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	32.23	31.22	38.5	PASS
		MCH	32.46	31.45	38.5	PASS
		HCH	32.77	31.76	38.5	PASS
	GSM/TM2	LCH	26.05	25.04	38.5	PASS
		MCH	26.01	25	38.5	PASS
		HCH	26.02	25.01	38.5	PASS
WCDMA850	UMTS/TM1	LCH	22.45	21.44	38.5	PASS
		MCH	22.26	21.25	38.5	PASS
		HCH	22.02	21.01	38.5	PASS
Test Band	**Test Mode**	**Test Channel**	**Conducted Power [dBm]**	**EIRP [dBm]**	**Limit [dBm]**	**Verdict**
GSM1900	GSM/TM1	LCH	28.92	30.05	33	PASS
		MCH	29.03	30.16	33	PASS
		HCH	29.15	30.28	33	PASS
	GSM/TM2	LCH	24.19	25.32	33	PASS
		MCH	24.11	25.24	33	PASS
		HCH	24.07	25.2	33	PASS
WCDMA1900	UMTS/TM1	LCH	21.97	23.1	33	PASS
		MCH	21.6	22.73	33	PASS
		HCH	21.9	23.03	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
GSM850	GSM/TM1	LCH	0.1	13	PASS
		MCH	0.12	13	PASS
		HCH	0.12	13	PASS
	GSM/TM2	LCH	2.99	13	PASS
		MCH	3.06	13	PASS
		HCH	3	13	PASS
GSM1900	GSM/TM1	LCH	0.14	13	PASS
		MCH	0.14	13	PASS
		HCH	0.14	13	PASS
	GSM/TM2	LCH	2.89	13	PASS
		MCH	2.87	13	PASS
		HCH	2.85	13	PASS

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA850	UMTS/TM1	LCH	3.2	13	PASS
		MCH	3.24	13	PASS
		HCH	3.18	13	PASS
WCDMA1900	UMTS/TM1	LCH	9.63	13	PASS
		MCH	3.15	13	PASS
		HCH	3.19	13	PASS

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3Appendix_C: Modulation Characteristics

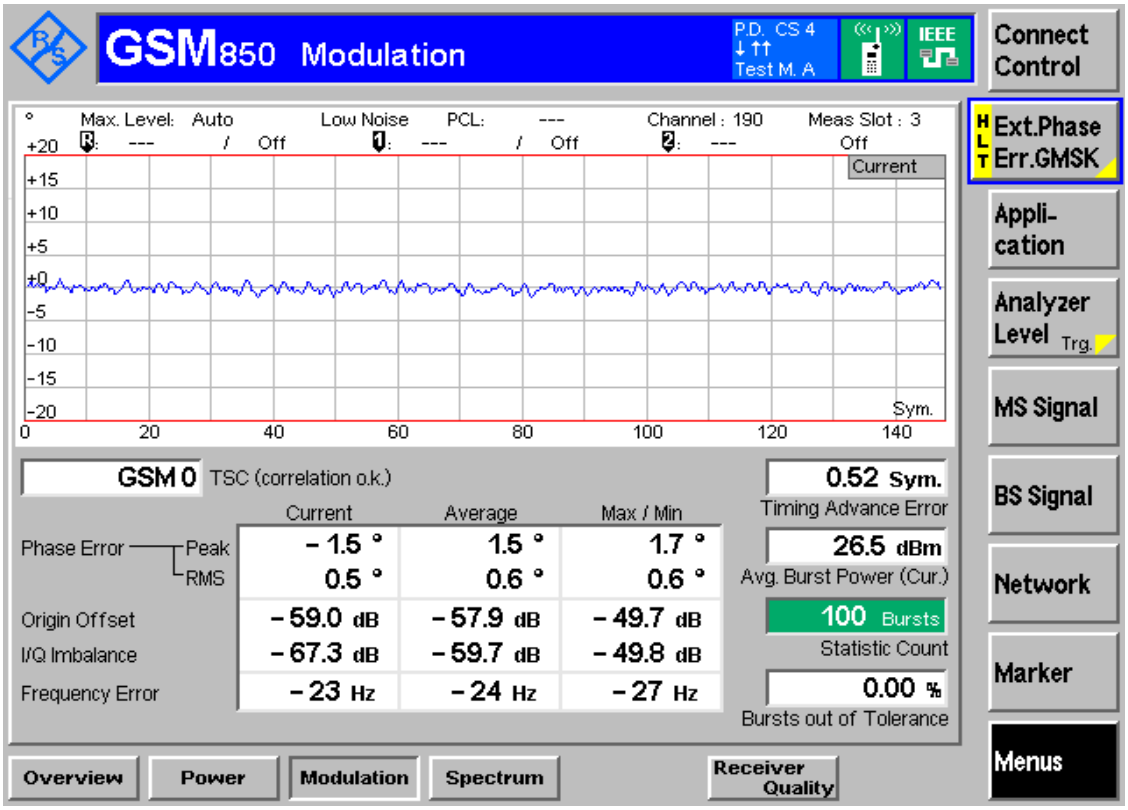
Part I - Test Plots

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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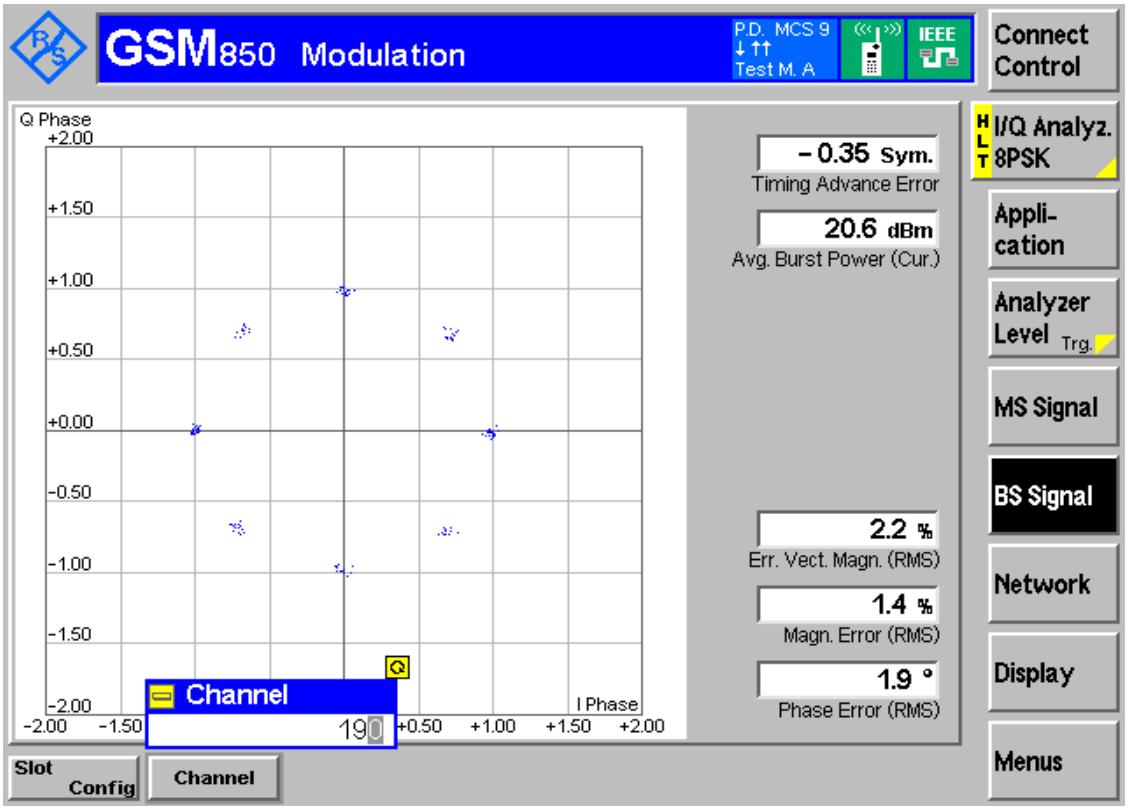
3.1.1.2 Test Mode = GSM/TM2

3.1.1.2.1 Test Channel = MCH



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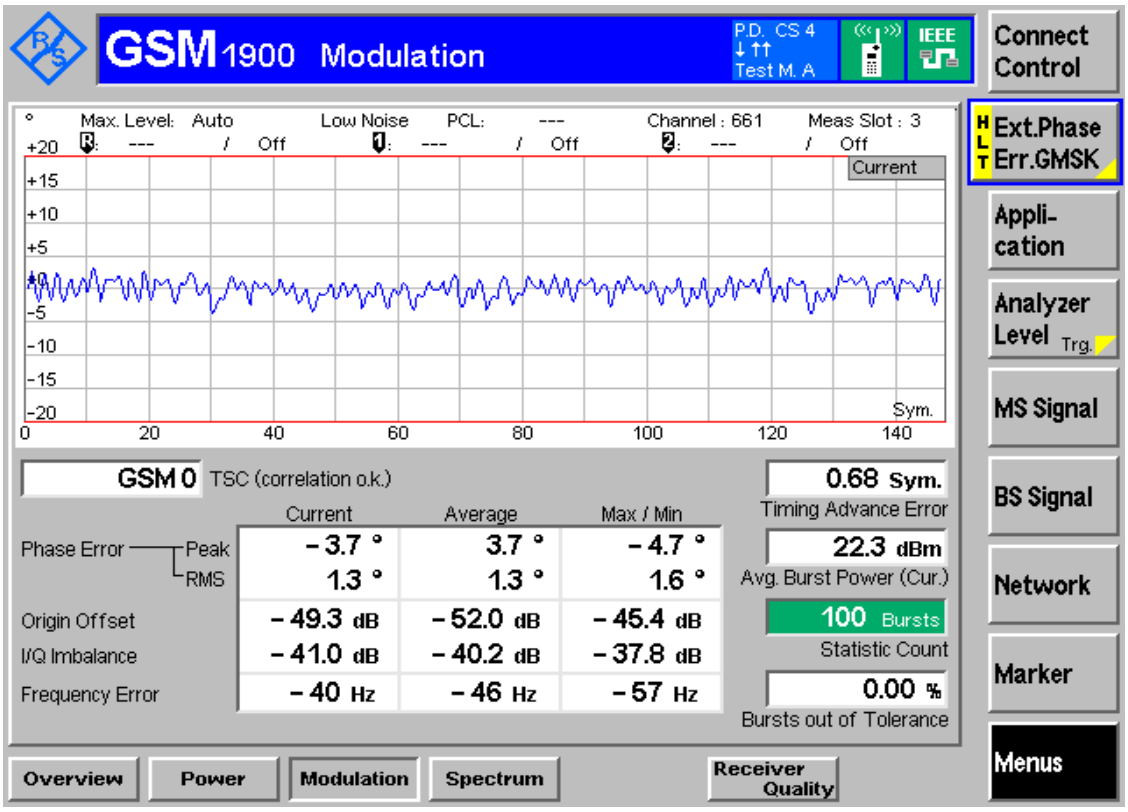
3.1.2 Test Band = GSM1900

3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH



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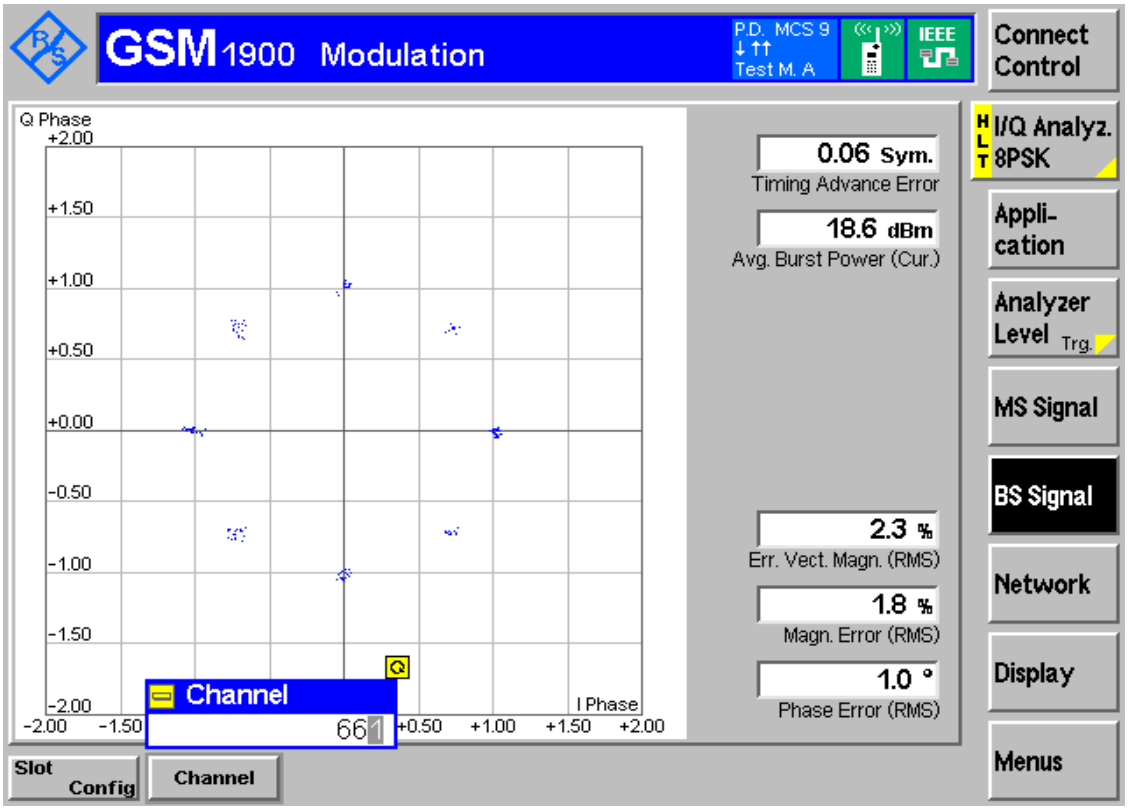
3.1.2.2 Test Mode = GSM/TM2

3.1.2.2.1 Test Channel = MCH



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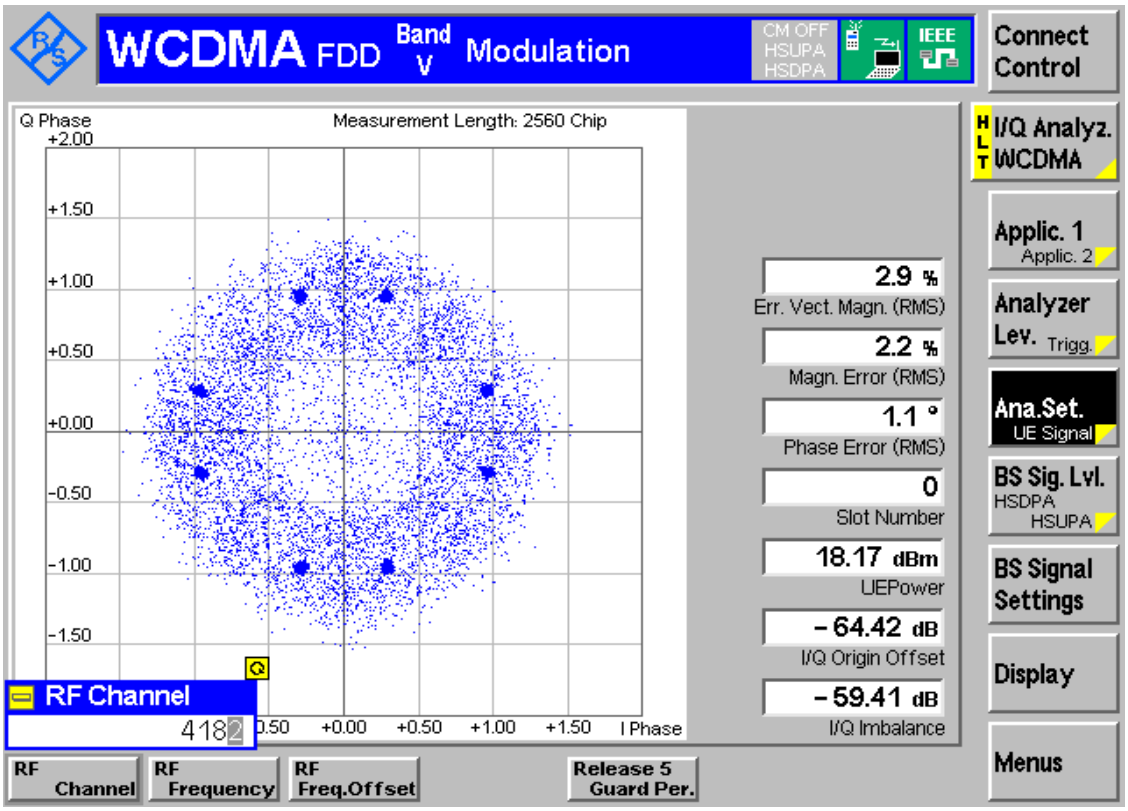
3.2 For UMTS

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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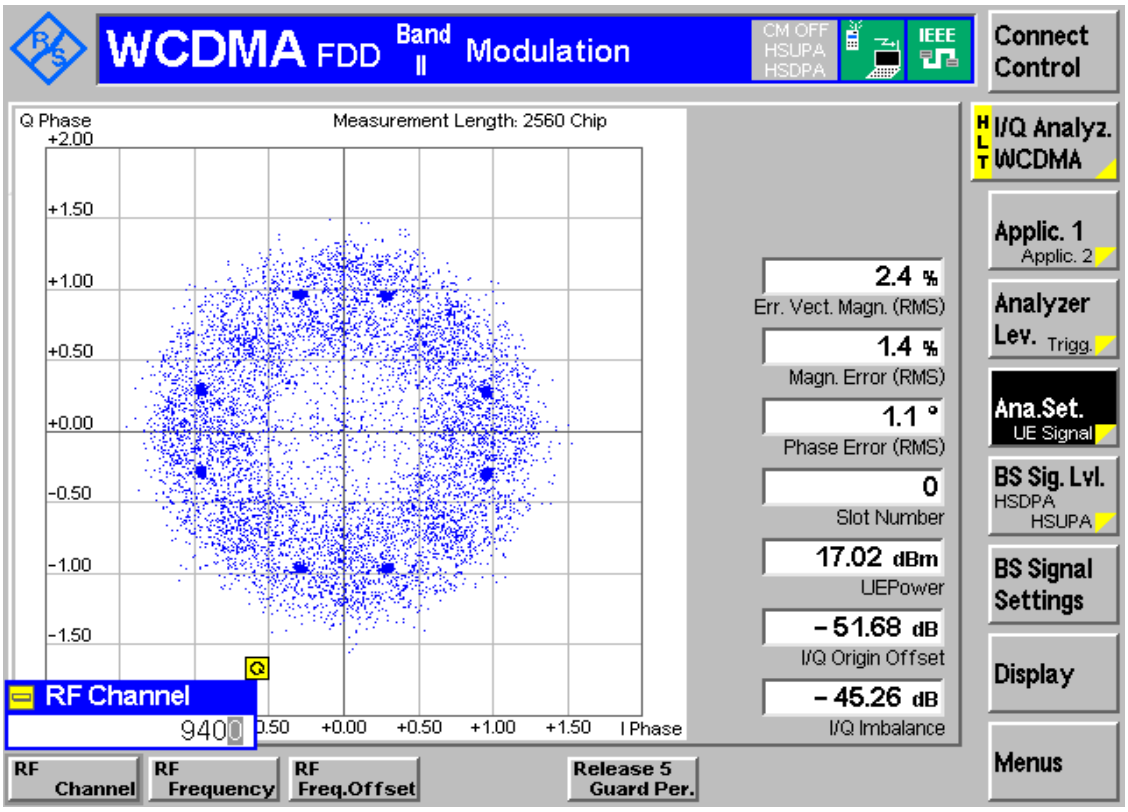
3.2.2 Test Band = WCDMA1900

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	243.23	317.09	Pass
		MCH	242.87	313.99	Pass
		HCH	243.29	316.54	Pass
	GSM/TM2	LCH	254.23	318.34	Pass
		MCH	238.47	313.90	Pass
		HCH	247.27	320.06	Pass
GSM1900	GSM/TM1	LCH	246.52	314.67	Pass
		MCH	242.73	311.02	Pass
		HCH	243.90	312.47	Pass
	GSM/TM2	LCH	241.55	305.98	Pass
		MCH	249.63	323.71	Pass
		HCH	243.42	307.03	Pass

Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA850	UMTS/TM1	LCH	4.14	4.70	Pass
		MCH	4.17	4.70	Pass
		HCH	4.15	4.69	Pass
WCDMA1900	UMTS/TM1	LCH	4.16	4.71	Pass
		MCH	4.15	4.71	Pass
		HCH	4.16	4.72	Pass

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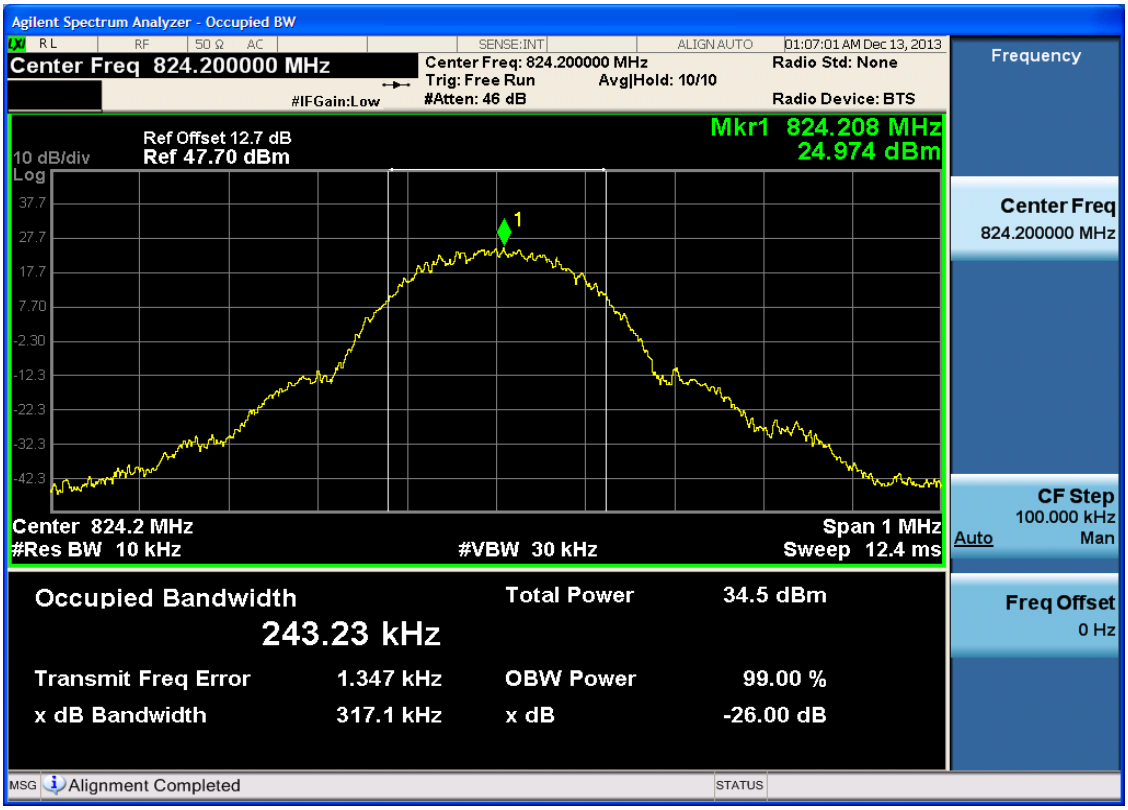
Part II - Test Plots

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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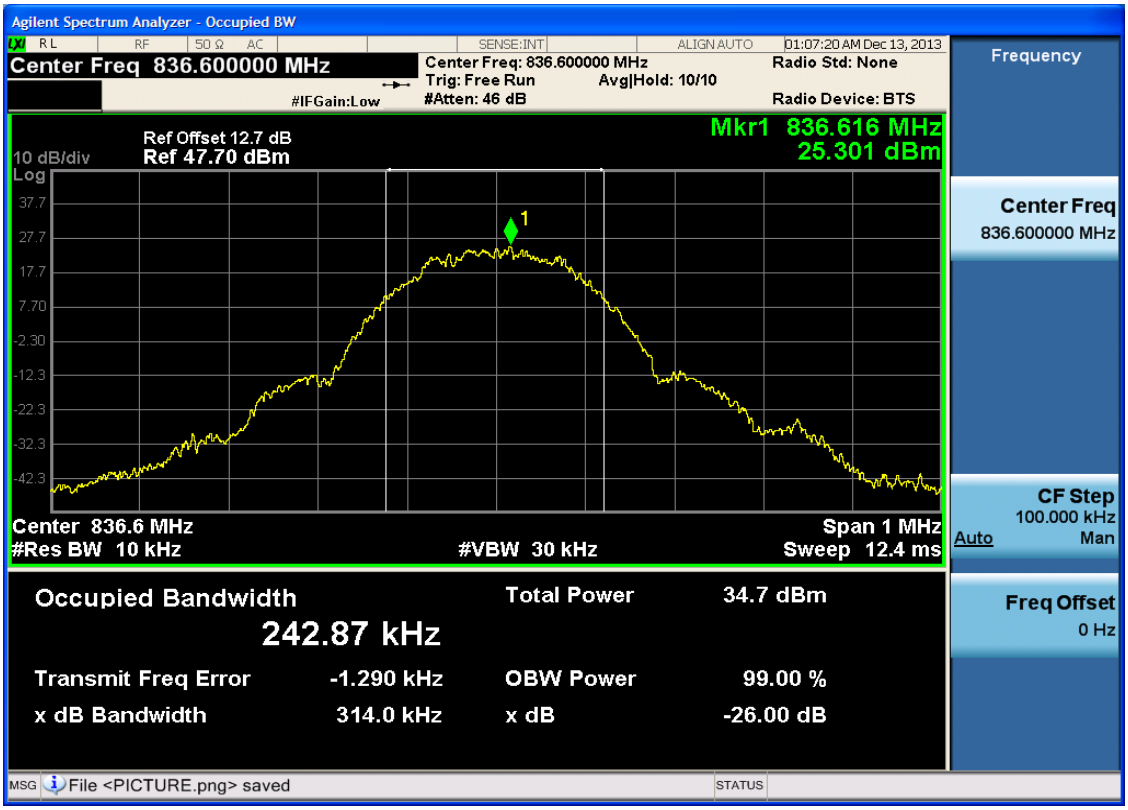
4.1.1.1.2 Test Channel = MCH



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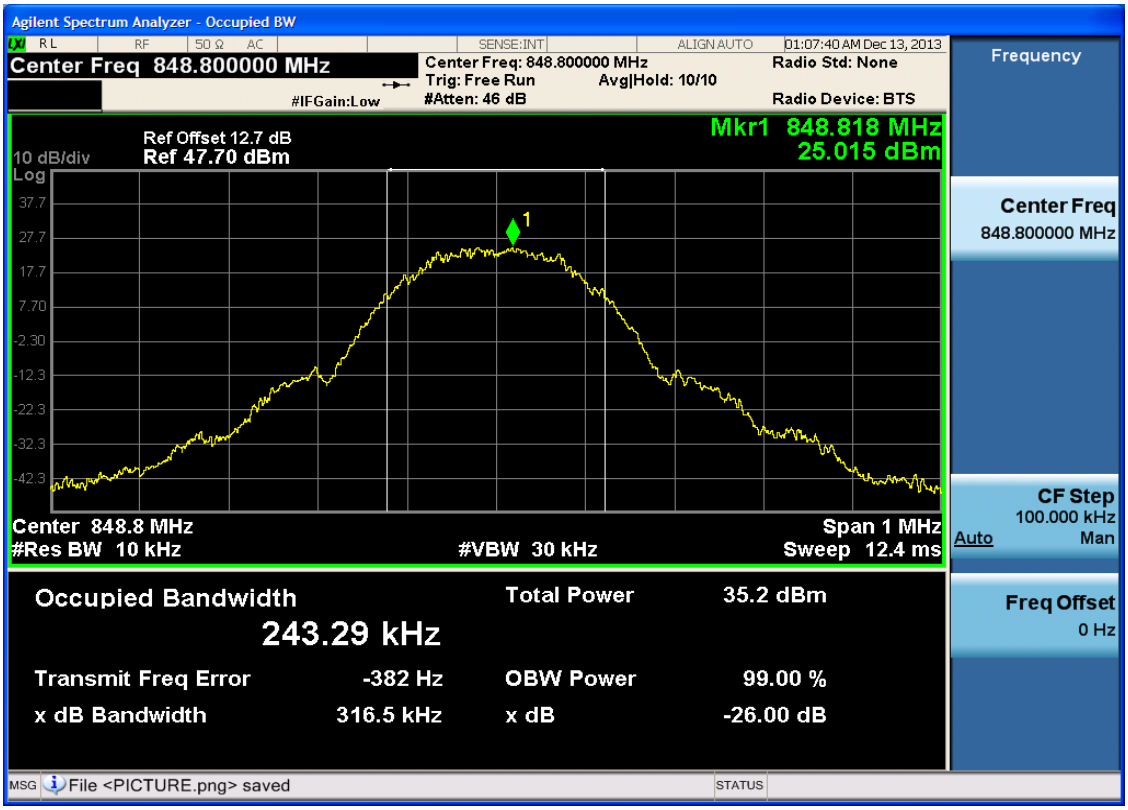
4.1.1.1.3 Test Channel = HCH



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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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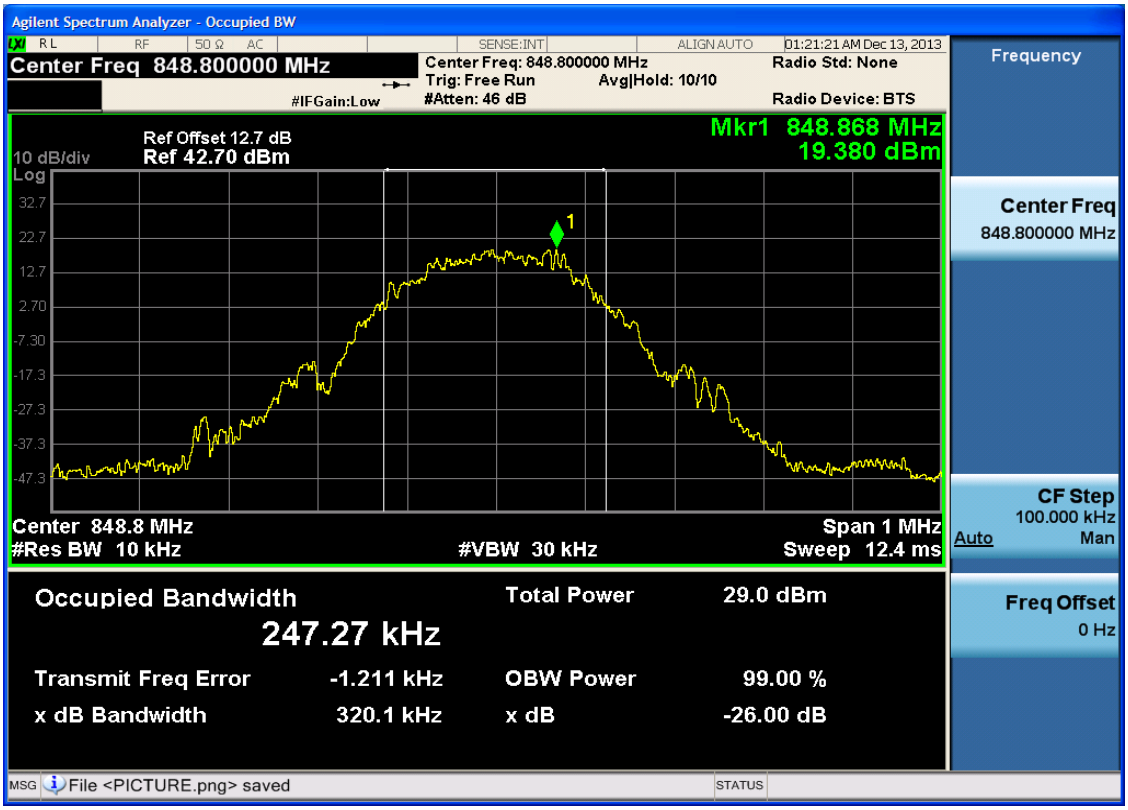
4.1.1.2.3 Test Channel = HCH



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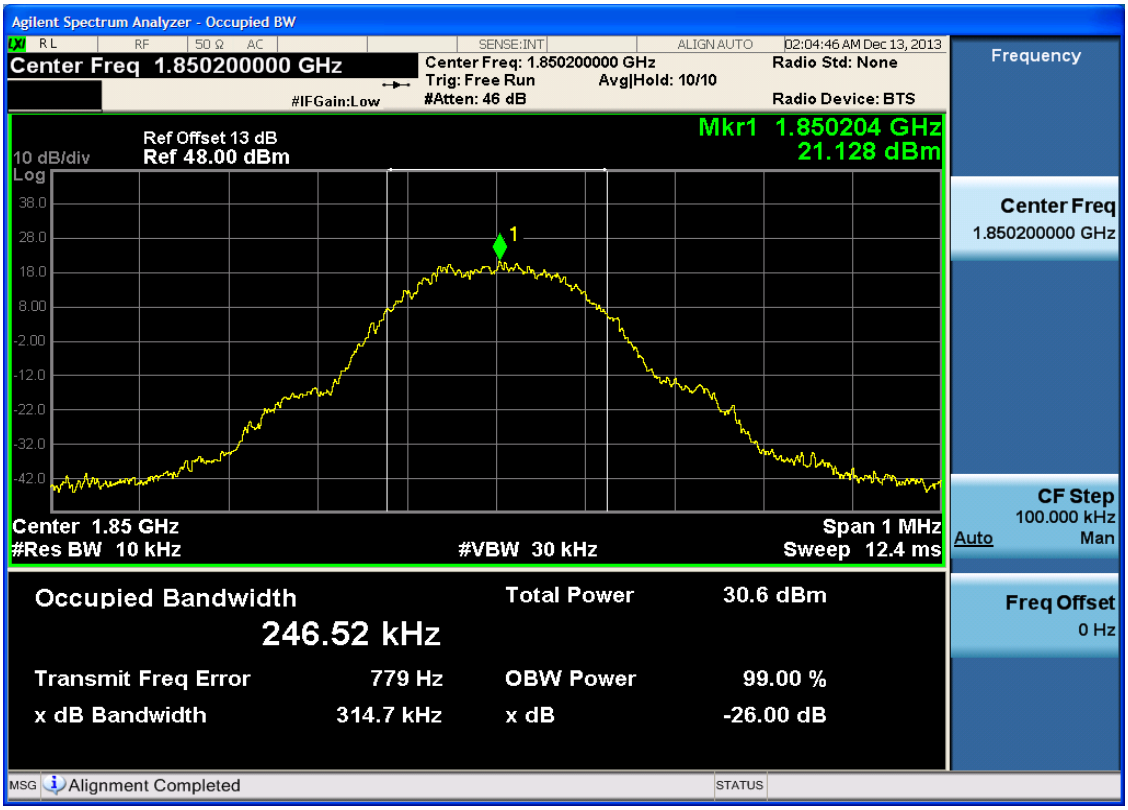
4.1.2 Test Band = GSM1900

