7. OCCUPIED BANDWIDTH

FCC Rules

Test Requirement(s):

§ 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.

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 passband and rolloff 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.

Test Results: The EUT complies with the requirements of this section.

LTE 700 MHz Band

Input Signal	Input Level (dBm)	Maximum Amp Gain
LTE 5 MHz	UL : -42 dBm	UL : 37 dB
LTE 10 MHz		
CDMA 1.25 MHz		
P25 12.5 kHz		
FM		

[Uplink Output]

	Channel	Frequency (MHz)	OBW (MHz)
700 Band_ LTE 5 MHz AGC threshold	Low	790.5000	4.495
	Middle	-	-
	High	765.5000	4.517
700 Band_ LTE 10 MHz AGC threshold	Low	-	-
	Middle	793.0000	8.971
	High	-	-

	Channel	Frequency (MHz)	OBW (kHz)
700 Band_P25 AGC threshold	Low	793.0125	8.036
	Middle	799.0125	8.267
	High	804.9875	8.079
700 Band_FM AGC threshold	Low	793.0125	10.140
	Middle	799.0125	10.139
	High	804.9875	10.140

	Channel	Frequency (MHz)	OBW (MHz)
700 Band_ LTE 5 MHz +3dB above AGC threshold	Low	790.5000	4.495
	Middle	-	-
	High	765.5000	4.233
700 Band_ LTE 10 MHz +3dB above AGC threshold	Low	-	-
	Middle	793.0000	8.595
	High	-	-

	Channel	Frequency (MHz)	OBW (kHz)
700 Band_P25 +3dB above AGC threshold	Low	793.0125	8.194
	Middle	799.0125	8.196
	High	804.9875	8.189
700 Band_FM +3dB above AGC threshold	Low	793.0125	10.140
	Middle	799.0125	10.140
	High	804.9875	10.140

	Channel	Frequency (MHz)	OBW (MHz)
800 Band_ LTE 5 MHz AGC threshold	Low	819.5000	4.512
	Middle	-	-
	High	821.5000	4.506
800 Band_ CDMA 1.25 MHz AGC threshold	Low	818.2500	1.262
	Middle	820.5000	1.263
	High	822.7500	1.259

	Channel	Frequency (MHz)	OBW (kHz)
800 Band_P25 AGC threshold	Low	806.0125	8.069
	Middle	811.0000	8.154
	High	815.9875	8.142
800 Band_FM AGC threshold	Low	806.0125	10.139
	Middle	811.0000	10.139
	High	815.9875	10.141

	Channel	Frequency (MHz)	OBW (MHz)
800 Band_ LTE 5 MHz +3dB above AGC threshold	Low	819.5000	4.516
	Middle	-	-
	High	821.5000	4.507
800 Band_ CDMA 1.25 MHz +3dB above AGC threshold	Low	818.2500	1.260
	Middle	820.5000	1.261
	High	822.7500	1.264

	Channel	Frequency (MHz)	OBW (kHz)
800 Band_P25 +3dB above AGC threshold	Low	806.0125	8.112
	Middle	811.0000	7.997
	High	815.9875	8.134
800 Band_FM +3dB above AGC threshold	Low	806.0125	10.139
	Middle	811.0000	10.139
	High	815.9875	10.141

[Uplink Input]

	Channel	Frequency (MHz)	OBW (MHz)
700 Band_ LTE 5 MHz AGC threshold	Low	790.5000	4.519
	Middle	-	-
	High	765.5000	4.519
700 Band_ LTE 10 MHz AGC threshold	Low	-	
	Middle	793.0000	9.009
	High	-	-

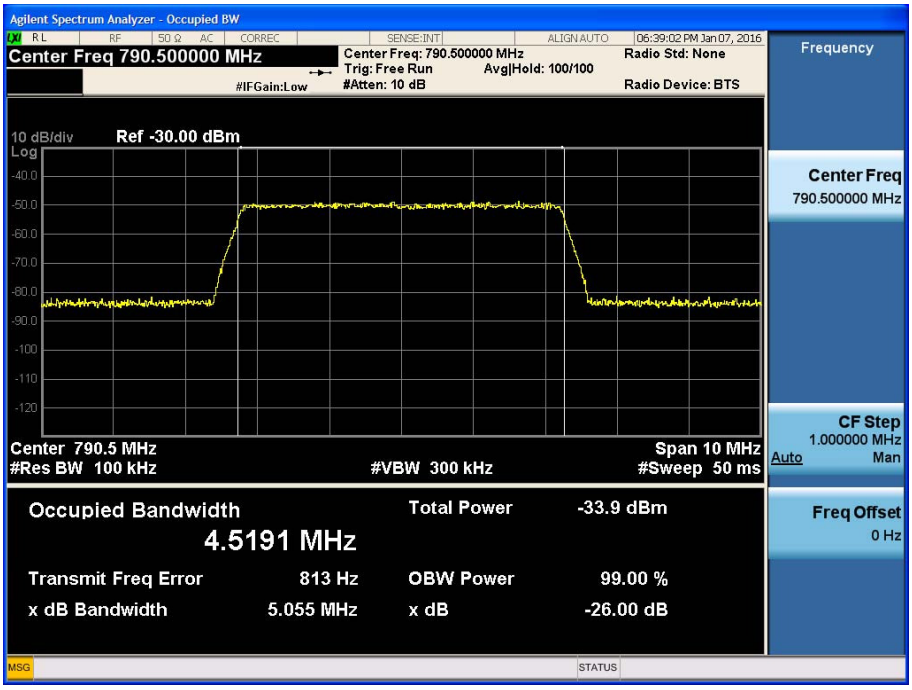
	Channel	Frequency (MHz)	OBW (kHz)
700 Band_P25 AGC threshold	Low	793.0125	8.101
	Middle	799.0125	8.055
	High	804.9875	7.686
700 Band_FM AGC threshold	Low	793.0125	10.140
	Middle	799.0125	10.140
	High	804.9875	10.140

	Channel	Frequency (MHz)	OBW (MHz)
800 Band_ LTE 5 MHz AGC threshold	Low	819.5000	4.516
	Middle	-	-
	High	821.5000	4.5189
800 Band_ CDMA 1.25 MHz AGC threshold	Low	818.2500	1.262
	Middle	820.5000	1.265
	High	822.7500	1.265

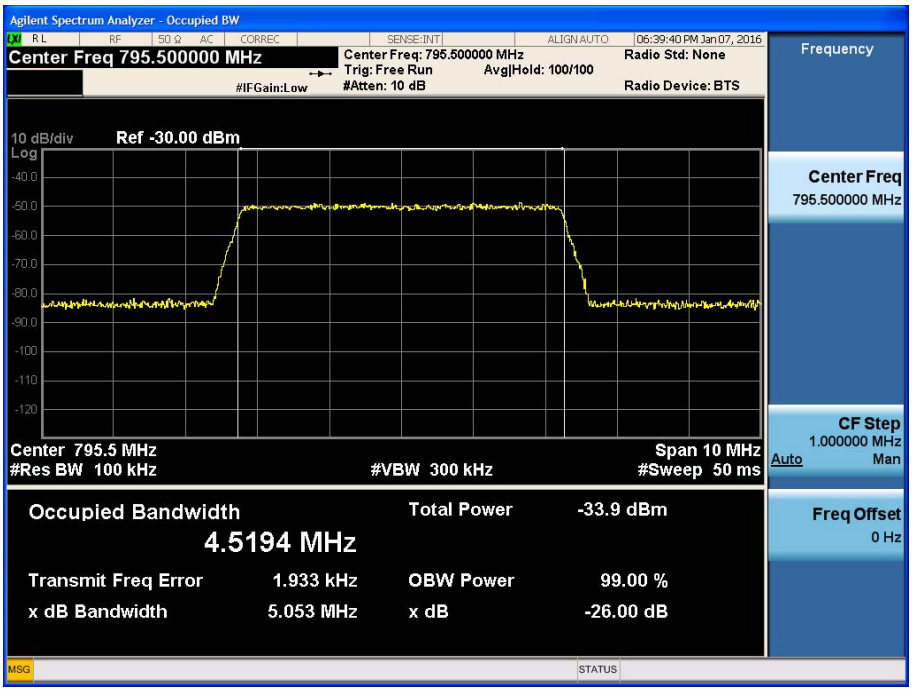
	Channel	Frequency (MHz)	OBW (kHz)
800 Band_P25 AGC threshold	Low	806.0125	8.416
	Middle	811.0000	8.317
	High	815.9875	7.920
800 Band_FM AGC threshold	Low	806.0125	10.139
	Middle	811.0000	10.140
	High	815.9875	10.141

Plots of Occupied Bandwidth
700 MHz Band_LTE UL

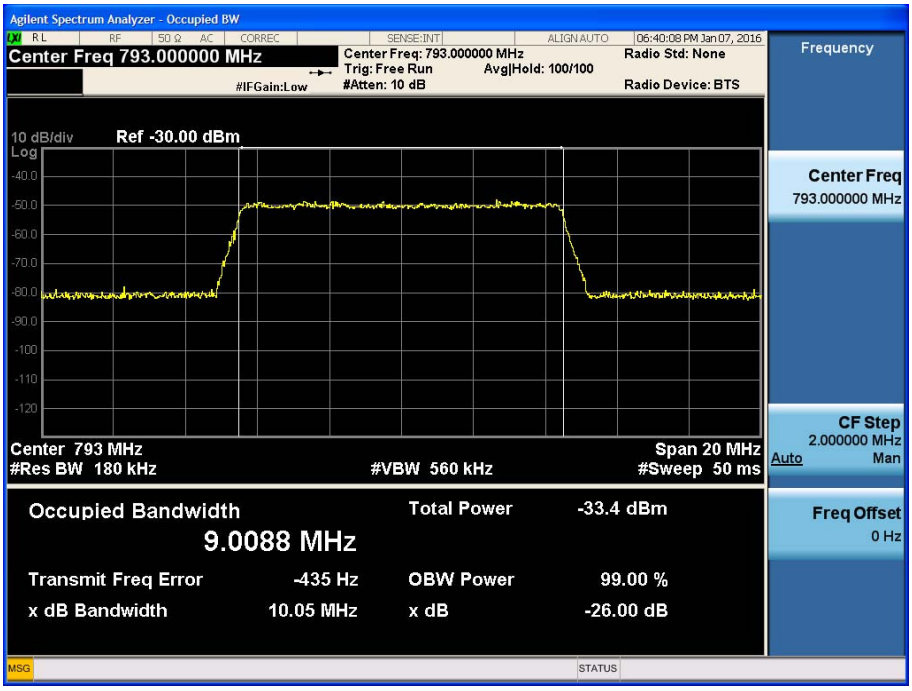
[700 Band AGC threshold Uplink Input LTE 5 MHz Low]



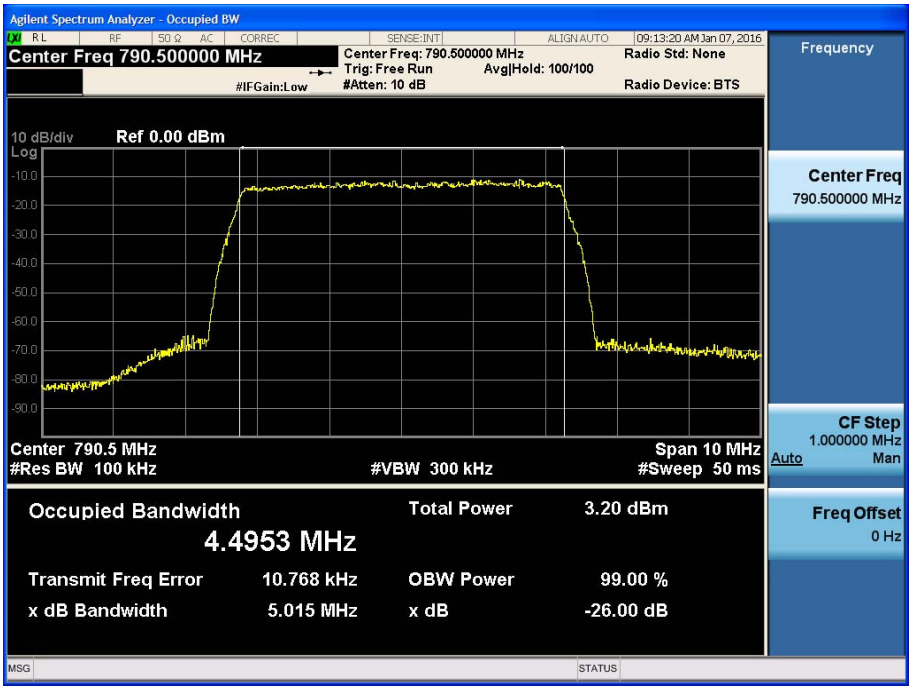
[700 Band AGC threshold Uplink Input LTE 5 MHz High]



