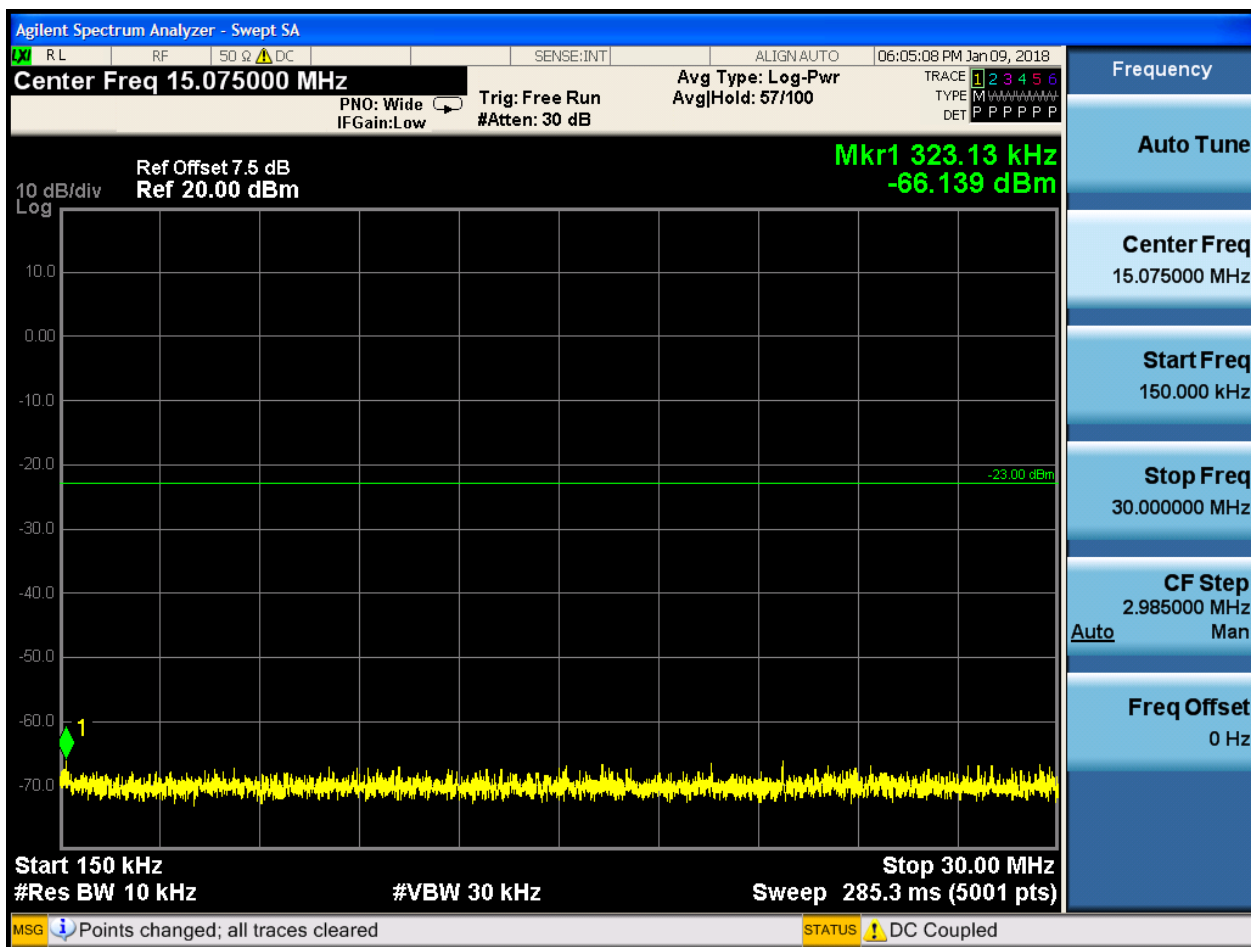


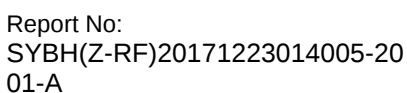


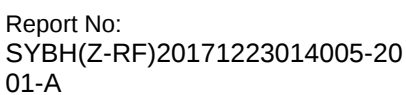


6.1.1.1.3 Test Channel = HCH



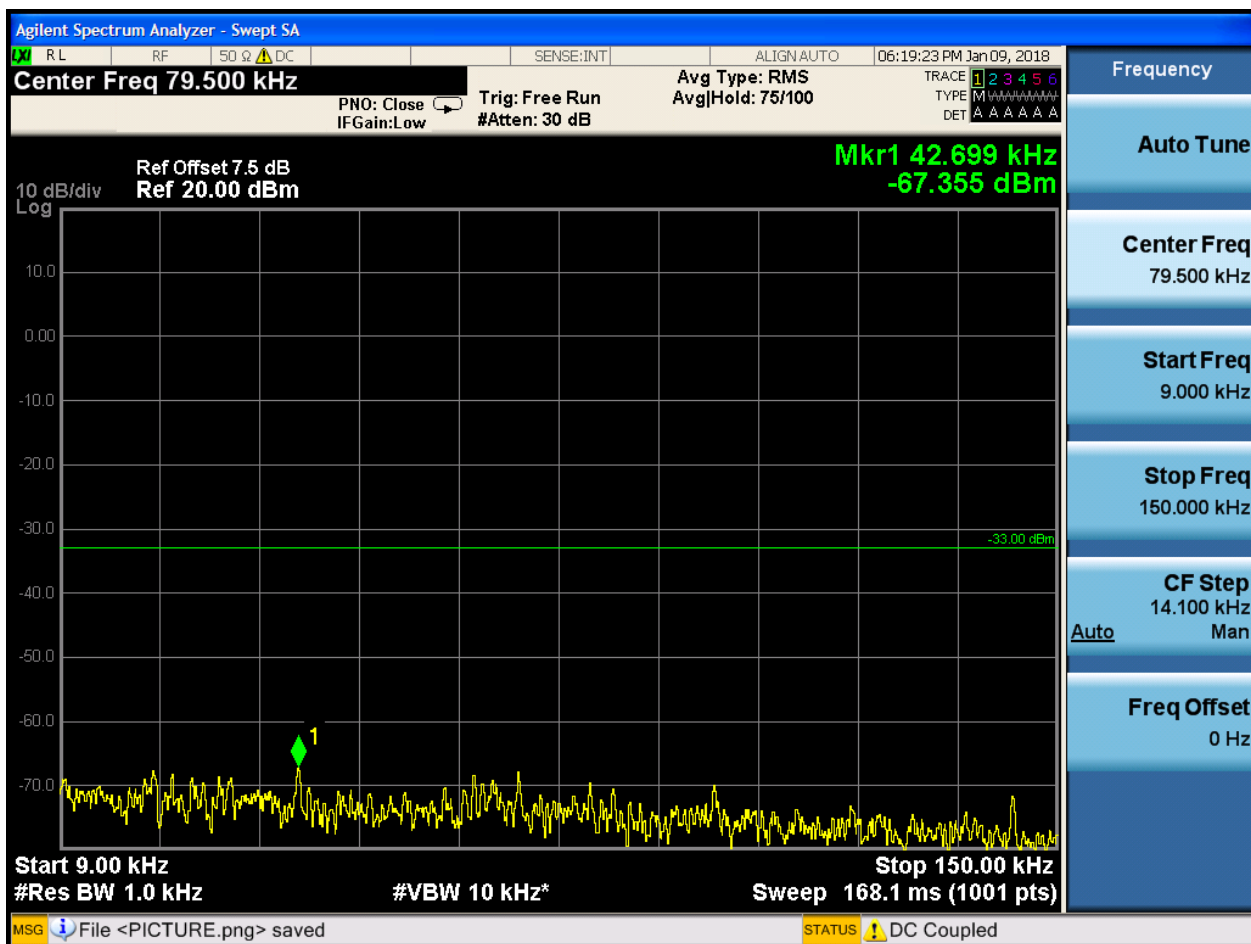


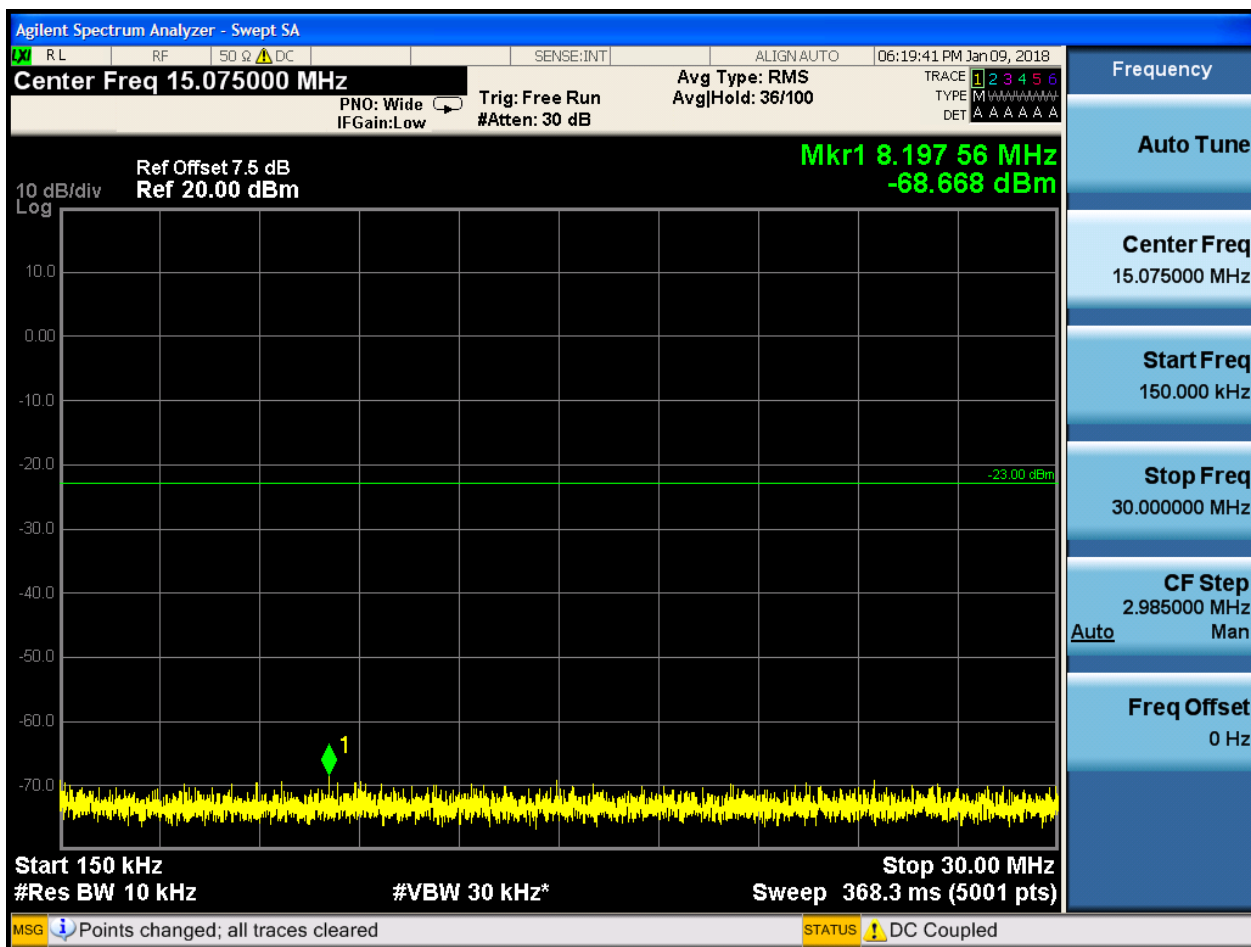


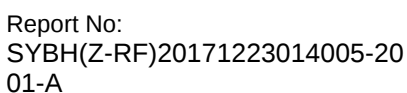


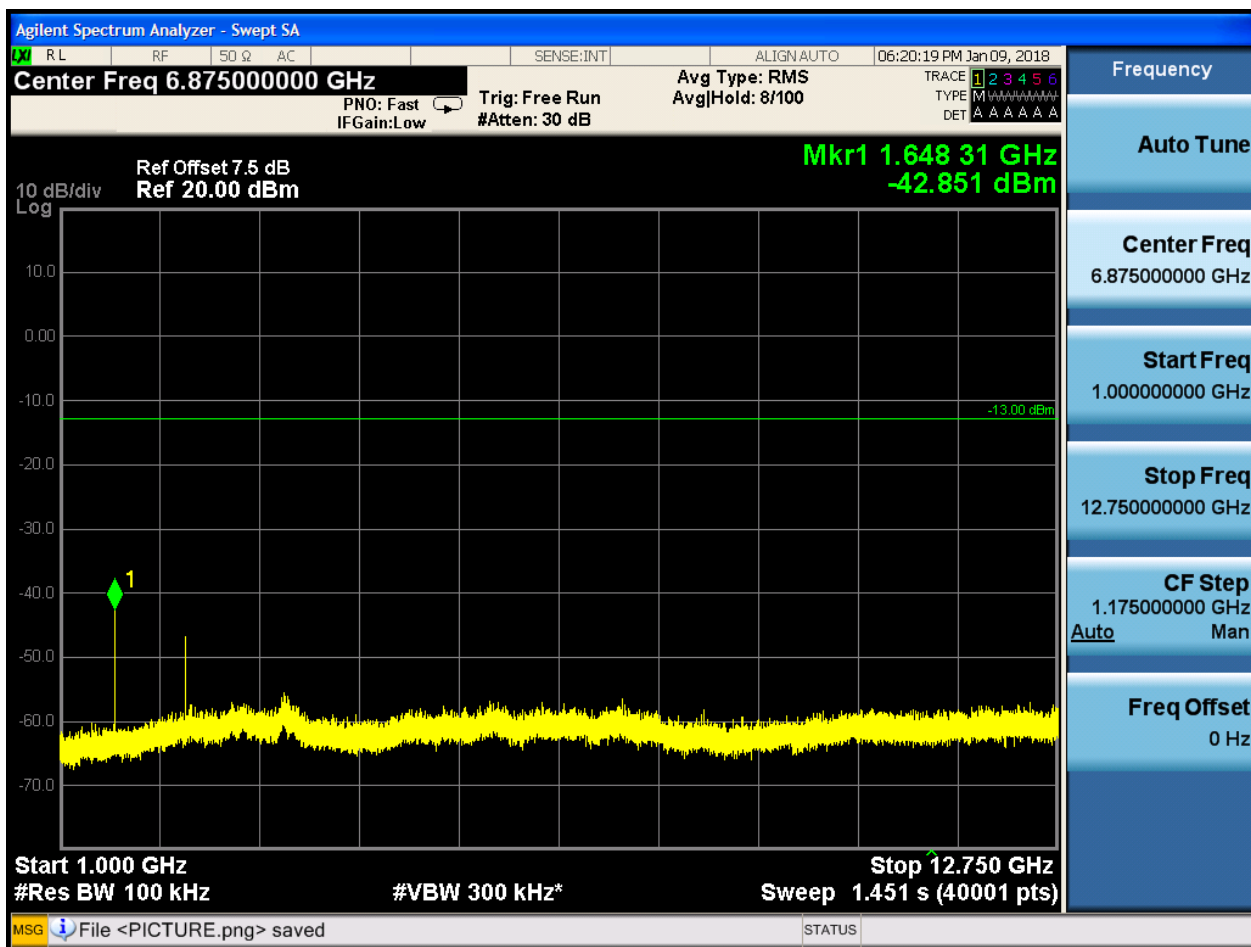
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH

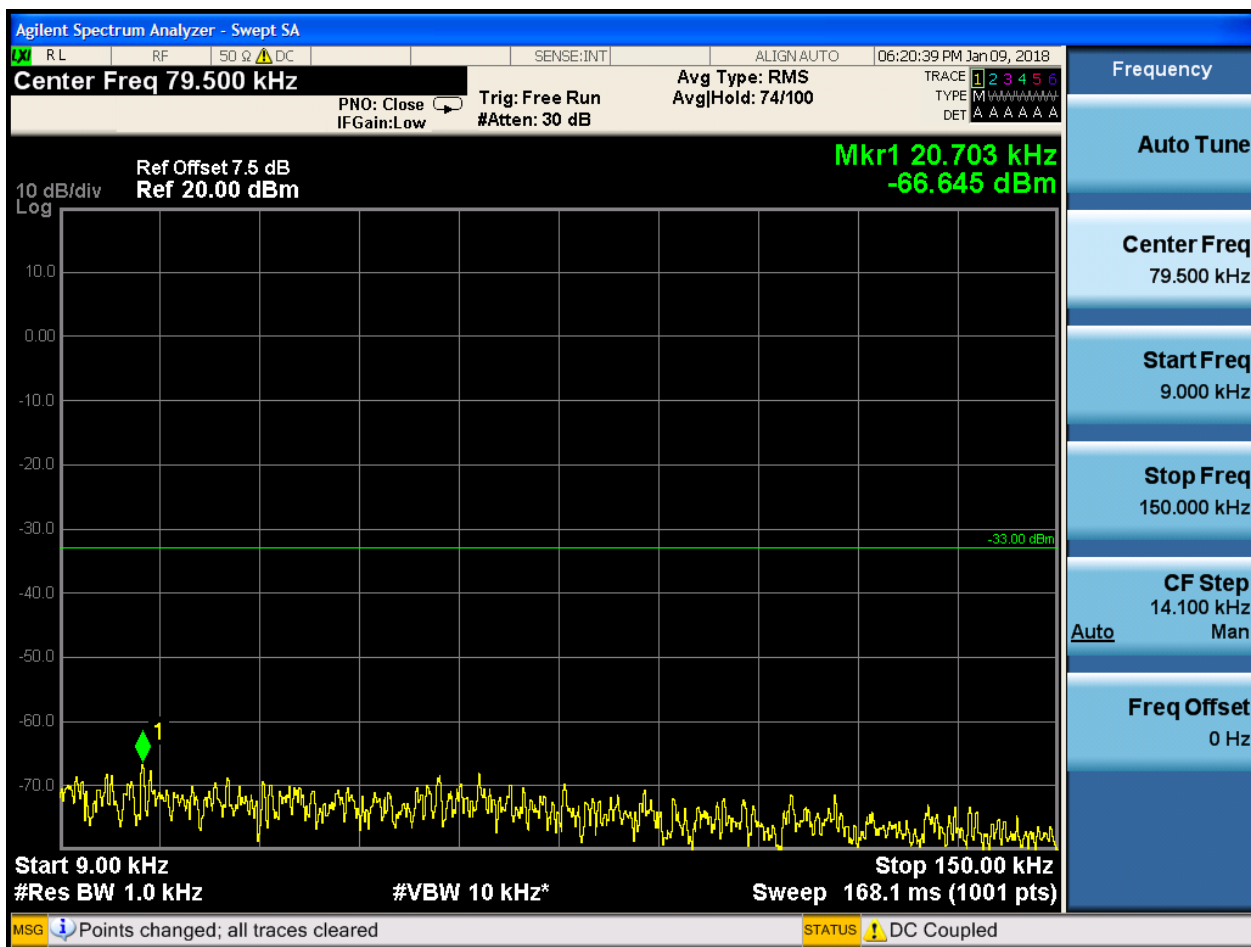


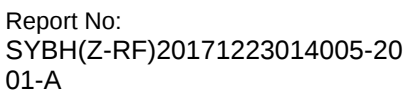


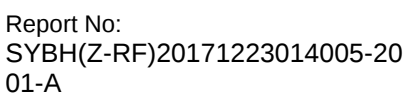


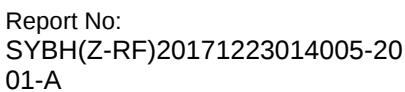


6.1.1.2.2 Test Channel = MCH



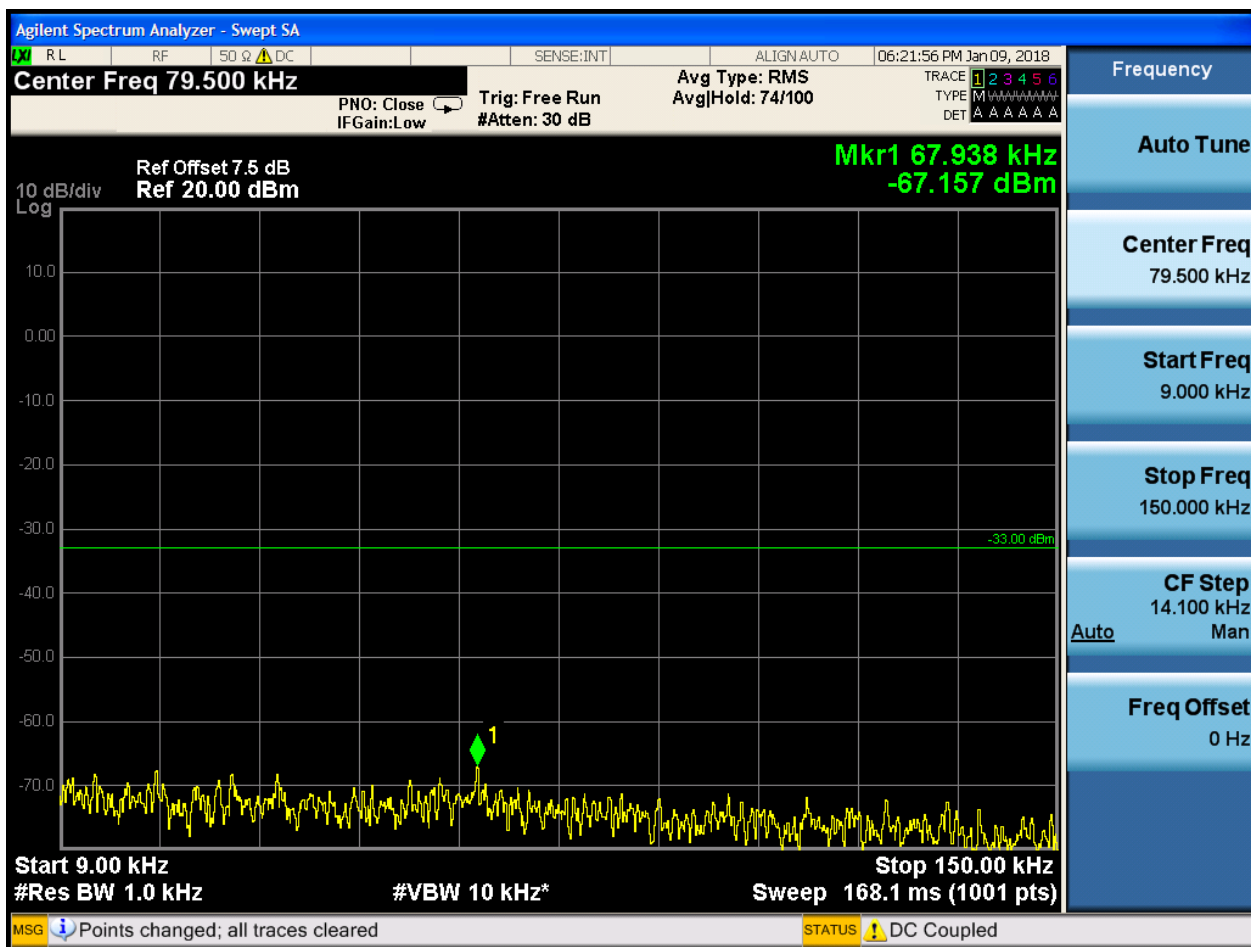


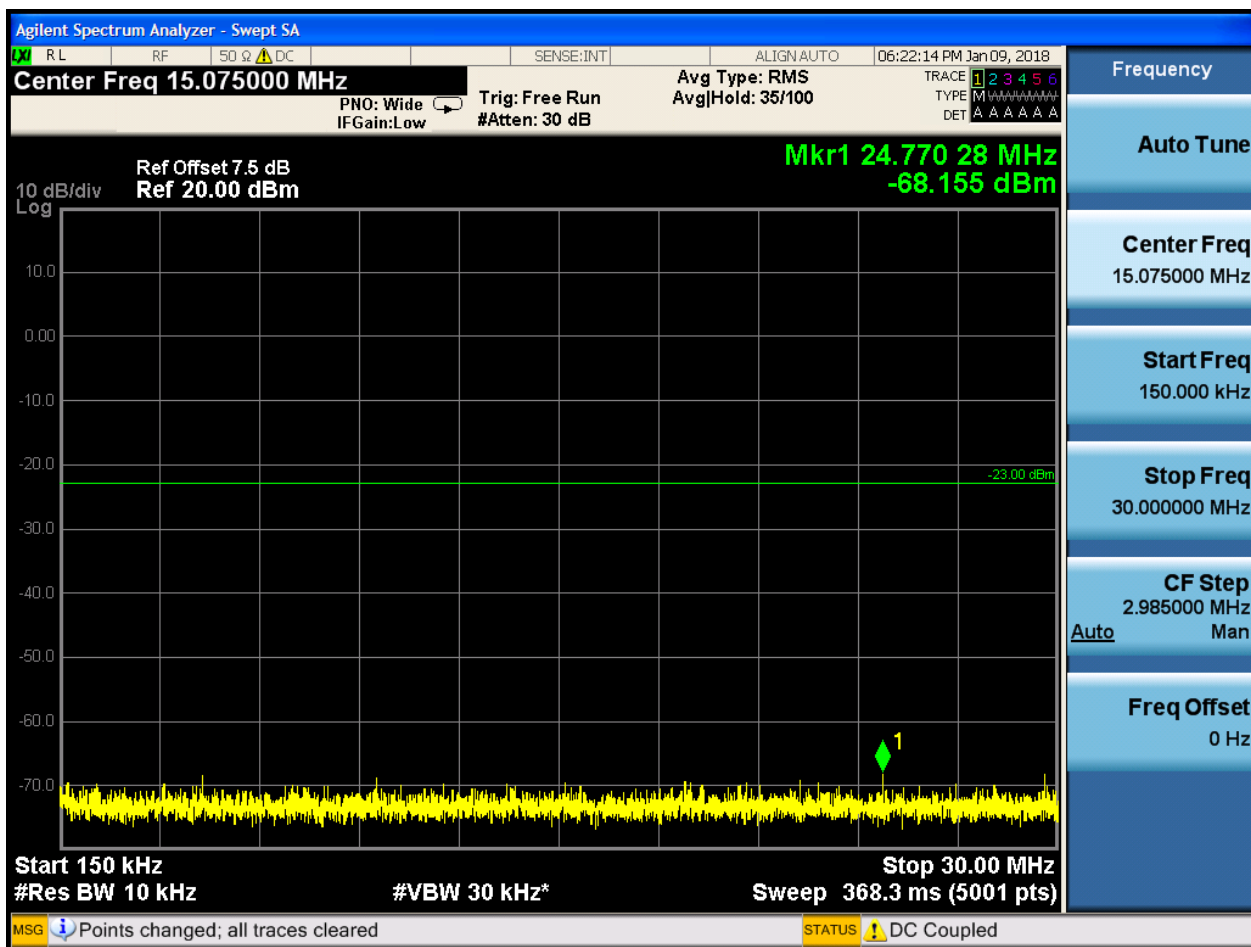


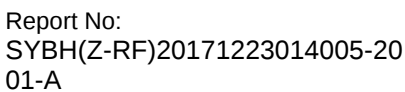


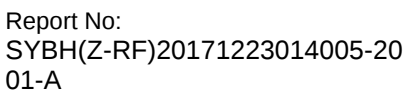


6.1.1.2.3 Test Channel = HCH







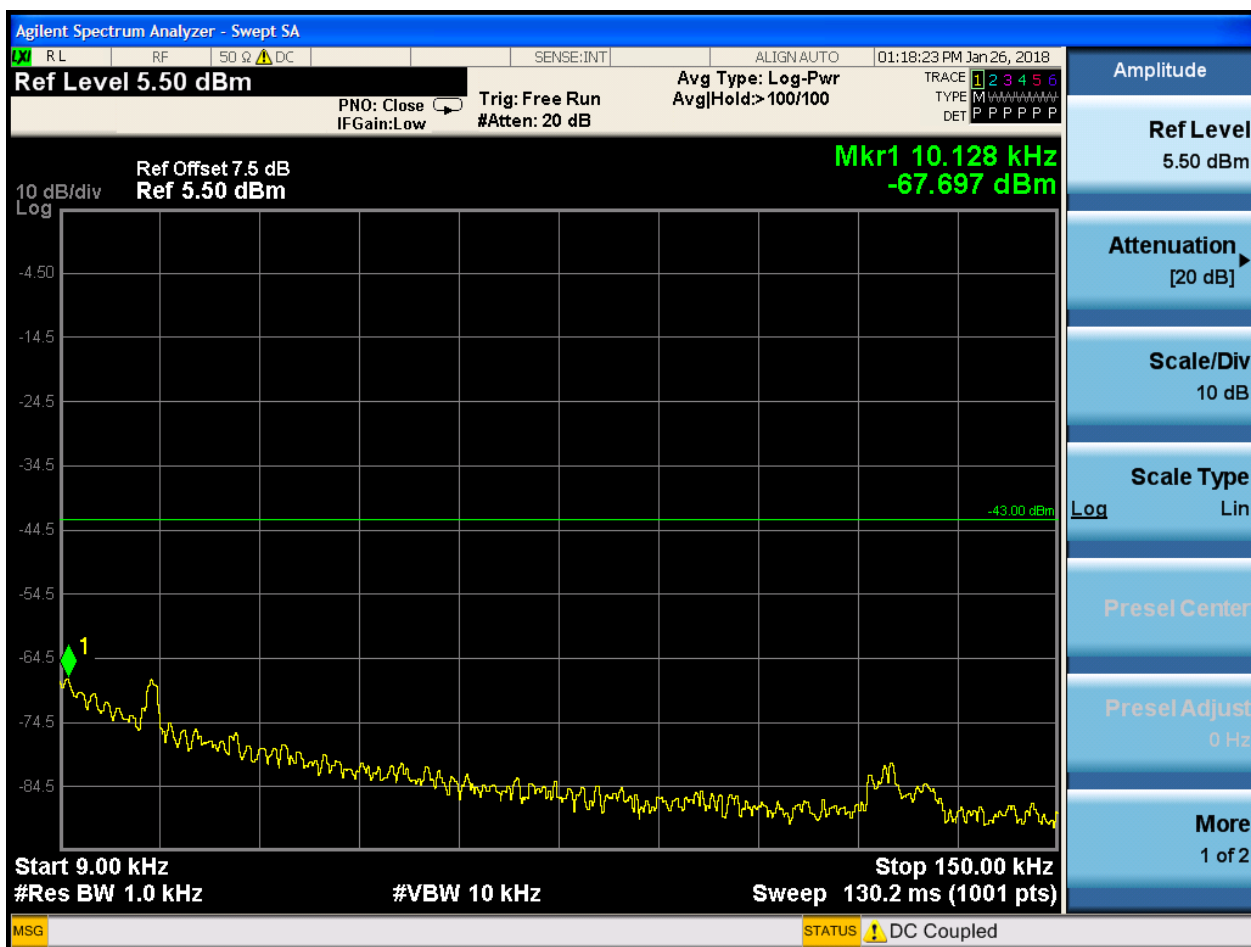


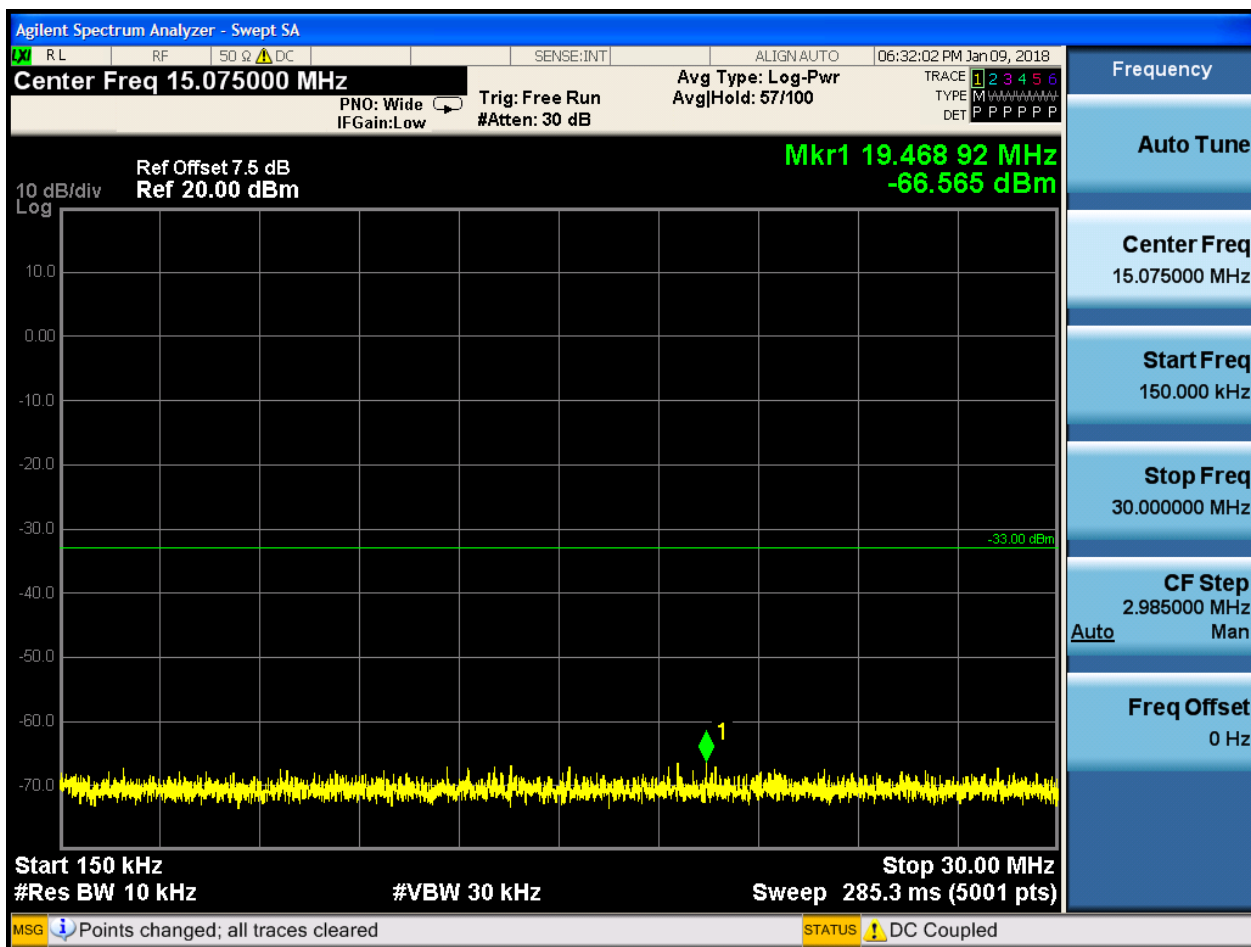


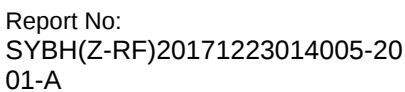
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH

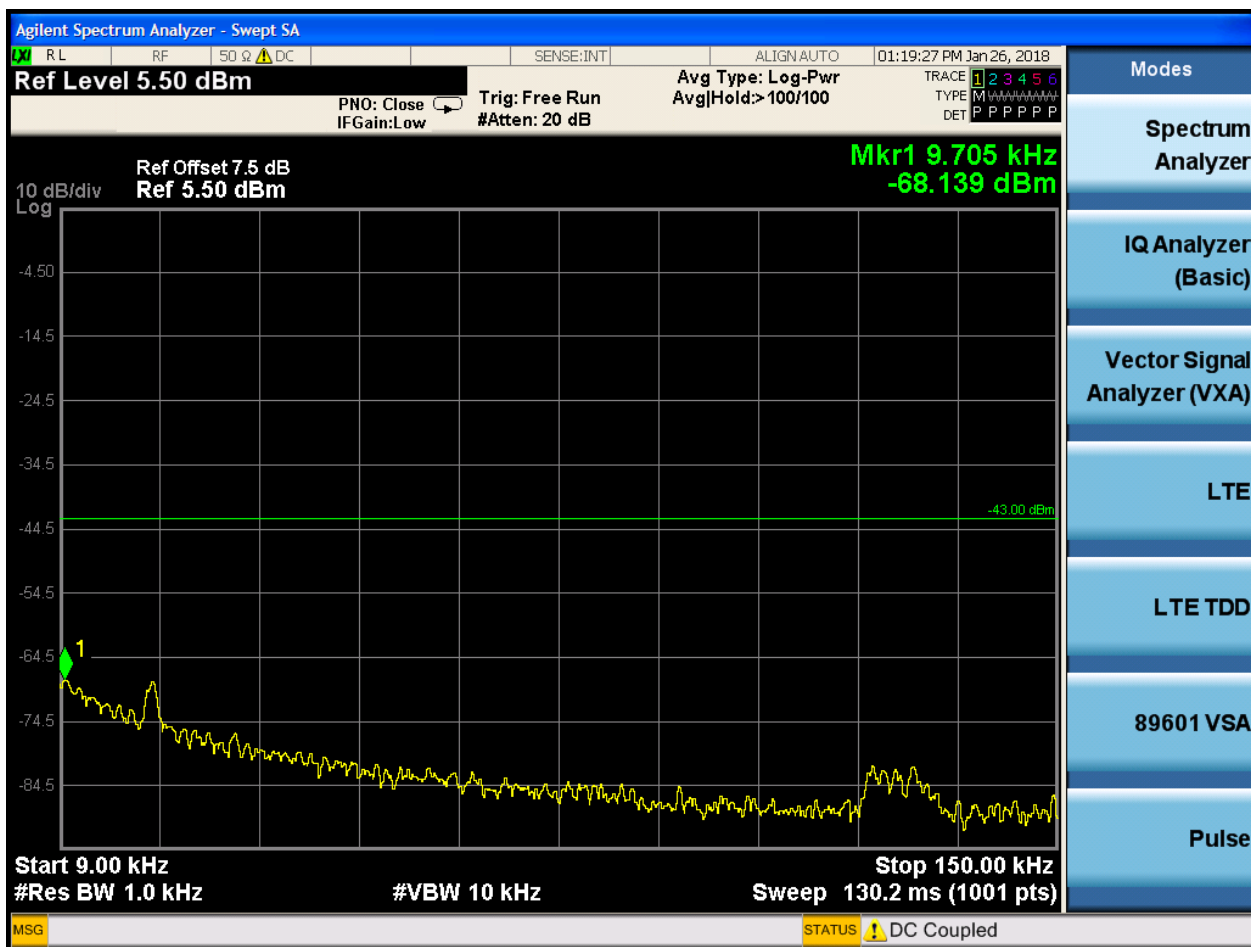


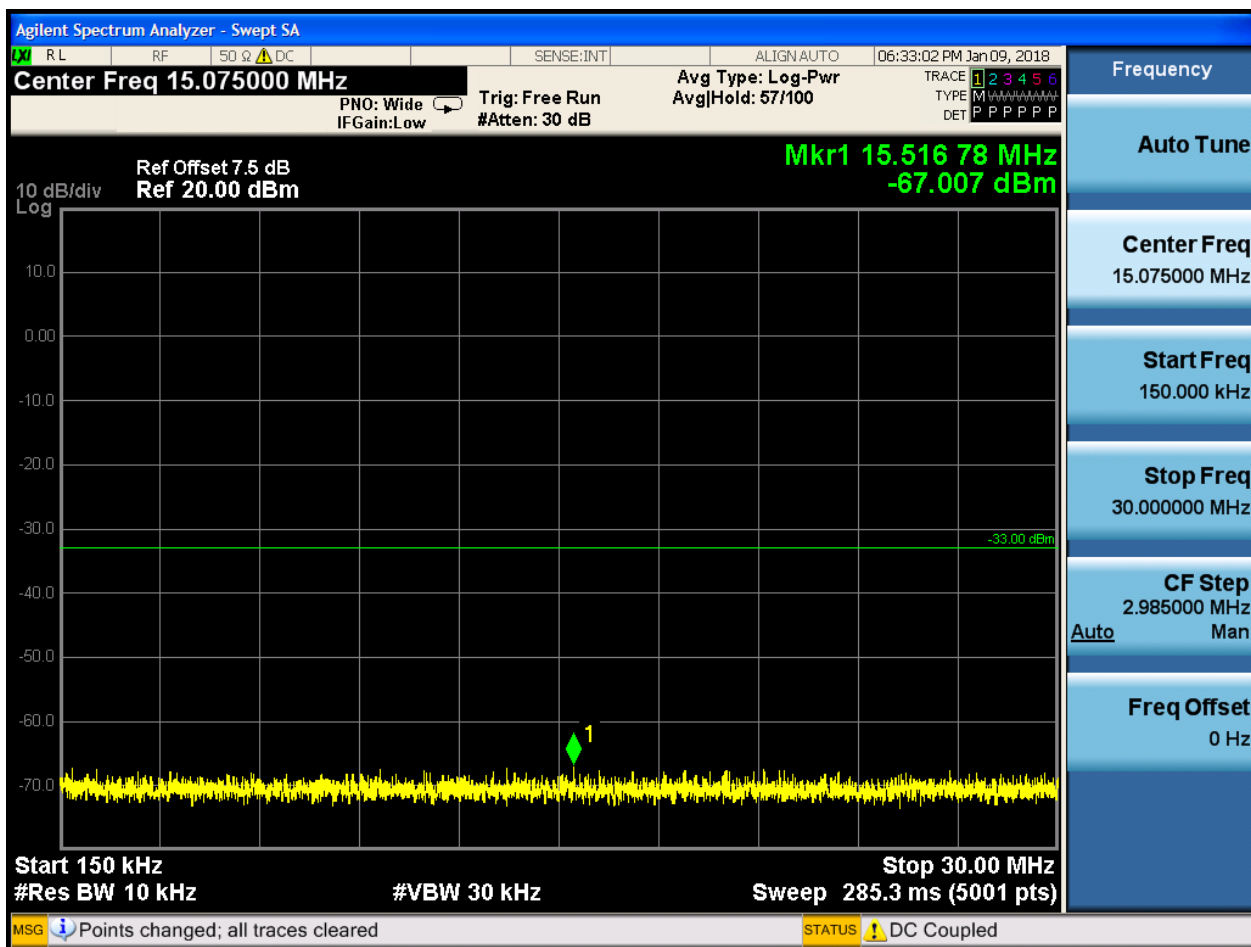


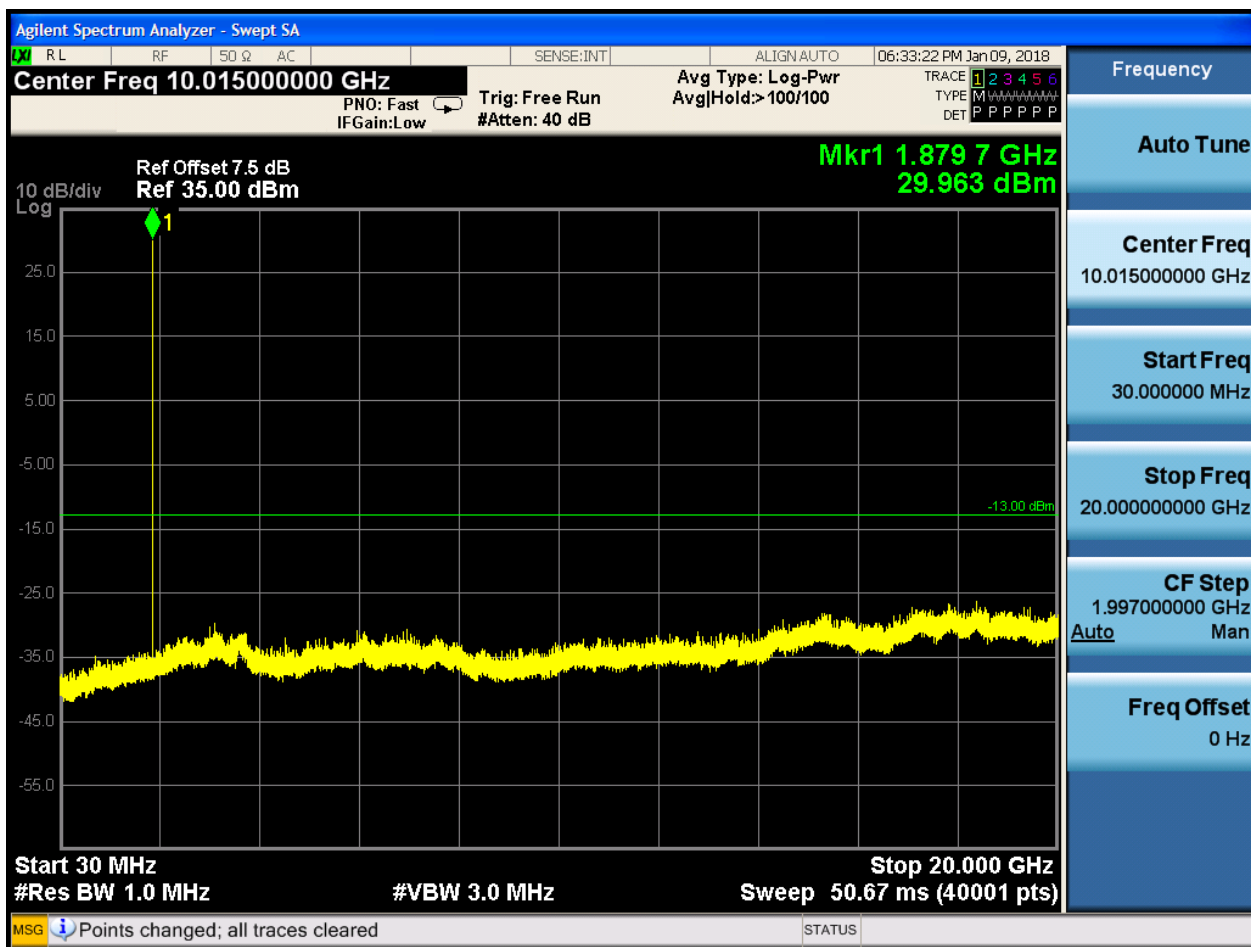




6.1.2.1.2 Test Channel = MCH

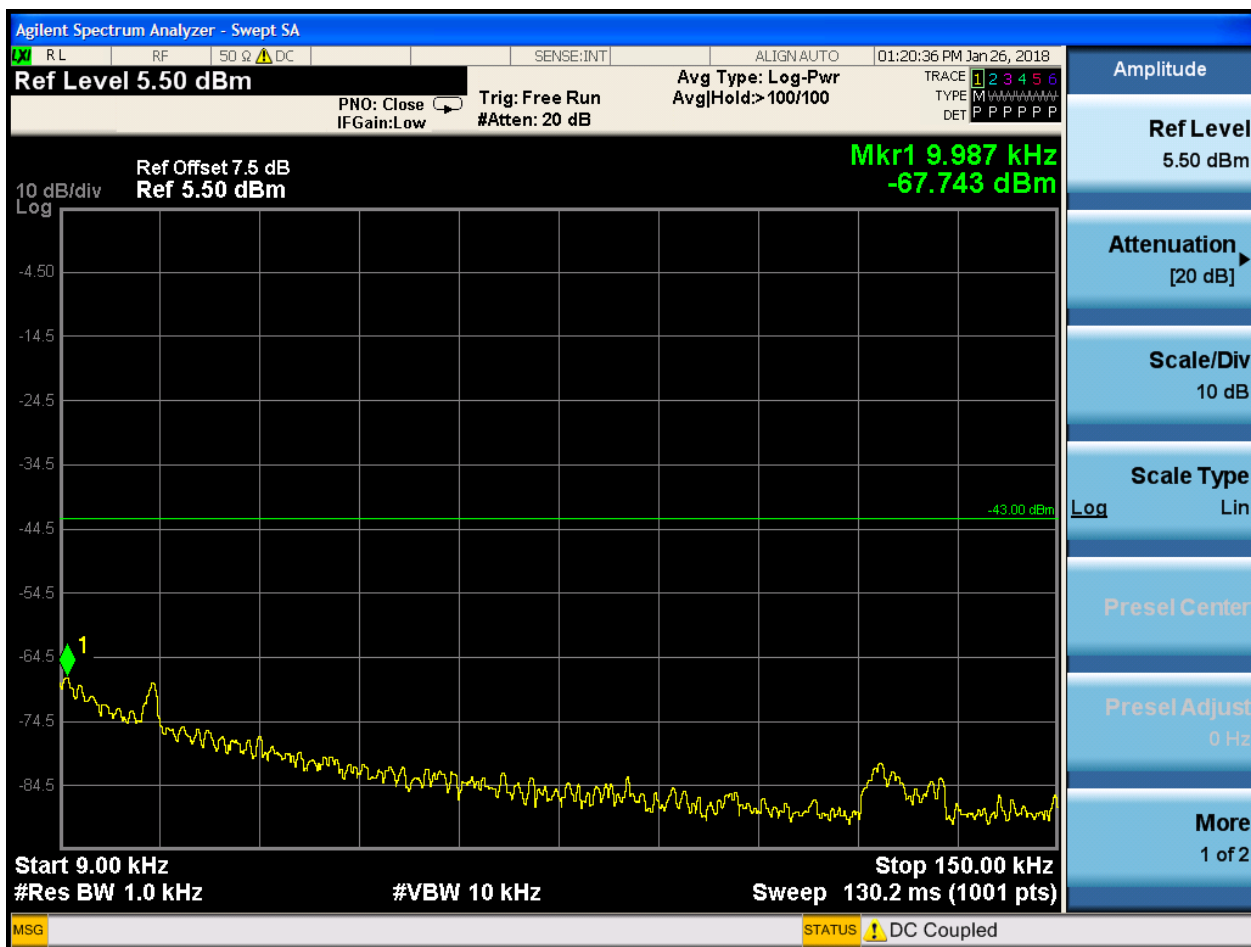


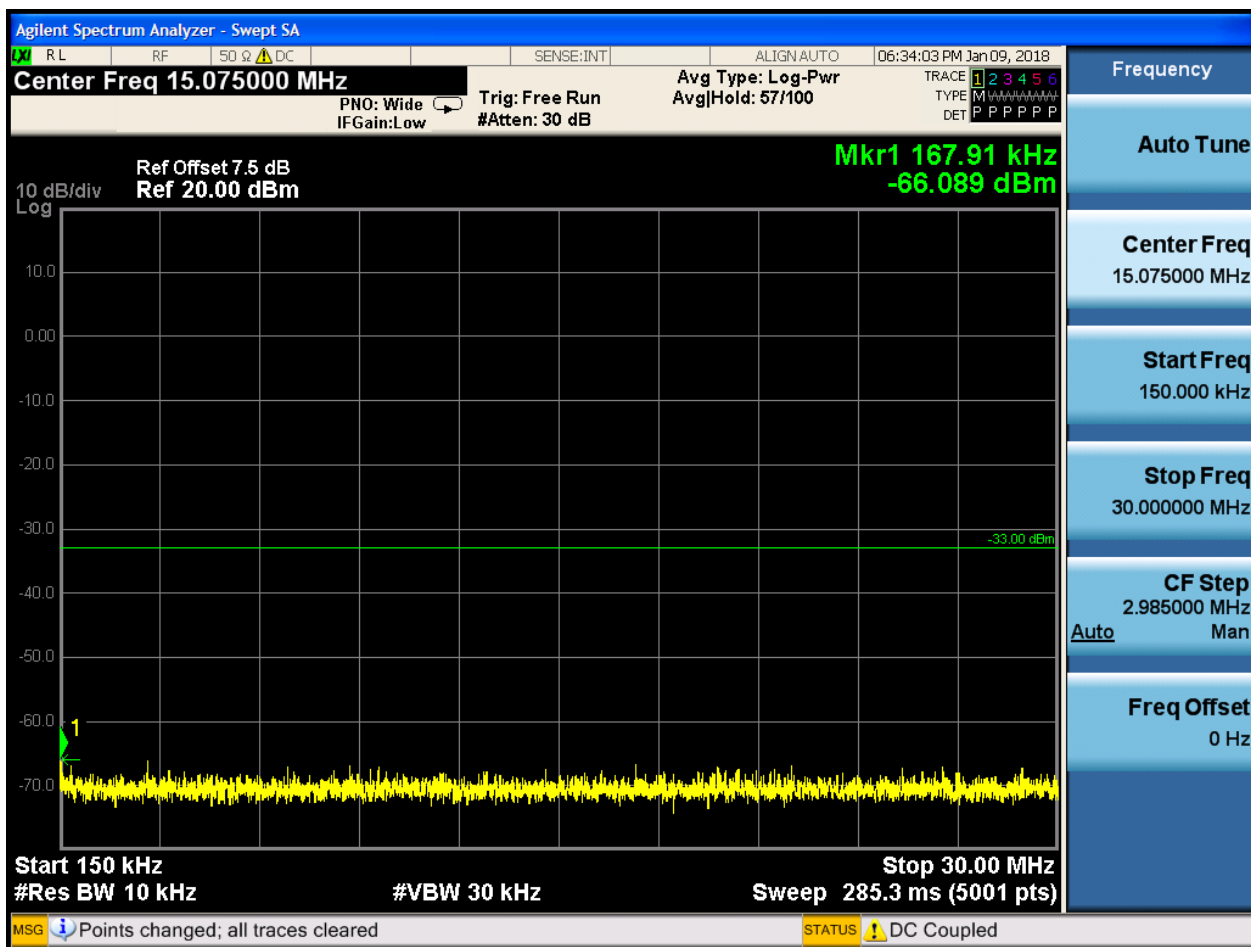






6.1.2.1.3 Test Channel = HCH

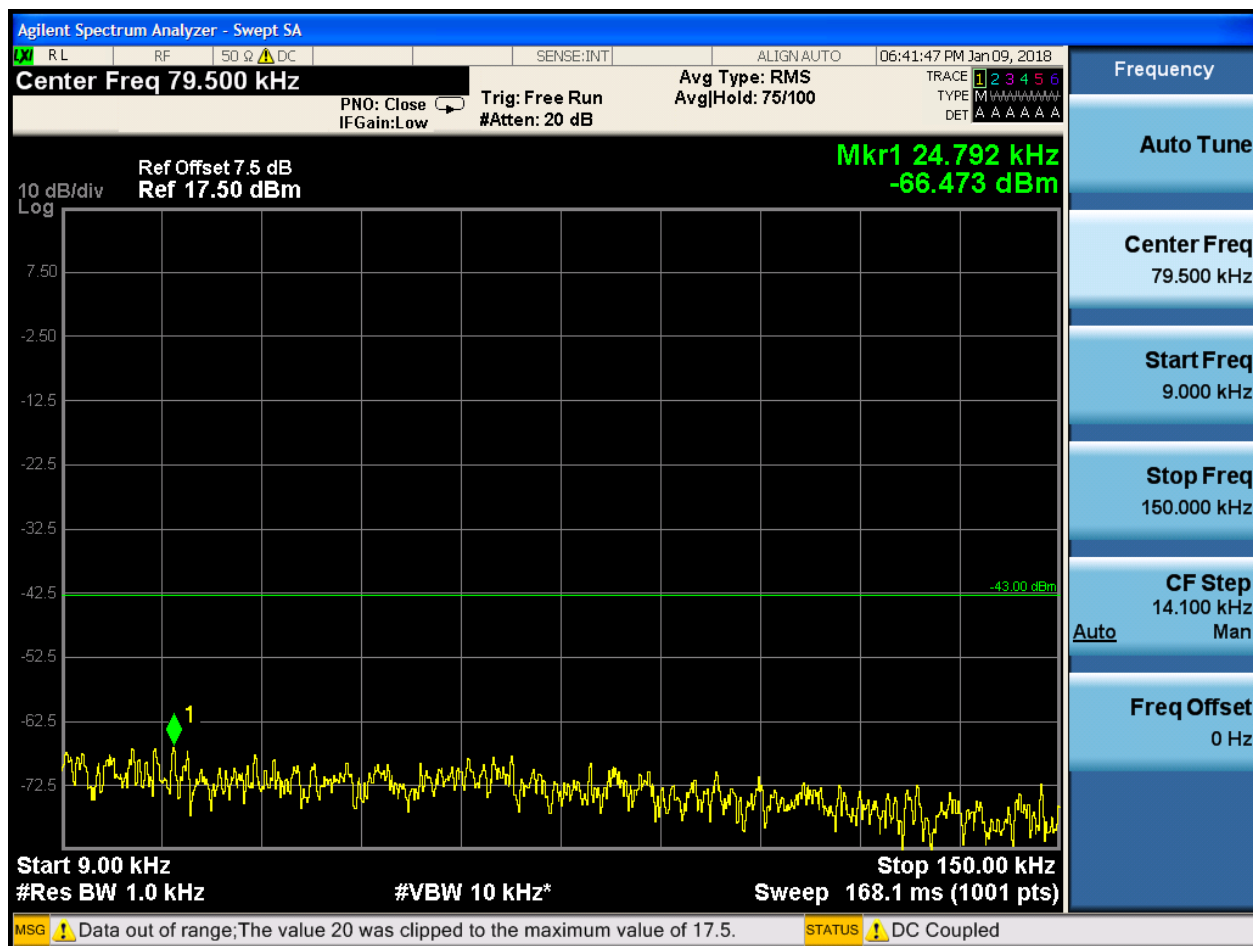


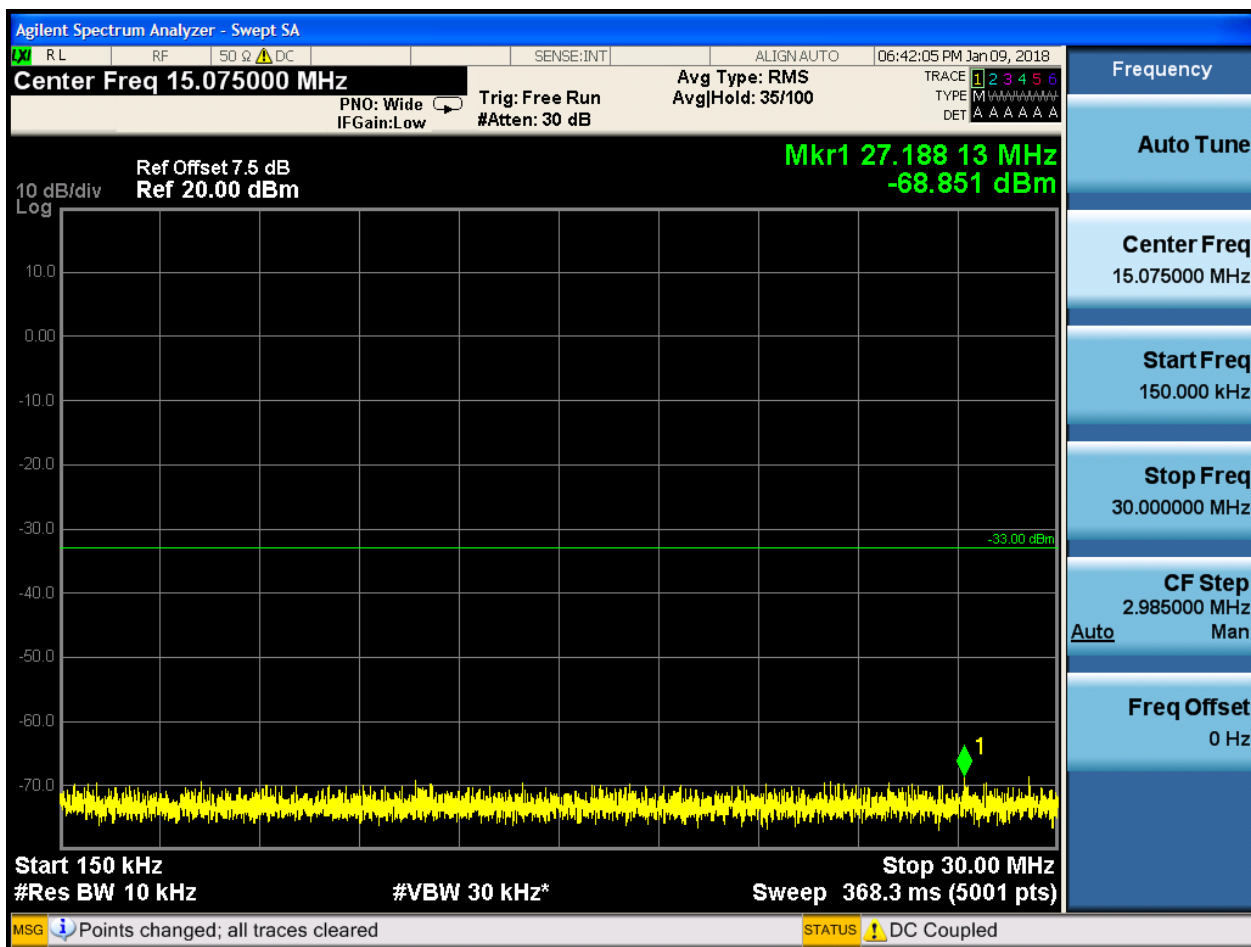