4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



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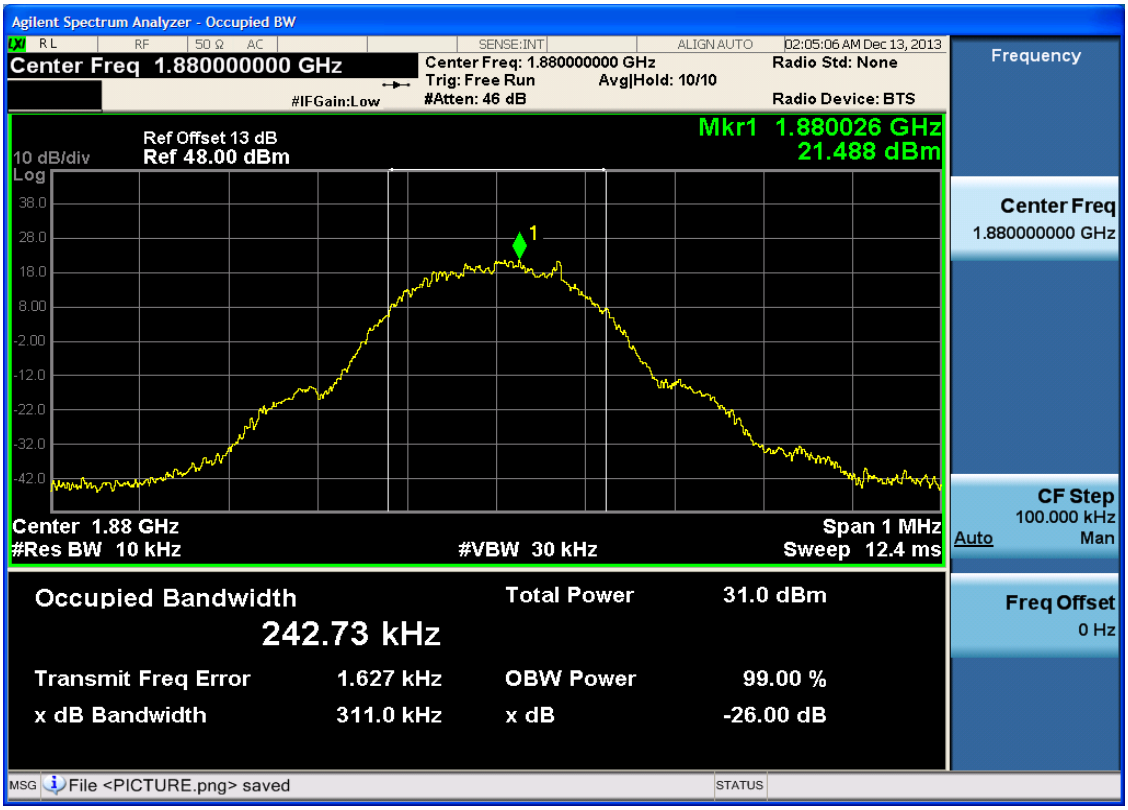
4.1.2.1.2 Test Channel = MCH



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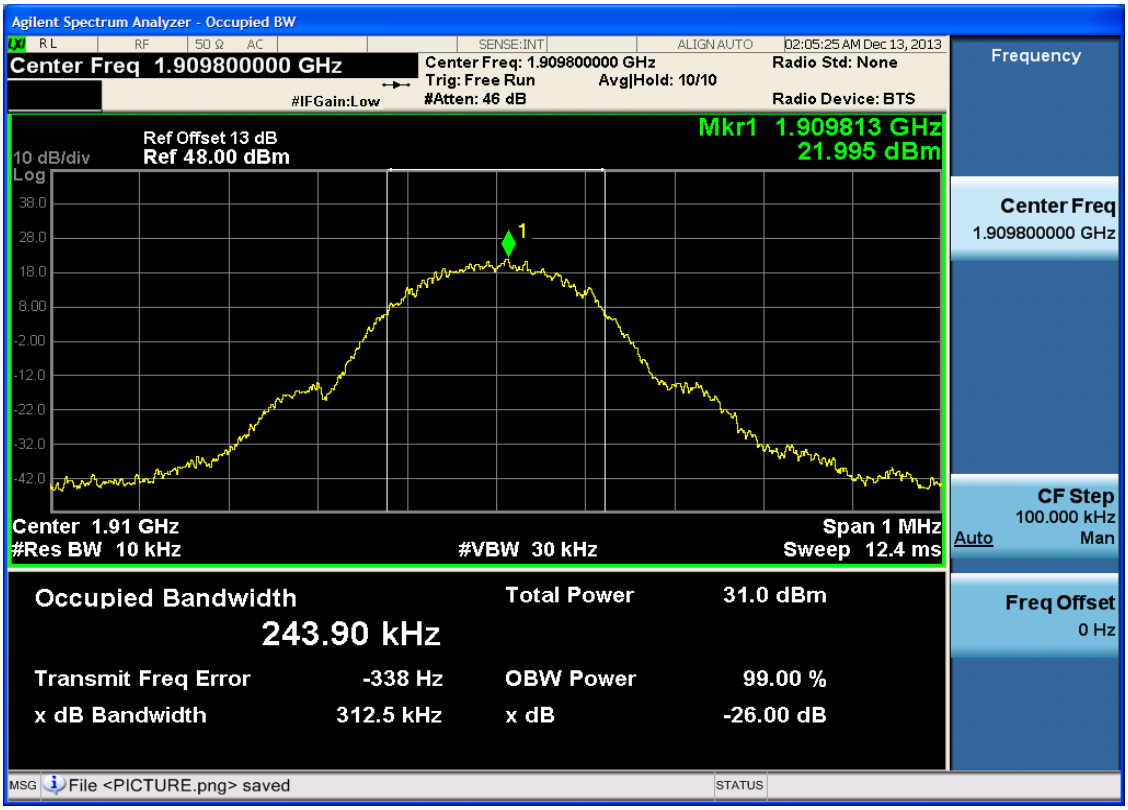
4.1.2.1.3 Test Channel = HCH



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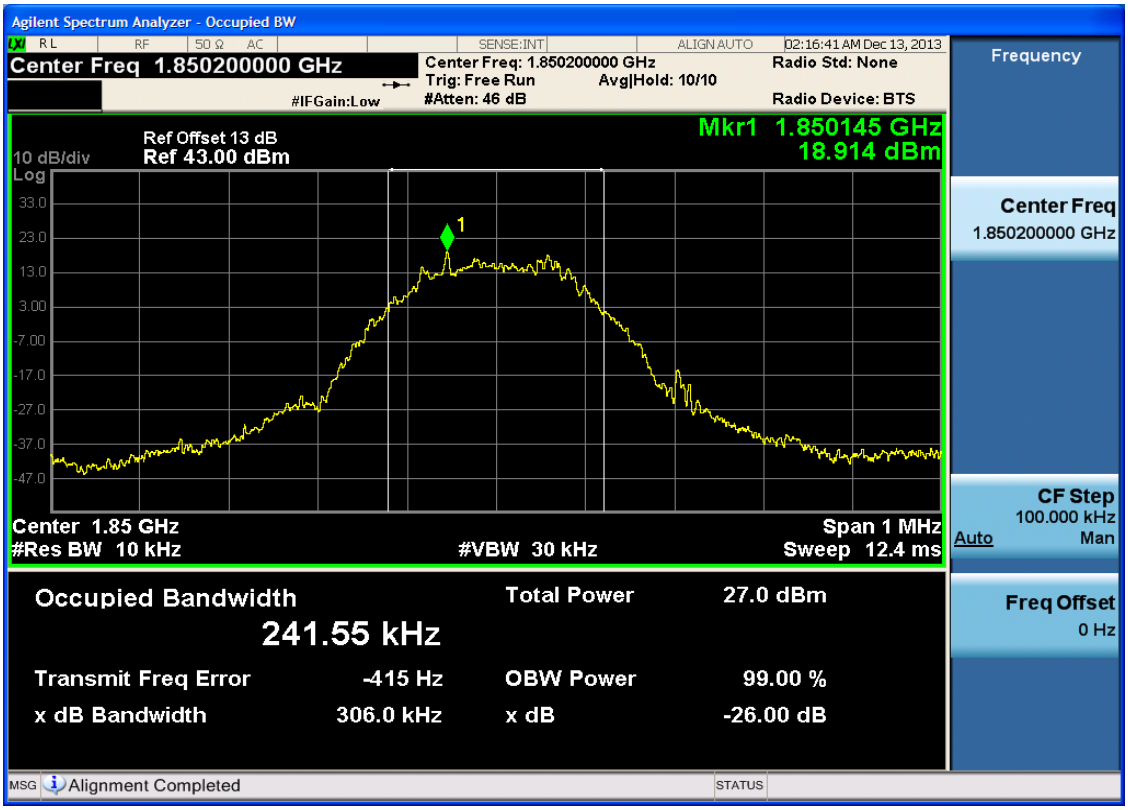
4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



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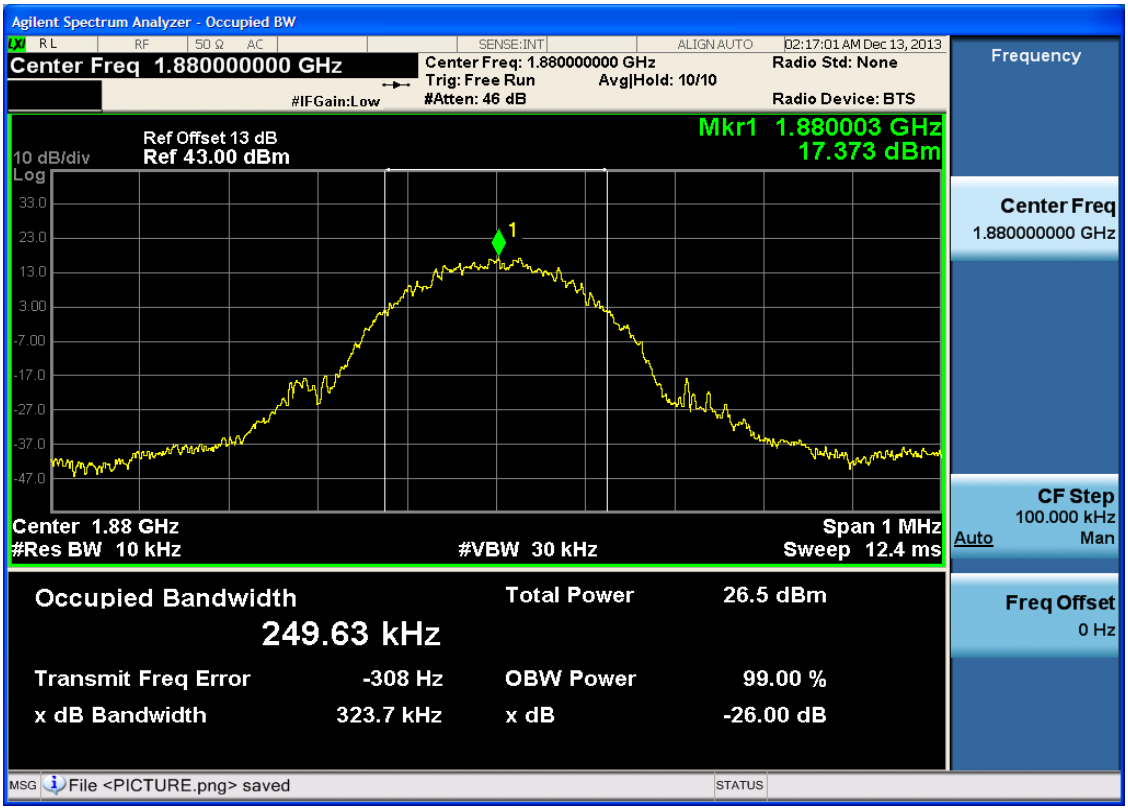
4.1.2.2.2 Test Channel = MCH



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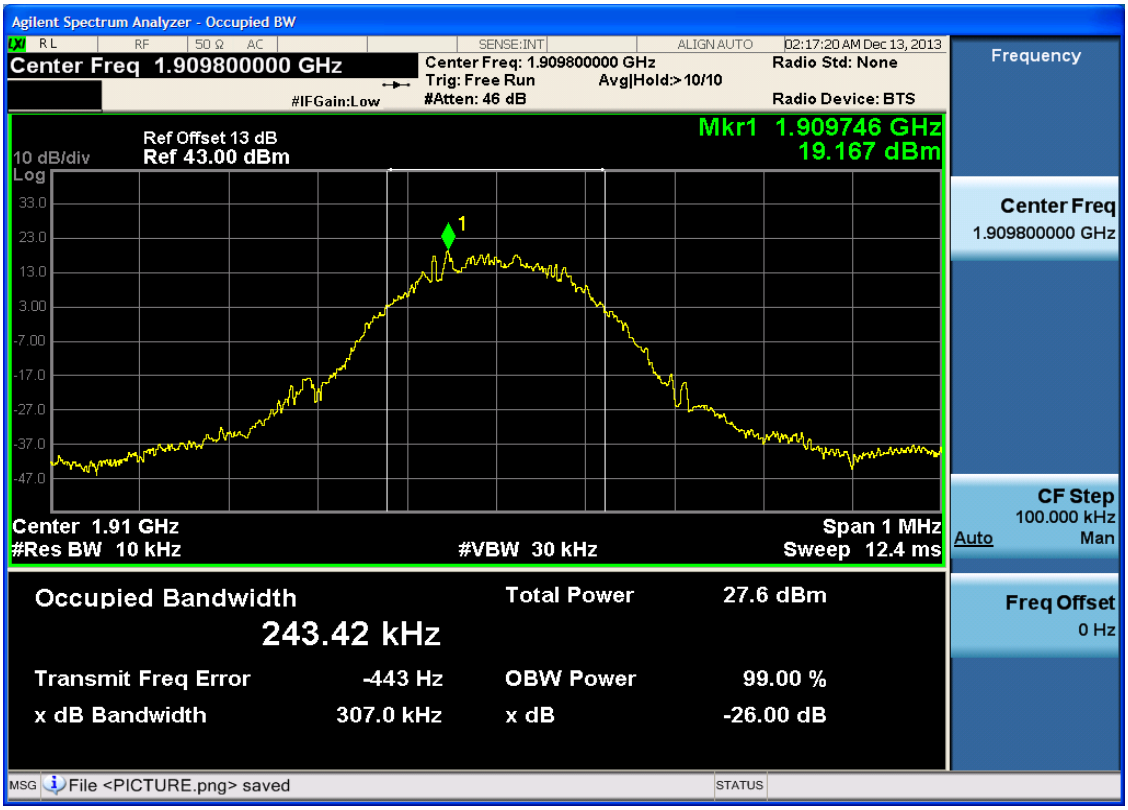
4.1.2.2.3 Test Channel = HCH



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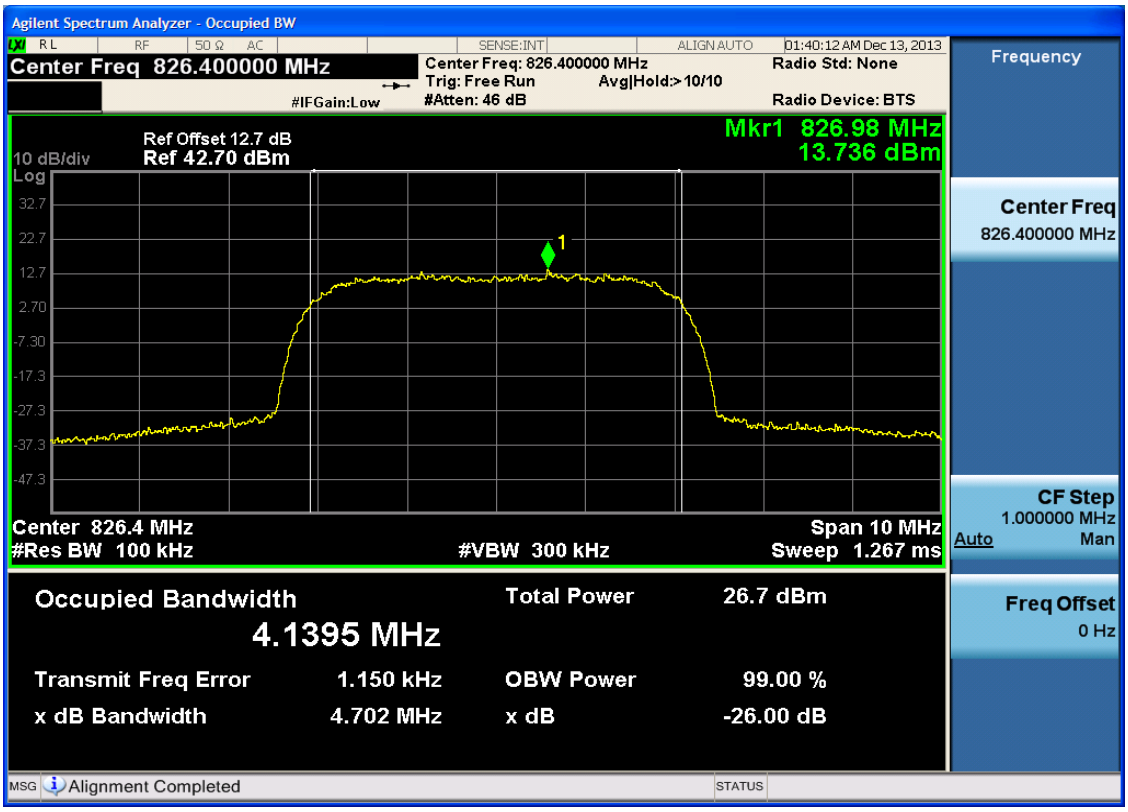
4.2 For UMTS

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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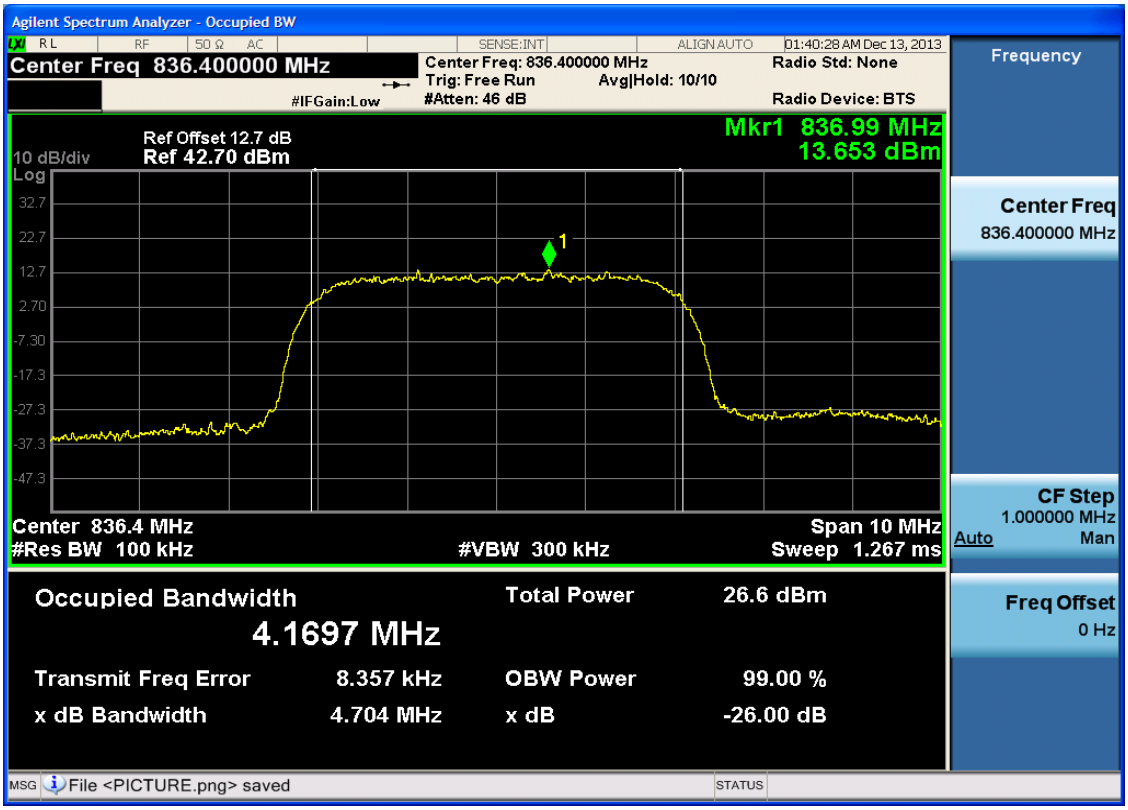
4.2.1.1.2 Test Channel = MCH



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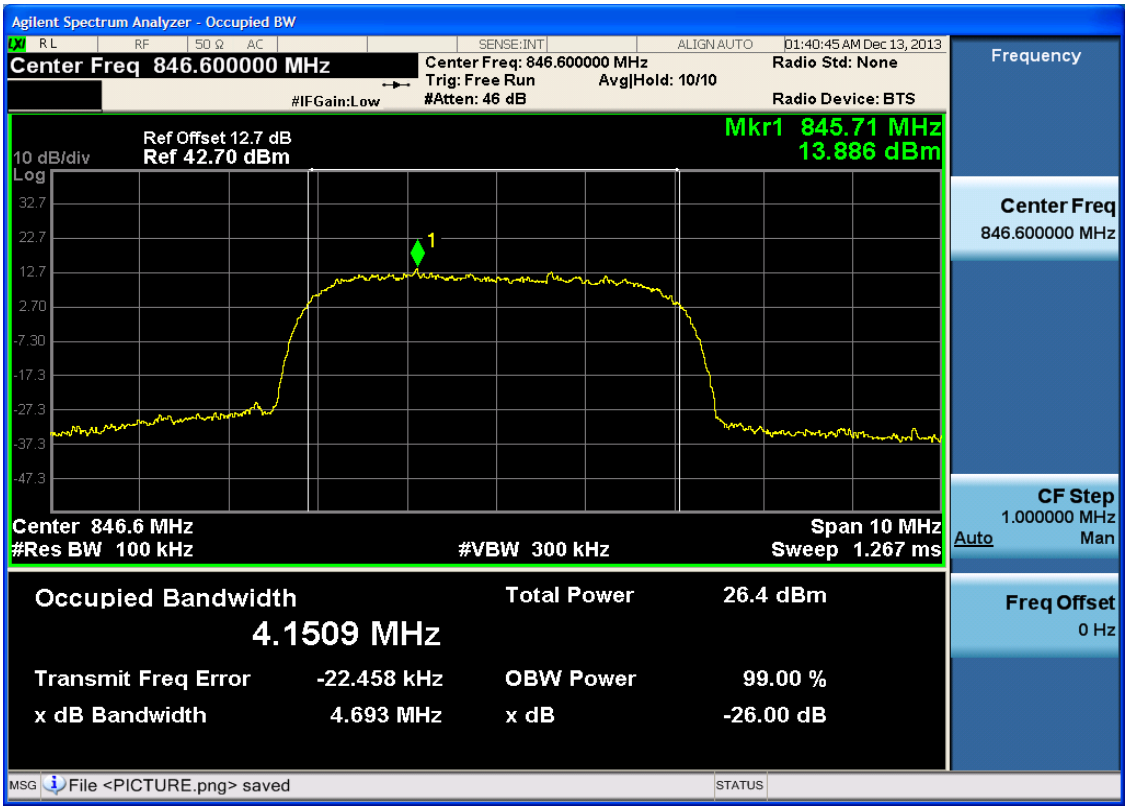
4.2.1.1.3 Test Channel = HCH



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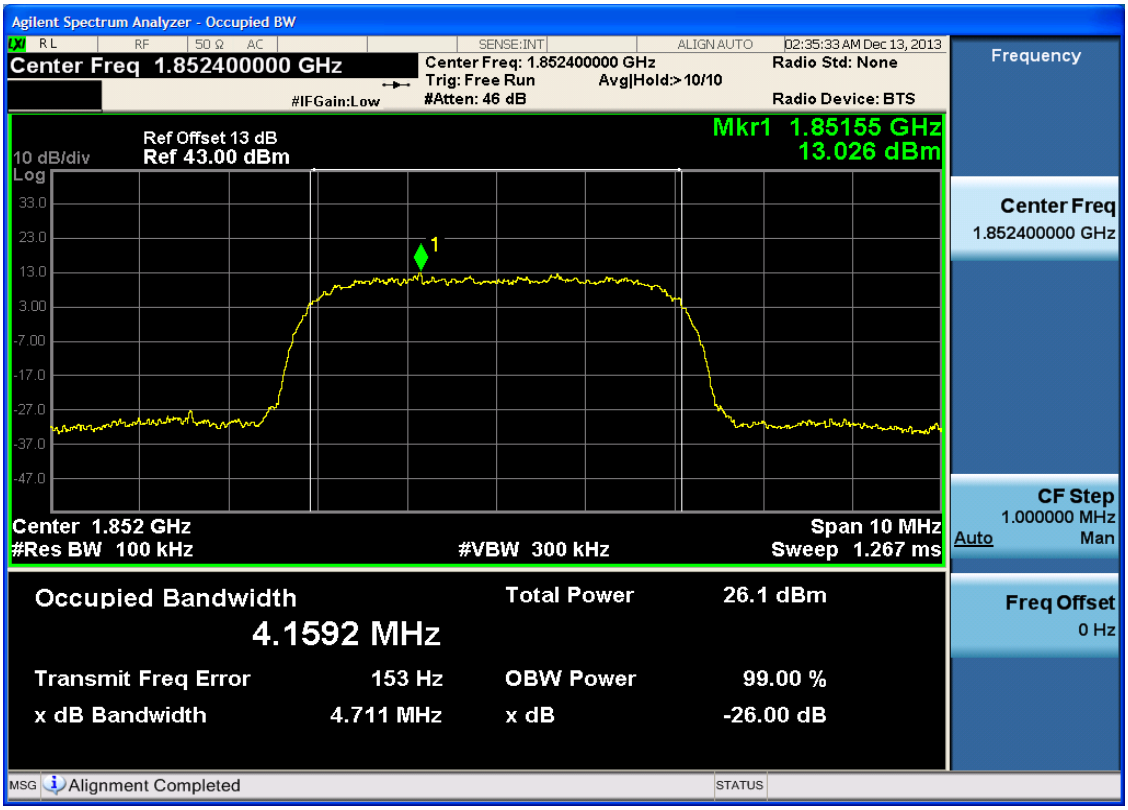
4.2.2 Test Band = WCDMA1900

4.2.2.1 Test Mode = UMTS/TM1

4.2.2.1.1 Test Channel = LCH



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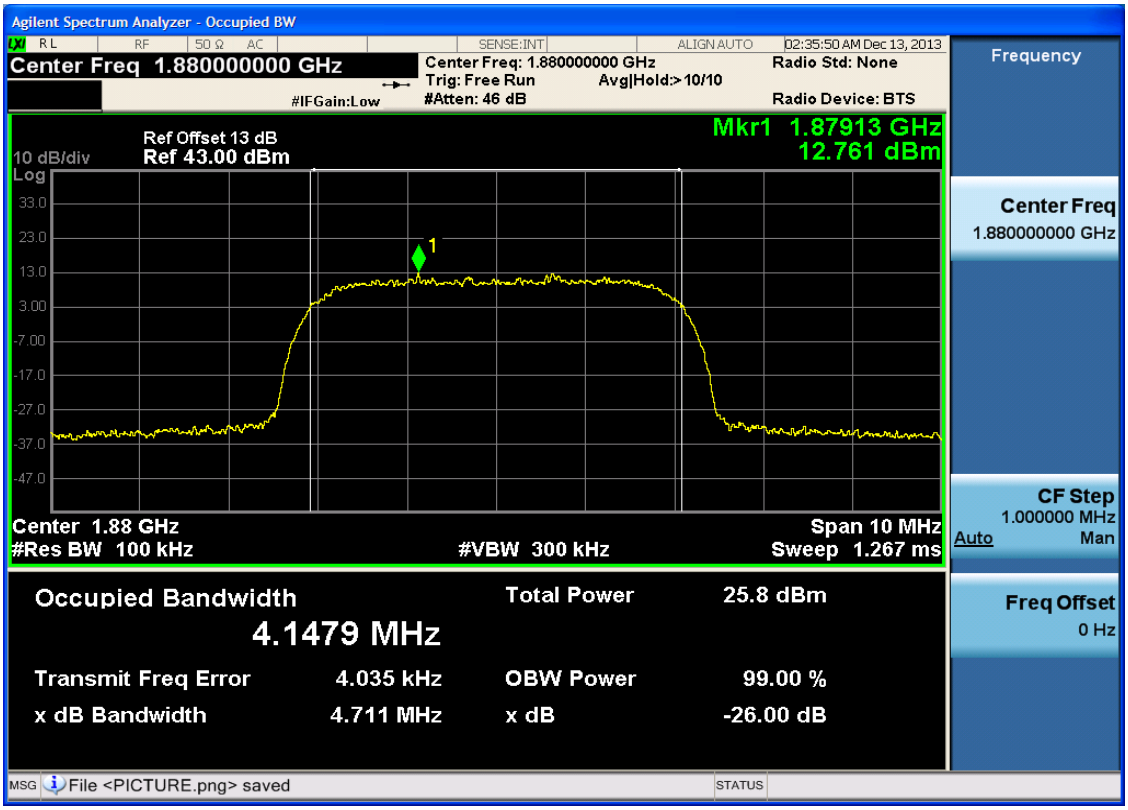
4.2.2.1.2 Test Channel = MCH



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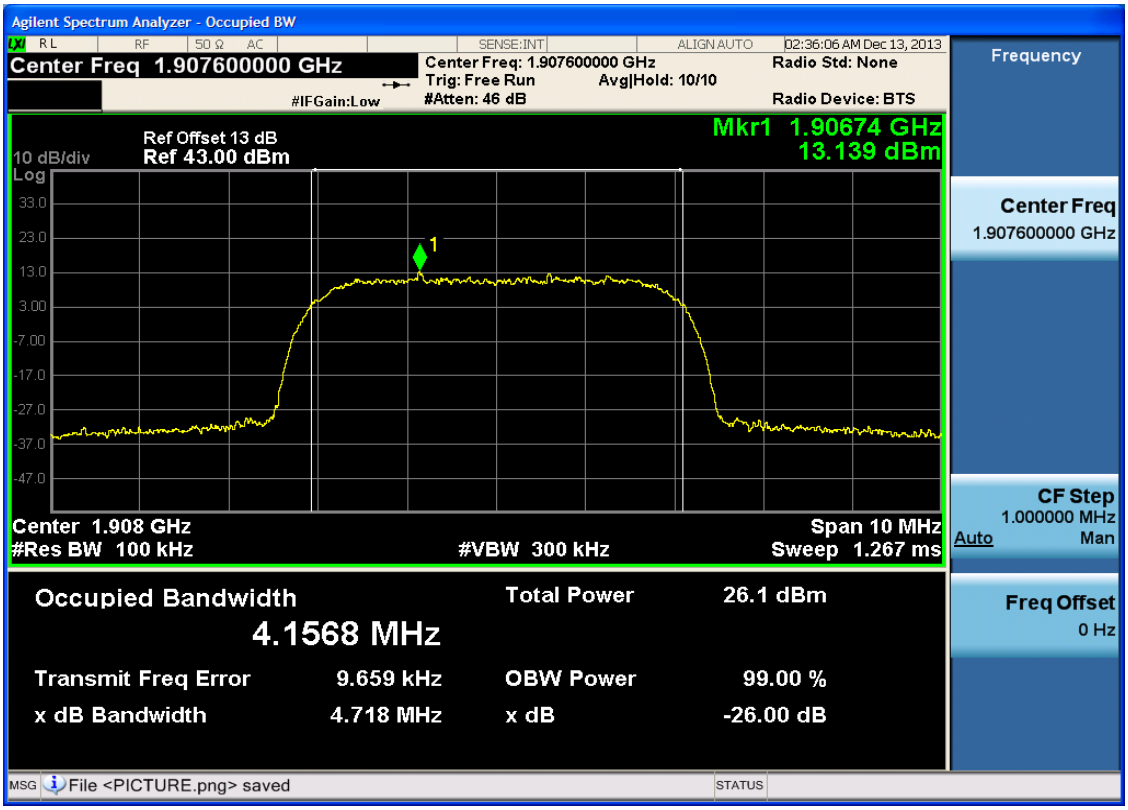
4.2.2.1.3 Test Channel = HCH



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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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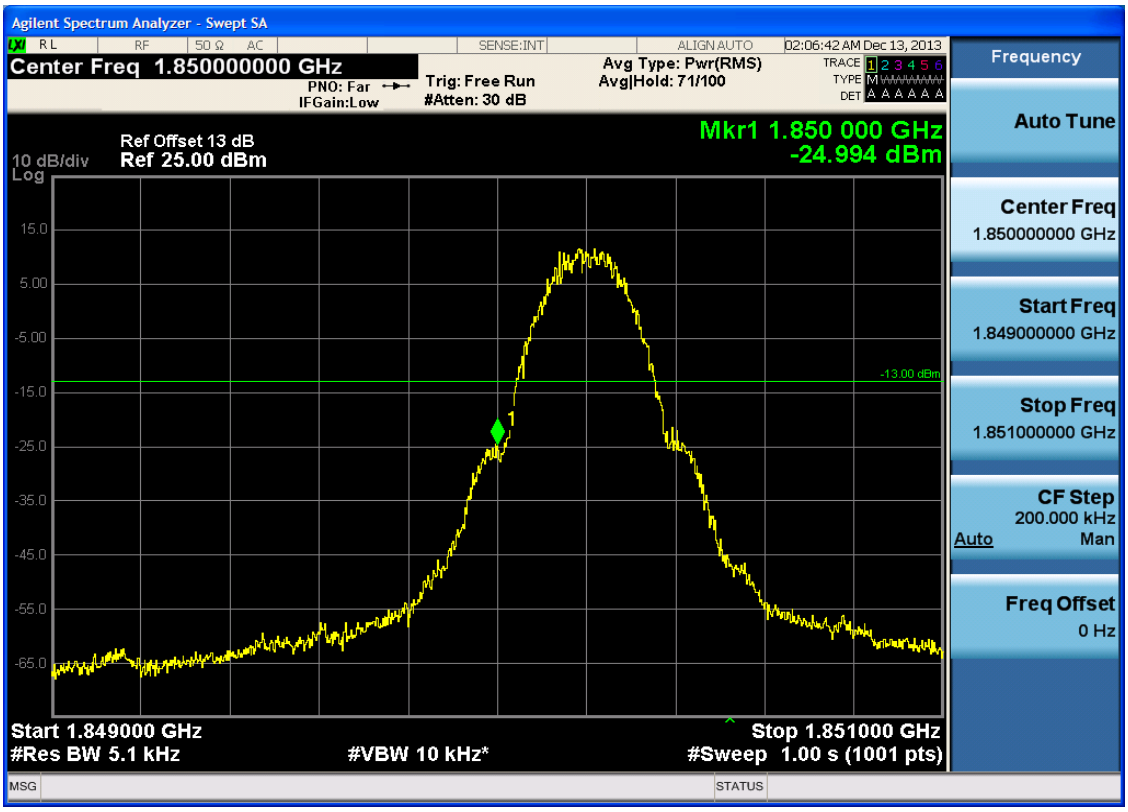
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH



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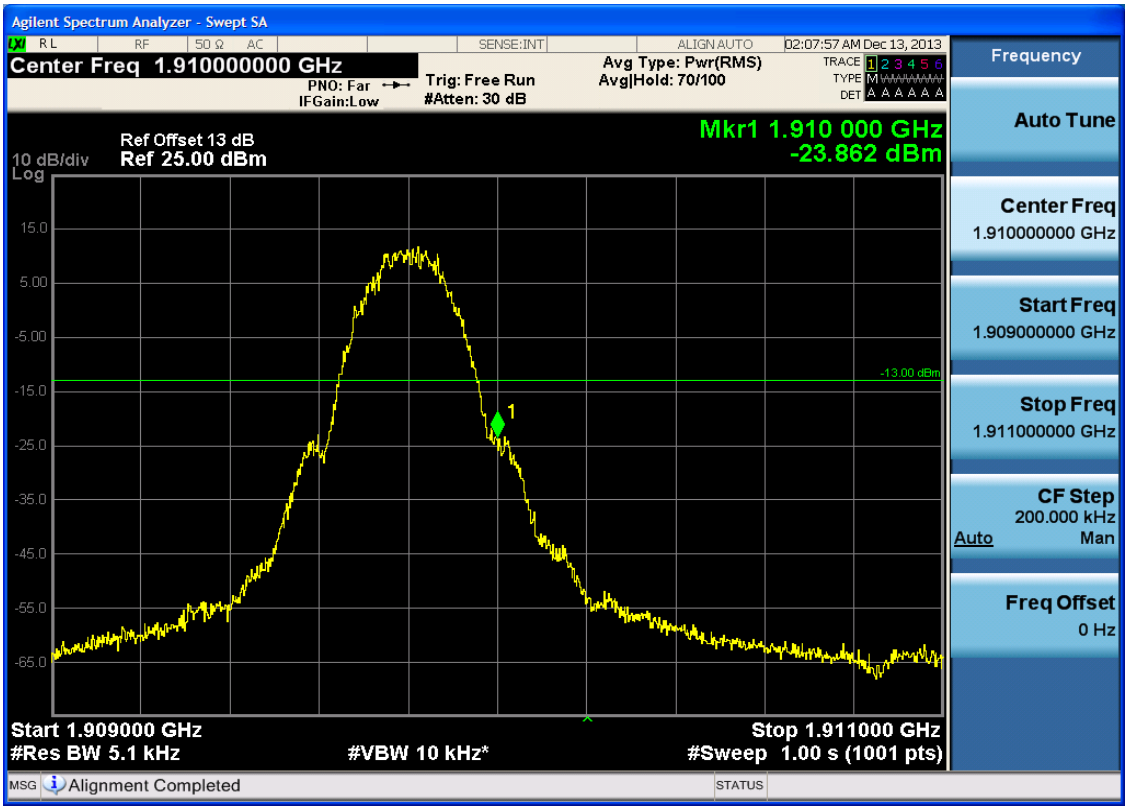
5.1.2.1.2 Test Channel = HCH



