



# RF TEST REPORT

**Applicant**      Quectel Wireless Solutions Co., Ltd  
**FCC ID**            XMR202006EC25AUX  
**Product**          LTE Module  
**Brand**             Quectel  
**Model**             EC25-AUX, EC25-AUX MINIPCIE  
**Report No.**      R2108A0762-R3  
**Issue Date**      December 1, 2021

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2020)/ FCC CFR47 Part 27C (2020)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

*Performed by: Peng Tao*

*Approved by: Kai Xu*

---

## TA Technology (Shanghai) Co., Ltd.

*No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China*

*TEL: +86-021-50791141/2/3*

*FAX: +86-021-50791141/2/3-8000*



## TABLE OF CONTENT

|      |   |    |
|------|---|----|
| 1    | Test Laboratory.....  | 5  |
| 1.1  | Notes of the Test Report.....                               | 5  |
| 1.2. | Test facility.....  | 5  |
| 1.3  | Testing Location.....                                       | 5  |
| 2    | General Description of Equipment under Test.....            | 6  |
| 2.1  | Applicant and Manufacturer Information.....                 | 6  |
| 2.2  | General information.....                                    | 6  |
| 3    | Applied Standards.....                                      | 7  |
| 4    | Test Configuration.....                                     | 8  |
| 5    | Test Case Results.....                                      | 9  |
| 5.1  | RF Power Output and Effective Isotropic Radiated Power..... | 9  |
| 5.2  | Occupied Bandwidth.....                                     | 22 |
| 5.3  | Band Edge Compliance.....                                   | 35 |
| 5.4  | Peak-to-Average Power Ratio (PAPR).....                     | 51 |
| 5.5  | Frequency Stability.....                                    | 54 |
| 5.6  | Spurious Emissions at Antenna Terminals.....                | 61 |
| 5.7  | Radiates Spurious Emission.....                             | 78 |
| 6    | Main Test Instruments.....                                  | 84 |
|      | ANNEX A: The EUT Appearance.....                            | 86 |
|      | ANNEX B: Test Setup Photos.....                             | 87 |
|      | ANNEX C: Product Change Description.....                    | 88 |
|      | ANNEX D: Verify data.....                                   | 89 |

### Summary of Measurement Results

| Number | Test Case  | Clause in FCC rules                   | Verdict |
|--------|--|---------------------------------------|---------|
| 1      | RF Power Output and Effective Isotropic Radiated Power | 2.1046<br>27.50(d)(4)<br>/27.50(h)(2) | PASS    |
| 2      | Occupied Bandwidth                                     | 2.1049                                | PASS    |
| 3      | Band Edge Compliance                                   | 27.53(h)<br>/27.53(m)                 | PASS    |
| 4      | Peak-to-Average Power Ratio                            | 27.50(d)/KDB971168 D01(5.7)           | PASS    |
| 5      | Frequency Stability                                    | 2.1055 / 27.54                        | PASS    |
| 6      | Spurious Emissions at Antenna Terminals                | 2.1051<br>/27.53(h)<br>/27.53(m)      | PASS    |
| 7      | Radiates Spurious Emission                             | 2.1053<br>/27.53(h)<br>/27.53(m)      | PASS    |

Date of Testing: (Original) April 12, 2018~ April 18, 2018 and May 12, 2020~ May 13, 2020  
(Variant) September 28, 2021~ October 4, 2021

Note: PASS: The EUT complies with the essential requirements in the standard.

FAIL: The EUT does not comply with the essential requirements in the standard.

All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.

**EC25-AUX, EC25-AUX MINIPCIE (Report No.: R2108A0762-R3) is a variant model of EC25-AUX, EC25-AUX MINIPCIE (Report No.: R2005A0269-R3). There is only changed the Power Amplifier and Software Version of product.**

**Tested cases refer to the following table. Please refer to Appendix C for Verify data**

| Test Case                                    | Original | Variant  |
|--|----------|--|
| RF Power Output and Effective Radiated Power | PASS     | Retest(LTE band4/7)  |
| Occupied Bandwidth                           | PASS     | Verify the worst combination of each frequency band(LTE band4/7) |
| Band Edge Compliance                         | PASS     | Verify the worst combination of each frequency band(LTE band4/7) |
| Peak-to-Average Power Ratio                  | PASS     | Retest(LTE band4/7)  |
| Frequency Stability                          | PASS     | Retest(LTE band4/7)  |



|   |      |  |
|---|------|--|
| Spurious Emissions at Antenna Terminals | PASS | Verify the worst combination of each frequency band(LTE band4/7) |
| Radiates Spurious Emission              | PASS | Verify the worst combination of each frequency band(LTE band4/7) |

**The detailed product change description please refers to the Difference Declaration Letter.**



# 1 Test Laboratory

## 1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

## 1.2. Test facility

### **FCC (Designation number: CN1179, Test Firm Registration Number: 446626)**

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

### **A2LA (Certificate Number: 3857.01)**

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

## 1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.  
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China  
City: Shanghai  
Post code: 201201  
Country: P. R. China  
Contact: Xu Kai  
Telephone: +86-021-50791141/2/3  
Fax: +86-021-50791141/2/3-8000  
Website: <http://www.ta-shanghai.com>  
E-mail: [xukai@ta-shanghai.com](mailto:xukai@ta-shanghai.com)

## 2 General Description of Equipment under Test

### 2.1 Applicant and Manufacturer Information

|                             |   |
|-----------------------------|---|
| <b>Applicant</b>            | Quectel Wireless Solutions Co., Ltd   |
| <b>Applicant address</b>    | Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233 |
| <b>Manufacturer</b>         | Quectel Wireless Solutions Co., Ltd   |
| <b>Manufacturer address</b> | Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233 |

### 2.2 General information

| EUT Description  |   |             |             |
|--|---|-------------|-------------|
| Model  | EC25-AUX, EC25-AUX MINIPCIE   |             |             |
| IMEI:  | 862708040005709   |             |             |
| Hardware Version   | R2.0  |             |             |
| Software Version   | EC25AUXGAR08A05M1G  |             |             |
| Power Supply   | External supply power   |             |             |
| Antenna Type   | The EUT don't have standard Antenna, The Antenna used for testing in this report is the after-market accessory (Dipole Antenna) |             |             |
| Antenna Gain   | Band  | Gain(dBi)   |             |
|  | LTE Band 4  | 1.94        |             |
|  | LTE Band 7  | 2.44        |             |
| Test Mode(s)   | LTE Band 4; LTE Band 7;   |             |             |
| Test Modulation  | (LTE)QPSK 16QAM;  |             |             |
| LTE Category   | 4   |             |             |
| Maximum E.I.R.P./ E.R.P.   | LTE Band 4:   | 25.65dBm    |             |
|  | LTE Band 7:   | 25.92dBm    |             |
| Rated Power Supply Voltage:  | 3.8 V   |             |             |
| Extreme Voltage  | Minimum: 3.3 V Maximum: 4.3V  |             |             |
| Extreme Temperature  | Lowest: -40°C Highest: +85°C  |             |             |
| Operating Frequency Range(s)   | Mode  | Tx (MHz)    | Rx (MHz)    |
|  | LTE Band 4  | 1710 ~ 1755 | 2110 ~ 2155 |
|  | LTE Band 7  | 2500 ~ 2570 | 2620 ~ 2690 |
| Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant. |   |             |             |

The series model number is: EC25-AUX MINIPCIE. The difference of these models are have different marketing requirement.



### 3 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**Test standards:**

**FCC CFR47 Part 27C (2020)**

**FCC CFR47 Part 2 (2020)**

**Reference standard:**

**ANSI C63.26 (2015)**

**KDB 971168 D01 Power Meas License Digital Systems v03r01**

## 4 Test Configuration

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (Z axis, horizontal polarization) and the worst case was recorded.

All mode and data rates and positions and RB size and modulations were investigated. Subsequently, only the worst case emissions are reported.

The following testing in LTE is set based on the maximum RF Output Power.

The following testing in different Bandwidth is set to detail in the following table:

Test modes are chosen to be reported as the worst case configuration below for LTE Band 4/7:

| Test items   | Modes   | Bandwidth (MHz) |   |   |    |    |    | Modulation |       | RB |     |      | Test Channel |   |   |   |
|--|---|-----------------|---|---|----|----|----|------------|-------|----|-----|------|--------------|---|---|---|
|  |   | 1.4             | 3 | 5 | 10 | 15 | 20 | QPSK       | 16QAM | 1  | 50% | 100% | L            | M | H |   |
| RF Power Output and Effective Isotropic Radiated Power | LTE 4   | O               | O | O | O  | O  | O  | O          | O     | O  | O   | O    | O            | O | O | O |
|  | LTE 7   | -               | - | O | O  | O  | O  | O          | O     | O  | O   | O    | O            | O | O | O |
| Occupied Bandwidth                                     | LTE 4   | O               | O | O | O  | O  | O  | O          | O     | -  | -   | O    | O            | O | O |   |
|  | LTE 7   | -               | - | O | O  | O  | O  | O          | O     | -  | -   | O    | O            | O | O |   |
| Band Edge Compliance                                   | LTE 4   | O               | O | O | O  | O  | O  | O          | O     | O  | -   | O    | O            | - | O |   |
|  | LTE 7   | -               | - | O | O  | O  | O  | O          | O     | O  | -   | O    | O            | - | O |   |
| Peak-to-Average Power Ratio                            | LTE 4   | O               | O | O | O  | O  | O  | O          | O     | -  | -   | O    | O            | O | O |   |
|  | LTE 7   | -               | - | O | O  | O  | O  | O          | O     | -  | -   | O    | O            | O | O |   |
| Frequency Stability                                    | LTE 4   | O               | O | O | O  | O  | O  | O          | O     | O  | O   | O    | O            | O | O |   |
|  | LTE 7   | -               | - | O | O  | O  | O  | O          | O     | O  | O   | O    | O            | O | O |   |
| Spurious Emissions at Antenna Terminals                | LTE 4   | O               | O | O | O  | O  | O  | O          | -     | O  | -   | -    | O            | O | O |   |
|  | LTE 7   | -               | - | O | O  | O  | O  | O          | -     | O  | -   | -    | O            | O | O |   |
| Radiates Spurious Emission                             | LTE 4   | O               | - | O | -  | -  | O  | O          | -     | O  | -   | -    | -            | O | - |   |
|  | LTE 7   | -               | - | O | -  | O  | O  | O          | -     | O  | -   | -    | -            | O | - |   |
| Note   | 1. The mark "O" means that this configuration is chosen for testing.<br>2. The mark "-" means that this configuration is not testing. |                 |   |   |    |    |    |            |       |    |     |      |              |   |   |   |



## 5 Test Case Results

### 5.1 RF Power Output and Effective Isotropic Radiated Power

#### Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

#### Methods of Measurement

During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure max power transmission and proper modulation.

1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI C63.26 (2015).

- a) Connect the equipment as illustrated. Mount the equipment with the manufacturer specified antenna in a vertical orientation on a manufacturer specified mounting surface located on a non-conducting rotating platform of a RF anechoic chamber (preferred) or a standard radiation site.
- b) Key the transmitter, then rotate the EUT 360° azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. (Note: several batteries may be needed to offset the effect of battery voltage droop, which should not exceed 5% of the manufactured specified battery voltage during transmission).
- c) Replace the transmitter under test with a vertically polarized half-wave dipole (or an antenna whose gain is known relative to an ideal half-wave dipole). The center of the antenna should be at the same location as the center of the antenna under test.
- d) Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading.  $LOSS = \text{Generator Output Power (dBm)} - \text{Analyzer reading (dBm)}$
- e) Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation:  $ERP \text{ (dBm)} = \text{LVL (dBm)} + \text{LOSS (dB)}$
- f) The maximum ERP is the maximum value determined in the preceding step.
- g) When calculating ERP, in addition to knowing the antenna radiation and matching characteristics, it is necessary to know the loss values of all elements (e.g. transmission line attenuation, mismatches, filters, combiners) interposed between the point where transmitter output power is measured, and the point where power is applied to the antenna. ERP can then be calculated as follows:

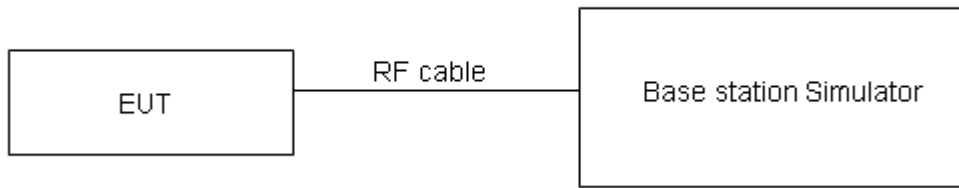
$$EIRP \text{ (dBm)} = \text{Output Power (dBm)} - \text{Losses (dB)} + \text{Antenna Gain (dBi)}$$

where: dBd refers to gain relative to an ideal dipole.

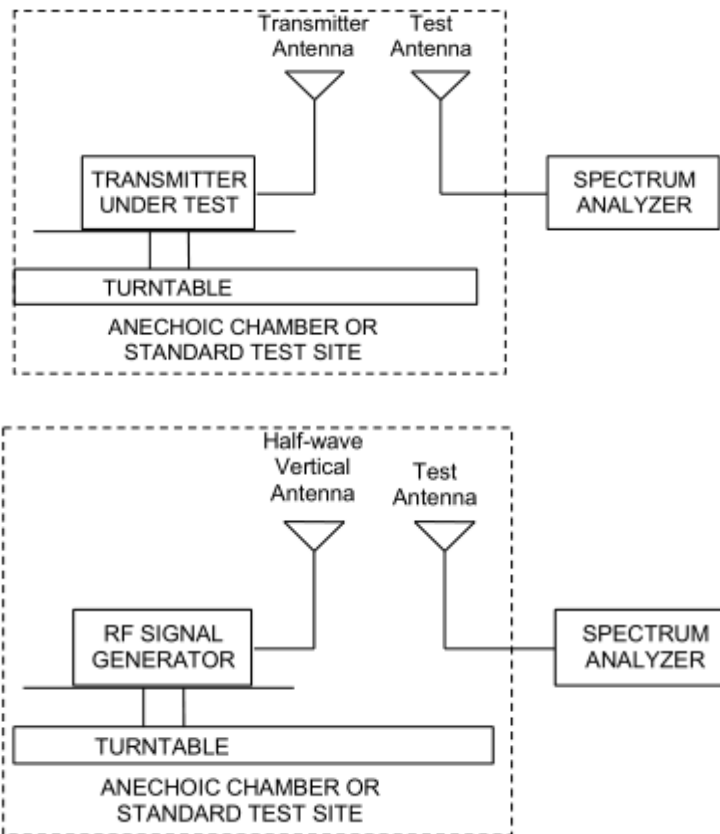
$$EIRP \text{ (dBm)} = ERP \text{ (dBm)} + 2.15 \text{ (dB.)}$$

The RB allocation refers to section 5.1, using the maximum output power configuration.

**Test Setup**



The loss between RF output port of the EUT and the input port of the tester has been taken into consideration.



Note: Area side:2.4mX3.6m

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

**Limits**

No specific RF power output requirements in part 2.1046.

Rule Part 27.50(d) (4) specifies that “Fixed, mobile and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP”

Rule Part 27.50(h) (2) specifies that “Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.”



|                        |                             |
|------------------------|-----------------------------|
| Part 27.50(d)(4)Limit  | $\leq 1 \text{ W}$ (30 dBm) |
| Part 27.50(h)(2) Limit | $\leq 2 \text{ W}$ (33 dBm) |

### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U=0.4 \text{ dB}$  for RF power output,  $k = 2$ ,  $U= 1.19 \text{ dB}$  for ERP/EIRP.



