



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	23.61	19.12	33	PASS
		MCH	23.72	19.48	33	PASS
		HCH	23.56	19.28	33	PASS

Test Band	Test Mode	Test Channel	Conducte d Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
WCDMA1900	UMTS/TM1	LCH	23.04	23.12	33	PASS
		MCH	23.34	23.73	33	PASS
		HCH	23.19	23.46	33	PASS
WCDMA1700	UMTS/TM1	LCH	23.03	22.84	30	PASS
		MCH	23.33	23.11	30	PASS
		HCH	23.29	23.02	30	PASS

Note1:

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

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

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

b, SGP=Signal Generator Level

Note2: RBW > emission bandwidth, VBW > 3 x RBW.

Detector: RMS

2Appendix_B: Peak-to-Average Ratio

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA850	UMTS/TM1	LCH	3.04	13	PASS
		MCH	3.34	13	PASS
		HCH	3.26	13	PASS
WCDMA1900	UMTS/TM1	LCH	2.97	13	PASS
		MCH	3.08	13	PASS
		HCH	2.96	13	PASS
WCDMA1700	UMTS/TM1	LCH	2.75	13	PASS
		MCH	3.2	13	PASS
		HCH	2.94	13	PASS

3Appendix_C: Modulation Characteristics

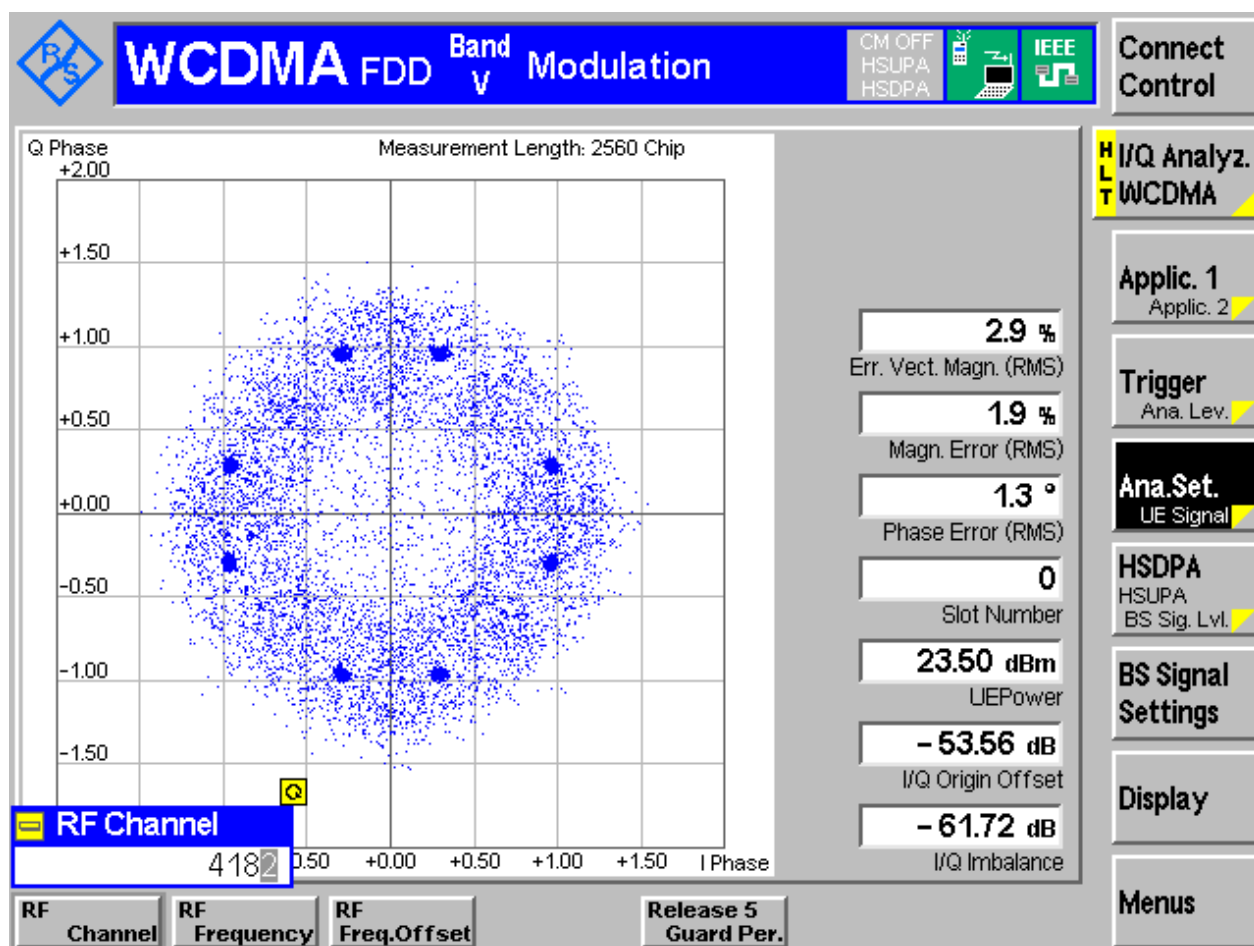
Part I - Test Plots

3.1 For UMTS

3.1.1 Test Band = WCDMA850

3.1.1.1 Test Mode = UMTS/TM1

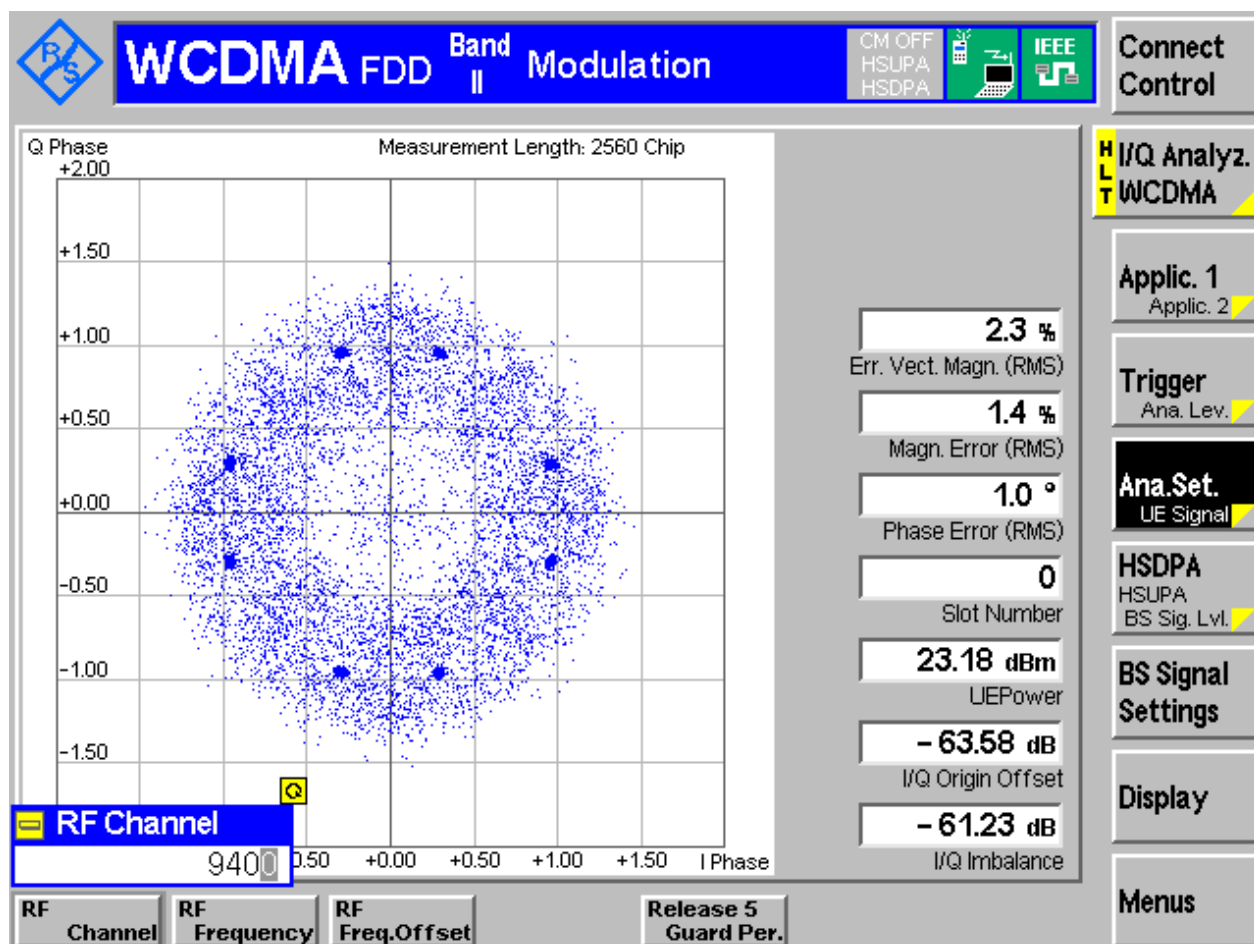
3.1.1.1.1 Test Channel = MCH



3.1.2 Test Band = WCDMA1900

3.1.2.1 Test Mode = UMTS/TM1

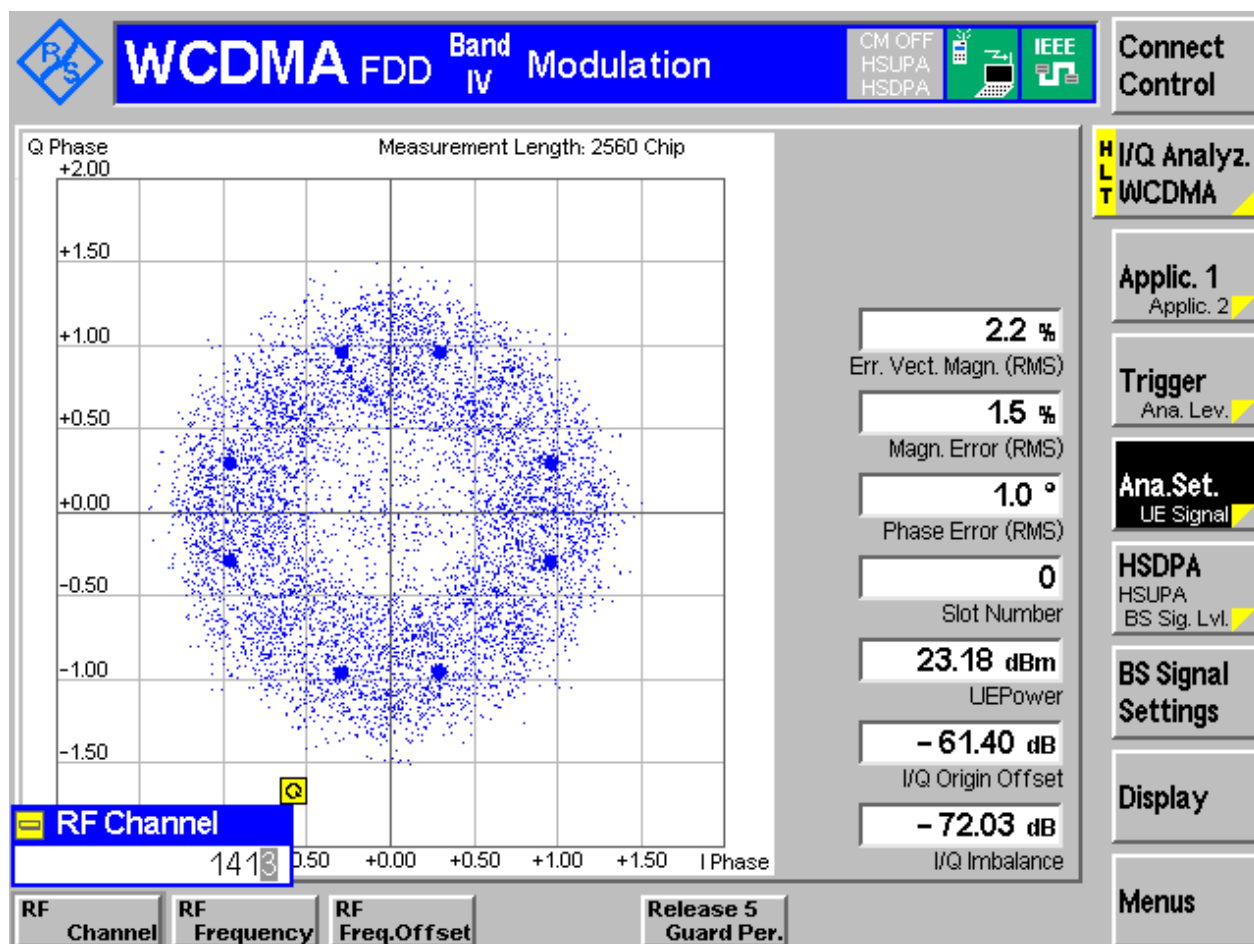
3.1.2.1.1 Test Channel = MCH



3.1.3 Test Band = WCDMA1700

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	4.14	4.73	Pass
		MCH	4.14	4.72	Pass
		HCH	4.14	4.73	Pass
WCDMA1900	UMTS/TM1	LCH	4.15	4.73	Pass
		MCH	4.15	4.74	Pass
		HCH	4.16	4.75	Pass
WCDMA1700	UMTS/TM1	LCH	4.17	4.74	Pass
		MCH	4.17	4.75	Pass
		HCH	4.16	4.74	Pass

