[Downlink] – WCS 2300

	Channel	Frequency (MHz)	Output Power	
			(dBm)	(W)
2300_WCS Band_ LTE 10 MHz AGC threshold	Low	-	-	-
	Middle	2355.00	44.74	29.785
	High	-	-	-
2300_WCS Band_ LTE 10 MHz +3dBm above the AGC threshold	Low	-	-	-
	Middle	2355.00	44.77	29.992
	High	-	-	-

[Uplink] – WCS 2300

	Channel	Frequency (MHz)	Output Power	
			(dBm)	(mW)
2300_WCS Band_ LTE 10 MHz AGC threshold	Low	-	-	-
	Middle	2310.00	-10.15	0.0966
	High	-	-	-
2300_WCS Band_ LTE 10 MHz +3dBm above the AGC threshold	Low	-	-	-
	Middle	2310.00	-10.02	0.0995
	High	-	-	-

Peak-to-Average Power Ratio

[Downlink] – WCS 2300

	Channel	Frequency (MHz)	PAPR (dB)
LTE 10 MHz	Middle	2355.00	8.35

[Uplink] – WCS 2300

	Channel	Frequency (MHz)	PAPR (dB)
LTE 10 MHz	Middle	2310.00	8.35

RF Output Power for 2300_WCS Band LTE 10 MHz

[AGC threshold Downlink Middle]

[+3dBm above AGC threshold Downlink Middle]

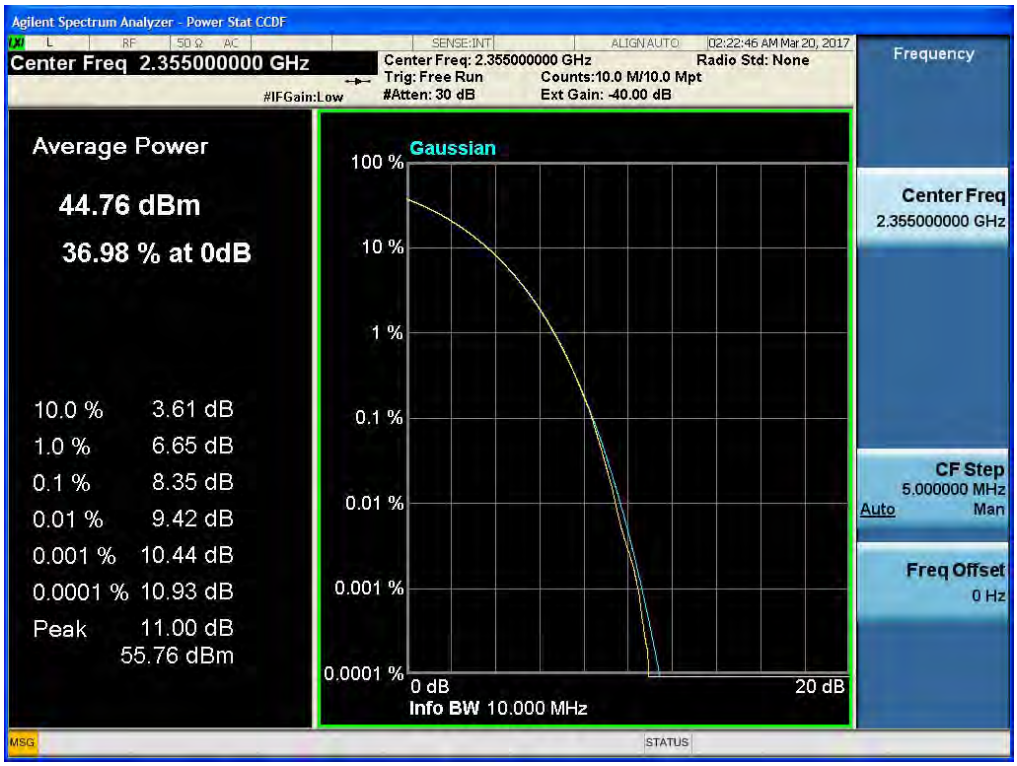
RF Output Power for 2300_WCS Band LTE 10 MHz

[AGC threshold Uplink Middle]

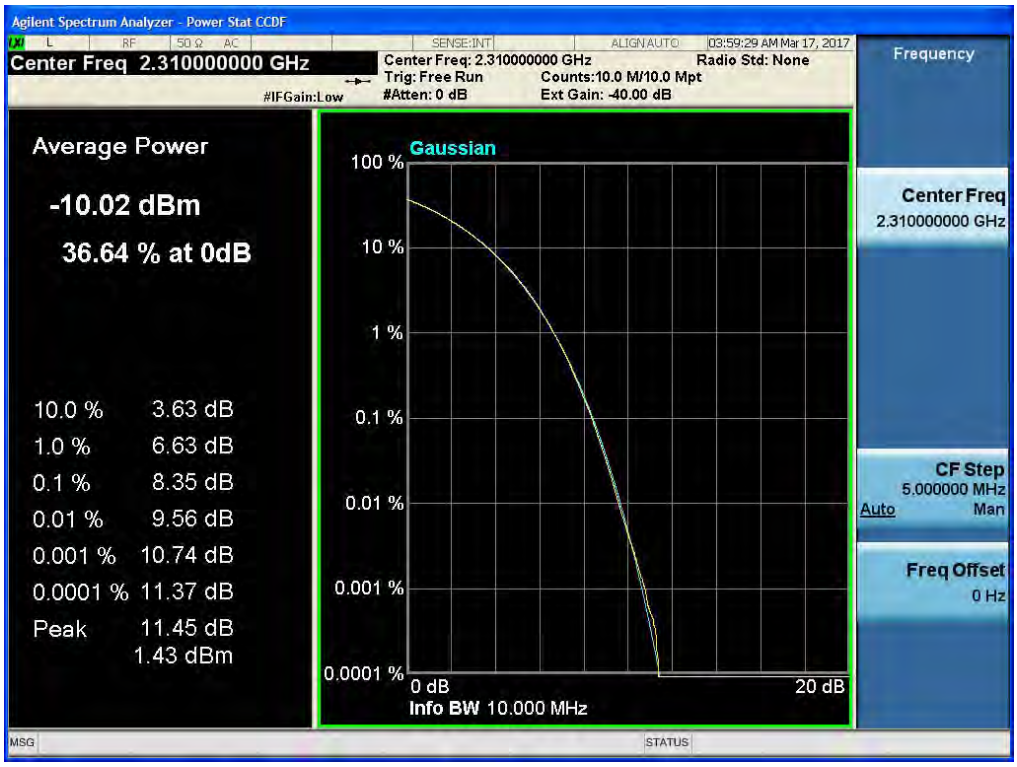
[+3dBm above AGC threshold Uplink Middle]

PAPR for 2300_WCS Band LTE 10 MHz

[Downlink Middle]



[Uplink Middle]



[Downlink] – BRS 2600

	Channel	Frequency (MHz)	Output Power	
			(dBm)	(W)
BRS Band_ LTE 20 MHz AGC threshold	Low	2506.00	45.93	39.174
	Middle	2593.00	45.96	39.446
	High	2680.00	45.97	39.537
BRS Band_ LTE 20 MHz +3dBm above the AGC threshold	Low	2506.00	45.96	39.446
	Middle	2593.00	45.99	39.719
	High	2680.00	45.96	39.446

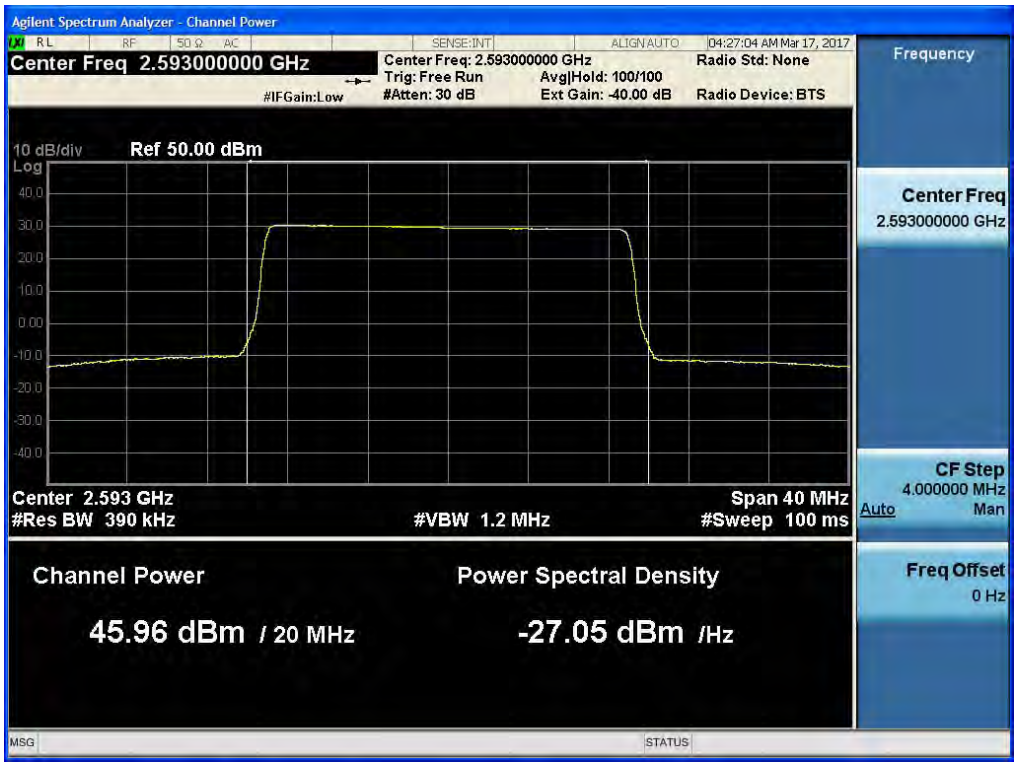
[Uplink] – BRS 2600

	Channel	Frequency (MHz)	Output Power	
			(dBm)	(mW)
BRS Band_ LTE 20 MHz AGC threshold	Low	2506.00	-10.08	0.0982
	Middle	2593.00	-10.06	0.0986
	High	2680.00	-10.00	0.1000
BRS Band_ LTE 20 MHz +3dBm above the AGC threshold	Low	2506.00	-10.01	0.0998
	Middle	2593.00	-10.06	0.0986
	High	2680.00	-10.05	0.0989

Plots of RF Output Power for BRS 2600 Band LTE 20MHz

[AGC threshold Downlink Low]

[AGC threshold Downlink Middle]



[AGC threshold Downlink High]

[+3dBm above AGC threshold Downlink Low]

[+3dBm above AGC threshold Downlink Middle]

[+3dBm above AGC threshold Downlink High]

Plots of RF Output Power for BRS 2600 Band LTE 20MHz

[AGC threshold Uplink Low]

[AGC threshold Uplink Middle]

[AGC threshold Uplink High]

[+3dBm above AGC threshold Uplink Low]

[+3dBm above AGC threshold Uplink Middle]

[+3dBm above AGC threshold Uplink High]

7. OCCUPIED BANDWIDTH

FCC Rules

Test Requirements:

§ 2.1049 Measurements required: Occupied bandwidth:

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the specified conditions of § 2.1049 (a) through (i) as applicable.

IC Rules

Test Requirements:

RSS-Gen

6 Technical Requirements

6.6 Occupied Bandwidth

When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99 % emission bandwidth, as calculated or measured.

Test Procedures:

Measurements were in accordance with the test methods section 3.4 of KDB 935210 D05 v01r01 and section 4.2 of KDB 971168 D01 v02r02.

Test is 99% OBW measured and used.

a) Connect a signal generator to the input of the EUT.

b) Configure the signal generator to transmit the AWGN signal.

c) Configure the signal amplitude to be just below the AGC threshold level (see 3.2), but not more than 0.5 dB below.

d) Connect a spectrum analyzer to the output of the EUT using appropriate attenuation.

e) Set the spectrum analyzer center frequency to the center frequency of the operational band under test. The span range of the spectrum analyzer shall be between 2 times to 5 times the OBW.

f) The nominal resolution bandwidth (RBW) shall be in the range of 1% to 5 % of the anticipated OBW, and the VBW shall be ≥ 3 × RBW.

g) Set the reference level of the instrument as required to preclude the signal from exceeding the maximum spectrum analyzer input mixer level for linear operation. In general, the peak of the spectral envelope must be more than [10 log (OBW / RBW)] below the reference level.

NOTE—Steps f) and g) may require iteration to enable adjustments within the specified tolerances.

h) The noise floor of the spectrum analyzer at the selected RBW shall be at least 36 dB below the reference level.
i) Set spectrum analyzer detection function to positive peak.
j) Set the trace mode to max hold.
k) Use the 99 % power bandwidth function of the spectrum analyzer (if available) and report the measured bandwidth.
l) Repeat steps e) to k) with the input signal connected directly to the spectrum analyzer (i.e., input signal measurement).
m) Compare the spectral plot of the input signal (determined from step l) to the output signal (determined from step k) to affirm that they are similar (in pass band and roll off characteristic features and relative spectral locations), and include plot(s) and descriptions in test report.
n) Repeat for all frequency bands authorized for use by the EUT.
o) Repeat the procedure [steps e) to n)] with the input signal amplitude set to 3 dB above the AGC threshold.
p) Repeat steps e) to o) with the signal generator set to the narrowband signal.
q) Repeat steps e) to p) for all frequency bands authorized for use by the EUT.

RSS-GEN

6 Technical Requirements

6.6 Occupied Bandwidth

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3×RBW.

Note: Video averaging is not permitted.
A peak, or peak hold, may be used in place of the sampling detector as this may produce a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold may be necessary to determine the occupied bandwidth if the device is not transmitting continuously.
The trace data points are recovered and are directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded.
The difference between the two recorded frequencies is the 99% occupied bandwidth.

Test Results:

[Downlink Output_700 LTE]

	Channel	Frequency (MHz)	OBW (MHz)
700 LTE Band_ LTE 10 MHz AGC threshold	Low	733.00	8.8666
	Middle	742.00	8.8766
	High	751.00	8.9823
700 LTE Band_ LTE 10 MHz +3dBm above the AGC threshold	Low	733.00	8.8630
	Middle	742.00	8.8899
	High	751.00	8.8657

[Downlink Input_700 LTE]

	Channel	Frequency (MHz)	OBW (MHz)
700 LTE Band_ LTE 10 MHz AGC threshold	Low	733.00	8.9960
	Middle	742.00	9.0021
	High	751.00	8.9969

[Uplink_Lower Output_700 LTE]

	Channel	Frequency (MHz)	OBW (MHz)
700 LTE Band_ LTE 10 MHz AGC threshold	Low	703.00	9.0348
	Middle	-	-
	High	711.00	9.0317
700 LTE Band_ LTE 10 MHz +3dBm above the AGC threshold	Low	703.00	9.0348
	Middle	-	-
	High	711.00	9.0406

[Uplink_Lower Input_700 LTE]

	Channel	Frequency (MHz)	OBW (MHz)
700 LTE Band_ LTE 10 MHz AGC threshold	Low	703.00	9.0119
	Middle	-	-
	High	711.00	9.0034

[Uplink_Upper Output_700 LTE]

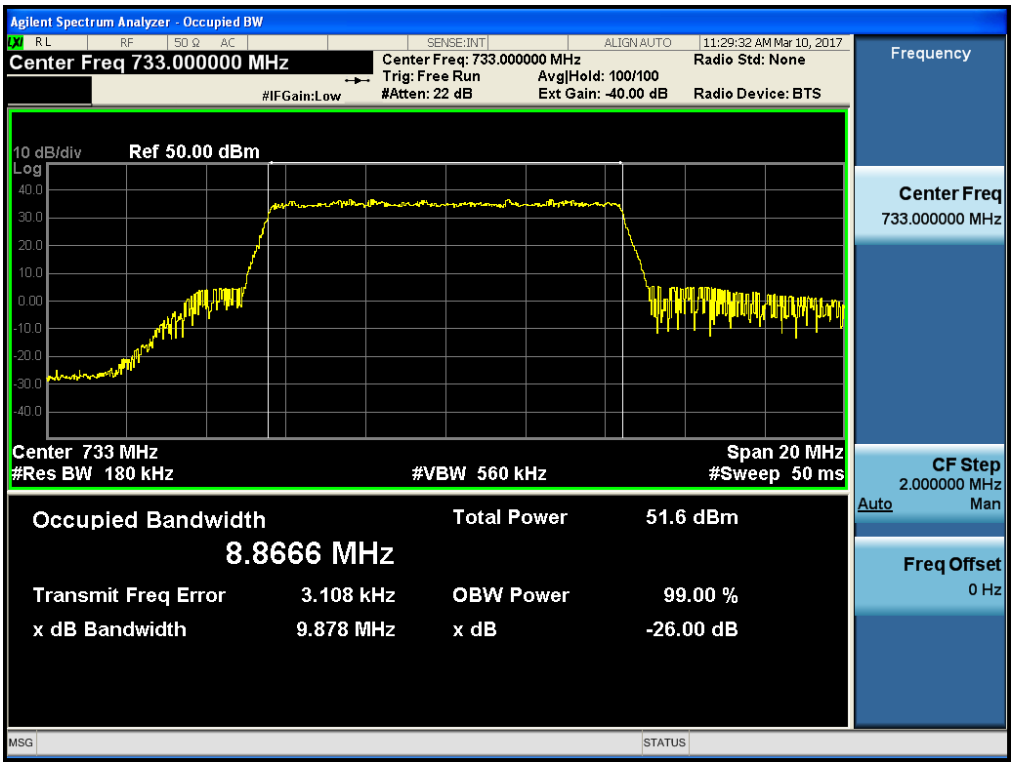
	Channel	Frequency (MHz)	OBW (MHz)
700 LTE Band_ LTE 10 MHz AGC threshold	Low	-	-
	Middle	782.00	9.0412
	High	-	-
700 LTE Band_ LTE 10 MHz +3dBm above the AGC threshold	Low	-	-
	Middle	782.00	9.0421
	High	-	-

[Uplink_Upper Input_700 LTE]

	Channel	Frequency (MHz)	OBW (MHz)
700 LTE Band_ LTE 10 MHz AGC threshold	Low	-	-
	Middle	782.00	9.0083
	High	-	-

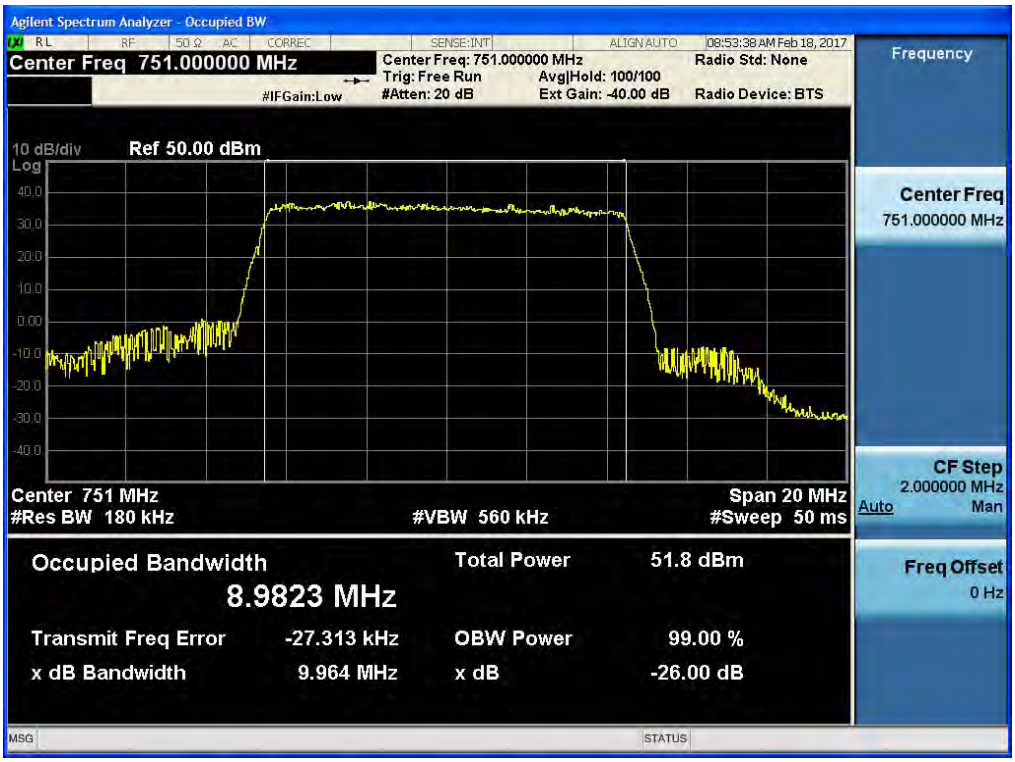
Plots of Occupied Bandwidth_ 700 LTE BAND LTE 10 MHz_Output_Downlink

[AGC threshold Output Downlink Low]



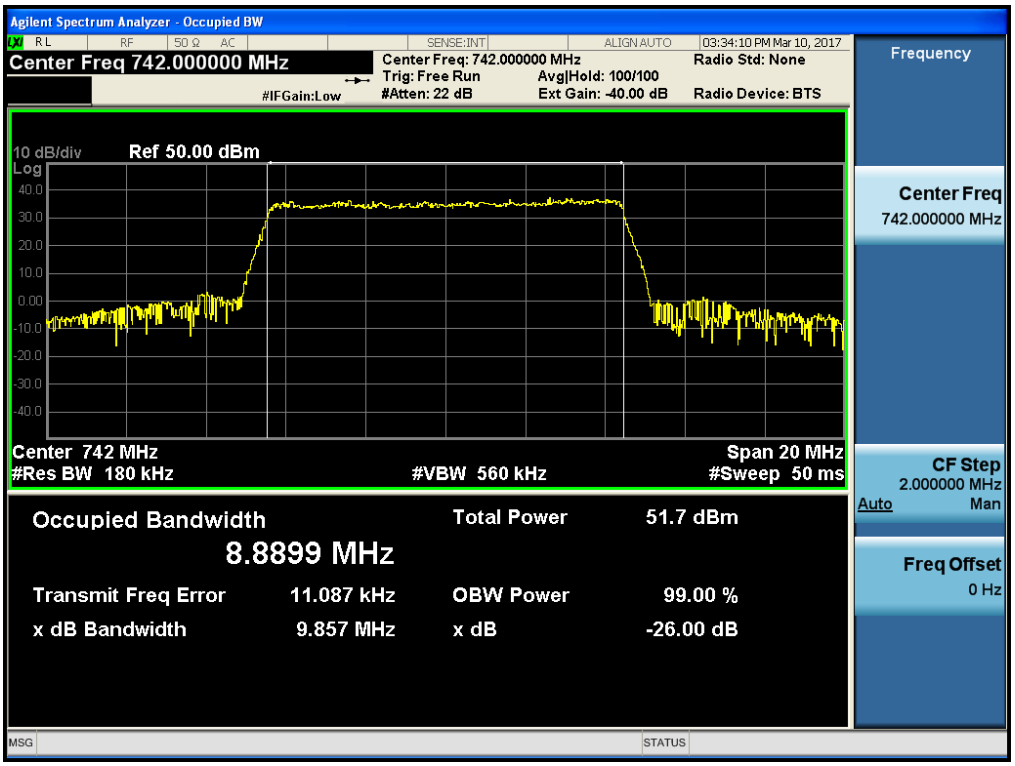
[AGC threshold Output Downlink Middle]

[AGC threshold Output Downlink High]

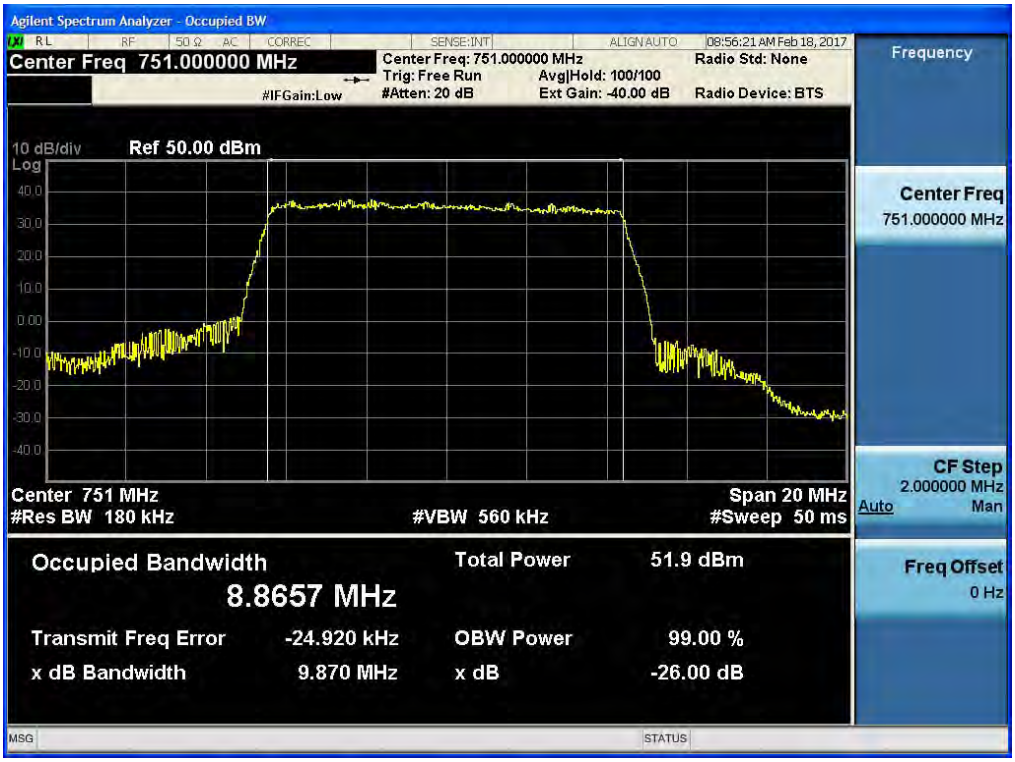


[+3dBmabove AGC threshold Output Downlink Low]

[+3dBm above AGC threshold Output Downlink Middle]

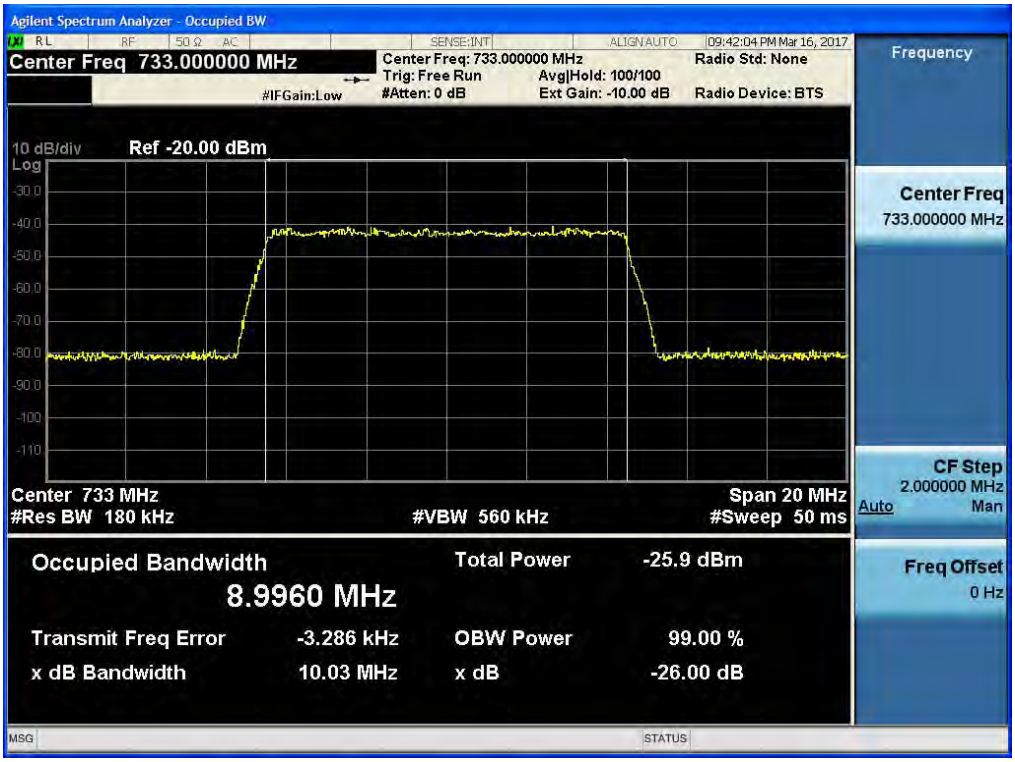


[+3dBm above AGC threshold Output Downlink High]