## Test Results

| Band      | Bandwidth (MHz) | UL Channel | RB Size | RB Position | Modulation | Power (dBm) | EIRP (dBm) | Verdict |
|-----------|-----------------|------------|---------|-------------|------------|-------------|------------|---------|
| LTE Band4 | 1.4             | 19957      | 1       | #0          | QPSK       | 23.35       | 25.29      | PASS    |
| LTE Band4 | 1.4             | 19957      | 1       | #Mid        | QPSK       | 23.43       | 25.37      | PASS    |
| LTE Band4 | 1.4             | 19957      | 1       | #Max        | QPSK       | 23.27       | 25.21      | PASS    |
| LTE Band4 | 1.4             | 19957      | 3       | #0          | QPSK       | 23.04       | 24.98      | PASS    |
| LTE Band4 | 1.4             | 19957      | 3       | #Mid        | QPSK       | 23.03       | 24.97      | PASS    |
| LTE Band4 | 1.4             | 19957      | 3       | #Max        | QPSK       | 22.99       | 24.93      | PASS    |
| LTE Band4 | 1.4             | 19957      | 6       | #0          | QPSK       | 22.18       | 24.12      | PASS    |
| LTE Band4 | 1.4             | 19957      | 1       | #0          | QAM16      | 22.21       | 24.15      | PASS    |
| LTE Band4 | 1.4             | 19957      | 1       | #Mid        | QAM16      | 22.40       | 24.34      | PASS    |
| LTE Band4 | 1.4             | 19957      | 1       | #Max        | QAM16      | 22.23       | 24.17      | PASS    |
| LTE Band4 | 1.4             | 19957      | 3       | #0          | QAM16      | 22.18       | 24.12      | PASS    |
| LTE Band4 | 1.4             | 19957      | 3       | #Mid        | QAM16      | 22.14       | 24.08      | PASS    |
| LTE Band4 | 1.4             | 19957      | 3       | #Max        | QAM16      | 22.05       | 23.99      | PASS    |
| LTE Band4 | 1.4             | 19957      | 6       | #0          | QAM16      | 21.26       | 23.20      | PASS    |
| LTE Band4 | 1.4             | 20175      | 1       | #0          | QPSK       | 22.83       | 24.77      | PASS    |
| LTE Band4 | 1.4             | 20175      | 1       | #Mid        | QPSK       | 23.07       | 25.01      | PASS    |
| LTE Band4 | 1.4             | 20175      | 1       | #Max        | QPSK       | 22.86       | 24.80      | PASS    |
| LTE Band4 | 1.4             | 20175      | 3       | #0          | QPSK       | 23.06       | 25.00      | PASS    |
| LTE Band4 | 1.4             | 20175      | 3       | #Mid        | QPSK       | 23.03       | 24.97      | PASS    |
| LTE Band4 | 1.4             | 20175      | 3       | #Max        | QPSK       | 22.99       | 24.93      | PASS    |
| LTE Band4 | 1.4             | 20175      | 6       | #0          | QPSK       | 22.08       | 24.02      | PASS    |
| LTE Band4 | 1.4             | 20175      | 1       | #0          | QAM16      | 22.68       | 24.62      | PASS    |
| LTE Band4 | 1.4             | 20175      | 1       | #Mid        | QAM16      | 22.84       | 24.78      | PASS    |
| LTE Band4 | 1.4             | 20175      | 1       | #Max        | QAM16      | 22.30       | 24.24      | PASS    |
| LTE Band4 | 1.4             | 20175      | 3       | #0          | QAM16      | 21.89       | 23.83      | PASS    |
| LTE Band4 | 1.4             | 20175      | 3       | #Mid        | QAM16      | 21.88       | 23.82      | PASS    |
| LTE Band4 | 1.4             | 20175      | 3       | #Max        | QAM16      | 21.88       | 23.82      | PASS    |
| LTE Band4 | 1.4             | 20175      | 6       | #0          | QAM16      | 20.85       | 22.79      | PASS    |
| LTE Band4 | 1.4             | 20393      | 1       | #0          | QPSK       | 23.45       | 25.39      | PASS    |
| LTE Band4 | 1.4             | 20393      | 1       | #Mid        | QPSK       | 23.71       | 25.65      | PASS    |
| LTE Band4 | 1.4             | 20393      | 1       | #Max        | QPSK       | 23.59       | 25.53      | PASS    |
| LTE Band4 | 1.4             | 20393      | 3       | #0          | QPSK       | 23.42       | 25.36      | PASS    |
| LTE Band4 | 1.4             | 20393      | 3       | #Mid        | QPSK       | 23.42       | 25.36      | PASS    |
| LTE Band4 | 1.4             | 20393      | 3       | #Max        | QPSK       | 23.58       | 25.52      | PASS    |
| LTE Band4 | 1.4             | 20393      | 6       | #0          | QPSK       | 22.37       | 24.31      | PASS    |
| LTE Band4 | 1.4             | 20393      | 1       | #0          | QAM16      | 22.15       | 24.09      | PASS    |
| LTE Band4 | 1.4             | 20393      | 1       | #Mid        | QAM16      | 22.61       | 24.55      | PASS    |
| LTE Band4 | 1.4             | 20393      | 1       | #Max        | QAM16      | 22.43       | 24.37      | PASS    |
| LTE Band4 | 1.4             | 20393      | 3       | #0          | QAM16      | 22.56       | 24.50      | PASS    |



|           |     |       |    |      |       |       |       |      |
|-----------|-----|-------|----|------|-------|-------|-------|------|
| LTE Band4 | 1.4 | 20393 | 3  | #Mid | QAM16 | 22.55 | 24.49 | PASS |
| LTE Band4 | 1.4 | 20393 | 3  | #Max | QAM16 | 22.74 | 24.68 | PASS |
| LTE Band4 | 1.4 | 20393 | 6  | #0   | QAM16 | 21.31 | 23.25 | PASS |
| LTE Band4 | 3   | 19965 | 1  | #0   | QPSK  | 22.61 | 24.55 | PASS |
| LTE Band4 | 3   | 19965 | 1  | #Mid | QPSK  | 22.53 | 24.47 | PASS |
| LTE Band4 | 3   | 19965 | 1  | #Max | QPSK  | 22.82 | 24.76 | PASS |
| LTE Band4 | 3   | 19965 | 8  | #0   | QPSK  | 21.71 | 23.65 | PASS |
| LTE Band4 | 3   | 19965 | 8  | #Mid | QPSK  | 21.81 | 23.75 | PASS |
| LTE Band4 | 3   | 19965 | 8  | #Max | QPSK  | 21.93 | 23.87 | PASS |
| LTE Band4 | 3   | 19965 | 15 | #0   | QPSK  | 21.96 | 23.90 | PASS |
| LTE Band4 | 3   | 19965 | 1  | #0   | QAM16 | 21.92 | 23.86 | PASS |
| LTE Band4 | 3   | 19965 | 1  | #Mid | QAM16 | 21.78 | 23.72 | PASS |
| LTE Band4 | 3   | 19965 | 1  | #Max | QAM16 | 22.24 | 24.18 | PASS |
| LTE Band4 | 3   | 19965 | 8  | #0   | QAM16 | 20.56 | 22.50 | PASS |
| LTE Band4 | 3   | 19965 | 8  | #Mid | QAM16 | 20.77 | 22.71 | PASS |
| LTE Band4 | 3   | 19965 | 8  | #Max | QAM16 | 20.67 | 22.61 | PASS |
| LTE Band4 | 3   | 19965 | 15 | #0   | QAM16 | 21.00 | 22.94 | PASS |
| LTE Band4 | 3   | 20175 | 1  | #0   | QPSK  | 22.84 | 24.78 | PASS |
| LTE Band4 | 3   | 20175 | 1  | #Mid | QPSK  | 22.58 | 24.52 | PASS |
| LTE Band4 | 3   | 20175 | 1  | #Max | QPSK  | 22.69 | 24.63 | PASS |
| LTE Band4 | 3   | 20175 | 8  | #0   | QPSK  | 21.73 | 23.67 | PASS |
| LTE Band4 | 3   | 20175 | 8  | #Mid | QPSK  | 21.82 | 23.76 | PASS |
| LTE Band4 | 3   | 20175 | 8  | #Max | QPSK  | 21.88 | 23.82 | PASS |
| LTE Band4 | 3   | 20175 | 15 | #0   | QPSK  | 21.86 | 23.80 | PASS |
| LTE Band4 | 3   | 20175 | 1  | #0   | QAM16 | 22.22 | 24.16 | PASS |
| LTE Band4 | 3   | 20175 | 1  | #Mid | QAM16 | 22.61 | 24.55 | PASS |
| LTE Band4 | 3   | 20175 | 1  | #Max | QAM16 | 22.19 | 24.13 | PASS |
| LTE Band4 | 3   | 20175 | 8  | #0   | QAM16 | 20.92 | 22.86 | PASS |
| LTE Band4 | 3   | 20175 | 8  | #Mid | QAM16 | 20.93 | 22.87 | PASS |
| LTE Band4 | 3   | 20175 | 8  | #Max | QAM16 | 20.89 | 22.83 | PASS |
| LTE Band4 | 3   | 20175 | 15 | #0   | QAM16 | 20.94 | 22.88 | PASS |
| LTE Band4 | 3   | 20385 | 1  | #0   | QPSK  | 23.43 | 25.37 | PASS |
| LTE Band4 | 3   | 20385 | 1  | #Mid | QPSK  | 23.01 | 24.95 | PASS |
| LTE Band4 | 3   | 20385 | 1  | #Max | QPSK  | 23.37 | 25.31 | PASS |
| LTE Band4 | 3   | 20385 | 8  | #0   | QPSK  | 22.09 | 24.03 | PASS |
| LTE Band4 | 3   | 20385 | 8  | #Mid | QPSK  | 22.10 | 24.04 | PASS |
| LTE Band4 | 3   | 20385 | 8  | #Max | QPSK  | 22.17 | 24.11 | PASS |
| LTE Band4 | 3   | 20385 | 15 | #0   | QPSK  | 22.24 | 24.18 | PASS |
| LTE Band4 | 3   | 20385 | 1  | #0   | QAM16 | 22.13 | 24.07 | PASS |
| LTE Band4 | 3   | 20385 | 1  | #Mid | QAM16 | 21.86 | 23.80 | PASS |
| LTE Band4 | 3   | 20385 | 1  | #Max | QAM16 | 22.28 | 24.22 | PASS |
| LTE Band4 | 3   | 20385 | 8  | #0   | QAM16 | 20.91 | 22.85 | PASS |
| LTE Band4 | 3   | 20385 | 8  | #Mid | QAM16 | 20.92 | 22.86 | PASS |



|           |   |       |    |      |       |       |       |      |
|-----------|---|-------|----|------|-------|-------|-------|------|
| LTE Band4 | 3 | 20385 | 8  | #Max | QAM16 | 20.79 | 22.73 | PASS |
| LTE Band4 | 3 | 20385 | 15 | #0   | QAM16 | 21.15 | 23.09 | PASS |
| LTE Band4 | 5 | 19975 | 1  | #0   | QPSK  | 23.10 | 25.04 | PASS |
| LTE Band4 | 5 | 19975 | 1  | #Mid | QPSK  | 23.18 | 25.12 | PASS |
| LTE Band4 | 5 | 19975 | 1  | #Max | QPSK  | 23.25 | 25.19 | PASS |
| LTE Band4 | 5 | 19975 | 12 | #0   | QPSK  | 21.99 | 23.93 | PASS |
| LTE Band4 | 5 | 19975 | 12 | #Mid | QPSK  | 22.09 | 24.03 | PASS |
| LTE Band4 | 5 | 19975 | 12 | #Max | QPSK  | 22.16 | 24.10 | PASS |
| LTE Band4 | 5 | 19975 | 25 | #0   | QPSK  | 22.12 | 24.06 | PASS |
| LTE Band4 | 5 | 19975 | 1  | #0   | QAM16 | 22.55 | 24.49 | PASS |
| LTE Band4 | 5 | 19975 | 1  | #Mid | QAM16 | 21.92 | 23.86 | PASS |
| LTE Band4 | 5 | 19975 | 1  | #Max | QAM16 | 22.23 | 24.17 | PASS |
| LTE Band4 | 5 | 19975 | 12 | #0   | QAM16 | 20.98 | 22.92 | PASS |
| LTE Band4 | 5 | 19975 | 12 | #Mid | QAM16 | 20.98 | 22.92 | PASS |
| LTE Band4 | 5 | 19975 | 12 | #Max | QAM16 | 20.95 | 22.89 | PASS |
| LTE Band4 | 5 | 19975 | 25 | #0   | QAM16 | 21.18 | 23.12 | PASS |
| LTE Band4 | 5 | 20175 | 1  | #0   | QPSK  | 23.11 | 25.05 | PASS |
| LTE Band4 | 5 | 20175 | 1  | #Mid | QPSK  | 22.94 | 24.88 | PASS |
| LTE Band4 | 5 | 20175 | 1  | #Max | QPSK  | 22.95 | 24.89 | PASS |
| LTE Band4 | 5 | 20175 | 12 | #0   | QPSK  | 22.17 | 24.11 | PASS |
| LTE Band4 | 5 | 20175 | 12 | #Mid | QPSK  | 22.17 | 24.11 | PASS |
| LTE Band4 | 5 | 20175 | 12 | #Max | QPSK  | 22.09 | 24.03 | PASS |
| LTE Band4 | 5 | 20175 | 25 | #0   | QPSK  | 22.12 | 24.06 | PASS |
| LTE Band4 | 5 | 20175 | 1  | #0   | QAM16 | 22.29 | 24.23 | PASS |
| LTE Band4 | 5 | 20175 | 1  | #Mid | QAM16 | 21.85 | 23.79 | PASS |
| LTE Band4 | 5 | 20175 | 1  | #Max | QAM16 | 22.16 | 24.10 | PASS |
| LTE Band4 | 5 | 20175 | 12 | #0   | QAM16 | 20.96 | 22.90 | PASS |
| LTE Band4 | 5 | 20175 | 12 | #Mid | QAM16 | 20.96 | 22.90 | PASS |
| LTE Band4 | 5 | 20175 | 12 | #Max | QAM16 | 20.87 | 22.81 | PASS |
| LTE Band4 | 5 | 20175 | 25 | #0   | QAM16 | 21.04 | 22.98 | PASS |
| LTE Band4 | 5 | 20375 | 1  | #0   | QPSK  | 23.25 | 25.19 | PASS |
| LTE Band4 | 5 | 20375 | 1  | #Mid | QPSK  | 23.00 | 24.94 | PASS |
| LTE Band4 | 5 | 20375 | 1  | #Max | QPSK  | 23.30 | 25.24 | PASS |
| LTE Band4 | 5 | 20375 | 12 | #0   | QPSK  | 22.16 | 24.10 | PASS |
| LTE Band4 | 5 | 20375 | 12 | #Mid | QPSK  | 22.17 | 24.11 | PASS |
| LTE Band4 | 5 | 20375 | 12 | #Max | QPSK  | 22.09 | 24.03 | PASS |
| LTE Band4 | 5 | 20375 | 25 | #0   | QPSK  | 22.18 | 24.12 | PASS |
| LTE Band4 | 5 | 20375 | 1  | #0   | QAM16 | 22.20 | 24.14 | PASS |
| LTE Band4 | 5 | 20375 | 1  | #Mid | QAM16 | 22.21 | 24.15 | PASS |
| LTE Band4 | 5 | 20375 | 1  | #Max | QAM16 | 22.44 | 24.38 | PASS |
| LTE Band4 | 5 | 20375 | 12 | #0   | QAM16 | 21.04 | 22.98 | PASS |
| LTE Band4 | 5 | 20375 | 12 | #Mid | QAM16 | 21.05 | 22.99 | PASS |
| LTE Band4 | 5 | 20375 | 12 | #Max | QAM16 | 21.05 | 22.99 | PASS |



