

# TEST REPORT

## FCC Part 24 Subpart E

**Report Reference No.** : LCS170831042AE6**Date of Issue** : Nov. 13, 2017**Testing Laboratory Name** : Shenzhen LCS Compliance Testing Laboratory Ltd.**Address** : 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue,  
Bao'an District, Shenzhen, Guangdong, China**Applicant's Name** : Covert Scouting Cameras, Inc**Address** : 4338 Greenridge Spa Rd, Lewisburg, KY 42256 , US**Test Specification****Standard** : FCC CFR Title 47 Part 2, Part 24E

EIA/TIA 603-D: 2010

KDB 971168 D01

**Test Report Form No.** : LCSEMC-1.0**TRF Originator** : Shenzhen LCS Compliance Testing Laboratory Ltd.**Master TRF** : Dated 2011-03**Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.**

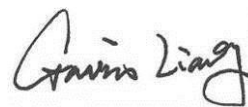
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**Test Item Description** : Code Black LTE**Trade Mark** : Covert**Model/Type reference** : 5472**Listed Models** : N/A**Modulation Type** : QPSK, 16QAM**Ratings** : DC 6V**Hardware version** : L4V52MG**Software version** : V1.00.01**Date of Test** : Oct. 17, 2017–Nov. 12, 2017**Result** : Pass**Compiled by:**

Ada Liang/ File administrators

**Supervised by:**

Glin Lu/ Technique principal

**Approved by:**

Gavin Liang/ Manager

# TEST REPORT

<b>Test Report No. :</b>	<b>LCS170831042AE6</b>	Nov. 13, 2017
		Date of issue

Equipment under Test : Code Black LTE

Model /Type : 5472

Listed Models : /

**Applicant** : **Covert Scouting Cameras, Inc**

Address : 4338 Greenridge Spa Rd, Lewisburg, KY 42256, US

**Manufacturer** : **UOVision Technology (Shenzhen) Co., Ltd.**

Address : 4th Floor, A1 Building, Shunheda Factory,  
liuxiandong Industrial Zone, Xili street, Nanshan  
District, Shenzhen CHN 518055

<b>Test result</b>	<b>Pass *</b>
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\* In the configuration tested, the EUT complied with the standards specified page 5.

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

**Revision History**

Revision	Issue Date	Revisions	Revised By
00	Nov. 13, 2017	Initial Issue	Gavin Liang

# Contents

<b>1</b>	<b>SUMMARY.....</b>	<b>5</b>
1.1	TEST STANDARDS .....	5
1.2	TEST DESCRIPTION.....	5
1.3	TEST FACILITY .....	6
1.4	STATEMENT OF THE MEASUREMENT UNCERTAINTY.....	6
<b>2</b>	<b>GENERAL INFORMATION .....</b>	<b>7</b>
2.1	ENVIRONMENTAL CONDITIONS .....	7
2.2	GENERAL DESCRIPTION OF EUT .....	7
2.3	DESCRIPTION OF TEST MODES .....	7
2.4	EQUIPMENTS USED DURING THE TEST .....	7
2.5	RELATED SUBMITTAL(S) / GRANT (S).....	8
2.6	MODIFICATIONS.....	8
<b>3</b>	<b>TEST CONDITIONS AND RESULTS .....</b>	<b>9</b>
3.1	OUTPUT POWER .....	9
3.2	PEAK-TO-AVERAGE RATIO (PAR).....	15
3.3	OCCUPIED BANDWIDTH AND EMISSION BANDWIDTH.....	23
3.4	BAND EDGE COMPLIANCE .....	30
3.5	SPURIOUS EMISSION .....	37
3.6	FREQUENCY STABILITY UNDER TEMPERATURE & VOLTAGE VARIATIONS .....	61
<b>4</b>	<b>TEST SETUP PHOTOS OF THE EUT .....</b>	<b>63</b>
<b>5</b>	<b>PHOTOS OF THE EUT .....</b>	<b>64</b>

# 1 SUMMARY

## 1.1 TEST STANDARDS

The tests were performed according to following standards:

[FCC Part 24](#): PUBLIC MOBILE SERVICES

[TIA/EIA 603 D June 2010](#): Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

[FCC Part 2](#): FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

[KDB971168 D01:v02r02](#) MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS

[ANSI C63.10-2013](#) Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

## 1.2 Test Description

Test Item	Section in CFR 47	Result
RF Output Power	Part 2.1046 Part 24.232 (c)	Pass
Peak-to-Average Ratio	Part 24.232 (d)	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 24.238	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 24.238 (a)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 24.238 (a)	Pass
Out of band emission, Band Edge	Part 24.238 (a)	Pass
Frequency stability	Part 2.1055 Part 24.235	Pass

## 1.3 Test Facility

### 1.3.1 Address of the test laboratory

Shenzhen LCS Compliance Testing Laboratory Ltd.

1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China

There is one 3m semi-anechoic chamber fulfils CISPR 16-1-4 according to ANSI C63.10:2013 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

### 1.3.2 Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

CNAS Registration Number. is L4595.

FCC Designation Number. is CN5024.

Industry Canada Registration Number. is 9642A-1.

ESMD Registration Number. is ARCB0108.

UL Registration Number. is 100571-492.

TUV SUD Registration Number. is SCN1081.

TUV RH Registration Number. is UA 50296516-001

## 1.4 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	3.10 dB	(1)
Radiated Emission	1~18GHz	3.80 dB	(1)
Radiated Emission	18-40GHz	3.90 dB	(1)
Conducted Disturbance	0.15~30MHz	1.63 dB	(1)
Conducted Power	9KHz~18GHz	0.61 dB	(1)
Spurious RF Conducted Emission	9KHz~40GHz	1.22 dB	(1)
Band Edge Compliance of RF Emission	9KHz~40GHz	1.22 dB	(1)
Occupied Bandwidth	9KHz~40GHz	-	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=1.96$ .

## 2 GENERAL INFORMATION

### 2.1 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

### 2.2 General Description of EUT

Product Name:	Code Black LTE
Model/Type reference:	5472
Power supply:	DC 6.0V from battery
<b>LTE</b>	
Operation Band:	FDD-LTE: Band 2/4/12
Modulation Type:	QPSK, 16QAM
Release Version:	Release 9
Category:	Cat 4
Antenna Type:	External antenna

Note: For more details, refer to the user's manual of the EUT.

### 2.3 Description of Test Modes

The EUT has been tested under typical operating condition. The CMW500 used to control the EUT staying in continuous transmitting and receiving mode for testing. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.

### 2.4 Equipments Used during the Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1	EMC Receiver	R&S	ESCS 30	100174	2017-06-18	2018-06-17
2	Signal analyzer	Agilent	E4448A(External mixers to 40GHz)	US44300469	2017-07-16	2018-06-17
3	Spectrum Analyzer	Agilent	N9020A	MY50510140	2017-10-27	2018-10-26
4	LISN	MESS Tec	NNB-2/16Z	99079	2017-06-18	2018-06-17
5	LISN	EMCO	3819/2NM	9703-1839	2017-06-18	2018-06-17
6	RF Cable-CON	UTIFLEX	3102-26886-4	CB049	2017-06-18	2018-06-17
7	ISN	SCHAFFNER	ISN ST08	21653	2017-06-18	2018-06-17
8	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2017-06-18	2018-06-17
9	Amplifier	SCHAFFNER	COA9231A	18667	2017-06-18	2018-06-17
10	Amplifier	Agilent	8449B	3008A02120	2017-06-16	2018-06-15
11	Amplifier	MITEQ	AMF-6F-260400	9121372	2017-06-16	2018-06-15

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12	Loop Antenna	R&S	HFH2-Z2	860004/001	2017-06-18	2018-06-17
13	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2017-06-10	2018-06-09
14	Horn Antenna	EMCO	3115	6741	2017-06-10	2018-06-09
15	Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	2017-06-10	2018-06-09
16	RF Cable-R03m	Jye Bao	RG142	CB021	2017-06-18	2018-06-17
17	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2017-06-18	2018-06-17
18	Power Sensor	R&S	NRV-Z81	100458	2017-06-18	2018-06-17
19	Power Sensor	R&S	NRV-Z32	10057	2017-06-18	2018-06-17
20	Power Meter	R&S	NRVS	100444	2017-06-18	2018-06-17
21	Universal Radio Communication Tester	R&S	CMU200	112012	2017-10-27	2018-10-26
22	Wideband Radia Communication Tester	R&S	CMW500	1201.0002K50	2016-11-19	2017-11-18

## 2.5 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with of the Part 24 Rules.

## 2.6 Modifications

No modifications were implemented to meet testing criteria.



### 3 TEST CONDITIONS AND RESULTS

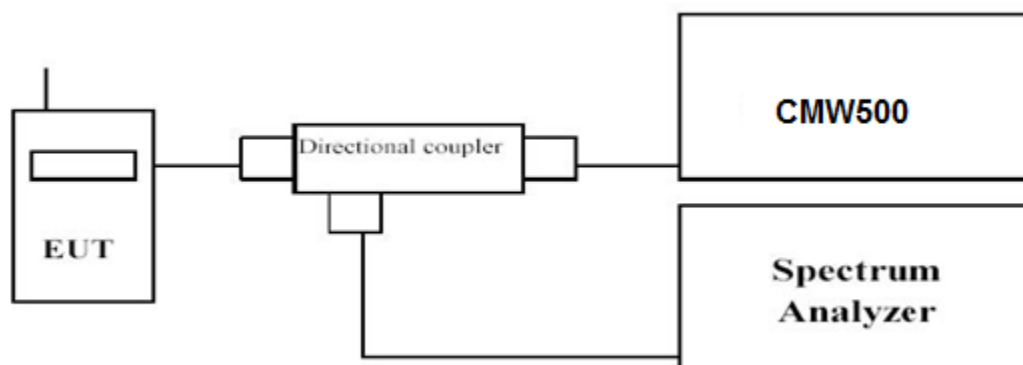
#### 3.1 Output Power

##### LIMIT

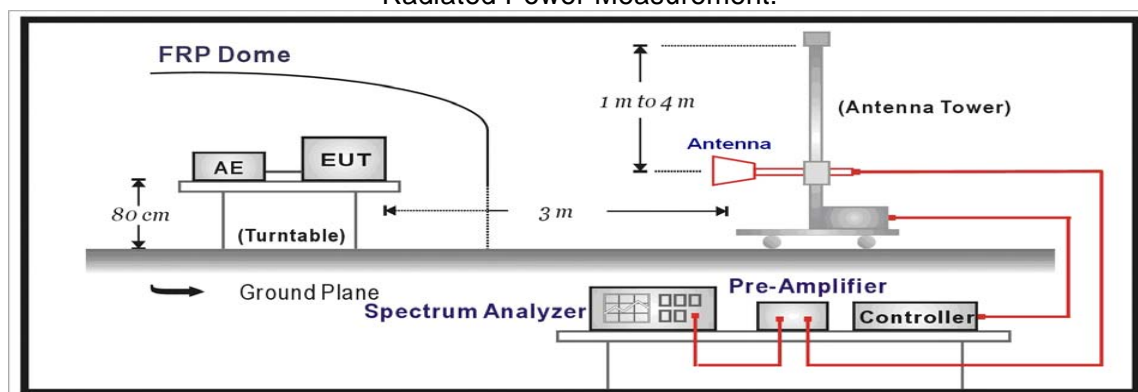
Rule Part 24.232(b) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p.

##### TEST CONFIGURATION

Conducted Power Measurement



Radiated Power Measurement:



##### TEST PROCEDURE

The EUT was setup according to EIA/TIA 603D

##### **Conducted Power Measurement:**

- Place the EUT on a bench and set it in transmitting mode.
- Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
- EUT Communicate with CMW500 then selects a channel for testing.
- Add a correction factor to the display of spectrum, and then test.

##### **Radiated Power Measurement:**

- The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter

- c) The output of the test antenna shall be connected to the measuring receiver.
- d) The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
- e) The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- f) The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- g) The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- h) The maximum signal level detected by the measuring receiver shall be noted.
- i) The transmitter shall be replaced by a substitution antenna.
- j) The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- k) The substitution antenna shall be connected to a calibrated signal generator.
- l) If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- m) The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
- n) The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
- o) The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
- p) The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
- q) Test site anechoic chamber refer to ANSI C63.4.