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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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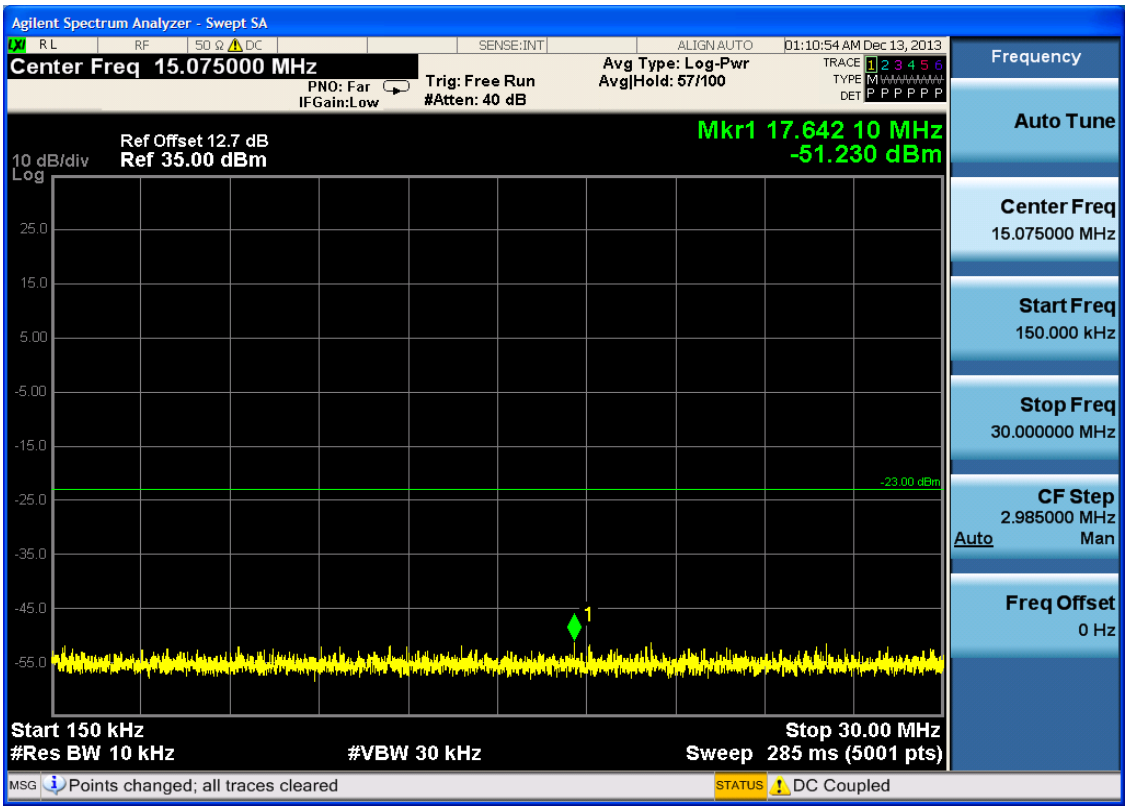

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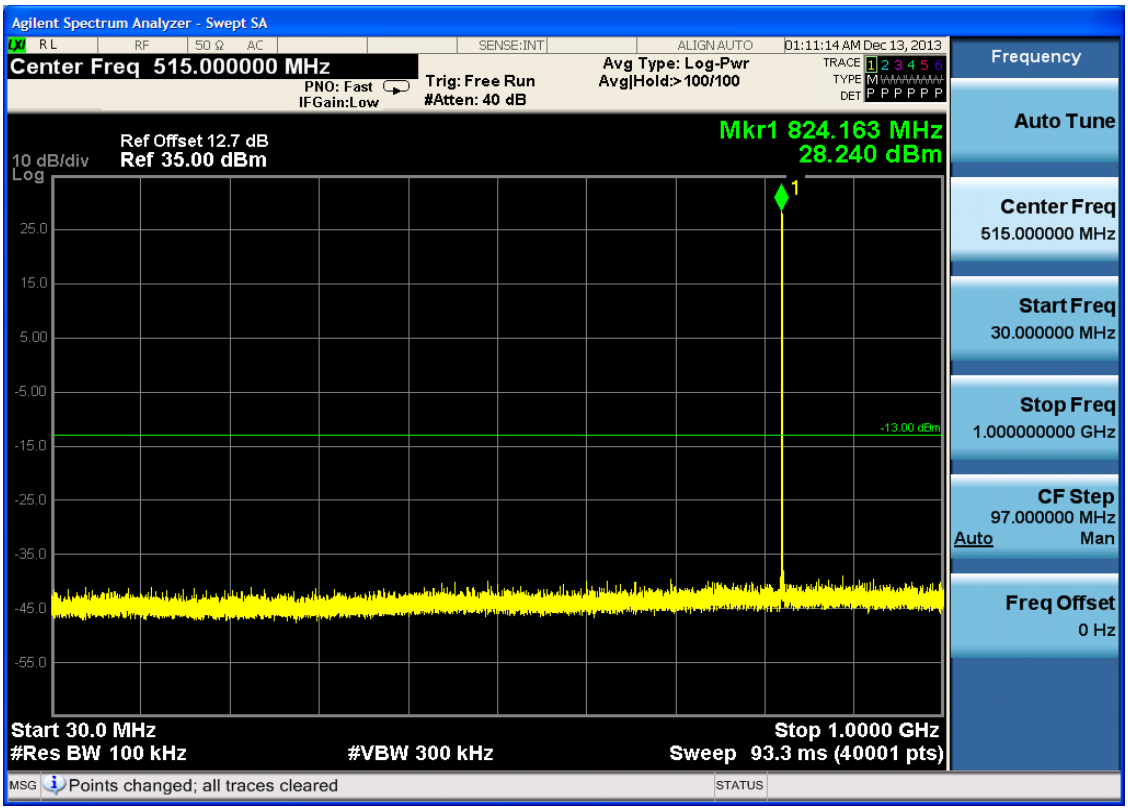

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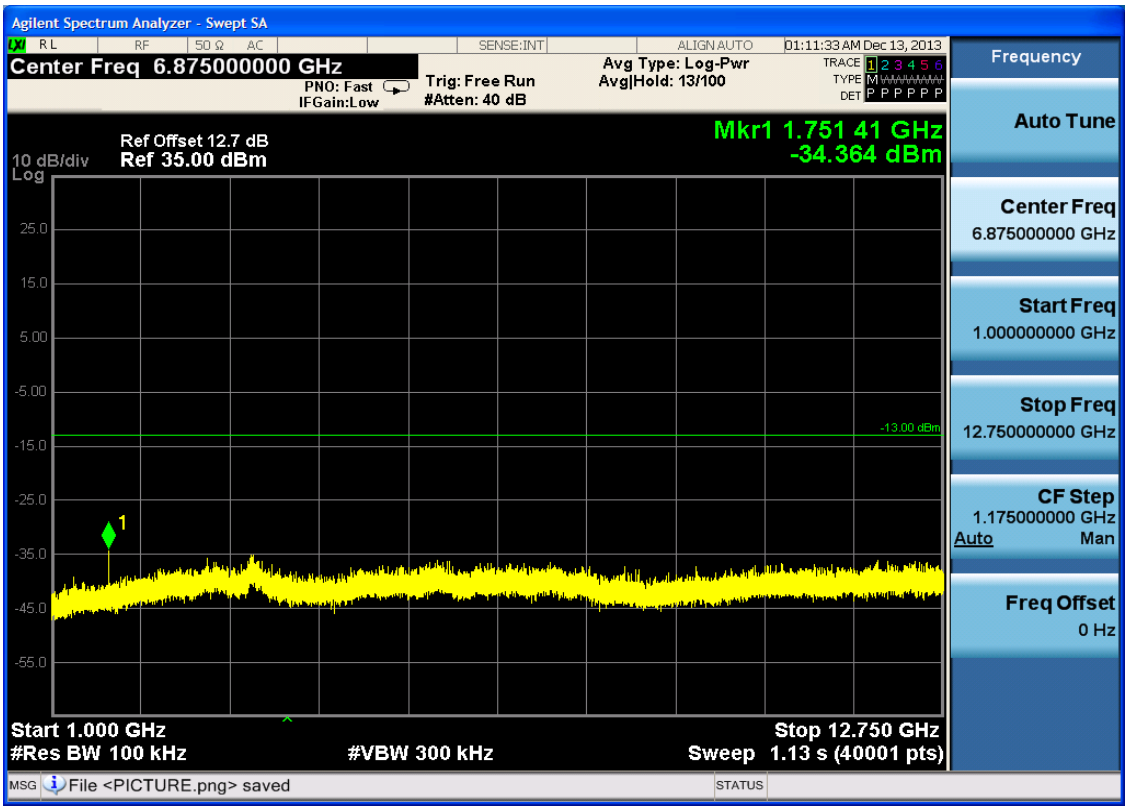

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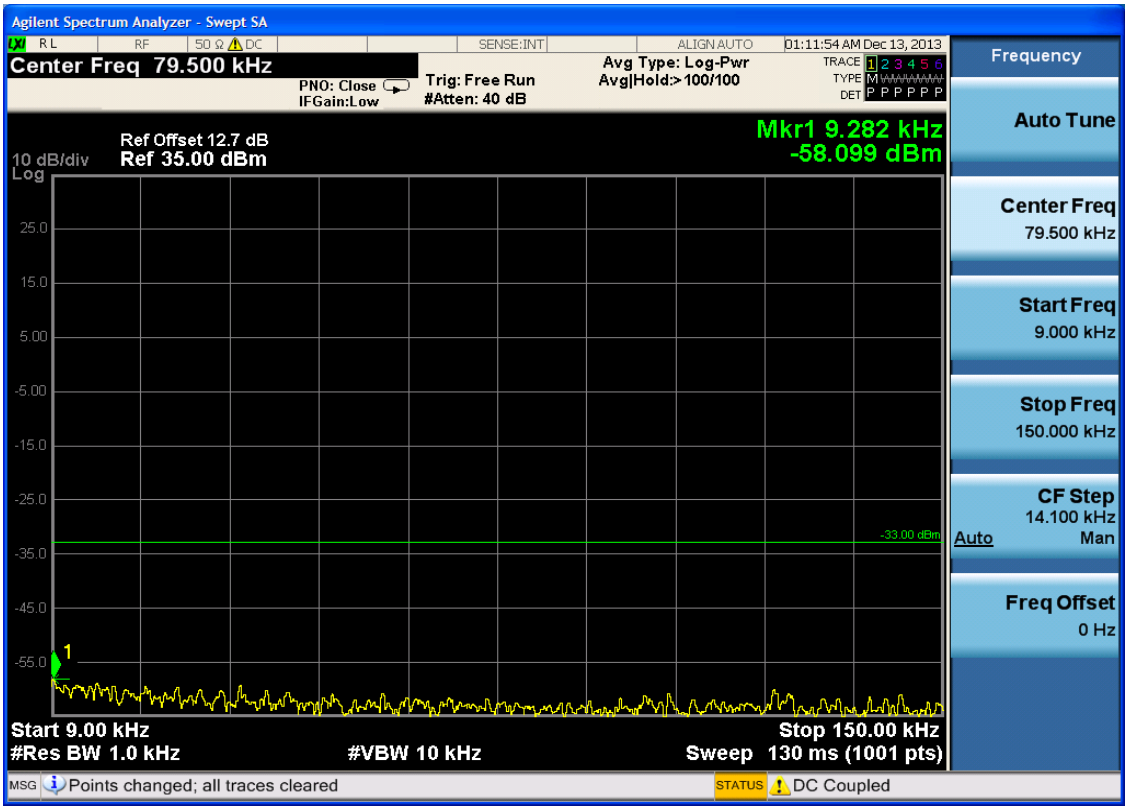
6.1.1.1.2 Test Channel = MCH



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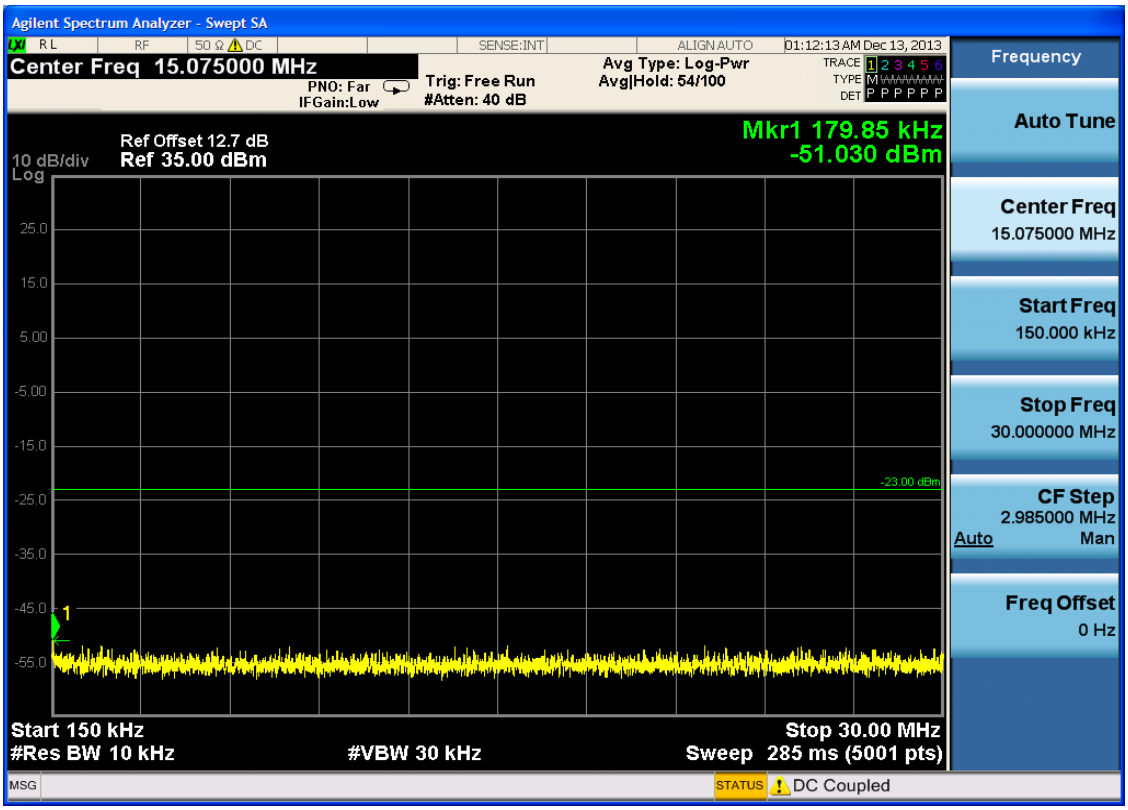

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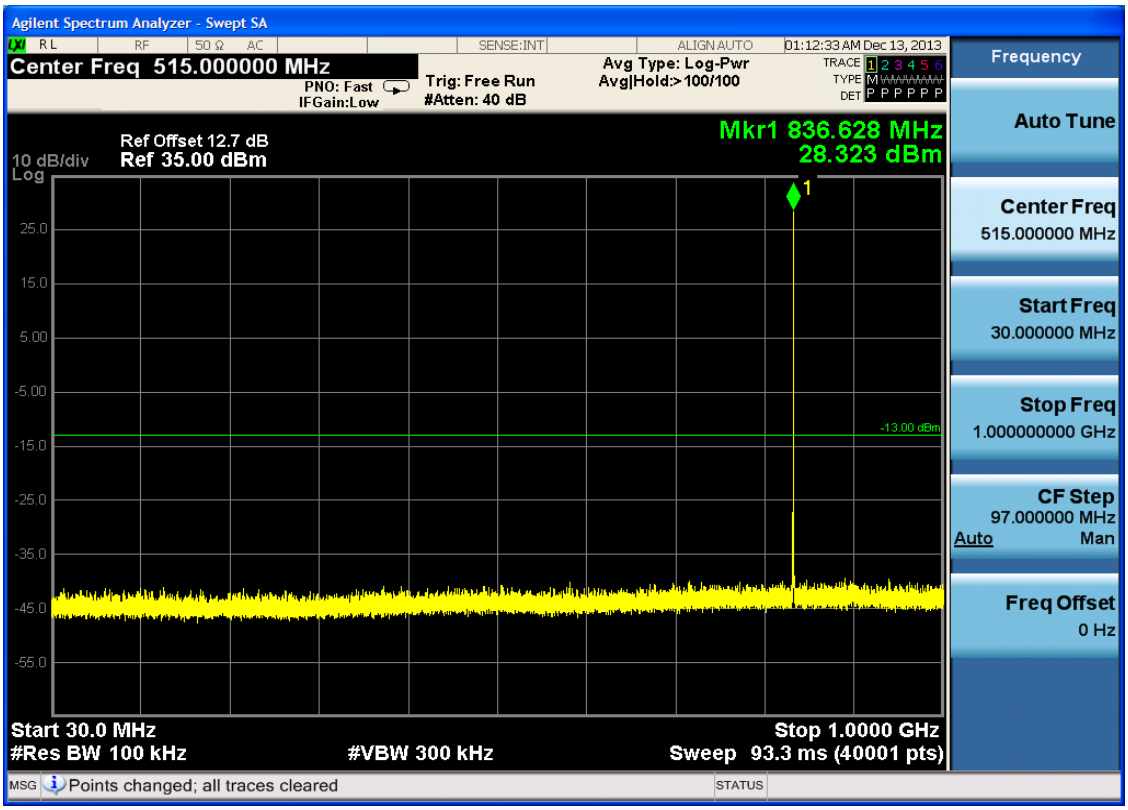

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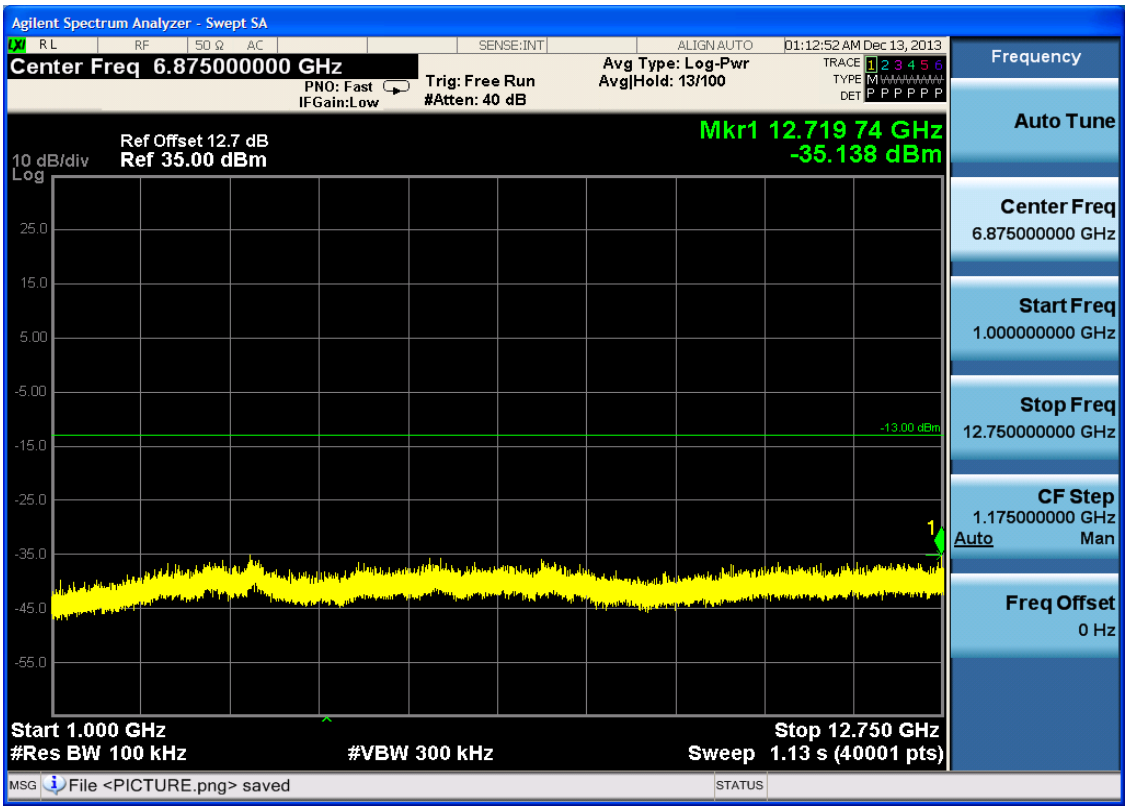

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6.1.1.1.3 Test Channel = HCH

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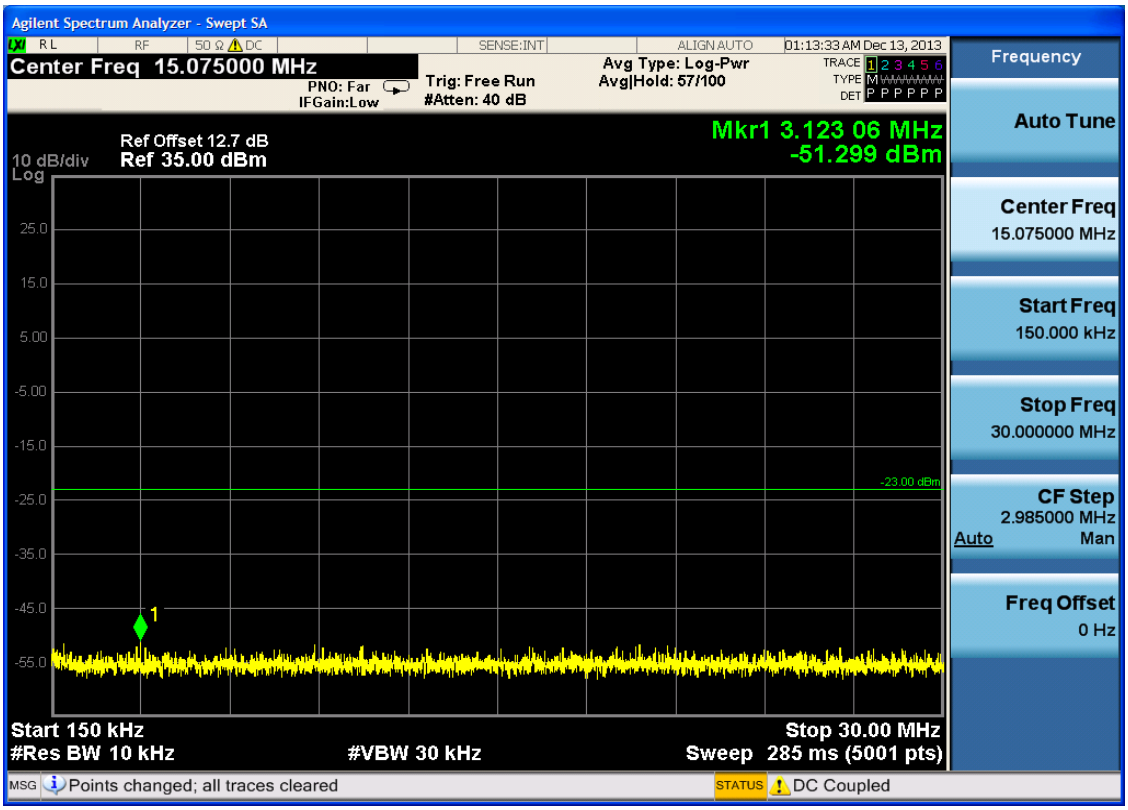

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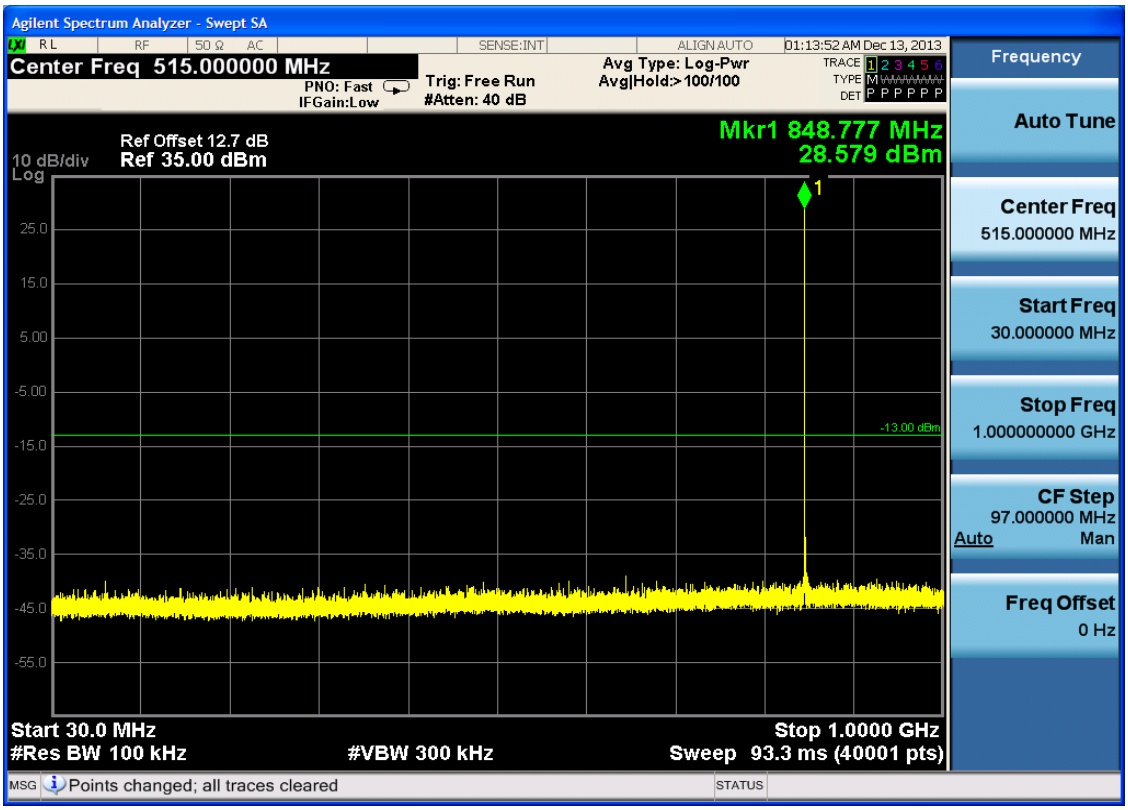

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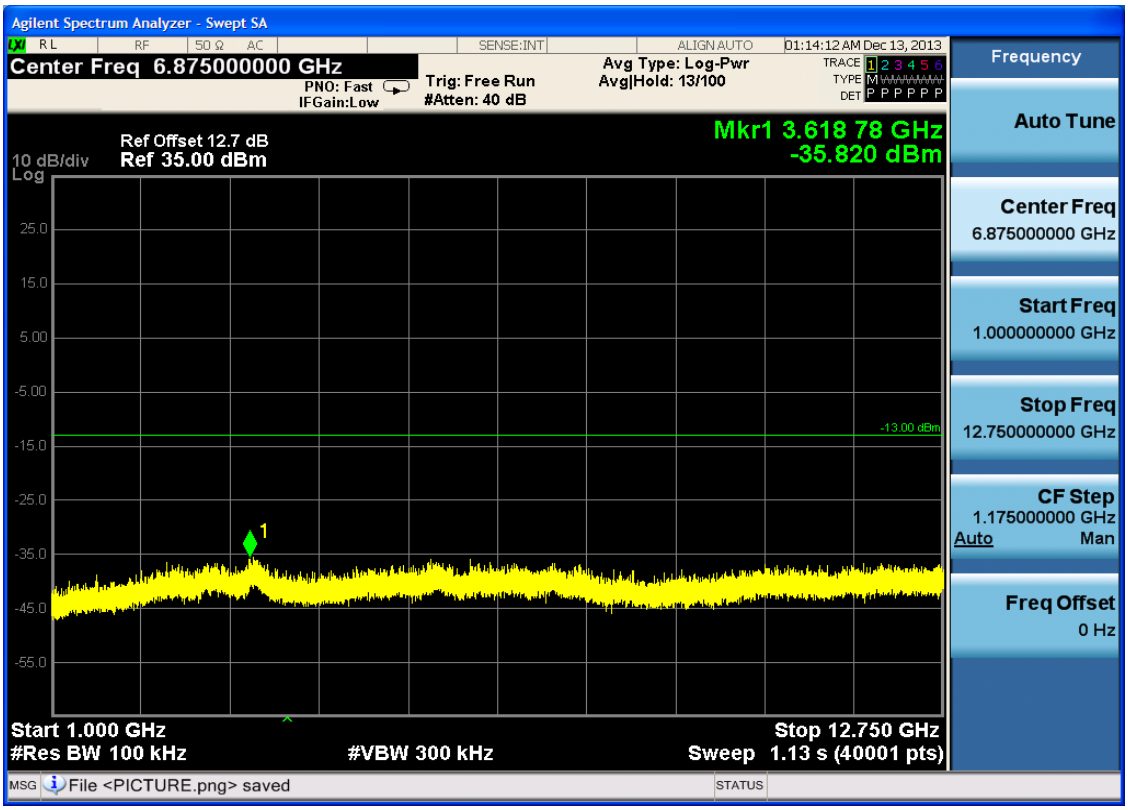

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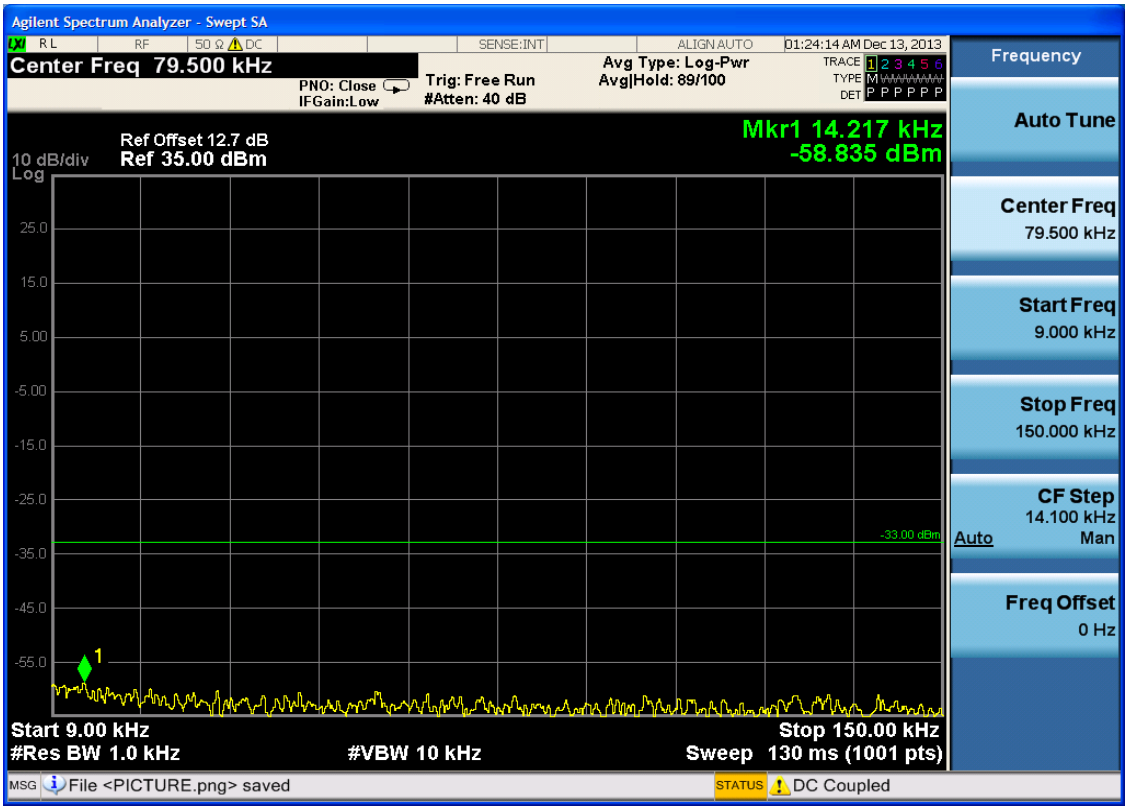
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH



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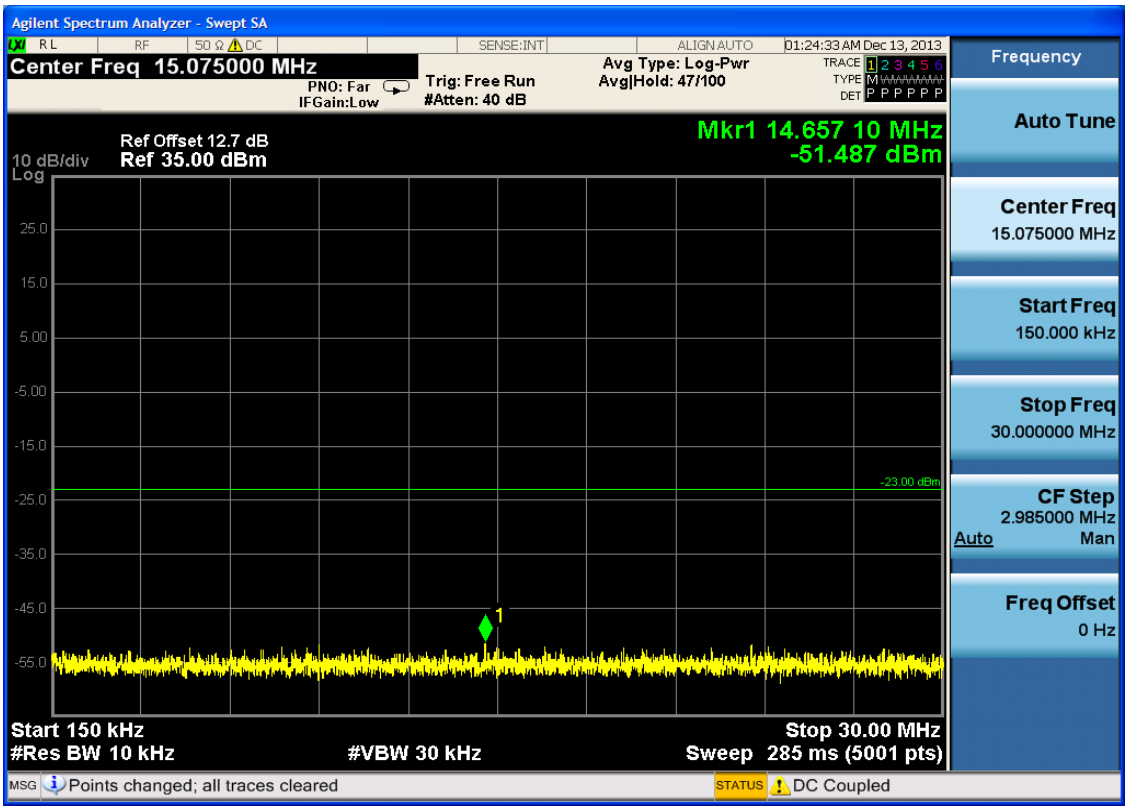