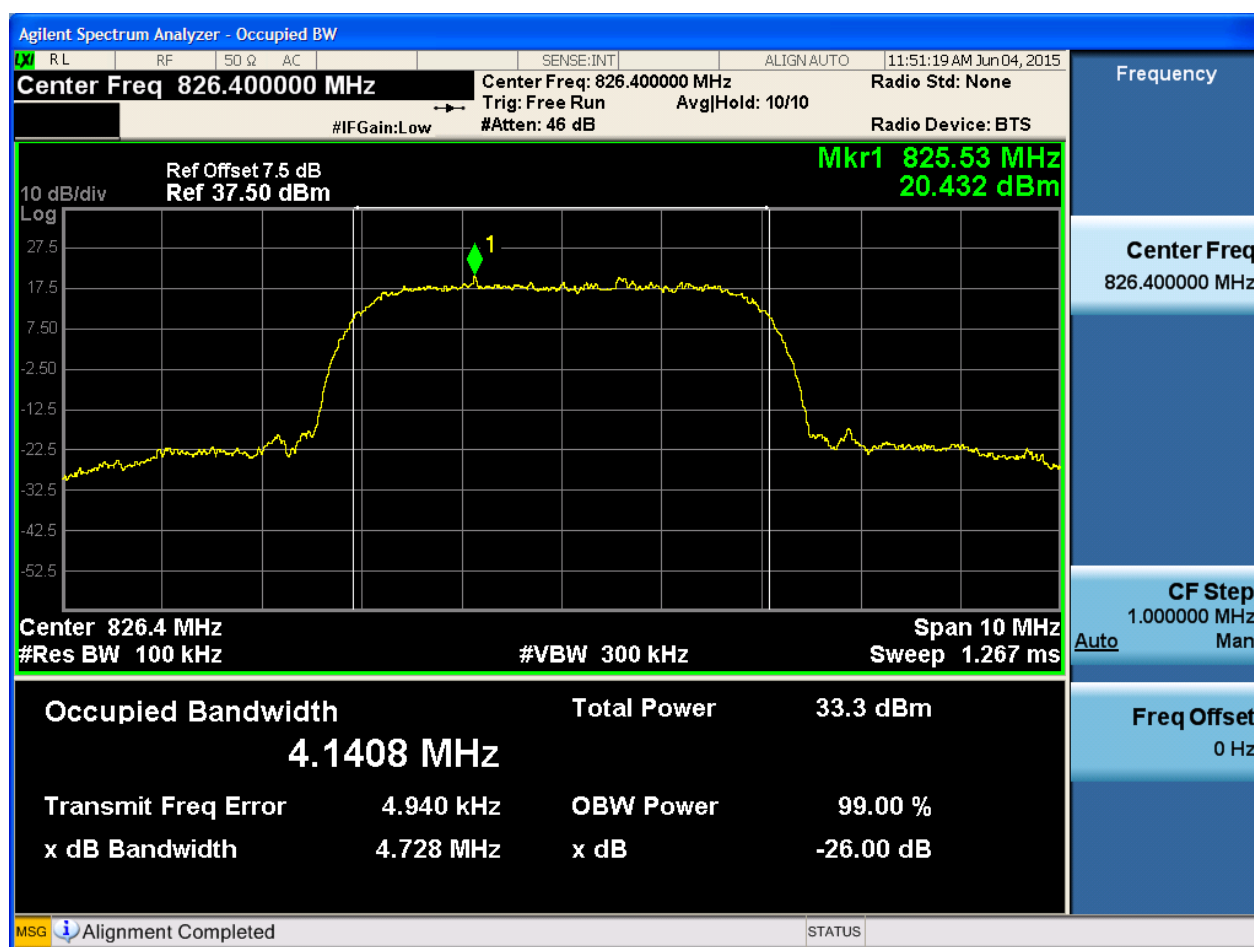
Part II - Test Plots

4.1 For UMTS

4.1.1 Test Band = WCDMA850

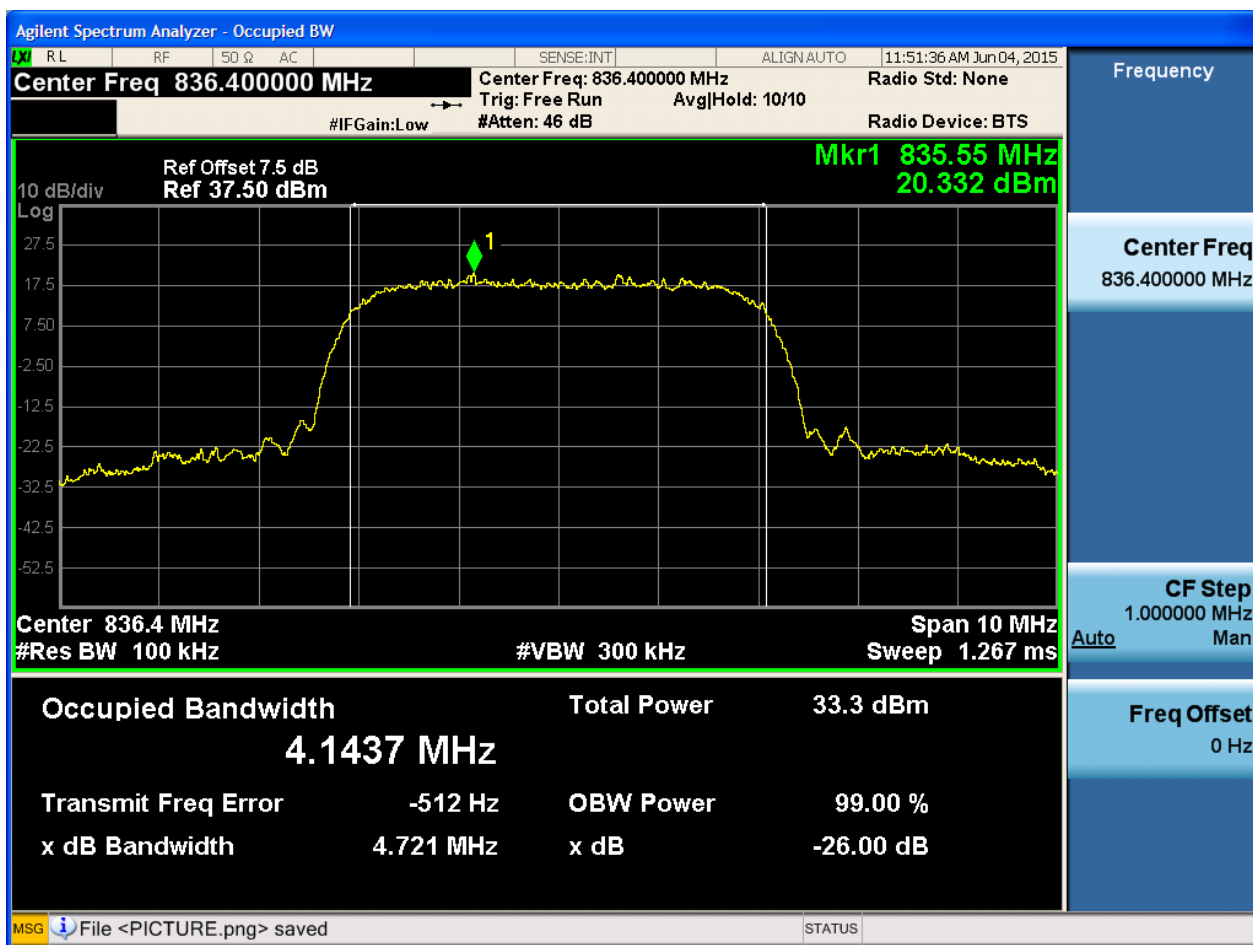
4.1.1.1 Test Mode = UMTS/TM1

4.1.1.1.1 Test Channel = LCH



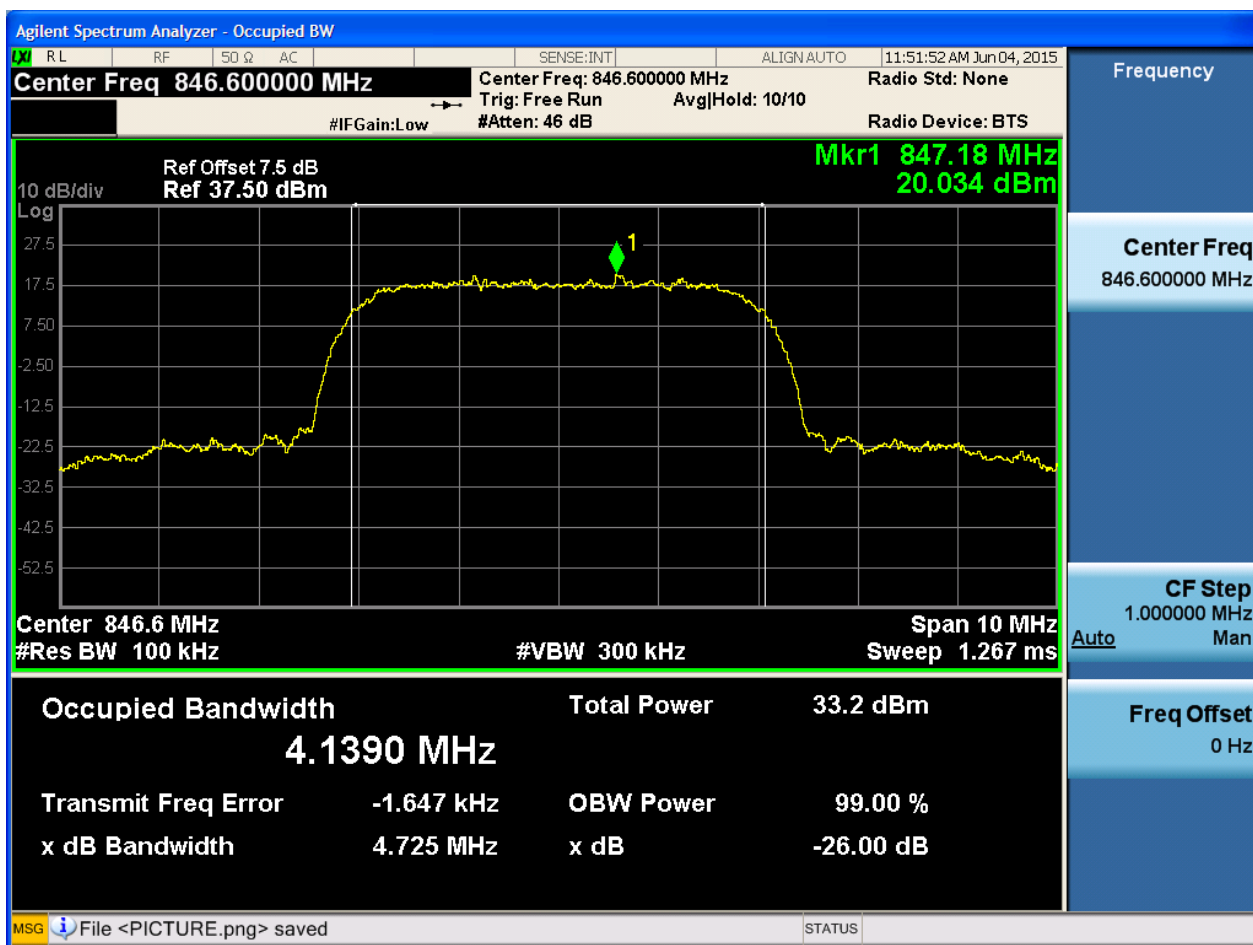


4.1.1.1.2 Test Channel = MCH





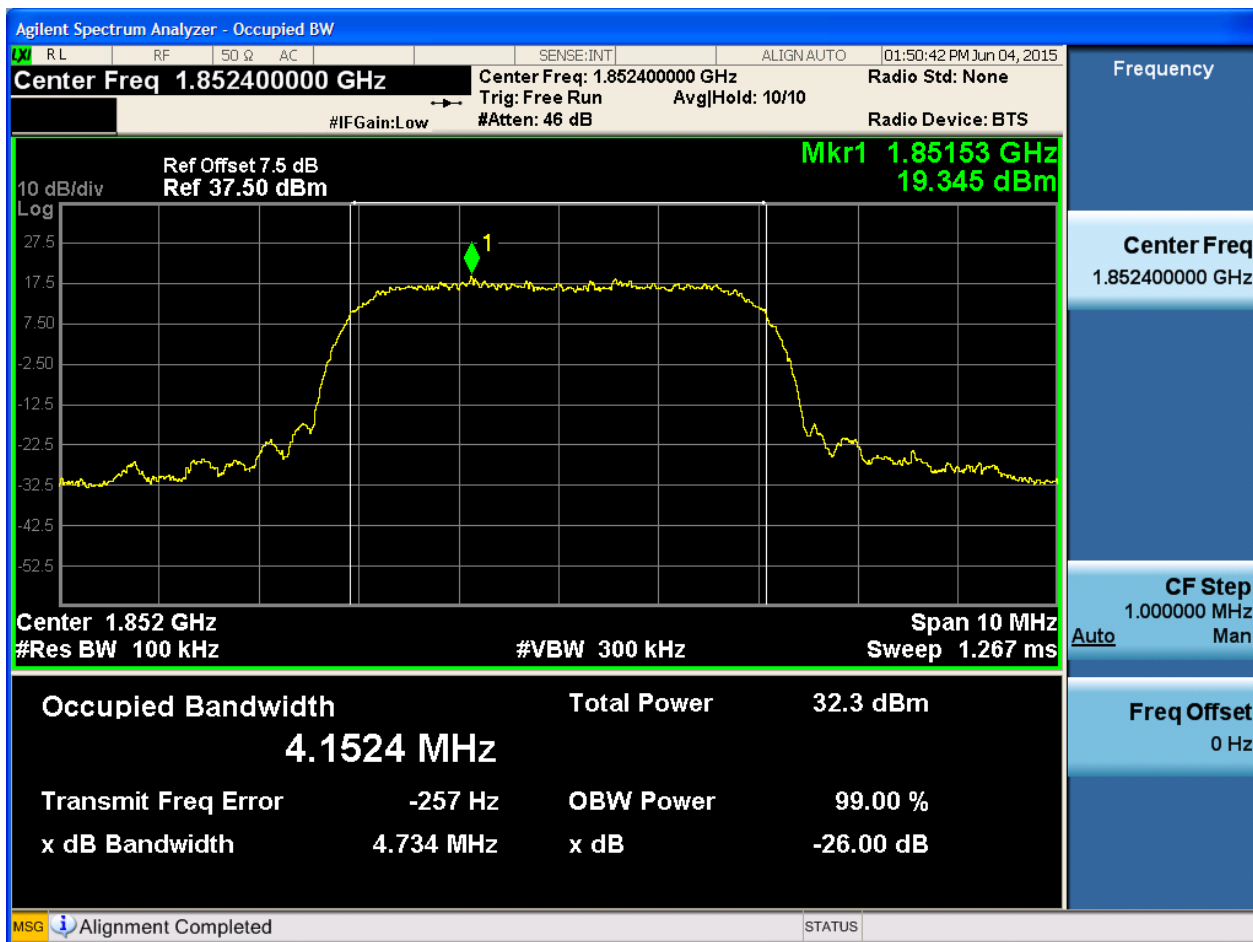
4.1.1.1.3 Test Channel = HCH



4.1.2 Test Band = WCDMA1900

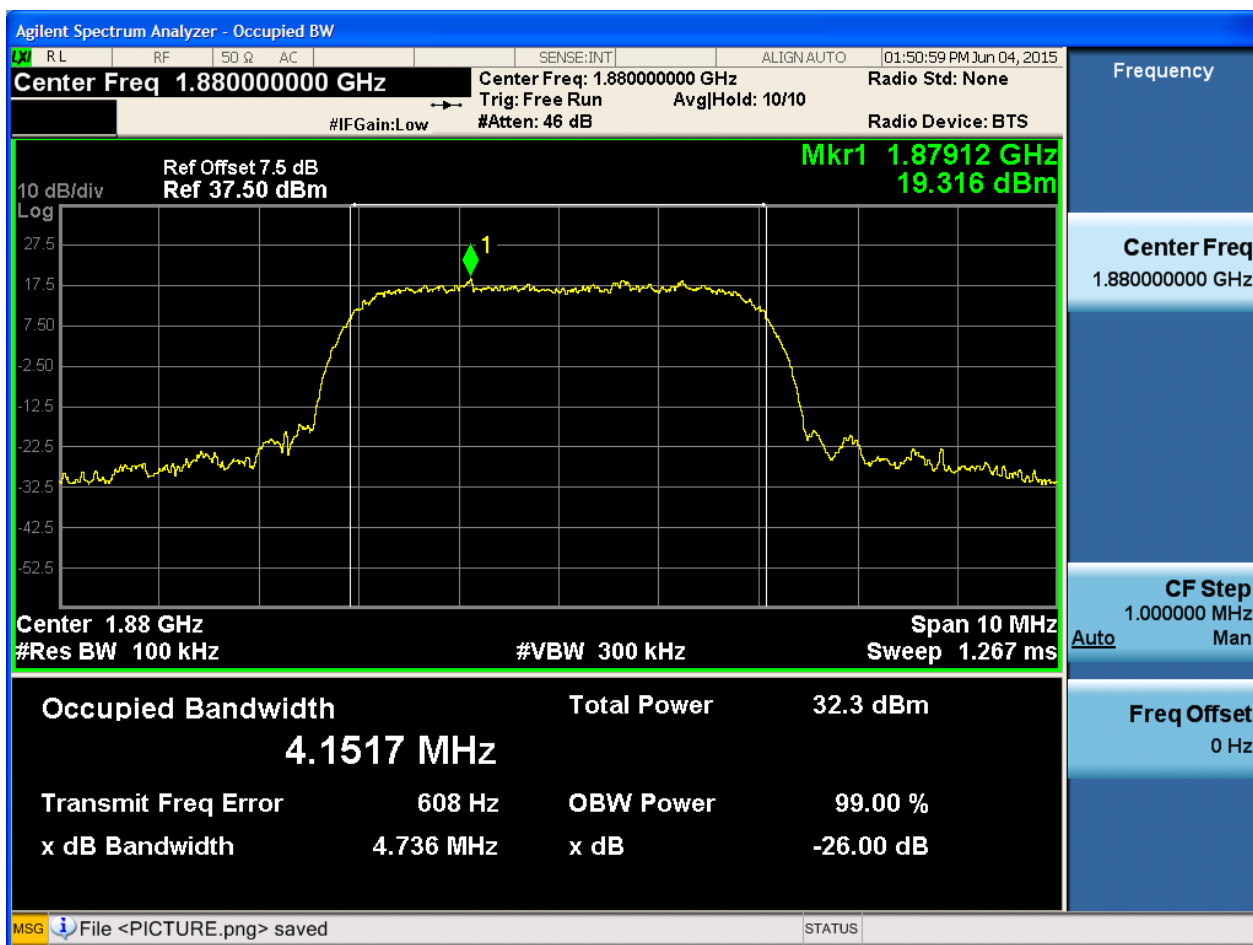
4.1.2.1 Test Mode = UMTS/TM1

4.1.2.1.1 Test Channel = LCH



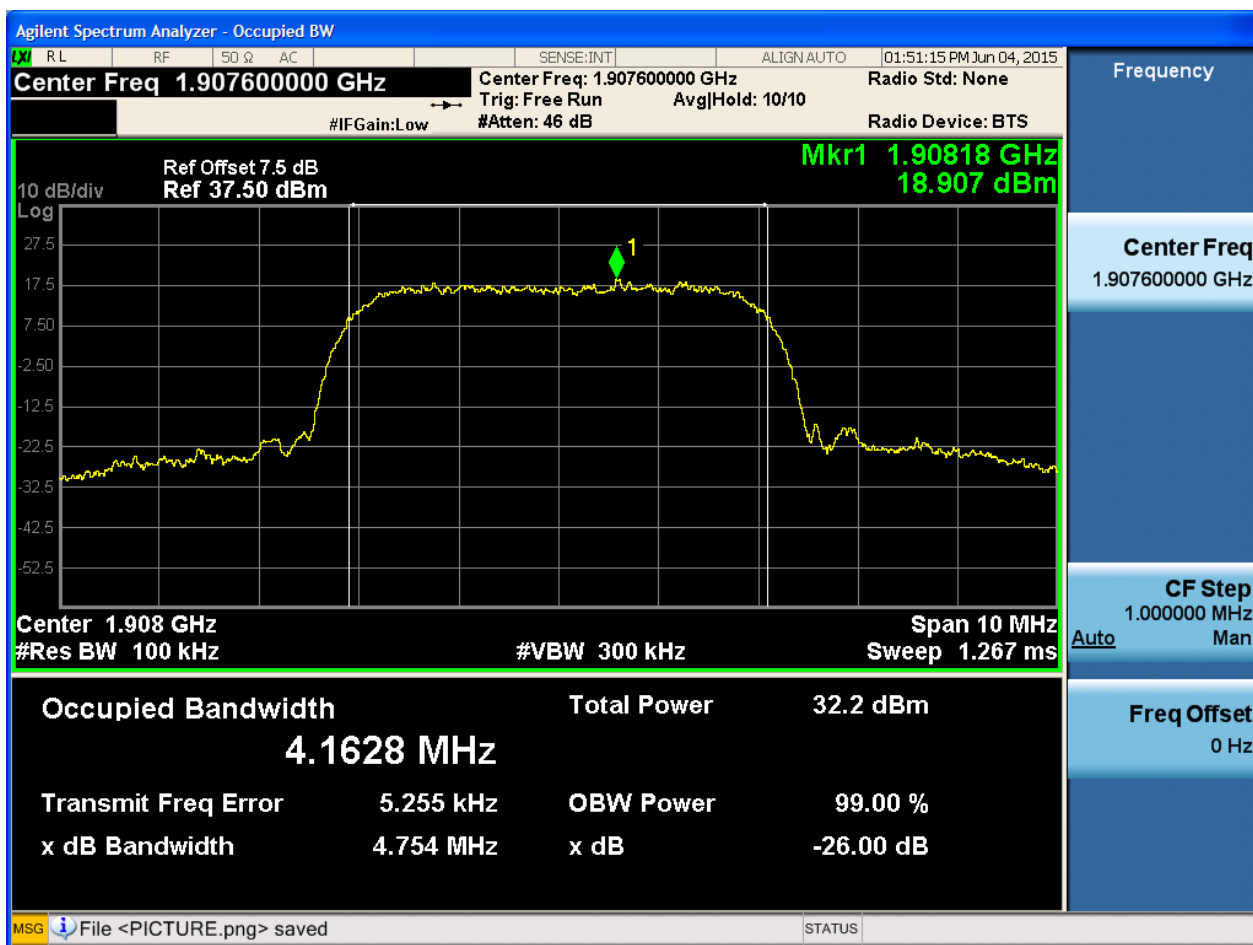


4.1.2.1.2 Test Channel = MCH





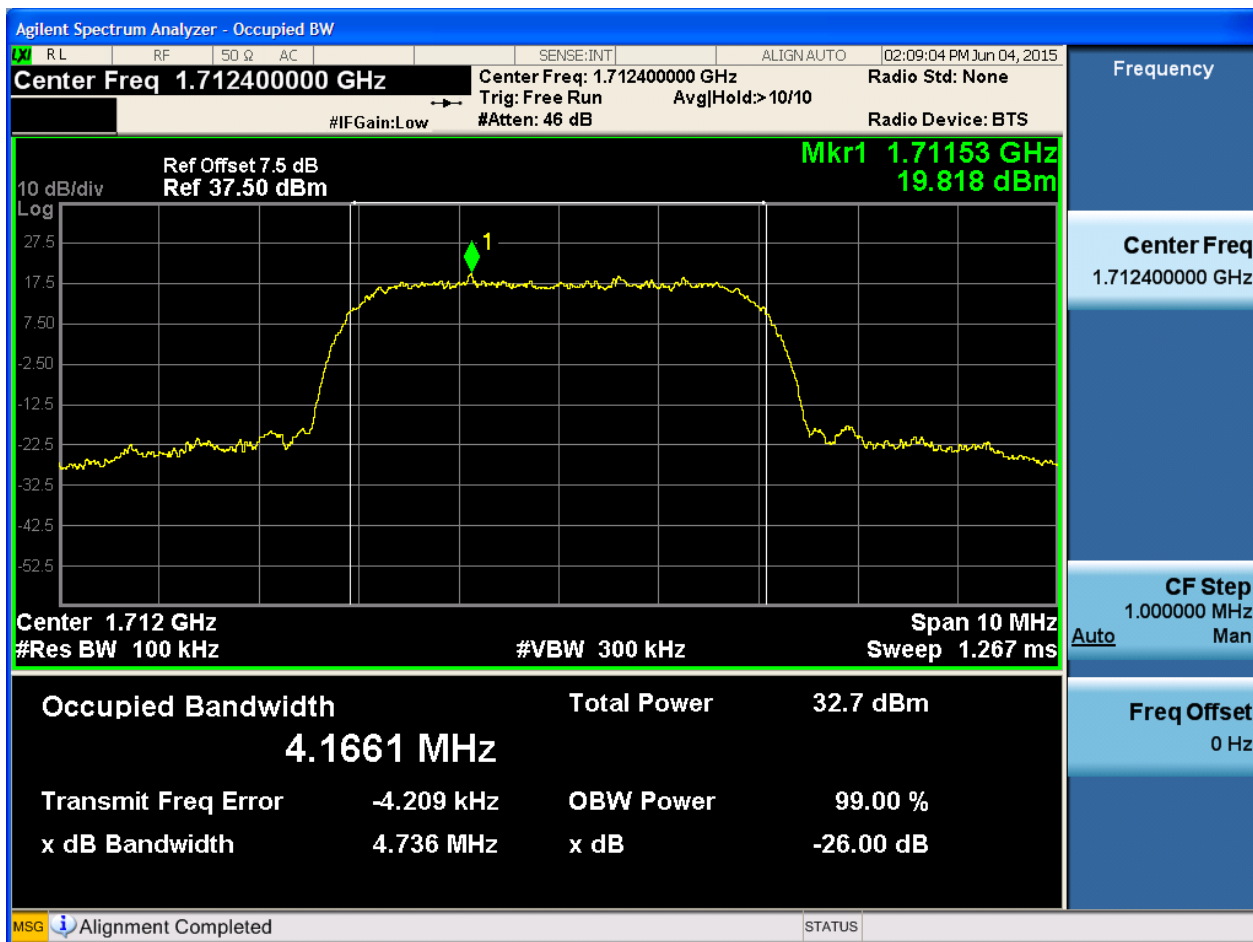
4.1.2.1.3 Test Channel = HCH



4.1.3 Test Band = WCDMA1700

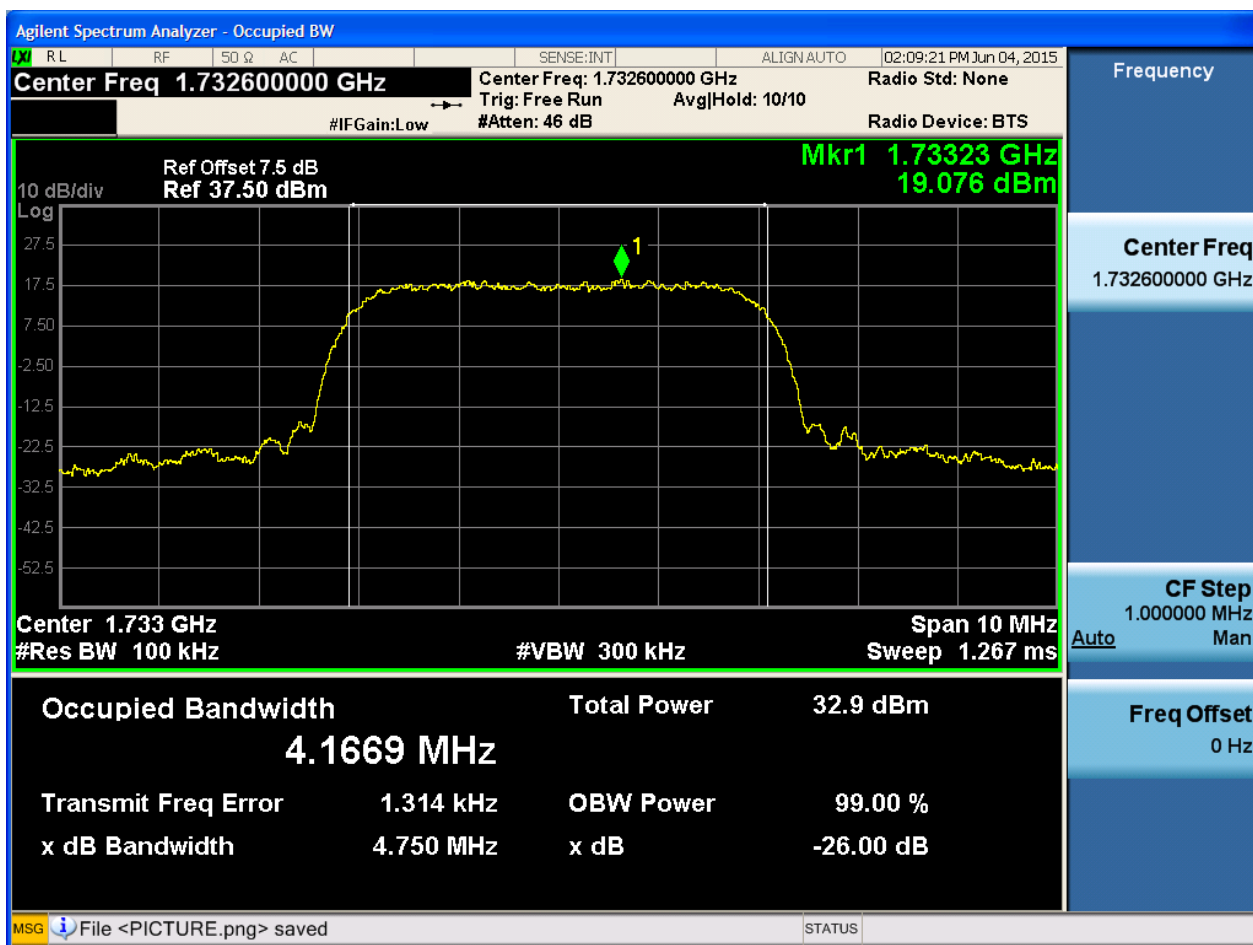
4.1.3.1 Test Mode = UMTS/TM1

4.1.3.1.1 Test Channel = LCH



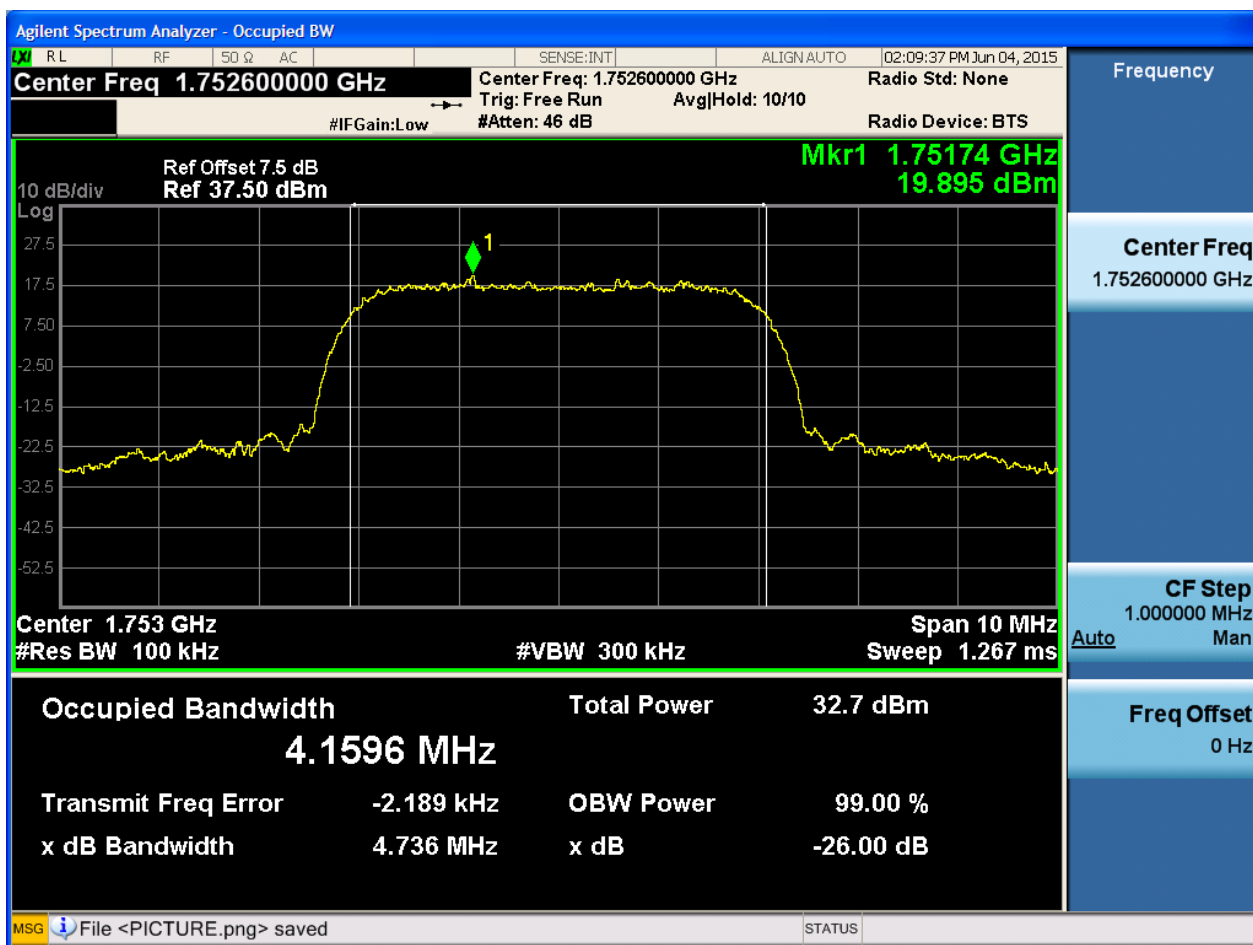


4.1.3.1.2 Test Channel = MCH





4.1.3.1.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

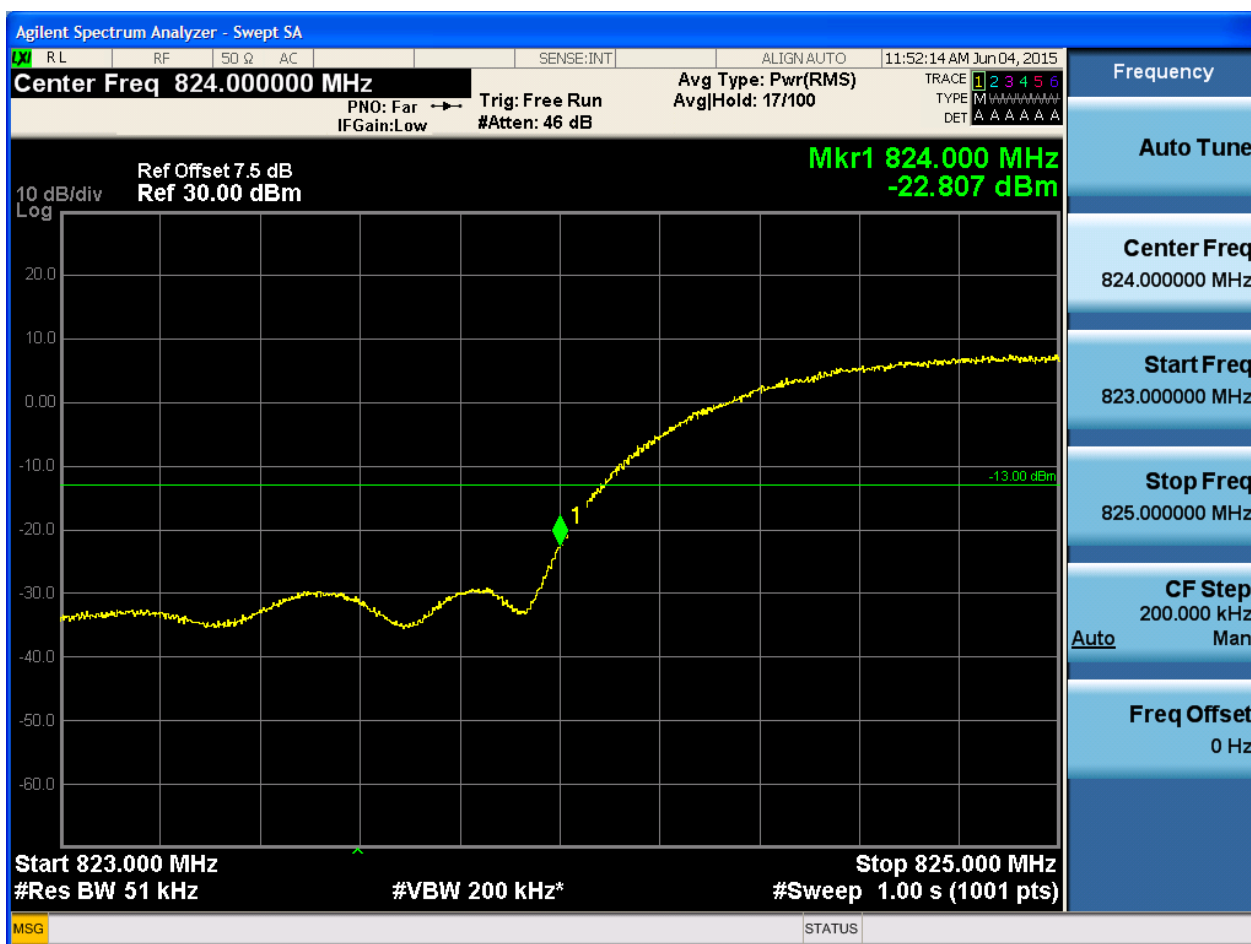
Part I - Test Plots

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



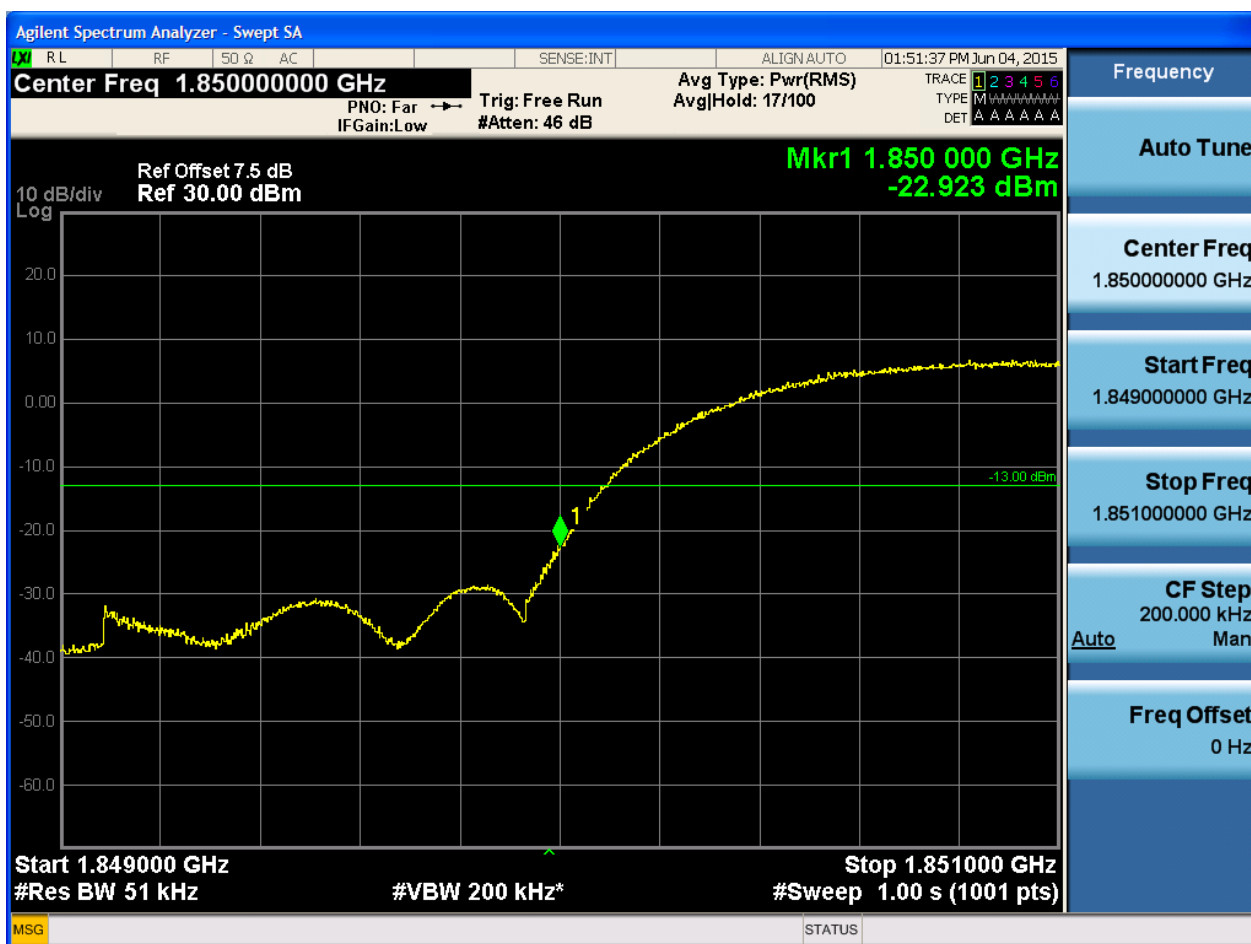
5.1.1.1.2 Test Channel = HCH



5.1.2 Test Band = WCDMA1900

5.1.2.1 Test Mode = UMTS/TM1

5.1.2.1.1 Test Channel = LCH





Agilent Spectrum Analyzer - Swept SA

Center Freq 1.91000000 GHz

Ref Offset 7.5 dB
Ref 30.00 dBm

10 dB/div
Log

Mkr1 1.910 000 GHz
-22.253 dBm

Start 1.909000 GHz
#Res BW 51 kHz

Stop 1.911000 GHz
#Sweep 1.00 s (1001 pts)

#VBW 200 kHz*

Trig: Free Run
#Atten: 46 dB

PNO: Far
IFGain: Low

Avg Type: Pwr(RMS)
AvgHold: 17/100

TRACE 1 2 3 4 5 6
TYPE M W W W W W W W
DET A A A A A A

Frequency

Auto Tune

Center Freq
1.91000000 GHz

Start Freq
1.909000000 GHz

Stop Freq
1.911000000 GHz

CF Step
200.000 kHz
Man

Auto

Freq Offset
0 Hz

MSG File <PICTURE.png> saved

STATUS

5.1.3 Test Band = WCDMA1700

5.1.3.1 Test Mode = UMTS/TM1

5.1.3.1.1 Test Channel = LCH





Agilent Spectrum Analyzer - Swept SA

Center Freq 1.755000000 GHz

Ref Offset 7.5 dB
Ref 30.00 dBm

Mkr1 1.755 000 GHz
-23.427 dBm

10 dB/div
Log

Start 1.754000 GHz
#Res BW 51 kHz

Stop 1.756000 GHz
#Sweep 1.00 s (1001 pts)

#VBW 200 kHz*

Auto Tune

Center Freq 1.755000000 GHz

Start Freq 1.754000000 GHz

Stop Freq 1.756000000 GHz

CF Step 200.000 kHz
Man

Freq Offset 0 Hz

MSG File <PICTURE.png> saved

STATUS

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.

