Appendix for test report

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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	31.9	30.13	38.5	PASS
		MCH	31.95	30.18	38.5	PASS
		HCH	31.93	30.16	38.5	PASS
	GSM/TM2	LCH	24.9	23.13	38.5	PASS
		MCH	24.83	23.06	38.5	PASS
		HCH	24.74	22.97	38.5	PASS
WCDMA850	UMTS/TM1	LCH	21.82	20.05	38.5	PASS
		MCH	22.05	20.28	38.5	PASS
		HCH	21.79	20.02	38.5	PASS
Test Band	**Test Mode**	**Test Channel**	**Conducted Power [dBm]**	**EIRP [dBm]**	**Limit [dBm]**	**Verdict**
GSM1900	GSM/TM1	LCH	29.13	31.41	33	PASS
		MCH	29.1	31.38	33	PASS
		HCH	29.04	31.32	33	PASS
	GSM/TM2	LCH	24.65	26.93	33	PASS
		MCH	24.6	26.88	33	PASS
		HCH	24.46	26.74	33	PASS
WCDMA1900	UMTS/TM1	LCH	22.15	24.43	33	PASS
		MCH	21.95	24.23	33	PASS
		HCH	21.99	24.27	33	PASS

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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: RBW > emission bandwidth, VBW > 3 x RBW.

Detector: RMS

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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	0.14	13	PASS
	GSM/TM2	LCH	2.9	13	PASS
		MCH	2.87	13	PASS
		HCH	2.84	13	PASS

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA1900	UMTS/TM1	LCH	3.08	13	PASS
		MCH	3.04	13	PASS
		HCH	3.09	13	PASS

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3Appendix_C: Modulation Characteristics

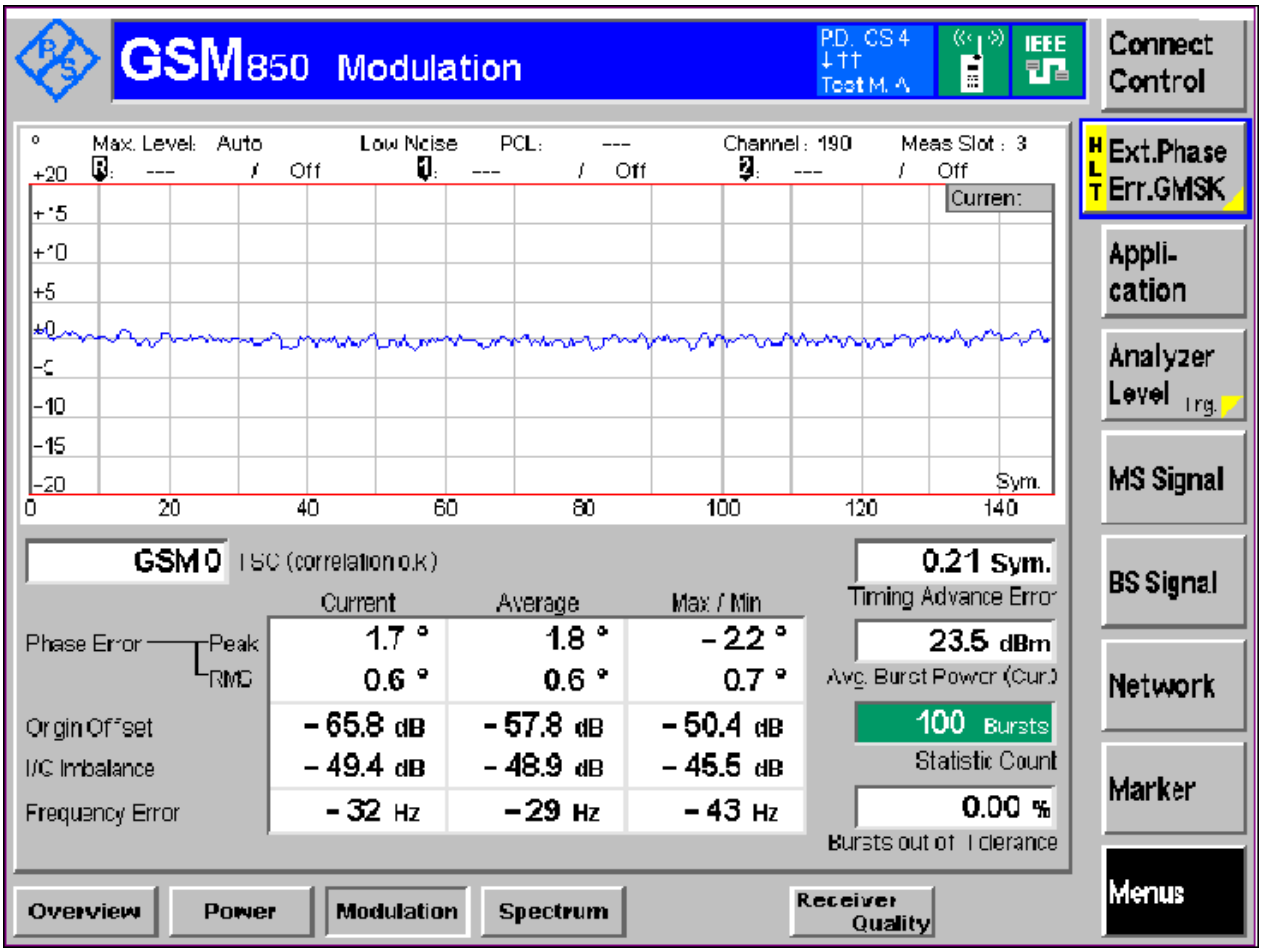
Part I - Test Plots

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



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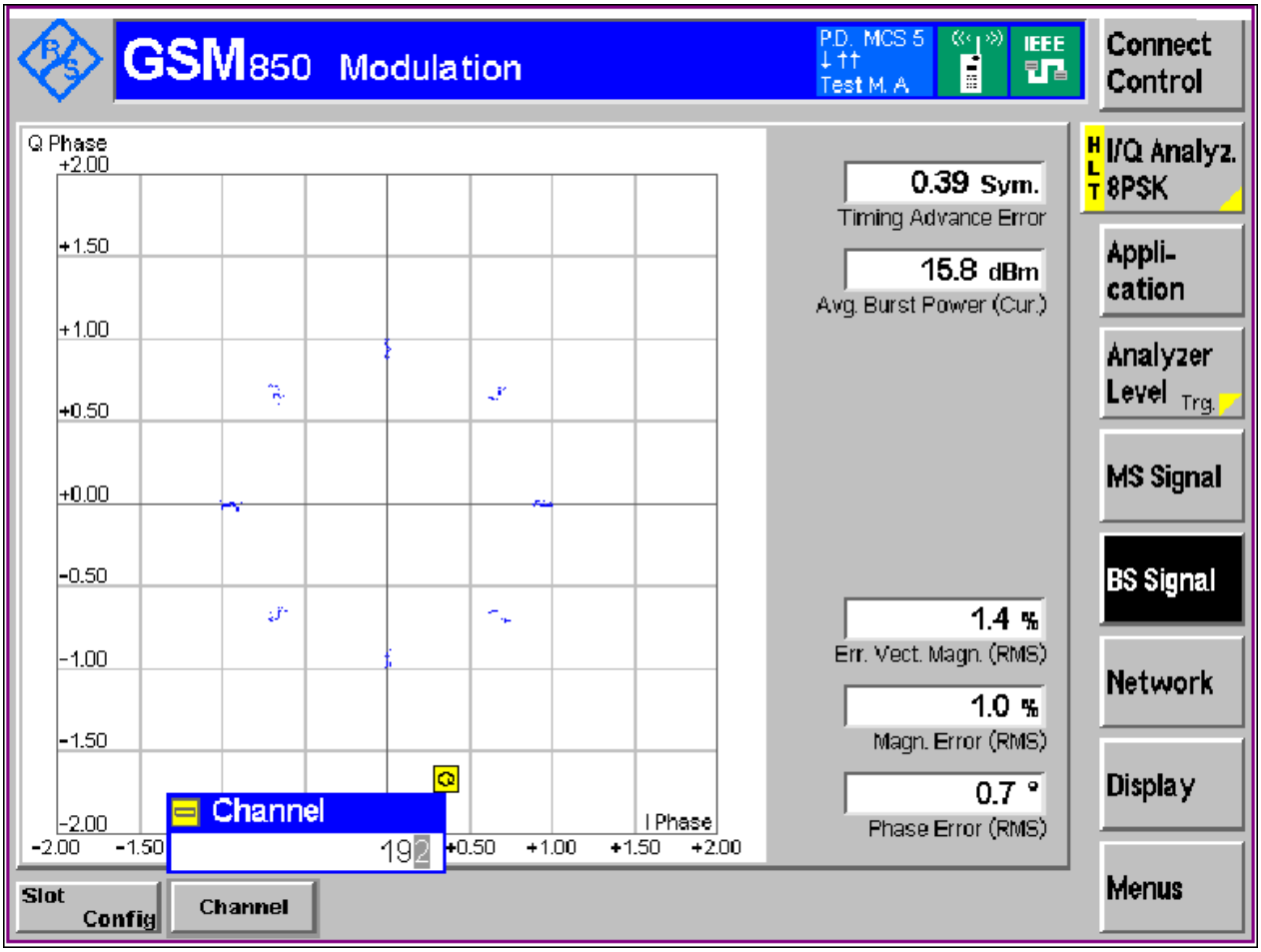
3.1.1.2 Test Mode = GSM/TM2

3.1.1.2.1 Test Channel = MCH



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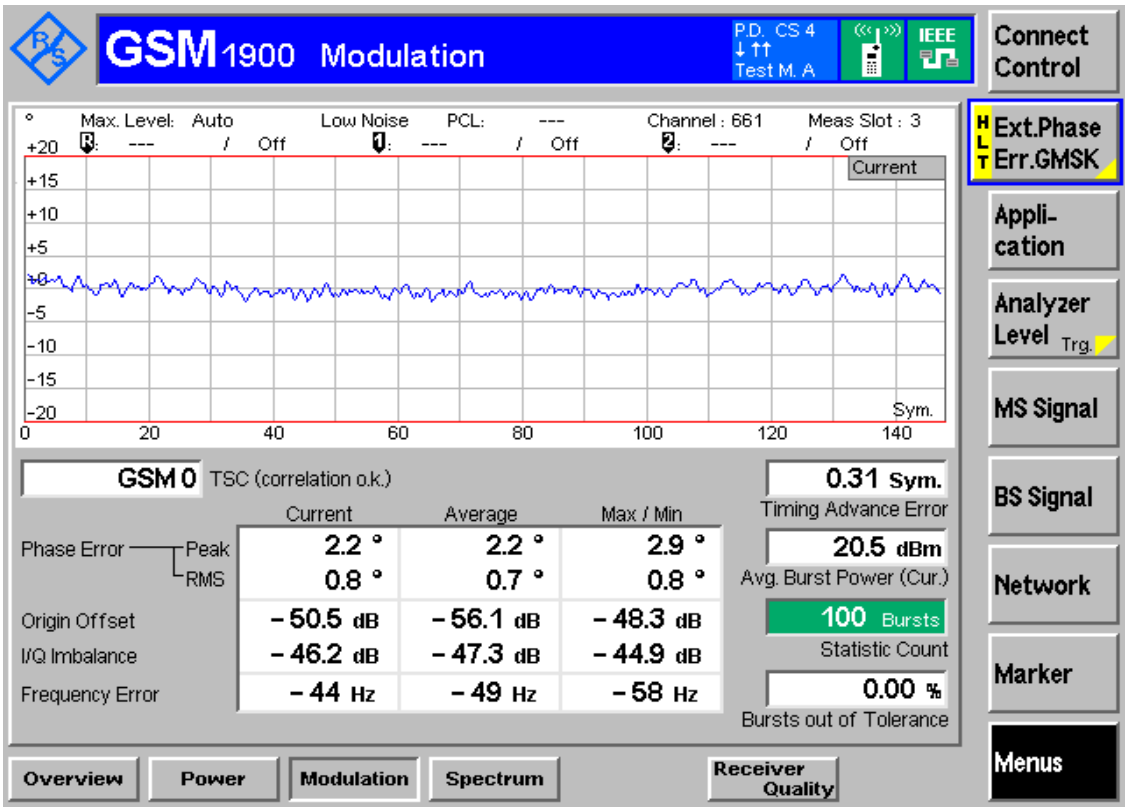
3.1.2 Test Band = GSM1900

3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH



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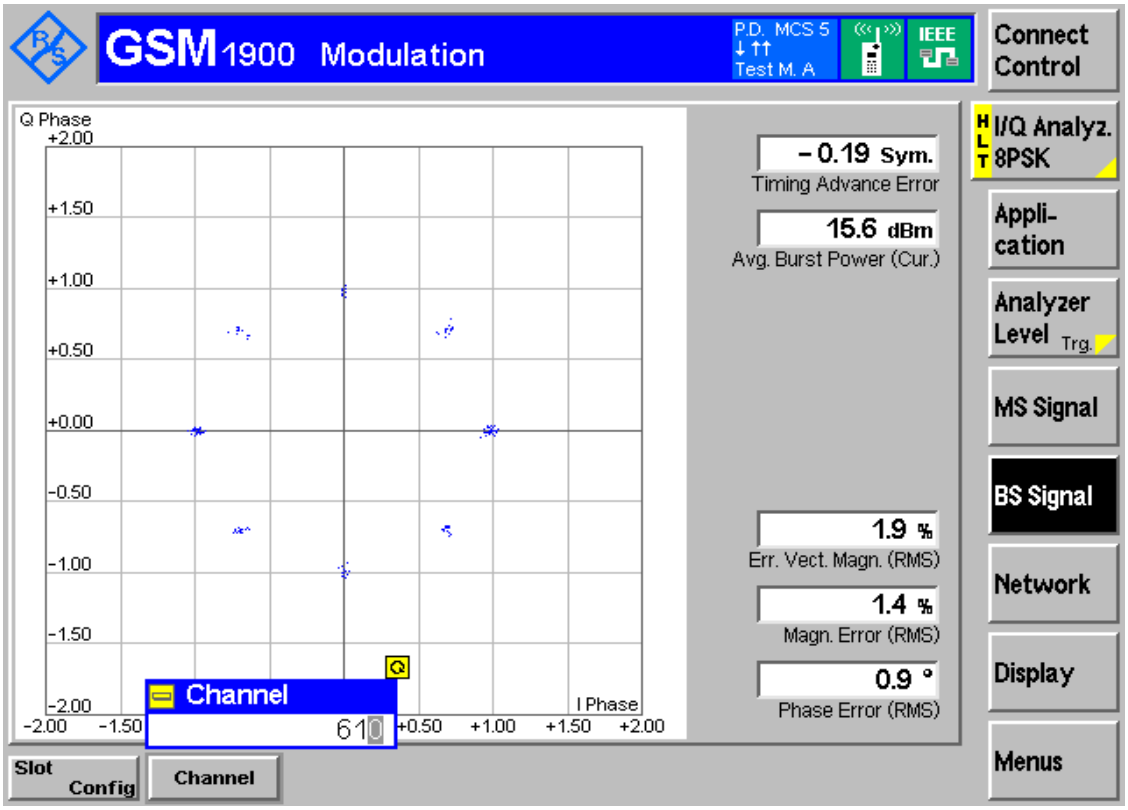
3.1.2.2 Test Mode = GSM/TM2

3.1.2.2.1 Test Channel = MCH



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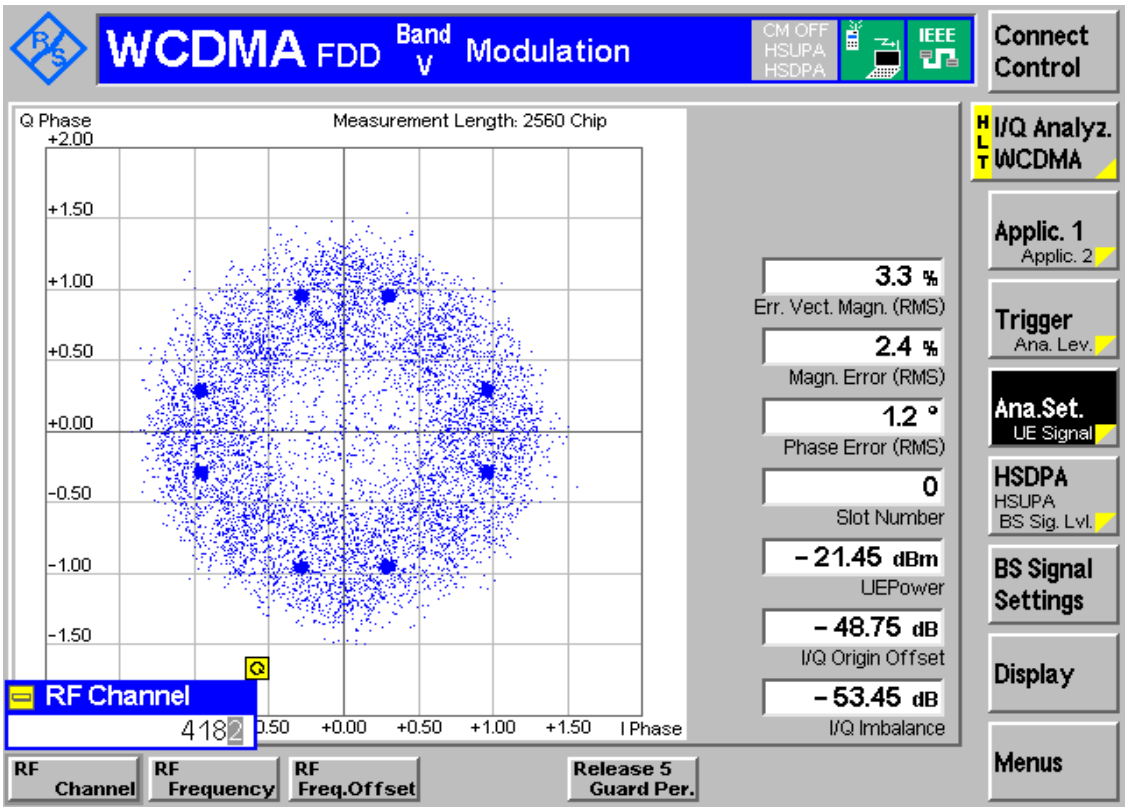
3.2 For UMTS

3.2.1 Test Band = WCDMA850

3.2.1.1 Test Mode = UMTS/TM1

3.2.1.1.1 Test Channel = MCH



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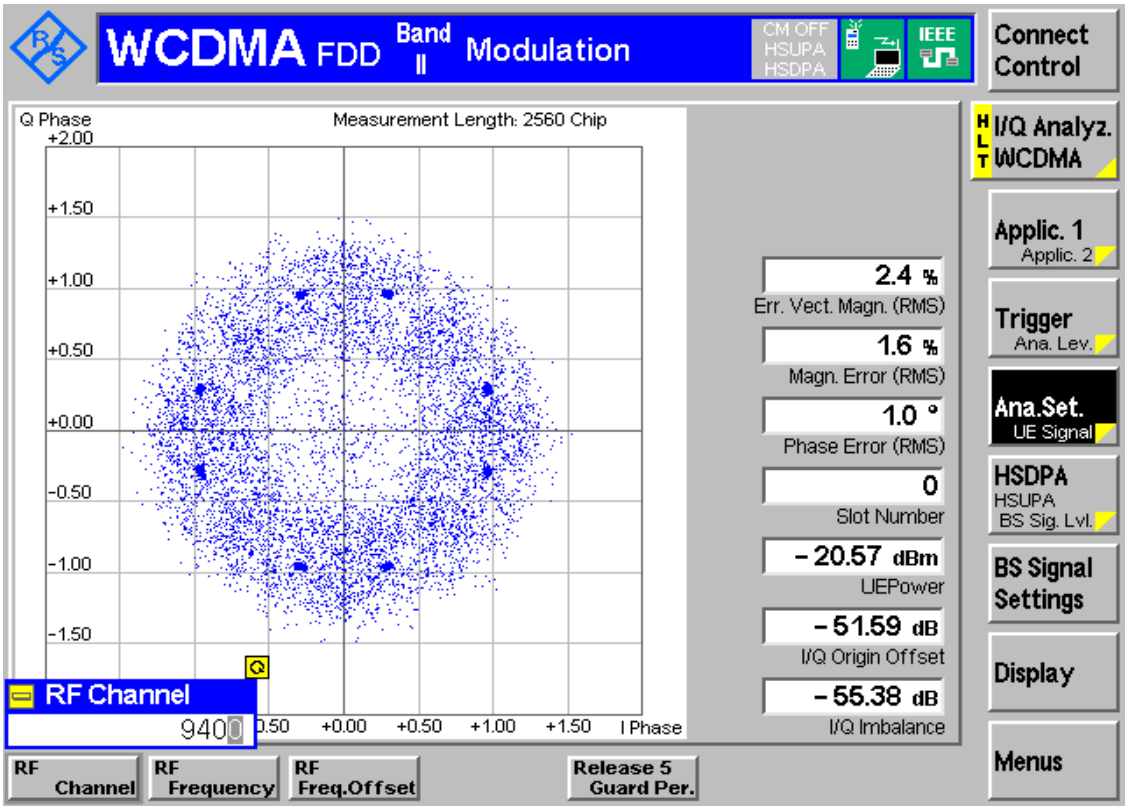
3.2.2 Test Band = WCDMA1900

3.2.2.1 Test Mode = UMTS/TM1

3.2.2.1.1 Test Channel = MCH



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4Appendix_D: Bandwidth

Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
GSM850	GSM/TM1	LCH	242.85	319.49	Pass
		MCH	245.90	313.03	Pass
		HCH	242.52	314.19	Pass
	GSM/TM2	LCH	245.67	309.10	Pass
		MCH	243.47	317.17	Pass
		HCH	244.10	316.16	Pass
GSM1900	GSM/TM1	LCH	240.13	307.22	Pass
		MCH	240.29	312.96	Pass
		HCH	241.39	306.71	Pass
	GSM/TM2	LCH	250.55	320.48	Pass
		MCH	249.33	323.61	Pass
		HCH	250.90	329.90	Pass

Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA850	UMTS/TM1	LCH	4.15	4.71	Pass
		MCH	4.16	4.71	Pass
		HCH	4.16	4.71	Pass
WCDMA1900	UMTS/TM1	LCH	4.16	4.73	Pass
		MCH	4.18	4.75	Pass
		HCH	4.16	4.74	Pass

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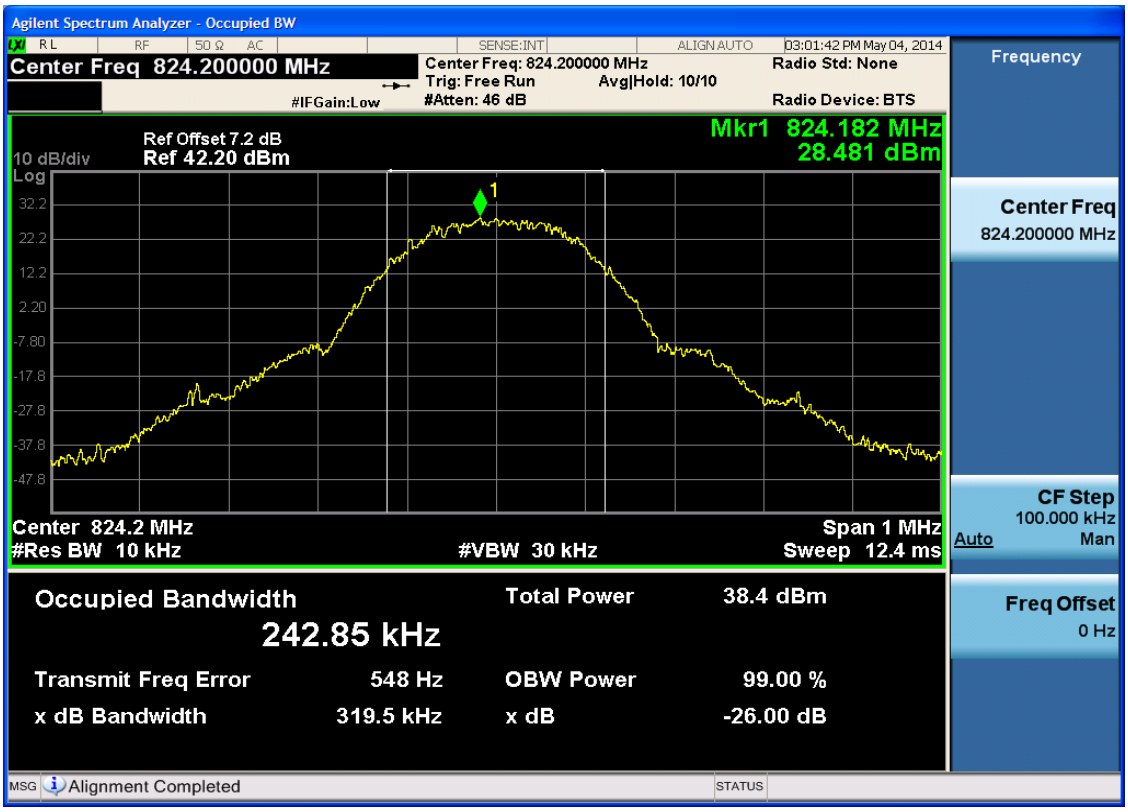
Part II - Test Plots

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



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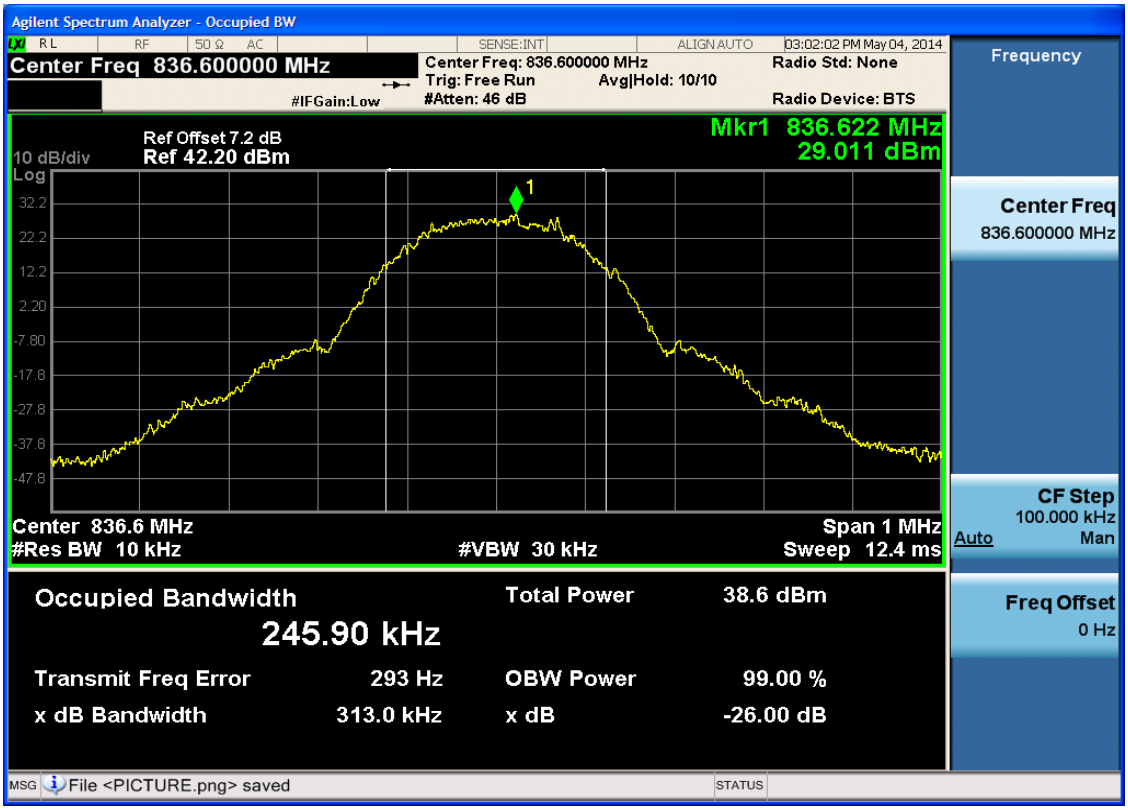
4.1.1.1.2 Test Channel = MCH



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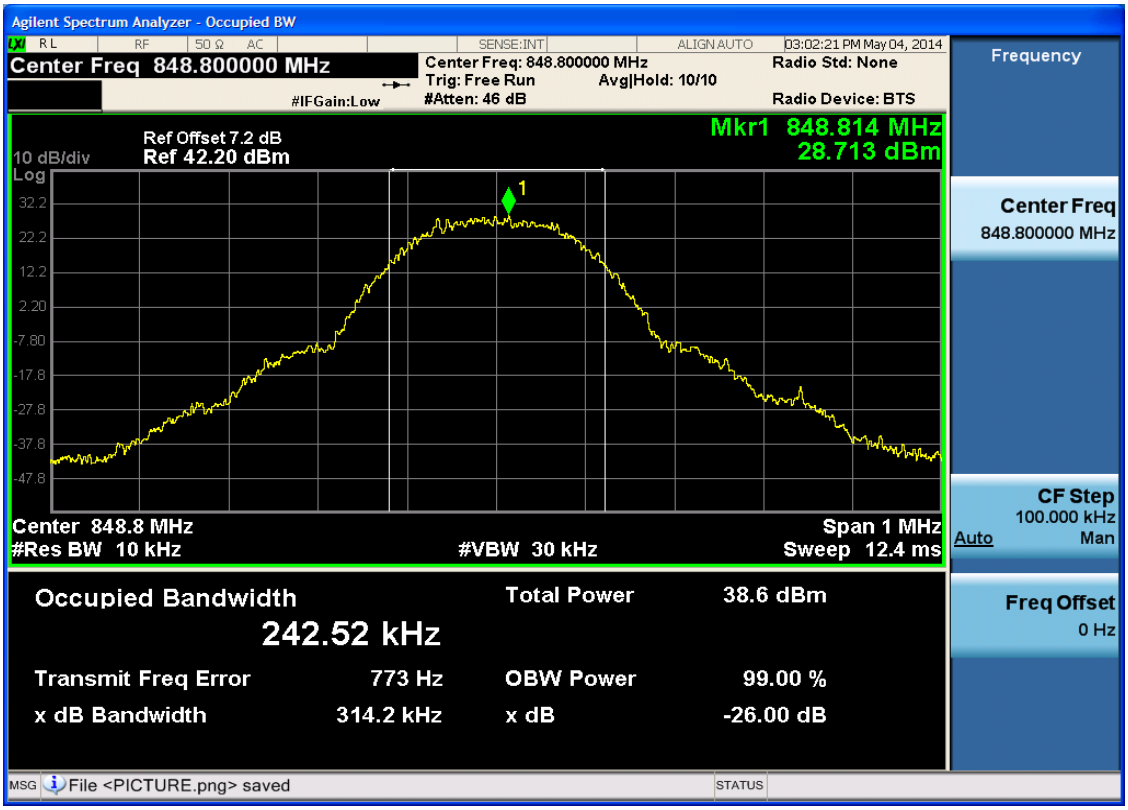
4.1.1.1.3 Test Channel = HCH



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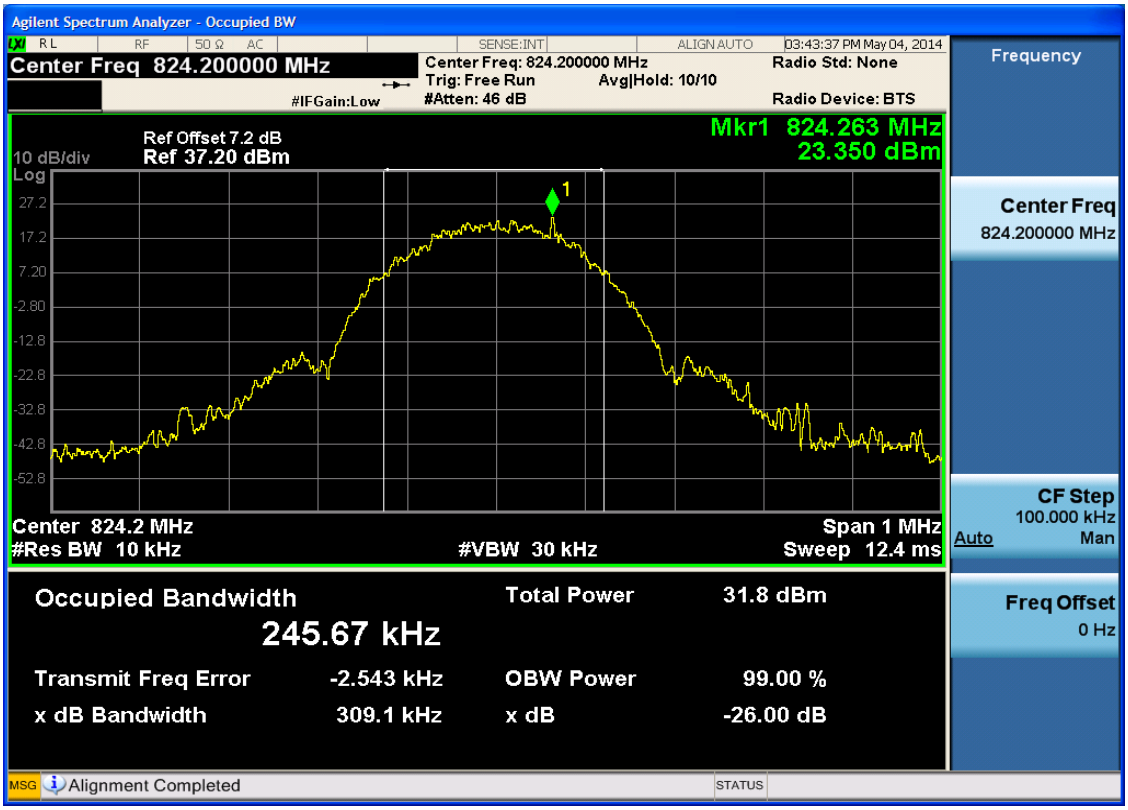
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH



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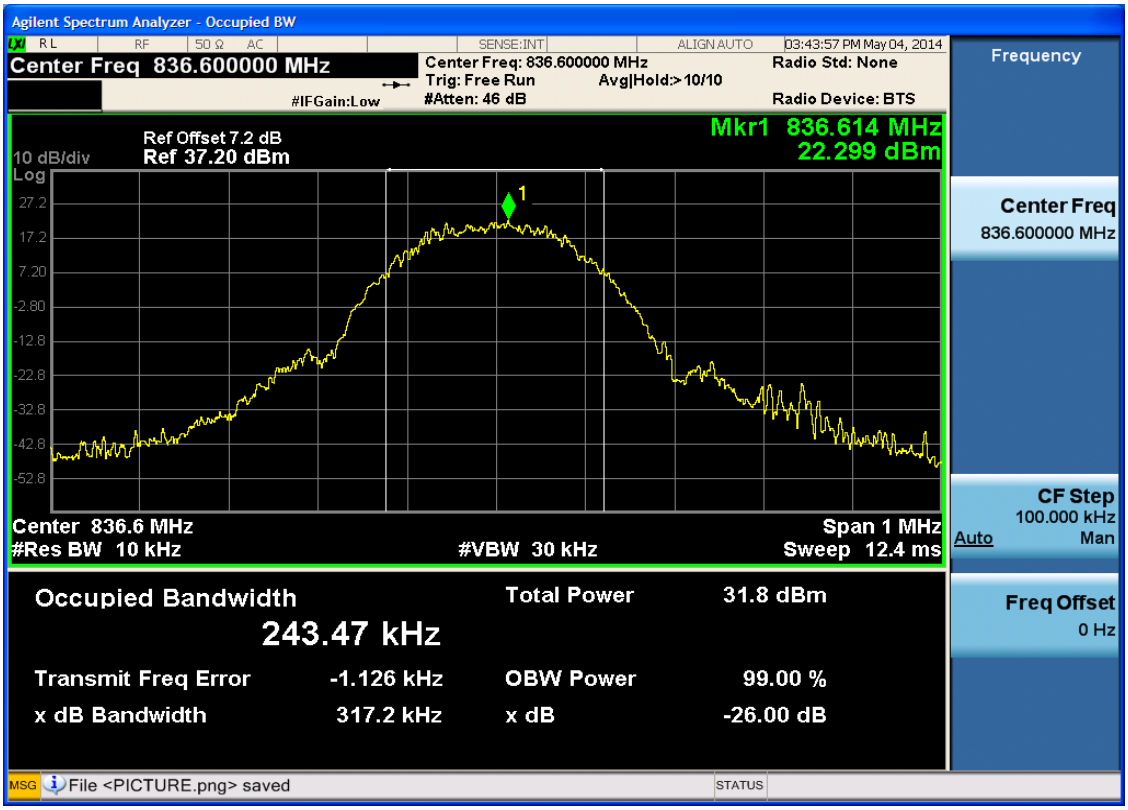
4.1.1.2.2 Test Channel = MCH



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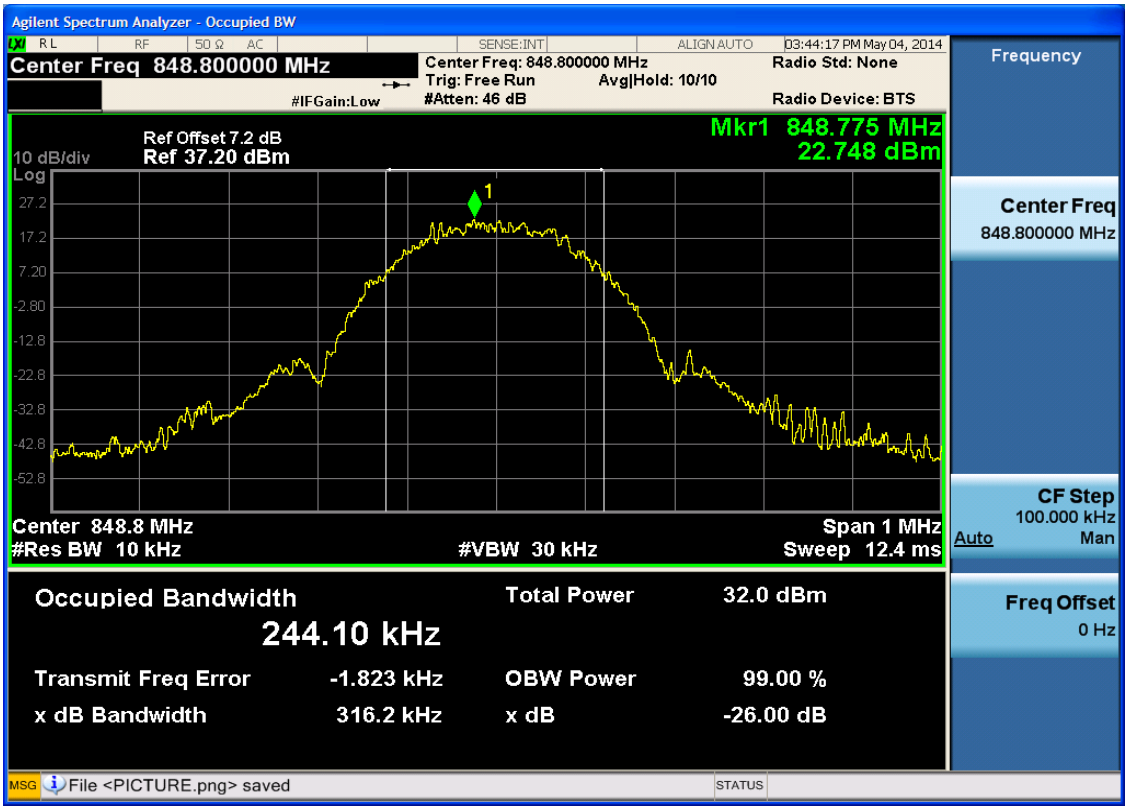
4.1.1.2.3 Test Channel = HCH



