



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[dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	29.88	28.68	33	PASS
		MCH	29.82	28.62	33	PASS
		HCH	29.89	28.69	33	PASS
	GSM/TM2	LCH	25.04	23.84	33	PASS
		MCH	25.1	23.9	33	PASS
		HCH	25.04	23.84	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:

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

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

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

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

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	0.31	13	PASS
		MCH	0.3	13	PASS
		HCH	0.31	13	PASS
	GSM/TM2	LCH	3.1	13	PASS
		MCH	2.91	13	PASS
		HCH	3.17	13	PASS

3Appendix_C: Modulation Characteristics

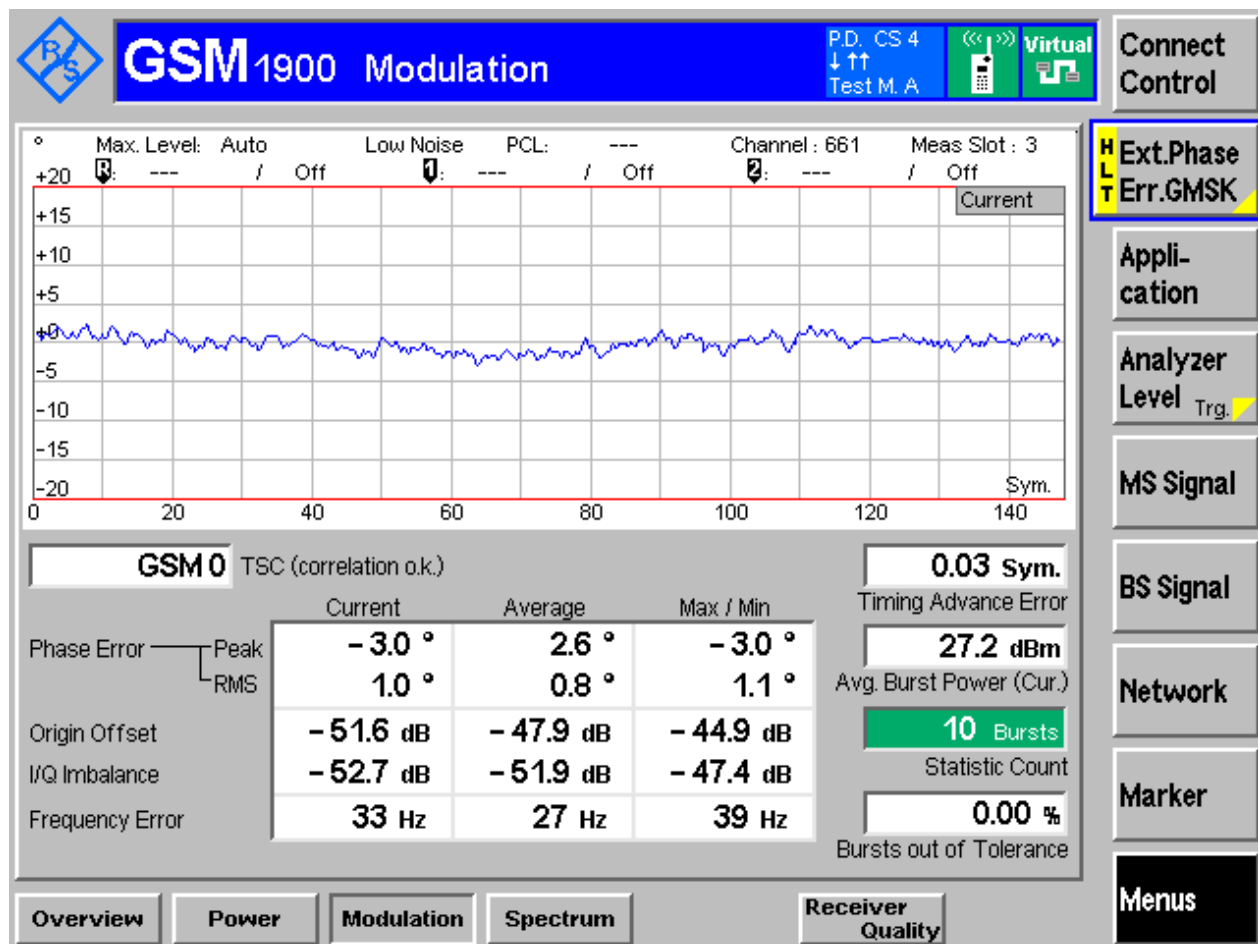
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM1900

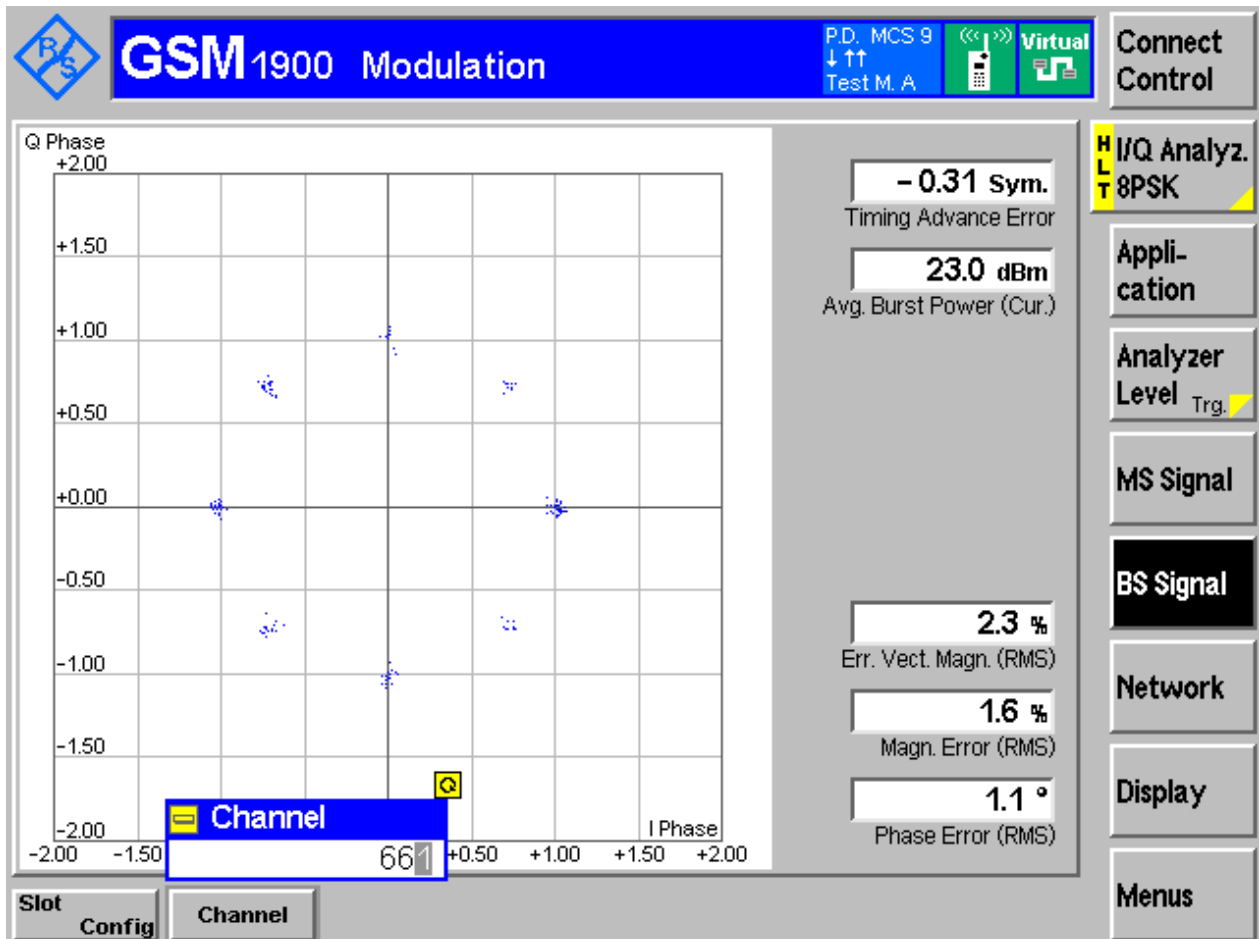
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

3.1.1.2.1 Test Channel = MCH



4Appendix_D: Bandwidth

Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
GSM1900	GSM/TM1	LCH	242.66	310.50	Pass
		MCH	243.43	313.13	Pass
		HCH	244.57	312.21	Pass
	GSM/TM2	LCH	248.64	316.23	Pass
		MCH	251.02	312.26	Pass
		HCH	250.43	320.26	Pass

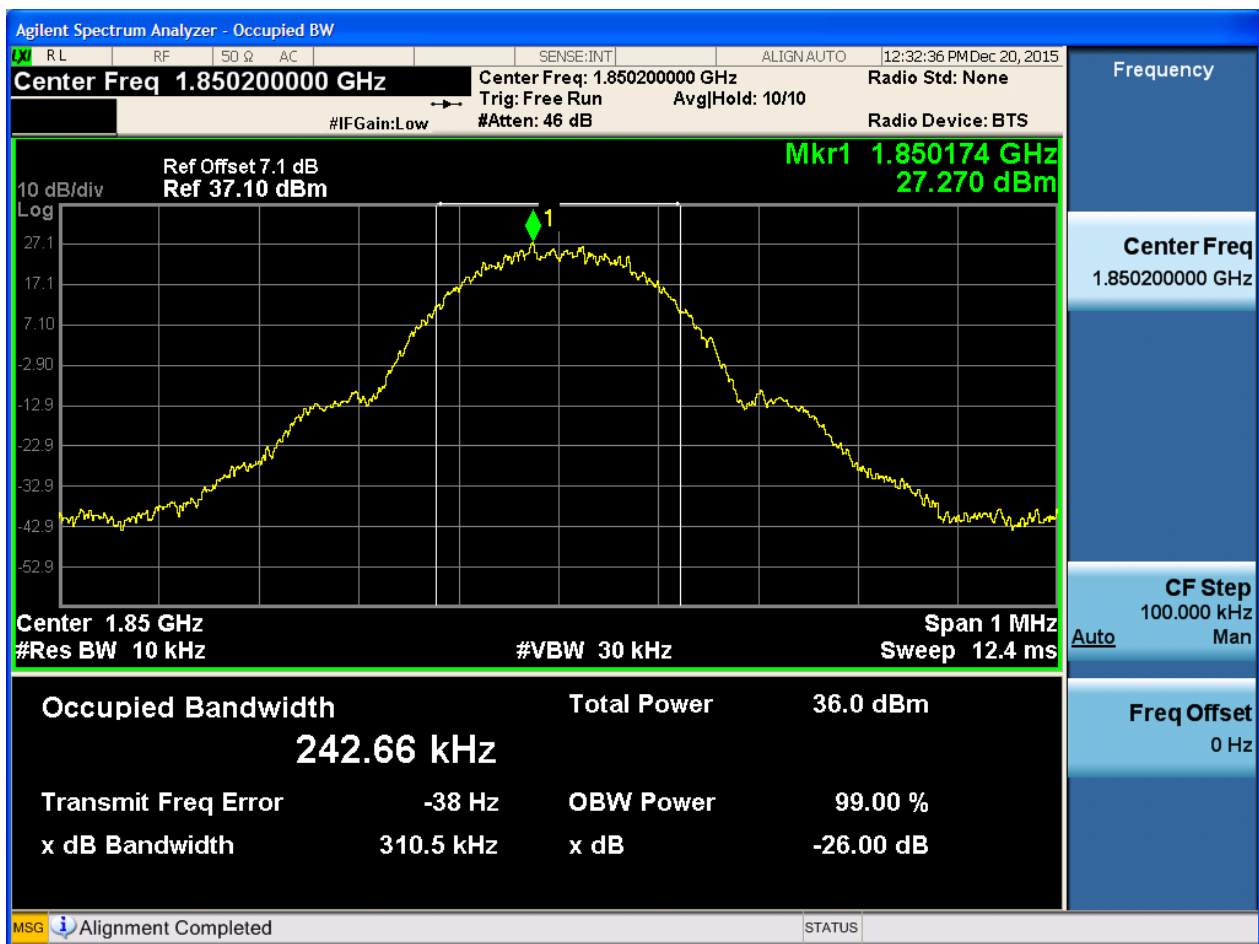
Part II - Test Plots

4.1 For GSM

4.1.1 Test Band = GSM1900

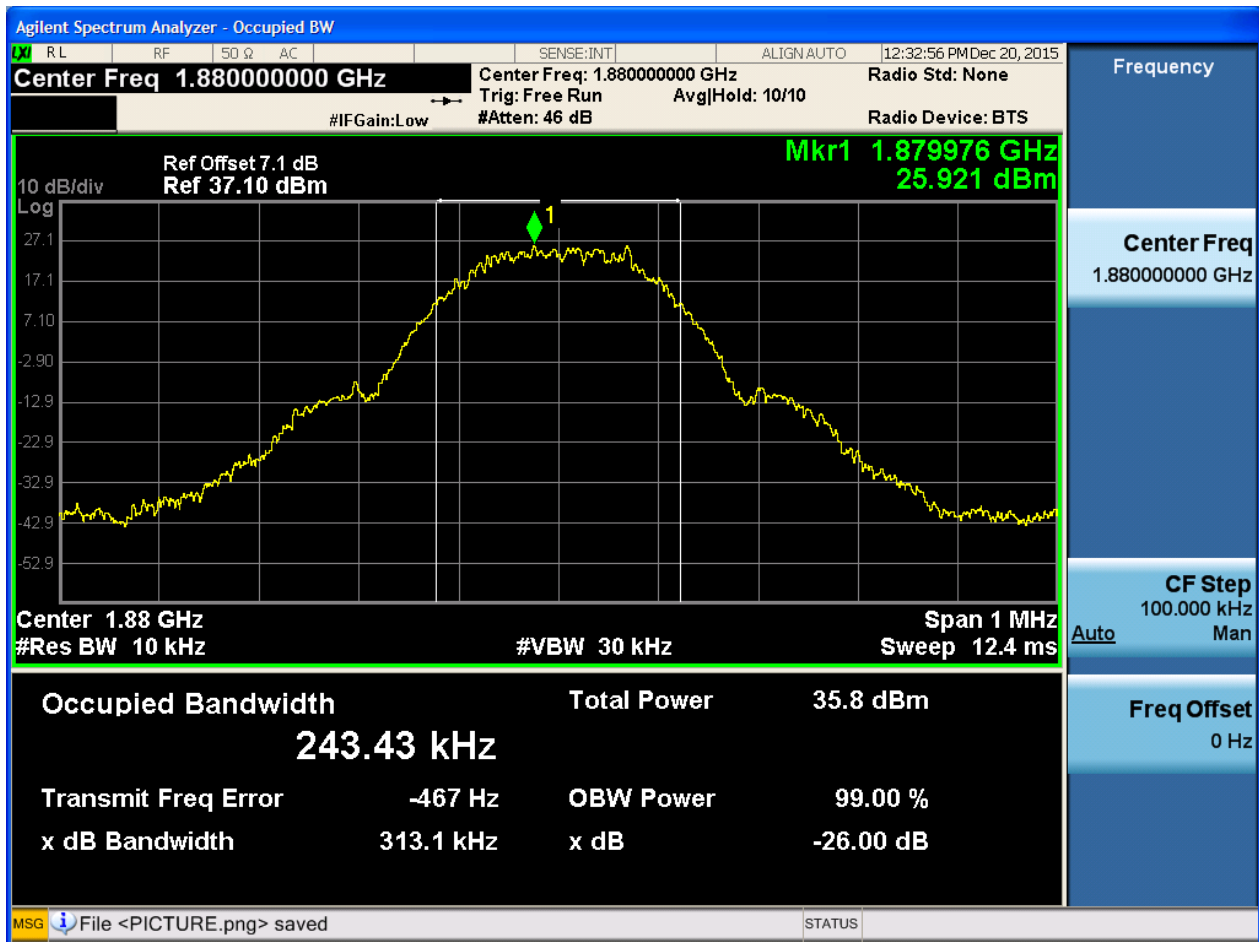
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH



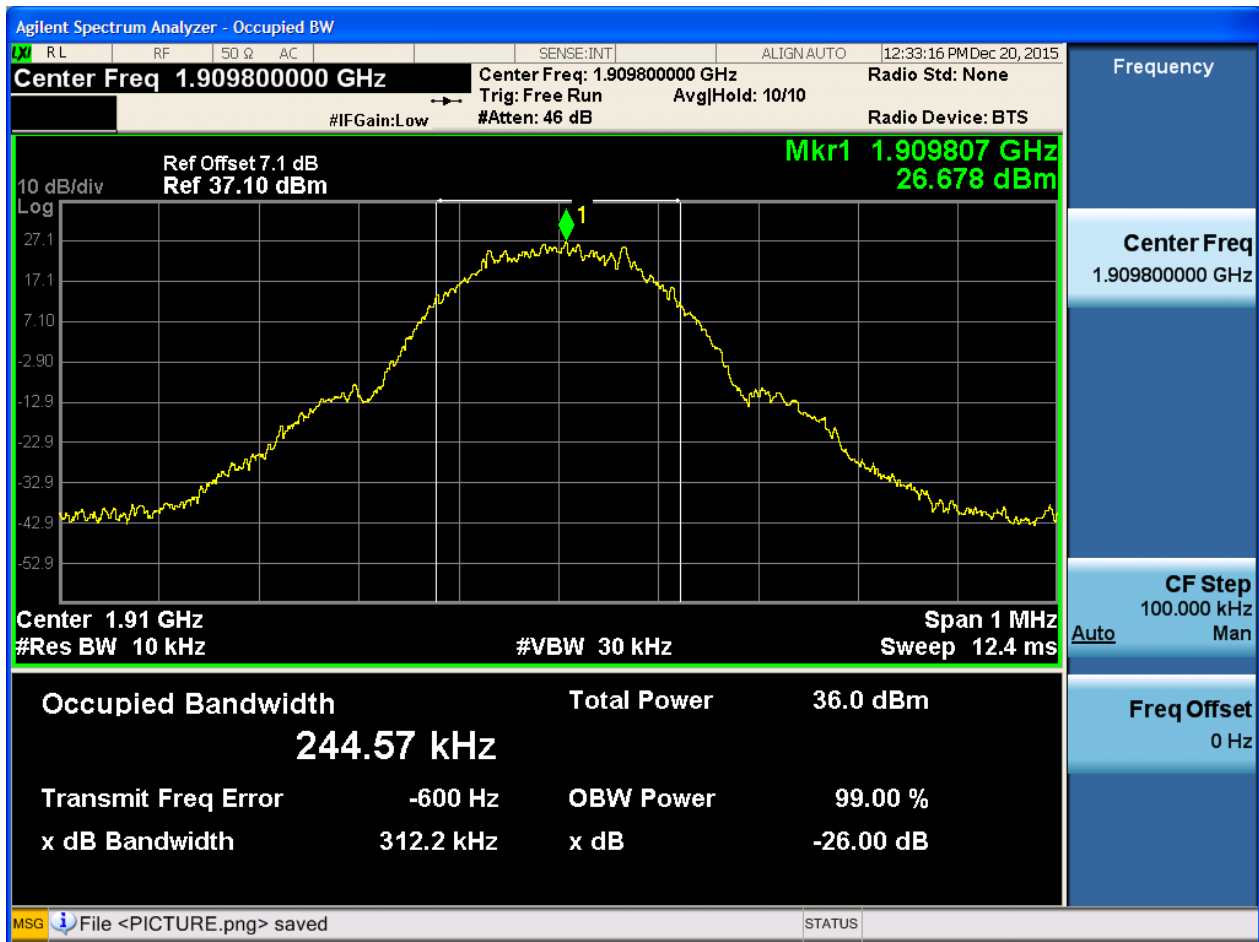


4.1.1.1.2 Test Channel = MCH





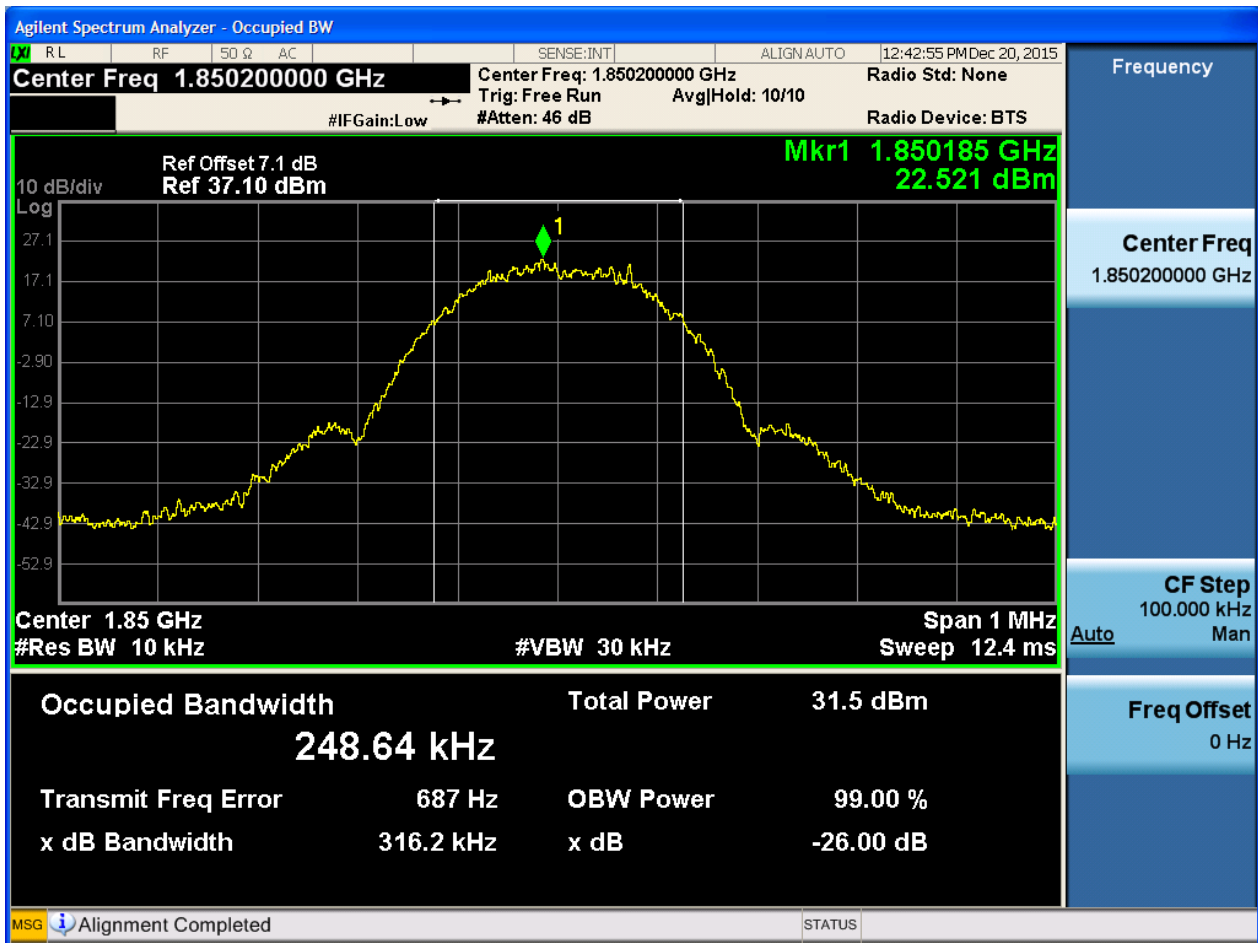
4.1.1.1.3 Test Channel = HCH





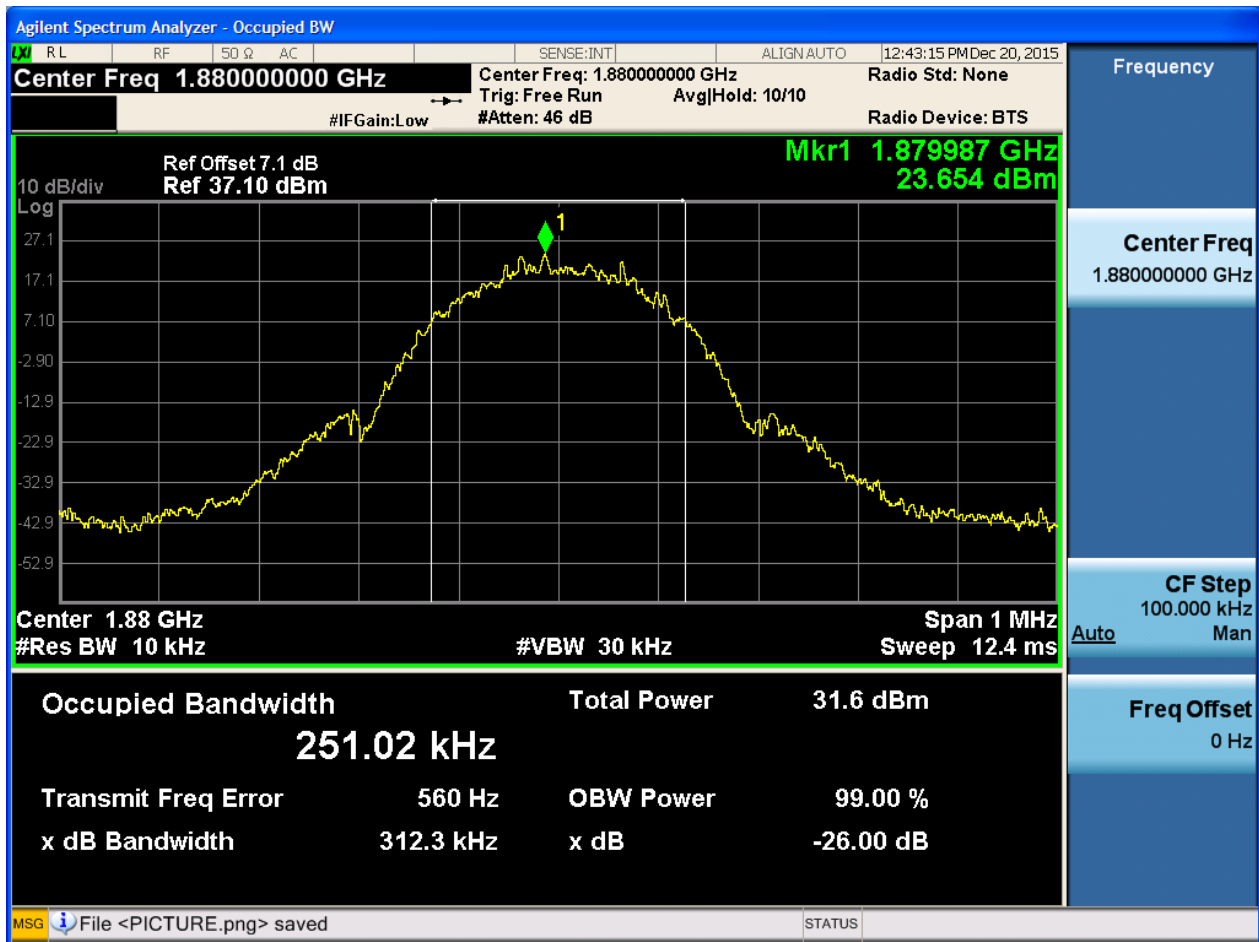
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH



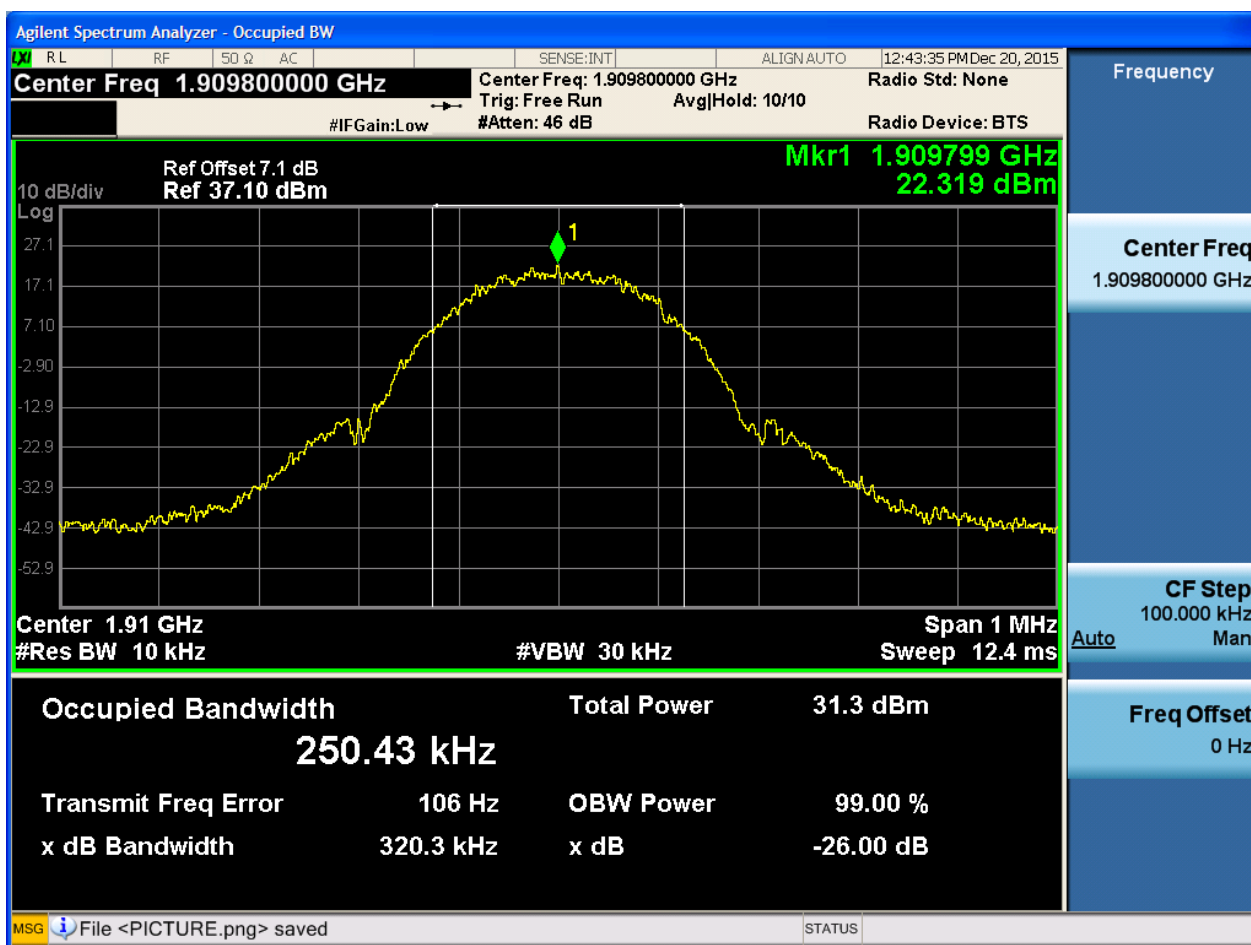


4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

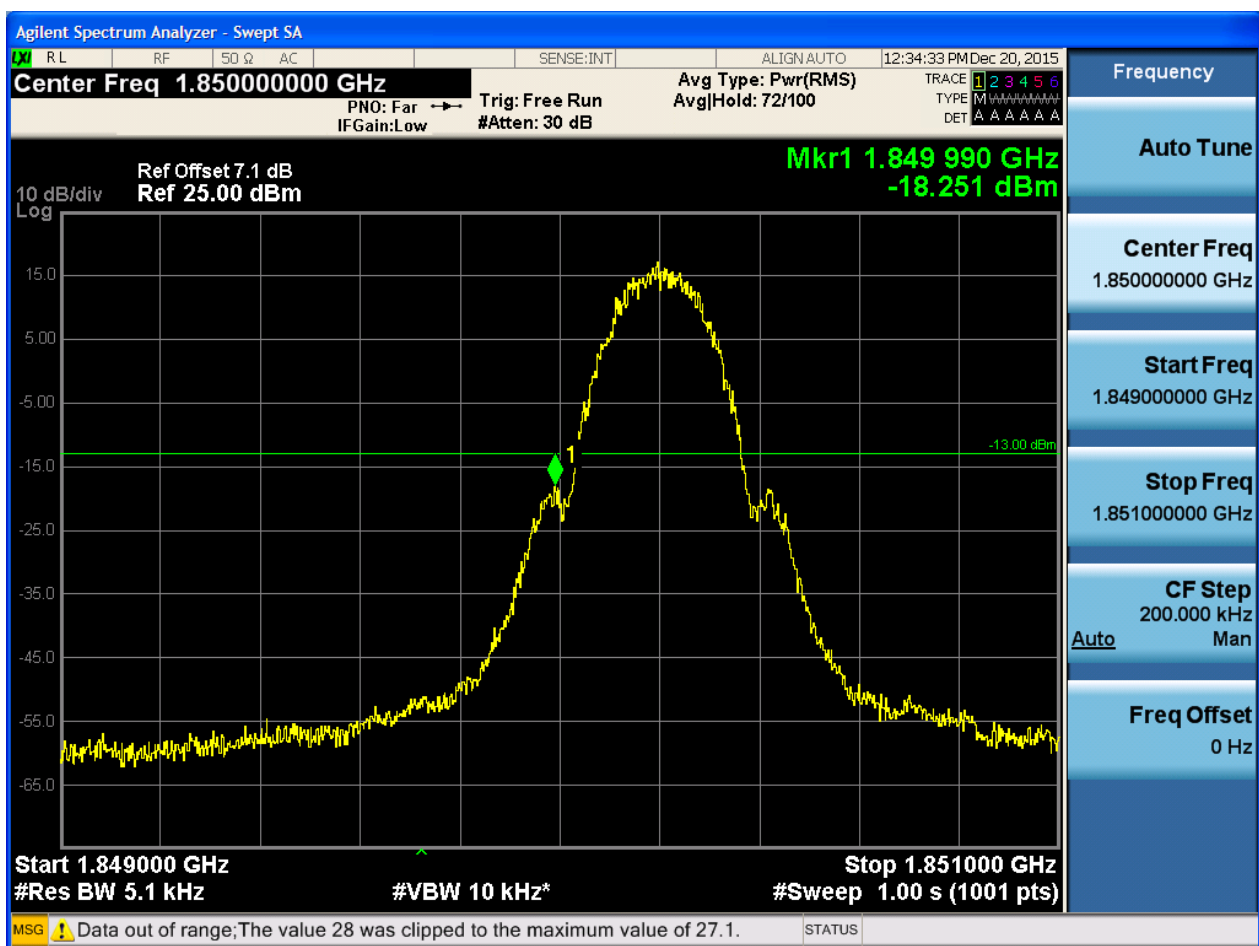
Part I - Test Plots

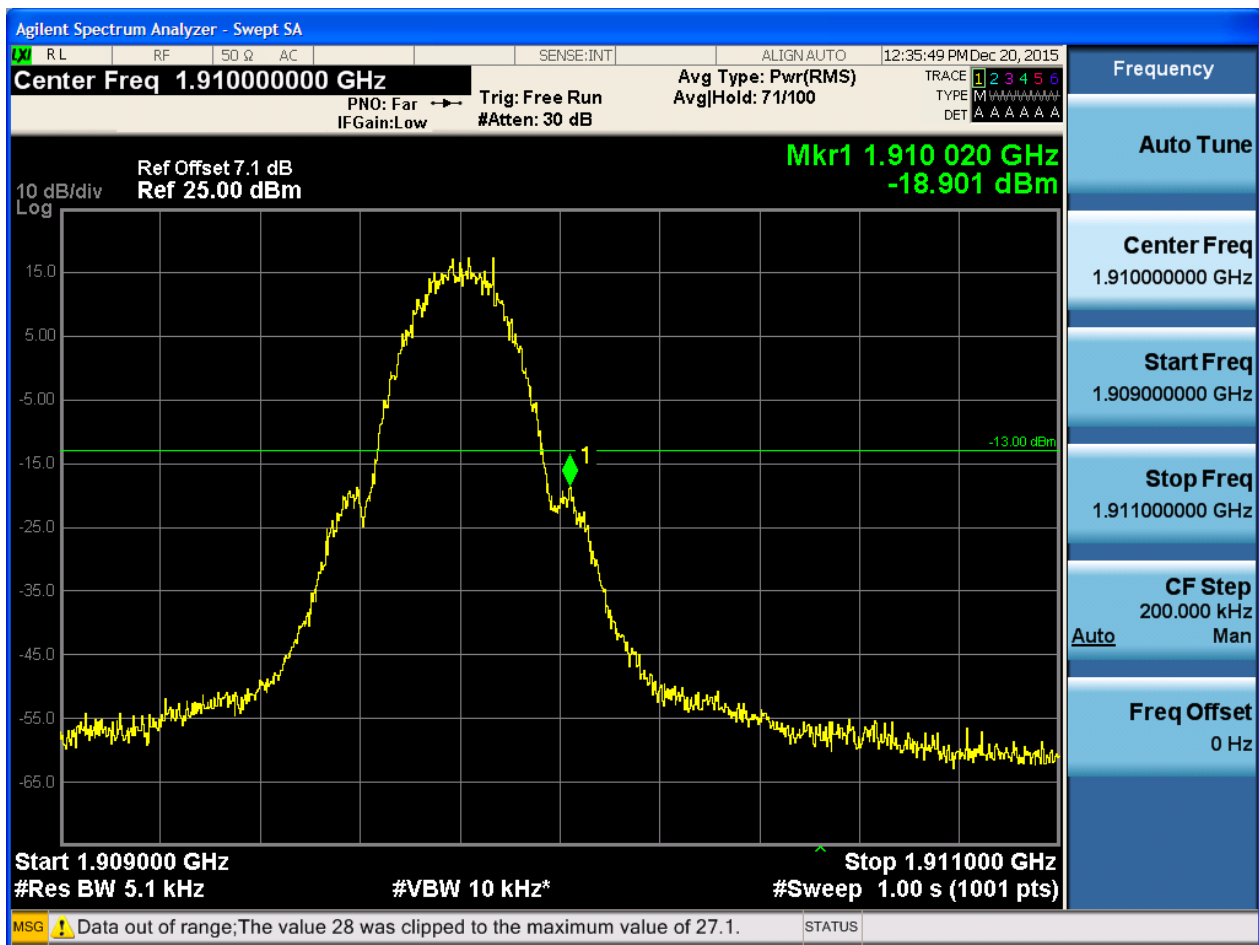
5.1 For GSM

5.1.1 Test Band = GSM1900

5.1.1.1 Test Mode = GSM/TM1

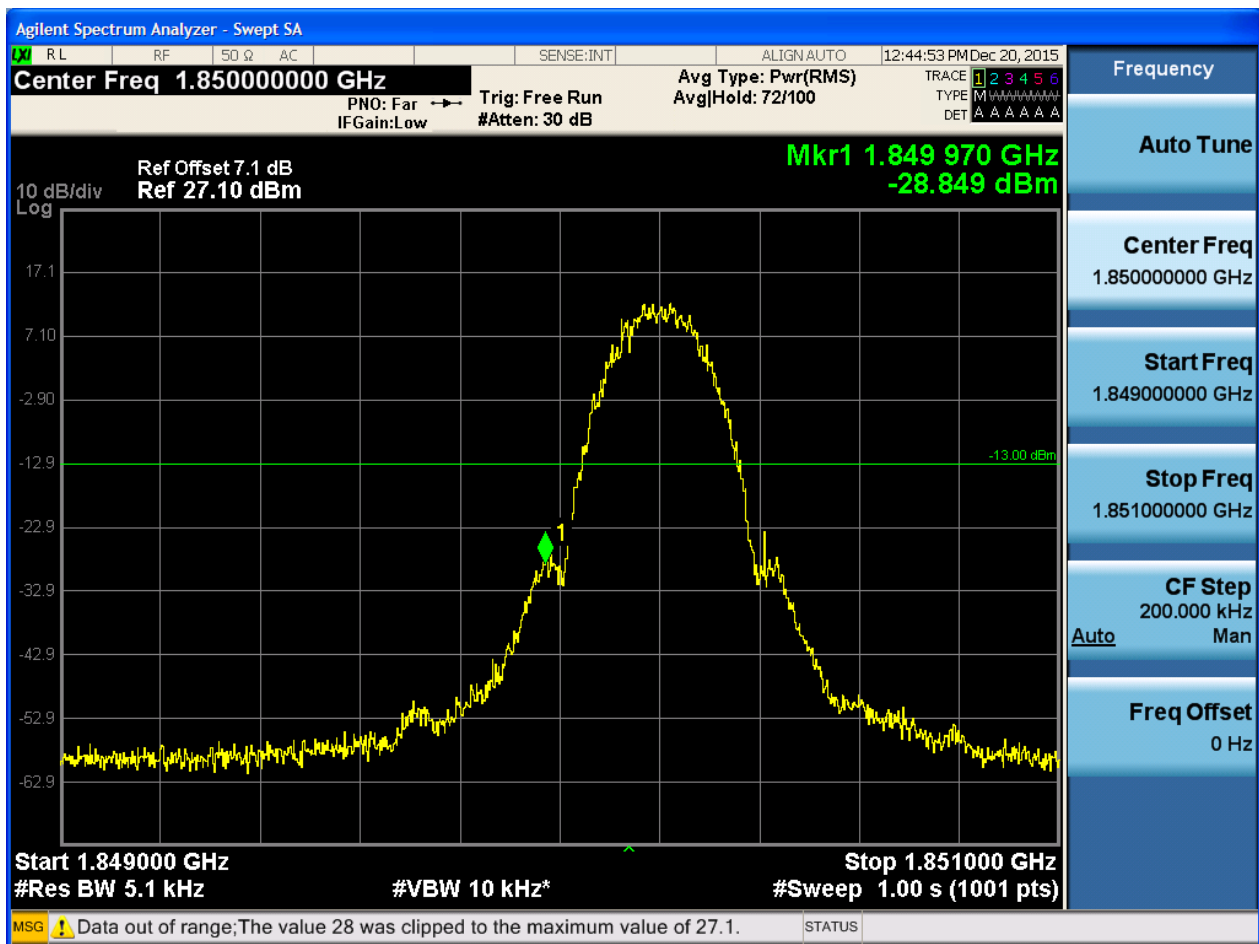
5.1.1.1.1 Test Channel = LCH



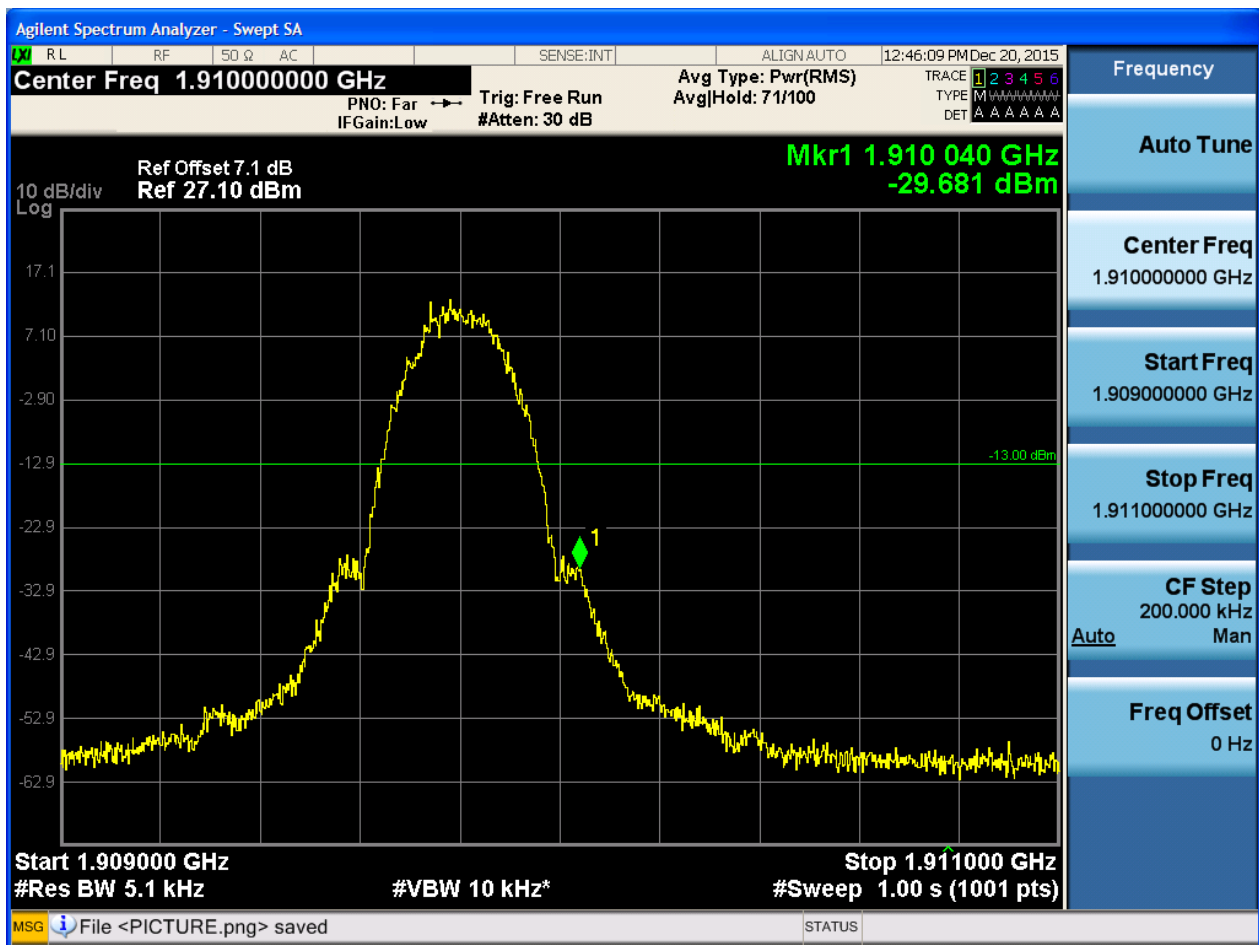


5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



5.1.1.2.2 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.