**TEST RESULTS****Conducted Measurement:**

LTE FDD Band 2				
TX Channel Bandwidth	Frequency (MHz)	RB Size/Offset	Average Power [dBm]	
			QPSK	16QAM
1.4 MHz	1850.7	1 RB low	22.37	21.59
		1 RB high	21.52	21.01
		50% RB mid	23.45	22.89
		100% RB	22.12	21.61
	1880.0	1 RB low	22.41	21.60
		1 RB high	23.01	22.30
		50% RB mid	23.05	22.25
		100% RB	22.84	22.19
	1909.3	1 RB low	23.01	22.66
		1 RB high	23.42	22.99
		50% RB mid	21.78	20.93
		100% RB	21.56	21.16
3 MHz	1851.5	1 RB low	22.11	21.75
		1 RB high	22.16	21.50
		50% RB mid	22.88	22.08
		100% RB	22.87	22.52
	1851.5	1 RB low	22.78	21.94
		1 RB high	22.94	22.49
		50% RB mid	21.61	20.79
		100% RB	22.63	22.27
	1908.5	1 RB low	22.73	21.90
		1 RB high	22.29	21.46
		50% RB mid	21.86	21.25
		100% RB	22.03	21.20
5 MHz	1852.5	1 RB low	23.07	22.26
		1 RB high	22.74	22.18
		50% RB mid	22.76	22.15
		100% RB	23.36	22.70
	1880.0	1 RB low	22.76	22.30
		1 RB high	21.90	21.29
		50% RB mid	22.69	21.86
		100% RB	21.65	20.80
	1907.5	1 RB low	22.75	21.99
		1 RB high	22.02	21.17
		50% RB mid	22.66	22.19
		100% RB	23.27	22.85
10 MHz	1855.0	1 RB low	21.69	21.26
		1 RB high	23.40	22.69
		50% RB mid	21.94	21.21
		100% RB	23.01	22.55
	1880.0	1 RB low	21.93	21.22
		1 RB high	22.07	21.32
		50% RB mid	21.63	21.04
		100% RB	23.41	22.91
	1905.0	1 RB low	22.06	21.28
		1 RB high	22.31	21.64
		50% RB mid	22.97	22.43
		100% RB	23.33	22.77
15 MHz	1857.5	1 RB low	22.17	21.70

		1 RB high	23.05	22.48
		50% RB mid	21.54	21.07
		100% RB	22.66	22.13
	1880.0	1 RB low	22.10	21.67
		1 RB high	21.73	21.27
		50% RB mid	22.07	21.42
		100% RB	23.32	22.89
	1902.5	1 RB low	22.93	22.23
		1 RB high	23.05	22.63
		50% RB mid	21.71	20.92
		100% RB	22.48	21.98
20 MHz	1860.0	1 RB low	22.01	21.60
		1 RB high	23.08	22.30
		50% RB mid	23.30	22.80
		100% RB	22.66	22.18
	1880.0	1 RB low	22.52	21.87
		1 RB high	23.19	22.38
		50% RB mid	21.53	20.97
		100% RB	23.32	22.76
	1900.0	1 RB low	23.26	22.61
		1 RB high	22.51	22.11
		50% RB mid	23.23	22.88
		100% RB	21.66	20.88

**Radiated Measurement:**

Remark:

1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 2; recorded worst case for each Channel Bandwidth of LTE FDD Band 2.
2.  $EIRP = P_{Mea}(dBm) - P_{cl}(dB) + P_{Ag}(dB) + G_a(dBi)$

**LTE FDD Band 2\_Channel Bandwidth 1.4MHz\_QPSK**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1850.7	-15.27	3.41	10.23	33.60	25.15	33.01	7.86	V
1880.0	-14.93	3.49	10.23	33.60	25.41	33.01	7.60	V
1909.3	-14.65	3.55	10.25	33.60	25.65	33.01	7.36	V

**LTE FDD Band 2\_Channel Bandwidth 3MHz\_QPSK**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1851.5	-15.16	3.41	10.23	33.60	25.26	33.01	7.75	V
1880.0	-14.76	3.49	10.23	33.60	25.58	33.01	7.43	V
1908.5	-14.83	3.55	10.25	33.60	25.47	33.01	7.54	V

**LTE FDD Band 2\_Channel Bandwidth 5MHz\_QPSK**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1852.5	-14.68	3.41	10.23	33.60	25.74	33.01	7.27	V
1880.0	-14.71	3.49	10.23	33.60	25.63	33.01	7.38	V
1907.5	-14.51	3.55	10.25	33.60	25.79	33.01	7.22	V

**LTE FDD Band 2\_Channel Bandwidth 10MHz\_QPSK**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1855.0	-14.87	3.41	10.23	33.60	25.55	33.01	7.46	V
1880.0	-15.02	3.49	10.23	33.60	25.32	33.01	7.69	V
1905.0	-14.83	3.55	10.25	33.60	25.47	33.01	7.54	V

**LTE FDD Band 2\_Channel Bandwidth 15MHz\_QPSK**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1857.5	-14.88	3.41	10.23	33.60	25.54	33.01	7.47	V
1880.0	-14.19	3.49	10.23	33.60	26.15	33.01	6.86	V
1902.5	-14.34	3.55	10.25	33.60	25.96	33.01	7.05	V

**LTE FDD Band 2\_Channel Bandwidth 20MHz\_QPSK**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1860.0	-15.06	3.41	10.23	33.60	25.36	33.01	7.65	V
1880.0	-14.87	3.49	10.23	33.60	25.47	33.01	7.54	V
1900.0	-14.52	3.55	10.25	33.60	25.78	33.01	7.23	V

***LTE FDD Band 2\_Channel Bandwidth 1.4MHz\_16QAM***

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1850.7	-16.09	3.41	10.23	33.60	24.33	33.01	8.68	V
1880.0	-15.87	3.49	10.23	33.60	24.47	33.01	8.54	V
1909.3	-15.79	3.55	10.25	33.60	24.51	33.01	8.50	V

***LTE FDD Band 2\_Channel Bandwidth 3MHz\_16QAM***

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1851.5	-16.28	3.41	10.23	33.60	24.14	33.01	8.87	V
1880.0	-16.01	3.49	10.23	33.60	24.33	33.01	8.68	V
1908.5	-16.02	3.55	10.25	33.60	24.28	33.01	8.73	V

***LTE FDD Band 2\_Channel Bandwidth 5MHz\_16QAM***

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1852.5	-15.98	3.41	10.23	33.60	24.44	33.01	8.57	V
1880.0	-15.82	3.49	10.23	33.60	24.52	33.01	8.49	V
1907.5	-15.92	3.55	10.25	33.60	24.38	33.01	8.63	V

***LTE FDD Band 2\_Channel Bandwidth 10MHz\_16QAM***

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1855.0	-16.01	3.41	10.23	33.60	24.41	33.01	8.60	V
1880.0	-15.29	3.49	10.23	33.60	25.05	33.01	7.96	V
1905.0	-15.19	3.55	10.25	33.60	25.11	33.01	7.90	V

***LTE FDD Band 2\_Channel Bandwidth 15MHz\_16QAM***

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1857.5	-16.10	3.41	10.23	33.60	24.32	33.01	8.69	V
1880.0	-15.93	3.49	10.23	33.60	24.41	33.01	8.60	V
1902.5	-15.78	3.55	10.25	33.60	24.52	33.01	8.49	V

***LTE FDD Band 2\_Channel Bandwidth 20MHz\_16QAM***

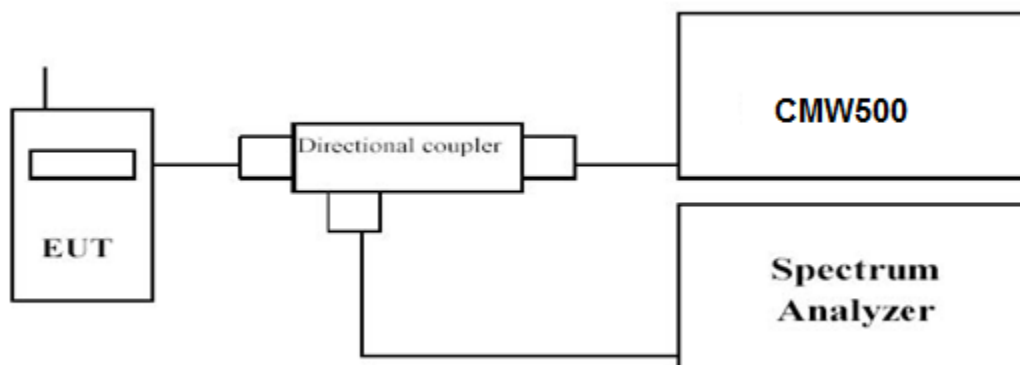
Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1860.0	-15.98	3.41	10.23	33.60	24.44	33.01	8.57	V
1880.0	-15.77	3.49	10.23	33.60	24.57	33.01	8.44	V
1900.0	-15.88	3.55	10.25	33.60	24.42	33.01	8.59	V

## 3.2 Peak-to-Average Ratio (PAR)

### LIMIT

The Peak-to-Average Ratio (PAR) of the transmission may not exceed 13 dB.

### TEST CONFIGURATION



### TEST PROCEDURE

1. Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
2. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
3. Set the number of counts to a value that stabilizes the measured CCDF curve;
4. Set the measurement interval as follows:
  - 1). for continuous transmissions, set to 1 ms,
  - 2). for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
5. Record the maximum PAPR level associated with a probability of 0.1%.

**TEST RESULTS****Remark:**

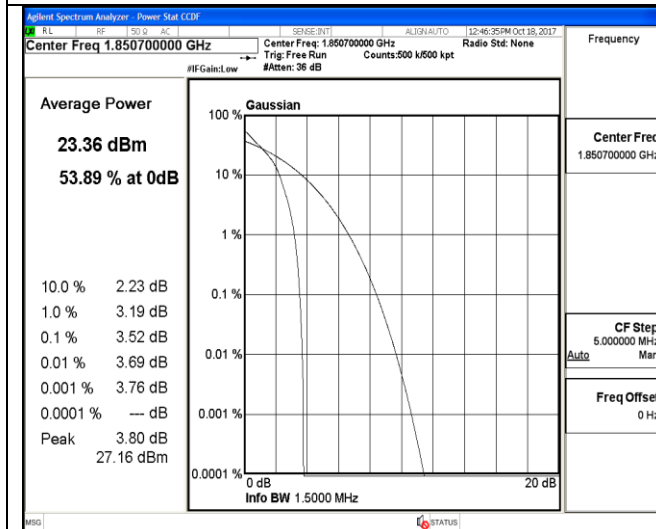
1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 2; recorded worst case for each Channel Bandwidth of LTE FDD Band 2.

LTE FDD Band 2				
TX Channel Bandwidth	Frequency (MHz)	RB Size/Offset	PAPR (dB)	
			QPSK	16QAM
1.4 MHz	1850.7	1RB#0	3.52	4.73
	1880.0		3.40	4.33
	1909.3		3.98	4.87
3 MHz	1851.5	1RB#0	3.60	4.51
	1880.0		3.46	4.22
	1908.5		3.65	4.52
5 MHz	1852.5	1RB#0	3.50	4.19
	1880.0		3.43	4.29
	1907.5		3.55	4.22
10 MHz	1855.0	1RB#0	3.73	4.62
	1880.0		3.78	4.58
	1905.0		3.18	4.08
15 MHz	1857.5	1RB#0	9.52	9.38
	1880.0		9.47	9.42
	1902.5		9.46	9.23
20 MHz	1860.0	1RB#0	8.80	8.89
	1880.0		9.12	8.99
	1900.0		9.04	8.88

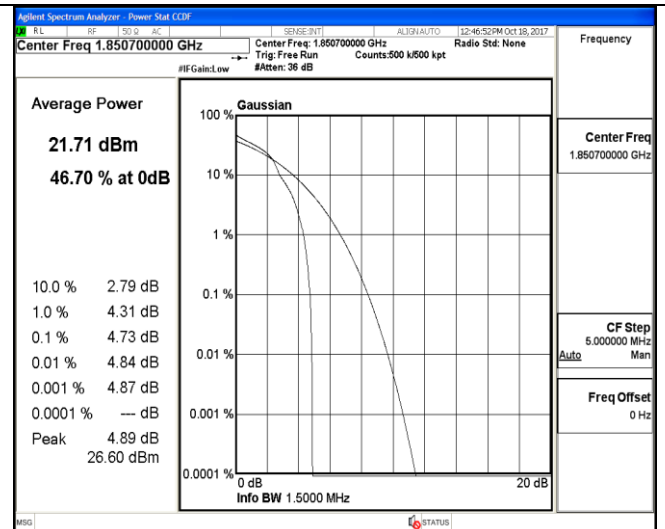


## LTE FDD Band 2-1.4MHz Channel Bandwidth PAPR

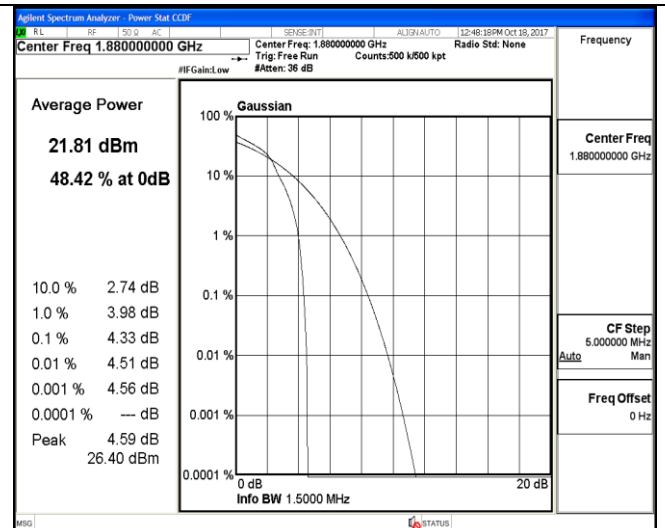
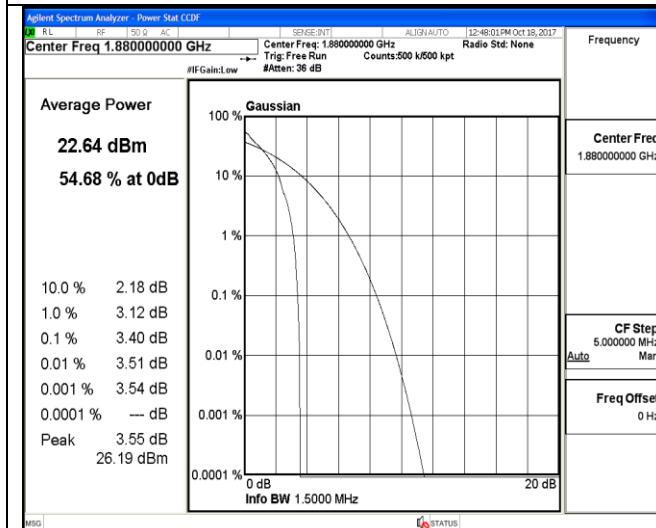
## QPSK



