



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	33.65	30.69	38.5	PASS
		MCH	33.72	30.76	38.5	PASS
		HCH	33.61	30.75	38.5	PASS
	GSM/TM2	LCH	26.35	23.48	38.5	PASS
		MCH	26.34	23.41	38.5	PASS
		HCH	26.33	23.45	38.5	PASS
WCDMA850	UMTS/TM1	LCH	23.77	20.83	38.5	PASS
		MCH	23.85	20.97	38.5	PASS
		HCH	23.88	20.93	38.5	PASS
Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	29.92	29.22	33	PASS
		MCH	29.74	29.03	33	PASS
		HCH	30.4	29.71	33	PASS
	GSM/TM2	LCH	25.04	24.35	33	PASS
		MCH	25.05	24.44	33	PASS
		HCH	25.07	24.47	33	PASS
WCDMA1900	UMTS/TM1	LCH	23.57	22.84	33	PASS
		MCH	23.55	22.97	33	PASS
		HCH	23.71	23.01	33	PASS
WCDMA1700	UMTS/TM1	LCH	24.05	23.14	33	PASS
		MCH	23.66	22.91	33	PASS
		HCH	23.55	22.87	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: 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	0.25	13	PASS
		MCH	0.2	13	PASS
		HCH	0.19	13	PASS
	GSM/TM2	LCH	3.26	13	PASS
		MCH	3.25	13	PASS
		HCH	3.12	13	PASS
WCDMA1700	UMTS/TM1	LCH	3.13	13	PASS
		MCH	3	13	PASS
		HCH	3.24	13	PASS
WCDMA1900	UMTS/TM1	LCH	3.16	13	PASS
		MCH	3.27	13	PASS
		HCH	3.11	13	PASS

3Appendix_C: Modulation Characteristics

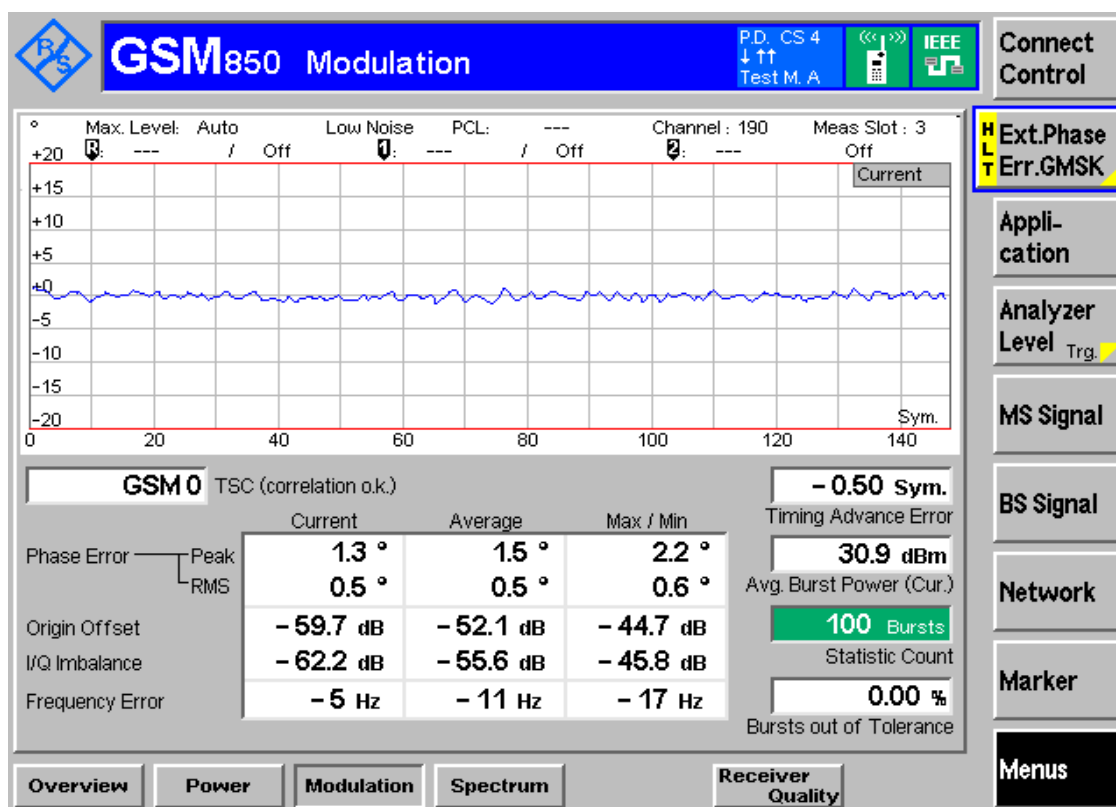
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

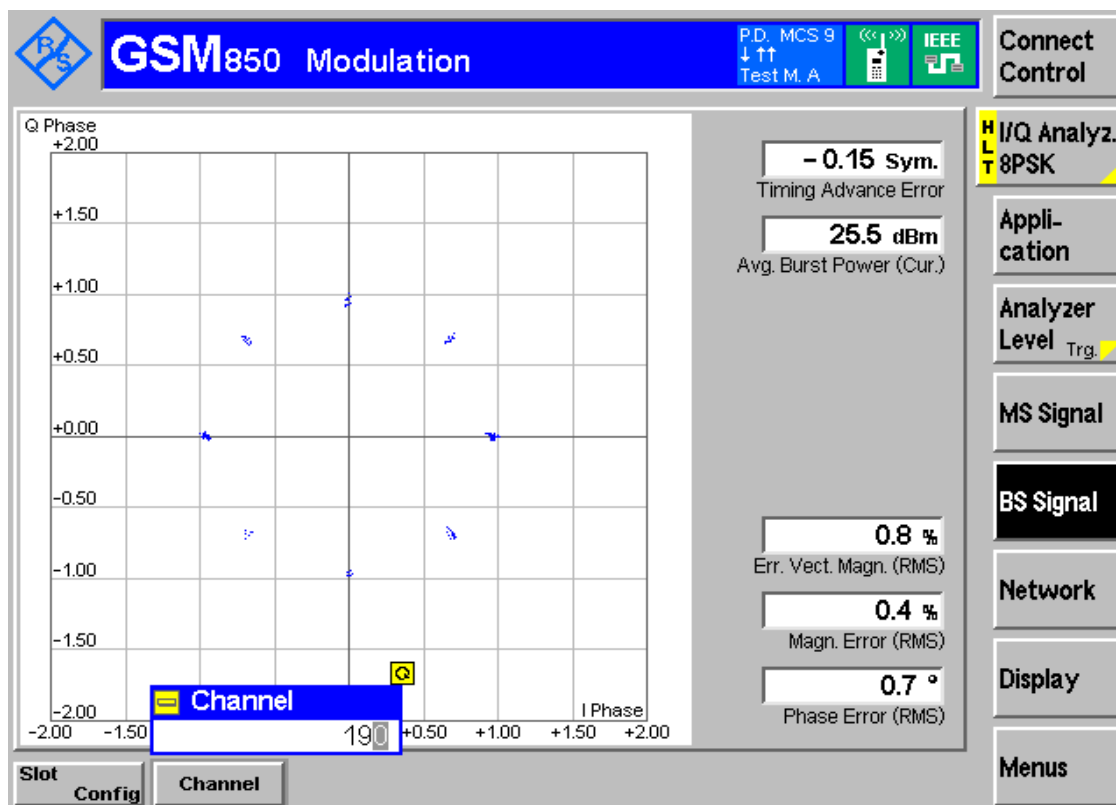
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

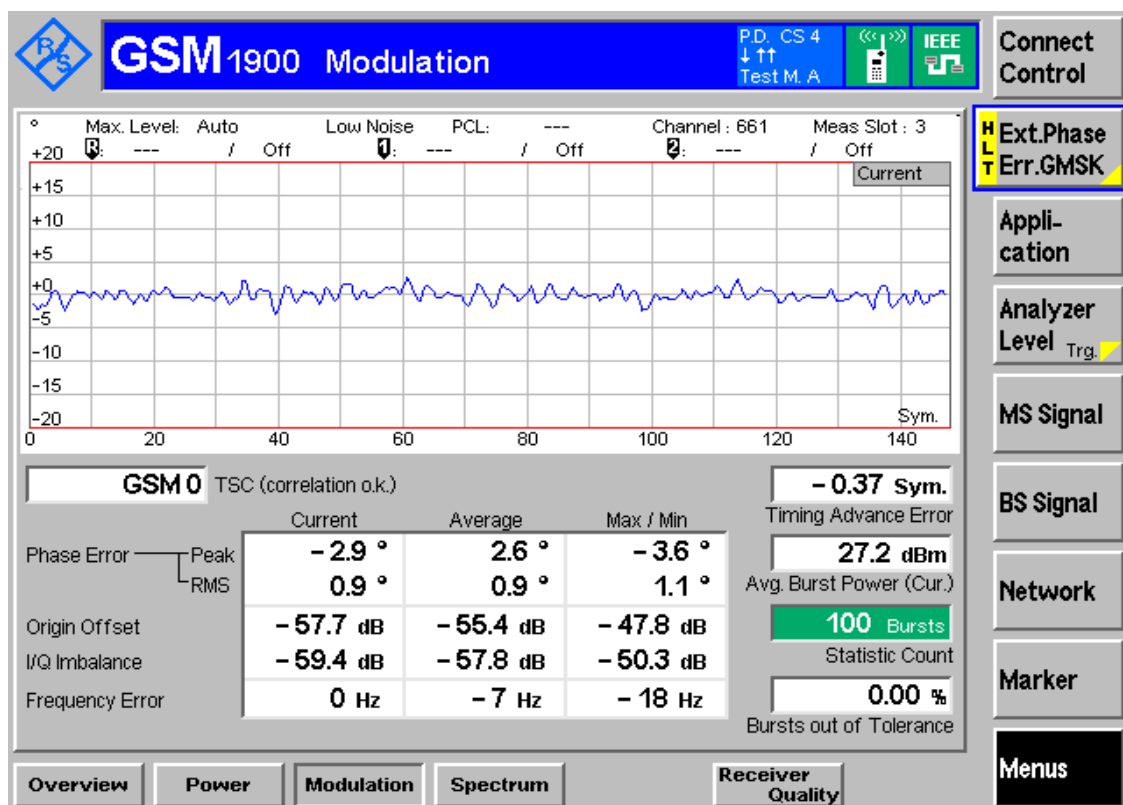
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

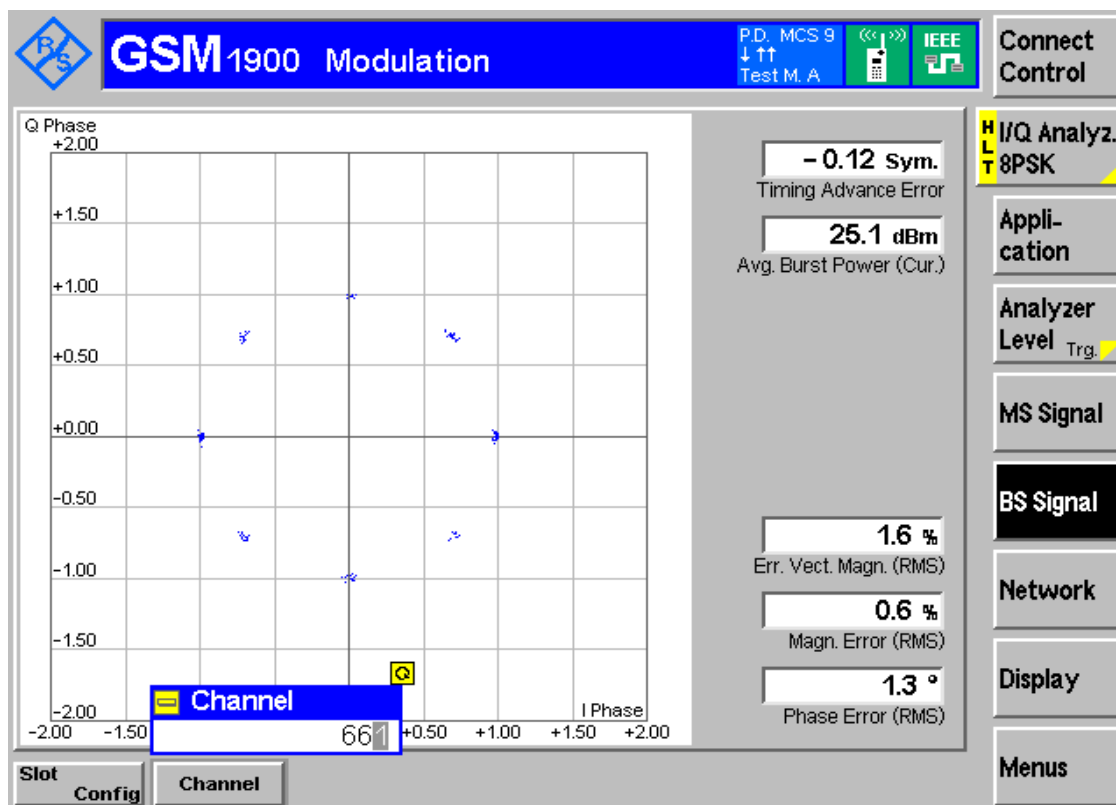
3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH



3.1.2.2 Test Mode = GSM/TM2

3.1.2.2.1 Test Channel = MCH

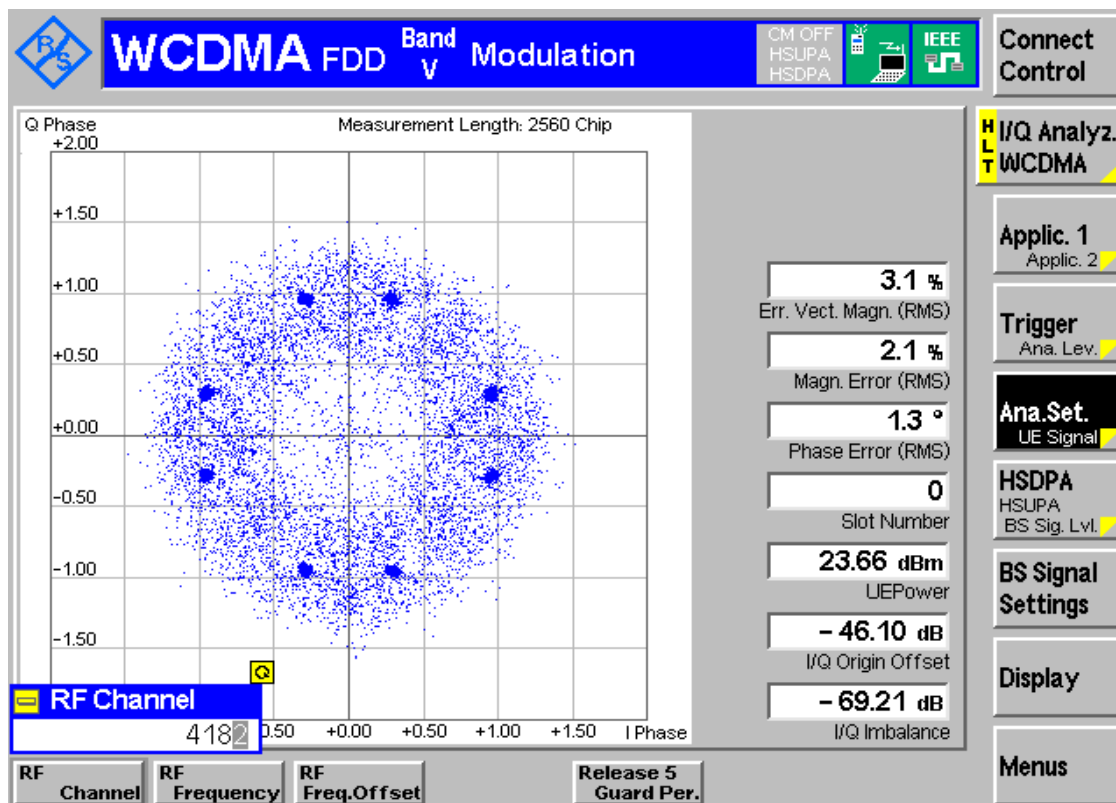


3.2 For UMTS

3.2.1 Test Band = WCDMA850

3.2.1.1 Test Mode = UMTS/TM1

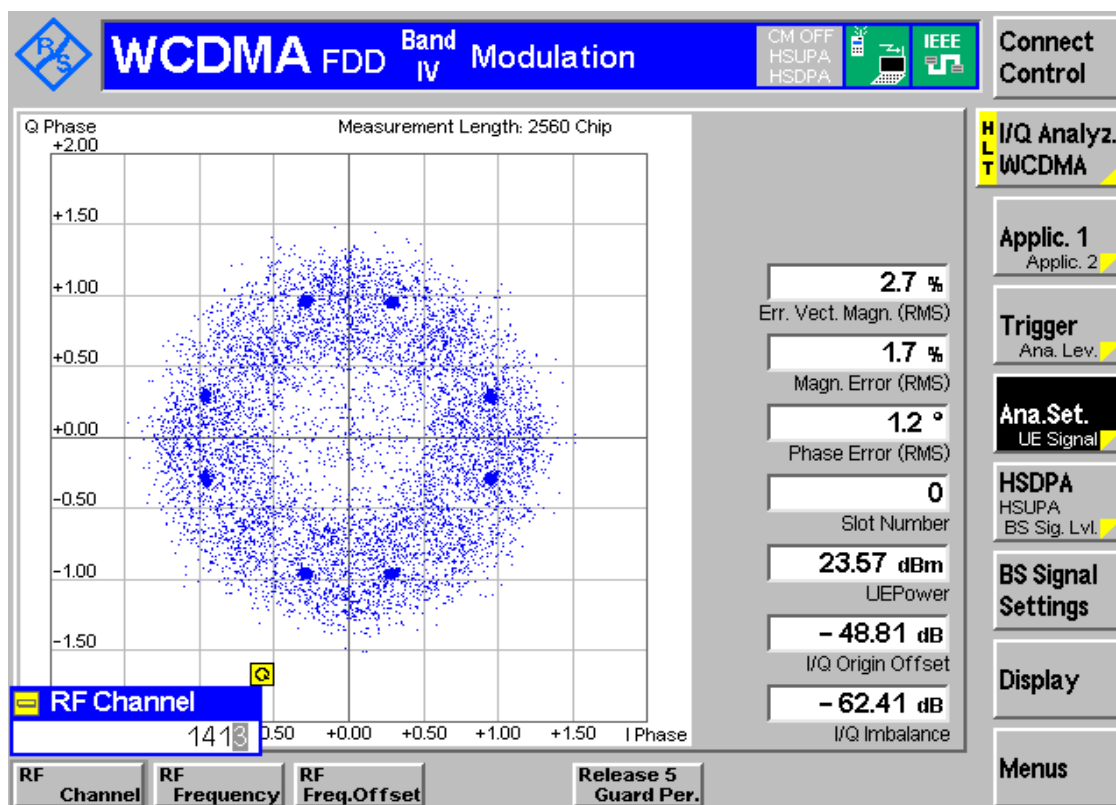
3.2.1.1.1 Test Channel = MCH



3.2.2 Test Band = WCDMA1700

3.2.2.1 Test Mode = UMTS/TM1

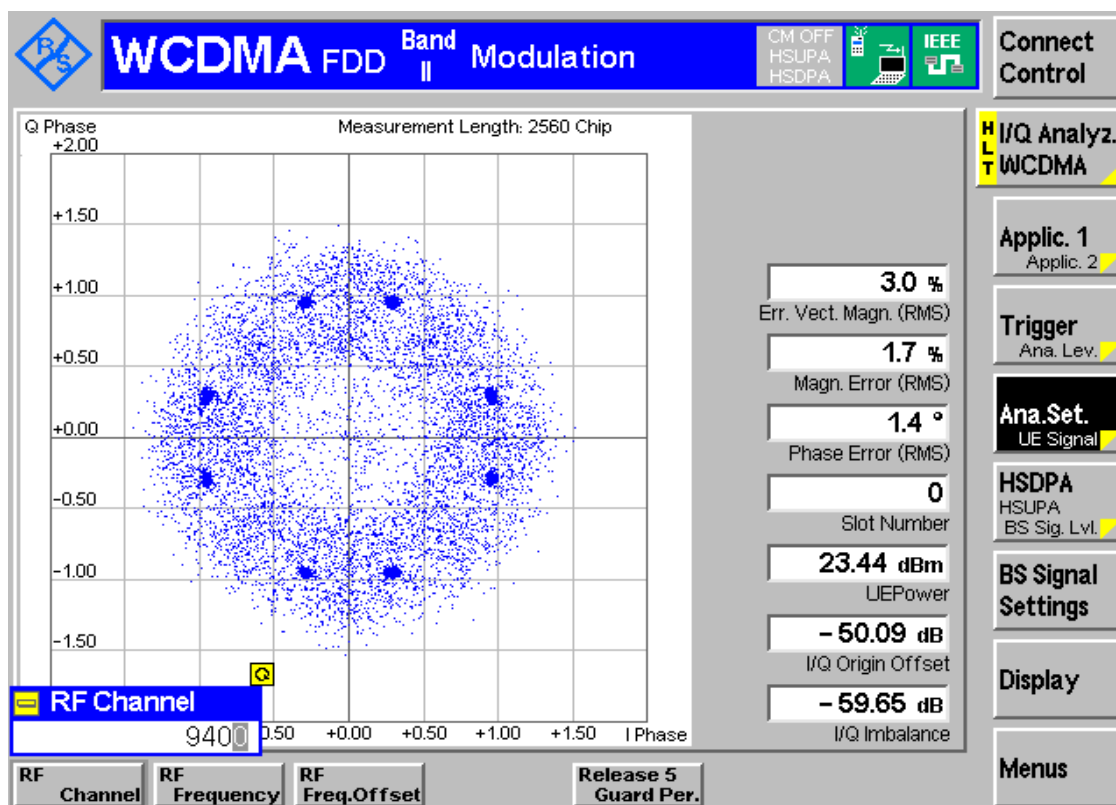
3.2.2.1.1 Test Channel = MCH



3.2.3 Test Band = WCDMA1900

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	246.47	315.69	Pass
		MCH	243.26	320.61	Pass
		HCH	245.75	316.28	Pass
	GSM/TM2	LCH	228.91	295.28	Pass
		MCH	234.56	289.32	Pass
		HCH	242.93	311.72	Pass
GSM1900	GSM/TM1	LCH	243.30	318.30	Pass
		MCH	242.66	314.00	Pass
		HCH	244.12	314.47	Pass
	GSM/TM2	LCH	241.31	303.89	Pass
		MCH	242.12	308.06	Pass
		HCH	238.14	315.66	Pass
Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA850	UMTS/TM1	LCH	4.17	4.73	Pass
		MCH	4.16	4.72	Pass
		HCH	4.17	4.72	Pass
WCDMA1700	UMTS/TM1	LCH	4.17	4.74	Pass
		MCH	4.17	4.75	Pass
		HCH	4.17	4.74	Pass
WCDMA1900	UMTS/TM1	LCH	4.15	4.72	Pass
		MCH	4.16	4.72	Pass
		HCH	4.17	4.74	Pass



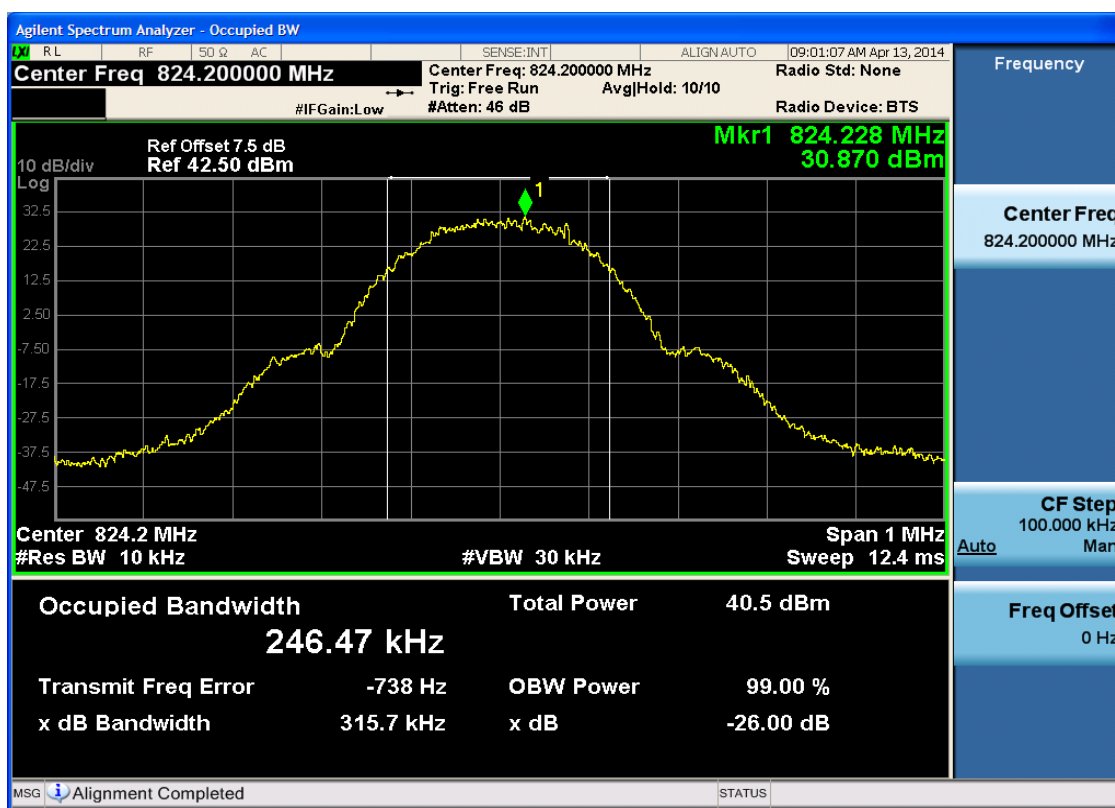
Part II - Test Plots

4.1 For GSM

4.1.1 Test Band = GSM850

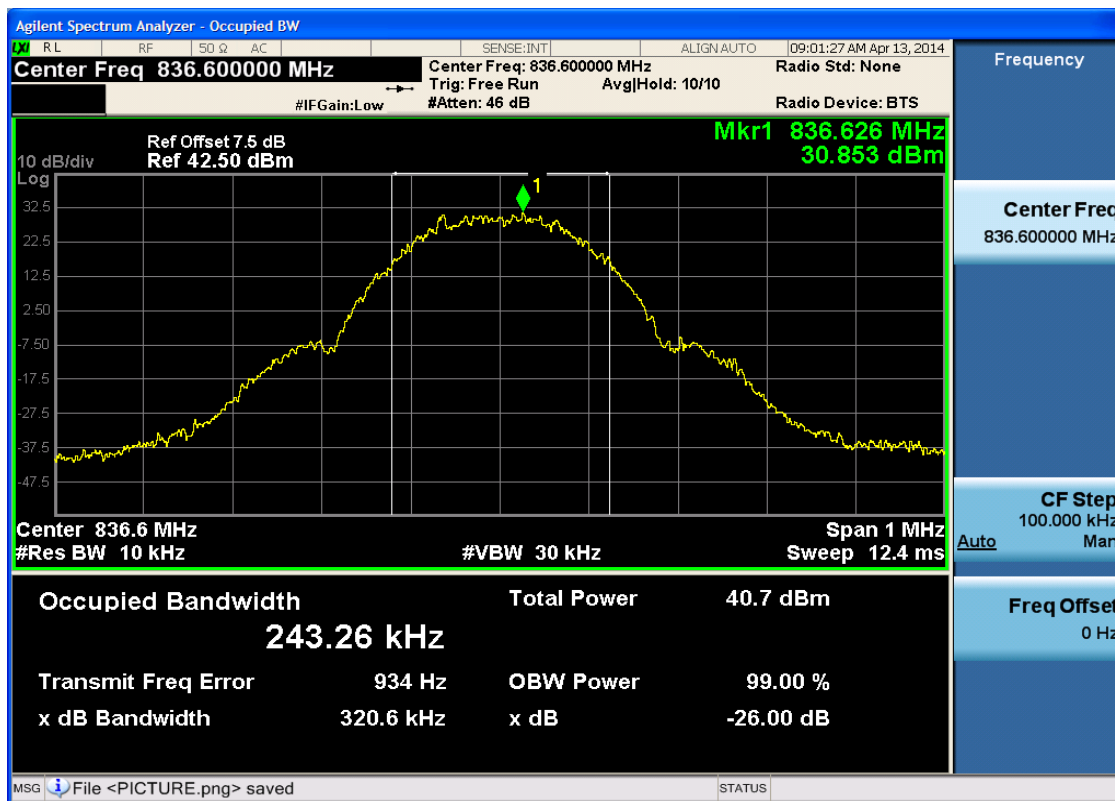
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH