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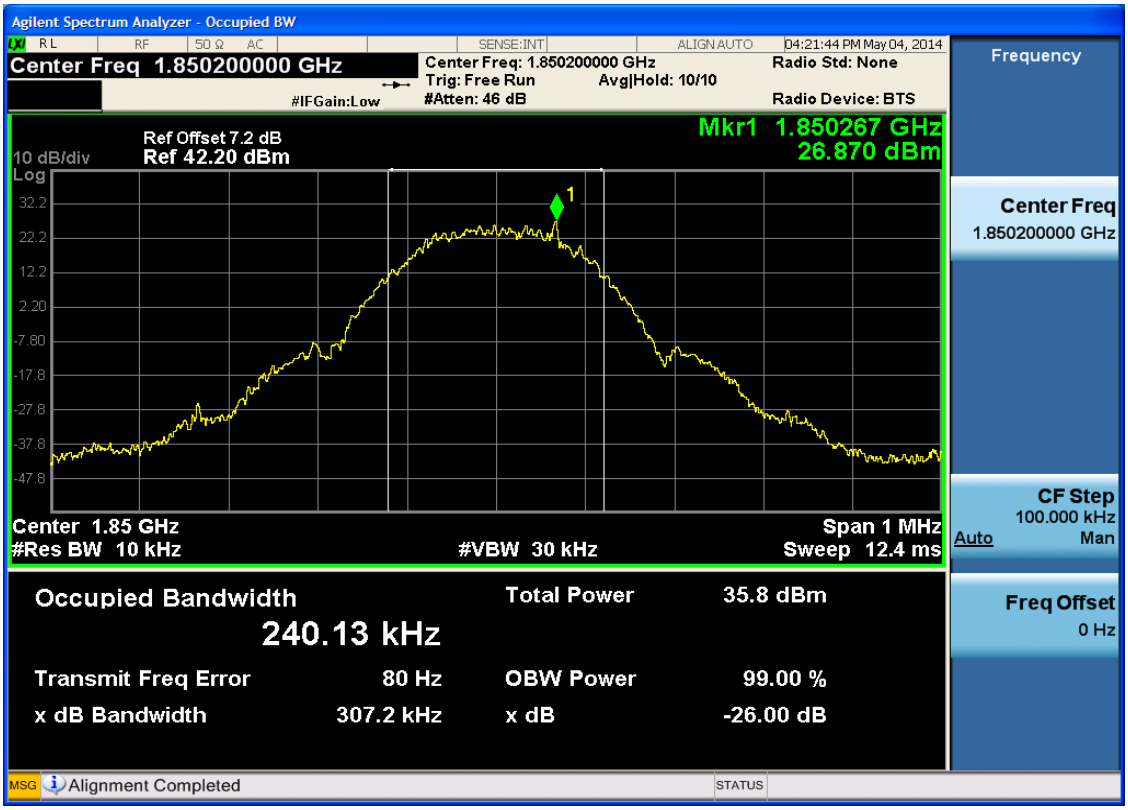
4.1.2 Test Band = GSM1900

4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



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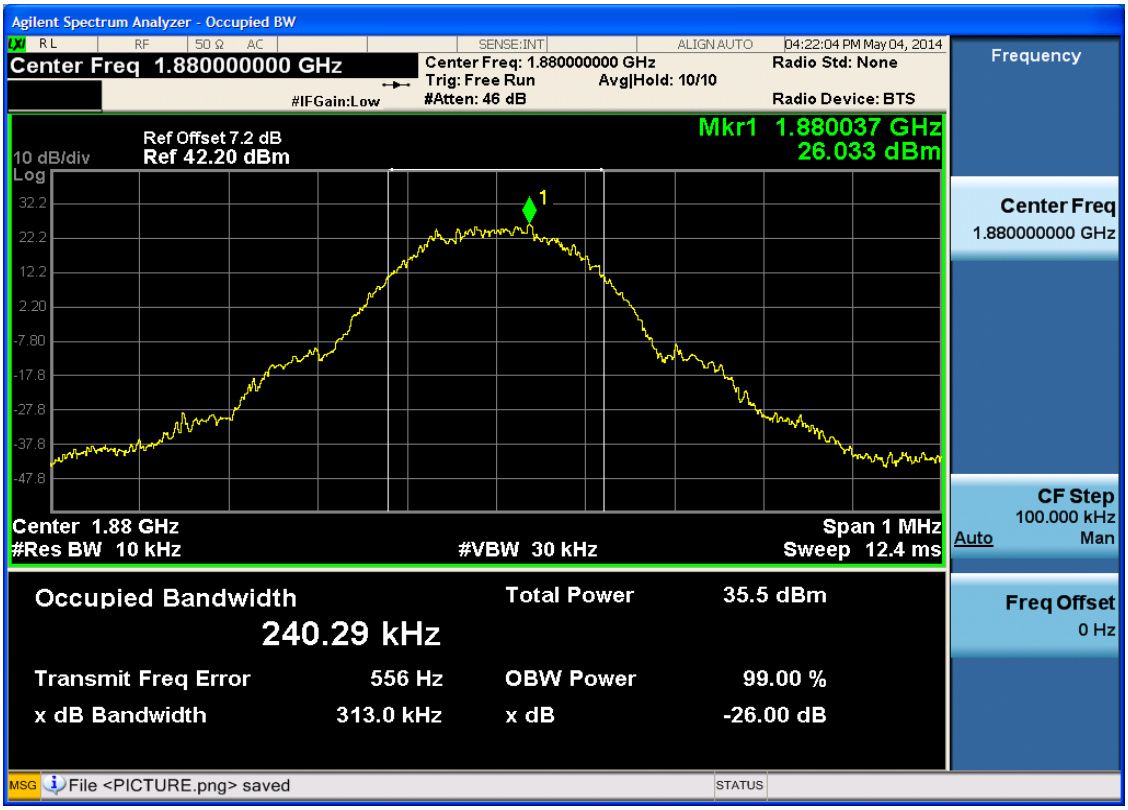
4.1.2.1.2 Test Channel = MCH



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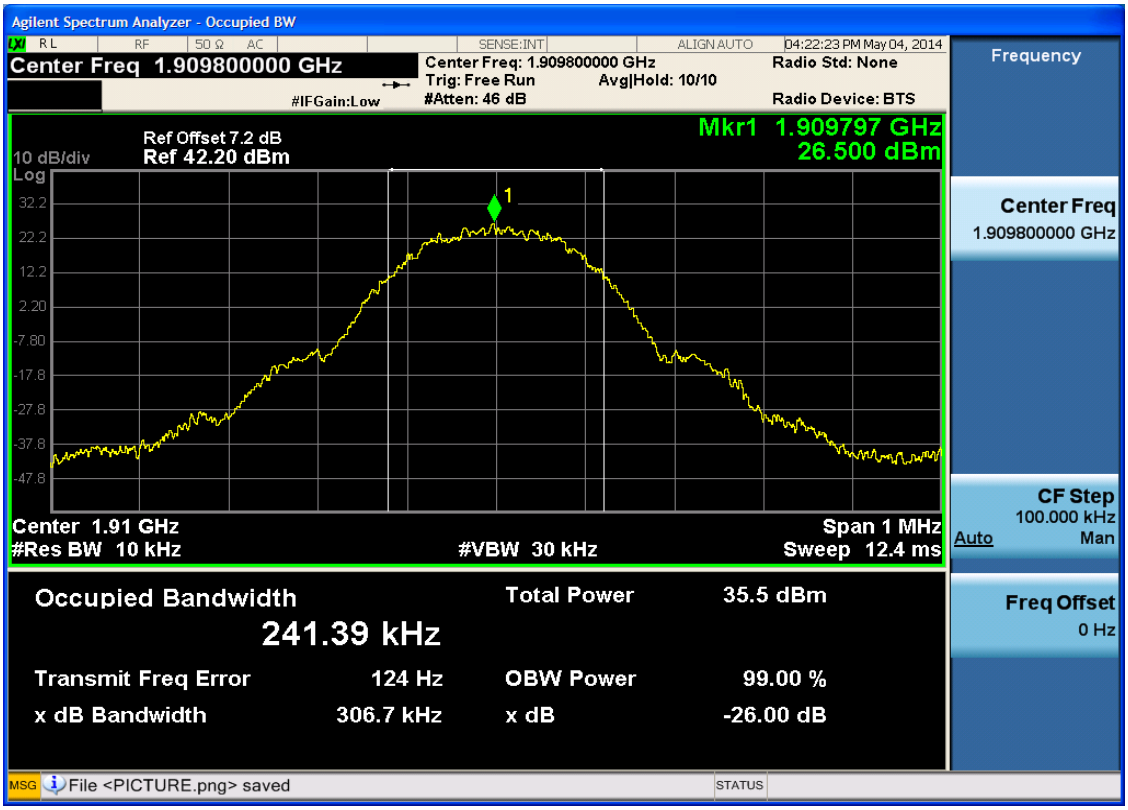
4.1.2.1.3 Test Channel = HCH



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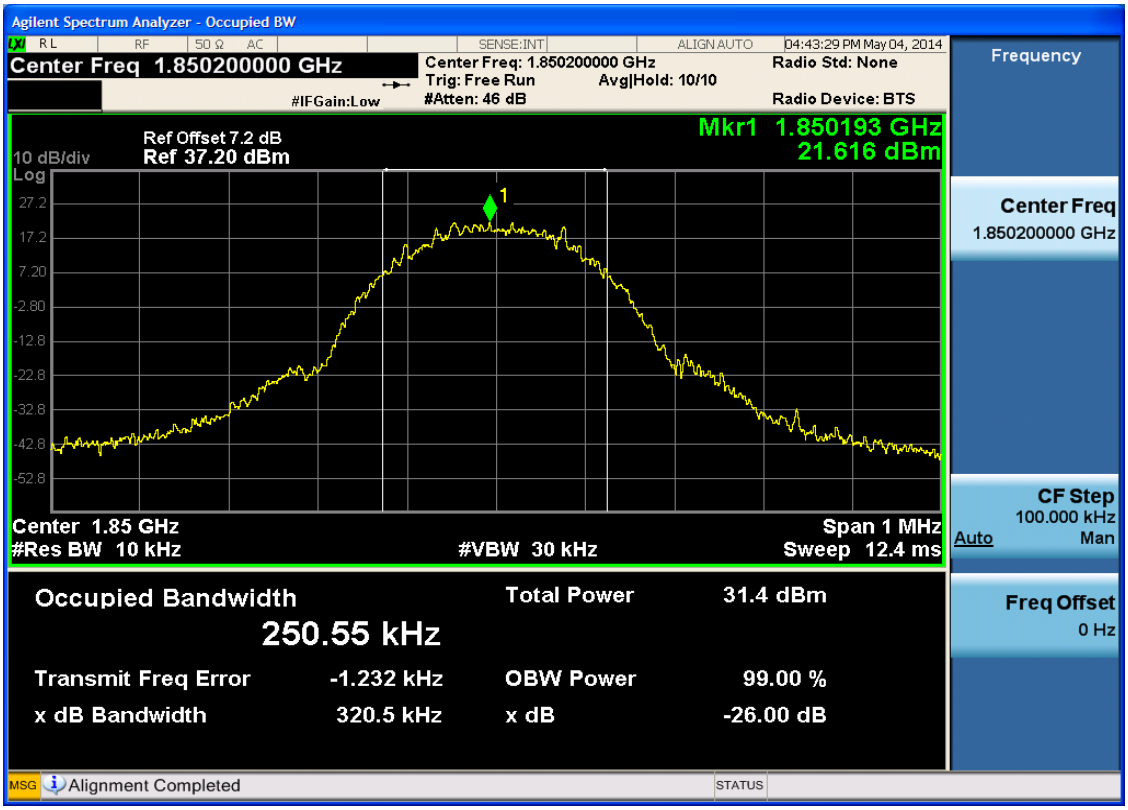
4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



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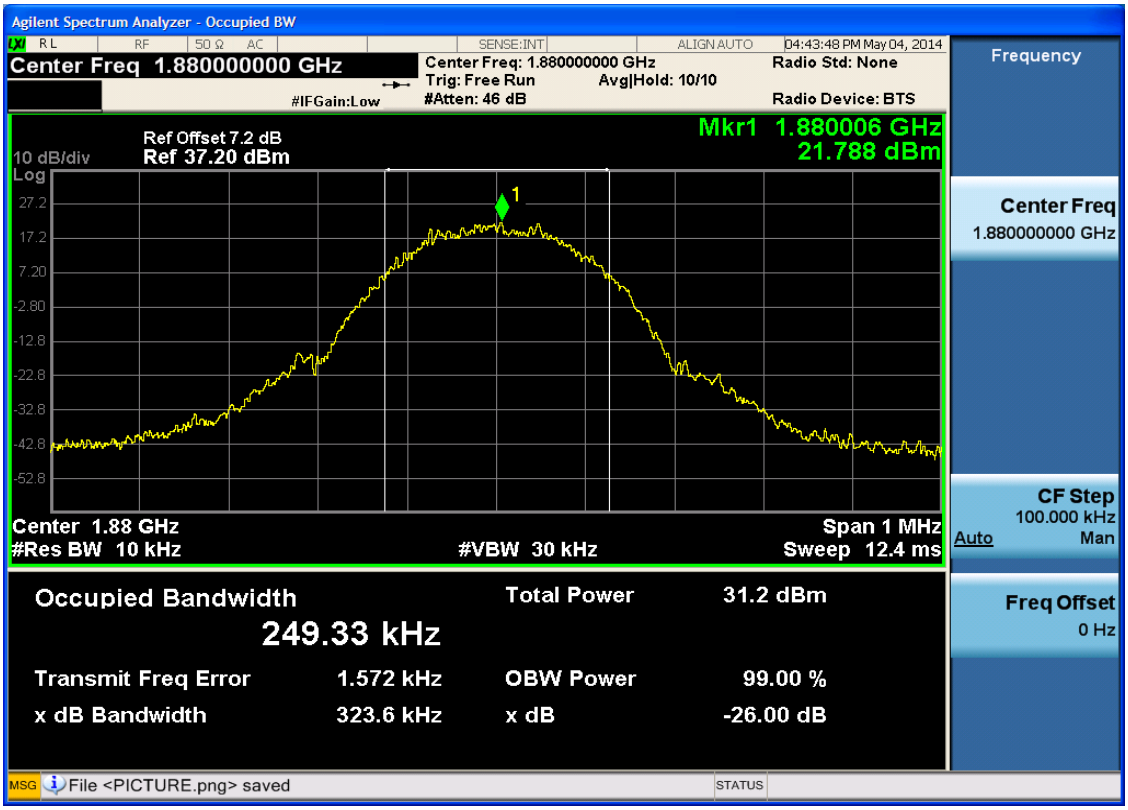
4.1.2.2.2 Test Channel = MCH



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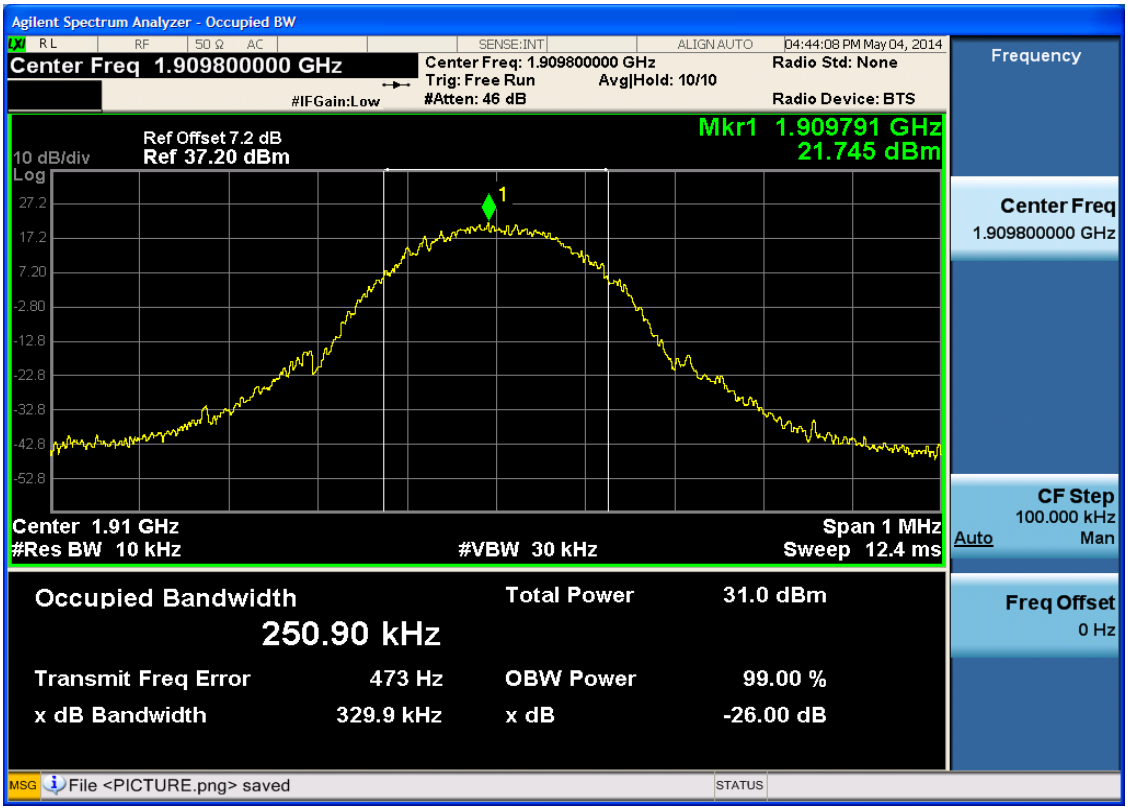
4.1.2.2.3 Test Channel = HCH



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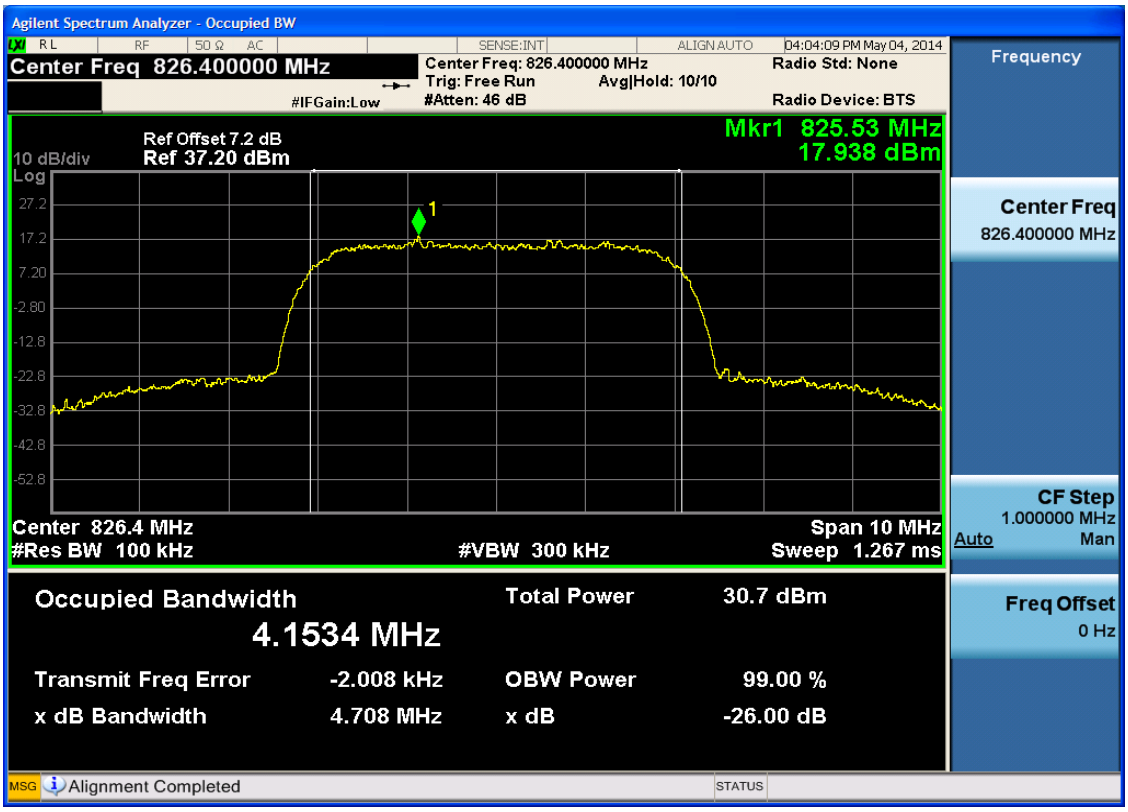
4.2 For UMTS

4.2.1 Test Band = WCDMA850

4.2.1.1 Test Mode = UMTS/TM1

4.2.1.1.1 Test Channel = LCH



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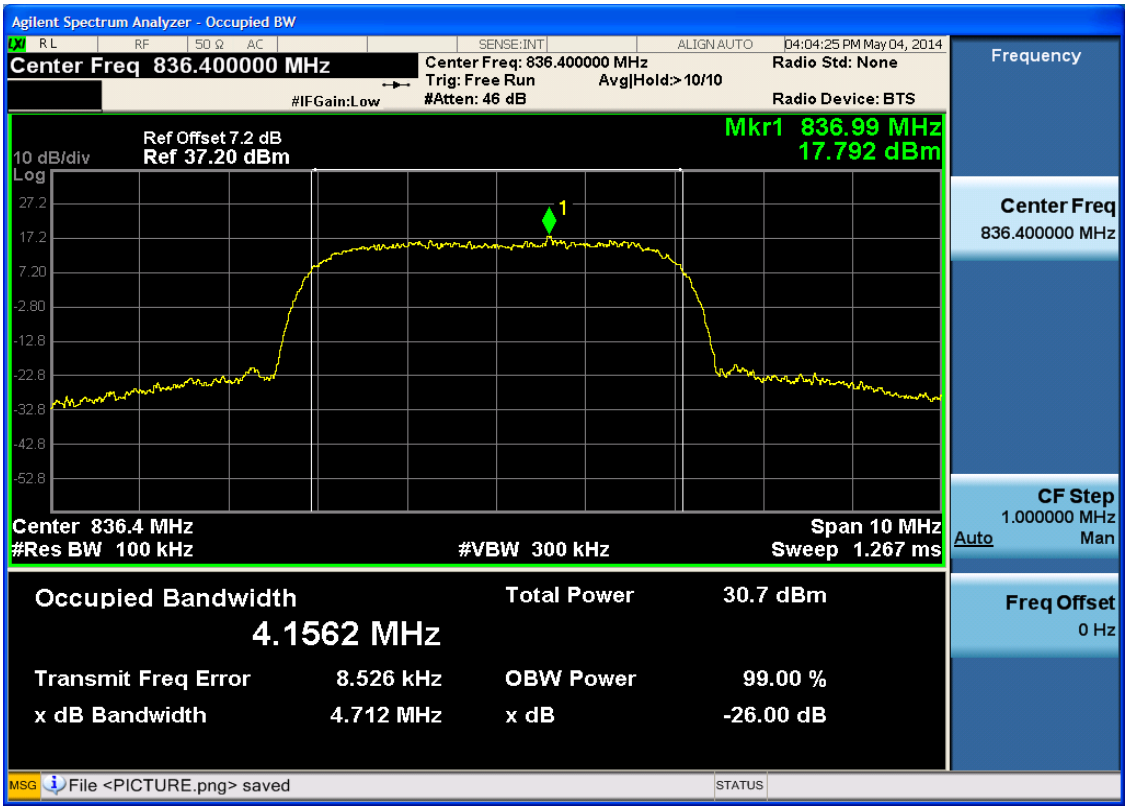
4.2.1.1.2 Test Channel = MCH



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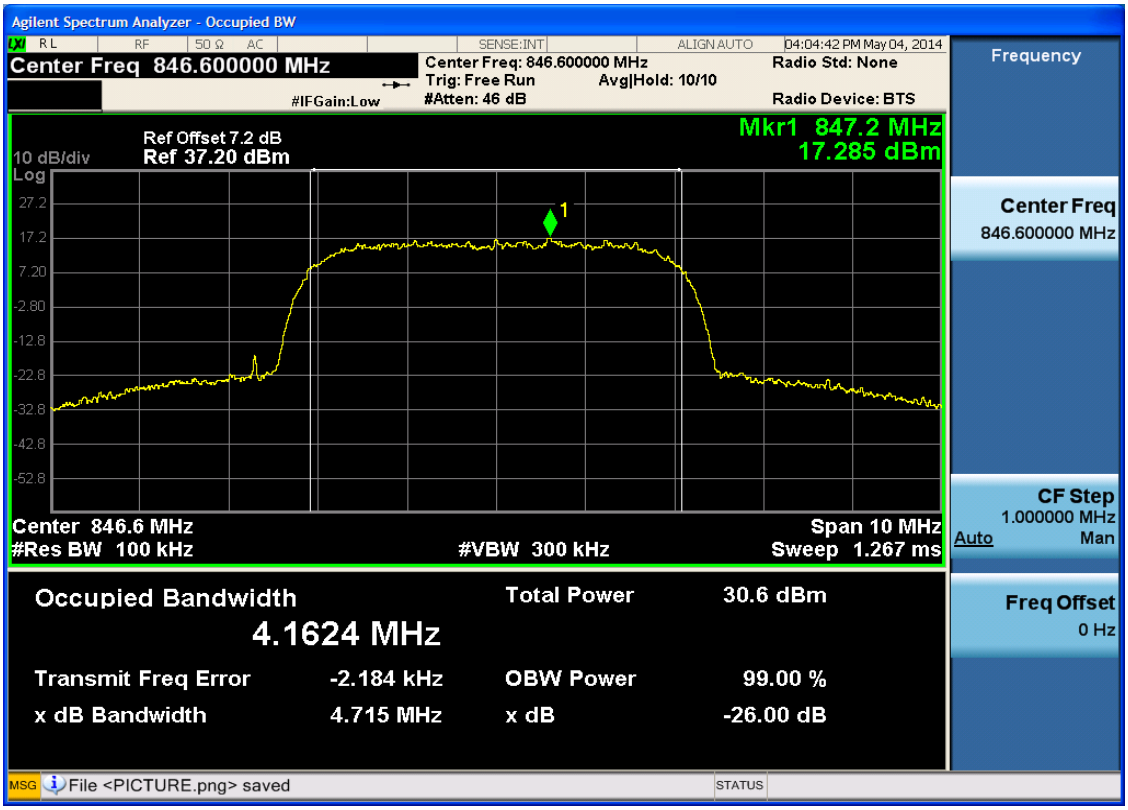
4.2.1.1.3 Test Channel = HCH



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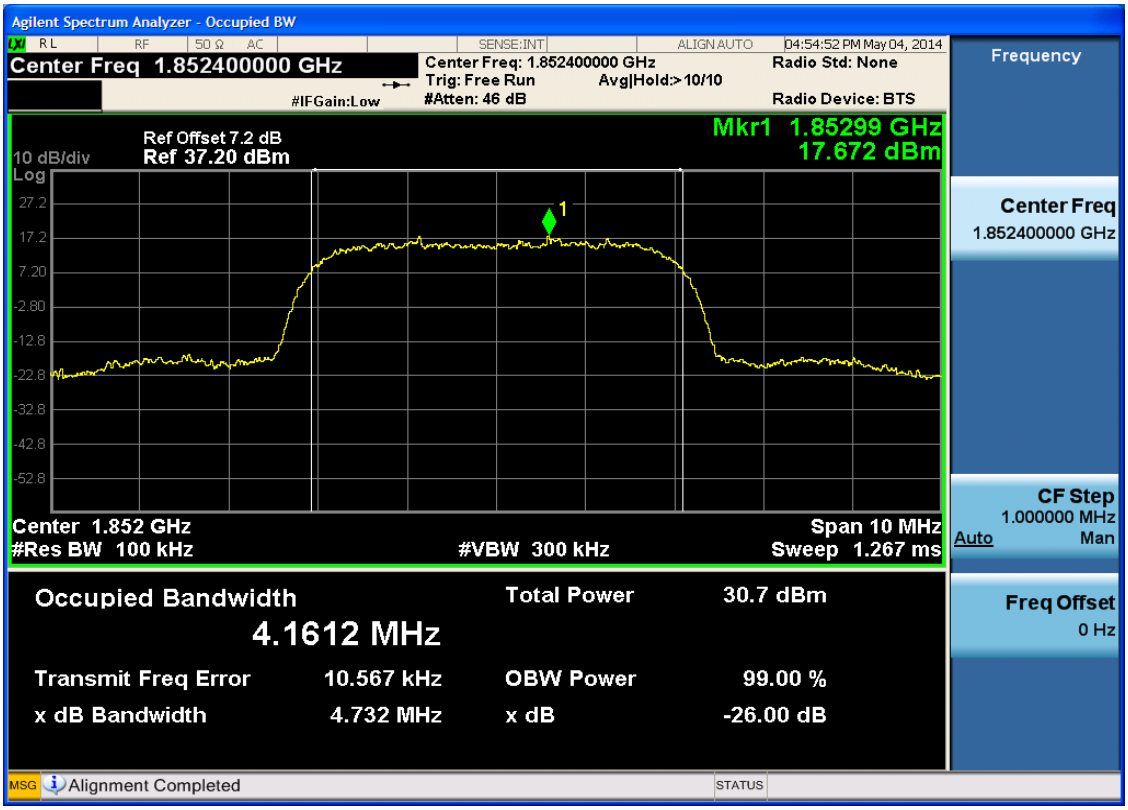
4.2.2 Test Band = WCDMA1900

4.2.2.1 Test Mode = UMTS/TM1

4.2.2.1.1 Test Channel = LCH



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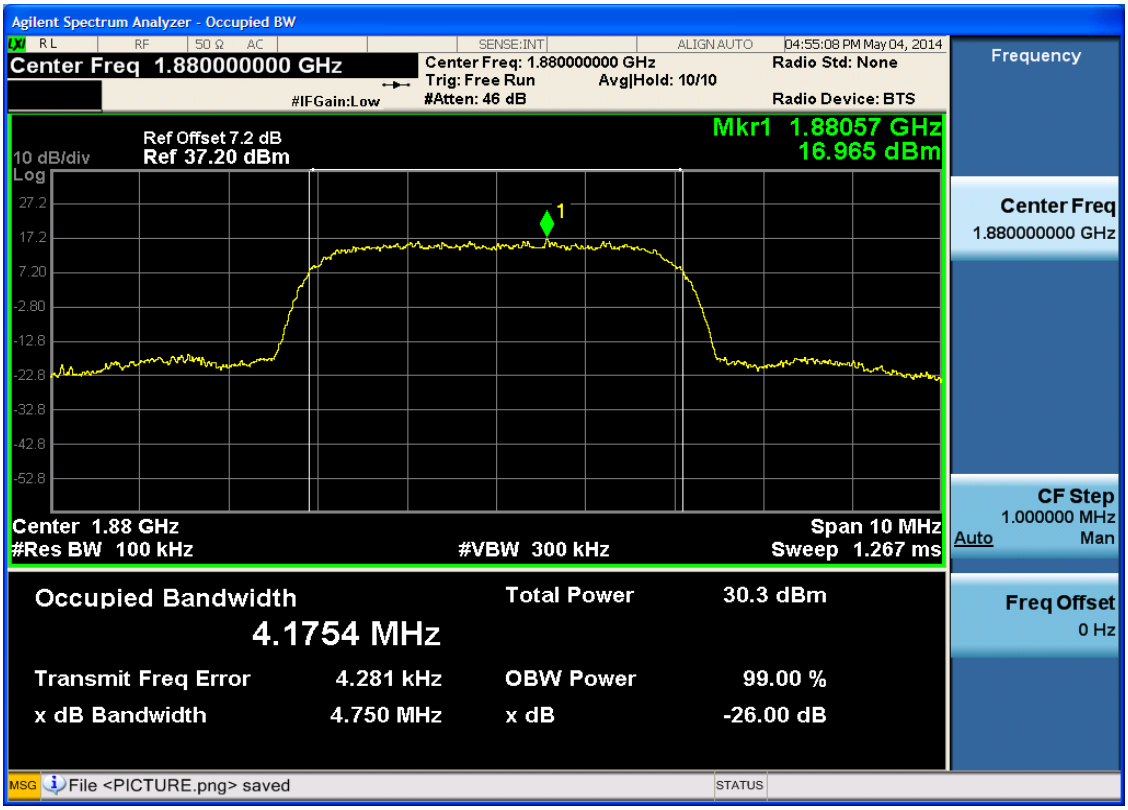
4.2.2.1.2 Test Channel = MCH



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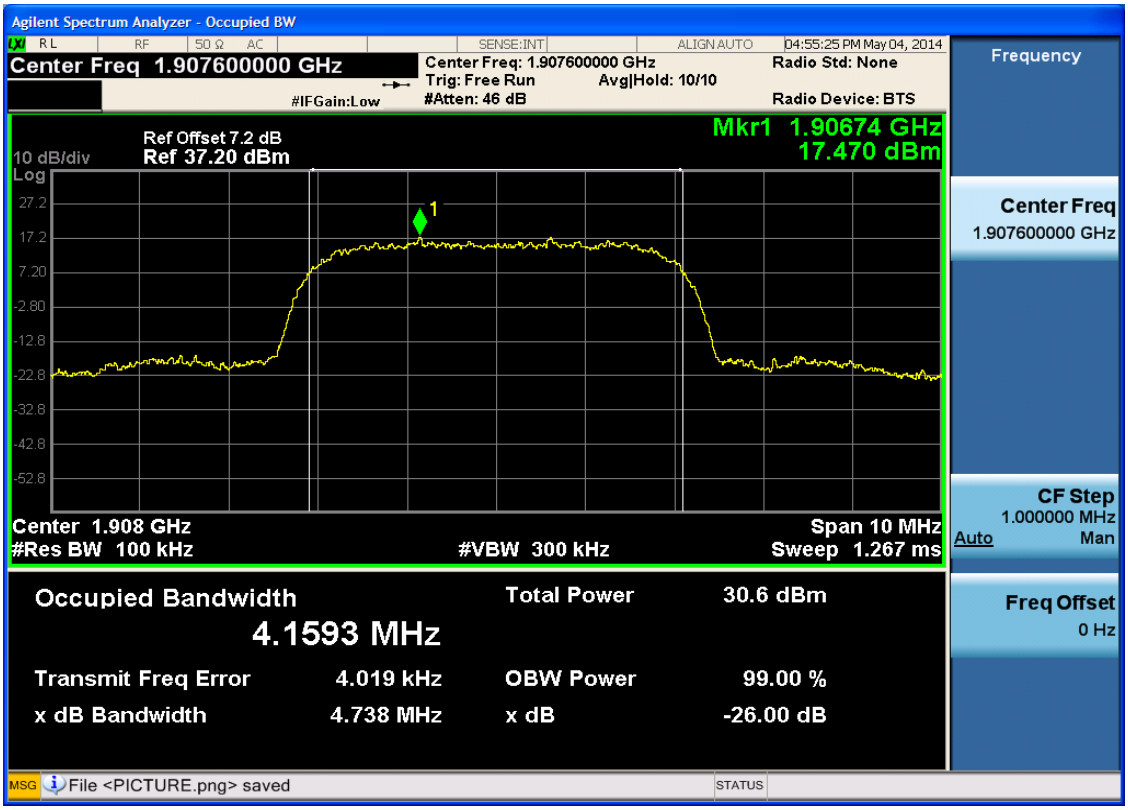
4.2.2.1.3 Test Channel = HCH



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5Appendix_E: Band Edges Compliance

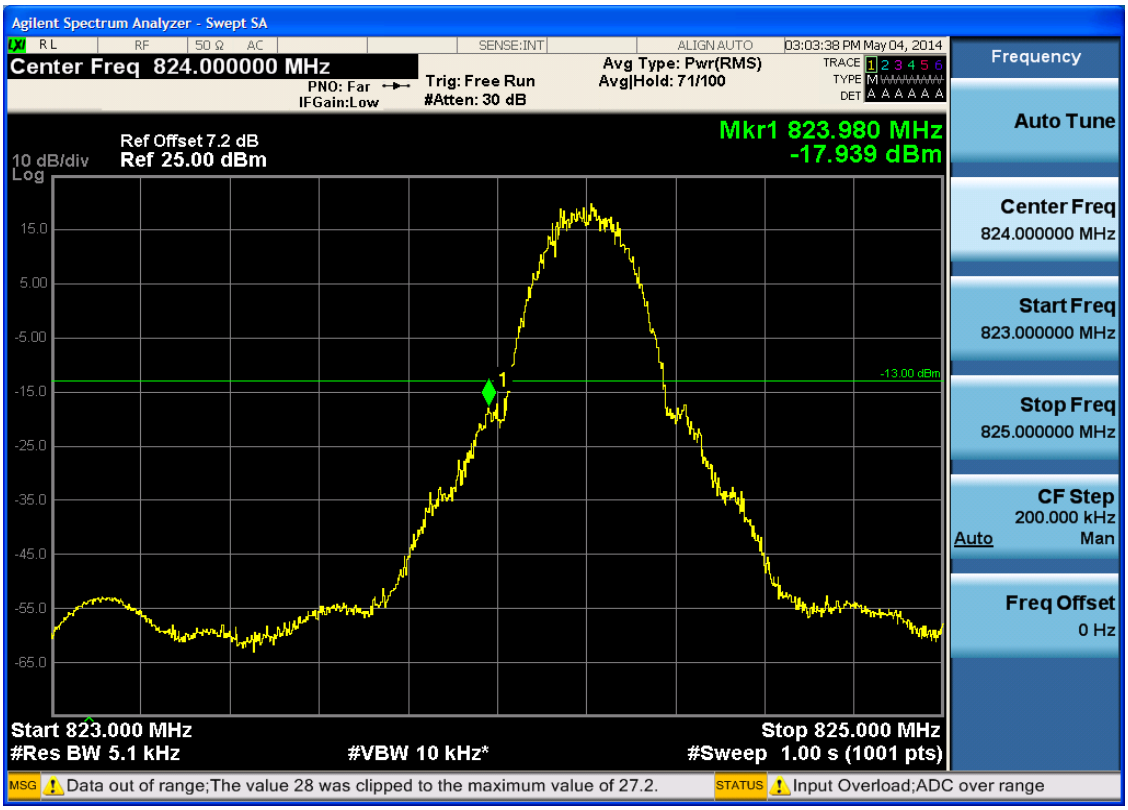
Part I - Test Plots

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



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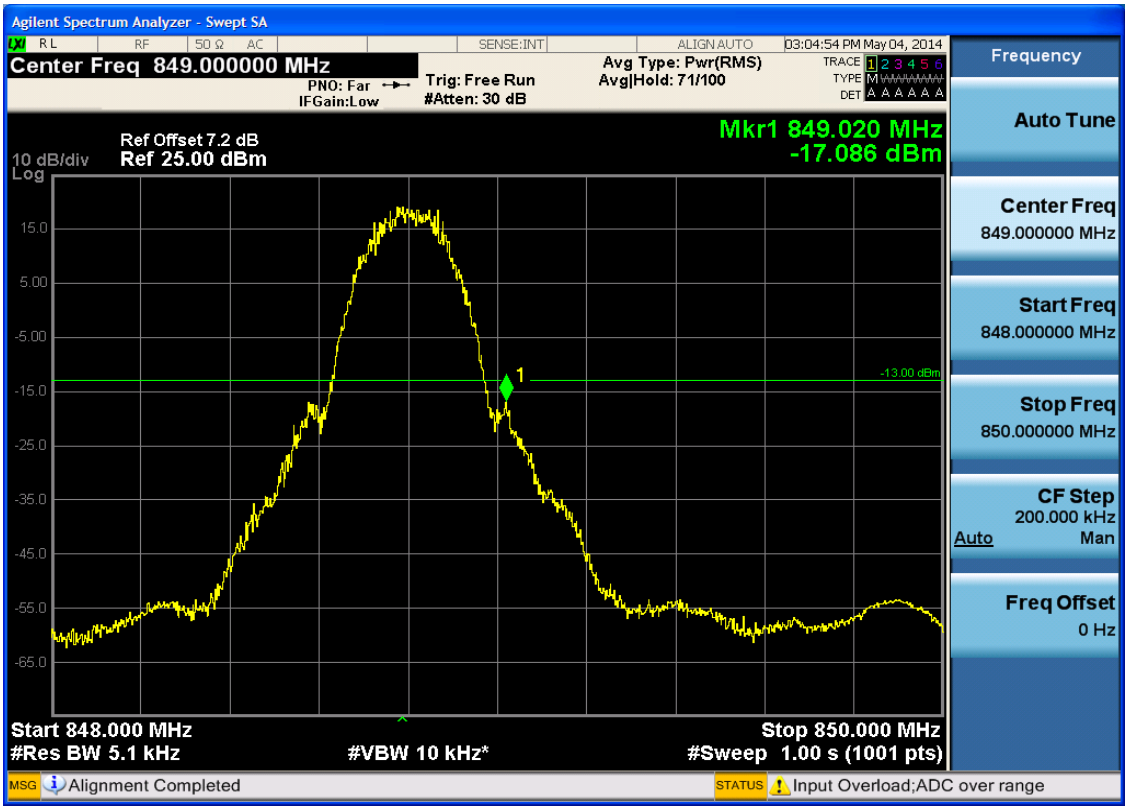
5.1.1.1.2 Test Channel = HCH