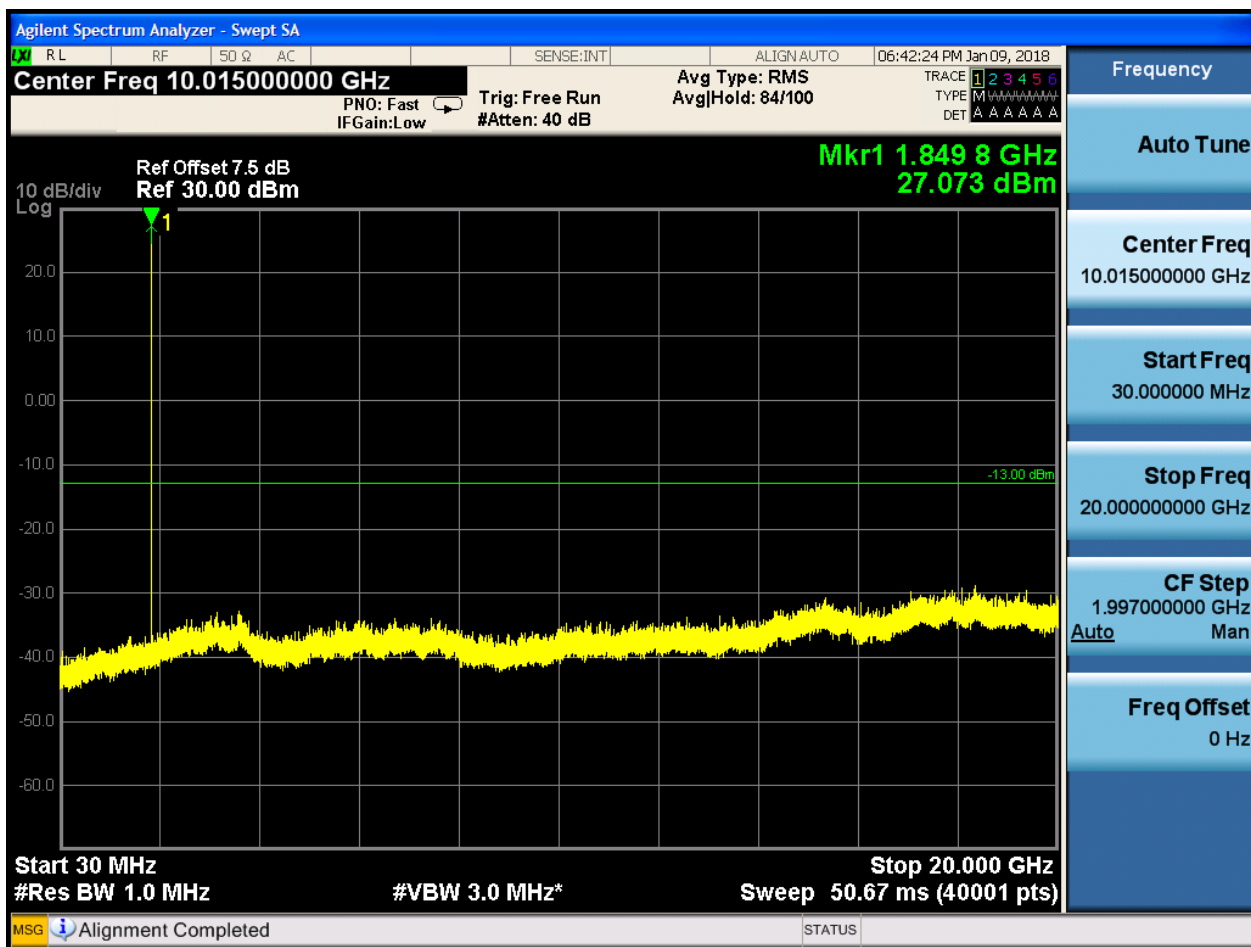


6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

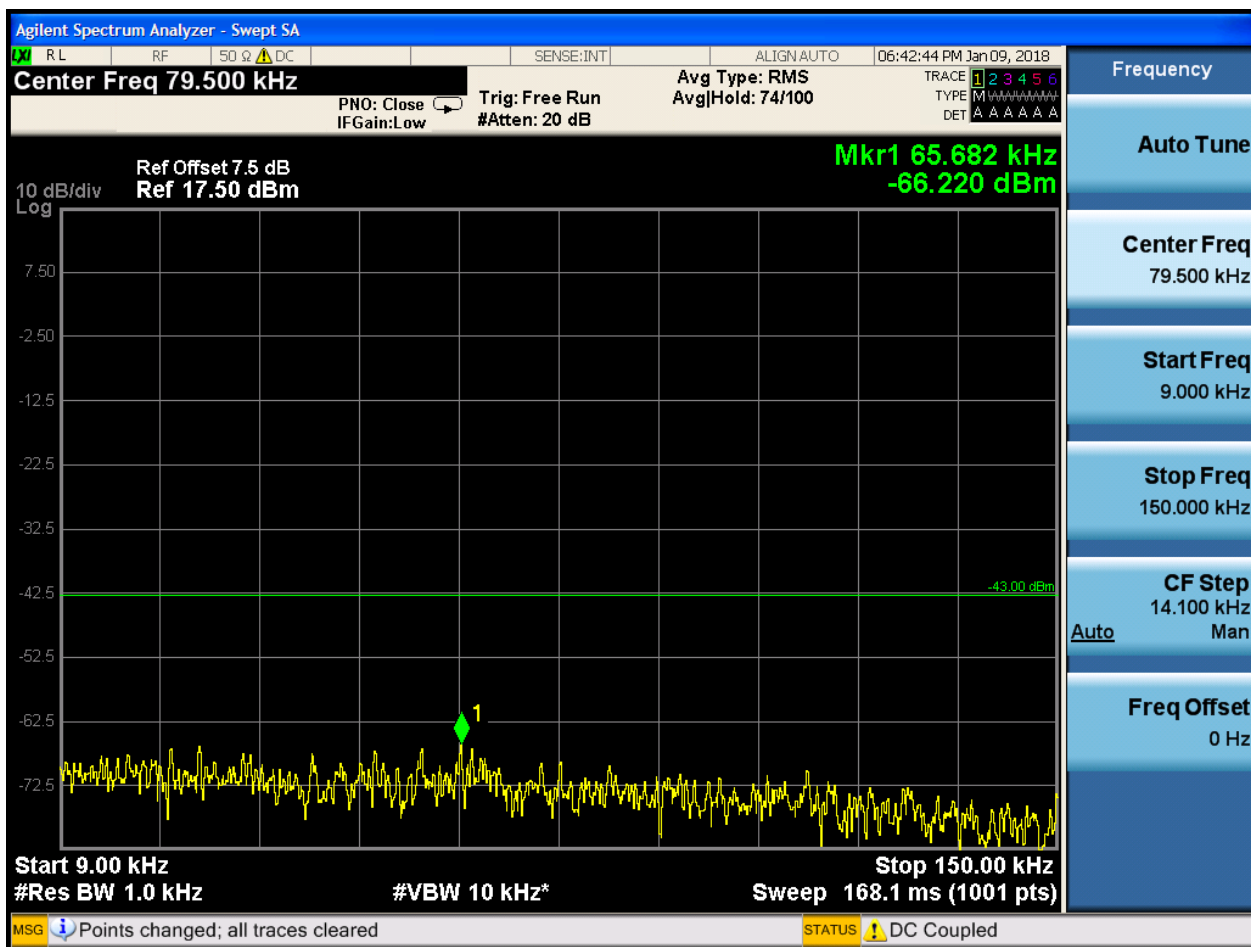


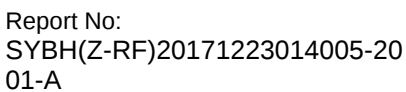


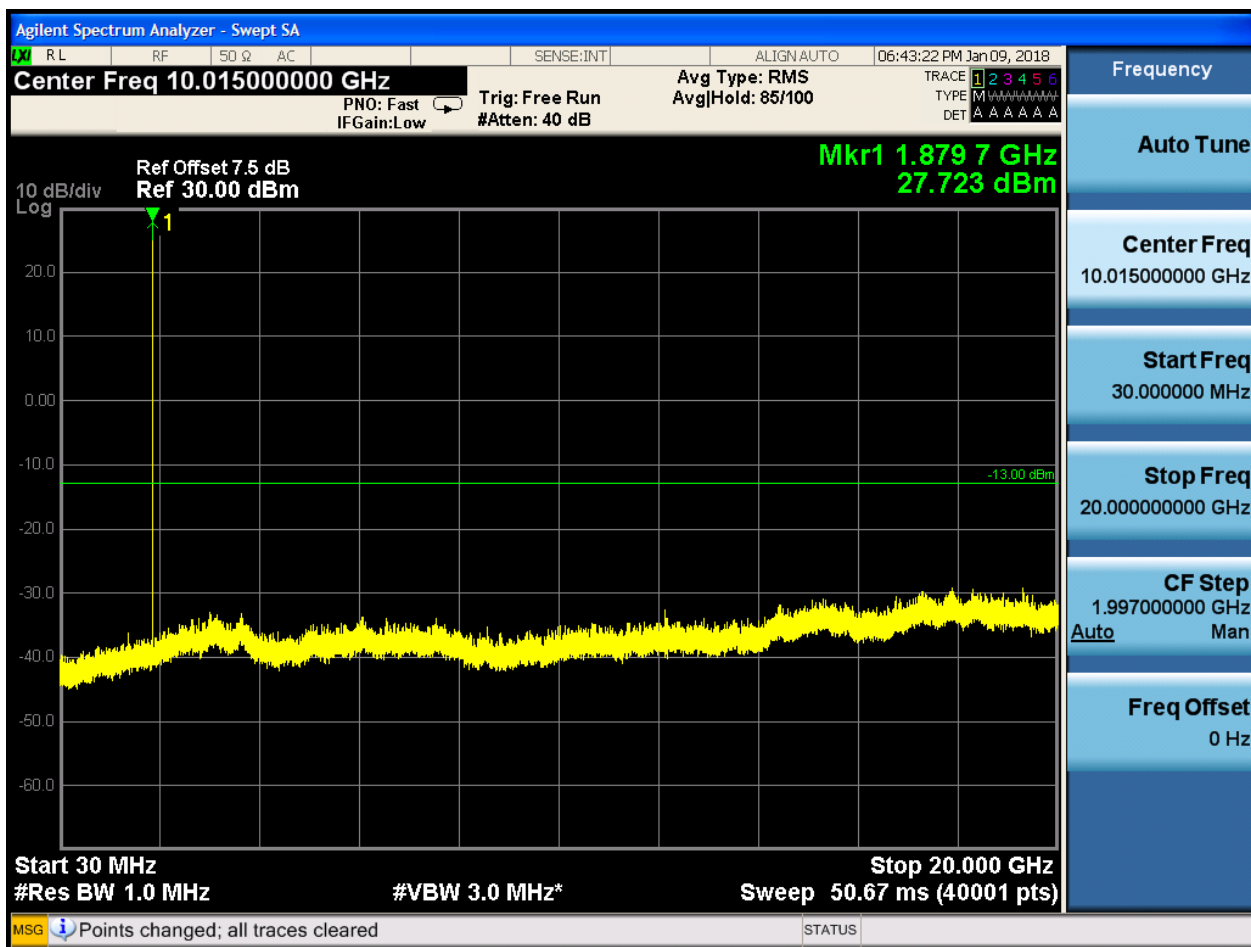




6.1.2.2.2 Test Channel = MCH

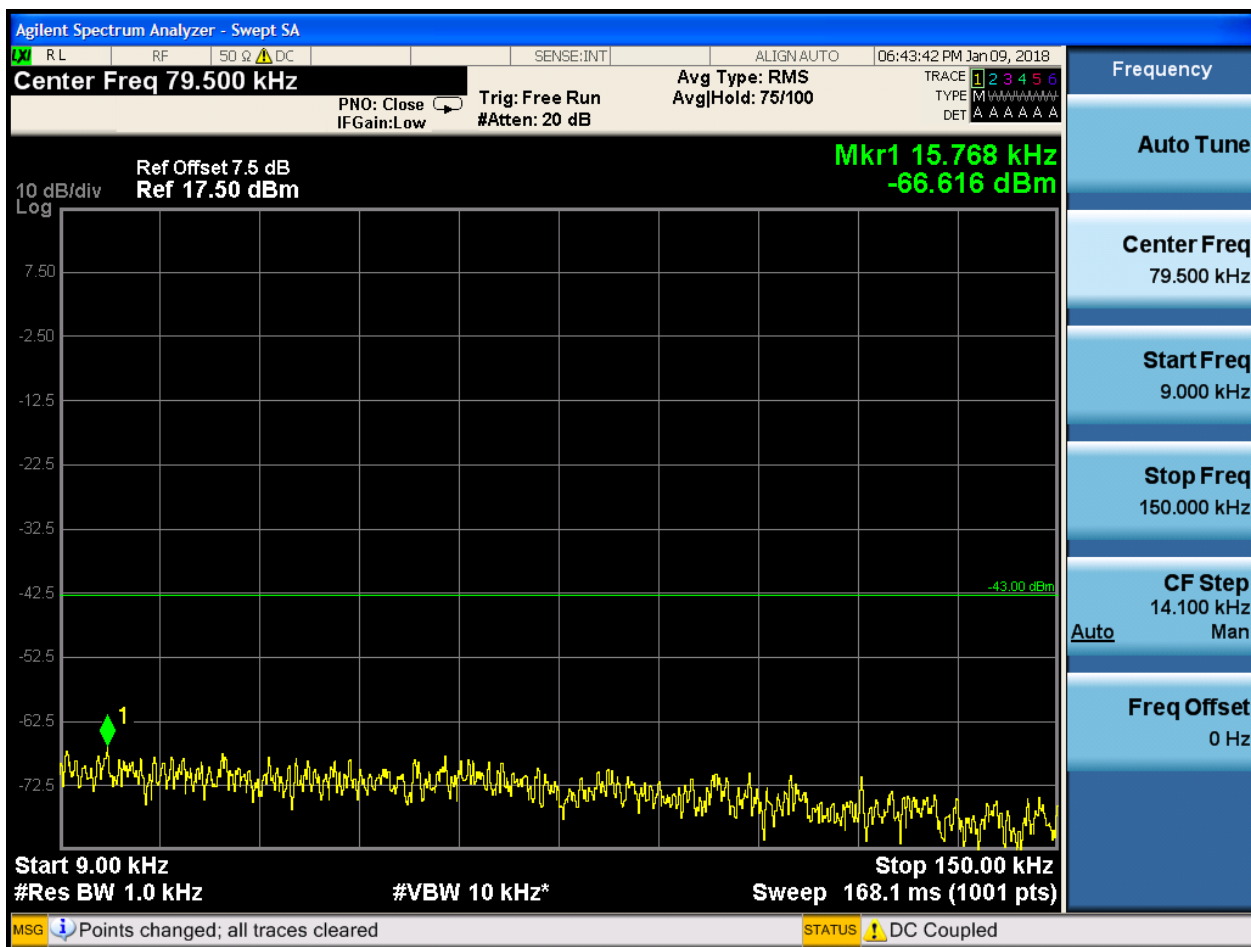


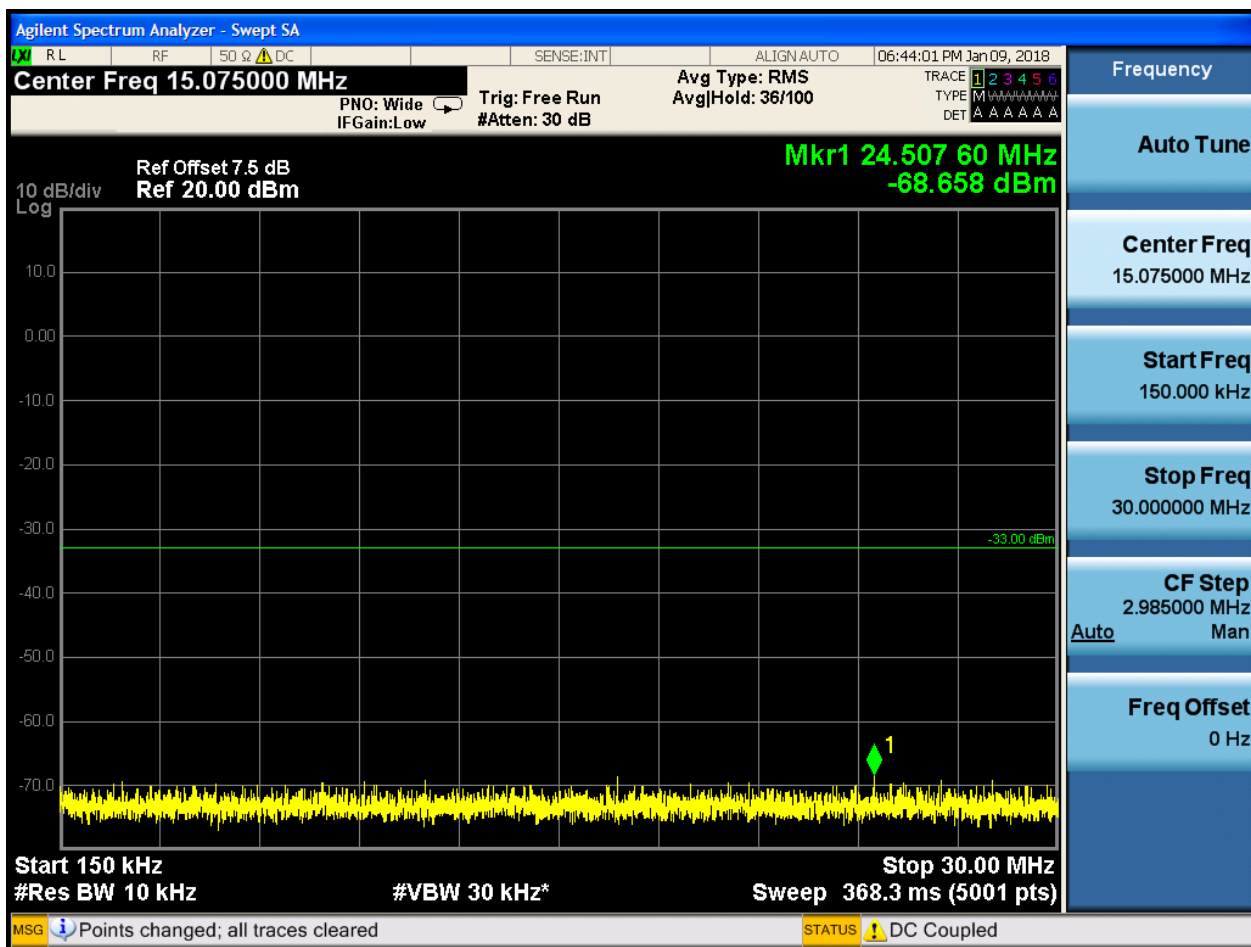


