



Appendix for test report

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	32.98	30.03	38.5	PASS
		MCH	32.95	30	38.5	PASS
		HCH	32.84	29.89	38.5	PASS
	GSM/TM2	LCH	27.68	24.73	38.5	PASS
		MCH	27.43	24.48	38.5	PASS
		HCH	27.1	24.15	38.5	PASS
WCDMA850	UMTS/TM1	LCH	23.8	20.85	38.5	PASS
		MCH	23.9	20.95	38.5	PASS
		HCH	23.87	20.92	38.5	PASS

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	29.41	31.34	33	PASS
		MCH	29.45	31.38	33	PASS

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
	GSM/TM2	HCH	29.25	31.18	33	PASS
		LCH	26.08	28.01	33	PASS
		MCH	26.09	28.02	33	PASS
		HCH	26.03	27.96	33	PASS
WCDMA1900	UMTS/TM1	LCH	22.97	24.9	33	PASS
		MCH	22.8	24.73	33	PASS
		HCH	22.81	24.74	33	PASS
WCDMA1700	UMTS/TM1	LCH	22.65	22.82	30	PASS
		MCH	22.78	22.95	30	PASS
		HCH	22.98	23.15	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
GSM1900	GSM/TM1	LCH	0.18	13	PASS
		MCH	0.18	13	PASS
		HCH	0.16	13	PASS
	GSM/TM2	LCH	3.27	13	PASS
		MCH	3.28	13	PASS
		HCH	3.22	13	PASS
Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA1900	UMTS/TM1	LCH	3.45	13	PASS
		MCH	3.46	13	PASS
		HCH	3.37	13	PASS
WCDMA1700	UMTS/TM1	LCH	3.44	13	PASS
		MCH	3.52	13	PASS
		HCH	3.67	13	PASS

3Appendix_C: Modulation Characteristics

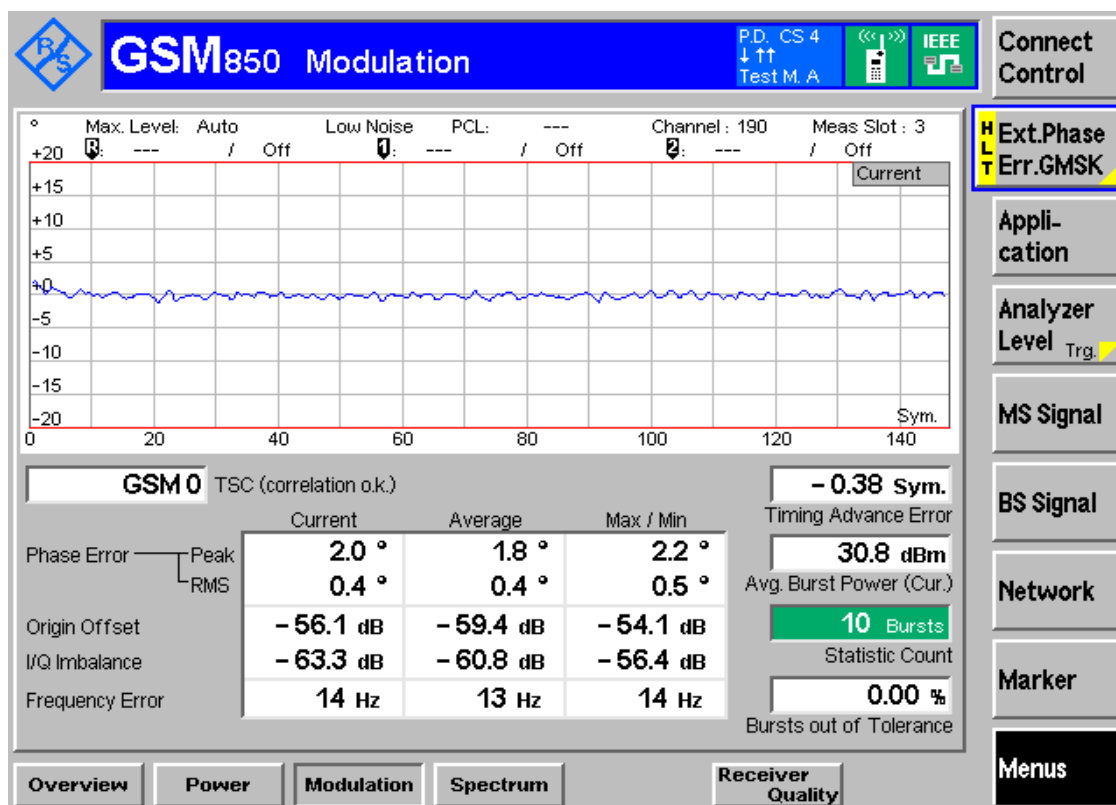
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

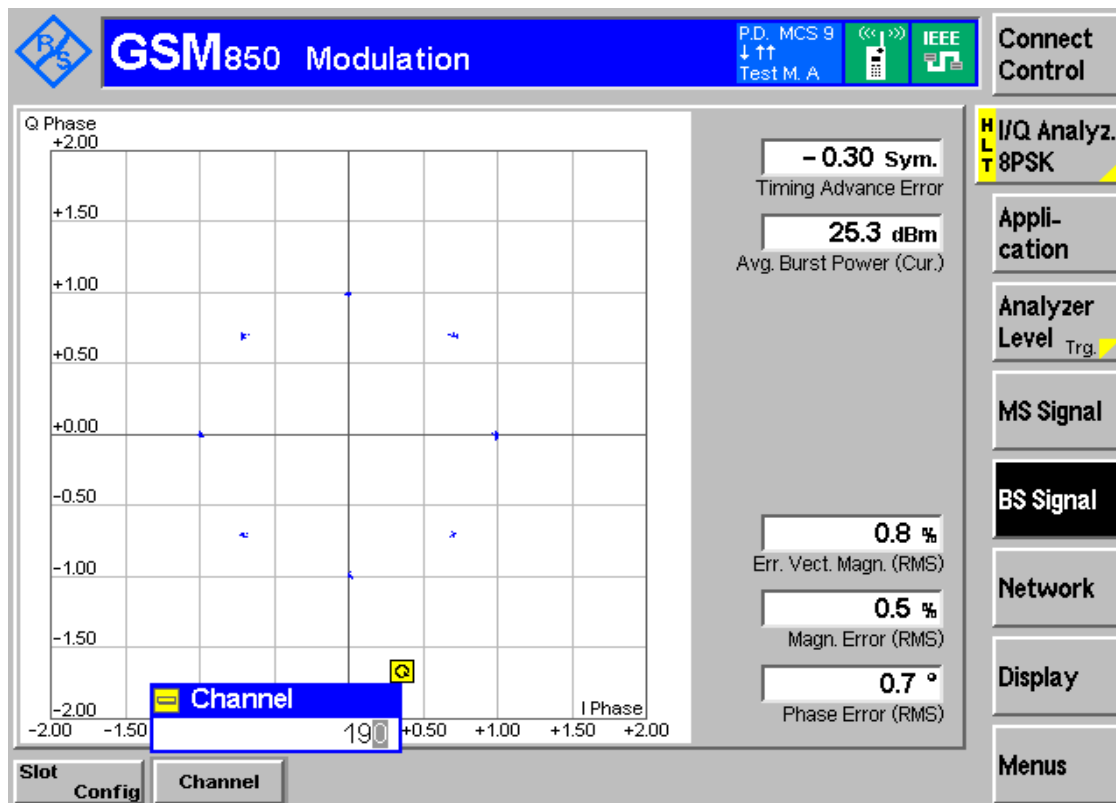
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

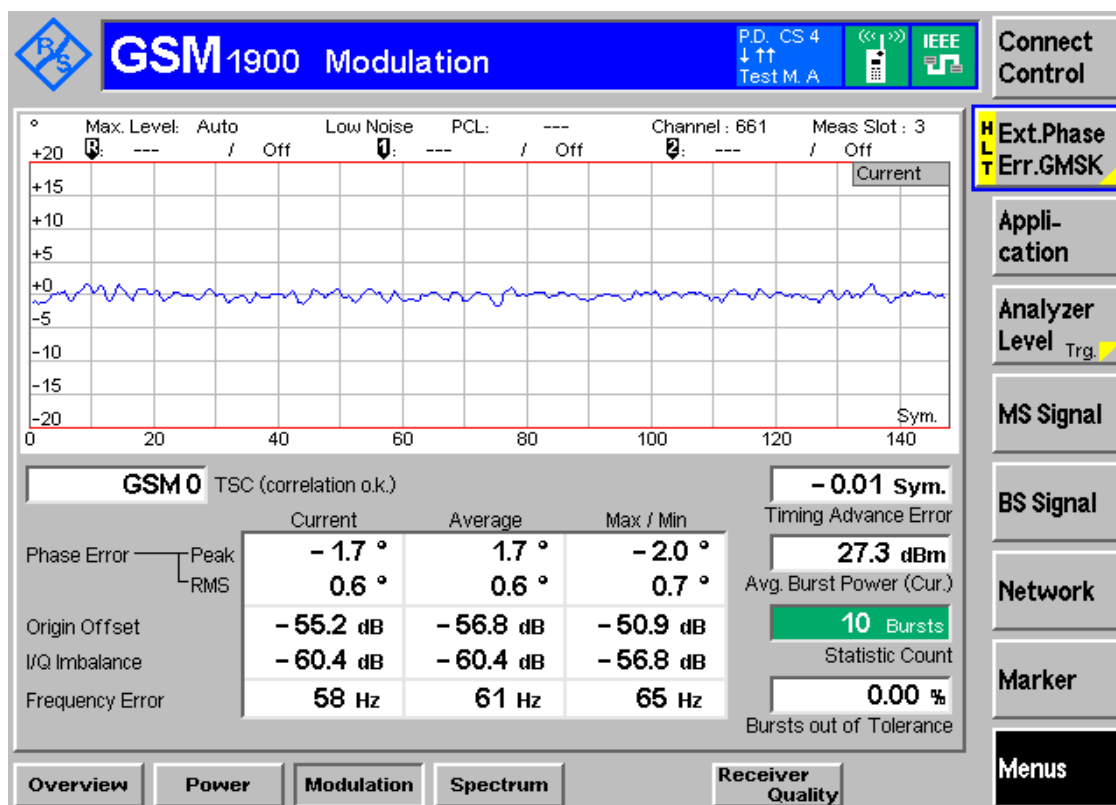
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

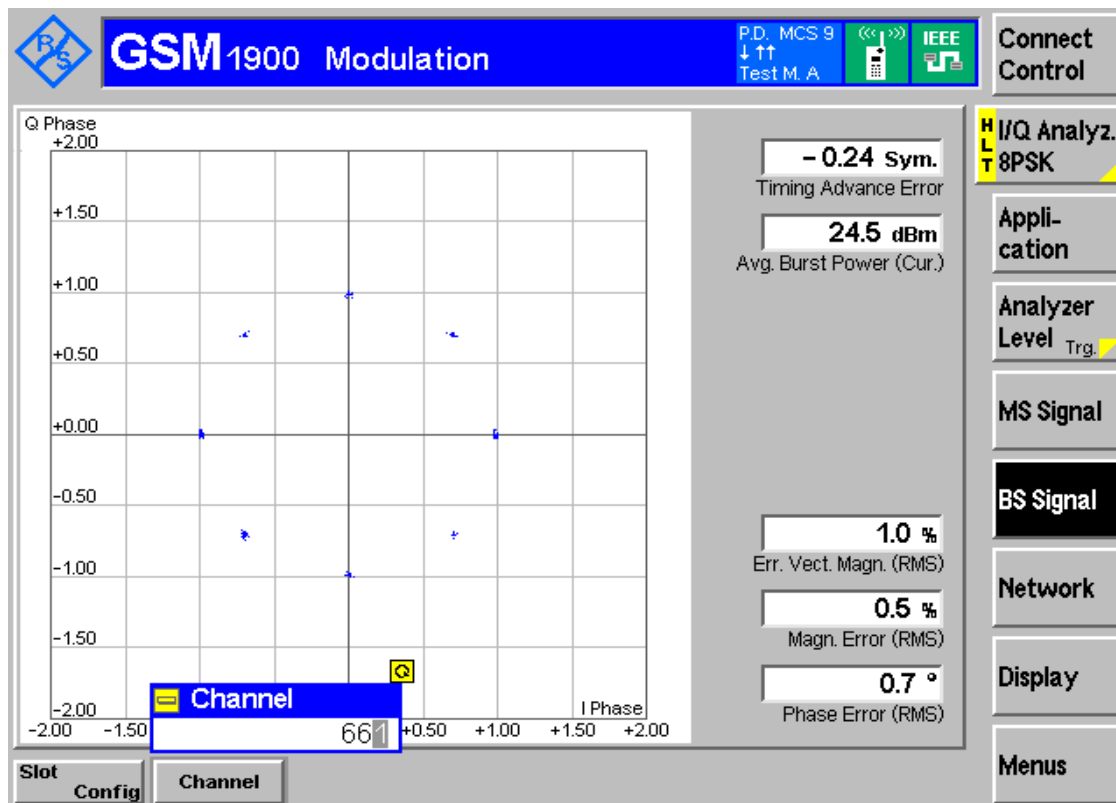
3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH



3.1.2.2 Test Mode = GSM/TM2

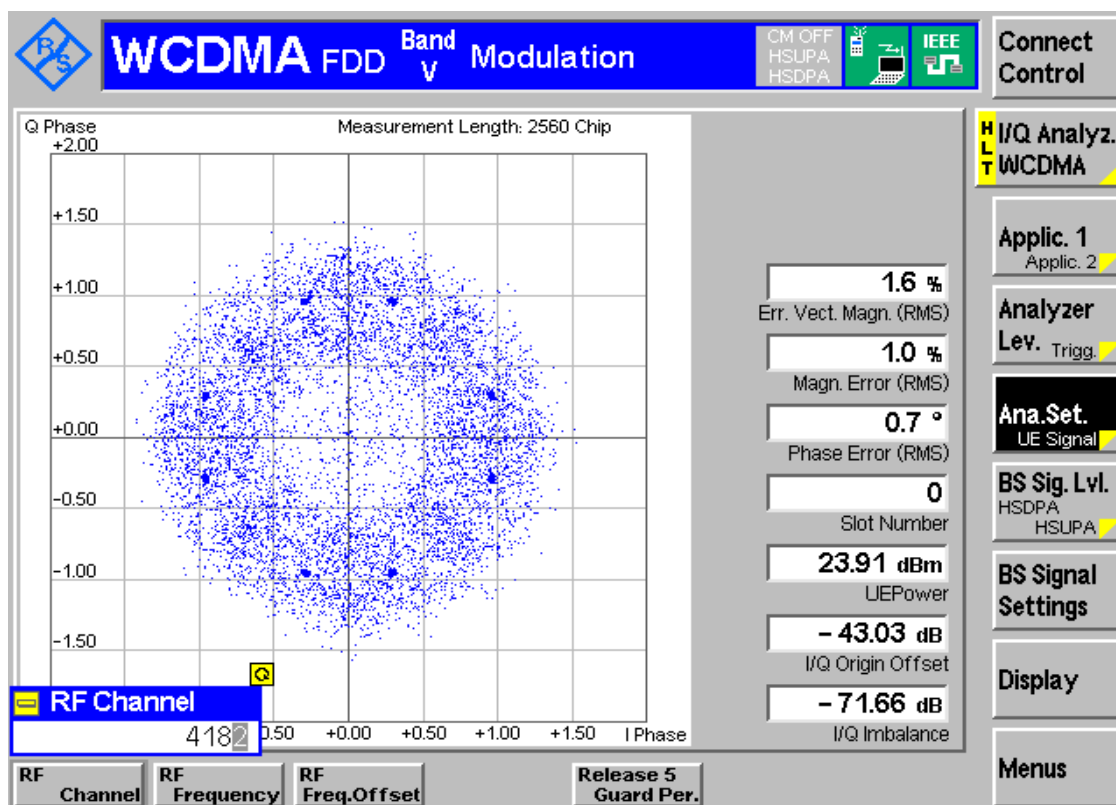
3.1.2.2.1 Test Channel = MCH



3.2.1 Test Band = WCDMA850

3.2.1.1 Test Mode = UMTS/TM1

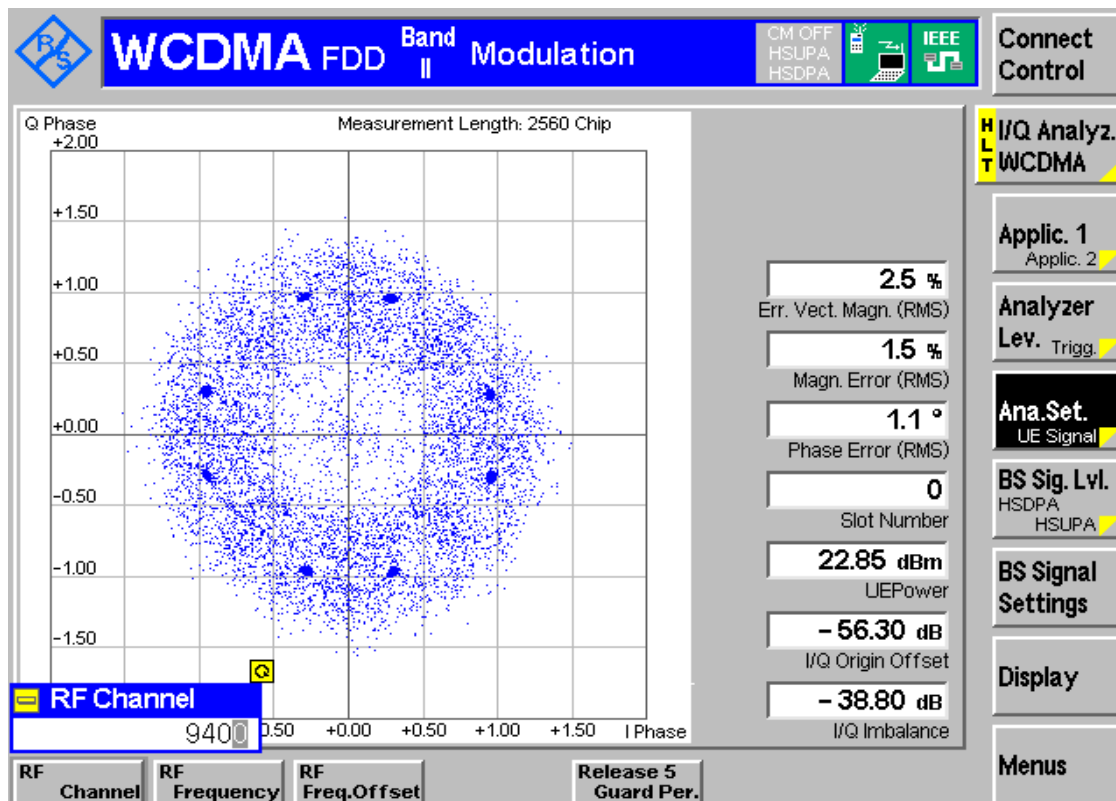
3.2.1.1.1 Test Channel = MCH



3.2.2 Test Band = WCDMA1900

3.2.2.1 Test Mode = UMTS/TM1

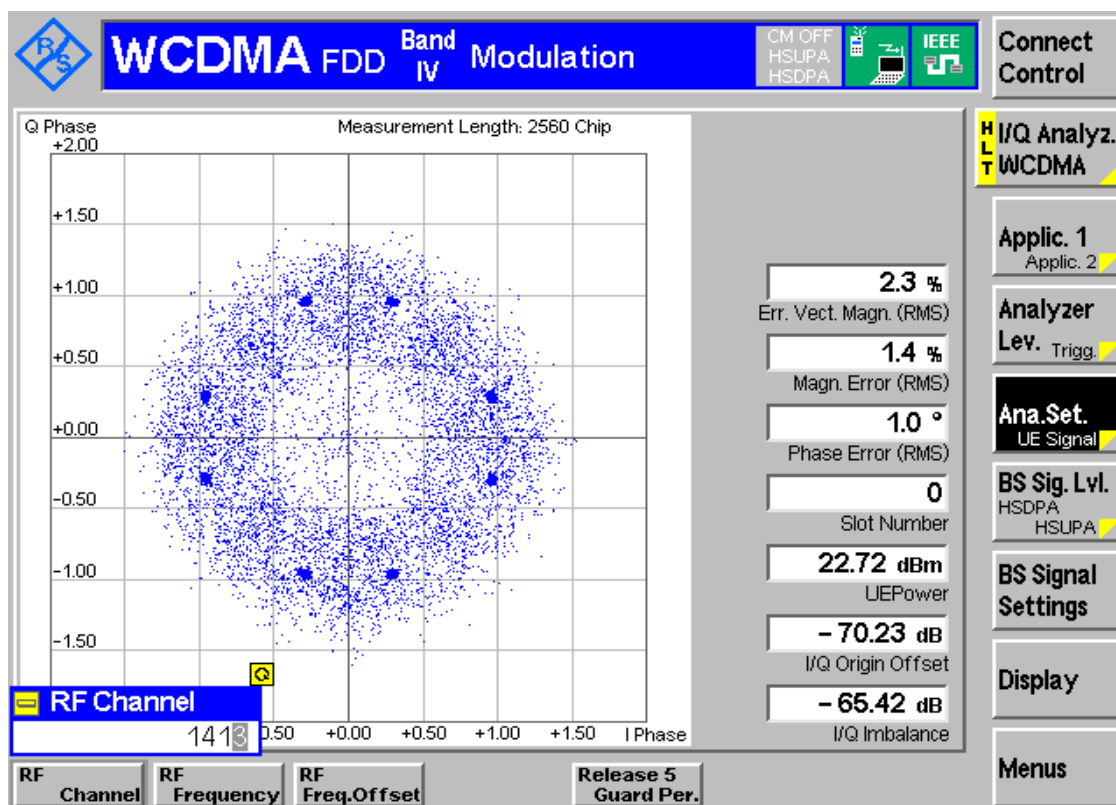
3.2.2.1.1 Test Channel = MCH



3.2.3 Test Band = WCDMA1700

3.2.3.1 Test Mode = UMTS/TM1

3.2.3.1.1 Test Channel = MCH



4Appendix_D: Bandwidth

Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
GSM850	GSM/TM1	LCH	244.07	314.82	Pass
		MCH	243.54	316.55	Pass
		HCH	246.20	317.43	Pass
	GSM/TM2	LCH	237.20	314.24	Pass
		MCH	244.25	302.80	Pass
		HCH	240.56	317.78	Pass
GSM1900	GSM/TM1	LCH	247.01	314.58	Pass
		MCH	243.88	312.81	Pass
		HCH	244.78	312.96	Pass
	GSM/TM2	LCH	241.59	319.25	Pass
		MCH	240.67	312.27	Pass
		HCH	237.65	307.61	Pass
Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA850	UMTS/TM1	LCH	4.16	4.68	Pass
		MCH	4.17	4.68	Pass
		HCH	4.18	4.67	Pass
WCDMA1900	UMTS/TM1	LCH	4.15	4.69	Pass
		MCH	4.15	4.68	Pass
		HCH	4.16	4.69	Pass
WCDMA1700	UMTS/TM1	LCH	4.17	4.69	Pass
		MCH	4.17	4.69	Pass
		HCH	4.16	4.69	Pass



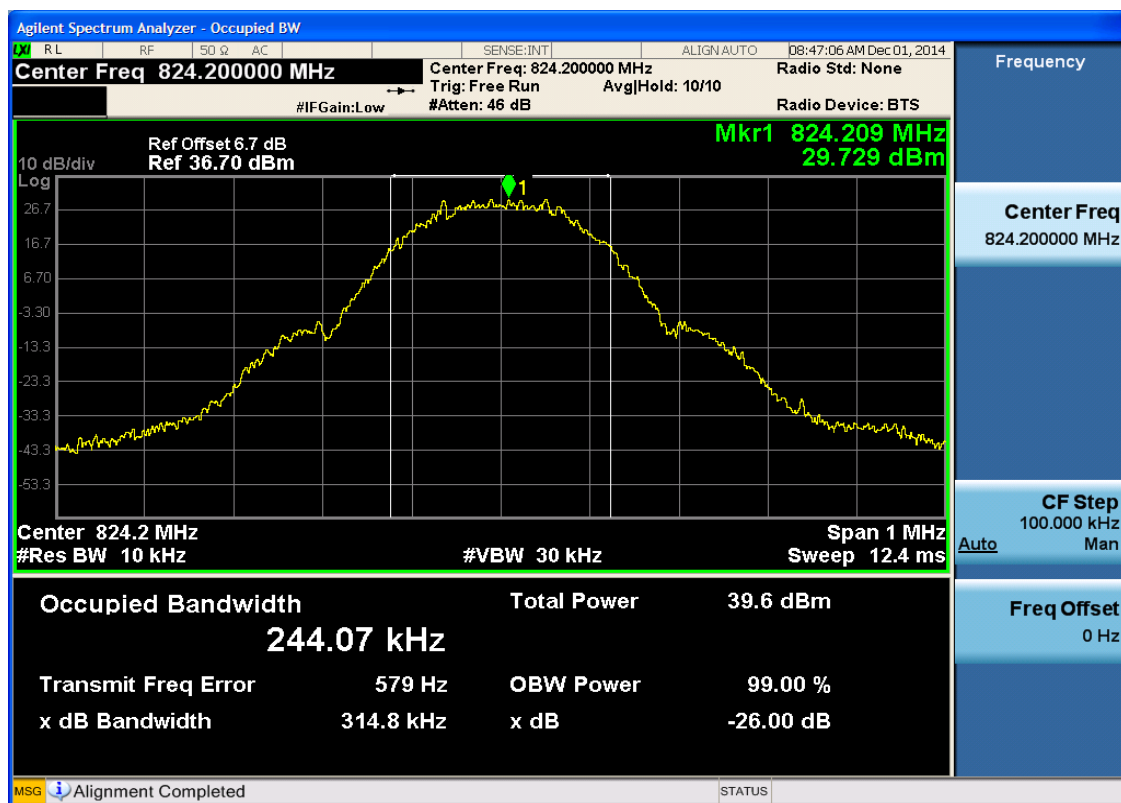
Part II - Test Plots

4.1 For GSM

4.1.1 Test Band = GSM850

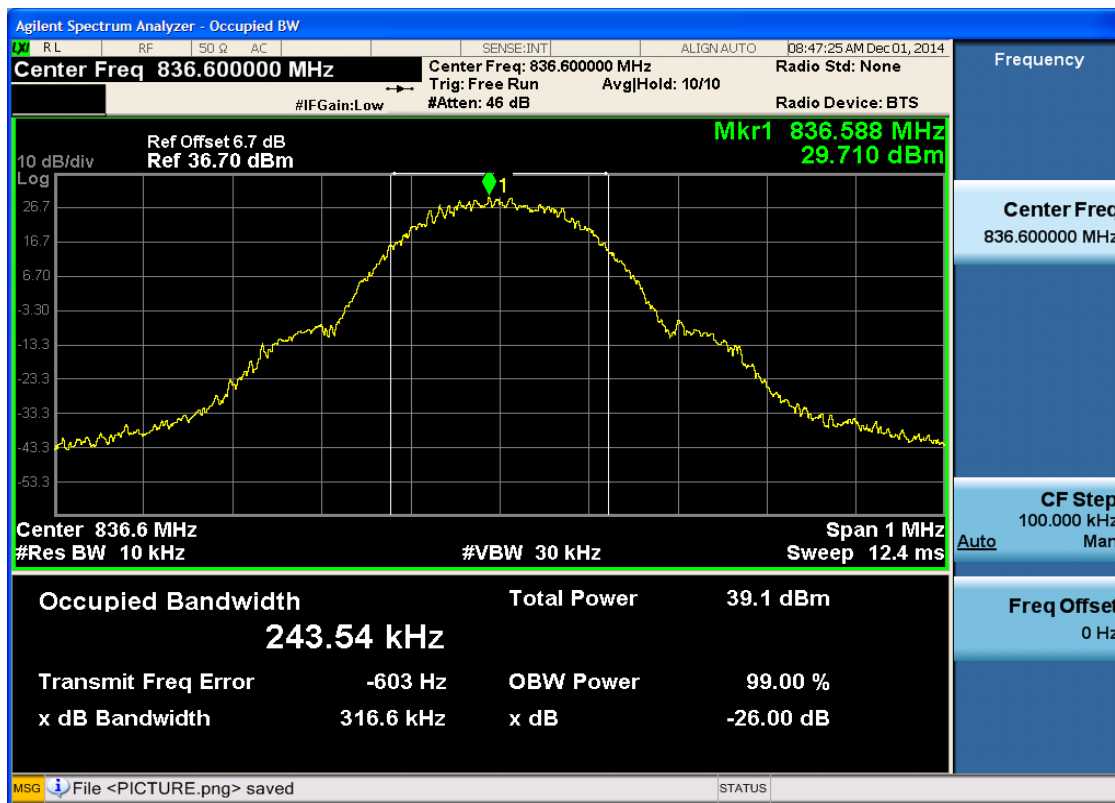
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH