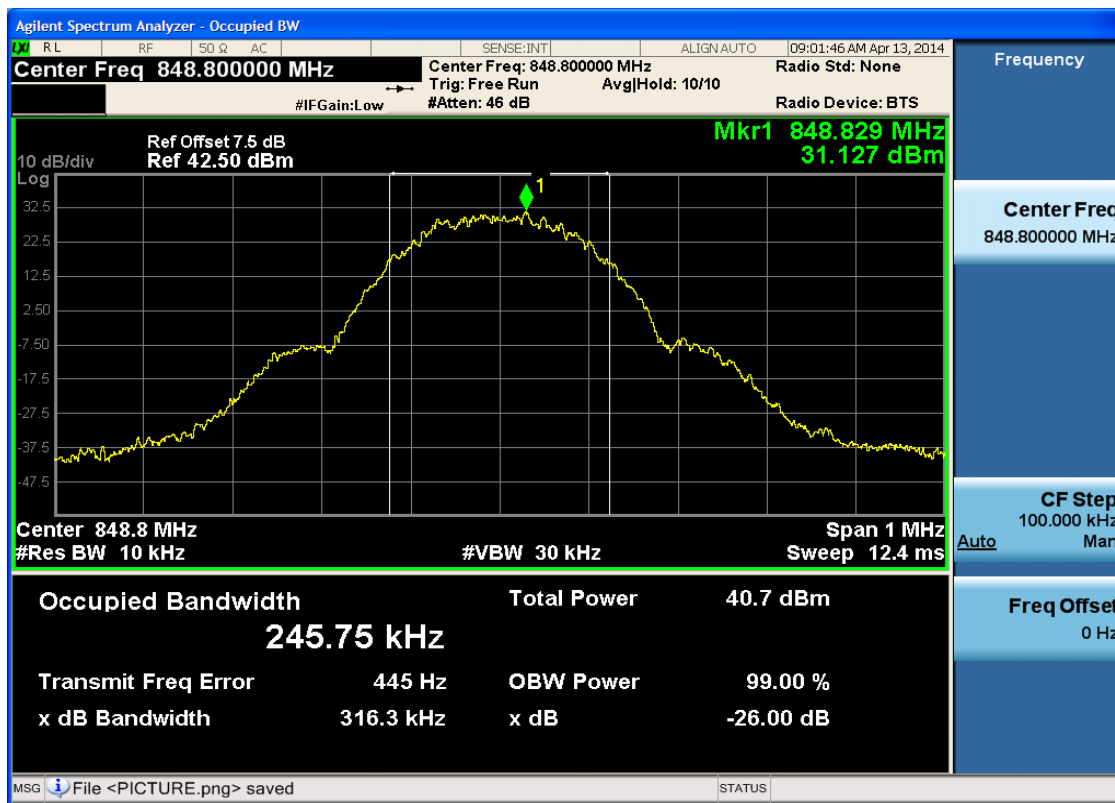


4.1.1.1.2 Test Channel = MCH





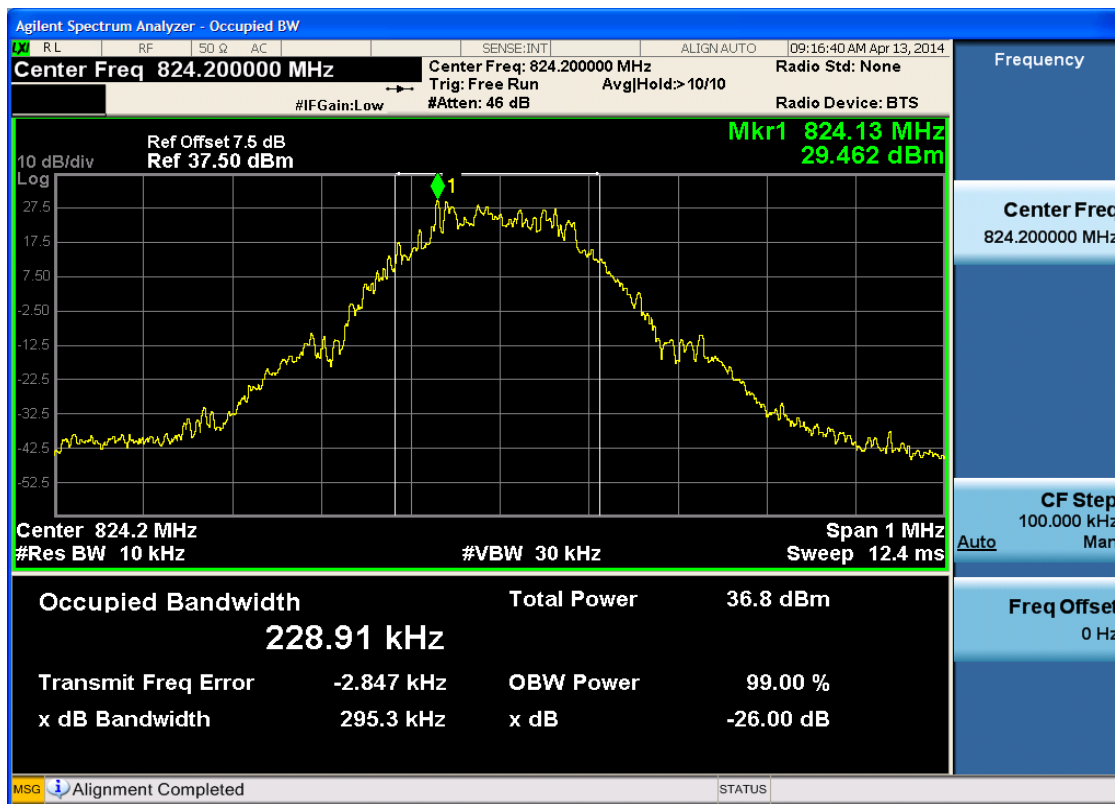
4.1.1.1.3 Test Channel = HCH





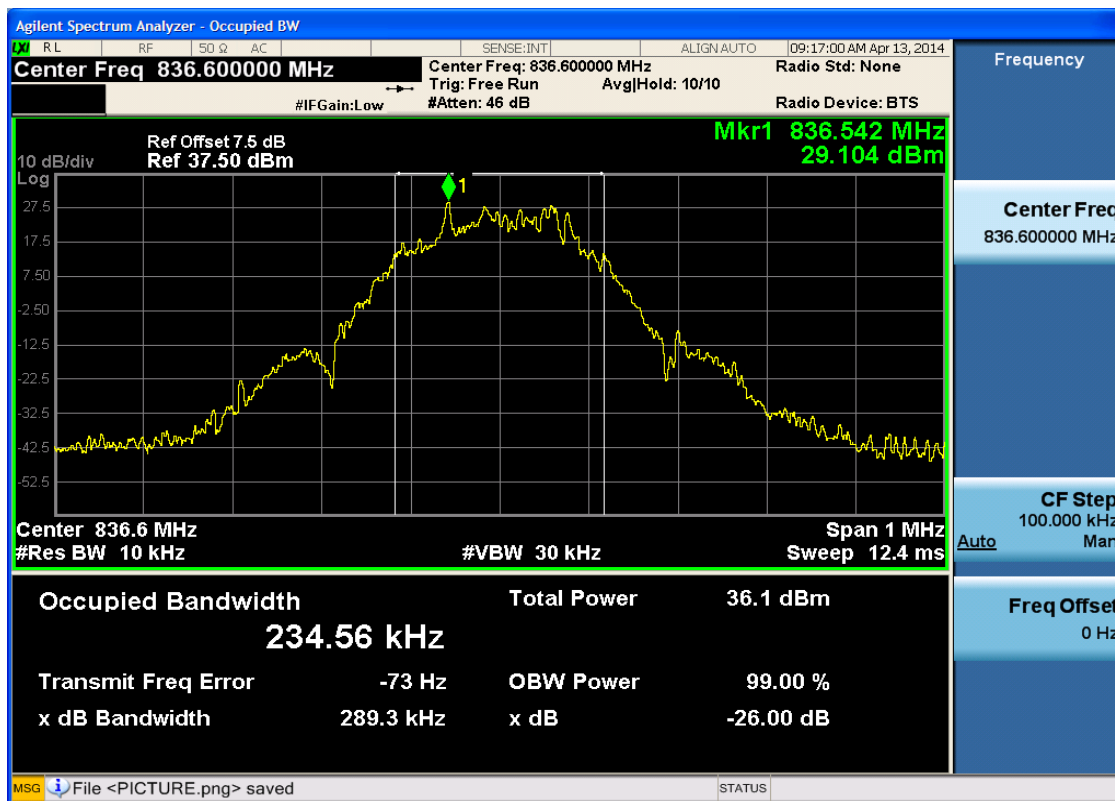
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH



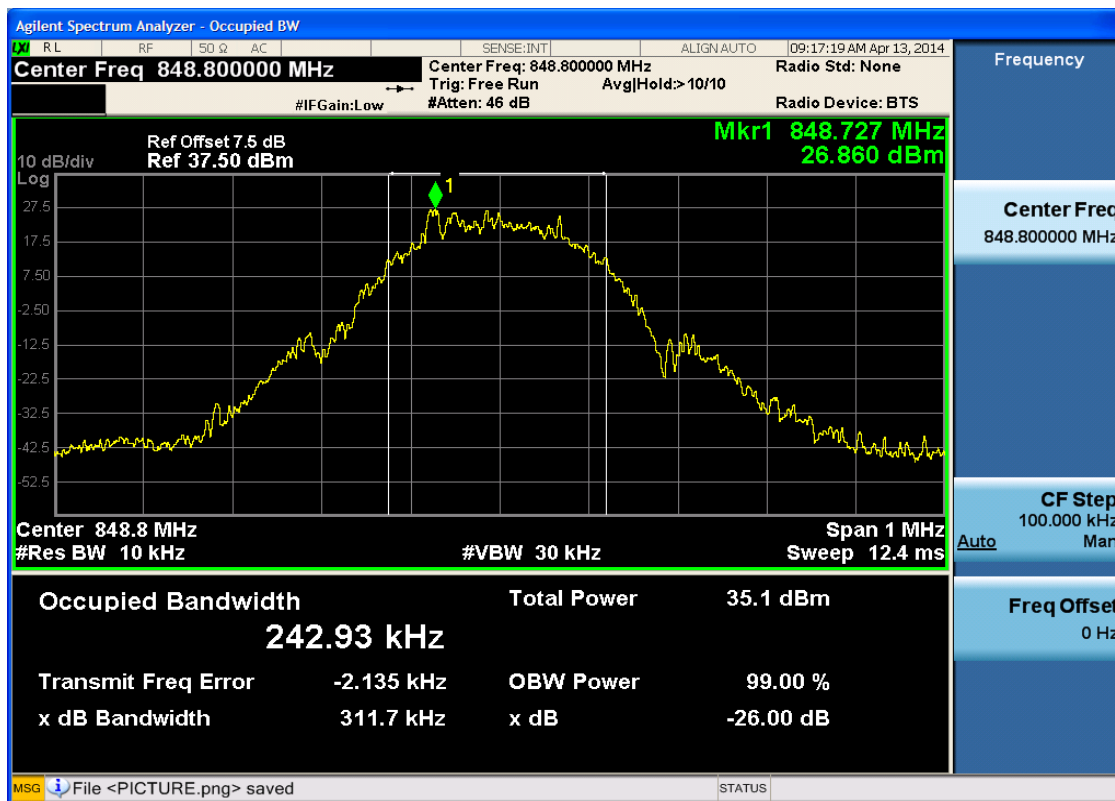


4.1.1.2.2 Test Channel = MCH





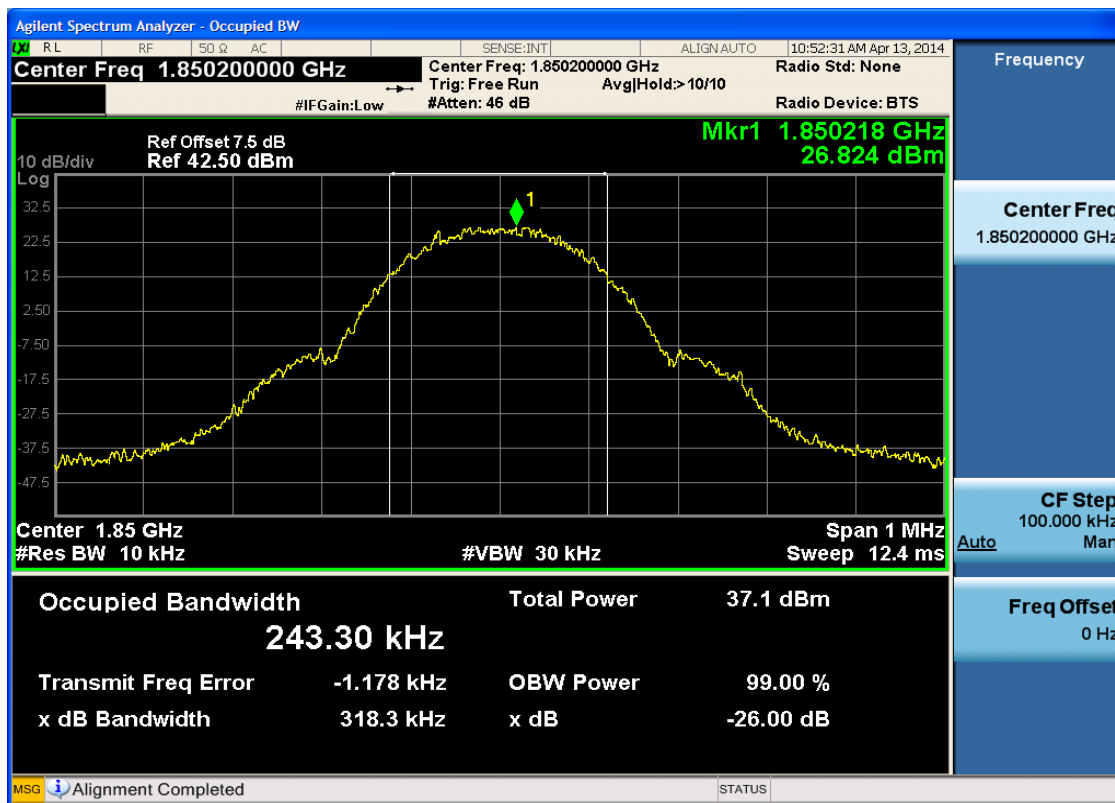
4.1.1.2.3 Test Channel = HCH



4.1.2 Test Band = GSM1900

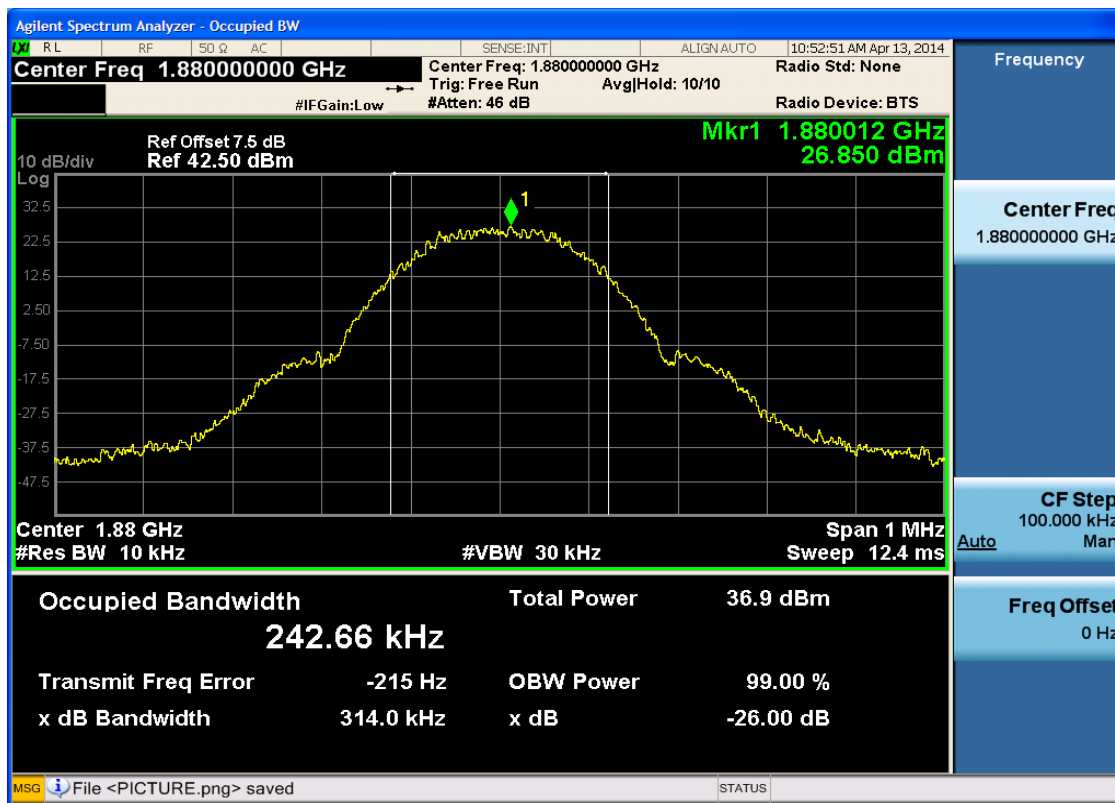
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



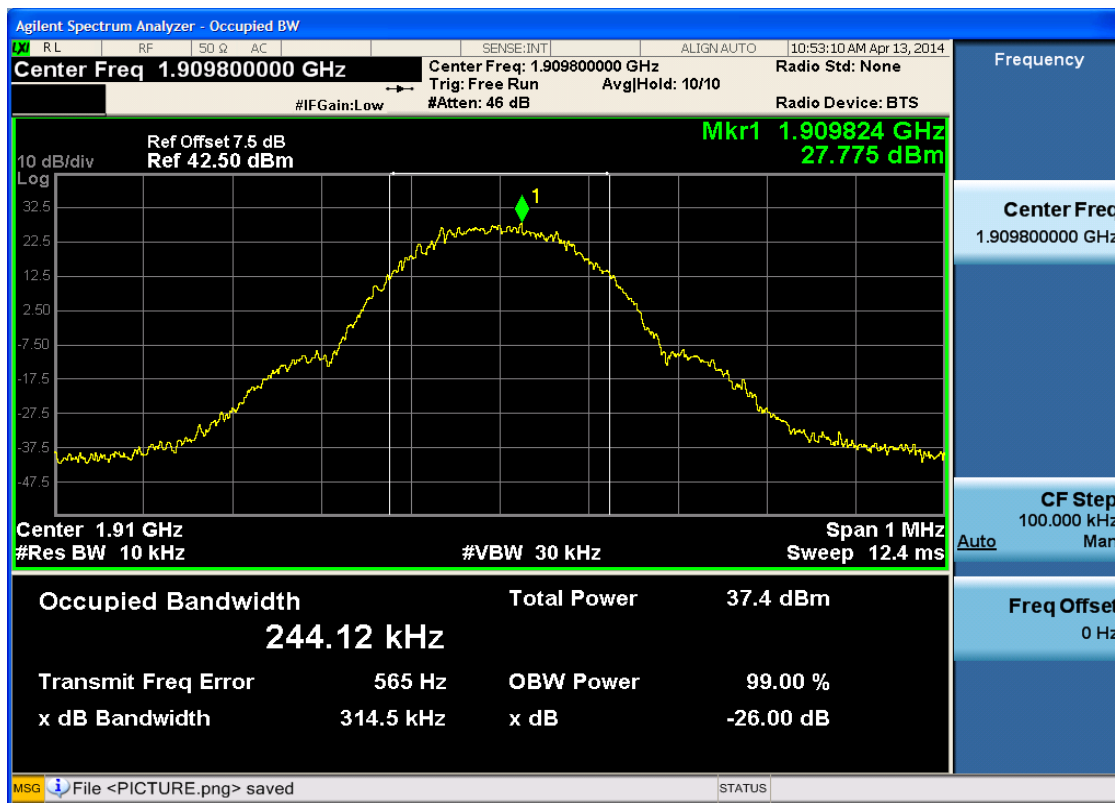


4.1.2.1.2 Test Channel = MCH





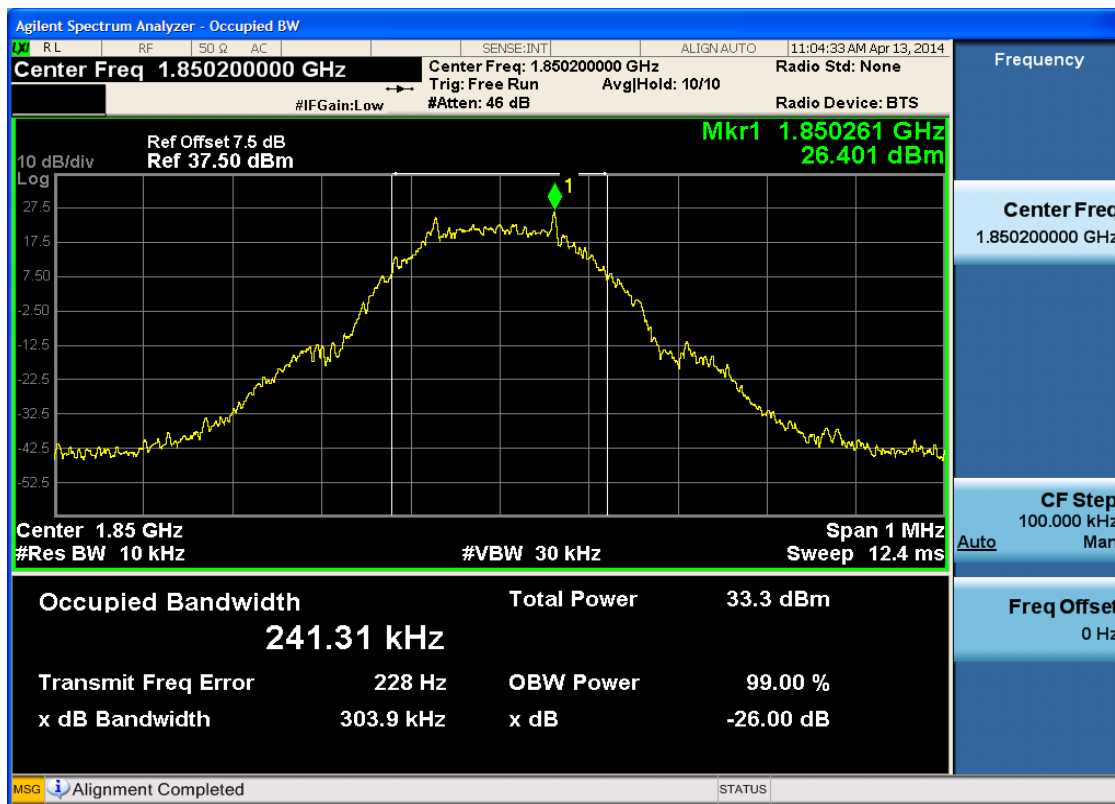
4.1.2.1.3 Test Channel = HCH





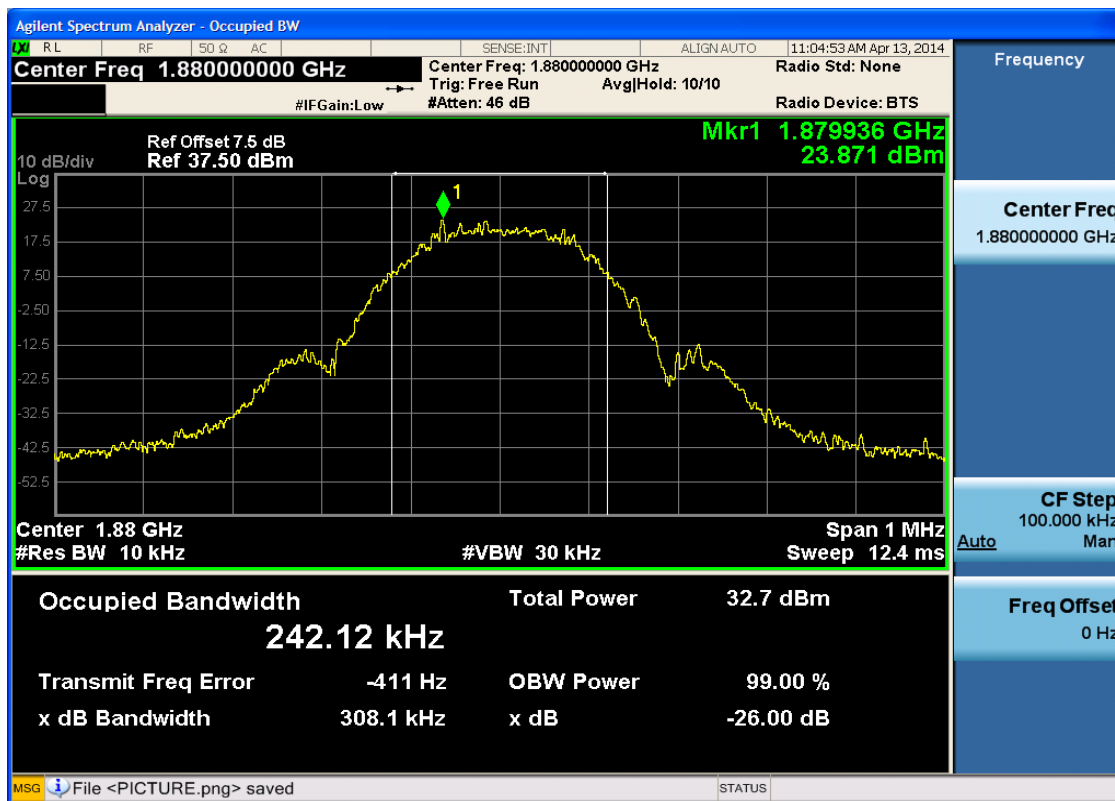
4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