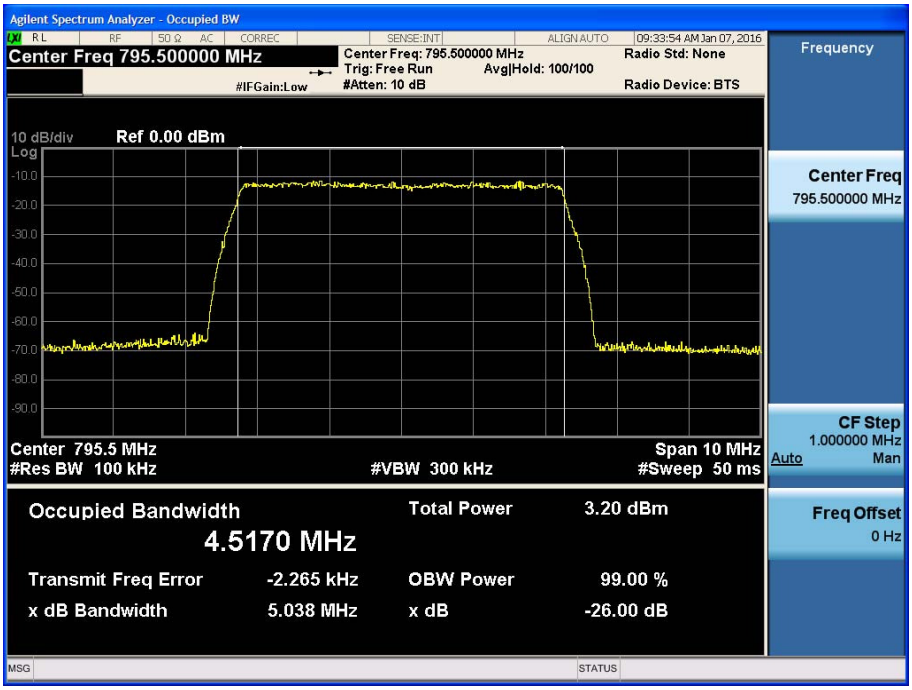
[700 Band AGC threshold Uplink Input LTE 10 MHz Middle]



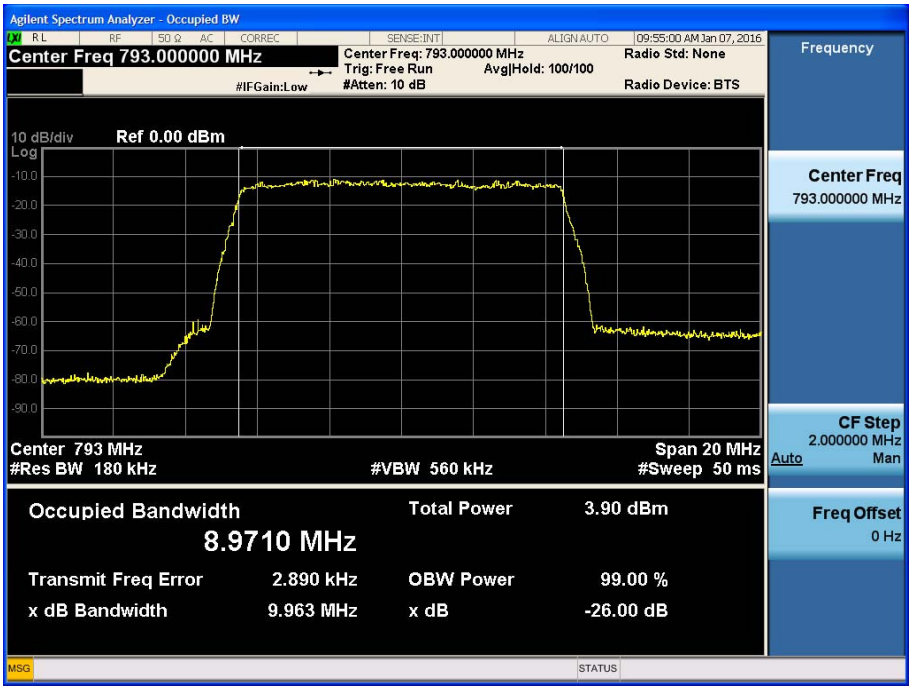
[700 Band AGC threshold Uplink Output LTE 5 MHz Low]



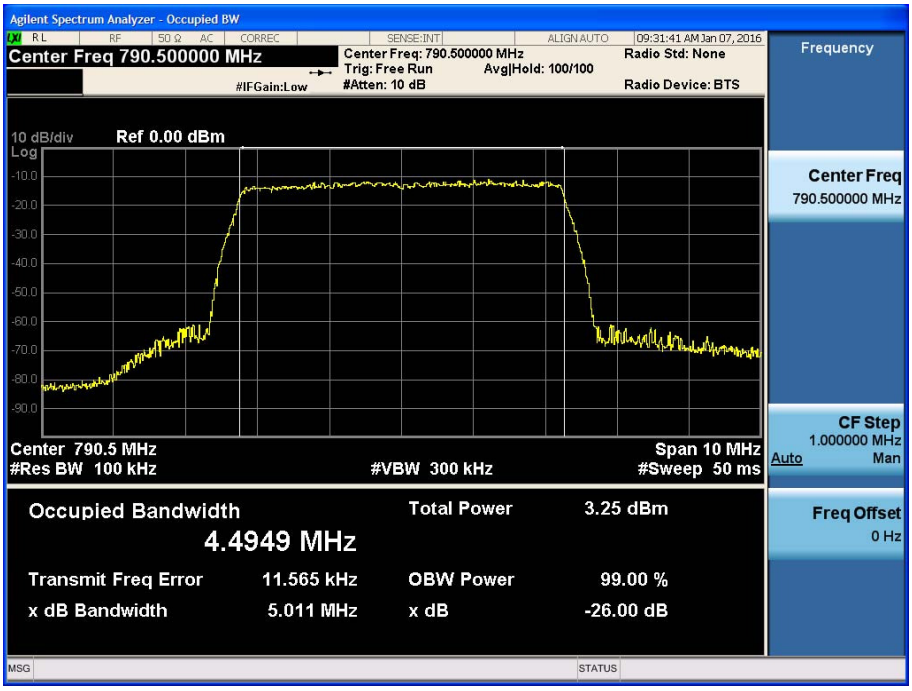
[700 Band AGC threshold Uplink Output LTE 5 MHz High]



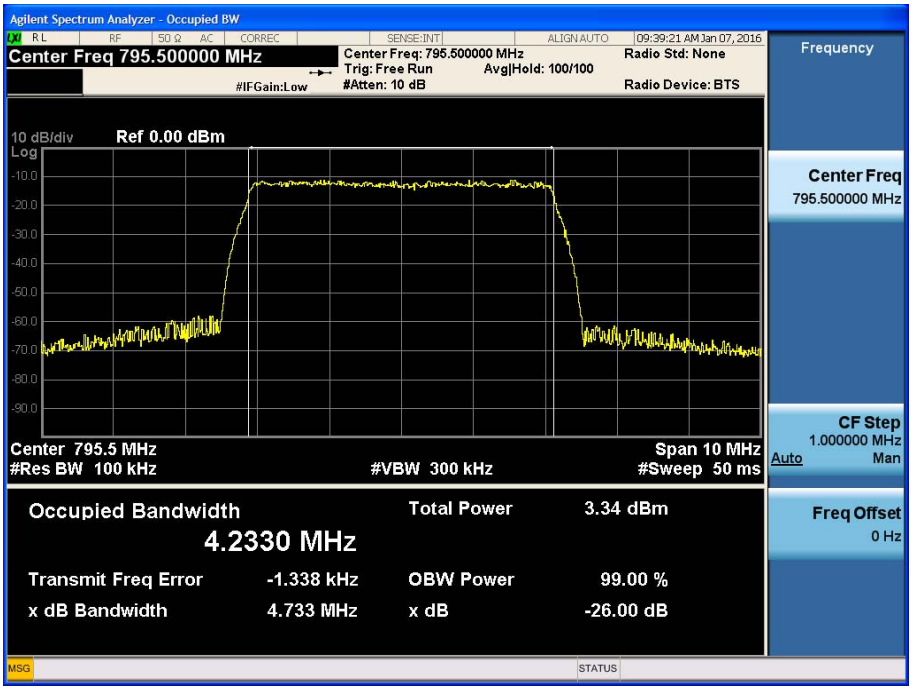
[700 Band AGC threshold Uplink Output LTE 10 MHz Middle]



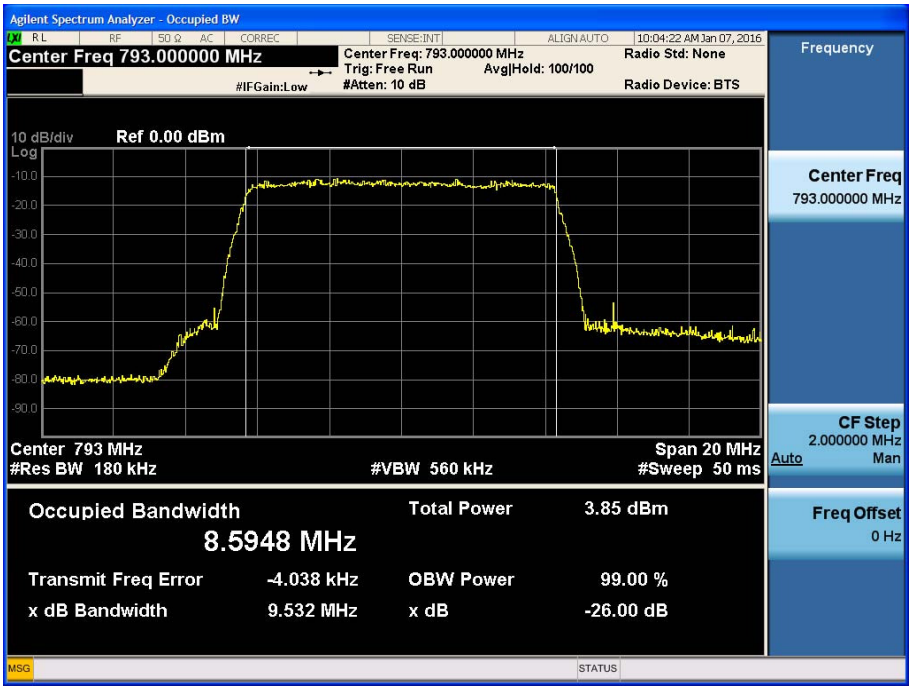
[700 Band +3 dB above the AGC threshold Uplink Output LTE 5 MHz Low]



[700 Band +3 dB above the AGC threshold Uplink Output LTE 5 MHz High]

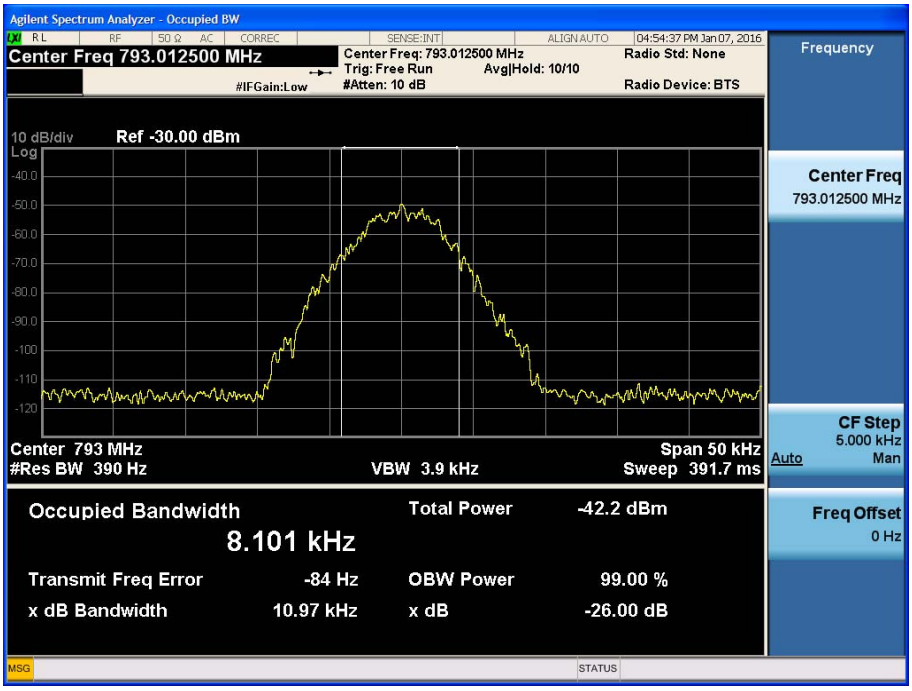


[700 Band +3 dB above the AGC threshold Uplink Output LTE 10 MHz Middle]