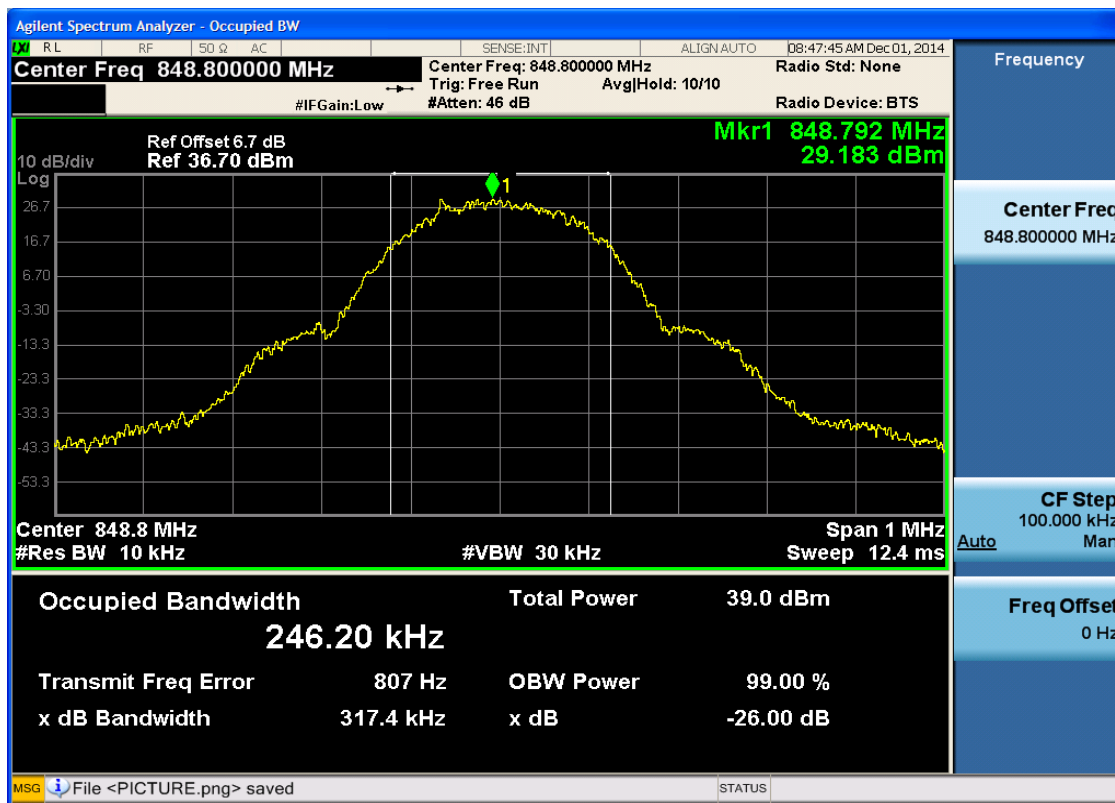


4.1.1.1.2 Test Channel = MCH





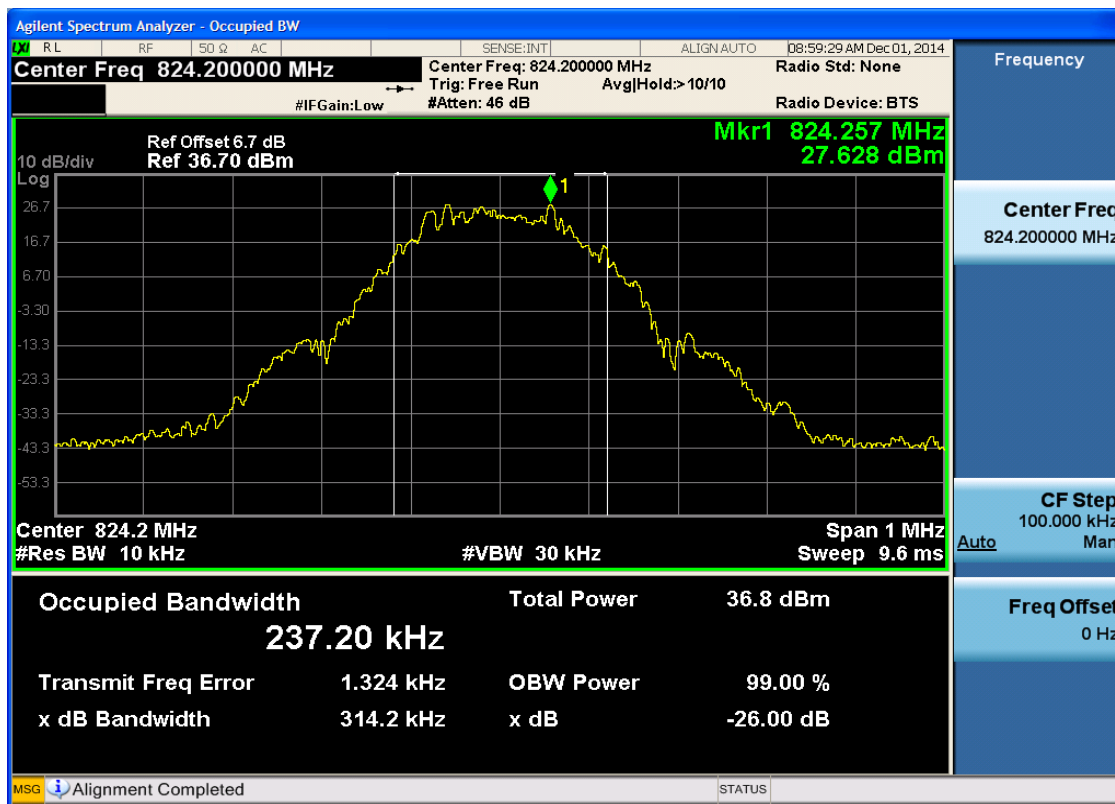
4.1.1.1.3 Test Channel = HCH





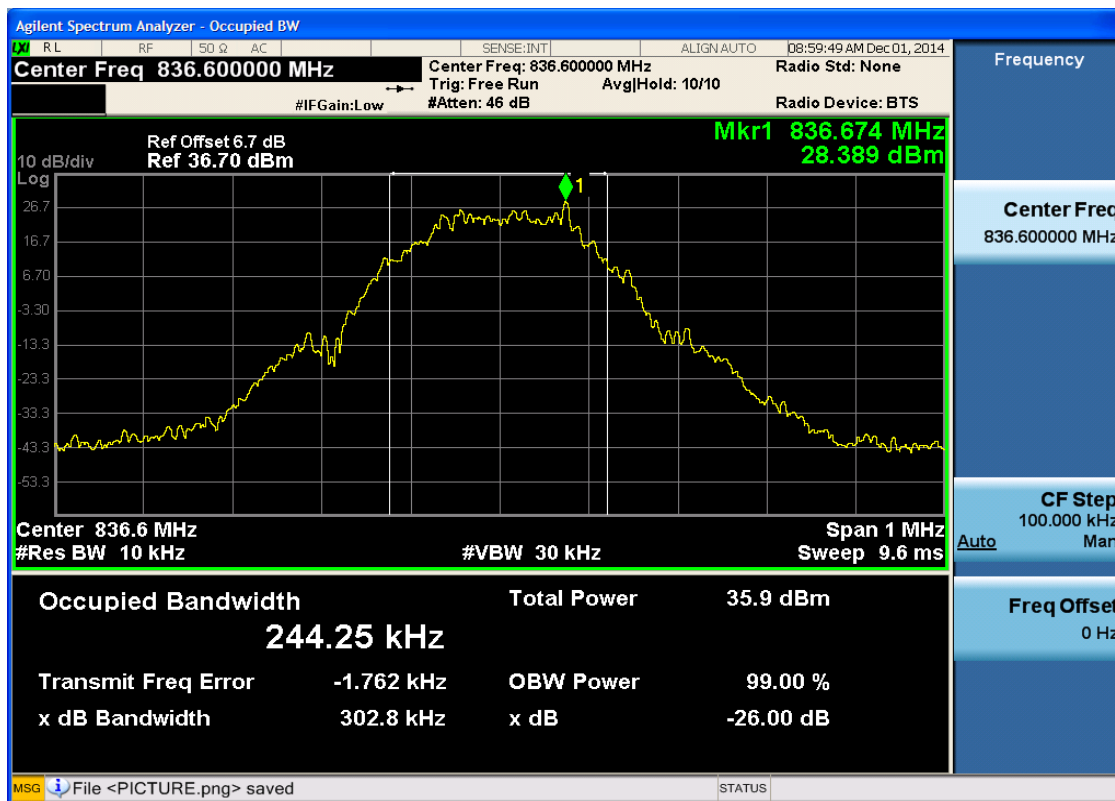
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH



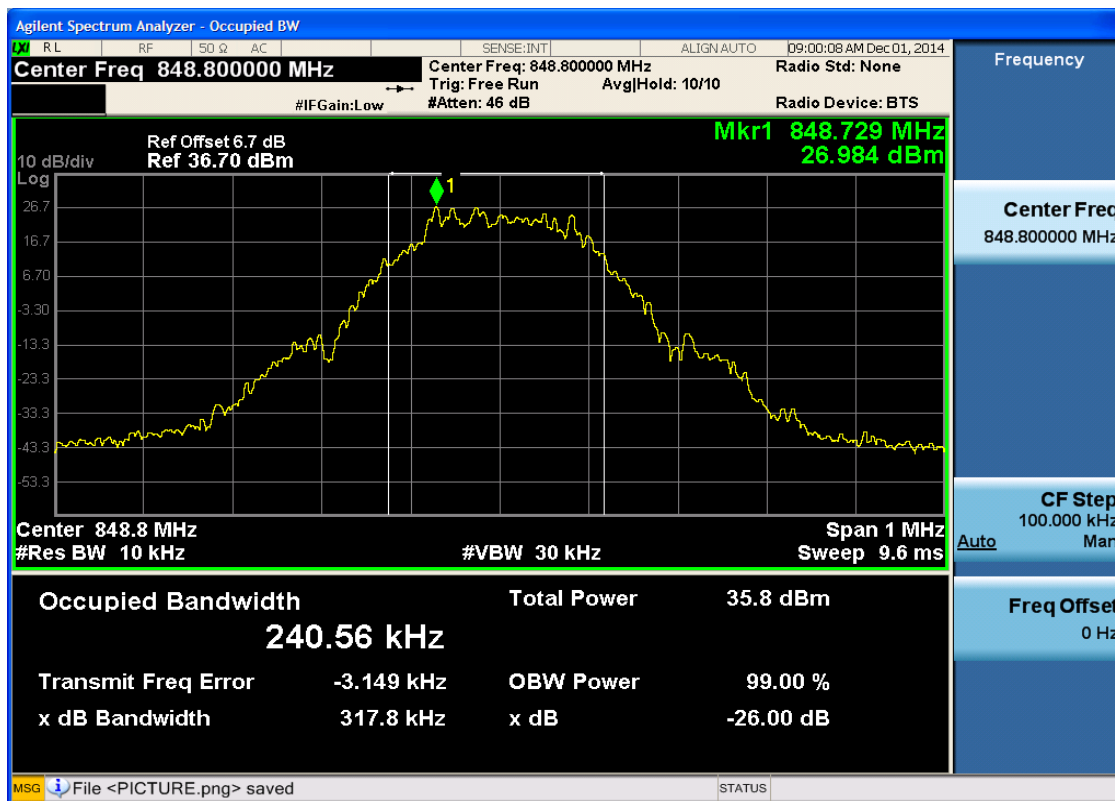


4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH

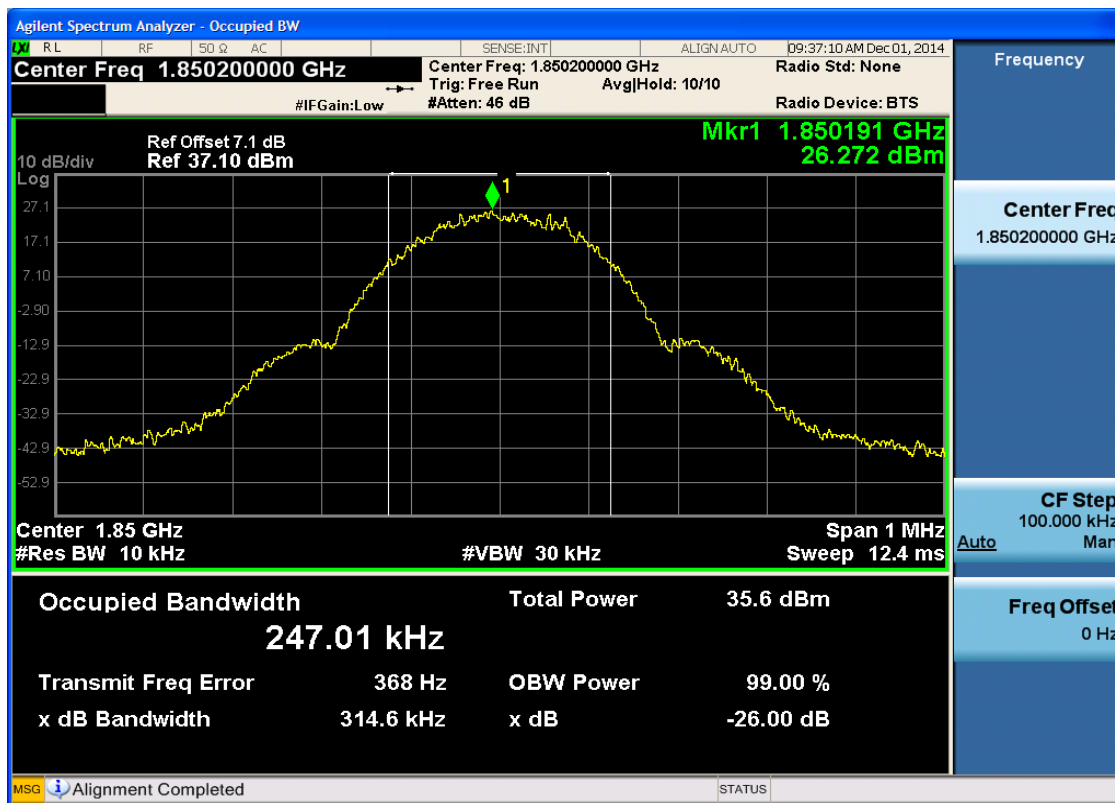




4.1.2 Test Band = GSM1900

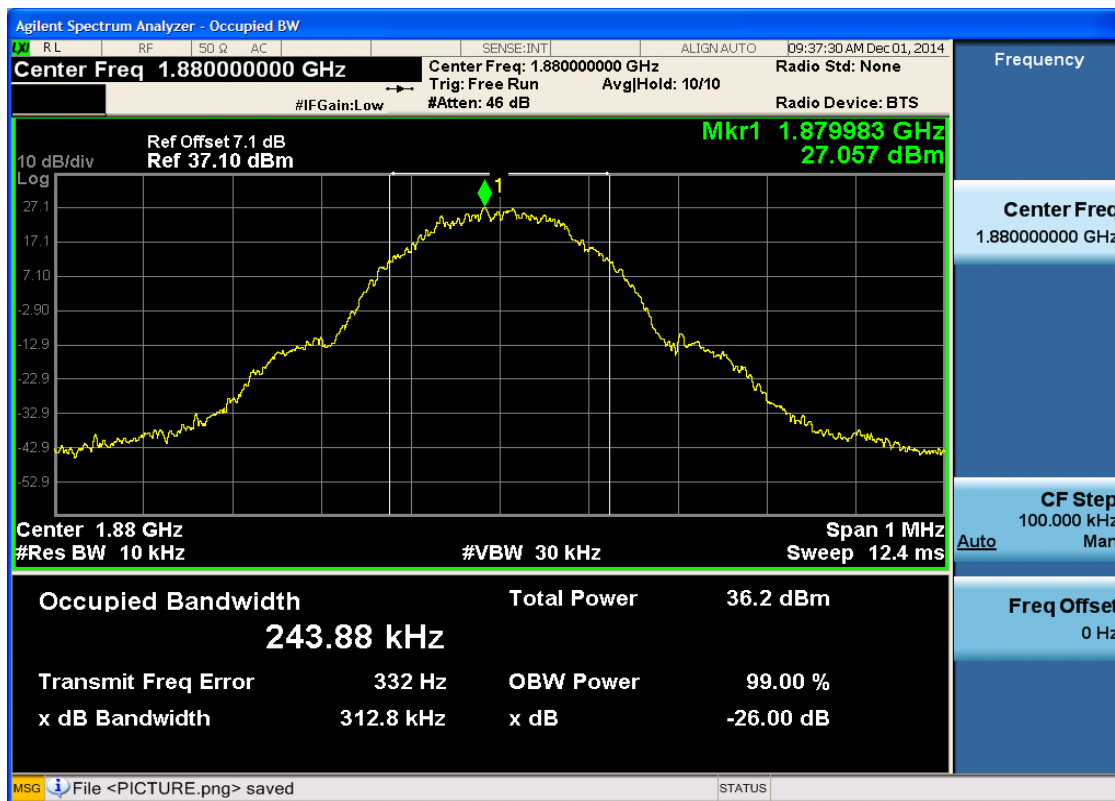
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



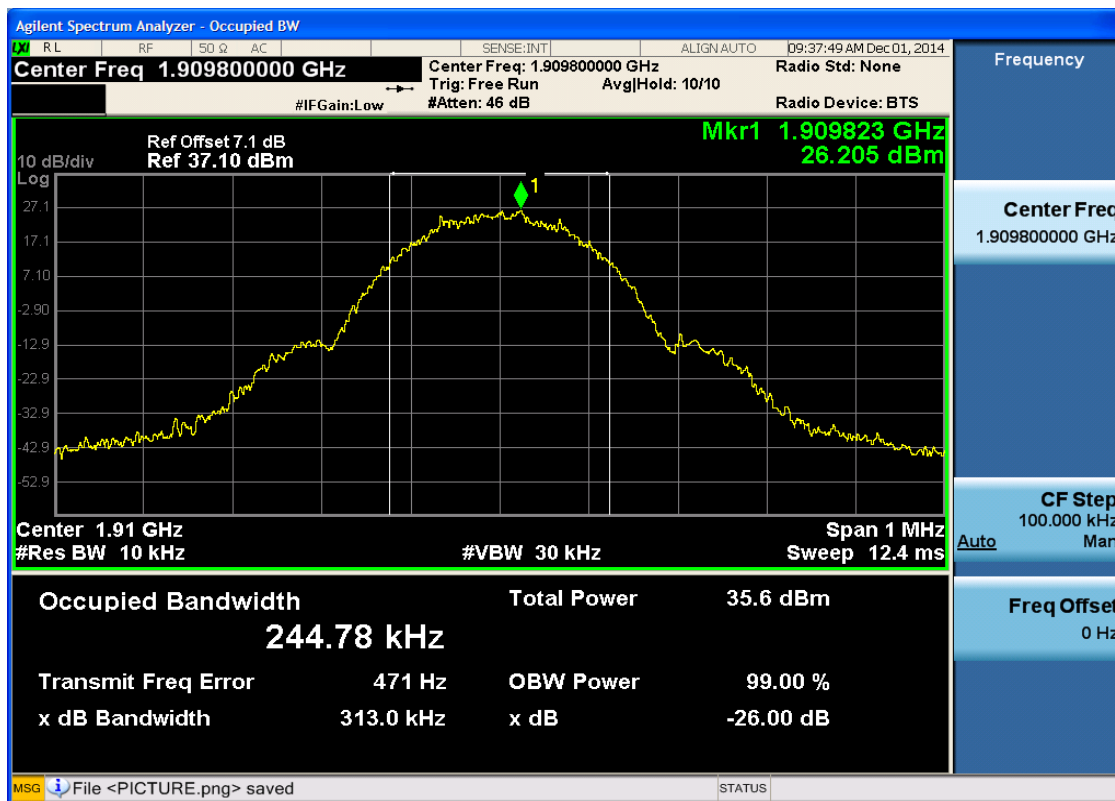


4.1.2.1.2 Test Channel = MCH





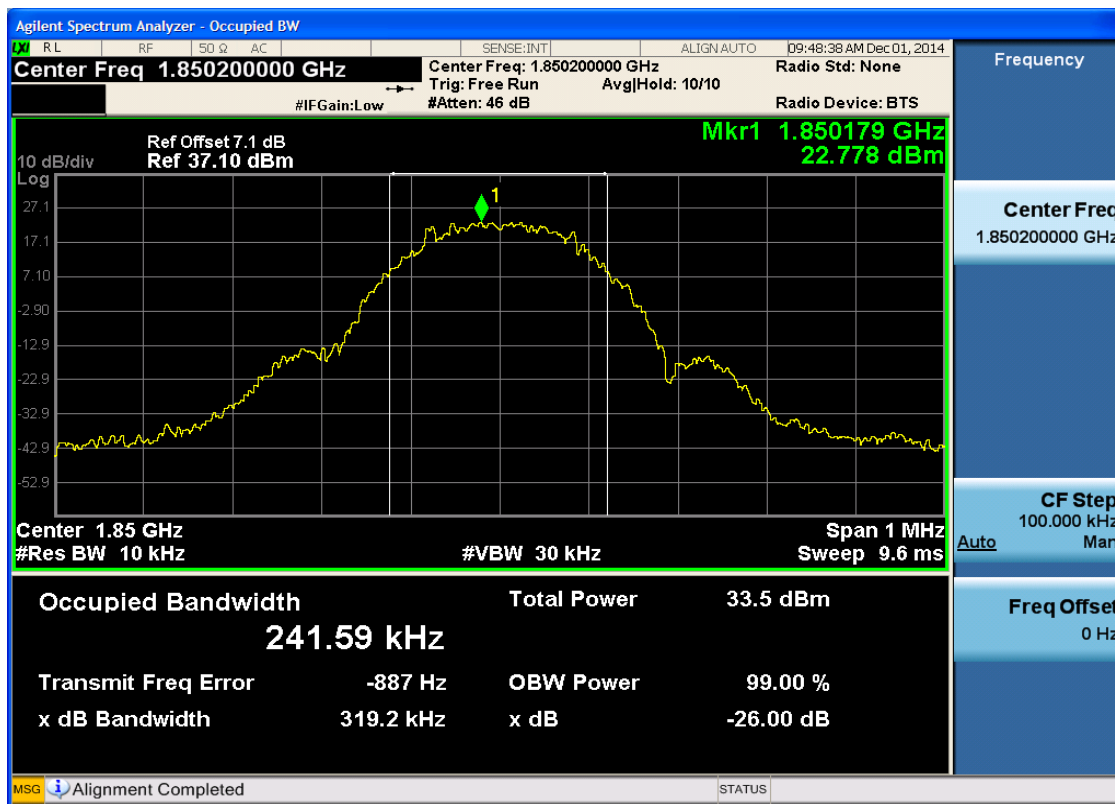
4.1.2.1.3 Test Channel = HCH





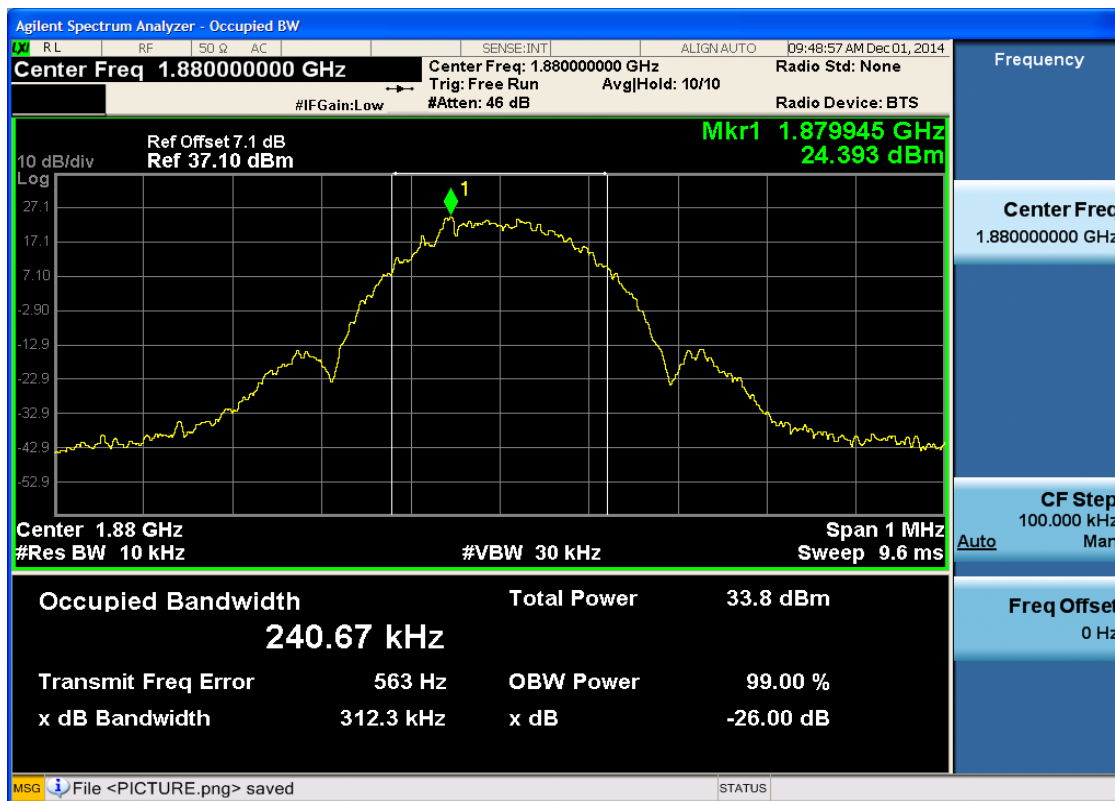
4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



