



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	31.66	31.1	38.5	PASS
		MCH	31.78	31.22	38.5	PASS
		HCH	31.86	31.3	38.5	PASS
	GSM/TM2	LCH	25.04	24.48	38.5	PASS
		MCH	25.01	24.45	38.5	PASS
		HCH	25.05	24.49	38.5	PASS

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	29.36	31.49	33	PASS
		MCH	29.15	31.28	33	PASS
		HCH	28.96	31.09	33	PASS
	GSM/TM2	LCH	24.7	26.83	33	PASS
		MCH	24.85	26.98	33	PASS
		HCH	24.76	26.89	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: RBW > emission bandwidth, VBW > 3 x RBW.

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	0.16	13	PASS
		MCH	0.16	13	PASS
		HCH	0.13	13	PASS
	GSM/TM2	LCH	3.06	13	PASS
		MCH	3.19	13	PASS
		HCH	3.1	13	PASS

3Appendix_C: Modulation Characteristics

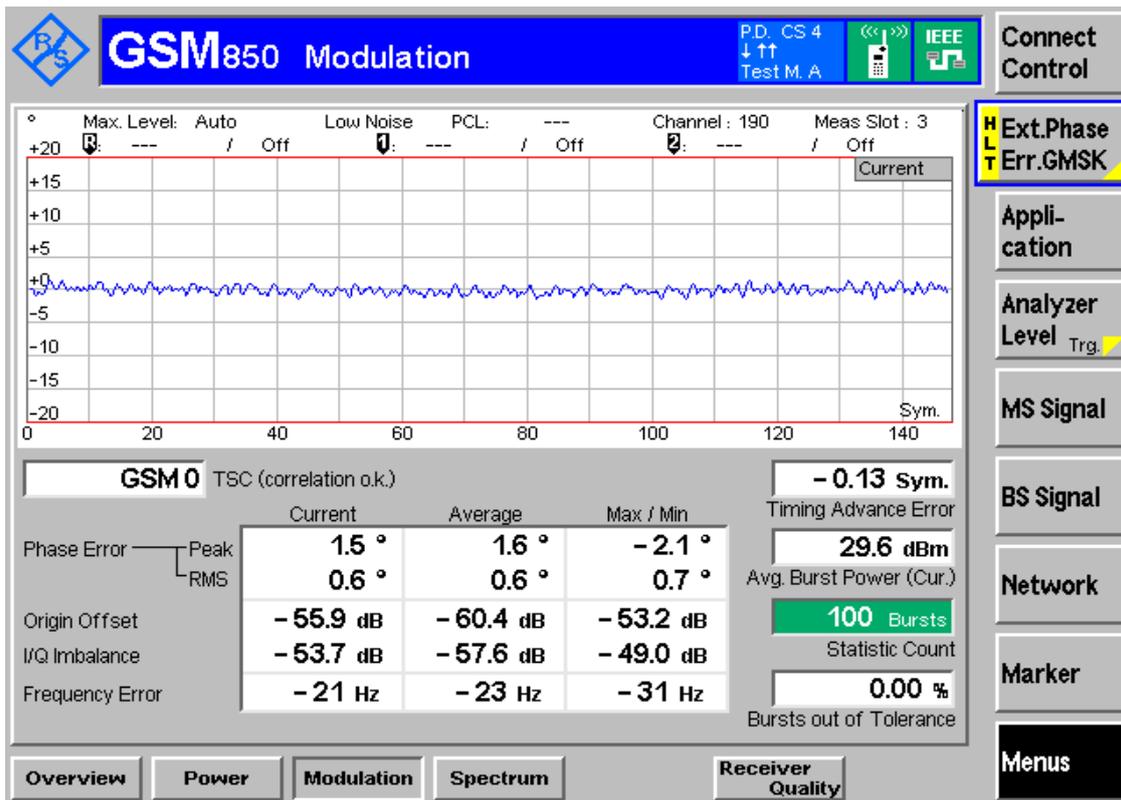
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

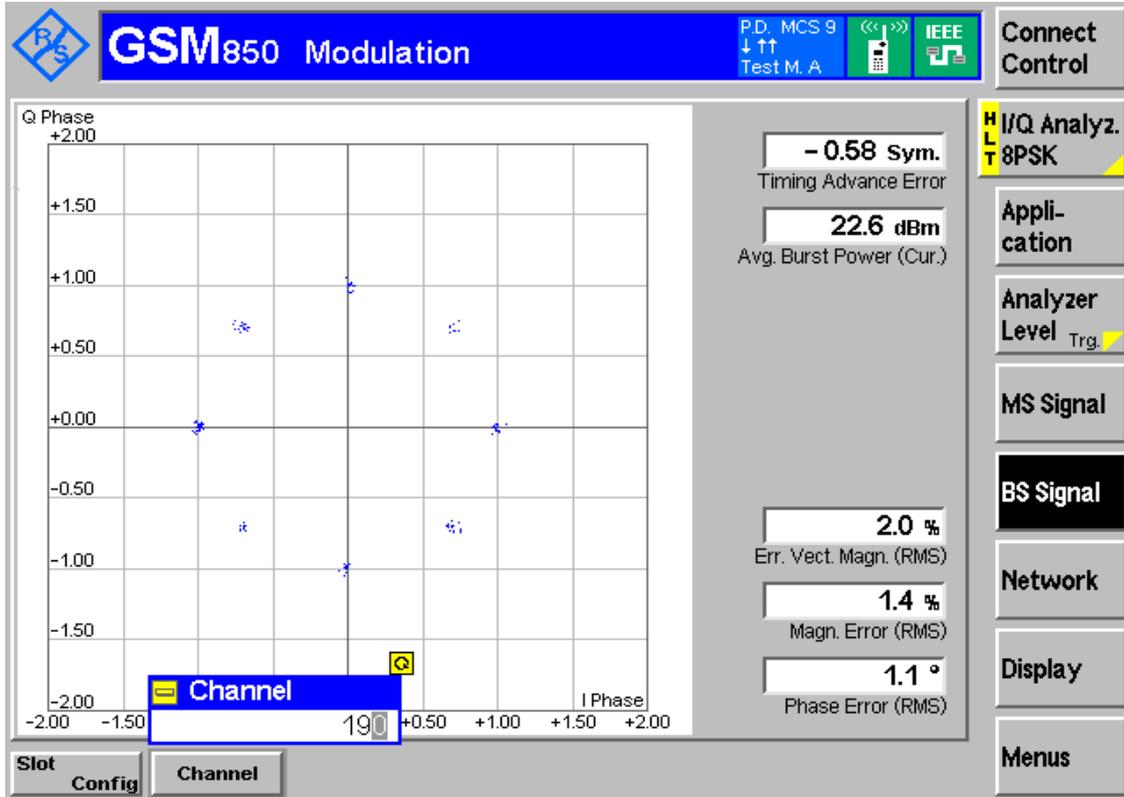
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

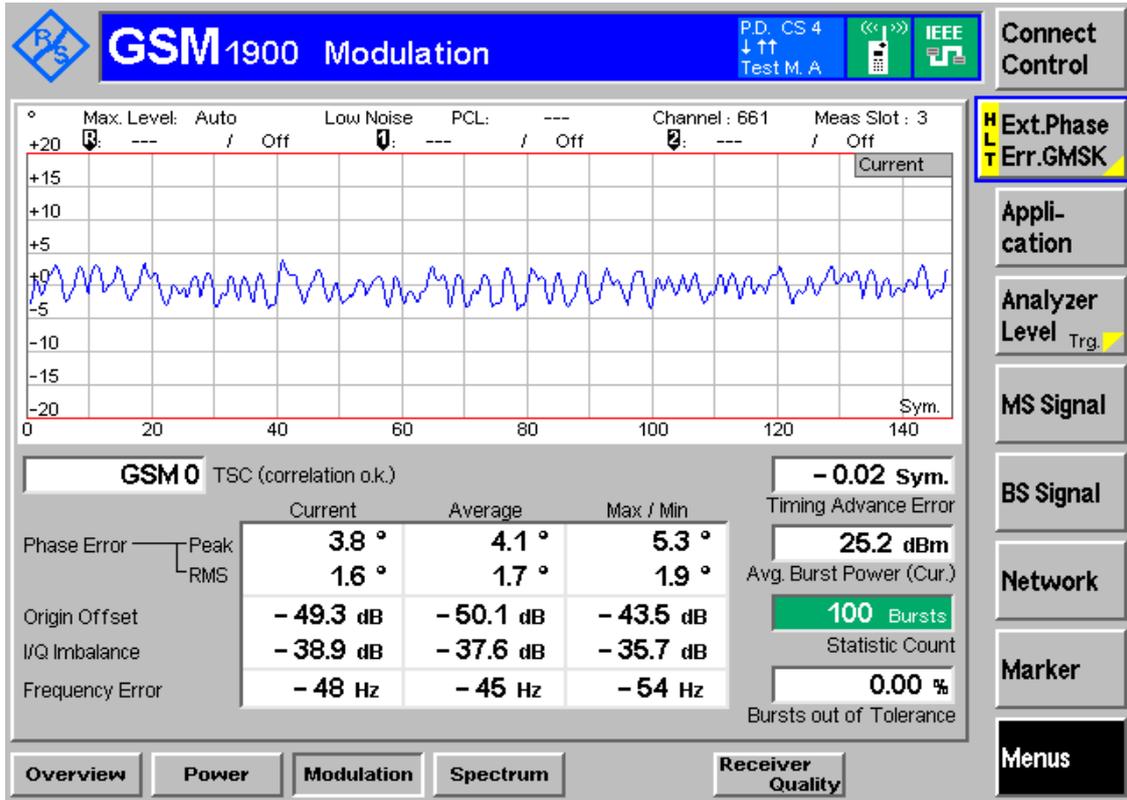
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

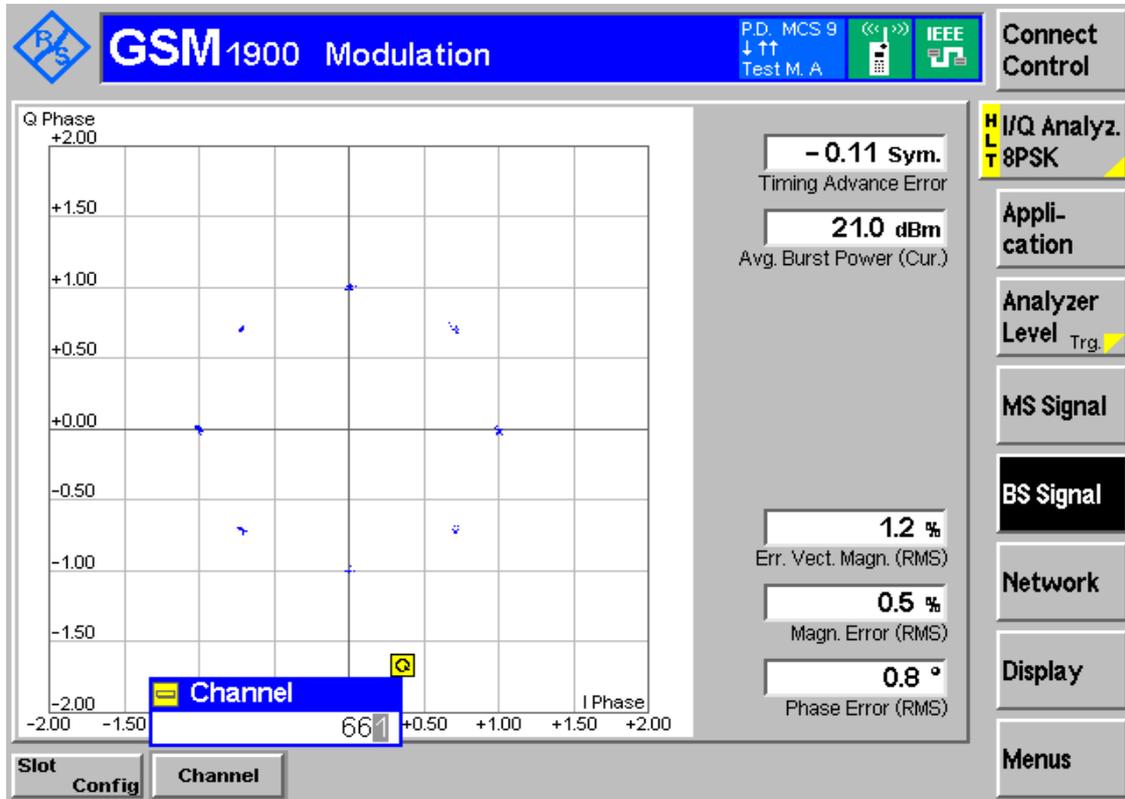
3.1.2.1 Test Mode = GSM/TM1

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	240.82	311.05	Pass
		MCH	242.56	310.16	Pass
		HCH	245.35	314.17	Pass
	GSM/TM2	LCH	241.32	302.81	Pass
		MCH	239.27	309.27	Pass
		HCH	243.10	305.35	Pass
GSM1900	GSM/TM1	LCH	238.25	306.86	Pass
		MCH	245.12	309.88	Pass
		HCH	244.46	307.91	Pass
	GSM/TM2	LCH	241.24	295.69	Pass
		MCH	241.75	309.90	Pass
		HCH	245.82	308.73	Pass

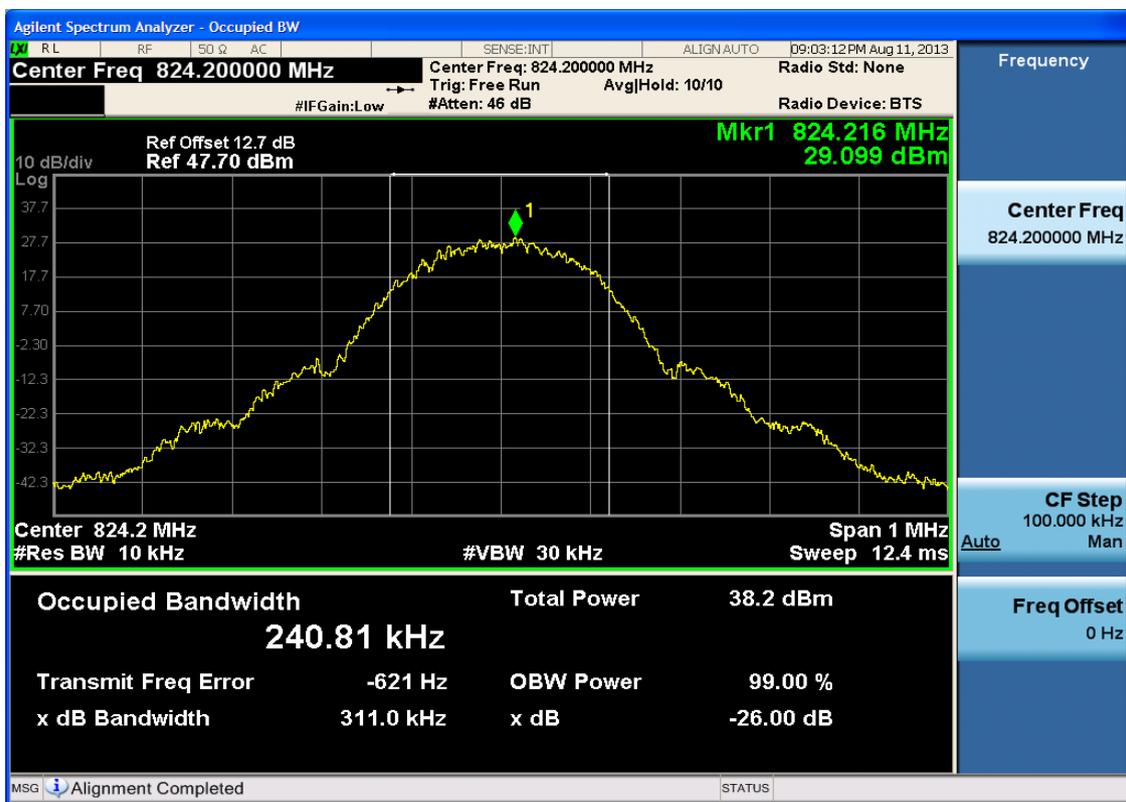
Part II - Test Plots

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

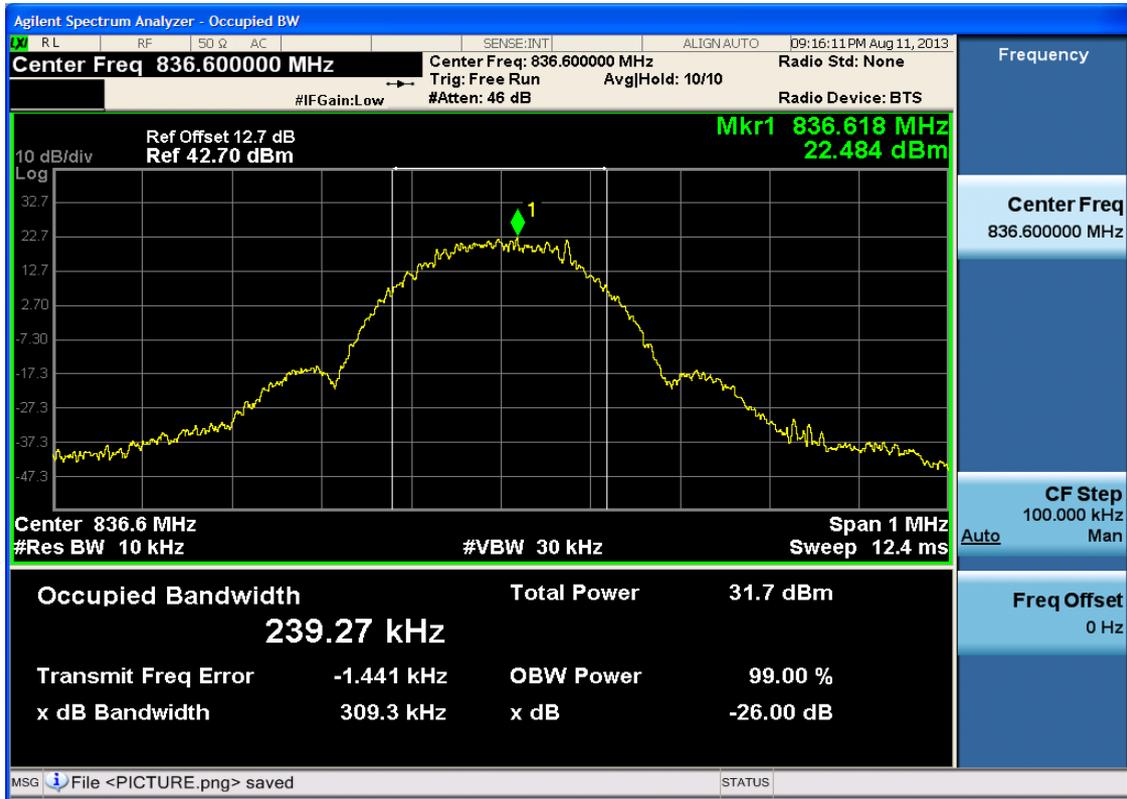


4.1.1.2 Test Mode = GSM/TM2

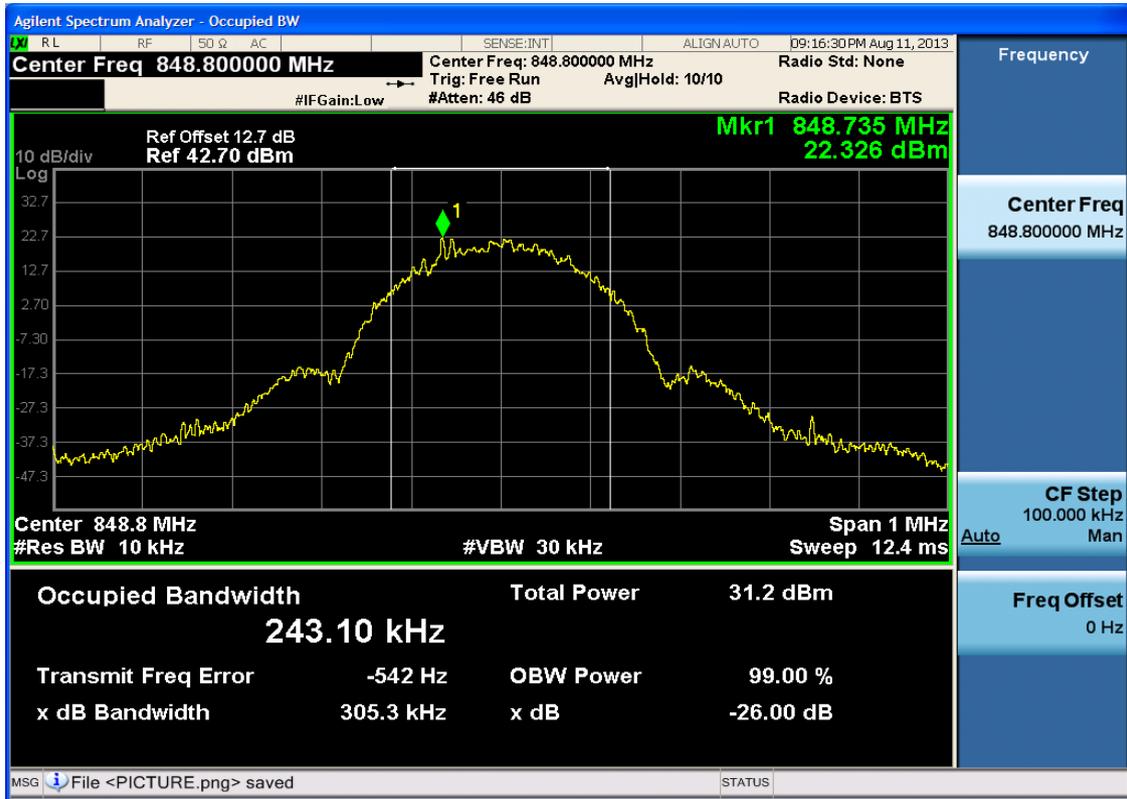
4.1.1.2.1 Test Channel = LCH



4.1.1.2.2 Test Channel = MCH



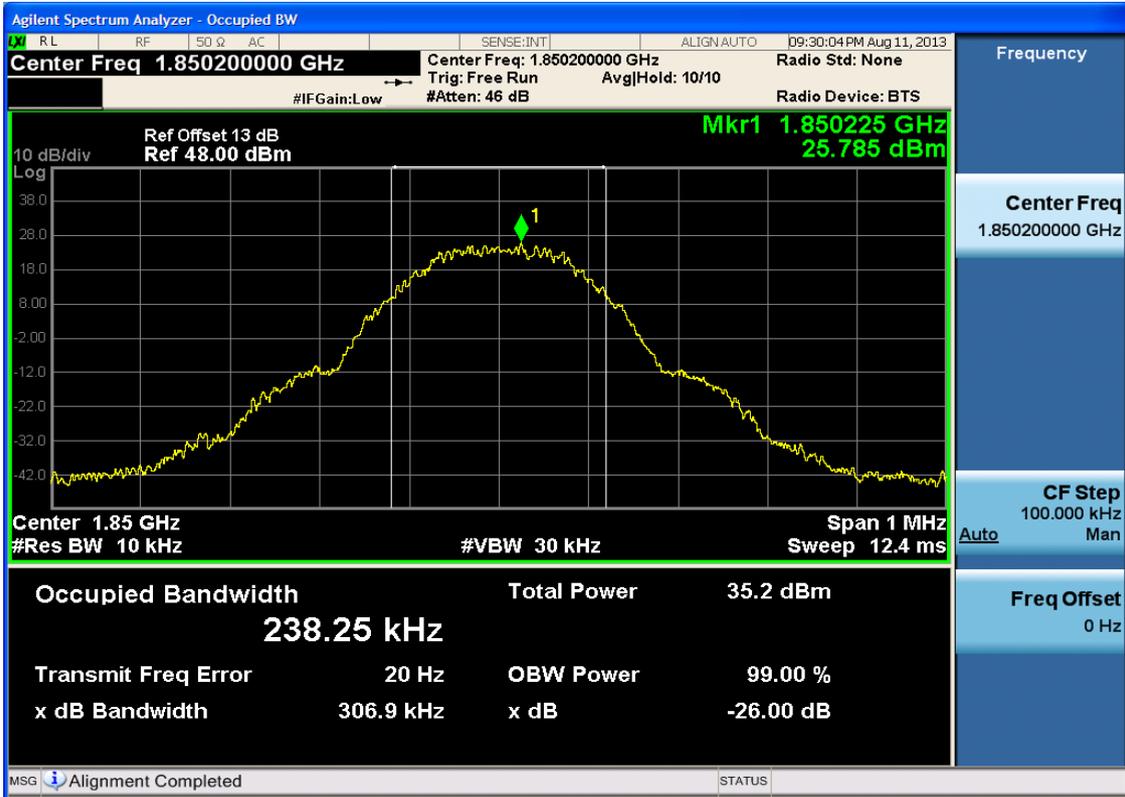
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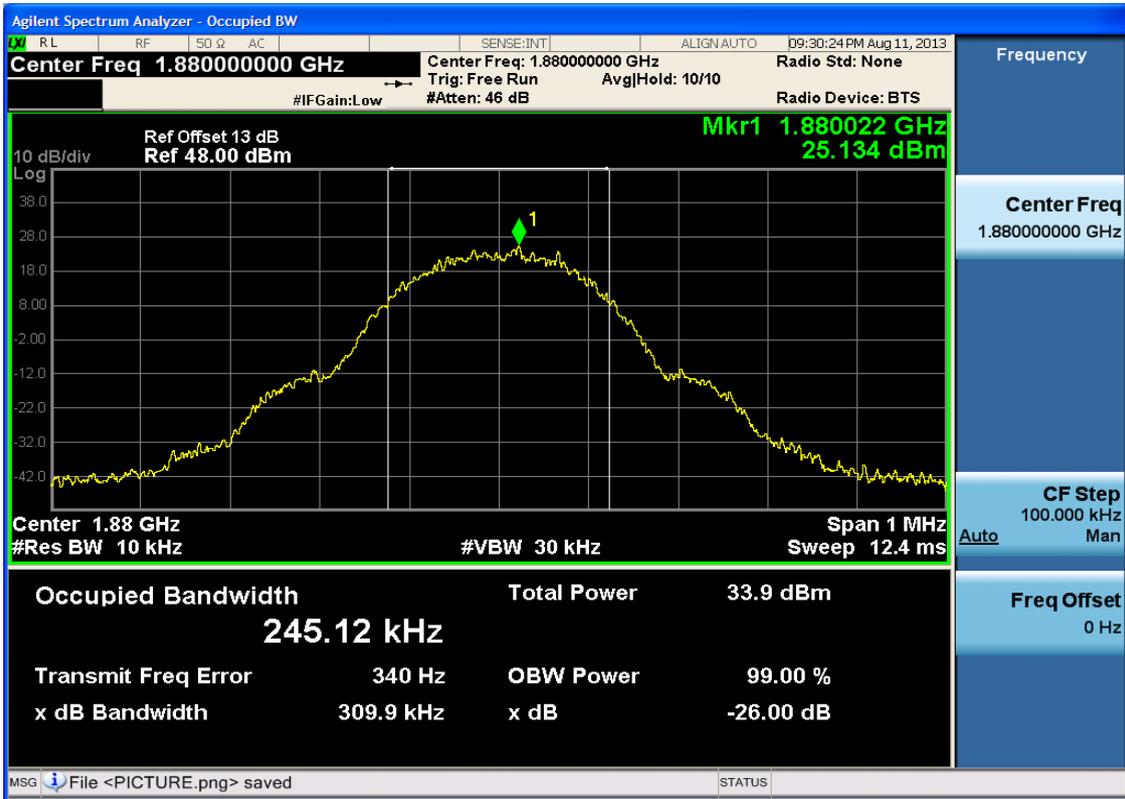
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4.1.2.1 Test Mode = GSM/TM1