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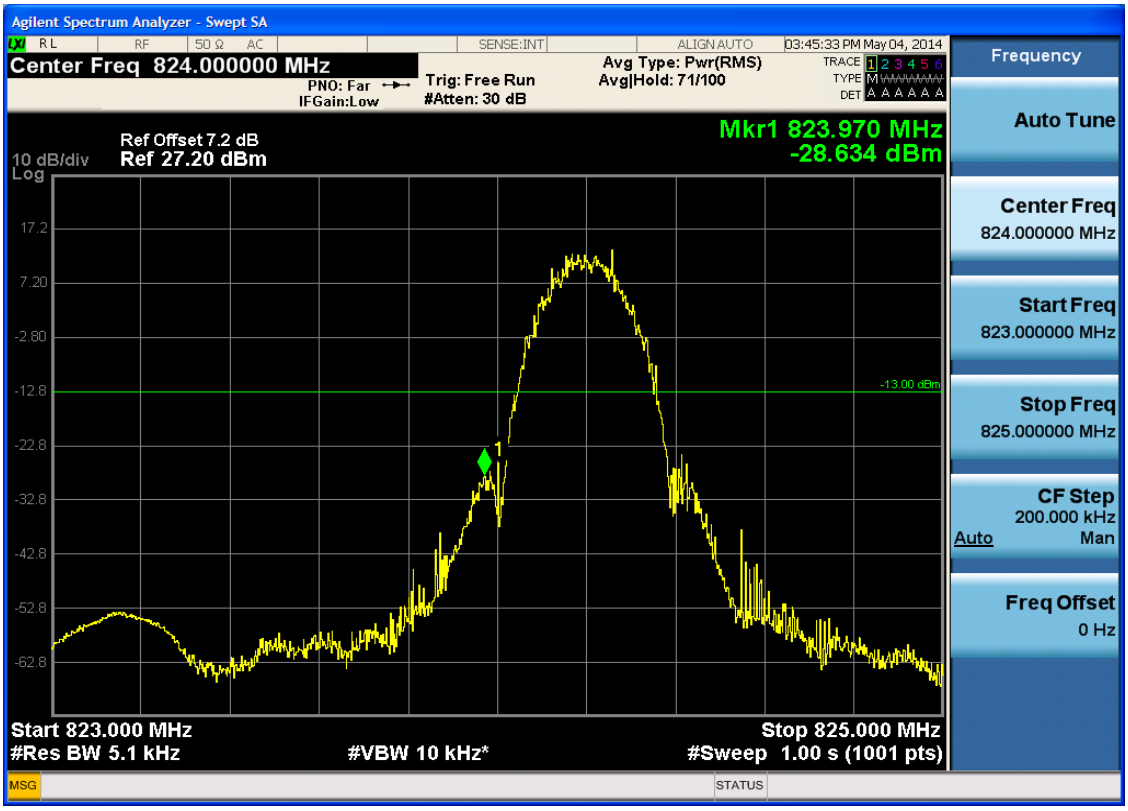
5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



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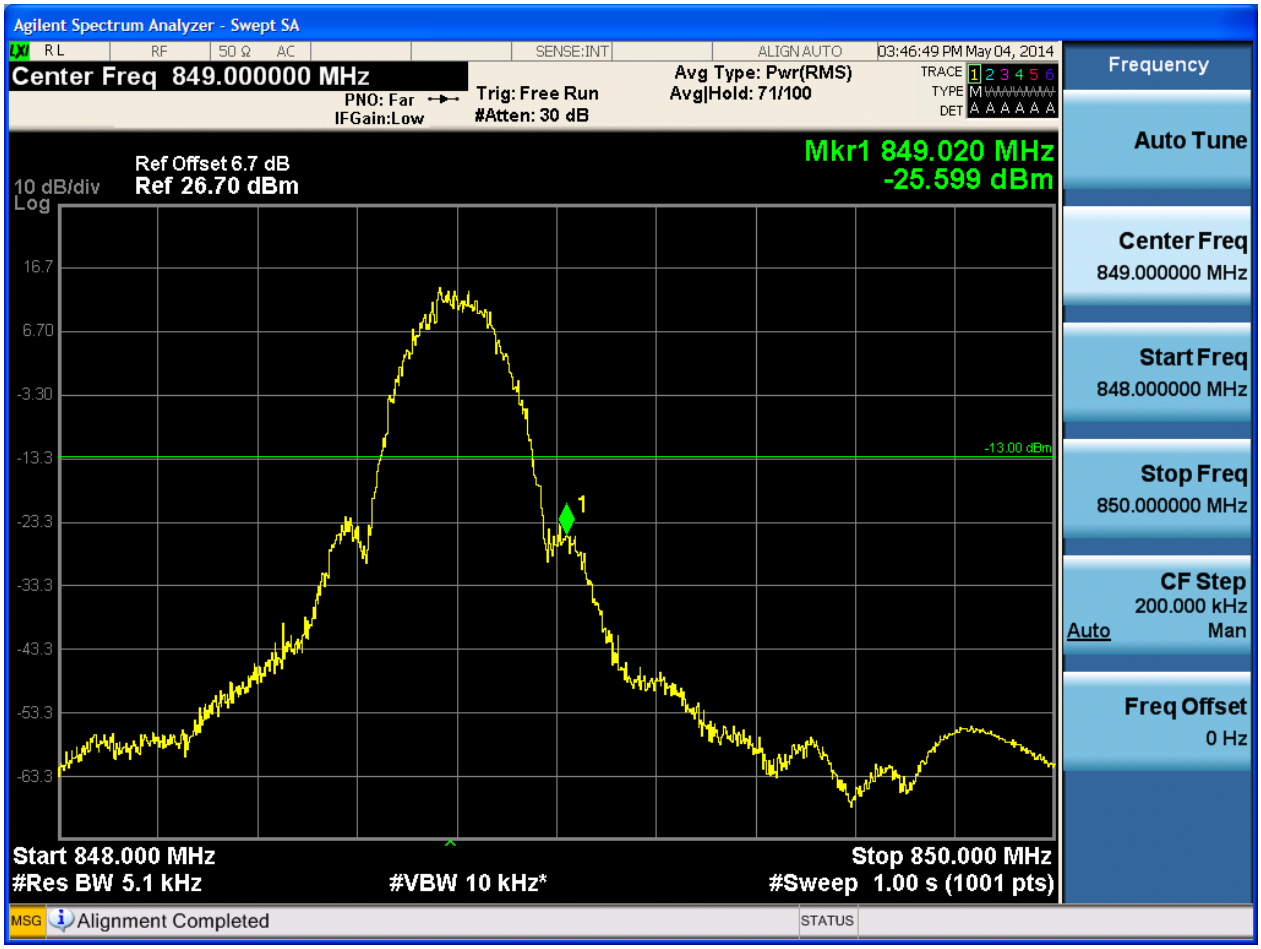
5.1.1.2.2 Test Channel = HCH



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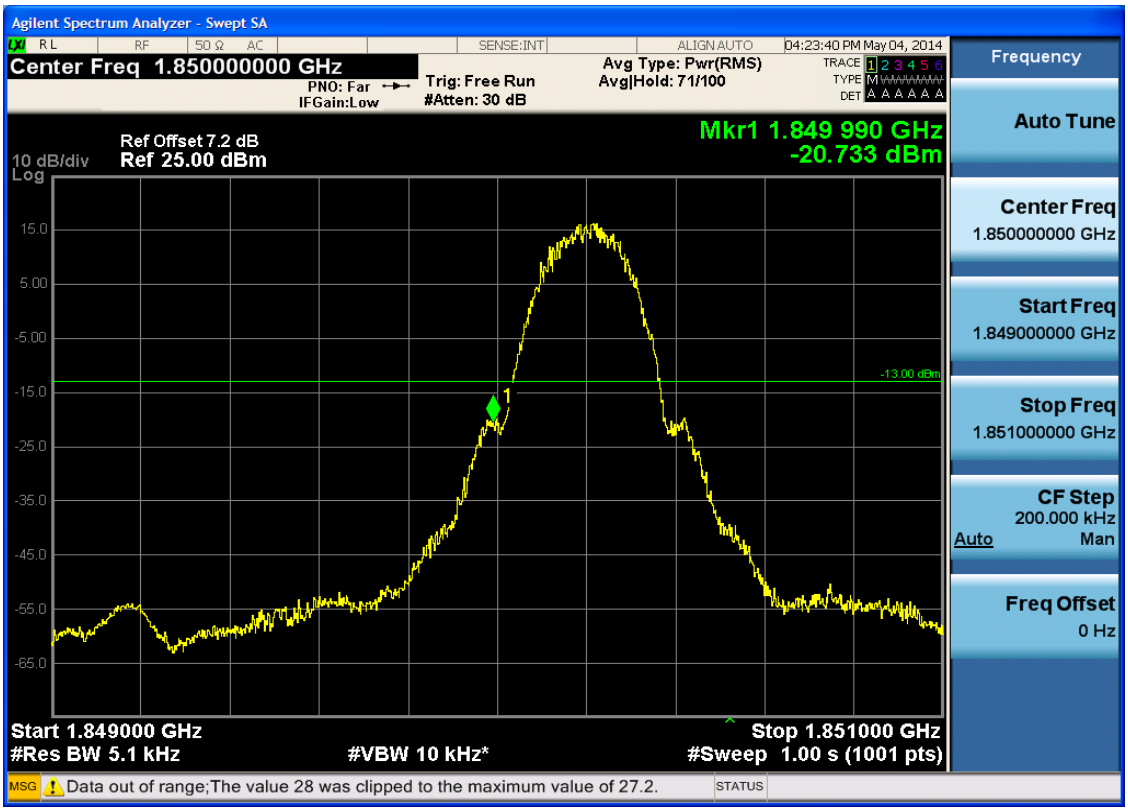
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH



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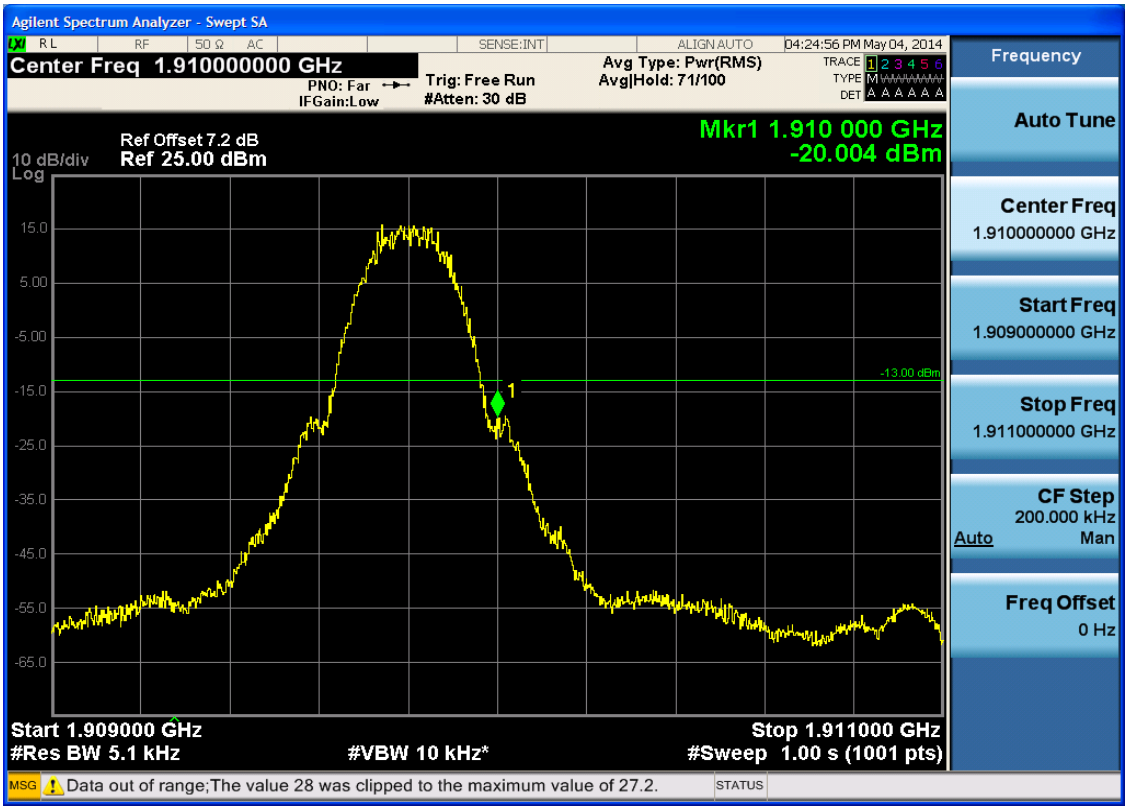
5.1.2.1.2 Test Channel = HCH



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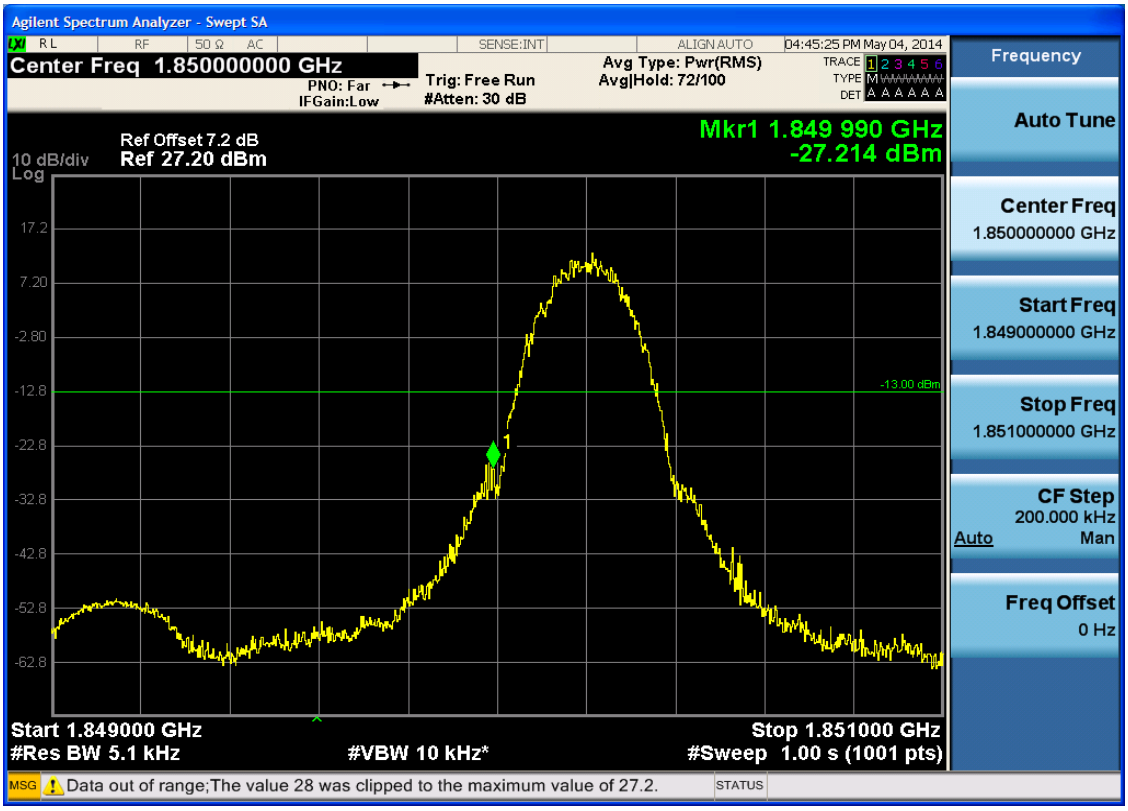
5.1.2.2 Test Mode = GSM/TM2

5.1.2.2.1 Test Channel = LCH



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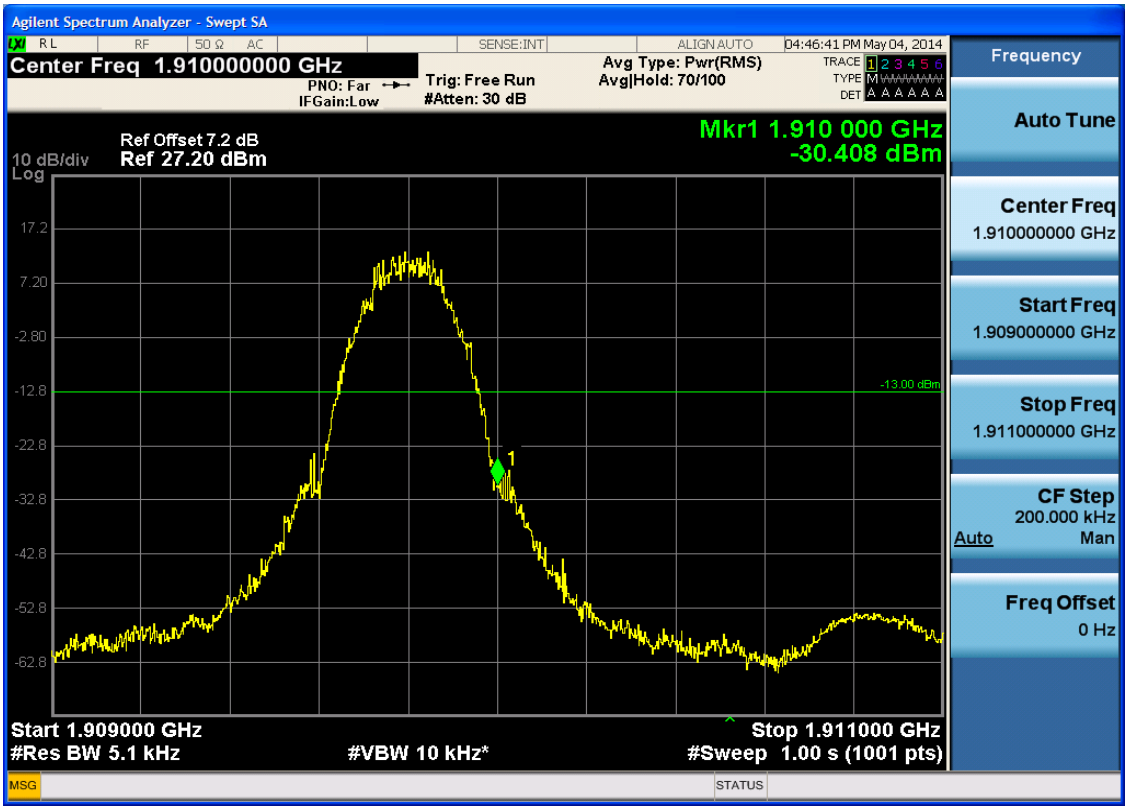
5.1.2.2.2 Test Channel = HCH



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5.2 For UMTS

5.2.1 Test Band = WCDMA850

5.2.1.1 Test Mode = UMTS/TM1

5.2.1.1.1 Test Channel = LCH

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5.2.1.1.2 Test Channel = HCH

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5.2.2 Test Band = WCDMA1900

5.2.2.1 Test Mode = UMTS/TM1

5.2.2.1.1 Test Channel = LCH

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5.2.2.1.2 Test Channel = HCH

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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.

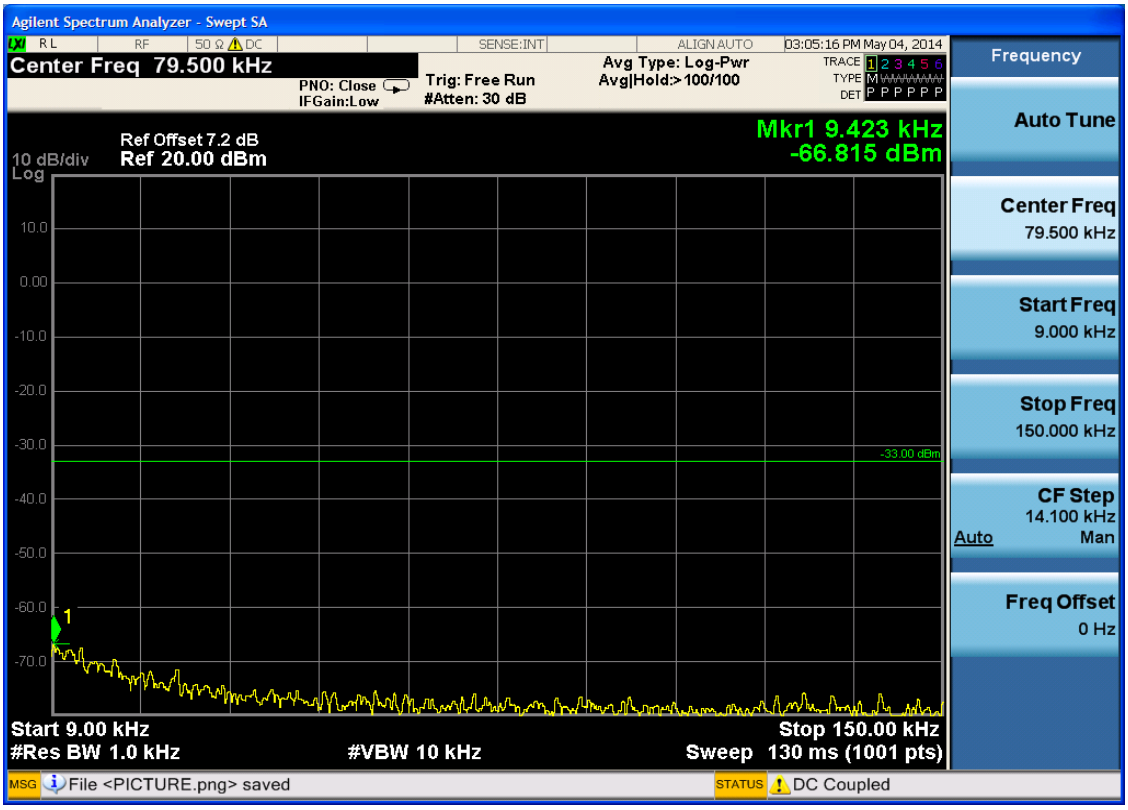
Part I - Test Plots

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



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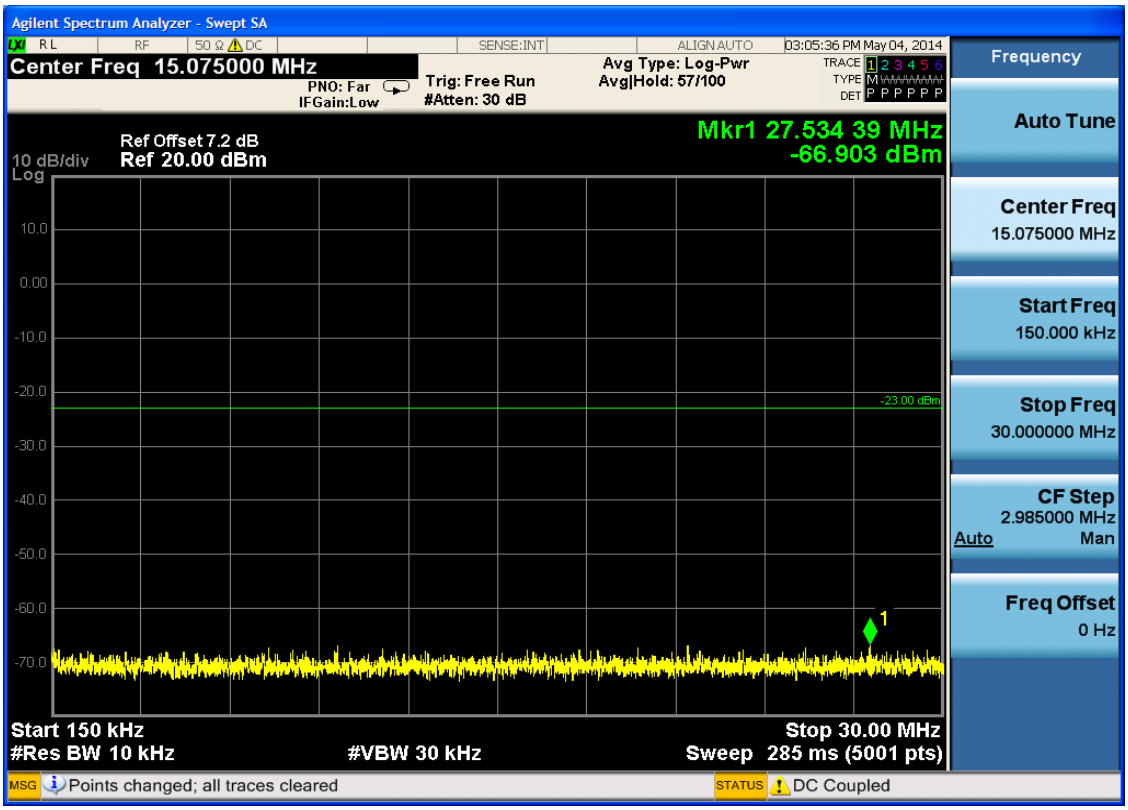

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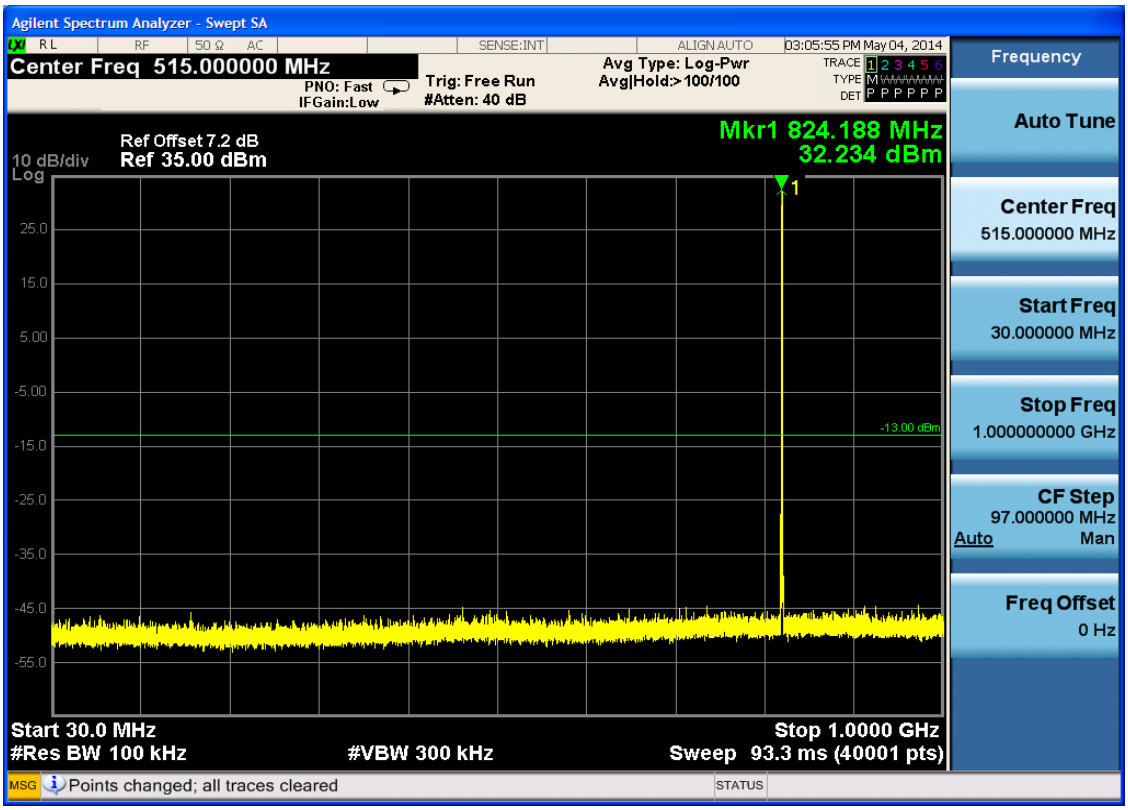

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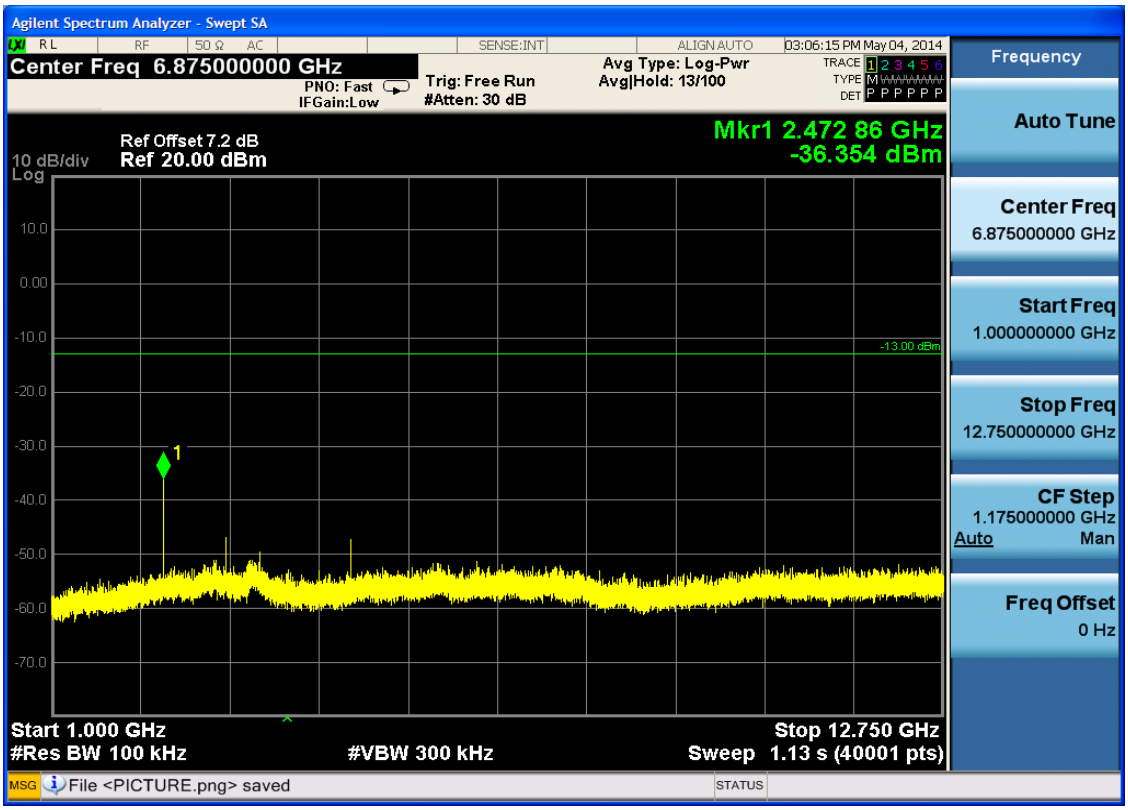

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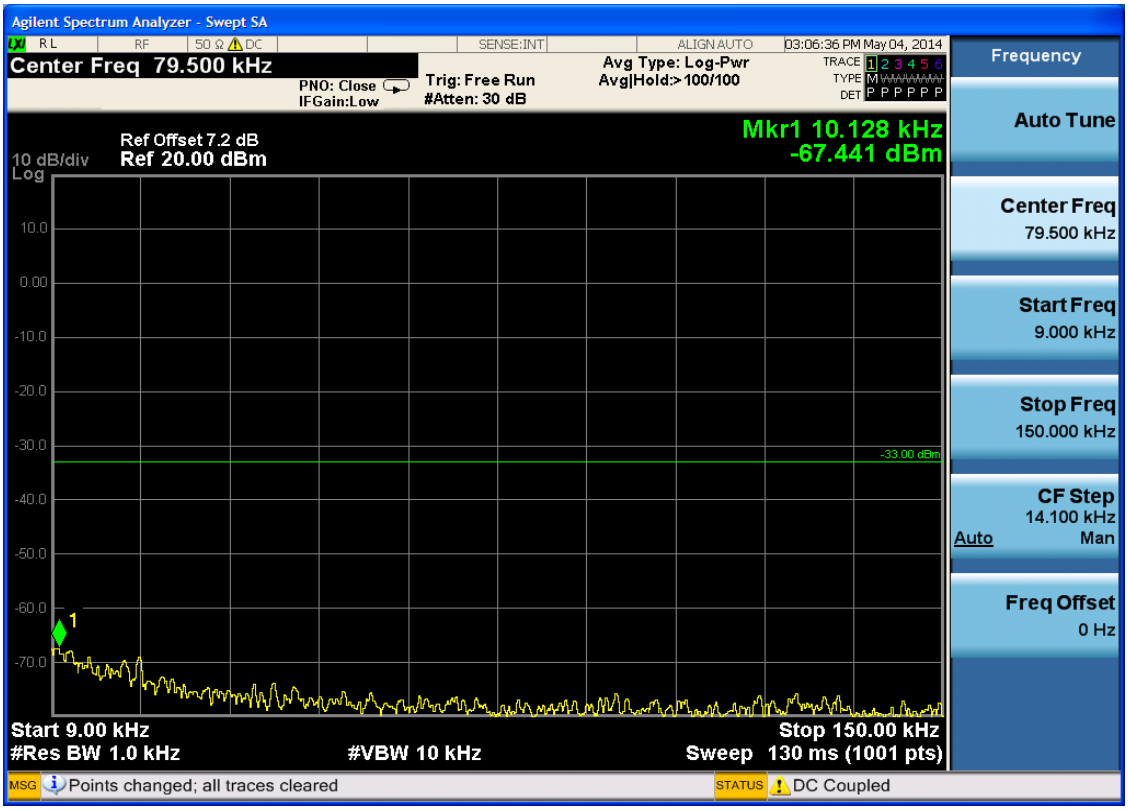
6.1.1.1.2 Test Channel = MCH



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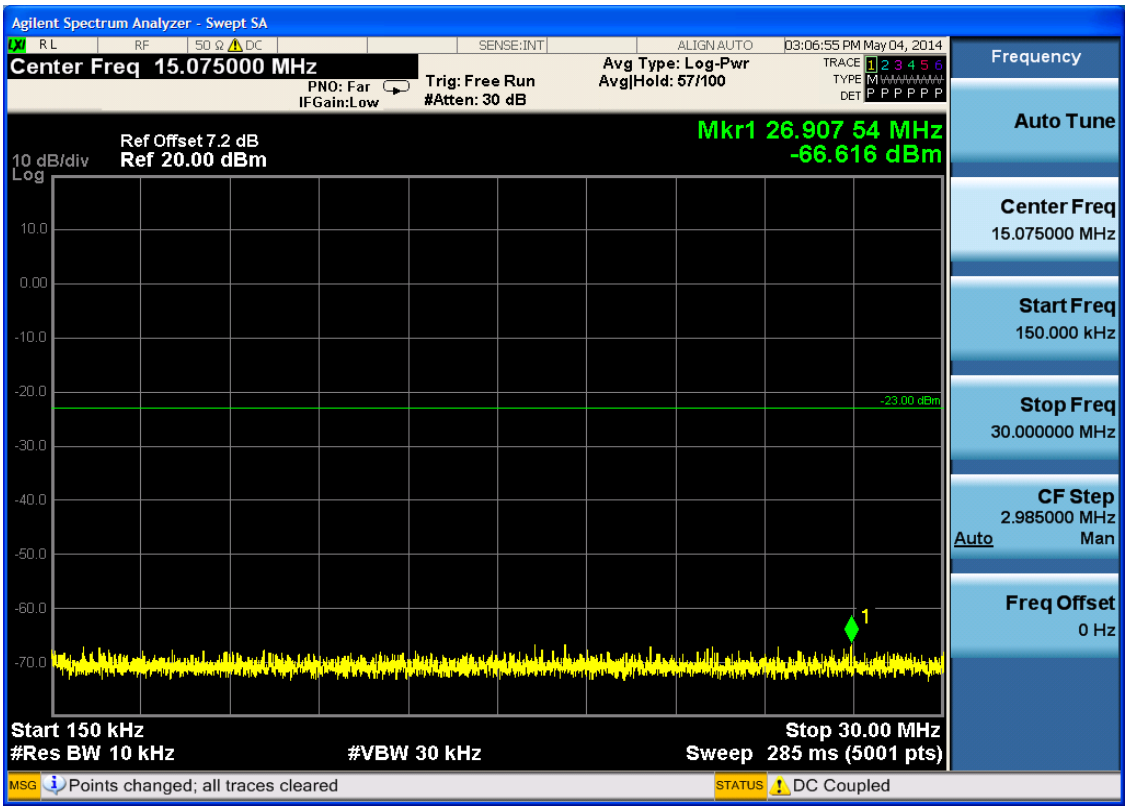

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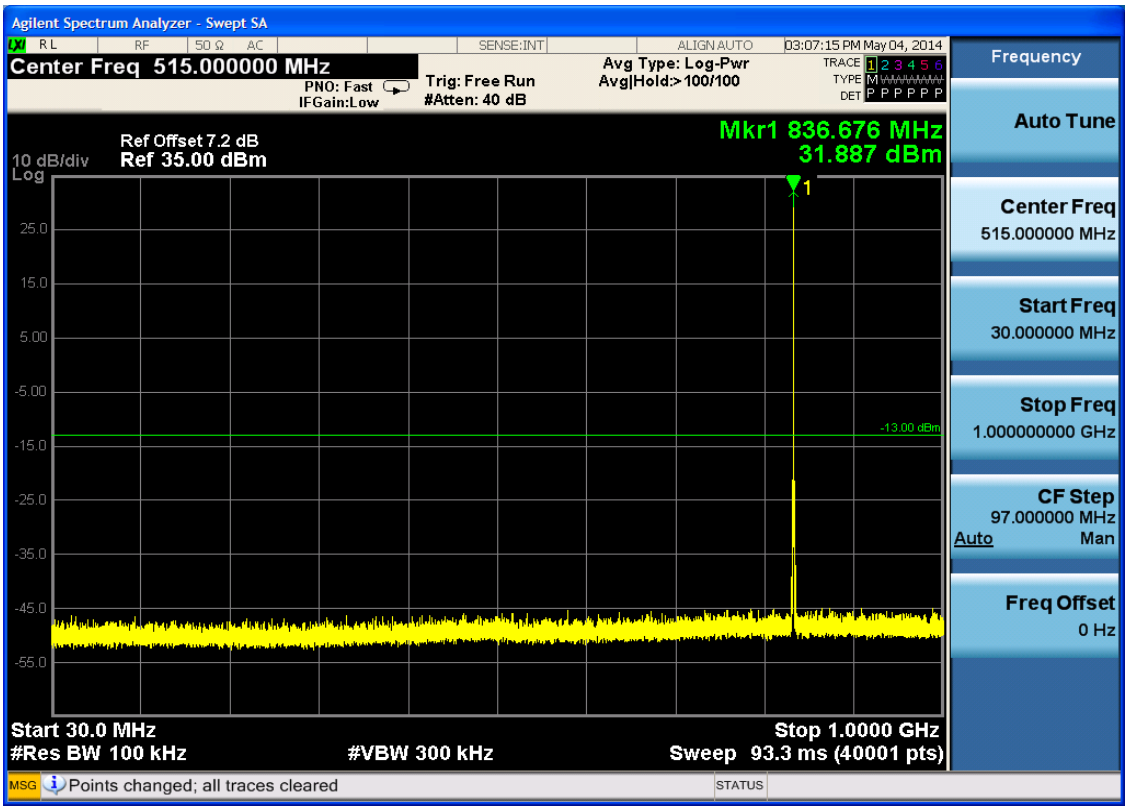

