Appendix for test report

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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	32.91	30.76	38.5	PASS
		MCH	32.87	30.72	38.5	PASS
		HCH	32.82	30.67	38.5	PASS
	GSM/TM2	LCH	26.72	24.57	38.5	PASS
		MCH	26.63	24.48	38.5	PASS
		HCH	26.73	24.58	38.5	PASS
WCDMA850	UMTS/TM1	LCH	22.52	20.37	38.5	PASS
		MCH	22.38	20.23	38.5	PASS
		HCH	22.01	19.86	38.5	PASS
Test Band	**Test Mode**	**Test Channel**	**Conducted Power [dBm]**	**EIRP [dBm]**	**Limit [dBm]**	**Verdict**
GSM1900	GSM/TM1	LCH	29.52	32.16	33	PASS
		MCH	28.92	31.73	33	PASS
		HCH	28.53	31.61	33	PASS
	GSM/TM2	LCH	24.05	27.21	33	PASS
		MCH	23.97	26.92	33	PASS
		HCH	24.04	27.06	33	PASS
WCDMA1900	UMTS/TM1	LCH	22.25	25.13	33	PASS
		MCH	22.4	25.32	33	PASS
		HCH	22.3	25.25	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	0.40	13	PASS
		MCH	0.40	13	PASS
		HCH	0.41	13	PASS
	GSM/TM2	LCH	3.31	13	PASS
		MCH	3.34	13	PASS
		HCH	3.33	13	PASS
Test Band	**Test Mode**	**Test Channel**	**Measured[dB]**	**Limit [dB]**	**Verdict**
WCDMA1900	UMTS/TM1	LCH	2.76	13	PASS
		MCH	2.71	13	PASS
		HCH	2.74	13	PASS

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3Appendix_C: Modulation Characteristics

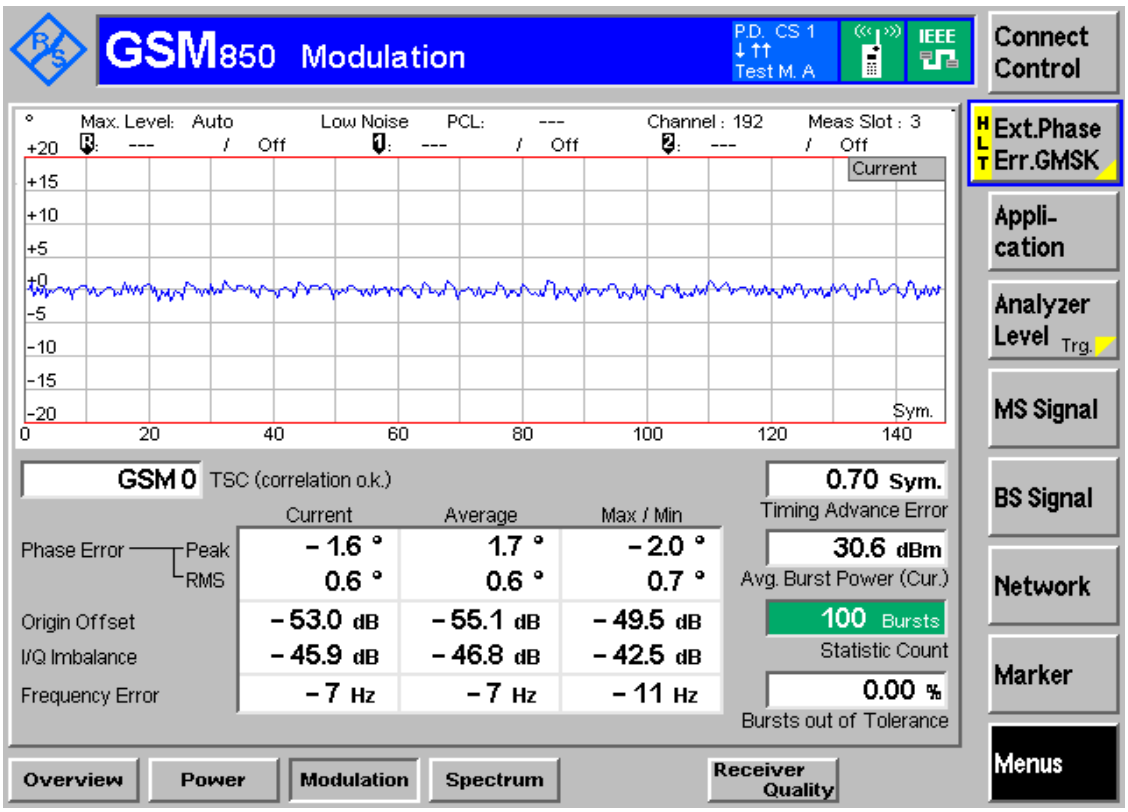
Part I - Test Plots

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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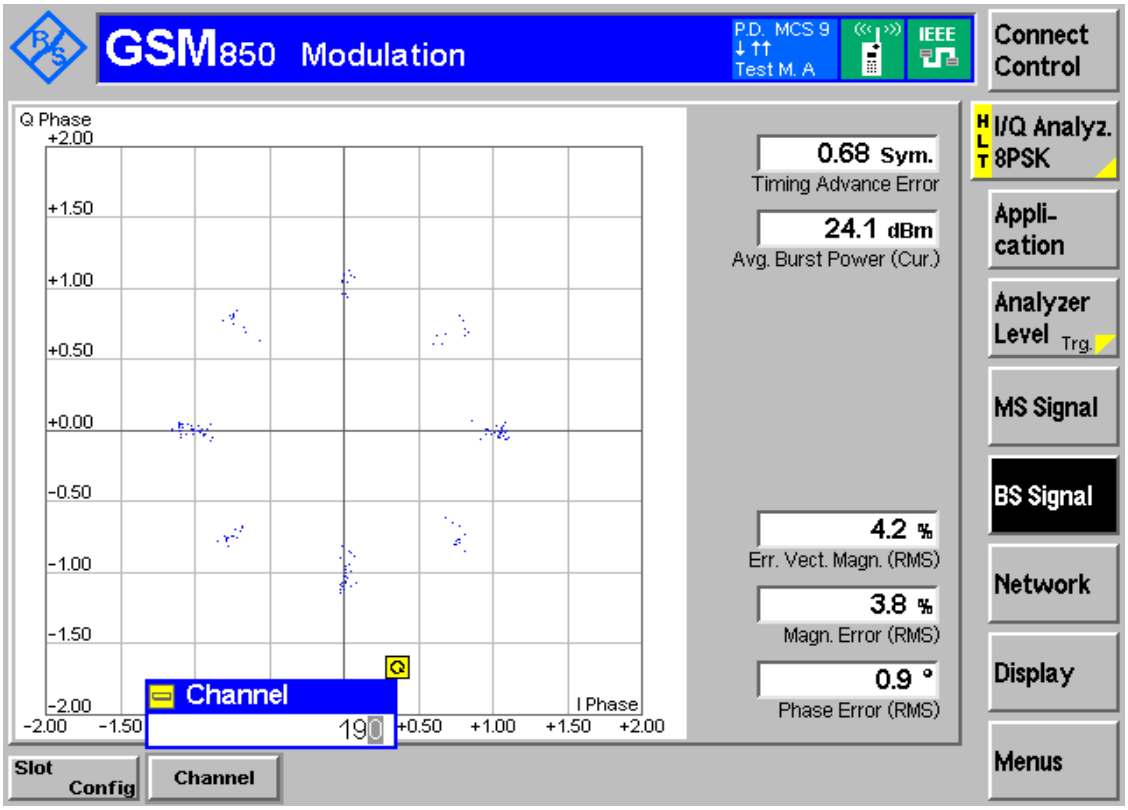
3.1.1.2 Test Mode = GSM/TM2

3.1.1.2.1 Test Channel = MCH



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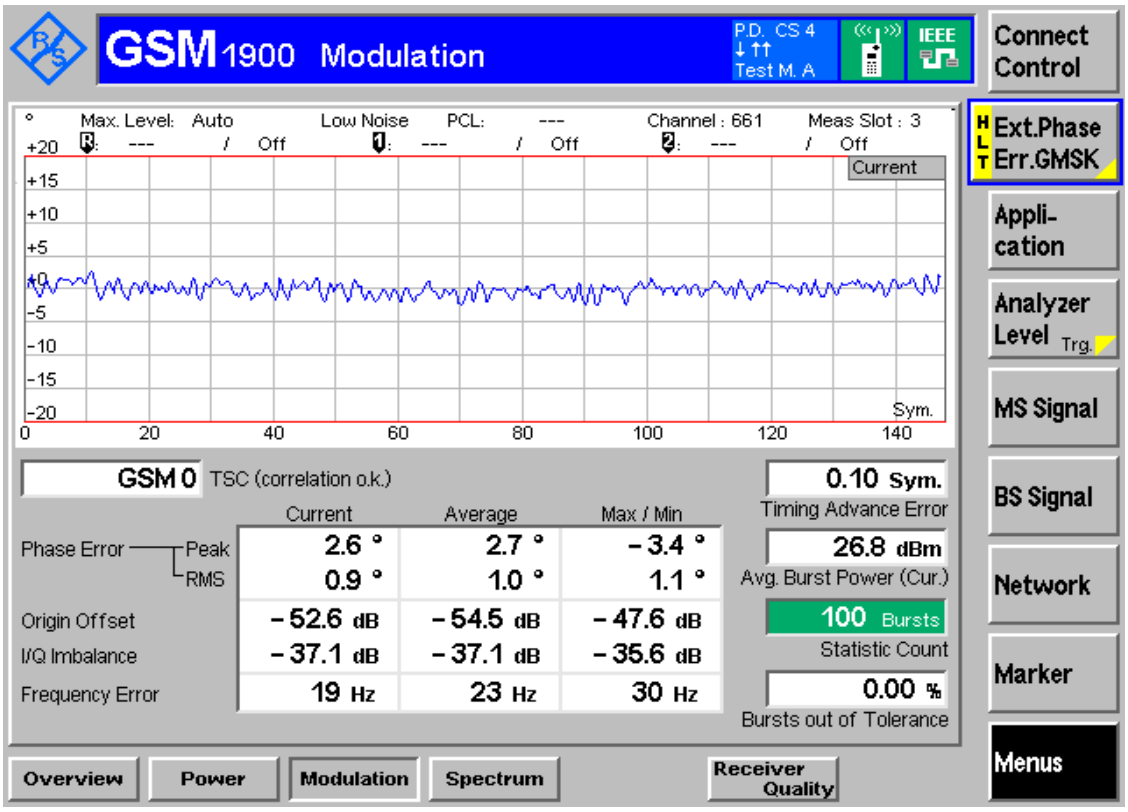
3.1.2 Test Band = GSM1900

3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH



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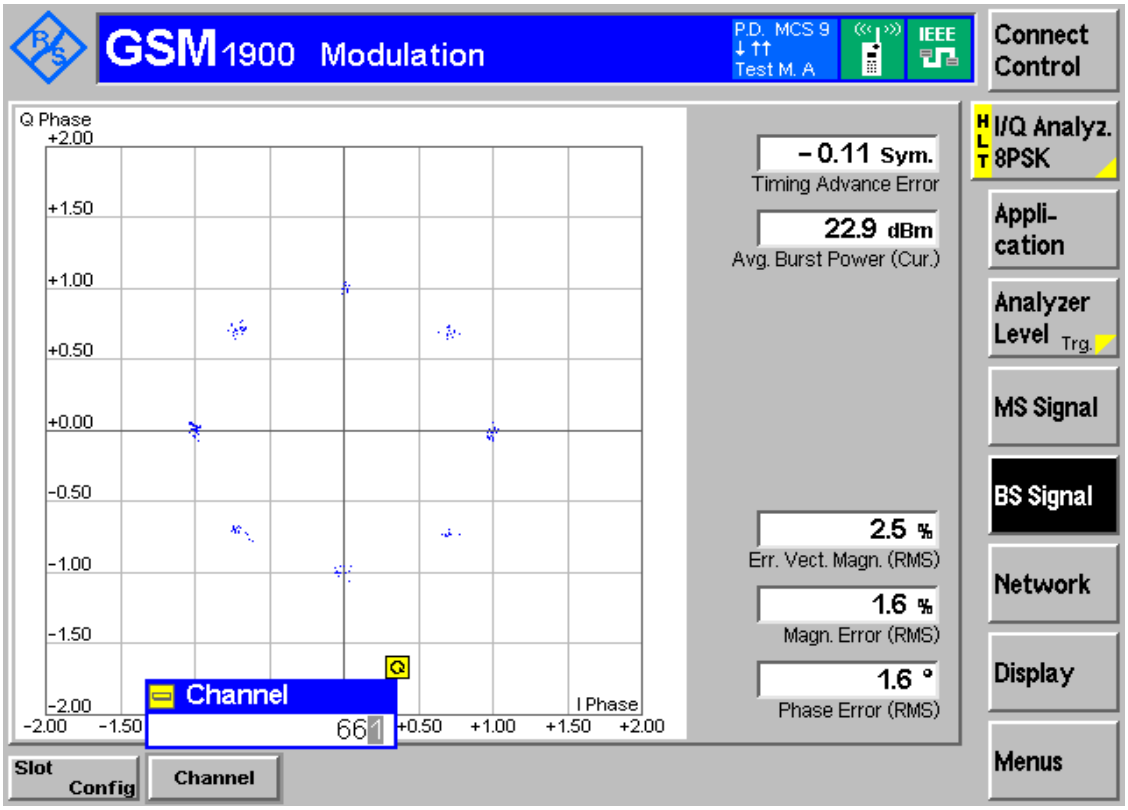
3.1.2.2 Test Mode = GSM/TM2

3.1.2.2.1 Test Channel = MCH



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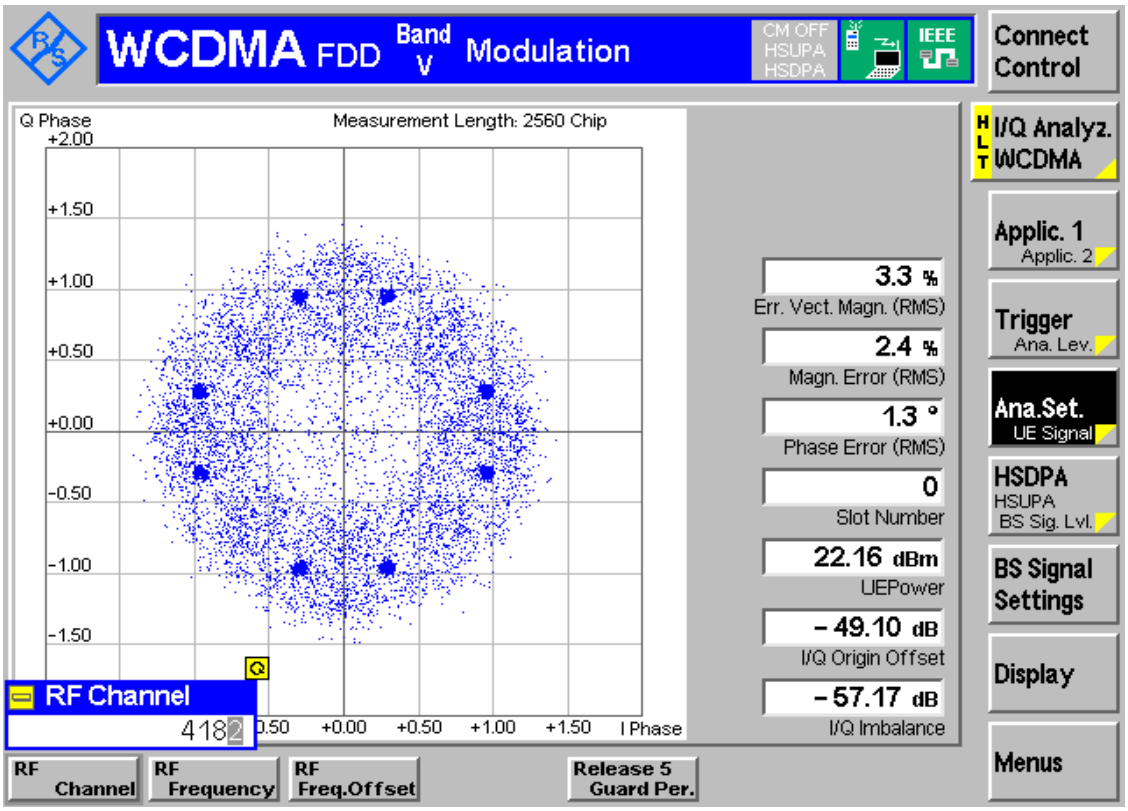
3.2 For UMTS

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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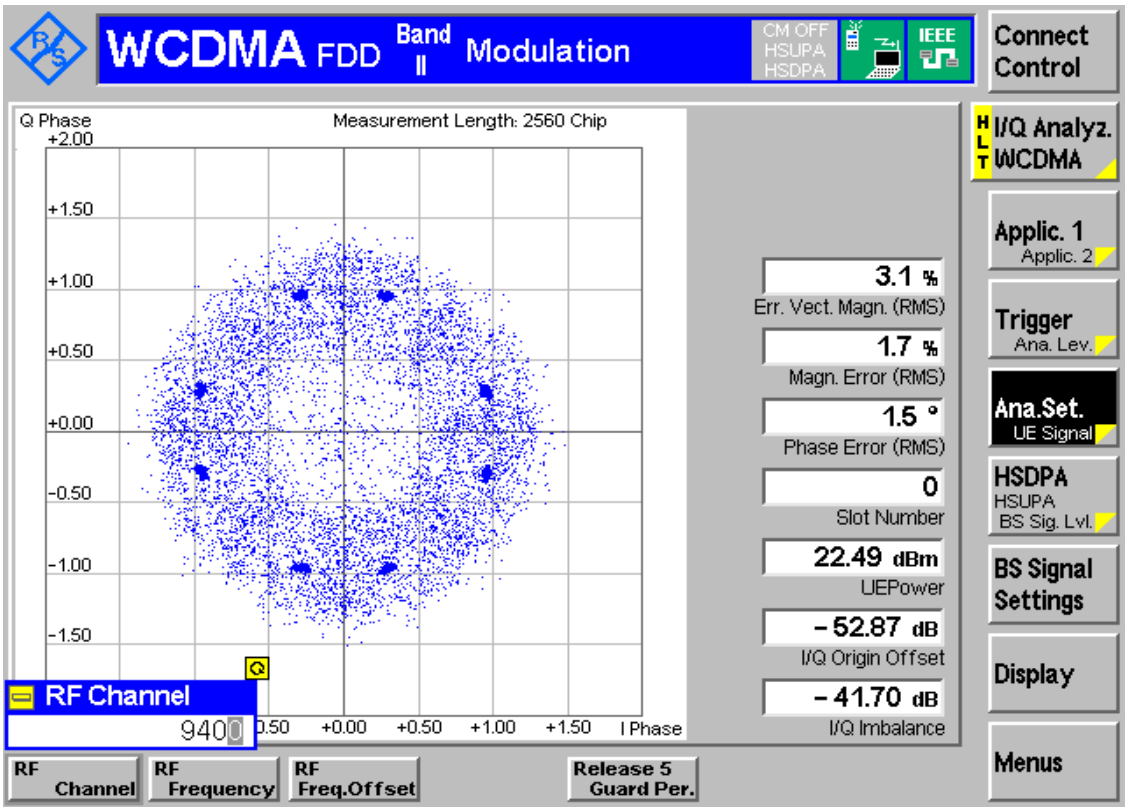
3.2.2 Test Band = WCDMA1900

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	243.60	316.82	Pass
		MCH	242.41	309.04	Pass
		HCH	240.74	312.47	Pass
	GSM/TM2	LCH	241.25	311.49	Pass
		MCH	238.61	308.77	Pass
		HCH	243.71	304.90	Pass
GSM1900	GSM/TM1	LCH	240.66	311.30	Pass
		MCH	239.12	312.78	Pass
		HCH	245.23	311.89	Pass
	GSM/TM2	LCH	238.80	292.87	Pass
		MCH	237.13	309.09	Pass
		HCH	245.80	316.14	Pass
Test Band	**Test Mode**	**Test Channel**	**Occupied Bandwidth [MHz]**	**Emission Bandwidth [MHz]**	**Verdict**
WCDMA850	UMTS/TM1	LCH	4.18	4.72	Pass
		MCH	4.16	4.71	Pass
		HCH	4.18	4.72	Pass
WCDMA1900	UMTS/TM1	LCH	4.16	4.72	Pass
		MCH	4.16	4.73	Pass
		HCH	4.16	4.72	Pass

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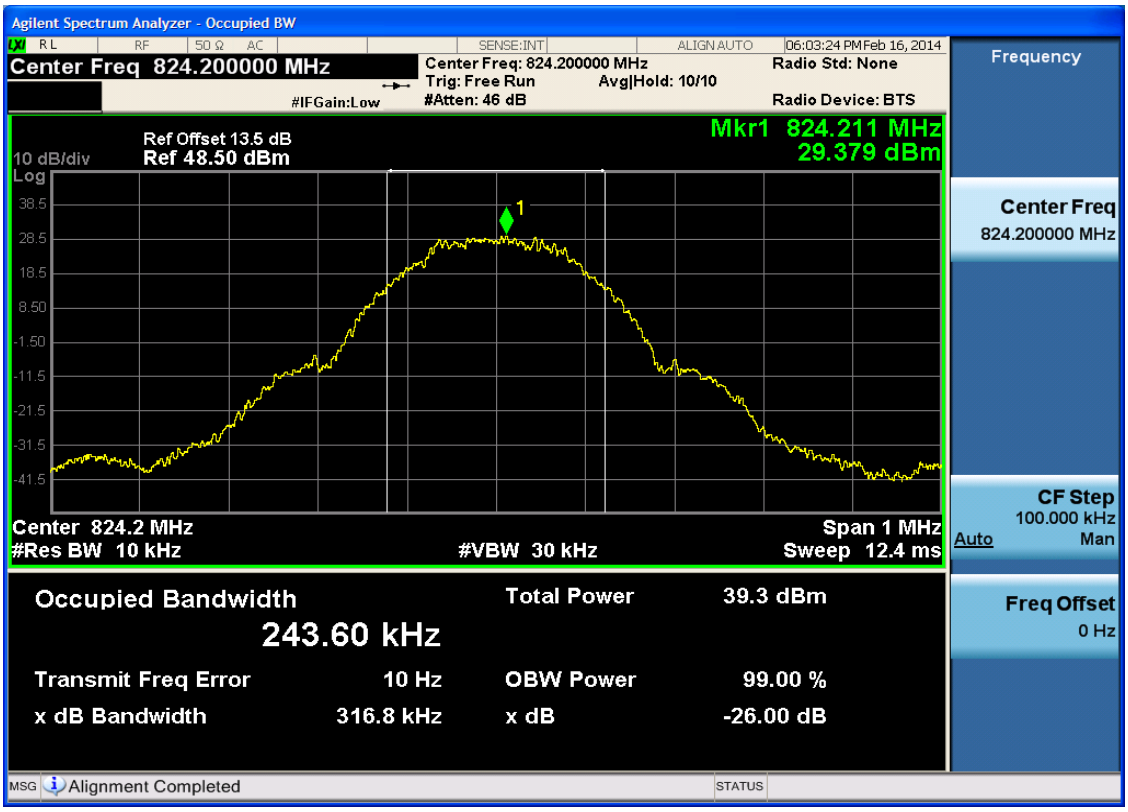
Part II - Test Plots

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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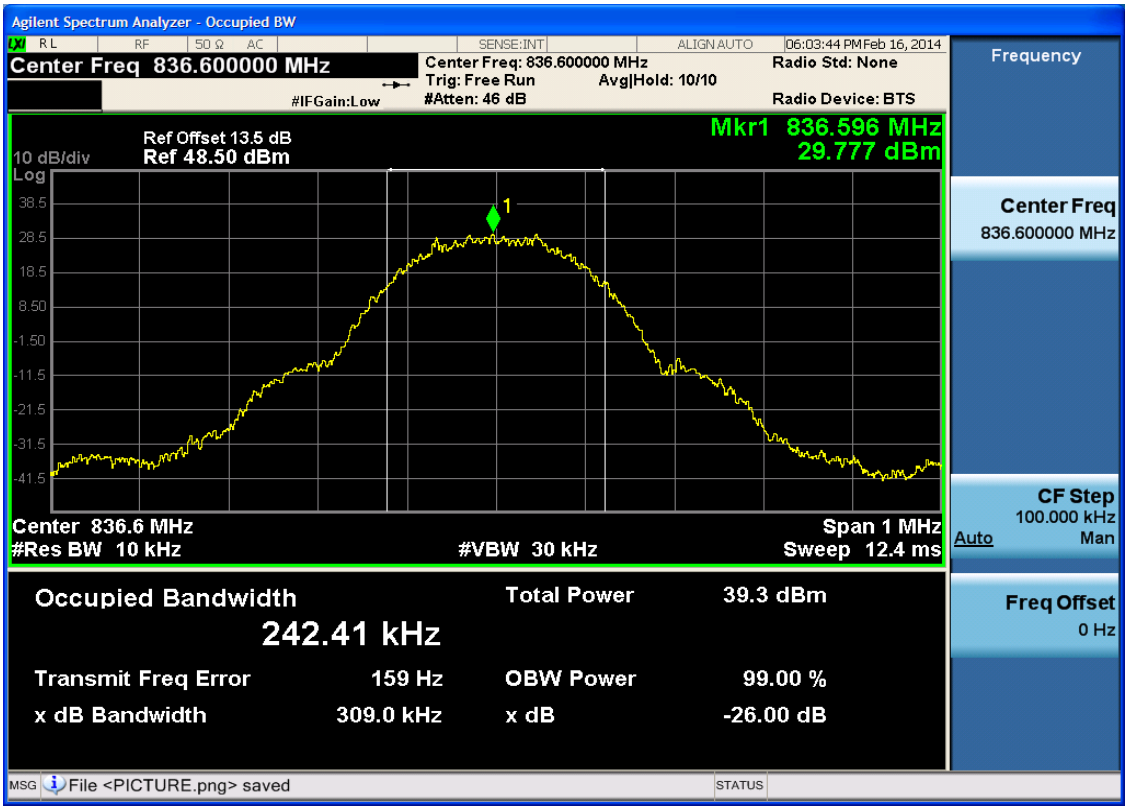
4.1.1.1.2 Test Channel = MCH



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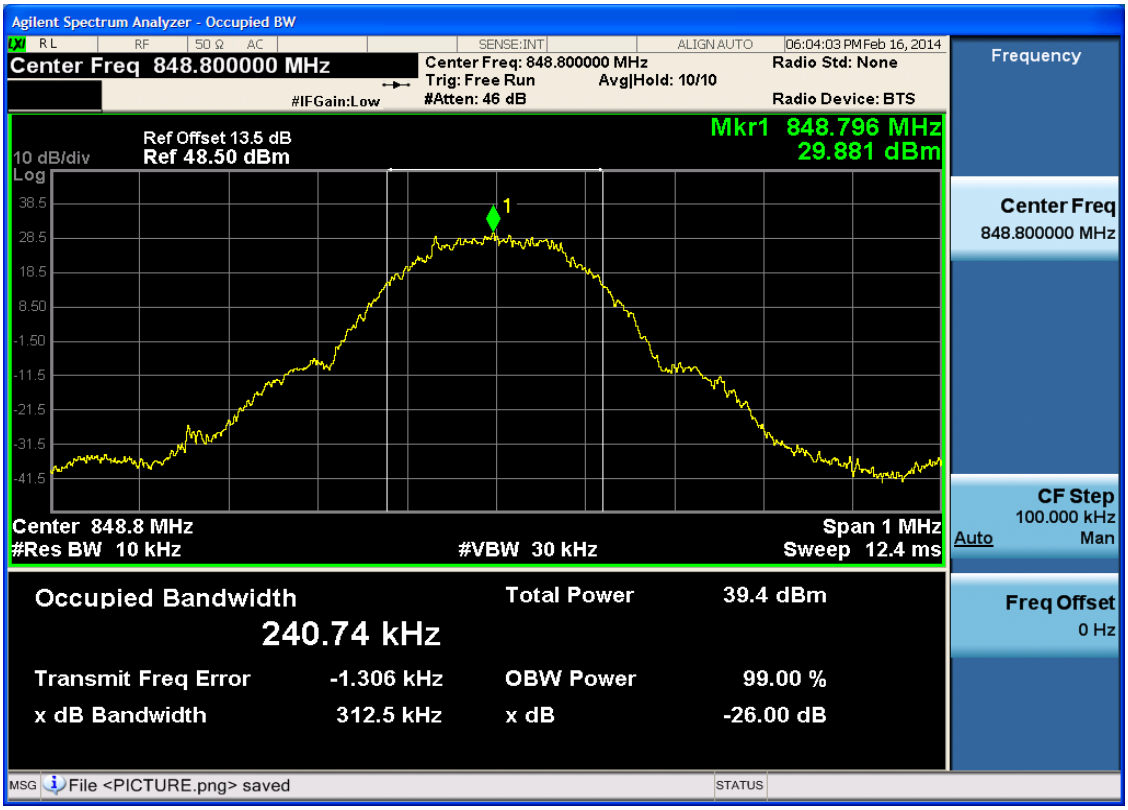
4.1.1.1.3 Test Channel = HCH



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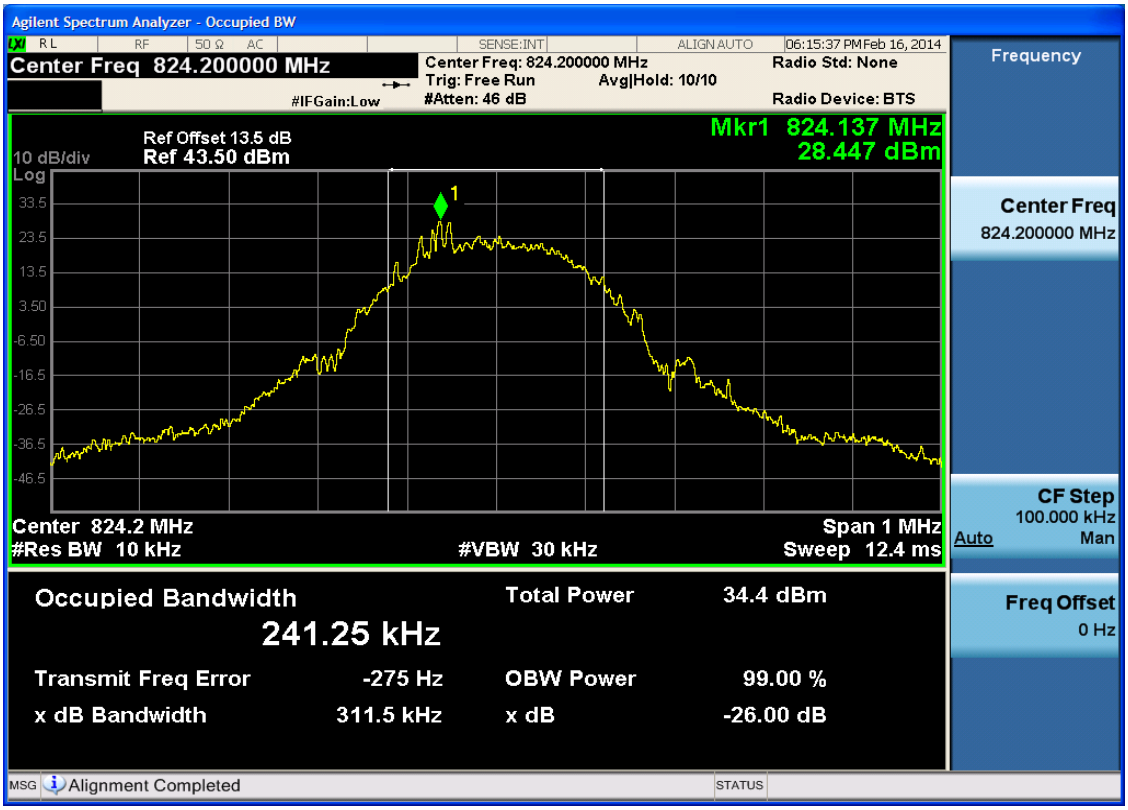
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH



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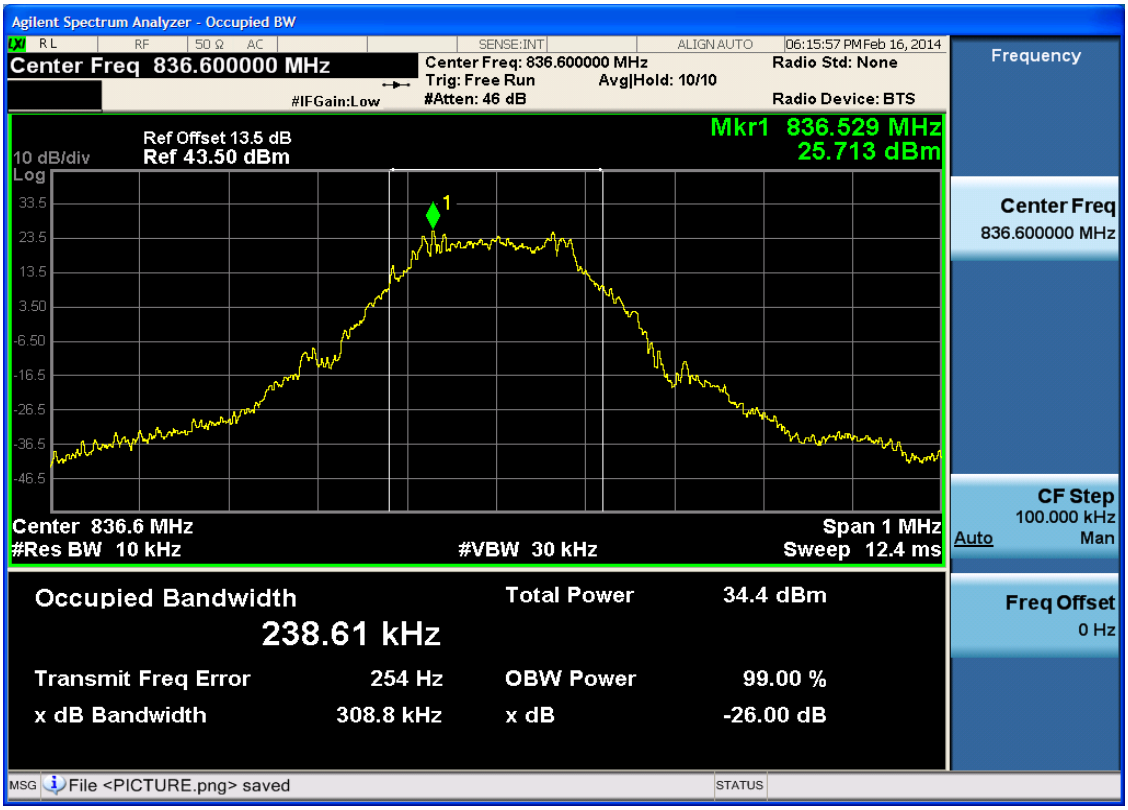
4.1.1.2.2 Test Channel = MCH



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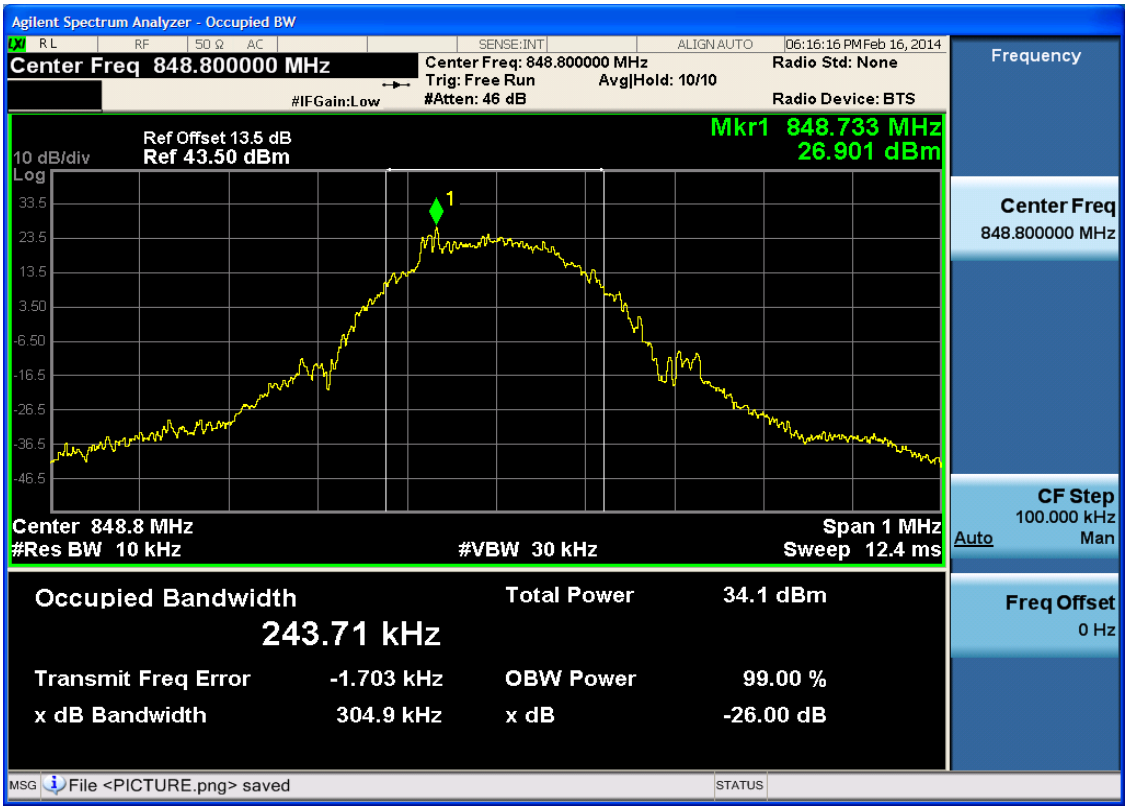
4.1.1.2.3 Test Channel = HCH



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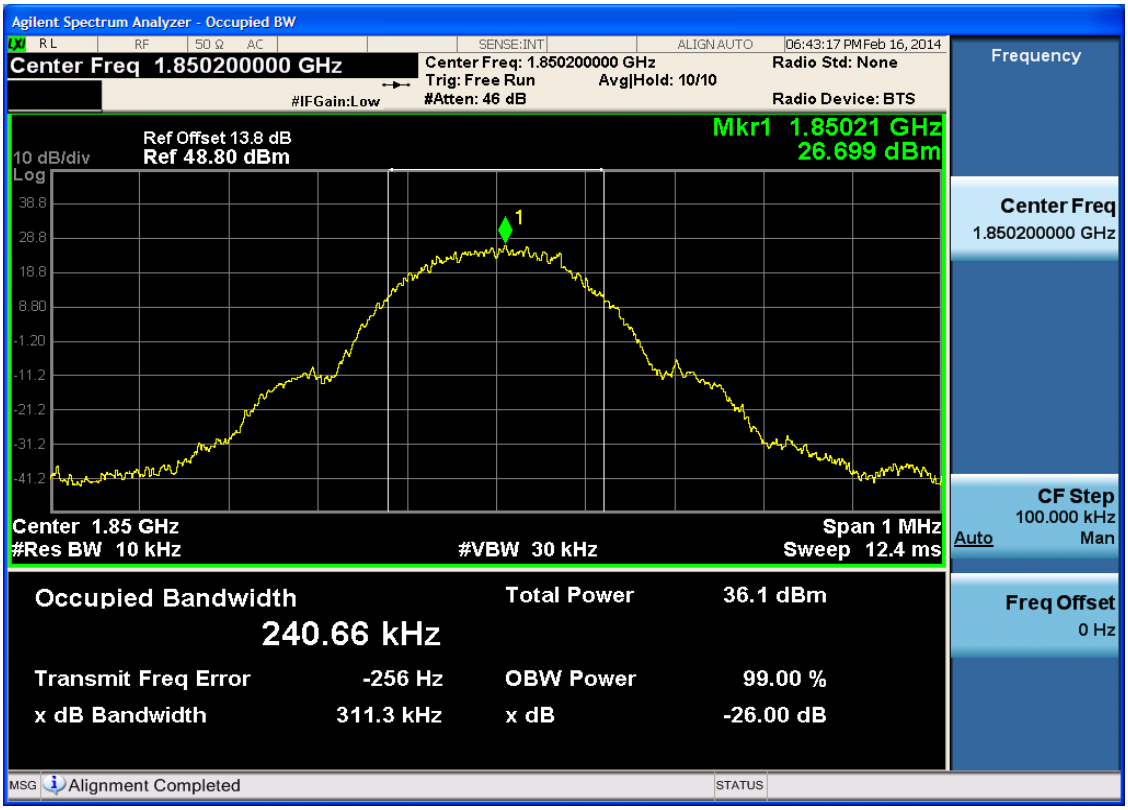
4.1.2 Test Band = GSM1900