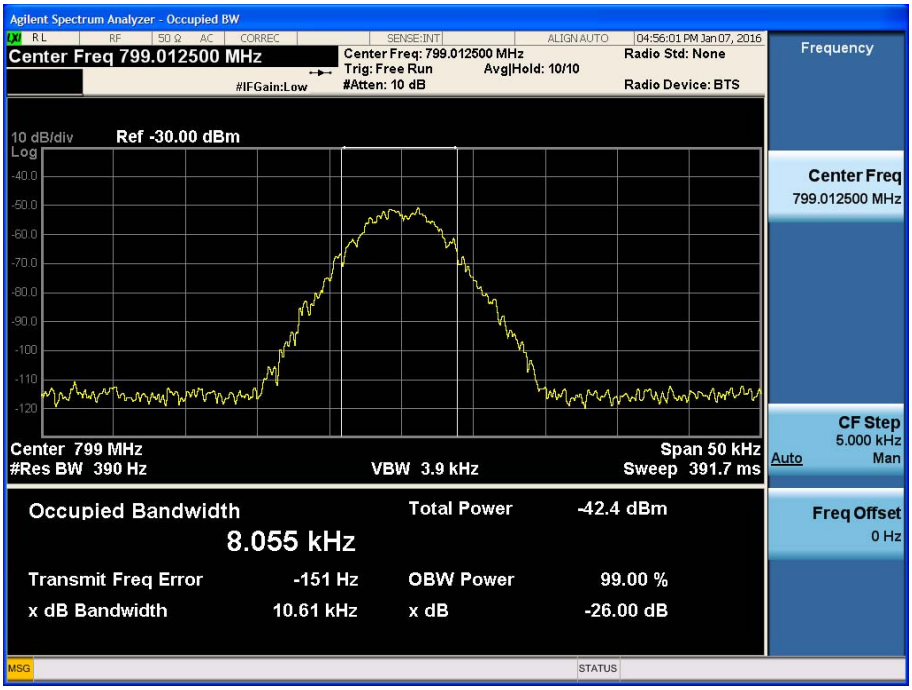


700 MHz Band_P25, FM UL

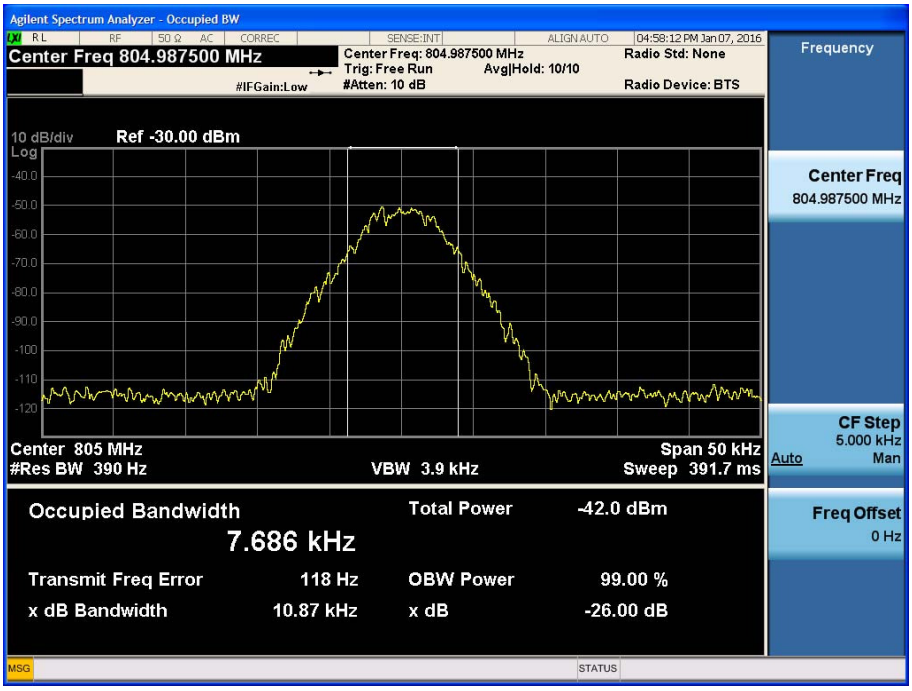
[700 Band AGC threshold Uplink Input P25 Low]



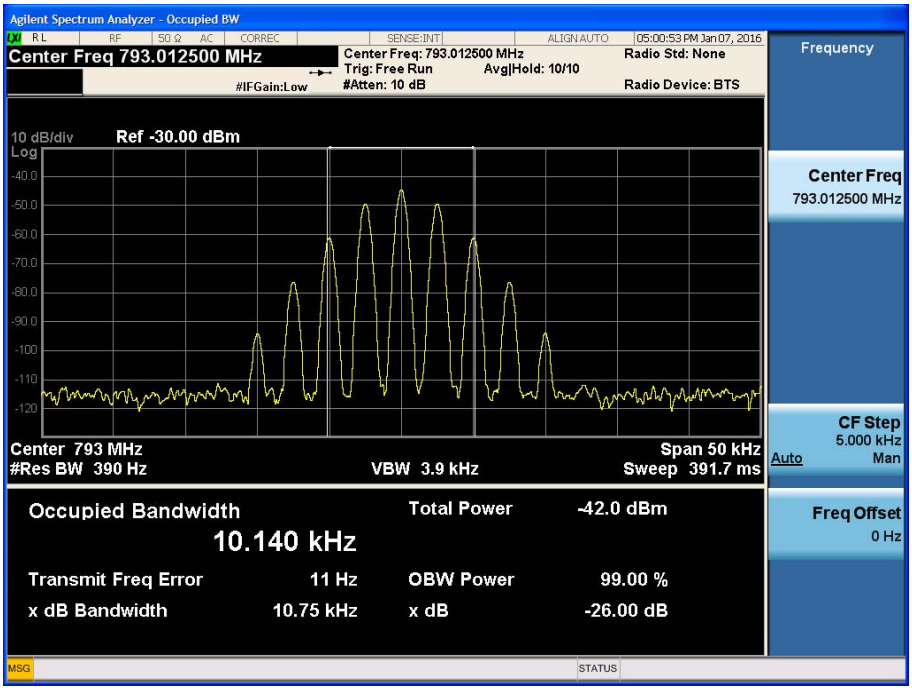
[700 Band AGC threshold Uplink Input P25 Middle]



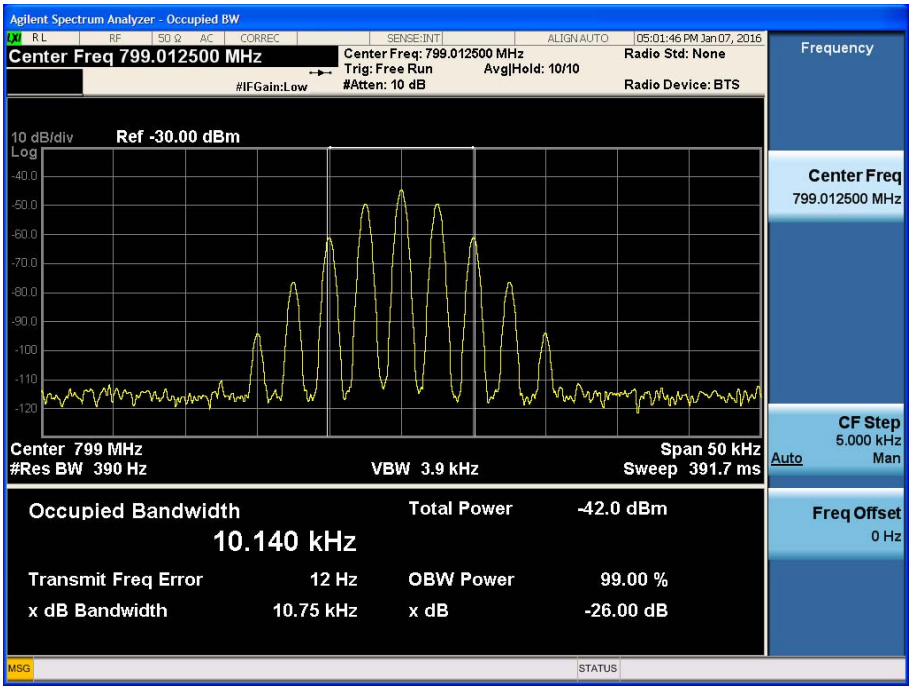
[700 Band AGC threshold Uplink Input P25 High]



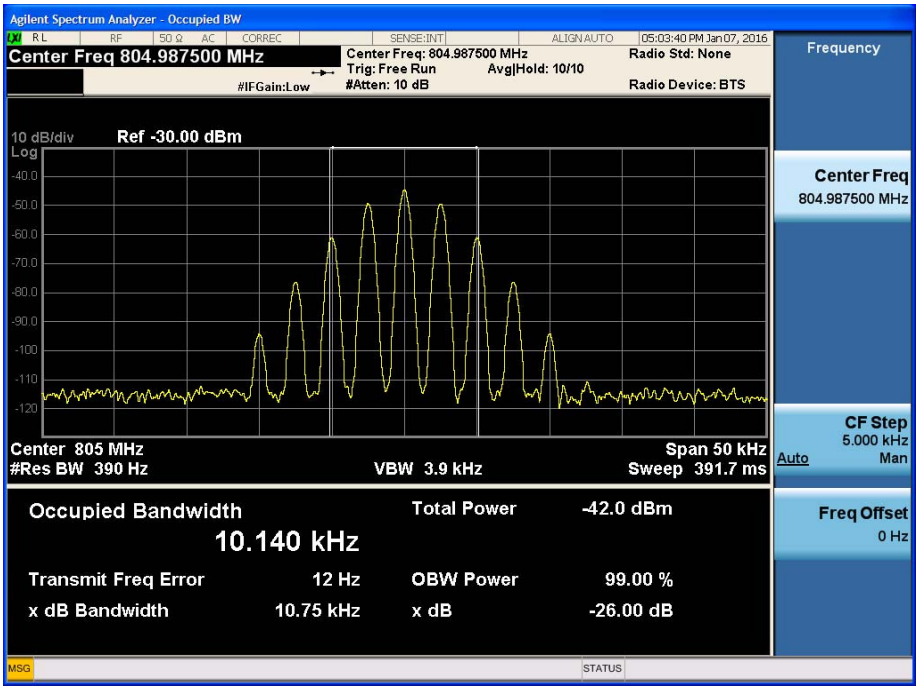
[700 Band AGC threshold Uplink Input FM Low]



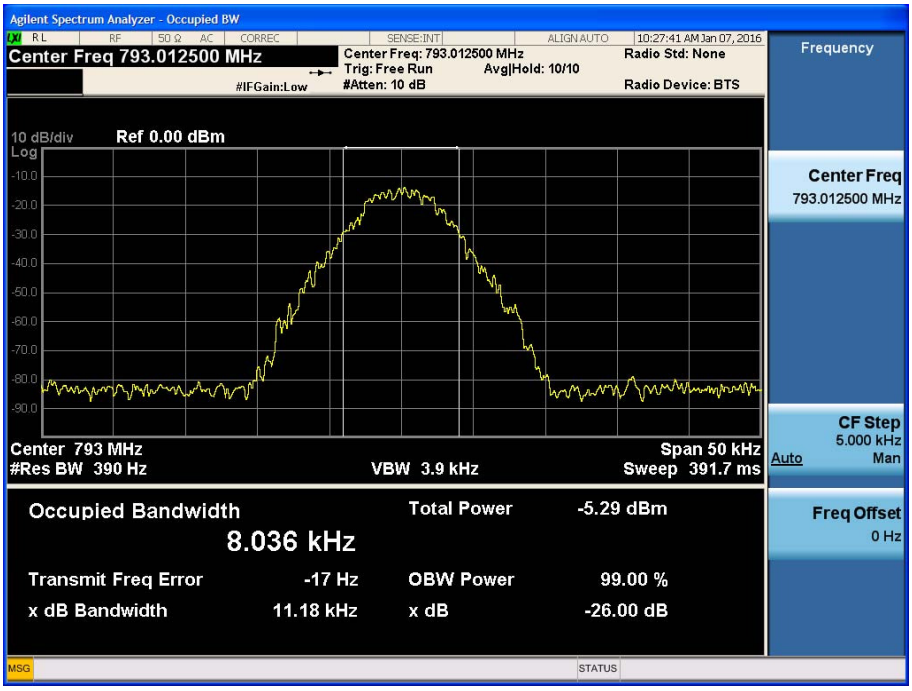
[700 Band AGC threshold Uplink Input FM Middle]