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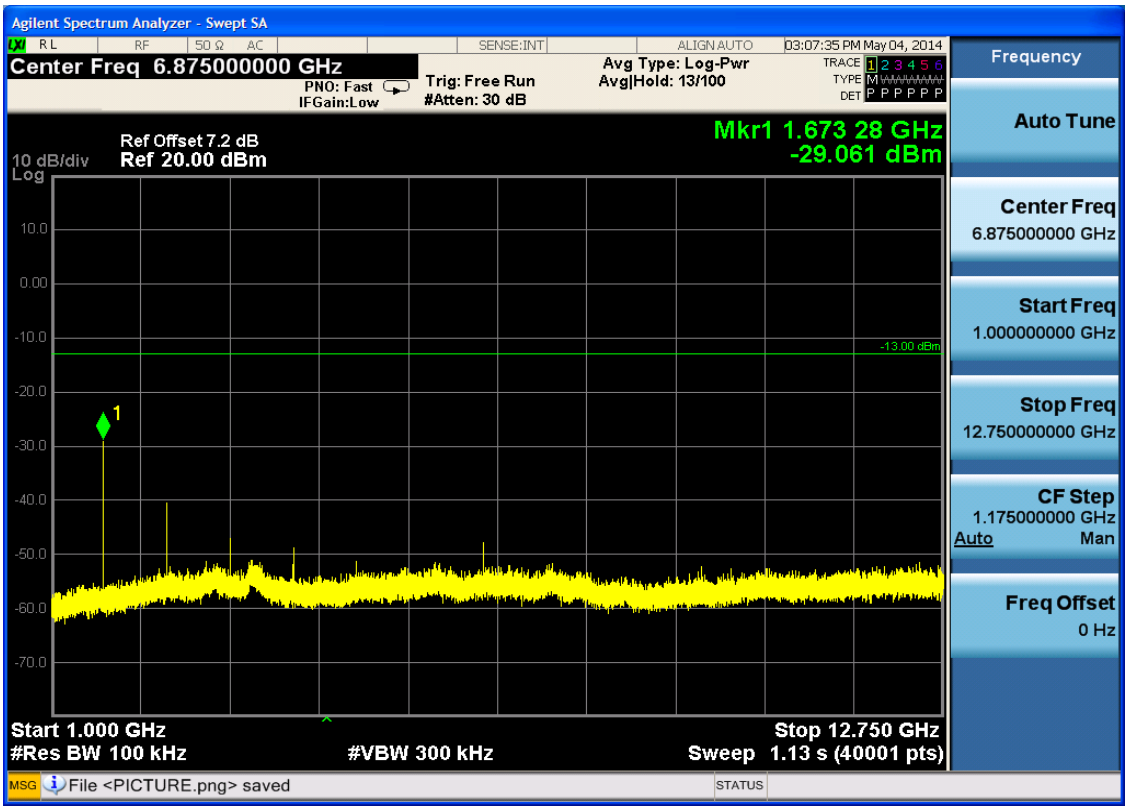

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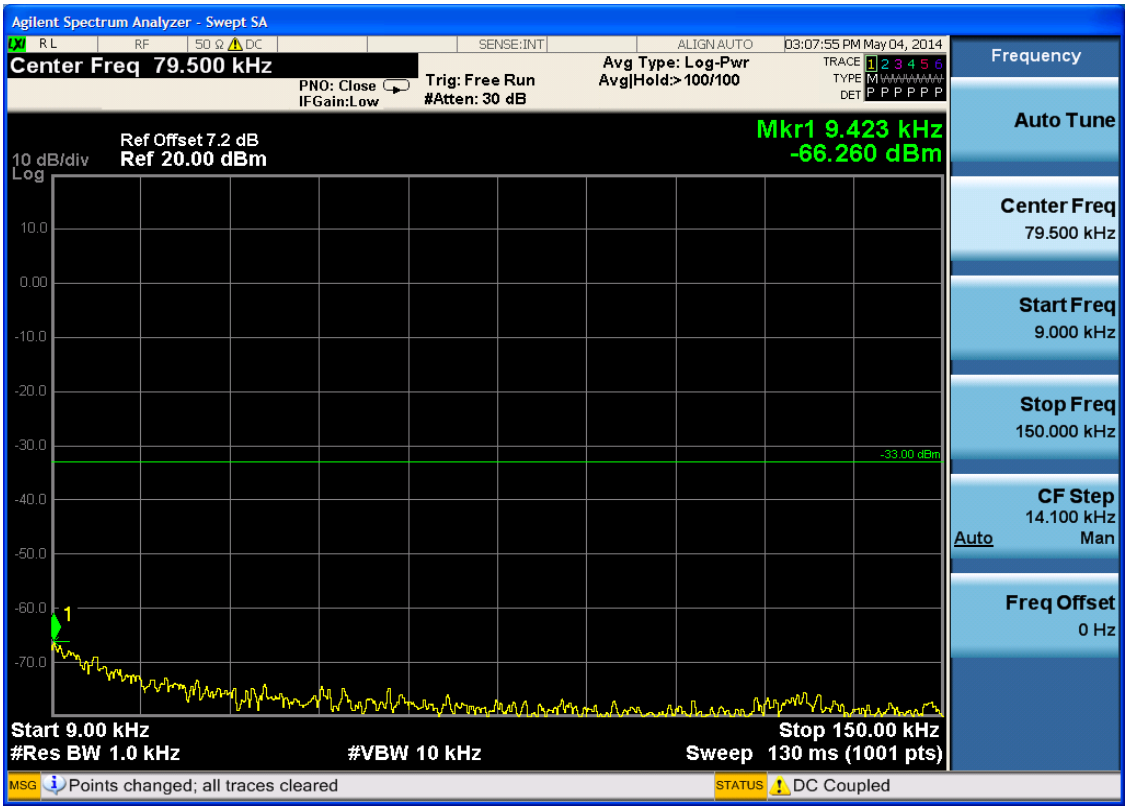
6.1.1.1.3 Test Channel = HCH



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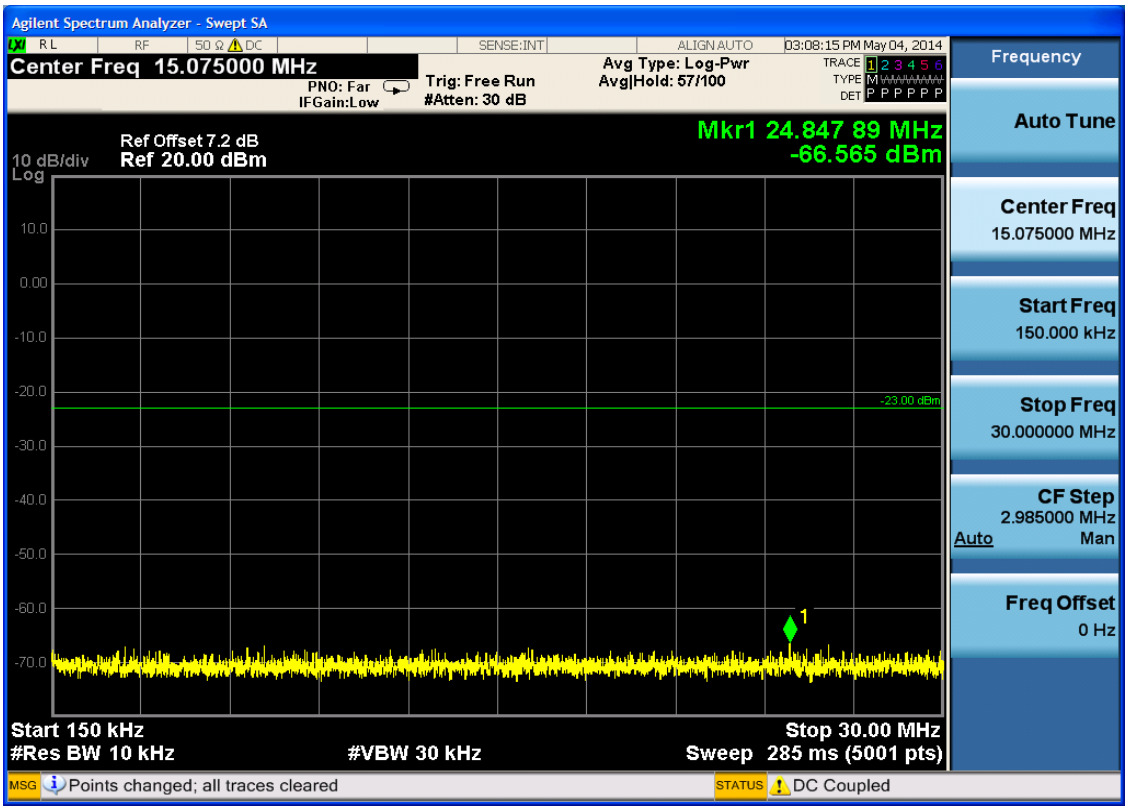

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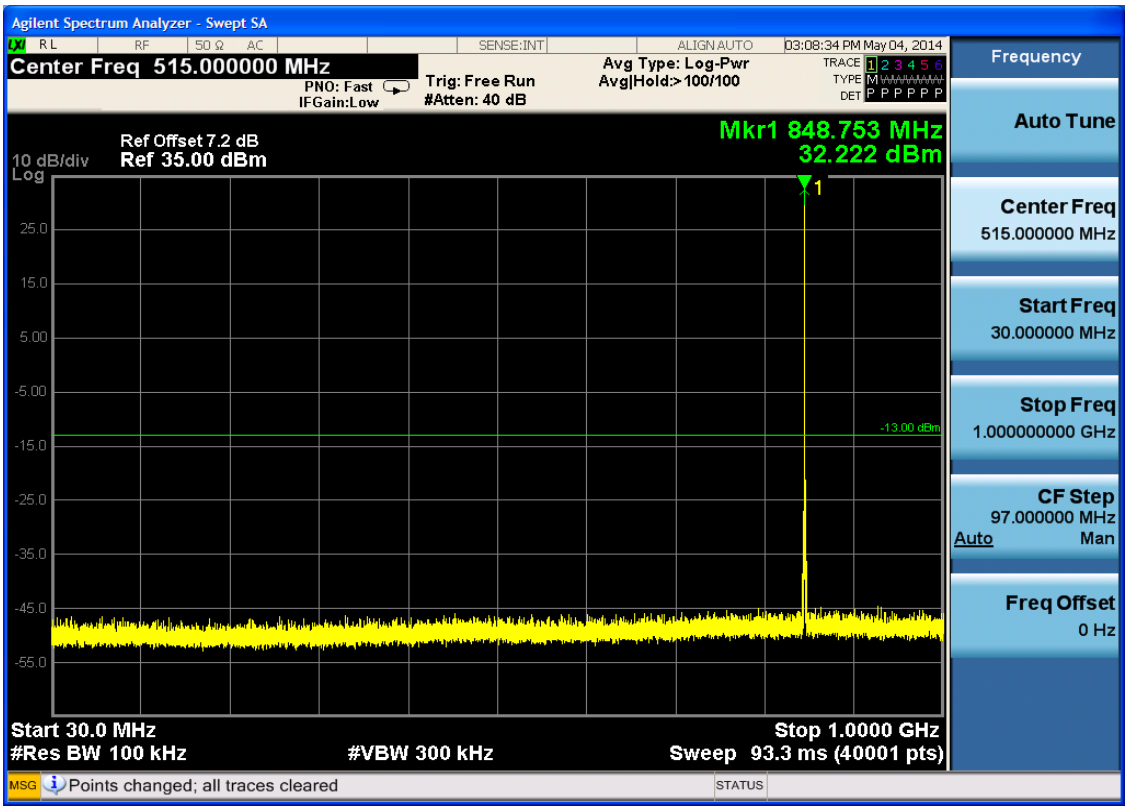

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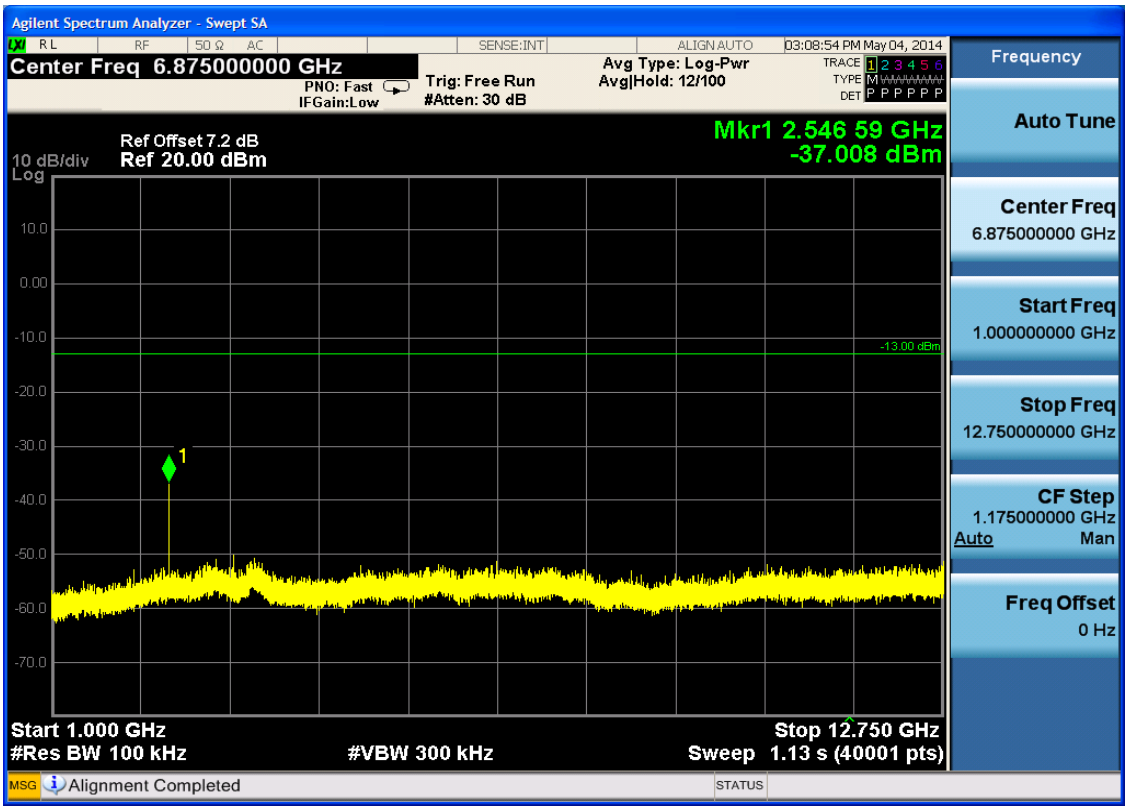

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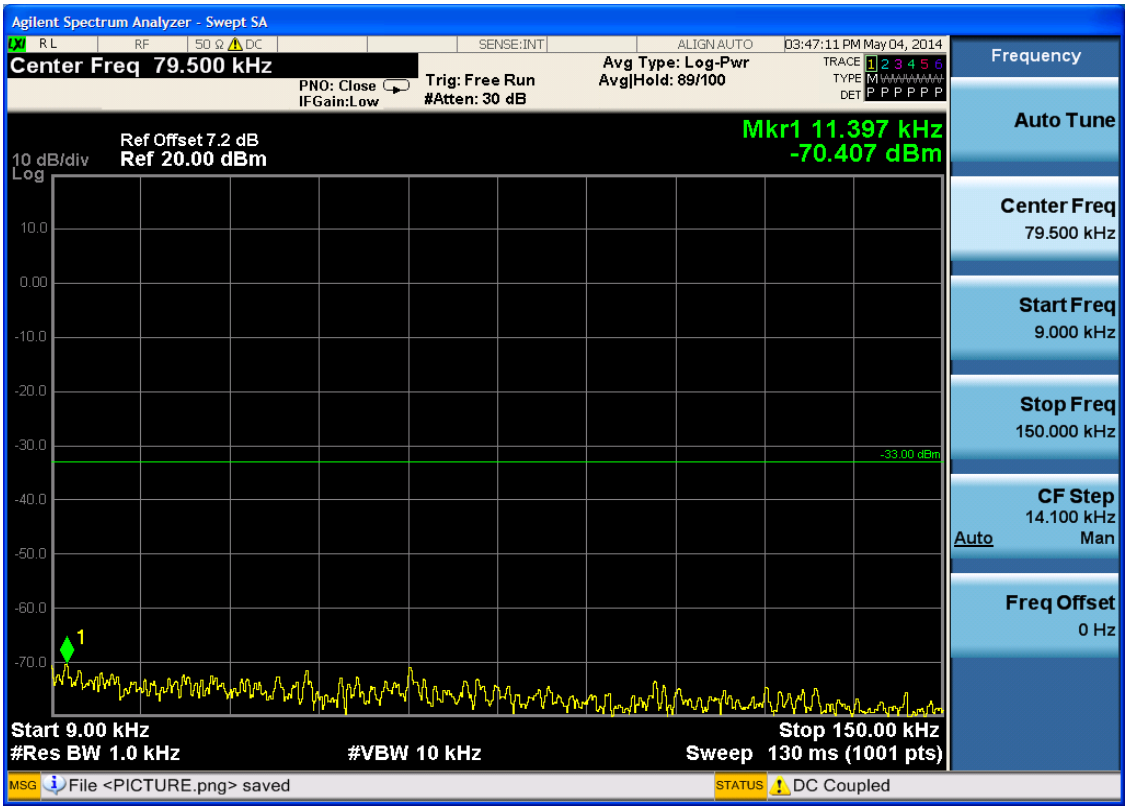
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH



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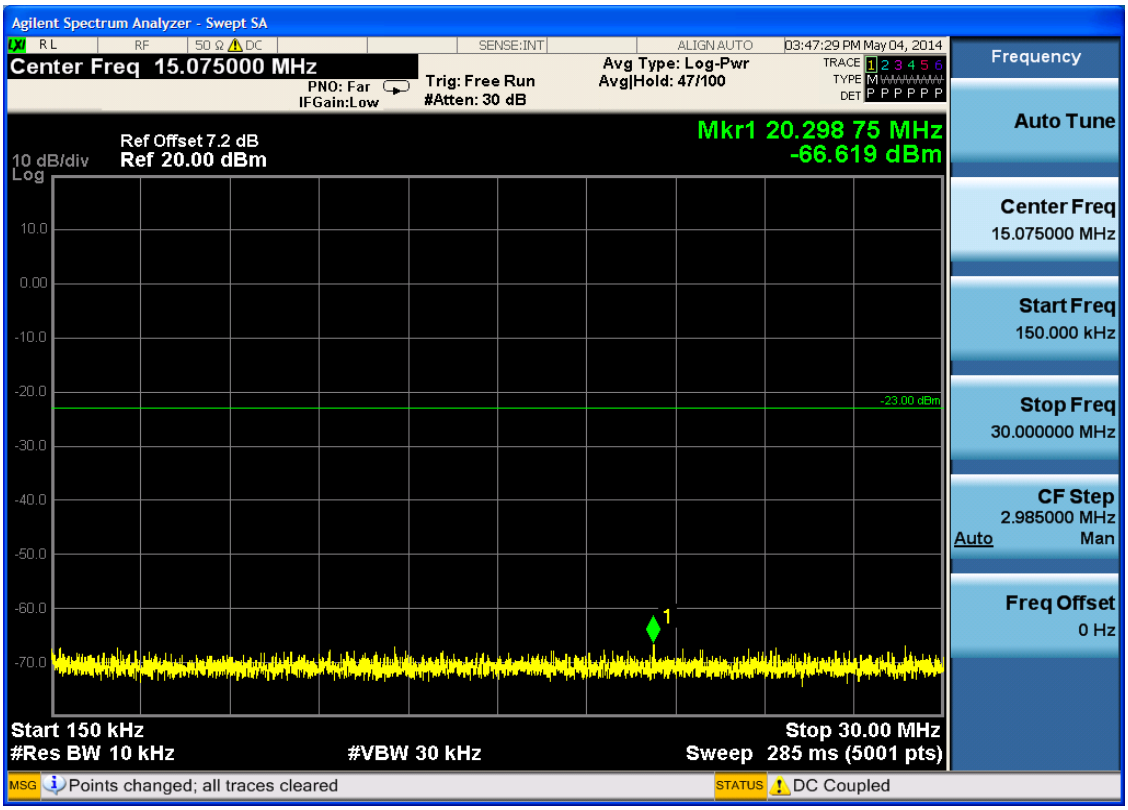

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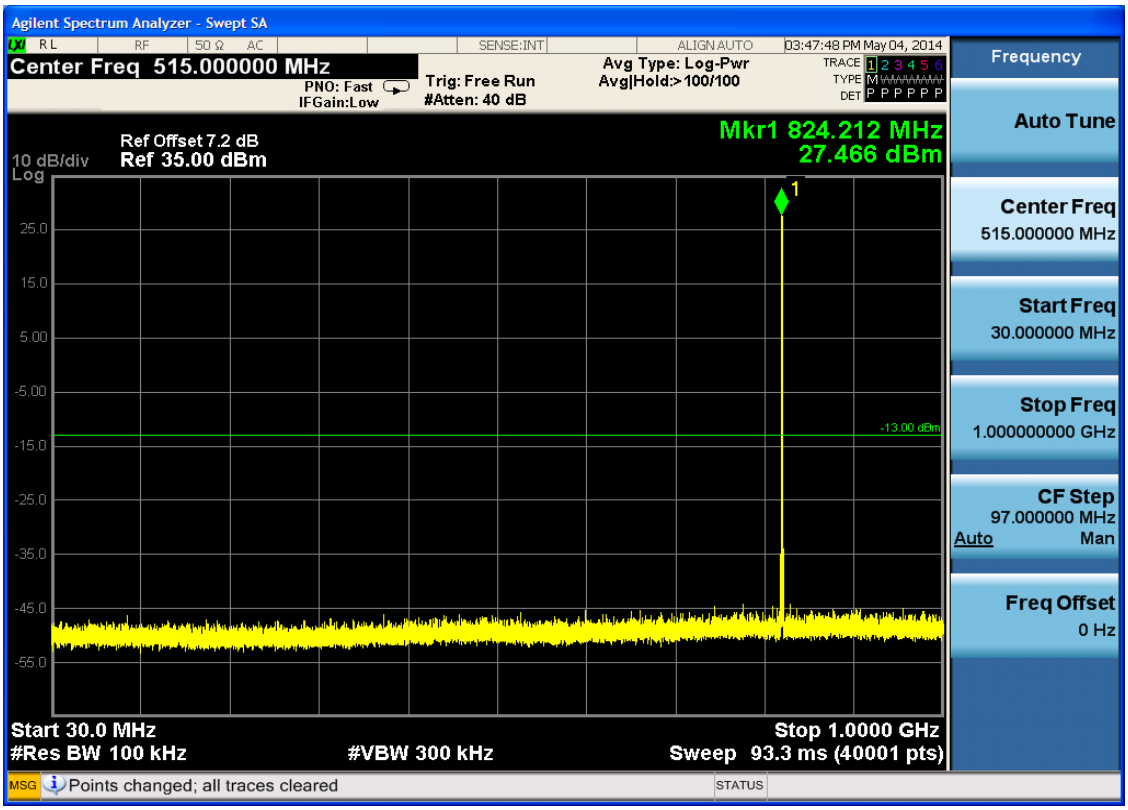

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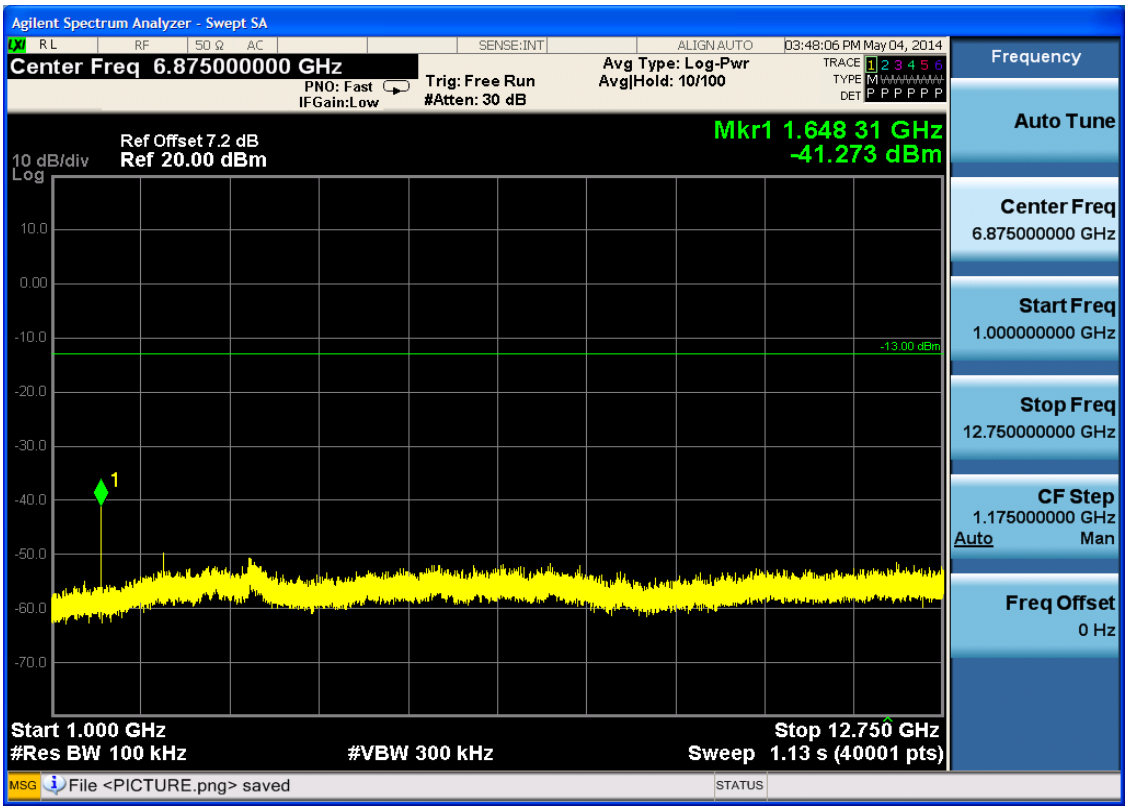

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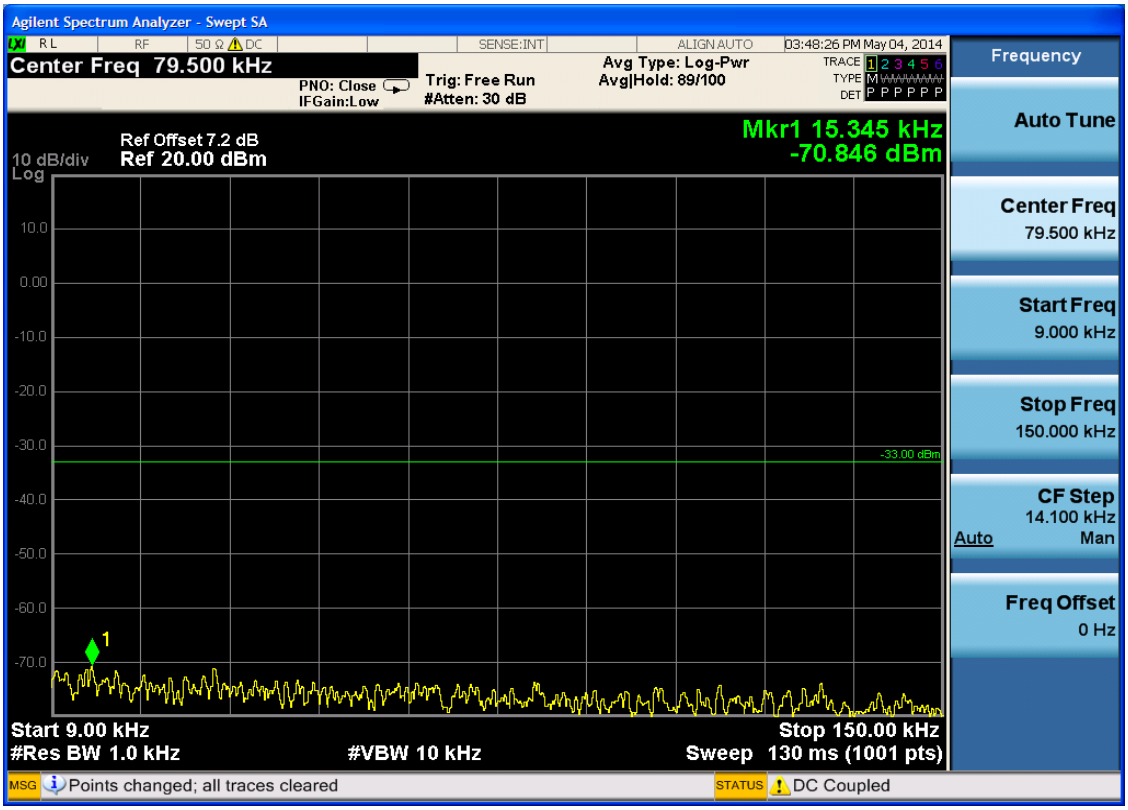
6.1.1.2.2 Test Channel = MCH



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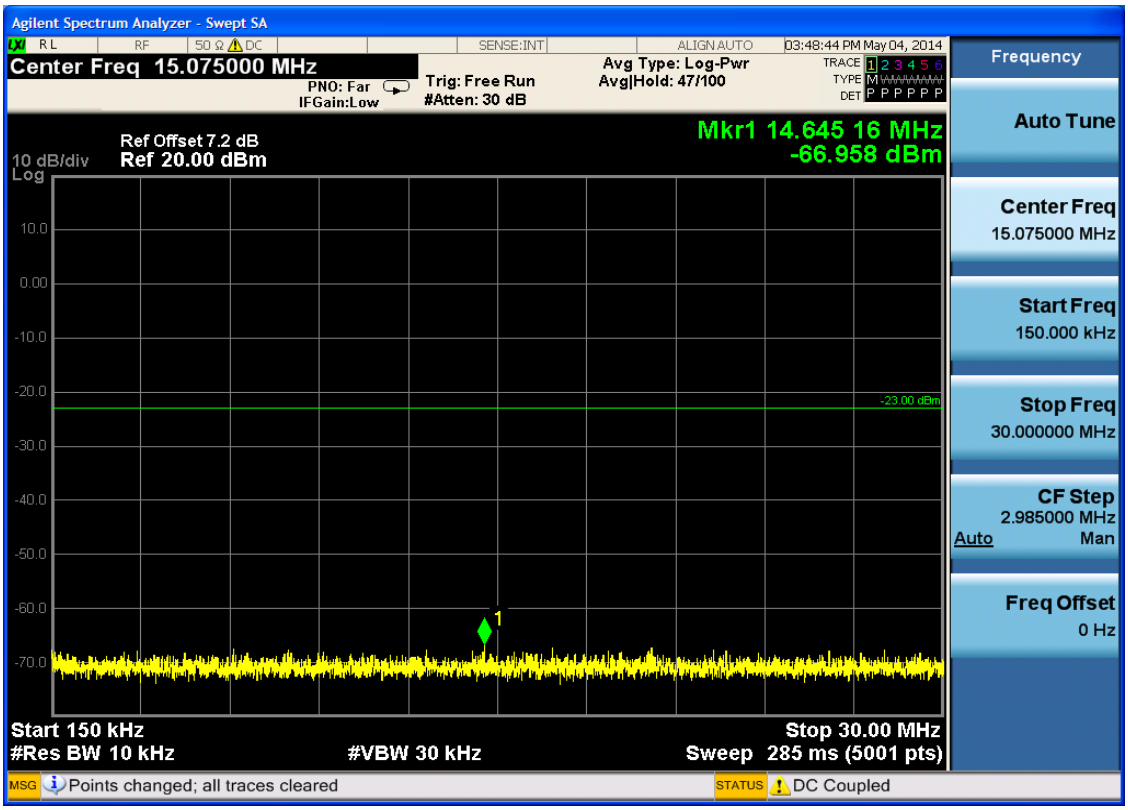

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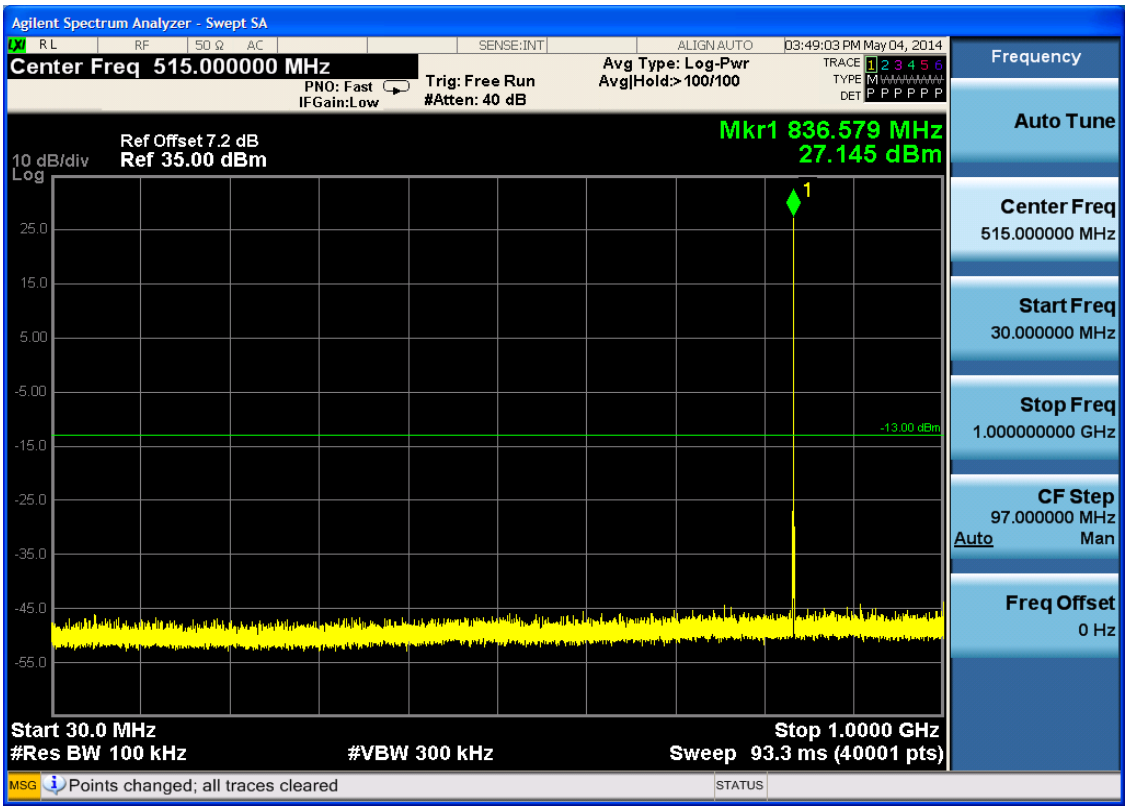

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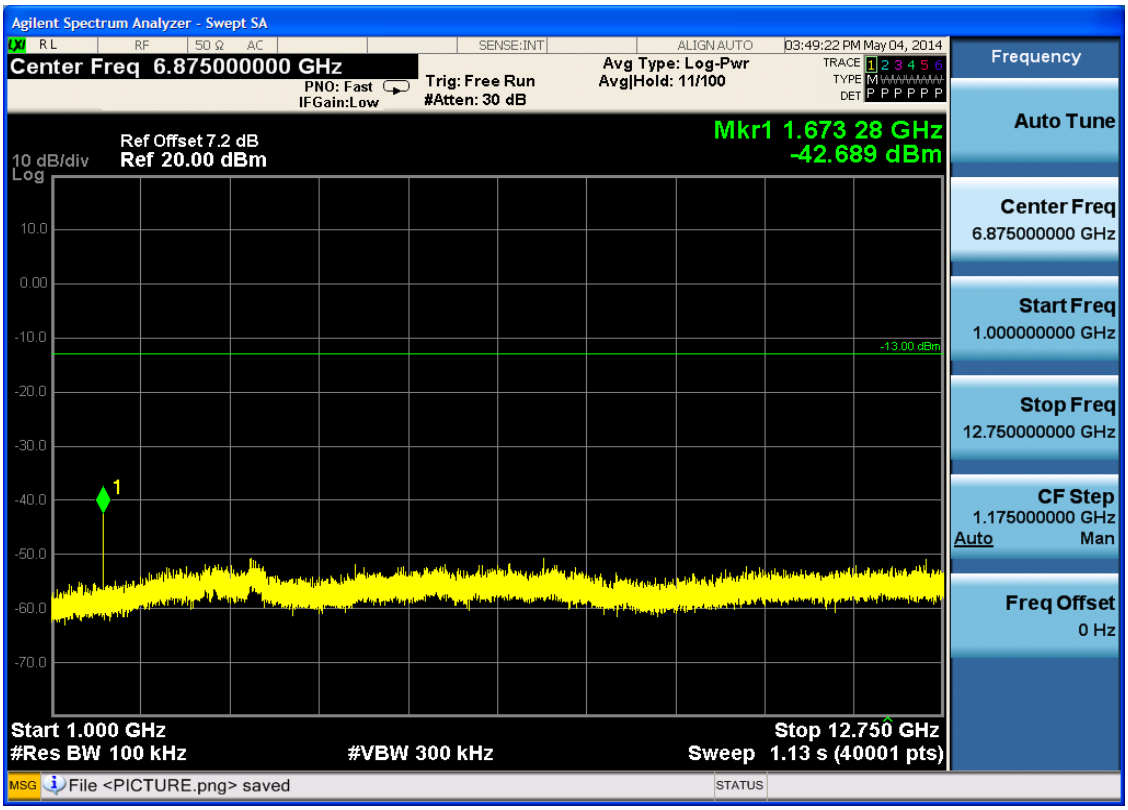

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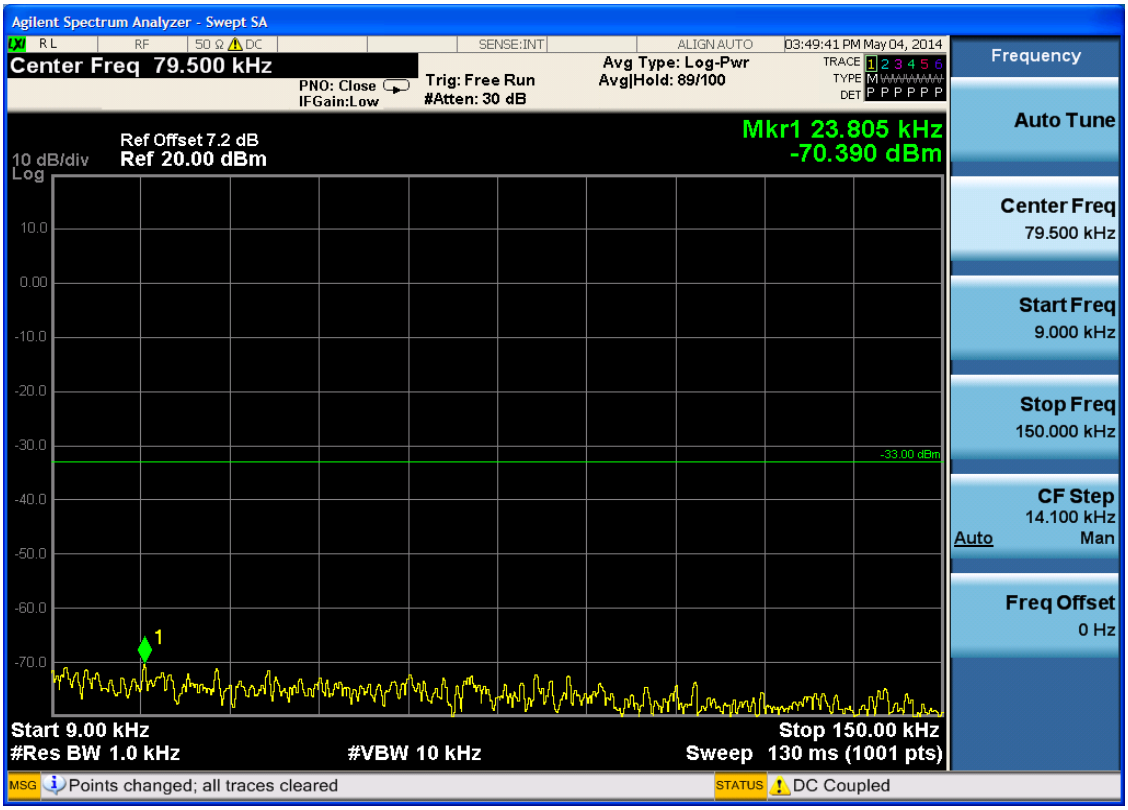
6.1.1.2.3 Test Channel = HCH



