

FCC REPORT

FCC Class II Permissive Change

Applicant Name:
SAMSUNG Electronics Co.,Ltd.**Date of Issue:**
December 29, 2017**Address:**
129, Samsung-ro, Yeongtong-gu, Suwon-si,
Gyeonggi-do, 16677, Rep. of Korea**Test Site/Location:**
HCT CO., LTD.,
74, Seoicheon-ro 578beon-gil, Majang-myeon,
Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA**Report No.:** HCT-R-1712-F009-1**FCC ID:** A3LRFD01F-26A**APPLICANT:** SAMSUNG Electronics Co.,Ltd.**FCC Model(s):** RFD01F-26A
EUT Type: RRU (RFD01F)
Frequency of Operation: 862 – 869 MHz
TX Output Power : 80 W (20 W *4 paths)**Emission Designator:**

Mode	Tx Frequency (MHz)	Emission Designator
		256QAM (W7D)
LTE – 3 MHz Bandwidth	862 ~ 869	2M73W7D
LTE – 5 MHz Bandwidth	862 ~ 869	4M51W7D

FCC Rule Part(s): FCC CFR 47 Part 2, 90**Data of Test:** November 07, 2017 ~ November 30, 2017**Note:** Refer to existing report 'HCT-R-1702-F001-2' for data not included.**Engineering Statement:**

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of FCC Part 27 of the FCC Rules under normal use and maintenance.

**Report prepared by : Kyung Soo Kang**
Engineer of Telecommunication testing center**Approved by : Yong Hyun Lee**
Manager of Telecommunication testing center

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1712-F009	December 14, 2017	- First Approval Report
HCT-R-1712-F009-1	December 29, 2017	- Adding a note to output power test processor about the sum power tolerance.

Table of Contents

1. GENERAL INFORMATION.....	4
1.1. CLIENT INFORMATION	4
1.2. PRODUCT INFORMATION	4
2. FACILITIES AND ACCREDITATIONS	5
2.1. FACILITIES	5
2.2. EQUIPMENT	5
3. TEST SPECIFICATIONS.....	6
3.1. STANDARDS	6
3.2. MODE OF OPERATION DURING THE TEST.....	6
3.3. MAXIMUM MEASUREMENTUNCERTAINTY	7
3.4. STANDARDS ENVIRONMENTAL TEST CONDITIONS	7
4. TEST EQUIPMENT	8
5. CONDUCTED OUTPUT POWER	9
6. OCCUPIED BANDWIDTH	31
7. SPURIOUS EMISSION AT ANTENNA TERMINAL.....	50
8. RADIATED SPURIOUS EMISSION	108
9. FREQUECNY STABILITY	110

1. GENERAL INFORMATION

1.1. CLIENT INFORMATION

Company	Samsung Electronics Co., Ltd.
Contact Point	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Contact person	Name: Hwan Youl Kim / Principal Research Engineer E-mail : hwanyoul.kim@samsung.com

1.2. PRODUCT INFORMATION

EUT Type	RRU (RFD01F)		
Power Supply	-48 VDC		
Emission Designator	Mode (MHz)	Tx Frequency (MHz)	Emission Designator
			256QAM (W7D)
	LTE Band 26 (3)	862 ~ 869	2M73W7D
	LTE Band 26 (5)	862 ~ 869	4M51W7D
Frequency Range	862 MHz ~ 869 MHz		
Conducted Output Power	Total 80 W (20 W * 4 port for LTE)		
Channel Bandwidths	LTE Band 26, 3 MHz / 5MHz Bandwidth		
MODULATION TYPE	256QAM		
ANTENNA SPECIFICATION	Manufacturer: KMW		
	Peak Gain : 8.2 dBd		

2. FACILITIES AND ACCREDITATIONS

2.1. FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 07, 2015 (Registration Number: 90661).

2.2. EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

3. TEST SPECIFICATIONS

3.1. STANDARDS

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 2, Part 90

SECTION	TEST ITEMS	RESULTS
§2.1046, §90.635	Conducted Output Power	Compliant
§2.1049	Occupied Bandwidth	Compliant
§2.1051, §90.691	Spurious Emissions at Antenna Terminals	Compliant
§2.1053, §90.691	Radiated Spurious Emissions.	Compliant
§2.1055, §90.213	Frequency Stability	Compliant

3.2. MODE OF OPERATION DURING THE TEST

The EUT is operated in a manner representative of the typical usage of the equipment.

During all testing, system components were manipulated within the confines of typical usage to maximize each emission. 256QAM modulation mode was tested. (Test result for other modulation method can be founded in existing reports.)

3.3. MAXIMUM MEASUREMENT UNCERTAINTY

The value of the measurement uncertainty for the measurement of each parameter.

Coverage factor $k = 2$, Confidence levels of 95 %

Description	Condition	Uncertainty
Conducted RF Output Power	-	± 0.72 dB
Occupied Bandwidth	OBW ≤ 20 MHz	± 52 kHz
Spurious Emissions at Antenna Terminals	-	± 1.08 dB
Radiated Spurious Emissions	$f \leq 1$ GHz	± 4.80 dB
	$f > 1$ GHz	± 6.07 dB
Frequency Stability	-	$\pm 1.22 \times 10^{-6}$

3.4. STANDARDS ENVIRONMENTAL TEST CONDITIONS

Temperature :	+ 15 °C to + 35 °C
Relative humidity:	30 % to 60 %
Air pressure	860 mbar to 1 060 mbar

4. TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Agilent	N9020A / Spectrum Analyzer	09/15/2017	Annual	MY46471250
Weinschel	67-30-33 / Fixed Attenuator	02/09/2017	Annual	CC7264
Weinschel	67-30-33 / Fixed Attenuator	02/09/2017	Annual	BU5347
Weinschel	67-30-33 / Fixed Attenuator	09/14/2017	Annual	N/A
Weinschel	67-30-33 / Fixed Attenuator	09/14/2017	Annual	N/A
Rohde&Schwarz	ATT / 10dB Attenuator	08/21/2017	Annual	N/A
KIKUSUI	PWR800L / DC Power Supply	03/28/2017	Annual	RE001154
KIKUSUI	PWR800L / DC Power Supply	07/18/2017	Annual	RK000880
NANGYEUL CO., LTD.	NY-THR18750 / Temperature and Humidity Chamber	10/21/2017	Annual	NY-2009012201A
11511Audix	AM4000 / Antenna Position Tower	N/A	N/A	N/A
Innco system	CT0800 / Turn Table	N/A	N/A	N/A
Audix	EM1000 / Controller	N/A	N/A	060520
Rohde & Schwarz	Loop Antenna	04/19/2017	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	04/06/2017	Biennial	760
Schwarzbeck	BBHA 9120D / Horn Antenna	06/30/2017	Biennial	9120D-1300
Rohde & Schwarz	FSP / Spectrum Analyzer	09/21/2017	Annual	836650/016
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/27/2017	Annual	101068-SZ
Wainwright Instruments	WHKX10-900-1000-15000-40SS	07/21/2017	Annual	5
CERNEX	CBLU1183540 / Power Amplifier	01/25/2017	Annual	24614
CERNEX	CBL06185030 / Power Amplifier	01/25/2017	Annual	24615

5. CONDUCTED OUTPUT POWER

Test Requirements:

§ 2.1046 Measurements required: RF power output:

- (a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in § 2.1033(c)(8). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.
- (b) For single sideband, independent sideband, and single channel, controlled carrier radio telephone transmitters, the procedure specified in paragraph (a) of this section shall be employed and, in addition, the transmitter shall be modulated during the test as specified and as applicable in § 2.1046 (b) (1-5). In all tests, the input level of the modulating signal shall be such as to develop rated peak envelope power or carrier power, as appropriate, for the transmitter.
- (c) For measurements conducted pursuant to paragraphs (a) and (b) of this section, all calculations and methods used by the applicant for determining carrier power or peak envelope power, as appropriate, on the basis of measured power in the radio frequency load attached to the transmitter output terminals shall be shown. Under the test conditions specified, no components of the emission spectrum shall exceed the limits specified in the applicable rule parts as necessary for meeting occupied bandwidth or emission limitations.

§90.635 Limitations on power and antenna height.

- (a) The effective radiated power and antenna height for base stations may not exceed 1 kilowatt (30 dBw) and 304 m. (1,000 ft.) above average terrain (AAT), respectively, or the equivalent thereof as determined from the Table. These are maximum values, and applicants will be required to justify power levels and antenna heights requested.
- (b) The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

Table—Equivalent Power and Antenna Heights for Base Stations in the 851-869 MHz and 935-940 MHz Bands Which Have a Requirement for a 32 km (20 mi) Service Area Radius

Antenna height (ATT) meters (feet)	Effective radiated power (watts)
Above 1,372 (4,500)	65
Above 1,220 (4,000) to 1,372 (4,500)	70
Above 1,067 (3,500) to 1,220 (4,000)	75
Above 915 (3,000) to 1,067 (3,500)	100

Above 763 (2,500) to 915 (3,000)	140
Above 610 (2,000) to 763 (2,500)	200
Above 458 (1,500) to 610 (2,000)	350
Above 305 (1,000) to 458 (1,500)	600
Up to 305 (1,000)	1,000

Test Procedures:

According to FCC §2.1046 (a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in § 2.1033(c). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

- 1) The radio frequency load attached to the EUT antenna terminal was 50 Ohm. The loss of the cables the test system is calibrated to correct the reading.
- 2) The spectrum analyzer was set to RMS Detector function and Average mode.
- 3) The resolution bandwidth of the spectrum analyzer was comparable to the emission bandwidth.
- 4) The conducted emission level is measured at each antenna port and then summed mathematically to determine the total emission level from the device.

Note:

- 1) Maximum ERP is sufficient level to pass the limit.
- 2) Sum data is in a tolerance of specification provide from manufacturer.

RF Output power tolerance: ± 1 dB (each port)

Maximum output power for one port: 25.177 W (43.01 dBm + 1 dB)

*Maximum output sum power: $25.177\text{ W} * 4 = 100.708\text{ W}$*

Measured sum maximum power: 94.956 W

The measured value is lower than the specification value.

Test Results:

LTE 3 MHz

Test Data at Downlink Port 0

Frequency (MHz)	Output Power	
	256QAM	
	dBm	W
863.50	43.35	21.627
865.50	43.73	23.605
867.50	43.53	22.542

Test Data at Downlink Port 1

Frequency (MHz)	Output Power	
	256QAM	
	dBm	W
863.50	43.93	24.717
865.50	43.30	21.380
867.50	43.23	21.038

Test Data at Downlink Port 2

Frequency (MHz)	Output Power	
	256QAM	
	dBm	W
863.50	43.79	23.933
865.50	43.31	21.429
867.50	43.84	24.210

Test Data at Downlink Port 3

Frequency (MHz)	Output Power	
	256QAM	
	dBm	W
863.50	43.87	24.378
865.50	43.46	22.182
867.50	43.42	21.979

Sum Data of Port 0, Port 1, Port 2 and Port 3

Frequency (MHz)	Output Power
	256QAM
	W
863.50	94.655
865.50	88.596
867.50	89.769

LTE 5 MHz

Test Data at Downlink Port 0

Frequency (MHz)	Output Power	
	256QAM	
	dBm	W
864.50	43.49	22.336
865.50	43.43	22.029
866.50	43.20	20.893

Test Data at Downlink Port 1

Frequency (MHz)	Output Power	
	256QAM	
	dBm	W
864.50	43.74	23.659
865.50	43.92	24.660
866.50	43.62	23.014

Test Data at Downlink Port 2

Frequency (MHz)	Output Power	
	256QAM	
	dBm	W
864.50	43.92	24.660
865.50	43.93	24.717
866.50	43.92	24.660

Test Data at Downlink Port 3

Frequency (MHz)	Output Power	
	256QAM	
	dBm	W
864.50	43.72	23.550
865.50	43.72	23.550
866.50	43.57	22.751

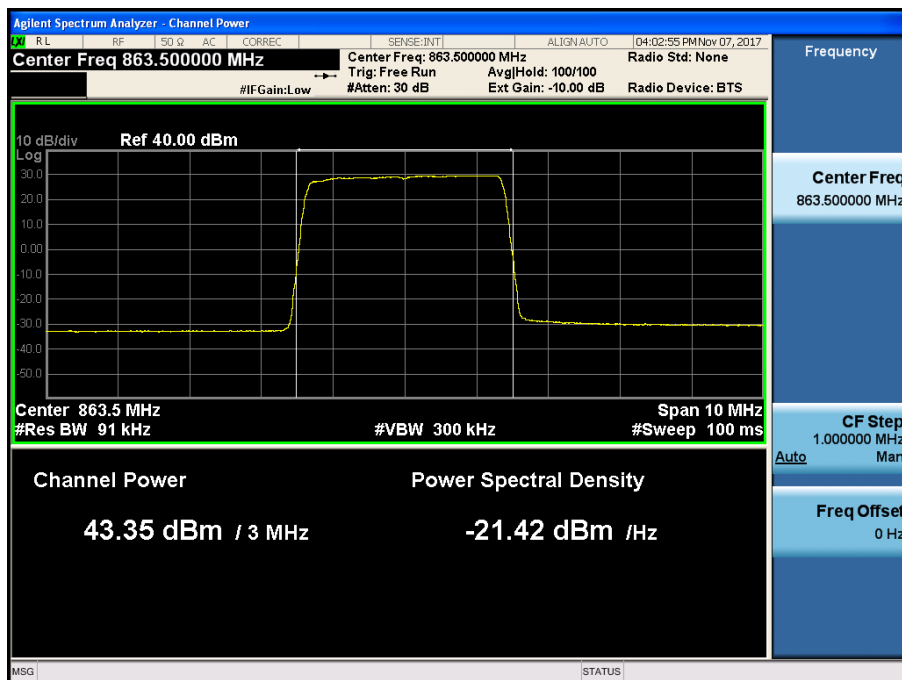
Sum Data of Port 0, Port 1, Port 2 and Port 3

Frequency (MHz)	Output Power
	256QAM
	W
863.50	94.205
865.50	94.956
867.50	91.318

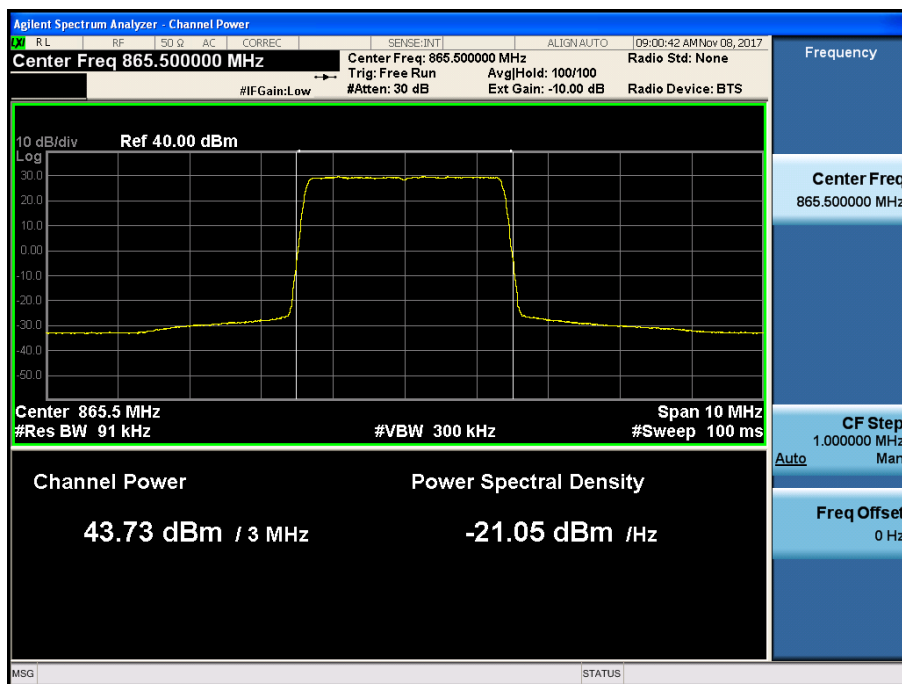
LTE 3 MHz

Plot Data for Output Port 0 (Conducted Output Power)

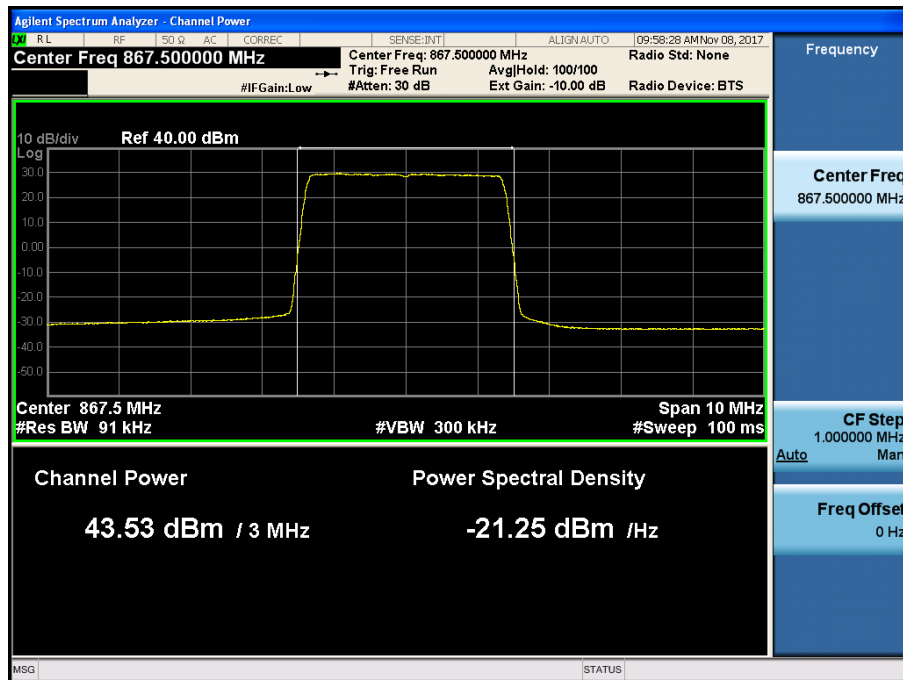
(256QAM Low Channel)



(256QAM Middle Channel)

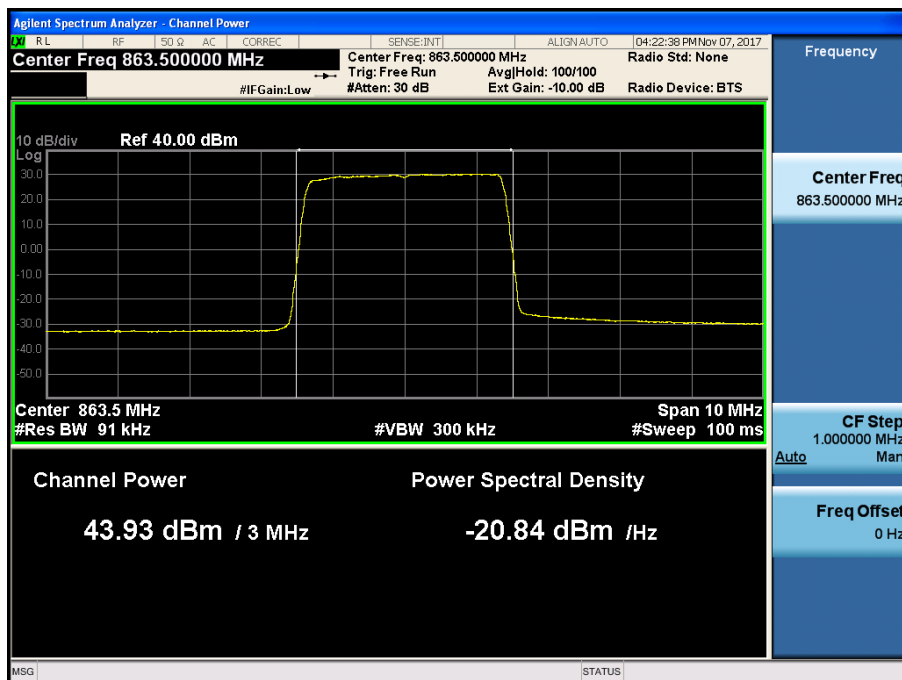


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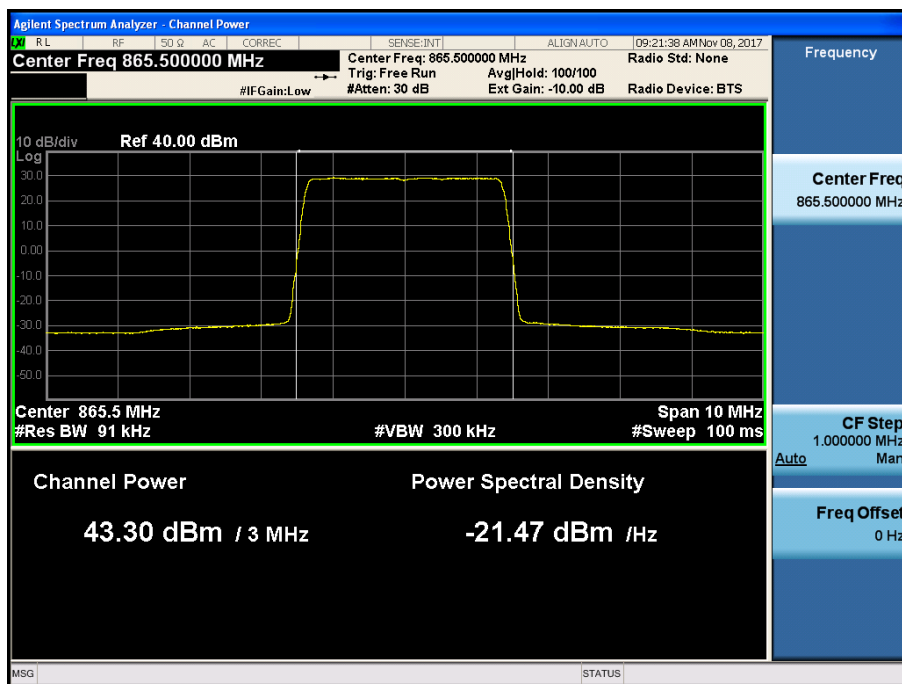


Plot Data for Output Port 1 (Conducted Output Power)