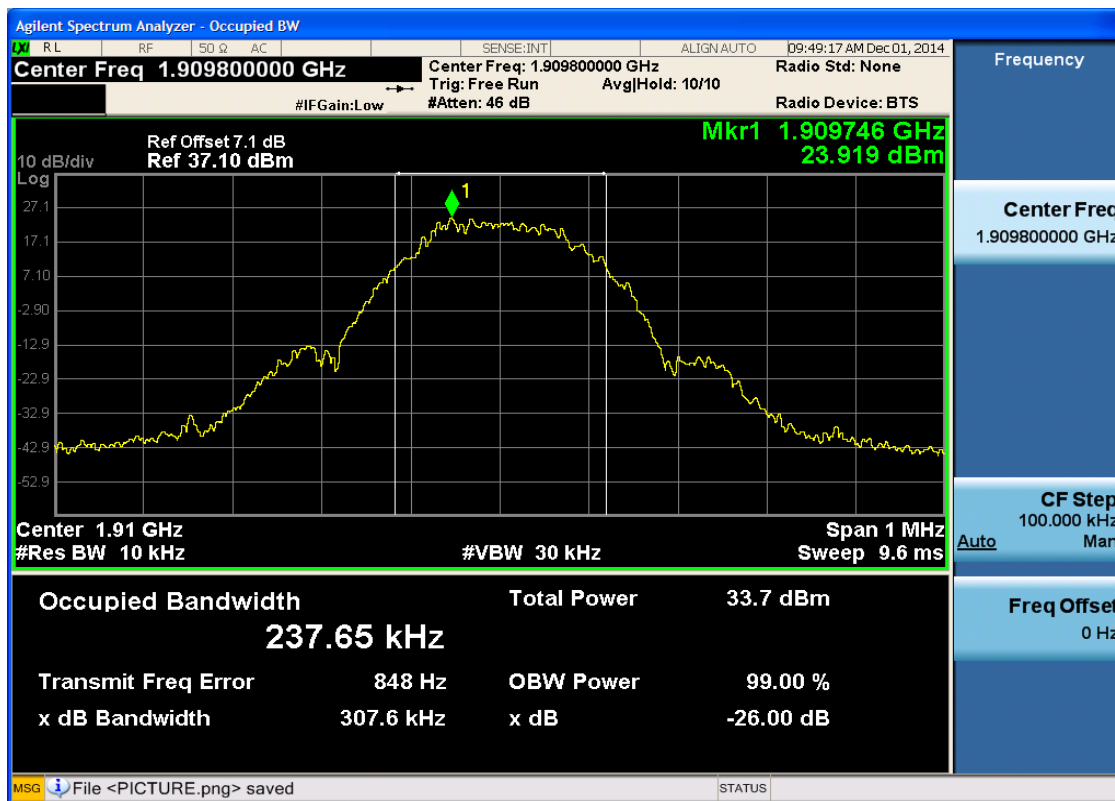


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH

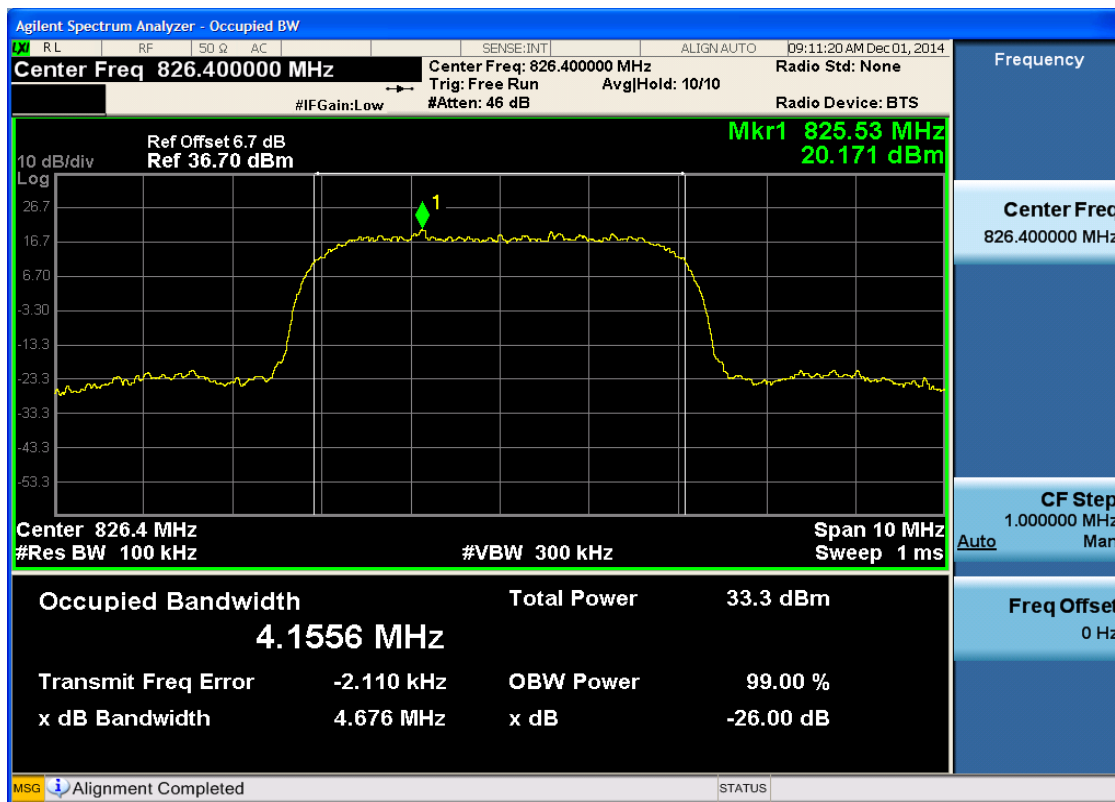


4.2 For UMTS

4.2.1 Test Band = WCDMA850

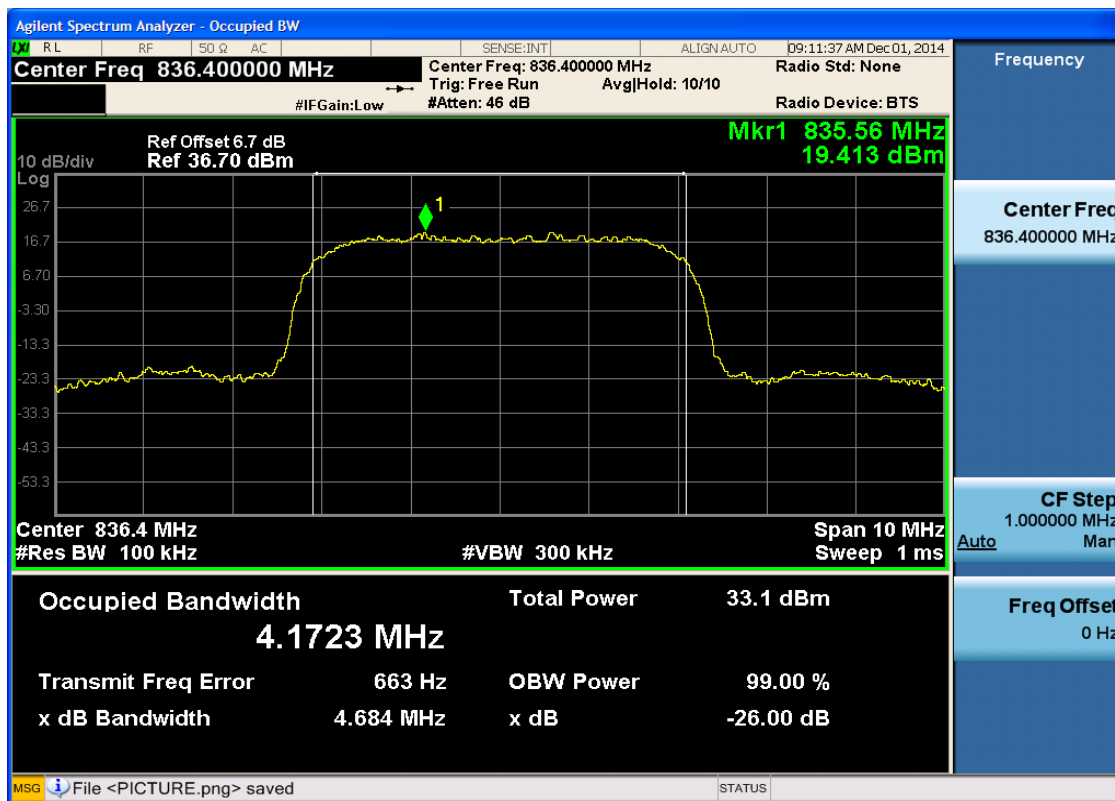
4.2.1.1 Test Mode = UMTS/TM1

4.2.1.1.1 Test Channel = LCH



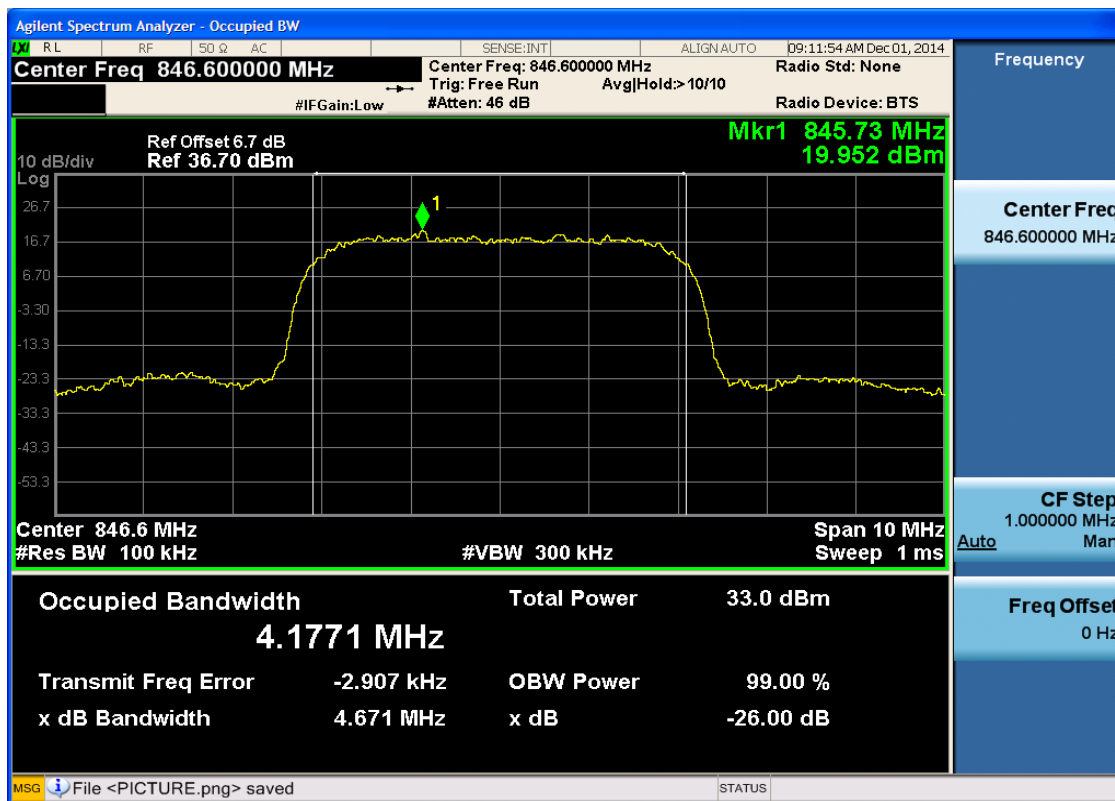


4.2.1.1.2 Test Channel = MCH





4.2.1.1.3 Test Channel = HCH

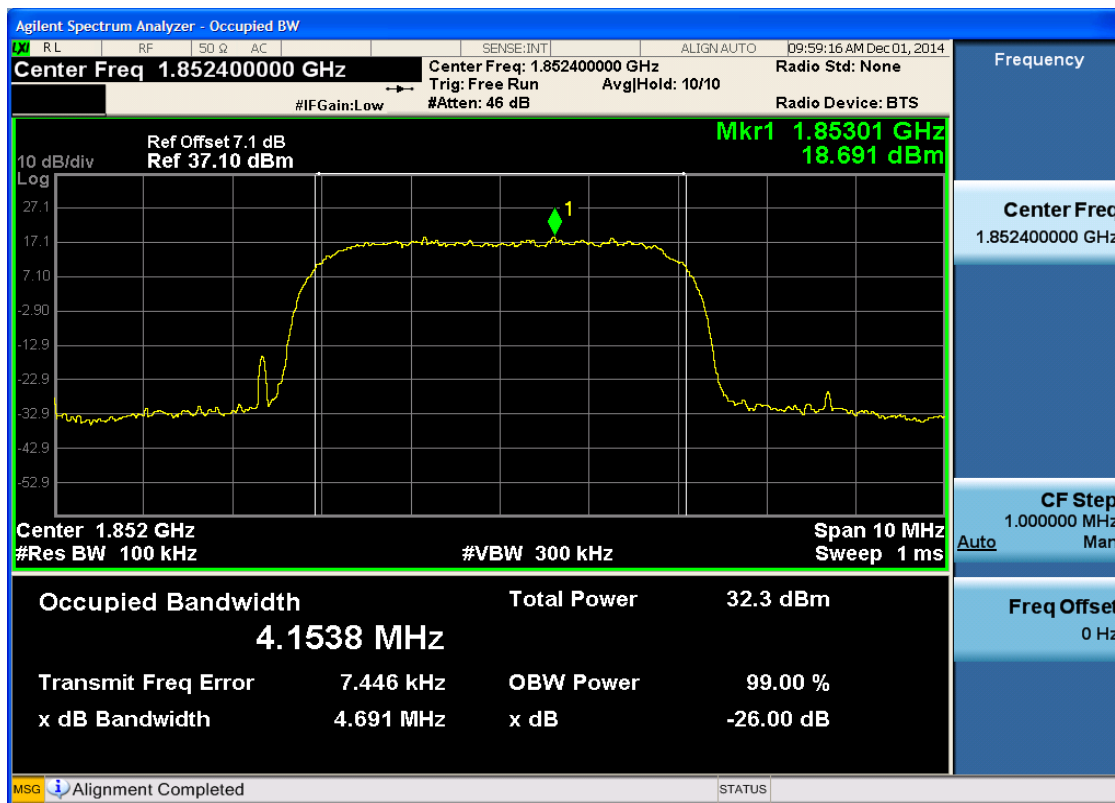




4.2.2 Test Band = WCDMA1900

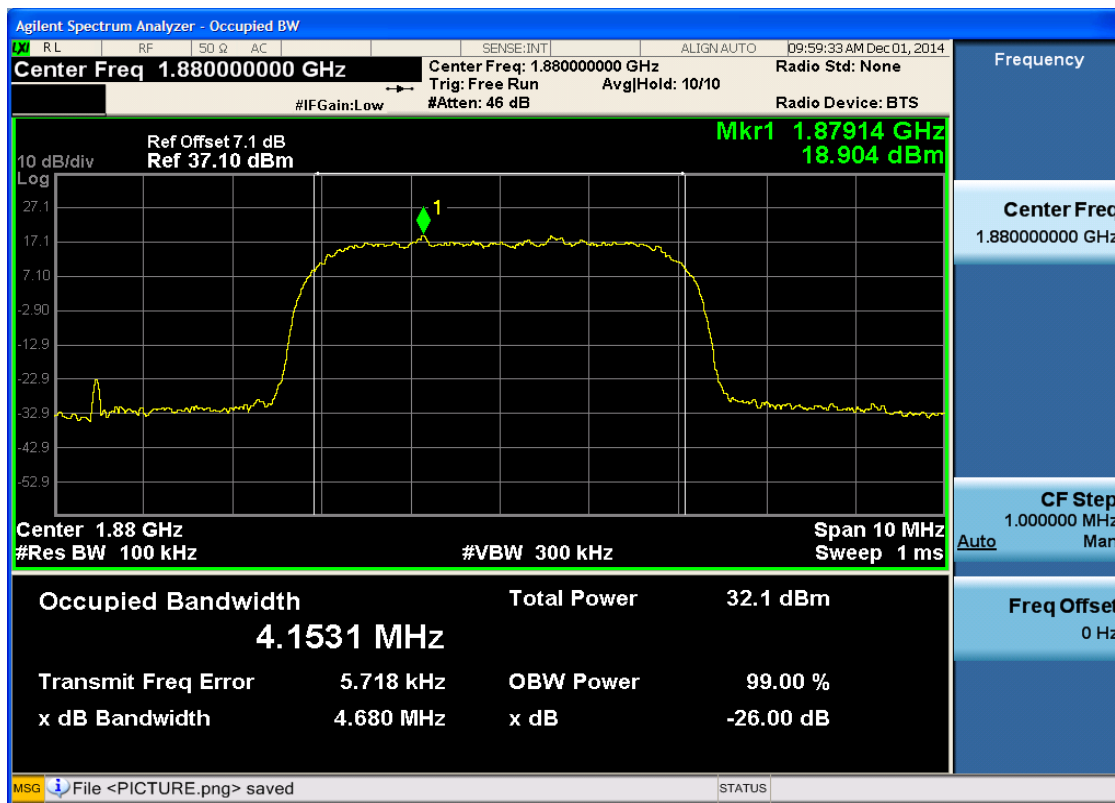
4.2.2.1 Test Mode = UMTS/TM1

4.2.2.1.1 Test Channel = LCH



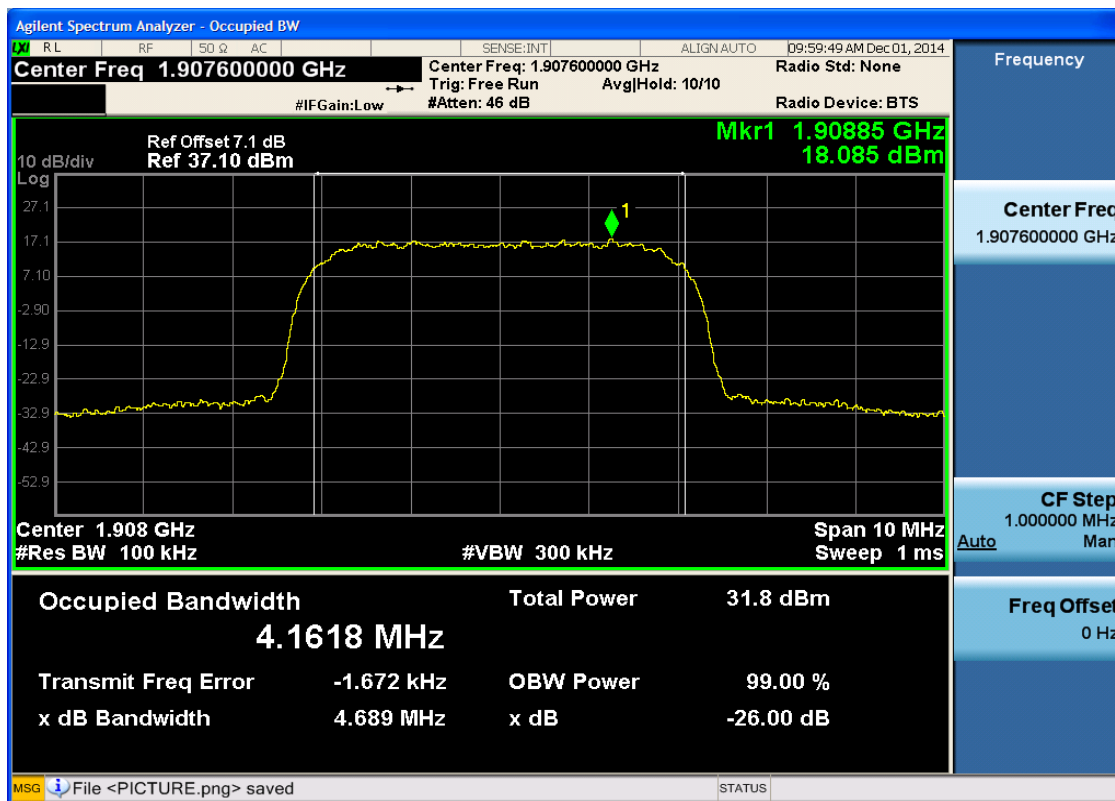


4.2.2.1.2 Test Channel = MCH





4.2.2.1.3 Test Channel = HCH

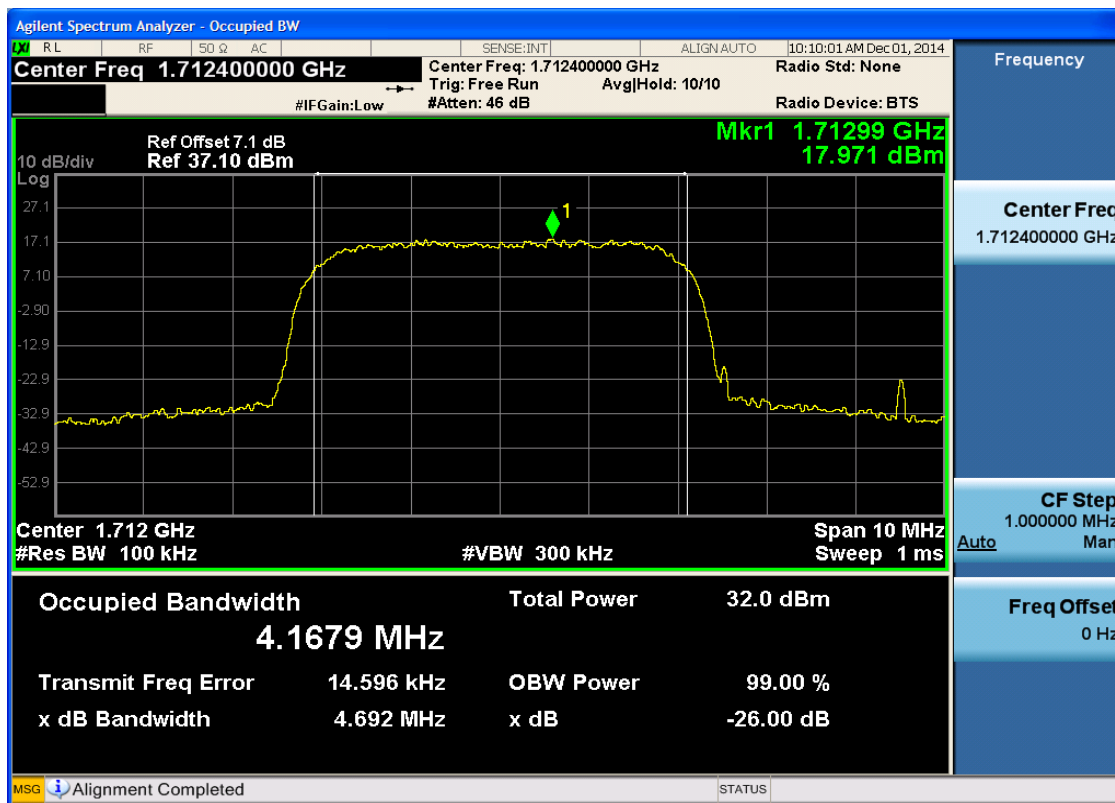




4.2.3 Test Band = WCDMA1700

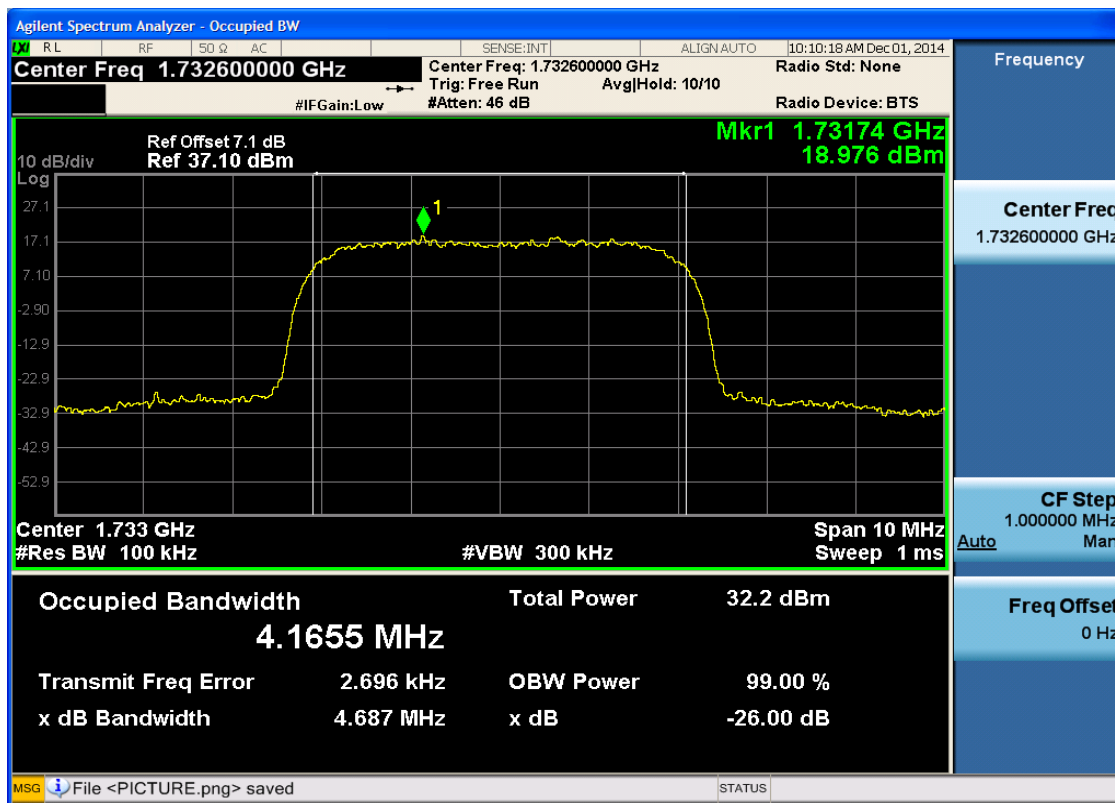
4.2.3.1 Test Mode = UMTS/TM1

4.2.3.1.1 Test Channel = LCH



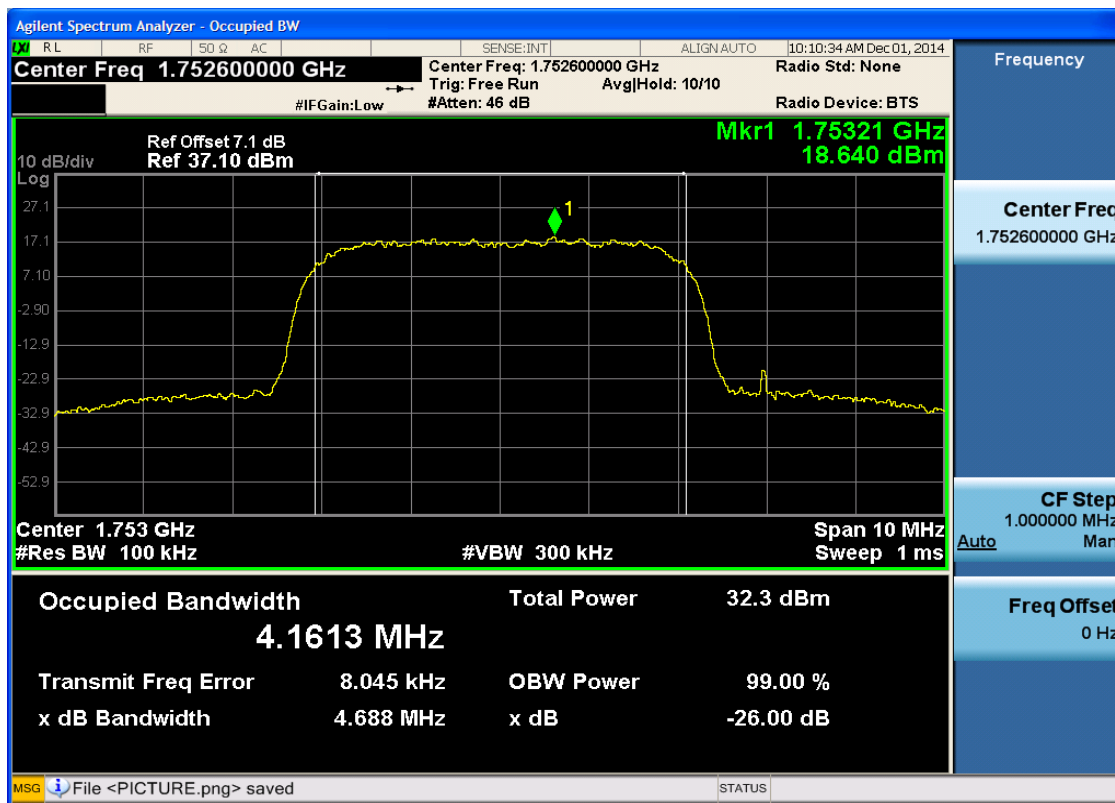


4.2.3.1.2 Test Channel = MCH





4.2.3.1.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

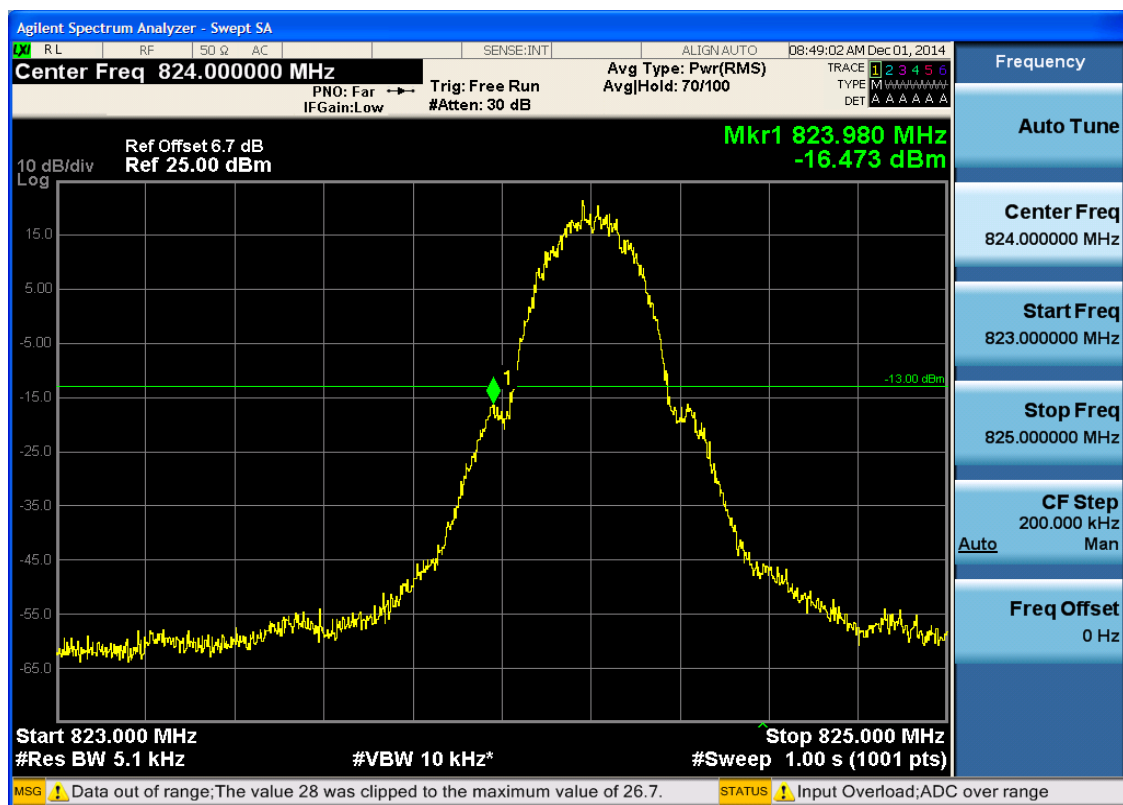
Part I - Test Plots

5.1 For GSM

5.1.1 Test Band = GSM850

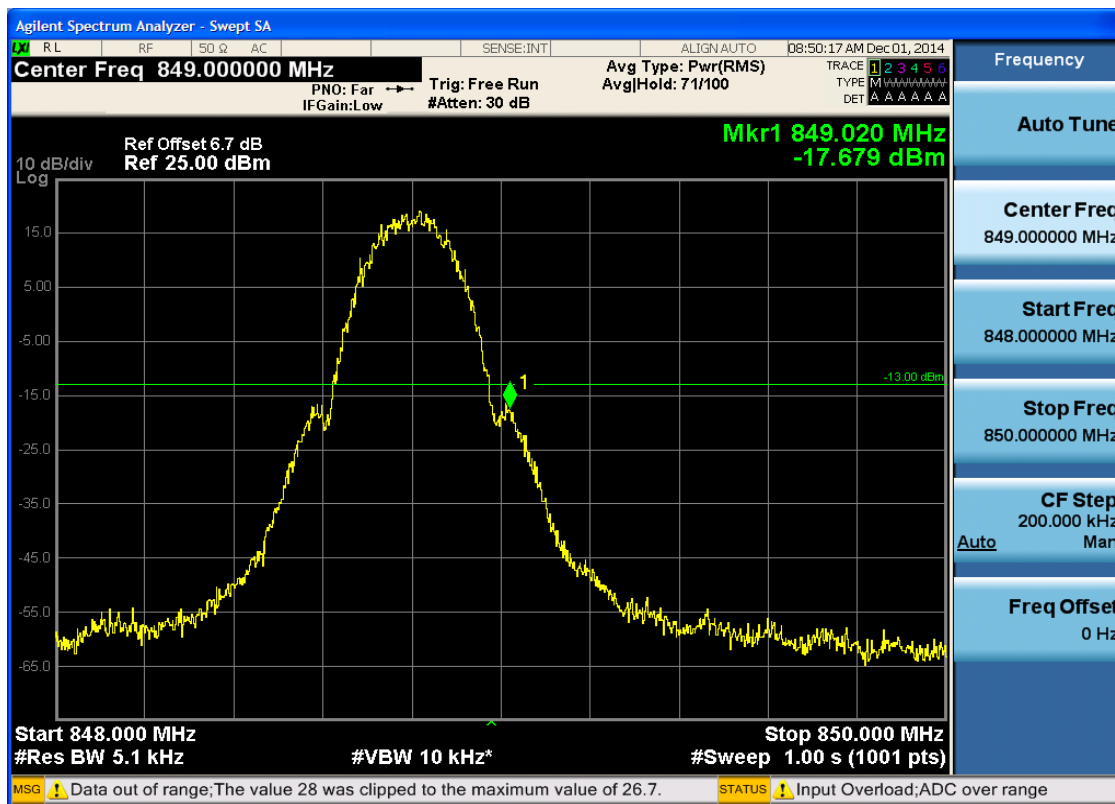
5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH



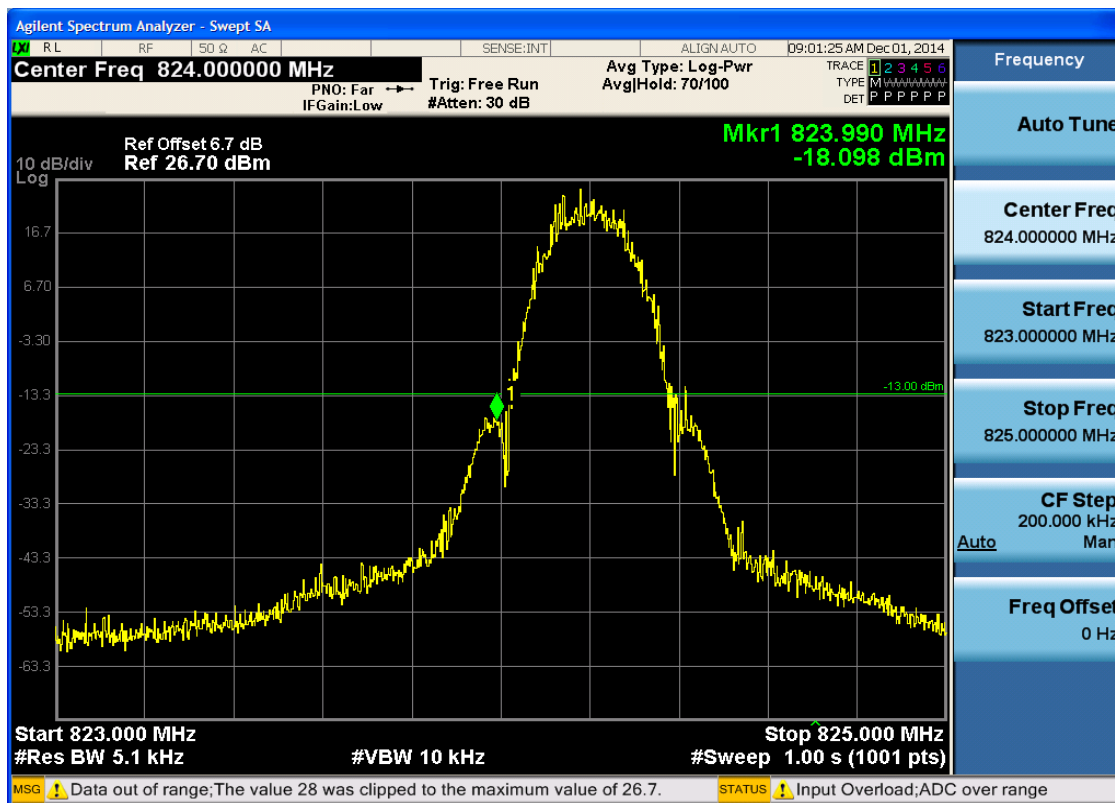


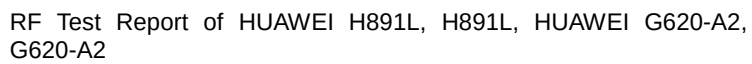
5.1.1.1.2 Test Channel = HCH



5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH





Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω AC SENSE:INT 09:02:40 AM Dec 01, 2014

Center Freq 849.000000 MHz Avg Type: Log-Pwr
PNO: Far → Trig: Free Run Avg/Hold: 71/100
IFGain: Low #Atten: 30 dB

TRACE 1 2 3 4 5 6
TYPE M M M M M M
DET P P P P P P

Ref Offset 6.7 dB Mkr1 849.040 MHz
Ref 26.70 dBm -18.360 dBm

10 dB/div Log

Start 848.000 MHz Stop 850.000 MHz
#Res BW 5.1 kHz #VBW 10 kHz #Sweep 1.00 s (1001 pts)

