



Appendix for test report

1Appendix_A: Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

Test Band	Test Mode	Test Channel	Conducte d Power [dBm]	ERP [dBm]	Limit [dBm]	Verdict
WCDMA850	UMTS/TM1	LCH	23.79	18.80	38.5	PASS
		MCH	23.63	18.83	38.5	PASS
		HCH	23.57	18.77	38.5	PASS

Test Band	Test Mode	Test Channel	Conducte d Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
WCDMA1700	UMTS/TM1	LCH	23.34	23.76	30	PASS
		MCH	23.31	23.93	30	PASS
		HCH	23.26	23.90	30	PASS
WCDMA1900	UMTS/TM1	LCH	23.44	24.61	33	PASS
		MCH	23.33	24.70	33	PASS
		HCH	23.44	24.89	33	PASS

Note1:

a, For getting the ERP (Efficient Radiated Power) or EIRP (Efficient Isotropic Radiated Power) in substitution method, the following formula should be taken to calculate it,

$$\text{ERP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBd]}$$

$$\text{EIRP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBi]}$$

b, SGP=Signal Generator Level

Note2:

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

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

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

SET Sweep time=auto-couple.

Detector:RMS

2Appendix_B: Peak-to-Average Ratio

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA850	UMTS/TM1	LCH	2.88	13	PASS
		MCH	2.53	13	PASS
		HCH	2.66	13	PASS
WCDMA1700	UMTS/TM1	LCH	3.18	13	PASS
		MCH	2.83	13	PASS
		HCH	3.21	13	PASS
WCDMA1900	UMTS/TM1	LCH	2.46	13	PASS
		MCH	2.70	13	PASS
		HCH	2.83	13	PASS

3Appendix_C: Modulation Characteristics

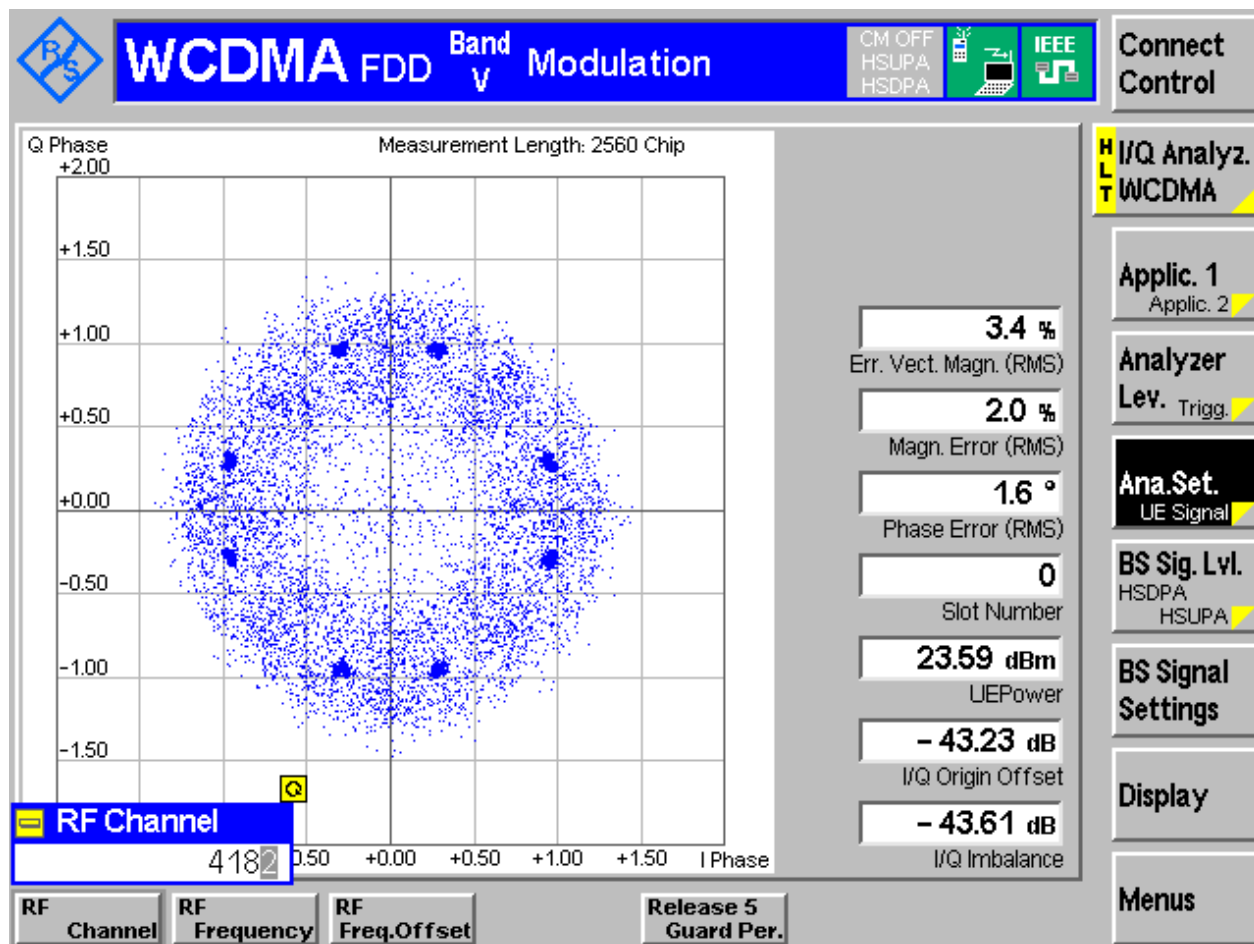
Part I - Test Plots

3.1 For UMTS

3.1.1 Test Band = WCDMA850

3.1.1.1 Test Mode = UMTS/TM1

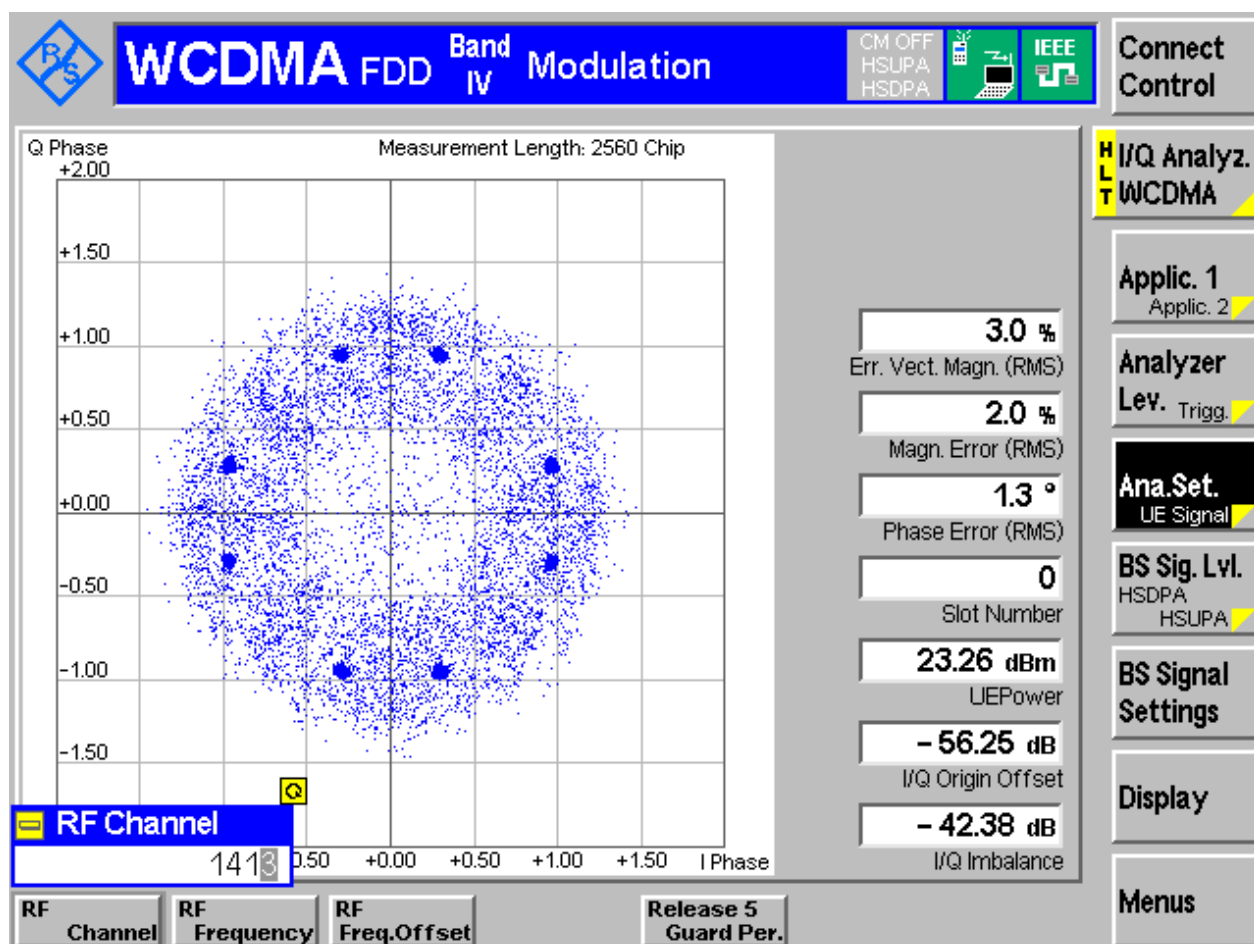
3.1.1.1.1 Test Channel = MCH



3.1.2 Test Band = WCDMA1700

3.1.2.1 Test Mode = UMTS/TM1

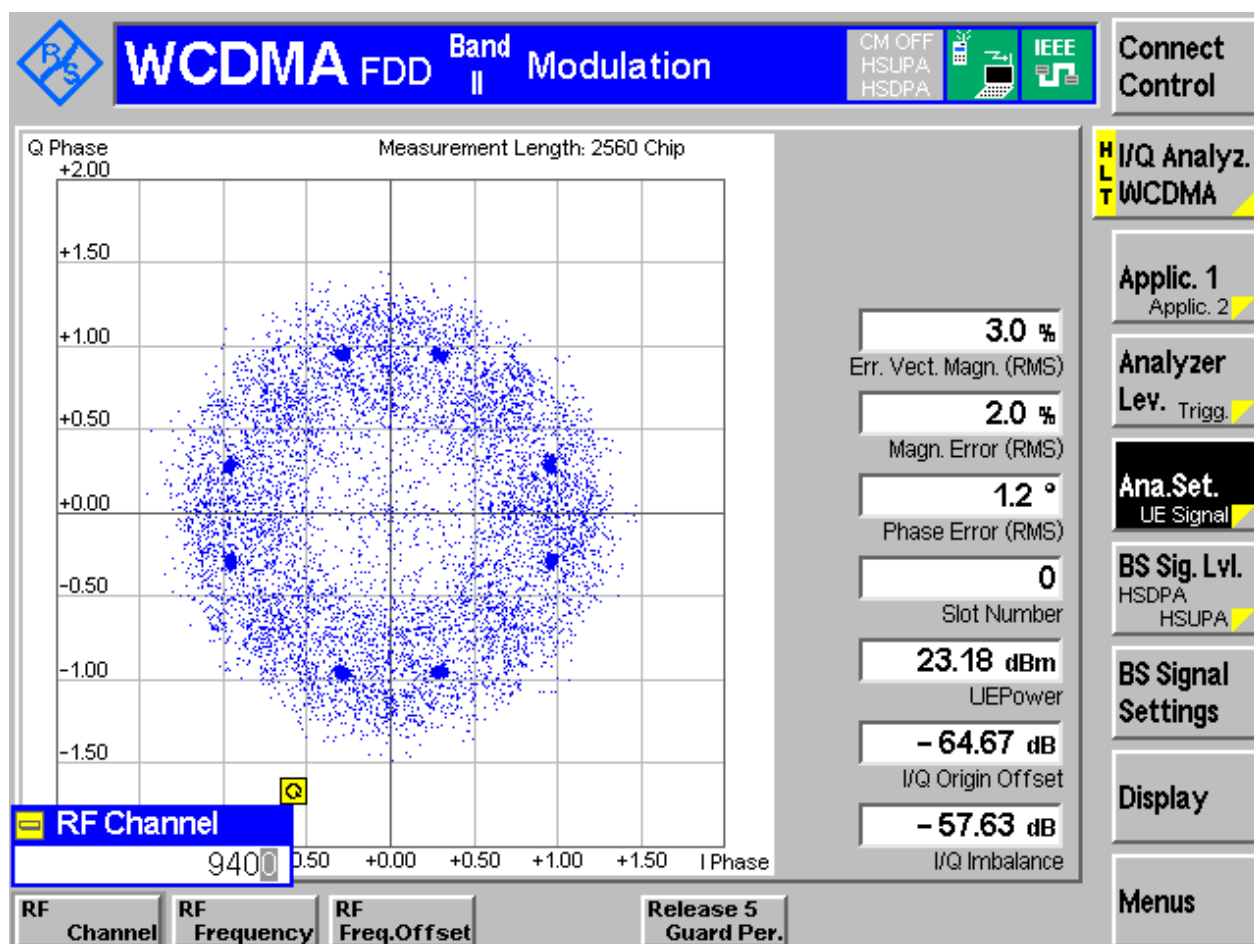
3.1.2.1.1 Test Channel = MCH



3.1.3 Test Band = WCDMA1900

3.1.3.1 Test Mode = UMTS/TM1

3.1.3.1.1 Test Channel = MCH



4Appendix_D: Bandwidth

Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA850	UMTS/TM1	LCH	4.15	4.72	Pass
		MCH	4.16	4.73	Pass
		HCH	4.16	4.73	Pass
WCDMA1700	UMTS/TM1	LCH	4.14	4.70	Pass
		MCH	4.15	4.74	Pass
		HCH	4.15	4.70	Pass
WCDMA1900	UMTS/TM1	LCH	4.15	4.73	Pass
		MCH	4.16	4.72	Pass
		HCH	4.13	4.71	Pass