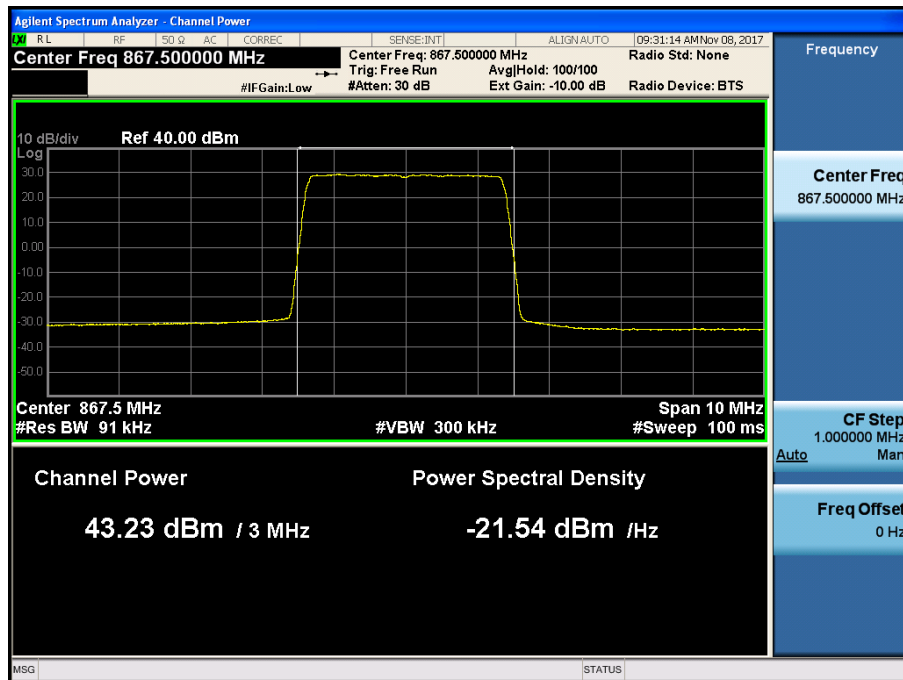
(256QAM Low Channel)



(256QAM Middle Channel)

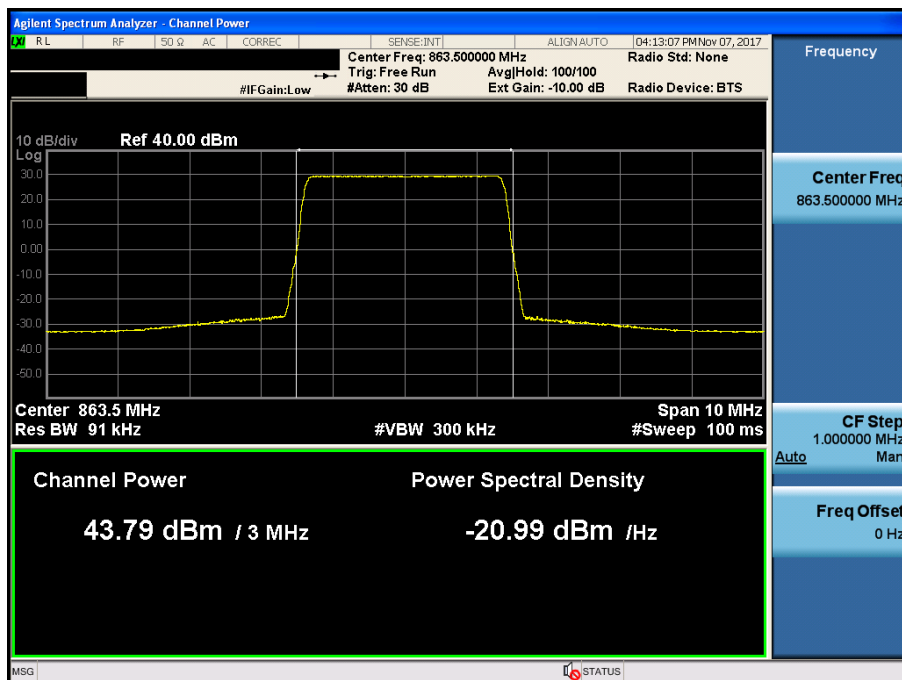


(256QAM High Channel)

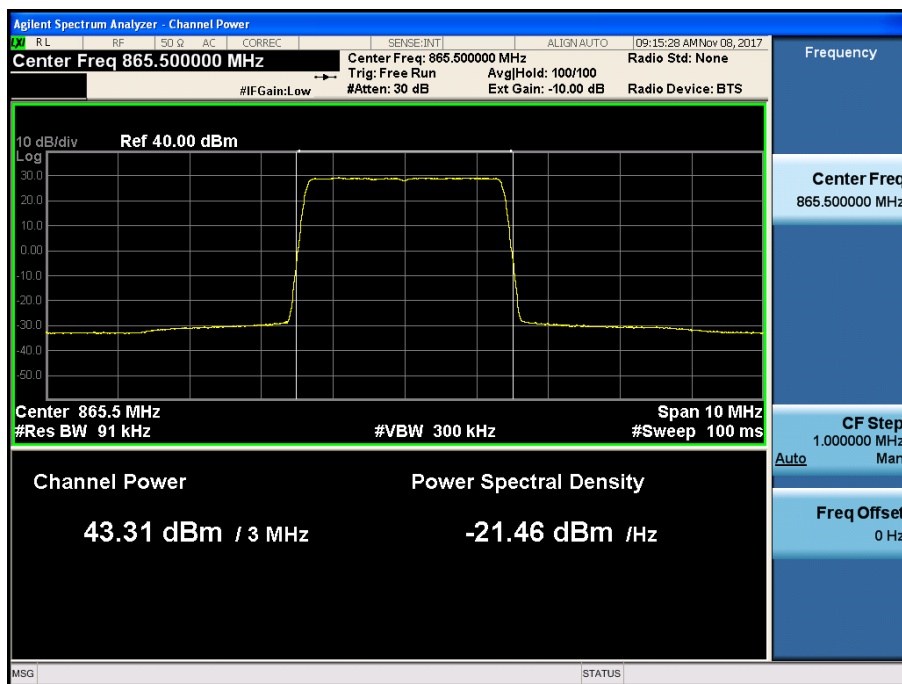


Plot Data for Output Port 2 (Conducted Output Power)

(256QAM Low Channel)

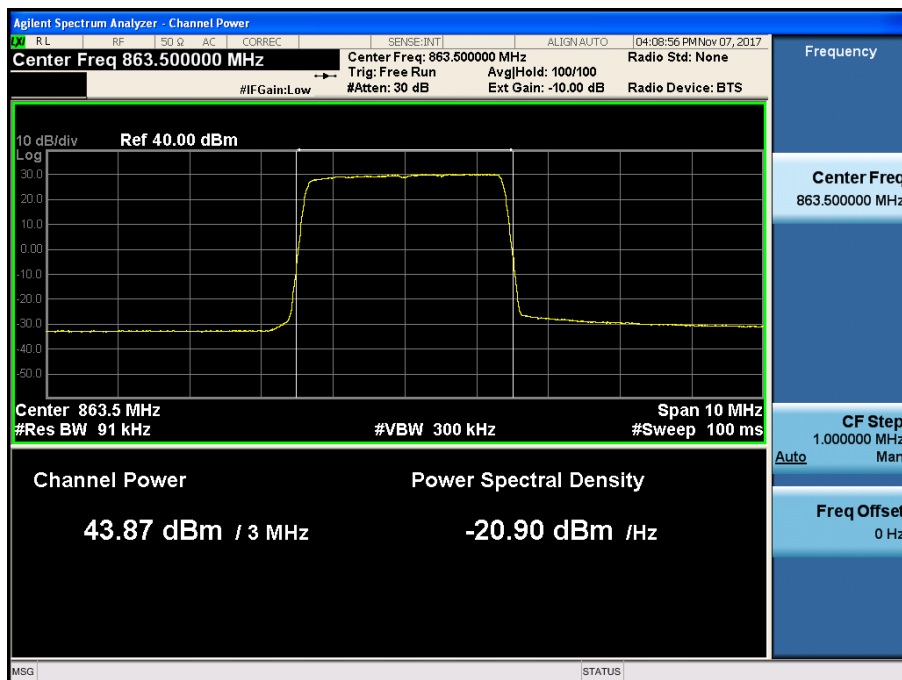


(256QAM Middle Channel)

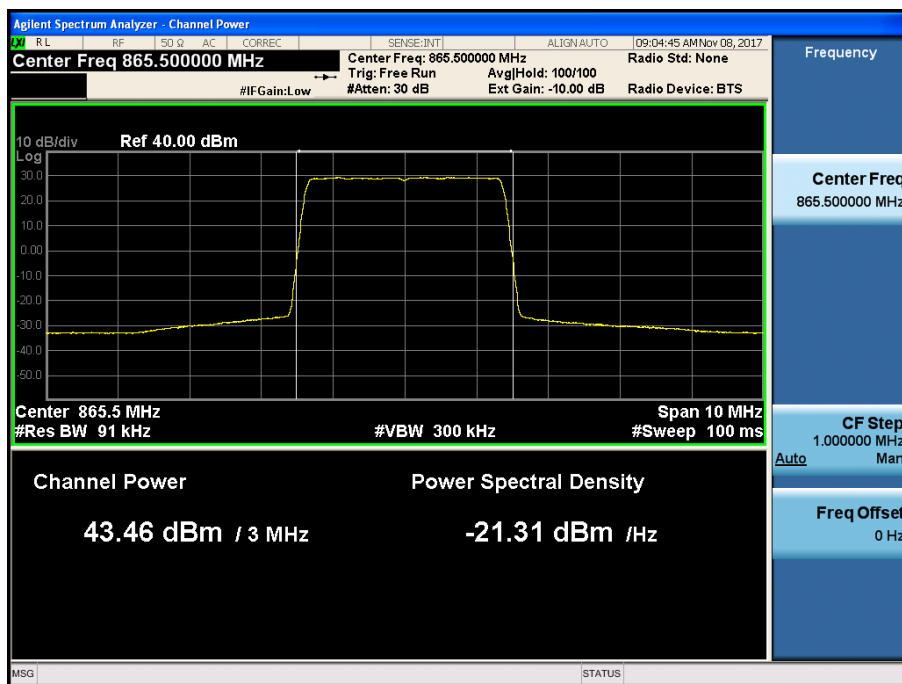


Plot Data for Output Port 3 (Conducted Output Power)

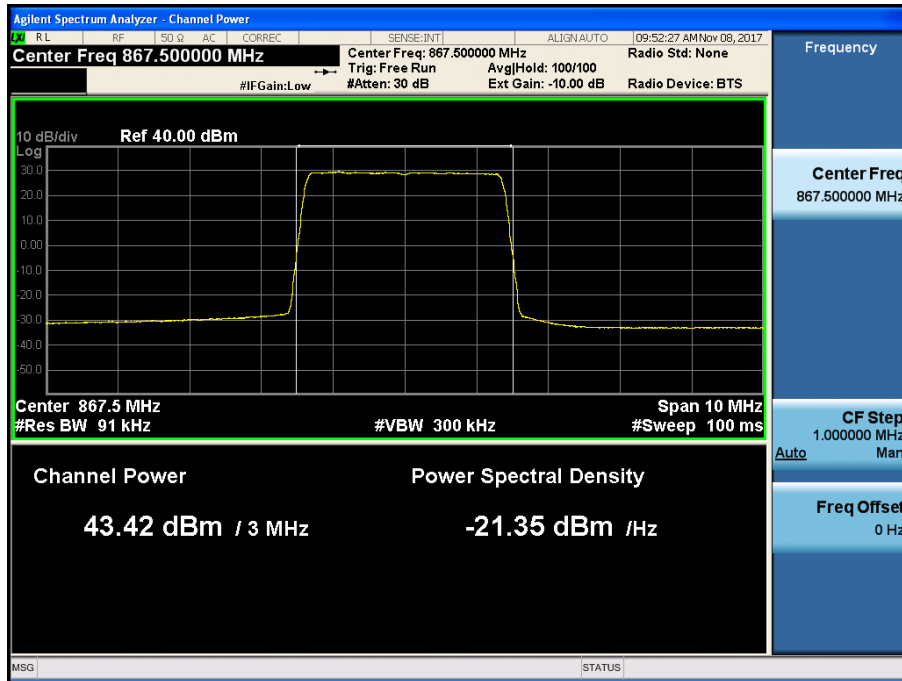
(256QAM Low Channel)



(256QAM Middle Channel)



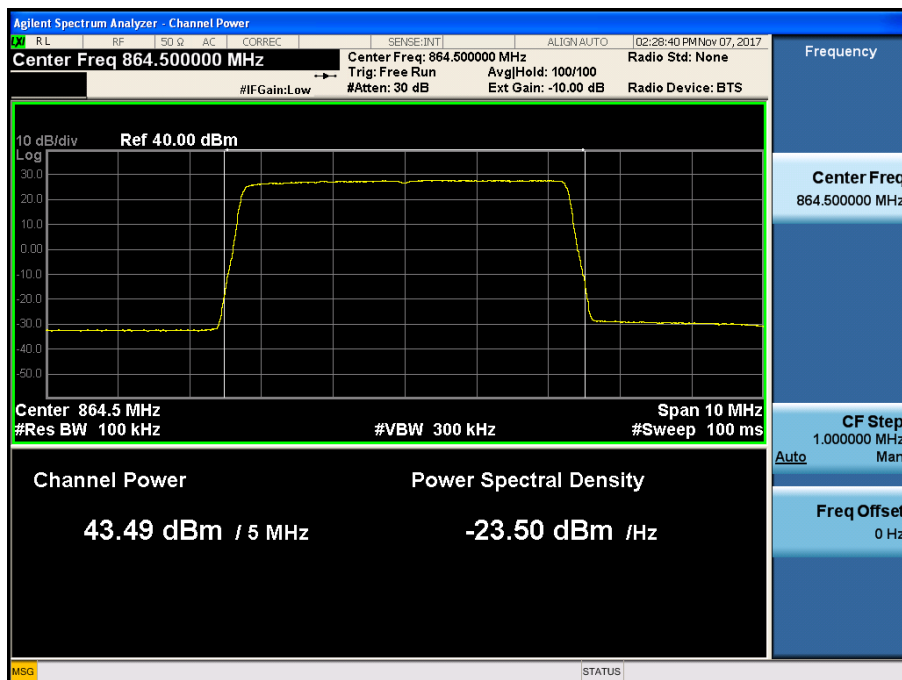
(256QAM High Channel)



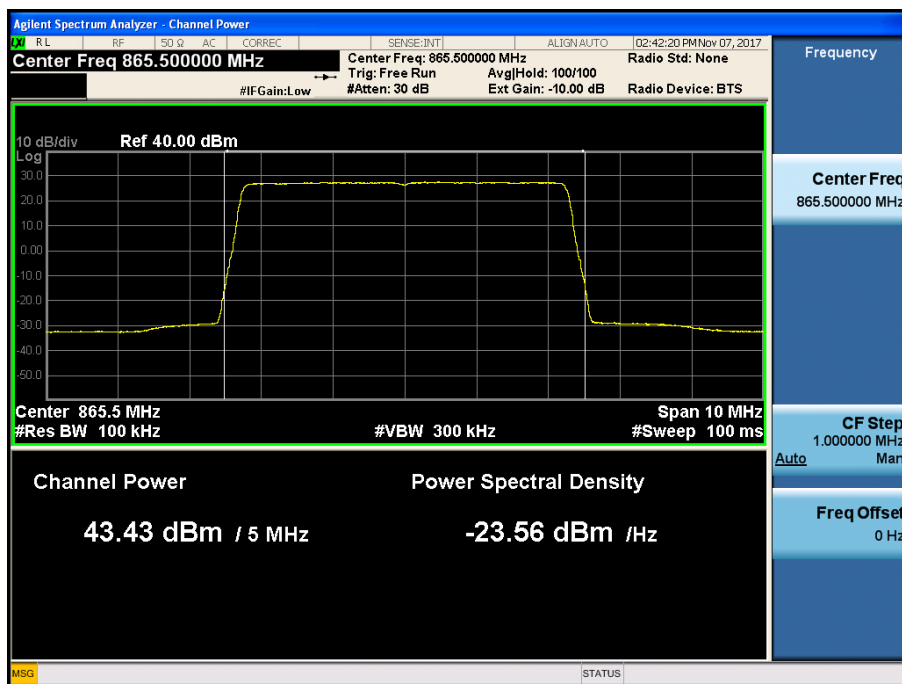
LTE 5 MHz

Plot Data for Output Port 0 (Conducted Output Power)

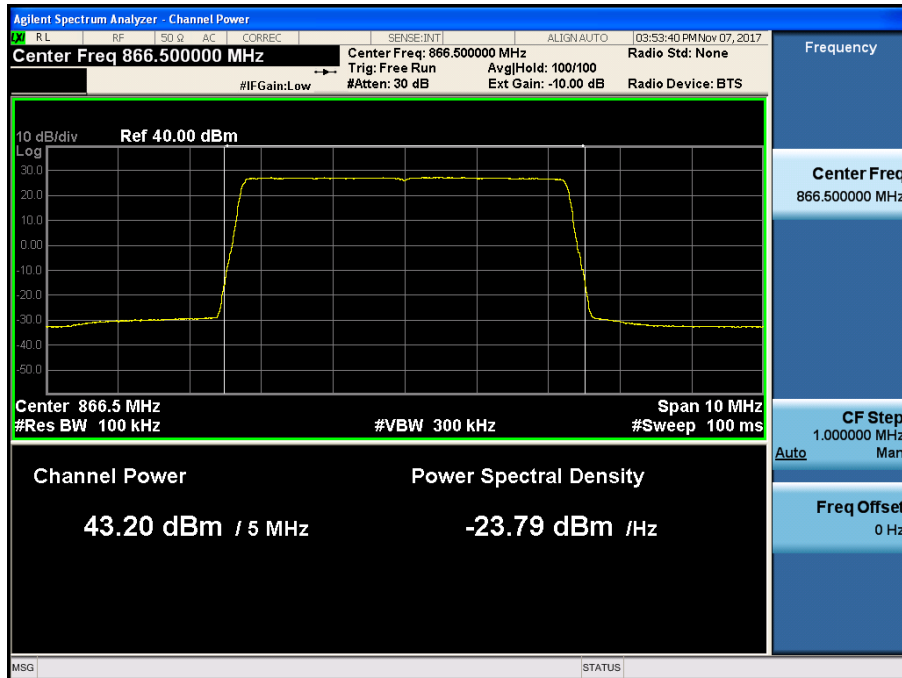
(256QAM Low Channel)



(256QAM Middle Channel)

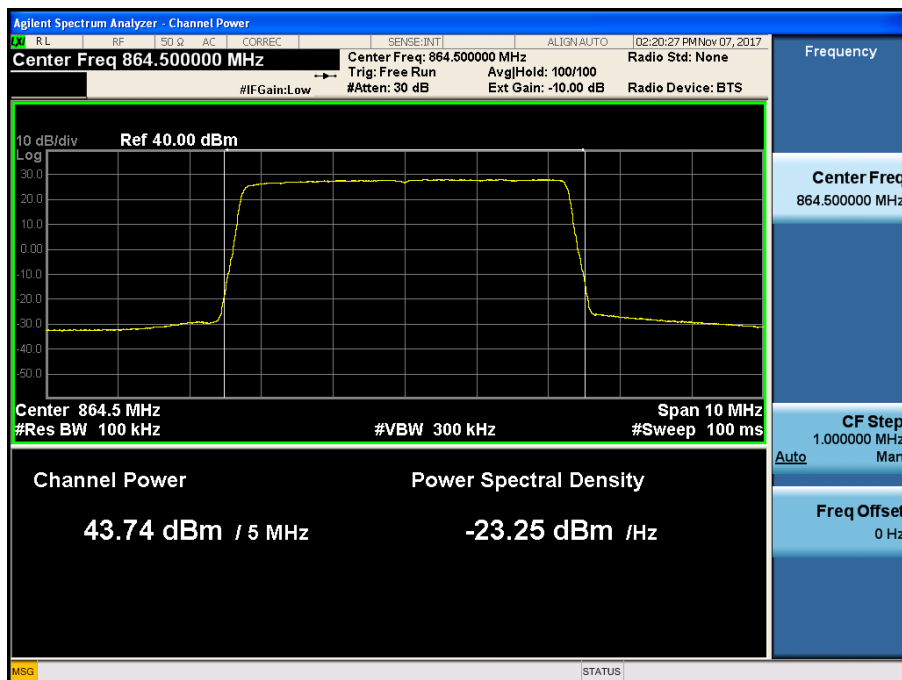


(256QAM High Channel)

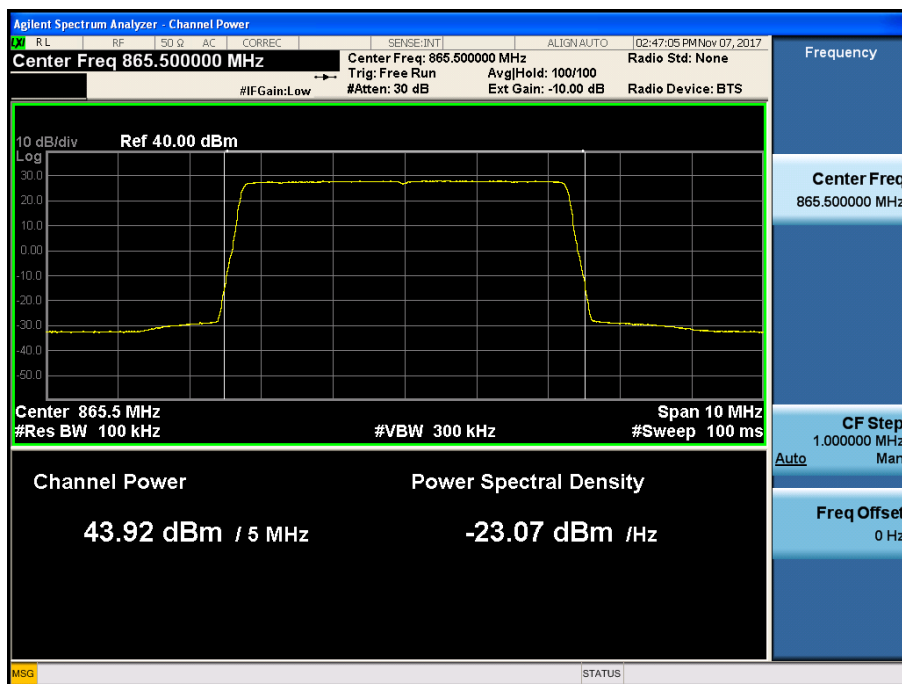


Plot Data for Output Port 1 (Conducted Output Power)

(256QAM Low Channel)

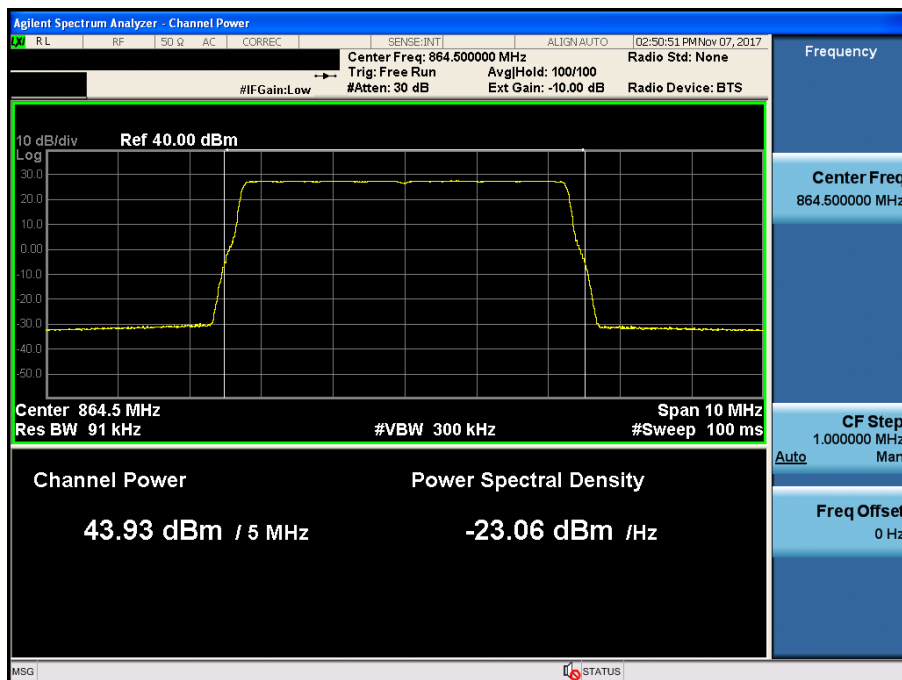


(256QAM Middle Channel)