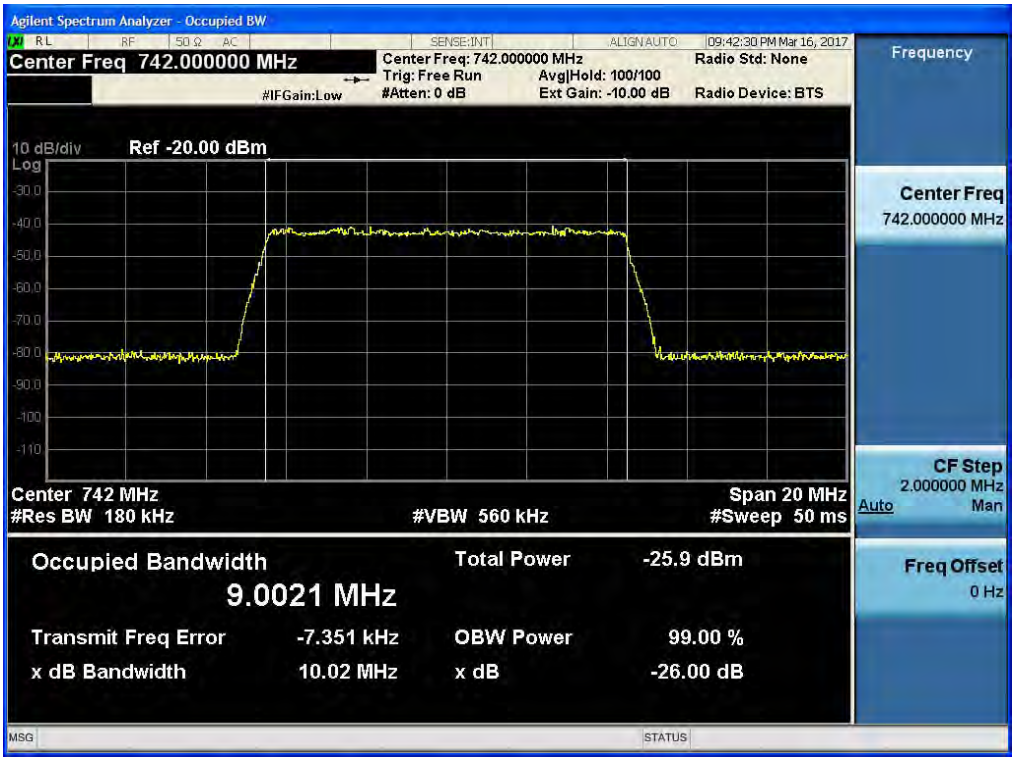


Plots of Occupied Bandwidth_ 700 LTE BAND LTE 10 MHz_Input_Downlink

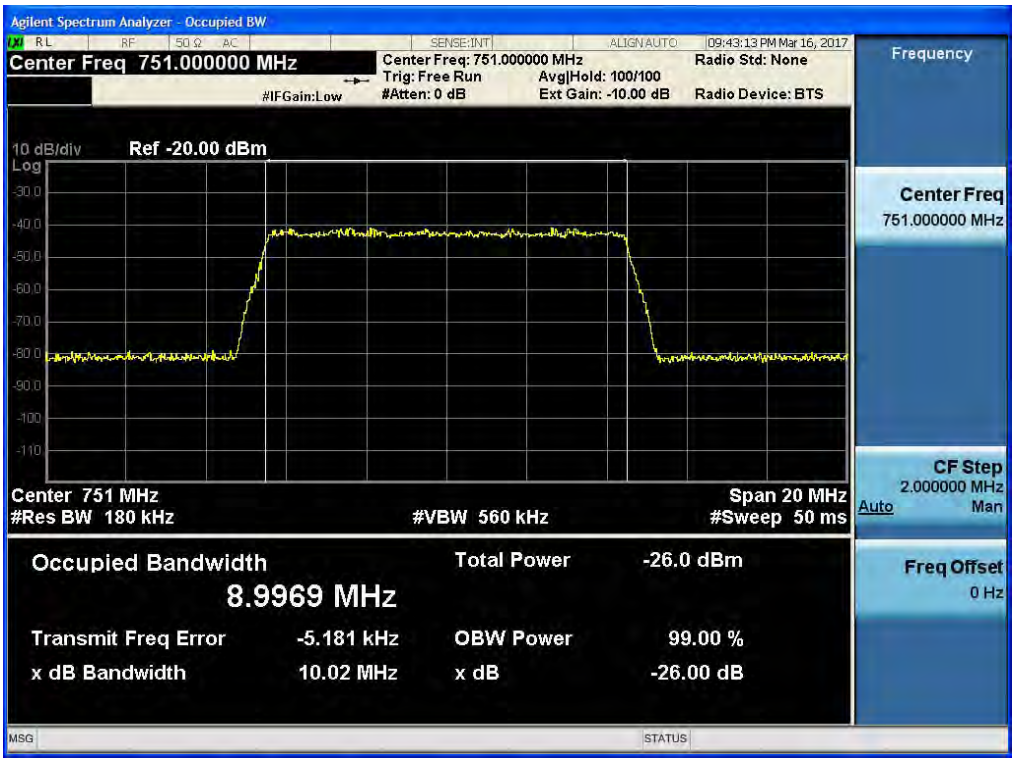
[AGC threshold Input Downlink Low]



[AGC threshold Input Downlink Middle]

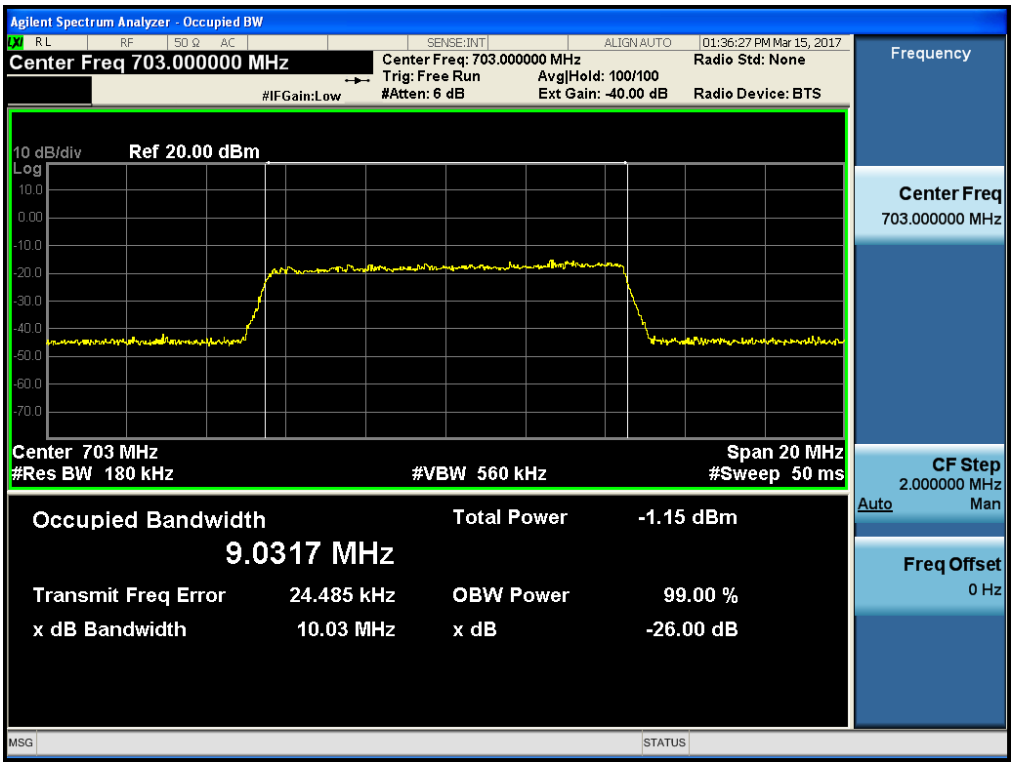


[AGC threshold Input Downlink High]

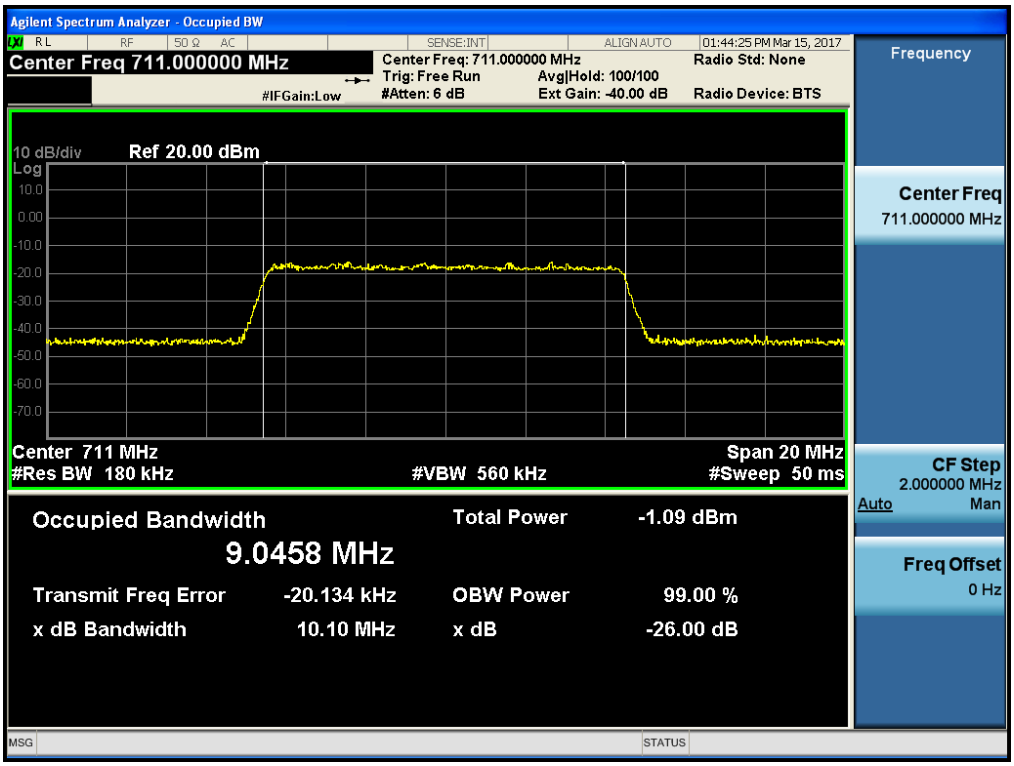


Plots of Occupied Bandwidth_ 700 LTE BAND LTE 10 MHz_Output_Uplink(Lower)

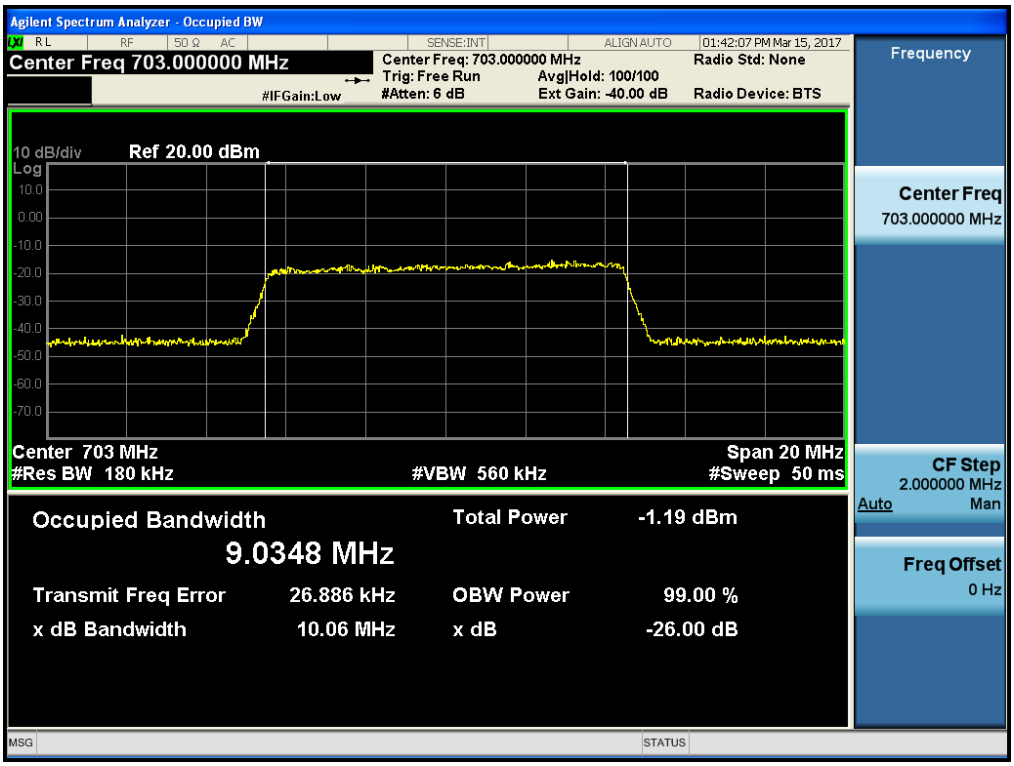
[AGC threshold Output Uplink Low]



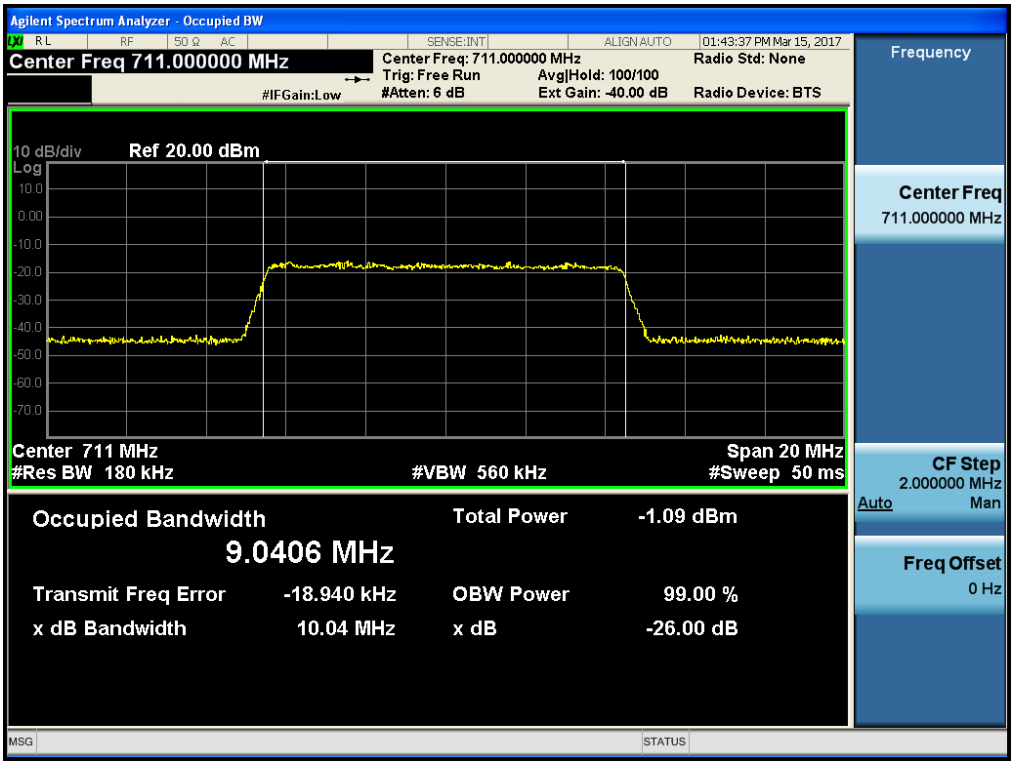
[AGC threshold Output Uplink High]



[+3dBmabove AGC threshold Output Uplink Low]

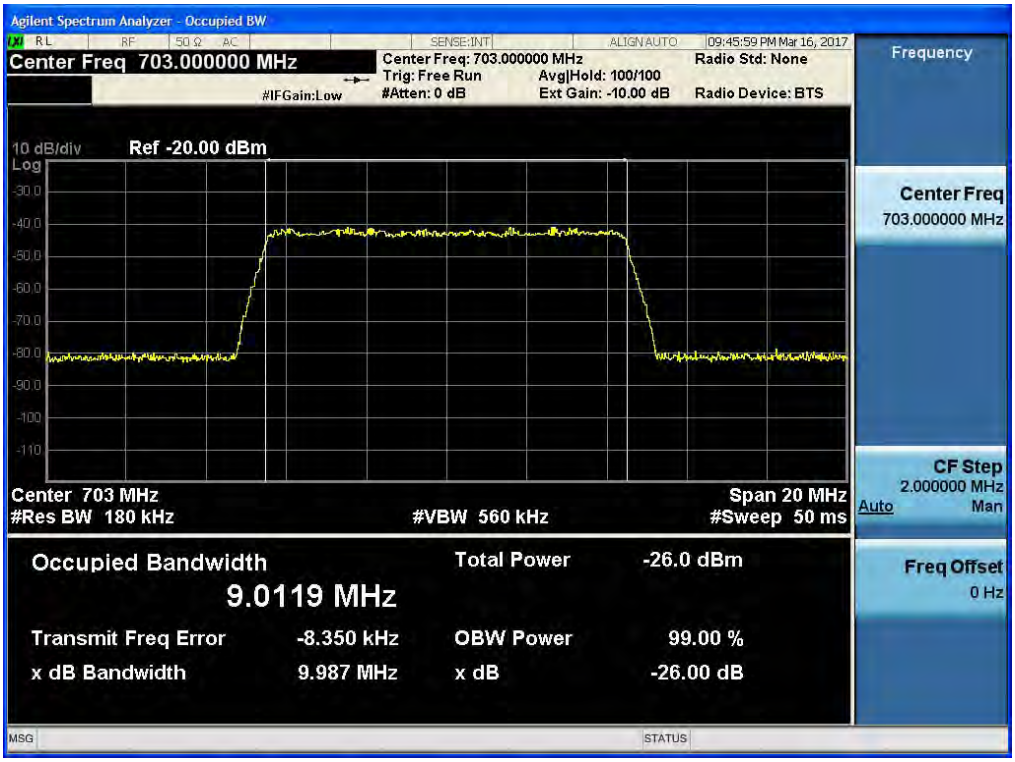


[+3dBm above AGC threshold Output Uplink High]

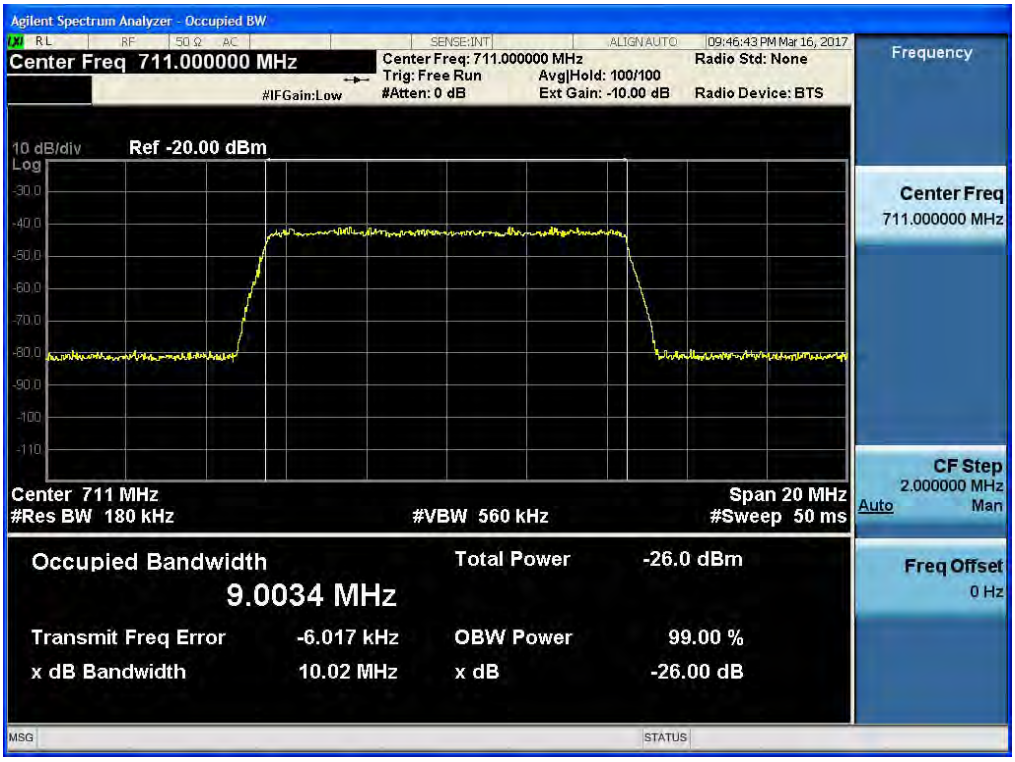


Plots of Occupied Bandwidth_ 700 LTE BAND LTE 10 MHz_Input_Uplink(Lower)

[AGC threshold Input Uplink Low]

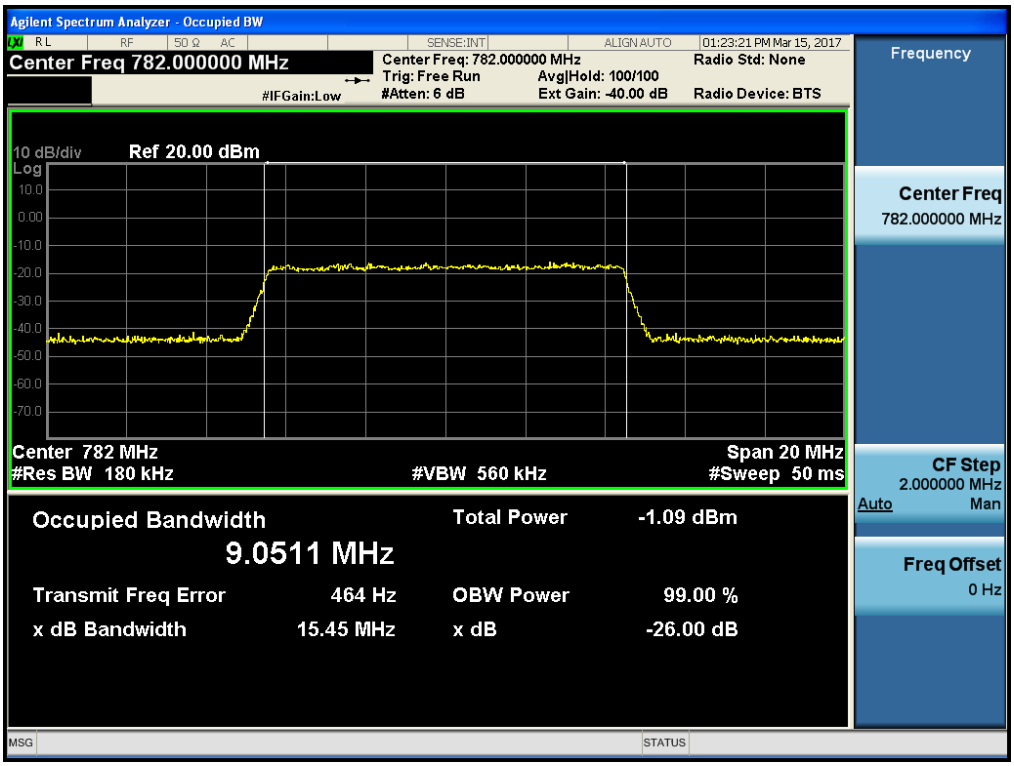


[AGC threshold Input Uplink High]

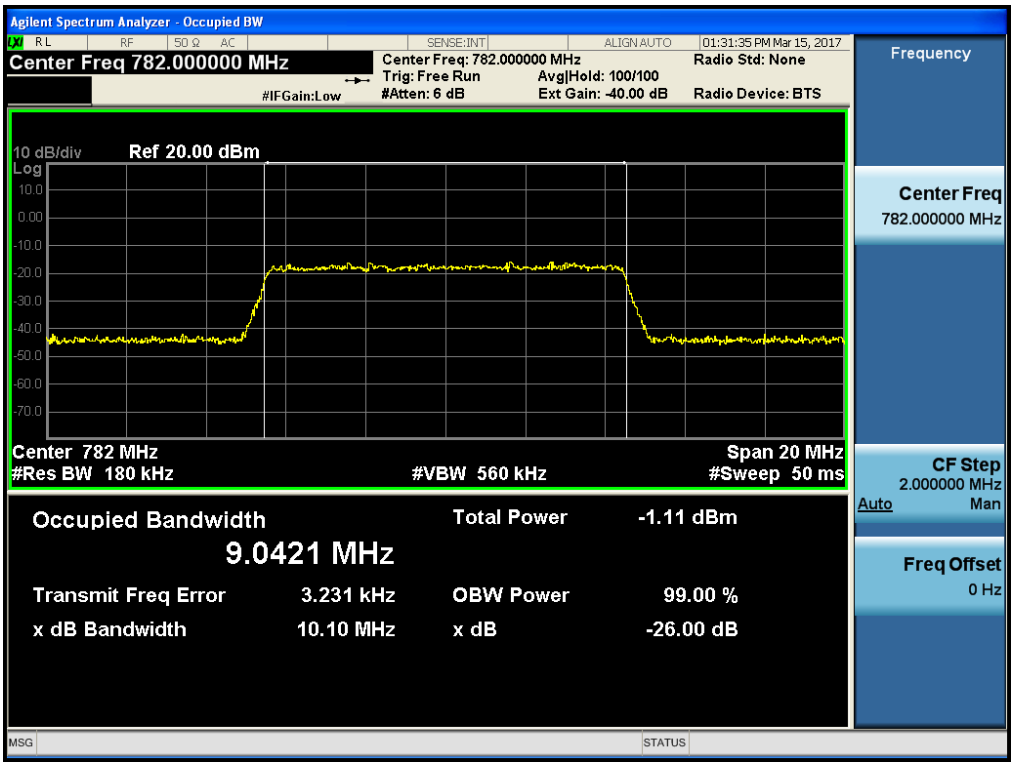


Plots of Occupied Bandwidth_ 700 LTE BAND LTE 10 MHz_Output_Uplink(Upper)

[AGC threshold Output Uplink Middle]

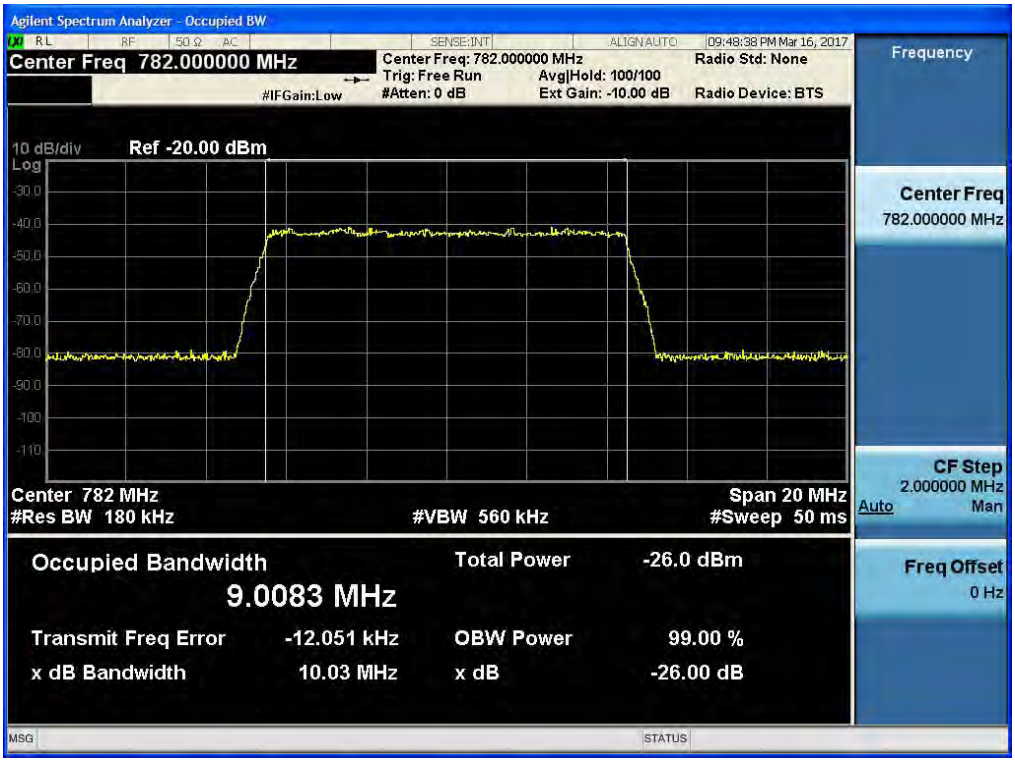


[+3dBmabove AGC threshold Output Uplink Middle]



Plots of Occupied Bandwidth_ 700 LTE BAND LTE 10 MHz_Input_Uplink(Lower)

[AGC threshold Input Uplink Middle]



[Downlink Output_Part 22] – 800 MHz

	Channel	Frequency (MHz)	OBW (MHz)
800 MHz Band_ LTE 20 MHz AGC threshold	Low	879.00	17.977
	Middle	-	-
	High	884.00	17.989
800 MHz Band_ LTE 20 MHz +3dBm above the AGC threshold	Low	879.00	17.977
	Middle	-	-
	High	884.00	18.010
800 MHz Band_ CDMA AGC threshold	Low	870.25	1.2760
	Middle	881.50	1.2757
	High	892.75	1.2776
800 MHz Band_ CDMA +3dBm above the AGC threshold	Low	870.25	1.2742
	Middle	881.50	1.2742
	High	892.75	1.2678

[Downlink Input_Part 22] – 800 MHz

	Channel	Frequency (MHz)	OBW (MHz)
800 MHz Band_ LTE 20 MHz AGC threshold	Low	879.00	18.020
	Middle	-	-
	High	884.00	18.008
800 MHz Band_ CDMA AGC threshold	Low	870.25	1.2719
	Middle	881.50	1.2718
	High	892.75	1.2706

[Uplink Output_Part 22] – 800 MHz

	Channel	Frequency (MHz)	OBW (MHz)
800 MHz Band_ LTE 20 MHz AGC threshold	Low	834.00	18.242
	Middle	-	-
	High	839.00	18.207
800 MHz Band_ LTE 20 MHz +3dBm above the AGC threshold	Low	834.00	18.269
	Middle	-	-
	High	839.00	18.224
800 MHz Band_ CDMA AGC threshold	Low	825.25	1.2798
	Middle	836.50	1.2798
	High	847.75	1.2698
800 MHz Band_ CDMA +3dBm above the AGC threshold	Low	825.25	1.2775
	Middle	836.50	1.2813
	High	847.75	1.2758

[Uplink Input_Part 22] – 800 MHz

	Channel	Frequency (MHz)	OBW (MHz)
800 MHz Band_ LTE 20 MHz AGC threshold	Low	834.00	18.037
	Middle	-	-
	High	839.00	18.031
800 MHz Band_ CDMA AGC threshold	Low	825.25	1.2771
	Middle	836.50	1.2746
	High	847.75	1.2698

[Downlink Output_Part 90] – 800 MHz

	Channel	Frequency (MHz)	OBW (MHz)
800 MHz Band _ LTE 5 MHz AGC threshold	Low	864.50	4.5116
	Middle	-	-
	High	866.50	4.3991
800 MHz Band _ LTE 5 MHz +3dBm above the AGC threshold	Low	864.50	4.3968
	Middle	-	-
	High	866.50	4.3977