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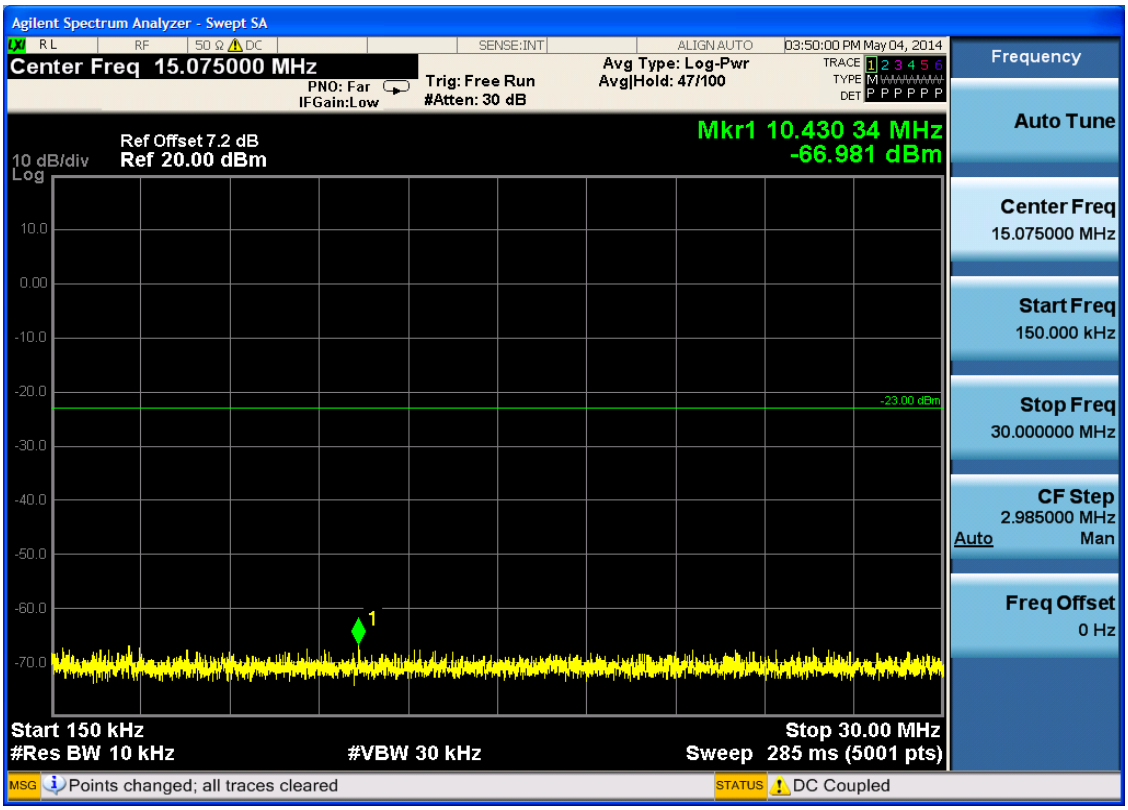

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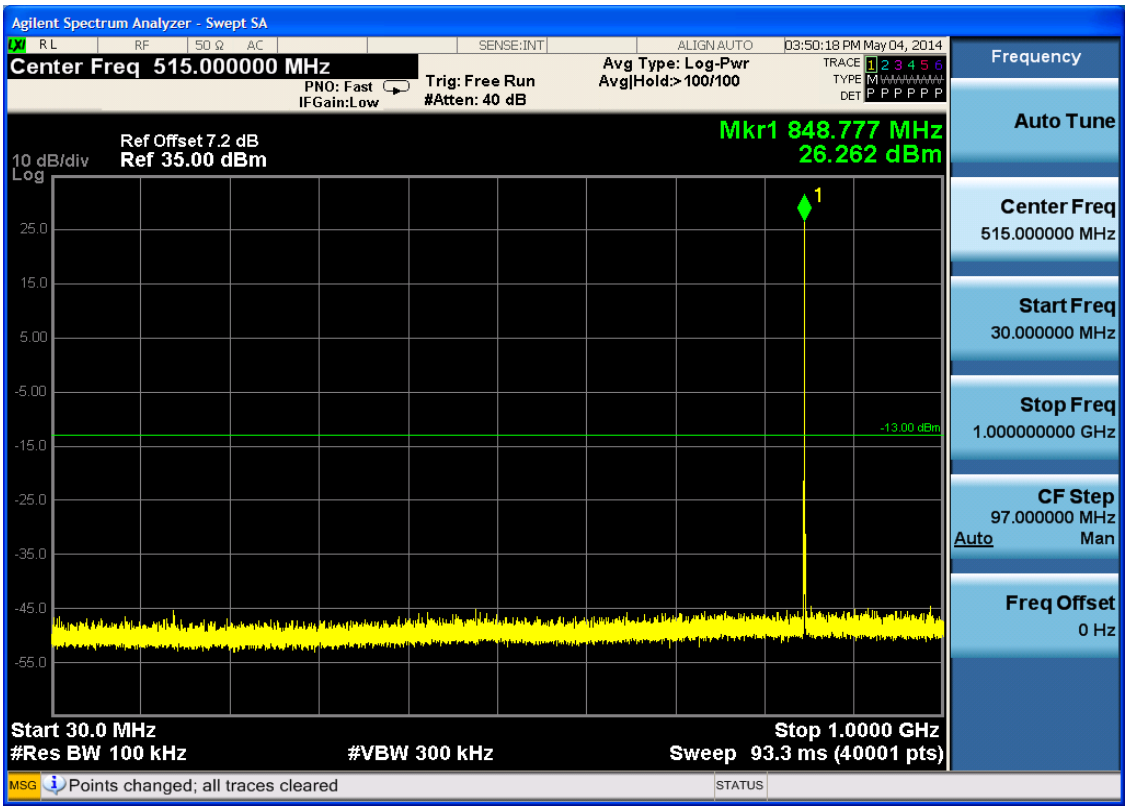

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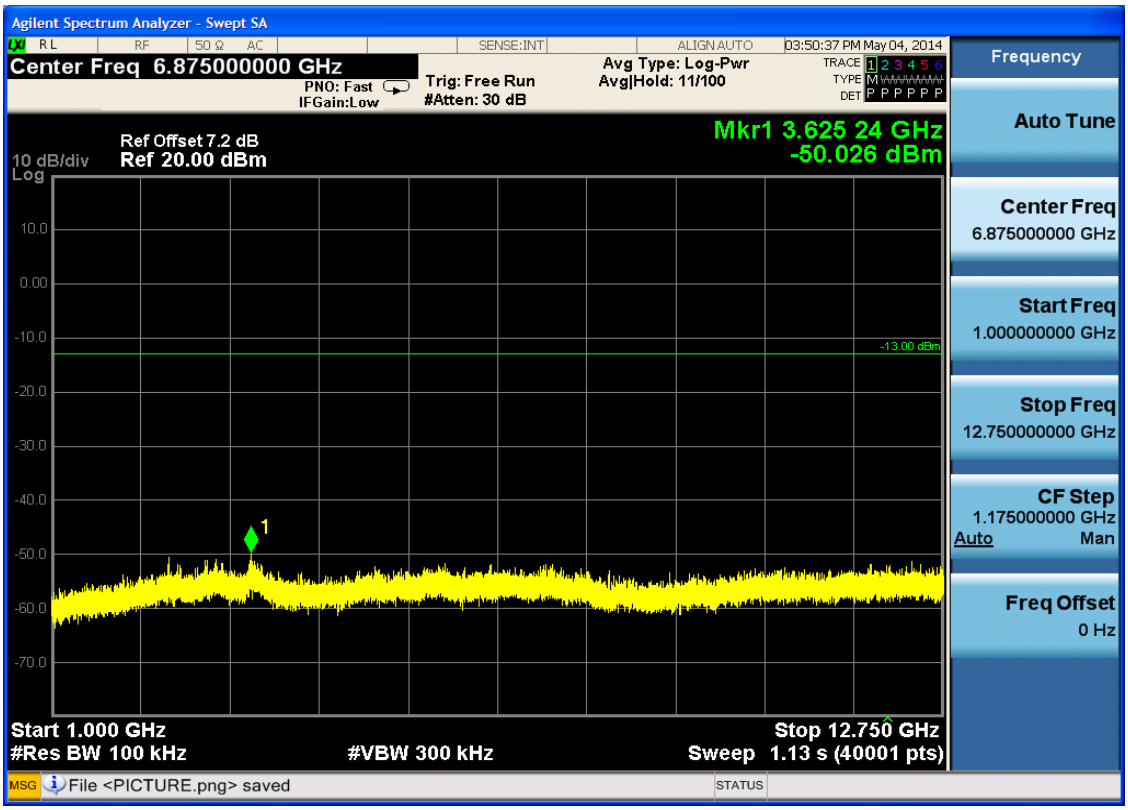

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6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH

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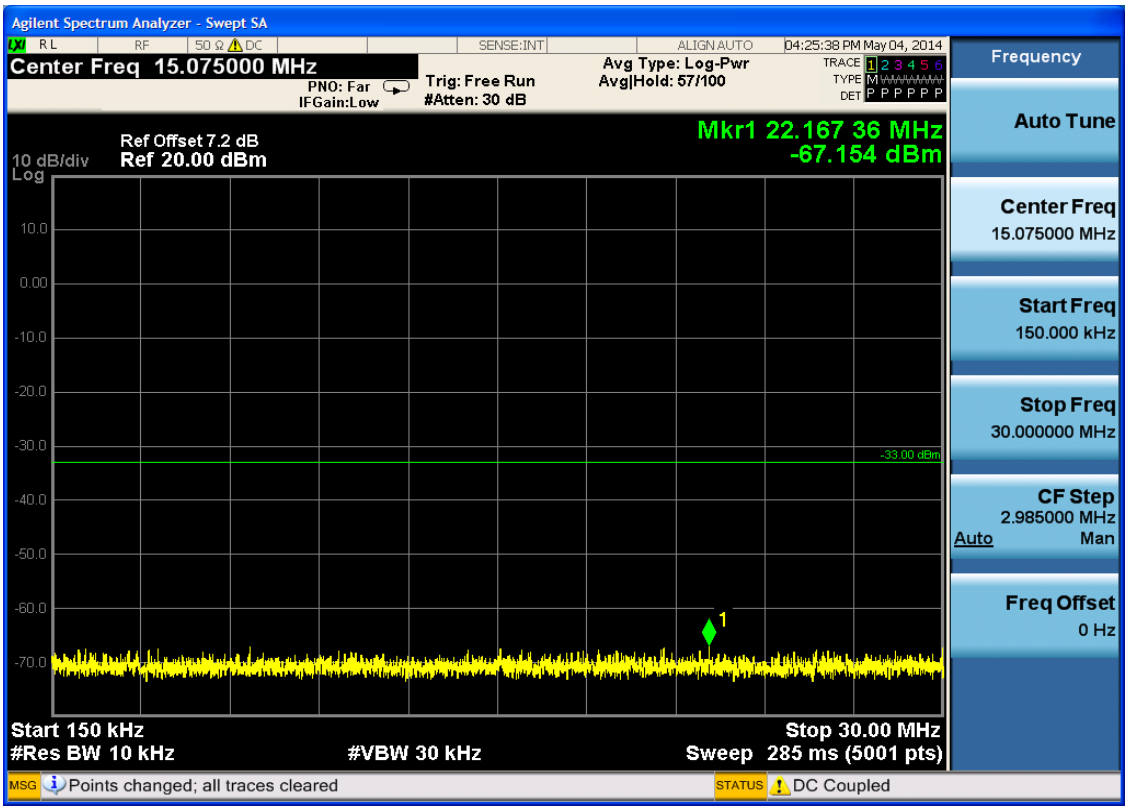

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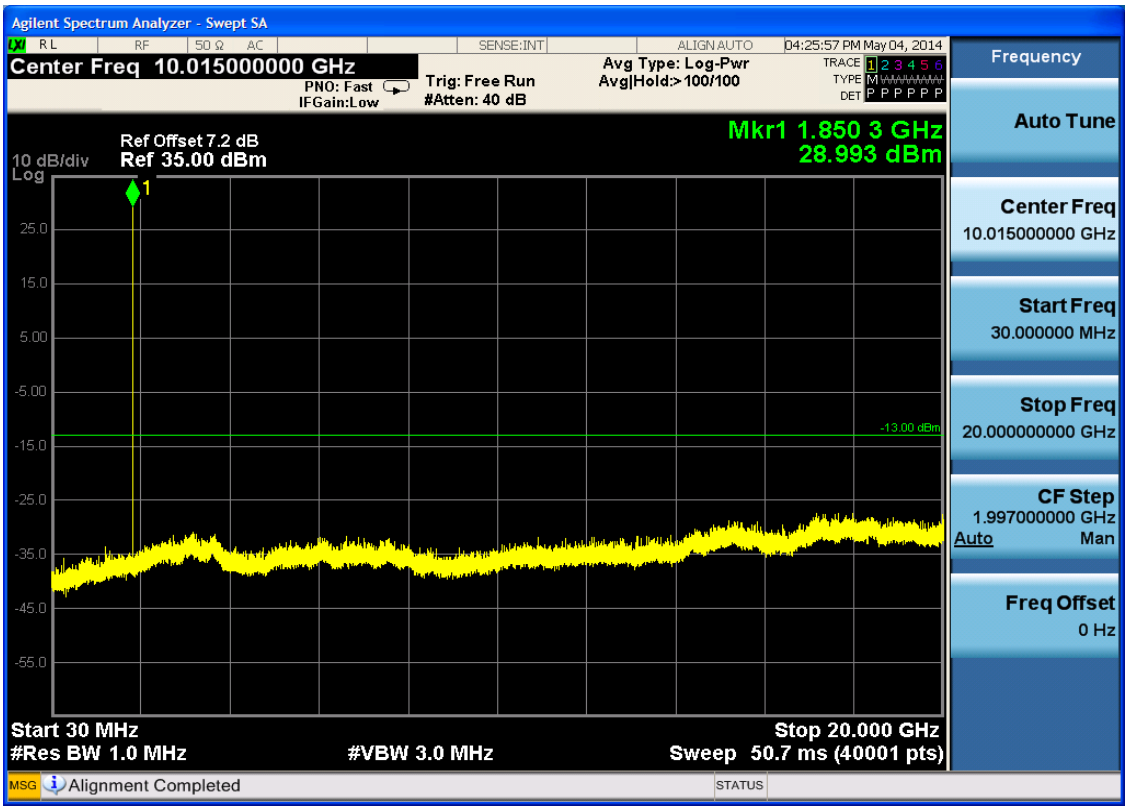

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6.1.2.1.2 Test Channel = MCH

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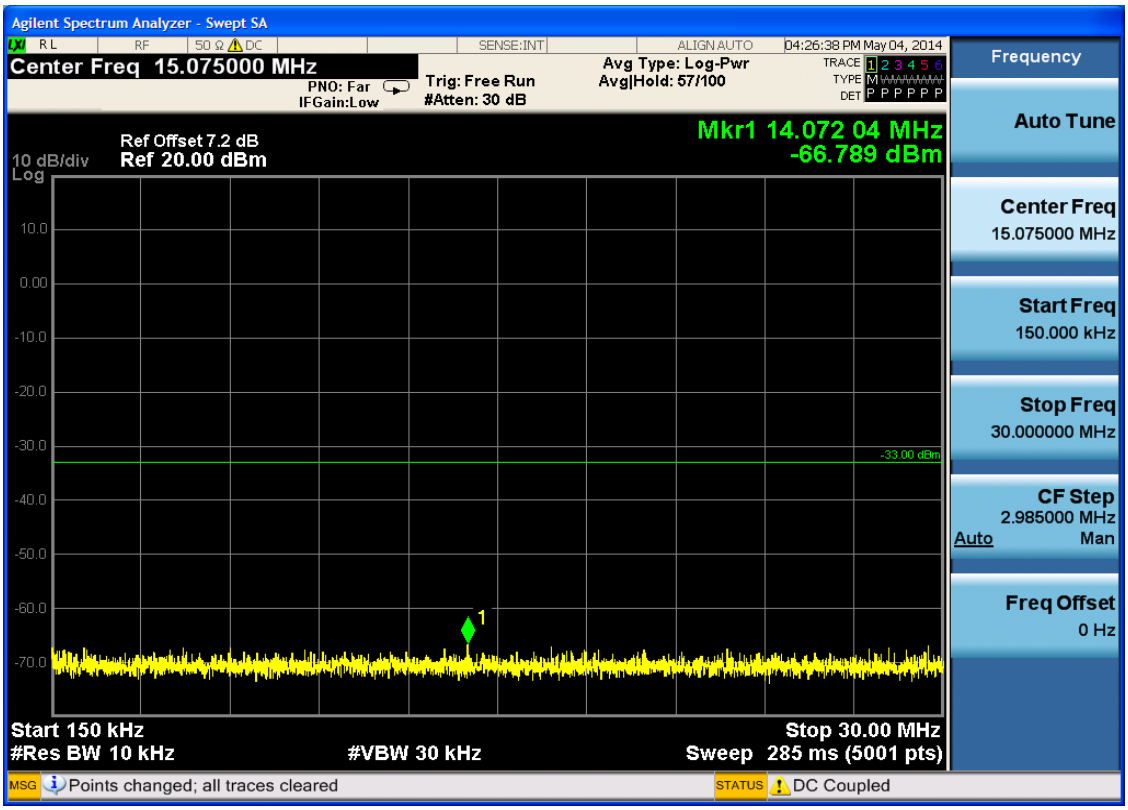

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6.1.2.1.3 Test Channel = HCH

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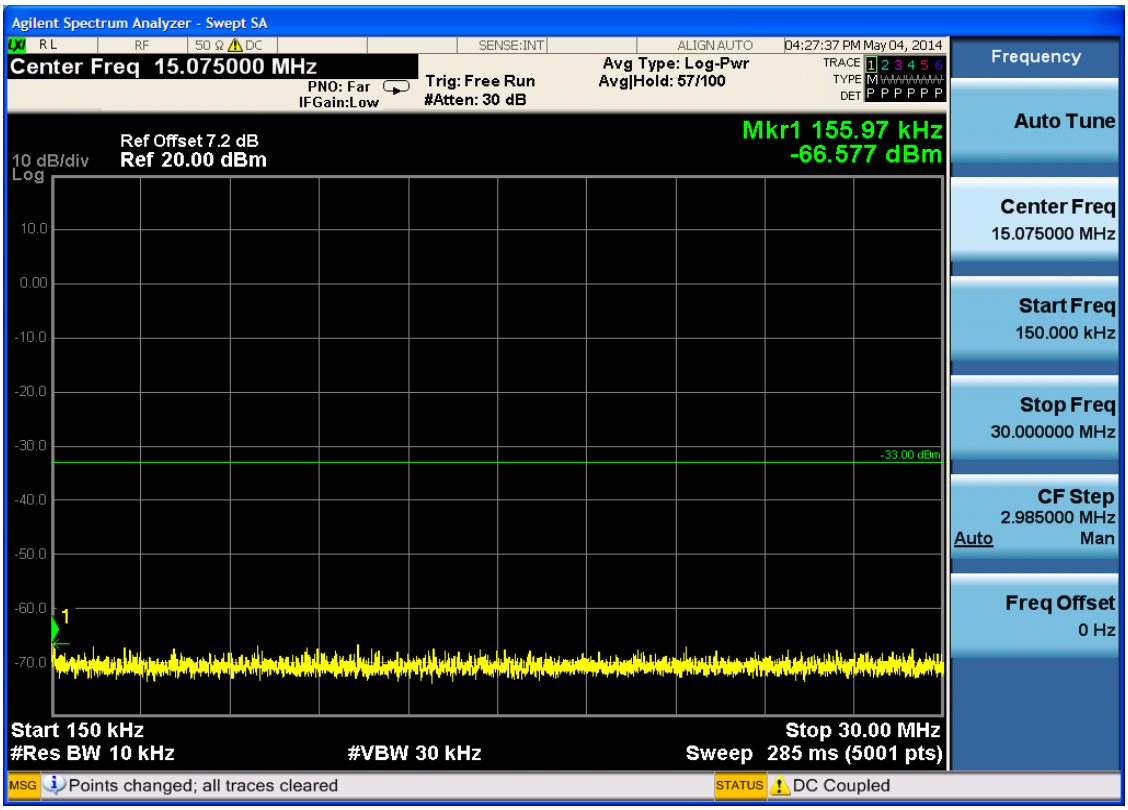

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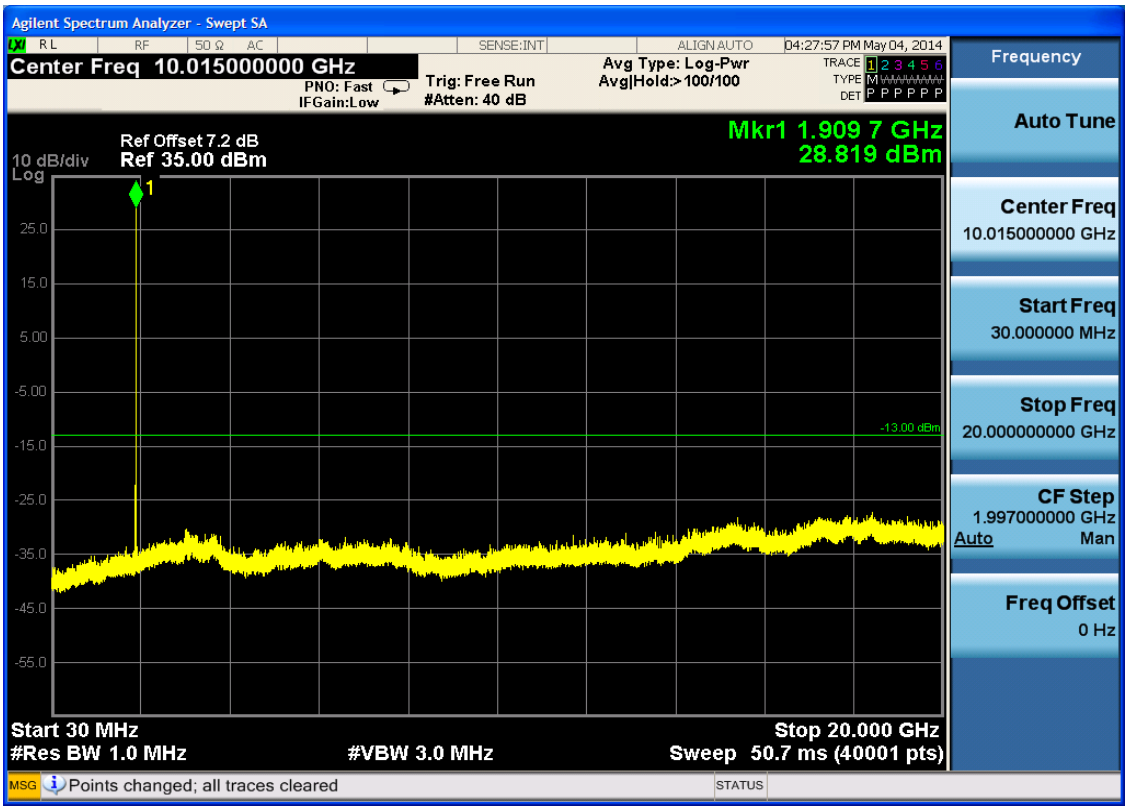

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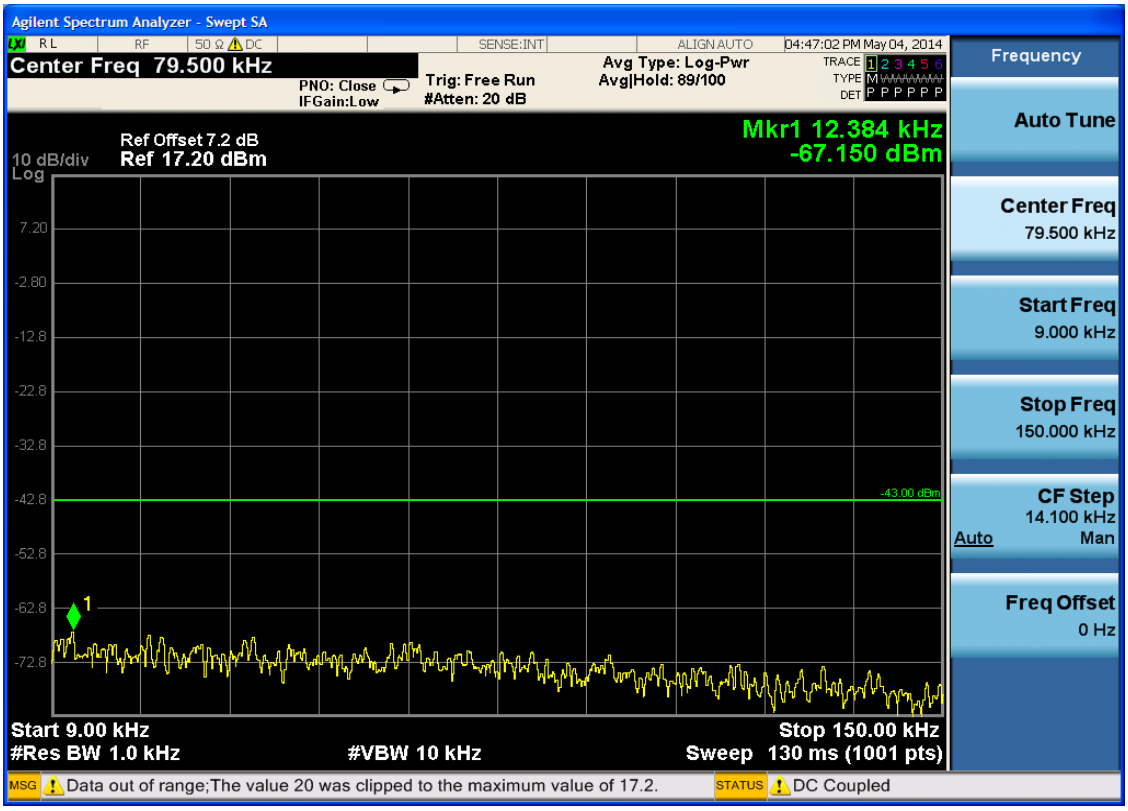
6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH



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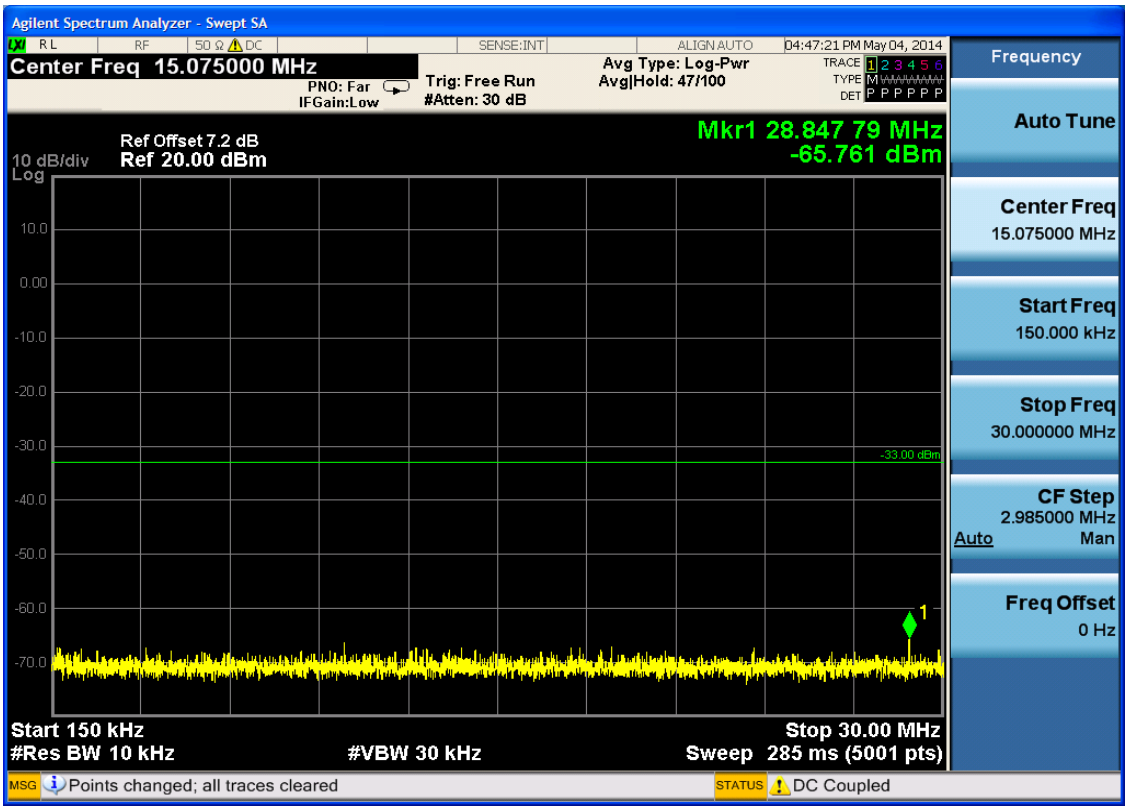

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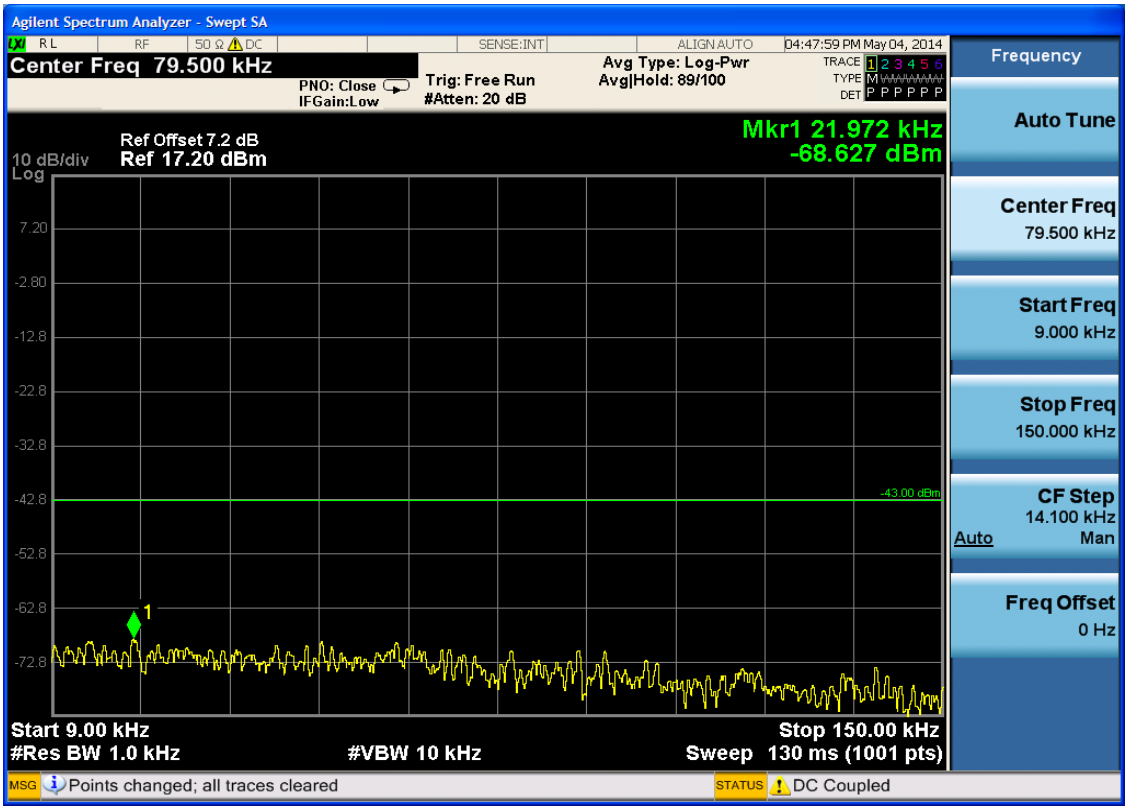
6.1.2.2.2 Test Channel = MCH



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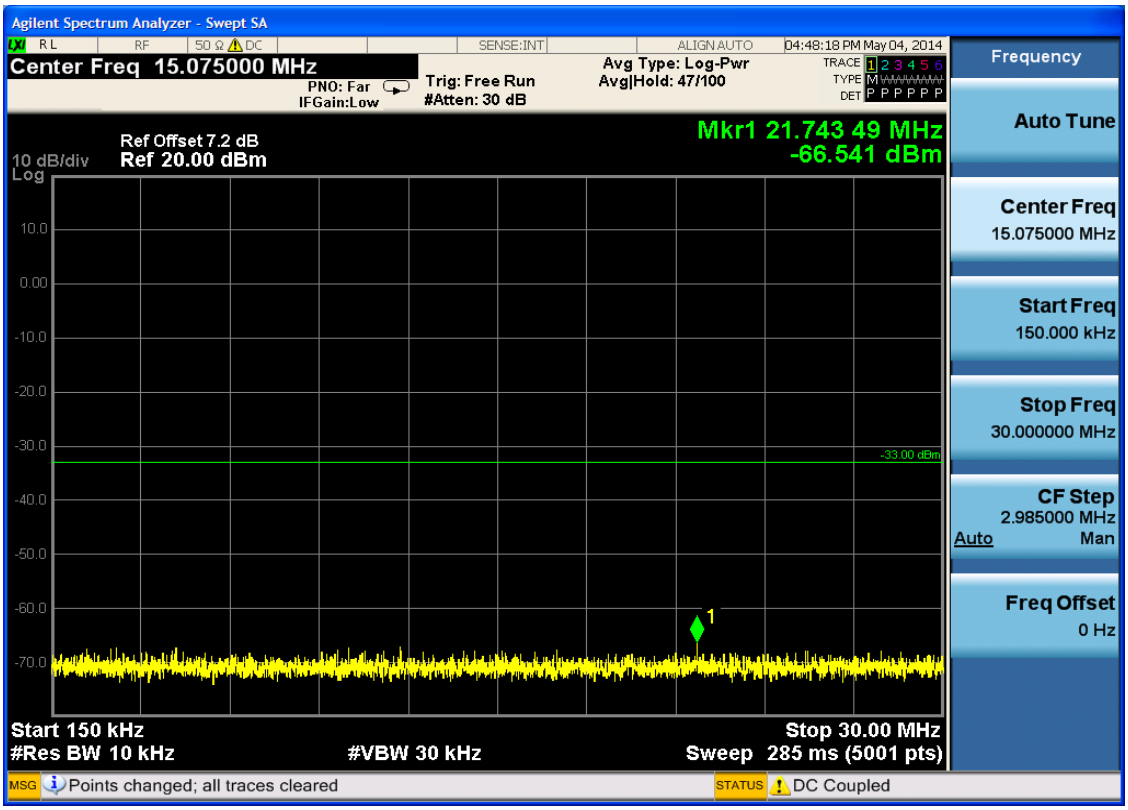

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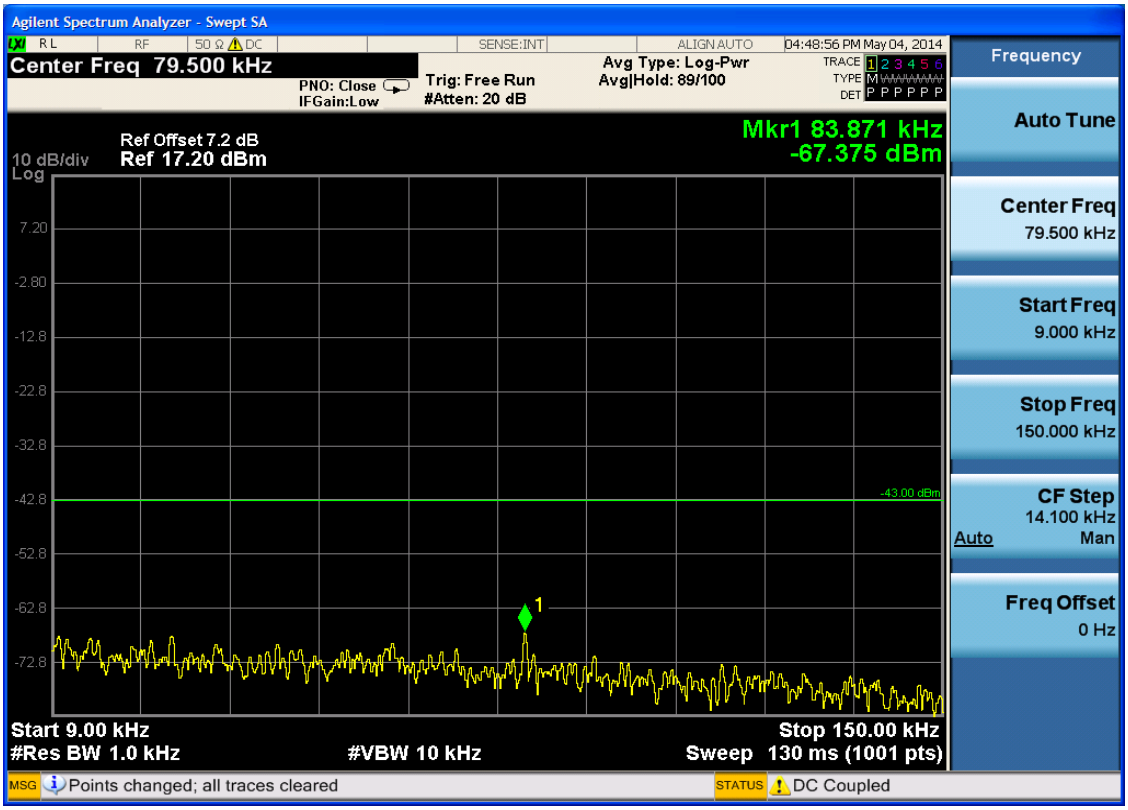
6.1.2.2.3 Test Channel = HCH



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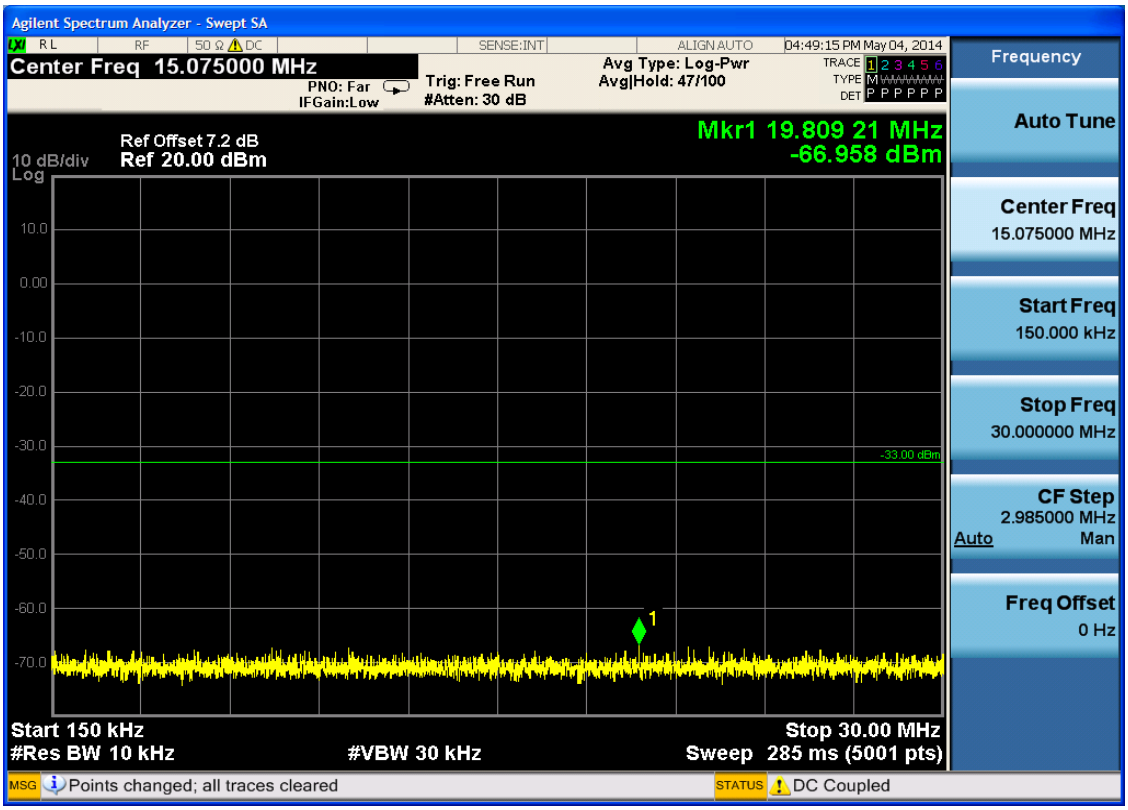