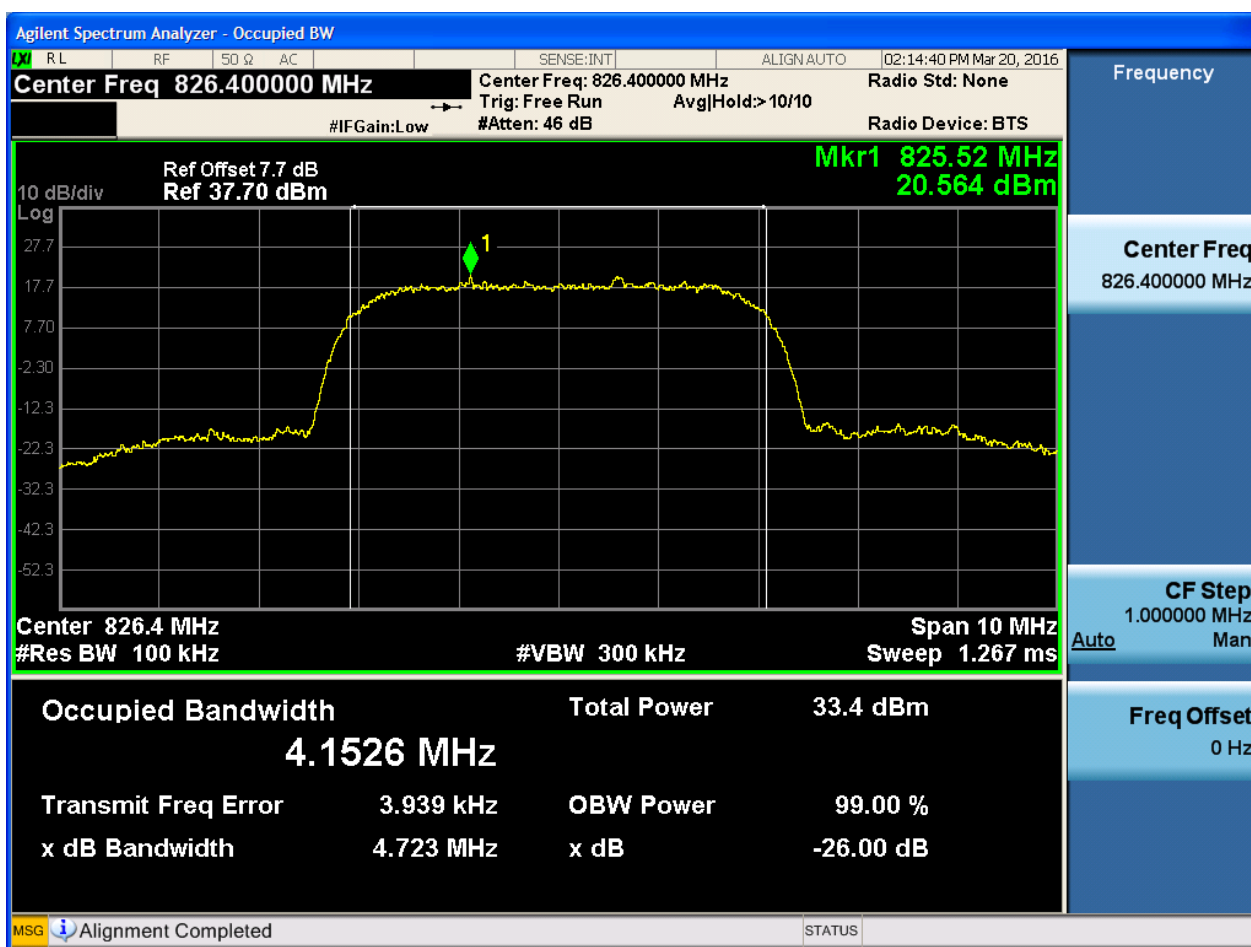
Part II - Test Plots

4.1 For UMTS

4.1.1 Test Band = WCDMA850

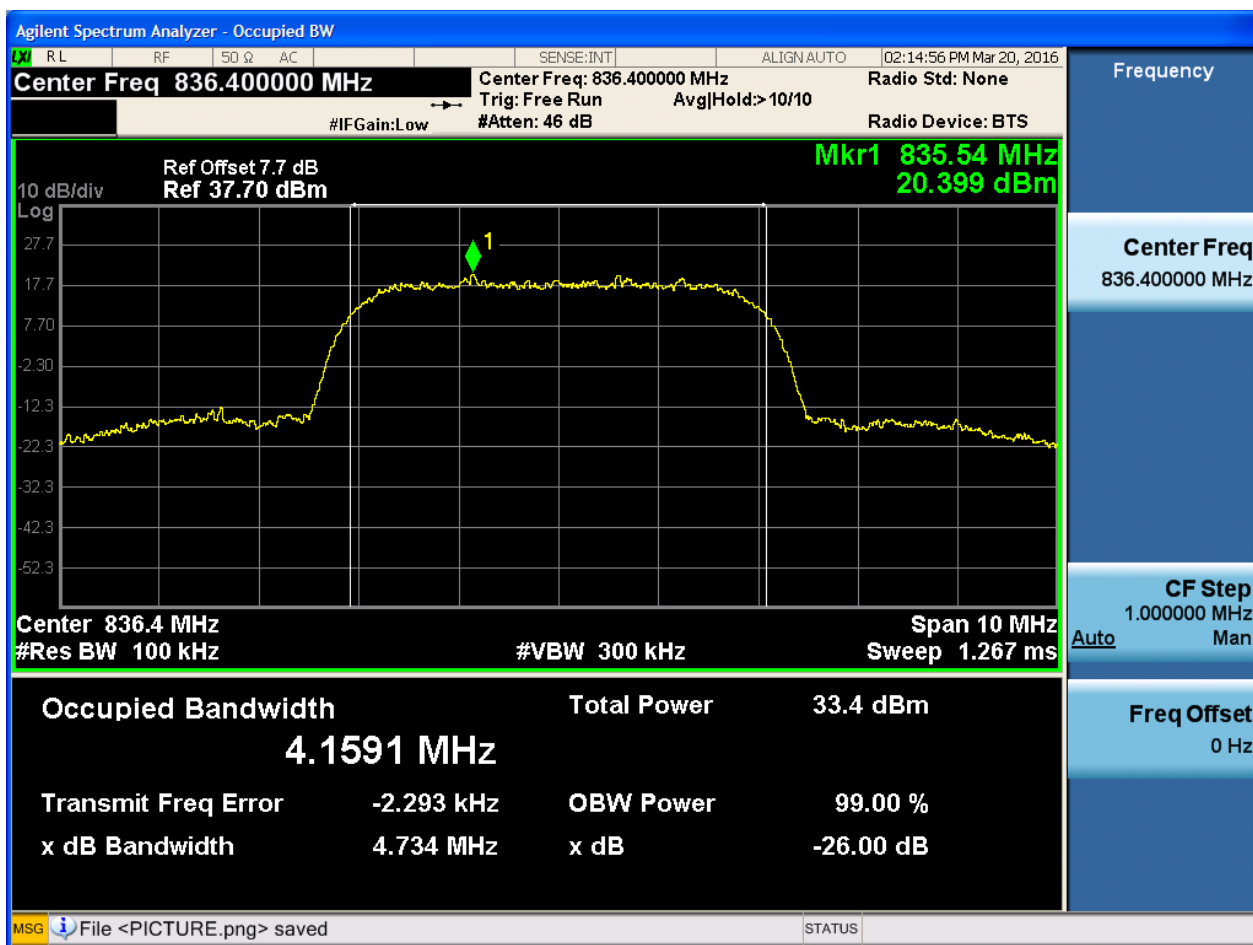
4.1.1.1 Test Mode = UMTS/TM1

4.1.1.1.1 Test Channel = LCH



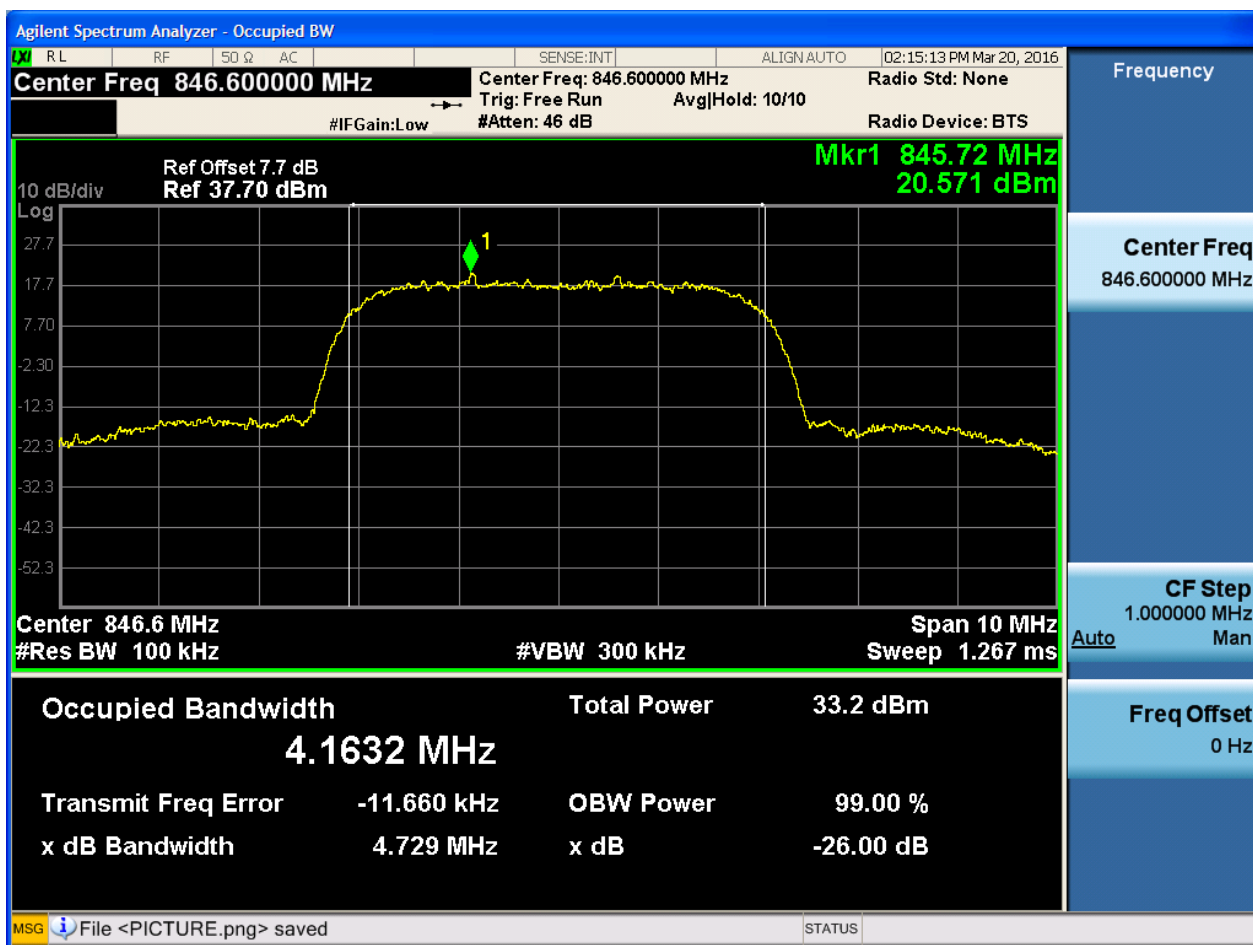


4.1.1.1.2 Test Channel = MCH





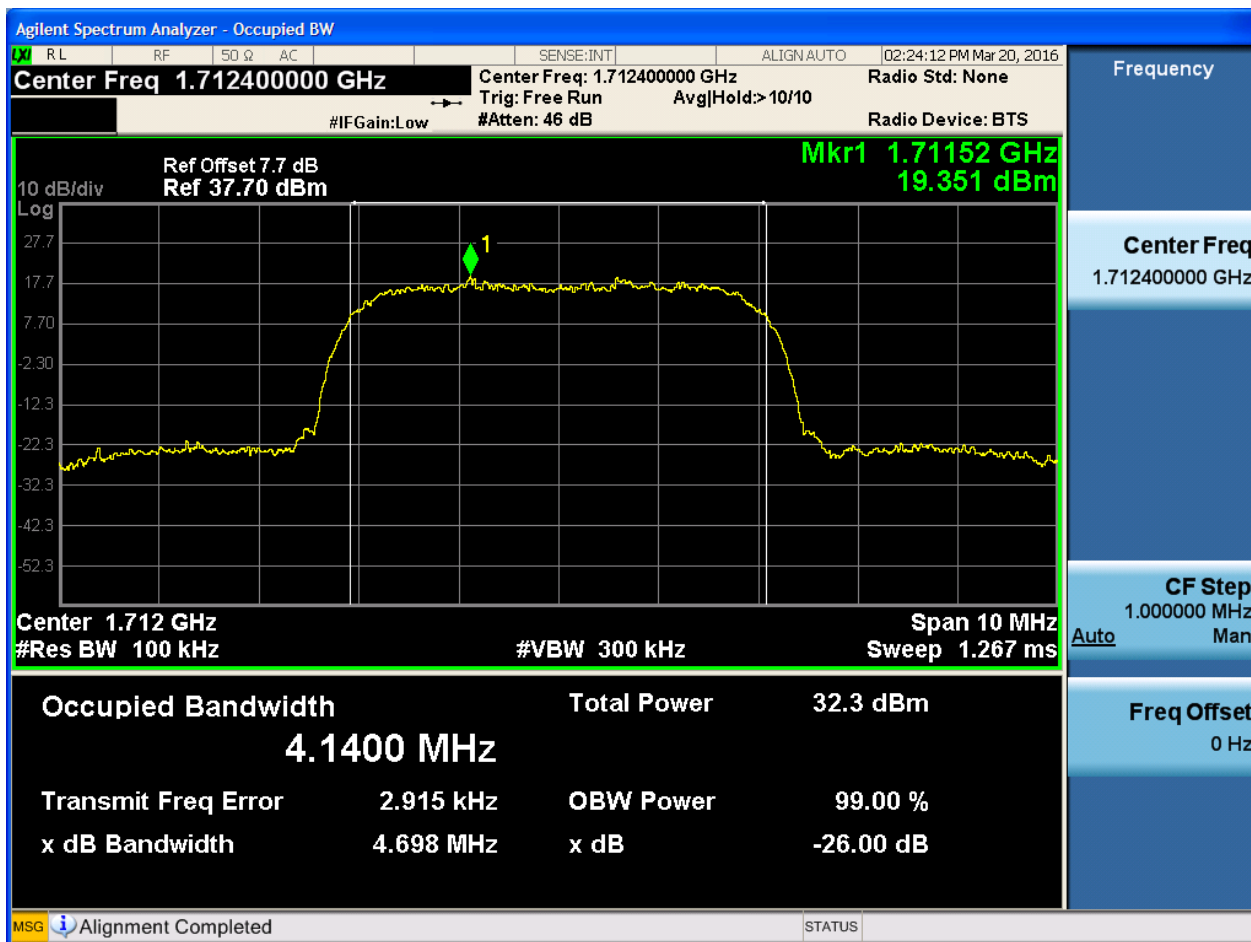
4.1.1.1.3 Test Channel = HCH



4.1.2 Test Band = WCDMA1700

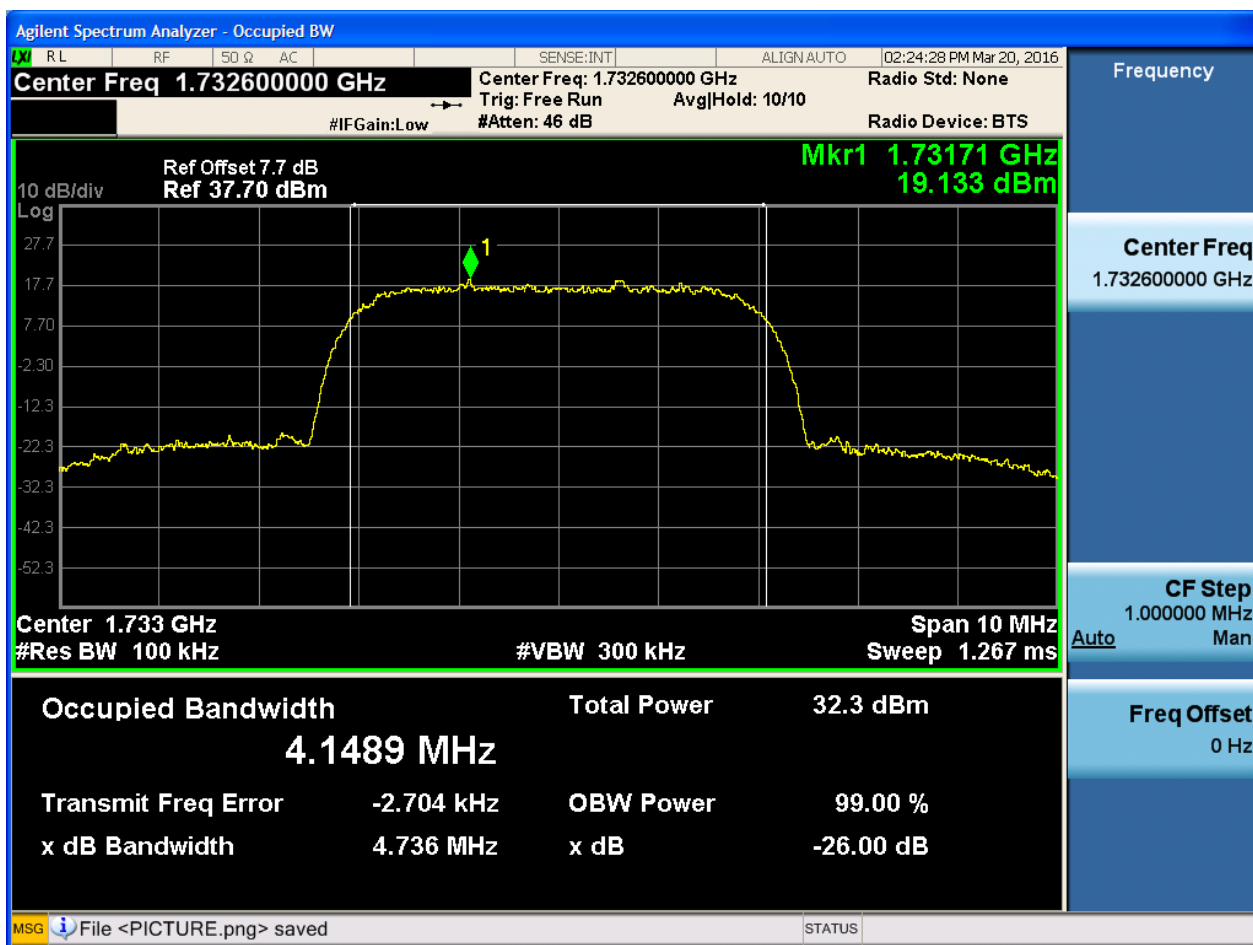
4.1.2.1 Test Mode = UMTS/TM1

4.1.2.1.1 Test Channel = LCH



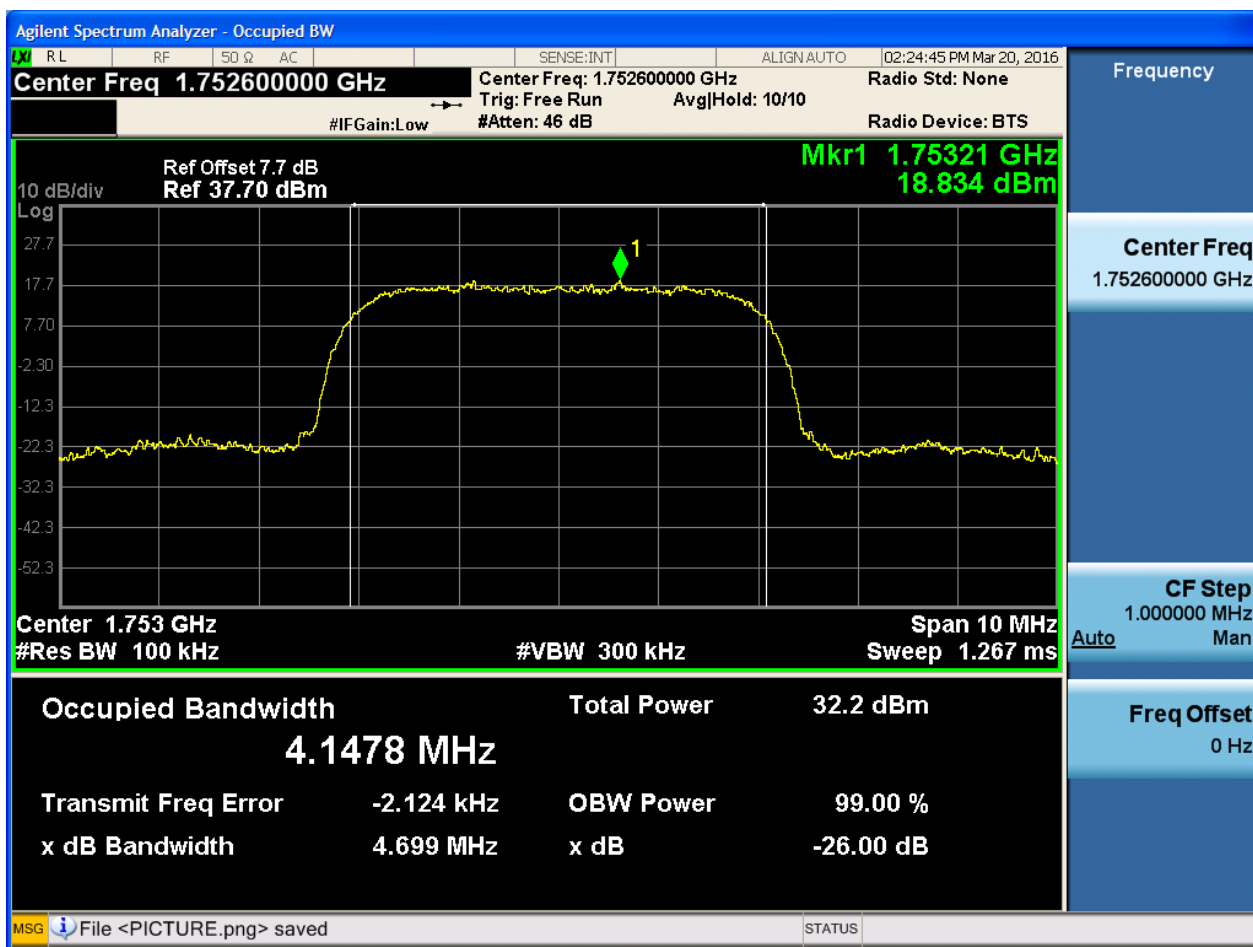


4.1.2.1.2 Test Channel = MCH





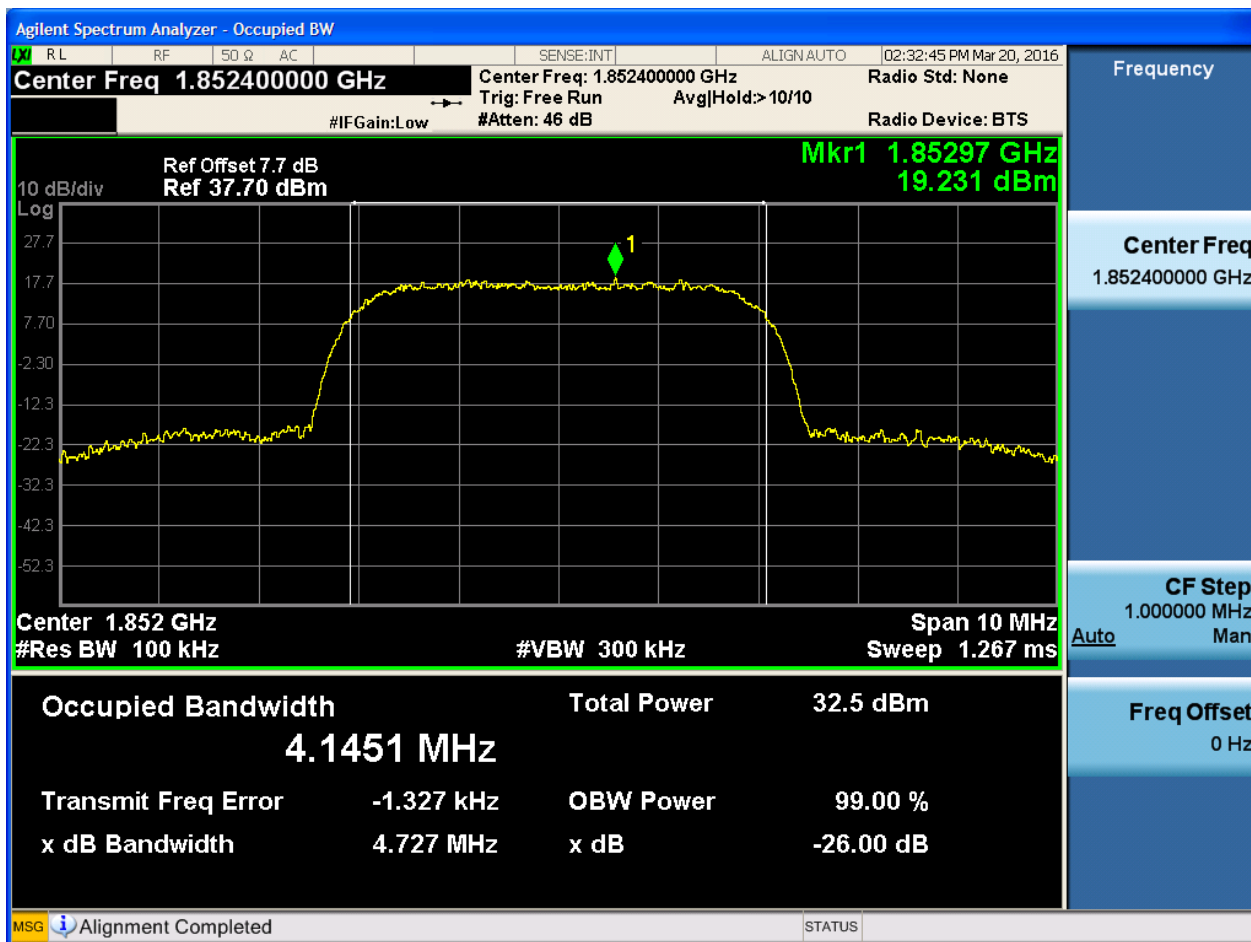
4.1.2.1.3 Test Channel = HCH



4.1.3 Test Band = WCDMA1900

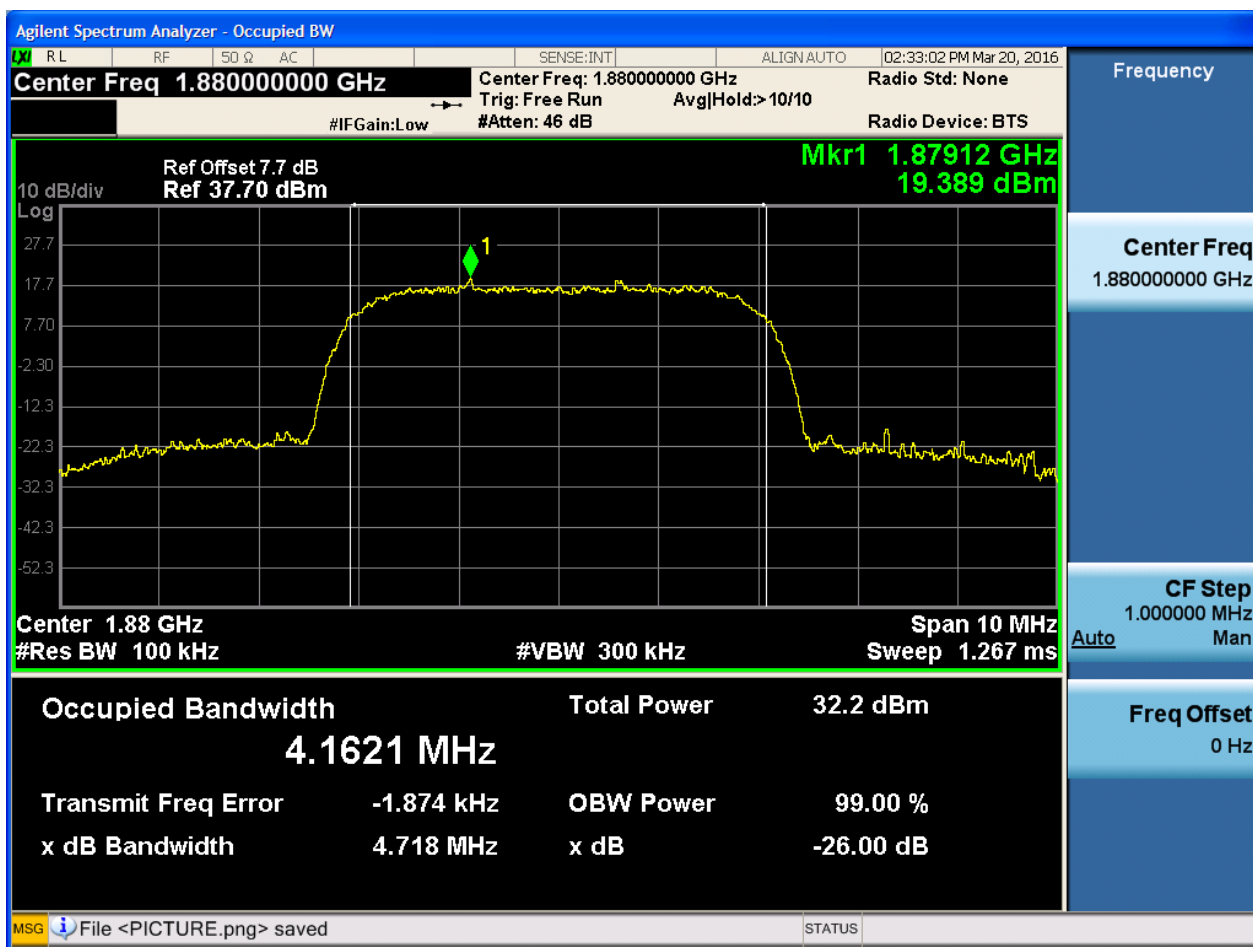
4.1.3.1 Test Mode = UMTS/TM1

4.1.3.1.1 Test Channel = LCH



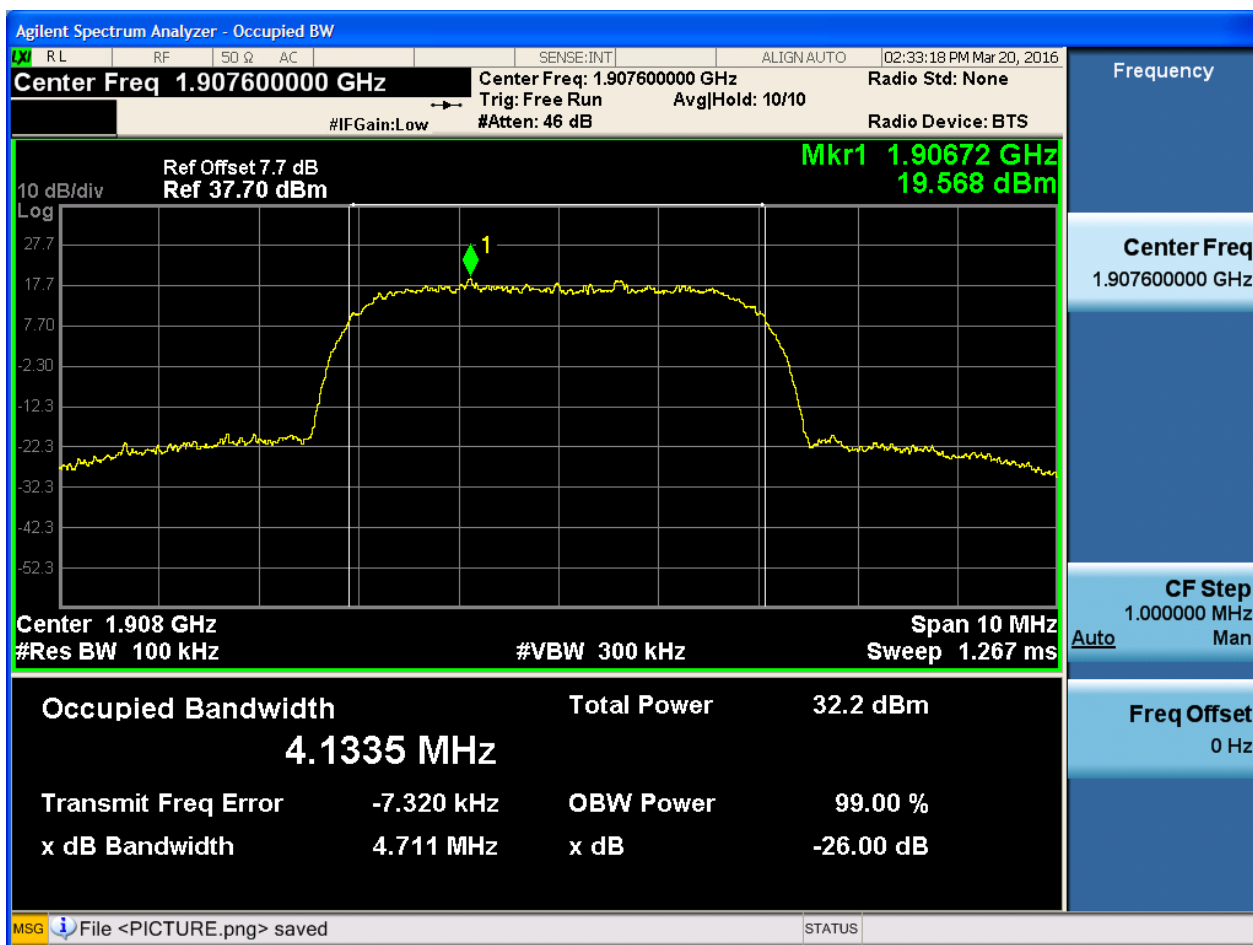


4.1.3.1.2 Test Channel = MCH





4.1.3.1.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

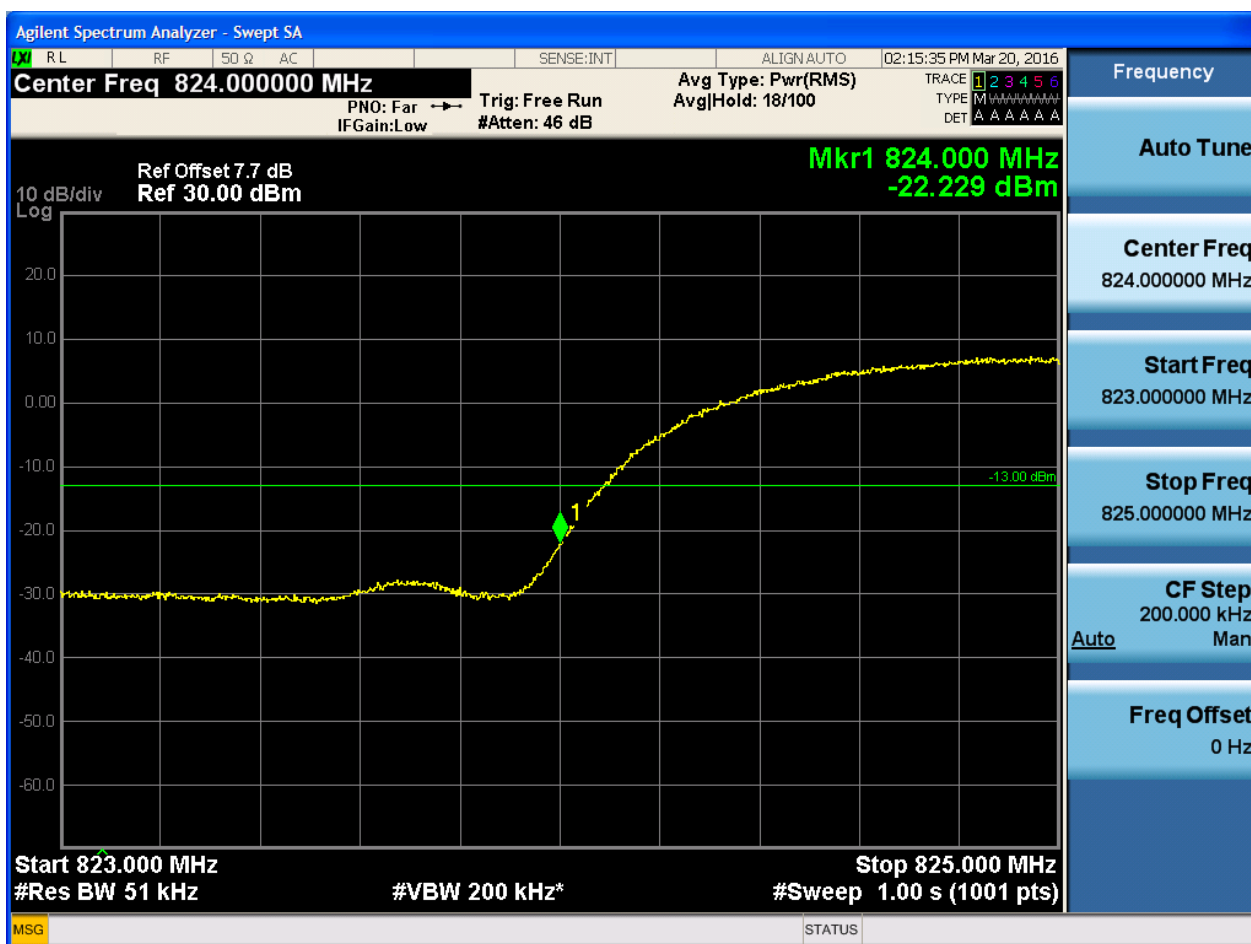
Part I - Test Plots

5.1 For UMTS

5.1.1 Test Band = WCDMA850

5.1.1.1 Test Mode = UMTS/TM1

5.1.1.1.1 Test Channel = LCH





Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω AC SENSE:INT ALIGN:AUTO 02:15:57 PM Mar 20, 2016