[Downlink Input_Part 90] – 800 MHz

	Channel	Frequency (MHz)	OBW (MHz)
800 MHz Band_ LTE 5 MHz AGC threshold	Low	864.50	4.3988
	Middle	-	-
	High	866.50	4.3985

[Uplink Output_Part 90] – 800 MHz

	Channel	Frequency (MHz)	OBW (MHz)
800 MHz Band _ LTE 5 MHz AGC threshold	Low	819.50	4.5566
	Middle	-	-
	High	821.50	4.5662
800 MHz Band _ LTE 5 MHz +3dBm above the AGC threshold	Low	819.50	4.5558
	Middle	-	-
	High	821.50	4.5621

[Uplink Input_Part 90] – 800 MHz

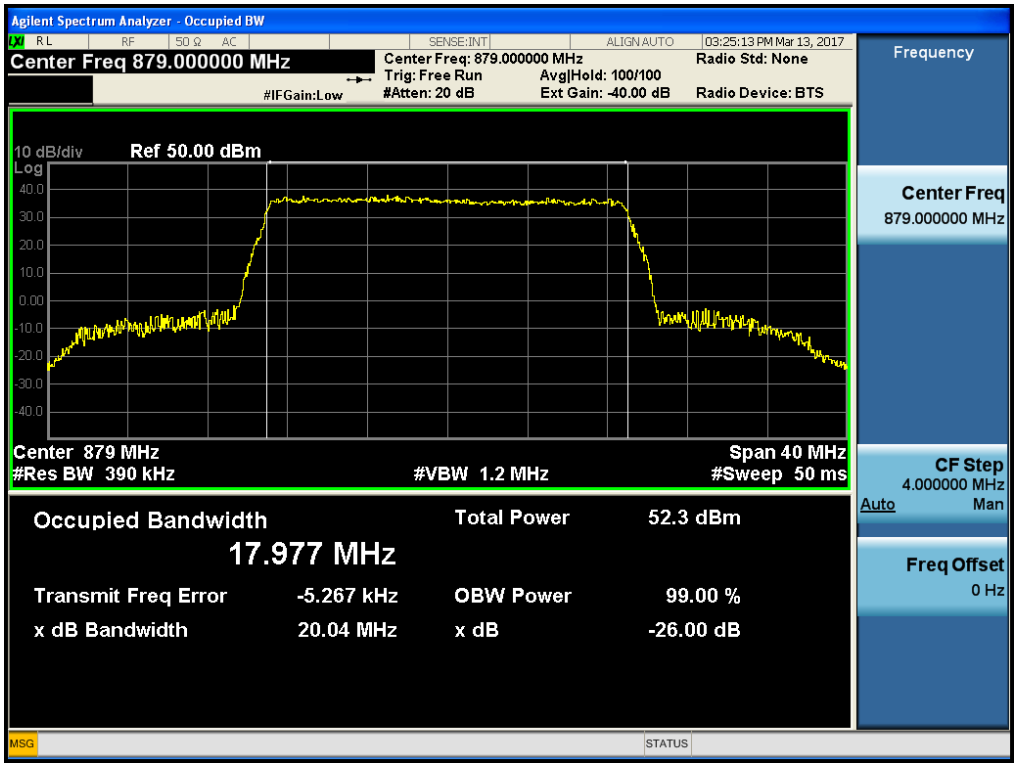
	Channel	Frequency (MHz)	OBW (MHz)
800 MHz Band_ LTE 5 MHz AGC threshold	Low	819.50	4.5354
	Middle	-	-
	High	821.50	4.5370

Plots of Occupied Bandwidth_800 MHz BAND LTE 20 MHz_Part 22

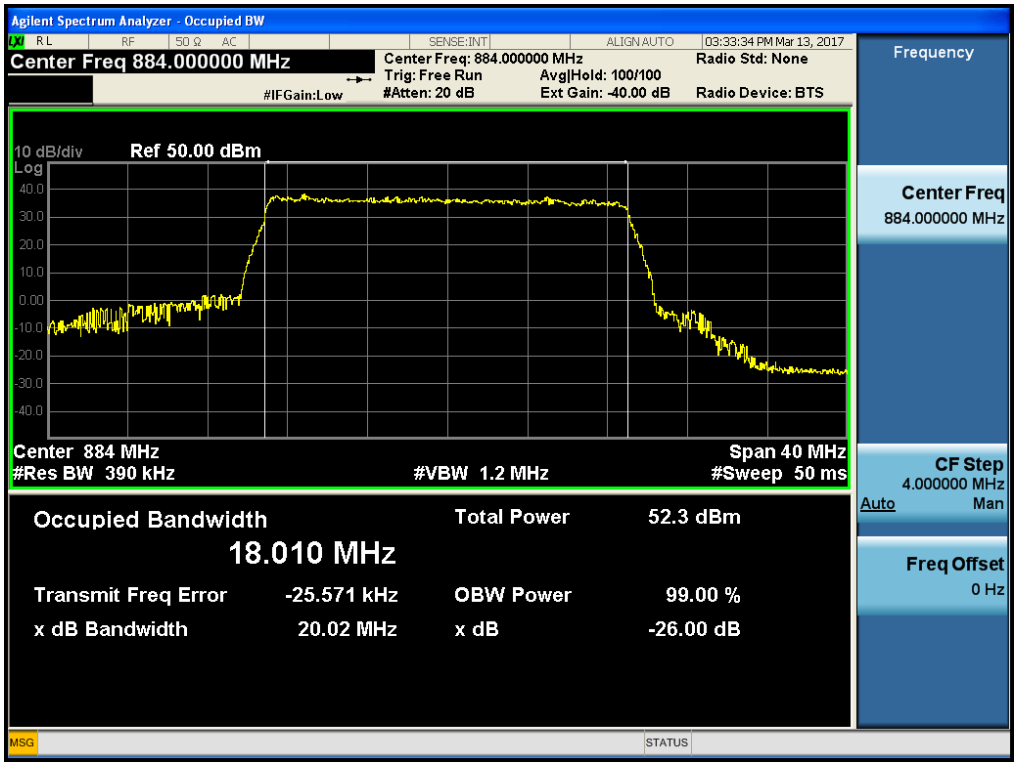
[AGC threshold Output Downlink Low]

[AGC threshold Output Downlink High]

[+3dBmabove AGC threshold Output Downlink Low]

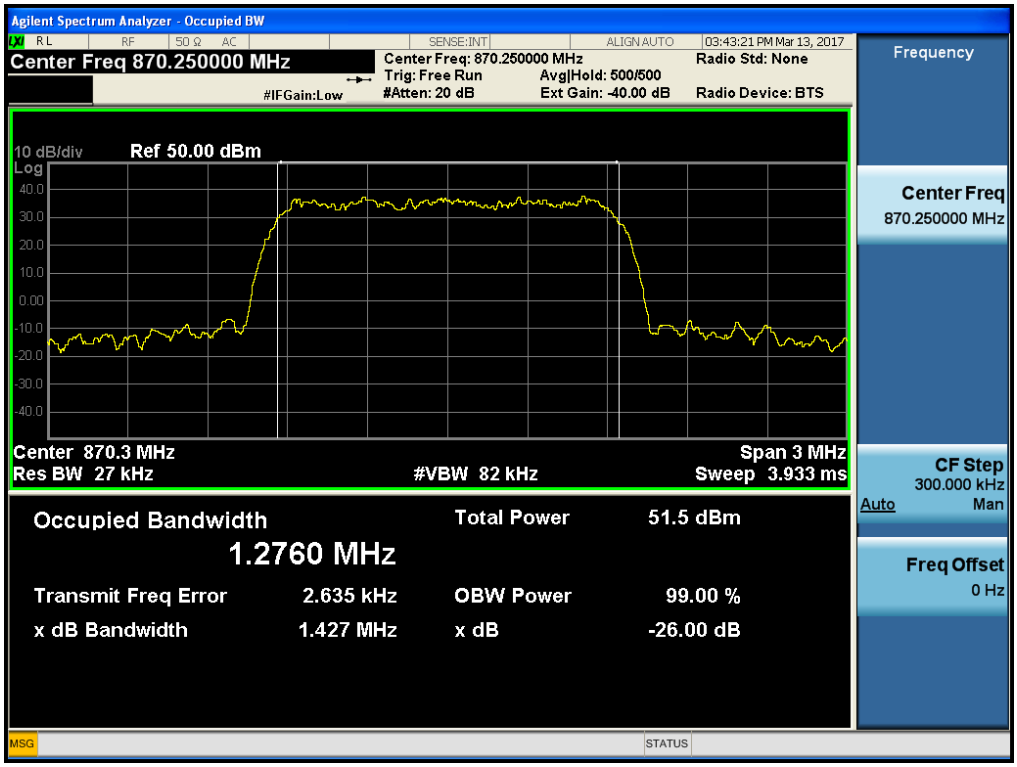


[+3dBm above AGC threshold Output Downlink High]

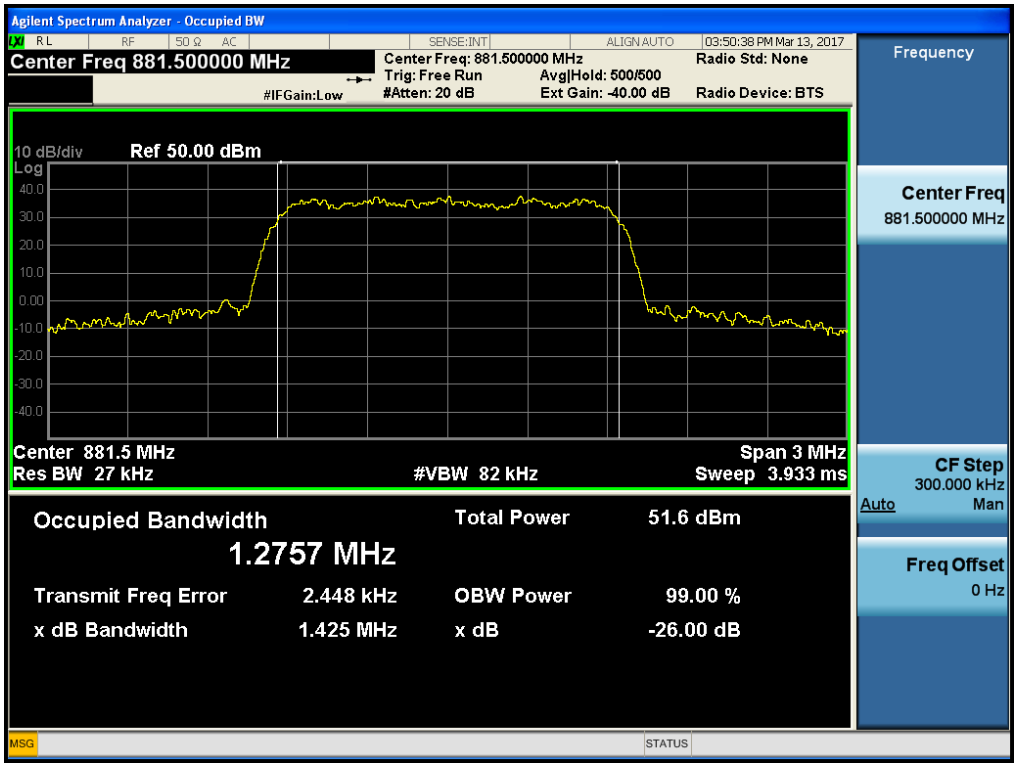


Plots of Occupied Bandwidth_800 MHz BAND CDMA_Part 22

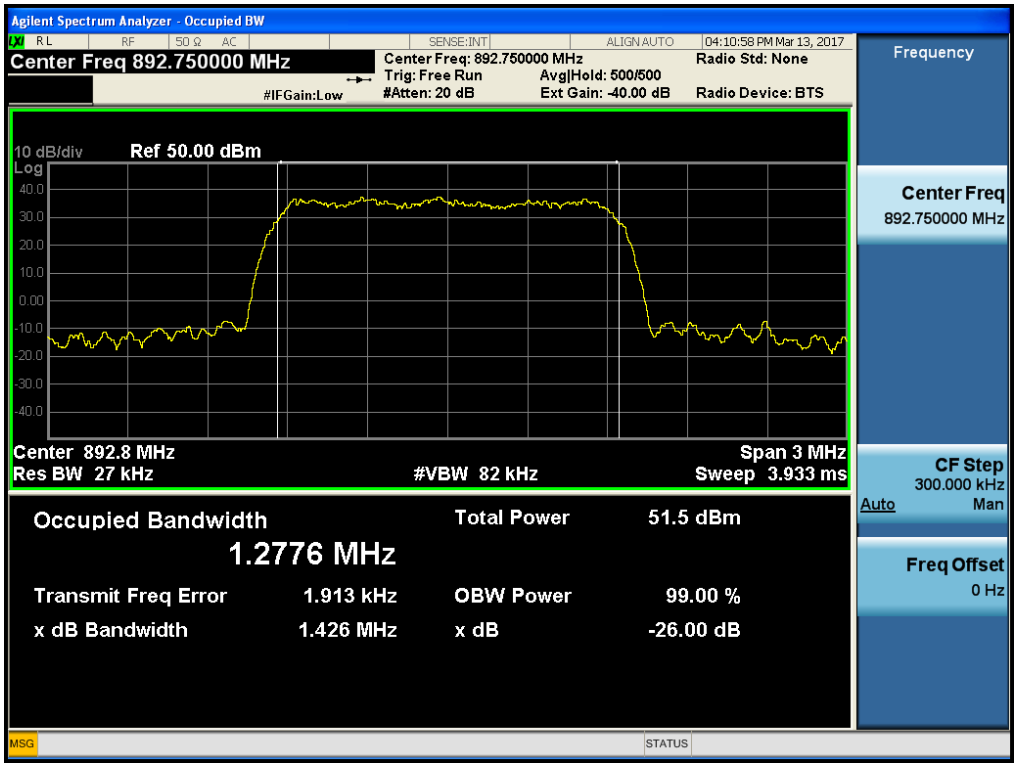
[AGC threshold Output Downlink Low]



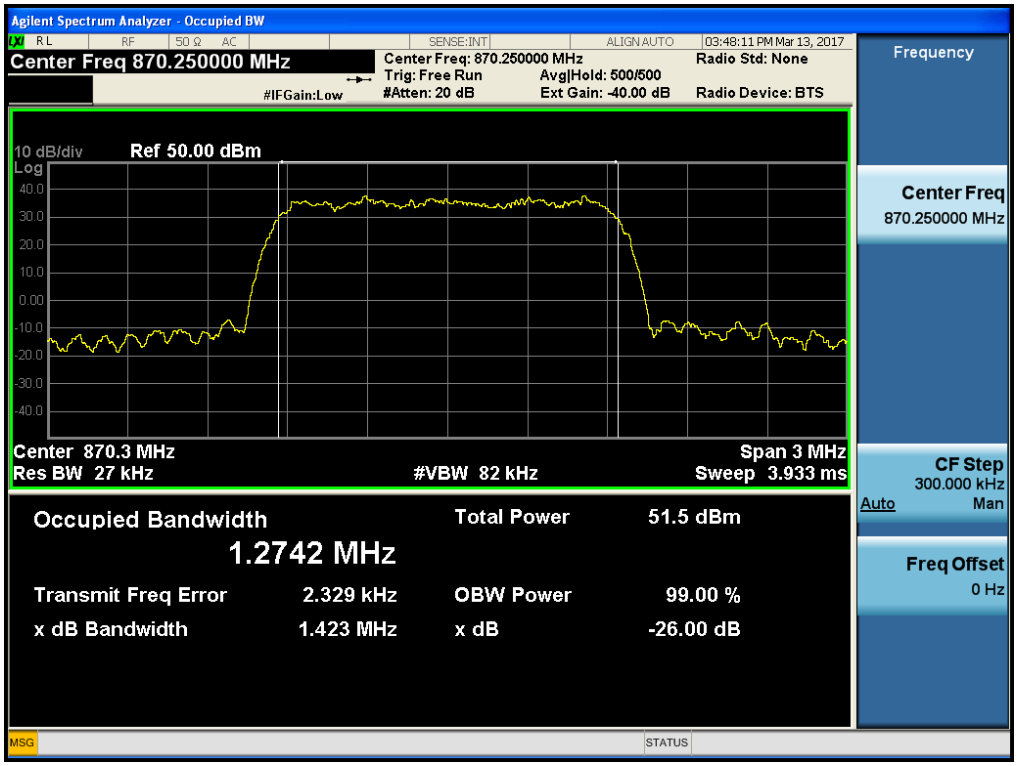
[AGC threshold Output Downlink Middle]



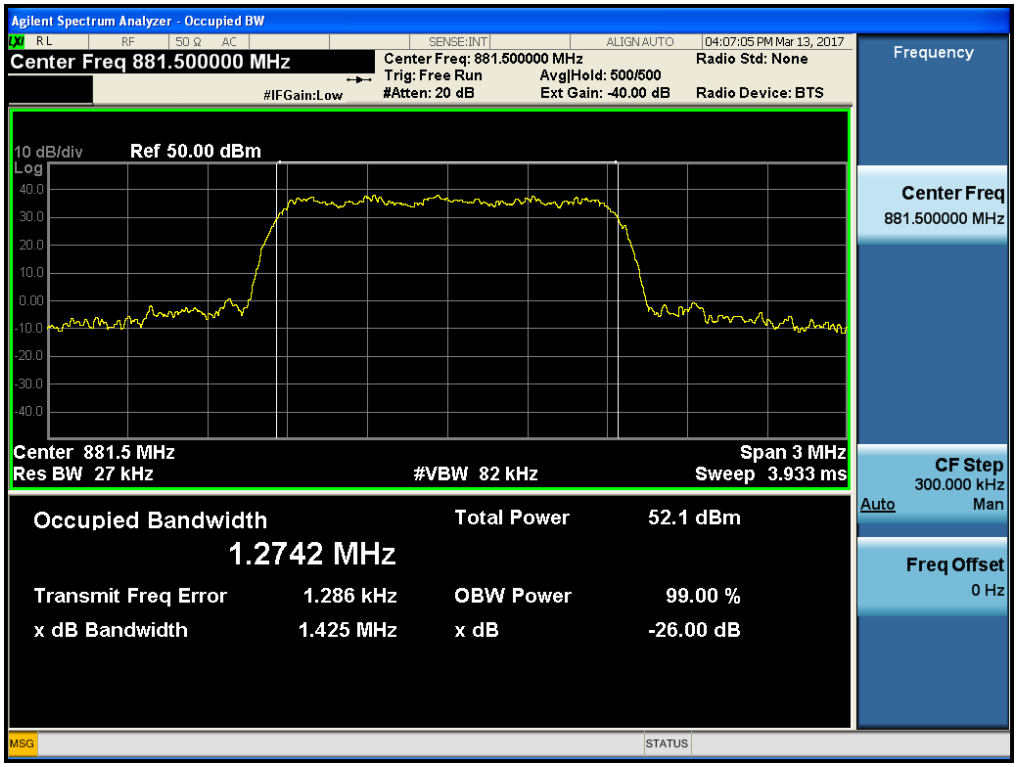
[AGC threshold Output Downlink High]



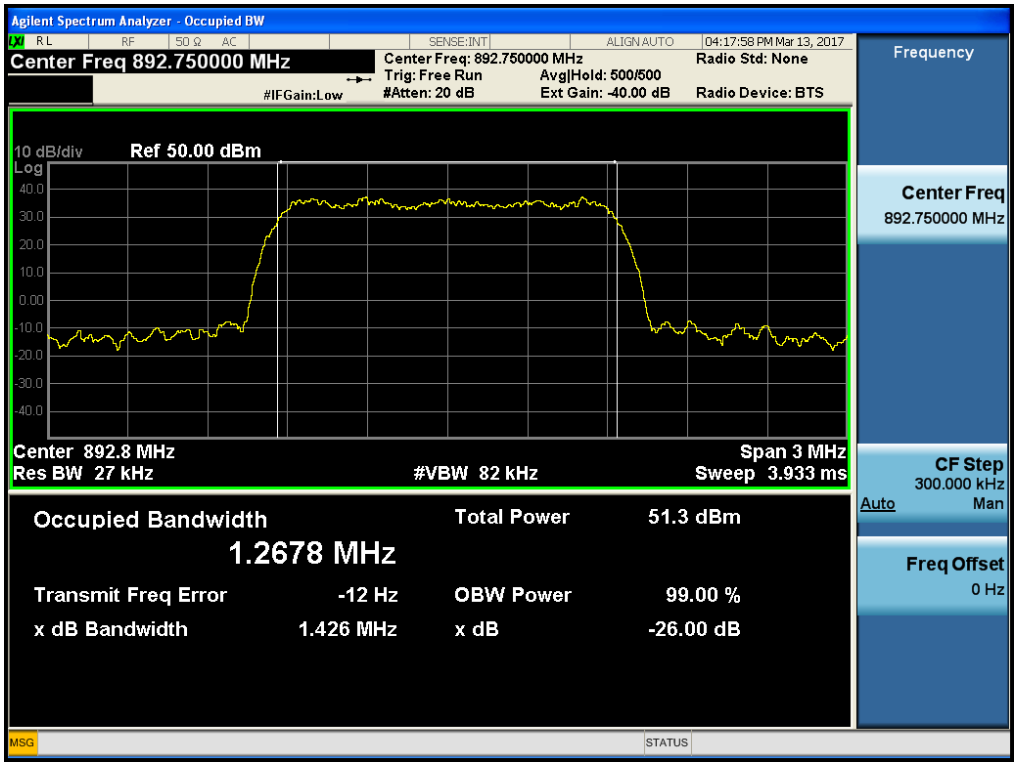
[+3dBmabove AGC threshold Output Downlink Low]



[+3dBm above AGC threshold Output Downlink Middle]



[+3dBm above AGC threshold Output Downlink High]



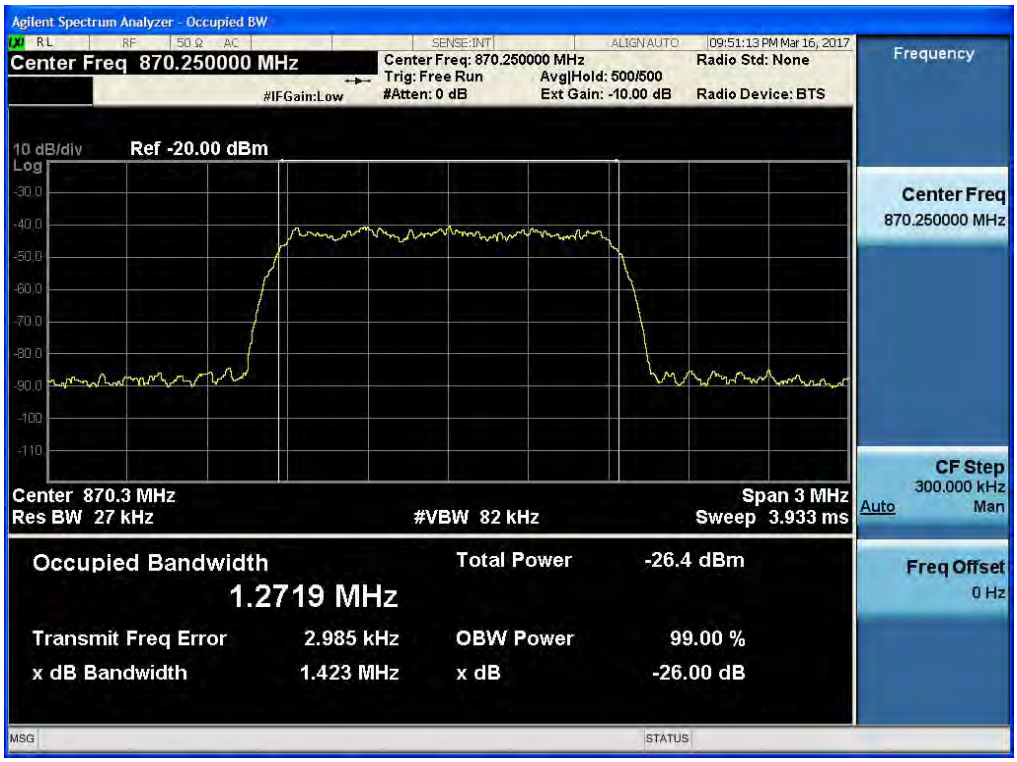
Plots of Occupied Bandwidth_800 MHz BAND LTE 20 MHz_Part 22

[AGC threshold Input Downlink Low]

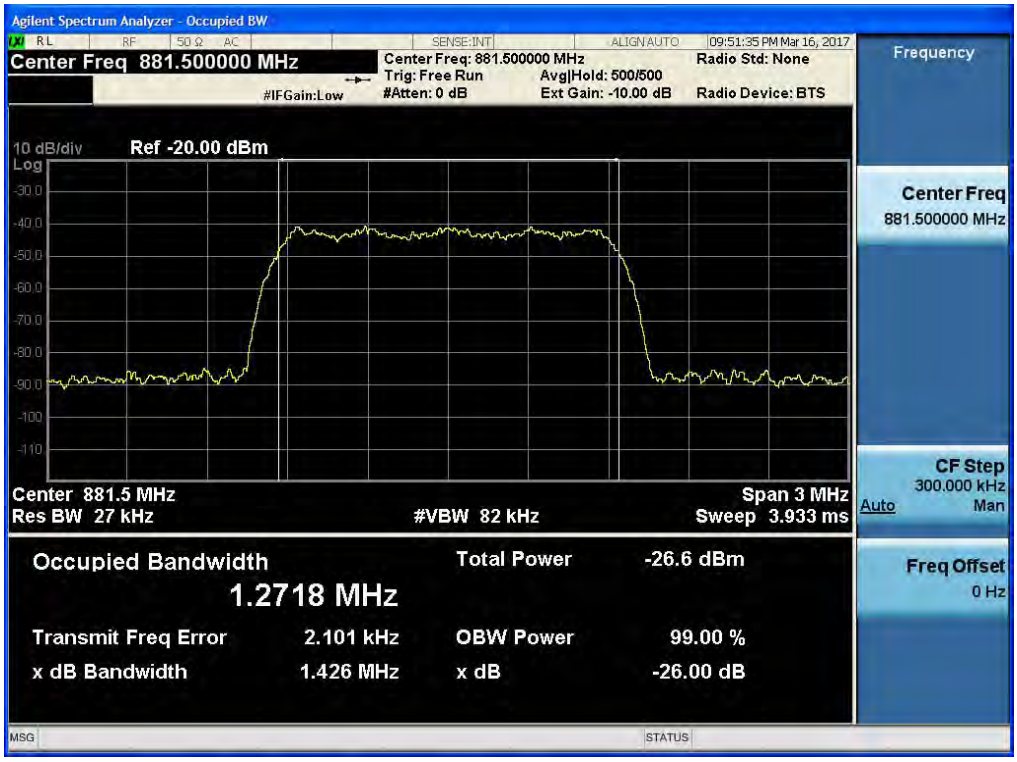
[AGC threshold Input Downlink High]

Plots of Occupied Bandwidth_800 MHz BAND CDMA_Part 22

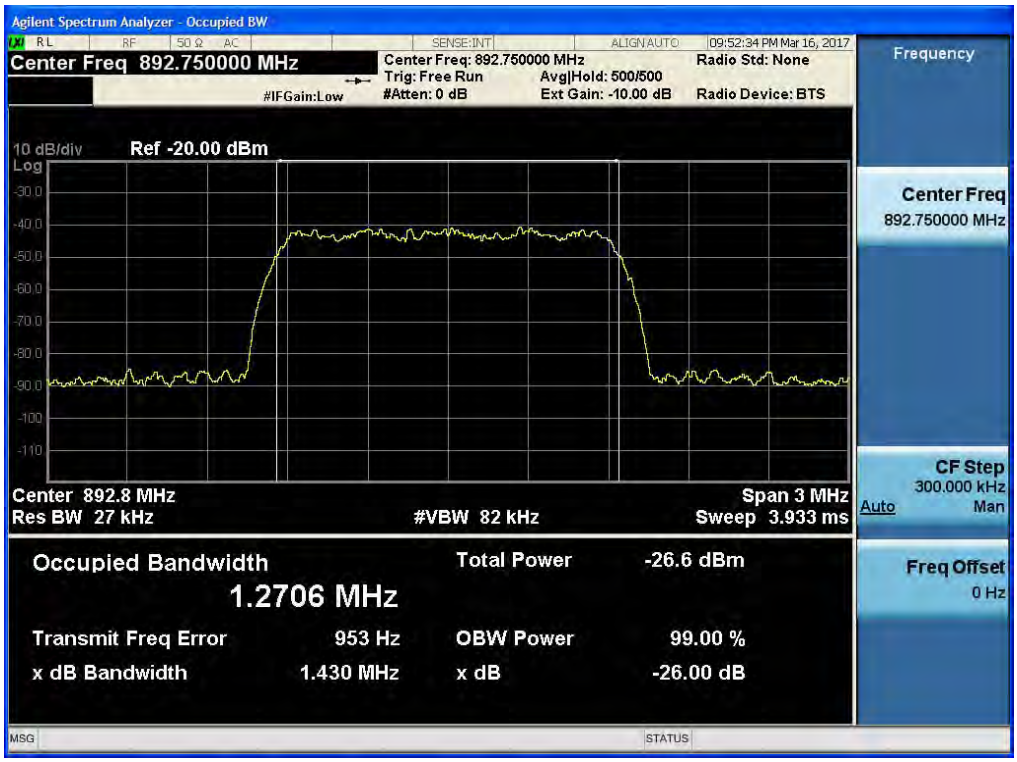
[AGC threshold Input Downlink Low]



[AGC threshold Input Downlink Middle]