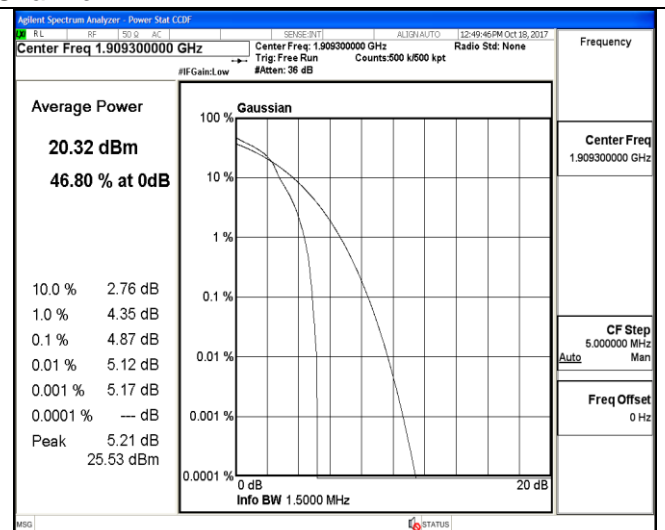
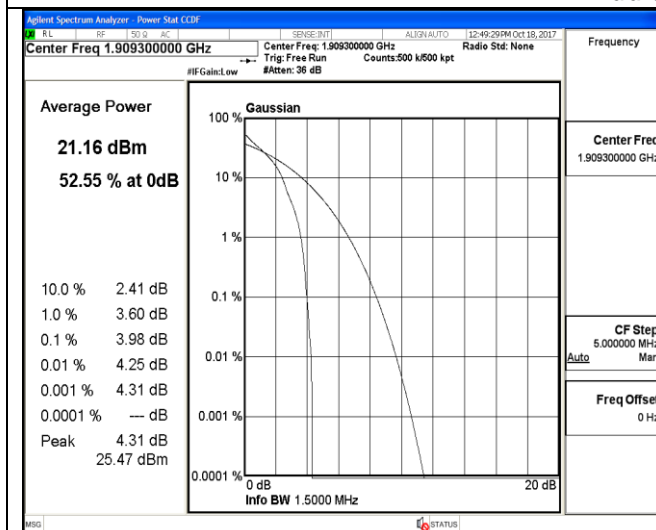
## 16QAM



## Low Channel



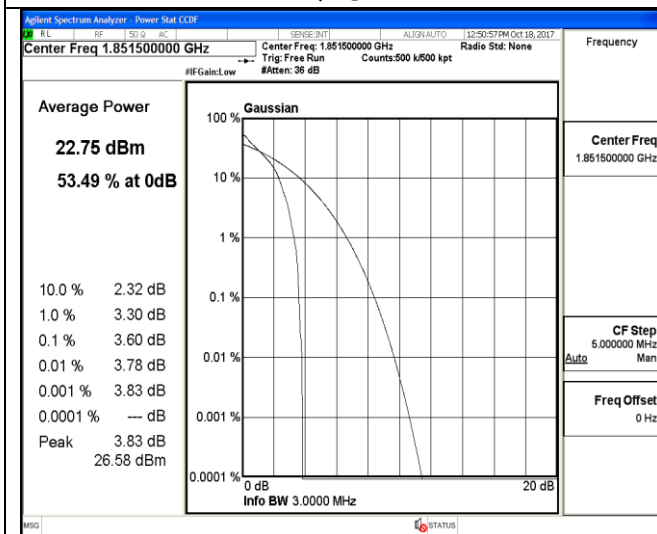
## Middle Channel



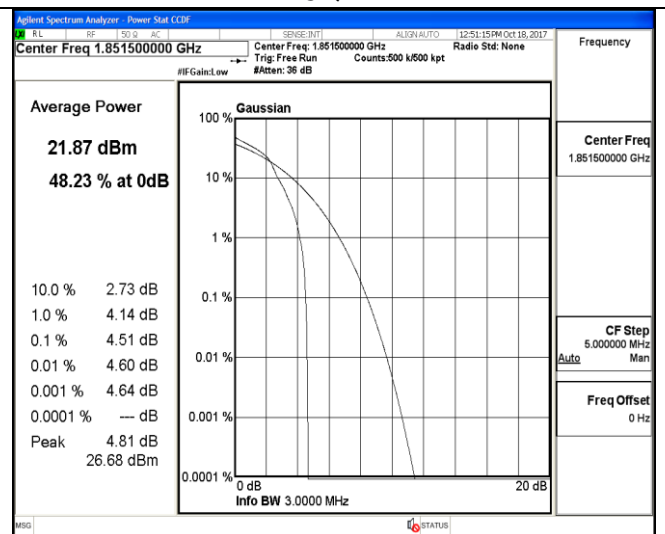
## High Channel

## LTE FDD Band 2-3MHz Channel Bandwidth PAPR

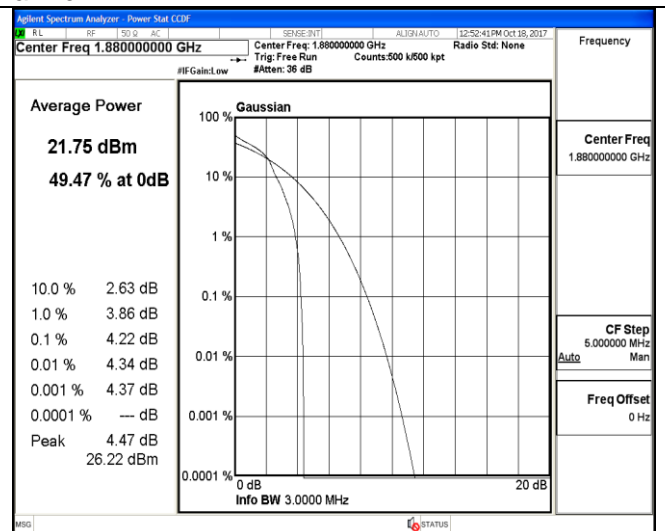
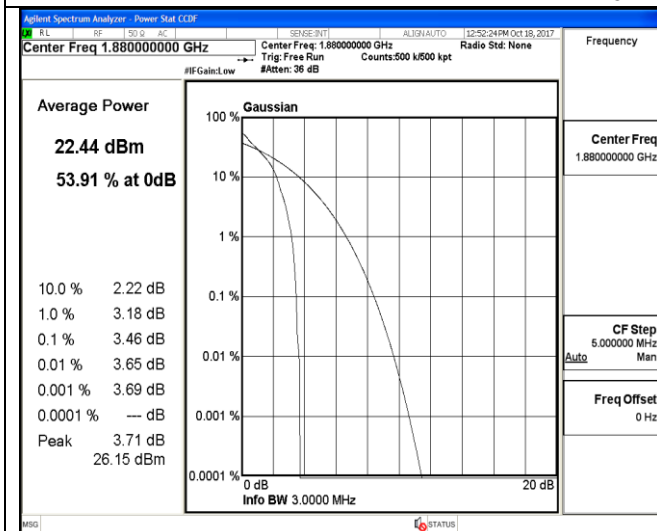
## QPSK



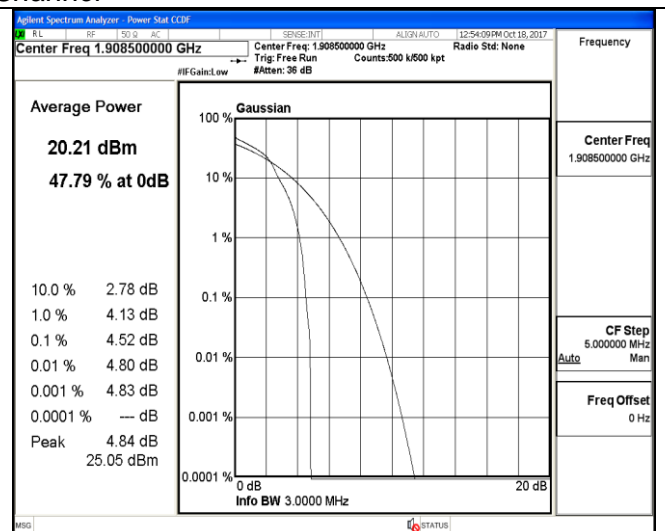
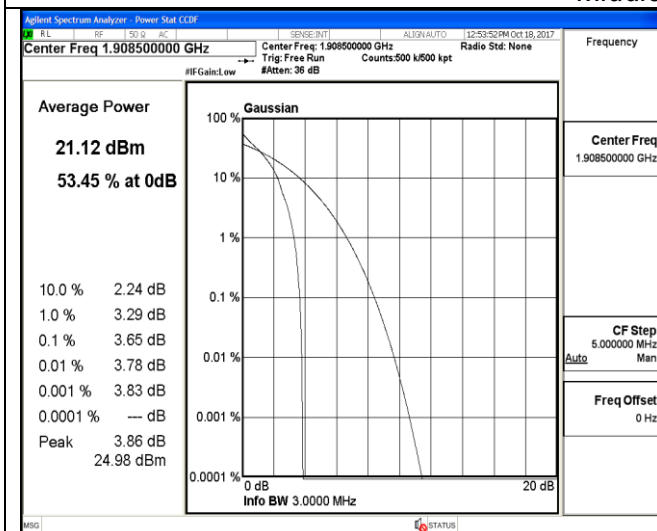
## 16QAM