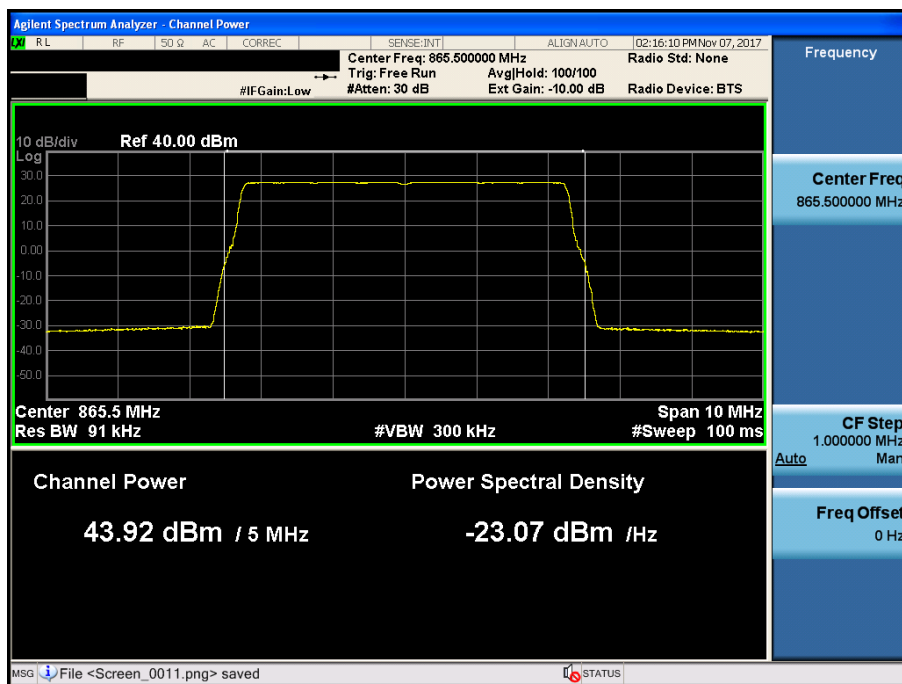


Plot Data for Output Port 2 (Conducted Output Power)

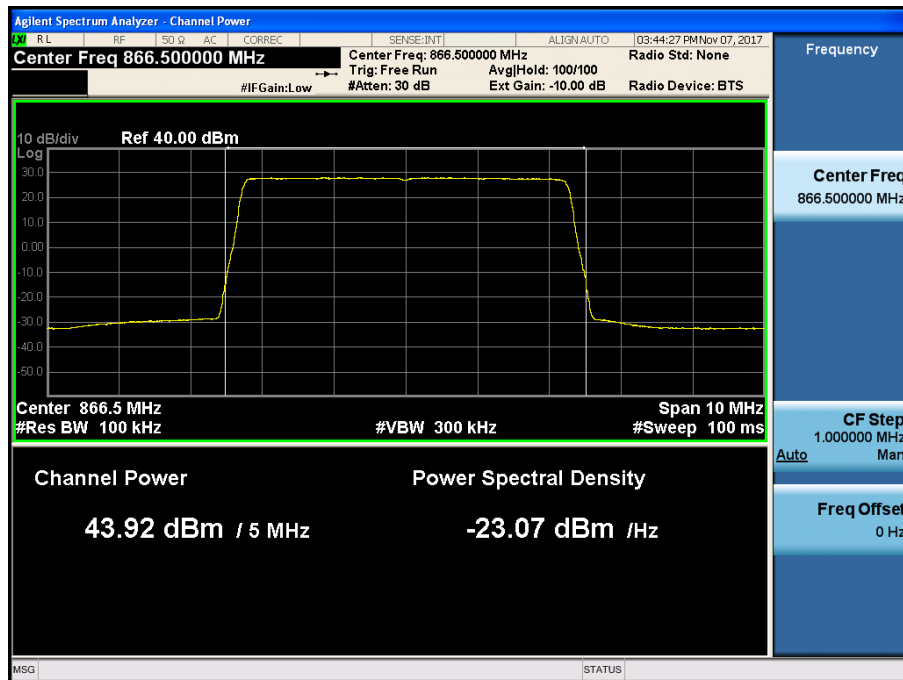
(256QAM Low Channel)



(256QAM Middle Channel)

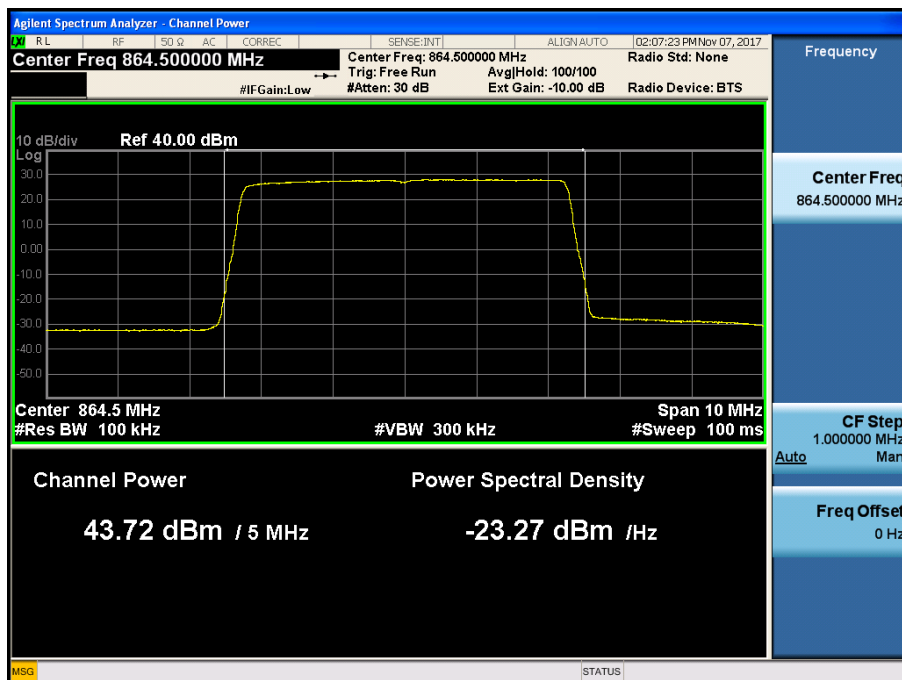


(256QAM High Channel)

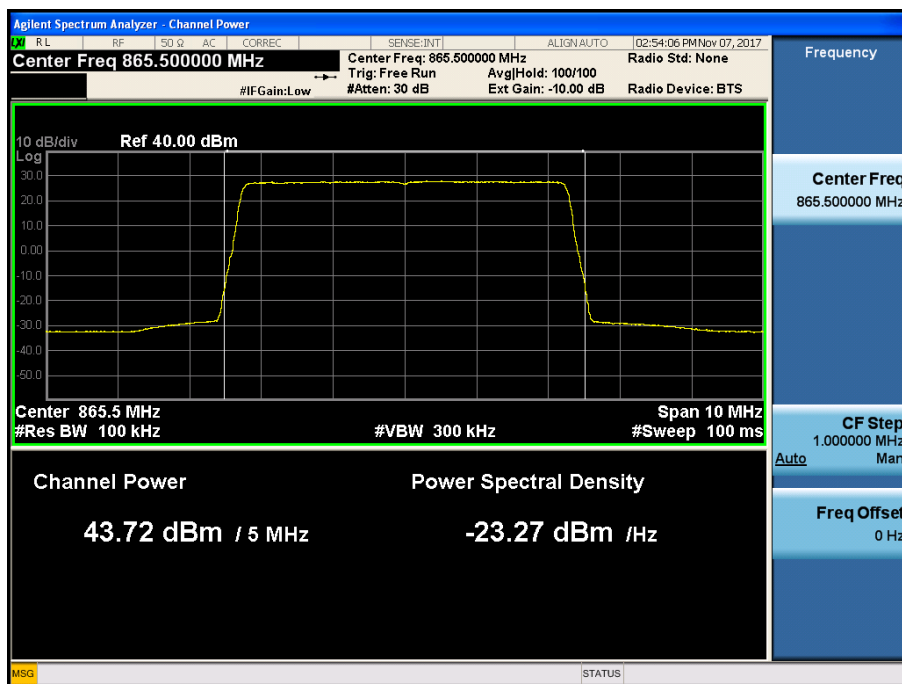


Plot Data for Output Port 3 (Conducted Output Power)

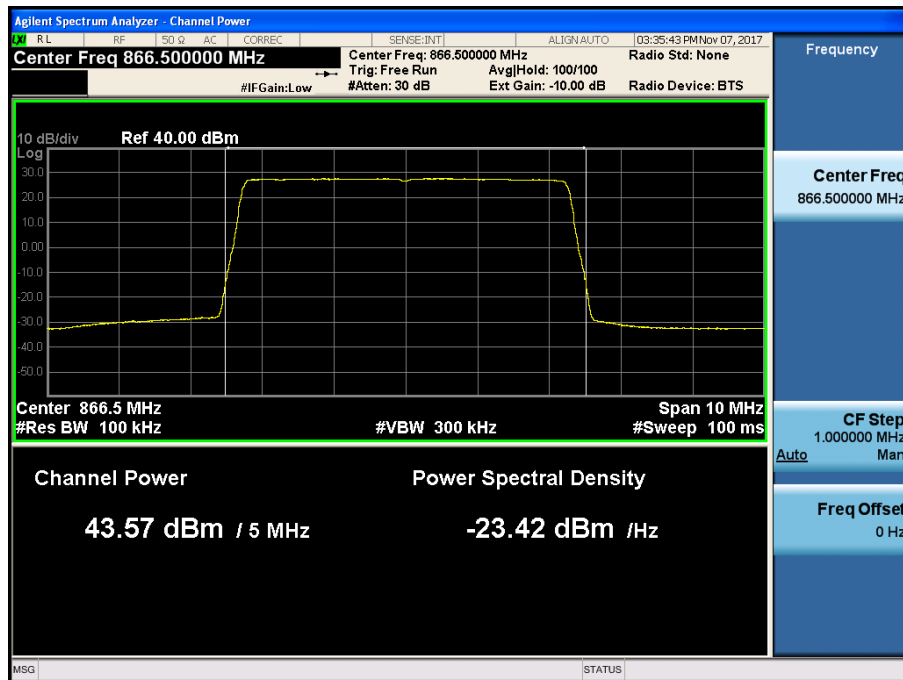
(256QAM Low Channel)



(256QAM Middle Channel)



(256QAM High Channel)



6. OCCUPIED BANDWIDTH

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 following conditions as applicable:

- (g) Transmitters in which the modulating baseband comprises not more than three independent channels—when modulated by the full complement of signals for which the transmitter is rated. The level of modulation for each channel should be set to that prescribed in rule parts applicable to the services for which the transmitter is intended. If specific modulation levels are not set forth in the rules, the tests should provide the manufacturer's maximum rated condition.
- (h) Transmitters employing digital modulation techniques—when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the user.

Test Procedures:

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation. The EUT was connected to a spectrum analyzer enabled with an occupied bandwidth function via its antenna port. Measurements were performed to determine the occupied bandwidth in accordance with FCC Part 2.1049. The occupied bandwidth was measured from the fundamental emission at the bottom, middle and top channels. The occupied bandwidth was measured using the built in occupied bandwidth function of the spectrum analyzer. It was set to measure the bandwidth where 99% of the signal power was contained. The analyzer automatically configures the measurement bandwidths to make an accurate measurement based on the channel bandwidth and channel spacing of the EUT.

Test Results:**LTE 3 MHz****Test Data at Output Port 0**

Frequency (MHz)	Occupied Bandwidth (MHz)
	256QAM
863.50	2.7117
865.50	2.7262
867.50	2.7272

Test Data at Output Port 1

Frequency (MHz)	Occupied Bandwidth (MHz)
	256QAM
863.50	2.7112
865.50	2.7273
867.50	2.7266

Test Data at Output Port 2

Frequency (MHz)	Occupied Bandwidth (MHz)
	256QAM
863.50	2.7147
865.50	2.7290
867.50	2.7267

Test Data at Output Port 3

Frequency (MHz)	Occupied Bandwidth (MHz)
	256QAM
863.50	2.7133
865.50	2.7296
867.50	2.7274

LTE 5 MHz

Test Data at Output Port 0

Frequency (MHz)	Occupied Bandwidth (MHz)
	256QAM
864.50	4.4910
865.50	4.5065
866.50	4.5054

Test Data at Output Port 1

Frequency (MHz)	Occupied Bandwidth (MHz)
	256QAM
864.50	4.4862
865.50	4.5055
866.50	4.5050

Test Data at Output Port 2

Frequency (MHz)	Occupied Bandwidth (MHz)
	256QAM
864.50	4.4898
865.50	4.5067
866.50	4.5055

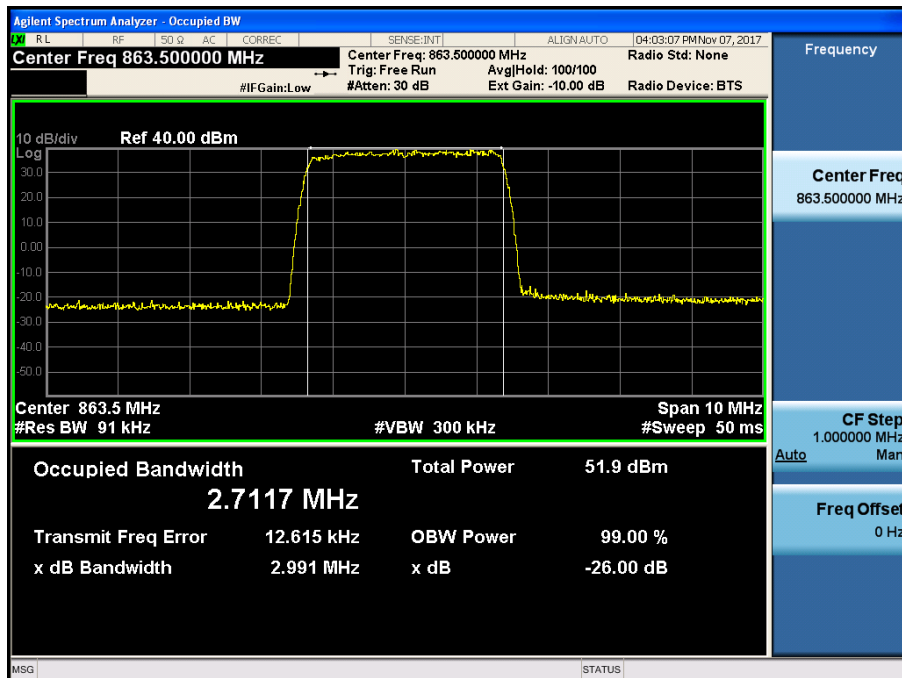
Test Data at Output Port 3

Frequency (MHz)	Occupied Bandwidth (MHz)
	256QAM
864.50	4.4952
865.50	4.5013
866.50	4.5034

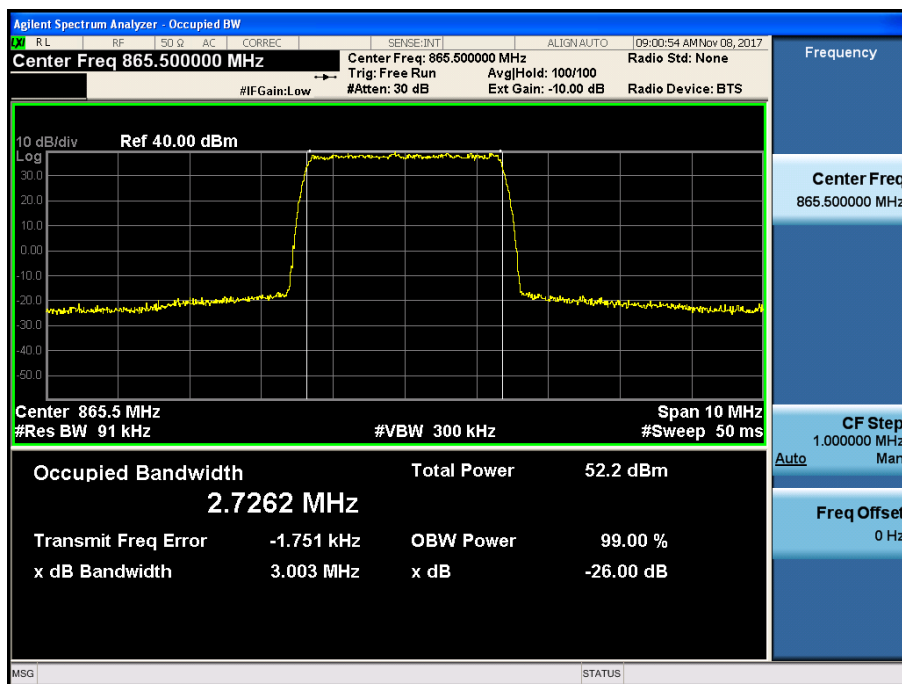
LTE 3 MHz

Test Plot at Output Port 0

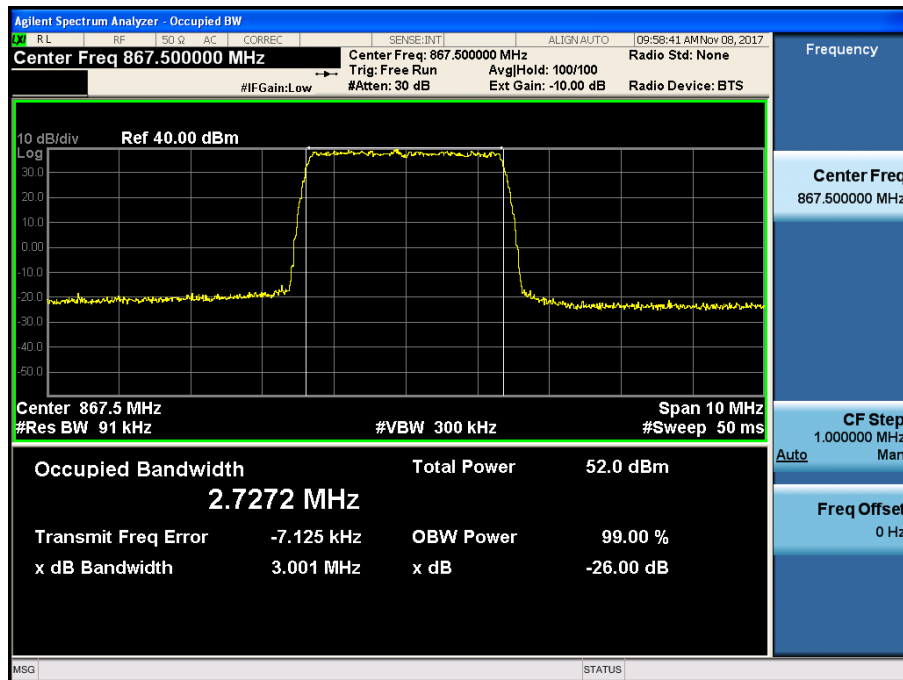
(256QAM Low Channel)



(256QAM Middle Channel)

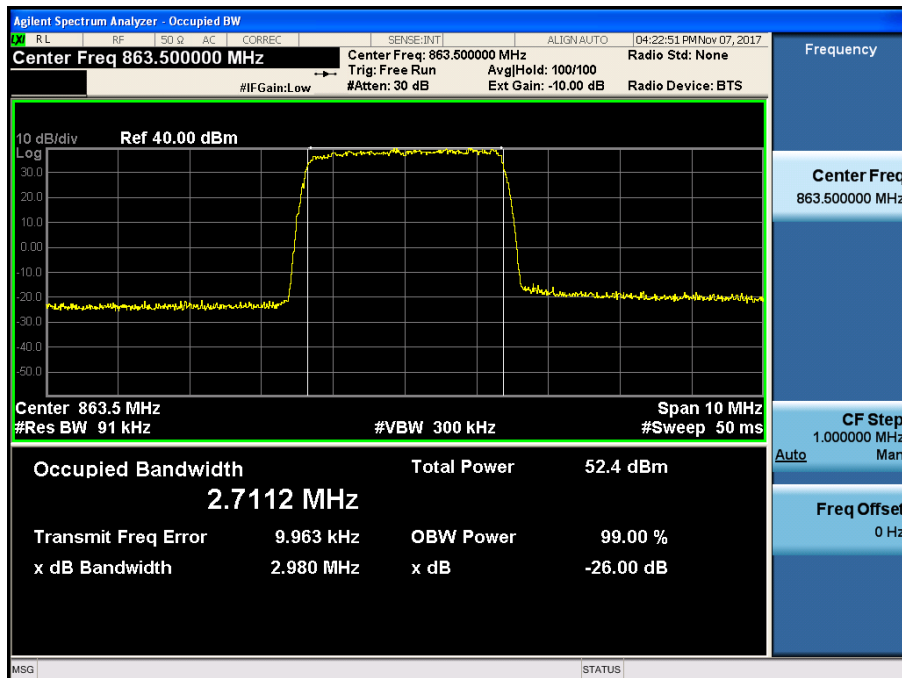


(256QAM High Channel)