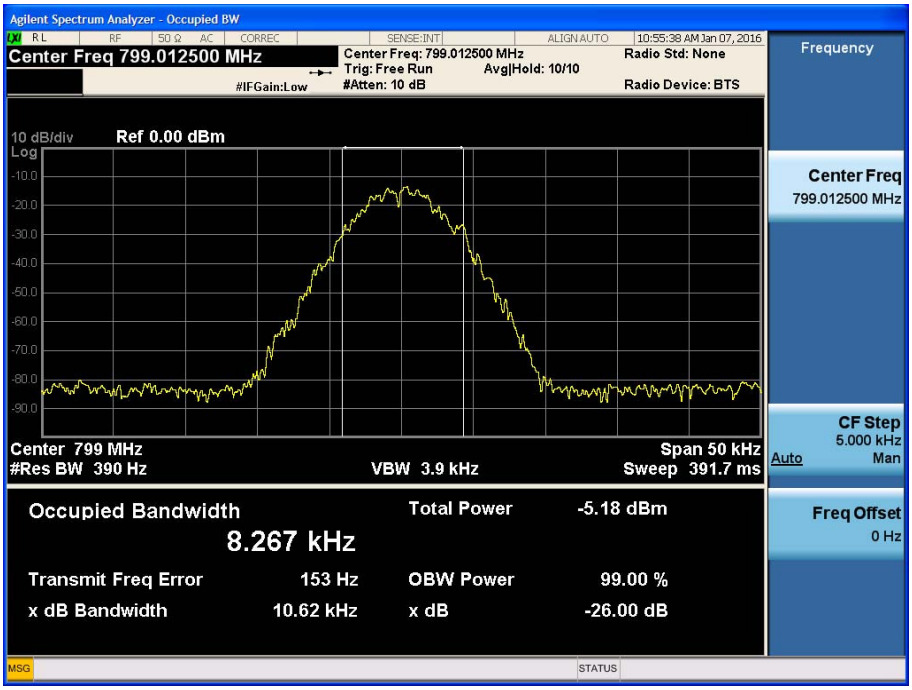
[700 Band AGC threshold Uplink Input FM High]



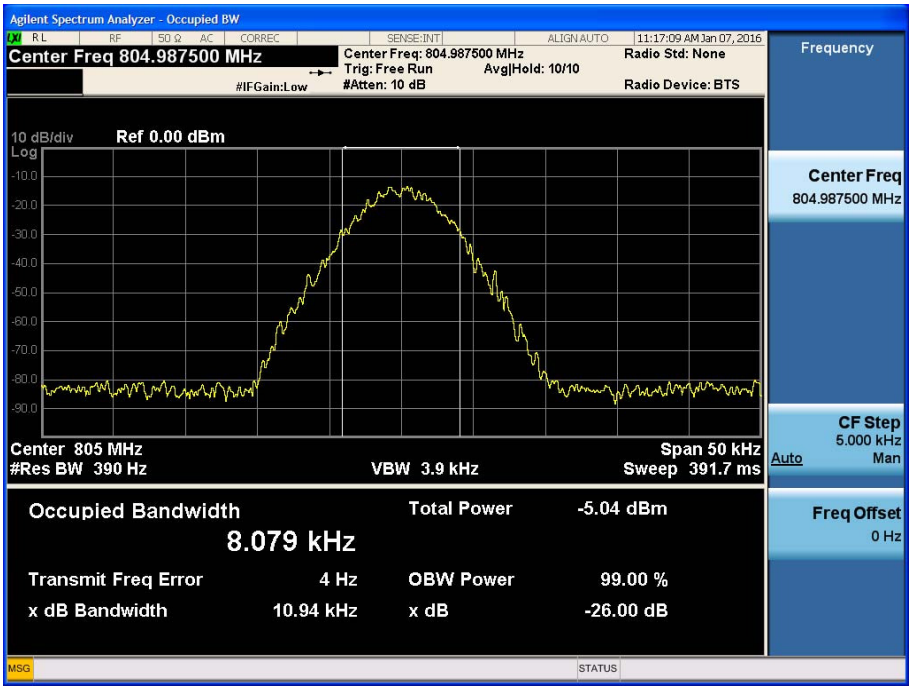
[700 Band AGC threshold Uplink Output P25 Low]



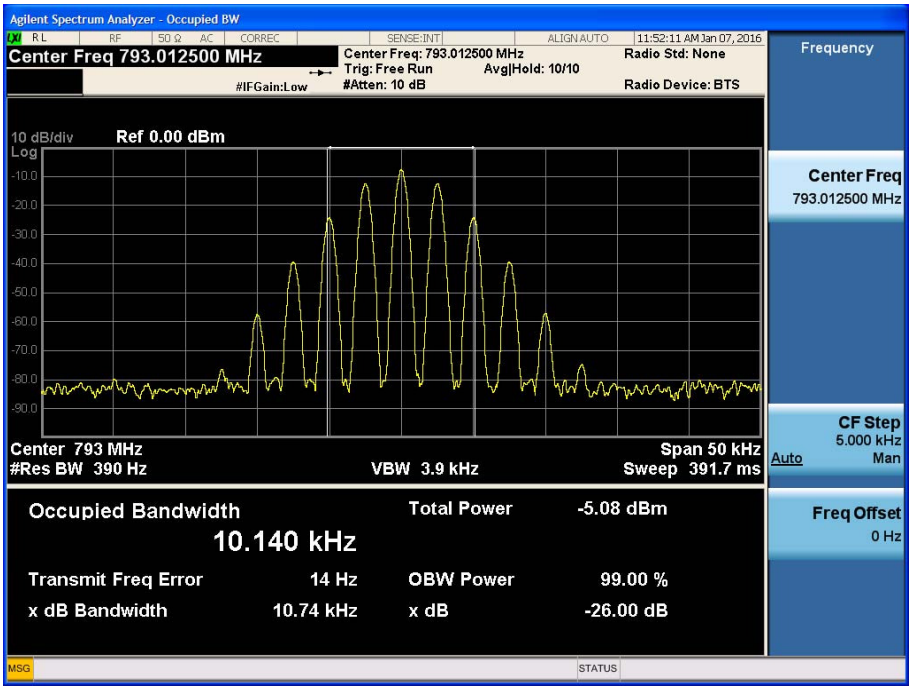
[700 Band AGC threshold Uplink Output P25 Middle]



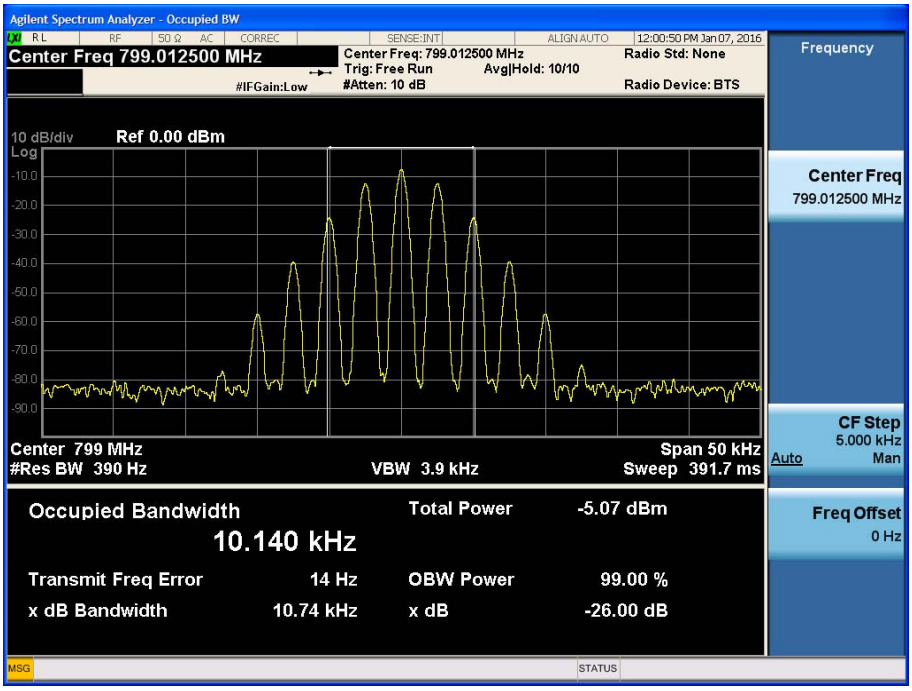
[700 Band AGC threshold Uplink Output P25 High]



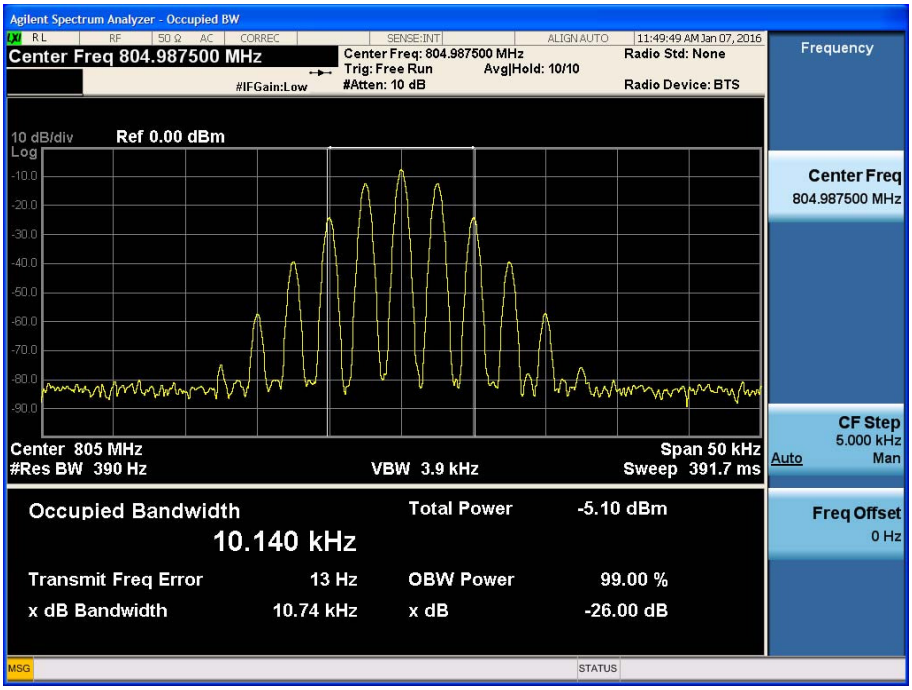
[700 Band AGC threshold Uplink Output FM Low]



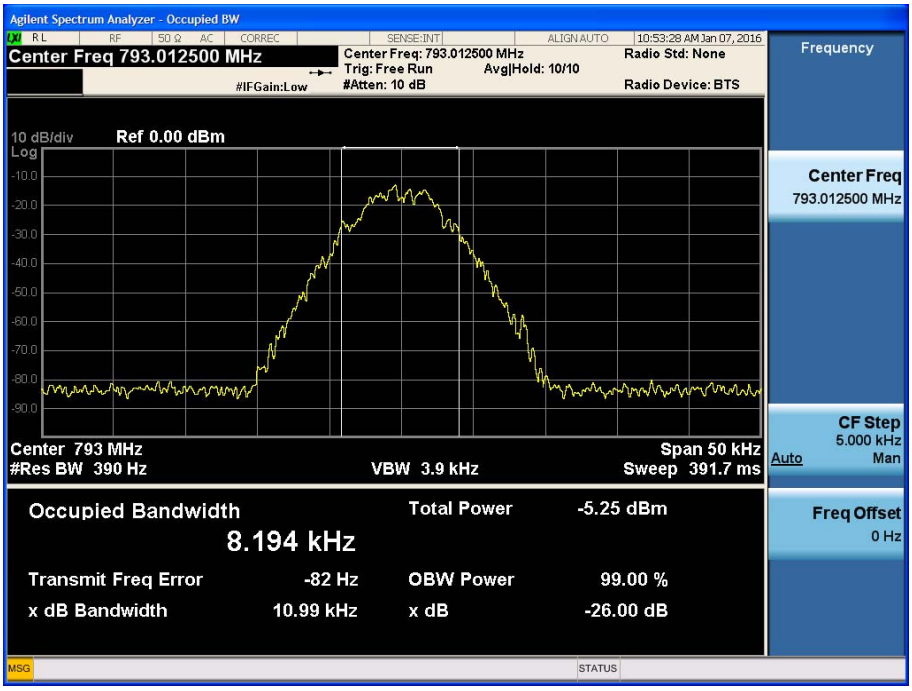
[700 Band AGC threshold Uplink Output FM Middle]