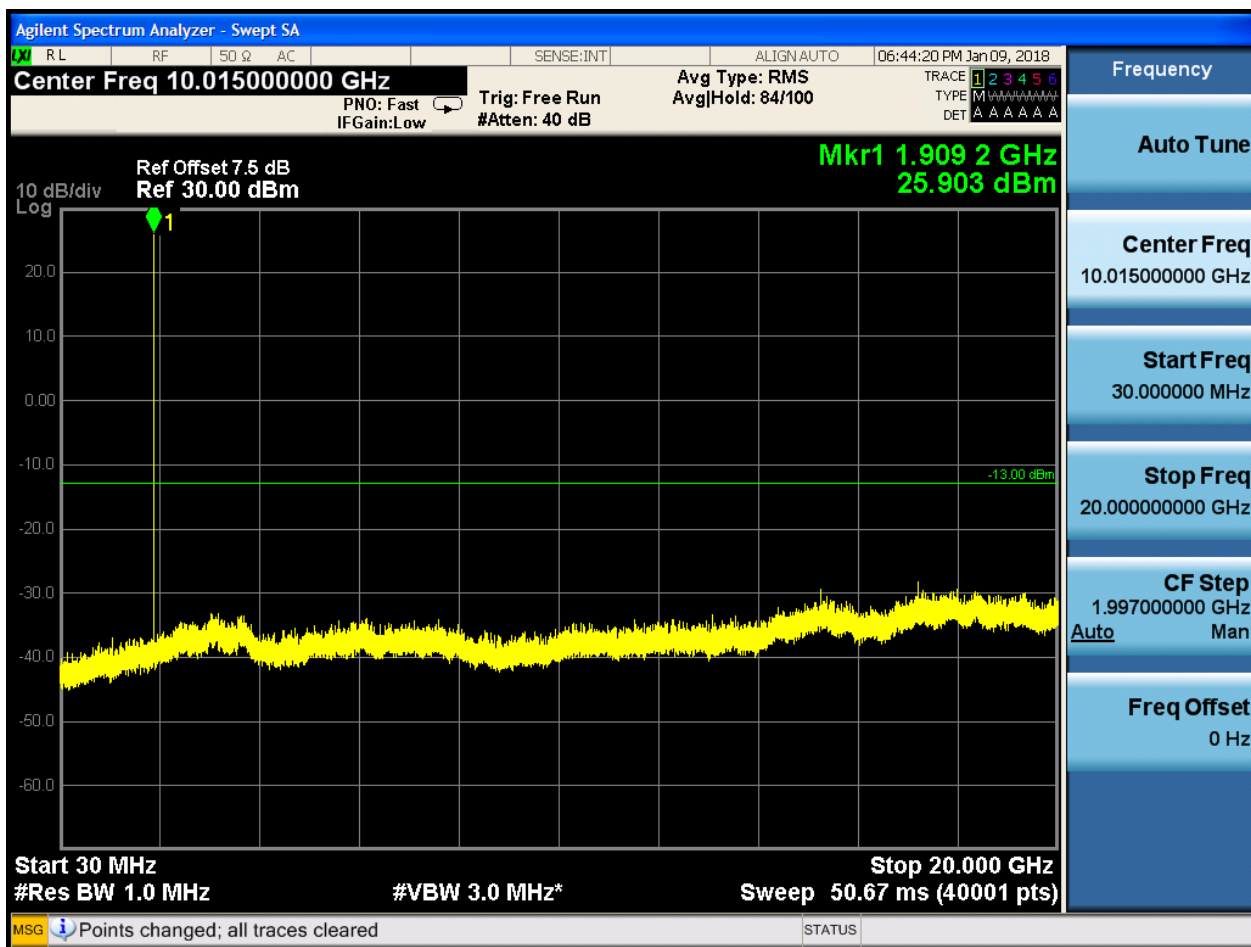




6.1.2.2.3 Test Channel = HCH







7Appendix_G: Field Strength of Spurious Radiation

Note:

9kHz~150kHz, RBW = 200Hz, VBW = 600 Hz, Detector: PK

150kHz~30MHz, RBW = 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

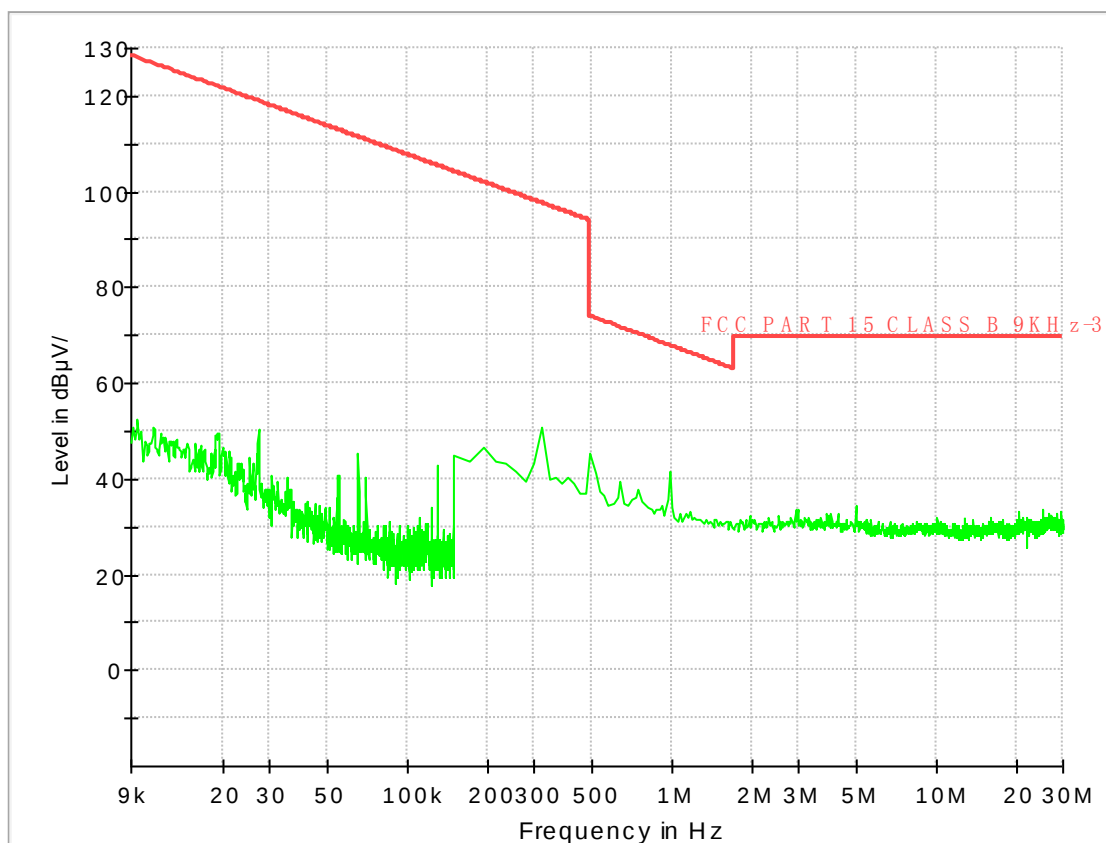
We tested all modes, but the data presented below is the worst case.

