

# TEST REPORT

**Applicant:** Roadefend Intelligence Technology (Shanghai) Co., Ltd.

**Address of Applicant:** Room 01, level3, block B3, lane221, Huangxing Road Yangpu District, Shanghai, China

**Manufacturer/Factory:** Roadefend Intelligence Technology (Shanghai) Co., Ltd.

**Address of Manufacturer/Factory:** Room 01, level3, block B3, lane221, Huangxing Road Yangpu District, Shanghai, China

**Equipment Under Test (EUT)**

Product Name: Active Safety Intelligent Control System

Model No.: RDT500B

Trade mark: N/A

**FCC ID:** 2AXWG-RDT500B

**Applicable standards:** FCC CFR Title 47 Part 2  
FCC CFR Title 47 Part 22

**Date of sample receipt:** 2021-01-05

**Date of Test:** 2021-01-05-2021-01-25

**Date of report issued:** 2021-02-01

**Test Result :** PASS \*

\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

A circular blue ink stamp from GTS (Global United Technology Services Co., Ltd.) is visible. The stamp contains the text "GTS", "GLOBAL UNITED TECHNOLOGY SERVICES CO., LTD.", and "198019". A handwritten signature in blue ink is written over the stamp.

**Robinson Luo**

**Laboratory Manager**

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

## 2 Version

| Version No. | Date       | Description |
|-------------|------------|-------------|
| 00          | 2021-02-01 | Original    |
|             |            |             |
|             |            |             |
|             |            |             |
|             |            |             |

Prepared By:

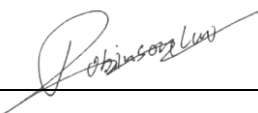


Date:

2021-02-01

Project Engineer

Check By:



Date:

2021-02-01

Reviewer

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## 4 Test Summary

| Test Item                              | Section in CFR 47                            | Result                                |
|----------------------------------------|----------------------------------------------|---------------------------------------|
| RF Exposure (SAR)                      | Part 1.1307<br>Part 2.1093                   | Pass*<br>(Please refer to SAR Report) |
| RF Output Power                        | Part 2.1046<br>Part 22.913 (a)               | Pass                                  |
| Peak-to-Average Ratio                  | Part 22.913(d)                               | Pass                                  |
| Modulation Characteristics             | Part 2.1047                                  | N/A                                   |
| 99% & -26 dB Occupied Bandwidth        | Part 2.1049<br>Part 22.917(b)                | Pass                                  |
| Spurious Emissions at Antenna Terminal | Part 2.1051<br>Part 22.917                   | Pass                                  |
| Field Strength of Spurious Radiation   | Part 2.1053<br>Part 22.917                   | Pass                                  |
| Out of band emission, Band Edge        | Part 22.917                                  | Pass                                  |
| Frequency stability                    | Part 2.1055(a)(1)(b)<br>Part 2.1055(d)(1)(2) | Pass                                  |

### Remarks:

1. Pass: The EUT complies with the essential requirements in the standard.
2. N/A: Not applicable.

## 5 General Information

### 5.1 General Description of EUT

|                      |                                          |
|----------------------|------------------------------------------|
| Product Name:        | Active Safety Intelligent Control System |
| Model No.:           | RDT500B                                  |
| Serial No.:          | N/A                                      |
| Hardware Version:    | HVL2.1                                   |
| Software Version:    | 1.2.58                                   |
| Tested Sample(s) ID: | GTSL202012000202-1                       |
| Support Networks:    | LTE                                      |
| Support Bands:       | LTE BAND 5                               |
| TX Frequency:        | LTE BAND 5:824-849MHz                    |
| Modulation type:     | QPSK, 16QAM                              |
| Antenna type:        | Internal antenna                         |
| Antenna gain:        | 1.5dBi                                   |
| Power supply:        | DC 9-36V                                 |

## Test Frequency

| Test Mode  | Channel Bandwidth | RF Channel     |                |                 |
|------------|-------------------|----------------|----------------|-----------------|
|            |                   | Lowest channel | Middle channel | Highest channel |
| LTE Band 5 | 1.4M              | Channel 20407  | Channel 20525  | Channel 20643   |
|            |                   | 824.7 MHz      | 836.5 MHz      | 848.3 MHz       |
|            | 3M                | Channel 20415  | Channel 20525  | Channel 20635   |
|            |                   | 825.5 MHz      | 836.5 MHz      | 847.5 MHz       |
|            | 5M                | Channel 20425  | Channel 20525  | Channel 20625   |
|            |                   | 826.5 MHz      | 836.5 MHz      | 846.5 MHz       |
|            | 10M               | Channel 20450  | Channel 20525  | Channel 20600   |
|            |                   | 829.0 MHz      | 836.5 MHz      | 844.0 MHz       |

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

This submittal(s) (test report) is filing to comply with Section Part 22/24/27 of the FCC CFR 47 Rules.

## 5.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on ANSI C63.26:2015 and FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057

## 5.4 Test Facility

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

- **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383.

- **IC —Registration No.: 9079A**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A.