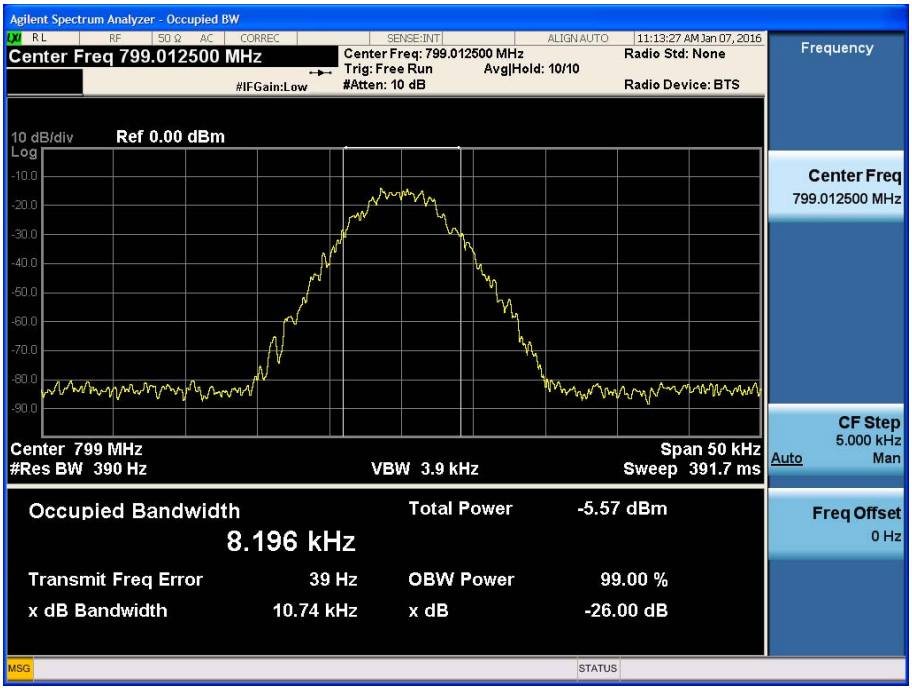
[700 Band AGC threshold Uplink Output FM High]



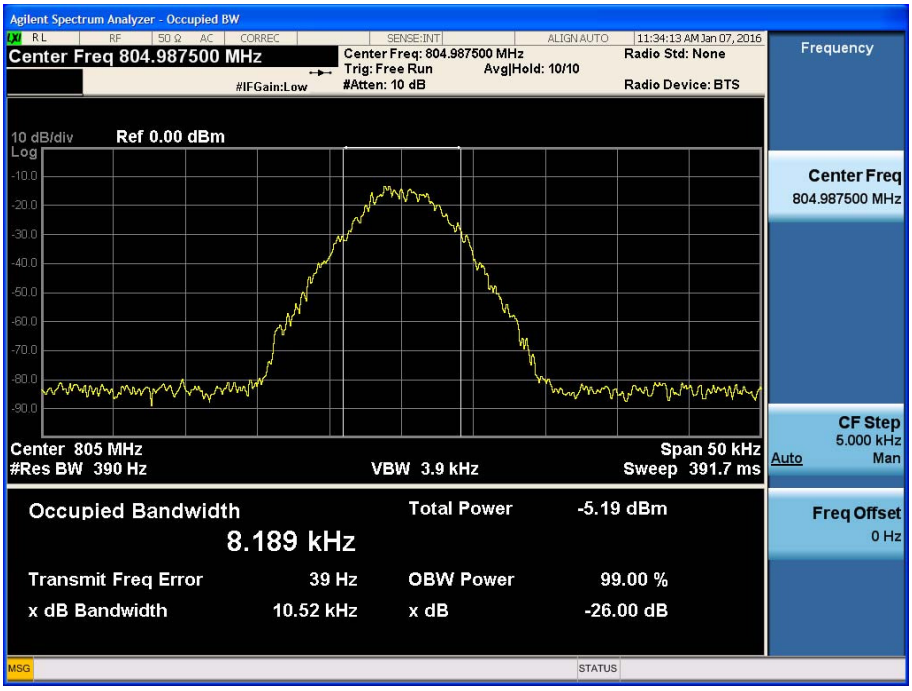
[700 Band +3 dB above the AGC threshold Uplink Output P25 Low]



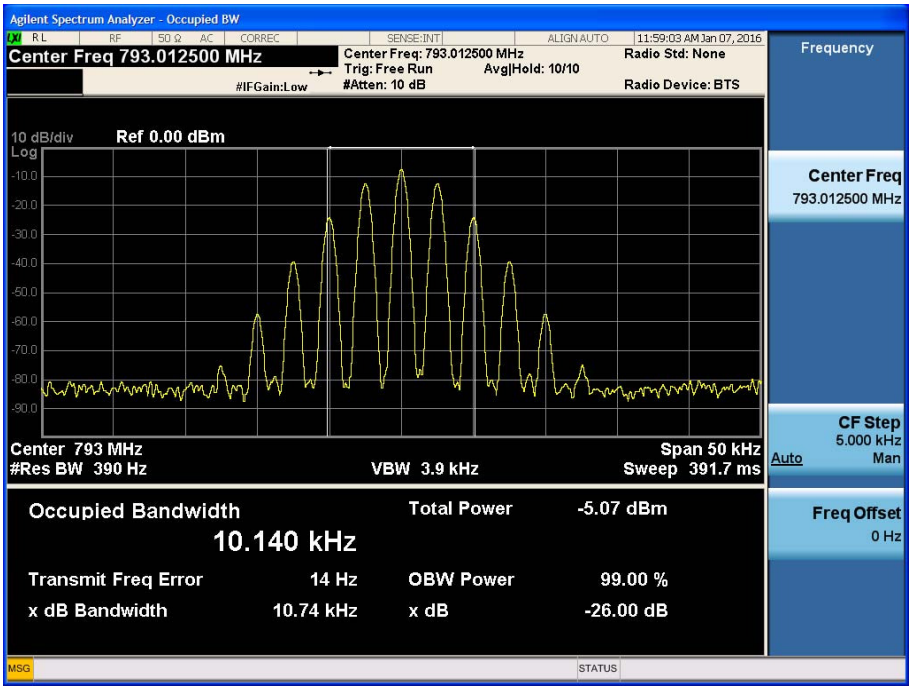
[700 Band +3 dB above the AGC threshold Uplink Output P25 Middle]



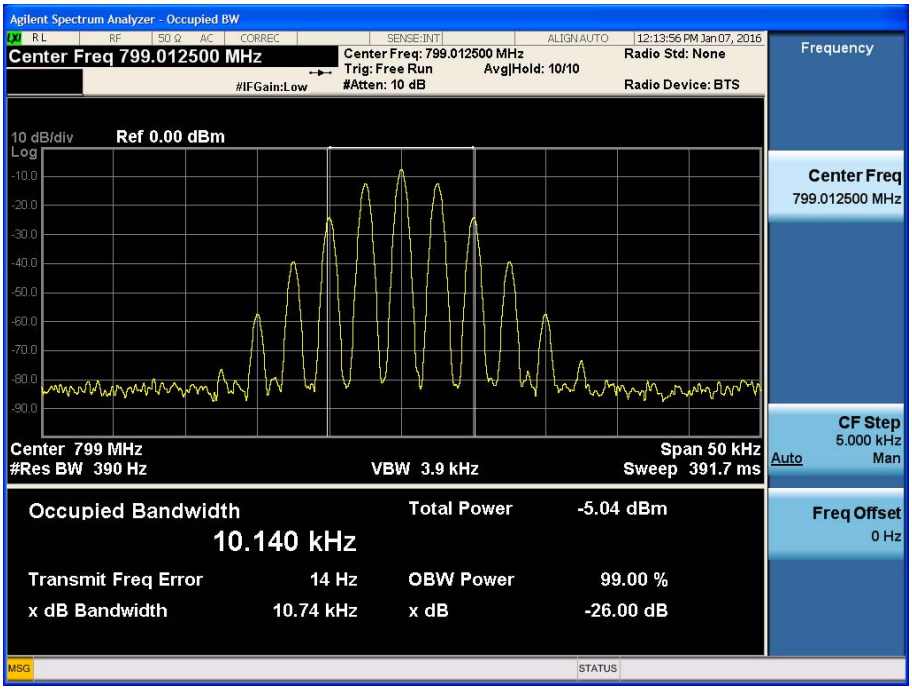
[700 Band +3 dB above the AGC threshold Uplink Output P25 High]



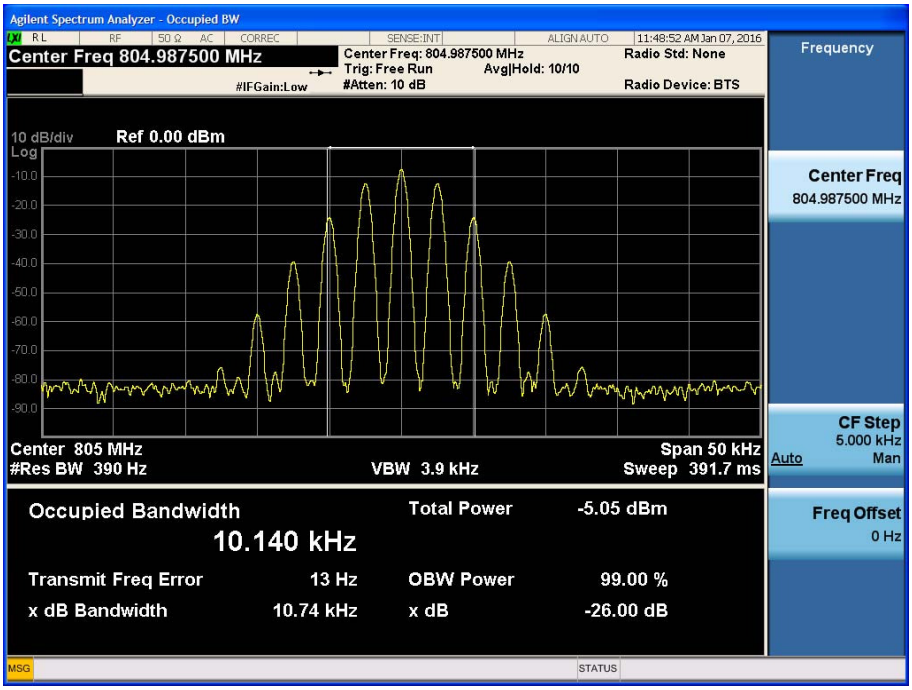
[700 Band +3 dB above the AGC threshold Uplink Output FM Low]



[700 Band +3 dB above the AGC threshold Uplink Output FM Middle]

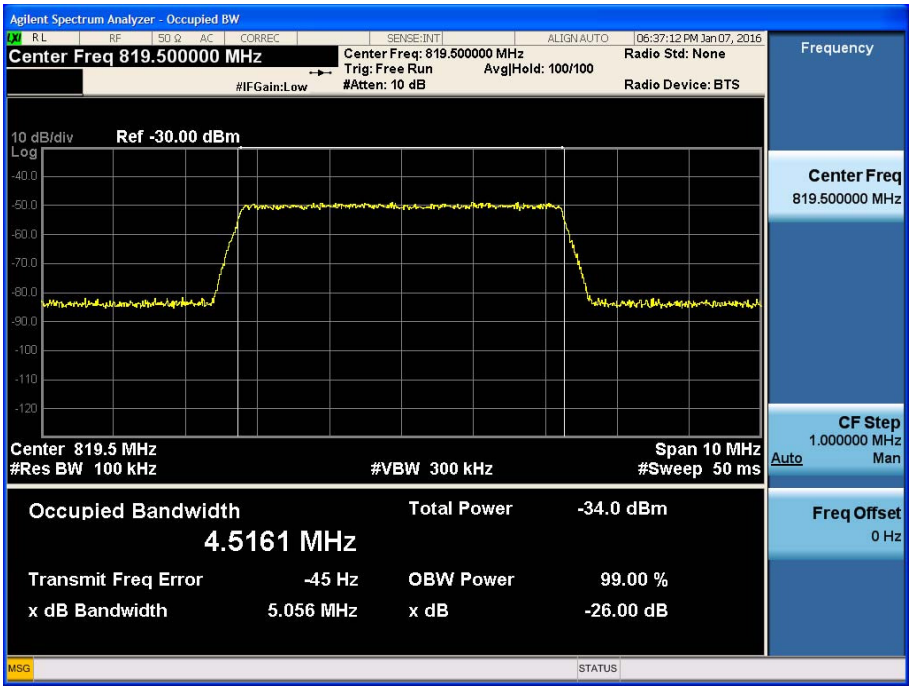


[700 Band +3 dB above the AGC threshold Uplink Output FM High]

