



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	32.88	29.23	38.5	PASS
		MCH	32.98	29.33	38.5	PASS
		HCH	33.06	29.41	38.5	PASS
	GSM/TM2	LCH	26.77	23.12	38.5	PASS
		MCH	26.75	23.1	38.5	PASS
		HCH	26.78	23.13	38.5	PASS
WCDMA850	UMTS/TM1	LCH	22.67	19.02	38.5	PASS
		MCH	22.77	19.12	38.5	PASS
		HCH	22.77	19.12	38.5	PASS
Test Band	Test Mode	Test Channel	Conducted Power[dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	29.68	28.88	33	PASS
		MCH	29.61	28.81	33	PASS
		HCH	29.48	28.68	33	PASS
	GSM/TM2	LCH	25.39	24.59	33	PASS
		MCH	25.37	24.57	33	PASS
		HCH	25.29	24.49	33	PASS
WCDMA1900	UMTS/TM1	LCH	22.65	21.85	33	PASS
		MCH	22.78	21.98	33	PASS
		HCH	22.71	21.91	33	PASS
Test Band	Test Mode	Test Channel	Conducted Power[dBm]	EIRP [dBm]	Limit [dBm]	Verdict
WCDMA1700	UMTS/TM1	LCH	22.74	21.94	30	PASS
		MCH	22.54	21.74	30	PASS
		HCH	22.61	21.81	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,



$ERP [dBm] = SGP [dBm] - Cable Loss [dB] + Gain [dBd]$

$EIRP [dBm] = SGP [dBm] - Cable Loss [dB] + Gain [dBi]$

b, SGP=Signal Generator Level

Note2: $RBW > \text{emission bandwidth}$, $VBW > 3 \times RBW$.

Detector: RMS

2Appendix_B: Peak-to-Average Ratio

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
GSM850	GSM/TM1	LCH	0.23	13	PASS
		MCH	0.24	13	PASS
		HCH	0.25	13	PASS
	GSM/TM2	LCH	3.22	13	PASS
		MCH	3.18	13	PASS
		HCH	3.16	13	PASS
GSM1900	GSM/TM1	LCH	0.14	13	PASS
		MCH	0.16	13	PASS
		HCH	0.14	13	PASS
	GSM/TM2	LCH	3.09	13	PASS
		MCH	3.26	13	PASS
		HCH	3.12	13	PASS
Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA850	UMTS/TM1	LCH	2.91	13	PASS
		MCH	3.33	13	PASS
		HCH	3.39	13	PASS
WCDMA1900	UMTS/TM1	LCH	3.39	13	PASS
		MCH	3.45	13	PASS
		HCH	3.44	13	PASS
WCDMA1700	UMTS/TM1	LCH	3.3	13	PASS
		MCH	3.4	13	PASS
		HCH	3.07	13	PASS

3Appendix_C: Modulation Characteristics

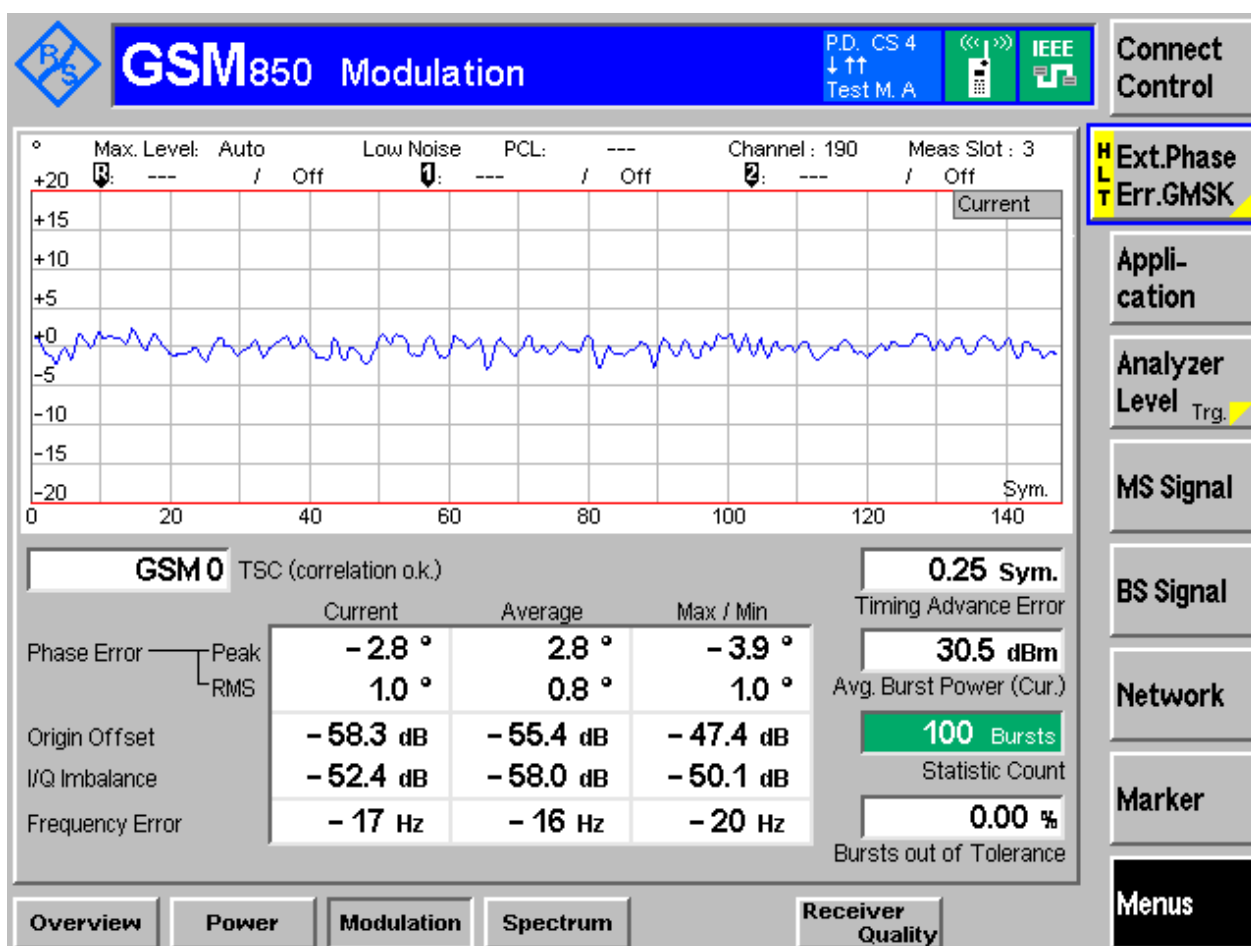
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

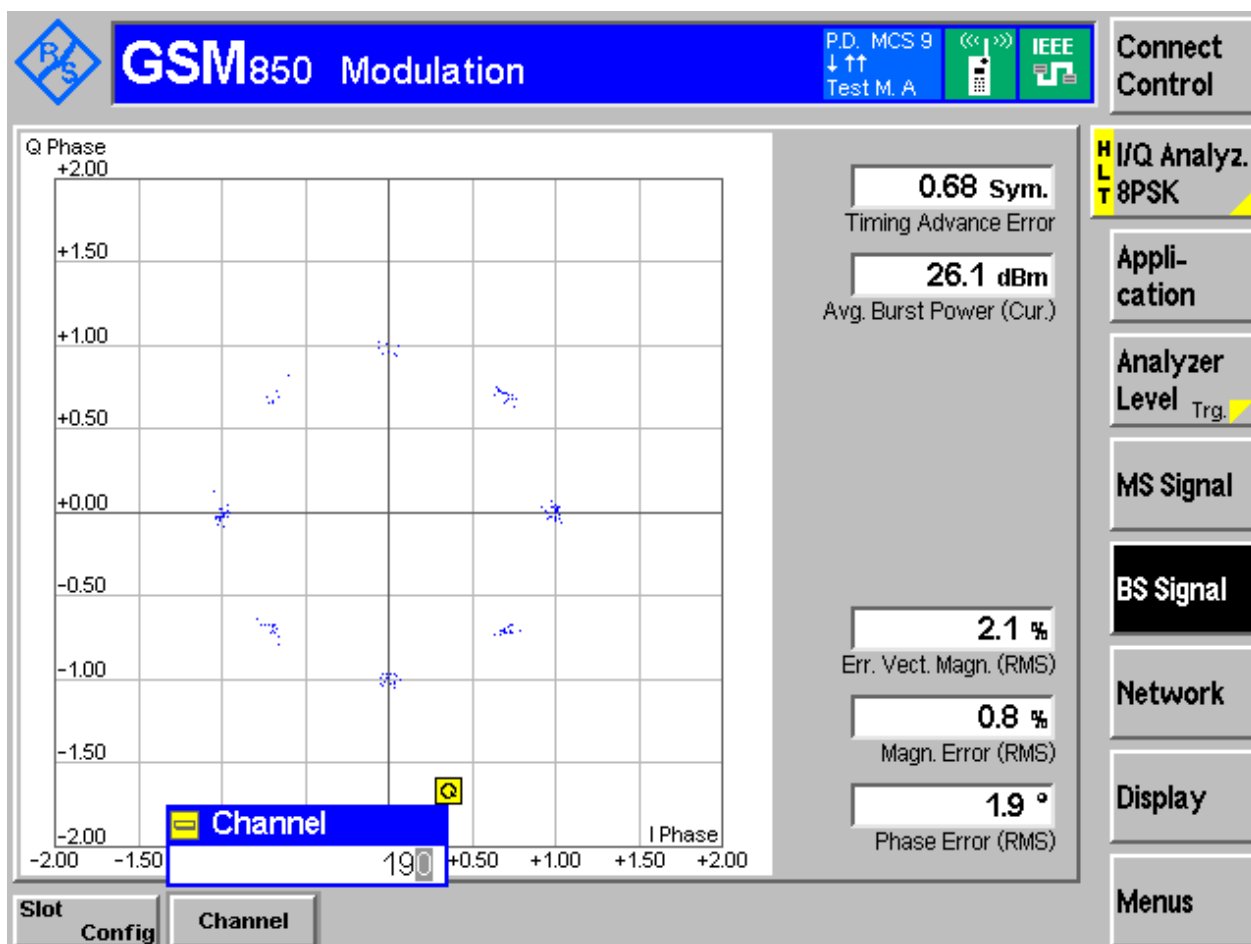
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

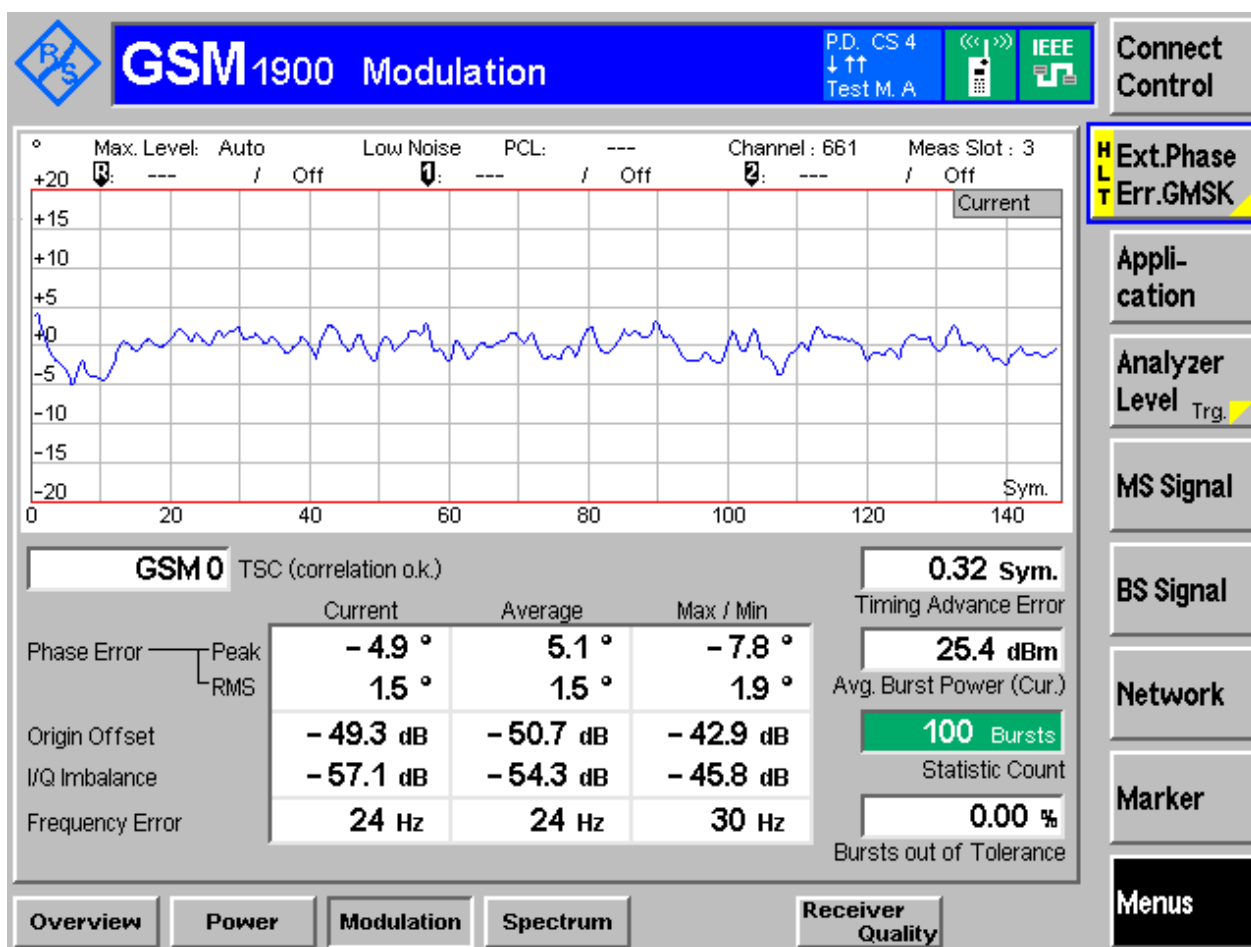
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

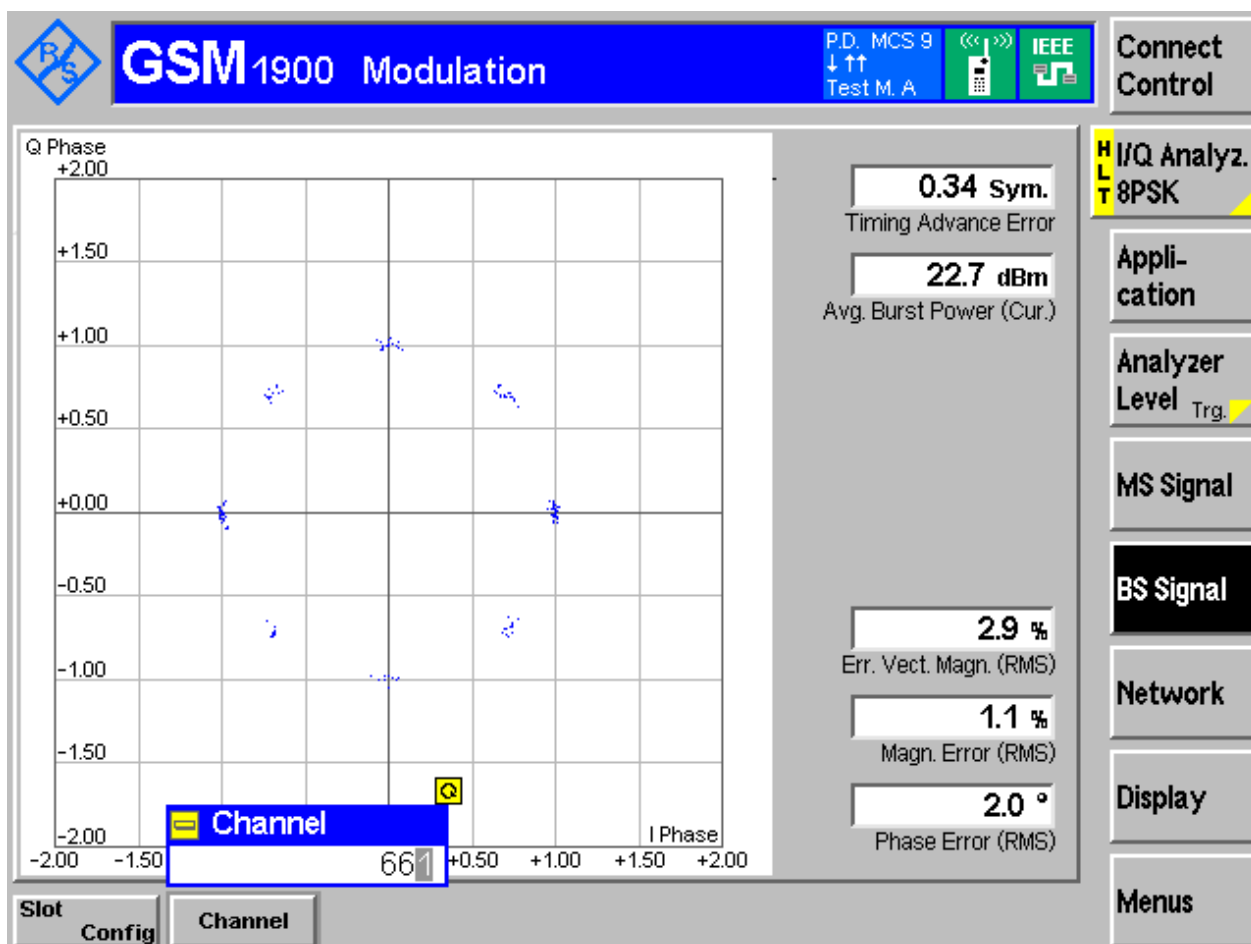
3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH



3.1.2.2 Test Mode = GSM/TM2

3.1.2.2.1 Test Channel = MCH

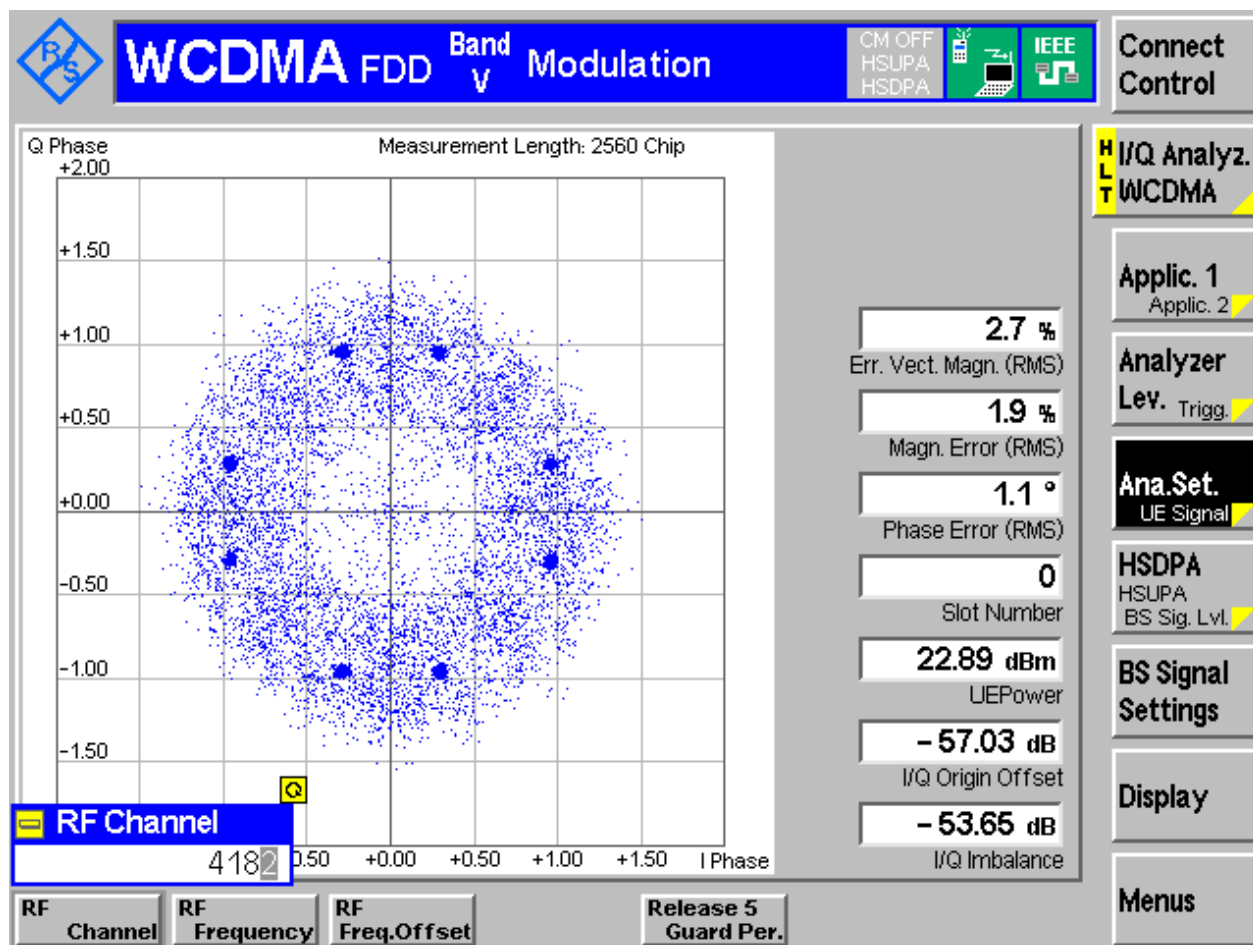


3.2 For UMTS

3.2.1 Test Band = WCDMA850

3.2.1.1 Test Mode = UMTS/TM1

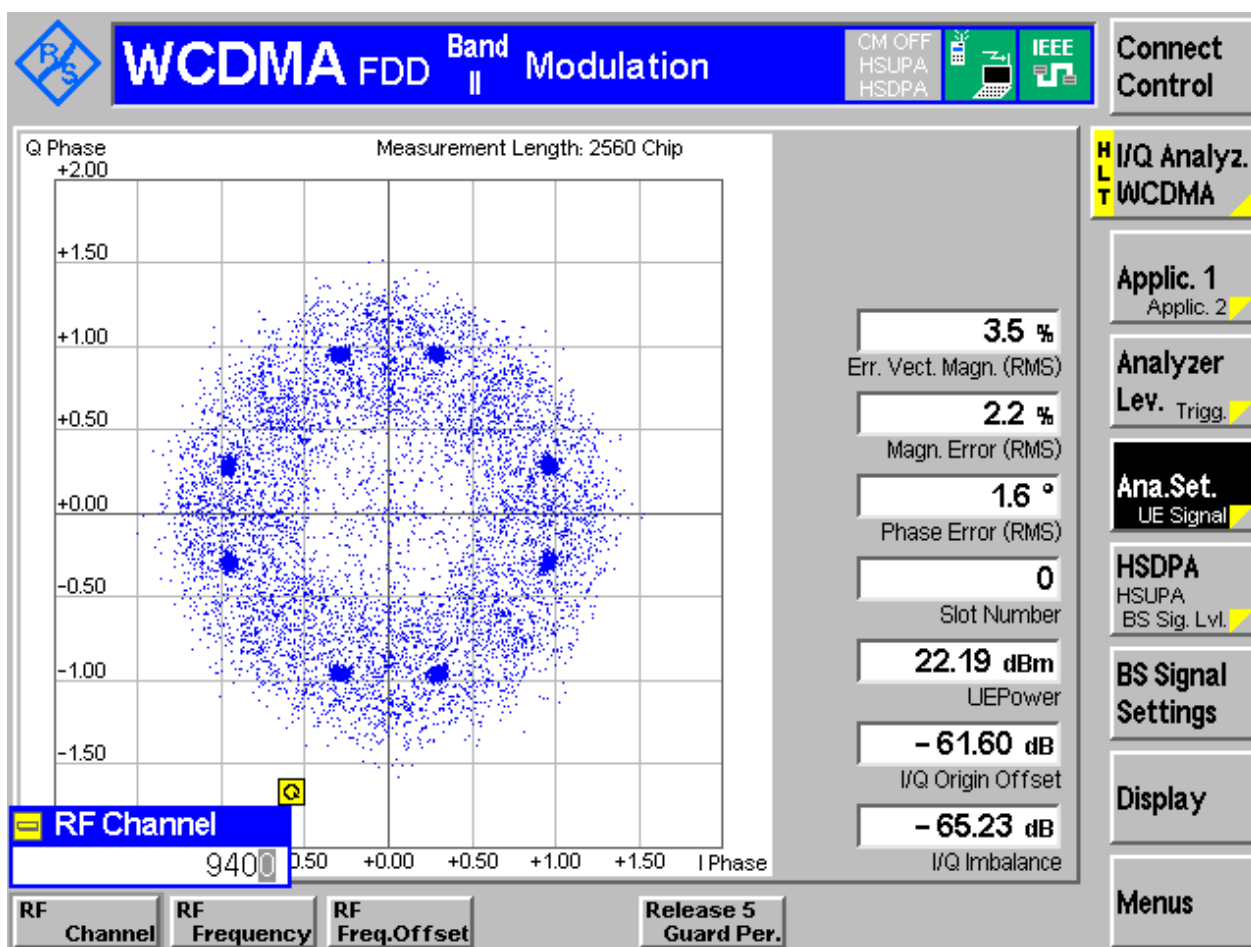
3.2.1.1.1 Test Channel = MCH



3.2.2 Test Band = WCDMA1900

3.2.2.1 Test Mode = UMTS/TM1

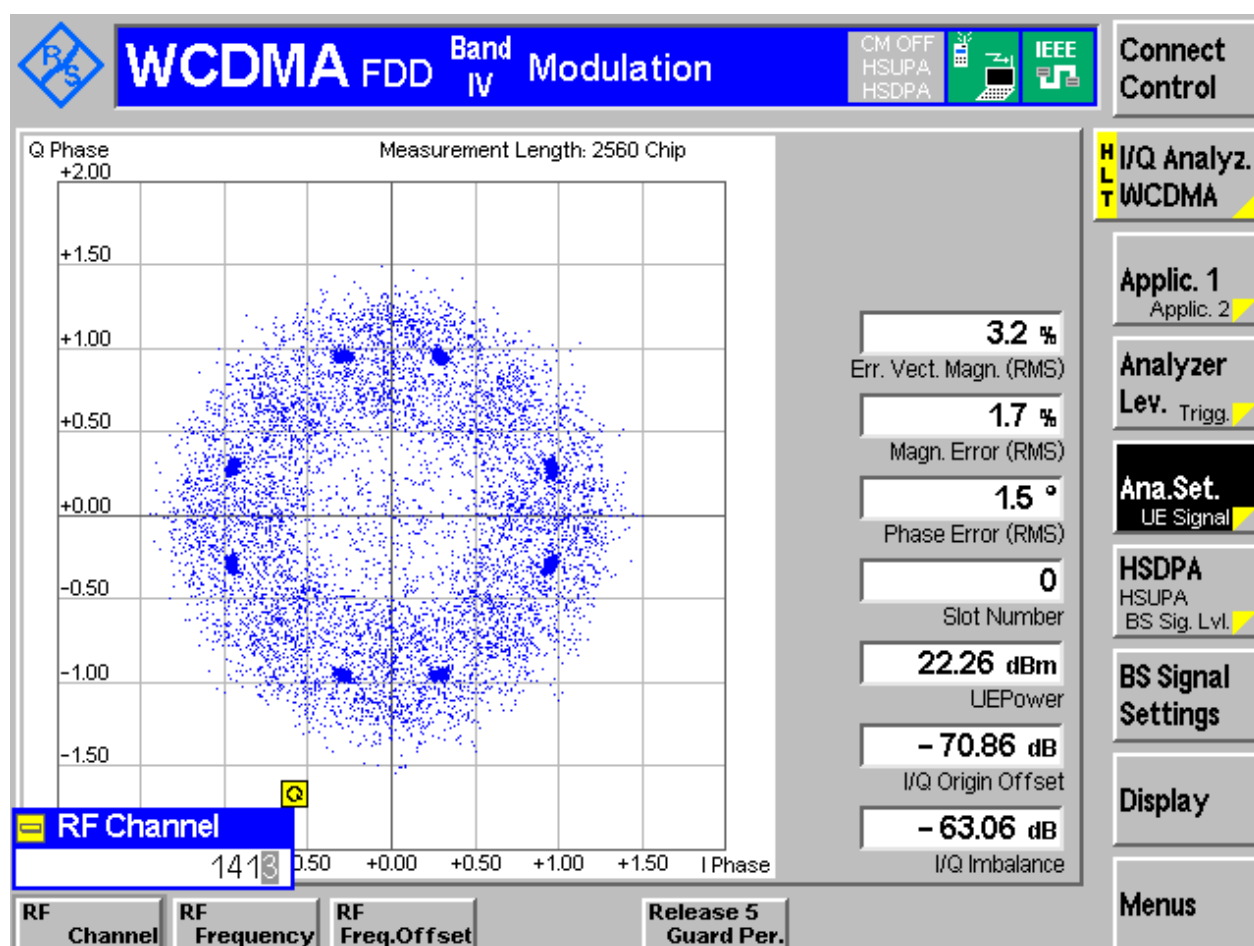
3.2.2.1.1 Test Channel = MCH



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	245.24	314.11	Pass
		MCH	245.04	315.02	Pass
		HCH	246.56	318.02	Pass
	GSM/TM2	LCH	241.59	312.46	Pass
		MCH	237.35	312.85	Pass
		HCH	238.72	311.69	Pass
GSM1900	GSM/TM1	LCH	244.20	317.01	Pass
		MCH	245.46	318.51	Pass
		HCH	243.26	320.12	Pass
	GSM/TM2	LCH	240.98	304.70	Pass
		MCH	239.19	304.46	Pass
		HCH	238.83	299.53	Pass
Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA850	UMTS/TM1	LCH	4.12	4.68	Pass
		MCH	4.15	4.67	Pass
		HCH	4.11	4.63	Pass
WCDMA1900	UMTS/TM1	LCH	4.14	4.66	Pass
		MCH	4.14	4.66	Pass
		HCH	4.14	4.66	Pass
WCDMA1700	UMTS/TM1	LCH	4.14	4.66	Pass
		MCH	4.15	4.66	Pass
		HCH	4.15	4.67	Pass

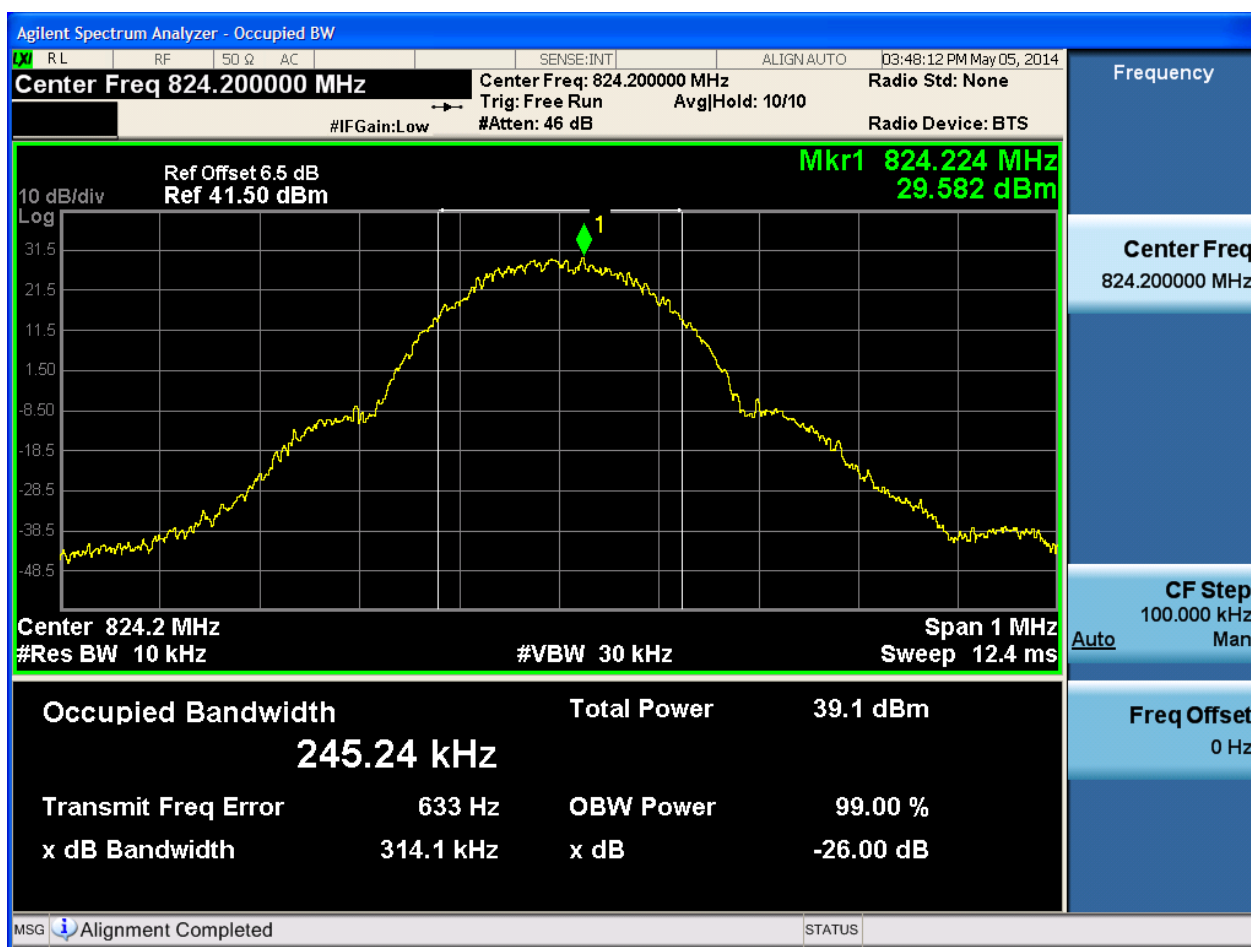
Part II - Test Plots

4.1 For GSM

4.1.1 Test Band = GSM850

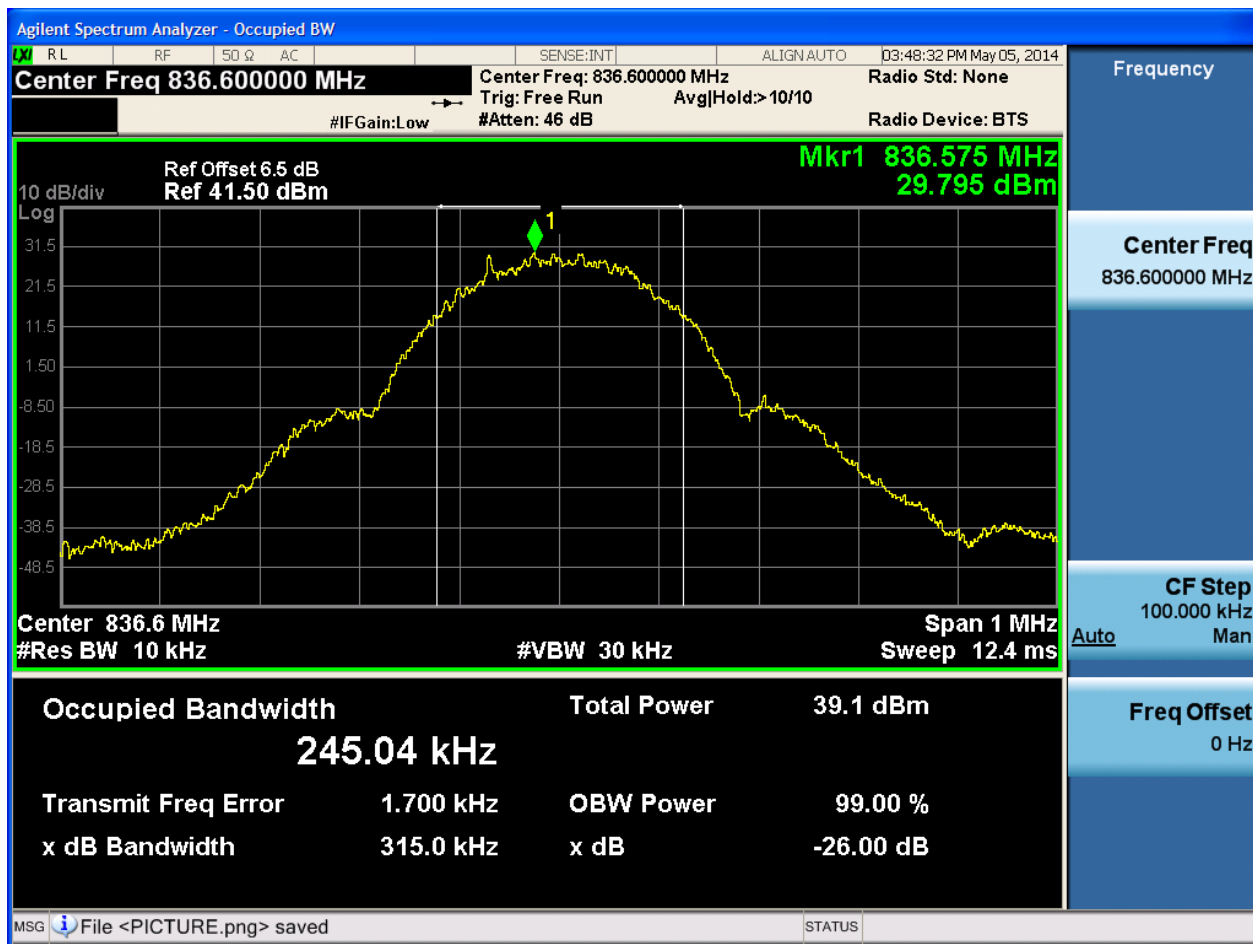
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH



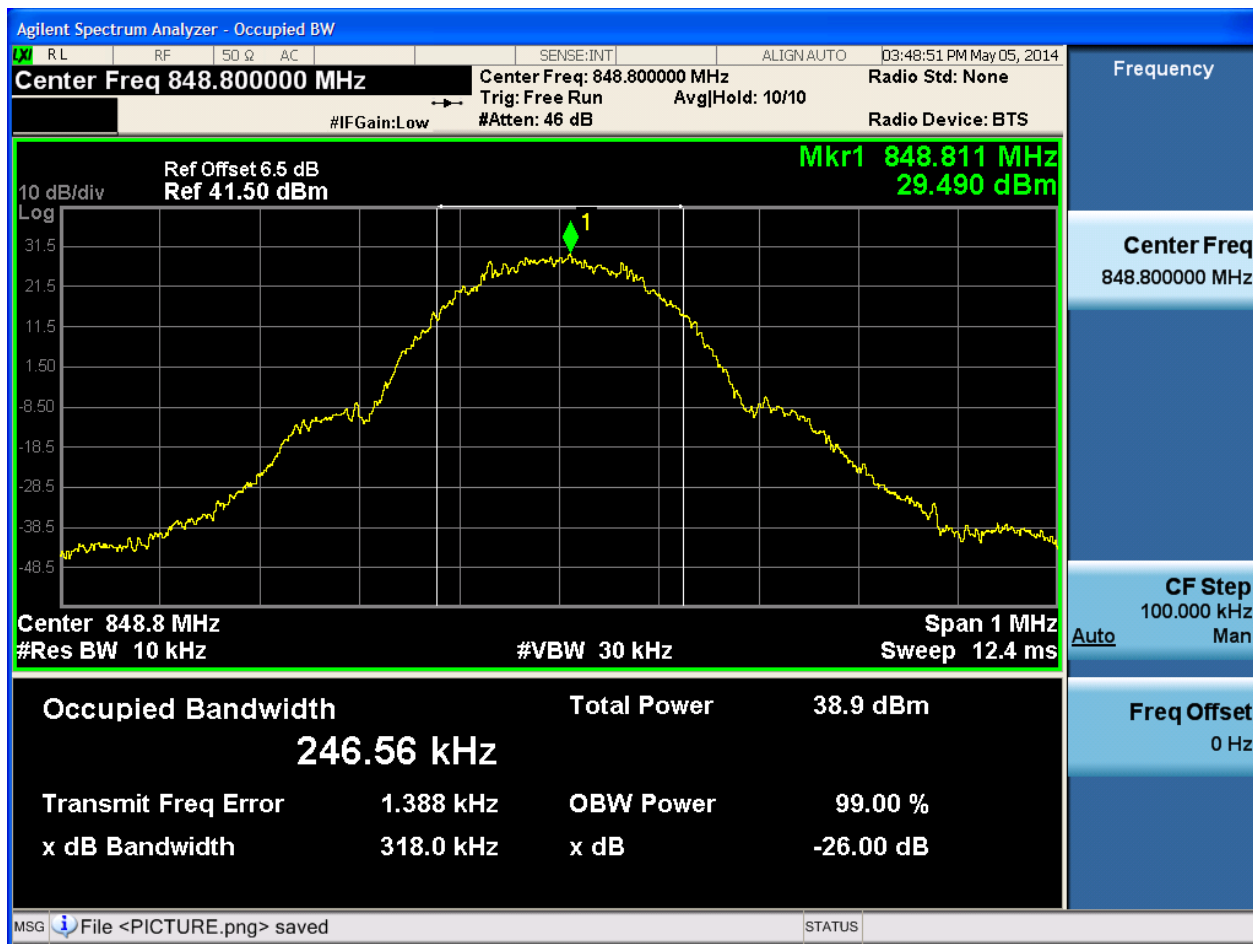


4.1.1.1.2 Test Channel = MCH





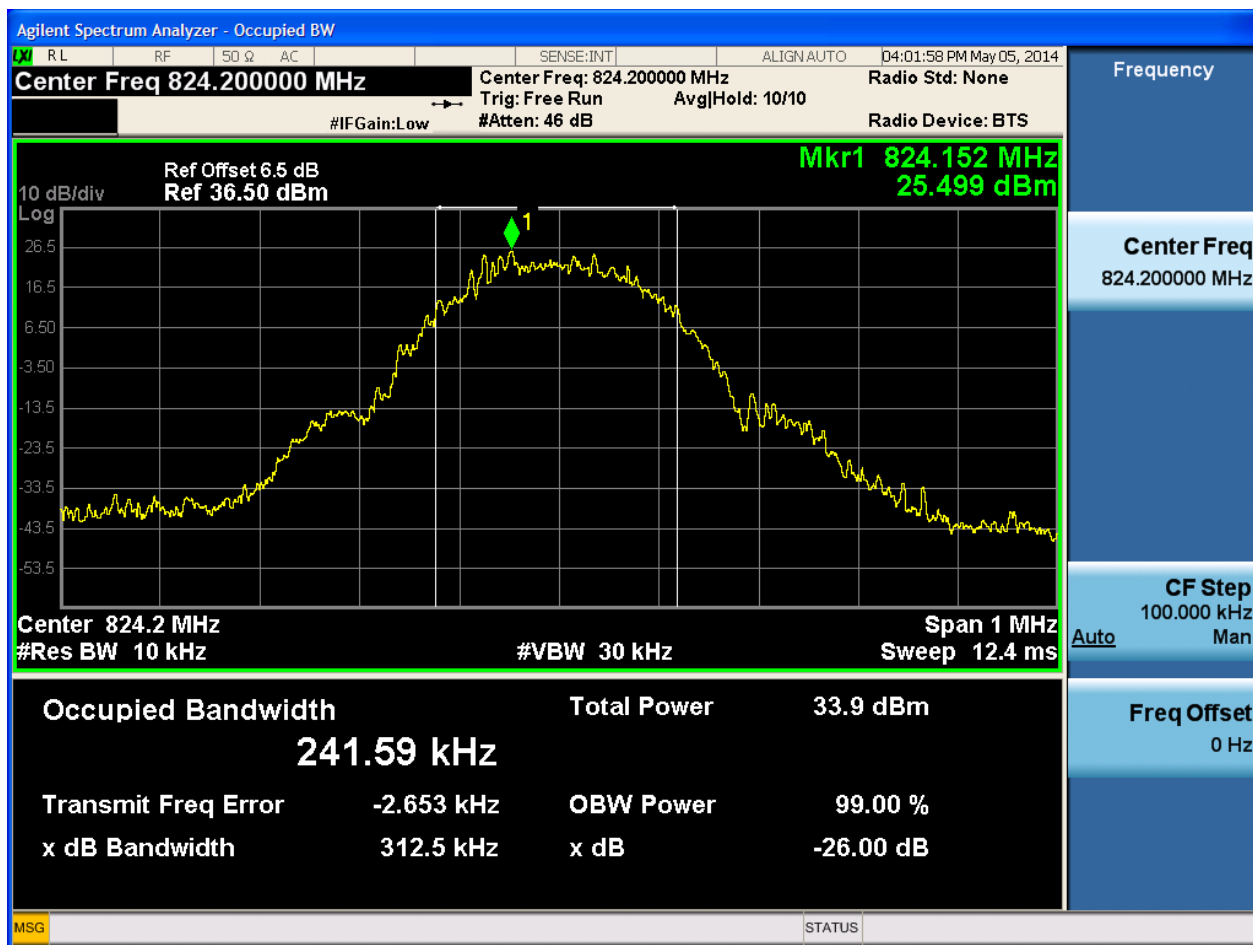
4.1.1.1.3 Test Channel = HCH





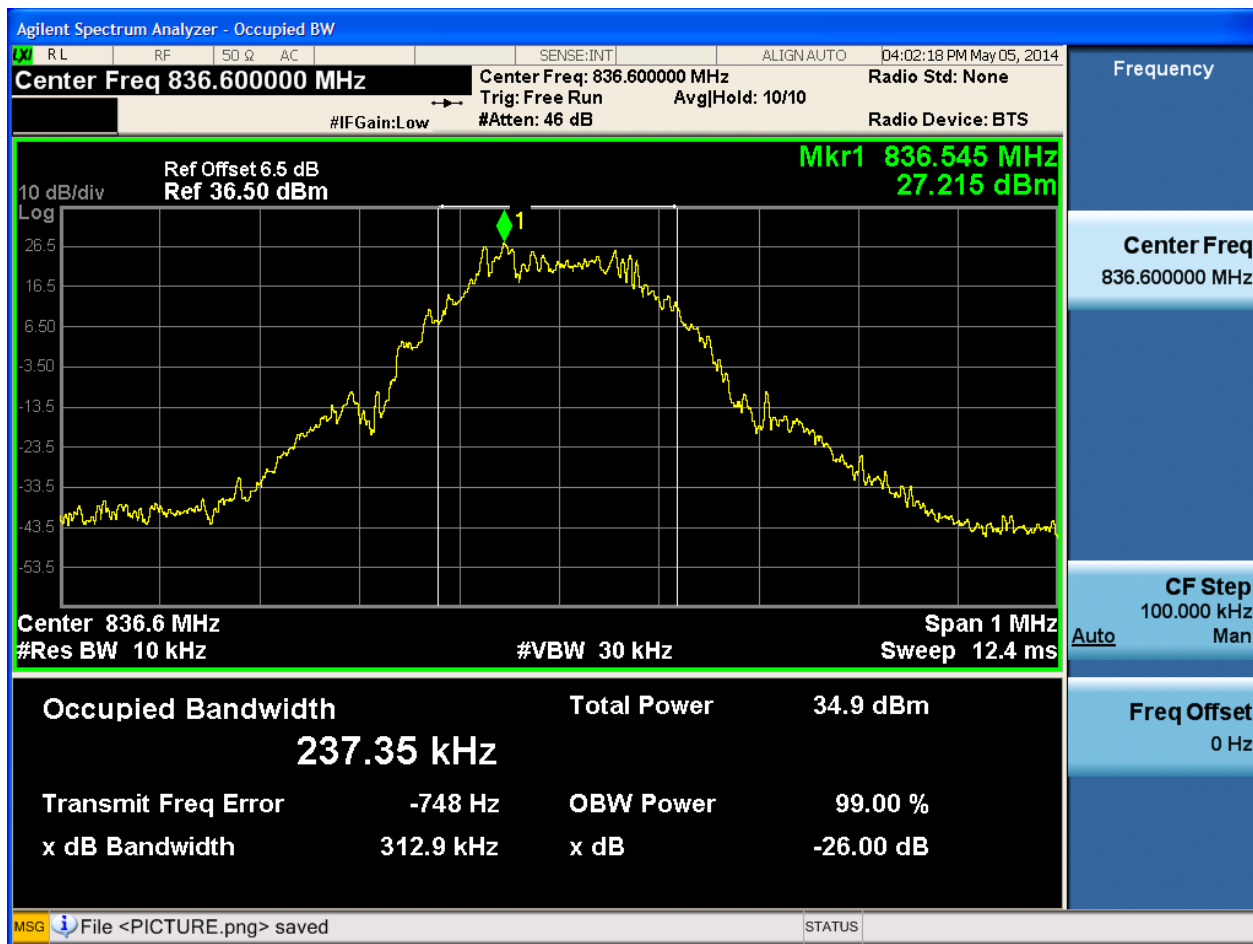
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH



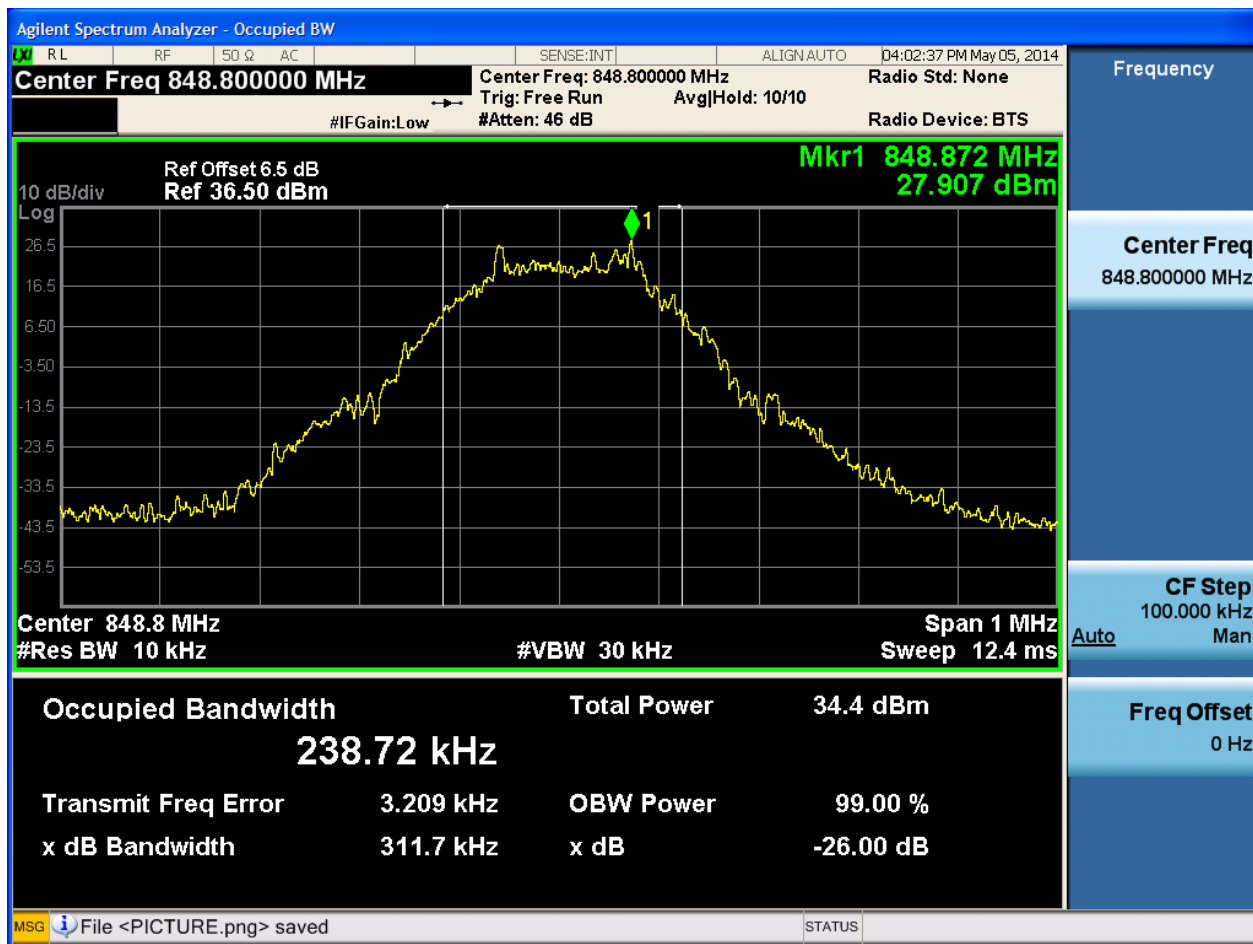


4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH

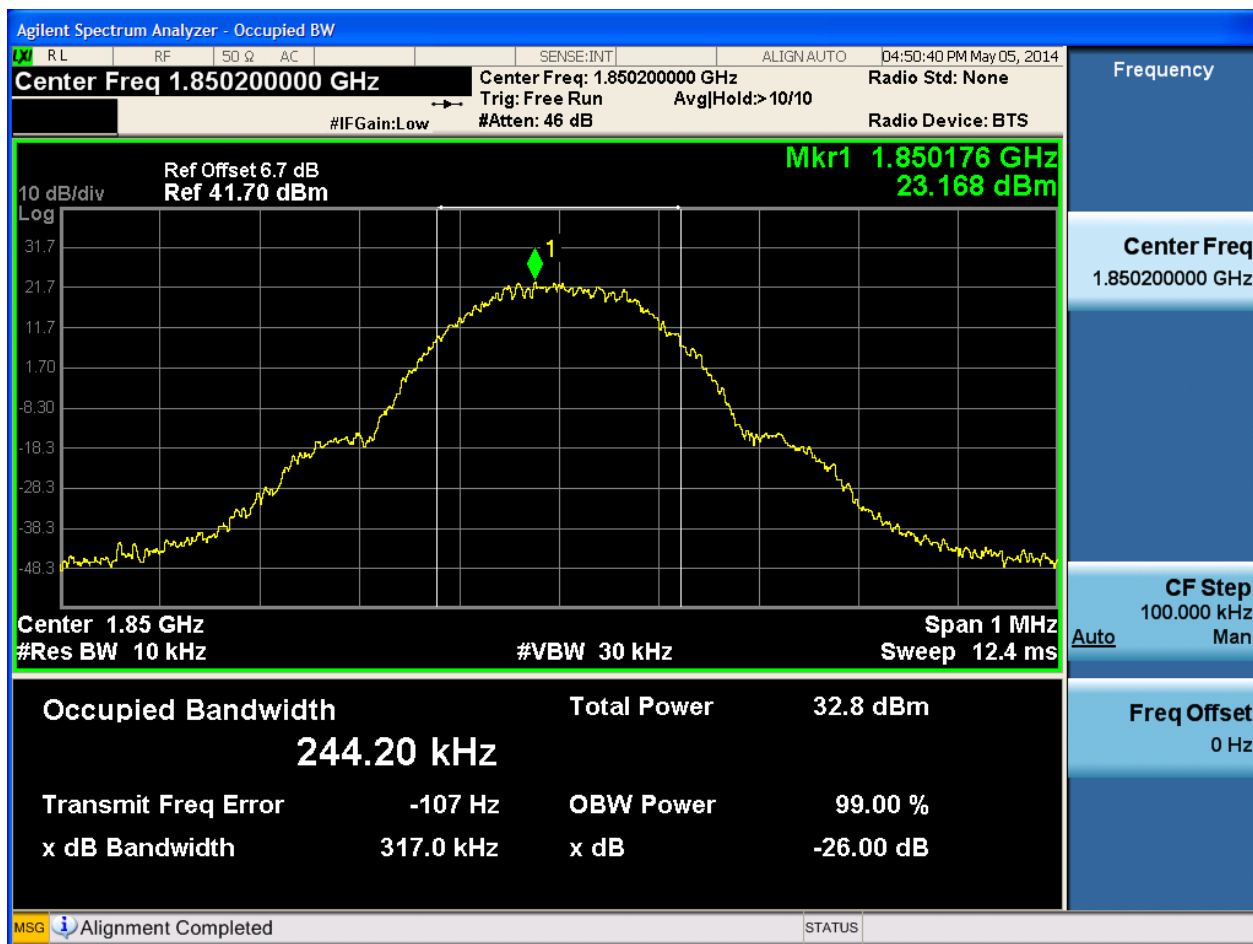




4.1.2 Test Band = GSM1900

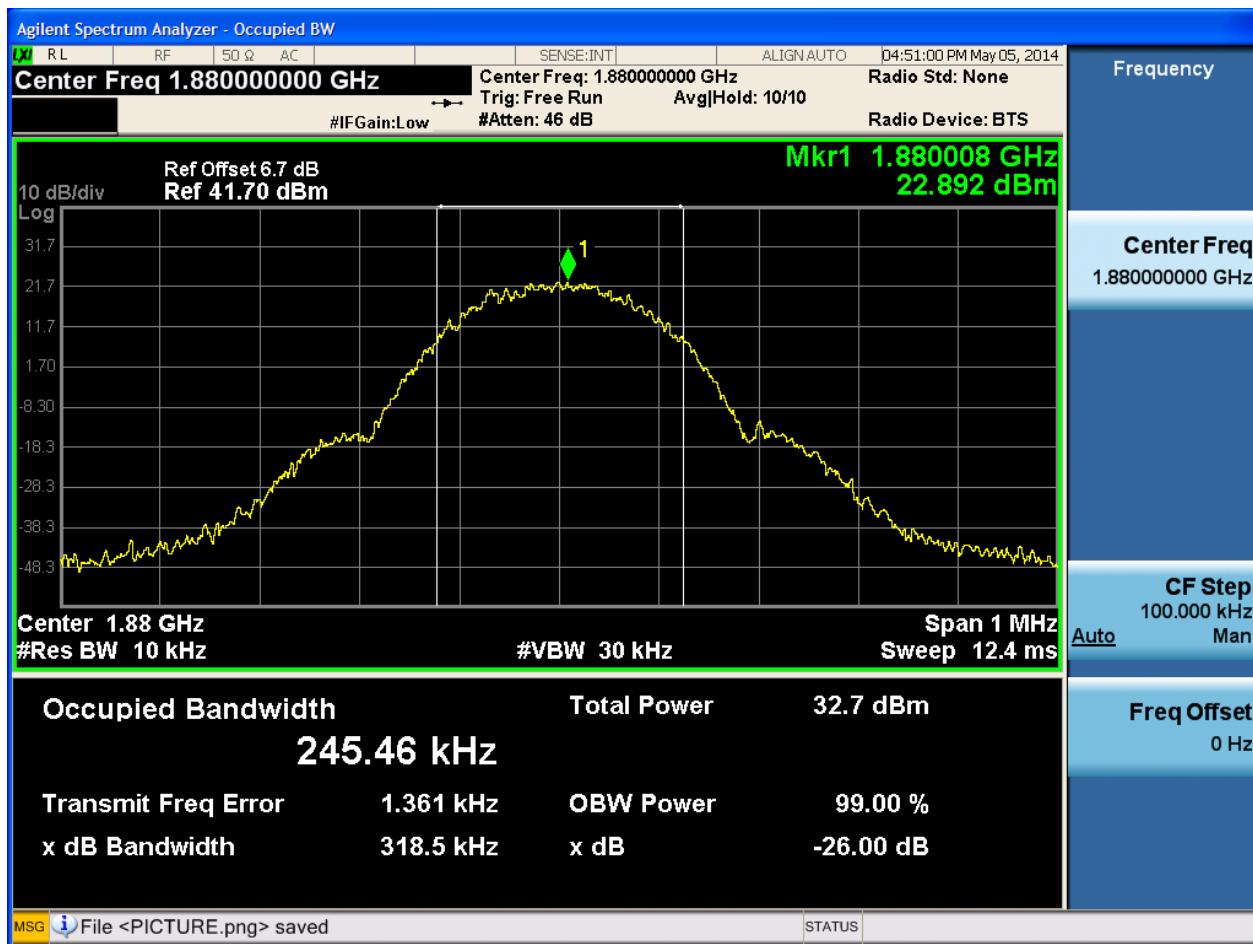
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



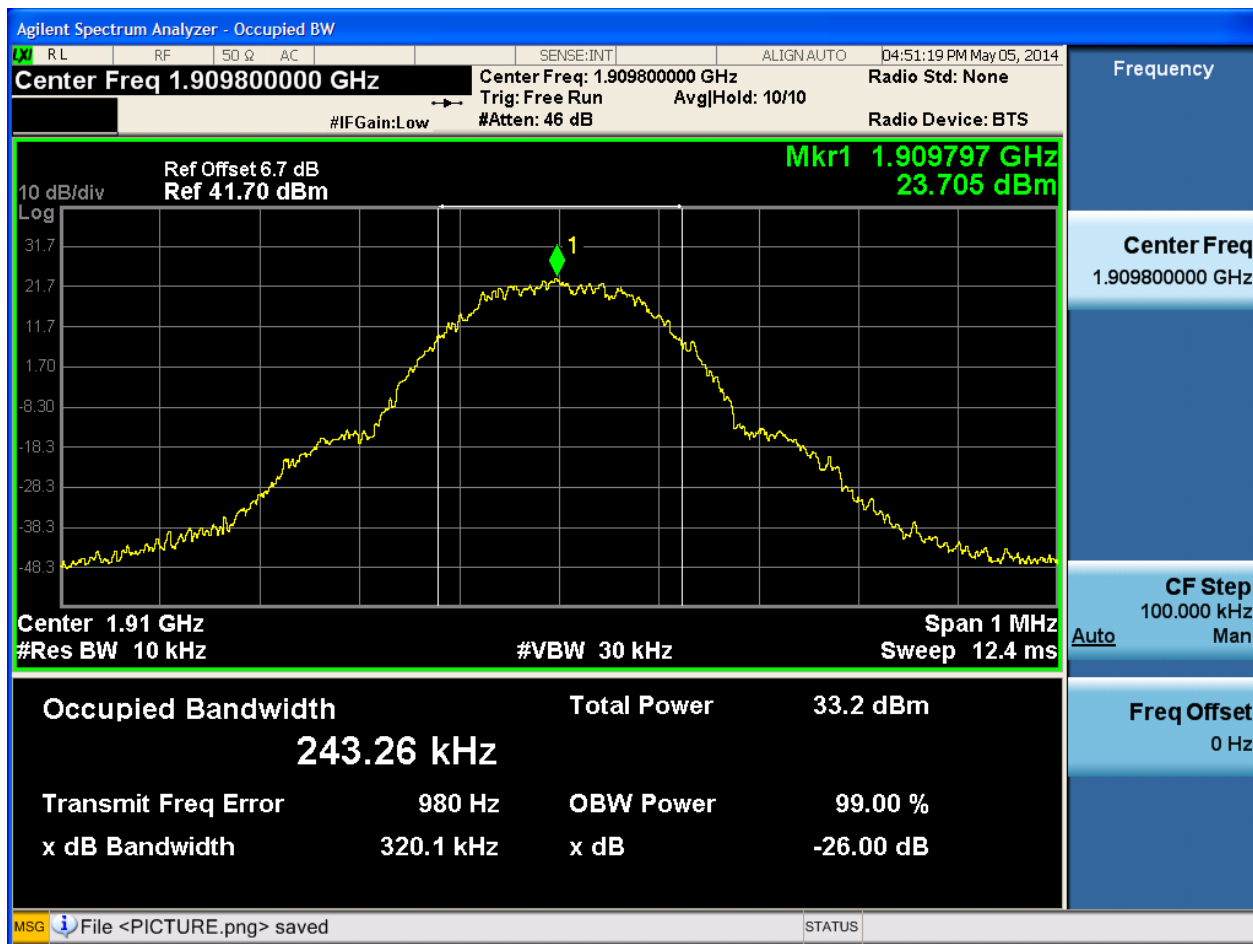


4.1.2.1.2 Test Channel = MCH





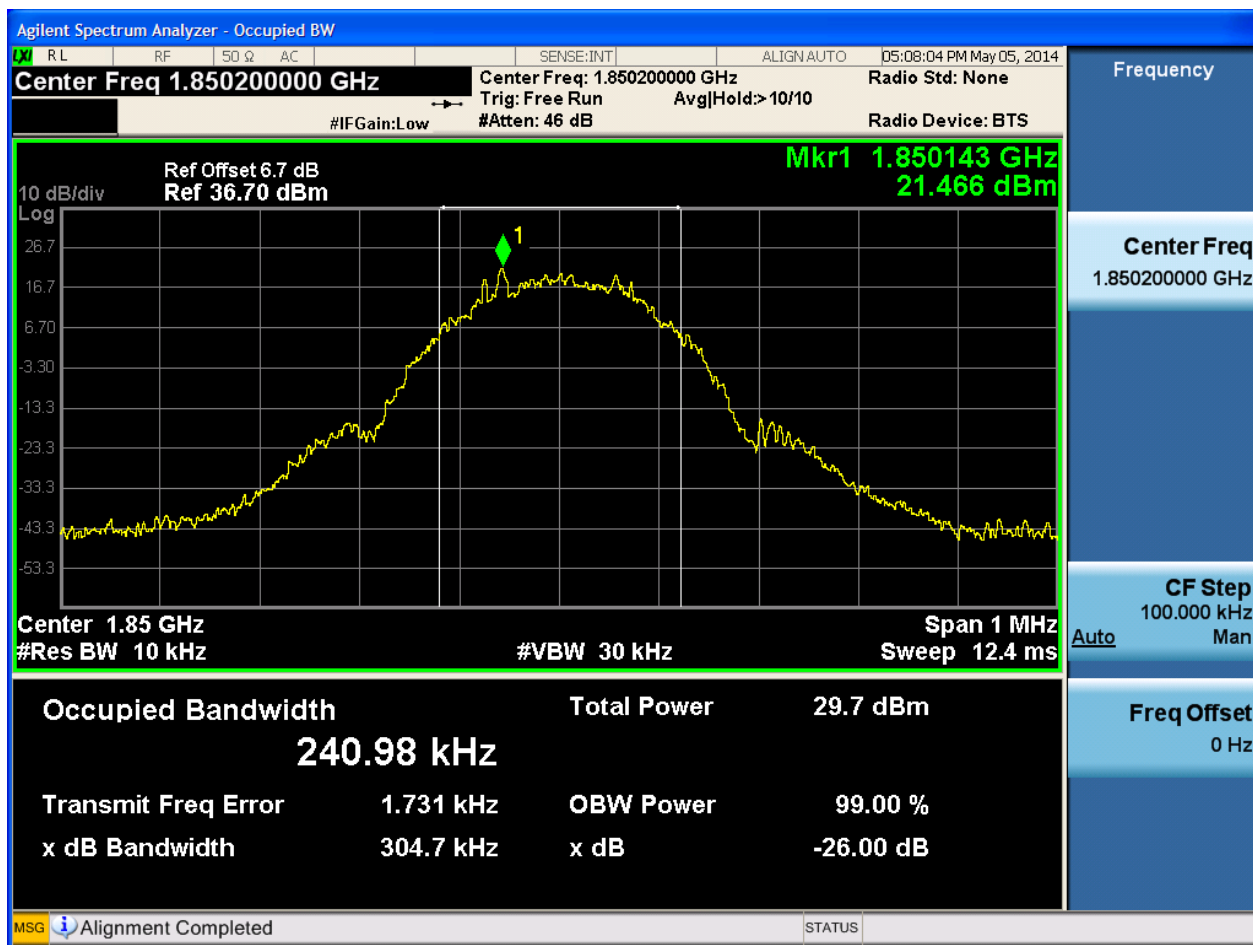
4.1.2.1.3 Test Channel = HCH





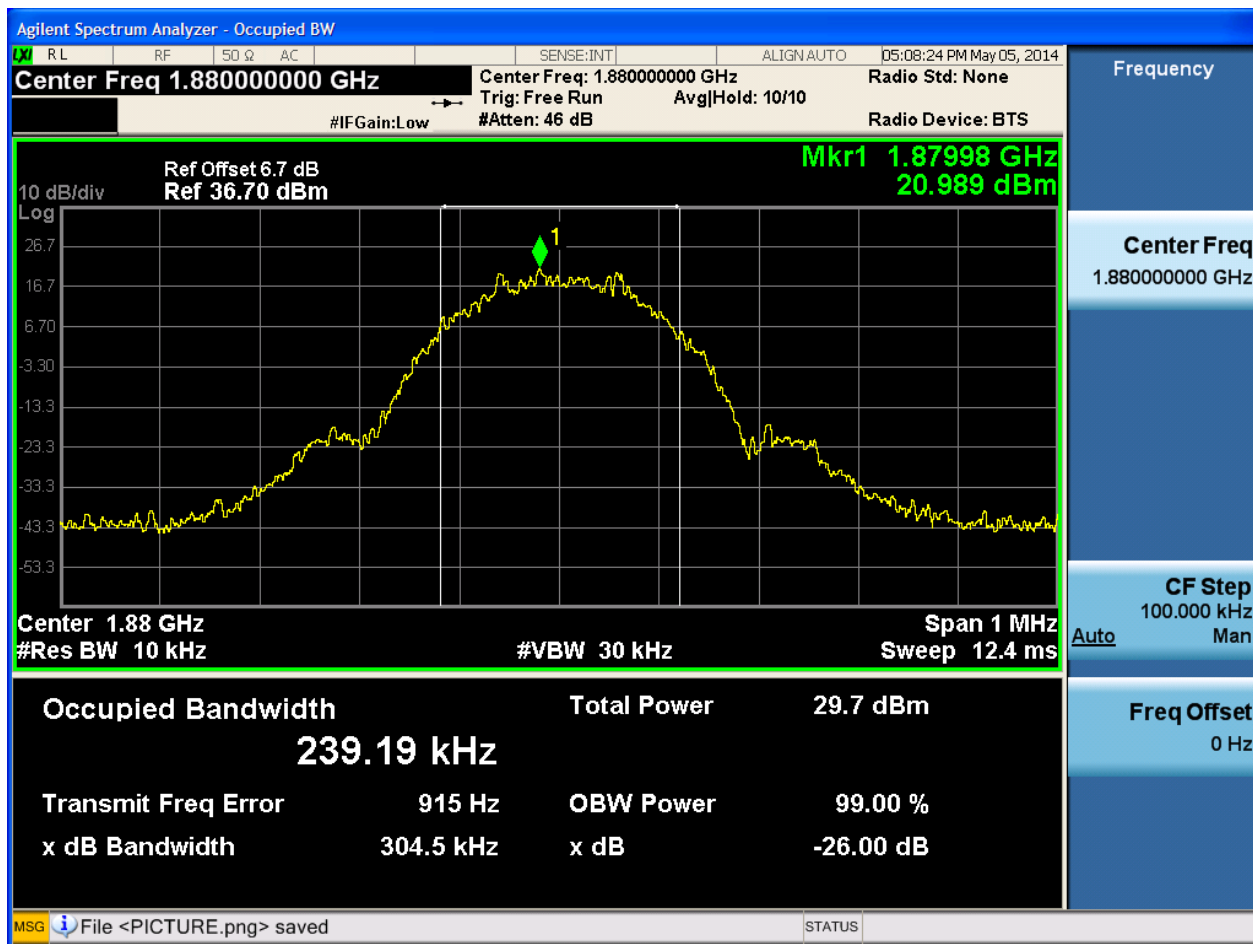
4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