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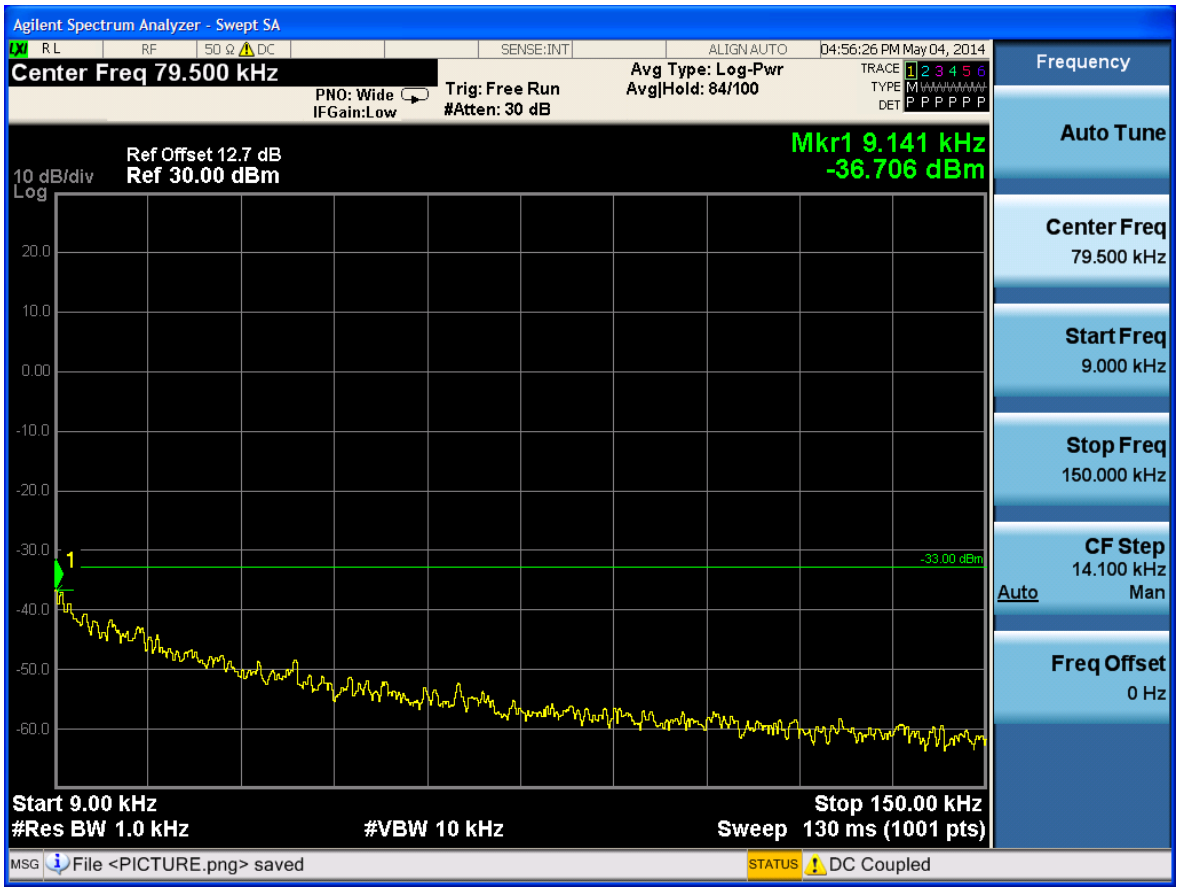
6.2 For UMTS

6.2.1 Test Band = WCDMA850

6.2.1.1 Test Mode = UMTS/TM1

6.2.1.1.1 Test Channel = LCH



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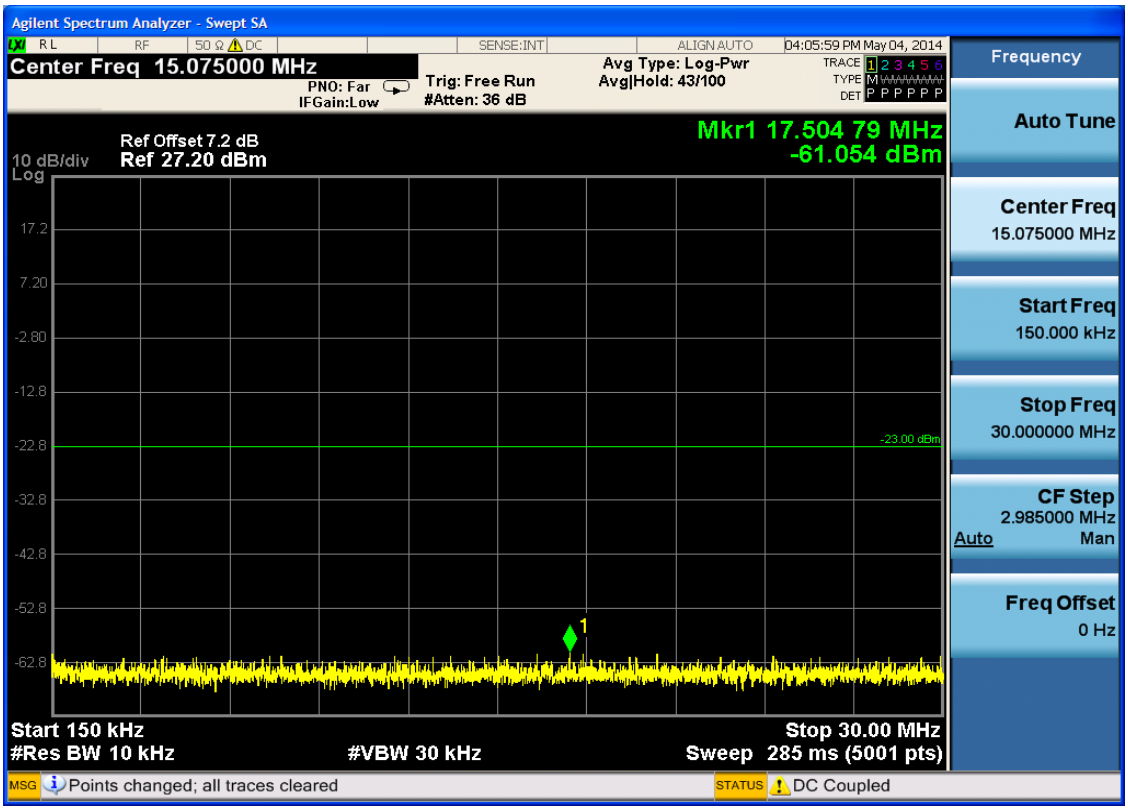

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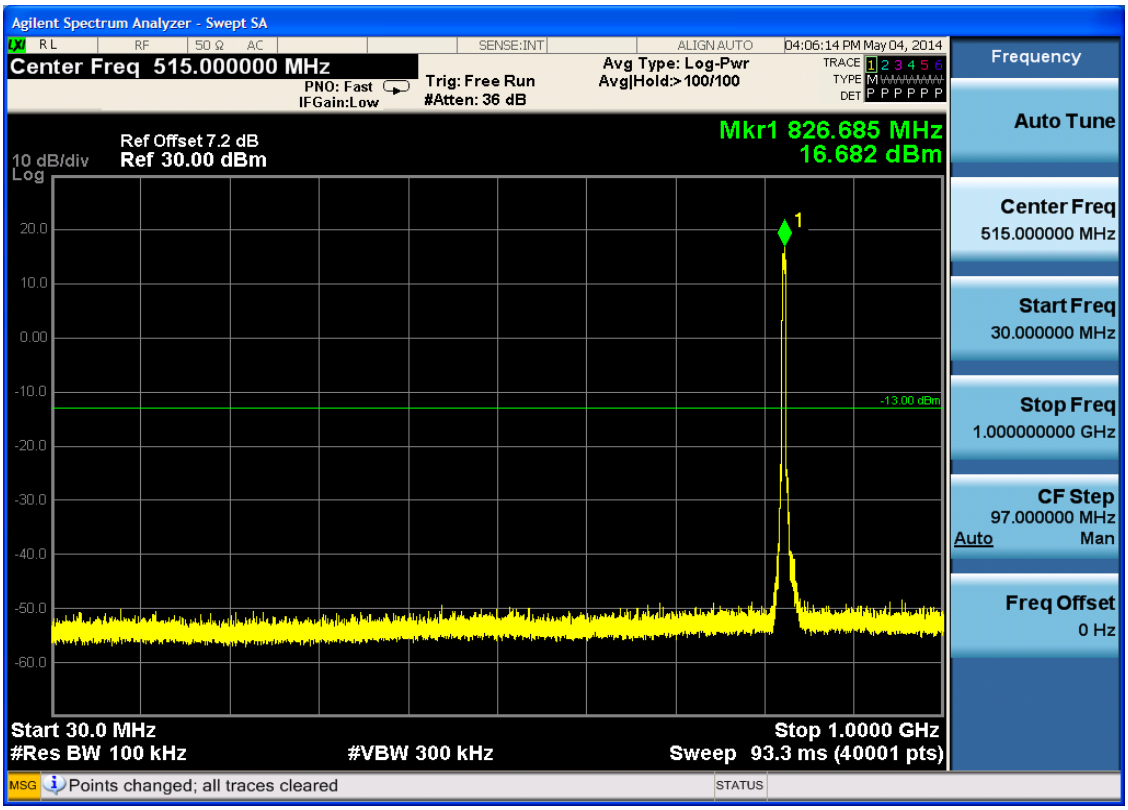

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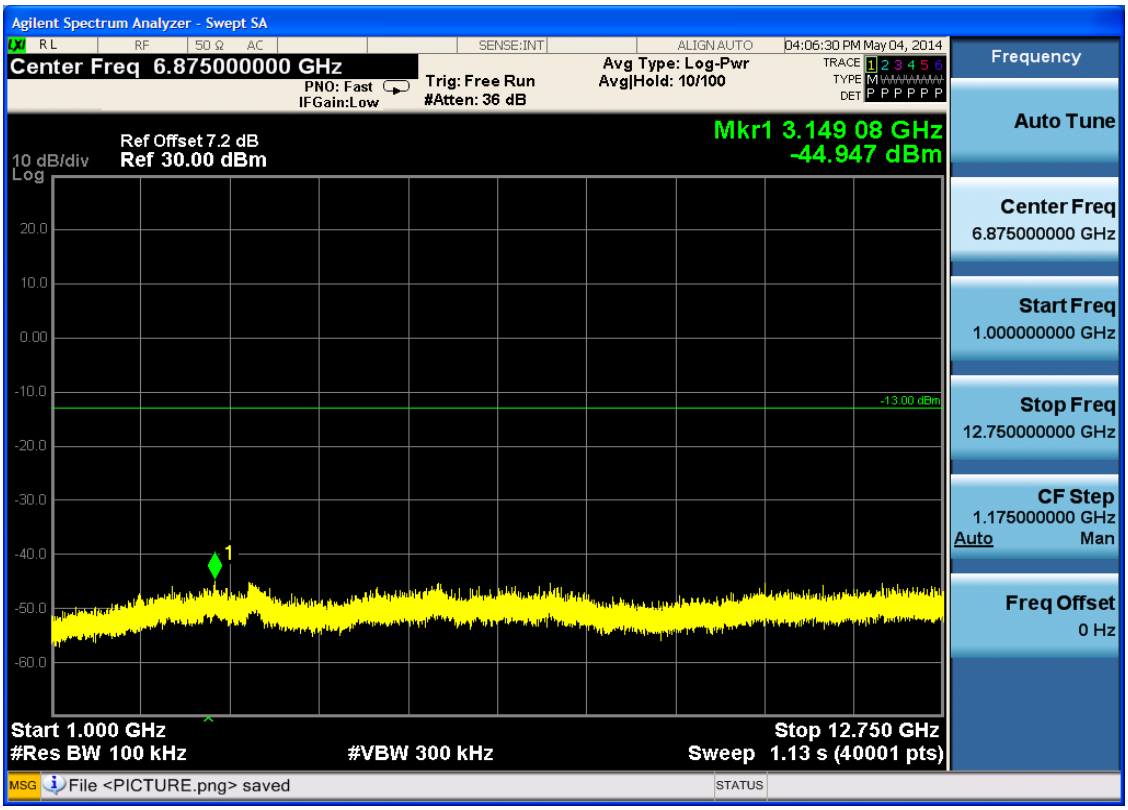

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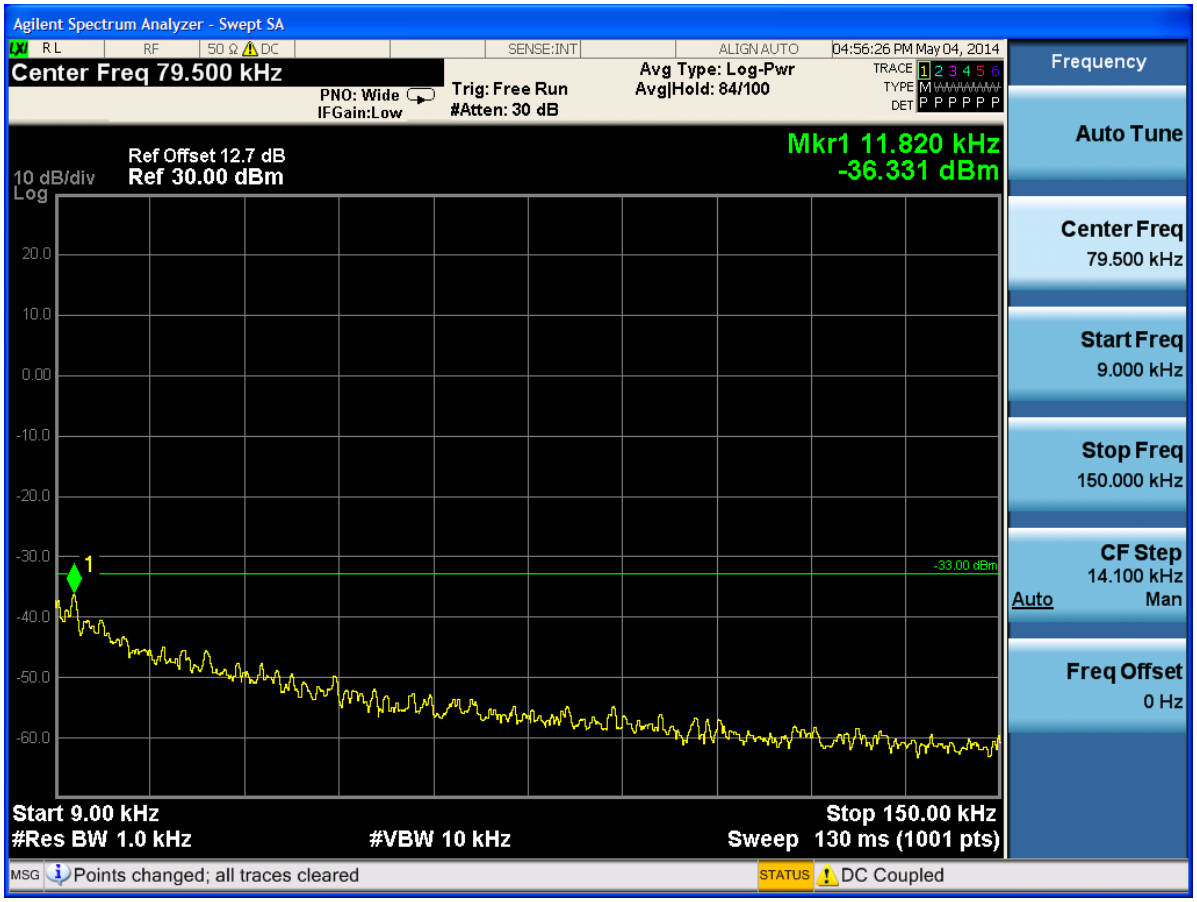
6.2.1.1.2 Test Channel = MCH



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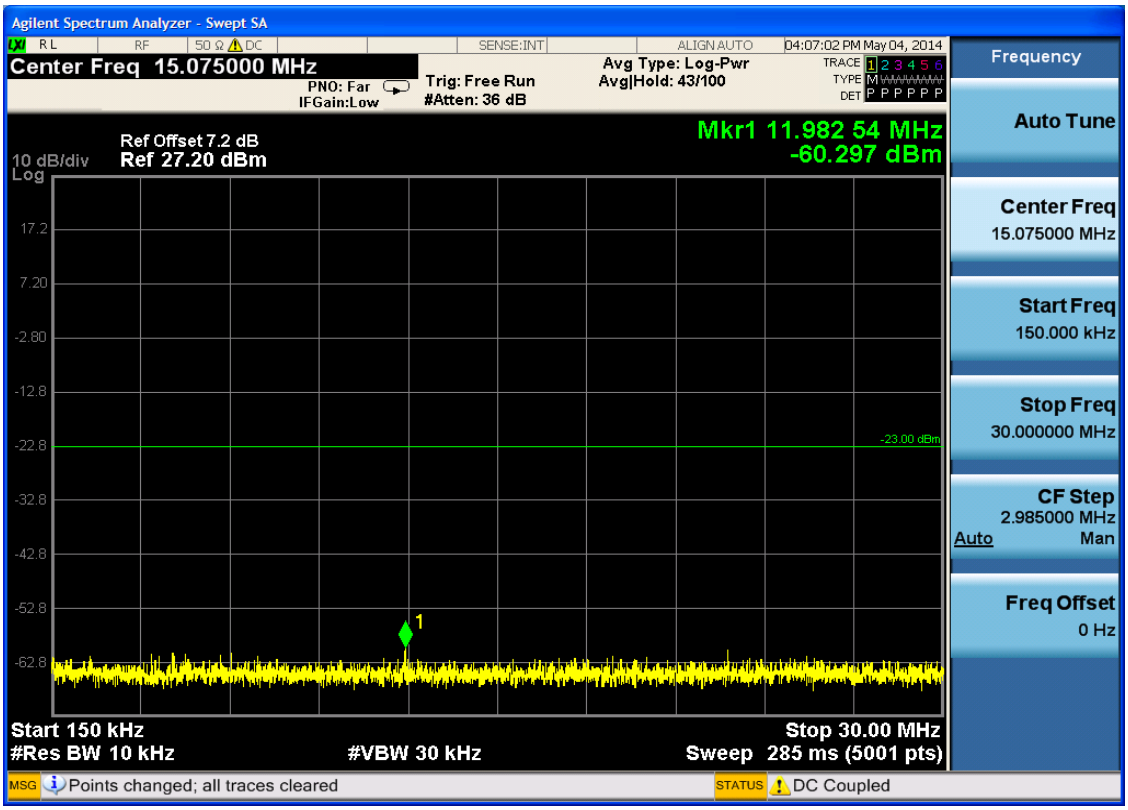

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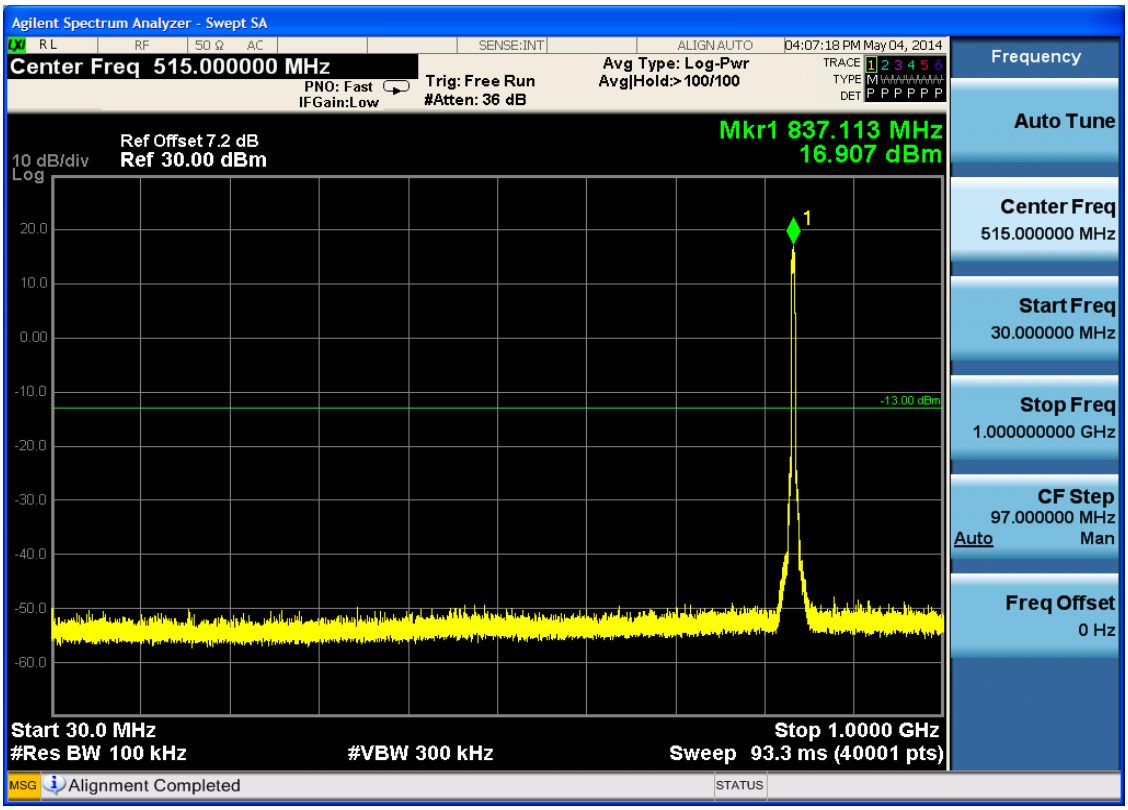

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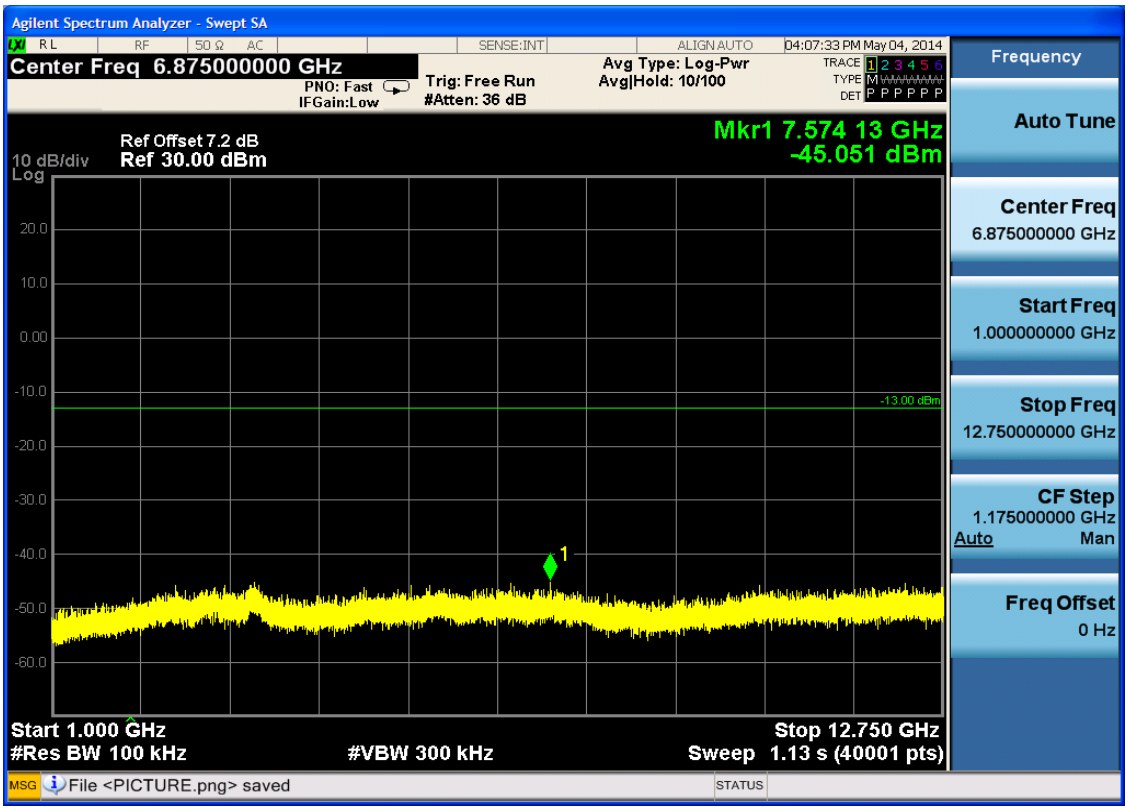

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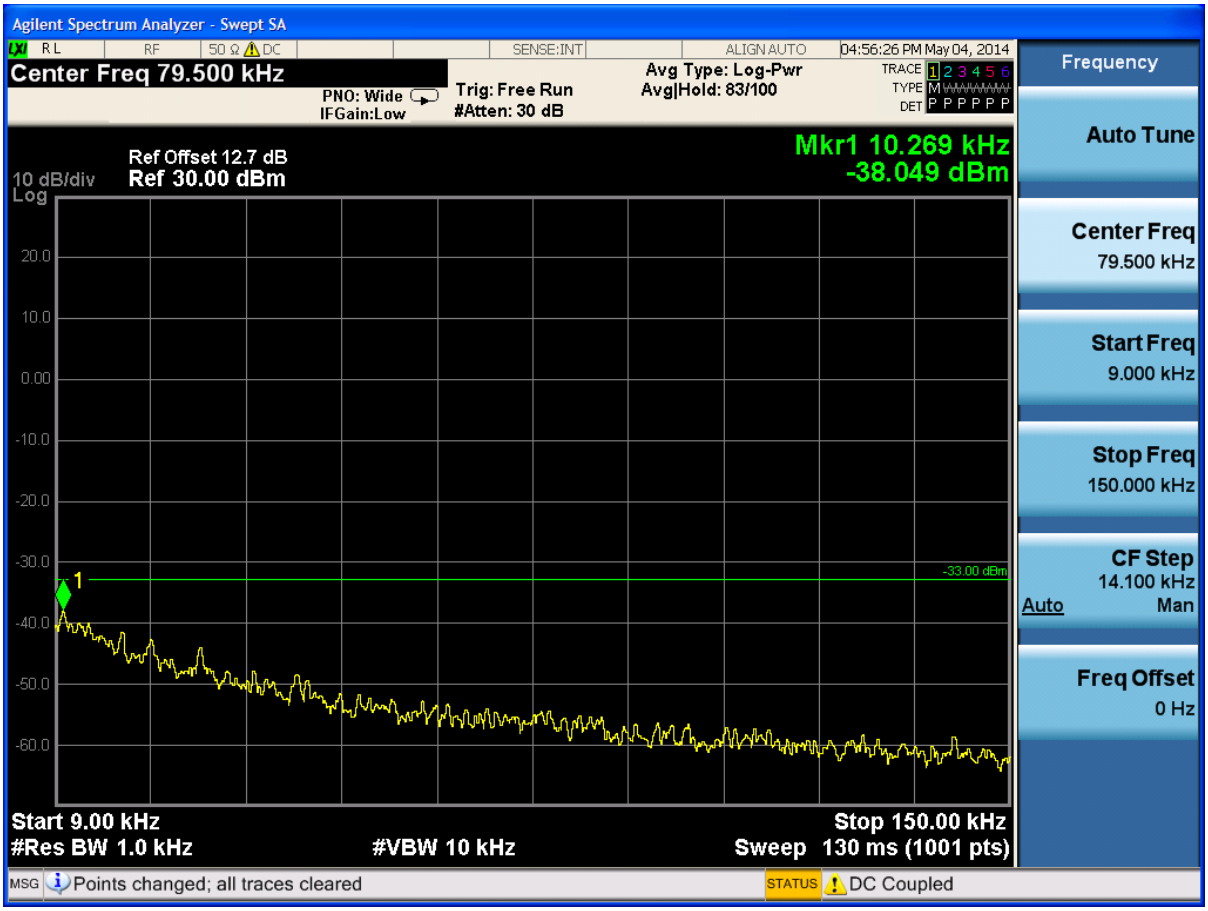
6.2.1.1.3 Test Channel = HCH



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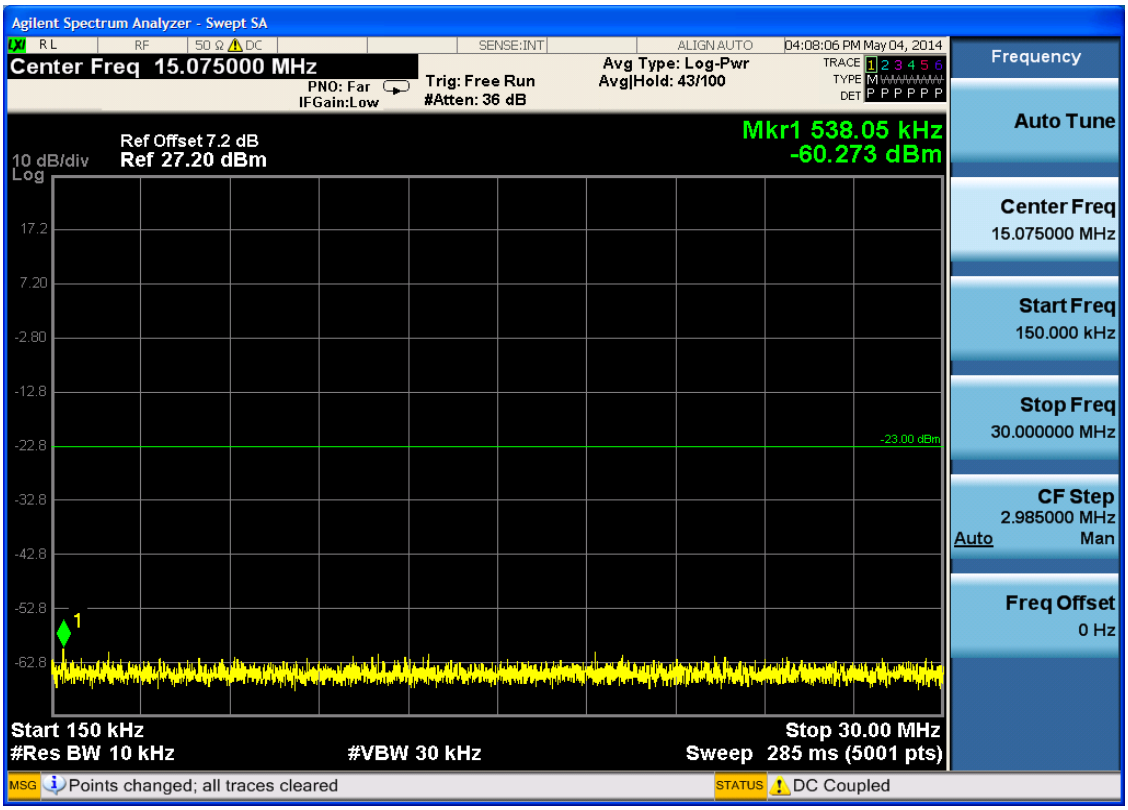

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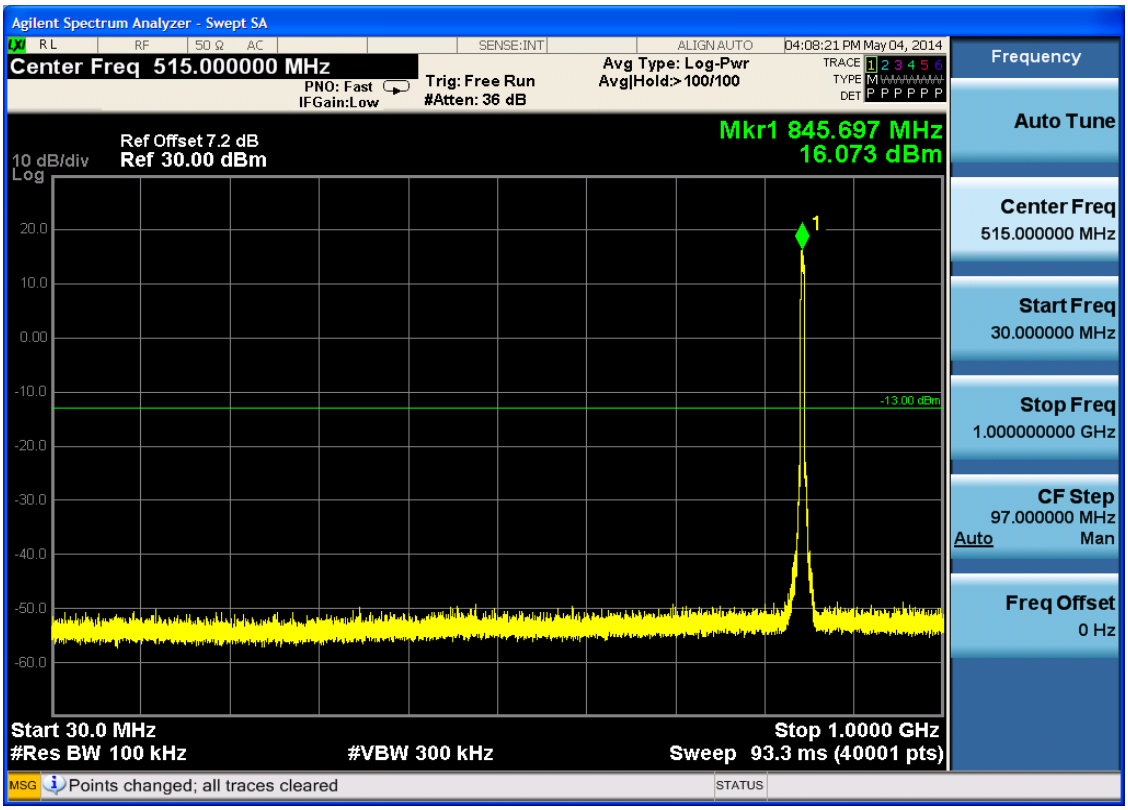

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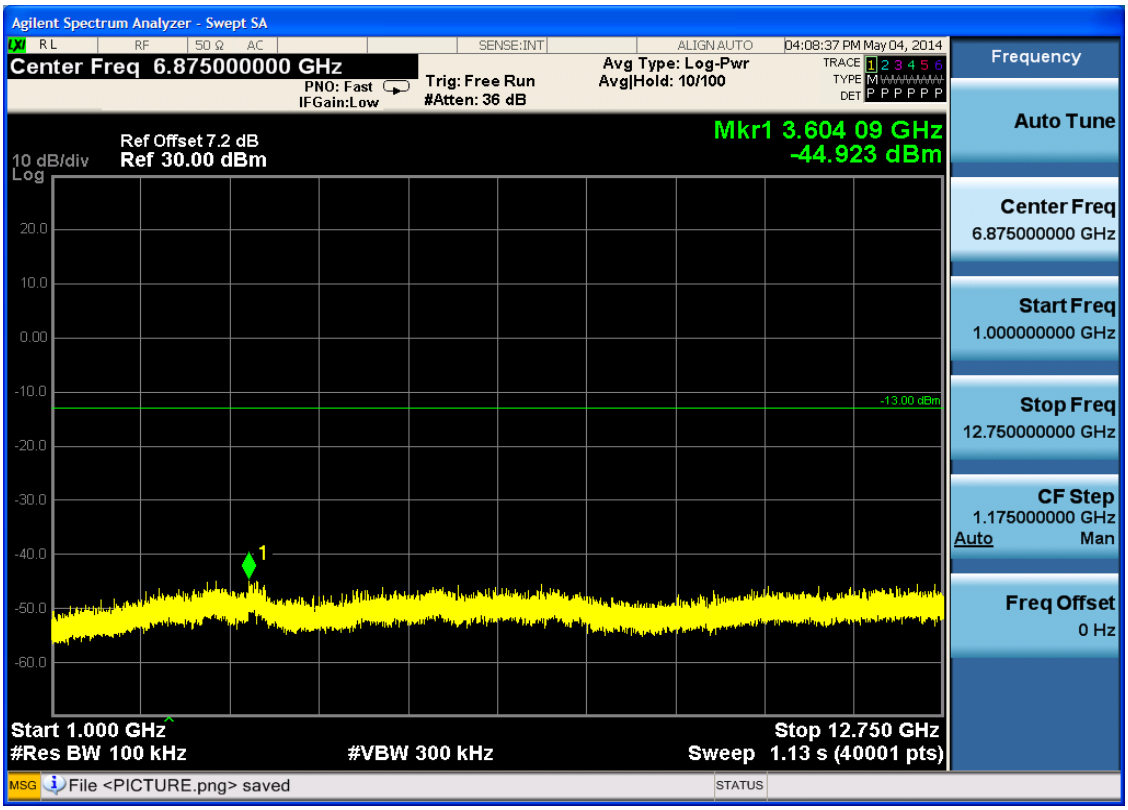

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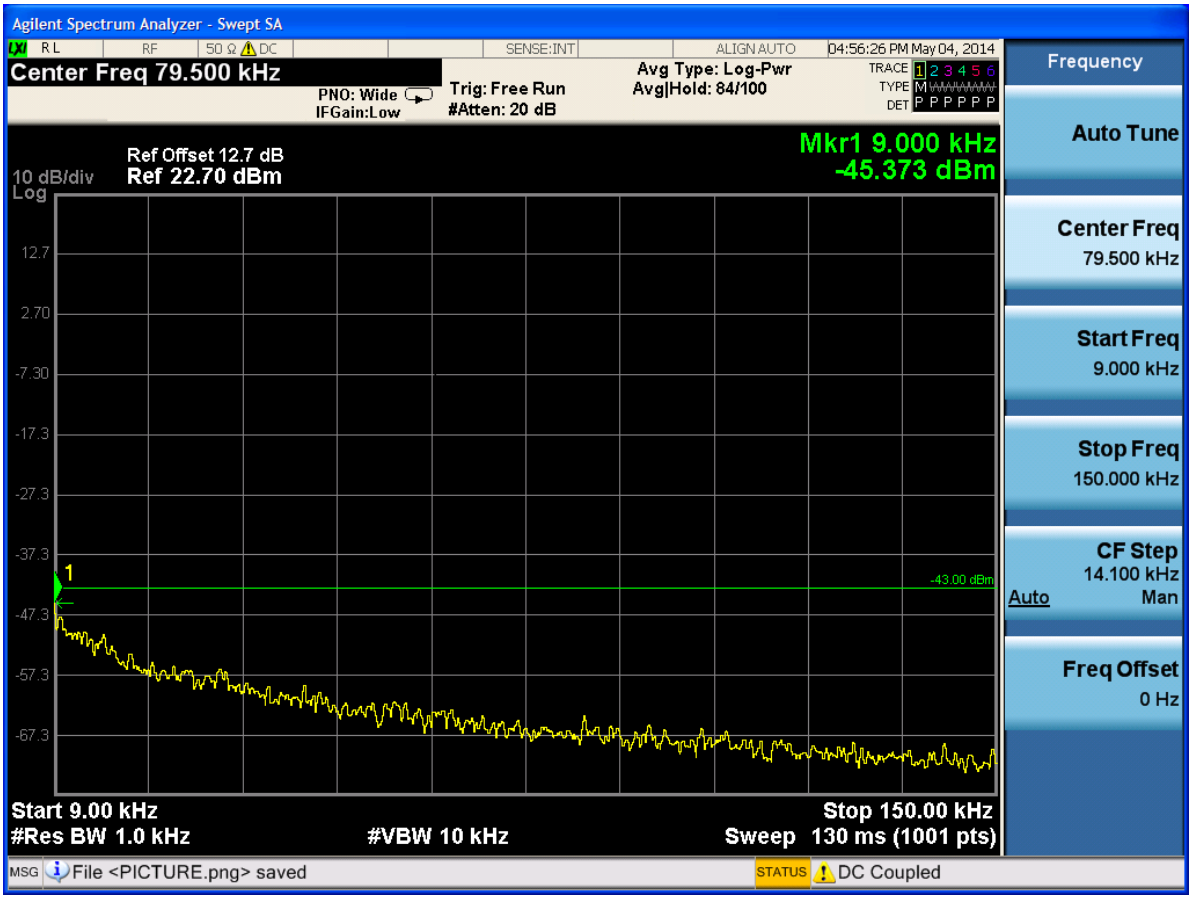
6.2.2 Test Band = WCDMA1900