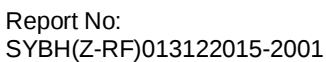
Part I - Test Plots

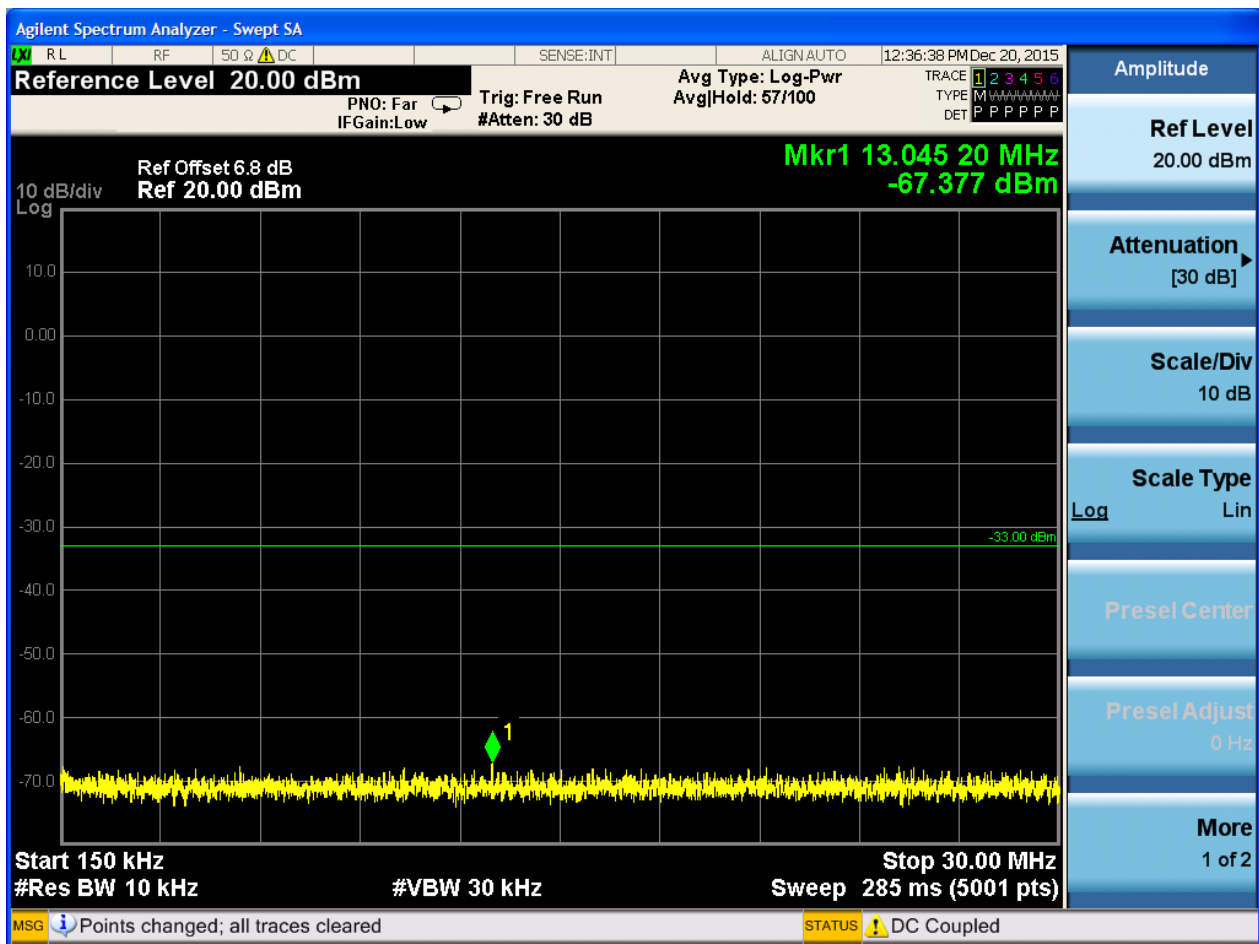
6.1 For GSM

6.1.1 Test Band = GSM1900

6.1.1.1 Test Mode = GSM/TM1

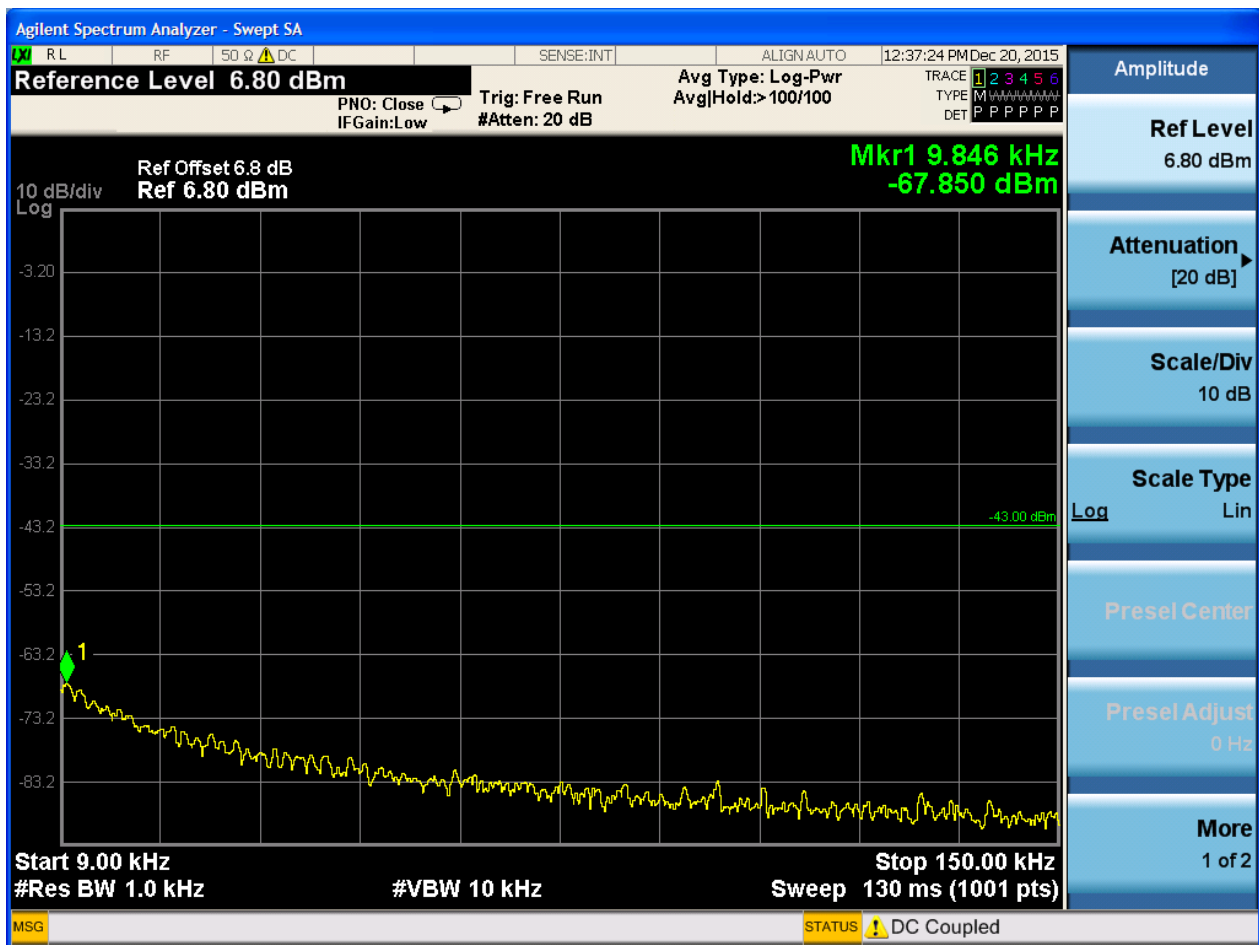
6.1.1.1.1 Test Channel = LCH

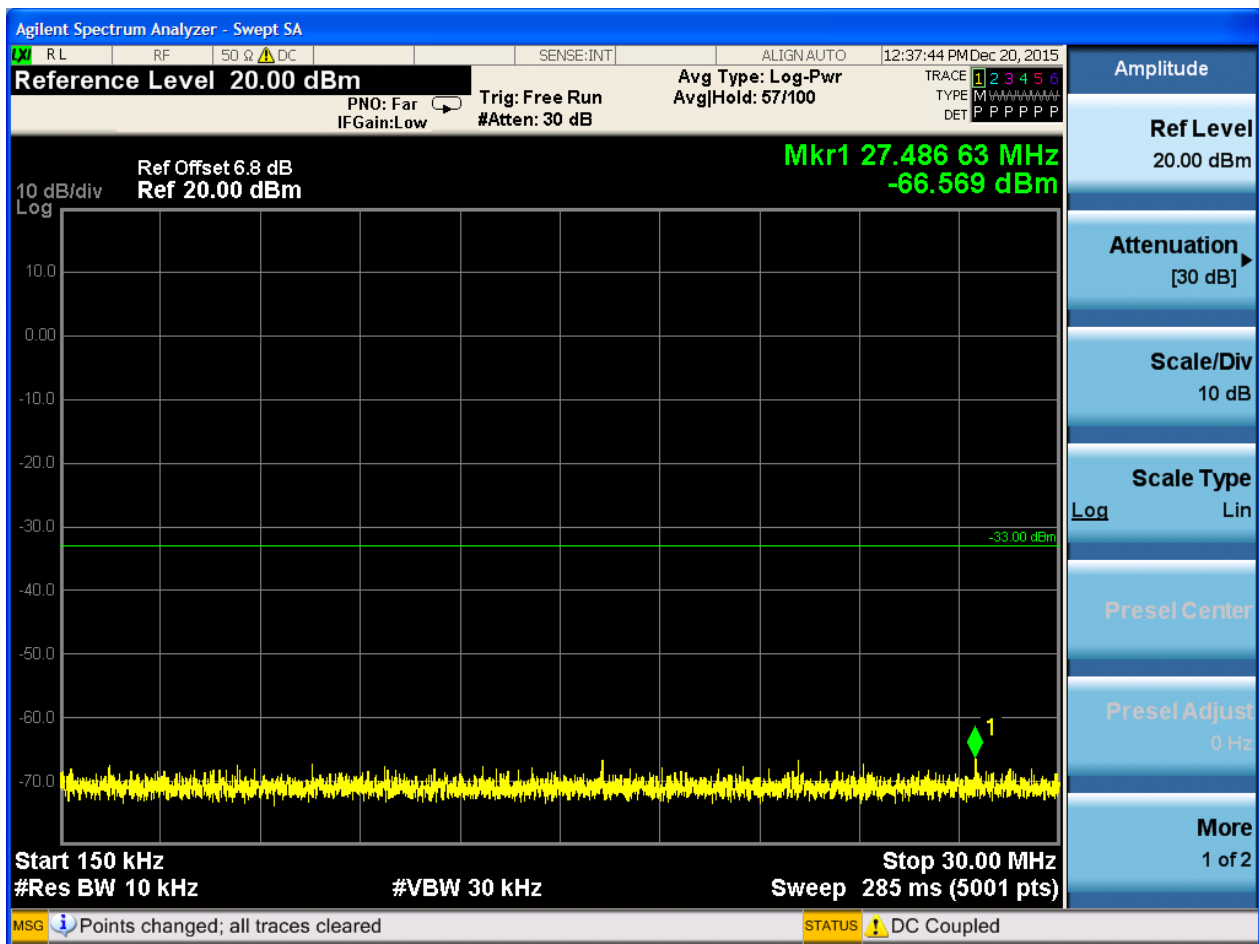


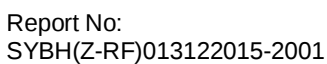




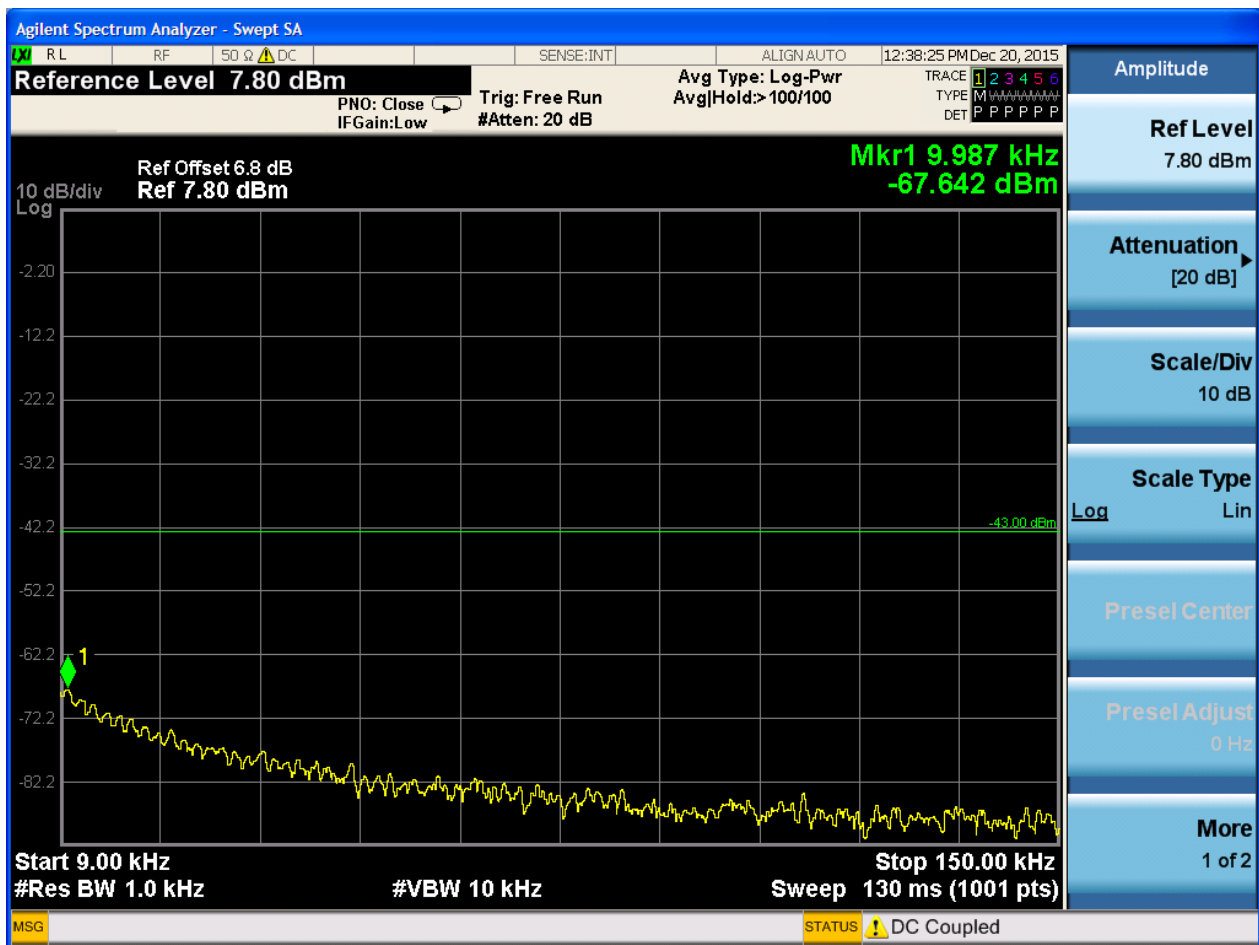
6.1.1.1.2 Test Channel = MCH

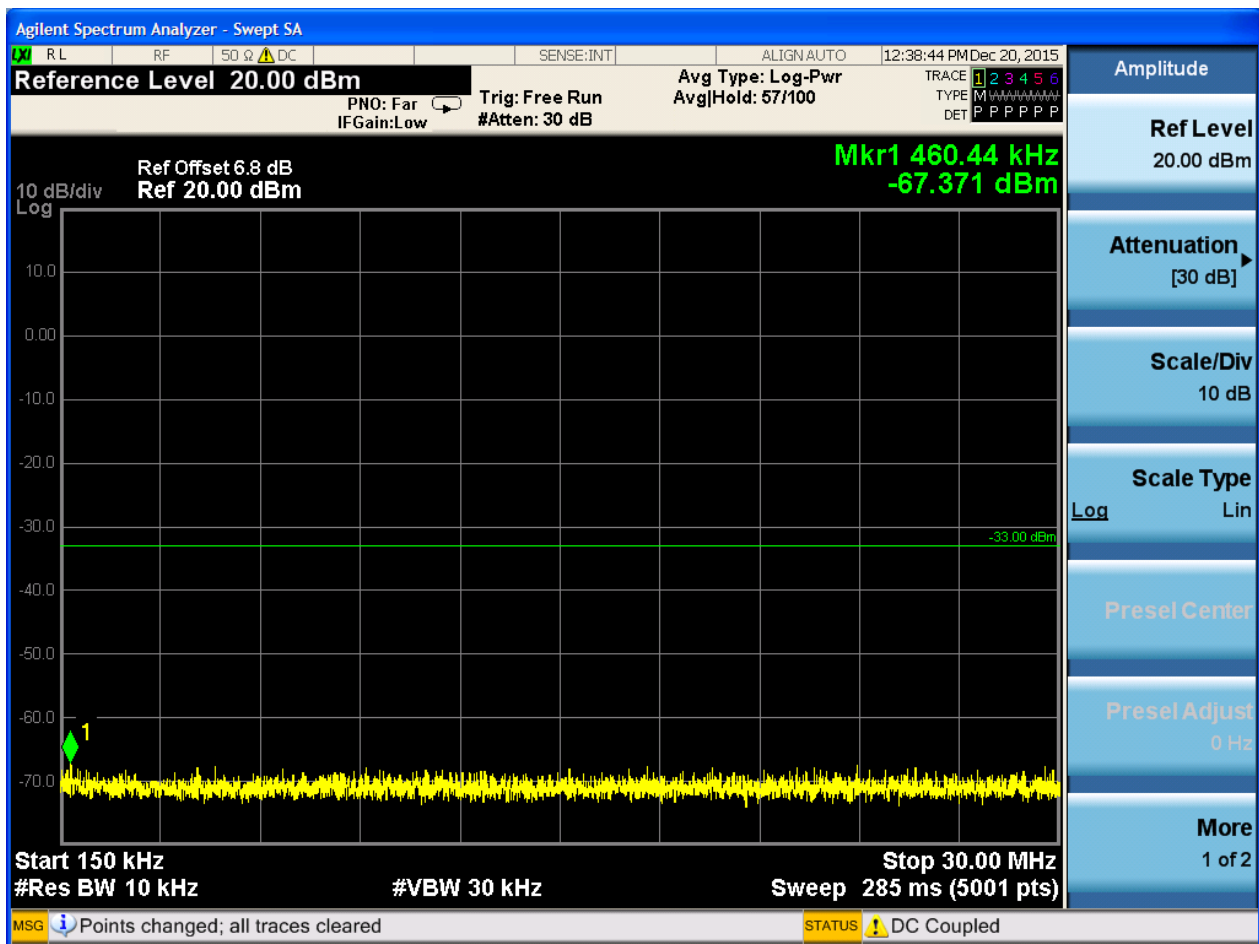


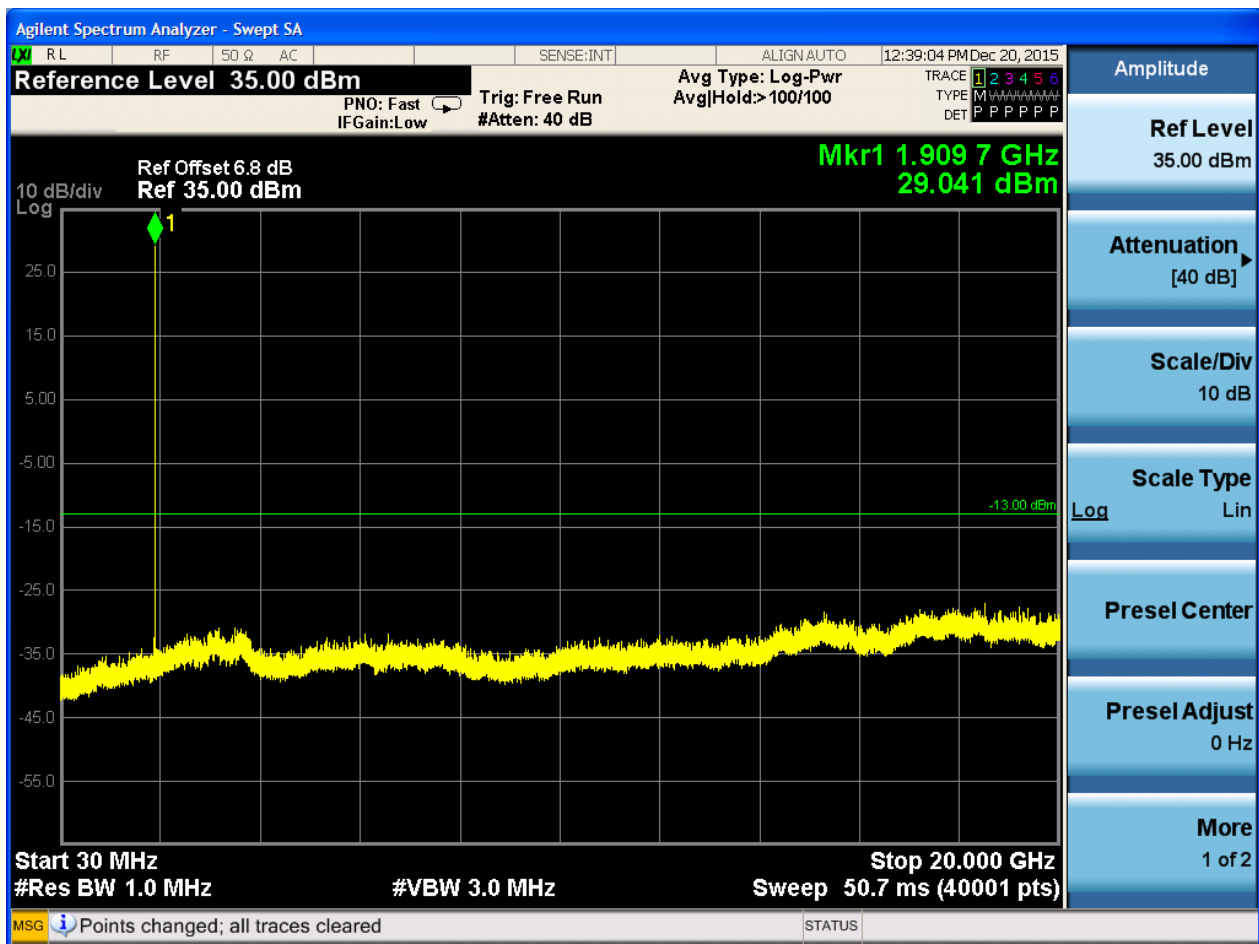




6.1.1.1.3 Test Channel = HCH

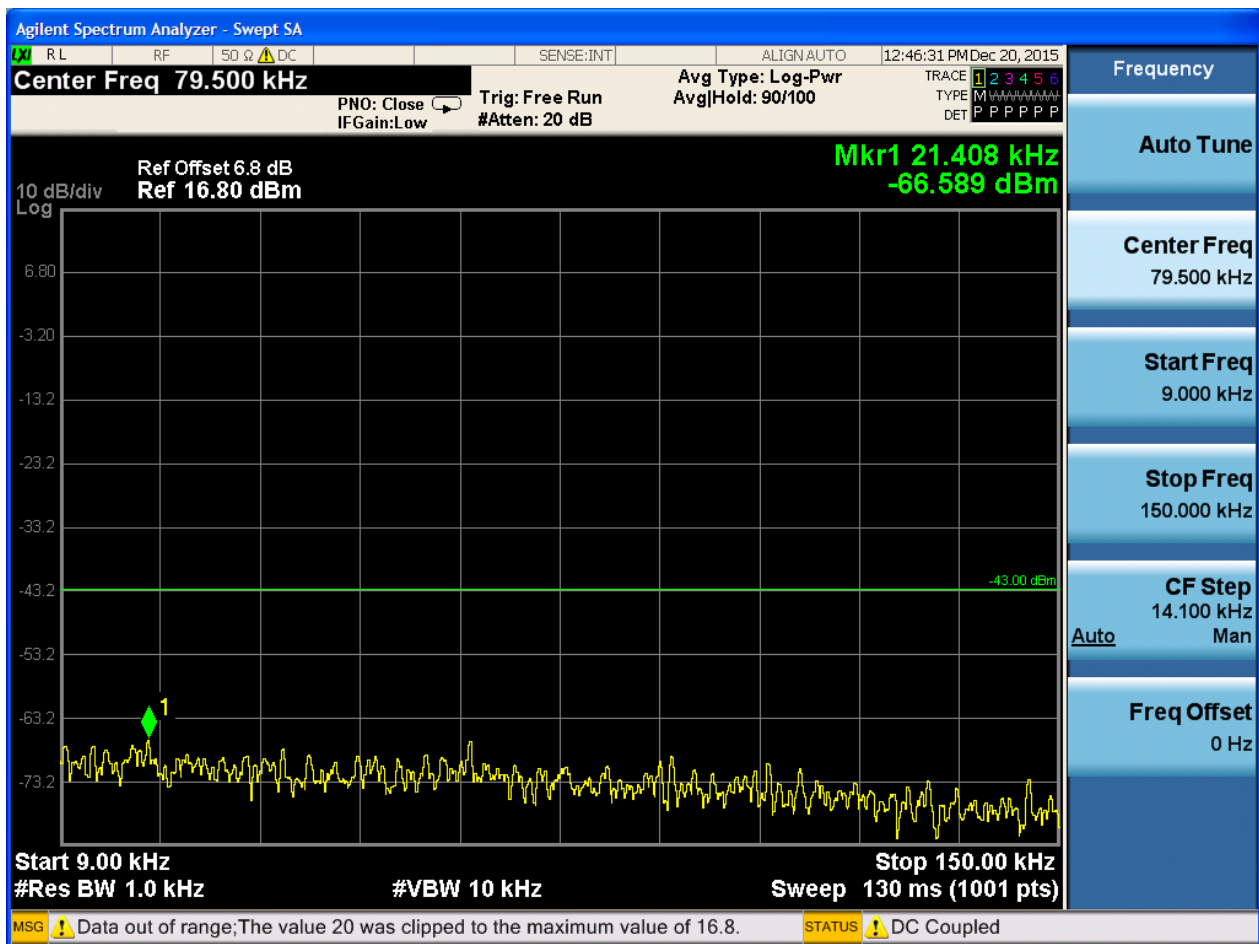


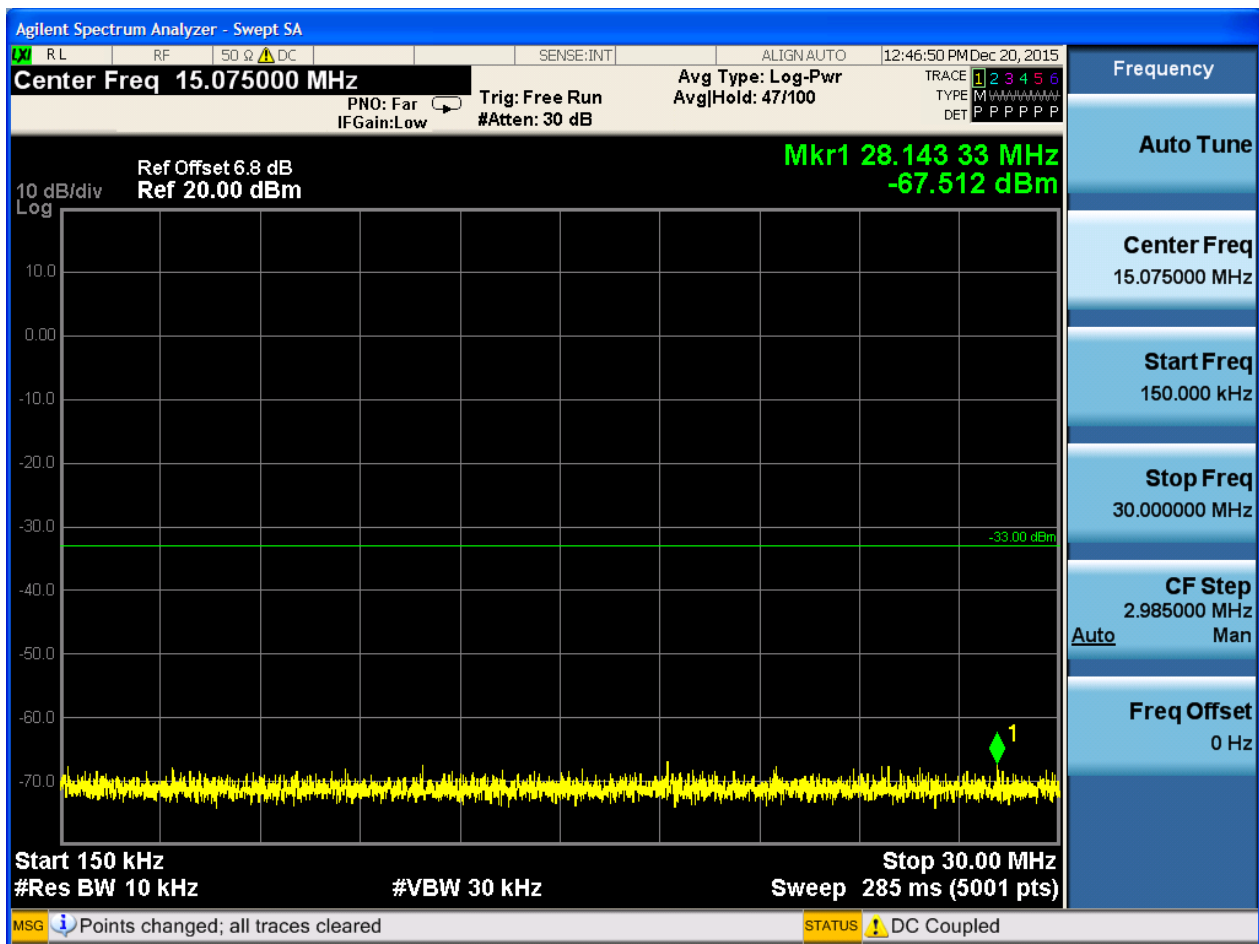


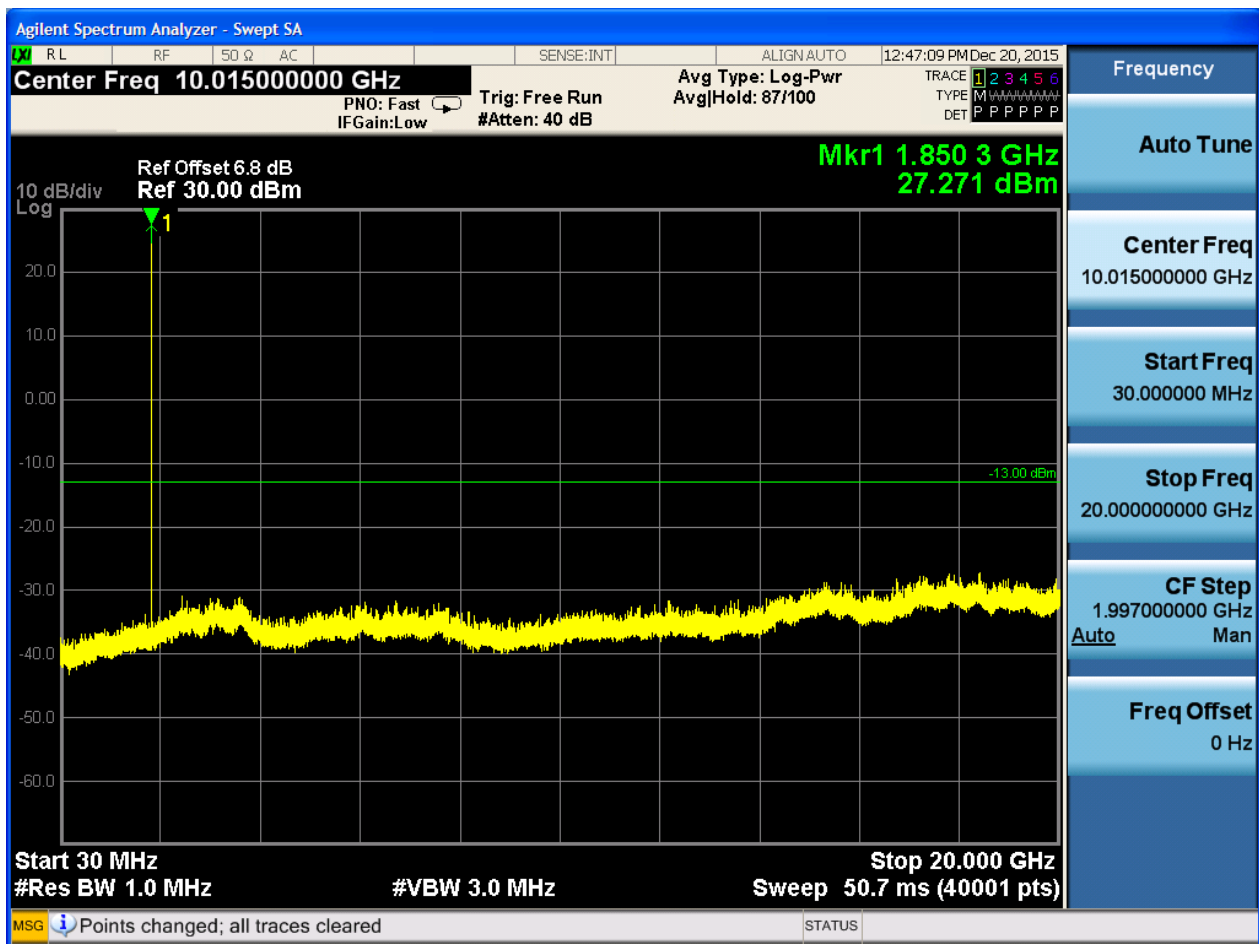


6.1.1.2 Test Mode = GSM/TM2

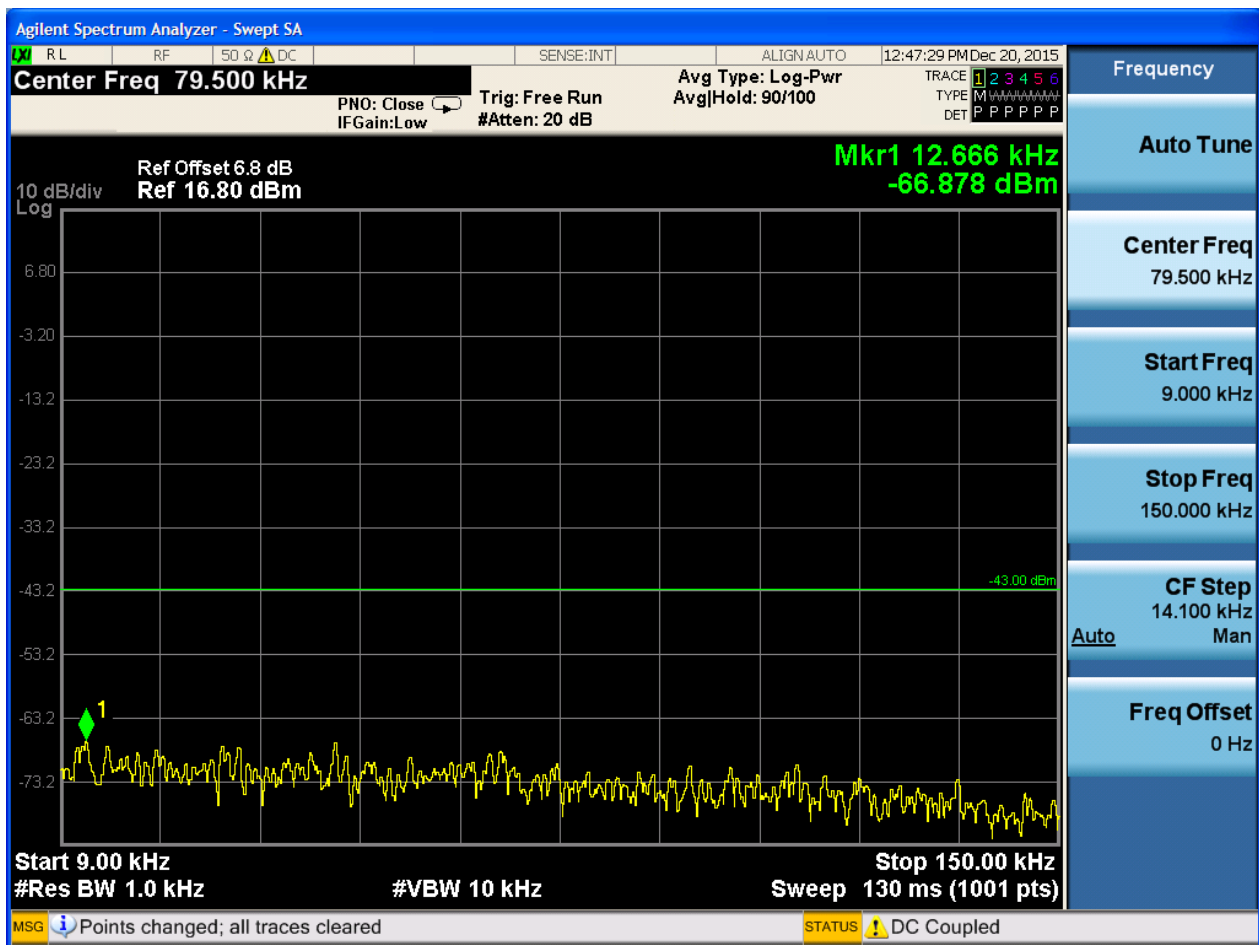