- **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). LAB CODE:600179-0

## 5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

## 6 Test Instruments list

| Radiated Emission: |                                     |                                |                             |               |                     |                         |
|--------------------|-------------------------------------|--------------------------------|-----------------------------|---------------|---------------------|-------------------------|
| Item               | Test Equipment                      | Manufacturer                   | Model No.                   | Inventory No. | Cal.Date (mm-dd-yy) | Cal.Due date (mm-dd-yy) |
| 1                  | 3m Semi- Anechoic Chamber           | ZhongYu Electron               | 9.2(L)*6.2(W)* 6.4(H)       | GTS250        | July. 02 2020       | July. 01 2025           |
| 2                  | Control Room                        | ZhongYu Electron               | 6.2(L)*2.5(W)* 2.4(H)       | GTS251        | N/A                 | N/A                     |
| 3                  | EMI Test Receiver                   | Rohde & Schwarz                | ESU26                       | GTS203        | June. 25 2020       | June. 24 2021           |
| 4                  | BiConiLog Antenna                   | SCHWARZBECK<br>MESS-ELEKTRONIK | VULB9163                    | GTS214        | June. 25 2020       | June. 24 2021           |
| 5                  | Double -ridged waveguide horn       | SCHWARZBECK<br>MESS-ELEKTRONIK | BBHA 9120 D                 | GTS208        | June. 25 2020       | June. 24 2021           |
| 6                  | Horn Antenna                        | ETS-LINDGREN                   | 3160                        | GTS217        | June. 25 2020       | June. 24 2021           |
| 7                  | EMI Test Software                   | AUDIX                          | E3                          | N/A           | N/A                 | N/A                     |
| 8                  | Coaxial Cable                       | GTS                            | N/A                         | GTS213        | June. 25 2020       | June. 24 2021           |
| 9                  | Coaxial Cable                       | GTS                            | N/A                         | GTS211        | June. 25 2020       | June. 24 2021           |
| 10                 | Coaxial cable                       | GTS                            | N/A                         | GTS210        | June. 25 2020       | June. 24 2021           |
| 11                 | Coaxial Cable                       | GTS                            | N/A                         | GTS212        | June. 25 2020       | June. 24 2021           |
| 12                 | Amplifier(100kHz-3GHz)              | HP                             | 8347A                       | GTS204        | June. 25 2020       | June. 24 2021           |
| 13                 | Amplifier(2GHz-20GHz)               | HP                             | 84722A                      | GTS206        | June. 25 2020       | June. 24 2021           |
| 14                 | Amplifier (18-26GHz)                | Rohde & Schwarz                | AFS33-18002<br>650-30-8P-44 | GTS218        | June. 25 2020       | June. 24 2021           |
| 15                 | Band filter                         | Amindeon                       | 82346                       | GTS219        | June. 25 2020       | June. 24 2021           |
| 16                 | Power Meter                         | Anritsu                        | ML2495A                     | GTS540        | June. 25 2020       | June. 24 2021           |
| 17                 | Power Sensor                        | Anritsu                        | MA2411B                     | GTS541        | June. 25 2020       | June. 24 2021           |
| 18                 | Wideband Radio Communication Tester | Rohde & Schwarz                | CMW500                      | GTS575        | June. 25 2020       | June. 24 2021           |
| 19                 | Splitter                            | Agilent                        | 11636B                      | GTS237        | June. 25 2020       | June. 24 2021           |
| 20                 | Loop Antenna                        | ZHINAN                         | ZN30900A                    | GTS534        | June. 25 2020       | June. 24 2021           |
| 21                 | Breitband hornantenne               | SCHWARZBECK                    | BBHA 9170                   | GTS579        | Oct. 18 2020        | Oct. 17 2021            |
| 22                 | Amplifier                           | TDK                            | PA-02-02                    | GTS574        | Oct. 18 2020        | Oct. 17 2021            |
| 23                 | Amplifier                           | TDK                            | PA-02-03                    | GTS576        | Oct. 18 2020        | Oct. 17 2021            |
| 24                 | PSA Series Spectrum Analyzer        | Rohde & Schwarz                | FSP                         | GTS578        | June. 25 2020       | June. 24 2021           |

| General used equipment: |                                 |              |           |               |                     |                         |
|-------------------------|---------------------------------|--------------|-----------|---------------|---------------------|-------------------------|
| Item                    | Test Equipment                  | Manufacturer | Model No. | Inventory No. | Cal.Date (mm-dd-yy) | Cal.Due date (mm-dd-yy) |
| 1                       | Humidity/ Temperature Indicator | KTJ          | TA328     | GTS243        | June. 25 2020       | June. 24 2021           |
| 2                       | Barometer                       | ChangChun    | DYM3      | GTS255        | June. 25 2020       | June. 24 2021           |

| RF Conducted Test: |                                                |              |                  |            |                        |                            |
|--------------------|------------------------------------------------|--------------|------------------|------------|------------------------|----------------------------|
| Item               | Test Equipment                                 | Manufacturer | Model No.        | Serial No. | Cal.Date<br>(mm-dd-yy) | Cal.Due date<br>(mm-dd-yy) |
| 1                  | MXA Signal Analyzer                            | Agilent      | N9020A           | GTS566     | June. 25 2020          | June. 24 2021              |
| 2                  | EMI Test Receiver                              | R&S          | ESCI 7           | GTS552     | June. 25 2020          | June. 24 2021              |
| 3                  | Spectrum Analyzer                              | Agilent      | E4440A           | GTS533     | June. 25 2020          | June. 24 2021              |
| 4                  | MXG vector Signal Generator                    | Agilent      | N5182A           | GTS567     | June. 25 2020          | June. 24 2021              |
| 5                  | ESG Analog Signal Generator                    | Agilent      | E4428C           | GTS568     | June. 25 2020          | June. 24 2021              |
| 6                  | USB RF Power Sensor                            | DARE         | RPR3006W         | GTS569     | June. 25 2020          | June. 24 2021              |
| 7                  | RF Switch Box                                  | Shongyi      | RFSW3003328      | GTS571     | June. 25 2020          | June. 24 2021              |
| 8                  | Programmable Constant Temp & Humi Test Chamber | WEWON        | WHTH-150L-40-880 | GTS572     | June. 25 2020          | June. 24 2021              |

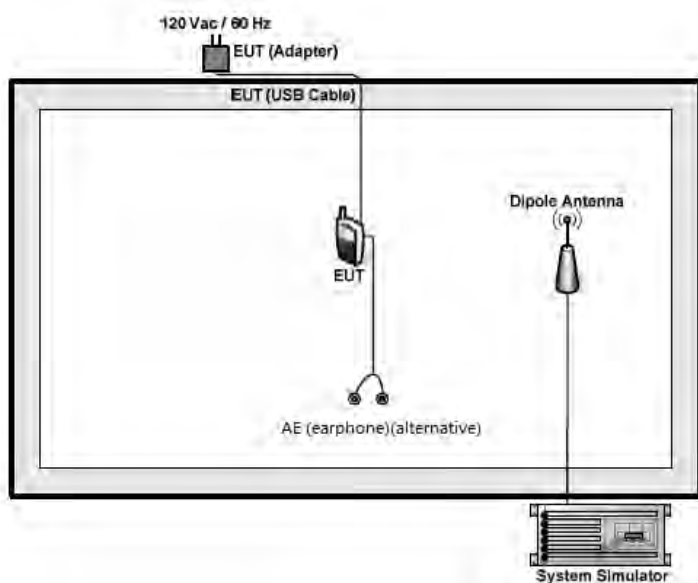
## 7 System test configuration

### 7.1 Test mode

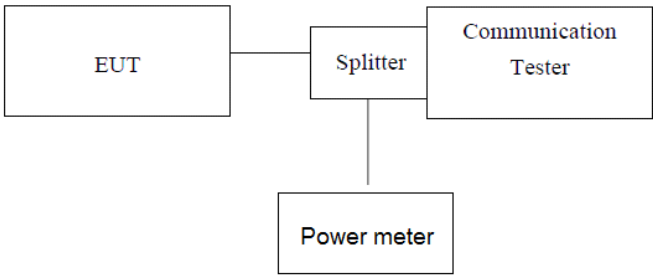
During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

| Test modes |                       |                       |
|------------|-----------------------|-----------------------|
| Band       | Radiated              | Conducted             |
| LTE Band 5 | ■ QPSK and 16QAM link | ■ QPSK and 16QAM link |

### 7.2 Configuration of Tested System



## 7.3 Conducted Output Power

|                   |                                                                                                                                                           |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | FCC part 22.913                                                                                                                                           |
| Test Method:      | FCC part 2.1046                                                                                                                                           |
| Limit:            | LTE Band 5: 2W                                                                                                                                            |
| Test setup:       |  <p><i>Note: Measurement setup for testing on Antenna connector</i></p> |
| Test Instruments: | Refer to section 6.0 for details                                                                                                                          |
| Test mode:        | Refer to section 6.1 for details                                                                                                                          |
| Test results:     | Pass                                                                                                                                                      |

### Measurement Data:

Note: Measurement Uncertainty:  $\pm 2.6$  dB.