4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



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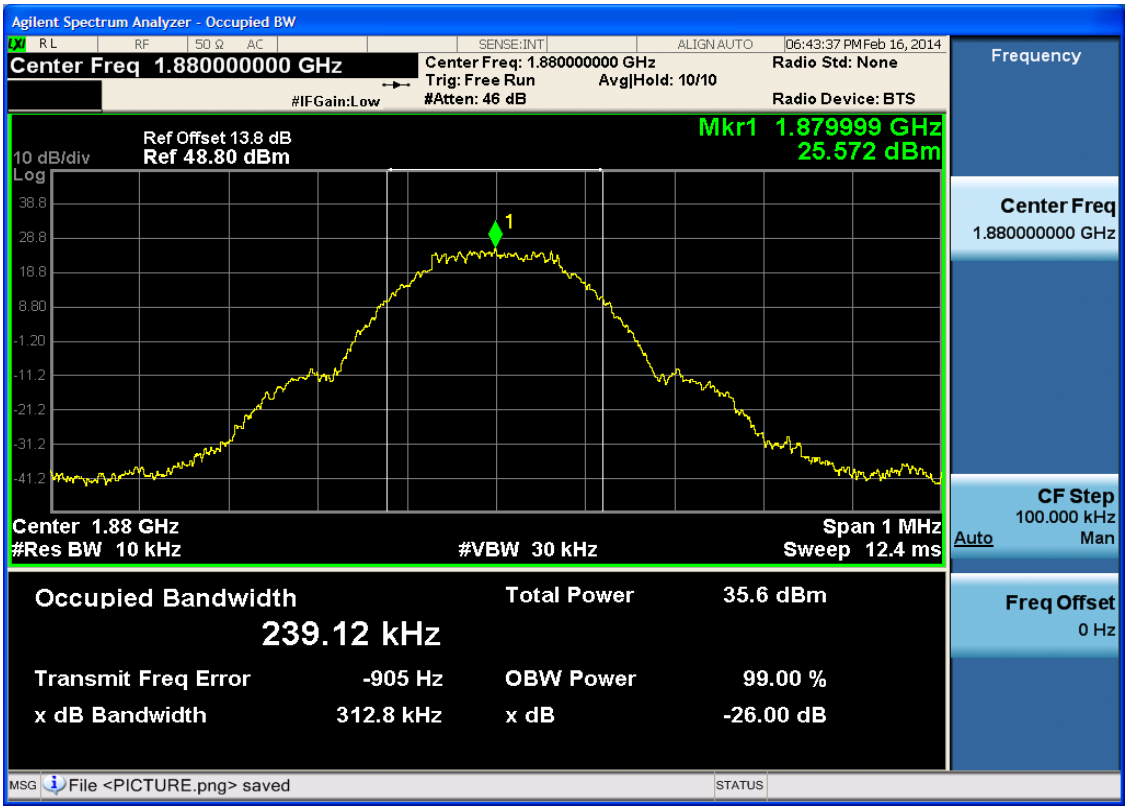
4.1.2.1.2 Test Channel = MCH



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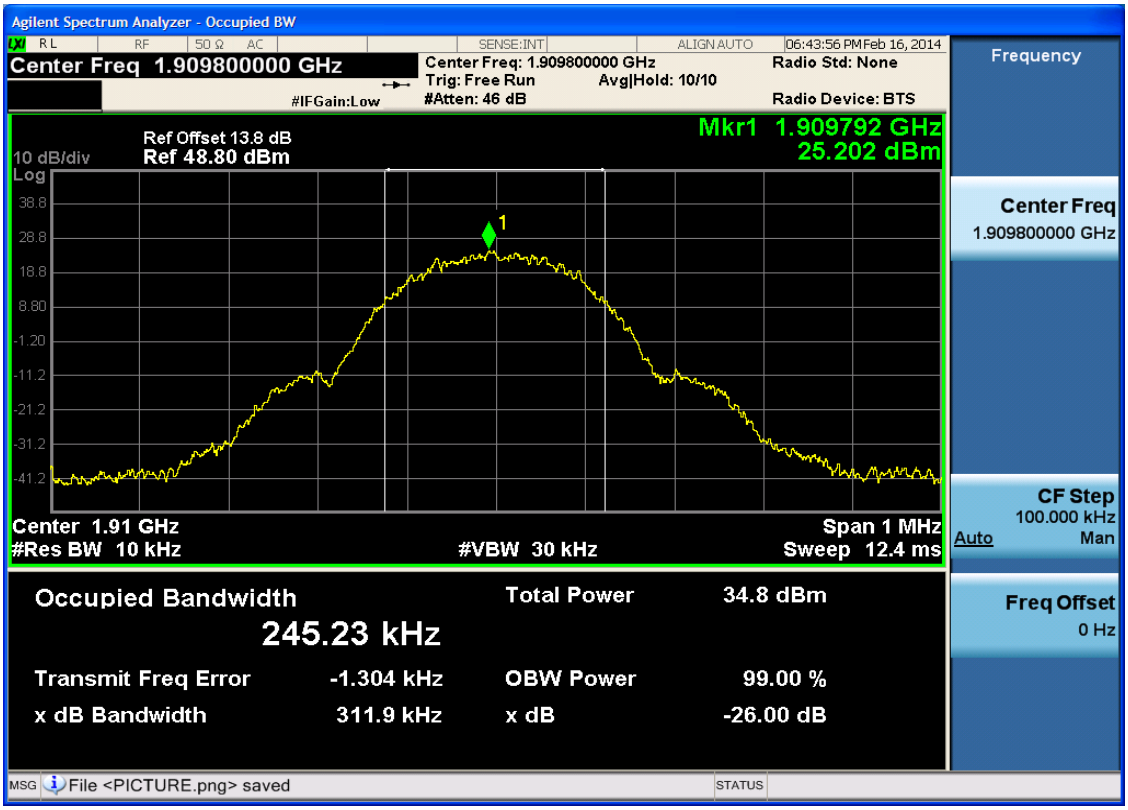
4.1.2.1.3 Test Channel = HCH



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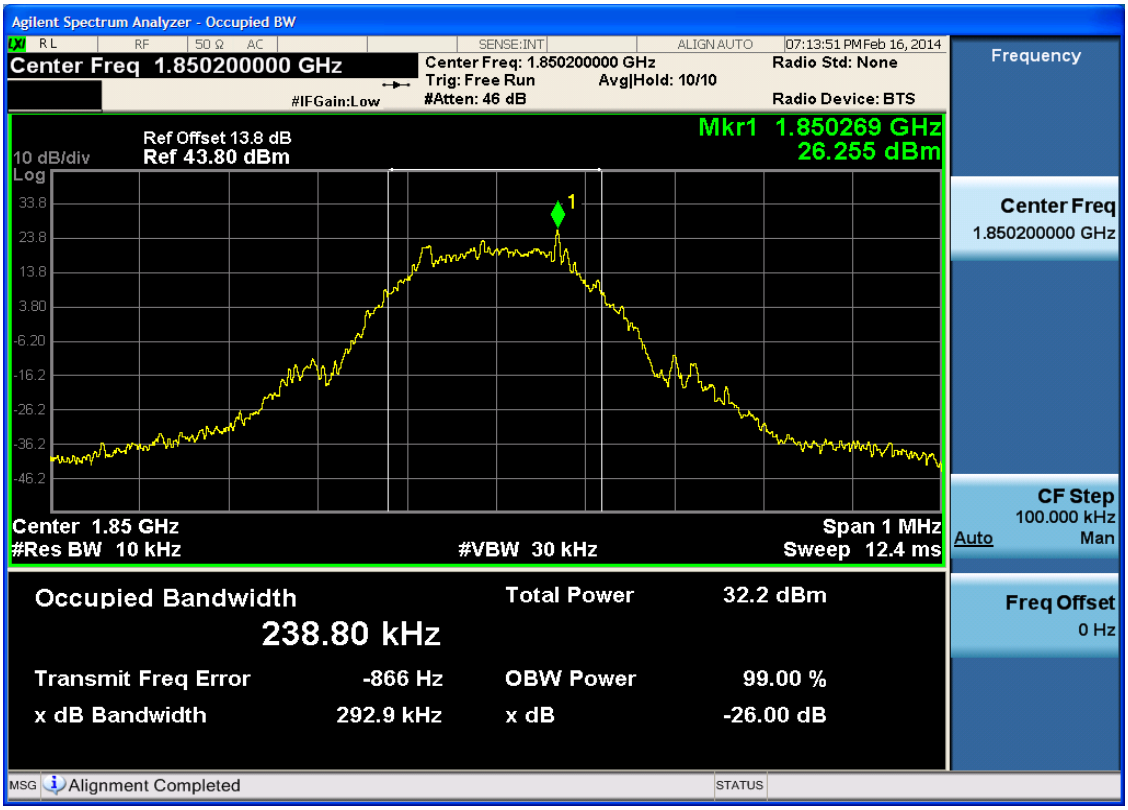
4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



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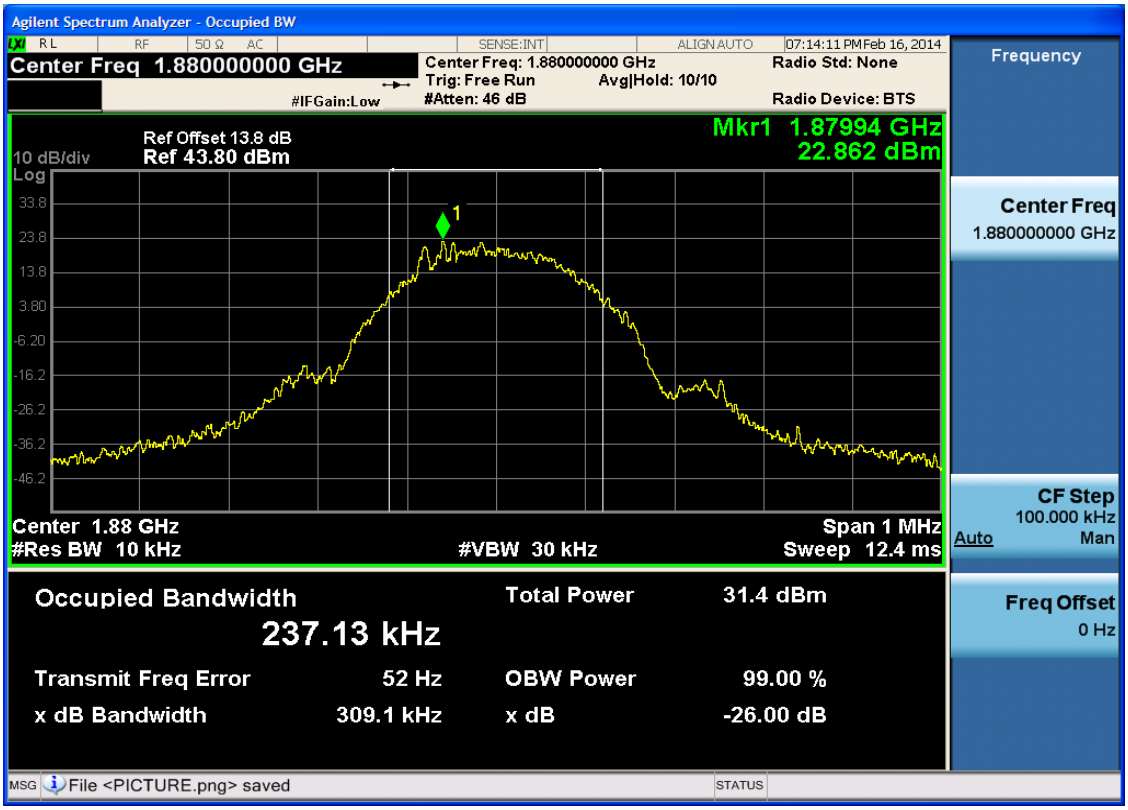
4.1.2.2.2 Test Channel = MCH



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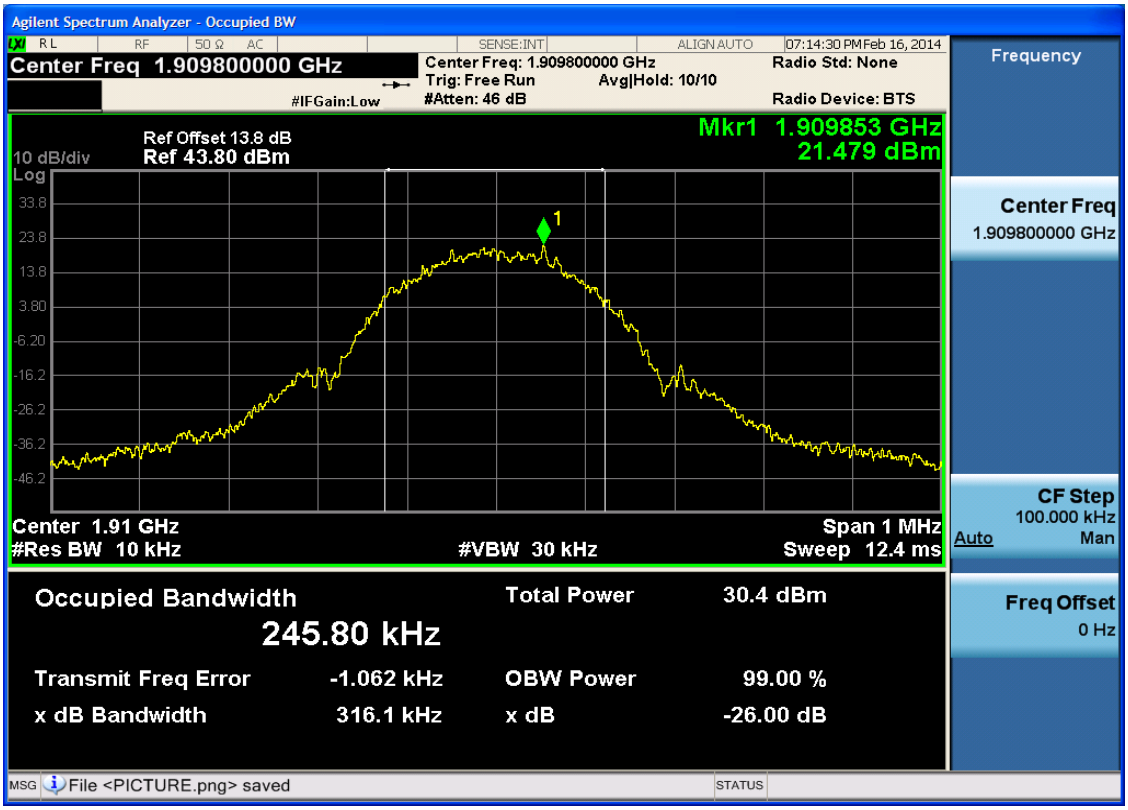
4.1.2.2.3 Test Channel = HCH



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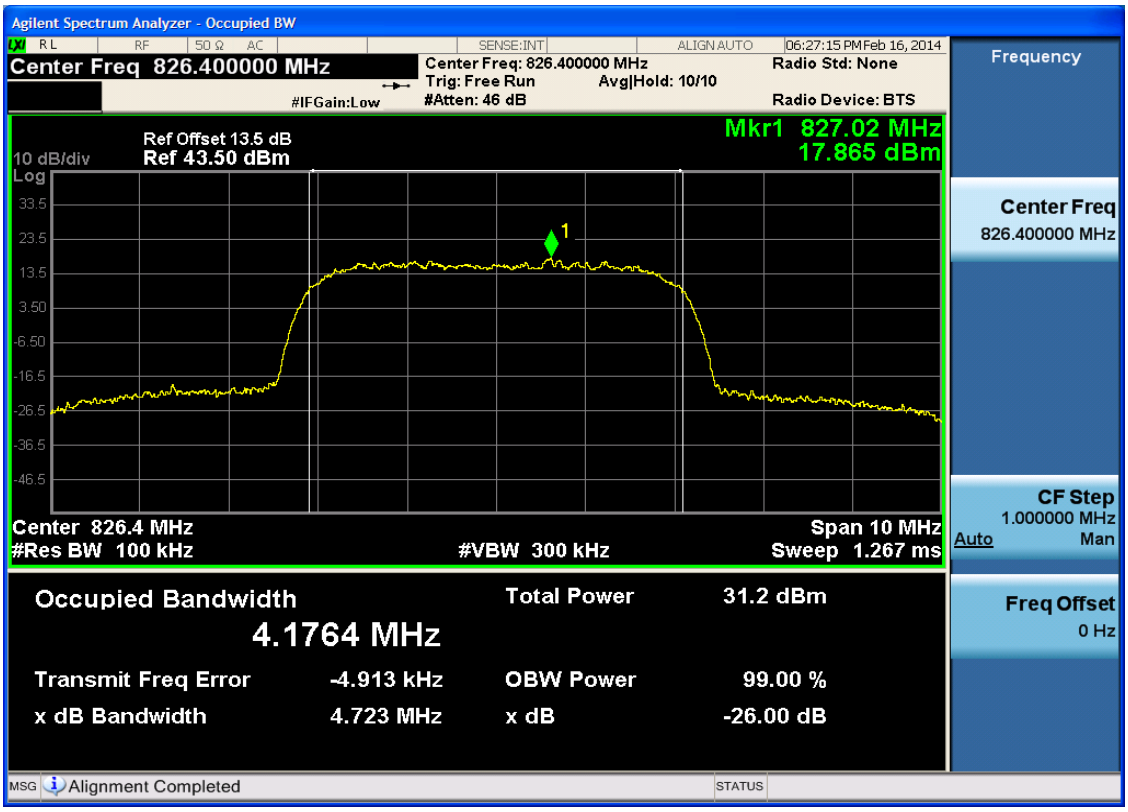
4.2 For UMTS

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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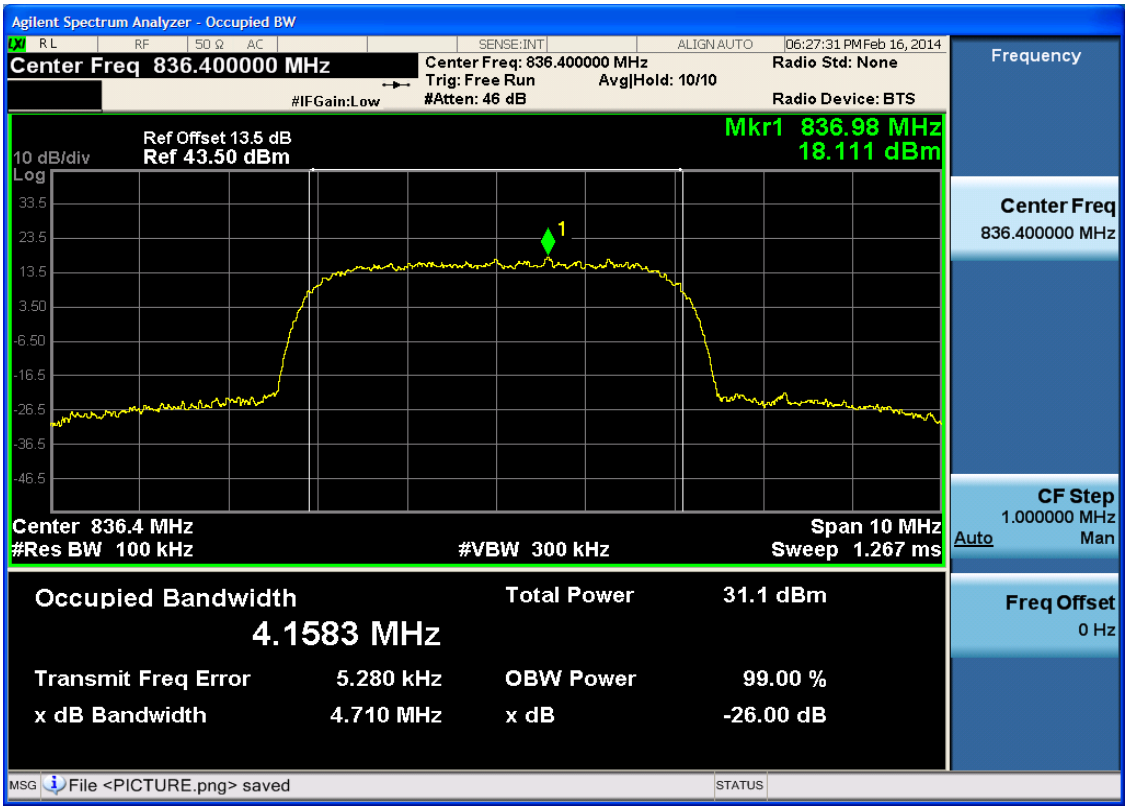
4.2.1.1.2 Test Channel = MCH



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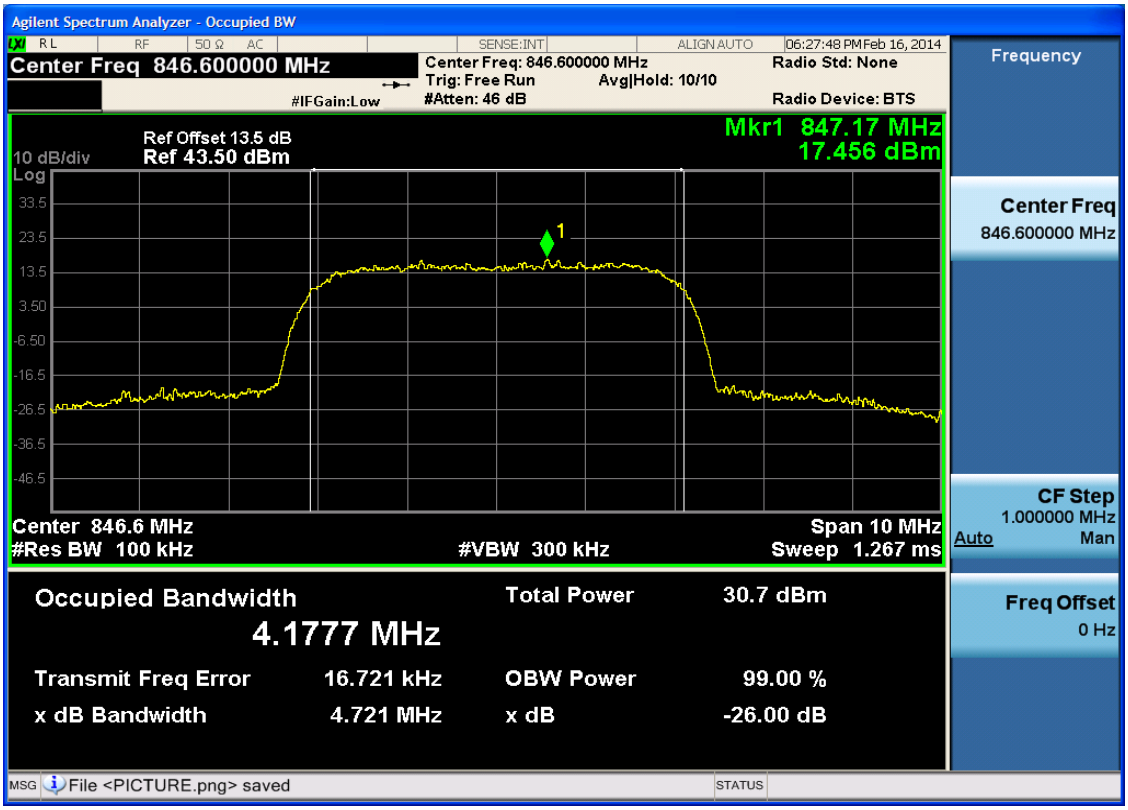
4.2.1.1.3 Test Channel = HCH



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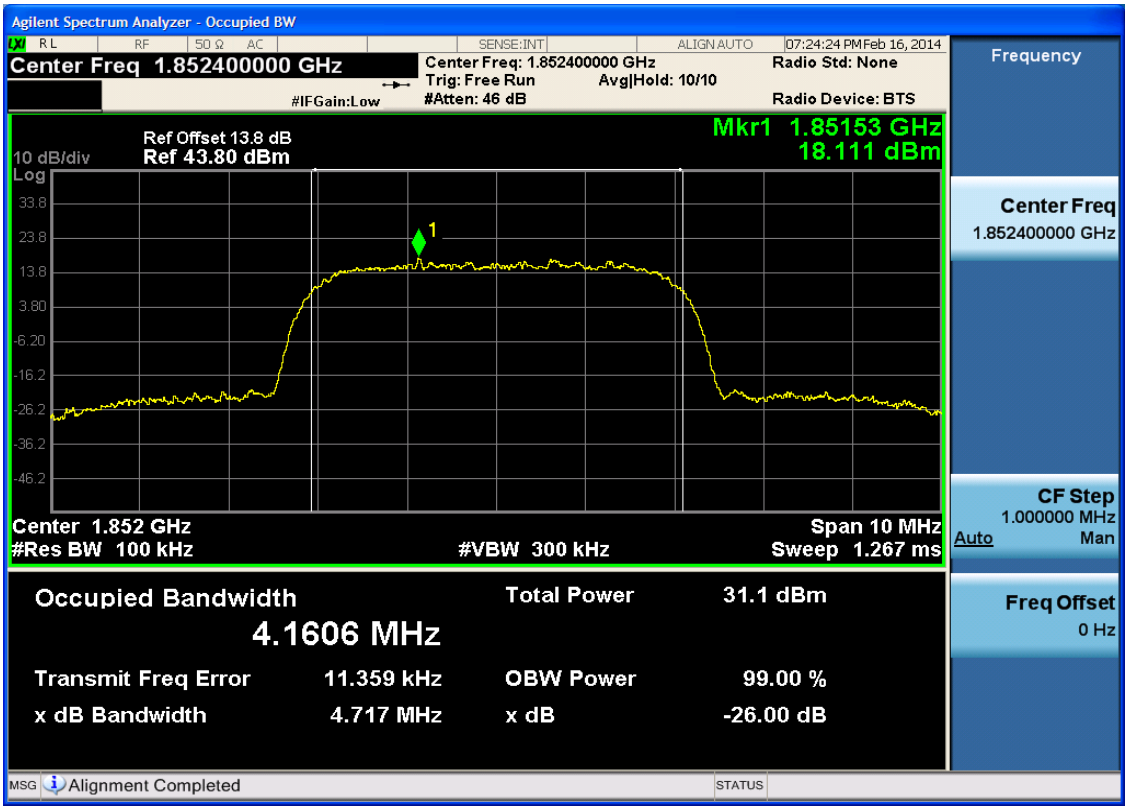
4.2.2 Test Band = WCDMA1900

4.2.2.1 Test Mode = UMTS/TM1

4.2.2.1.1 Test Channel = LCH



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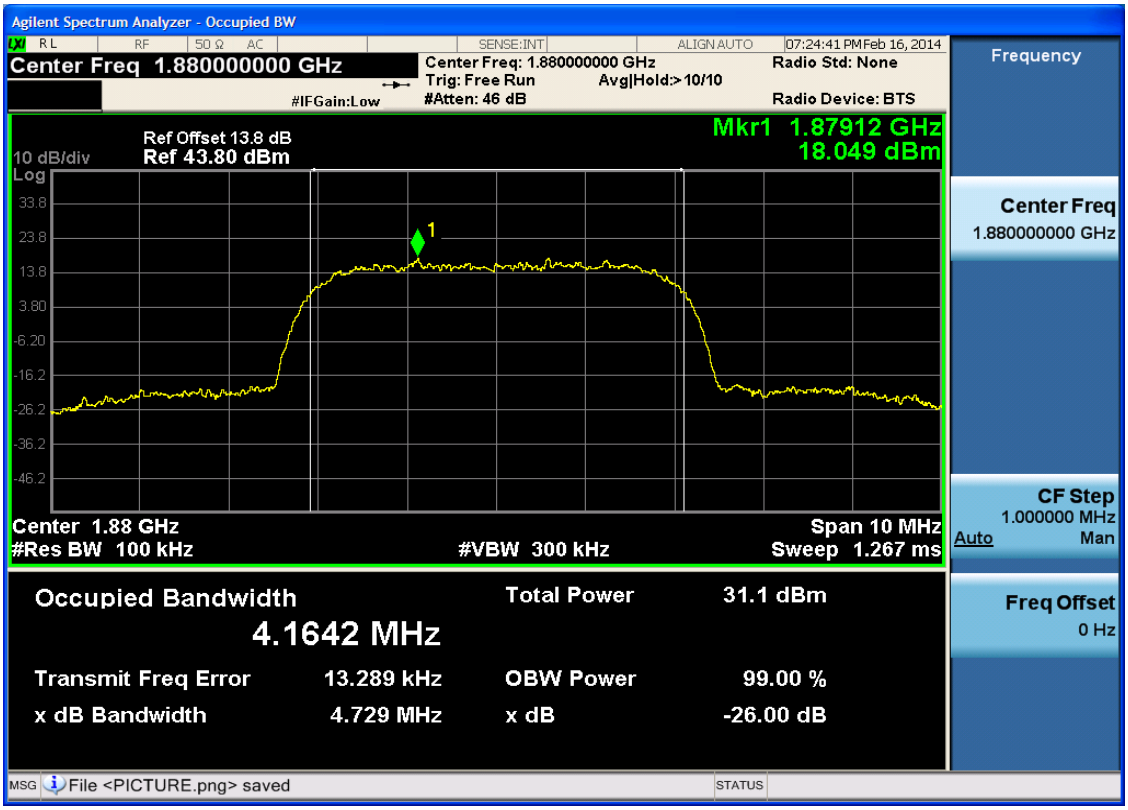
4.2.2.1.2 Test Channel = MCH



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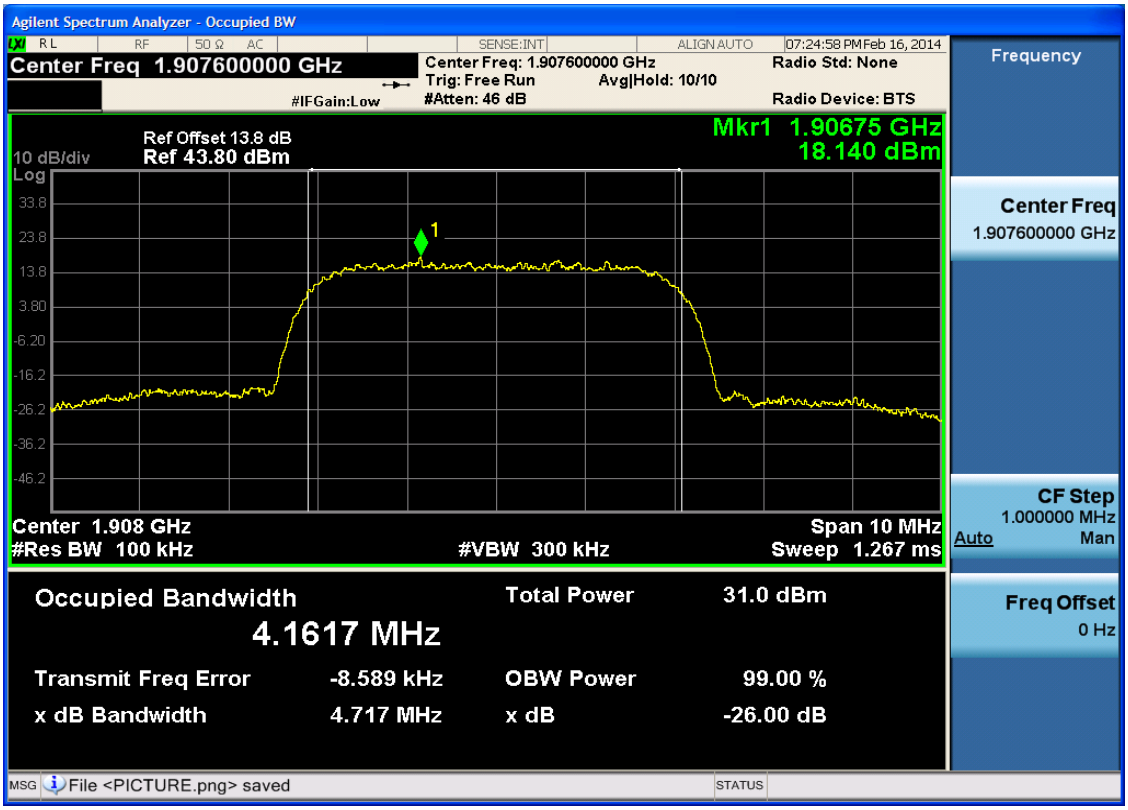
4.2.2.1.3 Test Channel = HCH



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5Appendix_E: Band Edges Compliance

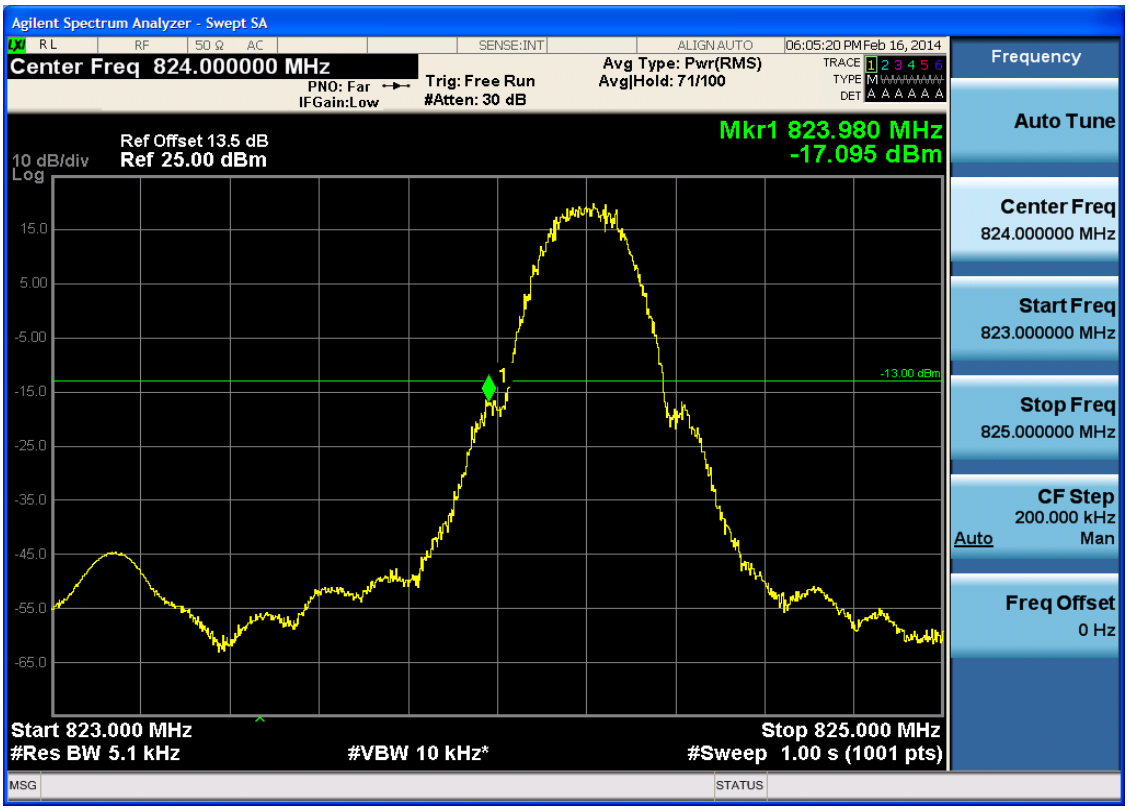
Part I - Test Plots

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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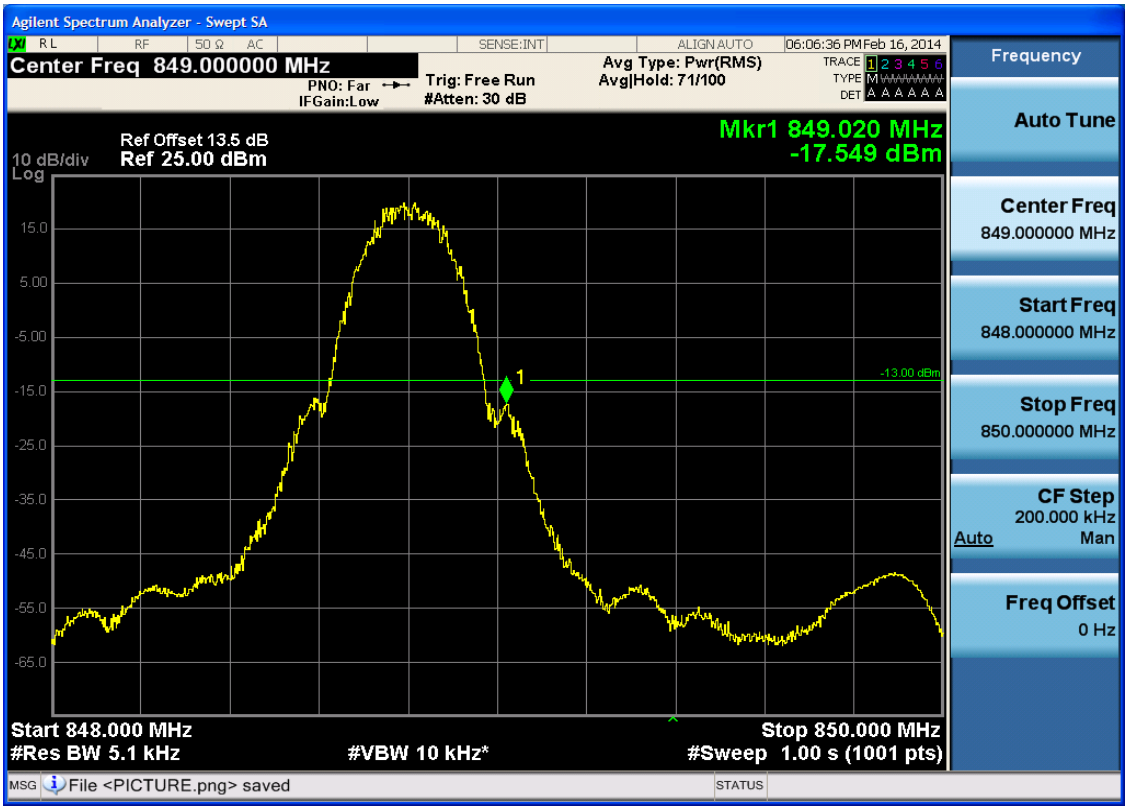
5.1.1.1.2 Test Channel = HCH



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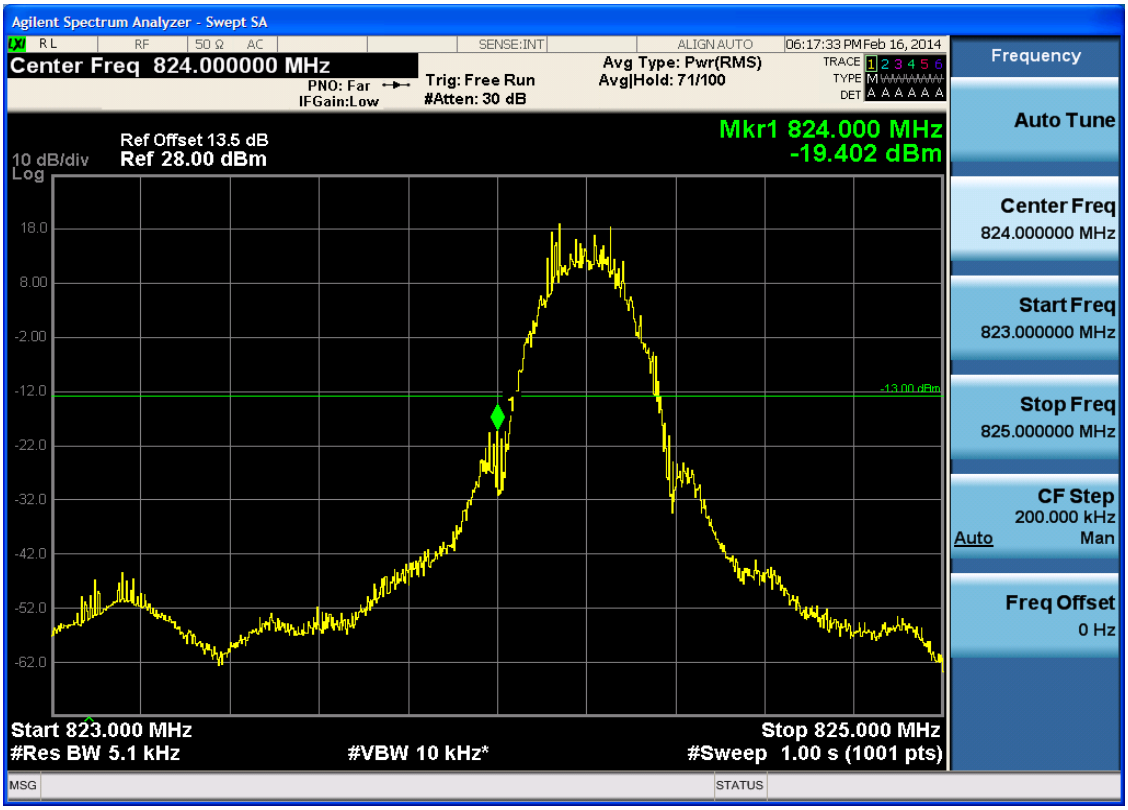
5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