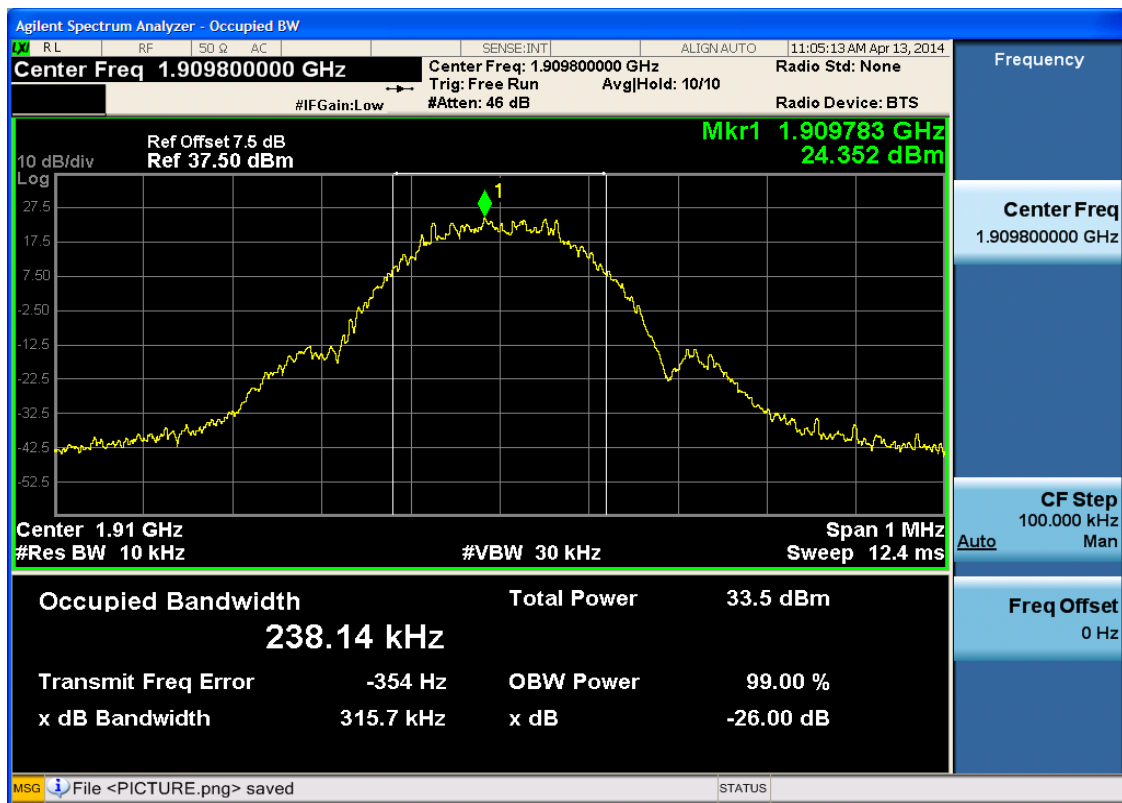


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH



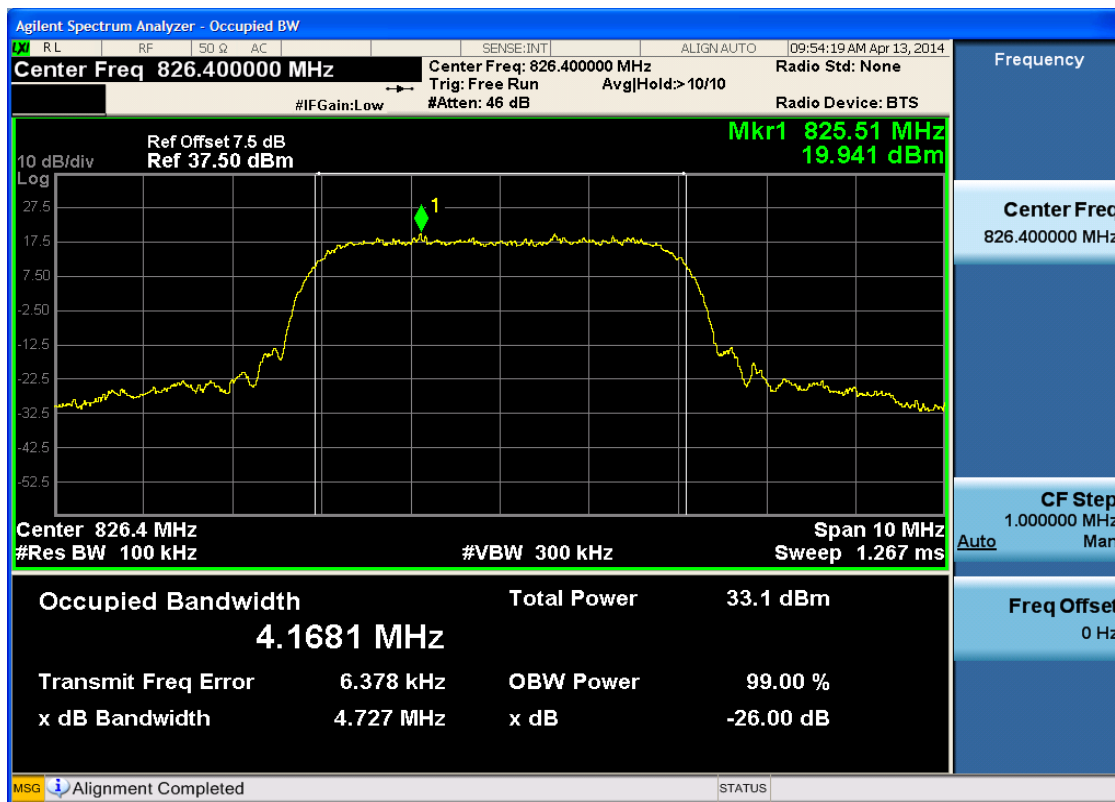


4.2 For UMTS

4.2.1 Test Band = WCDMA850

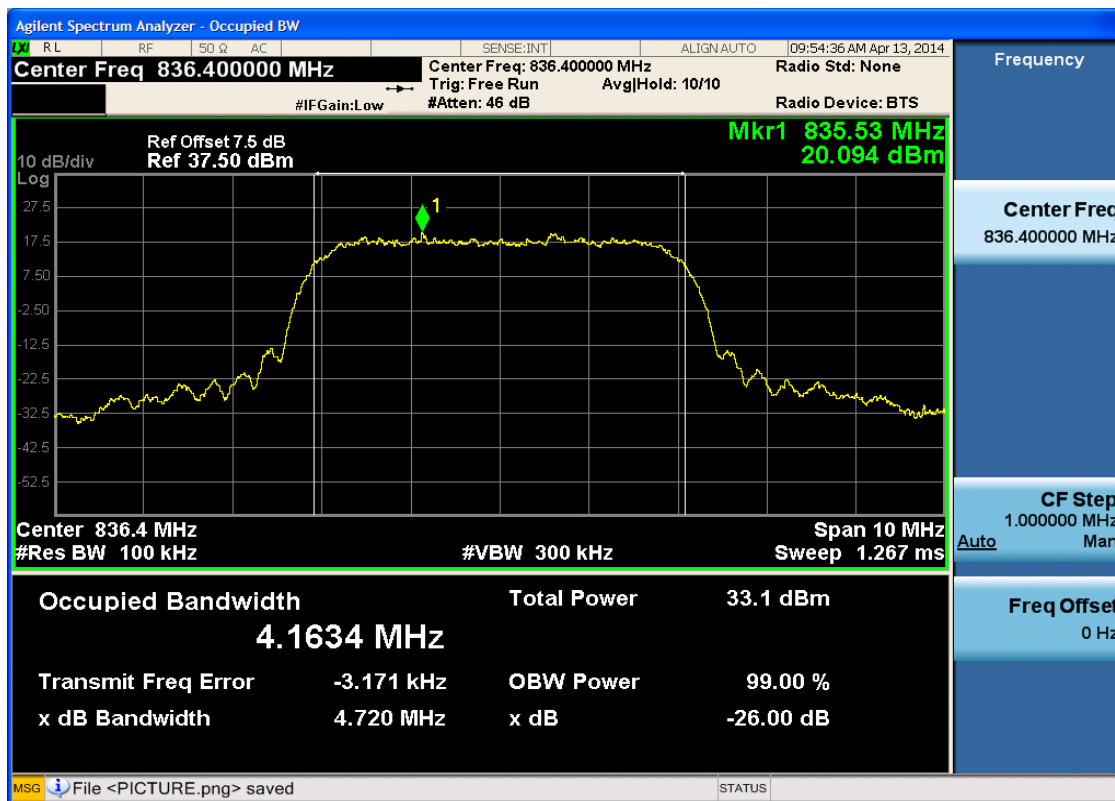
4.2.1.1 Test Mode = UMTS/TM1

4.2.1.1.1 Test Channel = LCH



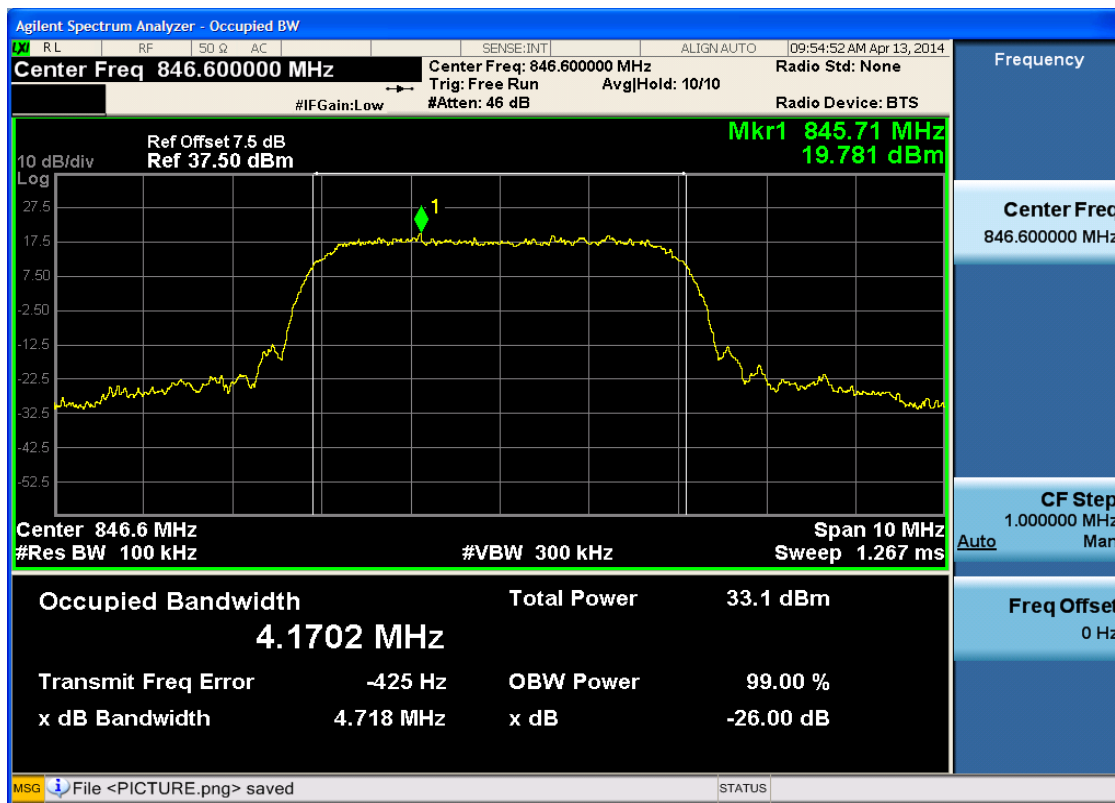


4.2.1.1.2 Test Channel = MCH





4.2.1.1.3 Test Channel = HCH

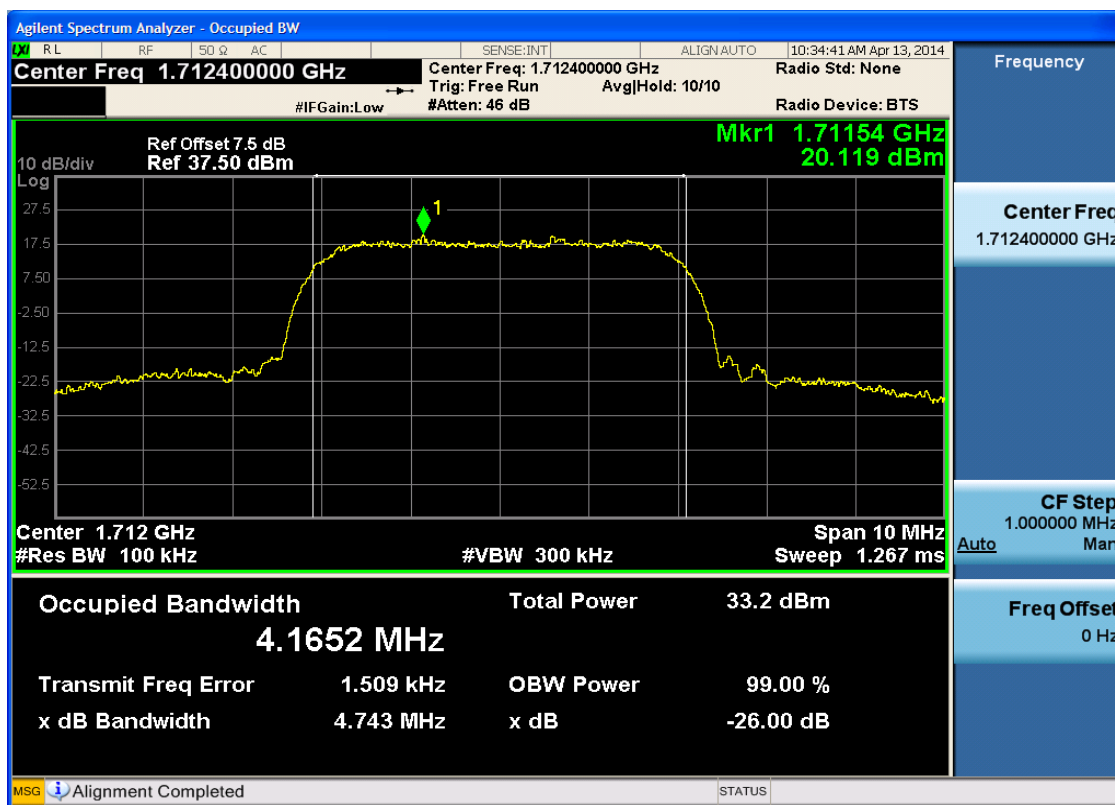




4.2.2 Test Band = WCDMA1700

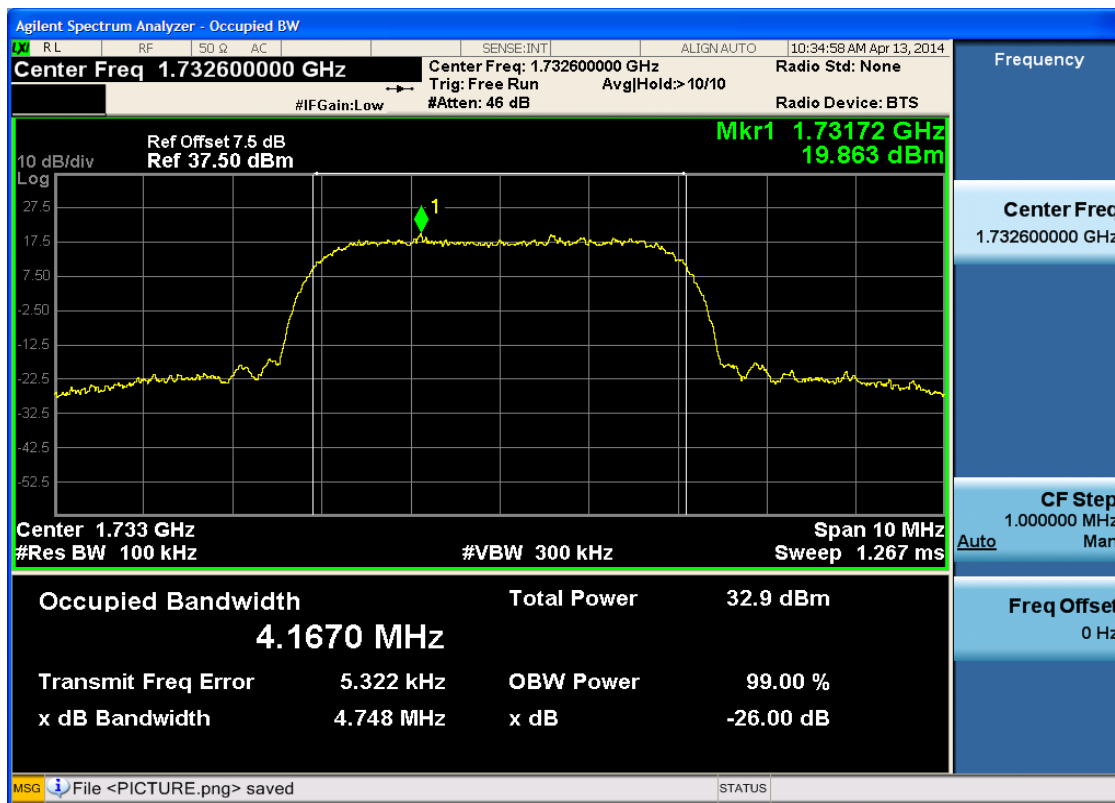
4.2.2.1 Test Mode = UMTS/TM1

4.2.2.1.1 Test Channel = LCH



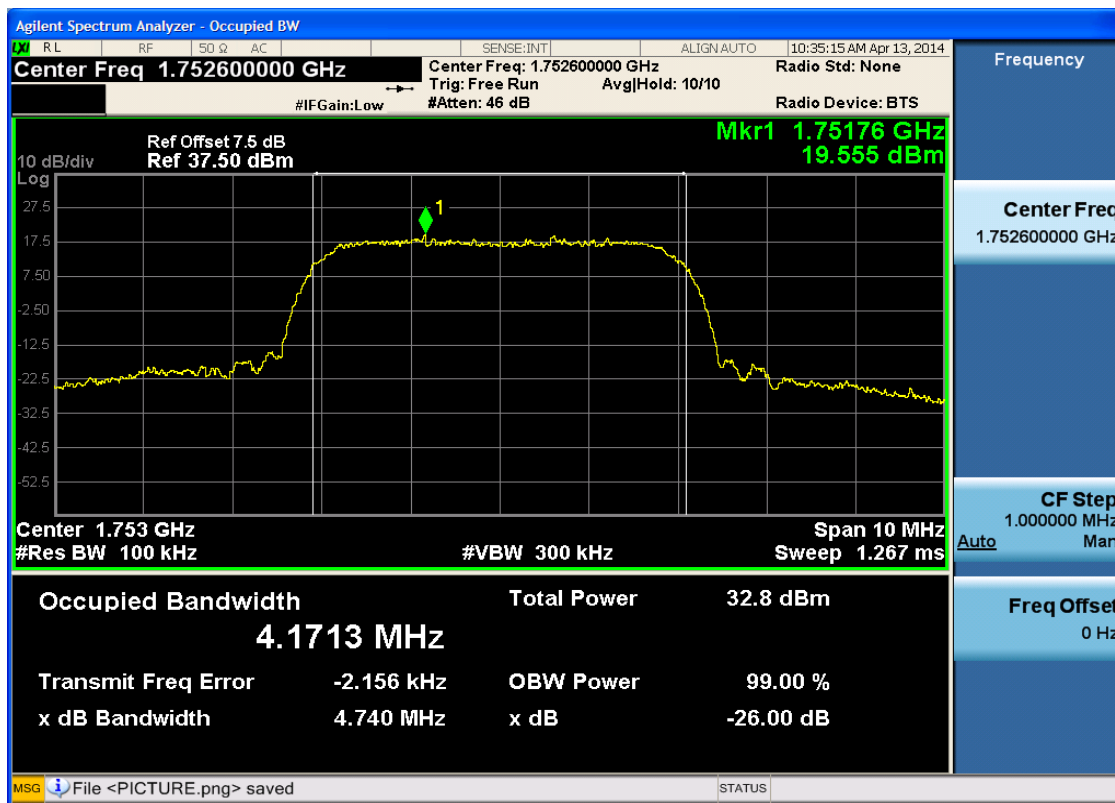


4.2.2.1.2 Test Channel = MCH





4.2.2.1.3 Test Channel = HCH

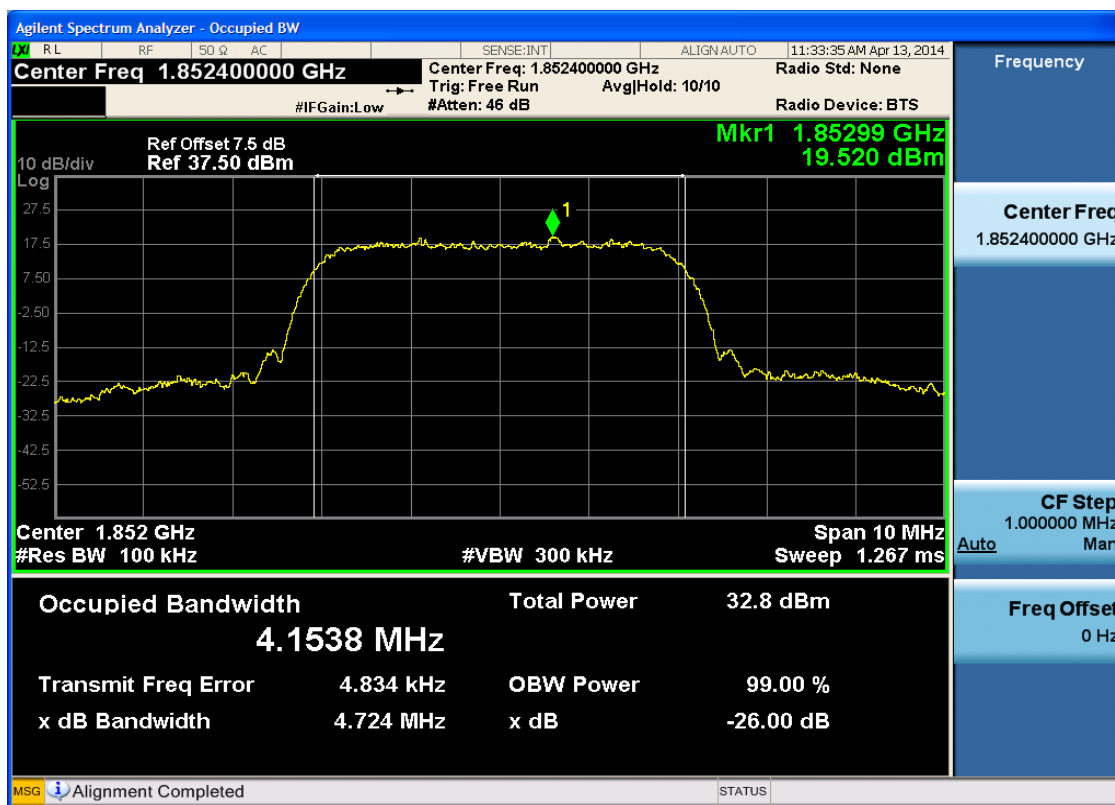




4.2.3 Test Band = WCDMA1900

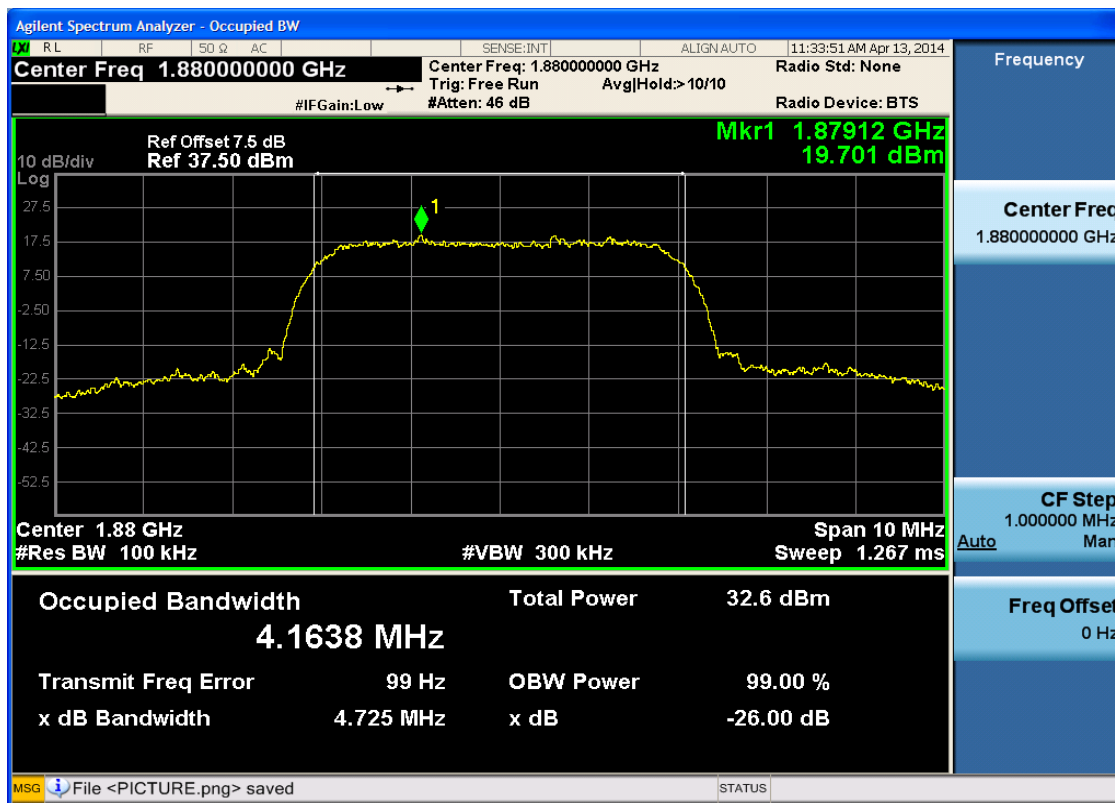
4.2.3.1 Test Mode = UMTS/TM1

4.2.3.1.1 Test Channel = LCH



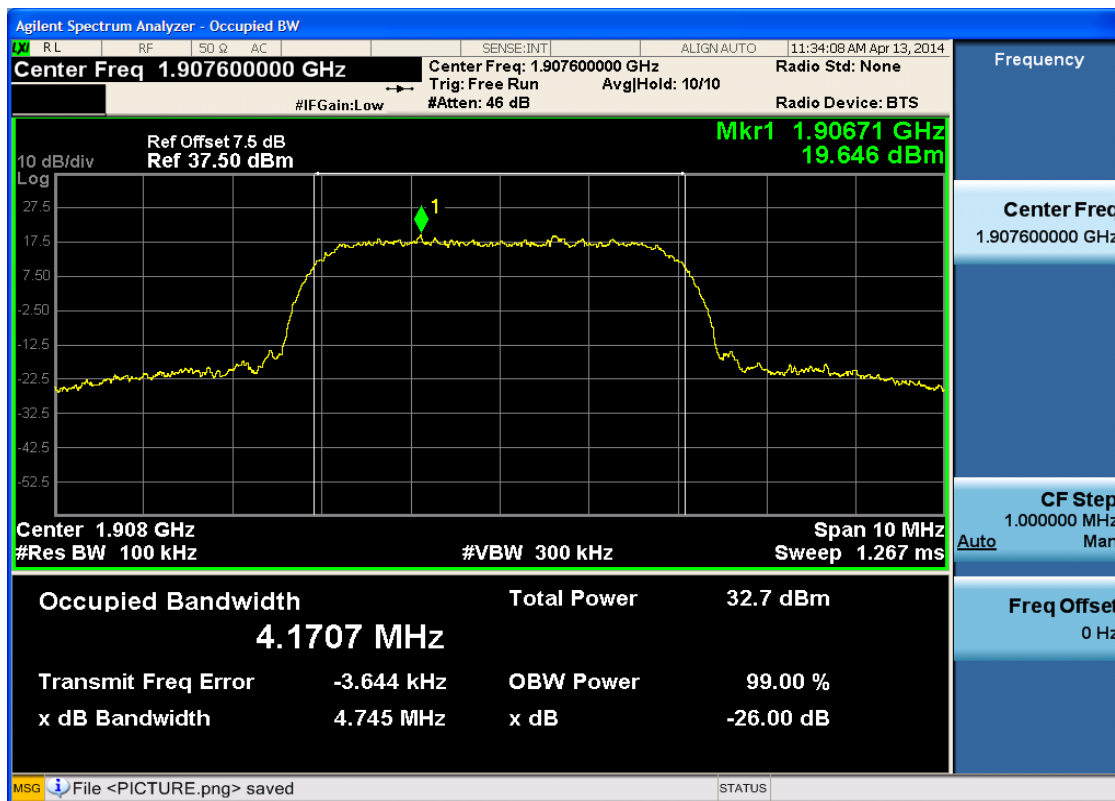


4.2.3.1.2 Test Channel = MCH





4.2.3.1.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

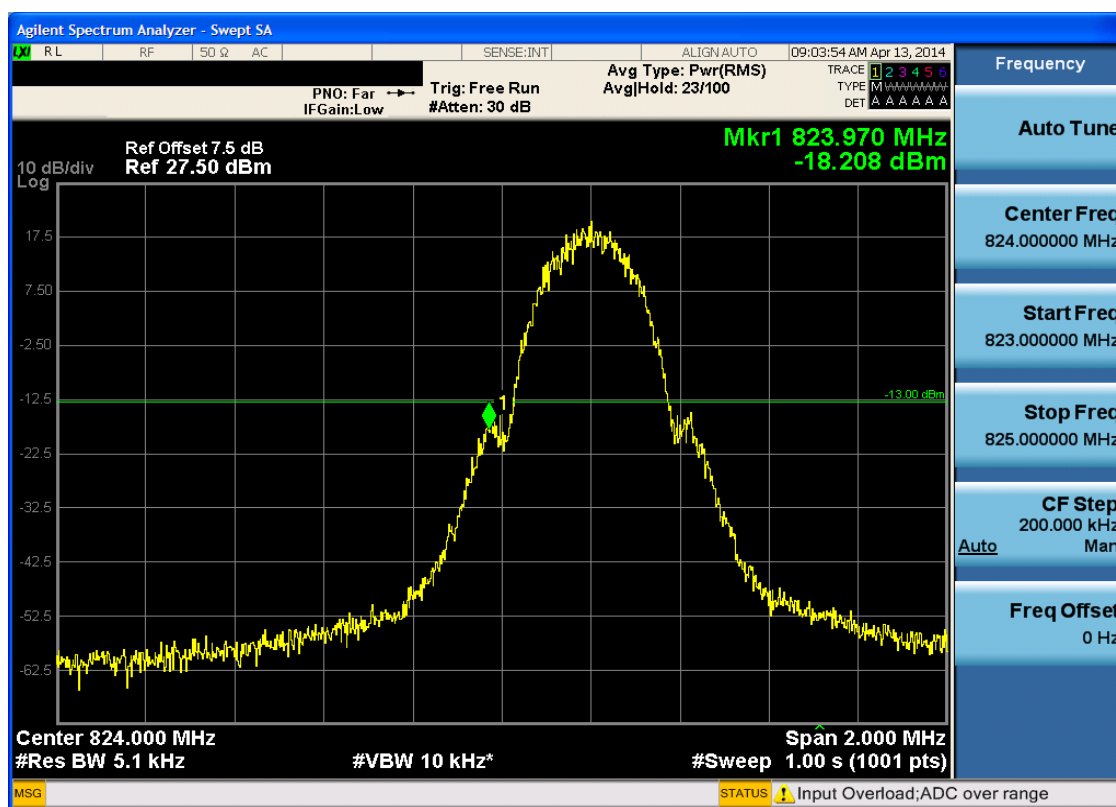
Part I - Test Plots

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





Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 09:05:10 AM Apr 13, 2014

PNO: Far → Trig: Free Run Avg Type: Pwr(RMS) TRACE 1 2 3 4 5 6
 IFGain: Low #Atten: 36 dB AvgHld: 39/100 TYPE MAAAAAA
 DET A A A A A A