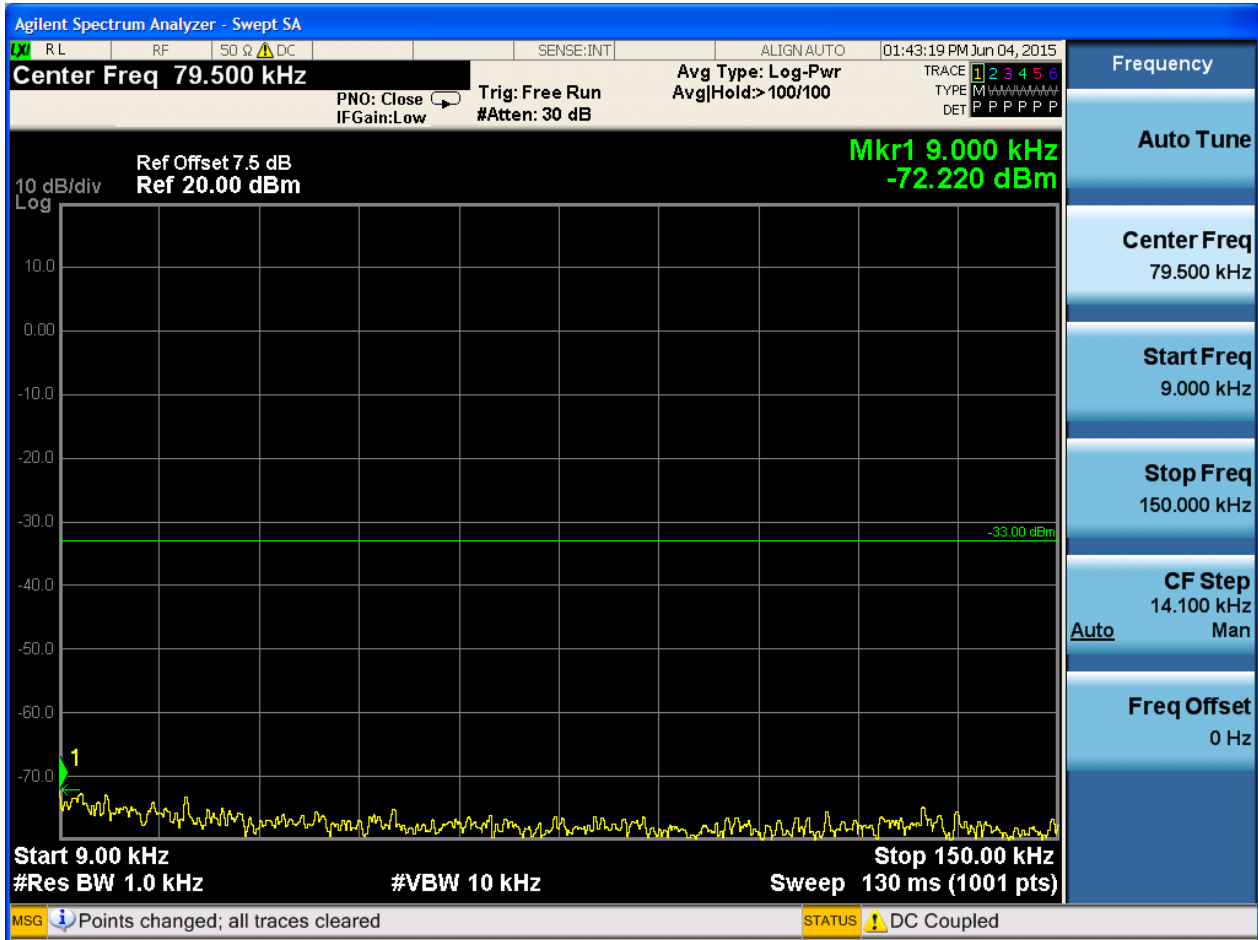
Part I - Test Plots

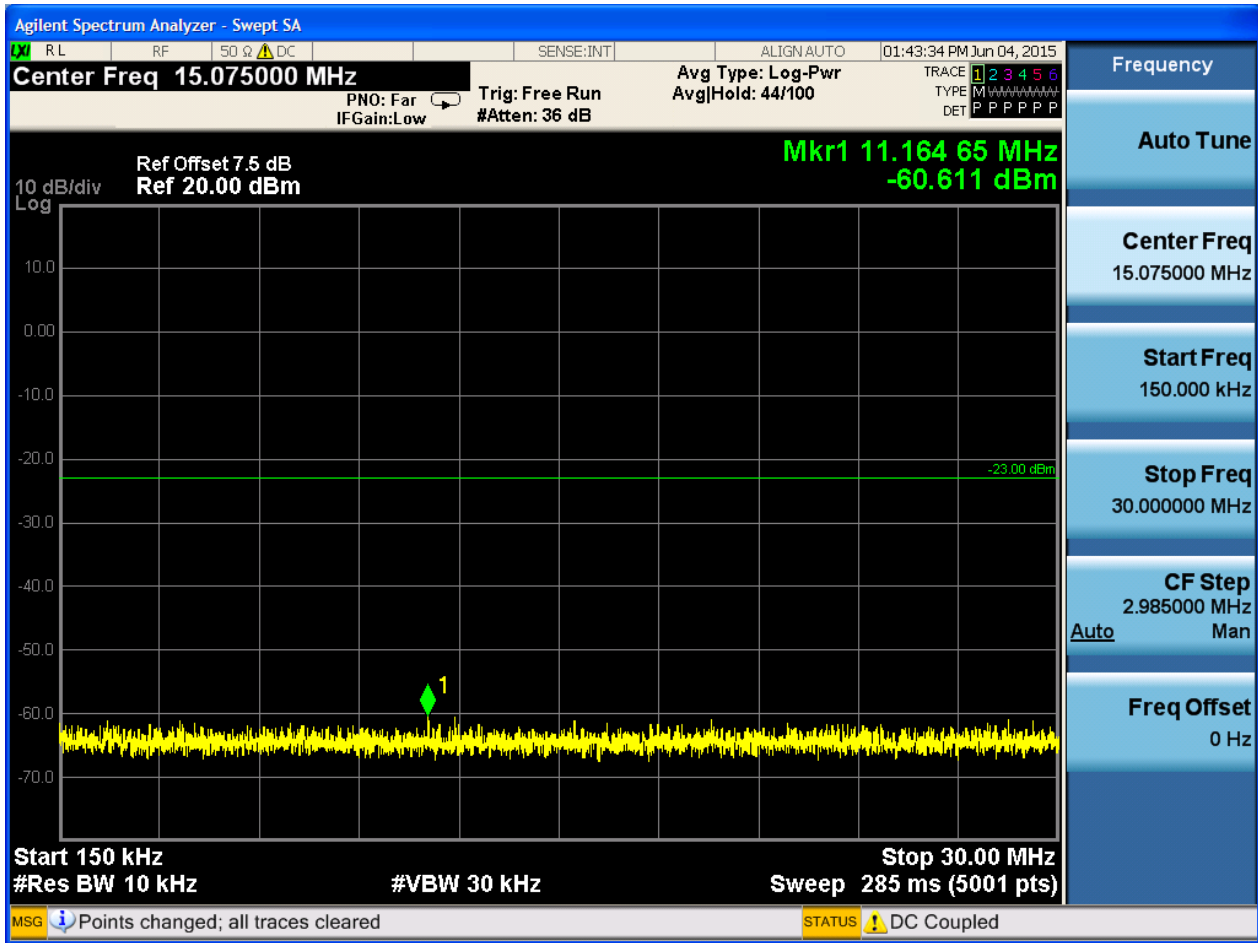
6.1 For UMTS

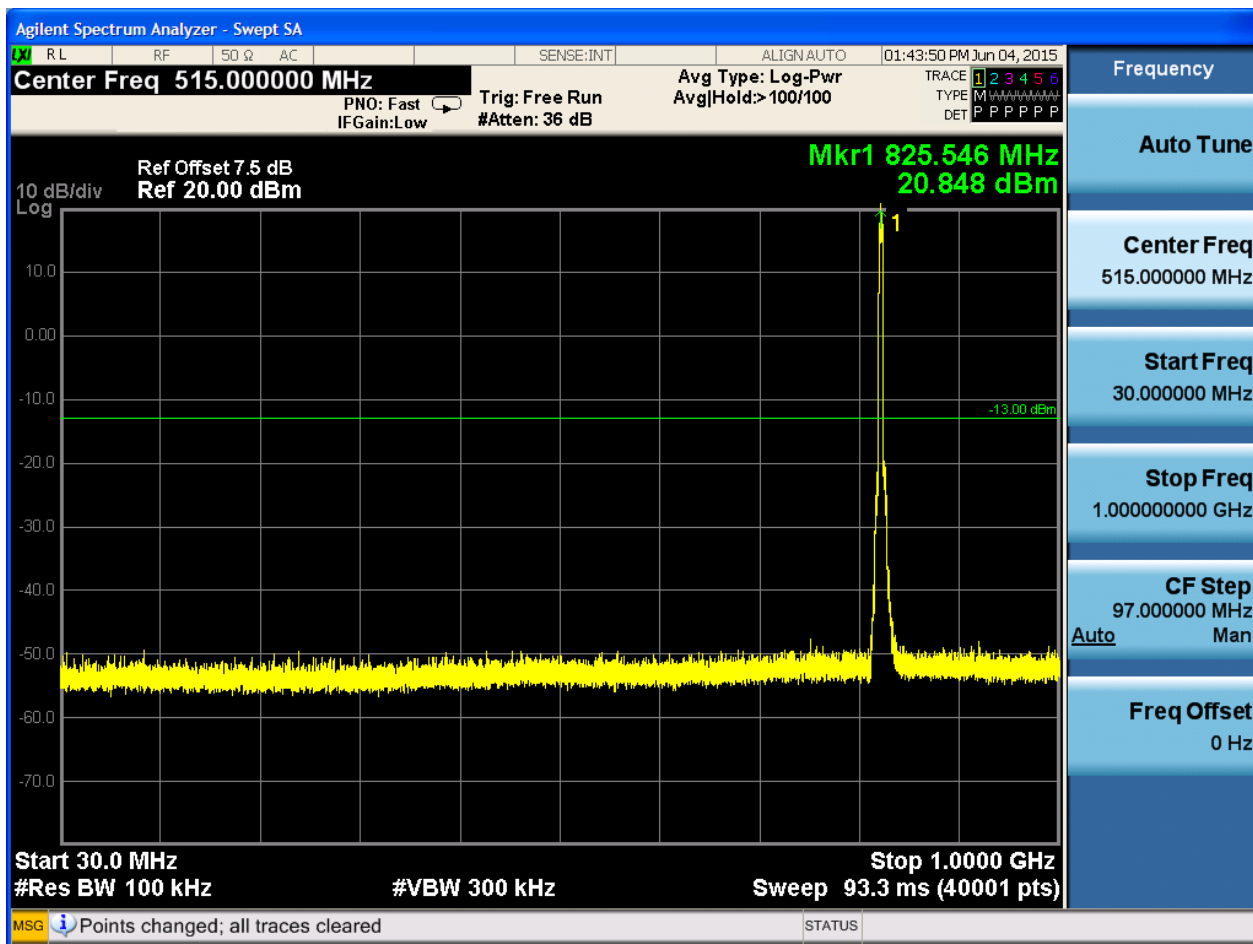
6.1.1 Test Band = WCDMA850

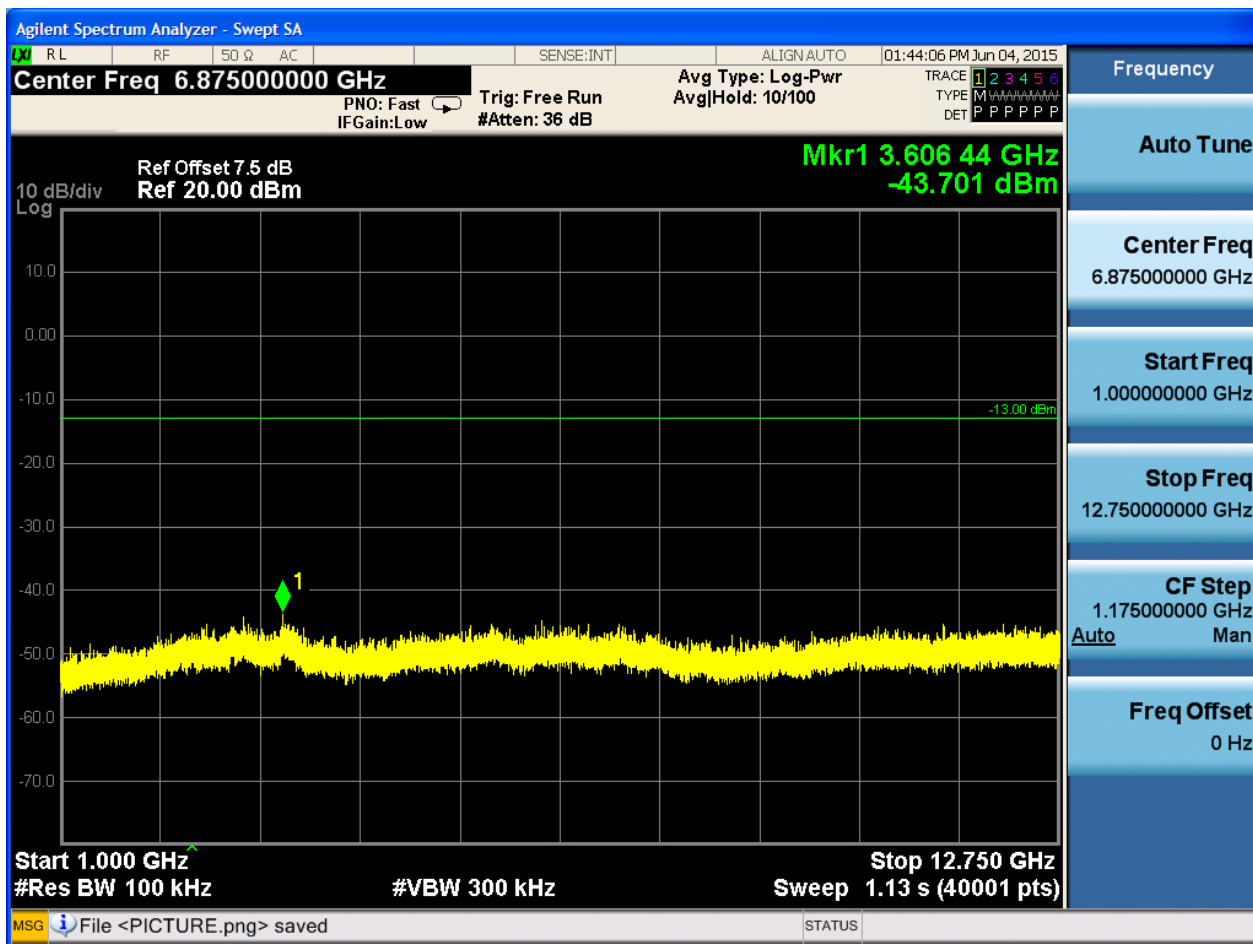
6.1.1.1 Test Mode = UMTS/TM1

6.1.1.1.1 Test Channel = LCH

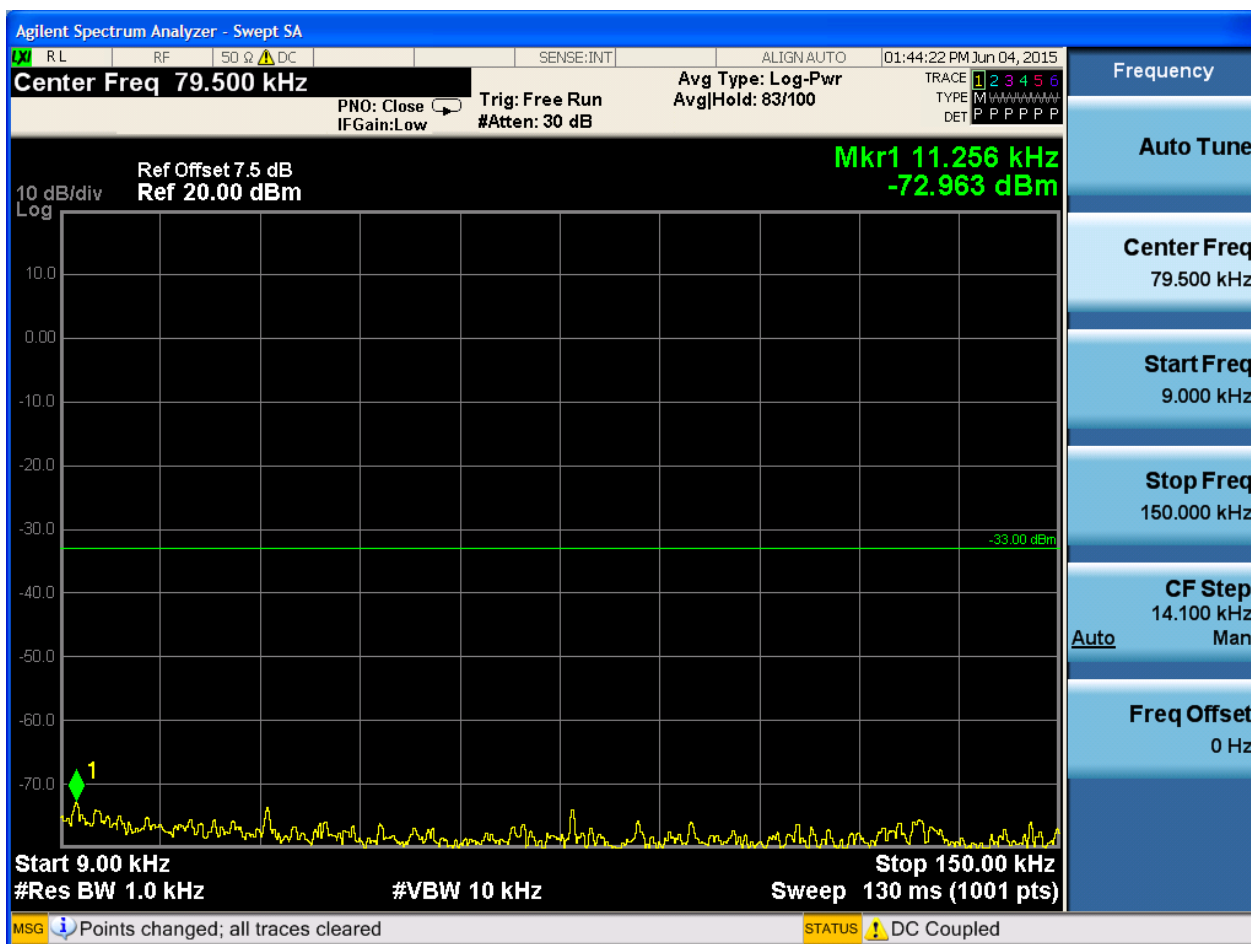


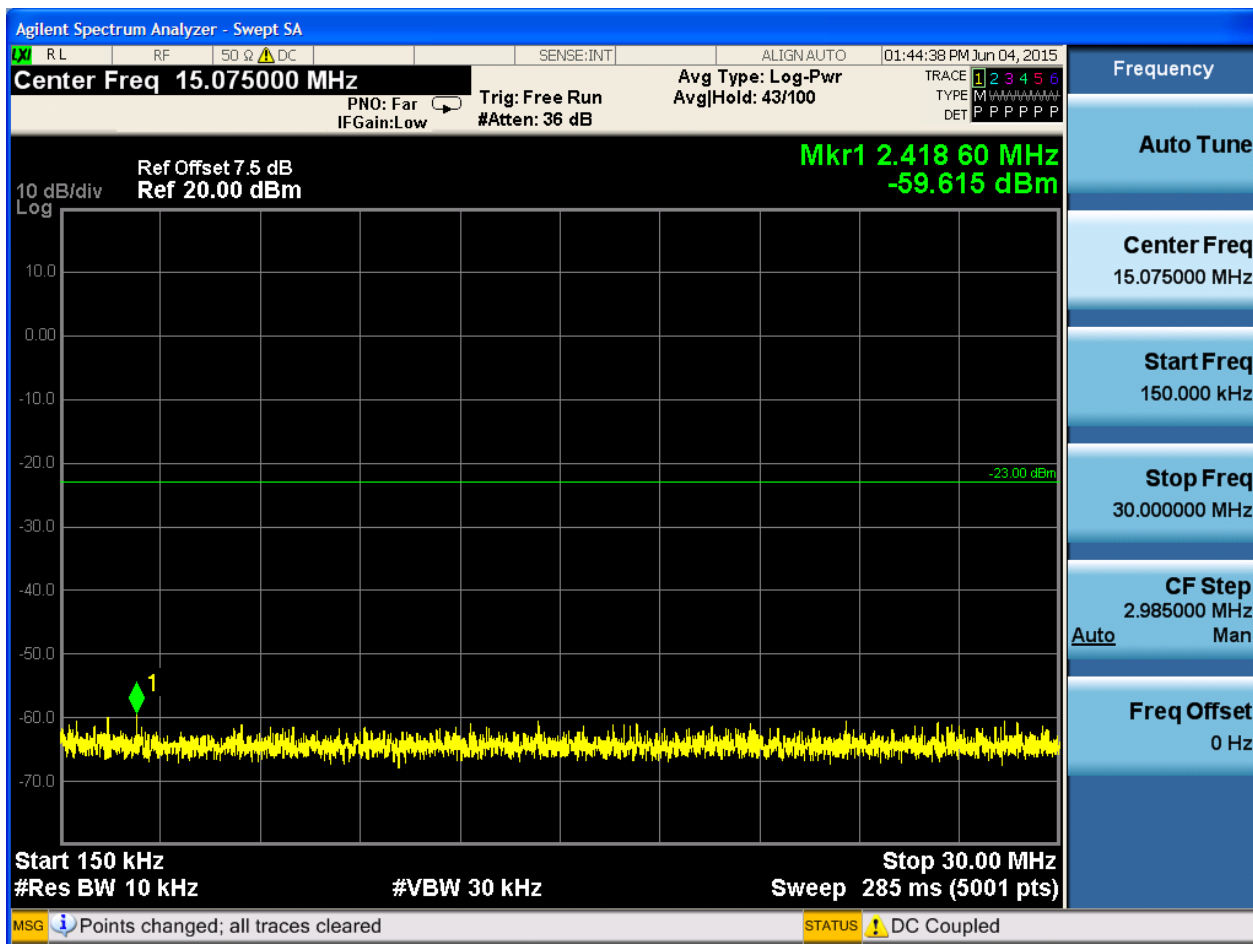


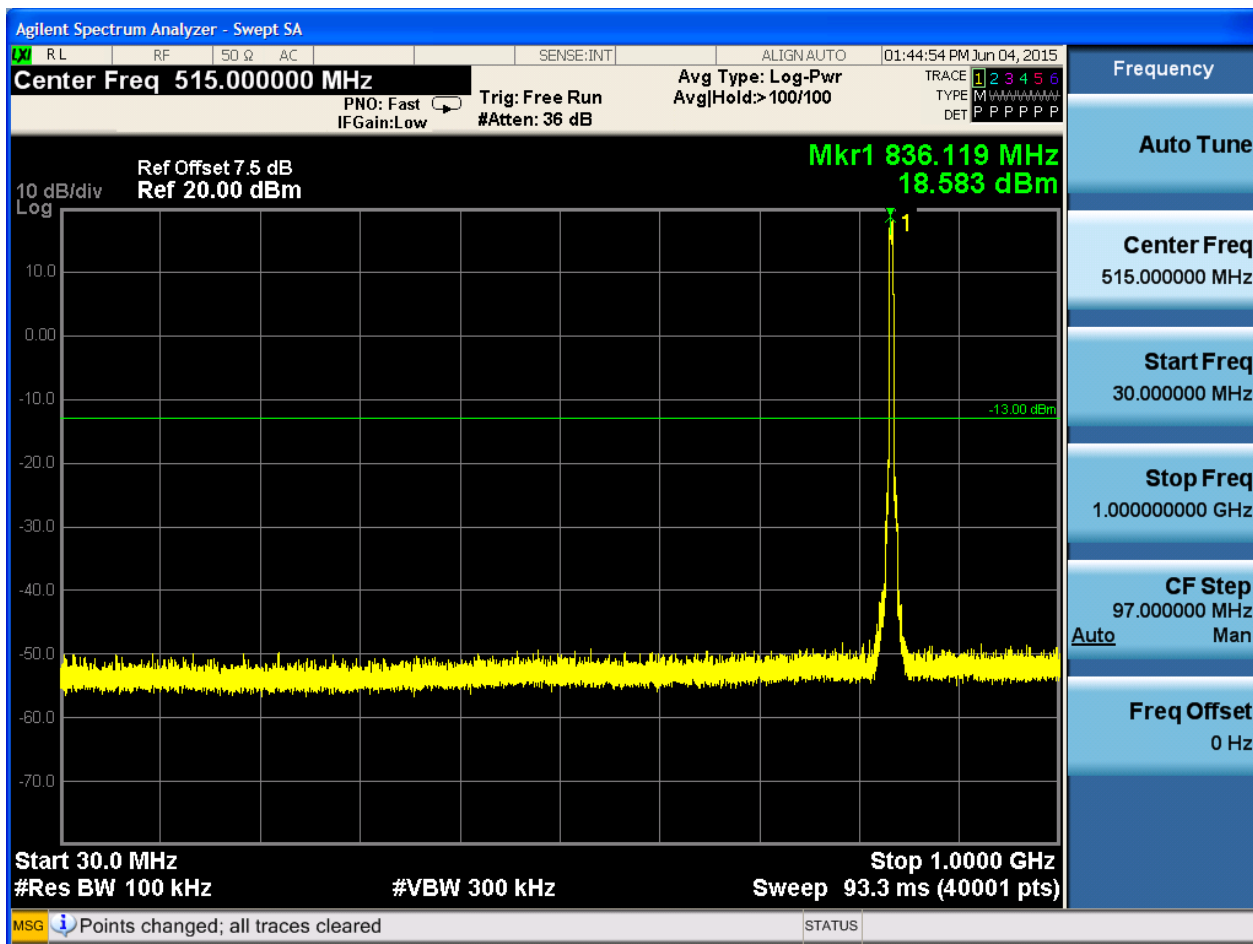


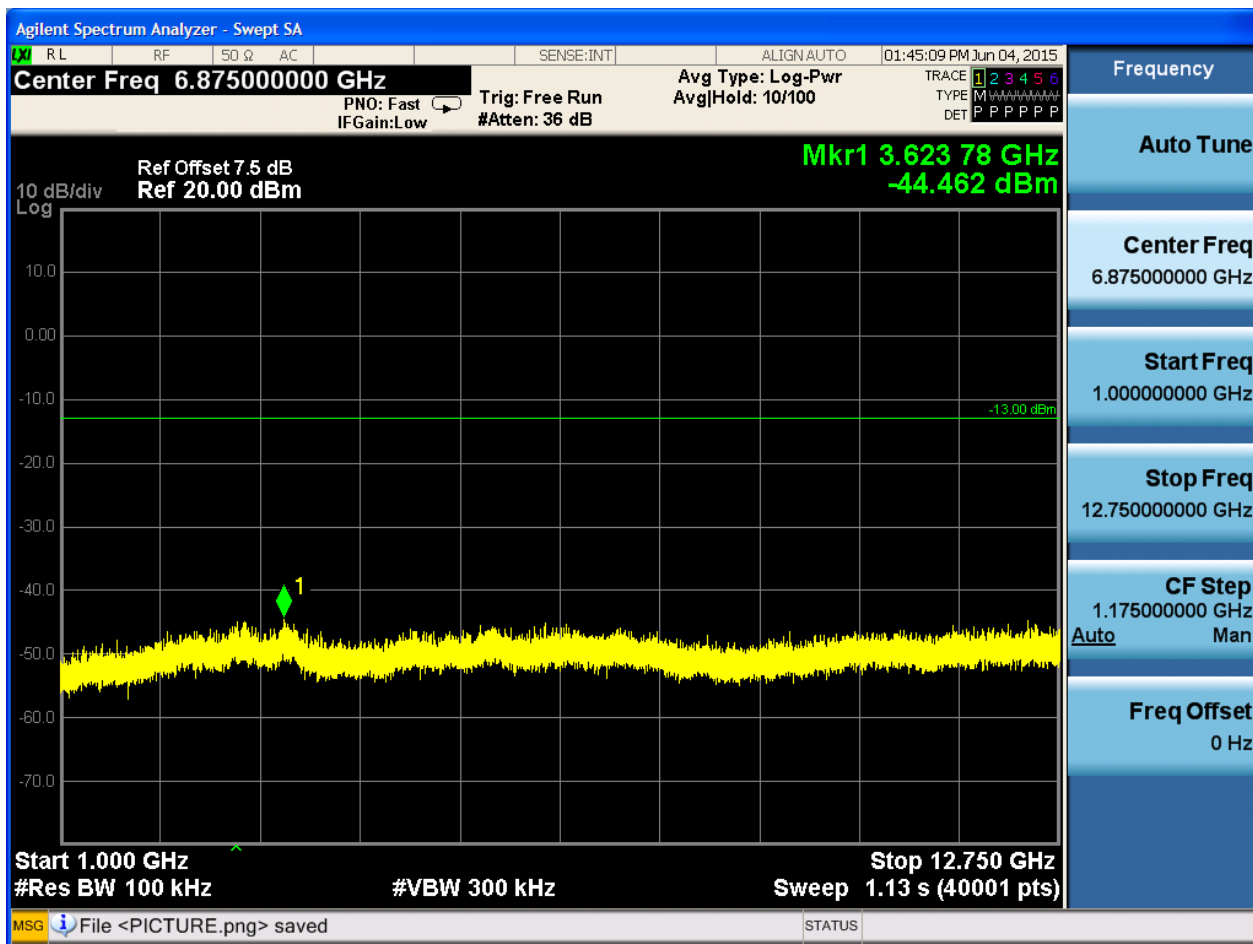


6.1.1.1.2 Test Channel = MCH

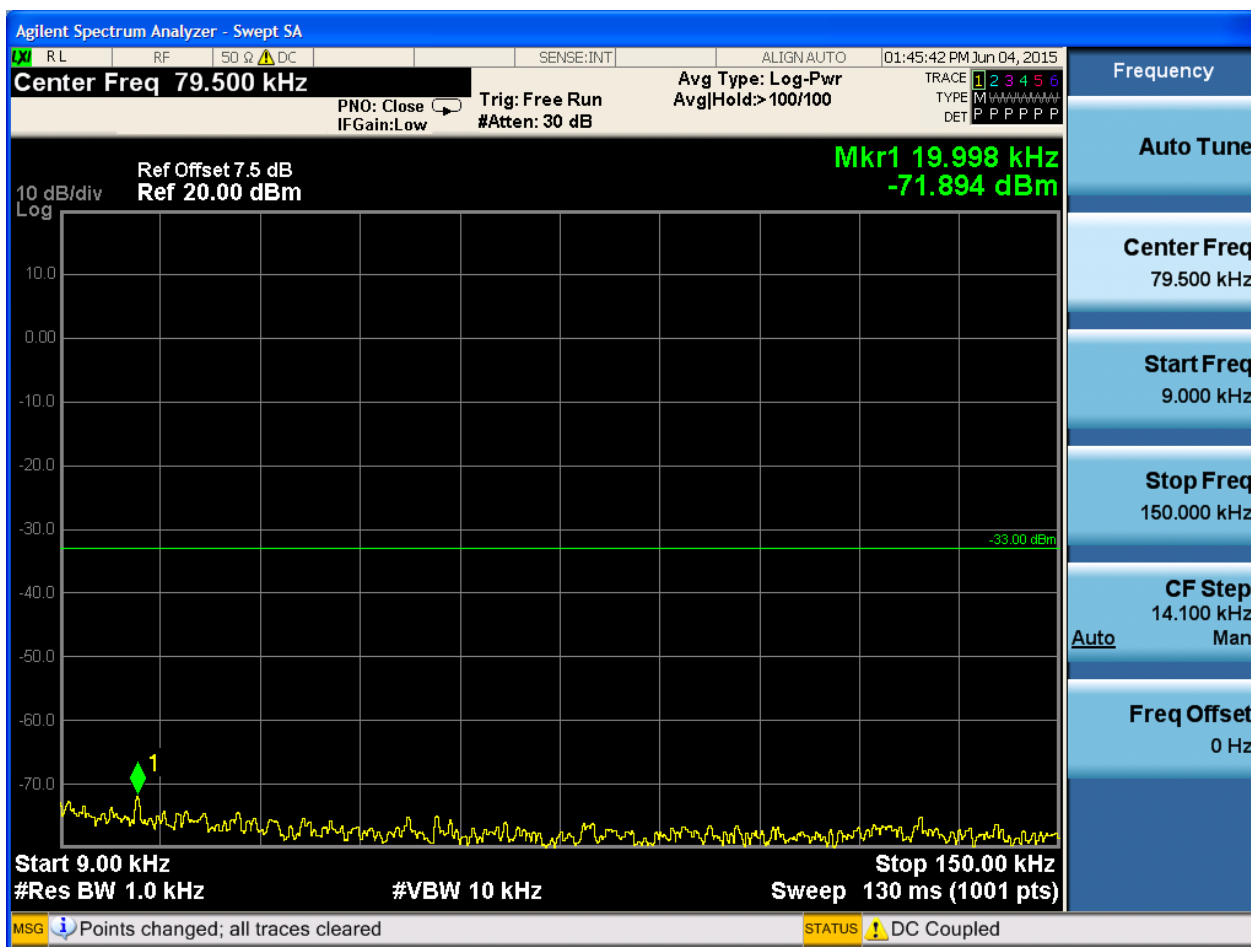


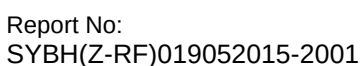