6.2.2.1 Test Mode = UMTS/TM1

6.2.2.1.1 Test Channel = LCH



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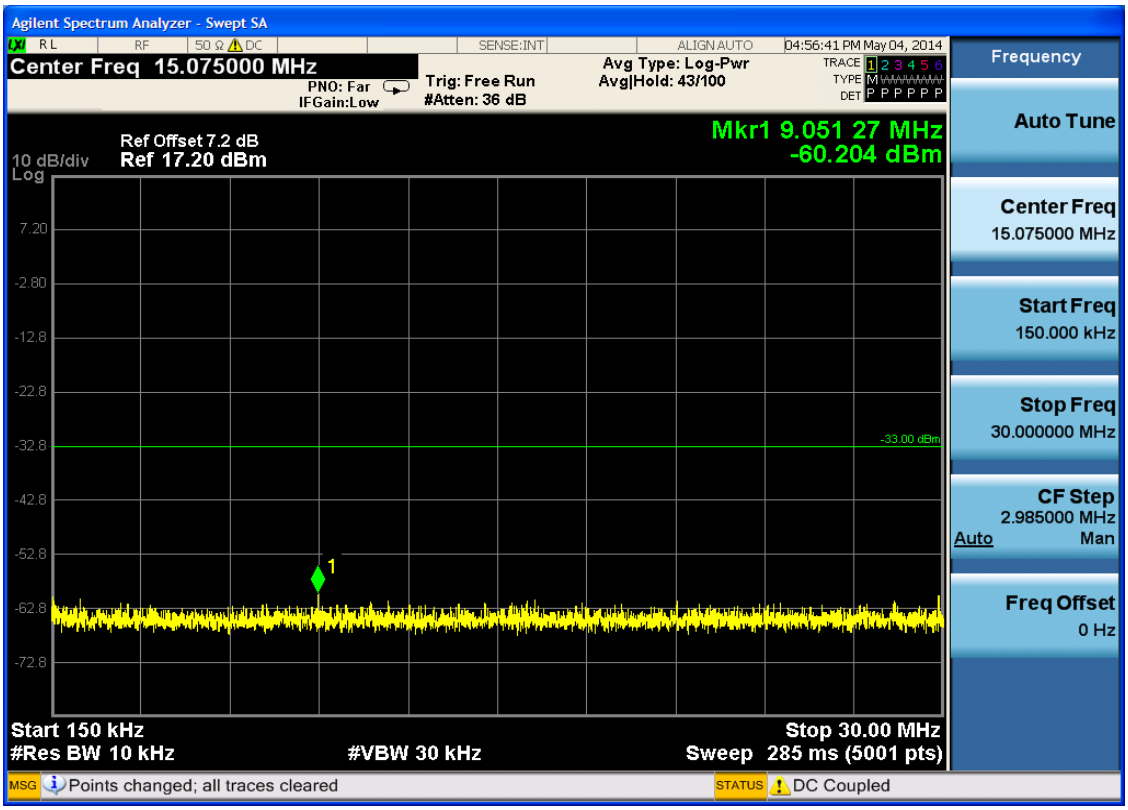

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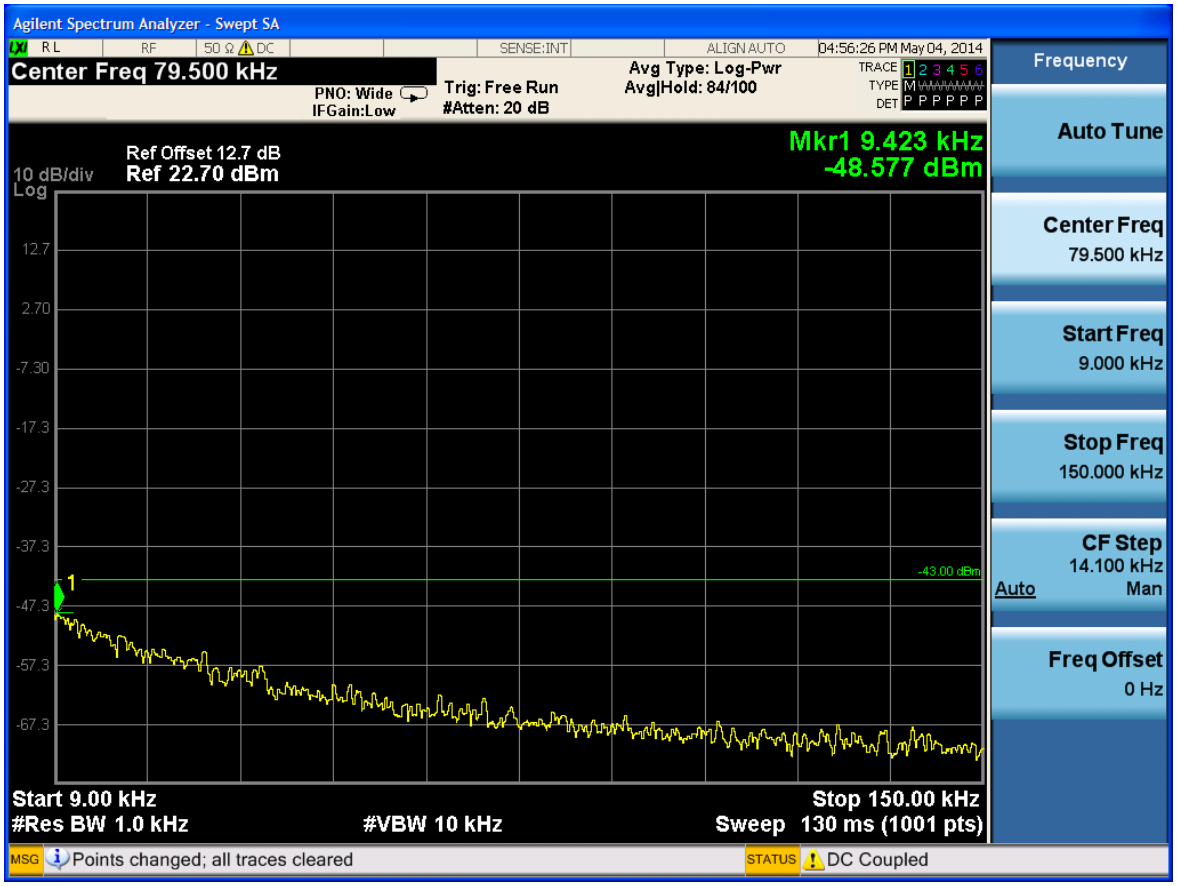
6.2.2.1.2 Test Channel = MCH



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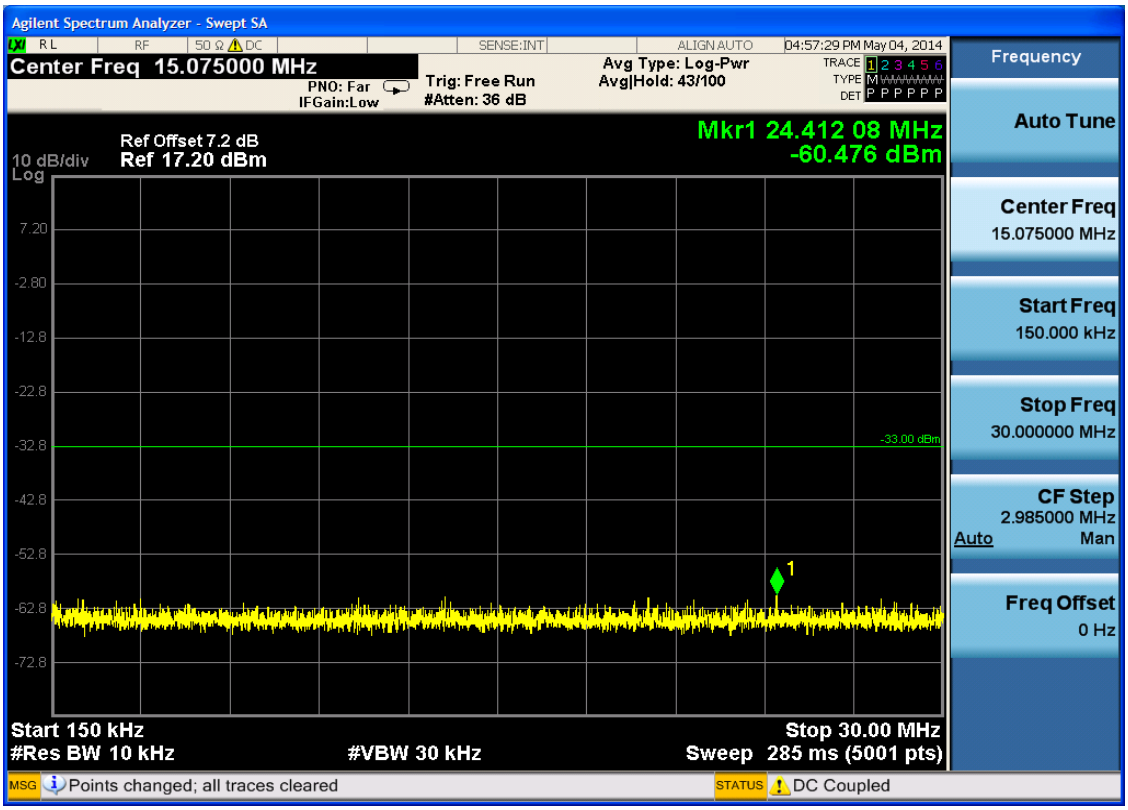

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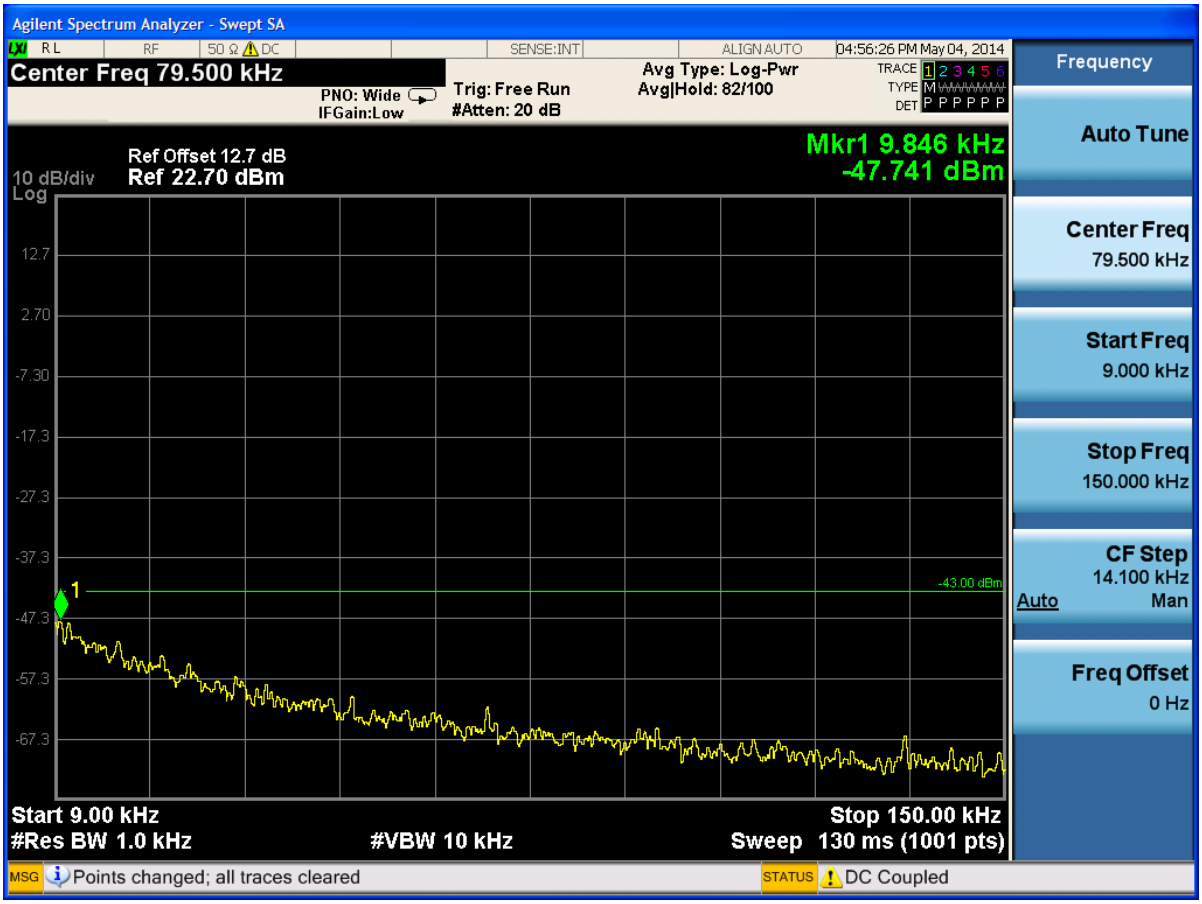
6.2.2.1.3 Test Channel = HCH



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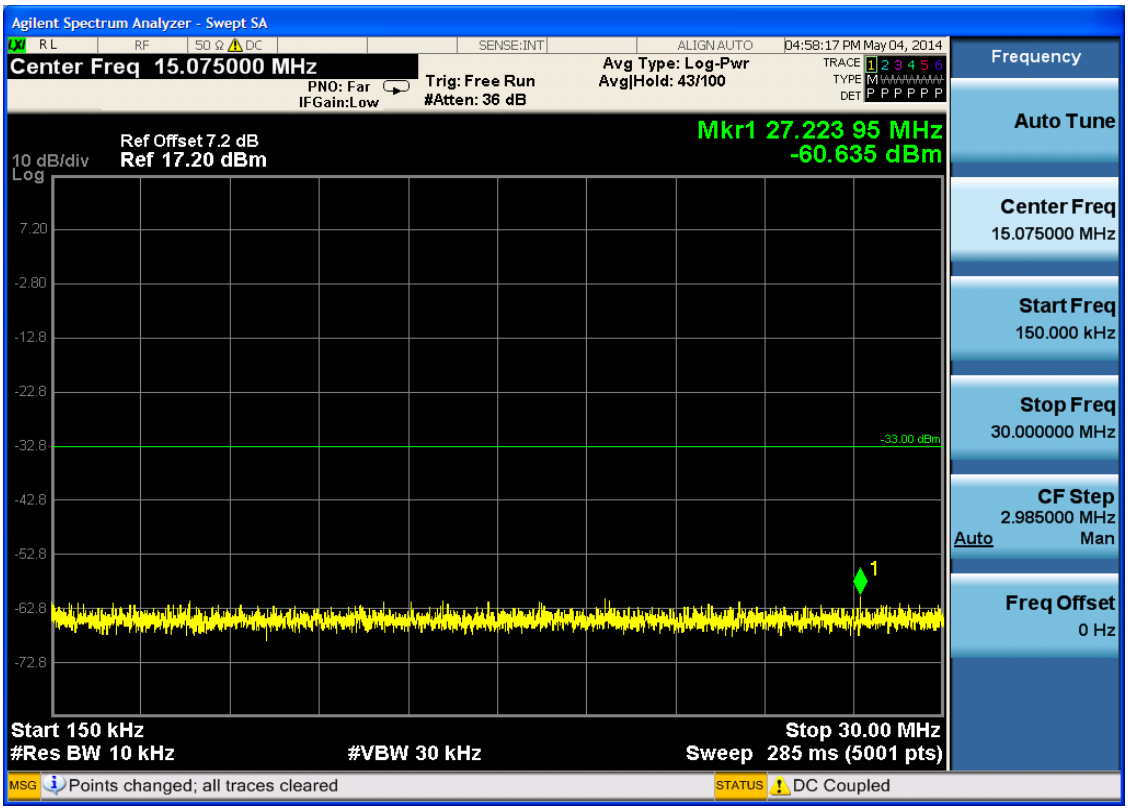

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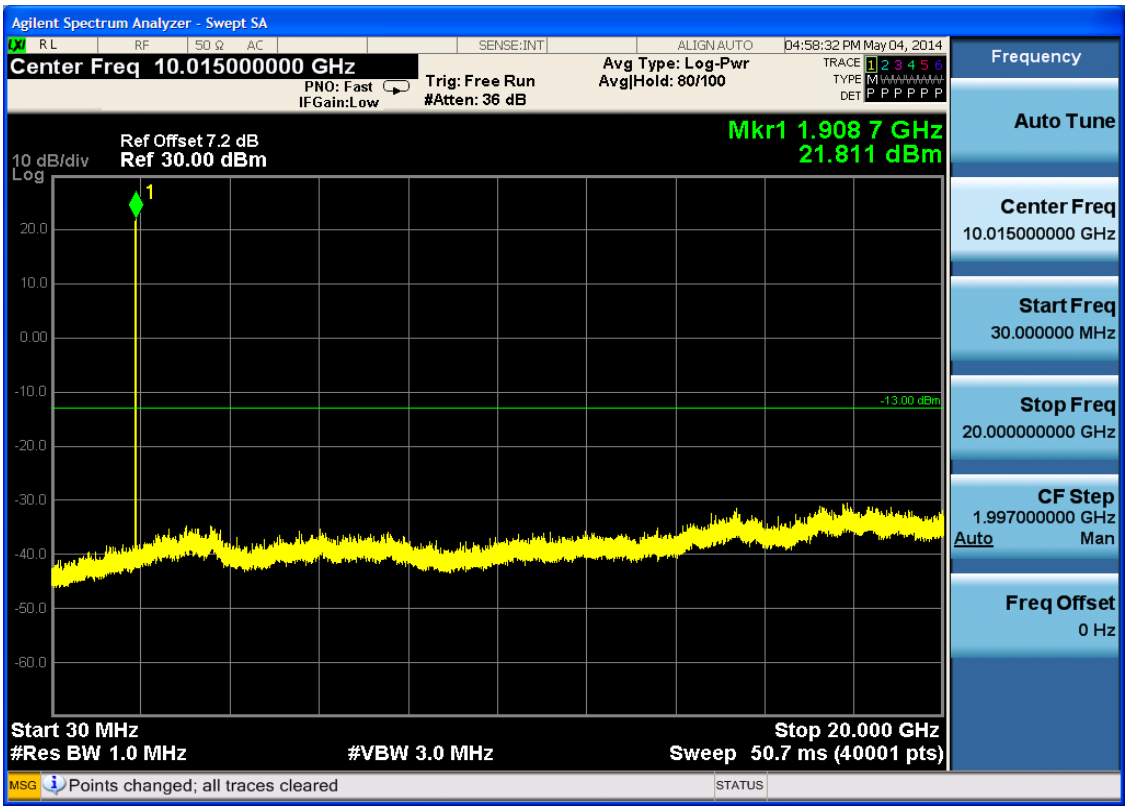

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7Appendix_G: Field Strength of Spurious Radiation

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

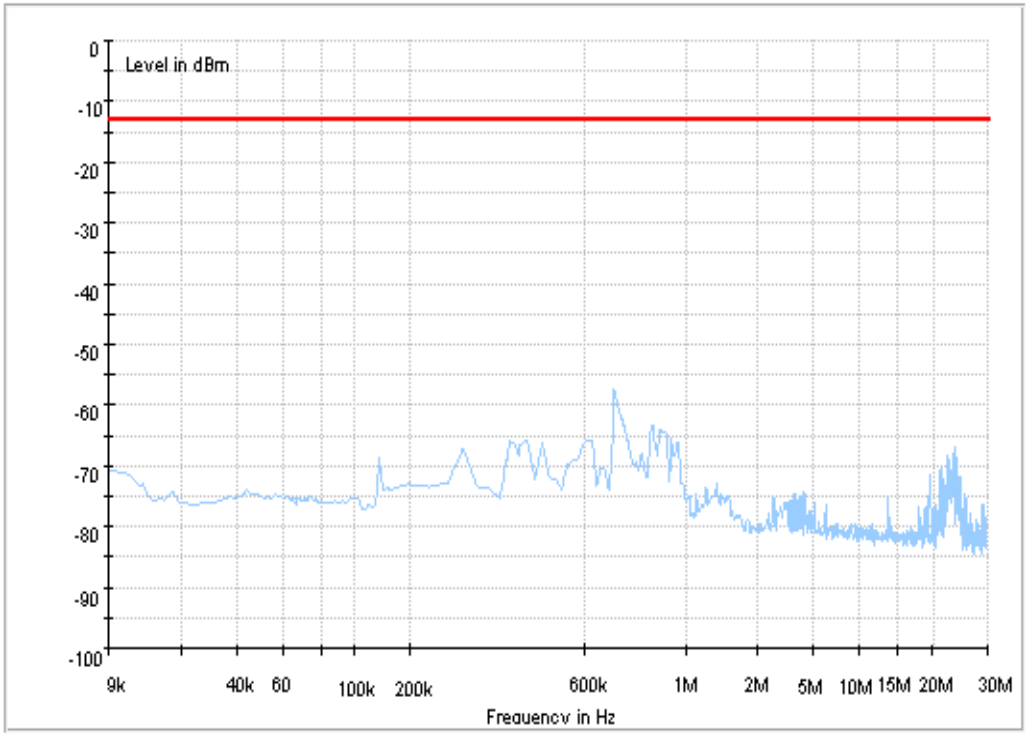
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

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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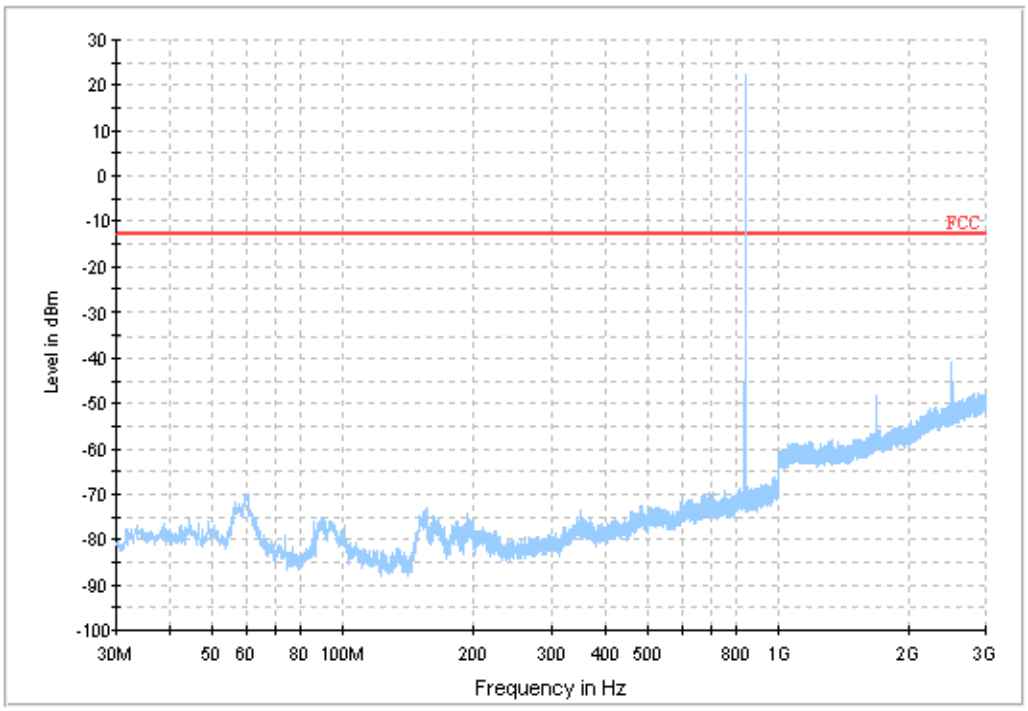
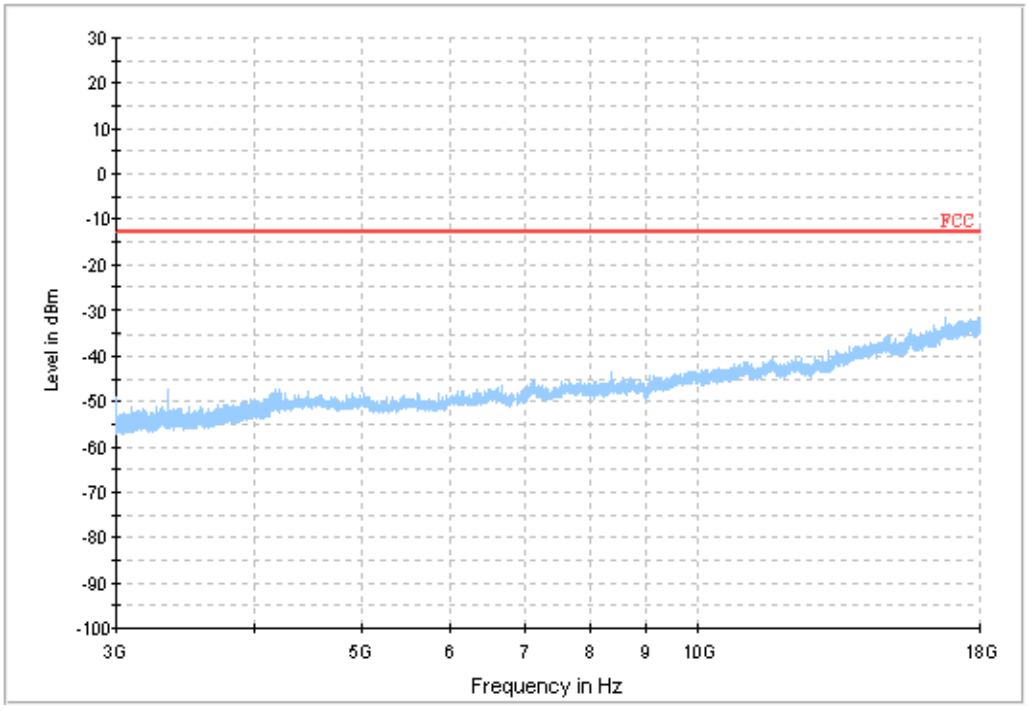


Copy of FCC PART22 GSM850_H



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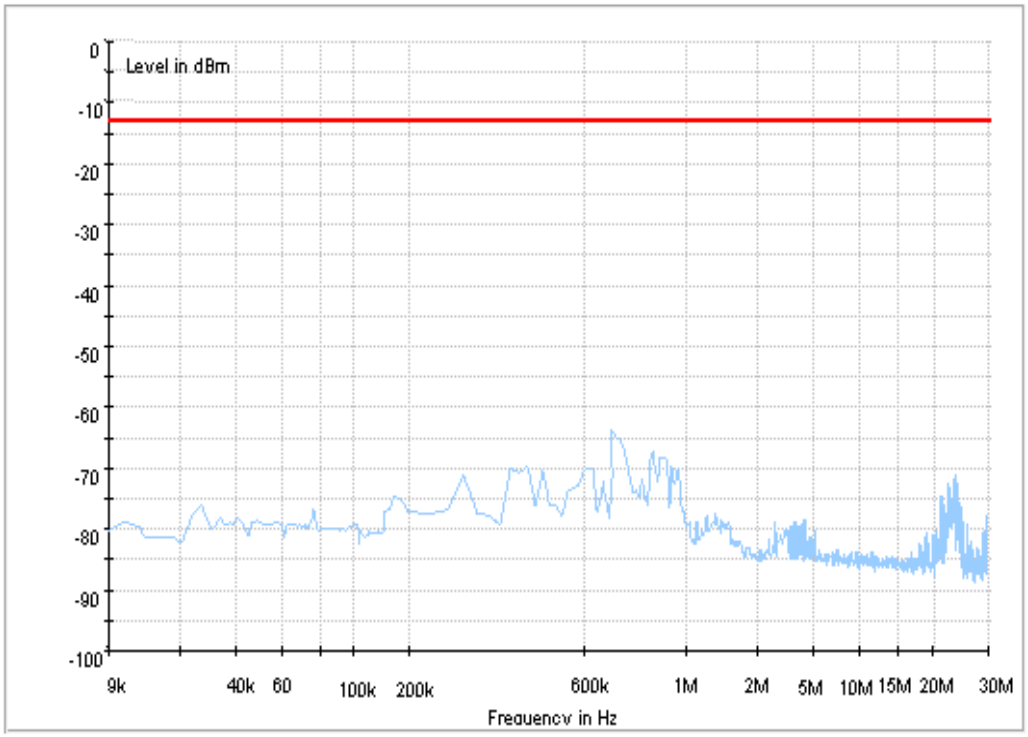
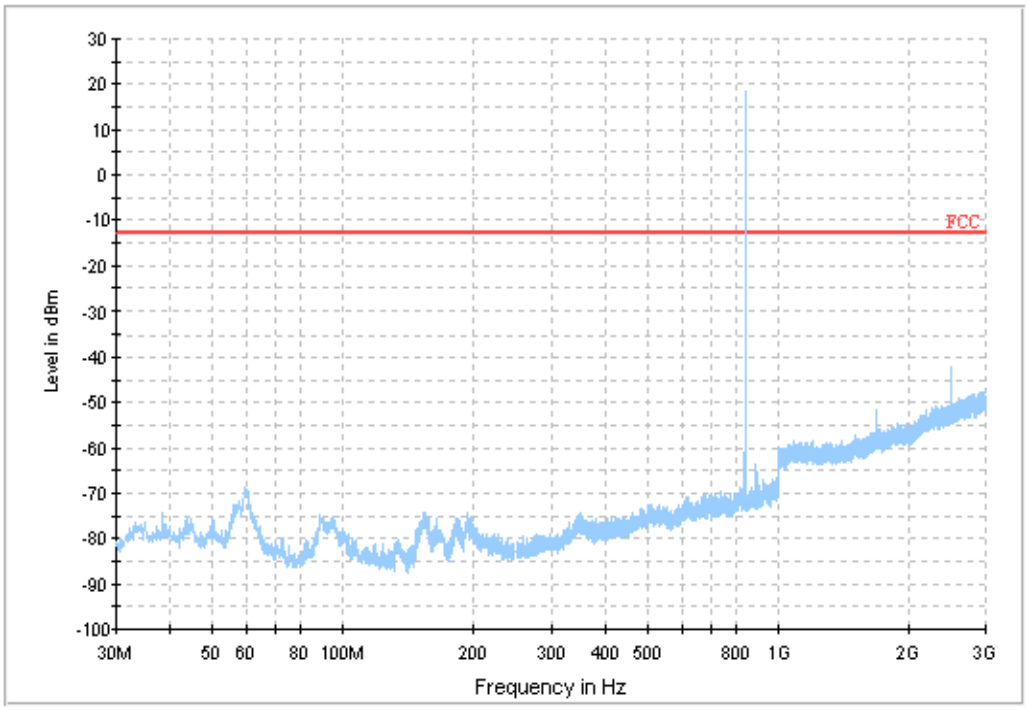
7.1.1.2 Test Mode = GSM/TM2



Copy of FCC PART22 GSM850_L



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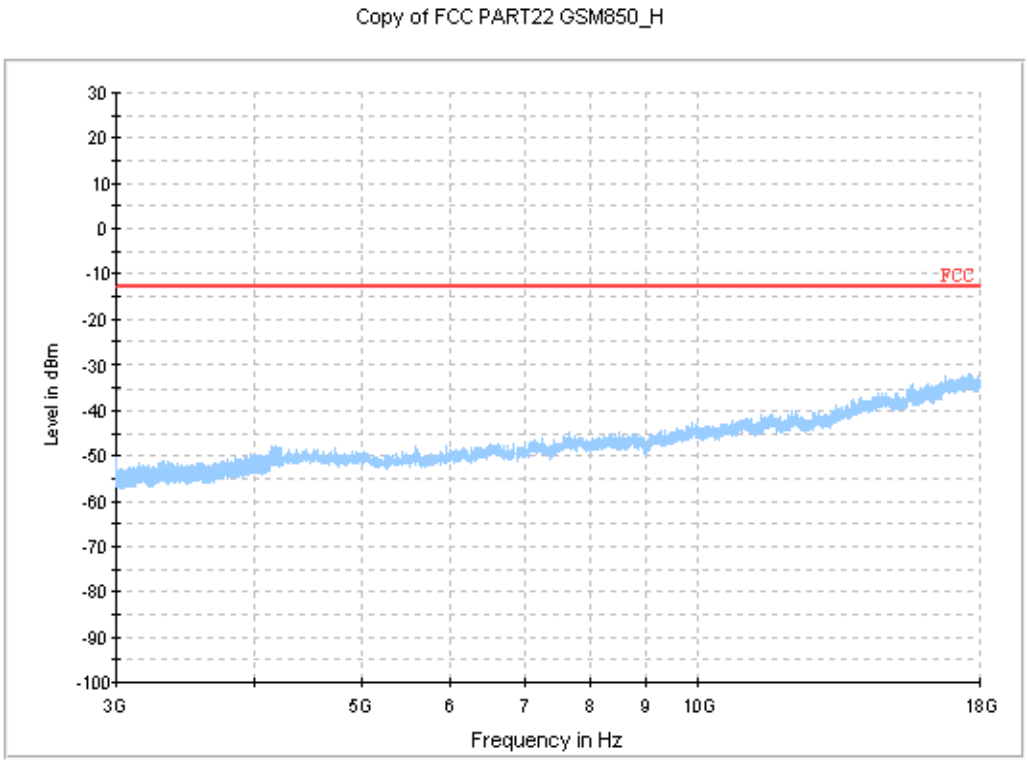

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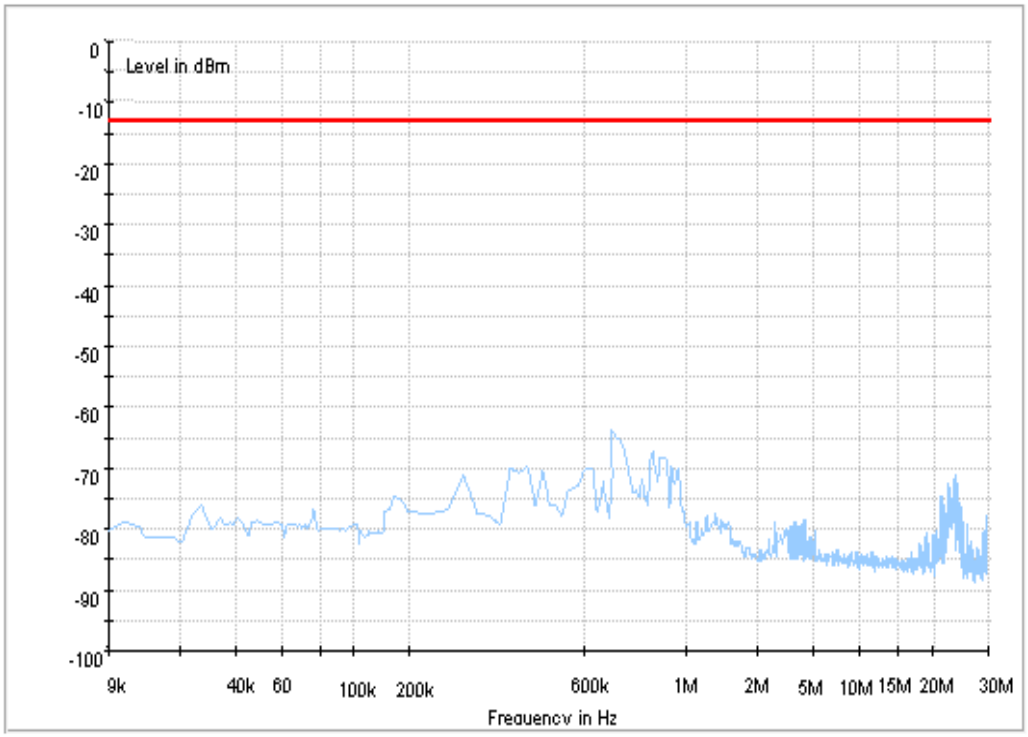
7.1.2 Test Band = GSM1900

7.1.2.1 Test Mode = GSM/TM1



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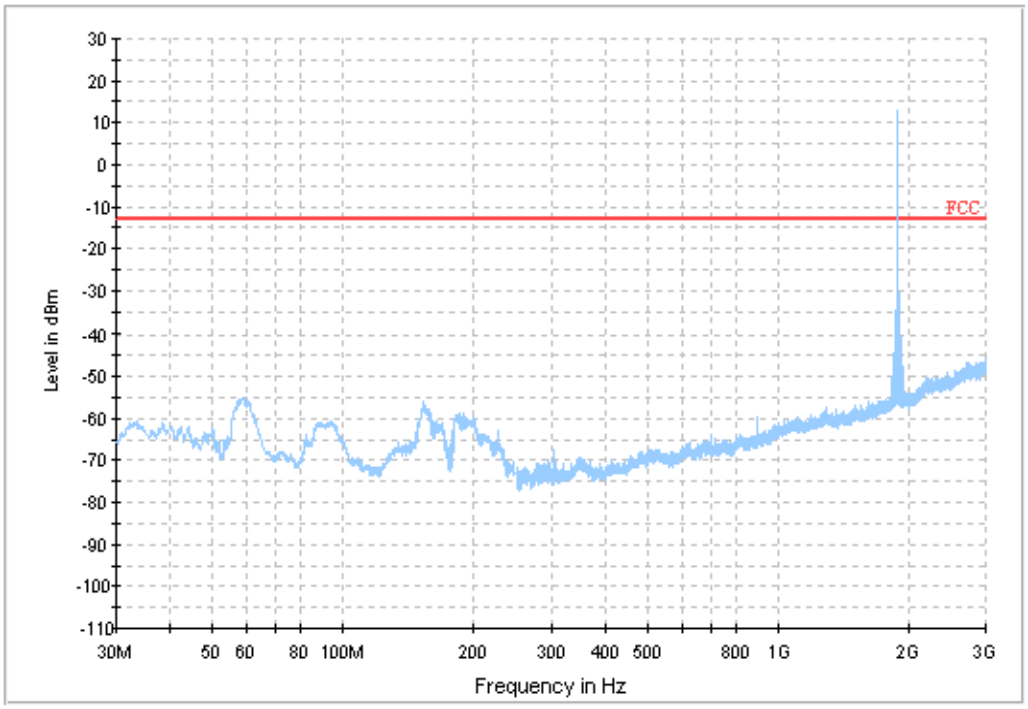
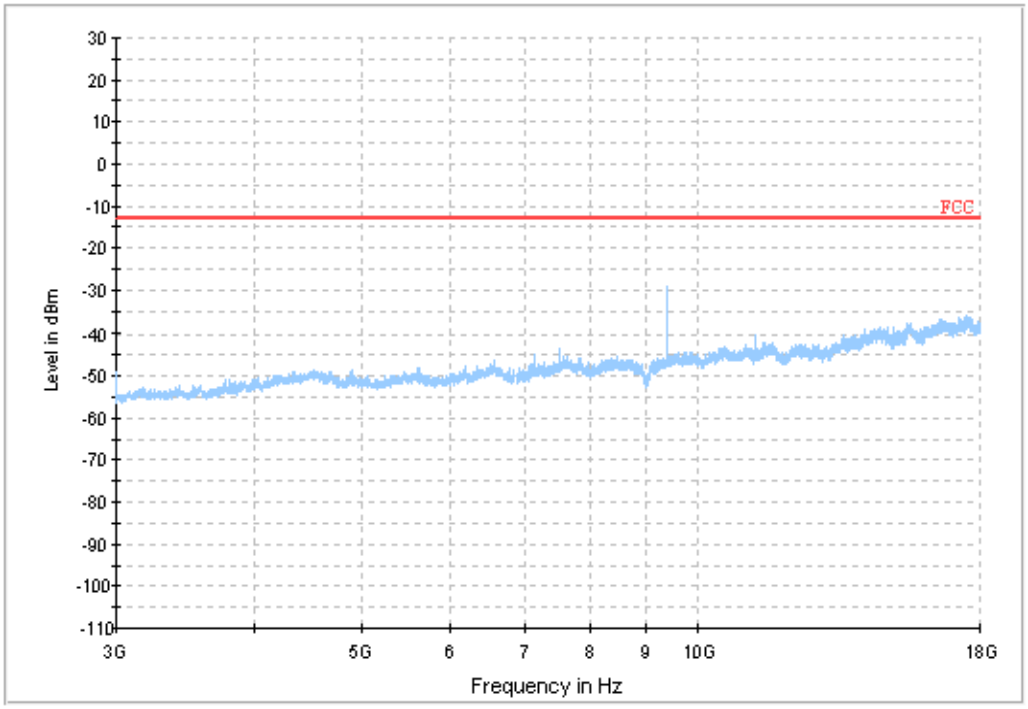
Copy of FCC PART24 GSM1900_L