Ref Offset 7.5 dB Mkr1 849.020 MHz
 Ref 25.00 dBm -16.953 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 STATUS

Frequency

Auto Tune

Center Freq
 849.000000 MHz

Start Freq
 848.000000 MHz

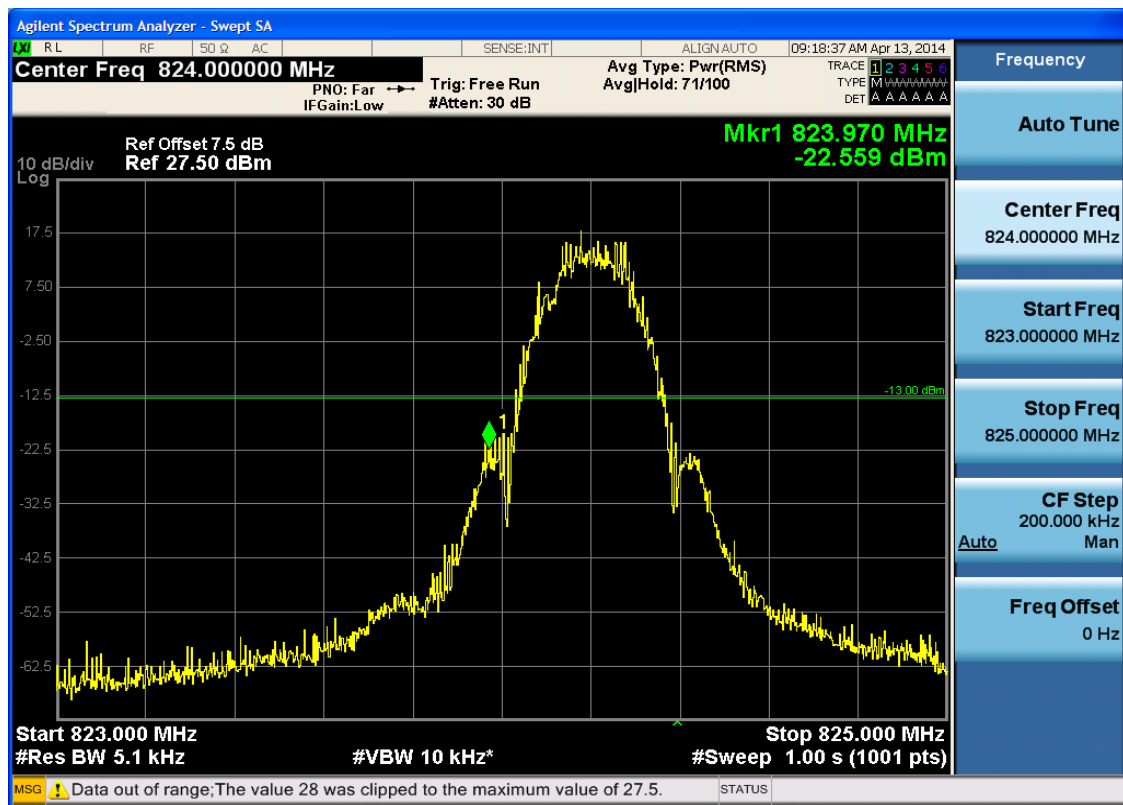
Stop Freq
 850.000000 MHz

CF Step
 200.000 kHz
 Auto Man

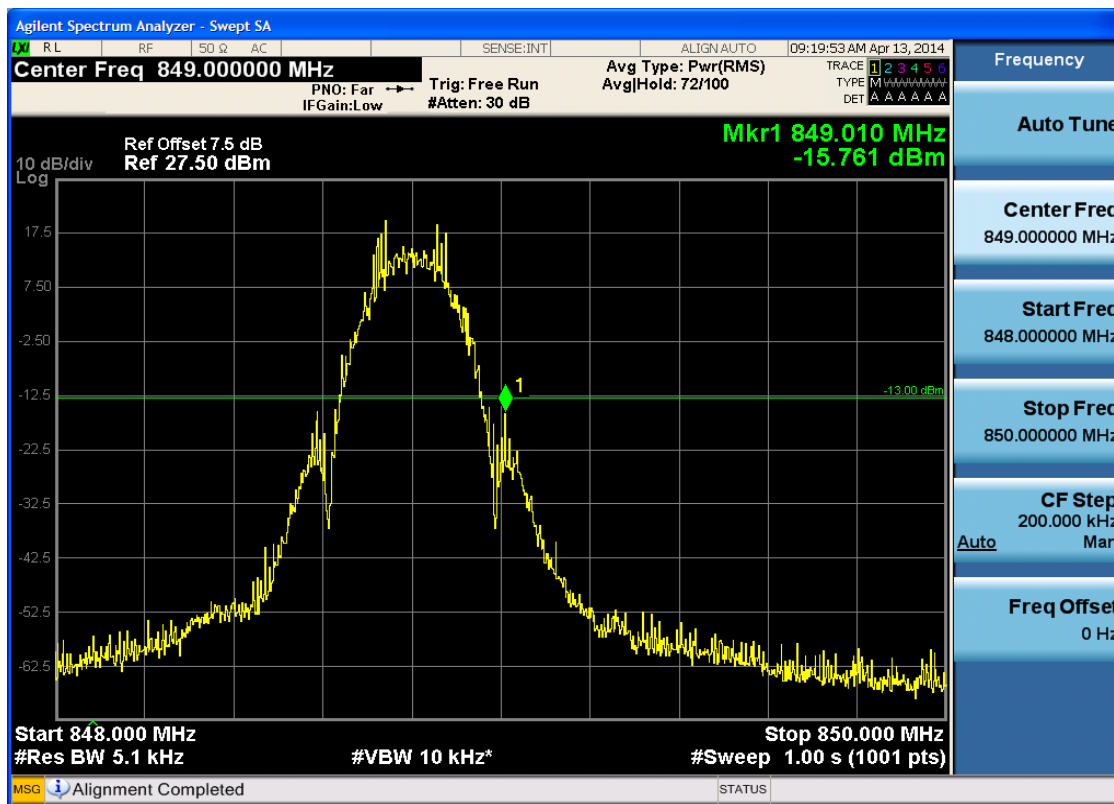
Freq Offset
 0 Hz

5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



5.1.1.2.2 Test Channel = HCH

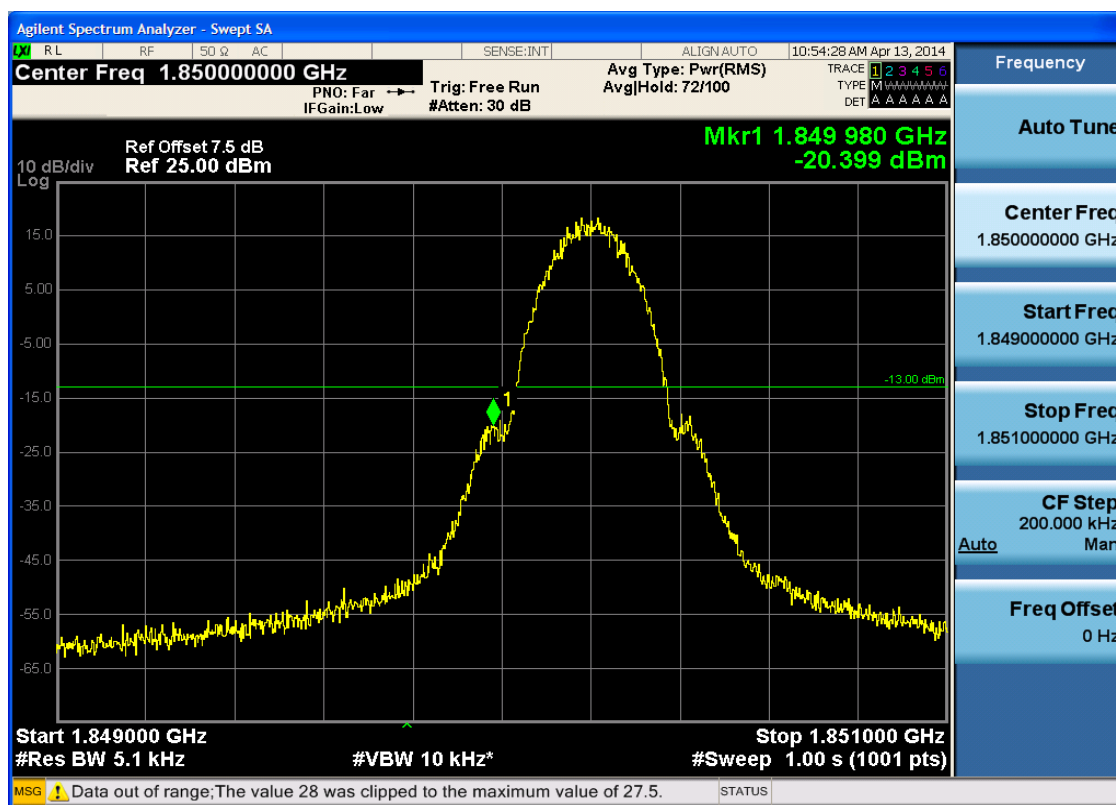




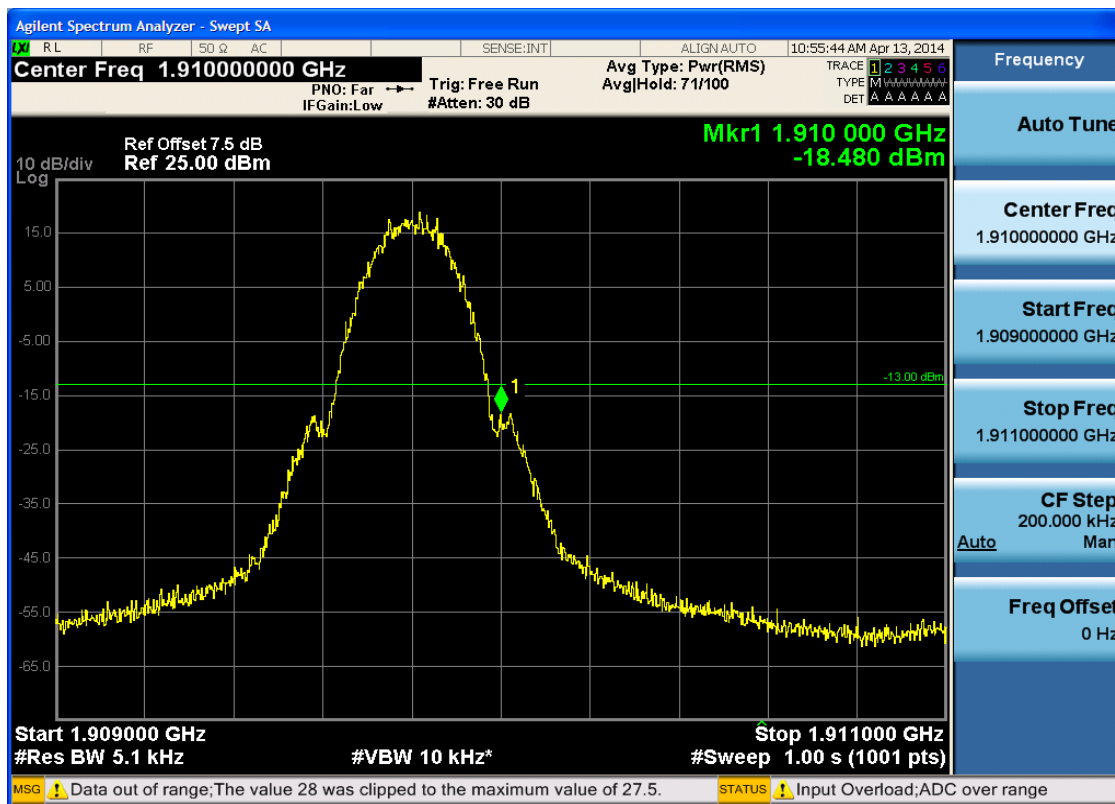
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH

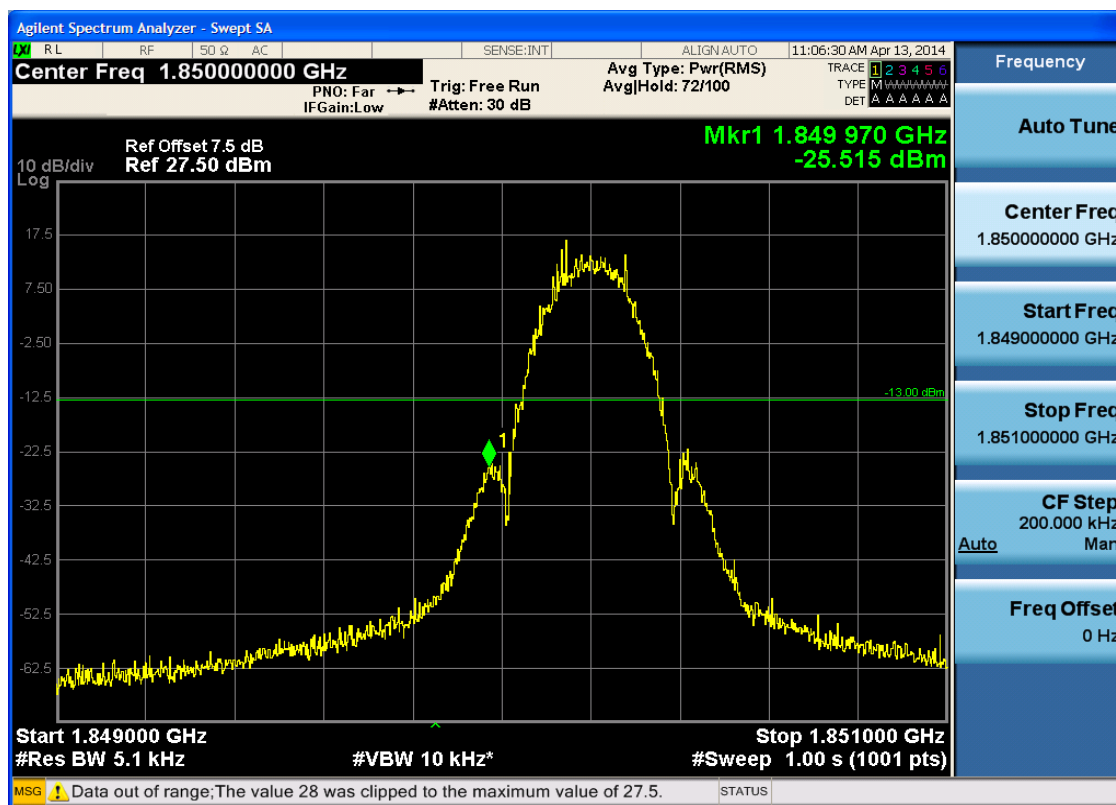


5.1.2.1.2 Test Channel = HCH

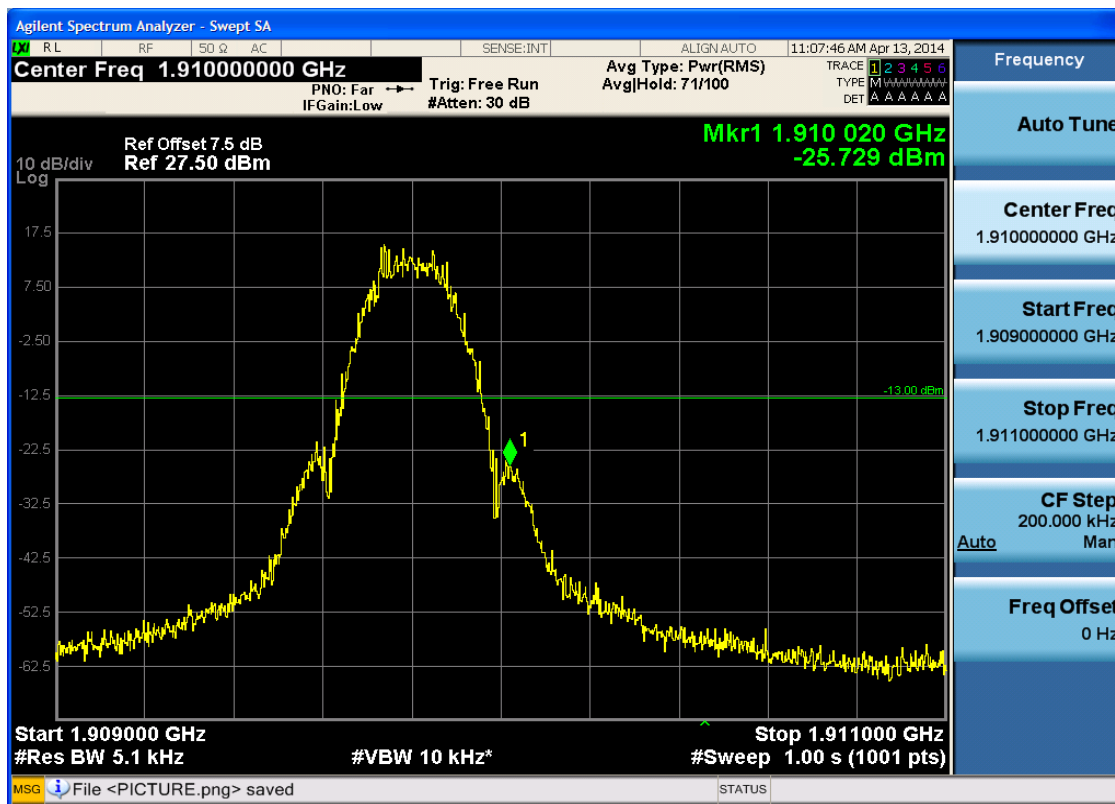


5.1.2.2 Test Mode = GSM/TM2

5.1.2.2.1 Test Channel = LCH



5.1.2.2.2 Test Channel = HCH

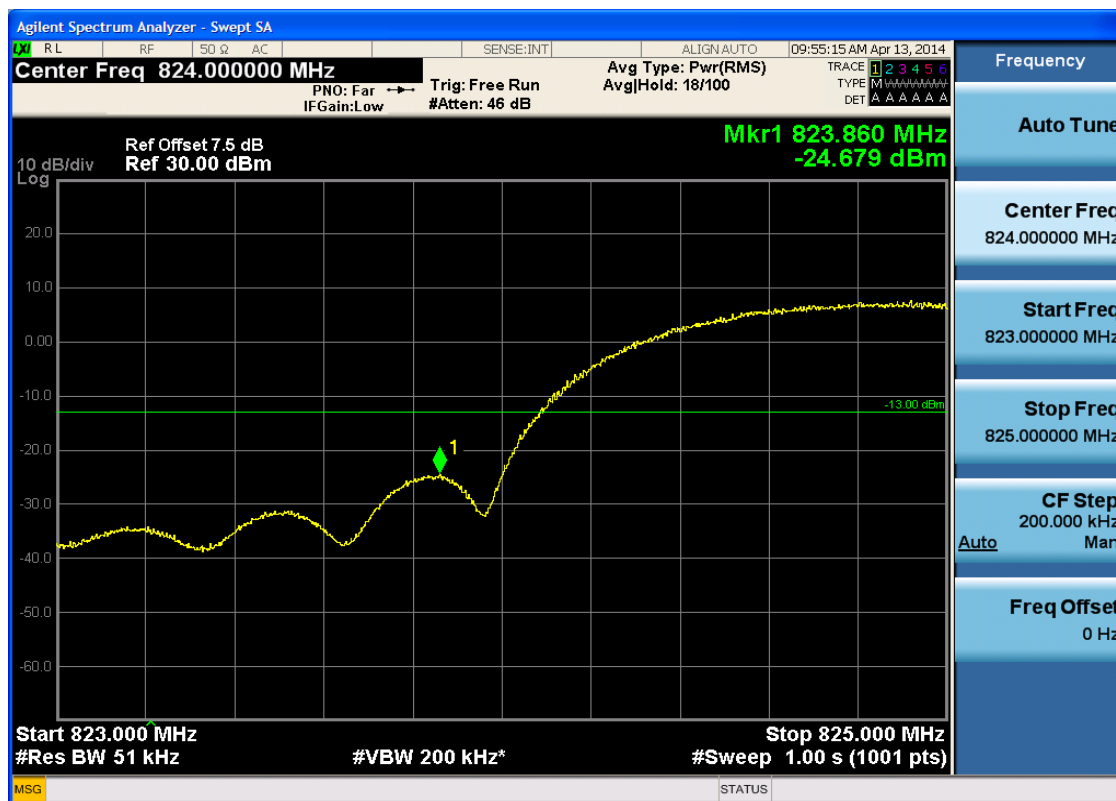


5.2 For UMTS

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

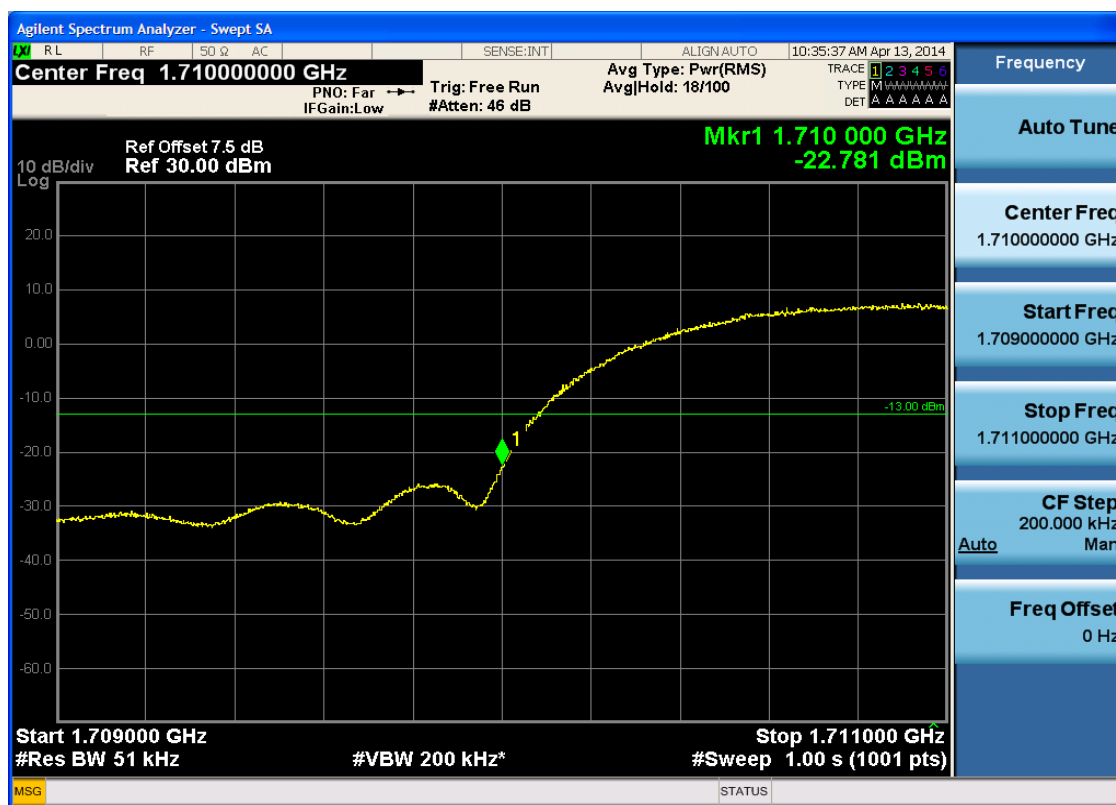




5.2.2 Test Band = WCDMA1700

5.2.2.1 Test Mode = UMTS/TM1

5.2.2.1.1 Test Channel = LCH



5.2.2.1.2 Test Channel = HCH

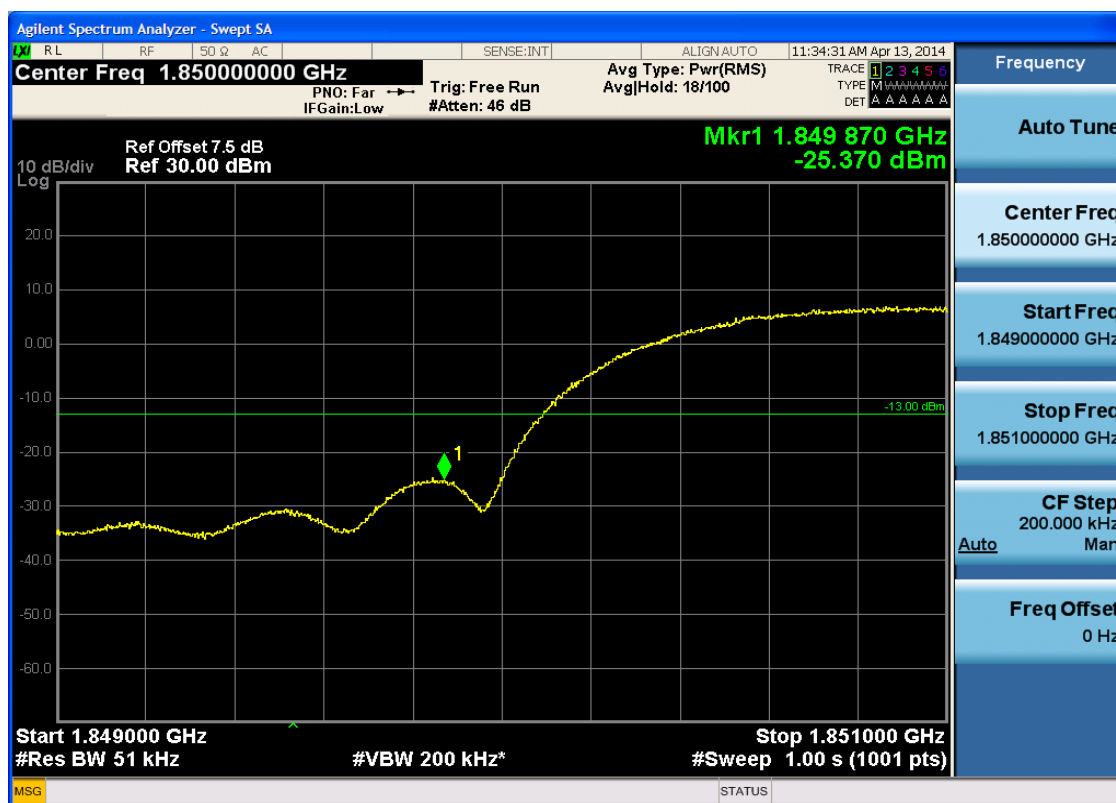




5.2.3 Test Band = WCDMA1900

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.