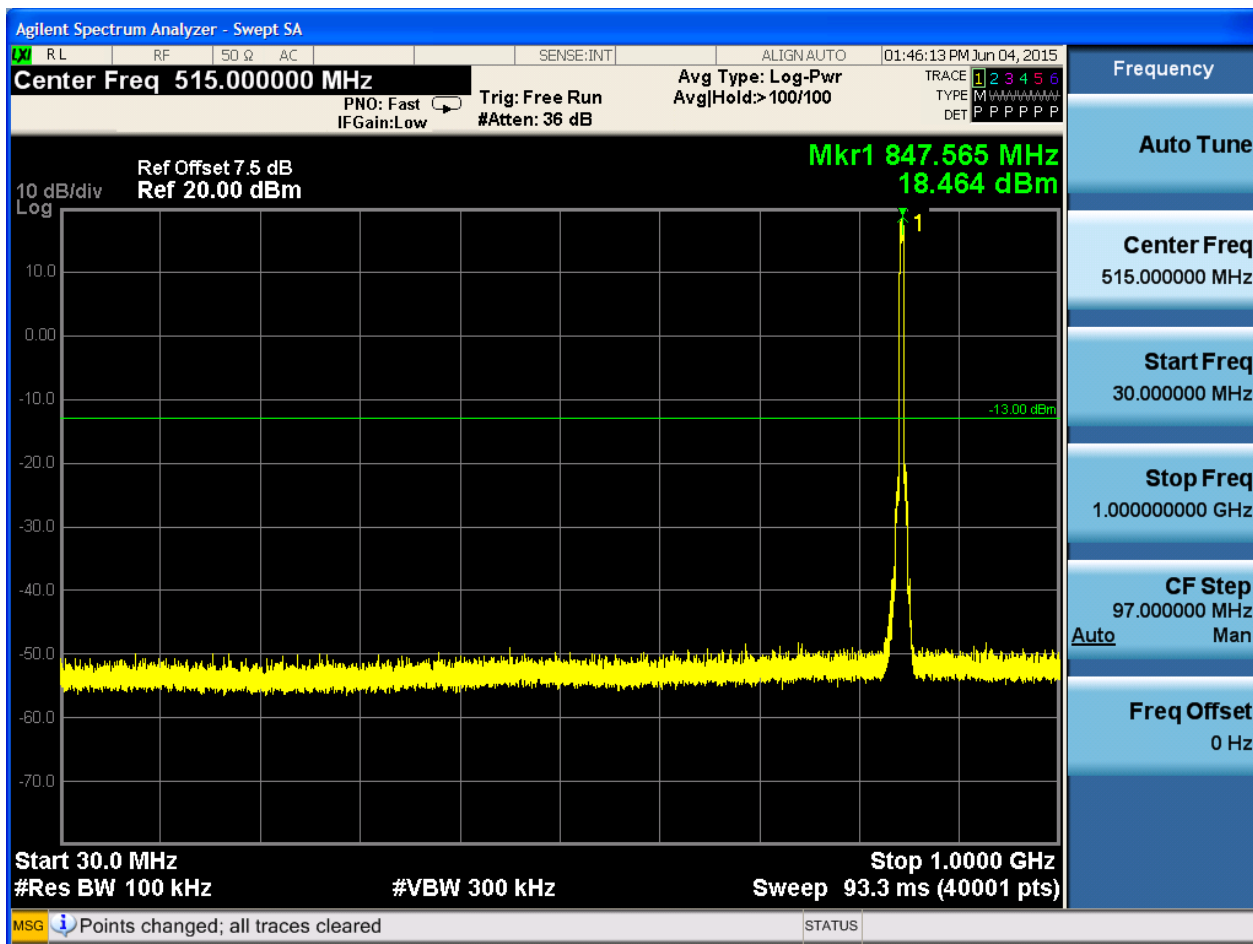


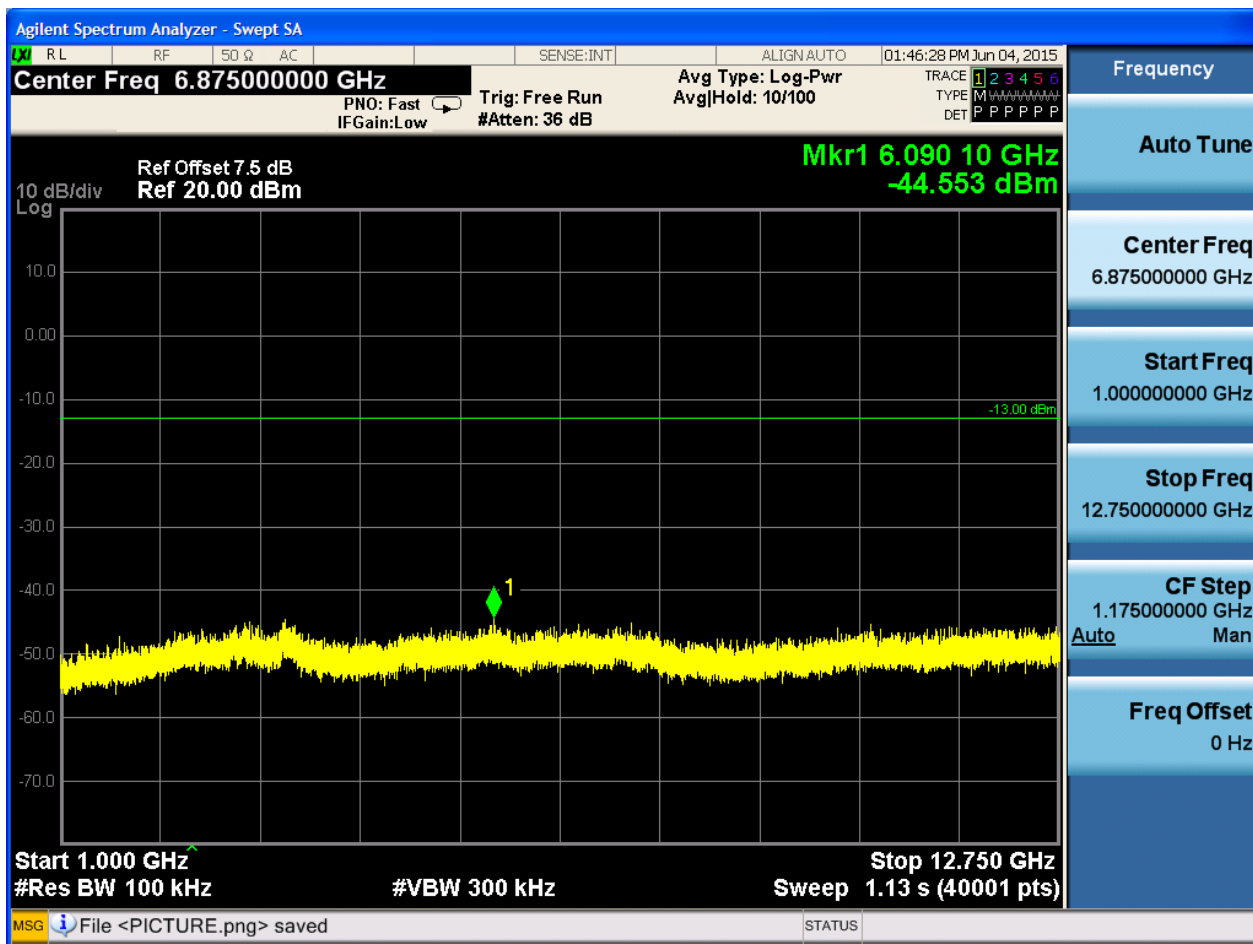


6.1.1.1.3 Test Channel = HCH





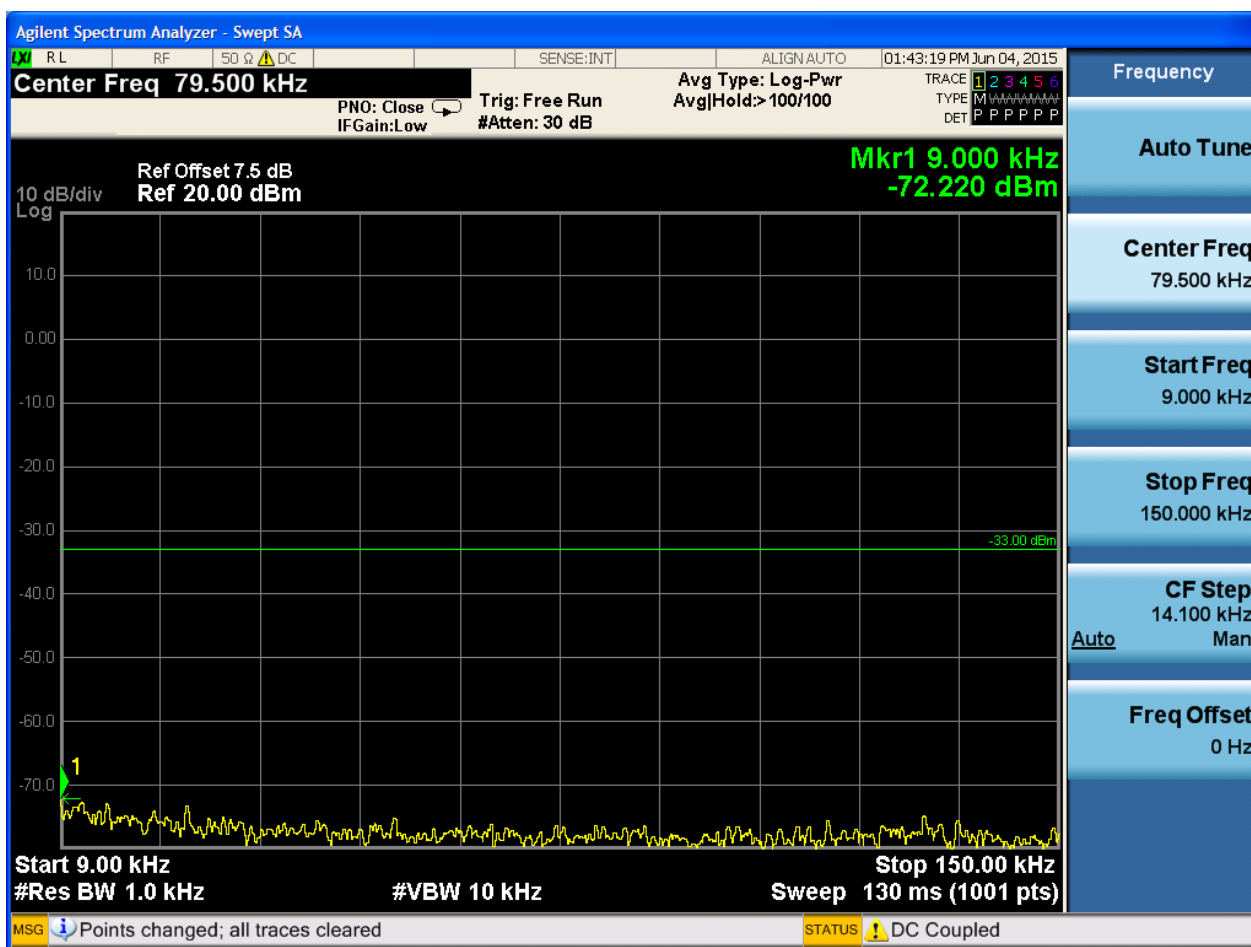


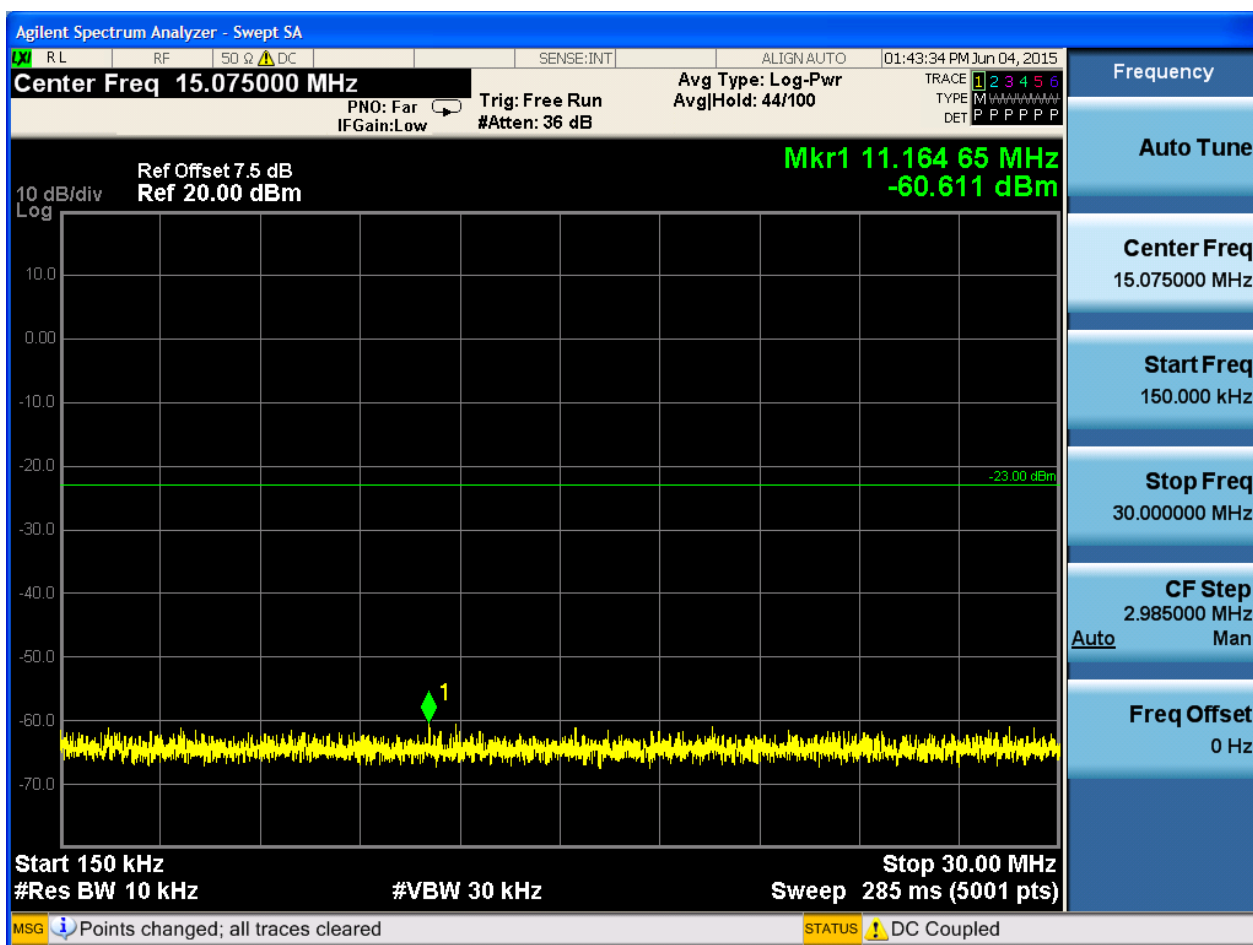


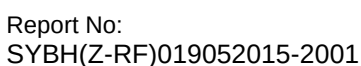
6.1.2 Test Band = WCDMA850

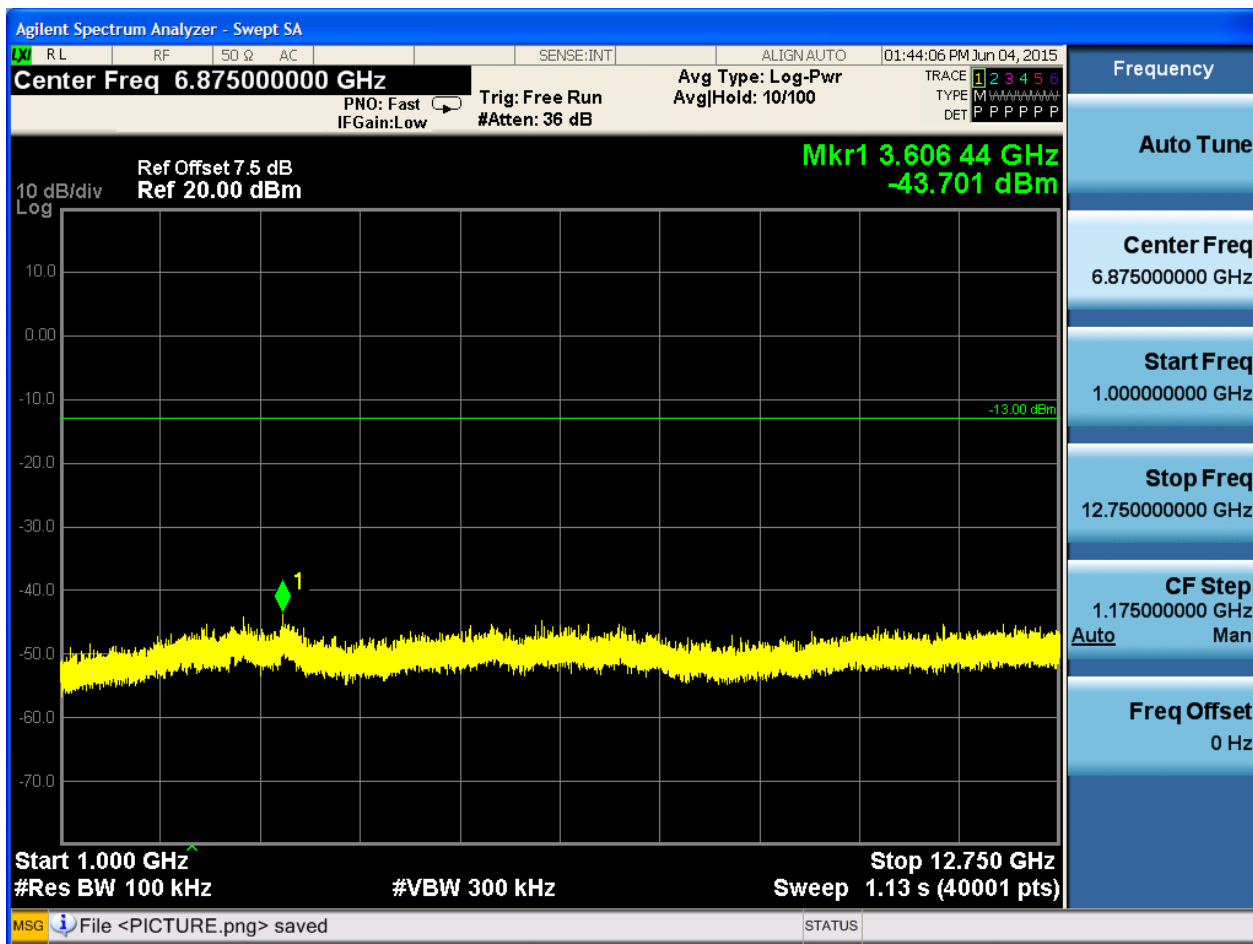
6.1.2.1 Test Mode = UMTS/TM1

6.1.2.1.1 Test Channel = LCH

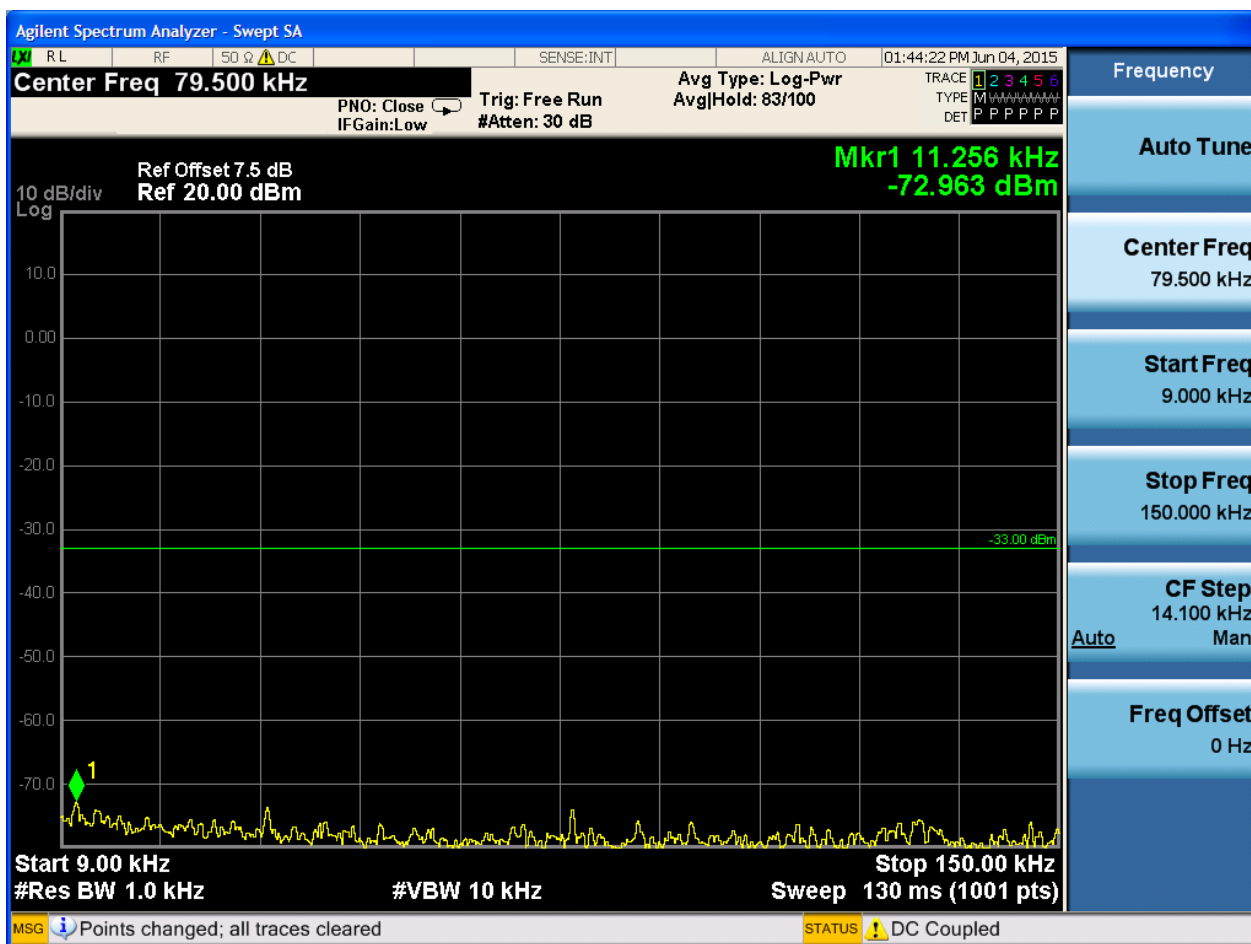


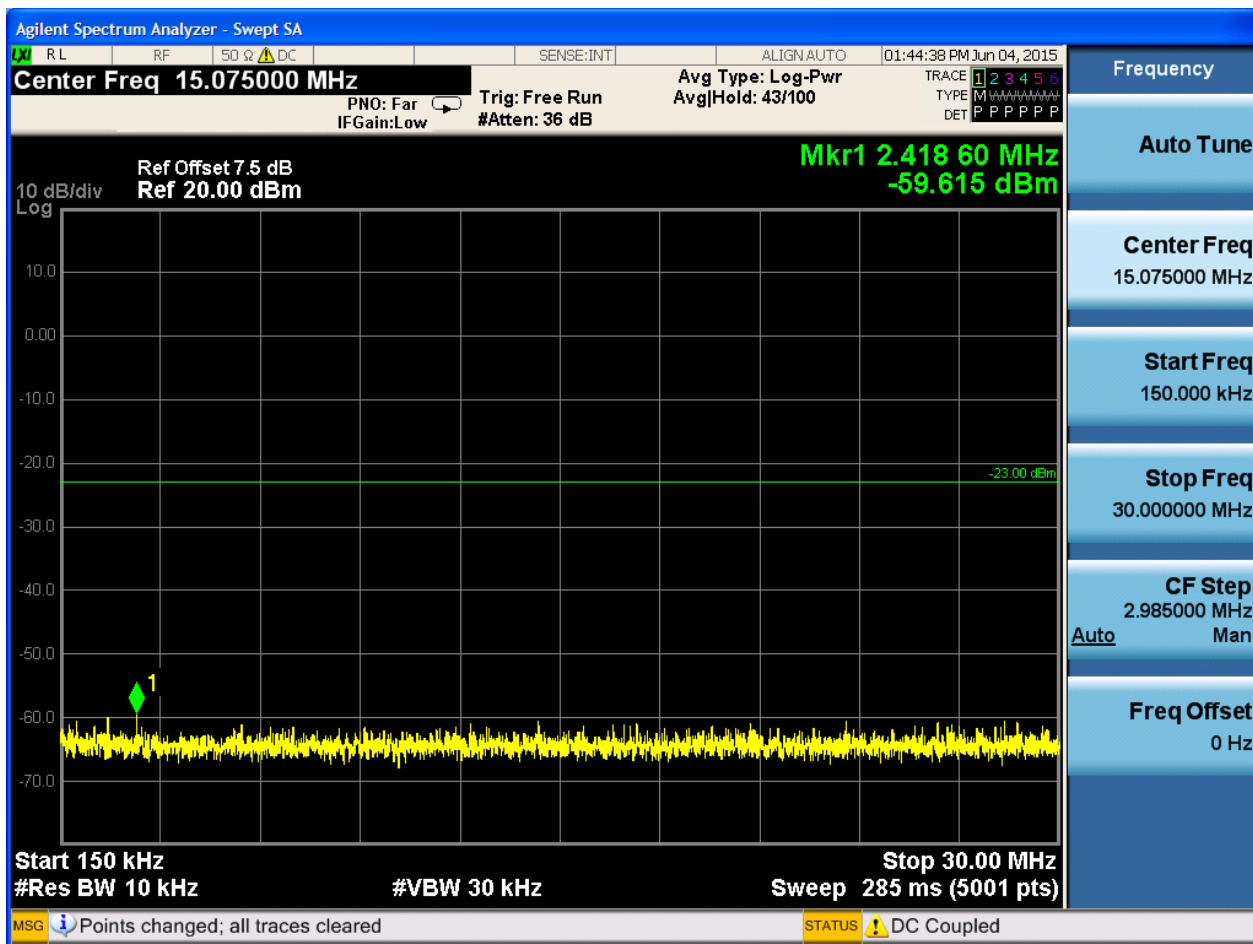


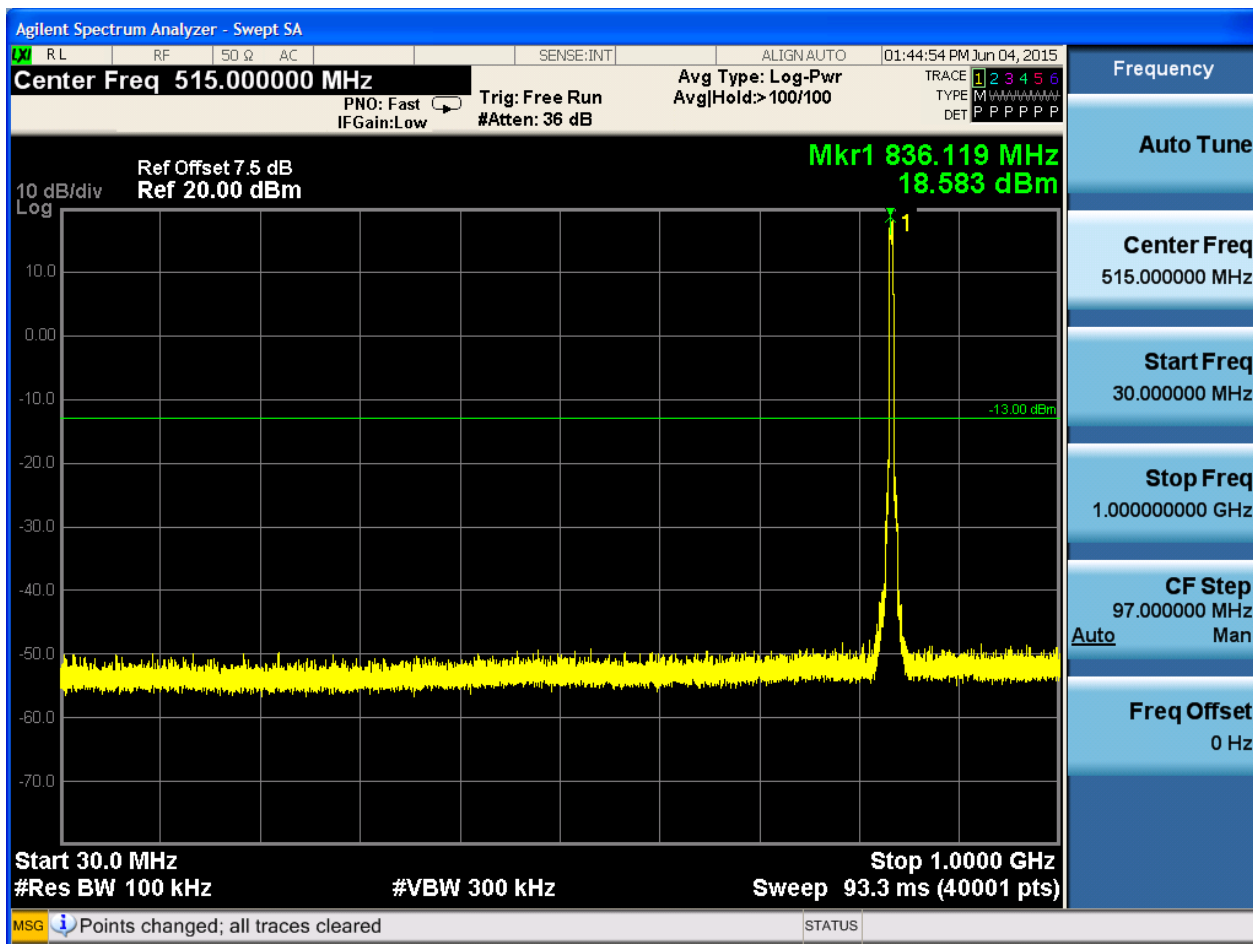


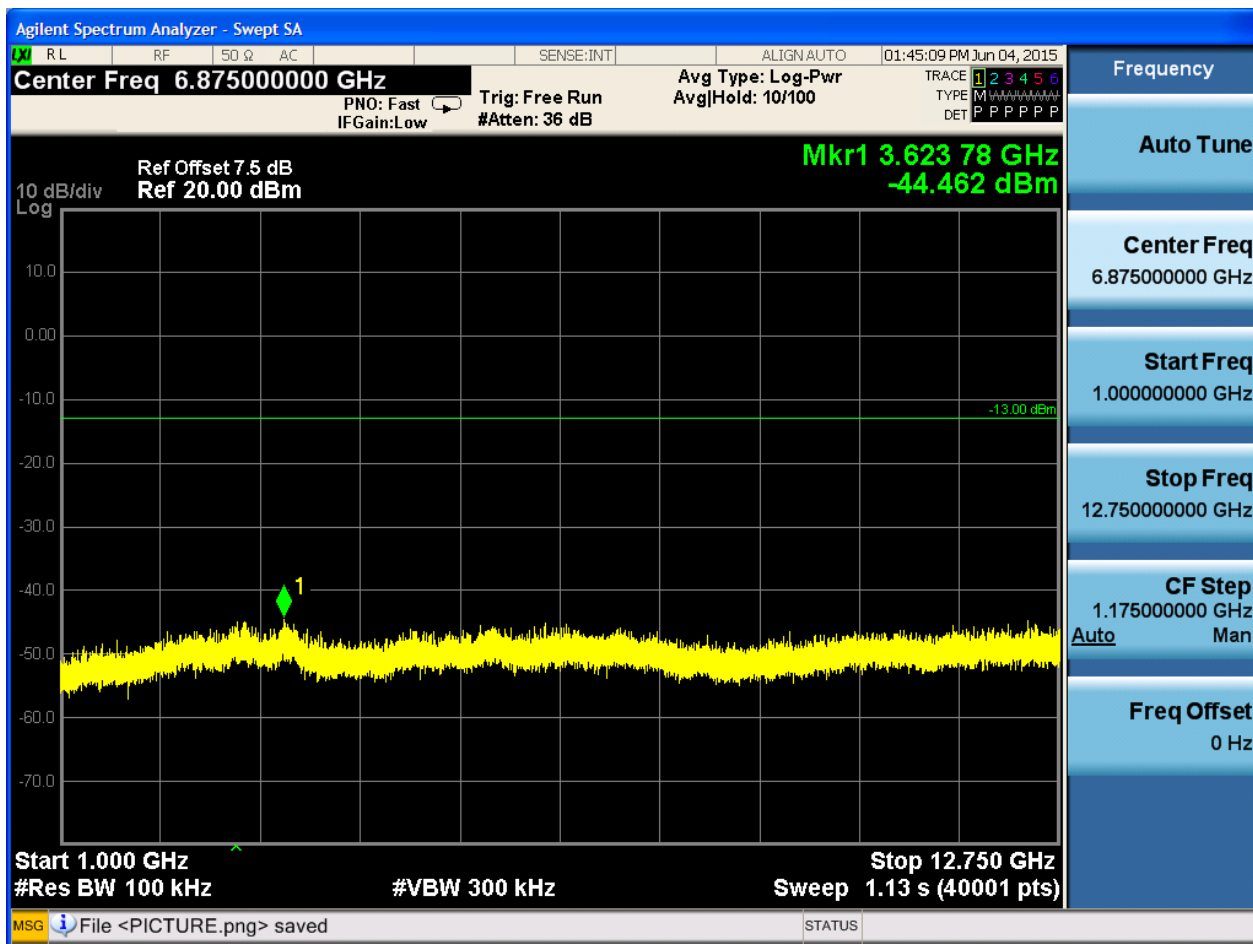


6.1.2.1.2 Test Channel = MCH