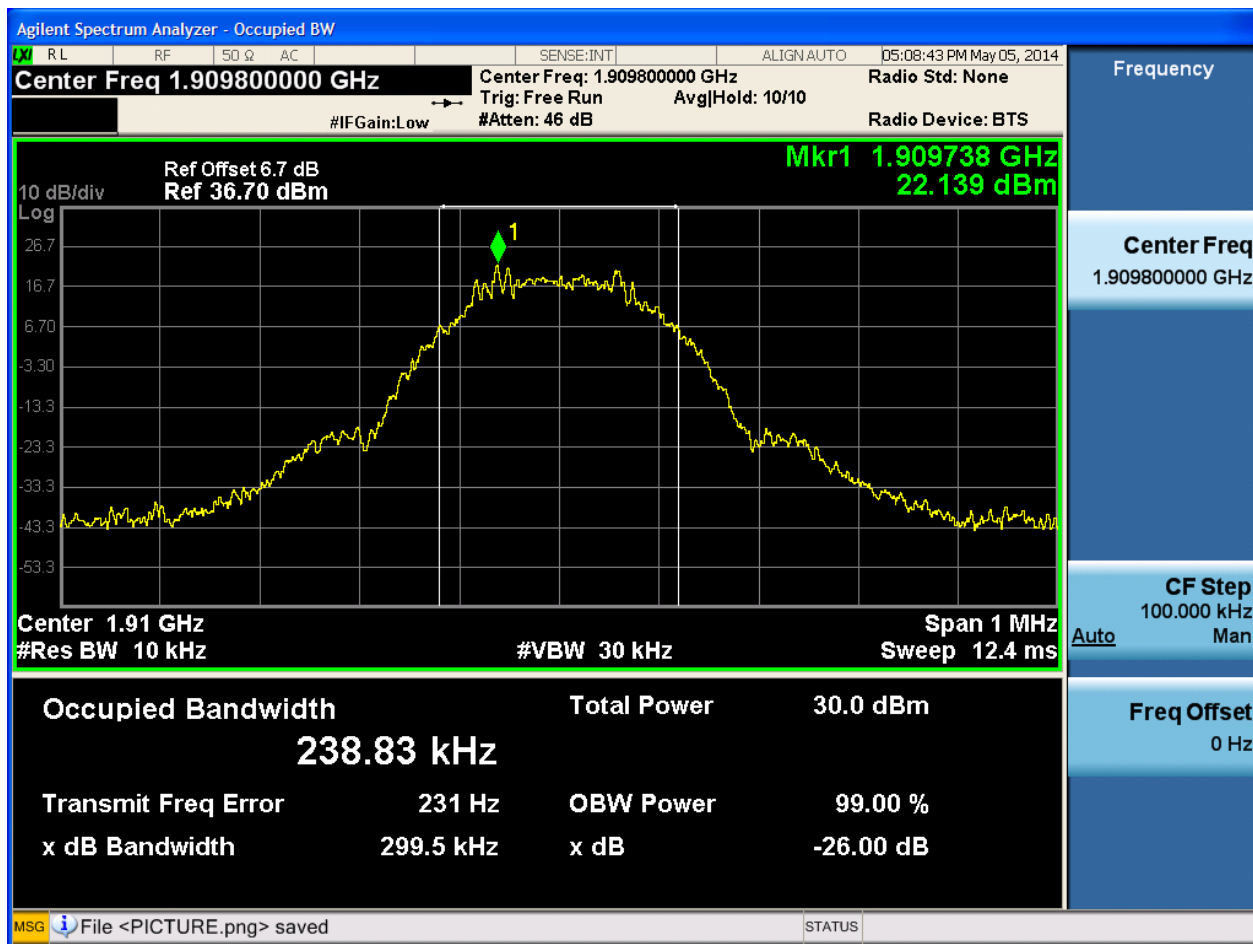


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH



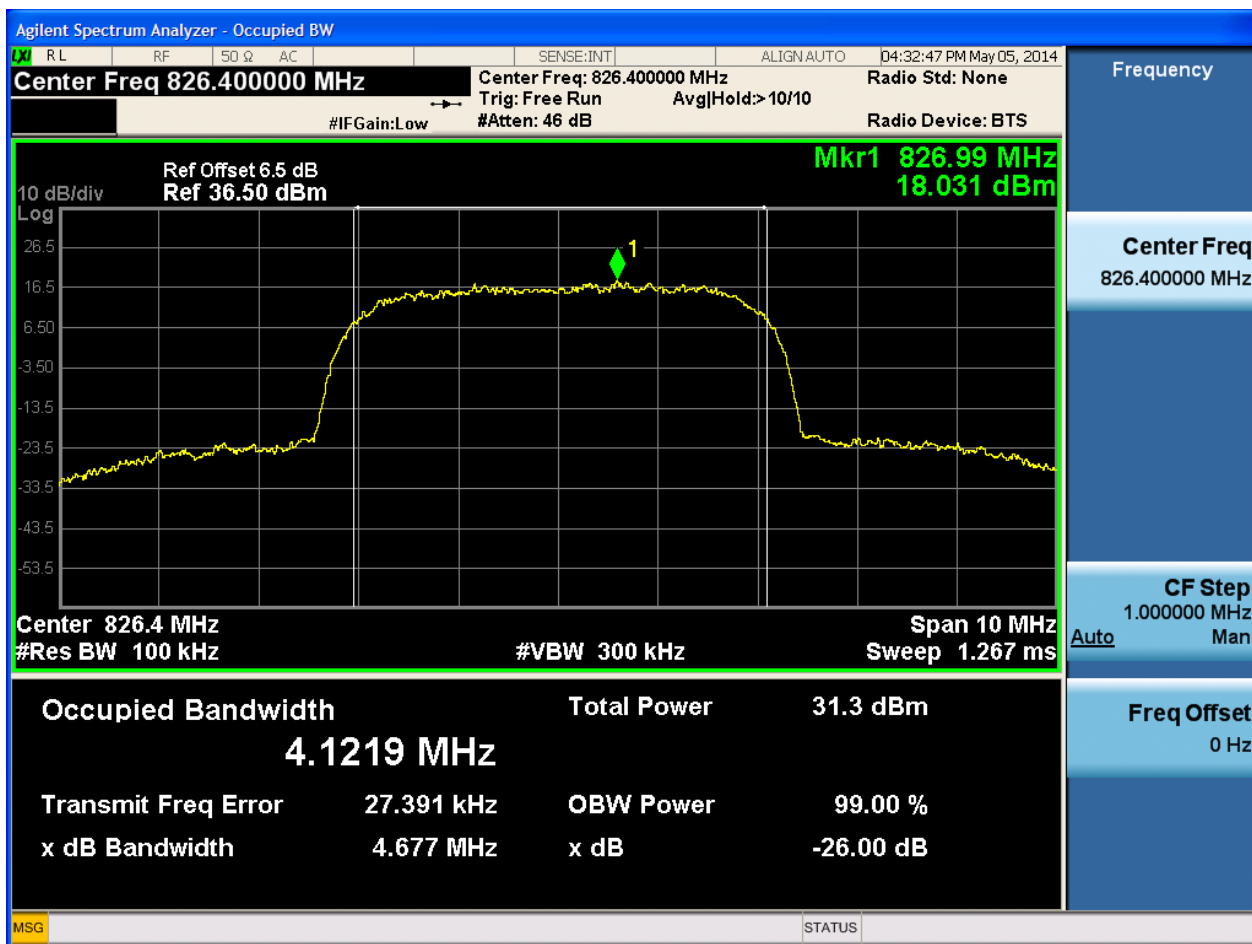


4.2 For UMTS

4.2.1 Test Band = WCDMA850

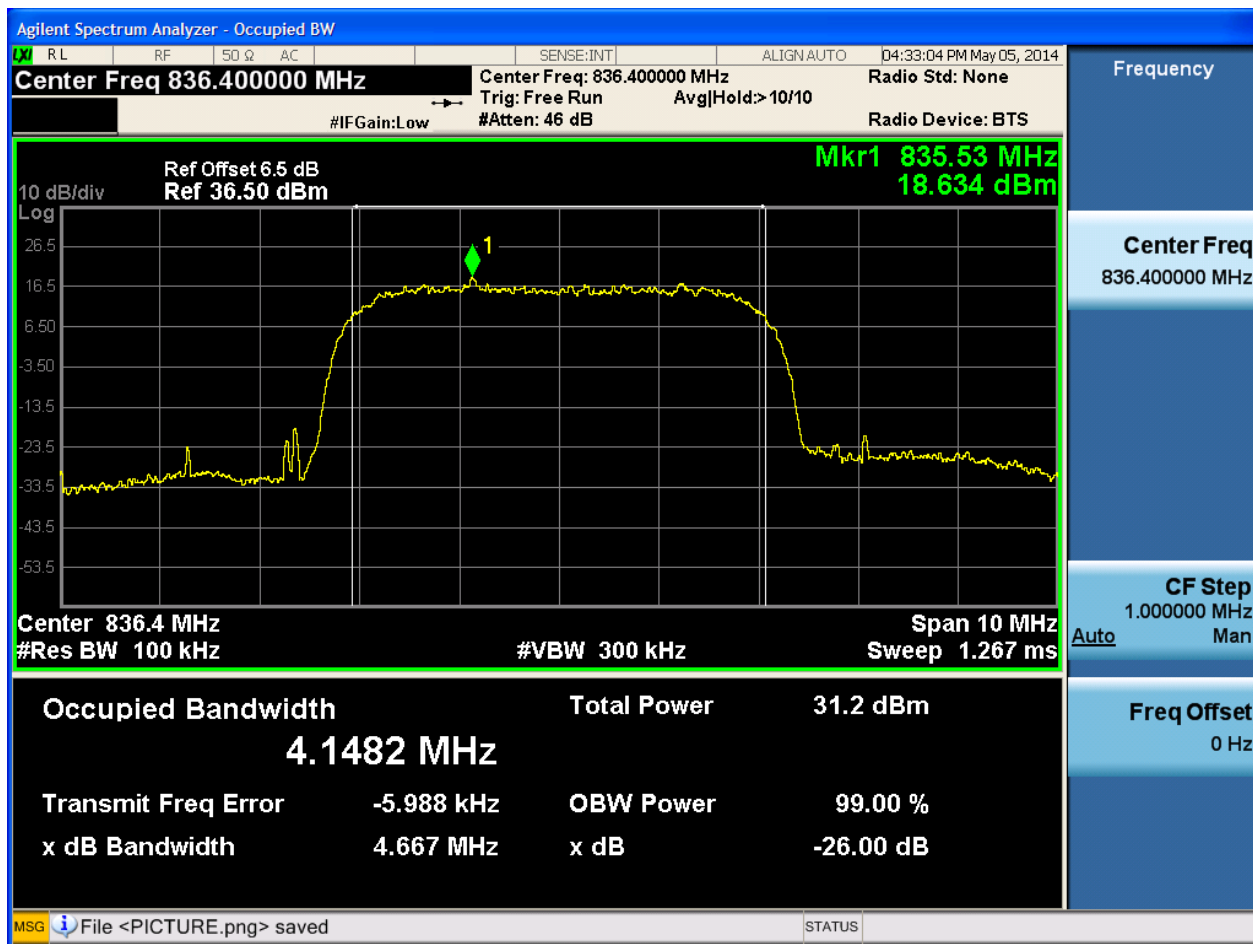
4.2.1.1 Test Mode = UMTS/TM1

4.2.1.1.1 Test Channel = LCH



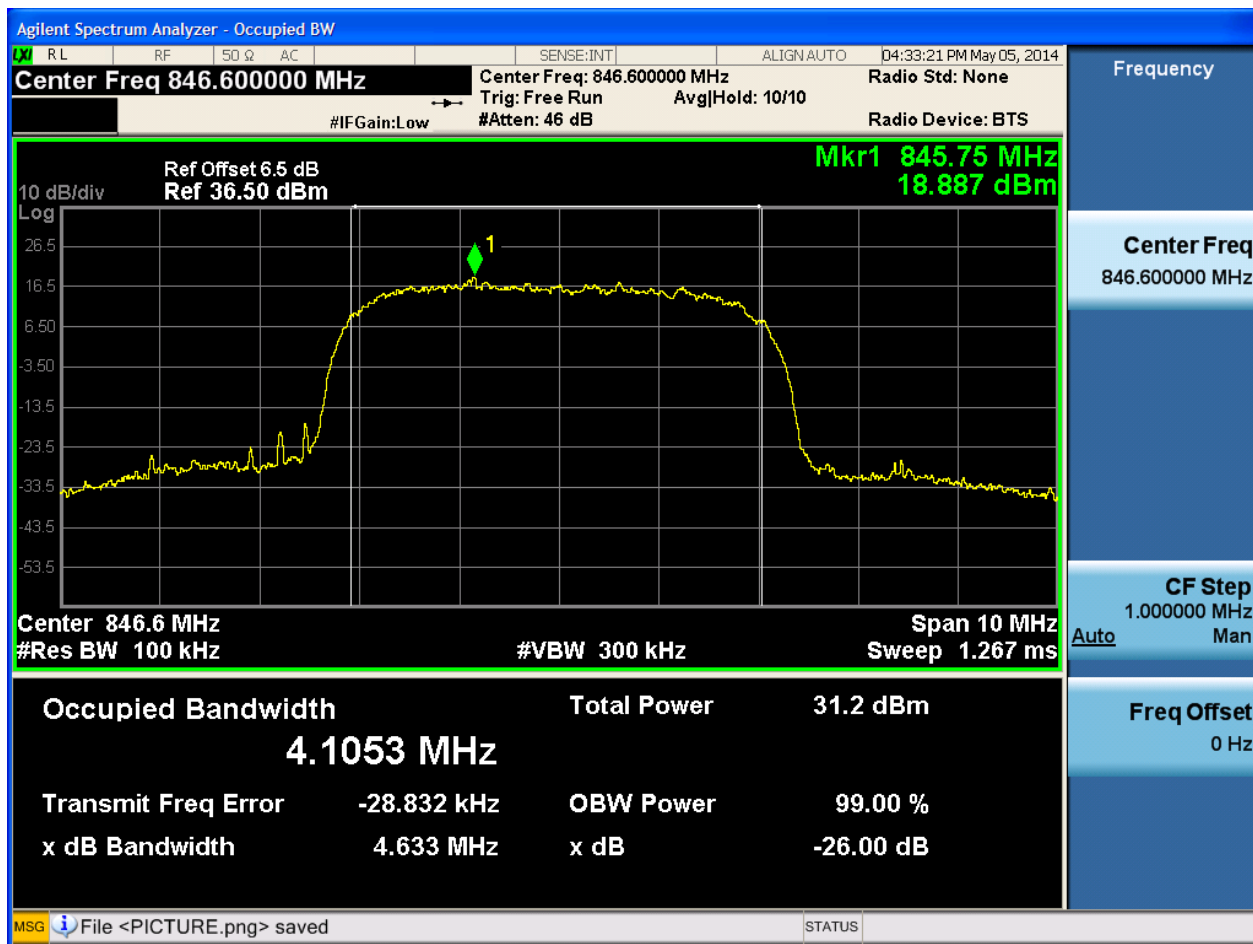


4.2.1.1.2 Test Channel = MCH





4.2.1.1.3 Test Channel = HCH

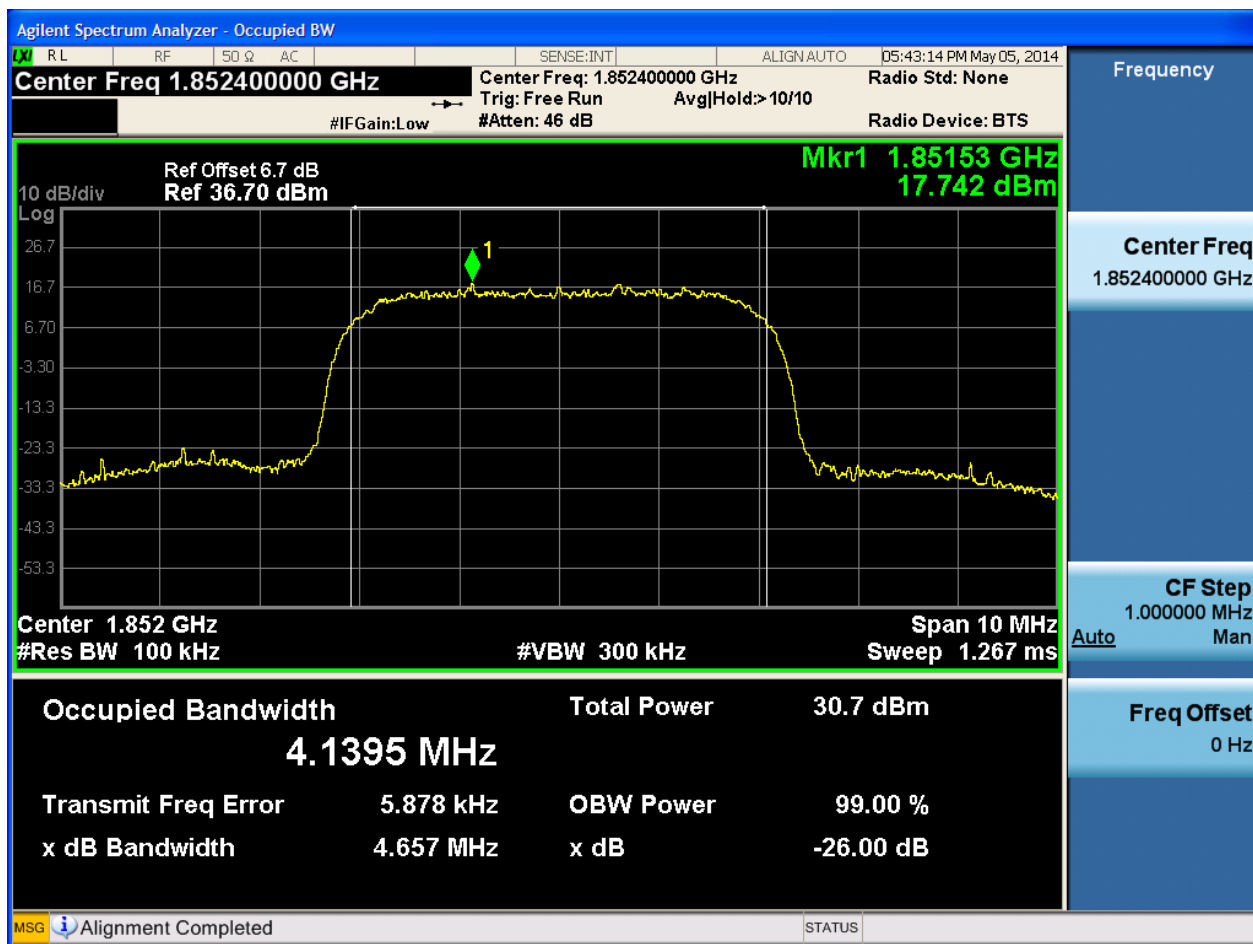




4.2.2 Test Band = WCDMA1900

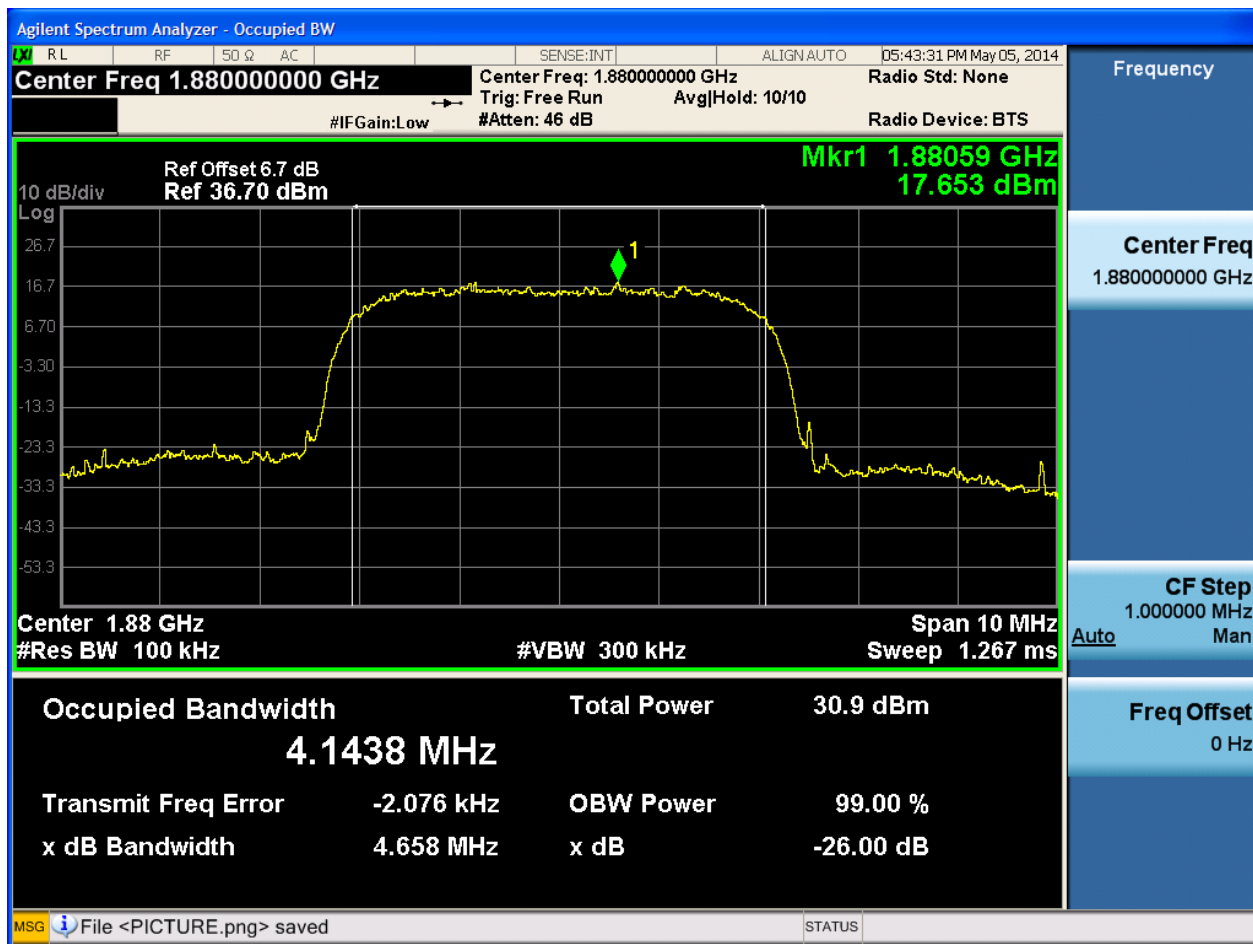
4.2.2.1 Test Mode = UMTS/TM1

4.2.2.1.1 Test Channel = LCH



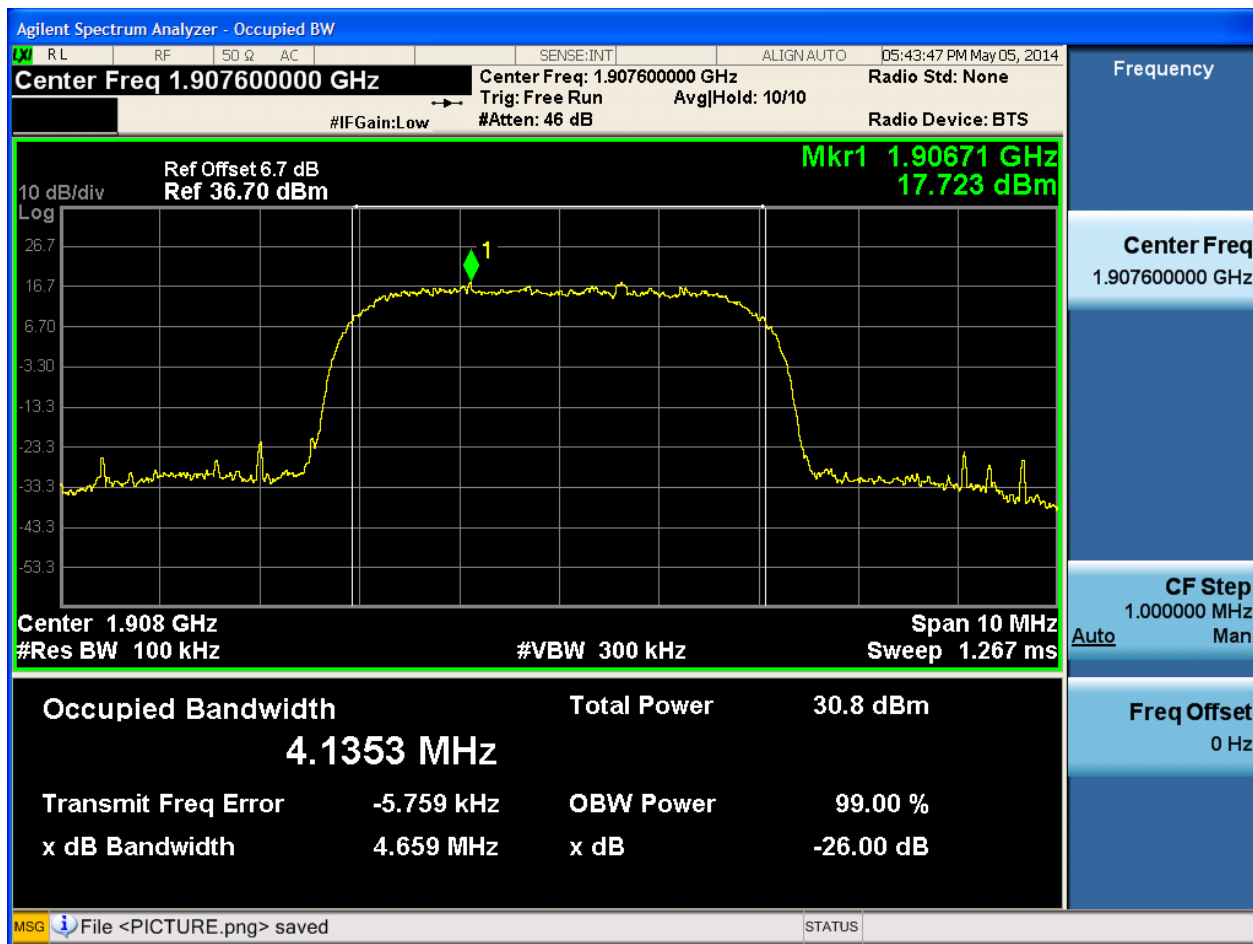


4.2.2.1.2 Test Channel = MCH





4.2.2.1.3 Test Channel = HCH

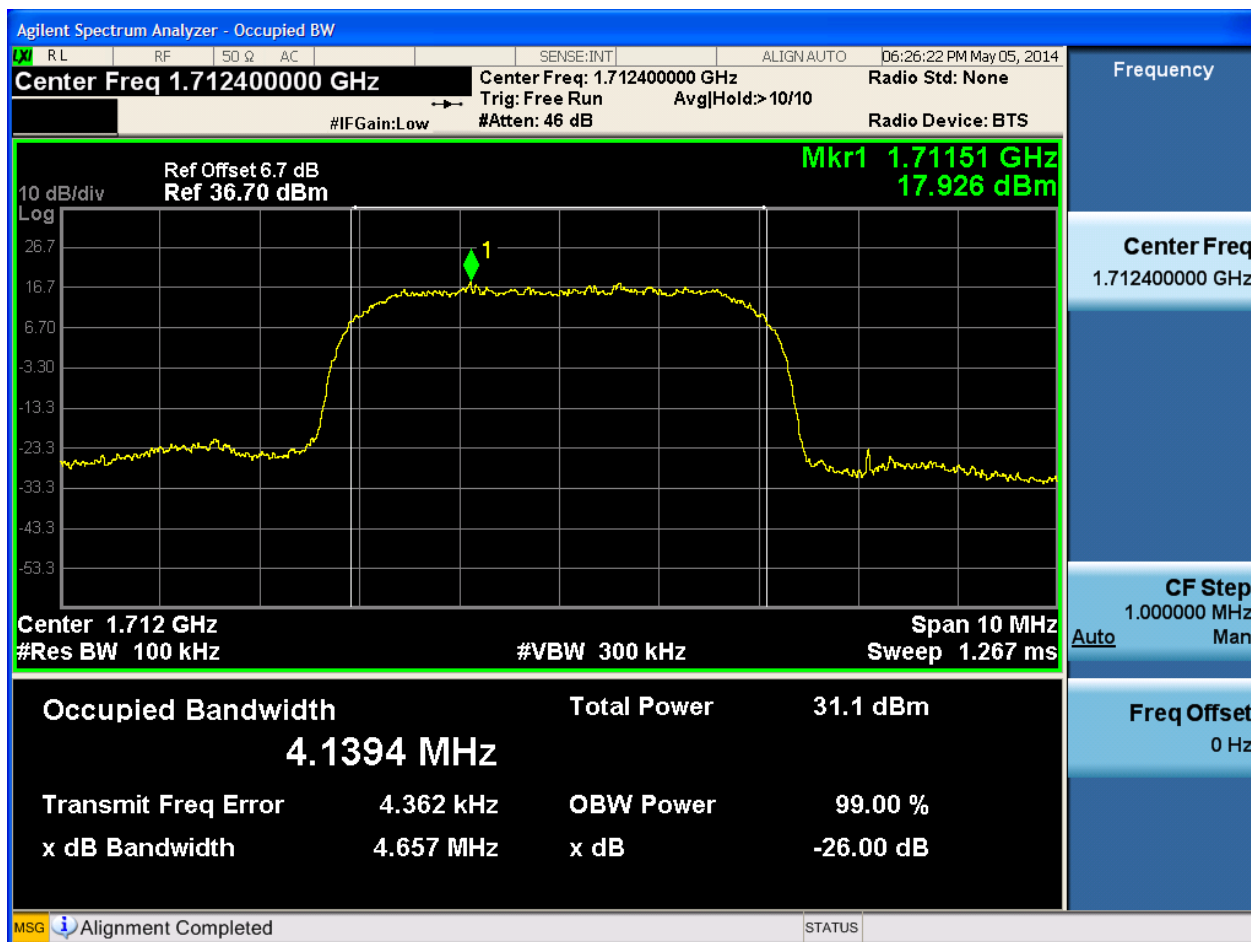




4.2.3 Test Band = WCDMA1700

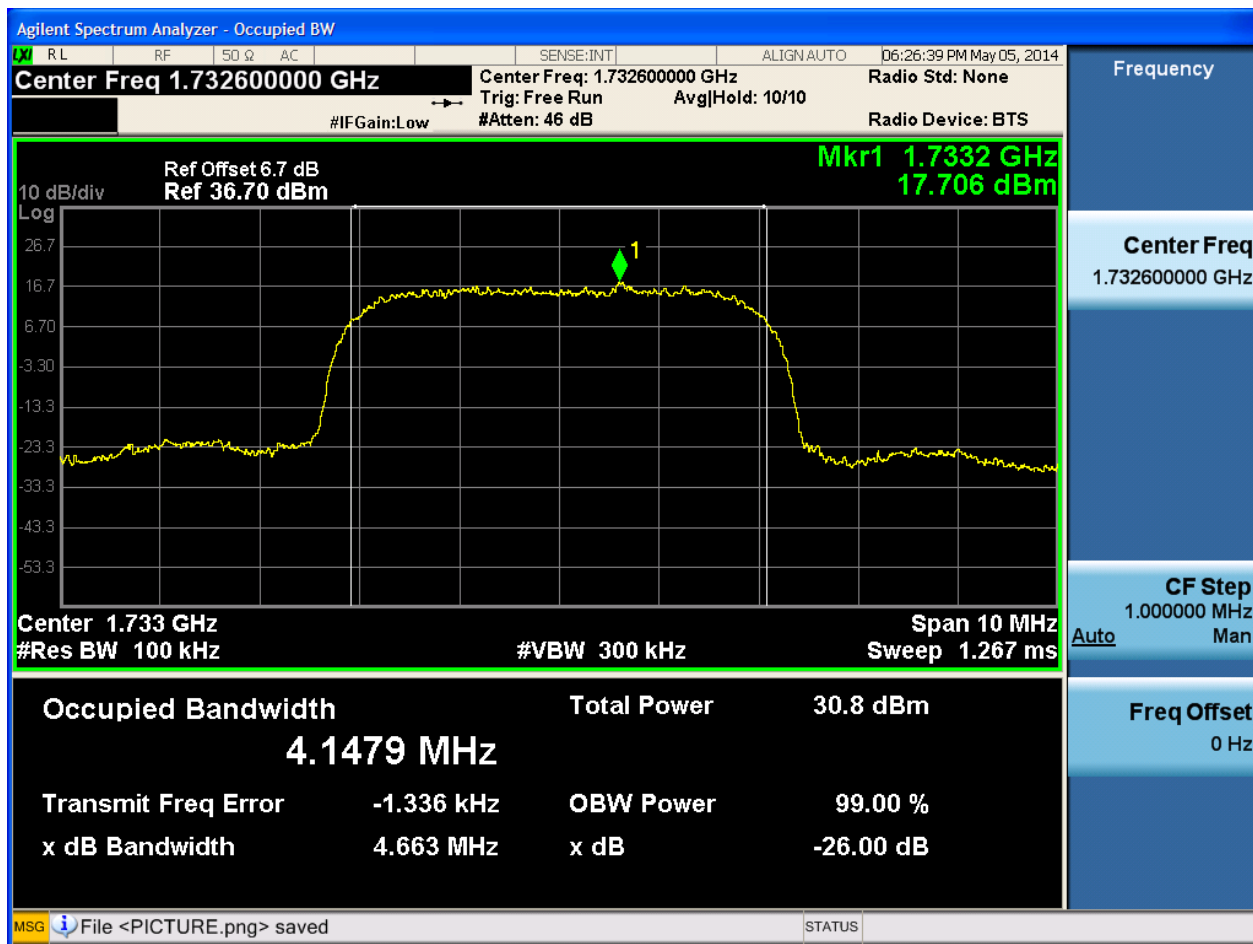
4.2.3.1 Test Mode = UMTS/TM1

4.2.3.1.1 Test Channel = LCH



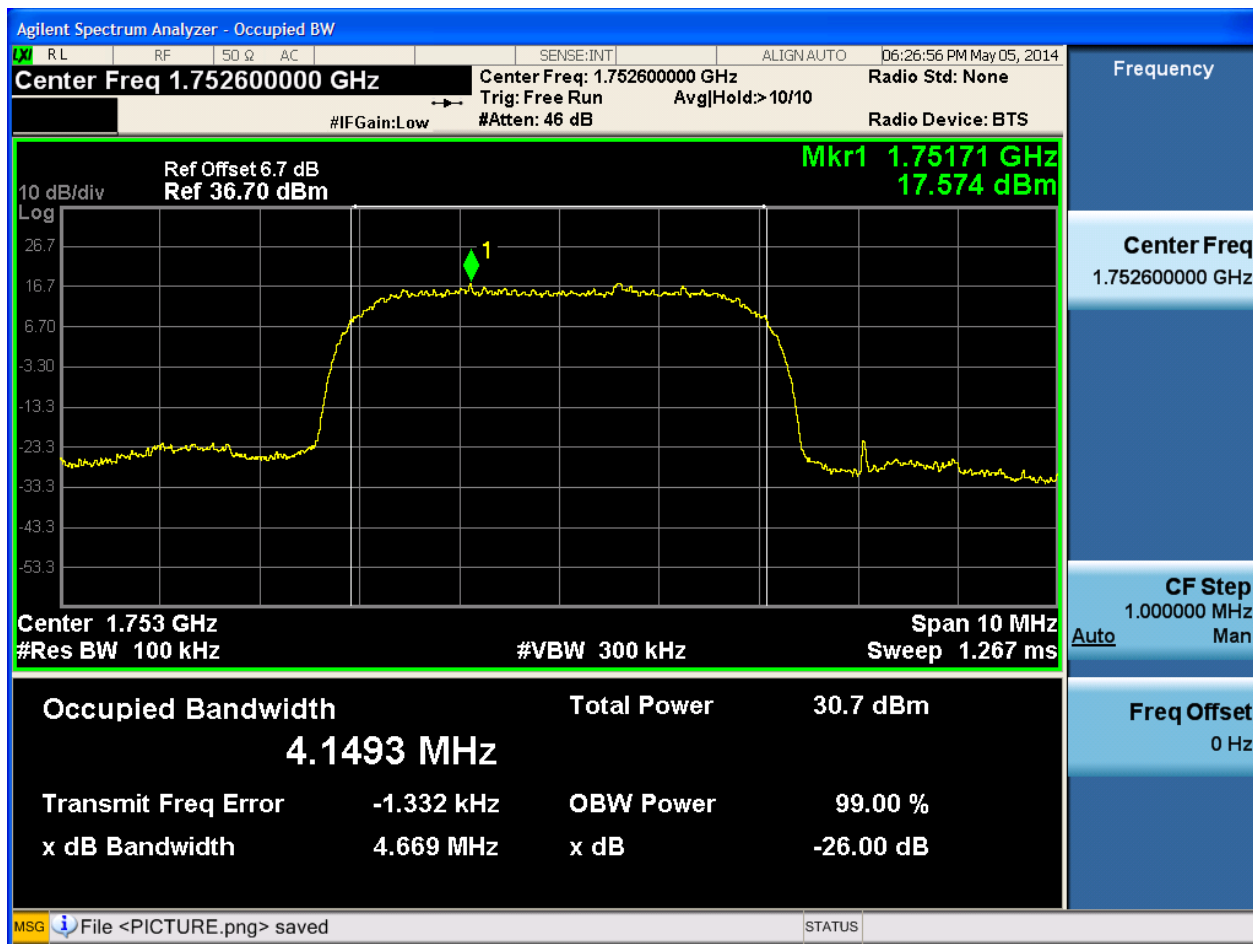


4.2.3.1.2 Test Channel = MCH





4.2.3.1.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

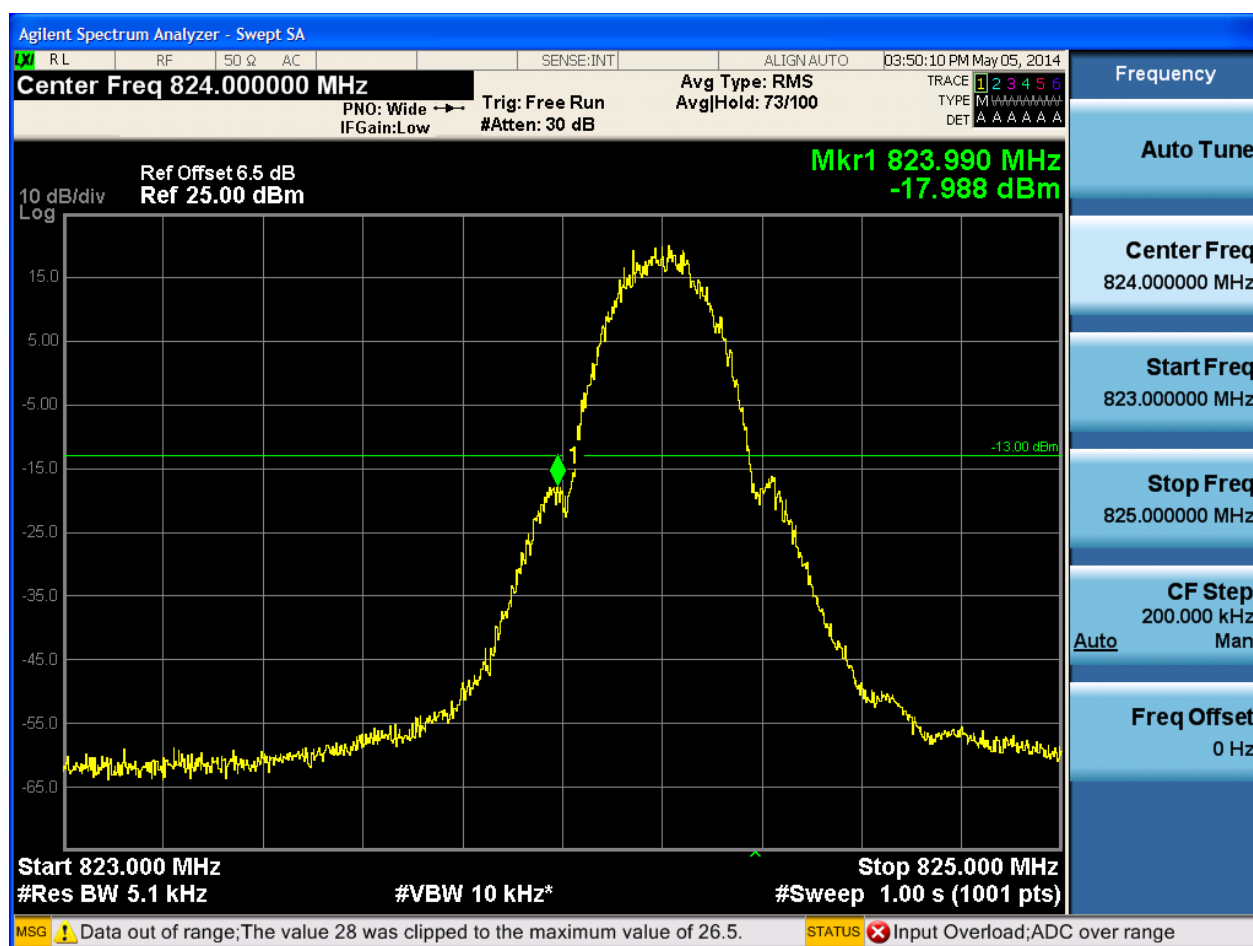
Part I - Test Plots

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





Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 03:51:27 PM May 05, 2014

Center Freq 849.000000 MHz Avg Type: RMS
PNO: Wide Trg: Free Run Avg|Hold: 73/100
IFGain: Low #Atten: 30 dB

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 6.5 dB
Ref 25.00 dBm

Mkr1 849.020 MHz
-15.241 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 Input Overload; ADC over range