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5.1.1.2.2 Test Channel = HCH

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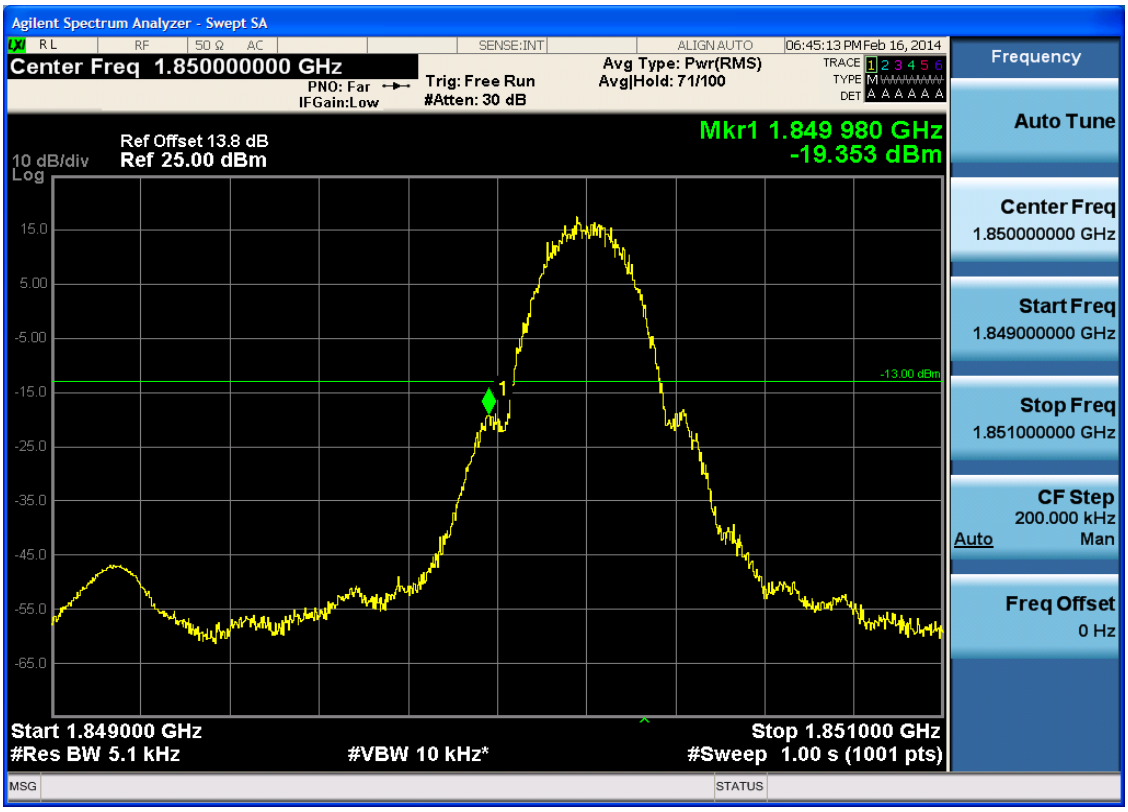
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH



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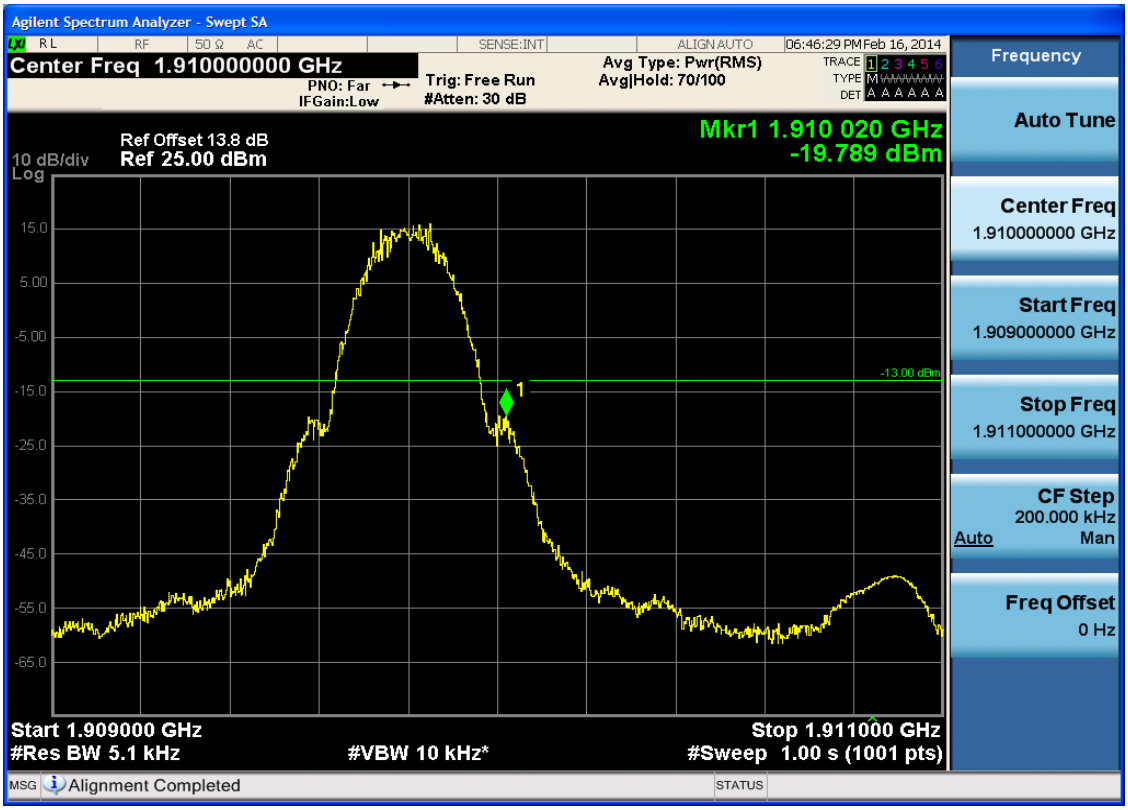
5.1.2.1.2 Test Channel = HCH



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5.1.2.2 Test Mode = GSM/TM2

5.1.2.2.1 Test Channel = LCH

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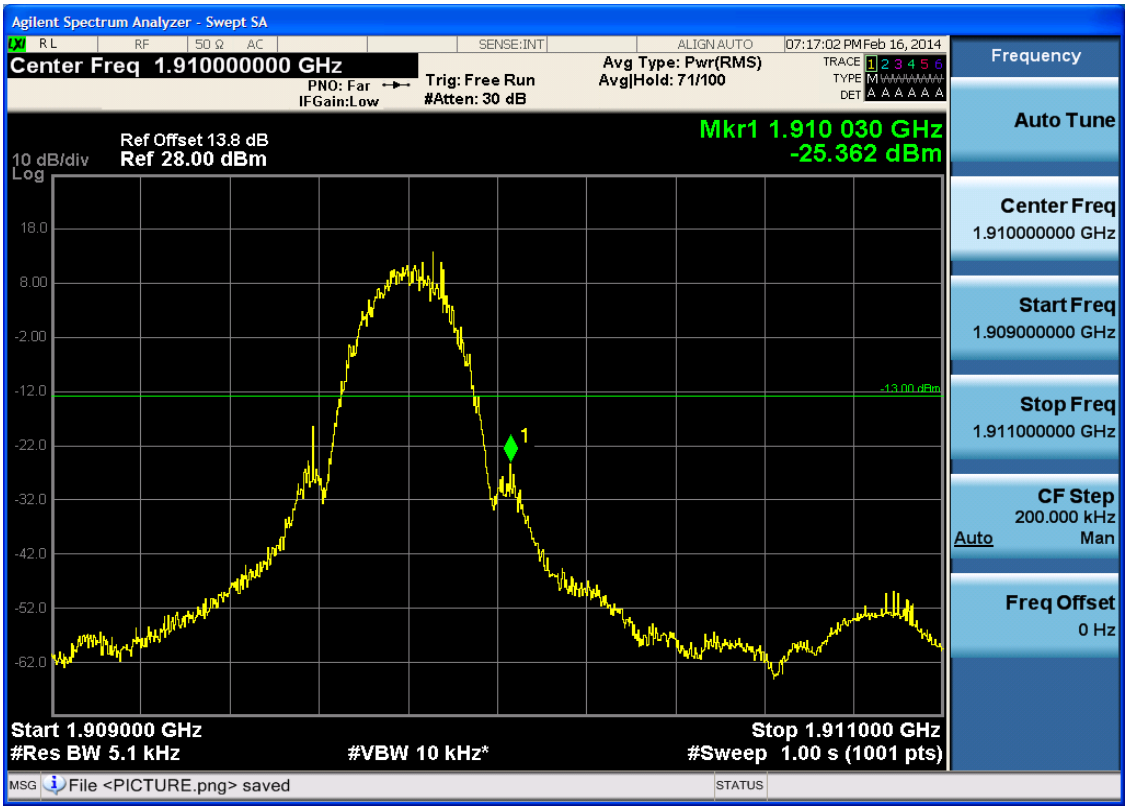
5.1.2.2.2 Test Channel = HCH



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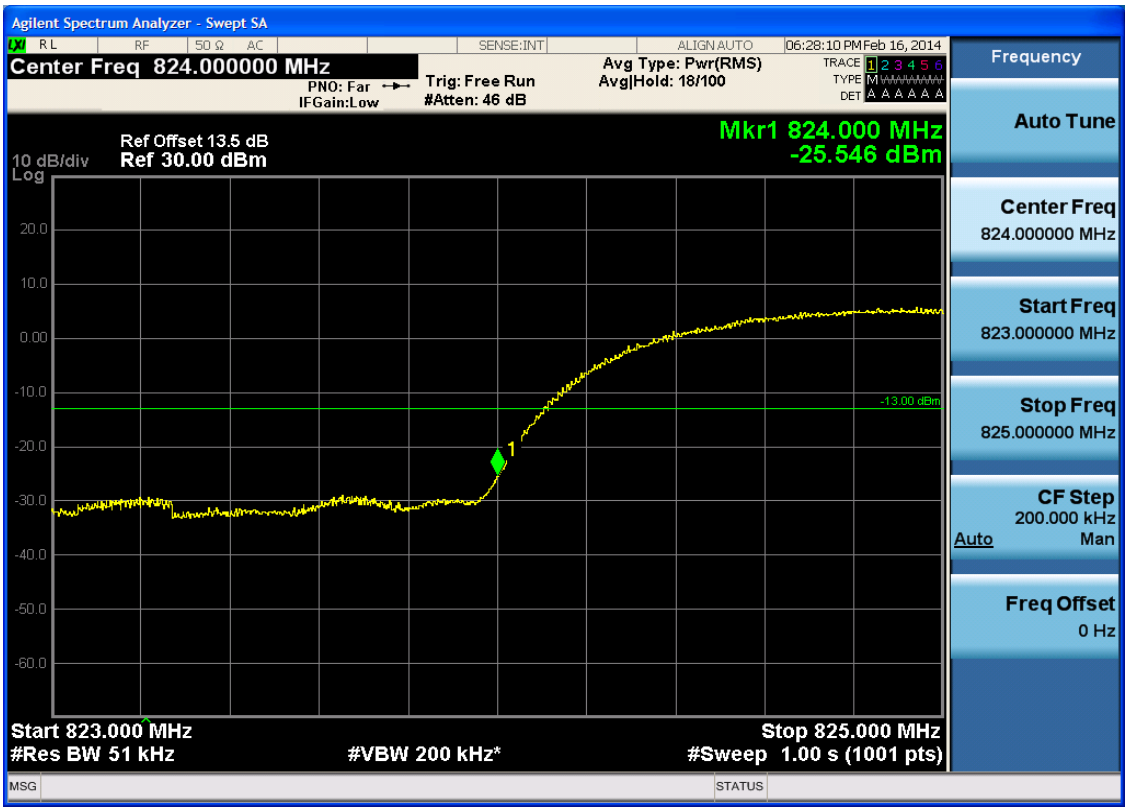
5.2 For UMTS

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.

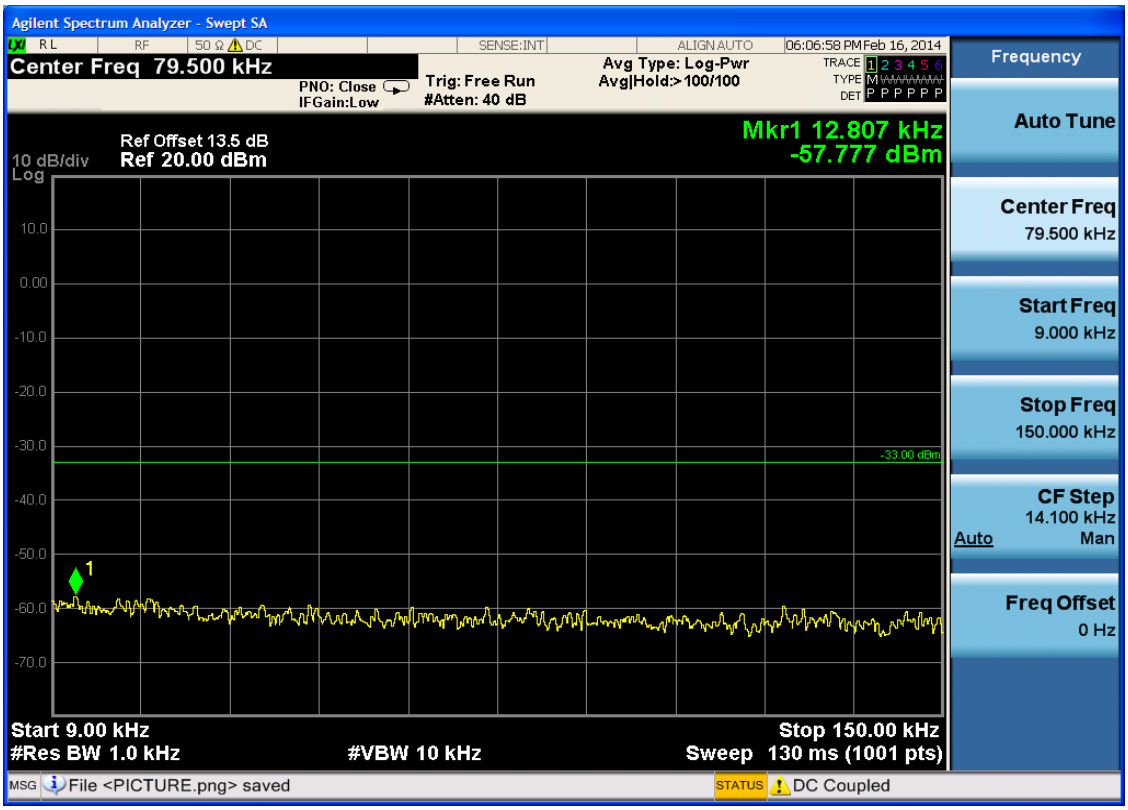
Part I - Test Plots

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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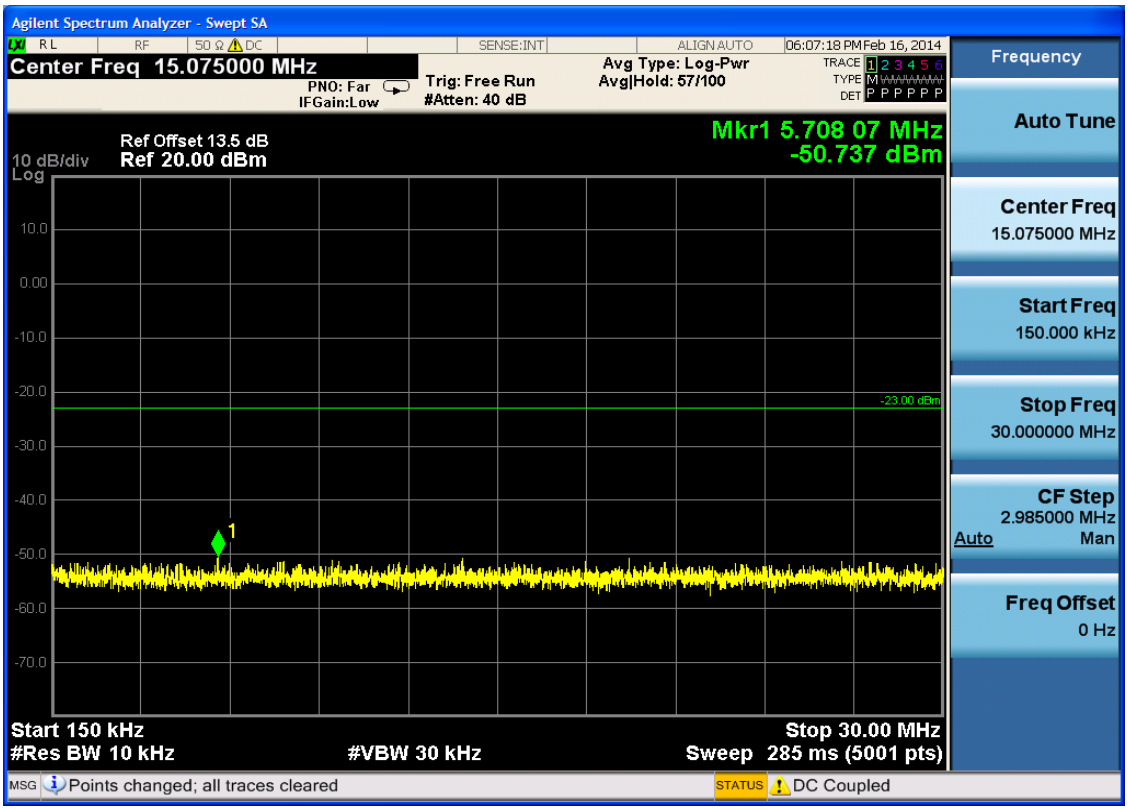

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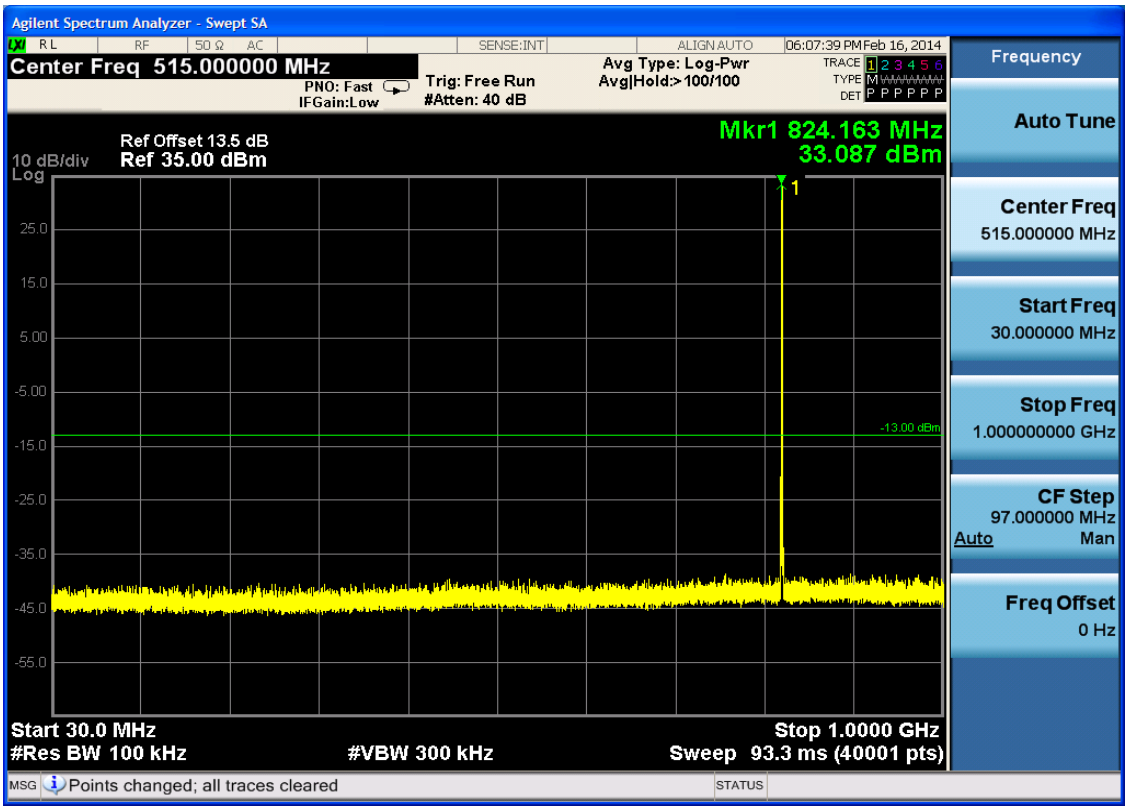

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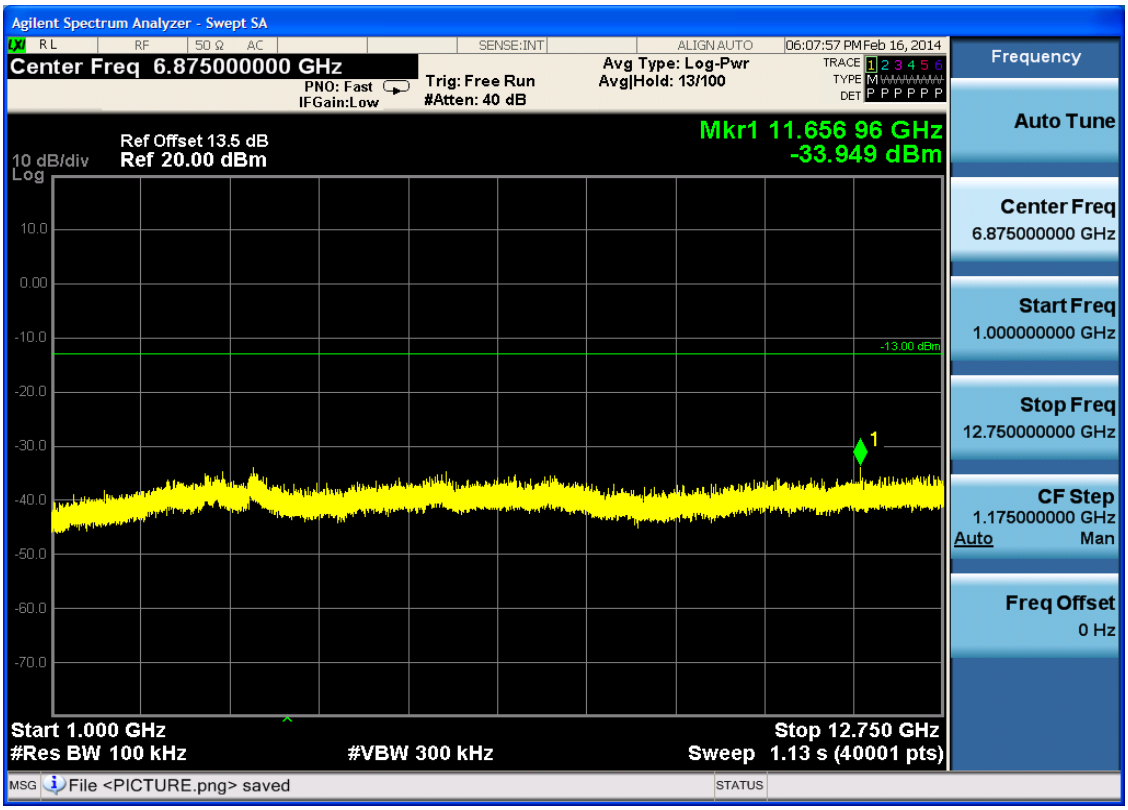

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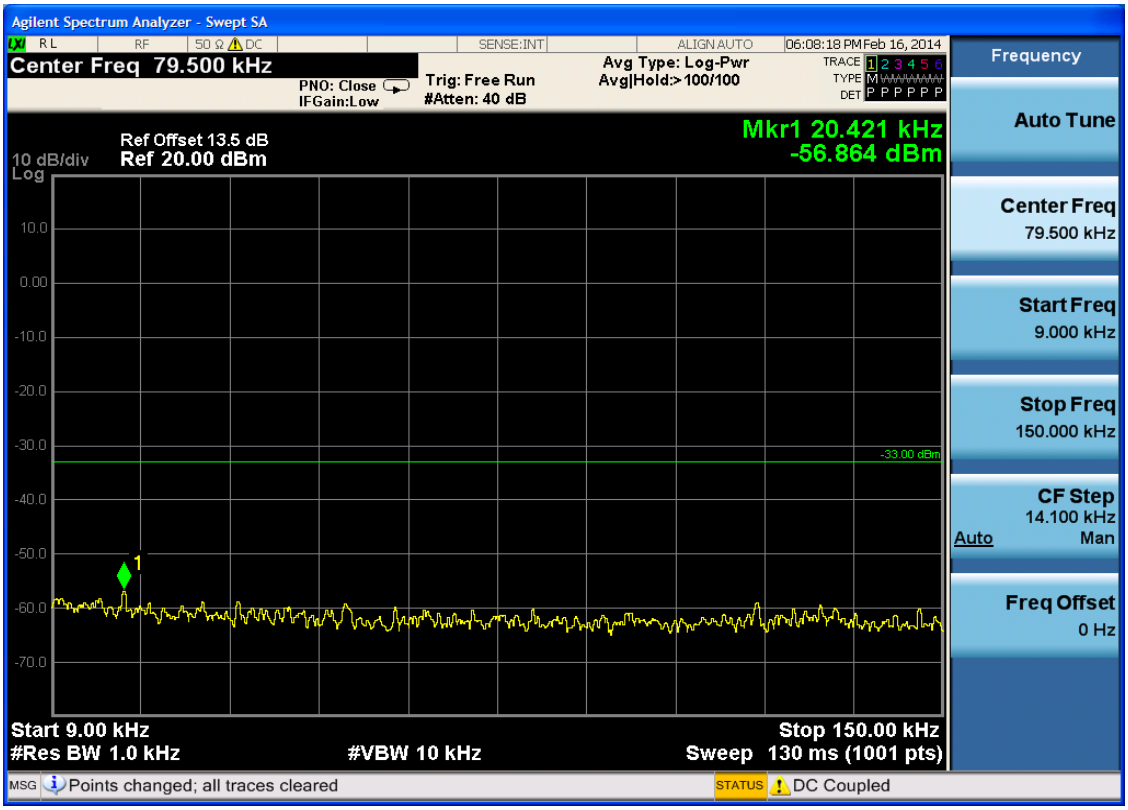
6.1.1.1.2 Test Channel = MCH



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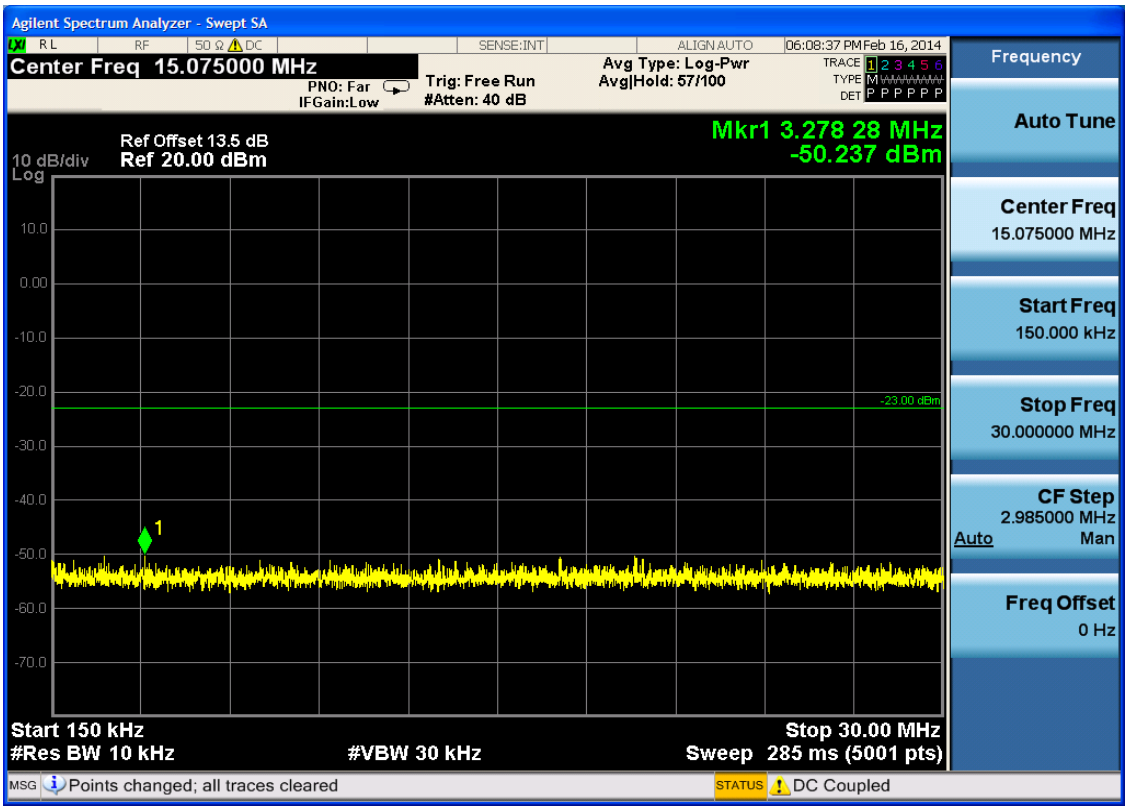

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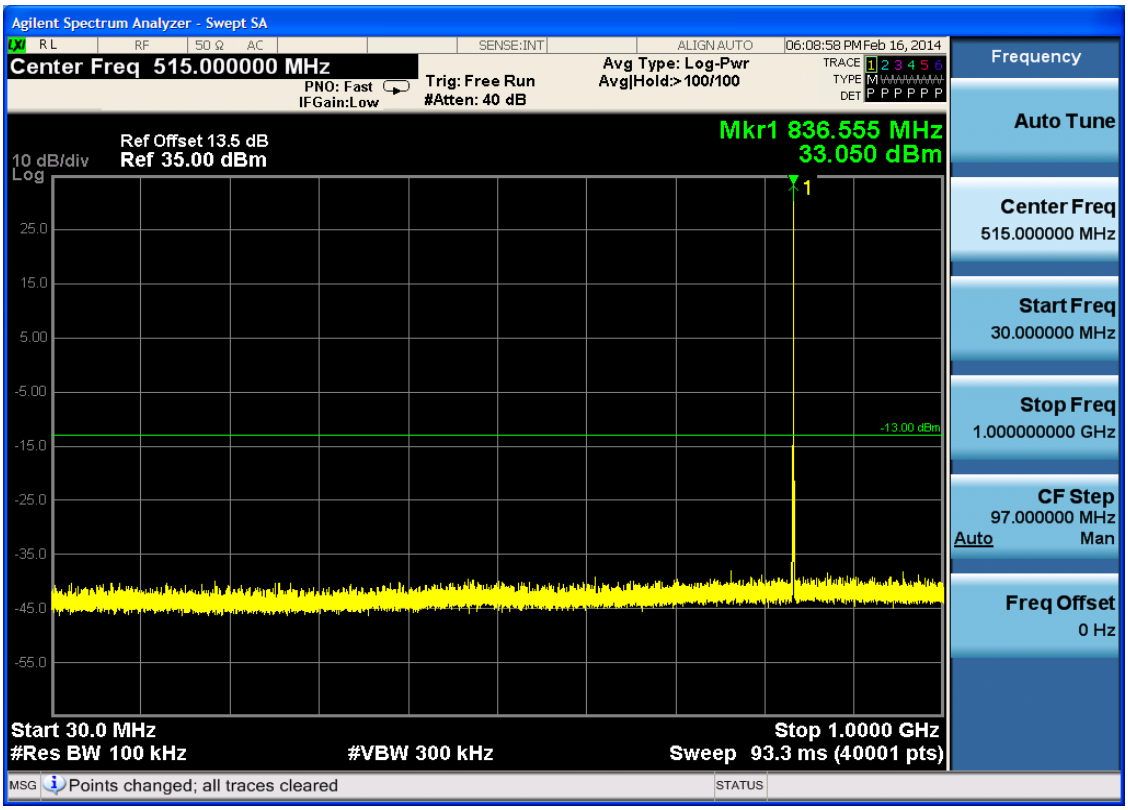

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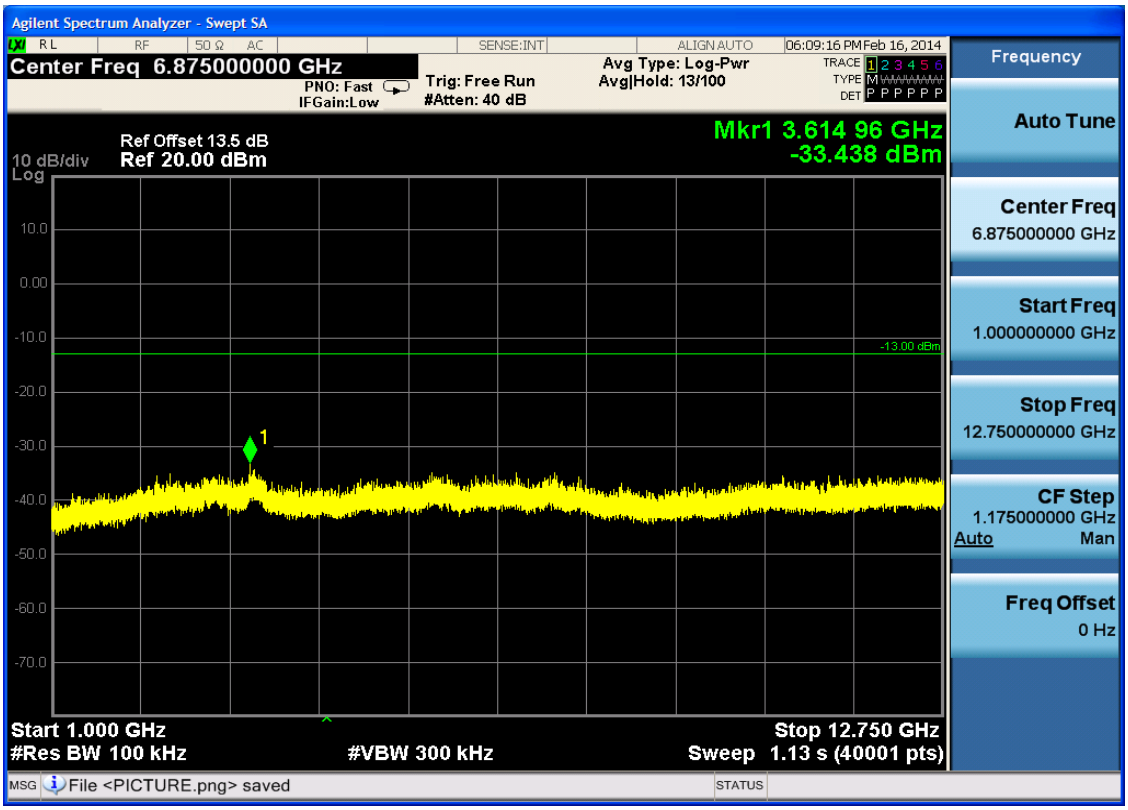

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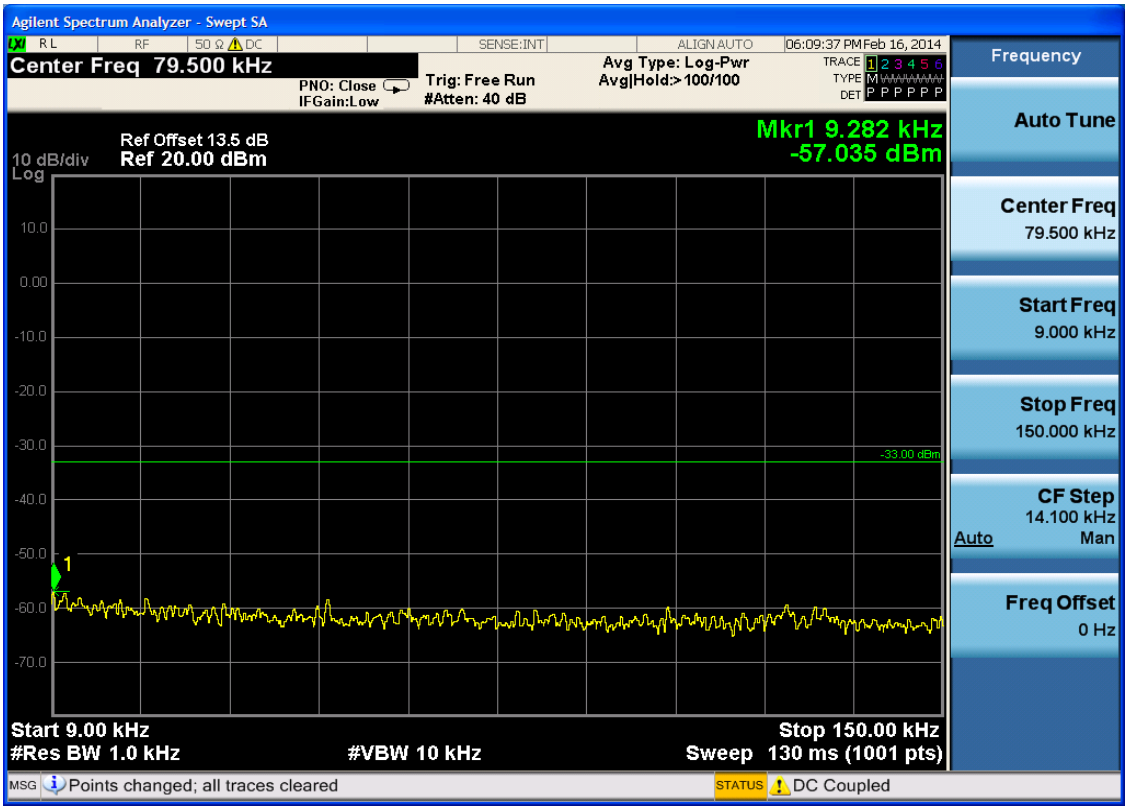
6.1.1.1.3 Test Channel = HCH



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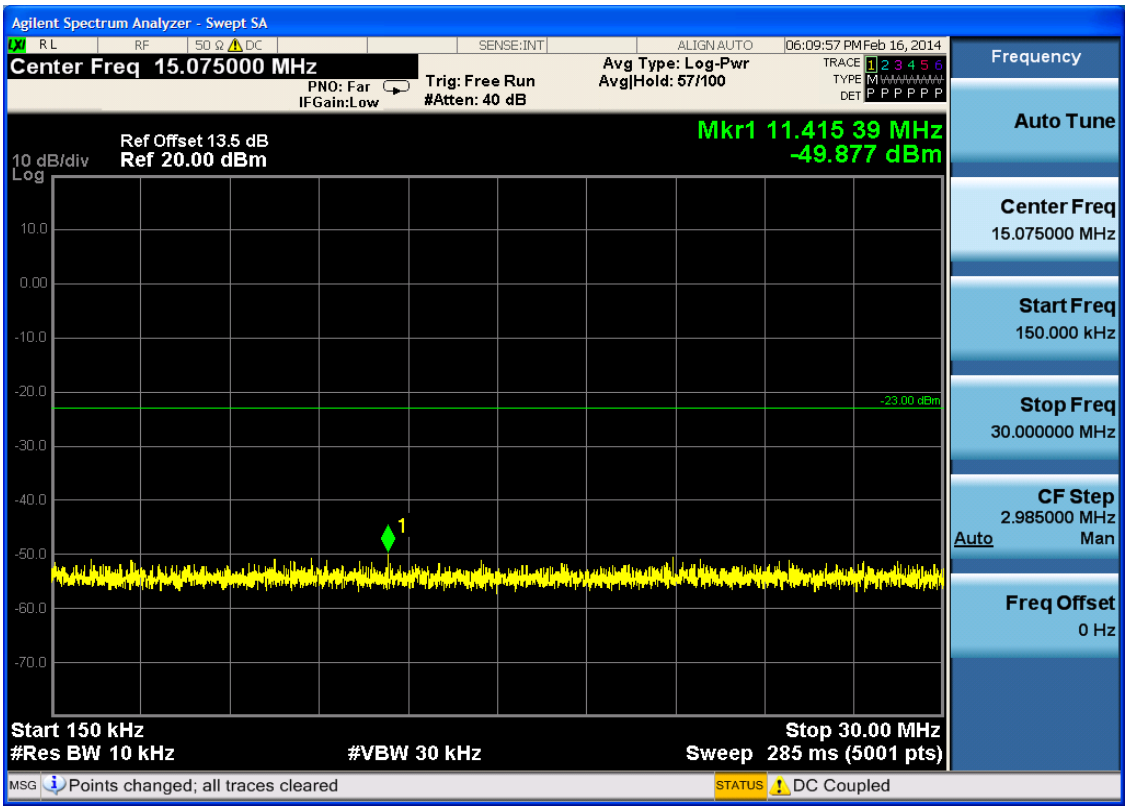