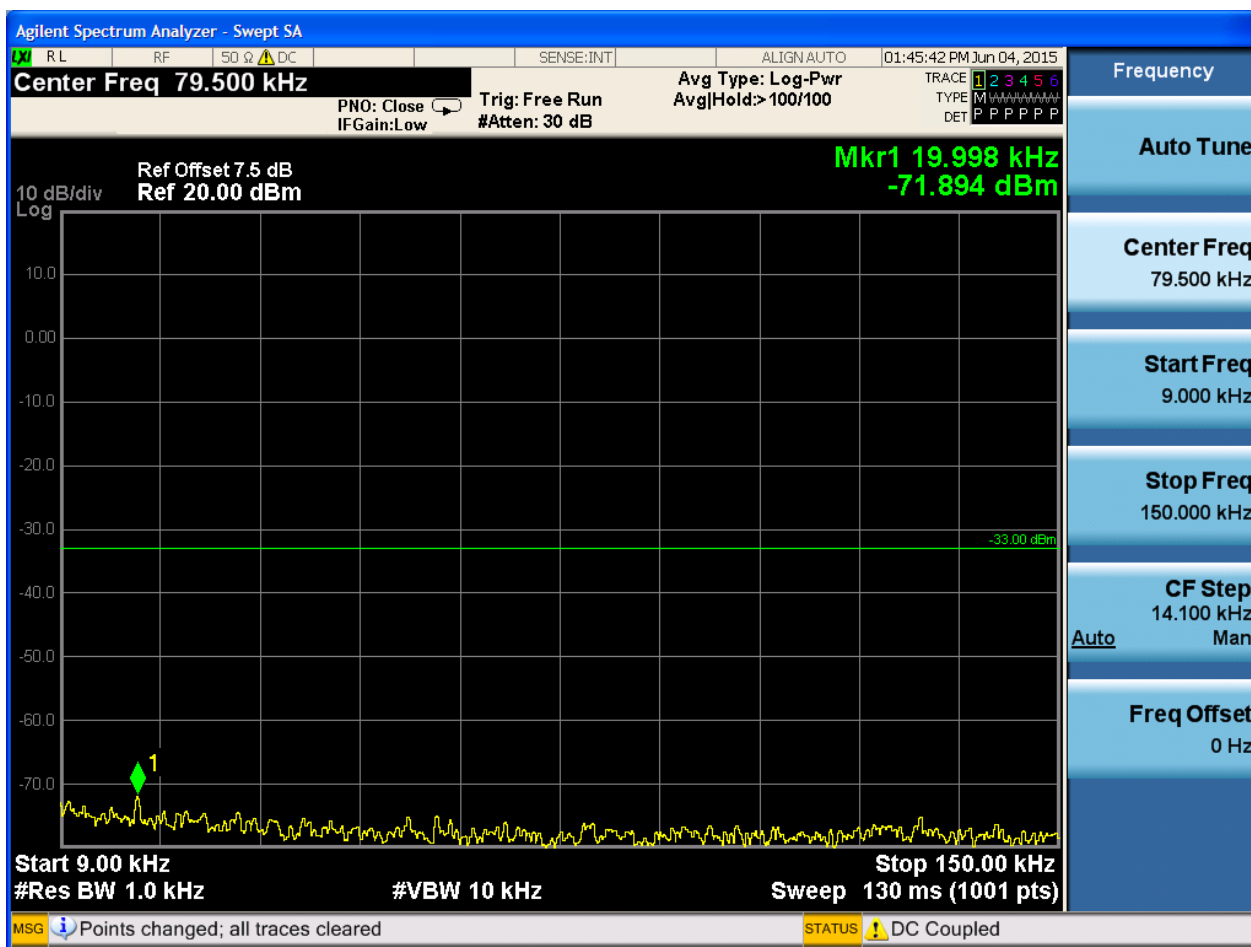


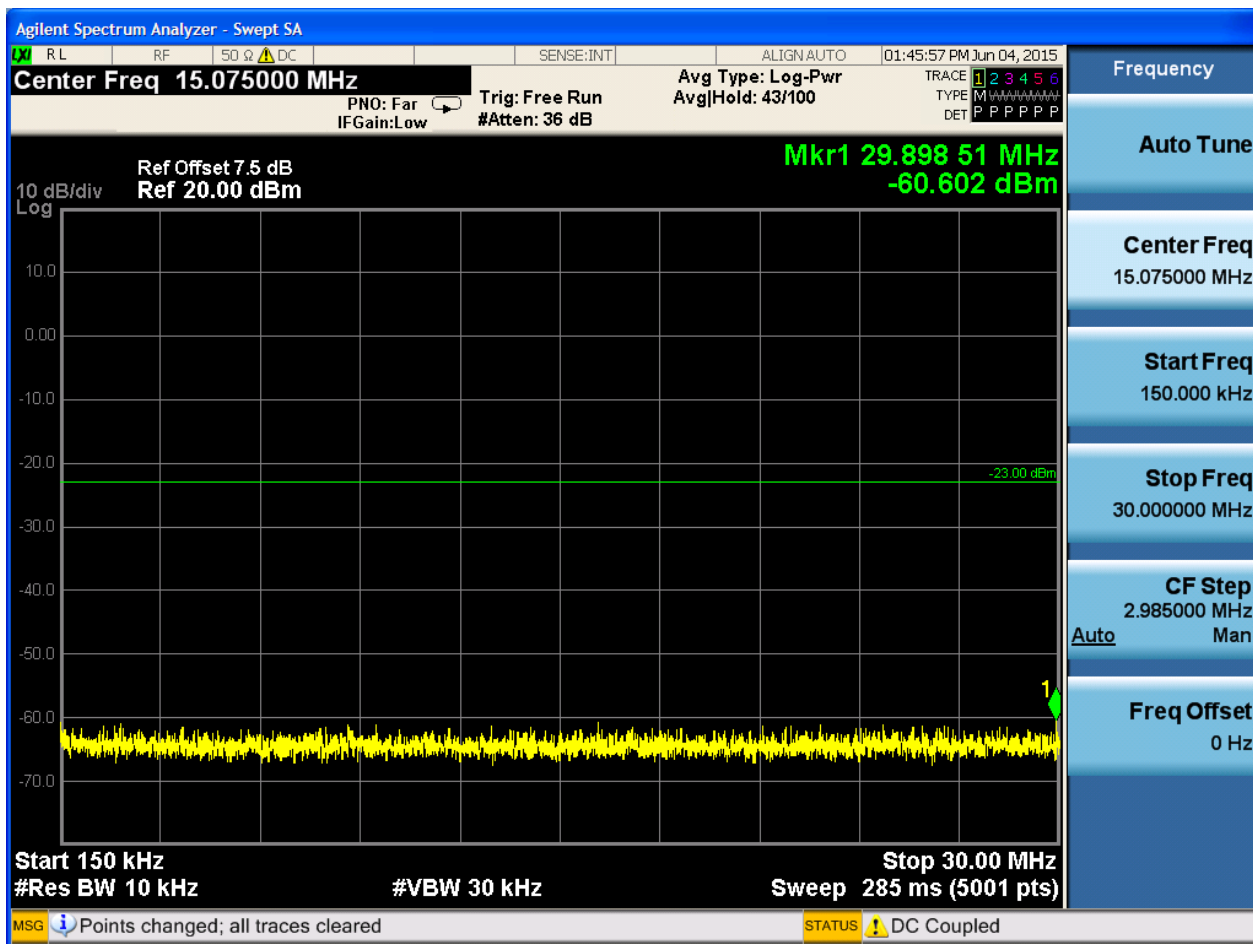


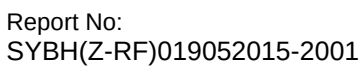


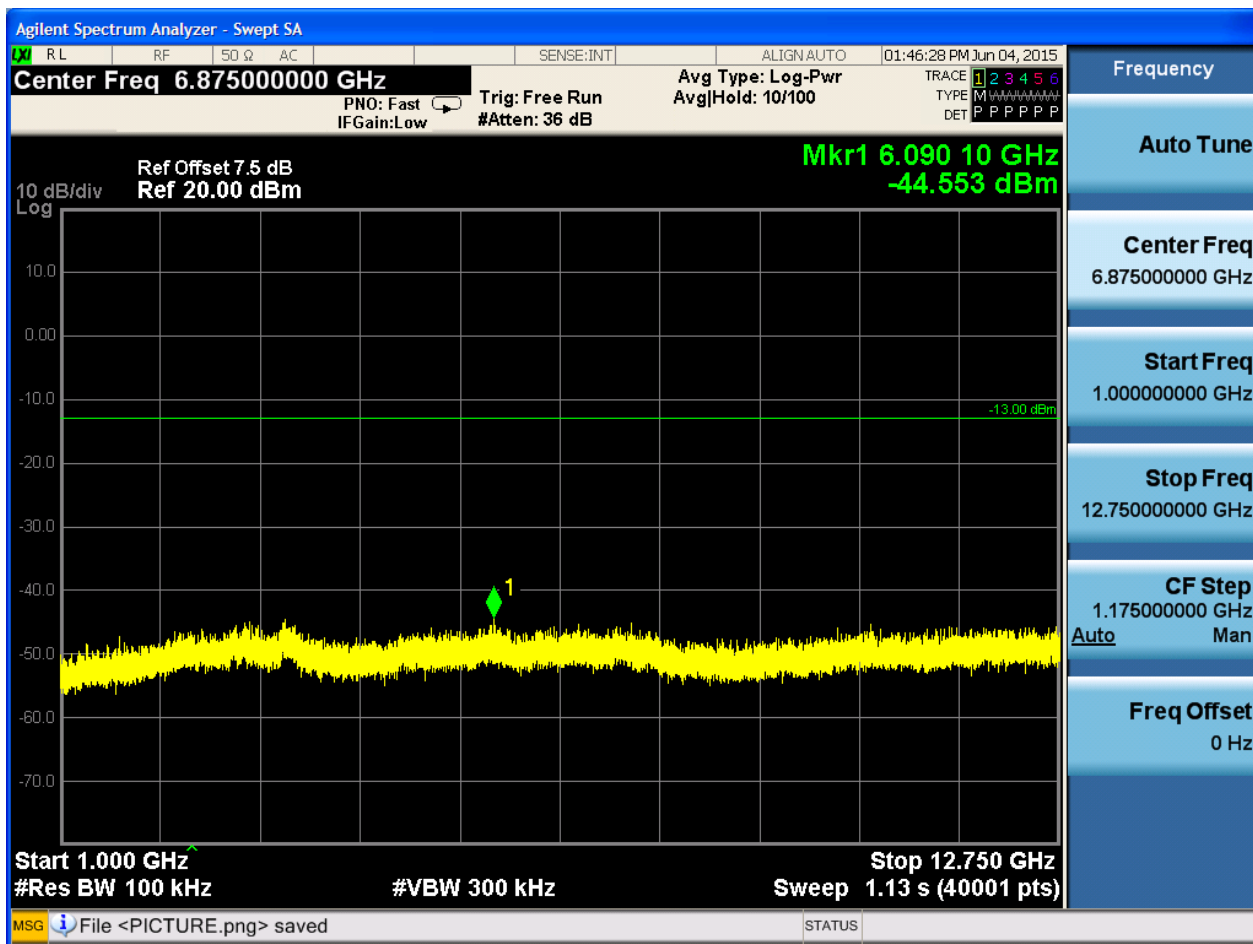


6.1.2.1.3 Test Channel = HCH





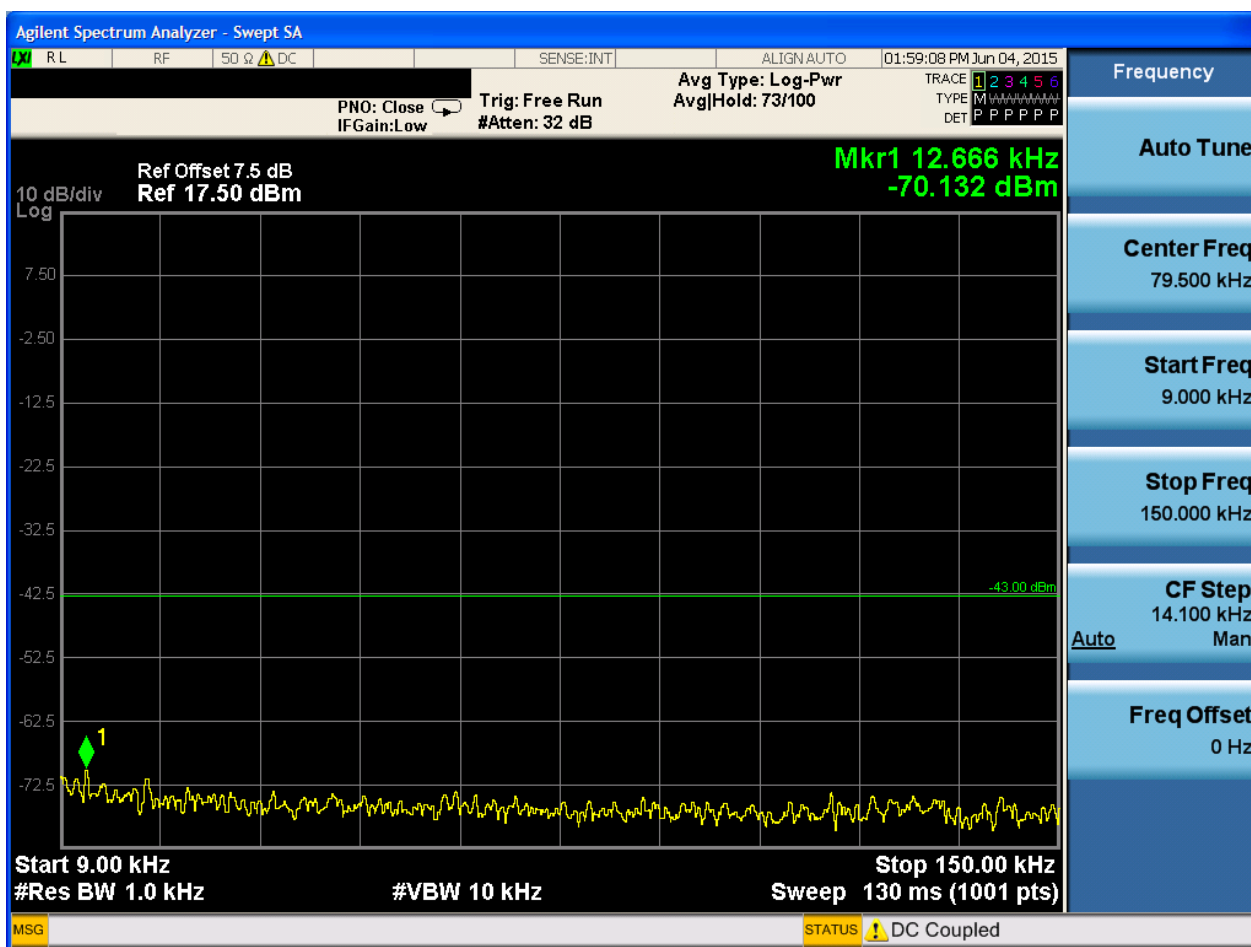


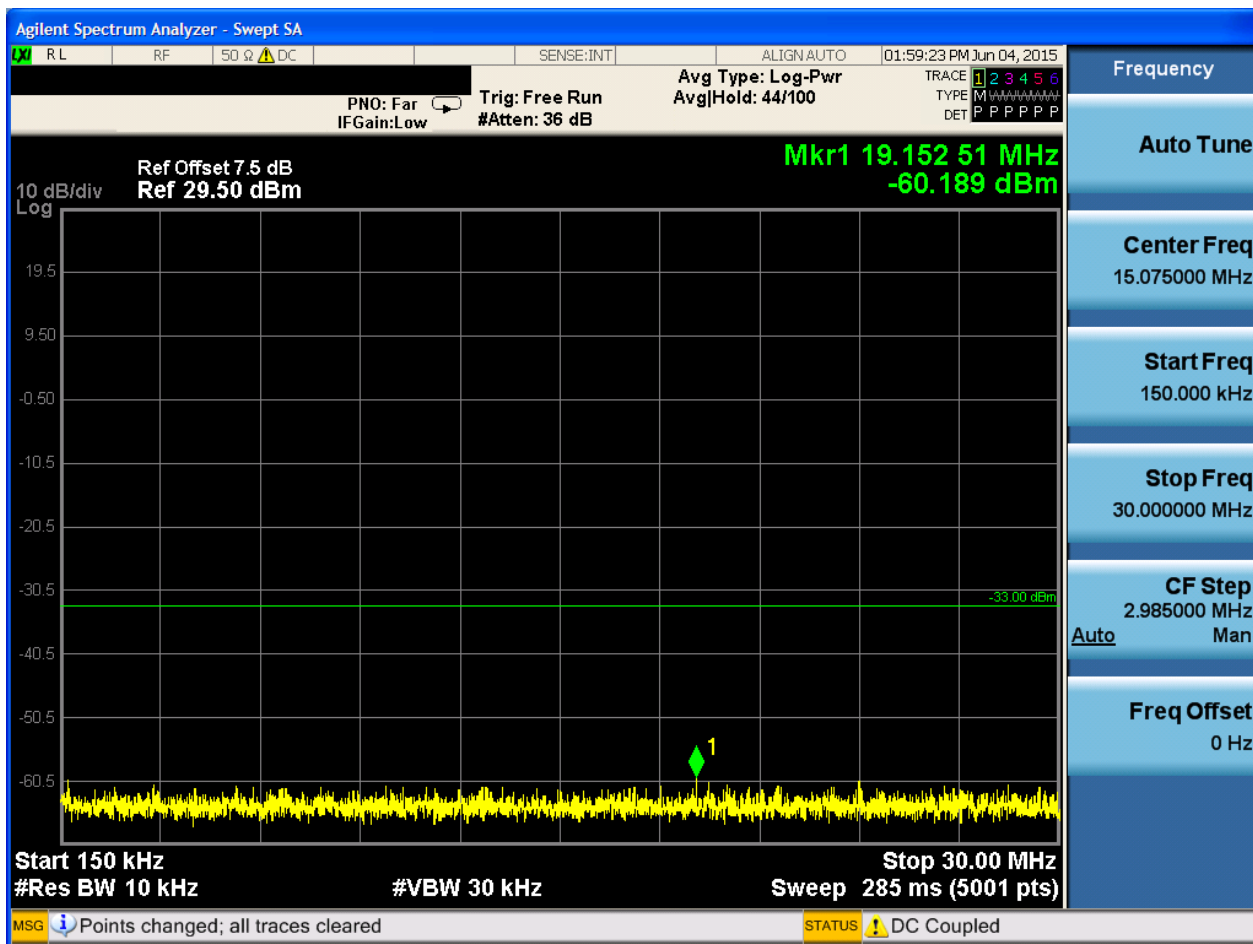


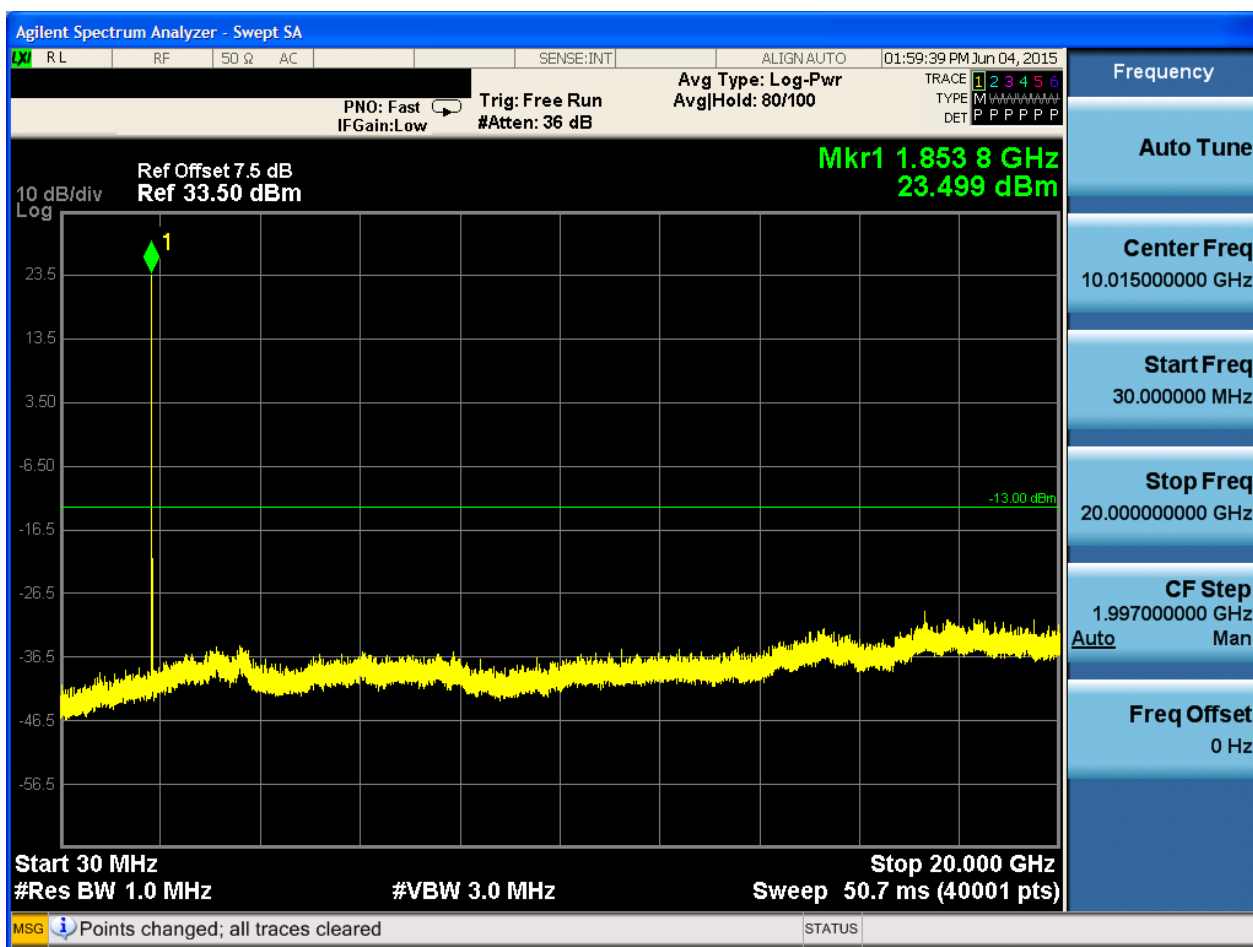
6.1.3 Test Band = WCDMA1900

6.1.3.1 Test Mode = UMTS/TM1

6.1.3.1.1 Test Channel = LCH







6.1.3.1.2 Test Channel =

6.1.4 Test Band = WCDMA1900

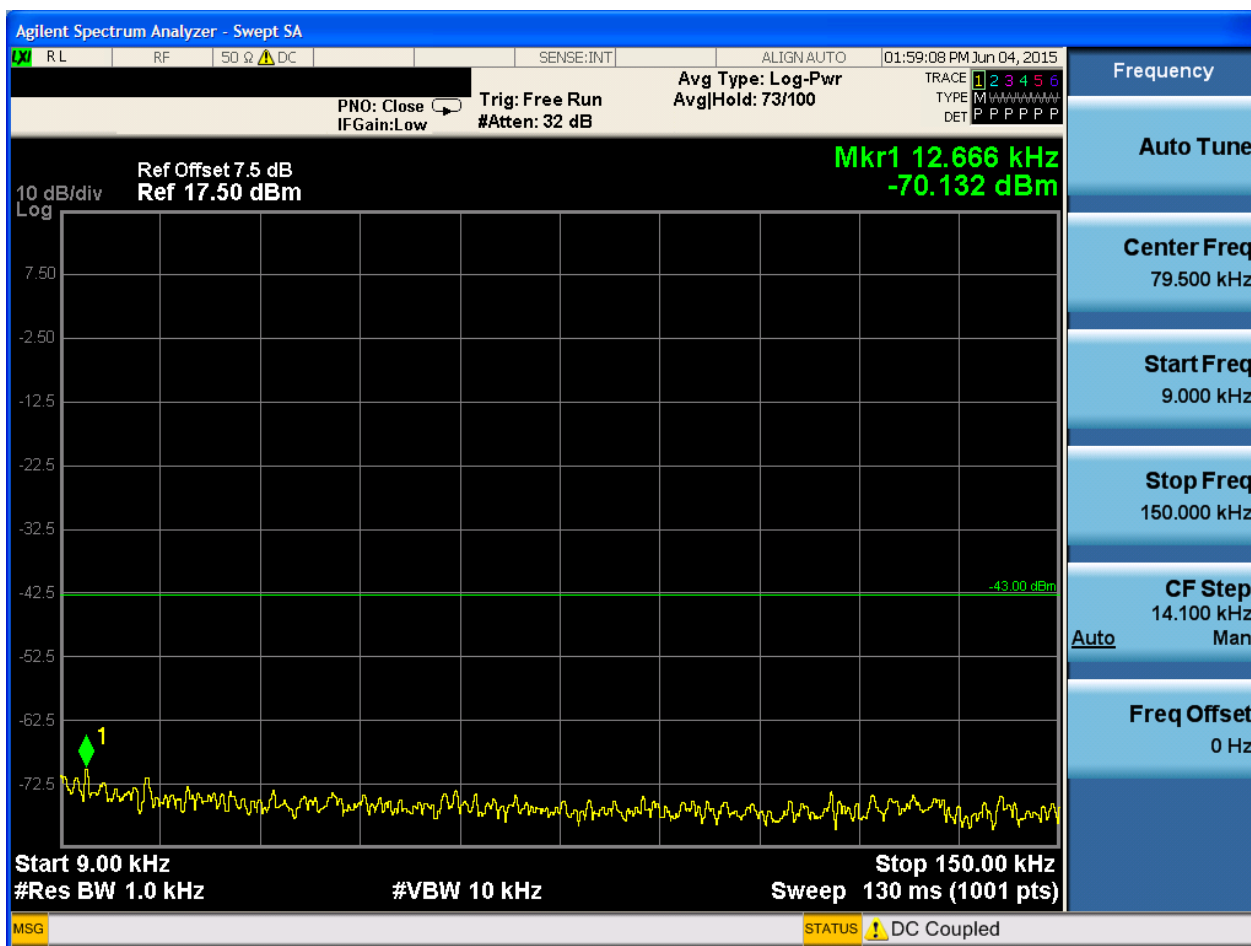
6.1.4.1 Test Mode = UMTS/TM1