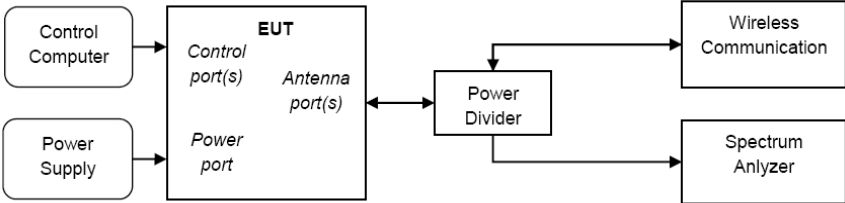
| BW(MHz) | Freq(MHz) | Mode  | RB<br>Size/Offset | Average<br>Power (dBm) | Tune up<br>limited(dBm) | MPR<br>(dB) |
|---------|-----------|-------|-------------------|------------------------|-------------------------|-------------|
| 1.4MHz  | 824.7     | QPSK  | 1                 | 23.15                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.07                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.09                  | 23.0±1                  | /           |
|         |           |       | 3                 | 23.11                  | 22.0±1                  | 1.0         |
|         |           |       | 3                 | 23.06                  | 22.0±1                  | 1.0         |
|         |           |       | 3                 | 23.08                  | 22.0±1                  | 1.0         |
|         |           |       | 6                 | 22.21                  | 22.0±1                  | 1.0         |
|         |           | 16QAM | 1                 | 22.35                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.31                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.46                  | 22.0±1                  | 1.0         |
|         |           |       | 3                 | 21.56                  | 21.0±1                  | 2.0         |
|         |           |       | 3                 | 21.68                  | 21.0±1                  | 2.0         |
|         |           |       | 3                 | 21.61                  | 21.0±1                  | 2.0         |
|         |           |       | 6                 | 21.21                  | 21.0±1                  | 2.0         |
|         | 836.5     | QPSK  | 1                 | 23.18                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.21                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.08                  | 23.0±1                  | /           |
|         |           |       | 3                 | 22.57                  | 22.0±1                  | 1.0         |
|         |           |       | 3                 | 22.62                  | 22.0±1                  | 1.0         |
|         |           |       | 3                 | 22.53                  | 22.0±1                  | 1.0         |
|         |           |       | 6                 | 22.39                  | 22.0±1                  | 1.0         |
|         |           | 16QAM | 1                 | 22.49                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.64                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.56                  | 22.0±1                  | 1.0         |
|         |           |       | 3                 | 21.32                  | 21.0±1                  | 2.0         |
|         |           |       | 3                 | 21.56                  | 21.0±1                  | 2.0         |
|         |           |       | 3                 | 21.32                  | 21.0±1                  | 2.0         |
|         |           |       | 6                 | 21.52                  | 21.0±1                  | 2.0         |
|         | 848.5     | QPSK  | 1                 | 23.21                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.19                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.11                  | 23.0±1                  | /           |
|         |           |       | 3                 | 22.32                  | 22.0±1                  | 1.0         |
|         |           |       | 3                 | 22.31                  | 22.0±1                  | 1.0         |
|         |           |       | 3                 | 22.26                  | 22.0±1                  | 1.0         |
|         |           |       | 6                 | 22.11                  | 22.0±1                  | 1.0         |
|         |           | 16QAM | 1                 | 22.13                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.02                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.08                  | 22.0±1                  | 1.0         |
|         |           |       | 3                 | 21.47                  | 21.0±1                  | 2.0         |
|         |           |       | 3                 | 21.76                  | 21.0±1                  | 2.0         |
|         |           |       | 3                 | 21.48                  | 21.0±1                  | 2.0         |
|         |           |       | 6                 | 21.53                  | 21.0±1                  | 2.0         |

| BW(MHz) | Freq(MHz) | Mode  | RB<br>Size/Offset | Average<br>Power (dBm) | Tune up<br>limited(dBm) | MPR<br>(dB) |
|---------|-----------|-------|-------------------|------------------------|-------------------------|-------------|
| 3MHz    | 825.5     | QPSK  | 1                 | 23.21                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.17                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.32                  | 23.0±1                  | /           |
|         |           |       | 8                 | 22.36                  | 22.0±1                  | 1.0         |
|         |           |       | 8                 | 22.26                  | 22.0±1                  | 1.0         |
|         |           |       | 8                 | 22.31                  | 22.0±1                  | 1.0         |
|         |           |       | 15                | 22.27                  | 22.0±1                  | 1.0         |
|         |           | 16QAM | 1                 | 22.21                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.18                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.53                  | 22.0±1                  | 1.0         |
|         |           |       | 8                 | 21.64                  | 21.0±1                  | 2.0         |
|         |           |       | 8                 | 21.36                  | 21.0±1                  | 2.0         |
|         |           |       | 8                 | 21.56                  | 21.0±1                  | 2.0         |
|         |           |       | 15                | 21.58                  | 21.0±1                  | 2.0         |
|         | 836.5     | QPSK  | 1                 | 23.18                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.08                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.11                  | 23.0±1                  | /           |
|         |           |       | 8                 | 22.44                  | 22.0±1                  | 1.0         |
|         |           |       | 8                 | 22.38                  | 22.0±1                  | 1.0         |
|         |           |       | 8                 | 22.37                  | 22.0±1                  | 1.0         |
|         |           |       | 15                | 22.51                  | 22.0±1                  | 1.0         |
|         |           | 16QAM | 1                 | 22.47                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.62                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.53                  | 22.0±1                  | 1.0         |
|         |           |       | 8                 | 21.64                  | 21.0±1                  | 2.0         |
|         |           |       | 8                 | 21.73                  | 21.0±1                  | 2.0         |
|         |           |       | 8                 | 21.36                  | 21.0±1                  | 2.0         |
|         |           |       | 15                | 21.42                  | 21.0±1                  | 2.0         |
|         | 847.5     | QPSK  | 1                 | 23.21                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.32                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.08                  | 23.0±1                  | /           |
|         |           |       | 8                 | 22.42                  | 22.0±1                  | 1.0         |
|         |           |       | 8                 | 22.32                  | 22.0±1                  | 1.0         |
|         |           |       | 8                 | 22.21                  | 22.0±1                  | 1.0         |
|         |           |       | 15                | 22.32                  | 22.0±1                  | 1.0         |
|         |           | 16QAM | 1                 | 22.27                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.18                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.21                  | 22.0±1                  | 1.0         |
|         |           |       | 8                 | 21.36                  | 21.0±1                  | 2.0         |
|         |           |       | 8                 | 21.45                  | 21.0±1                  | 2.0         |
|         |           |       | 8                 | 21.39                  | 21.0±1                  | 2.0         |
|         |           |       | 15                | 21.21                  | 21.0±1                  | 2.0         |