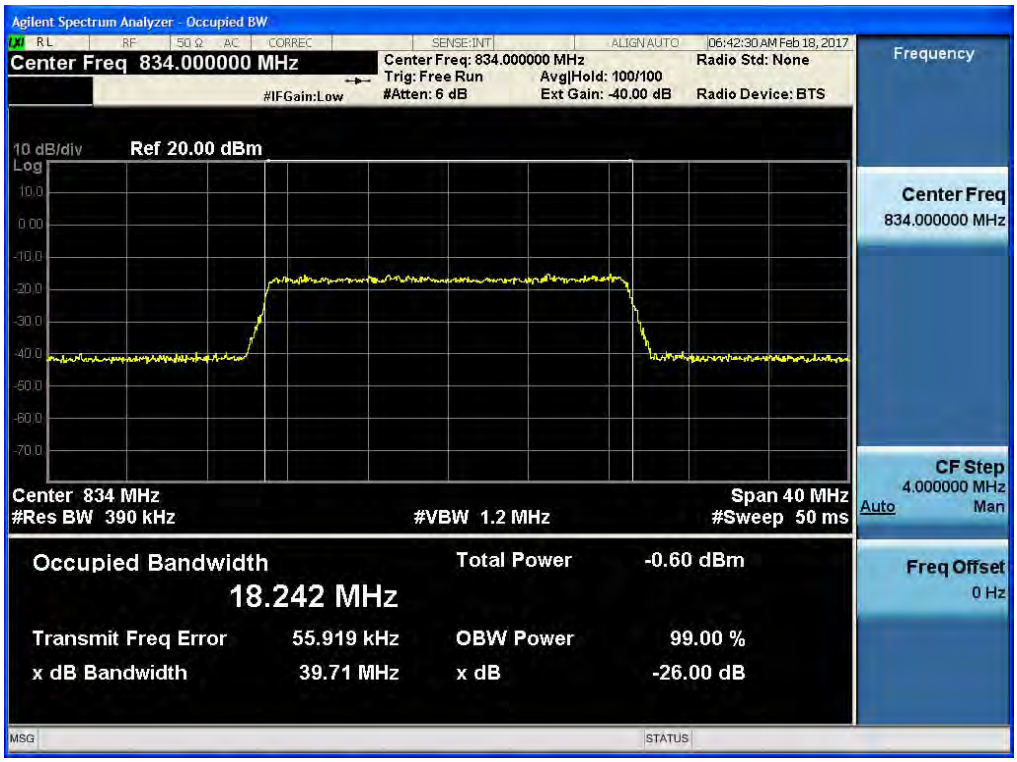


[AGC threshold Input Downlink High]

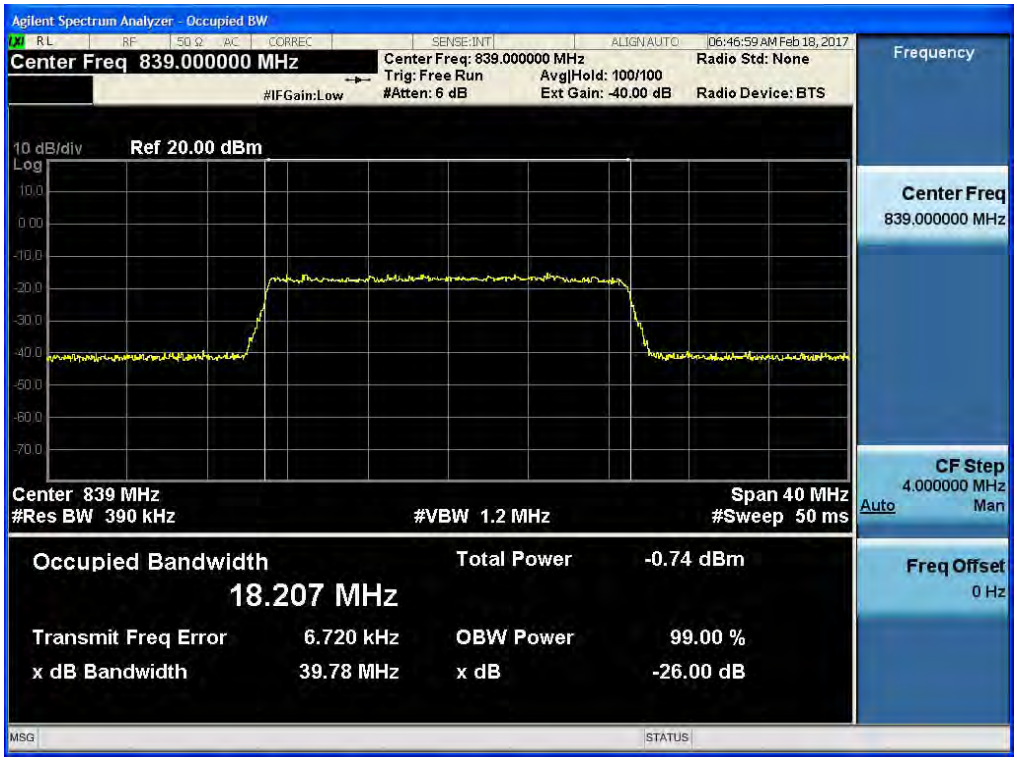


Plots of Occupied Bandwidth_800 MHz BAND LTE 20 MHz_Part 22

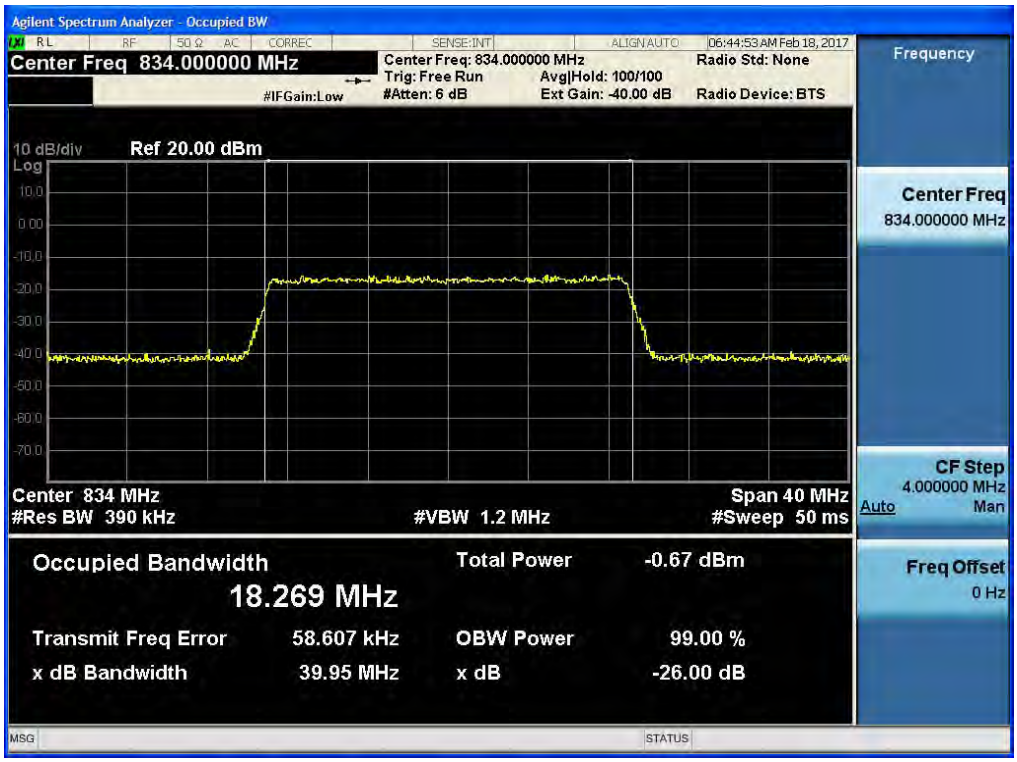
[AGC threshold Output Uplink Low]



[AGC threshold Output Uplink High]



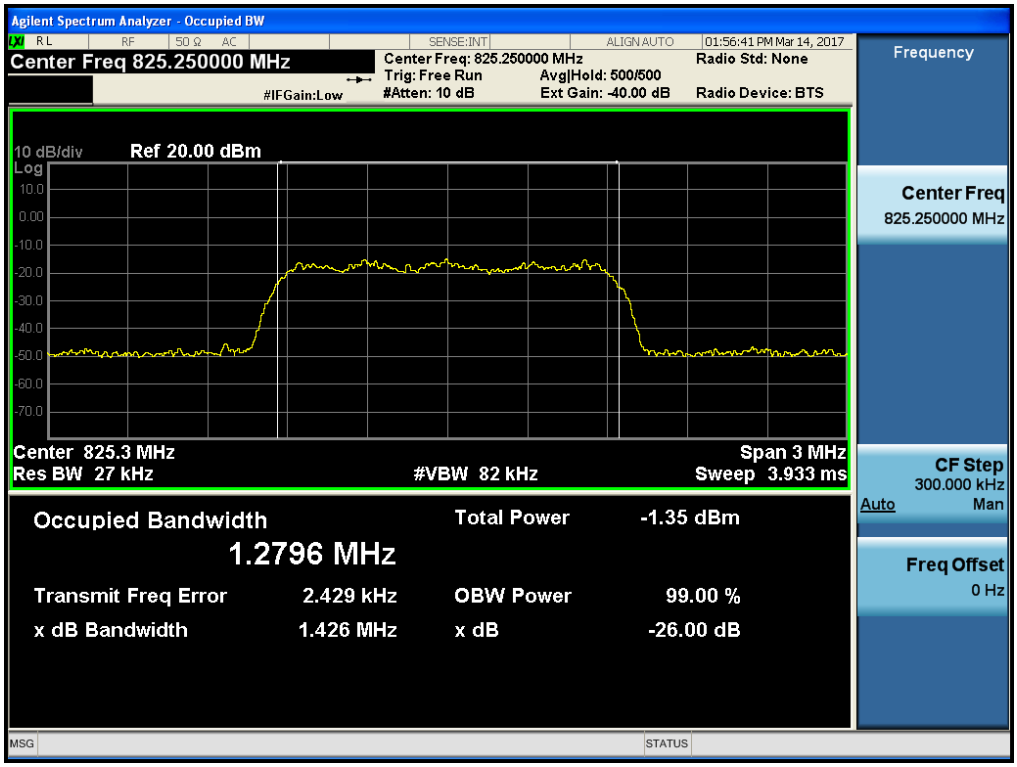
[+3dBmabove AGC threshold Output Uplink Low]



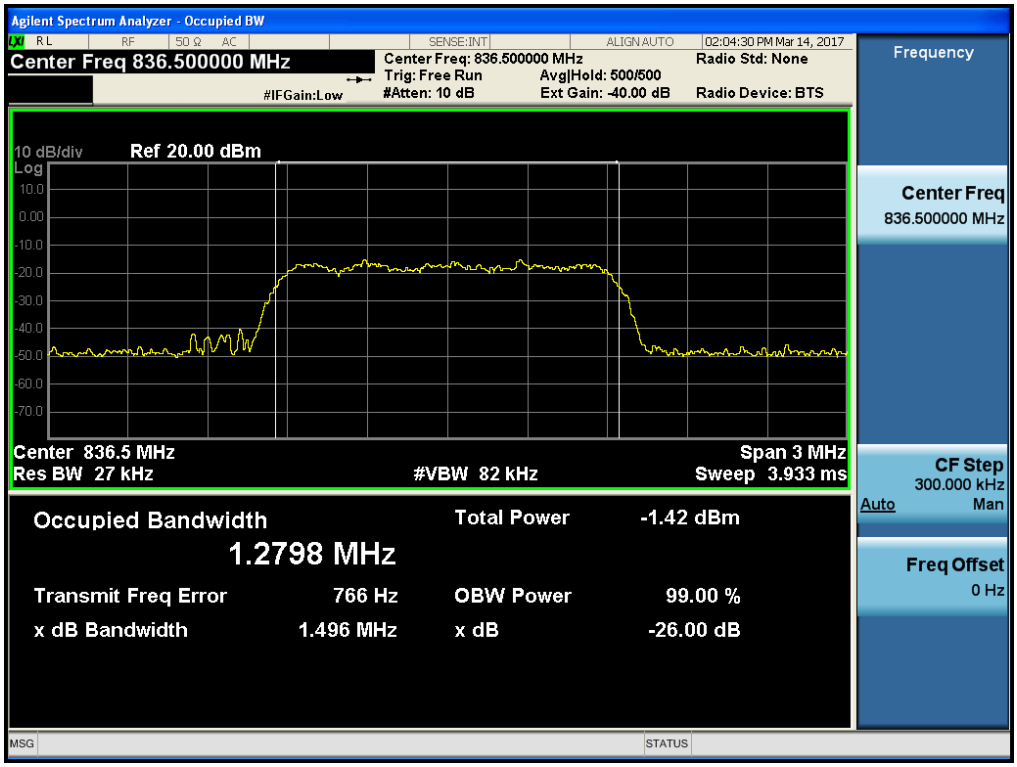
[+3dBm above AGC threshold Output Uplink High]

Plots of Occupied Bandwidth_800 MHz BAND CDMA_Part 22

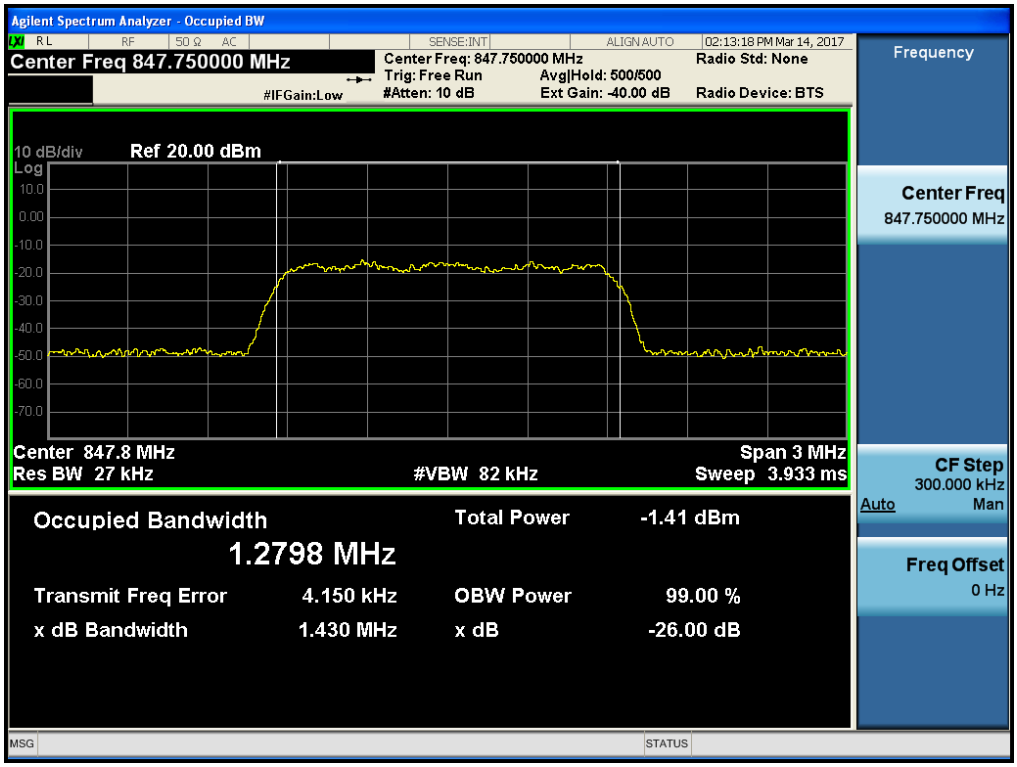
[AGC threshold Output Uplink Low]



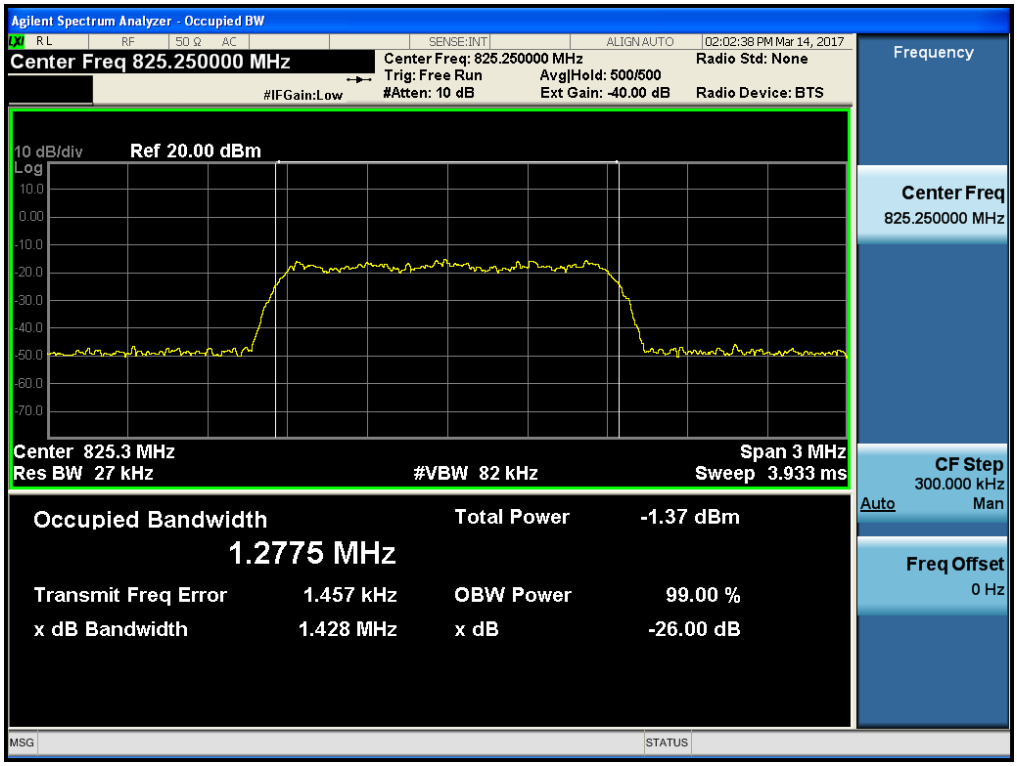
[AGC threshold Output Uplink Middle]



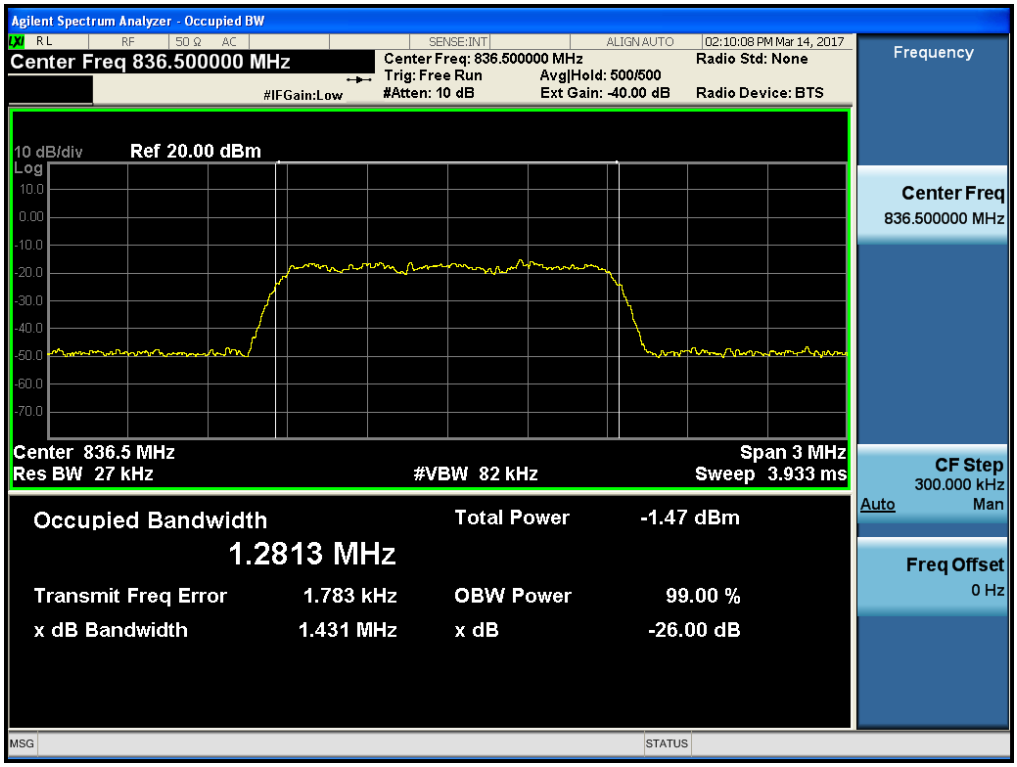
[AGC threshold Output Uplink High]



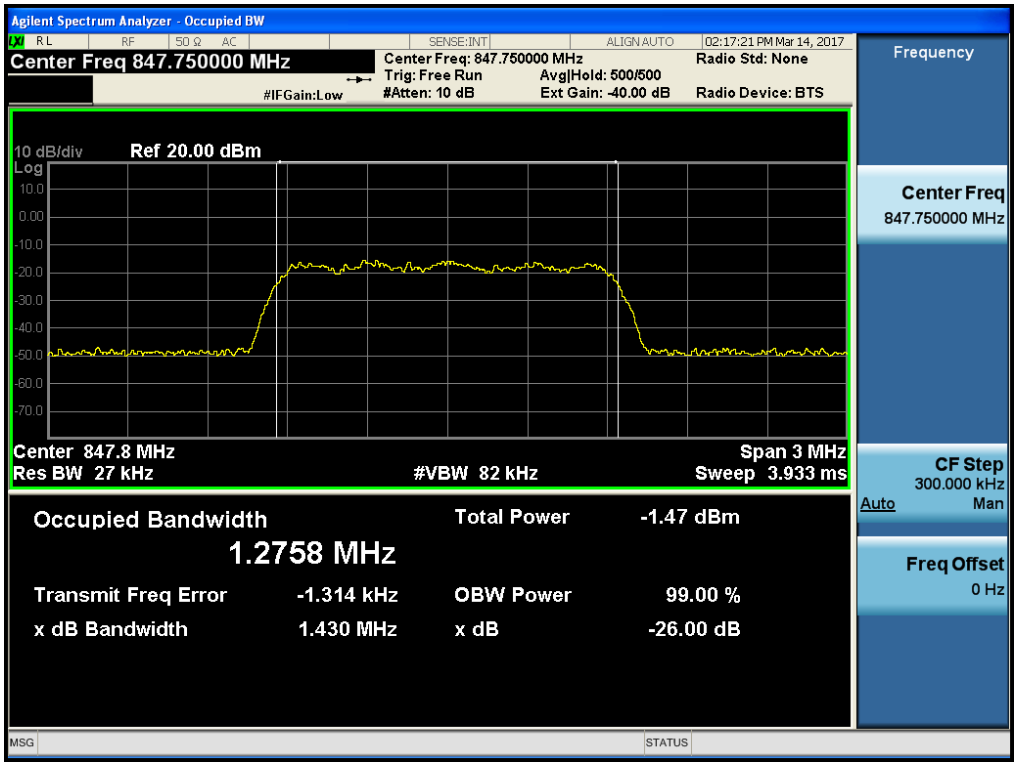
[+3dBmabove AGC threshold Output Uplink Low]



[+3dBm above AGC threshold Output Uplink Middle]



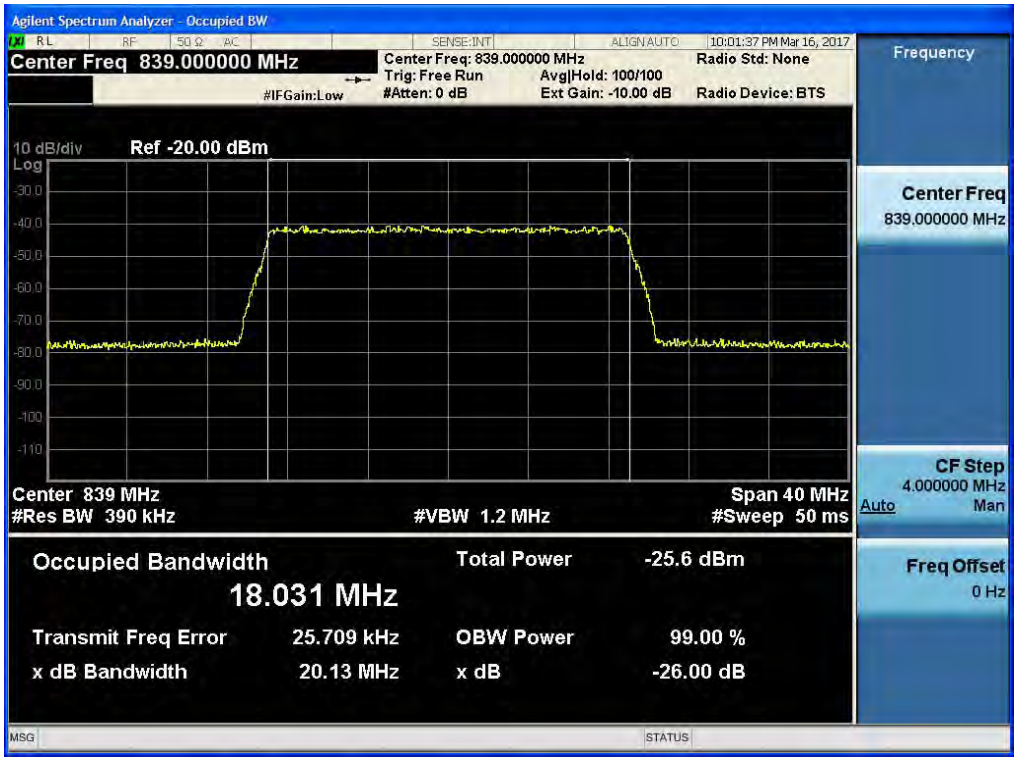
[+3dBm above AGC threshold Output Uplink High]



Plots of Occupied Bandwidth_800 MHz BAND LTE 20 MHz_Part 22

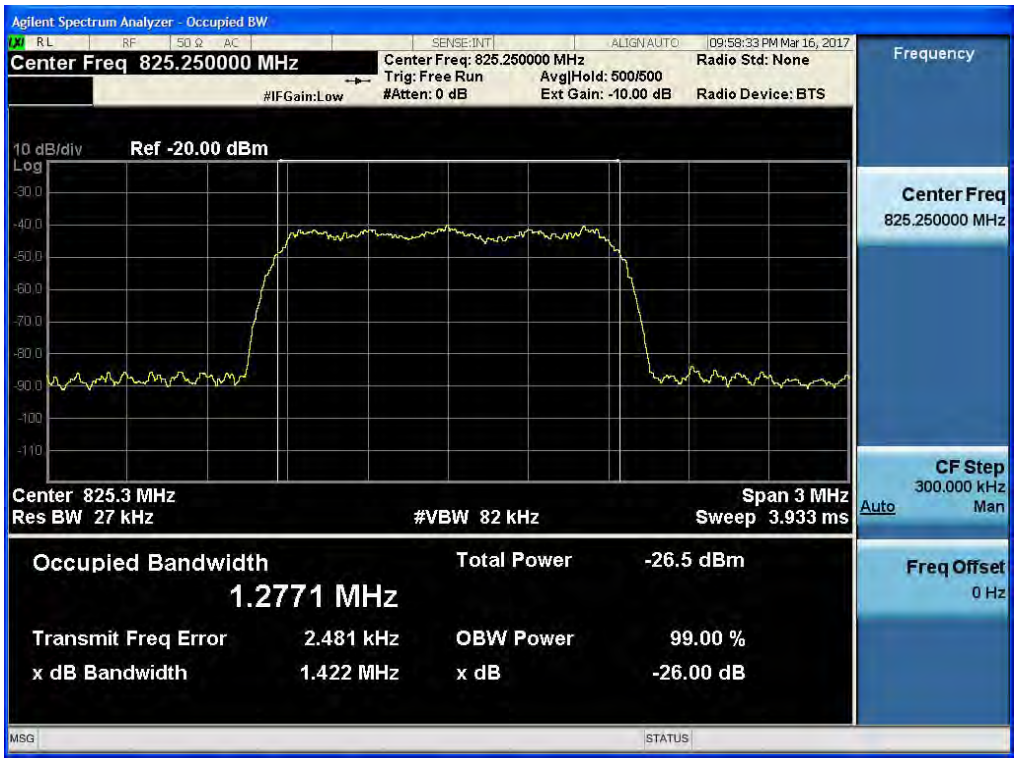
[AGC threshold Input Uplink Low]

[AGC threshold Input Uplink High]



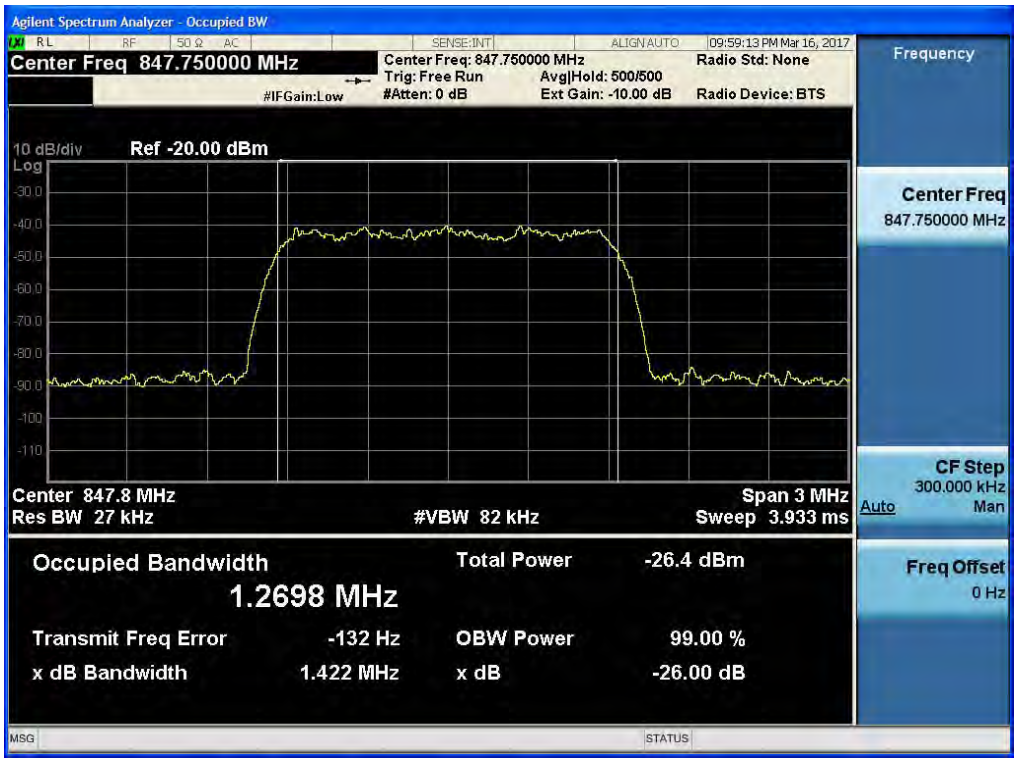
Plots of Occupied Bandwidth_800 MHz BAND CDMA_Part 22