MSG Alignment Completed 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

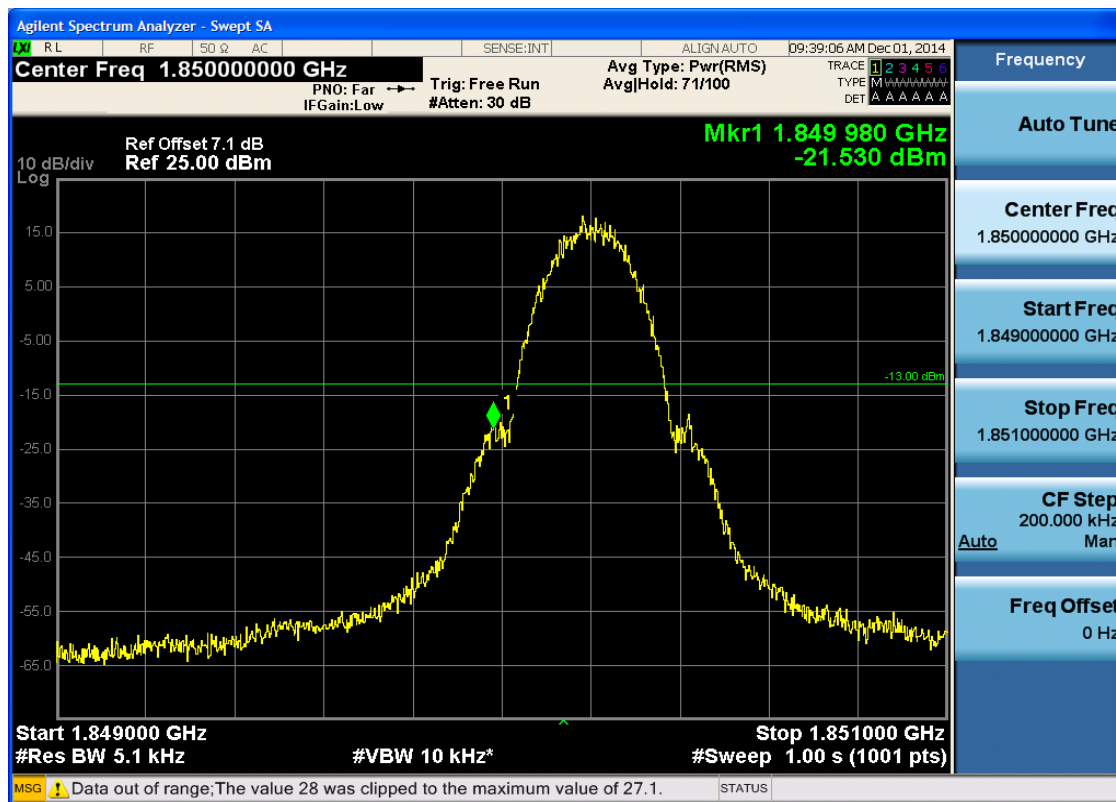
Freq Offset
0 Hz

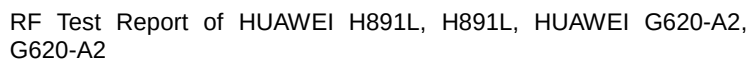


5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH





Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω AC SENSE:INT ALIGN:AUTO 09:40:22 AM Dec 01, 2014

Center Freq 1.91000000 GHz Avg Type: Pwr(RMS) Avg/Hold: 70/100

PNO: Far → Trig: Free Run #Atten: 30 dB

IF Gain: Low

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

Ref Offset 7.1 dB
Ref 25.00 dBm

Mkr1 1.910 000 GHz
-21.328 dBm

10 dB/div
Log

Start 1.909000 GHz Stop 1.911000 GHz
#Res BW 5.1 kHz #VBW 10 kHz* #Sweep 1.00 s (1001 pts)

MSG Alignment Completed STATUS

Frequency

Auto Tune

Center Freq
1.91000000 GHz

Start Freq
1.90900000 GHz

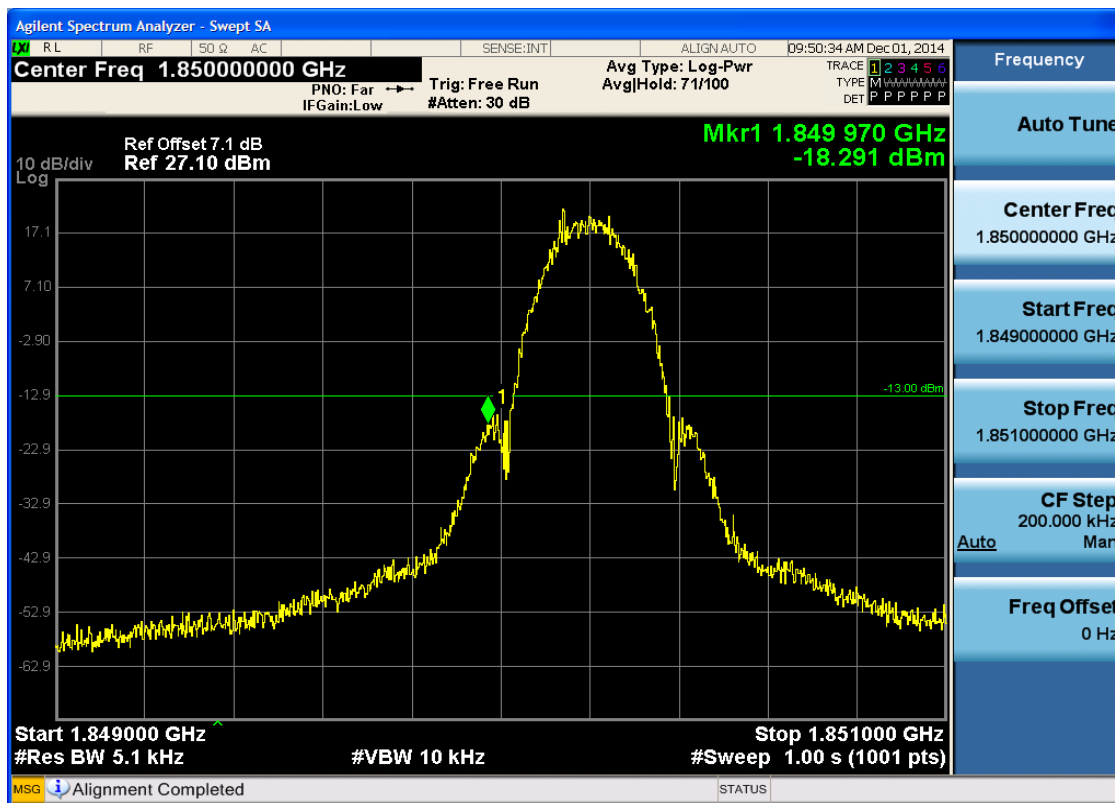
Stop Freq
1.91100000 GHz

CF Step
200.000 kHz
Auto Man

Freq Offset
0 Hz

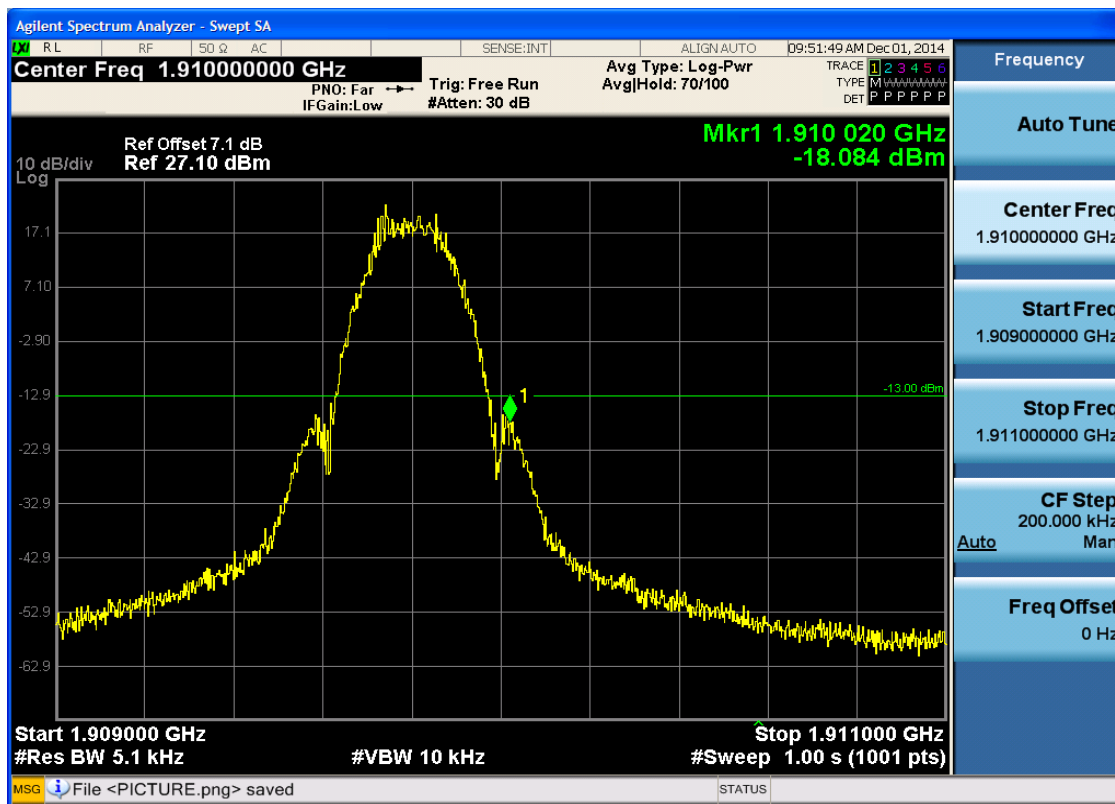
5.1.2.2 Test Mode = GSM/TM2

5.1.2.2.1 Test Channel = LCH





5.1.2.2.2 Test Channel = HCH



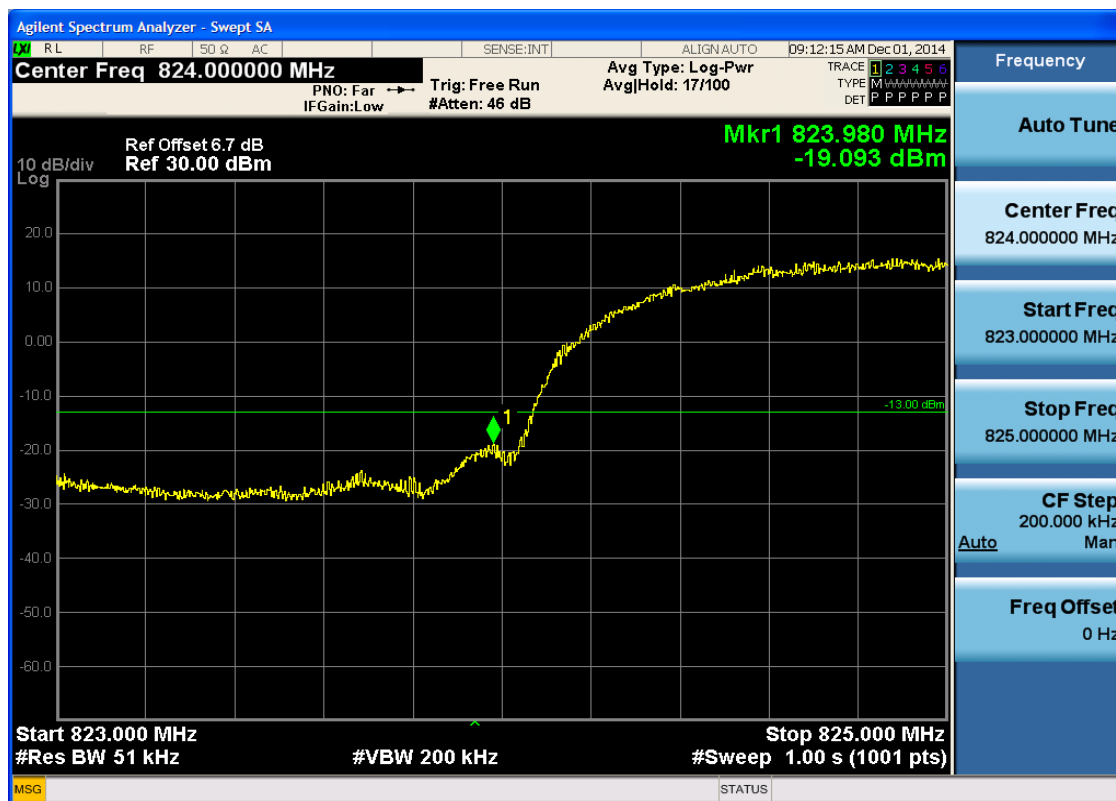


5.2 For UMTS

5.2.1 Test Band = WCDMA850

5.2.1.1 Test Mode = UMTS/TM1

5.2.1.1.1 Test Channel = LCH



5.2.1.1.2 Test Channel = HCH

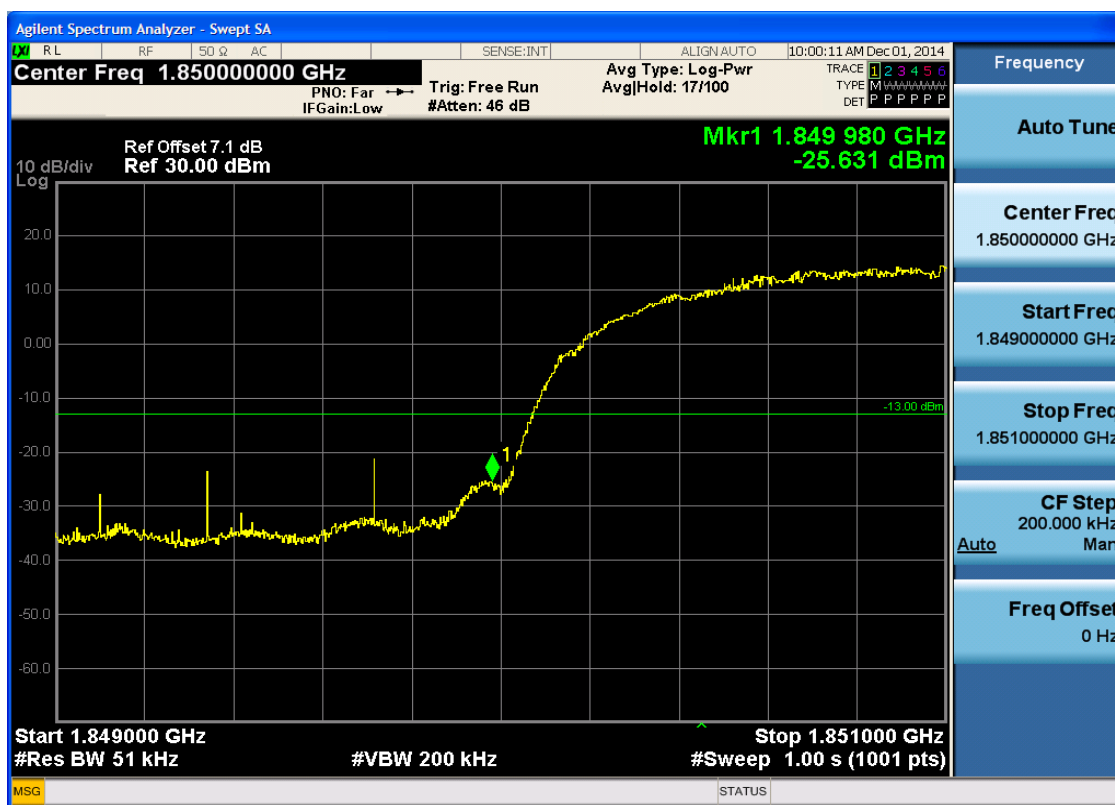




5.2.2 Test Band = WCDMA1900

5.2.2.1 Test Mode = UMTS/TM1

5.2.2.1.1 Test Channel = LCH



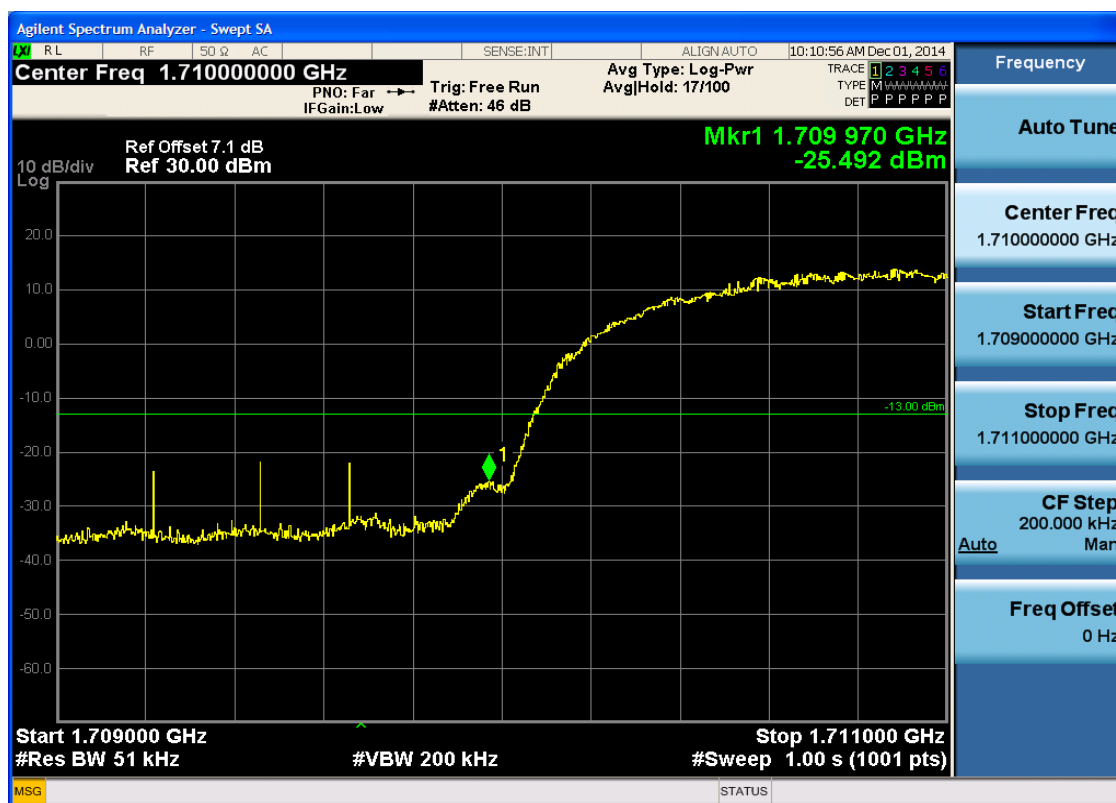
5.2.2.1.2 Test Channel = HCH



5.2.3 Test Band = WCDMA1700

5.2.3.1 Test Mode = UMTS/TM1

5.2.3.1.1 Test Channel = LCH





5.2.3.1.2 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.

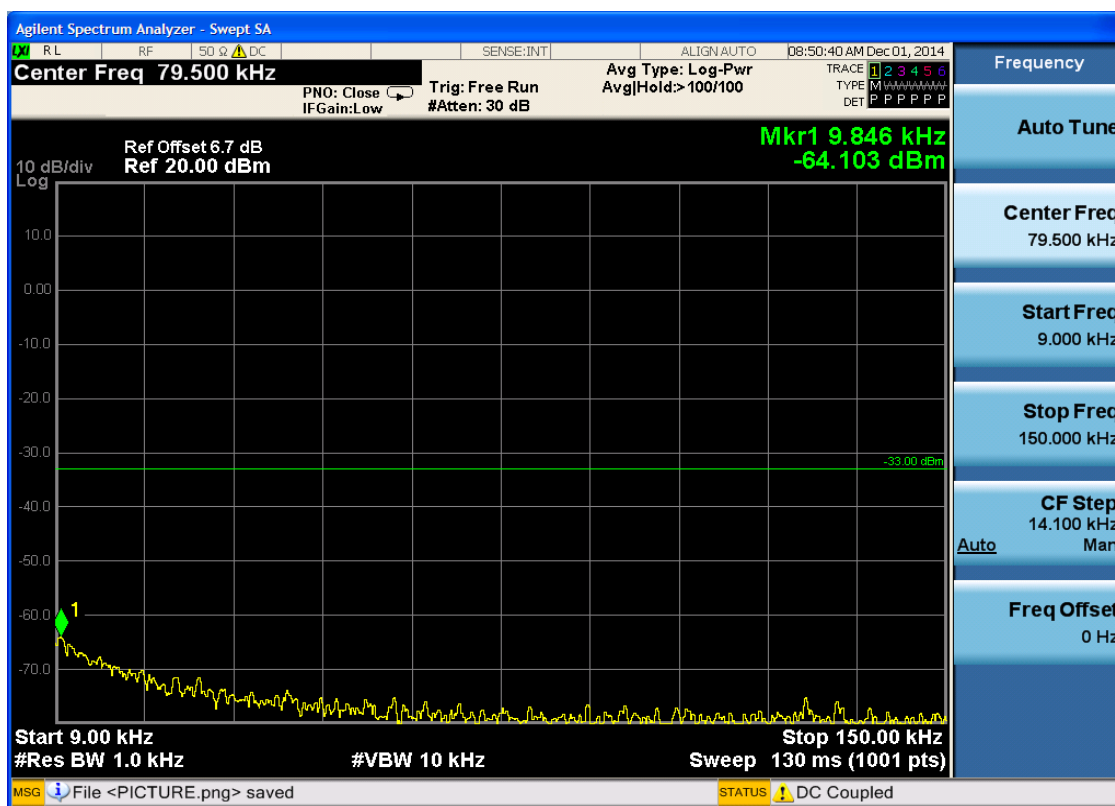
Part I - Test Plots

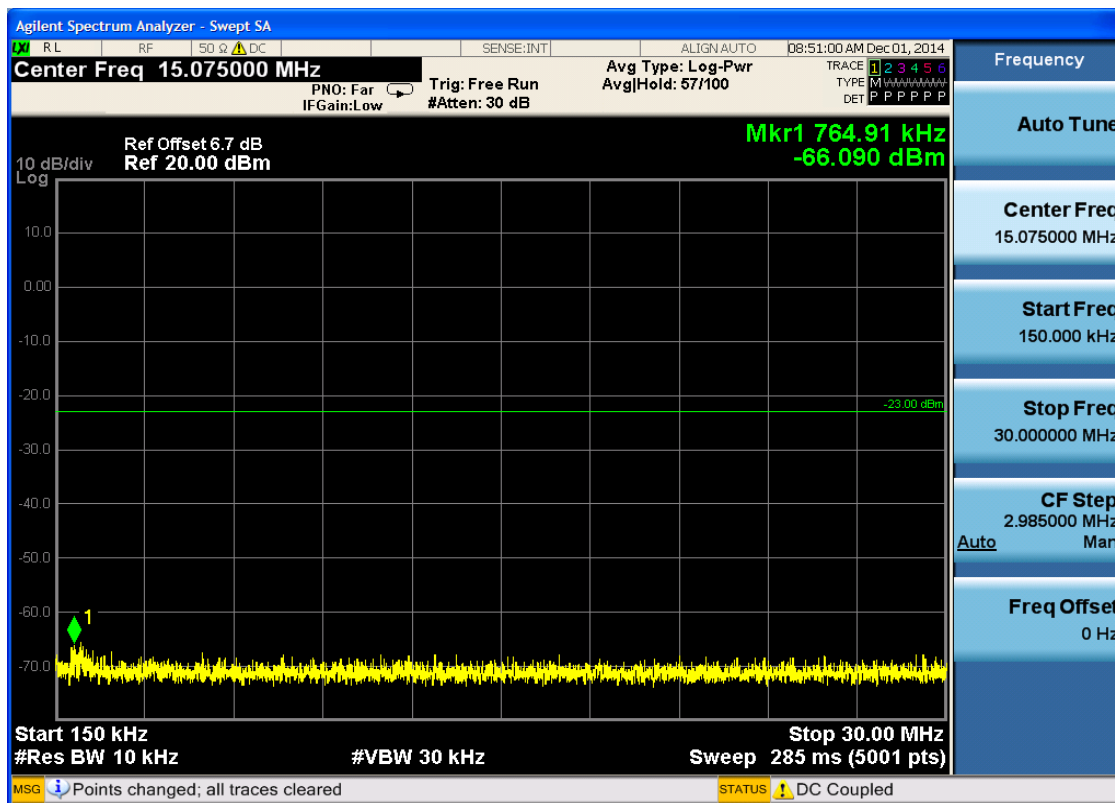
6.1 For GSM

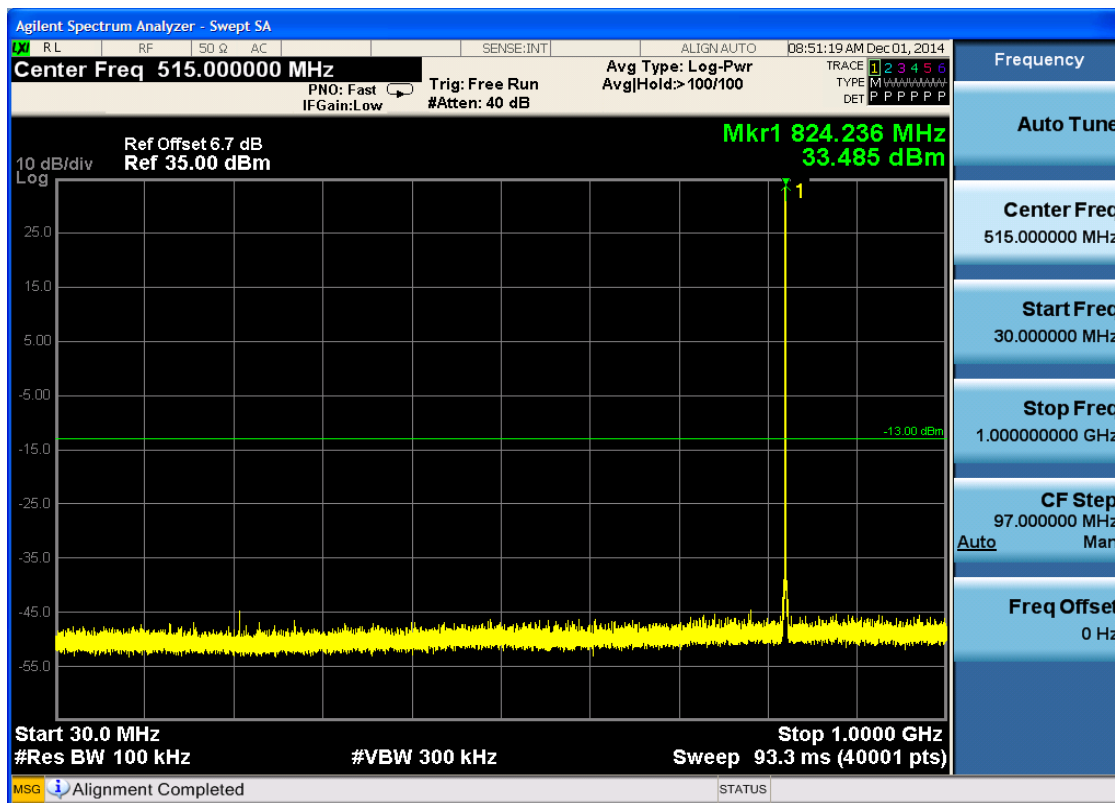
6.1.1 Test Band = GSM850

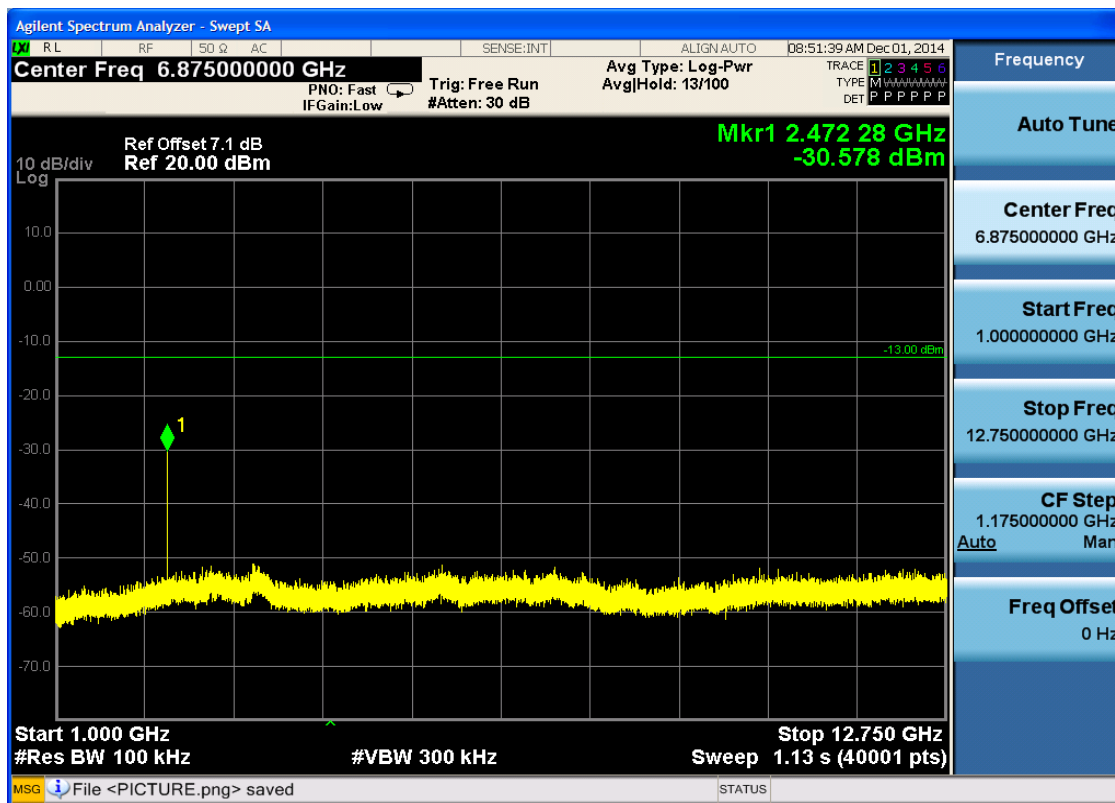
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH



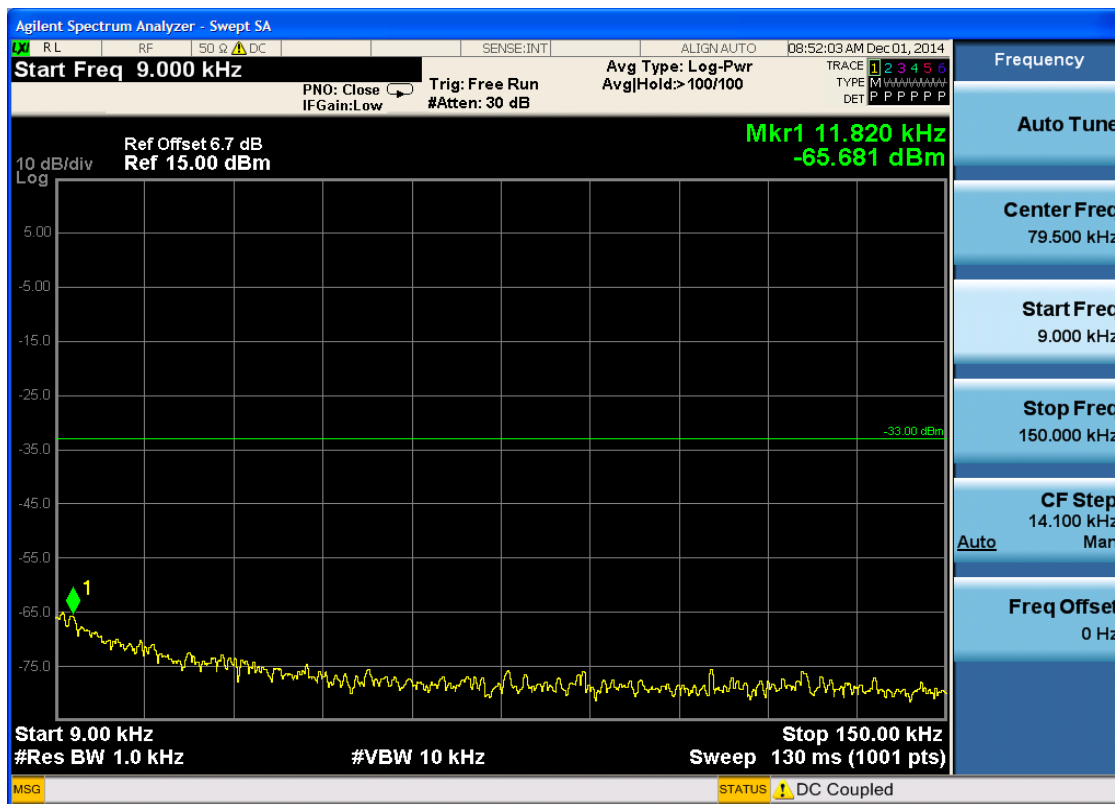


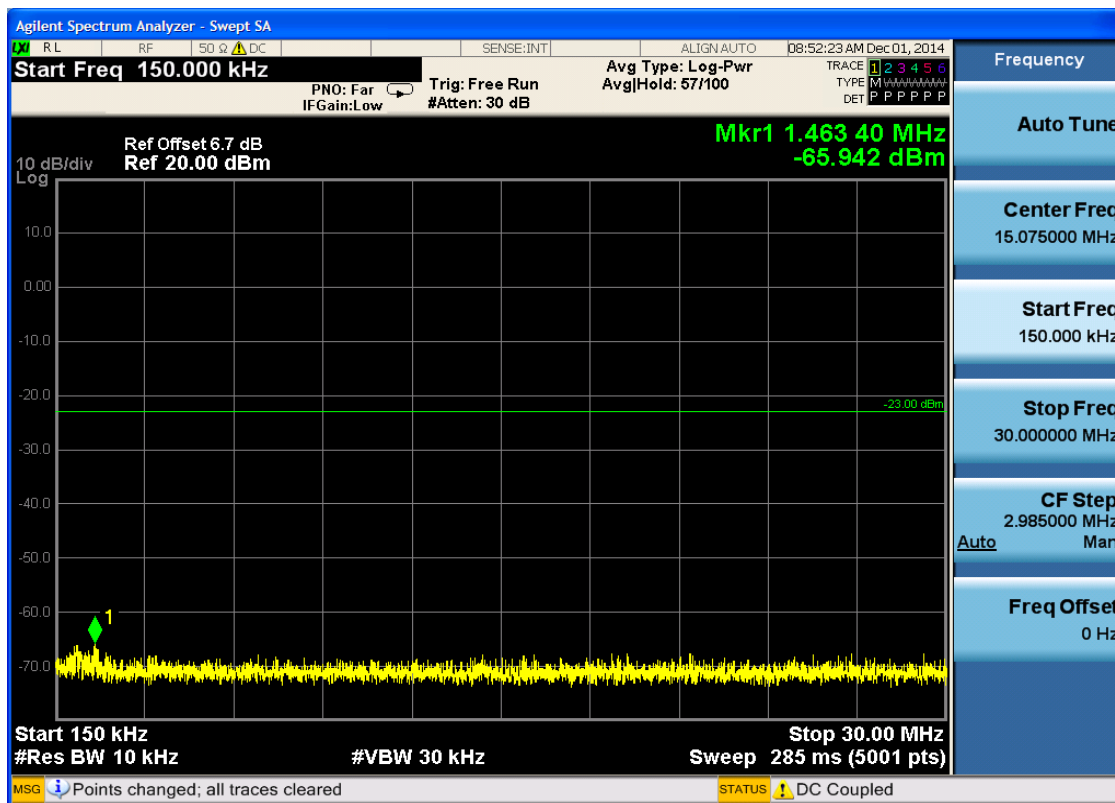


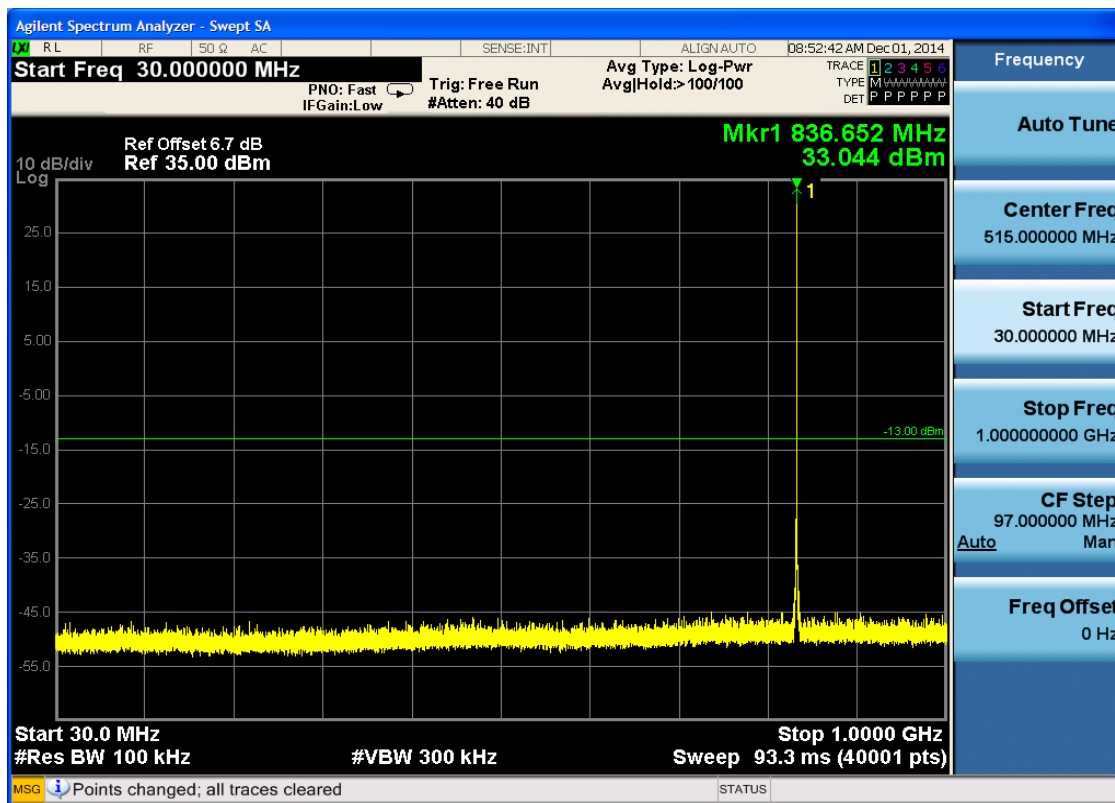


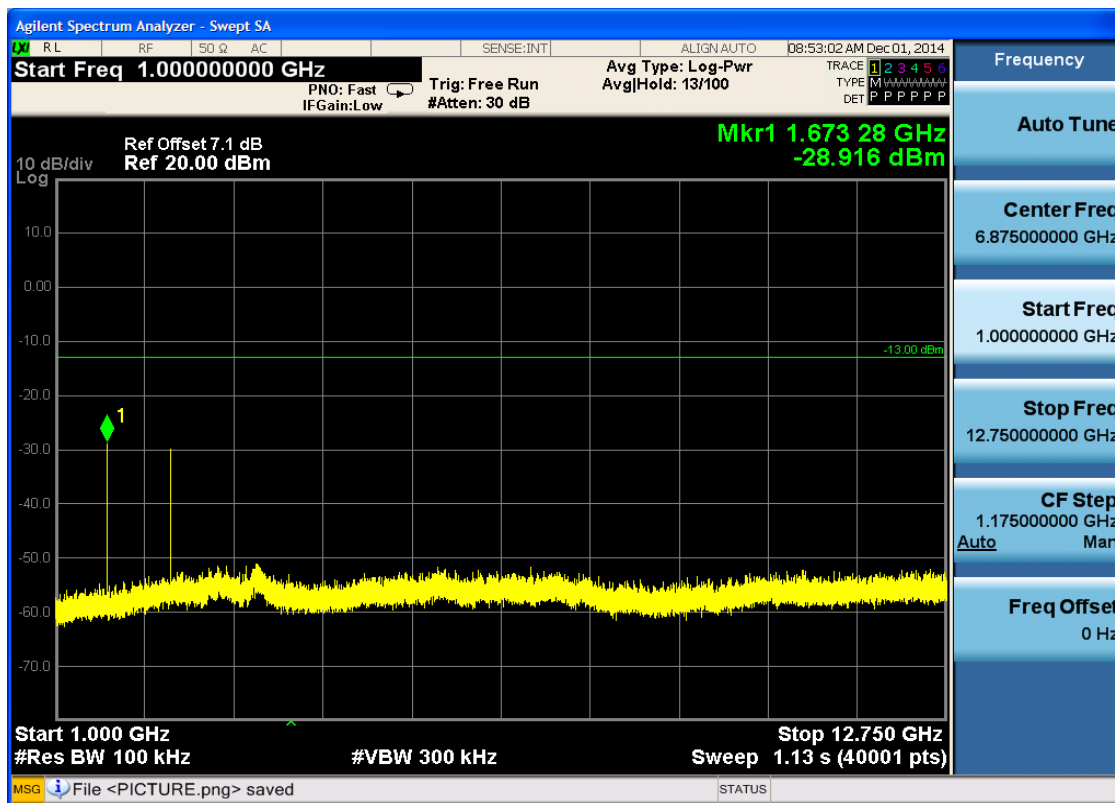


6.1.1.1.2 Test Channel = MCH



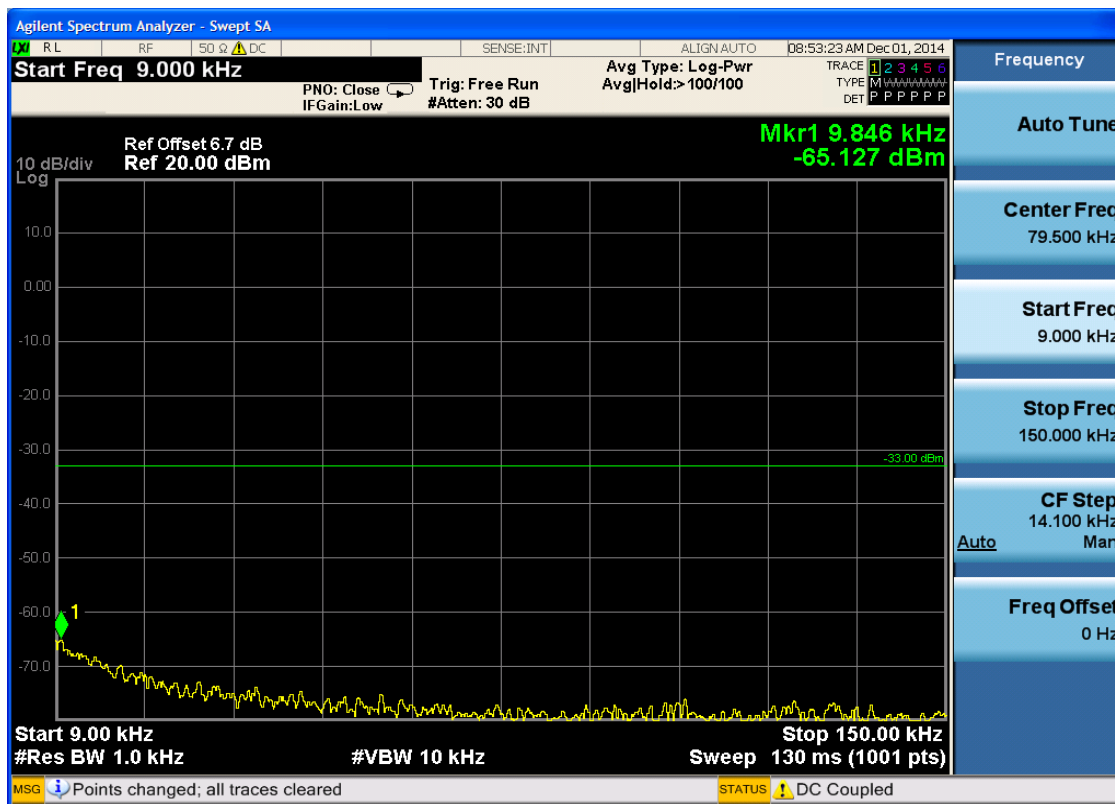


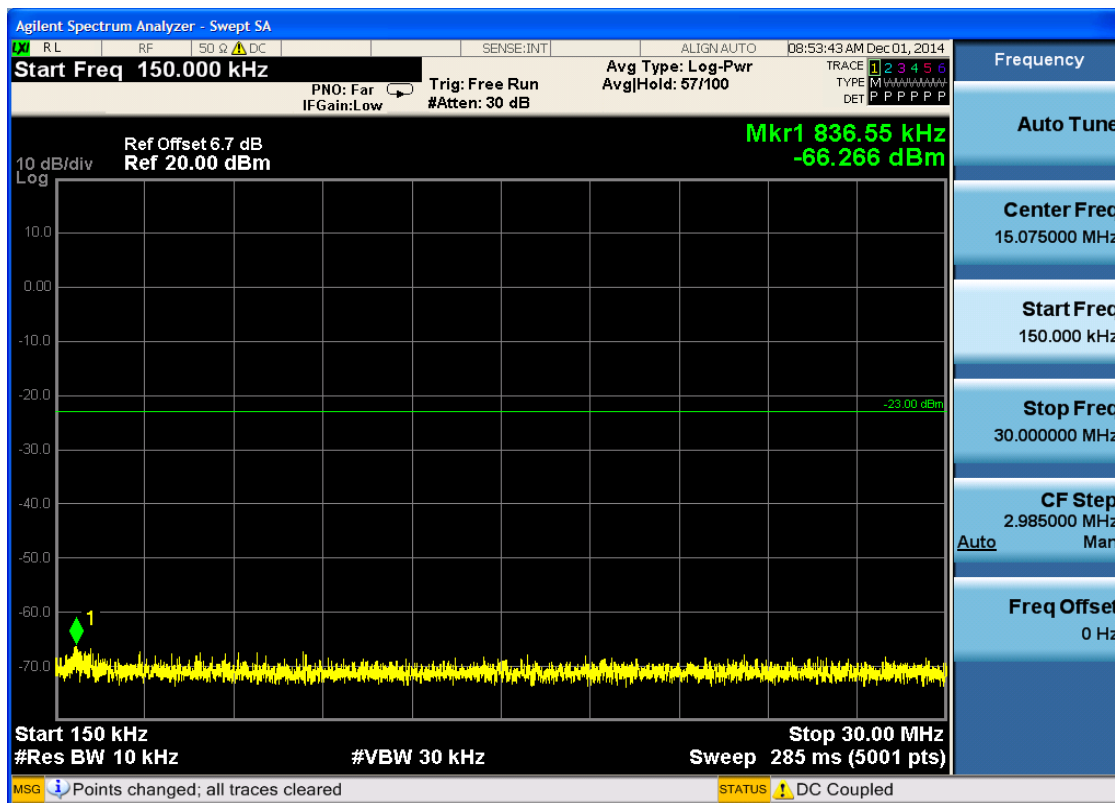


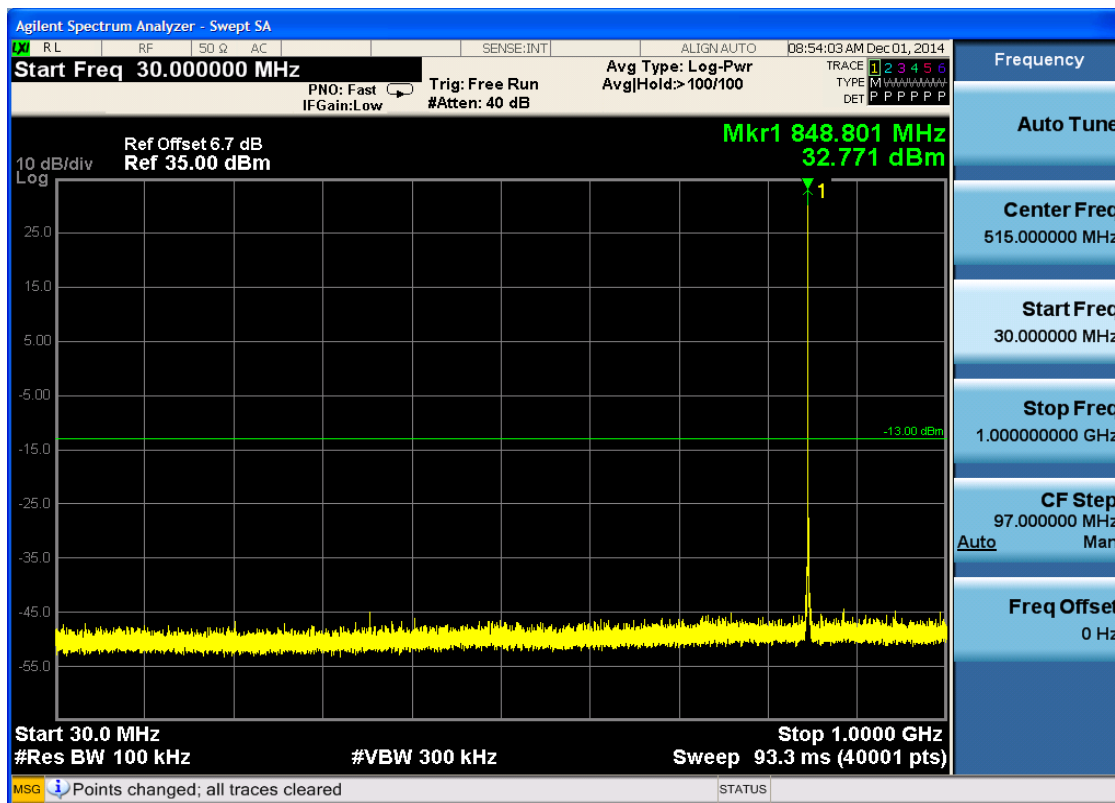


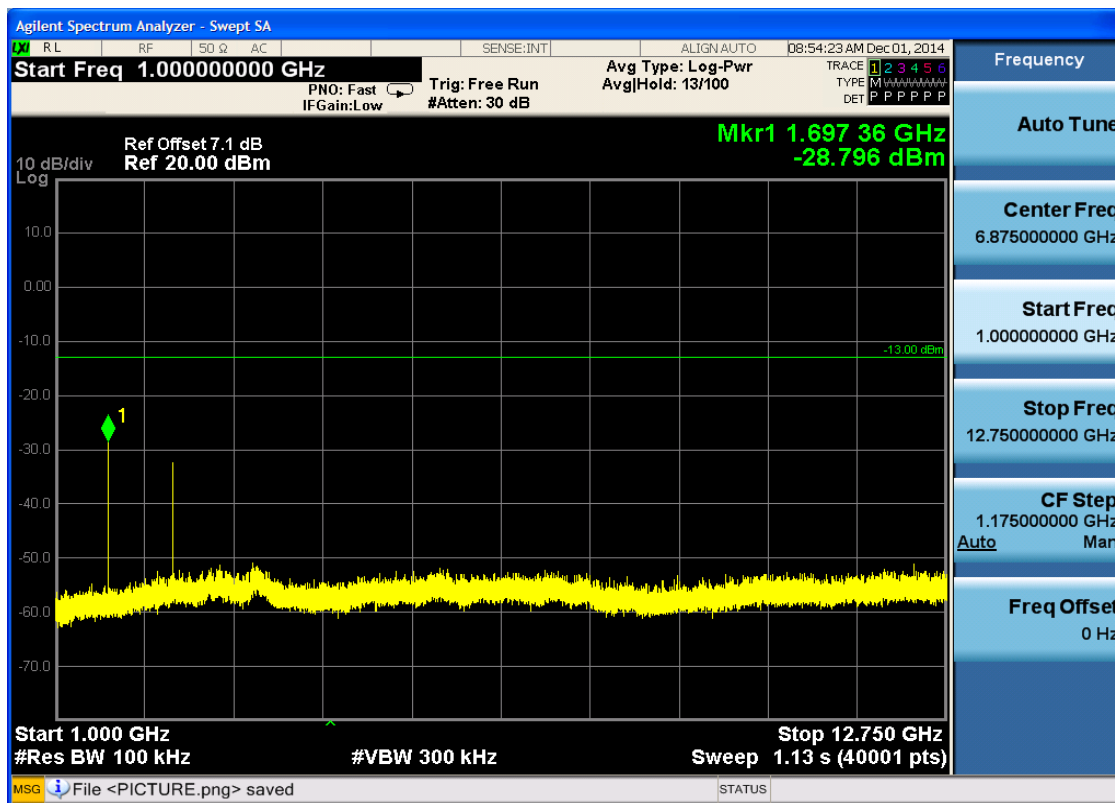


6.1.1.1.3 Test Channel = HCH





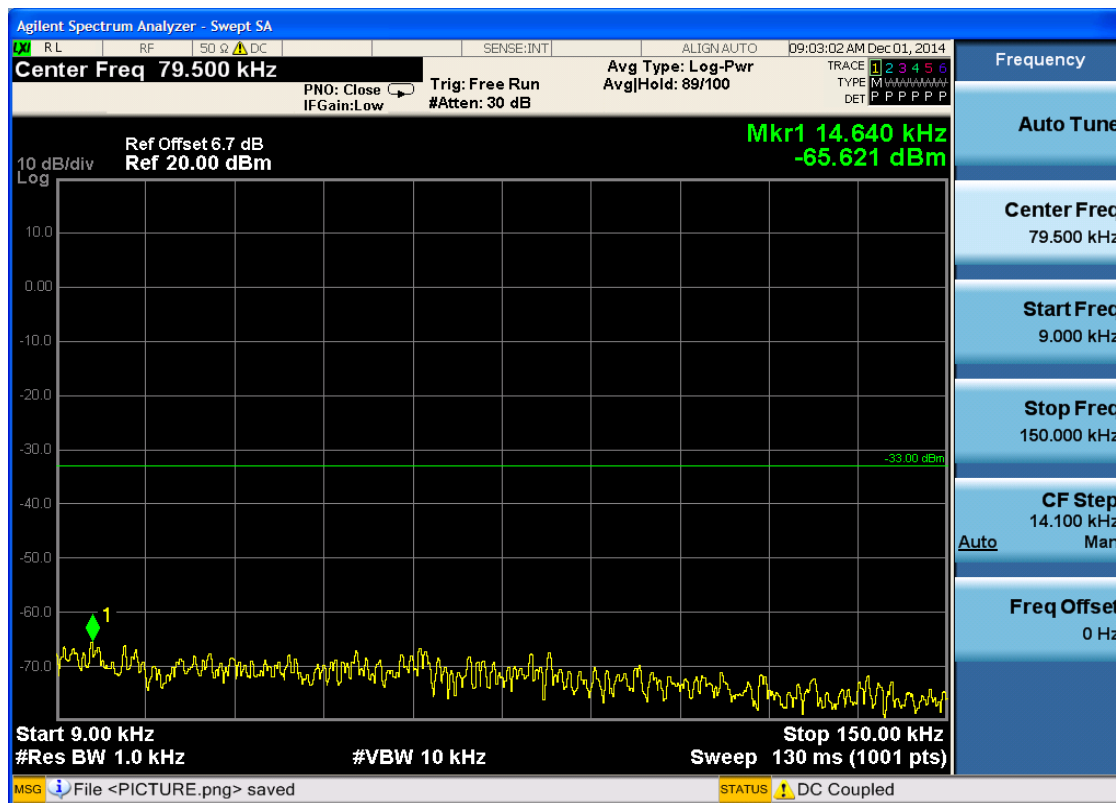


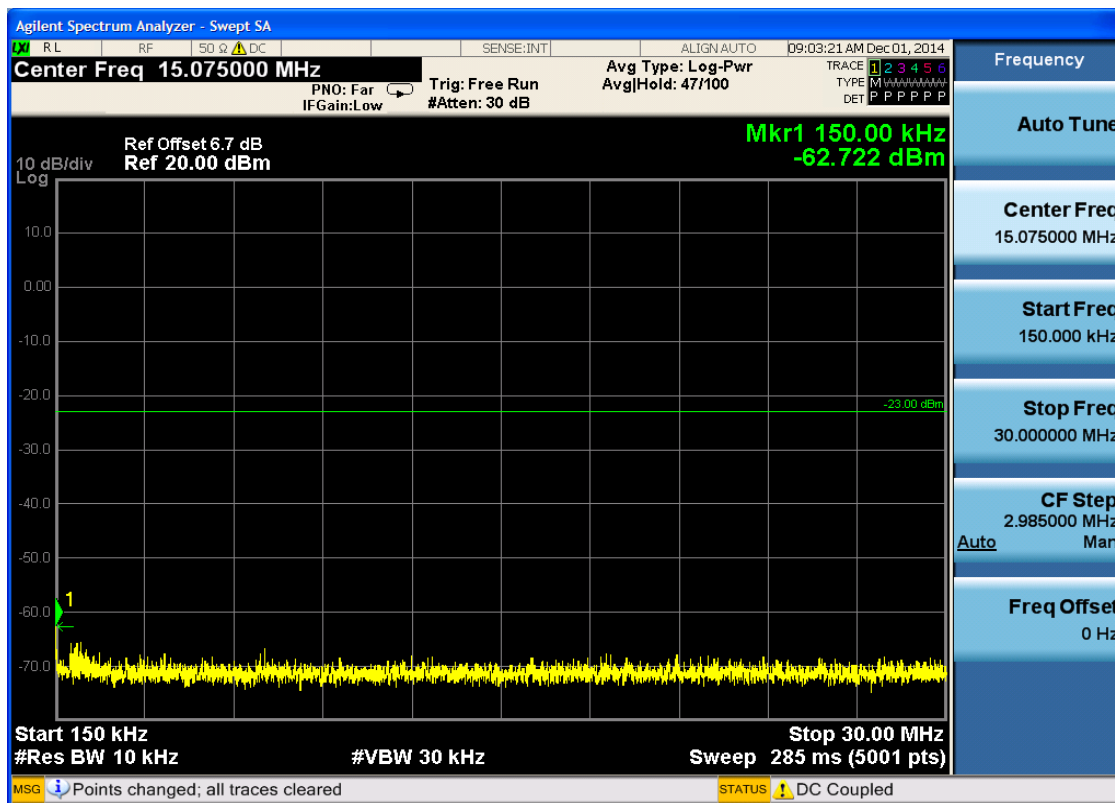


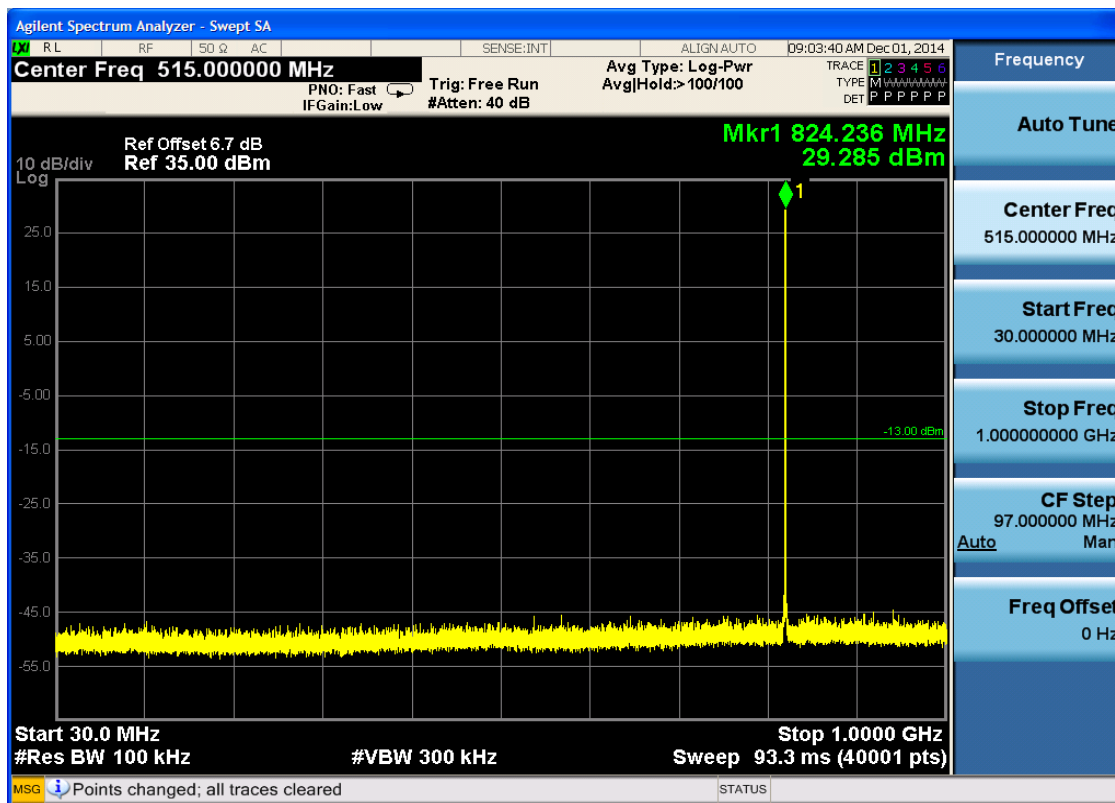


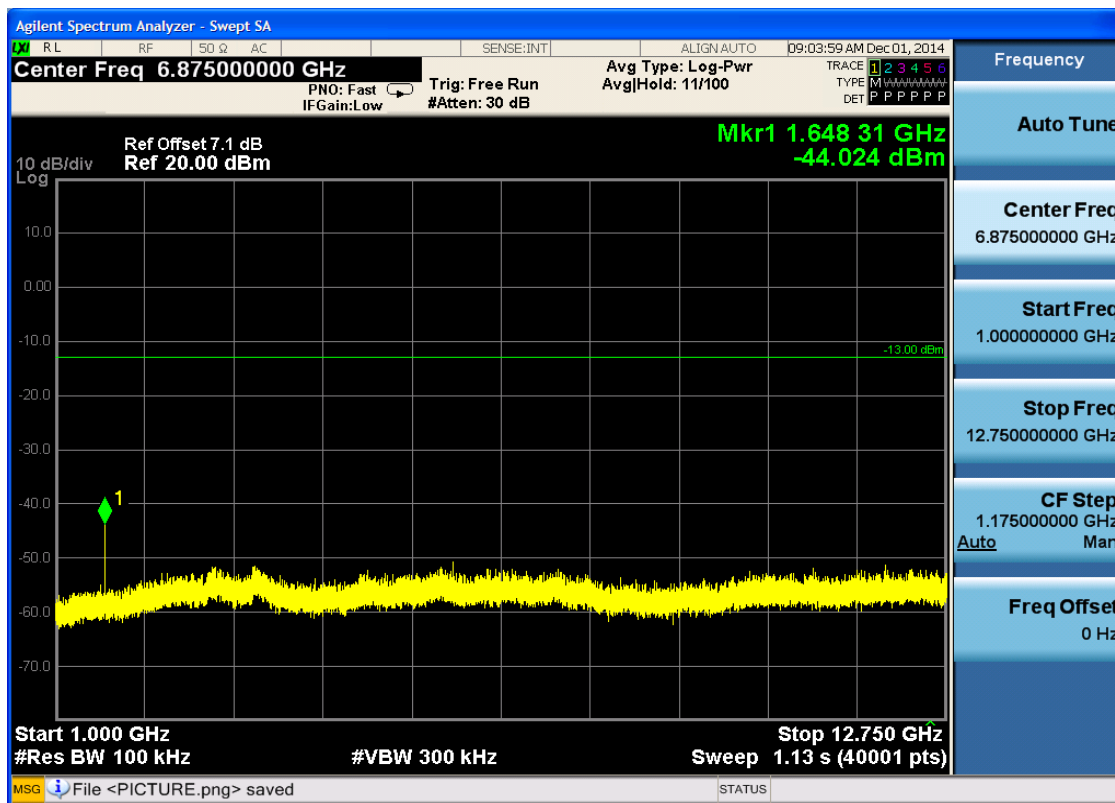
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH



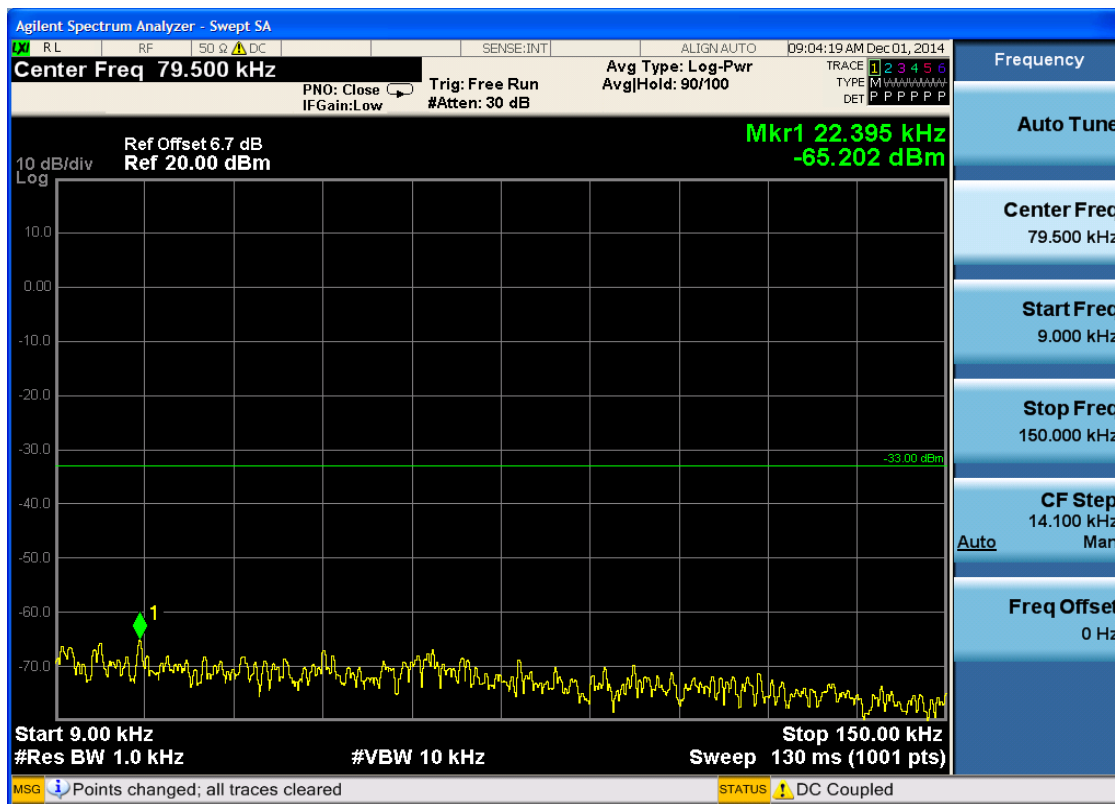


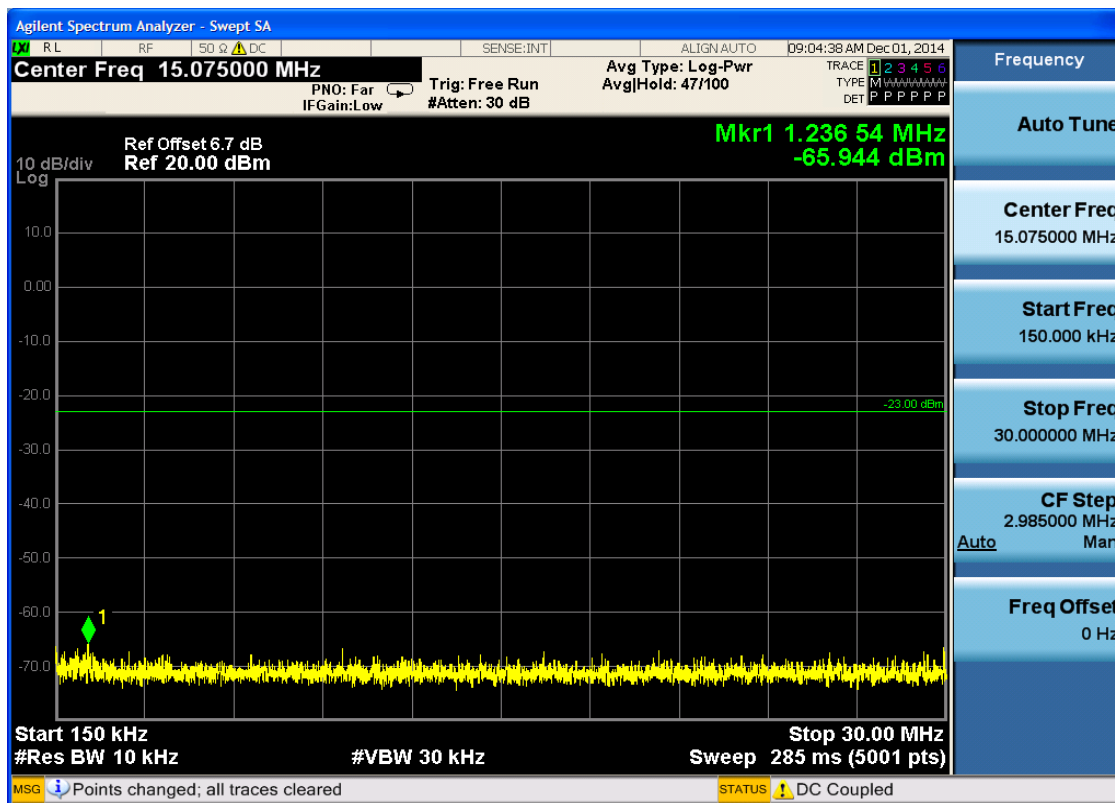


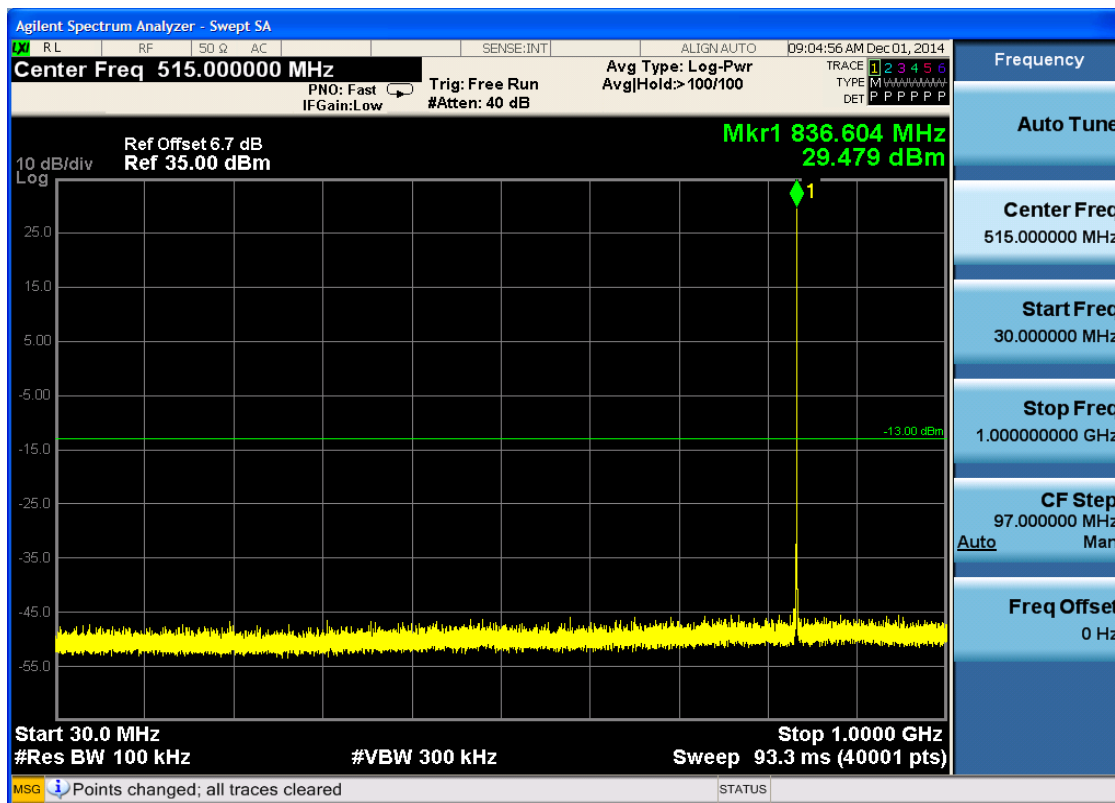


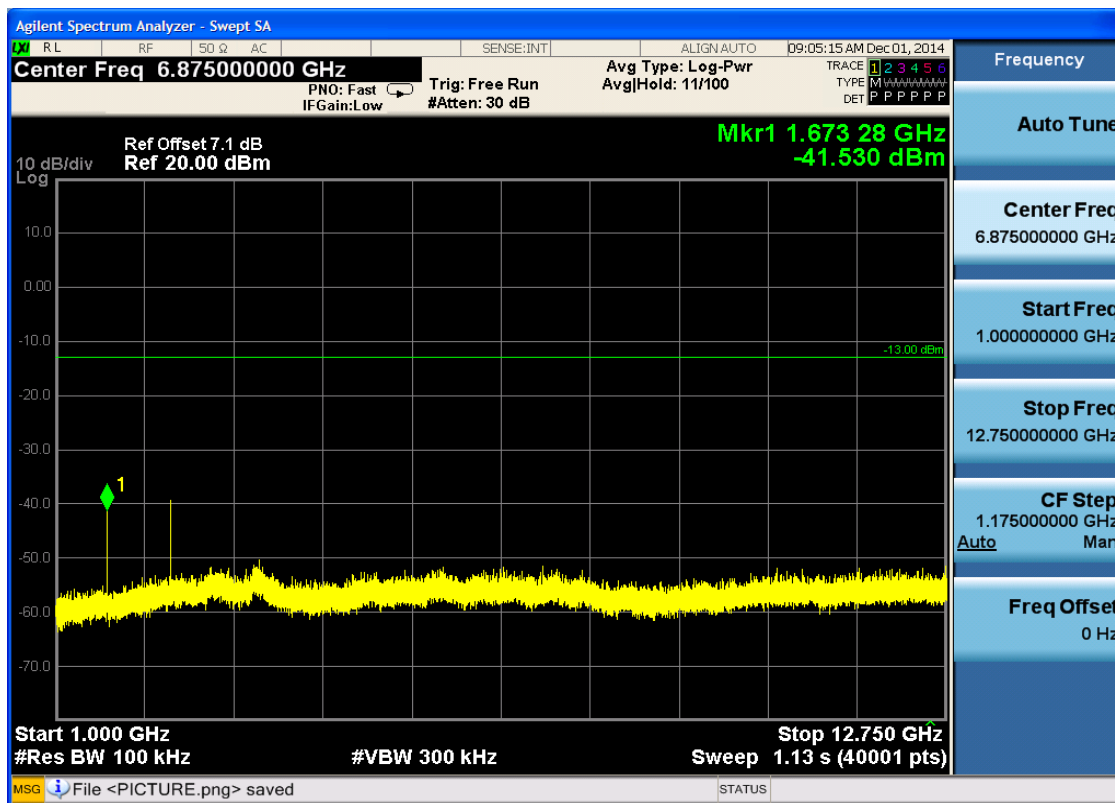


6.1.1.2.2 Test Channel = MCH



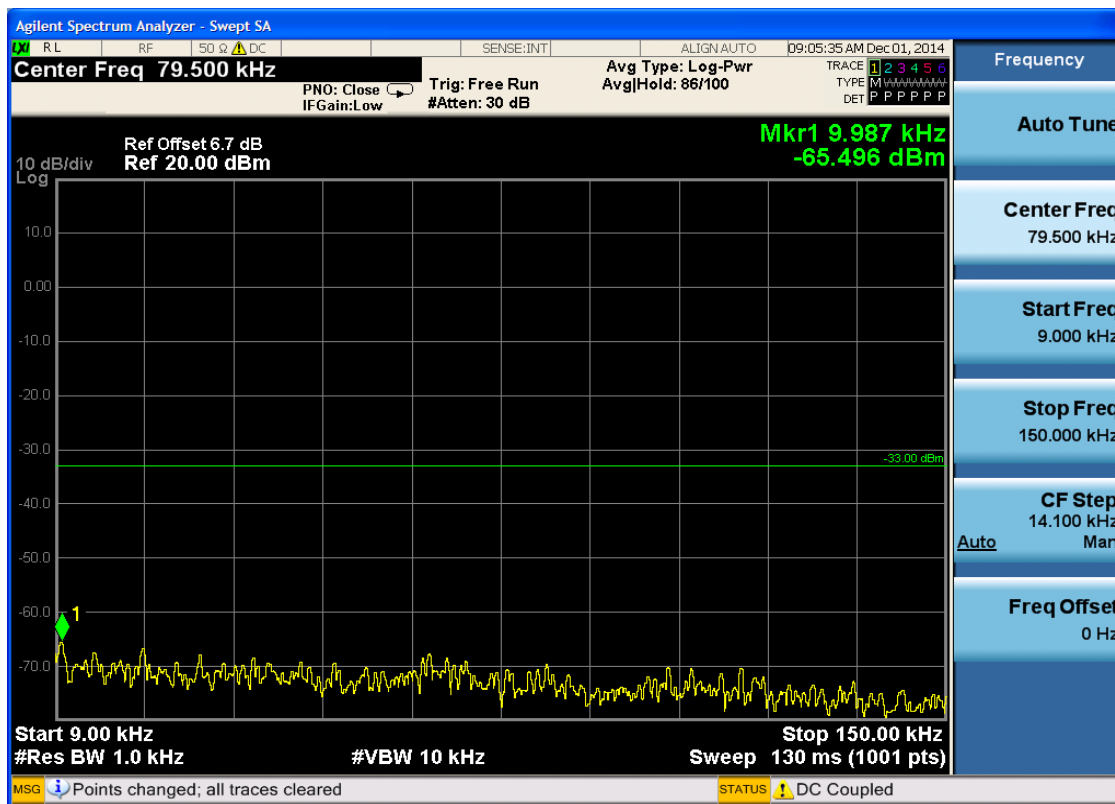


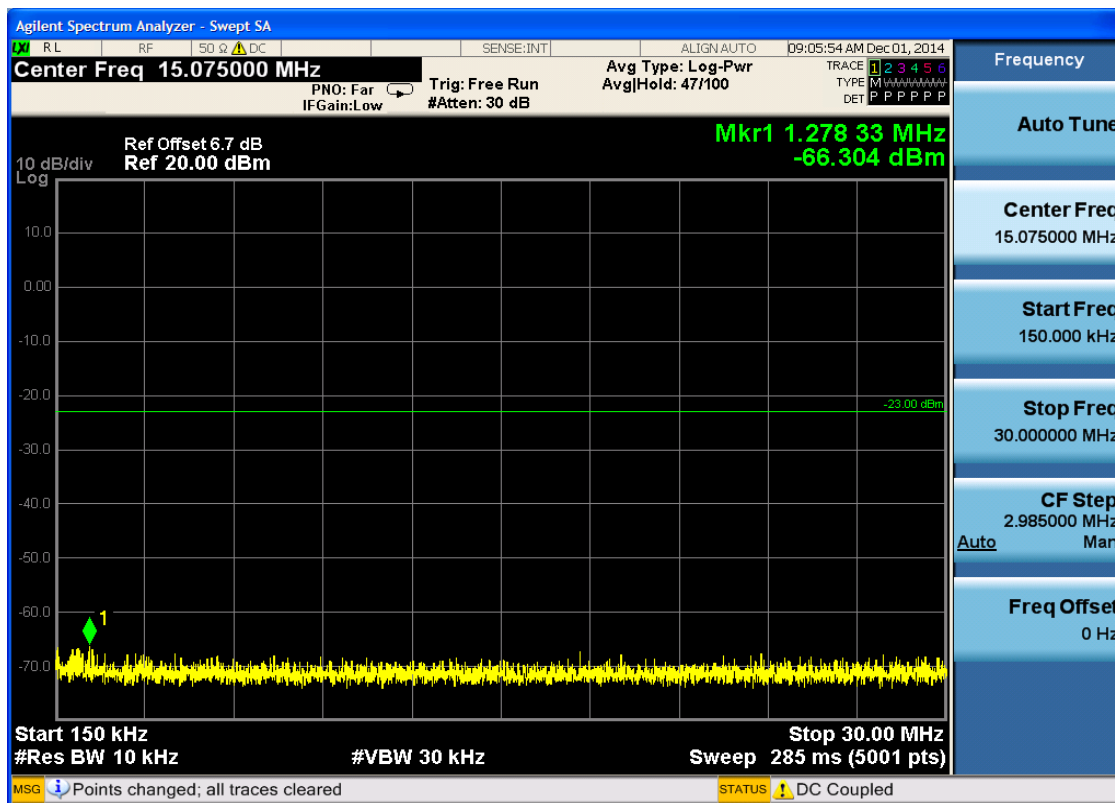


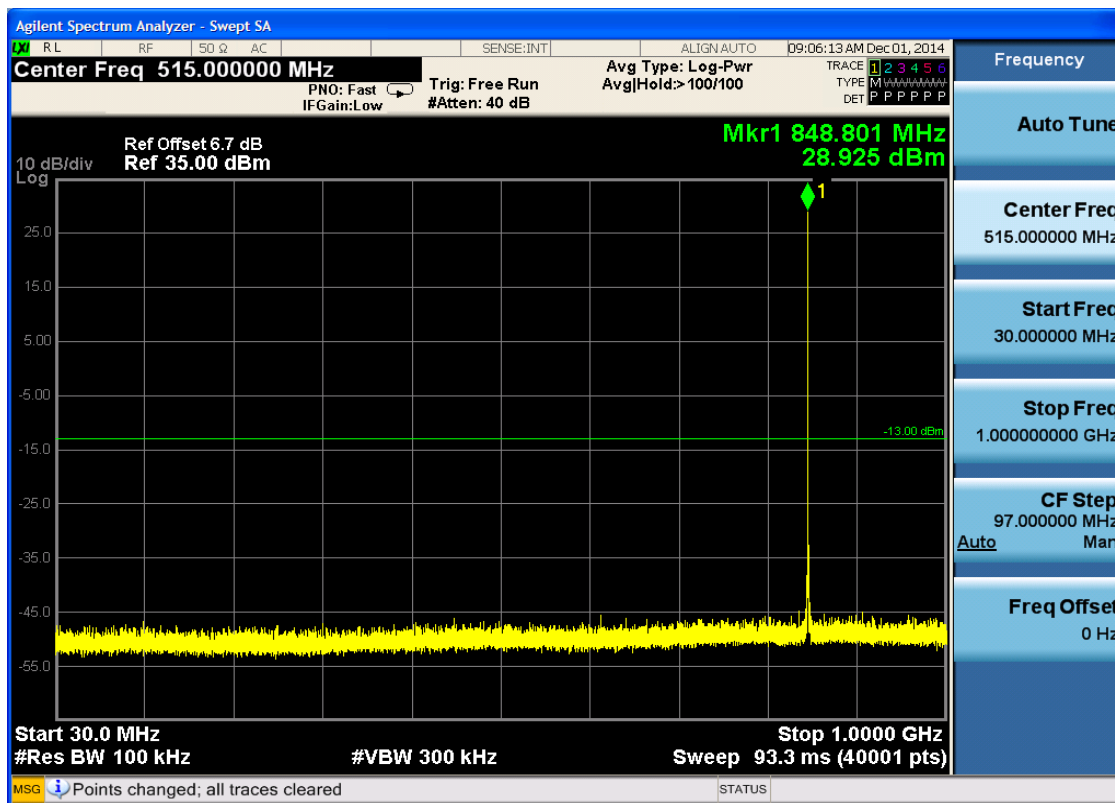


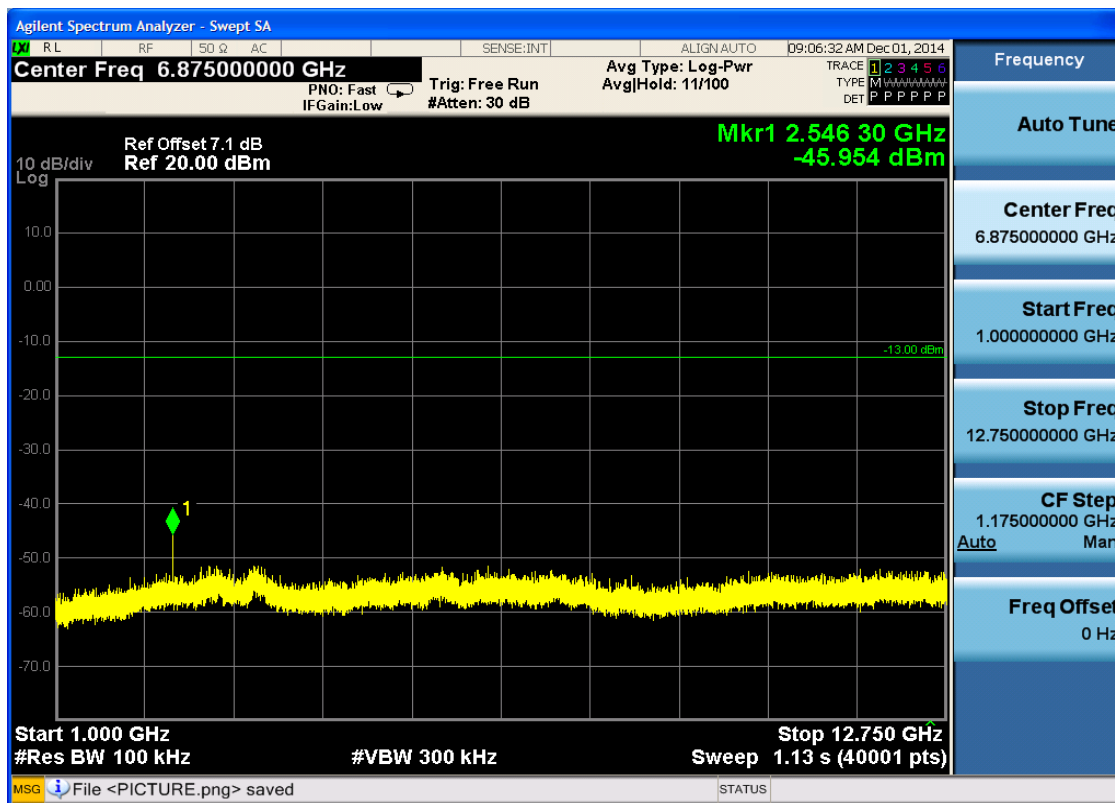


6.1.1.2.3 Test Channel = HCH







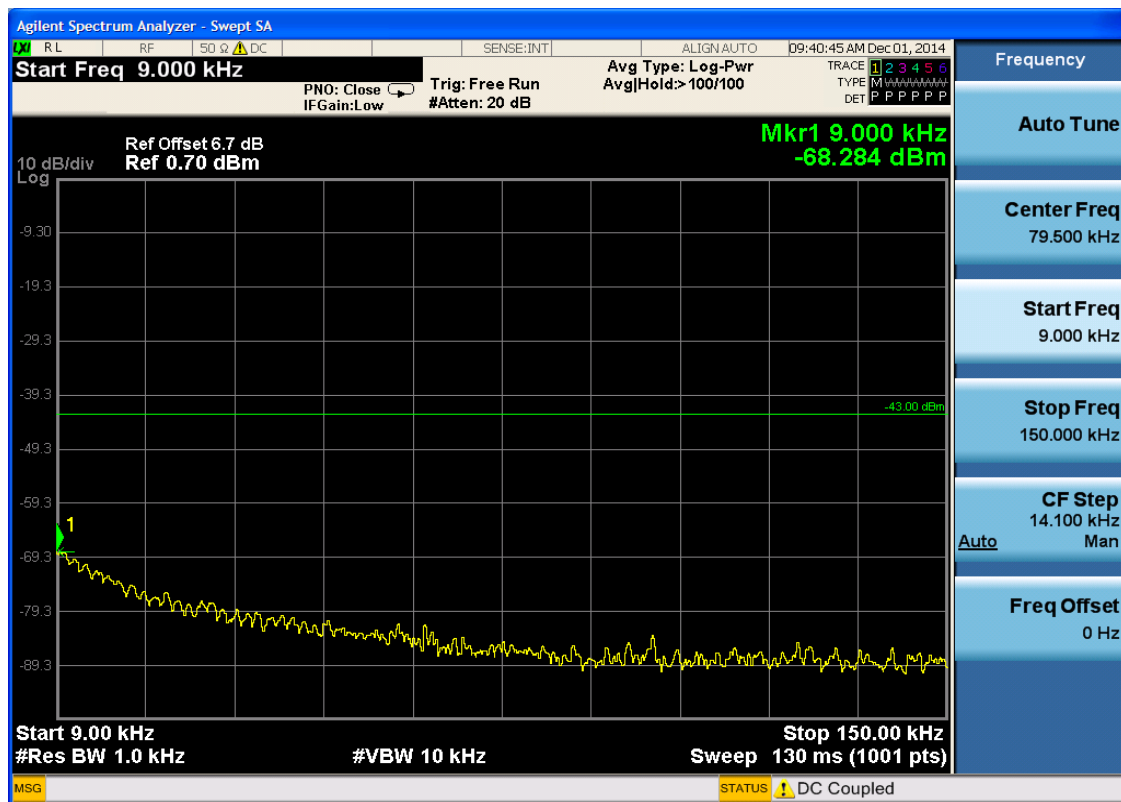


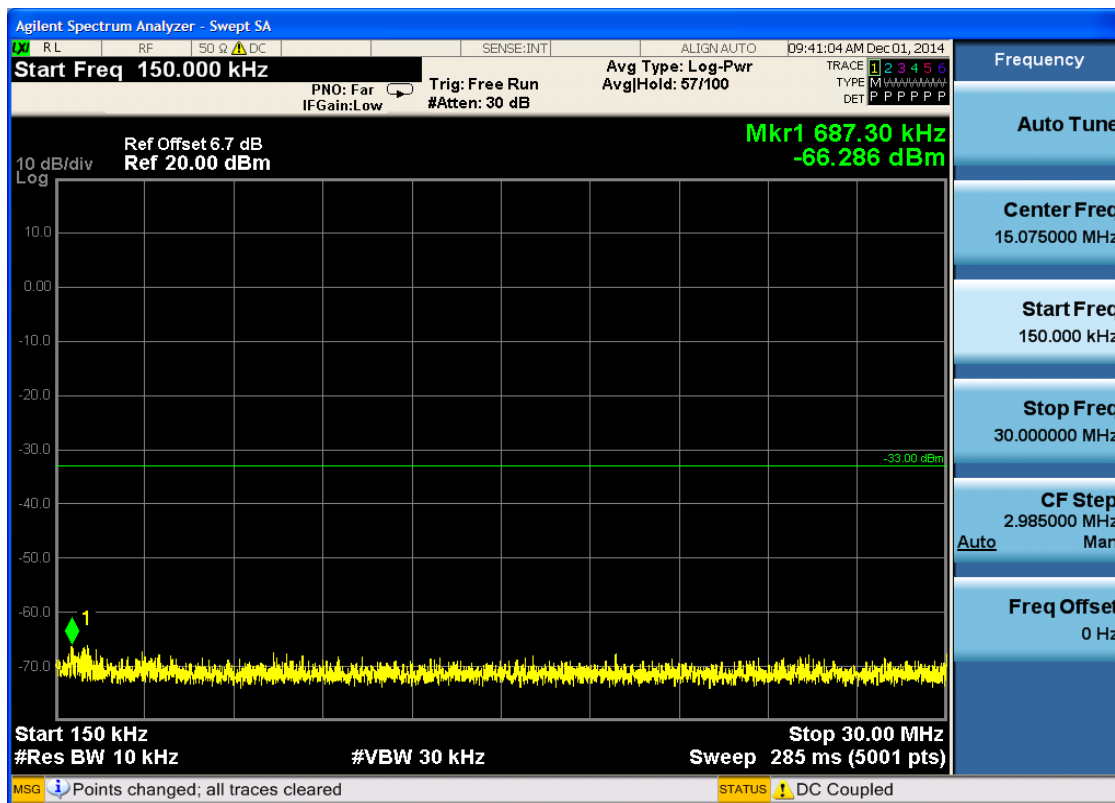


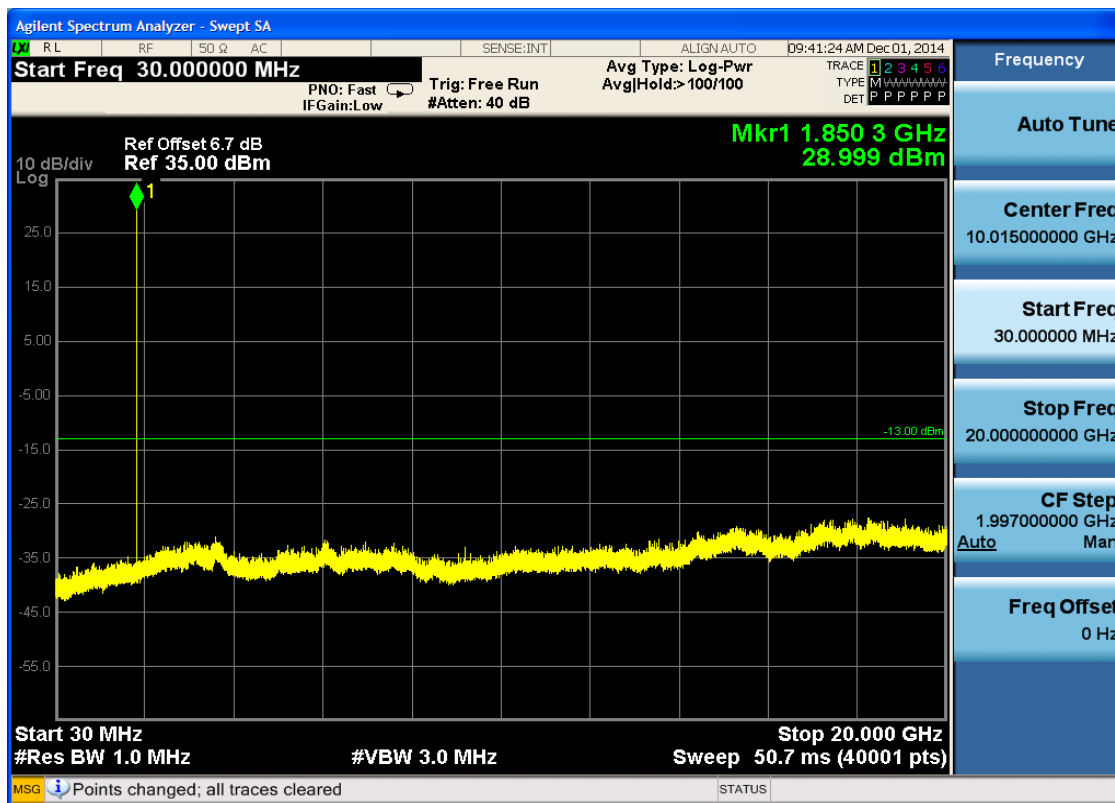
6.1.2 Test Band = GSM1900

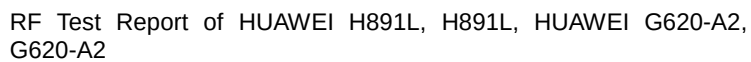
6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH









Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω DC SENSE:INT ALIGN:AUTO 09:41:48 AM Dec 01, 2014

Start Freq 9.000 kHz PNO: Close Trig: Free Run Avg Type: Log-Pwr Avg|Hold:>100/100