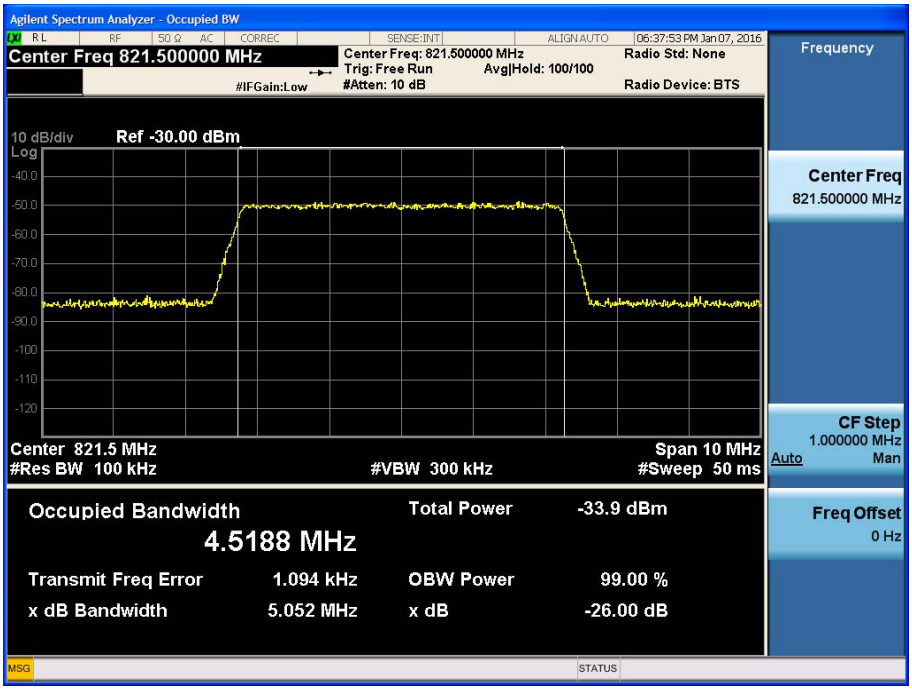


800 MHz Band_LTE UL

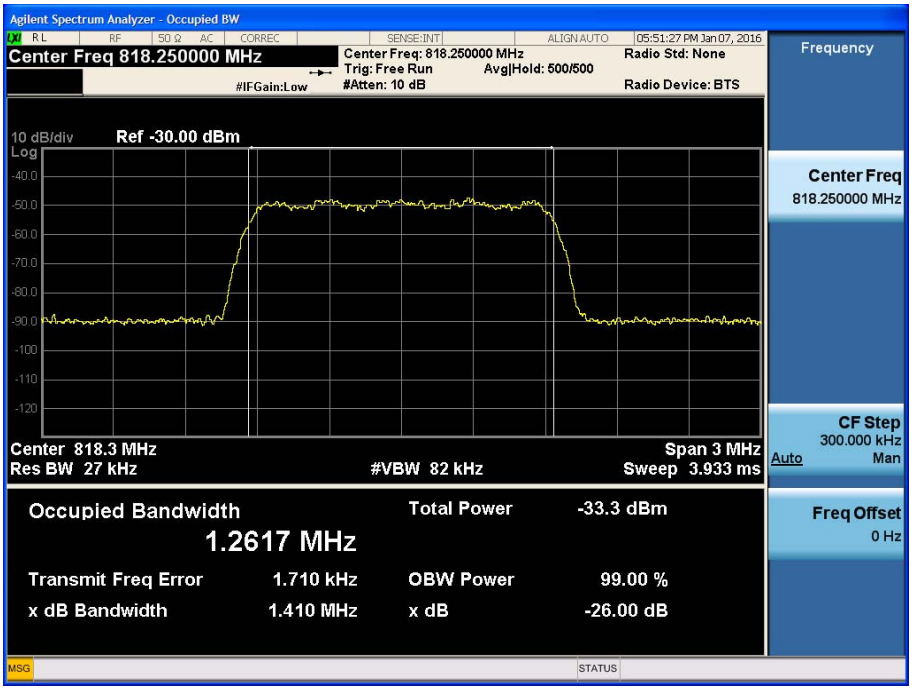
[800 Band AGC threshold Uplink Input LTE 5 MHz Low]



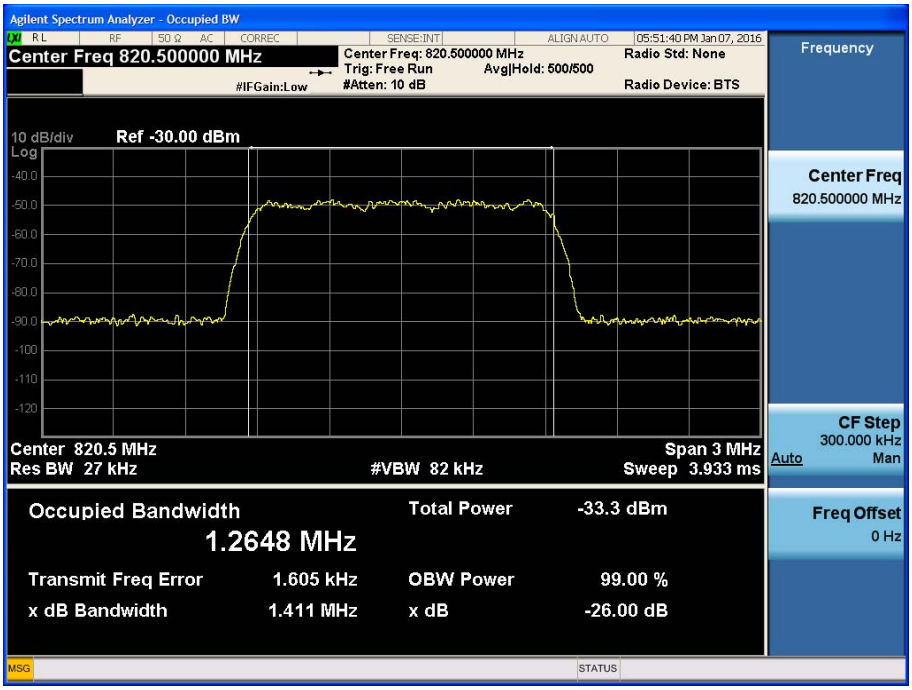
[800 Band AGC threshold Uplink Input LTE 5 MHz High]



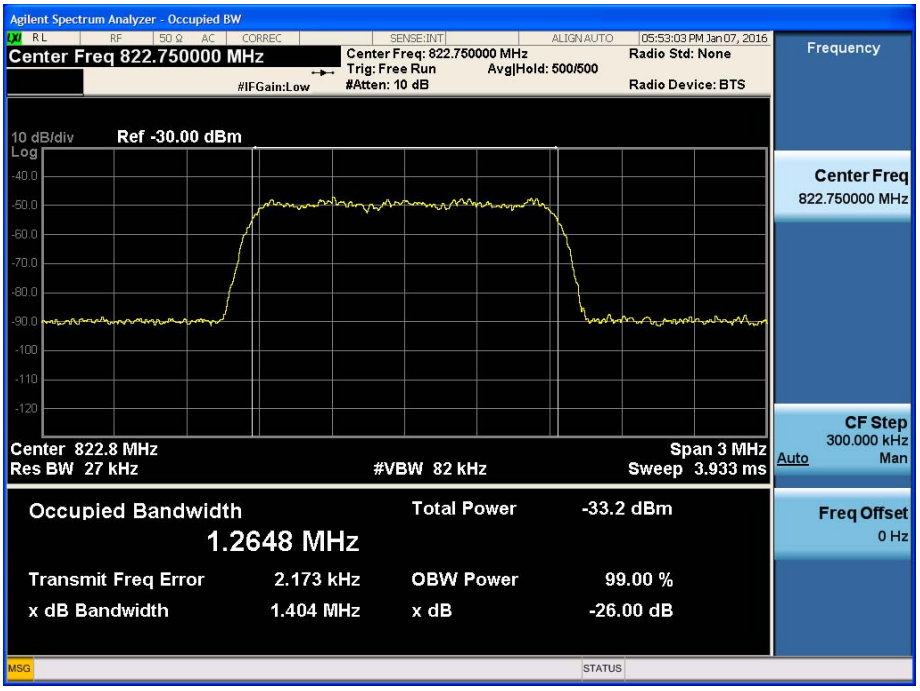
[800 Band AGC threshold Uplink Input CDMA 1.25 MHz Low]



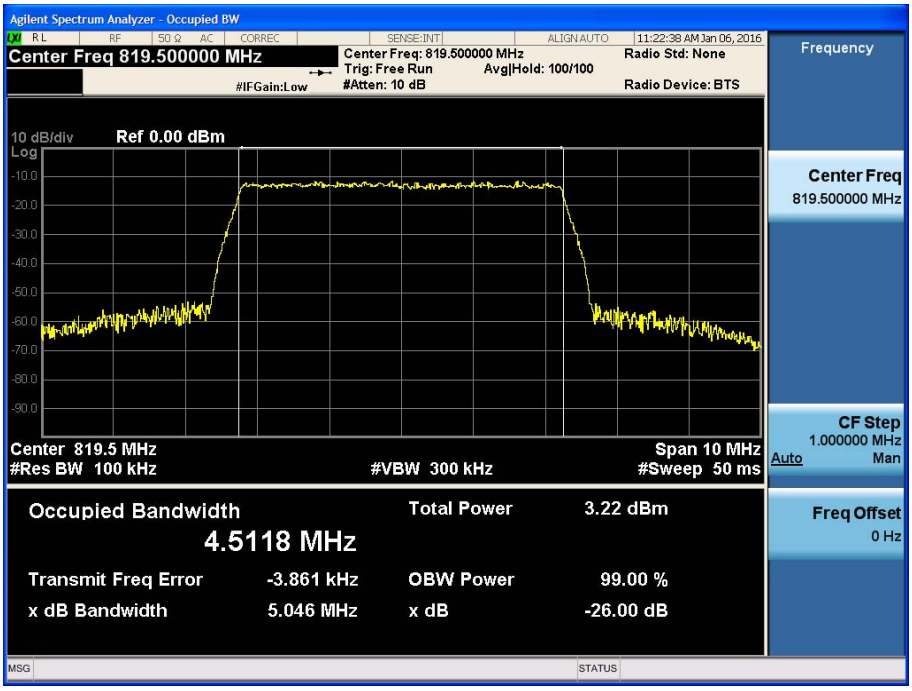
[800 Band AGC threshold Uplink Input CDMA 1.25 MHz Middle]



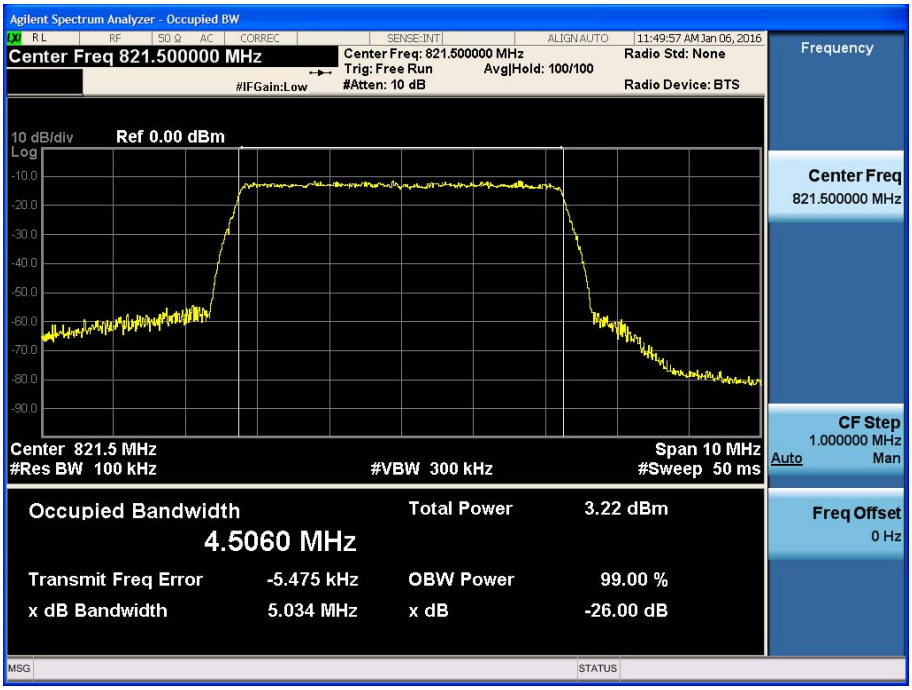
[800 Band AGC threshold Uplink Input CDMA 1.25 MHz High]