## Low Channel



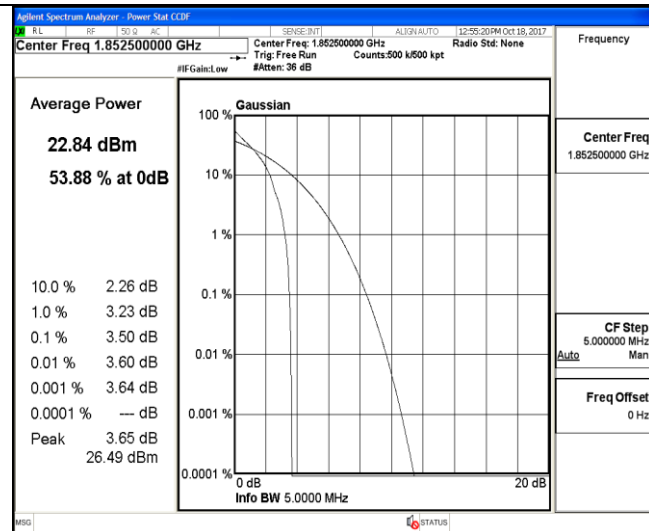
## Middle Channel



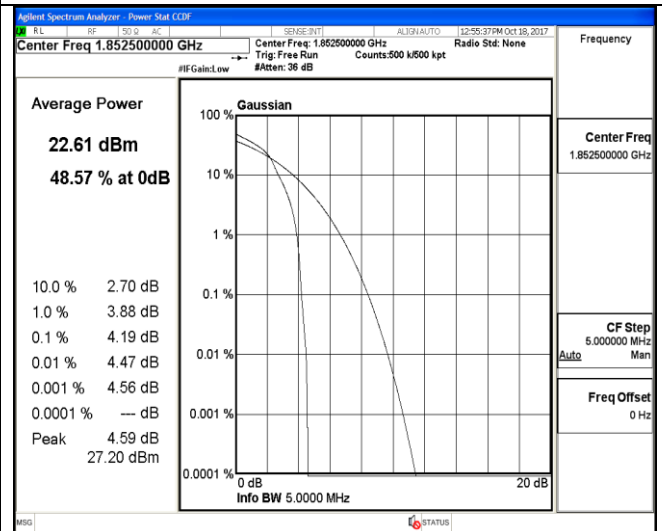
## High Channel

## LTE FDD Band 2-5MHz Channel Bandwidth PAPR

## QPSK



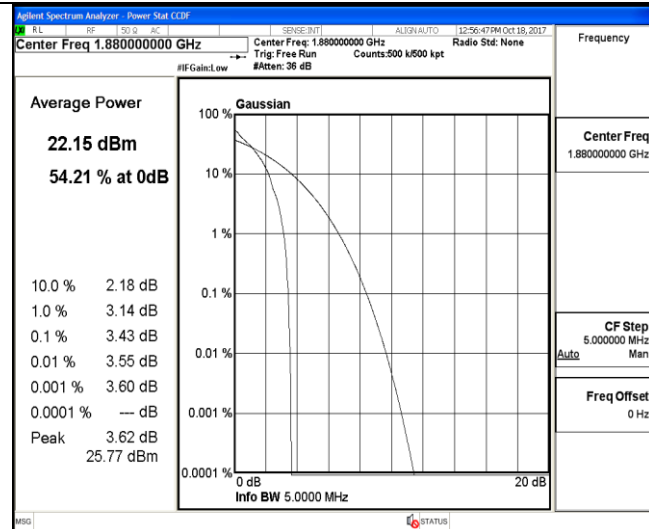
## 16QAM



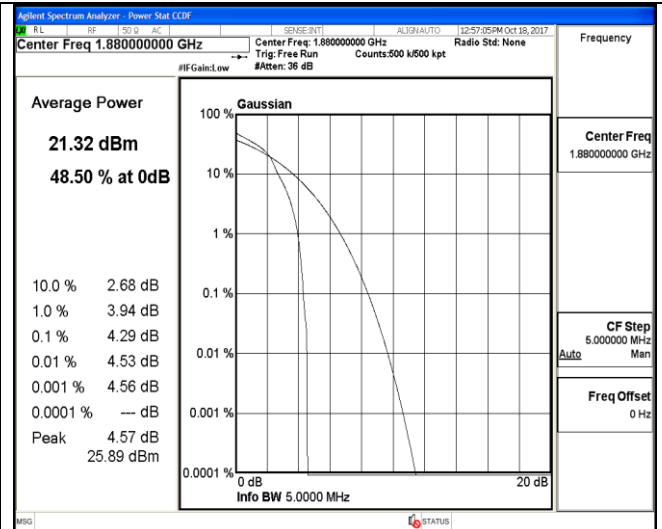
1RB#0

1RB#0

## Low Channel

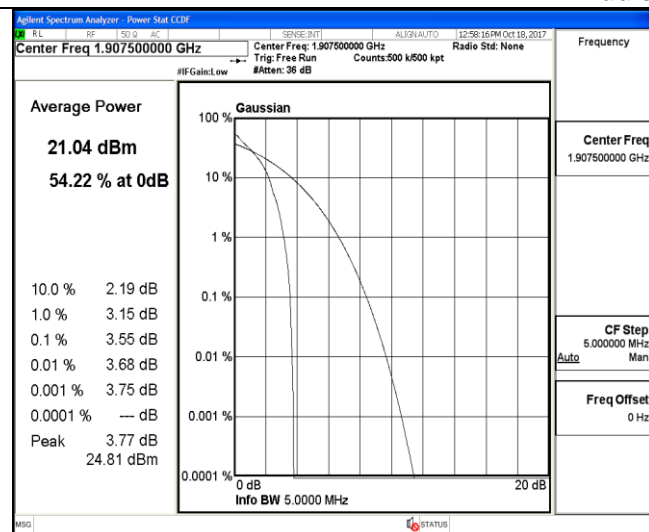


1RB#0

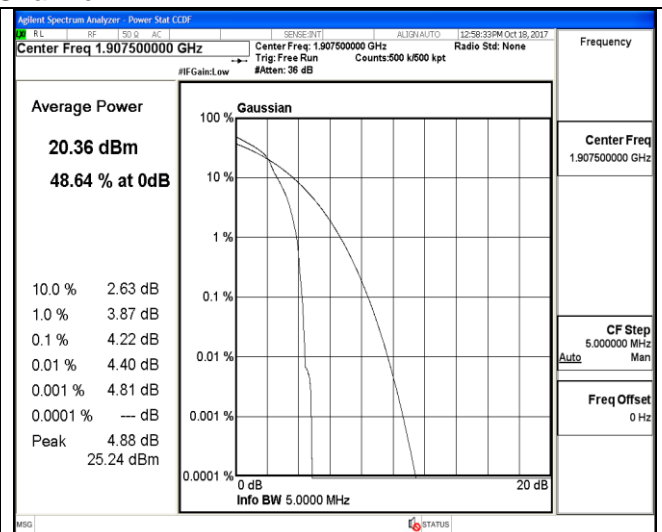


1RB#0

## Middle Channel



1RB#0

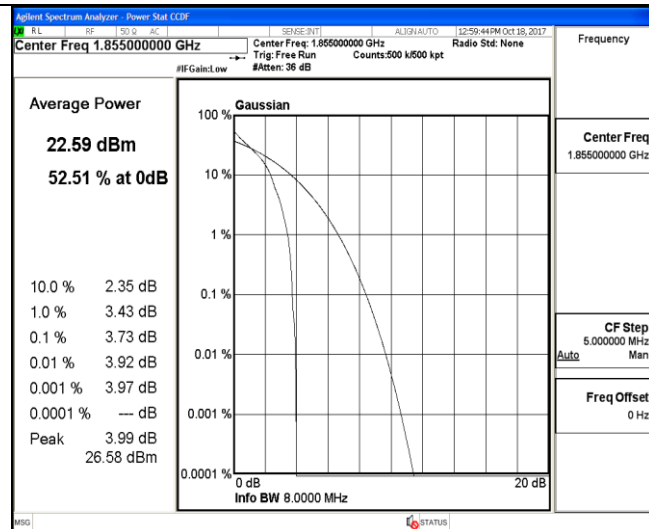


1RB#0

## High Channel

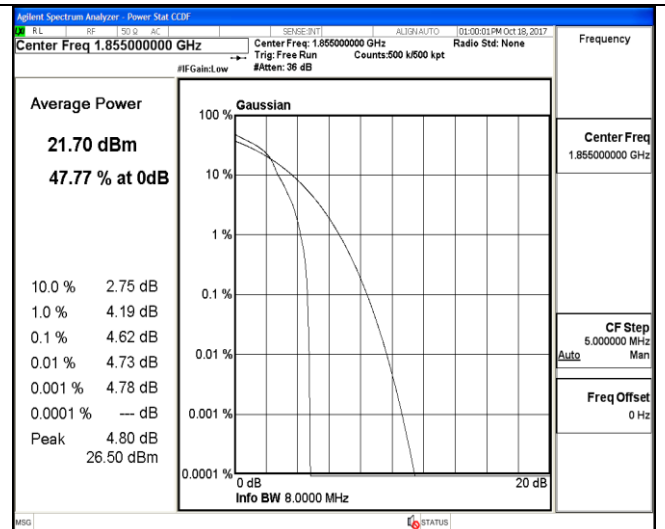
## LTE FDD Band 2-10MHz Channel Bandwidth PAPR

## QPSK



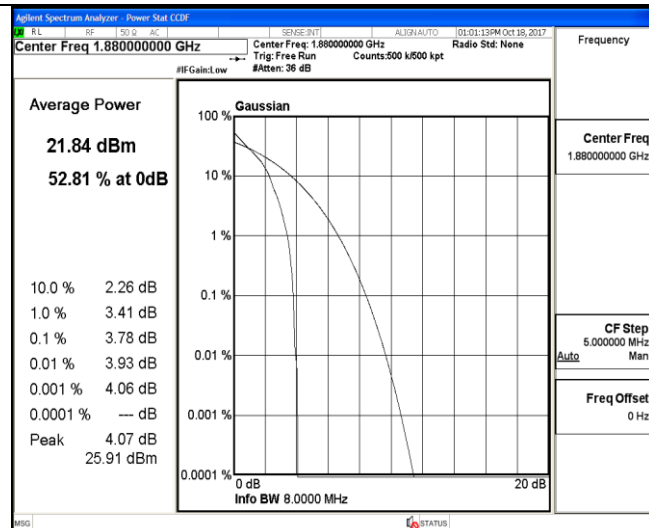
1RB#0

## 16QAM

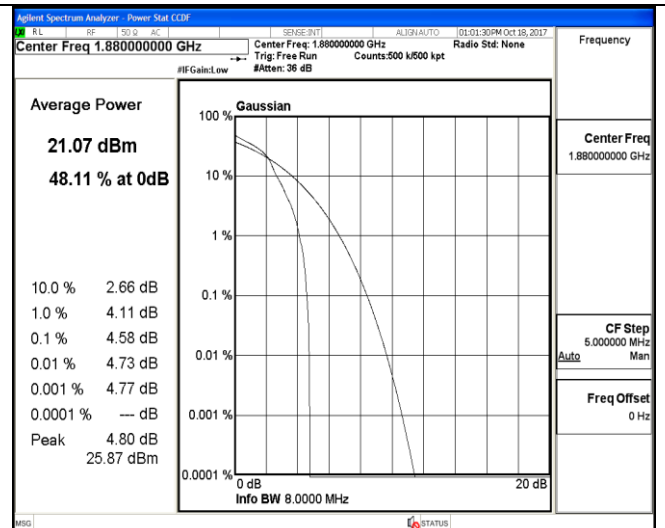


1RB#0

## Low Channel

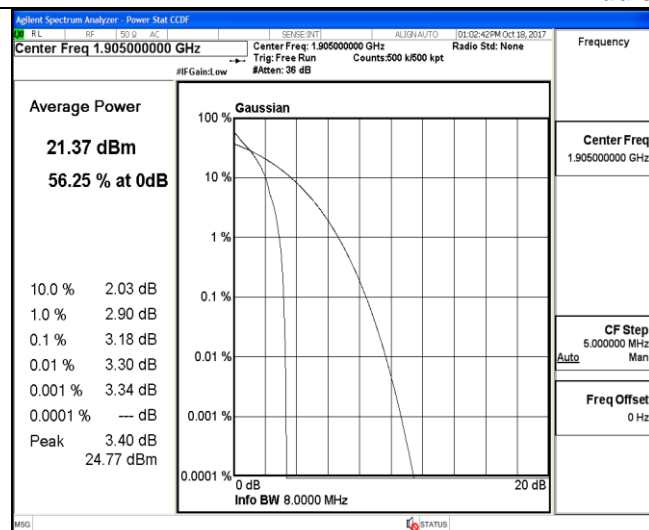


1RB#0

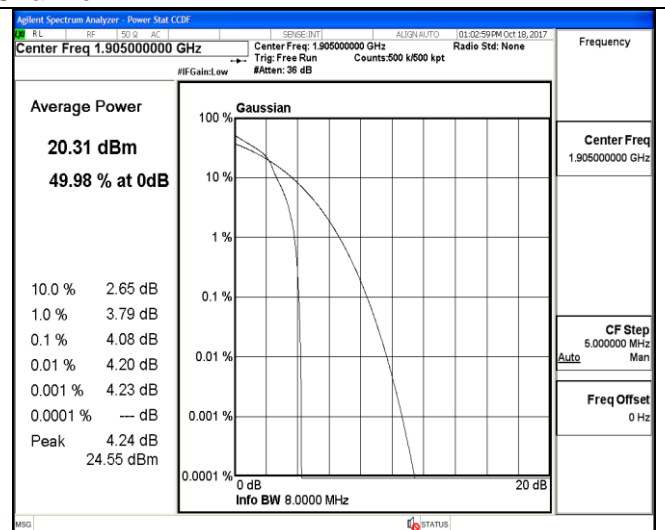


1RB#0

## Middle Channel



1RB#0

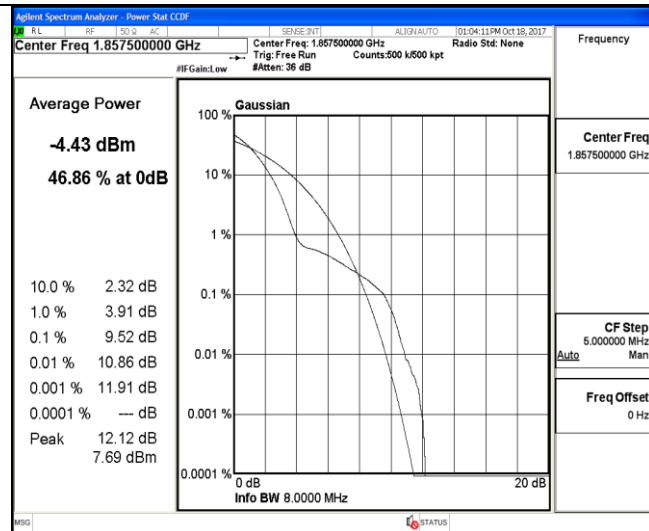


1RB#0

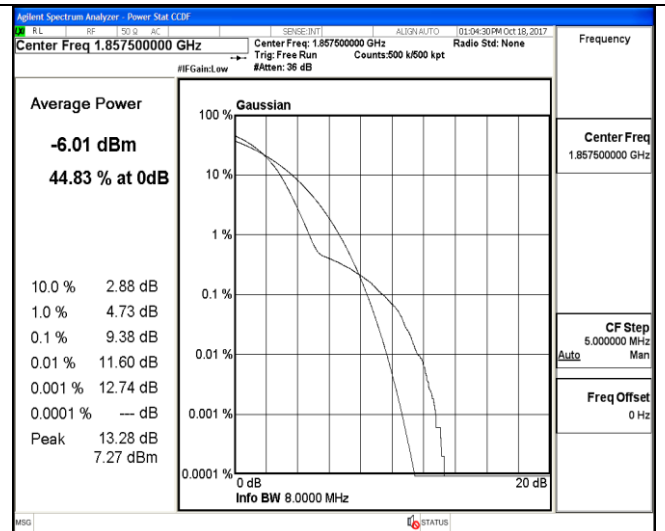
## High Channel

## LTE FDD Band 2-15MHz Channel Bandwidth PAPR

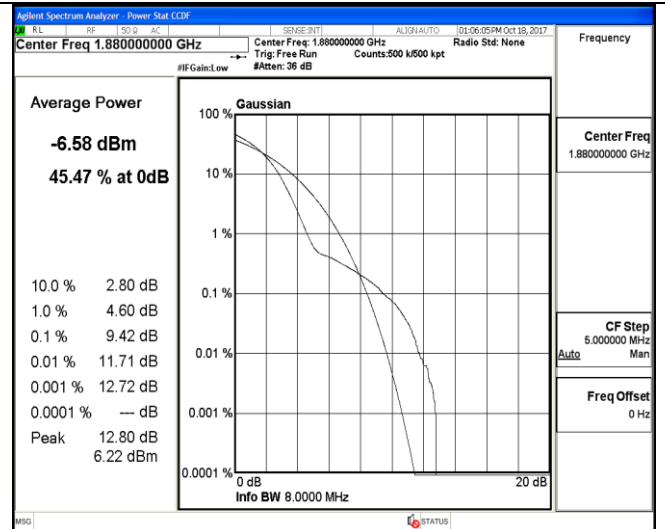
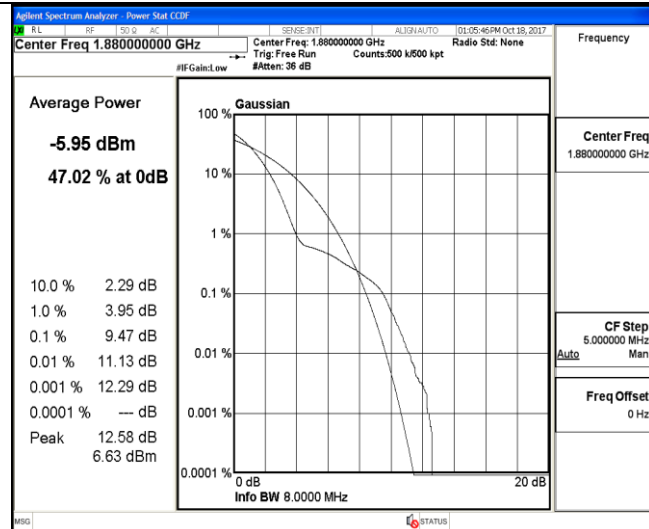
## QPSK