IFGain:Low #Atten: 20 dB TRACE 1 2 3 4 5 6 TYPE M P P P P P P DET P P P P P P

Ref Offset 6.7 dB Mkr1 9.846 kHz
Ref -0.30 dBm -67.807 dBm

10 dB/div Log

-10.3
-20.3
-30.3
-40.3
-50.3
-60.3
-70.3
-80.3
-90.3

-43.00 dBm

Start 9.00 kHz Stop 150.00 kHz
#Res BW 1.0 kHz #VBW 10 kHz Sweep 130 ms (1001 pts)

MSG STATUS DC Coupled

Frequency

Auto Tune

Center Freq 79.500 kHz

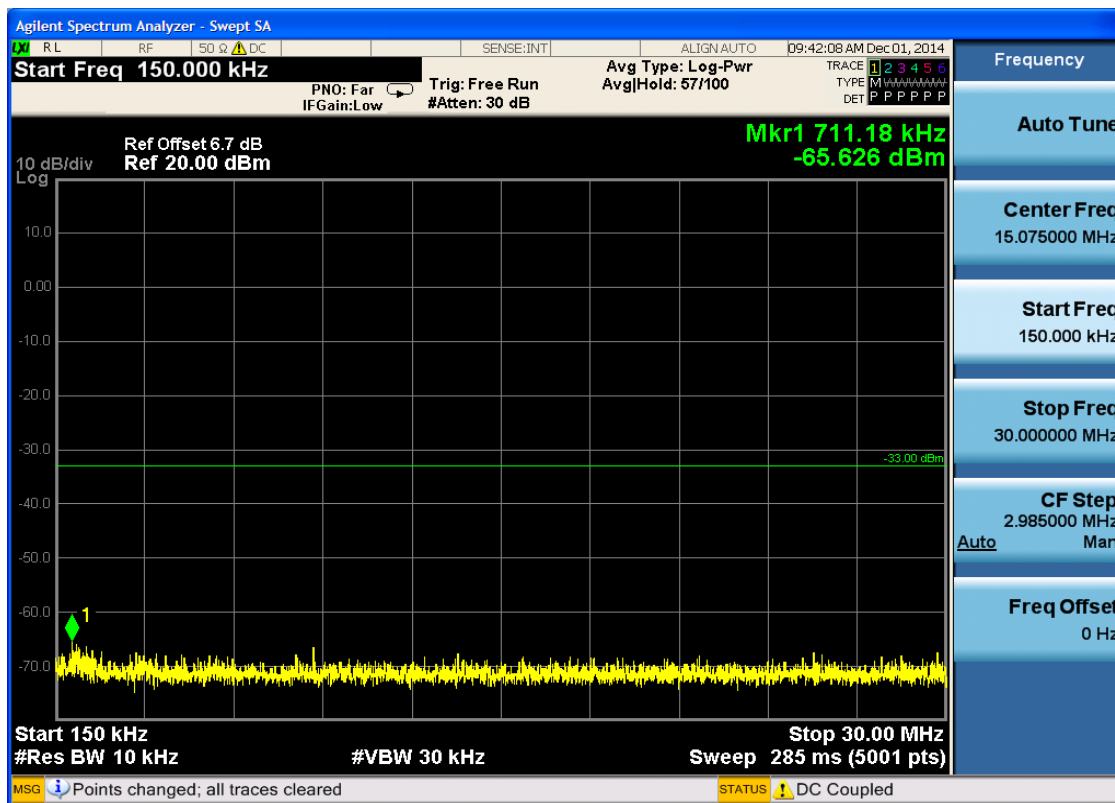
Start Freq 9.000 kHz

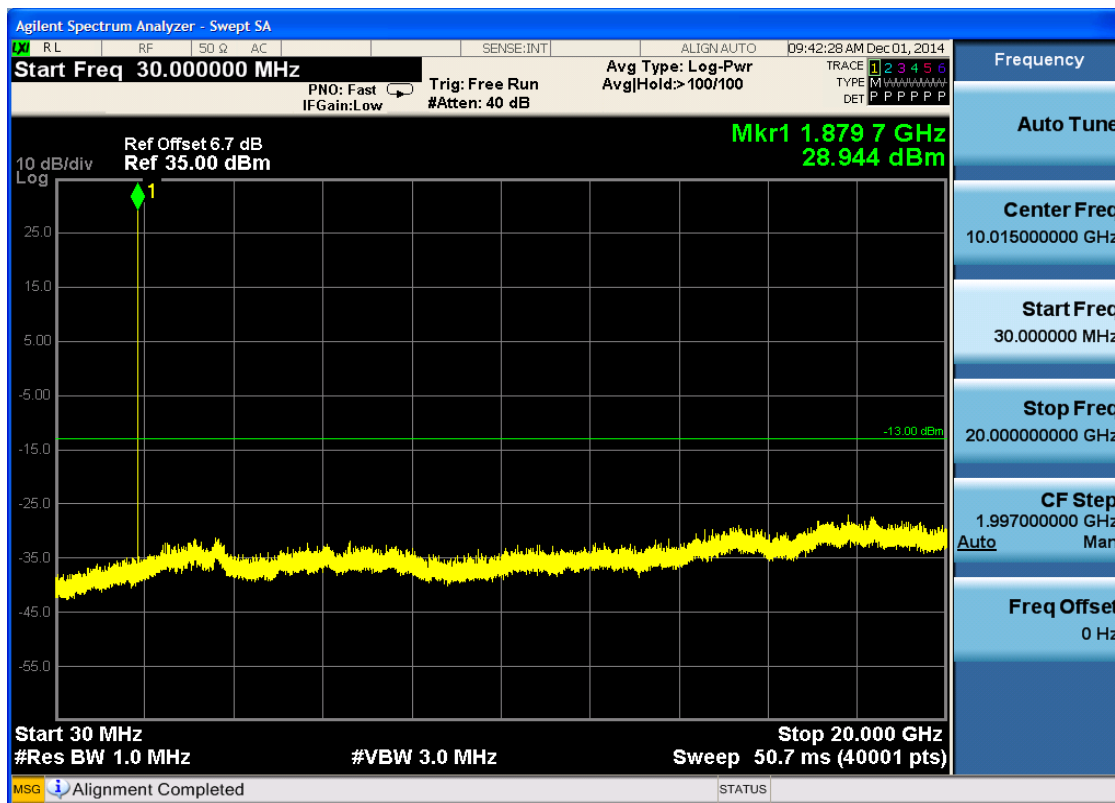
Stop Freq 150.00 kHz

CF Step 14.100 kHz

Auto

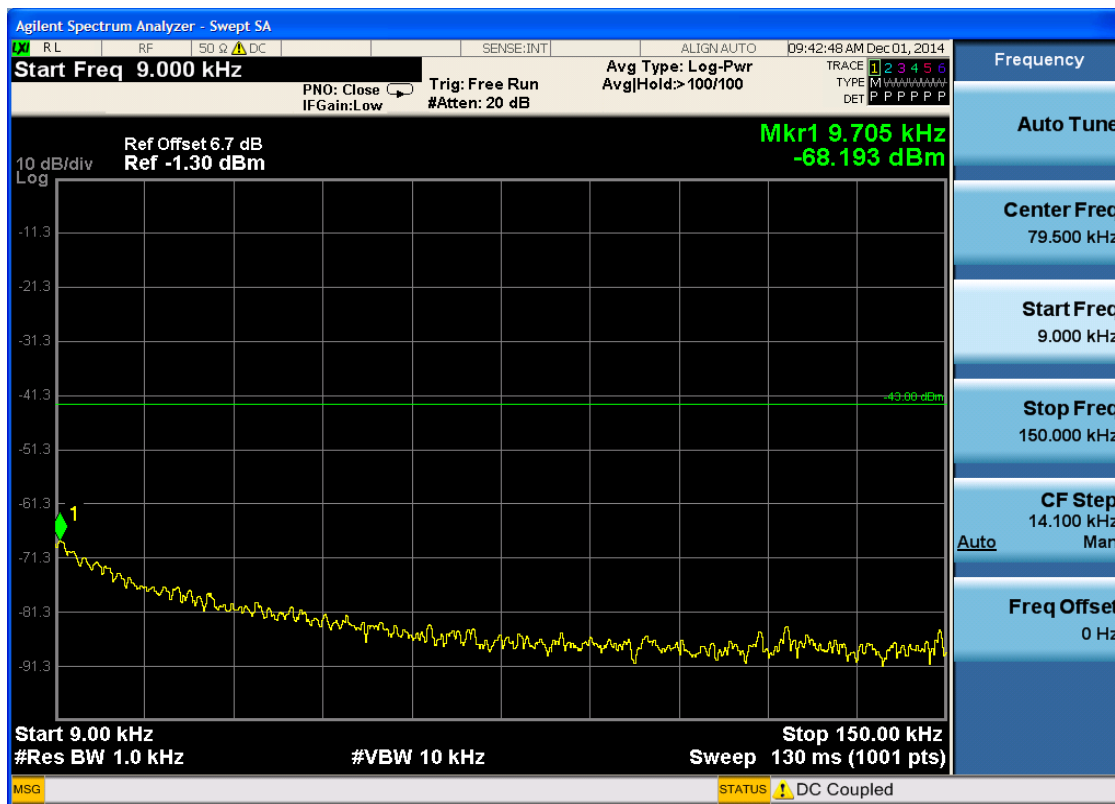
Freq Offset 0 Hz

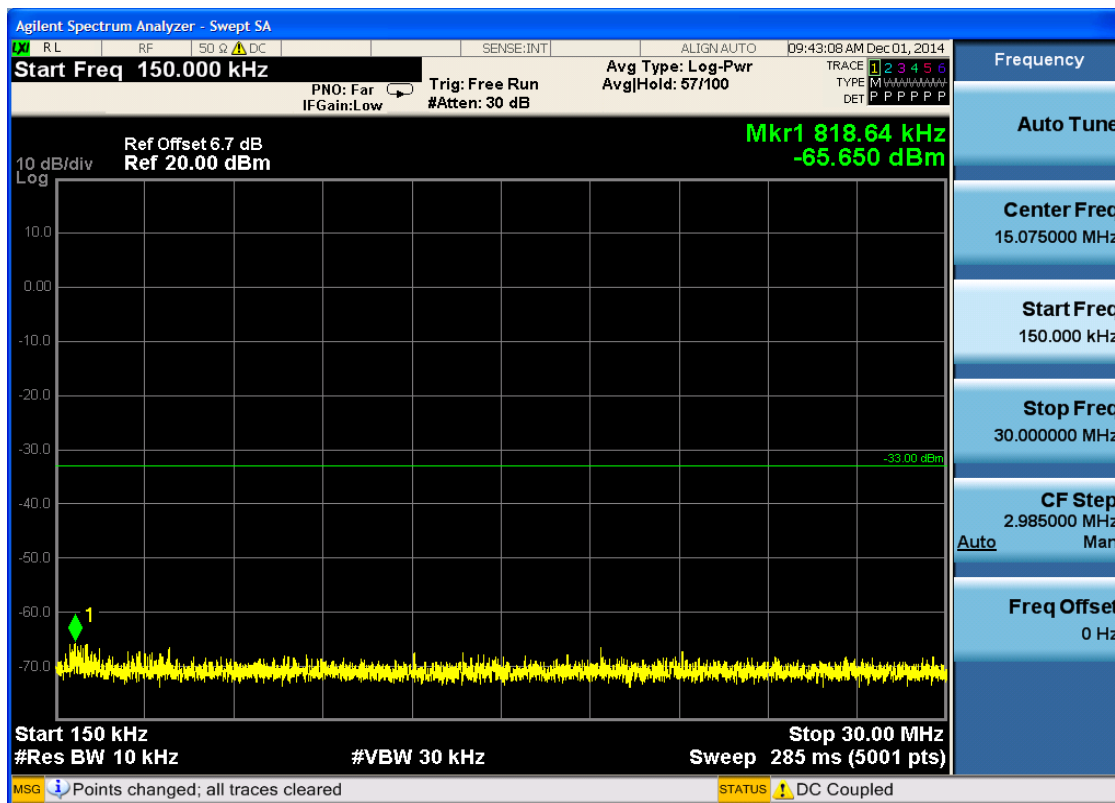


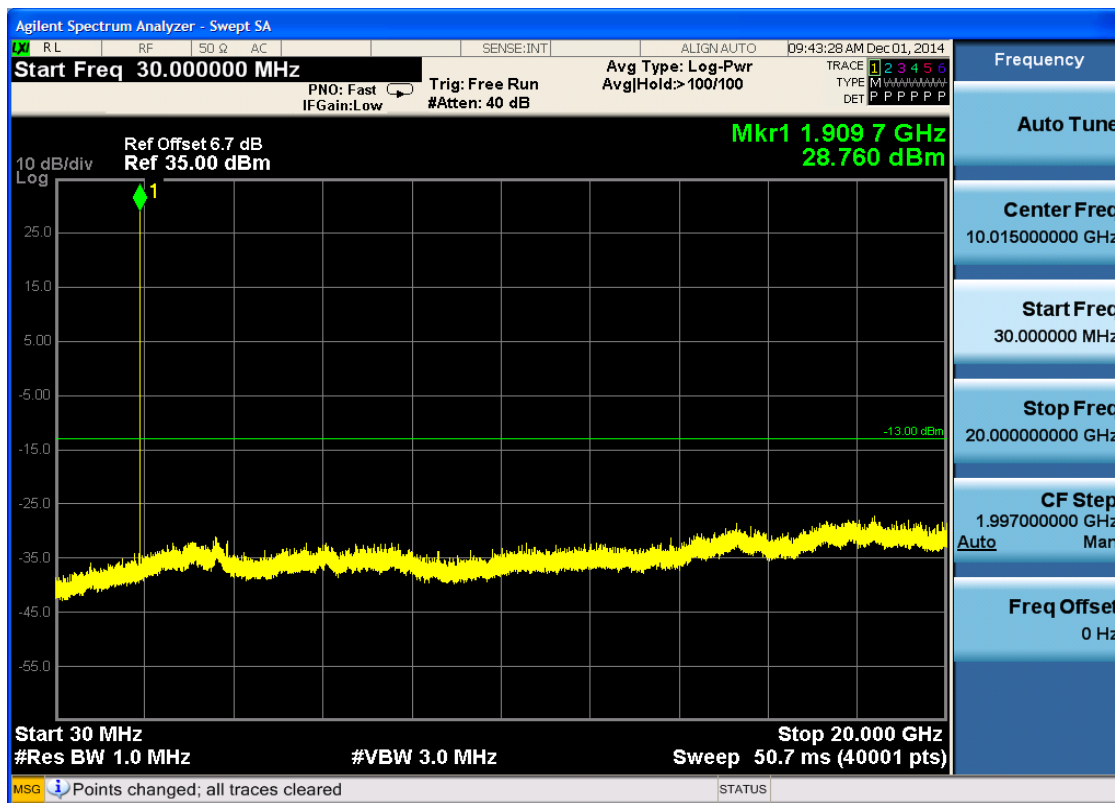




6.1.2.1.3 Test Channel = HCH

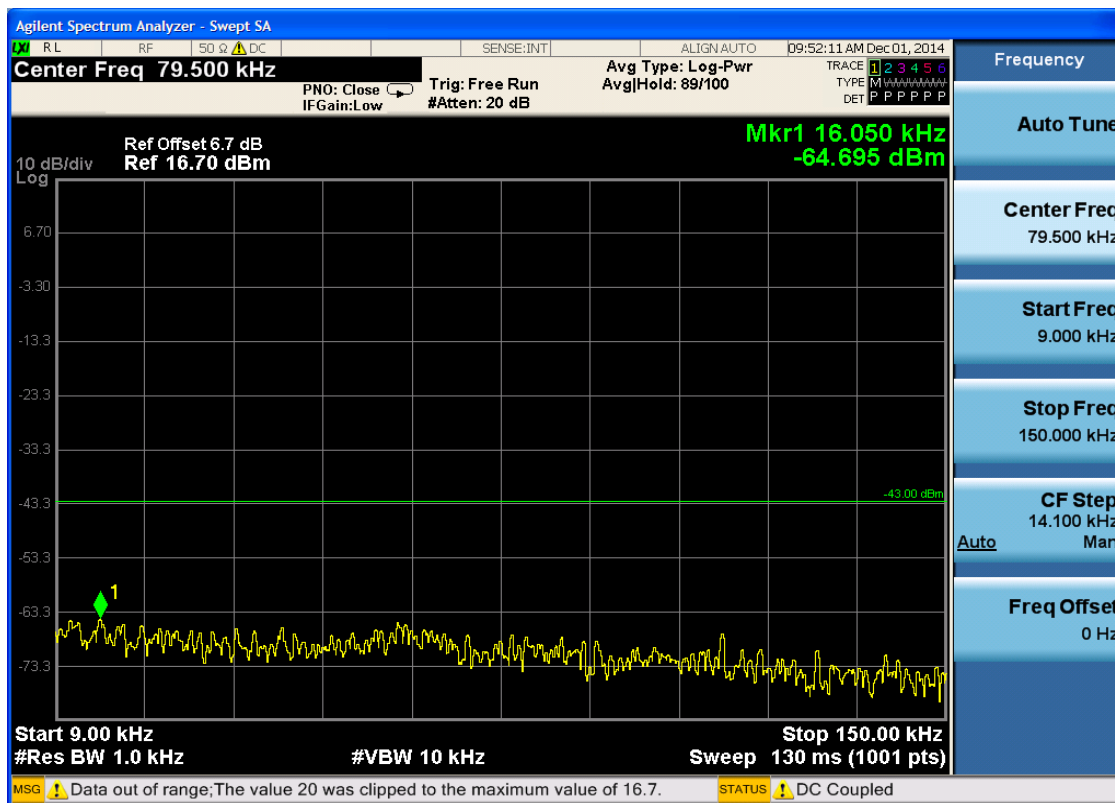


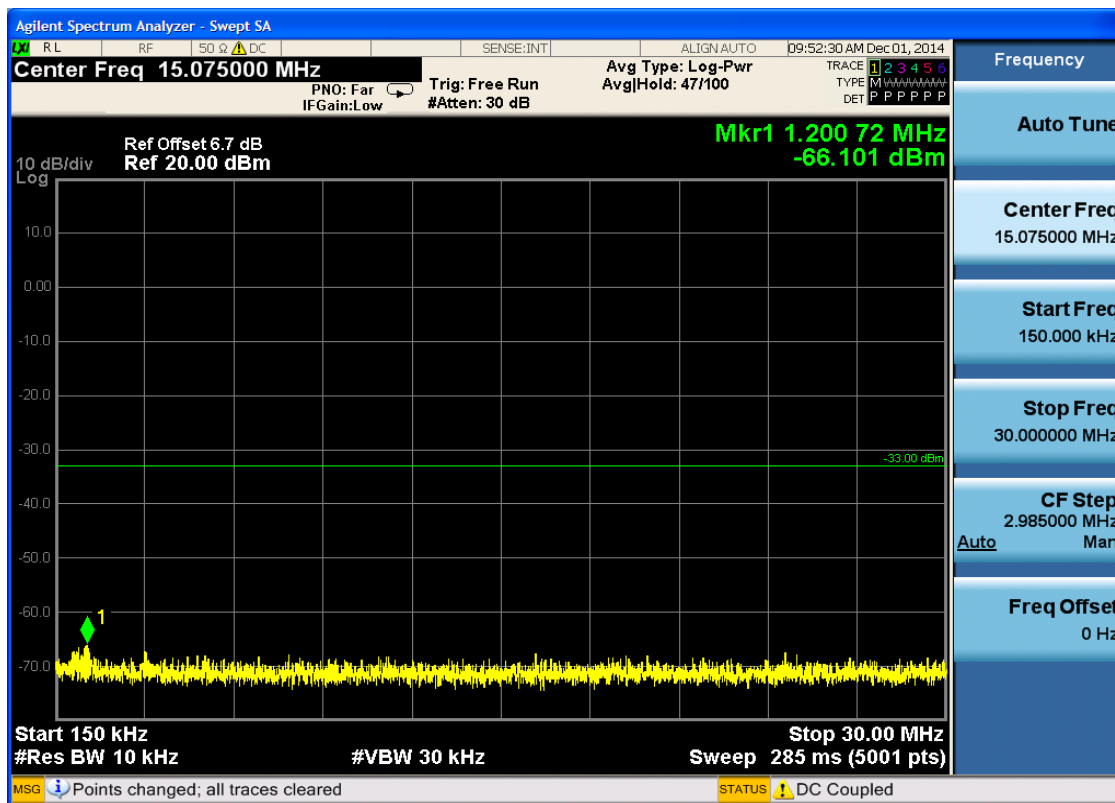


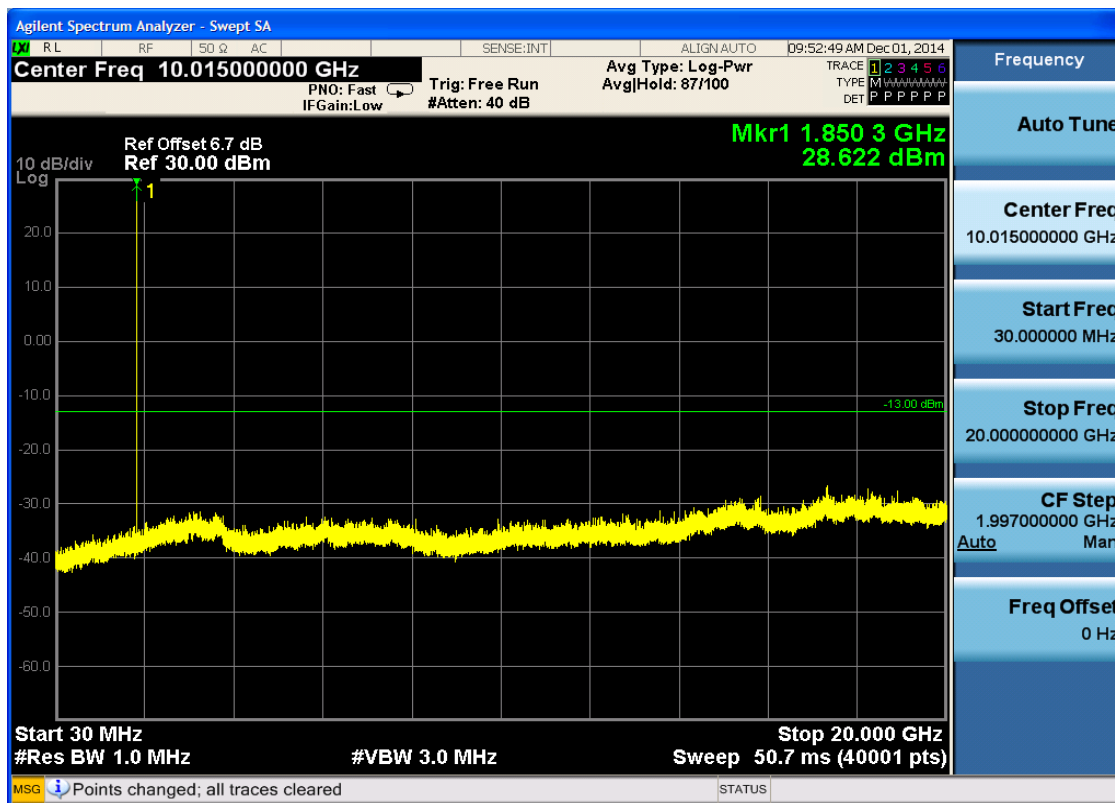


6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