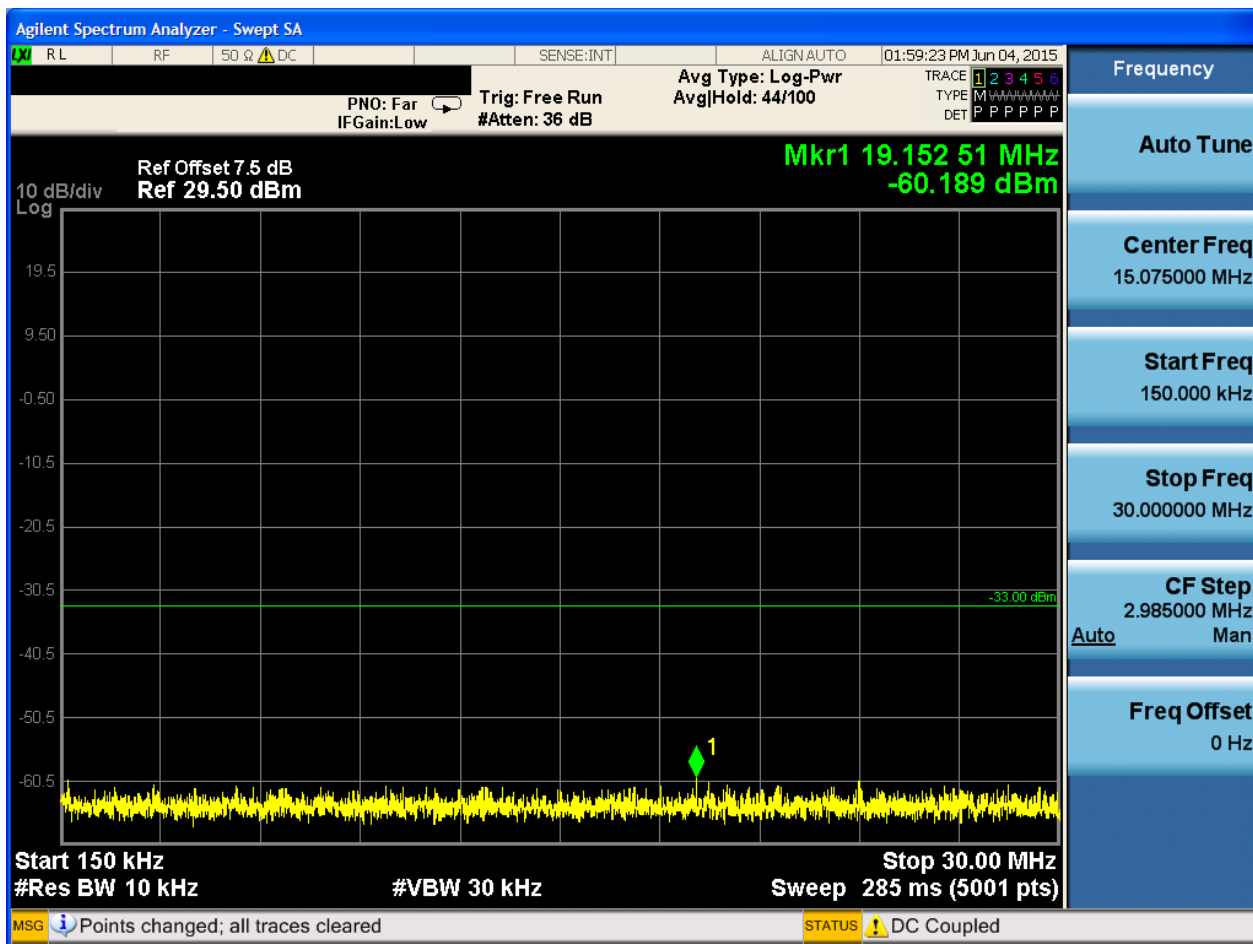
6.1.4.1.1 Test Channel =

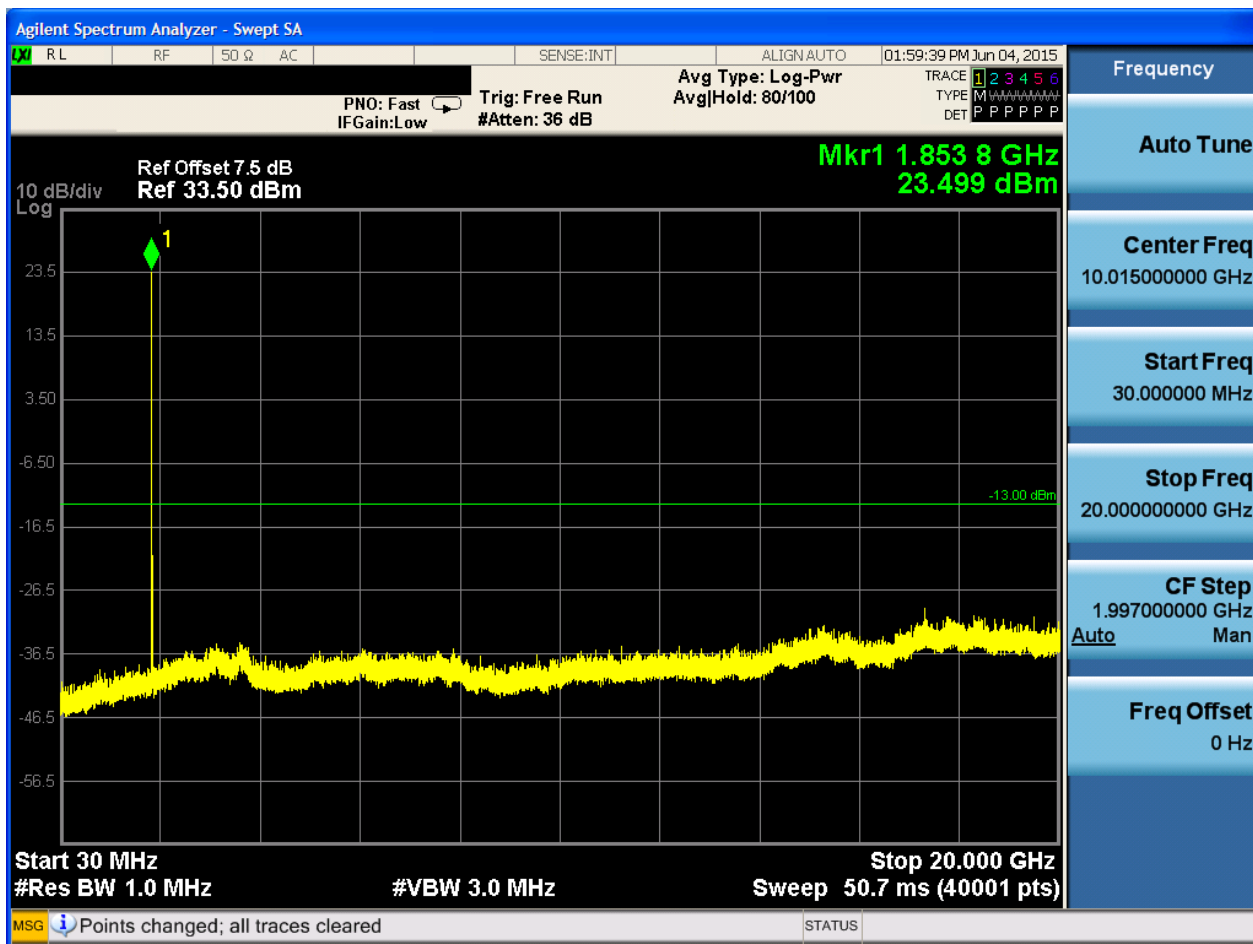
6.1.5 Test Band = WCDMA1900

6.1.5.1 Test Mode = UMTS/TM1

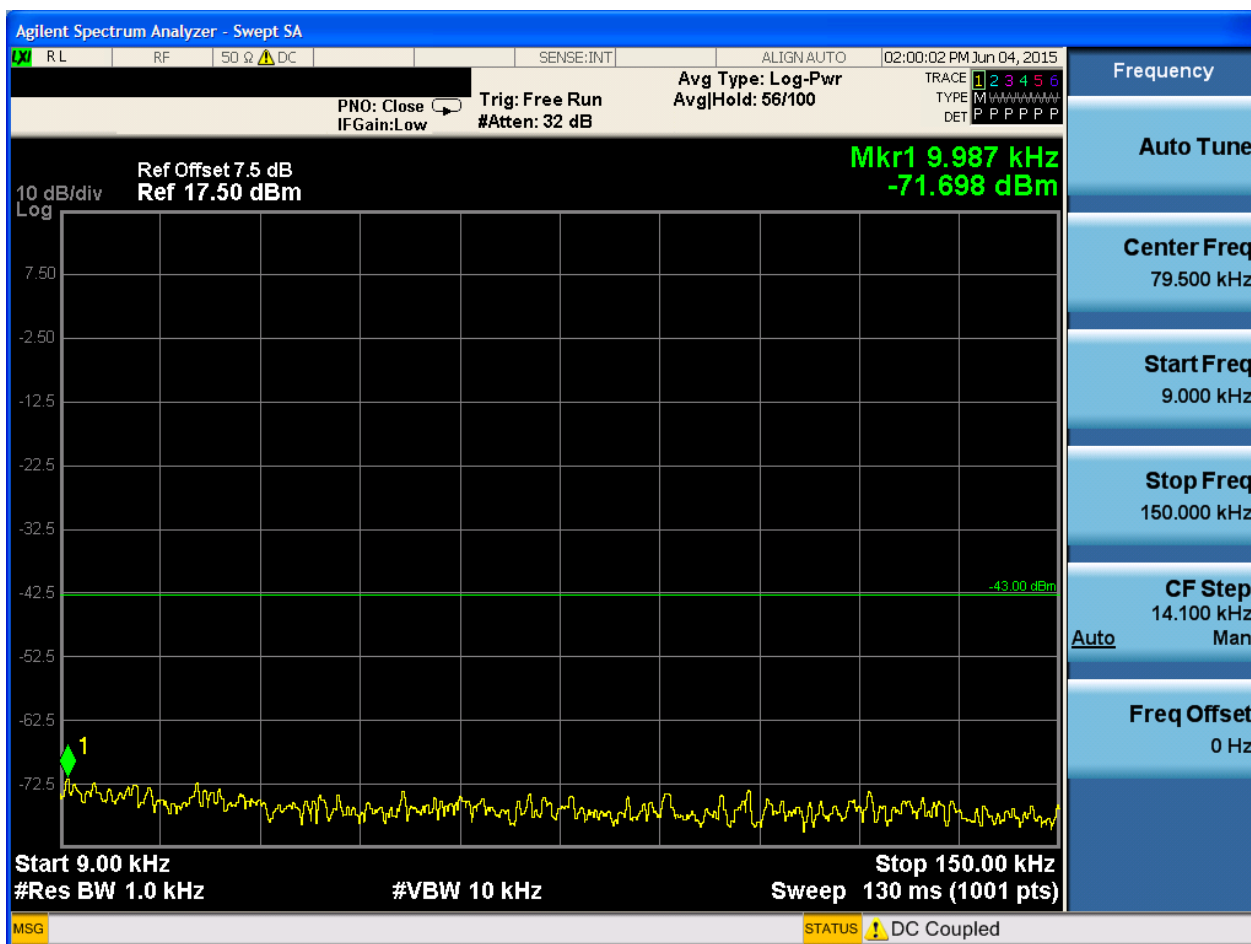
6.1.5.1.1 Test Channel = LCH

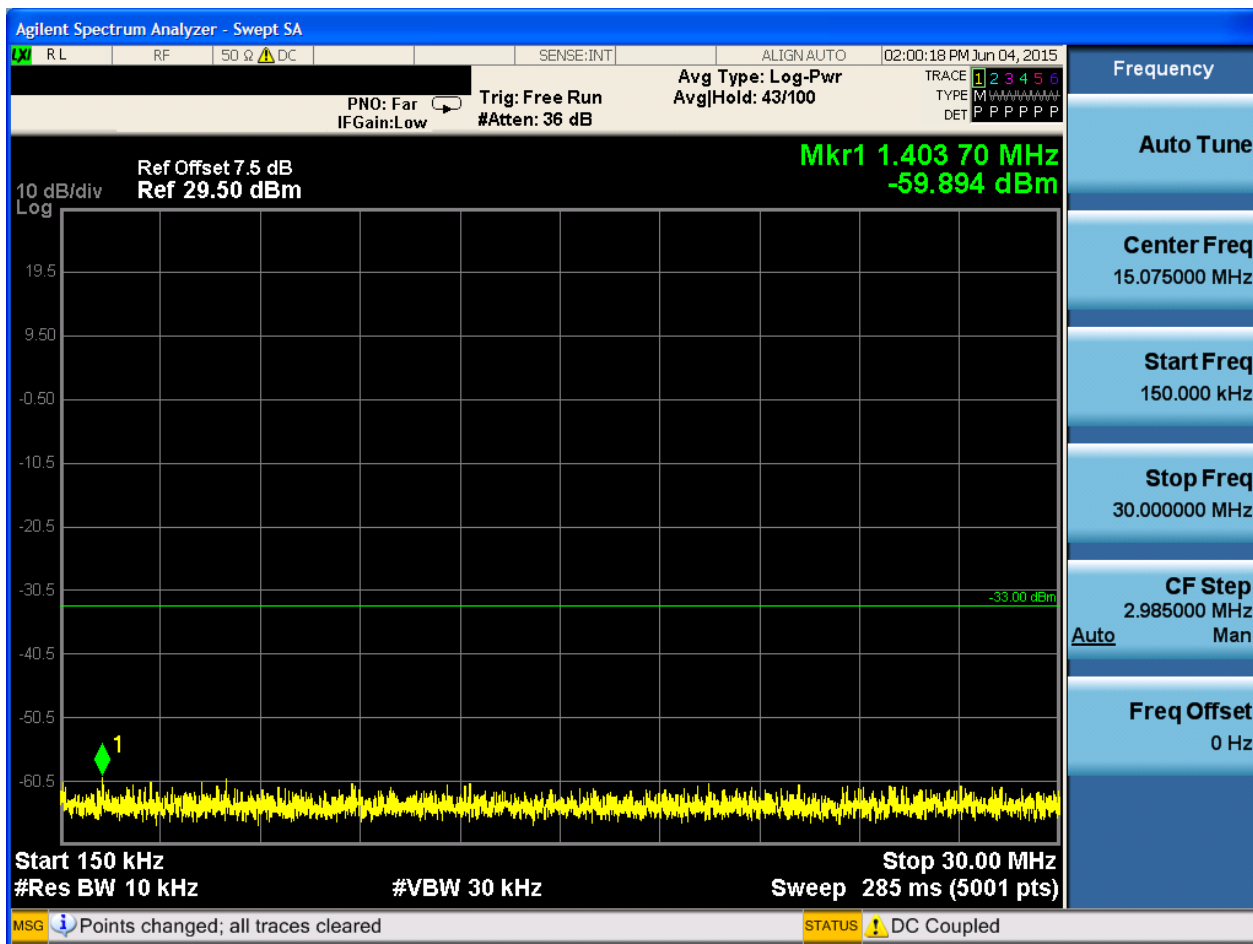


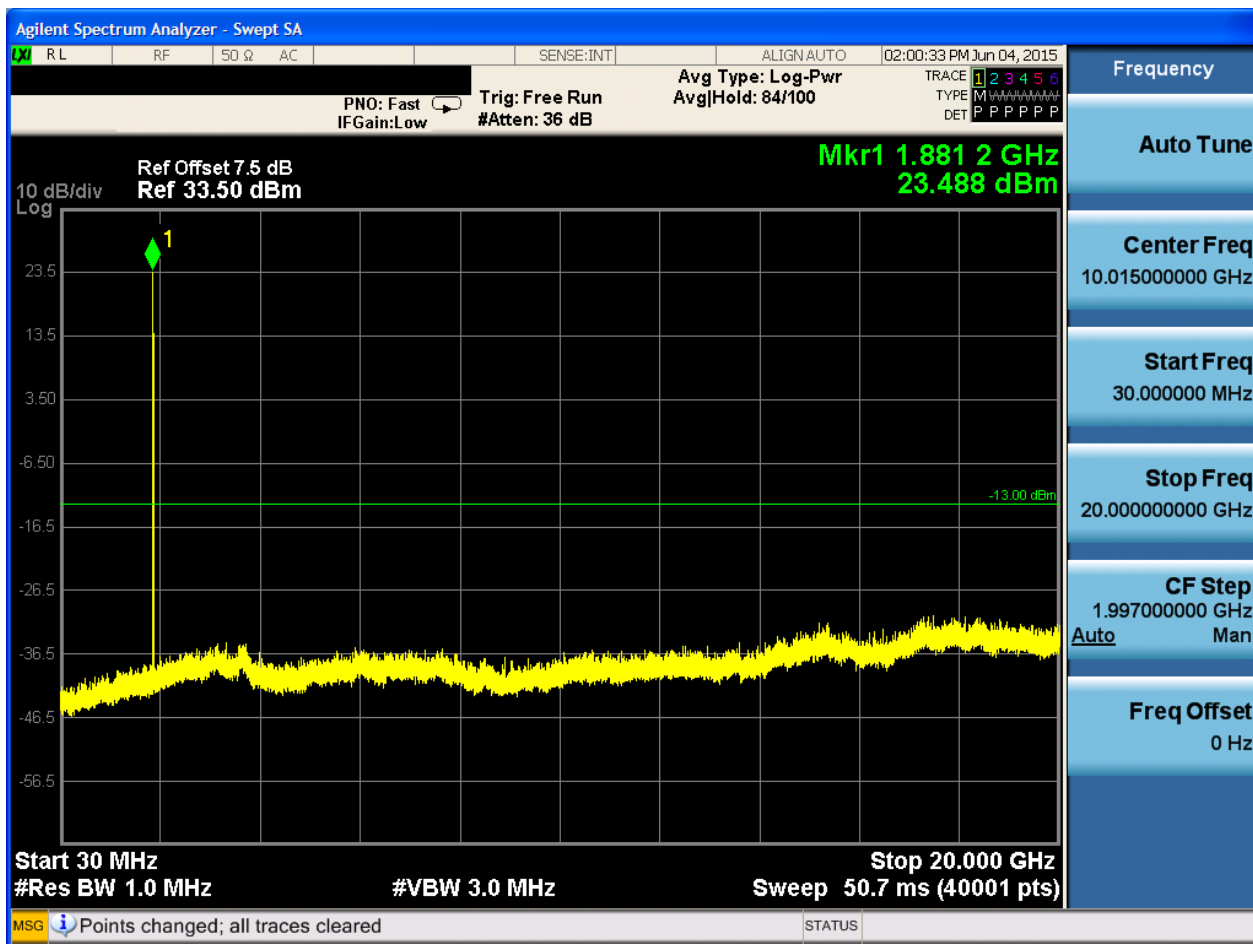




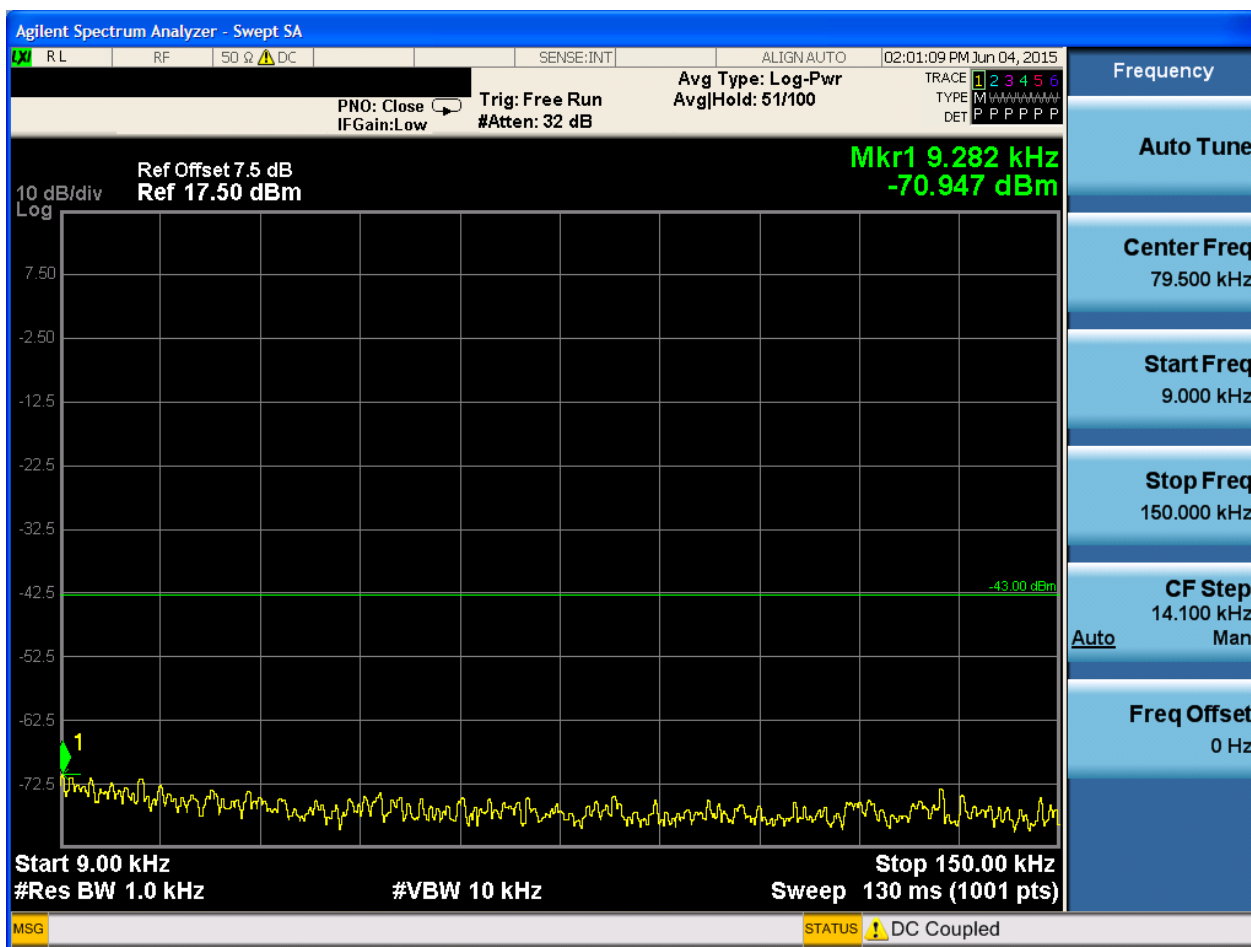
6.1.5.1.2 Test Channel = MCH

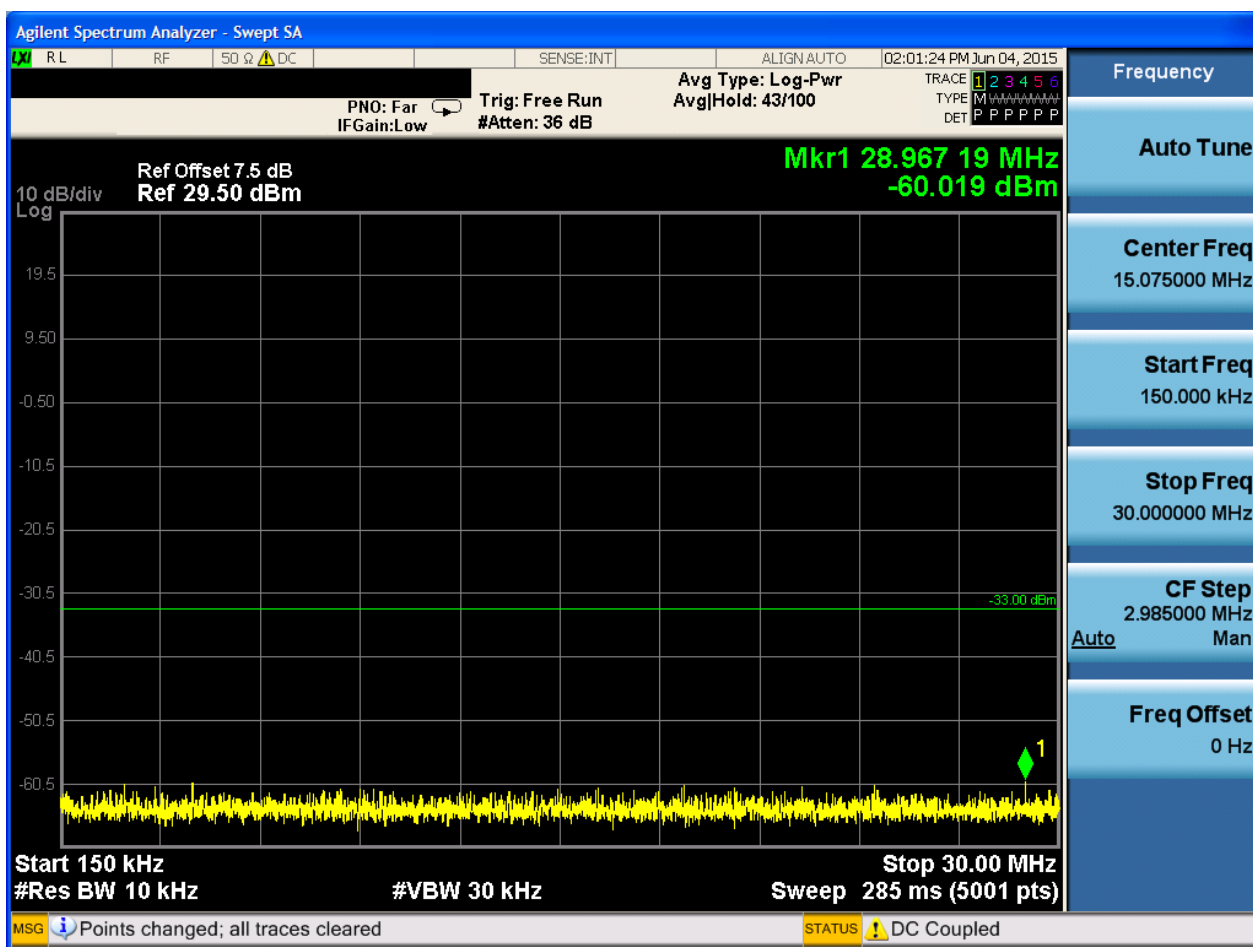


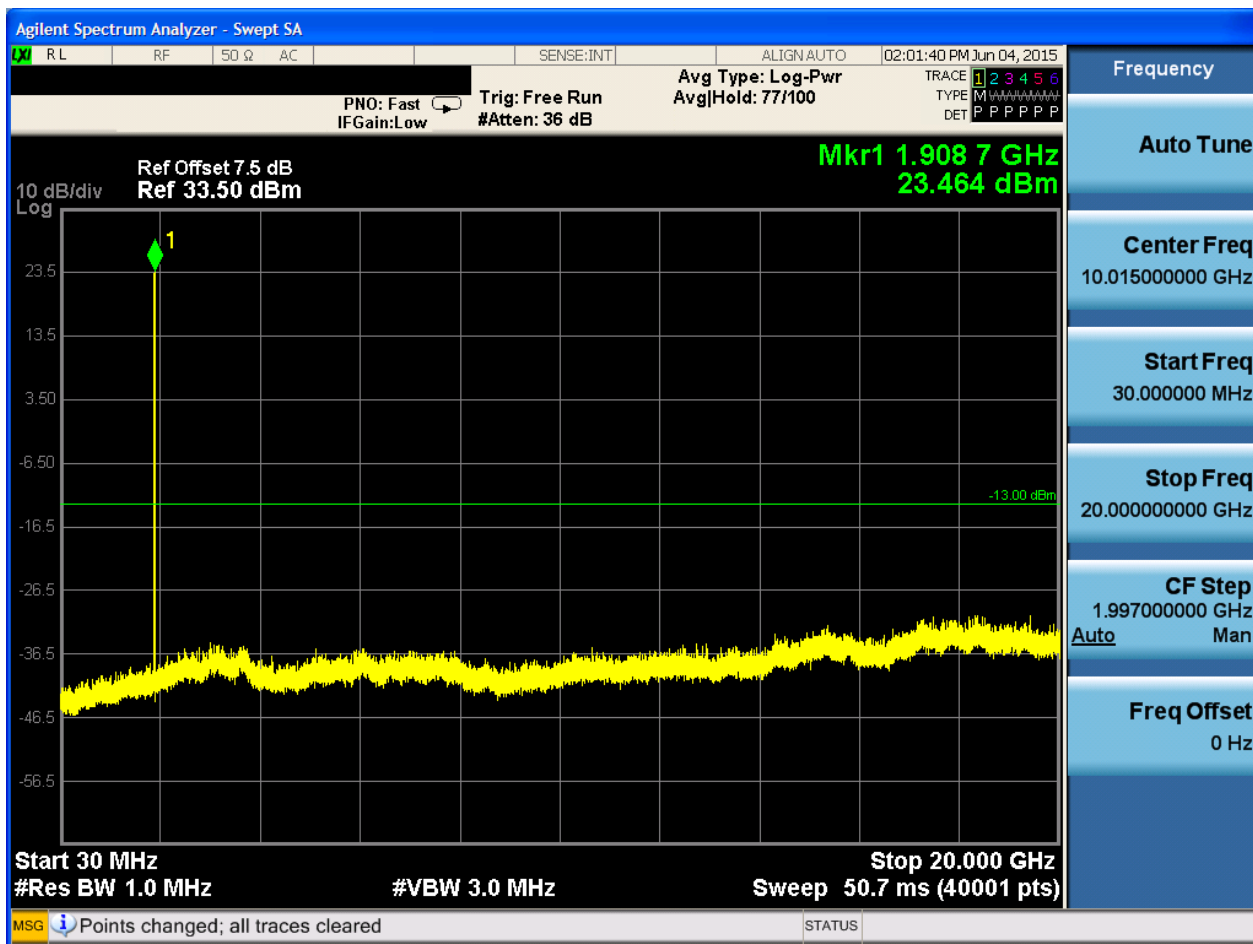




6.1.5.1.3 Test Channel = HCH



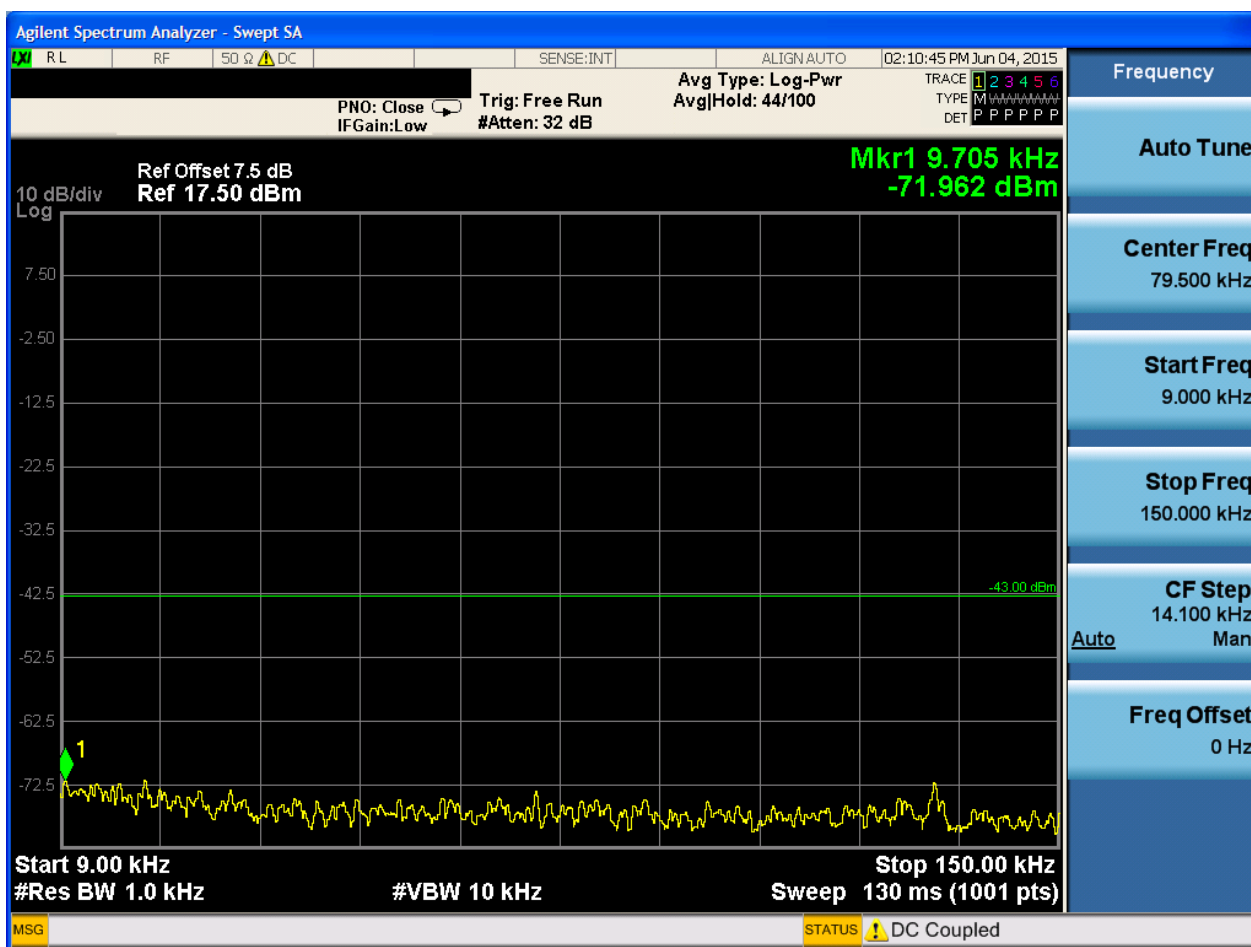


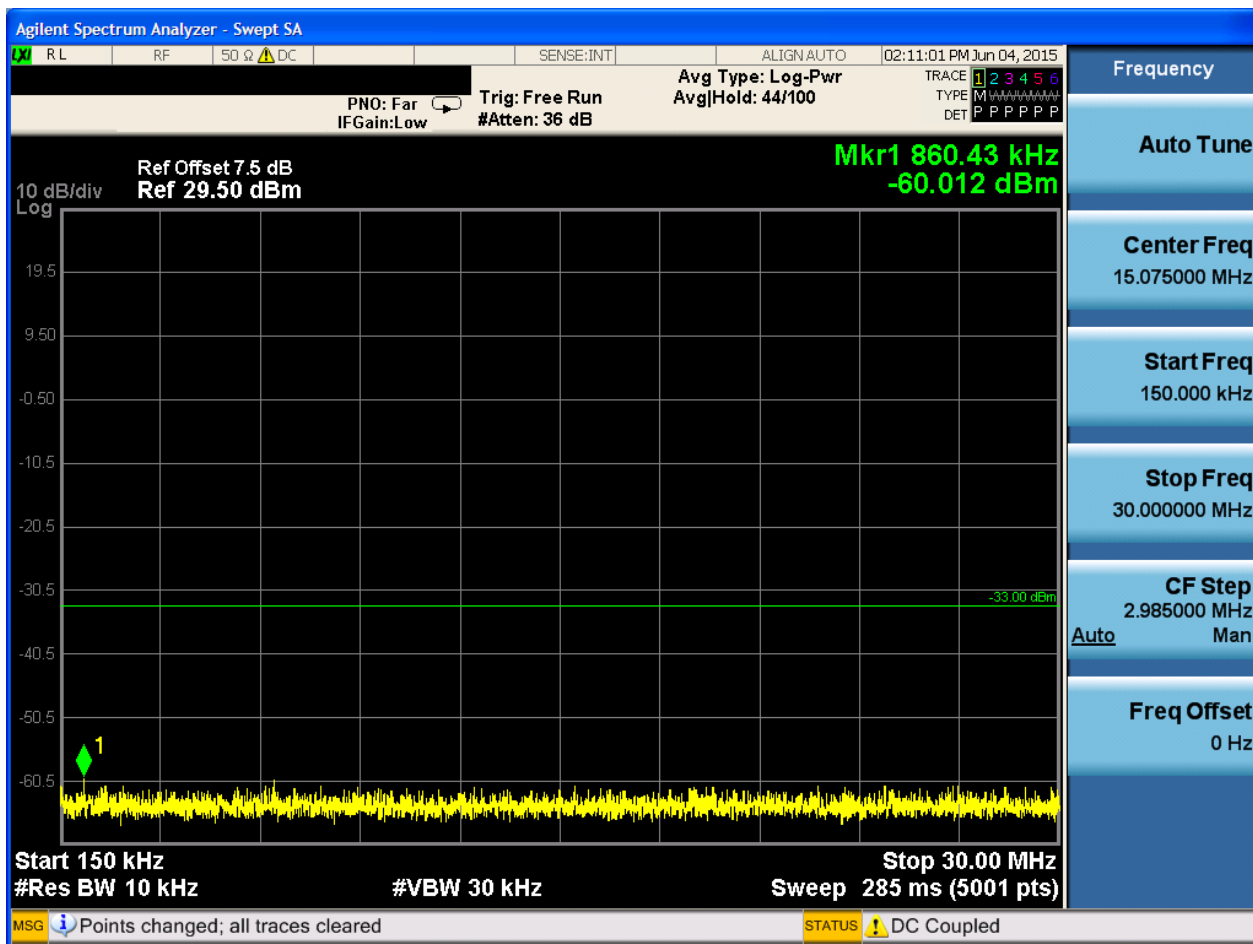