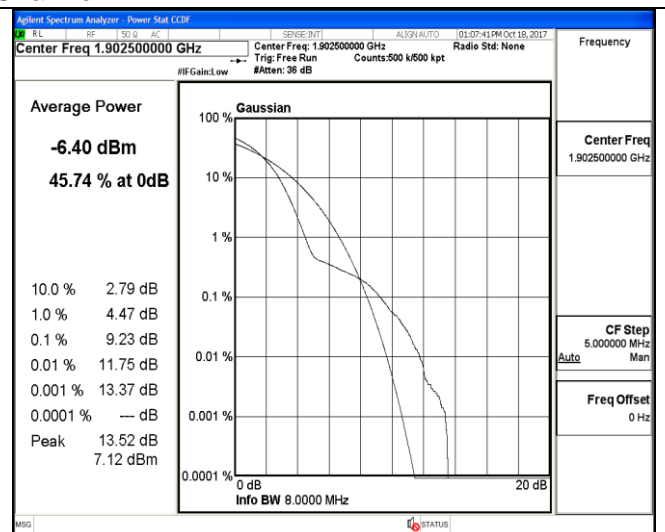
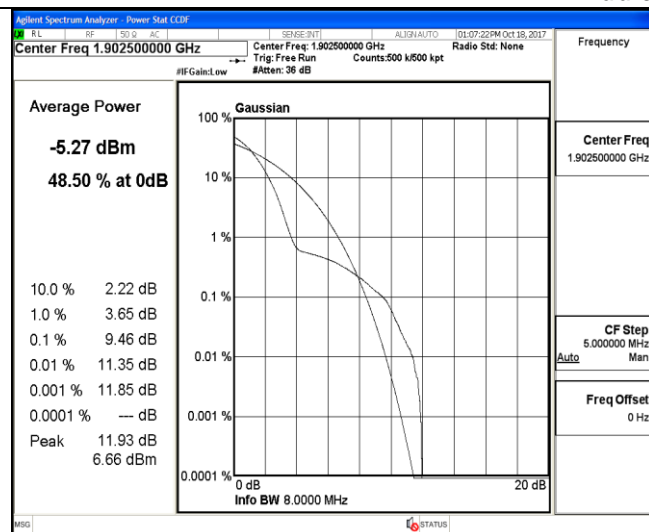
## 16QAM



## Low Channel



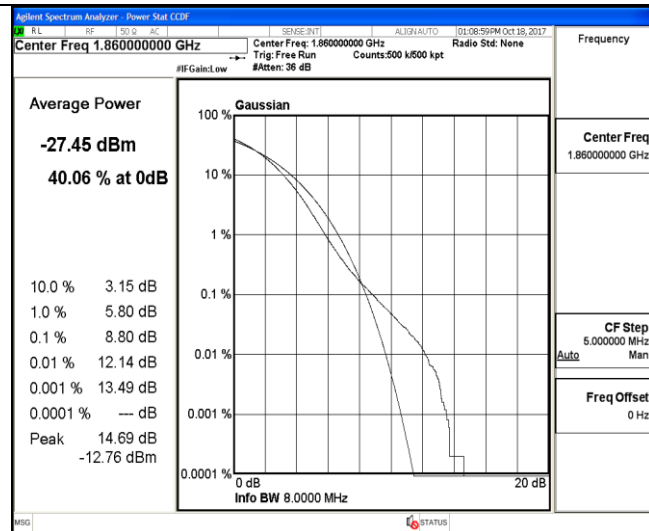
## Middle Channel



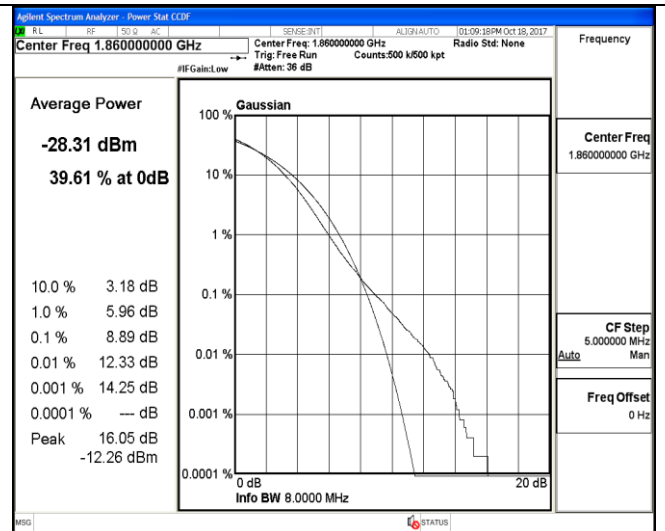
## High Channel

## LTE FDD Band 2-20MHz Channel Bandwidth PAPR

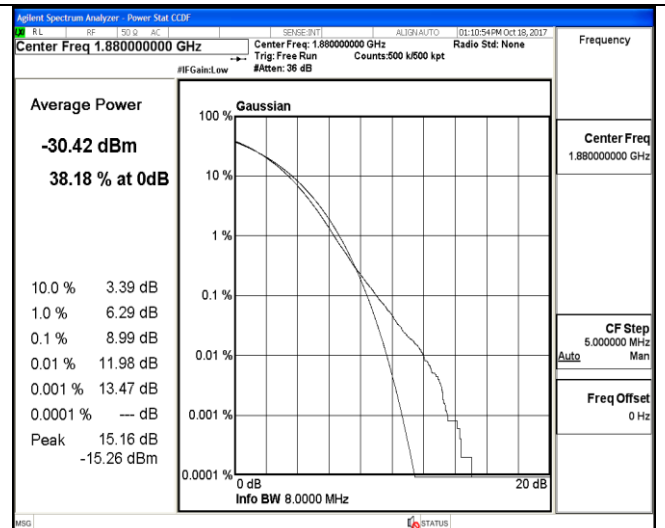
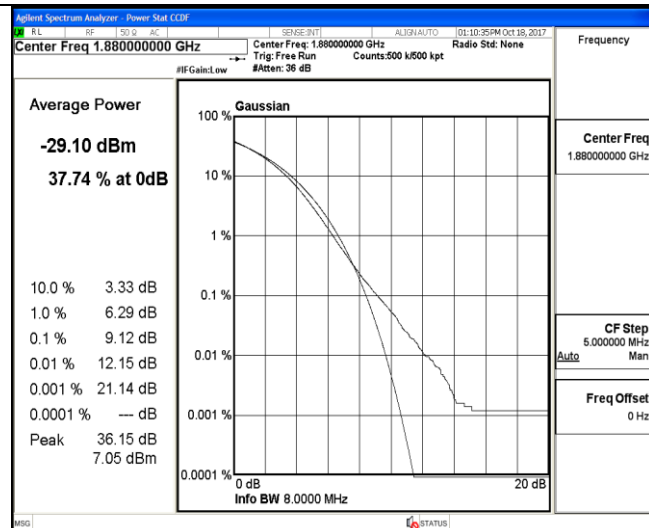
## QPSK



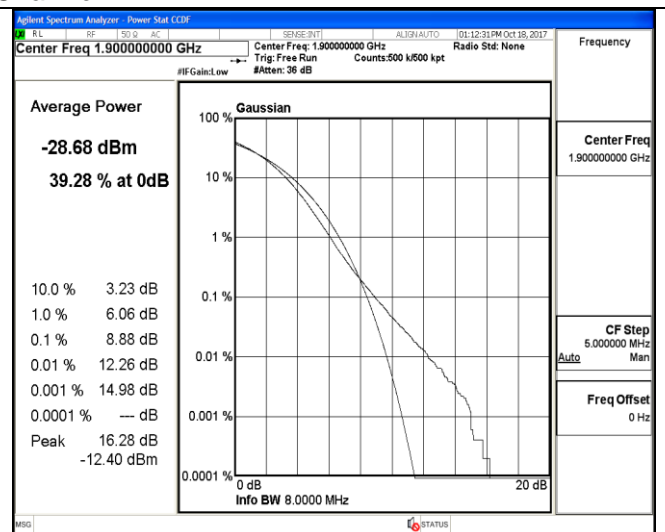
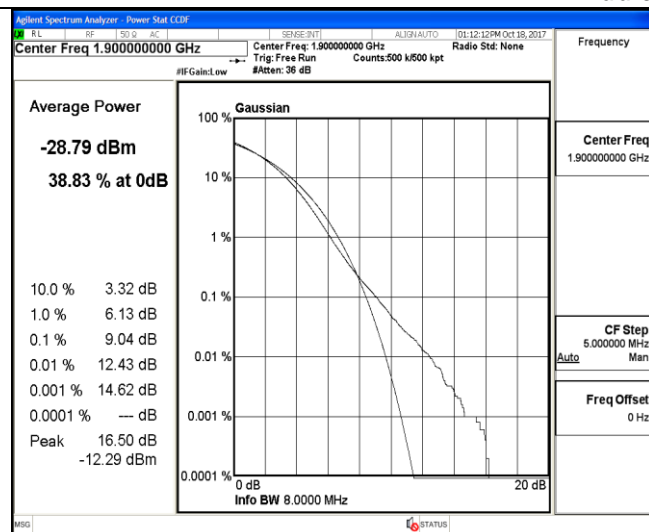
## 16QAM



## Low Channel



## Middle Channel



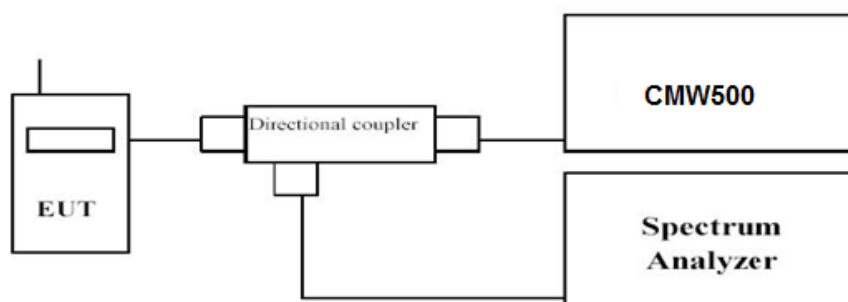
## High Channel

### 3.3 Occupied Bandwidth and Emission Bandwidth

#### LIMIT

N/A

#### TEST CONFIGURATION



#### TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at low, middle and high channel in each band. The -26dBc Emission bandwidth was also measured and recorded.

Set RBW was set to about 1% of emission BW, VBW $\geq$ 3 times RBW.

-26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

#### TEST RESULTS

Remark:

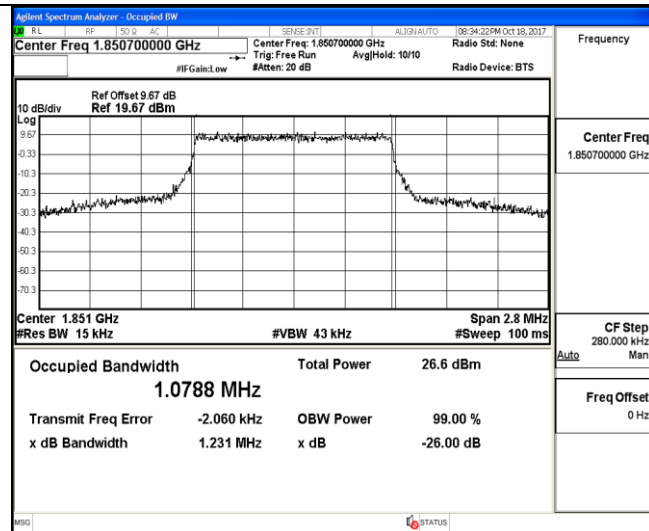
1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 2; recorded worst case for each Channel Bandwidth of LTE FDD Band 2.

LTE FDD Band 2						
TX Channel Bandwidth	RB Size/Offset	Frequency (MHz)	-26dBc Emission bandwidth (MHz)		99% Occupied bandwidth (MHz)	
			QPSK	16QAM	QPSK	16QAM
1.4 MHz	6RB#0	1850.7	1.231	1.234	1.0788	1.0801
		1880.0	1.233	1.224	1.0765	1.0810
		1909.3	1.224	1.211	1.0793	1.0768
3 MHz	15RB#0	1851.5	2.881	2.877	2.6815	2.6831
		1880.0	2.868	2.878	2.6854	2.6863
		1908.5	2.876	2.866	2.6818	2.6870
5 MHz	25RB#0	1852.5	4.787	4.825	4.4877	4.4870
		1880.0	4.824	4.834	4.4827	4.4796
		1907.5	4.822	4.811	4.4795	4.4863
10 MHz	50RB#0	1855.0	9.426	9.452	8.9355	8.9412
		1880.0	9.609	9.529	8.9401	8.9430
		1905.0	9.597	9.466	8.9337	8.9403
15 MHz	75RB#0	1857.5	14.19	14.13	13.409	13.408
		1880.0	14.30	14.10	13.417	13.409
		1902.5	14.14	14.10	13.405	13.405
20 MHz	100RB#0	1860.0	18.70	18.68	17.873	17.862
		1880.0	18.68	18.62	17.881	17.884
		1900.0	18.69	18.59	17.862	17.837