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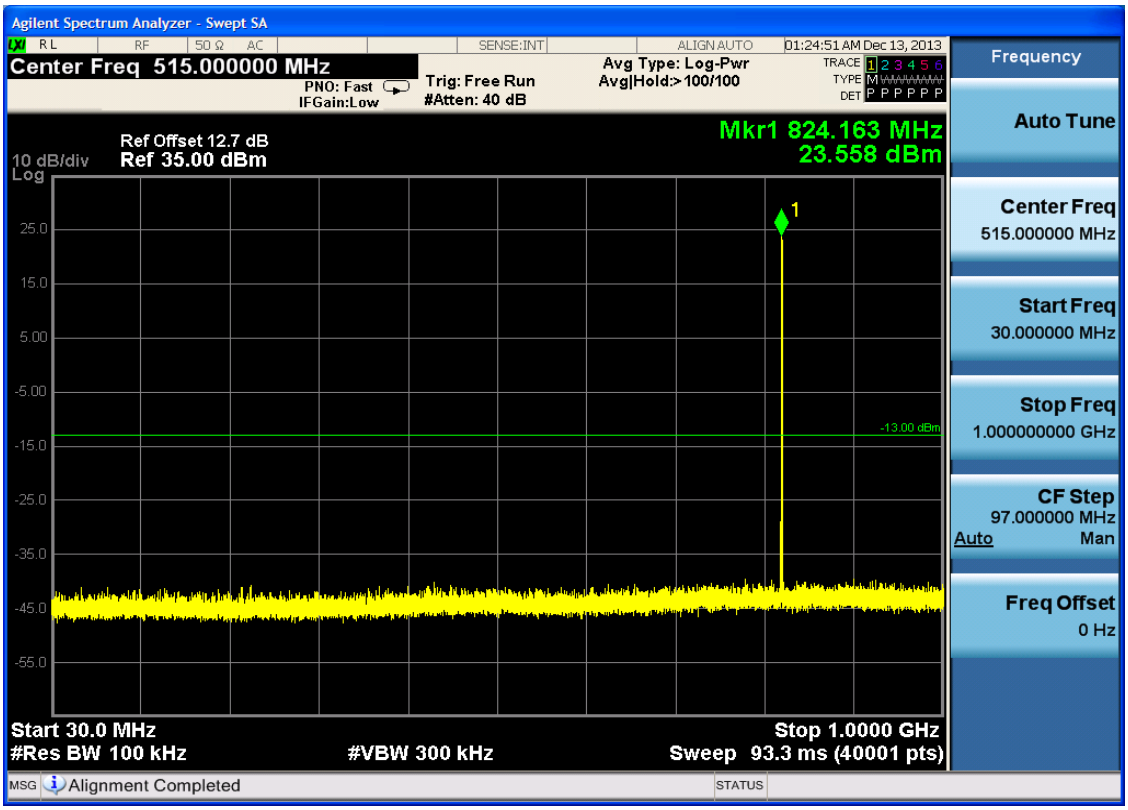

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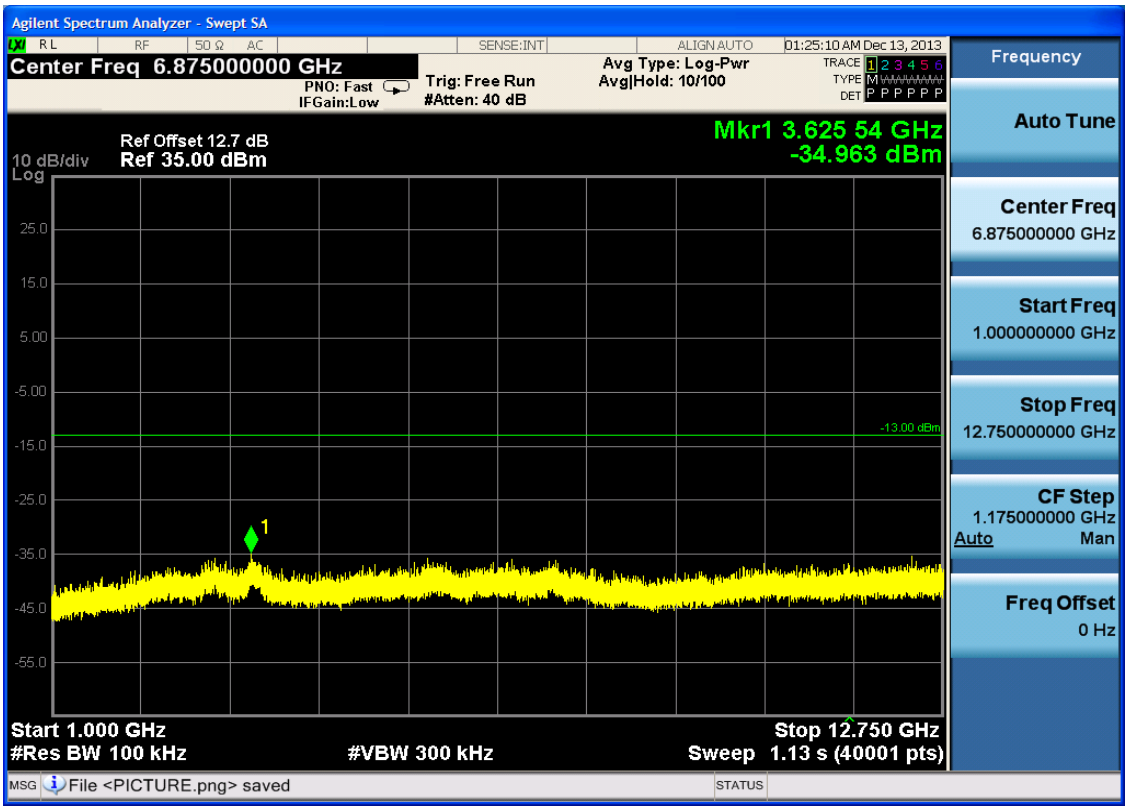

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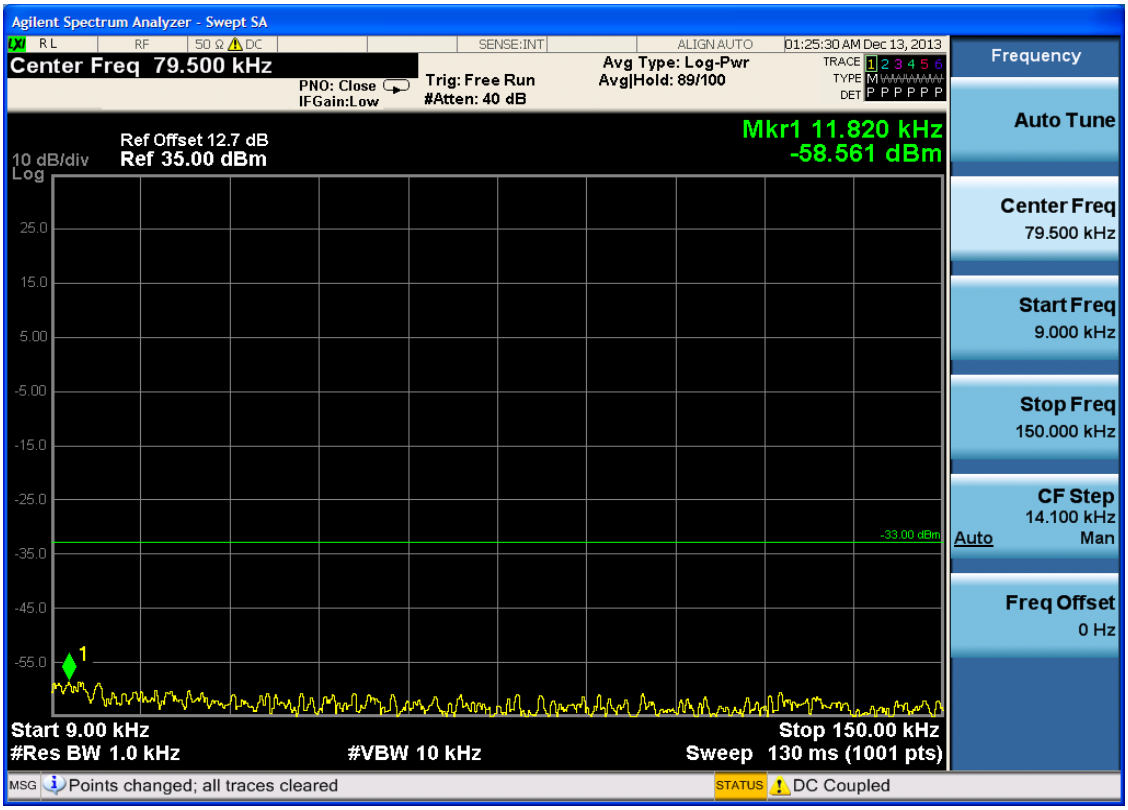
6.1.1.2.2 Test Channel = MCH



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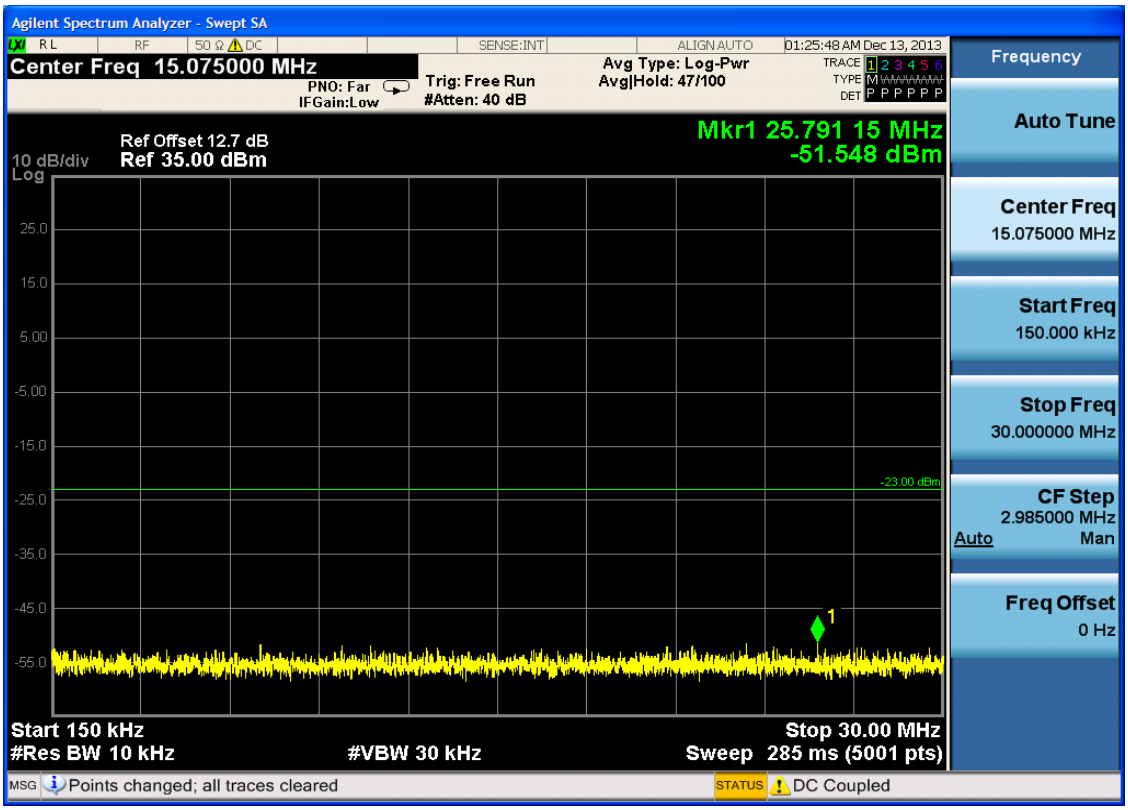

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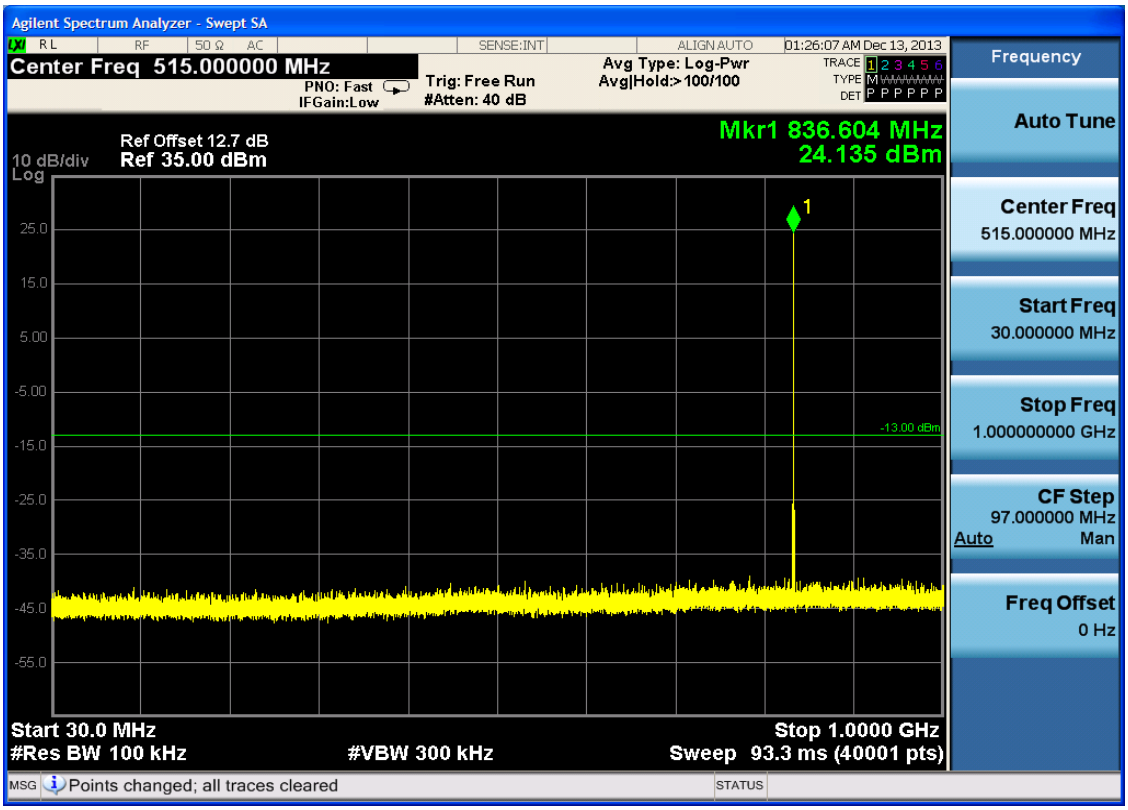

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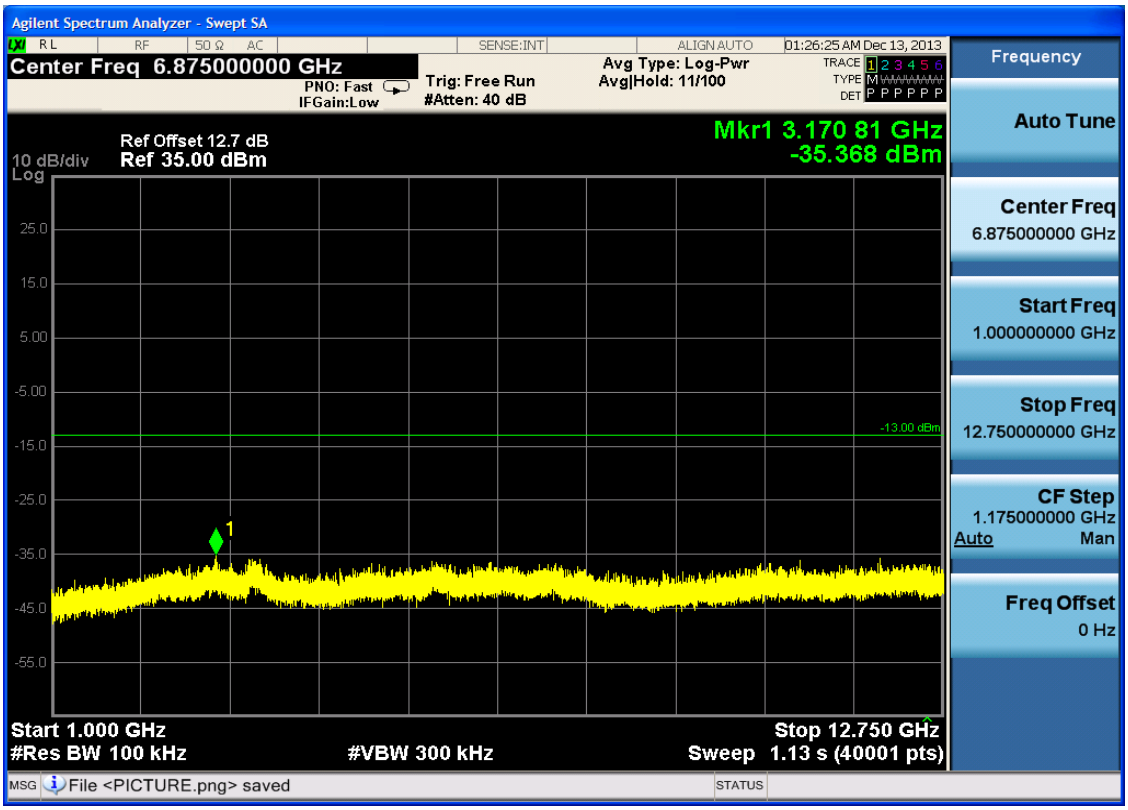

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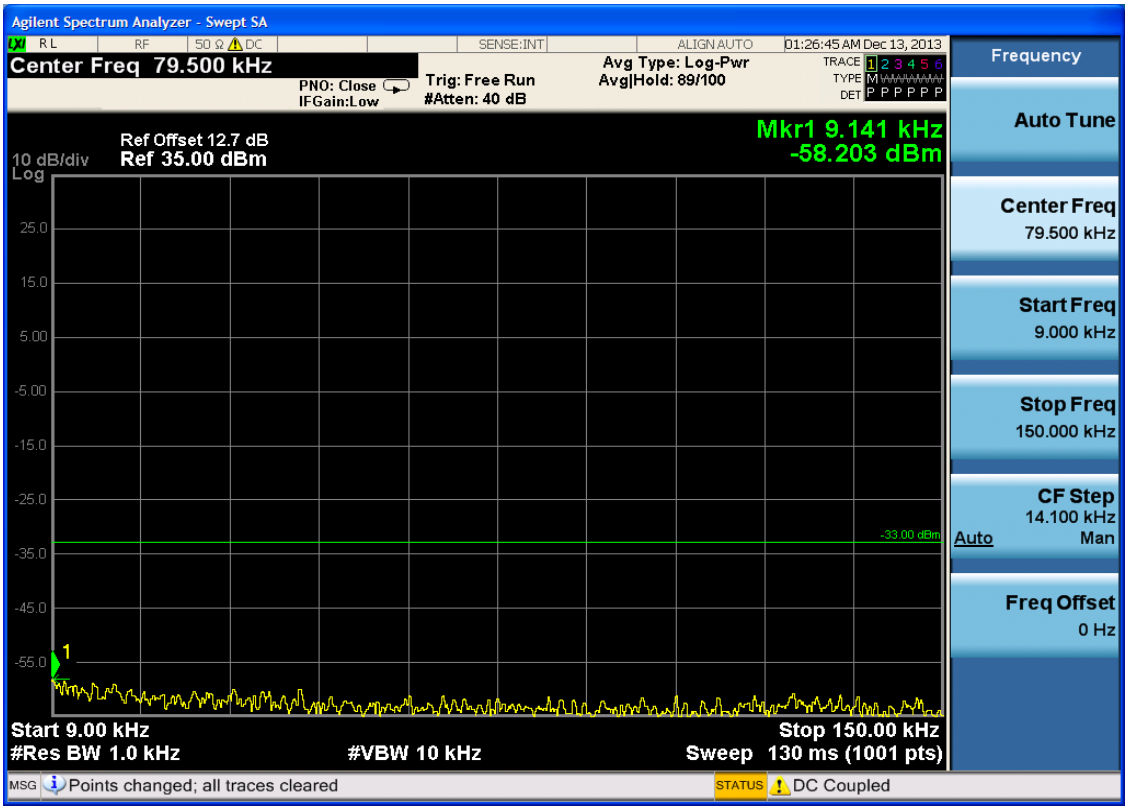
6.1.1.2.3 Test Channel = HCH



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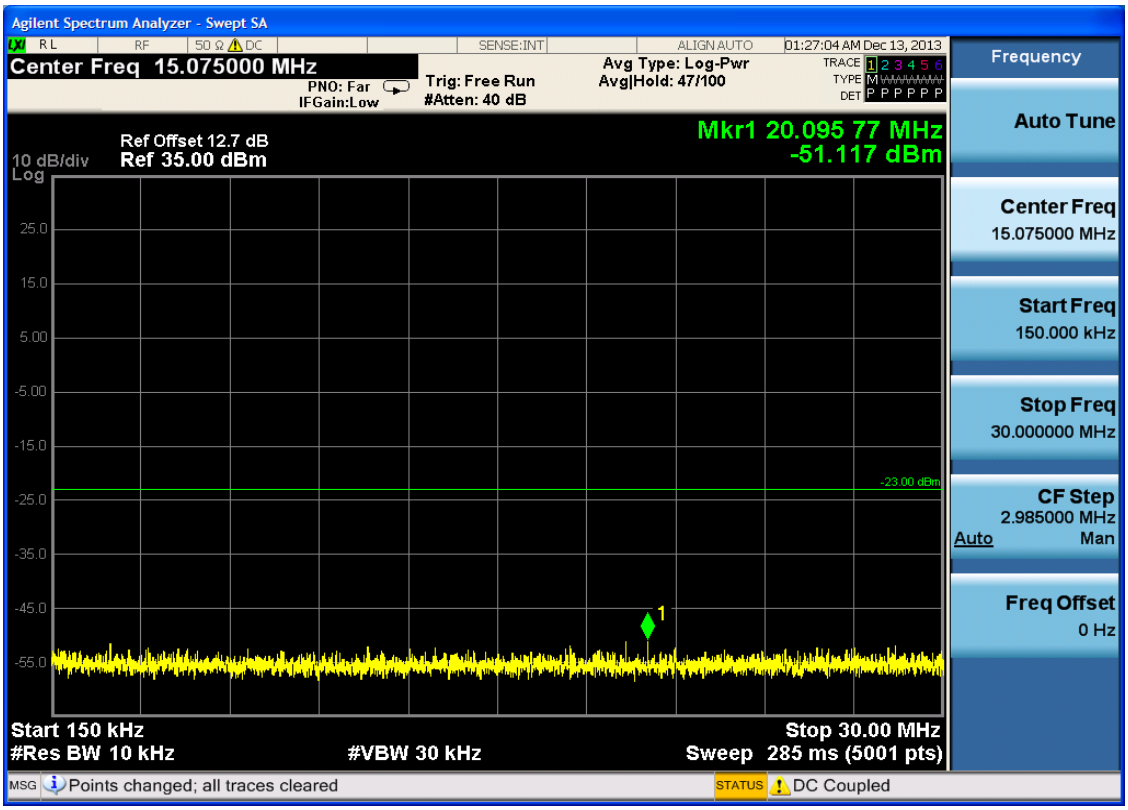

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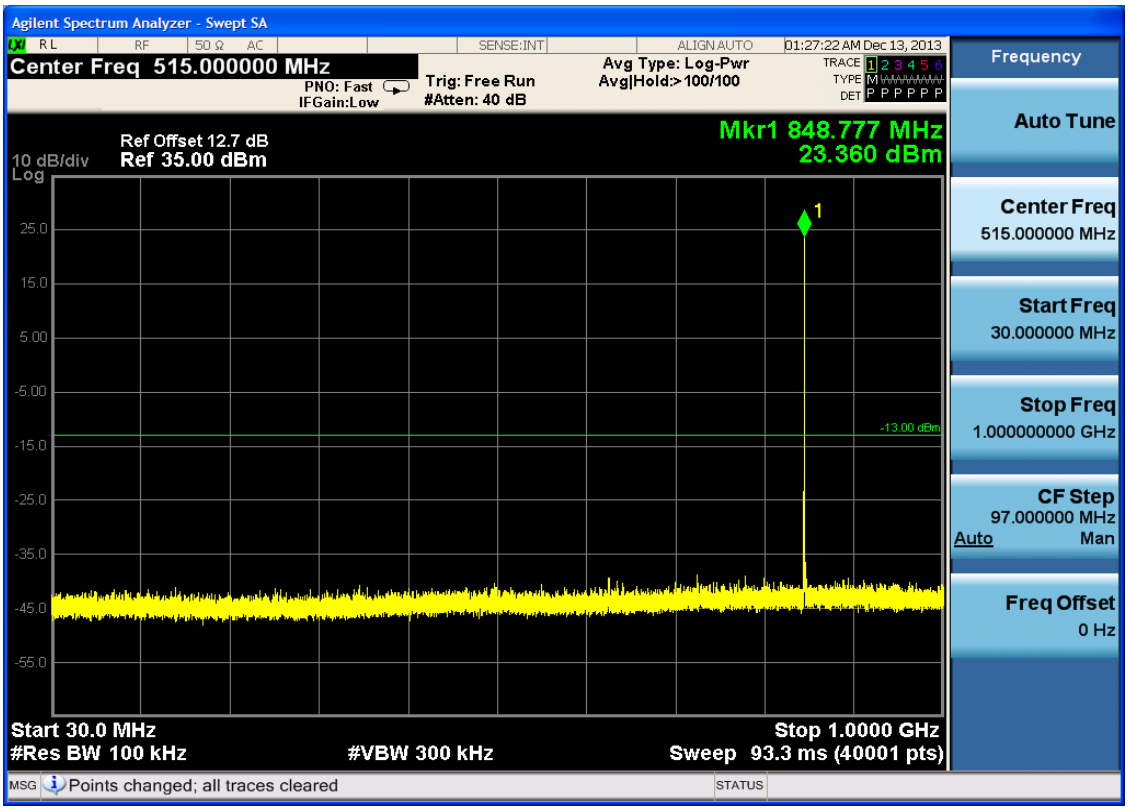

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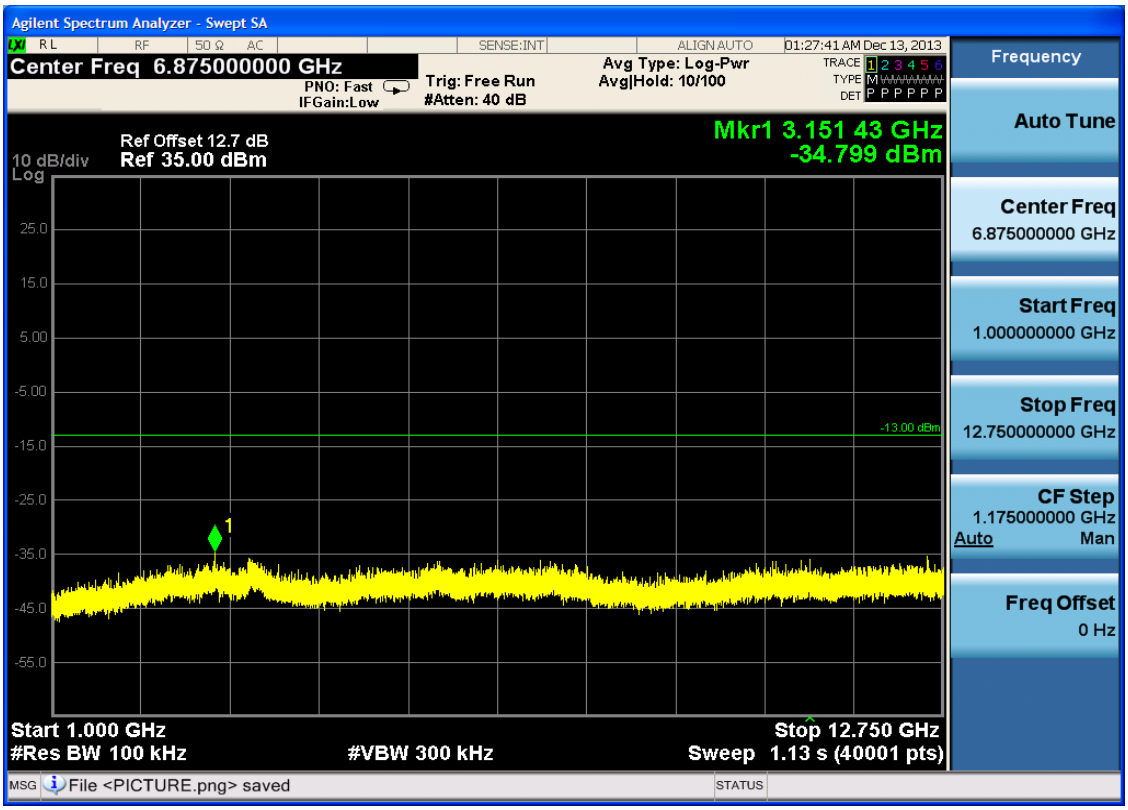

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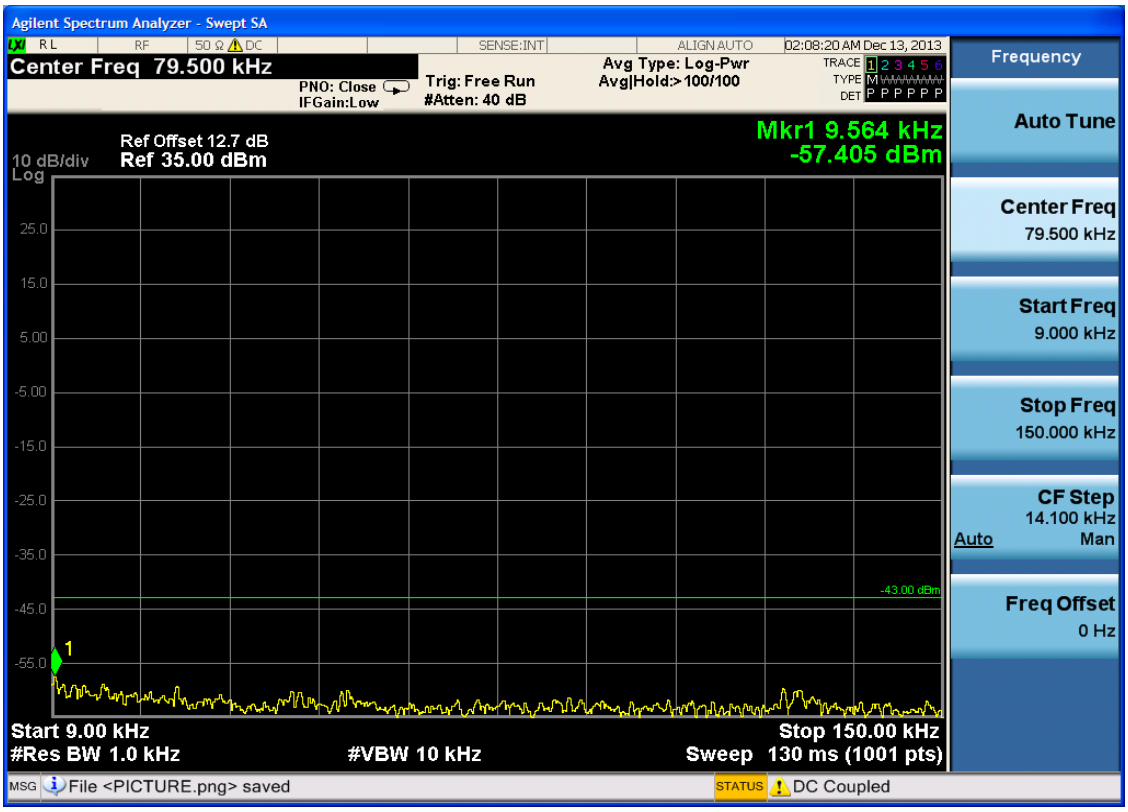
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH



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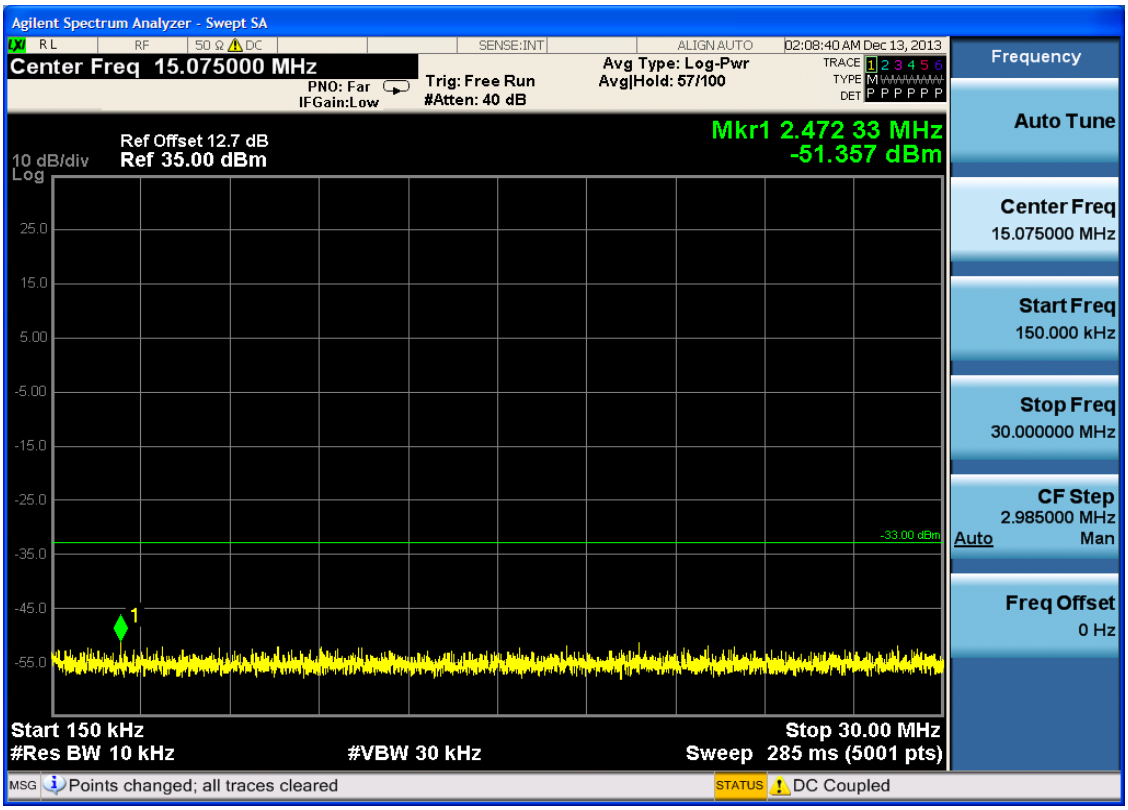

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6.1.2.1.2 Test Channel = MCH

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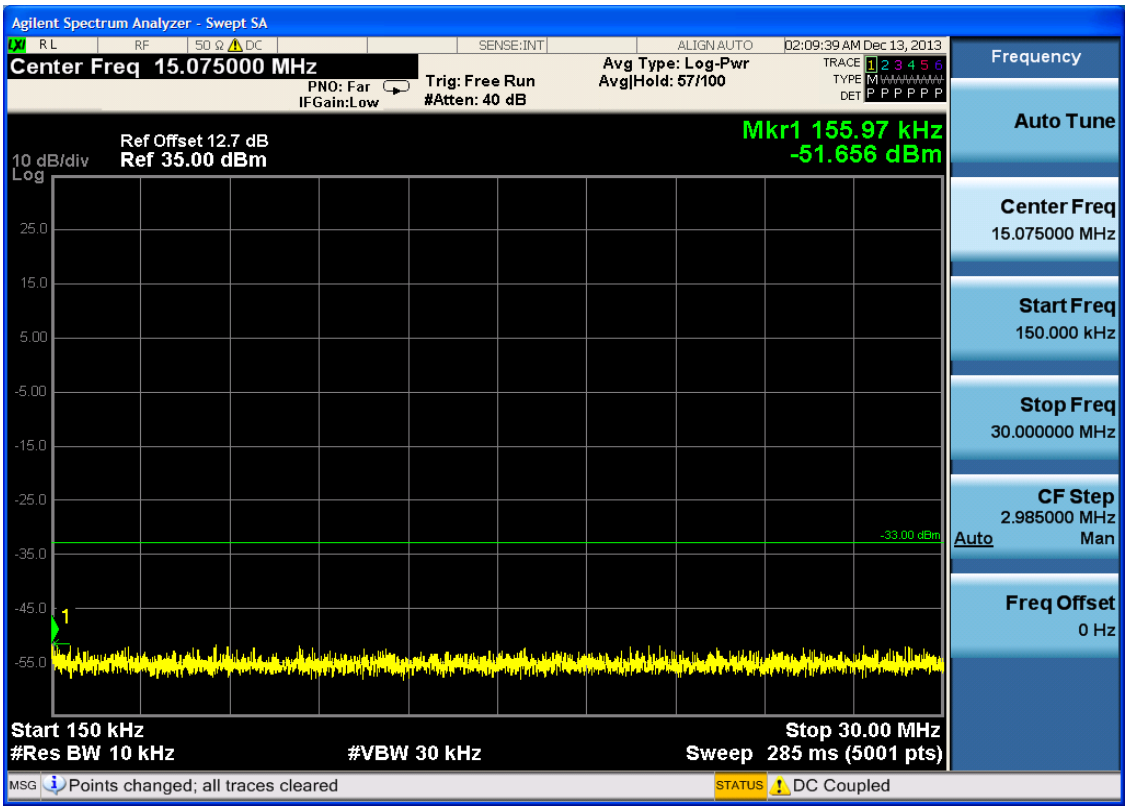