Part I - Test Plots

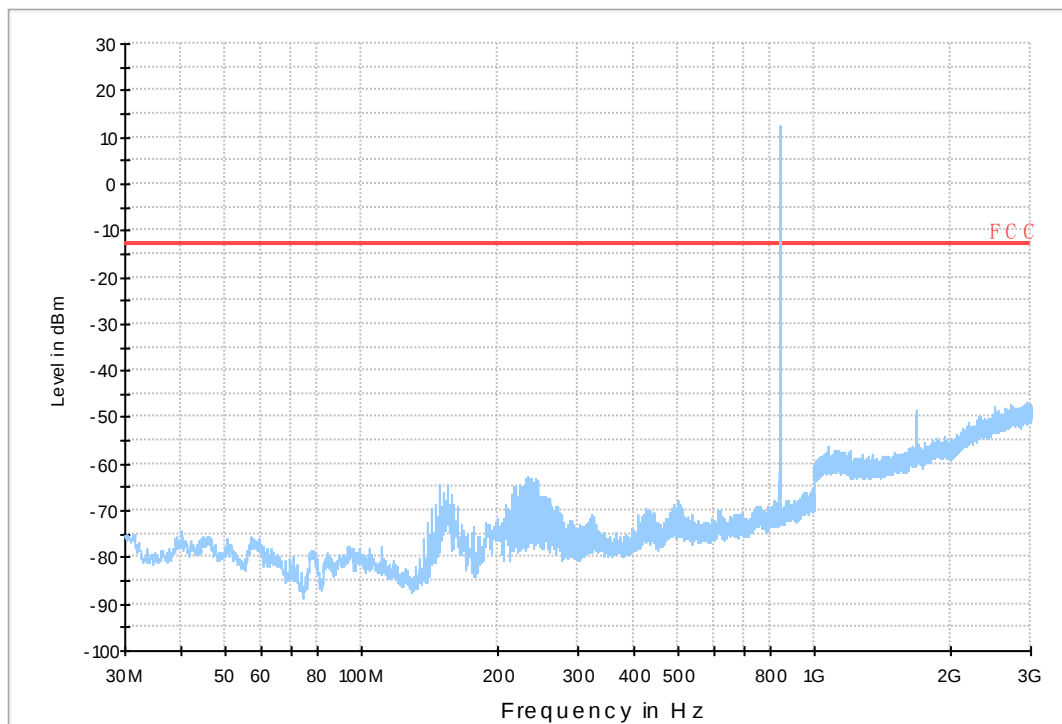
7.1 For GSM

7.1.1 Test Band = GSM850_ANT1

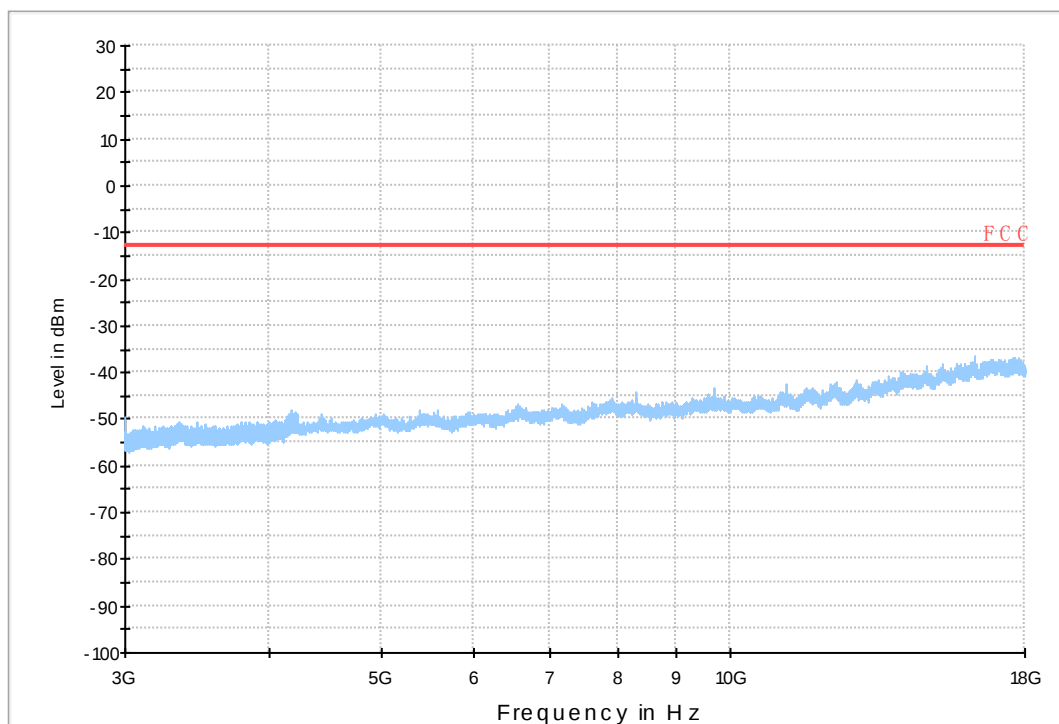
7.1.1.1 Test Mode = GSM/TM1



Copy of FCC PART22 GSM850_L

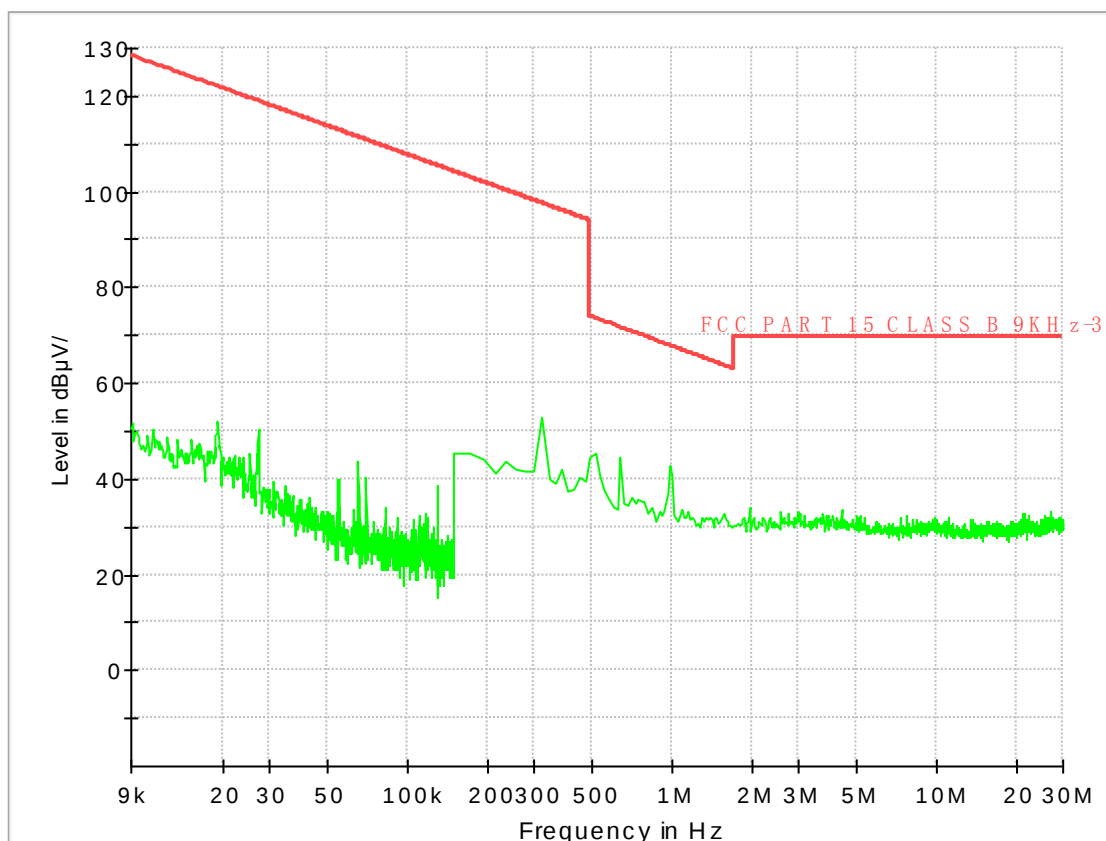


Copy of FCC PART22 GSM850_H

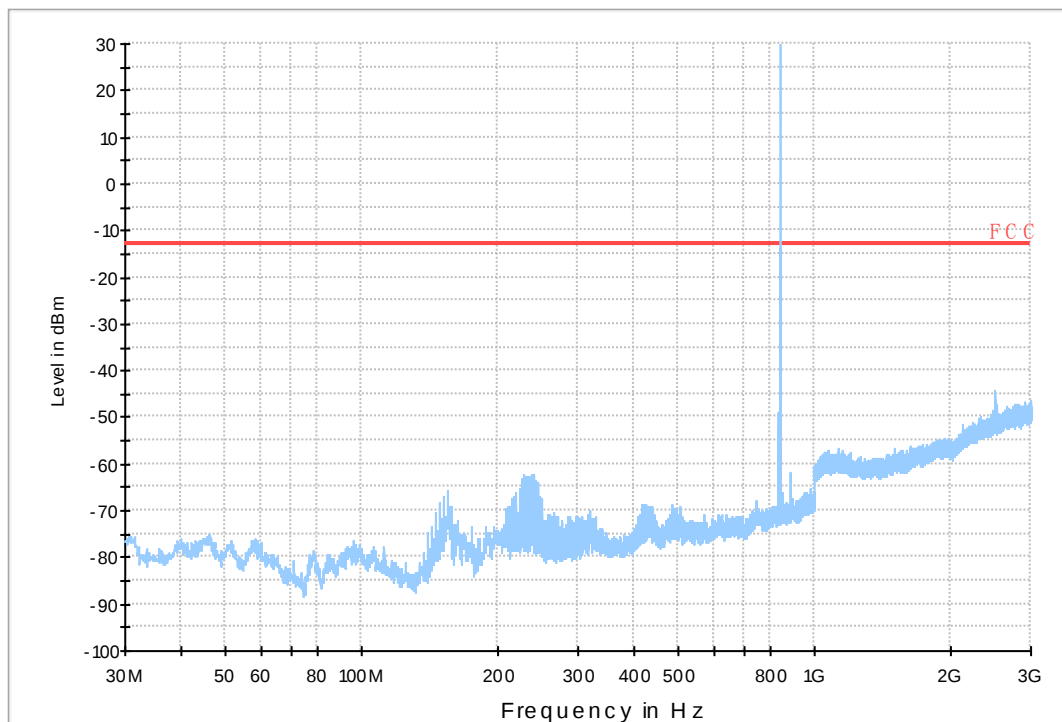


7.1.2 Test Band = GSM850_ANT2

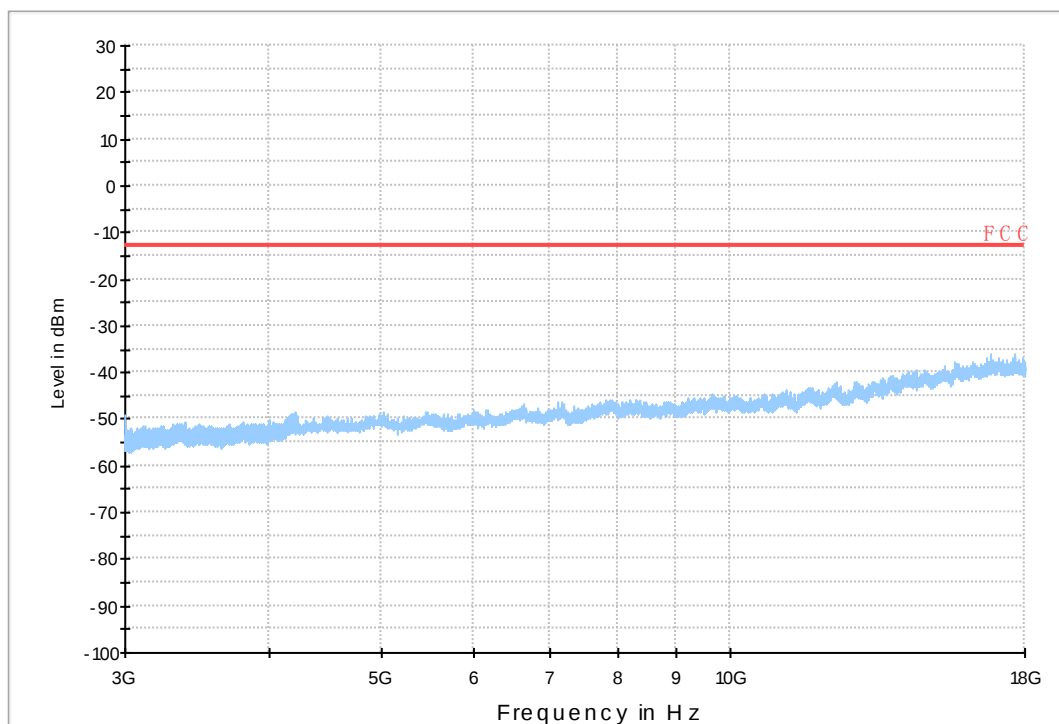
7.1.2.1 Test Mode = GSM/TM1



Copy of FCC PART22 GSM850_L

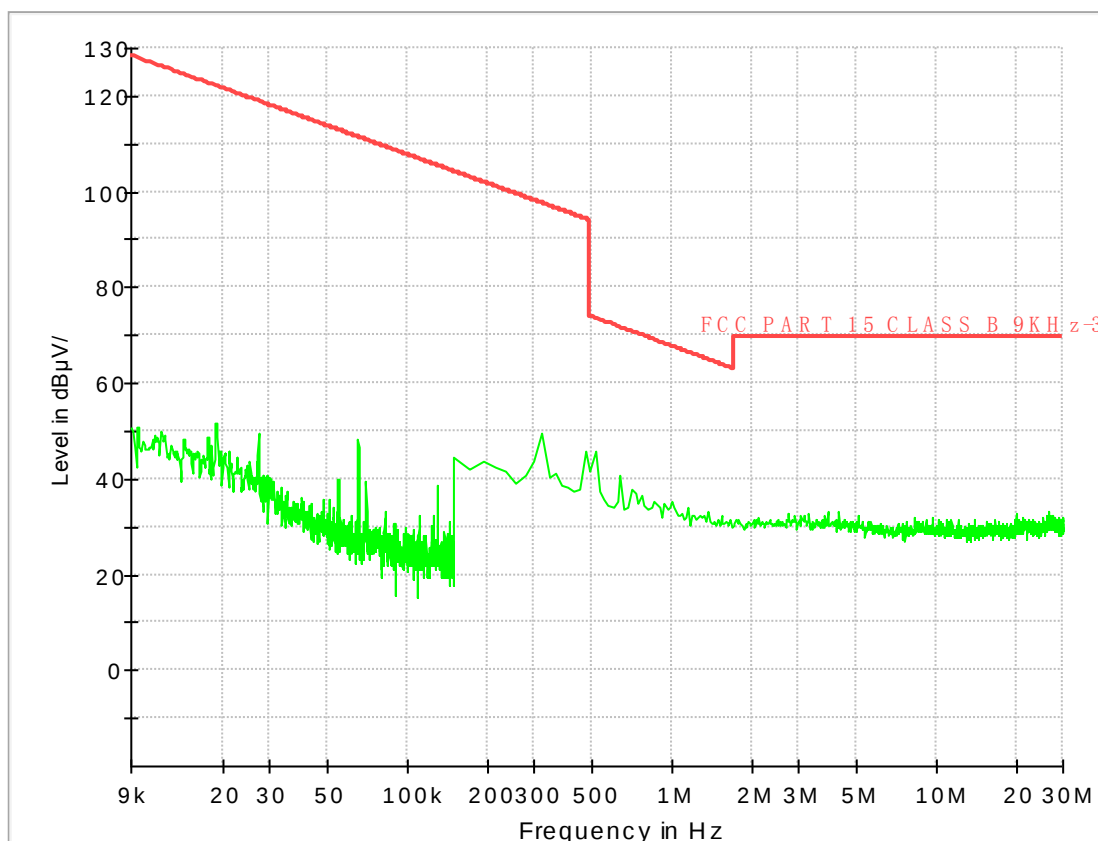


Copy of FCC PART22 GSM850_H

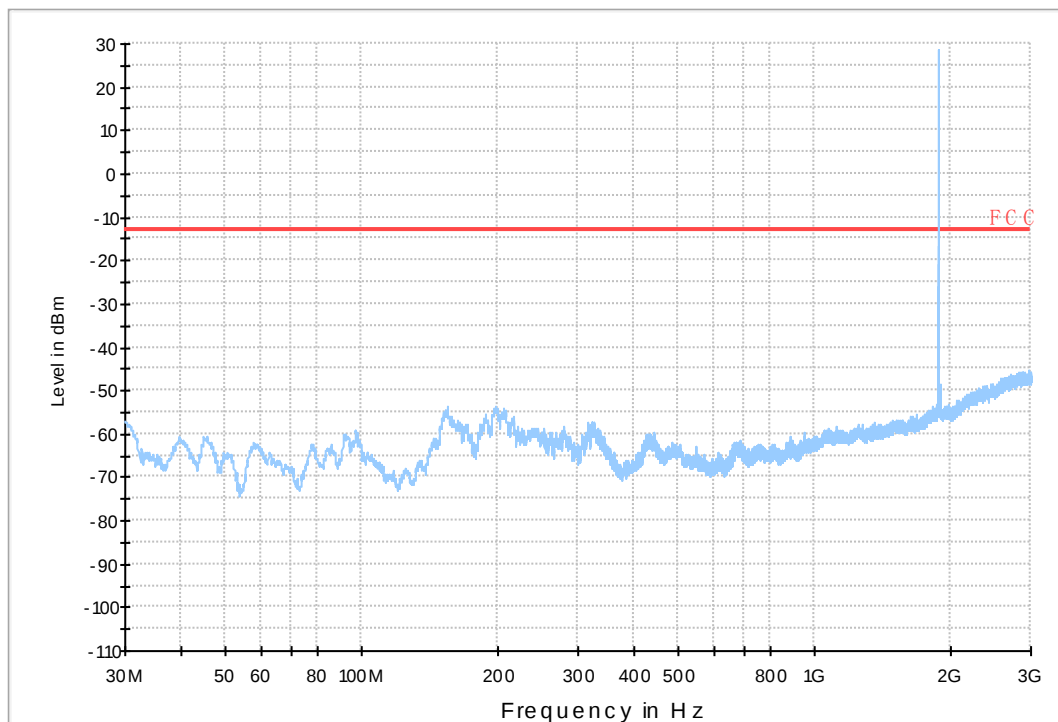


7.1.3 Test Band = GSM1900_ANT1

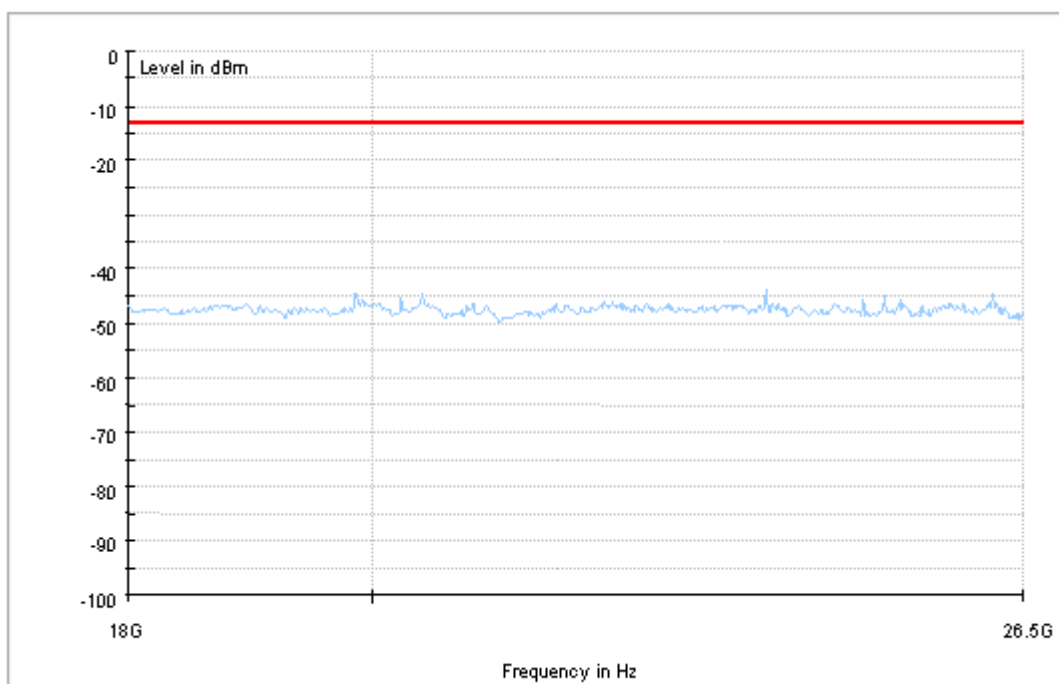
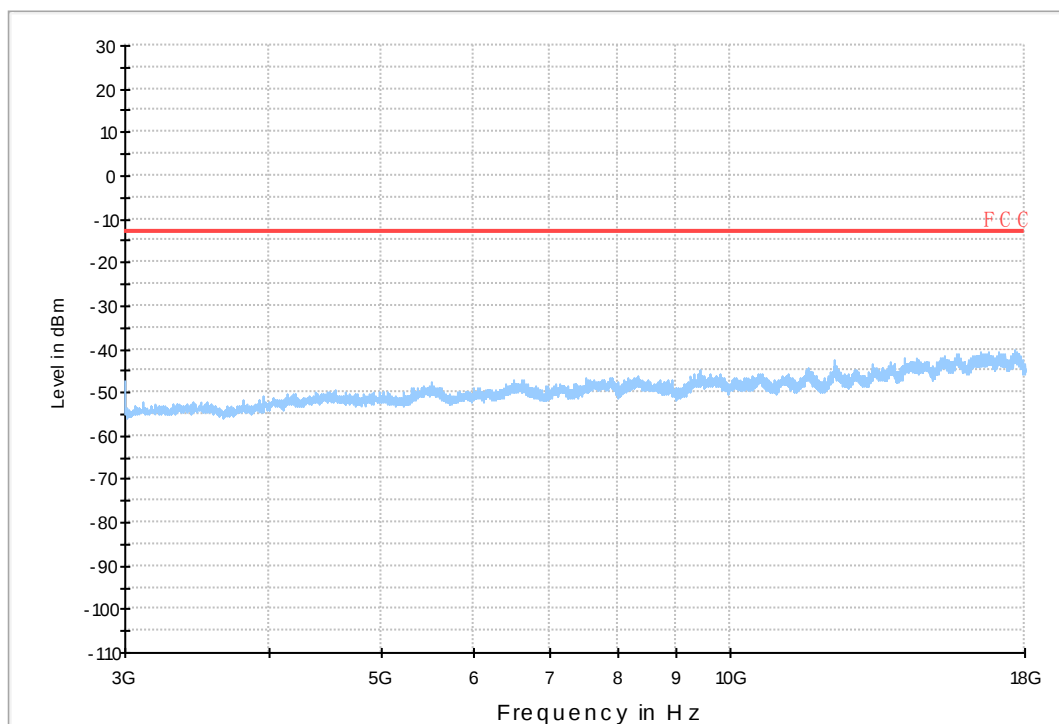
7.1.3.1 Test Mode = GSM/TM1