| BW(MHz) | Freq(MHz) | Mode  | RB<br>Size/Offset | Average<br>Power (dBm) | Tune up<br>limited(dBm) | MPR<br>(dB) |
|---------|-----------|-------|-------------------|------------------------|-------------------------|-------------|
| 5MHz    | 826.5     | QPSK  | 1                 | 23.26                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.13                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.18                  | 23.0±1                  | /           |
|         |           |       | 12                | 22.42                  | 22.0±1                  | 1.0         |
|         |           |       | 12                | 22.27                  | 22.0±1                  | 1.0         |
|         |           |       | 12                | 22.32                  | 22.0±1                  | 1.0         |
|         |           |       | 25                | 22.25                  | 22.0±1                  | 1.0         |
|         |           | 16QAM | 1                 | 22.34                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.42                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.39                  | 22.0±1                  | 1.0         |
|         |           |       | 12                | 21.58                  | 21.0±1                  | 2.0         |
|         |           |       | 12                | 21.73                  | 21.0±1                  | 2.0         |
|         |           |       | 12                | 21.64                  | 21.0±1                  | 2.0         |
|         |           |       | 25                | 21.37                  | 21.0±1                  | 2.0         |
|         | 836.5     | QPSK  | 1                 | 23.28                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.22                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.19                  | 23.0±1                  | /           |
|         |           |       | 12                | 22.53                  | 22.0±1                  | 1.0         |
|         |           |       | 12                | 22.51                  | 22.0±1                  | 1.0         |
|         |           |       | 12                | 22.52                  | 22.0±1                  | 1.0         |
|         |           |       | 25                | 22.55                  | 22.0±1                  | 1.0         |
|         |           | 16QAM | 1                 | 22.46                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.43                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.54                  | 22.0±1                  | 1.0         |
|         |           |       | 12                | 21.43                  | 21.0±1                  | 2.0         |
|         |           |       | 12                | 21.62                  | 21.0±1                  | 2.0         |
|         |           |       | 12                | 21.47                  | 21.0±1                  | 2.0         |
|         |           |       | 25                | 21.52                  | 21.0±1                  | 2.0         |
|         | 846.5     | QPSK  | 1                 | 23.22                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.18                  | 23.0±1                  | /           |
|         |           |       | 1                 | 23.20                  | 23.0±1                  | /           |
|         |           |       | 12                | 22.19                  | 22.0±1                  | 1.0         |
|         |           |       | 12                | 22.28                  | 22.0±1                  | 1.0         |
|         |           |       | 12                | 22.17                  | 22.0±1                  | 1.0         |
|         |           |       | 25                | 22.02                  | 22.0±1                  | 1.0         |
|         |           | 16QAM | 1                 | 22.32                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.28                  | 22.0±1                  | 1.0         |
|         |           |       | 1                 | 22.25                  | 22.0±1                  | 1.0         |
|         |           |       | 12                | 21.65                  | 21.0±1                  | 2.0         |
|         |           |       | 12                | 21.61                  | 21.0±1                  | 2.0         |
|         |           |       | 12                | 21.55                  | 21.0±1                  | 2.0         |
|         |           |       | 25                | 21.57                  | 21.0±1                  | 2.0         |

| BW(MHz) | Freq(MHz) | Mode  | UL RB Allocation | Average Power (dBm) | Tune up limited(dBm) | MPR (dB) |
|---------|-----------|-------|------------------|---------------------|----------------------|----------|
| 10MHz   | 829.0     | QPSK  | 1                | 23.15               | 23.0±1               | /        |
|         |           |       | 1                | 23.17               | 23.0±1               | /        |
|         |           |       | 1                | 23.11               | 23.0±1               | /        |
|         |           |       | 25               | 22.53               | 22.0±1               | 1.0      |
|         |           |       | 25               | 22.49               | 22.0±1               | 1.0      |
|         |           |       | 25               | 22.53               | 22.0±1               | 1.0      |
|         |           |       | 50               | 22.21               | 22.0±1               | 1.0      |
|         |           | 16QAM | 1                | 22.27               | 22.0±1               | 1.0      |
|         |           |       | 1                | 22.31               | 22.0±1               | 1.0      |
|         |           |       | 1                | 22.26               | 22.0±1               | 1.0      |
|         |           |       | 25               | 21.42               | 21.0±1               | 2.0      |
|         |           |       | 25               | 21.37               | 21.0±1               | 2.0      |
|         |           |       | 25               | 21.32               | 21.0±1               | 2.0      |
|         |           |       | 50               | 21.52               | 21.0±1               | 2.0      |
|         | 2593      | QPSK  | 1                | 23.28               | 23.0±1               | /        |
|         |           |       | 1                | 23.25               | 23.0±1               | /        |
|         |           |       | 1                | 23.24               | 23.0±1               | /        |
|         |           |       | 25               | 22.44               | 22.0±1               | 1.0      |
|         |           |       | 25               | 22.46               | 22.0±1               | 1.0      |
|         |           |       | 25               | 22.39               | 22.0±1               | 1.0      |
|         |           |       | 50               | 22.15               | 22.0±1               | 1.0      |
|         |           | 16QAM | 1                | 22.32               | 22.0±1               | 1.0      |
|         |           |       | 1                | 22.34               | 22.0±1               | 1.0      |
|         |           |       | 1                | 22.29               | 22.0±1               | 1.0      |
|         |           |       | 25               | 21.62               | 21.0±1               | 2.0      |
|         |           |       | 25               | 21.61               | 21.0±1               | 2.0      |
|         |           |       | 25               | 21.57               | 21.0±1               | 2.0      |
|         |           |       | 50               | 21.51               | 21.0±1               | 2.0      |
|         | 2680      | QPSK  | 1                | 23.18               | 23.0±1               | /        |
|         |           |       | 1                | 23.21               | 23.0±1               | /        |
|         |           |       | 1                | 23.19               | 23.0±1               | /        |
|         |           |       | 25               | 22.42               | 22.0±1               | 1.0      |
|         |           |       | 25               | 22.23               | 22.0±1               | 1.0      |
|         |           |       | 25               | 22.32               | 22.0±1               | 1.0      |
|         |           |       | 50               | 22.12               | 22.0±1               | 1.0      |
|         |           | 16QAM | 1                | 22.56               | 22.0±1               | 1.0      |
|         |           |       | 1                | 22.31               | 22.0±1               | 1.0      |
|         |           |       | 1                | 22.28               | 22.0±1               | 1.0      |
|         |           |       | 25               | 21.56               | 21.0±1               | 2.0      |
|         |           |       | 25               | 21.42               | 21.0±1               | 2.0      |
|         |           |       | 25               | 21.51               | 21.0±1               | 2.0      |
|         |           |       | 50               | 21.34               | 21.0±1               | 2.0      |