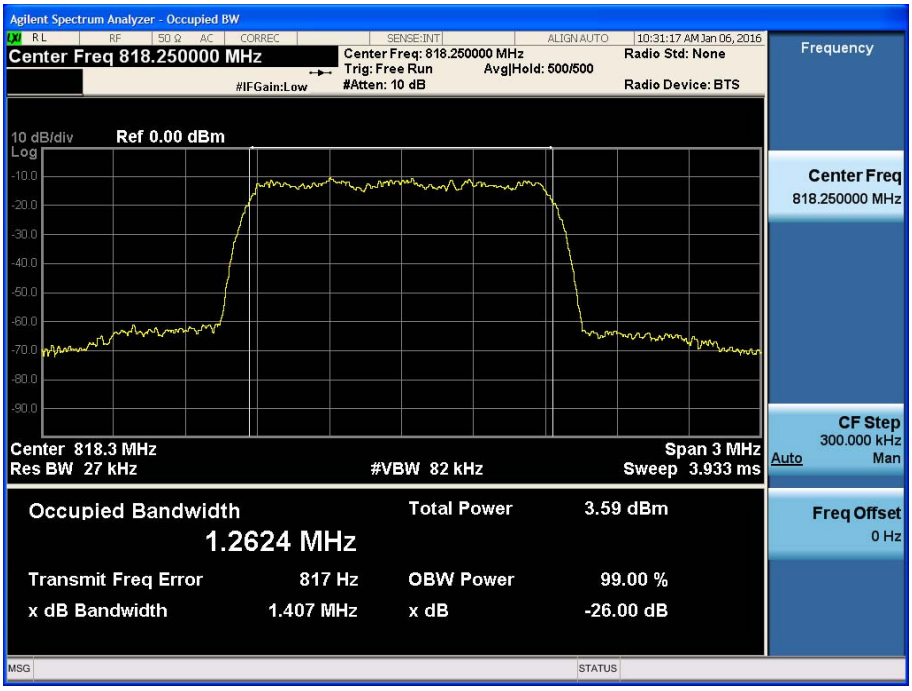
[800 Band AGC threshold Uplink Output LTE 5 MHz Low]



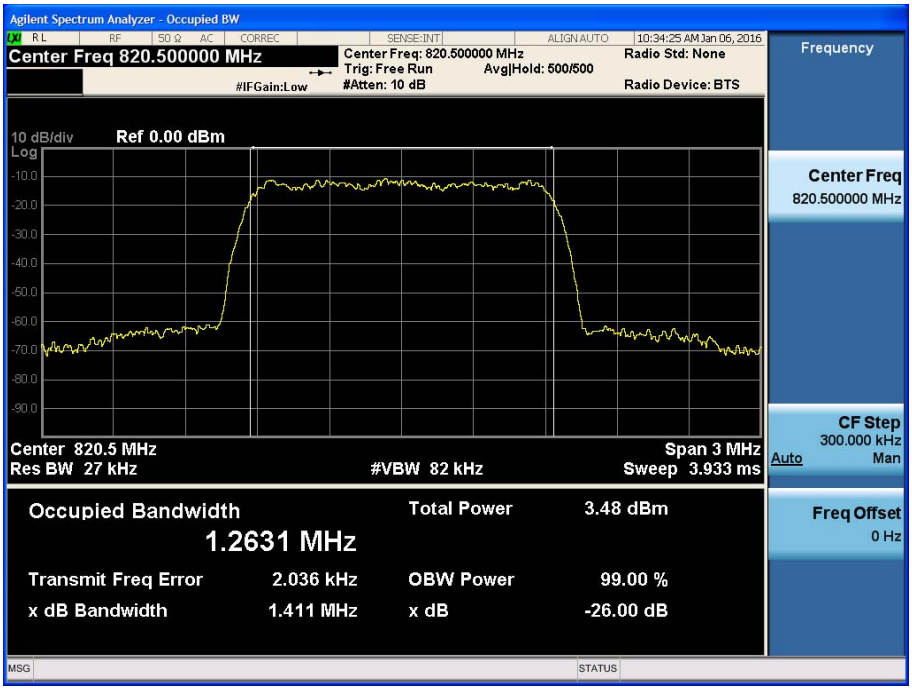
[800 Band AGC threshold Uplink Output LTE 5 MHz High]



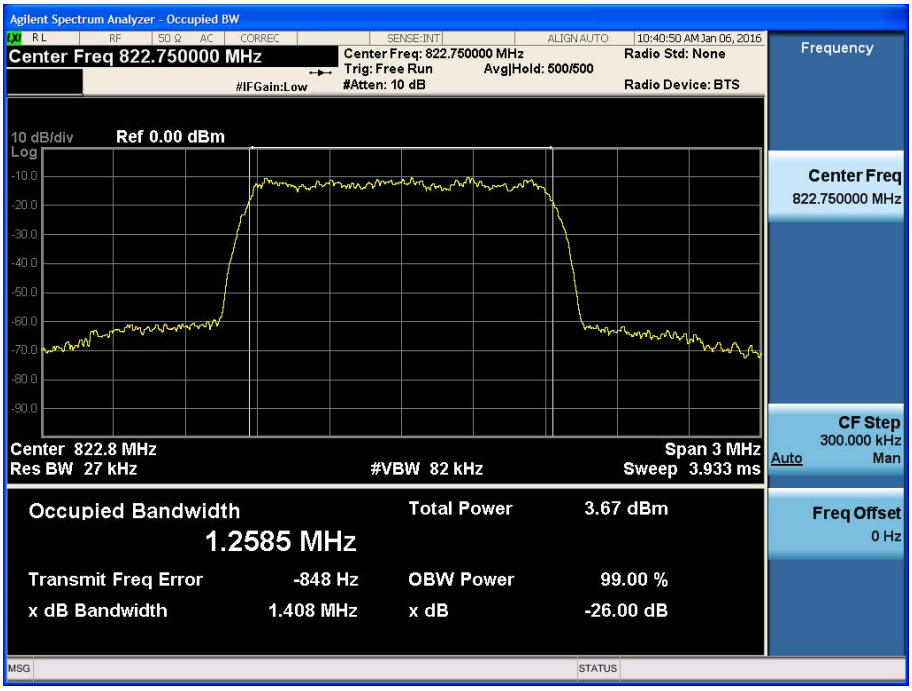
[800 Band AGC threshold Uplink Output CDMA 1.25 MHz Low]



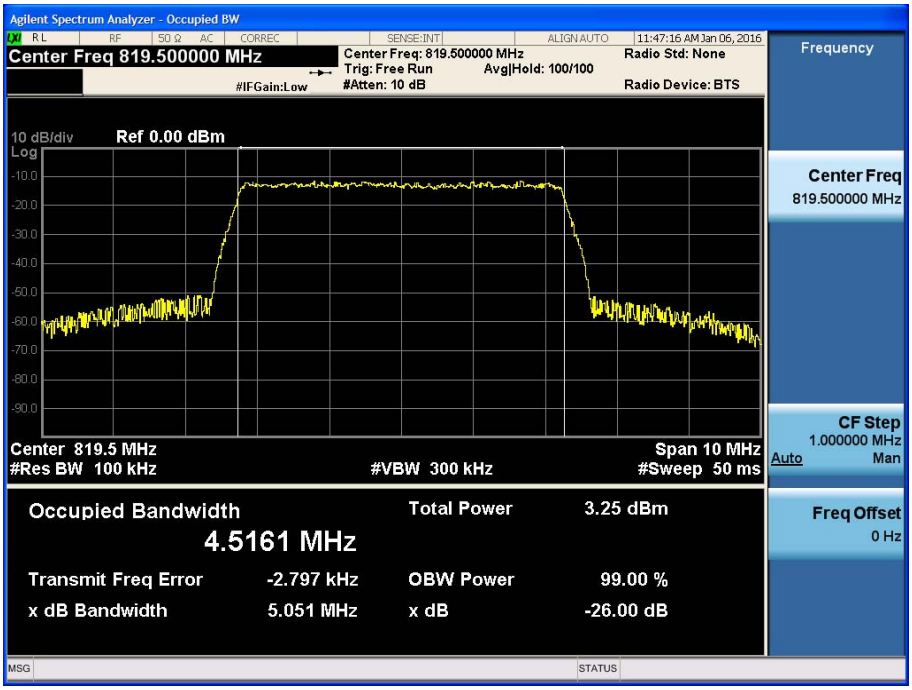
[800 Band AGC threshold Uplink Output CDMA 1.25 MHz Middle]



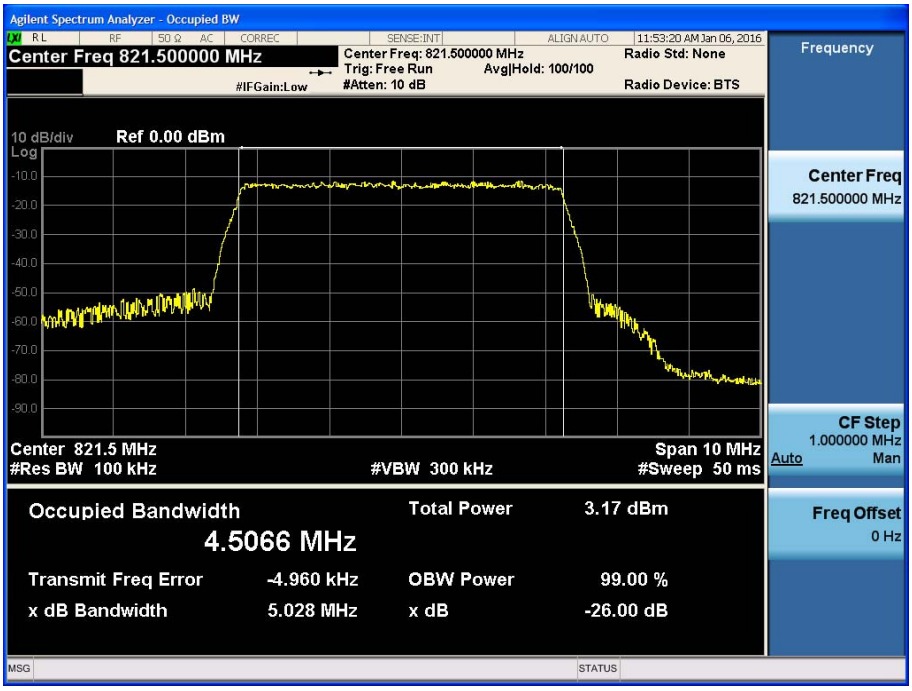
[800 Band AGC threshold Uplink Output CDMA 1.25 MHz High]



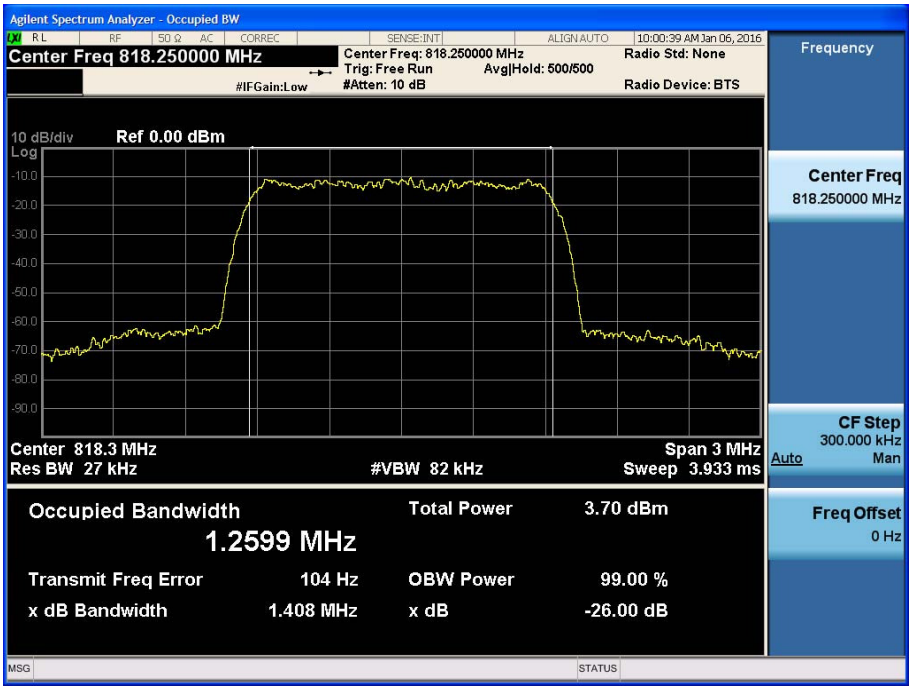
[800 Band +3 dB above the AGC threshold Uplink Output LTE 5 MHz Low]