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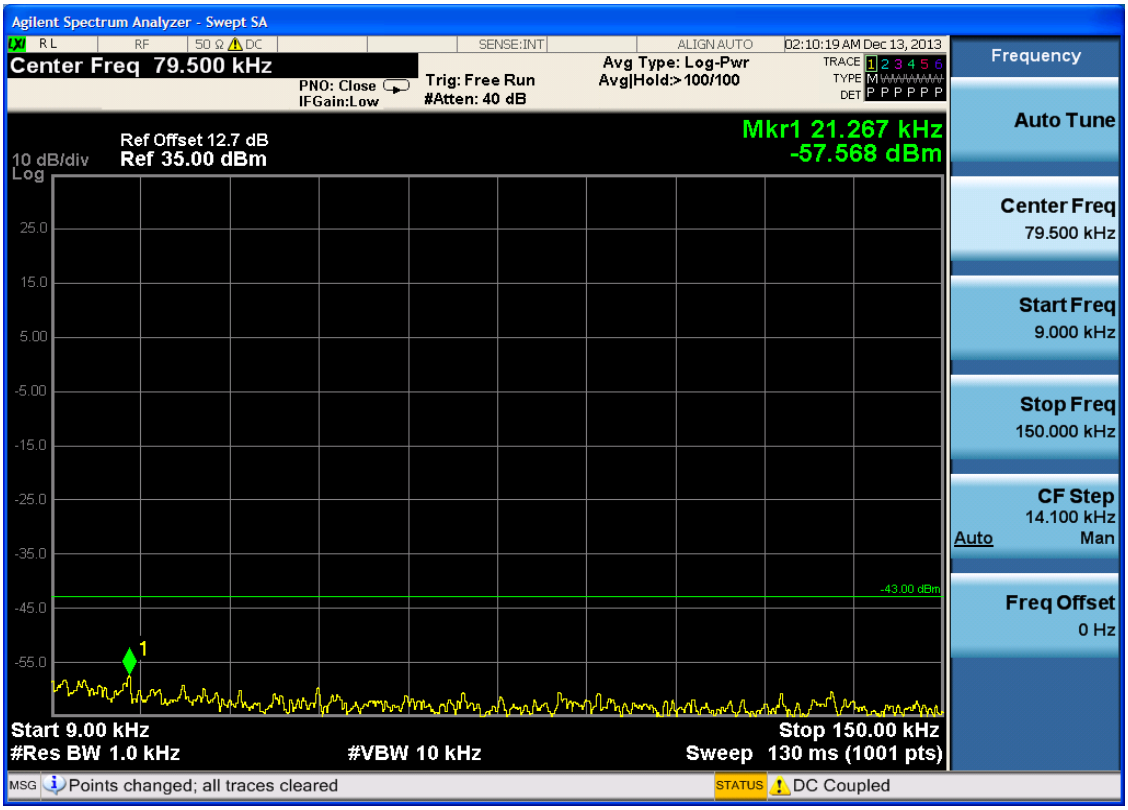
6.1.2.1.3 Test Channel = HCH



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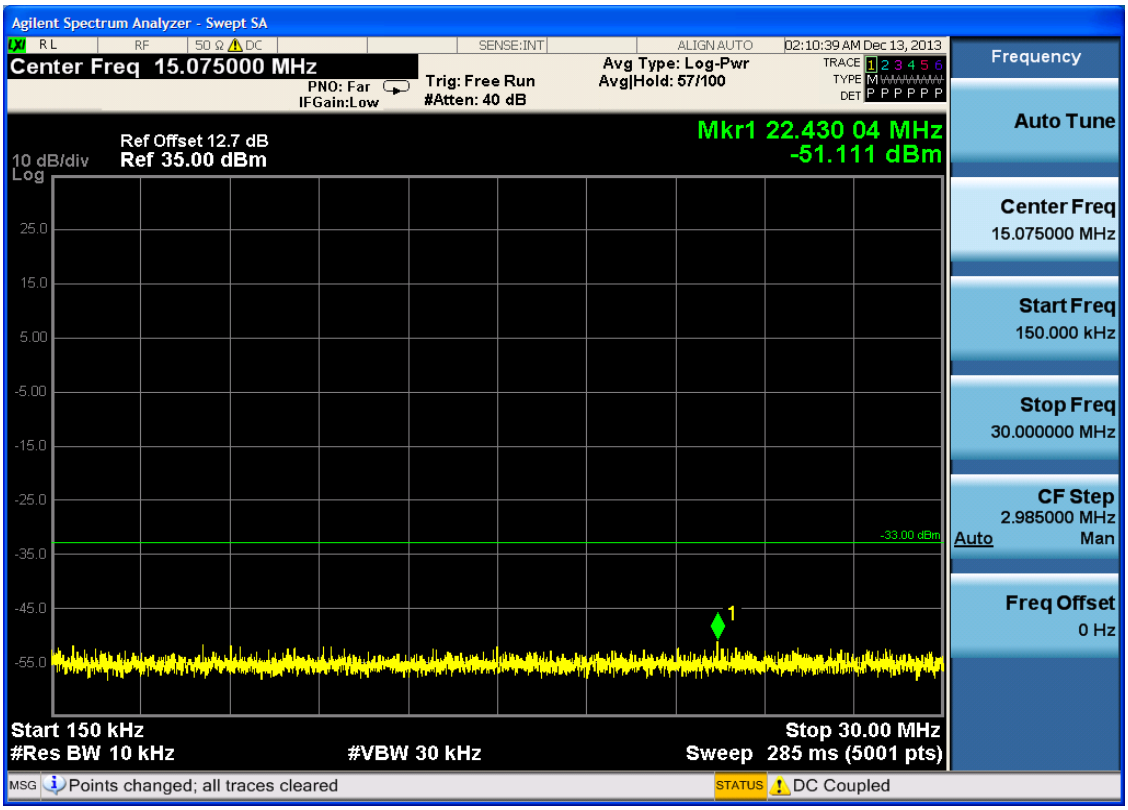

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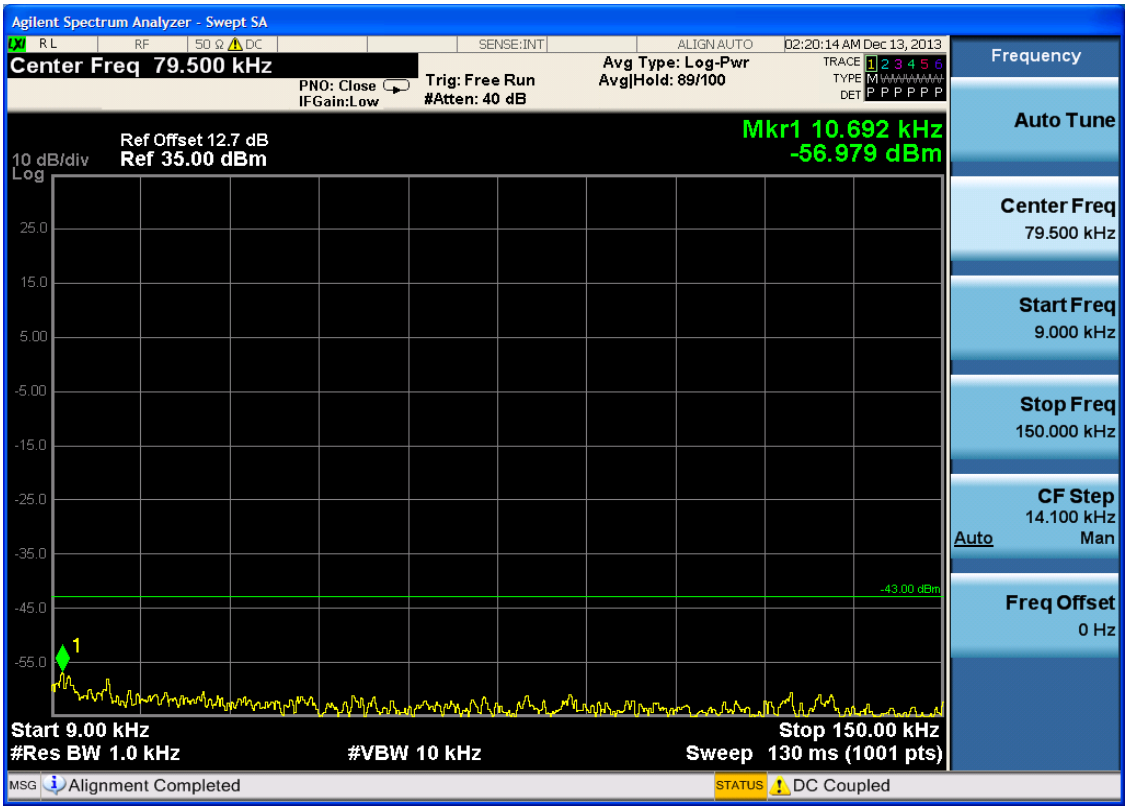
6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH



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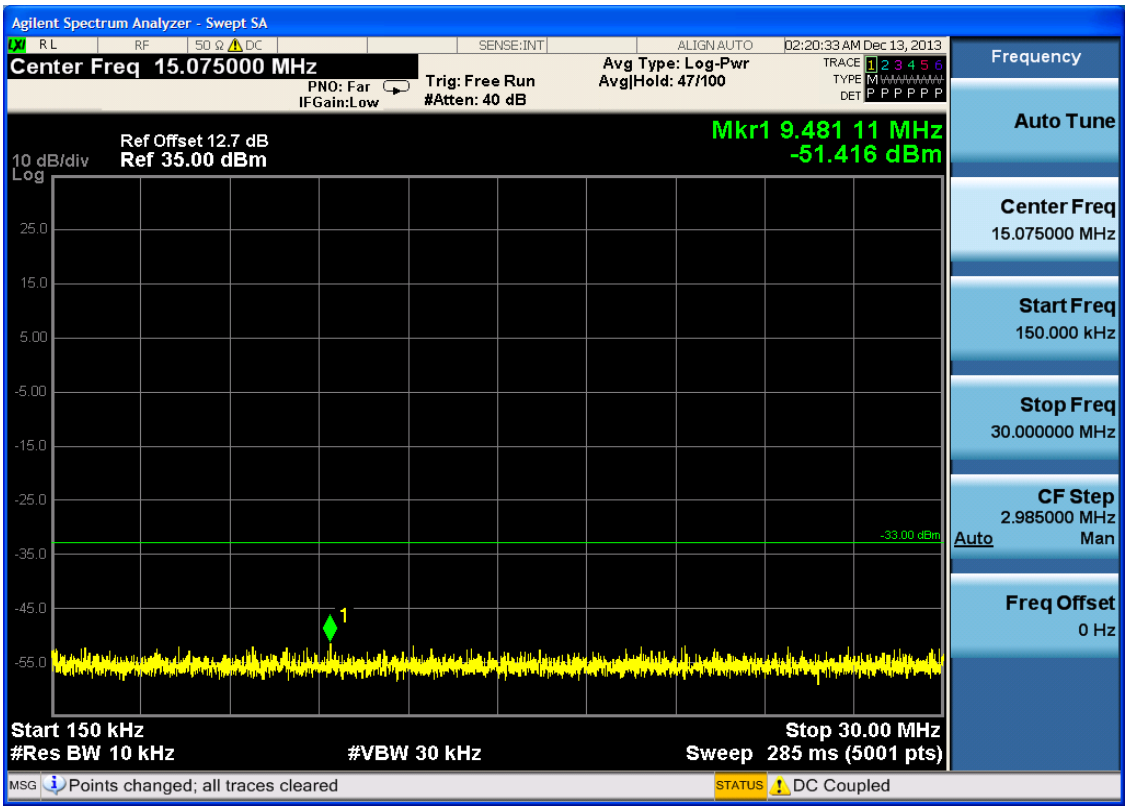

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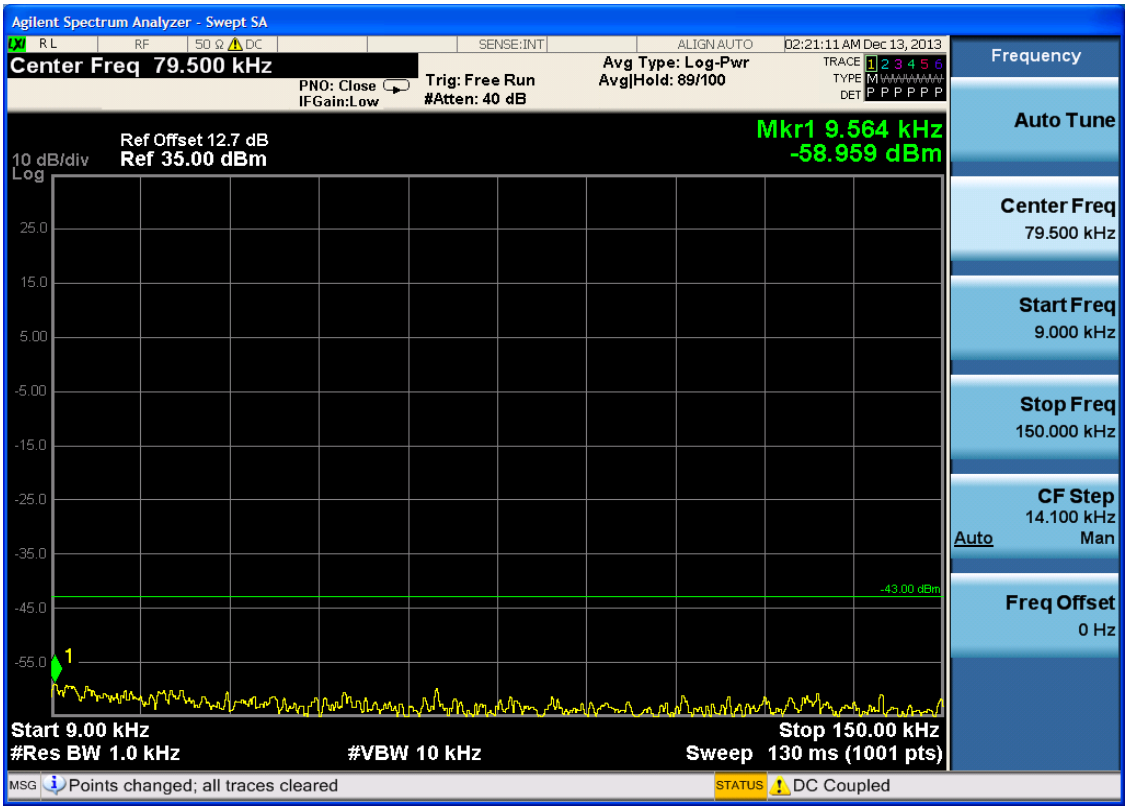
6.1.2.2.2 Test Channel = MCH



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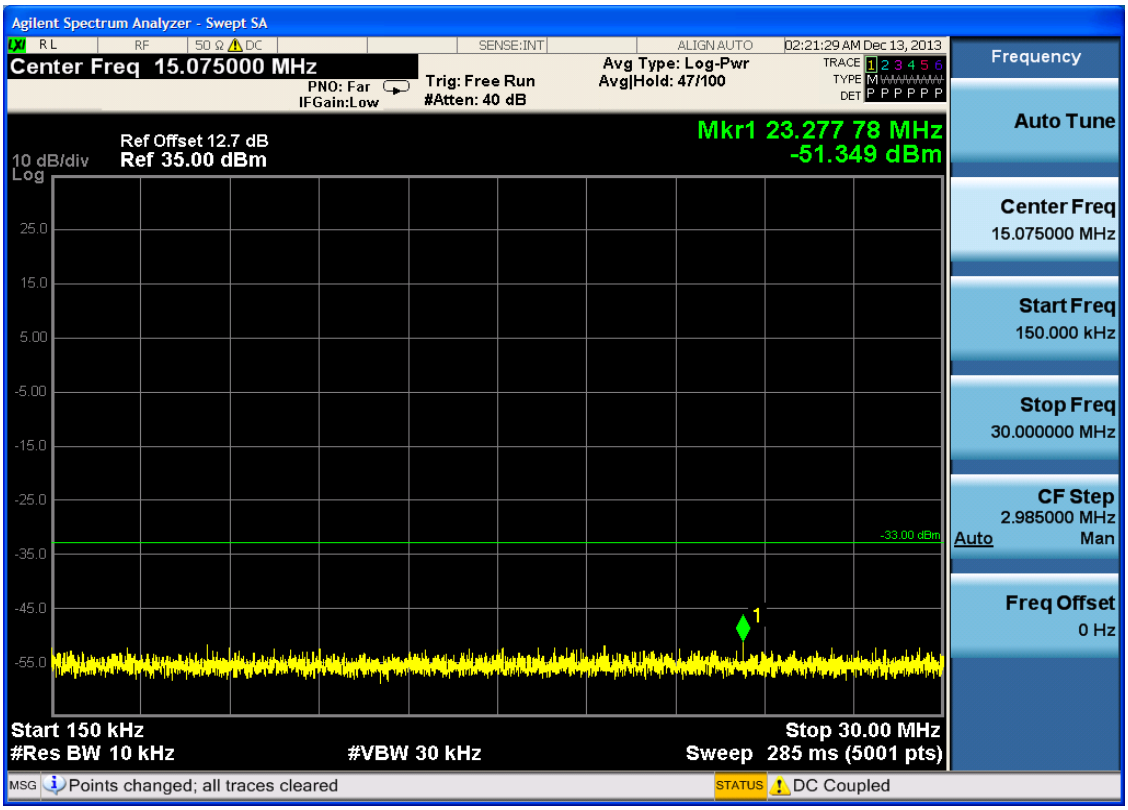

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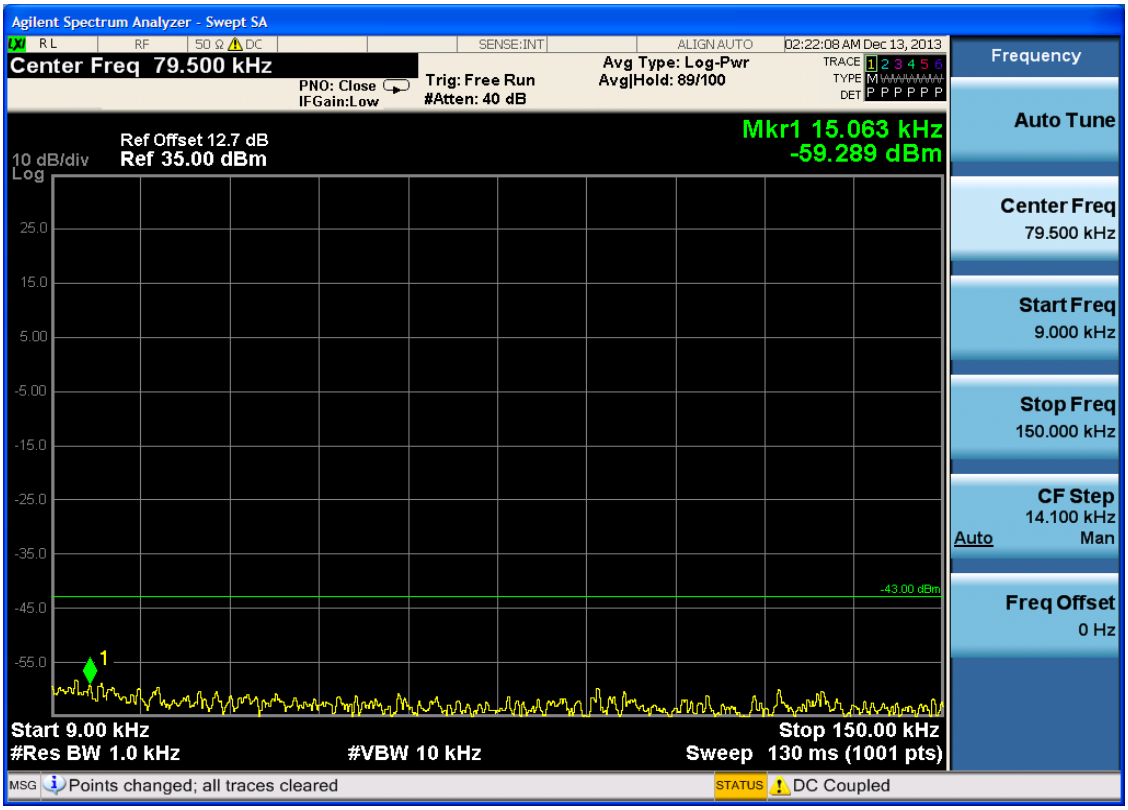
6.1.2.2.3 Test Channel = HCH



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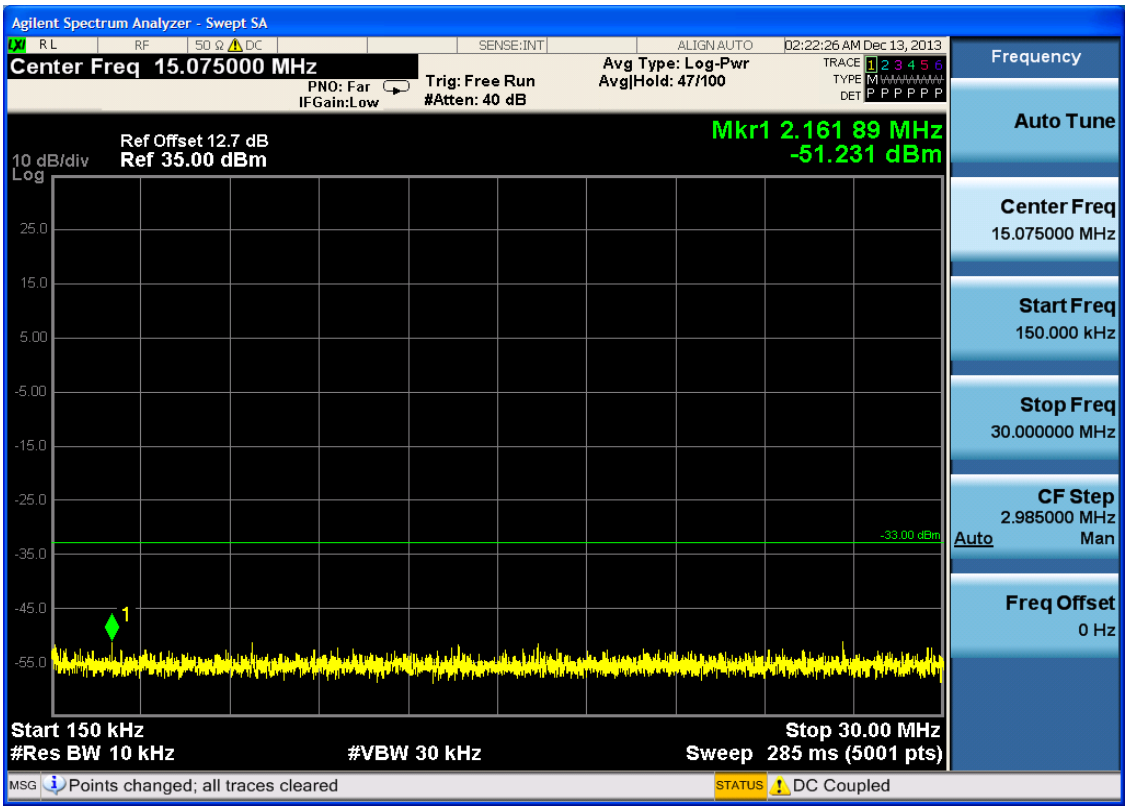

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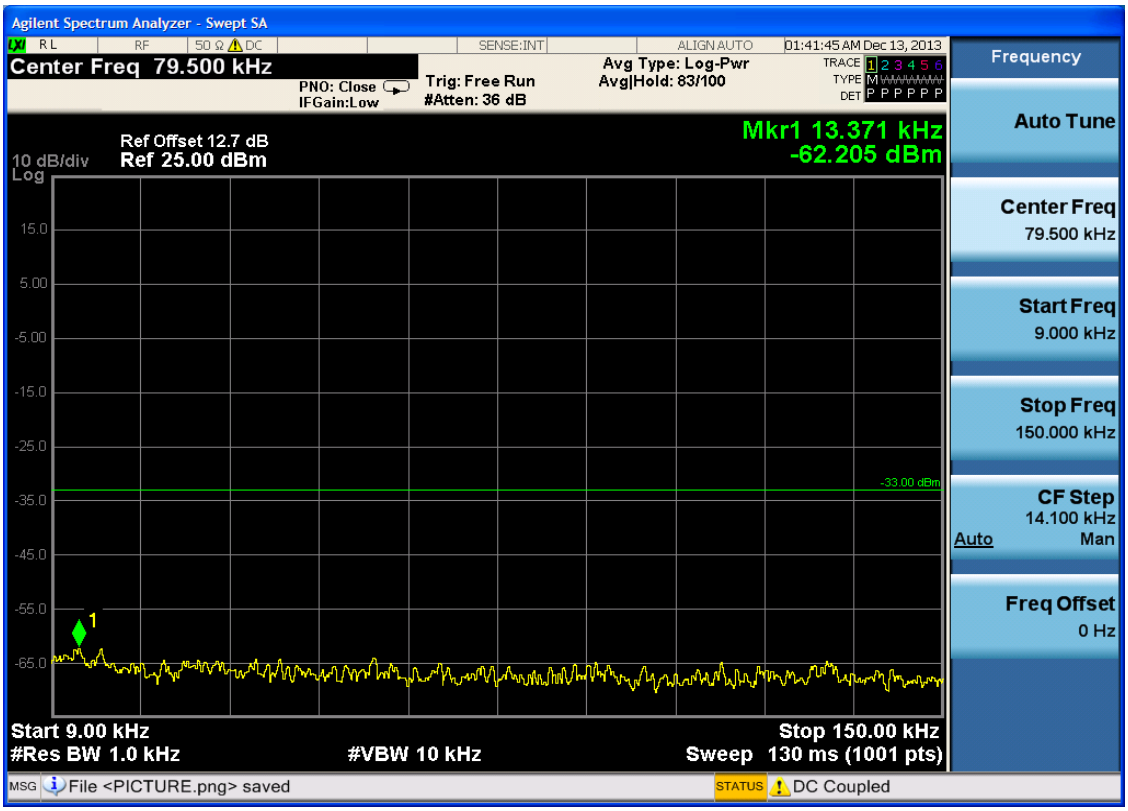
6.2 For UMTS

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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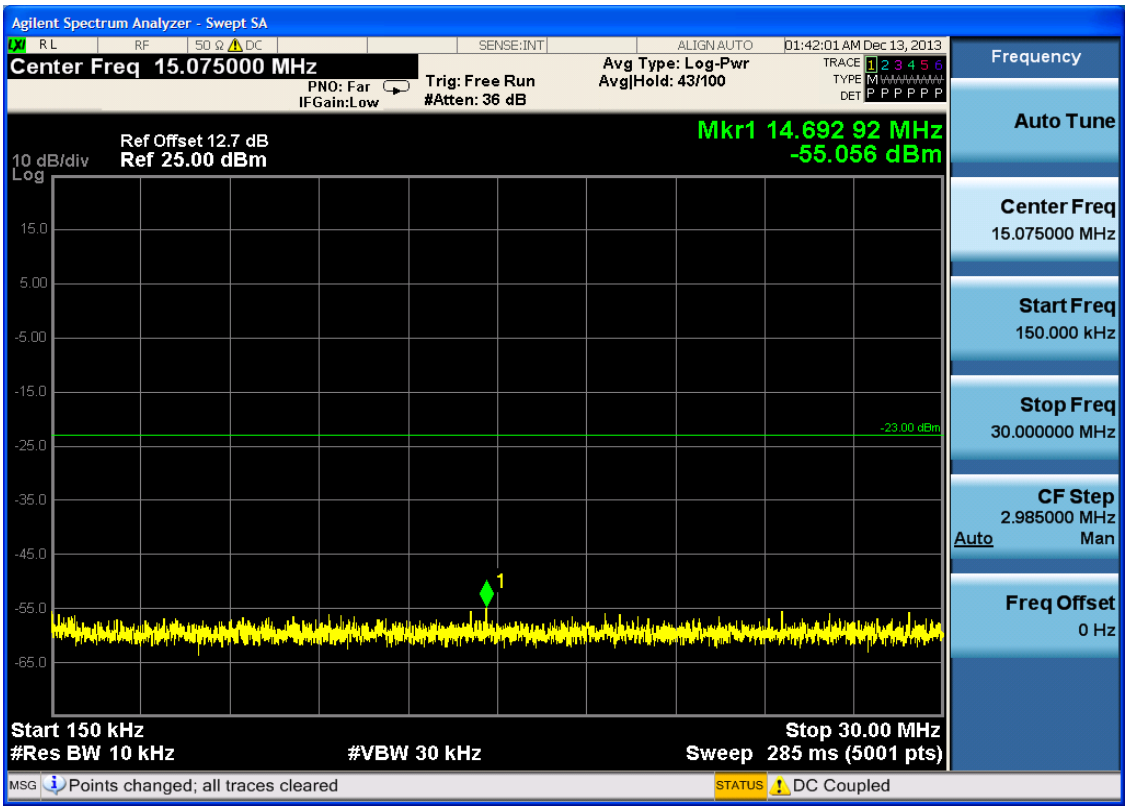

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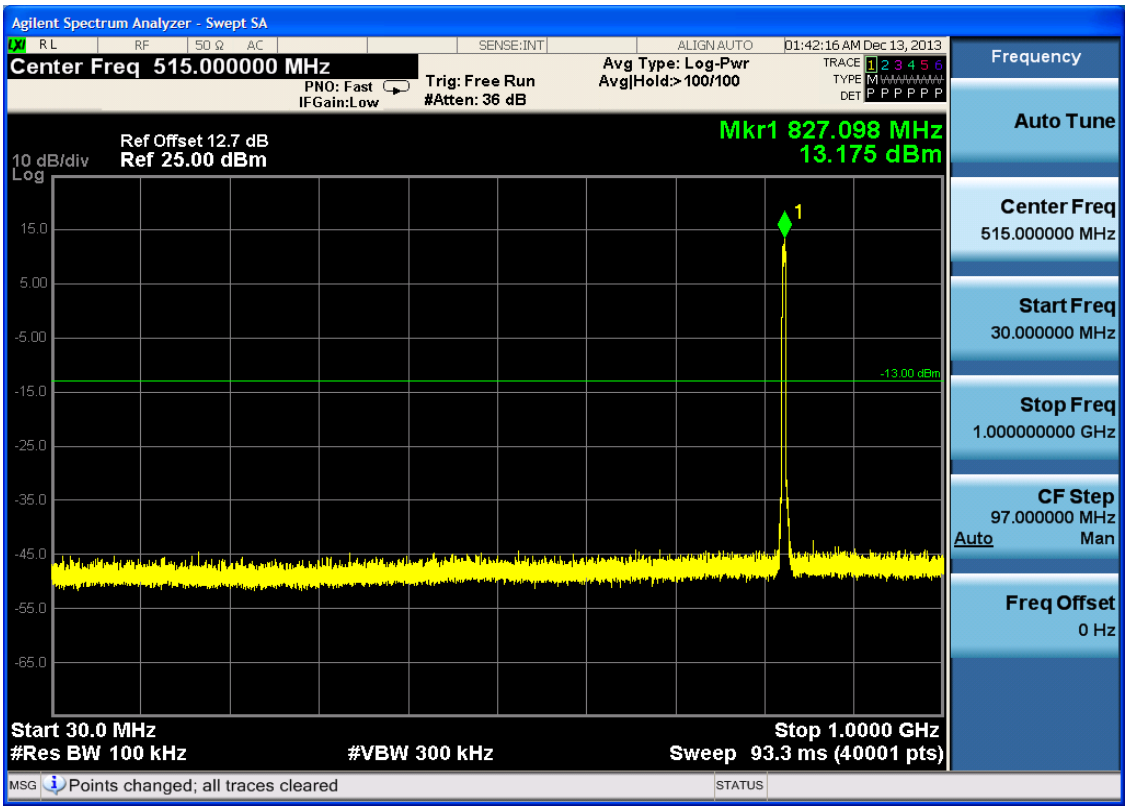

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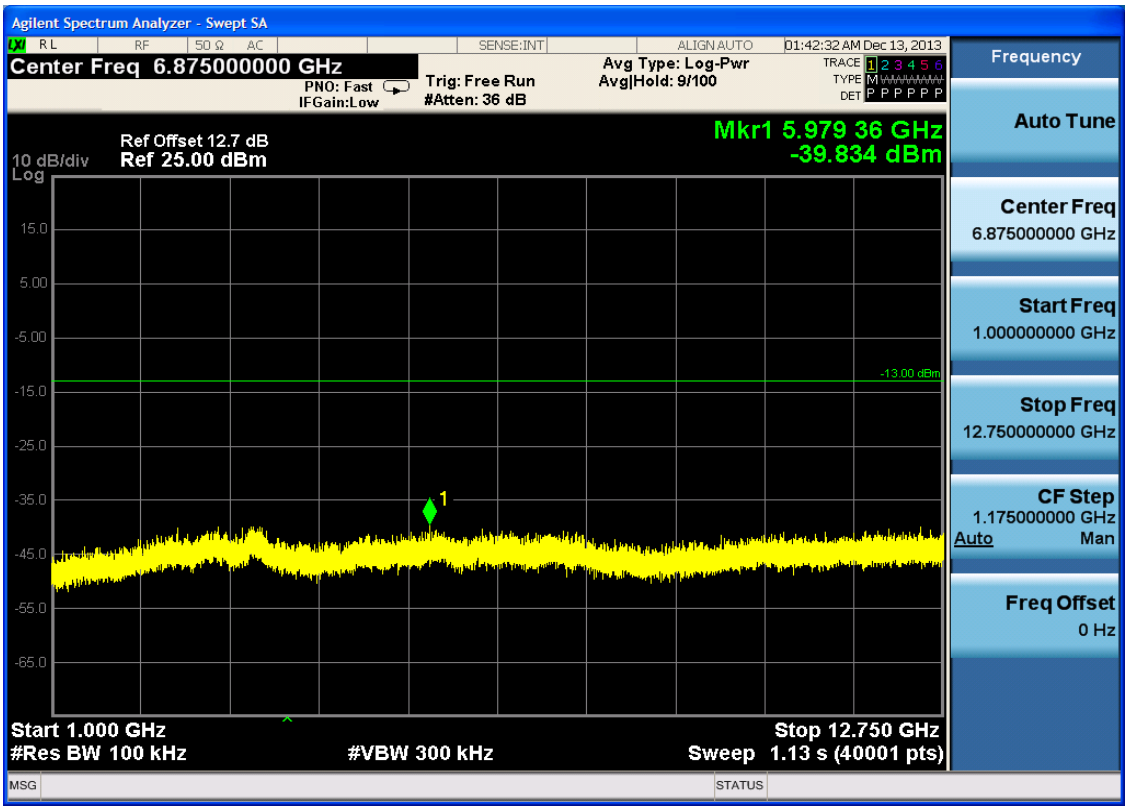