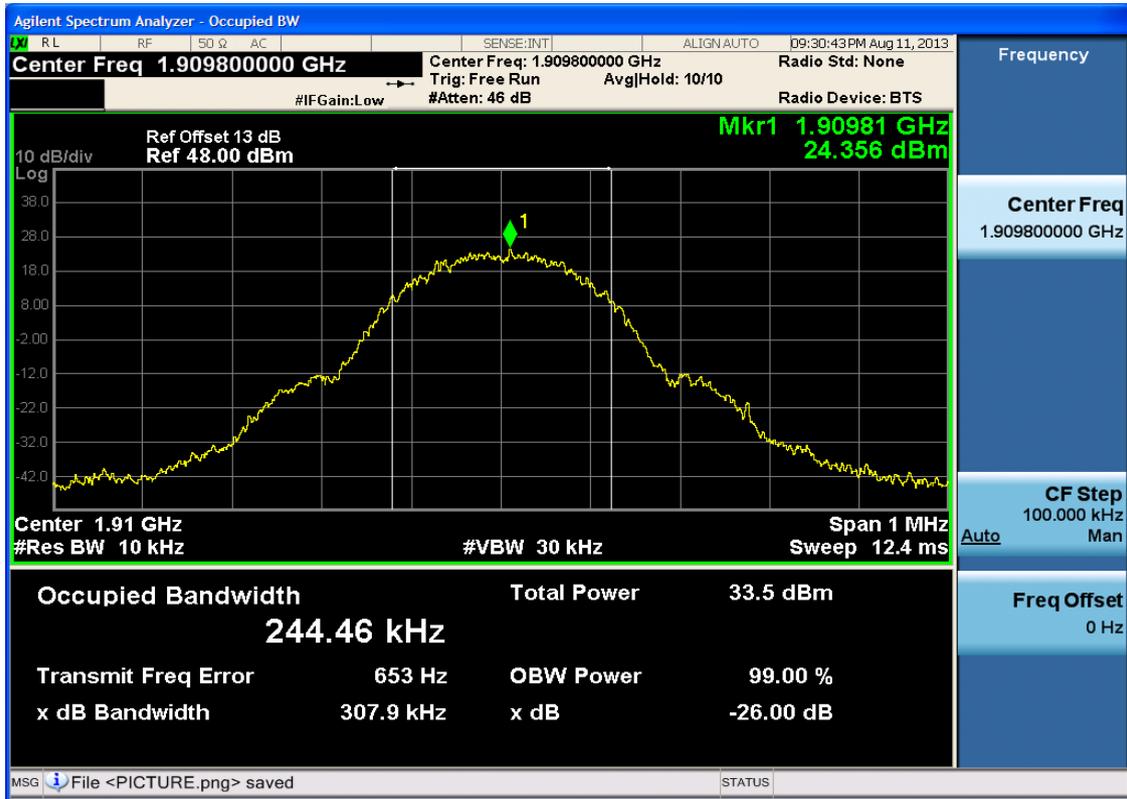
4.1.2.1.1 Test Channel = LCH



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

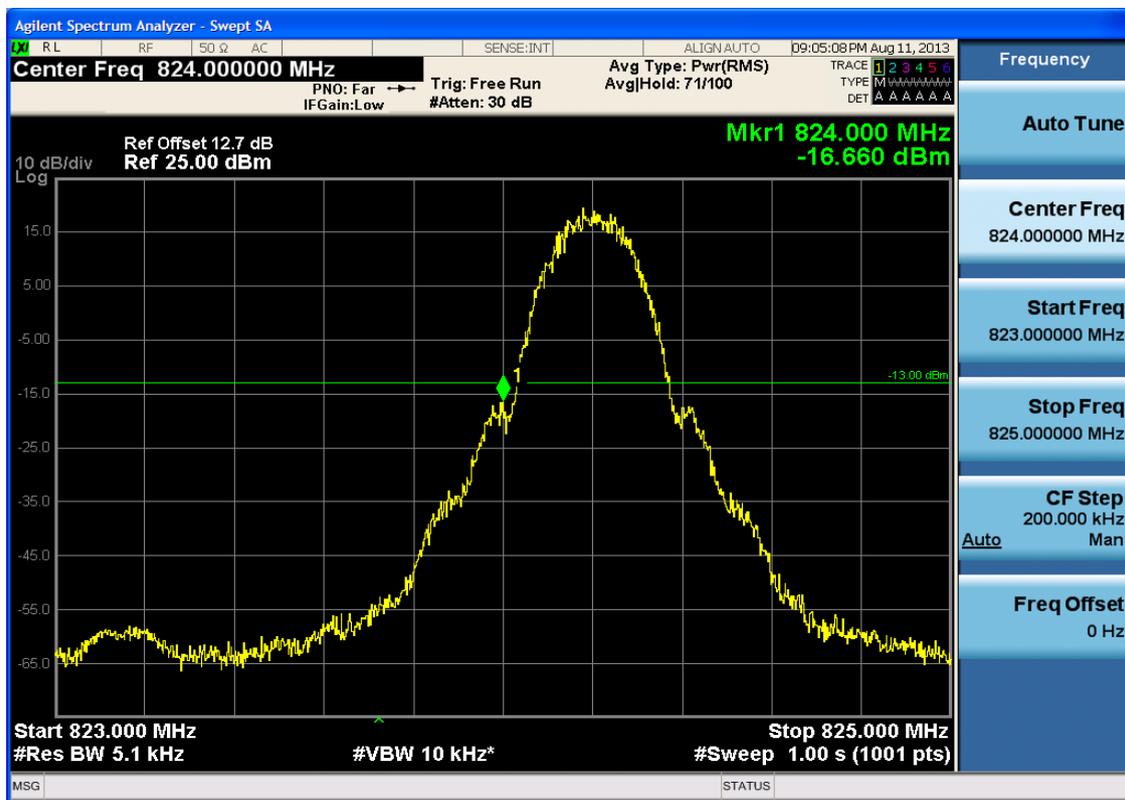
Part I - Test Plots

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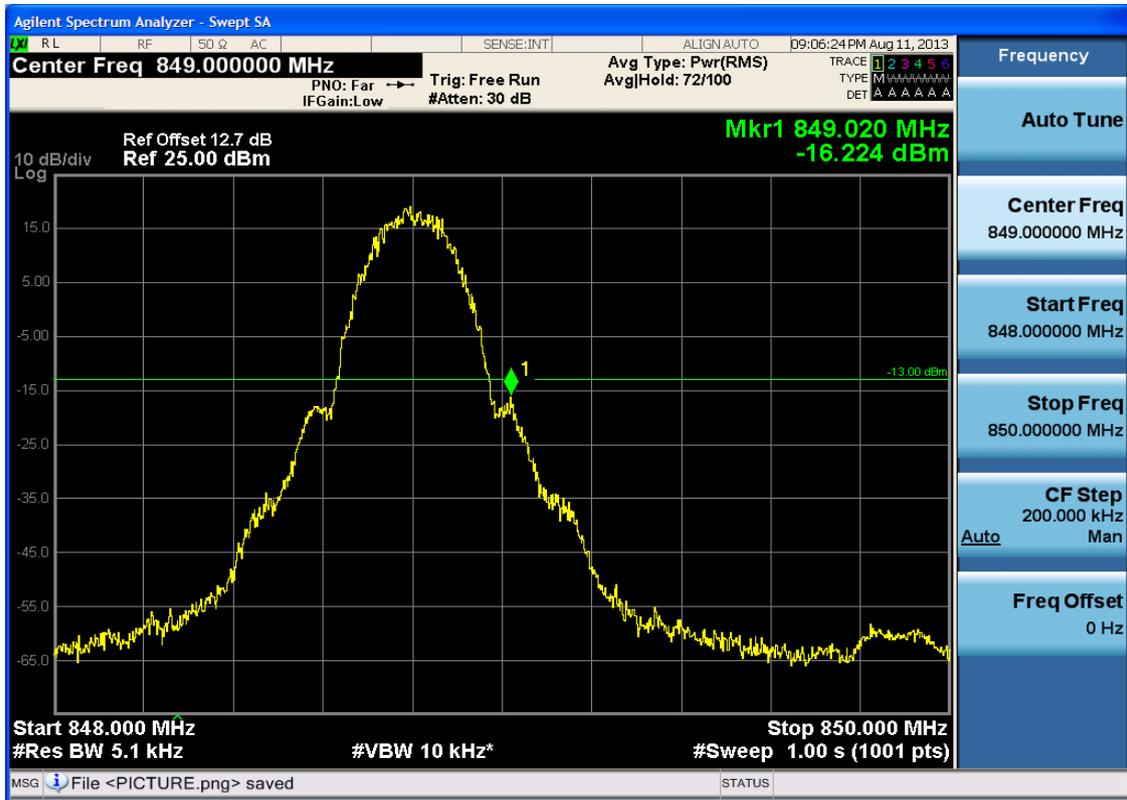
5.1.1 Test Band = GSM850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH

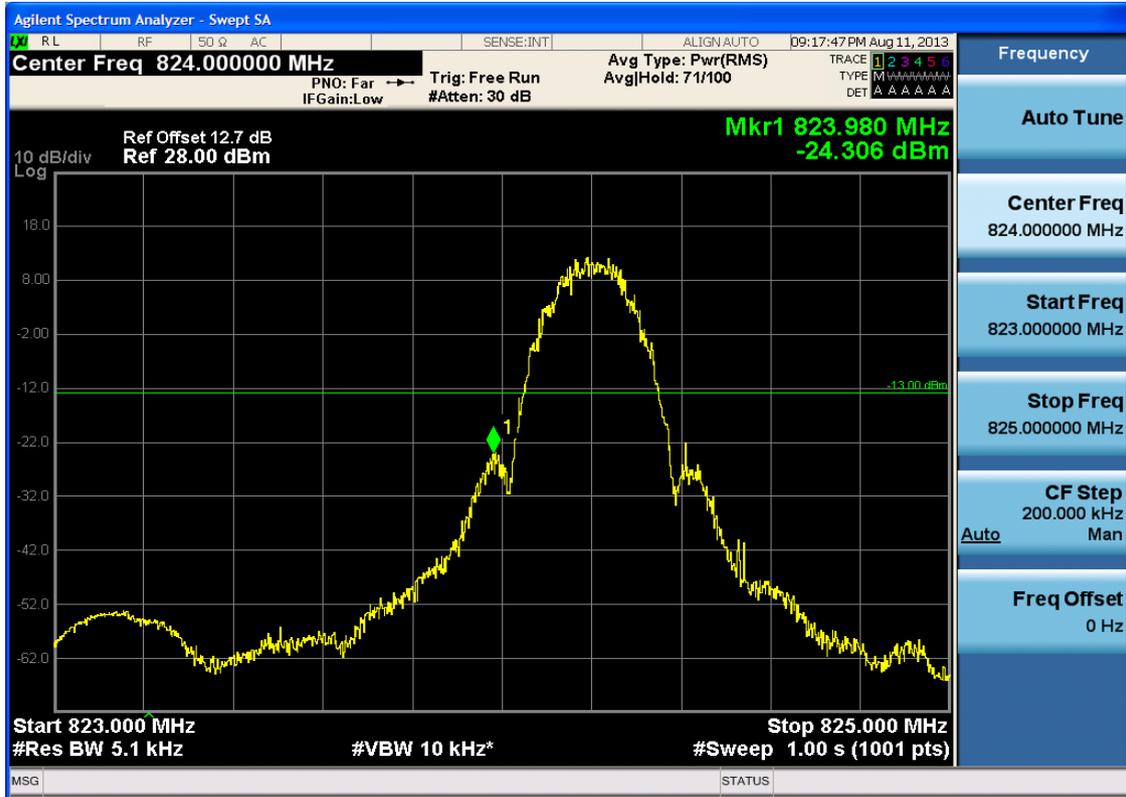


5.1.1.1.2 Test Channel = HCH

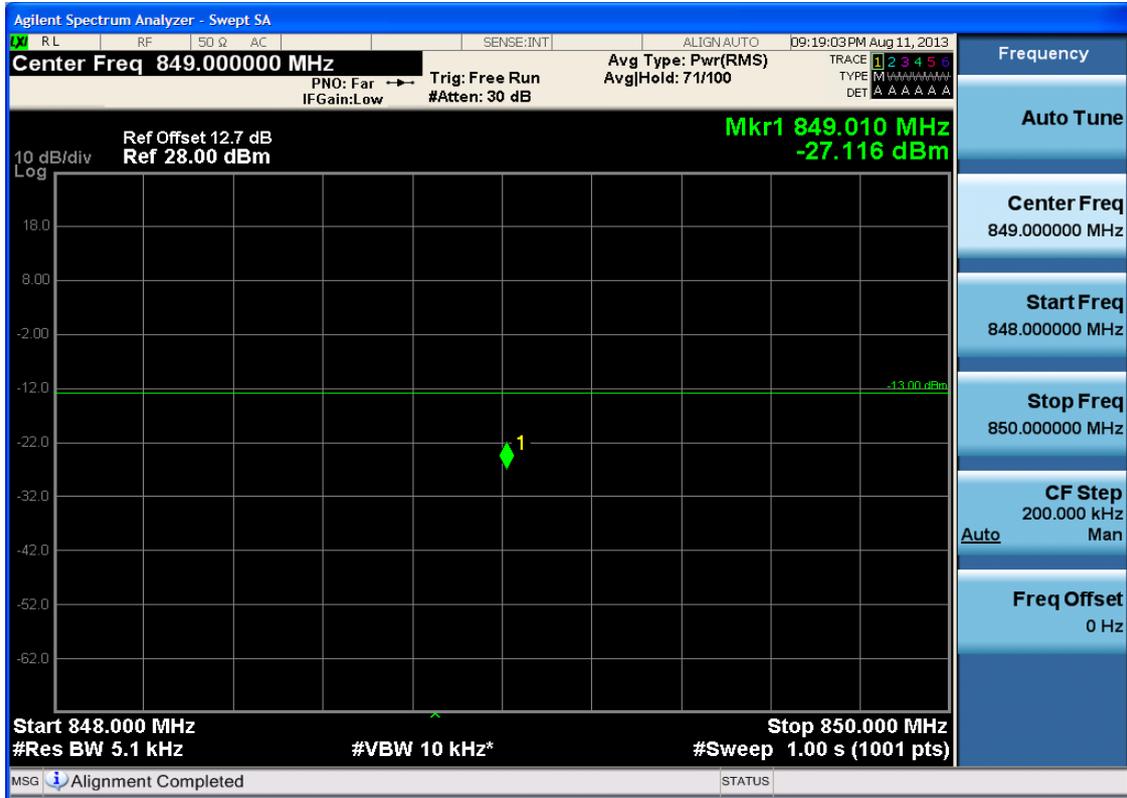


5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



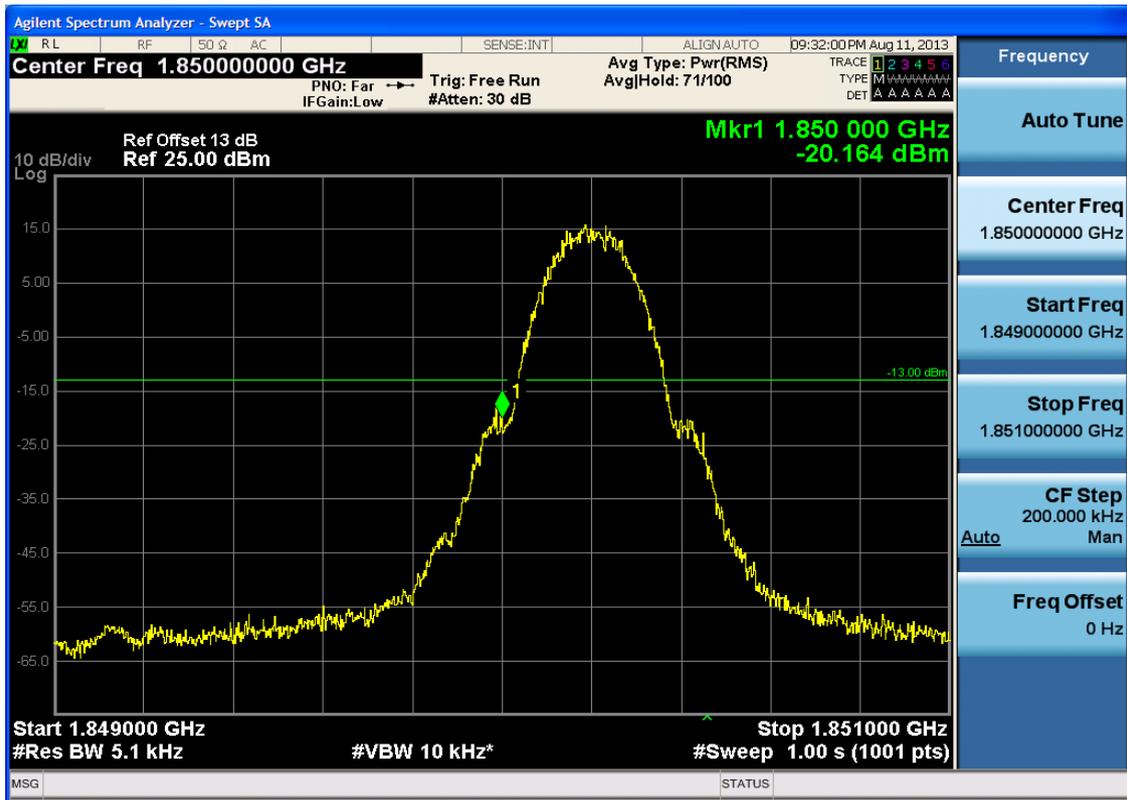
5.1.1.2.2 Test Channel = HCH



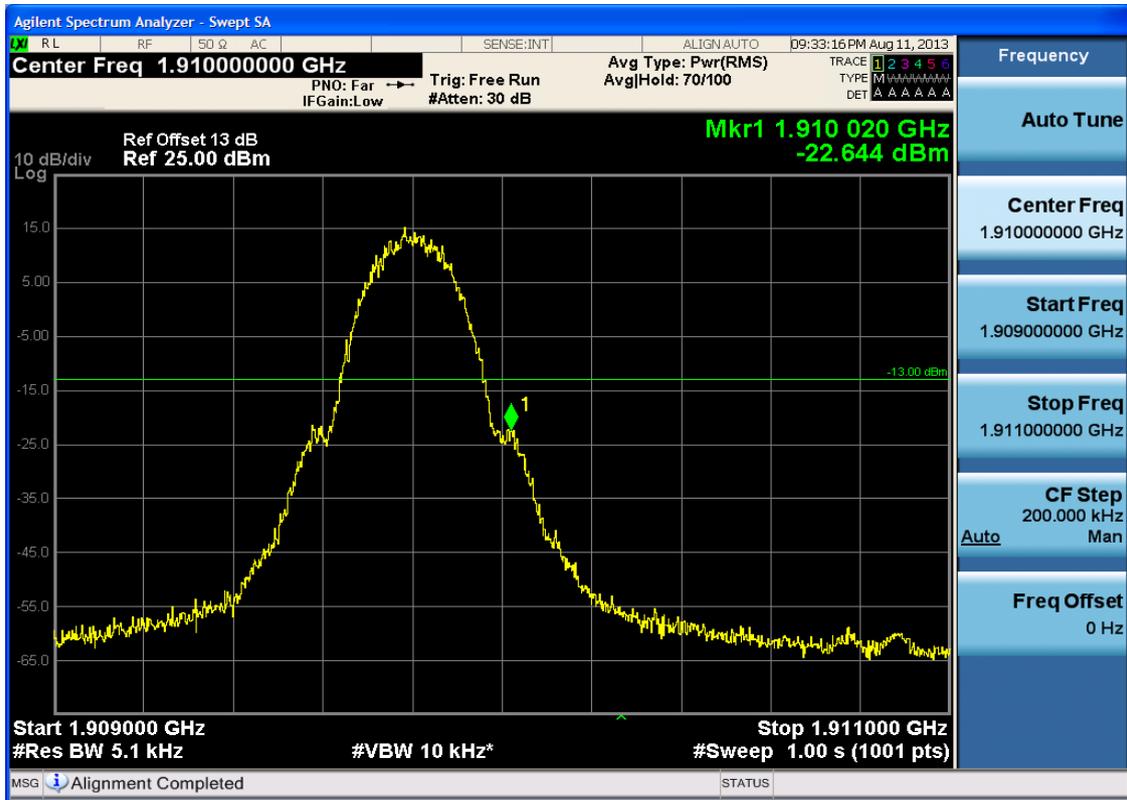
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH

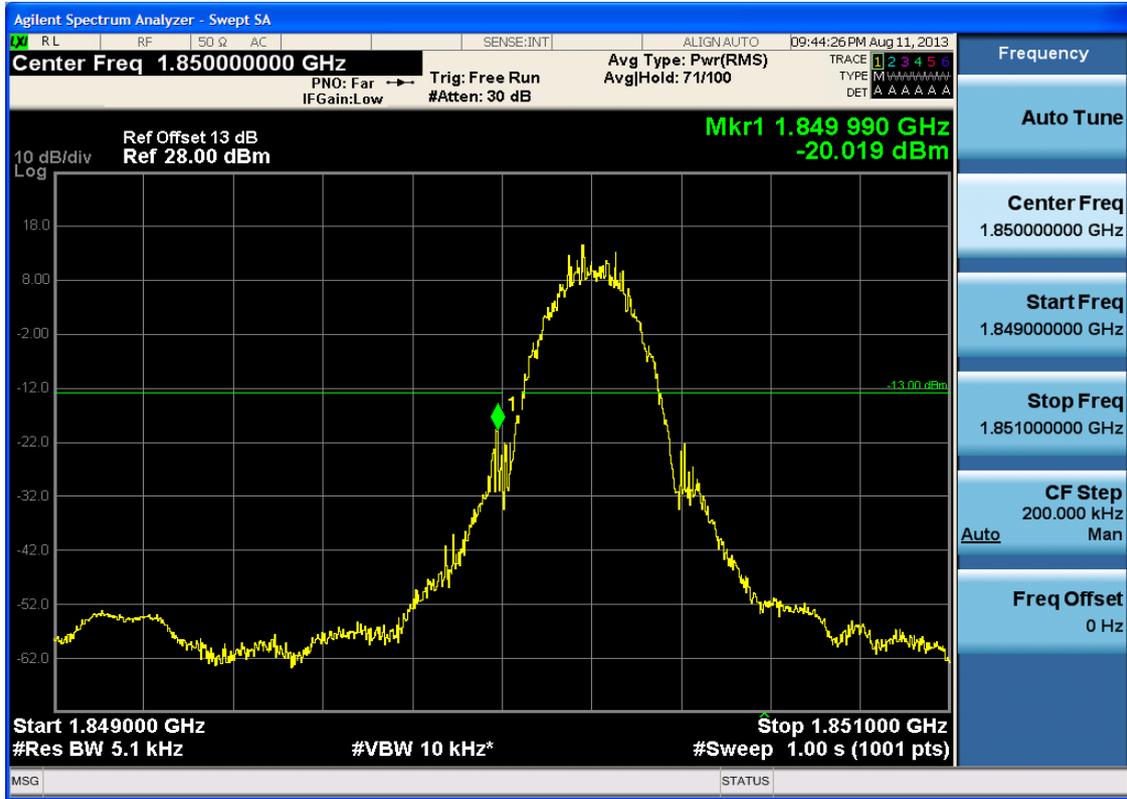


5.1.2.1.2 Test Channel = HCH

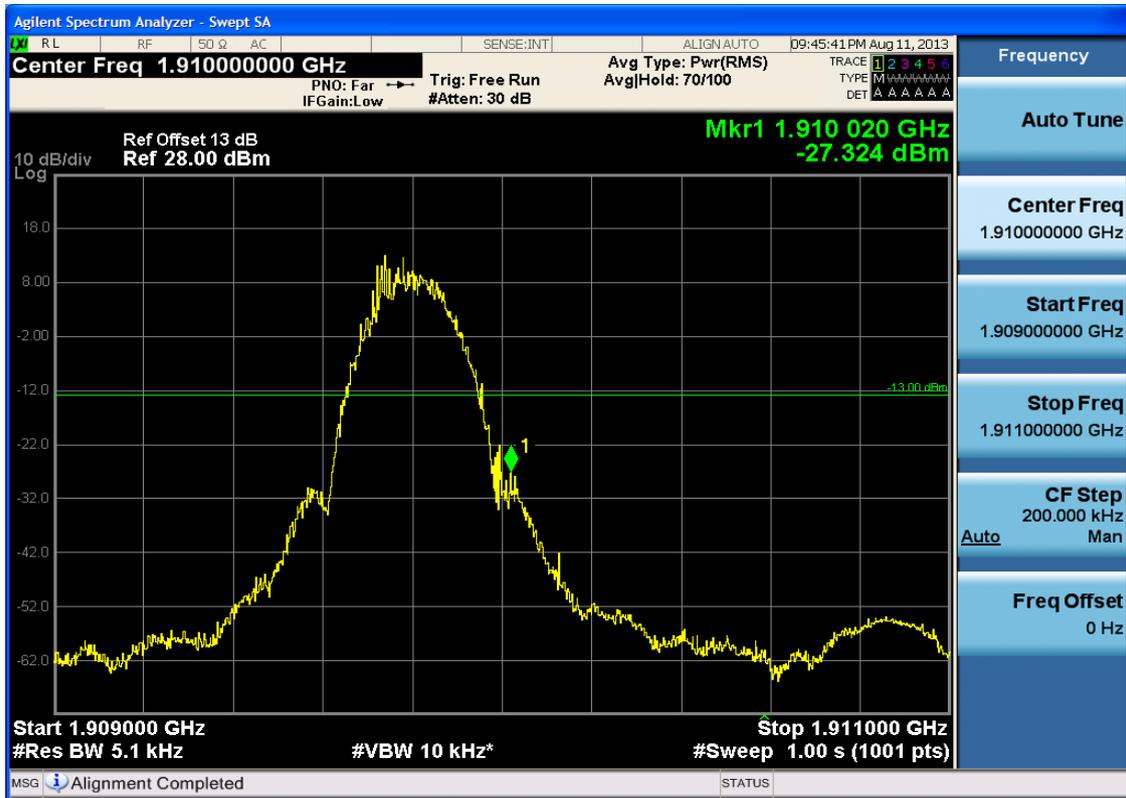


5.1.2.2 Test Mode = GSM/TM2

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.