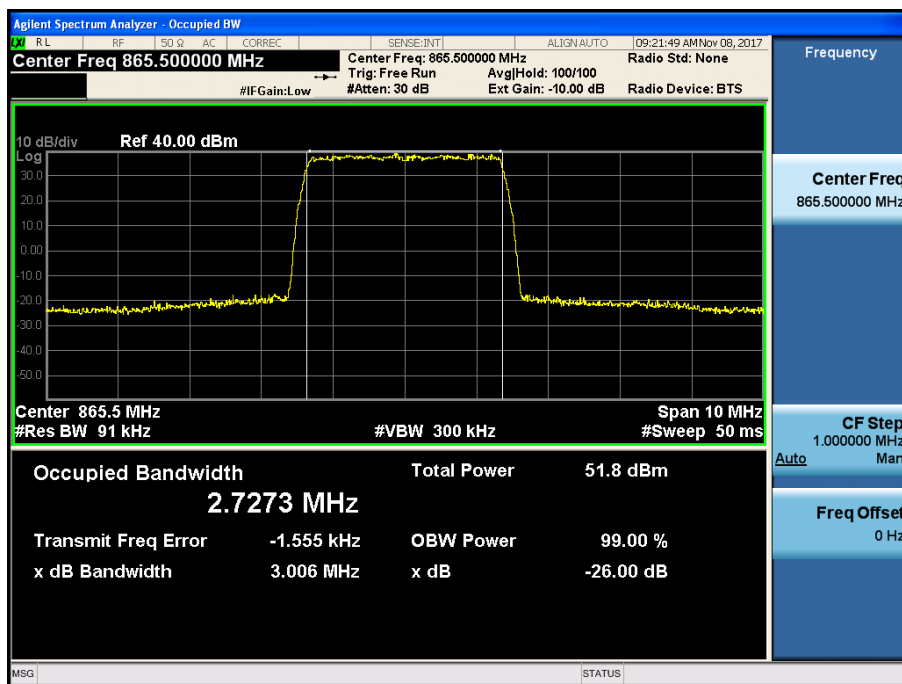


Test Plot at Output Port 1

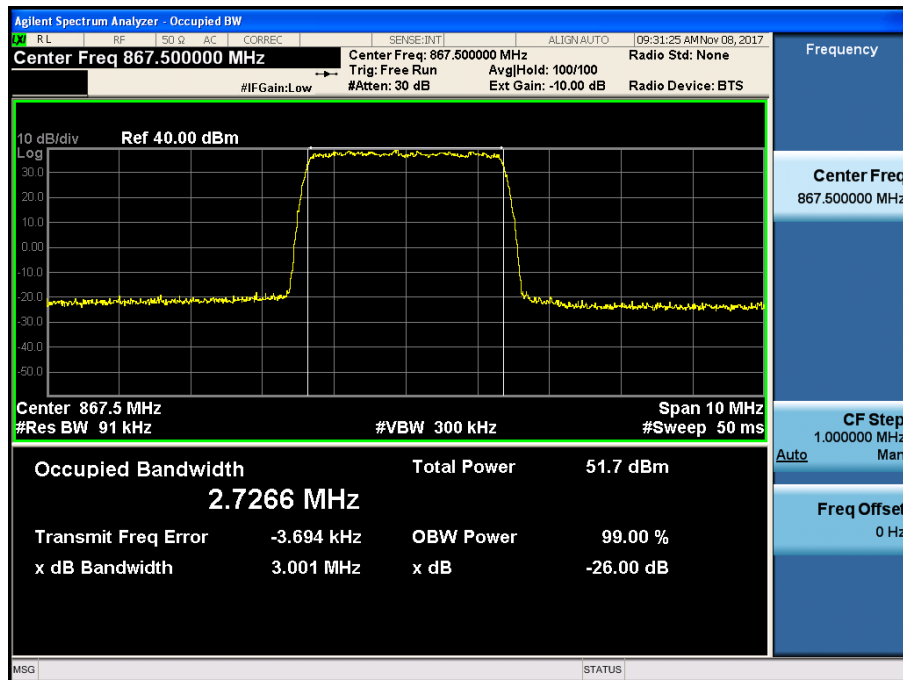
(256QAM Low Channel)



(256QAM Middle Channel)

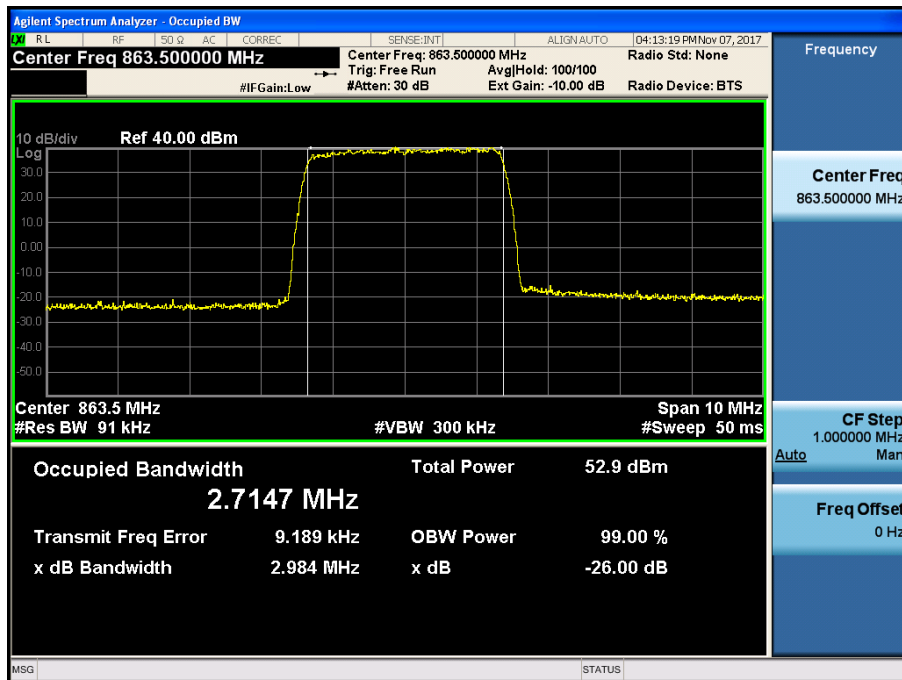


(256QAM High Channel)

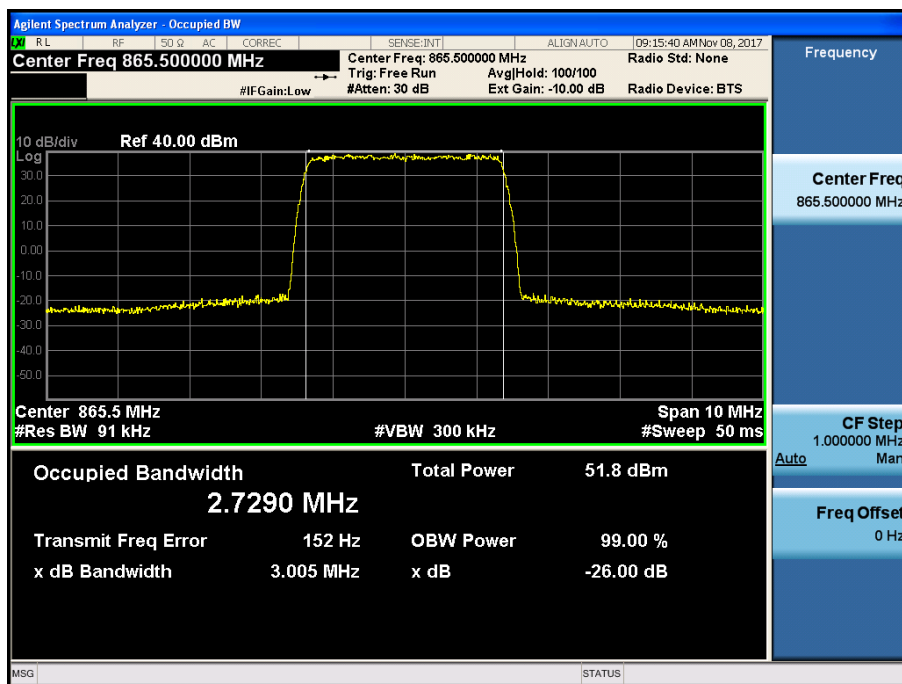


Test Plot at Output Port 2

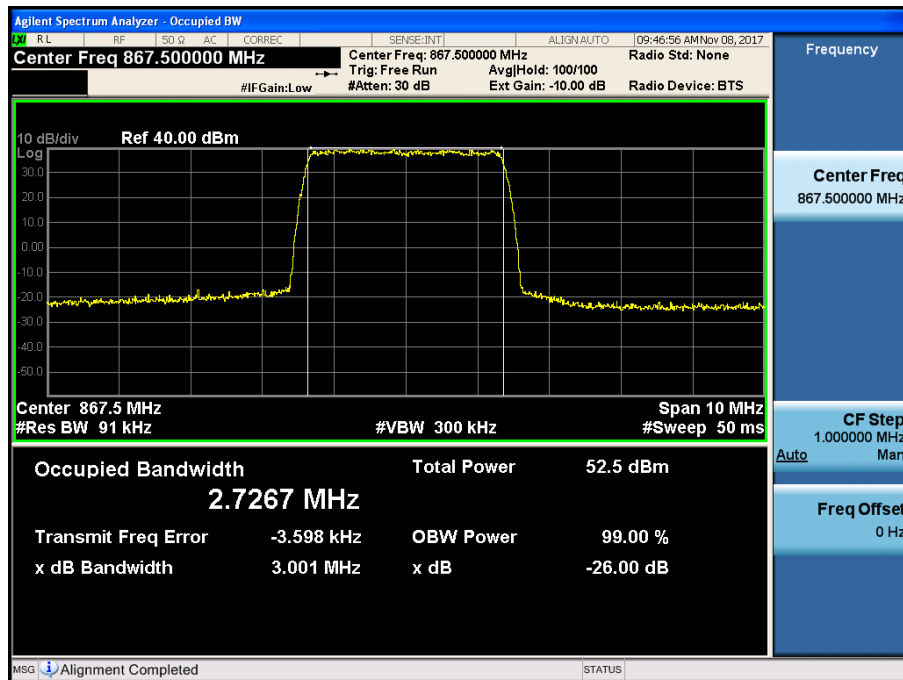
(256QAM Low Channel)



(256QAM Middle Channel)

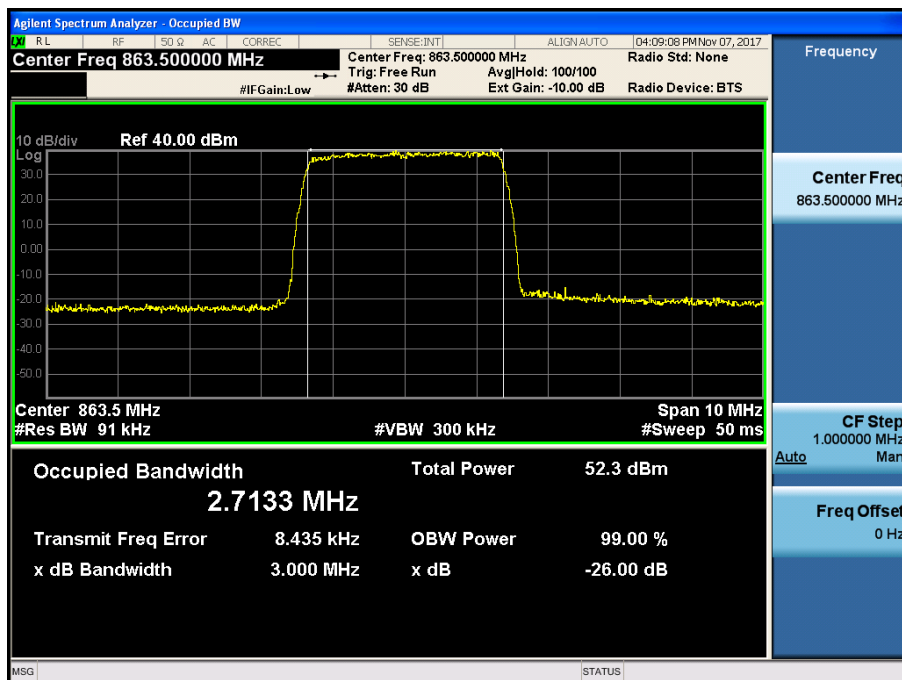


(256QAM High Channel)

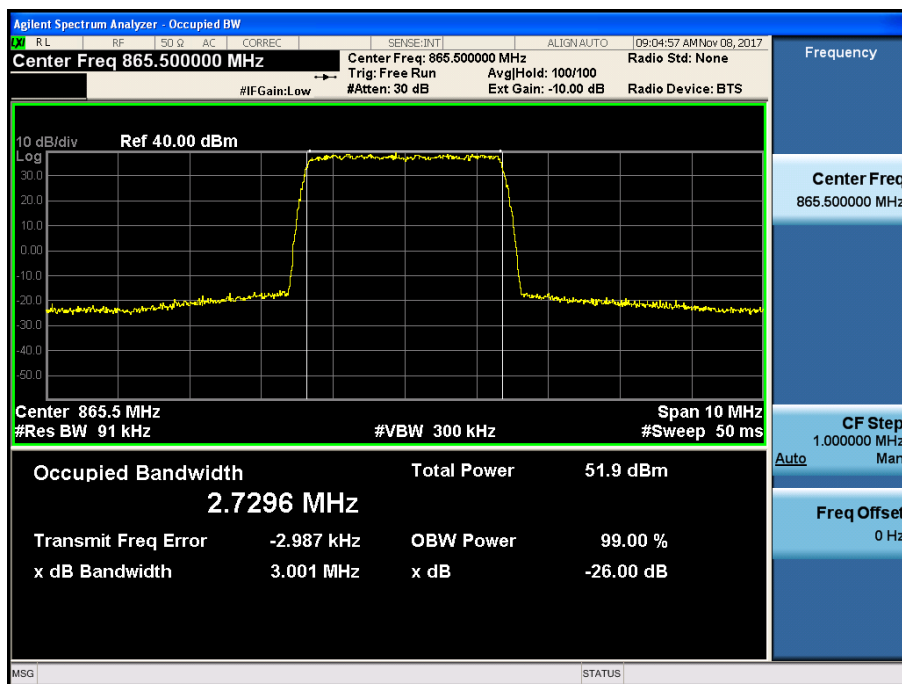


Test Plot at Output Port 3

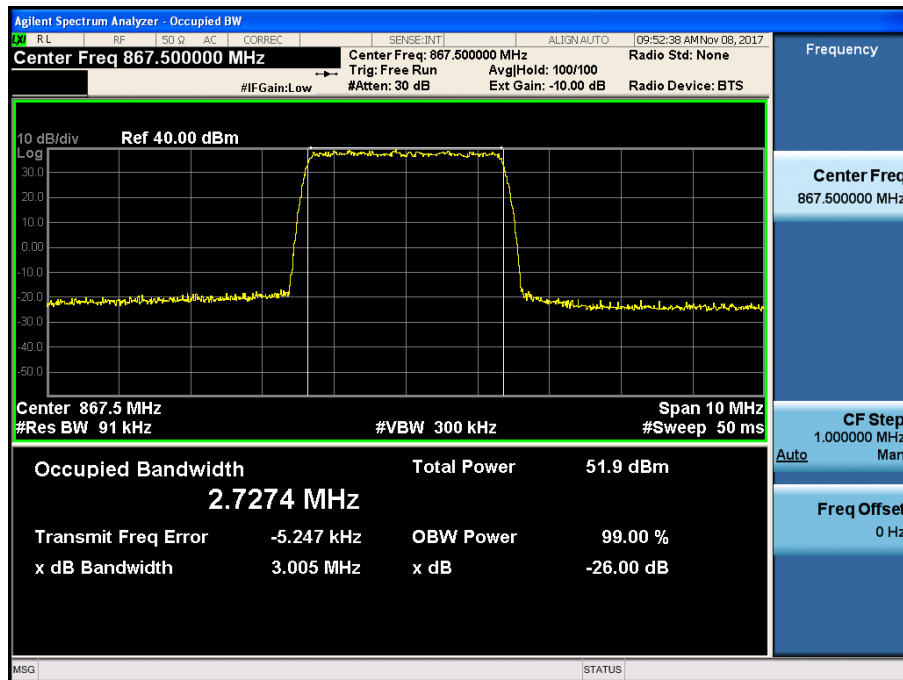
(256QAM Low Channel)



(256QAM Middle Channel)



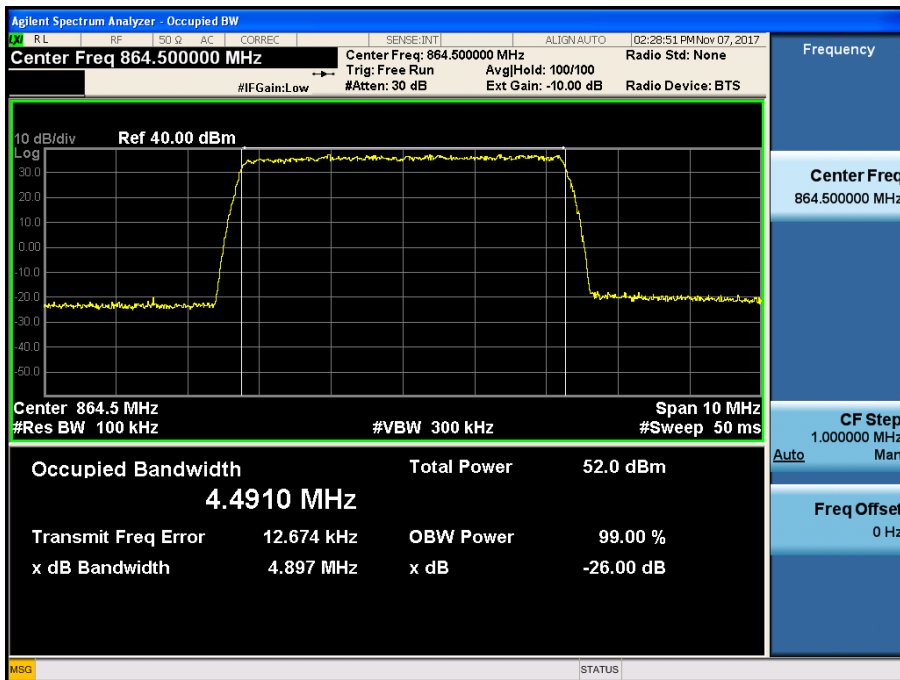
(256QAM High Channel)



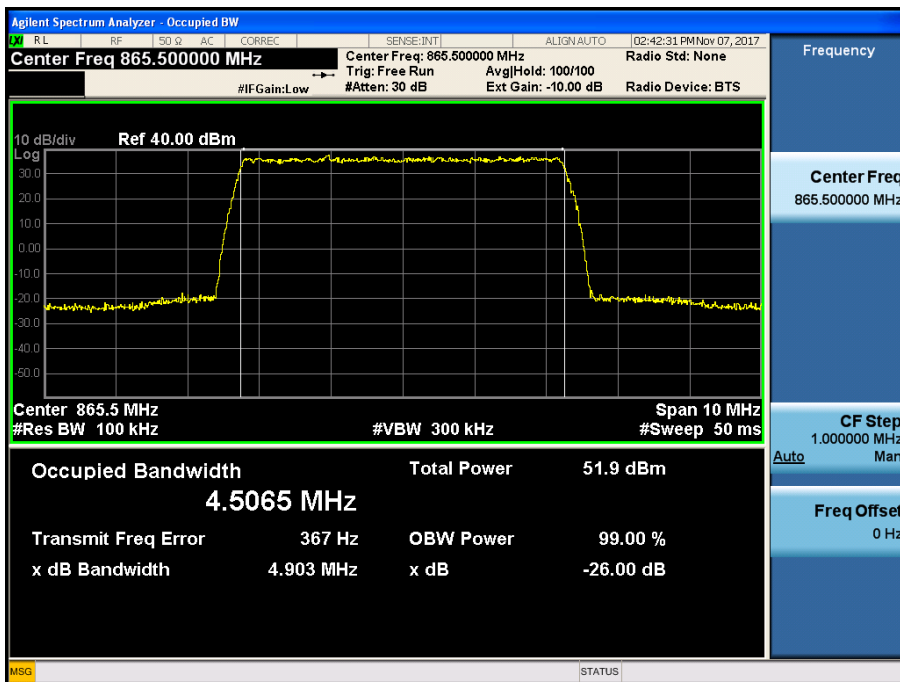
LTE 5 MHz

Test Plot at Output Port 0

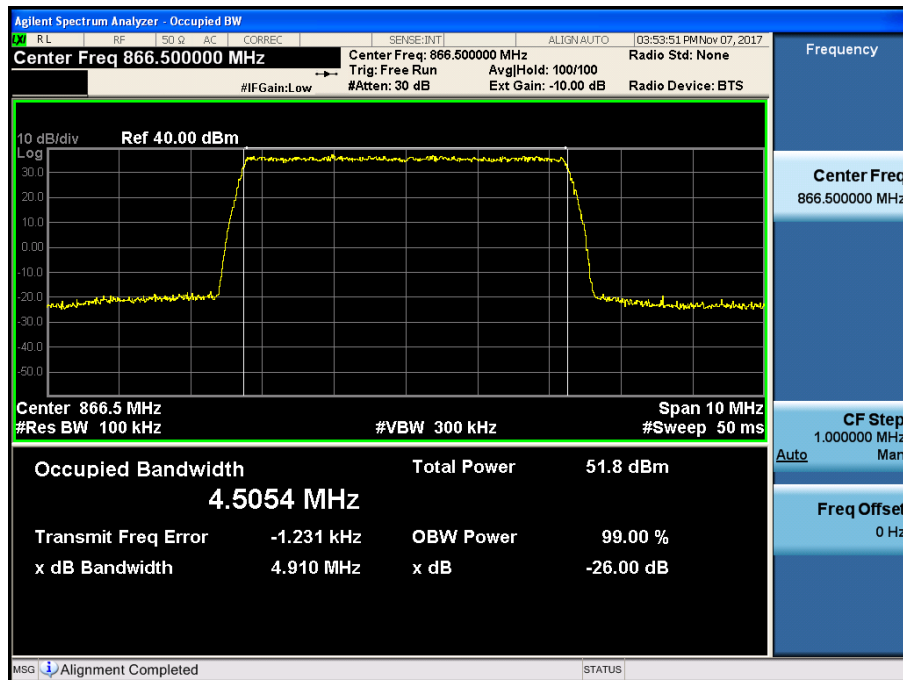
(256QAM Low Channel)



(256QAM Middle Channel)

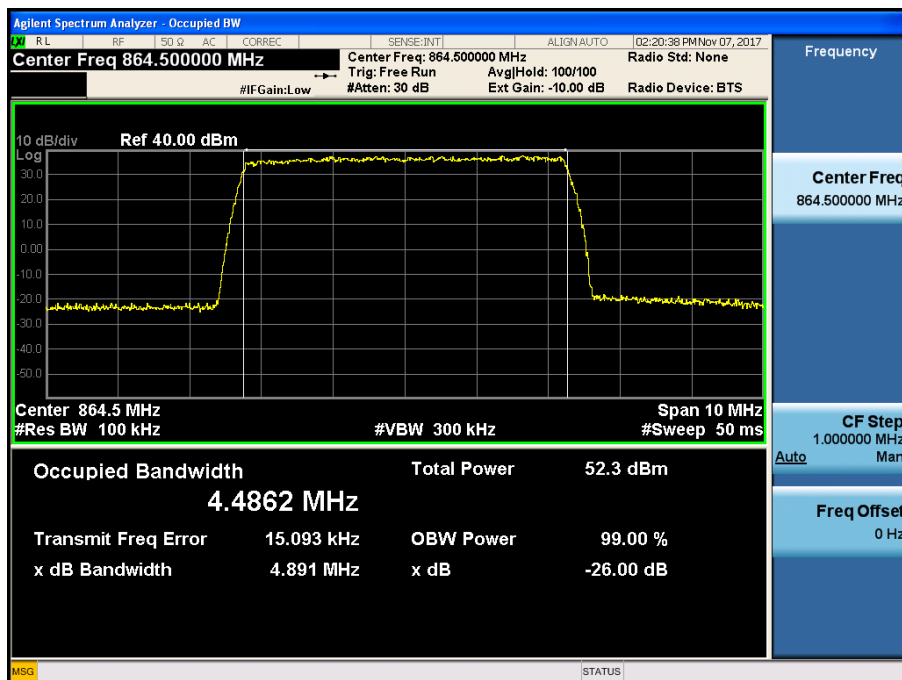


(256QAM High Channel)