[AGC threshold Input Uplink Low]



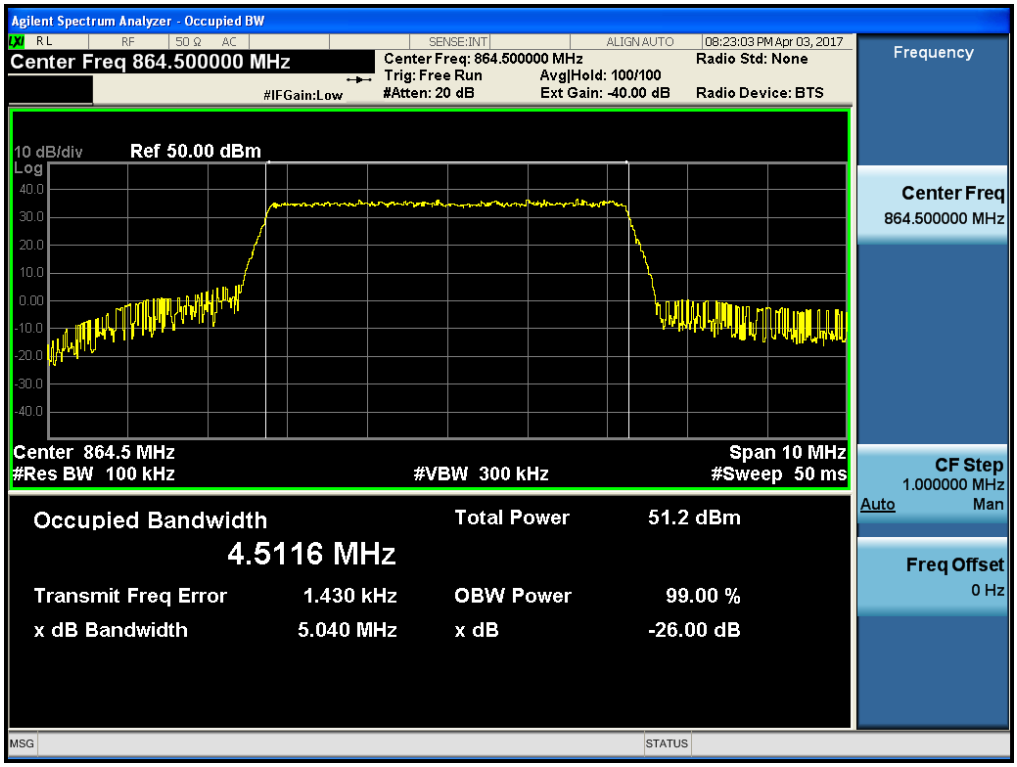
[AGC threshold Input Uplink Middle]

[AGC threshold Input Uplink High]

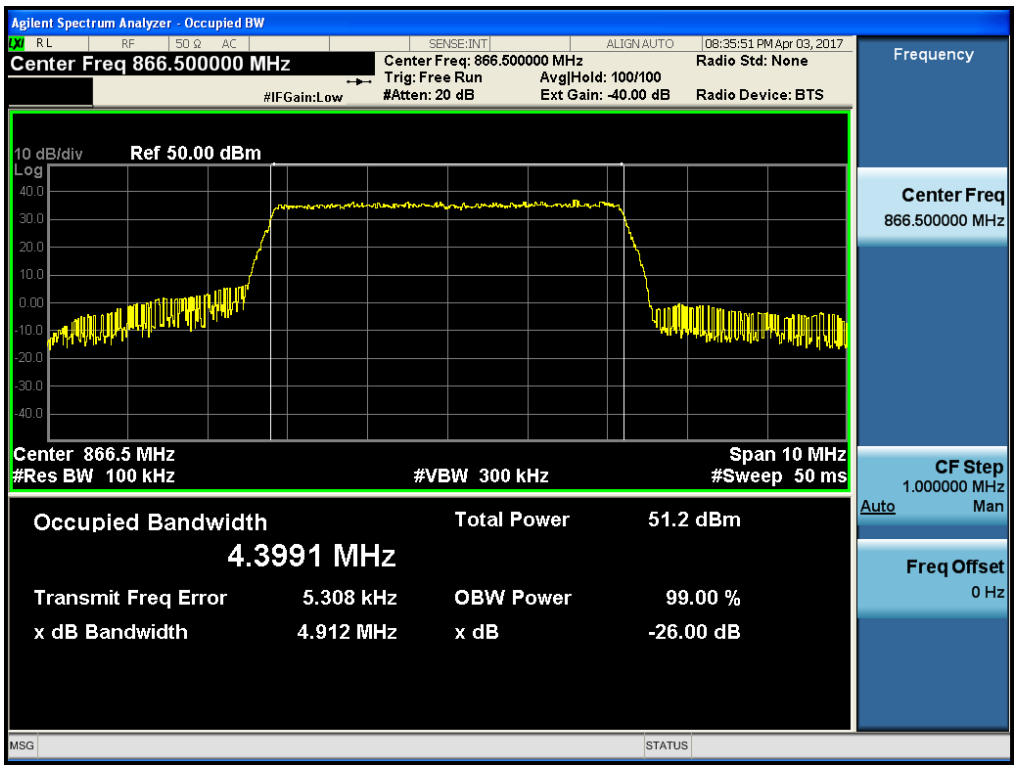


Plots of Occupied Bandwidth_800 MHz BAND LTE 5 MHz_Part 90

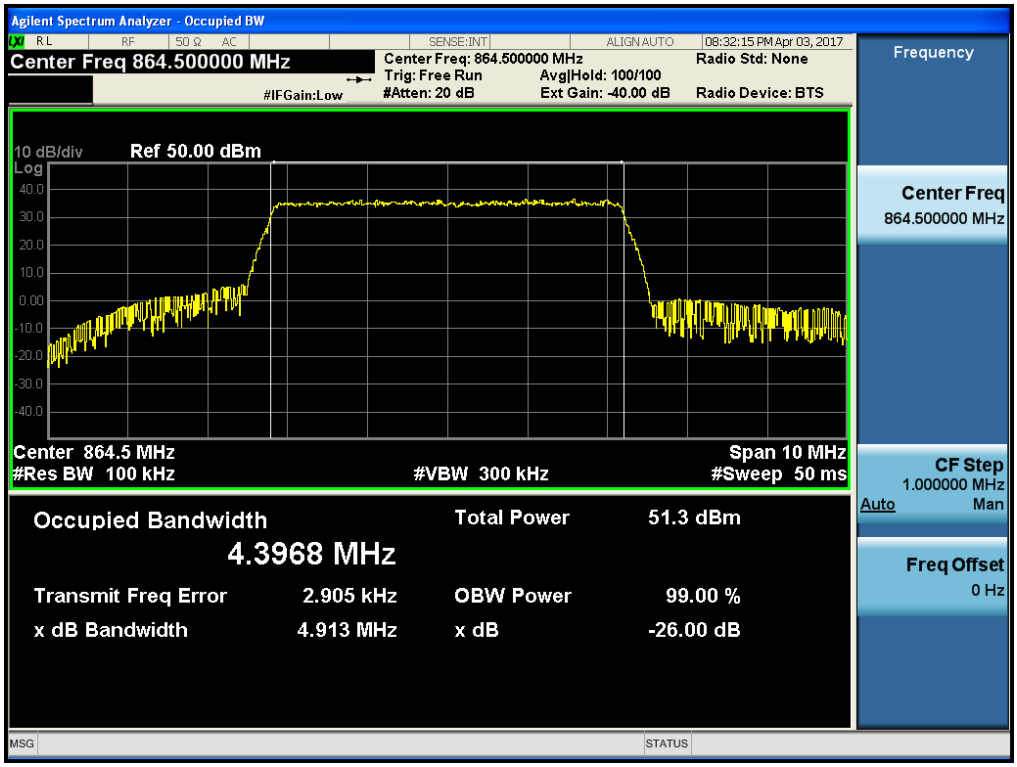
[AGC threshold Output Downlink Low]



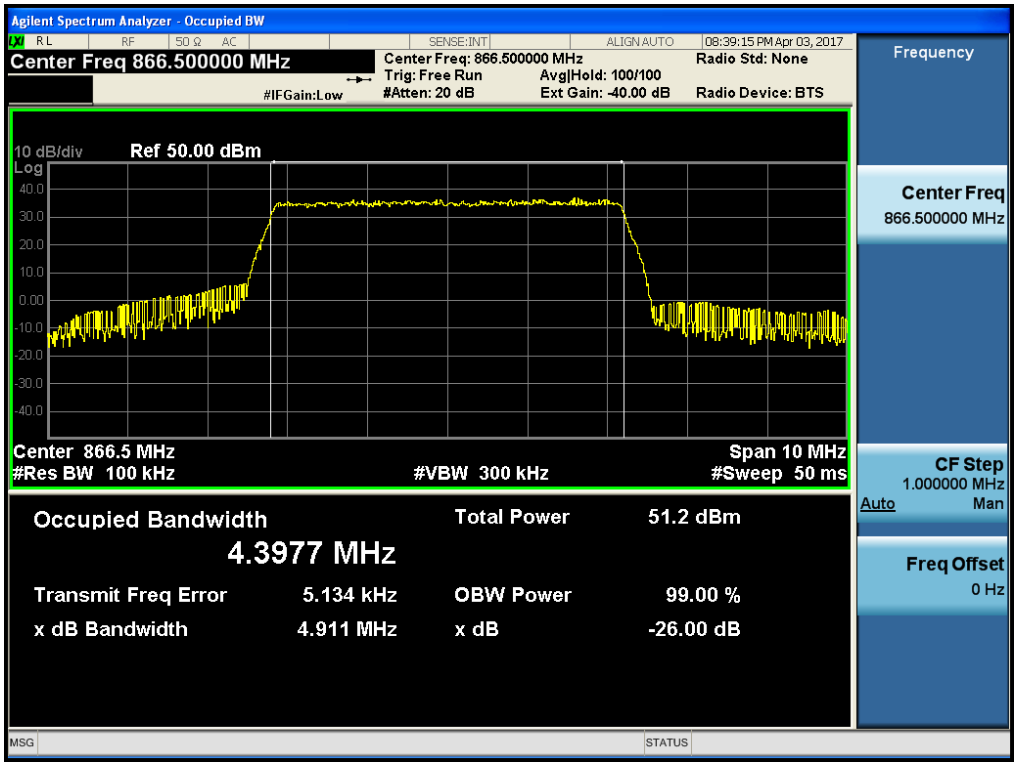
[AGC threshold Output Downlink High]



[+3dBmabove AGC threshold Output Downlink Low]

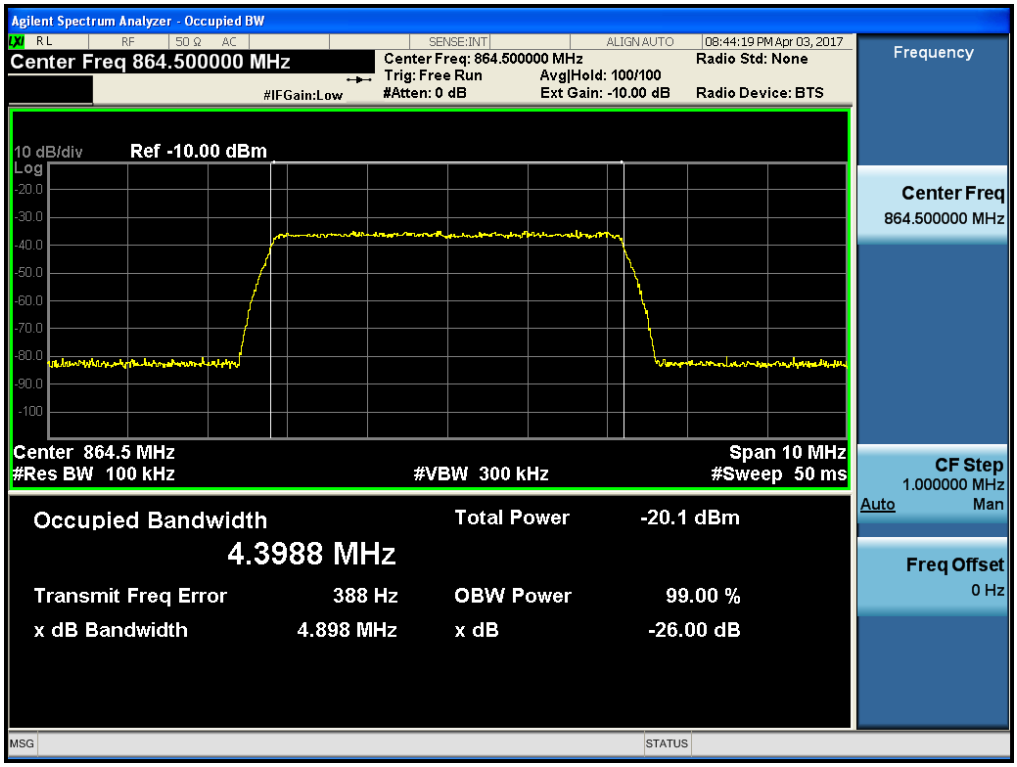


[+3dBm above AGC threshold Output Downlink High]

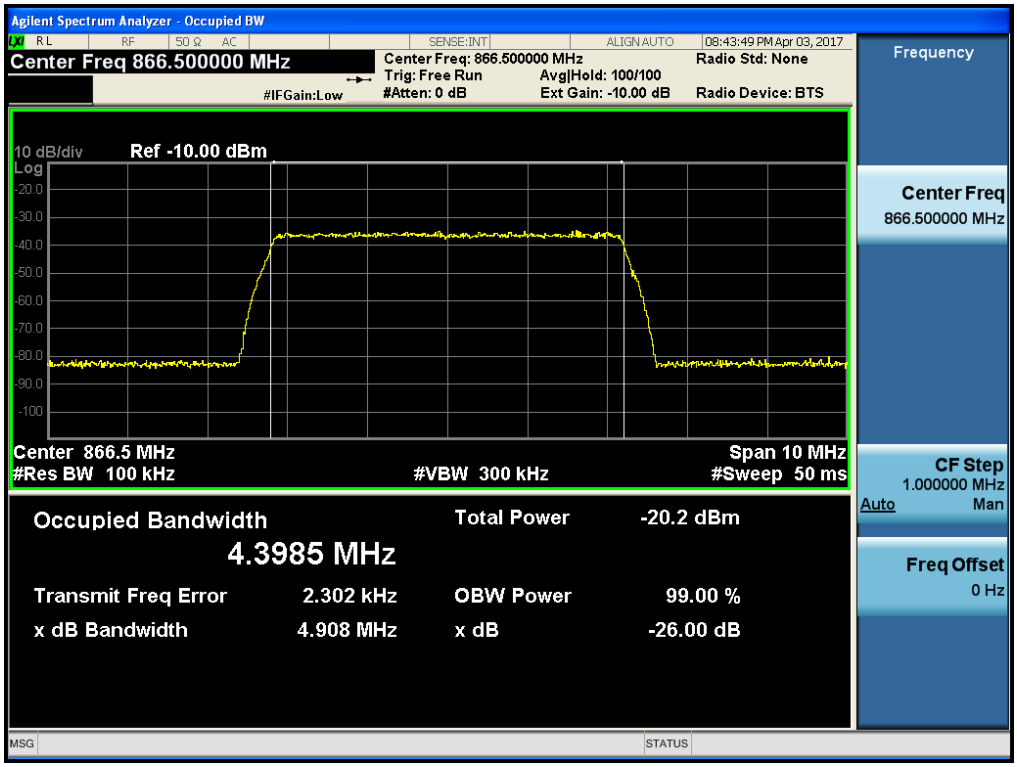


Plots of Occupied Bandwidth_800 MHz BAND LTE 5 MHz_Part 90

[AGC threshold Input Downlink Low]

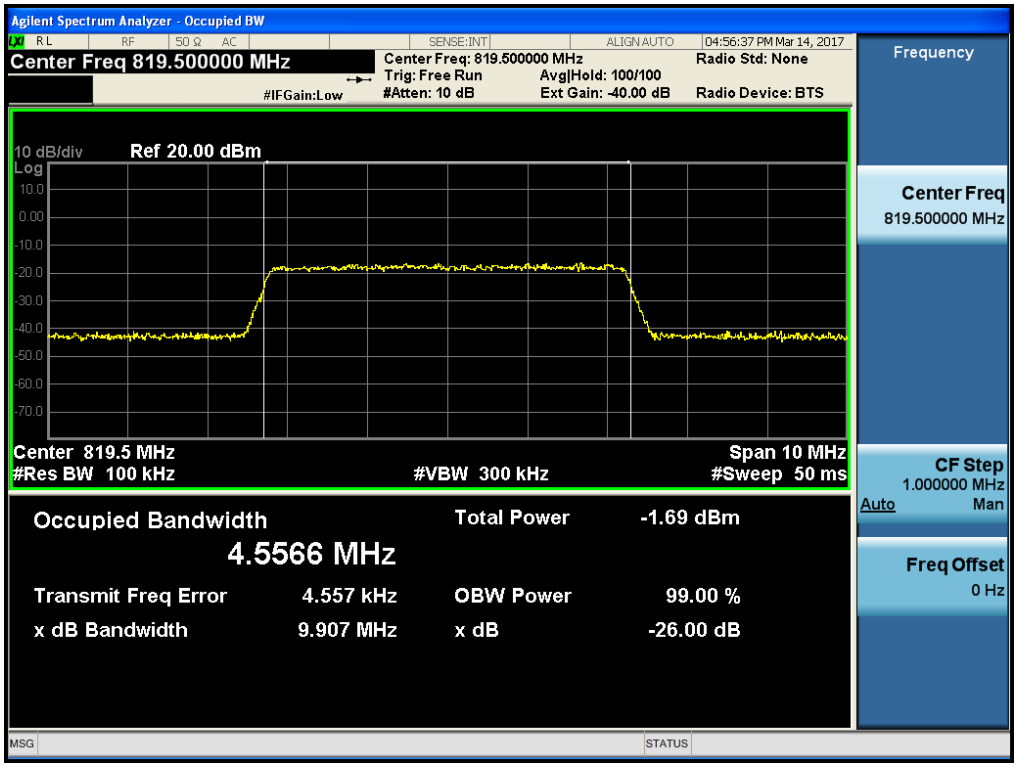


[AGC threshold Input Downlink High]

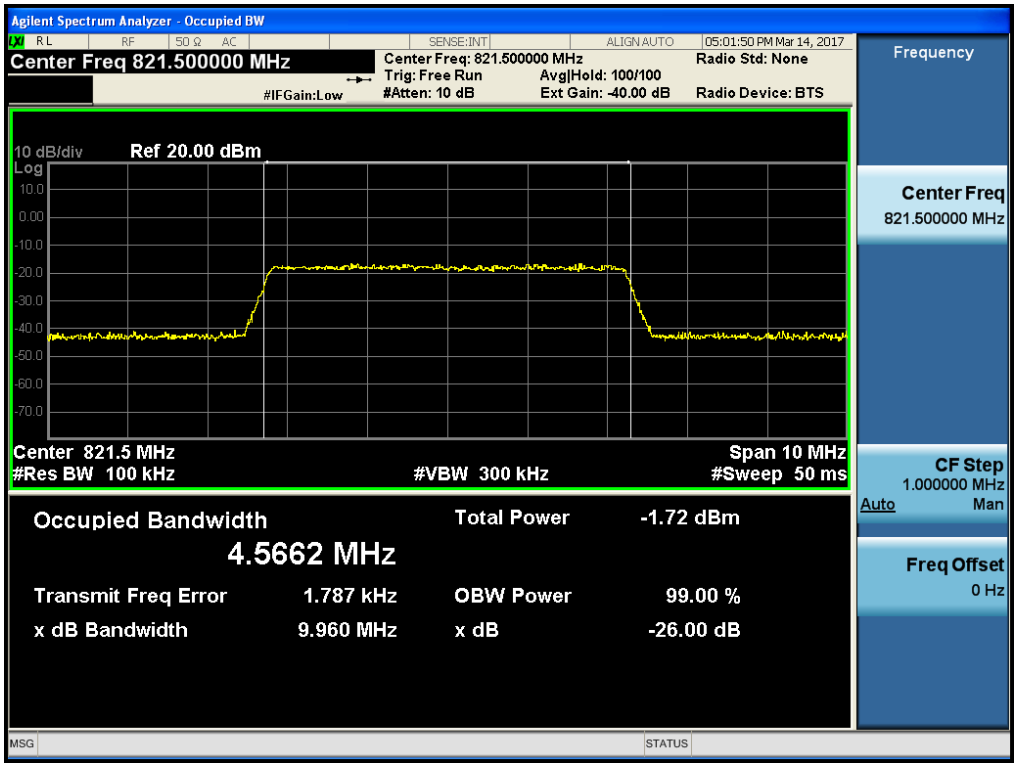


Plots of Occupied Bandwidth_800 MHz BAND LTE 5 MHz_Part 90

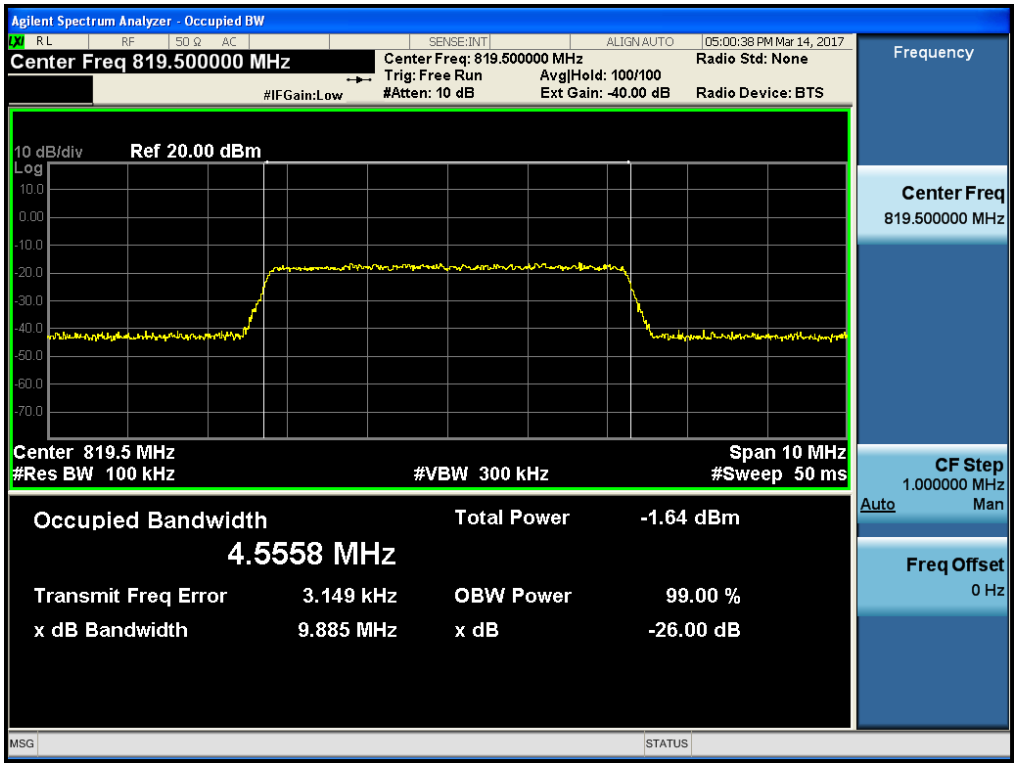
[AGC threshold Output Uplink Low]



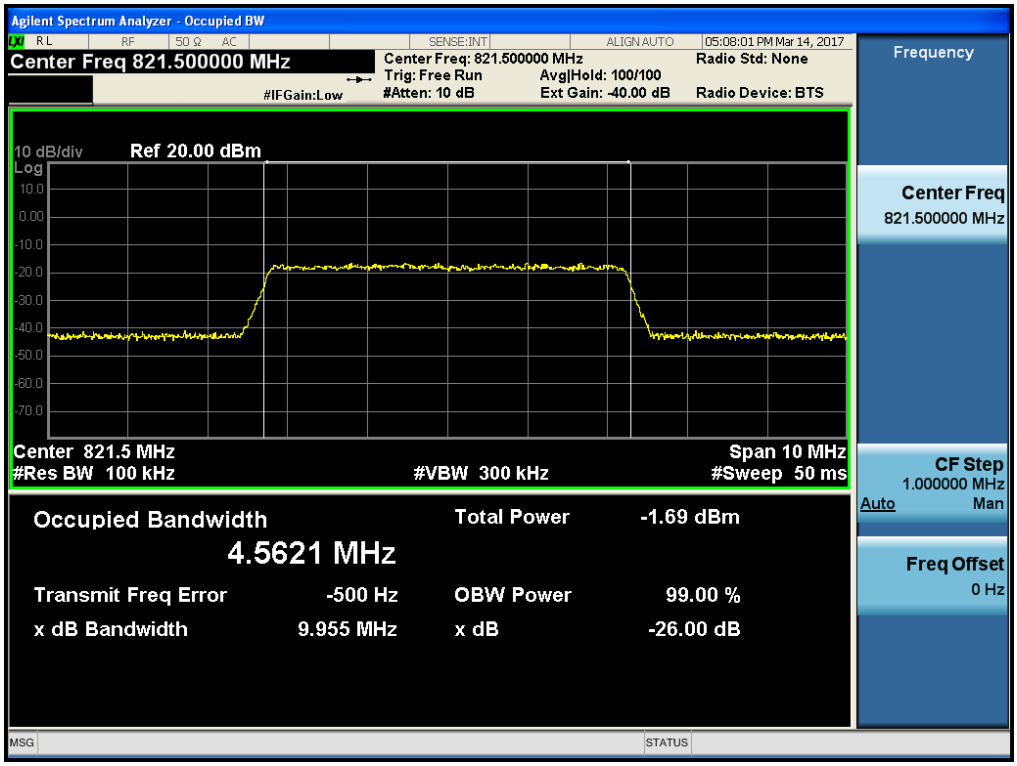
[AGC threshold Output Uplink High]



[+3dBmabove AGC threshold Output Uplink Low]



[+3dBm above AGC threshold Output Uplink High]



Plots of Occupied Bandwidth_800 MHz BAND LTE 5 MHz_Part 90

[AGC threshold Input Uplink Low]

[AGC threshold Input Uplink High]

[Downlink Output] – PCS 1900

	Channel	Frequency (MHz)	OBW (kHz)
LTE 20 MHz AGC threshold	Low	1940.00	17.782
	Middle	1962.50	17.807
	High	1985.00	17.741
LTE 20 MHz +3dB above AGC threshold	Low	1940.00	17.783
	Middle	1962.50	17.802
	High	1985.00	17.723
CDMA AGC threshold	Low	1931.25	1.2691
	Middle	1962.50	1.2704
	High	1993.75	1.2763
CDMA +3dB above AGC threshold	Low	1931.25	1.2739
	Middle	1962.50	1.2755
	High	1993.75	1.2754

[Uplink Output] – PCS 1900

	Channel	Frequency (MHz)	OBW (kHz)
LTE 20 MHz AGC threshold	Low	1860.00	18.362
	Middle	1882.50	18.408
	High	1905.00	18.288
LTE 20 MHz +3dB above AGC threshold	Low	1860.00	18.370
	Middle	1882.50	18.410
	High	1905.00	18.024
CDMA AGC threshold	Low	1851.25	1.2730
	Middle	1882.50	1.2744
	High	1913.75	1.2770
CDMA +3dB above AGC threshold	Low	1851.25	1.2758
	Middle	1882.50	1.2729
	High	1913.75	1.2809

[Downlink Input] – PCS 1900

	Channel	Frequency (MHz)	OBW (kHz)
LTE 20 MHz AGC threshold	Low	1940.00	18.030
	Middle	1962.50	18.041
	High	1985.00	18.045
CDMA AGC threshold	Low	1931.25	1.2756
	Middle	1962.50	1.2730
	High	1993.75	1.2747