## 7.4 Peak-to-Average Ratio

|                   |                                                                                                                                                                                                                                                                                                 |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | FCC part 22.913(d)                                                                                                                                                                                                                                                                              |
| Test Method:      | FCC part 2.1046                                                                                                                                                                                                                                                                                 |
| Limit:            | 13db                                                                                                                                                                                                                                                                                            |
| Test setup:       |  <pre> graph LR     CC[Control Computer] --&gt; EUT[EUT]     PS[Power Supply] --&gt; EUT     EUT --&gt; PD[Power Divider]     PD --&gt; WC[Wireless Communication]     PD --&gt; SA[Spectrum Analyzer] </pre> |
| Test Instruments: | Refer to section 6.0 for details                                                                                                                                                                                                                                                                |
| Test mode:        | Refer to section 7.1 for details                                                                                                                                                                                                                                                                |
| Test results:     | Pass                                                                                                                                                                                                                                                                                            |

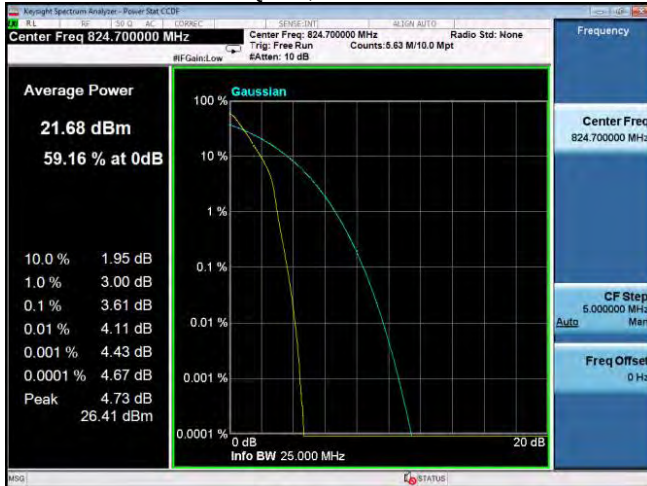
Remark: Both modulation modes have been tested, showing only the worst QPSK test data.

### Measurement data:

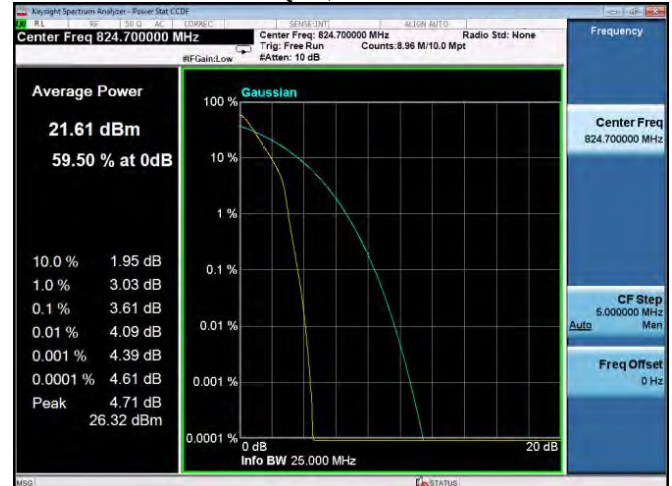
| BW(MHz) | Frequency (MHz) | Modulation | PAR Percent (%) | PAR (dB) | Upper Limit (dB) | Result |
|---------|-----------------|------------|-----------------|----------|------------------|--------|
| 1.4     | 824.7           | QPSK       | 0.1             | 3.61     | 13               | Pass   |
|         |                 | 16QAM      | 0.1             | 3.61     | 13               | Pass   |
| 1.4     | 836.5           | QPSK       | 0.1             | 2.56     | 13               | Pass   |
|         |                 | 16QAM      | 0.1             | 2.52     | 13               | Pass   |
| 1.4     | 848.3           | QPSK       | 0.1             | 2.61     | 13               | Pass   |
|         |                 | 16QAM      | 0.1             | 2.62     | 13               | Pass   |
| 3       | 825.5           | QPSK       | 0.1             | 3.42     | 13               | Pass   |
|         |                 | 16QAM      | 0.1             | 2.95     | 13               | Pass   |
| 3       | 836.5           | QPSK       | 0.1             | 2.70     | 13               | Pass   |
|         |                 | 16QAM      | 0.1             | 2.75     | 13               | Pass   |
| 3       | 847.5           | QPSK       | 0.1             | 2.70     | 13               | Pass   |
|         |                 | 16QAM      | 0.1             | 2.74     | 13               | Pass   |
| 5       | 826.5           | QPSK       | 0.1             | 2.95     | 13               | Pass   |
|         |                 | 16QAM      | 0.1             | 2.88     | 13               | Pass   |
| 5       | 836.5           | QPSK       | 0.1             | 2.96     | 13               | Pass   |
|         |                 | 16QAM      | 0.1             | 3.10     | 13               | Pass   |
| 5       | 846.5           | QPSK       | 0.1             | 2.93     | 13               | Pass   |
|         |                 | 16QAM      | 0.1             | 2.91     | 13               | Pass   |
| 10      | 829.0           | QPSK       | 0.1             | 3.34     | 13               | Pass   |
|         |                 | 16QAM      | 0.1             | 3.49     | 13               | Pass   |
| 10      | 836.5           | QPSK       | 0.1             | 3.39     | 13               | Pass   |
|         |                 | 16QAM      | 0.1             | 3.38     | 13               | Pass   |
| 10      | 844.0           | QPSK       | 0.1             | 3.48     | 13               | Pass   |
|         |                 | 16QAM      | 0.1             | 3.49     | 13               | Pass   |