Center Freq 849.000000 MHz Avg Type: Pwr(RMS) Trace 1 2 3 4 5 6
PNO: Far Trig: Free Run Avg|Hold: 18/100 TYPE M
IFGain:Low #Atten: 46 dB DET A A A A A A

Ref Offset 7.7 dB Mkr1 849.000 MHz
Ref 30.00 dBm -21.350 dBm

10 dB/div
Log

Start 848.000 MHz Stop 850.000 MHz
#Res BW 51 kHz #VBW 200 kHz* #Sweep 1.00 s (1001 pts)

MSG File <PICTURE.png> saved STATUS

Frequency

Auto Tune

Center Freq
849.000000 MHz

Start Freq
848.000000 MHz

Stop Freq
850.000000 MHz

CF Step
200.000 kHz
Auto Man

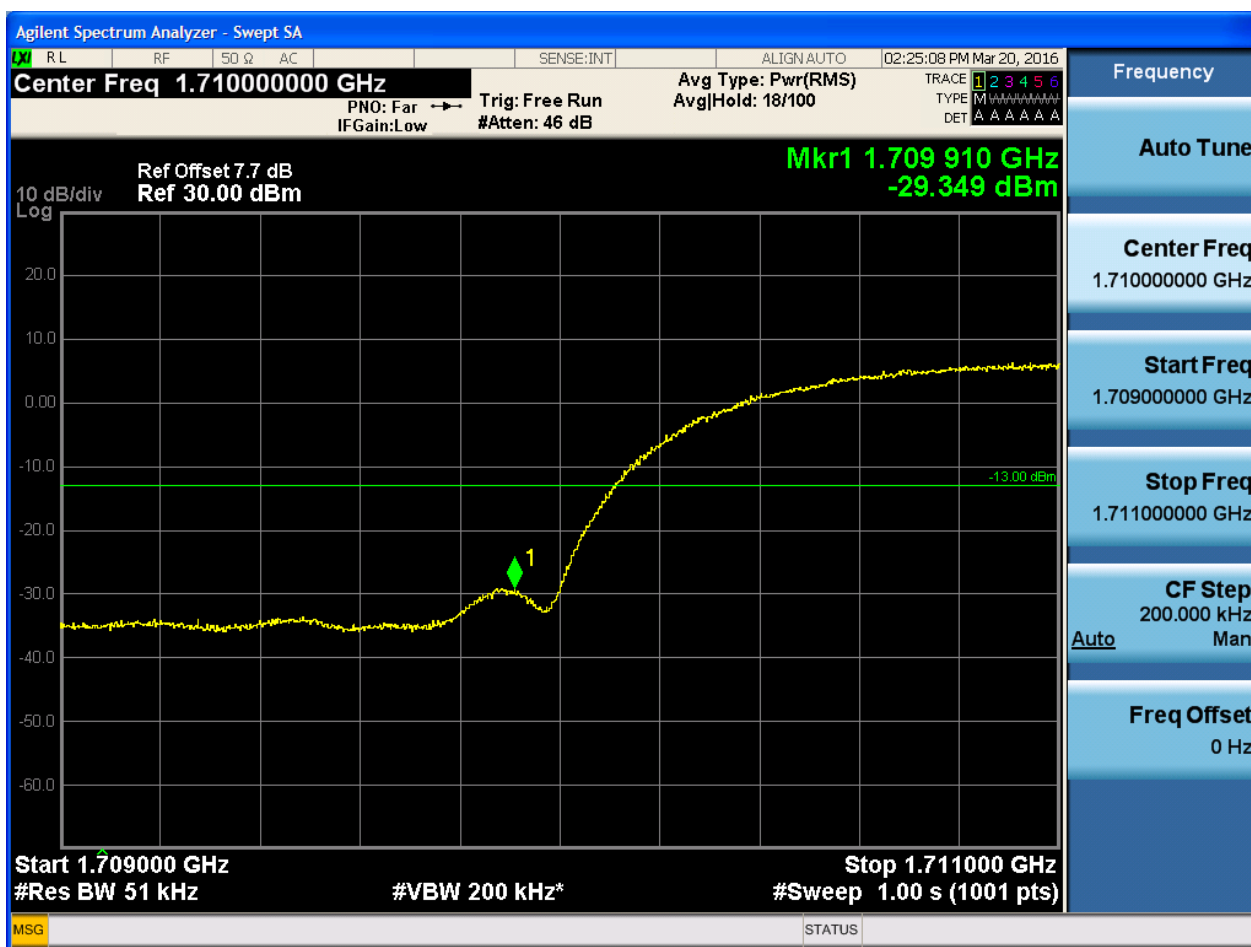
Freq Offset
0 Hz



5.1.2 Test Band = WCDMA1700

5.1.2.1 Test Mode = UMTS/TM1

5.1.2.1.1 Test Channel = LCH





Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 02:25:29 PM Mar 20, 2016

Center Freq 1.755000000 GHz Avg Type: Pwr(RMS) TRACE 1 2 3 4 5 6
PNO: Far Trig: Free Run Avg|Hold: 18/100 TYPE M
IFGain:Low #Atten: 46 dB DET A A A A A A

Ref Offset 7.7 dB Mkr1 1.755 000 GHz
Ref 30.00 dBm -27.966 dBm

10 dB/div
Log

Start 1.754000 GHz Stop 1.756000 GHz
#Res BW 51 kHz #VBW 200 kHz* #Sweep 1.00 s (1001 pts)

MSG File <PICTURE.png> saved STATUS

Frequency

Auto Tune

Center Freq
1.755000000 GHz

Start Freq
1.754000000 GHz

Stop Freq
1.756000000 GHz

CF Step
200.000 kHz
Auto Man

Freq Offset
0 Hz



5.1.3 Test Band = WCDMA1900

5.1.3.1 Test Mode = UMTS/TM1

5.1.3.1.1 Test Channel = LCH



5.1.3.1.2 Test Channel = HCH



6Appendix_F: Spurious Emission at Antenna Terminal

NOTE: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of $< RBW/2$ so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = $k * (Span / RBW)$ " with k between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