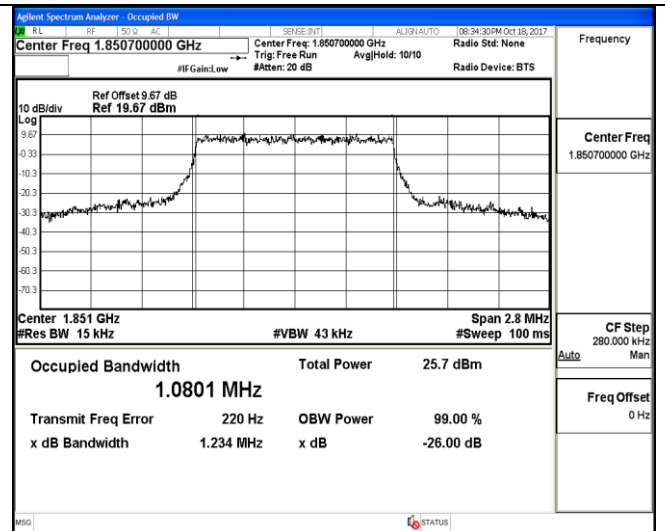


## LTE FDD Band 2-1.4MHz Channel Bandwidth

## QPSK



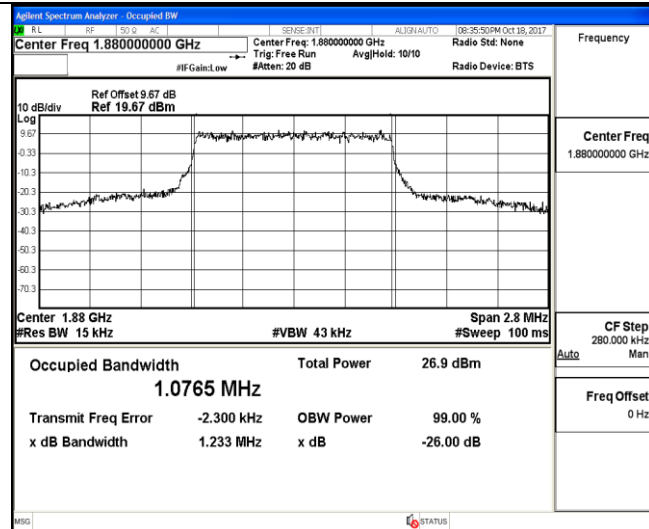
## 16QAM



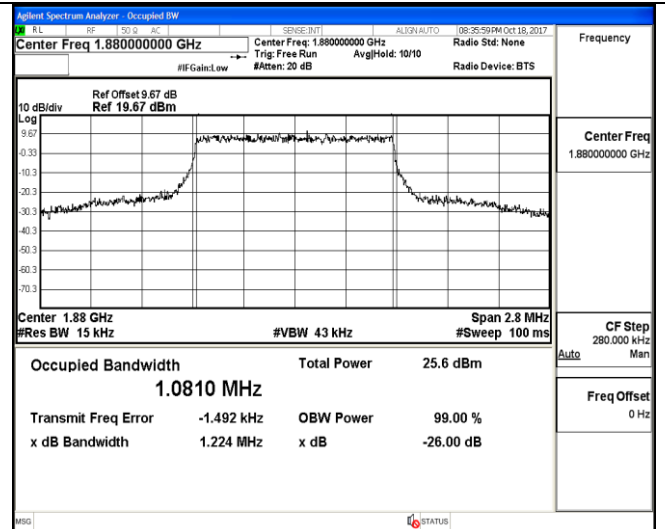
6RB#0

6RB#0

## Low Channel

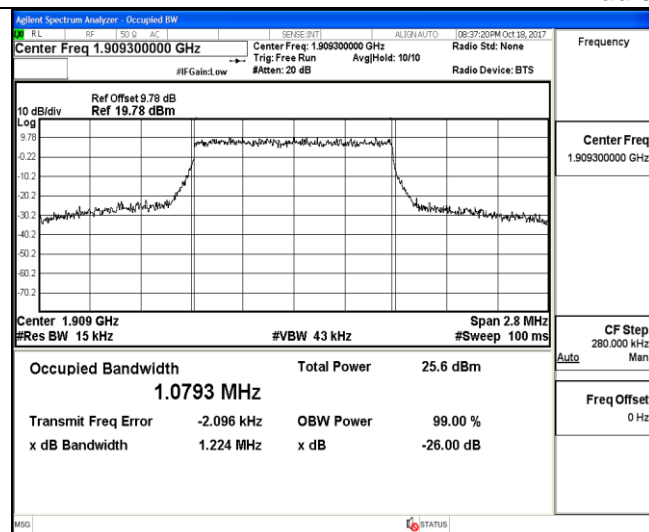


6RB#0

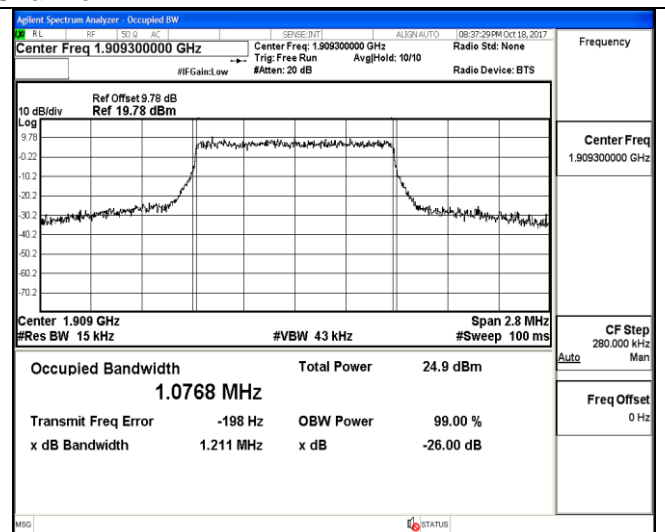


6RB#0

## Middle Channel



6RB#0



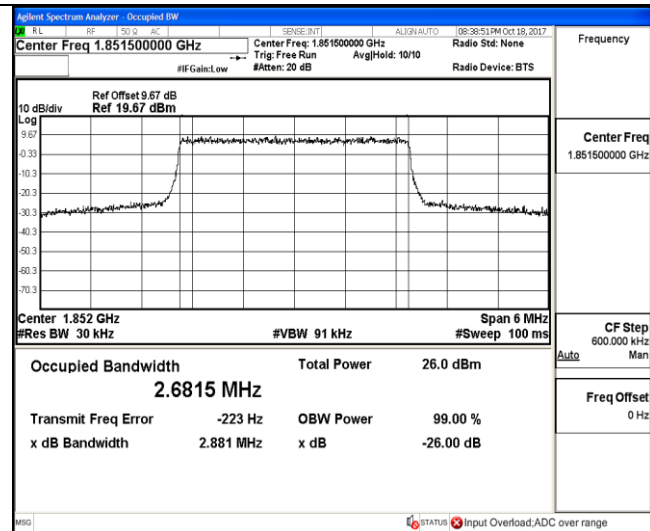
6RB#0

## High Channel

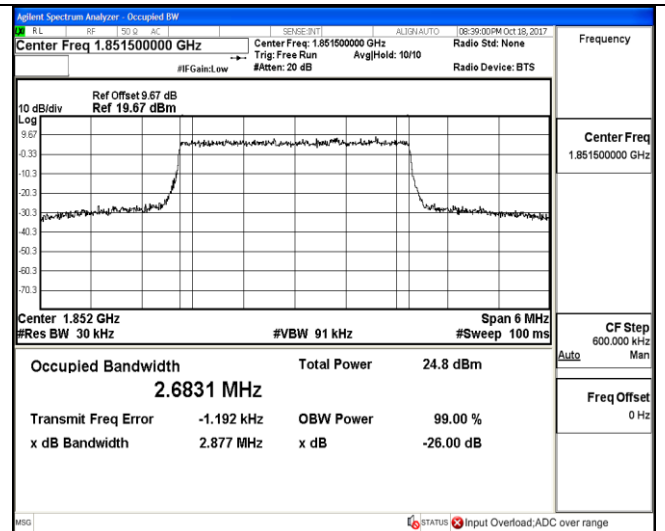


## LTE FDD Band 2-3MHz Channel Bandwidth

## QPSK



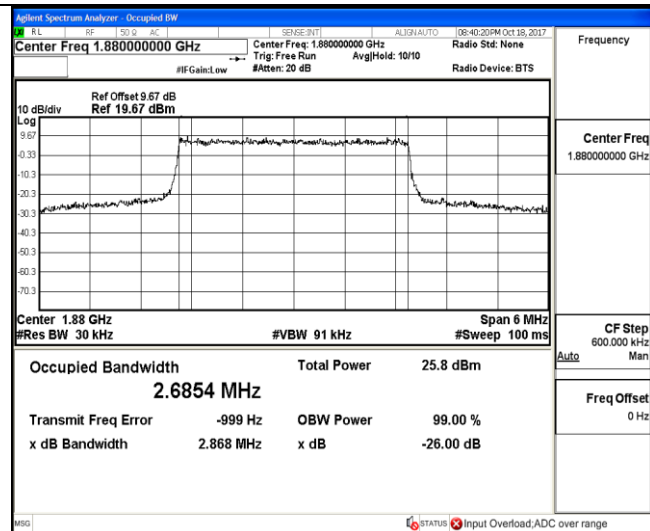
## 16QAM



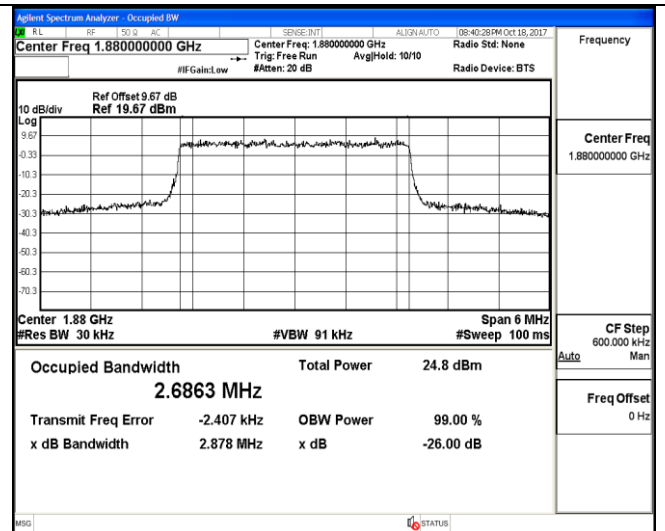
15RB#0

15RB#0

## Low Channel

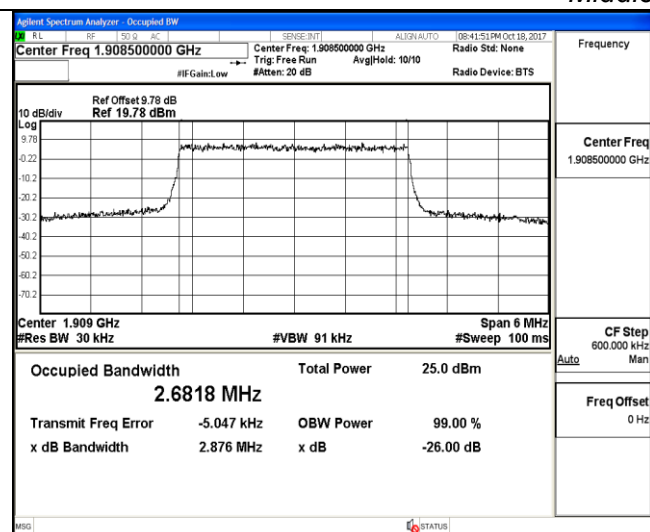


15RB#0

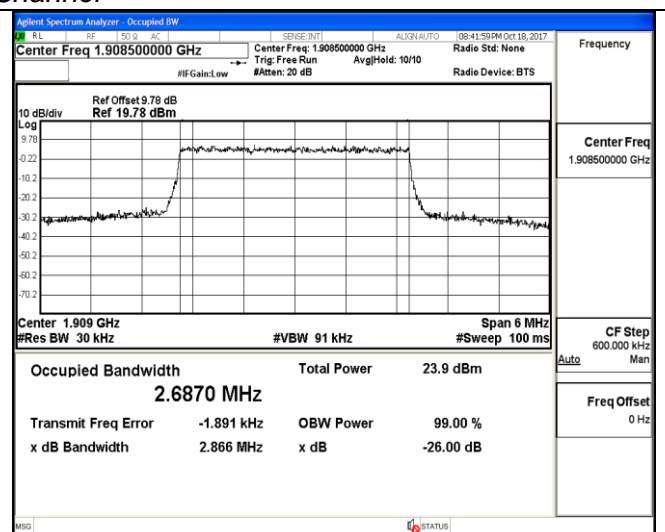


15RB#0

## Middle Channel



15RB#0

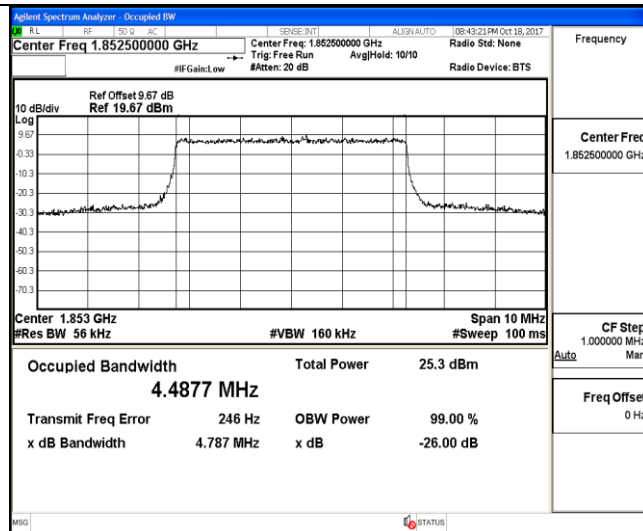


15RB#0

## High Channel

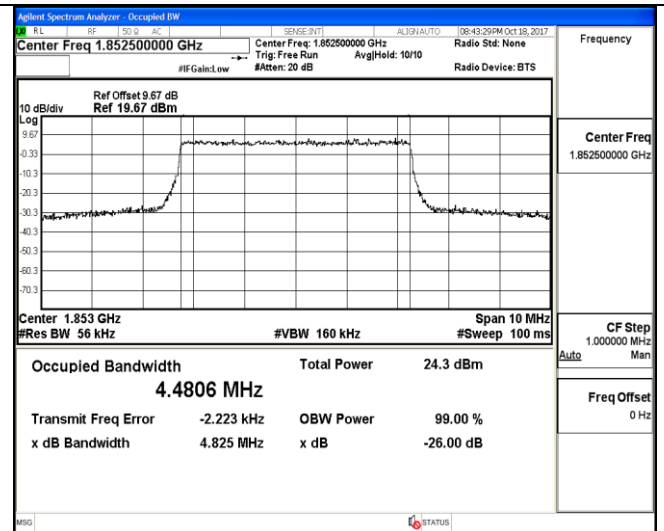
## LTE FDD Band 2-5MHz Channel Bandwidth