Frequency

Auto Tune

Center Freq
849.000000 MHz

Start Freq
848.000000 MHz

Stop Freq
850.000000 MHz

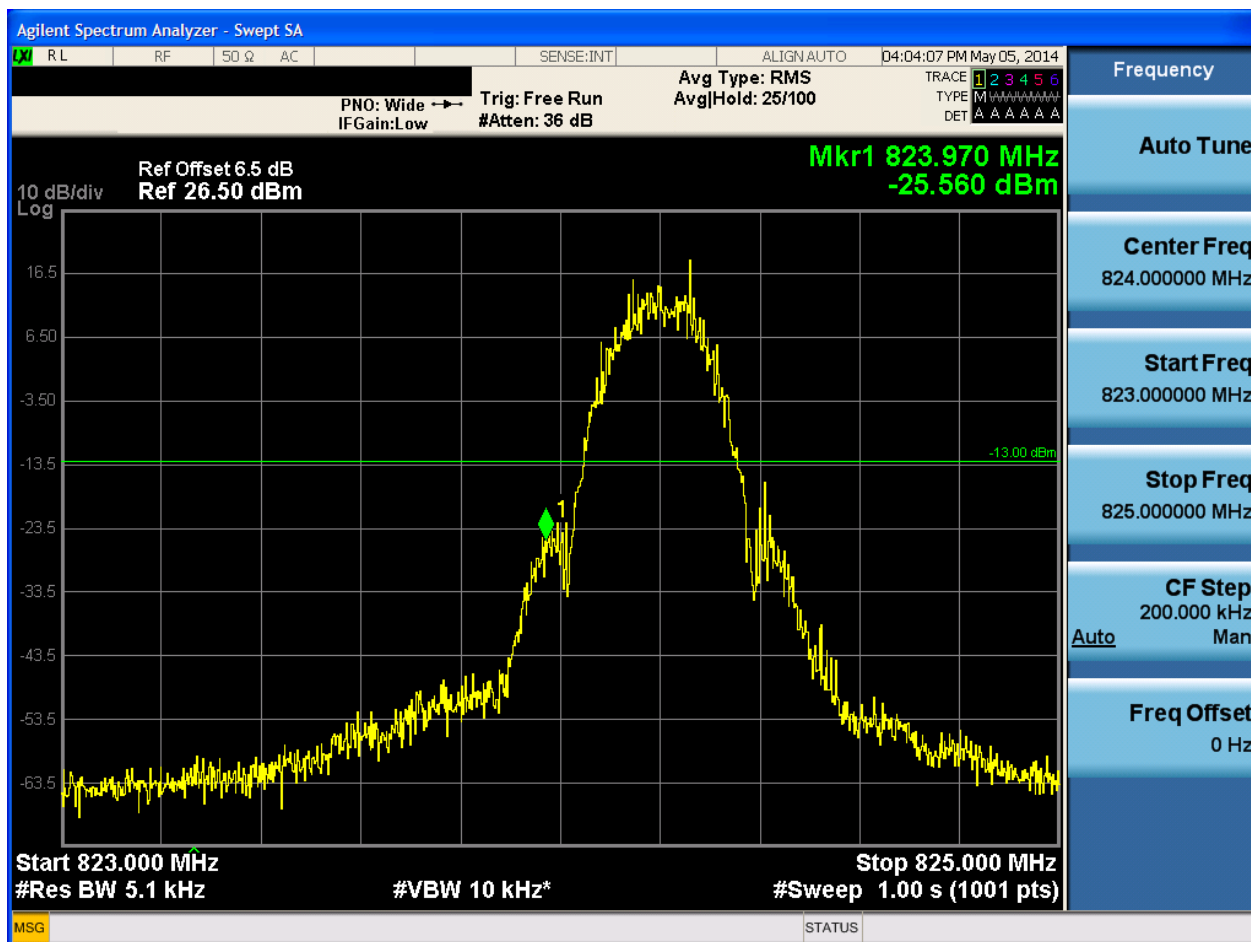
CF Step
200.000 kHz
Auto Man

Freq Offset
0 Hz



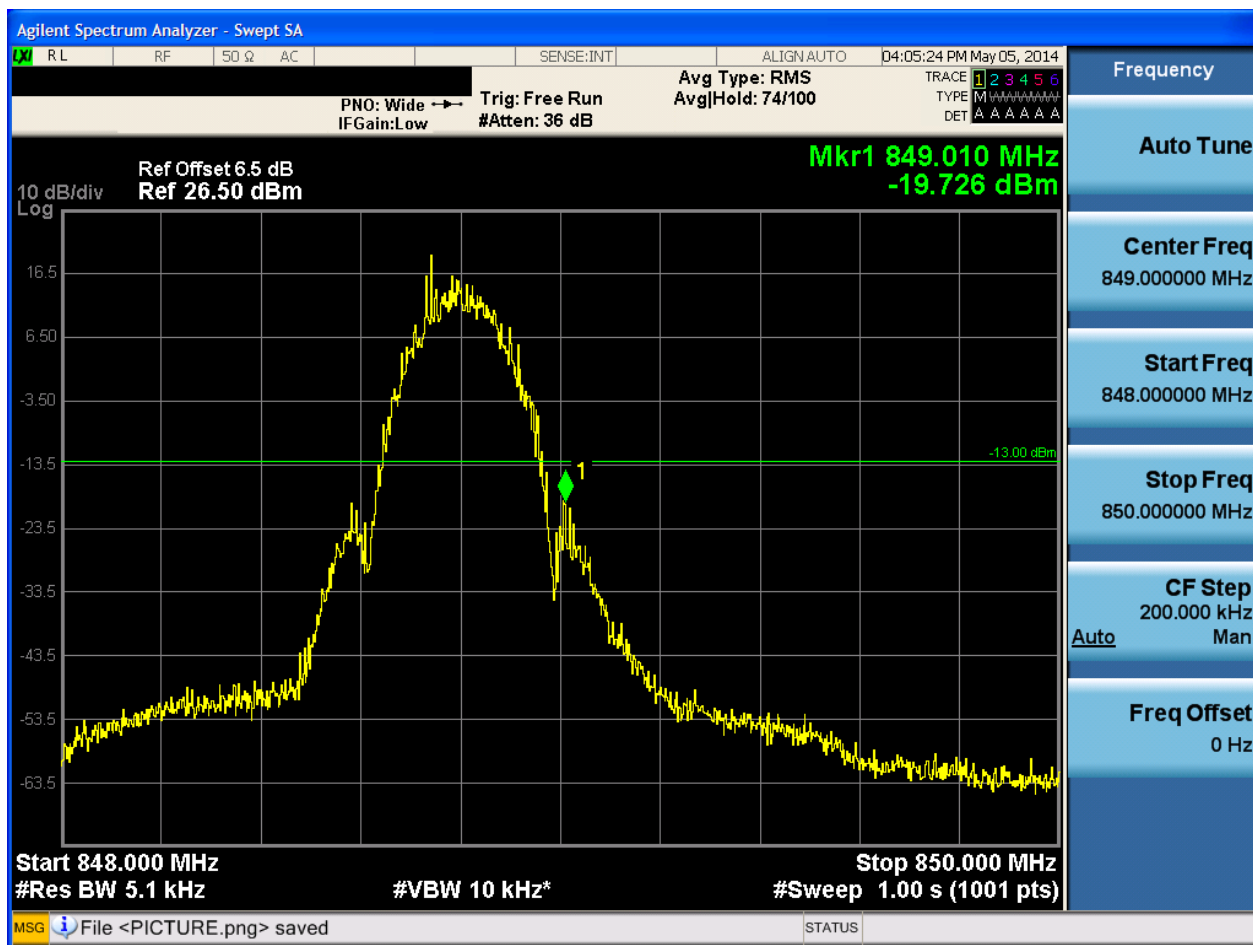
5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH





5.1.1.2.2 Test Channel = HCH

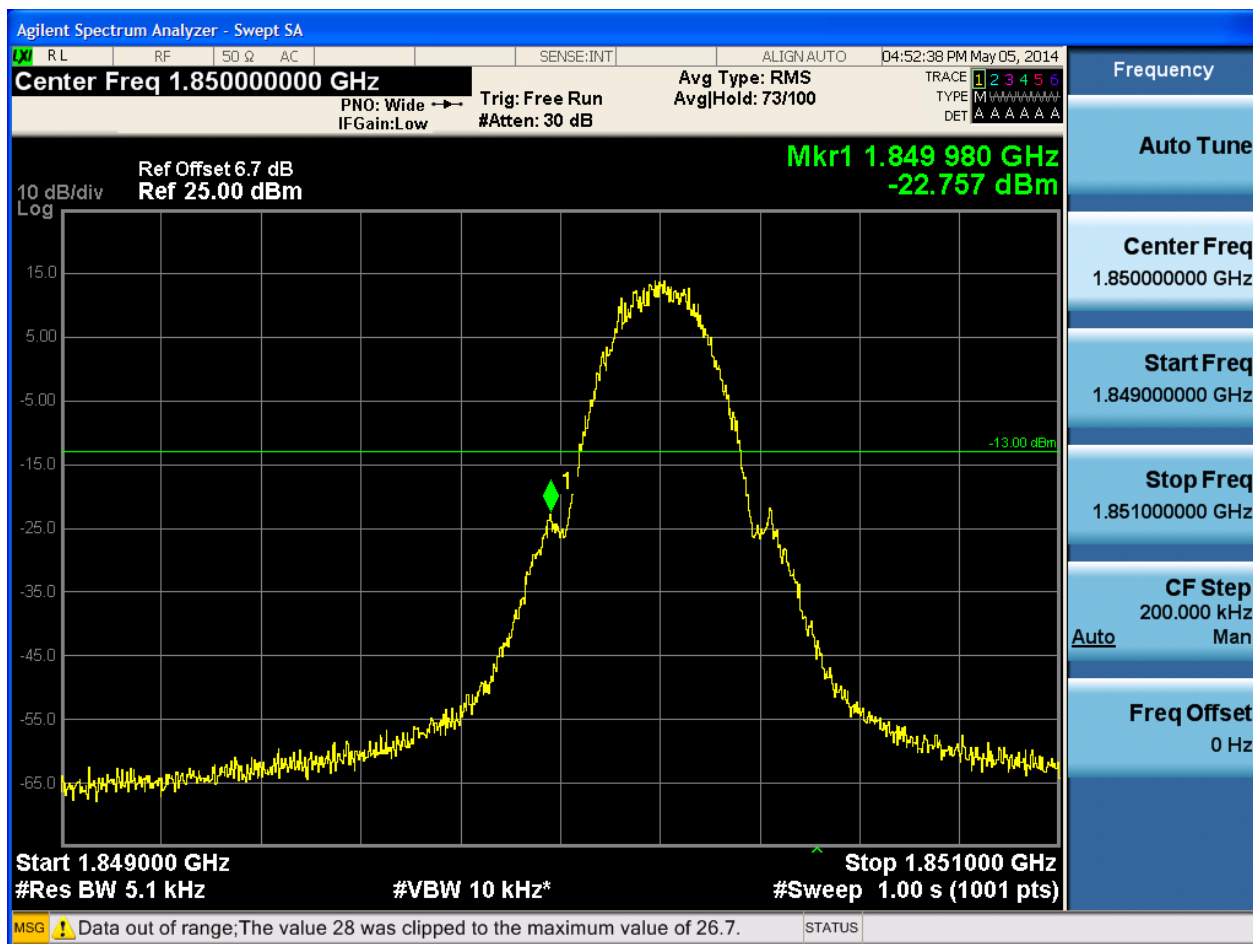




5.1.2 Test Band = GSM1900

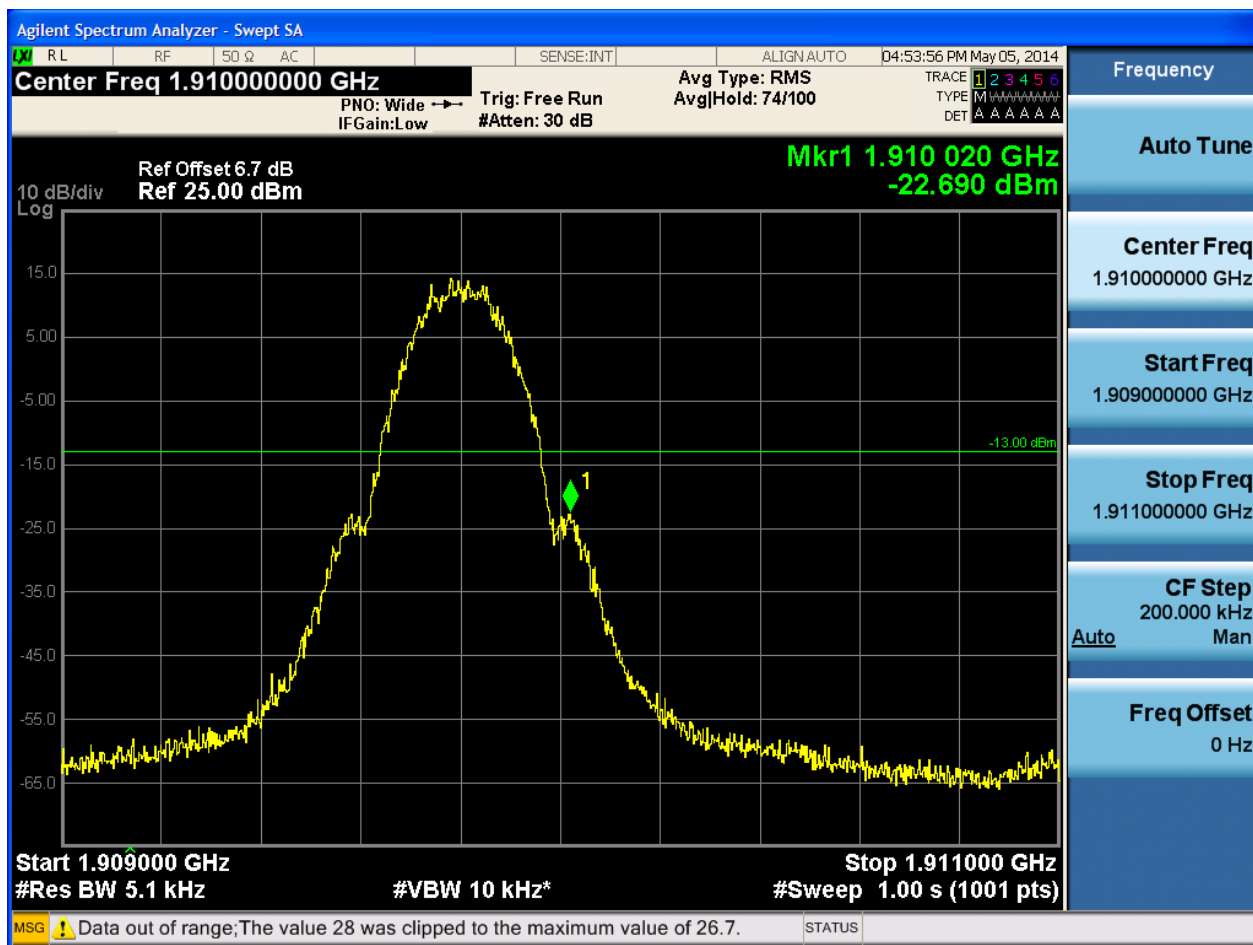
5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH





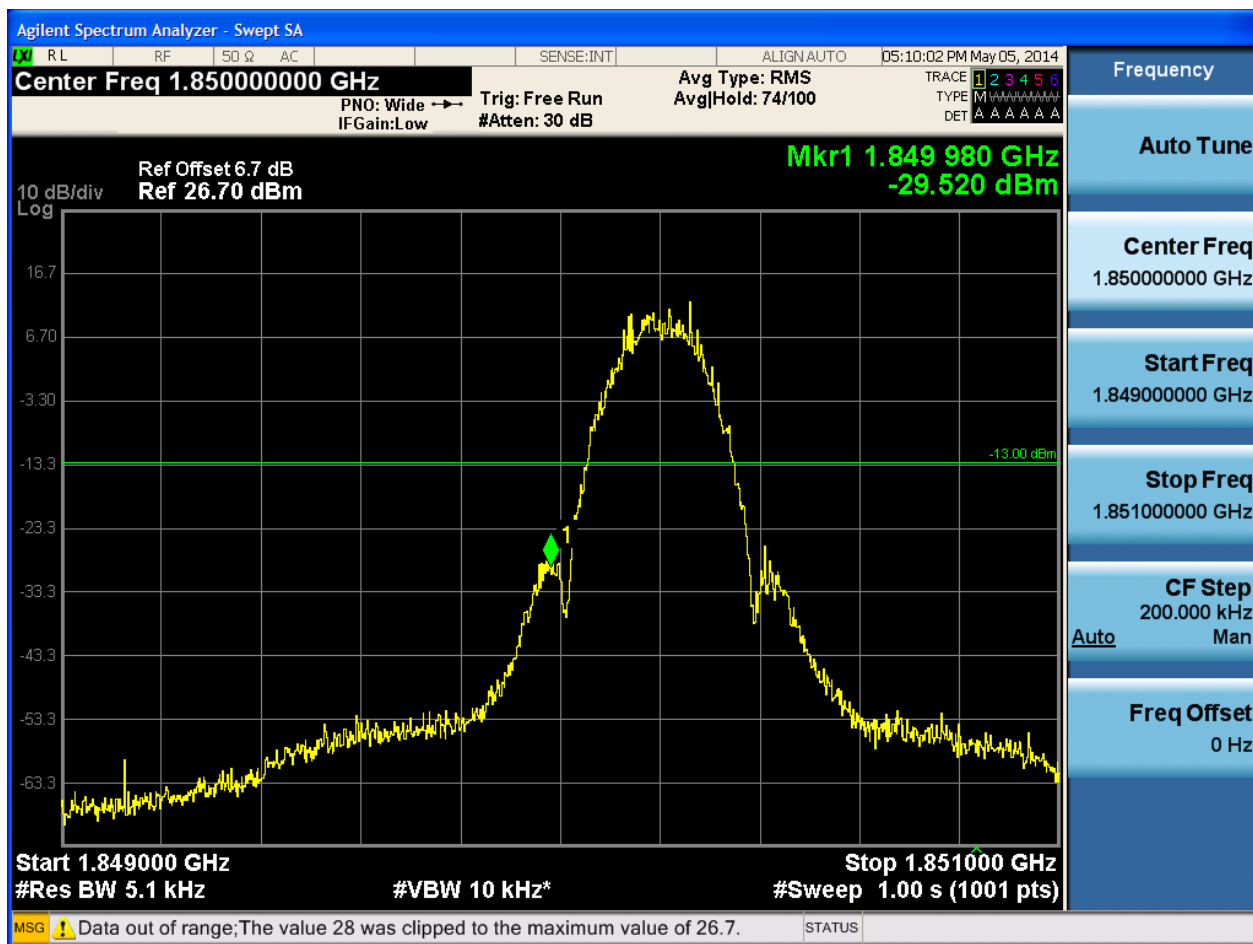
5.1.2.1.2 Test Channel = HCH





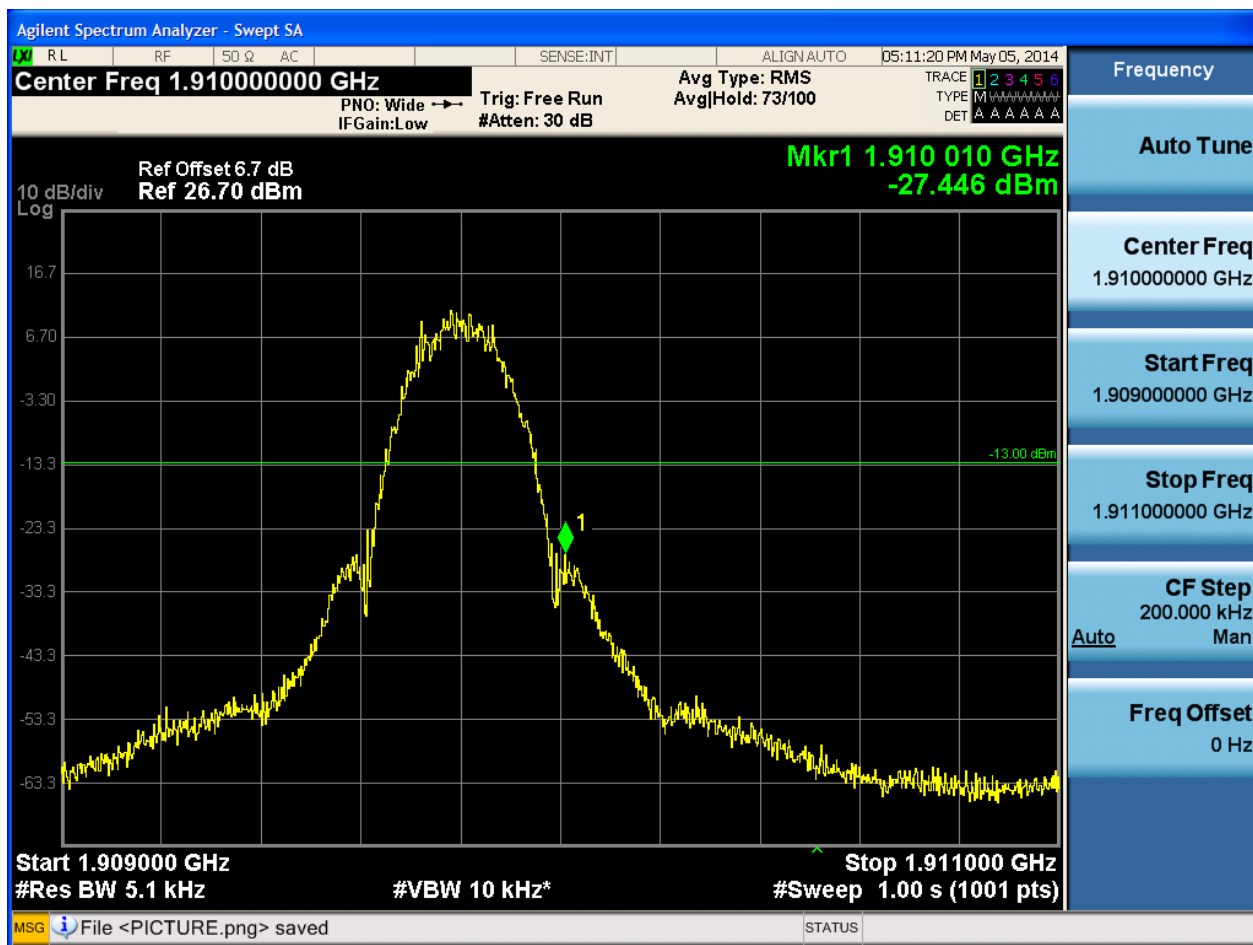
5.1.2.2 Test Mode = GSM/TM2

5.1.2.2.1 Test Channel = LCH





5.1.2.2.2 Test Channel = HCH

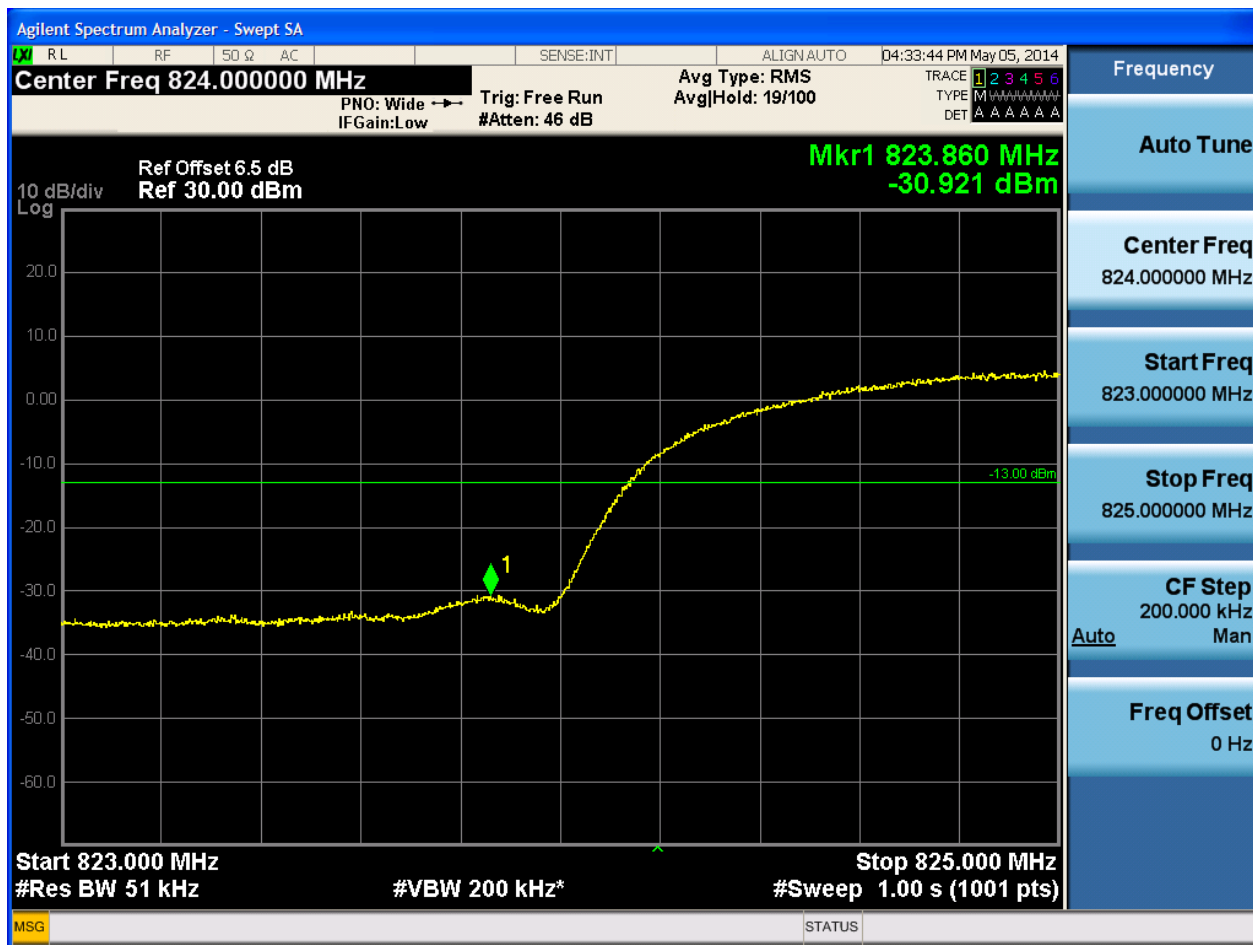


5.2 For UMTS

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 = 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

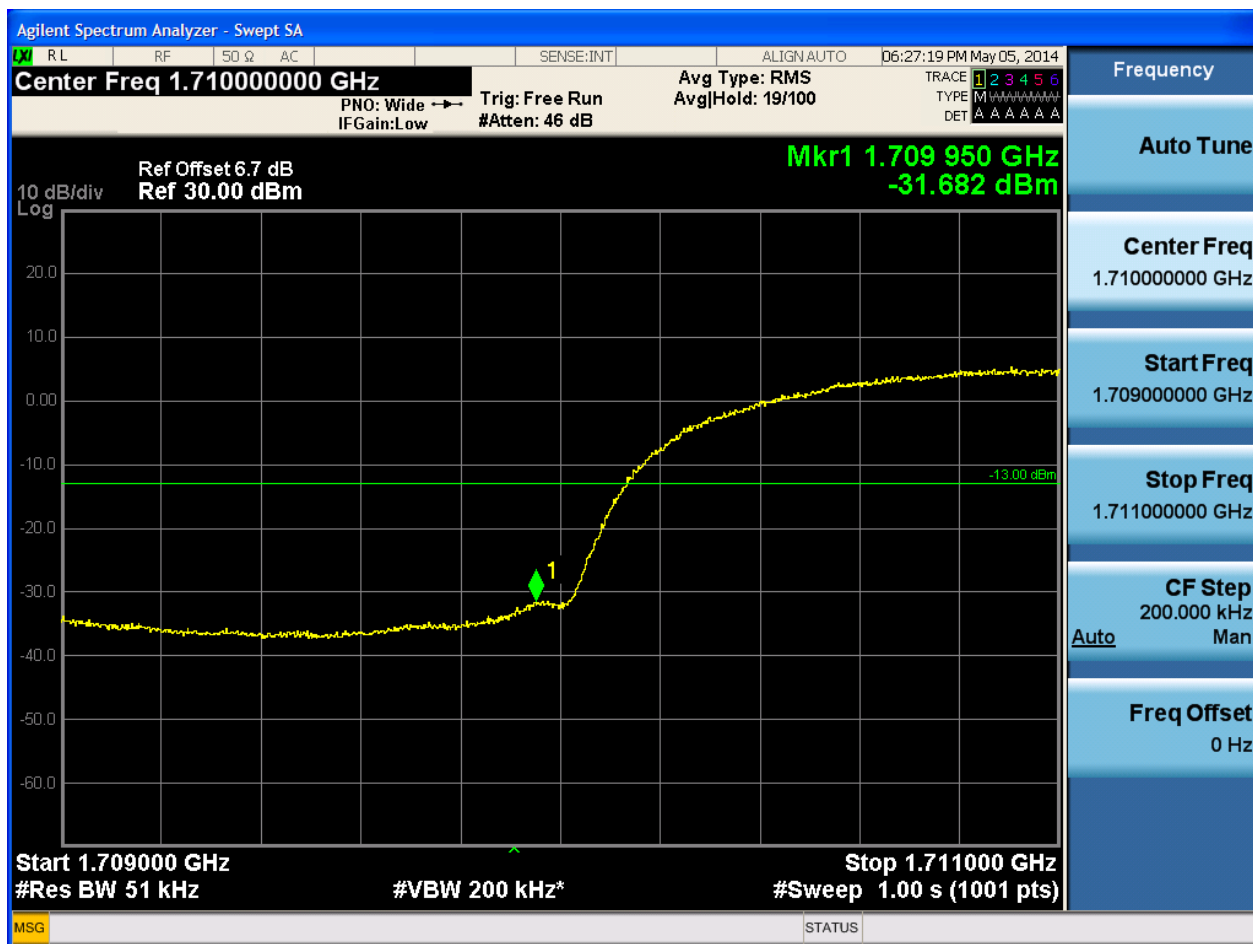




5.2.3 Test Band = WCDMA1700

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.

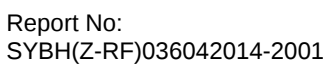
Part I - Test Plots

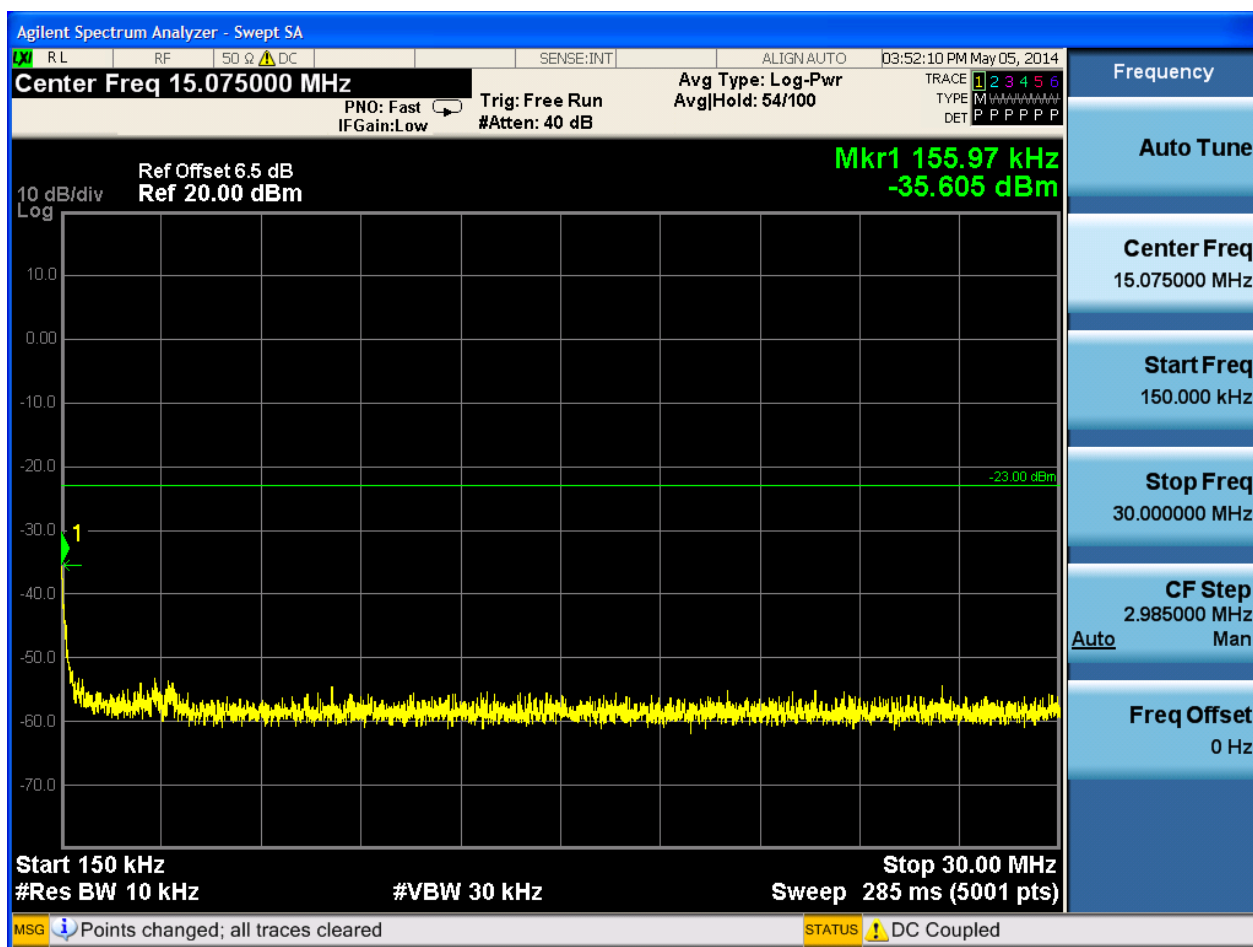
6.1 For GSM

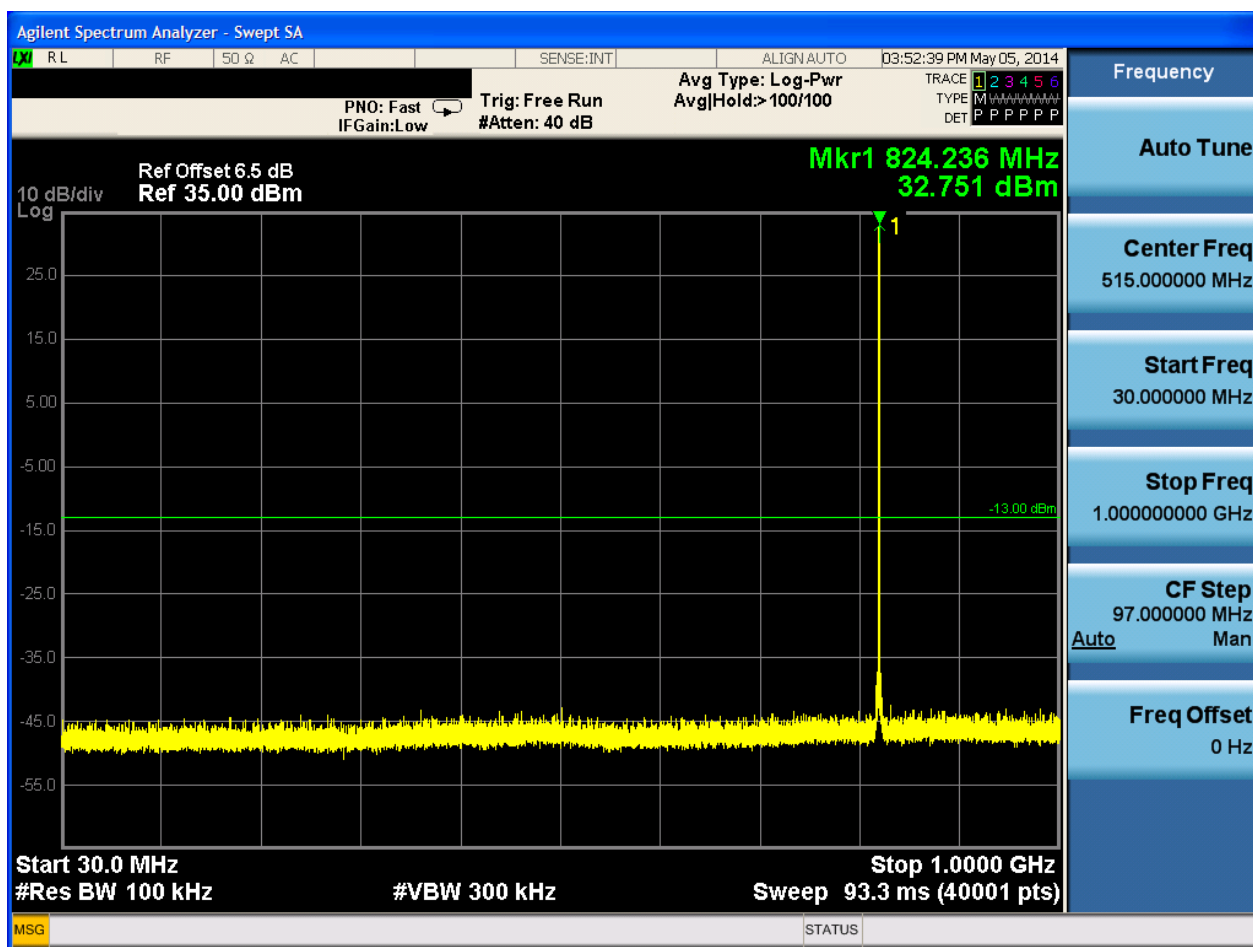
6.1.1 Test Band = GSM850

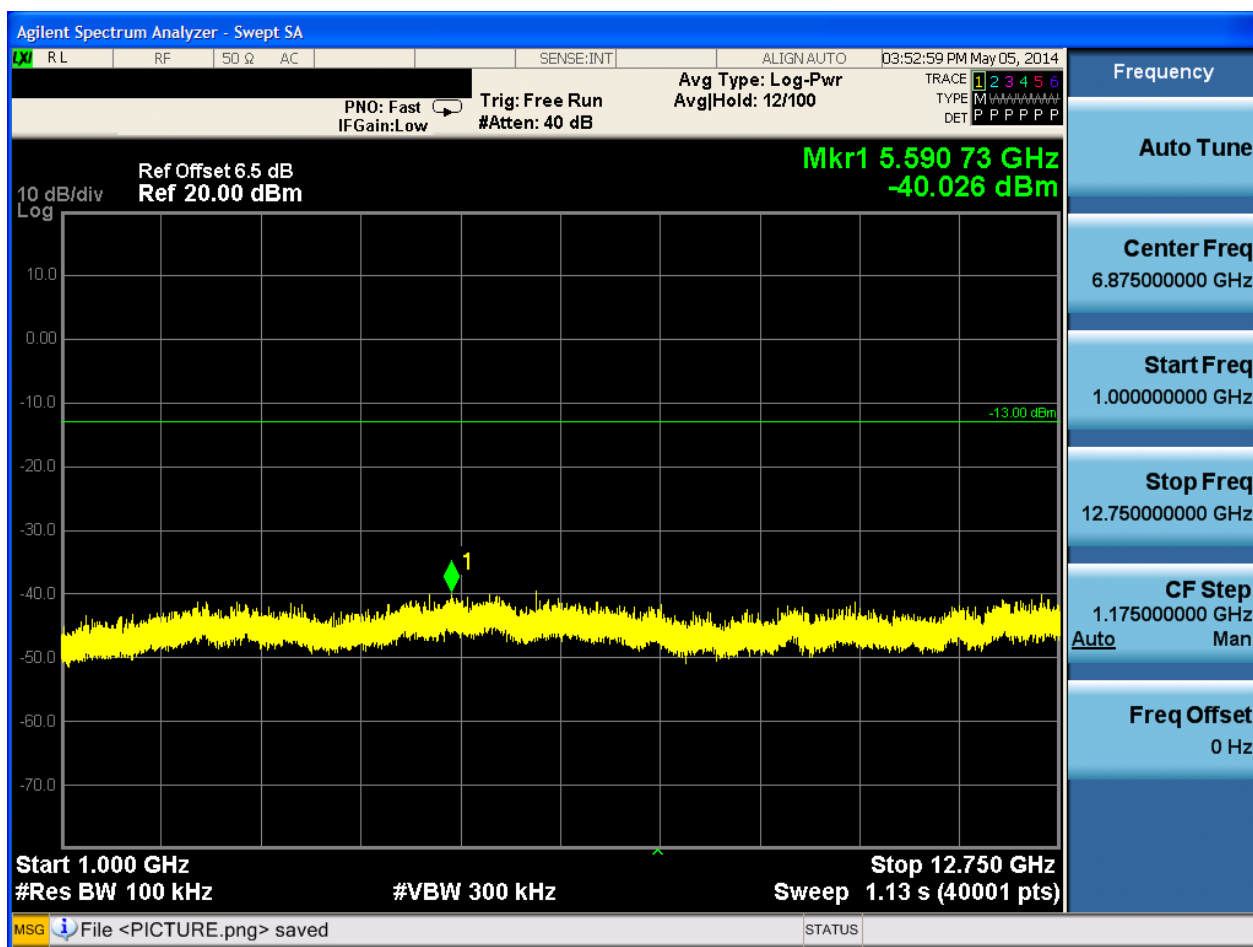
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH



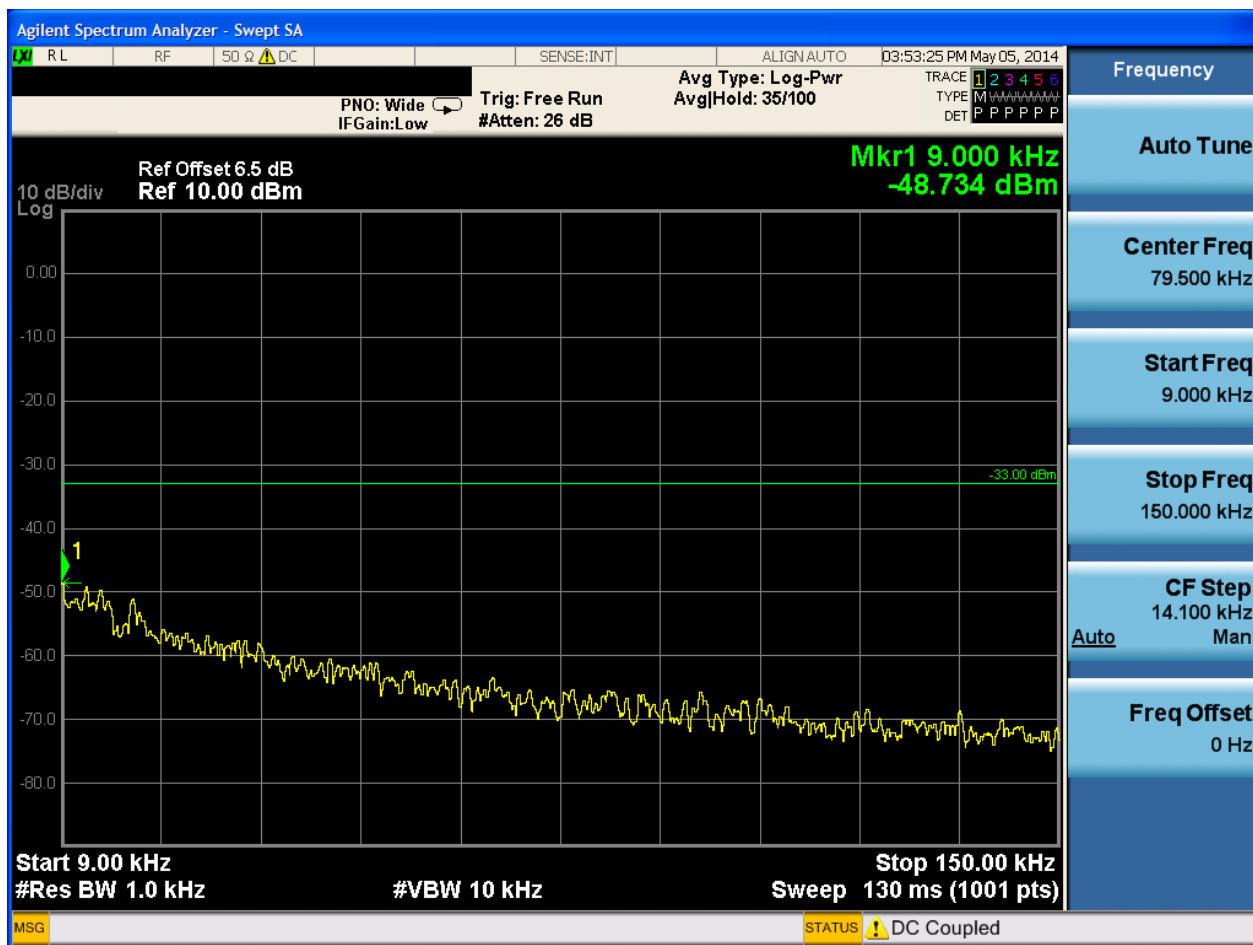


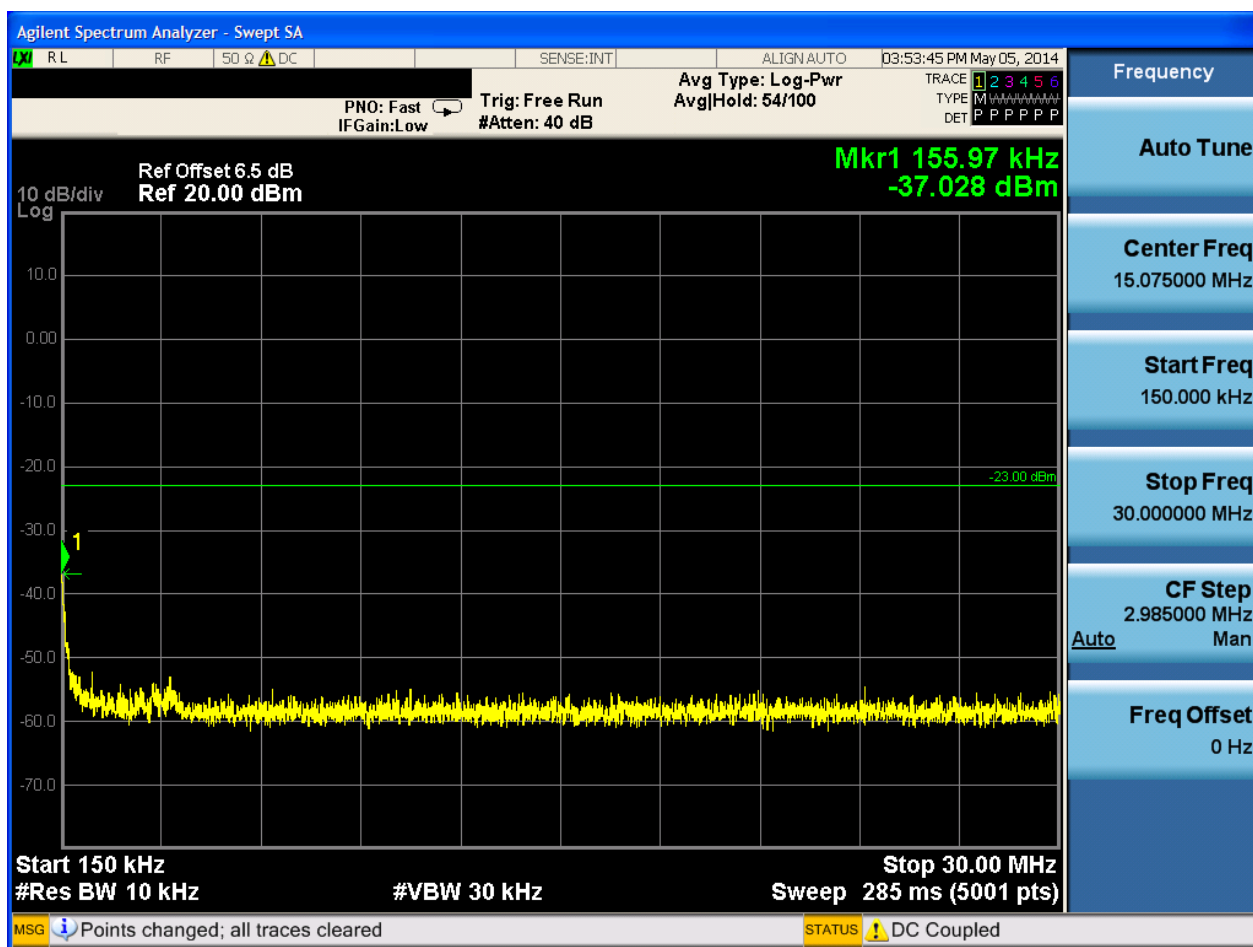


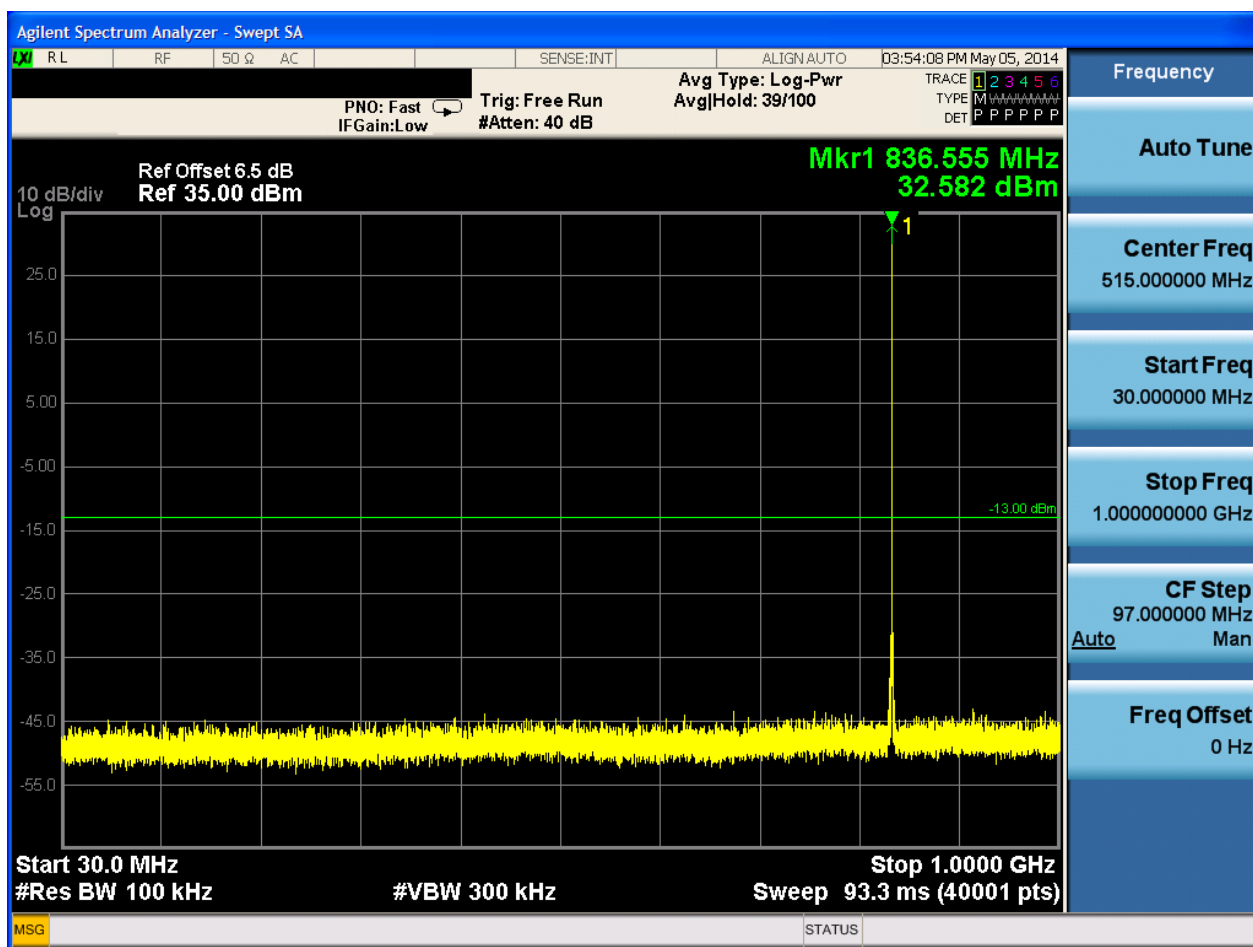


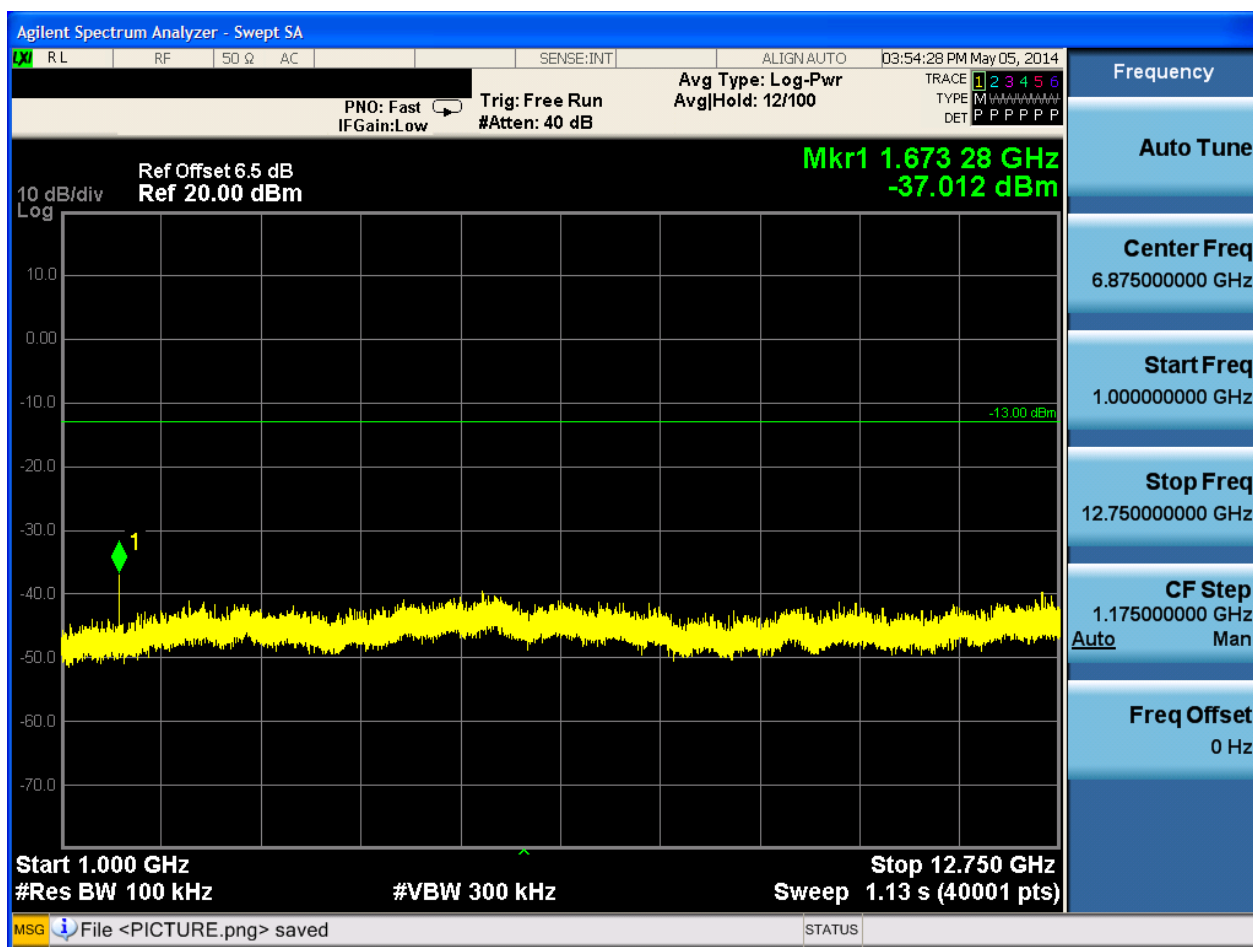


6.1.1.1.2 Test Channel = MCH



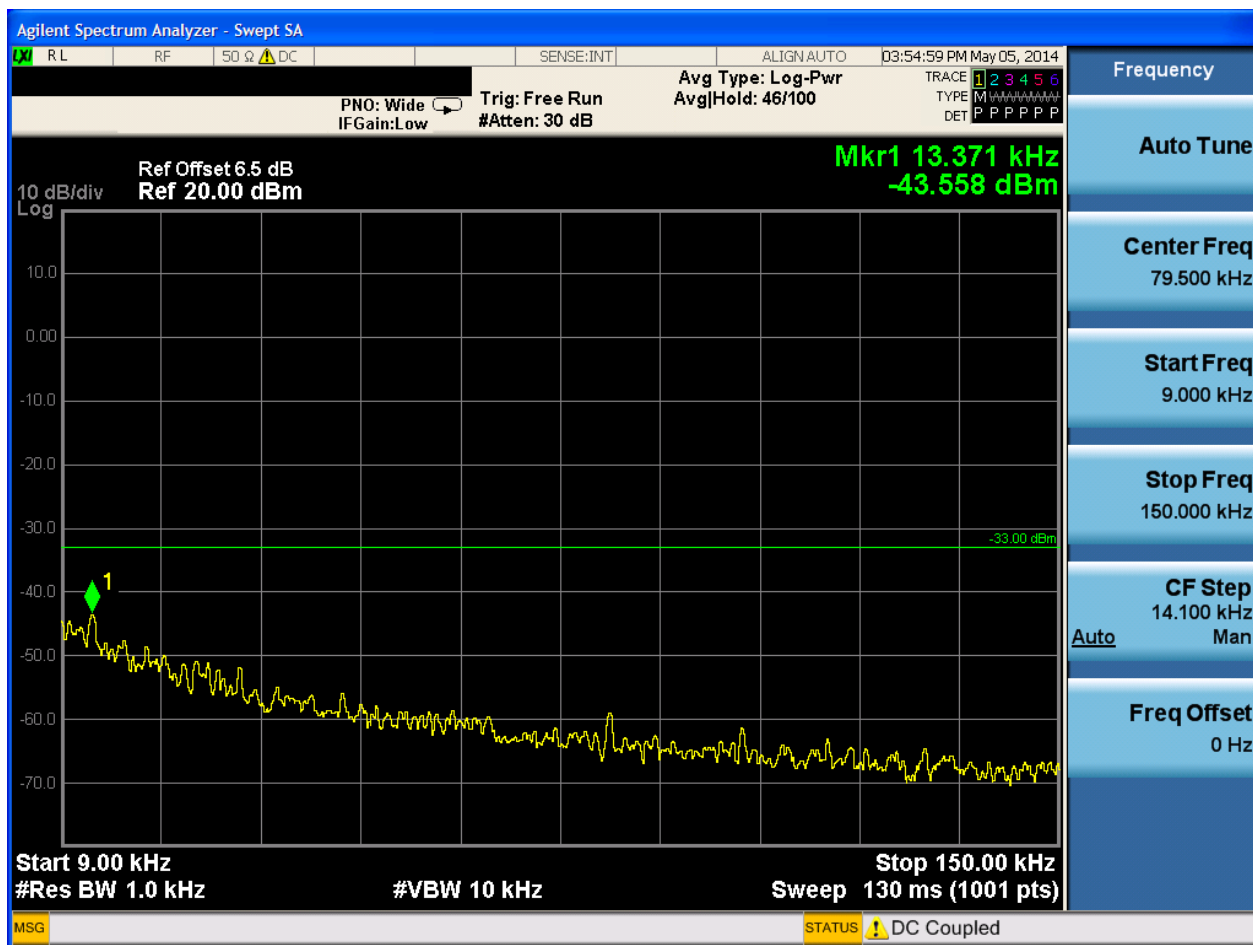


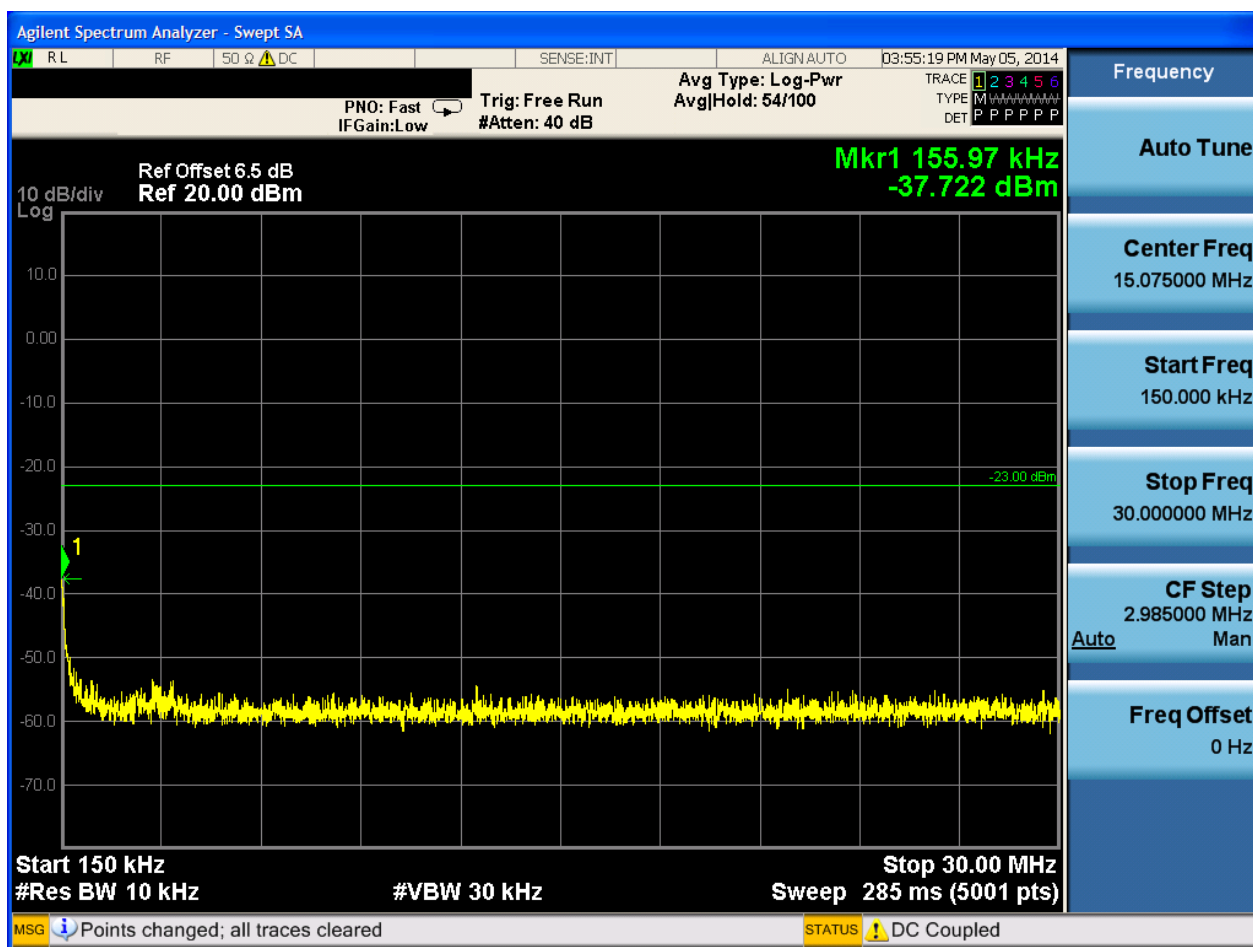


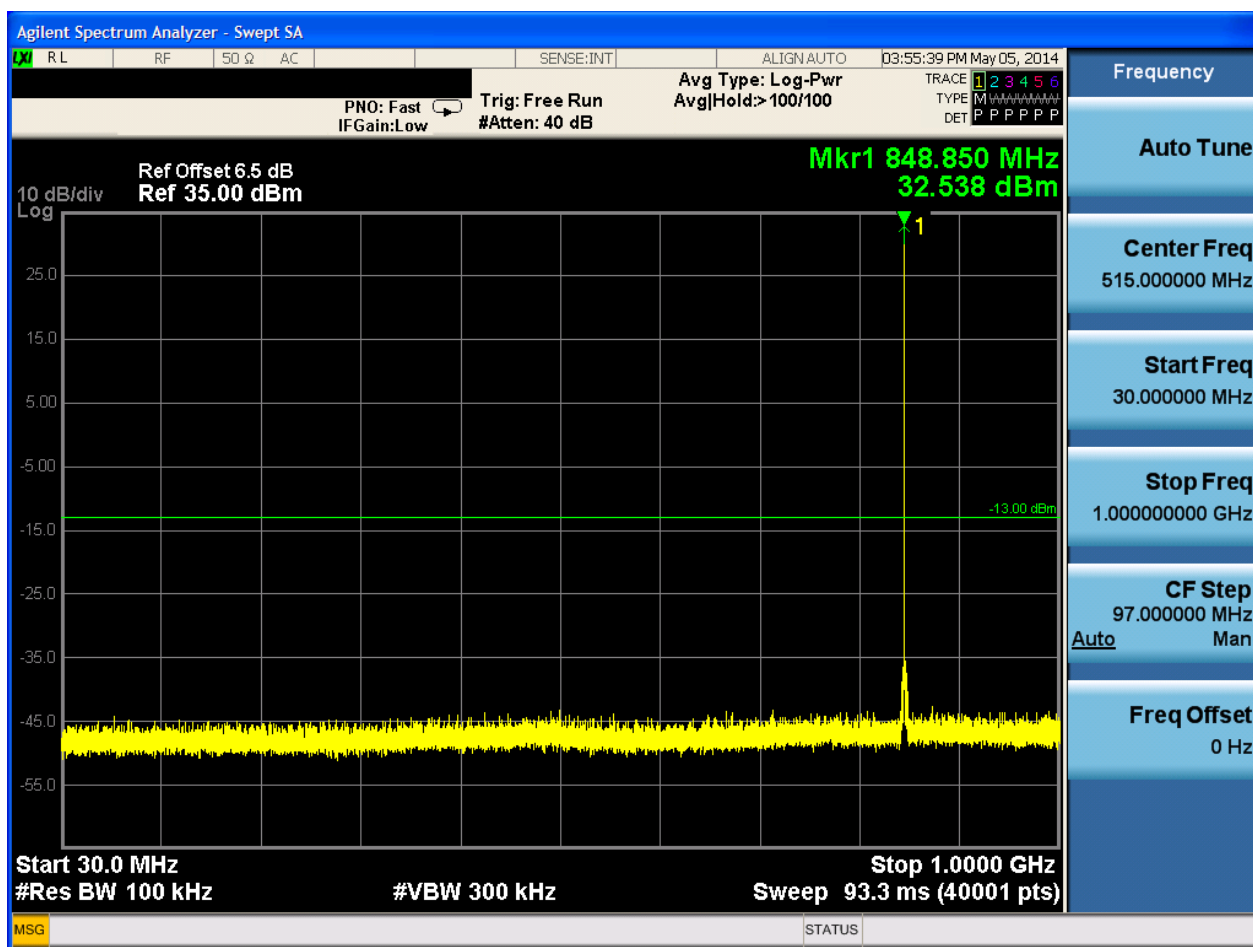


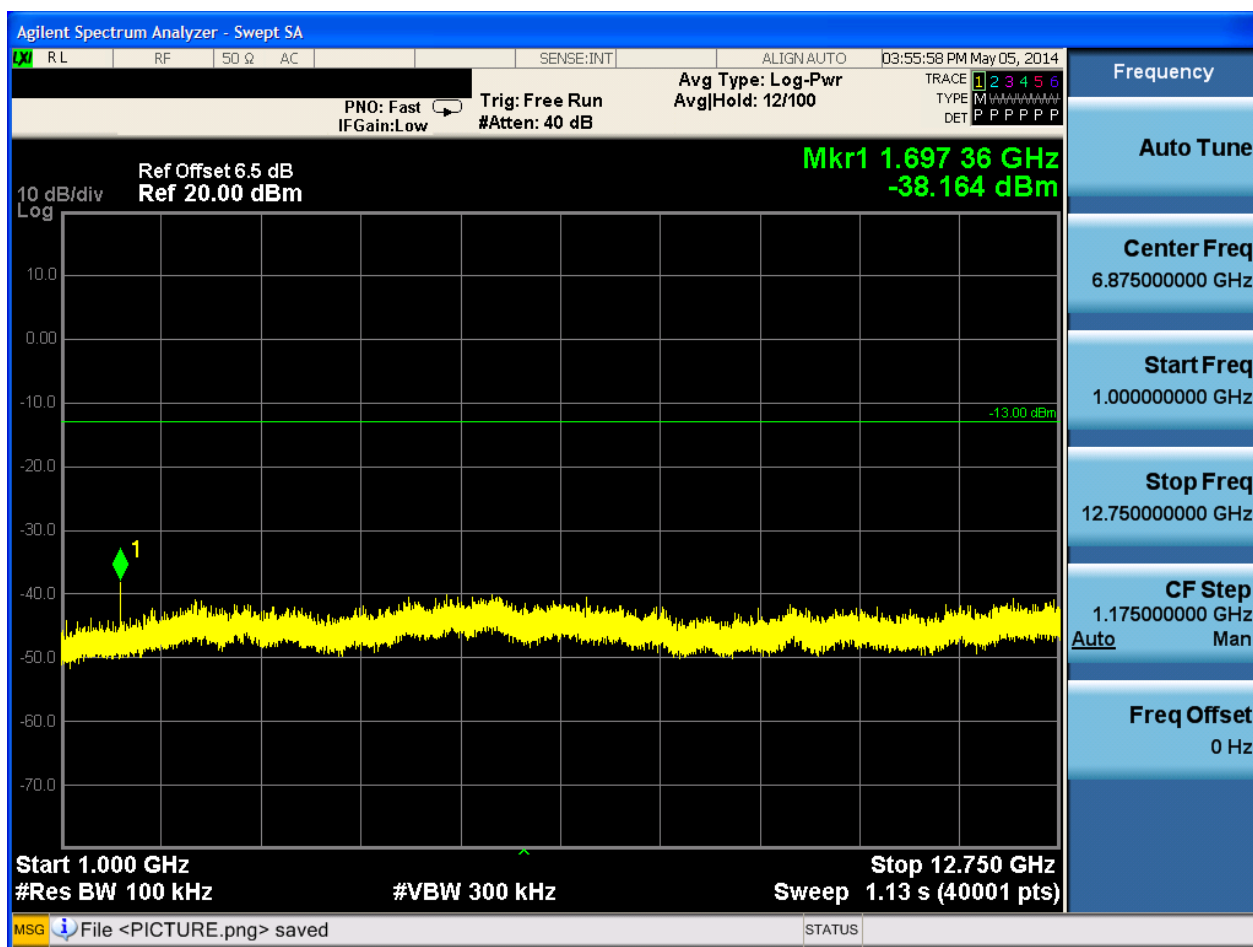


6.1.1.1.3 Test Channel = HCH





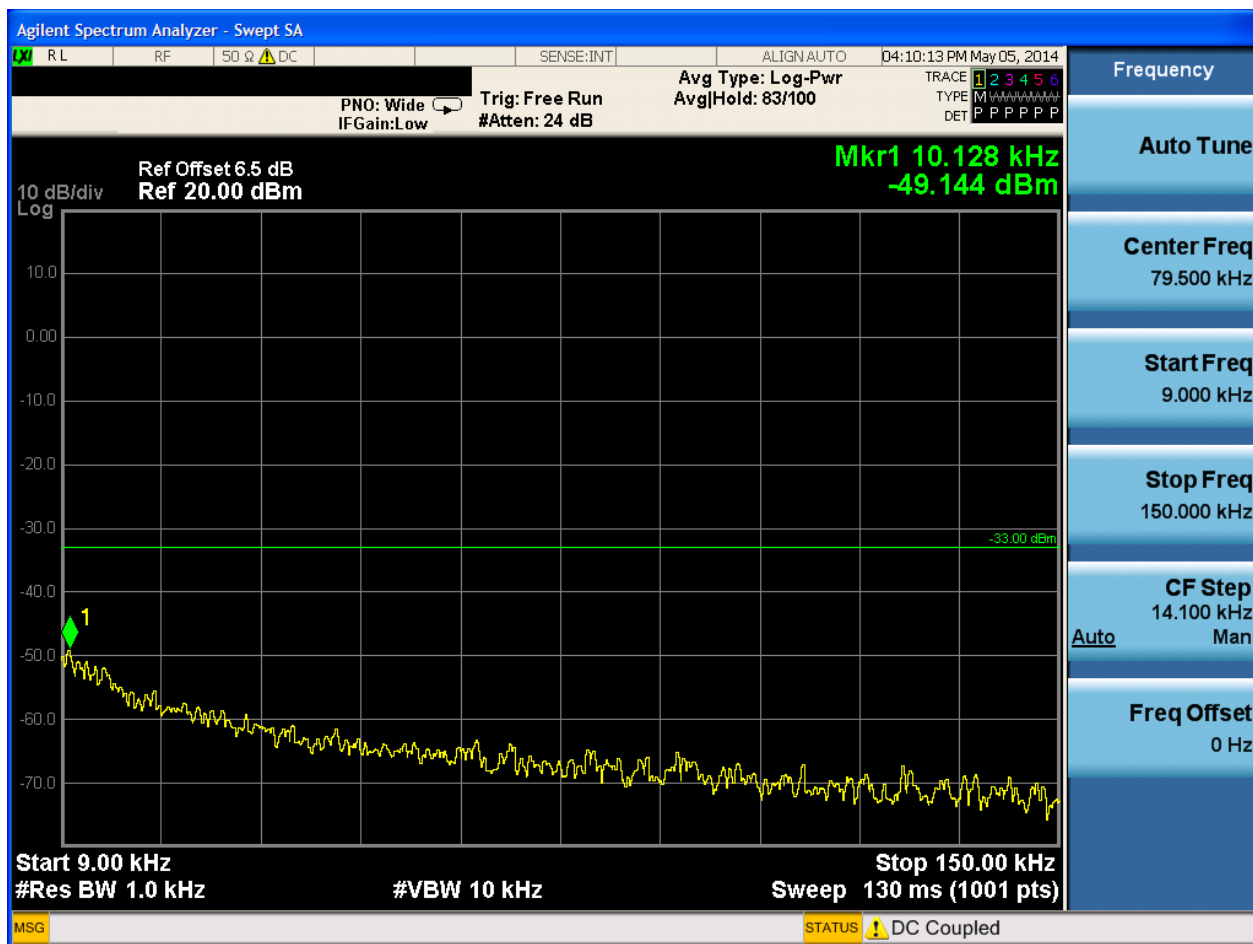


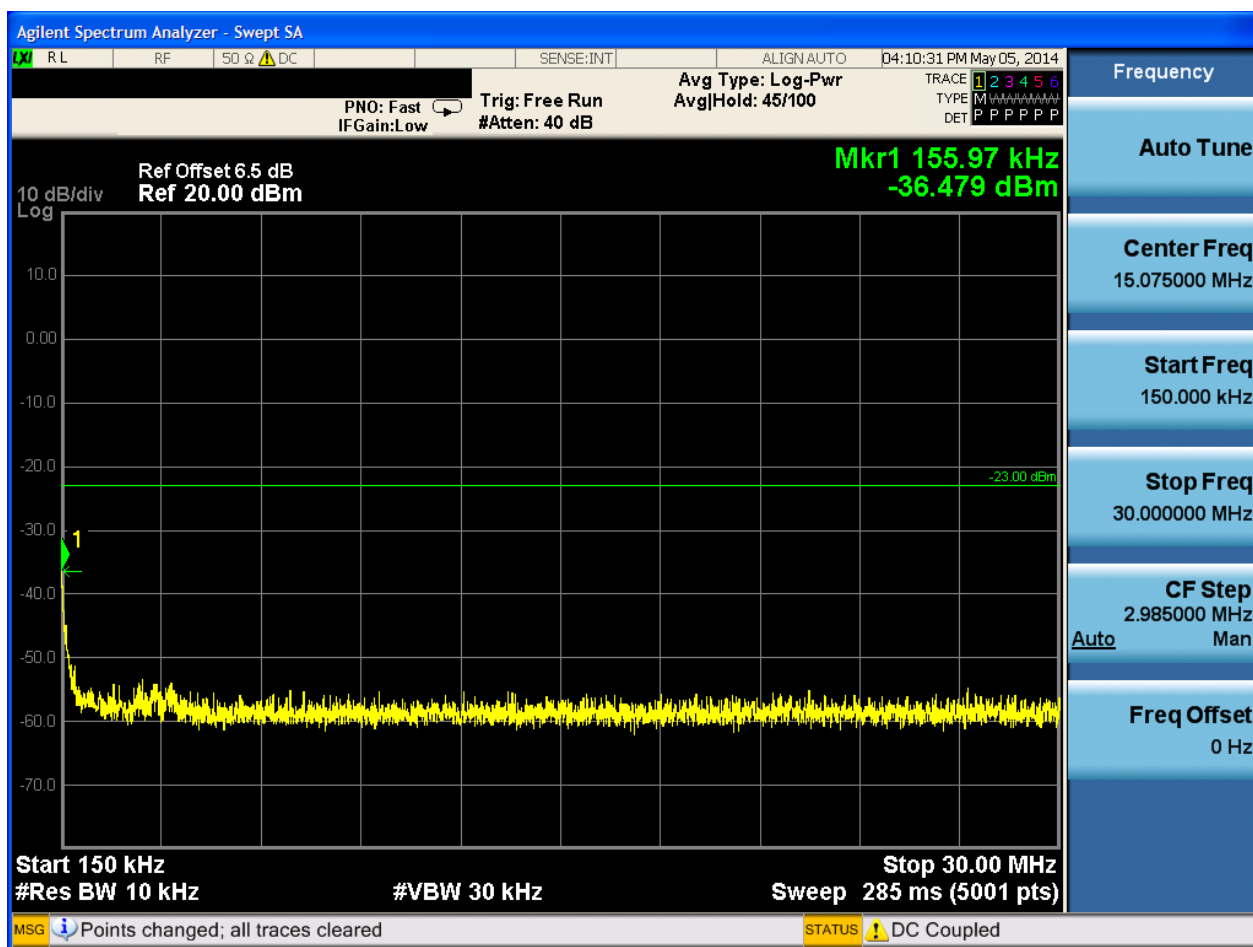


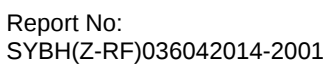


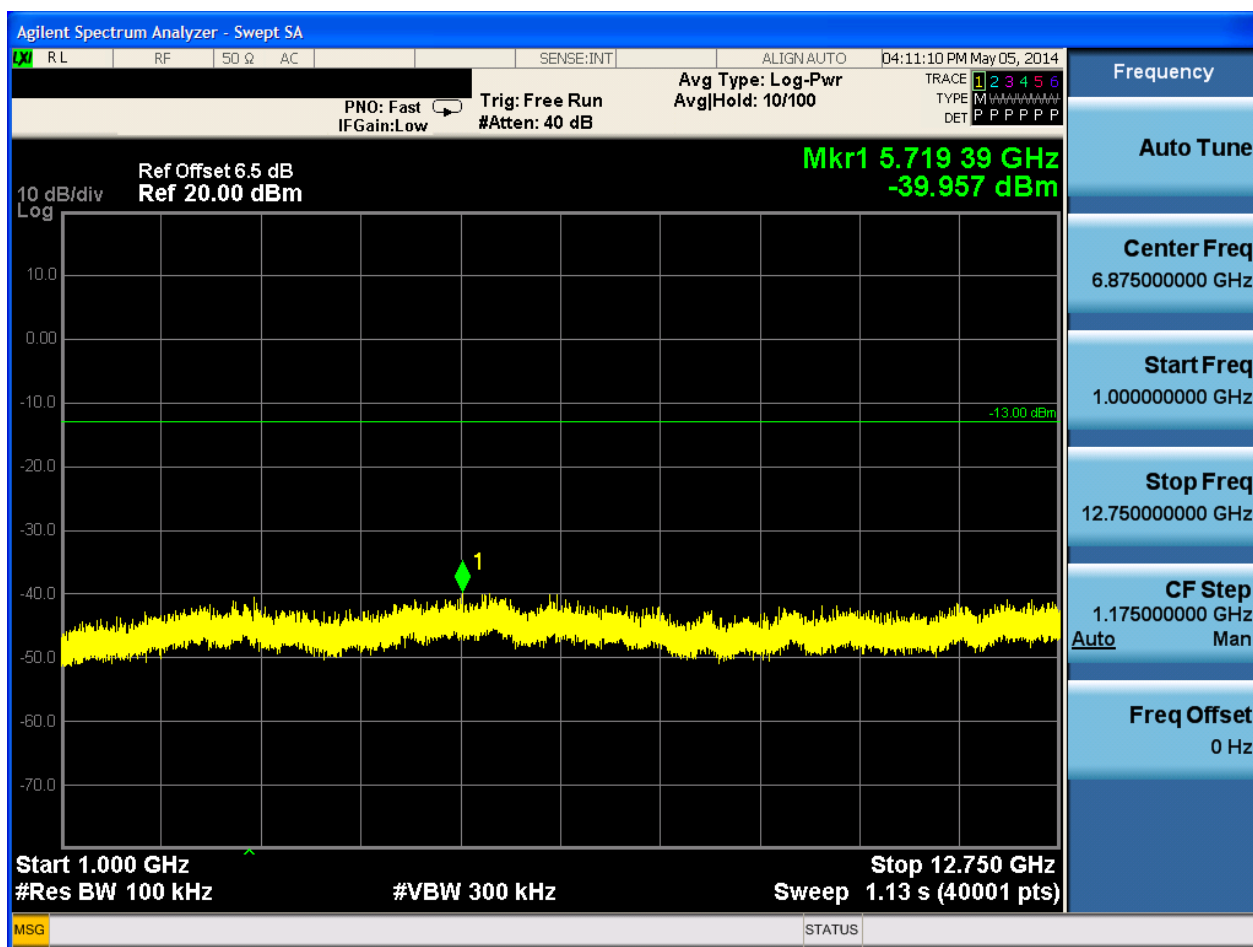
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH

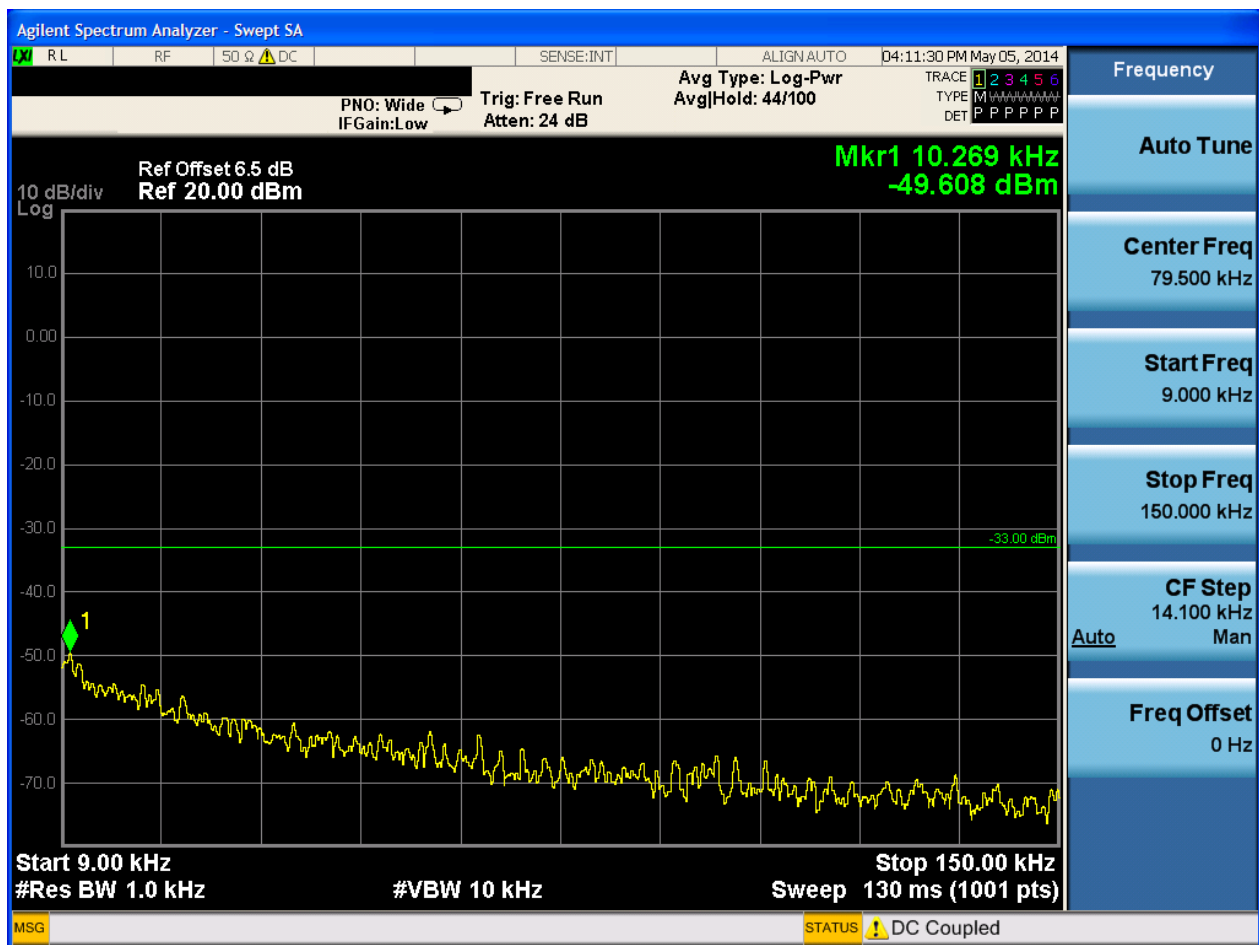


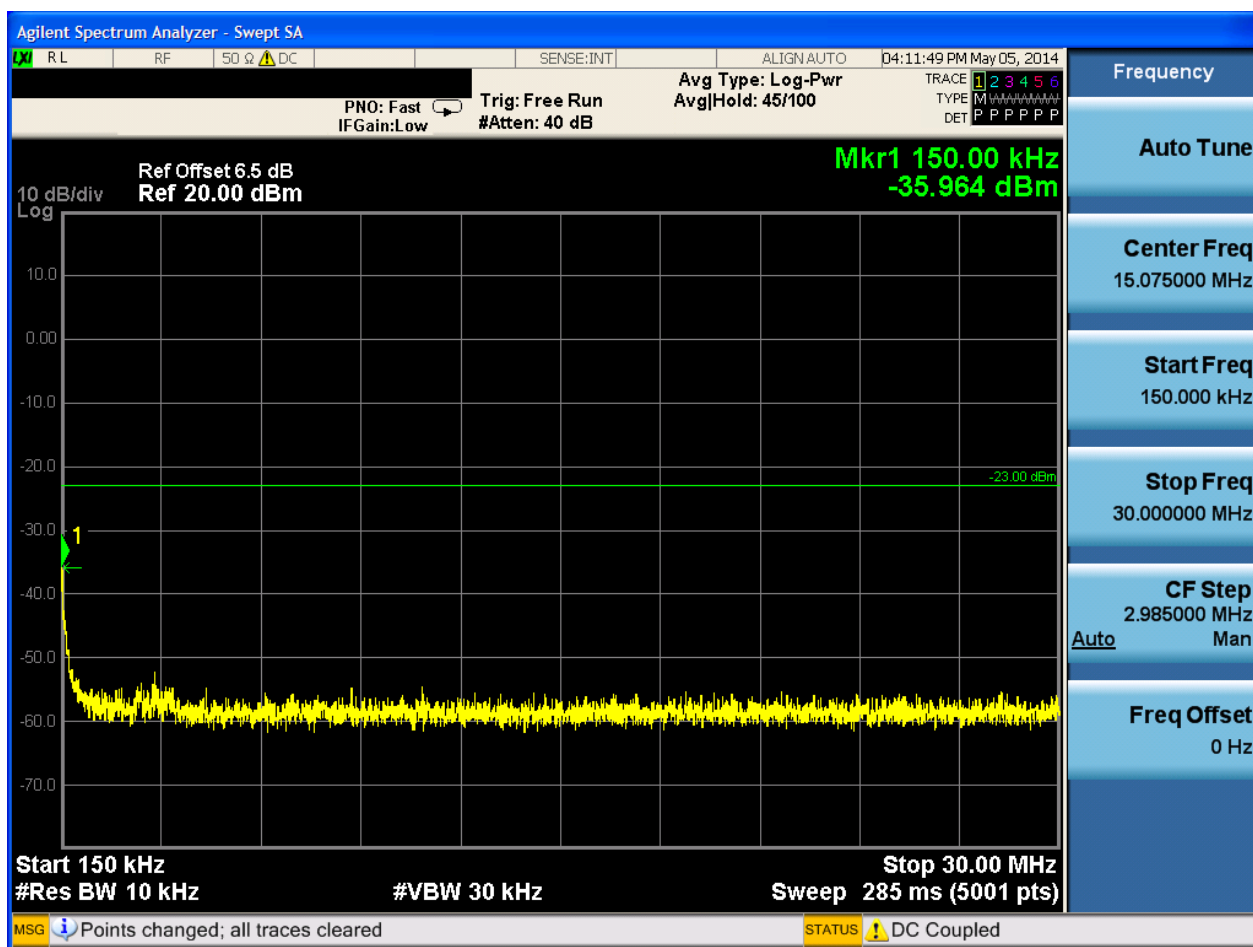


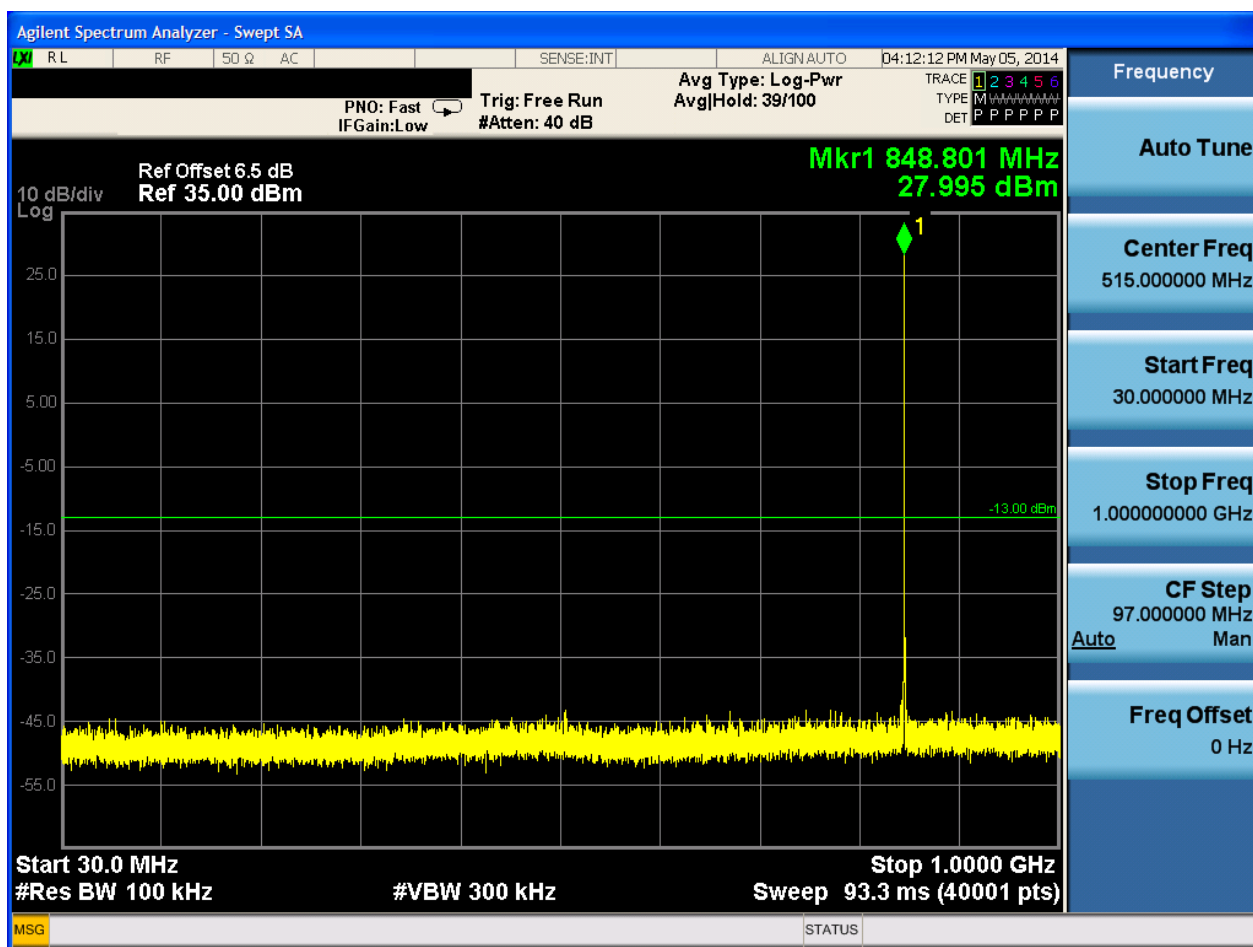


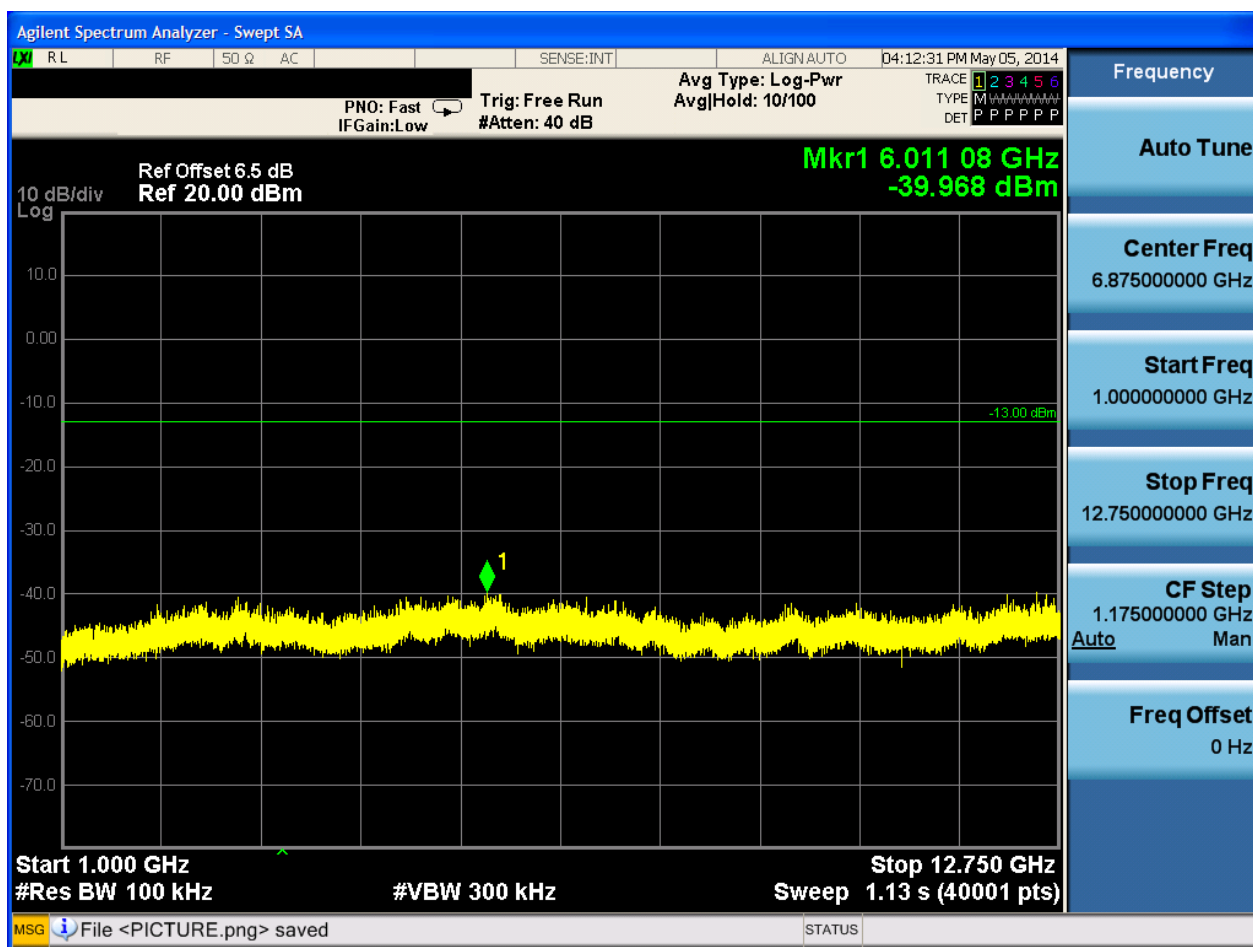


6.1.1.2.2 Test Channel = MCH



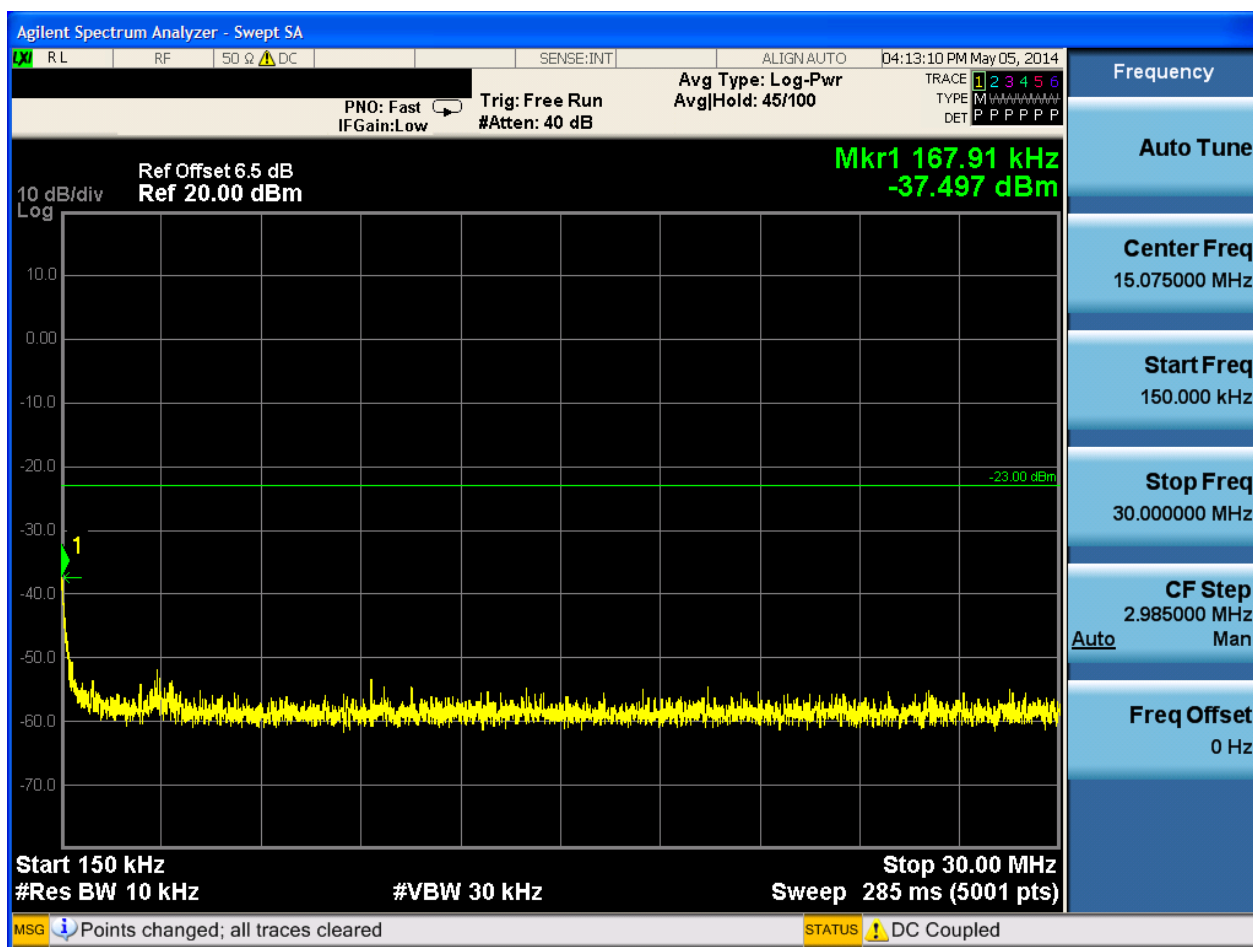


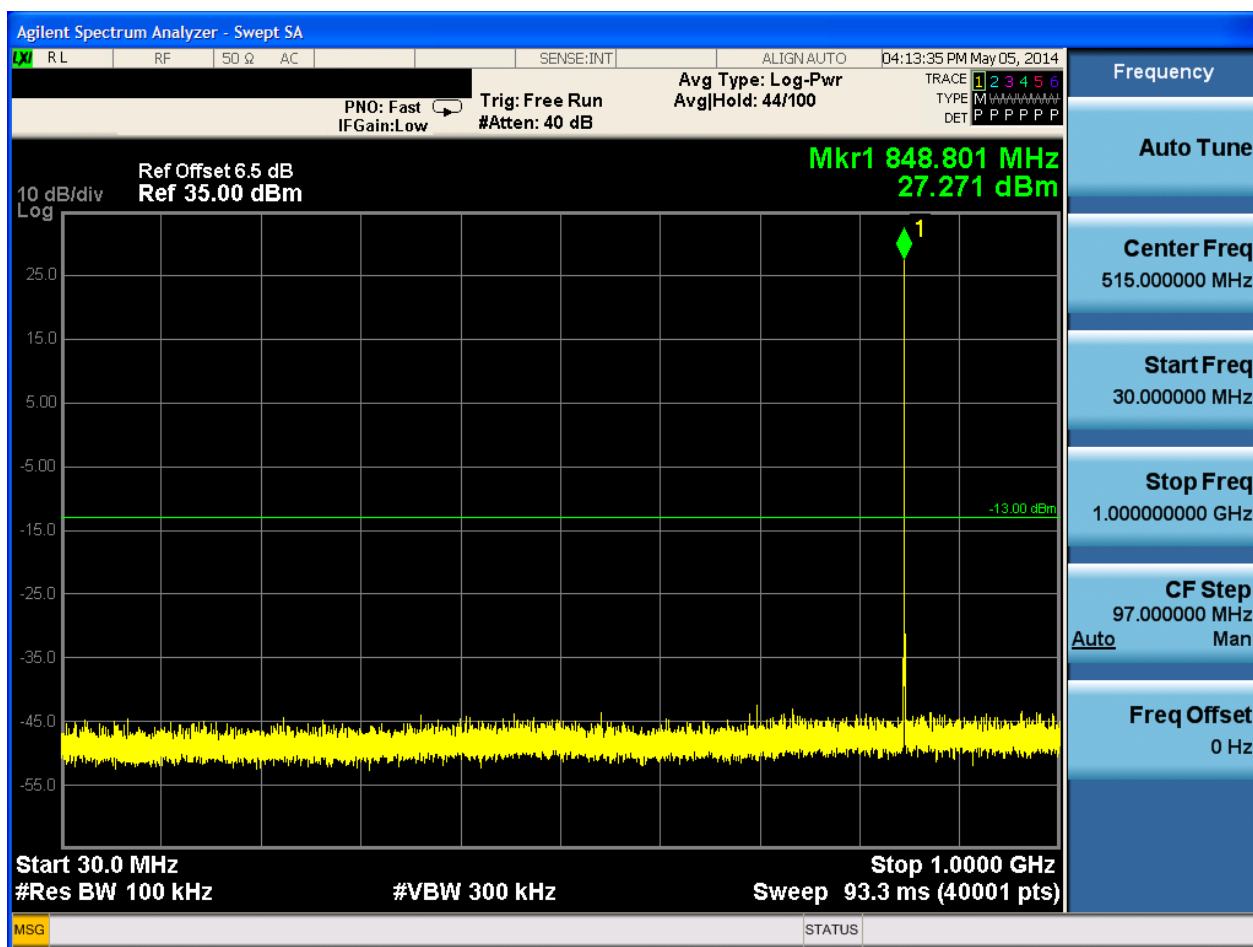


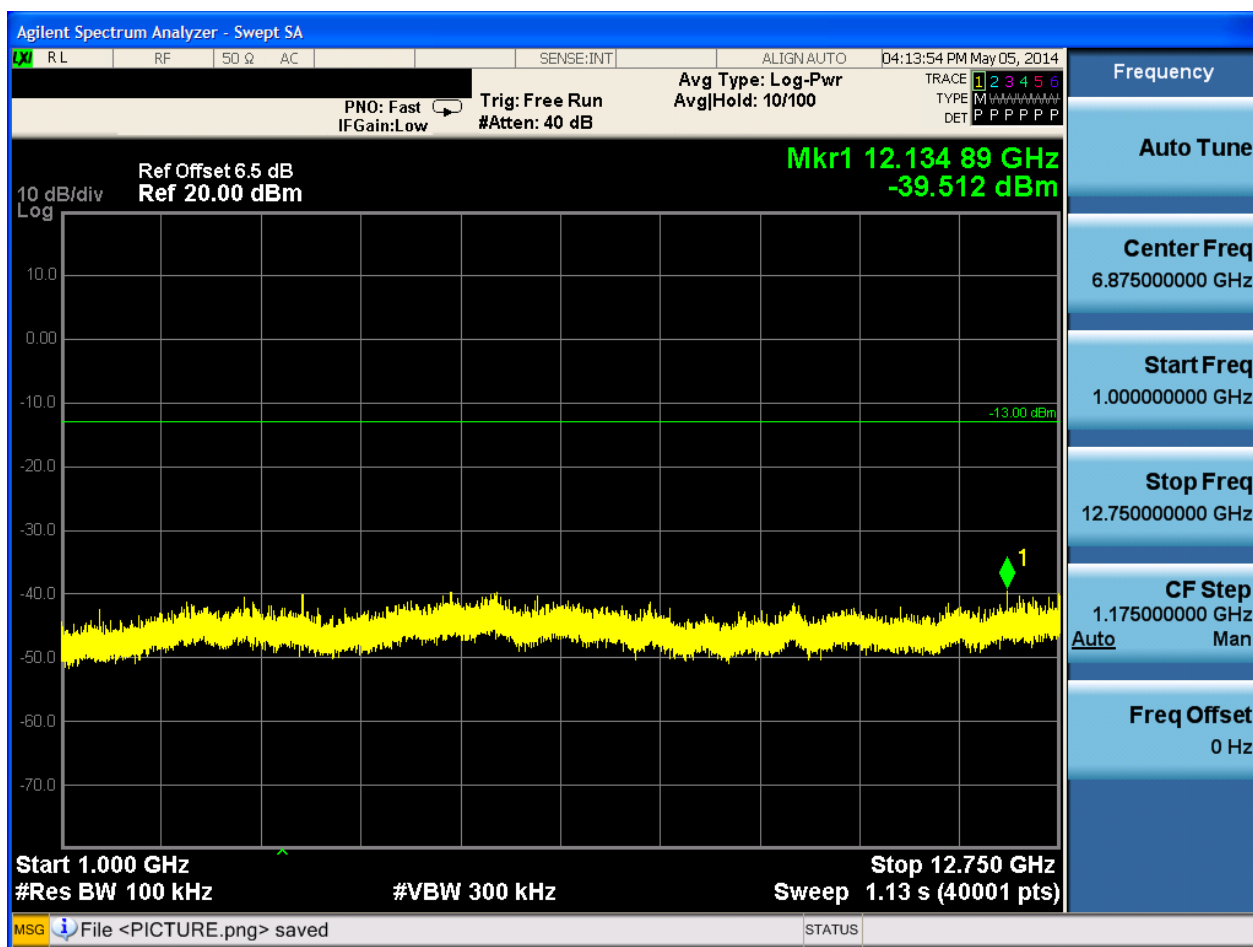


6.1.1.2.3 Test Channel = HCH









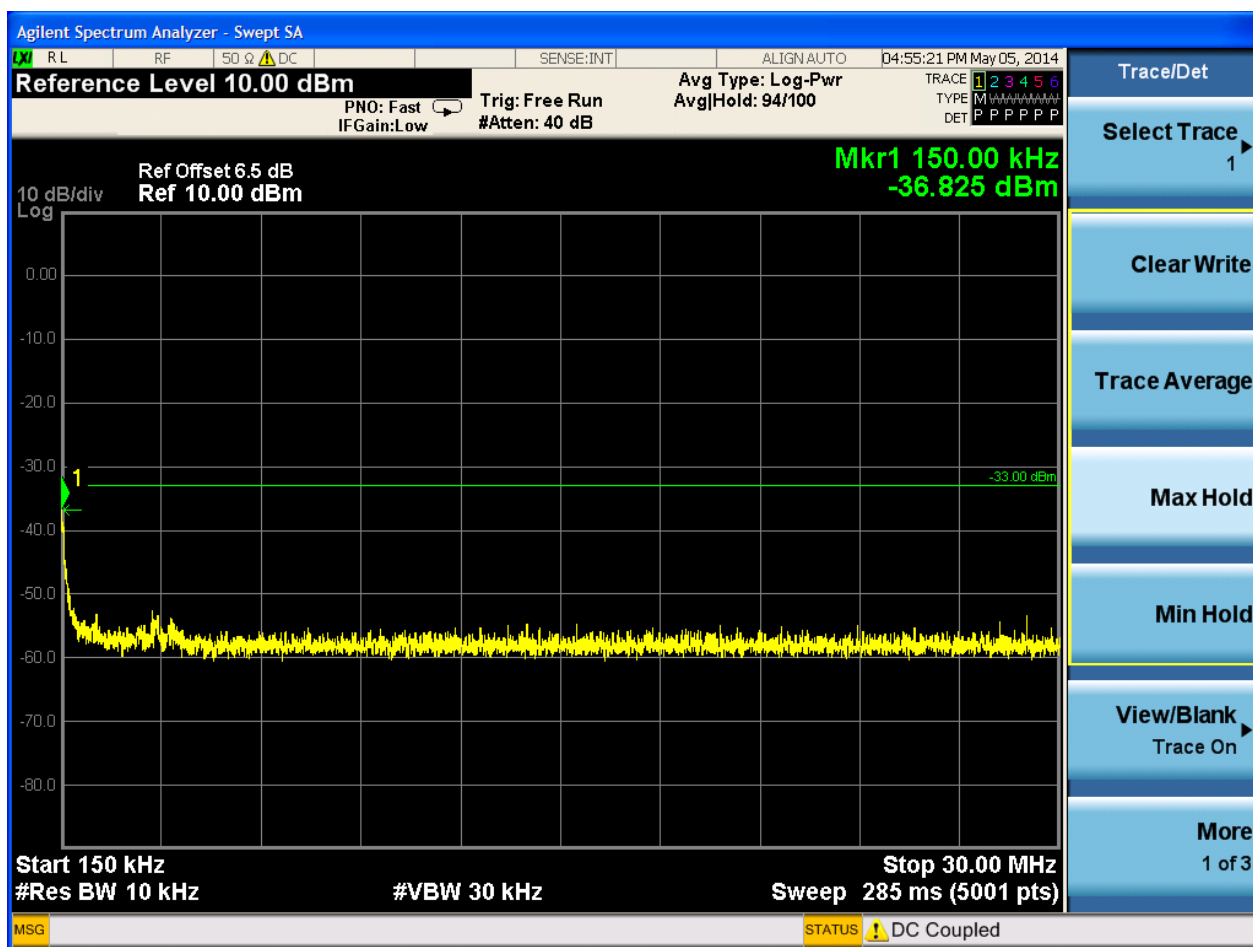


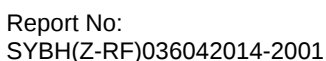
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH

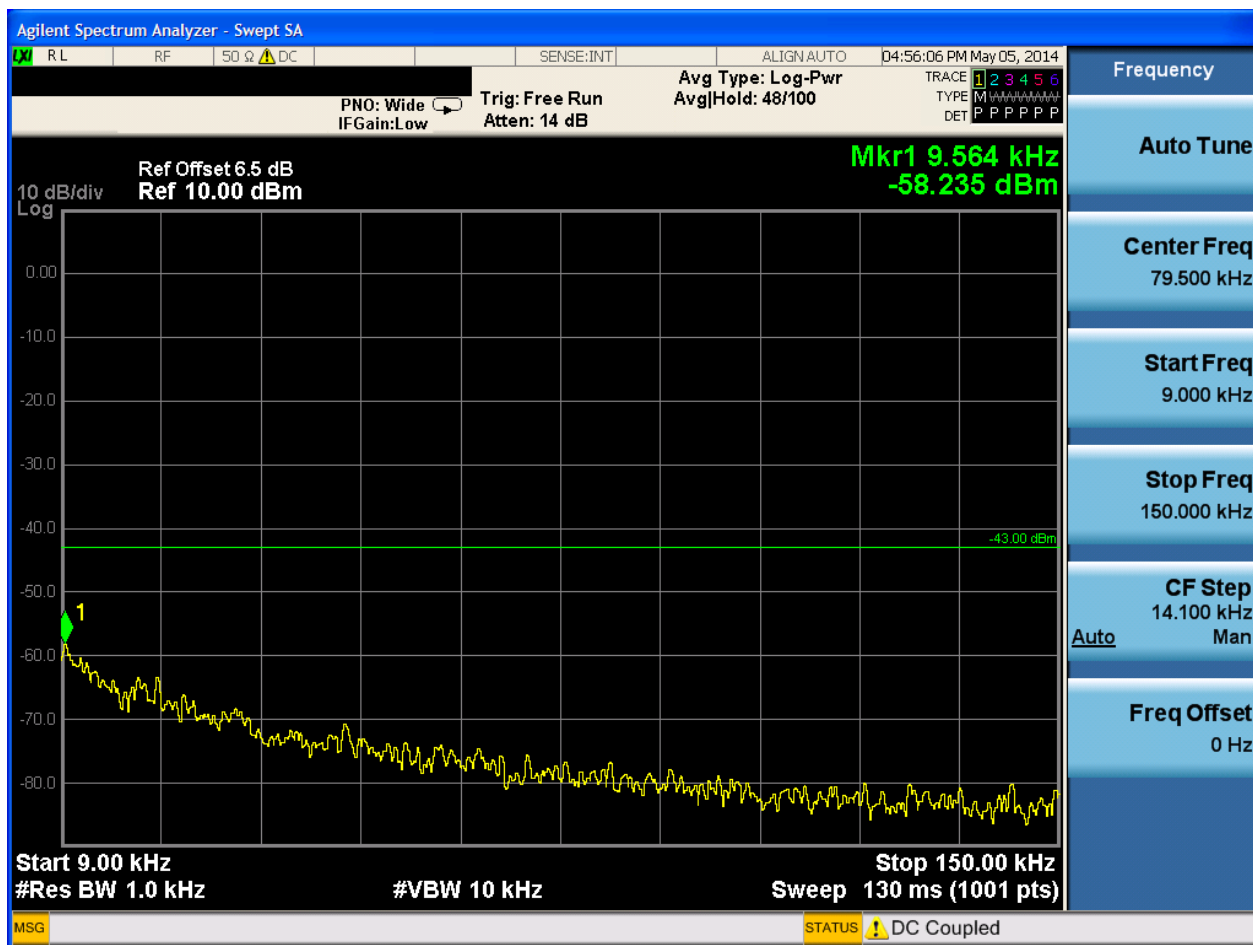


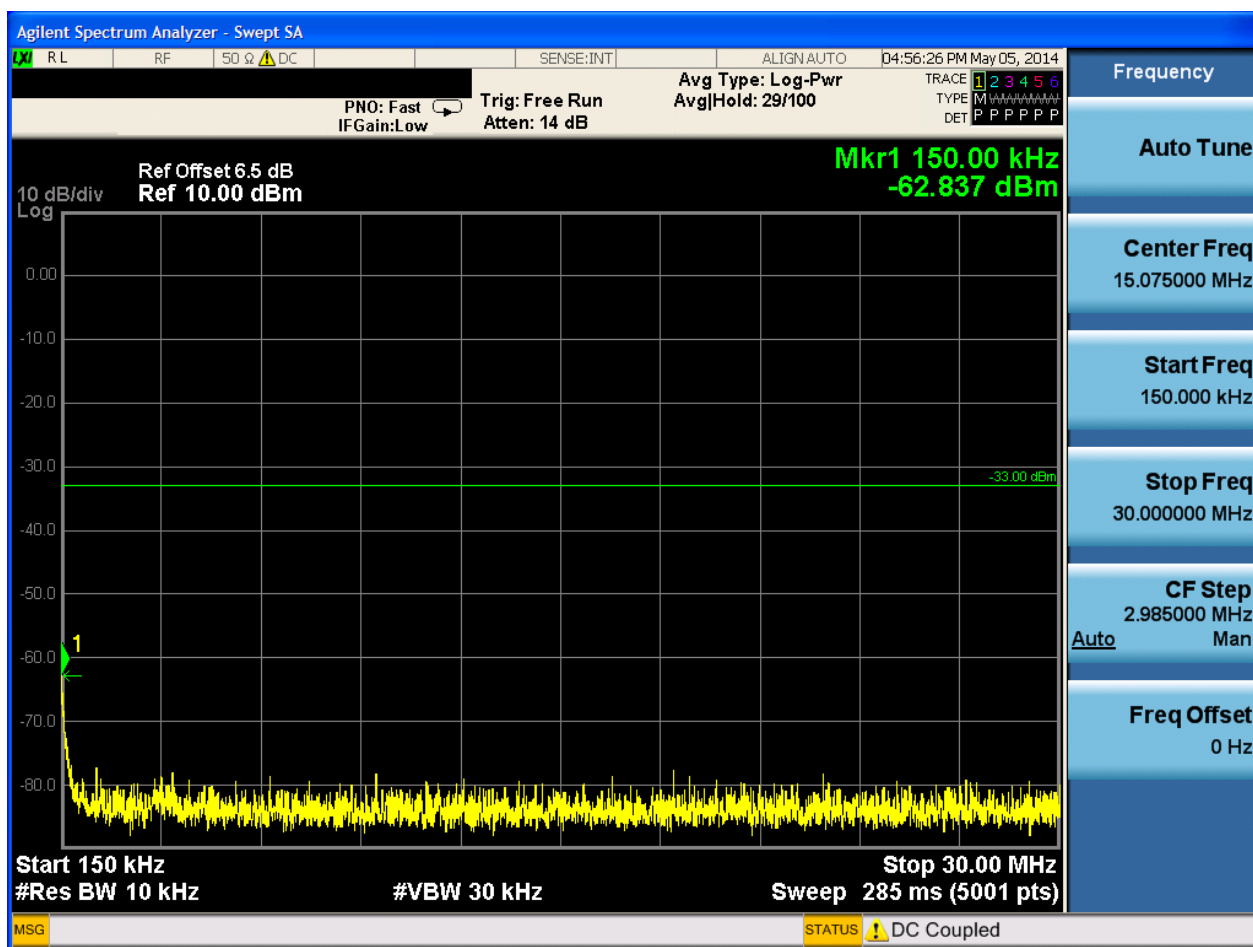


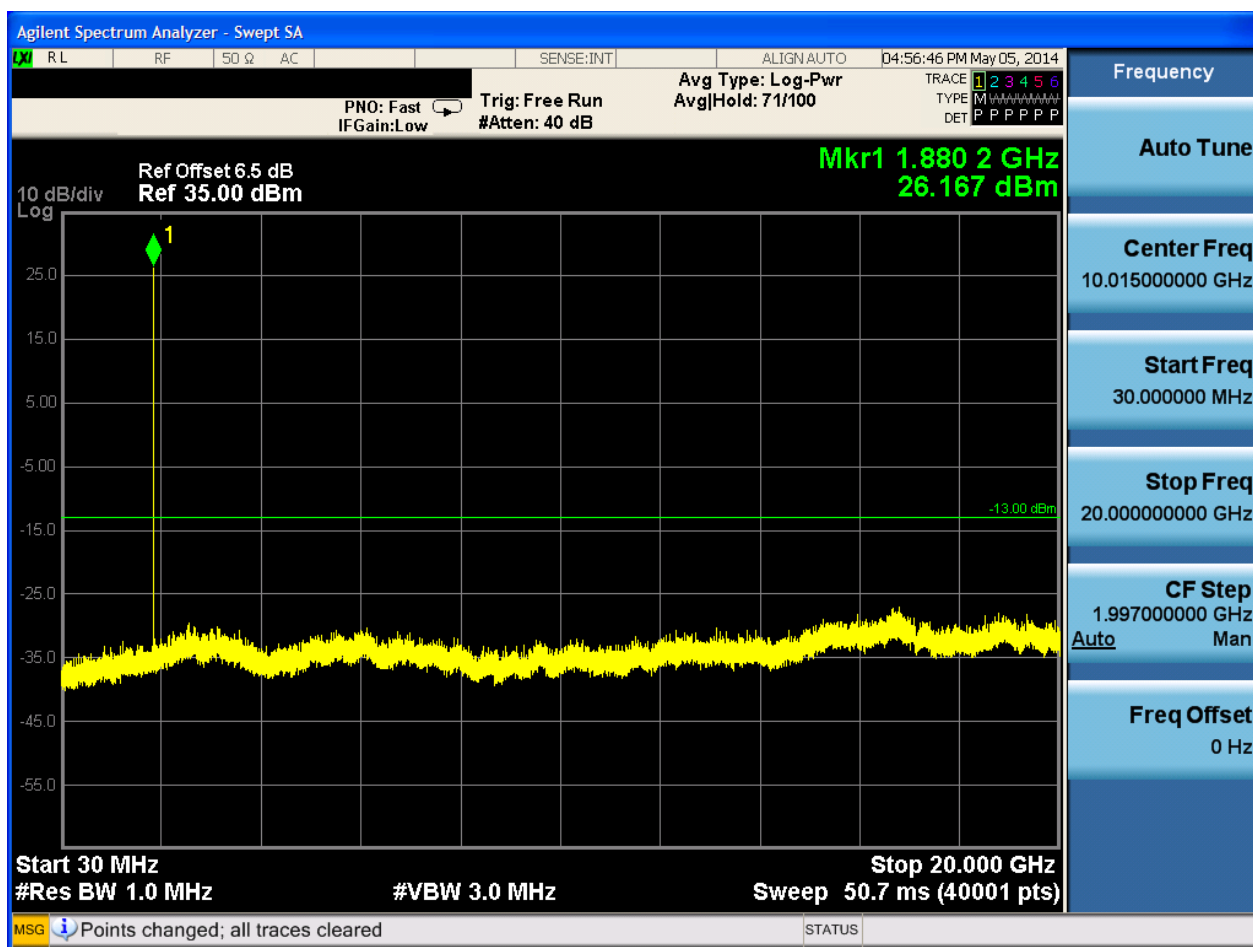




6.1.2.1.2 Test Channel = MCH









Agilent Spectrum Analyzer - Swept SA

Xi RL RF 50 Ω DC SENSE:INT ALIGN:AUTO 04:57:06 PM May 05, 2014

PNO: Wide Trg: Free Run Avg Type: Log-Pwr
IFGain:Low #Atten: 16 dB AvgHold: 55/100