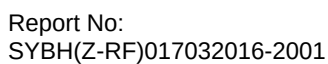
Part I - Test Plots

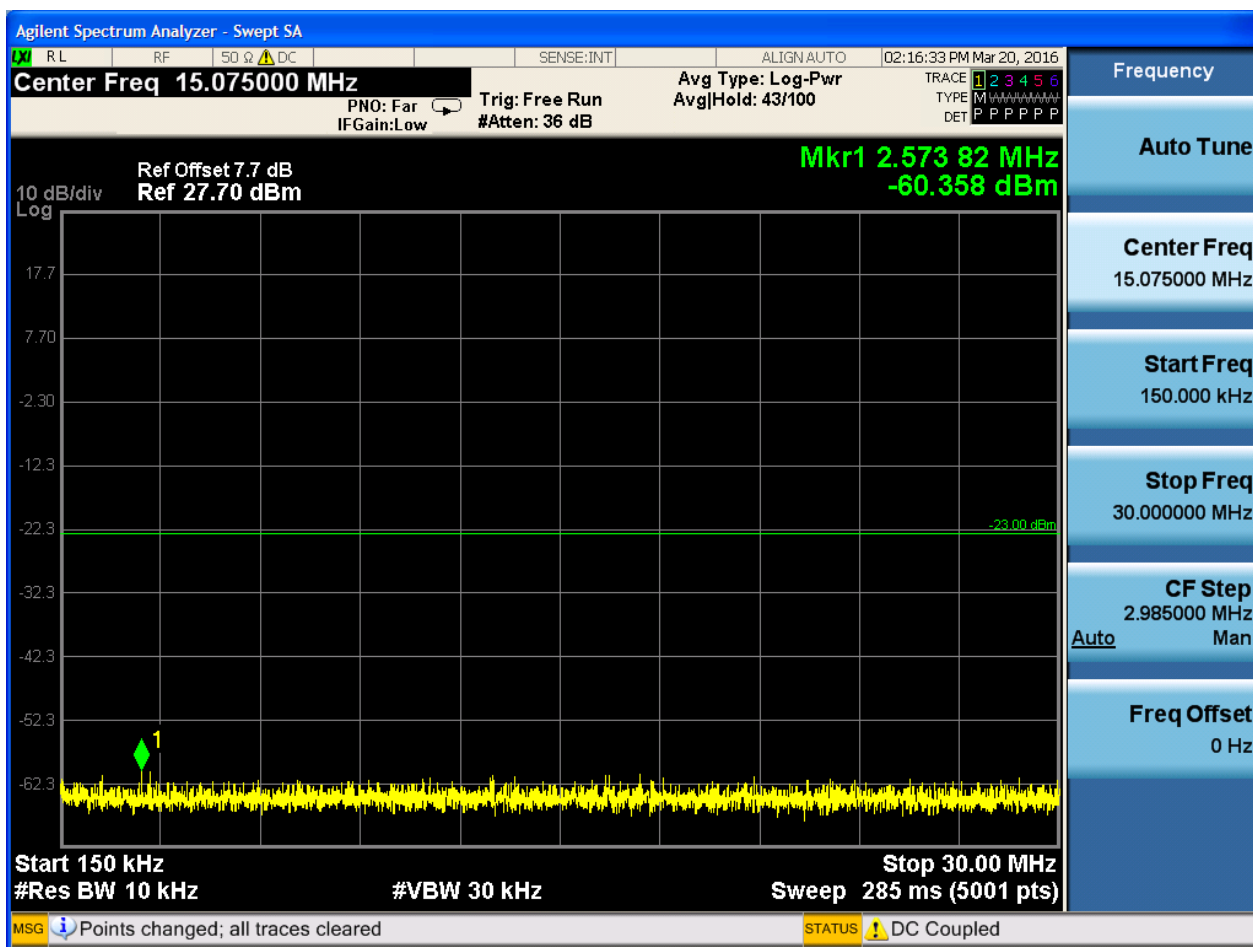
6.1 For UMTS

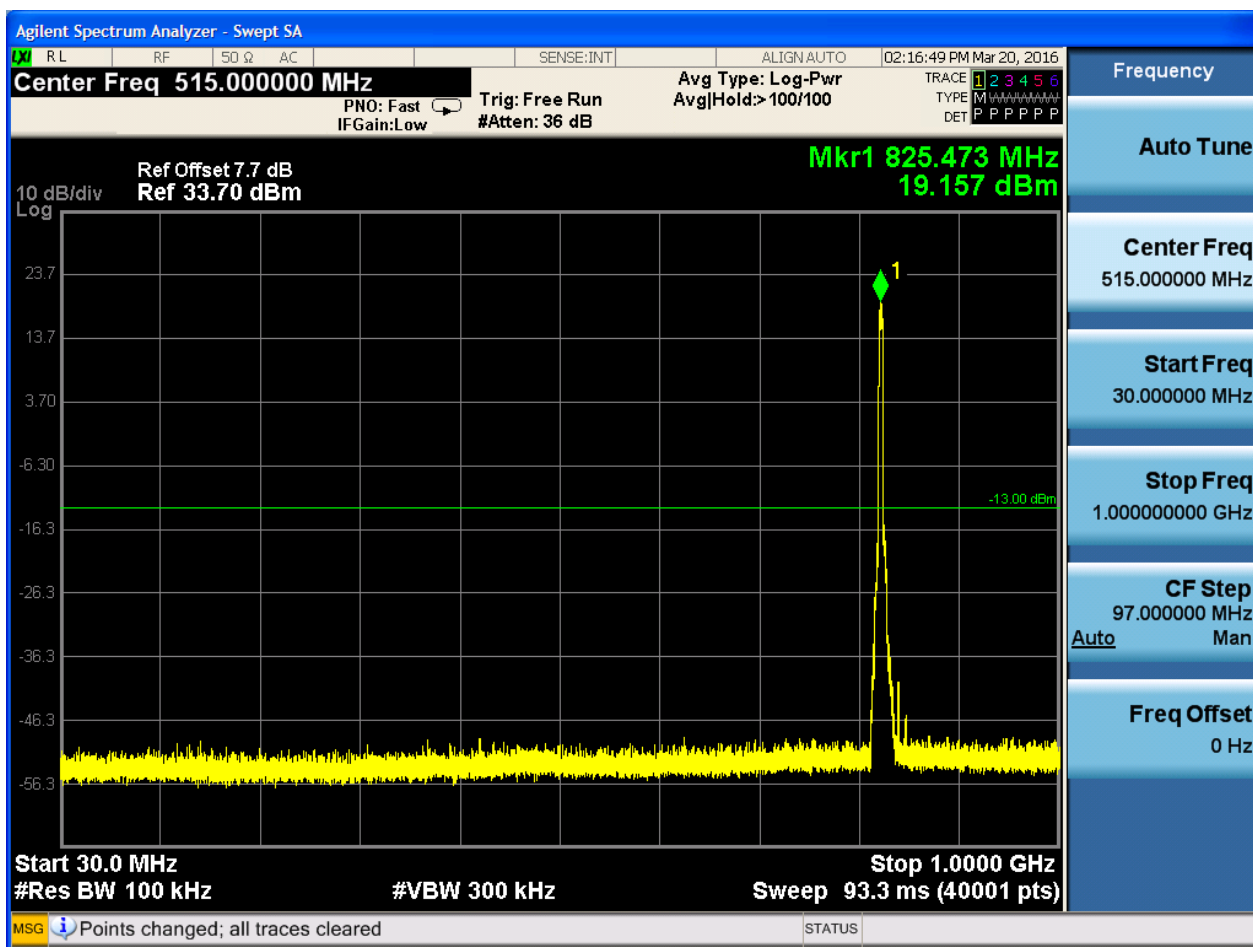
6.1.1 Test Band = WCDMA850

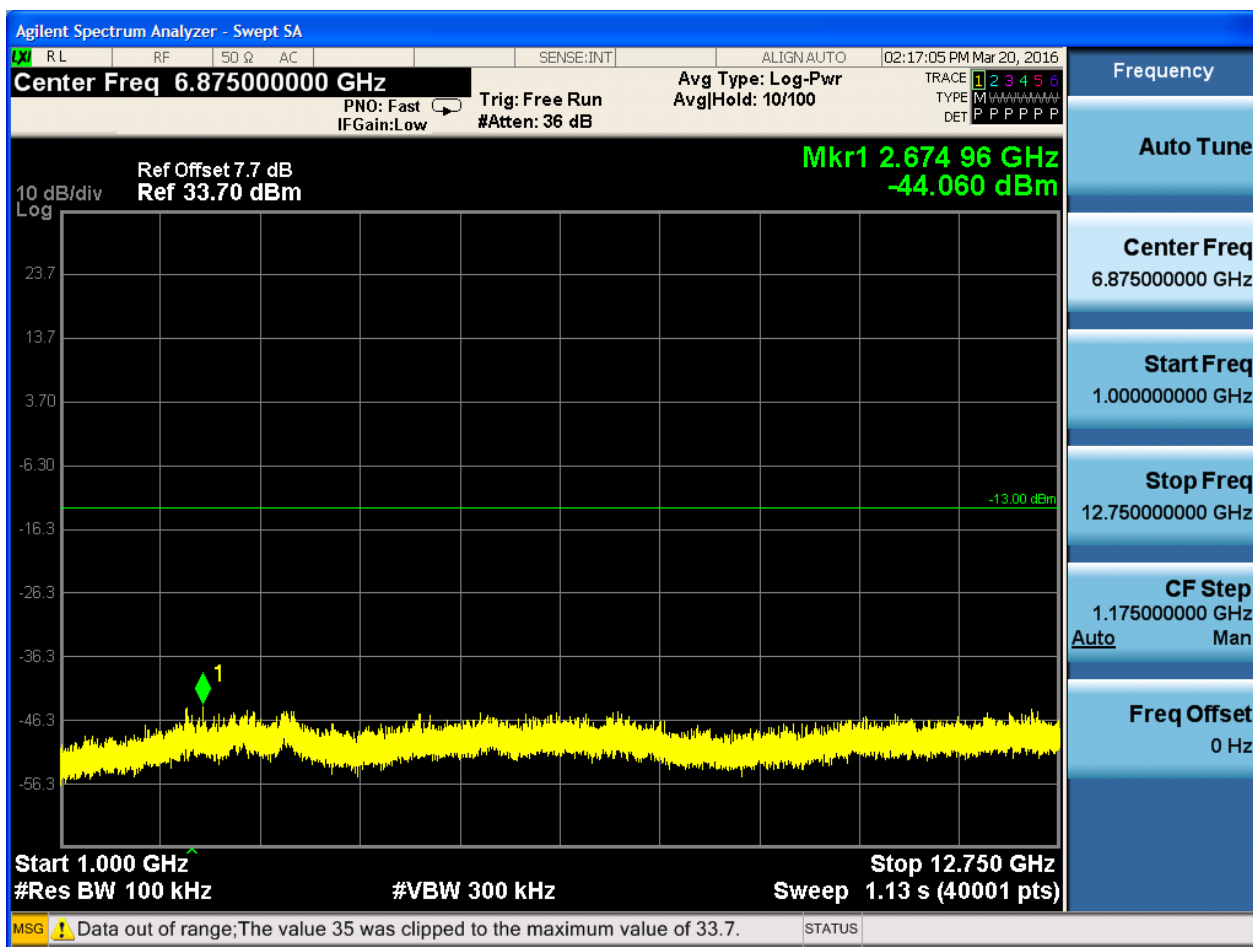
6.1.1.1 Test Mode = UMTS/TM1

6.1.1.1.1 Test Channel = LCH

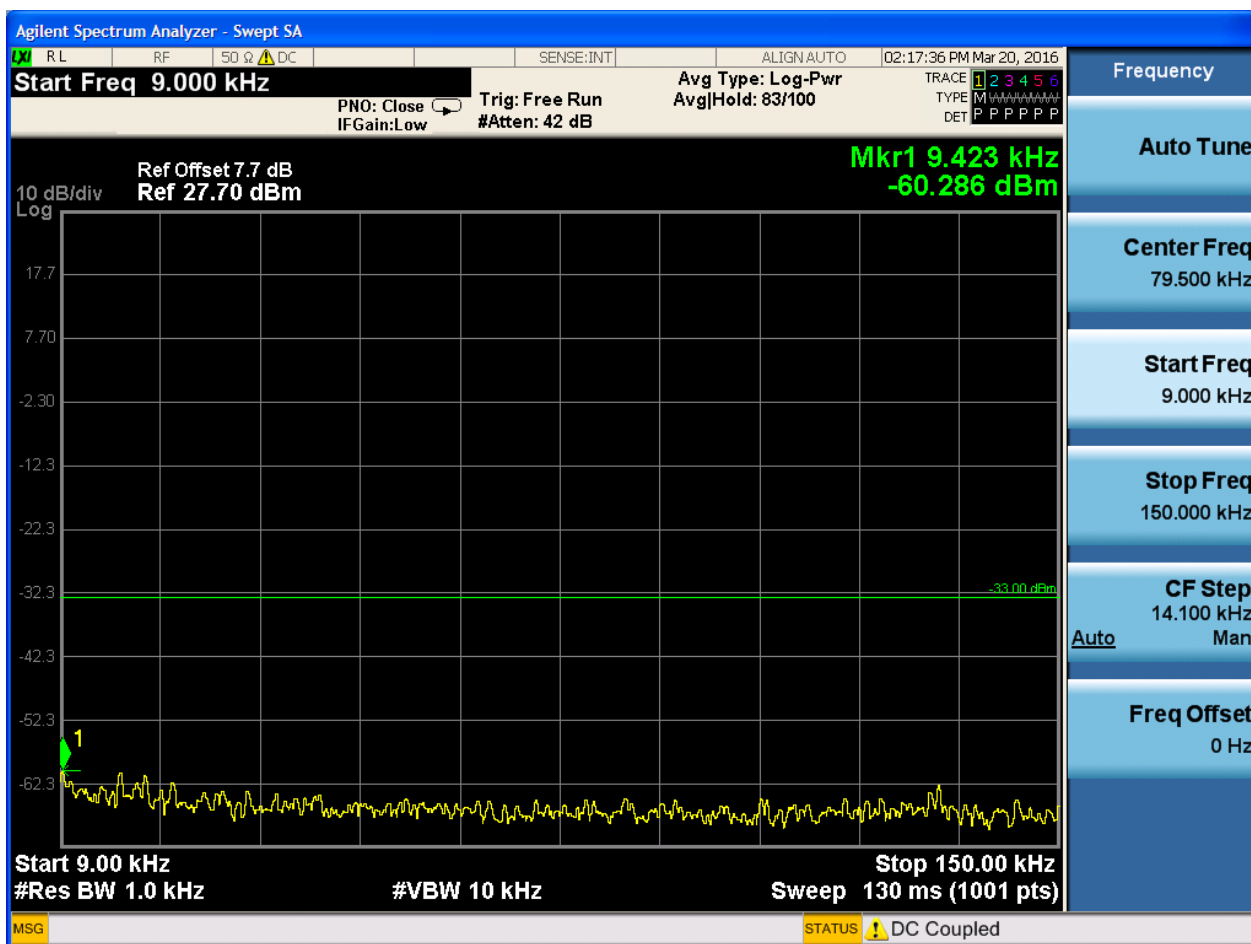


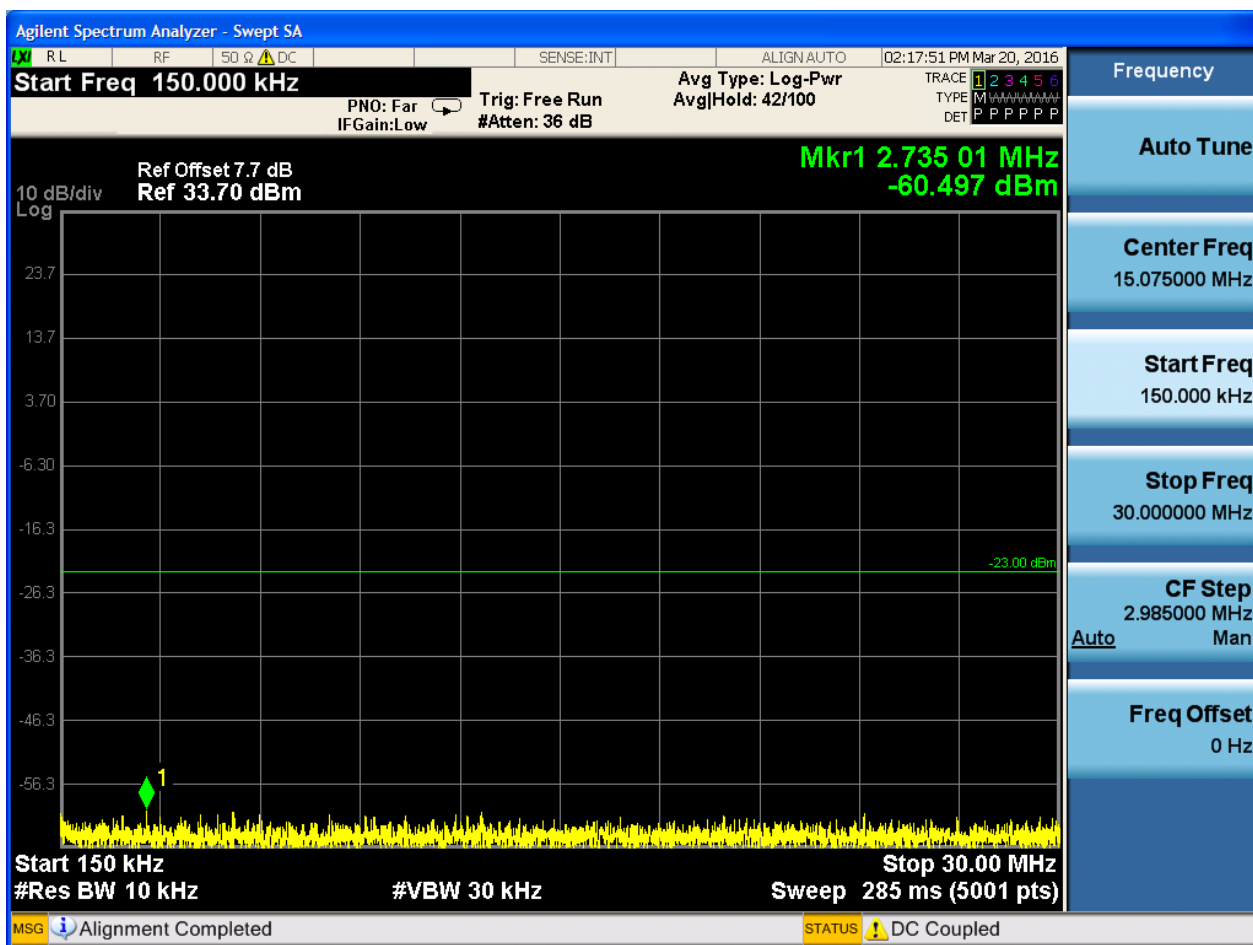


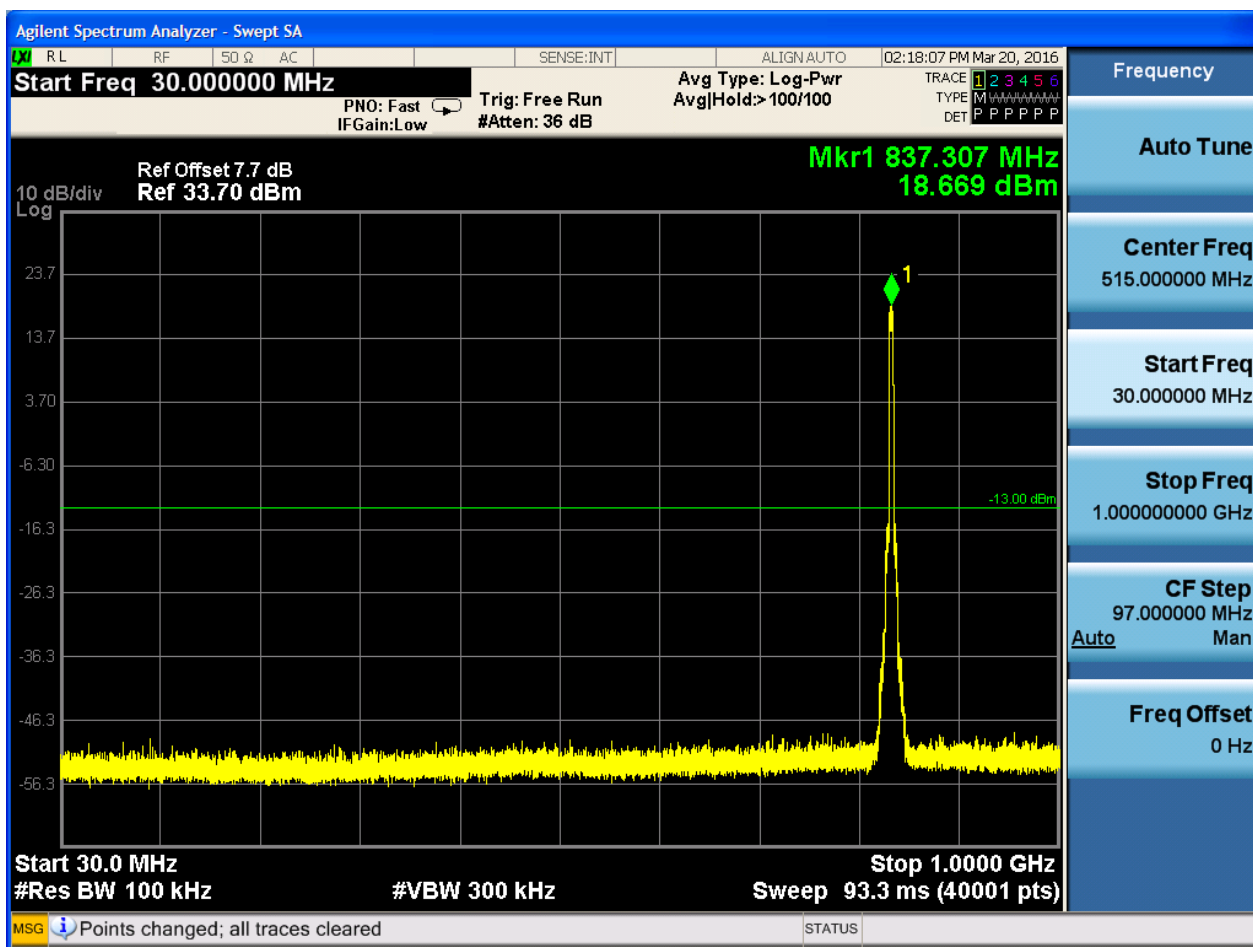


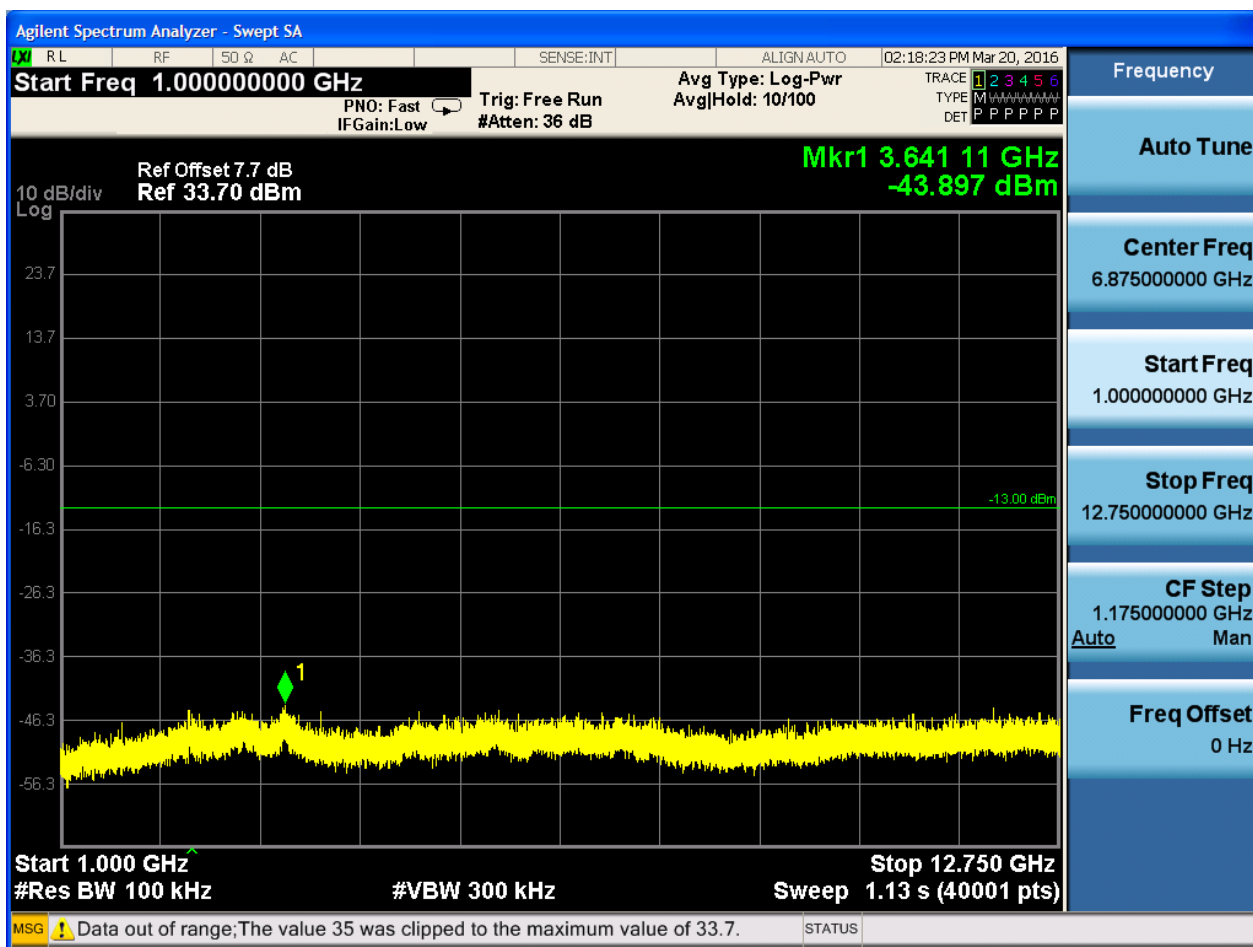


6.1.1.1.2 Test Channel = MCH

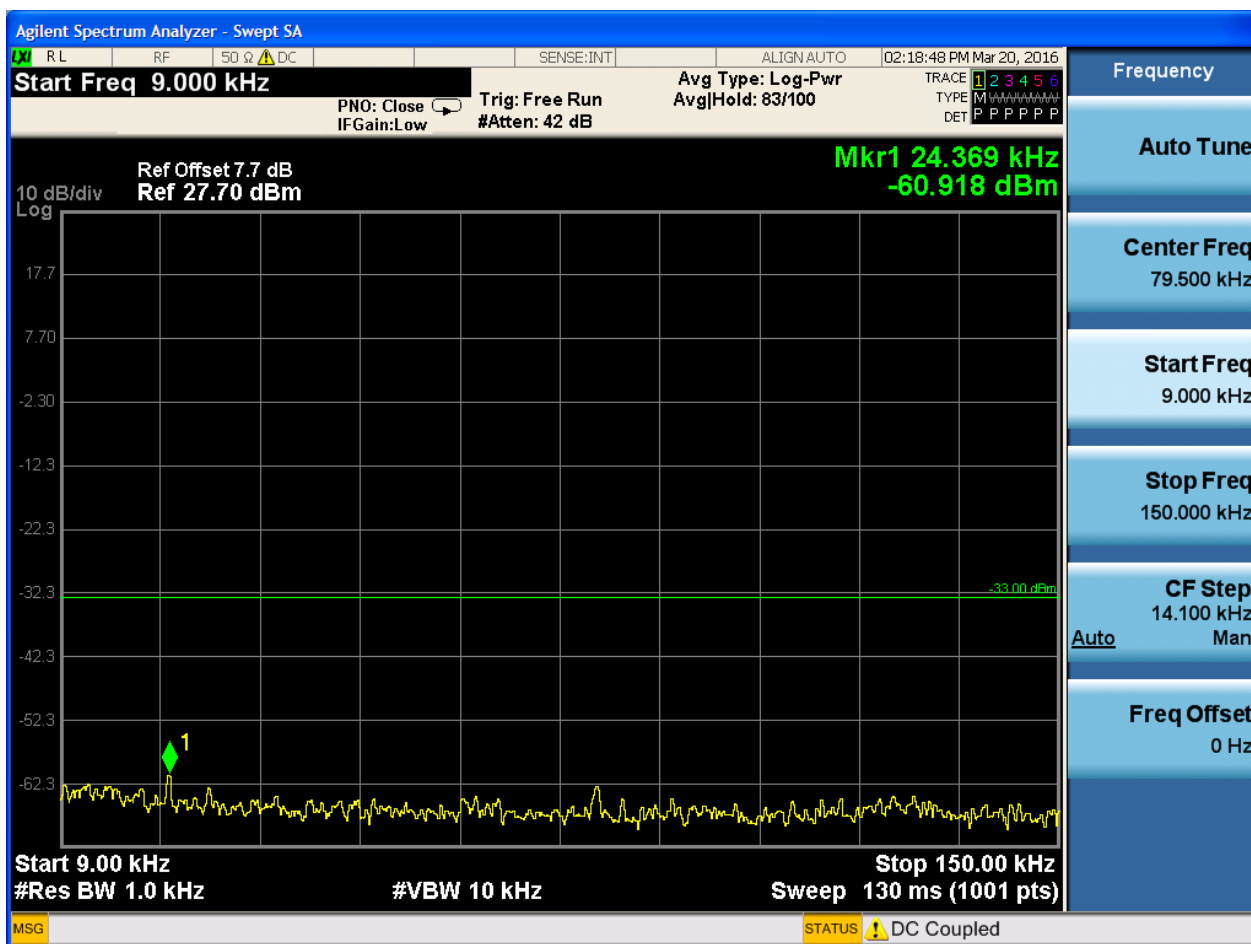