Copy of FCC PART24 GSM1900_H



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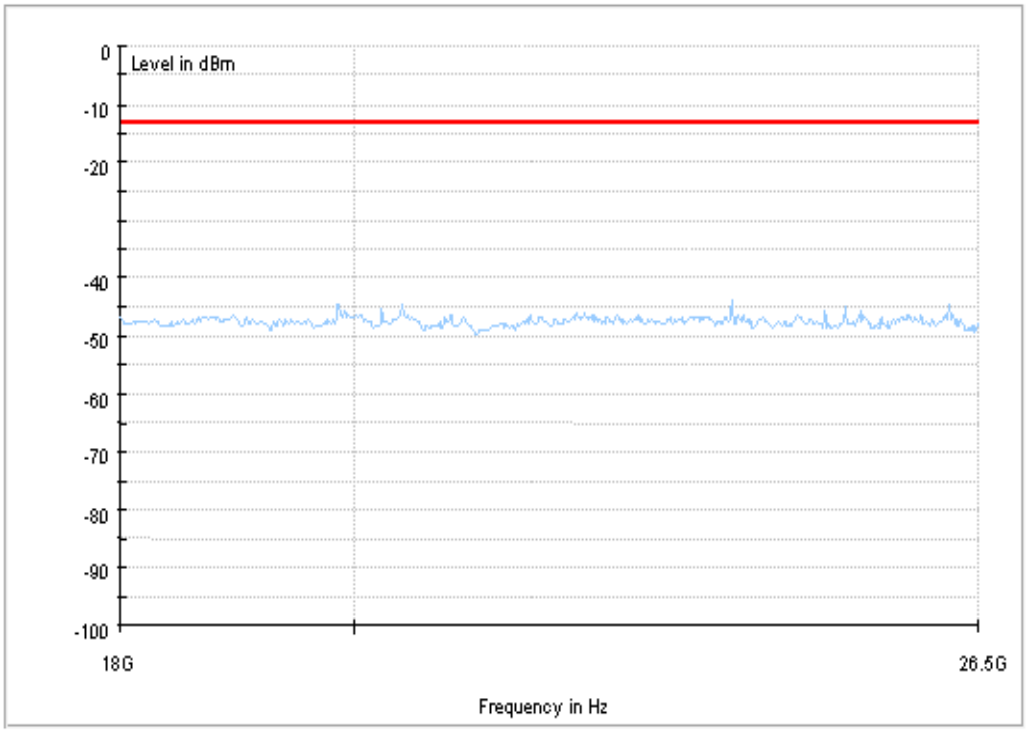

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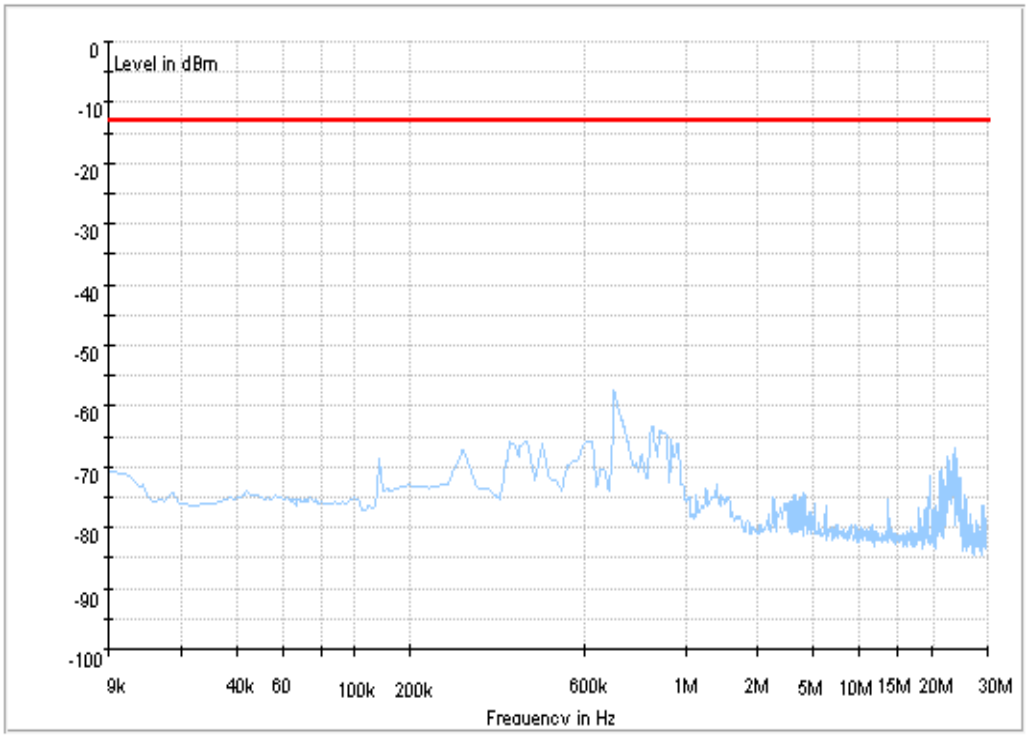
7.1.2.2 Test Mode = GSM/TM2



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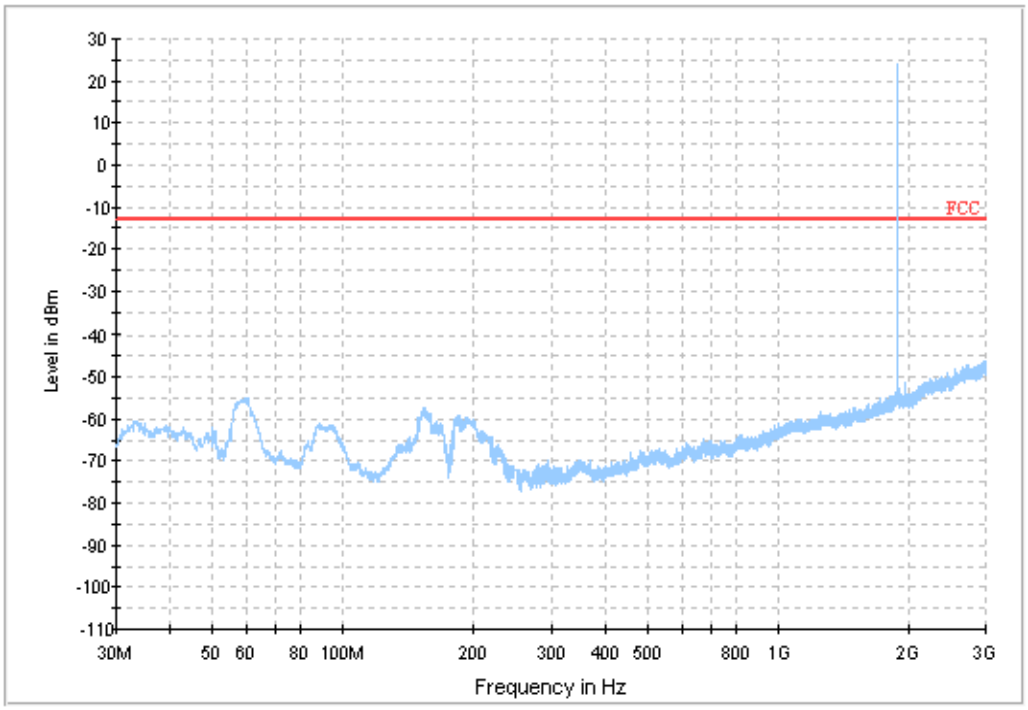

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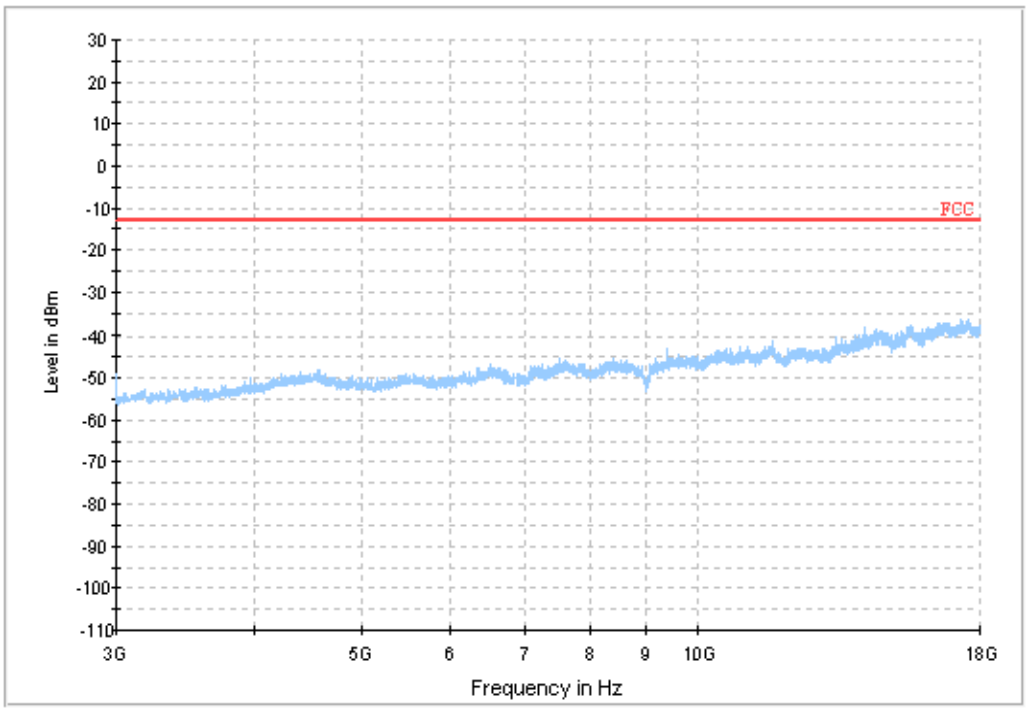

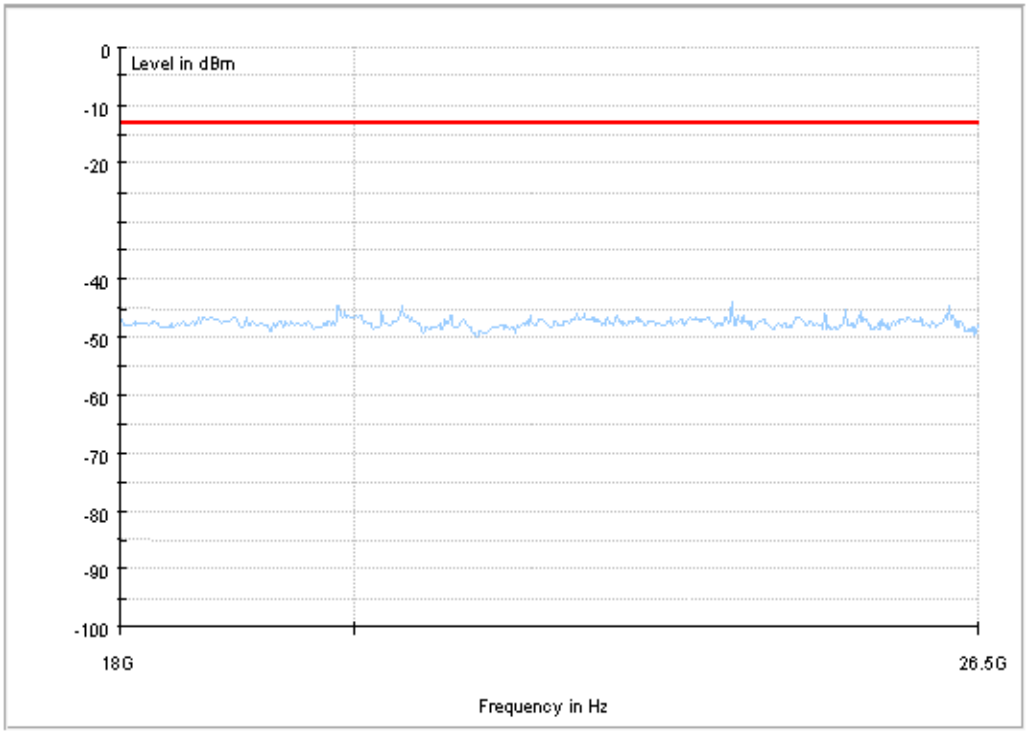

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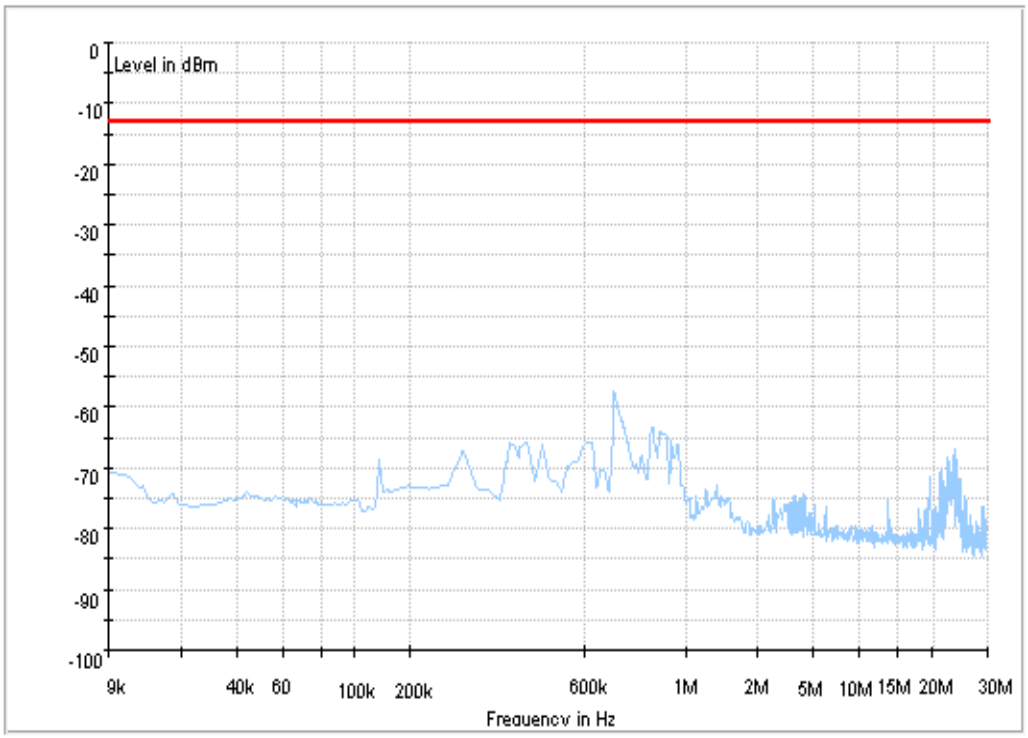
7.2 For UMTS

7.2.1 Test Band = WCDMA850

7.2.1.1 Test Mode = UMTS/TM1



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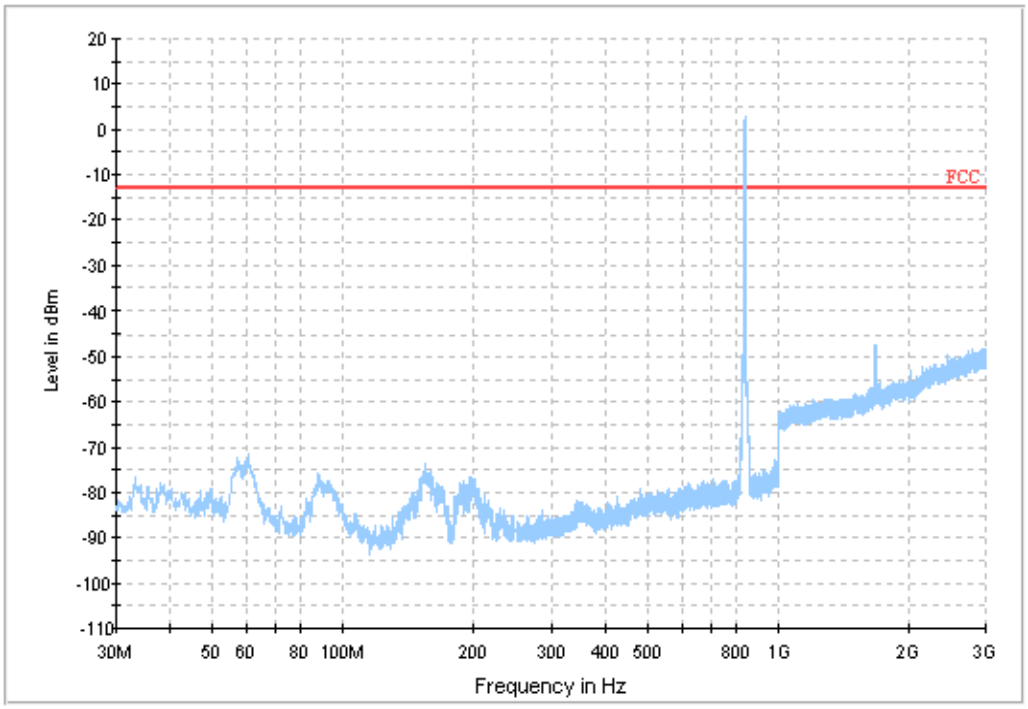
Copy of FCC PART22 WCDMA850_L



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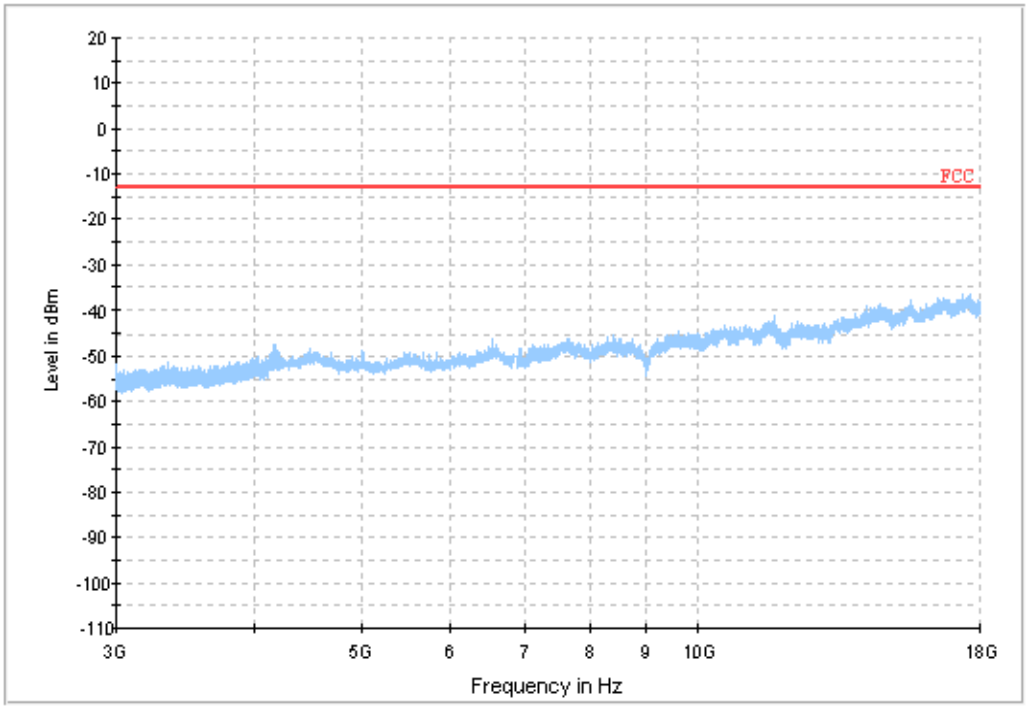

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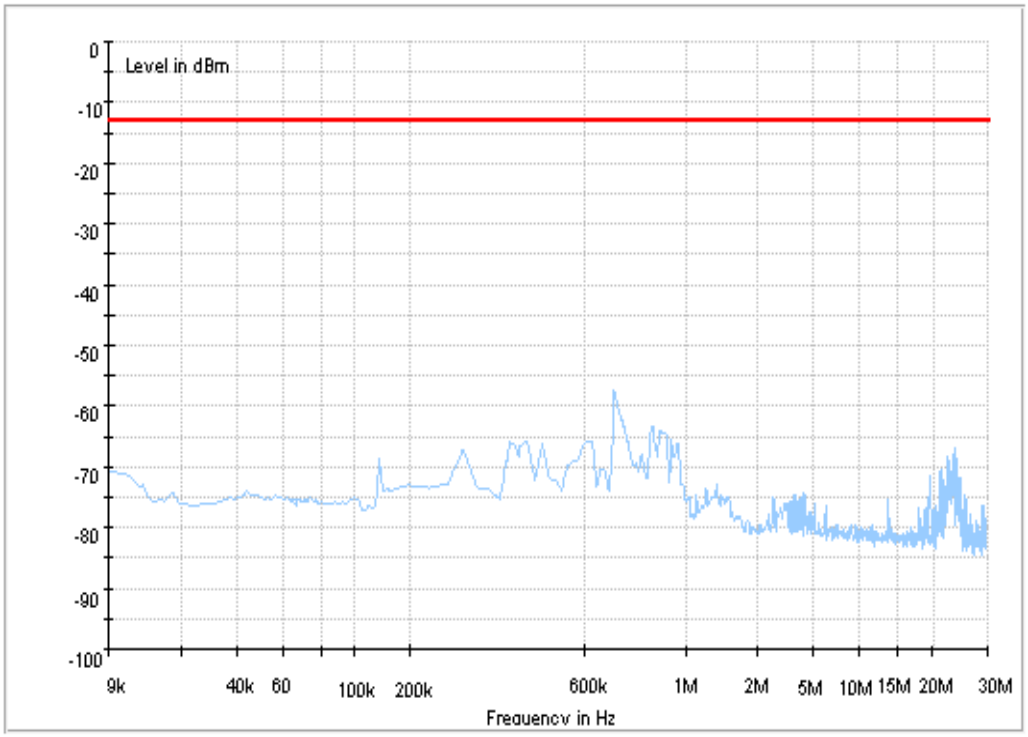
7.2.2 Test Band = WCDMA1900

7.2.2.1 Test Mode = UMTS/TM1



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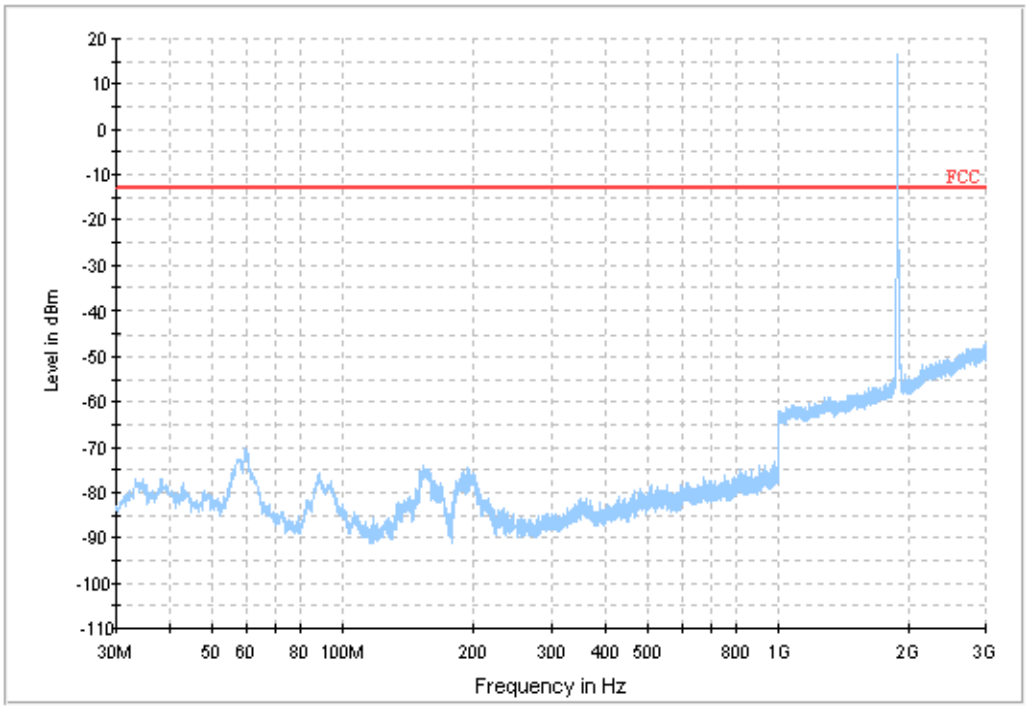
Copy of FCC PART24 WCDMA1900_L



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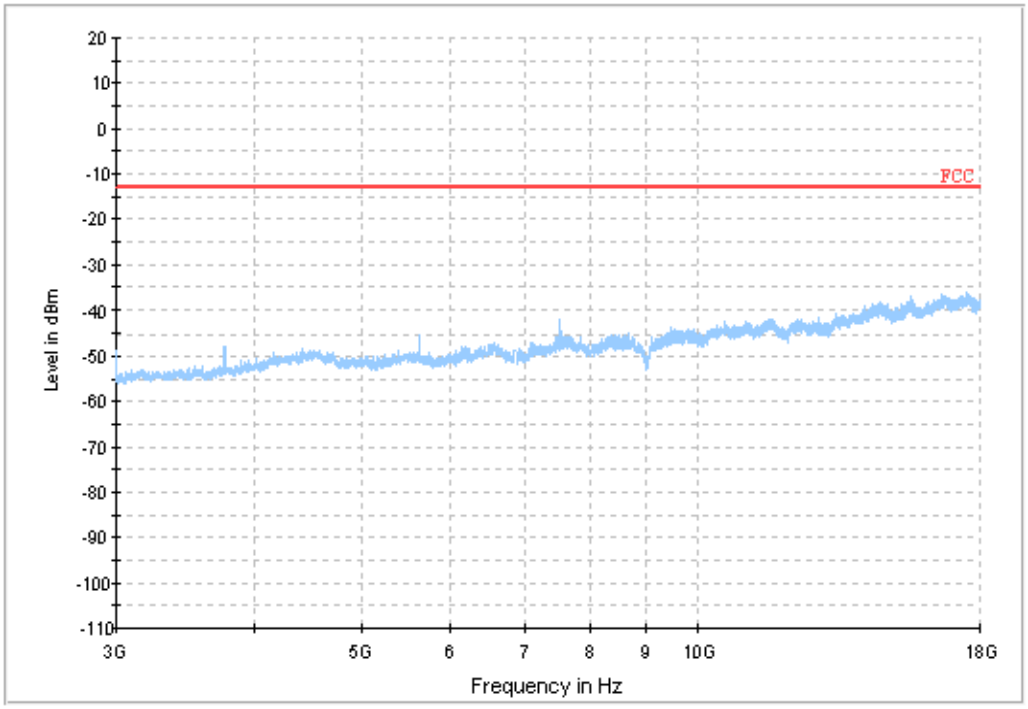

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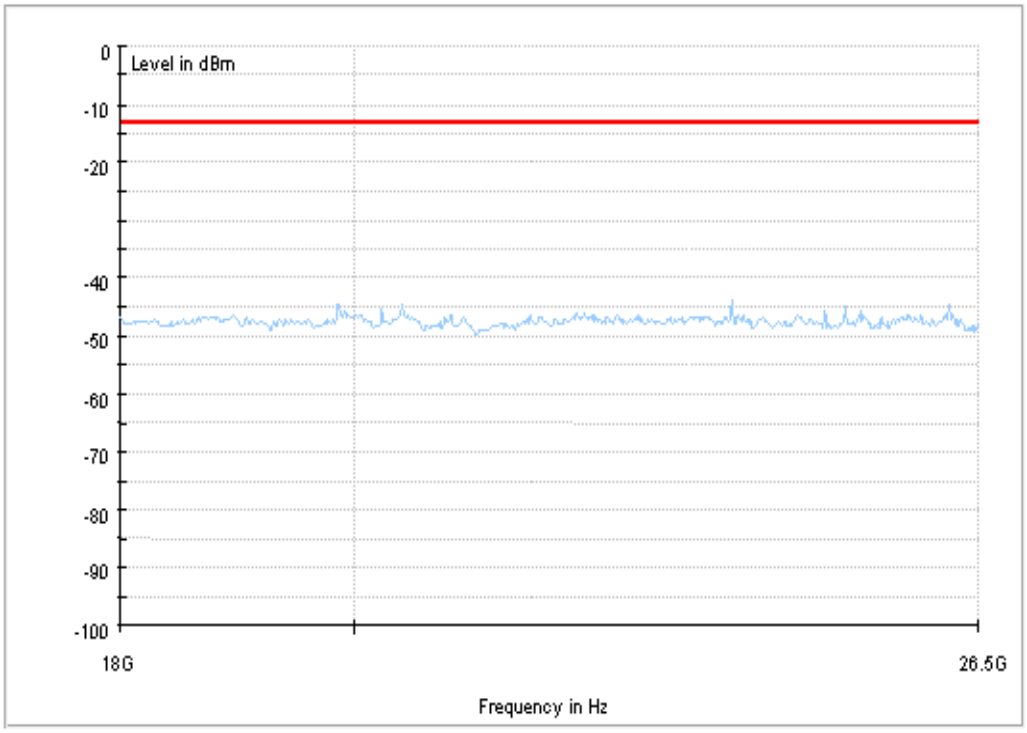

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8Appendix_H: Frequency Stability

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	-41.00	-0.04975	PASS
				VN	-36.94	-0.04482	PASS
				VH	-36.94	-0.04482	PASS
		MCH	TN	VL	-36.10	-0.04315	PASS
				VN	-34.55	-0.0413	PASS
				VH	-34.74	-0.04153	PASS
		HCH	TN	VL	-27.18	-0.03202	PASS
				VN	-28.80	-0.03393	PASS
				VH	-30.87	-0.03637	PASS
	GSM/TM2	LCH	TN	VL	-26.73	-0.03243	PASS
				VN	-34.26	-0.04157	PASS
				VH	-32.38	-0.03929	PASS
		MCH	TN	VL	-40.84	-0.04882	PASS
				VN	-36.39	-0.0435	PASS
				VH	-38.94	-0.04655	PASS
		HCH	TN	VL	-19.21	-0.02263	PASS
				VN	-30.54	-0.03598	PASS
				VH	-34.74	-0.04093	PASS
GSM1900	GSM/TM1	LCH	TN	VL	-70.71	-0.03822	PASS
				VN	-71.67	-0.03874	PASS
				VH	-70.32	-0.03801	PASS
		MCH	TN	VL	-41.71	-0.02219	PASS
				VN	-42.42	-0.02256	PASS
				VH	-40.49	-0.02154	PASS
		HCH	TN	VL	-40.03	-0.02096	PASS
				VN	-46.43	-0.02431	PASS
				VH	-40.03	-0.02096	PASS
	GSM/TM2	LCH	TN	VL	-89.40	-0.04832	PASS
				VN	-80.07	-0.04328	PASS
				VH	-75.71	-0.04092	PASS

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Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		MCH	TN	VL	-67.57	-0.03594	PASS
				VN	-40.84	-0.02172	PASS
				VH	-37.00	-0.01968	PASS
		HCH	TN	VL	-49.37	-0.02585	PASS
				VN	-53.05	-0.02778	PASS
				VH	-51.40	-0.02691	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	-40.62	-0.04928	PASS
				-20	-36.55	-0.04435	PASS
				-10	-38.36	-0.04654	PASS
				0	-38.81	-0.04709	PASS
				10	-36.03	-0.04372	PASS
				20	-35.39	-0.04294	PASS
				30	-37.71	-0.04575	PASS
				40	-36.10	-0.0438	PASS
				50	-39.26	-0.04763	PASS
		MCH	VN	-30	-37.65	-0.045	PASS
				-20	-36.35	-0.04345	PASS
				-10	-31.45	-0.03759	PASS
				0	-32.54	-0.0389	PASS
				10	-39.91	-0.0477	PASS
				20	-35.32	-0.04222	PASS
				30	-36.81	-0.044	PASS
				40	-41.97	-0.05017	PASS
				50	-35.84	-0.04284	PASS
		HCH	VN	-30	-22.79	-0.02685	PASS
				-20	-28.80	-0.03393	PASS
				-10	-29.90	-0.03523	PASS
				0	-27.83	-0.03279	PASS
				10	-25.51	-0.03005	PASS
				20	-27.96	-0.03294	PASS
				30	-25.05	-0.02951	PASS
				40	-30.41	-0.03583	PASS
				50	-26.54	-0.03127	PASS
	GSM/TM2	LCH	VN	-30	-36.32	-0.04407	PASS
				-20	-37.87	-0.04595	PASS

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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-10	-39.13	-0.04748	PASS
				0	-39.39	-0.04779	PASS
				10	-33.13	-0.0402	PASS
				20	-20.92	-0.02538	PASS
				30	-31.77	-0.03855	PASS
				40	-41.13	-0.0499	PASS
				50	-42.88	-0.05203	PASS
		MCH	VN	-30	-38.68	-0.04623	PASS
				-20	-34.32	-0.04102	PASS
				-10	-28.38	-0.03392	PASS
				0	-31.77	-0.03798	PASS
				10	-36.52	-0.04365	PASS
				20	-40.45	-0.04835	PASS
				30	-26.60	-0.0318	PASS
				40	-40.49	-0.0484	PASS
				50	-39.32	-0.047	PASS
		HCH	VN	-30	-24.54	-0.02891	PASS
				-20	-35.22	-0.04149	PASS
				-10	-25.09	-0.02956	PASS
				0	-27.25	-0.0321	PASS
				10	-39.16	-0.04614	PASS
				20	-34.61	-0.04078	PASS
				30	-36.10	-0.04253	PASS
				40	-21.83	-0.02572	PASS
				50	-27.28	-0.03214	PASS
GSM1900	GSM/TM1	LCH	VN	-30	-67.35	-0.0364	PASS
				-20	-71.67	-0.03874	PASS
				-10	-67.03	-0.03623	PASS
				0	-67.54	-0.0365	PASS
				10	-71.80	-0.03881	PASS
				20	-71.74	-0.03877	PASS
				30	-73.10	-0.03951	PASS
				40	-67.99	-0.03675	PASS
				50	-75.94	-0.04104	PASS
		MCH	VN	-30	-41.58	-0.02212	PASS
				-20	-41.97	-0.02232	PASS
				-10	-42.94	-0.02284	PASS
				0	-43.00	-0.02287	PASS
				10	-41.65	-0.02215	PASS
				20	-46.75	-0.02487	PASS

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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	-44.94	-0.0239	PASS
				40	-43.91	-0.02336	PASS
				50	-41.20	-0.02191	PASS
		HCH	VN	-30	-45.39	-0.02377	PASS
				-20	-47.59	-0.02492	PASS
				-10	-50.17	-0.02627	PASS
				0	-50.24	-0.02631	PASS
				10	-49.53	-0.02593	PASS
				20	-47.27	-0.02475	PASS
				30	-52.50	-0.02749	PASS
				40	-46.56	-0.02438	PASS
				50	-50.75	-0.02657	PASS
	GSM/TM2	LCH	VN	-30	-67.03	-0.03623	PASS
				-20	-85.17	-0.04603	PASS
				-10	-67.35	-0.0364	PASS
				0	-78.97	-0.04268	PASS
				10	-63.99	-0.03459	PASS
				20	-91.72	-0.04957	PASS
				30	-71.77	-0.03879	PASS
				40	-84.72	-0.04579	PASS
				50	-70.25	-0.03797	PASS
		MCH	VN	-30	-42.81	-0.02277	PASS
				-20	-38.10	-0.02027	PASS
				-10	-49.20	-0.02617	PASS
				0	-48.98	-0.02605	PASS
				10	-48.14	-0.02561	PASS
				20	-46.46	-0.02471	PASS
				30	-45.65	-0.02428	PASS
				40	-62.63	-0.03331	PASS
				50	-53.08	-0.02823	PASS
		HCH	VN	-30	-73.10	-0.03828	PASS
				-20	-58.37	-0.03056	PASS
				-10	-50.30	-0.02634	PASS
				0	-59.86	-0.03134	PASS
				10	-47.20	-0.02471	PASS
				20	-47.69	-0.02497	PASS
				30	-32.64	-0.01709	PASS
				40	-58.37	-0.03056	PASS
				50	-50.43	-0.02641	PASS

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8.2 For UMTS

8.2.1Frequency Error vs. Voltage:

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA850	UMTS/TM1	LCH	TN	VL	-10.91	-0.0132	PASS
				VN	9.17	0.0111	PASS
				VH	16.45	0.01991	PASS
		MCH	TN	VL	-1.02	-0.00122	PASS
				VN	-18.30	-0.02188	PASS
				VH	6.20	0.00741	PASS
		HCH	TN	VL	-0.27	-0.00032	PASS
				VN	-1.14	-0.00135	PASS
				VH	-12.89	-0.01523	PASS
WCDMA1900	UMTS/TM1	LCH	TN	VL	12.79	0.0069	PASS
				VN	-23.86	-0.01288	PASS
				VH	12.88	0.00695	PASS
		MCH	TN	VL	-11.95	-0.00636	PASS
				VN	-29.72	-0.01581	PASS
				VH	4.73	0.00252	PASS
		HCH	TN	VL	7.43	0.00389	PASS
				VN	-15.40	-0.00807	PASS
				VH	-5.63	-0.00295	PASS

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8.2.2Frequency Error vs. Temperature:

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA850	UMTS/TM1	LCH	VN	-30	11.12	0.01346	PASS
				-20	3.28	0.00397	PASS
				-10	-8.54	-0.01033	PASS
				0	17.52	0.0212	PASS
				10	-10.13	-0.01226	PASS
				20	-2.67	-0.00323	PASS
				30	-0.32	-0.00039	PASS
				40	11.09	0.01342	PASS
				50	7.68	0.00929	PASS
		MCH	VN	-30	-2.90	-0.00347	PASS
				-20	-5.80	-0.00693	PASS
				-10	-5.72	-0.00684	PASS
				0	-3.91	-0.00467	PASS
				10	-5.07	-0.00606	PASS
				20	18.22	0.02178	PASS
				30	12.57	0.01503	PASS
				40	4.06	0.00485	PASS
				50	-6.39	-0.00764	PASS
		HCH	VN	-30	-22.81	-0.02694	PASS
				-20	-2.00	-0.00236	PASS
				-10	2.52	0.00298	PASS
				0	-3.77	-0.00445	PASS
				10	2.78	0.00328	PASS
				20	-17.59	-0.02078	PASS
				30	5.92	0.00699	PASS
				40	9.28	0.01096	PASS
				50	-2.38	-0.00281	PASS
WCDMA1900	UMTS/TM1	LCH	VN	-30	-3.60	-0.00194	PASS
				-20	15.46	0.00835	PASS
				-10	5.46	0.00295	PASS
				0	12.77	0.00689	PASS
				10	-4.39	-0.00237	PASS
				20	3.34	0.0018	PASS
				30	0.64	0.00035	PASS
				40	1.63	0.00088	PASS
				50	1.27	0.00069	PASS

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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		MCH	VN	-30	-0.93	-0.00049	PASS
				-20	-1.45	-0.00077	PASS
				-10	0.99	0.00053	PASS
				0	0.61	0.00032	PASS
				10	4.46	0.00237	PASS
				20	-3.16	-0.00168	PASS
				30	4.64	0.00247	PASS
				40	-2.18	-0.00116	PASS
				50	2.56	0.00136	PASS
		HCH	VN	-30	3.33	0.00175	PASS
				-20	1.85	0.00097	PASS
				-10	-0.56	-0.00029	PASS
				0	-0.60	-0.00031	PASS
				10	6.38	0.00334	PASS
				20	-3.19	-0.00167	PASS
				30	0.78	0.00041	PASS
				40	-2.75	-0.00144	PASS
				50	1.62	0.00085	PASS

END

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