|           |    |       |    |      |       |       |       |      |
|-----------|----|-------|----|------|-------|-------|-------|------|
| LTE Band4 | 5  | 20375 | 25 | #0   | QAM16 | 21.14 | 23.08 | PASS |
| LTE Band4 | 10 | 20000 | 1  | #0   | QPSK  | 22.98 | 24.92 | PASS |
| LTE Band4 | 10 | 20000 | 1  | #Mid | QPSK  | 23.34 | 25.28 | PASS |
| LTE Band4 | 10 | 20000 | 1  | #Max | QPSK  | 23.34 | 25.28 | PASS |
| LTE Band4 | 10 | 20000 | 25 | #0   | QPSK  | 22.24 | 24.18 | PASS |
| LTE Band4 | 10 | 20000 | 25 | #Mid | QPSK  | 22.16 | 24.10 | PASS |
| LTE Band4 | 10 | 20000 | 25 | #Max | QPSK  | 22.26 | 24.20 | PASS |
| LTE Band4 | 10 | 20000 | 50 | #0   | QPSK  | 22.13 | 24.07 | PASS |
| LTE Band4 | 10 | 20000 | 1  | #0   | QAM16 | 22.09 | 24.03 | PASS |
| LTE Band4 | 10 | 20000 | 1  | #Mid | QAM16 | 22.26 | 24.20 | PASS |
| LTE Band4 | 10 | 20000 | 1  | #Max | QAM16 | 22.42 | 24.36 | PASS |
| LTE Band4 | 10 | 20000 | 25 | #0   | QAM16 | 21.20 | 23.14 | PASS |
| LTE Band4 | 10 | 20000 | 25 | #Mid | QAM16 | 21.29 | 23.23 | PASS |
| LTE Band4 | 10 | 20000 | 25 | #Max | QAM16 | 21.15 | 23.09 | PASS |
| LTE Band4 | 10 | 20000 | 50 | #0   | QAM16 | 21.12 | 23.06 | PASS |
| LTE Band4 | 10 | 20175 | 1  | #0   | QPSK  | 23.01 | 24.95 | PASS |
| LTE Band4 | 10 | 20175 | 1  | #Mid | QPSK  | 23.03 | 24.97 | PASS |
| LTE Band4 | 10 | 20175 | 1  | #Max | QPSK  | 22.97 | 24.91 | PASS |
| LTE Band4 | 10 | 20175 | 25 | #0   | QPSK  | 22.13 | 24.07 | PASS |
| LTE Band4 | 10 | 20175 | 25 | #Mid | QPSK  | 22.13 | 24.07 | PASS |
| LTE Band4 | 10 | 20175 | 25 | #Max | QPSK  | 22.05 | 23.99 | PASS |
| LTE Band4 | 10 | 20175 | 50 | #0   | QPSK  | 22.11 | 24.05 | PASS |
| LTE Band4 | 10 | 20175 | 1  | #0   | QAM16 | 22.71 | 24.65 | PASS |
| LTE Band4 | 10 | 20175 | 1  | #Mid | QAM16 | 22.70 | 24.64 | PASS |
| LTE Band4 | 10 | 20175 | 1  | #Max | QAM16 | 22.82 | 24.76 | PASS |
| LTE Band4 | 10 | 20175 | 25 | #0   | QAM16 | 21.16 | 23.10 | PASS |
| LTE Band4 | 10 | 20175 | 25 | #Mid | QAM16 | 21.17 | 23.11 | PASS |
| LTE Band4 | 10 | 20175 | 25 | #Max | QAM16 | 21.19 | 23.13 | PASS |
| LTE Band4 | 10 | 20175 | 50 | #0   | QAM16 | 21.17 | 23.11 | PASS |
| LTE Band4 | 10 | 20350 | 1  | #0   | QPSK  | 23.02 | 24.96 | PASS |
| LTE Band4 | 10 | 20350 | 1  | #Mid | QPSK  | 23.03 | 24.97 | PASS |
| LTE Band4 | 10 | 20350 | 1  | #Max | QPSK  | 23.15 | 25.09 | PASS |
| LTE Band4 | 10 | 20350 | 25 | #0   | QPSK  | 22.11 | 24.05 | PASS |
| LTE Band4 | 10 | 20350 | 25 | #Mid | QPSK  | 22.12 | 24.06 | PASS |
| LTE Band4 | 10 | 20350 | 25 | #Max | QPSK  | 22.22 | 24.16 | PASS |
| LTE Band4 | 10 | 20350 | 50 | #0   | QPSK  | 22.23 | 24.17 | PASS |
| LTE Band4 | 10 | 20350 | 1  | #0   | QAM16 | 21.86 | 23.80 | PASS |
| LTE Band4 | 10 | 20350 | 1  | #Mid | QAM16 | 21.51 | 23.45 | PASS |
| LTE Band4 | 10 | 20350 | 1  | #Max | QAM16 | 22.01 | 23.95 | PASS |
| LTE Band4 | 10 | 20350 | 25 | #0   | QAM16 | 21.09 | 23.03 | PASS |
| LTE Band4 | 10 | 20350 | 25 | #Mid | QAM16 | 21.10 | 23.04 | PASS |
| LTE Band4 | 10 | 20350 | 25 | #Max | QAM16 | 21.12 | 23.06 | PASS |
| LTE Band4 | 10 | 20350 | 50 | #0   | QAM16 | 21.21 | 23.15 | PASS |



|           |    |       |    |      |       |       |       |      |
|-----------|----|-------|----|------|-------|-------|-------|------|
| LTE Band4 | 15 | 20025 | 1  | #0   | QPSK  | 23.35 | 25.29 | PASS |
| LTE Band4 | 15 | 20025 | 1  | #Mid | QPSK  | 23.32 | 25.26 | PASS |
| LTE Band4 | 15 | 20025 | 1  | #Max | QPSK  | 23.07 | 25.01 | PASS |
| LTE Band4 | 15 | 20025 | 36 | #0   | QPSK  | 21.98 | 23.92 | PASS |
| LTE Band4 | 15 | 20025 | 36 | #Mid | QPSK  | 22.22 | 24.16 | PASS |
| LTE Band4 | 15 | 20025 | 36 | #Max | QPSK  | 22.23 | 24.17 | PASS |
| LTE Band4 | 15 | 20025 | 75 | #0   | QPSK  | 22.34 | 24.28 | PASS |
| LTE Band4 | 15 | 20025 | 1  | #0   | QAM16 | 21.91 | 23.85 | PASS |
| LTE Band4 | 15 | 20025 | 1  | #Mid | QAM16 | 21.99 | 23.93 | PASS |
| LTE Band4 | 15 | 20025 | 1  | #Max | QAM16 | 22.09 | 24.03 | PASS |
| LTE Band4 | 15 | 20025 | 36 | #0   | QAM16 | 21.19 | 23.13 | PASS |
| LTE Band4 | 15 | 20025 | 36 | #Mid | QAM16 | 21.10 | 23.04 | PASS |
| LTE Band4 | 15 | 20025 | 36 | #Max | QAM16 | 21.28 | 23.22 | PASS |
| LTE Band4 | 15 | 20025 | 75 | #0   | QAM16 | 21.18 | 23.12 | PASS |
| LTE Band4 | 15 | 20175 | 1  | #0   | QPSK  | 22.99 | 24.93 | PASS |
| LTE Band4 | 15 | 20175 | 1  | #Mid | QPSK  | 22.85 | 24.79 | PASS |
| LTE Band4 | 15 | 20175 | 1  | #Max | QPSK  | 22.94 | 24.88 | PASS |
| LTE Band4 | 15 | 20175 | 36 | #0   | QPSK  | 22.03 | 23.97 | PASS |
| LTE Band4 | 15 | 20175 | 36 | #Mid | QPSK  | 22.03 | 23.97 | PASS |
| LTE Band4 | 15 | 20175 | 36 | #Max | QPSK  | 22.03 | 23.97 | PASS |
| LTE Band4 | 15 | 20175 | 75 | #0   | QPSK  | 22.00 | 23.94 | PASS |
| LTE Band4 | 15 | 20175 | 1  | #0   | QAM16 | 22.57 | 24.51 | PASS |
| LTE Band4 | 15 | 20175 | 1  | #Mid | QAM16 | 22.41 | 24.35 | PASS |
| LTE Band4 | 15 | 20175 | 1  | #Max | QAM16 | 22.55 | 24.49 | PASS |
| LTE Band4 | 15 | 20175 | 36 | #0   | QAM16 | 20.85 | 22.79 | PASS |
| LTE Band4 | 15 | 20175 | 36 | #Mid | QAM16 | 20.86 | 22.80 | PASS |
| LTE Band4 | 15 | 20175 | 36 | #Max | QAM16 | 20.86 | 22.80 | PASS |
| LTE Band4 | 15 | 20175 | 75 | #0   | QAM16 | 21.03 | 22.97 | PASS |
| LTE Band4 | 15 | 20325 | 1  | #0   | QPSK  | 23.09 | 25.03 | PASS |
| LTE Band4 | 15 | 20325 | 1  | #Mid | QPSK  | 22.93 | 24.87 | PASS |
| LTE Band4 | 15 | 20325 | 1  | #Max | QPSK  | 22.94 | 24.88 | PASS |
| LTE Band4 | 15 | 20325 | 36 | #0   | QPSK  | 22.12 | 24.06 | PASS |
| LTE Band4 | 15 | 20325 | 36 | #Mid | QPSK  | 22.13 | 24.07 | PASS |
| LTE Band4 | 15 | 20325 | 36 | #Max | QPSK  | 22.00 | 23.94 | PASS |
| LTE Band4 | 15 | 20325 | 75 | #0   | QPSK  | 22.12 | 24.06 | PASS |
| LTE Band4 | 15 | 20325 | 1  | #0   | QAM16 | 21.70 | 23.64 | PASS |
| LTE Band4 | 15 | 20325 | 1  | #Mid | QAM16 | 21.85 | 23.79 | PASS |
| LTE Band4 | 15 | 20325 | 1  | #Max | QAM16 | 21.86 | 23.80 | PASS |
| LTE Band4 | 15 | 20325 | 36 | #0   | QAM16 | 21.00 | 22.94 | PASS |
| LTE Band4 | 15 | 20325 | 36 | #Mid | QAM16 | 21.00 | 22.94 | PASS |
| LTE Band4 | 15 | 20325 | 36 | #Max | QAM16 | 21.00 | 22.94 | PASS |
| LTE Band4 | 15 | 20325 | 75 | #0   | QAM16 | 21.16 | 23.10 | PASS |
| LTE Band4 | 20 | 20050 | 1  | #0   | QPSK  | 22.99 | 24.93 | PASS |





|           |    |       |     |      |       |       |       |      |
|-----------|----|-------|-----|------|-------|-------|-------|------|
| LTE Band4 | 20 | 20050 | 1   | #Mid | QPSK  | 23.13 | 25.07 | PASS |
| LTE Band4 | 20 | 20050 | 1   | #Max | QPSK  | 22.84 | 24.78 | PASS |
| LTE Band4 | 20 | 20050 | 50  | #0   | QPSK  | 22.23 | 24.17 | PASS |
| LTE Band4 | 20 | 20050 | 50  | #Mid | QPSK  | 22.22 | 24.16 | PASS |
| LTE Band4 | 20 | 20050 | 50  | #Max | QPSK  | 22.07 | 24.01 | PASS |
| LTE Band4 | 20 | 20050 | 100 | #0   | QPSK  | 22.14 | 24.08 | PASS |
| LTE Band4 | 20 | 20050 | 1   | #0   | QAM16 | 21.92 | 23.86 | PASS |
| LTE Band4 | 20 | 20050 | 1   | #Mid | QAM16 | 22.06 | 24.00 | PASS |
| LTE Band4 | 20 | 20050 | 1   | #Max | QAM16 | 21.88 | 23.82 | PASS |
| LTE Band4 | 20 | 20050 | 50  | #0   | QAM16 | 21.23 | 23.17 | PASS |
| LTE Band4 | 20 | 20050 | 50  | #Mid | QAM16 | 21.23 | 23.17 | PASS |
| LTE Band4 | 20 | 20050 | 50  | #Max | QAM16 | 21.32 | 23.26 | PASS |
| LTE Band4 | 20 | 20050 | 100 | #0   | QAM16 | 21.36 | 23.30 | PASS |
| LTE Band4 | 20 | 20175 | 1   | #0   | QPSK  | 23.20 | 25.14 | PASS |
| LTE Band4 | 20 | 20175 | 1   | #Mid | QPSK  | 23.07 | 25.01 | PASS |
| LTE Band4 | 20 | 20175 | 1   | #Max | QPSK  | 23.07 | 25.01 | PASS |
| LTE Band4 | 20 | 20175 | 50  | #0   | QPSK  | 22.00 | 23.94 | PASS |
| LTE Band4 | 20 | 20175 | 50  | #Mid | QPSK  | 21.96 | 23.90 | PASS |
| LTE Band4 | 20 | 20175 | 50  | #Max | QPSK  | 21.97 | 23.91 | PASS |
| LTE Band4 | 20 | 20175 | 100 | #0   | QPSK  | 22.10 | 24.04 | PASS |
| LTE Band4 | 20 | 20175 | 1   | #0   | QAM16 | 21.71 | 23.65 | PASS |
| LTE Band4 | 20 | 20175 | 1   | #Mid | QAM16 | 21.73 | 23.67 | PASS |
| LTE Band4 | 20 | 20175 | 1   | #Max | QAM16 | 21.78 | 23.72 | PASS |
| LTE Band4 | 20 | 20175 | 50  | #0   | QAM16 | 21.09 | 23.03 | PASS |
| LTE Band4 | 20 | 20175 | 50  | #Mid | QAM16 | 20.93 | 22.87 | PASS |
| LTE Band4 | 20 | 20175 | 50  | #Max | QAM16 | 21.14 | 23.08 | PASS |
| LTE Band4 | 20 | 20175 | 100 | #0   | QAM16 | 21.18 | 23.12 | PASS |
| LTE Band4 | 20 | 20300 | 1   | #0   | QPSK  | 23.09 | 25.03 | PASS |
| LTE Band4 | 20 | 20300 | 1   | #Mid | QPSK  | 23.13 | 25.07 | PASS |
| LTE Band4 | 20 | 20300 | 1   | #Max | QPSK  | 22.98 | 24.92 | PASS |
| LTE Band4 | 20 | 20300 | 50  | #0   | QPSK  | 22.20 | 24.14 | PASS |
| LTE Band4 | 20 | 20300 | 50  | #Mid | QPSK  | 22.21 | 24.15 | PASS |
| LTE Band4 | 20 | 20300 | 50  | #Max | QPSK  | 22.22 | 24.16 | PASS |
| LTE Band4 | 20 | 20300 | 100 | #0   | QPSK  | 22.26 | 24.20 | PASS |
| LTE Band4 | 20 | 20300 | 1   | #0   | QAM16 | 21.97 | 23.91 | PASS |
| LTE Band4 | 20 | 20300 | 1   | #Mid | QAM16 | 22.24 | 24.18 | PASS |
| LTE Band4 | 20 | 20300 | 1   | #Max | QAM16 | 22.05 | 23.99 | PASS |
| LTE Band4 | 20 | 20300 | 50  | #0   | QAM16 | 21.22 | 23.16 | PASS |
| LTE Band4 | 20 | 20300 | 50  | #Mid | QAM16 | 21.23 | 23.17 | PASS |
| LTE Band4 | 20 | 20300 | 50  | #Max | QAM16 | 21.25 | 23.19 | PASS |
| LTE Band4 | 20 | 20300 | 100 | #0   | QAM16 | 21.25 | 23.19 | PASS |