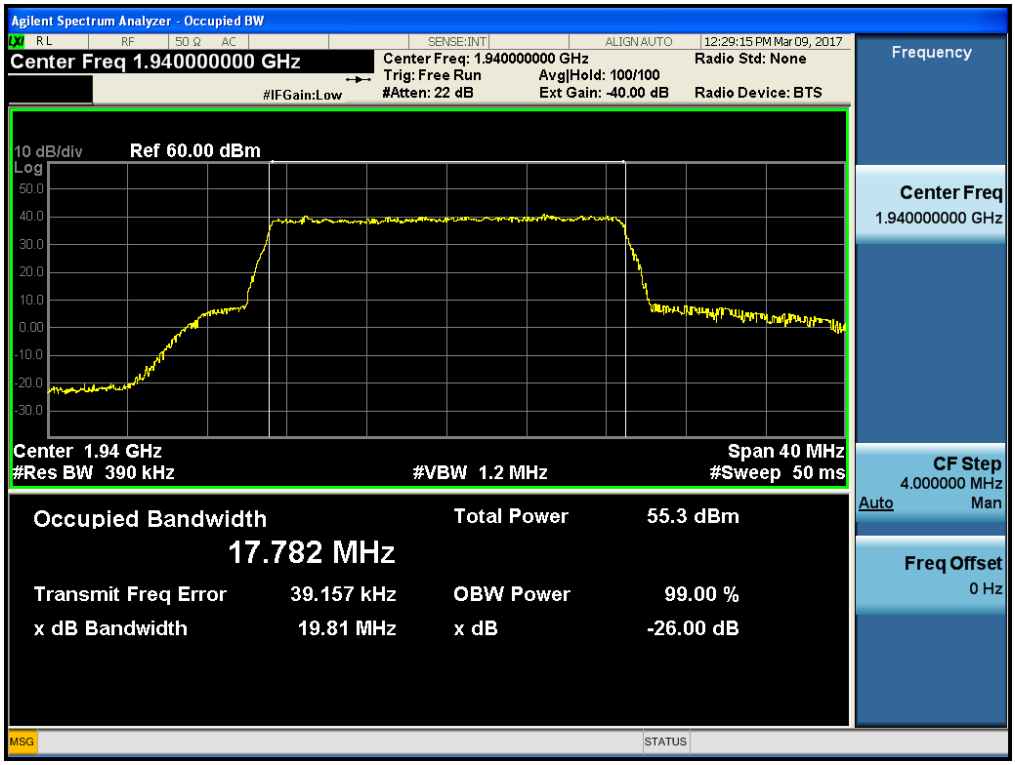
[Uplink Input] – PCS 1900

	Channel	Frequency (MHz)	OBW (kHz)
LTE 20 MHz AGC threshold	Low	1860.00	18.034
	Middle	1882.50	18.038
	High	1905.00	18.033
CDMA AGC threshold	Low	1851.25	1.2756
	Middle	1882.50	1.2746
	High	1913.75	1.2684

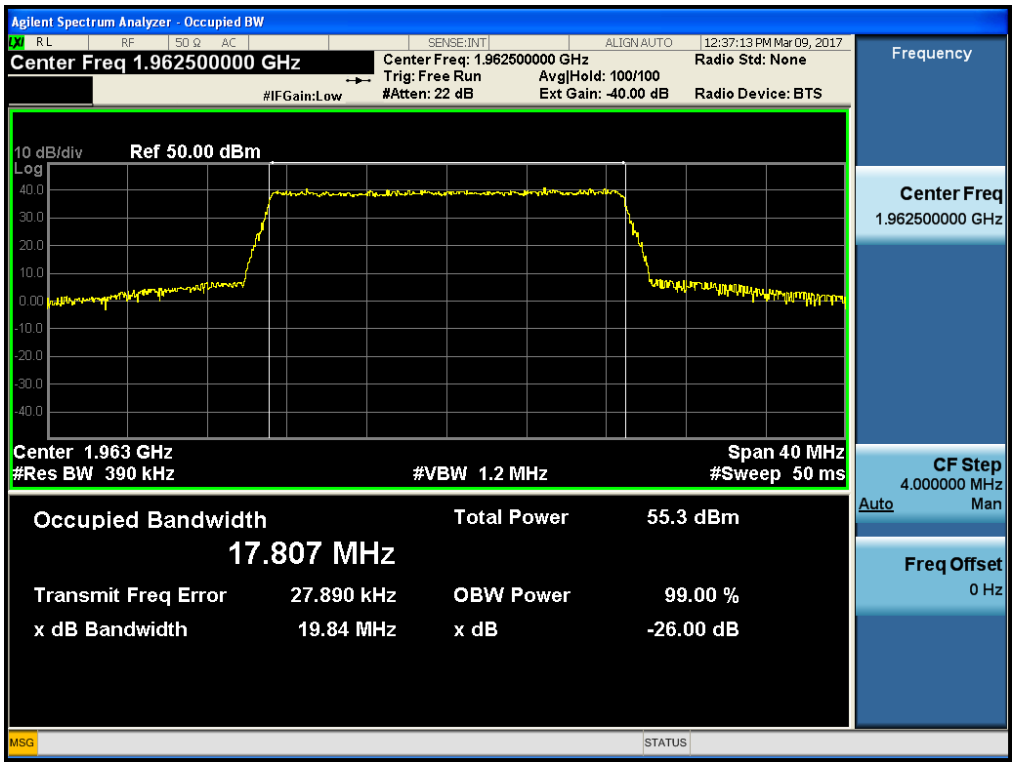
Plots of Occupied Bandwidth (PCS 1900)

LTE 20 MHz DL_Output

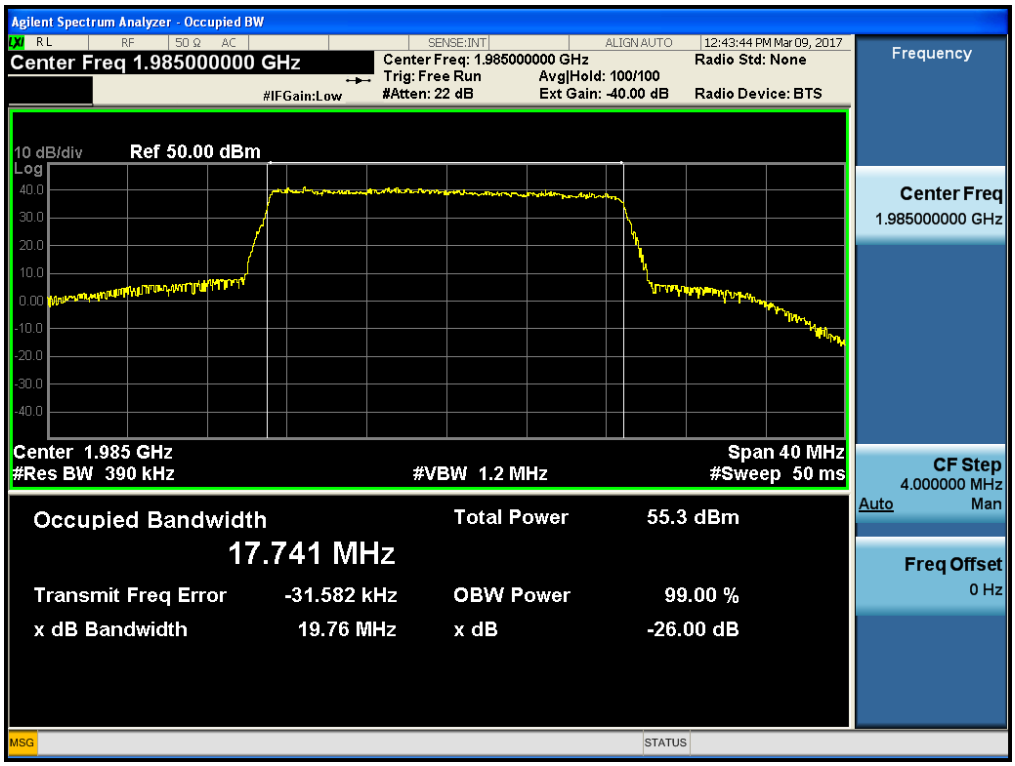
[LTE 20 MHz AGC threshold Downlink Low]



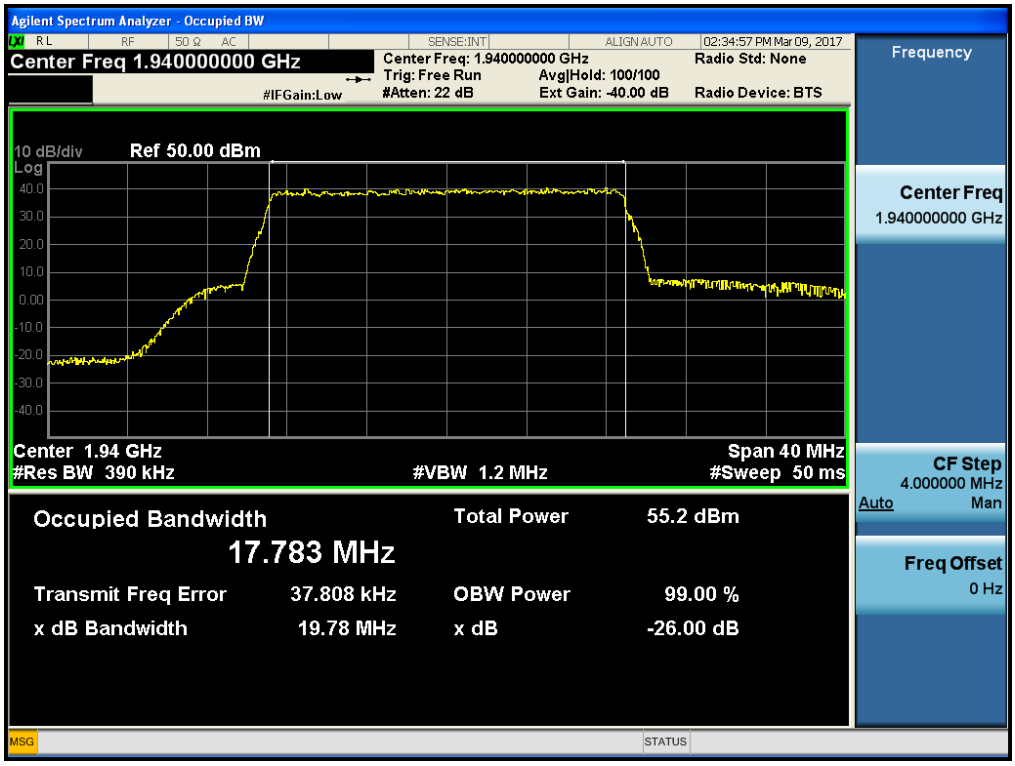
[LTE 20 MHz AGC threshold Downlink Middle]



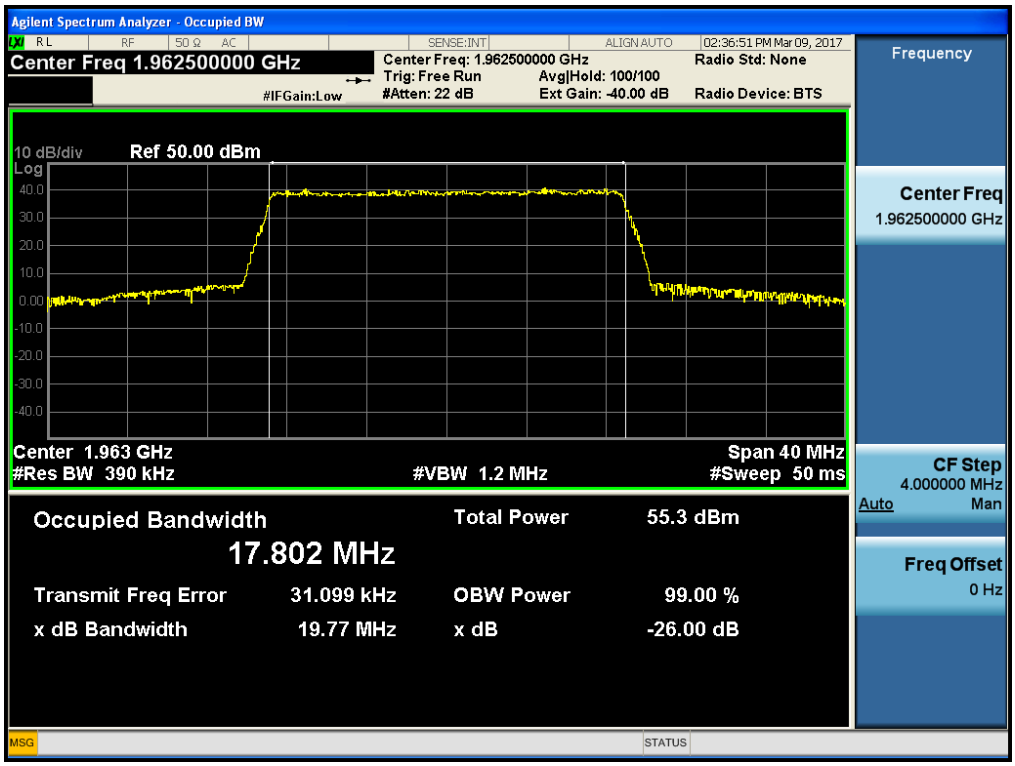
[LTE 20 MHz AGC threshold Downlink High]



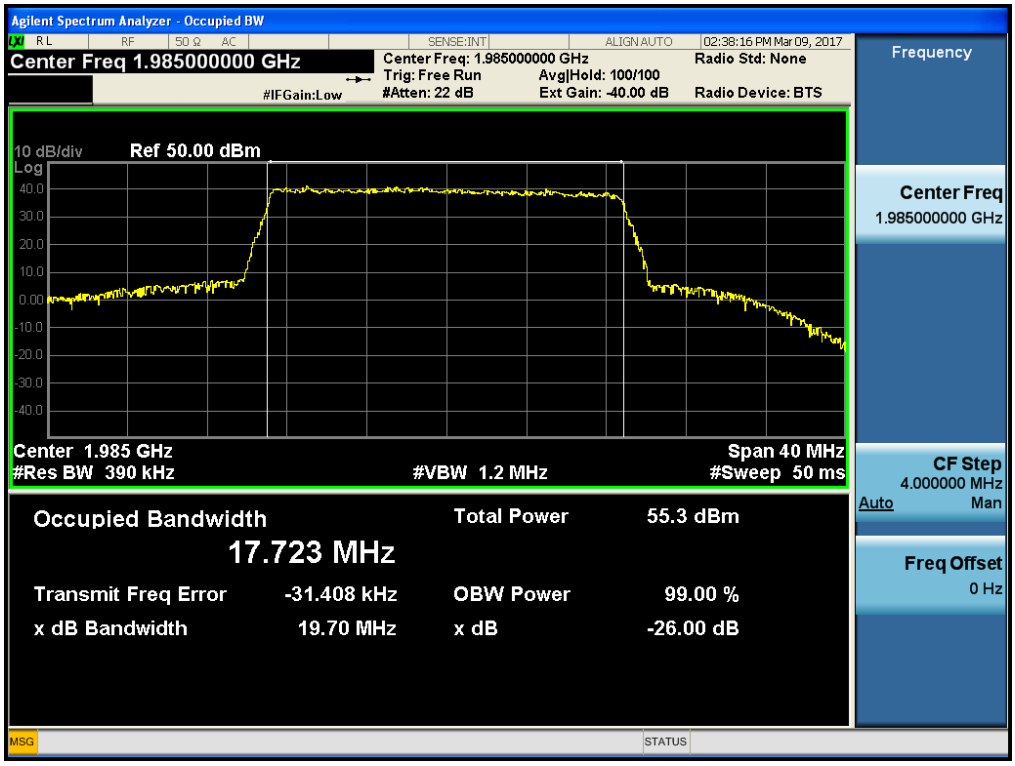
[LTE 20 MHz +3dB above the AGC threshold Downlink Low]



[LTE 20 MHz +3dB above the AGC threshold Downlink Middle]

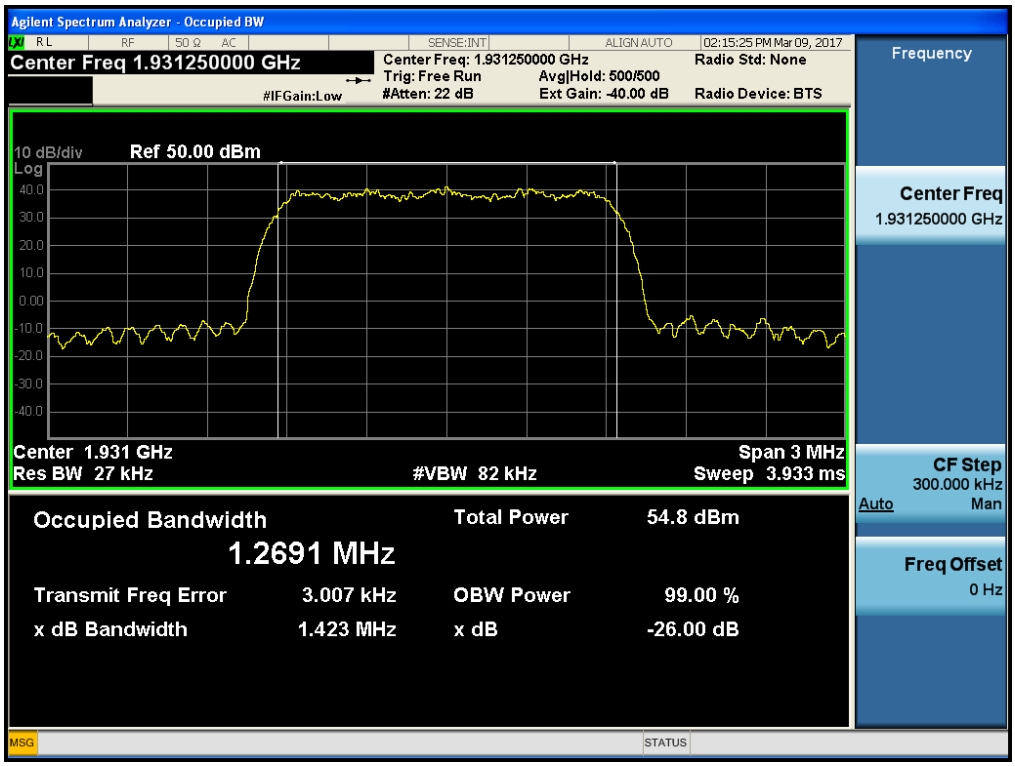


[LTE 20 MHz +3dB above the AGC threshold Downlink High]

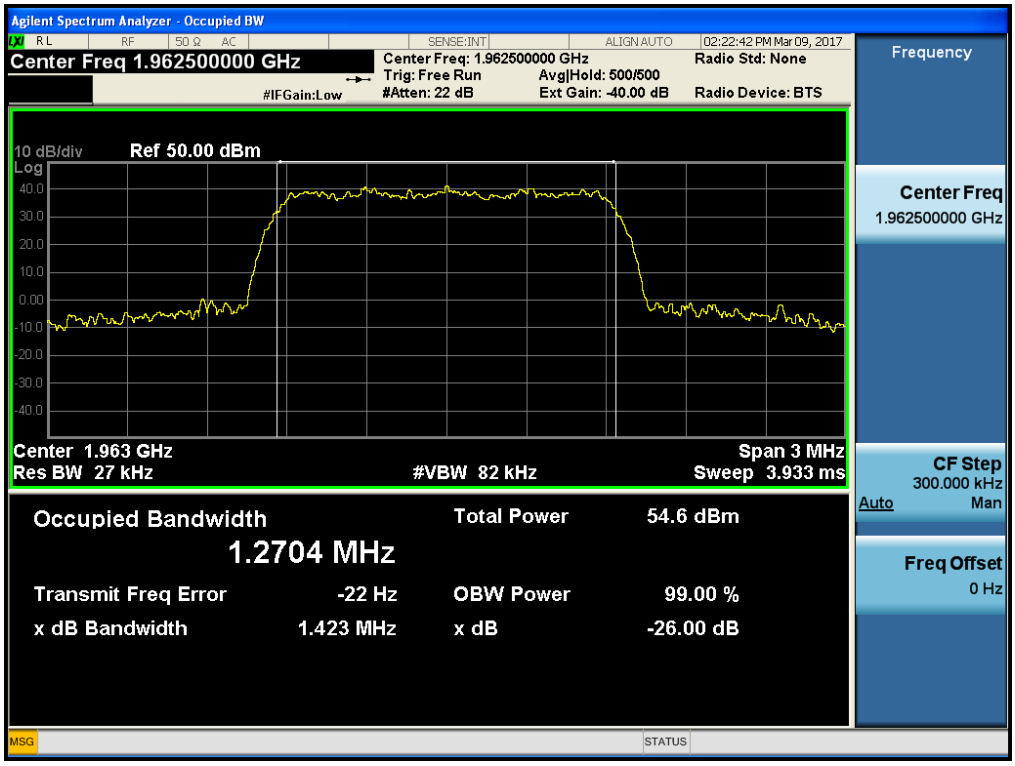


CDMA DL_Output

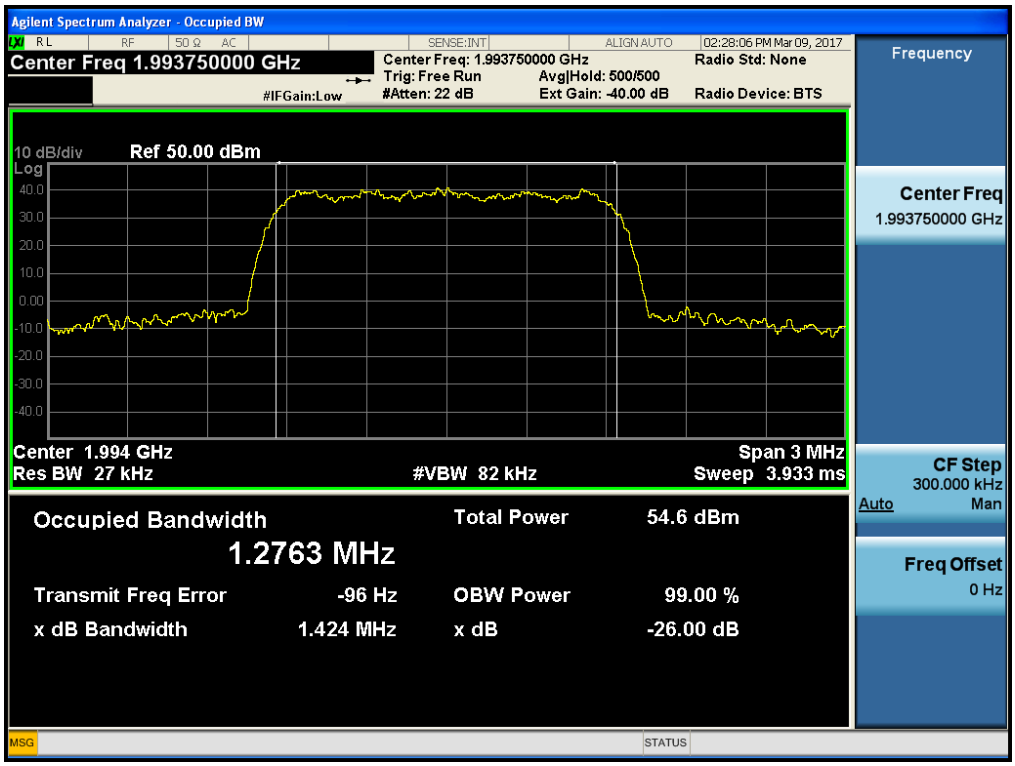
[CDMA AGC threshold Downlink Low]



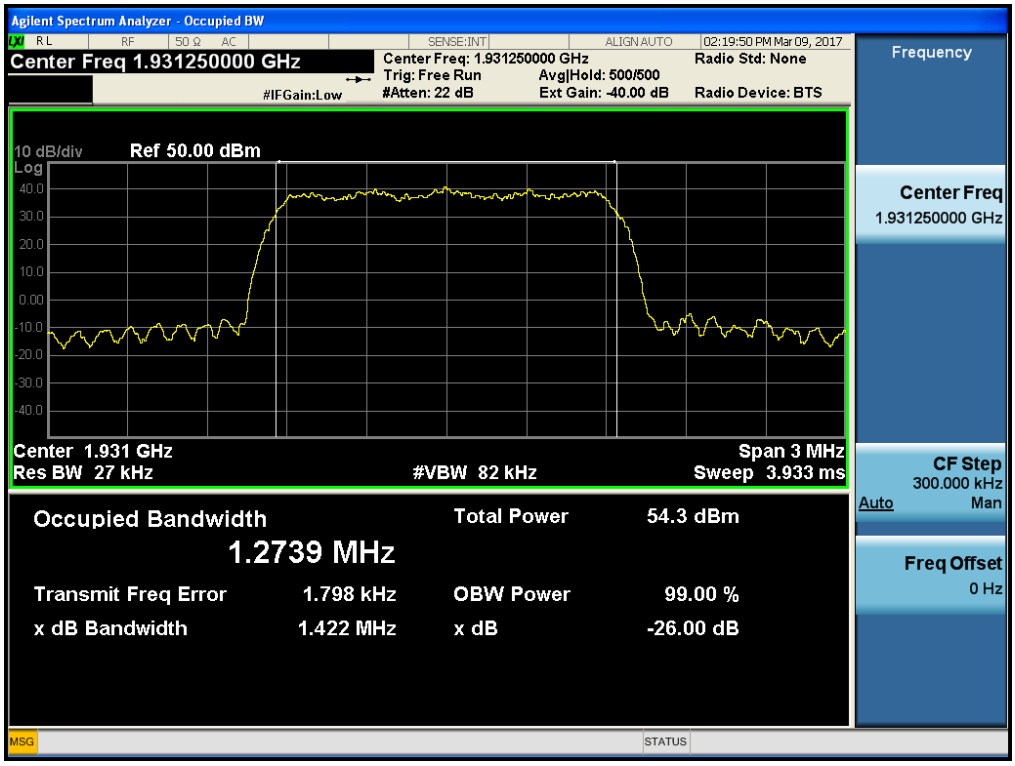
[CDMA AGC threshold Downlink Middle]



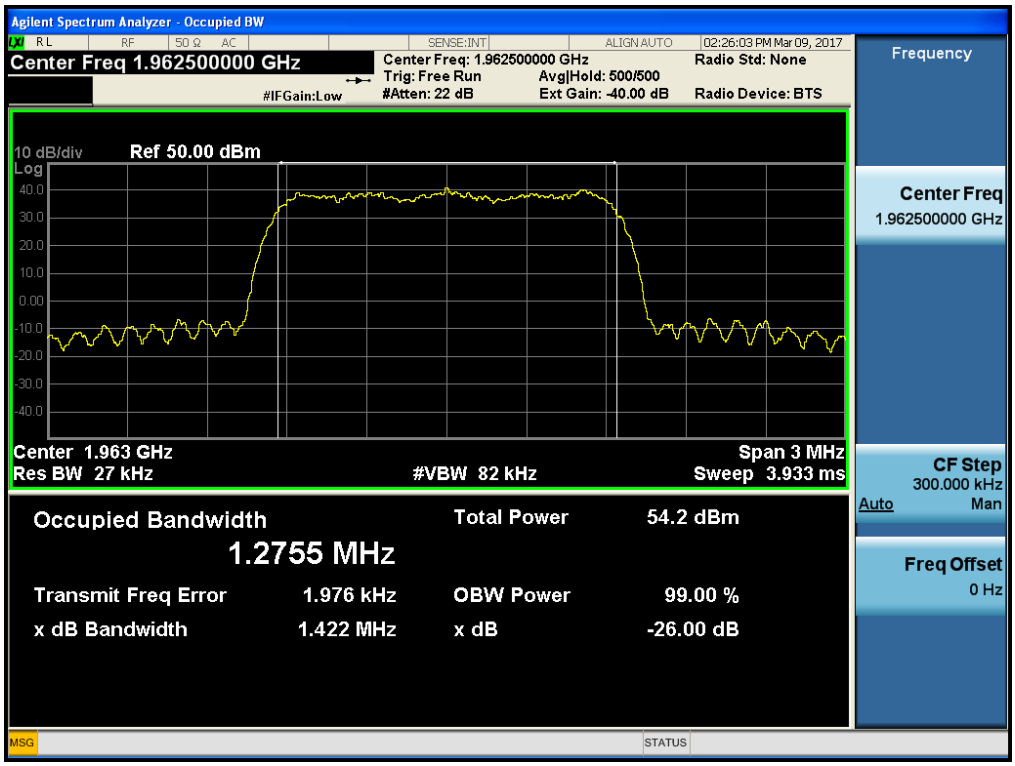
[CDMA AGC threshold Downlink High]



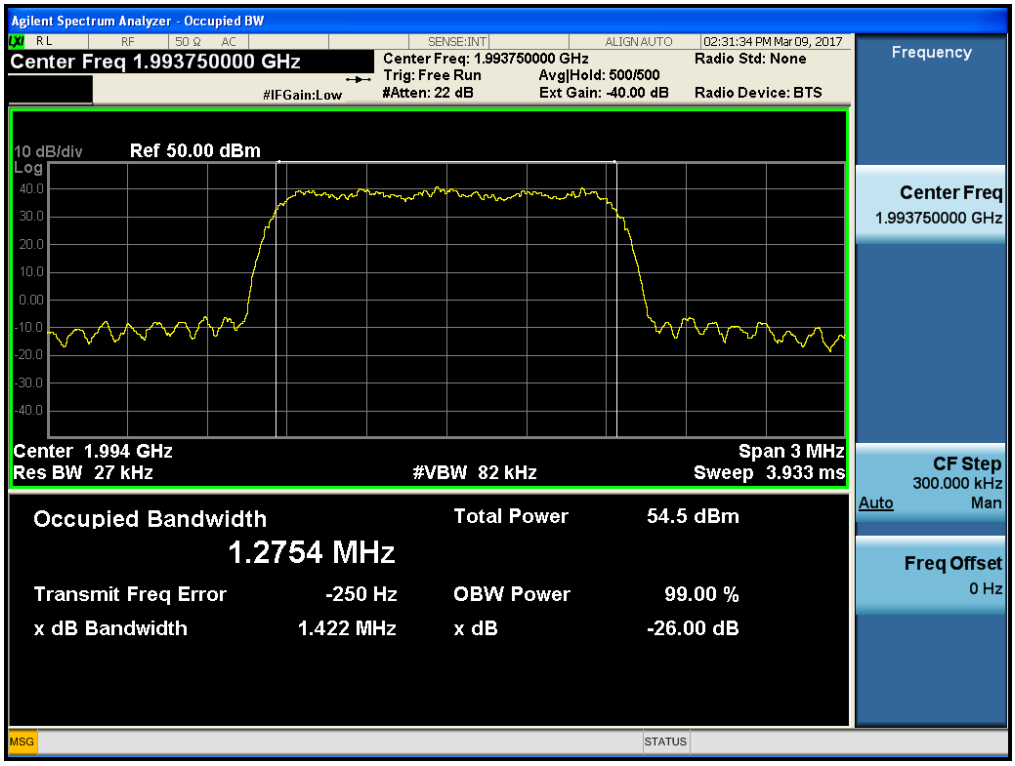
[CDMA +3dB above the AGC threshold Downlink Low]