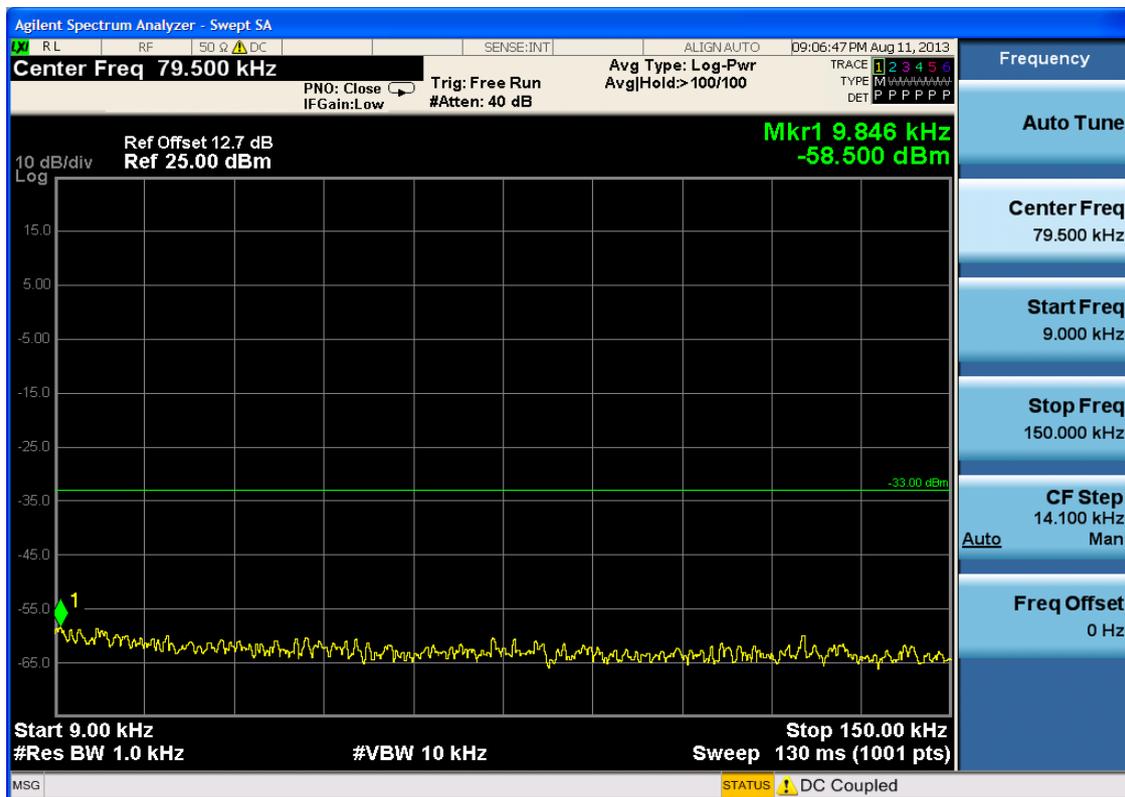
Part I - Test Plots

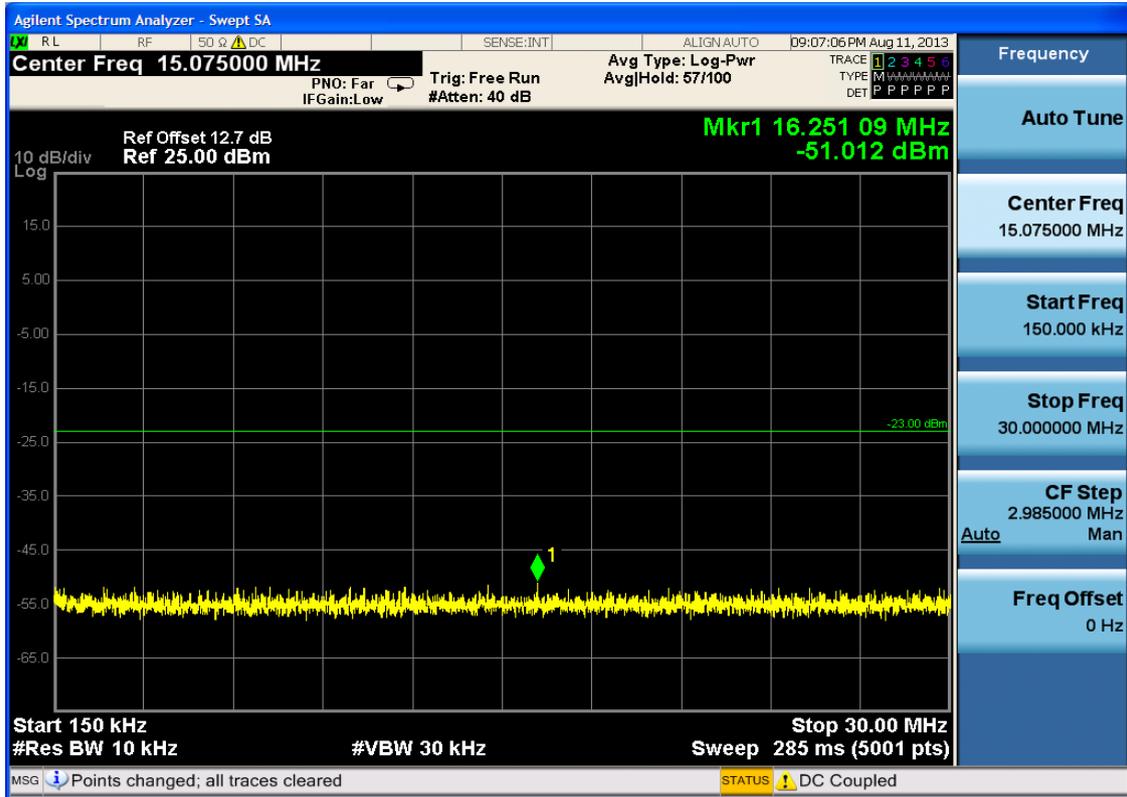
6.1 For GSM

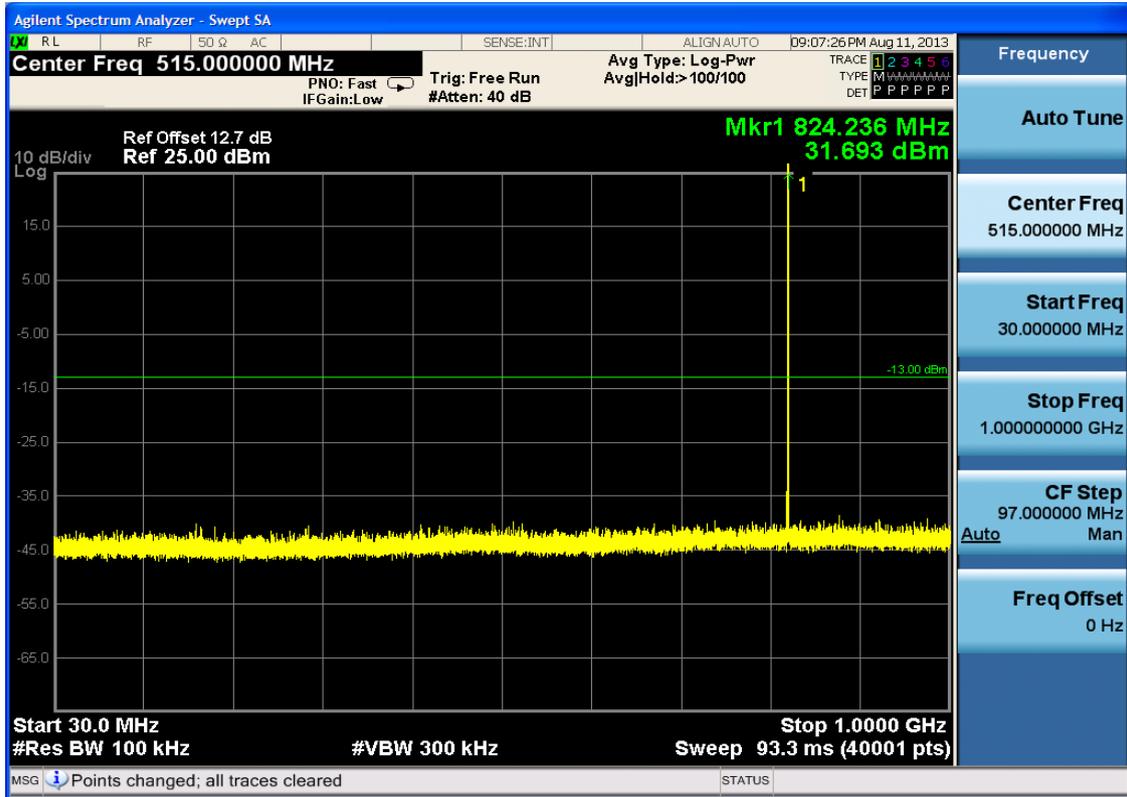
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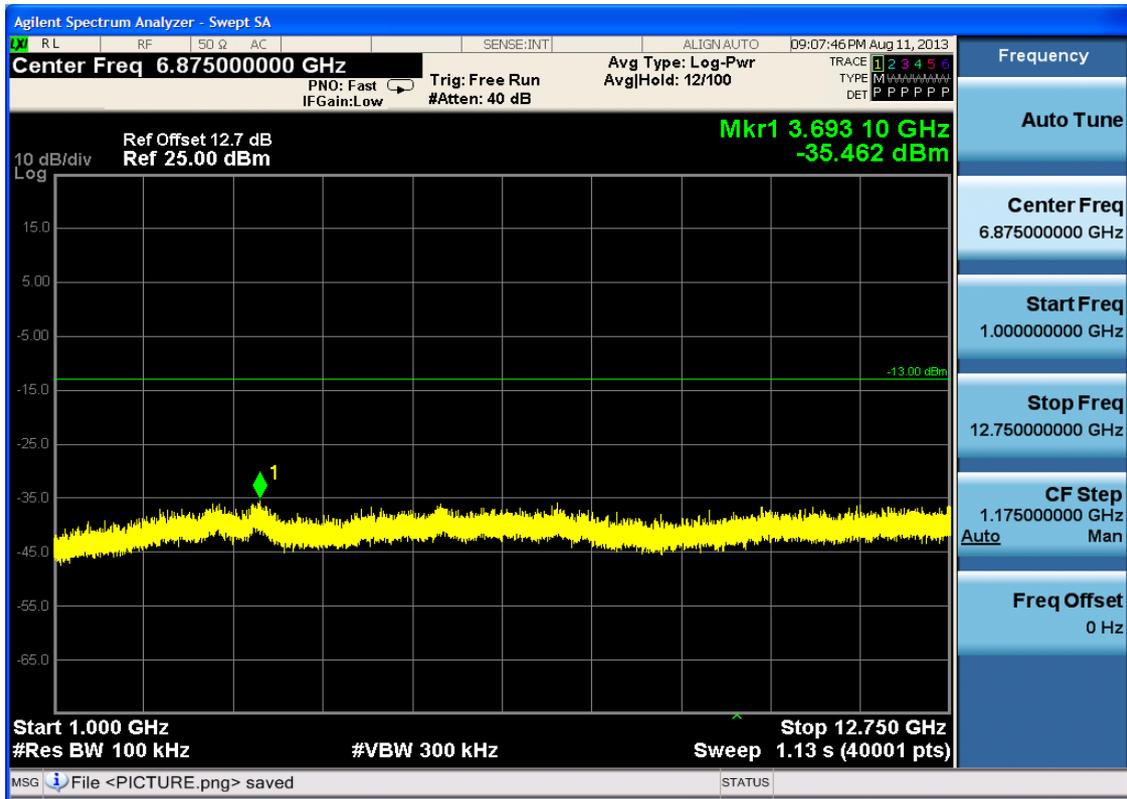
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH

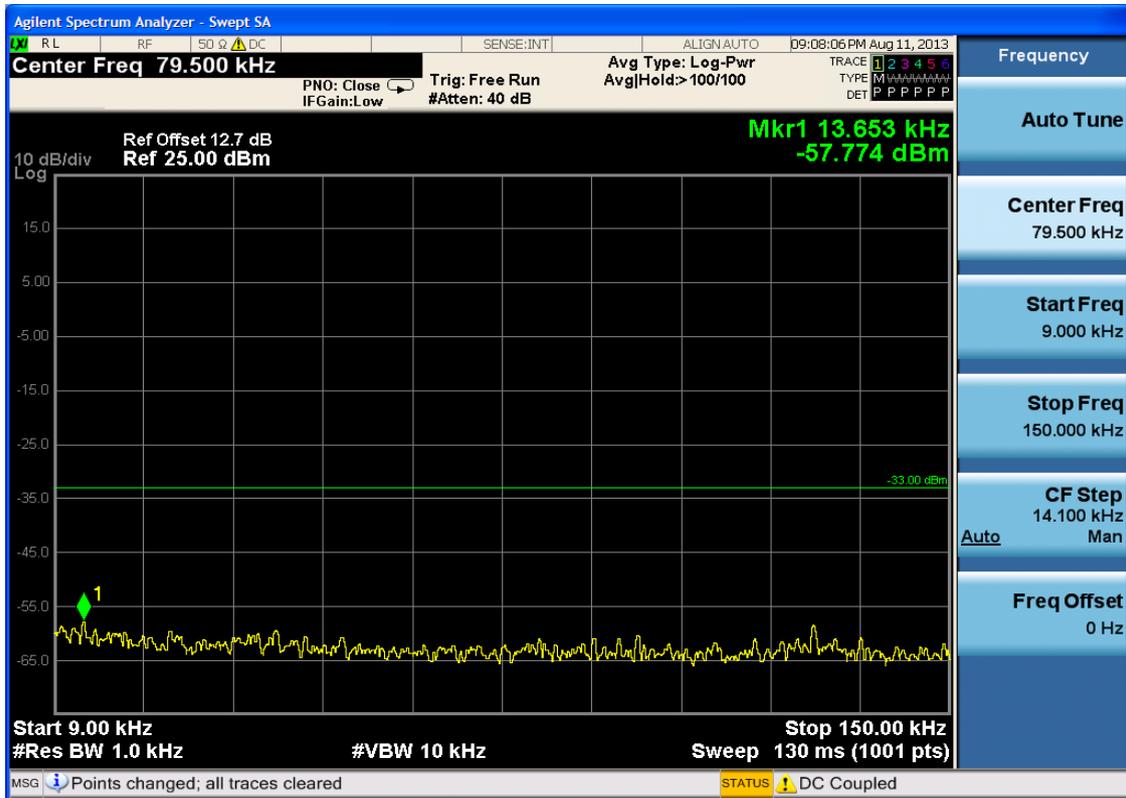


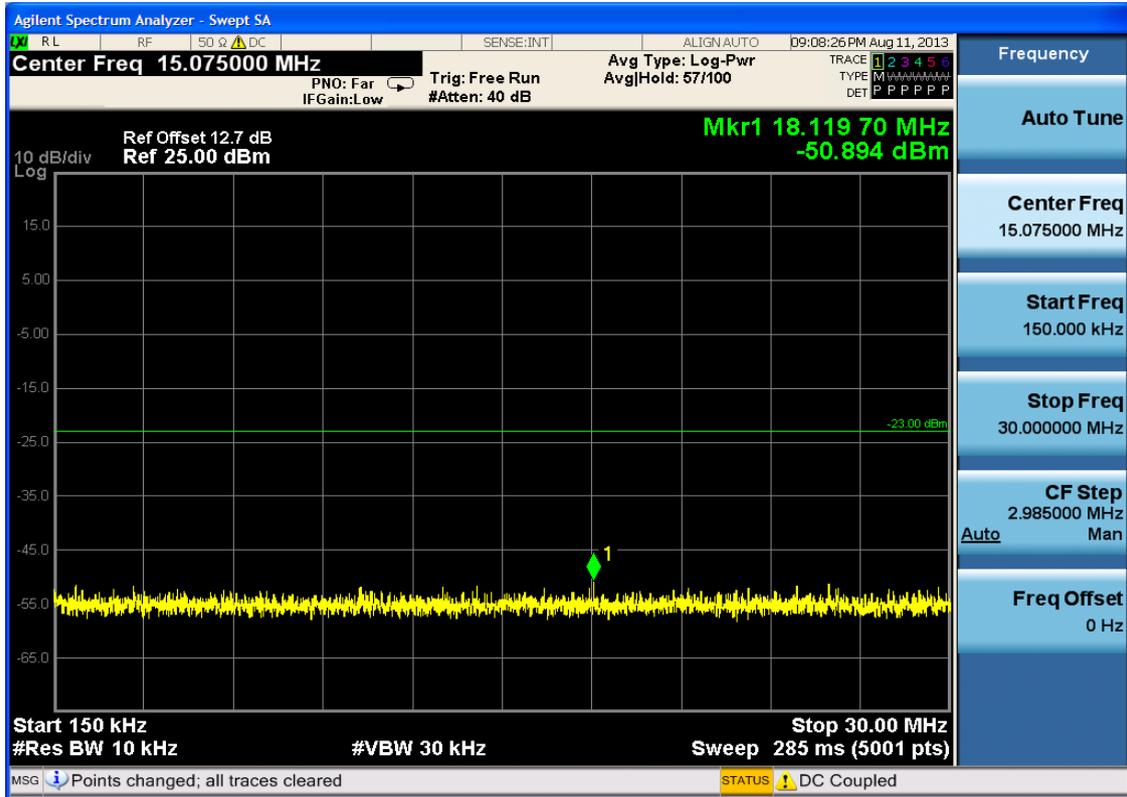


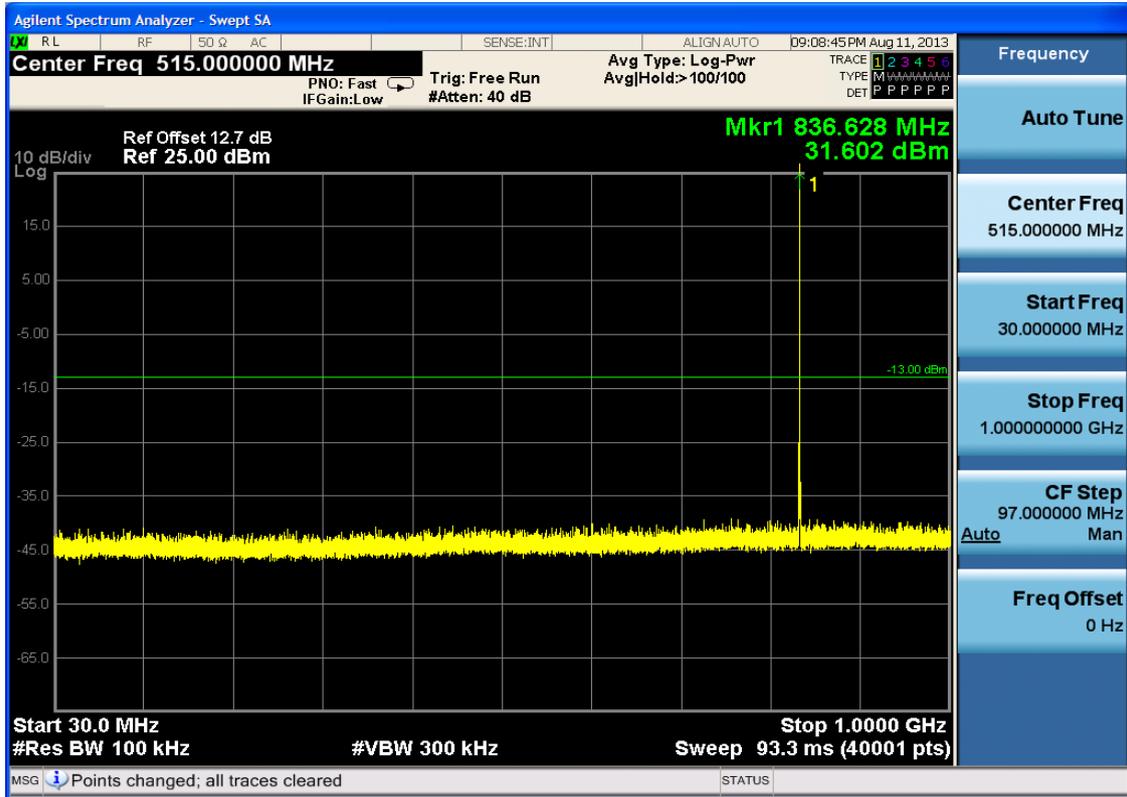


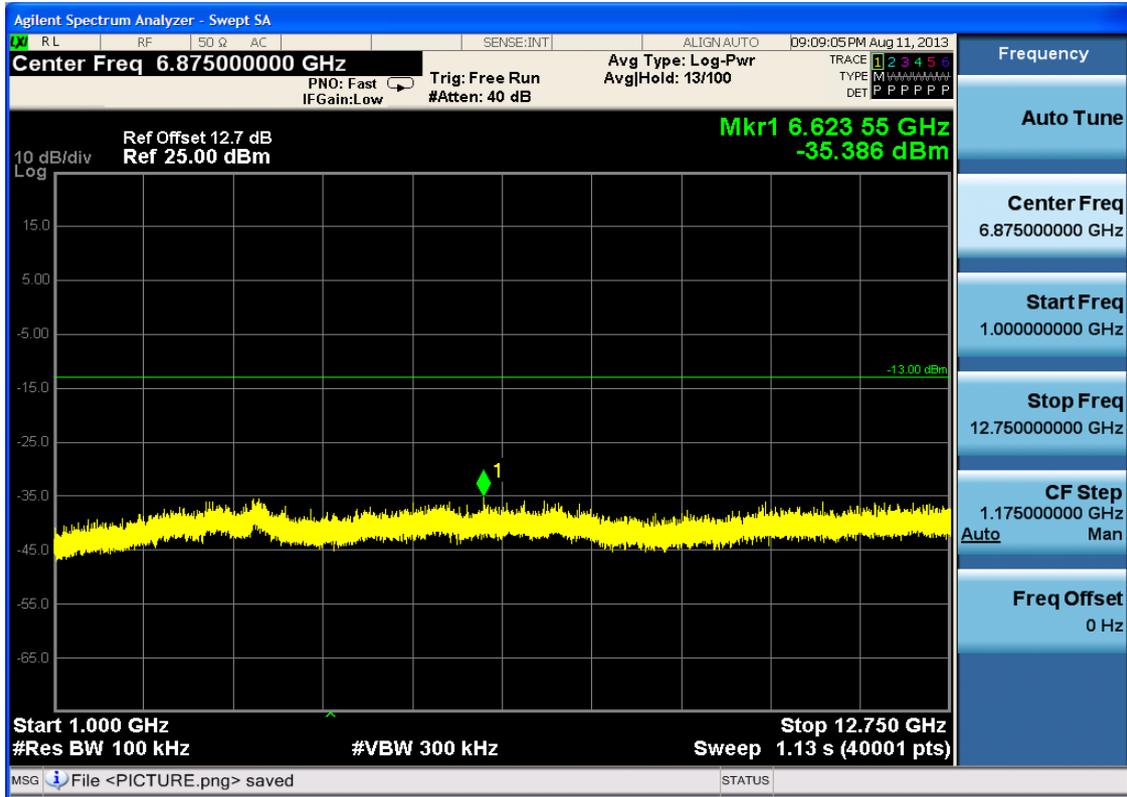


6.1.1.1.2 Test Channel = MCH

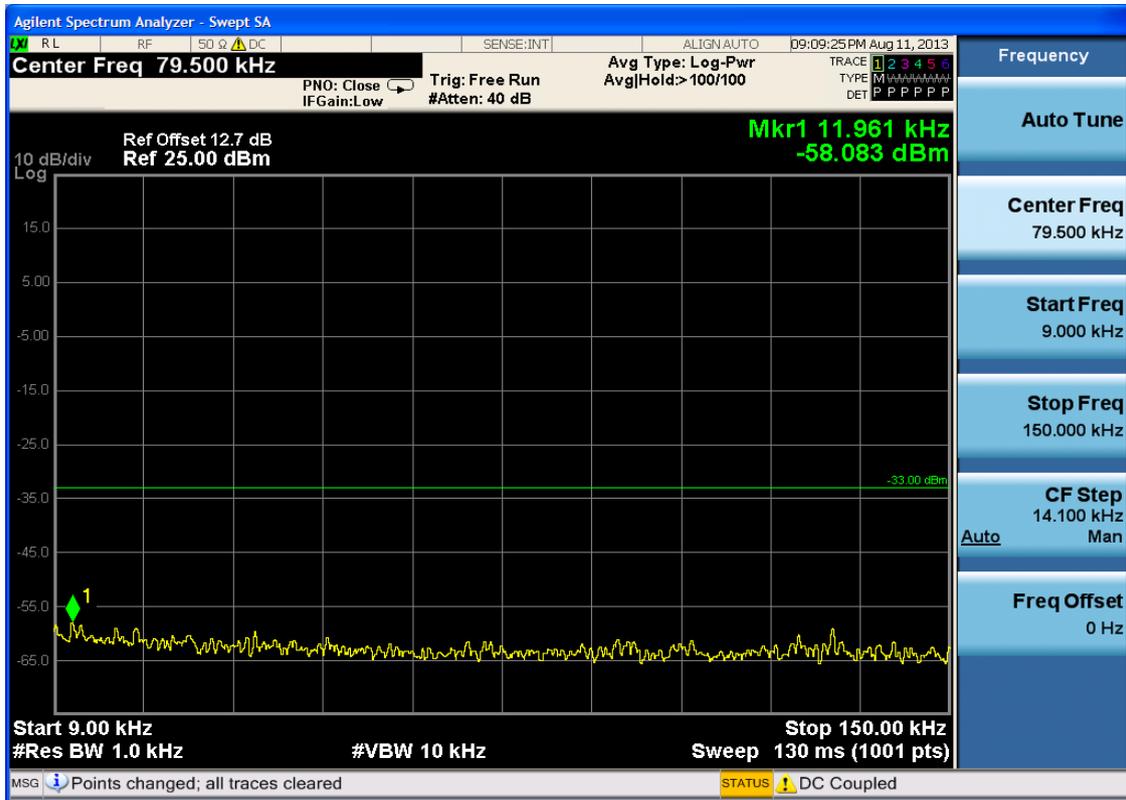


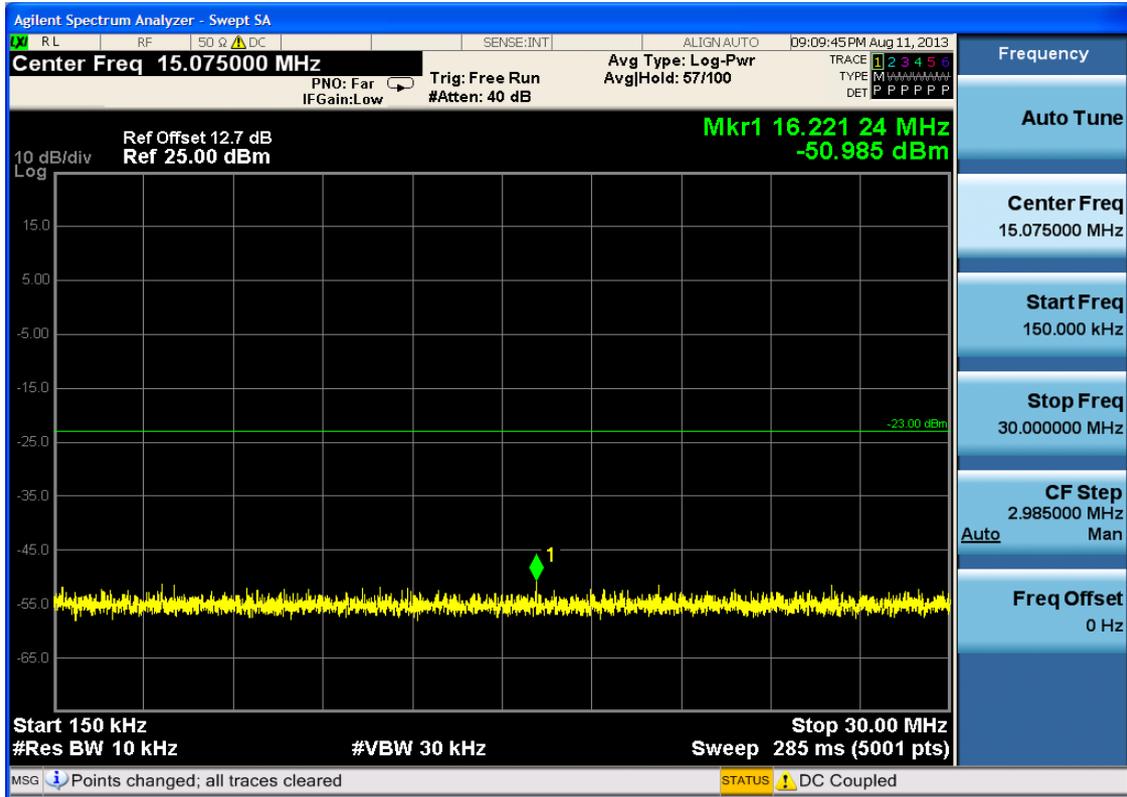


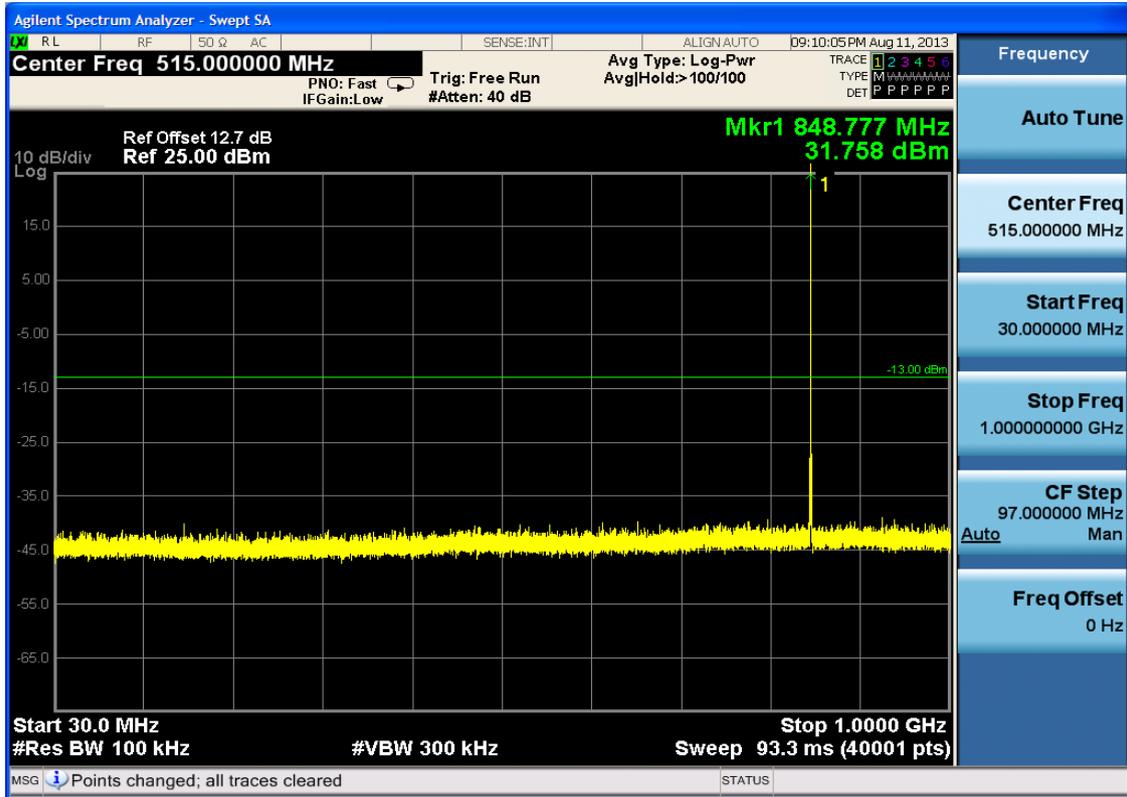


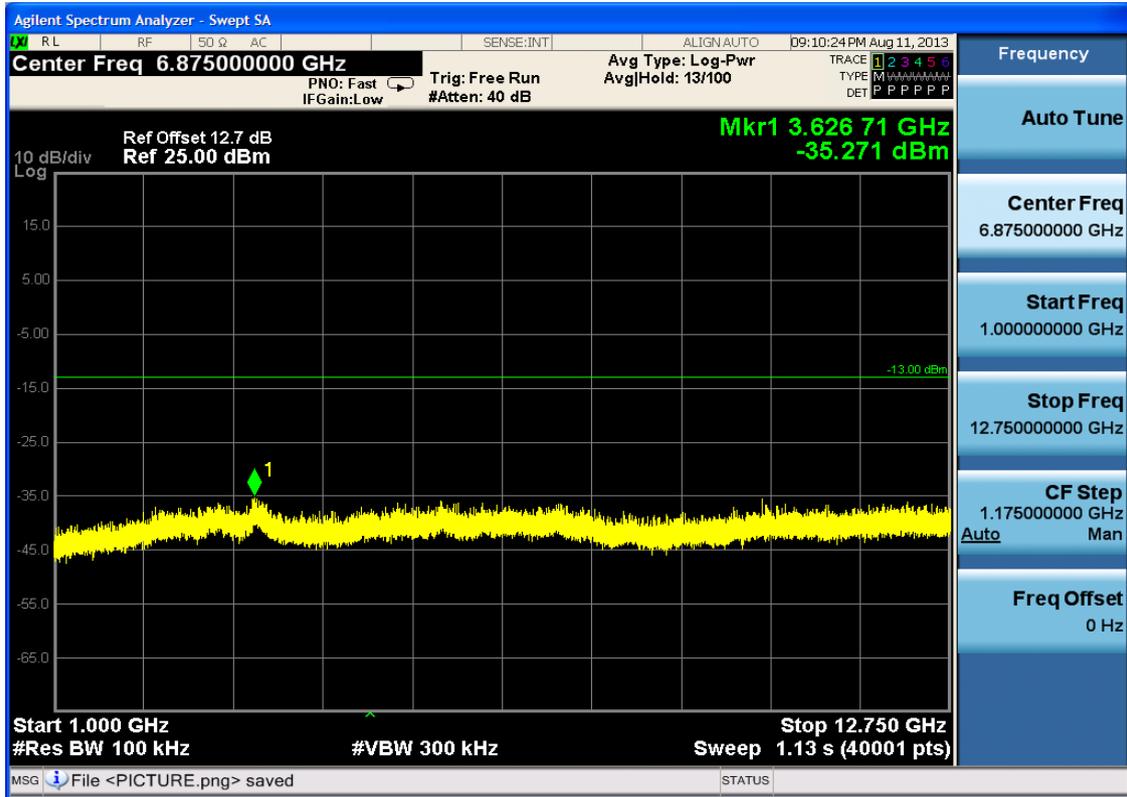


6.1.1.1.3 Test Channel = HCH



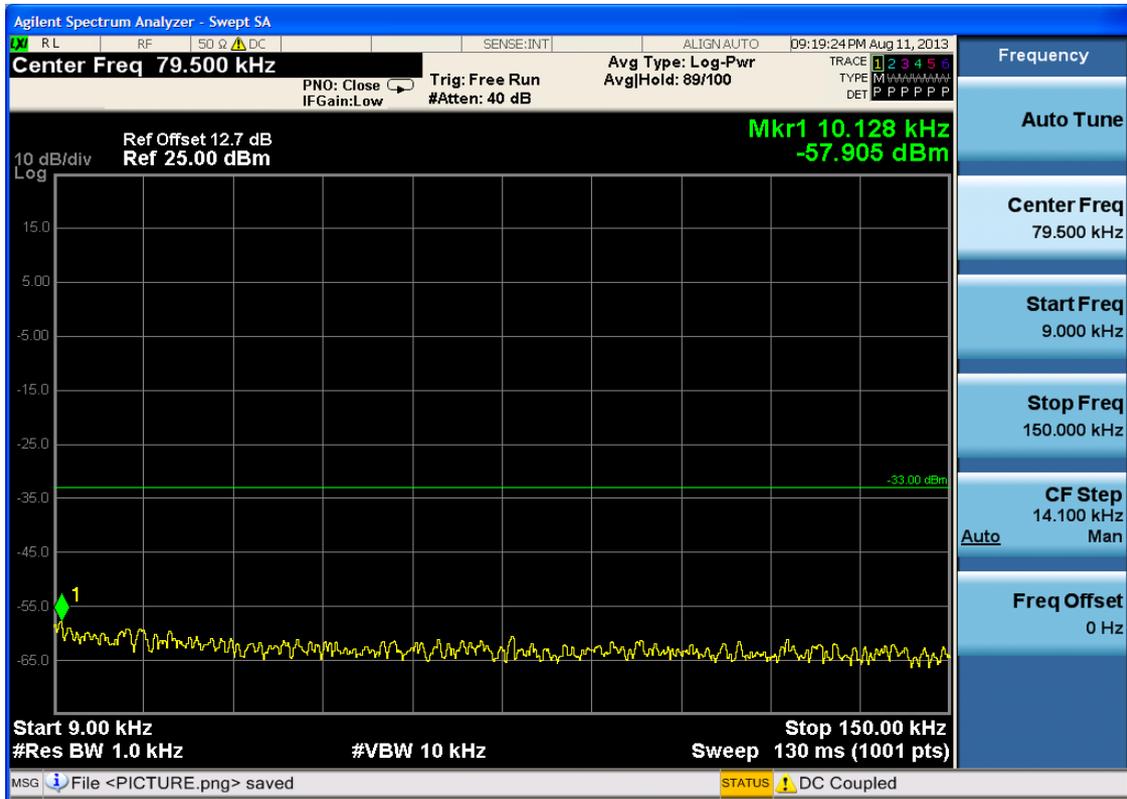


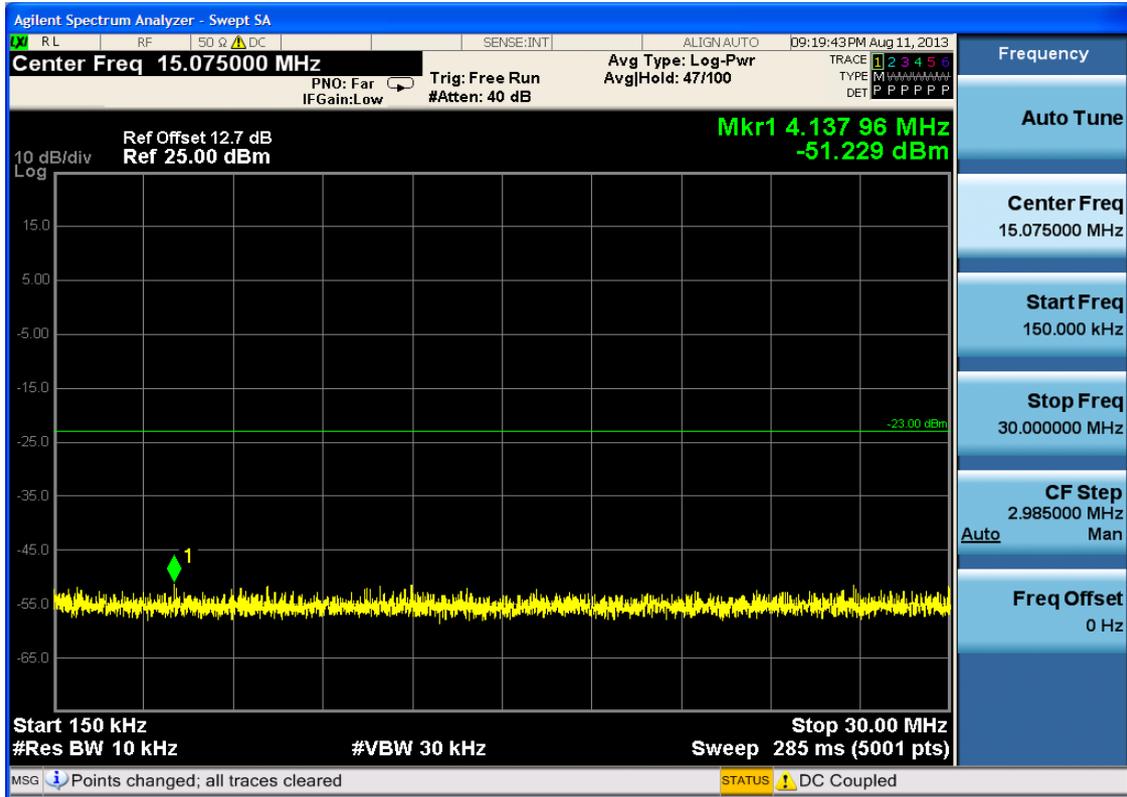


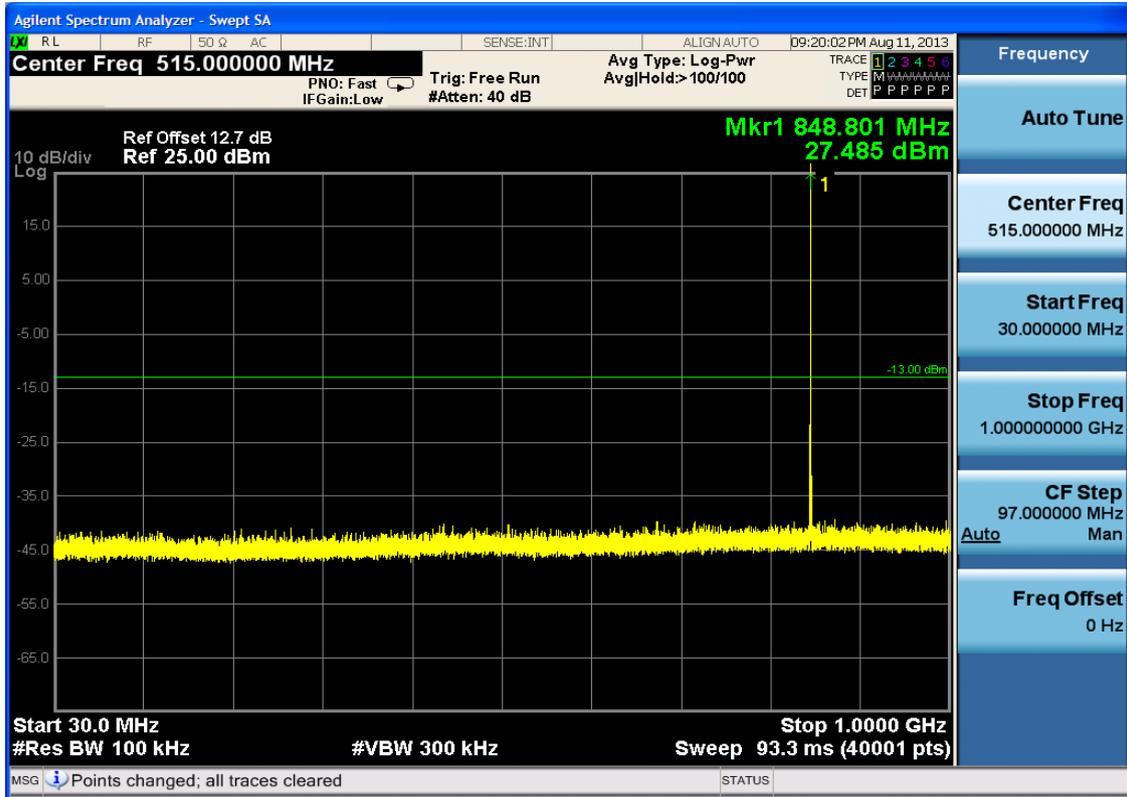


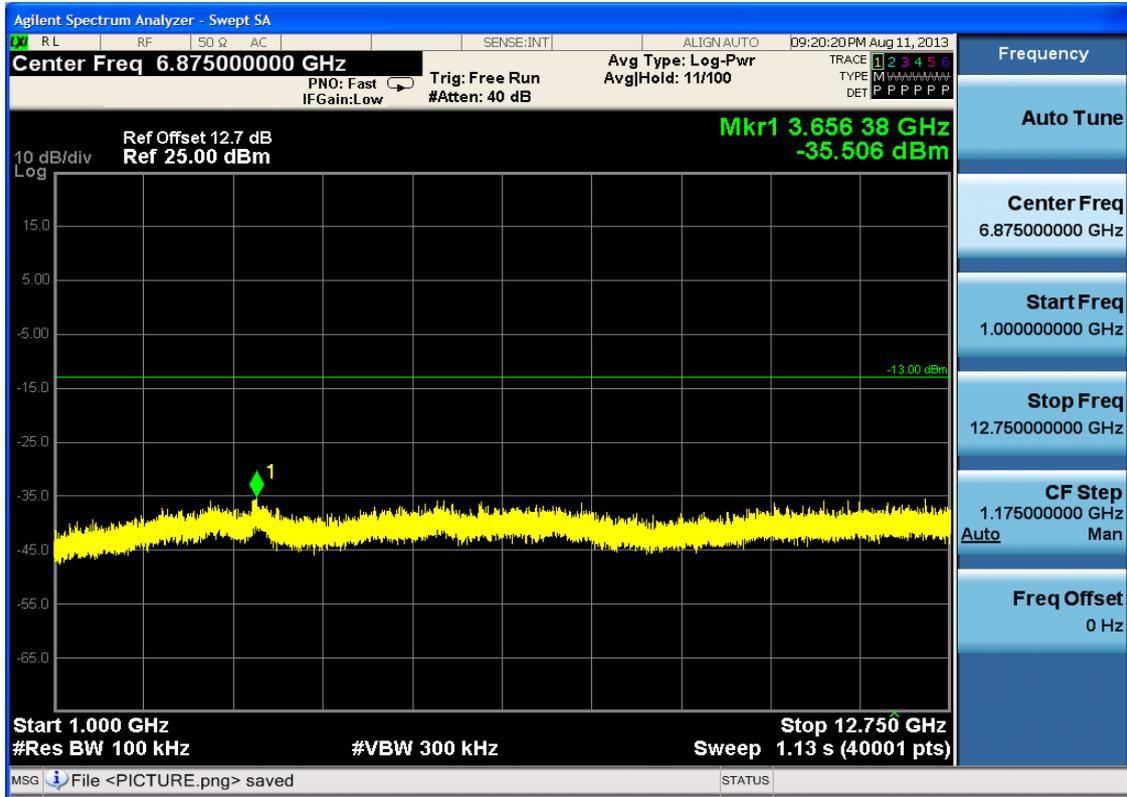
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH

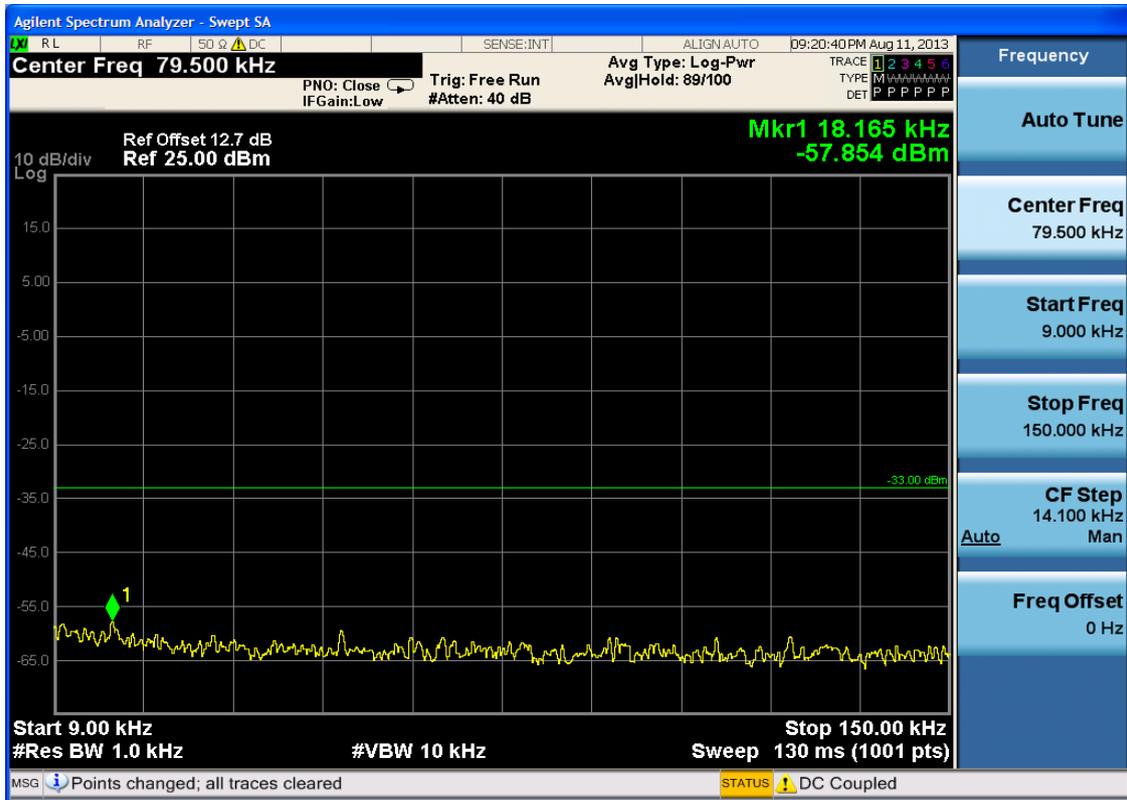


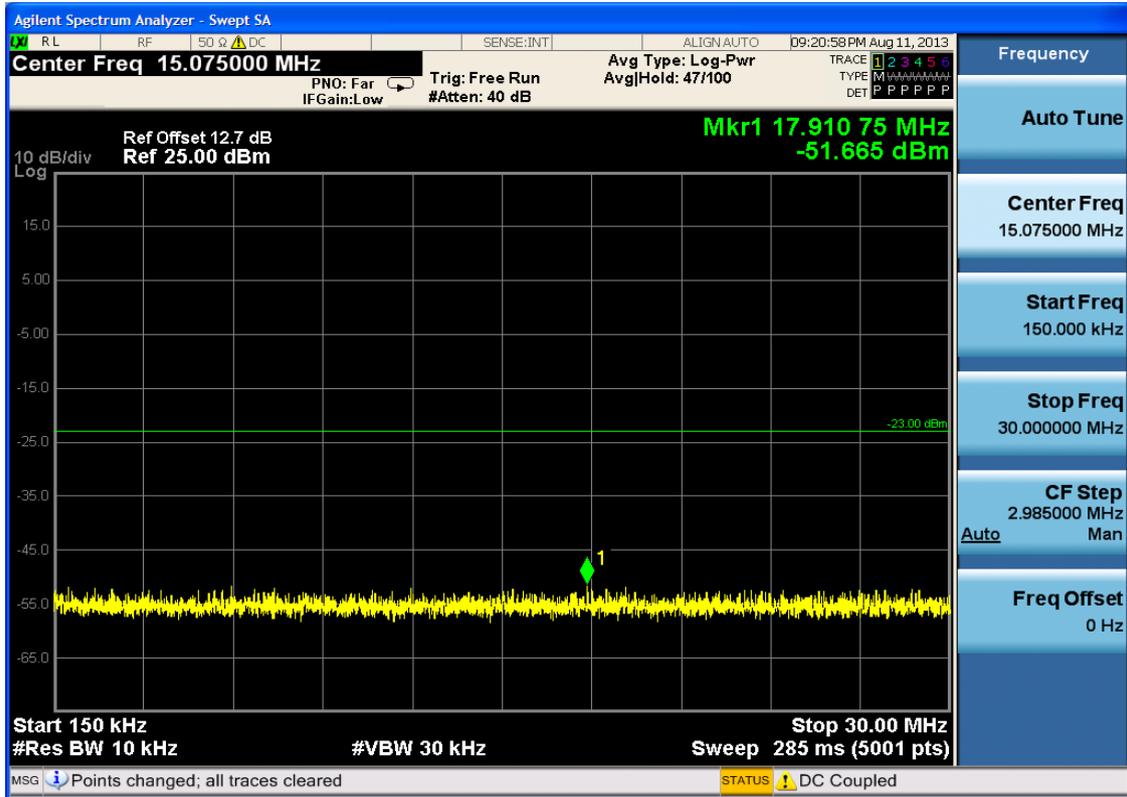


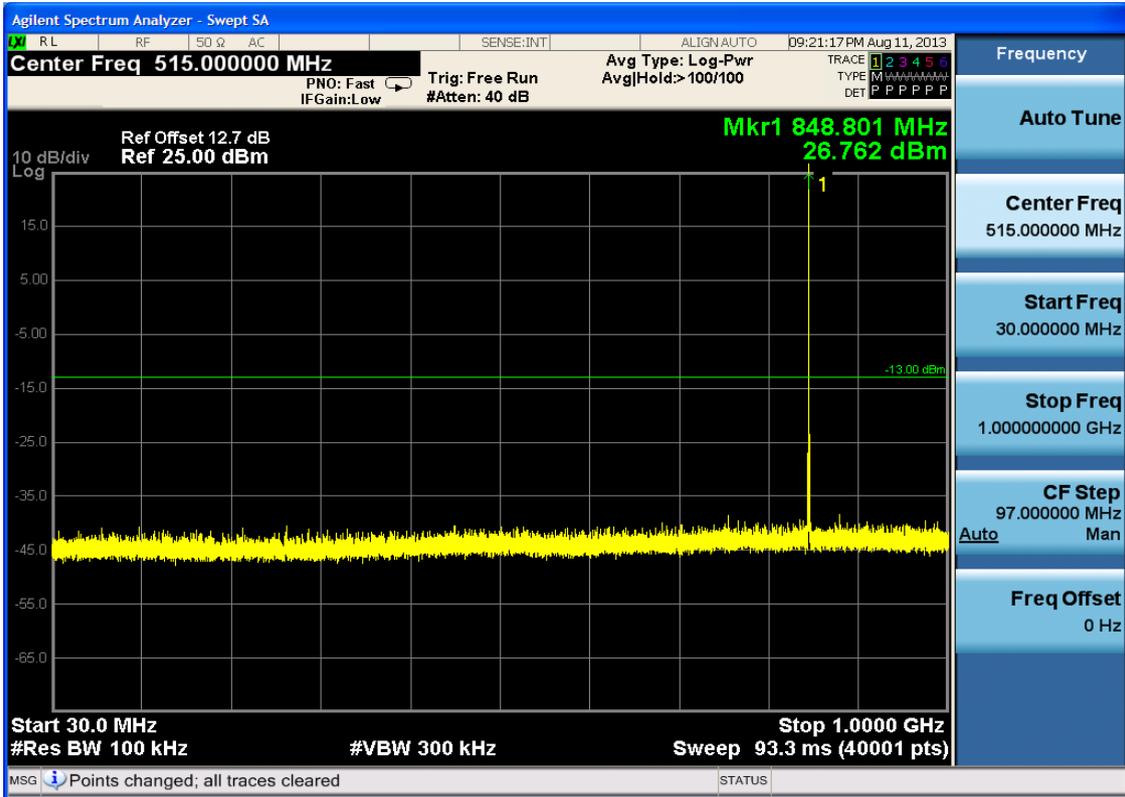


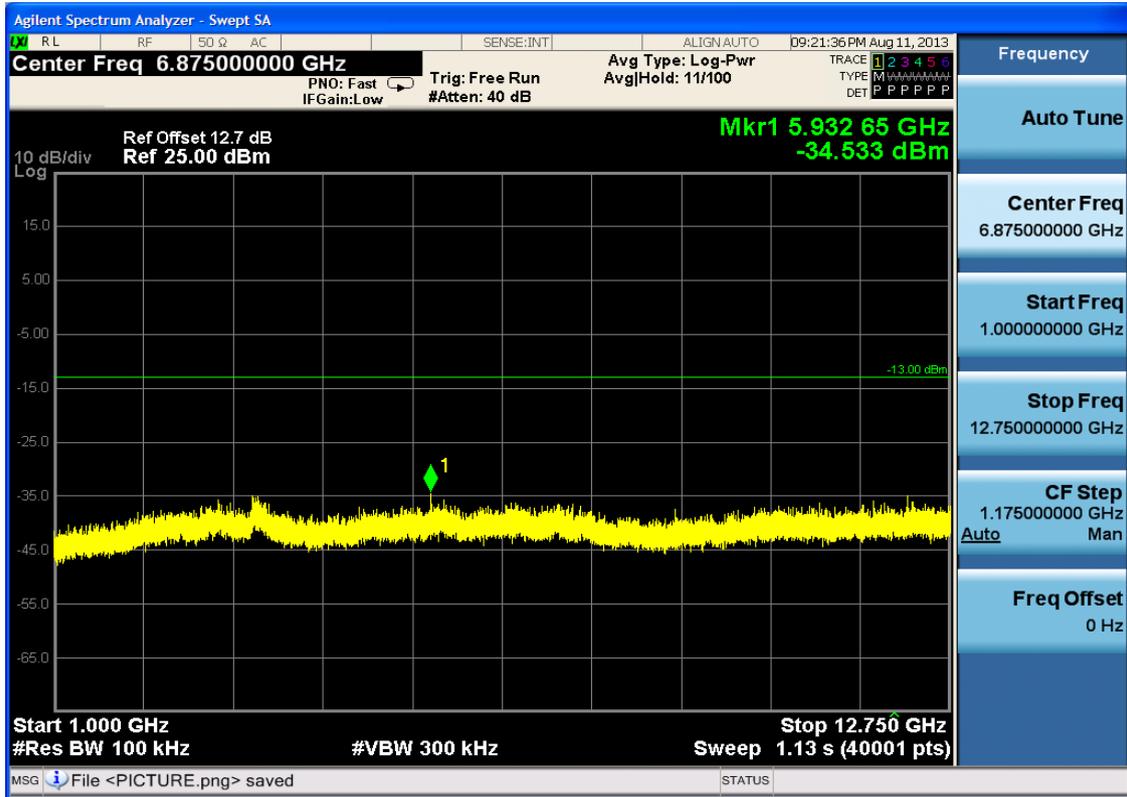


6.1.1.2.2 Test Channel = MCH



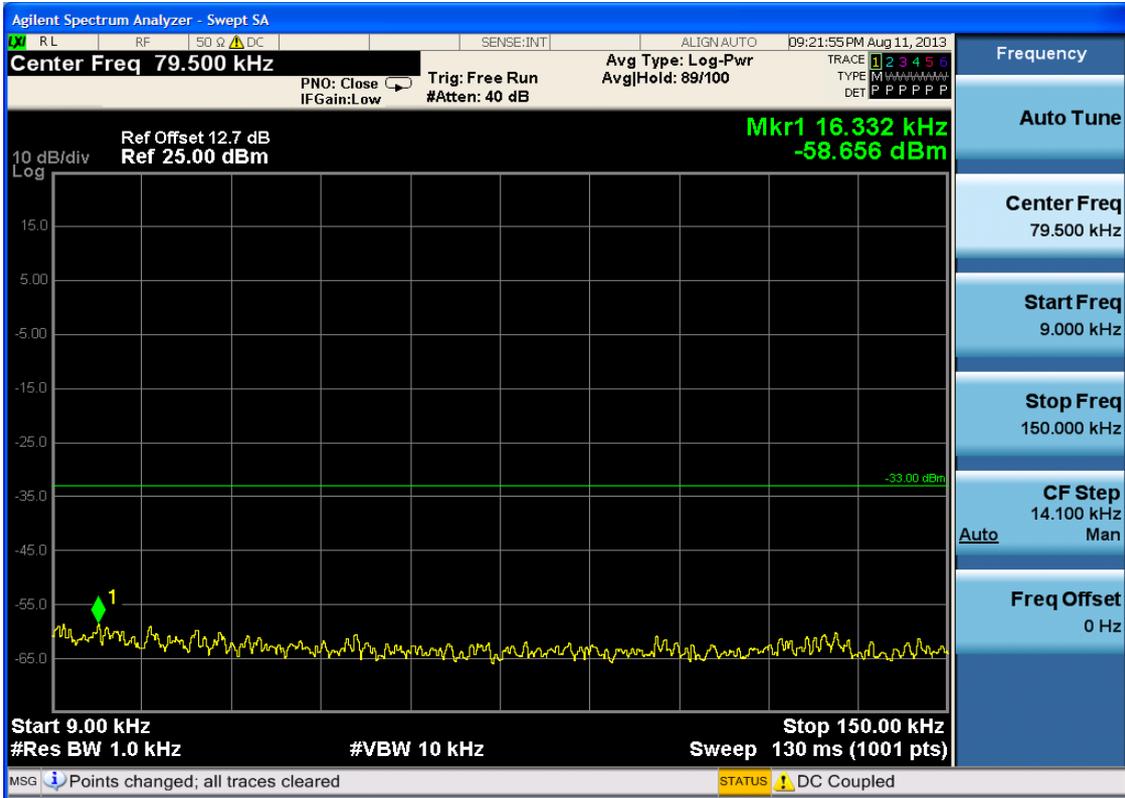


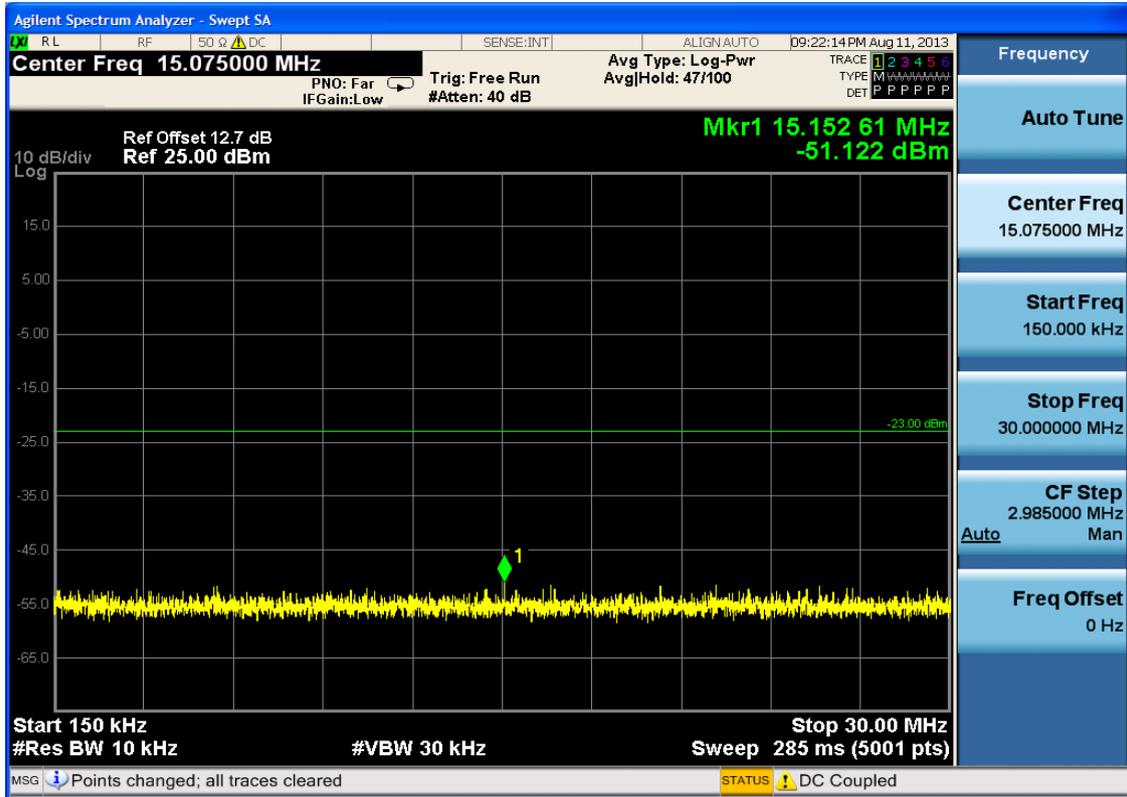


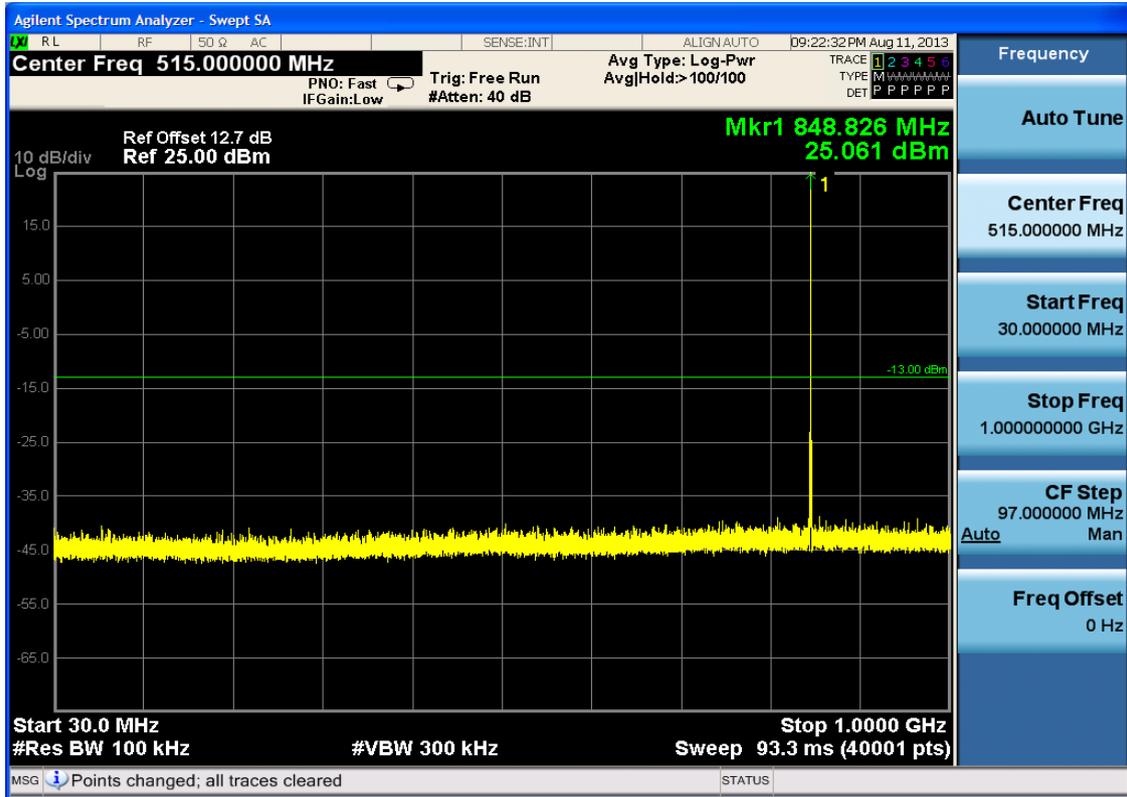


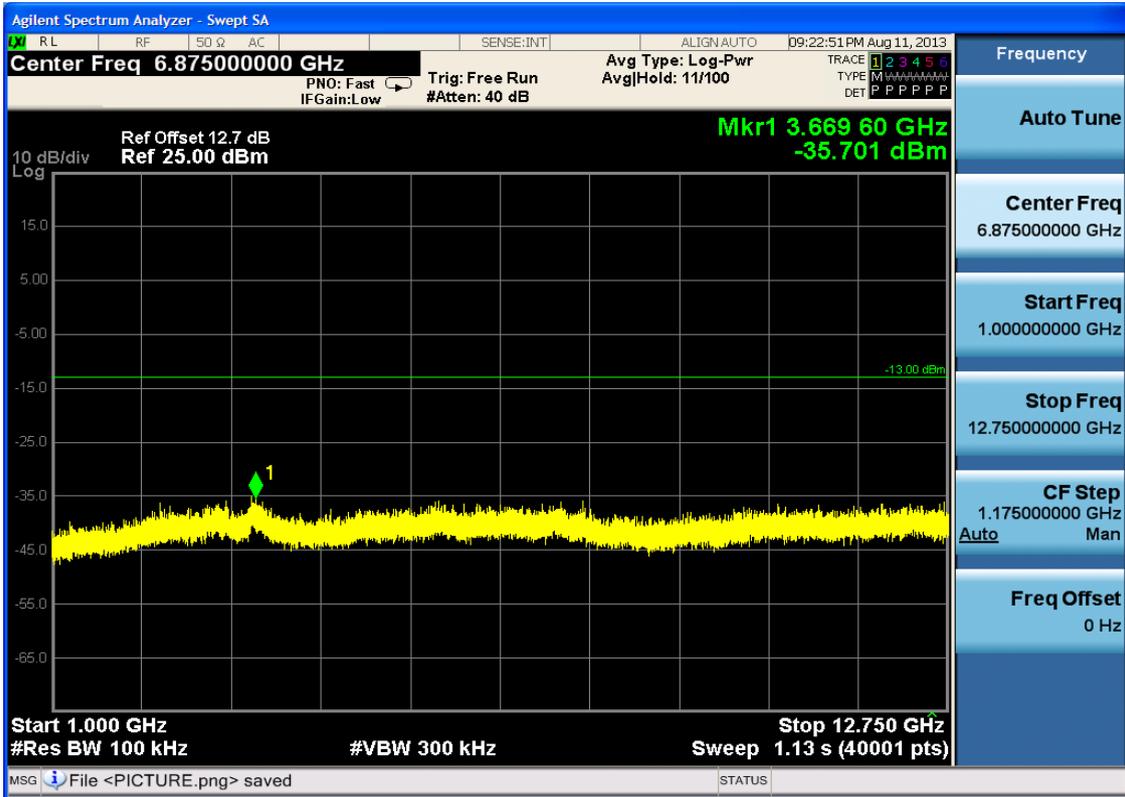


6.1.1.2.3 Test Channel = HCH





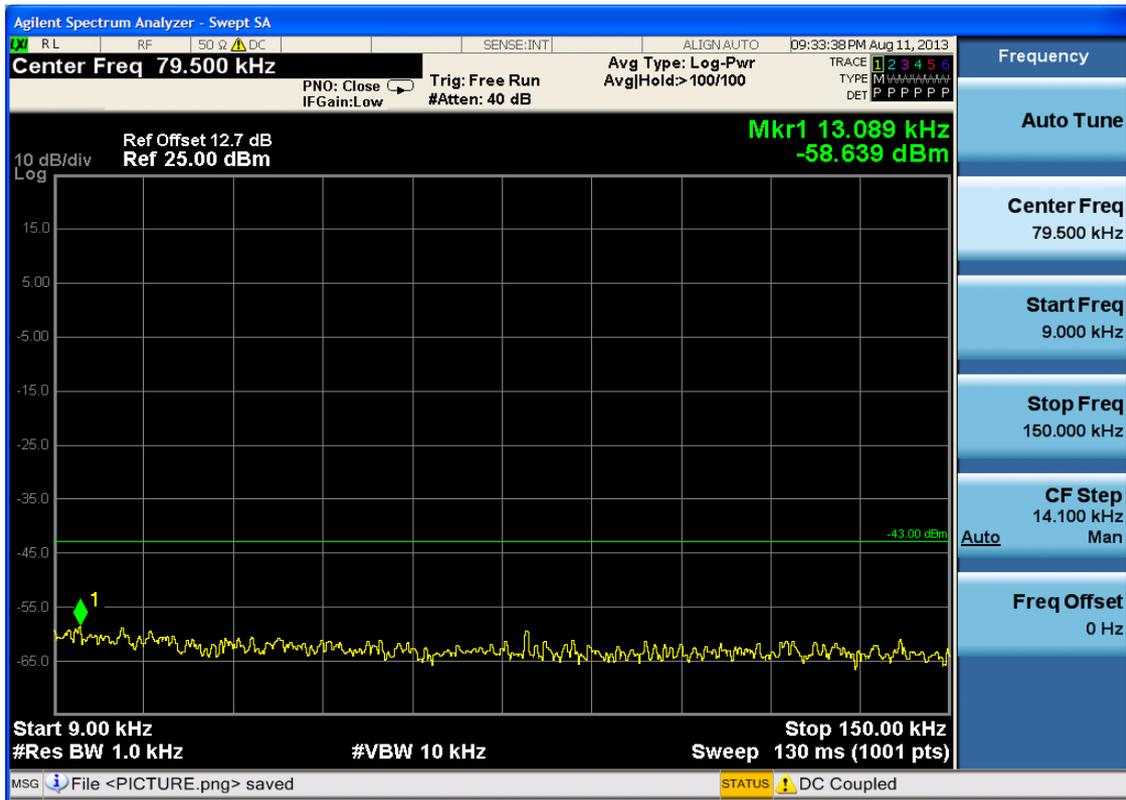


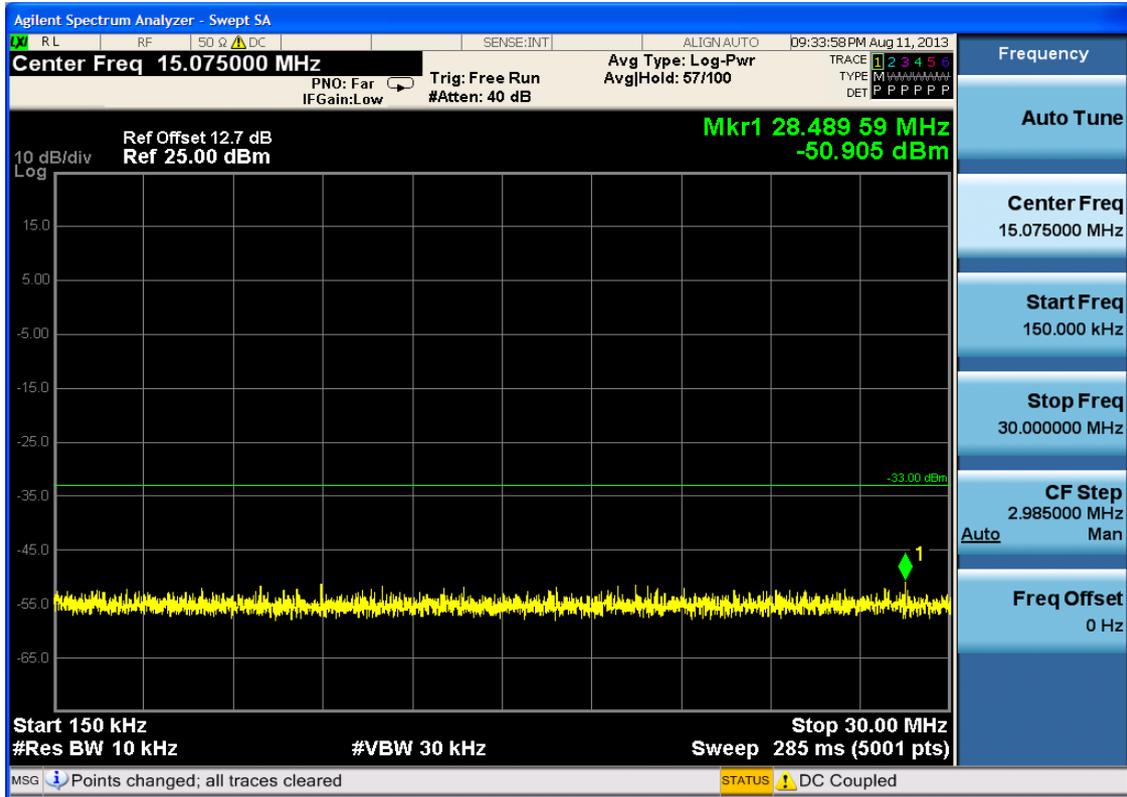


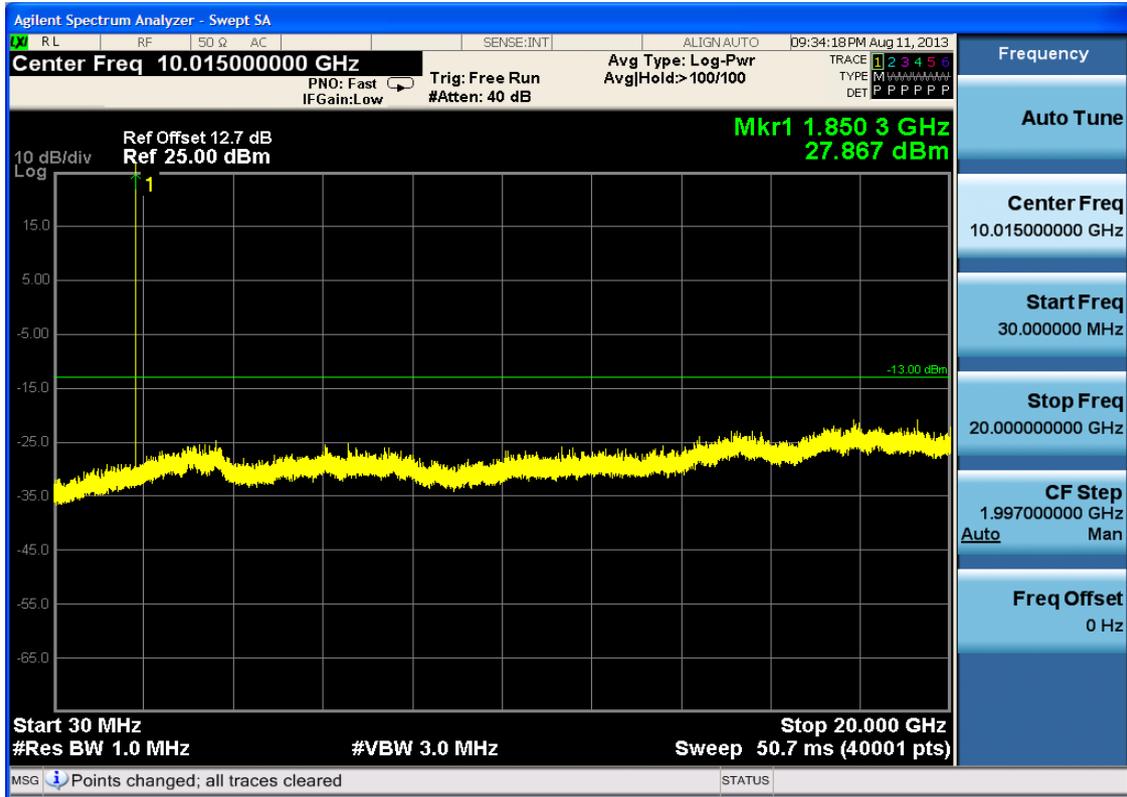
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH

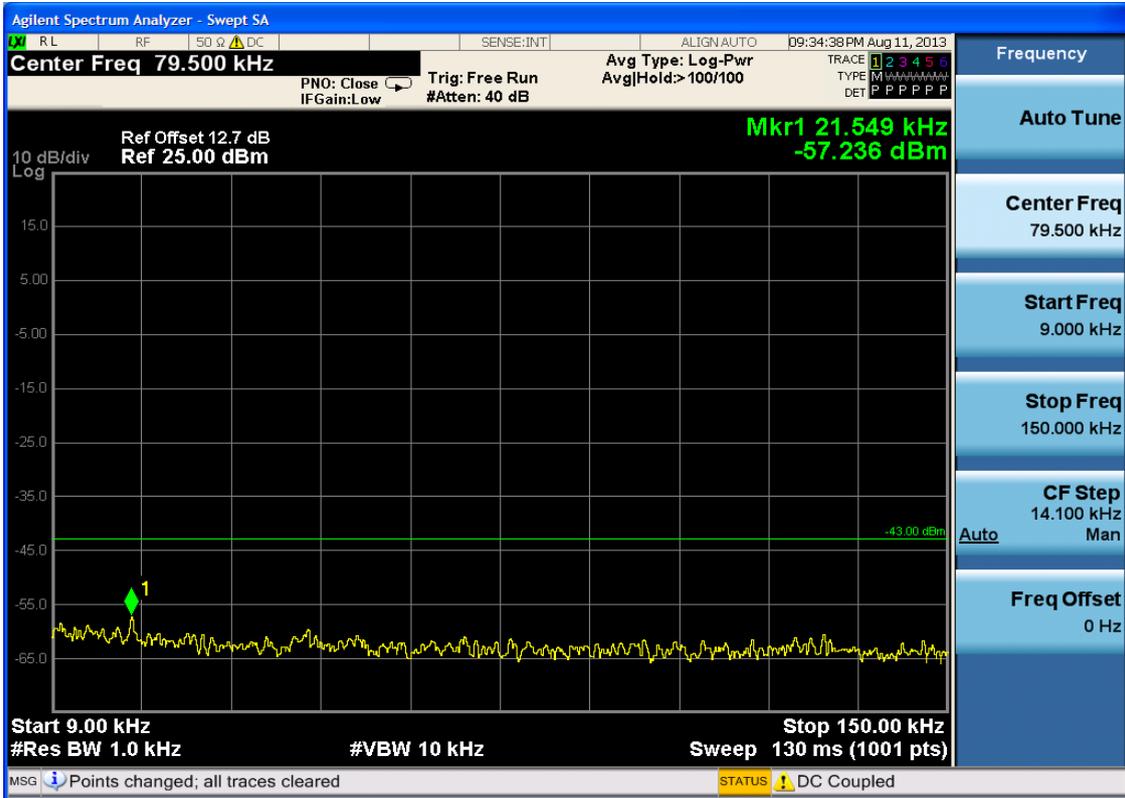


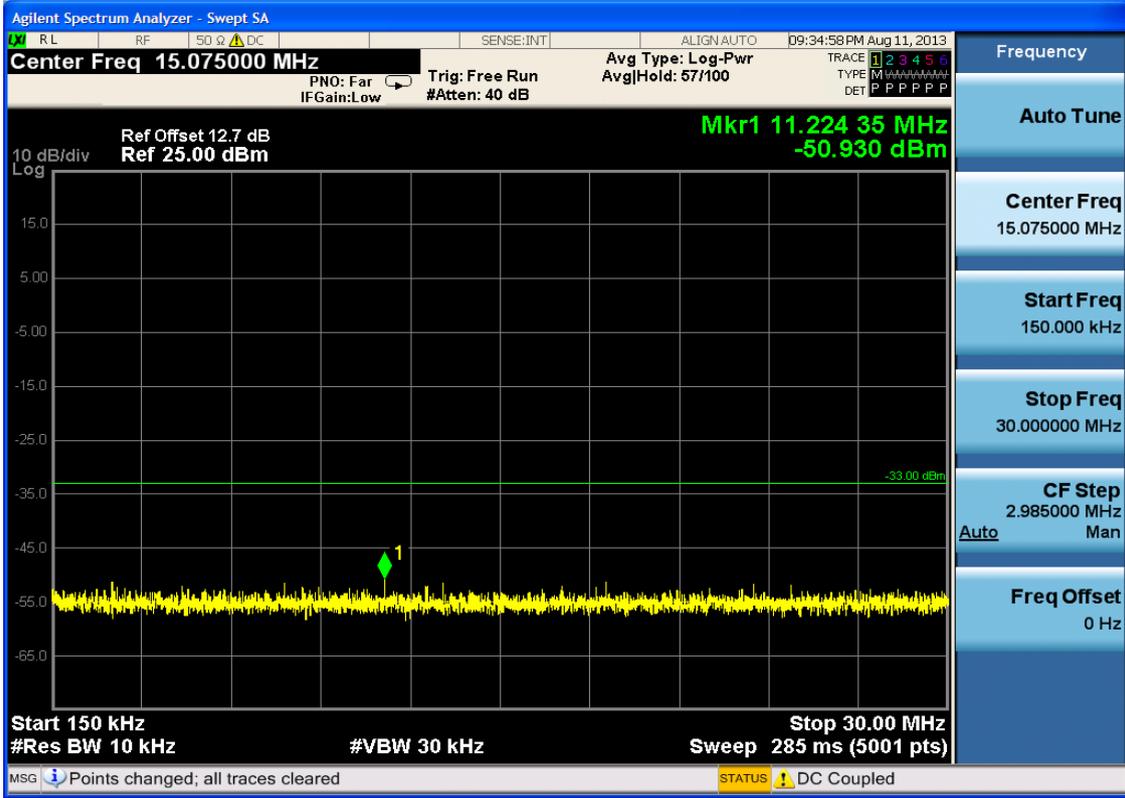


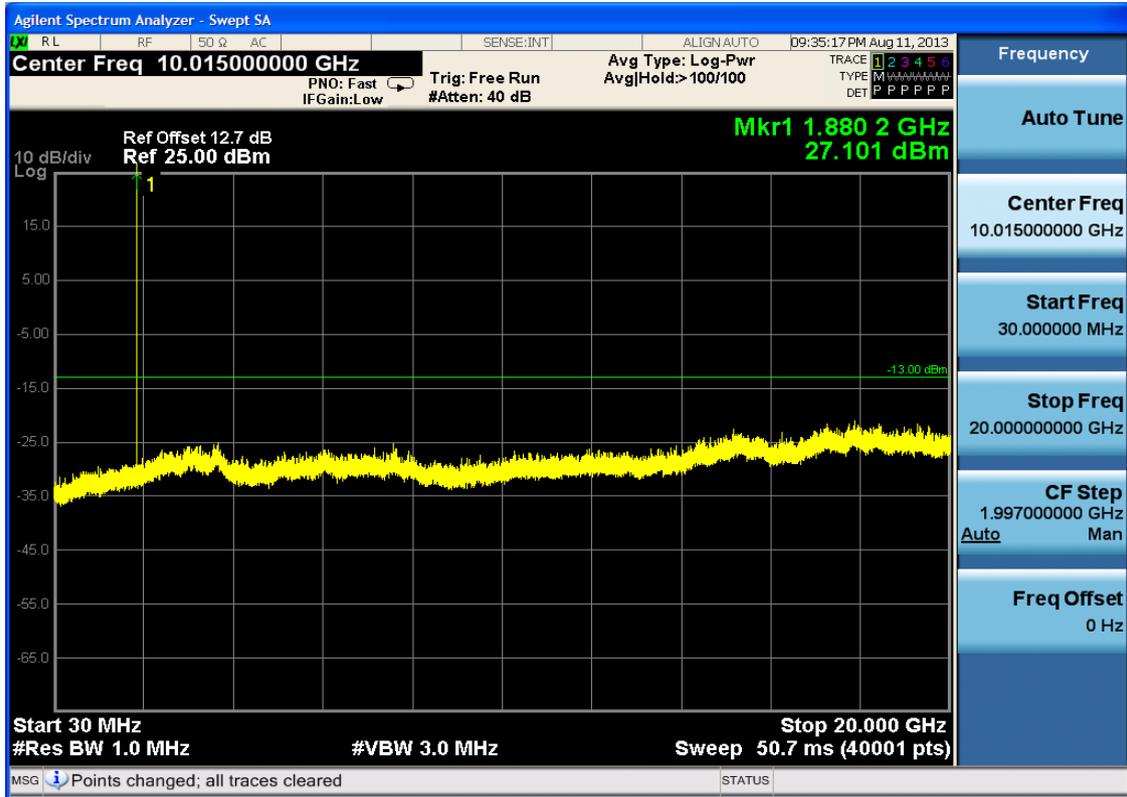




6.1.2.1.2 Test Channel = MCH

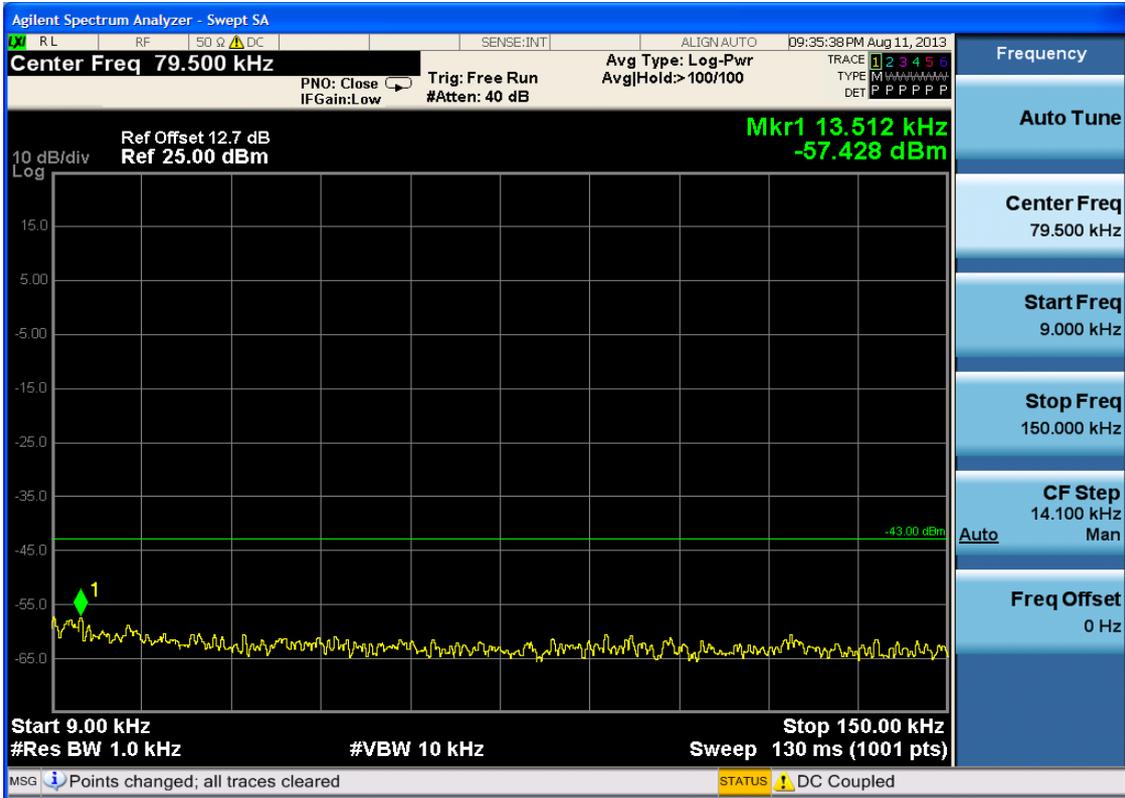


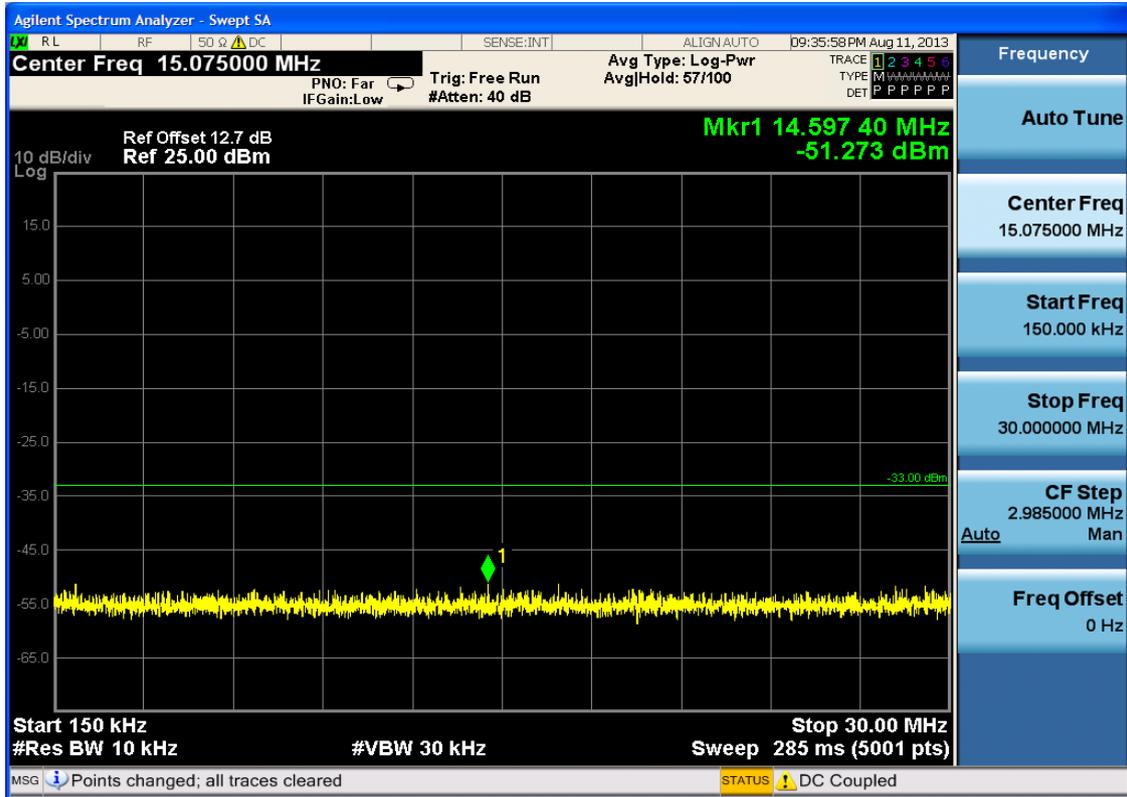


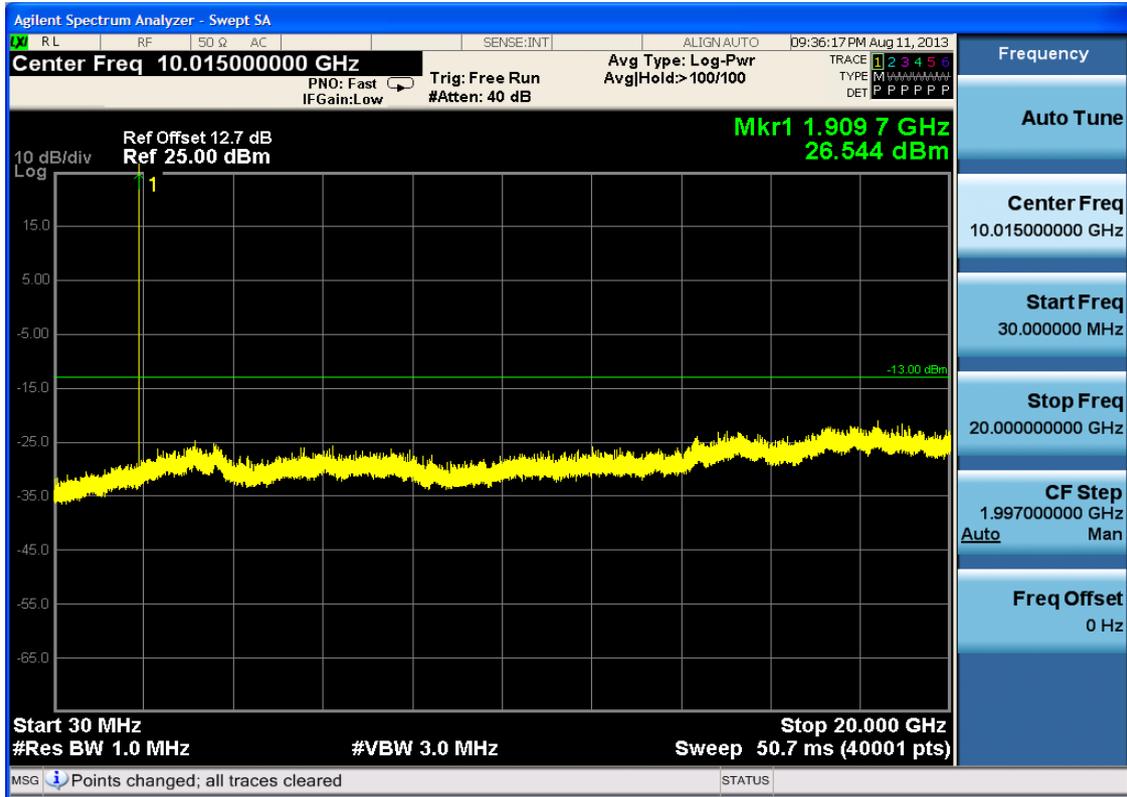




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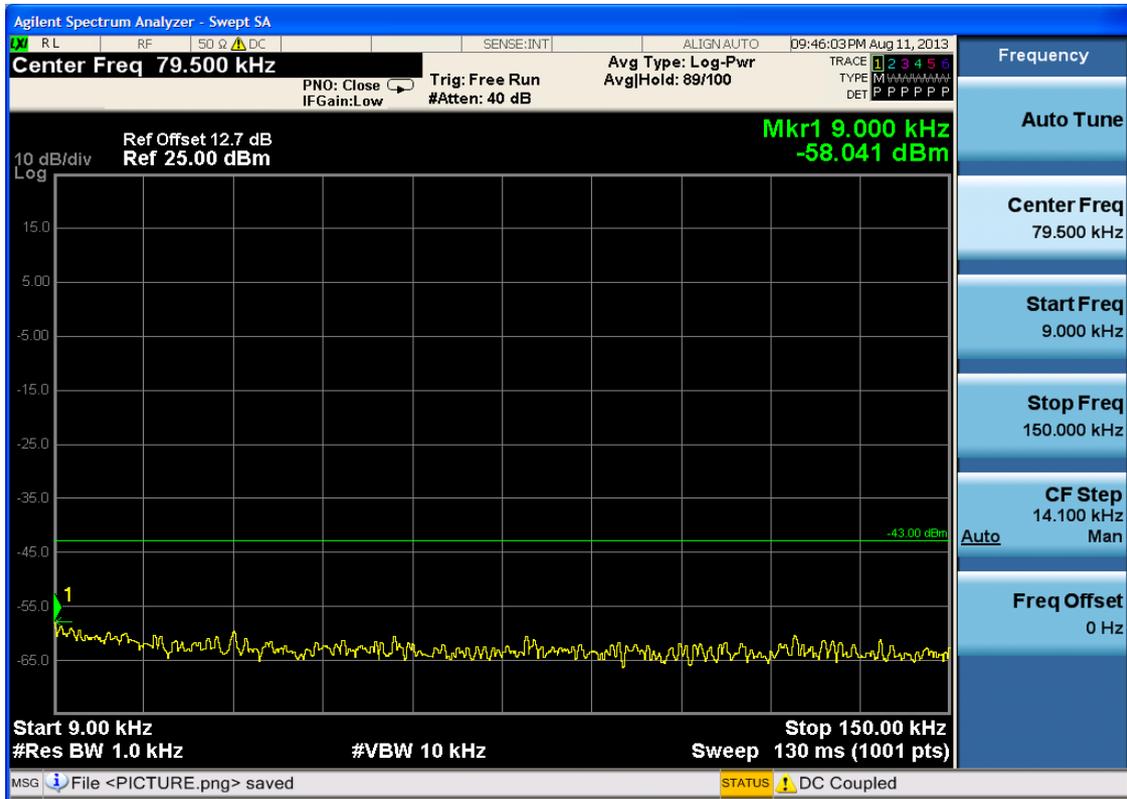