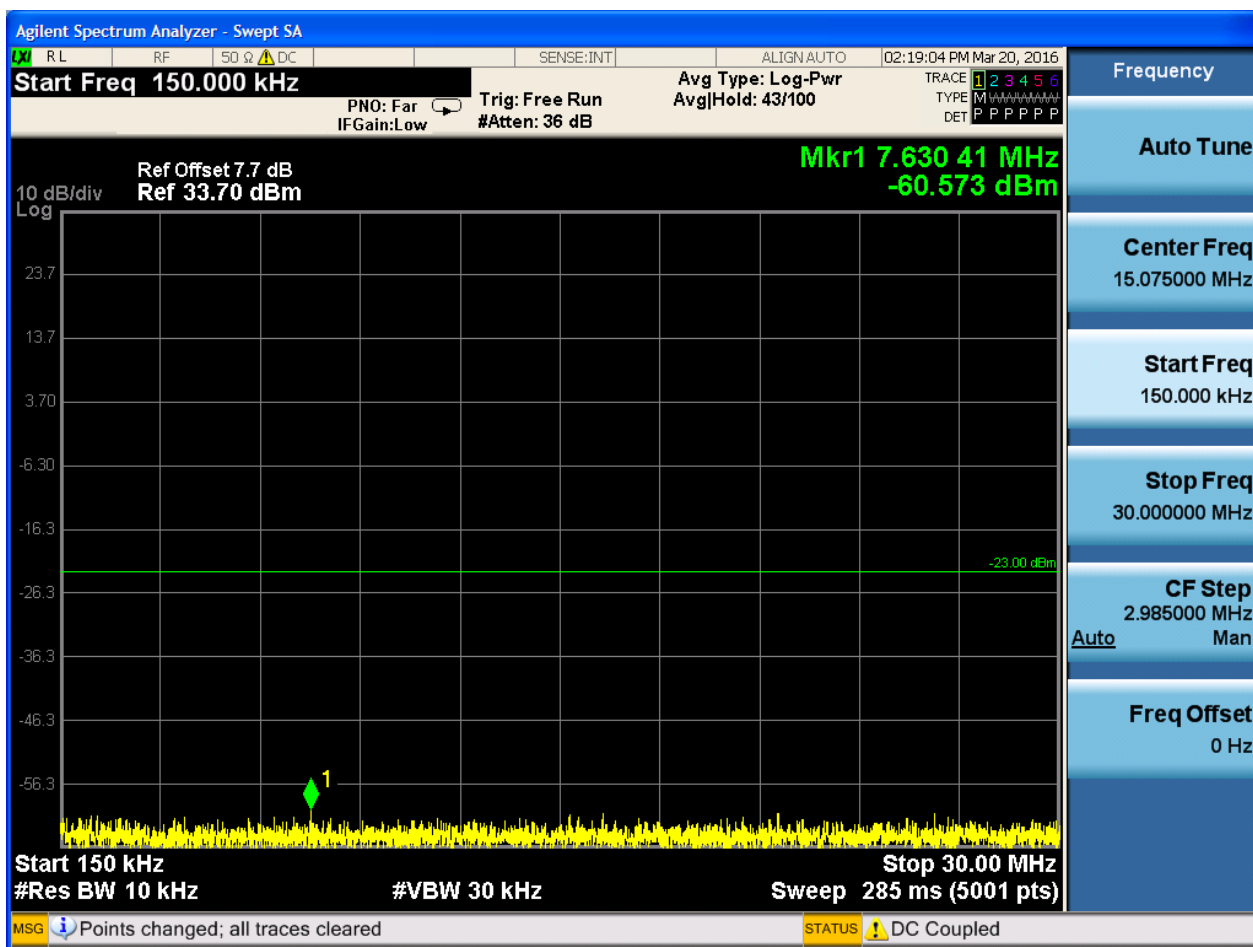


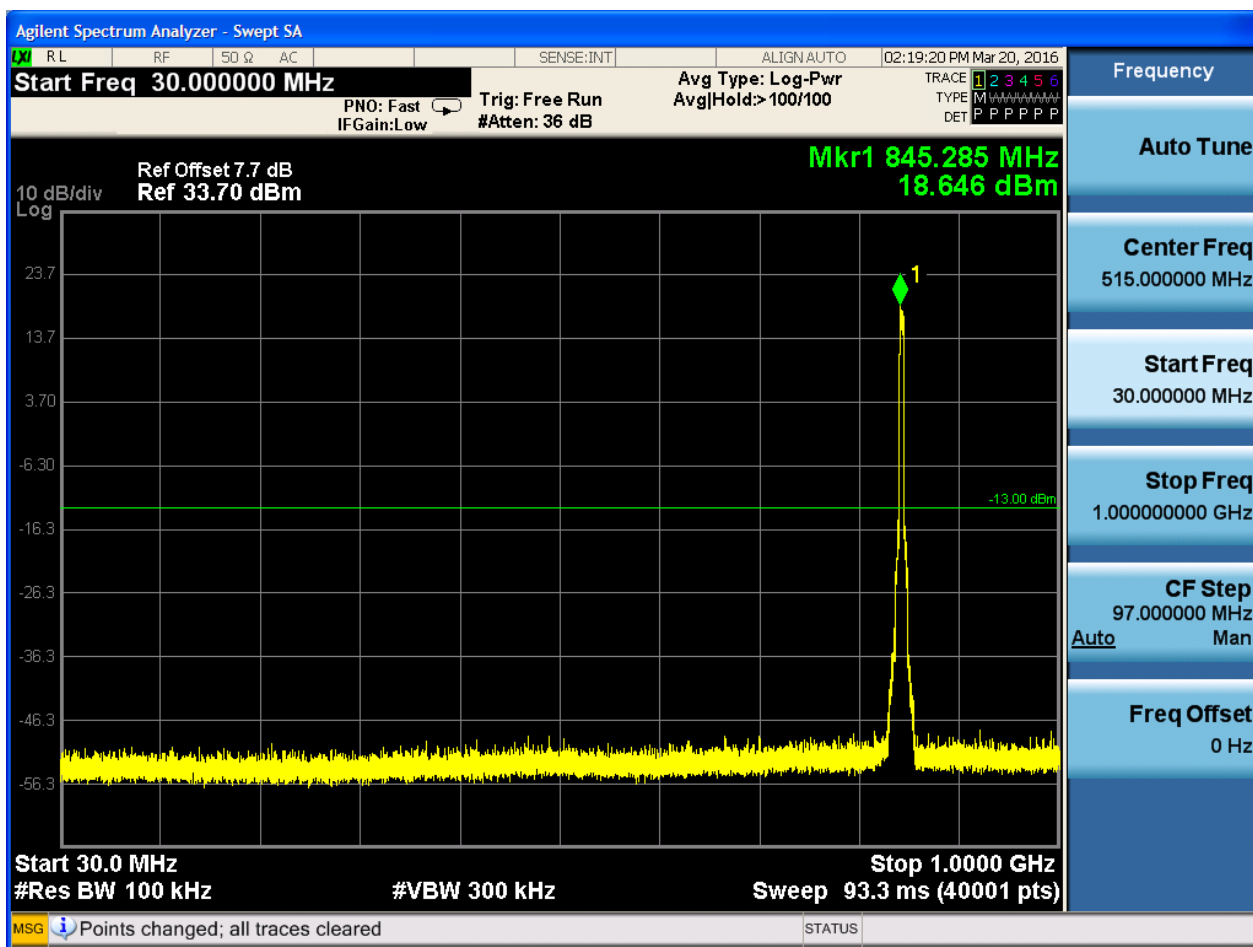


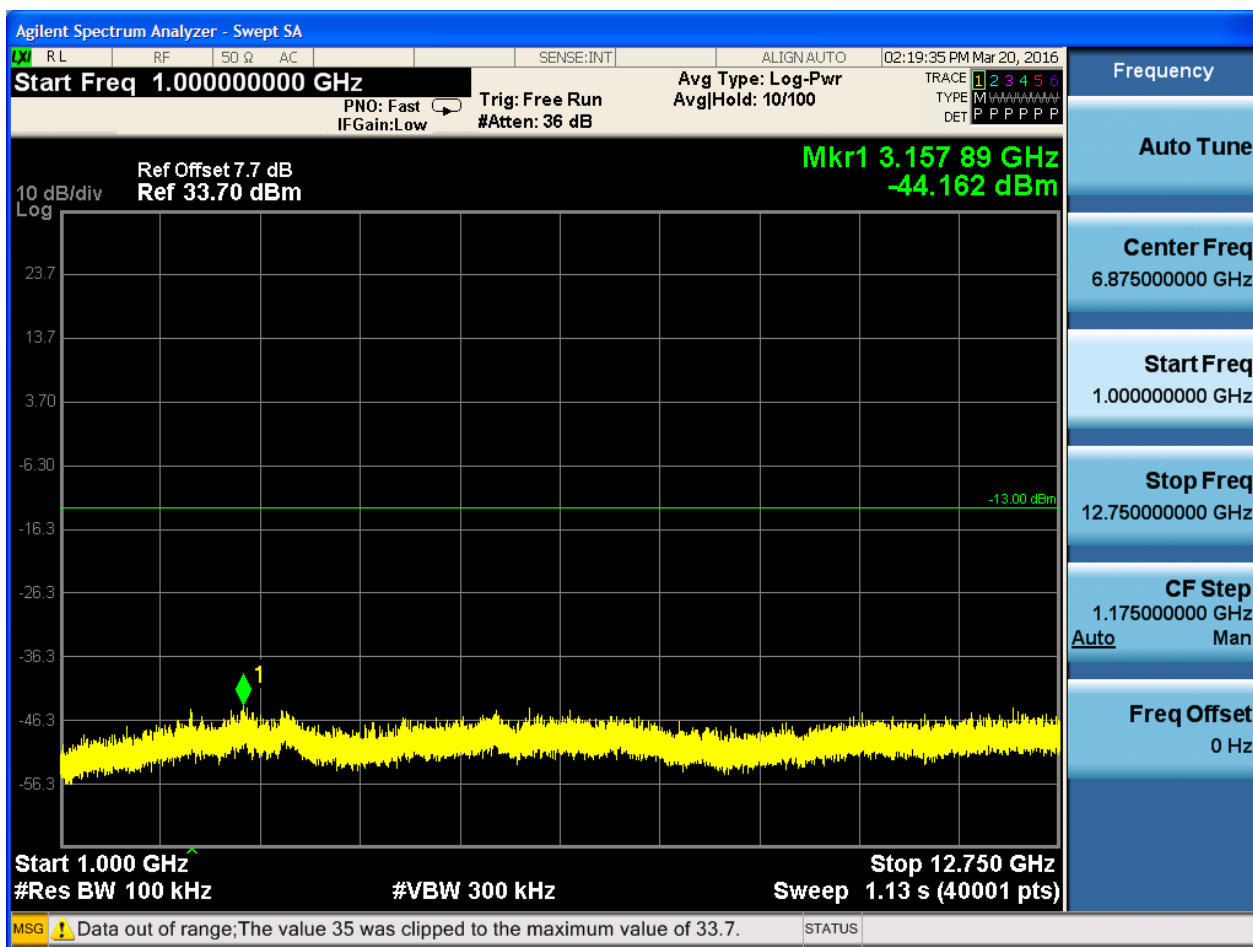


6.1.1.1.3 Test Channel = HCH





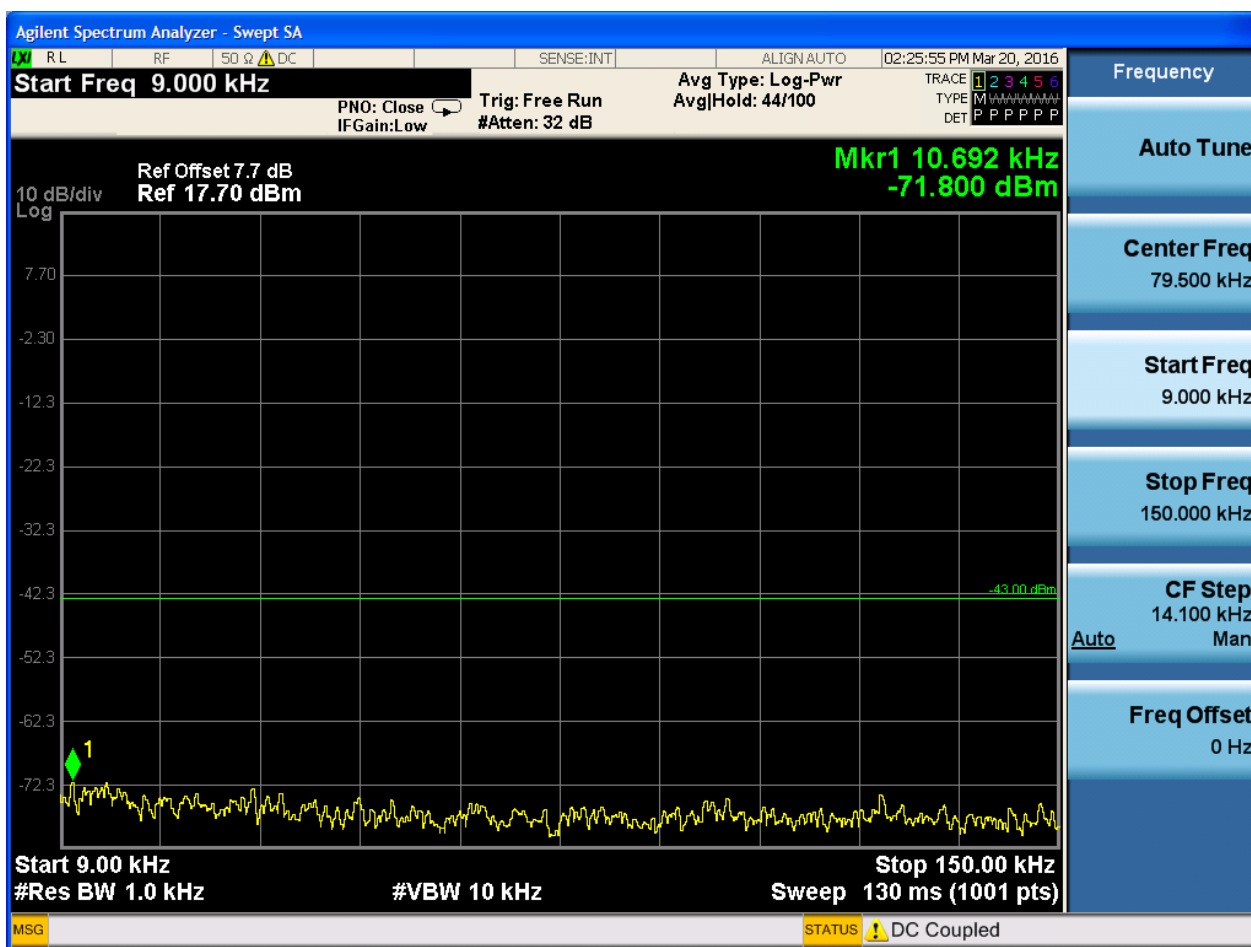


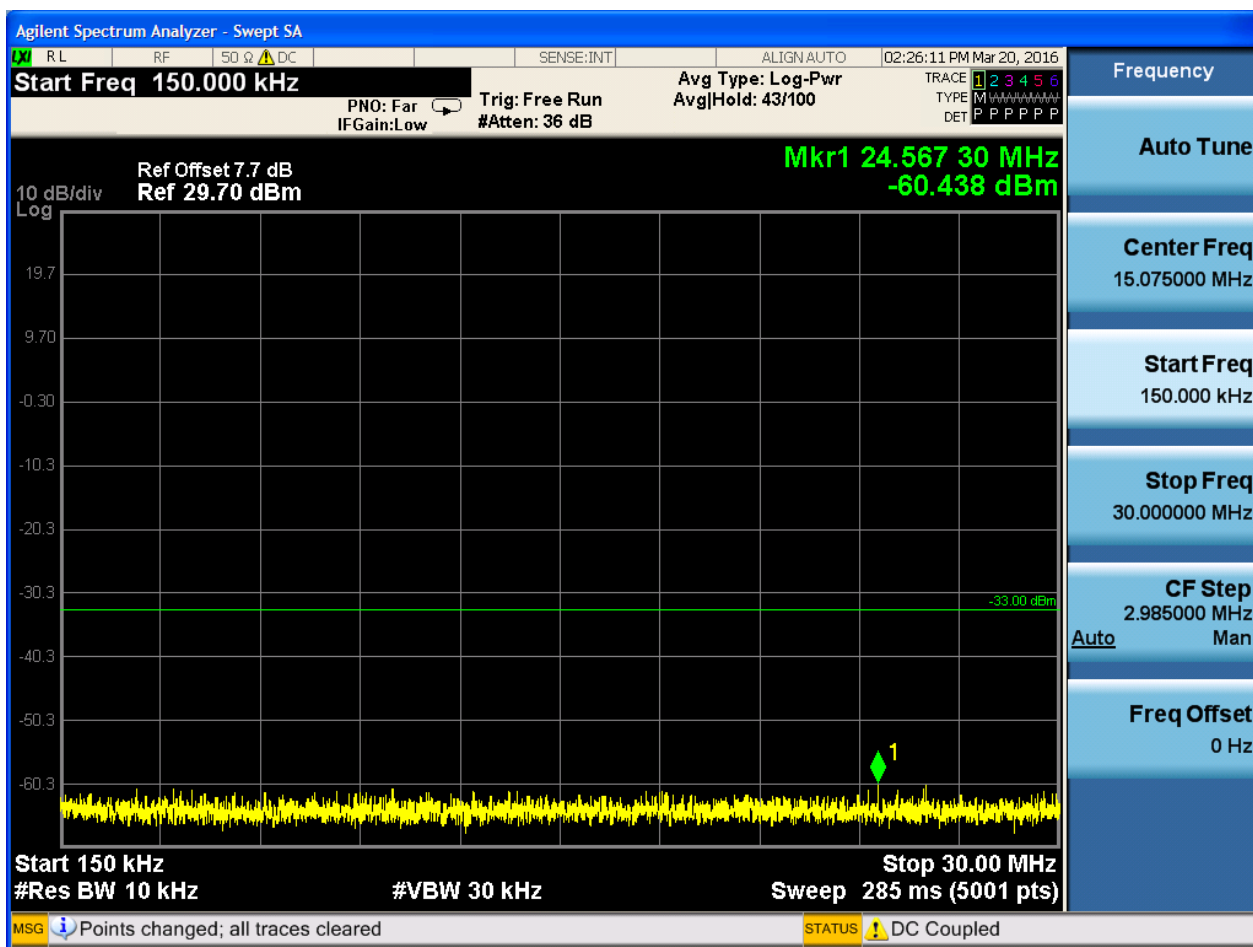


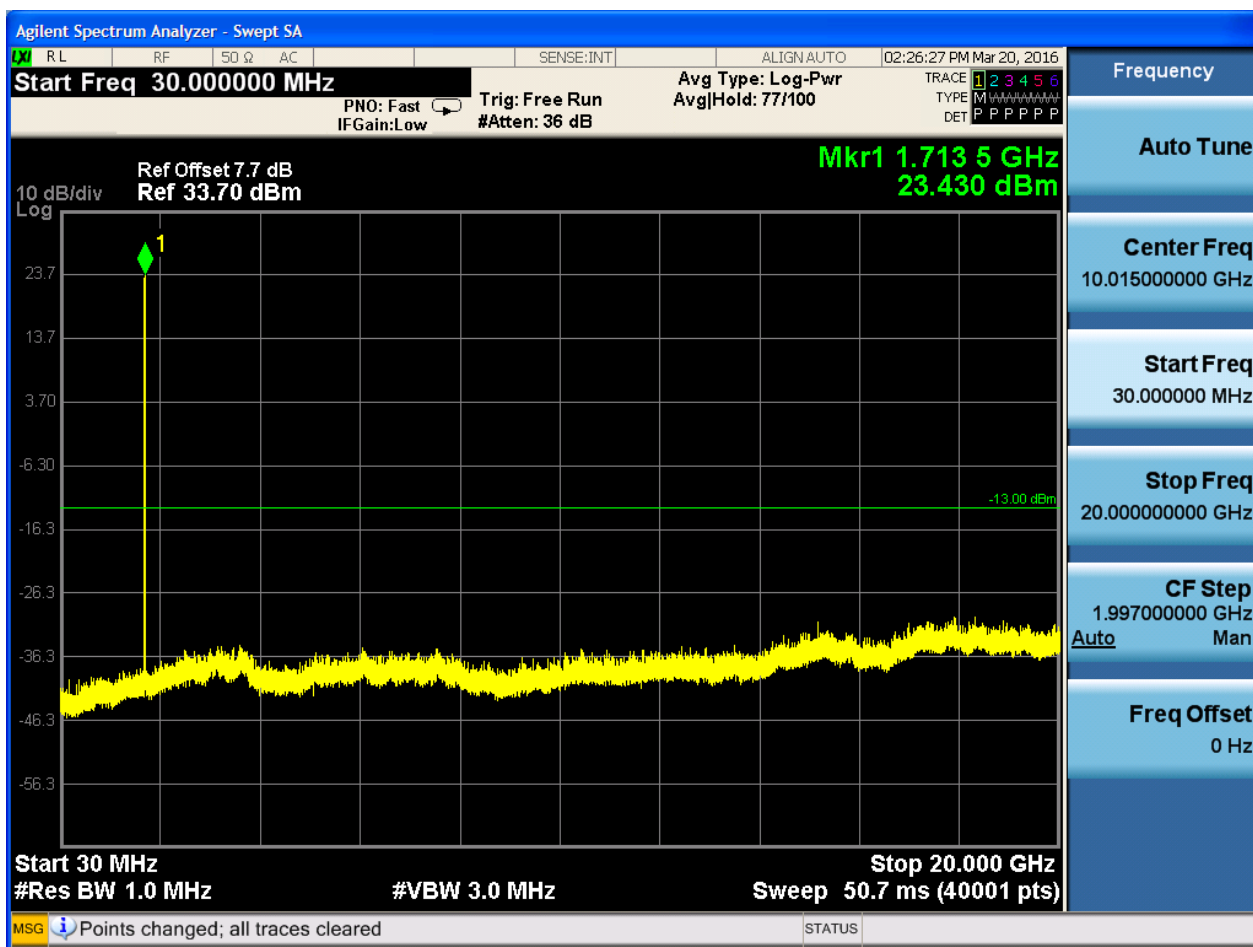
6.1.2 Test Band = WCDMA1700

6.1.2.1 Test Mode = UMTS/TM1

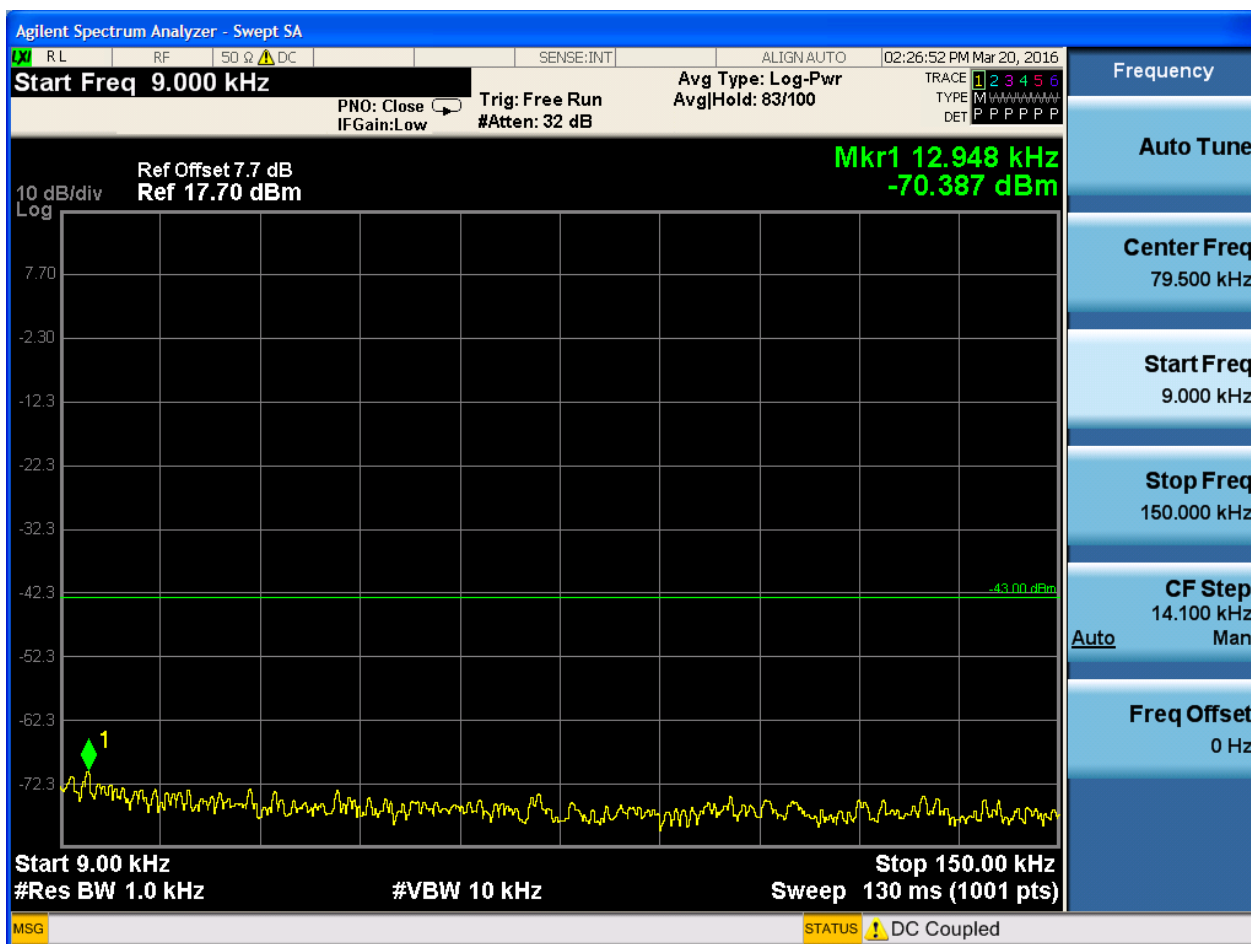
6.1.2.1.1 Test Channel = LCH

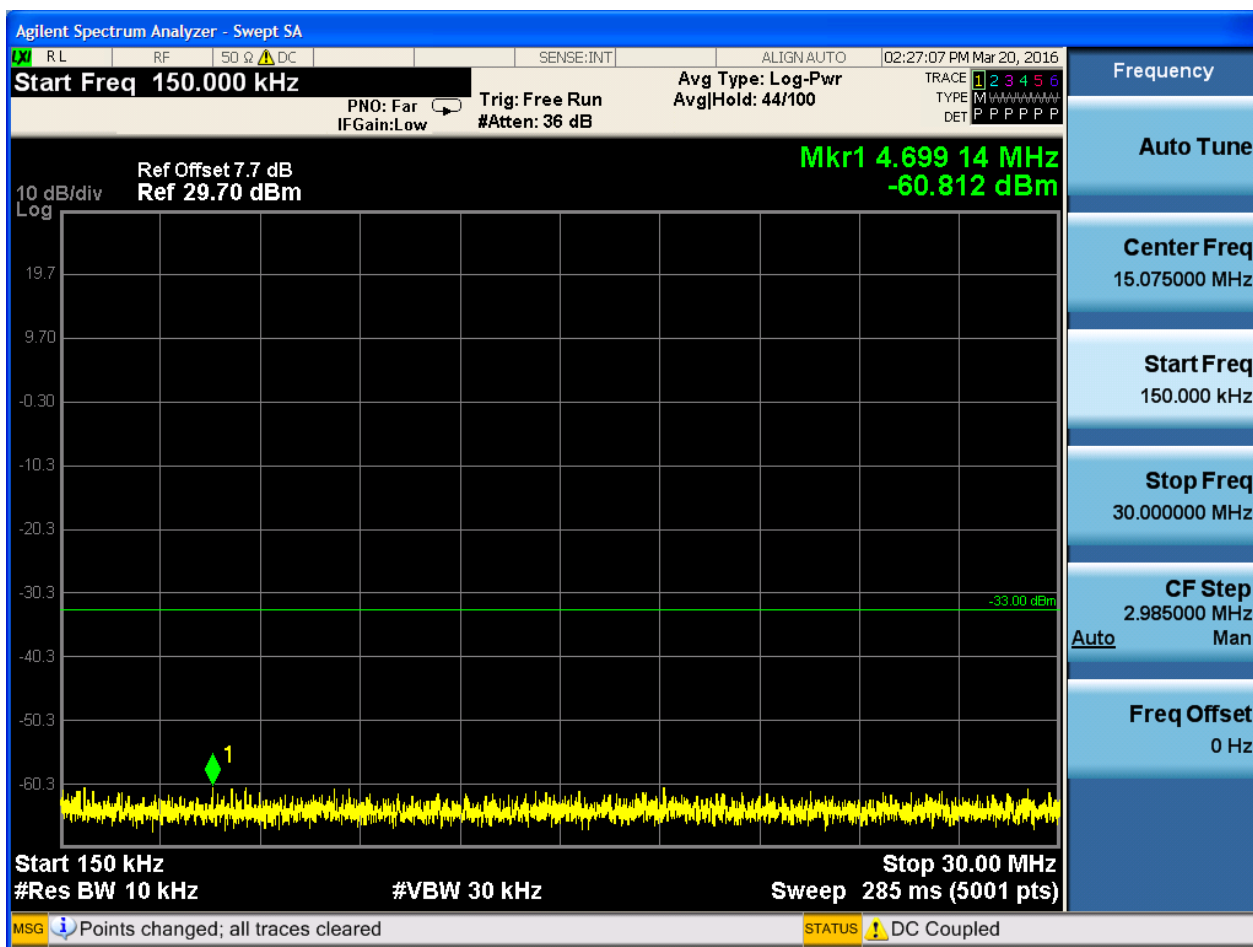


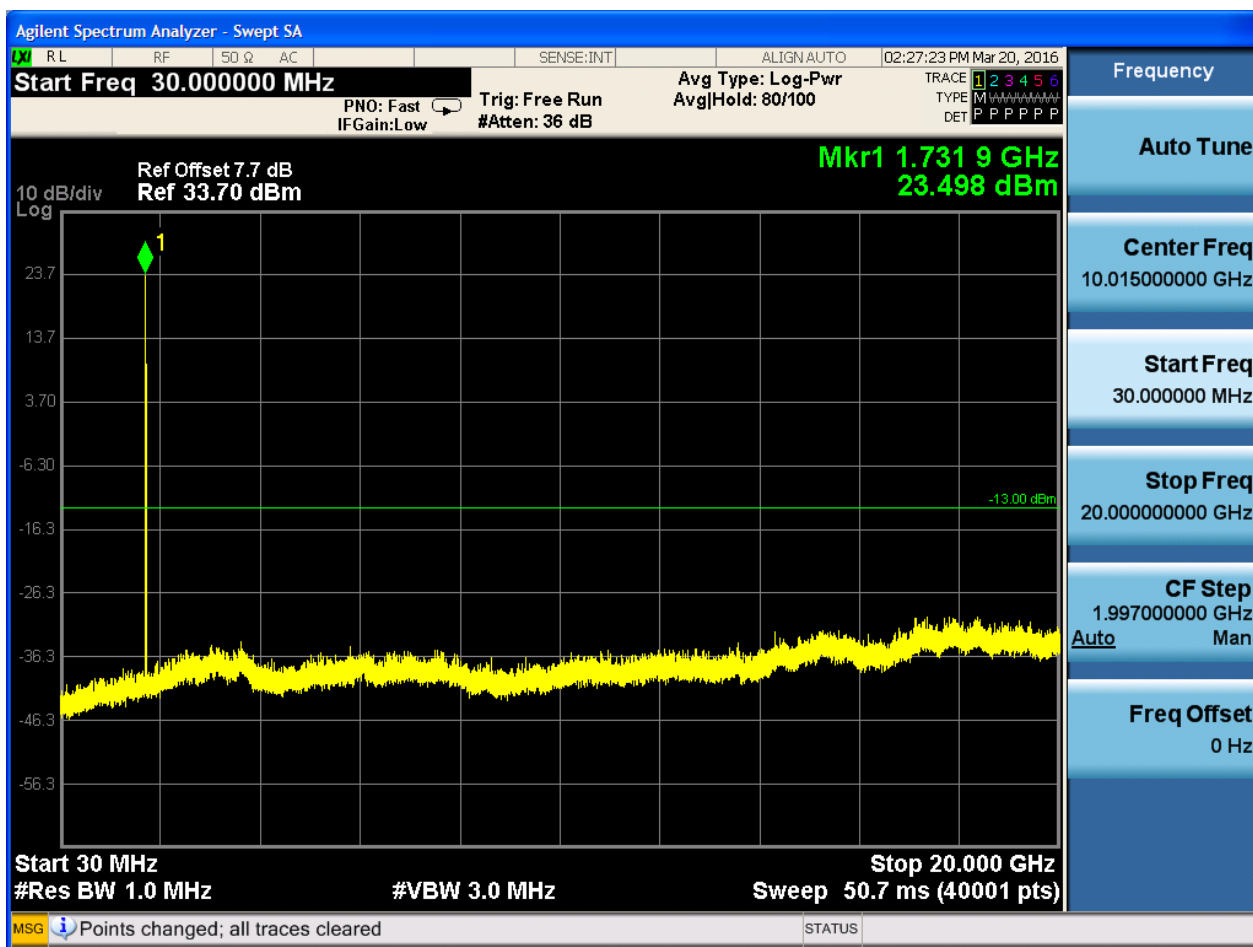




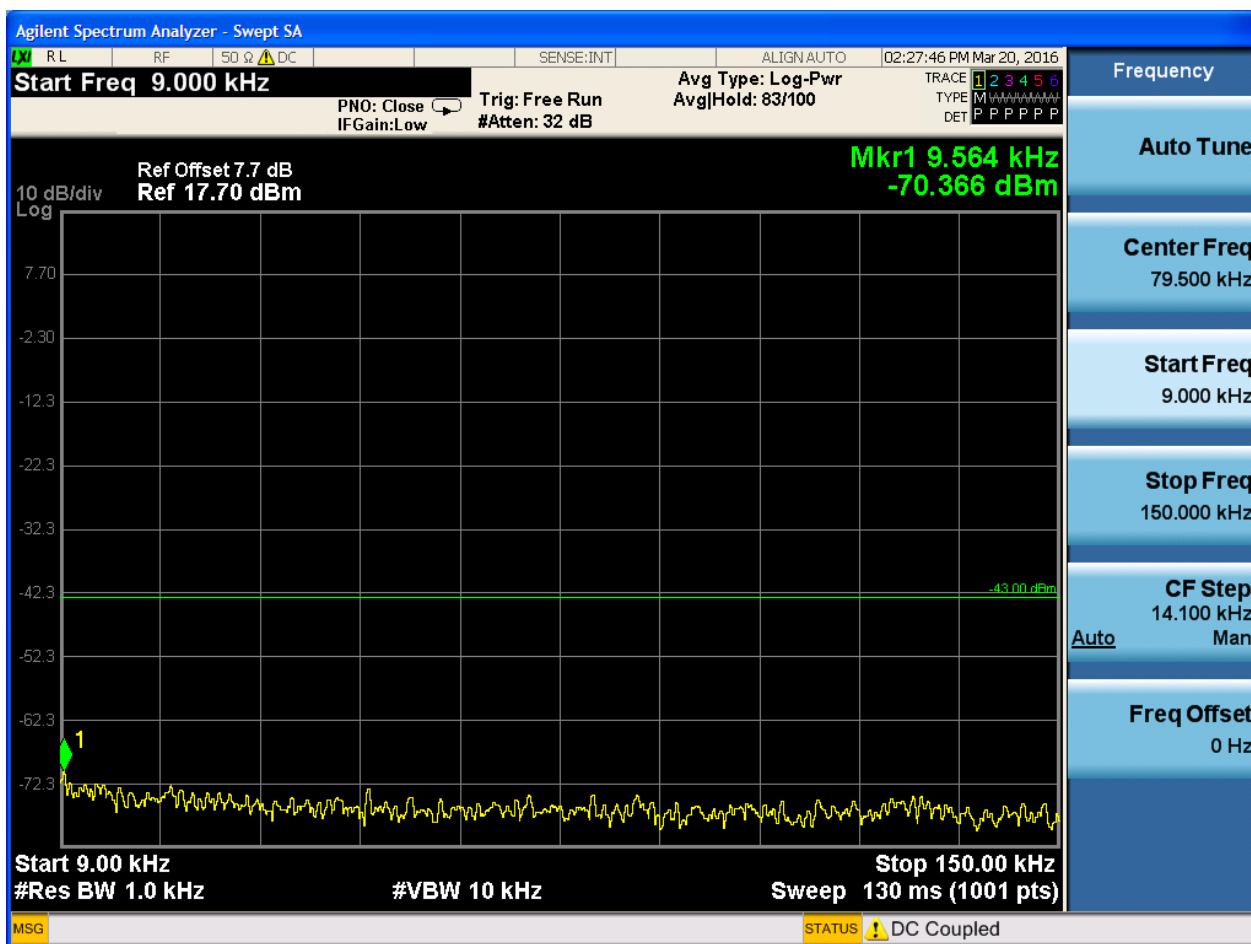