6.1.1.2.1 Test Channel = LCH

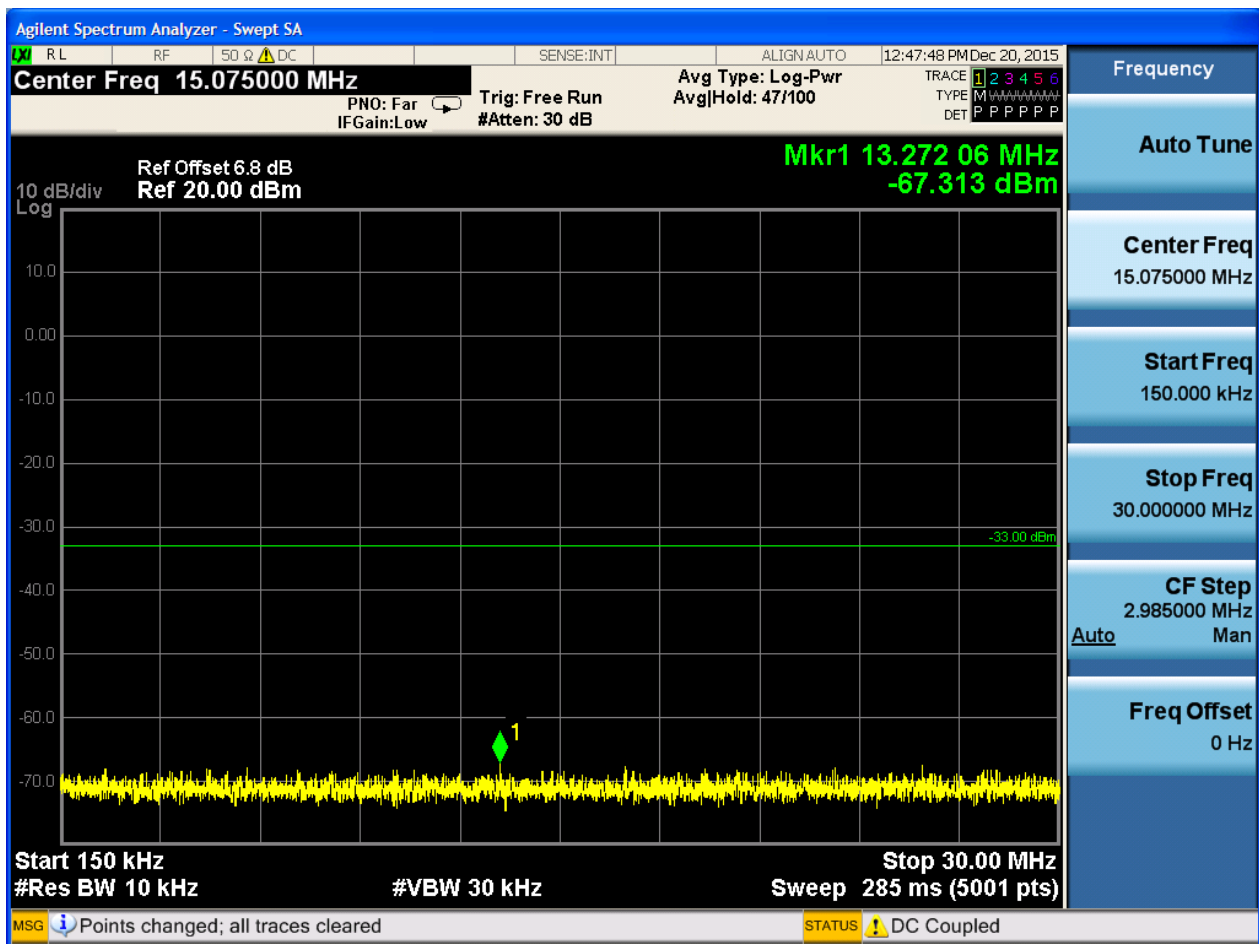


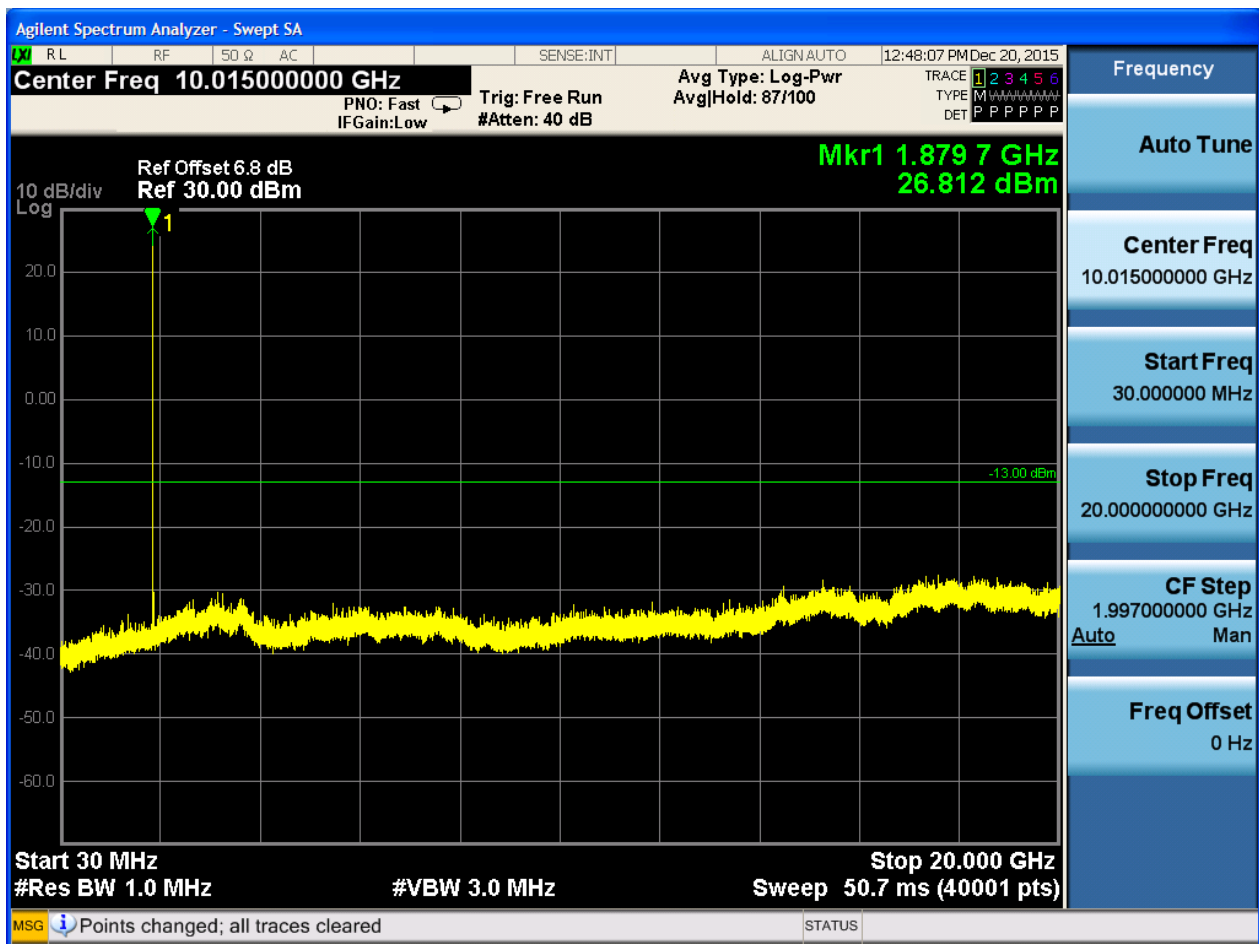




6.1.1.2.2 Test Channel = MCH

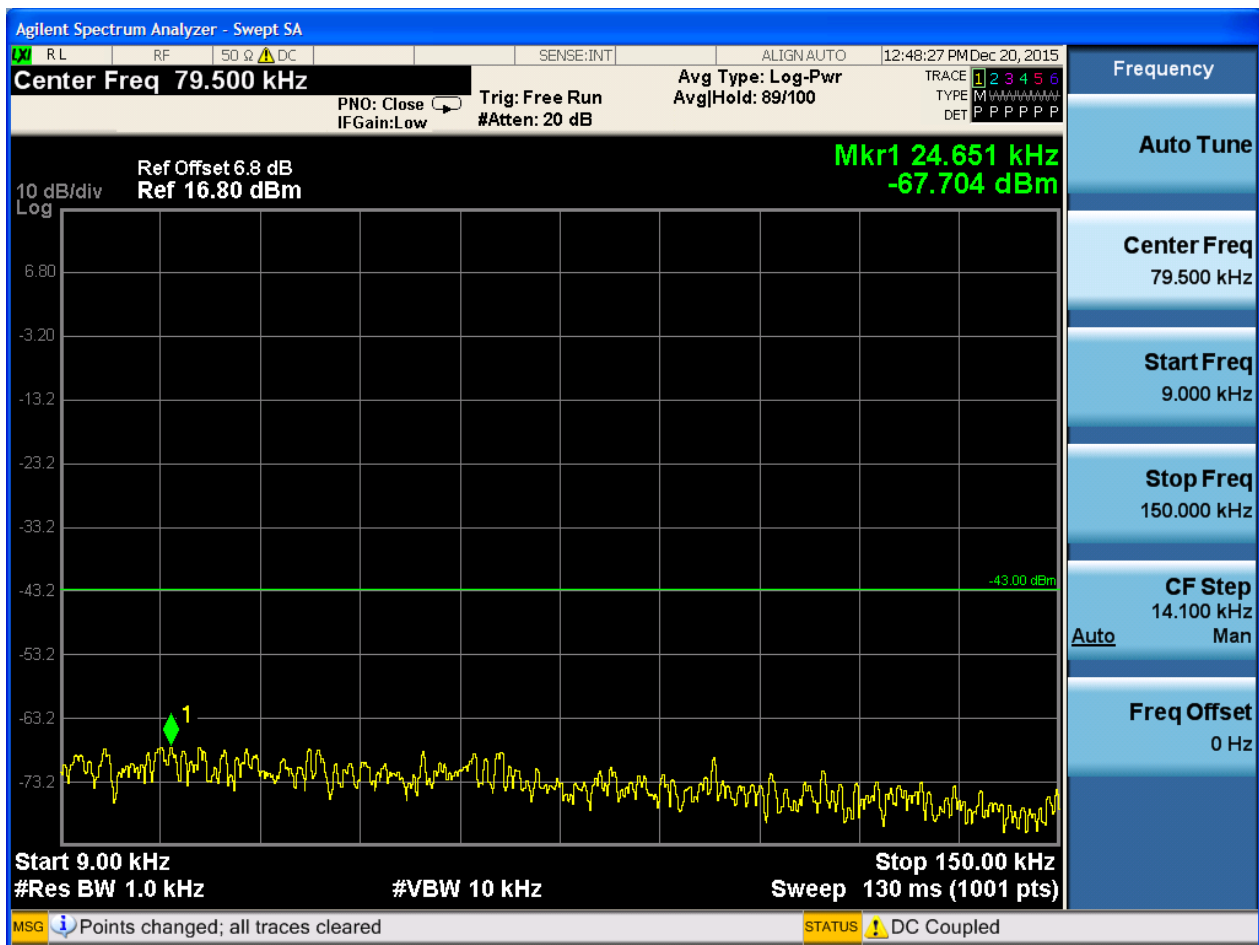


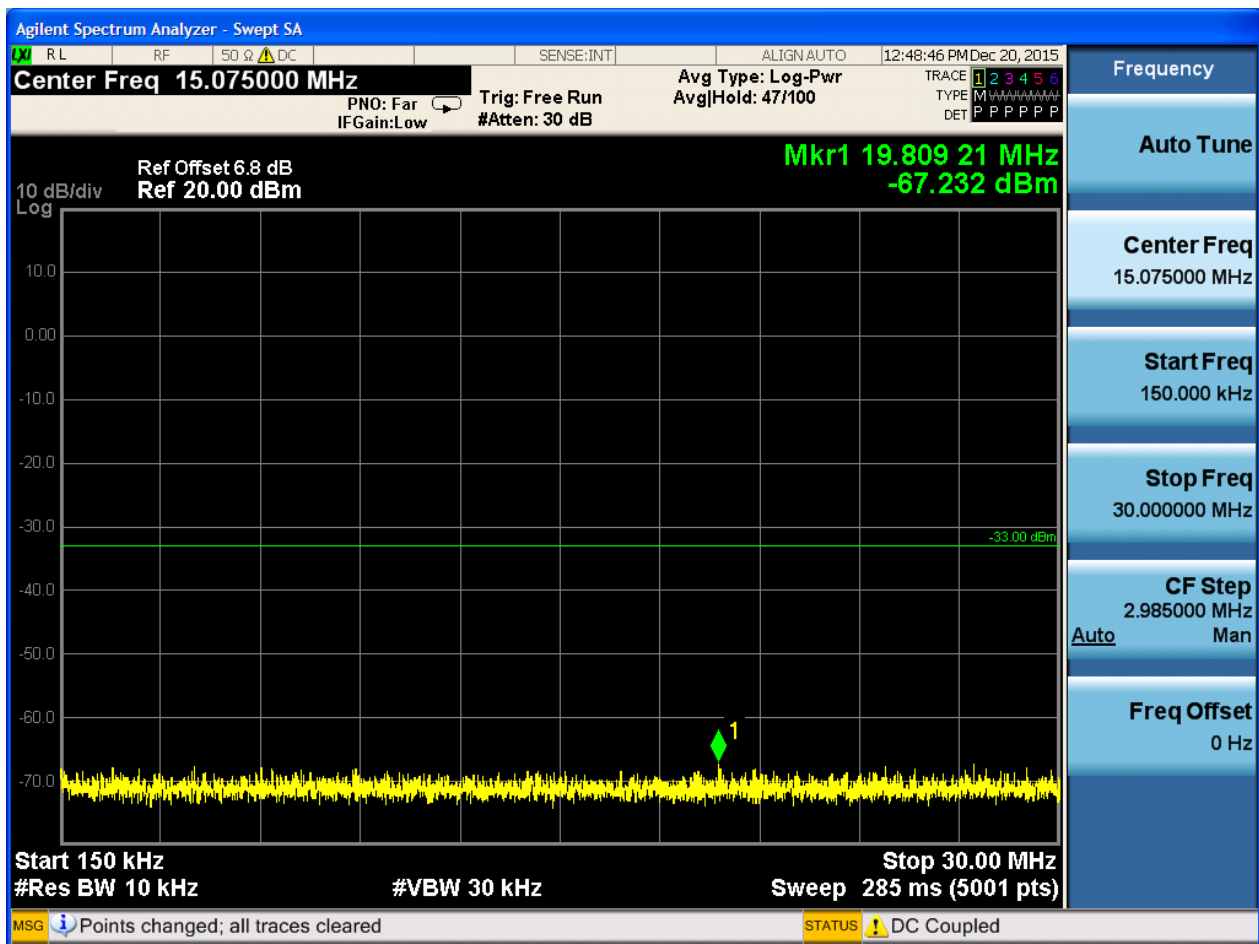


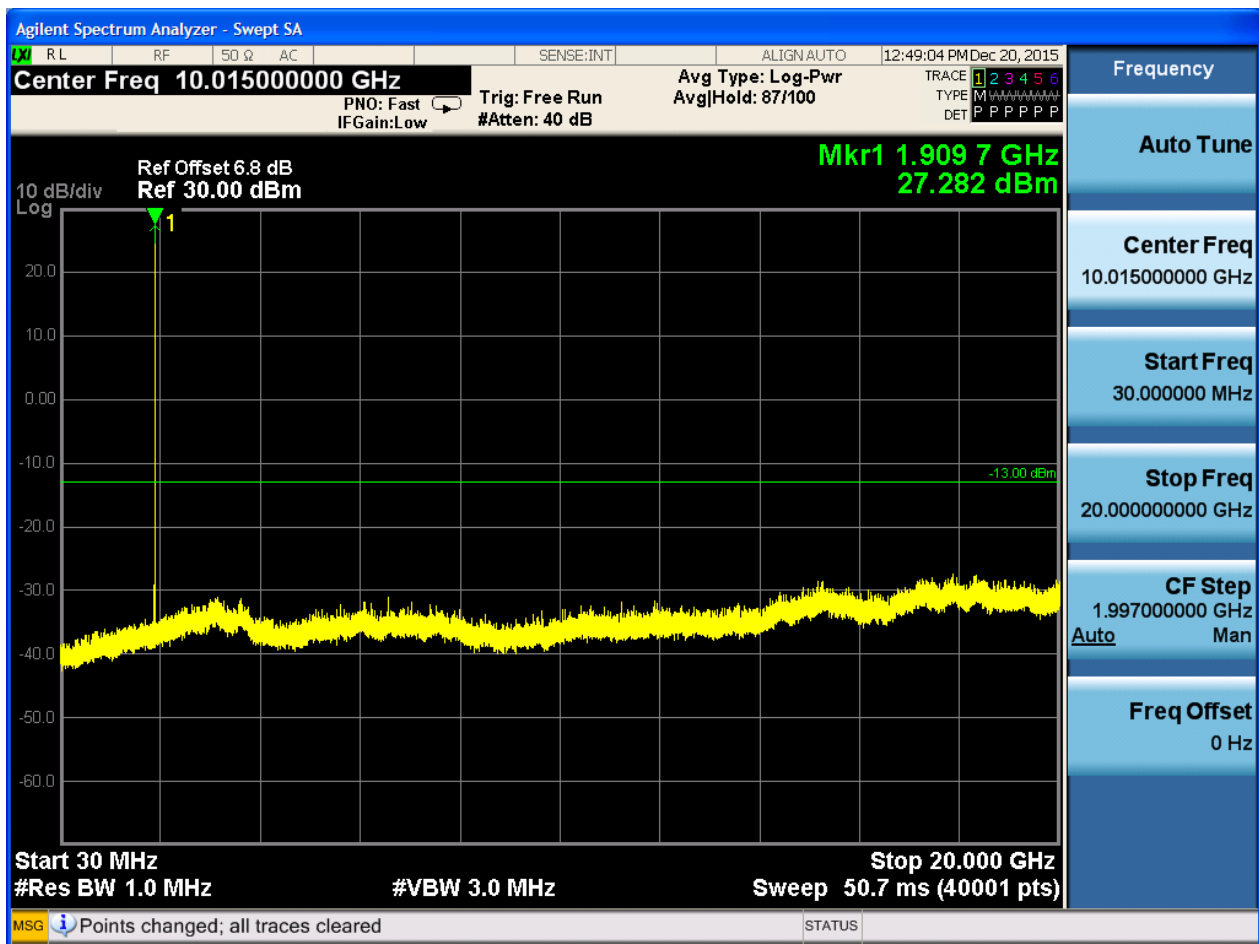




6.1.1.2.3 Test Channel = HCH







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

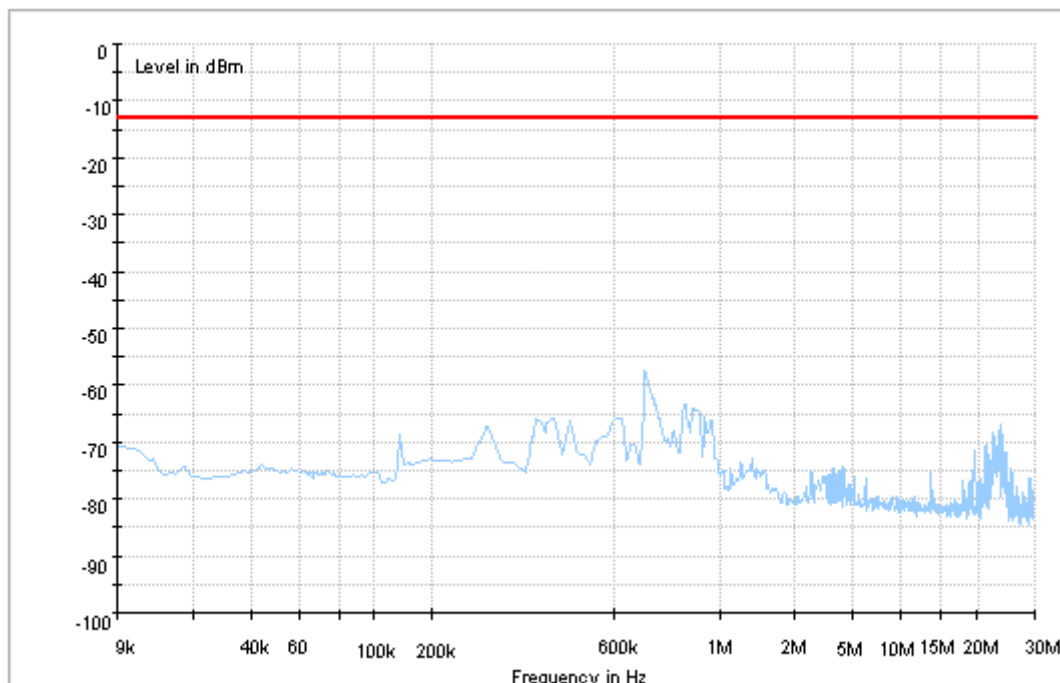
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

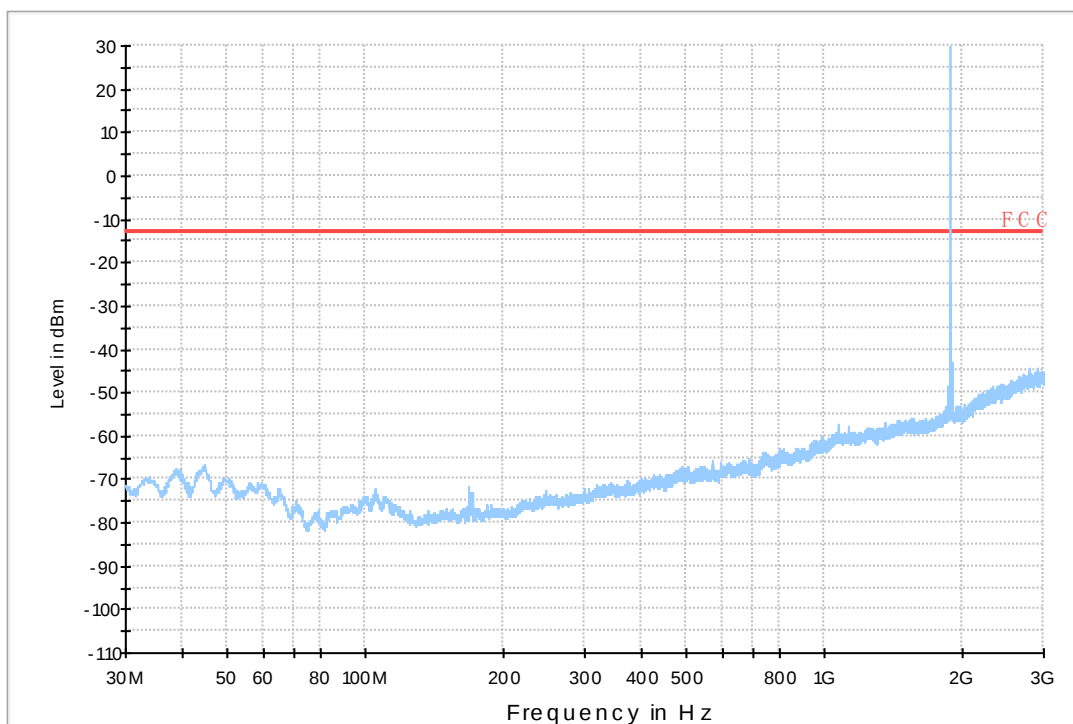
7.1 For GSM

7.1.1 Test Band = GSM1900

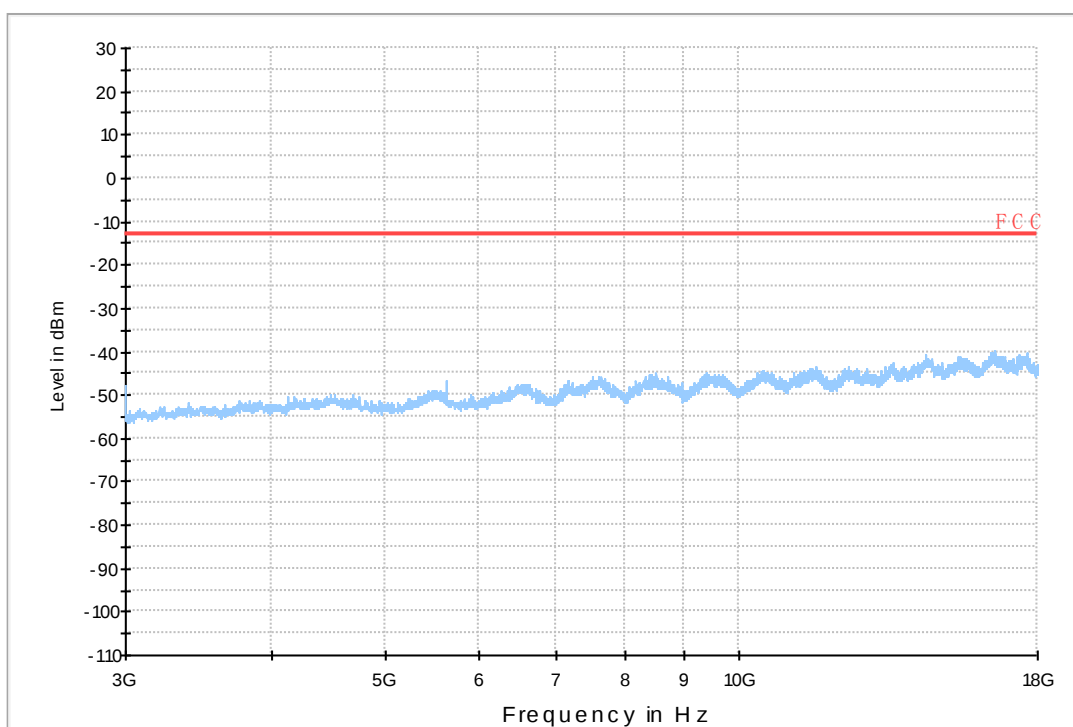
7.1.1.1 Test Mode = GSM/TM1

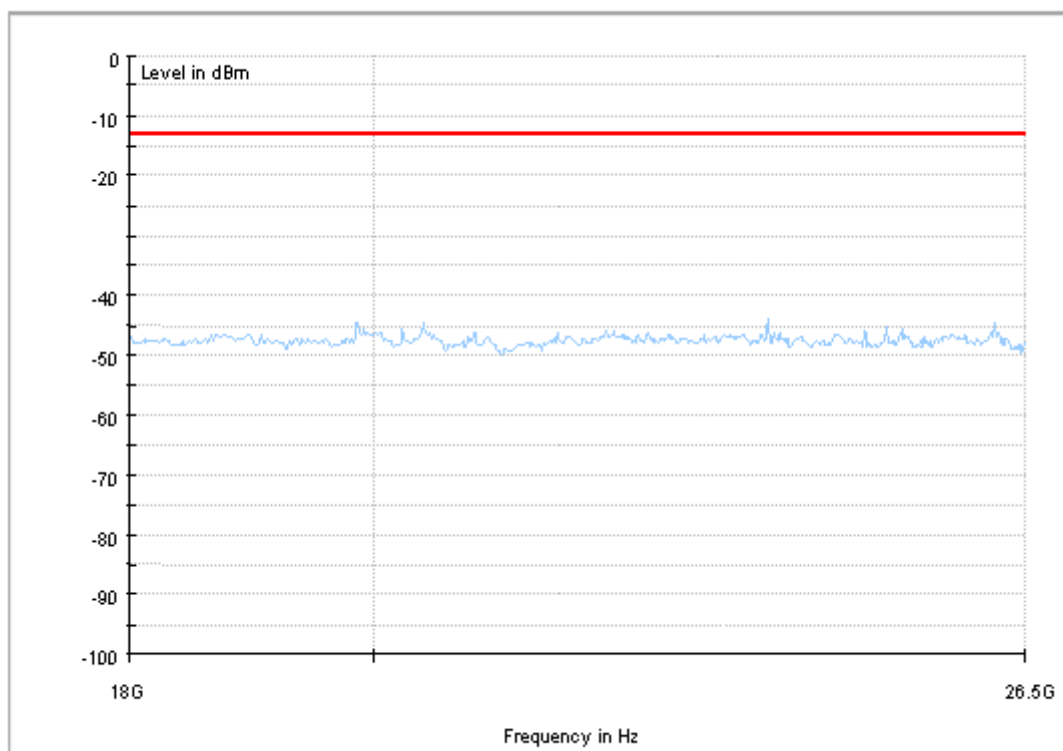


Copy of FCC PART24 GSM1900_L