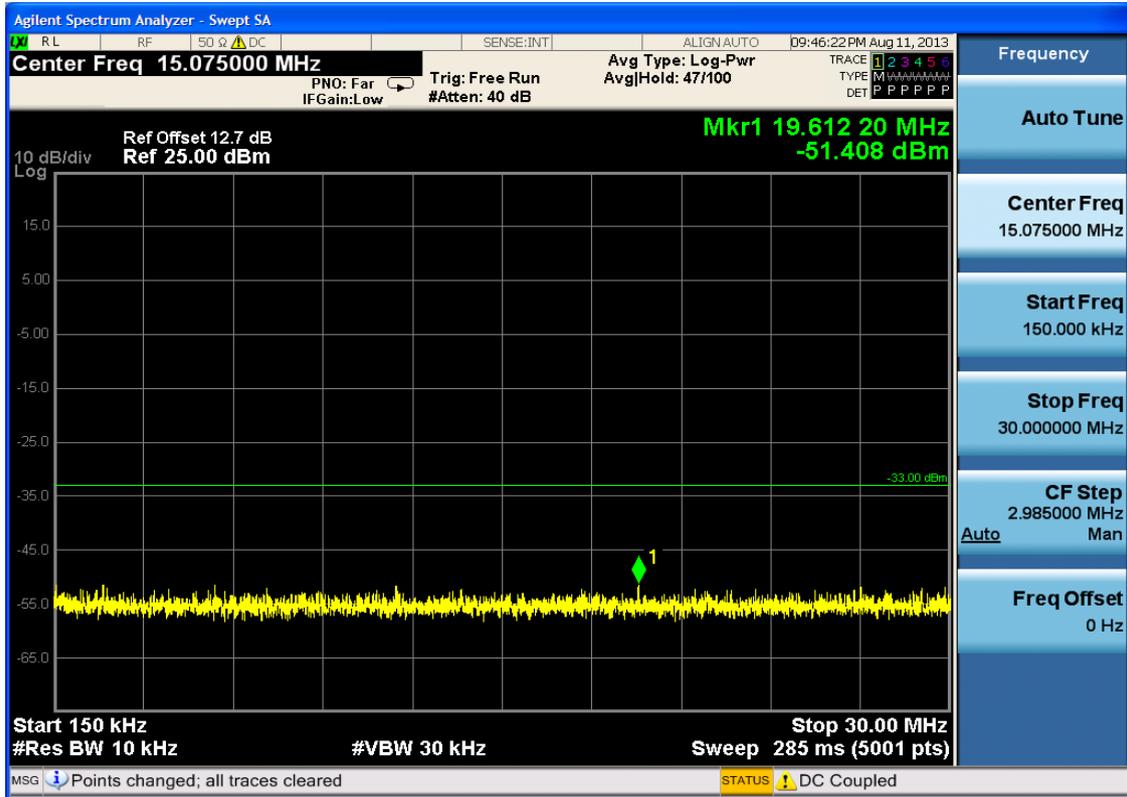




6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

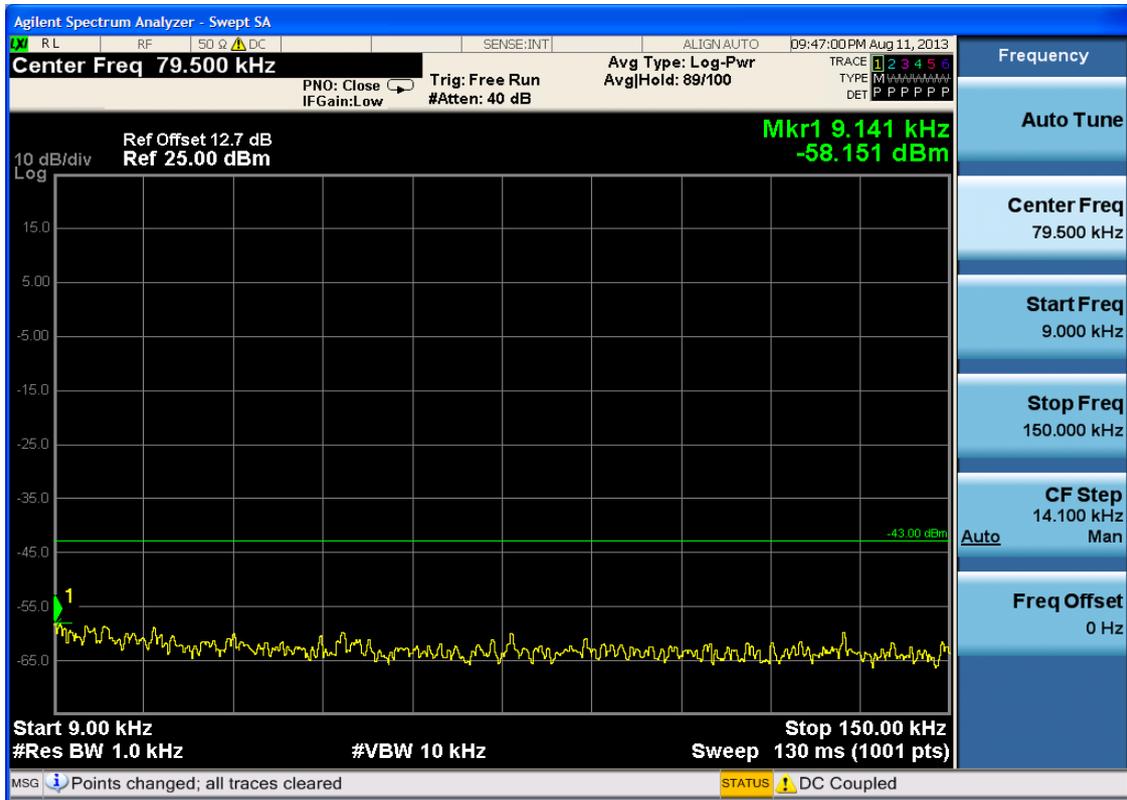


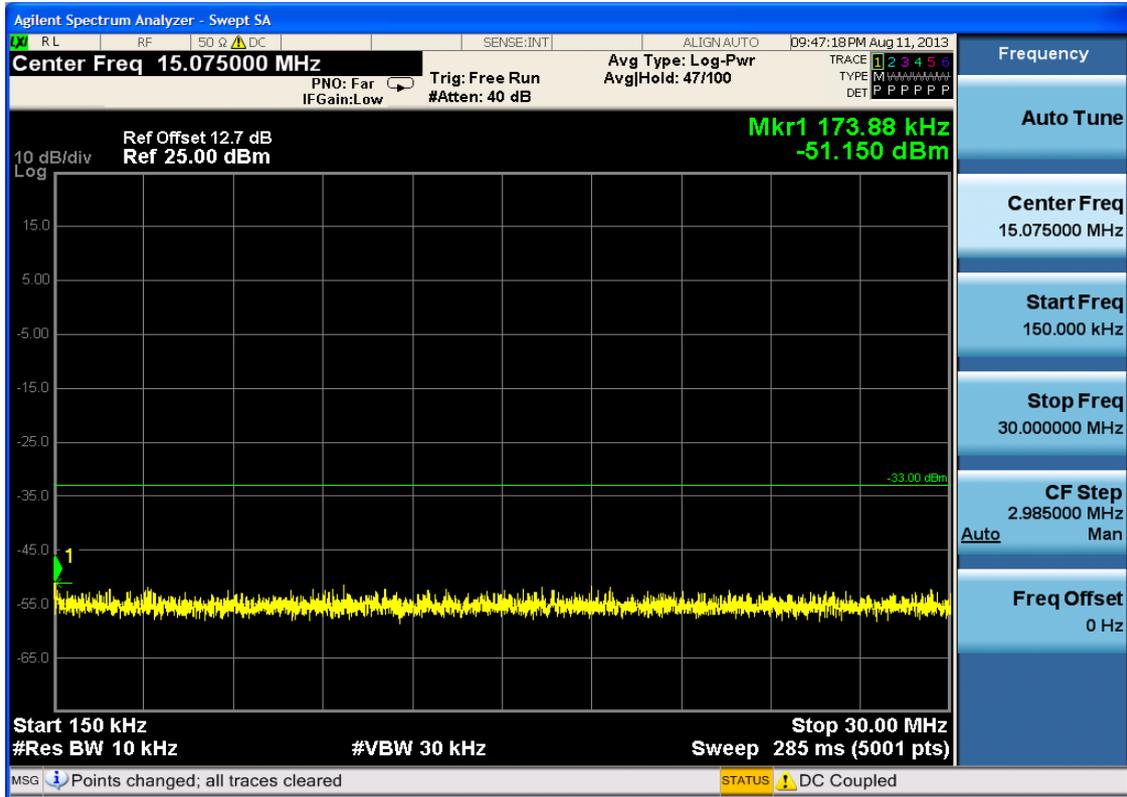


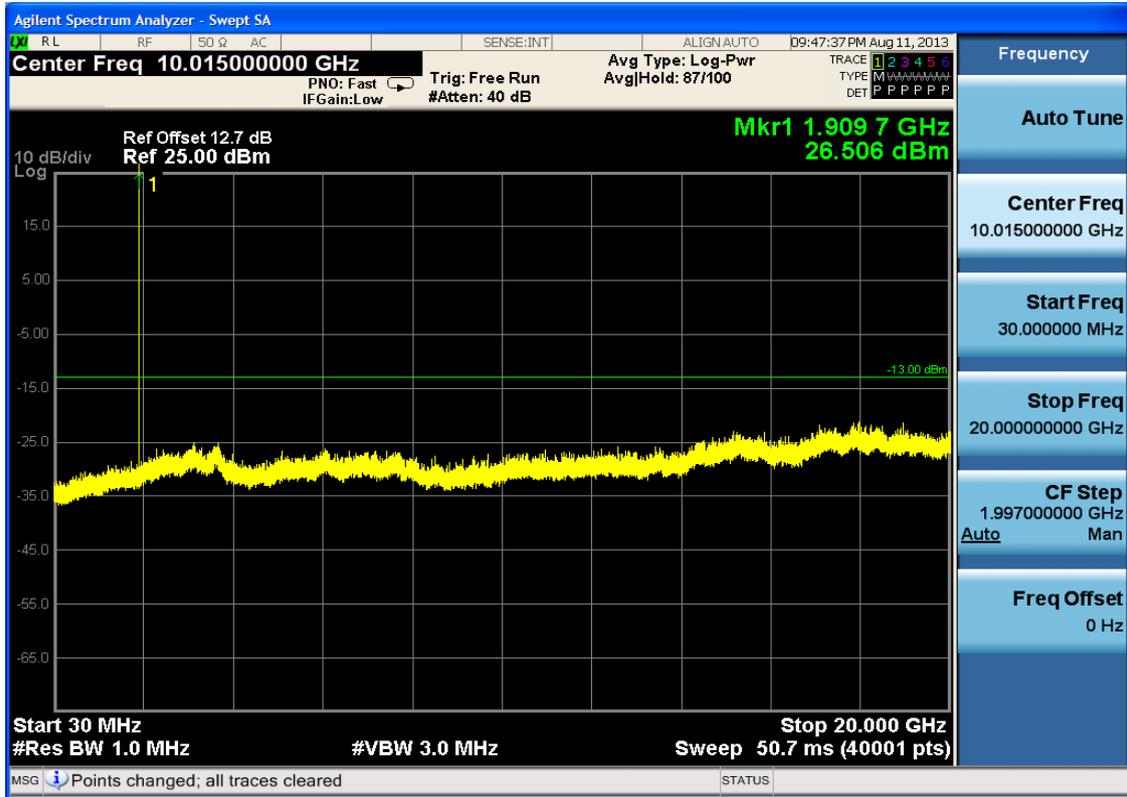




6.1.2.2.2 Test Channel = MCH

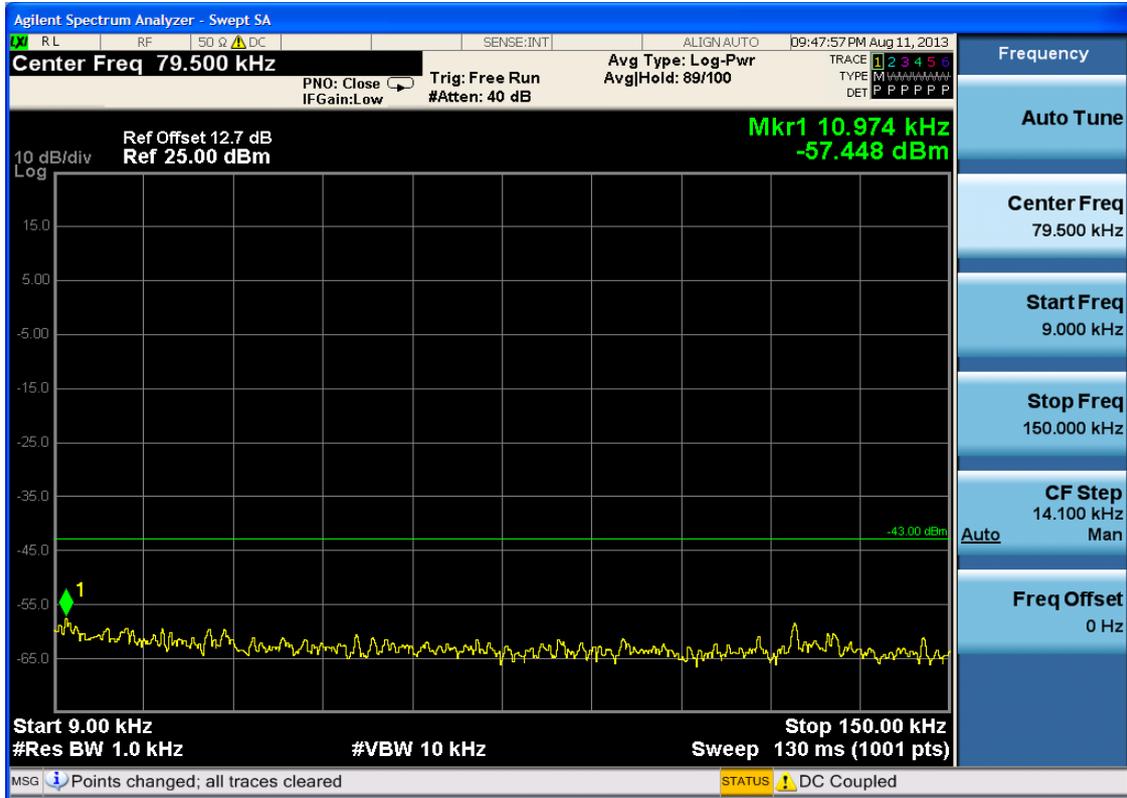


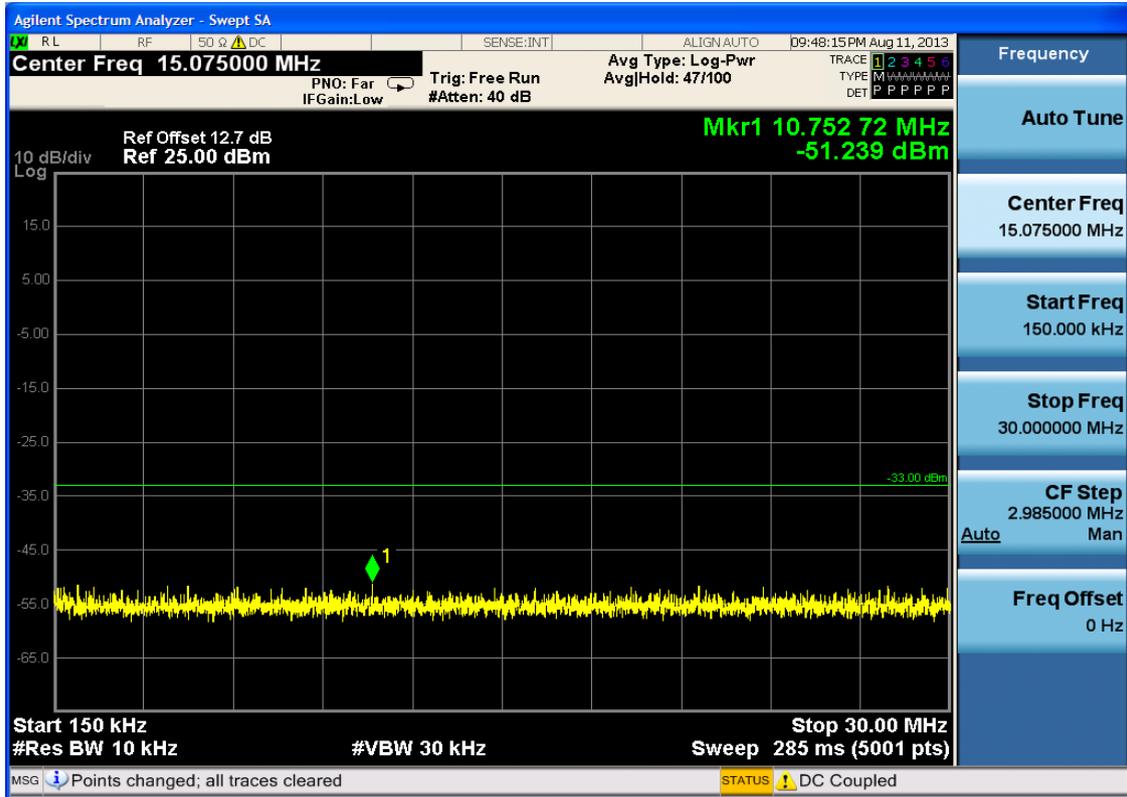


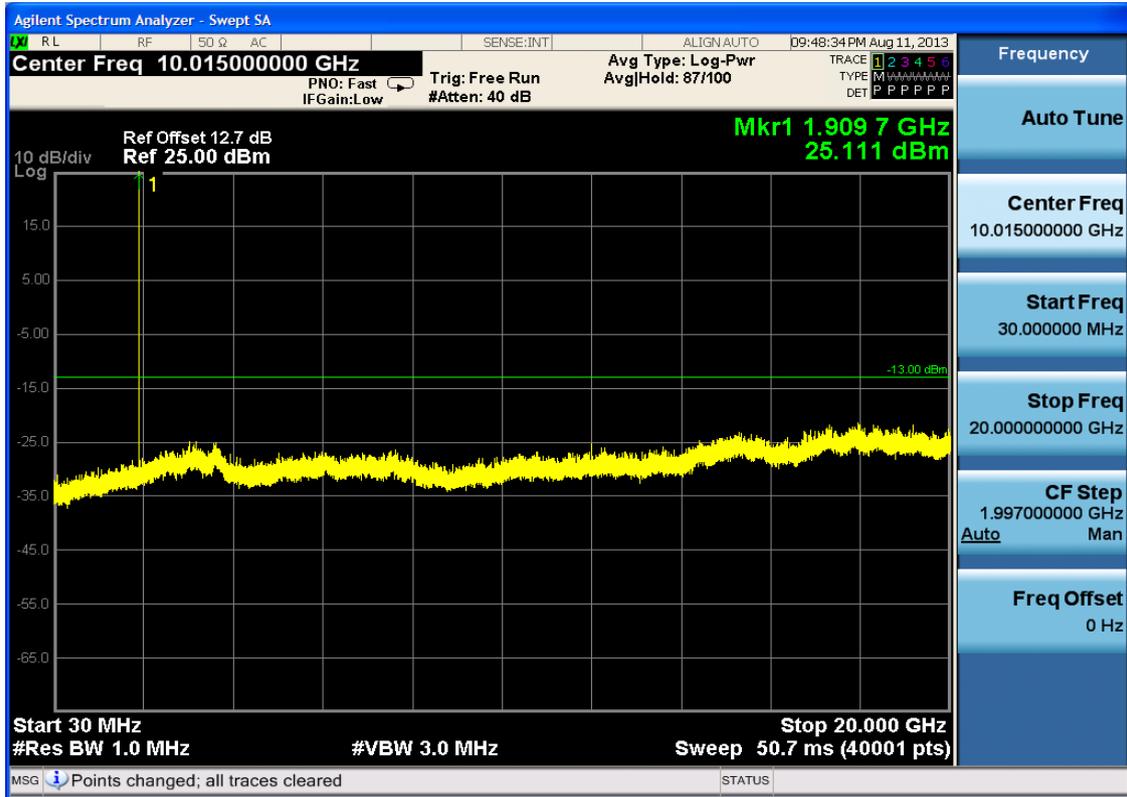




6.1.2.2.3 Test Channel = HCH







7Appendix_G: Field Strength of Spurious Radiation

Note:

9kHz~150kHz, 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

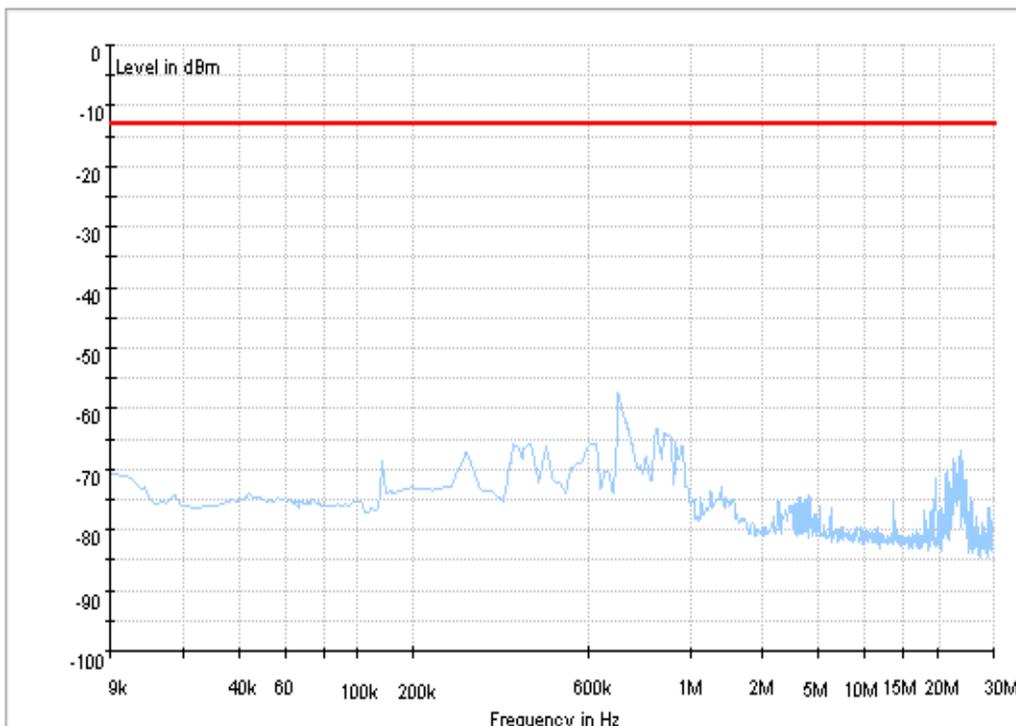
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

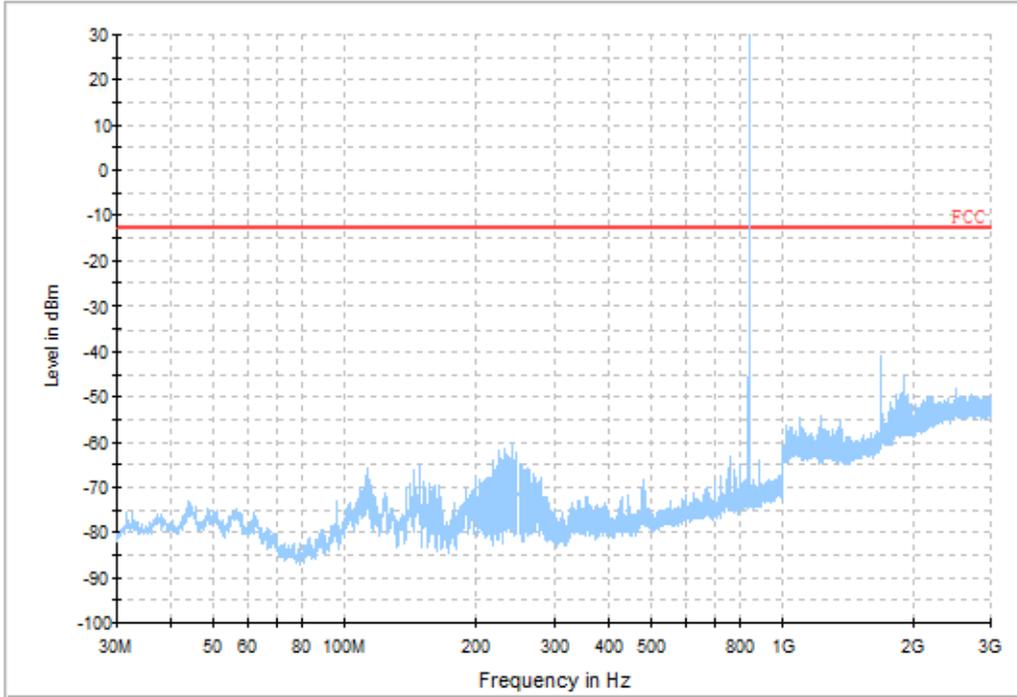
7.1 For GSM

7.1.1 Test Band = GSM850

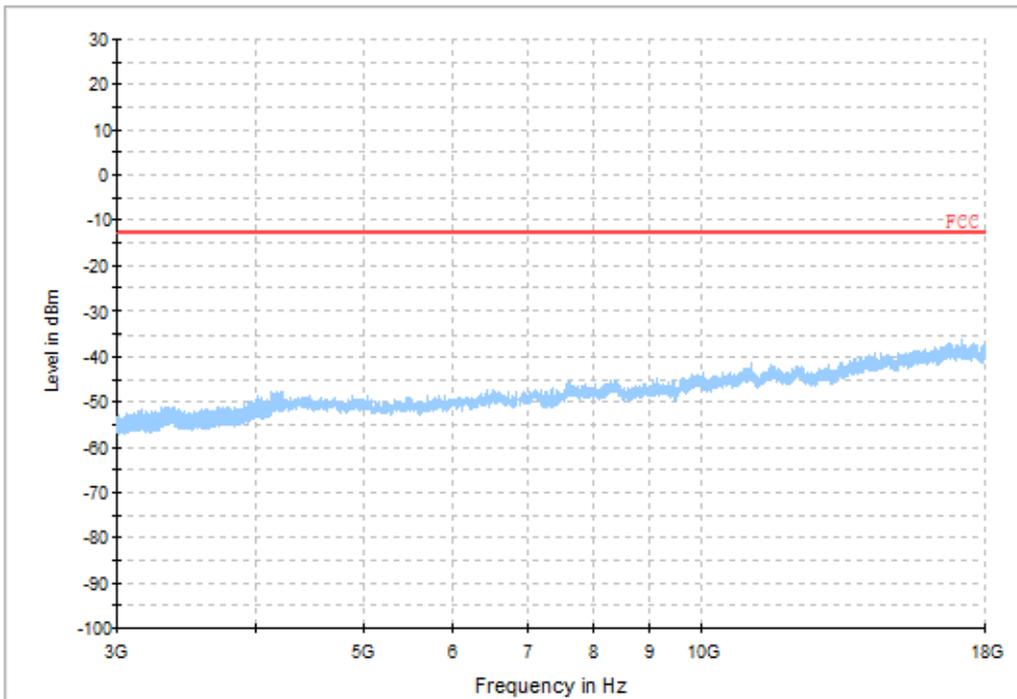
7.1.1.1 Test Mode = GSM/TM1



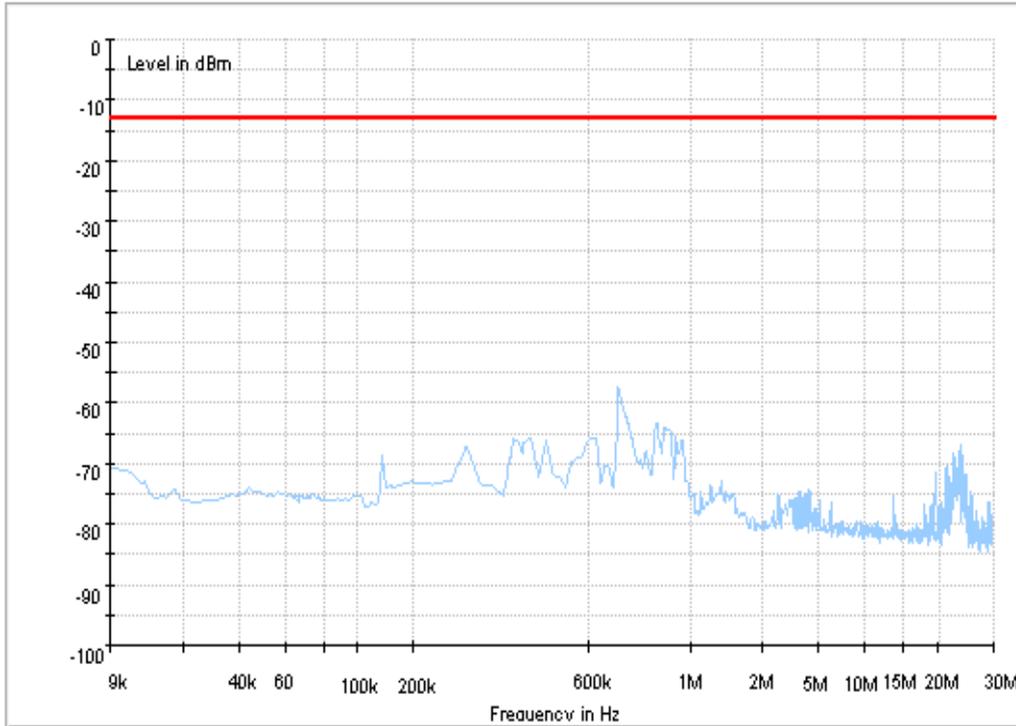
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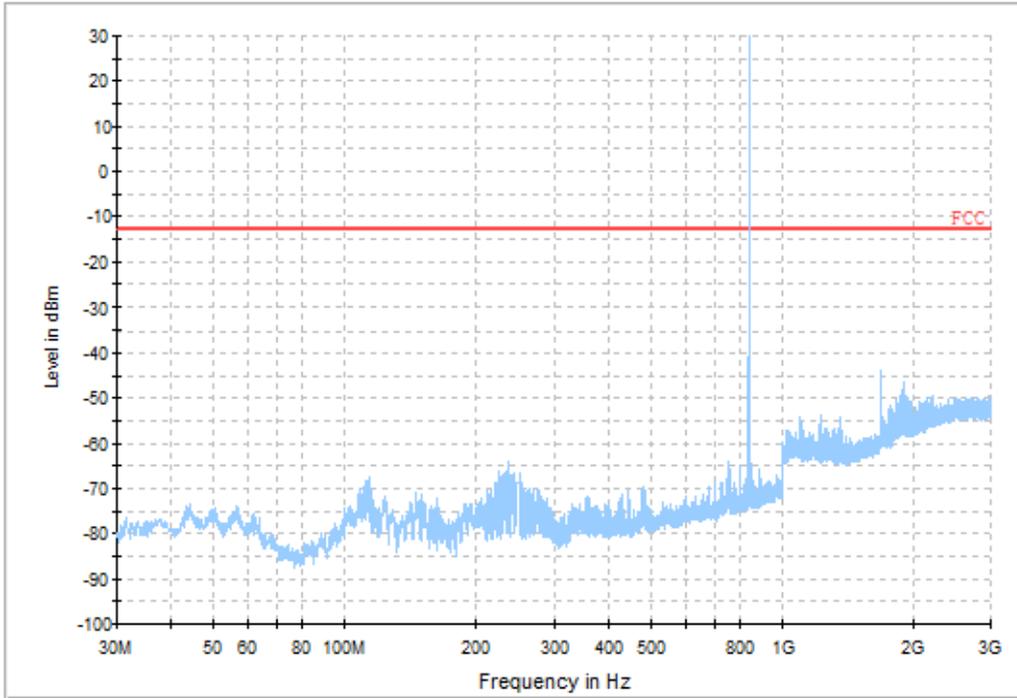
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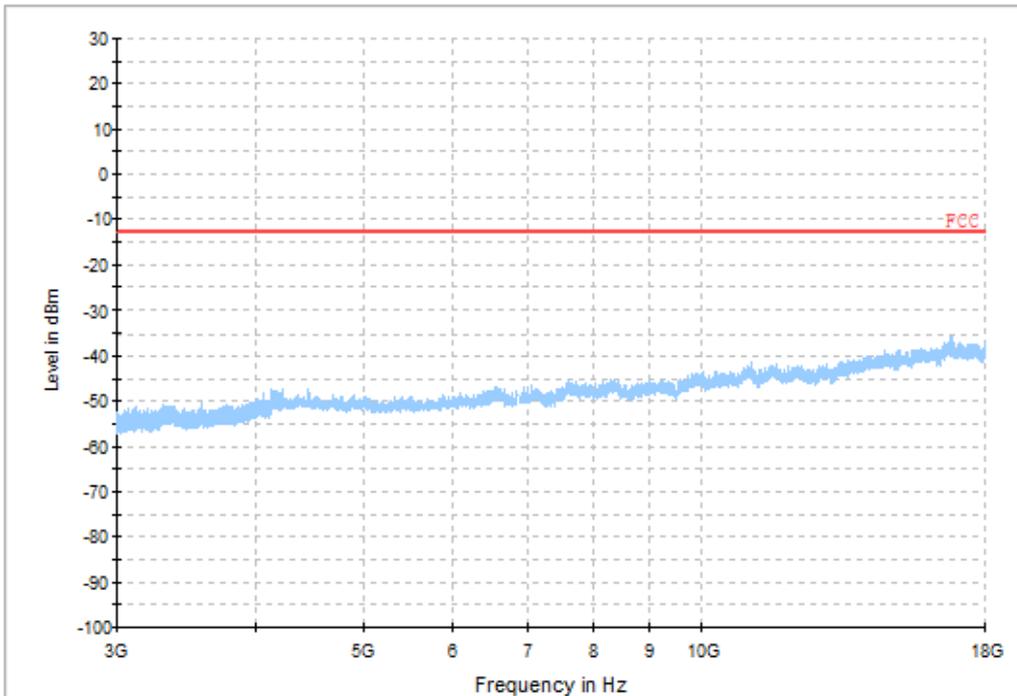
7.1.1.2 Test Mode = GSM/TM2