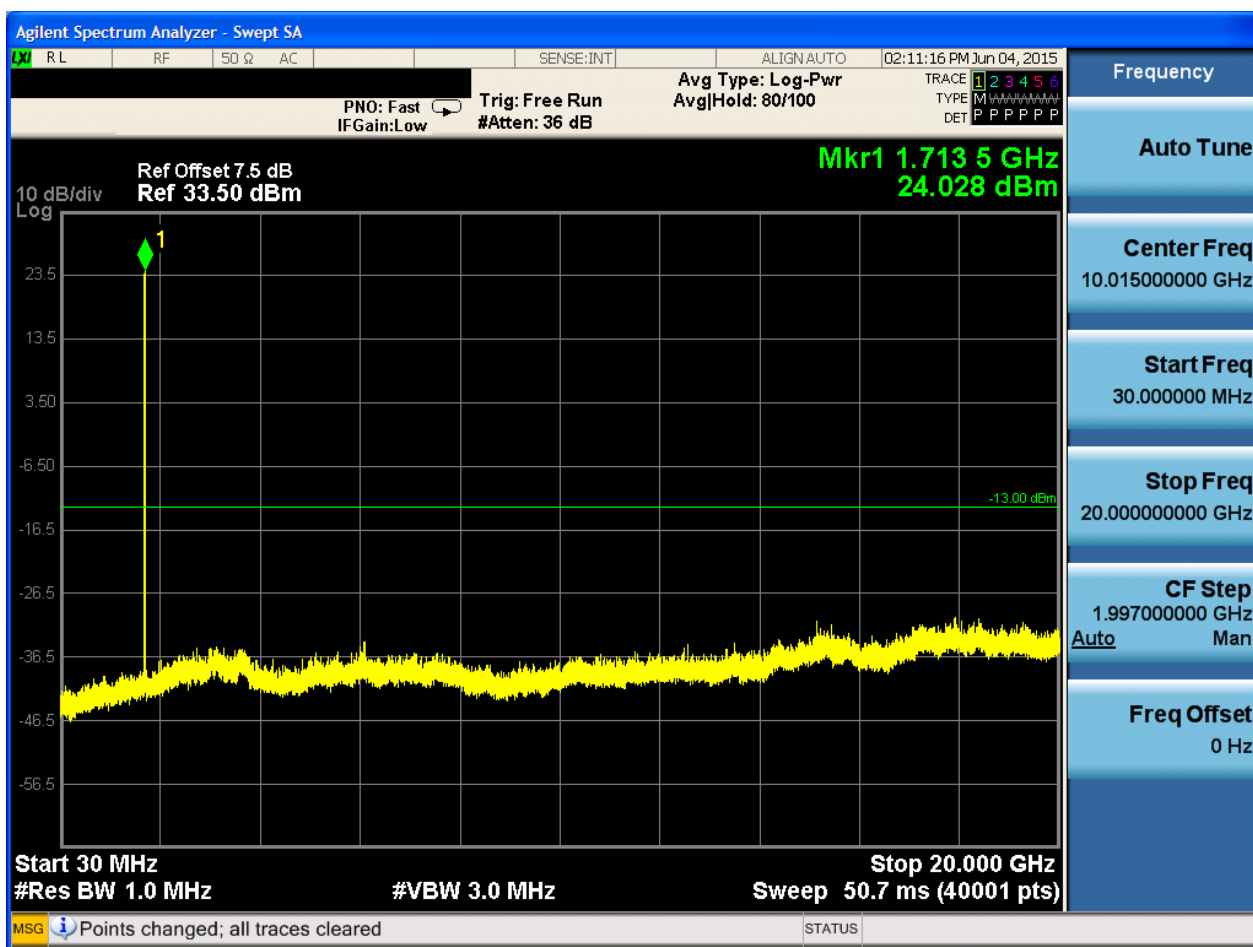
6.1.6 Test Band = WCDMA1700

6.1.6.1 Test Mode = UMTS/TM1

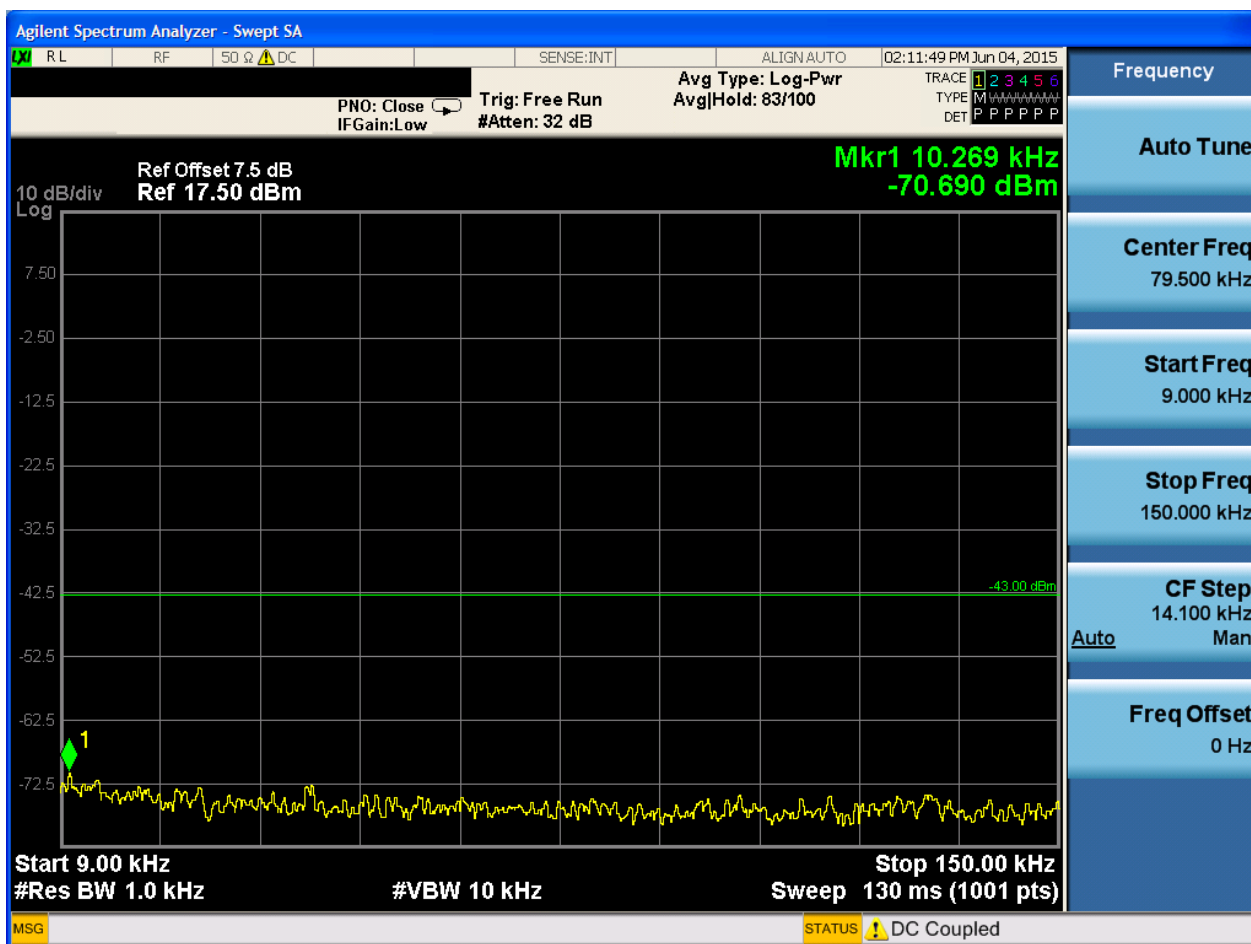
6.1.6.1.1 Test Channel = LCH

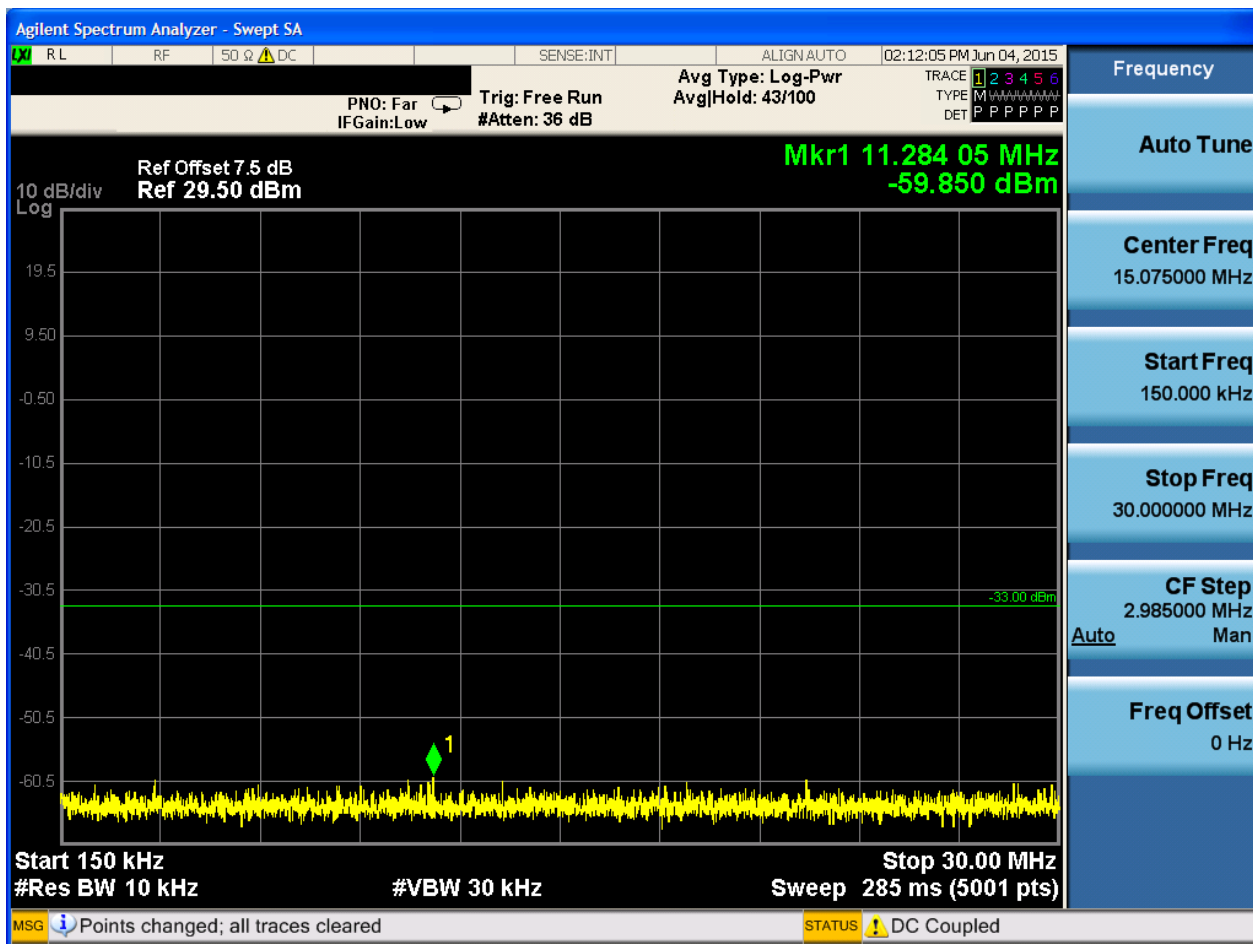


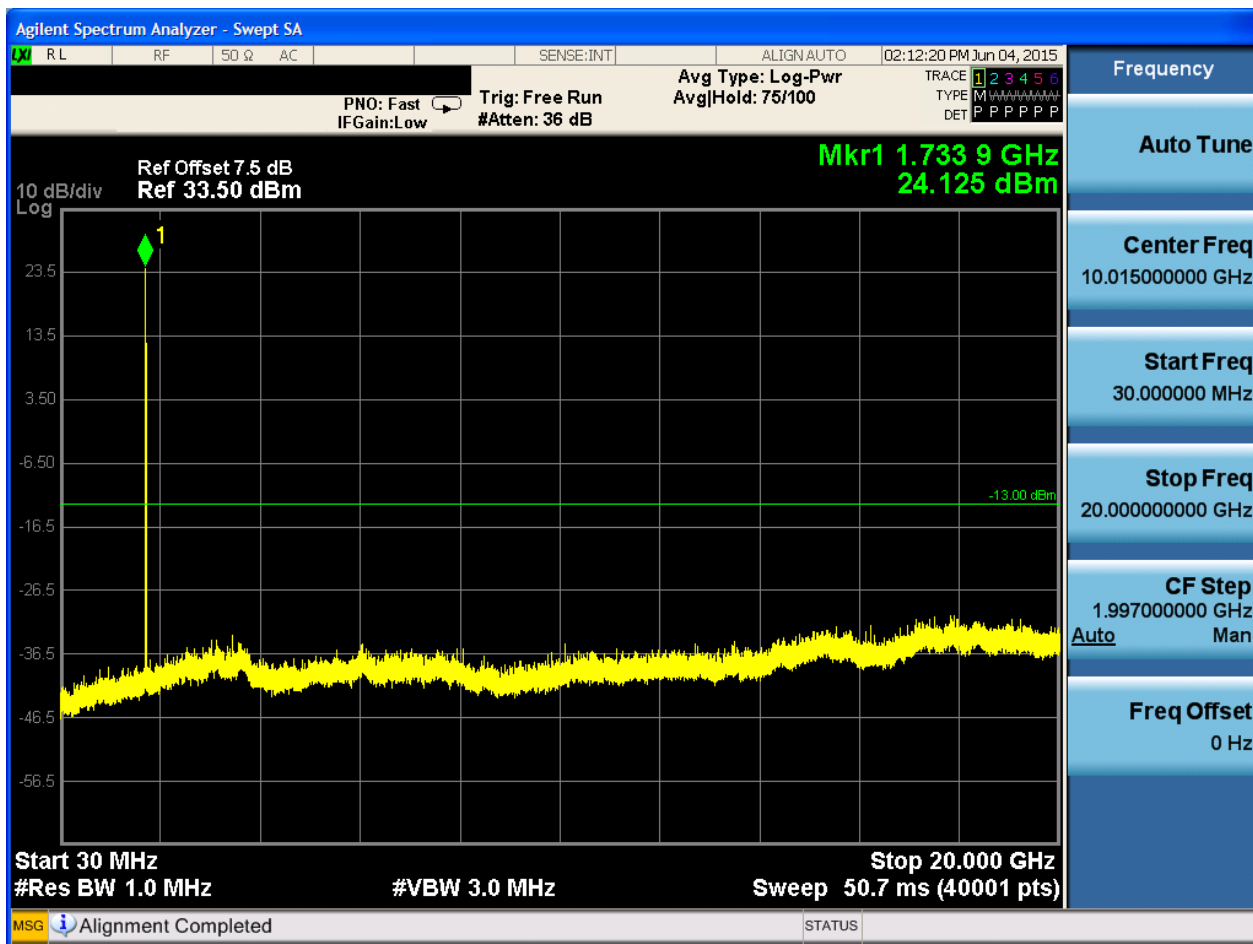




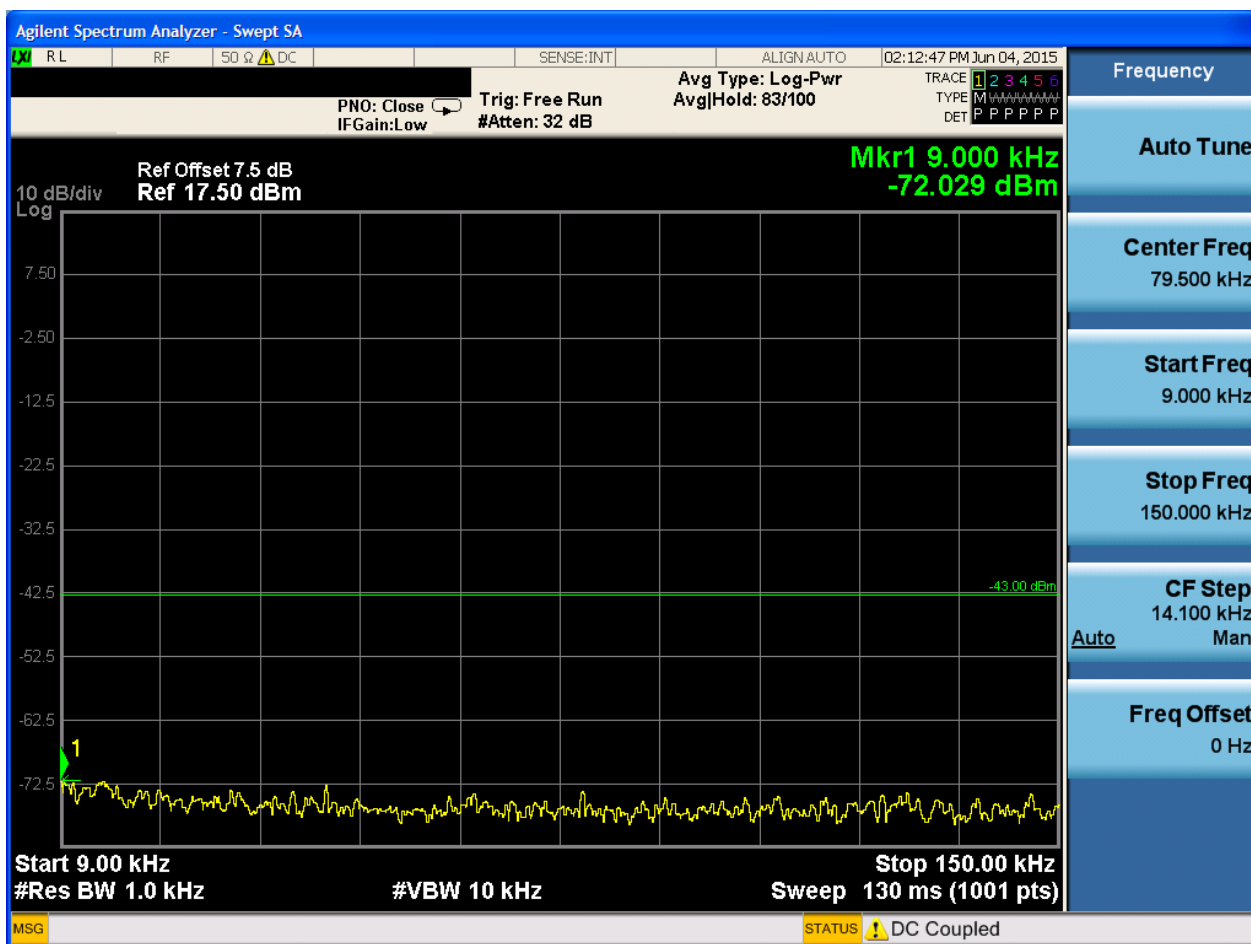
6.1.6.1.2 Test Channel = MCH

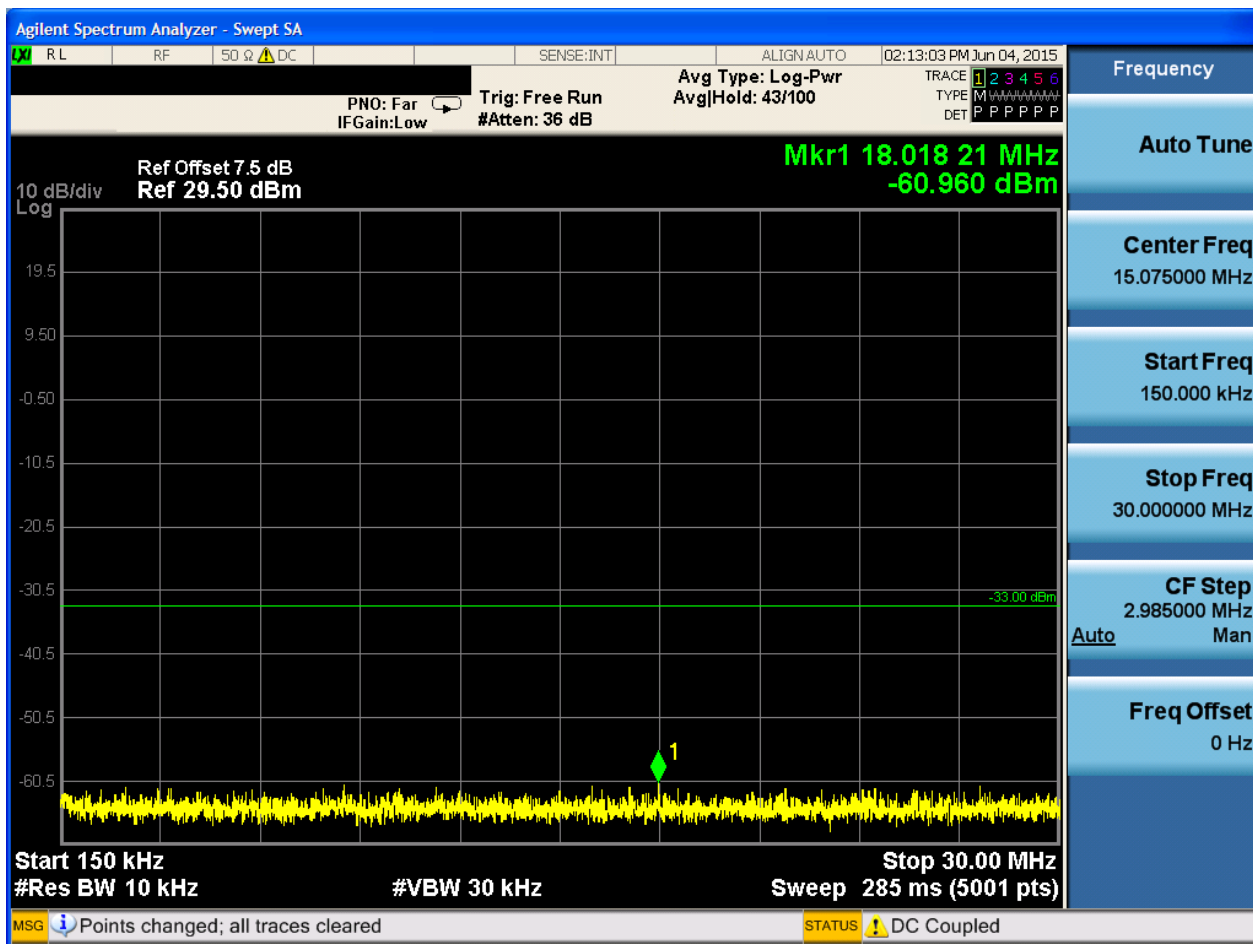


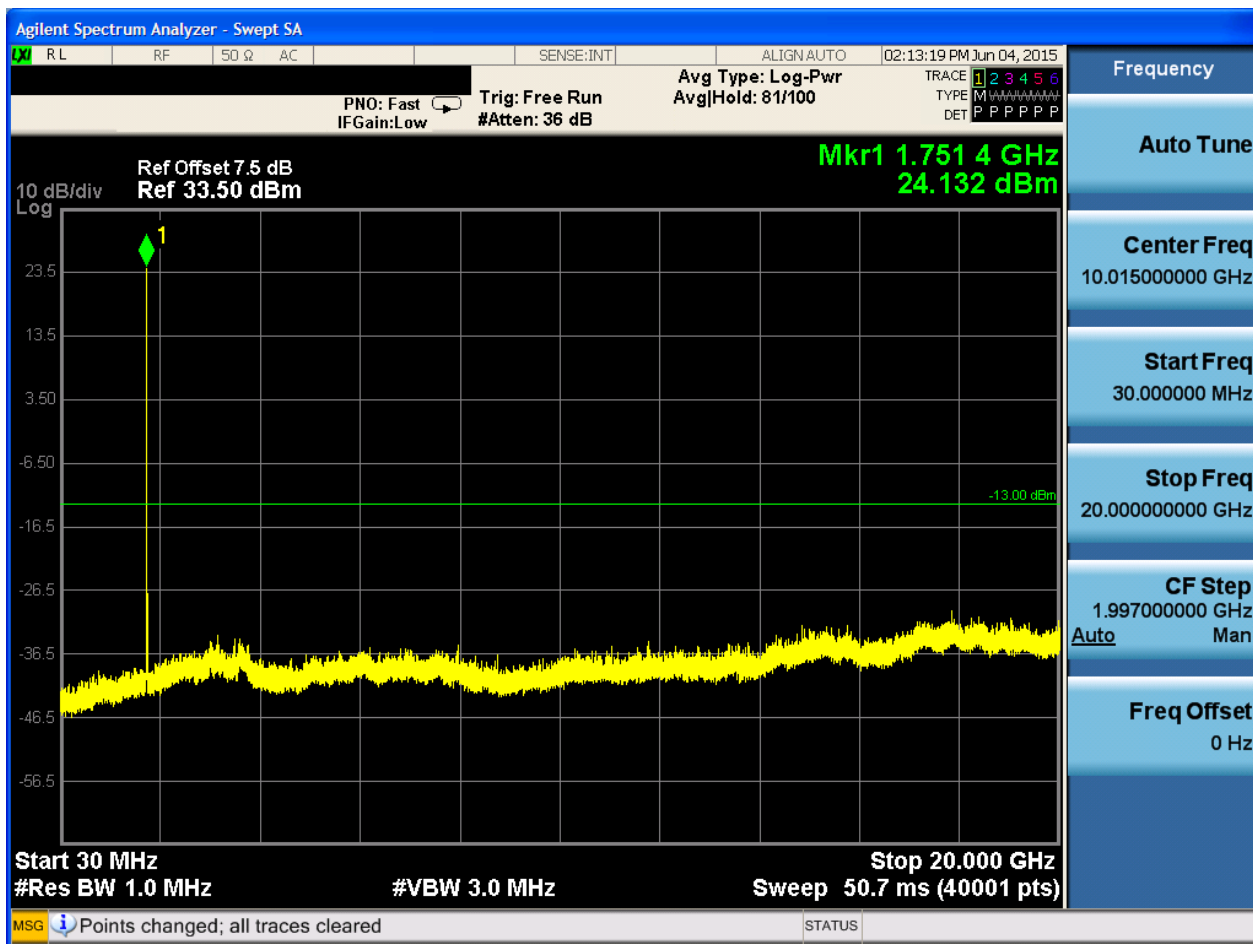




6.1.6.1.3 Test Channel = HCH







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

NOTE1: No peak found in the Test Range of “9 kHz to 30MHz”