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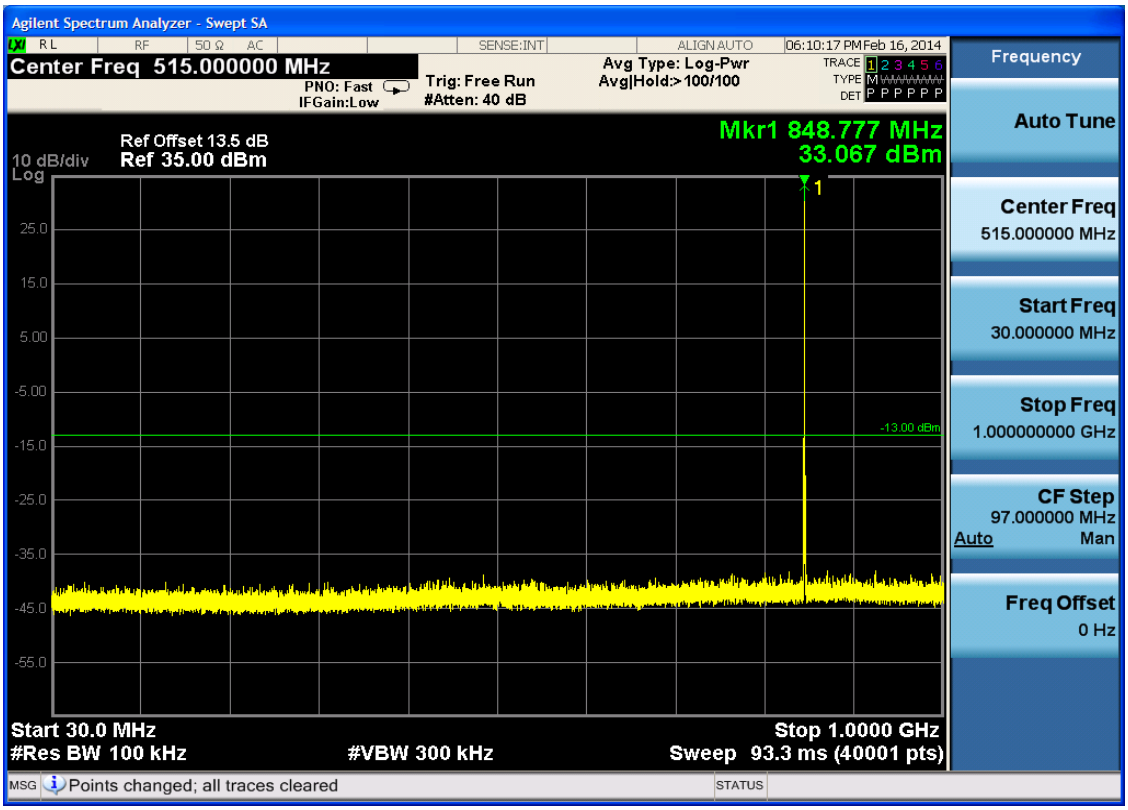

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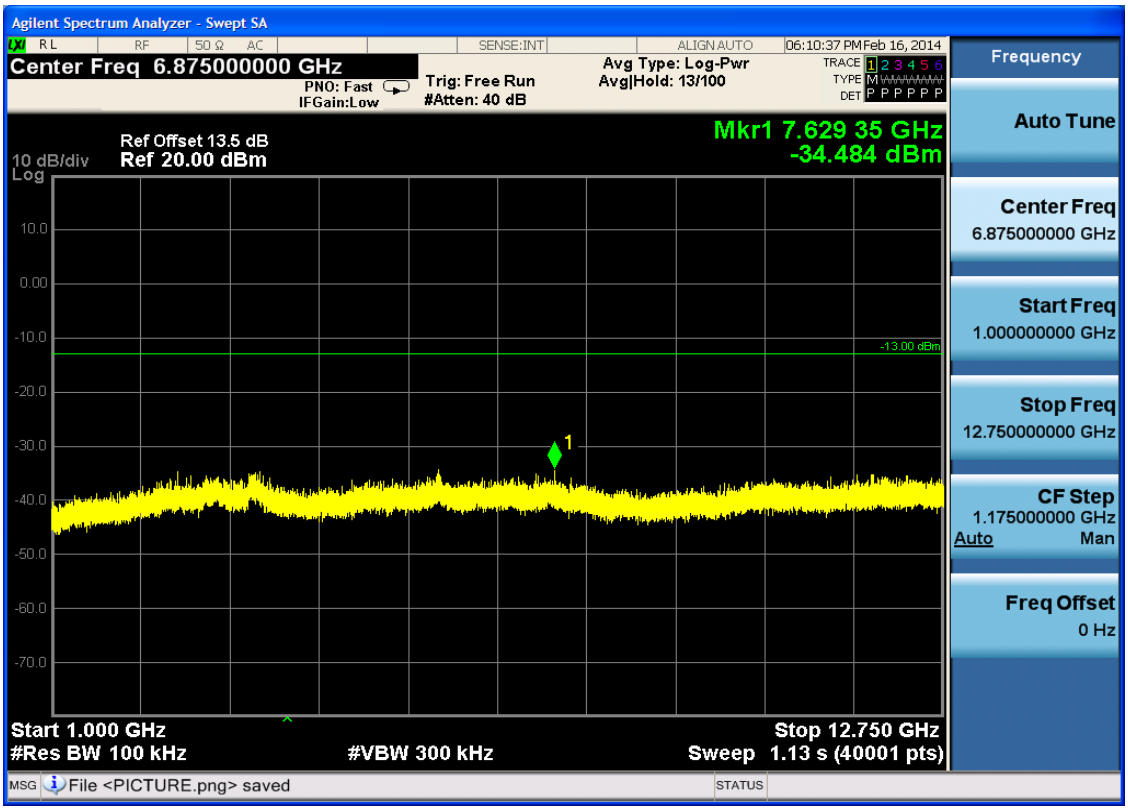

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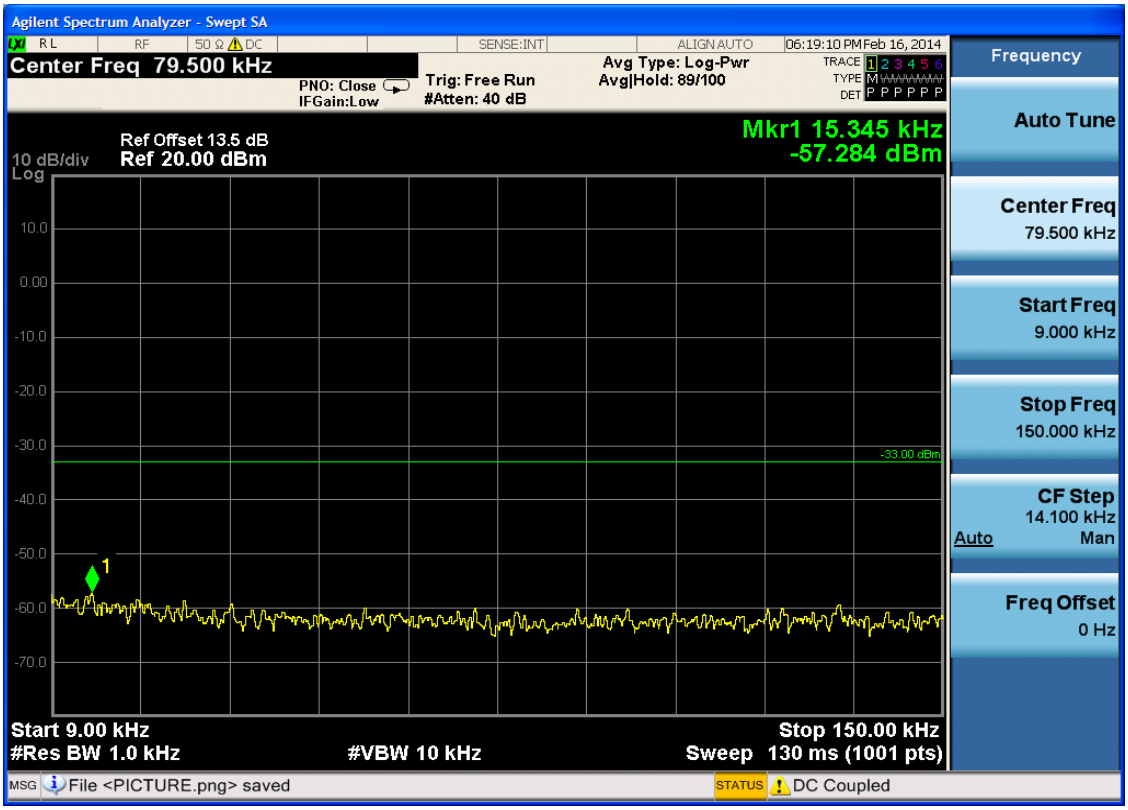
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH



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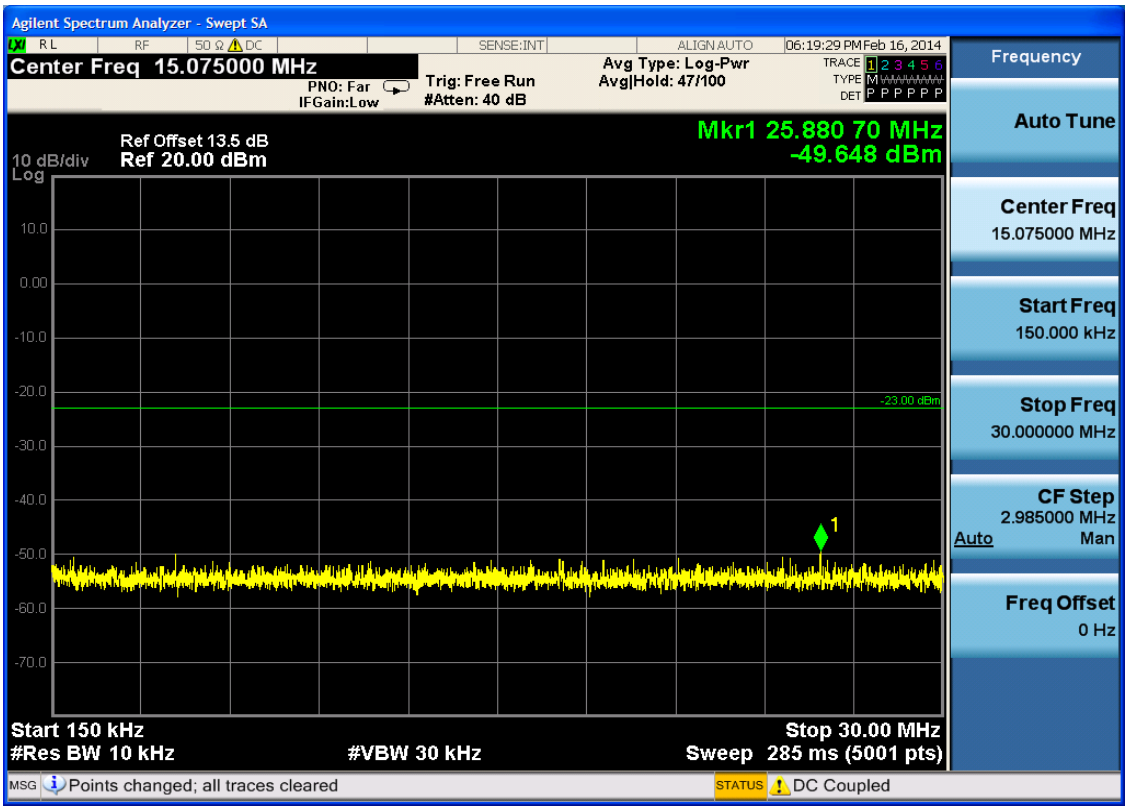

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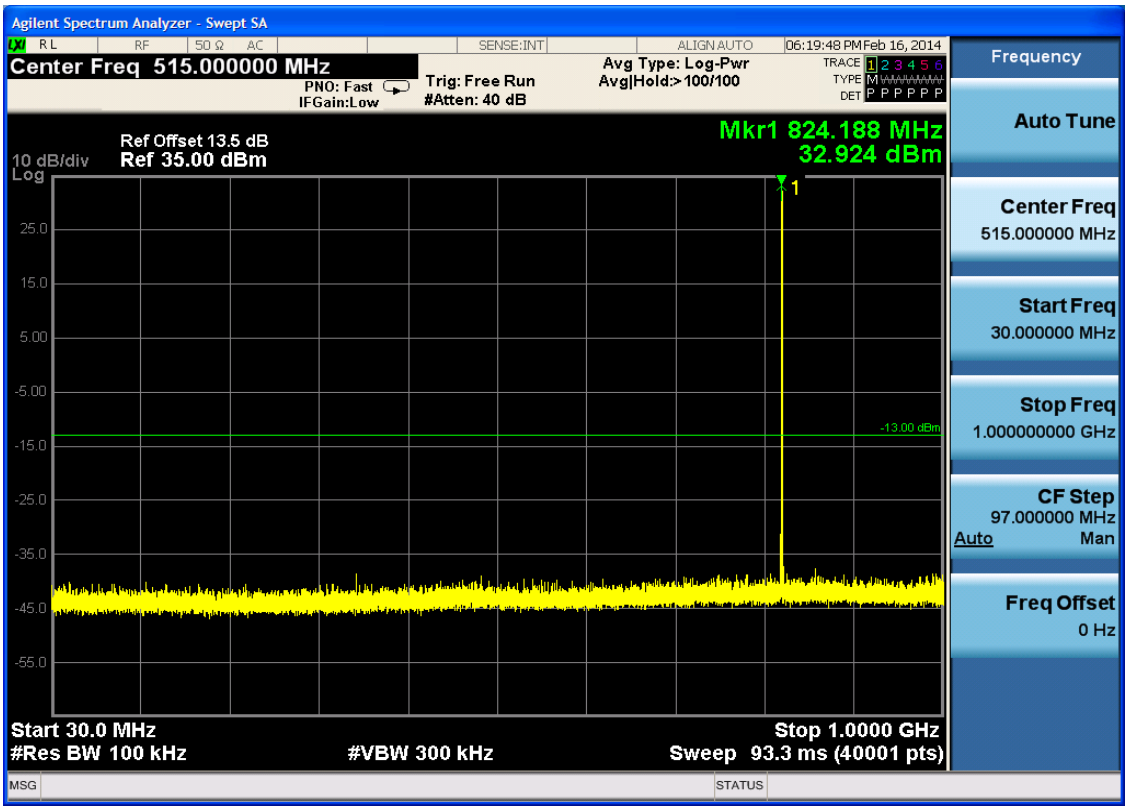

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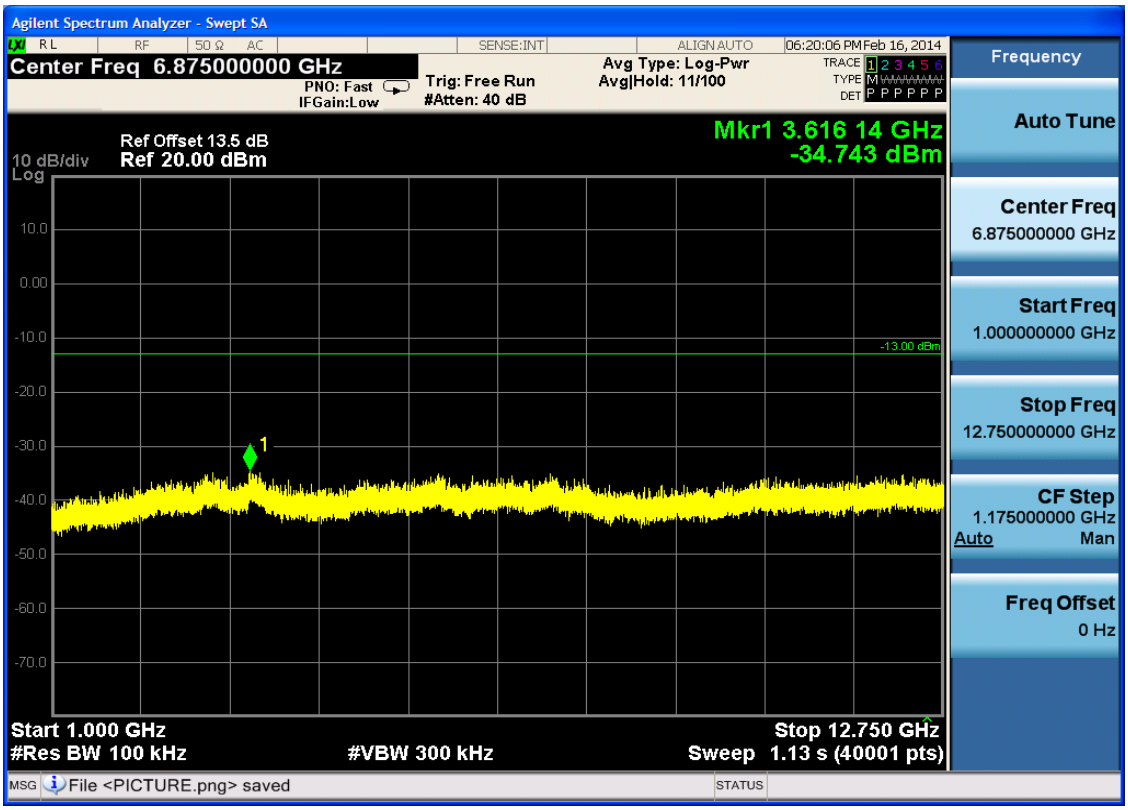

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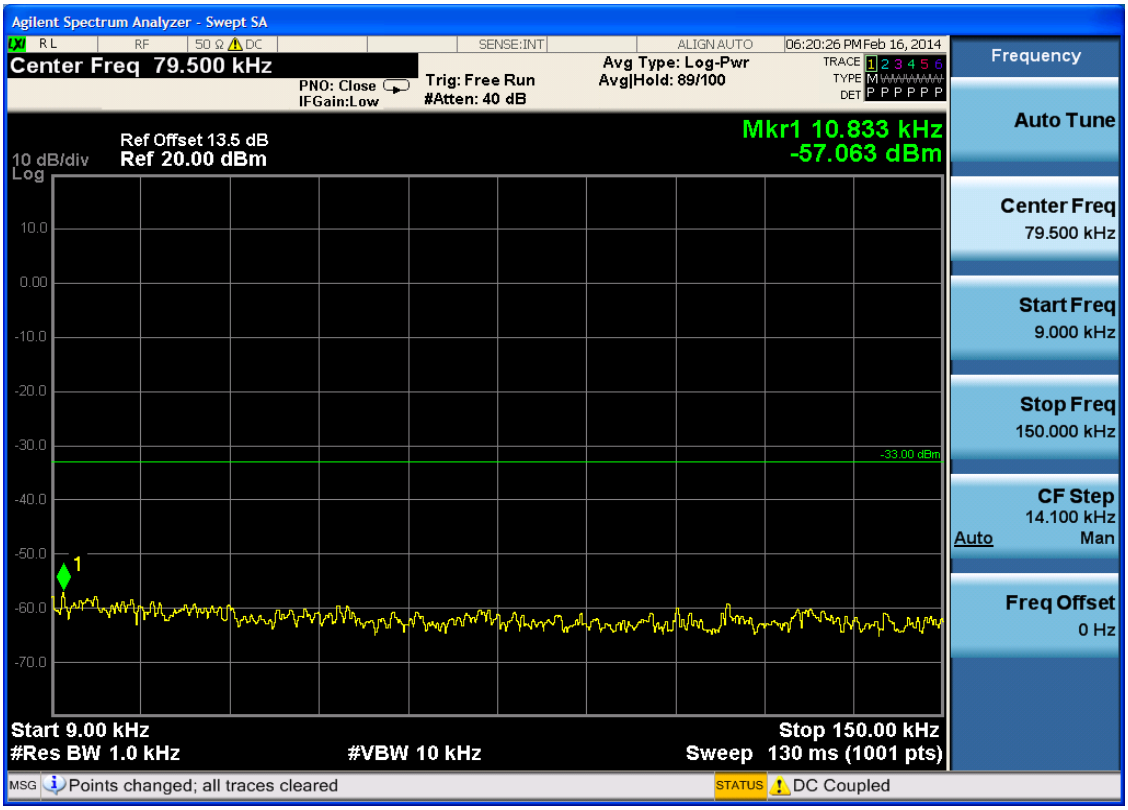
6.1.1.2.2 Test Channel = MCH



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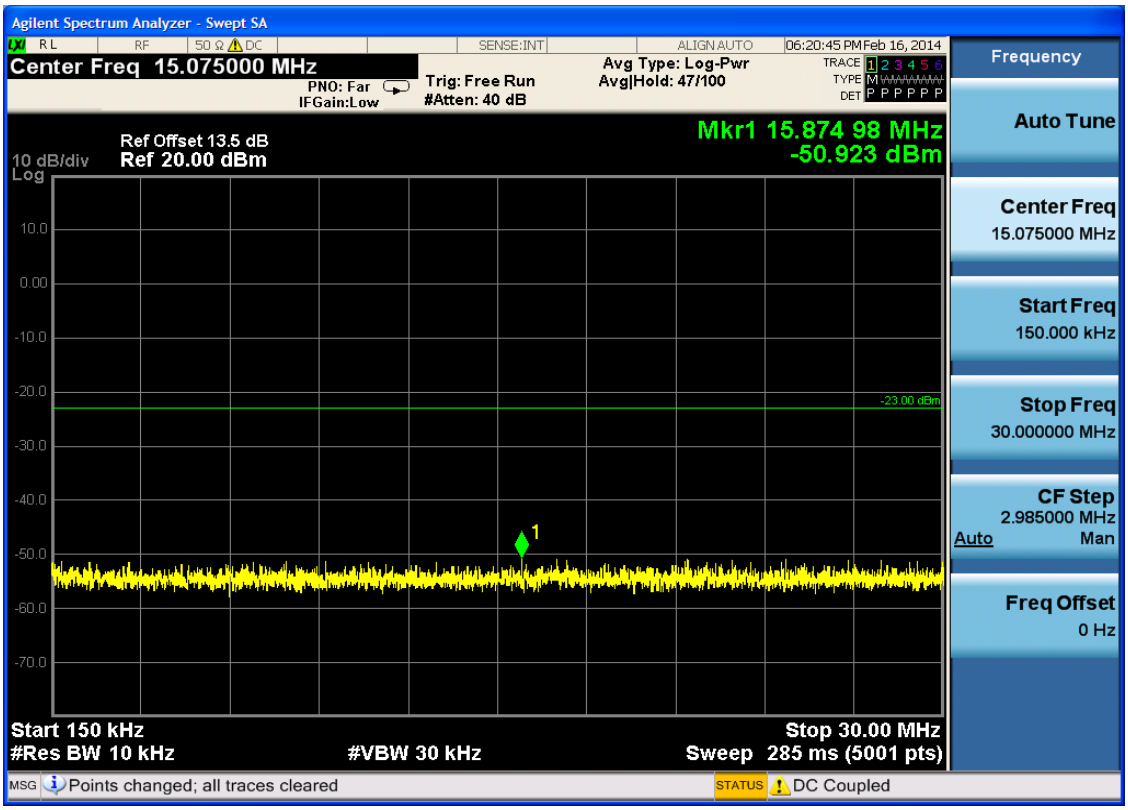

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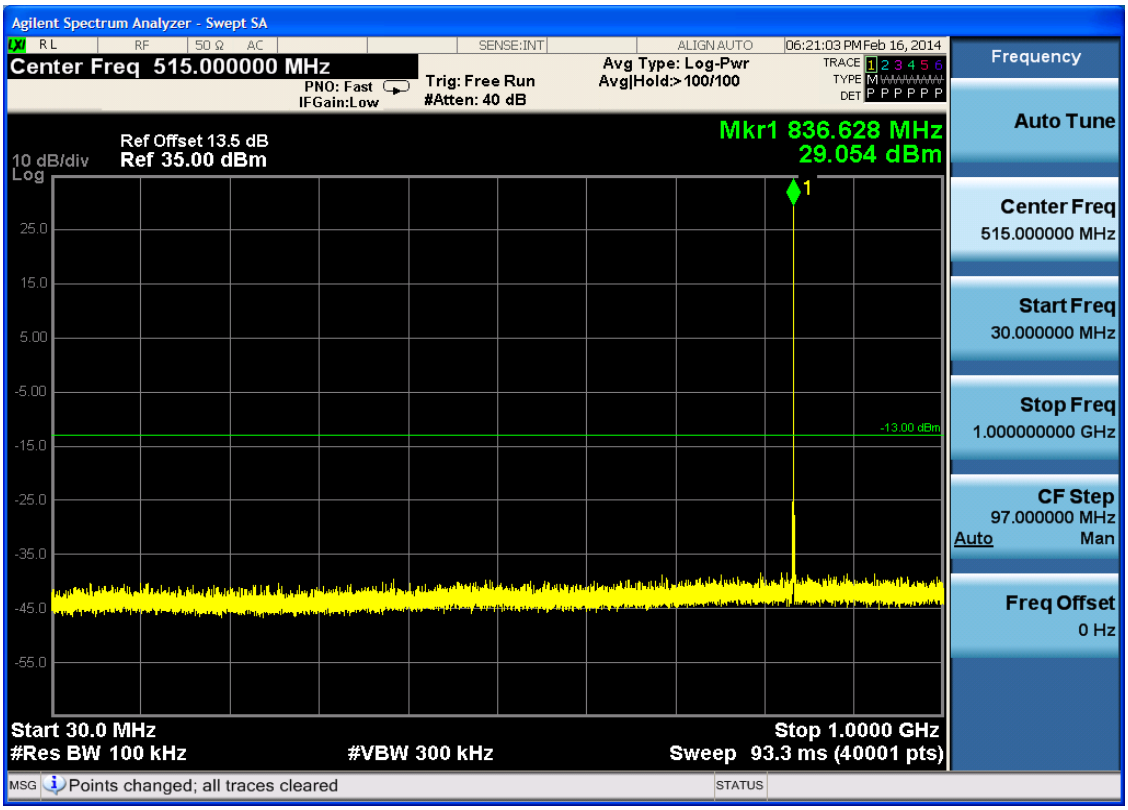

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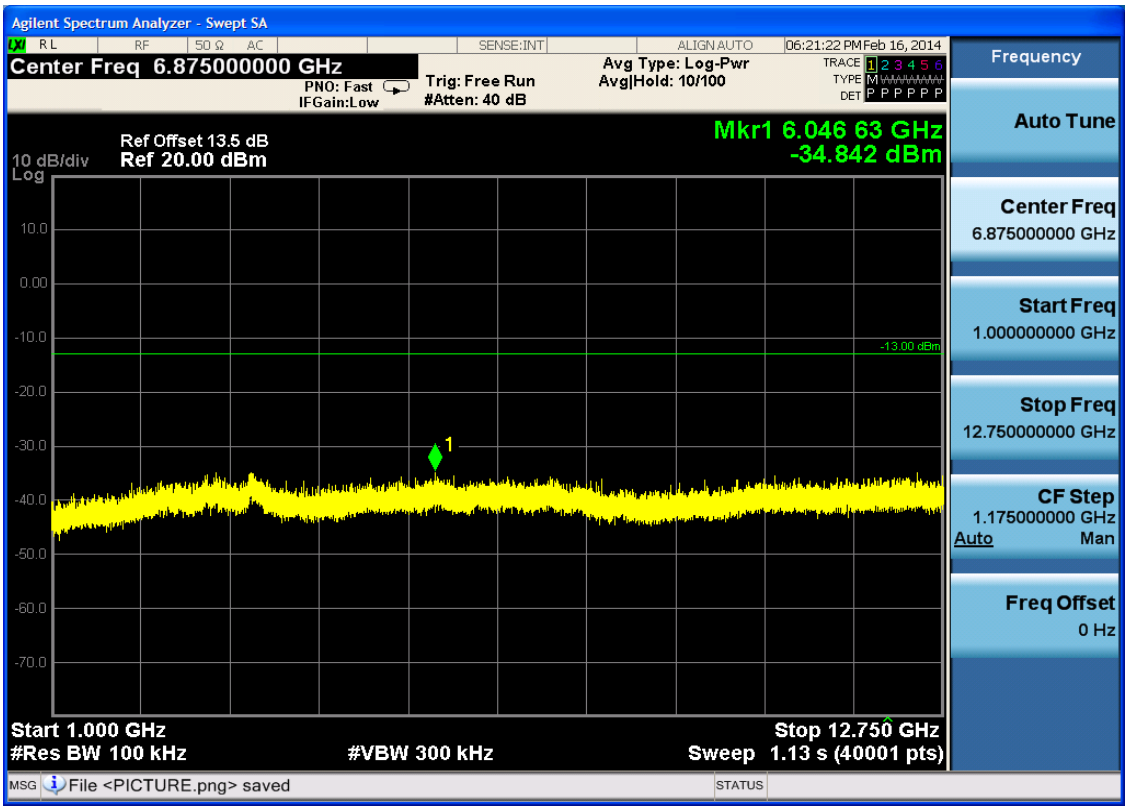

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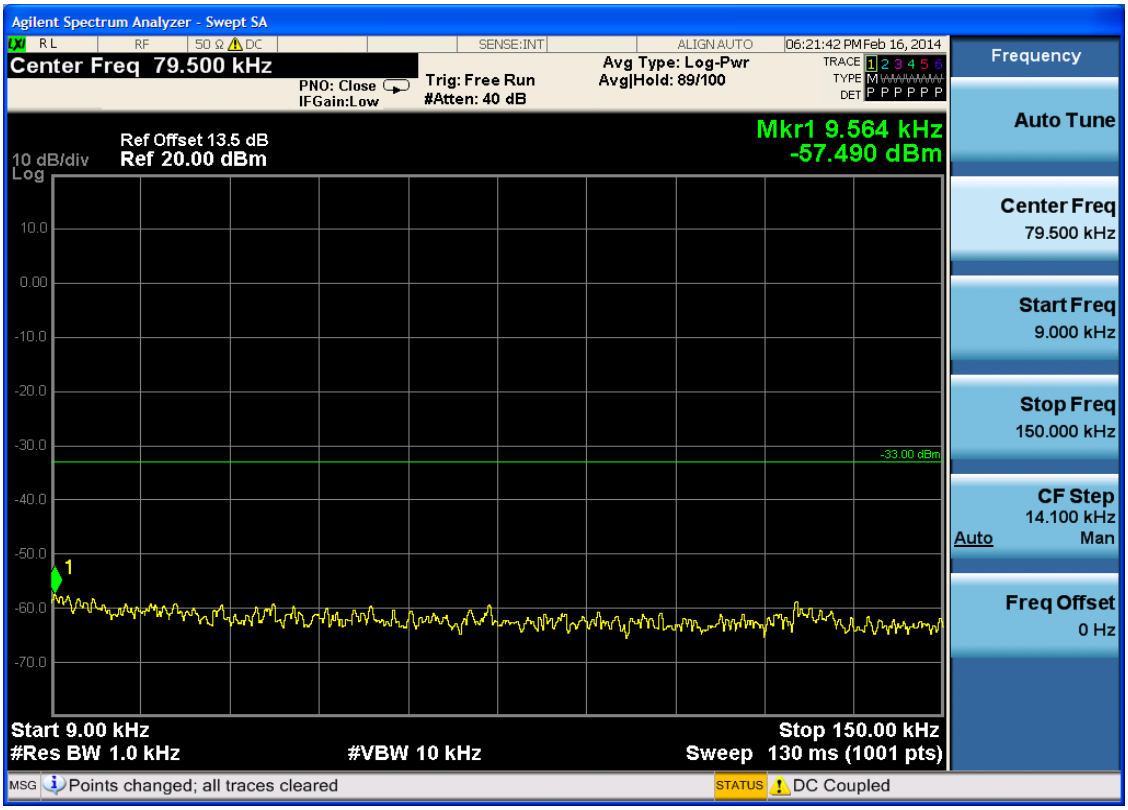
6.1.1.2.3 Test Channel = HCH



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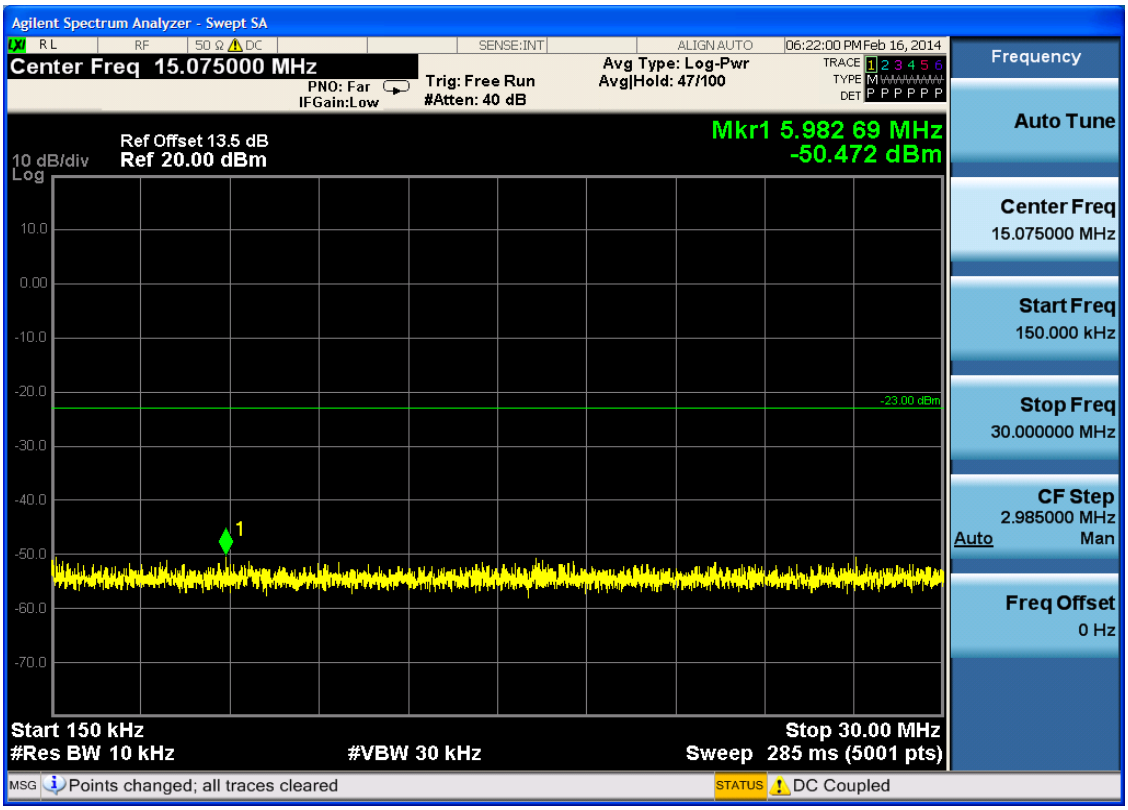

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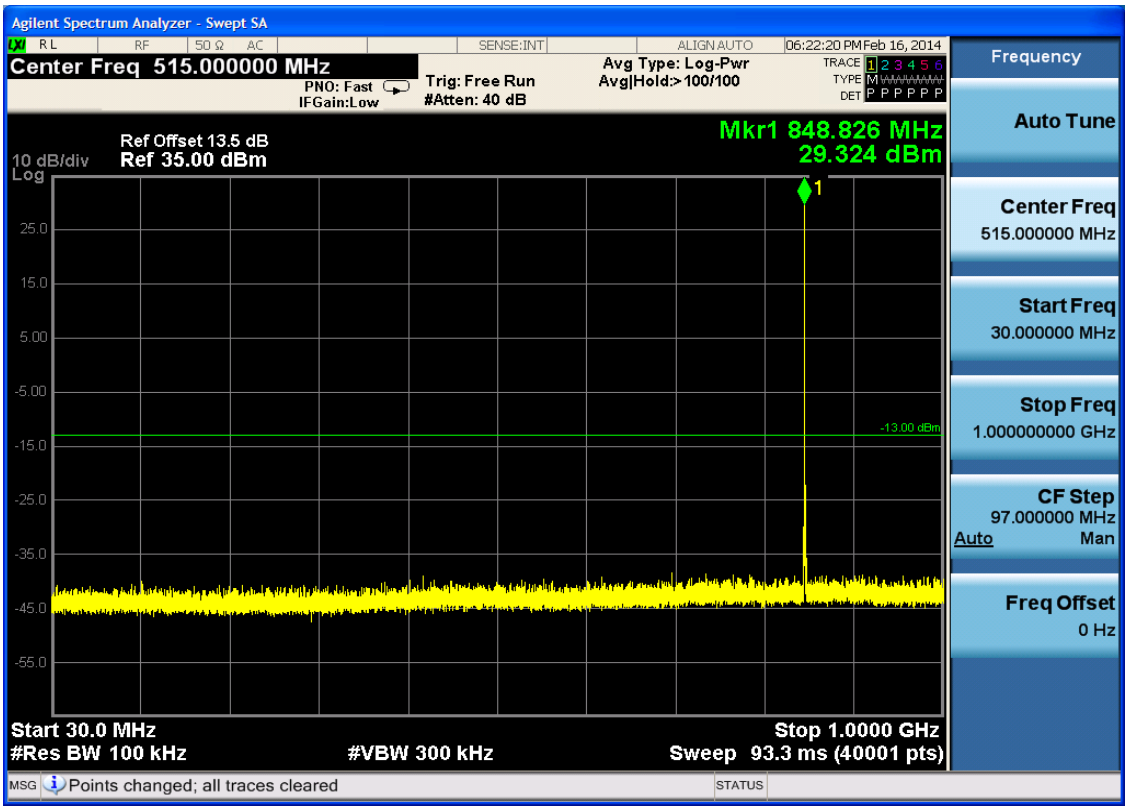

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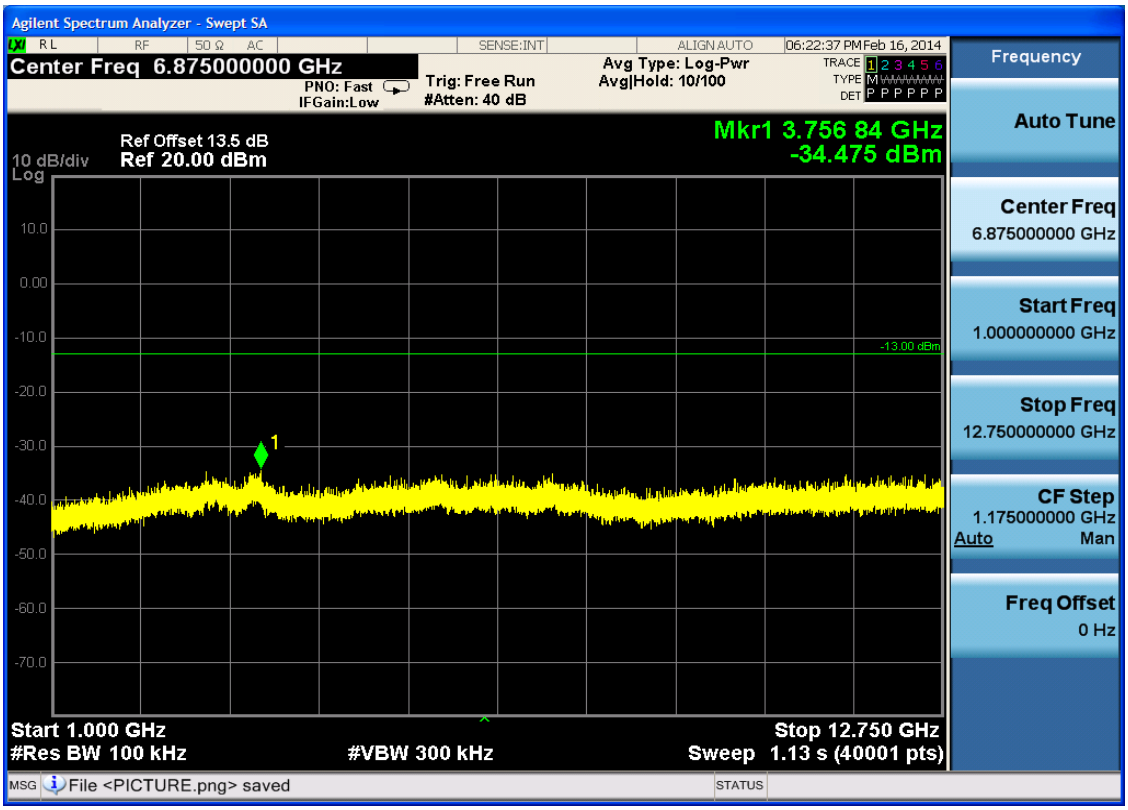