[CDMA +3dB above the AGC threshold Downlink Middle]

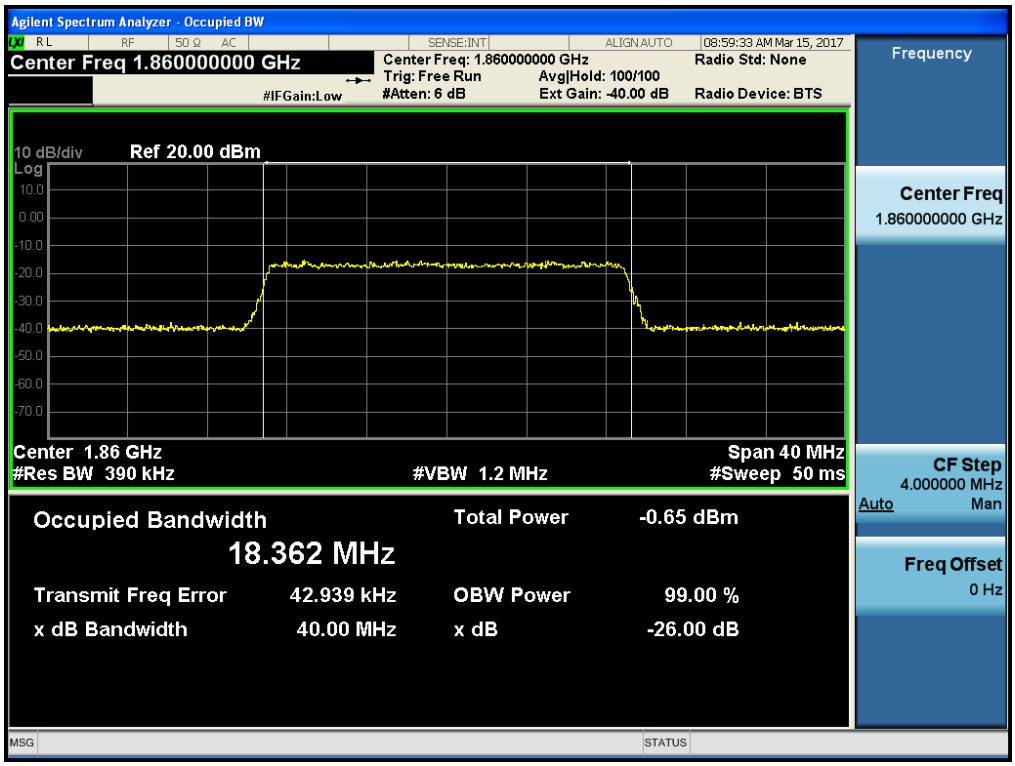


[CDMA +3dB above the AGC threshold Downlink High]

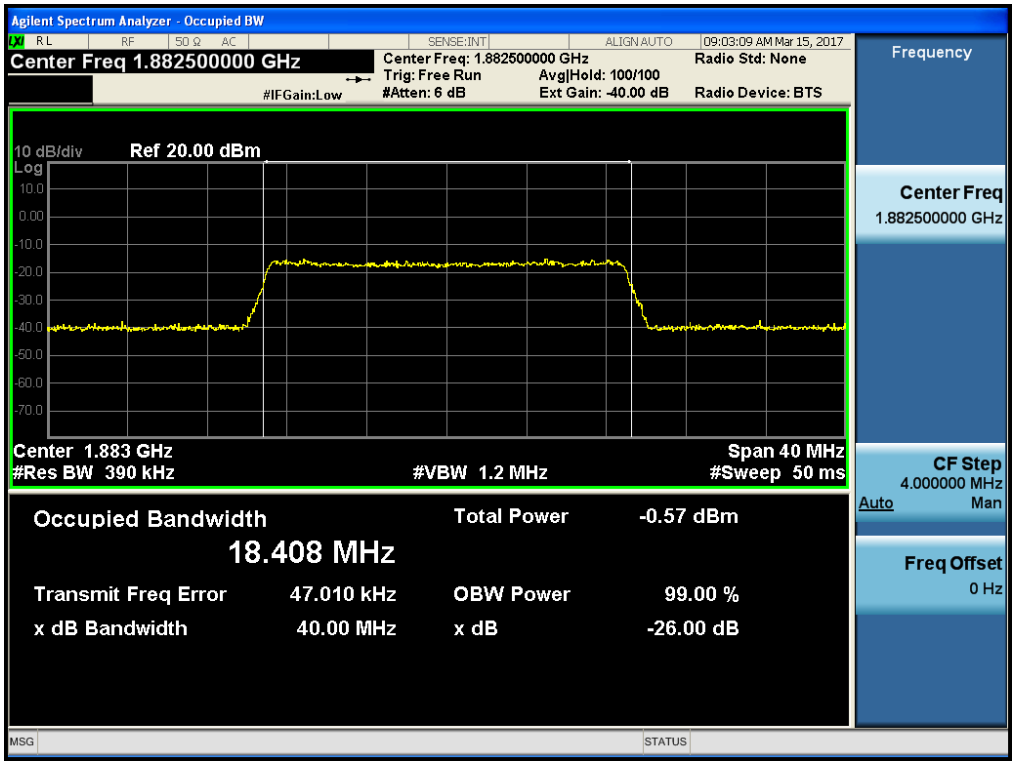


LTE 20 MHz UL_Output

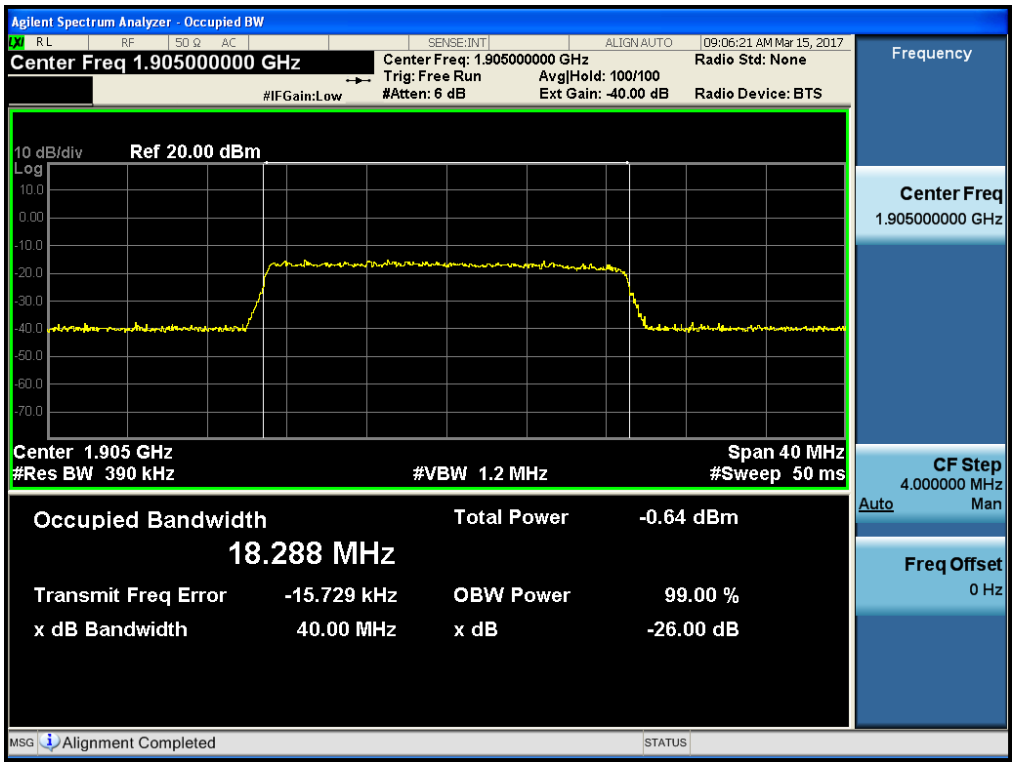
[LTE 20 MHz AGC threshold Uplink Low]



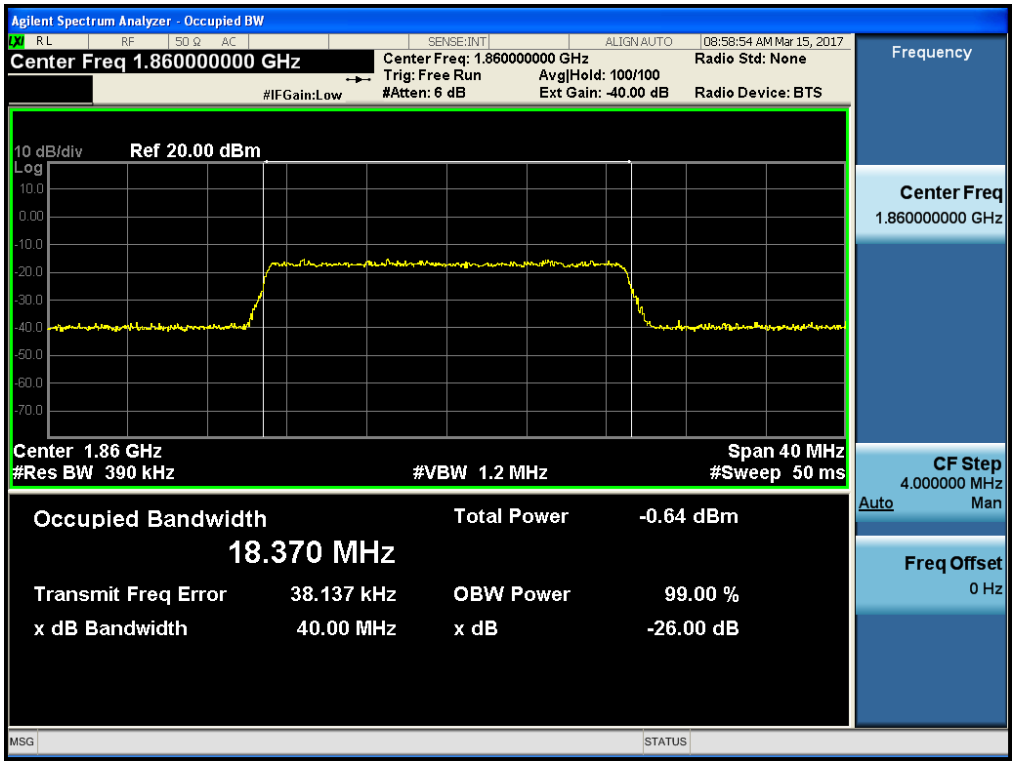
[LTE 20 MHz AGC threshold Uplink Middle]



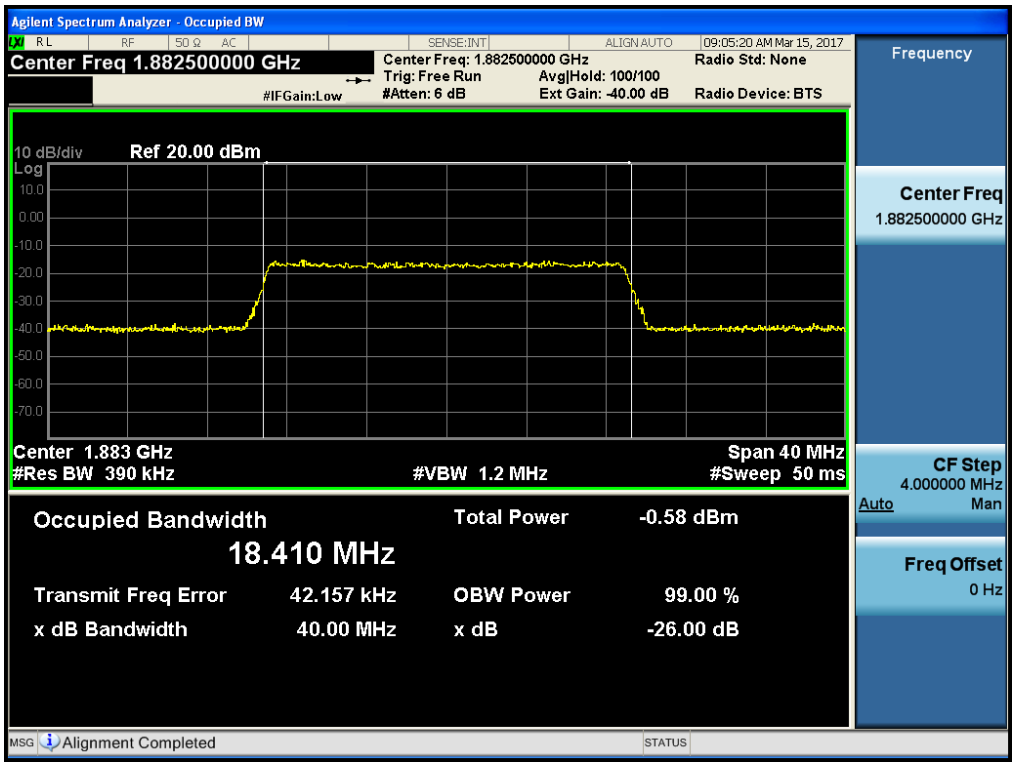
[LTE 20 MHz AGC threshold Uplink High]



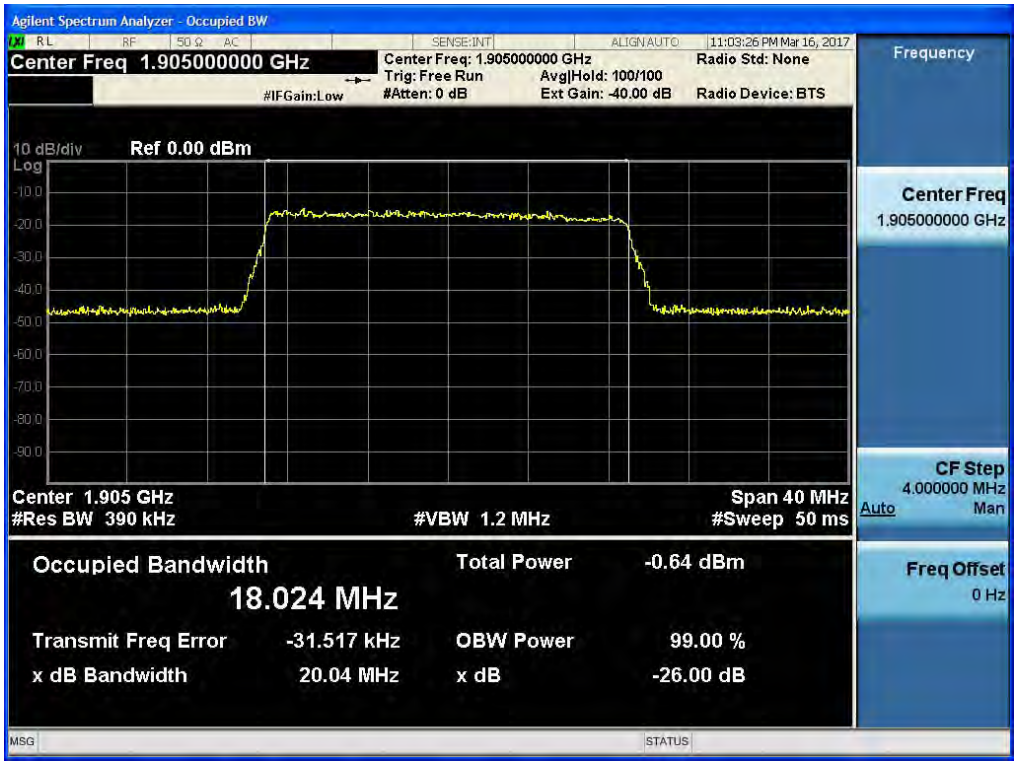
[LTE 20 MHz +3dB above the AGC threshold Uplink Low]



[LTE 20 MHz +3dB above the AGC threshold Uplink Middle]

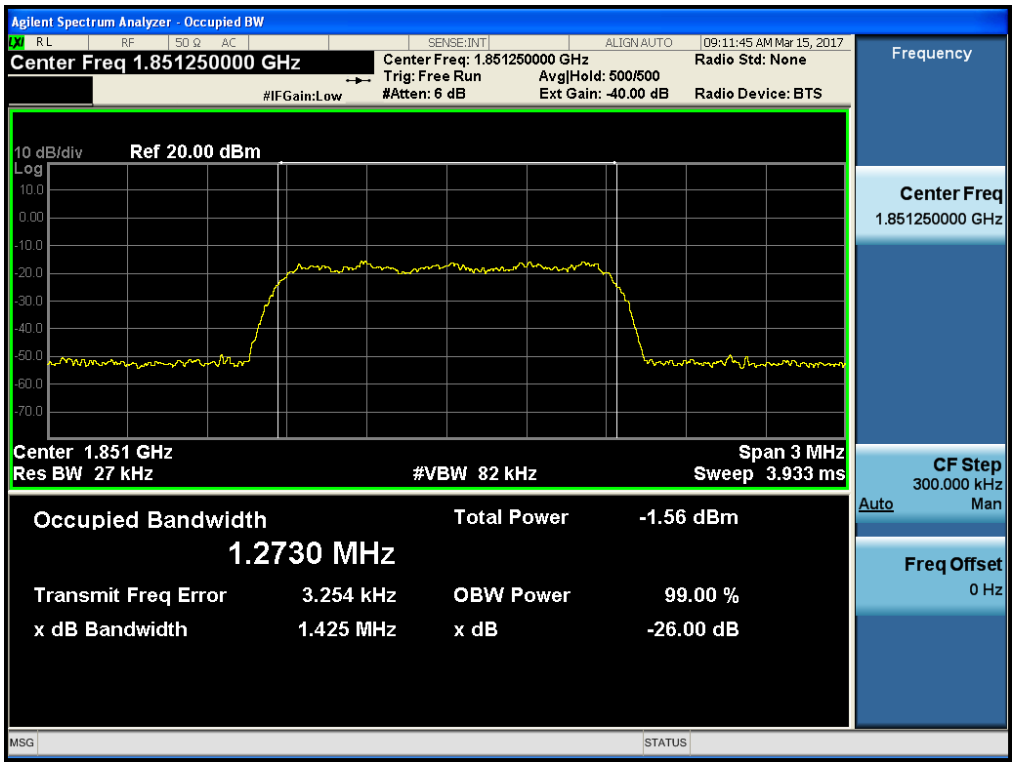


[LTE 20 MHz +3dB above the AGC threshold Uplink High]

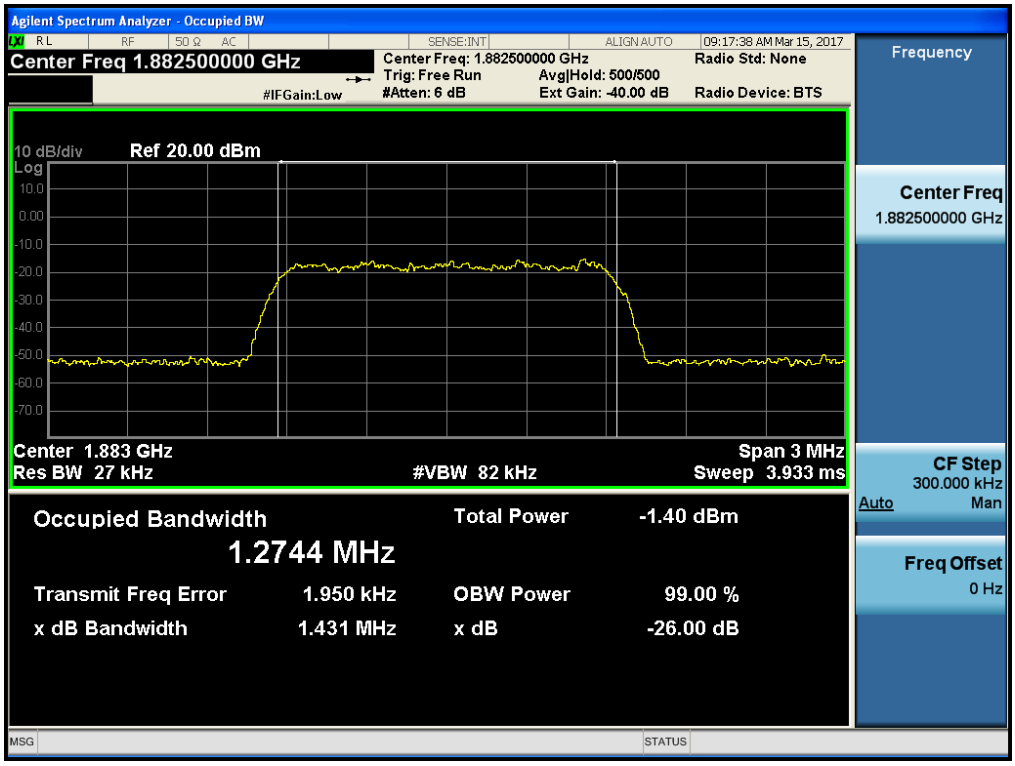


CDMA UL_Output

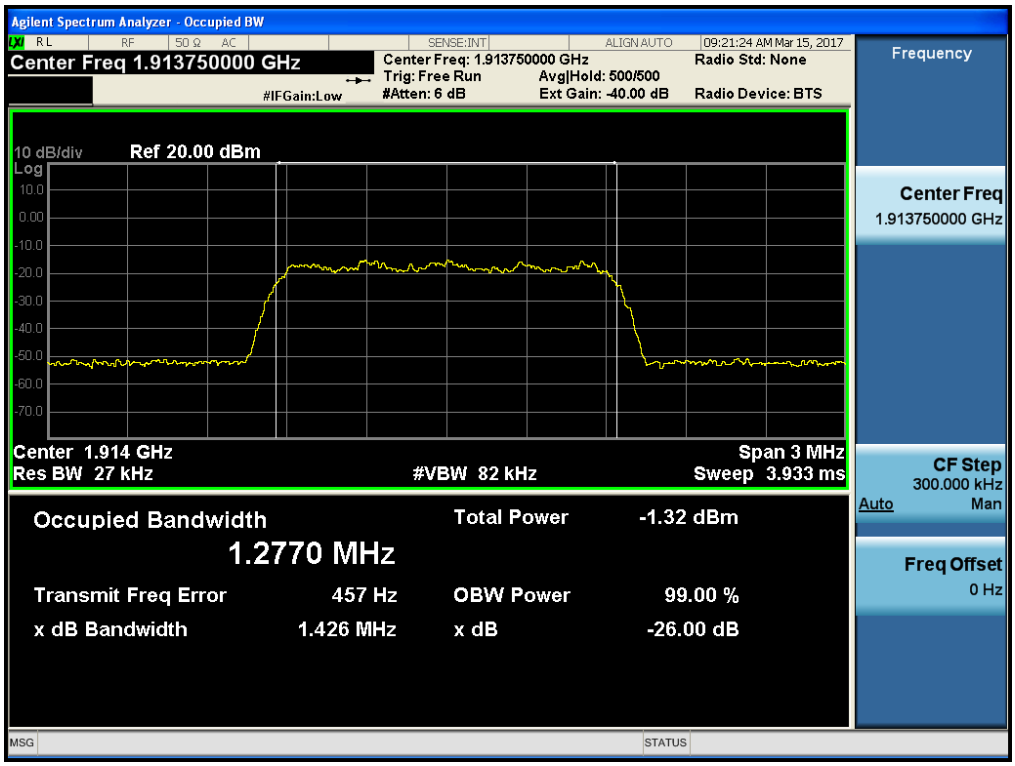
[CDMA AGC threshold Uplink Low]



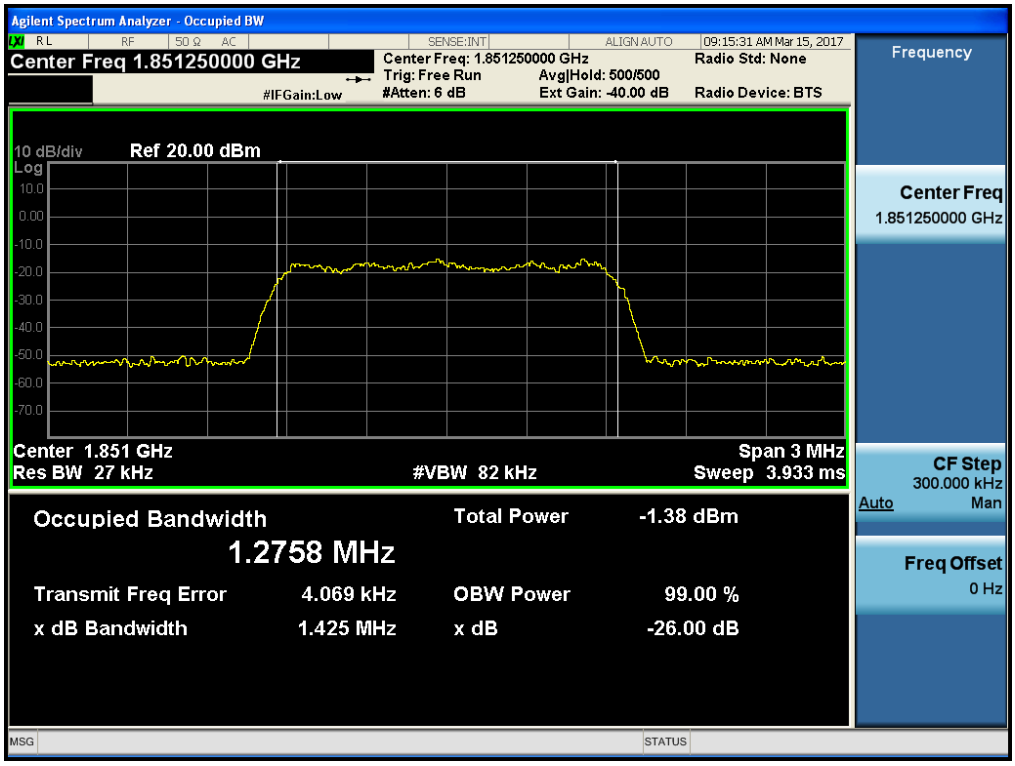
[CDMA AGC threshold Uplink Middle]



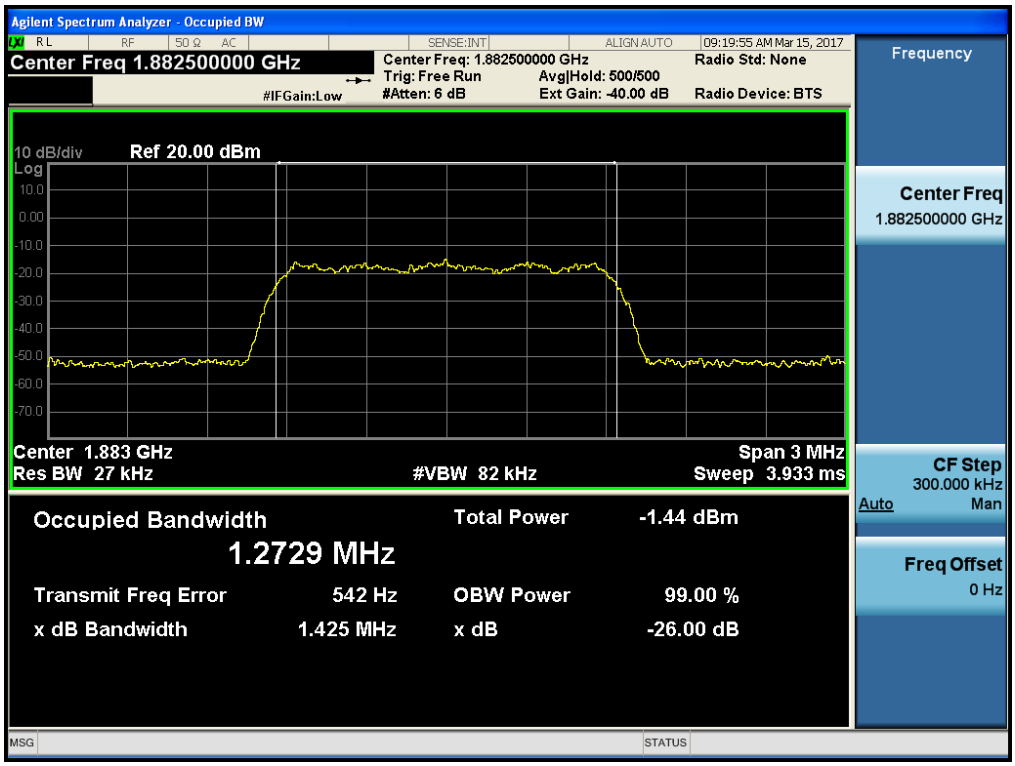
[CDMA AGC threshold Uplink High]