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
GSM1900	GSM/TM1	LCH	TN	VL	17.50	0.00946	PASS
				VN	24.34	0.01316	PASS
				VH	10.20	0.00551	PASS
		MCH	TN	VL	19.69	0.01047	PASS
				VN	20.92	0.01113	PASS
				VH	24.02	0.01278	PASS
		HCH	TN	VL	28.67	0.01501	PASS
				VN	28.41	0.01488	PASS
				VH	27.96	0.01464	PASS
	GSM/TM2	LCH	TN	VL	1.00	0.00054	PASS
				VN	2.91	0.00157	PASS
				VH	8.65	0.00468	PASS
		MCH	TN	VL	22.05	0.01173	PASS
				VN	23.79	0.01265	PASS
				VH	22.86	0.01216	PASS
		HCH	TN	VL	13.14	0.00688	PASS
				VN	11.59	0.00607	PASS
				VH	17.21	0.00901	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
GSM1900	GSM/TM1	LCH	VN	-30	7.30	0.00395	PASS
				-20	4.84	0.00262	PASS
				-10	8.98	0.00485	PASS
				0	12.46	0.00673	PASS
				10	5.49	0.00297	PASS
				20	5.55	0.003	PASS
				30	16.01	0.00865	PASS
				40	14.08	0.00761	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		MCH	VN	50	19.05	0.0103	PASS
				-30	28.61	0.01522	PASS
				-20	27.18	0.01446	PASS
				-10	18.40	0.00979	PASS
				0	8.39	0.00446	PASS
				10	19.24	0.01023	PASS
				20	15.50	0.00824	PASS
				30	4.13	0.0022	PASS
				40	28.99	0.01542	PASS
				50	31.25	0.01662	PASS
		HCH	VN	-30	25.96	0.01359	PASS
				-20	30.35	0.01589	PASS
				-10	23.50	0.0123	PASS
				0	20.73	0.01085	PASS
				10	19.95	0.01045	PASS
				20	26.09	0.01366	PASS
				30	26.28	0.01376	PASS
				40	13.50	0.00707	PASS
				50	24.73	0.01295	PASS
	GSM/TM2	LCH	VN	-30	-5.39	-0.00291	PASS
				-20	-6.23	-0.00337	PASS
				-10	-5.13	-0.00277	PASS
				0	-4.39	-0.00237	PASS
				10	-3.29	-0.00178	PASS
				20	-3.03	-0.00164	PASS
				30	12.59	0.0068	PASS
				40	-5.65	-0.00305	PASS
				50	4.62	0.0025	PASS
		MCH	VN	-30	4.94	0.00263	PASS
				-20	18.18	0.00967	PASS
				-10	13.92	0.0074	PASS
				0	7.43	0.00395	PASS
				10	7.72	0.00411	PASS
				20	13.69	0.00728	PASS
				30	13.04	0.00694	PASS
				40	6.59	0.00351	PASS
				50	14.08	0.00749	PASS
		HCH	VN	-30	16.47	0.00862	PASS
				-20	4.10	0.00215	PASS
				-10	33.80	0.0177	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				0	17.82	0.00933	PASS
				10	4.33	0.00227	PASS
				20	17.95	0.0094	PASS
				30	5.68	0.00297	PASS
				40	10.07	0.00527	PASS
				50	15.37	0.00805	PASS

END