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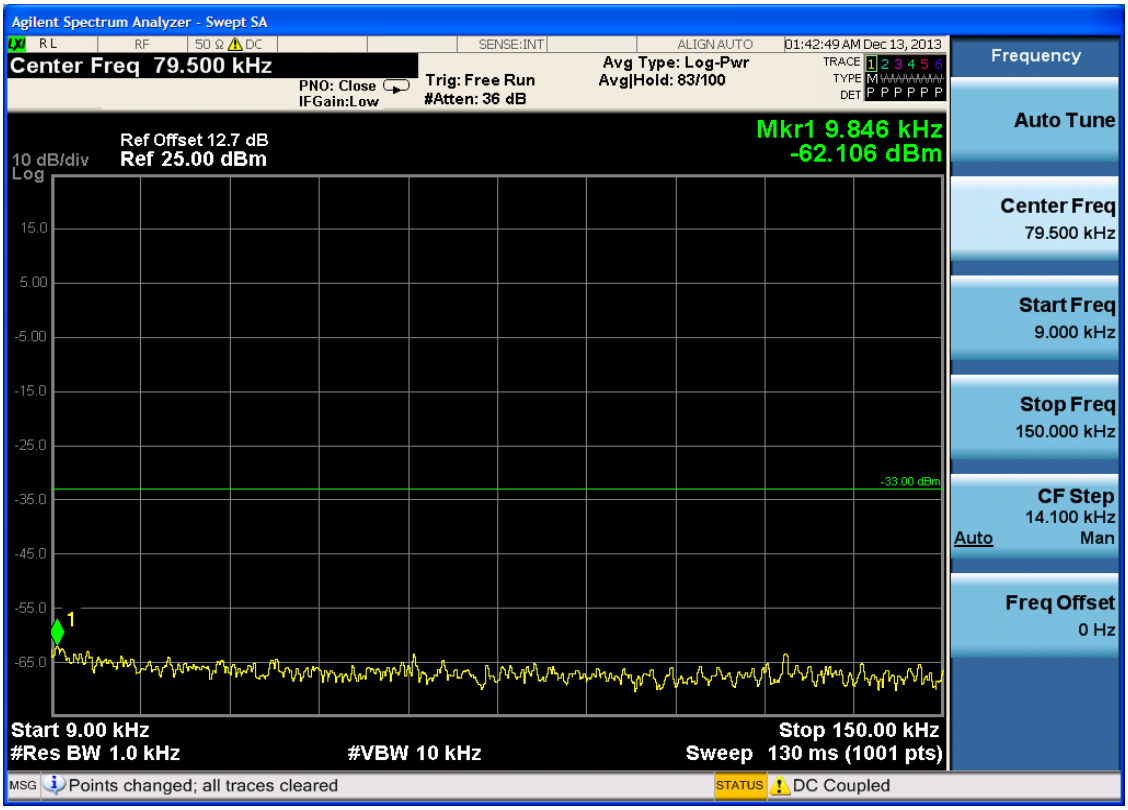
6.2.1.1.2 Test Channel = MCH



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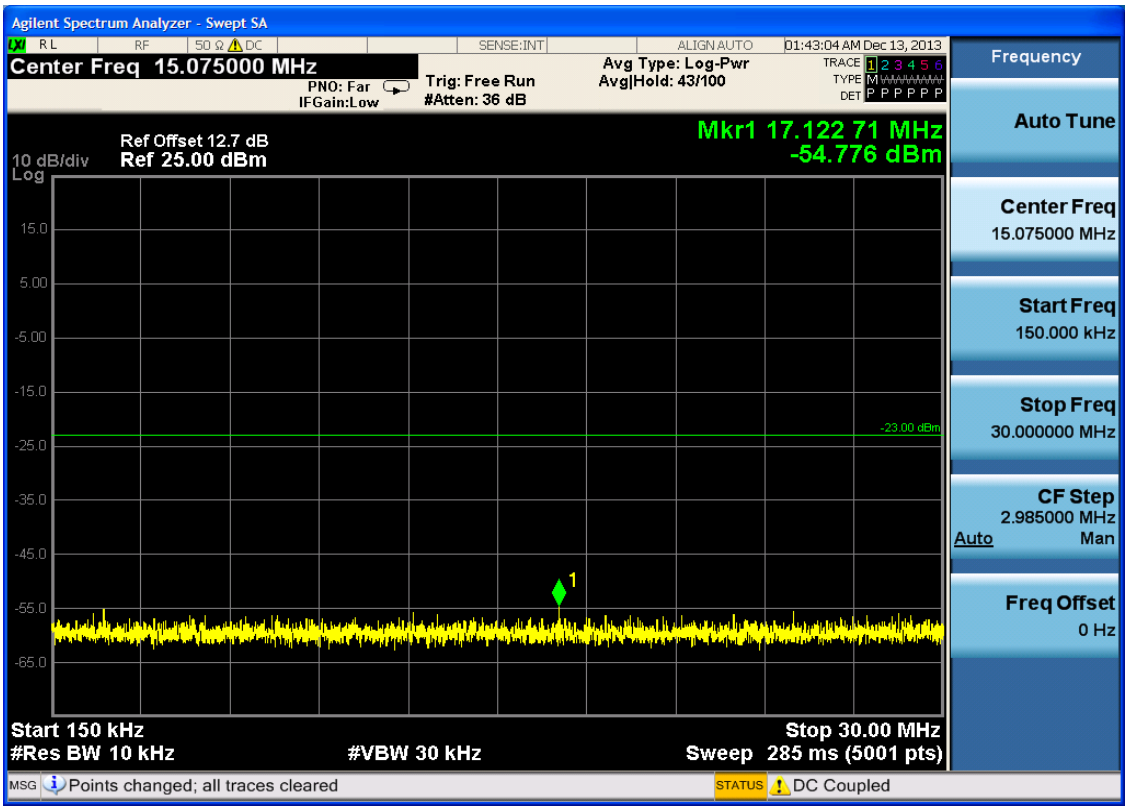

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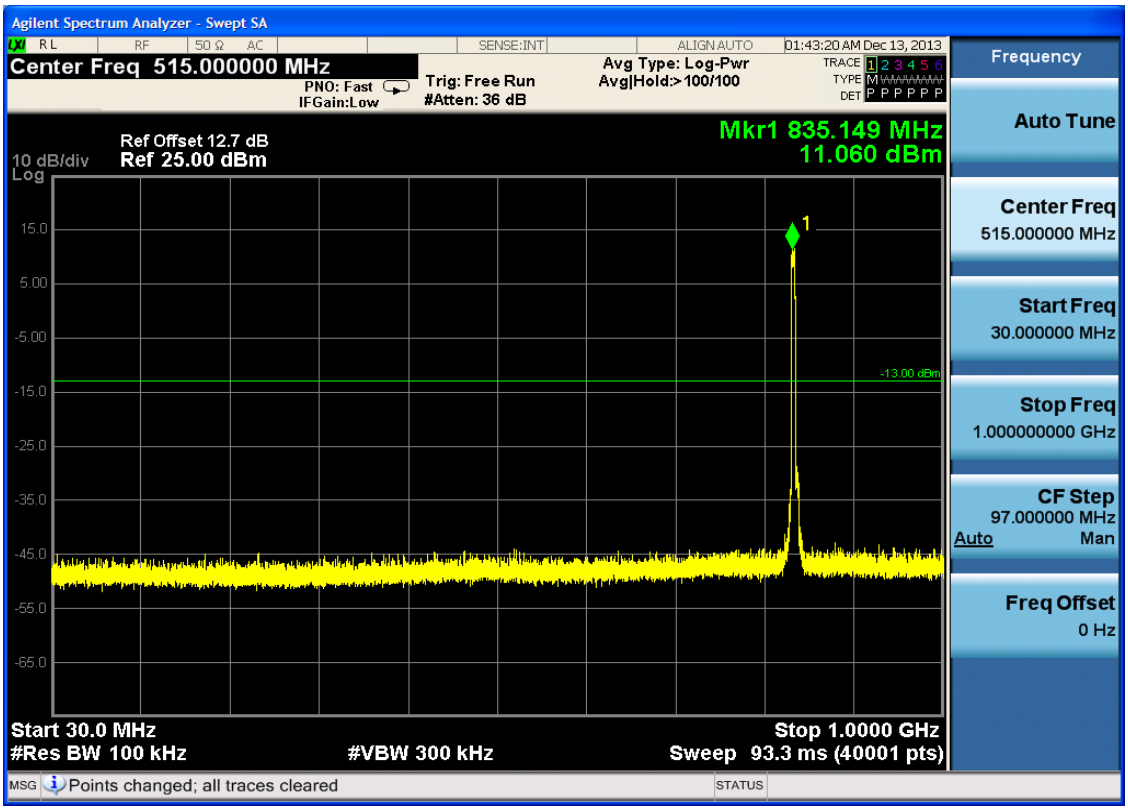

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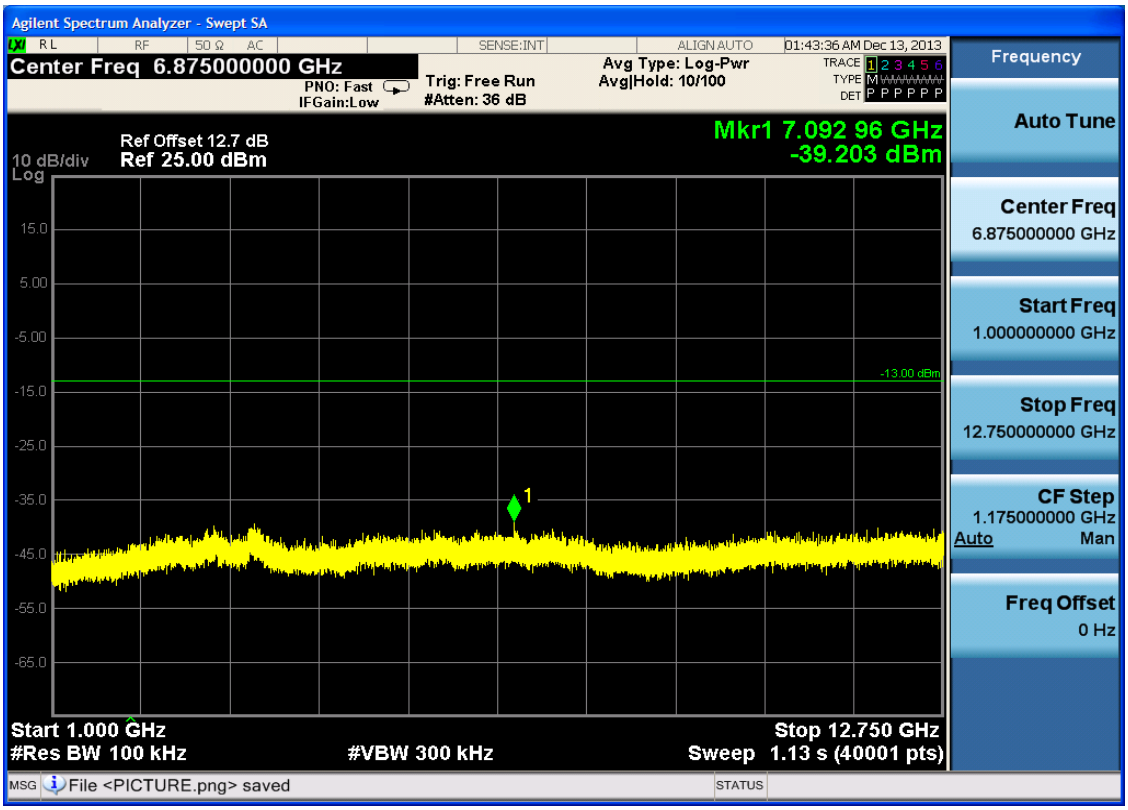

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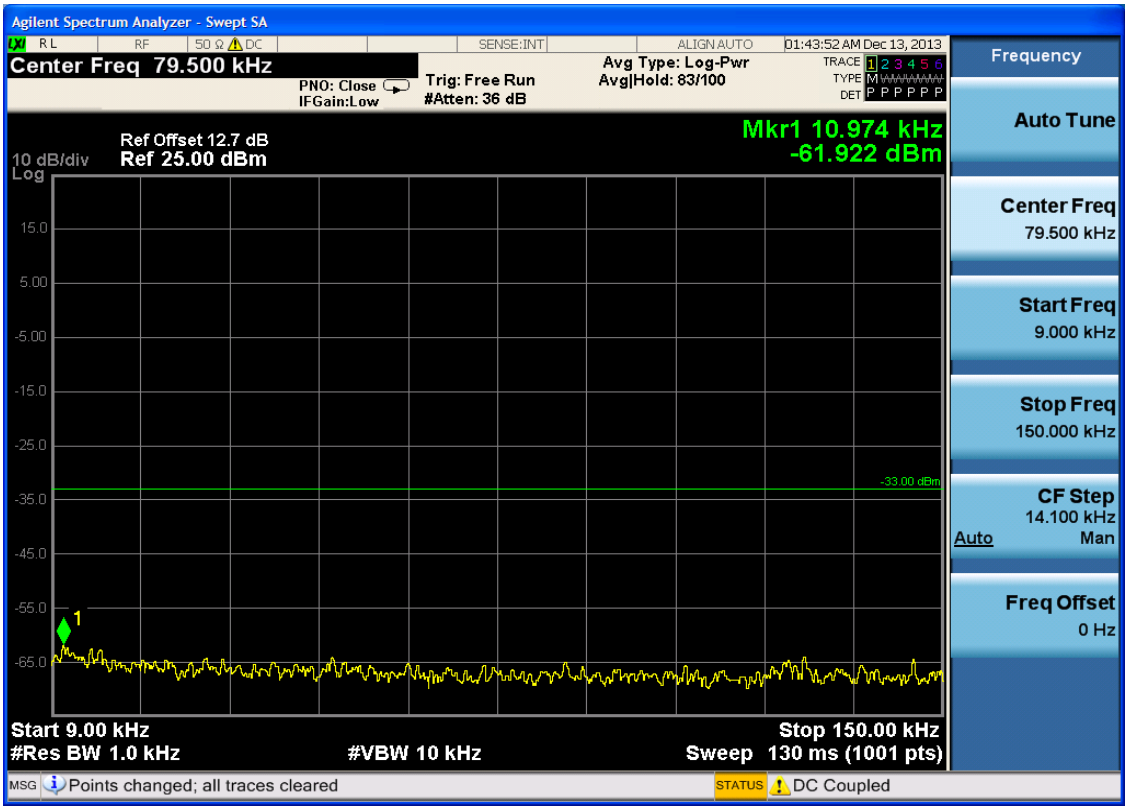
6.2.1.1.3 Test Channel = HCH



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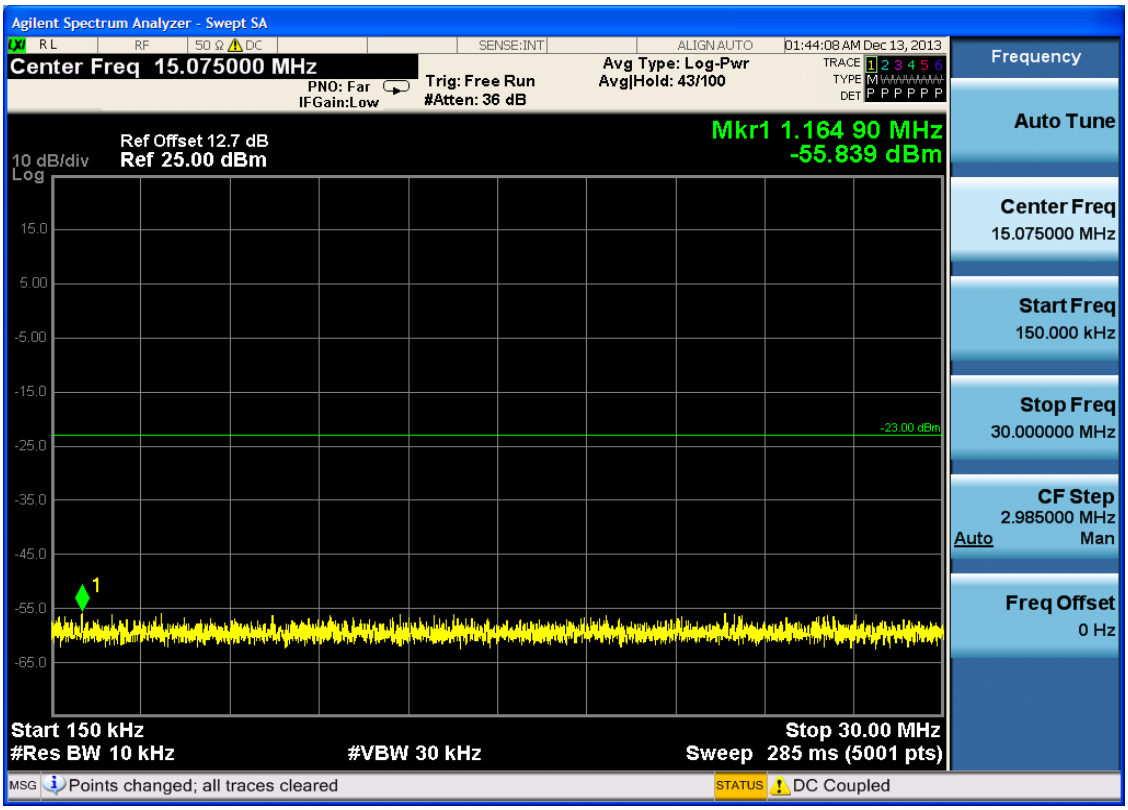

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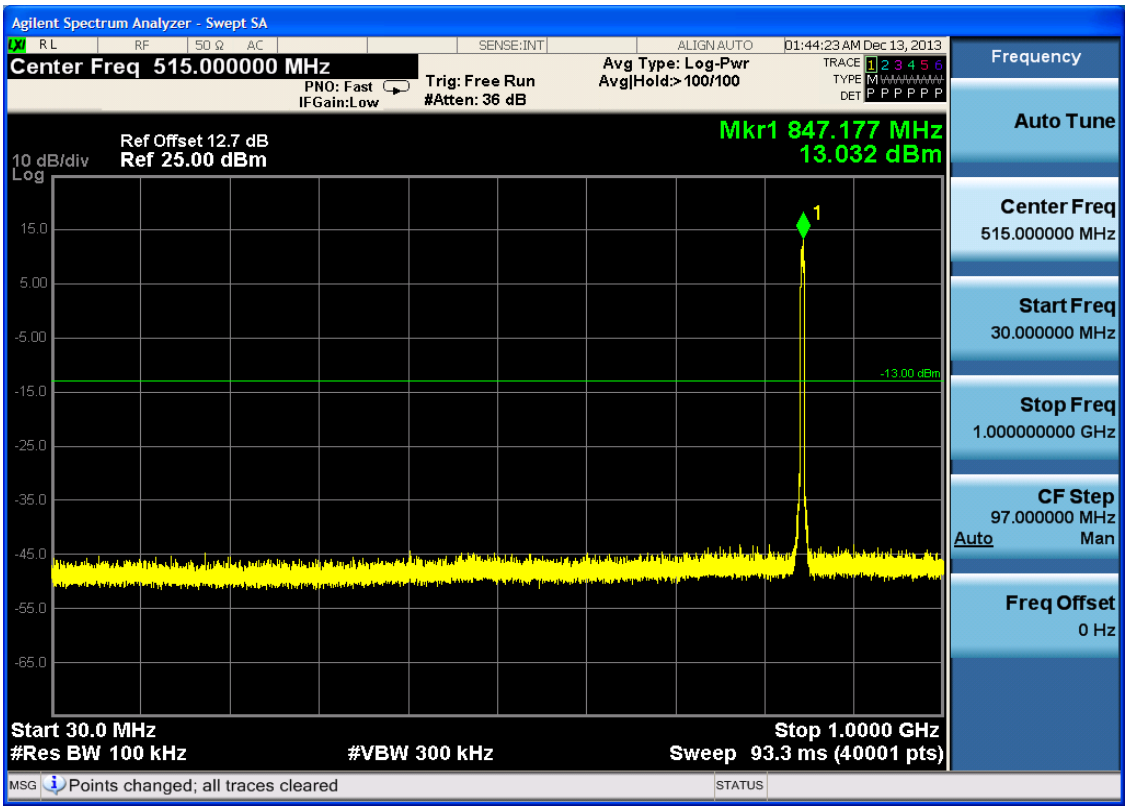

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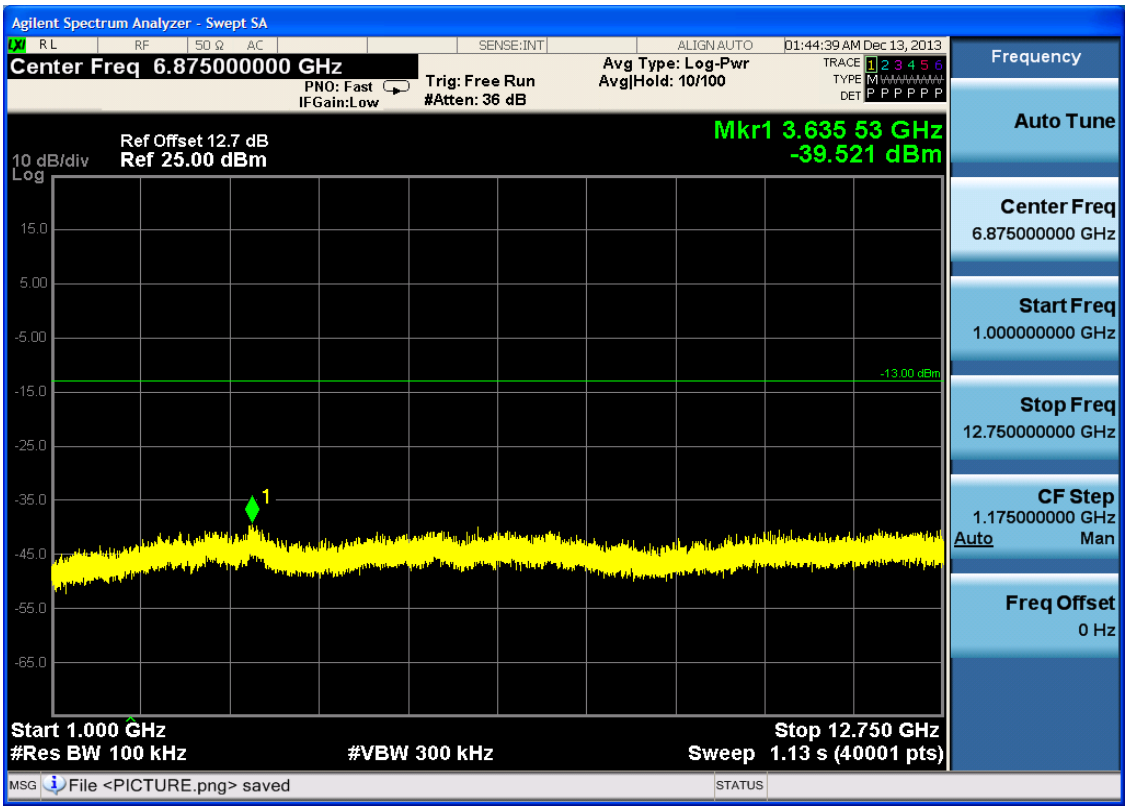

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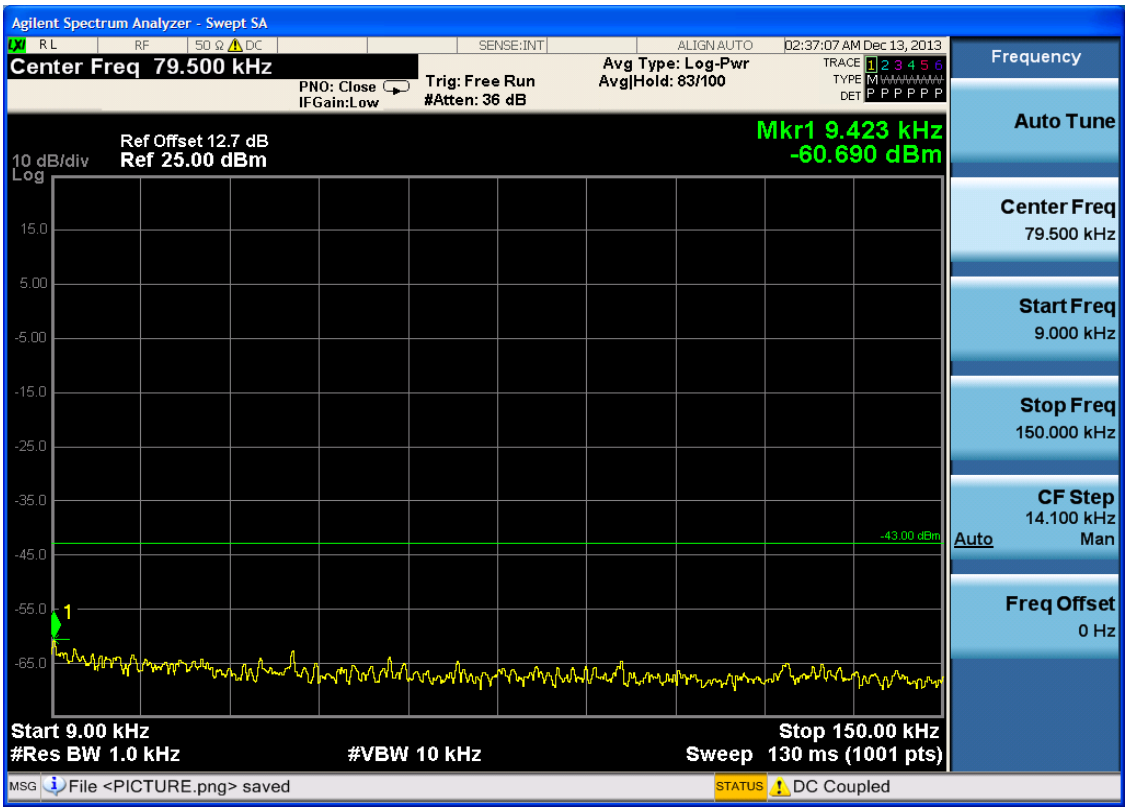
6.2.2 Test Band = WCDMA1900

6.2.2.1 Test Mode = UMTS/TM1

6.2.2.1.1 Test Channel = LCH



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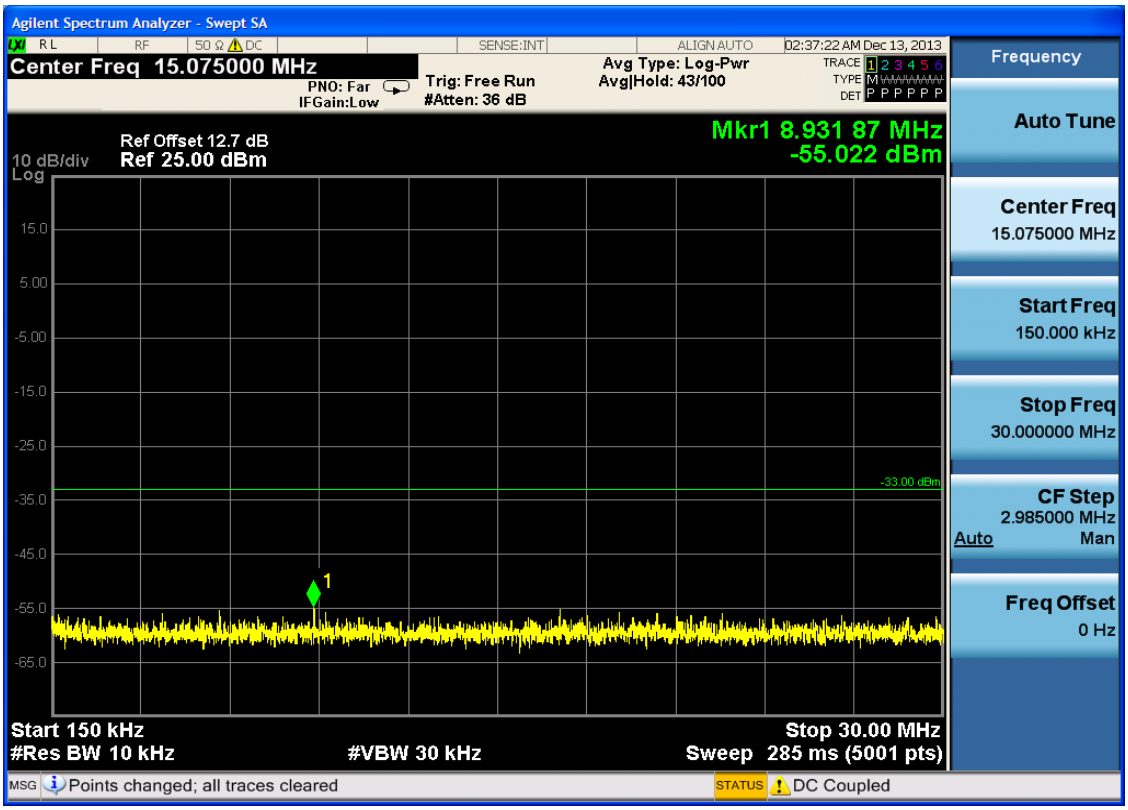

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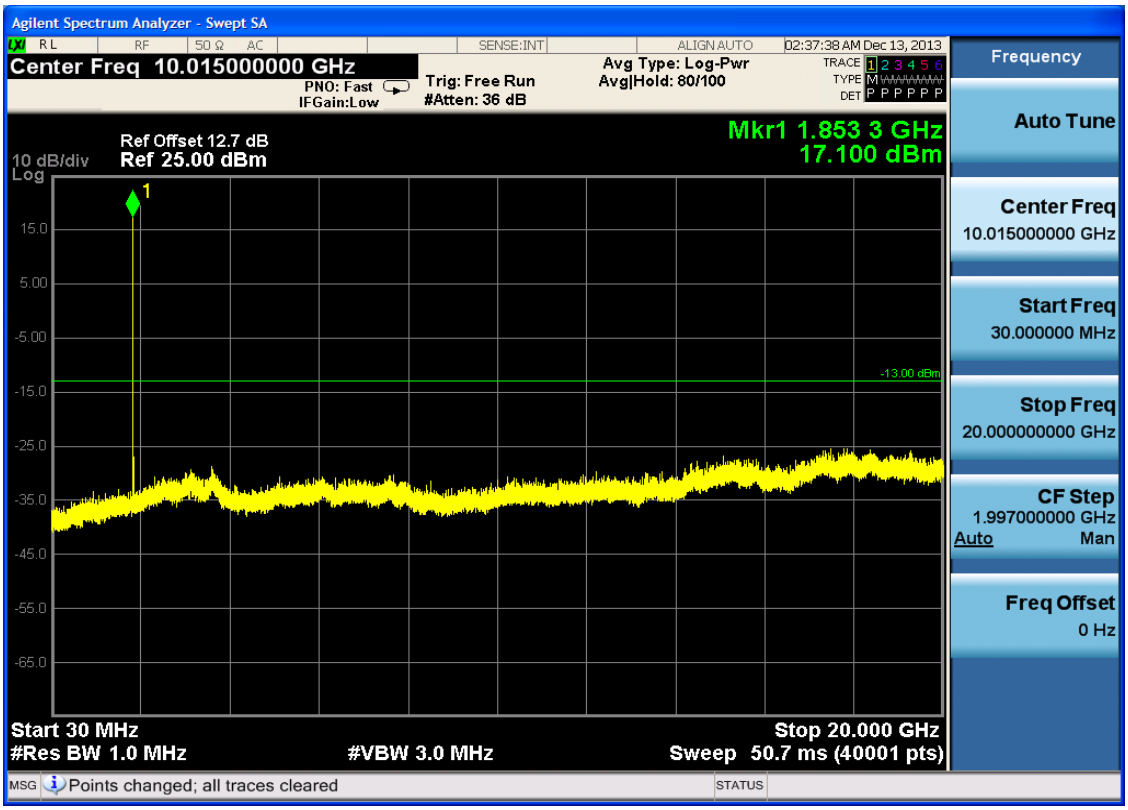

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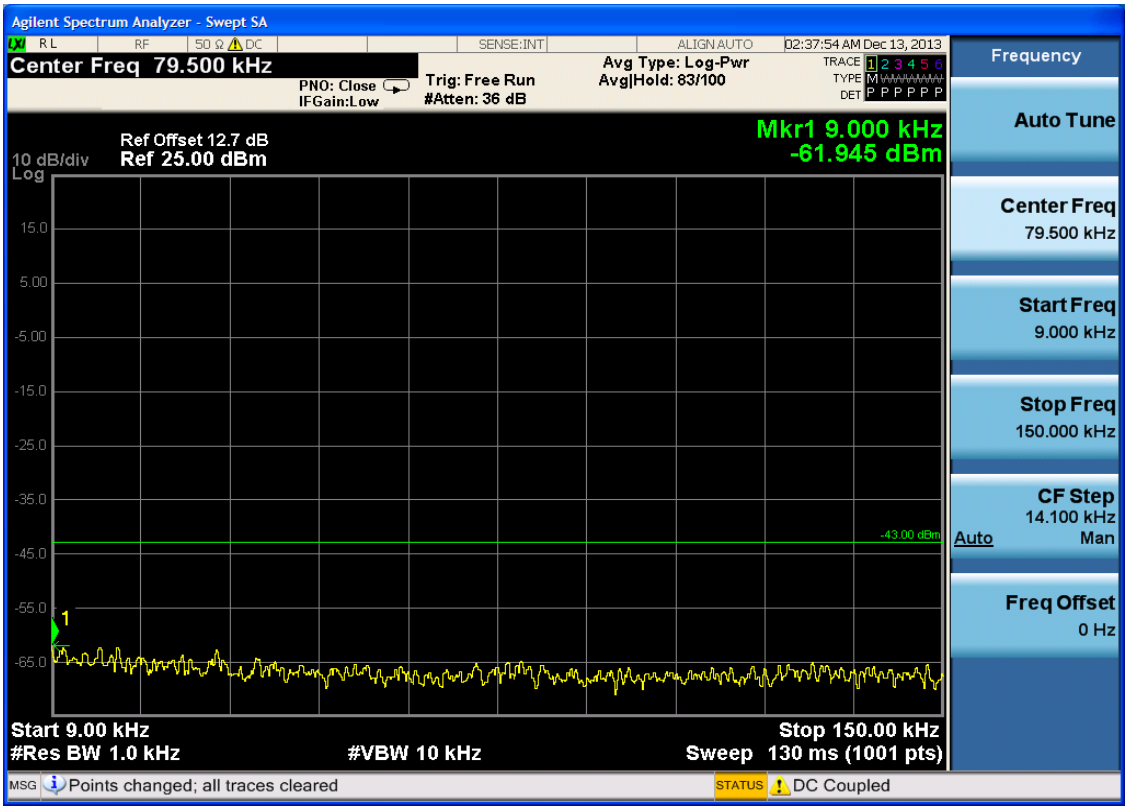
6.2.2.1.2 Test Channel = MCH



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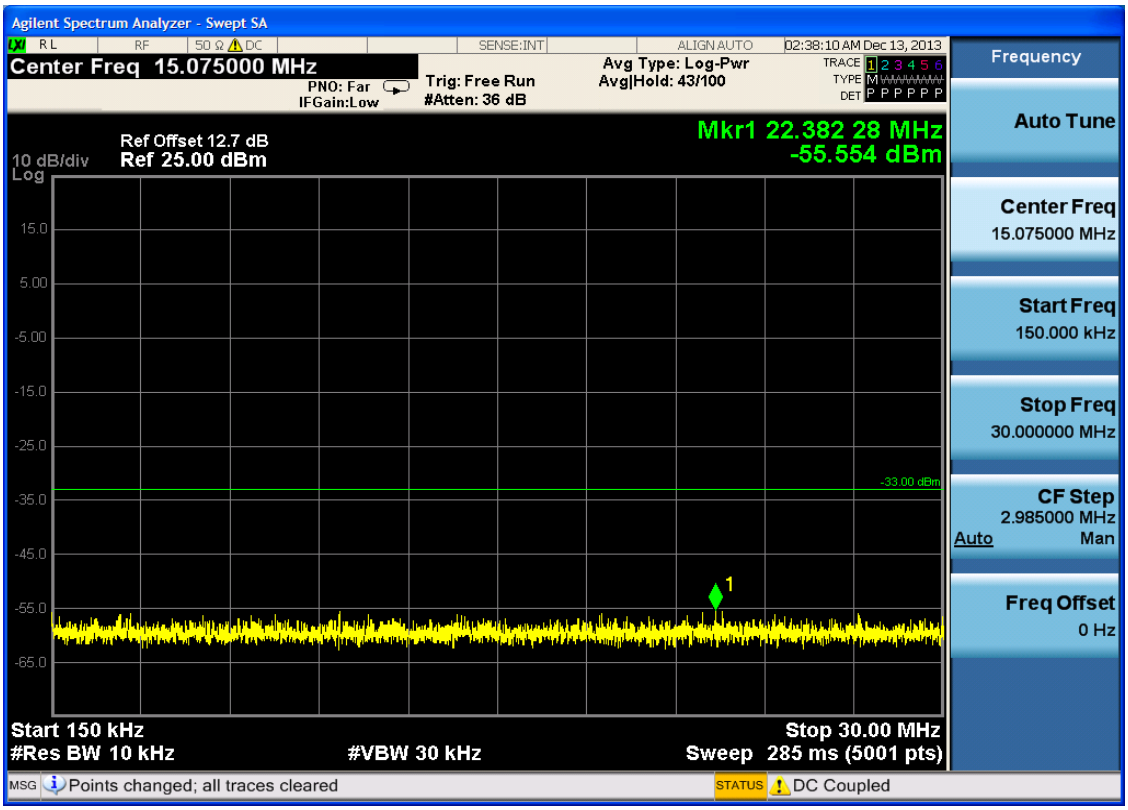