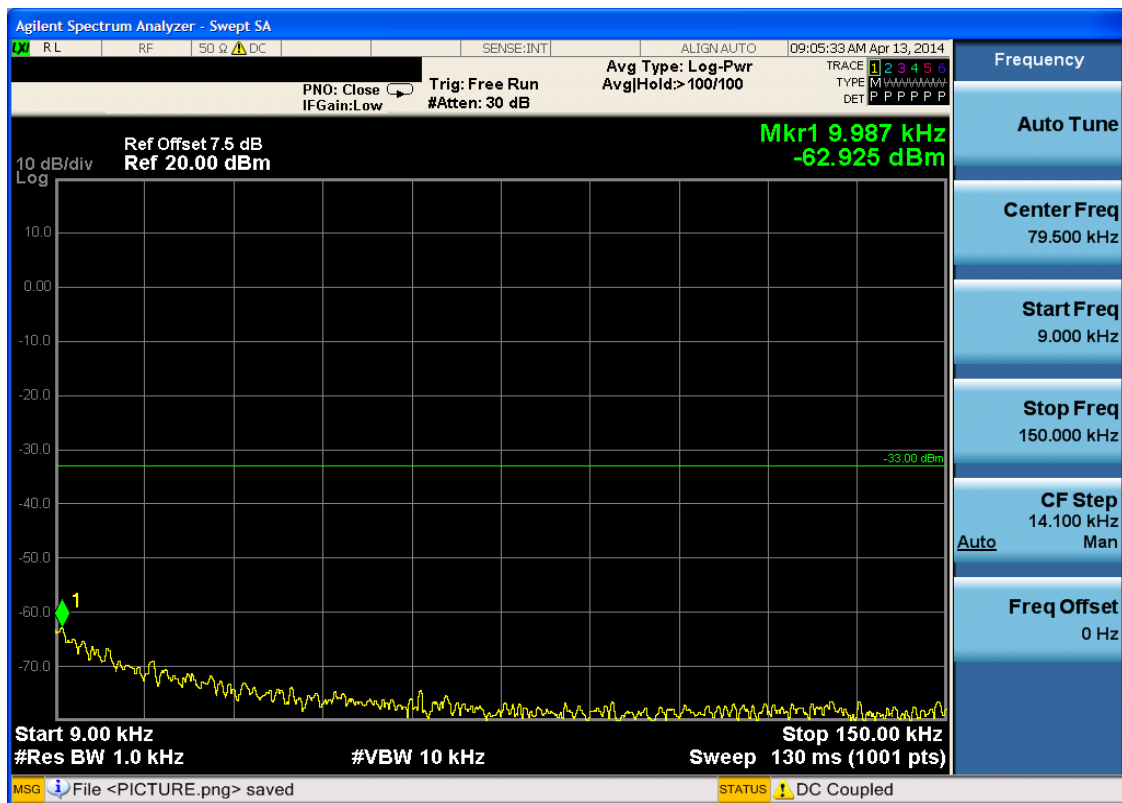
Part I - Test Plots

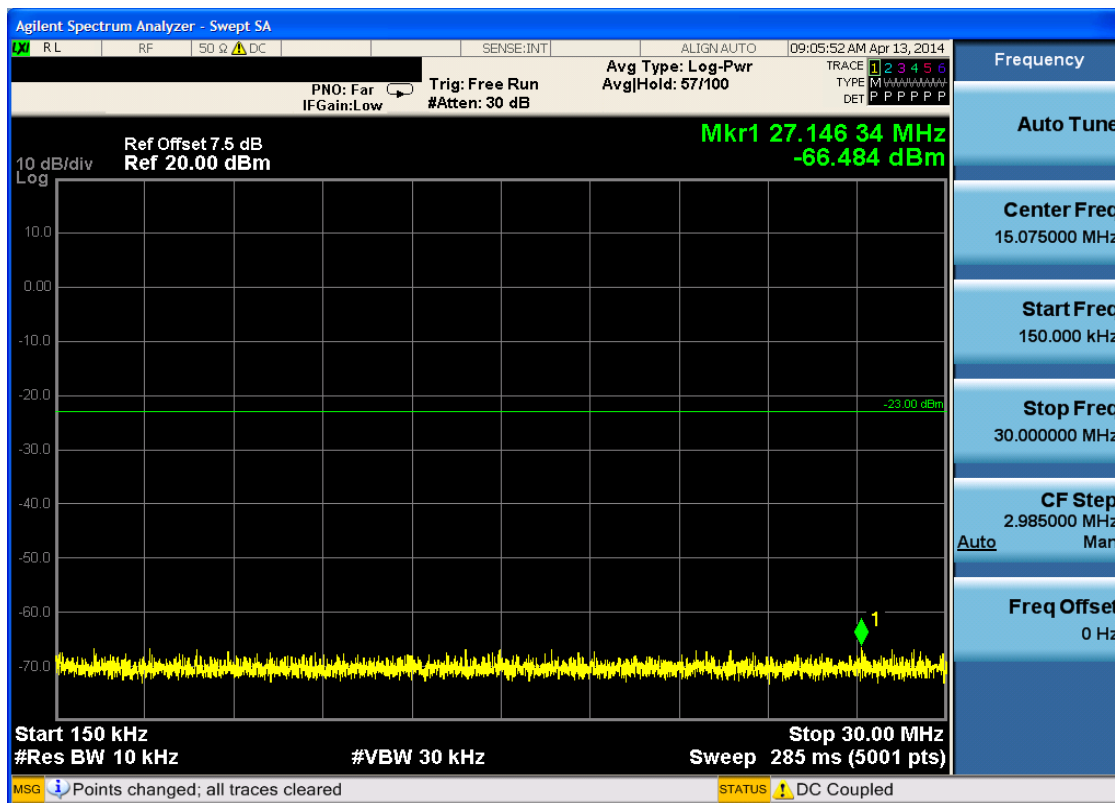
6.1 For GSM

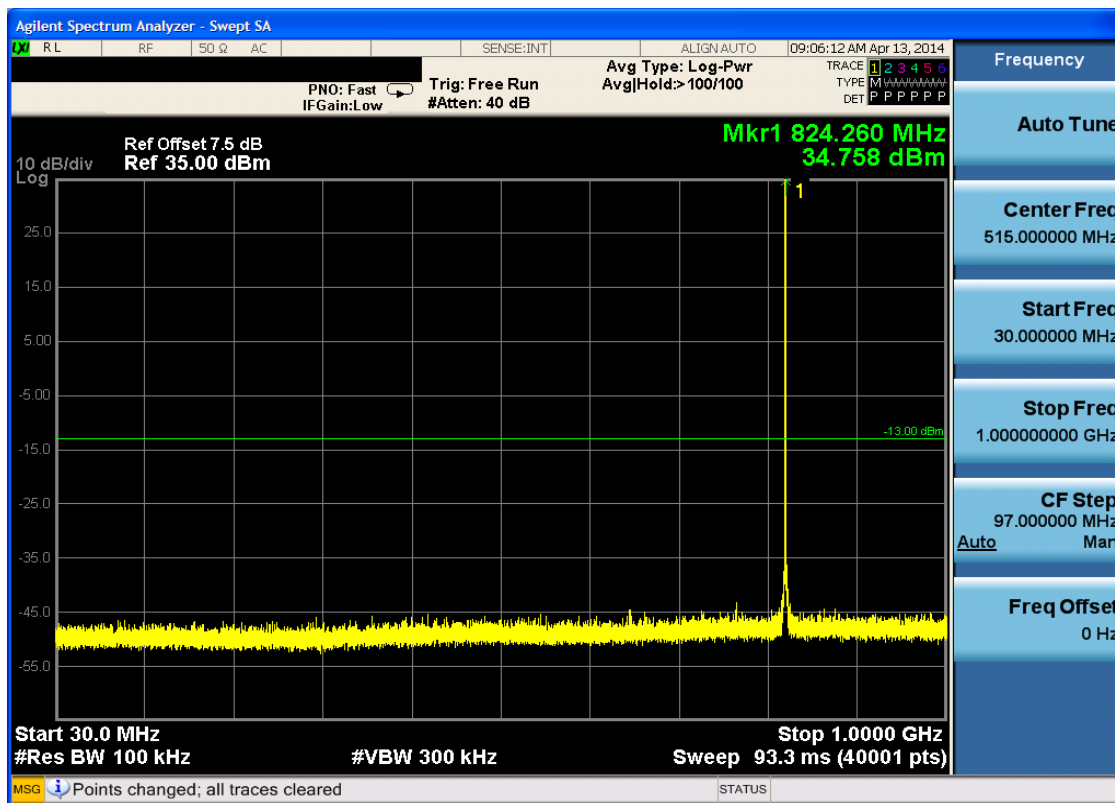
6.1.1 Test Band = GSM850

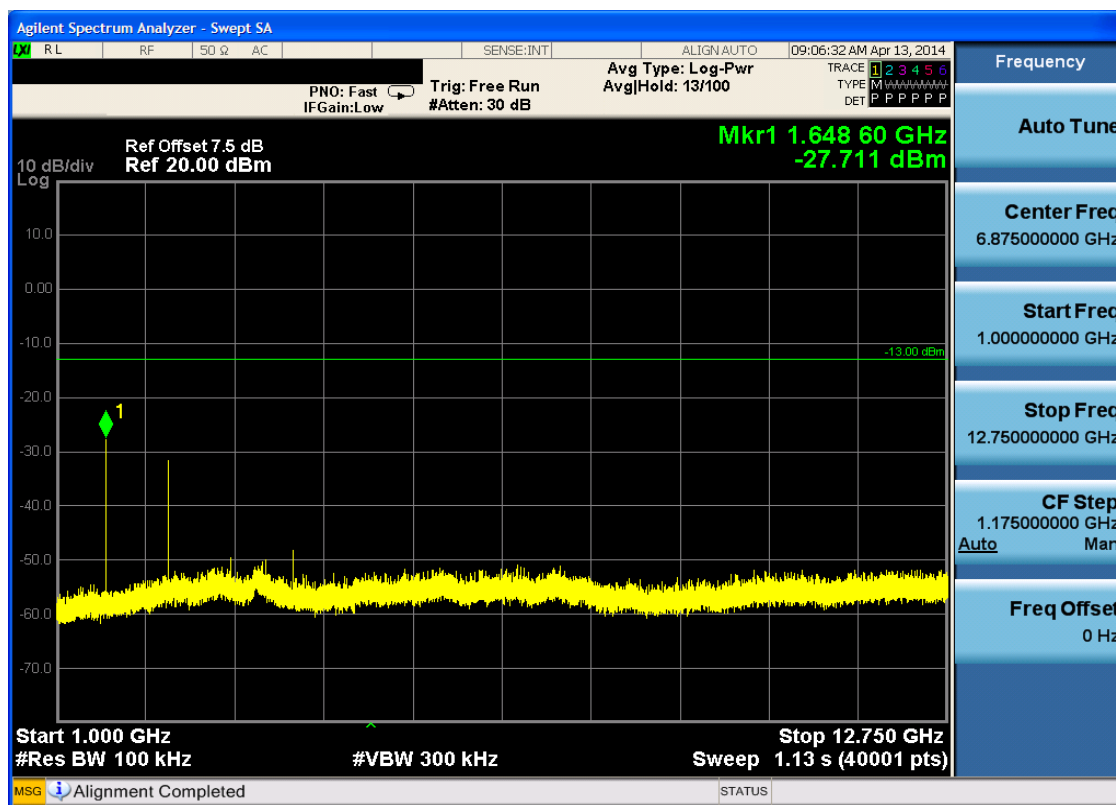
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH

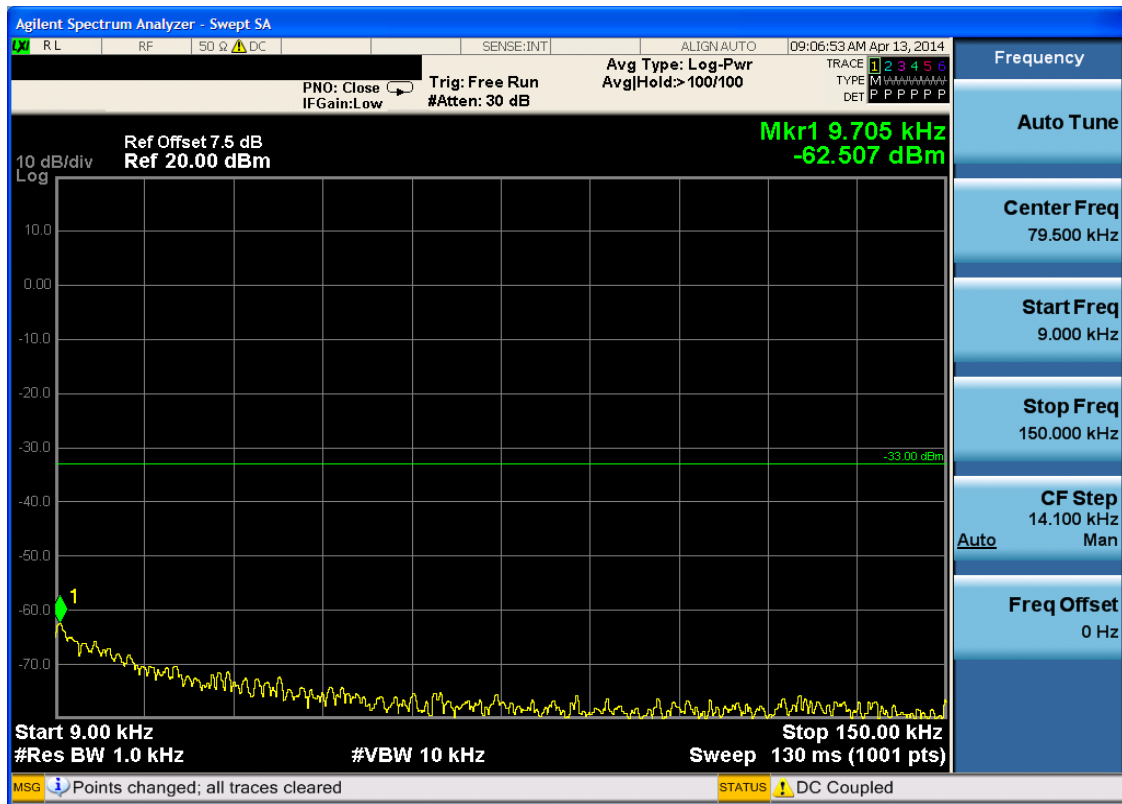


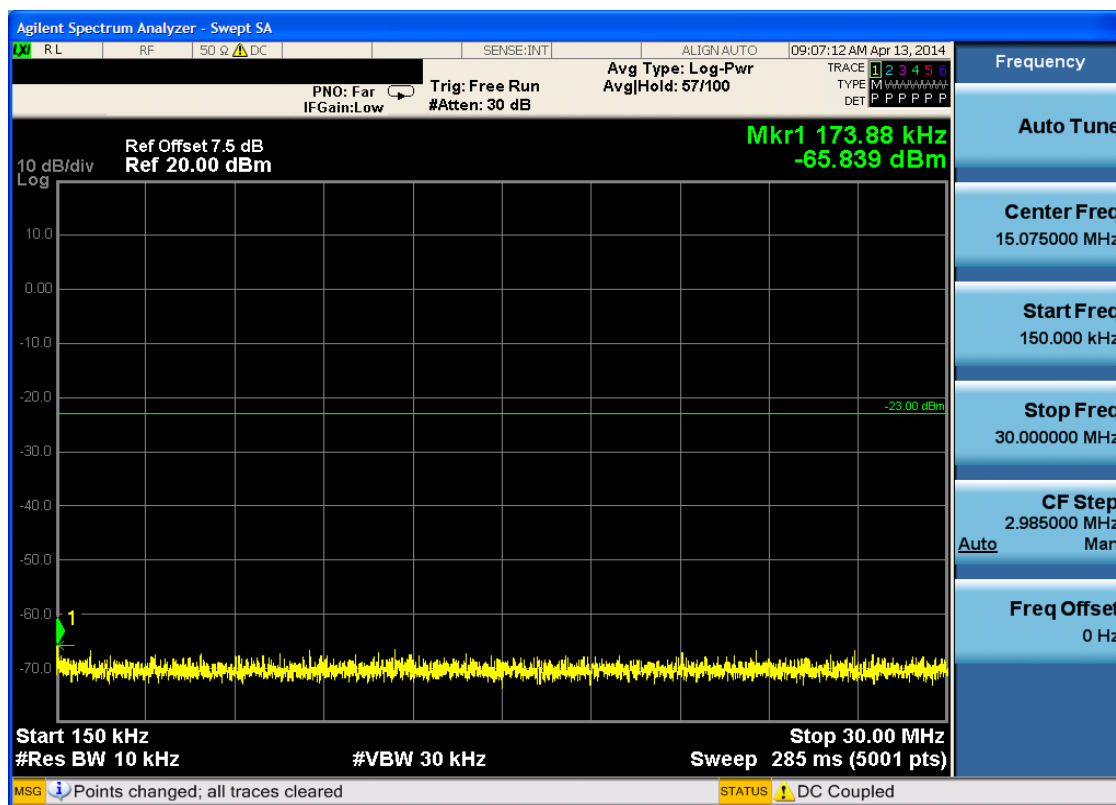


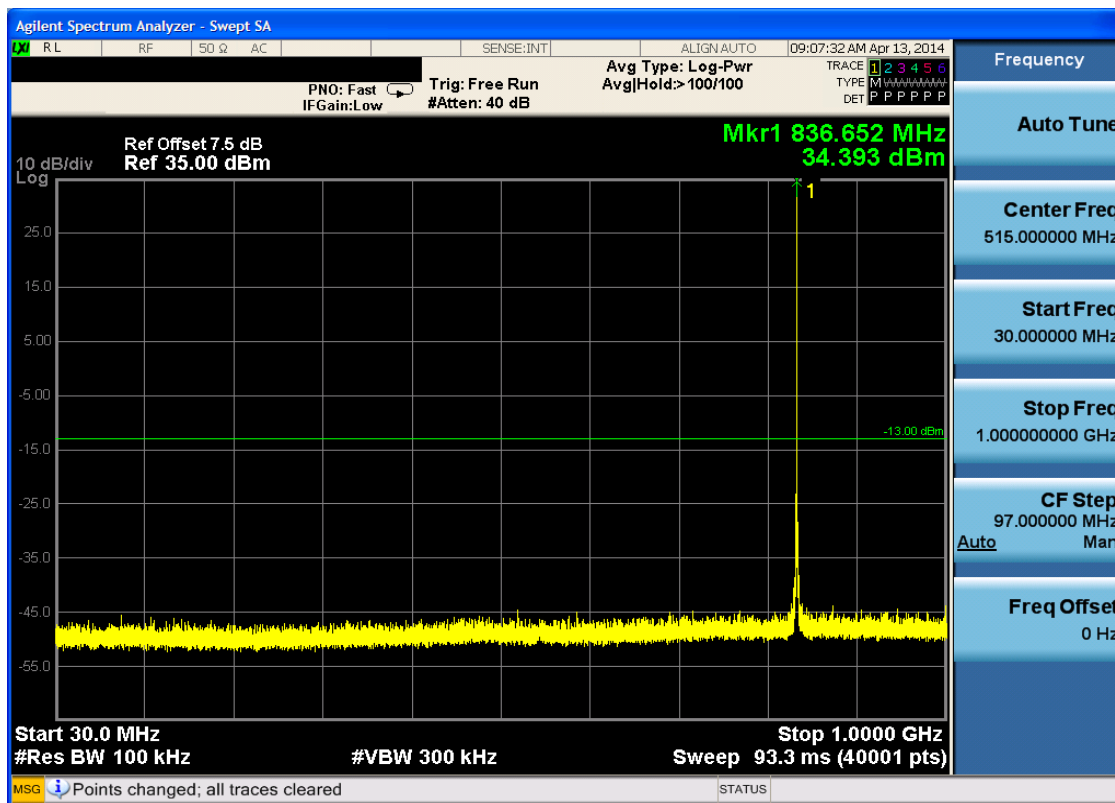


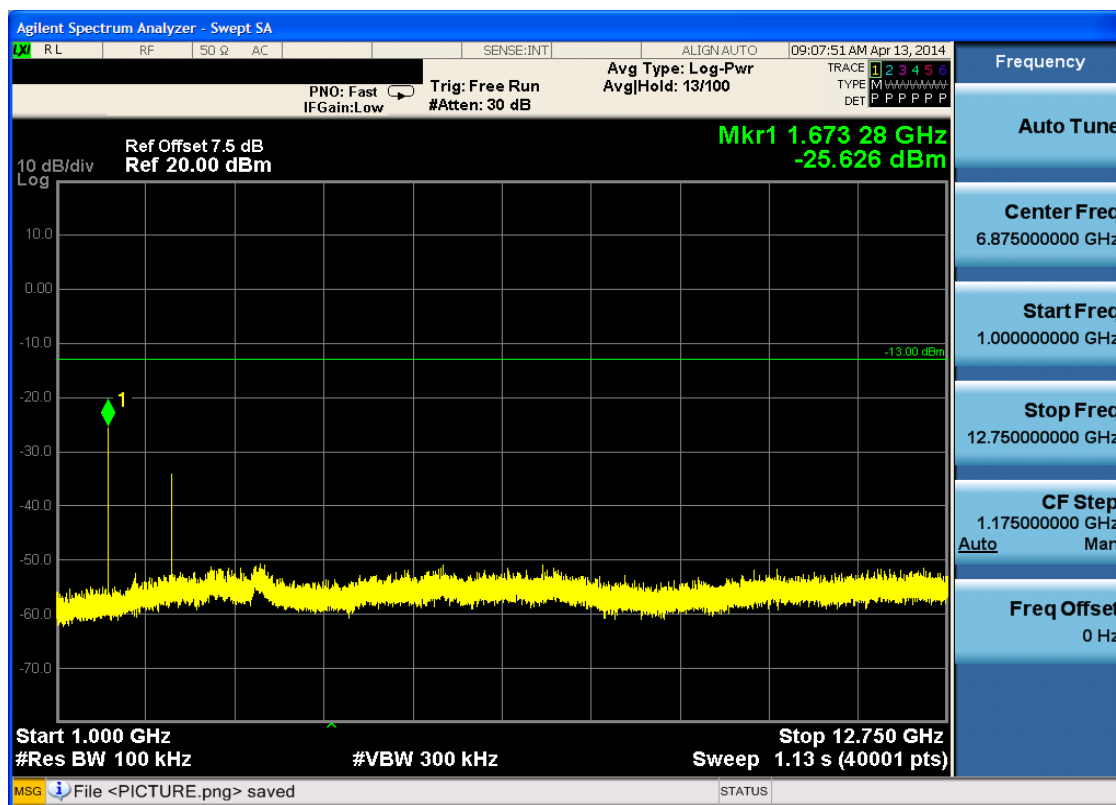


6.1.1.1.2 Test Channel = MCH



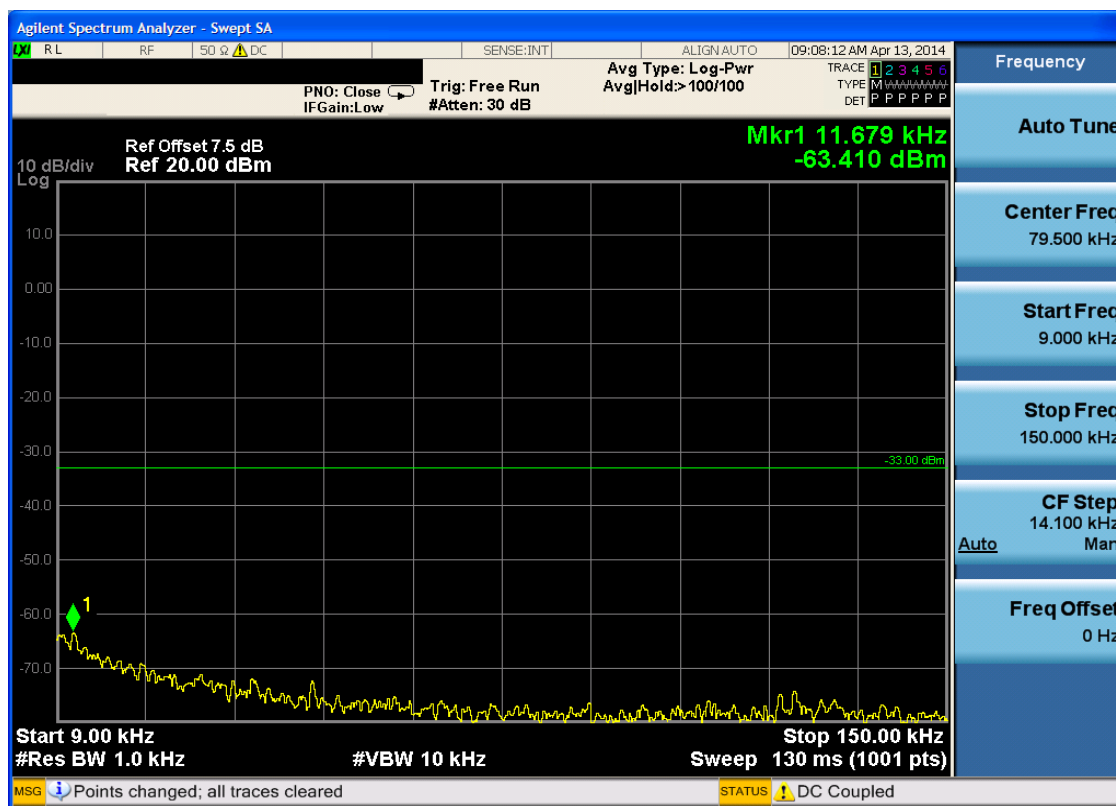


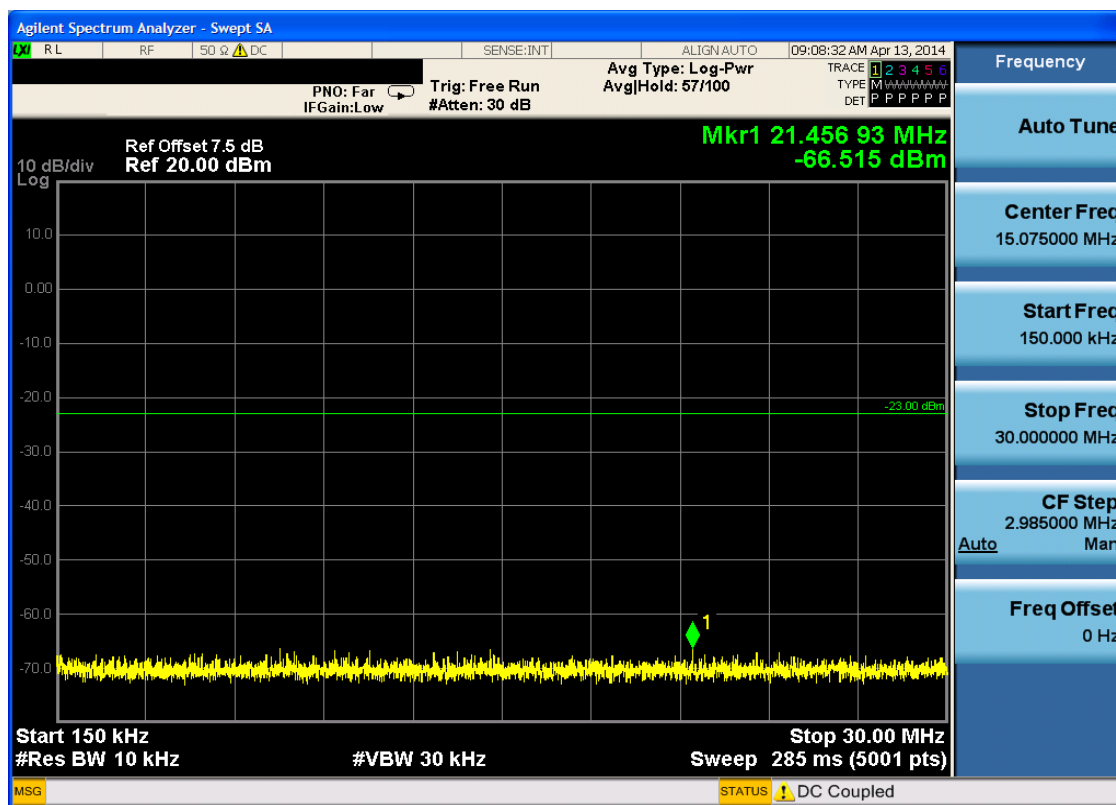


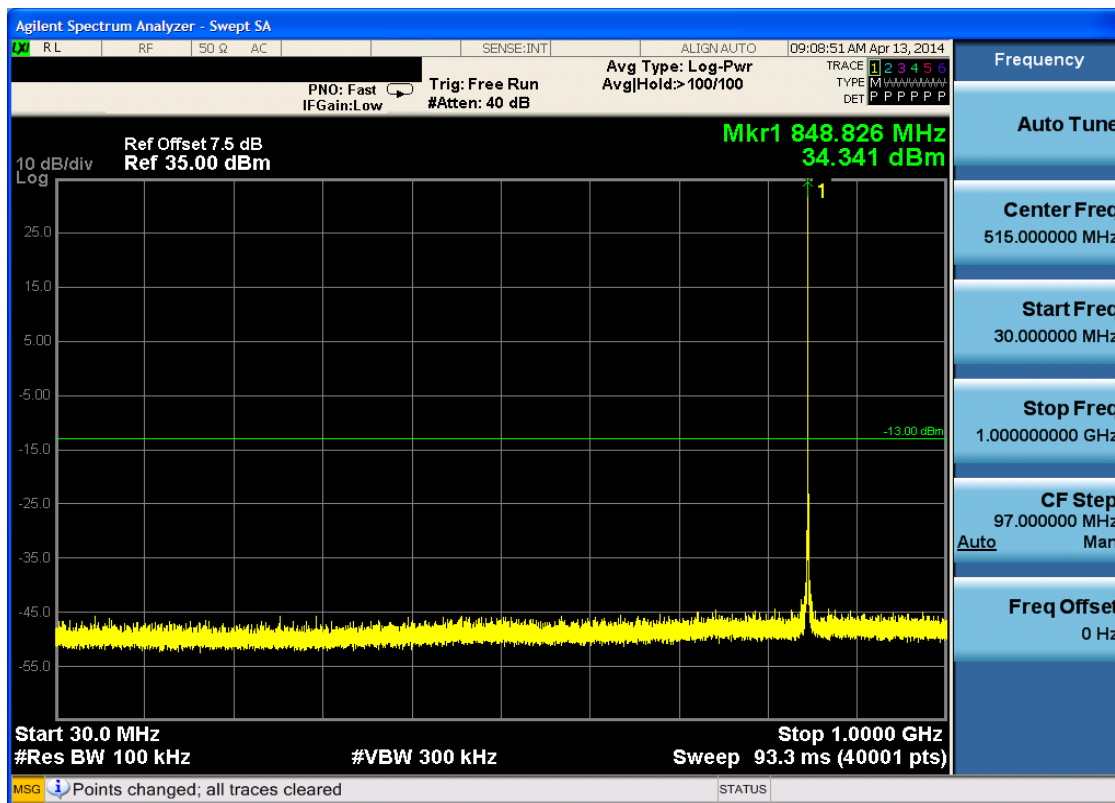


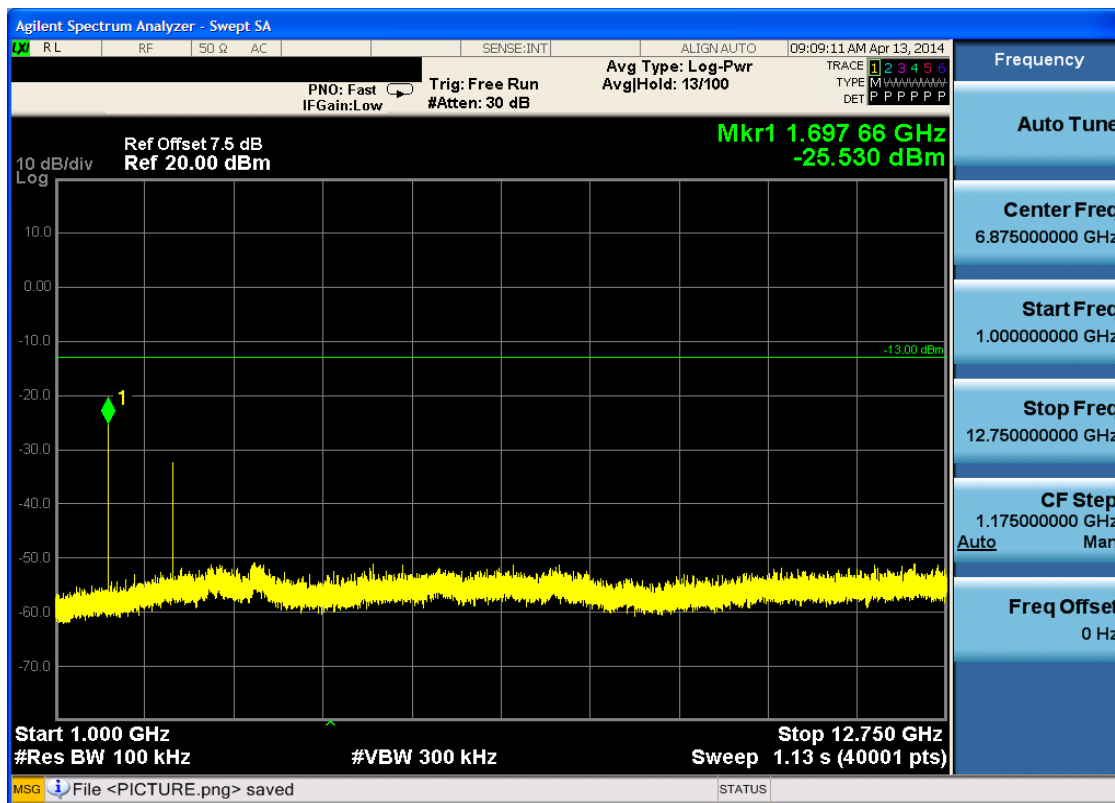


6.1.1.1.3 Test Channel = HCH



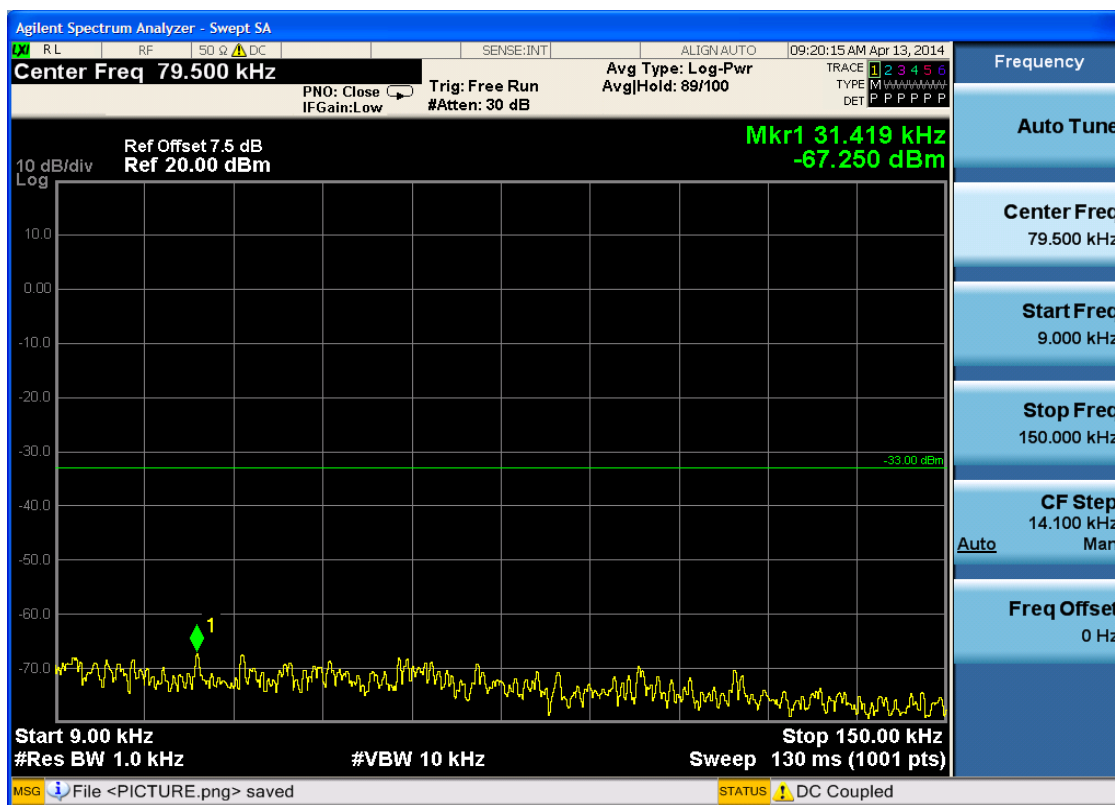


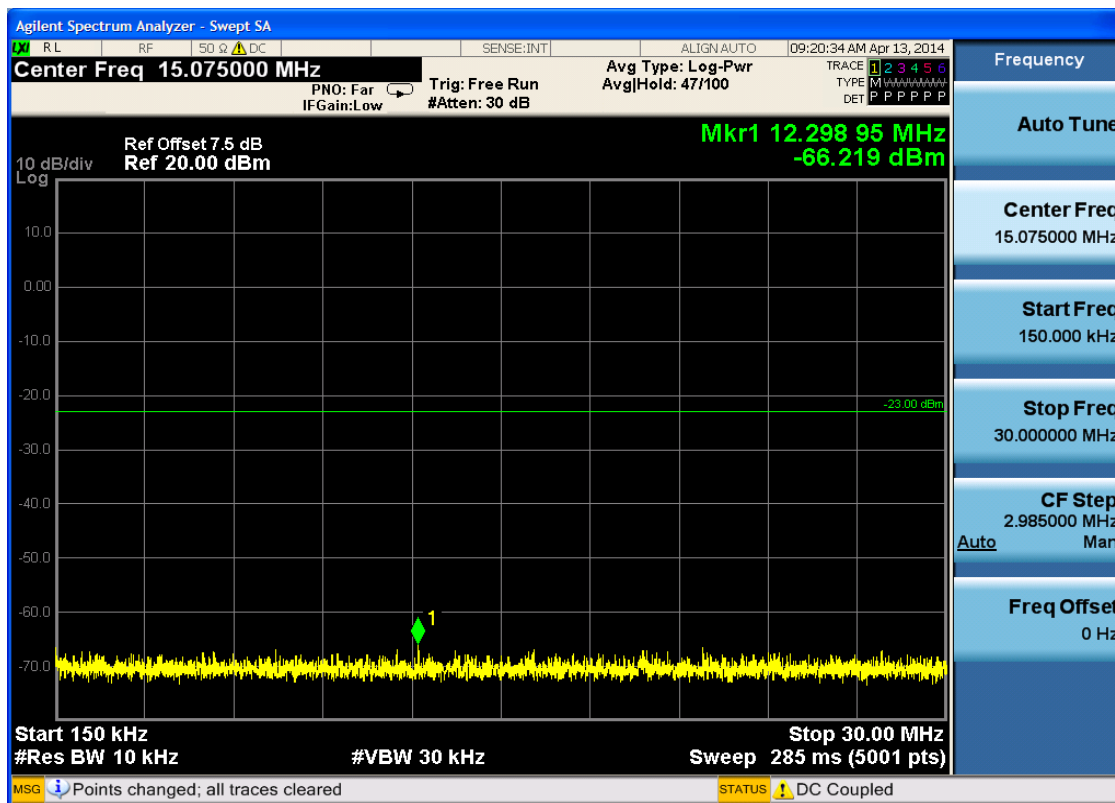


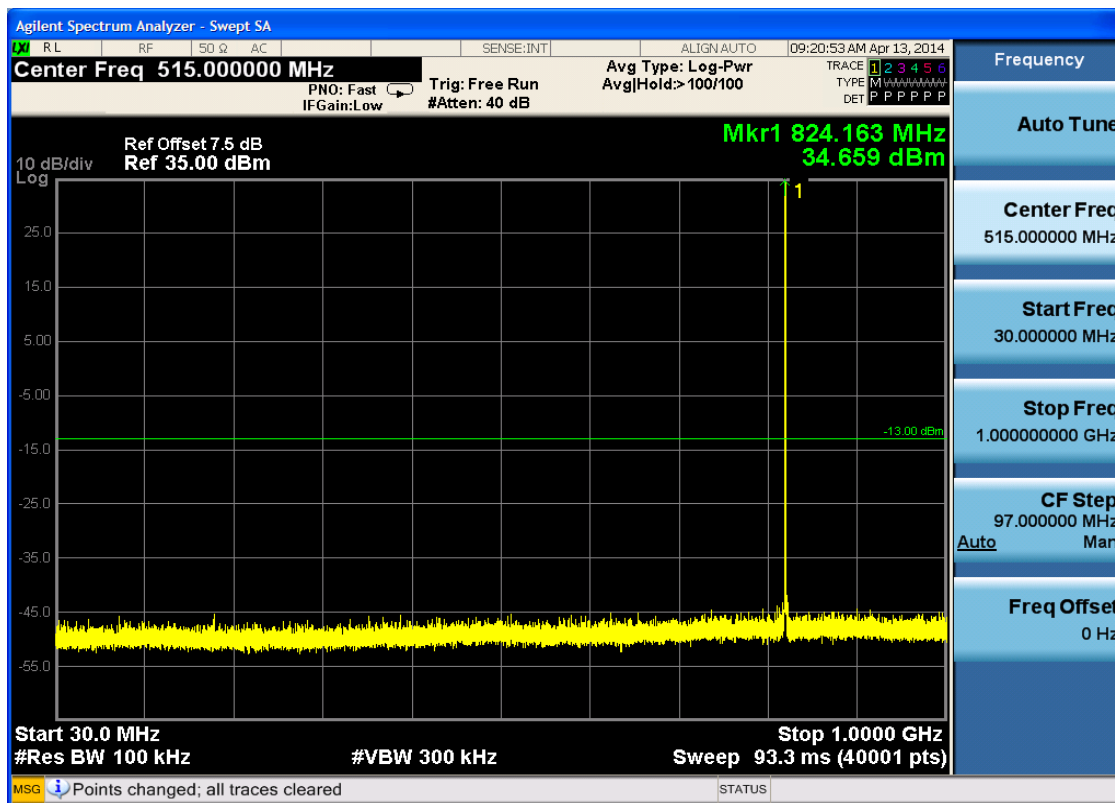


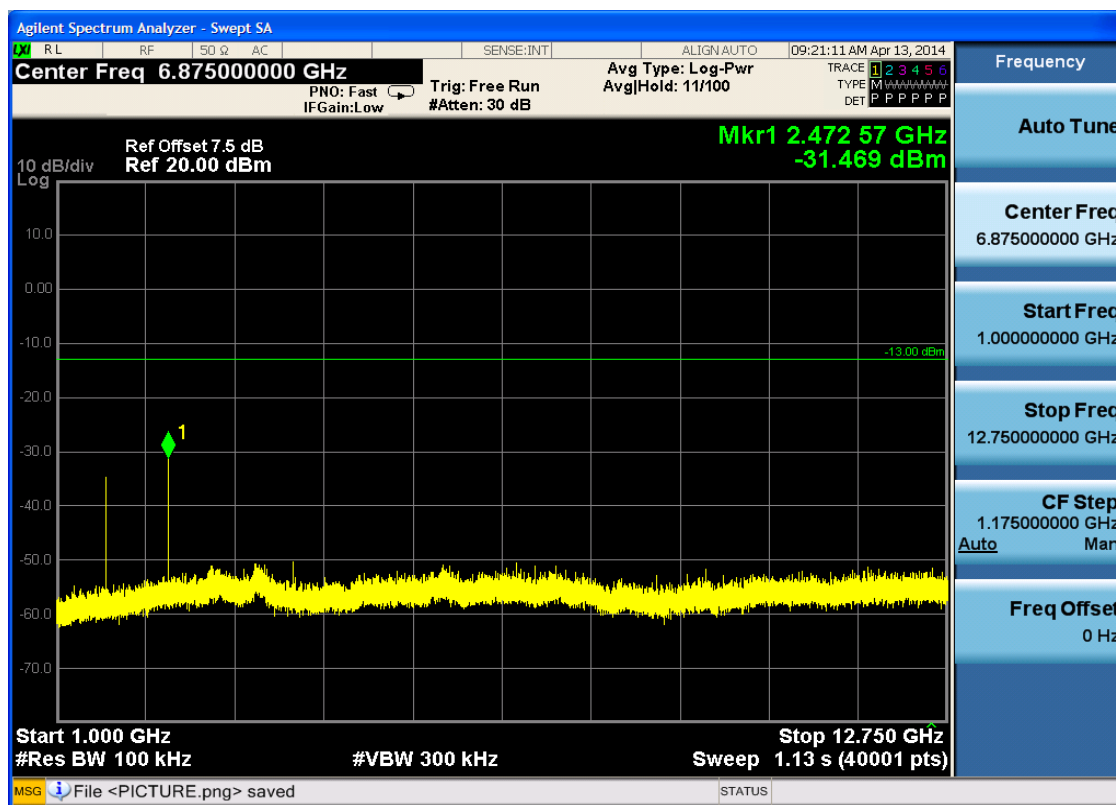
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH











Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω DC SENSE:INT ALIGN:AUTO 09:21:31 AM Apr 13, 2014

Center Freq 79.500 kHz

PNO: Close Trig: Free Run Avg Type: Log-Pwr
IFGain:Low #Atten: 30 dB AvgHold: 89/100

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

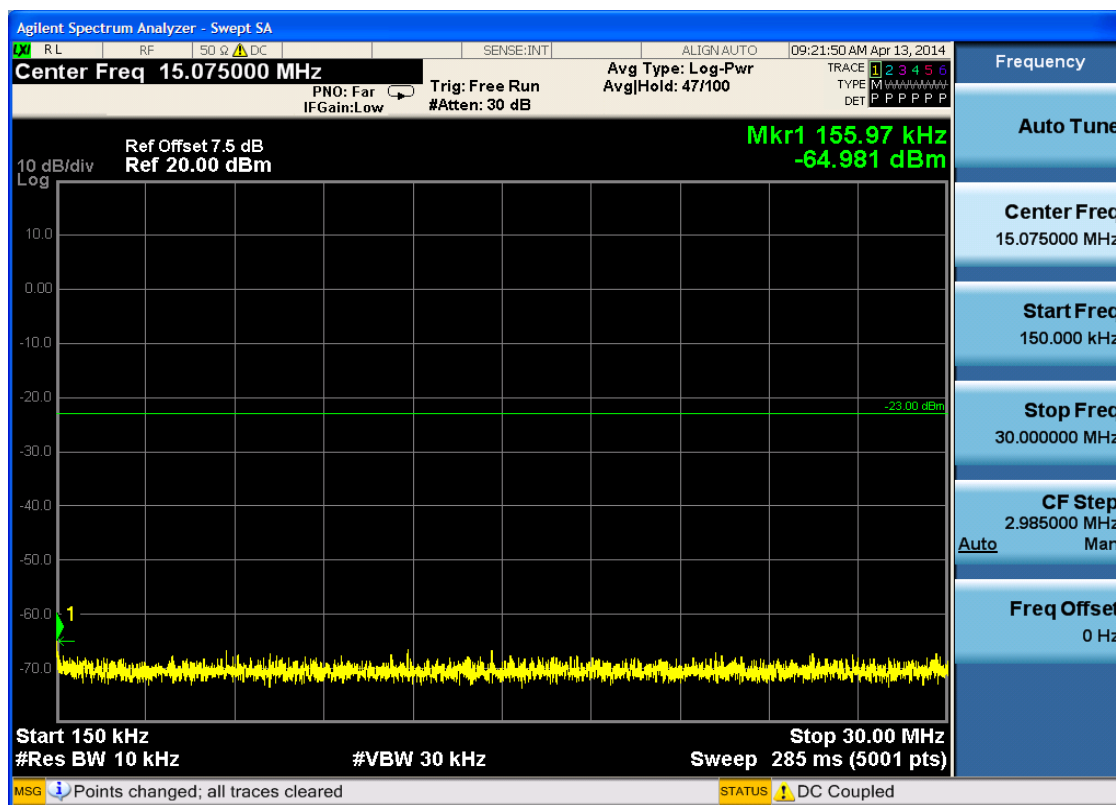
Ref Offset 7.5 dB Mkr1 74.142 kHz
Ref 20.00 dBm -66.903 dBm

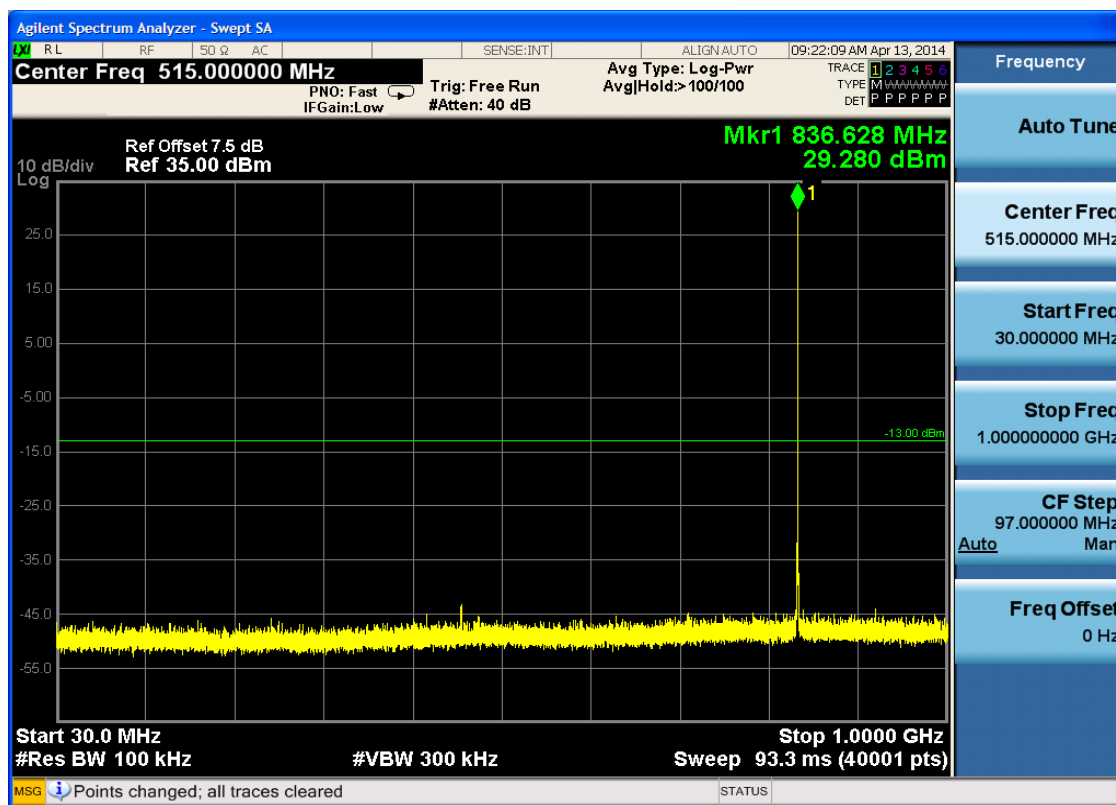
10 dB/div Log

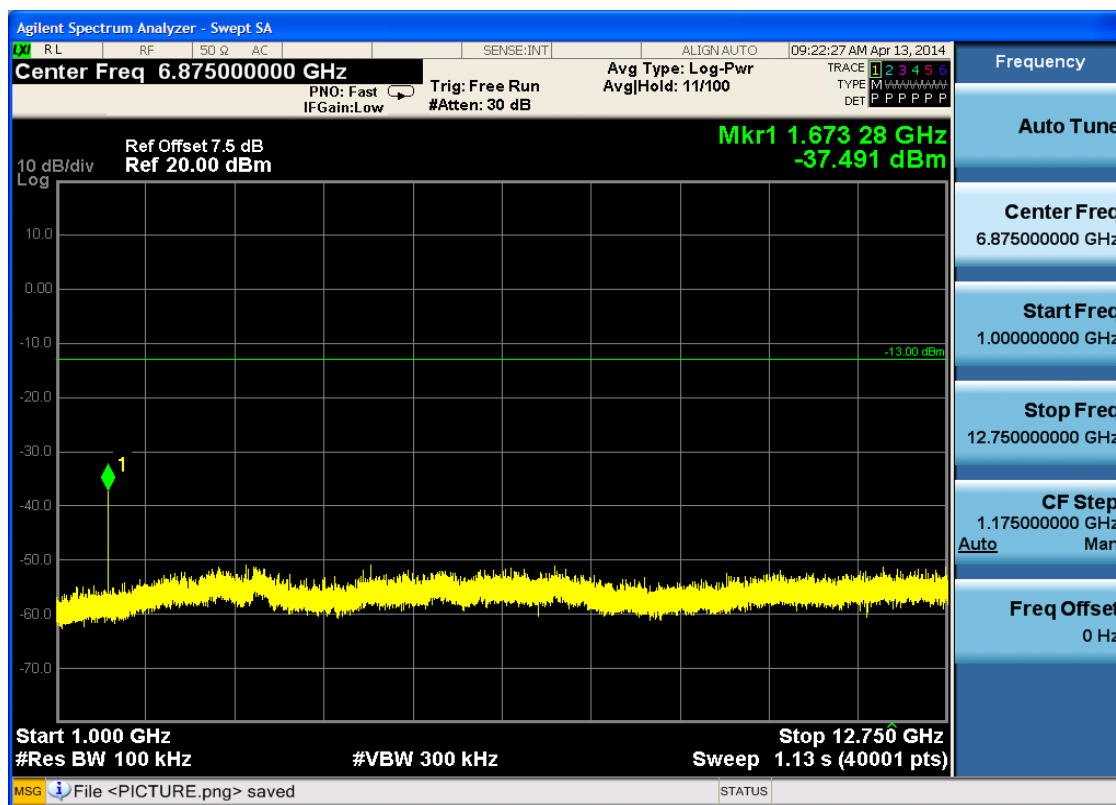
Start 9.00 kHz Stop 150.00 kHz
#Res BW 1.0 kHz #VBW 10 kHz Sweep 130 ms (1001 pts)

MSG Points changed; all traces cleared STATUS DC Coupled

The screenshot displays a spectrum analyzer interface. The main plot area shows a noisy signal in yellow, centered around 79.500 kHz. A green horizontal line is drawn at -33.00 dBm. A green diamond marker labeled '1' is positioned at 74.142 kHz with a power level of -66.903 dBm. The y-axis is labeled '10 dB/div Log' and ranges from -70.0 to 10.0. The x-axis represents frequency from 9.00 kHz to 150.00 kHz. The top status bar includes various settings like 'RL', 'RF', '50 Ω ', 'DC', 'SENSE:INT', 'ALIGN:AUTO', and the date/time '09:21:31 AM Apr 13, 2014'. The right sidebar shows settings for 'Frequency', 'Auto Tune', 'Center Freq', 'Start Freq', 'Stop Freq', 'CF Step', 'Auto', and 'Freq Offset'. The bottom status bar shows a message 'Points changed; all traces cleared' and a 'STATUS' indicator with 'DC Coupled'.









Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω DC SENSE:INT ALIGN:AUTO 09:22:47 AM Apr 13, 2014

Center Freq 79.500 kHz

PNO: Close Trig: Free Run Avg Type: Log-Pwr
IFGain:Low #Atten: 30 dB AvgHold: 90/100

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

Ref Offset 7.5 dB Mkr1 88.947 kHz
Ref 20.00 dBm -67.618 dBm

10 dB/div Log

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

MSG Points changed; all traces cleared STATUS DC Coupled

Frequency

Auto Tune

Center Freq 79.500 kHz

Start Freq 9.000 kHz

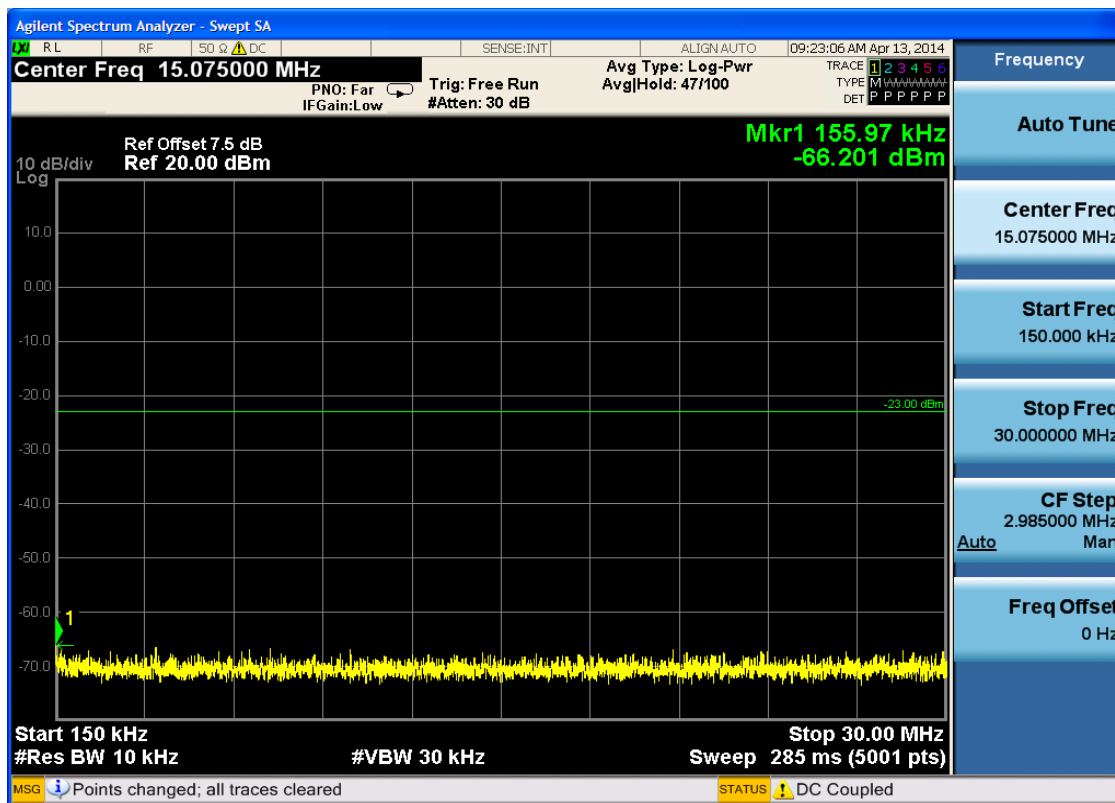
Stop Freq 150.000 kHz

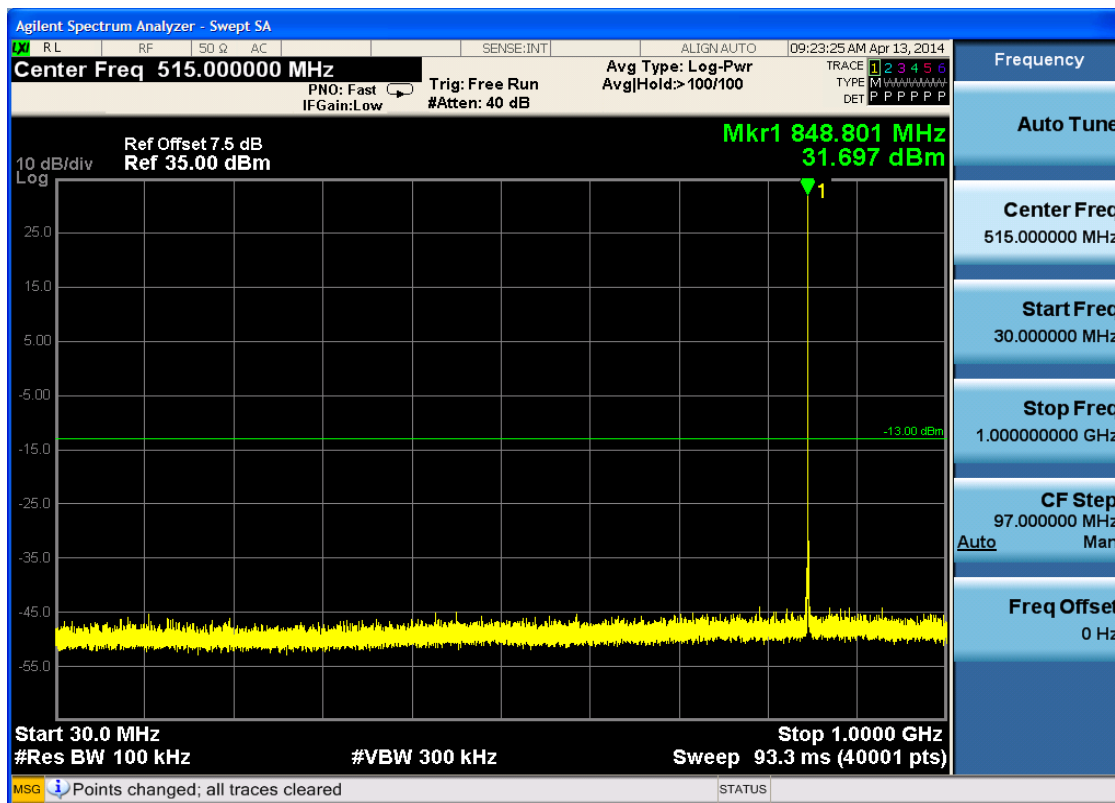
CF Step 14.100 kHz

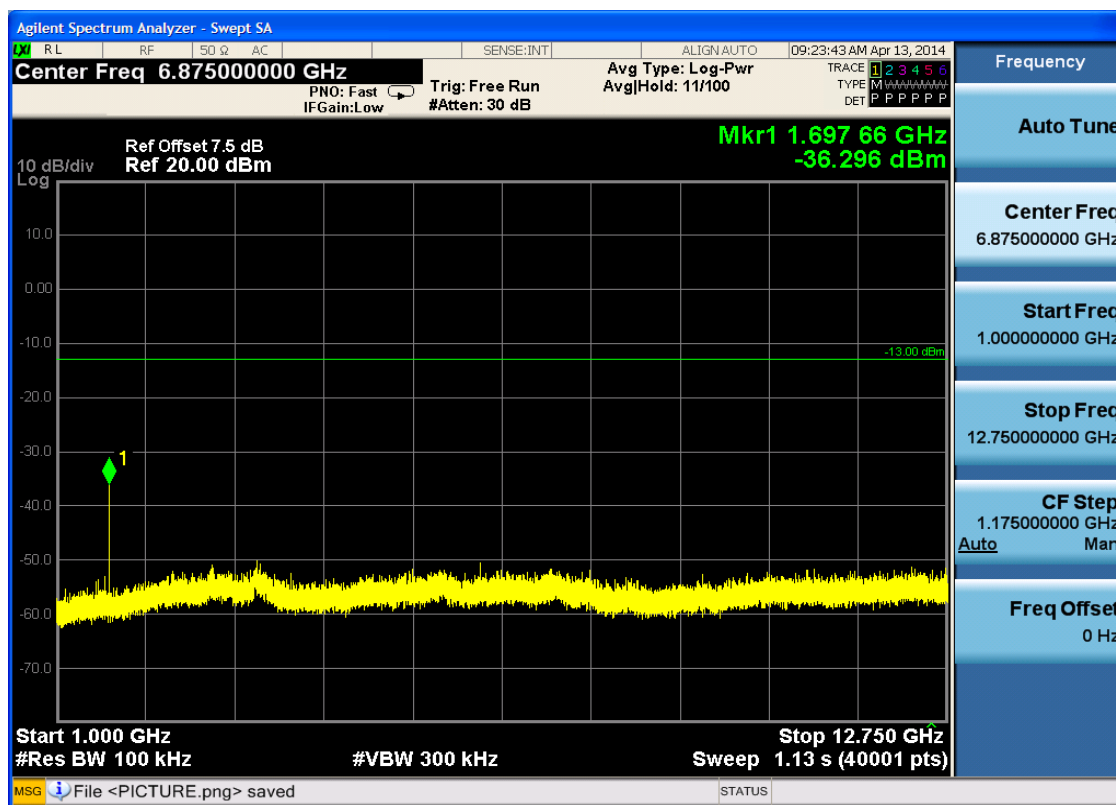
Auto

Freq Offset 0 Hz

The screenshot displays a spectrum analyzer interface. The main plot area shows a noisy signal centered around 79.500 kHz. A green horizontal line is drawn at -33.00 dBm. A yellow marker labeled '1' is positioned at 88.947 kHz with a level of -67.618 dBm. The plot has a grid with a vertical scale from -70.0 to 10.0 dBm and a horizontal scale from 9.00 to 150.00 kHz. The top status bar includes various settings like 'RL', 'RF', '50 Ω ', 'DC', 'SENSE:INT', 'ALIGN:AUTO', and the date/time '09:22:47 AM Apr 13, 2014'. The right sidebar contains controls for 'Frequency', 'Auto Tune', 'Center Freq', 'Start Freq', 'Stop Freq', 'CF Step', 'Auto', and 'Freq Offset'.





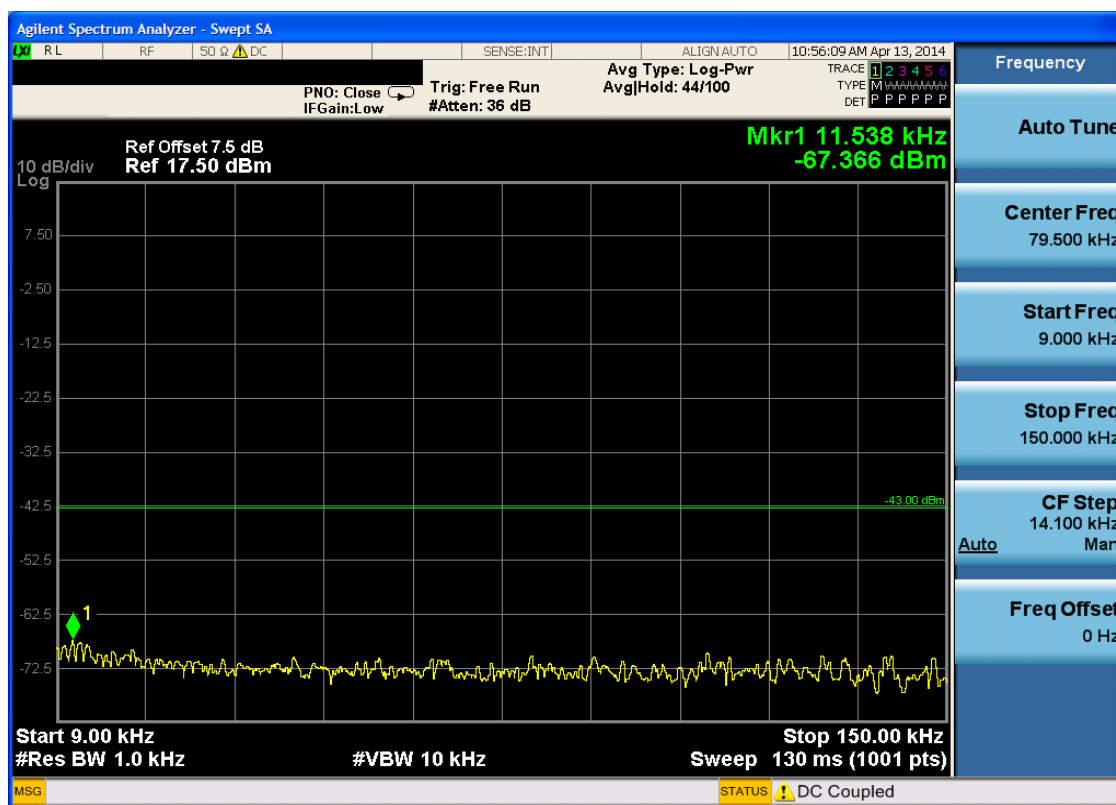


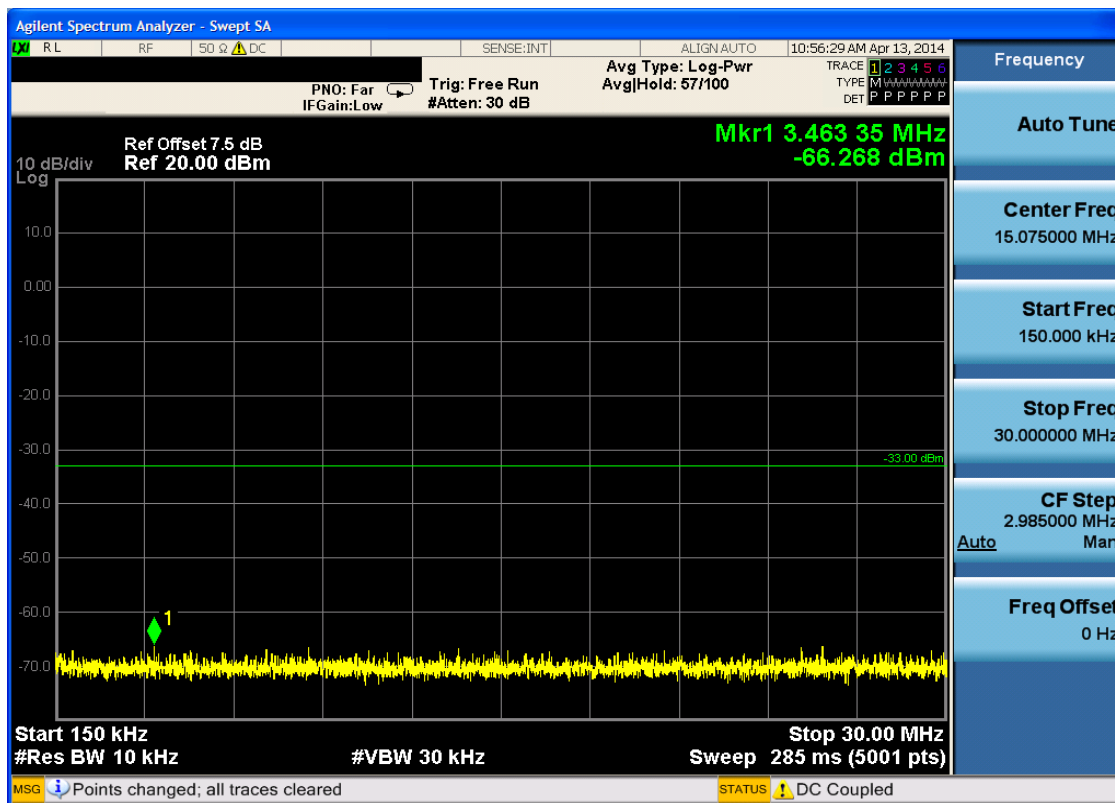


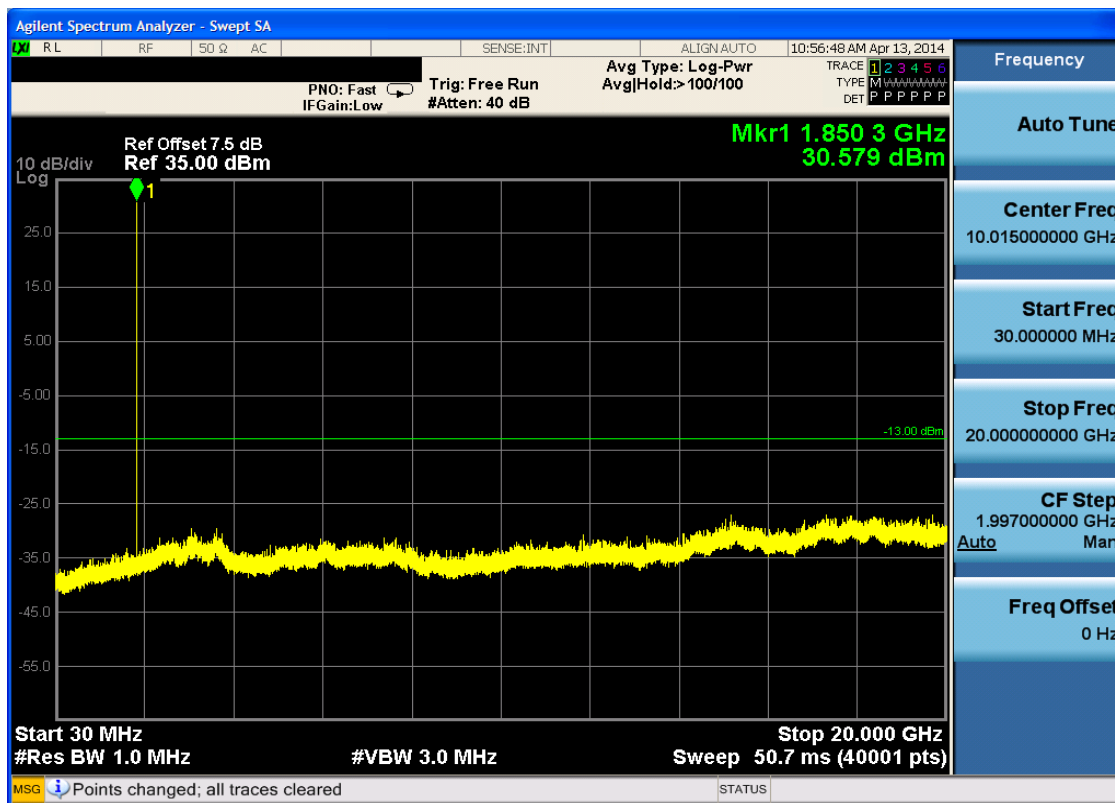
6.1.2 Test Band = GSM1900

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 10:57:09 AM Apr 13, 2014

PNO: Close IFGain:Low Trig: Free Run Avg Type: Log-Pwr
#Atten: 36 dB AvgHld: 61/100

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

Ref Offset 7.5 dB
Ref 17.50 dBm

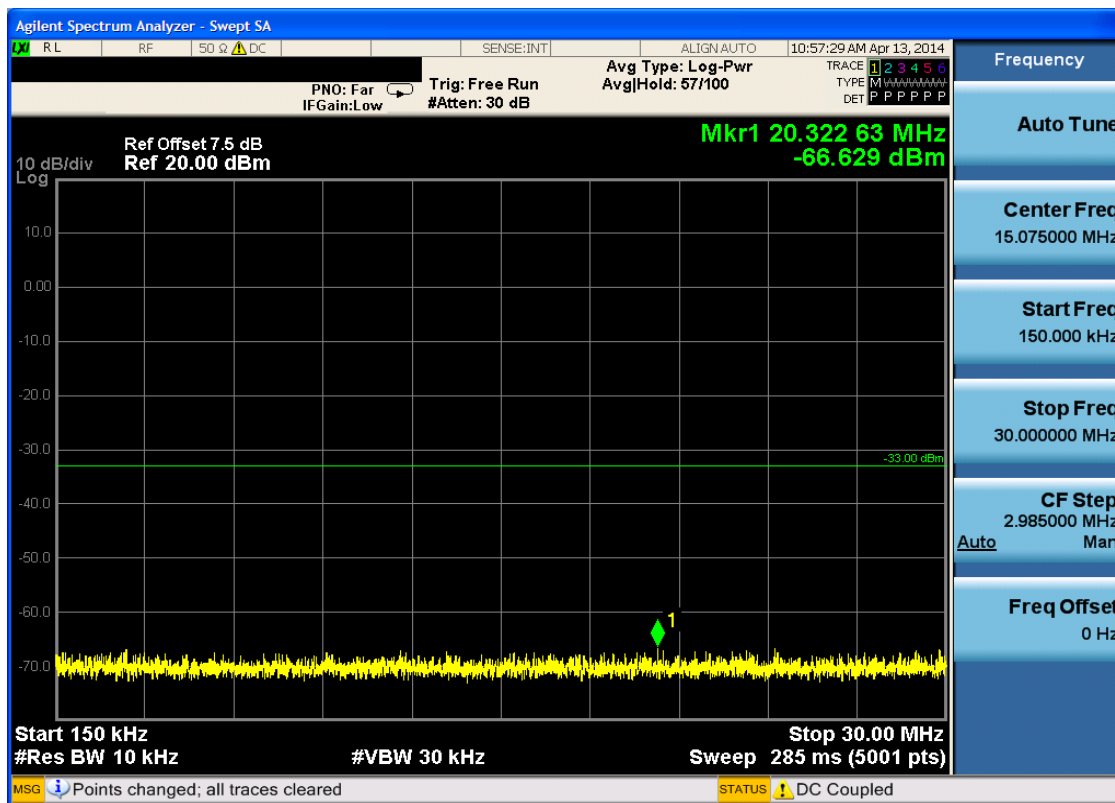
Mkr1 17.178 kHz
-66.256 dBm

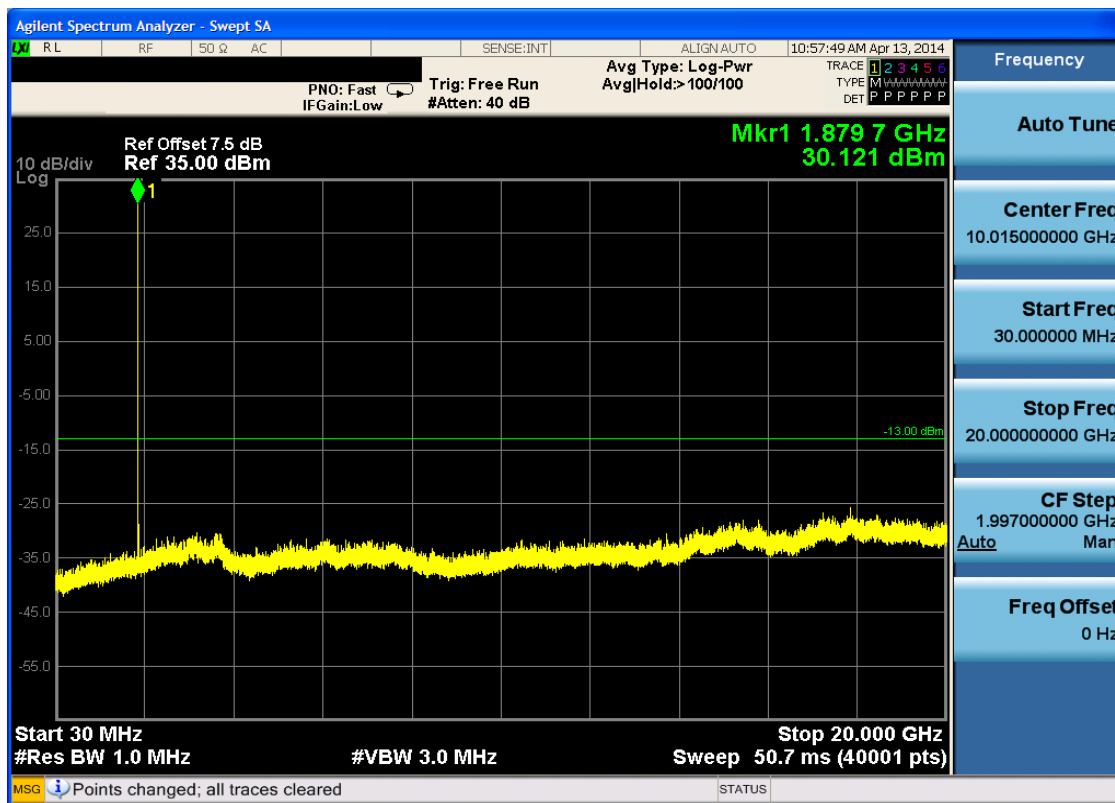
10 dB/div
Log

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

Frequency
Auto Tune
Center Freq 79.500 kHz
Start Freq 9.000 kHz
Stop Freq 150.000 kHz
CF Step 14.100 kHz Man
Freq Offset 0 Hz