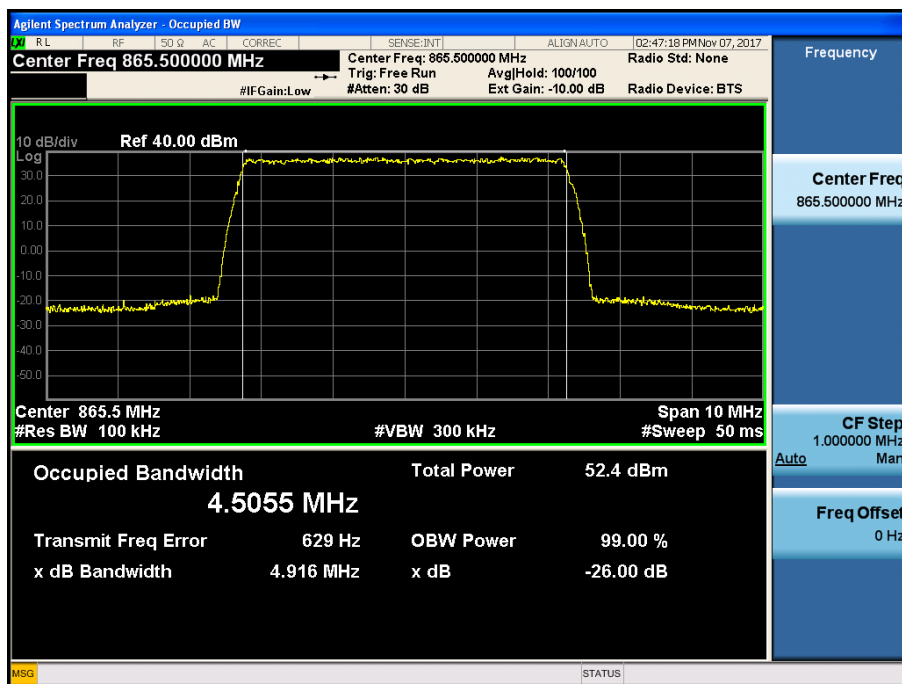


Test Plot at Output Port 1

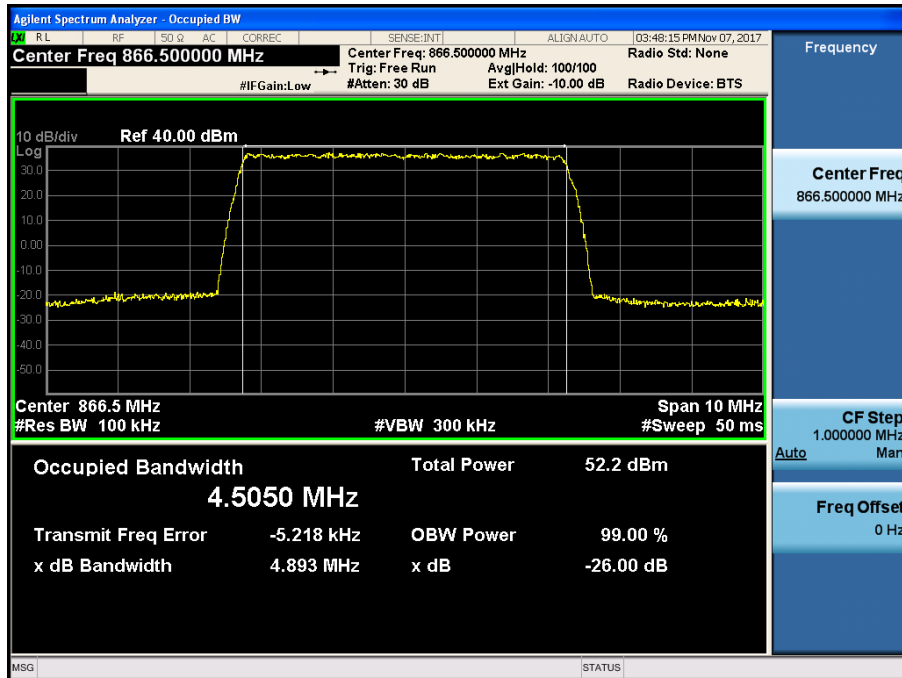
(256QAM Low Channel)



(256QAM Middle Channel)

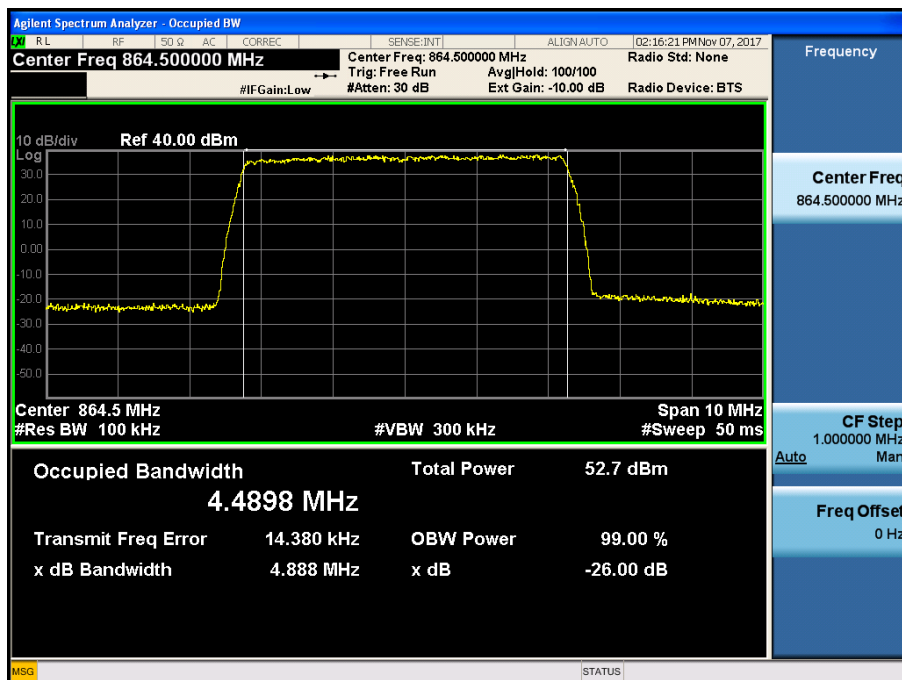


(256QAM High Channel)

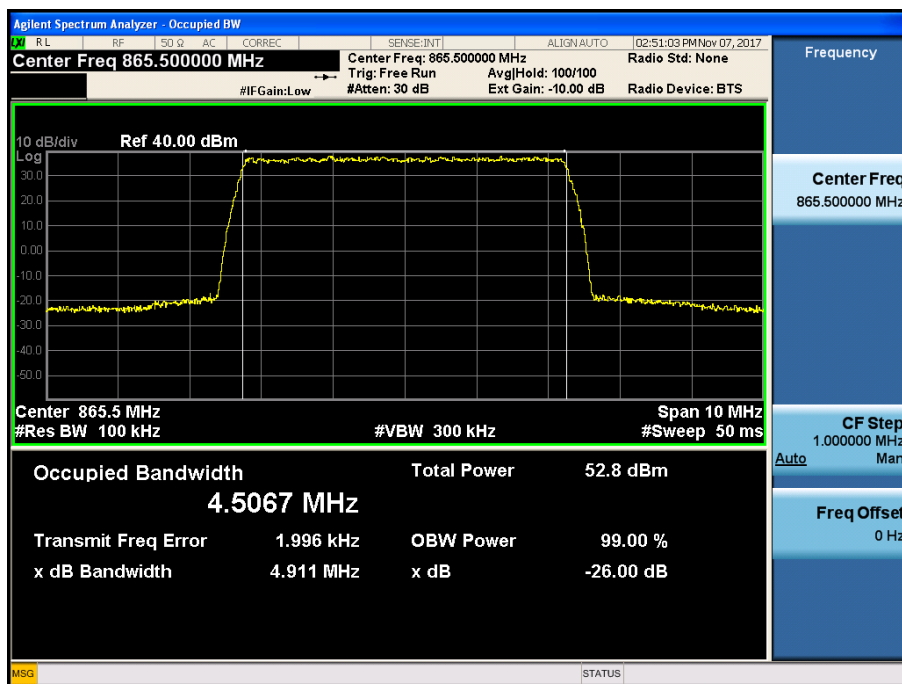


Test Plot at Output Port 2

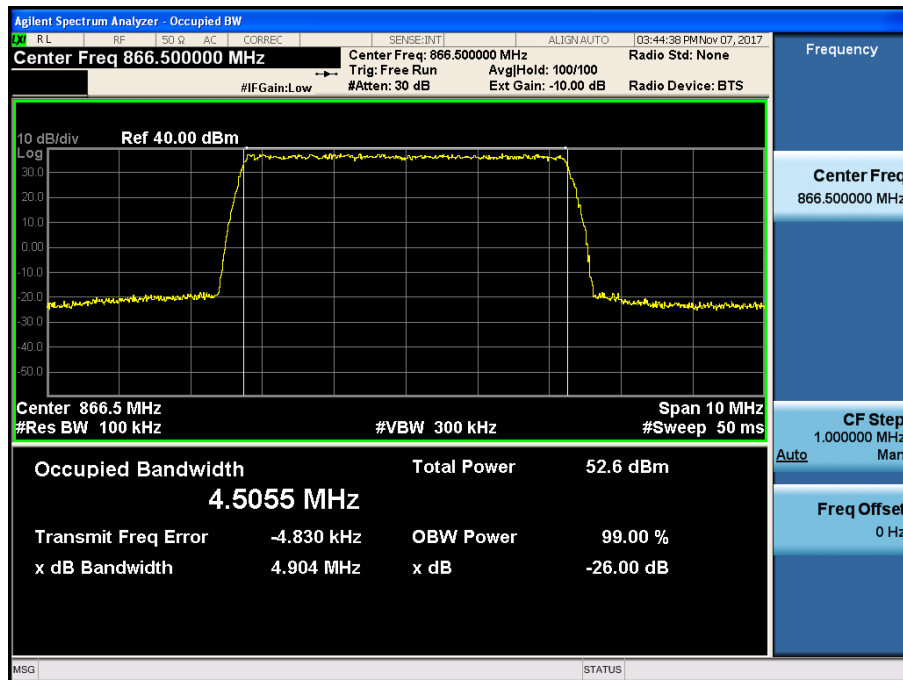
(256QAM Low Channel)



(256QAM Middle Channel)

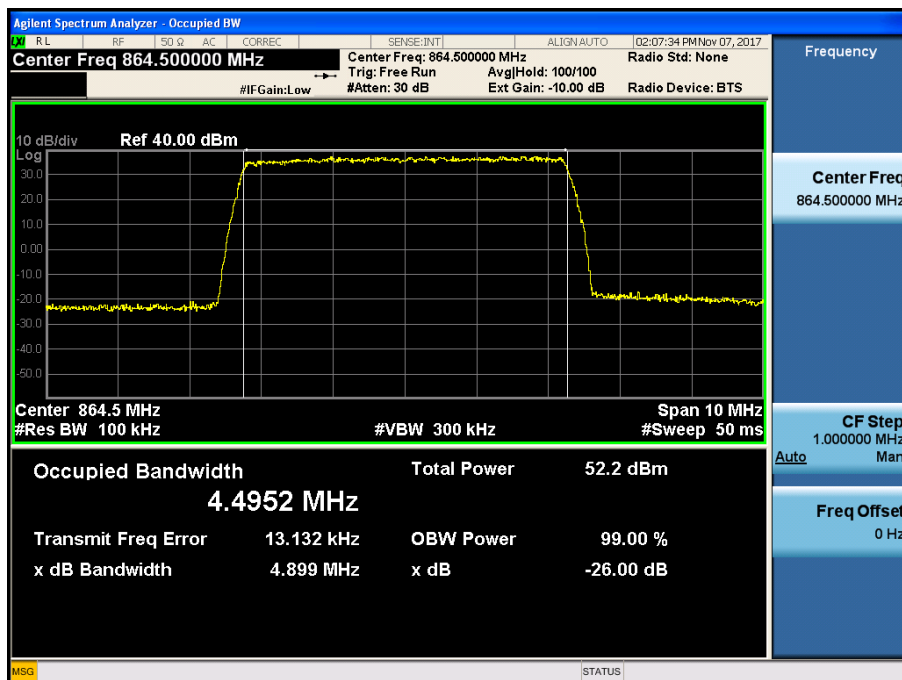


(256QAM High Channel)

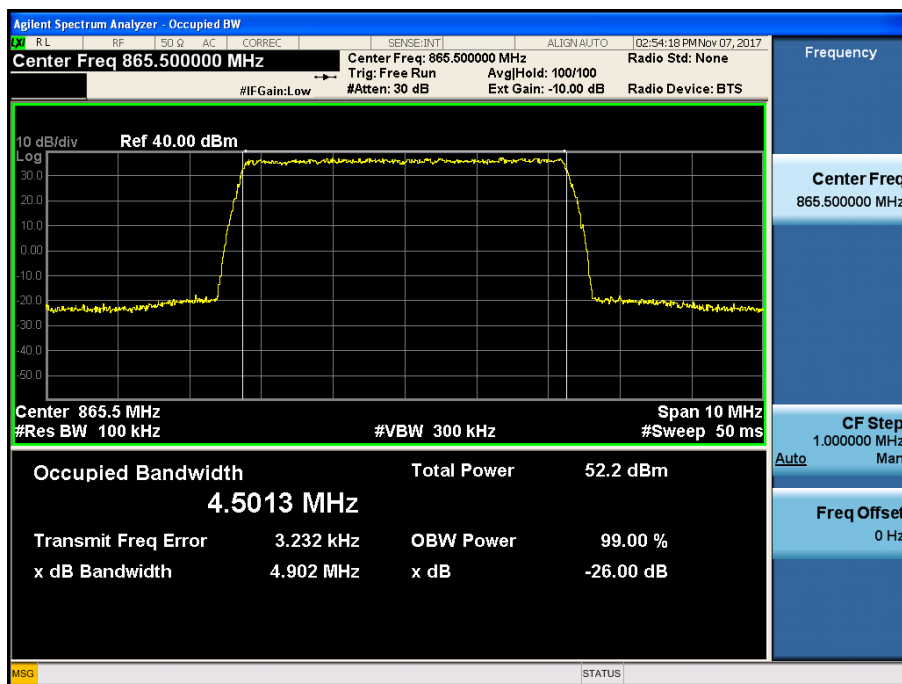


Test Plot at Output Port 3

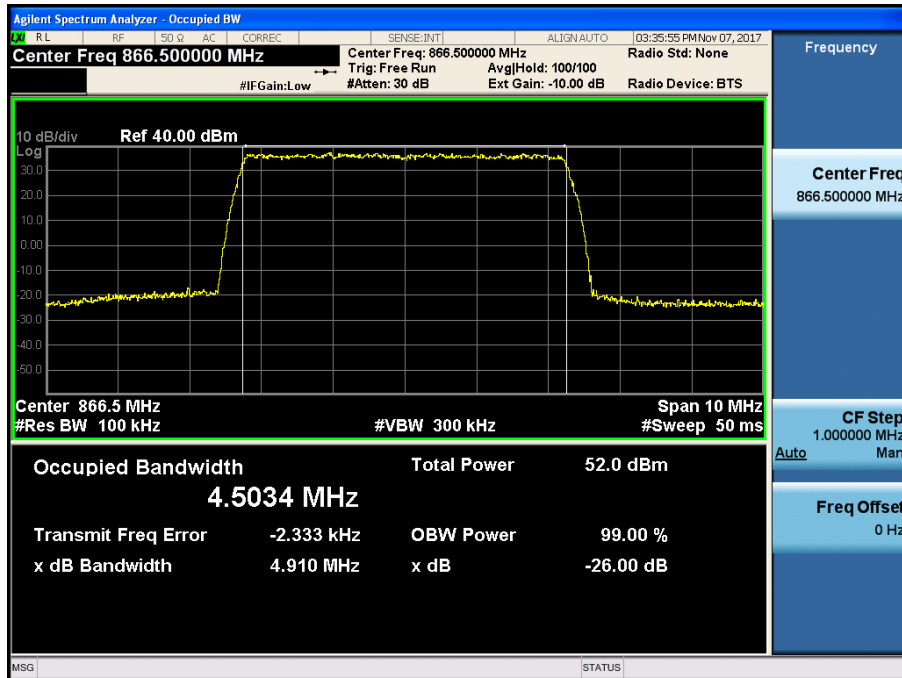
(256QAM Low Channel)



(256QAM Middle Channel)



(256QAM High Channel)



7. SPURIOUS EMISSION AT ANTENNA TERMINAL

Test Requirements:

§ 2.1051 Measurements required: Spurious emissions at antenna terminals:

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in § 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

§90.691 Emission mask requirements for EA-based systems.

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

Test Procedures:

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.

The resolution bandwidth of the spectrum analyzer was set at 100 KHz (Under 1 GHz), 1MHz (Above 1 GHz). Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

Notes:

1) In 9 KHz-150 KHz and 150 KHz-30 MHz bands, RBW was reduced to 1% and 10% of the reference bandwidth for measuring unwanted emission level (typically, 100KHz if the authorized frequency band is below 1GHz) and power was integrated. (1% = +20 dB, 10% = +10 dB)

2) Due to 4x4 MIMO operation, limit is -19.02 dBm (-13 dBm – $10 \cdot \log(4)$) per FCC KDB 662911D01v02r01.

Conducted Spurious Emissions

LTE 3 MHz

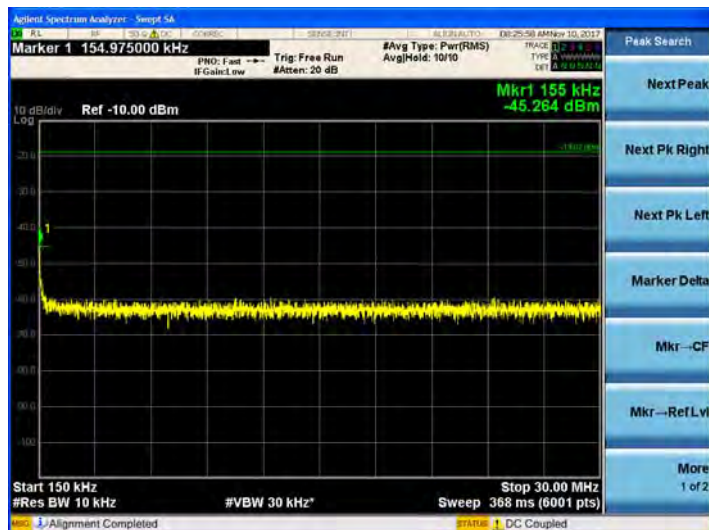
Test Data at Output Port 0

(256QAM Low channel)

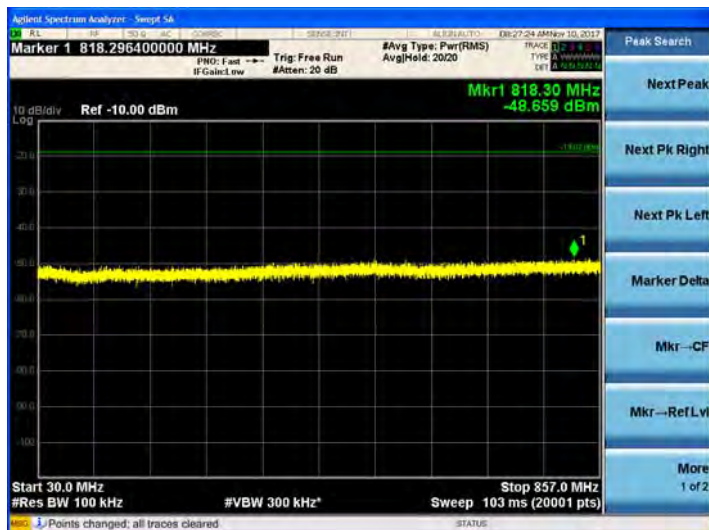
9 kHz ~ 150 kHz



150 kHz ~ 30 MHz



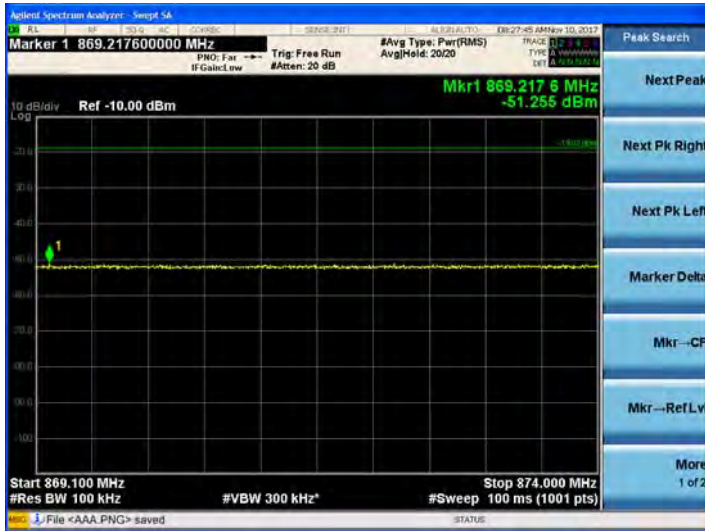
30 MHz ~ 857 MHz



857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz

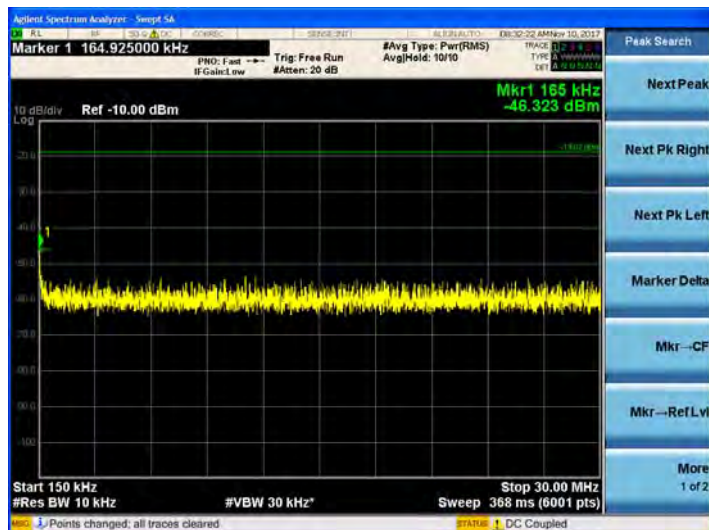


(256QAM Middle channel)

9 kHz ~ 150 kHz



150 kHz ~ 30 MHz



30 MHz ~ 857 MHz



857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz

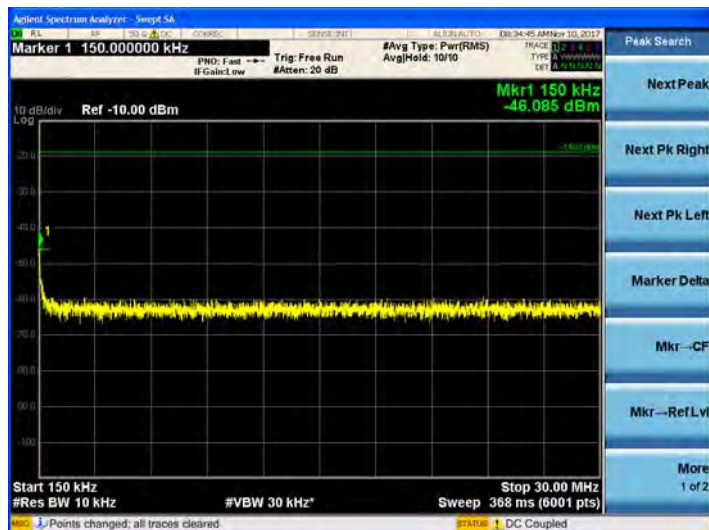


(256QAM High channel)