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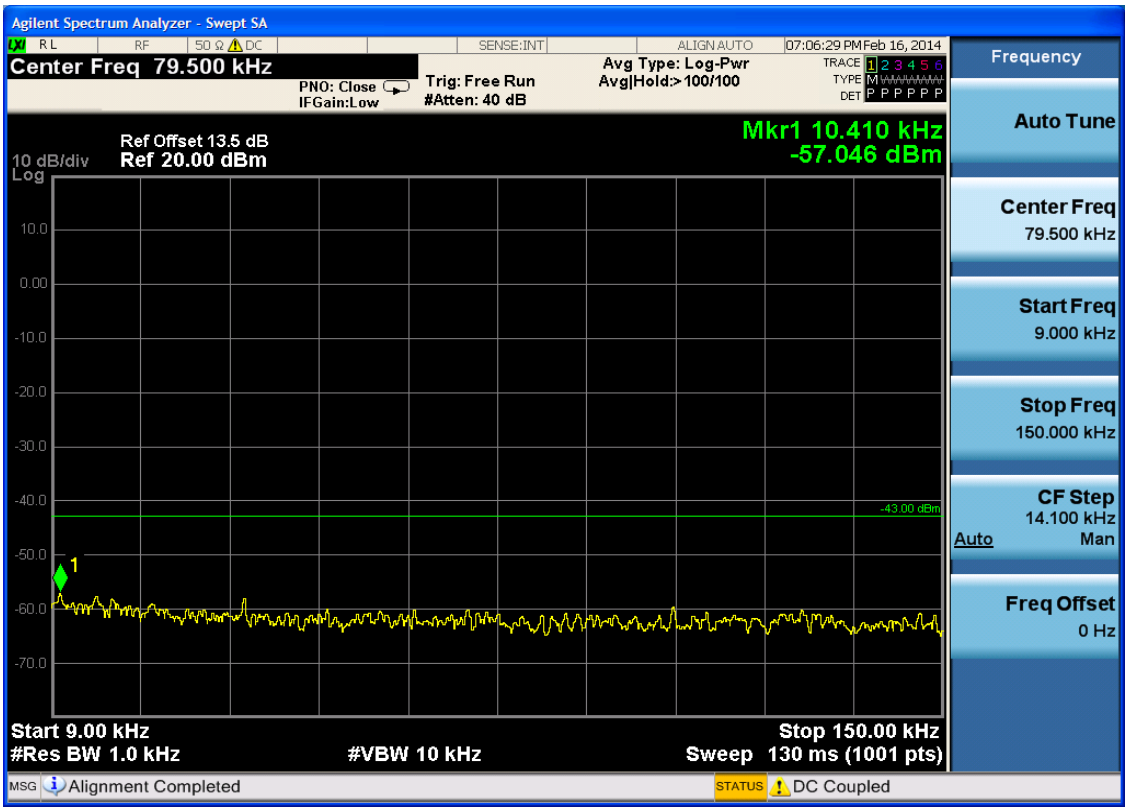
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH



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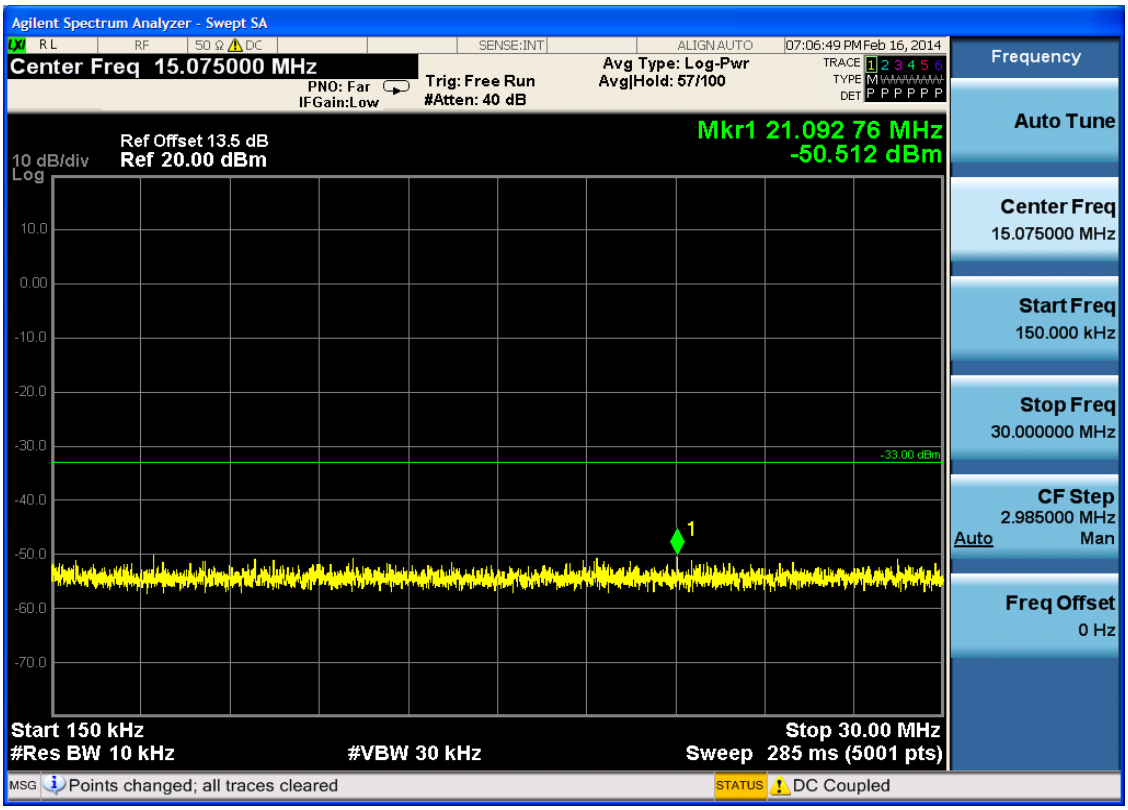

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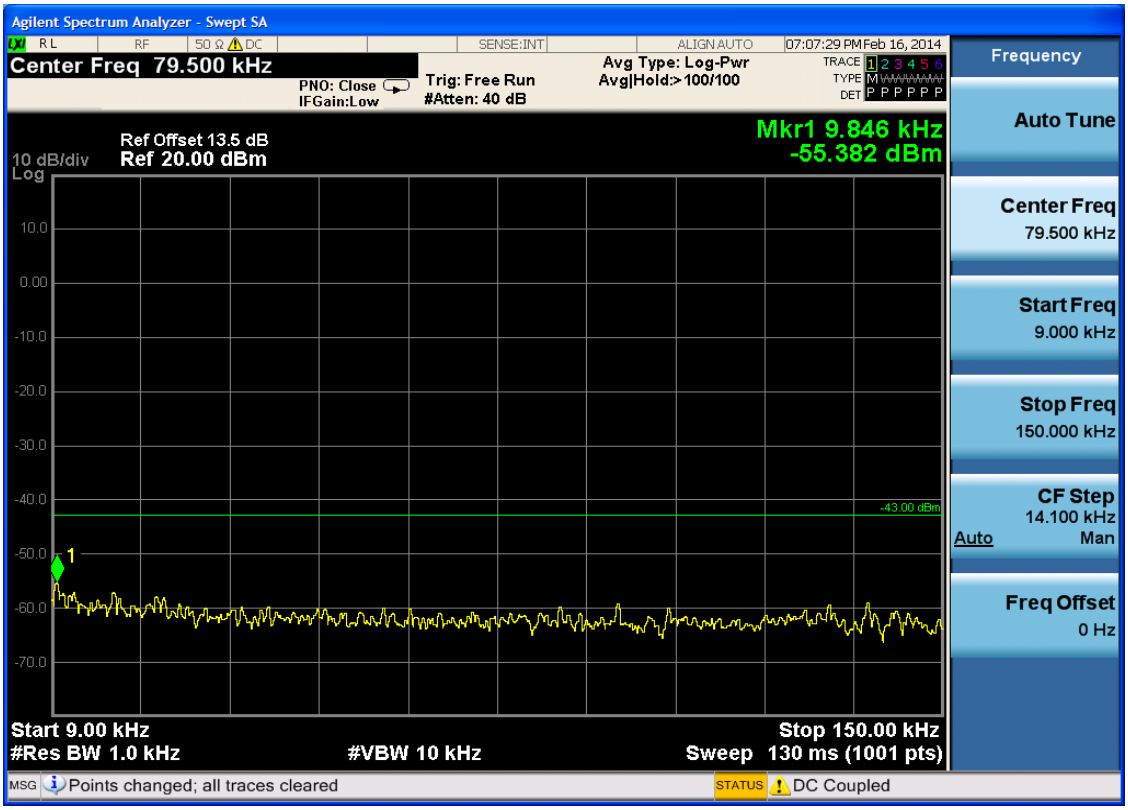
6.1.2.1.2 Test Channel = MCH



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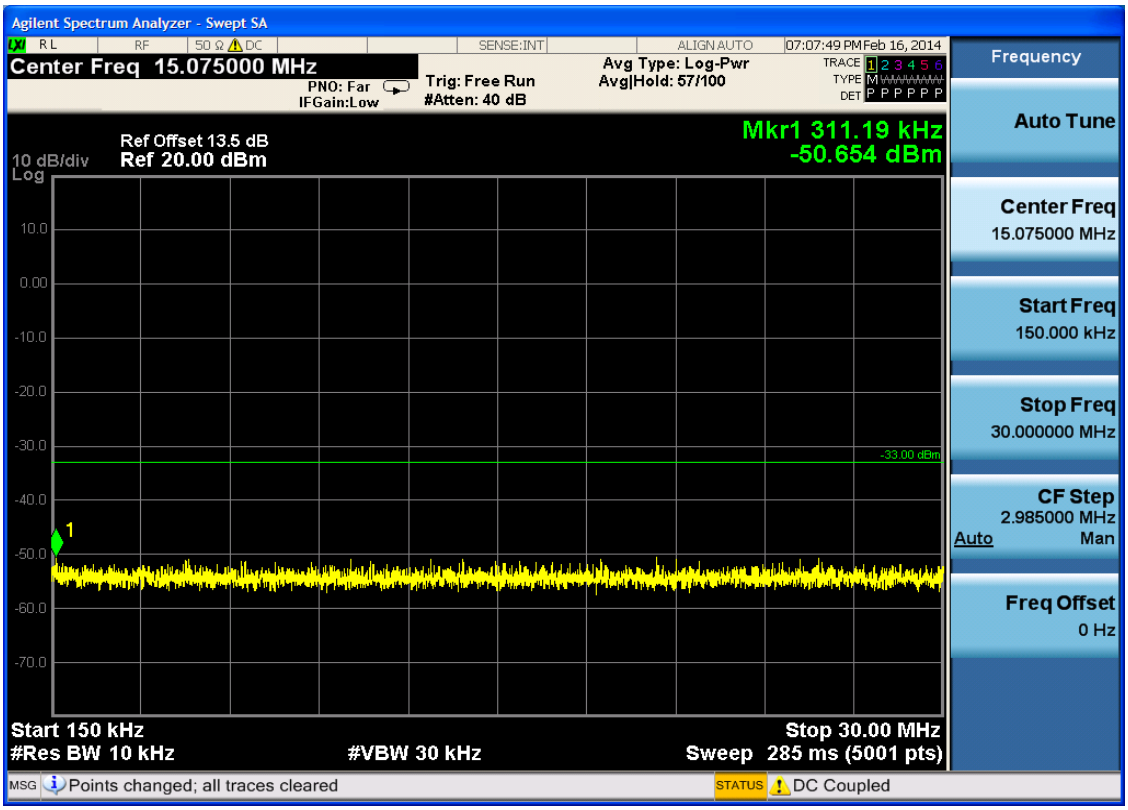

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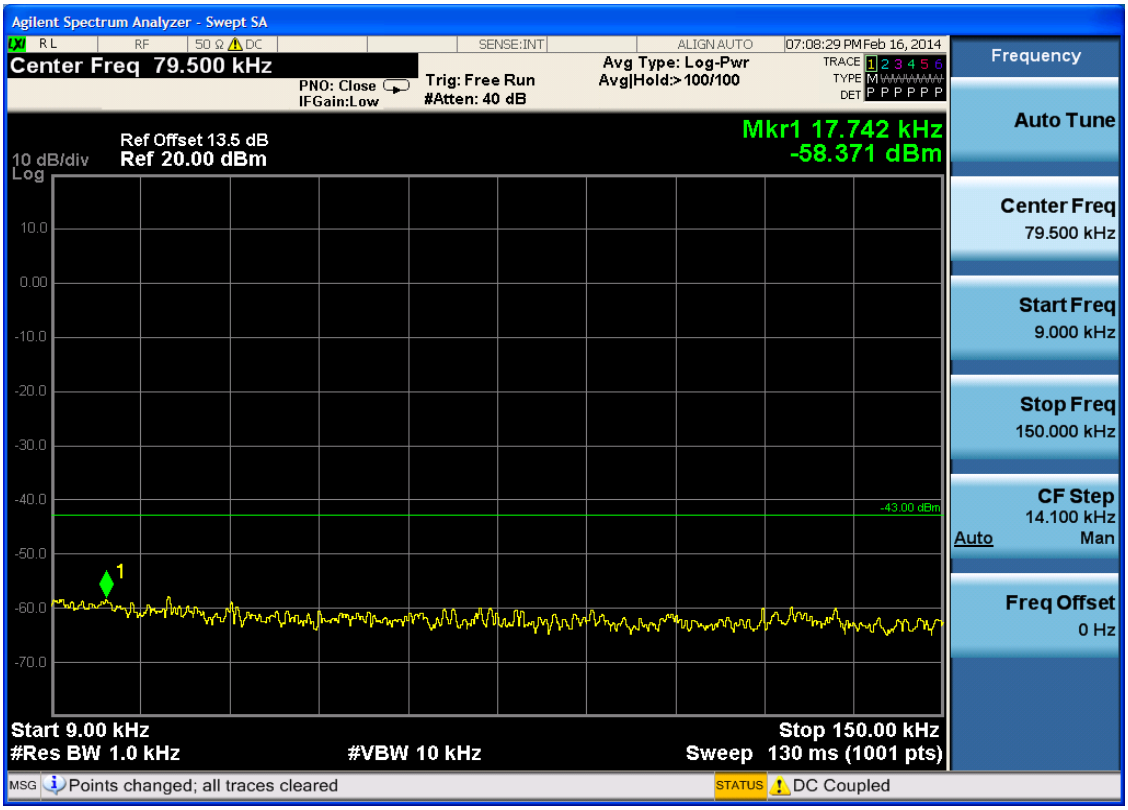
6.1.2.1.3 Test Channel = HCH



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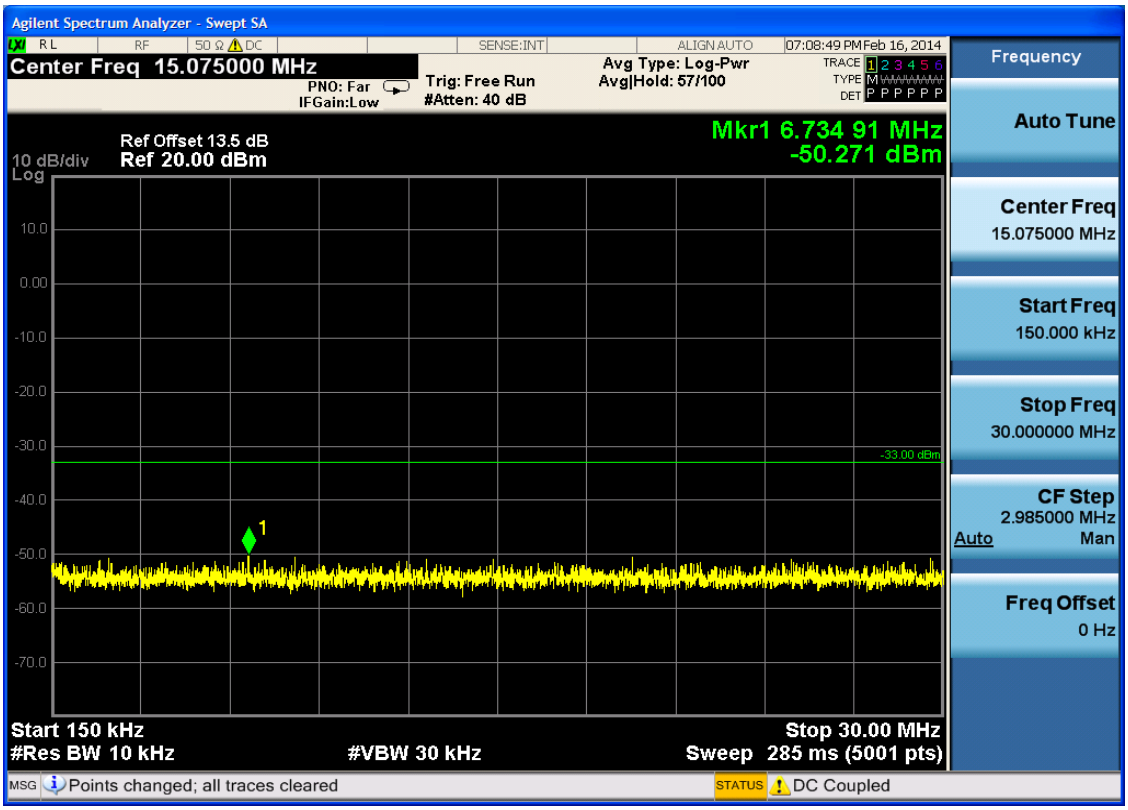

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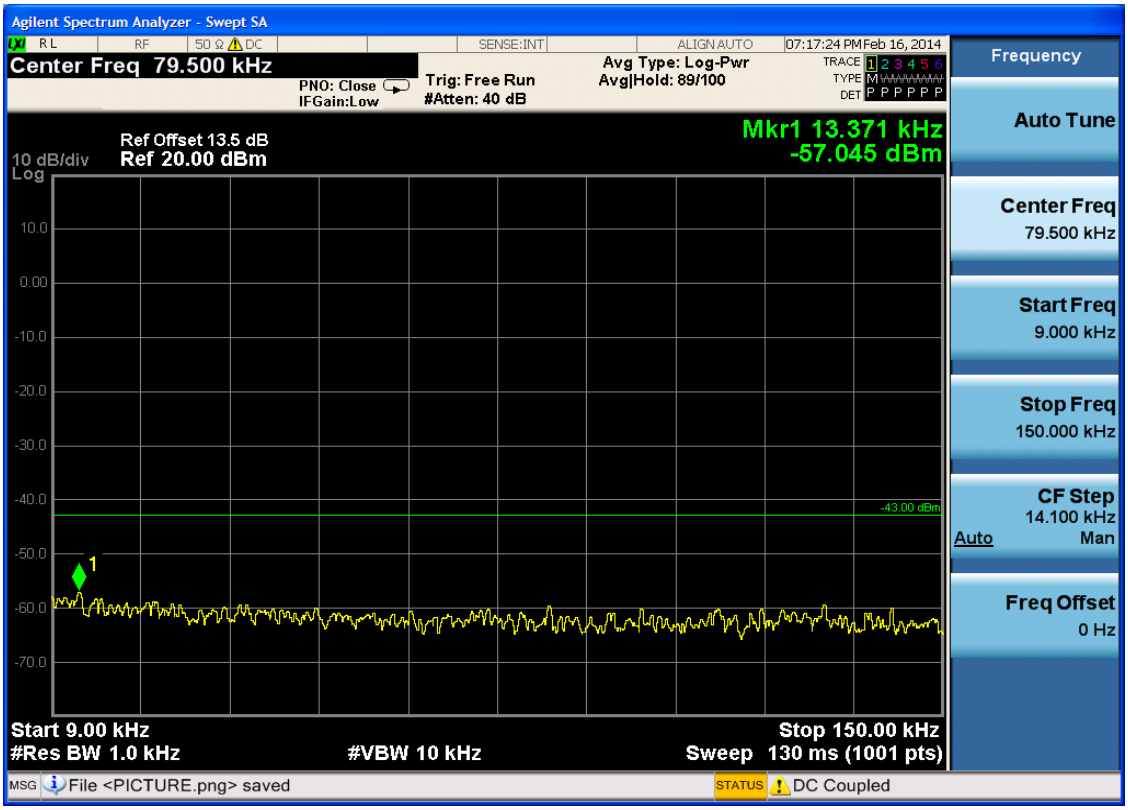
6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH



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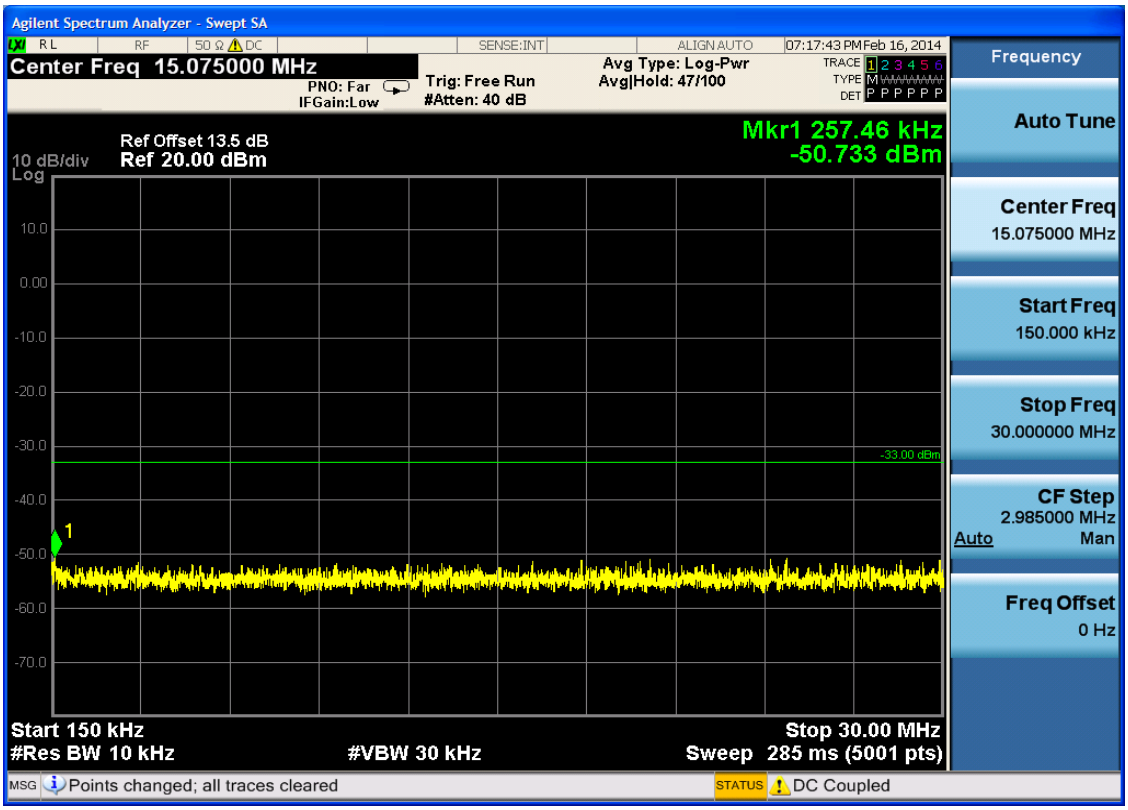

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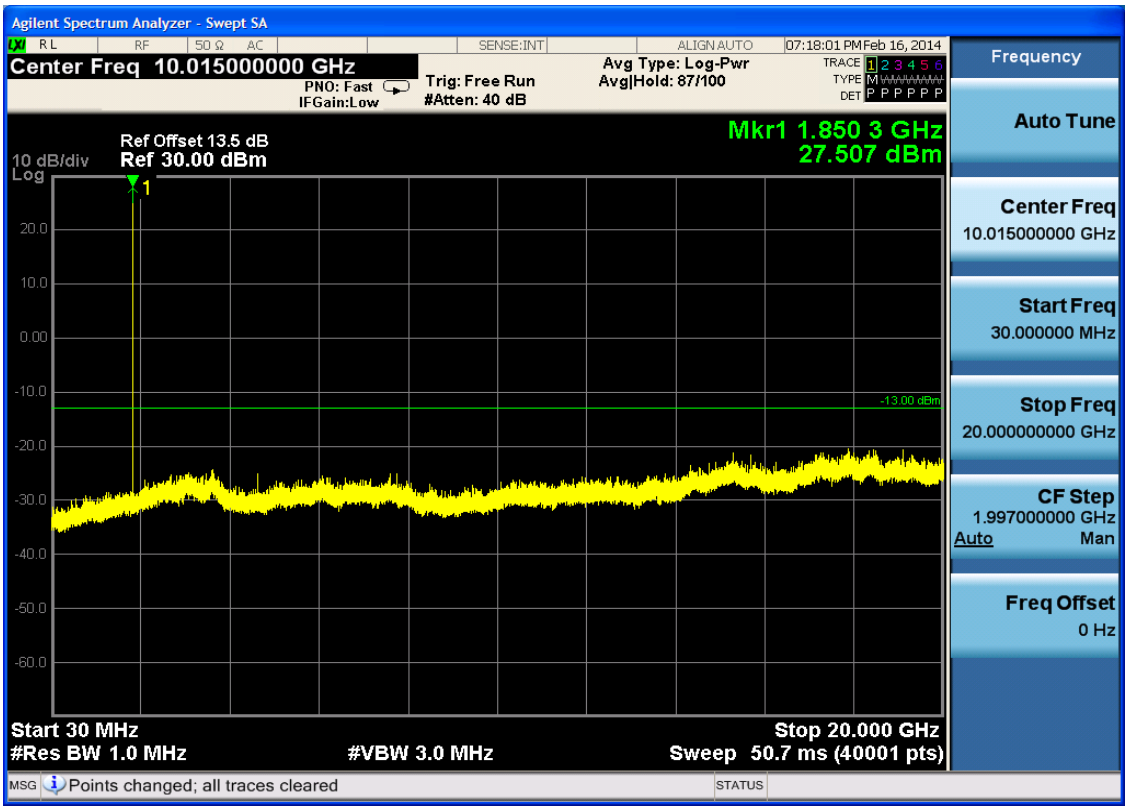

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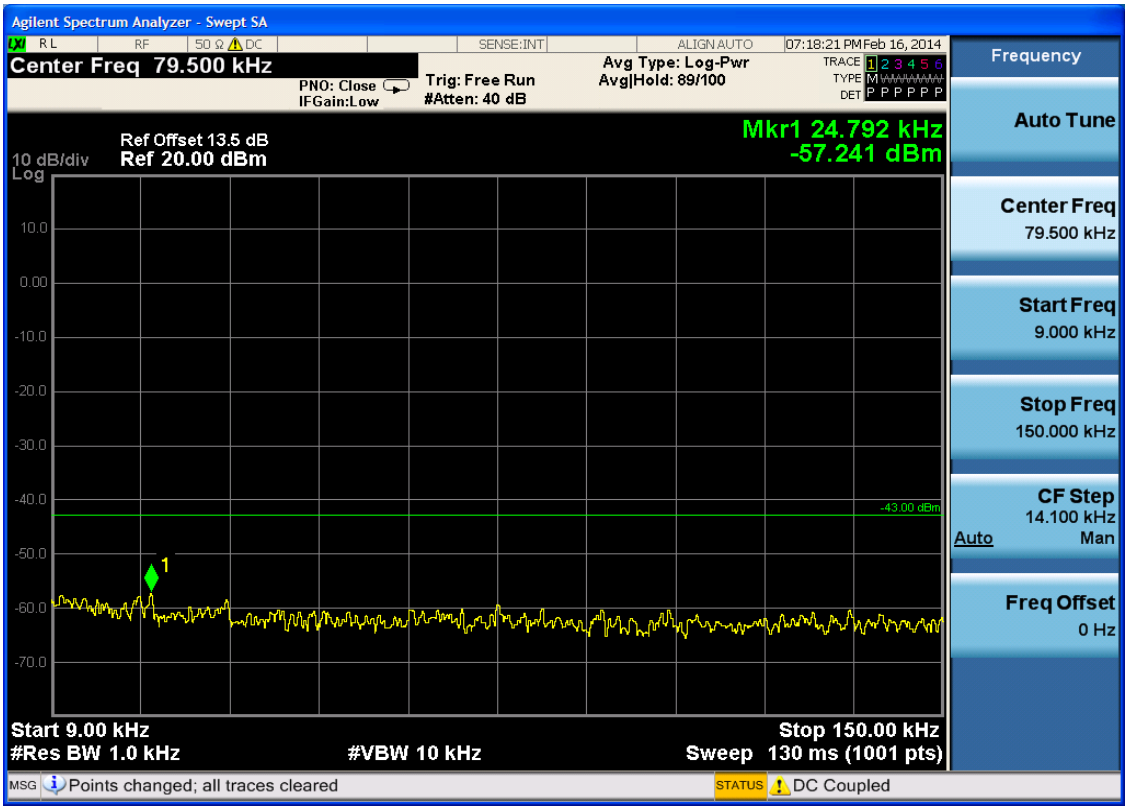
6.1.2.2.2 Test Channel = MCH



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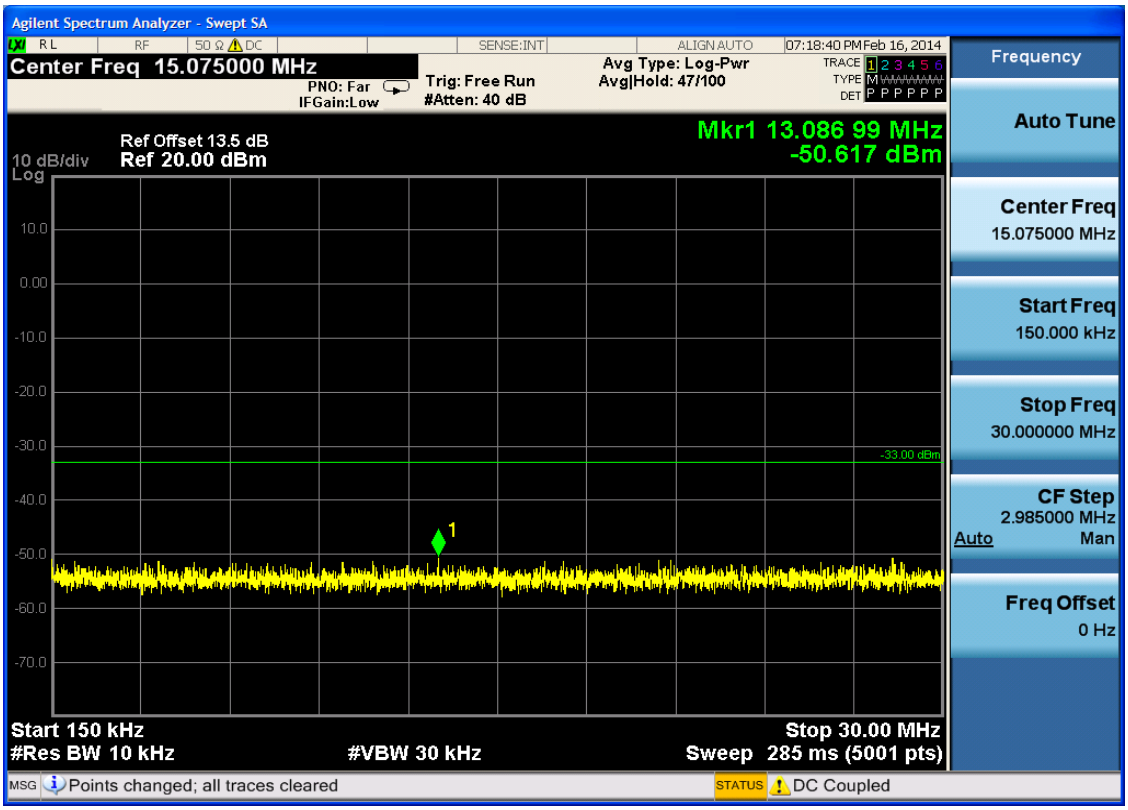

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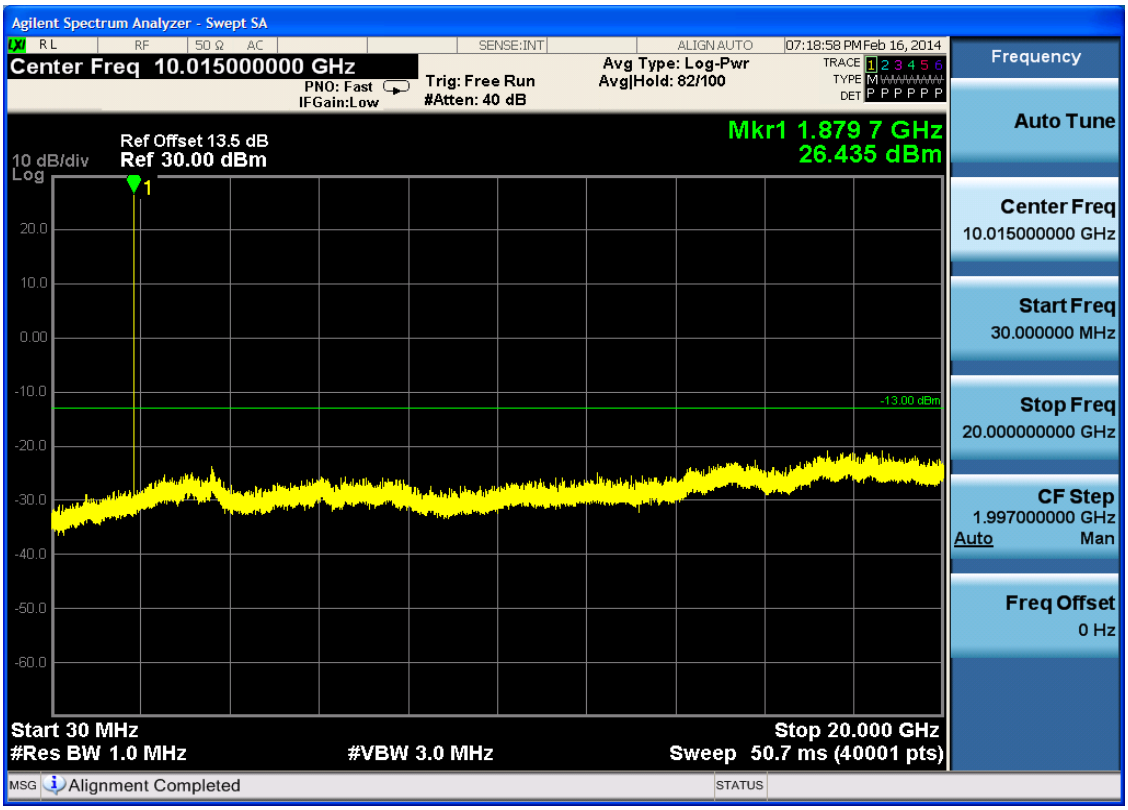

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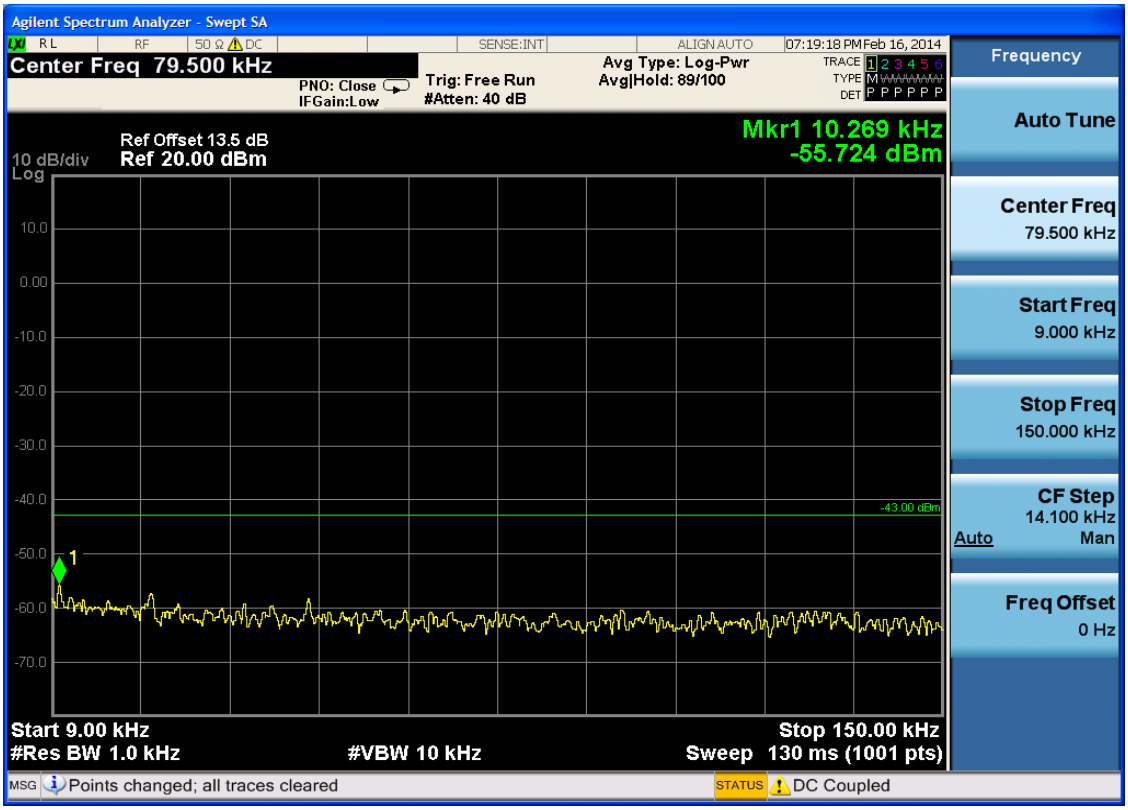
6.1.2.2.3 Test Channel = HCH



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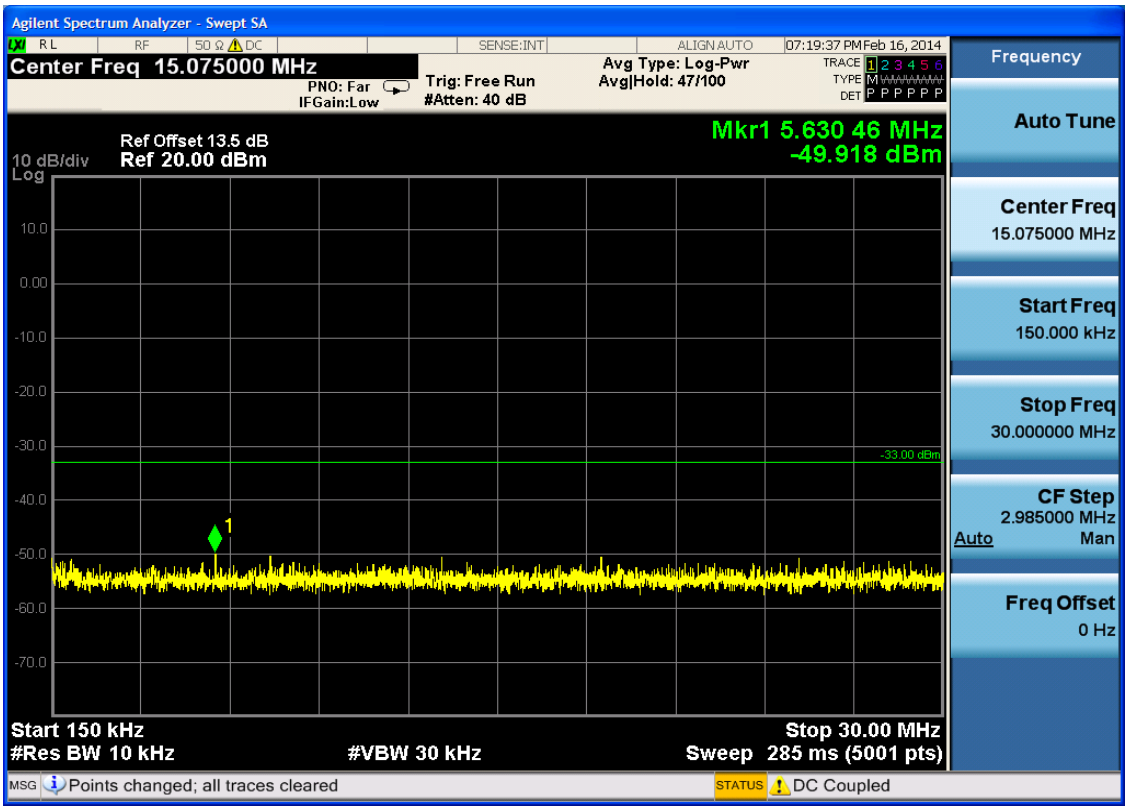