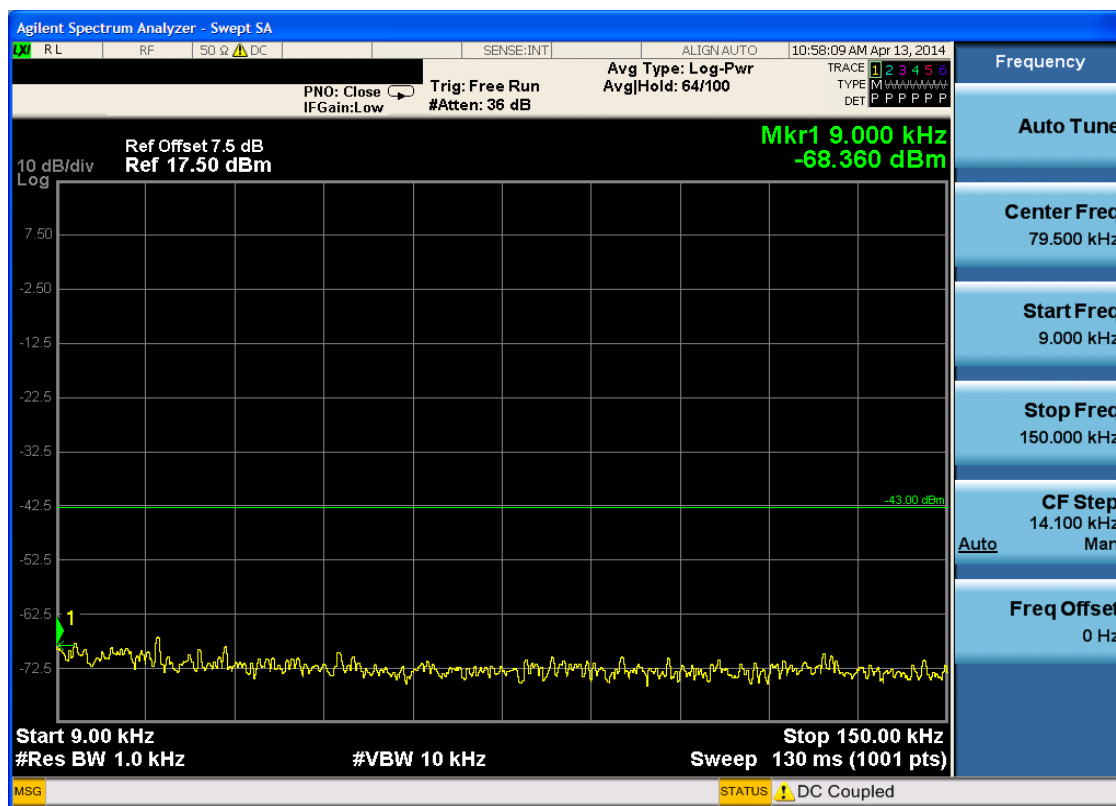
MSG STATUS ⚠ DC Coupled

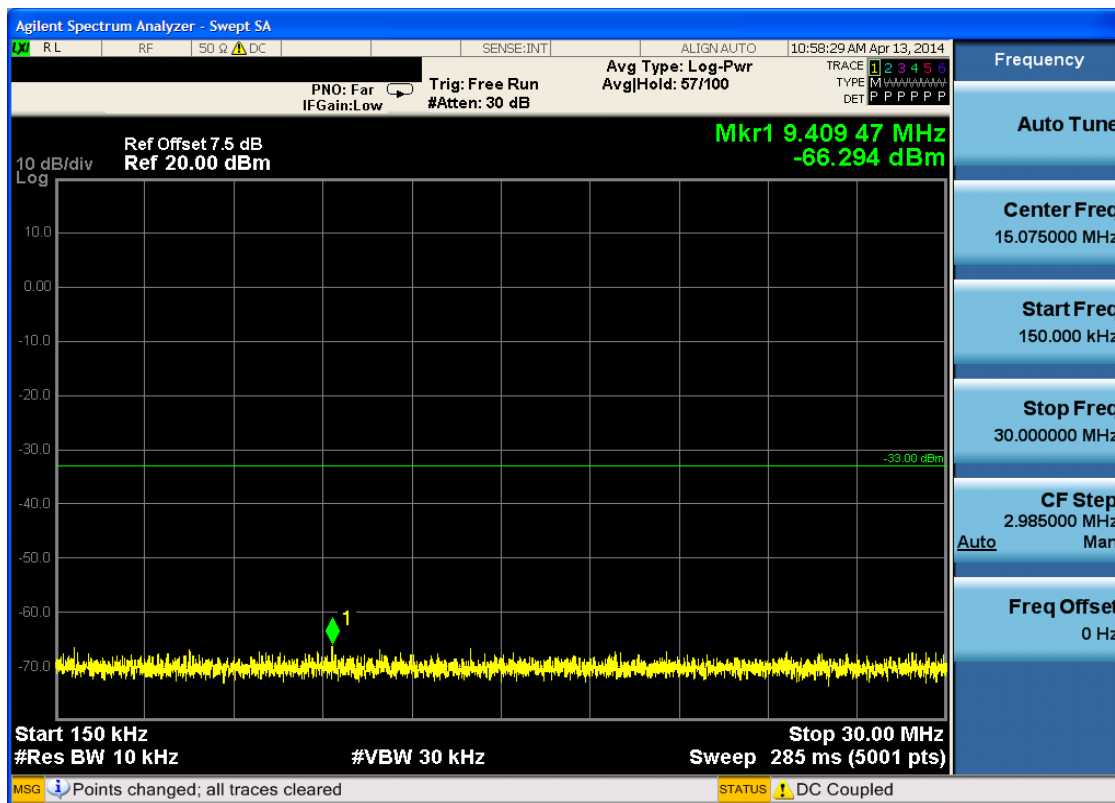


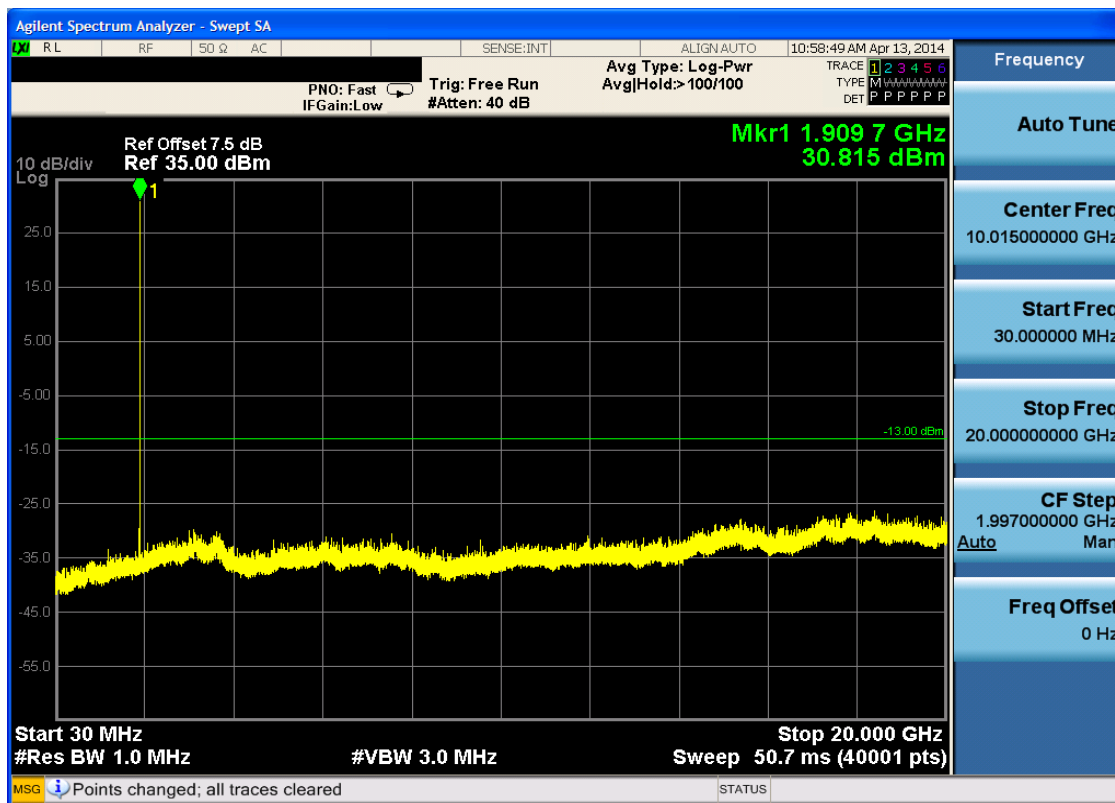




6.1.2.1.3 Test Channel = HCH

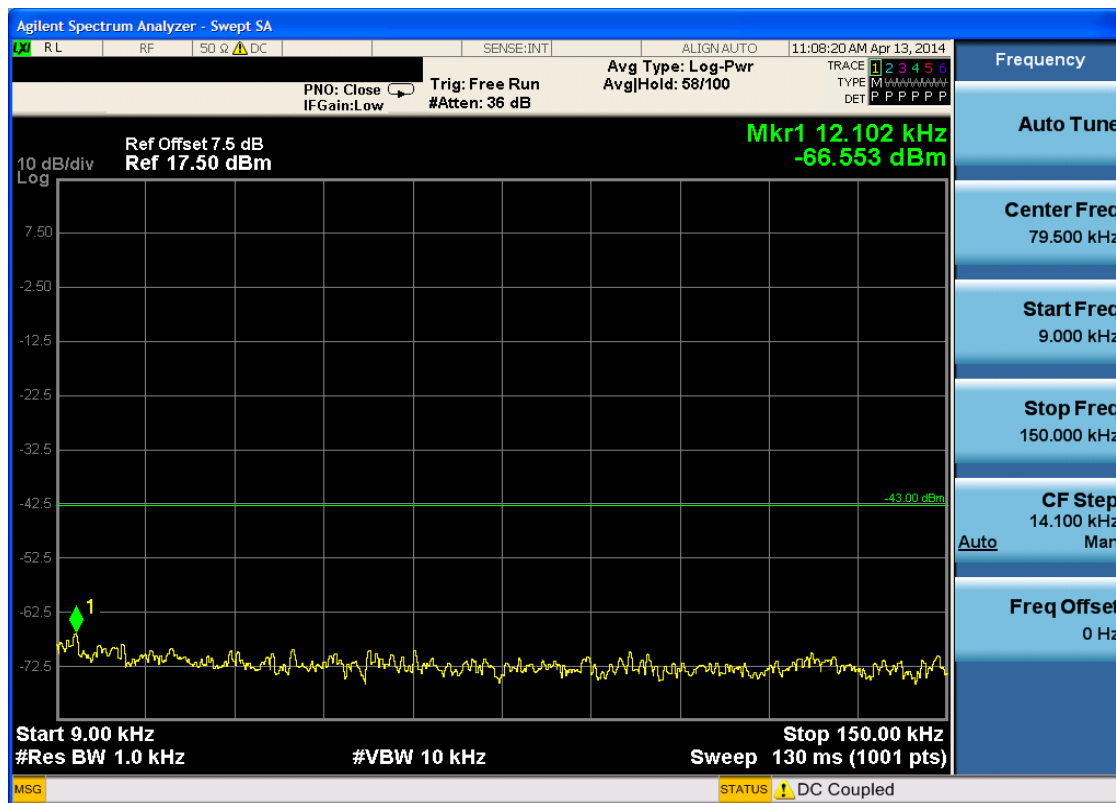


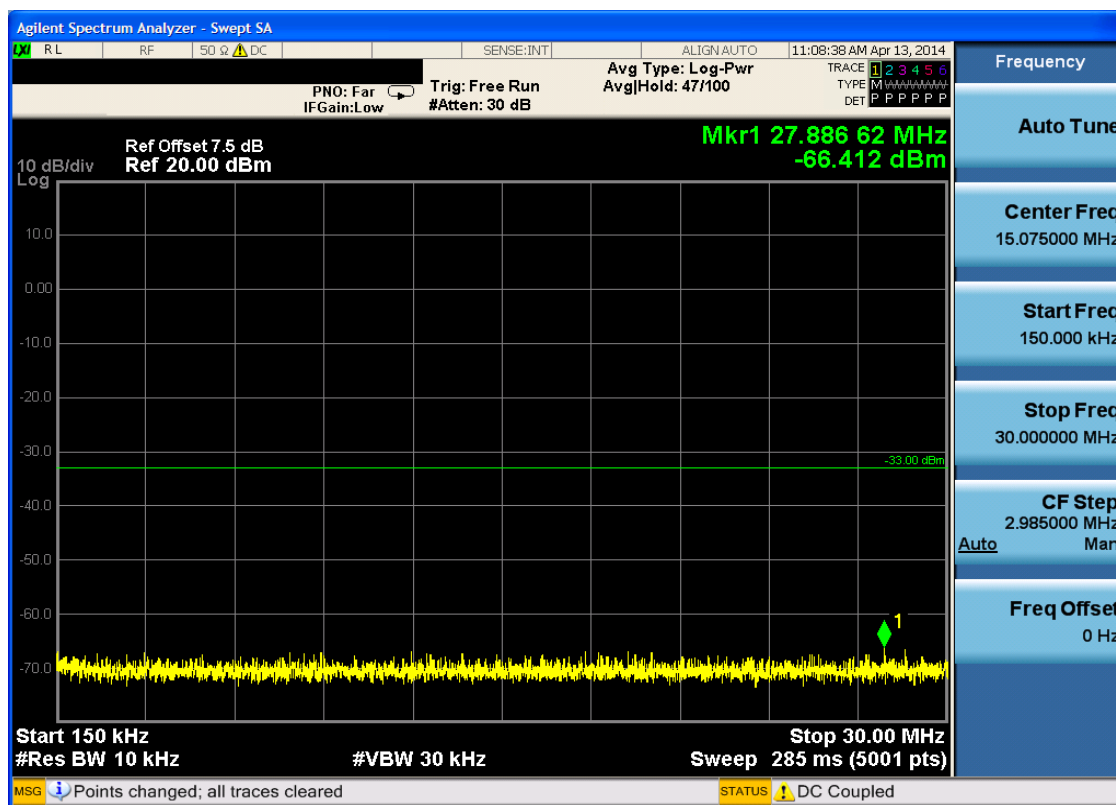


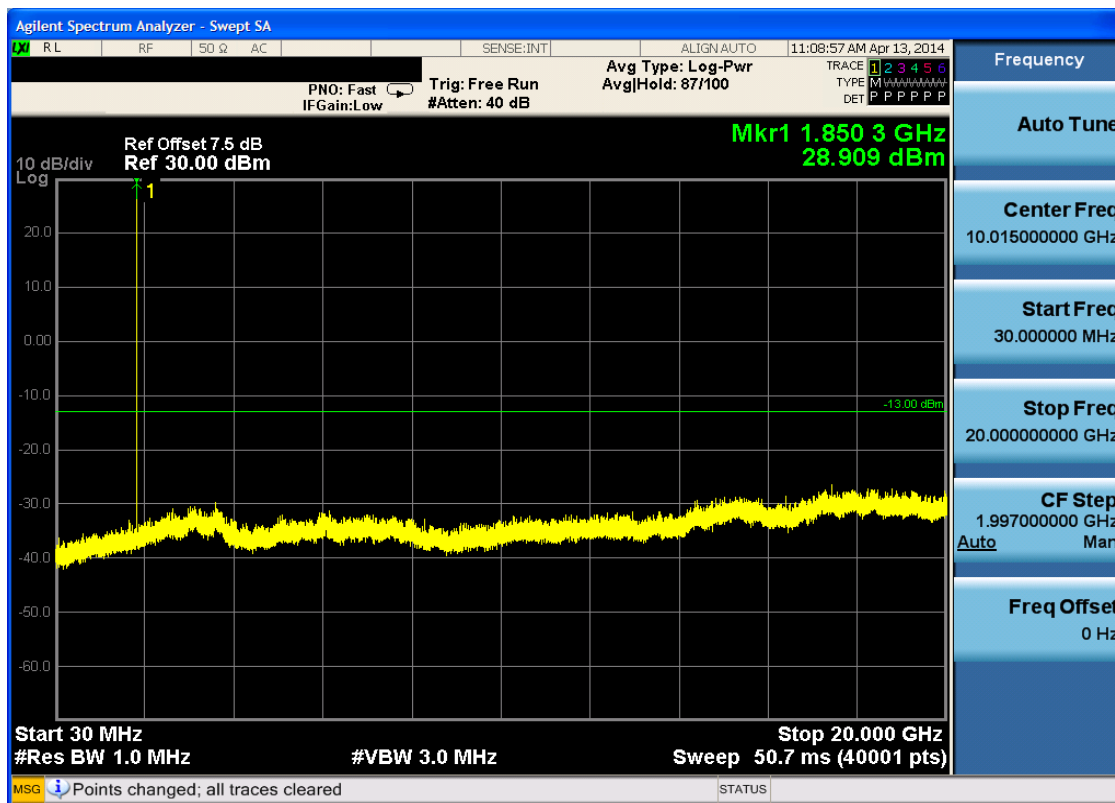


6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

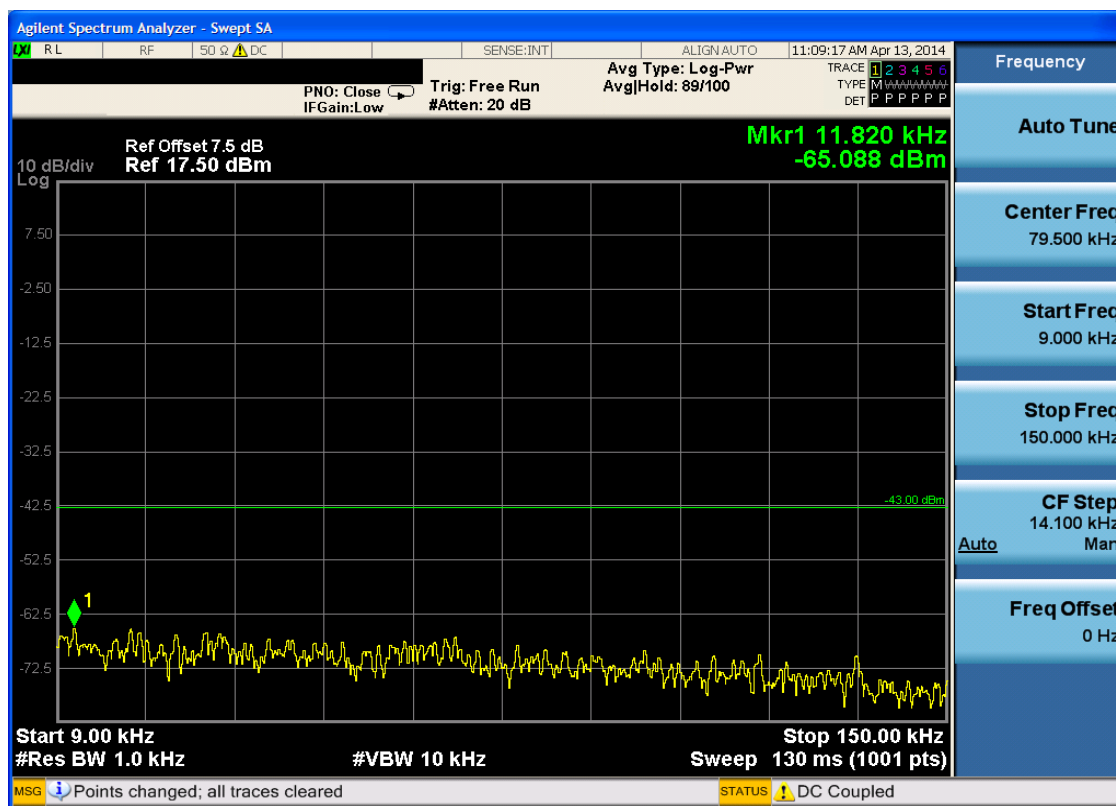


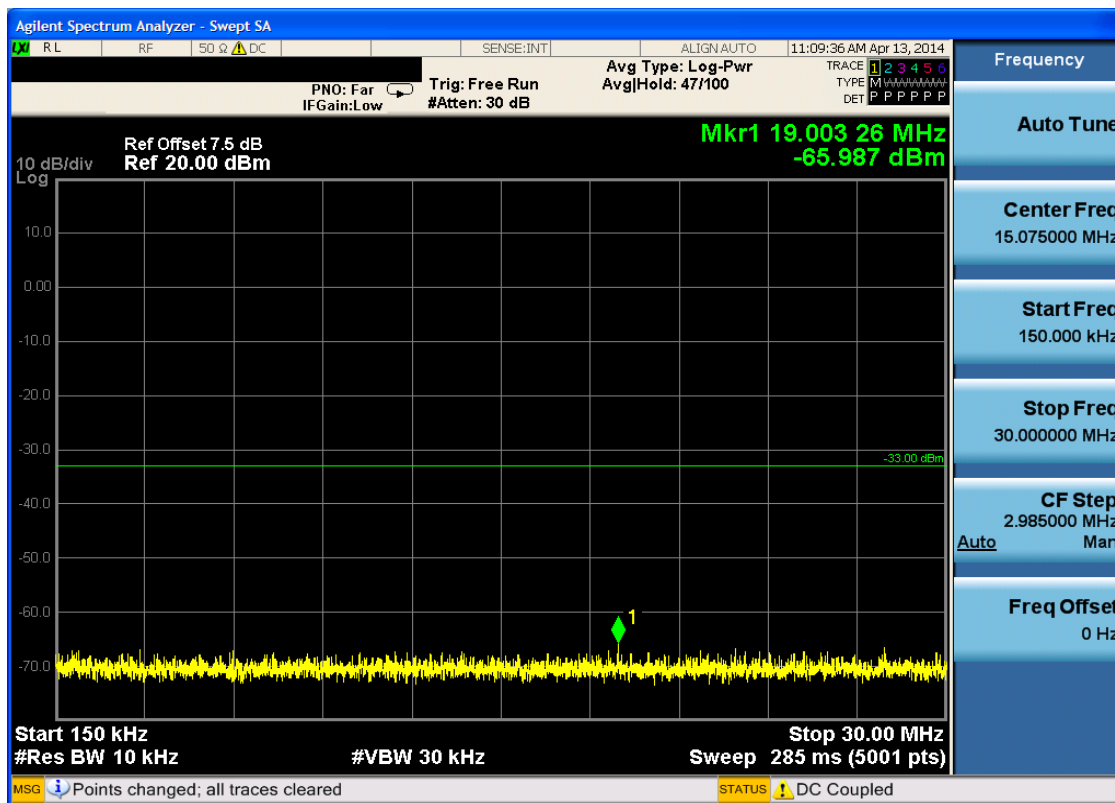


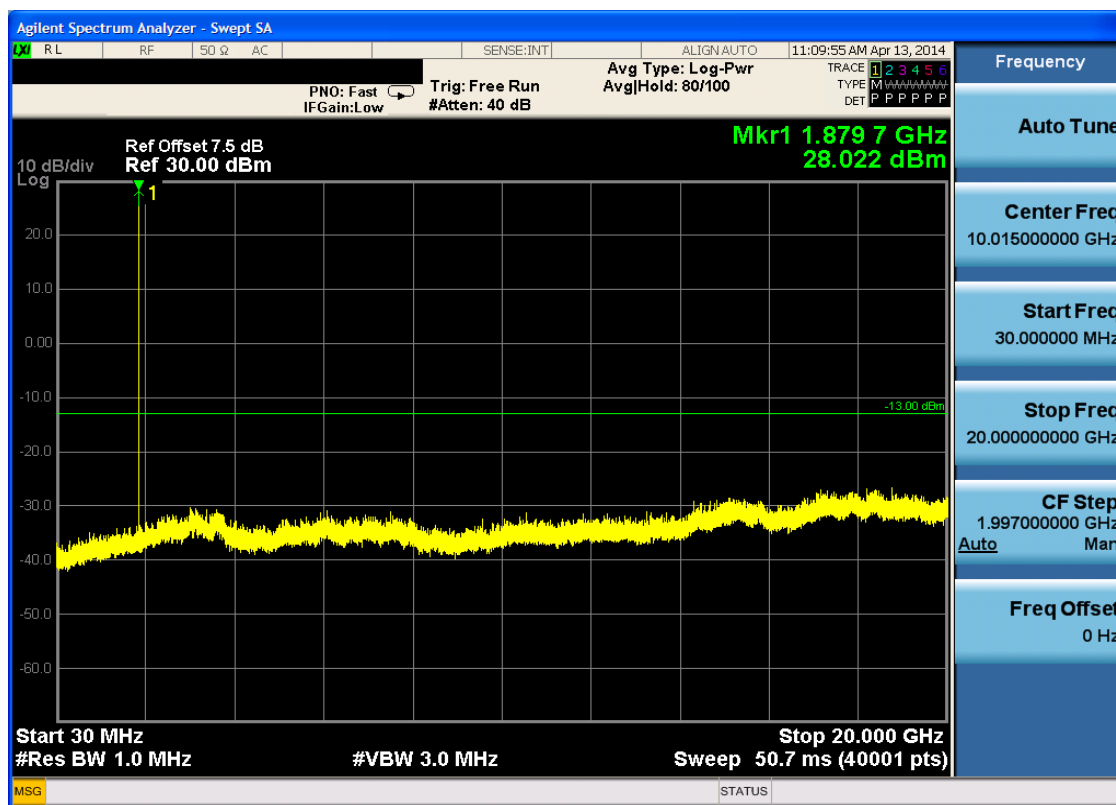




6.1.2.2.2 Test Channel = MCH

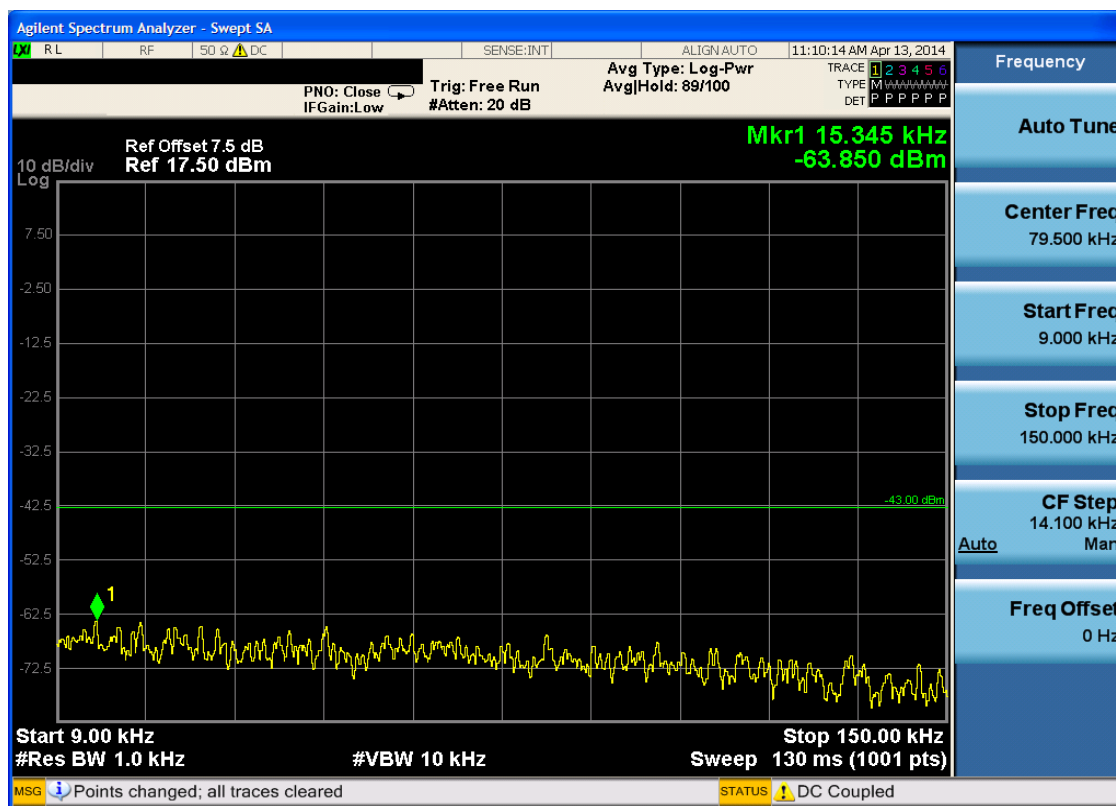


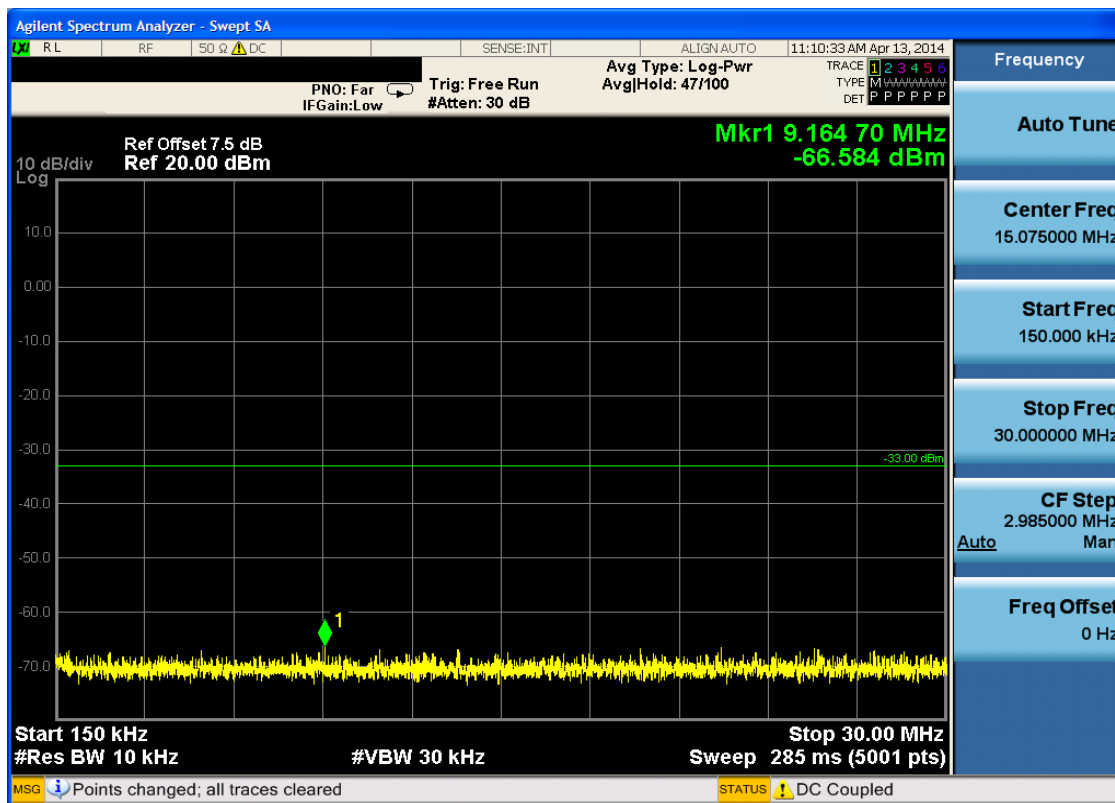


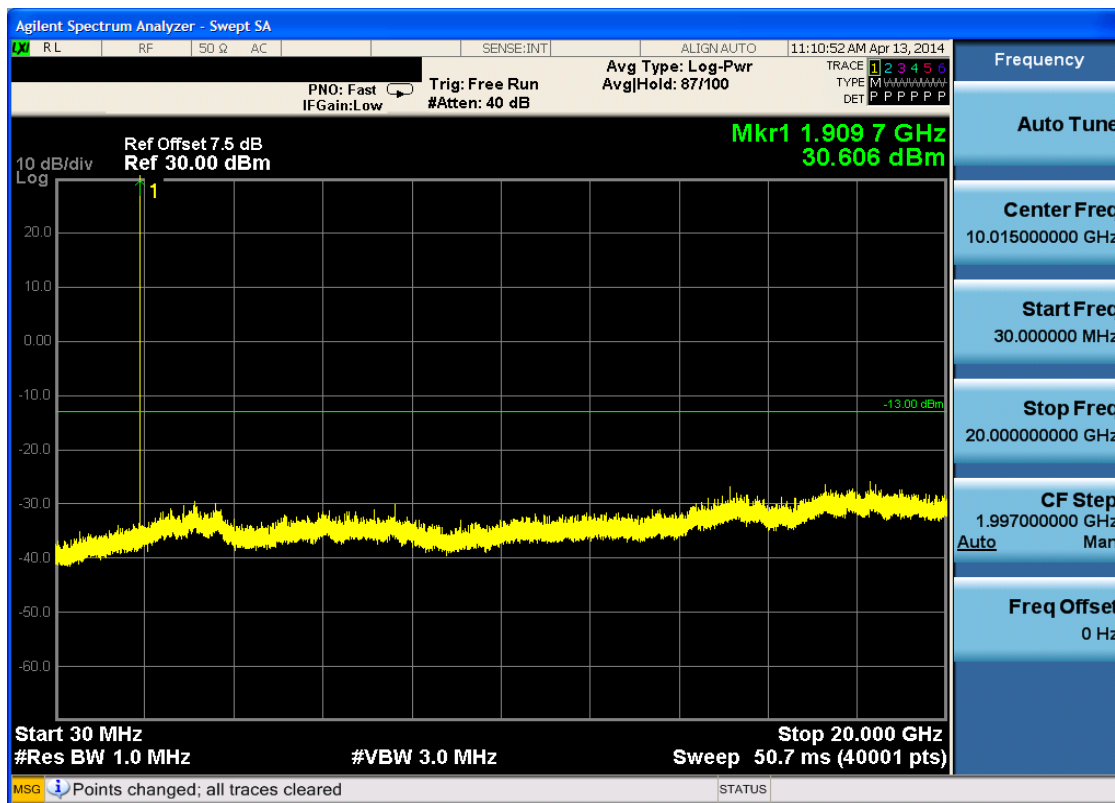




6.1.2.2.3 Test Channel = HCH







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