| Band      | Bandwidth (MHz) | UL Channel | RB Size | RB Position | Modulation | Power (dBm) | EIRP (dBm) | Verdict |
|-----------|-----------------|------------|---------|-------------|------------|-------------|------------|---------|
| LTE Band7 | 5               | 20775      | 1       | #0          | QPSK       | 22.90       | 25.34      | PASS    |
| LTE Band7 | 5               | 20775      | 1       | #Mid        | QPSK       | 22.99       | 25.43      | PASS    |
| LTE Band7 | 5               | 20775      | 1       | #Max        | QPSK       | 23.05       | 25.49      | PASS    |
| LTE Band7 | 5               | 20775      | 12      | #0          | QPSK       | 22.27       | 24.71      | PASS    |
| LTE Band7 | 5               | 20775      | 12      | #Mid        | QPSK       | 22.27       | 24.71      | PASS    |
| LTE Band7 | 5               | 20775      | 12      | #Max        | QPSK       | 22.30       | 24.74      | PASS    |
| LTE Band7 | 5               | 20775      | 25      | #0          | QPSK       | 22.29       | 24.73      | PASS    |
| LTE Band7 | 5               | 20775      | 1       | #0          | QAM16      | 21.90       | 24.34      | PASS    |
| LTE Band7 | 5               | 20775      | 1       | #Mid        | QAM16      | 21.95       | 24.39      | PASS    |
| LTE Band7 | 5               | 20775      | 1       | #Max        | QAM16      | 22.15       | 24.59      | PASS    |
| LTE Band7 | 5               | 20775      | 12      | #0          | QAM16      | 21.05       | 23.49      | PASS    |
| LTE Band7 | 5               | 20775      | 12      | #Mid        | QAM16      | 21.11       | 23.55      | PASS    |
| LTE Band7 | 5               | 20775      | 12      | #Max        | QAM16      | 21.14       | 23.58      | PASS    |
| LTE Band7 | 5               | 20775      | 25      | #0          | QAM16      | 21.17       | 23.61      | PASS    |
| LTE Band7 | 5               | 21100      | 1       | #0          | QPSK       | 23.17       | 25.61      | PASS    |
| LTE Band7 | 5               | 21100      | 1       | #Mid        | QPSK       | 23.22       | 25.66      | PASS    |
| LTE Band7 | 5               | 21100      | 1       | #Max        | QPSK       | 23.27       | 25.71      | PASS    |
| LTE Band7 | 5               | 21100      | 12      | #0          | QPSK       | 22.17       | 24.61      | PASS    |
| LTE Band7 | 5               | 21100      | 12      | #Mid        | QPSK       | 22.18       | 24.62      | PASS    |
| LTE Band7 | 5               | 21100      | 12      | #Max        | QPSK       | 22.32       | 24.76      | PASS    |
| LTE Band7 | 5               | 21100      | 25      | #0          | QPSK       | 22.29       | 24.73      | PASS    |
| LTE Band7 | 5               | 21100      | 1       | #0          | QAM16      | 22.21       | 24.65      | PASS    |
| LTE Band7 | 5               | 21100      | 1       | #Mid        | QAM16      | 22.11       | 24.55      | PASS    |
| LTE Band7 | 5               | 21100      | 1       | #Max        | QAM16      | 22.16       | 24.60      | PASS    |
| LTE Band7 | 5               | 21100      | 12      | #0          | QAM16      | 21.10       | 23.54      | PASS    |
| LTE Band7 | 5               | 21100      | 12      | #Mid        | QAM16      | 21.10       | 23.54      | PASS    |
| LTE Band7 | 5               | 21100      | 12      | #Max        | QAM16      | 21.14       | 23.58      | PASS    |
| LTE Band7 | 5               | 21100      | 25      | #0          | QAM16      | 21.16       | 23.60      | PASS    |
| LTE Band7 | 5               | 21425      | 1       | #0          | QPSK       | 23.09       | 25.53      | PASS    |
| LTE Band7 | 5               | 21425      | 1       | #Mid        | QPSK       | 22.90       | 25.34      | PASS    |
| LTE Band7 | 5               | 21425      | 1       | #Max        | QPSK       | 23.07       | 25.51      | PASS    |
| LTE Band7 | 5               | 21425      | 12      | #0          | QPSK       | 22.13       | 24.57      | PASS    |
| LTE Band7 | 5               | 21425      | 12      | #Mid        | QPSK       | 22.16       | 24.60      | PASS    |
| LTE Band7 | 5               | 21425      | 12      | #Max        | QPSK       | 22.06       | 24.50      | PASS    |
| LTE Band7 | 5               | 21425      | 25      | #0          | QPSK       | 22.09       | 24.53      | PASS    |
| LTE Band7 | 5               | 21425      | 1       | #0          | QAM16      | 22.29       | 24.73      | PASS    |
| LTE Band7 | 5               | 21425      | 1       | #Mid        | QAM16      | 22.08       | 24.52      | PASS    |
| LTE Band7 | 5               | 21425      | 1       | #Max        | QAM16      | 22.35       | 24.79      | PASS    |
| LTE Band7 | 5               | 21425      | 12      | #0          | QAM16      | 20.88       | 23.32      | PASS    |
| LTE Band7 | 5               | 21425      | 12      | #Mid        | QAM16      | 20.79       | 23.23      | PASS    |



|           |    |       |    |      |       |       |       |      |
|-----------|----|-------|----|------|-------|-------|-------|------|
| LTE Band7 | 5  | 21425 | 12 | #Max | QAM16 | 20.81 | 23.25 | PASS |
| LTE Band7 | 5  | 21425 | 25 | #0   | QAM16 | 20.95 | 23.39 | PASS |
| LTE Band7 | 10 | 20800 | 1  | #0   | QPSK  | 23.24 | 25.68 | PASS |
| LTE Band7 | 10 | 20800 | 1  | #Mid | QPSK  | 23.09 | 25.53 | PASS |
| LTE Band7 | 10 | 20800 | 1  | #Max | QPSK  | 22.99 | 25.43 | PASS |
| LTE Band7 | 10 | 20800 | 25 | #0   | QPSK  | 22.27 | 24.71 | PASS |
| LTE Band7 | 10 | 20800 | 25 | #Mid | QPSK  | 22.26 | 24.70 | PASS |
| LTE Band7 | 10 | 20800 | 25 | #Max | QPSK  | 22.23 | 24.67 | PASS |
| LTE Band7 | 10 | 20800 | 50 | #0   | QPSK  | 22.25 | 24.69 | PASS |
| LTE Band7 | 10 | 20800 | 1  | #0   | QAM16 | 22.10 | 24.54 | PASS |
| LTE Band7 | 10 | 20800 | 1  | #Mid | QAM16 | 22.34 | 24.78 | PASS |
| LTE Band7 | 10 | 20800 | 1  | #Max | QAM16 | 22.16 | 24.60 | PASS |
| LTE Band7 | 10 | 20800 | 25 | #0   | QAM16 | 21.01 | 23.45 | PASS |
| LTE Band7 | 10 | 20800 | 25 | #Mid | QAM16 | 21.01 | 23.45 | PASS |
| LTE Band7 | 10 | 20800 | 25 | #Max | QAM16 | 21.04 | 23.48 | PASS |
| LTE Band7 | 10 | 20800 | 50 | #0   | QAM16 | 21.14 | 23.58 | PASS |
| LTE Band7 | 10 | 21100 | 1  | #0   | QPSK  | 23.26 | 25.70 | PASS |
| LTE Band7 | 10 | 21100 | 1  | #Mid | QPSK  | 23.41 | 25.85 | PASS |
| LTE Band7 | 10 | 21100 | 1  | #Max | QPSK  | 23.22 | 25.66 | PASS |
| LTE Band7 | 10 | 21100 | 25 | #0   | QPSK  | 22.14 | 24.58 | PASS |
| LTE Band7 | 10 | 21100 | 25 | #Mid | QPSK  | 22.15 | 24.59 | PASS |
| LTE Band7 | 10 | 21100 | 25 | #Max | QPSK  | 22.26 | 24.70 | PASS |
| LTE Band7 | 10 | 21100 | 50 | #0   | QPSK  | 22.25 | 24.69 | PASS |
| LTE Band7 | 10 | 21100 | 1  | #0   | QAM16 | 22.70 | 25.14 | PASS |
| LTE Band7 | 10 | 21100 | 1  | #Mid | QAM16 | 23.13 | 25.57 | PASS |
| LTE Band7 | 10 | 21100 | 1  | #Max | QAM16 | 23.22 | 25.66 | PASS |
| LTE Band7 | 10 | 21100 | 25 | #0   | QAM16 | 21.28 | 23.72 | PASS |
| LTE Band7 | 10 | 21100 | 25 | #Mid | QAM16 | 21.30 | 23.74 | PASS |
| LTE Band7 | 10 | 21100 | 25 | #Max | QAM16 | 21.41 | 23.85 | PASS |
| LTE Band7 | 10 | 21100 | 50 | #0   | QAM16 | 21.17 | 23.61 | PASS |
| LTE Band7 | 10 | 21400 | 1  | #0   | QPSK  | 23.27 | 25.71 | PASS |
| LTE Band7 | 10 | 21400 | 1  | #Mid | QPSK  | 23.28 | 25.72 | PASS |
| LTE Band7 | 10 | 21400 | 1  | #Max | QPSK  | 23.48 | 25.92 | PASS |
| LTE Band7 | 10 | 21400 | 25 | #0   | QPSK  | 22.25 | 24.69 | PASS |
| LTE Band7 | 10 | 21400 | 25 | #Mid | QPSK  | 22.29 | 24.73 | PASS |
| LTE Band7 | 10 | 21400 | 25 | #Max | QPSK  | 22.15 | 24.59 | PASS |
| LTE Band7 | 10 | 21400 | 50 | #0   | QPSK  | 22.15 | 24.59 | PASS |
| LTE Band7 | 10 | 21400 | 1  | #0   | QAM16 | 22.02 | 24.46 | PASS |
| LTE Band7 | 10 | 21400 | 1  | #Mid | QAM16 | 22.11 | 24.55 | PASS |
| LTE Band7 | 10 | 21400 | 1  | #Max | QAM16 | 21.60 | 24.04 | PASS |
| LTE Band7 | 10 | 21400 | 25 | #0   | QAM16 | 21.23 | 23.67 | PASS |
| LTE Band7 | 10 | 21400 | 25 | #Mid | QAM16 | 21.26 | 23.70 | PASS |
| LTE Band7 | 10 | 21400 | 25 | #Max | QAM16 | 21.33 | 23.77 | PASS |



|           |    |       |    |      |       |       |       |      |
|-----------|----|-------|----|------|-------|-------|-------|------|
| LTE Band7 | 10 | 21400 | 50 | #0   | QAM16 | 21.19 | 23.63 | PASS |
| LTE Band7 | 15 | 20825 | 1  | #0   | QPSK  | 23.29 | 25.73 | PASS |
| LTE Band7 | 15 | 20825 | 1  | #Mid | QPSK  | 23.17 | 25.61 | PASS |
| LTE Band7 | 15 | 20825 | 1  | #Max | QPSK  | 23.06 | 25.50 | PASS |
| LTE Band7 | 15 | 20825 | 36 | #0   | QPSK  | 22.26 | 24.70 | PASS |
| LTE Band7 | 15 | 20825 | 36 | #Mid | QPSK  | 22.25 | 24.69 | PASS |
| LTE Band7 | 15 | 20825 | 36 | #Max | QPSK  | 22.26 | 24.70 | PASS |
| LTE Band7 | 15 | 20825 | 75 | #0   | QPSK  | 22.20 | 24.64 | PASS |
| LTE Band7 | 15 | 20825 | 1  | #0   | QAM16 | 22.28 | 24.72 | PASS |
| LTE Band7 | 15 | 20825 | 1  | #Mid | QAM16 | 22.25 | 24.69 | PASS |
| LTE Band7 | 15 | 20825 | 1  | #Max | QAM16 | 22.16 | 24.60 | PASS |
| LTE Band7 | 15 | 20825 | 36 | #0   | QAM16 | 21.21 | 23.65 | PASS |
| LTE Band7 | 15 | 20825 | 36 | #Mid | QAM16 | 21.21 | 23.65 | PASS |
| LTE Band7 | 15 | 20825 | 36 | #Max | QAM16 | 21.33 | 23.77 | PASS |
| LTE Band7 | 15 | 20825 | 75 | #0   | QAM16 | 21.28 | 23.72 | PASS |
| LTE Band7 | 15 | 21100 | 1  | #0   | QPSK  | 23.07 | 25.51 | PASS |
| LTE Band7 | 15 | 21100 | 1  | #Mid | QPSK  | 22.88 | 25.32 | PASS |
| LTE Band7 | 15 | 21100 | 1  | #Max | QPSK  | 22.87 | 25.31 | PASS |
| LTE Band7 | 15 | 21100 | 36 | #0   | QPSK  | 22.14 | 24.58 | PASS |
| LTE Band7 | 15 | 21100 | 36 | #Mid | QPSK  | 22.15 | 24.59 | PASS |
| LTE Band7 | 15 | 21100 | 36 | #Max | QPSK  | 22.27 | 24.71 | PASS |
| LTE Band7 | 15 | 21100 | 75 | #0   | QPSK  | 22.24 | 24.68 | PASS |
| LTE Band7 | 15 | 21100 | 1  | #0   | QAM16 | 22.74 | 25.18 | PASS |
| LTE Band7 | 15 | 21100 | 1  | #Mid | QAM16 | 22.58 | 25.02 | PASS |
| LTE Band7 | 15 | 21100 | 1  | #Max | QAM16 | 22.58 | 25.02 | PASS |
| LTE Band7 | 15 | 21100 | 36 | #0   | QAM16 | 21.09 | 23.53 | PASS |
| LTE Band7 | 15 | 21100 | 36 | #Mid | QAM16 | 21.08 | 23.52 | PASS |
| LTE Band7 | 15 | 21100 | 36 | #Max | QAM16 | 21.22 | 23.66 | PASS |
| LTE Band7 | 15 | 21100 | 75 | #0   | QAM16 | 21.20 | 23.64 | PASS |
| LTE Band7 | 15 | 21375 | 1  | #0   | QPSK  | 22.98 | 25.42 | PASS |
| LTE Band7 | 15 | 21375 | 1  | #Mid | QPSK  | 22.91 | 25.35 | PASS |
| LTE Band7 | 15 | 21375 | 1  | #Max | QPSK  | 22.95 | 25.39 | PASS |
| LTE Band7 | 15 | 21375 | 36 | #0   | QPSK  | 22.12 | 24.56 | PASS |
| LTE Band7 | 15 | 21375 | 36 | #Mid | QPSK  | 22.14 | 24.58 | PASS |
| LTE Band7 | 15 | 21375 | 36 | #Max | QPSK  | 22.03 | 24.47 | PASS |
| LTE Band7 | 15 | 21375 | 75 | #0   | QPSK  | 22.02 | 24.46 | PASS |
| LTE Band7 | 15 | 21375 | 1  | #0   | QAM16 | 21.84 | 24.28 | PASS |
| LTE Band7 | 15 | 21375 | 1  | #Mid | QAM16 | 21.85 | 24.29 | PASS |
| LTE Band7 | 15 | 21375 | 1  | #Max | QAM16 | 21.67 | 24.11 | PASS |
| LTE Band7 | 15 | 21375 | 36 | #0   | QAM16 | 20.80 | 23.24 | PASS |
| LTE Band7 | 15 | 21375 | 36 | #Mid | QAM16 | 20.83 | 23.27 | PASS |
| LTE Band7 | 15 | 21375 | 36 | #Max | QAM16 | 20.85 | 23.29 | PASS |
| LTE Band7 | 15 | 21375 | 75 | #0   | QAM16 | 20.92 | 23.36 | PASS |



|           |    |       |     |      |       |       |       |      |
|-----------|----|-------|-----|------|-------|-------|-------|------|
| LTE Band7 | 20 | 20850 | 1   | #0   | QPSK  | 23.16 | 25.60 | PASS |
| LTE Band7 | 20 | 20850 | 1   | #Mid | QPSK  | 23.15 | 25.59 | PASS |
| LTE Band7 | 20 | 20850 | 1   | #Max | QPSK  | 22.93 | 25.37 | PASS |
| LTE Band7 | 20 | 20850 | 50  | #0   | QPSK  | 22.18 | 24.62 | PASS |
| LTE Band7 | 20 | 20850 | 50  | #Mid | QPSK  | 22.17 | 24.61 | PASS |
| LTE Band7 | 20 | 20850 | 50  | #Max | QPSK  | 22.13 | 24.57 | PASS |
| LTE Band7 | 20 | 20850 | 100 | #0   | QPSK  | 22.11 | 24.55 | PASS |
| LTE Band7 | 20 | 20850 | 1   | #0   | QAM16 | 22.28 | 24.72 | PASS |
| LTE Band7 | 20 | 20850 | 1   | #Mid | QAM16 | 22.47 | 24.91 | PASS |
| LTE Band7 | 20 | 20850 | 1   | #Max | QAM16 | 22.12 | 24.56 | PASS |
| LTE Band7 | 20 | 20850 | 50  | #0   | QAM16 | 21.31 | 23.75 | PASS |
| LTE Band7 | 20 | 20850 | 50  | #Mid | QAM16 | 21.31 | 23.75 | PASS |
| LTE Band7 | 20 | 20850 | 50  | #Max | QAM16 | 21.18 | 23.62 | PASS |
| LTE Band7 | 20 | 20850 | 100 | #0   | QAM16 | 21.15 | 23.59 | PASS |
| LTE Band7 | 20 | 21100 | 1   | #0   | QPSK  | 22.99 | 25.43 | PASS |
| LTE Band7 | 20 | 21100 | 1   | #Mid | QPSK  | 23.44 | 25.88 | PASS |
| LTE Band7 | 20 | 21100 | 1   | #Max | QPSK  | 23.23 | 25.67 | PASS |
| LTE Band7 | 20 | 21100 | 50  | #0   | QPSK  | 22.04 | 24.48 | PASS |
| LTE Band7 | 20 | 21100 | 50  | #Mid | QPSK  | 22.05 | 24.49 | PASS |
| LTE Band7 | 20 | 21100 | 50  | #Max | QPSK  | 22.18 | 24.62 | PASS |
| LTE Band7 | 20 | 21100 | 100 | #0   | QPSK  | 22.15 | 24.59 | PASS |
| LTE Band7 | 20 | 21100 | 1   | #0   | QAM16 | 21.74 | 24.18 | PASS |
| LTE Band7 | 20 | 21100 | 1   | #Mid | QAM16 | 21.68 | 24.12 | PASS |
| LTE Band7 | 20 | 21100 | 1   | #Max | QAM16 | 21.68 | 24.12 | PASS |
| LTE Band7 | 20 | 21100 | 50  | #0   | QAM16 | 20.94 | 23.38 | PASS |
| LTE Band7 | 20 | 21100 | 50  | #Mid | QAM16 | 20.95 | 23.39 | PASS |
| LTE Band7 | 20 | 21100 | 50  | #Max | QAM16 | 21.19 | 23.63 | PASS |
| LTE Band7 | 20 | 21100 | 100 | #0   | QAM16 | 21.22 | 23.66 | PASS |
| LTE Band7 | 20 | 21350 | 1   | #0   | QPSK  | 22.89 | 25.33 | PASS |
| LTE Band7 | 20 | 21350 | 1   | #Mid | QPSK  | 23.07 | 25.51 | PASS |
| LTE Band7 | 20 | 21350 | 1   | #Max | QPSK  | 23.24 | 25.68 | PASS |
| LTE Band7 | 20 | 21350 | 50  | #0   | QPSK  | 22.09 | 24.53 | PASS |
| LTE Band7 | 20 | 21350 | 50  | #Mid | QPSK  | 22.12 | 24.56 | PASS |
| LTE Band7 | 20 | 21350 | 50  | #Max | QPSK  | 22.04 | 24.48 | PASS |
| LTE Band7 | 20 | 21350 | 100 | #0   | QPSK  | 22.04 | 24.48 | PASS |
| LTE Band7 | 20 | 21350 | 1   | #0   | QAM16 | 22.21 | 24.65 | PASS |
| LTE Band7 | 20 | 21350 | 1   | #Mid | QAM16 | 22.11 | 24.55 | PASS |
| LTE Band7 | 20 | 21350 | 1   | #Max | QAM16 | 22.39 | 24.83 | PASS |
| LTE Band7 | 20 | 21350 | 50  | #0   | QAM16 | 21.05 | 23.49 | PASS |
| LTE Band7 | 20 | 21350 | 50  | #Mid | QAM16 | 21.09 | 23.53 | PASS |
| LTE Band7 | 20 | 21350 | 50  | #Max | QAM16 | 21.06 | 23.50 | PASS |
| LTE Band7 | 20 | 21350 | 100 | #0   | QAM16 | 21.02 | 23.46 | PASS |