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

Ref Offset 6.5 dB Mkr1 10.128 kHz
Ref 12.50 dBm -57.465 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 STATUS DC Coupled

Frequency

Auto Tune

Center Freq 79.500 kHz

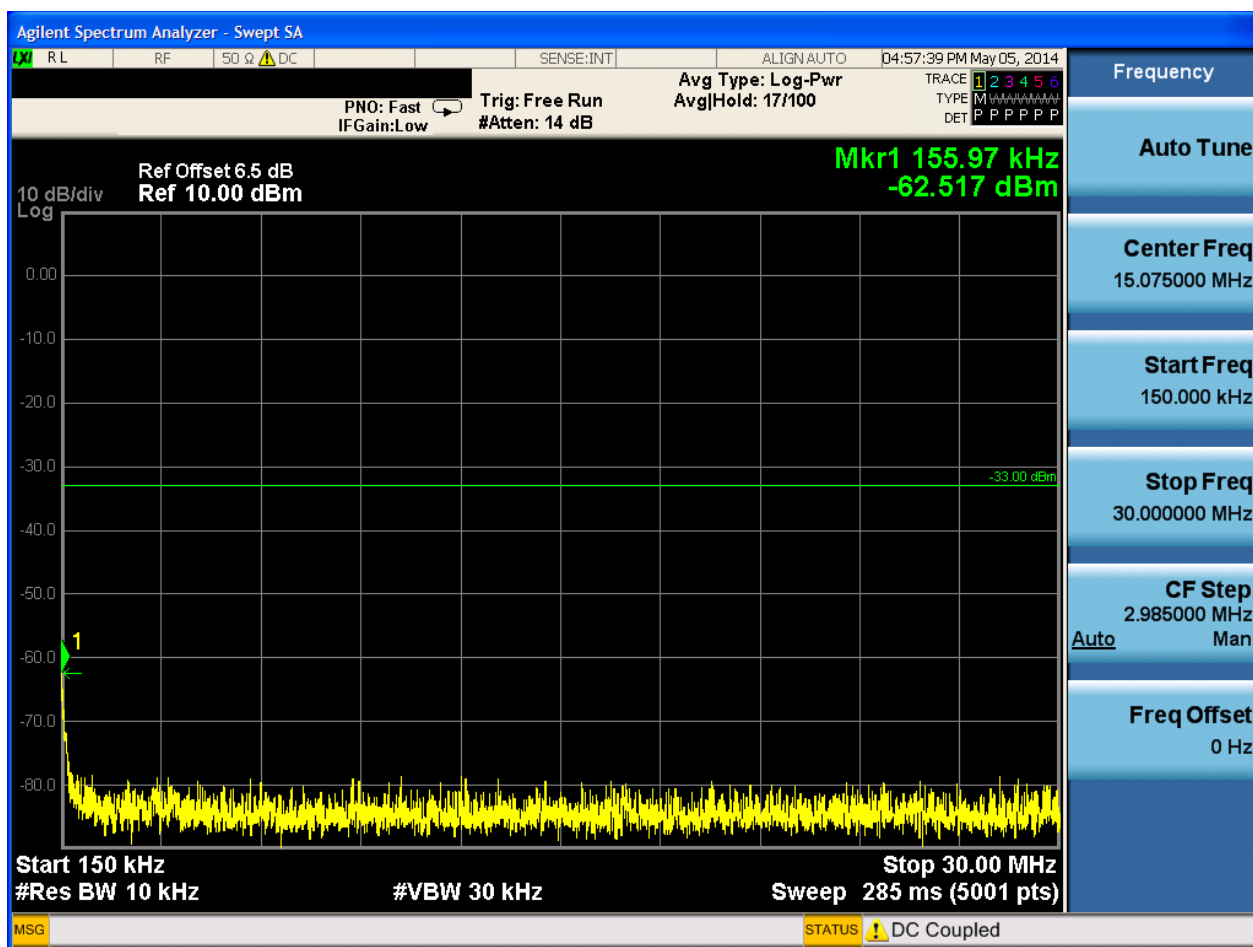
Start Freq 9.000 kHz

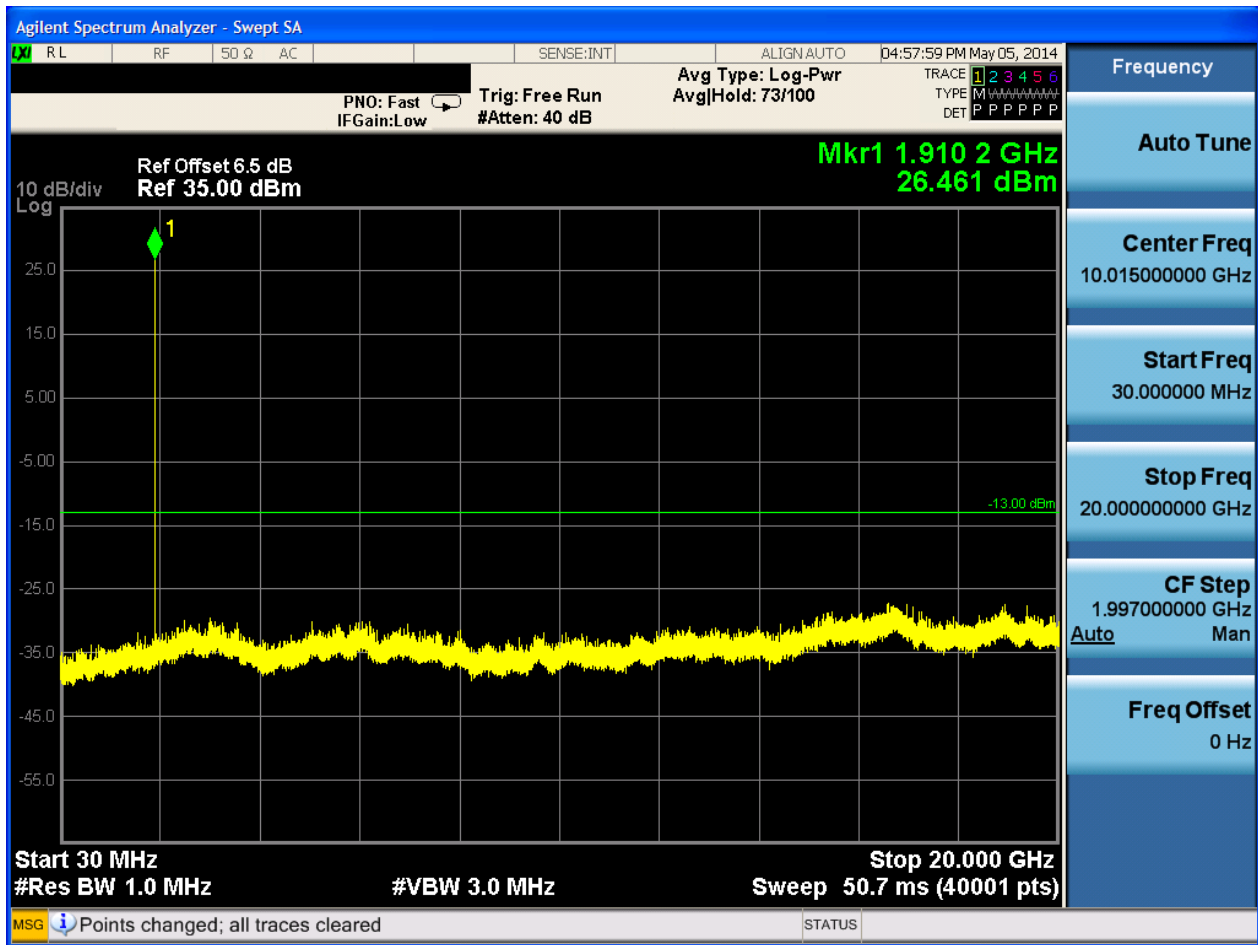
Stop Freq 150.000 kHz

CF Step 14.100 kHz
Man

Auto

Freq Offset 0 Hz

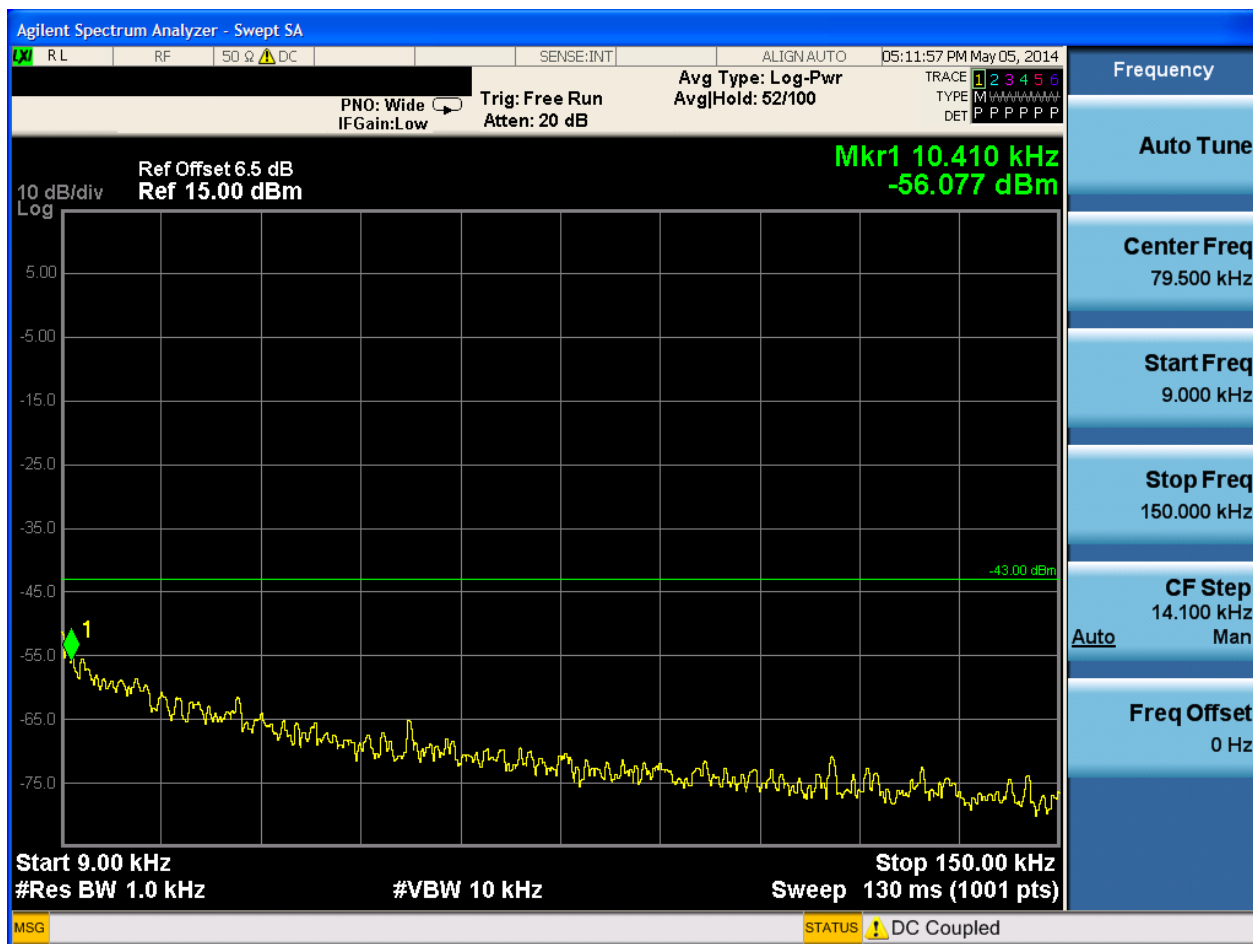


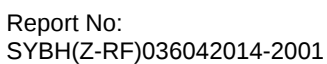


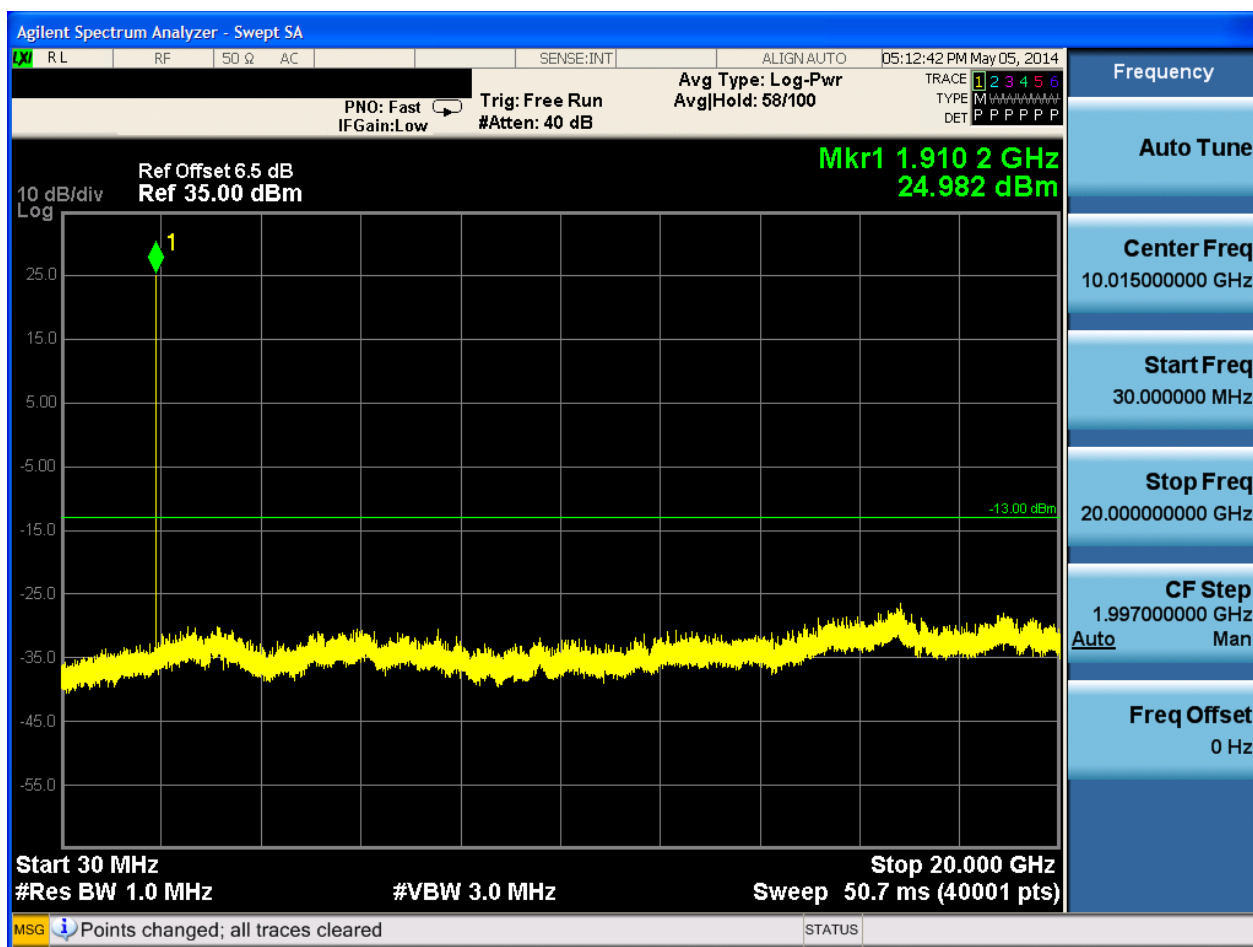


6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH









Agilent Spectrum Analyzer - Swept SA

Xi RL RF 50 Ω ⚠ DC SENSE:INT ALIGN:AUTO 05:13:09 PM May 05, 2014

PNO: Wide Trig: Free Run Avg Type: Log-Pwr
IFGain:Low #Atten: 16 dB AvgHold: 38/100