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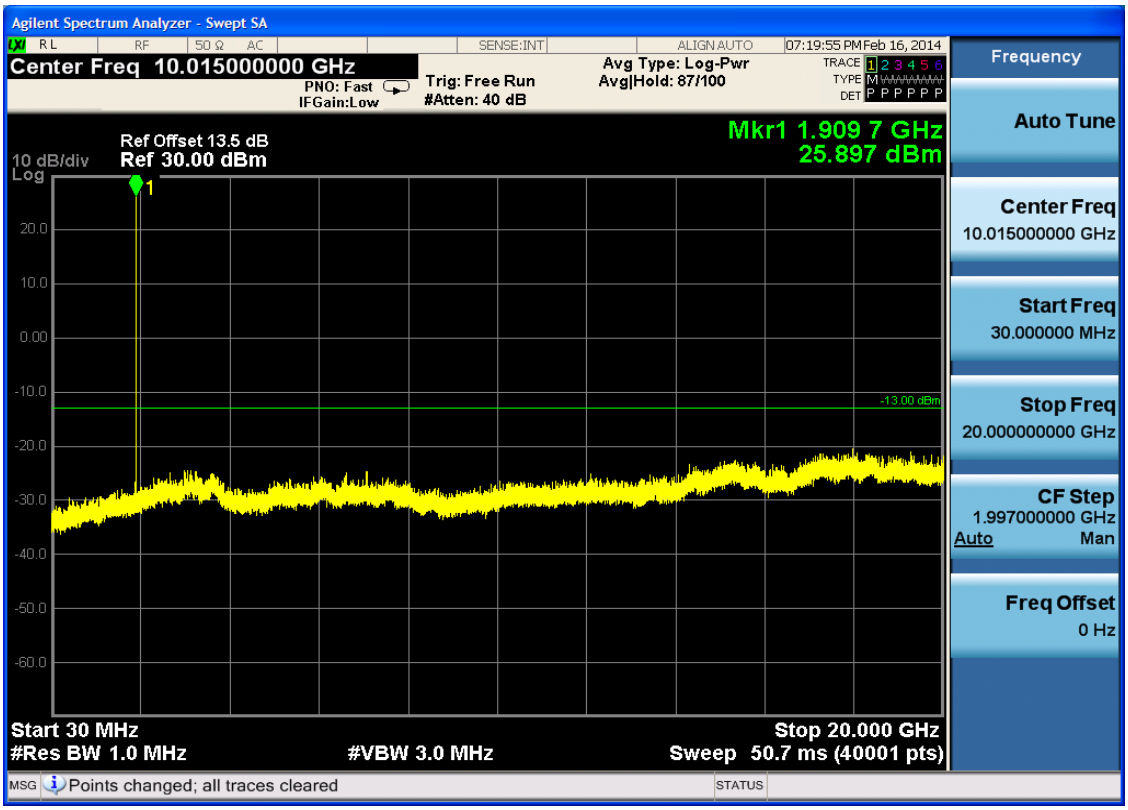

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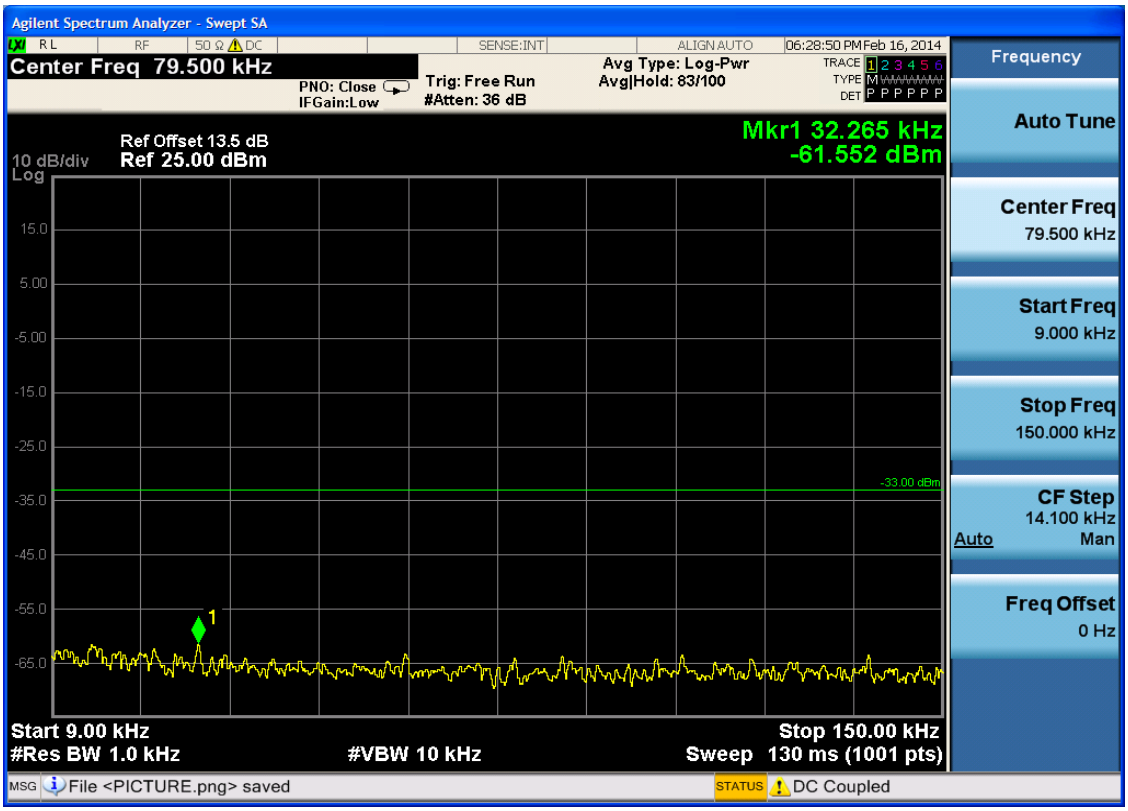
6.2 For UMTS

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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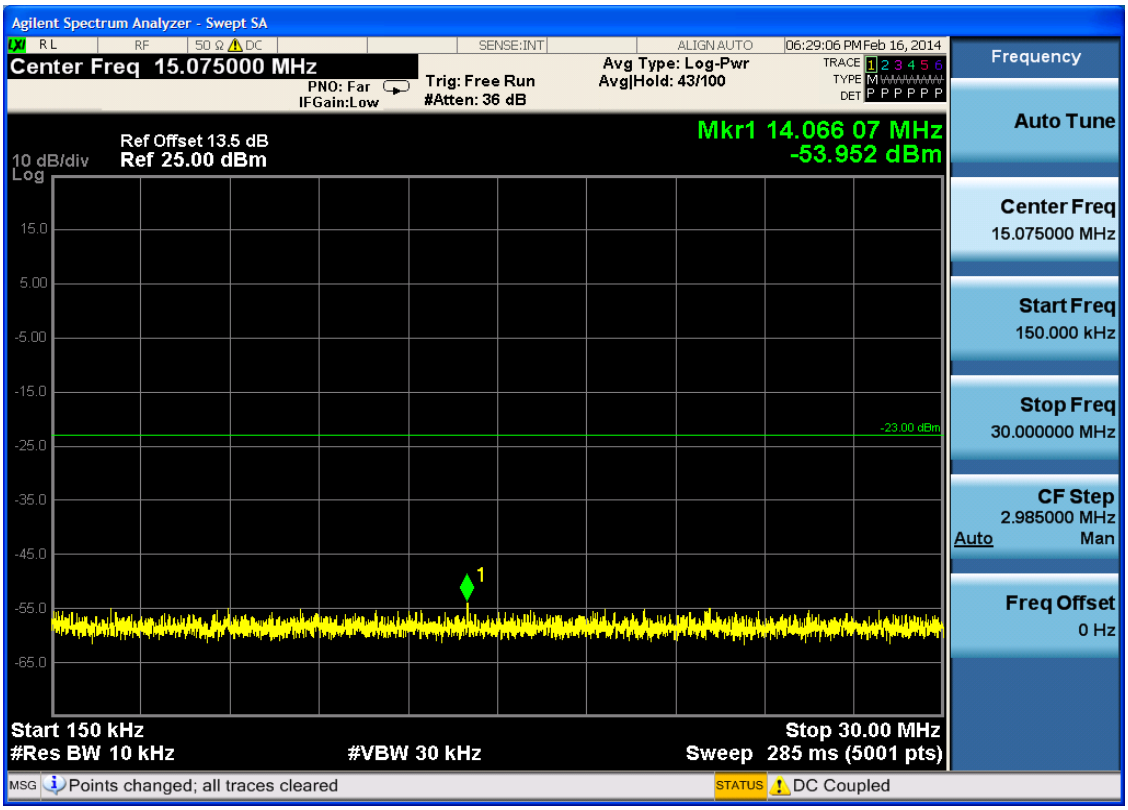

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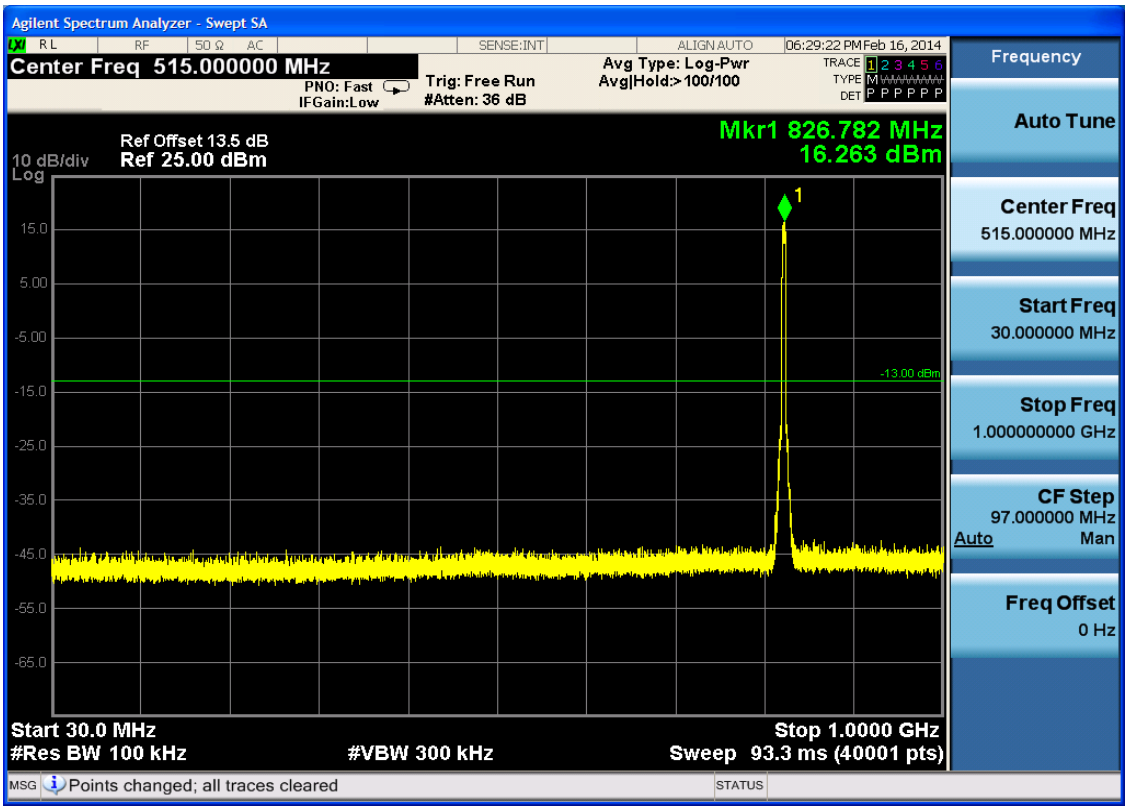

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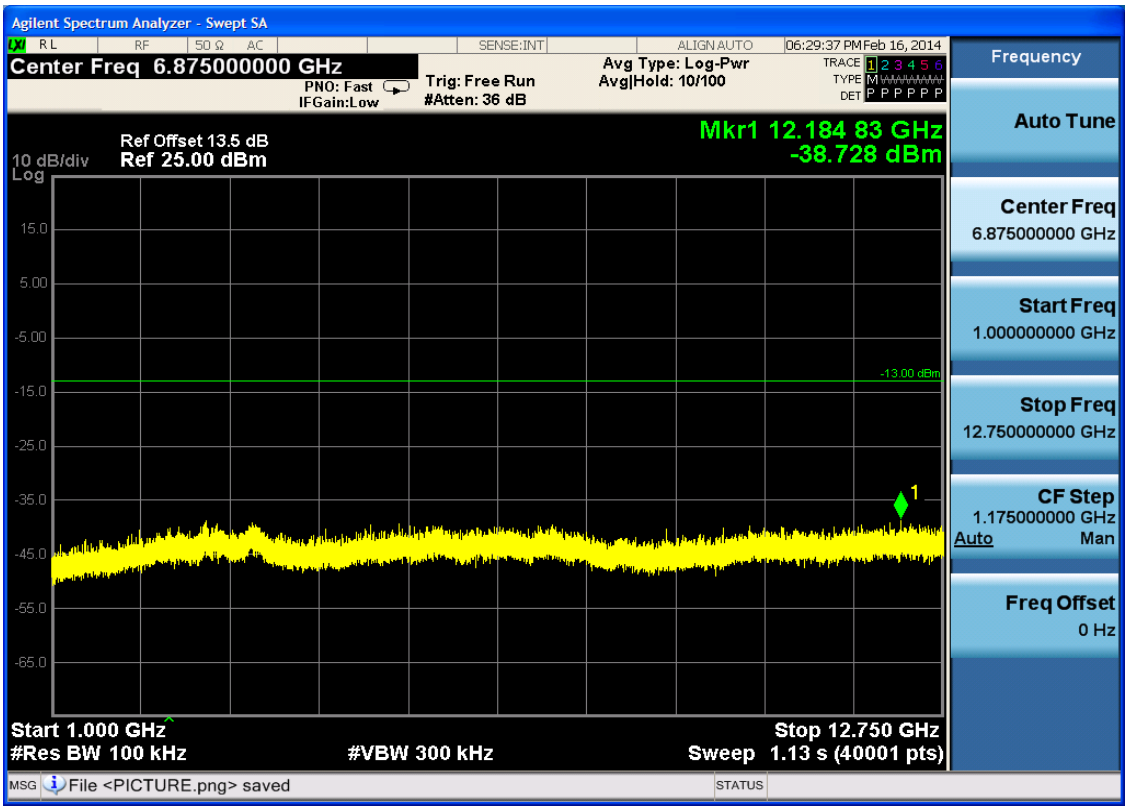

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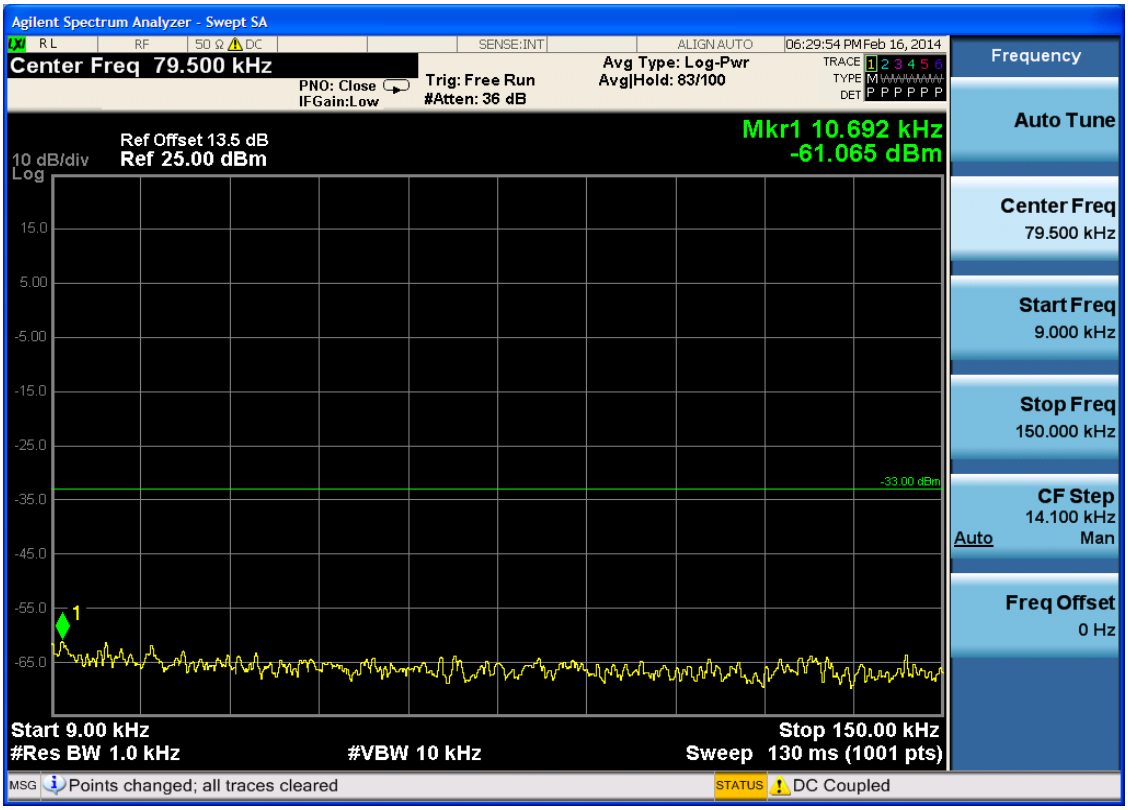
6.2.1.1.2 Test Channel = MCH



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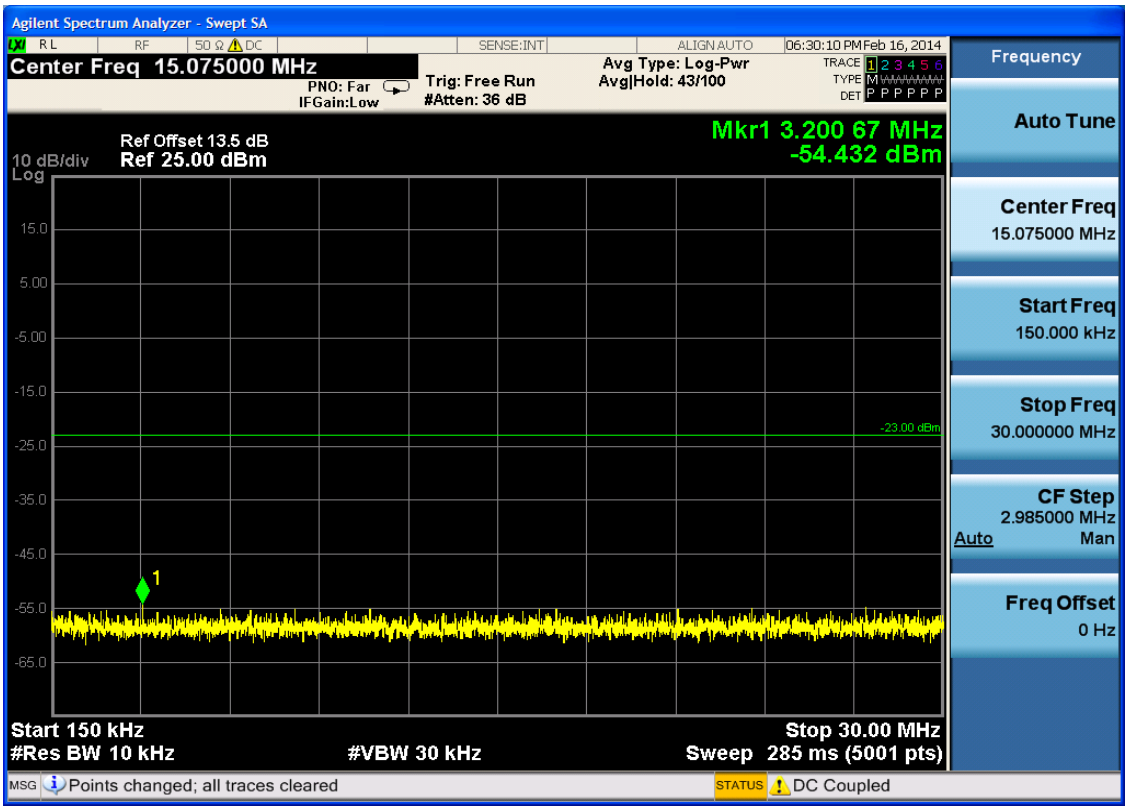

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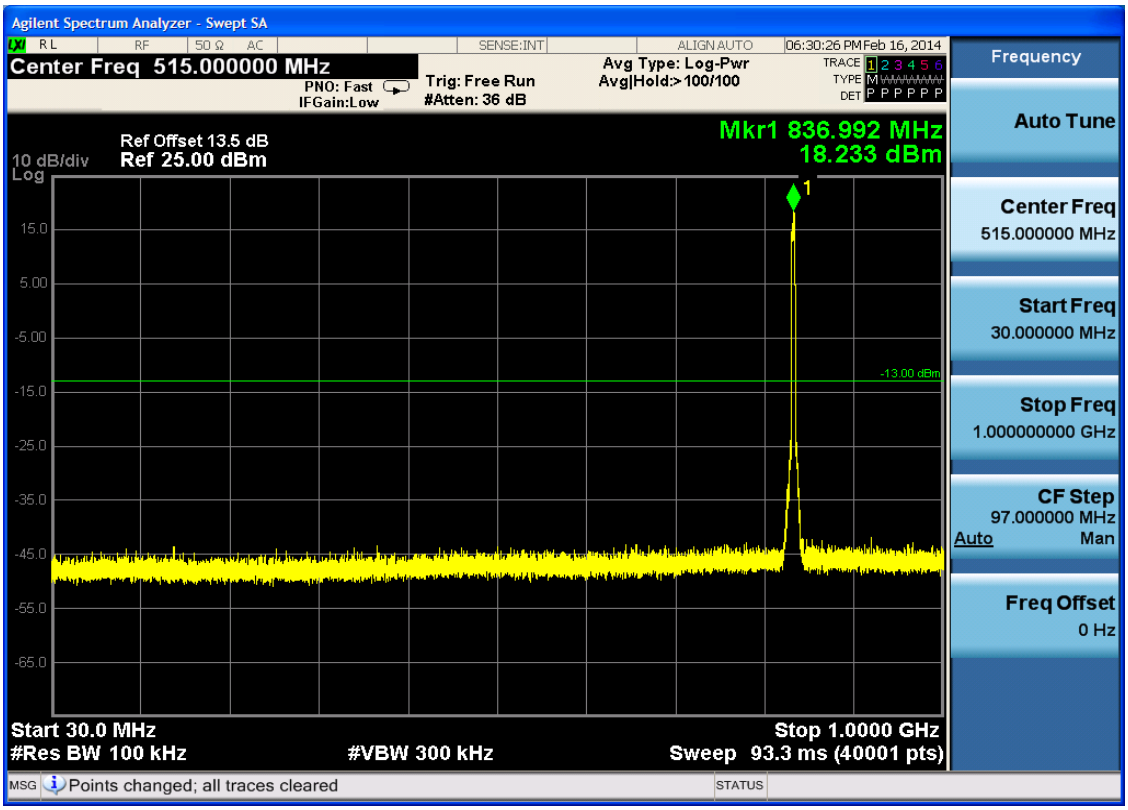

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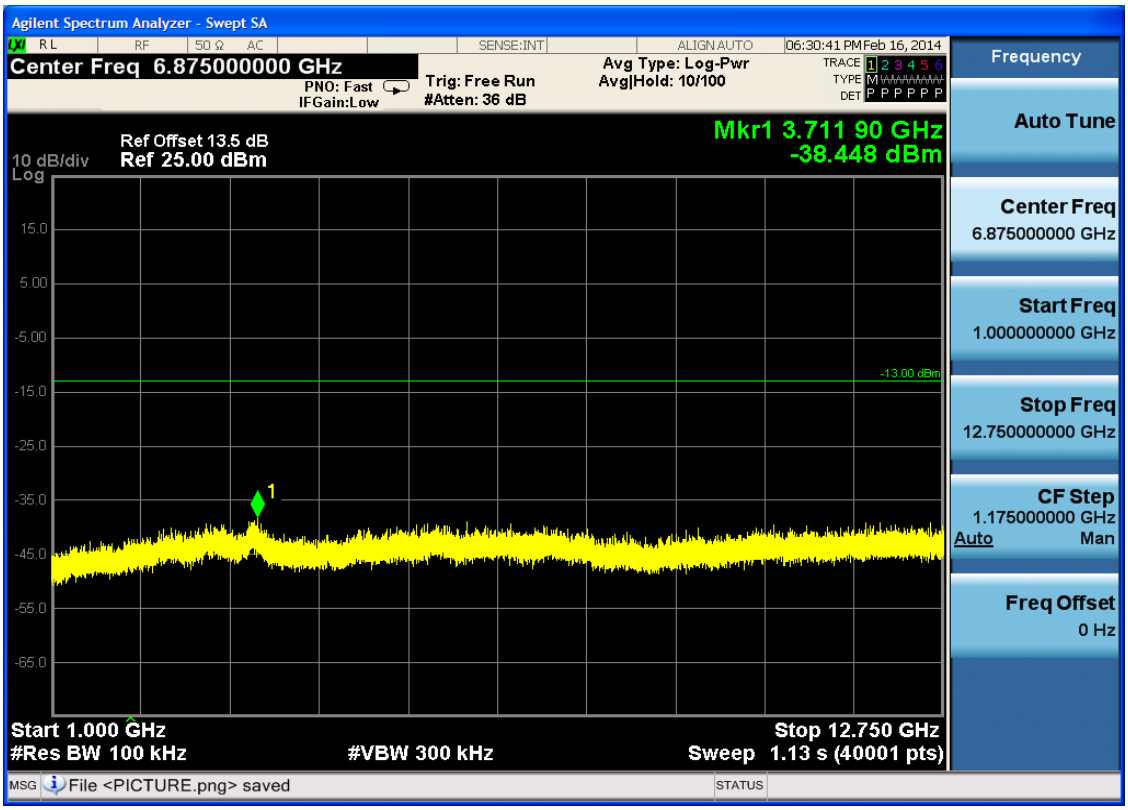

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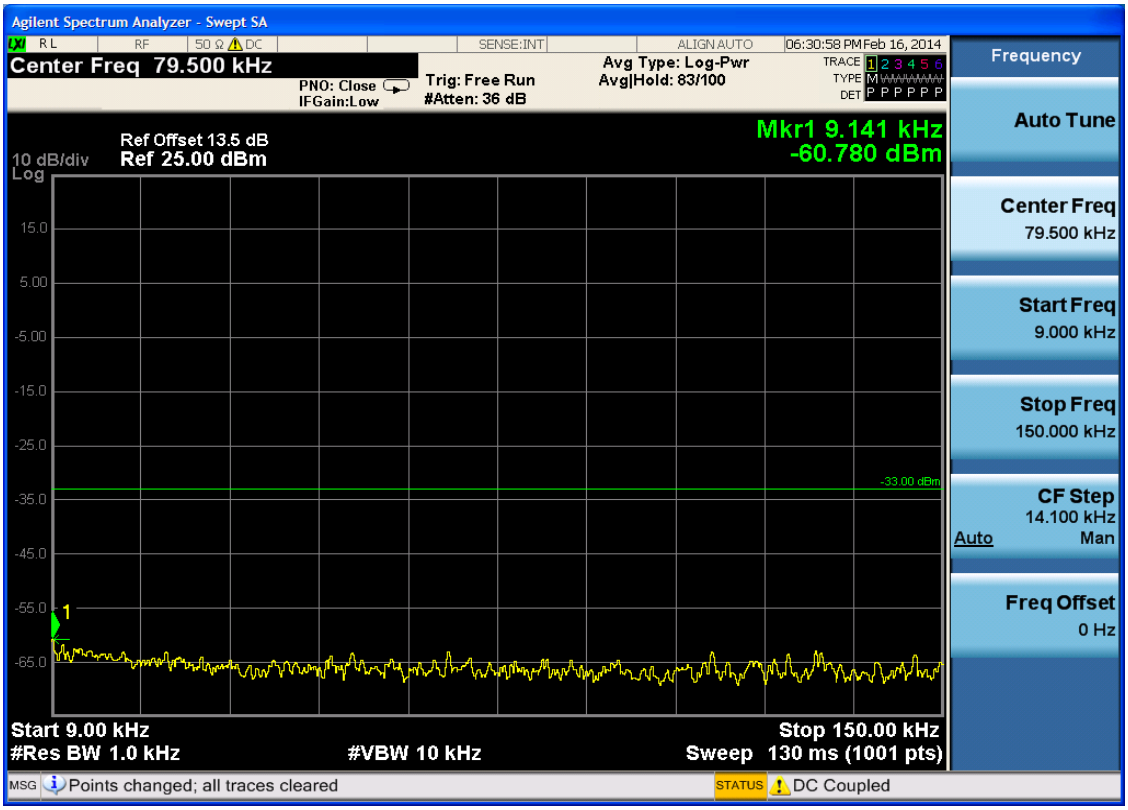
6.2.1.1.3 Test Channel = HCH



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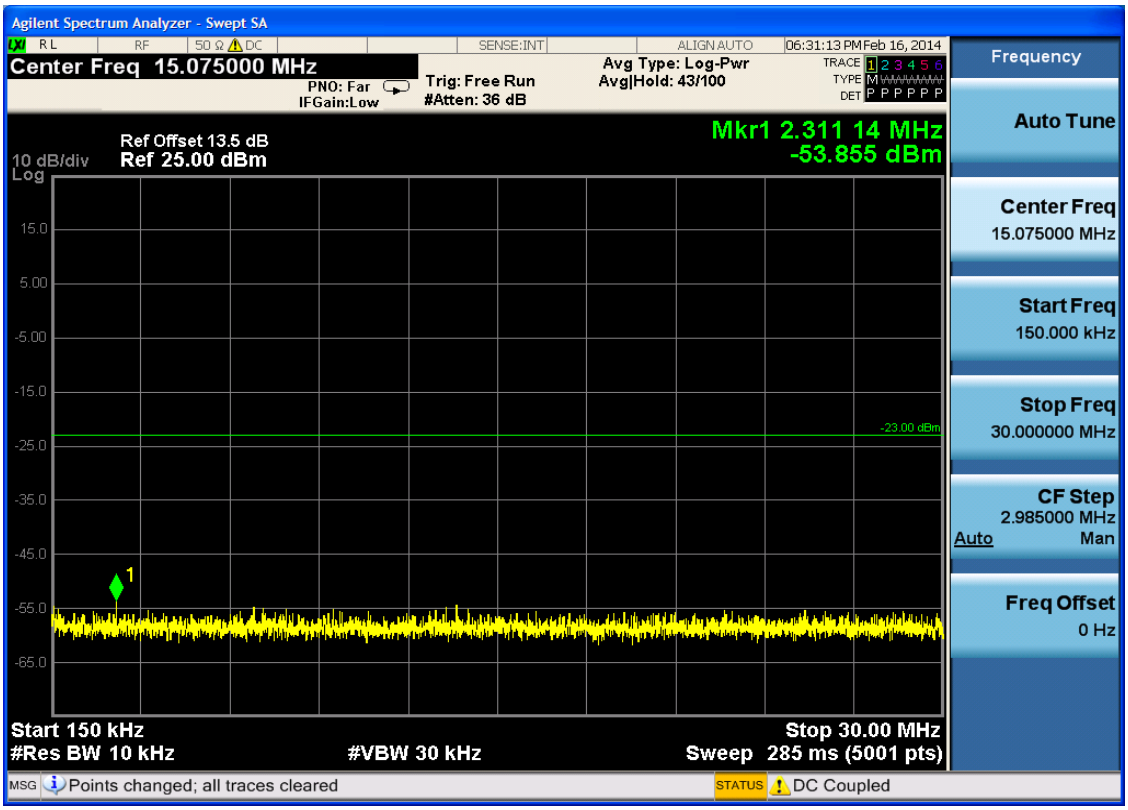

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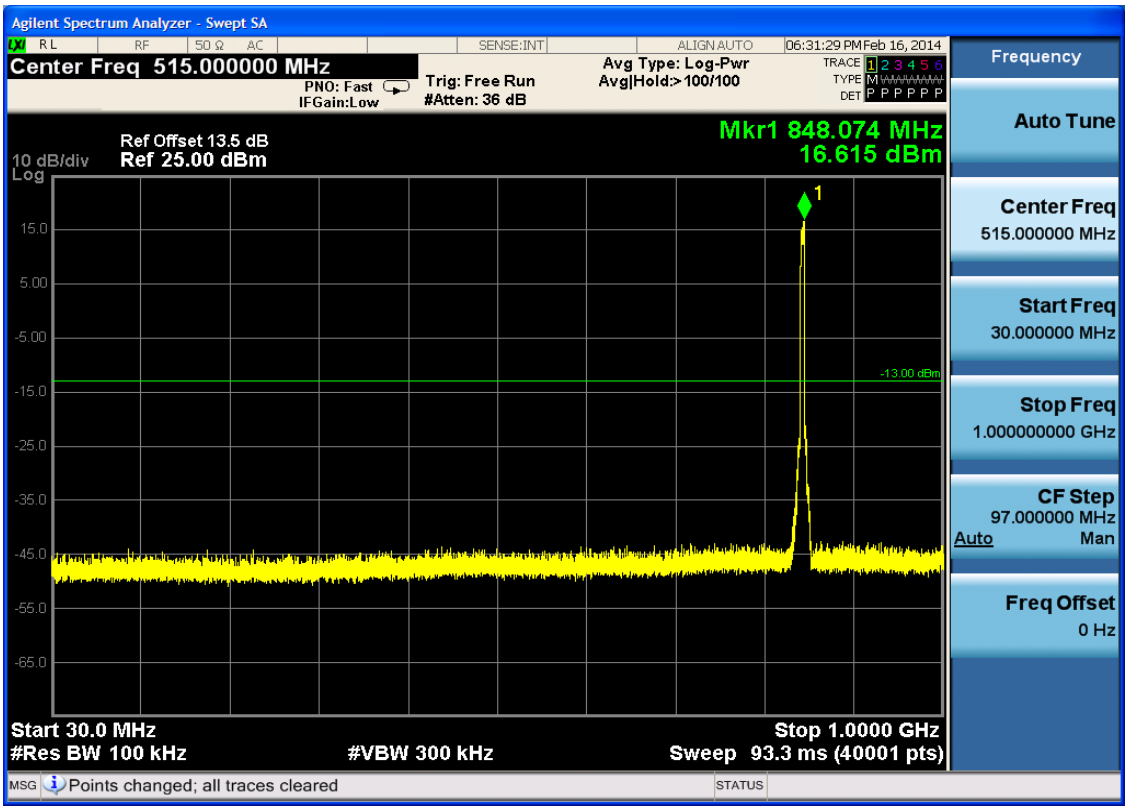

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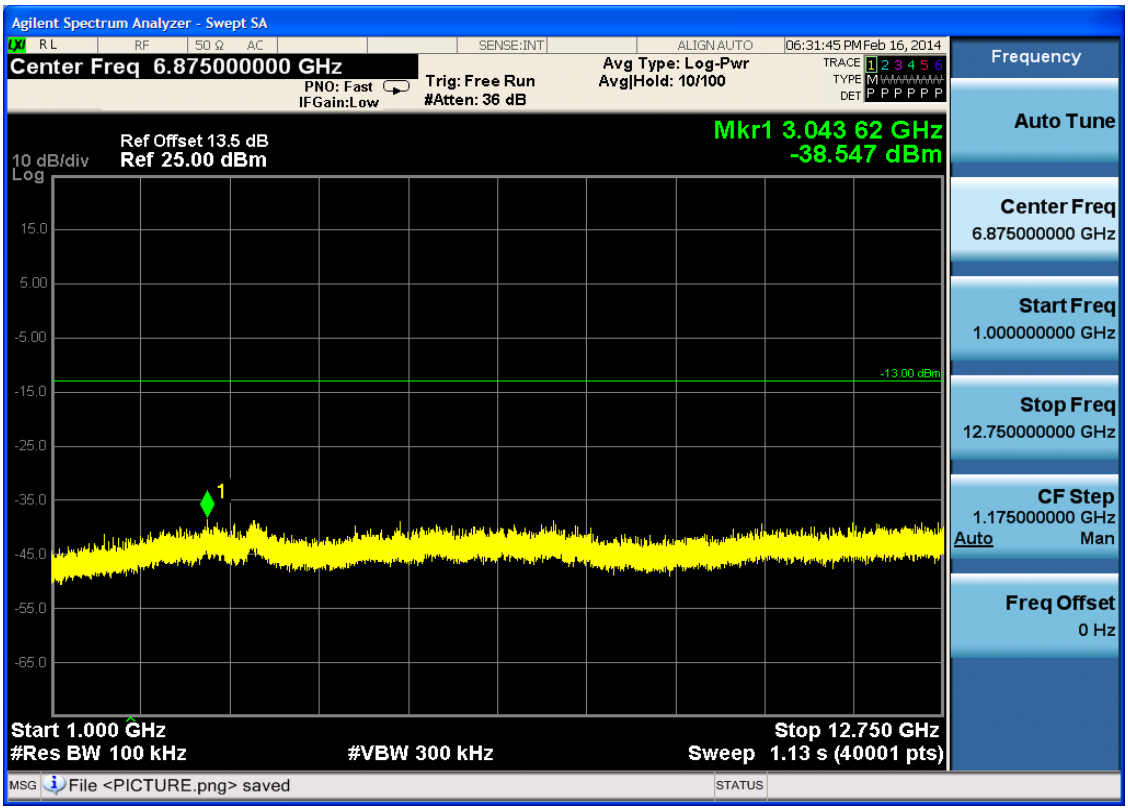

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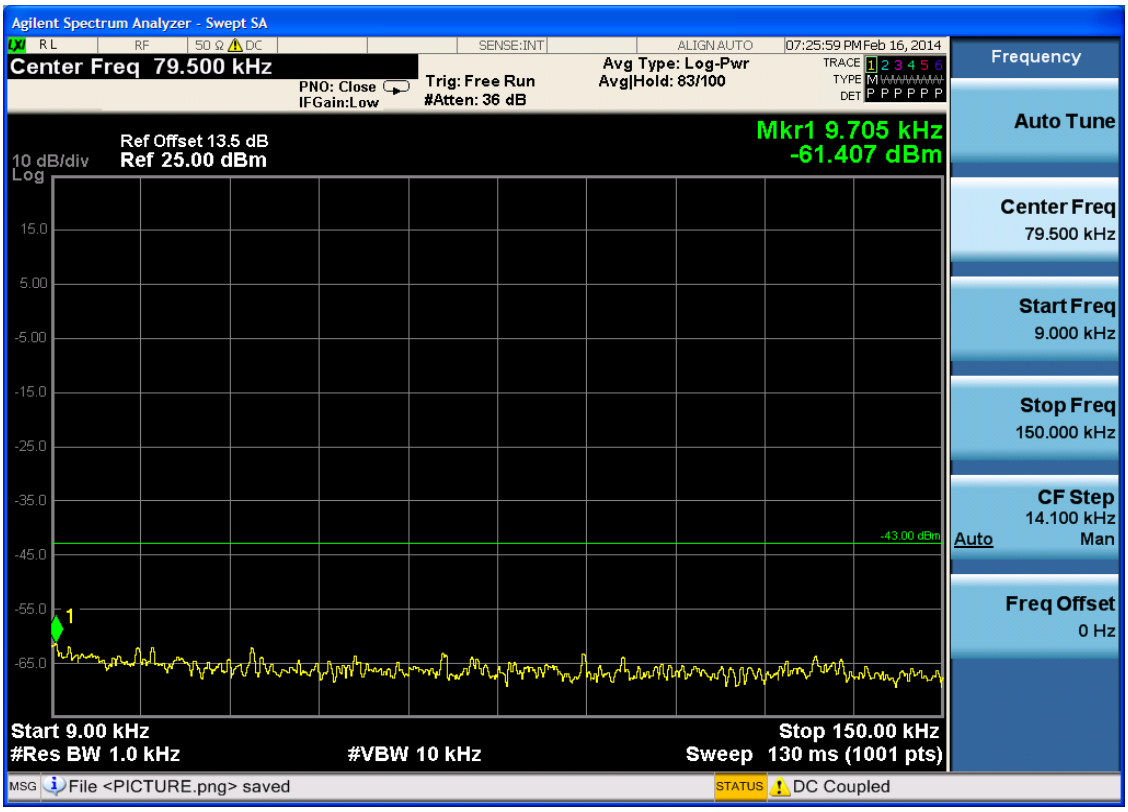
6.2.2 Test Band = WCDMA1900