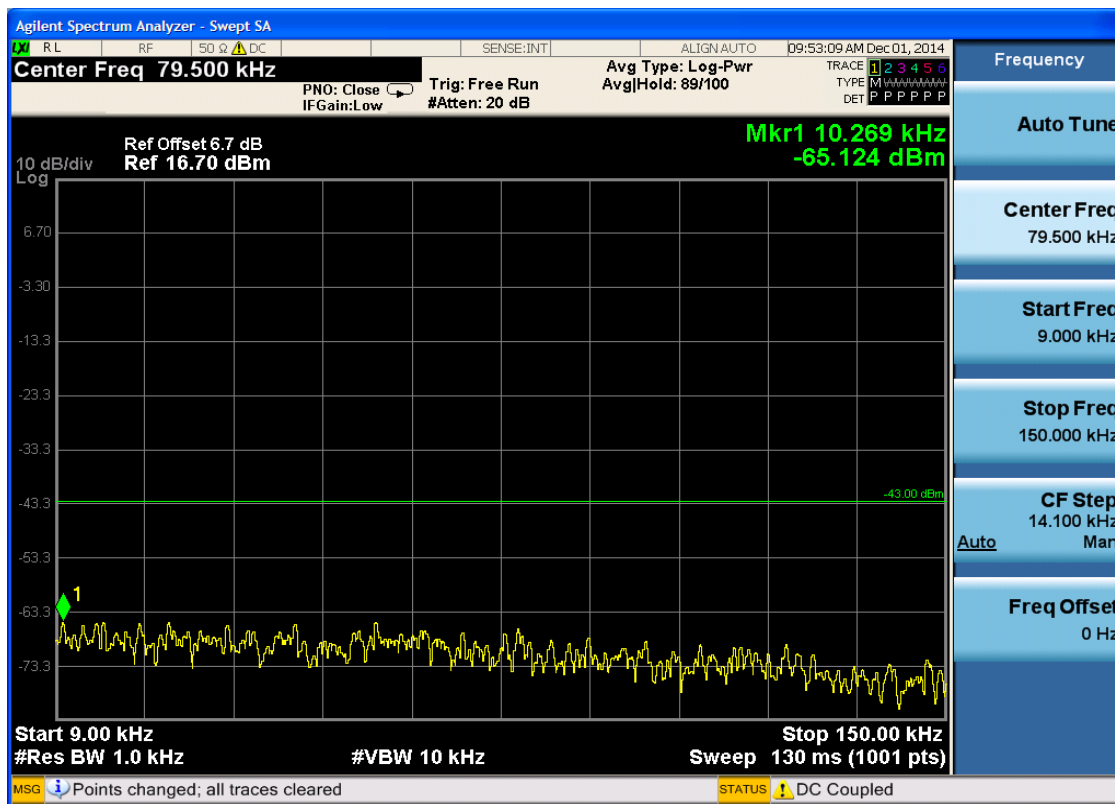


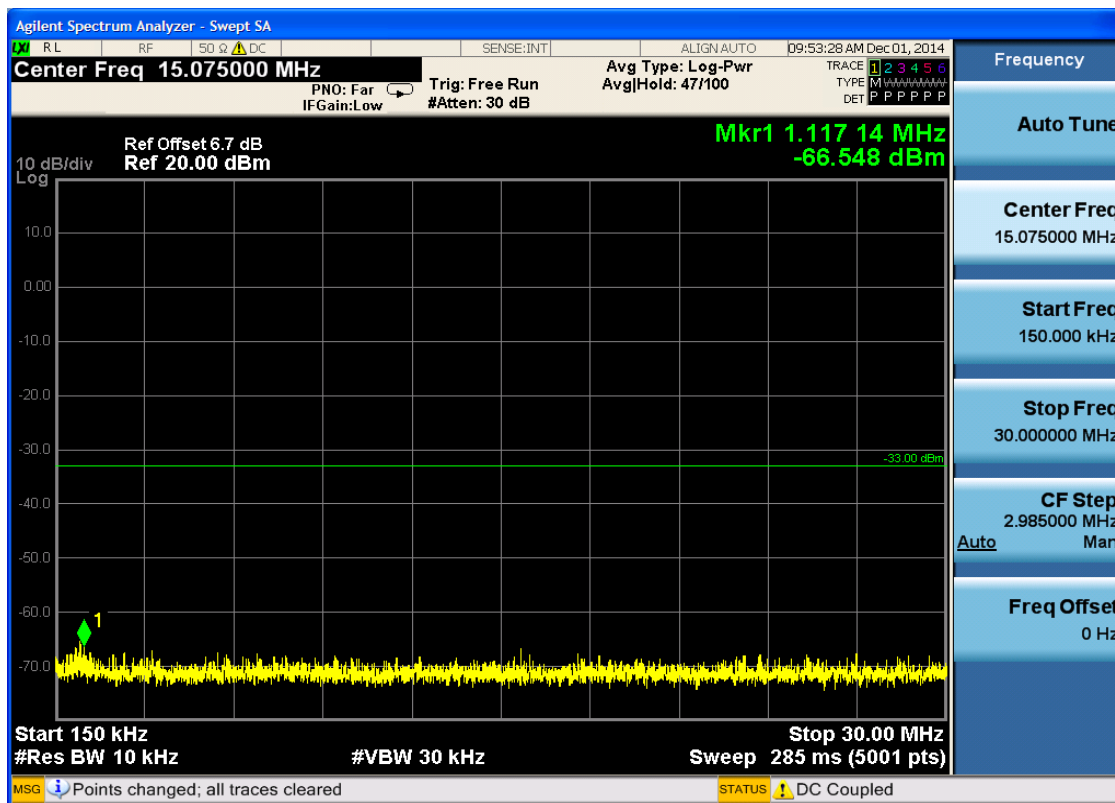


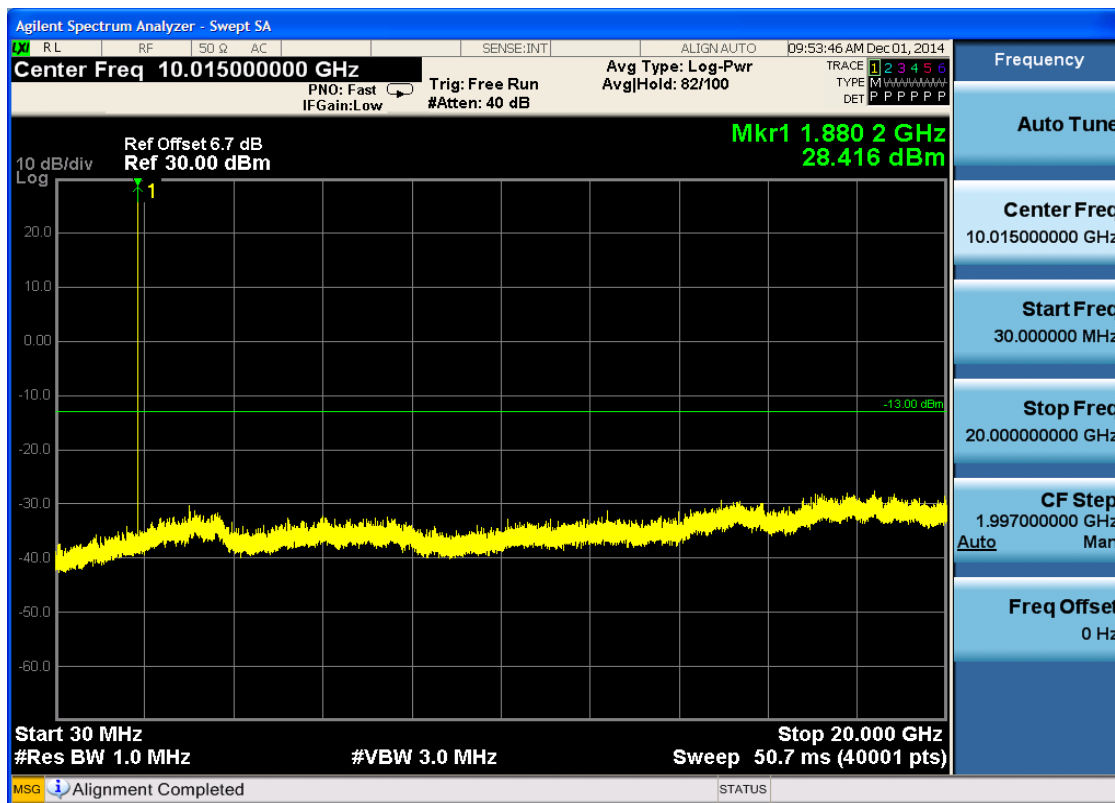




6.1.2.2.2 Test Channel = MCH

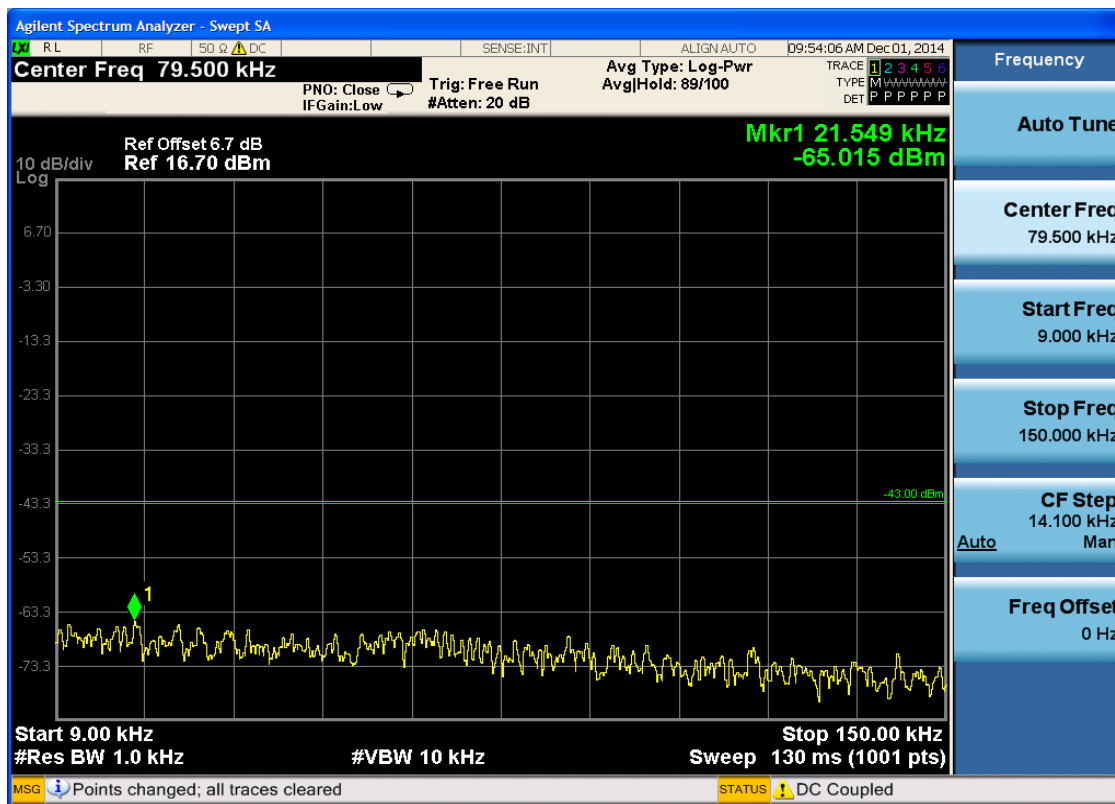


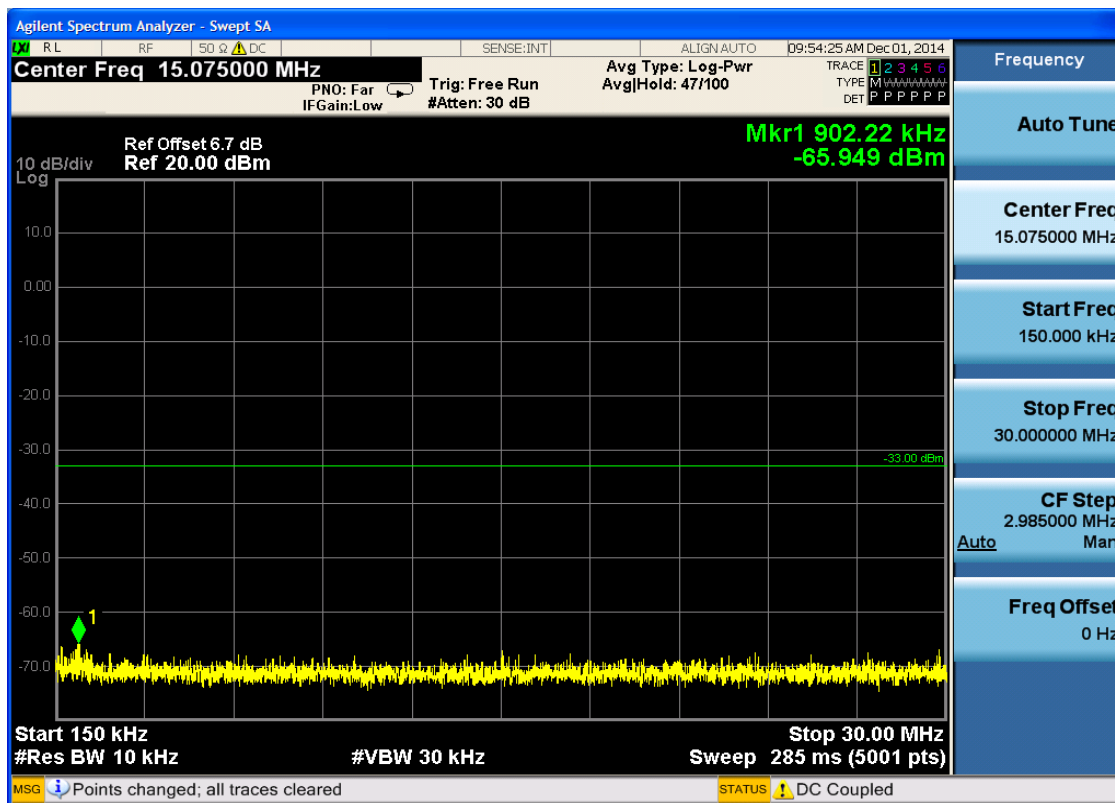


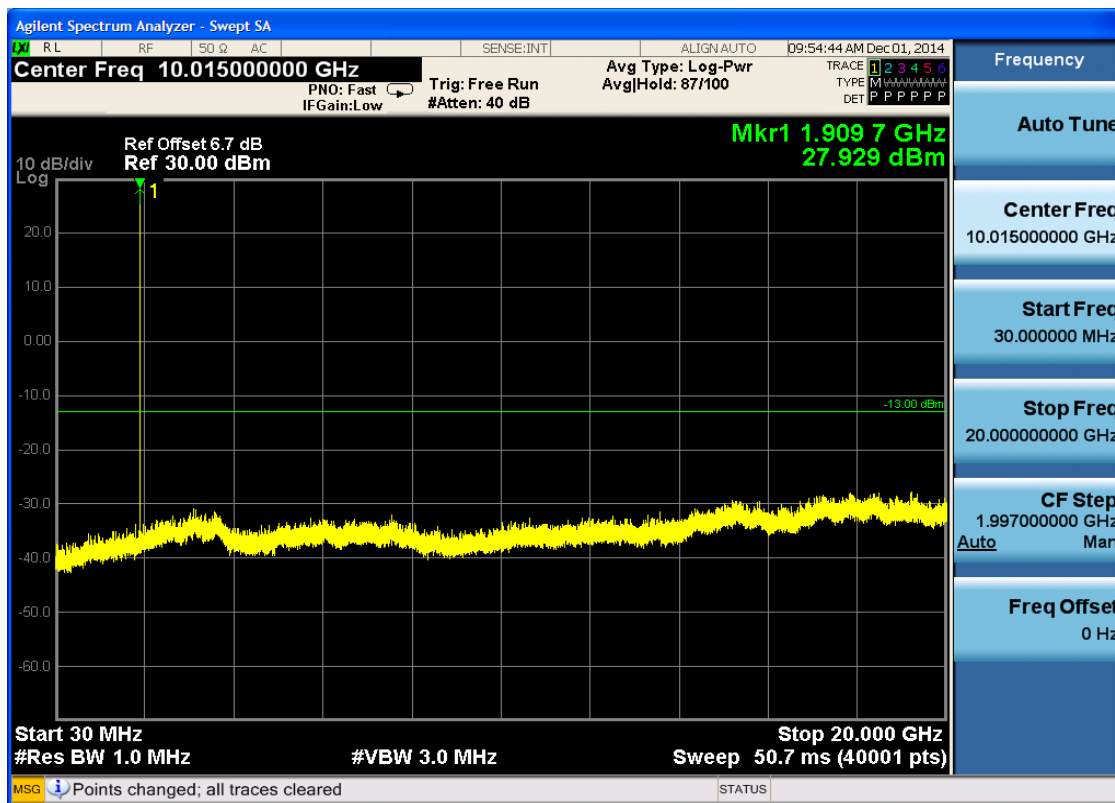




6.1.2.2.3 Test Channel = HCH







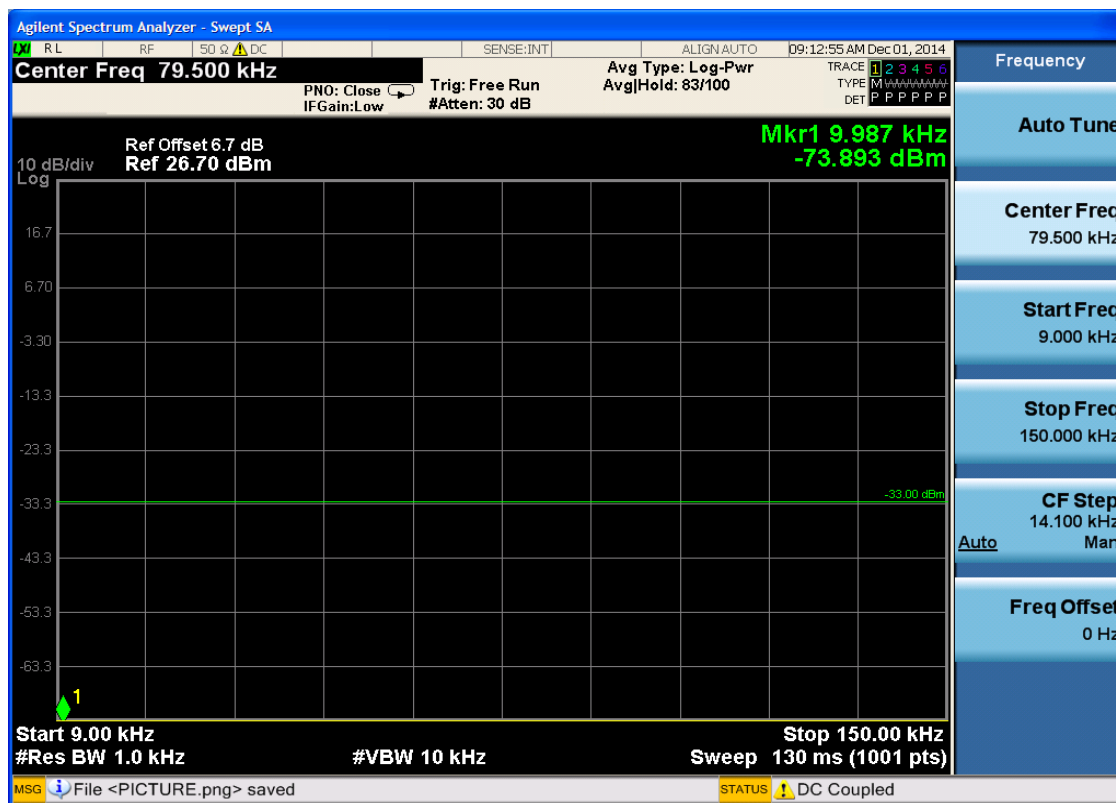


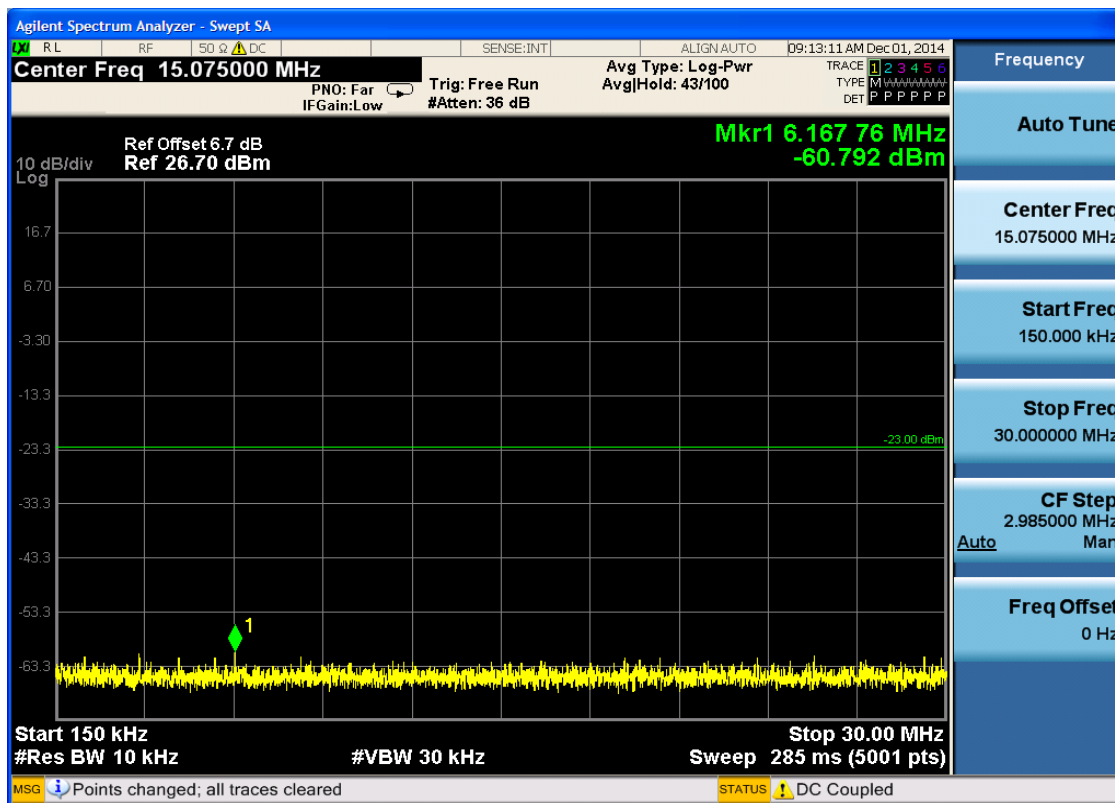
6.2 For UMTS

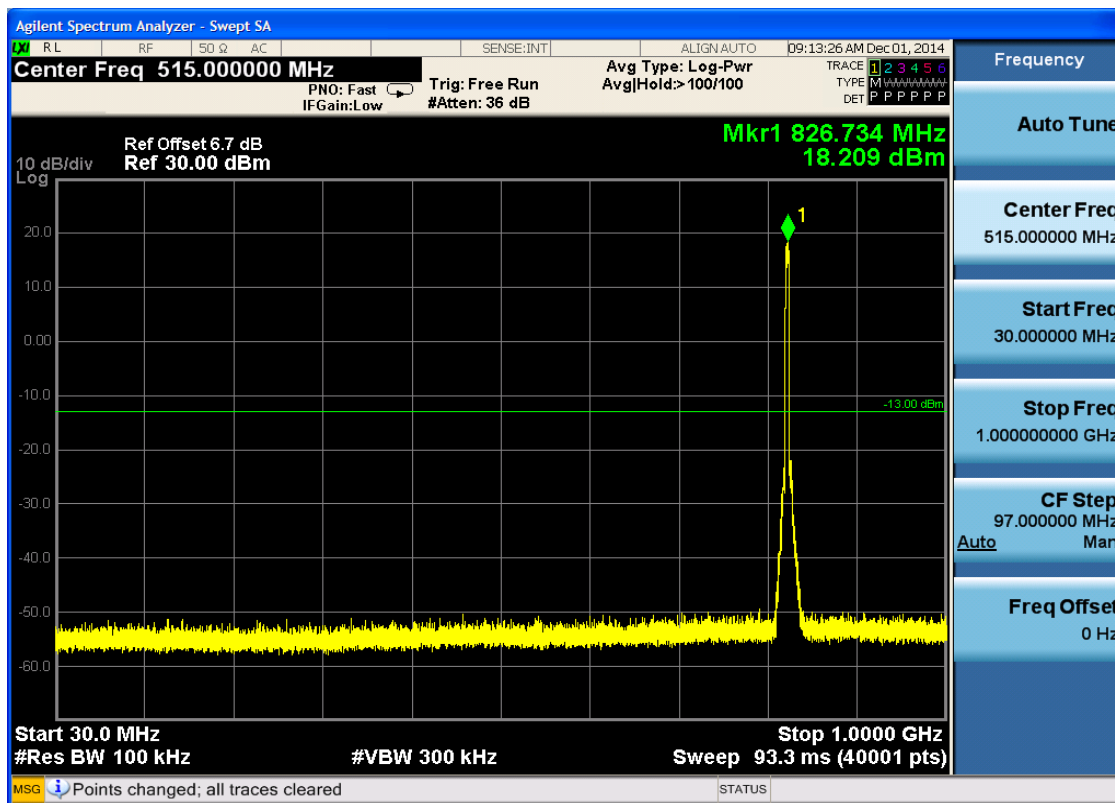
6.2.1 Test Band = WCDMA850

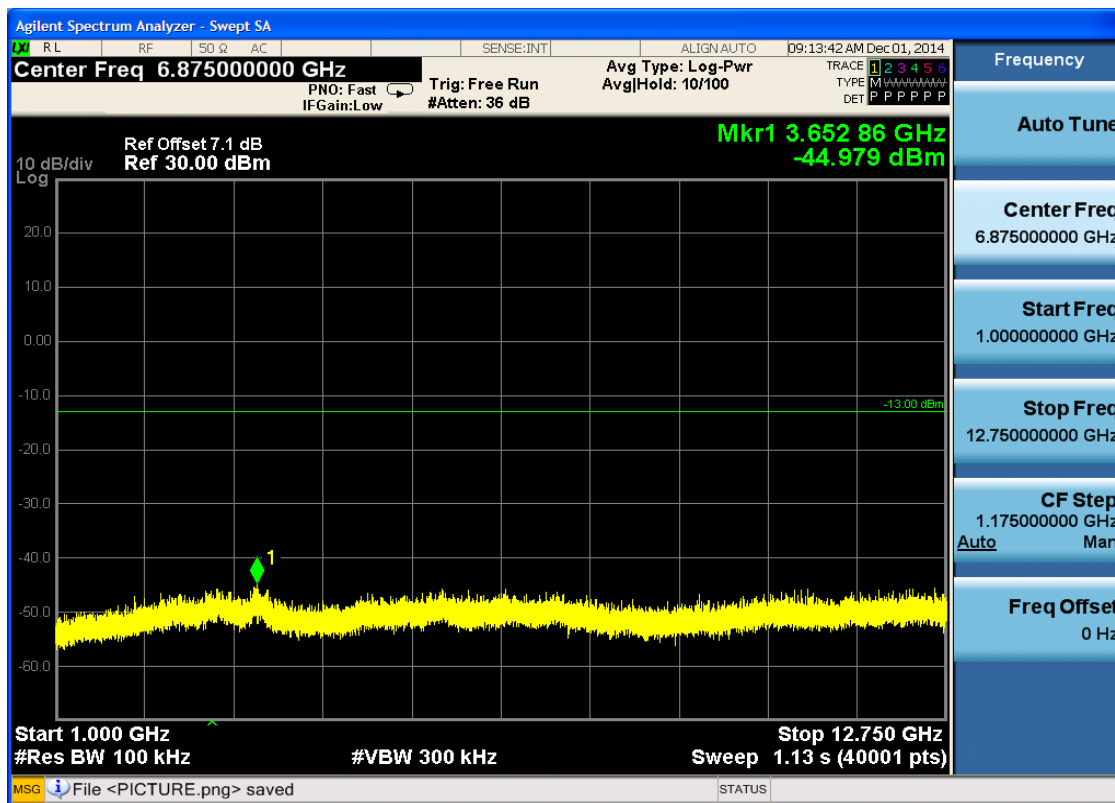
6.2.1.1 Test Mode = UMTS/TM1

6.2.1.1.1 Test Channel = LCH



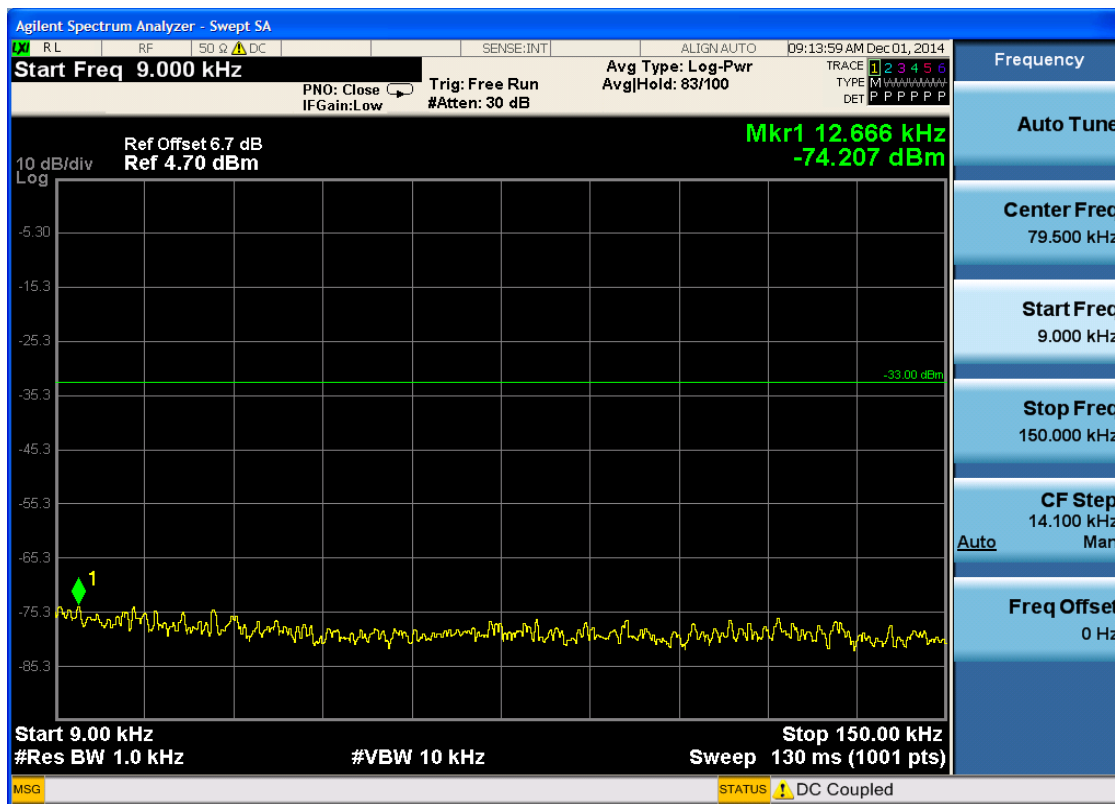


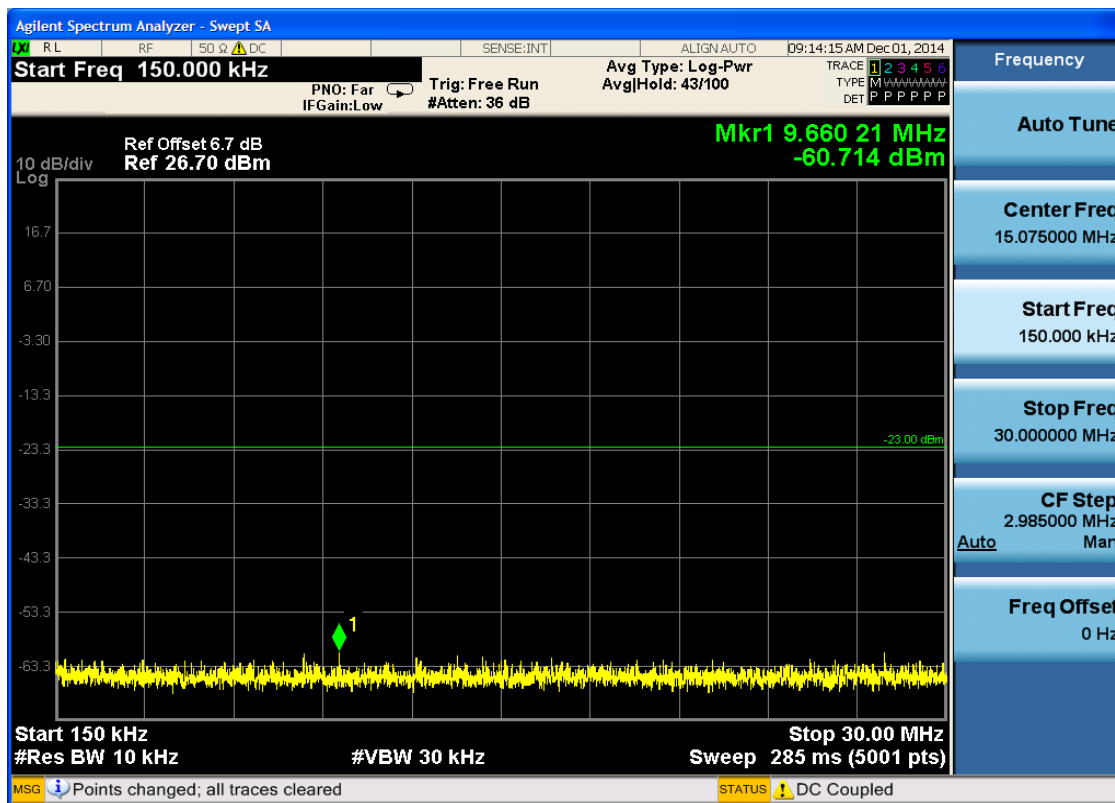


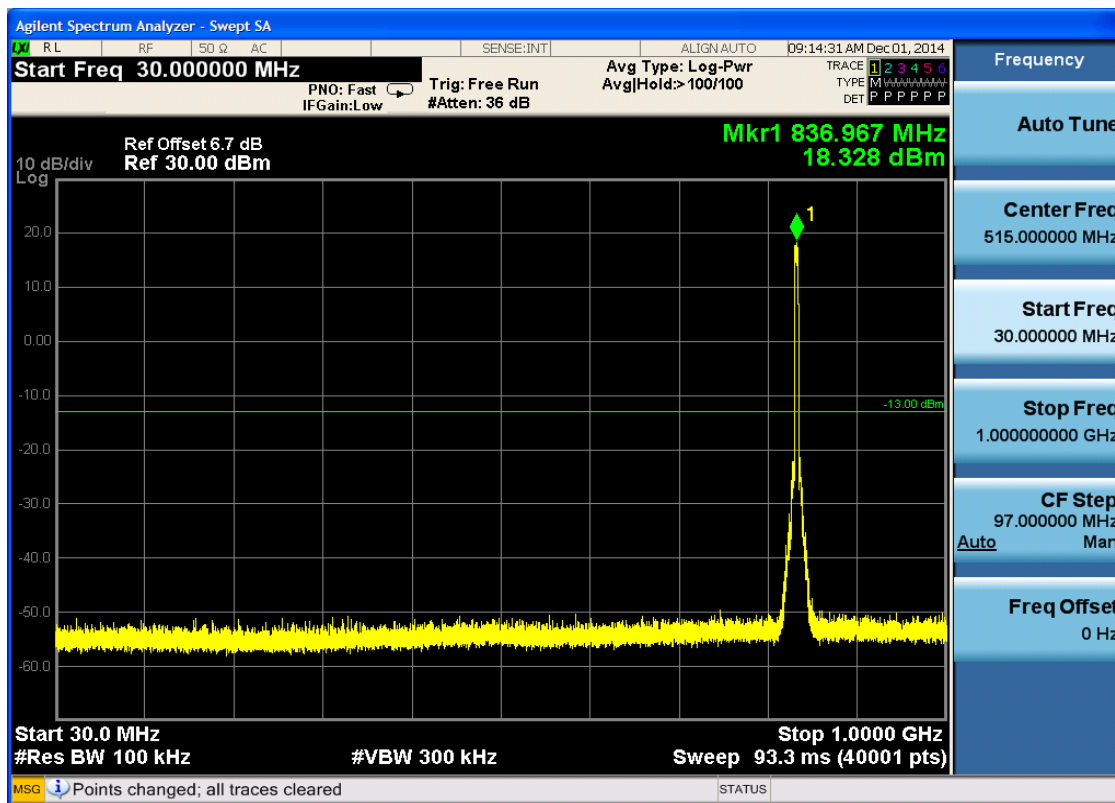


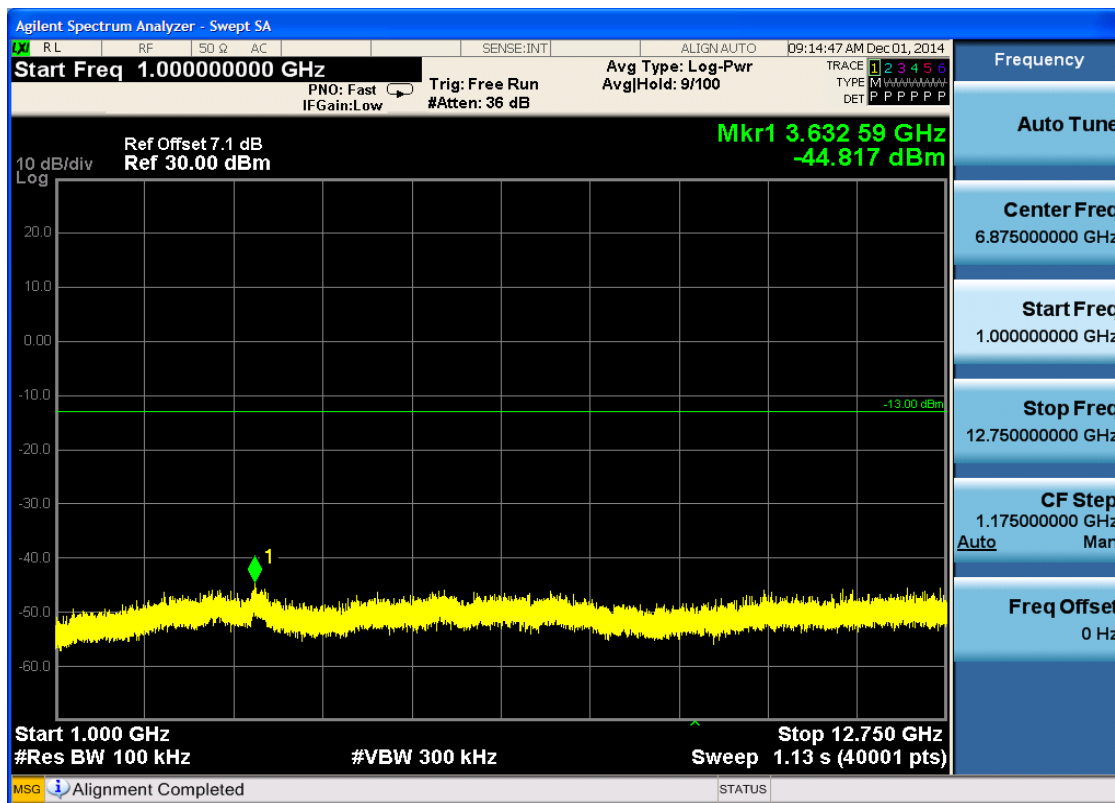


6.2.1.1.2 Test Channel = MCH











6.2.1.1.3 Test Channel = HCH