Copy of FCC PART22 GSM850_L

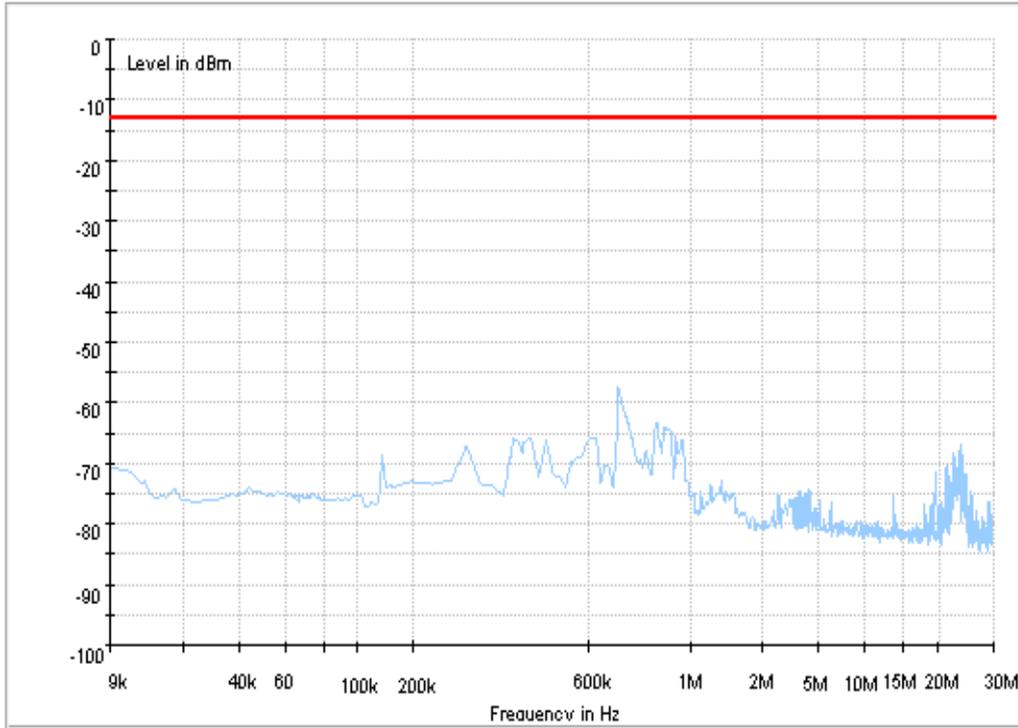


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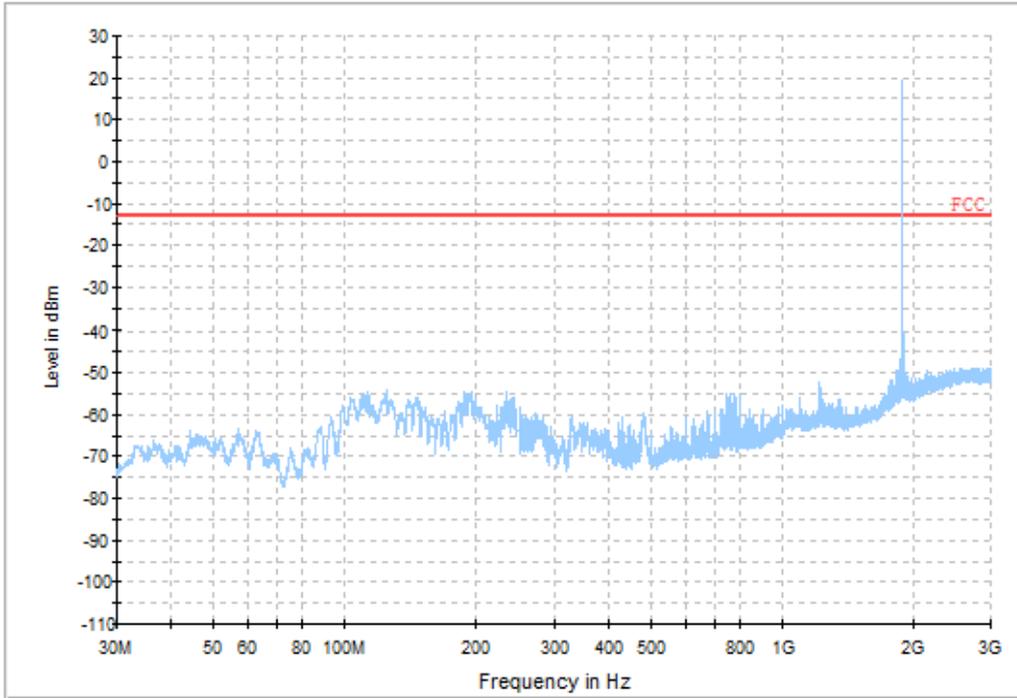


7.1.2 Test Band = GSM1900

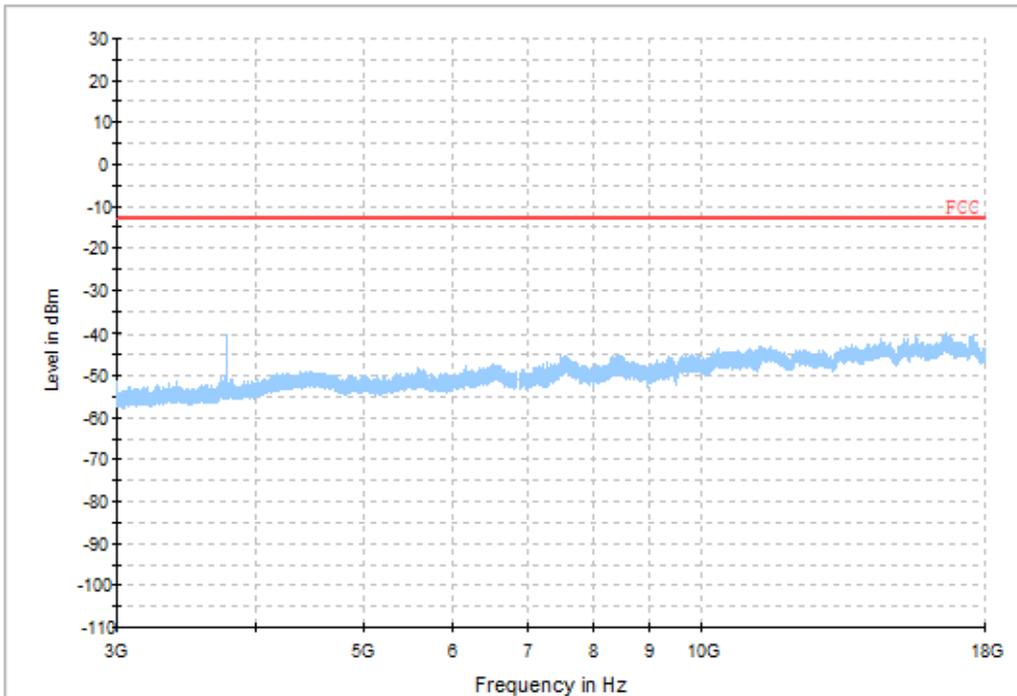
7.1.2.1 Test Mode = GSM/TM1

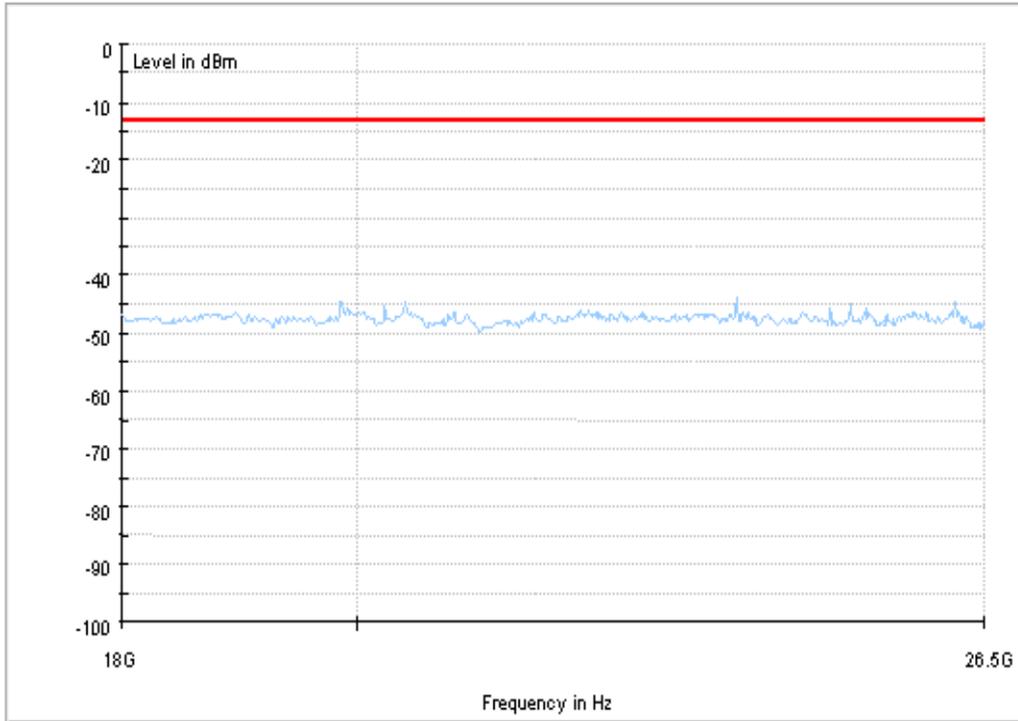


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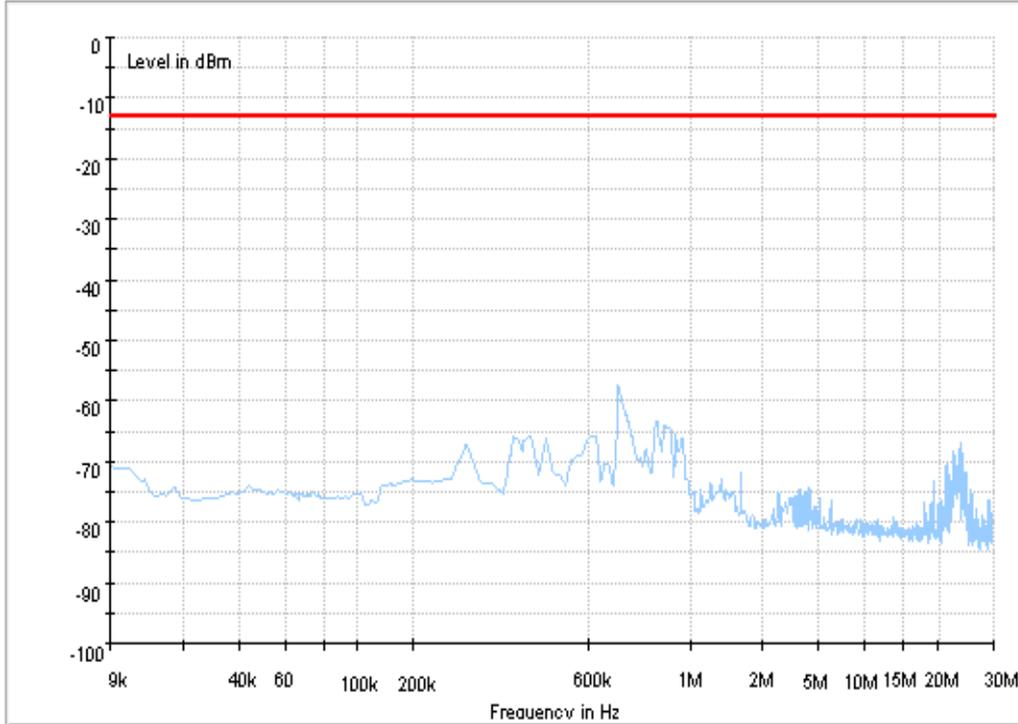


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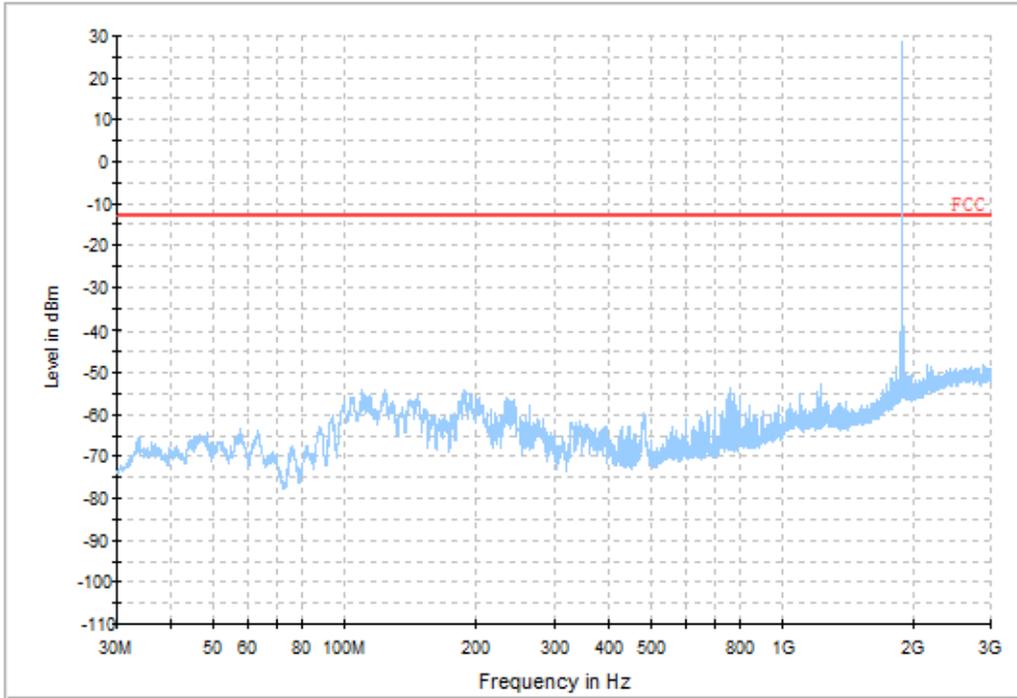




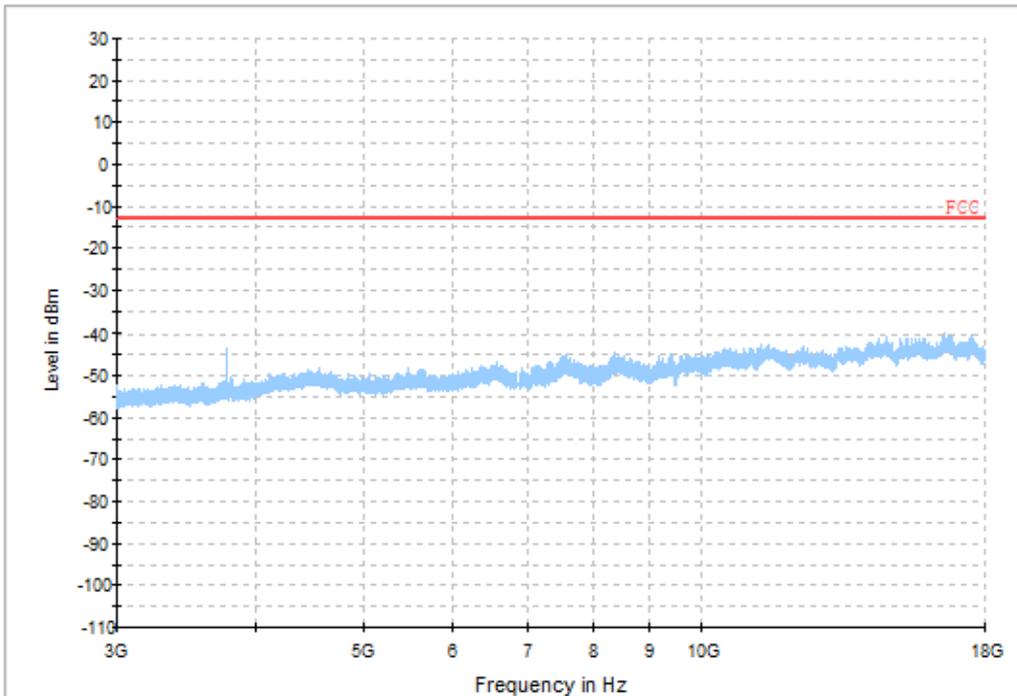
7.1.2.2 Test Mode = GSM/TM2

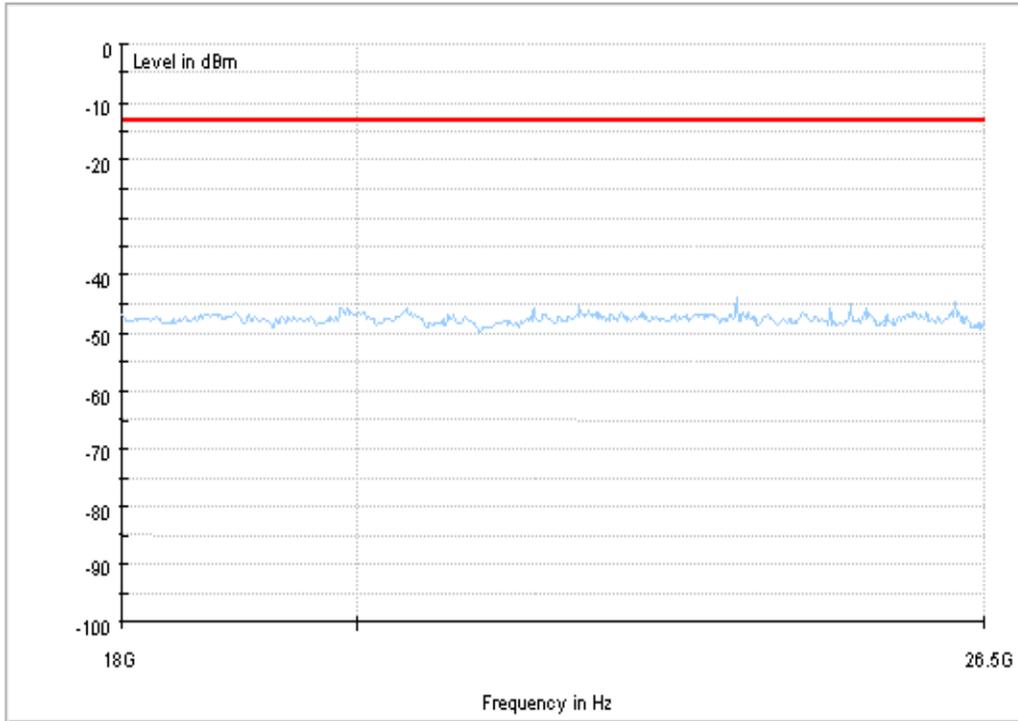


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8Appendix_H: Frequency Stability

8.1 For GSM

8.1.1 Frequency 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	-24.15	-0.0293	PASS
				VN	-25.44	-0.03087	PASS
				VH	-24.80	-0.03009	PASS
		MCH	TN	VL	-18.34	-0.02192	PASS
				VN	-22.21	-0.02655	PASS
				VH	-24.21	-0.02894	PASS
		HCH	TN	VL	-28.54	-0.03362	PASS
				VN	-28.15	-0.03316	PASS
				VH	-28.41	-0.03347	PASS
	GSM/TM2	LCH	TN	VL	-30.12	-0.03654	PASS
				VN	-28.93	-0.0351	PASS
				VH	-31.45	-0.03816	PASS
		MCH	TN	VL	-28.38	-0.03392	PASS
				VN	-30.87	-0.0369	PASS
				VH	-30.64	-0.03662	PASS
		HCH	TN	VL	-40.91	-0.0482	PASS
				VN	-29.44	-0.03468	PASS
				VH	-33.54	-0.03951	PASS
GSM1900	GSM/TM1	LCH	TN	VL	-53.92	-0.02914	PASS
				VN	-59.73	-0.03228	PASS
				VH	-60.83	-0.03288	PASS
		MCH	TN	VL	-39.20	-0.02085	PASS
				VN	-38.42	-0.02044	PASS
				VH	-39.26	-0.02088	PASS
	HCH	TN	VL	-42.04	-0.02201	PASS	
			VN	-50.24	-0.02631	PASS	
			VH	-39.39	-0.02063	PASS	
	GSM/TM2	LCH	TN	VL	-67.57	-0.03652	PASS
				VN	-47.43	-0.02564	PASS
				VH	-62.44	-0.03375	PASS
MCH		TN	VL	-50.62	-0.02693	PASS	

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VN	-53.85	-0.02864	PASS
				VH	-49.56	-0.02636	PASS
		HCH	TN	VL	-56.21	-0.02943	PASS
				VN	-47.43	-0.02484	PASS
				VH	-51.59	-0.02701	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	-23.70	-0.02876	PASS
				-20	-24.80	-0.03009	PASS
				-10	-27.57	-0.03345	PASS
				0	-26.41	-0.03204	PASS
				10	-23.37	-0.02835	PASS
				20	-21.83	-0.02649	PASS
				30	-27.64	-0.03354	PASS
				40	-23.70	-0.02876	PASS
				50	-24.60	-0.02985	PASS
		MCH	VN	-30	-20.92	-0.02501	PASS
				-20	-22.99	-0.02748	PASS
				-10	-20.79	-0.02485	PASS
				0	-20.21	-0.02416	PASS
				10	-24.47	-0.02925	PASS
				20	-20.99	-0.02509	PASS
				30	-18.47	-0.02208	PASS
				40	-21.70	-0.02594	PASS
				50	-24.47	-0.02925	PASS
		HCH	VN	-30	-26.35	-0.03104	PASS
				-20	-29.83	-0.03514	PASS
				-10	-28.67	-0.03378	PASS
				0	-25.12	-0.02959	PASS
				10	-25.89	-0.0305	PASS
				20	-24.73	-0.02914	PASS
				30	-28.35	-0.0334	PASS
				40	-27.89	-0.03286	PASS
				50	-28.54	-0.03362	PASS
	GSM/TM2	LCH	VN	-30	-36.97	-0.04486	PASS
				-20	-27.51	-0.03338	PASS
				-10	-31.64	-0.03839	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict		
				0	-36.97	-0.04486	PASS		
				10	-37.32	-0.04528	PASS		
				20	-37.13	-0.04505	PASS		
				30	-31.35	-0.03804	PASS		
				40	-38.84	-0.04712	PASS		
				50	-27.60	-0.03349	PASS		
		MCH	VN	-30	-31.54	-0.0377	PASS		
				-20	-22.21	-0.02655	PASS		
				-10	-22.83	-0.02729	PASS		
				0	-30.74	-0.03674	PASS		
				10	-30.80	-0.03682	PASS		
				20	-29.22	-0.03493	PASS		
				30	-25.47	-0.03044	PASS		
				40	-25.12	-0.03003	PASS		
		HCH	VN	50	-27.64	-0.03304	PASS		
				-30	-37.29	-0.04393	PASS		
				-20	-31.83	-0.0375	PASS		
				-10	-34.29	-0.0404	PASS		
				0	-24.86	-0.02929	PASS		
				10	-35.81	-0.04219	PASS		
				20	-38.97	-0.04591	PASS		
				30	-32.80	-0.03864	PASS		
		GSM1900	GSM/TM1	LCH	VN	40	-24.34	-0.02868	PASS
						50	-26.76	-0.03153	PASS
						-30	-56.89	-0.03075	PASS
						-20	-58.50	-0.03162	PASS
						-10	-56.89	-0.03075	PASS
0	-61.02					-0.03298	PASS		
10	-54.43					-0.02942	PASS		
20	-60.50					-0.0327	PASS		
30	-58.70					-0.03173	PASS		
MCH	VN			40	-56.82	-0.03071	PASS		
				50	-65.48	-0.03539	PASS		
				-30	-39.26	-0.02088	PASS		
				-20	-36.48	-0.0194	PASS		
				-10	-35.97	-0.01913	PASS		
				0	-35.64	-0.01896	PASS		
				10	-43.20	-0.02298	PASS		
				20	-43.07	-0.02291	PASS		
				30	-39.97	-0.02126	PASS		



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		HCH	VN	40	-41.91	-0.02229	PASS
				50	-38.29	-0.02037	PASS
				-30	-50.75	-0.02657	PASS
				-20	-42.10	-0.02204	PASS
				-10	-40.16	-0.02103	PASS
				0	-47.72	-0.02499	PASS
				10	-43.72	-0.02289	PASS
				20	-45.39	-0.02377	PASS
				30	-42.81	-0.02242	PASS
				40	-53.59	-0.02806	PASS
				50	-52.50	-0.02749	PASS
				GSM/TM2	LCH	VN	-30
	-20	-73.97	-0.03998				PASS
	-10	-74.94	-0.0405				PASS
	0	-64.83	-0.03504				PASS
	10	-66.99	-0.03621				PASS
	20	-82.07	-0.04436				PASS
	30	-70.03	-0.03785				PASS
	40	-57.31	-0.03098				PASS
	50	-85.69	-0.04631		PASS		
	MCH	VN	-30		-41.65	-0.02215	PASS
			-20		-39.16	-0.02083	PASS
			-10		-51.04	-0.02715	PASS
			0		-51.56	-0.02743	PASS
			10		-41.23	-0.02193	PASS
			20		-41.65	-0.02215	PASS
			30		-41.00	-0.02181	PASS
			40		-58.86	-0.03131	PASS
	50	-46.94	-0.02497		PASS		
	HCH	VN	-30		-65.51	-0.0343	PASS
			-20		-54.76	-0.02867	PASS
			-10		-45.10	-0.02362	PASS
0			-51.27		-0.02685	PASS	
10			-52.82		-0.02766	PASS	
20			-62.21		-0.03257	PASS	
30			-69.74	-0.03652	PASS		
40			-51.53	-0.02698	PASS		
50	-55.27	-0.02894	PASS				

END