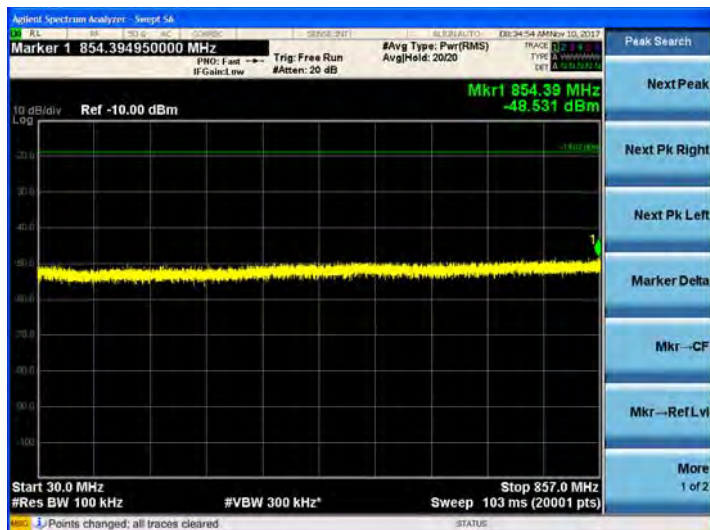
9 kHz ~ 150 kHz



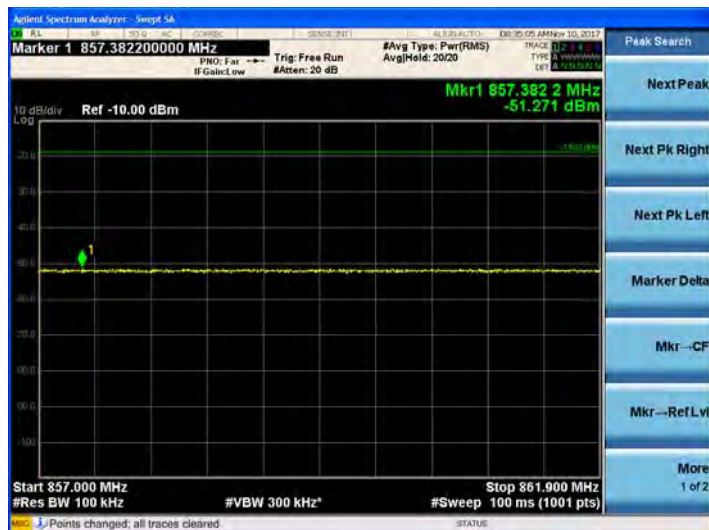
150 kHz ~ 30 MHz



30 MHz ~ 857 MHz



857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz



LTE 3 MHz

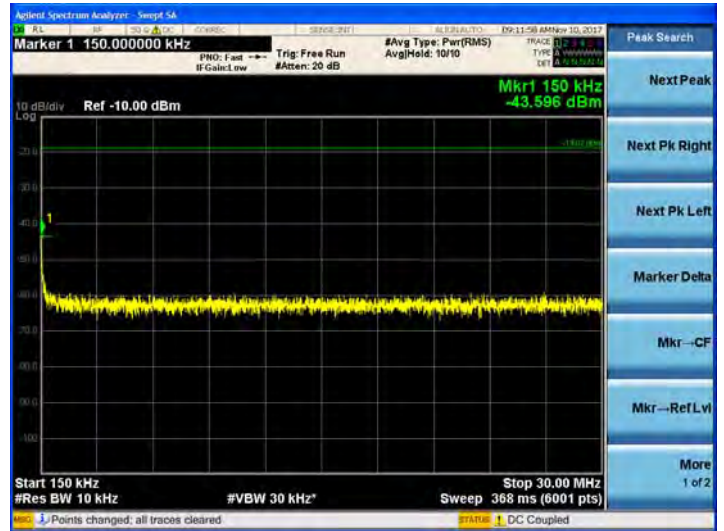
Test Data at Output Port 1

(256QAM Low channel)

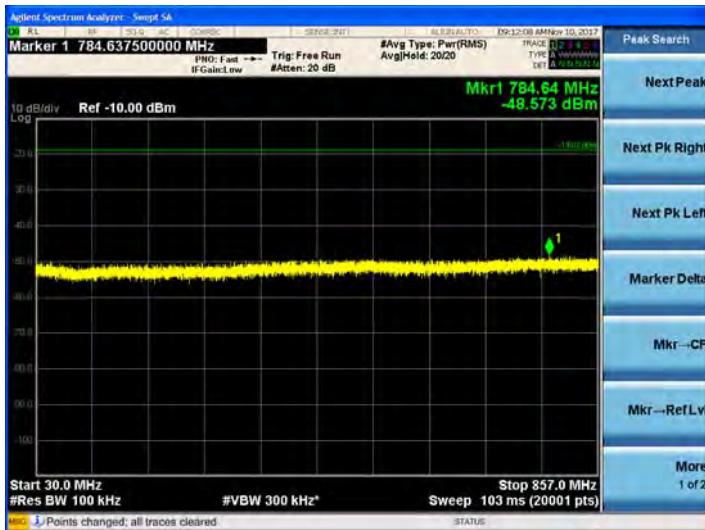
9 kHz ~ 150 kHz



150 kHz ~ 30 MHz



30 MHz ~ 857 MHz



857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz

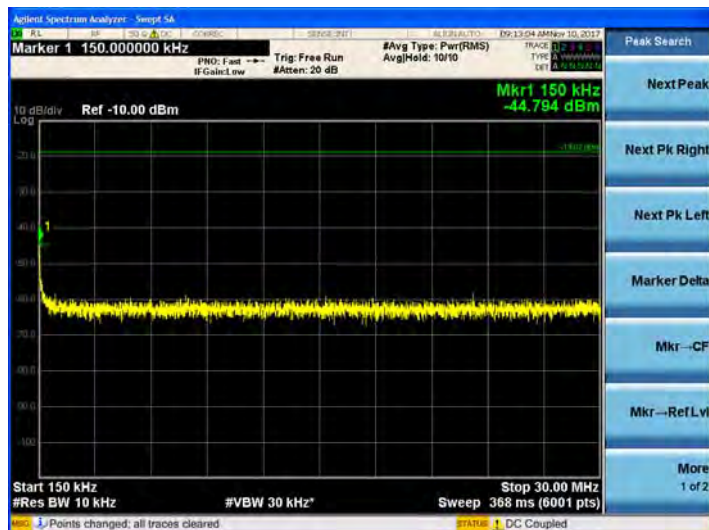


(256QAM Middle channel)

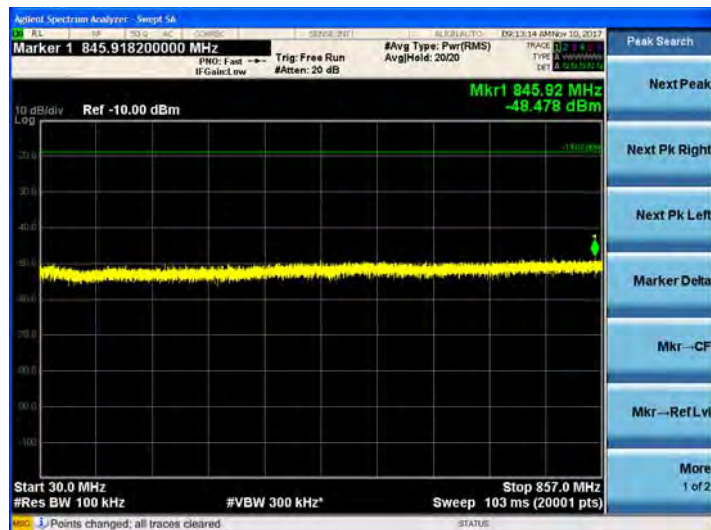
9 kHz ~ 150 kHz



150 kHz ~ 30 MHz



30 MHz ~ 857 MHz



857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz

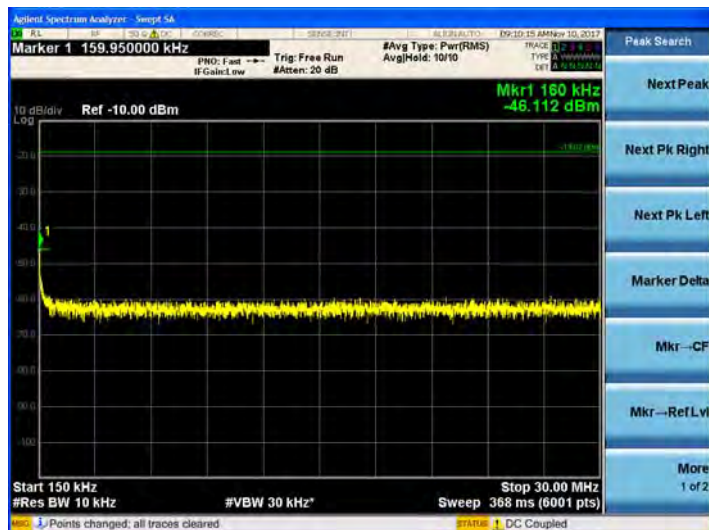


(256QAM High channel)

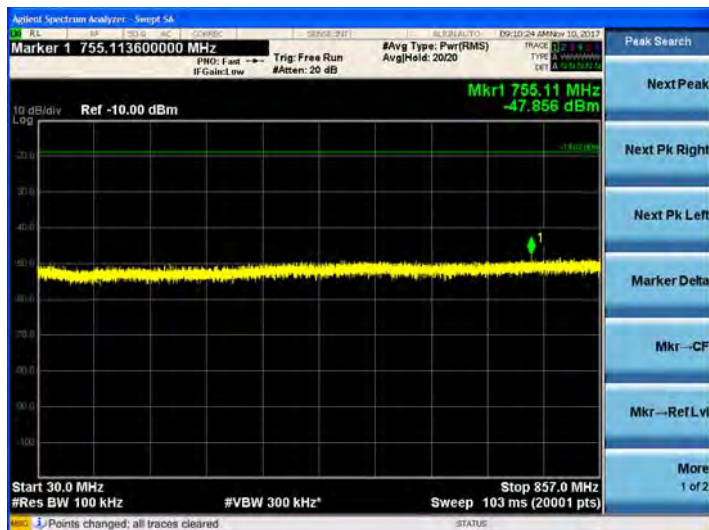
9 kHz ~ 150 kHz



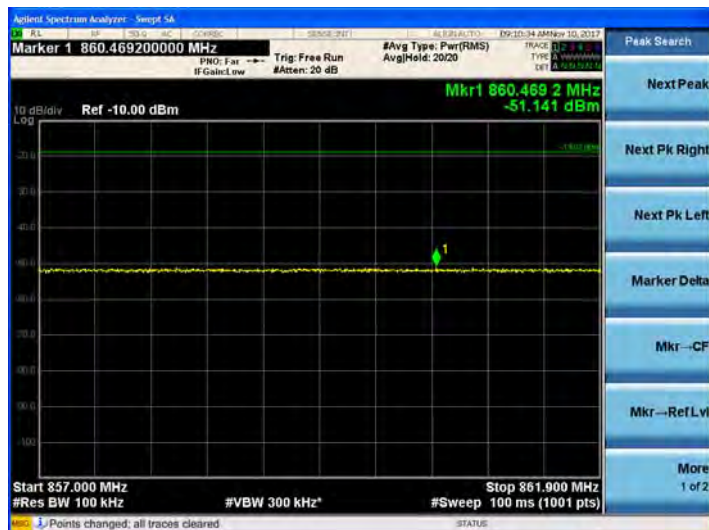
150 kHz ~ 30 MHz



30 MHz ~ 857 MHz



857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz



LTE 3 MHz

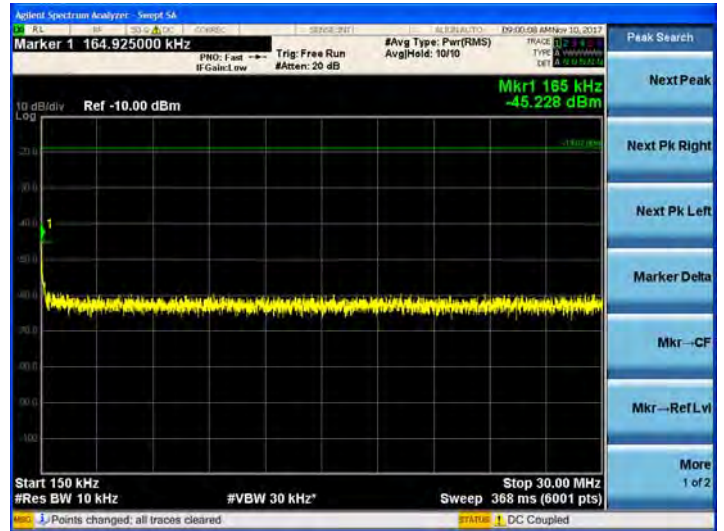
Test Data at Output Port 2

(256QAM Low channel)

9 kHz ~ 150 kHz



150 kHz ~ 30 MHz



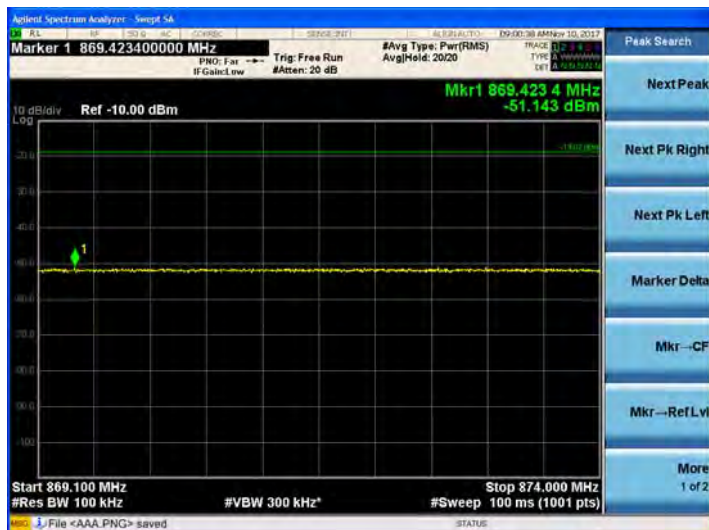
30 MHz ~ 857 MHz



857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz

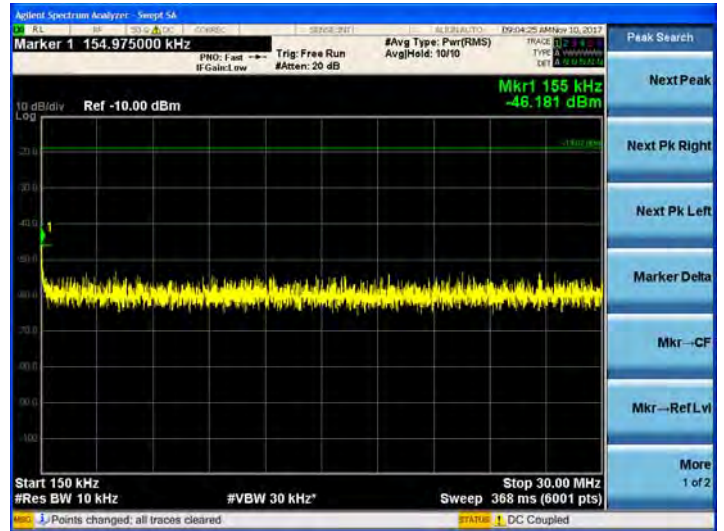


(256QAM Middle channel)

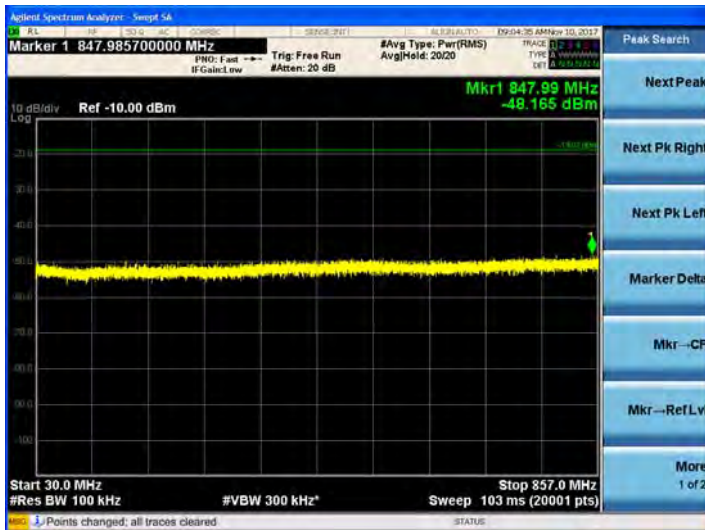
9 kHz ~ 150 kHz



150 kHz ~ 30 MHz



30 MHz ~ 857 MHz



857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz

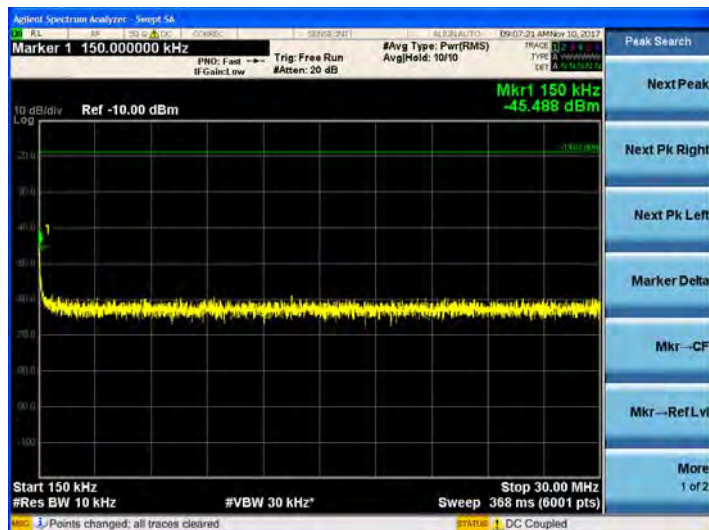


(256QAM High channel)

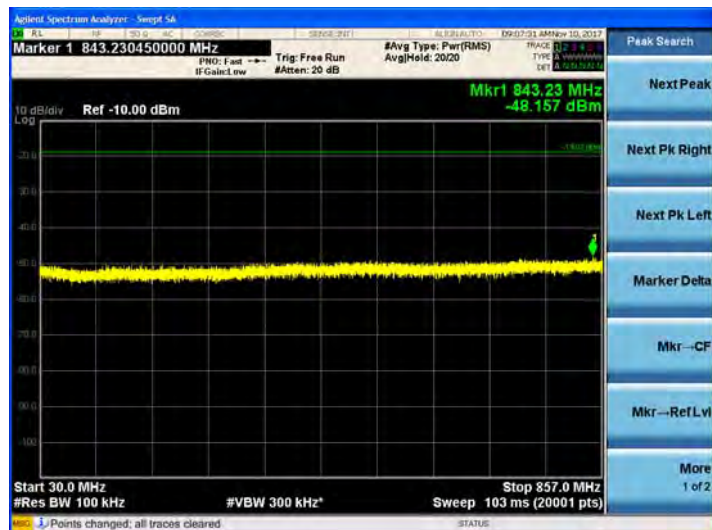
9 kHz ~ 150 kHz



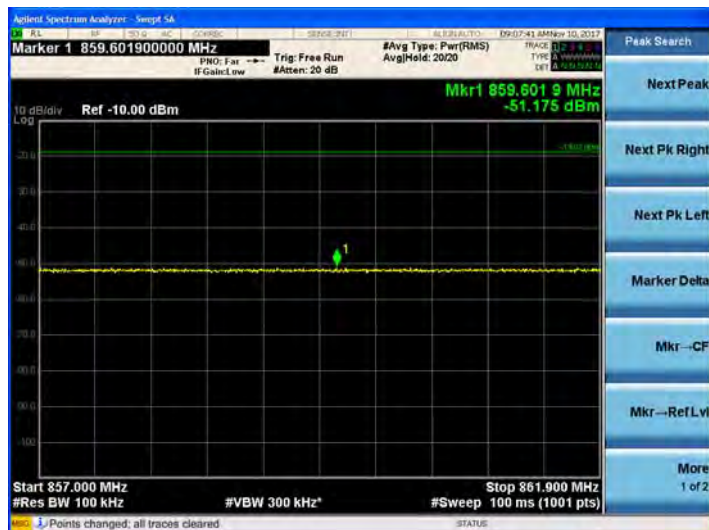
150 kHz ~ 30 MHz



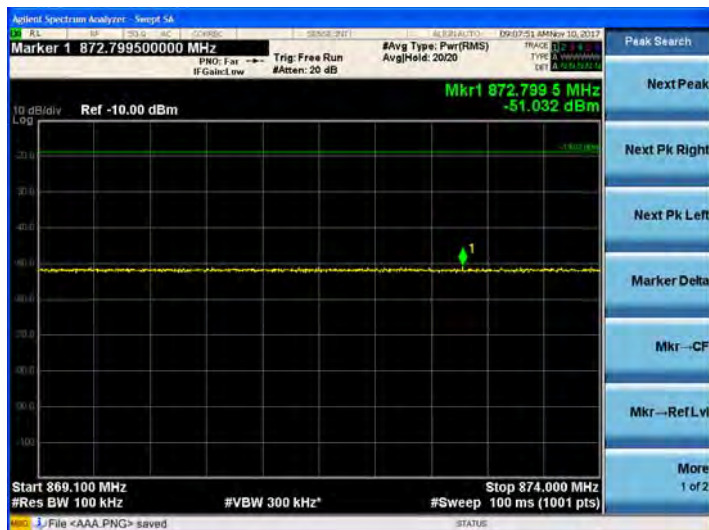
30 MHz ~ 857 MHz



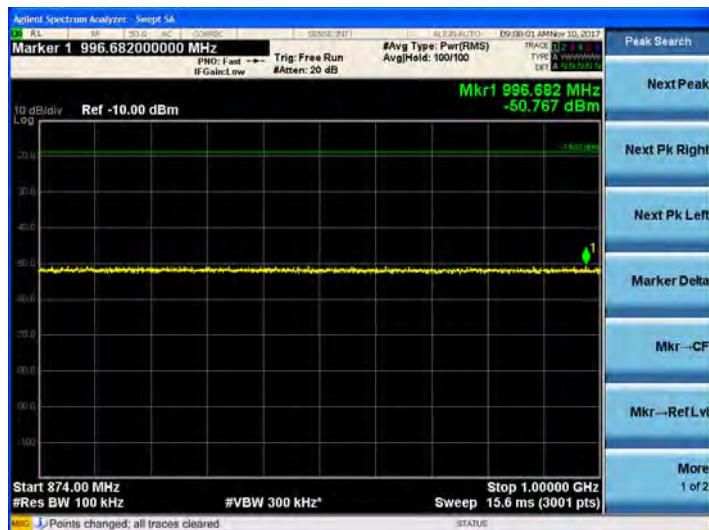
857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz



LTE 3 MHz

Test Data at Output Port 3

(256QAM Low channel)