LTE FDD Band 5– 1.4 MHz Channel Bandwidth

Modulation: QPSK, 1RB#0 Low Channel



Modulation:16QAM, 1RB#0 Low Channel



Modulation: QPSK, 1RB#0 Middle Channel



Modulation:16QAM, 1RB#0 Middle Channel



Modulation: QPSK, 1RB#0 High Channel

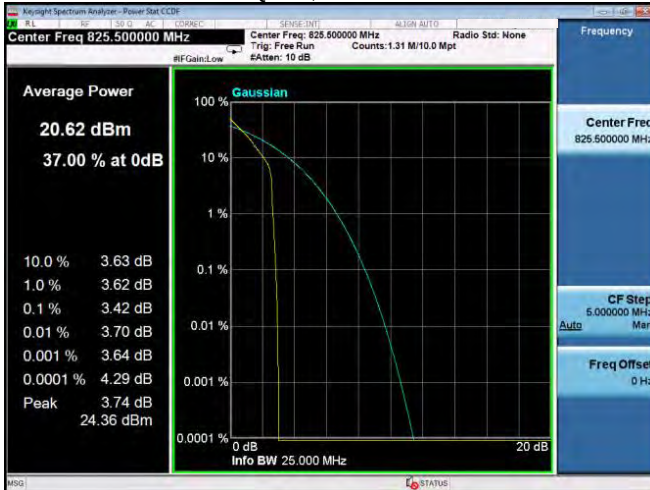


Modulation:16QAM, 1RB#0 High Channel

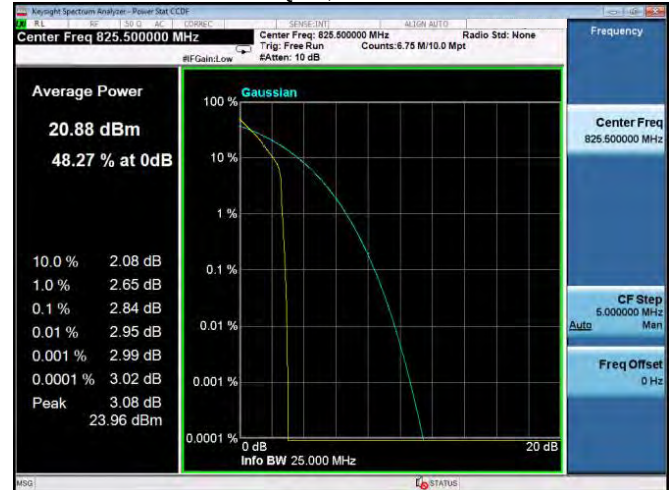


LTE FDD Band 5– 3 MHz Channel Bandwidth

Modulation: QPSK, 1RB#0 Low Channel



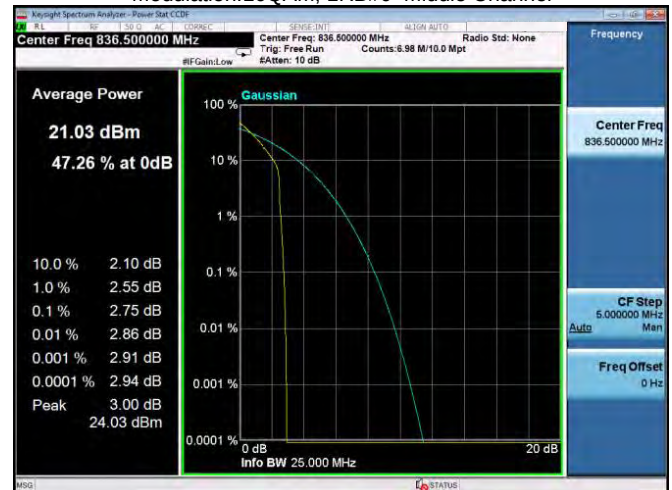
Modulation:16QAM, 1RB#0 Low Channel



Modulation: QPSK, 1RB#0 Middle Channel



Modulation:16QAM, 1RB#0 Middle Channel



Modulation: QPSK, 1RB#0 High Channel

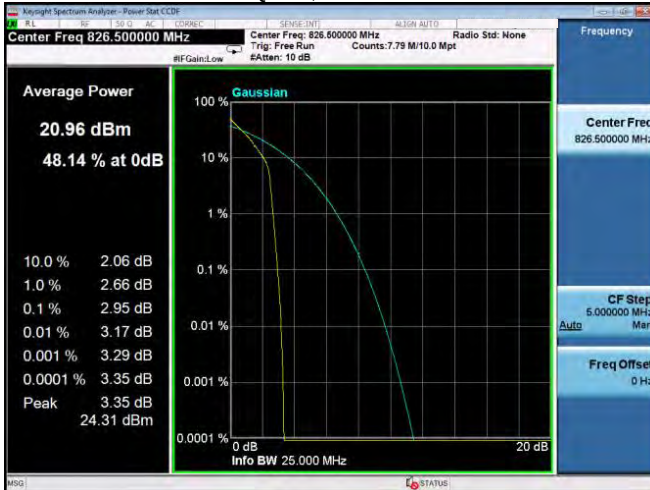


Modulation:16QAM, 1RB#0 High Channel

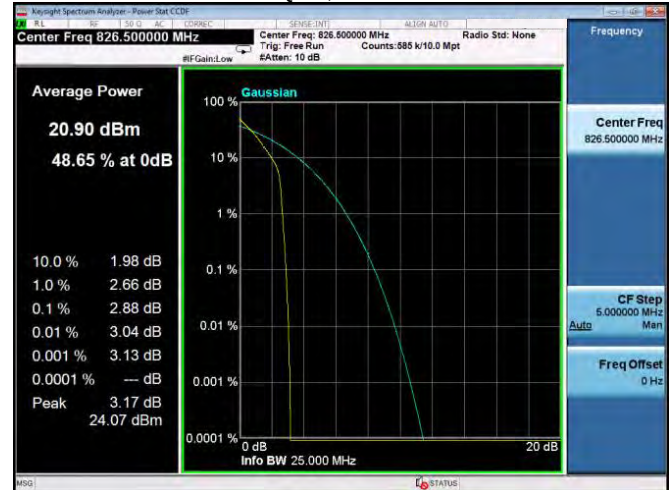


LTE FDD Band 5– 5 MHz Channel Bandwidth

Modulation: QPSK, 1RB#0 Low Channel



Modulation:16QAM, 1RB#0 Low Channel



Modulation: QPSK, 1RB#0 Middle Channel



Modulation:16QAM, 1RB#0 Middle Channel



Modulation: QPSK, 1RB#0 High Channel



Modulation:16QAM, 1RB#0 High Channel

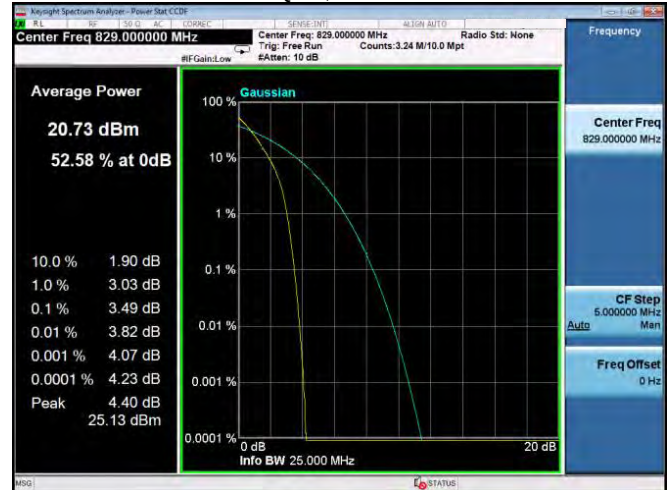


## LTE FDD Band 5– 10 MHz Channel Bandwidth

Modulation: QPSK, 1RB#0 Low Channel



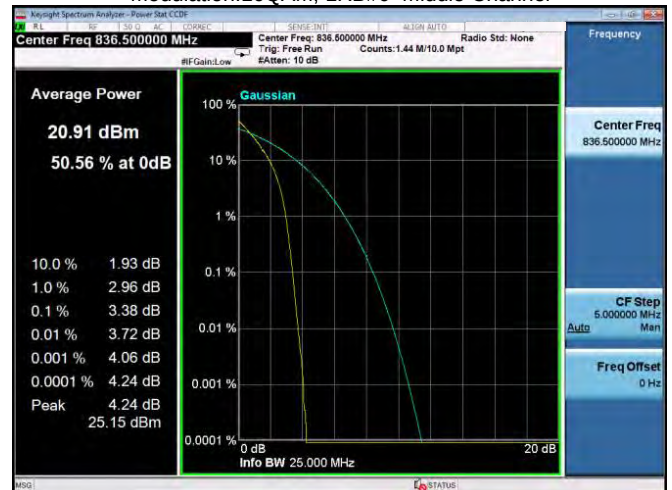
Modulation:16QAM, 1RB#0 Low Channel



Modulation: QPSK, 1RB#0 Middle Channel



Modulation:16QAM, 1RB#0 Middle Channel



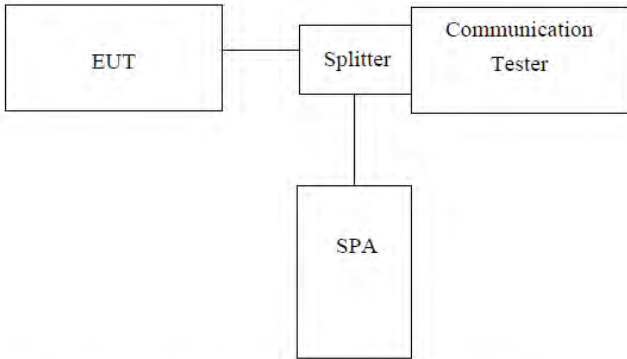
Modulation: QPSK, 1RB#0 High Channel



Modulation:16QAM, 1RB#0 High Channel



## 7.5 Occupy Bandwidth

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | part 22.917                                                                                                                                                                                                                                                                                                                                                                                                              |
| Test Method:      | FCC part2.1049                                                                                                                                                                                                                                                                                                                                                                                                           |
| Test setup:       |  <p><i>Note: Measurement setup for testing on Antenna connector</i></p>                                                                                                                                                                                                                                                                |
| Test Procedure:   | <ol style="list-style-type: none"> <li>1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer</li> <li>2. RBW was set to about 1% of emission BW, VBW= 3 times RBW.</li> <li>3. -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.</li> </ol> |
| Test Instruments: | Refer to section 6.0 for details                                                                                                                                                                                                                                                                                                                                                                                         |