## 5.2 Occupied Bandwidth

### Ambient condition

|             |                   |          |
|-------------|-------------------|----------|
| Temperature | Relative humidity | Pressure |
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

### Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer.

RBW is set to 30 kHz, VBW is set to 91 kHz for LTE Band 4 (1.4MHz).

RBW is set to 62 kHz, VBW is set to 180 kHz for LTE Band 4 (3MHz).

RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4/7 (5MHz).

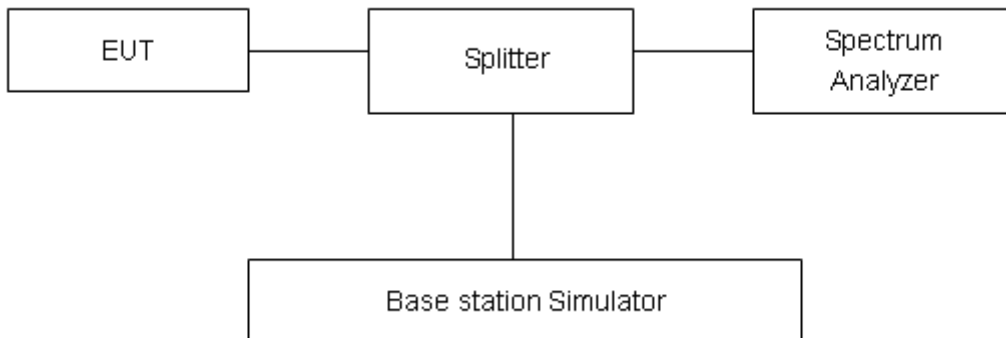
RBW is set to 200 kHz, VBW is set to 620kHz for LTE Band 4/7 (10MHz).

RBW is set to 300 kHz, VBW is set to 910kHz for LTE Band 4/7 (15MHz).

RBW is set to 430 kHz, VBW is set to 1.2MHz for LTE Band 4/7 (20MHz).

99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

### Test Setup



### Limits

No specific occupied bandwidth requirements in part 2.1049.

### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U=624\text{Hz}$ .



## Test Result

| LTE Band 4 |            |                 |         |                 |                          |                       |
|------------|------------|-----------------|---------|-----------------|--------------------------|-----------------------|
| RB         | Modulation | Bandwidth (MHz) | Channel | Frequency (MHz) | 99% Power Bandwidth(MHz) | -26dBc Bandwidth(MHz) |
| 100%       | QPSK       | 1.4             | 19957   | 1710.7          | 1.0971                   | 1.275                 |
|            |            |                 | 20175   | 1732.5          | 1.0913                   | 1.296                 |
|            |            |                 | 20393   | 1754.3          | 1.0949                   | 1.286                 |
|            |            | 3               | 19965   | 1711.5          | 2.7068                   | 2.983                 |
|            |            |                 | 20175   | 1732.5          | 2.7132                   | 2.972                 |
|            |            |                 | 20385   | 1753.5          | 2.6975                   | 2.966                 |
|            |            | 5               | 19975   | 1712.5          | 4.5223                   | 5.001                 |
|            |            |                 | 20175   | 1732.5          | 4.5097                   | 4.976                 |
|            |            |                 | 20375   | 1752.5          | 4.4971                   | 4.930                 |
|            |            | 10              | 20000   | 1715            | 8.9761                   | 9.908                 |
|            |            |                 | 20175   | 1732.5          | 8.9532                   | 9.716                 |
|            |            |                 | 20350   | 1750            | 8.9363                   | 9.787                 |
|            |            | 15              | 20025   | 1717.5          | 13.444                   | 14.63                 |
|            |            |                 | 20175   | 1732.5          | 13.384                   | 14.54                 |
|            |            |                 | 20325   | 1747.5          | 13.415                   | 14.56                 |
|            |            | 20              | 20050   | 1720            | 17.866                   | 19.44                 |
|            |            |                 | 20175   | 1732.5          | 17.907                   | 19.23                 |
|            |            |                 | 20300   | 1745            | 17.867                   | 19.51                 |
|            | 16QAM      | 1.4             | 19957   | 1710.7          | 1.0998                   | 1.289                 |
|            |            |                 | 20175   | 1732.5          | 1.1018                   | 1.293                 |
|            |            |                 | 20393   | 1754.3          | 1.0961                   | 1.278                 |
|            |            | 3               | 19965   | 1711.5          | 2.6908                   | 3.013                 |
|            |            |                 | 20175   | 1732.5          | 2.7016                   | 2.98                  |
|            |            |                 | 20385   | 1753.5          | 2.7053                   | 3.005                 |
|            |            | 5               | 19975   | 1712.5          | 4.5391                   | 5.025                 |
|            |            |                 | 20175   | 1732.5          | 4.5229                   | 4.992                 |
|            |            |                 | 20375   | 1752.5          | 4.5034                   | 5.066                 |
| 10         |            | 20000           | 1715    | 8.9448          | 9.745                    |                       |
|            |            | 20175           | 1732.5  | 8.9739          | 9.778                    |                       |
|            |            | 20350           | 1750    | 8.9784          | 9.707                    |                       |
| 15         |            | 20025           | 1717.5  | 13.451          | 14.66                    |                       |
|            |            | 20175           | 1732.5  | 13.417          | 14.54                    |                       |
|            |            | 20325           | 1747.5  | 13.454          | 14.65                    |                       |
| 20         |            | 20050           | 1720    | 17.891          | 19.33                    |                       |
|            |            | 20175           | 1732.5  | 17.883          | 19.41                    |                       |
|            |            | 20300           | 1745    | 17.866          | 19.32                    |                       |

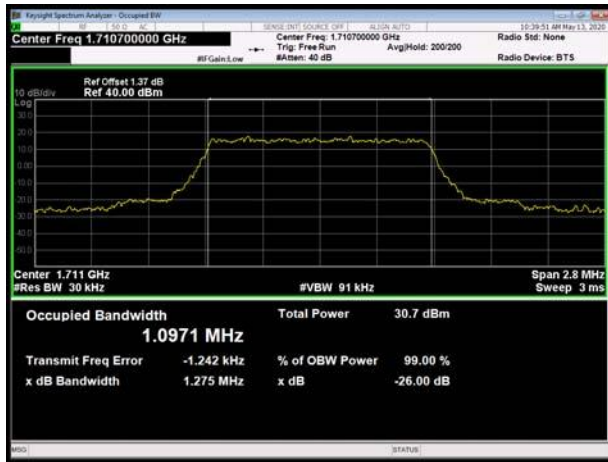


| LTE Band 7 |            |                 |         |                 |                          |                       |
|------------|------------|-----------------|---------|-----------------|--------------------------|-----------------------|
| RB         | Modulation | Bandwidth (MHz) | Channel | Frequency (MHz) | 99% Power Bandwidth(MHz) | -26dBc Bandwidth(MHz) |
| 100%       | QPSK       | 5               | 20775   | 2502.5          | 4.516                    | 4.992                 |
|            |            |                 | 21100   | 2535            | 4.513                    | 4.946                 |
|            |            |                 | 21425   | 2567.5          | 4.504                    | 4.936                 |
|            |            | 10              | 20800   | 2505            | 8.979                    | 9.836                 |
|            |            |                 | 21100   | 2535            | 8.963                    | 9.884                 |
|            |            |                 | 21400   | 2565            | 8.972                    | 9.801                 |
|            |            | 15              | 20825   | 2507.5          | 13.432                   | 14.730                |
|            |            |                 | 21100   | 2535            | 13.419                   | 14.580                |
|            |            |                 | 21375   | 2562.5          | 13.441                   | 14.600                |
|            |            | 20              | 20850   | 2510            | 17.928                   | 19.210                |
|            |            |                 | 21100   | 2535            | 17.908                   | 19.360                |
|            |            |                 | 21350   | 2560            | 17.886                   | 19.490                |
|            | 16QAM      | 5               | 20775   | 2502.5          | 4.508                    | 4.961                 |
|            |            |                 | 21100   | 2535            | 4.538                    | 5.011                 |
|            |            |                 | 21425   | 2567.5          | 4.514                    | 4.948                 |
|            |            | 10              | 20800   | 2505            | 8.966                    | 9.720                 |
|            |            |                 | 21100   | 2535            | 8.974                    | 9.648                 |
|            |            |                 | 21400   | 2565            | 8.981                    | 9.863                 |
|            |            | 15              | 20825   | 2507.5          | 13.423                   | 14.580                |
|            |            |                 | 21100   | 2535            | 13.396                   | 14.610                |
|            |            |                 | 21375   | 2562.5          | 13.404                   | 14.490                |
|            |            | 20              | 20850   | 2510            | 17.900                   | 19.300                |
|            |            |                 | 21100   | 2535            | 17.883                   | 19.380                |
|            |            |                 | 21350   | 2560            | 17.881                   | 19.330                |