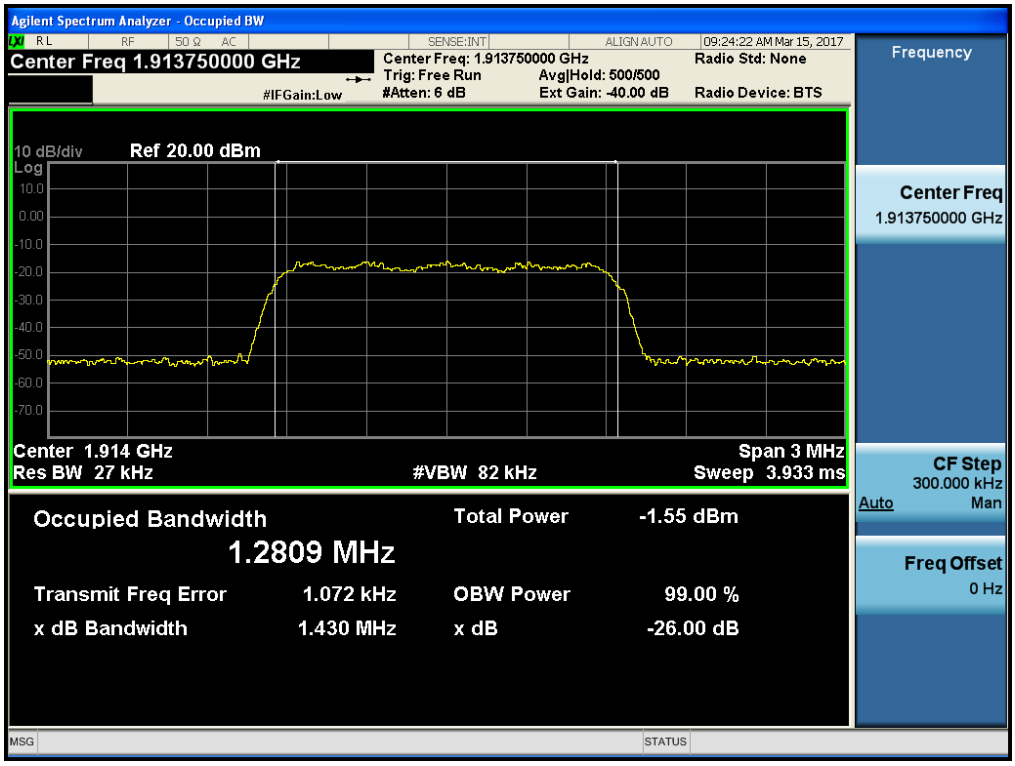
[CDMA +3dB above the AGC threshold Uplink Low]



[CDMA +3dB above the AGC threshold Uplink Middle]

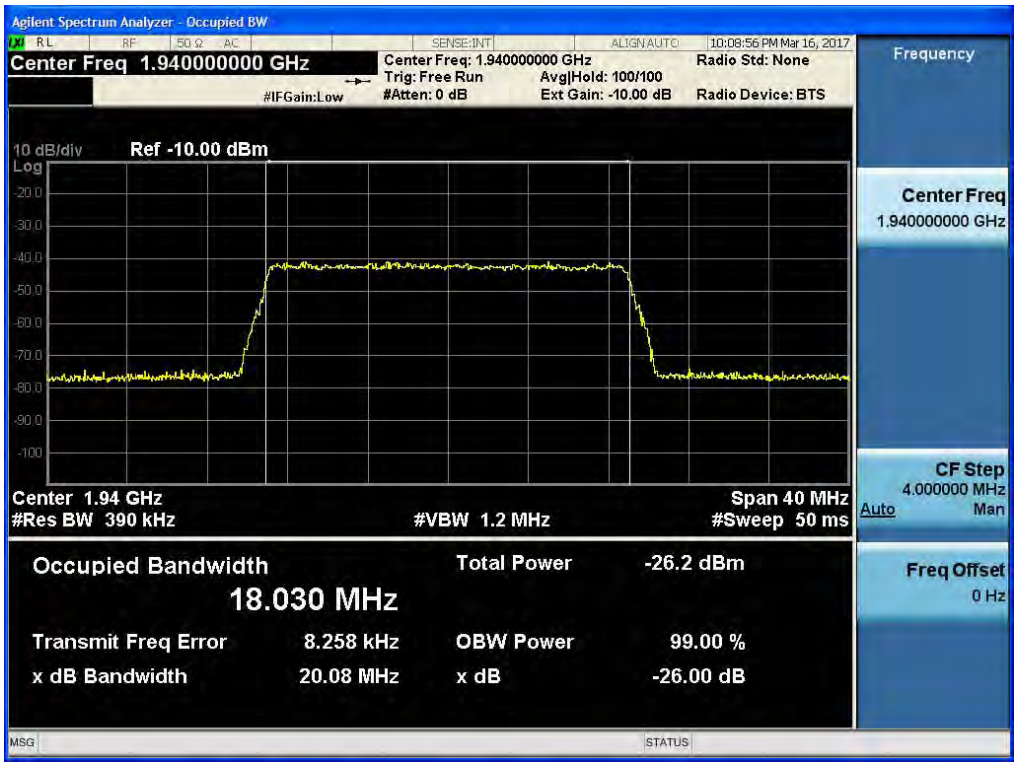


[CDMA +3dB above the AGC threshold Uplink High]

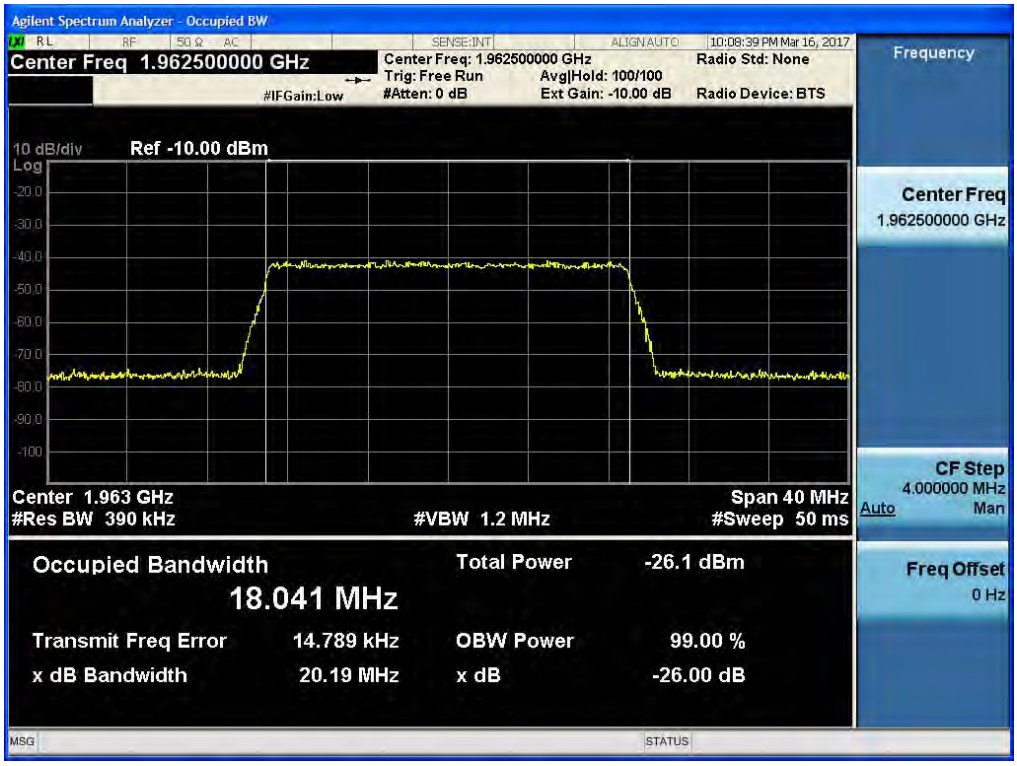


LTE 20 MHz DL_Input

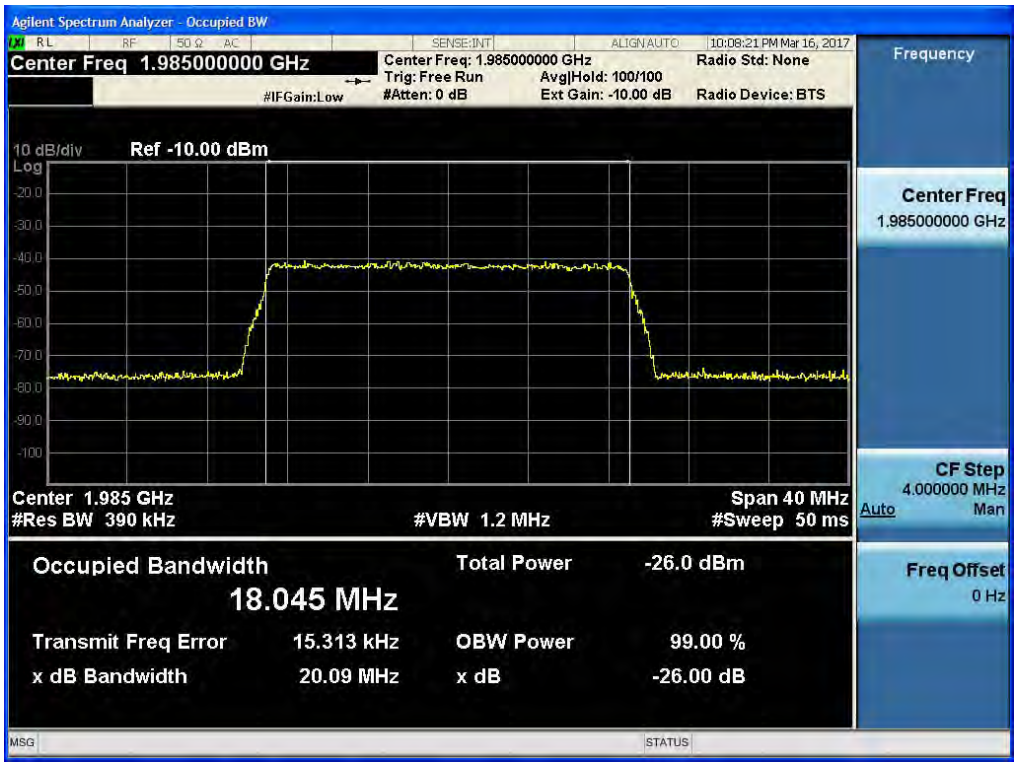
[LTE 20 MHz AGC threshold Downlink Low]



[LTE 20 MHz AGC threshold Downlink Middle]

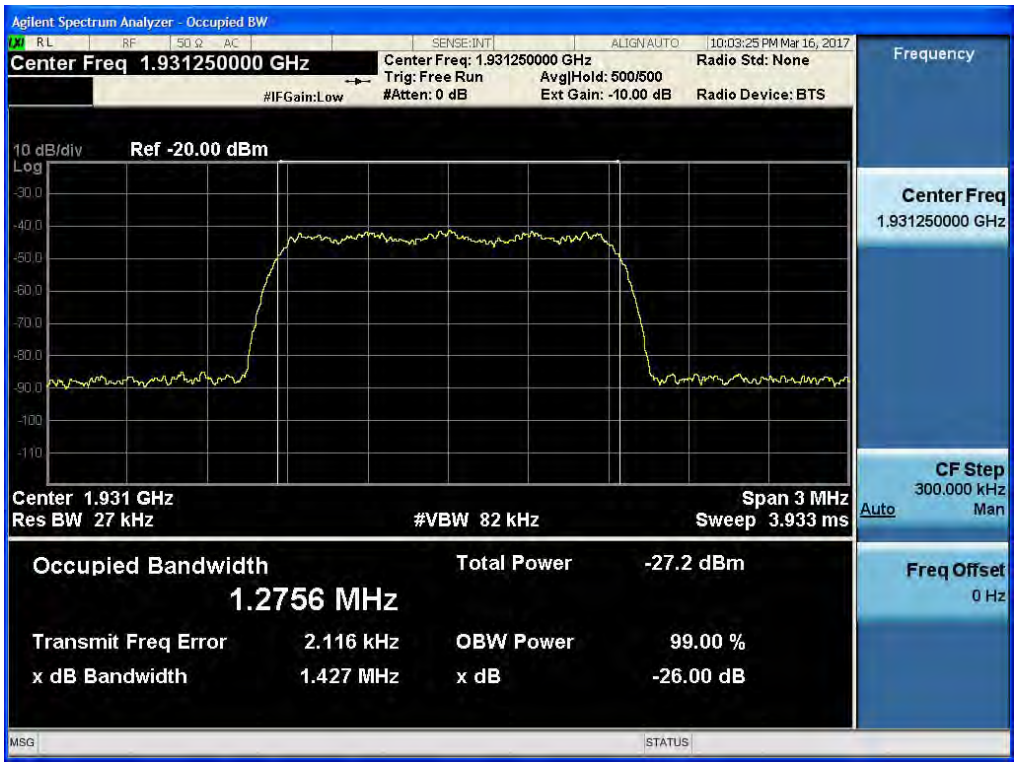


[LTE 20 MHz AGC threshold Downlink High]

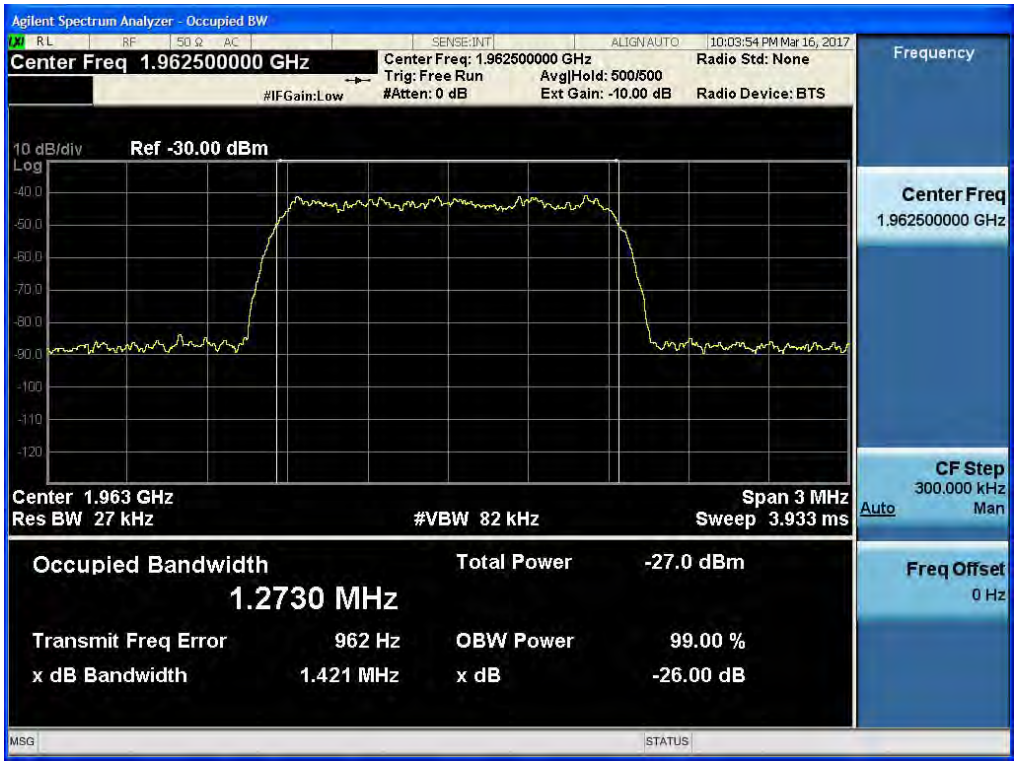


CDMA DL_Input

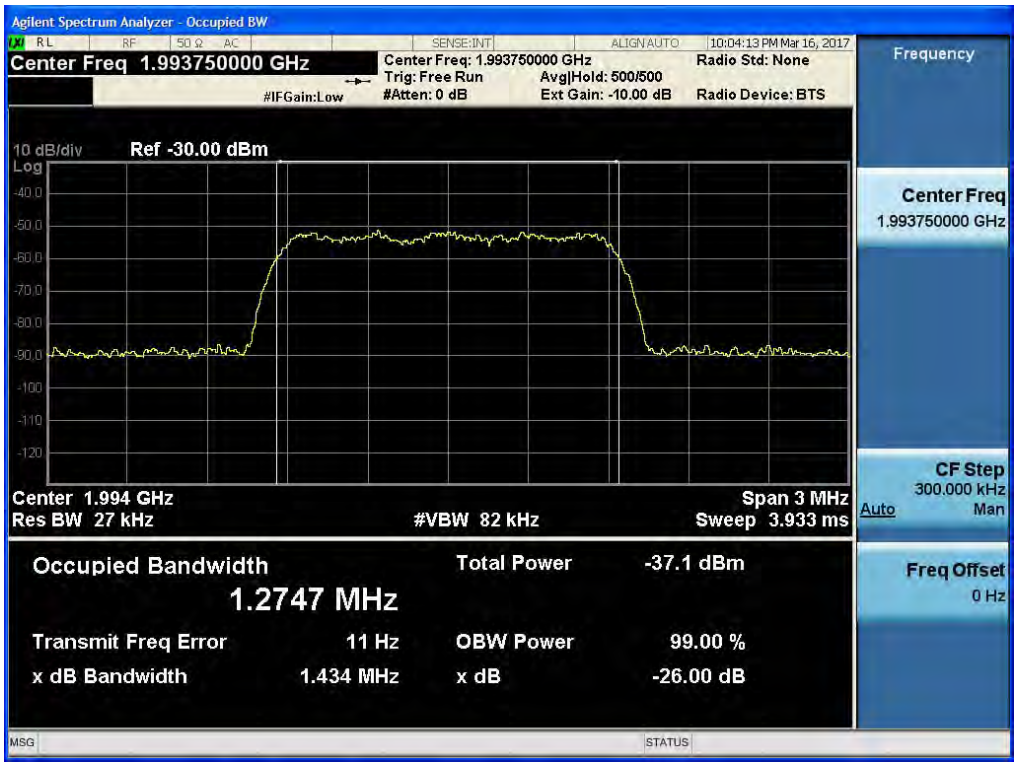
[CDMA AGC threshold Downlink Low]



[CDMA AGC threshold Downlink Middle]

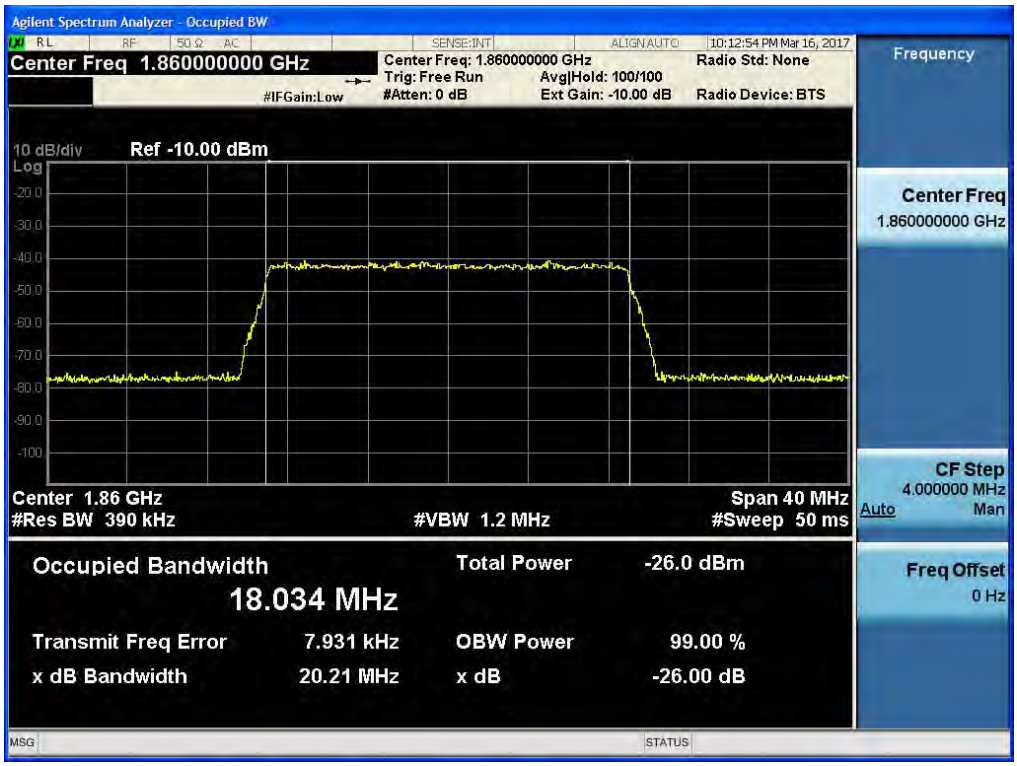


[CDMA AGC threshold Downlink High]

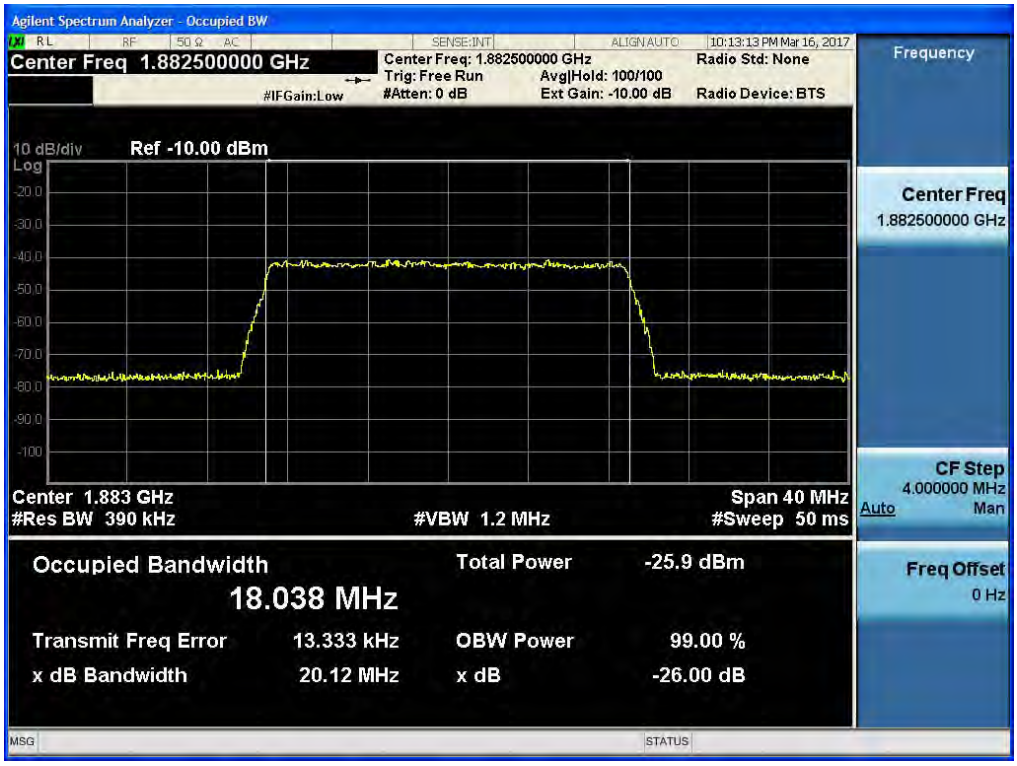


LTE 20 MHz UL_Input

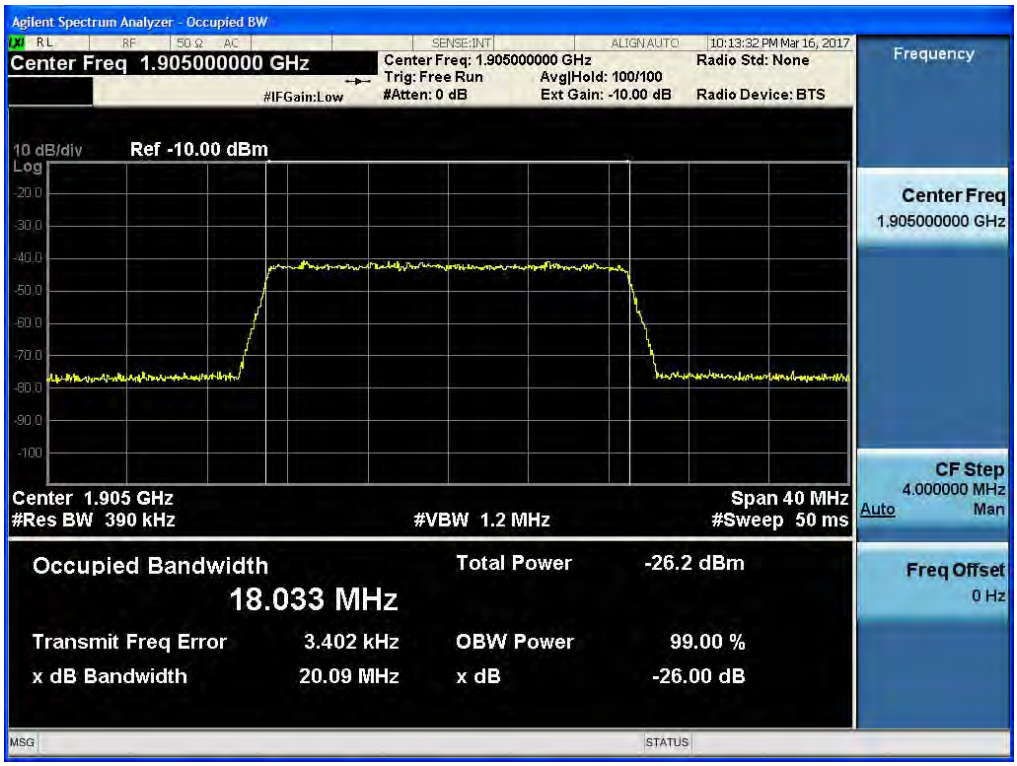
[LTE 20 MHz AGC threshold Uplink Low]



[LTE 20 MHz AGC threshold Uplink Middle]

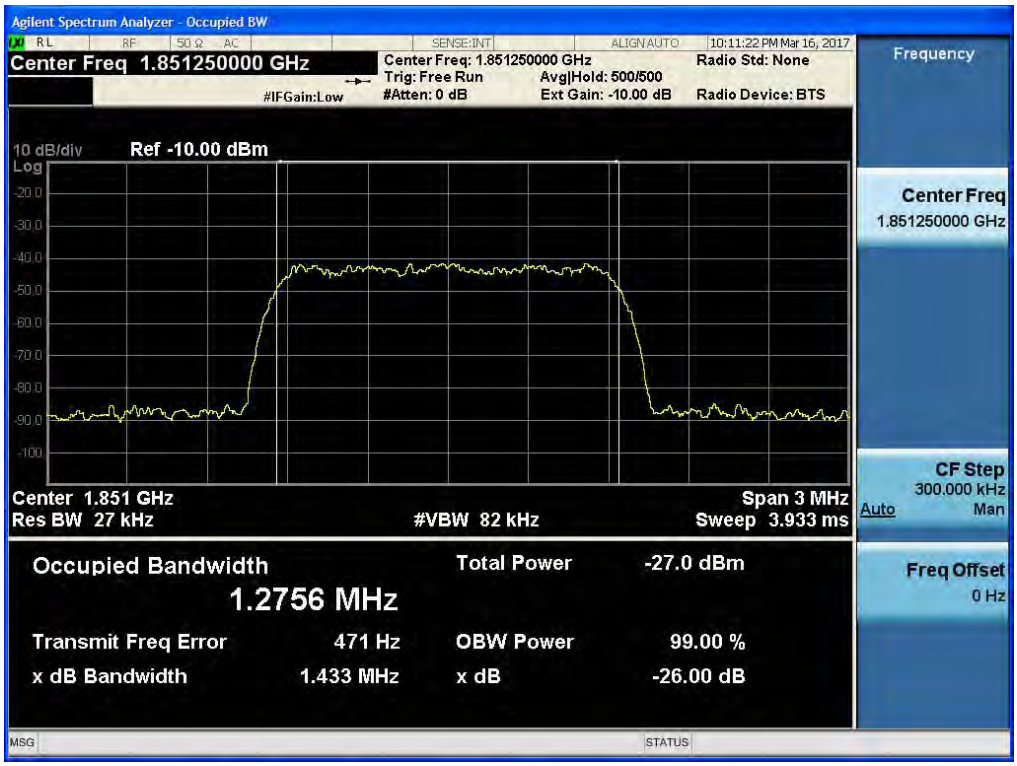


[LTE 20 MHz AGC threshold Uplink High]

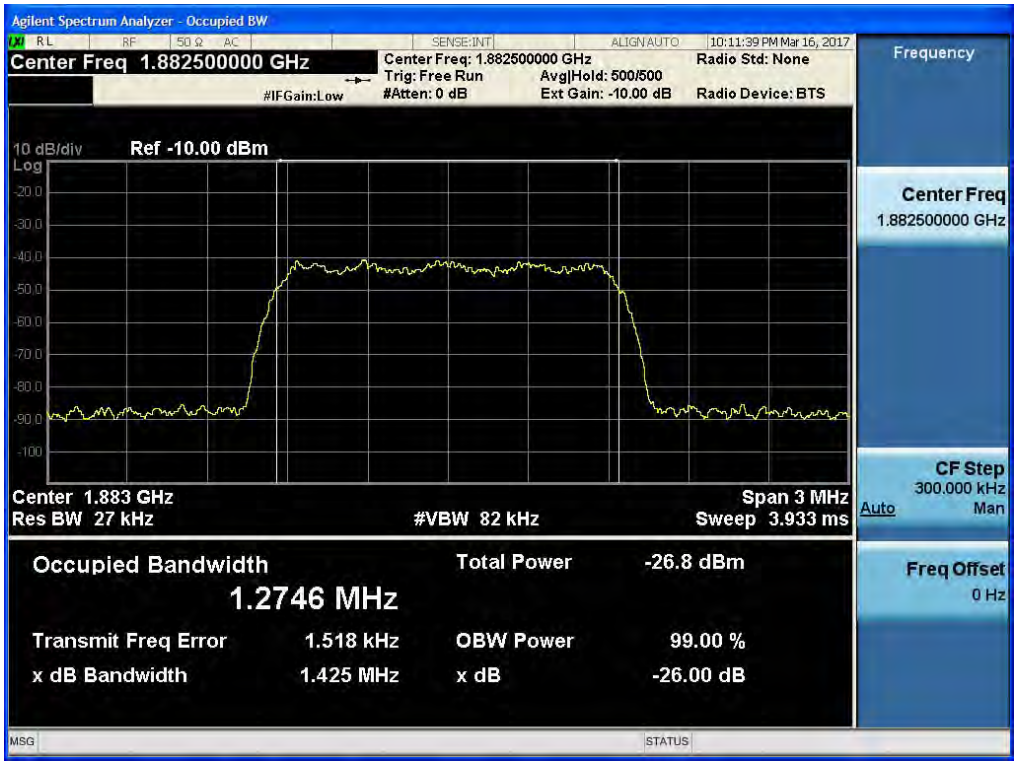


CDMA UL_Input

[CDMA AGC threshold Uplink Low]



[CDMA AGC threshold Uplink Middle]



[CDMA AGC threshold Uplink High]