6.2.2.1 Test Mode = UMTS/TM1

6.2.2.1.1 Test Channel = LCH



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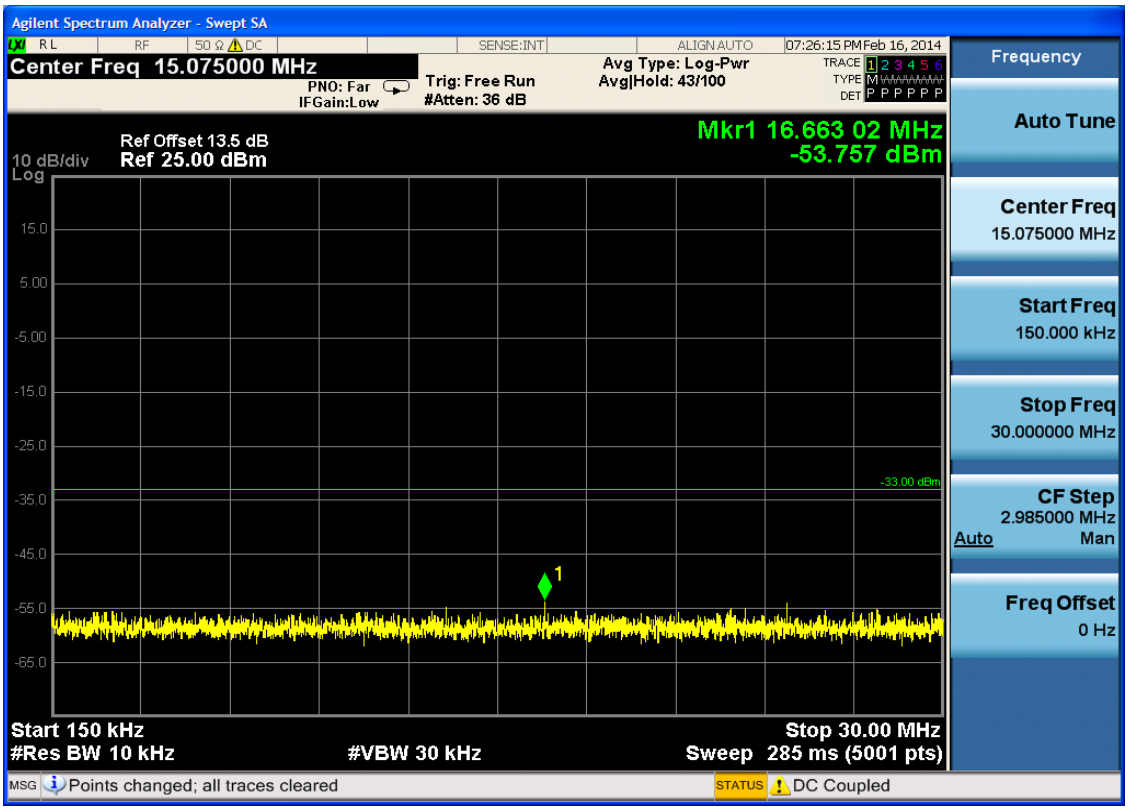

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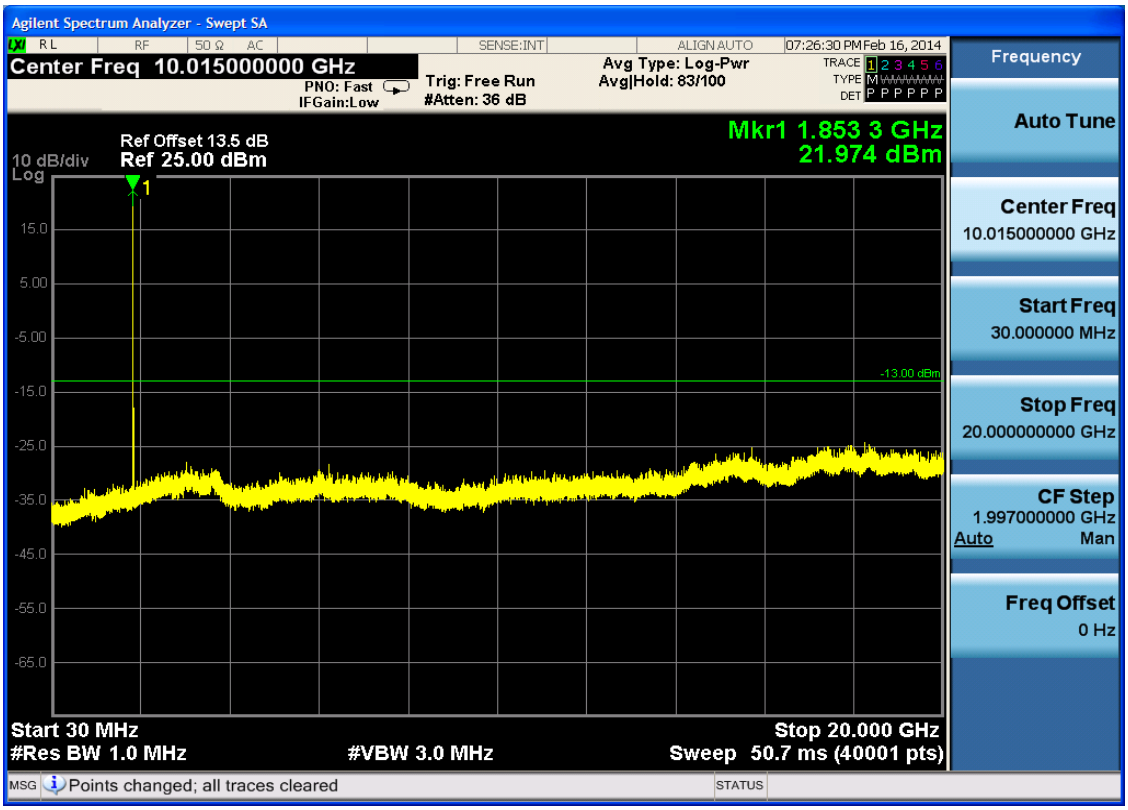

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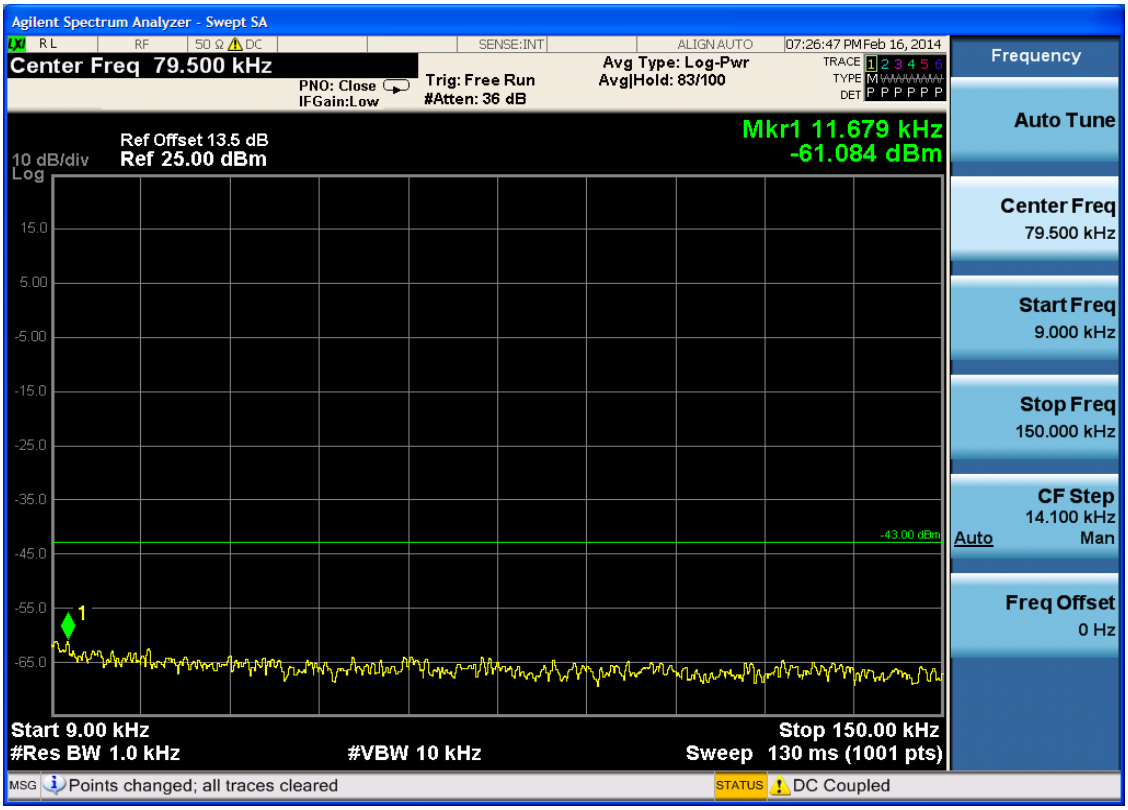
6.2.2.1.2 Test Channel = MCH



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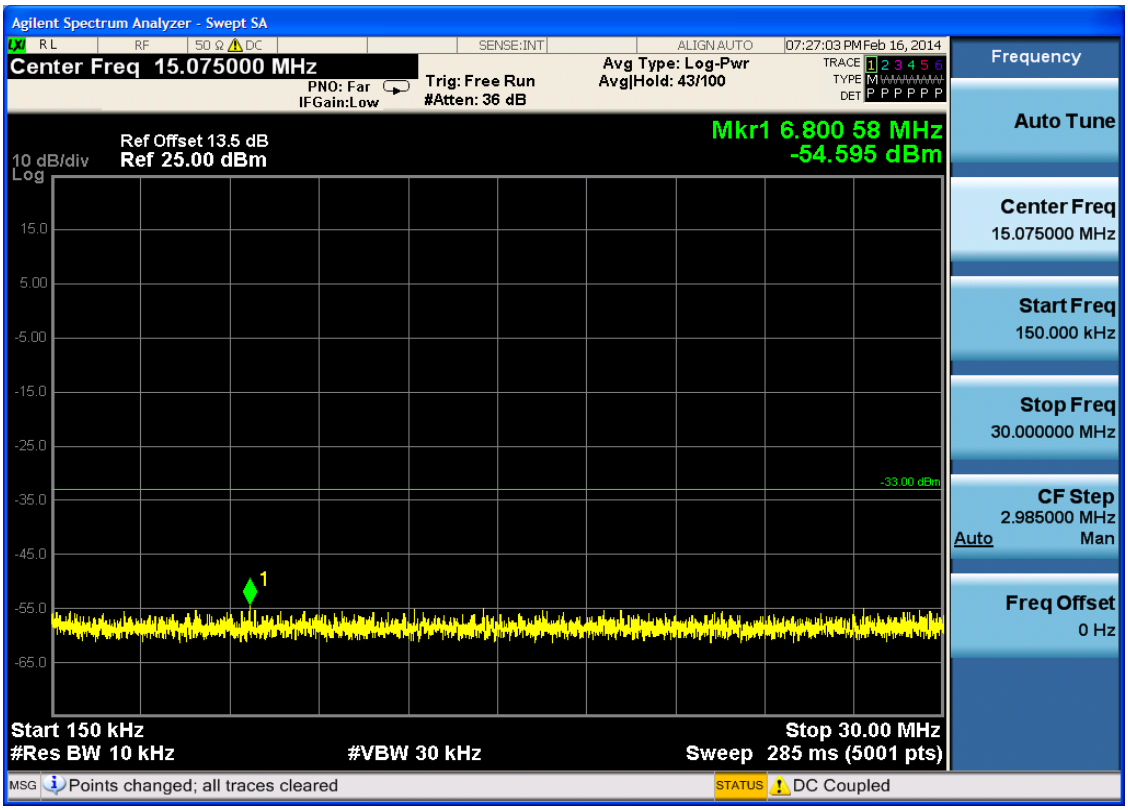

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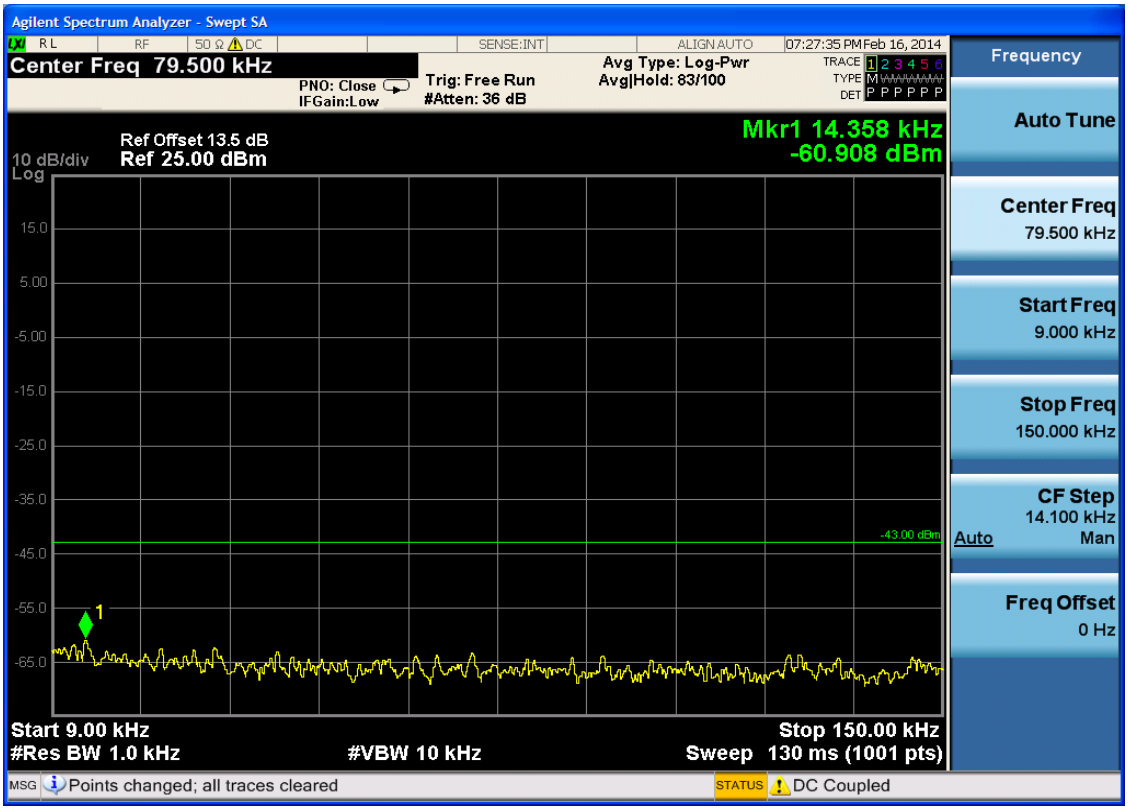
6.2.2.1.3 Test Channel = HCH



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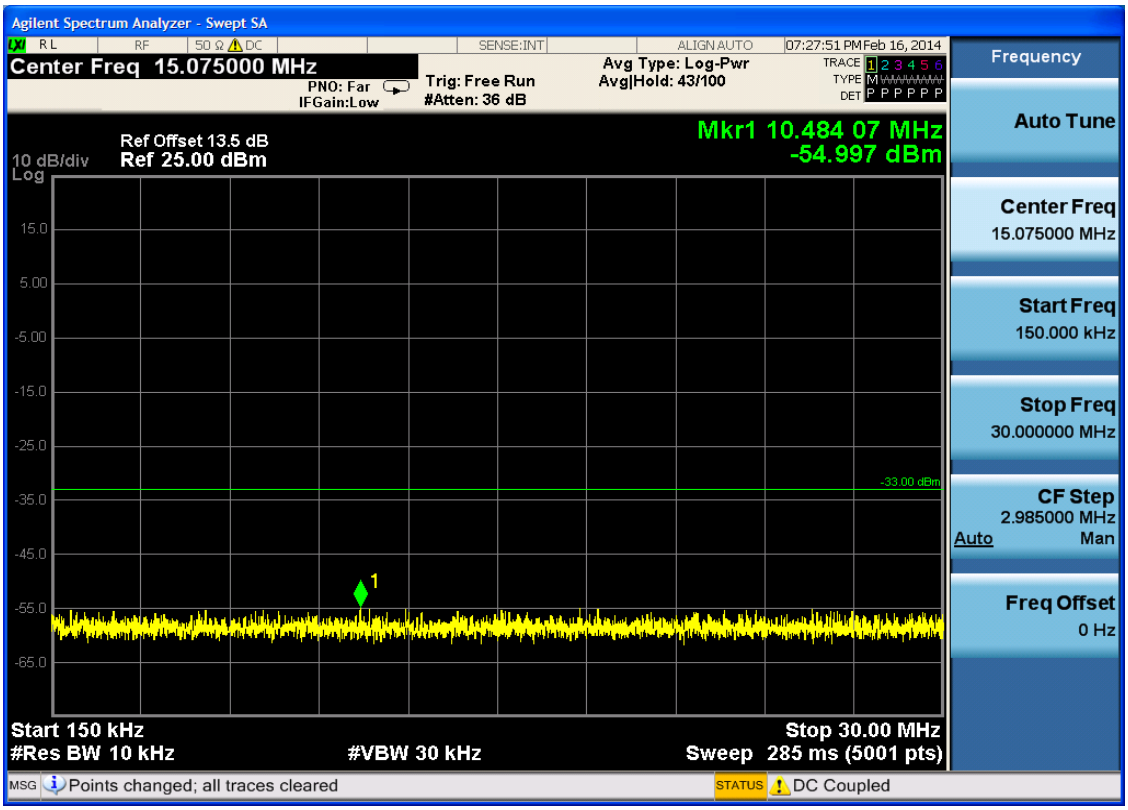

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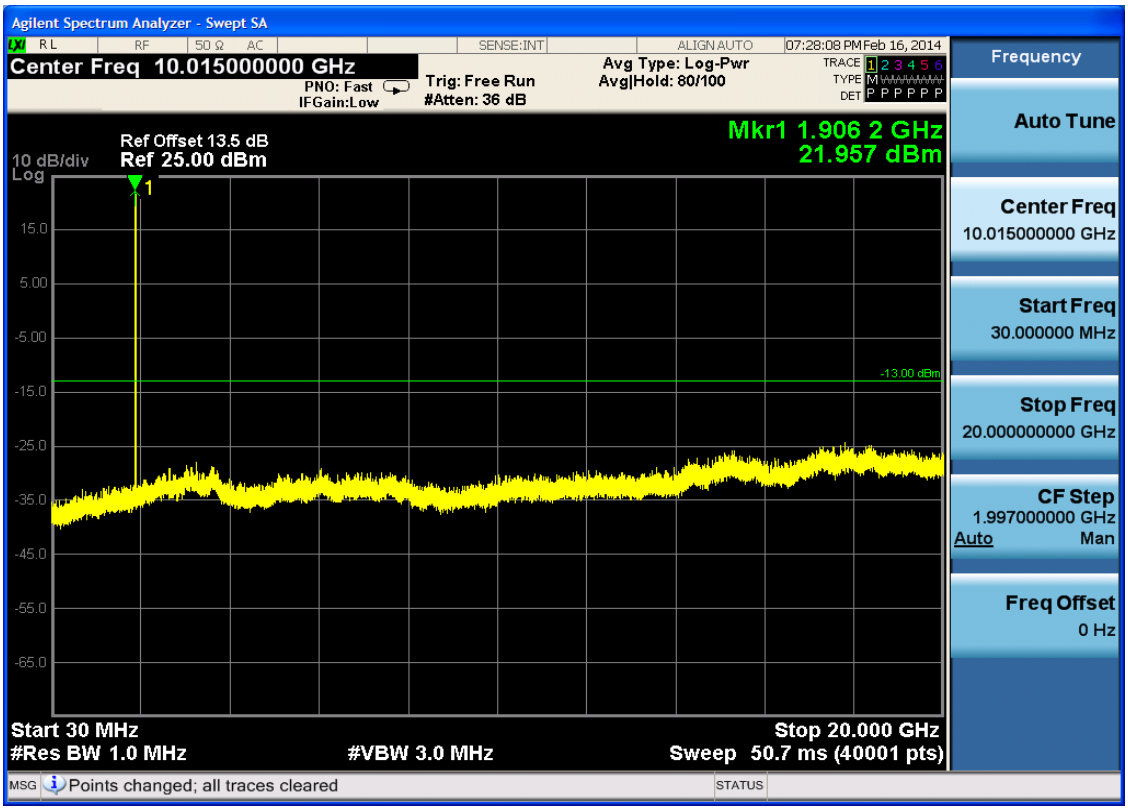

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7Appendix_G: Field Strength of Spurious Radiation

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

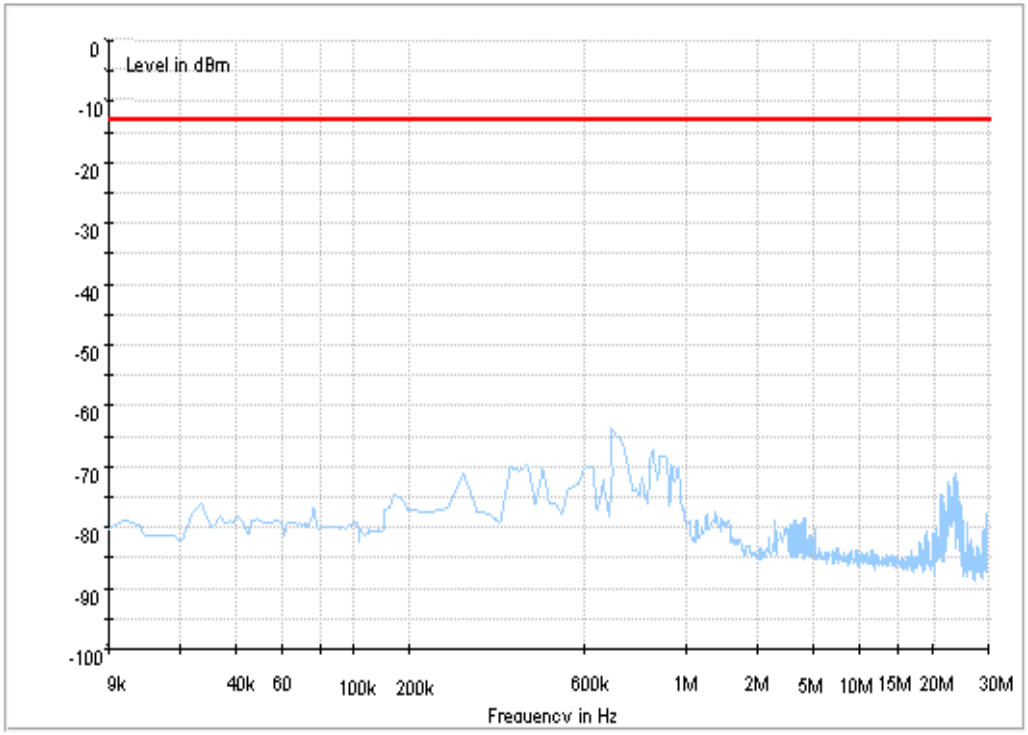
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

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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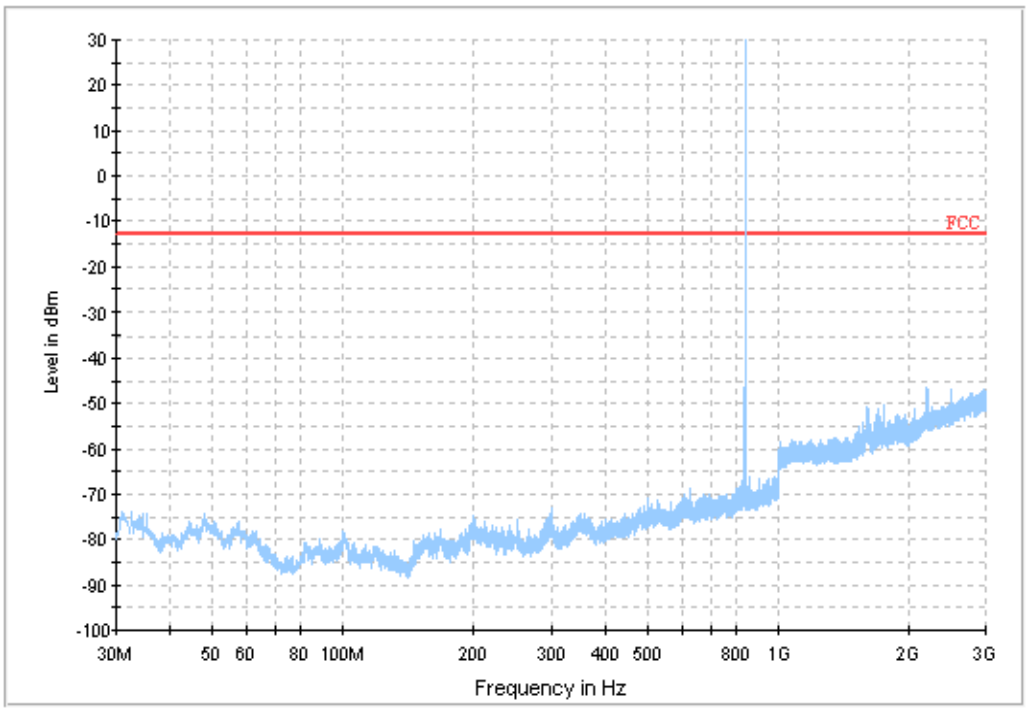
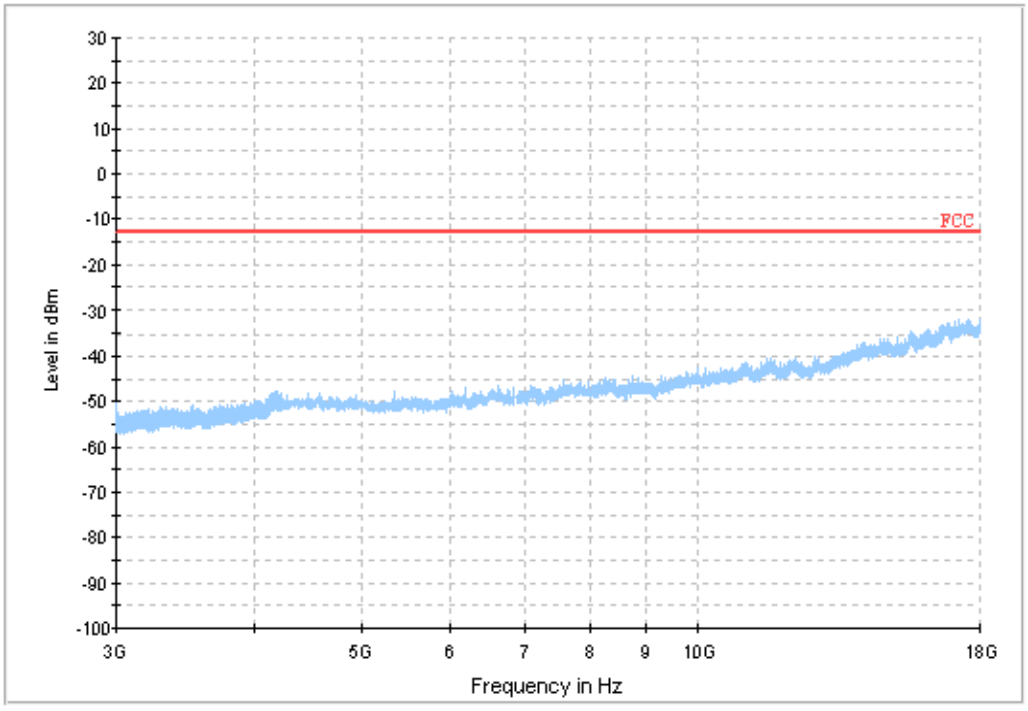
Copy of FCC PART22 GSM850_L



Copy of FCC PART22 GSM850_H



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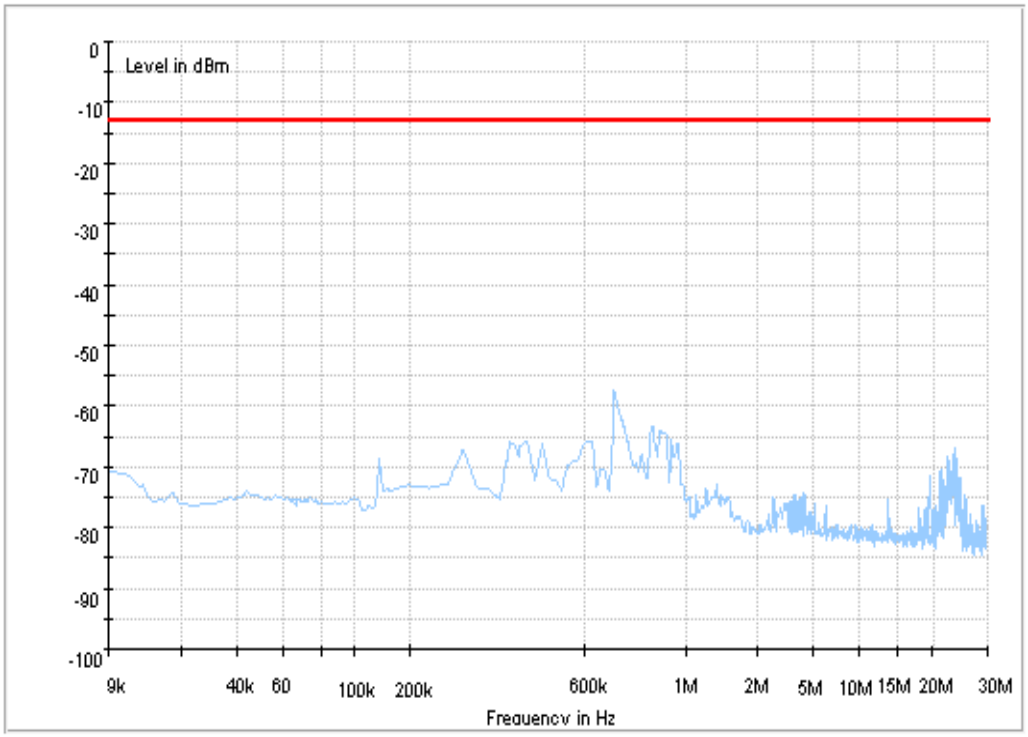
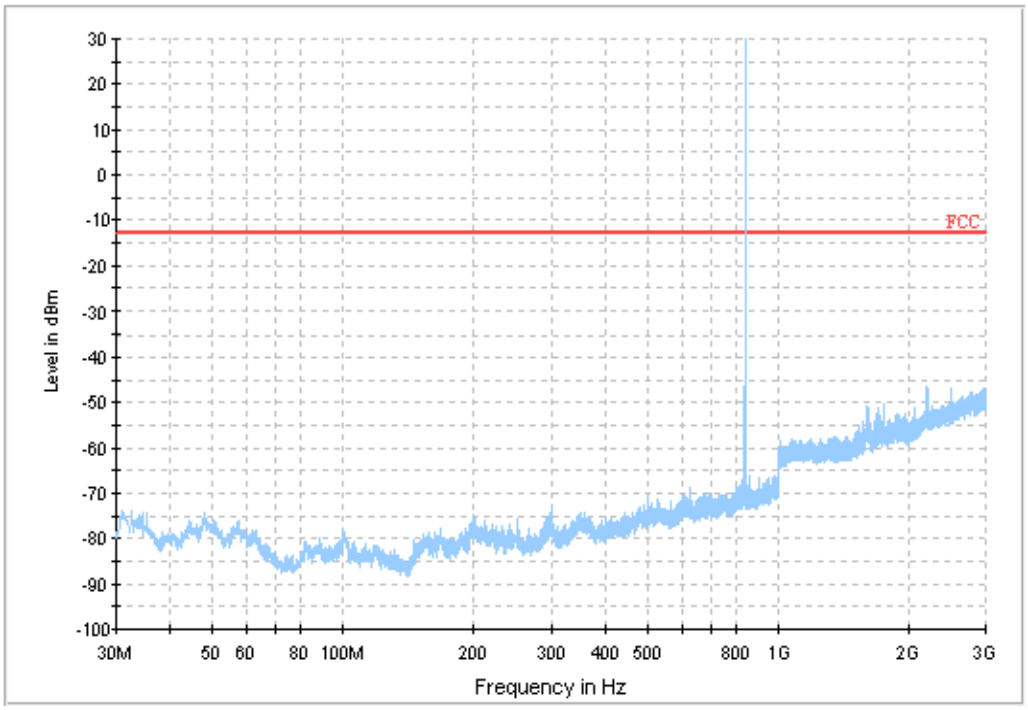
7.1.1.2 Test Mode = GSM/TM2



Copy of FCC PART22 GSM850_L



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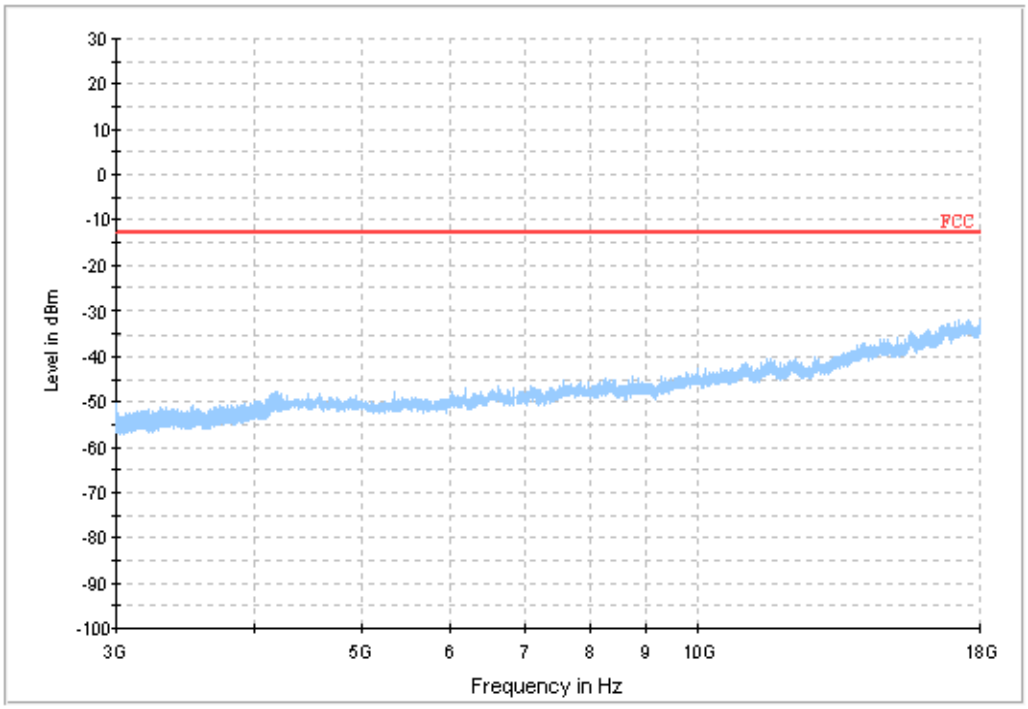

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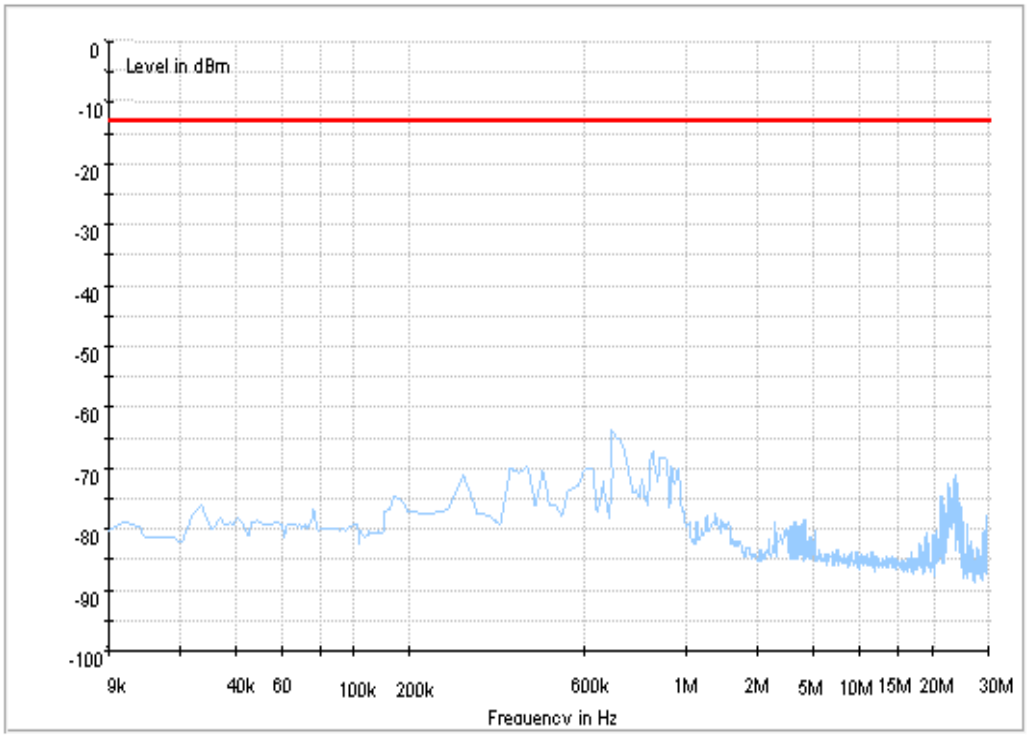
7.1.2 Test Band = GSM1900

7.1.2.1 Test Mode = GSM/TM1



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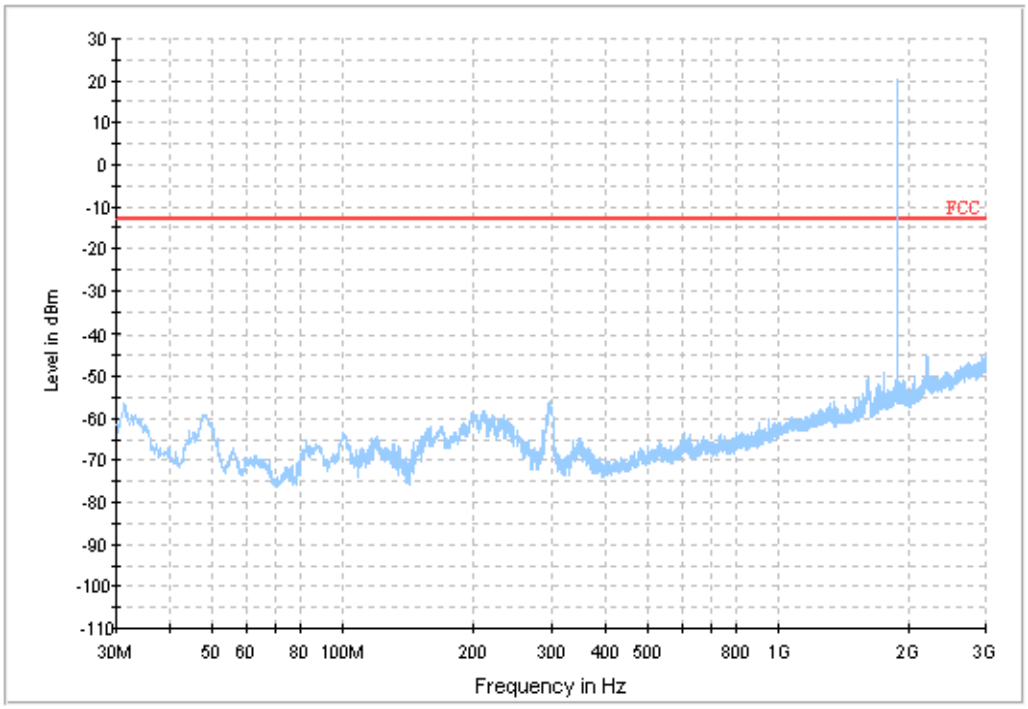
Copy of FCC PART24 GSM1900_L