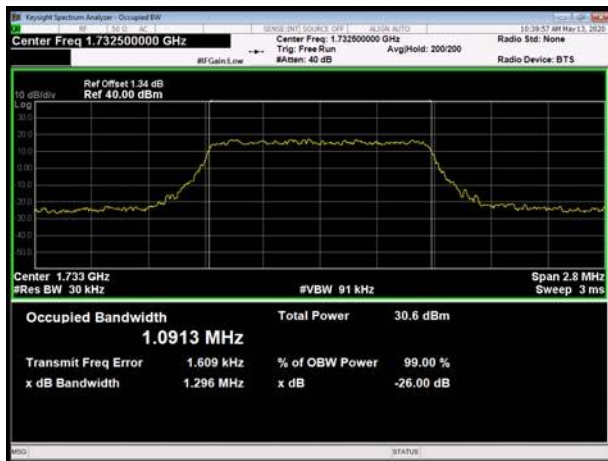
### LTE Band 4 QPSK 1.4MHz CH-Low



### LTE Band 4 QPSK 3MHz CH-Low



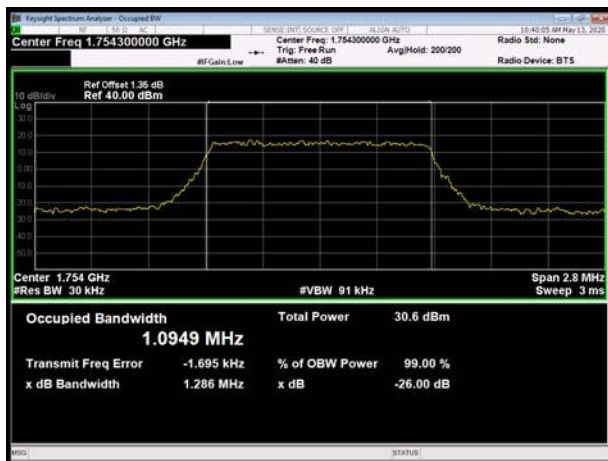
### LTE Band 4 QPSK 1.4MHz CH-Middle



### LTE Band 4 QPSK 3MHz CH-Middle



### LTE Band 4 QPSK 1.4MHz CH-High



### LTE Band 4 QPSK 3MHz CH-High

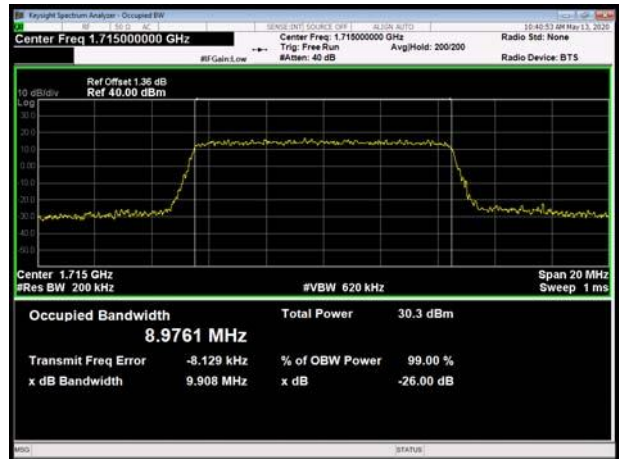




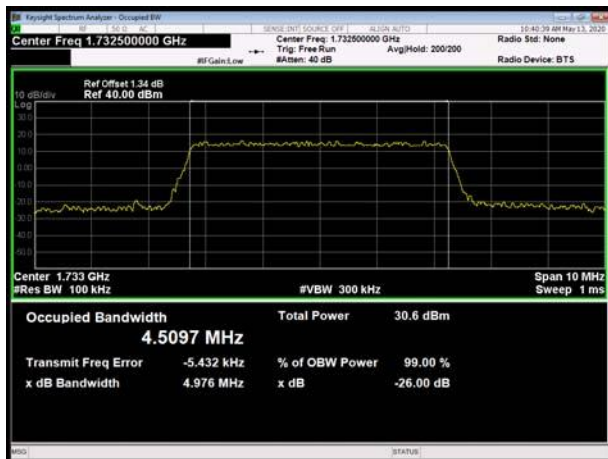
### LTE Band 4 QPSK 5MHz CH-Low



### LTE Band 4 QPSK 10MHz CH-Low



### LTE Band 4 QPSK 5MHz CH-Middle



### LTE Band 4 QPSK 10MHz CH-Middle



### LTE Band 4 QPSK 5MHz CH-High

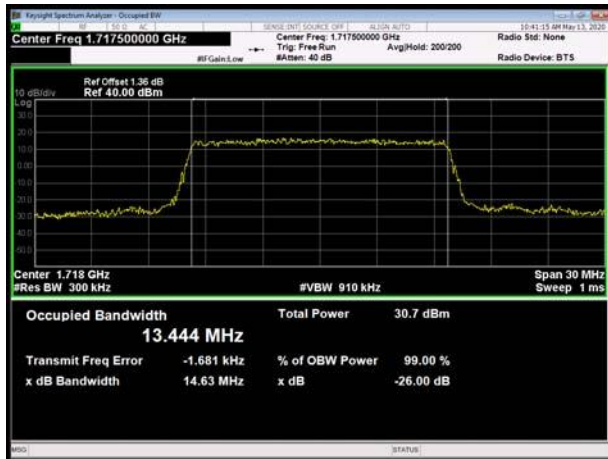


### LTE Band 4 QPSK 10MHz CH-High





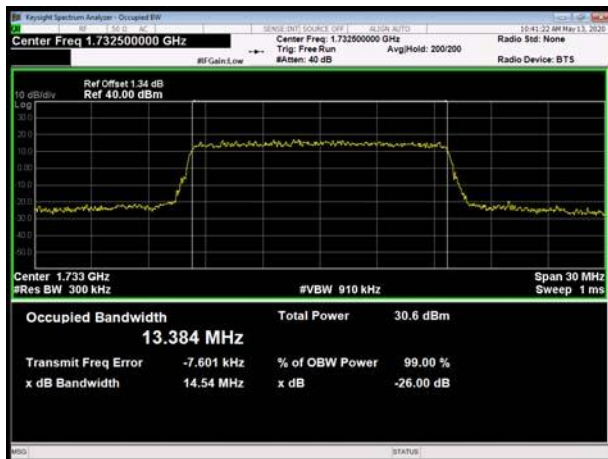
### LTE Band 4 QPSK 15MHz CH-Low



### LTE Band 4 QPSK 20MHz CH-Low



### LTE Band 4 QPSK 15MHz CH-Middle



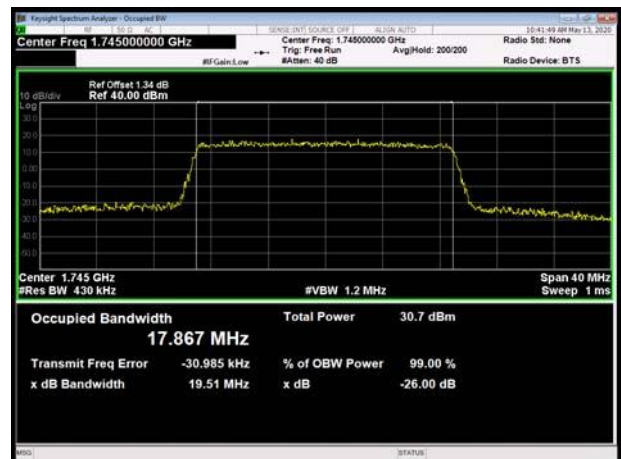
### LTE Band 4 QPSK 20MHz CH-Middle



### LTE Band 4 QPSK 15MHz CH-High



### LTE Band 4 QPSK 20MHz CH-High





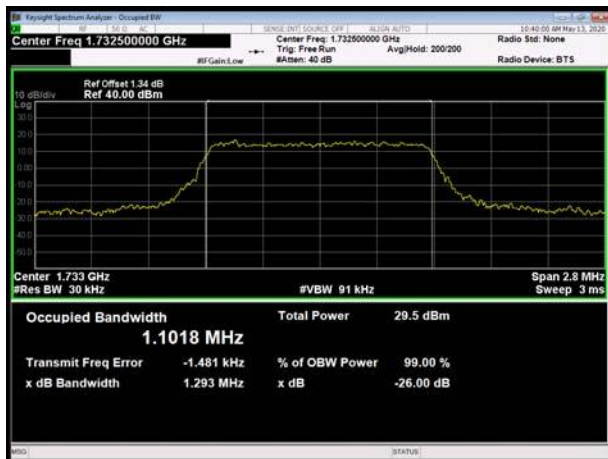
### LTE Band 4 16QAM 1.4MHz CH-Low



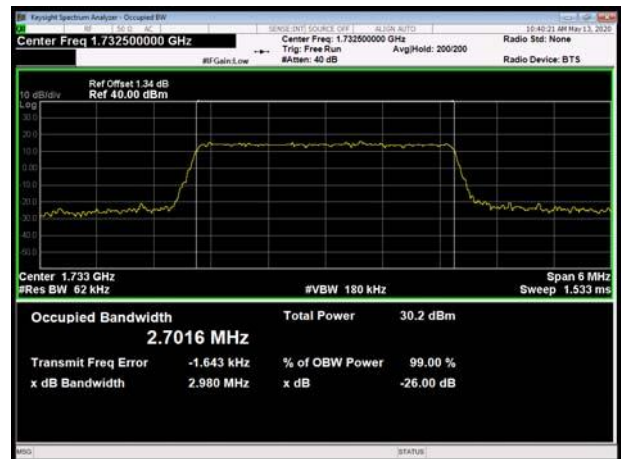
### LTE Band 4 16QAM 3MHz CH-Low



### LTE Band 4 16QAM 1.4MHz CH-Middle



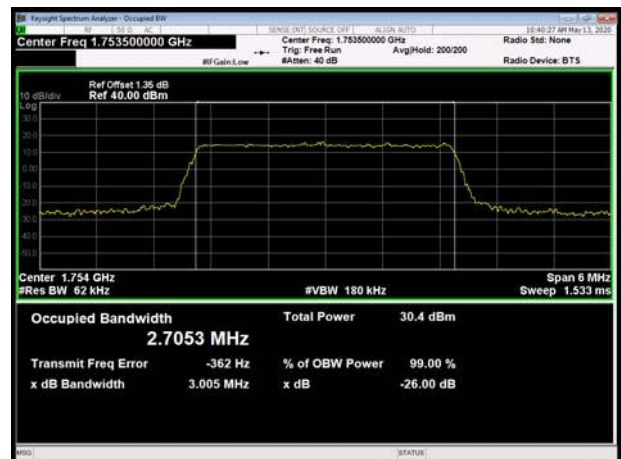
### LTE Band 4 16QAM 3MHz CH-Middle



### LTE Band 4 16QAM 1.4MHz CH-High



### LTE Band 4 16QAM 3MHz CH-High





### LTE Band 4 16QAM 5MHz CH-Low



### LTE Band 4 16QAM 10MHz CH-Low



### LTE Band 4 16QAM 5MHz CH-Middle



### LTE Band 4 16QAM 10MHz CH-Middle



### LTE Band 4 16QAM 5MHz CH-High



### LTE Band 4 16QAM 10MHz CH-High

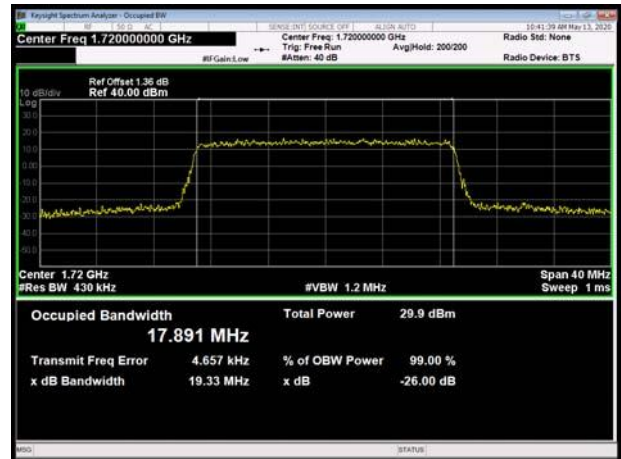




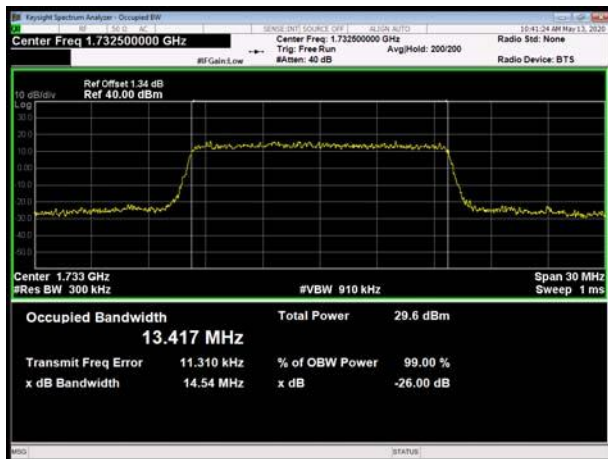
### LTE Band 4 16QAM 15MHz CH-Low



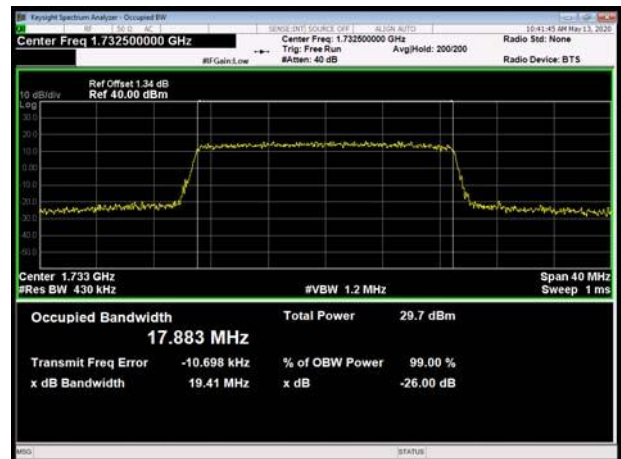
### LTE Band 4 16QAM 20MHz CH-Low



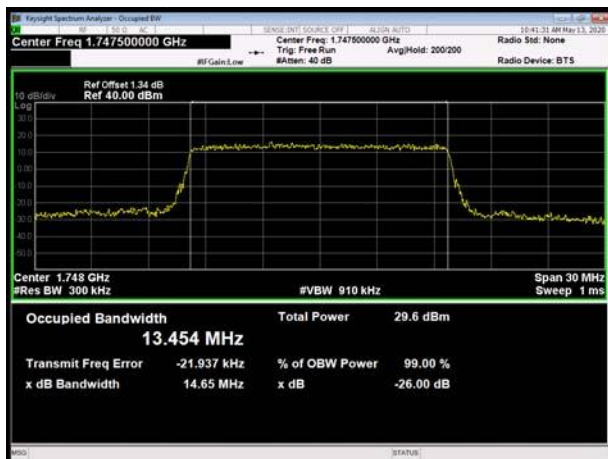
### LTE Band 4 16QAM 15MHz CH-Middle



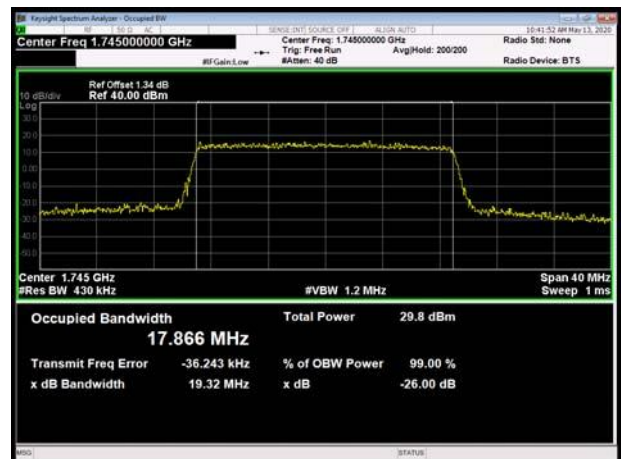
### LTE Band 4 16QAM 20MHz CH-Middle



### LTE Band 4 16QAM 15MHz CH-High

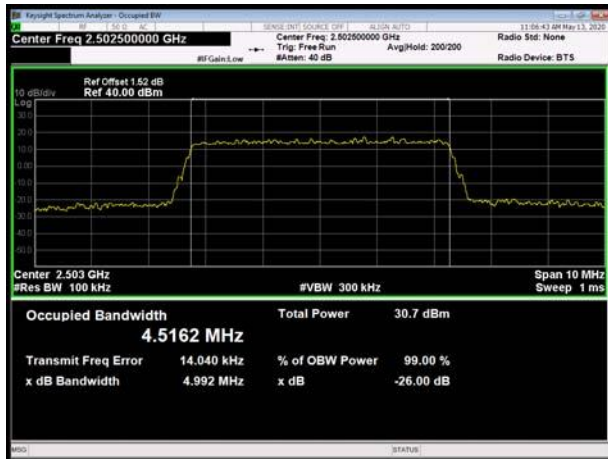


### LTE Band 4 16QAM 20MHz CH-High

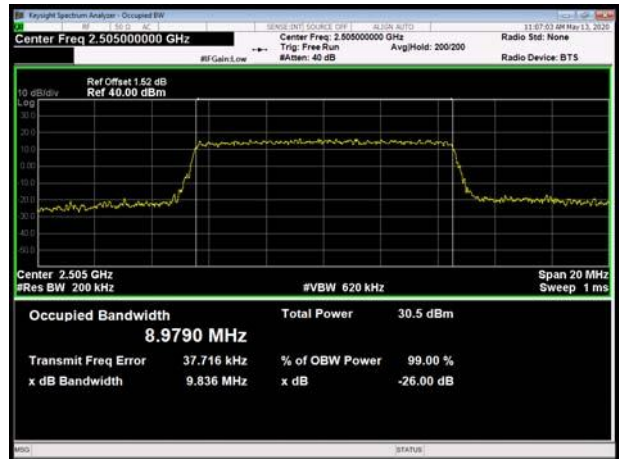




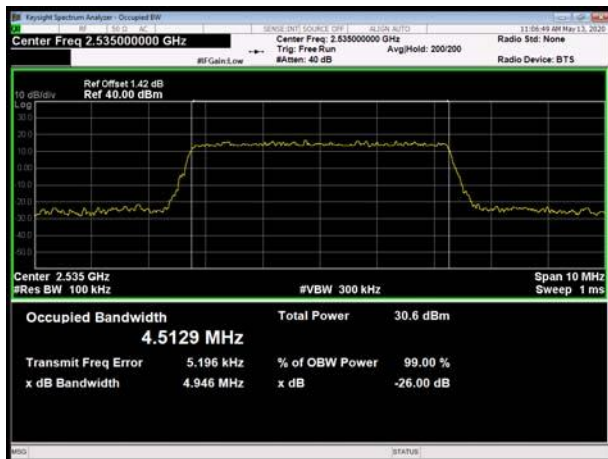
### LTE Band 7 QPSK 5MHz CH-Low



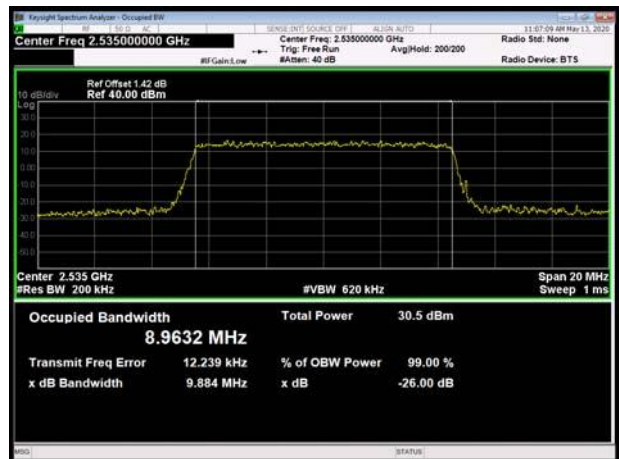
### LTE Band 7 QPSK 10MHz CH-Low



### LTE Band 7 QPSK 5MHz CH-Middle



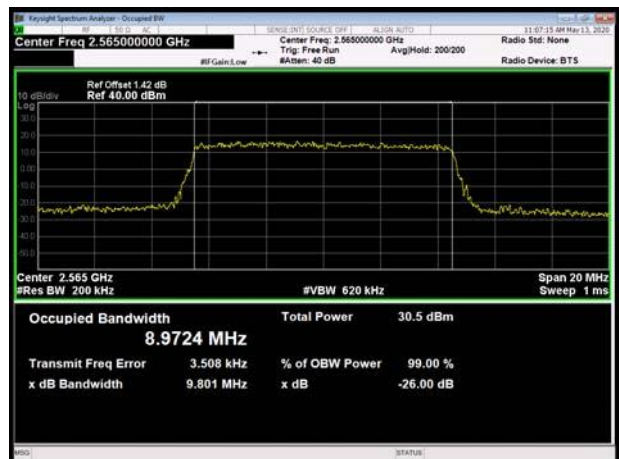
### LTE Band 7 QPSK 10MHz CH-Middle



### LTE Band 7 QPSK 5MHz CH-High

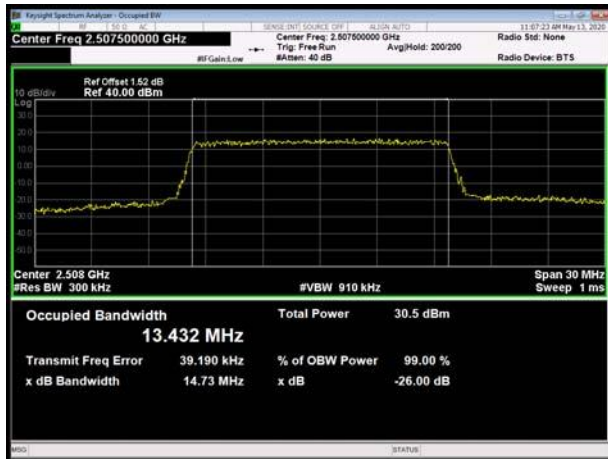


### LTE Band 7 QPSK 10MHz CH-High

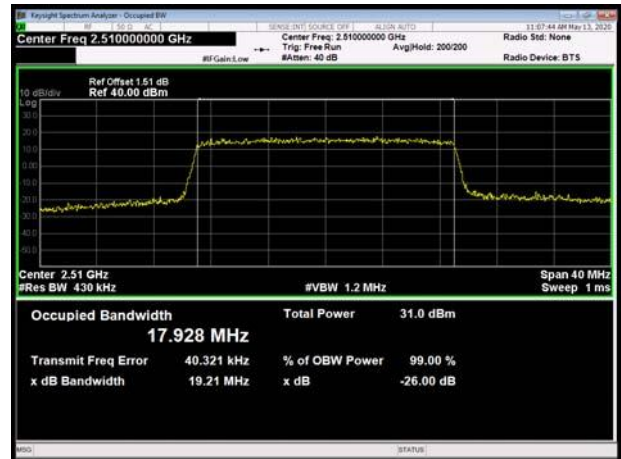




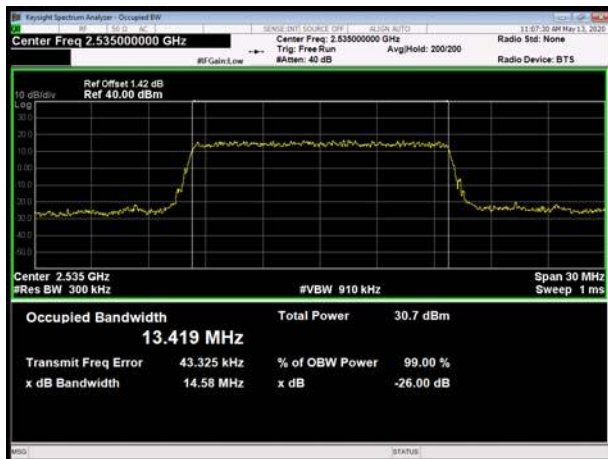
### LTE Band 7 QPSK 15MHz CH-Low



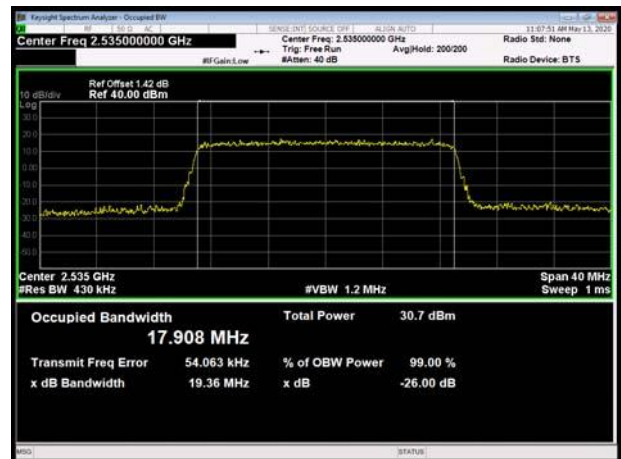
### LTE Band 7 QPSK 20MHz CH-Low



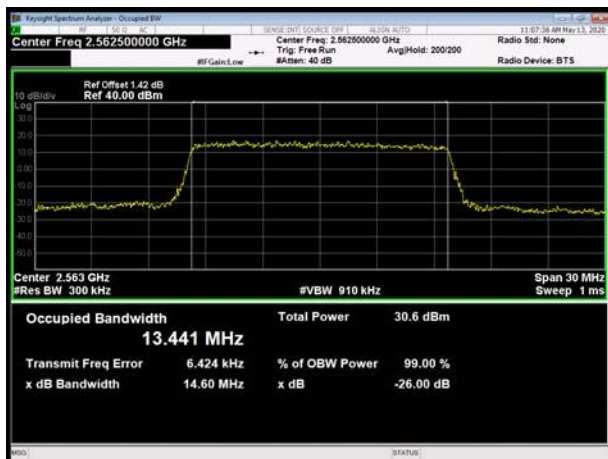
### LTE Band 7 QPSK 15MHz CH-Middle



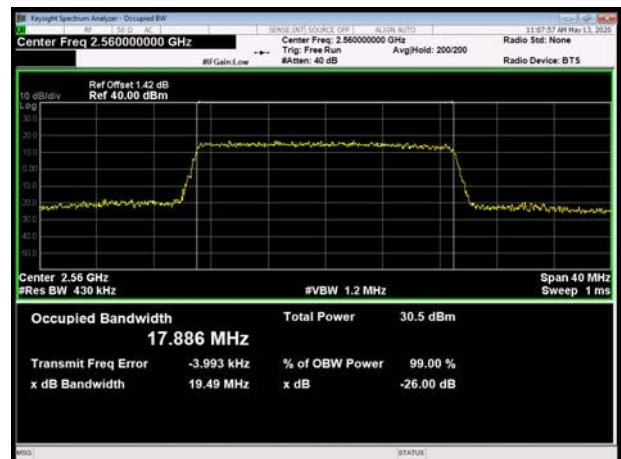
### LTE Band 7 QPSK 20MHz CH-Middle



### LTE Band 7 QPSK 15MHz CH-High



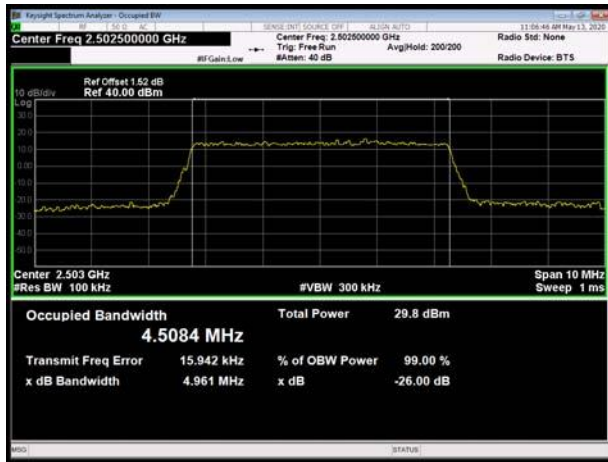
### LTE Band 7 QPSK 20MHz CH-High



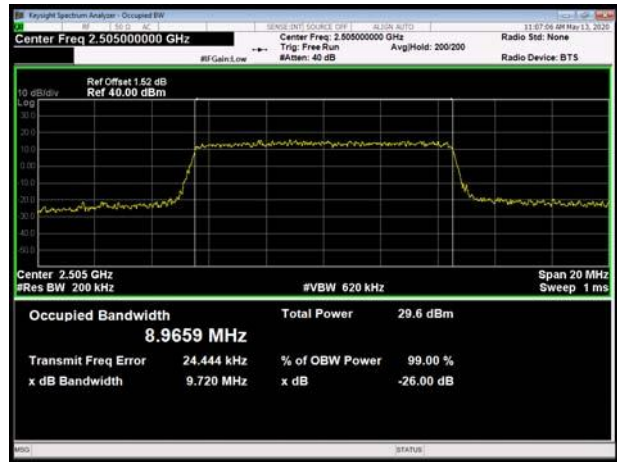




### LTE Band 7 16QAM 5MHz CH-Low



### LTE Band 7 16QAM 10MHz CH-Low



### LTE Band 7 16QAM 5MHz CH-Middle



### LTE Band 7 16QAM 10MHz CH-Middle



### LTE Band 7 16QAM 5MHz CH-High



### LTE Band 7 16QAM 10MHz CH-High

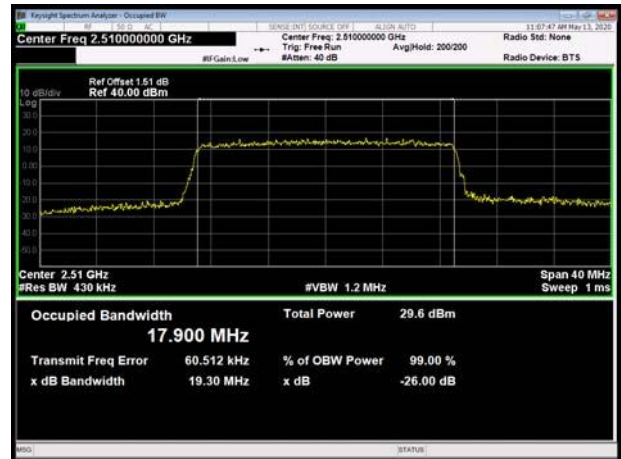




### LTE Band 7 16QAM 15MHz CH-Low



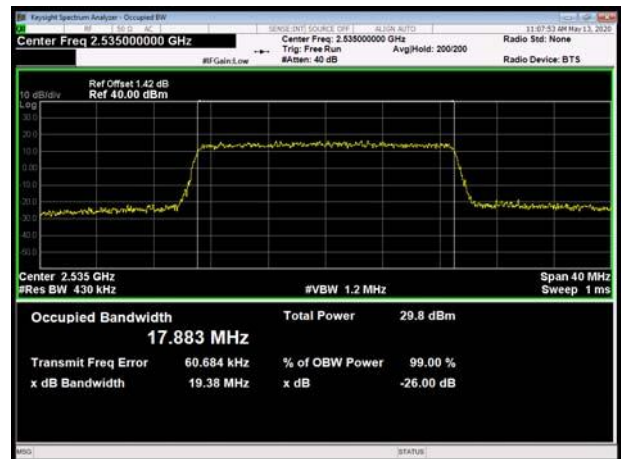
### LTE Band 7 16QAM 20MHz CH-Low



### LTE Band 7 16QAM 15MHz CH-Middle



### LTE Band 7 16QAM 20MHz CH-Middle



### LTE Band 7 16QAM 15MHz CH-High



### LTE Band 7 16QAM 20MHz CH-High



### 5.3 Band Edge Compliance

#### Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

#### Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The band edge of the lowest and highest channels were measured.

The testing follows KDB 971168 D01 v03r01 Section 6.0

The EUT was connected to spectrum analyzer and system simulator via a power divider.

The band edges of low and high channels for the highest RF powers were measured.

RBW is set to 15 kHz, VBW is set to 43 kHz for LTE Band 4 (1.4MHz).

RBW is set to 30 kHz, VBW is set to 91 kHz for LTE Band 4 (3MHz).

RBW is set to 51 kHz, VBW is set to 150 kHz for LTE Band 4 (5MHz).

RBW is set to 50 kHz, VBW is set to 200 kHz for LTE Band 7 (5MHz).

RBW is set to 100 kHz, VBW is set to 300kHz for LTE Band 4/7 (10MHz).

RBW is set to 150 kHz, VBW is set to 470 kHz for LTE Band 4 (15MHz).

RBW is set to 200 kHz, VBW is set to 620 kHz for LTE Band 4 (20MHz).

RBW is set to 200 kHz, VBW is set to 1 MHz for LTE Band 7 (15MHz/20MHz).

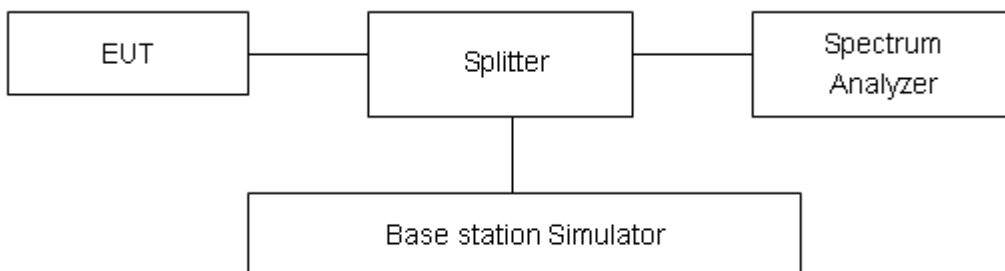
on spectrum analyzer.

Set spectrum analyzer with RMS detector.

The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

Checked that all the results comply with the emission limit line.

#### Test Setup



#### Limits

Rule Part 27.53(h) specifies that “ for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10} (P)$  dB”



Rule Part 27.53(m) (4) specifies that “for BRS and EBS stations. For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log (P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log (P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log (P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(4) of this section. In addition, the attenuation factor shall not be less than  $43 + 10 \log (P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log (P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Example:

The limit line is derived from  $43 + 10 \log (P)$  dB below the transmitter power P(Watts)

$$= P(W) - [43 + 10 \log(P)] \text{ (dB)}$$

$$= [30 + 10 \log (P)] \text{ (dBm)} - [43 + 10 \log(P)] \text{ (dB)} = -13 \text{ dBm.}$$

### Measurement Uncertainty

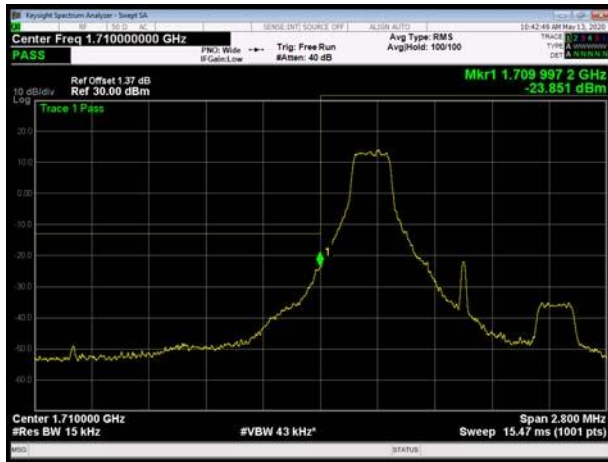
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ ,  $U=0.684$ dB.



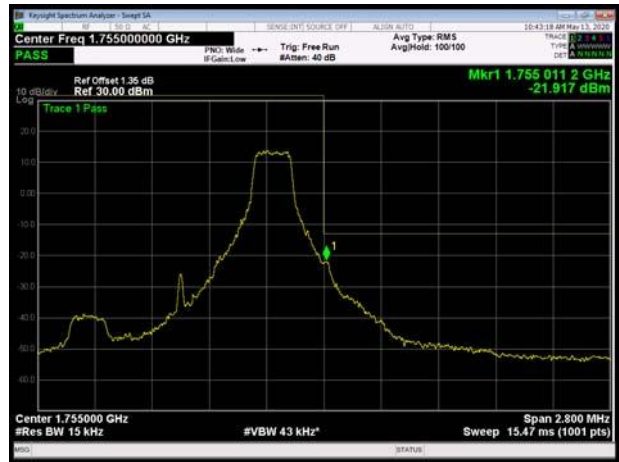
### Test Result

All the test traces in the plots shows the test results clearly.