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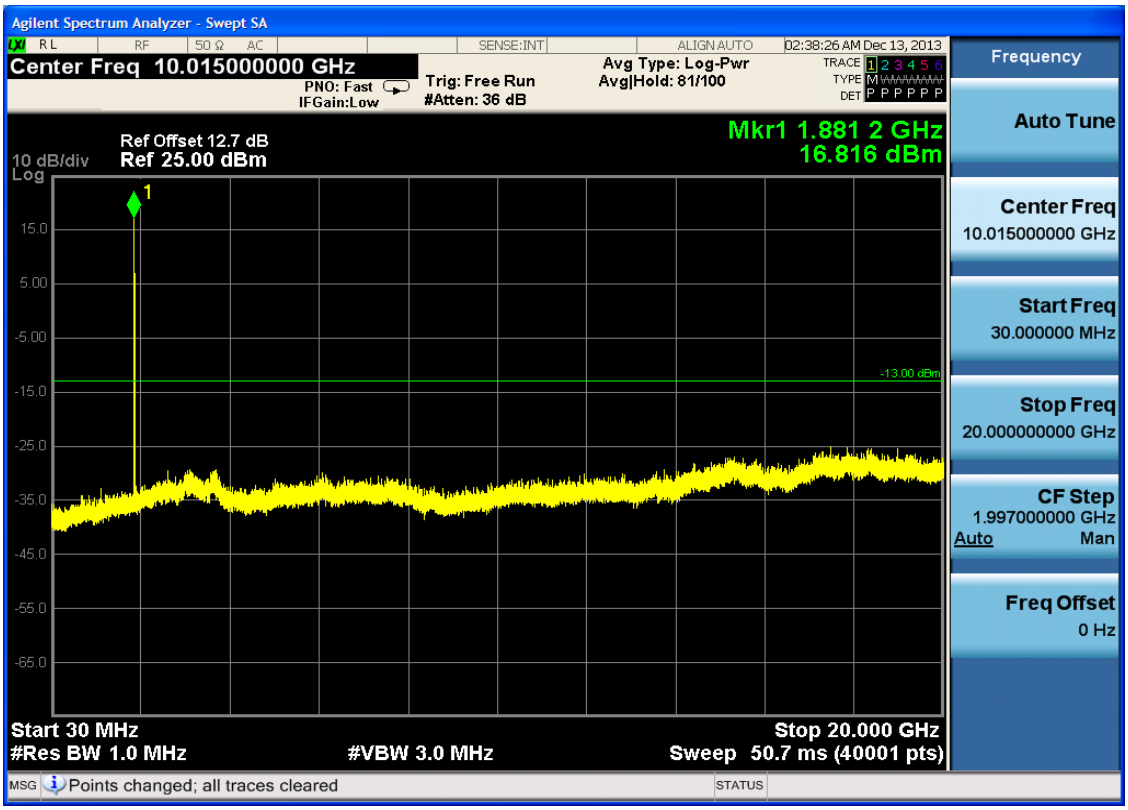

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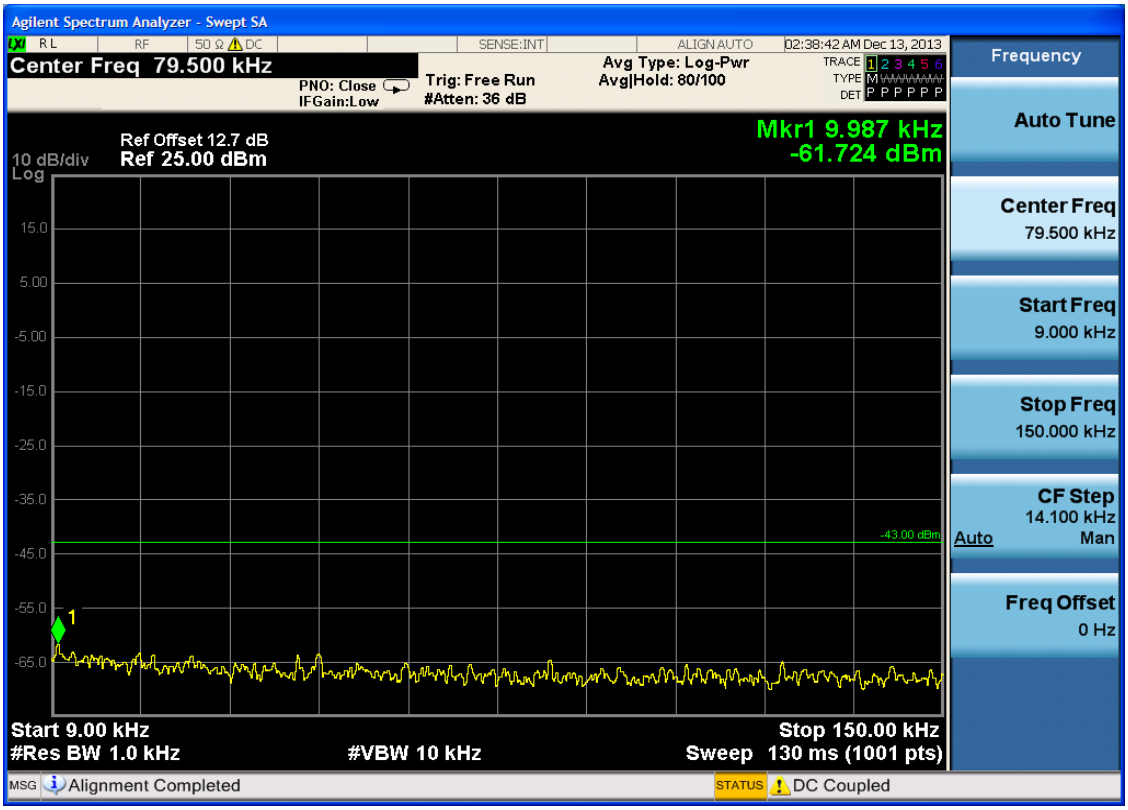

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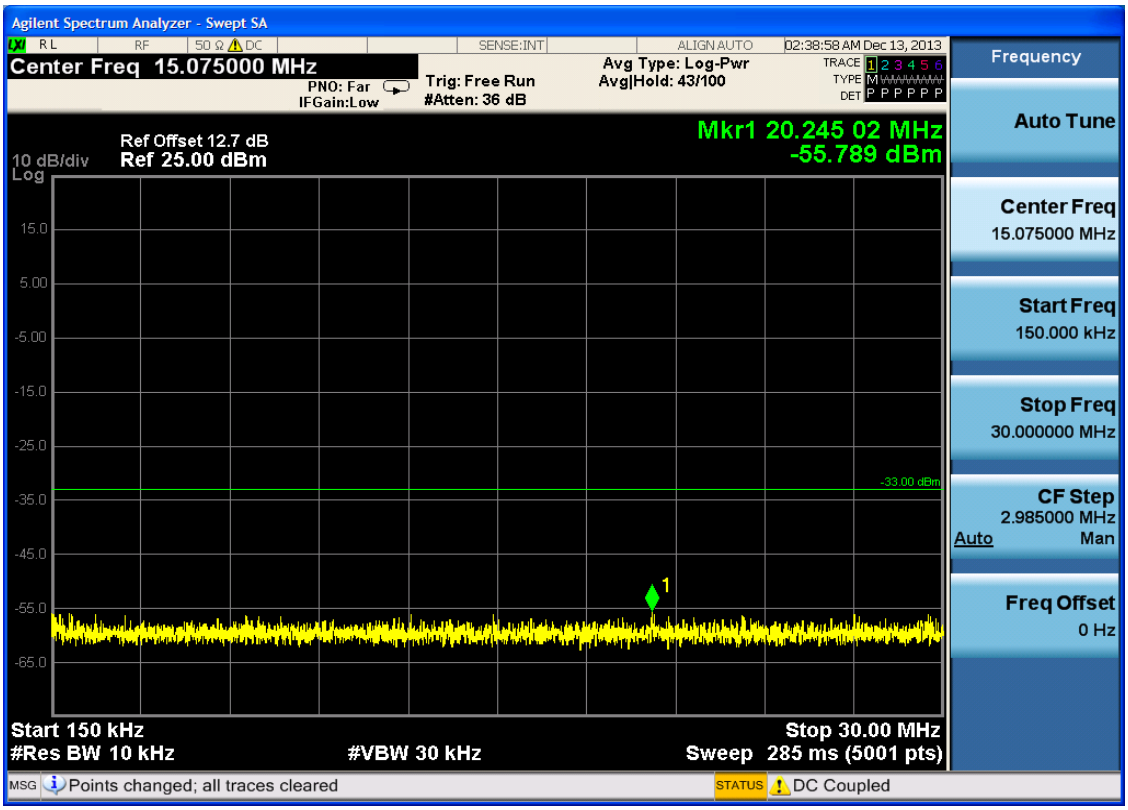

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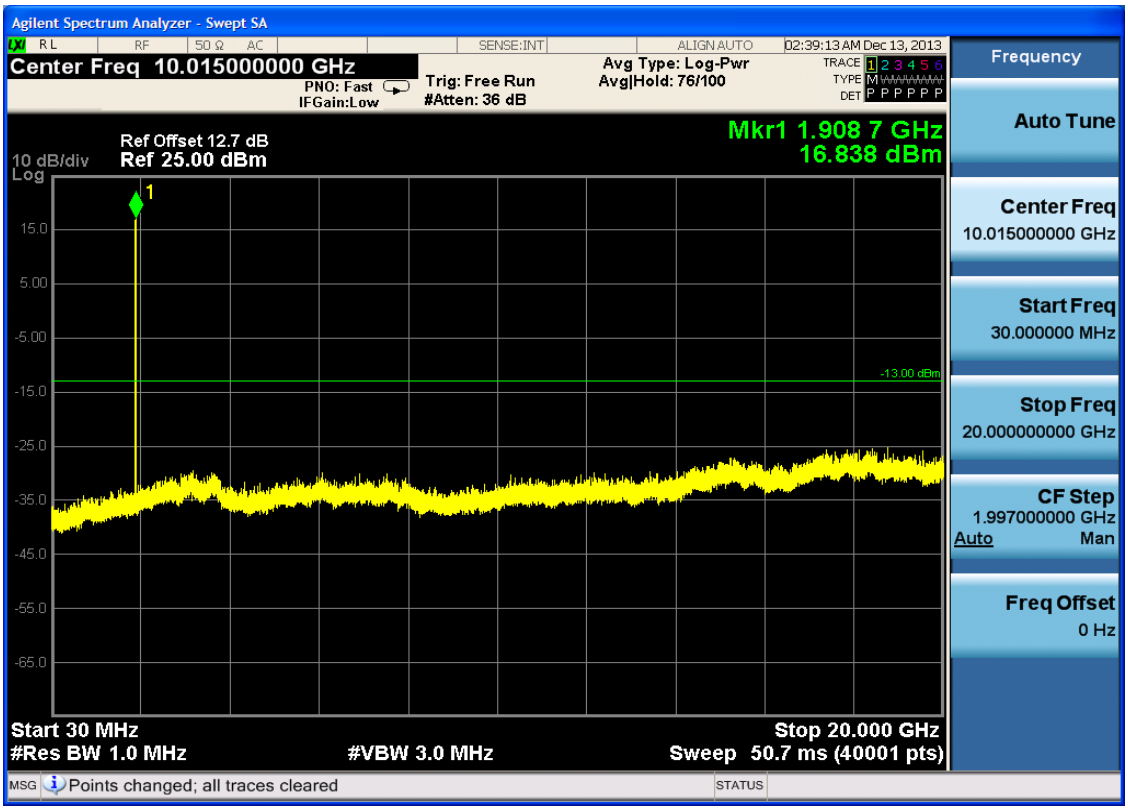

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7Appendix_G: Field Strength of Spurious Radiation

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

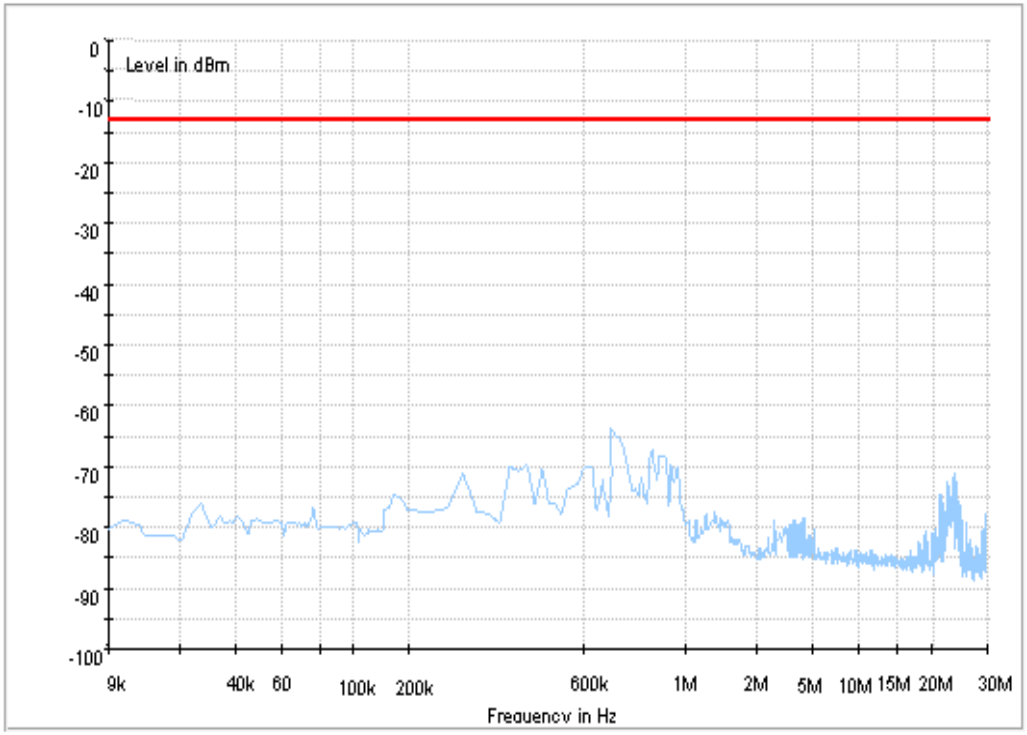
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

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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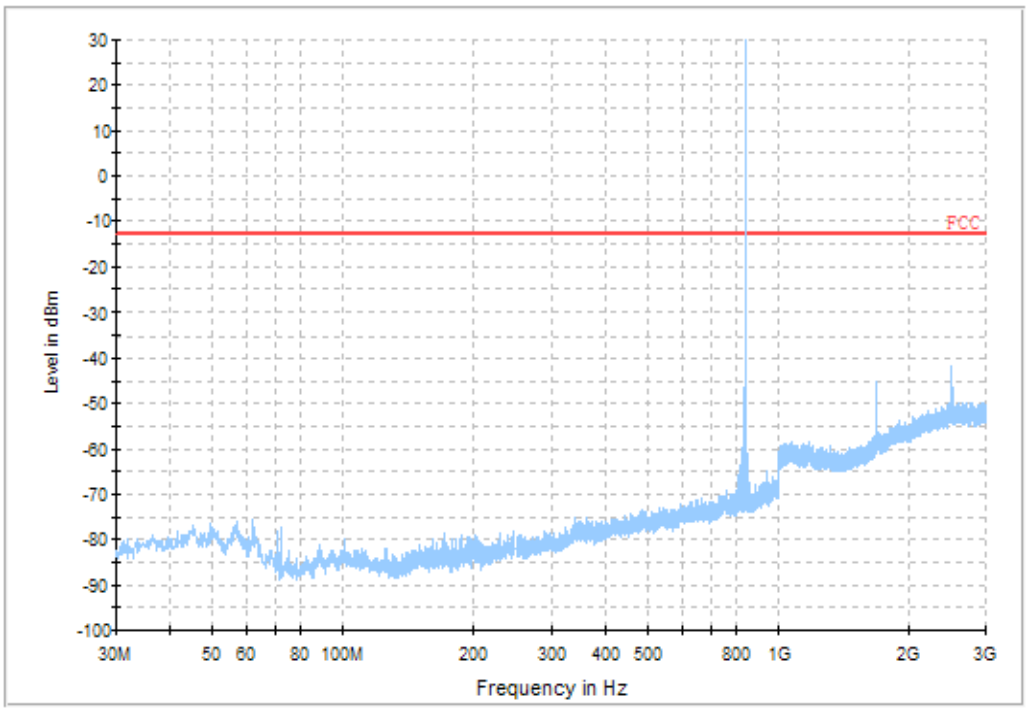
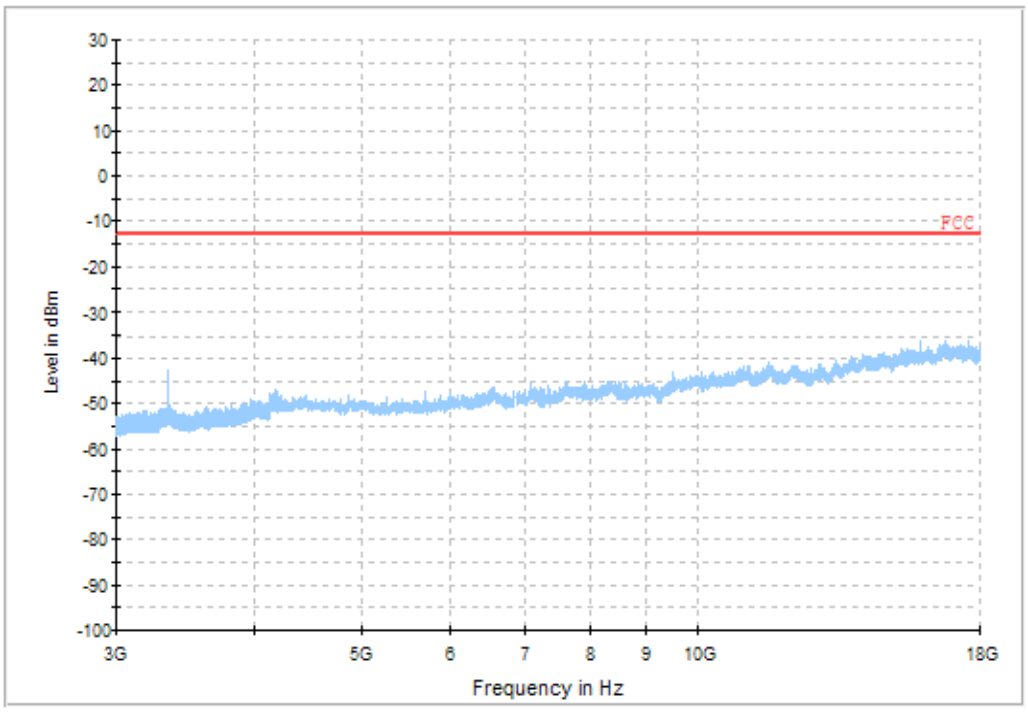
Copy of FCC PART22 GSM850_L



Copy of FCC PART22 GSM850_H



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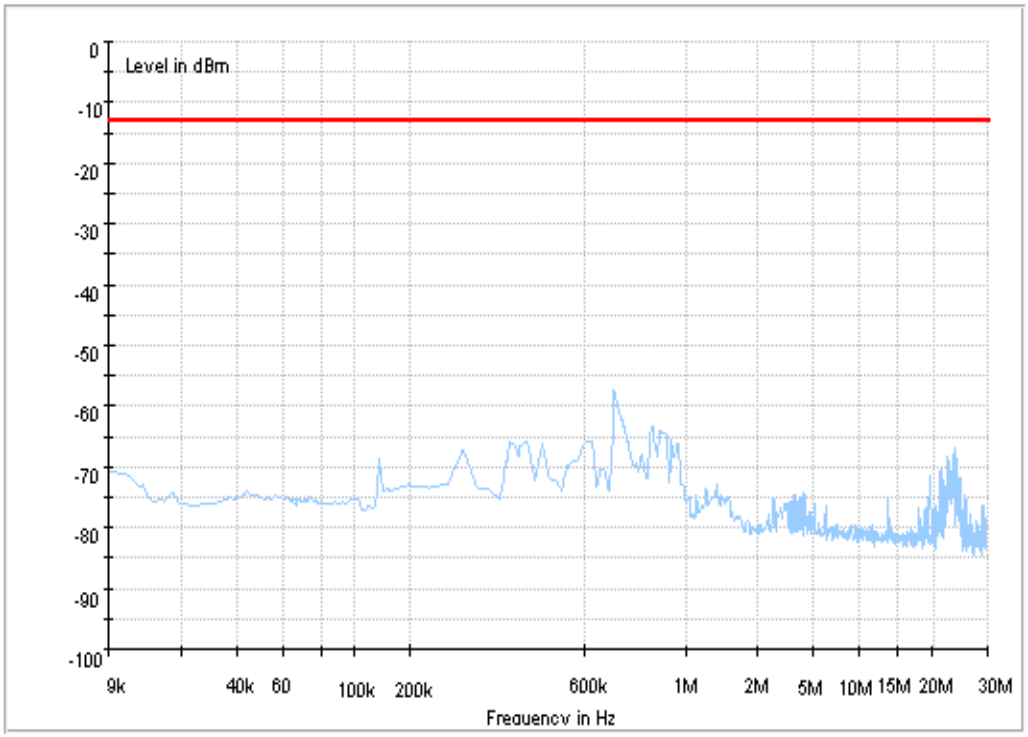
7.1.1.2 Test Mode = GSM/TM2



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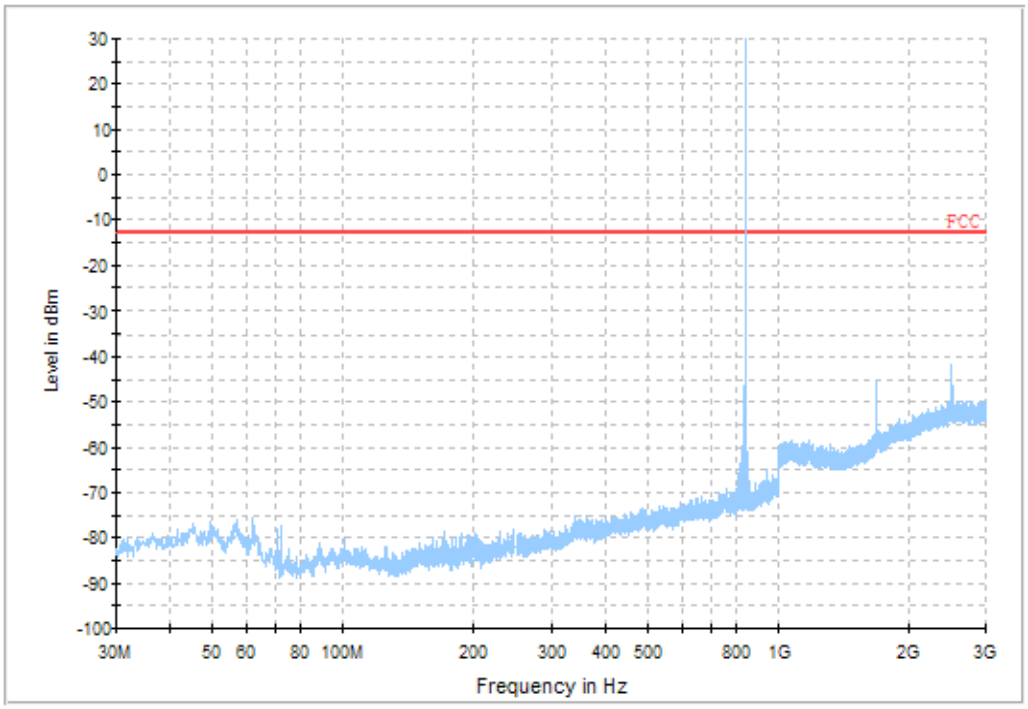
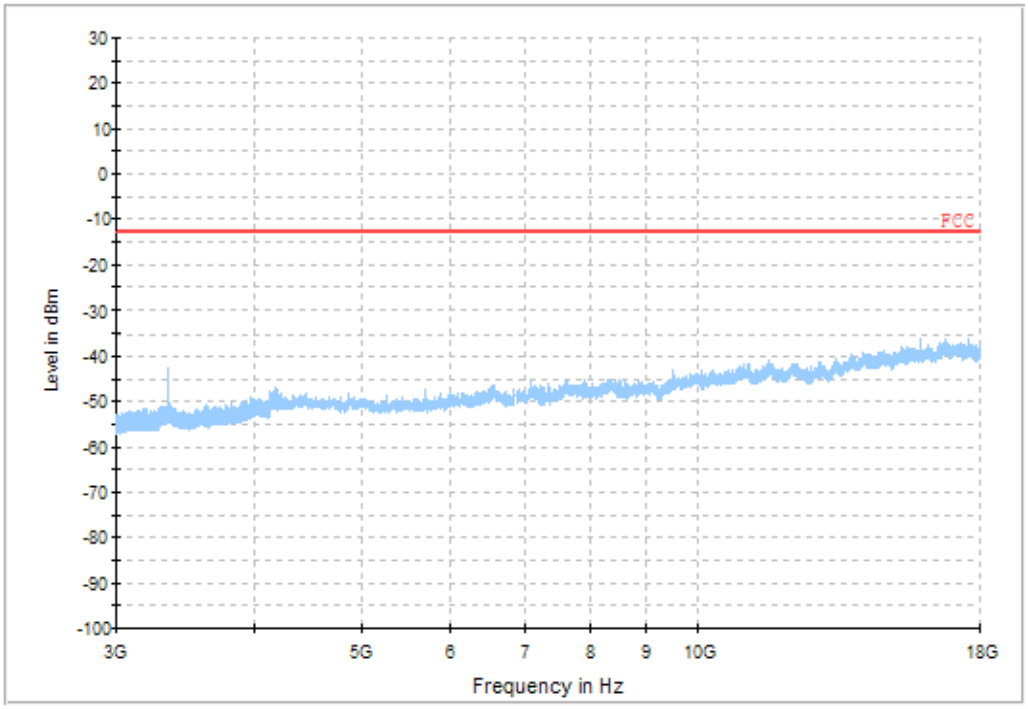
Copy of FCC PART22 GSM850_L



Copy of FCC PART22 GSM850_H



7.1.2 Test Band = GSM1900

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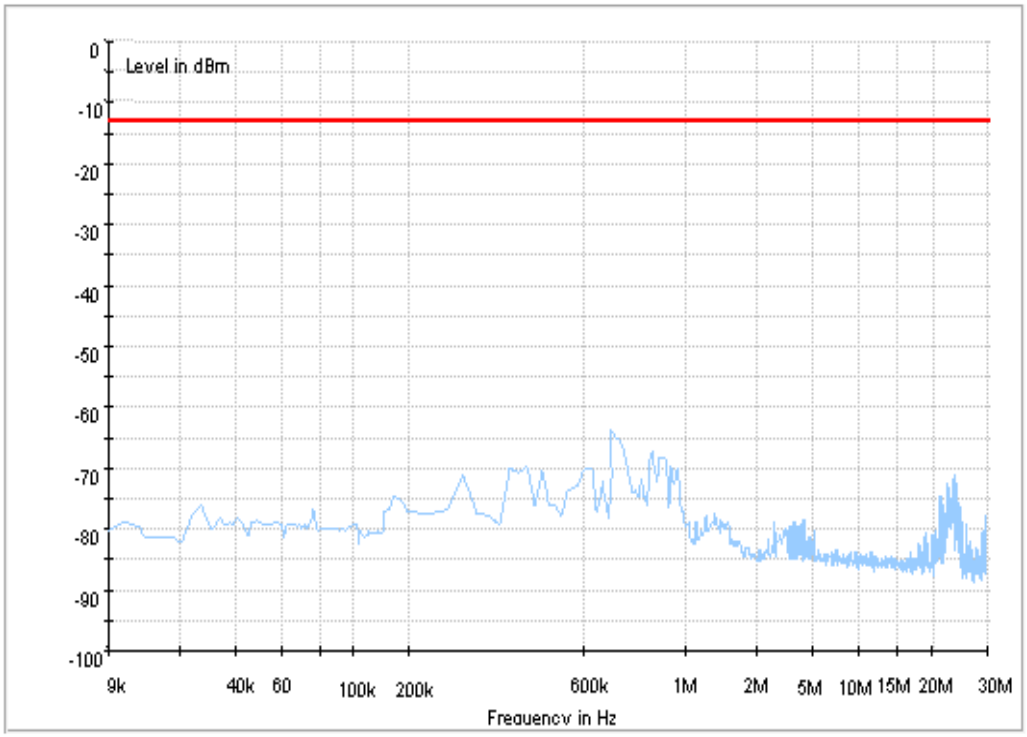
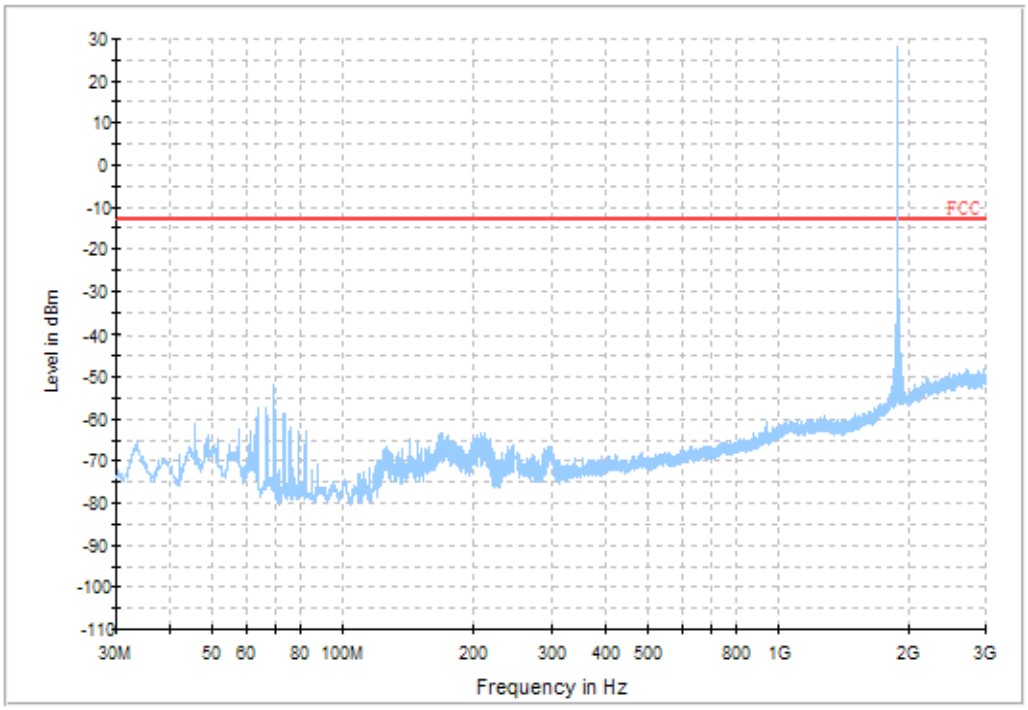
7.1.2.1 Test Mode = GSM/TM1



Copy of FCC PART24 GSM1900_L



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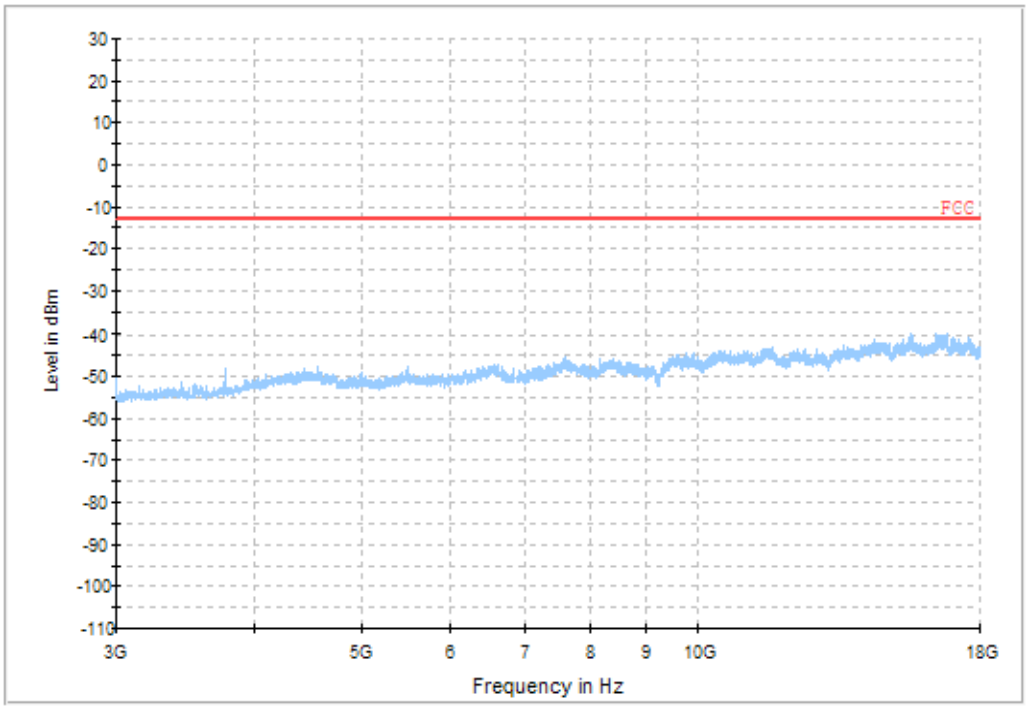

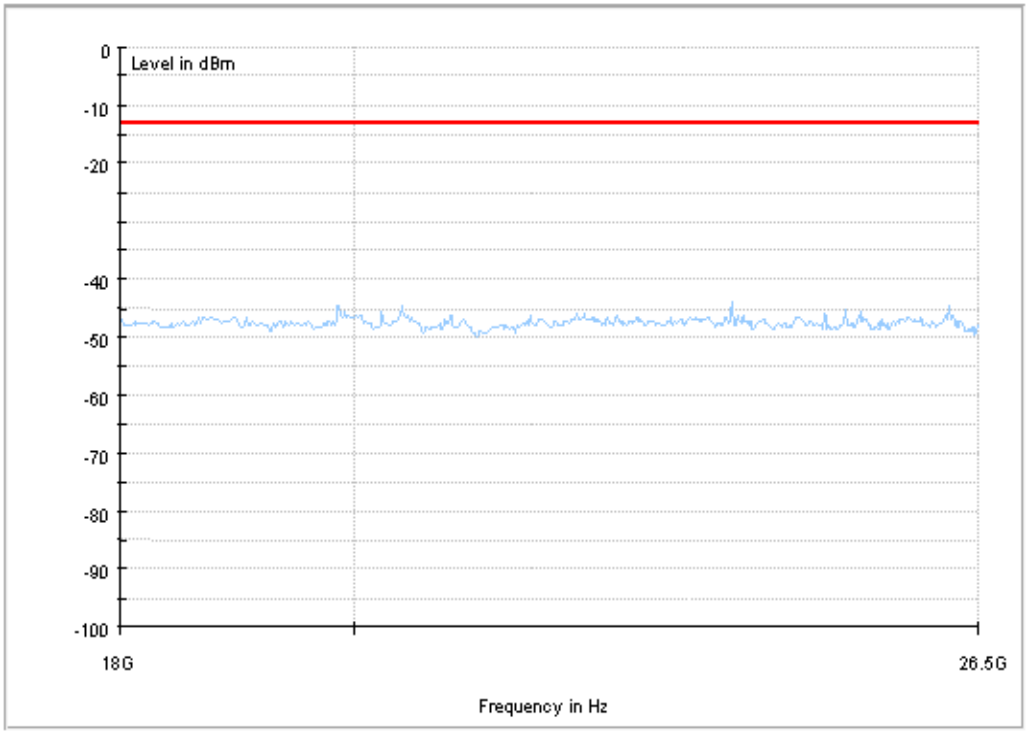

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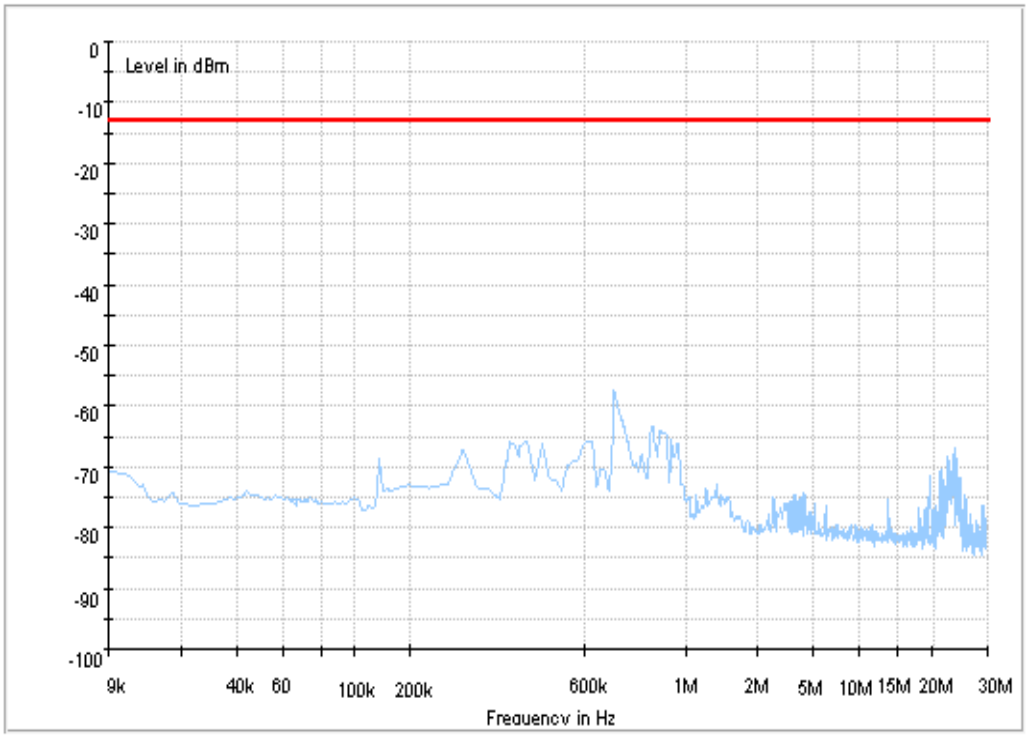
7.1.2.2 Test Mode = GSM/TM2