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

Ref Offset 6.5 dB
Ref 12.50 dBm

Mkr1 11.115 kHz
-58.623 dBm

10 dB/div
Log

2.50
-7.50
-17.5
-27.5
-37.5
-47.5
-57.5
-67.5
-77.5

-43.00 dBm

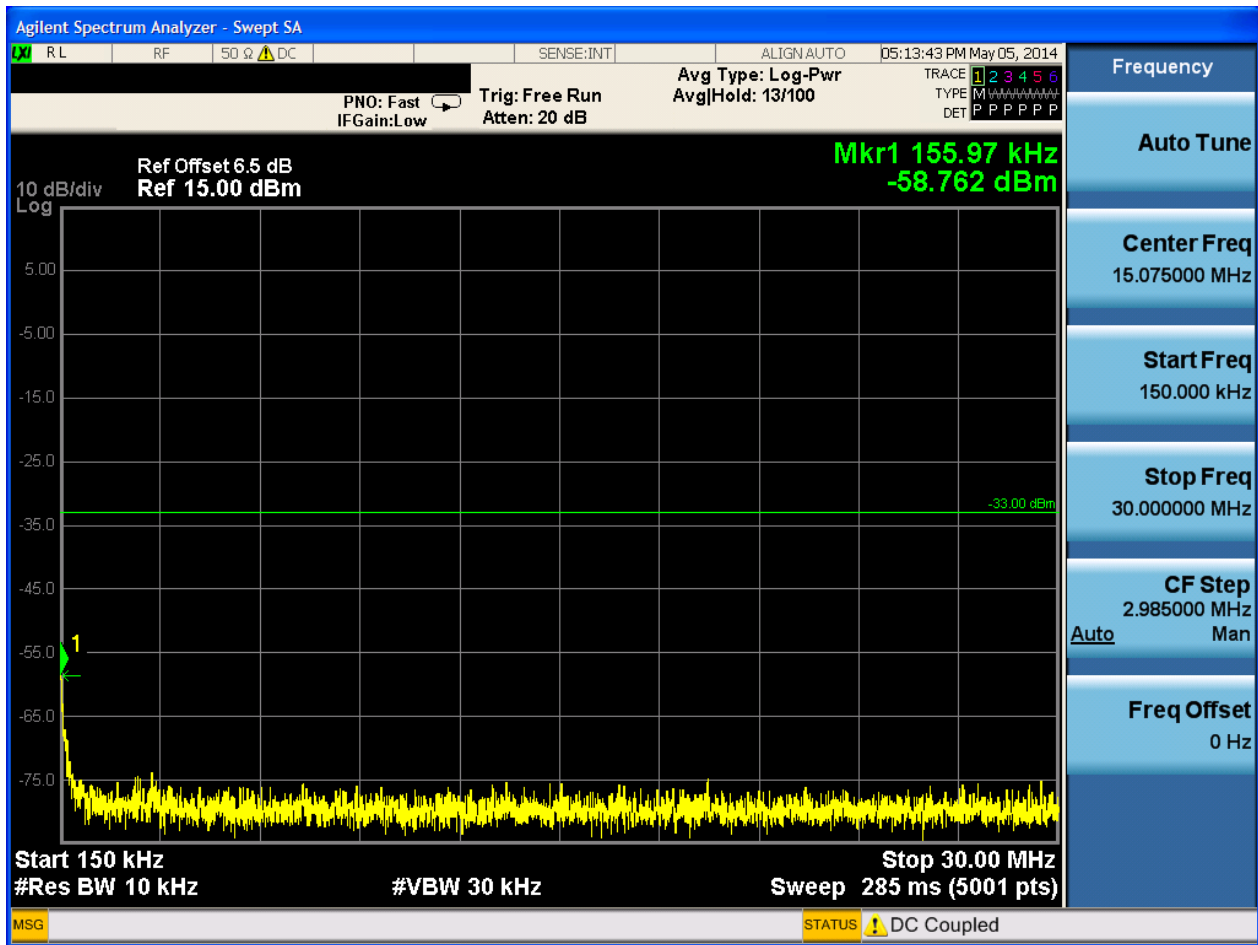
Start 9.00 kHz
#Res BW 1.0 kHz

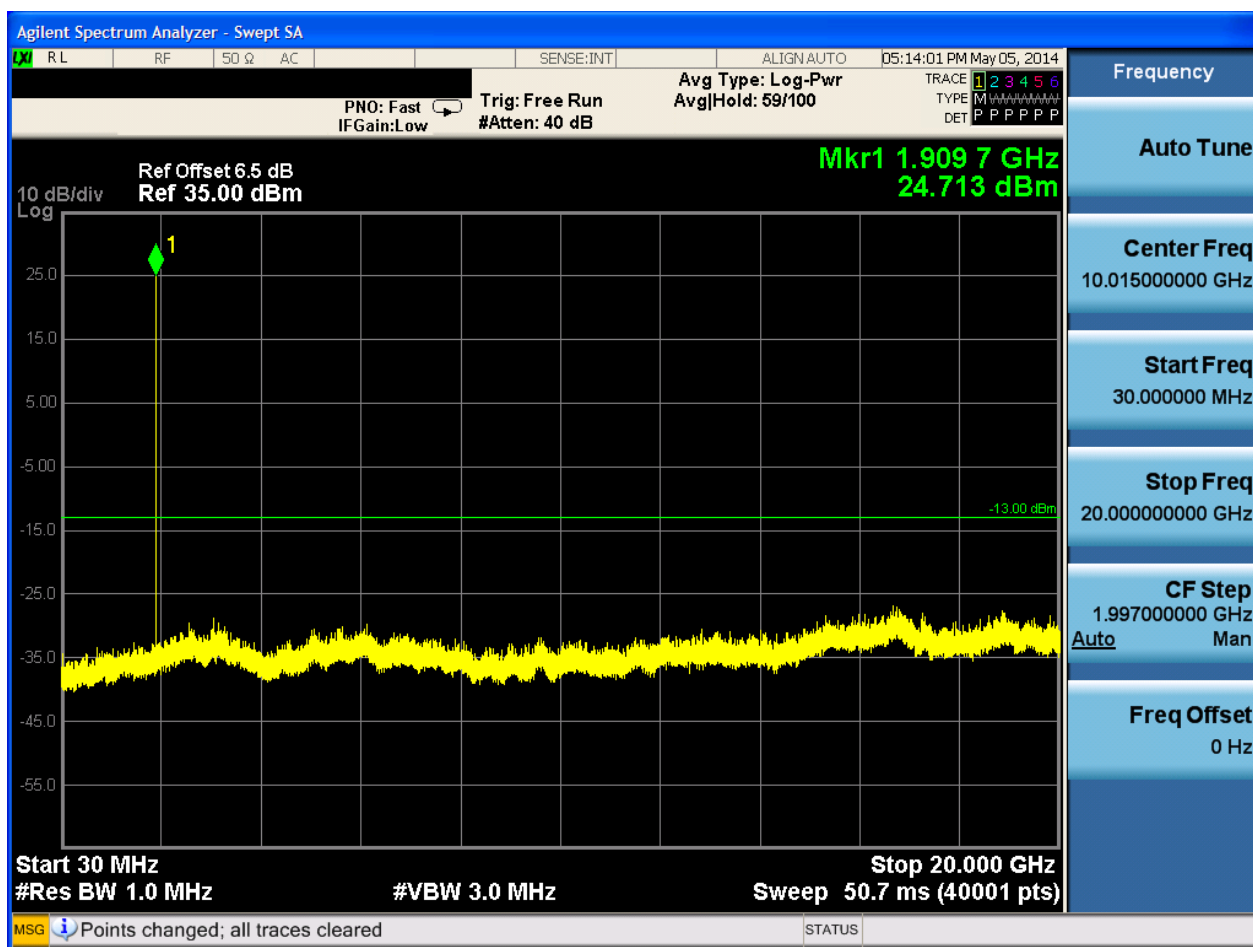
#VBW 10 kHz

Stop 150.00 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

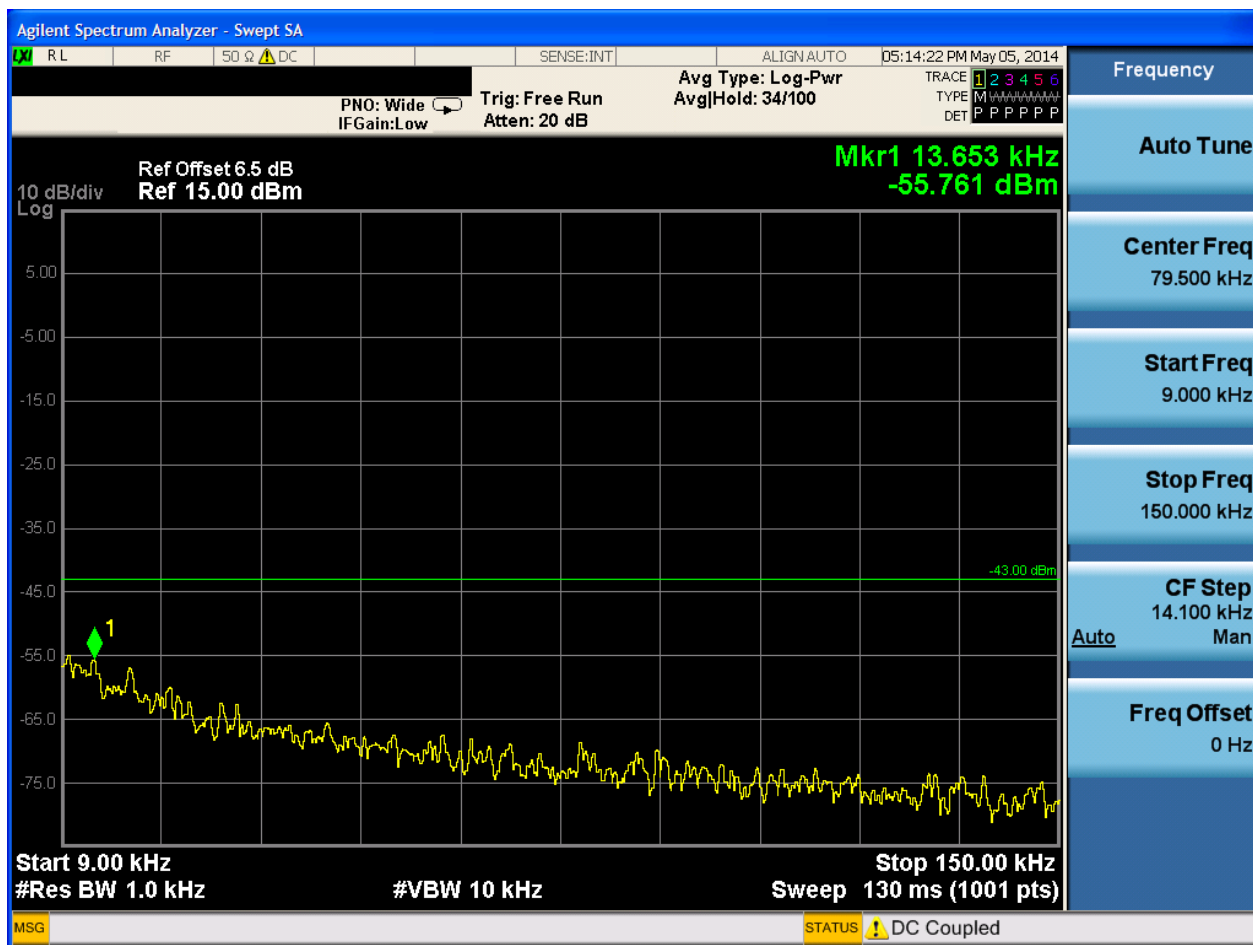
MSG STATUS ⚠ DC Coupled

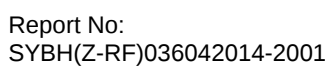


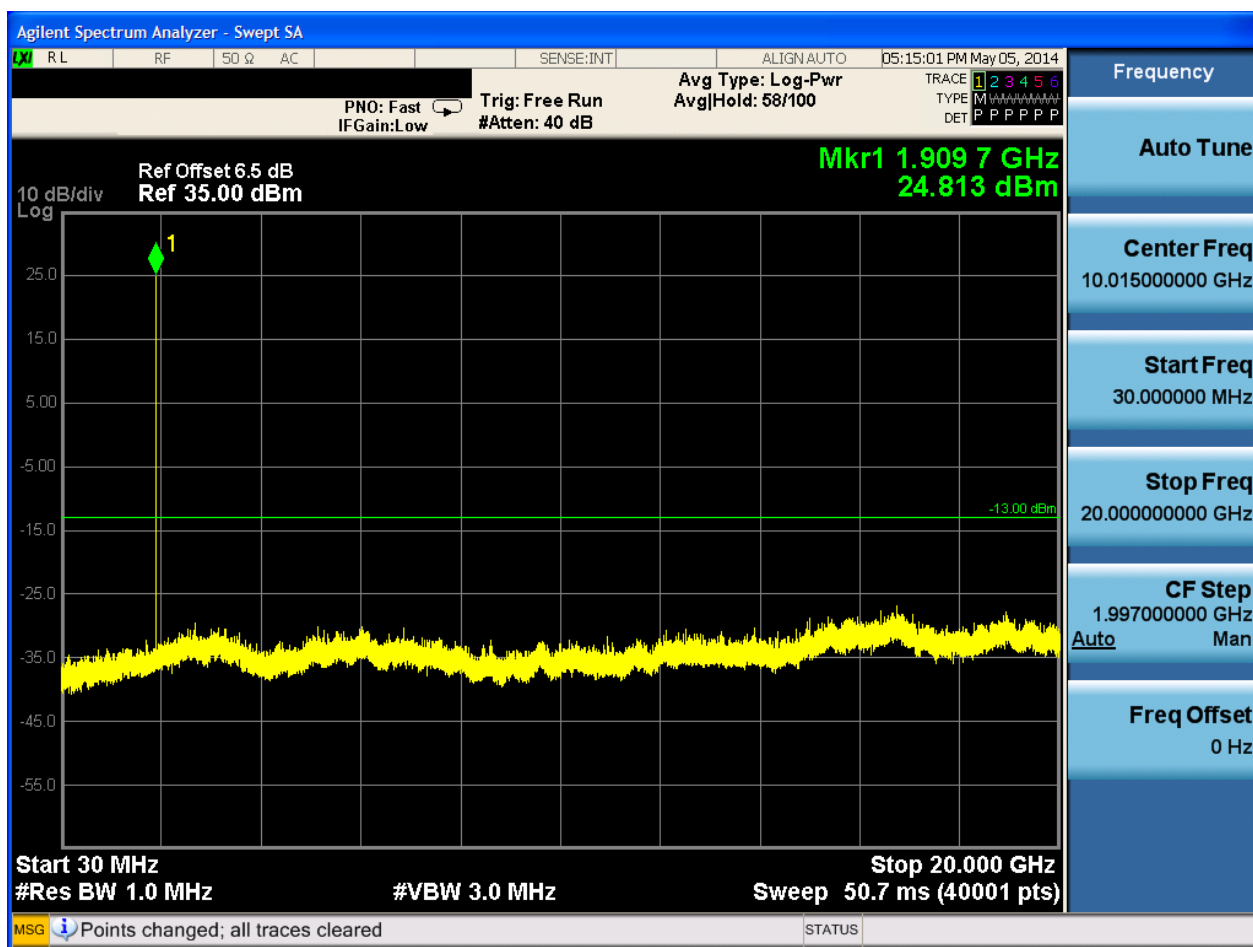




6.1.2.2.3 Test Channel = HCH







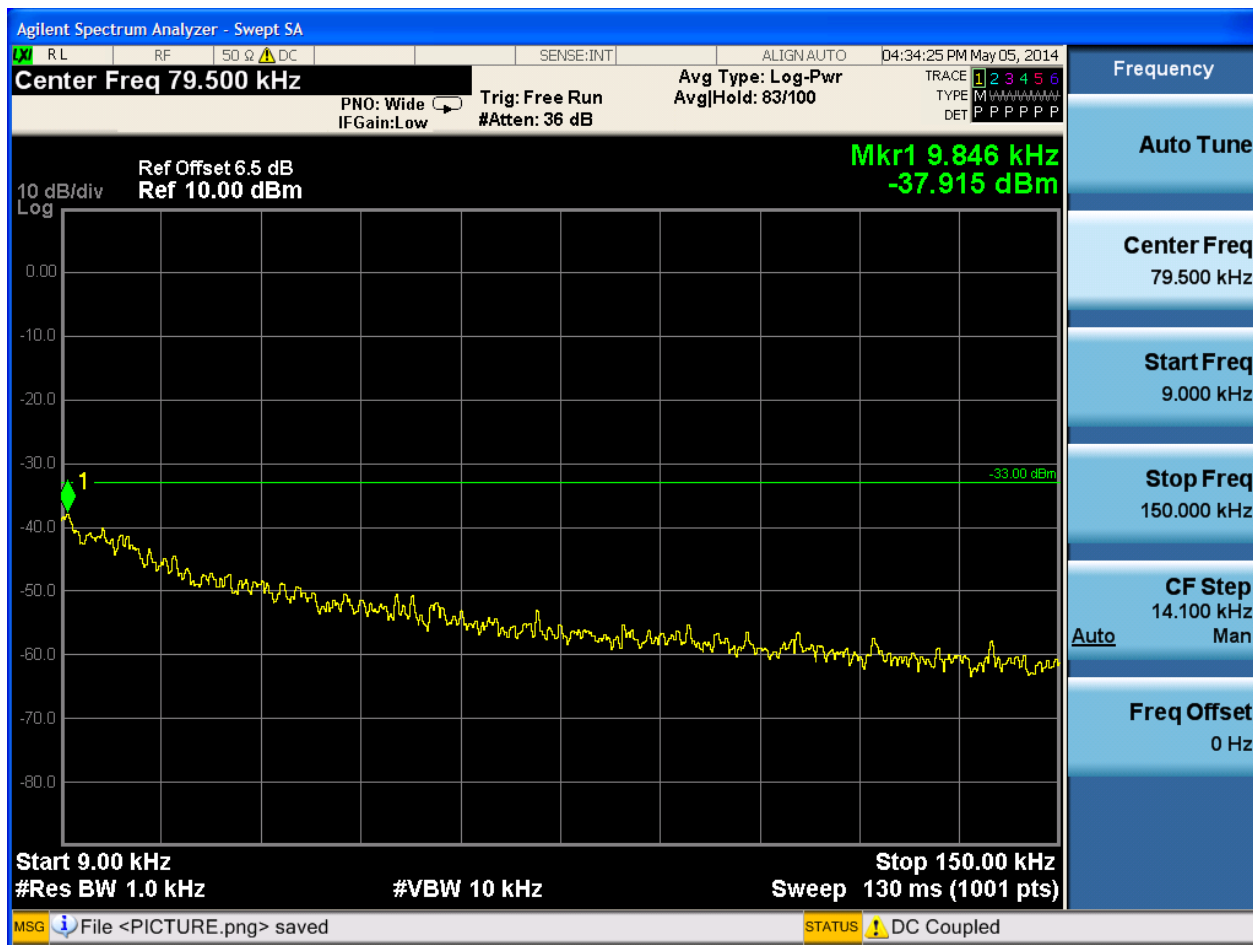


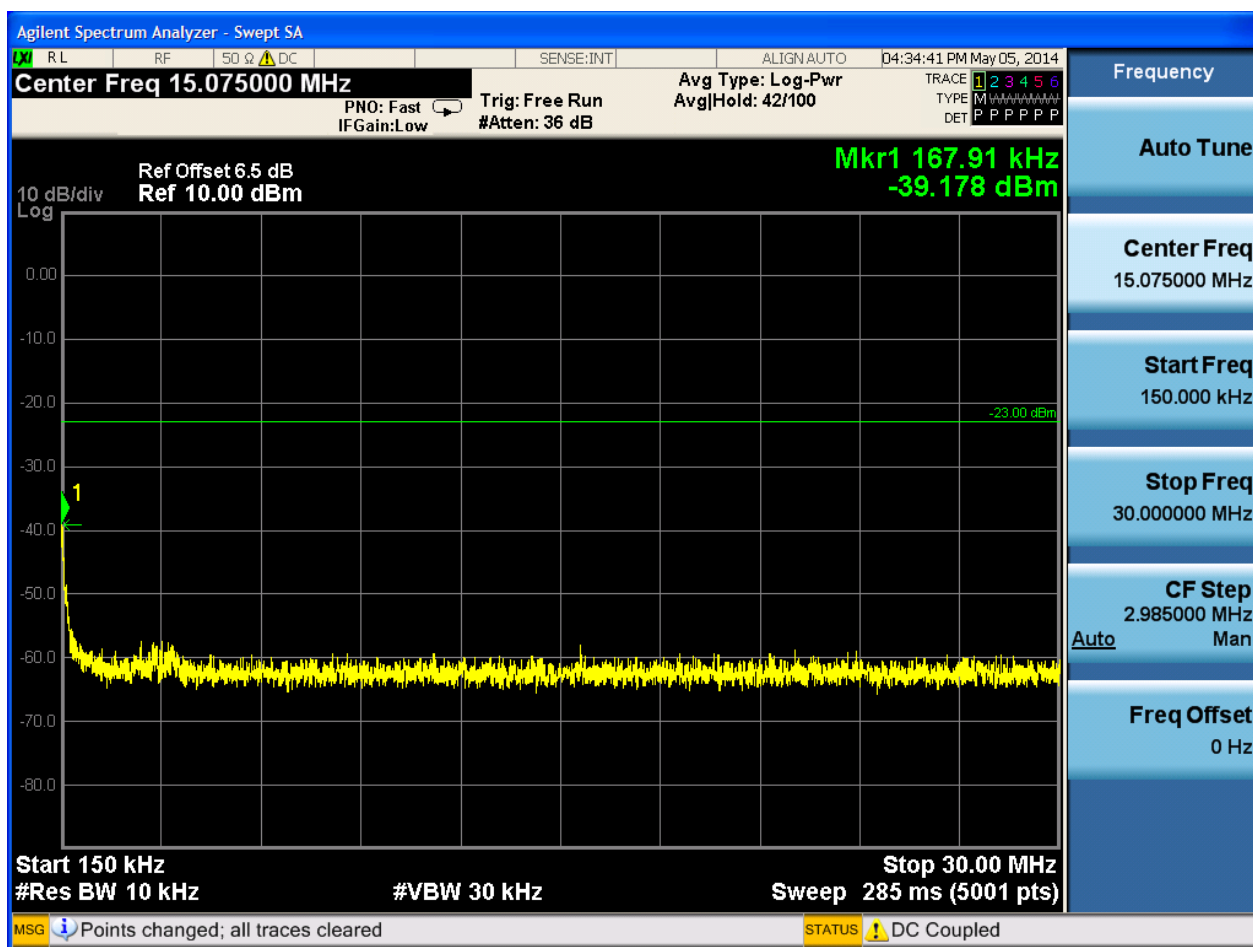
6.2 For UMTS

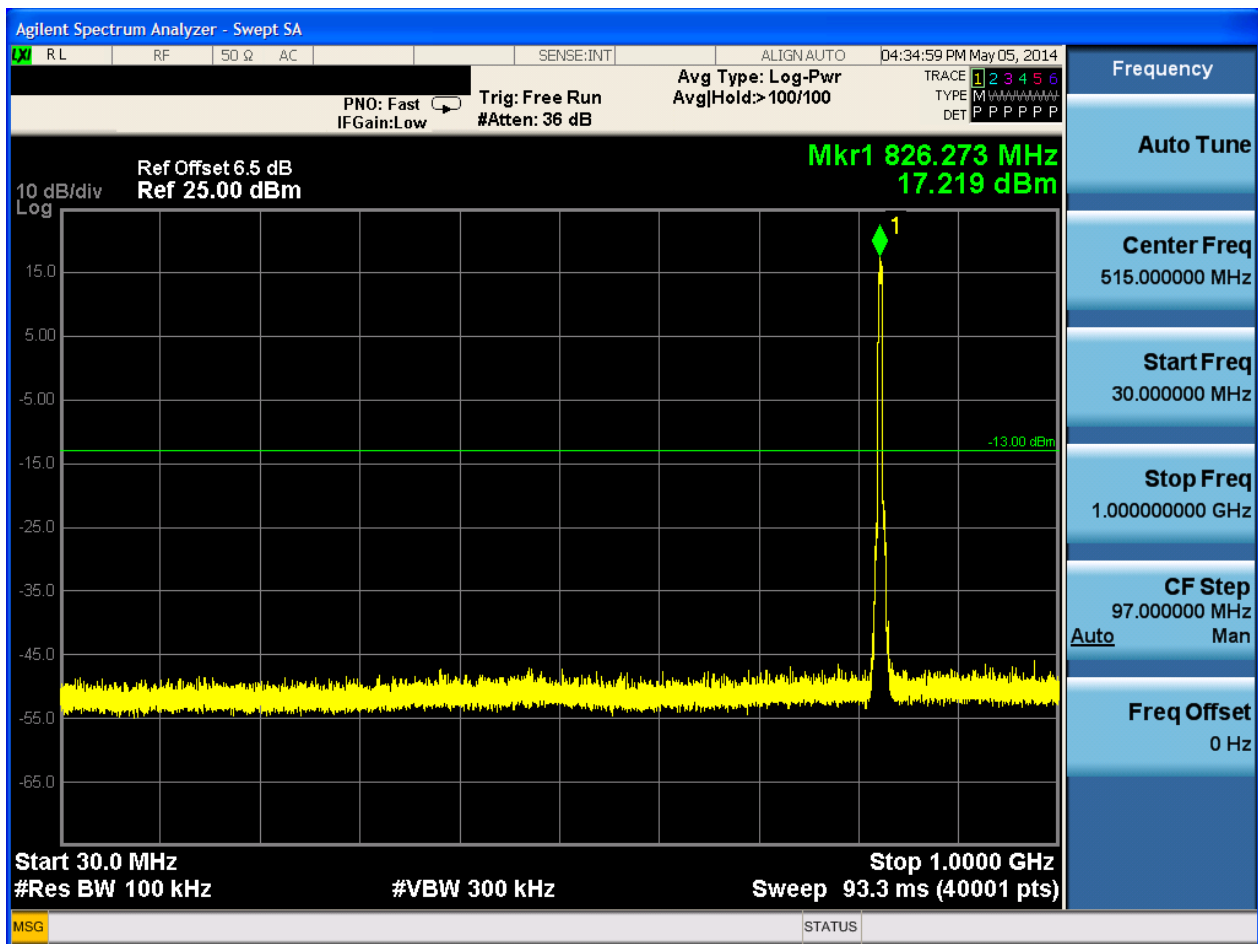
6.2.1 Test Band = WCDMA850

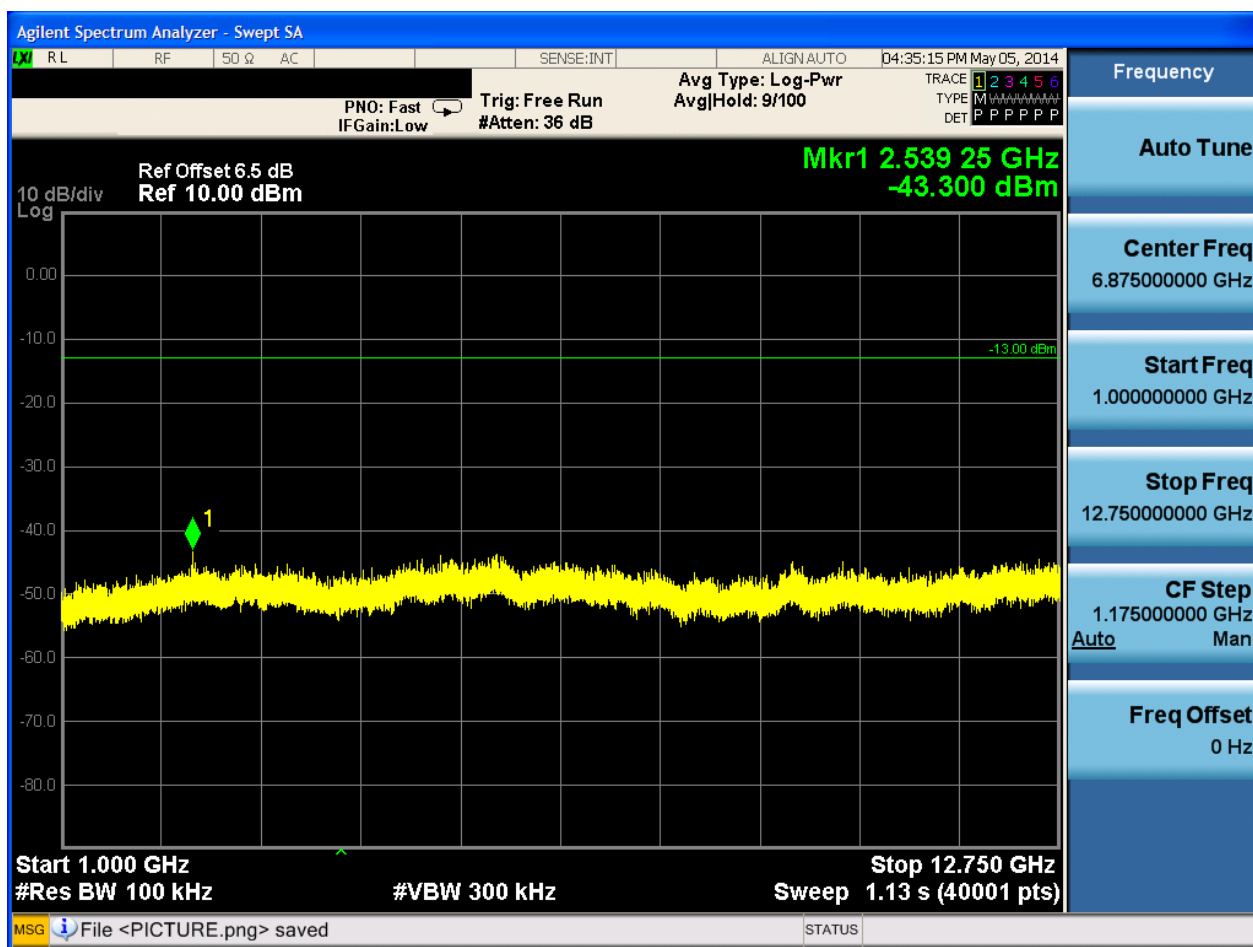
6.2.1.1 Test Mode = UMTS/TM1

6.2.1.1.1 Test Channel = LCH



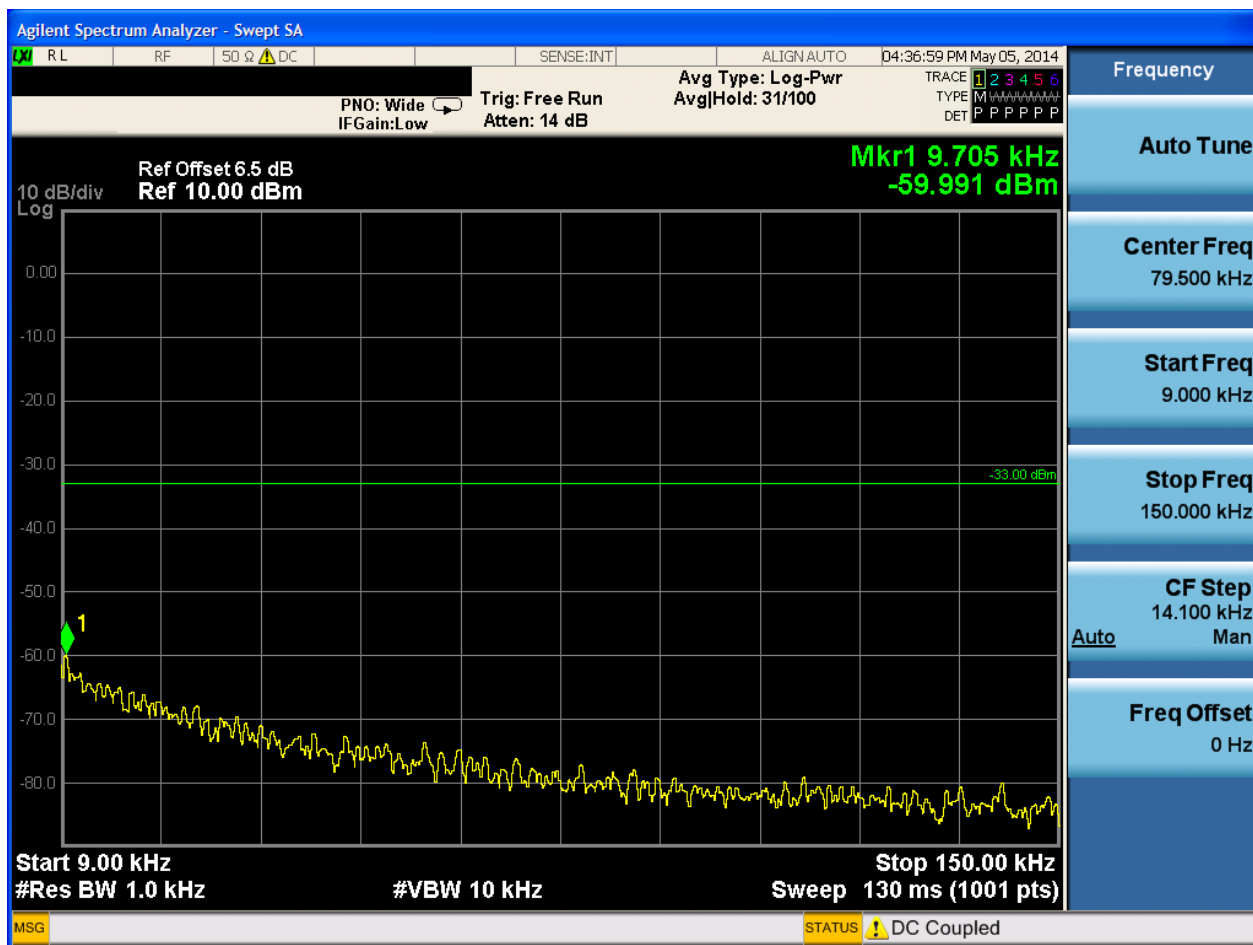


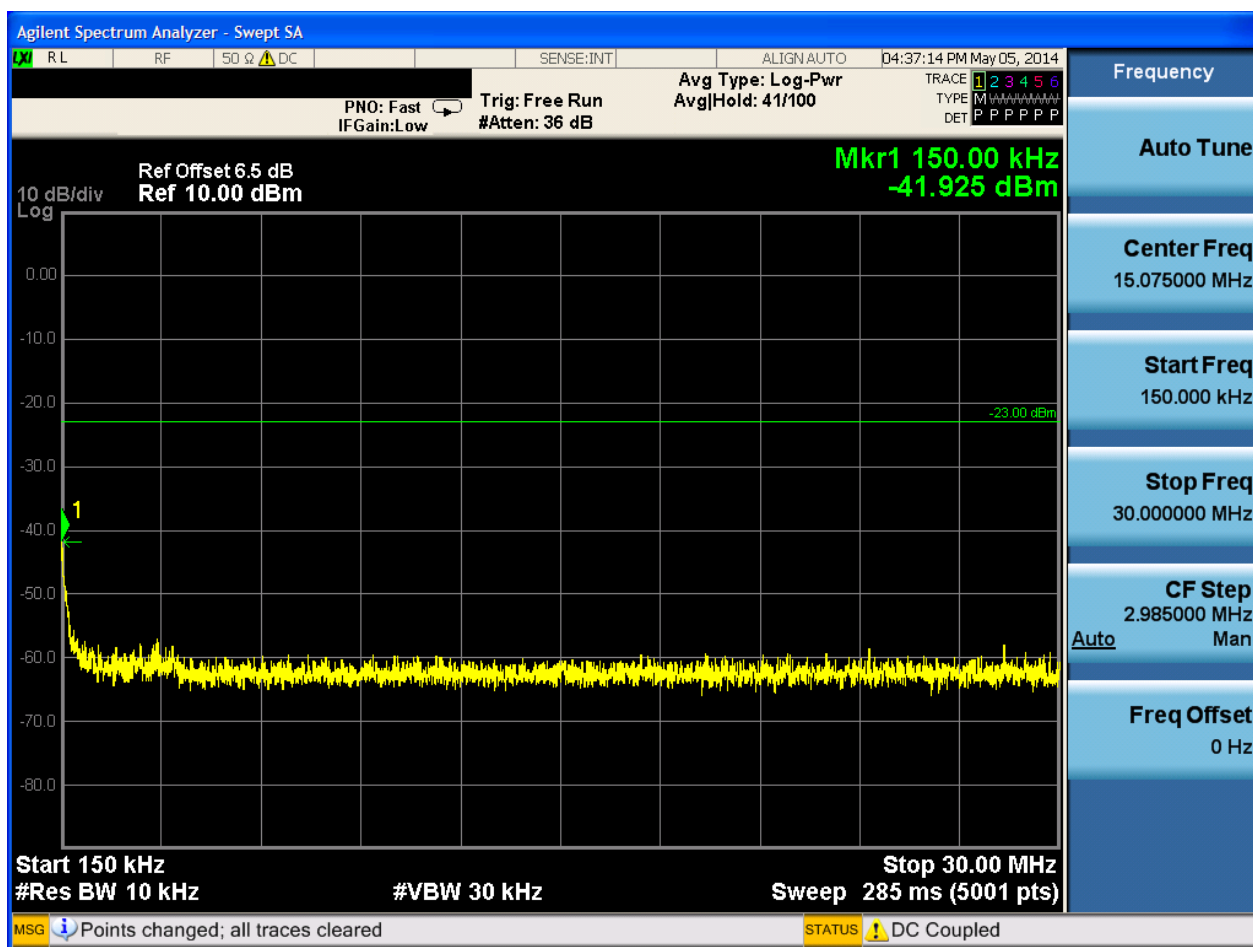


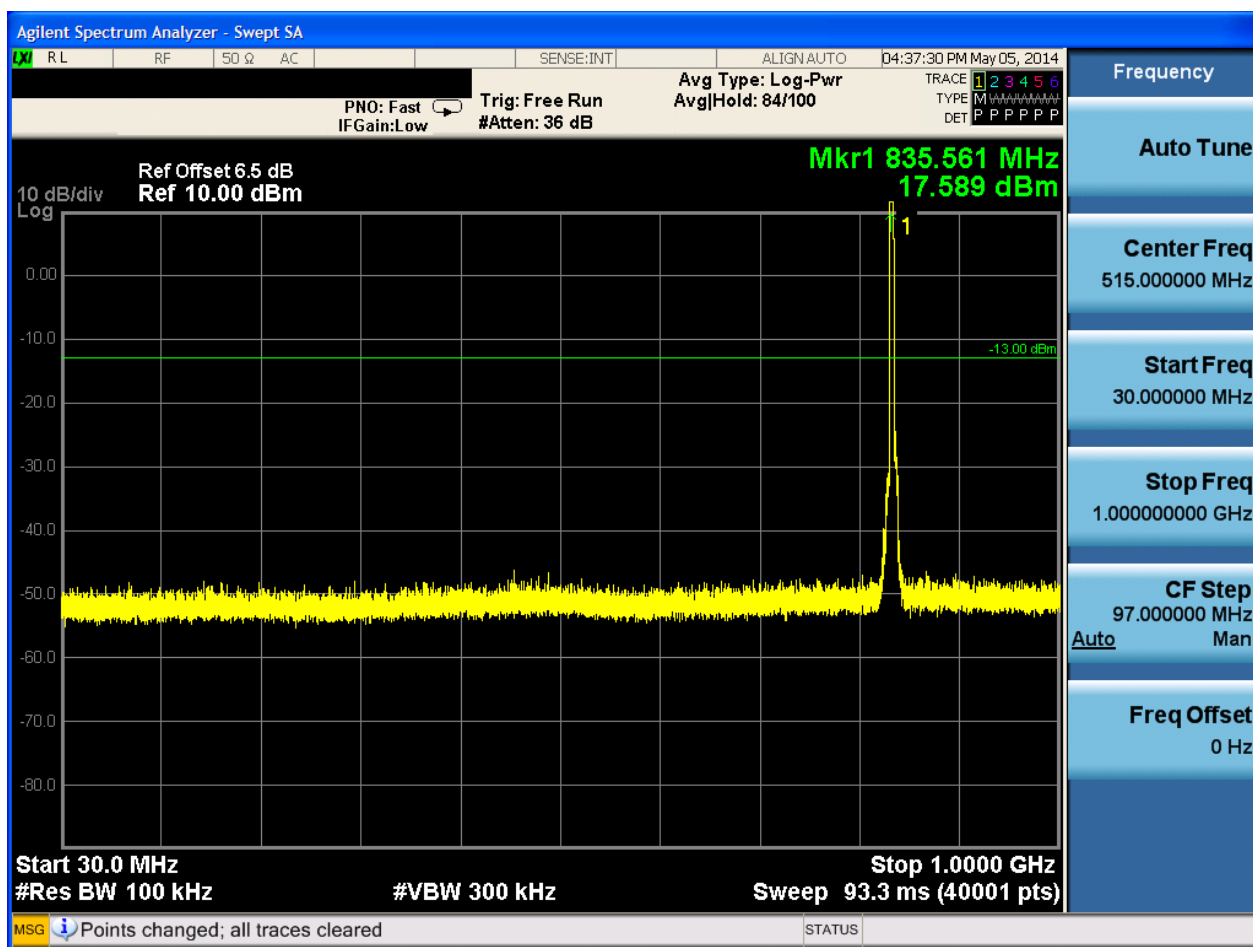


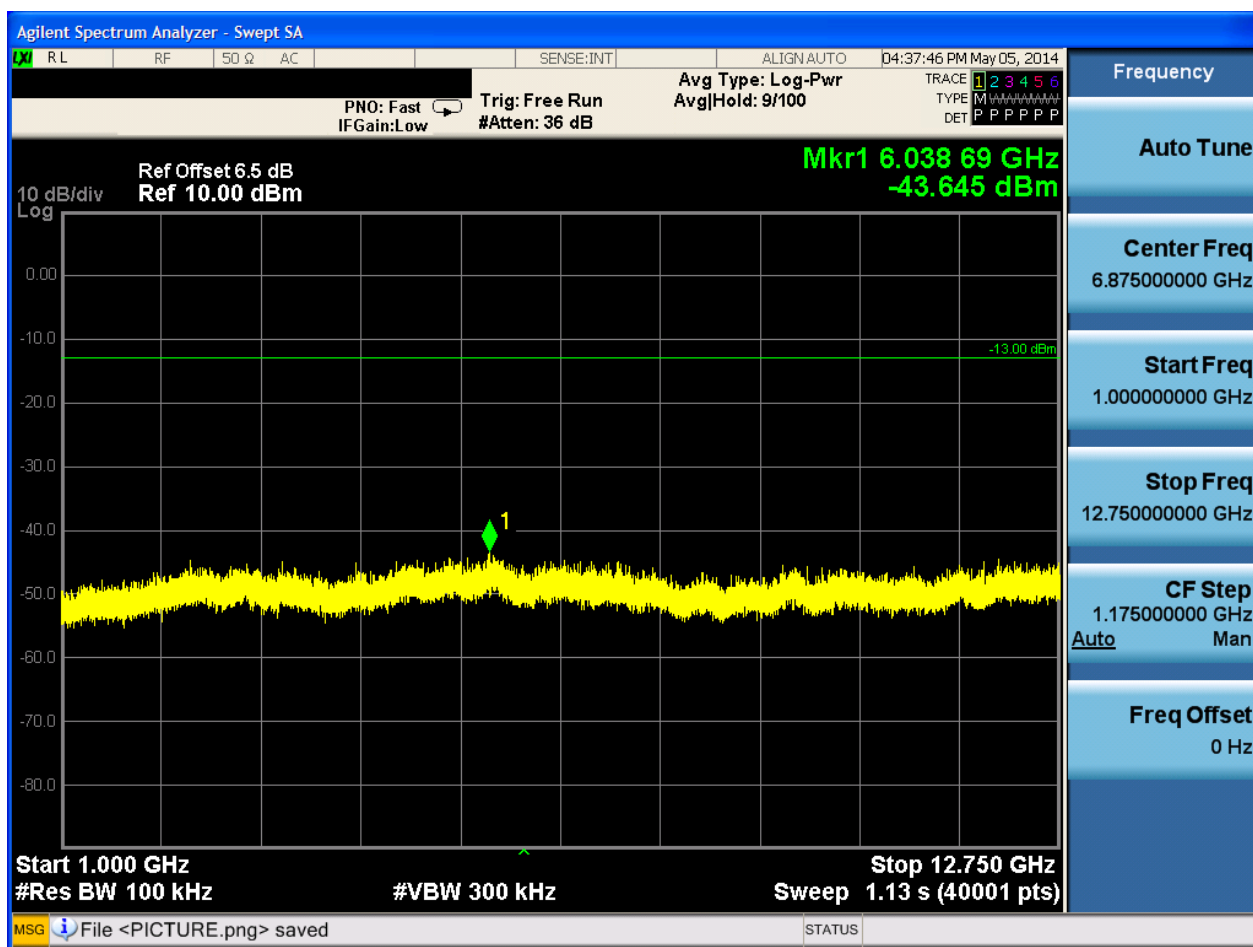


6.2.1.1.2 Test Channel = MCH











Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω DC SENSE:INT ALIGN: AUTO 04:38:02 PM May 05, 2014

PNO: Wide Trg: Free Run Avg Type: Log-Pwr
IFGain:Low #Atten: 36 dB AvgHold: 84/100

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

Ref Offset 6.5 dB
Ref 10.00 dBm

Mkr1 10.833 kHz
-39.086 dBm

10 dB/div
Log

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

Frequency

Auto Tune

Center Freq
79.500 kHz

Start Freq
9.000 kHz

Stop Freq
150.000 kHz

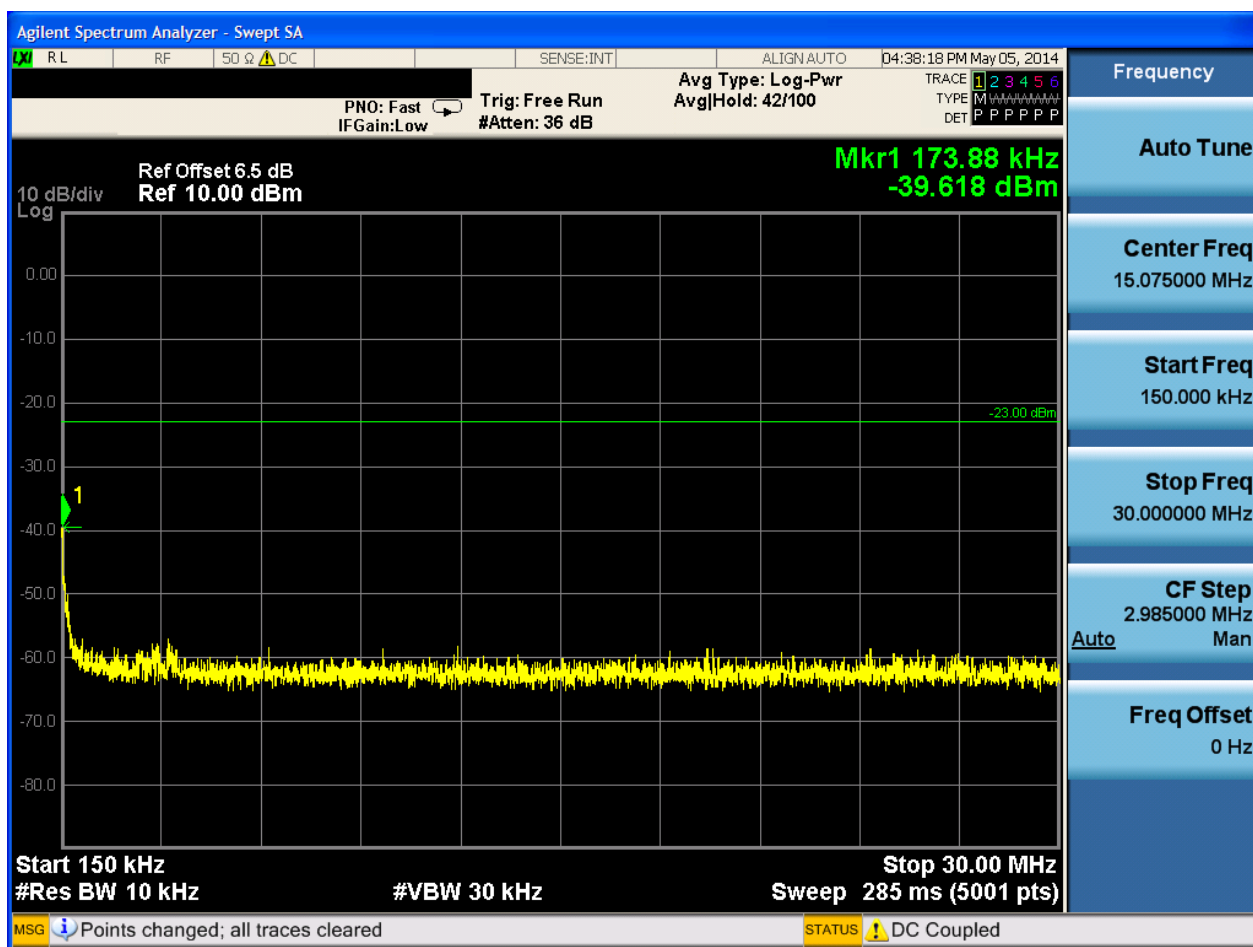
CF Step
14.100 kHz
Man

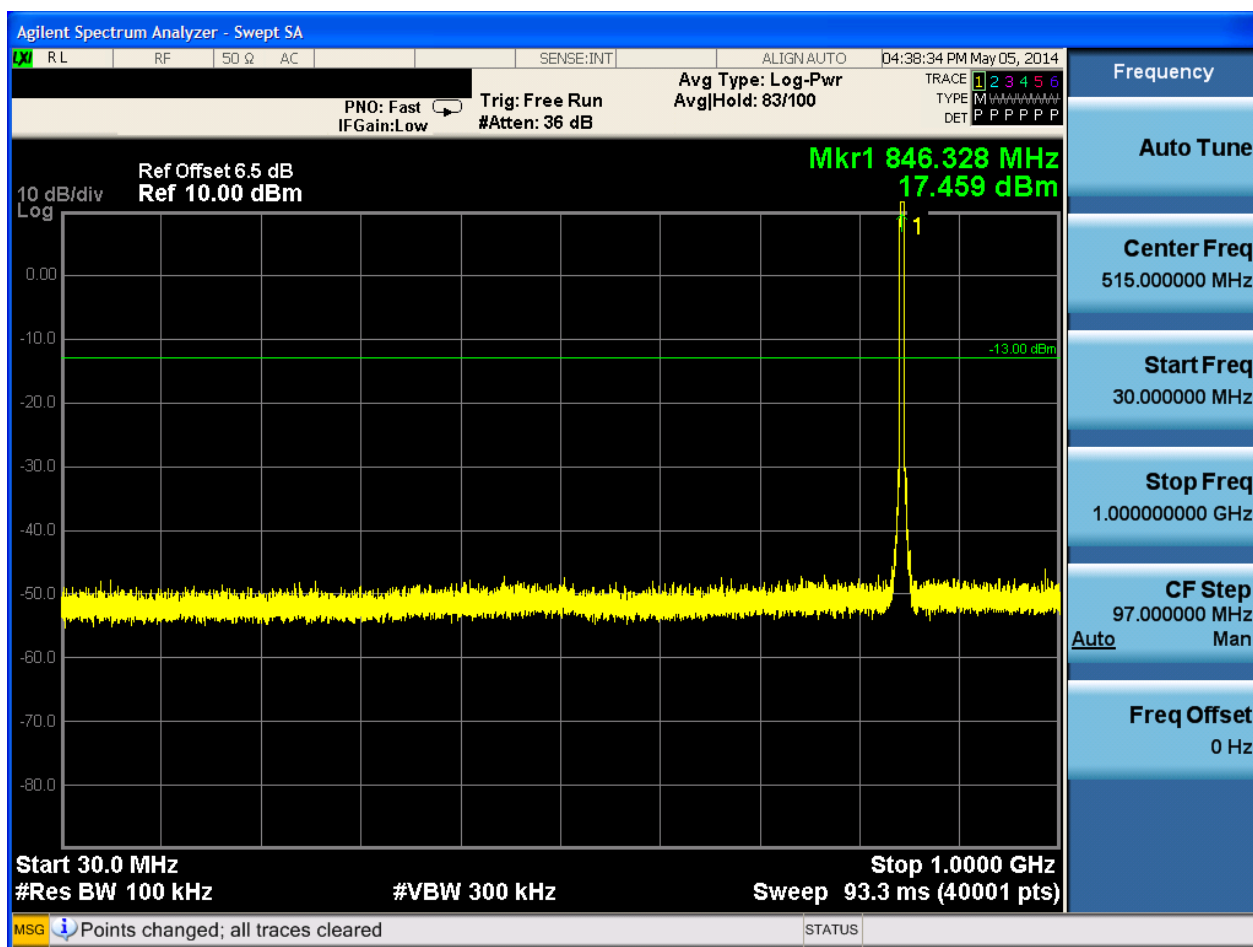
Auto

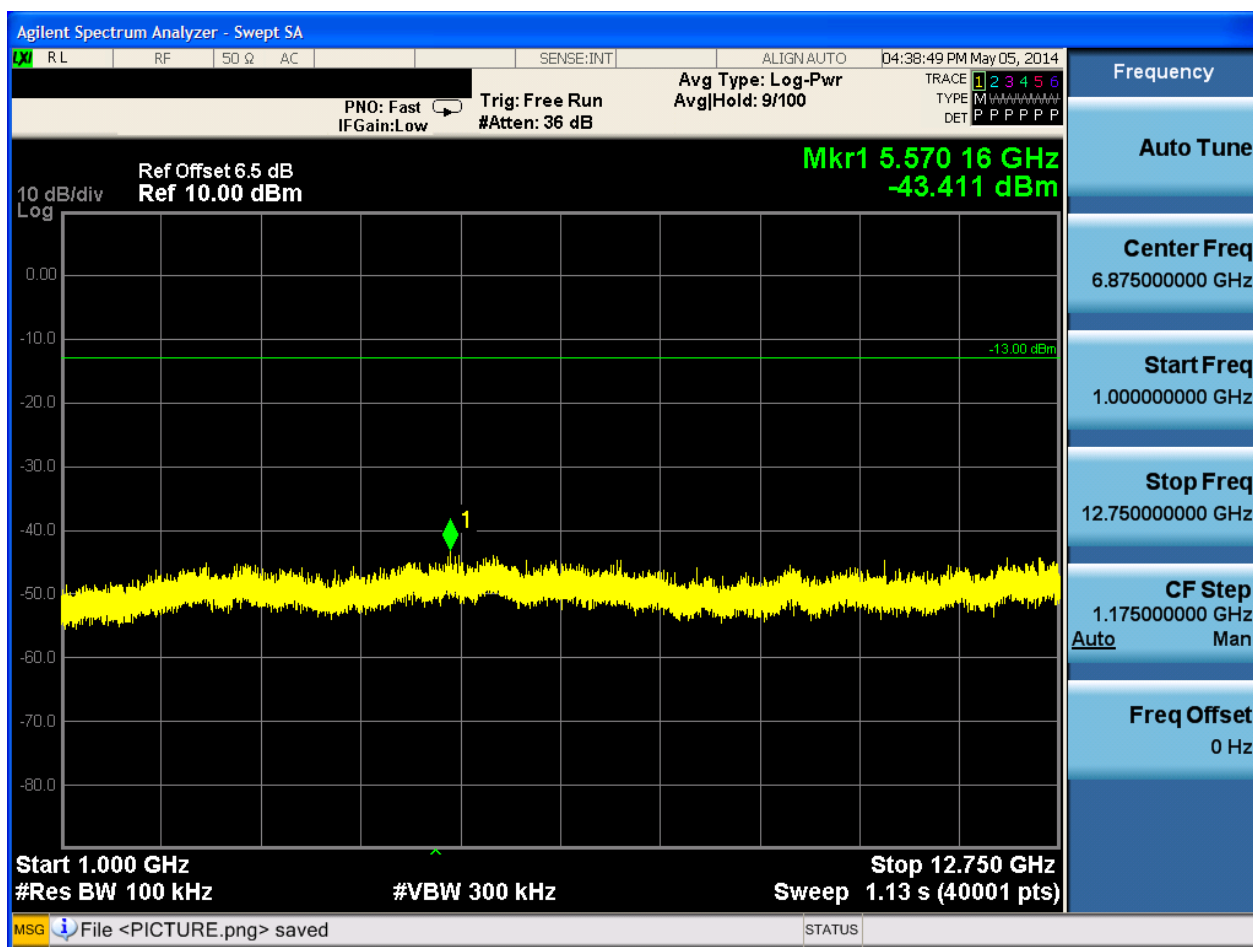
Freq Offset
0 Hz

MSG Points changed; all traces cleared

STATUS DC Coupled









6.2.2 Test Band = WCDMA1900

6.2.2.1 Test Mode = UMTS/TM1

6.2.2.1.1 Test Channel = LCH