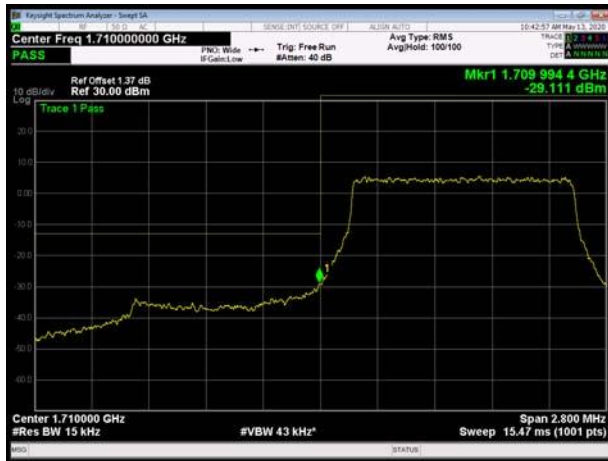
LTE Band 4 QPSK 1.4MHz CH-Low, 1 RB



LTE Band 4 QPSK 1.4MHz CH-High, 1 RB



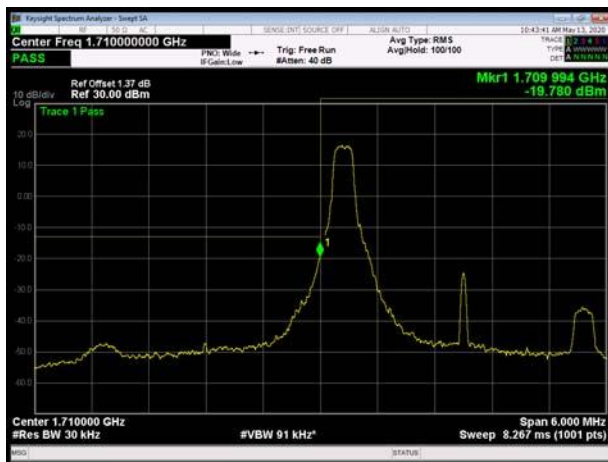
LTE Band 4 QPSK 1.4MHz CH-Low, 100%RB



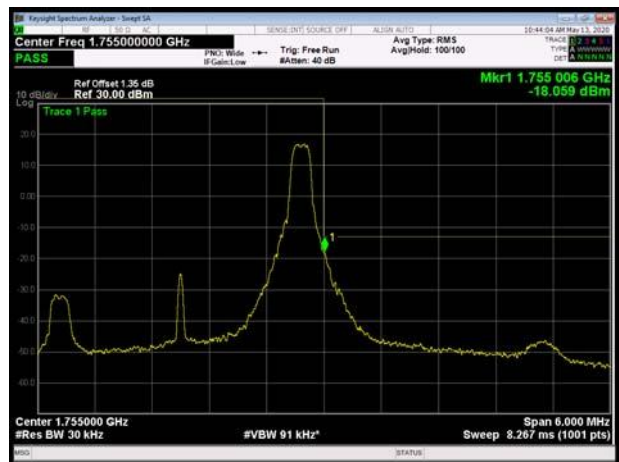
LTE Band 4 QPSK 1.4MHz CH-High, 100%RB



LTE Band 4 QPSK 3MHz CH-Low, 1 RB



LTE Band 4 QPSK 3MHz CH-High, 1 RB

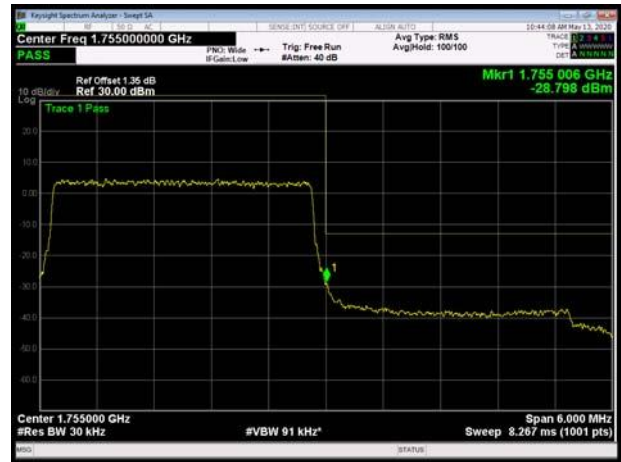




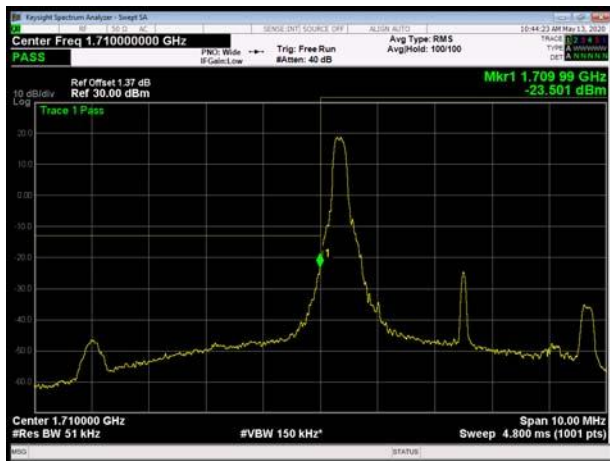
LTE Band 4 QPSK 3MHz CH-Low, 100%RB



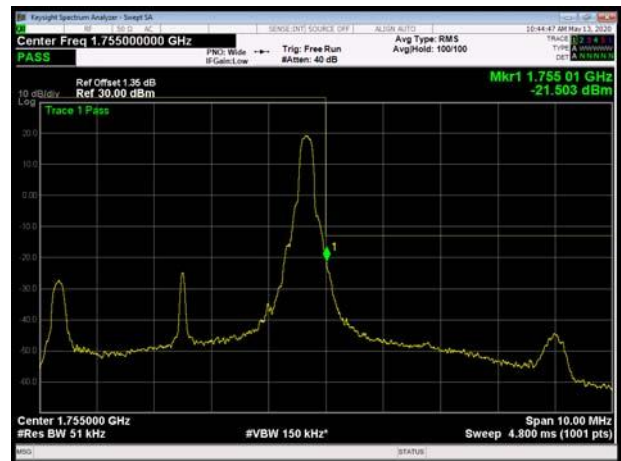
LTE Band 4 QPSK 3MHz CH-High, 100%RB



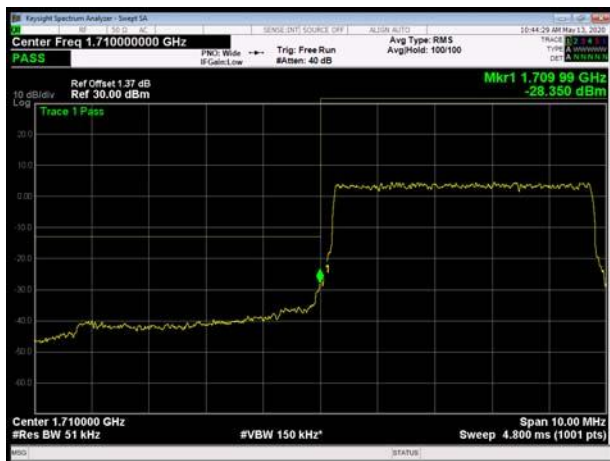
LTE Band 4 QPSK 5MHz CH-Low, 1 RB



LTE Band 4 QPSK 5MHz CH-High, 1 RB



LTE Band 4 QPSK 5MHz CH-Low, 100%RB

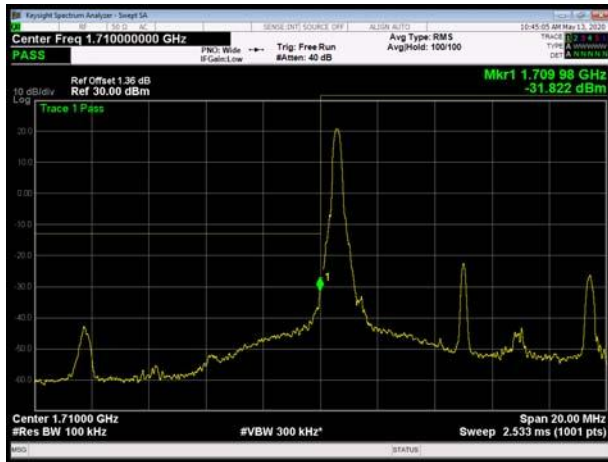


LTE Band 4 QPSK 5MHz CH-High, 100%RB

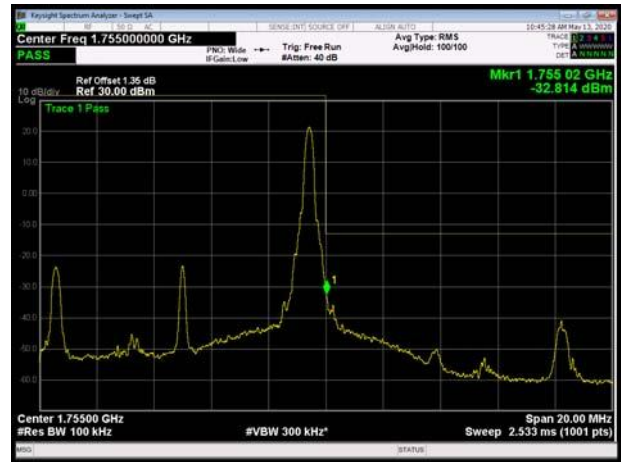




LTE Band 4 QPSK 10MHz CH-Low, 1 RB



LTE Band 4 QPSK 10MHz CH-High, 1 RB



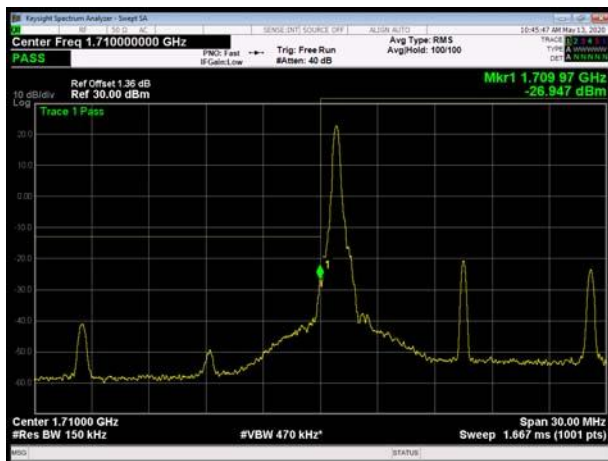
LTE Band 4 QPSK 10MHz CH-Low, 100%RB



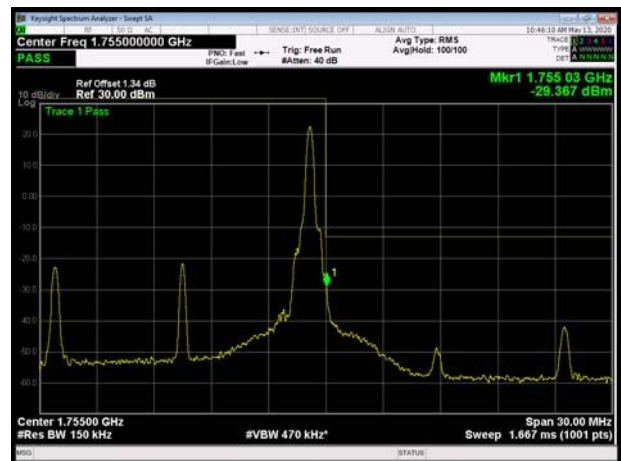
LTE Band 4 QPSK 10MHz CH-High, 100%RB



LTE Band 4 QPSK 15MHz CH-Low, 1 RB



LTE Band 4 QPSK 15MHz CH-High, 1 RB





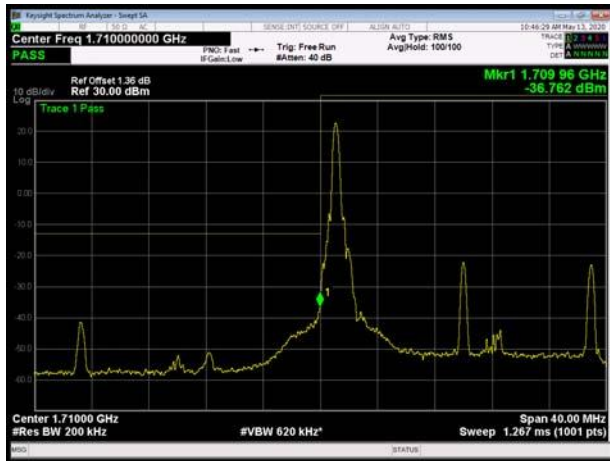
LTE Band 4 QPSK 15MHz CH-Low, 100%RB



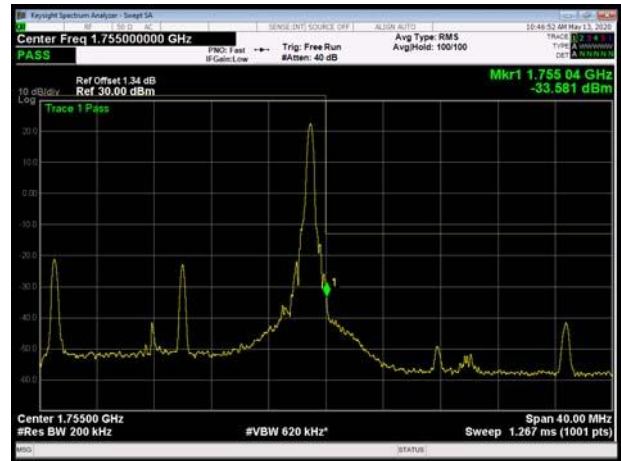
LTE Band 4 QPSK 15MHz CH-High, 100%RB



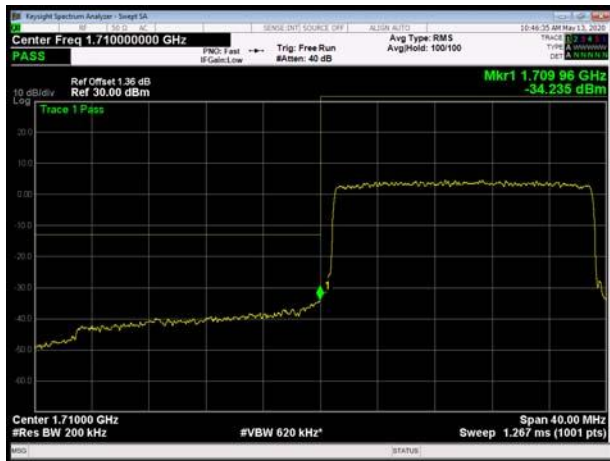
LTE Band 4 QPSK 20MHz CH-Low, 1 RB



LTE Band 4 QPSK 20MHz CH-High, 1 RB



LTE Band 4 QPSK 20MHz CH-Low, 100%RB



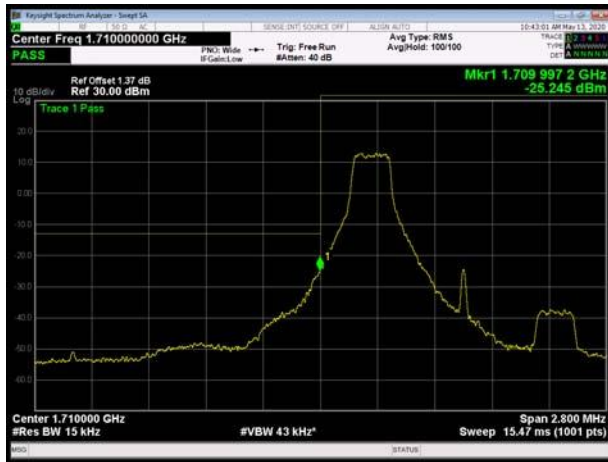
LTE Band 4 QPSK 20MHz CH-High, 100%RB



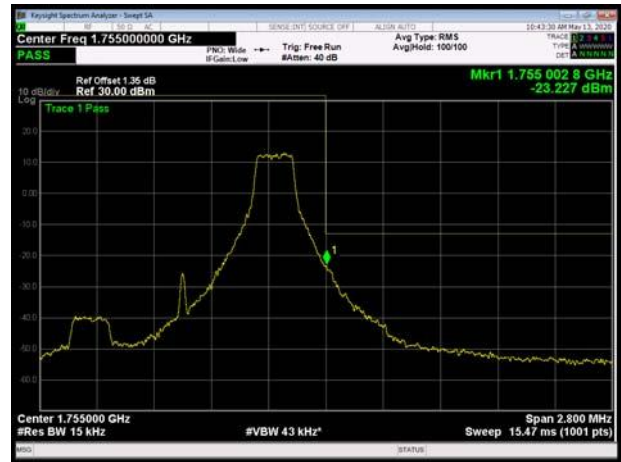




LTE Band 4 16QAM 1.4MHz CH-Low, 1 RB



LTE Band 4 16QAM 1.4MHz CH-High, 1 RB



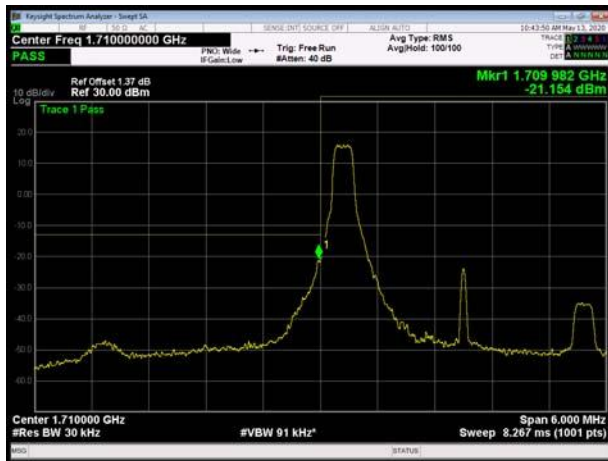
LTE Band 4 16QAM 1.4MHz CH-Low, 100%RB



LTE Band 4 16QAM 1.4MHz CH-High, 100%RB



LTE Band 4 16QAM 3MHz CH-Low, 1 RB



LTE Band 4 16QAM 3MHz CH-High, 1 RB