## QPSK



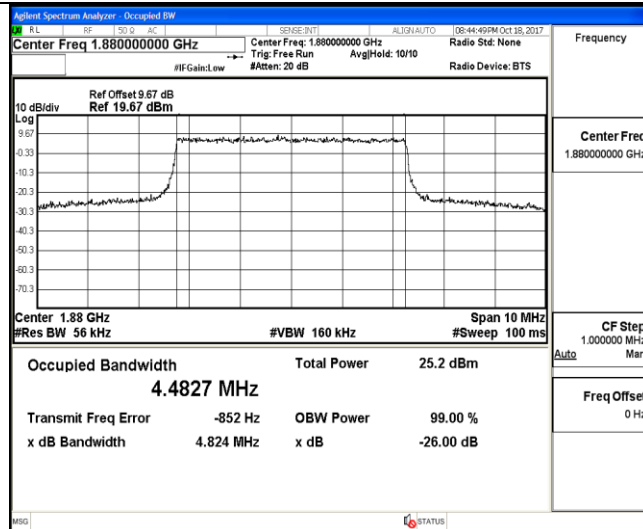
25RB#0

## 16QAM

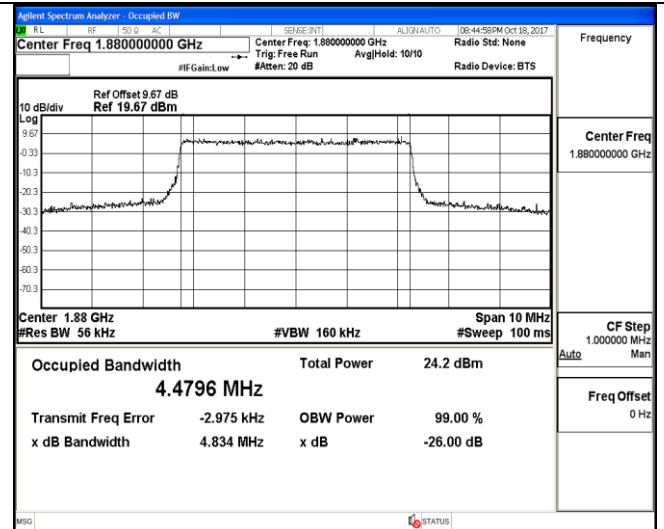


25RB#0

## Low Channel

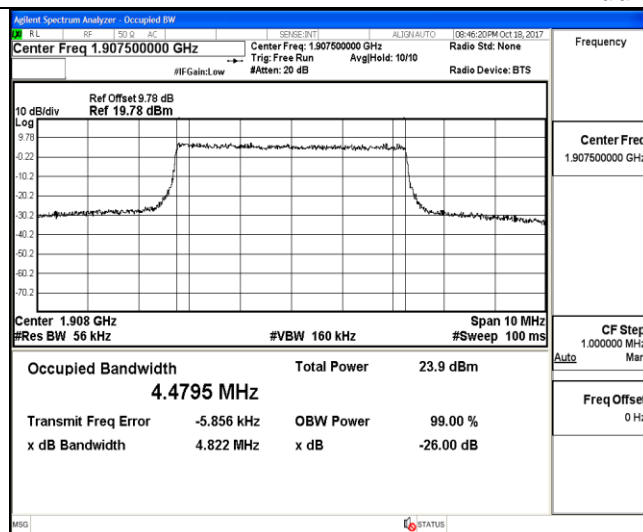


25RB#0

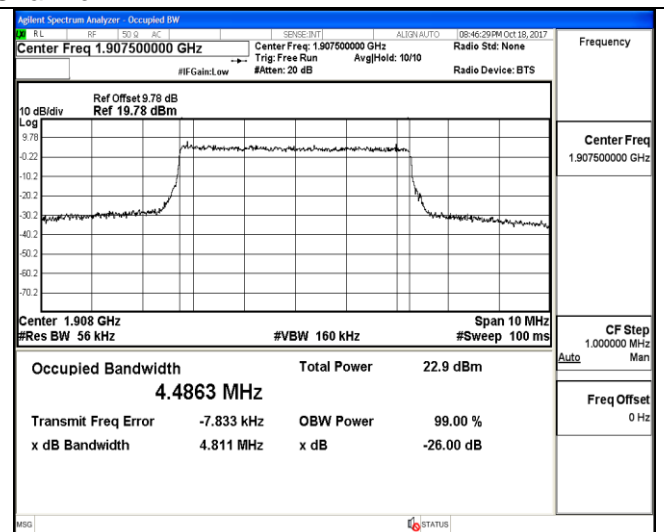


25RB#0

## Middle Channel



25RB#0

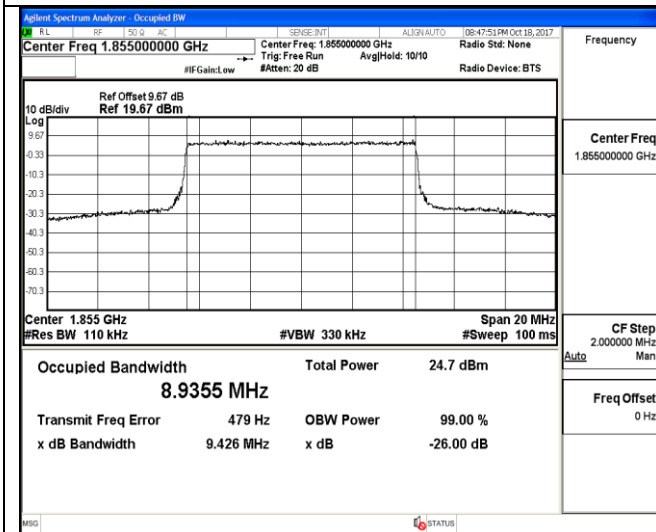


25RB#0

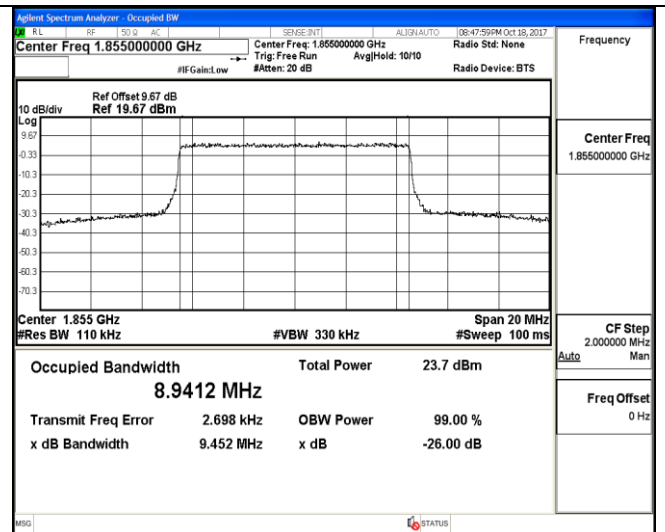
## High Channel

## LTE FDD Band 2-10MHz Channel Bandwidth

## QPSK



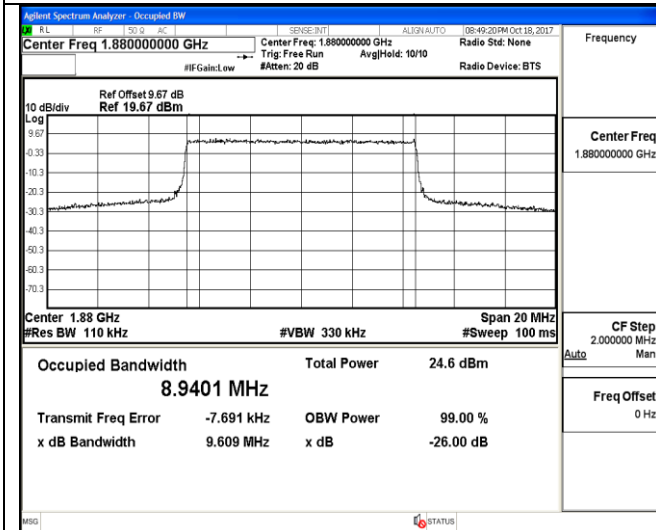
## 16QAM



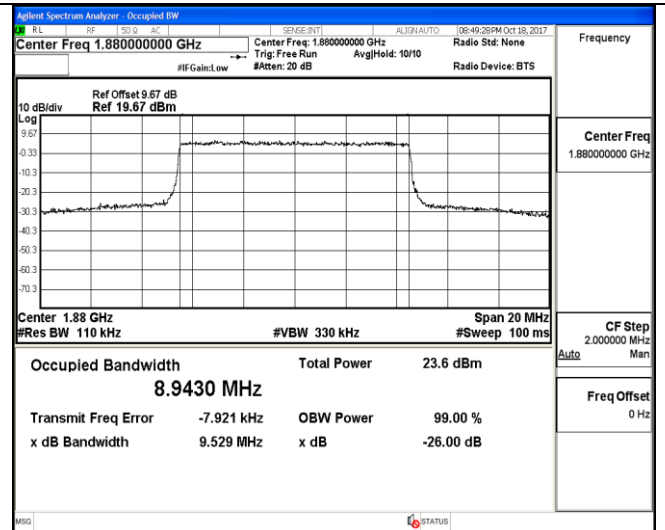
50RB#0

50RB#0

## Low Channel

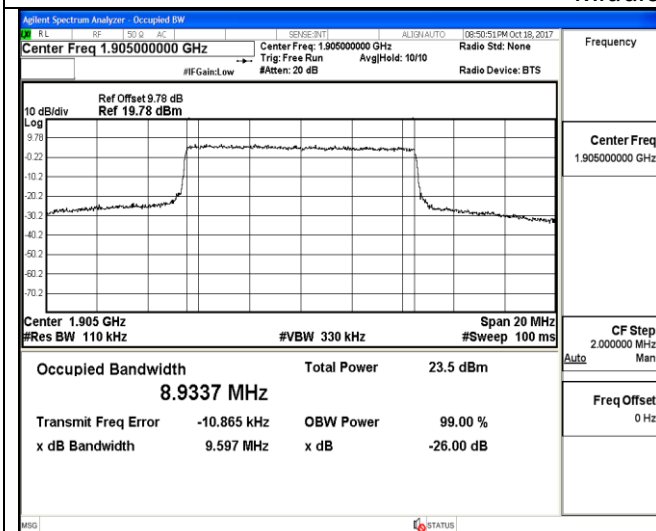


50RB#0

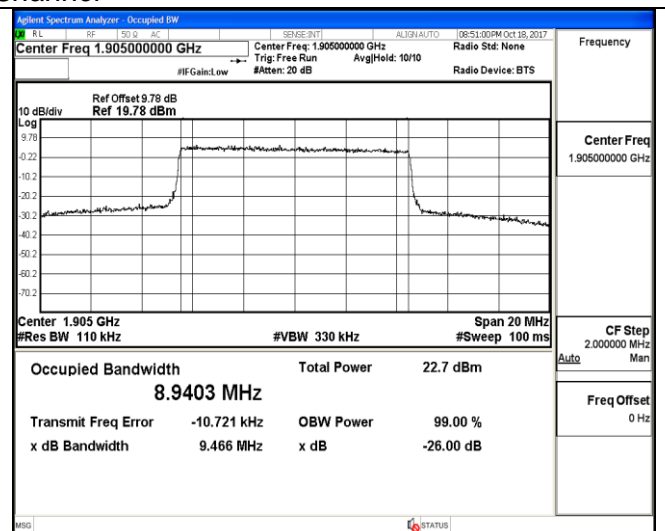


50RB#0

## Middle Channel



50RB#0

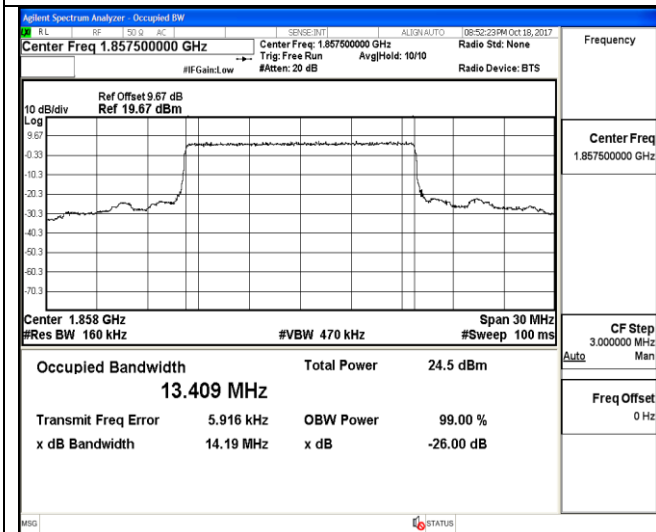


50RB#0

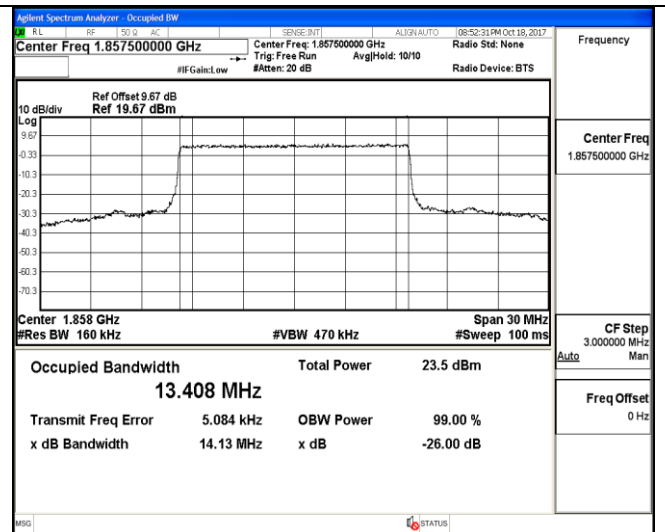
## High Channel

## LTE FDD Band 2-15MHz Channel Bandwidth

## QPSK



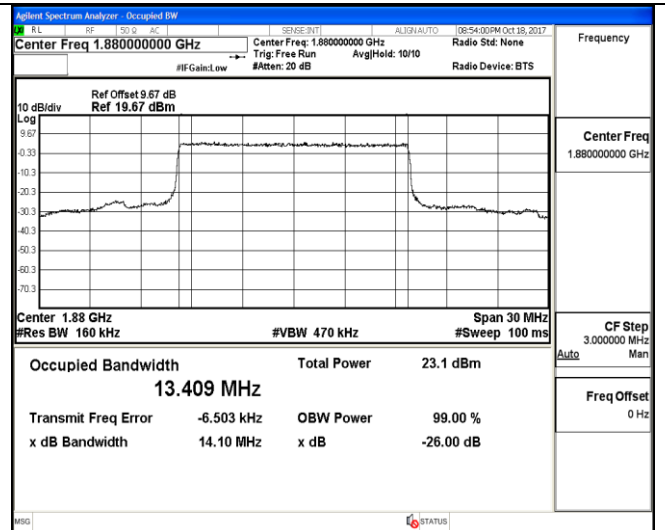
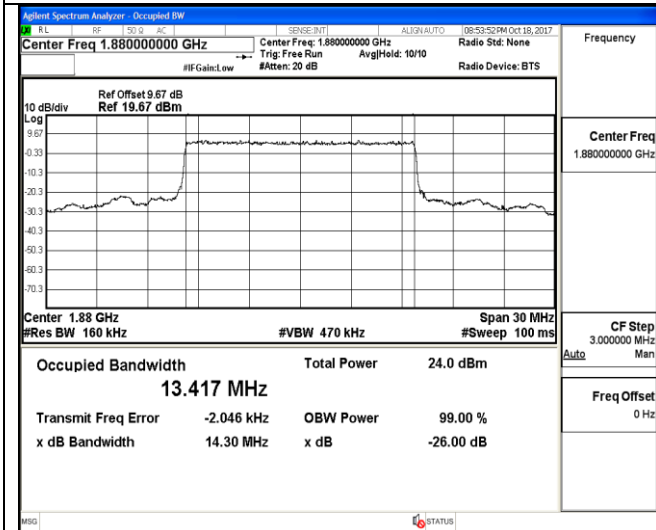
## 16QAM



75RB#0

75RB#0

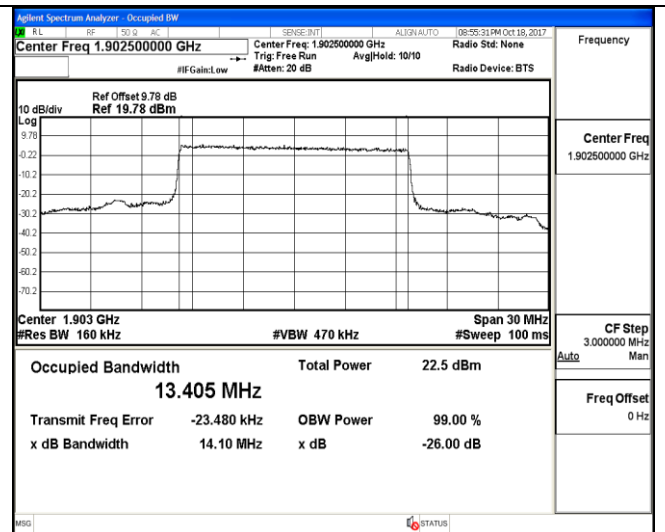
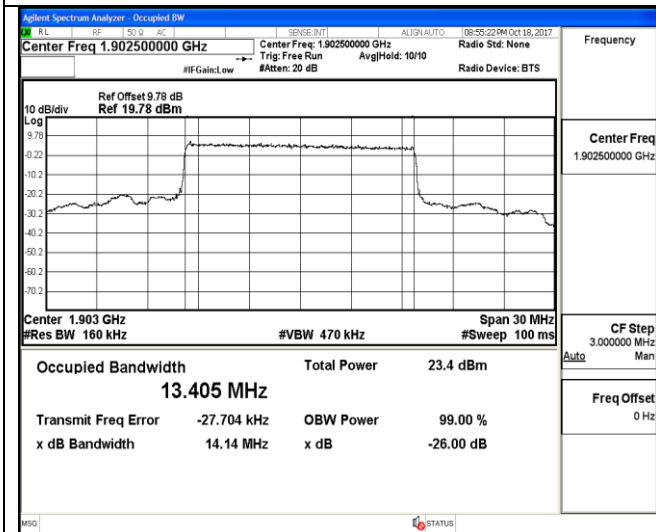