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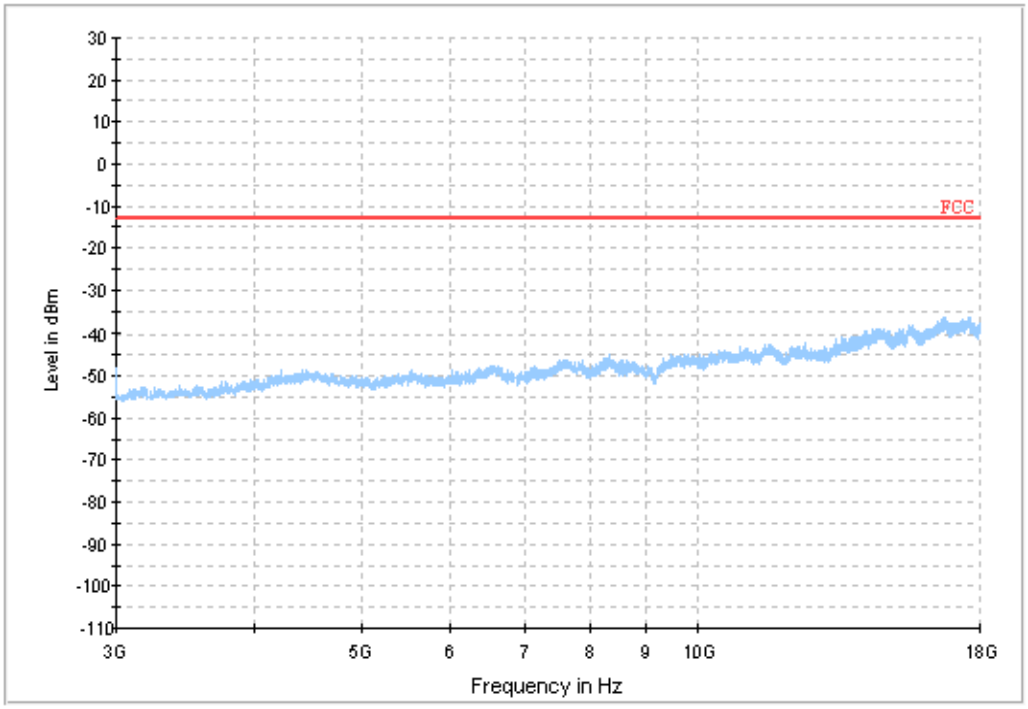

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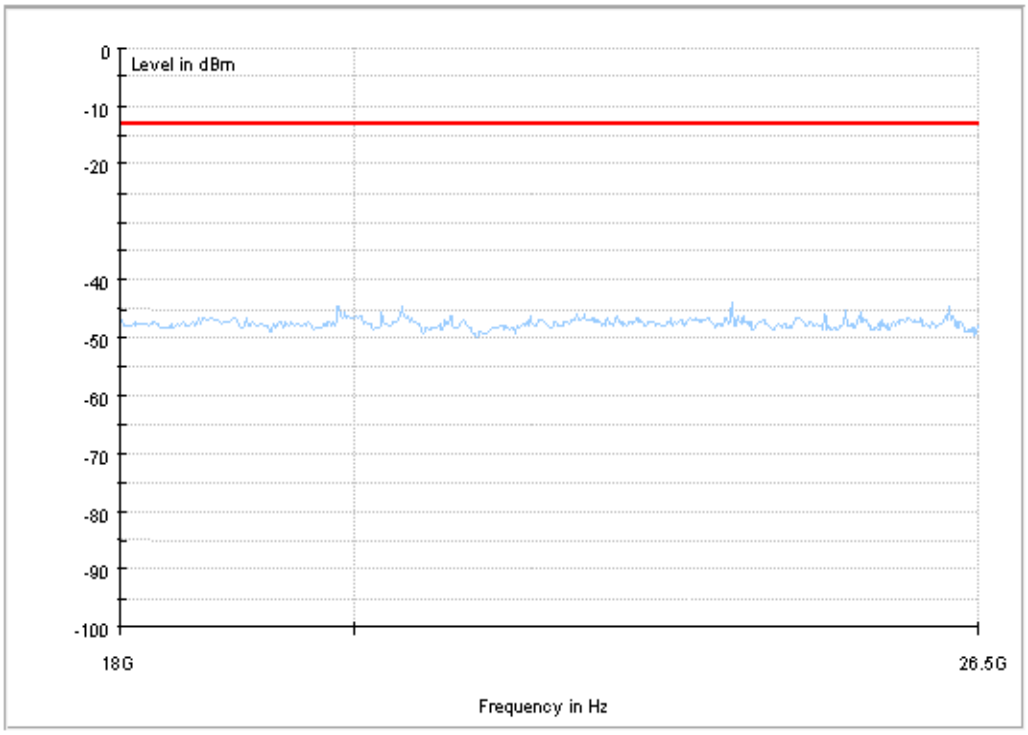
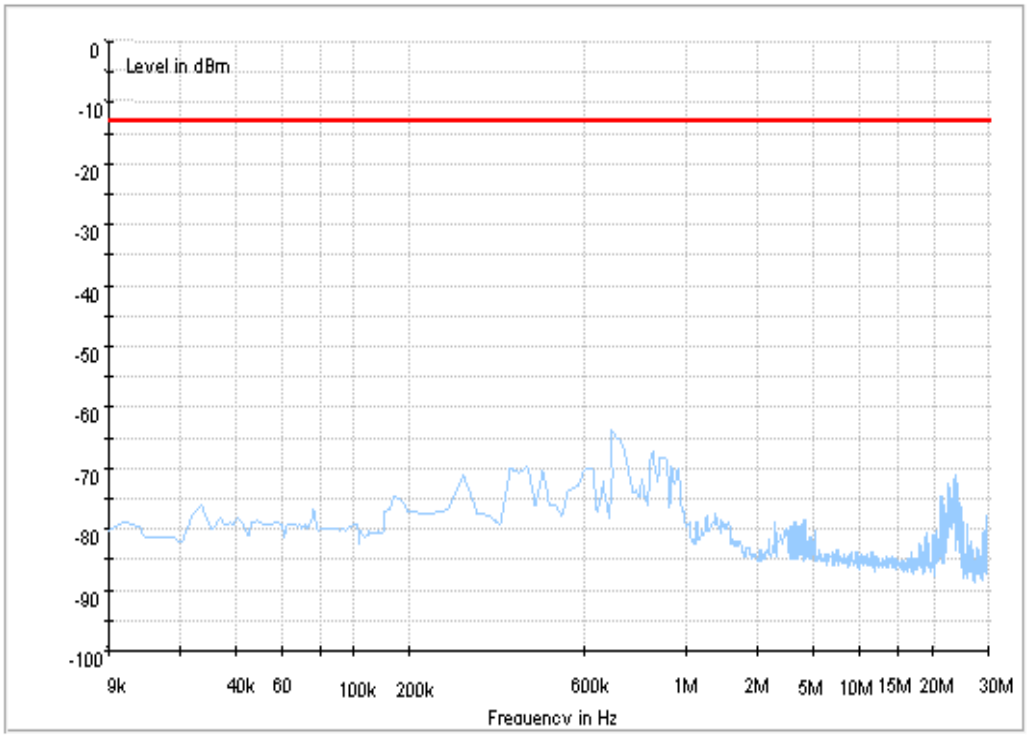


7.1.2.2 Test Mode = GSM/TM2



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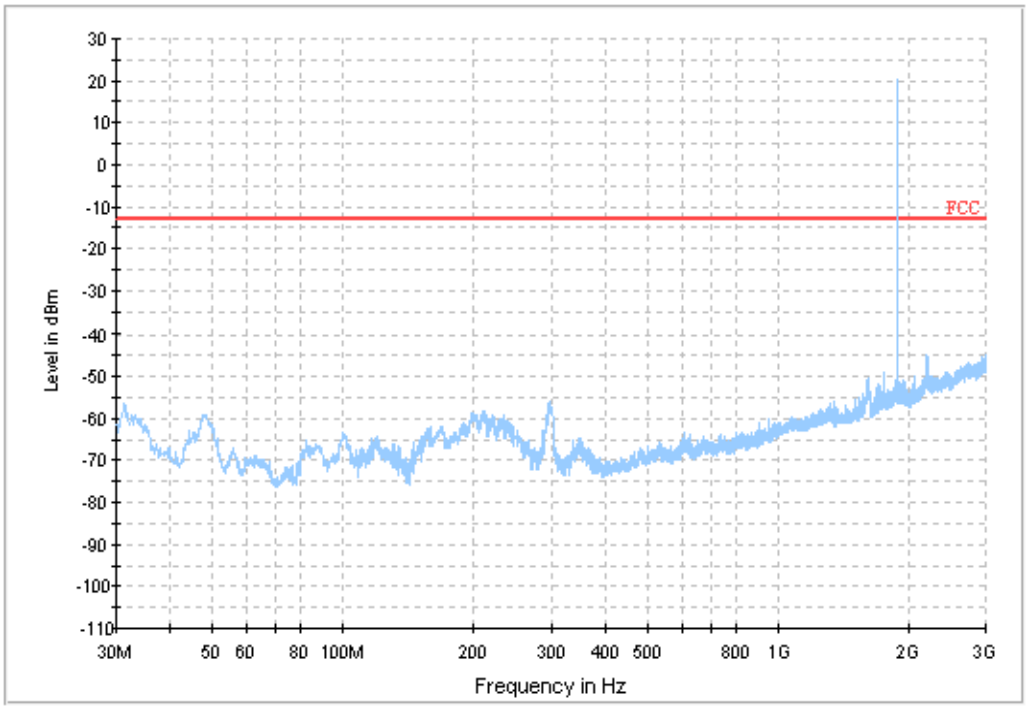

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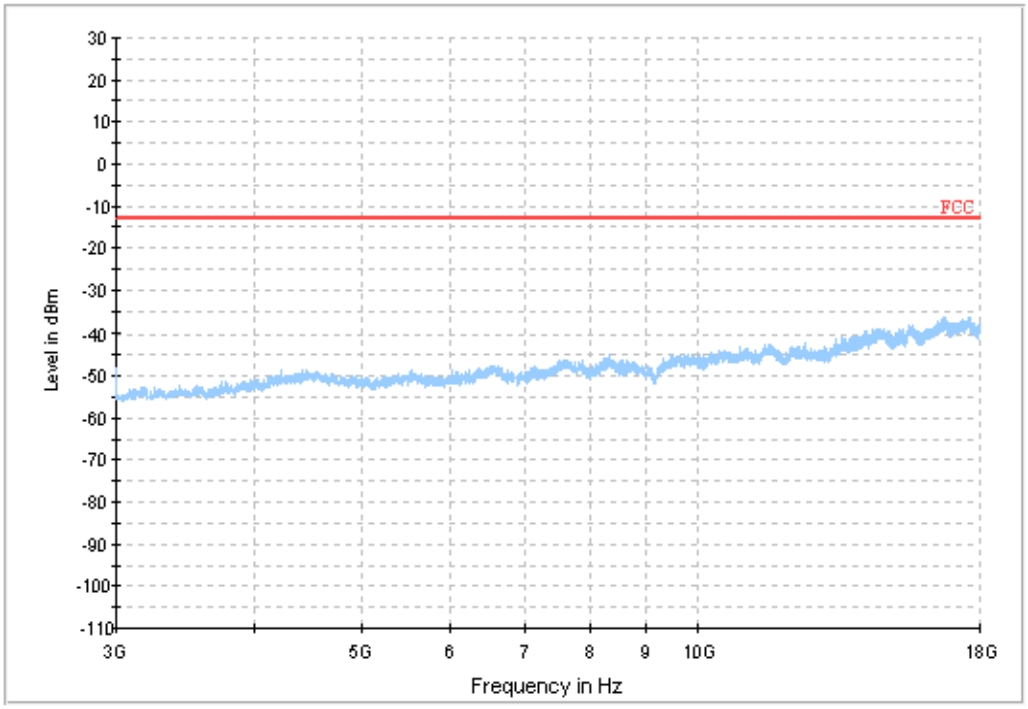

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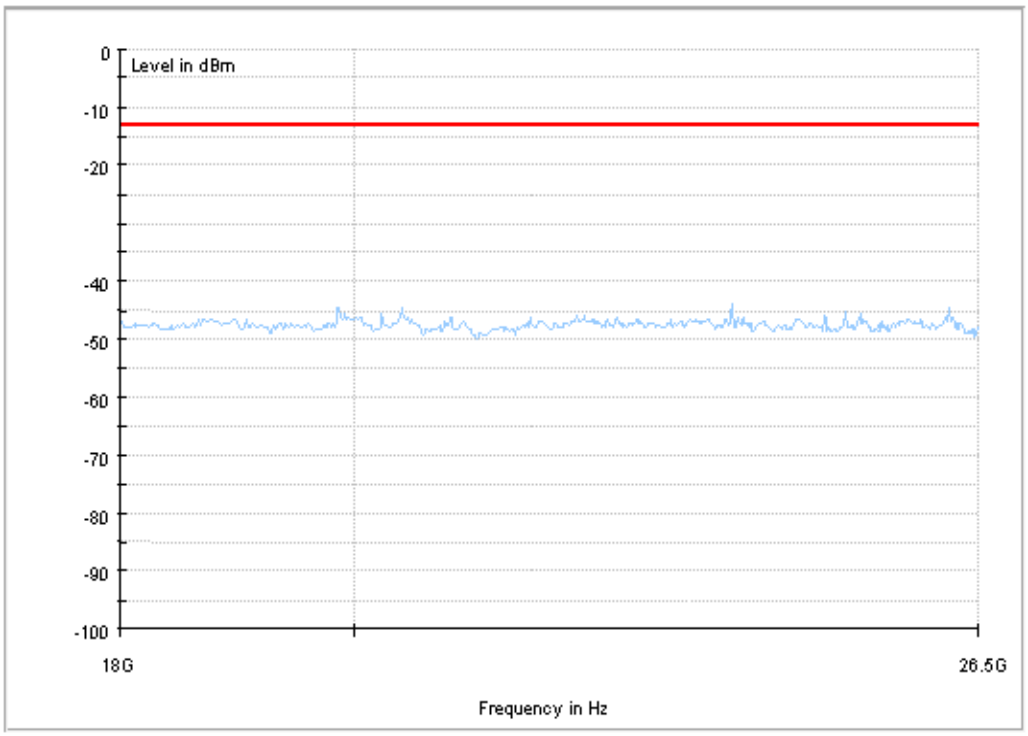

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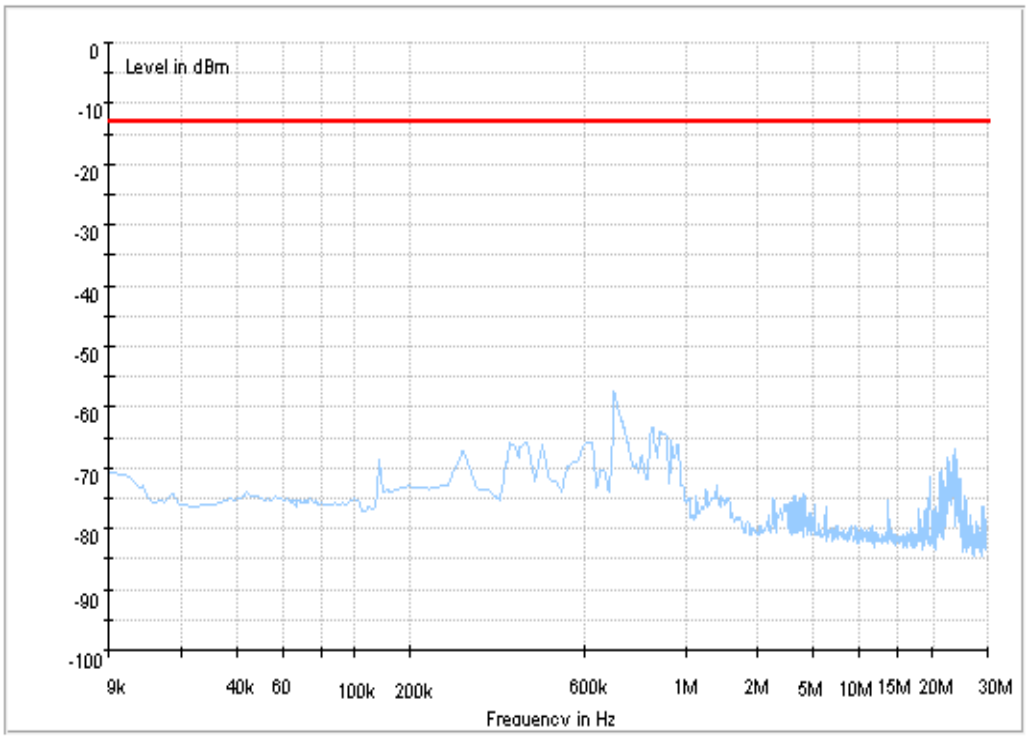
7.2 For UMTS

7.2.1 Test Band = WCDMA850

7.2.1.1 Test Mode = UMTS/TM1



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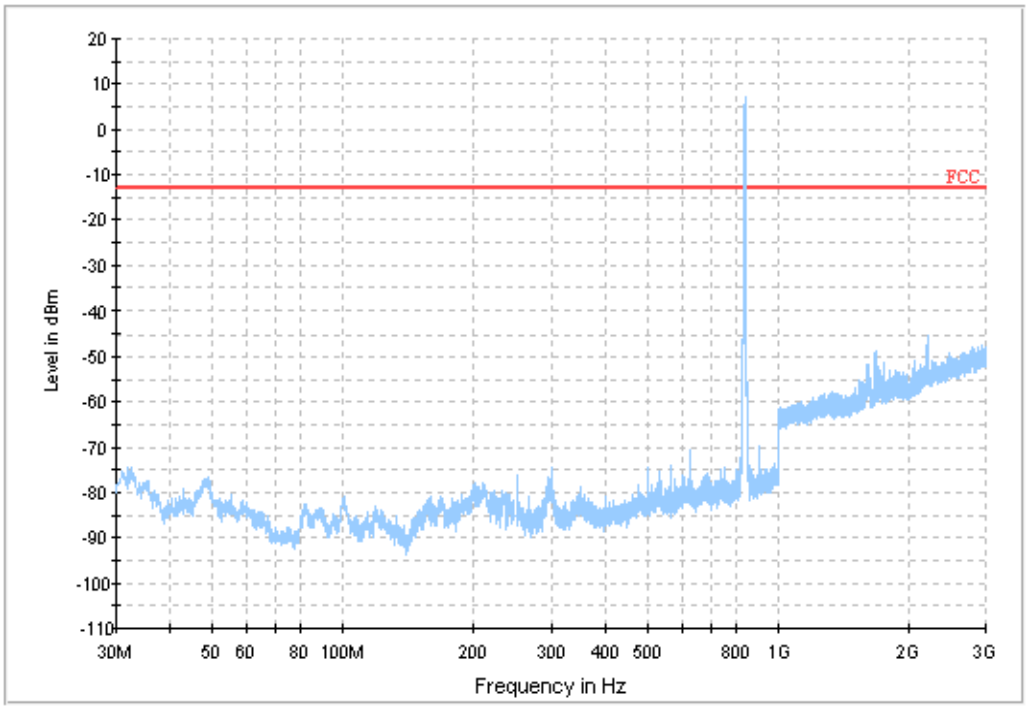
Copy of FCC PART22 WCDMA850_L



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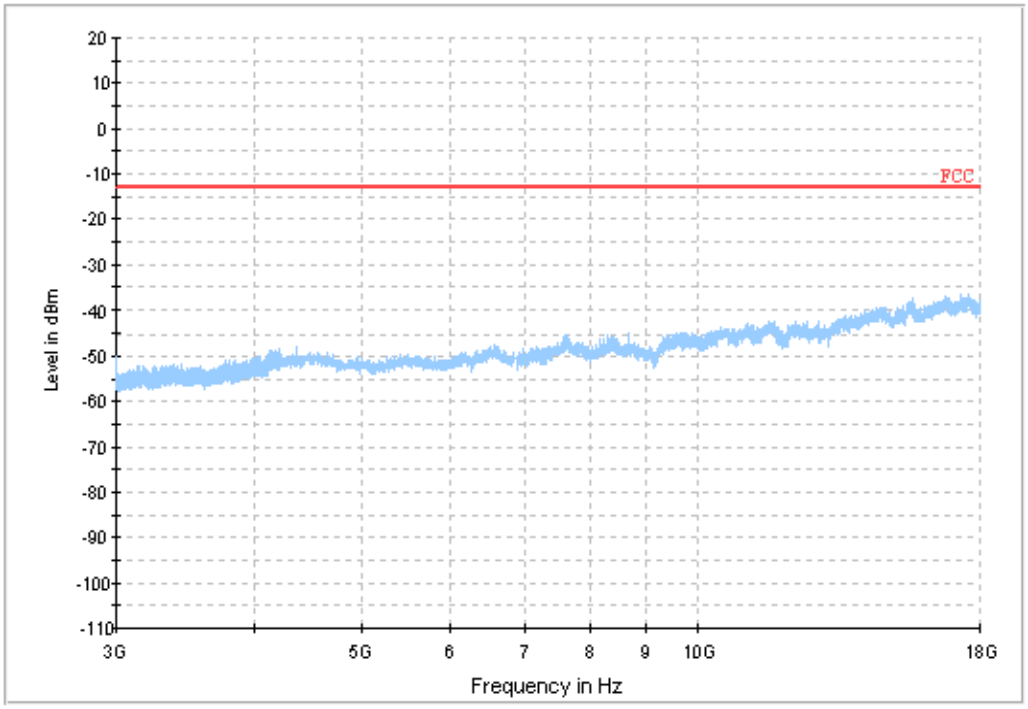

7.2.2 Test Band = WCDMA1900

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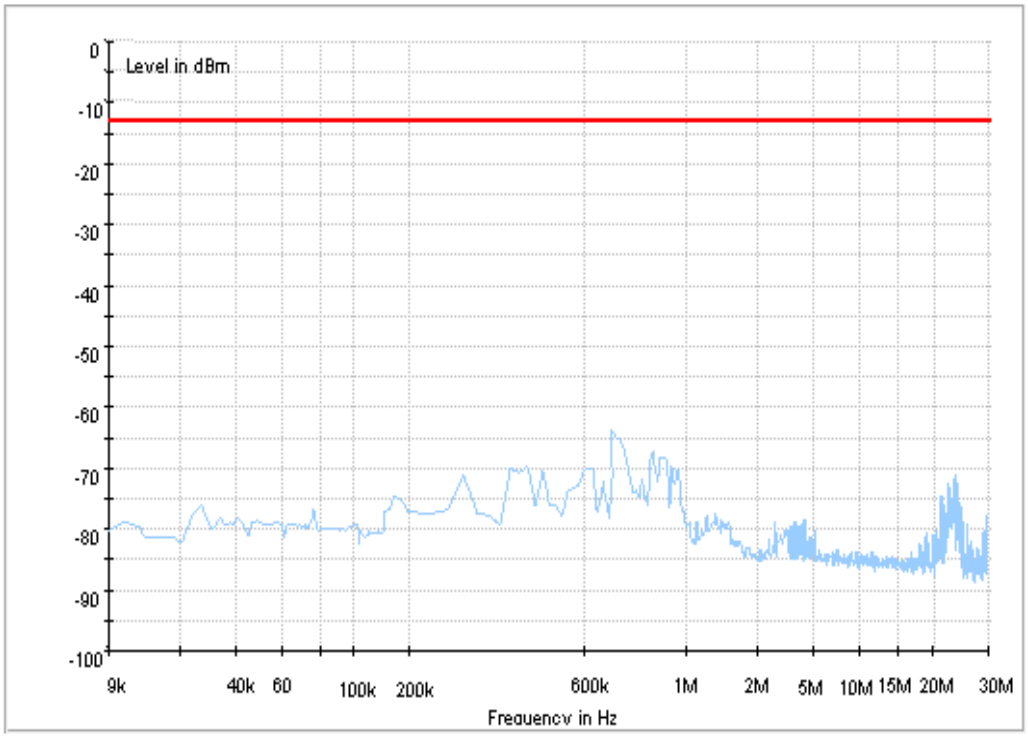
7.2.2.1 Test Mode = UMTS/TM1



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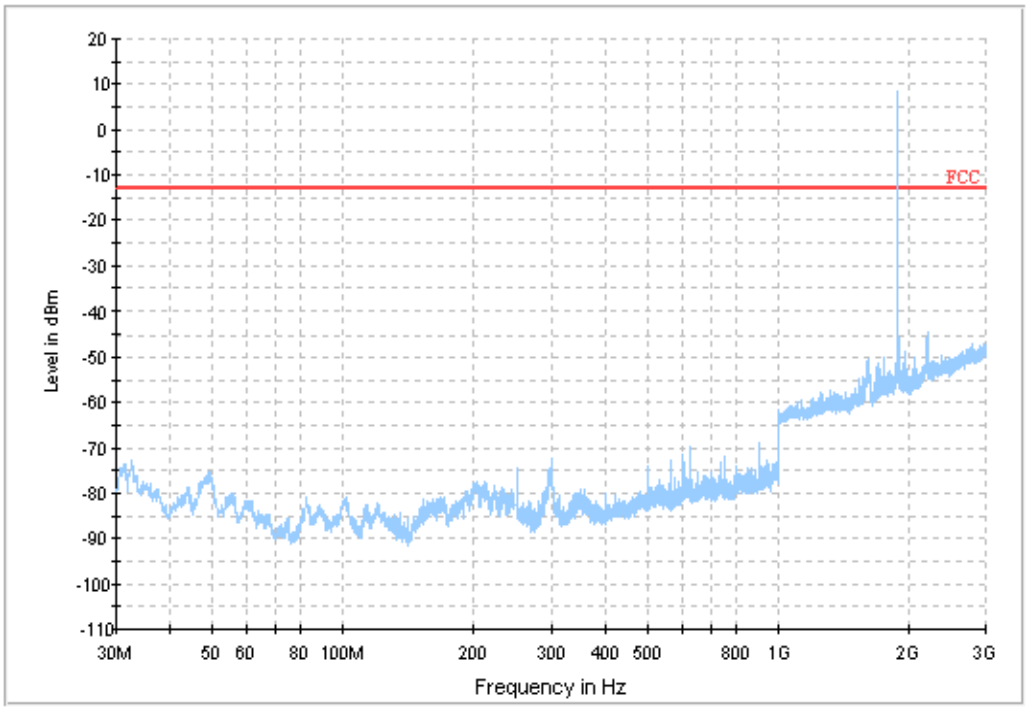

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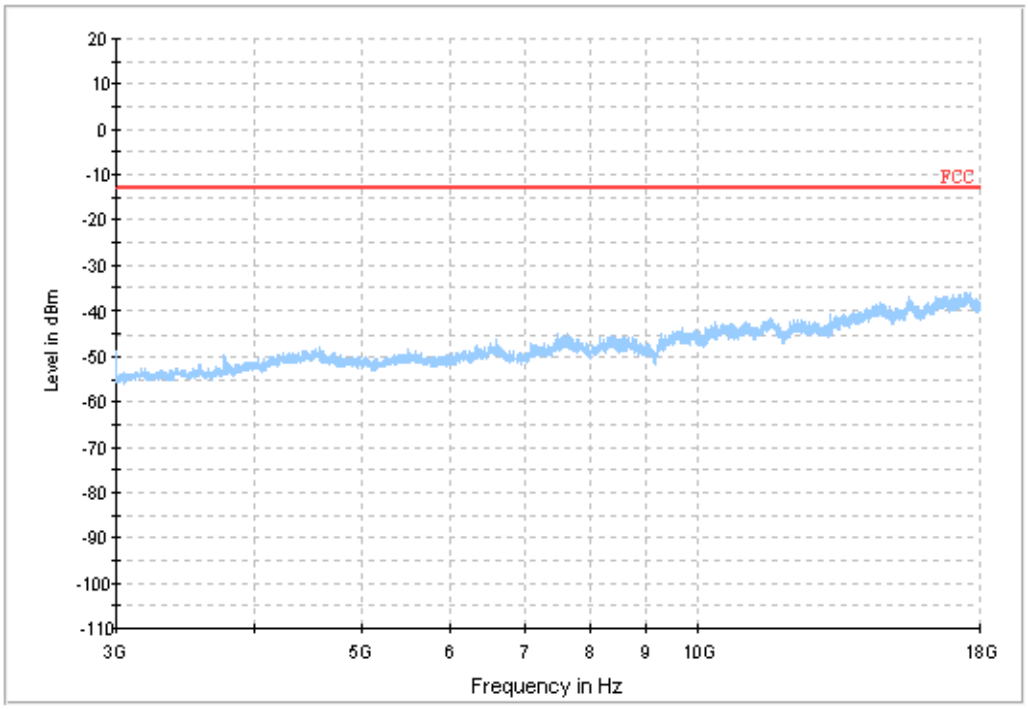

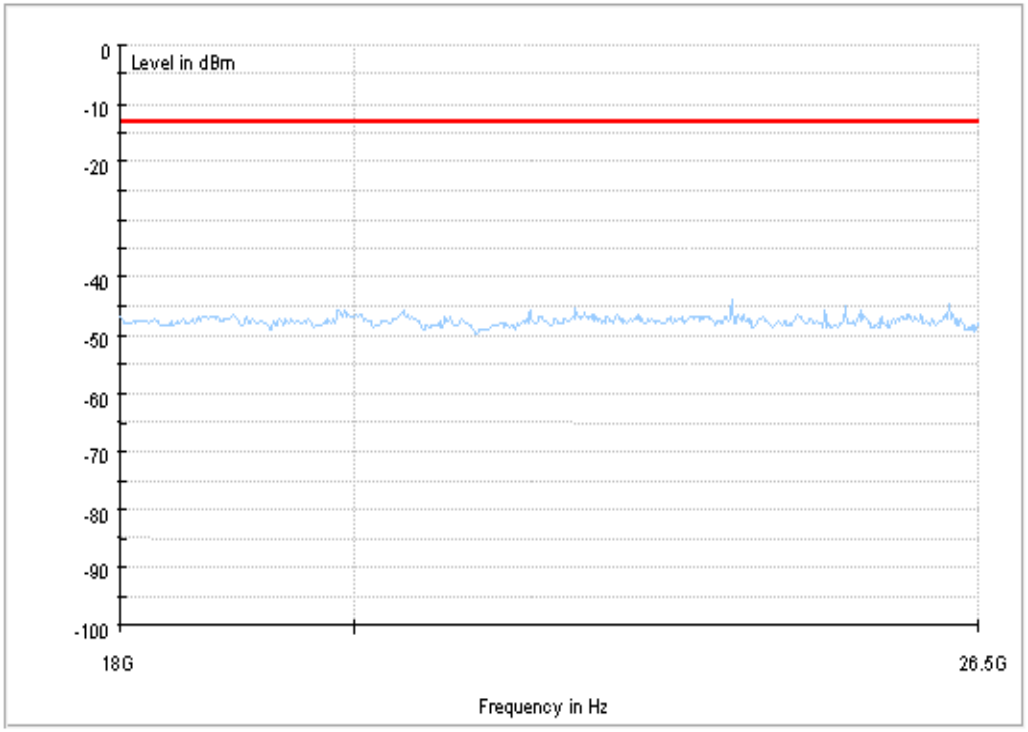

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8Appendix_H: Frequency Stability

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	-11.62	-0.0141	PASS
				VN	-12.59	-0.01528	PASS
				VH	-14.92	-0.0181	PASS
		MCH	TN	VL	-9.36	-0.01119	PASS
				VN	-8.33	-0.00996	PASS
				VH	-8.27	-0.00989	PASS
		HCH	TN	VL	-8.98	-0.01058	PASS
				VN	-12.66	-0.01492	PASS
				VH	-10.91	-0.01285	PASS
	GSM/TM2	LCH	TN	VL	-9.23	-0.0112	PASS
				VN	-6.26	-0.0076	PASS
				VH	-12.04	-0.01461	PASS
		MCH	TN	VL	-5.59	-0.00668	PASS
				VN	-3.81	-0.00455	PASS
				VH	-4.81	-0.00575	PASS
		HCH	TN	VL	-5.17	-0.00609	PASS
				VN	-1.71	-0.00201	PASS
				VH	-5.10	-0.00601	PASS
GSM1900	GSM/TM1	LCH	TN	VL	-4.13	-0.00223	PASS
				VN	7.36	0.00398	PASS
				VH	-0.52	-0.00028	PASS
		MCH	TN	VL	26.15	0.01391	PASS
				VN	25.05	0.01332	PASS
				VH	19.82	0.01054	PASS
		HCH	TN	VL	4.13	0.00216	PASS
				VN	12.98	0.0068	PASS
				VH	6.97	0.00365	PASS
	GSM/TM2	LCH	TN	VL	0.87	0.00047	PASS
				VN	-1.16	-0.00063	PASS
				VH	-17.14	-0.00926	PASS
		MCH	TN	VL	23.60	0.01255	PASS
				VN	20.05	0.01066	PASS

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Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VH	30.22	0.01607	PASS
		HCH	TN	VL	13.17	0.0069	PASS
				VN	7.81	0.00409	PASS
				VH	6.36	0.00333	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	-11.75	-0.01426	PASS
				-20	-17.50	-0.02123	PASS
				-10	-12.20	-0.0148	PASS
				0	-13.95	-0.01693	PASS
				10	-12.98	-0.01575	PASS
				20	-12.20	-0.0148	PASS
				30	-10.65	-0.01292	PASS
				40	-13.95	-0.01693	PASS
				50	-14.85	-0.01802	PASS
		MCH	VN	-30	-7.36	-0.0088	PASS
				-20	-8.46	-0.01011	PASS
				-10	-8.59	-0.01027	PASS
				0	-6.84	-0.00818	PASS
				10	-6.91	-0.00826	PASS
				20	-6.59	-0.00788	PASS
				30	-11.56	-0.01382	PASS
				40	-8.33	-0.00996	PASS
				50	-8.33	-0.00996	PASS
		HCH	VN	-30	-7.36	-0.00867	PASS
				-20	-6.97	-0.00821	PASS
				-10	-8.20	-0.00966	PASS
				0	-8.14	-0.00959	PASS
				10	-10.46	-0.01232	PASS
				20	-9.10	-0.01072	PASS
				30	-9.81	-0.01156	PASS
				40	-11.36	-0.01338	PASS
				50	-12.53	-0.01476	PASS
	GSM/TM2	LCH	VN	-30	-7.39	-0.00897	PASS
				-20	-14.24	-0.01728	PASS
				-10	-10.43	-0.01265	PASS
				0	-8.04	-0.00975	PASS

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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				10	-8.30	-0.01007	PASS
				20	-10.01	-0.01215	PASS
				30	-8.49	-0.0103	PASS
				40	-12.59	-0.01528	PASS
				50	-10.27	-0.01246	PASS
		MCH	VN	-30	-3.45	-0.00412	PASS
				-20	-4.55	-0.00544	PASS
				-10	-7.72	-0.00923	PASS
				0	-5.84	-0.00698	PASS
				10	-2.81	-0.00336	PASS
				20	-7.52	-0.00899	PASS
				30	-8.27	-0.00989	PASS
				40	-4.94	-0.0059	PASS
				50	-4.88	-0.00583	PASS
		HCH	VN	-30	-1.81	-0.00213	PASS
				-20	-2.10	-0.00247	PASS
				-10	-4.62	-0.00544	PASS
				0	-8.85	-0.01043	PASS
				10	-4.78	-0.00563	PASS
				20	-10.43	-0.01229	PASS
				30	-6.39	-0.00753	PASS
				40	-6.97	-0.00821	PASS
				50	-7.43	-0.00875	PASS
GSM1900	GSM/TM1	LCH	VN	-30	4.20	0.00227	PASS
				-20	-1.29	-0.0007	PASS
				-10	2.00	0.00108	PASS
				0	-0.77	-0.00042	PASS
				10	1.81	0.00098	PASS
				20	2.84	0.00153	PASS
				30	6.01	0.00325	PASS
				40	3.10	0.00168	PASS
				50	-0.84	-0.00045	PASS
		MCH	VN	-30	21.76	0.01157	PASS
				-20	23.76	0.01264	PASS
				-10	29.83	0.01587	PASS
				0	26.09	0.01388	PASS
				10	24.86	0.01322	PASS
				20	28.02	0.0149	PASS
				30	22.08	0.01174	PASS
				40	26.67	0.01419	PASS

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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				50	18.85	0.01003	PASS
		HCH	VN	-30	11.56	0.00605	PASS
				-20	8.01	0.00419	PASS
				-10	11.17	0.00585	PASS
				0	16.40	0.00859	PASS
				10	16.34	0.00856	PASS
				20	10.46	0.00548	PASS
				30	10.59	0.00555	PASS
				40	13.56	0.0071	PASS
				50	10.72	0.00561	PASS
	GSM/TM2	LCH	VN	-30	4.42	0.00239	PASS
				-20	-8.72	-0.00471	PASS
				-10	0.26	0.00014	PASS
				0	0.94	0.00051	PASS
				10	-6.91	-0.00373	PASS
				20	-2.65	-0.00143	PASS
				30	5.65	0.00305	PASS
				40	-10.69	-0.00578	PASS
				50	3.45	0.00186	PASS
		MCH	VN	-30	15.30	0.00814	PASS
				-20	25.76	0.0137	PASS
				-10	17.82	0.00948	PASS
				0	25.41	0.01352	PASS
				10	26.51	0.0141	PASS
				20	20.60	0.01096	PASS
				30	31.35	0.01668	PASS
				40	24.73	0.01315	PASS
				50	29.96	0.01594	PASS
		HCH	VN	-30	-2.10	-0.0011	PASS
				-20	16.82	0.00881	PASS
				-10	1.36	0.00071	PASS
				0	2.03	0.00106	PASS
				10	10.14	0.00531	PASS
				20	15.66	0.0082	PASS
				30	5.36	0.00281	PASS
				40	14.53	0.00761	PASS
				50	11.30	0.00592	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	0.11	0.00013	PASS
				VN	-12.60	-0.01525	PASS
				VH	-3.91	-0.00473	PASS
		MCH	TN	VL	0.90	0.00108	PASS
				VN	2.41	0.00288	PASS
				VH	-6.06	-0.00725	PASS
		HCH	TN	VL	3.08	0.00364	PASS
				VN	-3.04	-0.00359	PASS
				VH	-5.51	-0.00651	PASS
WCDMA1900	UMTS/TM1	LCH	TN	VL	5.60	0.00302	PASS
				VN	6.07	0.00328	PASS
				VH	-7.17	-0.00387	PASS
		MCH	TN	VL	5.83	0.0031	PASS
				VN	2.73	0.00145	PASS
				VH	-3.91	-0.00208	PASS
		HCH	TN	VL	8.03	0.00421	PASS
				VN	-2.04	-0.00107	PASS
				VH	9.00	0.00472	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	0.87	0.00105	PASS
				-20	-1.95	-0.00236	PASS
				-10	-0.15	-0.00018	PASS
				0	-9.45	-0.01144	PASS
				10	1.85	0.00224	PASS
				20	0.87	0.00105	PASS
				30	-0.56	-0.00068	PASS
				40	-3.97	-0.0048	PASS
				50	-5.46	-0.00661	PASS
		MCH	VN	-30	0.38	0.00045	PASS
				-20	-8.90	-0.01064	PASS
				-10	-2.81	-0.00336	PASS
				0	-6.74	-0.00806	PASS
				10	-0.73	-0.00087	PASS
				20	0.12	0.00014	PASS
				30	-9.35	-0.01118	PASS
				40	-0.49	-0.00059	PASS
				50	-6.04	-0.00722	PASS
		HCH	VN	-30	-9.26	-0.01094	PASS
				-20	-1.79	-0.00211	PASS
				-10	-9.31	-0.011	PASS
				0	-6.33	-0.00748	PASS
				10	0.35	0.00041	PASS
				20	-10.51	-0.01241	PASS
				30	-8.41	-0.00993	PASS
				40	5.25	0.0062	PASS
				50	7.08	0.00836	PASS
WCDMA1900	UMTS/TM1	LCH	VN	-30	1.25	0.00067	PASS
				-20	5.66	0.00306	PASS
				-10	3.37	0.00182	PASS
				0	4.78	0.00258	PASS
				10	-3.17	-0.00171	PASS
				20	5.45	0.00294	PASS
				30	-6.52	-0.00352	PASS
				40	3.31	0.00179	PASS
				50	-3.13	-0.00169	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	4.44	0.00236	PASS
				-20	2.21	0.00118	PASS
				-10	2.90	0.00154	PASS
				0	1.42	0.00076	PASS
				10	-6.21	-0.0033	PASS
				20	-7.63	-0.00406	PASS
				30	5.81	0.00309	PASS
				40	3.92	0.00209	PASS
				50	-3.77	-0.00201	PASS
		HCH	VN	-30	7.25	0.0038	PASS
				-20	1.07	0.00056	PASS
				-10	3.04	0.00159	PASS
				0	5.95	0.00312	PASS
				10	-0.55	-0.00029	PASS
				20	1.28	0.00067	PASS
				30	-1.54	-0.00081	PASS
				40	7.23	0.00379	PASS
				50	1.22	0.00064	PASS

END

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