6.1.2.1.2 Test Channel = MCH

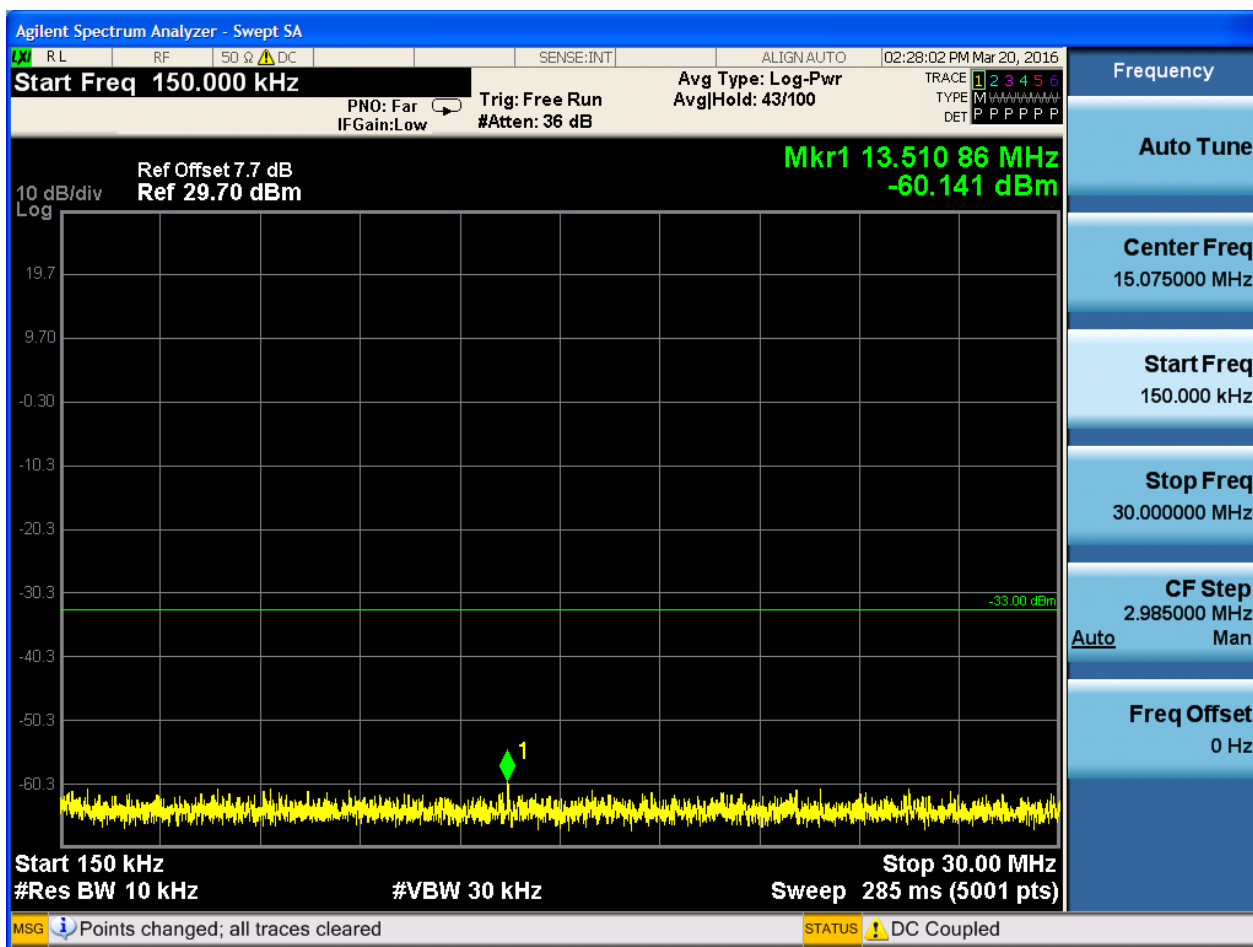


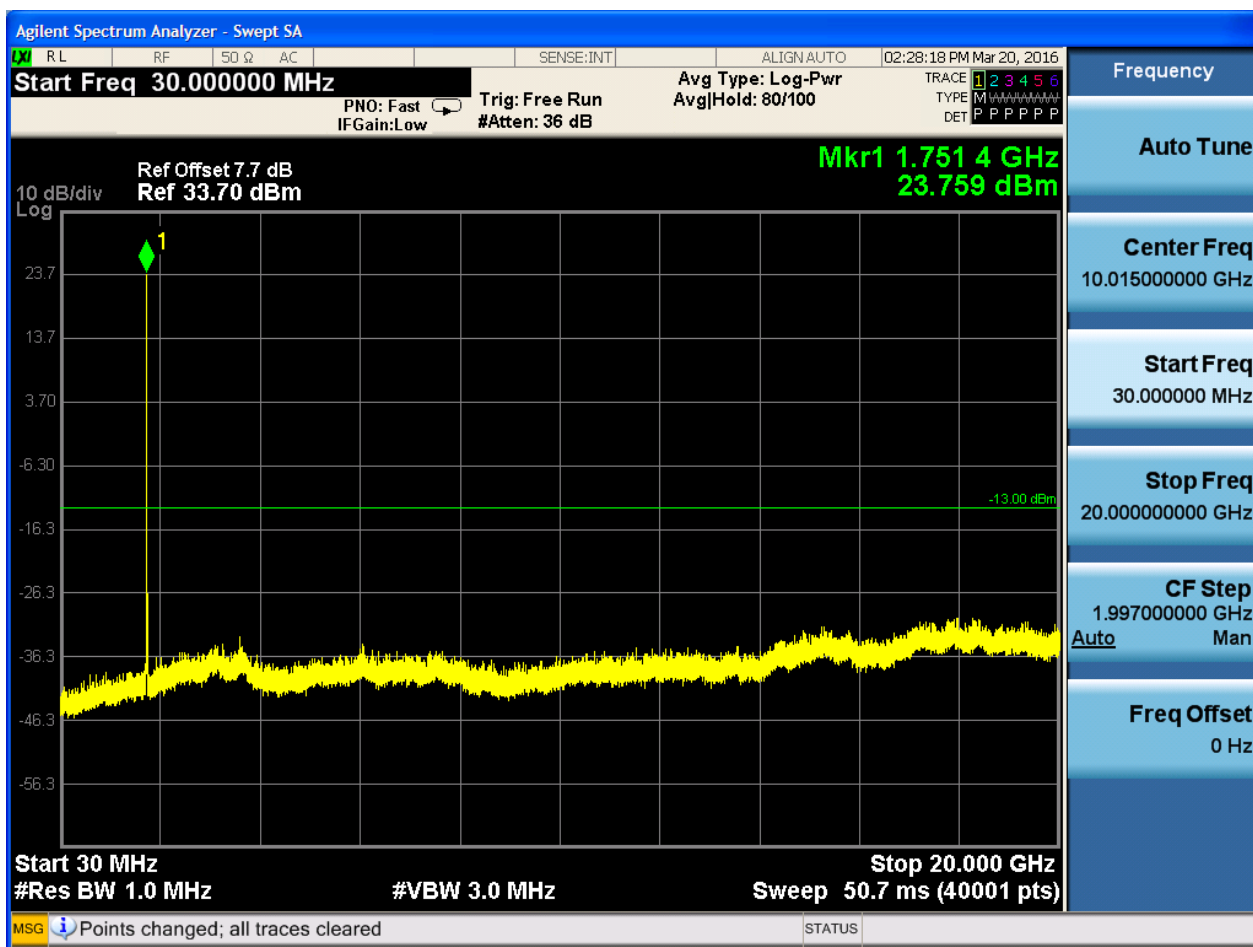




6.1.2.1.3 Test Channel = HCH



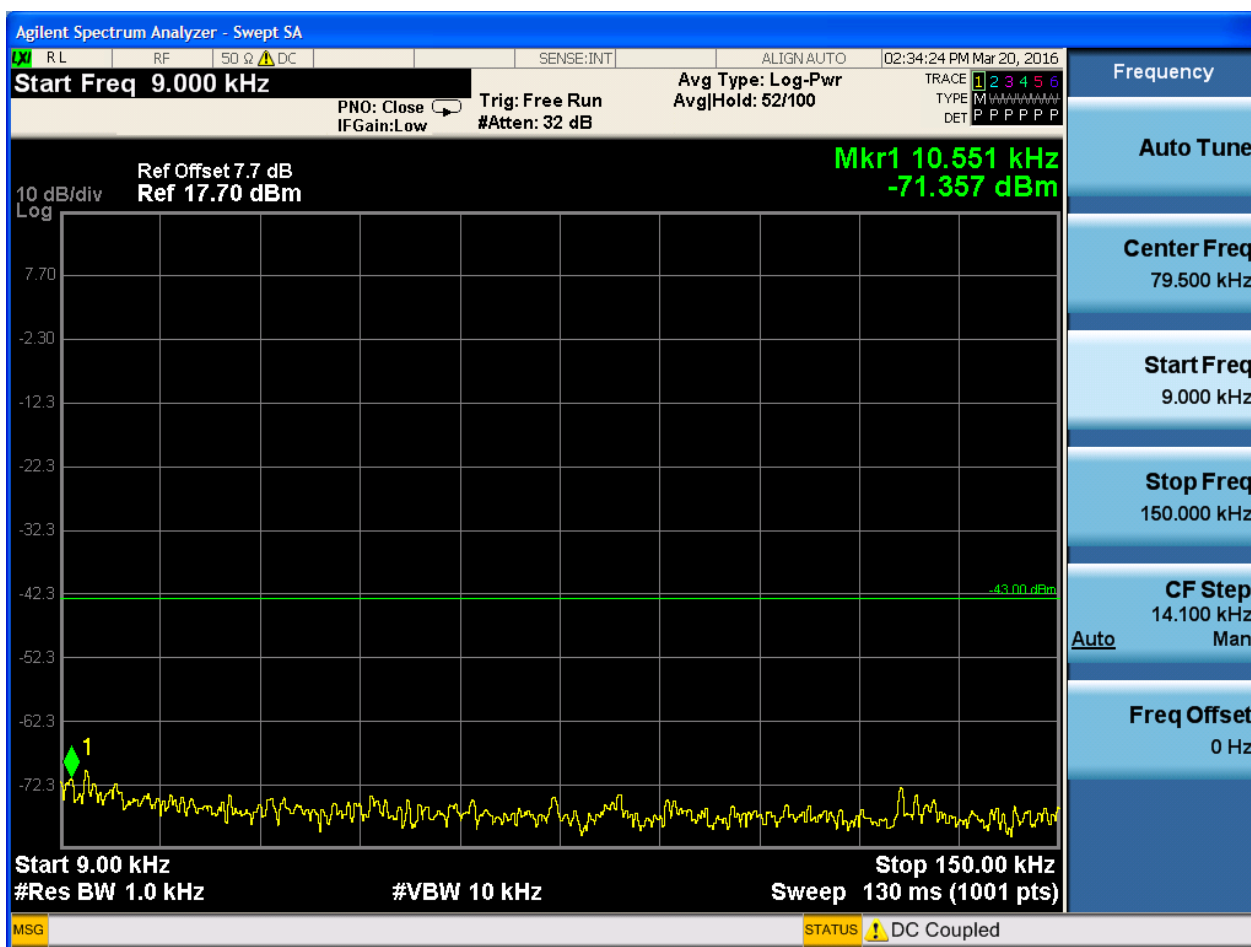


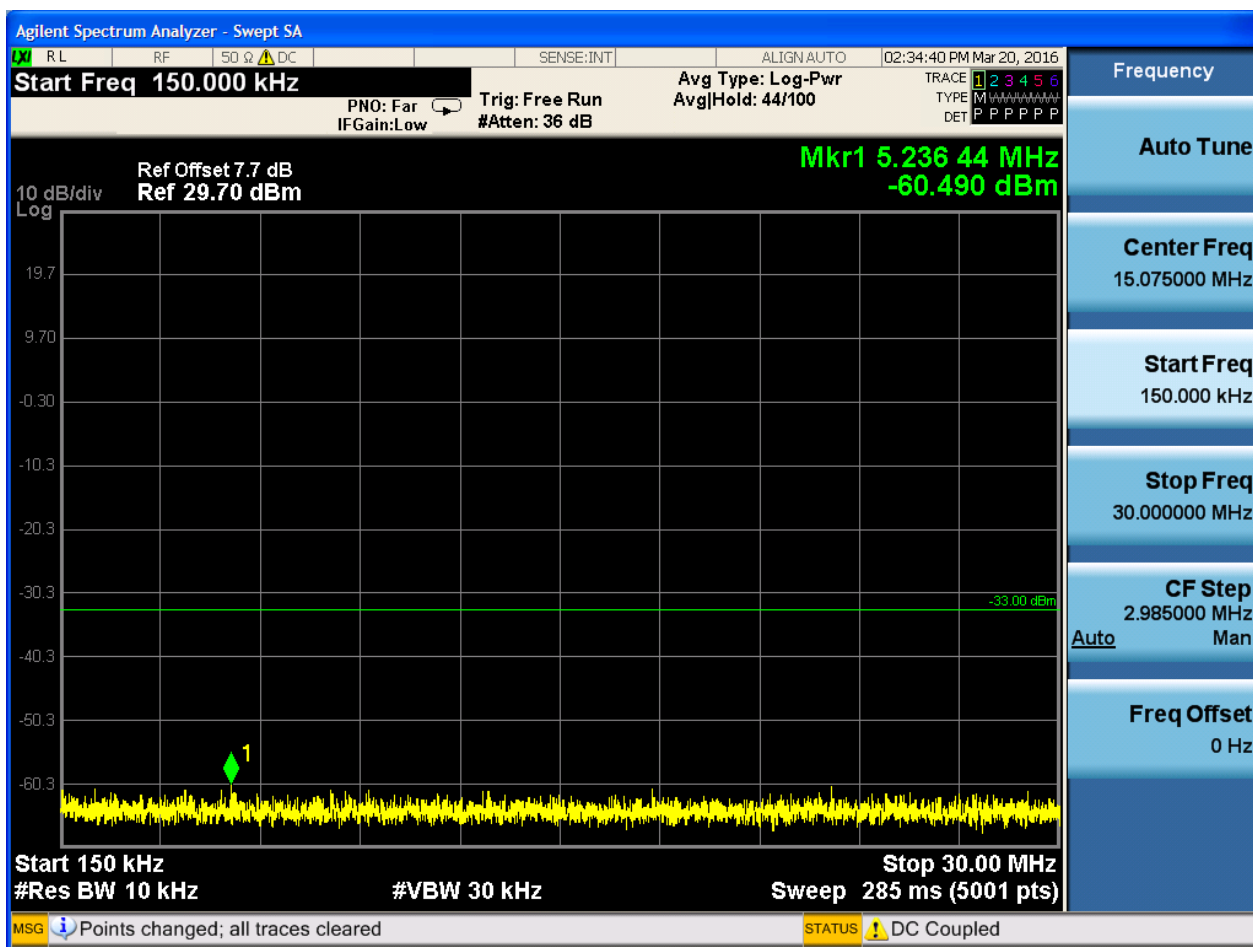


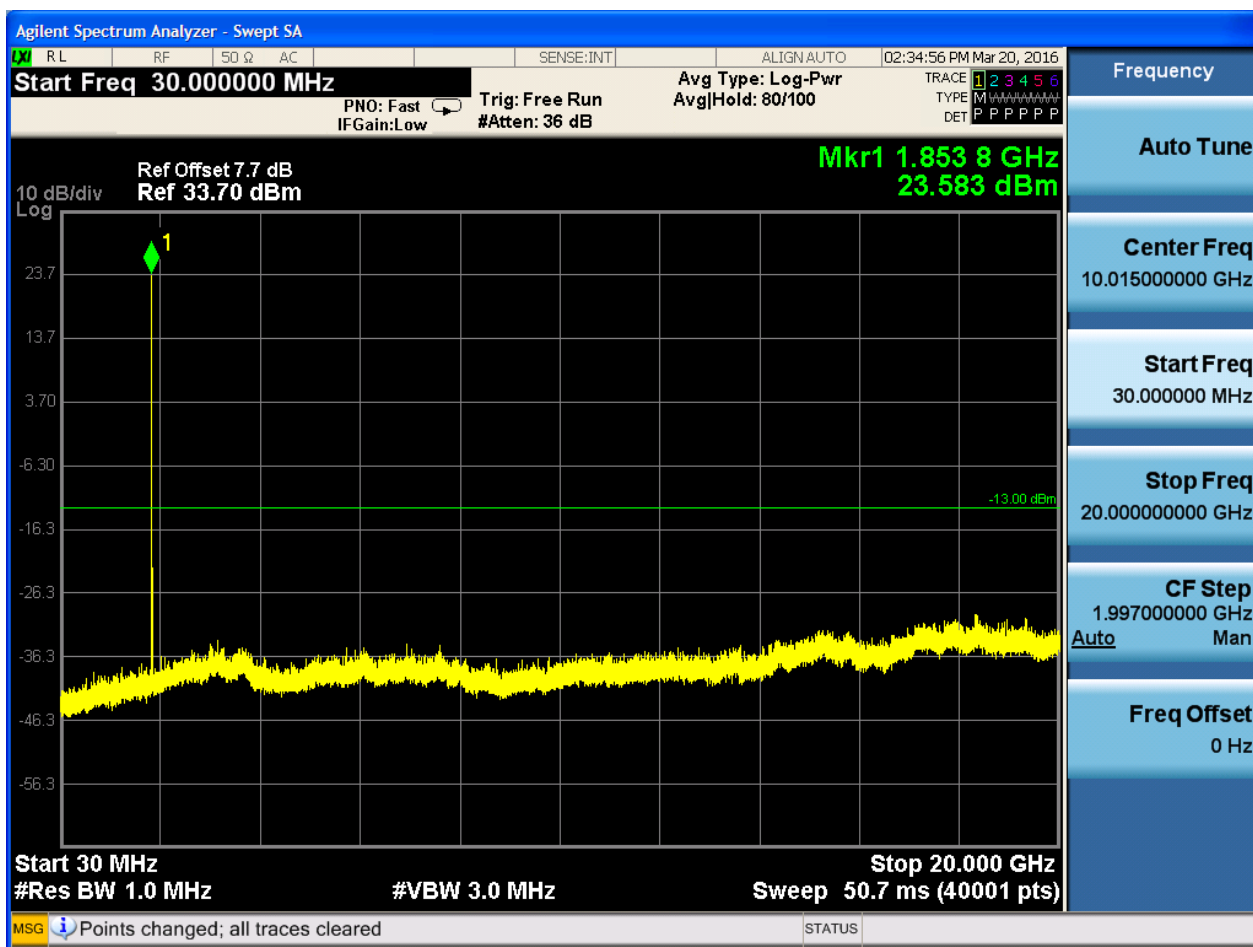
6.1.3 Test Band = WCDMA1900

6.1.3.1 Test Mode = UMTS/TM1

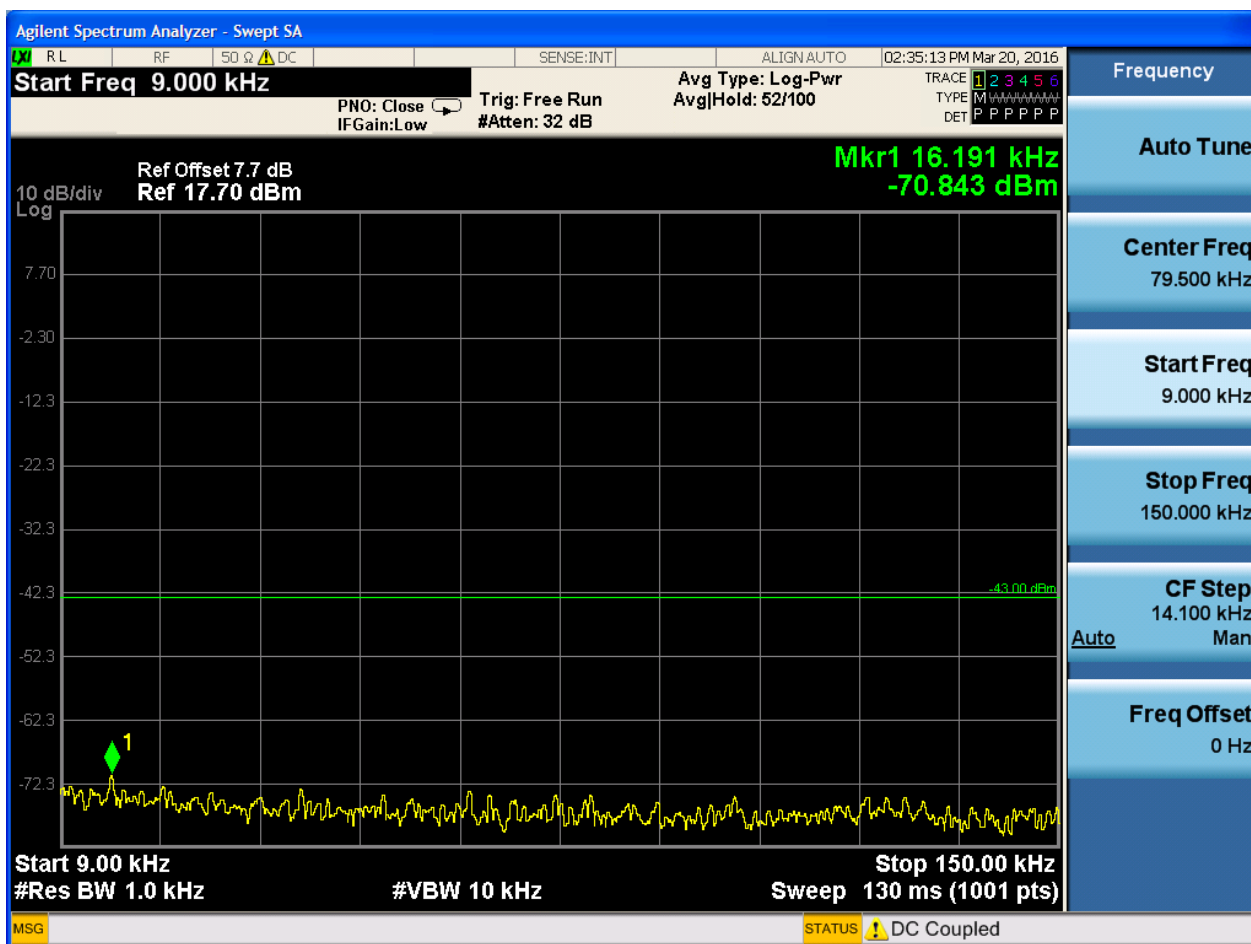
6.1.3.1.1 Test Channel = LCH

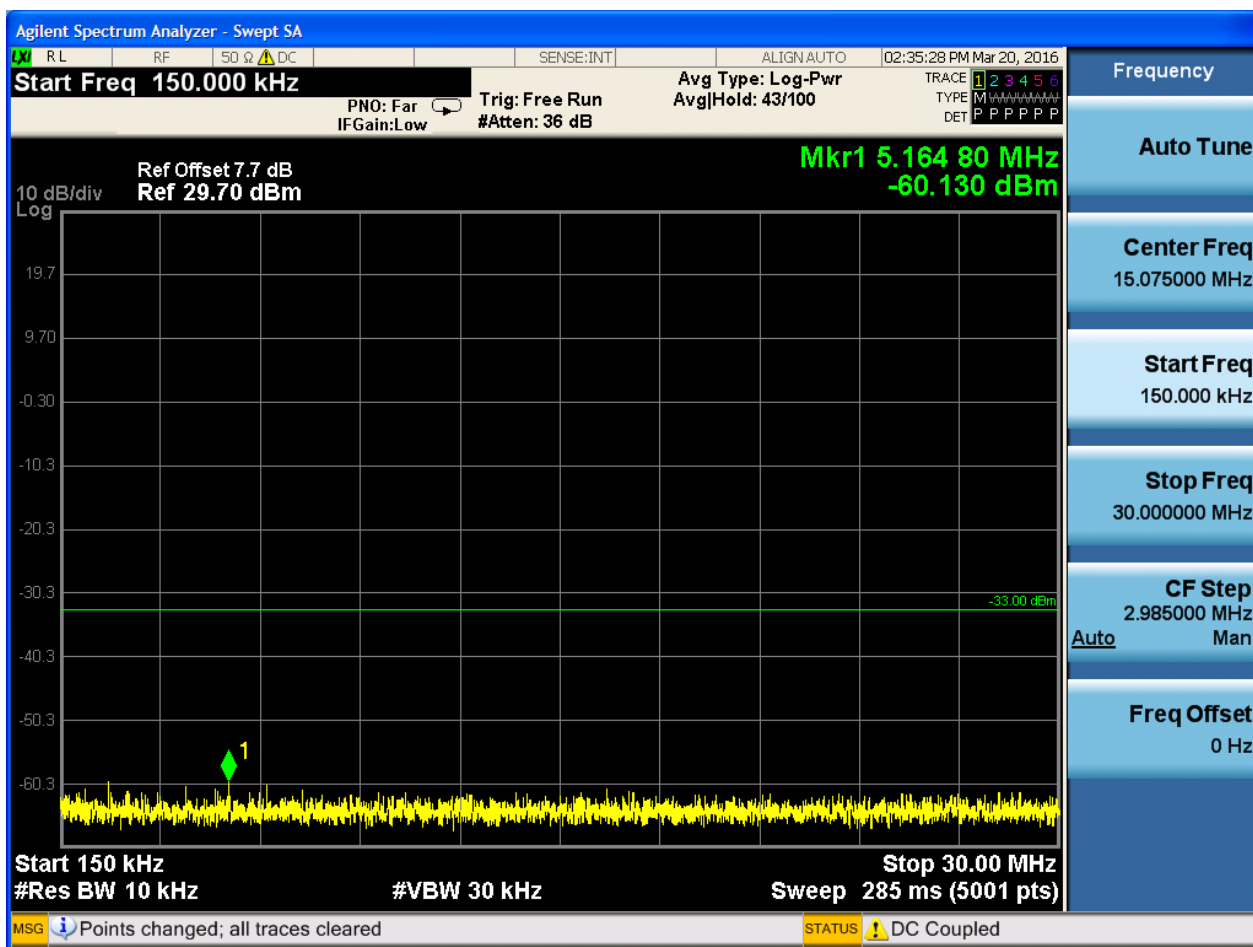


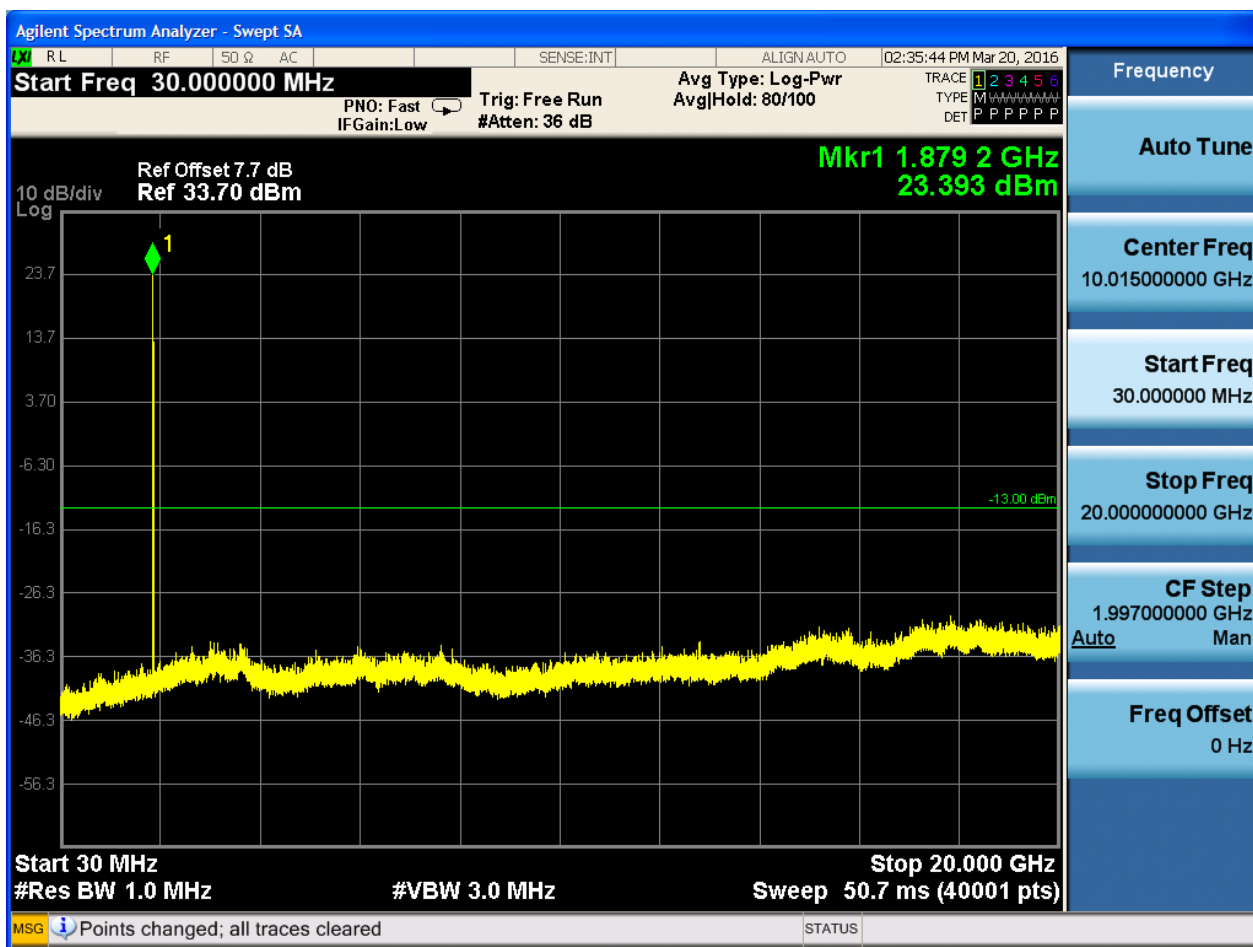




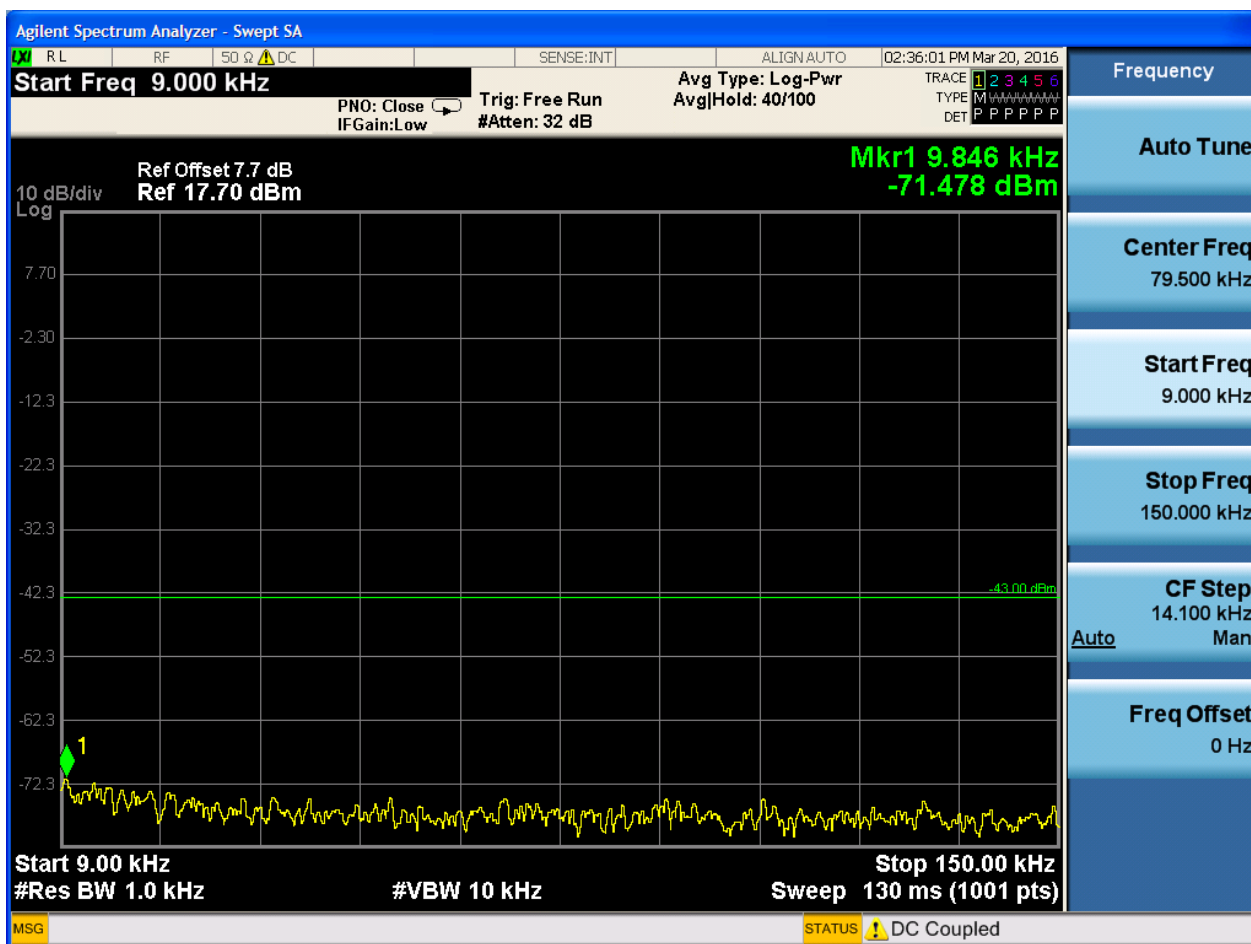