## Low Channel



75RB#0

75RB#0

## Middle Channel



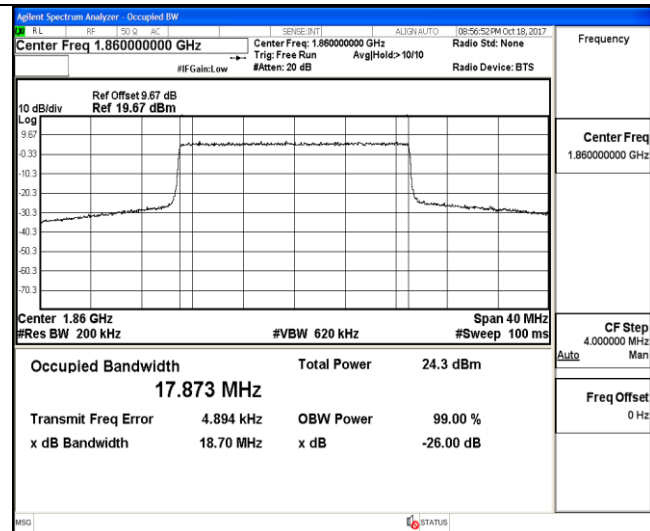
75RB#0

75RB#0

## High Channel

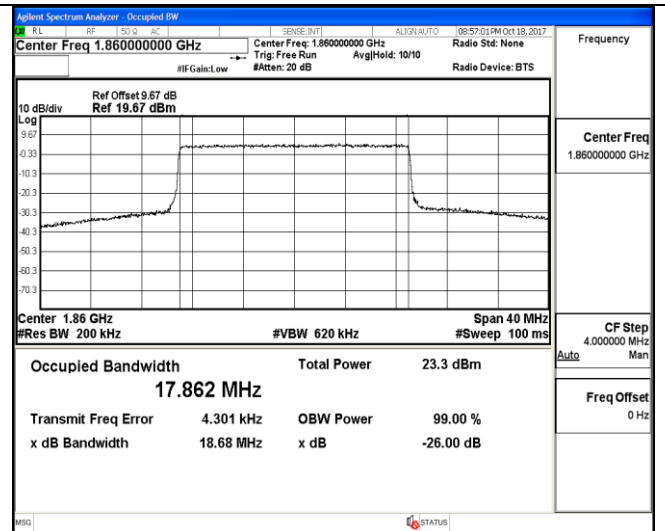
## LTE FDD Band 2-20MHz Channel Bandwidth

## QPSK



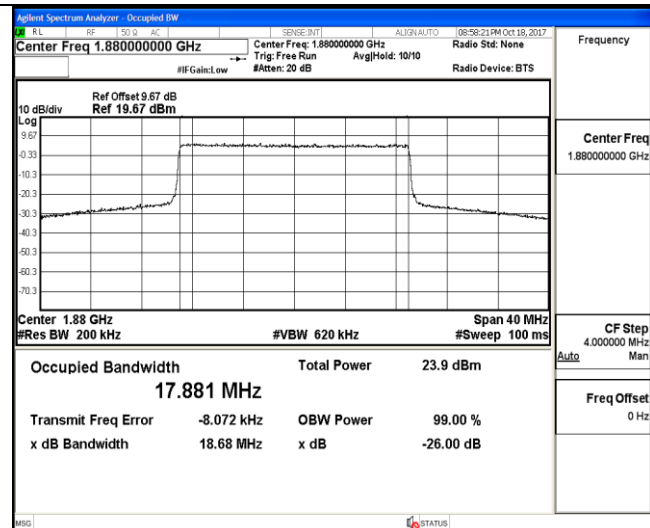
100RB#0

## 16QAM

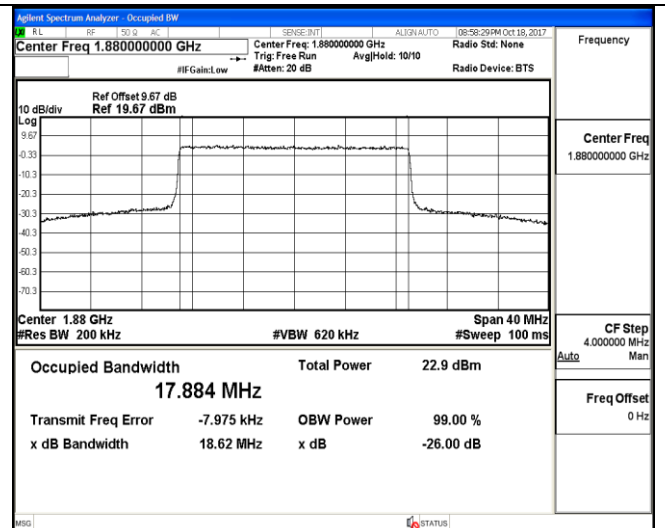


100RB#0

## Low Channel

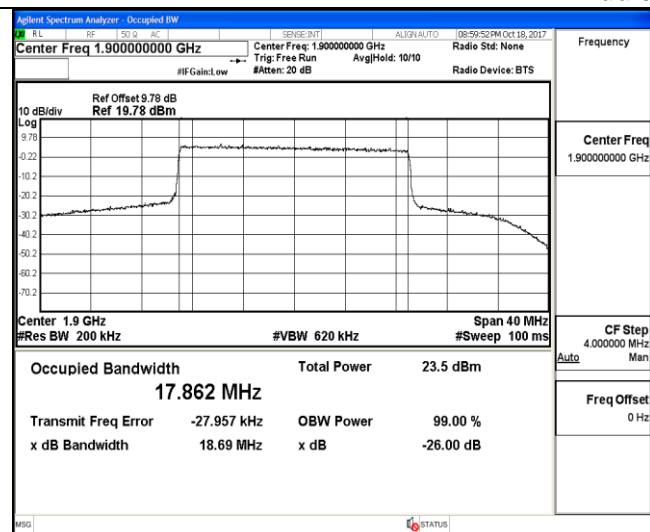


100RB#0

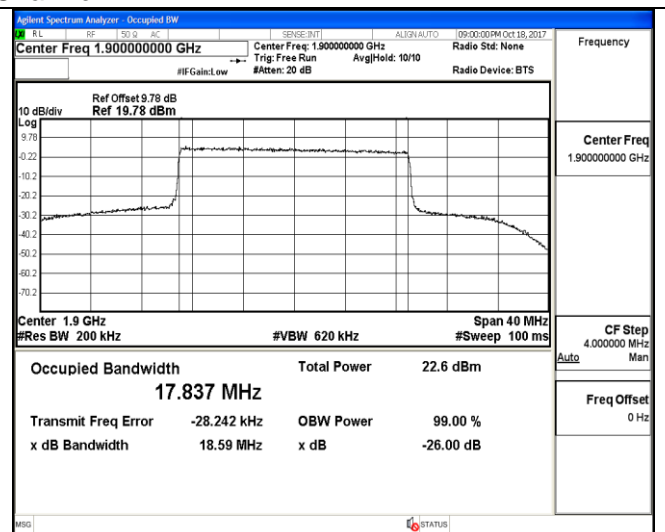


100RB#0

## Middle Channel



100RB#0



100RB#0

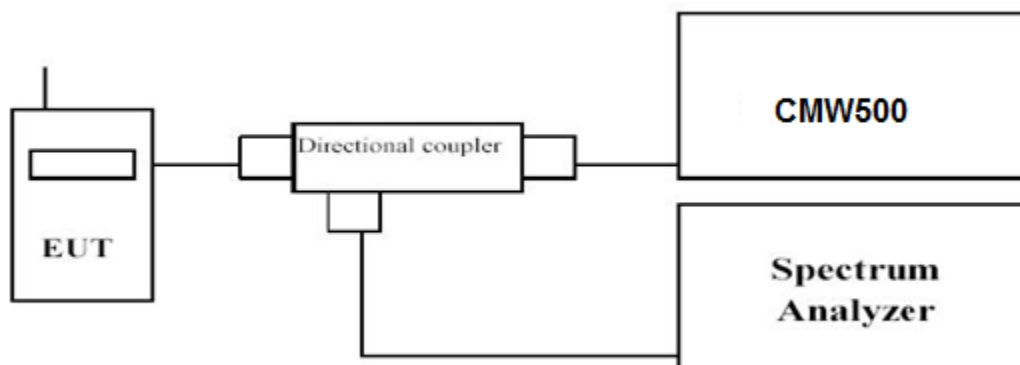
## High Channel

### 3.4 Band Edge compliance

#### LIMIT

Per FCC §24.238 the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10\log(P)$  dB.

#### TEST CONFIGURATION



#### TEST PROCEDURE

1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest and highest channels for each band and different modulation.
5. Measure Band edge using RMS (Average) detector by spectrum

#### TEST RESULTS

Remark:

1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 2; recorded worst case for each Channel Bandwidth of LTE FDD Band 2.