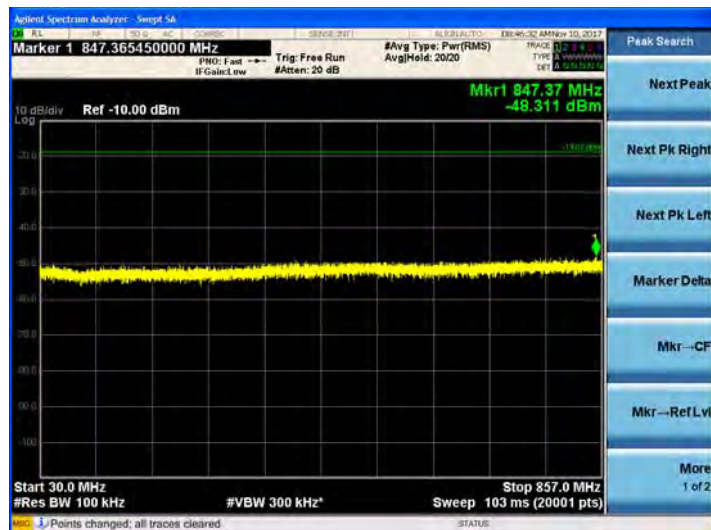
9 kHz ~ 150 kHz



150 kHz ~ 30 MHz



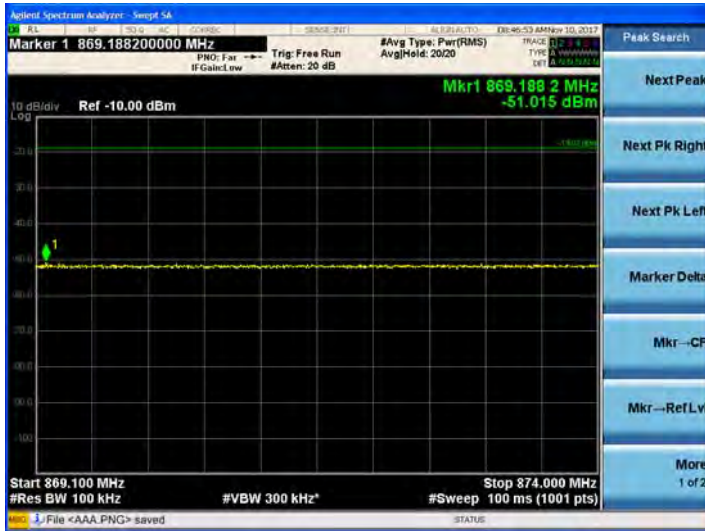
30 MHz ~ 857 MHz



857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz

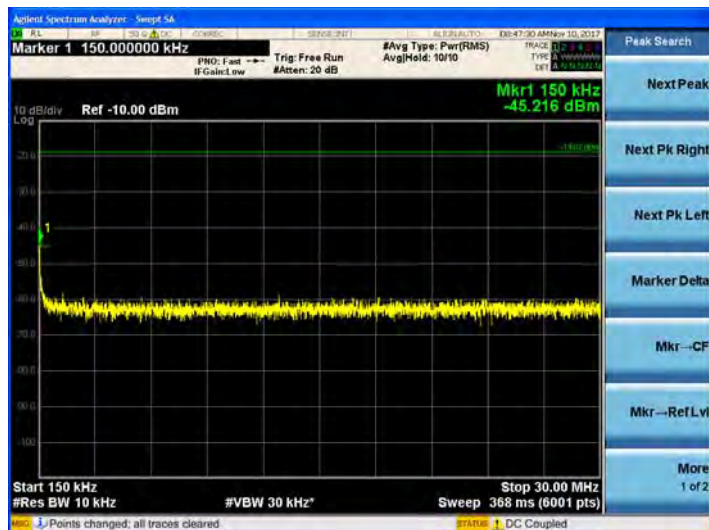


(256QAM Middle channel)

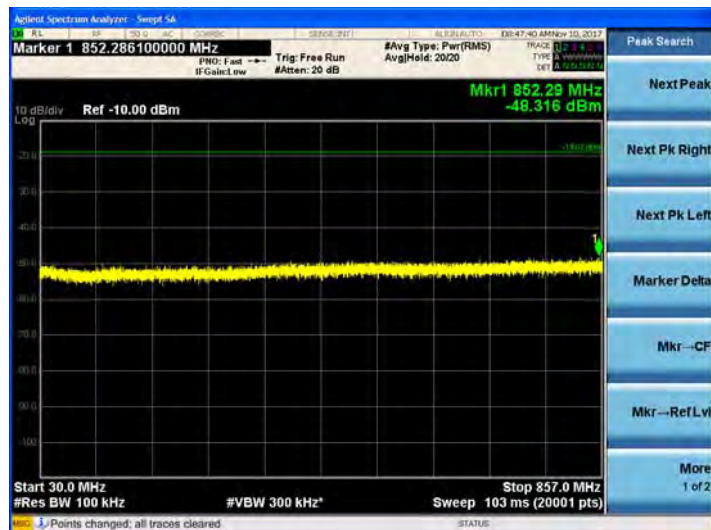
9 kHz ~ 150 kHz



150 kHz ~ 30 MHz



30 MHz ~ 857 MHz



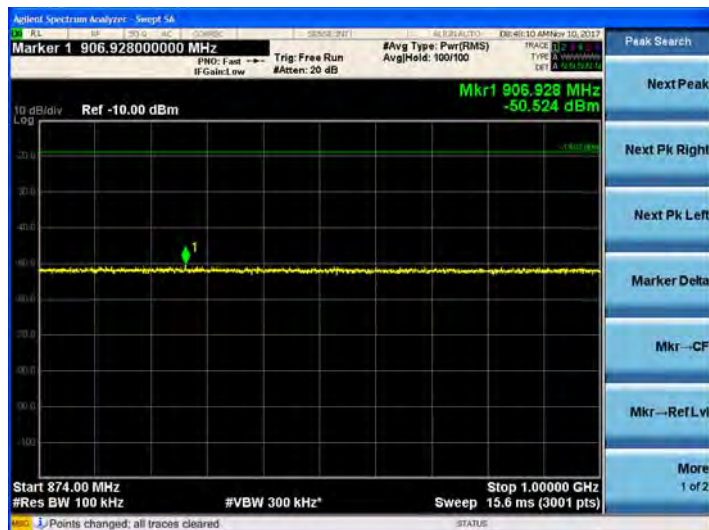
857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz

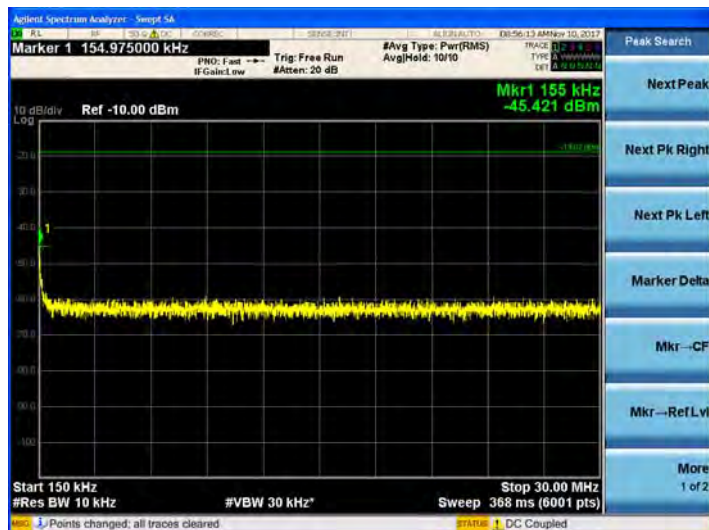


(256QAM High channel)

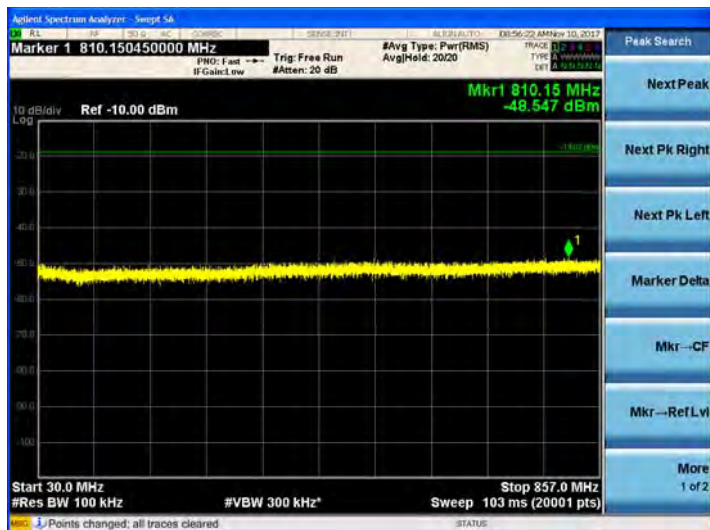
9 kHz ~ 150 kHz



150 kHz ~ 30 MHz



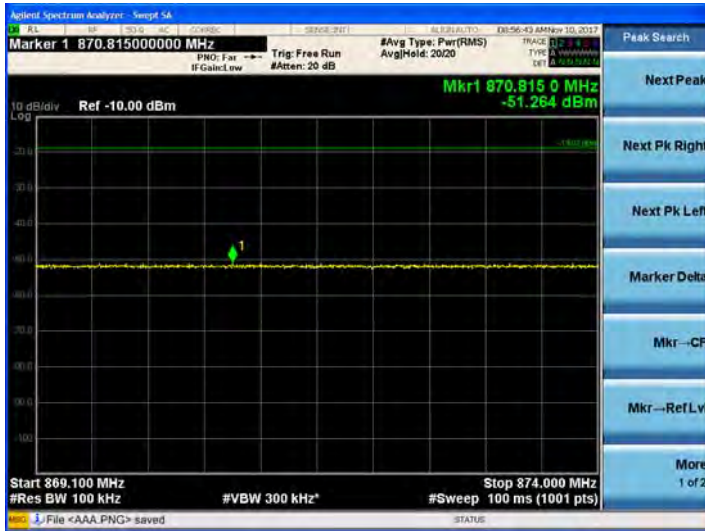
30 MHz ~ 857 MHz



857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz



LTE 5 MHz

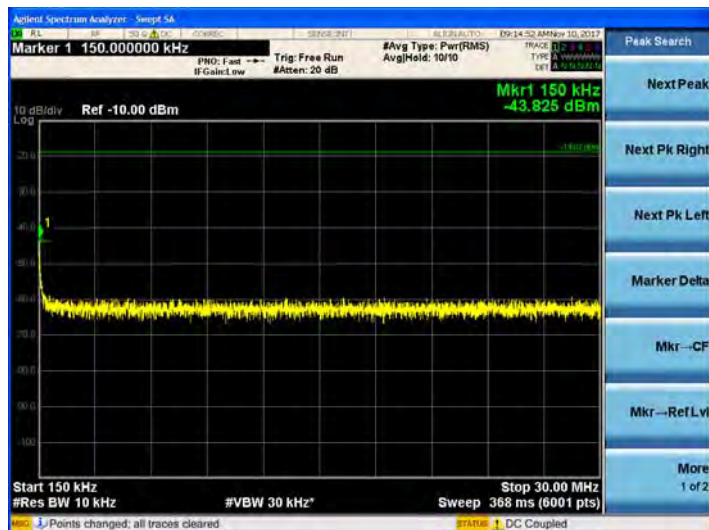
Test Data at Output Port 0

(256QAM Low channel)

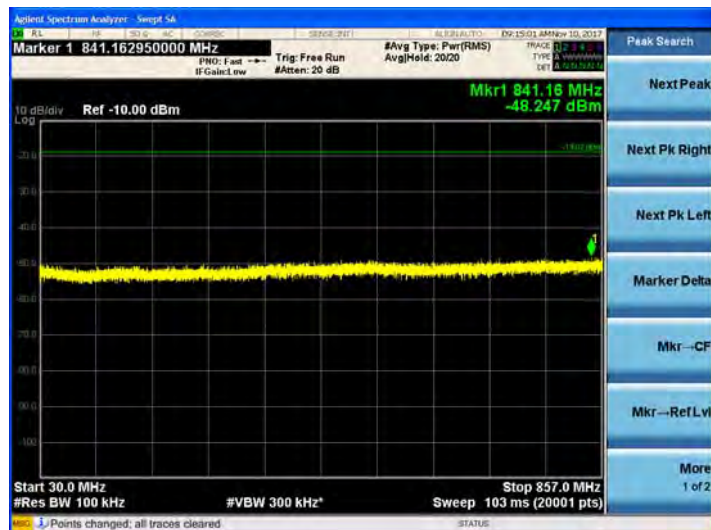
9 kHz ~ 150 kHz



150 kHz ~ 30 MHz



30 MHz ~ 857 MHz



857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz

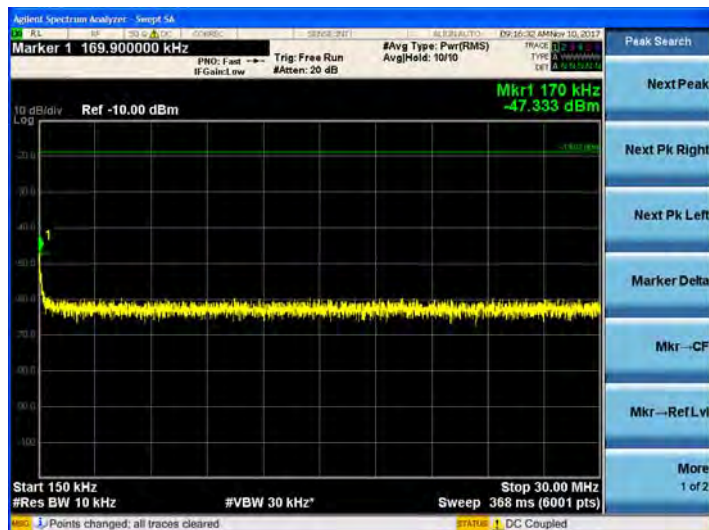


(256QAM Middle channel)

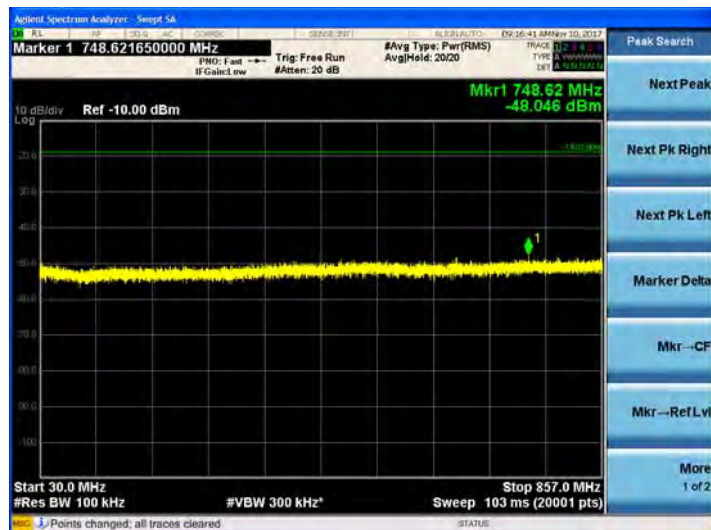
9 kHz ~ 150 kHz



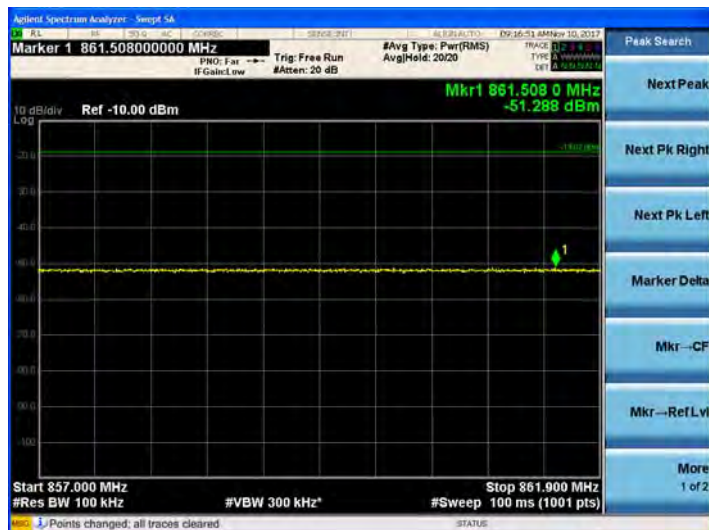
150 kHz ~ 30 MHz



30 MHz ~ 857 MHz



857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz

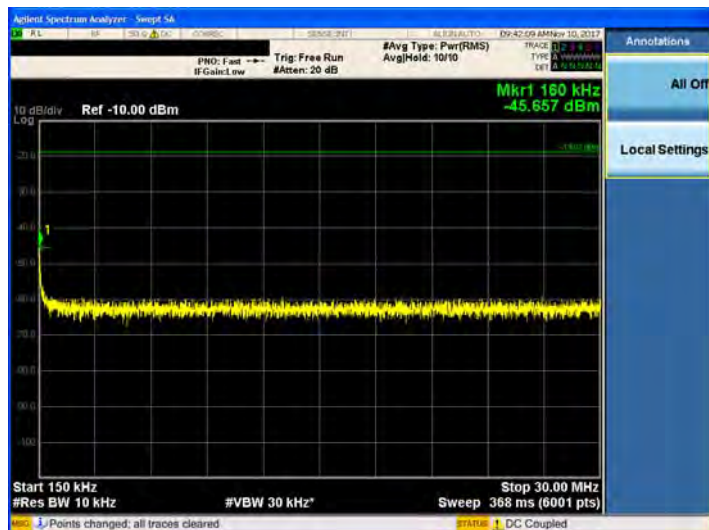


(256QAM High channel)

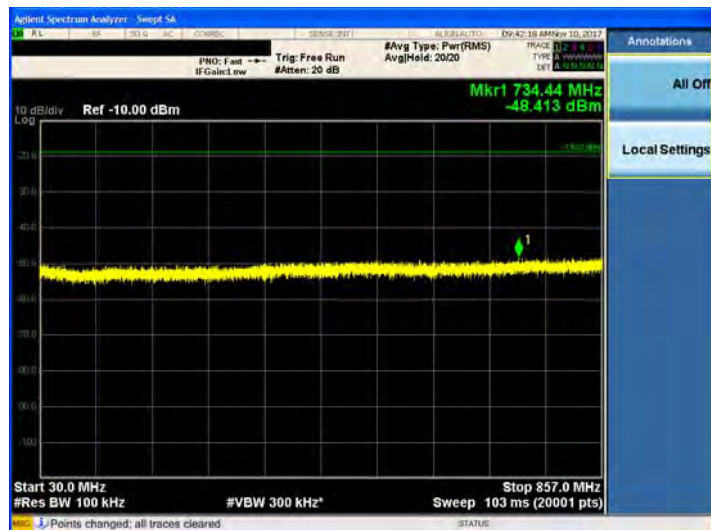
9 kHz ~ 150 kHz



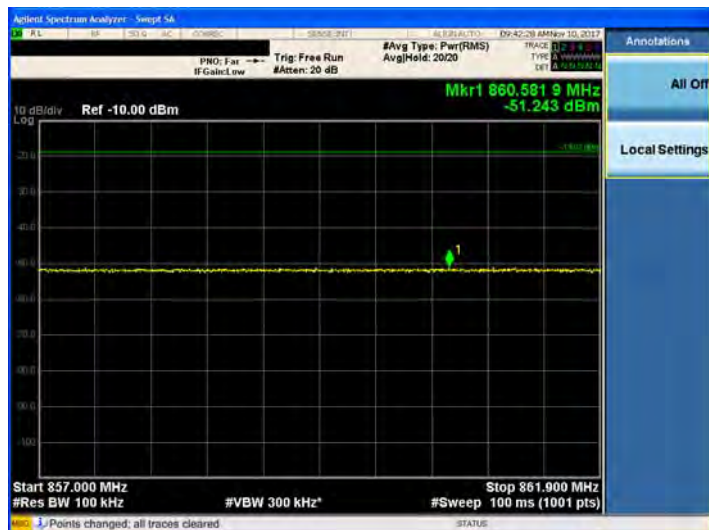
150 kHz ~ 30 MHz



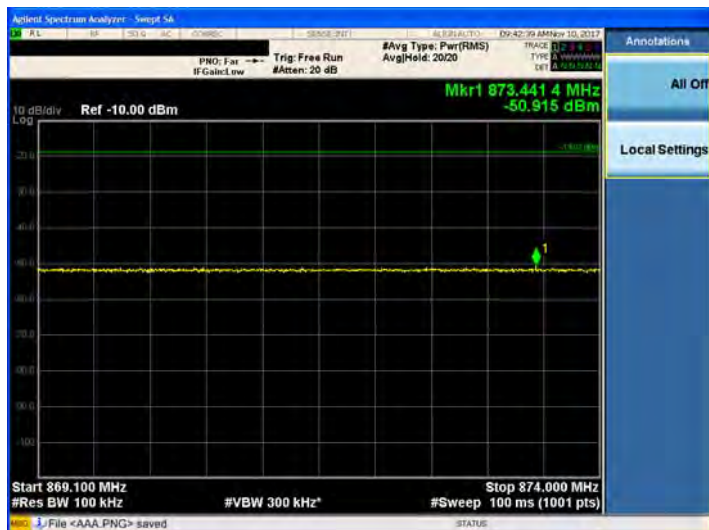
30 MHz ~ 857 MHz



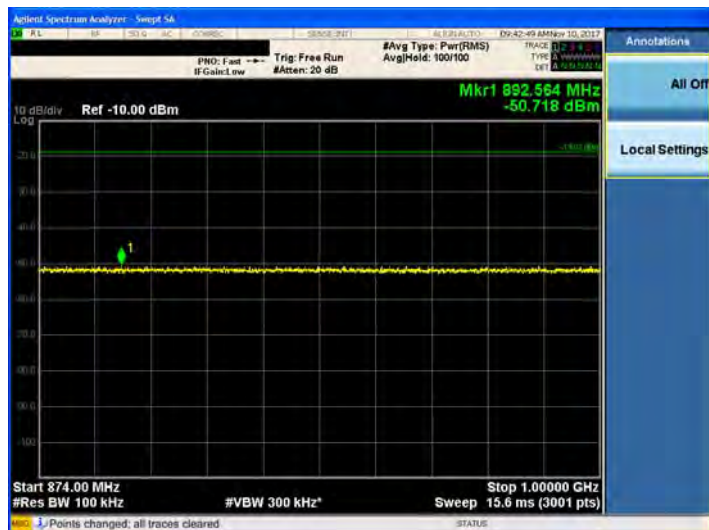
857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz



LTE 5 MHz

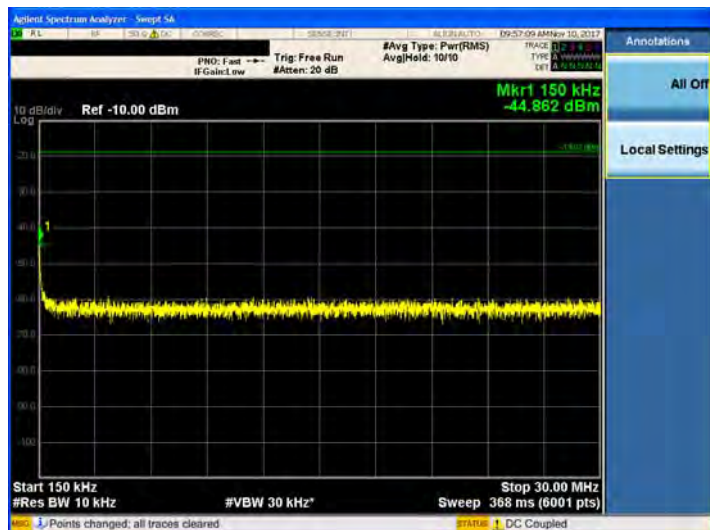
Test Data at Output Port 1

(256QAM Low channel)

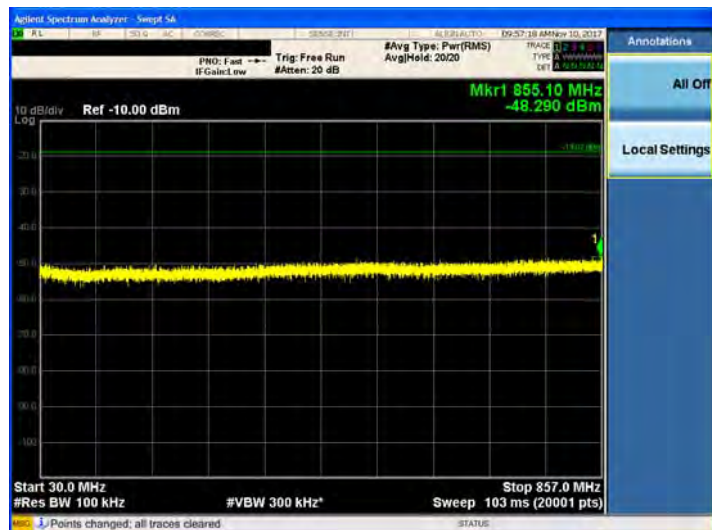
9 kHz ~ 150 kHz



150 kHz ~ 30 MHz



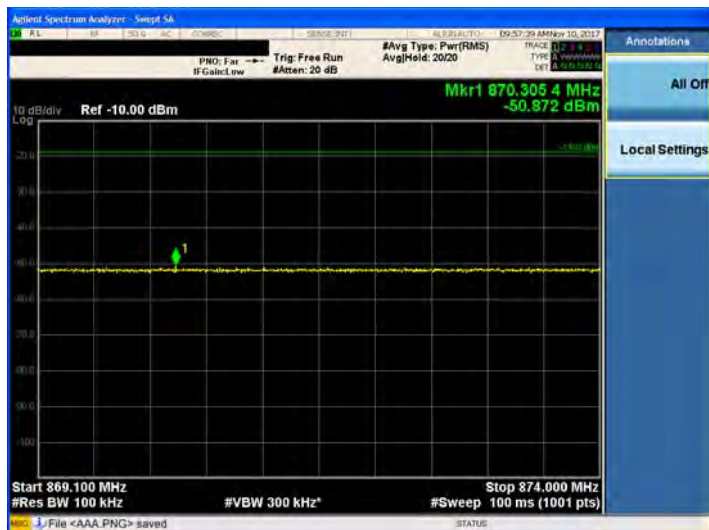
30 MHz ~ 857 MHz



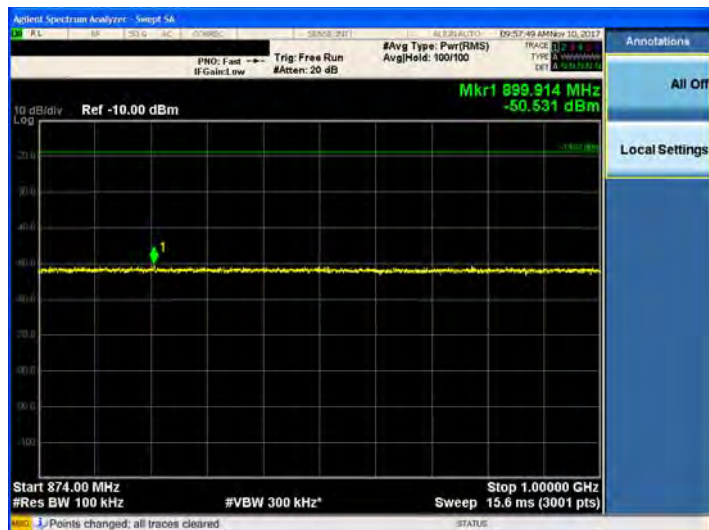
857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz

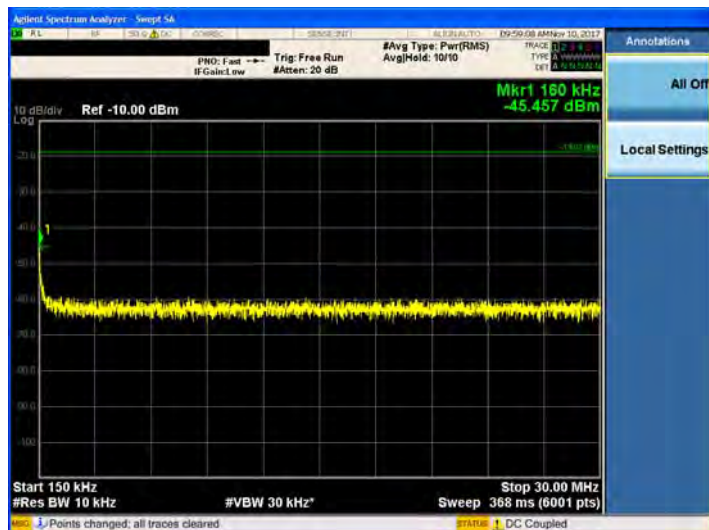


(256QAM Middle channel)

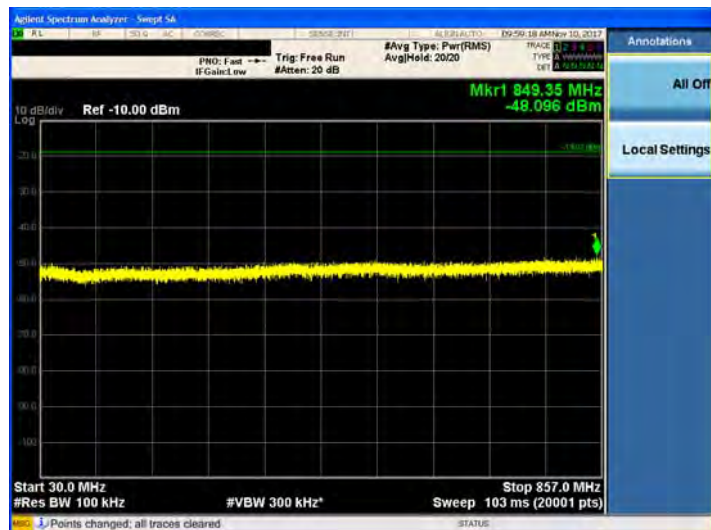
9 kHz ~ 150 kHz



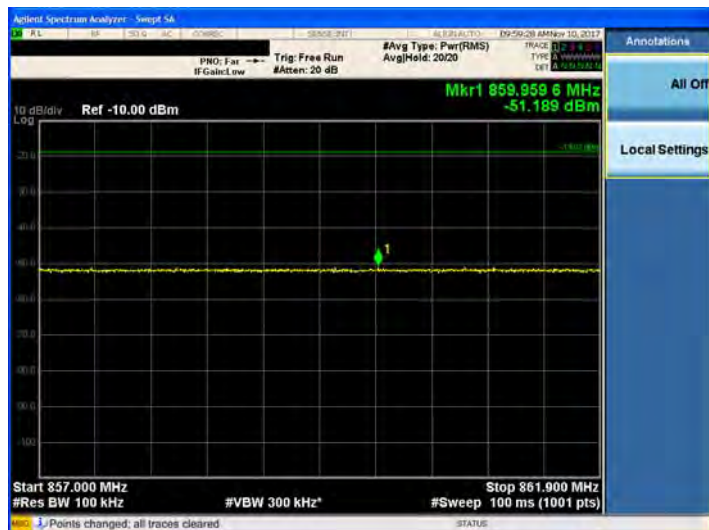
150 kHz ~ 30 MHz



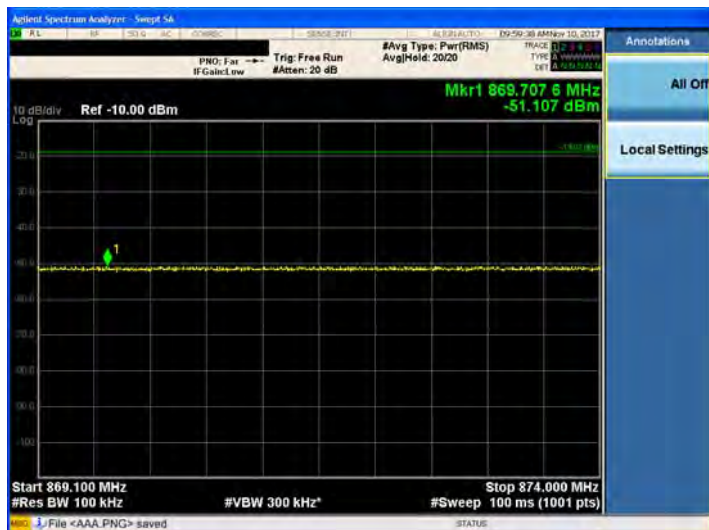
30 MHz ~ 857 MHz



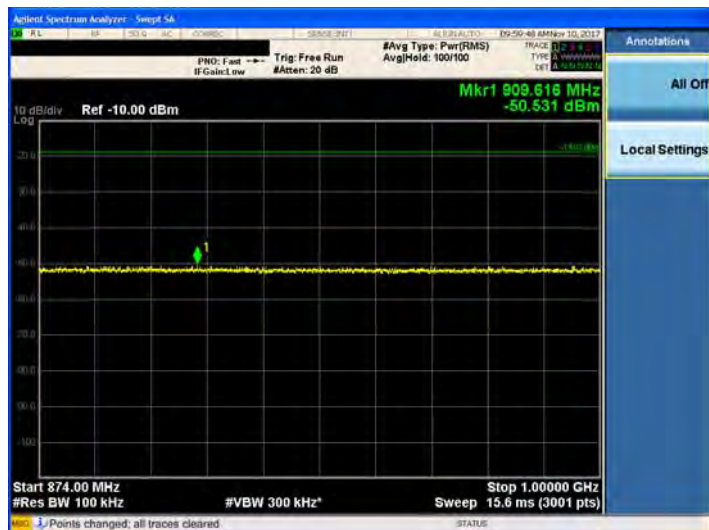
857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz

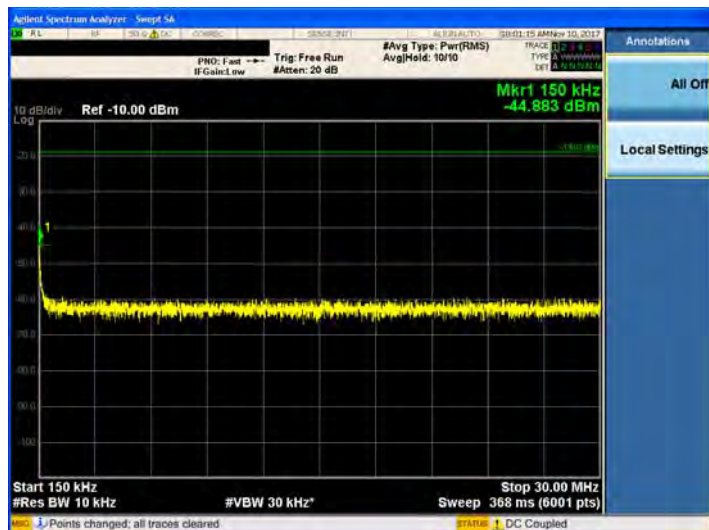


(256QAM High channel)

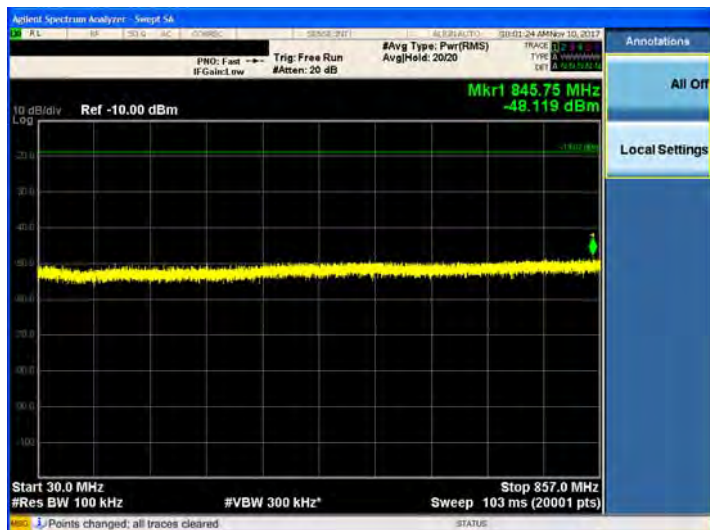
9 kHz ~ 150 kHz



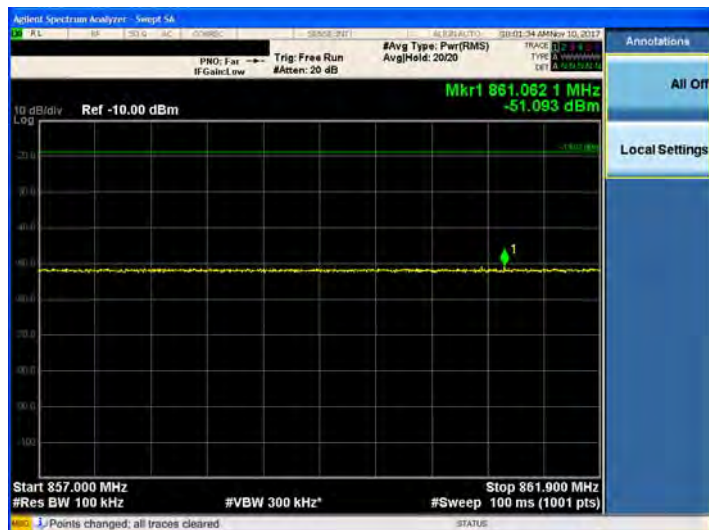
150 kHz ~ 30 MHz



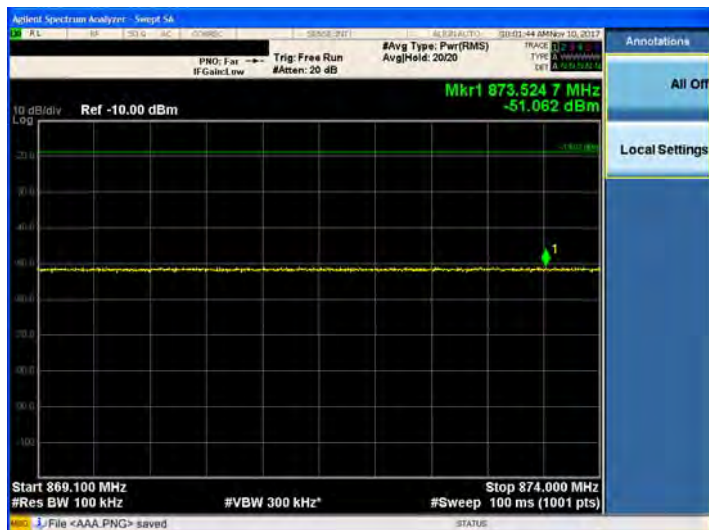
30 MHz ~ 857 MHz



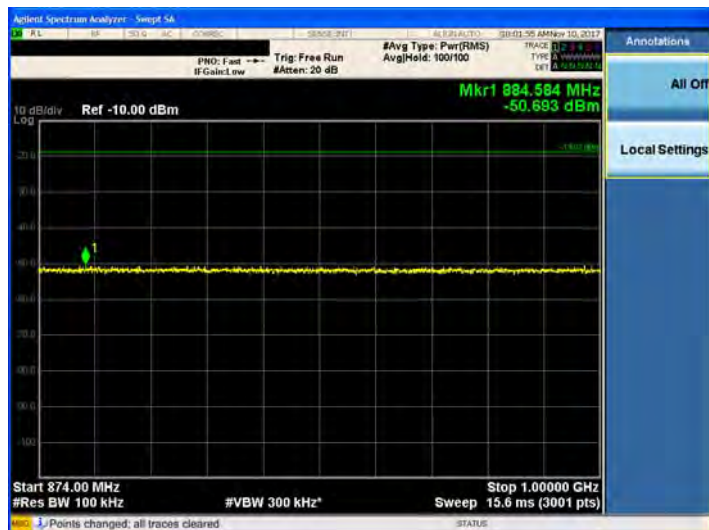
857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz



LTE 5 MHz

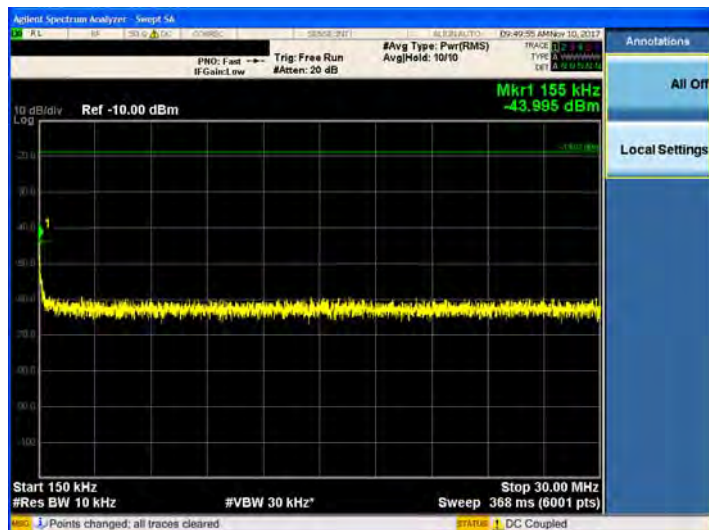
Test Data at Output Port 2

(256QAM Low channel)

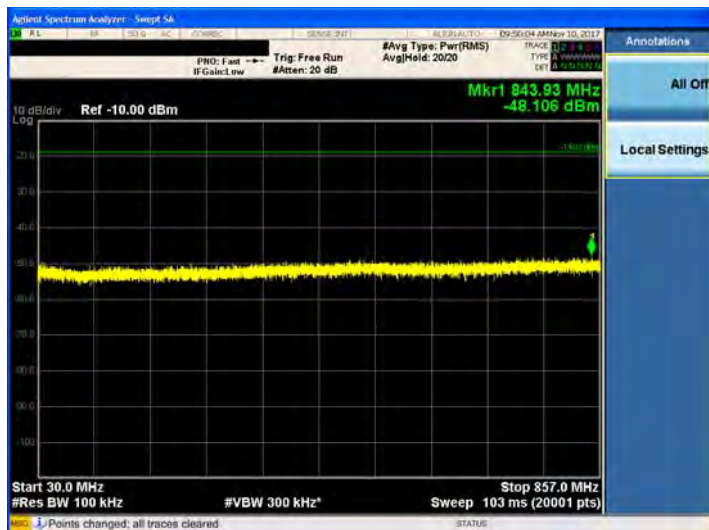
9 kHz ~ 150 kHz



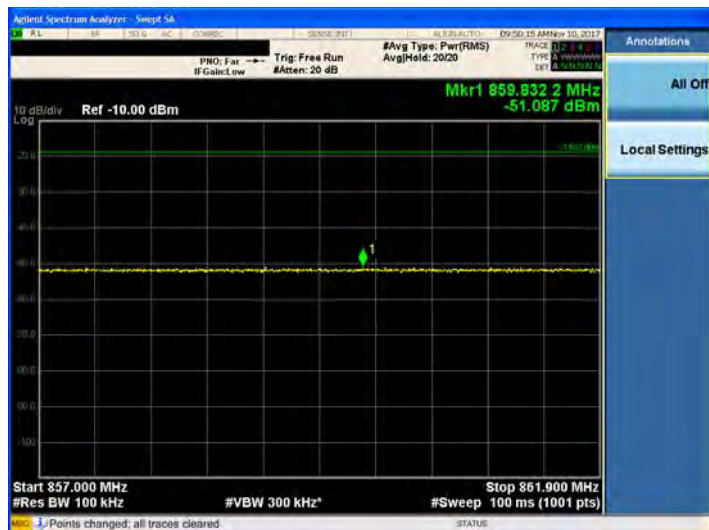
150 kHz ~ 30 MHz



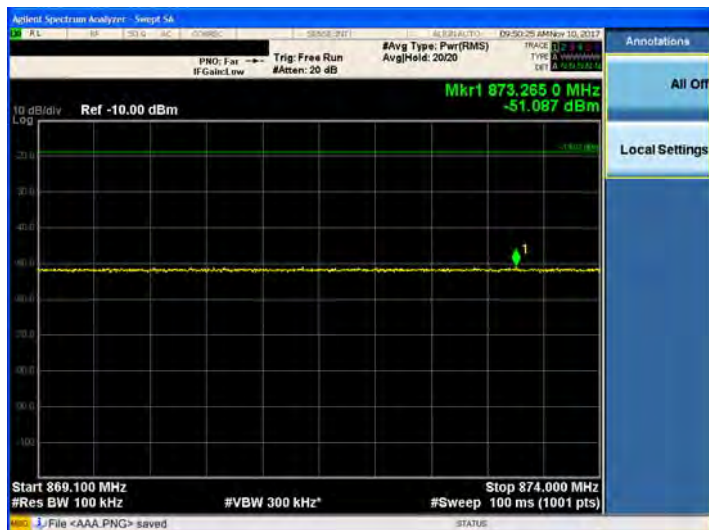
30 MHz ~ 857 MHz



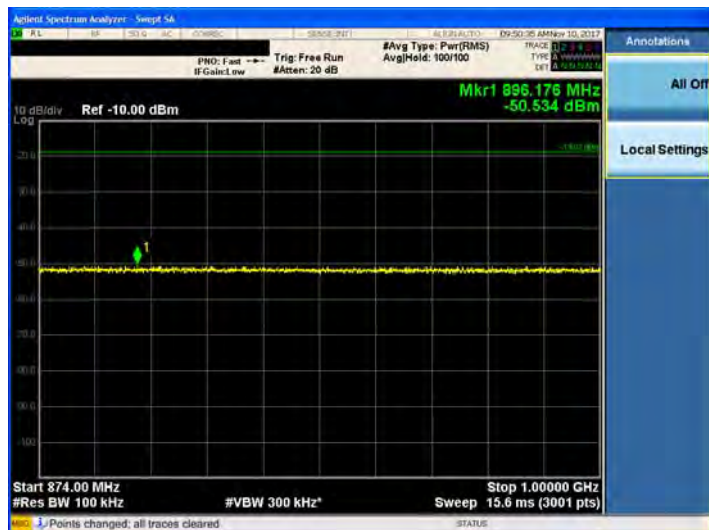
857 MHz ~ 861.9 MHz



869.1 MHz ~ 874 MHz



874 MHz ~ 1 GHz



1 GHz ~ 3 GHz



3 GHz ~ 12.75 GHz