6.1.3.1.2 Test Channel = MCH

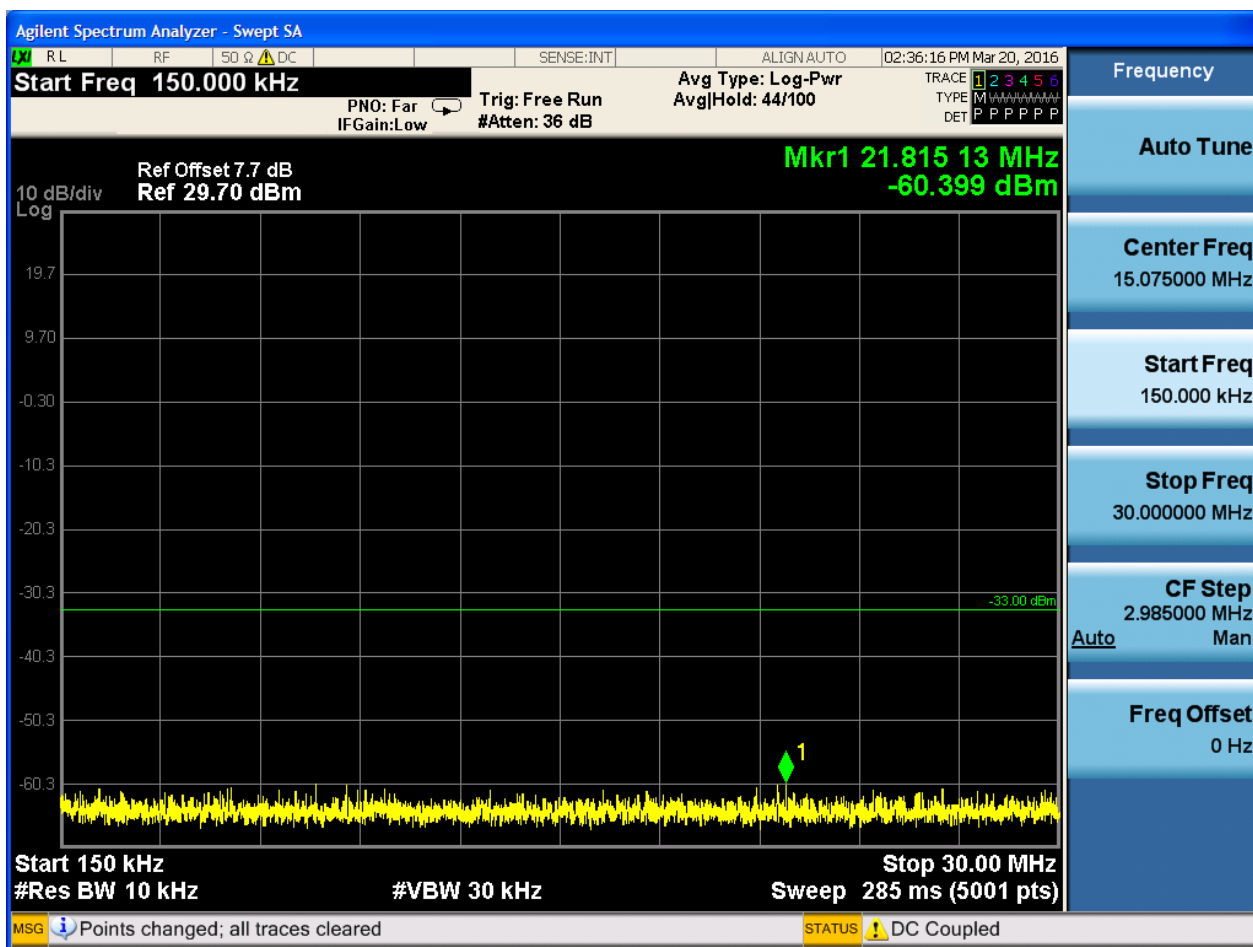


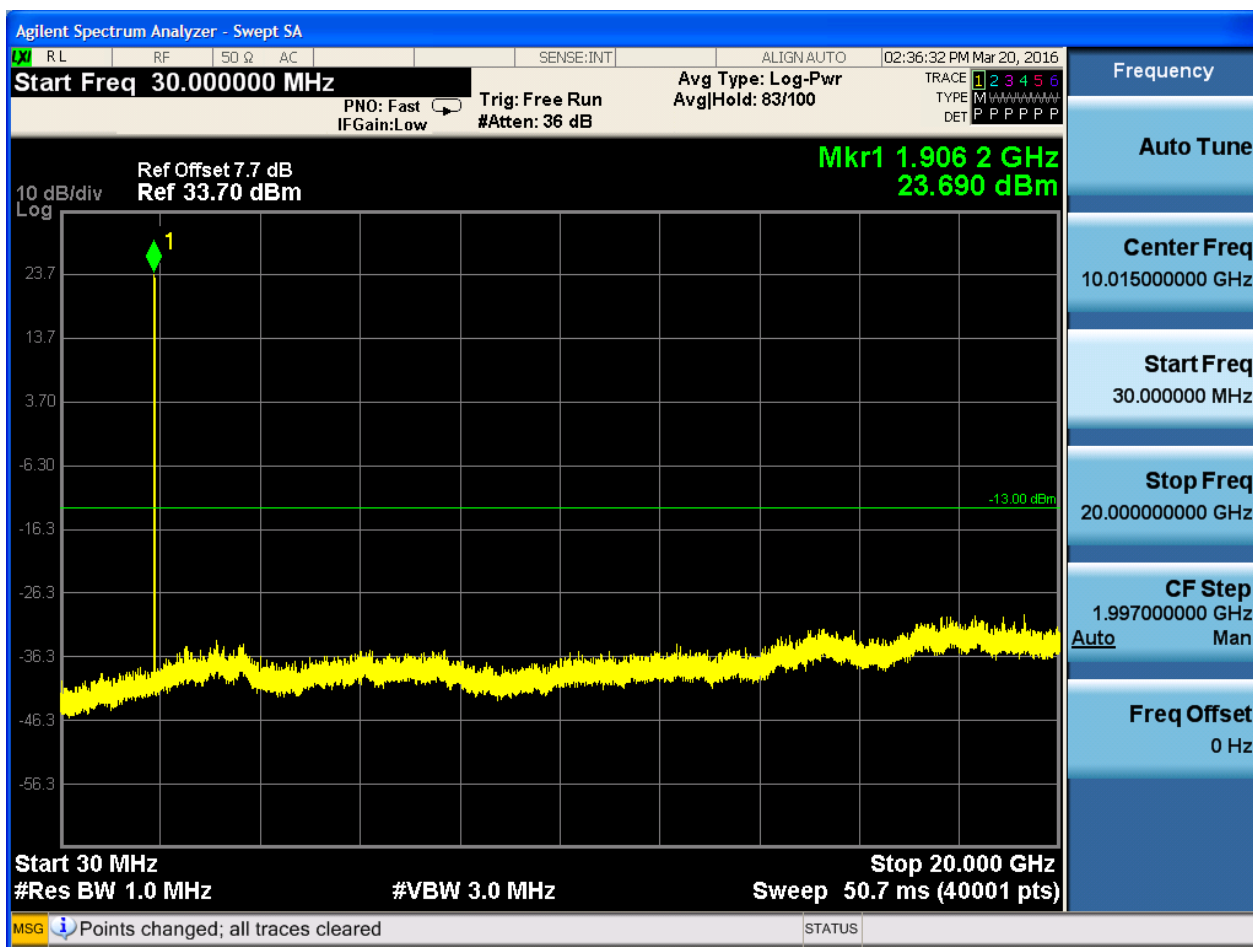




6.1.3.1.3 Test Channel = HCH









7Appendix_G: Field Strength of Spurious Radiation

Note:

9kHz~150kHz, VBW = 200Hz, VBW = 600 Hz, Detector: PK

150kHz~30MHz, VBW = 9kHz, VBW = 30k Hz, Detector: PK

30MHz~1GHz, RBW = 100 kHz, VBW = 300 kHz. Detector: PK

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

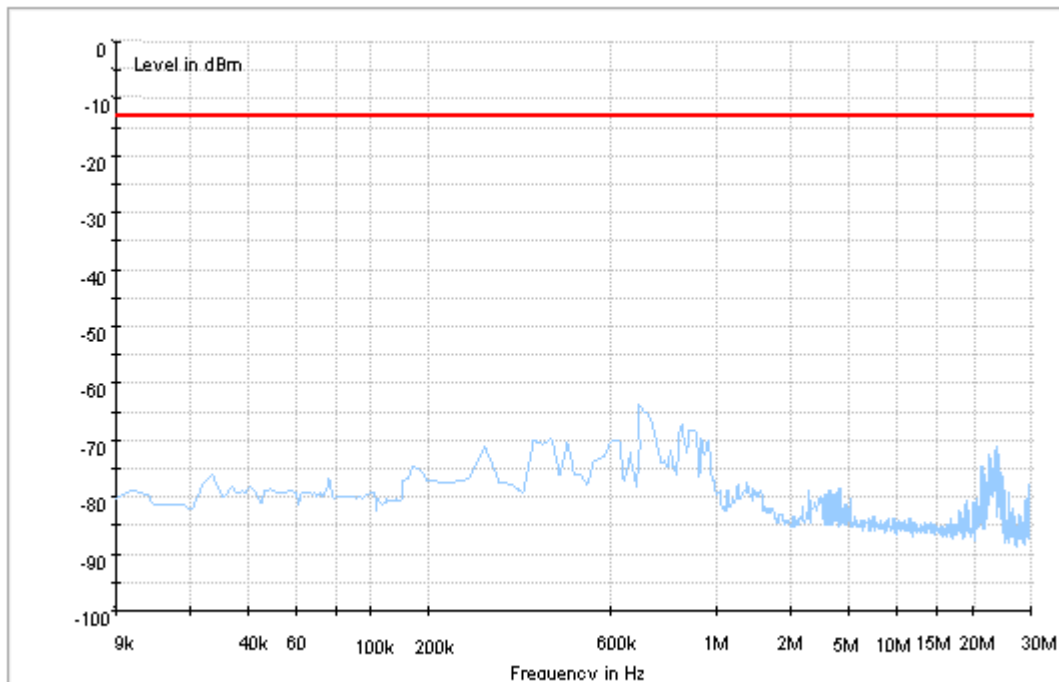
We tested all modes, but the data presented below is the worst case.