Copy of FCC PART 24 GSM1900_L

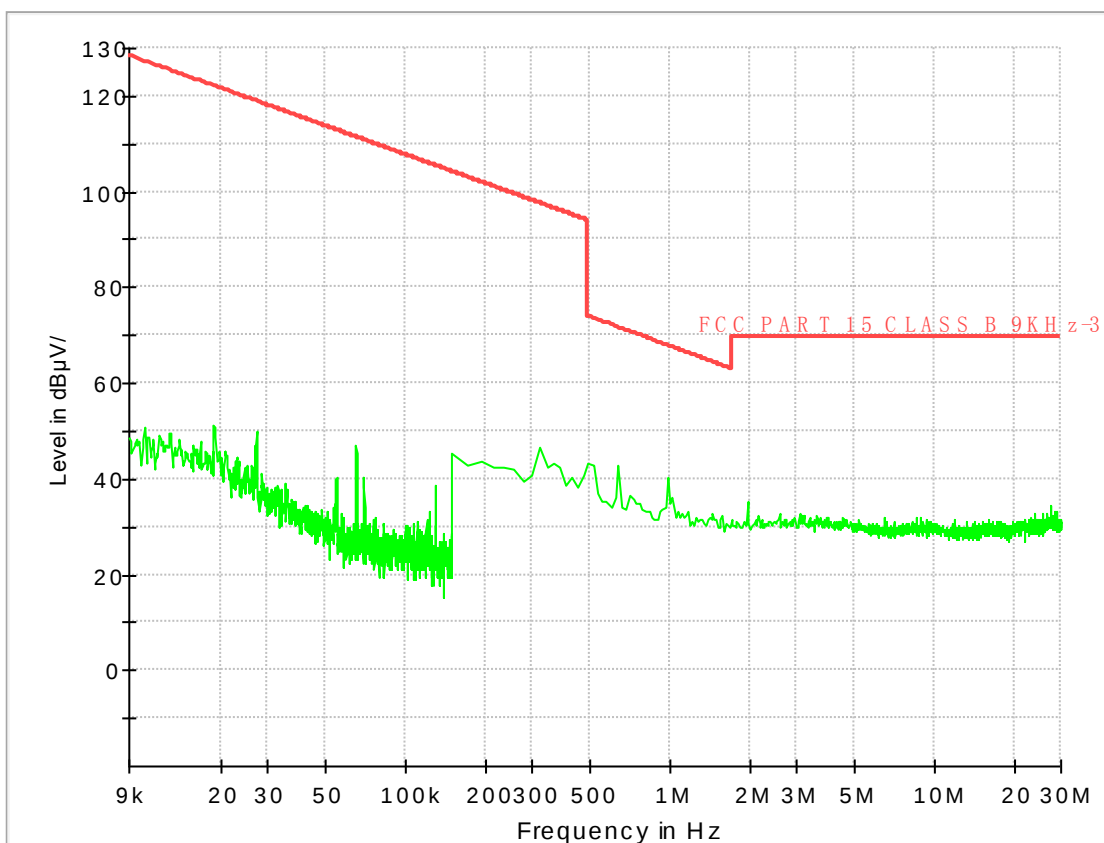


Copy of FCC PART24 GSM1900_H

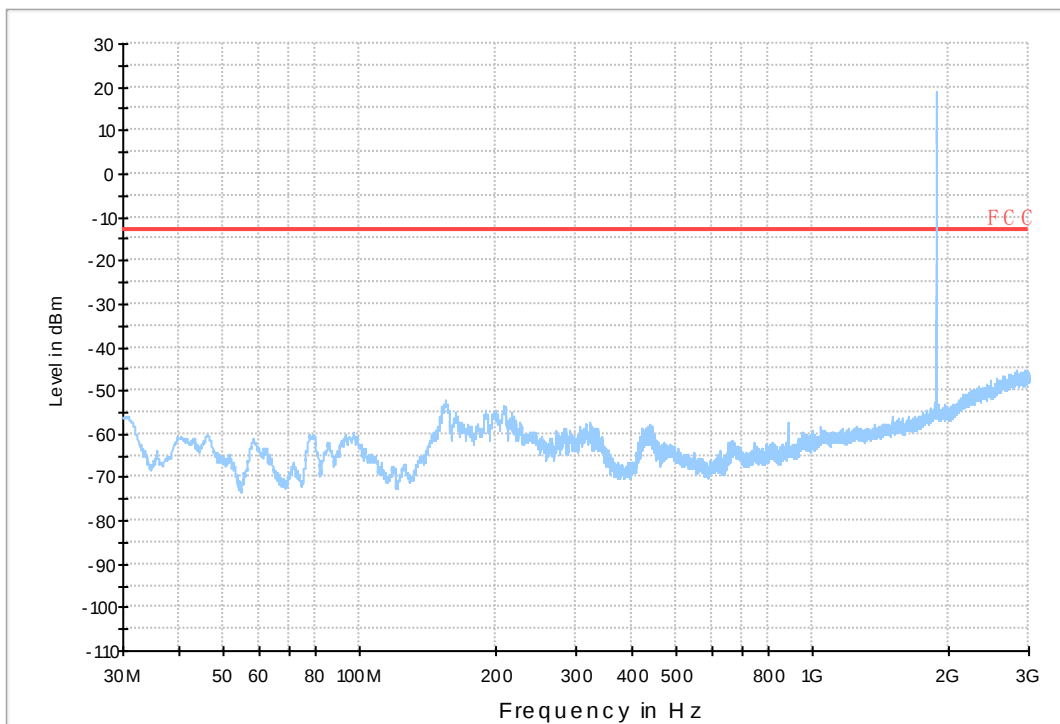


7.1.4 Test Band = GSM1900_ANT2

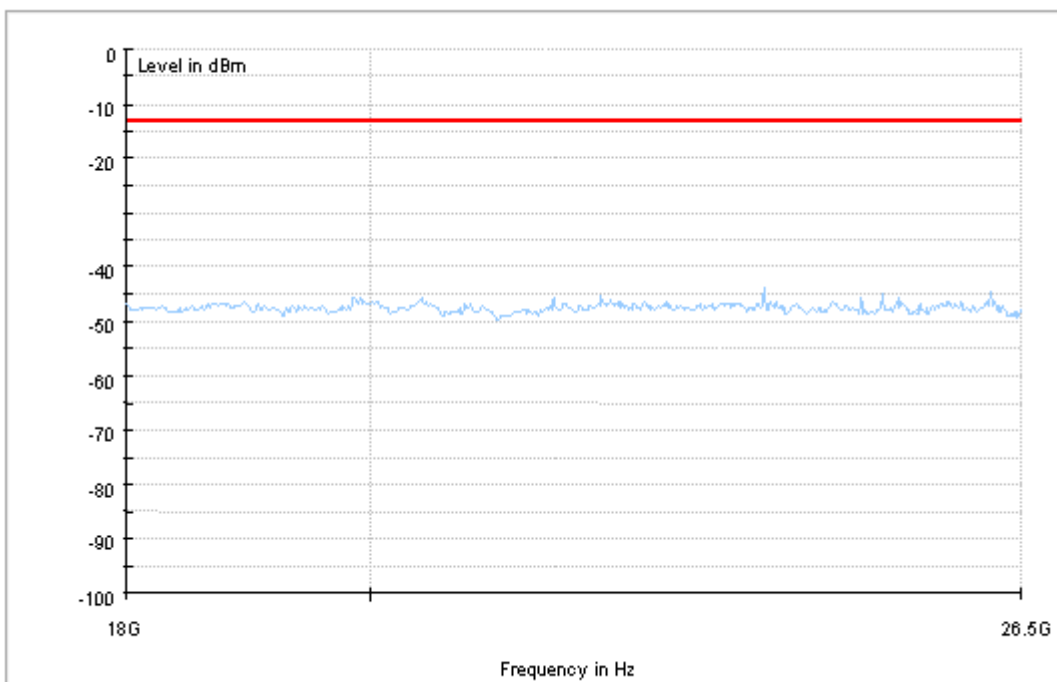
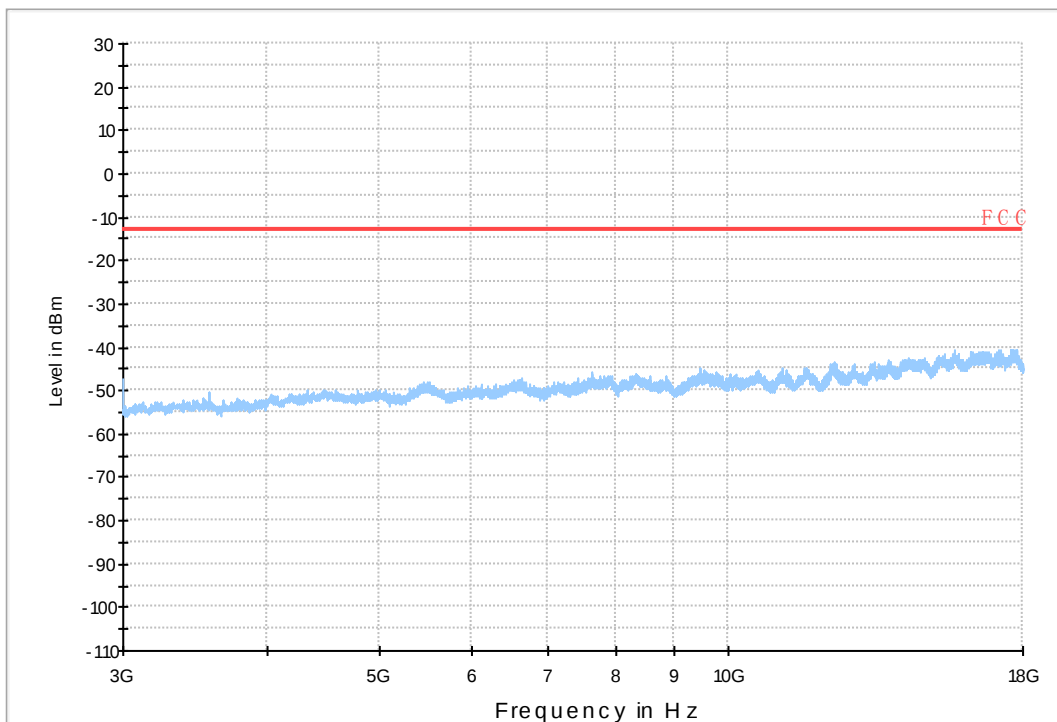
7.1.4.1 Test Mode = GSM/TM1



Copy of FCC PART 24 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	-15.69	-0.01904	PASS
				VN	-14.33	-0.01739	PASS
				VH	-9.36	-0.01136	PASS
		MCH	TN	VL	-9.43	-0.01127	PASS
				VN	-13.17	-0.01574	PASS
				VH	-10.46	-0.0125	PASS
		HCH	TN	VL	-14.33	-0.01688	PASS
				VN	-11.56	-0.01362	PASS
				VH	-12.91	-0.01521	PASS
	GSM/TM2	LCH	TN	VL	-13.24	-0.01606	PASS
				VN	-18.34	-0.02225	PASS
				VH	-15.66	-0.019	PASS
		MCH	TN	VL	-15.59	-0.01863	PASS
				VN	-5.26	-0.00629	PASS
				VH	-16.5	-0.01972	PASS
		HCH	TN	VL	-14.98	-0.01765	PASS
				VN	-15.08	-0.01777	PASS
				VH	-12.88	-0.01517	PASS
GSM1900	GSM/TM1	LCH	TN	VL	18.53	0.01002	PASS
				VN	33.71	0.01822	PASS
				VH	24.21	0.01309	PASS
		MCH	TN	VL	35.26	0.01876	PASS
				VN	23.96	0.01274	PASS
				VH	17.82	0.00948	PASS
		HCH	TN	VL	33.64	0.01761	PASS
				VN	28.86	0.01511	PASS
				VH	39.58	0.02072	PASS
	GSM/TM2	LCH	TN	VL	26.6	0.01438	PASS
				VN	36.94	0.01997	PASS
				VH	29.38	0.01588	PASS
		MCH	TN	VL	16.72	0.00889	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VN	20.6	0.01096	PASS
				VH	29.86	0.01588	PASS
		HCH	TN	VL	25.76	0.01349	PASS
				VN	14.46	0.00757	PASS
				VH	45.59	0.02387	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	-14.21	-0.01724	PASS
				-20	-15.5	-0.01881	PASS
				-10	-14.92	-0.0181	PASS
				0	-12.85	-0.01559	PASS
				10	-15.17	-0.01841	PASS
				20	-13.75	-0.01668	PASS
				30	-13.24	-0.01606	PASS
				40	-17.69	-0.02146	PASS
				50	-14.66	-0.01779	PASS
		MCH	VN	-30	-12.46	-0.01489	PASS
				-20	-15.69	-0.01875	PASS
				-10	-14.85	-0.01775	PASS
				0	-12.4	-0.01482	PASS
				10	-12.01	-0.01436	PASS
				20	-12.46	-0.01489	PASS
				30	-15.63	-0.01868	PASS
				40	-16.21	-0.01938	PASS
				50	-14.66	-0.01752	PASS
		HCH	VN	-30	-8.01	-0.00944	PASS
				-20	-11.56	-0.01362	PASS
				-10	-14.66	-0.01727	PASS
				0	-13.62	-0.01605	PASS
				10	-8.98	-0.01058	PASS
				20	-11.88	-0.014	PASS
				30	-14.85	-0.0175	PASS
				40	-12.14	-0.0143	PASS
				50	-9.43	-0.01111	PASS
	GSM/TM2	LCH	VN	-30	-18.24	-0.02213	PASS
				-20	-13.3	-0.01614	PASS
				-10	-19.44	-0.02359	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				0	-14.21	-0.01724	PASS
				10	-22.57	-0.02738	PASS
				20	-17.27	-0.02095	PASS
				30	-17.01	-0.02064	PASS
				40	-12.11	-0.01469	PASS
				50	-13.2	-0.01602	PASS
		MCH	VN	-30	-11.78	-0.01408	PASS
				-20	-17.79	-0.02126	PASS
				-10	-8.33	-0.00996	PASS
				0	-20.18	-0.02412	PASS
				10	-18.69	-0.02234	PASS
				20	-11.62	-0.01389	PASS
				30	-11.01	-0.01316	PASS
				40	-12.75	-0.01524	PASS
				50	-10.53	-0.01259	PASS
		HCH	VN	-30	-7.81	-0.0092	PASS
				-20	-10.53	-0.01241	PASS
				-10	-15.79	-0.0186	PASS
				0	-9.69	-0.01142	PASS
				10	-4.16	-0.0049	PASS
				20	-15.4	-0.01814	PASS
				30	-8.49	-0.01	PASS
				40	-8.46	-0.00997	PASS
				50	-8.3	-0.00978	PASS
GSM1900	GSM/TM1	LCH	VN	-30	26.67	0.01441	PASS
				-20	24.8	0.0134	PASS
				-10	29.9	0.01616	PASS
				0	27.89	0.01507	PASS
				10	28.99	0.01567	PASS
				20	33.58	0.01815	PASS
				30	34.8	0.01881	PASS
				40	35.71	0.0193	PASS
				50	28.61	0.01546	PASS
		MCH	VN	-30	12.98	0.0069	PASS
				-20	29.96	0.01594	PASS
				-10	22.92	0.01219	PASS
				0	27.57	0.01466	PASS
				10	20.86	0.0111	PASS
				20	30.03	0.01597	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	11.43	0.00608	PASS
				40	21.63	0.01151	PASS
				50	18.14	0.00965	PASS
		HCH	VN	-30	17.37	0.0091	PASS
				-20	33.84	0.01772	PASS
				-10	36.16	0.01893	PASS
				0	33.45	0.01751	PASS
				10	27.77	0.01454	PASS
				20	36.55	0.01914	PASS
				30	28.67	0.01501	PASS
				40	43.2	0.02262	PASS
				50	39.52	0.02069	PASS
	GSM/TM2	LCH	VN	-30	20.76	0.01122	PASS
				-20	33.77	0.01825	PASS
				-10	28.06	0.01517	PASS
				0	21.31	0.01152	PASS
				10	14.82	0.00801	PASS
				20	27.41	0.01481	PASS
				30	25.7	0.01389	PASS
				40	19.69	0.01064	PASS
				50	26.41	0.01427	PASS
		MCH	VN	-30	20.34	0.01082	PASS
				-20	4.04	0.00215	PASS
				-10	31.09	0.01654	PASS
				0	24.8	0.01319	PASS
				10	18.73	0.00996	PASS
				20	42.62	0.02267	PASS
				30	18.4	0.00979	PASS
				40	19.98	0.01063	PASS
				50	34.71	0.01846	PASS
		HCH	VN	-30	18.53	0.0097	PASS
				-20	10.01	0.00524	PASS
				-10	34.29	0.01795	PASS
				0	22.12	0.01158	PASS
				10	29.06	0.01522	PASS
				20	37.1	0.01943	PASS
				30	23.7	0.01241	PASS
				40	28.96	0.01516	PASS
				50	30.28	0.01586	PASS



END