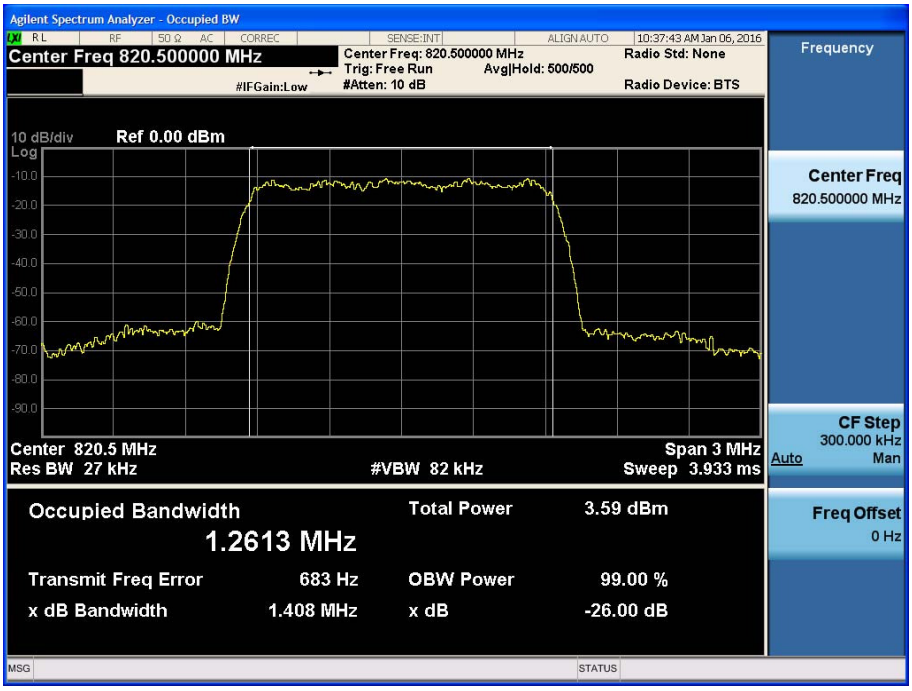
[800 Band +3 dB above the AGC threshold Uplink Output LTE 5 MHz High]



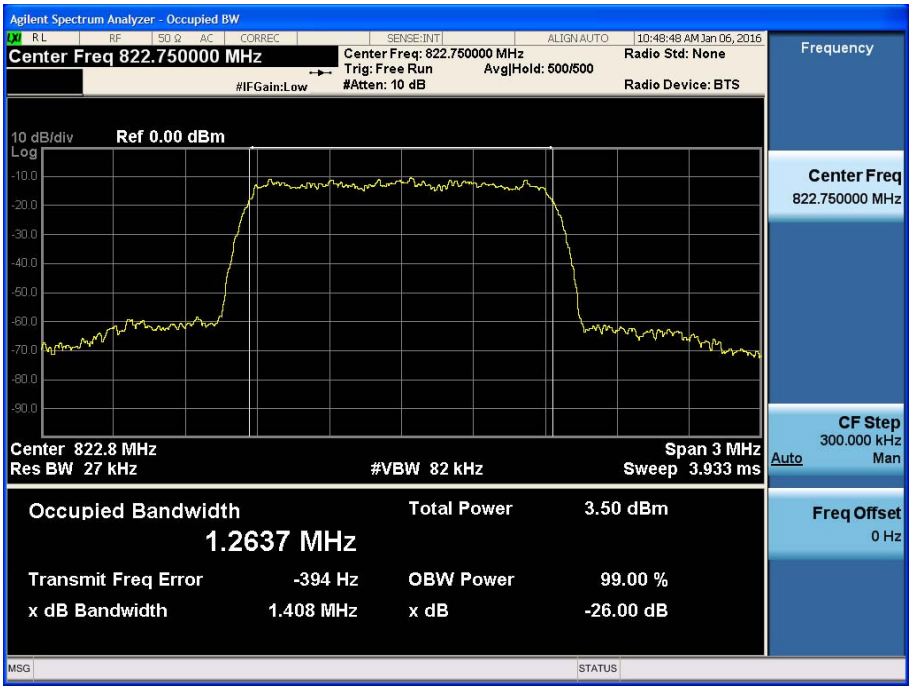
[800 Band +3 dB above the AGC threshold Uplink Output CDMA 1.25 MHz Low]



[800 Band +3 dB above the AGC threshold Uplink Output CDMA 1.25 MHz Middle]

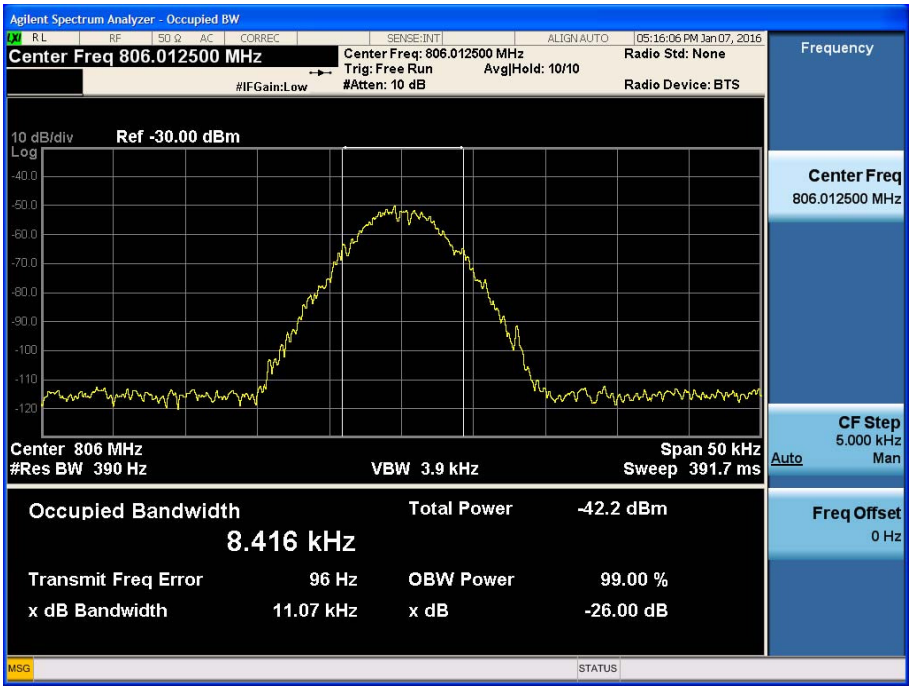


[800 Band +3 dB above the AGC threshold Uplink Output CDMA 1.25 MHz High]

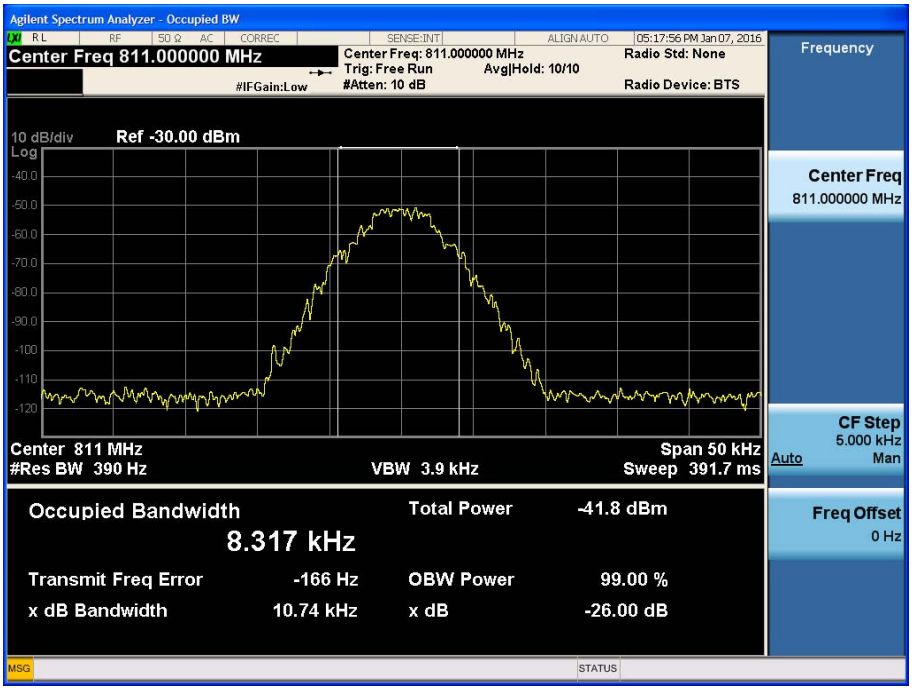


800 MHz Band_P25, FM UL

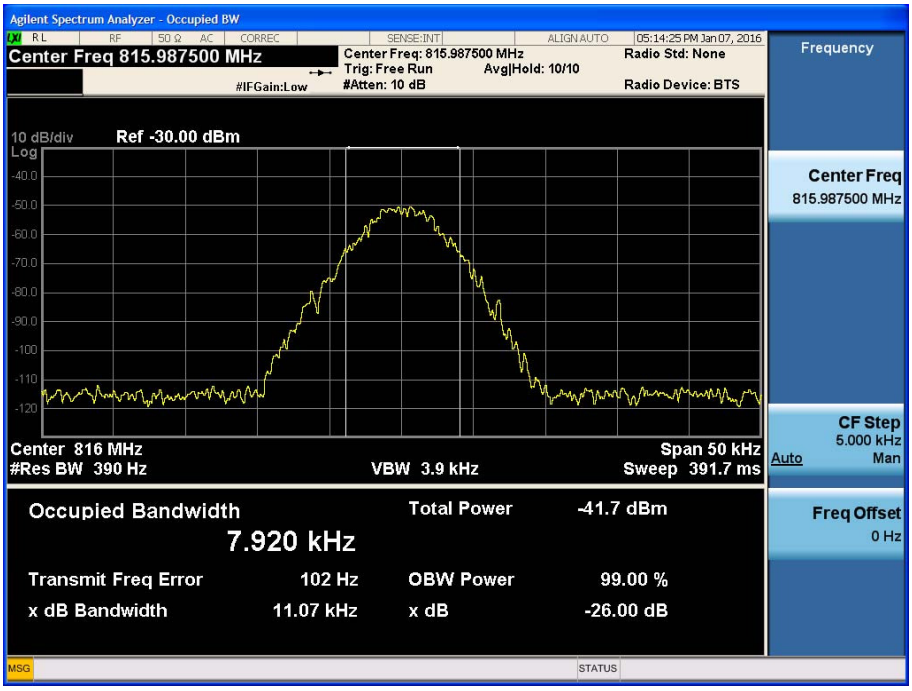
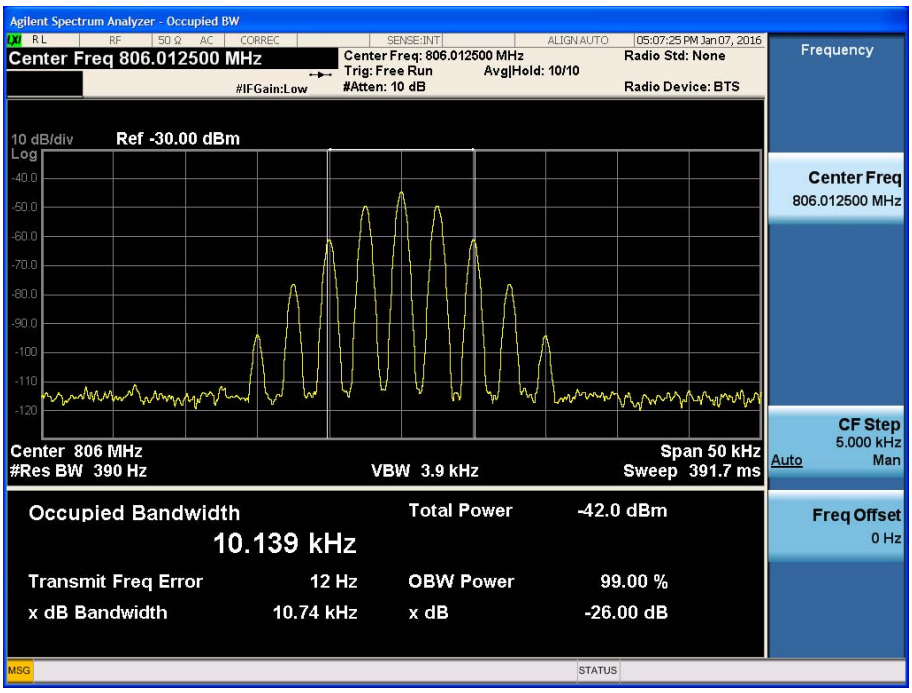
[800 Band AGC threshold Uplink Input P25 Low]



[800 Band AGC threshold Uplink Input P25 Middle]



[800 Band AGC threshold Uplink Input P25 High]



[800 Band AGC threshold Uplink Input FM Low]