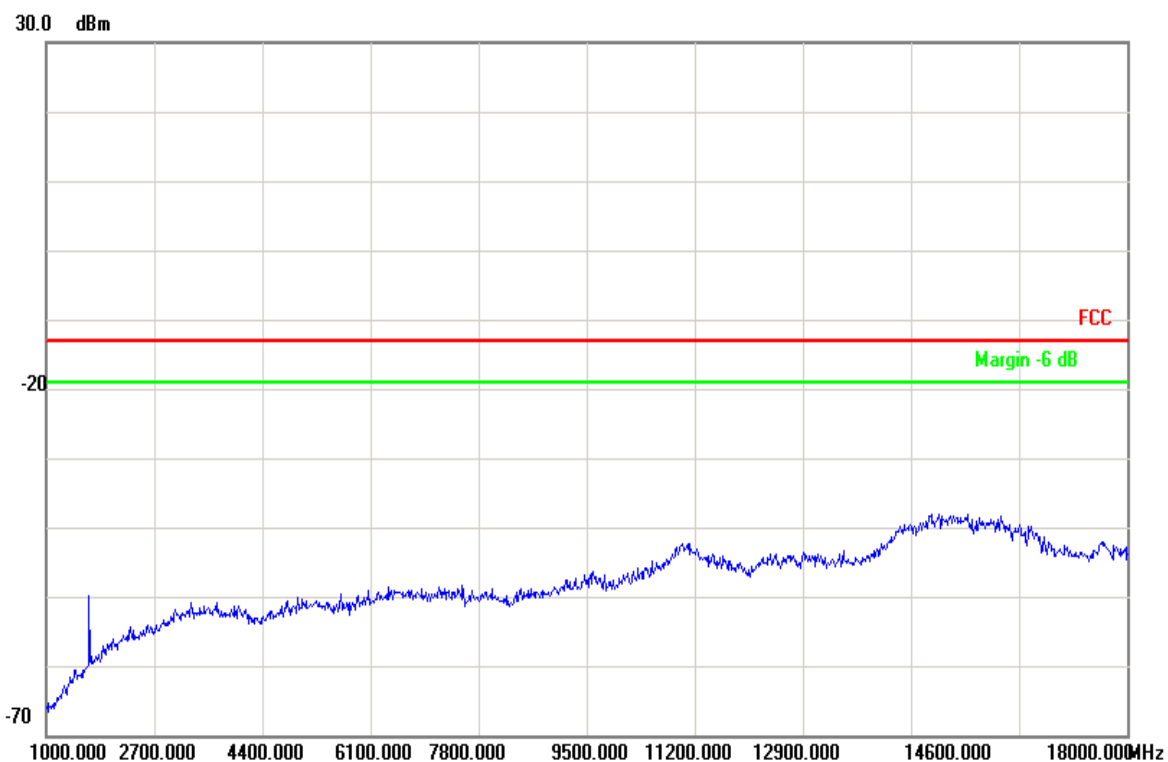
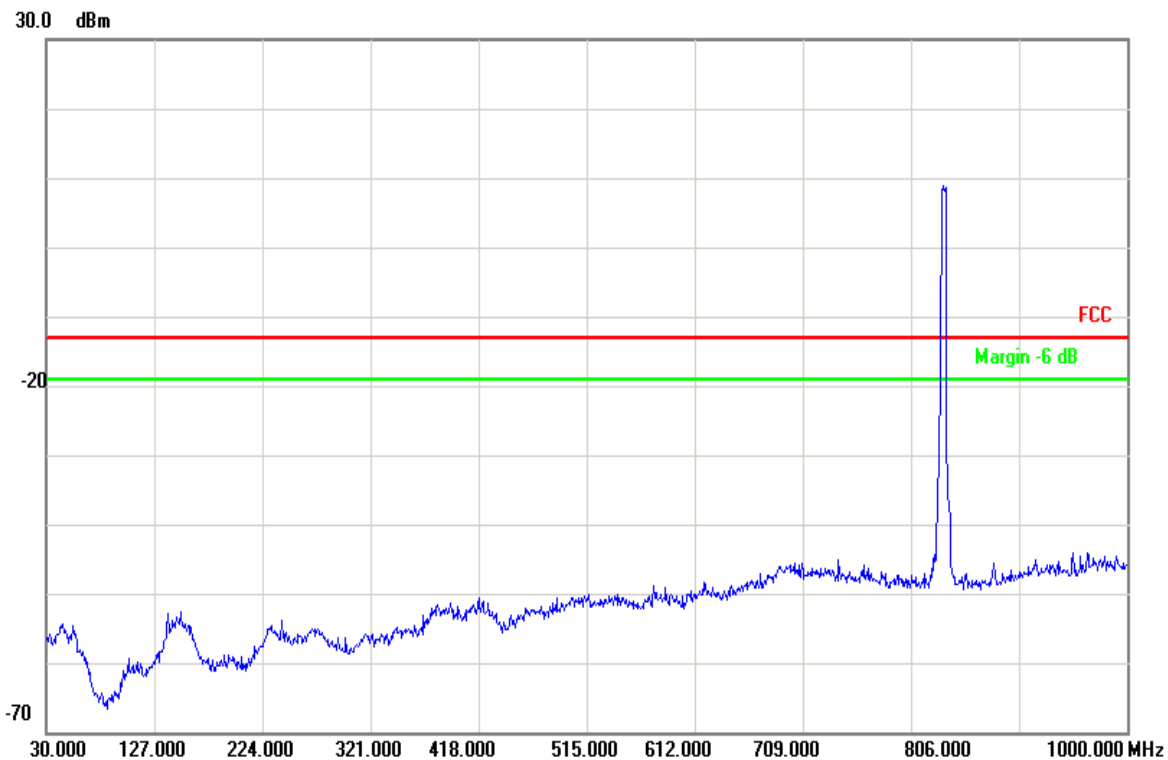
NOTE2: We tested all modes, but the data presented below is the worst case.

Part I - Test Plots

7.1 For UMTS

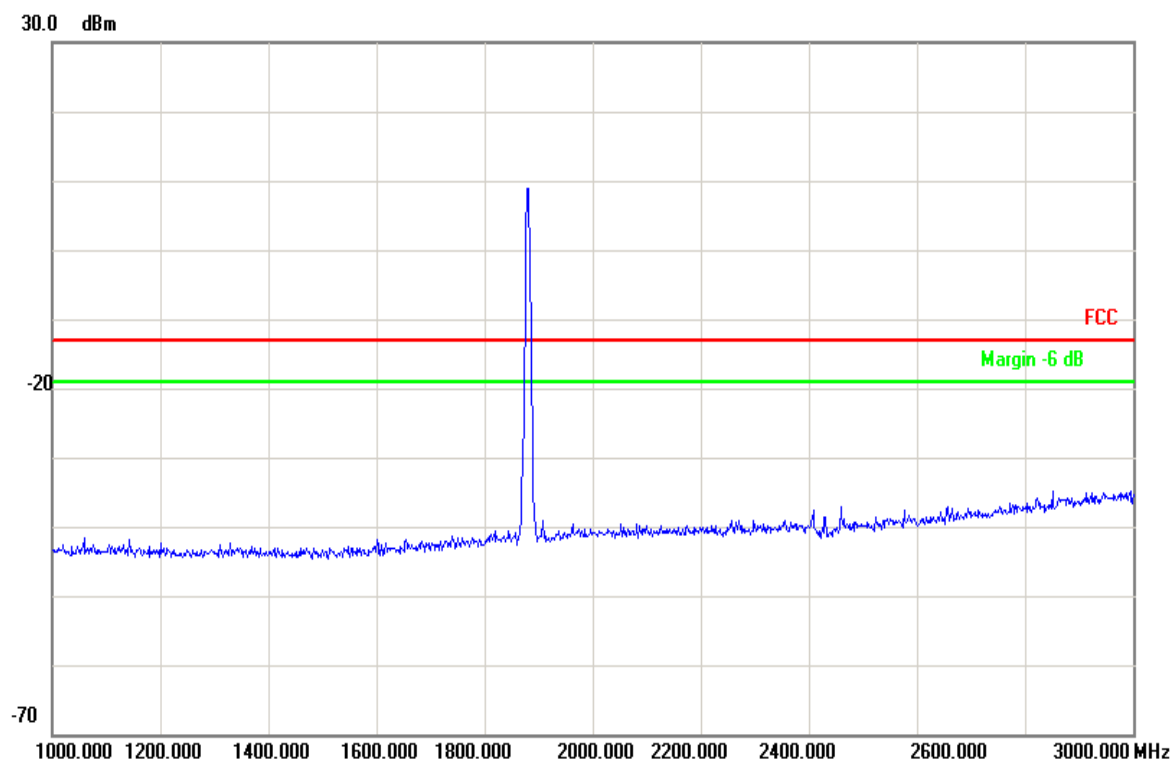
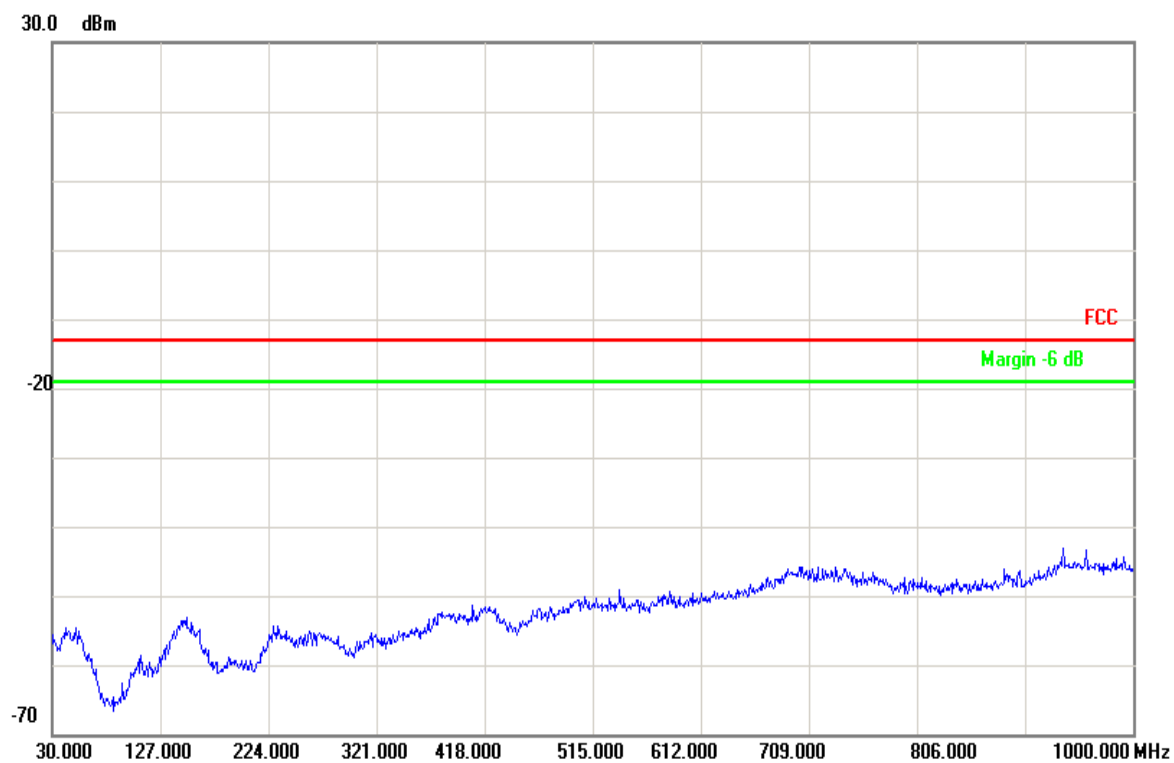
7.1.1 Test Band = WCDMA850

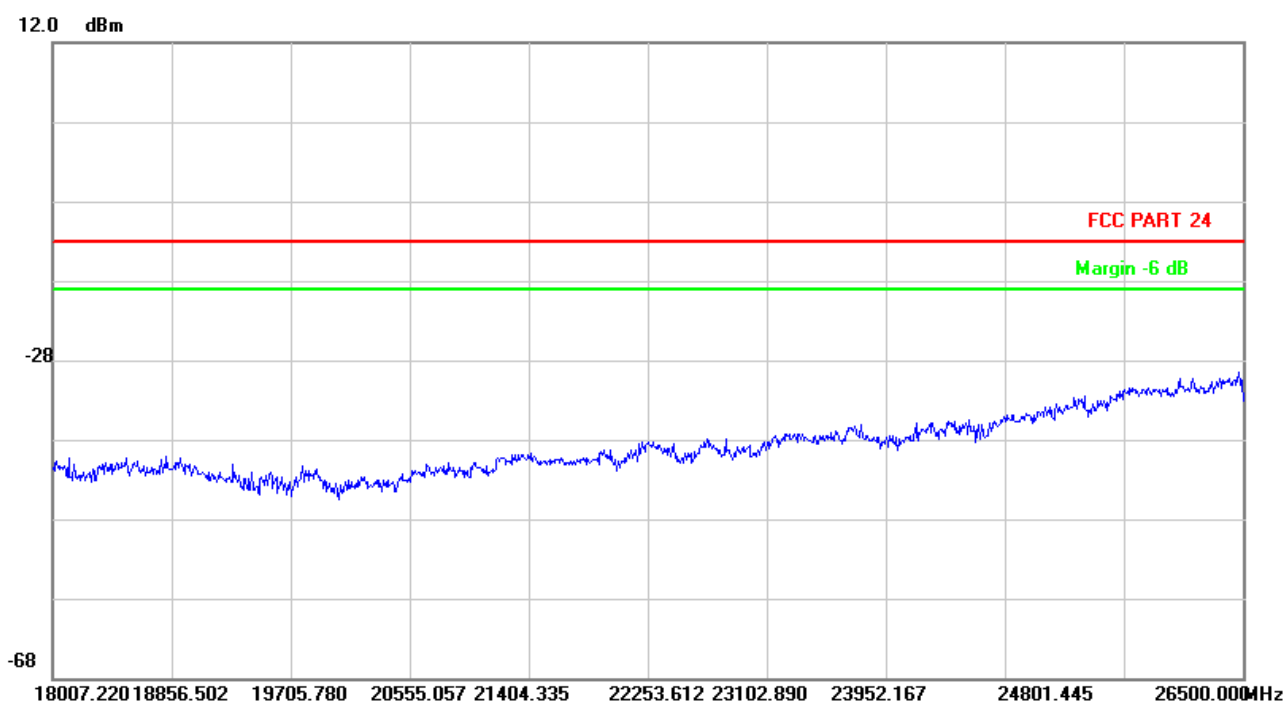
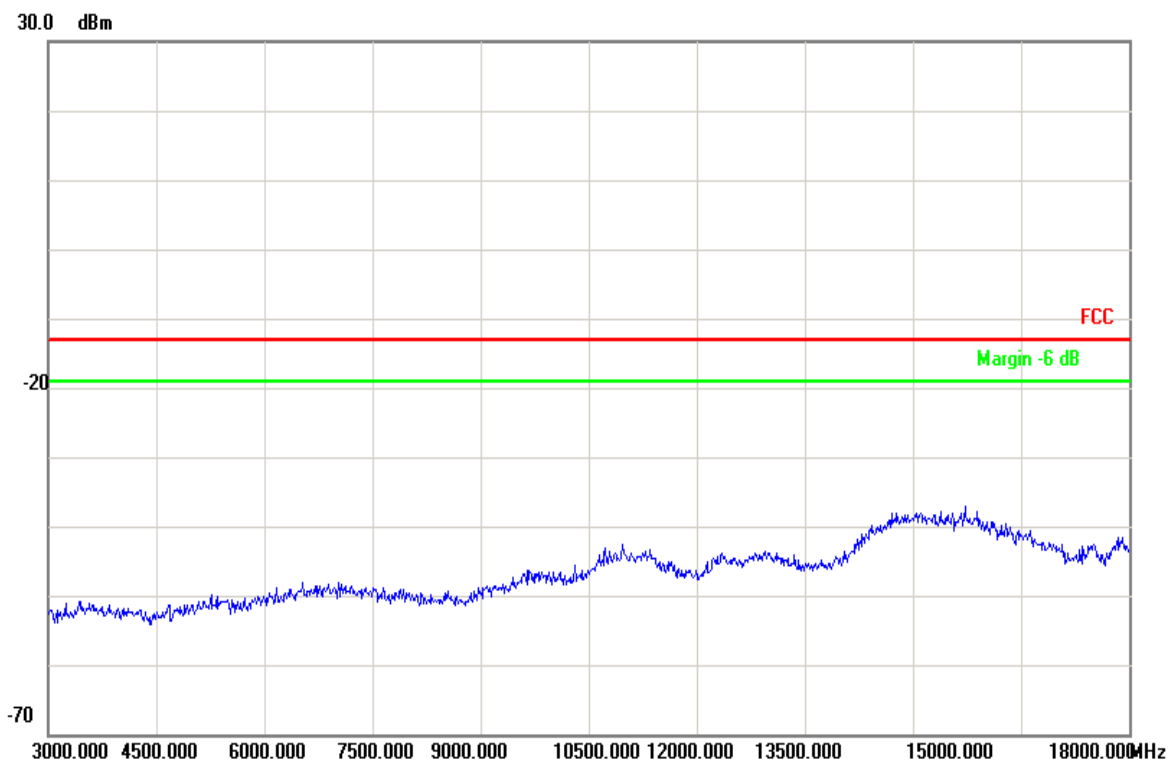
7.1.1.1 Test Mode = UMTS/TM1



7.1.2 Test Band = WCDMA1900

7.1.2.1 Test Mode = UMTS/TM1

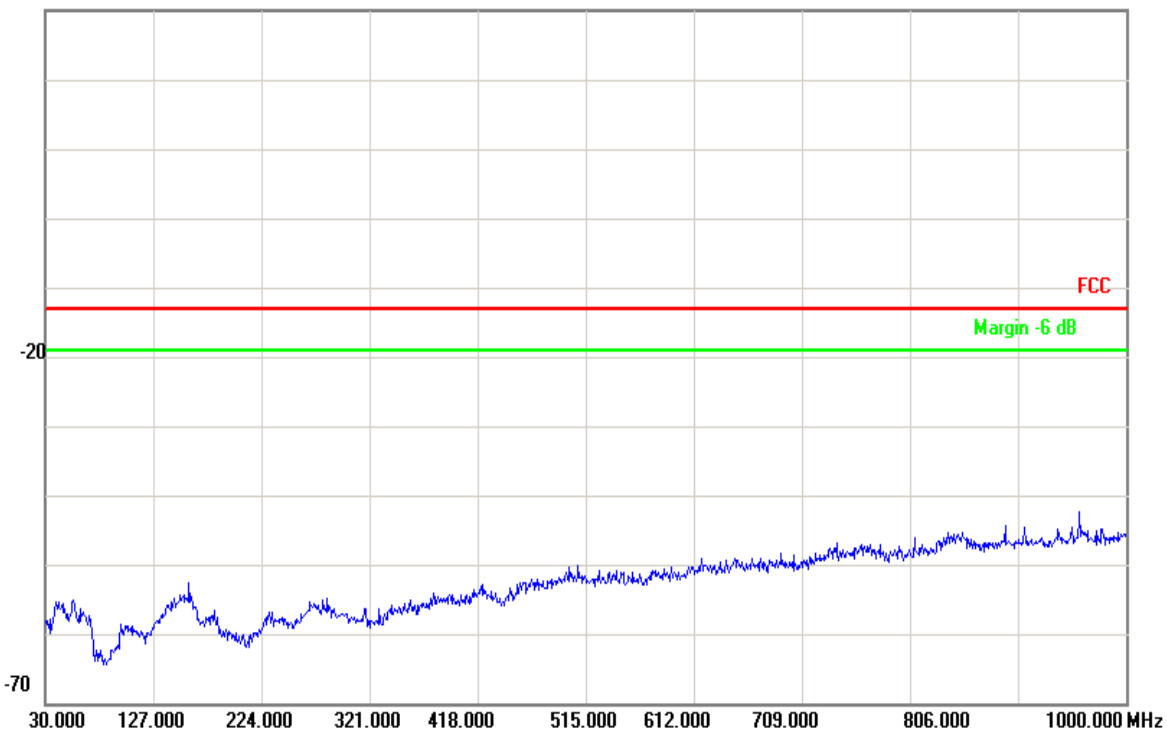




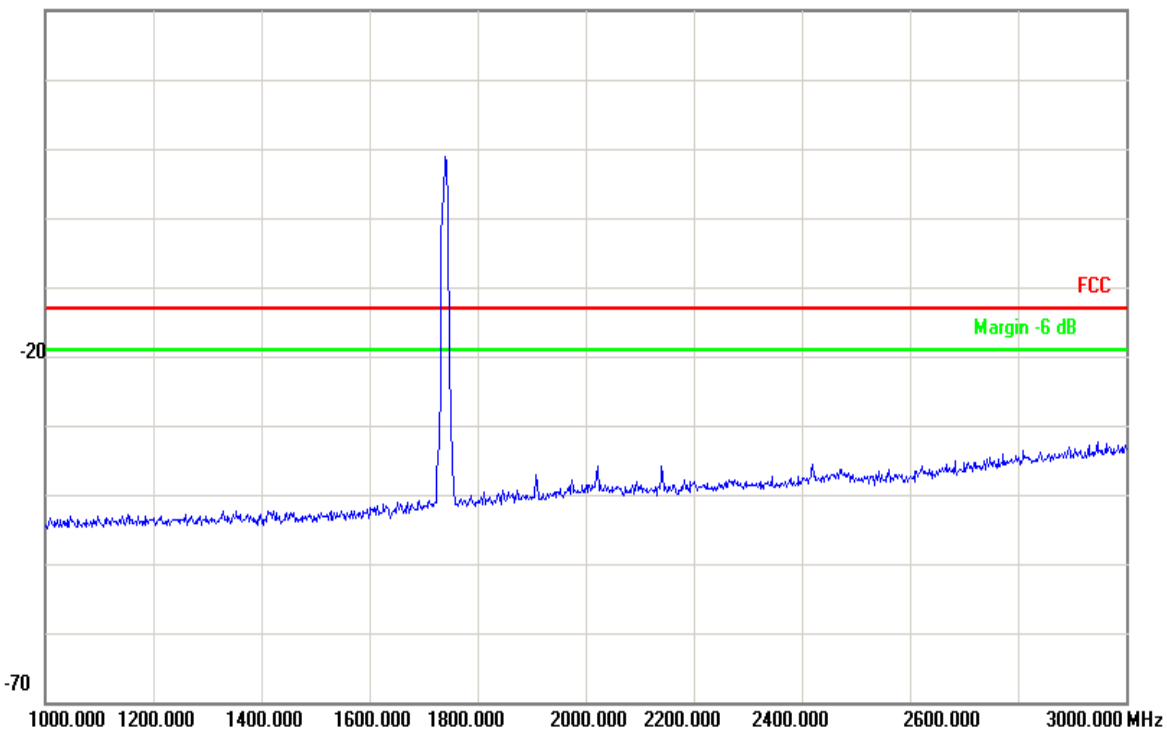
7.1.3 Test Band = WCDMA1700

7.1.3.1 Test Mode = UMTS/TM1

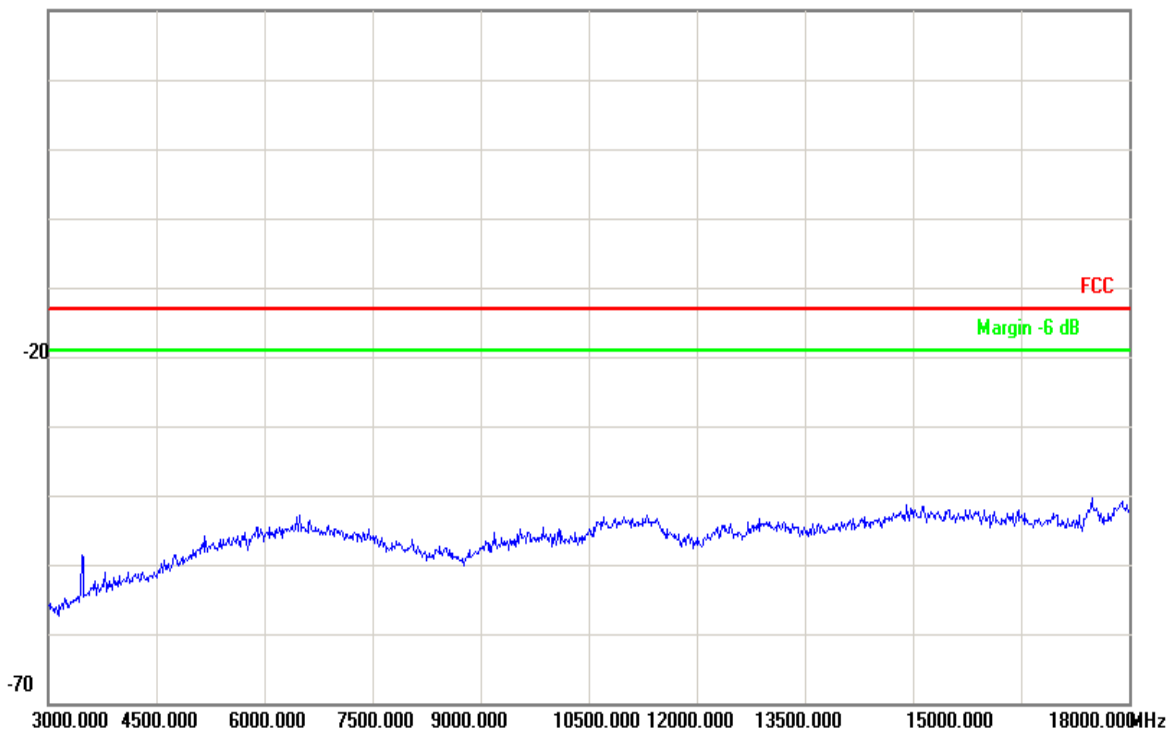
30.0 dBm



30.0 dBm



30.0 dBm



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	2.72	0.00329	PASS
				VN	-0.08	-0.0001	PASS
				VH	0.63	0.00076	PASS
		MCH	TN	VL	-2.32	-0.00277	PASS
				VN	0.55	0.00066	PASS
				VH	-1.45	-0.00173	PASS
		HCH	TN	VL	-2.41	-0.00285	PASS
				VN	-4.46	-0.00527	PASS
				VH	-2.23	-0.00263	PASS
WCDMA1900	UMTS/TM1	LCH	TN	VL	5.29	0.00286	PASS
				VN	8.36	0.00451	PASS
				VH	4.67	0.00252	PASS
		MCH	TN	VL	-2.59	-0.00138	PASS
				VN	0.87	0.00046	PASS
				VH	-1.02	-0.00054	PASS
		HCH	TN	VL	-5.28	-0.00277	PASS
				VN	-5.72	-0.003	PASS
				VH	-7	-0.00367	PASS
WCDMA1700	UMTS/TM1	LCH	TN	VL	20.83	0.01216	PASS
				VN	20.69	0.01208	PASS
				VH	20.07	0.01172	PASS
		MCH	TN	VL	-1.77	-0.00102	PASS
				VN	-1.71	-0.00099	PASS
				VH	-1.89	-0.00109	PASS
		HCH	TN	VL	-23.21	-0.01324	PASS
				VN	-21.16	-0.01207	PASS
				VH	-21.64	-0.01235	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
WCDMA850	UMTS/TM1	LCH	VN	-30	2.62	0.00317	PASS
				-20	0.34	0.00041	PASS
				-10	3.19	0.00386	PASS
				0	4.47	0.00541	PASS
				10	4.58	0.00554	PASS
				20	1.34	0.00162	PASS
				30	4.21	0.00509	PASS
				40	1.1	0.00133	PASS
				50	3.31	0.00401	PASS
		MCH	VN	-30	-0.15	-0.00018	PASS
				-20	0.37	0.00044	PASS
				-10	0.09	0.00011	PASS
				0	1.24	0.00148	PASS
				10	-1.3	-0.00155	PASS
				20	-2.43	-0.00291	PASS
				30	0.26	0.00031	PASS
				40	-3.13	-0.00374	PASS
				50	-1.86	-0.00222	PASS
		HCH	VN	-30	-3.36	-0.00397	PASS
				-20	-0.89	-0.00105	PASS
				-10	-4.43	-0.00523	PASS
				0	-3.75	-0.00443	PASS
				10	-3.6	-0.00425	PASS
				20	-4.04	-0.00477	PASS
				30	-4.04	-0.00477	PASS
				40	-1.62	-0.00191	PASS
				50	-1.79	-0.00211	PASS
WCDMA1900	UMTS/TM1	LCH	VN	-30	4.32	0.00233	PASS
				-20	5.97	0.00322	PASS
				-10	8.06	0.00435	PASS
				0	5.13	0.00277	PASS
				10	5.78	0.00312	PASS
				20	3.77	0.00204	PASS
				30	5.58	0.00301	PASS
				40	4.61	0.00249	PASS
				50	5.58	0.00301	PASS
		MCH	VN	-30	0.99	0.00053	PASS
				-20	2.17	0.00115	PASS
				-10	-2.03	-0.00108	PASS
				0	-1.43	-0.00076	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				10	0.46	0.00024	PASS
				20	-1.39	-0.00074	PASS
				30	0.08	0.00004	PASS
				40	1.01	0.00054	PASS
				50	-2.78	-0.00148	PASS
		HCH	VN	-30	-6.42	-0.00337	PASS
				-20	-6.24	-0.00327	PASS
				-10	-4.38	-0.0023	PASS
				0	-7.63	-0.004	PASS
				10	-7.52	-0.00394	PASS
				20	-8.68	-0.00455	PASS
				30	-6.12	-0.00321	PASS
				40	-6.2	-0.00325	PASS
				50	-5.98	-0.00313	PASS
WCDMA1700	UMTS/TM1	LCH	VN	-30	23.19	0.01354	PASS
				-20	24	0.01402	PASS
				-10	21.36	0.01247	PASS
				0	23.01	0.01344	PASS
				10	24.58	0.01435	PASS
				20	21.79	0.01272	PASS
				30	24.64	0.01439	PASS
				40	22.89	0.01337	PASS
				50	23.18	0.01354	PASS
		MCH	VN	-30	-0.03	-0.00002	PASS
				-20	-0.32	-0.00018	PASS
				-10	1.24	0.00072	PASS
				0	-0.67	-0.00039	PASS
				10	-2.06	-0.00119	PASS
				20	0.49	0.00028	PASS
				30	-0.47	-0.00027	PASS
				40	4.27	0.00246	PASS
				50	1.19	0.00069	PASS
		HCH	VN	-30	-21.45	-0.01224	PASS
				-20	-23.06	-0.01316	PASS
				-10	-21.94	-0.01252	PASS
				0	-21.3	-0.01215	PASS
				10	-18.16	-0.01036	PASS
				20	-20.42	-0.01165	PASS
				30	-22.25	-0.0127	PASS
				40	-21.91	-0.0125	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				50	-21.16	-0.01207	PASS

END