| Test mode:        | Refer to section 6.1 for details                                                                                                                                                                                                                                                                                                                                                                                         |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                                                                                     |

### Measurement Data:

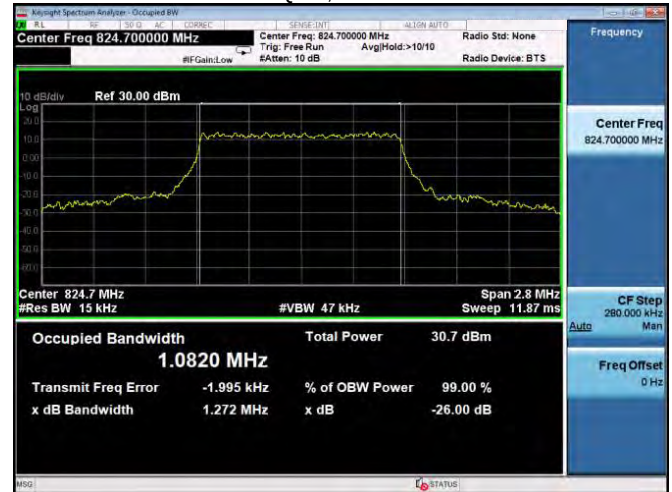
| BW(MHz) | Frequency (MHz) | Modulation | 99% Occupied Bandwidth (MHz) | 26 dB Bandwidth (MHz) |
|---------|-----------------|------------|------------------------------|-----------------------|
| 1.4     | 824.7           | QPSK       | 1.0829                       | 1.256                 |
|         |                 | 16QAM      | 1.0820                       | 1.272                 |
| 1.4     | 836.5           | QPSK       | 1.0833                       | 1.290                 |
|         |                 | 16QAM      | 1.0816                       | 1.253                 |
| 1.4     | 848.3           | QPSK       | 1.0827                       | 1.257                 |
|         |                 | 16QAM      | 1.0805                       | 1.244                 |
| 3       | 825.5           | QPSK       | 2.6839                       | 2.938                 |
|         |                 | 16QAM      | 2.6802                       | 2.929                 |
| 3       | 836.5           | QPSK       | 2.6969                       | 2.952                 |
|         |                 | 16QAM      | 2.6910                       | 2.930                 |
| 3       | 847.5           | QPSK       | 2.6916                       | 2.952                 |
|         |                 | 16QAM      | 2.6881                       | 2.940                 |
| 5       | 826.5           | QPSK       | 4.4904                       | 4.950                 |
|         |                 | 16QAM      | 4.4983                       | 4.967                 |
| 5       | 836.5           | QPSK       | 4.4904                       | 4.957                 |
|         |                 | 16QAM      | 4.4947                       | 4.957                 |
| 5       | 846.5           | QPSK       | 4.4953                       | 4.955                 |
|         |                 | 16QAM      | 4.5031                       | 4.966                 |
| 10      | 829.0           | QPSK       | 8.9615                       | 9.790                 |
|         |                 | 16QAM      | 8.9642                       | 9.795                 |
| 10      | 836.5           | QPSK       | 8.9290                       | 9.666                 |
|         |                 | 16QAM      | 8.9343                       | 9.649                 |
| 10      | 844.0           | QPSK       | 8.9494                       | 9.768                 |
|         |                 | 16QAM      | 8.9559                       | 9.774                 |