Part I - Test Plots

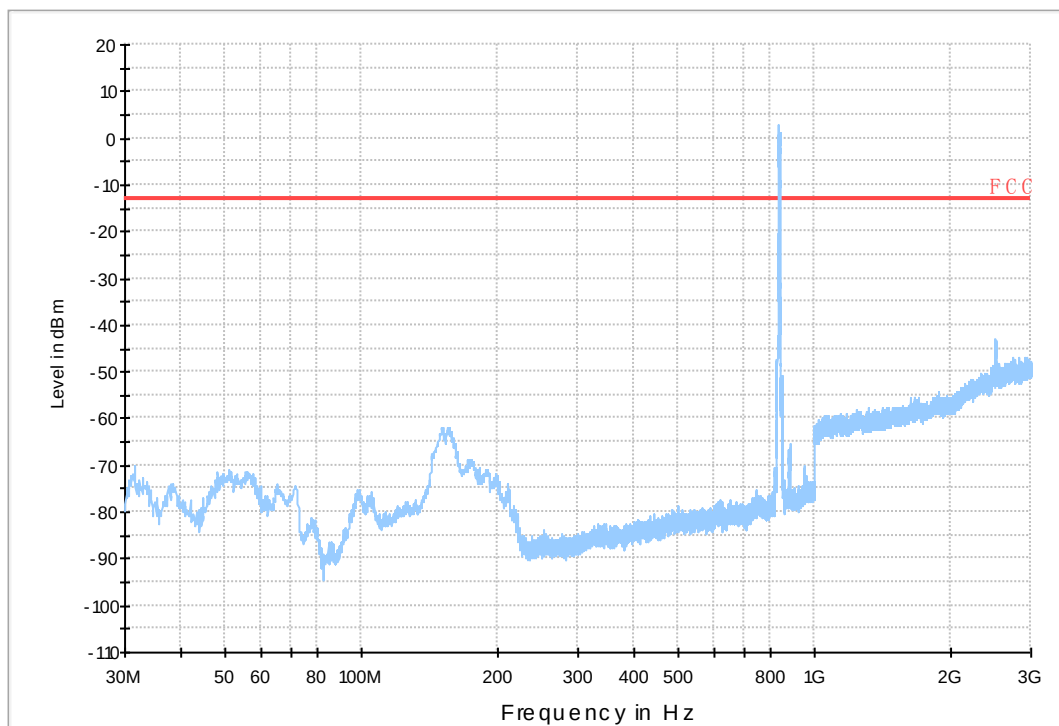
7.1 For UMTS

7.1.1 Test Band = WCDMA850

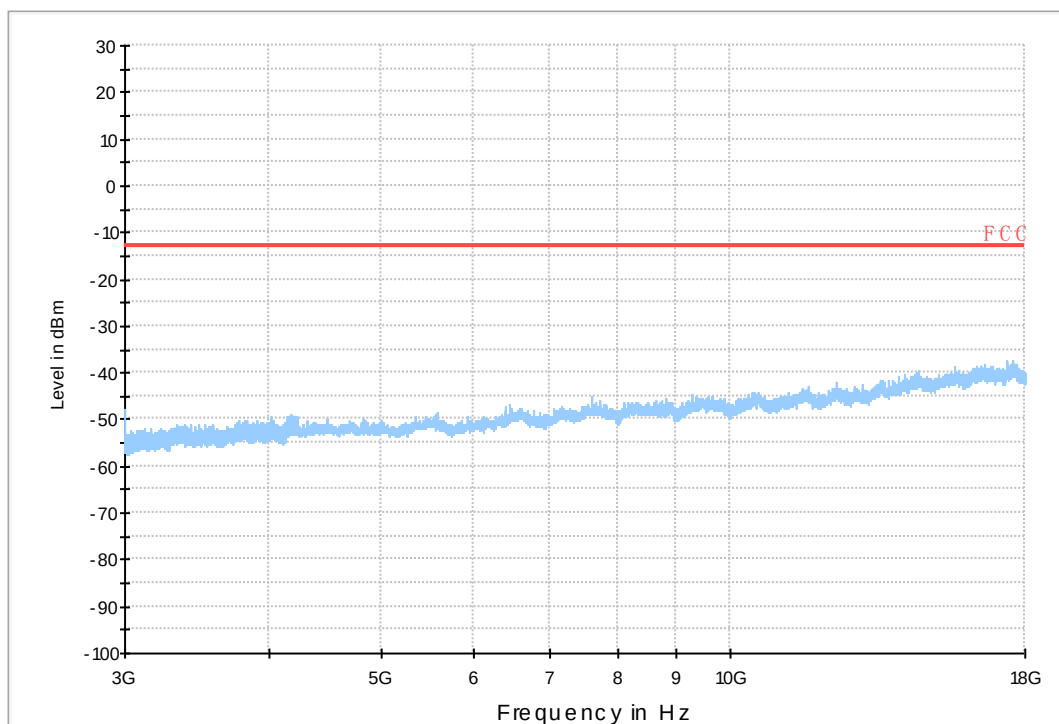
7.1.1.1 Test Mode = UMTS/TM1



Copy of FCC PART22 W CDMA850_L

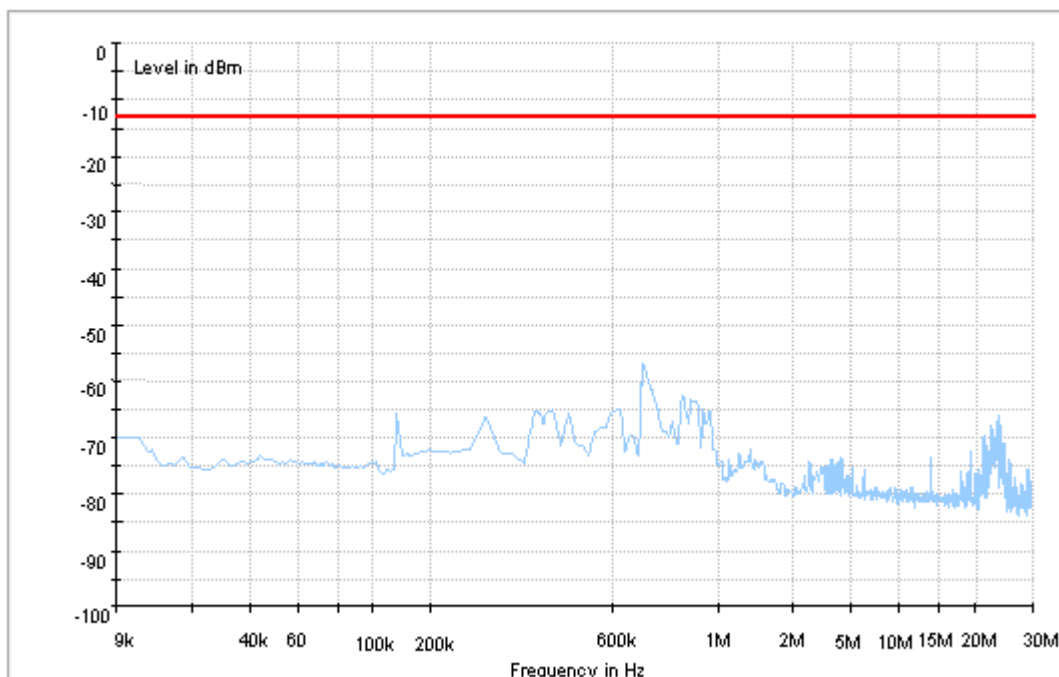


Copy of FCC PART22 GSM850_H

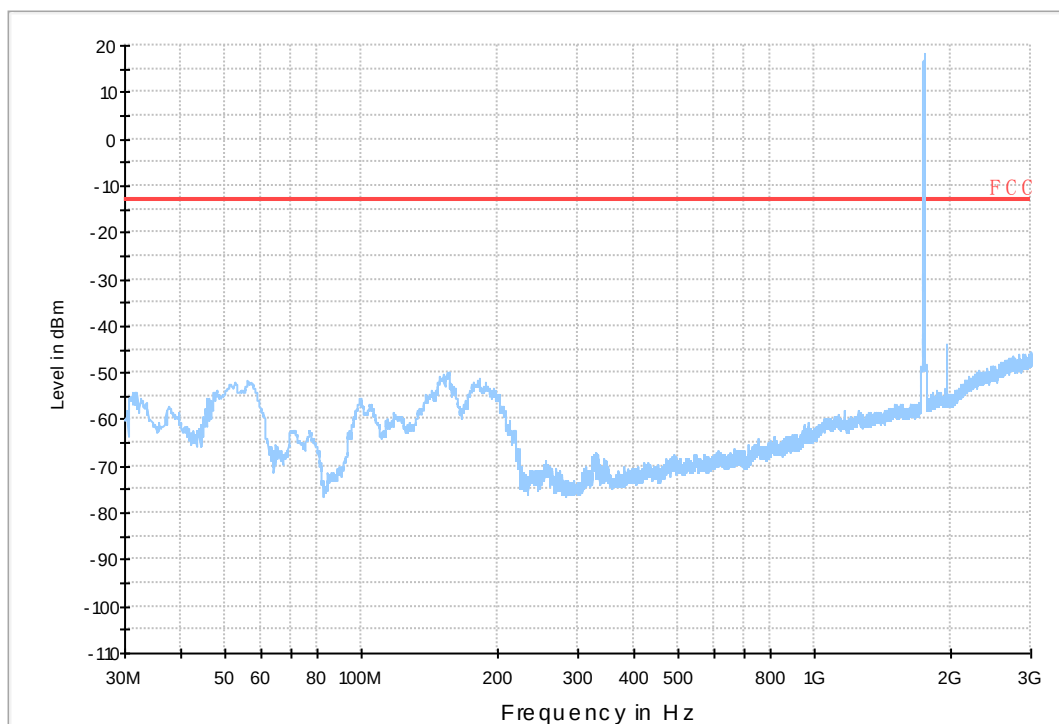


7.1.2 Test Band = WCDMA1700

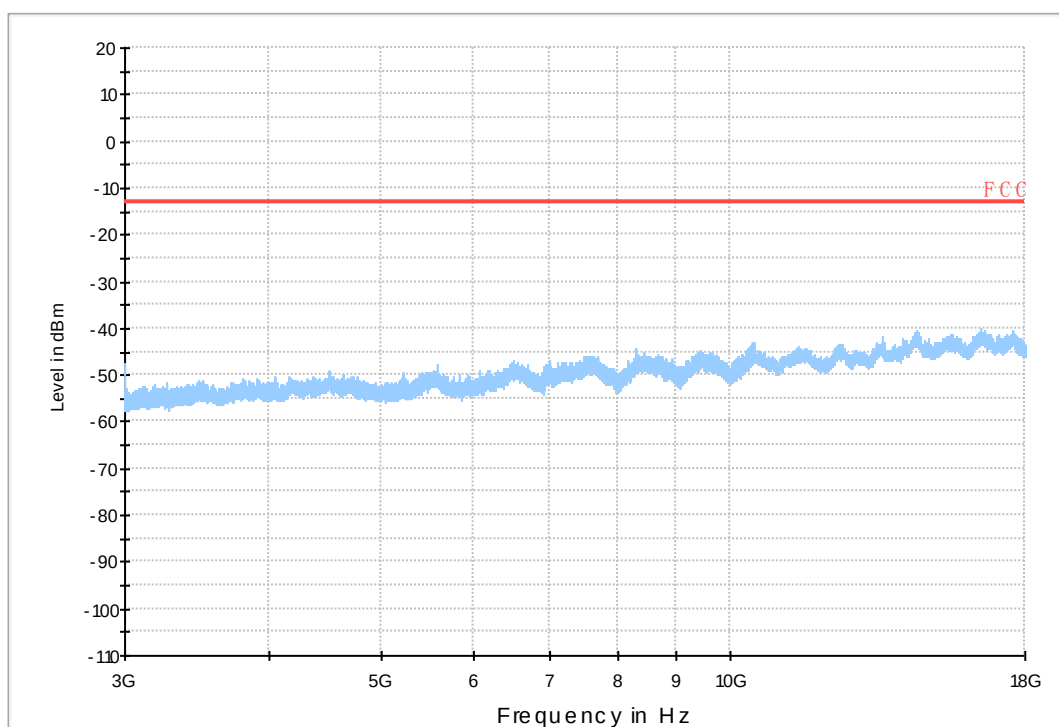
7.1.2.1 Test Mode = UMTS/TM1

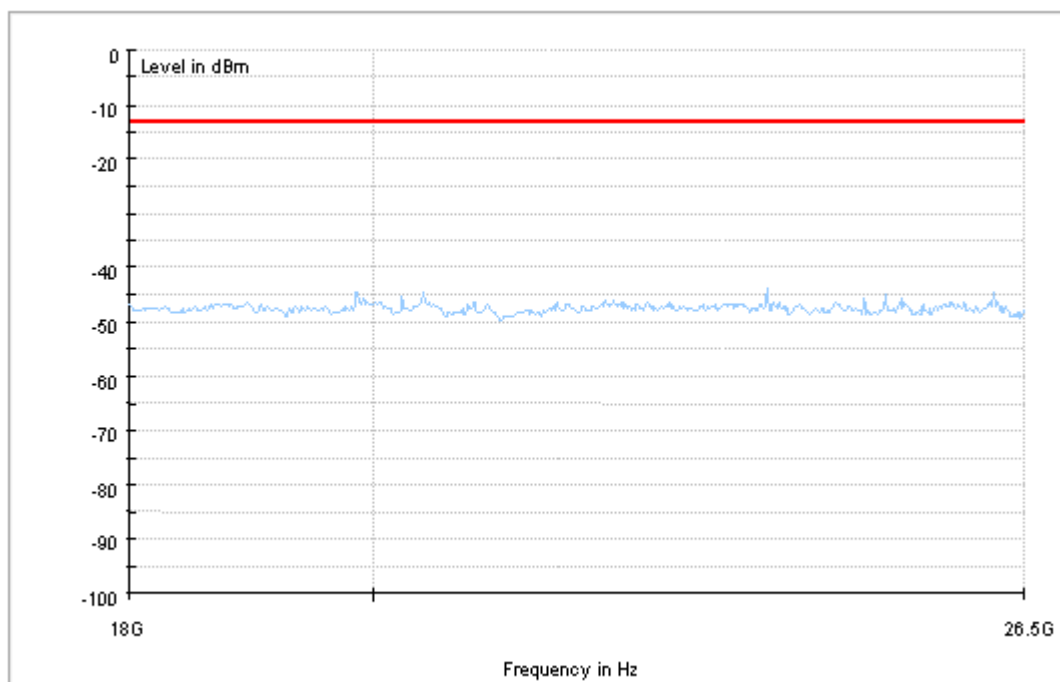


Copy of FCC PART27 W CDMA1700_L



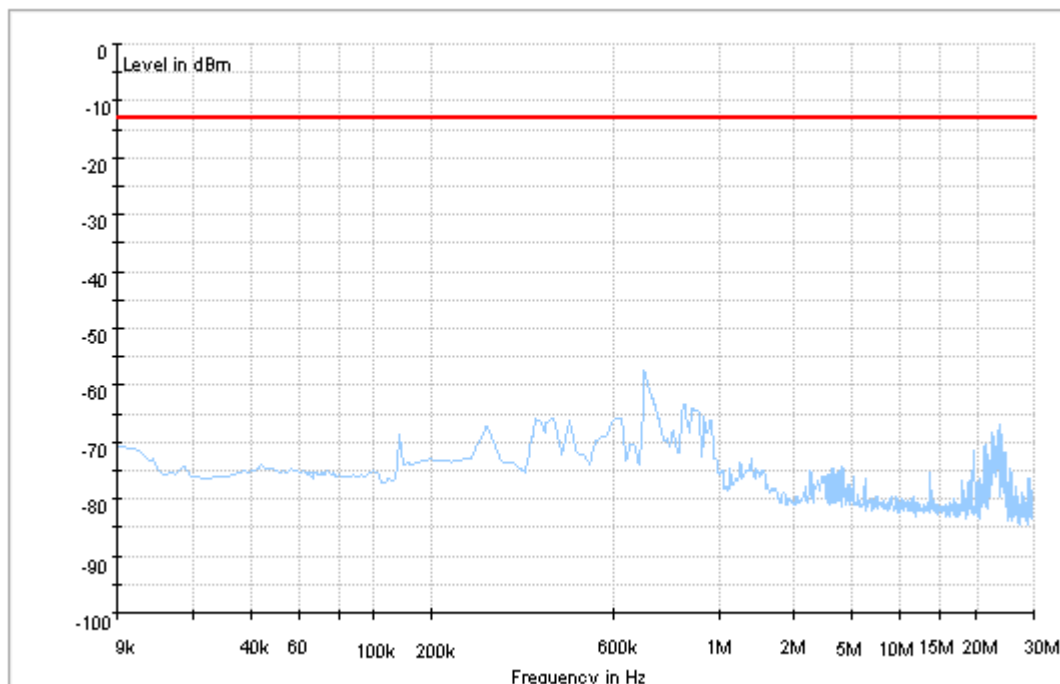
Copy of FCC PART27 W CDMA1700_H



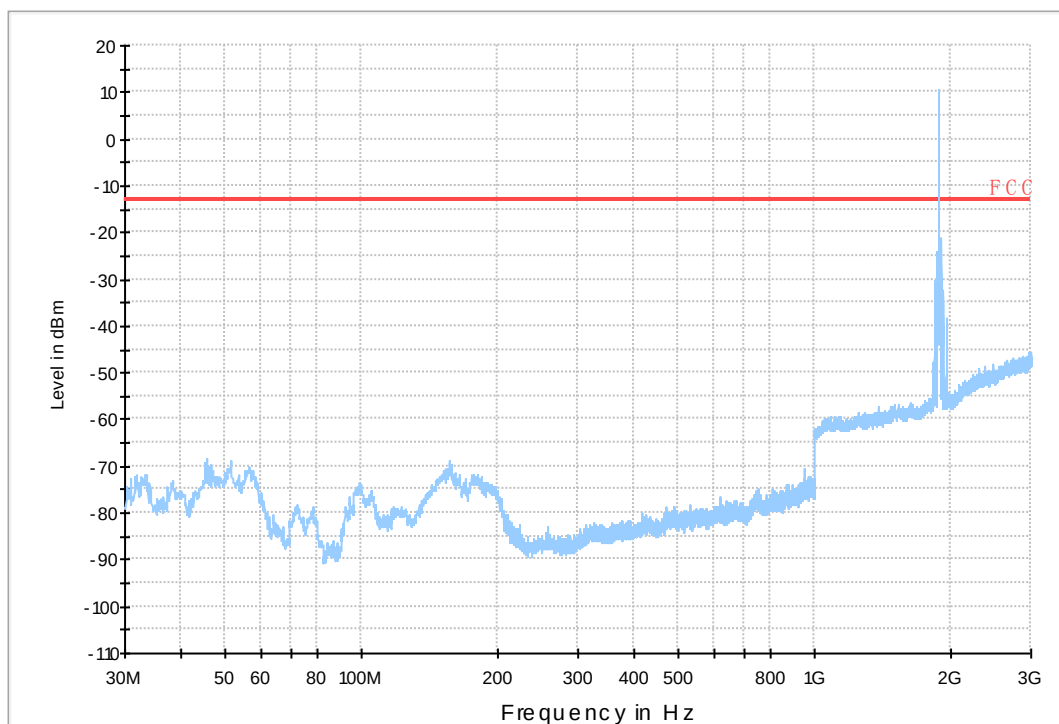


7.1.3 Test Band = WCDMA1900

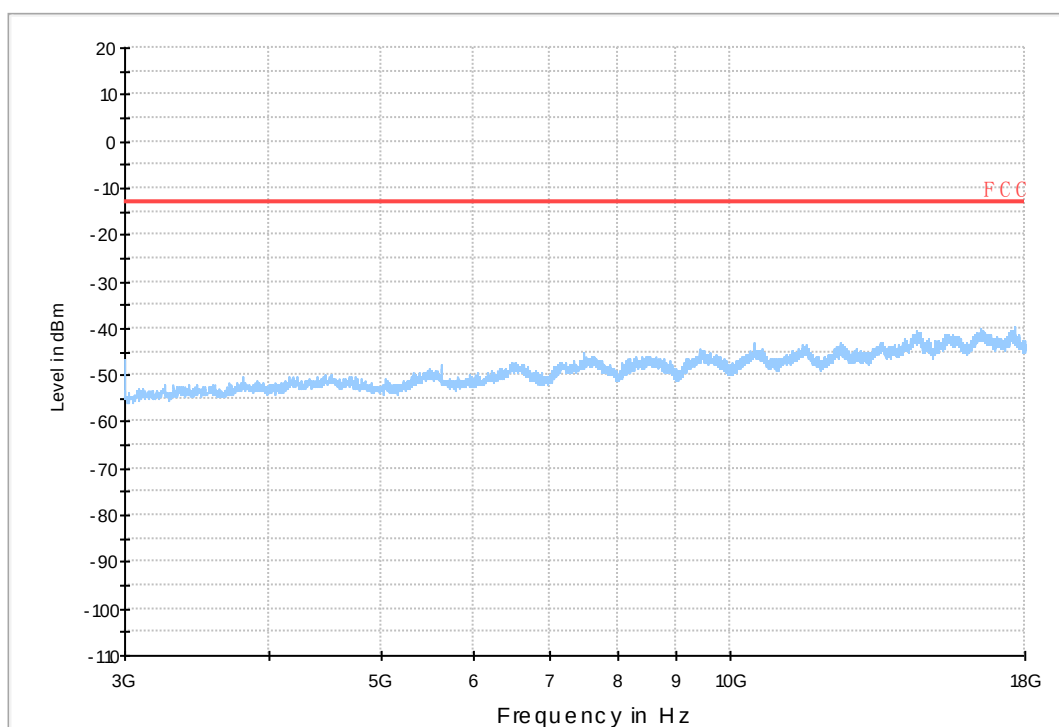
7.1.3.1 Test Mode = UMTS/TM1

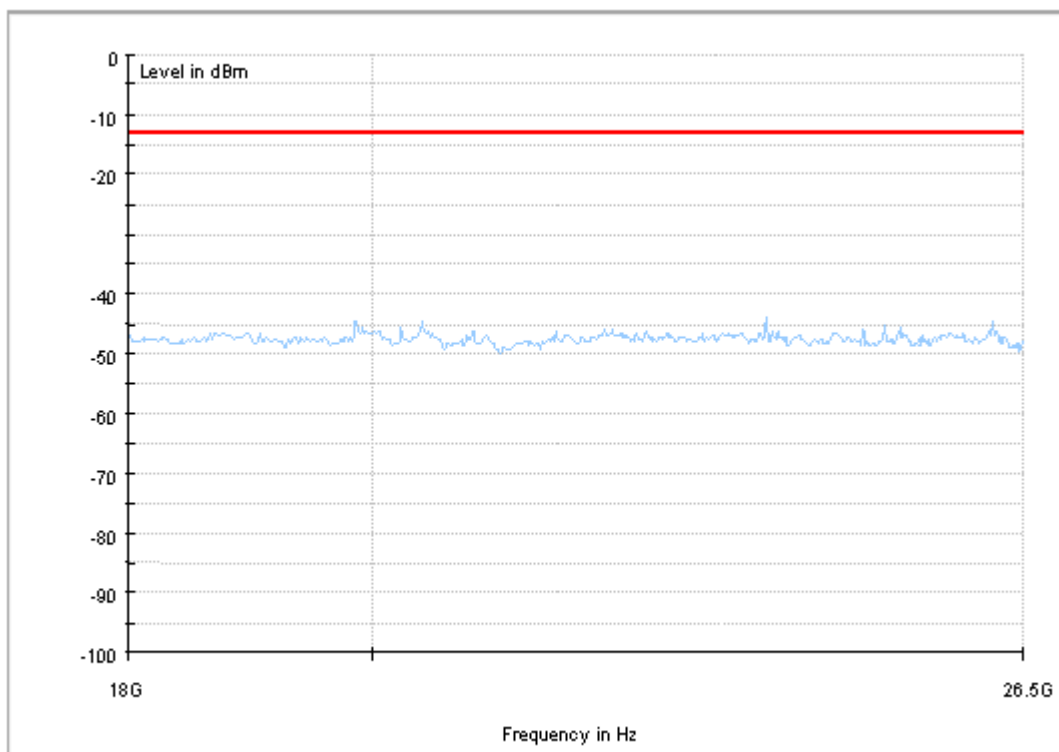


Copy of FCC PART24 W CDMA1900_L



Copy of FCC PART24 W CDMA1900_H





8Appendix_H: Frequency Stability

8.1 For UMTS

8.1.1Frequency 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	-4.67	-0.00565	PASS
				VN	4.44	0.00537	PASS
				VH	-7.42	-0.00898	PASS
		MCH	TN	VL	-3.13	-0.00374	PASS
				VN	-5.94	-0.0071	PASS
				VH	-1.31	-0.00157	PASS
		HCH	TN	VL	-0.43	-0.00051	PASS
				VN	-9.93	-0.01173	PASS
				VH	-6.76	-0.00798	PASS
WCDMA1700	UMTS/TM1	LCH	TN	VL	-4.27	-0.00249	PASS
				VN	-1.19	-0.00069	PASS
				VH	-11.52	-0.00673	PASS
		MCH	TN	VL	3.8	0.00219	PASS
				VN	3.04	0.00175	PASS
				VH	7.49	0.00432	PASS
		HCH	TN	VL	10.74	0.00613	PASS
				VN	3.22	0.00184	PASS
				VH	3.78	0.00216	PASS
WCDMA1900	UMTS/TM1	LCH	TN	VL	5.8	0.00313	PASS
				VN	-6.91	-0.00373	PASS
				VH	3.54	0.00191	PASS
		MCH	TN	VL	2.24	0.00119	PASS
				VN	0.08	0.00004	PASS
				VH	-8.24	-0.00438	PASS
		HCH	TN	VL	3.75	0.00197	PASS
				VN	-0.14	-0.00007	PASS
				VH	4.91	0.00257	PASS

8.1.2 Frequency Error vs. Temperature:

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA850	UMTS/TM1	LCH	VN	-30	3.34	0.00404	PASS
				-20	-4.59	-0.00555	PASS
				-10	-2.76	-0.00334	PASS
				0	-9.87	-0.01194	PASS
				10	-11.11	-0.01344	PASS
				20	-0.63	-0.00076	PASS
				30	7.22	0.00874	PASS
				40	-3.45	-0.00417	PASS
				50	-12.19	-0.01475	PASS
		MCH	VN	-30	-6.59	-0.00788	PASS
				-20	4.29	0.00513	PASS
				-10	-7.55	-0.00903	PASS
				0	-2.93	-0.0035	PASS
				10	-9.03	-0.0108	PASS
				20	-6.16	-0.00736	PASS
				30	1.71	0.00204	PASS
				40	-6.91	-0.00826	PASS
				50	-0.64	-0.00077	PASS
		HCH	VN	-30	-3.36	-0.00397	PASS
				-20	-2.96	-0.0035	PASS
				-10	-6.21	-0.00734	PASS
				0	-4.56	-0.00539	PASS
				10	2.99	0.00353	PASS
				20	-4.07	-0.00481	PASS
				30	-7.92	-0.00936	PASS
				40	-3.14	-0.00371	PASS
				50	-4.17	-0.00493	PASS
WCDMA1700	UMTS/TM1	LCH	VN	-30	-6.5	-0.0038	PASS
				-20	15.34	0.00896	PASS
				-10	7.77	0.00454	PASS
				0	-7.23	-0.00422	PASS
				10	3.4	0.00199	PASS
				20	-5.39	-0.00315	PASS
				30	-14.28	-0.00834	PASS
				40	-10.74	-0.00627	PASS
				50	0.79	0.00046	PASS
		MCH	VN	-30	0.43	0.00025	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-20	7.78	0.00449	PASS
				-10	0.67	0.00039	PASS
				0	16.1	0.00929	PASS
				10	17.58	0.01015	PASS
				20	-19.49	-0.01125	PASS
				30	-3.01	-0.00174	PASS
				40	7.42	0.00428	PASS
				50	1.31	0.00076	PASS
		HCH	VN	-30	5.25	0.003	PASS
				-20	7.75	0.00442	PASS
				-10	4.91	0.0028	PASS
				0	-6.23	-0.00355	PASS
				10	4.03	0.0023	PASS
				20	2.78	0.00159	PASS
				30	6.64	0.00379	PASS
				40	-5.86	-0.00334	PASS
				50	-0.78	-0.00045	PASS
WCDMA1900	UMTS/TM1	LCH	VN	-30	-5.62	-0.00303	PASS
				-20	-1.53	-0.00083	PASS
				-10	-1.05	-0.00057	PASS
				0	1.46	0.00079	PASS
				10	11.7	0.00632	PASS
				20	-1.22	-0.00066	PASS
				30	-0.38	-0.00021	PASS
				40	-7.58	-0.00409	PASS
				50	4.39	0.00237	PASS
		MCH	VN	-30	3.42	0.00182	PASS
				-20	-6.18	-0.00329	PASS
				-10	4.26	0.00227	PASS
				0	-0.58	-0.00031	PASS
				10	7.81	0.00415	PASS
				20	4.55	0.00242	PASS
				30	2.23	0.00119	PASS
				40	-3.2	-0.0017	PASS
				50	-6.2	-0.0033	PASS
		HCH	VN	-30	-11.51	-0.00603	PASS
				-20	-7.05	-0.0037	PASS
				-10	5.45	0.00286	PASS
				0	10.99	0.00576	PASS
				10	7.16	0.00375	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				20	-8.74	-0.00458	PASS
				30	-2.12	-0.00111	PASS
				40	-2.79	-0.00146	PASS
				50	0.84	0.00044	PASS

END