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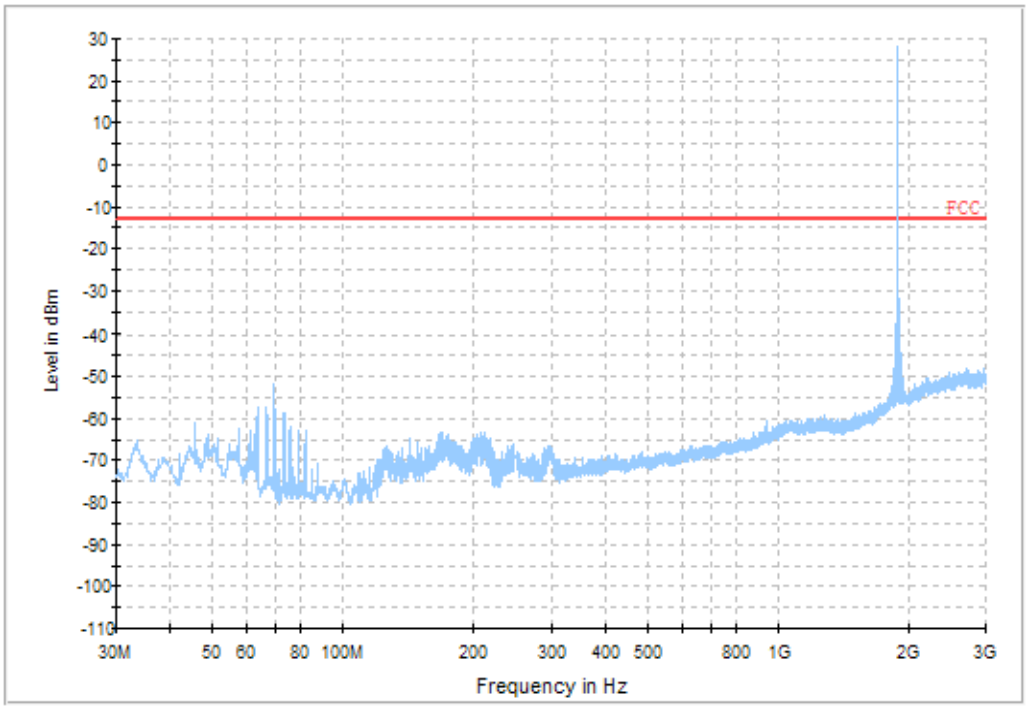
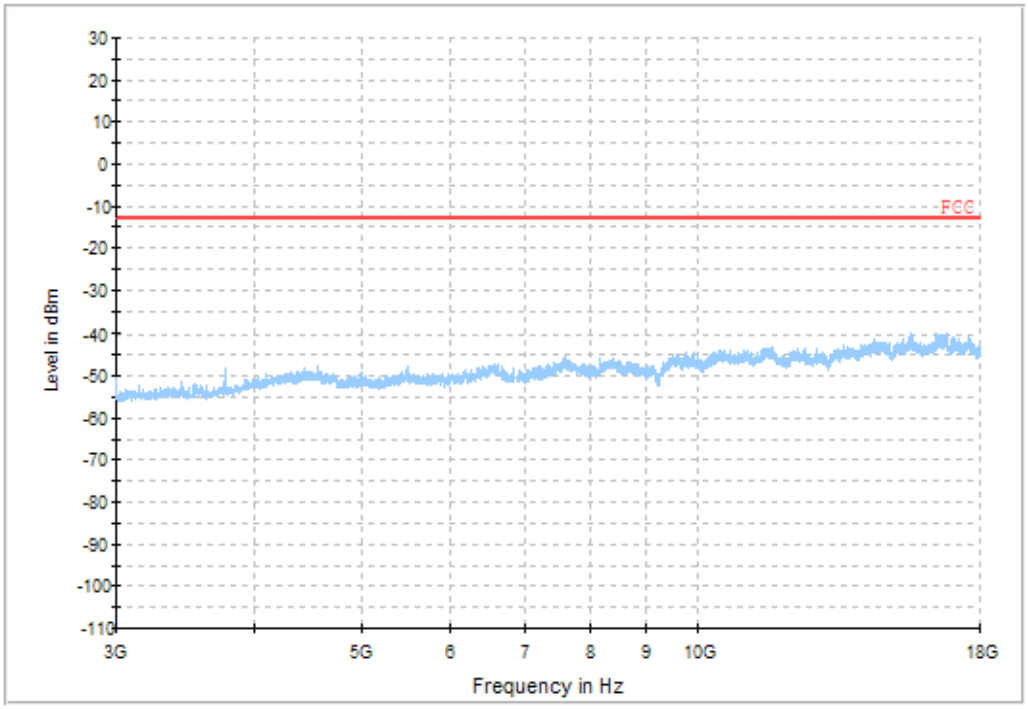


Copy of FCC PART24 GSM1900_H



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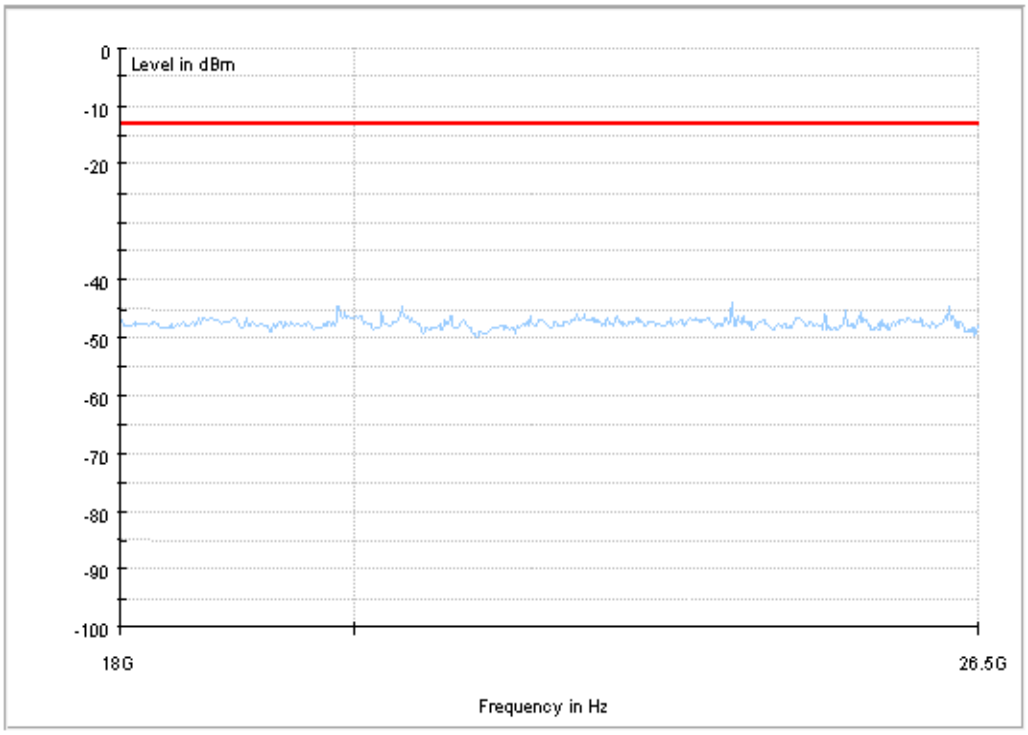

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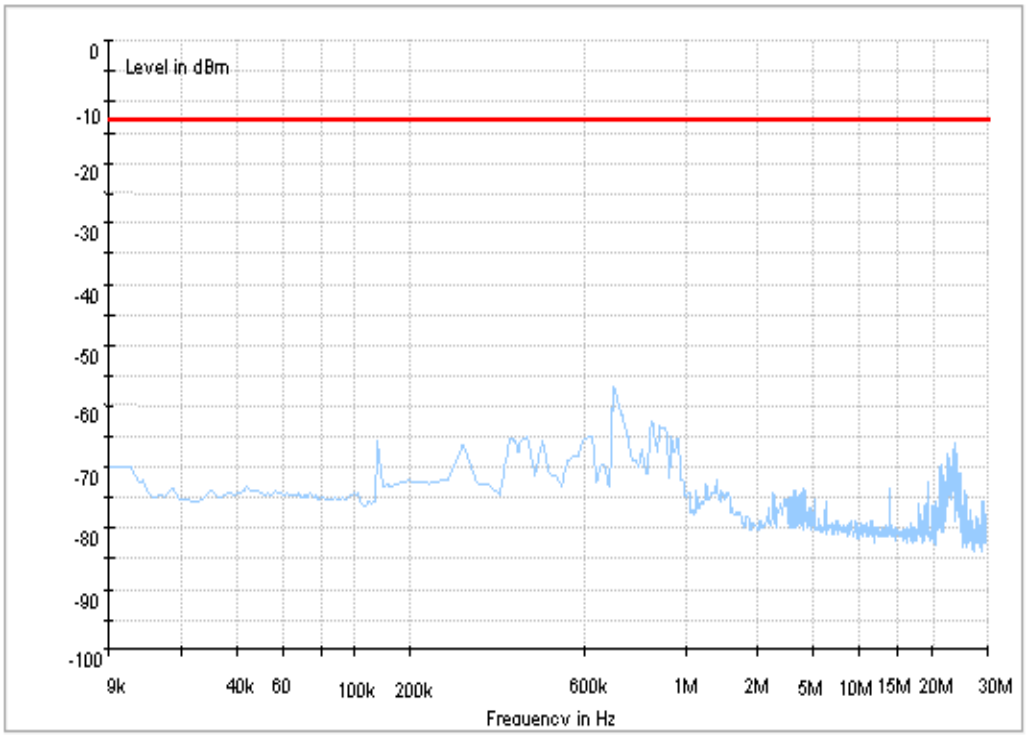
7.2 For UMTS

7.2.1 Test Band = WCDMA850

7.2.1.1 Test Mode = UMTS/TM1



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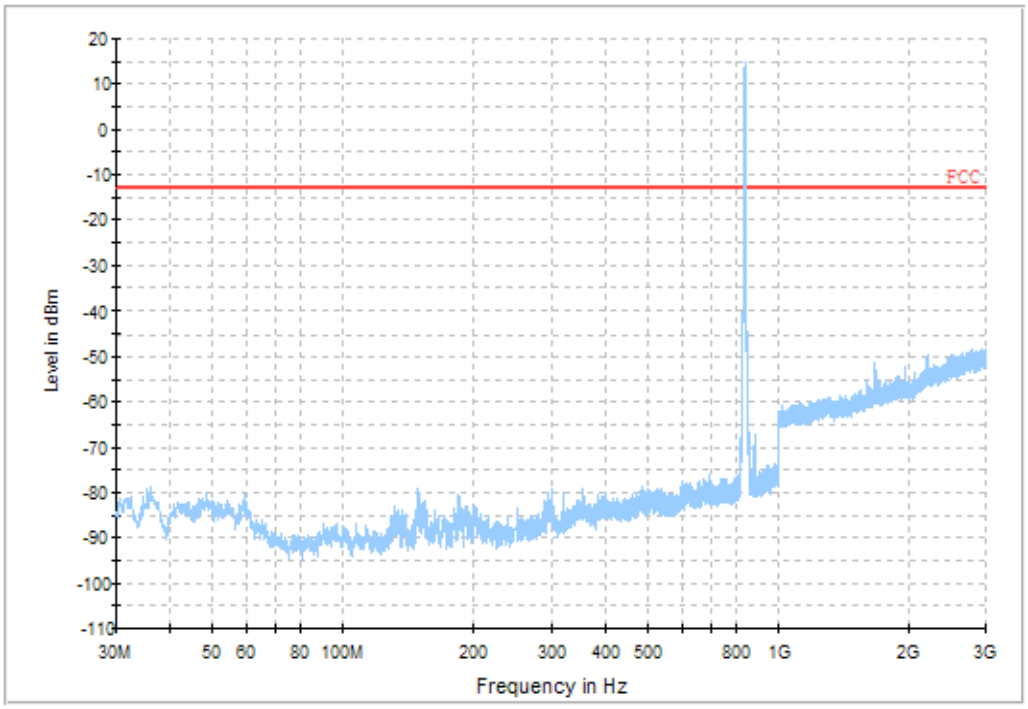
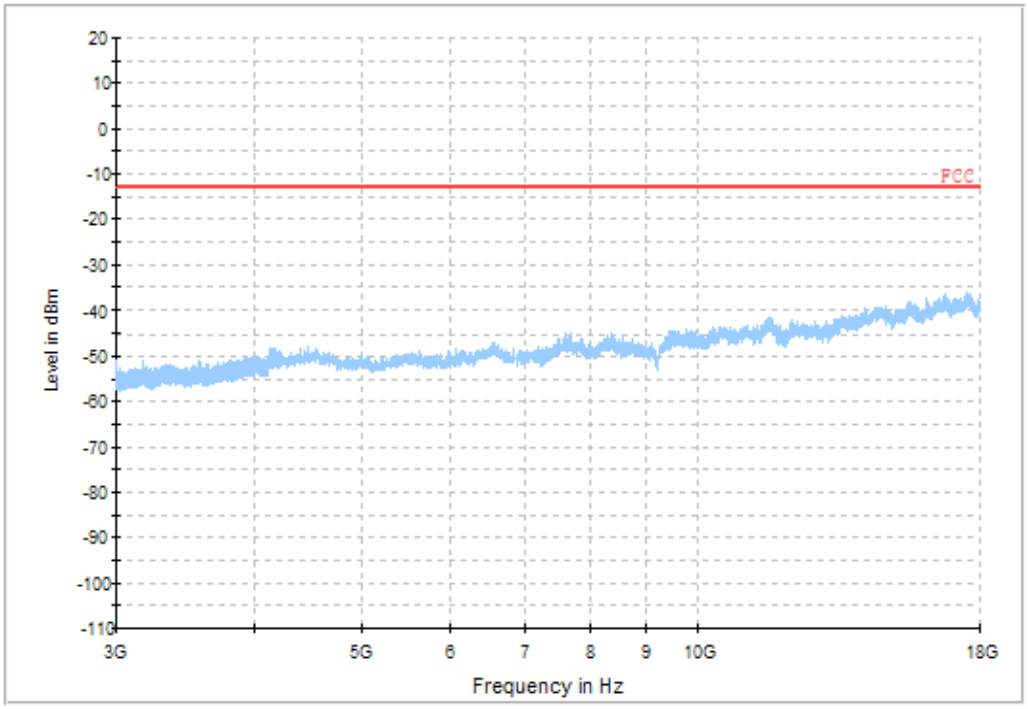
Copy of FCC PART22 WCDMA850_L



Copy of FCC PART22 WCDMA850_H



7.2.2 Test Band = WCDMA1900

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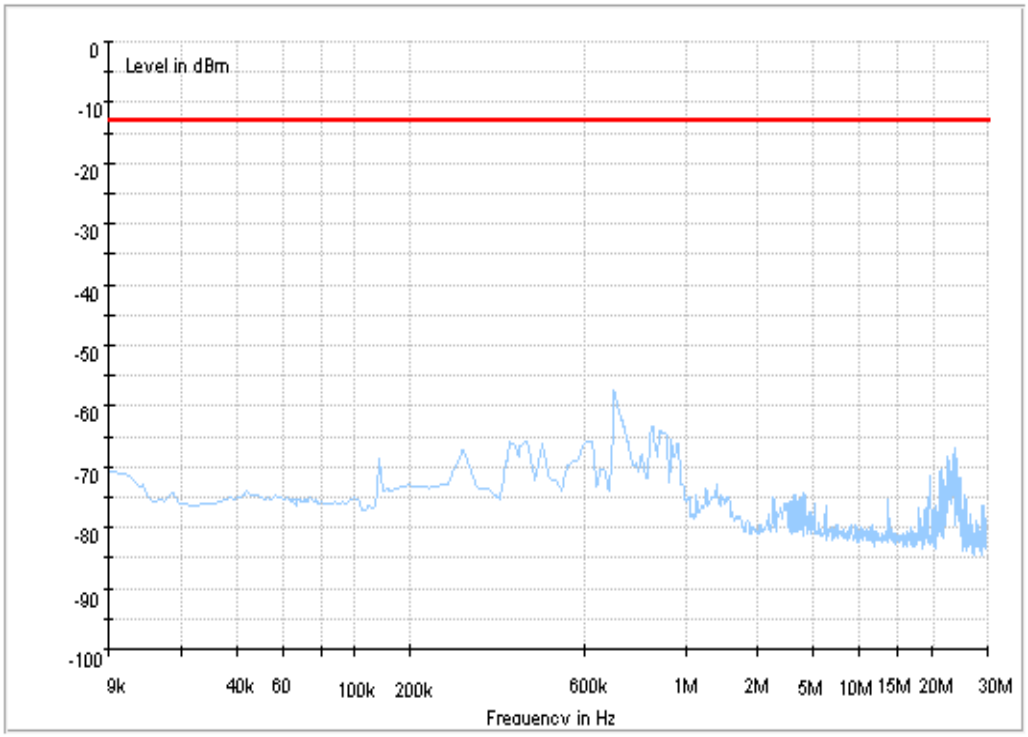
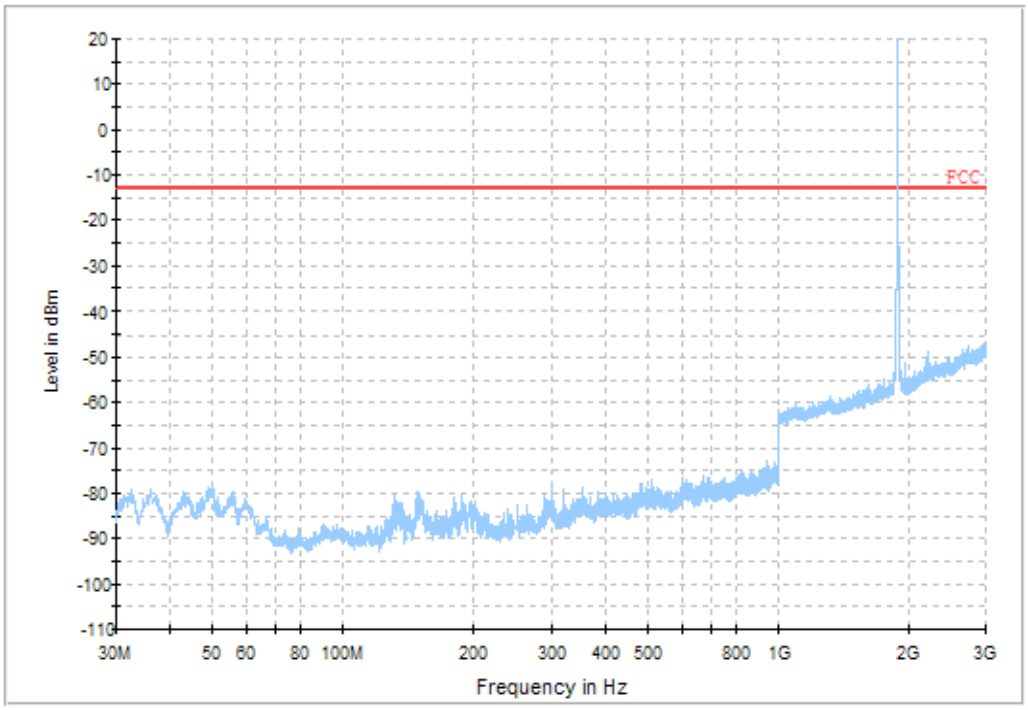
7.2.2.1 Test Mode = UMTS/TM1



Copy of FCC PART24 WCDMA1900_L



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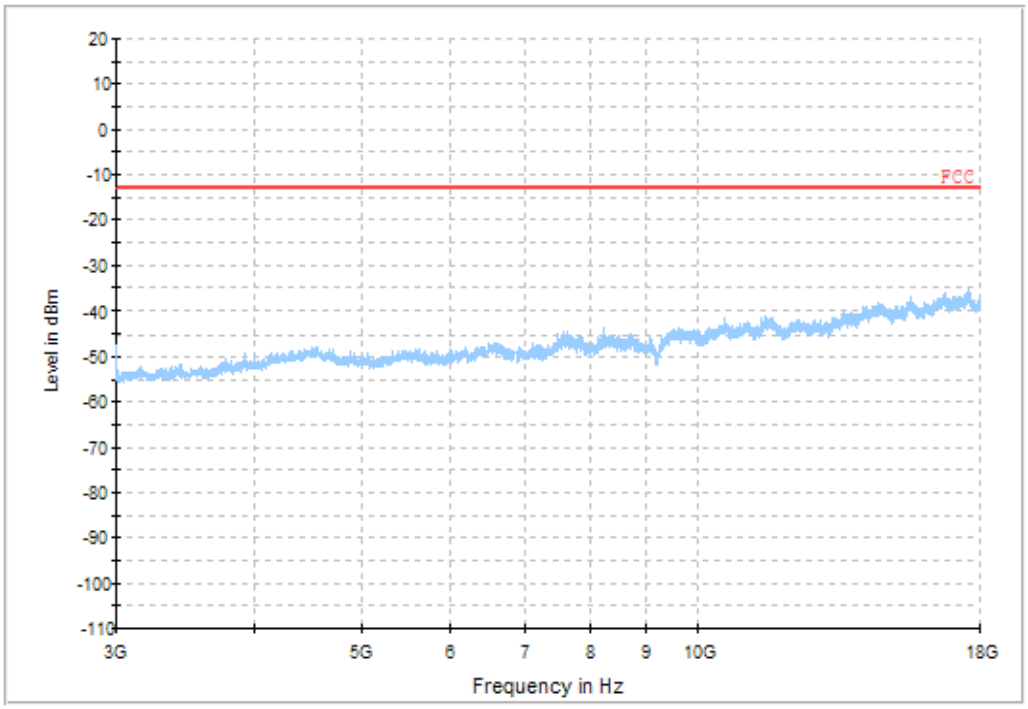

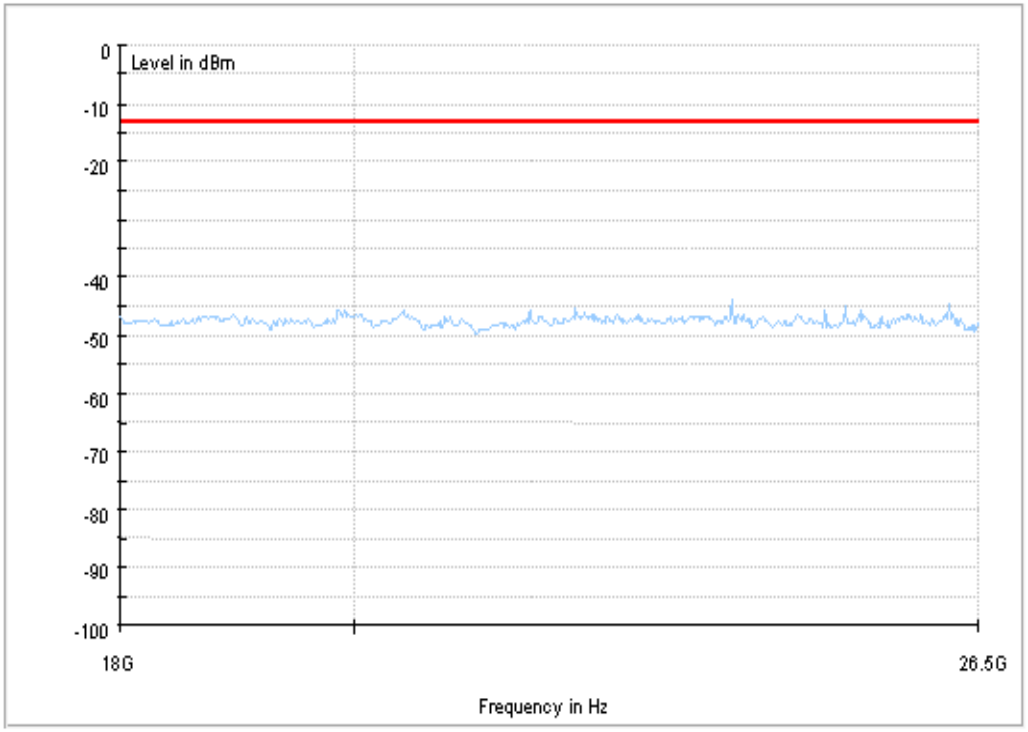

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8Appendix_H: Frequency Stability

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	-26.54	-0.0322	PASS
				VN	-26.99	-0.03275	PASS
				VH	-25.44	-0.03087	PASS
		MCH	TN	VL	-26.60	-0.0318	PASS
				VN	-20.99	-0.02509	PASS
				VH	-21.31	-0.02547	PASS
		HCH	TN	VL	-30.41	-0.03583	PASS
				VN	-24.34	-0.02868	PASS
				VH	-24.60	-0.02898	PASS
	GSM/TM2	LCH	TN	VL	-40.45	-0.04908	PASS
				VN	-36.68	-0.0445	PASS
				VH	-35.84	-0.04348	PASS
		MCH	TN	VL	-33.22	-0.03971	PASS
				VN	-31.96	-0.0382	PASS
				VH	-27.41	-0.03276	PASS
		HCH	TN	VL	-30.09	-0.03545	PASS
				VN	-40.13	-0.04728	PASS
				VH	-39.26	-0.04625	PASS
GSM1900	GSM/TM1	LCH	TN	VL	-49.78	-0.02691	PASS
				VN	-56.31	-0.03043	PASS
				VH	-59.28	-0.03204	PASS
		MCH	TN	VL	-46.10	-0.02452	PASS
				VN	-49.27	-0.02621	PASS
				VH	-37.19	-0.01978	PASS
		HCH	TN	VL	-54.69	-0.02864	PASS
				VN	-50.43	-0.02641	PASS
				VH	-54.43	-0.0285	PASS
	GSM/TM2	LCH	TN	VL	-84.04	-0.04542	PASS
				VN	-67.83	-0.03666	PASS

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Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VH	-76.78	-0.0415	PASS
		MCH	TN	VL	-57.66	-0.03067	PASS
				VN	-68.12	-0.03623	PASS
				VH	-57.08	-0.03036	PASS
		HCH	TN	VL	-74.52	-0.03902	PASS
				VN	-73.81	-0.03865	PASS
				VH	-62.31	-0.03263	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	-25.57	-0.03102	PASS
				-20	-17.82	-0.02162	PASS
				-10	-33.19	-0.04027	PASS
				0	-31.77	-0.03855	PASS
				10	-27.57	-0.03345	PASS
				20	-29.44	-0.03572	PASS
				30	-25.18	-0.03055	PASS
				40	-28.22	-0.03424	PASS
				50	-29.12	-0.03533	PASS
		MCH	VN	-30	-24.02	-0.02871	PASS
				-20	-24.86	-0.02972	PASS
				-10	-21.18	-0.02532	PASS
				0	-19.37	-0.02315	PASS
				10	-24.41	-0.02918	PASS
				20	-24.15	-0.02887	PASS
				30	-23.76	-0.0284	PASS
				40	-23.25	-0.02779	PASS
				50	-25.38	-0.03034	PASS
		HCH	VN	-30	-27.70	-0.03263	PASS
				-20	-27.25	-0.0321	PASS
				-10	-26.93	-0.03173	PASS
				0	-28.67	-0.03378	PASS
				10	-26.15	-0.03081	PASS
				20	-25.25	-0.02975	PASS
				30	-25.51	-0.03005	PASS
				40	-24.34	-0.02868	PASS
				50	-27.83	-0.03279	PASS
	GSM/TM2	LCH	VN	-30	-37.68	-0.04572	PASS

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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-20	-35.29	-0.04282	PASS
				-10	-35.90	-0.04356	PASS
				0	-38.81	-0.04709	PASS
				10	-25.44	-0.03087	PASS
				20	-37.94	-0.04603	PASS
				30	-37.71	-0.04575	PASS
				40	-31.38	-0.03807	PASS
				50	-27.83	-0.03377	PASS
		MCH	VN	-30	-41.42	-0.04951	PASS
				-20	-40.26	-0.04812	PASS
				-10	-30.74	-0.03674	PASS
				0	-29.57	-0.03535	PASS
				10	-29.96	-0.03581	PASS
				20	-32.35	-0.03867	PASS
				30	-40.10	-0.04793	PASS
				40	-32.58	-0.03894	PASS
				50	-41.71	-0.04986	PASS
		HCH	VN	-30	-37.00	-0.04359	PASS
				-20	-34.48	-0.04062	PASS
				-10	-33.22	-0.03914	PASS
				0	-38.90	-0.04583	PASS
				10	-28.44	-0.03351	PASS
				20	-34.03	-0.04009	PASS
				30	-28.38	-0.03344	PASS
				40	-31.83	-0.0375	PASS
				50	-32.58	-0.03838	PASS
GSM1900	GSM/TM1	LCH	VN	-30	-62.51	-0.03379	PASS
				-20	-58.76	-0.03176	PASS
				-10	-59.47	-0.03214	PASS
				0	-59.28	-0.03204	PASS
				10	-59.41	-0.03211	PASS
				20	-63.09	-0.0341	PASS
				30	-61.08	-0.03301	PASS
				40	-58.37	-0.03155	PASS
				50	-55.14	-0.0298	PASS
		MCH	VN	-30	-37.39	-0.01989	PASS
				-20	-46.75	-0.02487	PASS
				-10	-43.20	-0.02298	PASS
				0	-41.84	-0.02226	PASS

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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				10	-44.68	-0.02377	PASS
				20	-44.68	-0.02377	PASS
				30	-42.29	-0.02249	PASS
				40	-46.49	-0.02473	PASS
				50	-39.00	-0.02074	PASS
		HCH	VN	-30	-50.82	-0.02661	PASS
				-20	-49.14	-0.02573	PASS
				-10	-51.85	-0.02715	PASS
				0	-52.63	-0.02756	PASS
				10	-58.37	-0.03056	PASS
				20	-51.53	-0.02698	PASS
				30	-50.95	-0.02668	PASS
				40	-49.72	-0.02603	PASS
				50	-53.59	-0.02806	PASS
	GSM/TM2	LCH	VN	-30	-66.83	-0.03612	PASS
				-20	-76.81	-0.04151	PASS
				-10	-80.42	-0.04347	PASS
				0	-82.59	-0.04464	PASS
				10	-84.49	-0.04567	PASS
				20	-76.87	-0.04155	PASS
				30	-73.03	-0.03947	PASS
				40	-77.52	-0.0419	PASS
				50	-67.86	-0.03668	PASS
		MCH	VN	-30	-56.56	-0.03009	PASS
				-20	-63.51	-0.03378	PASS
				-10	-56.56	-0.03009	PASS
				0	-63.38	-0.03371	PASS
				10	-52.24	-0.02779	PASS
				20	-81.55	-0.04338	PASS
				30	-60.25	-0.03205	PASS
				40	-46.14	-0.02454	PASS
				50	-56.89	-0.03026	PASS
		HCH	VN	-30	-58.02	-0.03038	PASS
				-20	-58.95	-0.03087	PASS
				-10	-81.91	-0.04289	PASS
				0	-68.90	-0.03608	PASS
				10	-66.64	-0.03489	PASS
				20	-63.76	-0.03339	PASS
				30	-71.77	-0.03758	PASS

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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				40	-66.83	-0.03499	PASS
				50	-66.86	-0.03501	PASS

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	-1.46	-0.00177	PASS
				VN	-1.08	-0.00131	PASS
				VH	-13.57	-0.01642	PASS
		MCH	TN	VL	0.24	0.00029	PASS
				VN	-1.31	-0.00157	PASS
				VH	-11.46	-0.0137	PASS
		HCH	TN	VL	-3.31	-0.00391	PASS
				VN	-2.15	-0.00254	PASS
				VH	-1.59	-0.00188	PASS
WCDMA1900	UMTS/TM1	LCH	TN	VL	0.40	0.00022	PASS
				VN	3.25	0.00175	PASS
				VH	-4.73	-0.00255	PASS
		MCH	TN	VL	2.04	0.00109	PASS
				VN	-0.20	-0.00011	PASS
				VH	1.34	0.00071	PASS
		HCH	TN	VL	0.15	0.00008	PASS
				VN	3.72	0.00195	PASS
				VH	0.44	0.00023	PASS

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	-4.90	-0.00593	PASS
				-20	-12.39	-0.01499	PASS
				-10	-1.60	-0.00194	PASS
				0	-6.74	-0.00816	PASS
				10	-4.78	-0.00578	PASS
				20	-3.72	-0.0045	PASS
				30	-3.23	-0.00391	PASS
				40	-3.36	-0.00407	PASS

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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				50	-4.65	-0.00563	PASS
		MCH	VN	-30	-6.04	-0.00722	PASS
				-20	-4.90	-0.00586	PASS
				-10	2.91	0.00348	PASS
				0	-1.33	-0.00159	PASS
				10	-8.45	-0.0101	PASS
				20	-1.31	-0.00157	PASS
				30	-7.16	-0.00856	PASS
				40	-2.44	-0.00292	PASS
				50	-5.45	-0.00652	PASS
		HCH	VN	-30	-4.14	-0.00489	PASS
				-20	-6.87	-0.00811	PASS
				-10	-4.17	-0.00493	PASS
				0	1.40	0.00165	PASS
				10	-11.52	-0.01361	PASS
				20	-4.53	-0.00535	PASS
				30	0.64	0.00076	PASS
				40	1.33	0.00157	PASS
				50	0.11	0.00013	PASS
WCDMA1900	UMTS/TM1	LCH	VN	-30	-3.37	-0.00182	PASS
				-20	-6.61	-0.00357	PASS
				-10	0.43	0.00023	PASS
				0	-5.98	-0.00323	PASS
				10	-1.34	-0.00072	PASS
				20	-0.78	-0.00042	PASS
				30	0.35	0.00019	PASS
				40	4.61	0.00249	PASS
				50	1.30	0.0007	PASS
		MCH	VN	-30	1.30	0.00069	PASS
				-20	-0.18	-0.0001	PASS
				-10	2.32	0.00123	PASS
				0	6.47	0.00344	PASS
				10	4.43	0.00236	PASS
				20	-2.64	-0.0014	PASS
				30	2.67	0.00142	PASS
				40	4.52	0.0024	PASS
				50	3.95	0.0021	PASS
		HCH	VN	-30	0.27	0.00014	PASS
				-20	-6.96	-0.00365	PASS

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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-10	1.34	0.0007	PASS
				0	-4.35	-0.00228	PASS
				10	2.06	0.00108	PASS
				20	8.45	0.00443	PASS
				30	0.02	0.00001	PASS
				40	-6.61	-0.00347	PASS
				50	5.63	0.00295	PASS

END

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