## LTE FDD Band 5- 1.4 MHz Channel Bandwidth

### Modulation: QPSK, 1RB#0 Low Channel



### Modulation: 16QAM, 1RB#0 Low Channel



### Modulation: QPSK, 1RB#0 Middle Channel



### Modulation: 16QAM, 1RB#0 Middle Channel



### Modulation: QPSK, 1RB#0 High Channel

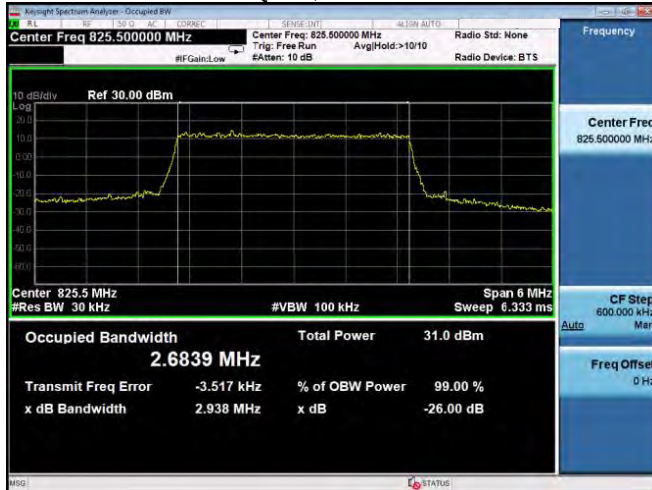


### Modulation: 16QAM, 1RB#0 High Channel

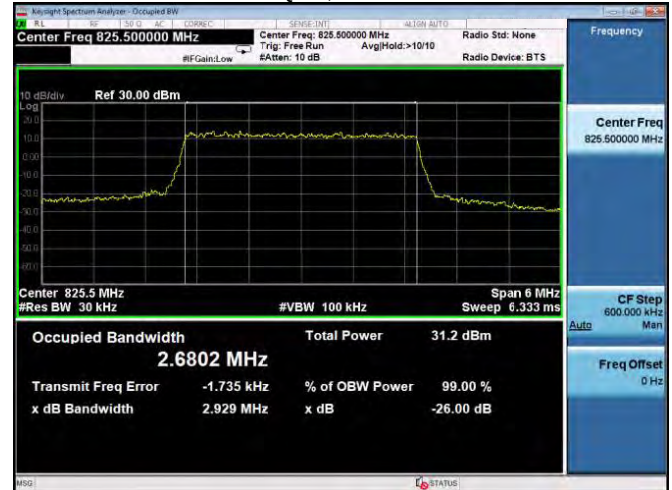


## LTE FDD Band 5– 3 MHz Channel Bandwidth

Modulation: QPSK, 1RB#0 Low Channel



Modulation:16QAM, 1RB#0 Low Channel



Modulation: QPSK, 1RB#0 Middle Channel



Modulation:16QAM, 1RB#0 Middle Channel



Modulation: QPSK, 1RB#0 High Channel

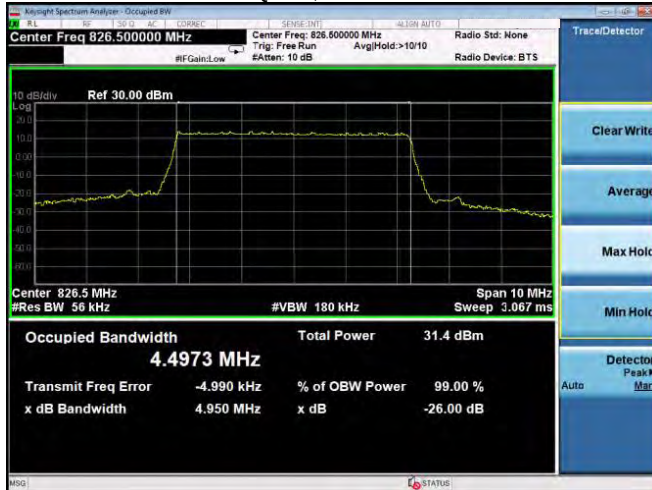


Modulation:16QAM, 1RB#0 High Channel

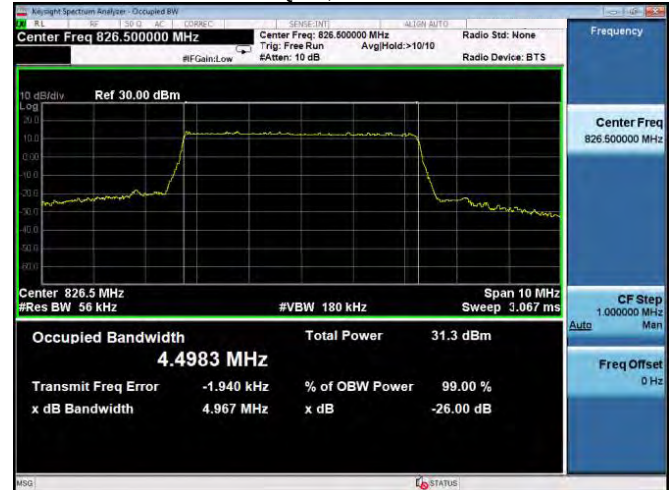


## LTE FDD Band 5– 5 MHz Channel Bandwidth

Modulation: QPSK, 1RB#0 Low Channel



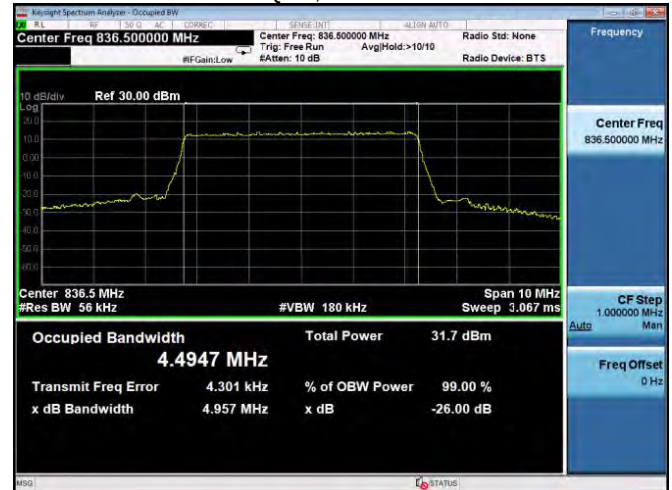
Modulation:16QAM, 1RB#0 Low Channel



Modulation: QPSK, 1RB#0 Middle Channel



Modulation:16QAM, 1RB#0 Middle Channel



Modulation: QPSK, 1RB#0 High Channel



Modulation:16QAM, 1RB#0 High Channel



## LTE FDD Band 5– 10 MHz Channel Bandwidth

Modulation: QPSK, 1RB#0 Low Channel



Modulation:16QAM, 1RB#0 Low Channel



Modulation: QPSK, 1RB#0 Middle Channel



Modulation:16QAM, 1RB#0 Middle Channel



Modulation: QPSK, 1RB#0 High Channel



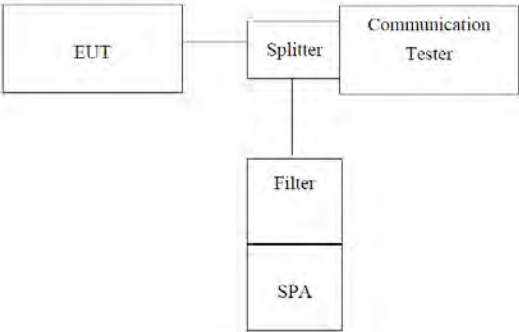
Modulation:16QAM, 1RB#0 High Channel



## 7.6 MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

## 7.7 Out of band emission at antenna terminals

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | Part 22.917                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Test Method:      | FCC part2.1051                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Test setup:       |  <p><i>Note: Measurement setup for testing on Antenna connector</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Test Procedure:   | <ol style="list-style-type: none"> <li>1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.</li> <li>2 The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.</li> <li>3 For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10th harmonic.</li> <li>4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.</li> </ol> |
| Test Instruments: | Refer to section 6.0 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Test mode:        | Refer to section 6.1 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

### Measurement Data: