

# FCC Radio Test Report

## FCC ID: XMR2019SC650TNA

This report concerns: Original Grant

**Project No.** : 2001H013  
**Equipment** : Smart Module  
**Brand Name** : QUECTEL  
**Test Model** : SC650T-NA  
**Series Model** : N/A  
**Applicant** : Quectel Wireless Solutions Co., Ltd.  
**Address** : Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233.  
**Manufacturer** : Quectel Wireless Solutions Co., Ltd.  
**Address** : Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233.  
**Date of Receipt** : Jan. 15, 2020  
**Date of Test** : Jan. 15, 2020~Feb. 27, 2020  
**Issued Date** : Mar. 19, 2020  
**Report Version** : R01  
**Test Sample** : Engineering Sample No.: SH2020011452  
**Standard(s)** : 47 CFR FCC Part 24 Subpart E  
47 CFR FCC Part 2  
ANSI/TIA/EIA-603-E-2016  
FCC KDB 971168 D01 Power Meas License Digital Systems v03r01

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

*Iscaa Min*

Prepared by : Iscaa Min

*Krain Wu*

Approved by : Krain Wu



Certificate # 5123. 03

Add: No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area, Shanghai 201210, China  
TEL: +86-021-61765666  
Web: [www.newbtl.com](http://www.newbtl.com)

**Declaration**

**BTL** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

**BTL's** reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

The report must not be used by the client to claim product certification, approval, or endorsement by NIST, A2LA, or any agency of the U.S. Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

**BTL's** laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

**BTL** is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

**Limitation**

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and is not use in determining the Pass/Fail results.

| <b>Table of Contents</b>                                     | <b>Page</b> |
|--------------------------------------------------------------|-------------|
| <b>REPORT ISSUED HISTORY</b>                                 | <b>5</b>    |
| <b>1 . SUMMARY OF TEST RESULTS</b>                           | <b>6</b>    |
| 1.1 TEST FACILITY                                            | 7           |
| 1.2 MEASUREMENT UNCERTAINTY                                  | 7           |
| 1.3 TEST ENVIRONMENT CONDITIONS                              | 7           |
| <b>2 . GENERAL INFORMATION</b>                               | <b>8</b>    |
| 2.1 GENERAL DESCRIPTION OF EUT                               | 8           |
| 2.2 DESCRIPTION OF TEST MODES AND TEST CONDITION             | 10          |
| 2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED | 14          |
| 3.4 DESCRIPTION OF SUPPORT UNITS                             | 14          |
| <b>3 . TEST RESULT</b>                                       | <b>15</b>   |
| 3.1 OUTPUT POWER MEASUREMENT                                 | 15          |
| 3.1.1 LIMIT                                                  | 15          |
| 3.1.2 TEST PROCEDURE                                         | 15          |
| 3.1.3 TEST SETUP LAYOUT                                      | 15          |
| 3.1.4 TEST DEVIATION                                         | 15          |
| 3.1.5 TEST RESULTS                                           | 15          |
| 3.2 OCCUPIED BANDWIDTH MEASUREMENT                           | 16          |
| 3.2.1 TEST PROCEDURE                                         | 16          |
| 3.2.2 TEST SETUP LAYOUT                                      | 16          |
| 3.2.3 TEST DEVIATION                                         | 16          |
| 3.2.4 TEST RESULTS                                           | 16          |
| 3.3 CONDUCTED EMISSIONS MEASUREMENT                          | 17          |
| 3.3.1 LIMIT                                                  | 17          |
| 3.3.2 TEST PROCEDURES                                        | 17          |
| 3.3.3 TEST SETUP LAYOUT                                      | 17          |
| 3.3.4 TEST DEVIATION                                         | 17          |
| 3.3.5 TEST RESULTS                                           | 17          |
| 3.4 RADIATED EMISSIONS MEASUREMENT                           | 18          |
| 3.4.1 LIMIT                                                  | 18          |
| 3.4.2 TEST PROCEDURES                                        | 18          |
| 3.4.3 TEST SETUP LAYOUT                                      | 19          |
| 3.4.4 TEST DEVIATION                                         | 20          |
| 3.4.5 TEST RESULTS (30MHZ TO 1000MHZ)                        | 20          |
| 3.4.6 TEST RESULTS (ABOVE 1000MHZ)                           | 20          |
| 3.5 BAND EDGE MEASUREMENT                                    | 21          |
| 3.5.1 LIMIT                                                  | 21          |

| <b>Table of Contents</b>                       | <b>Page</b> |
|------------------------------------------------|-------------|
| 3.5.2 TEST PROCEDURES                          | 21          |
| 3.5.3 TEST SETUP LAYOUT                        | 21          |
| 3.5.4 TEST DEVIATION                           | 21          |
| 3.5.5 TEST RESULTS                             | 21          |
| 3.6 PEAK TO AVERAGE RATIO MEASUREMENT          | 22          |
| 3.6.1 LIMIT                                    | 22          |
| 3.6.2 TEST PROCEDURES                          | 22          |
| 3.6.3 TEST SETUP LAYOUT                        | 22          |
| 3.6.4 TEST DEVIATION                           | 22          |
| 3.6.5 TEST RESULTS                             | 22          |
| 3.7 FREQUENCY STABILITY MEASUREMENT            | 23          |
| 3.7.1 LIMIT                                    | 23          |
| 3.7.2 TEST PROCEDURES                          | 23          |
| 3.7.3 TEST SETUP LAYOUT                        | 23          |
| 3.7.4 TEST DEVIATION                           | 23          |
| 3.7.5 TEST RESULTS                             | 23          |
| 4. LIST OF MEASUREMENT EQUIPMENTS              | 24          |
| APPENDIX A - OUTPUT POWER                      | 26          |
| APPENDIX B - OCCUPIED BANDWIDTH                | 39          |
| APPENDIX C - CONDUCTED EMISSIONS               | 64          |
| APPENDIX D - RADIATED EMISSION (30MHZ TO 1GHZ) | 71          |
| APPENDIX E - RADIATED EMISSION (ABOVE 1GHZ)    | 76          |
| APPENDIX F - BAND EDGE                         | 89          |
| APPENDIX G - PEAK TO AVERAGE RATIO             | 102         |
| APPENDIX H - FREQUENCY STABILITY               | 115         |

**REPORT ISSUED HISTORY**

| Report Version | Description                                                | Issued Date   |
|----------------|------------------------------------------------------------|---------------|
| R00            | Original Issue.                                            | Mar. 16, 2020 |
| R01            | Modify the type error of channel and frequency of band 25. | Mar. 19, 2020 |

## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

| FCC Part 24 Subpart E& Part 2 |                                     |          |        |
|-------------------------------|-------------------------------------|----------|--------|
| Standard(s) Section           | Test Item                           | Judgment | Remark |
| 2.1046 & 24.232(c)            | Equivalent Isotropic Radiated Power | PASS     | -----  |
| 2.1049                        | Occupied Bandwidth                  | PASS     | -----  |
| 2.1051 & 24.238(a)            | Conducted Spurious Emissions        | PASS     | -----  |
| 2.1053 & 24.238(a)            | Radiated Spurious Emissions         | PASS     | -----  |
| 24.238(a)                     | Band Edge Measurements              | PASS     | -----  |
| 24.232(d)                     | Peak To Average Ratio               | PASS     | -----  |
| 2.1055 & 24.235               | Frequency Stability                 | PASS     | -----  |

Note:

For the verdict, the “N/A” denotes “not applicable”, the “N/T” denotes “not tested”.

### 1.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area, Shanghai 201210, China.

BTL's Test Firm Registration Number for FCC: 476765

BTL's Designation Number for FCC: CN1241

### 1.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty figures shall be calculated according the methods described in the ETSI TR 100 028 and shall correspond to an expansion factor (coverage factor)  $k=1.96$  or  $k=2$ (which provide confidence levels of respectively 90% and 95.45% in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Measurement Uncertainty for a Level of Confidence of 95 %,  $U=2 \times U_c(y)$ .

The BTL measurement uncertainty as below table:

#### A. Radiated Measurement :

| Test Site | Method | Measurement Frequency Range | Ant. H / V | U,(dB) |
|-----------|--------|-----------------------------|------------|--------|
| SH-CB01   | CISPR  | 9KHz ~ 30MHz                | V          | 3.79   |
|           |        | 9KHz ~ 30MHz                | H          | 3.57   |
|           |        | 30MHz ~ 200MHz              | V          | 4.12   |
|           |        | 30MHz ~ 200MHz              | H          | 3.20   |
|           |        | 200MHz ~ 1,000MHz           | V          | 3.12   |
|           |        | 200MHz ~ 1,000MHz           | H          | 3.18   |

| Test Site | Method | Measurement Frequency Range | U,(dB) |
|-----------|--------|-----------------------------|--------|
| SH-CB01   | CISPR  | 1GHz ~ 6GHz                 | 4.40   |
|           |        | 6GHz ~ 18GHz                | 4.86   |

| Test Site | Method | Measurement Frequency Range | U,(dB) |
|-----------|--------|-----------------------------|--------|
| SH-CB01   | CISPR  | 18 ~ 26.5 GHz               | 3.64   |
|           |        | 26.5 ~ 40 GHz               | 3.78   |

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

### 1.3 TEST ENVIRONMENT CONDITIONS

| Test Item             | Environmental Conditions | Test Voltage       |
|-----------------------|--------------------------|--------------------|
| EIRP                  | 23°C, 59%RH              | DC 3.8V            |
| Output Power          | 23°C, 59%RH              | DC 3.8V            |
| Occupied Bandwidth    | 23°C, 59%RH              | DC 3.8V            |
| Conducted Emission    | 23°C, 59%RH              | DC 3.8V            |
| Radiated Emission     | 18°C, 40%RH              | DC 3.8V            |
| Band Edge             | 23°C, 59%RH              | DC 3.8V            |
| Peak to Average Ratio | 23°C, 59%RH              | DC 3.8V            |
| Frequency Stability   | Normal and Extreme       | Normal and Extreme |

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

|                     |                                         |                                  |
|---------------------|-----------------------------------------|----------------------------------|
| Equipment           | Smart Module                            |                                  |
| Brand Name          | QUECTEL                                 |                                  |
| Test Model          | SC650T-NA                               |                                  |
| Series Model        | N/A                                     |                                  |
| Model Difference(s) | N/A                                     |                                  |
| Software Version    | SC650TNAPAR05A03                        |                                  |
| Hardware Version    | R1.0                                    |                                  |
| Power Source        | DC power supply.                        |                                  |
| Power Rating        | DC 3.8V                                 |                                  |
| IMEI No.1           | 861394040018223                         |                                  |
| IMEI No.2           | 861394040018231                         |                                  |
| Antenna Type        | Internal Antenna                        |                                  |
| Antenna Gain        | LTE Band 2                              | 1.59dBi                          |
|                     | LTE Band 25                             |                                  |
| Modulation Type     | LTE                                     | UL: QPSK,16QAM<br>DL: QPSK,16QAM |
| Operation Frequency | LTE Band 2 (Channel Bandwidth: 1.4MHz)  | 1850.7MHz ~ 1909.3MHz            |
|                     | LTE Band 2 (Channel Bandwidth: 3MHz)    | 1851.5MHz ~ 1908.5MHz            |
|                     | LTE Band 2 (Channel Bandwidth: 5MHz)    | 1852.5MHz ~ 1907.5MHz            |
|                     | LTE Band 2 (Channel Bandwidth: 10MHz)   | 1855.0MHz ~ 1905.0MHz            |
|                     | LTE Band 2 (Channel Bandwidth: 15MHz)   | 1857.5MHz ~ 1902.5MHz            |
|                     | LTE Band 2 (Channel Bandwidth: 20MHz)   | 1860.0MHz ~ 1900.0MHz            |
|                     | LTE Band 25 (Channel Bandwidth: 1.4MHz) | 1850.7MHz ~ 1914.3MHz            |
|                     | LTE Band 25 (Channel Bandwidth: 3MHz)   | 1851.5MHz ~ 1913.5MHz            |
|                     | LTE Band 25 (Channel Bandwidth: 5MHz)   | 1852.5MHz ~ 1912.5MHz            |
|                     | LTE Band 25 (Channel Bandwidth: 10MHz)  | 1855.0MHz ~ 1910.0MHz            |
|                     | LTE Band 25 (Channel Bandwidth: 15MHz)  | 1857.5MHz ~ 1907.5MHz            |
|                     | LTE Band 25 (Channel Bandwidth: 20MHz)  | 1860.0MHz ~ 1905.0MHz            |

|                 |                                         |       |       |     |
|-----------------|-----------------------------------------|-------|-------|-----|
| Max. EIRP Power | LTE Band 2 (Channel Bandwidth: 1.4MHz)  | QPSK  | 25.31 | dBm |
|                 |                                         | 16QAM | 24.08 | dBm |
|                 | LTE Band 2 (Channel Bandwidth: 3MHz)    | QPSK  | 25.04 | dBm |
|                 |                                         | 16QAM | 24.12 | dBm |
|                 | LTE Band 2 (Channel Bandwidth: 5MHz)    | QPSK  | 25.12 | dBm |
|                 |                                         | 16QAM | 23.63 | dBm |
|                 | LTE Band 2 (Channel Bandwidth: 10MHz)   | QPSK  | 25.31 | dBm |
|                 |                                         | 16QAM | 23.96 | dBm |
|                 | LTE Band 2 (Channel Bandwidth: 15MHz)   | QPSK  | 25.05 | dBm |
|                 |                                         | 16QAM | 23.67 | dBm |
|                 | LTE Band 2 (Channel Bandwidth: 20MHz)   | QPSK  | 24.67 | dBm |
|                 |                                         | 16QAM | 23.55 | dBm |
|                 | LTE Band 25 (Channel Bandwidth: 1.4MHz) | QPSK  | 25.01 | dBm |
|                 |                                         | 16QAM | 24.04 | dBm |
|                 | LTE Band 25 (Channel Bandwidth: 3MHz)   | QPSK  | 24.85 | dBm |
|                 |                                         | 16QAM | 23.81 | dBm |
|                 | LTE Band 25 (Channel Bandwidth: 5MHz)   | QPSK  | 24.99 | dBm |
|                 |                                         | 16QAM | 23.54 | dBm |
|                 | LTE Band 25 (Channel Bandwidth: 10MHz)  | QPSK  | 25.20 | dBm |
|                 |                                         | 16QAM | 23.97 | dBm |
|                 | LTE Band 25 (Channel Bandwidth: 15MHz)  | QPSK  | 25.47 | dBm |
|                 |                                         | 16QAM | 24.21 | dBm |
|                 | LTE Band 25 (Channel Bandwidth: 20MHz)  | QPSK  | 24.56 | dBm |
|                 |                                         | 16QAM | 23.53 | dBm |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

## 2.2 DESCRIPTION OF TEST MODES AND TEST CONDITION

Following channel(s) was (were) selected for the final test as listed below:

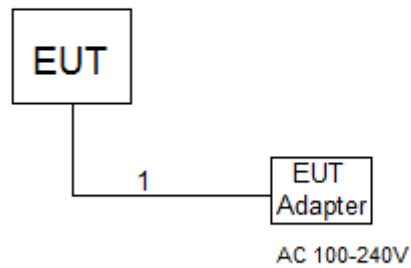
| LTE BAND 2 MODE     |                   |                     |                   |             |                |
|---------------------|-------------------|---------------------|-------------------|-------------|----------------|
| Test Item           | Available Channel | Tested Channel      | Channel Bandwidth | Modulation  | Mode           |
| Output Power & EIRP | 18607 to 19193    | 18607, 18900, 19193 | 1.4MHz            | QPSK, 16QAM | 1RB/3RB/6RB    |
|                     | 18615 to 19185    | 18615, 18900, 19185 | 3MHz              | QPSK, 16QAM | 1RB/8RB/15RB   |
|                     | 18625 to 19175    | 18625, 18900, 19175 | 5MHz              | QPSK, 16QAM | 1RB/12RB/25RB  |
|                     | 18650 to 19150    | 18650, 18900, 19150 | 10MHz             | QPSK, 16QAM | 1RB/25RB/50RB  |
|                     | 18675 to 19125    | 18675, 18900, 19125 | 15MHz             | QPSK, 16QAM | 1RB/36RB/75RB  |
|                     | 18700 to 19100    | 18700, 18900, 19100 | 20MHz             | QPSK, 16QAM | 1RB/50RB/100RB |
| Occupied Bandwidth  | 18607 to 19193    | 18607, 18900, 19193 | 1.4MHz            | QPSK, 16QAM | 6RB            |
|                     | 18615 to 19185    | 18615, 18900, 19185 | 3MHz              | QPSK, 16QAM | 15RB           |
|                     | 18625 to 19175    | 18625, 18900, 19175 | 5MHz              | QPSK, 16QAM | 25RB           |
|                     | 18650 to 19150    | 18650, 18900, 19150 | 10MHz             | QPSK, 16QAM | 50RB           |
|                     | 18675 to 19125    | 18675, 18900, 19125 | 15MHz             | QPSK, 16QAM | 75 RB          |
|                     | 18700 to 19100    | 18700, 18900, 19100 | 20MHz             | QPSK, 16QAM | 100RB          |
| Conducted Emission  | 18607 to 19193    | 18900               | 1.4 MHz           | QPSK        | 1RB            |
|                     | 18625 to 19175    | 18900               | 5MHz              | QPSK        | 1RB            |
|                     | 18700 to 19100    | 18900               | 20MHz             | QPSK        | 1RB            |
| Radiated Emission   | 18607 to 19193    | 18900               | 1.4 MHz           | QPSK        | 1RB            |
|                     | 18625 to 19175    | 18900               | 5MHz              | QPSK        | 1RB            |
|                     | 18700 to 19100    | 18900               | 20MHz             | QPSK        | 1RB            |
| Band Edge           | 18607 to 19193    | 18607               | 1.4MHz            | QPSK        | 1RB/6RB        |
|                     |                   | 19193               | 1.4MHz            | QPSK        |                |
|                     | 18615 to 19185    | 18615               | 3MHz              | QPSK        | 1RB/15RB       |
|                     |                   | 19185               | 3MHz              | QPSK        |                |
|                     | 18625 to 19175    | 18625               | 5MHz              | QPSK        | 1RB/25RB       |
|                     |                   | 19175               | 5MHz              | QPSK        |                |
|                     | 18650 to 19150    | 18650               | 10MHz             | QPSK        | 1RB/50RB       |
|                     |                   | 19150               | 10MHz             | QPSK        |                |
|                     | 18675 to 19125    | 18675               | 15MHz             | QPSK        | 1RB/75RB       |
|                     |                   | 19125               | 15MHz             | QPSK        |                |
|                     | 18700 to 19100    | 18700               | 20MHz             | QPSK        | 1RB/100RB      |
|                     |                   | 19100               | 20MHz             | QPSK        |                |

| LTE BAND 2 MODE       |                   |                     |                   |             |       |
|-----------------------|-------------------|---------------------|-------------------|-------------|-------|
| Test Item             | Available Channel | Tested Channel      | Channel Bandwidth | Modulation  | Mode  |
| Peak To Average Ratio | 18607 to 19193    | 18607, 18900, 19193 | 1.4MHz            | QPSK, 16QAM | 6RB   |
|                       | 18615 to 19185    | 18615, 18900, 19185 | 3MHz              | QPSK, 16QAM | 15RB  |
|                       | 18625 to 19175    | 18625, 18900, 19175 | 5MHz              | QPSK, 16QAM | 25RB  |
|                       | 18650 to 19150    | 18650, 18900, 19150 | 10MHz             | QPSK, 16QAM | 50RB  |
|                       | 18675 to 19125    | 18675, 18900, 19125 | 15MHz             | QPSK, 16QAM | 75 RB |
|                       | 18700 to 19100    | 18700, 18900, 19100 | 20MHz             | QPSK, 16QAM | 100RB |
| Frequency Stability   | 18607 to 19193    | 18900               | 1.4MHz            | QPSK        | 1RB   |
|                       | 18615 to 19185    | 18900               | 3MHz              | QPSK        | 1RB   |
|                       | 18625 to 19175    | 18900               | 5MHz              | QPSK        | 1RB   |
|                       | 18650 to 19150    | 18900               | 10MHz             | QPSK        | 1RB   |
|                       | 18675 to 19125    | 18900               | 15MHz             | QPSK        | 1RB   |
|                       | 18700 to 19100    | 18900               | 20MHz             | QPSK        | 1RB   |

| LTE BAND 25 MODE    |                   |                     |                   |             |                |
|---------------------|-------------------|---------------------|-------------------|-------------|----------------|
| Test Item           | Available Channel | Tested Channel      | Channel Bandwidth | Modulation  | Mode           |
| Output Power & EIRP | 26047 to 26683    | 26047, 26365, 26683 | 1.4MHz            | QPSK, 16QAM | 1RB/3RB/6RB    |
|                     | 26055 to 26675    | 26055, 26365, 26675 | 3MHz              | QPSK, 16QAM | 1RB/8RB/15RB   |
|                     | 26065 to 26665    | 26065, 26365, 26665 | 5MHz              | QPSK, 16QAM | 1RB/12RB/25RB  |
|                     | 26090 to 26640    | 26090, 26365, 26640 | 10MHz             | QPSK, 16QAM | 1RB/25RB/50RB  |
|                     | 26115 to 26615    | 26115, 26365, 26615 | 15MHz             | QPSK, 16QAM | 1RB/36RB/75RB  |
|                     | 26140 to 26590    | 26140, 26365, 26590 | 20MHz             | QPSK, 16QAM | 1RB/50RB/100RB |
| Occupied Bandwidth  | 26047 to 26683    | 26047, 26365, 26683 | 1.4MHz            | QPSK, 16QAM | 6RB            |
|                     | 26055 to 26675    | 26055, 26365, 26675 | 3MHz              | QPSK, 16QAM | 15RB           |
|                     | 26065 to 26665    | 26065, 26365, 26665 | 5MHz              | QPSK, 16QAM | 25RB           |
|                     | 26090 to 26640    | 26090, 26365, 26640 | 10MHz             | QPSK, 16QAM | 50RB           |
|                     | 26115 to 26615    | 26115, 26365, 26615 | 15MHz             | QPSK, 16QAM | 75 RB          |
|                     | 26140 to 26590    | 26140, 26365, 26590 | 20MHz             | QPSK, 16QAM | 100RB          |
| Conducted Emission  | 26047 to 26683    | 26365               | 1.4 MHz           | QPSK        | 1RB            |
|                     | 26065 to 26665    | 26365               | 5MHz              | QPSK        | 1RB            |
|                     | 26140 to 26590    | 26365               | 20MHz             | QPSK        | 1RB            |
| Radiated Emission   | 26047 to 26683    | 26365               | 1.4 MHz           | QPSK        | 1RB            |
|                     | 26065 to 26665    | 26365               | 5MHz              | QPSK        | 1RB            |
|                     | 26140 to 26590    | 26365               | 20MHz             | QPSK        | 1RB            |
| Band Edge           | 26047 to 26683    | 26047               | 1.4MHz            | QPSK        | 1RB/6RB        |
|                     |                   | 26683               | 1.4MHz            | QPSK        |                |
|                     | 26055 to 26675    | 26055               | 3MHz              | QPSK        | 1RB/15RB       |
|                     |                   | 26675               | 3MHz              | QPSK        |                |
|                     | 26065 to 26665    | 26065               | 5MHz              | QPSK        | 1RB/25RB       |
|                     |                   | 26665               | 5MHz              | QPSK        |                |
|                     | 26090 to 26640    | 26090               | 10MHz             | QPSK        | 1RB/50RB       |
|                     |                   | 26640               | 10MHz             | QPSK        |                |
|                     | 26115 to 26615    | 26115               | 15MHz             | QPSK        | 1RB/75RB       |
|                     |                   | 26615               | 15MHz             | QPSK        |                |
|                     | 26140 to 26590    | 26140               | 20MHz             | QPSK        | 1RB/100RB      |
|                     |                   | 26590               | 20MHz             | QPSK        |                |

| LTE BAND 25 MODE      |                   |                     |                   |             |       |
|-----------------------|-------------------|---------------------|-------------------|-------------|-------|
| Test Item             | Available Channel | Tested Channel      | Channel Bandwidth | Modulation  | Mode  |
| Peak To Average Ratio | 26047 to 26683    | 26047, 26365, 26683 | 1.4MHz            | QPSK, 16QAM | 6RB   |
|                       | 26055 to 26675    | 26055, 26365, 26675 | 3MHz              | QPSK, 16QAM | 15RB  |
|                       | 26065 to 26665    | 26065, 26365, 26665 | 5MHz              | QPSK, 16QAM | 25RB  |
|                       | 26090 to 26640    | 26090, 26365, 26640 | 10MHz             | QPSK, 16QAM | 50RB  |
|                       | 26115 to 26615    | 26115, 26365, 26615 | 15MHz             | QPSK, 16QAM | 75 RB |
|                       | 26140 to 26590    | 26140, 26365, 26590 | 20MHz             | QPSK, 16QAM | 100RB |
| Frequency Stability   | 26047 to 26683    | 26365               | 1.4MHz            | QPSK        | 1RB   |
|                       | 26055 to 26675    | 26365               | 3MHz              | QPSK        | 1RB   |
|                       | 26065 to 26665    | 26365               | 5MHz              | QPSK        | 1RB   |
|                       | 26090 to 26640    | 26365               | 10MHz             | QPSK        | 1RB   |
|                       | 26115 to 26615    | 26365               | 15MHz             | QPSK        | 1RB   |
|                       | 26140 to 26590    | 26365               | 20MHz             | QPSK        | 1RB   |

## 2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



## 3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment | Mfr/Brand | Model/Type No. | Series No. |
|------|-----------|-----------|----------------|------------|
| 1    | Adapter   | -         | YHSW-050100U/T | -          |

| Item | Cable Type | Shielded Type | Ferrite Core | Length |
|------|------------|---------------|--------------|--------|
| 1    | DC Cable   | N/A           | N/A          | 1m     |

### 3. TEST RESULT

#### 3.1 OUTPUT POWER MEASUREMENT

##### 3.1.1 LIMIT

Mobile / Portable station are limited to 2 watts e.i.r.p.

##### 3.1.2 TEST PROCEDURE

###### EIRP:

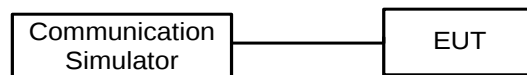
$EIRP = \text{Output Power} + \text{Antenan gain}$

###### Output Power:

The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.  
Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

##### 3.1.3 TEST SETUP LAYOUT

Output Power Measurement



##### 3.1.4 TEST DEVIATION

No deviation

##### 3.1.5 TEST RESULTS

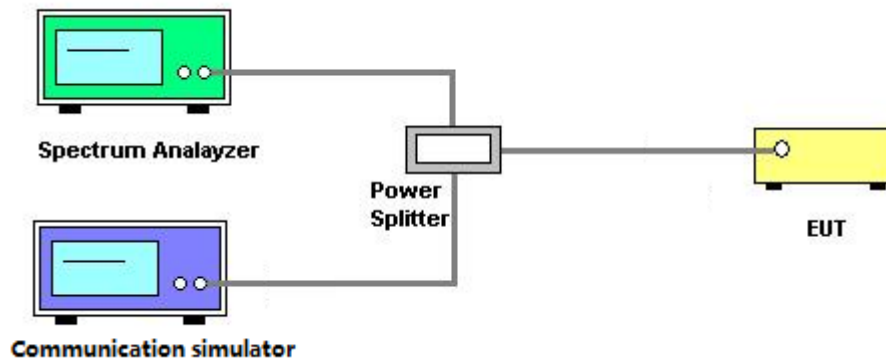
Please refer to the Appendix A.

### 3.2 OCCUPIED BANDWIDTH MEASUREMENT

#### 3.2.1 TEST PROCEDURE

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth and 26dB bandwidth.

#### 3.2.2 TEST SETUP LAYOUT



#### 3.2.3 TEST DEVIATION

No deviation

#### 3.2.4 TEST RESULTS

Please refer to the Appendix B.

### 3.3 CONDUCTED EMISSIONS MEASUREMENT

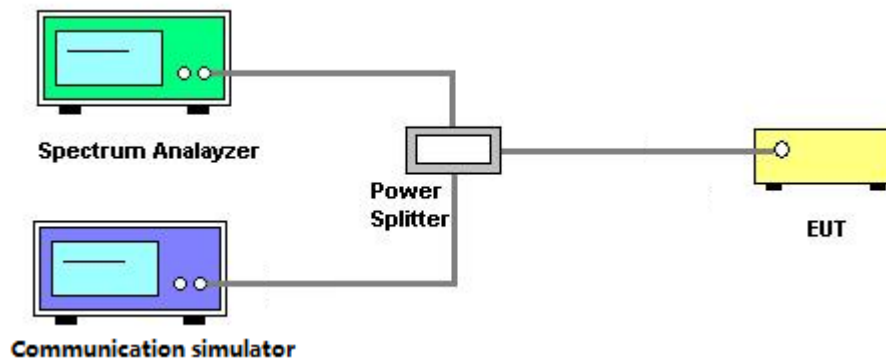
#### 3.3.1 LIMIT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to -13dBm.

#### 3.3.2 TEST PROCEDURES

1. The testing follows FCC KDB 971168 v03r01 Section 6.0.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured. Set RBW  $\geq 1\%$  EBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Set spectrum analyzer with RMS detector.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

#### 3.3.3 TEST SETUP LAYOUT



#### 3.3.4 TEST DEVIATION

No deviation

#### 3.3.5 TEST RESULTS

Please refer to the Appendix C.

### **3.4 RADIATED EMISSIONS MEASUREMENT**

#### **3.4.1 LIMIT**

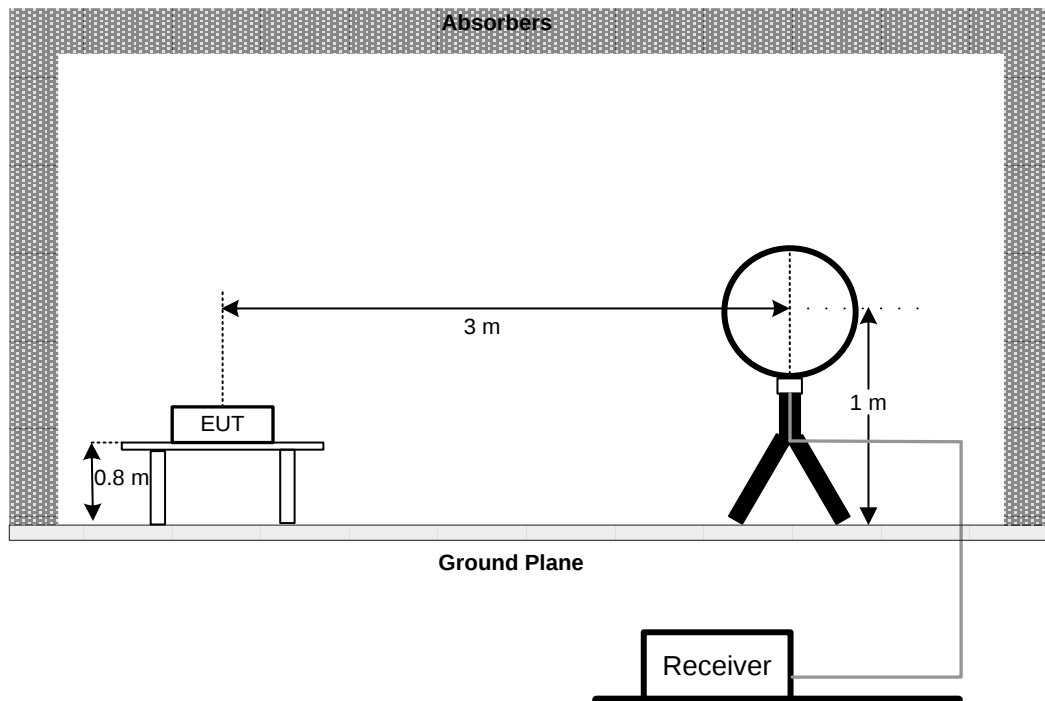
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to -13dBm.

#### **3.4.2 TEST PROCEDURES**

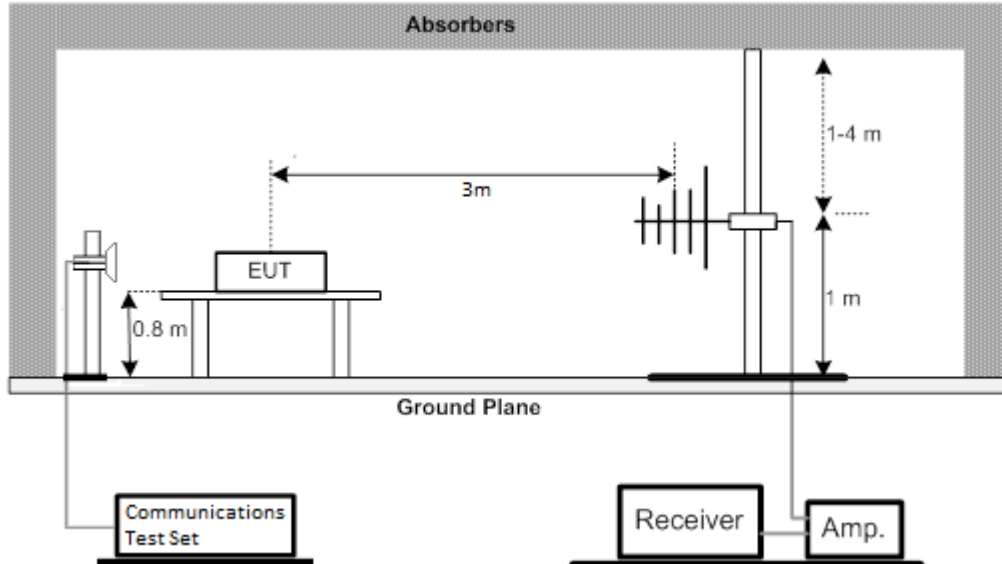
1. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
2. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value " of step a. Record the power level of S.G
3.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$
4. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,  $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15\text{dBi}.$
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

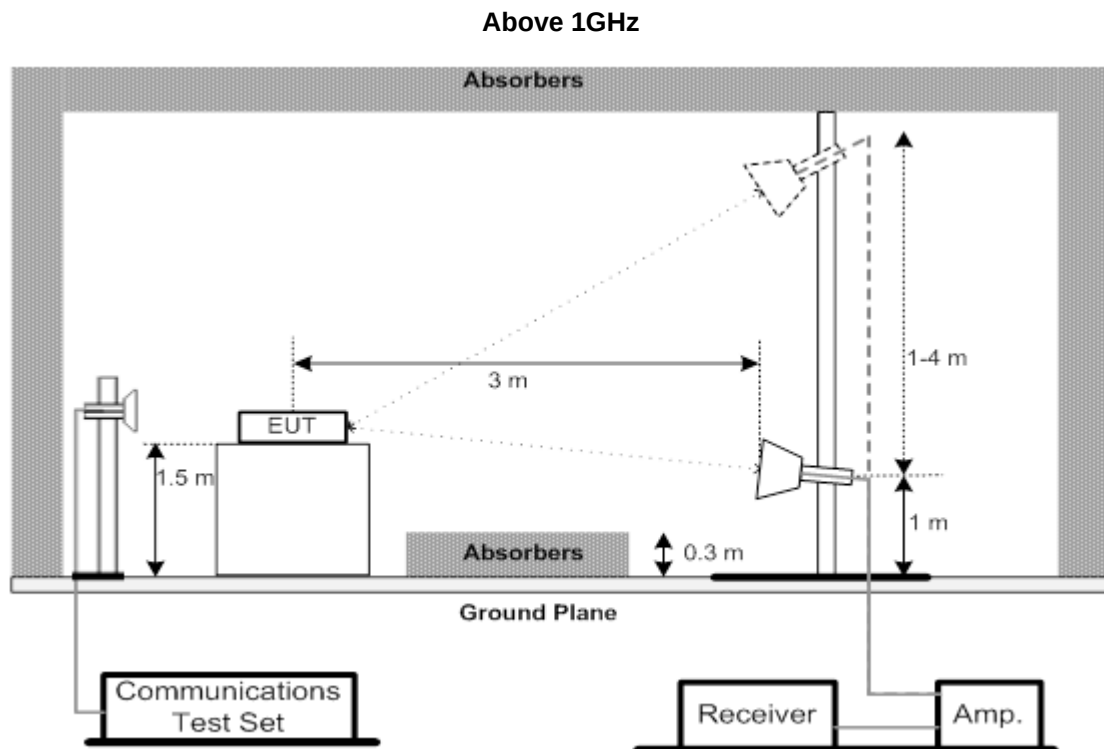
### 3.4.3 TEST SETUP LAYOUT

#### Below 30MHz



#### 30MHz to 1GHz





### 3.4.4 TEST DEVIATION

No deviation

### 3.4.5 TEST RESULTS (30MHZ TO 1000MHZ)

Please refer to the Appendix D.

### 3.4.6 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the Appendix E.

## 3.5 BAND EDGE MEASUREMENT

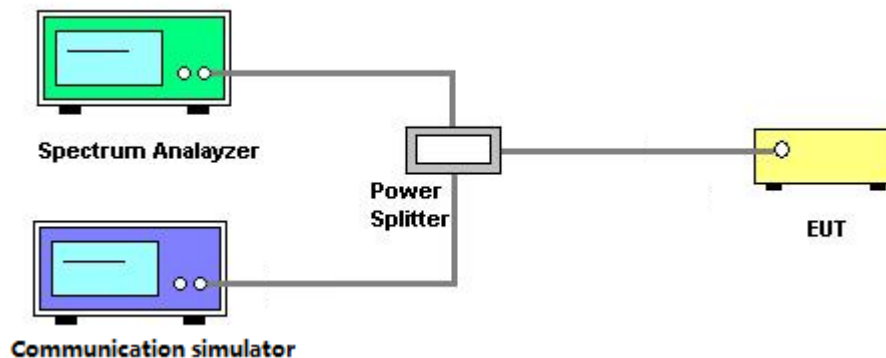
### 3.5.1 LIMIT

A Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

### 3.5.2 TEST PROCEDURES

1. All measurements were done at low and high operational frequency range.
2. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 15kHz and VB of the spectrum is 43kHz (LTE Bandwidth 1.4MHz).
3. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 30kHz and VB of the spectrum is 91kHz (LTE Bandwidth 3MHz).
4. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 51kHz and VB of the spectrum is 150kHz (LTE Bandwidth 5MHz).
5. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Bandwidth 10MHz).
6. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (LTE Bandwidth 15MHz).
7. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 200kHz and VB of the spectrum is 620kHz (LTE Bandwidth 20MHz).
8. Record the max trace plot into the test report.

### 3.5.3 TEST SETUP LAYOUT



### 3.5.4 TEST DEVIATION

No deviation

### 3.5.5 TEST RESULTS

Please refer to the Appendix F.

### 3.6 PEAK TO AVERAGE RATIO MEASUREMENT

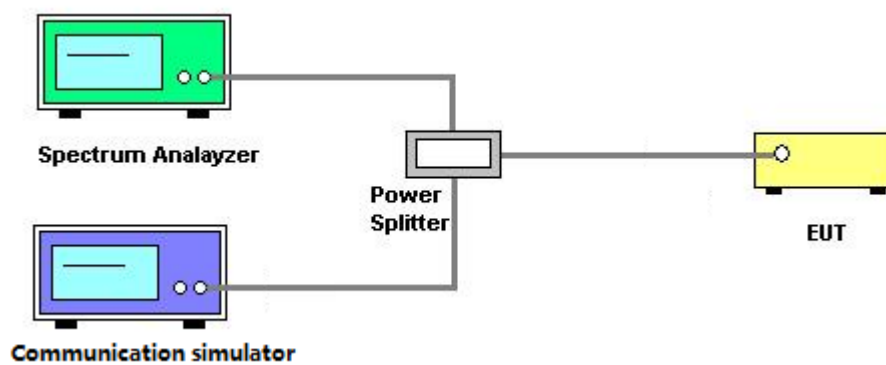
#### 3.6.1 LIMIT

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

#### 3.6.2 TEST PROCEDURES

1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

#### 3.6.3 TEST SETUP LAYOUT



#### 3.6.4 TEST DEVIATION

No deviation

#### 3.6.5 TEST RESULTS

Please refer to the Appendix G.

### 3.7 FREQUENCY STABILITY MEASUREMENT

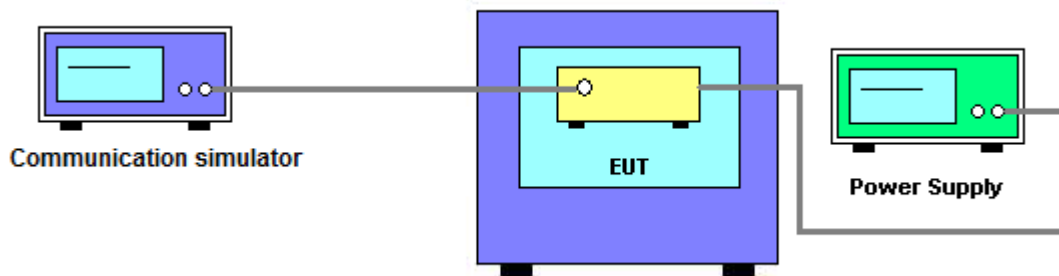
#### 3.7.1 LIMIT

$\pm 1.5$  ppm is for base and fixed station.  $\pm 2.5$  ppm is for mobile station.

#### 3.7.2 TEST PROCEDURES

1. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
2. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
3. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5^{\circ}\text{C}$  during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.
4. The frequency error was recorded frequency error from the communication simulator.

#### 3.7.3 TEST SETUP LAYOUT



#### 3.7.4 TEST DEVIATION

No deviation

#### 3.7.5 TEST RESULTS

Please refer to the Appendix H.

#### 4. LIST OF MEASUREMENT EQUIPMENTS

| Radiated Emission Measurement(9K-30M) |                      |              |                          |            |                  |
|---------------------------------------|----------------------|--------------|--------------------------|------------|------------------|
| Item                                  | Kind of Equipment    | Manufacturer | Type No.                 | Serial No. | Calibrated until |
| 1                                     | Loop Antenna         | EMCI         | EMCI LPA600              | 275        | Mar. 29, 2020    |
| 2                                     | EMI Test Receiver    | R&S          | ESCI                     | 100082     | Mar. 29, 2020    |
| 3                                     | Measurement Software | Farad        | EZ-EMC<br>Ver.NB-03A1-01 | N/A        | N/A              |

| Radiated Emission Measurement(30M-1G) |                                   |              |                          |            |                  |
|---------------------------------------|-----------------------------------|--------------|--------------------------|------------|------------------|
| Item                                  | Kind of Equipment                 | Manufacturer | Type No.                 | Serial No. | Calibrated until |
| 1                                     | TRILOG Broadband Antenna          | Schwarzbeck  | VULB 9168                | 719        | Mar. 29, 2020    |
| 2                                     | Pre-Amplifier                     | emci         | EMC9135                  | 980400     | Mar. 29, 2020    |
| 3                                     | MXE EMI Receiver                  | Keysight     | N9038A                   | MY57150106 | Mar. 29, 2020    |
| 4                                     | Test Cable                        | emci         | EMC104-SM-SM-7000        | 170330     | Apr. 17, 2020    |
| 5                                     | Test Cable                        | emci         | EMC104-SM-SM-1000        | 170331     | Apr. 17, 2020    |
| 6                                     | Test Cable                        | emci         | EMC104-SM-NM-3500        | 170621     | Apr. 17, 2020    |
| 7                                     | Measurement Software              | Farad        | EZ-EMC<br>Ver.NB-03A1-01 | N/A        | N/A              |
| 8                                     | Wideband Radio Communication Test | R&S          | CMW500                   | 131463     | Sep. 01, 2020    |

| Radiated Emission Measurement(1G-18G) |                                      |              |                   |            |                  |
|---------------------------------------|--------------------------------------|--------------|-------------------|------------|------------------|
| Item                                  | Kind of Equipment                    | Manufacturer | Type No.          | Serial No. | Calibrated until |
| 1                                     | Pre-Amplifier                        | emci         | EMC184045SE       | 980409     | Mar. 29, 2020    |
| 2                                     | Pre-Amplifier                        | emci         | EMC012645SE       | 980421     | Mar. 29, 2020    |
| 3                                     | Pre-Amplifier                        | emci         | EMC9135           | 980400     | Mar. 29, 2020    |
| 4                                     | Double Ridged Broadband Horn Antenna | Schwarzbeck  | BBHA 9120D        | 9120D-1787 | Mar. 29, 2020    |
| 5                                     | Double-Ridged Waveguide Horn Antenna | ETS-Lindgren | 3116C             | 00203919   | Mar. 29, 2020    |
| 6                                     | TRILOG Broadband Antenna             | Schwarzbeck  | VULB 9168         | 719        | Mar. 29, 2020    |
| 7                                     | Cable                                | N/A          | EMC102-SM-SM-6000 | 170336     | Apr. 17, 2020    |
| 8                                     | Wideband Radio Communication Test    | R&S          | CMW500            | 131463     | Sep. 01, 2020    |

| Conducted Emission & Band Edge & Occupied Bandwidth Measurement |                                   |              |             |            |                  |
|-----------------------------------------------------------------|-----------------------------------|--------------|-------------|------------|------------------|
| Item                                                            | Kind of Equipment                 | Manufacturer | Type No.    | Serial No. | Calibrated until |
| 1                                                               | EXA Spectrum Analyzer             | Keysight     | N9010A      | MY56480579 | Mar. 29, 2020    |
| 2                                                               | Power Divider                     | JUK          | PD-4SF-2060 | N/A        | N/A              |
| 3                                                               | Wideband Radio Communication Test | R&S          | CMW500      | 131463     | Sep. 01, 2020    |
| 4                                                               | Spectrum Analyzer                 | R&S          | FSP40       | 100626     | Mar. 29, 2020    |

| Frequency Stability Measurement |                                   |              |             |            |                  |
|---------------------------------|-----------------------------------|--------------|-------------|------------|------------------|
| Item                            | Kind of Equipment                 | Manufacturer | Type No.    | Serial No. | Calibrated until |
| 1                               | EXA Spectrum Analyzer             | Keysight     | N9010A      | MY56480579 | Mar. 29, 2020    |
| 2*                              | Power Divider                     | JUK          | PD-4SF-2060 | N/A        | N/A              |
| 3                               | Wideband Radio Communication Test | R&S          | CMW500      | 131463     | Sep. 01, 2020    |
| 4                               | Spectrum Analyzer                 | R&S          | FSP40       | 100626     | Mar. 29, 2020    |
| 5                               | Temperature And Humidity Box      | Blue pand    | BPHS-120B   | 170616454  | Sep. 01, 2020    |

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

\*All calibration period of equipment list is three year

## APPENDIX A - OUTPUT POWER

### Output Power (dBm):

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH    | Mid CH  | High CH   |
|---------------|------------|---------|-----------|-----------|---------|-----------|
|               |            |         |           | 18607CH   | 18900CH | 19193CH   |
|               |            |         |           | 1850.7MHz | 1880MHz | 1909.3MHz |
| 2 / 1.4M      | QPSK       | 1       | 0         | 23.30     | 23.58   | 23.48     |
|               |            | 1       | 2         | 23.06     | 23.48   | 23.30     |
|               |            | 1       | 5         | 23.15     | 23.51   | 23.30     |
|               |            | 3       | 0         | 23.51     | 23.58   | 23.39     |
|               |            | 3       | 1         | 23.02     | 23.25   | 23.72     |
|               |            | 3       | 2         | 23.29     | 23.40   | 23.50     |
|               |            | 6       | 0         | 22.17     | 22.28   | 22.42     |
|               | 16QAM      | 1       | 0         | 22.21     | 22.07   | 22.01     |
|               |            | 1       | 2         | 22.39     | 22.12   | 22.13     |
|               |            | 1       | 5         | 22.28     | 22.22   | 22.24     |
|               |            | 3       | 0         | 22.04     | 22.36   | 22.14     |
|               |            | 3       | 1         | 22.49     | 22.19   | 21.91     |
|               |            | 3       | 2         | 22.40     | 22.39   | 22.18     |
|               |            | 6       | 0         | 21.49     | 21.26   | 21.51     |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH    | Mid CH  | High CH   |
|---------------|------------|---------|-----------|-----------|---------|-----------|
|               |            |         |           | 18615CH   | 18900CH | 19185CH   |
|               |            |         |           | 1851.5MHz | 1880MHz | 1908.5MHz |
| 2 / 3M        | QPSK       | 1       | 0         | 23.26     | 23.25   | 23.11     |
|               |            | 1       | 7         | 23.27     | 22.97   | 23.17     |
|               |            | 1       | 14        | 22.96     | 23.31   | 23.20     |
|               |            | 8       | 0         | 23.41     | 23.02   | 23.13     |
|               |            | 8       | 4         | 23.33     | 23.34   | 22.98     |
|               |            | 8       | 7         | 23.03     | 23.45   | 23.13     |
|               |            | 15      | 0         | 22.25     | 22.38   | 22.42     |
|               | 16QAM      | 1       | 0         | 22.18     | 22.36   | 22.01     |
|               |            | 1       | 7         | 21.98     | 22.33   | 21.92     |
|               |            | 1       | 14        | 22.41     | 22.53   | 21.81     |
|               |            | 8       | 0         | 22.26     | 22.13   | 21.96     |
|               |            | 8       | 4         | 22.45     | 22.22   | 21.75     |
|               |            | 8       | 7         | 22.03     | 22.51   | 21.90     |
|               |            | 15      | 0         | 21.06     | 21.11   | 21.51     |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH    | Mid CH  | High CH   |
|---------------|------------|---------|-----------|-----------|---------|-----------|
|               |            |         |           | 18625CH   | 18900CH | 19175CH   |
|               |            |         |           | 1852.5MHz | 1880MHz | 1907.5MHz |
| 2 / 5M        | QPSK       | 1       | 0         | 23.37     | 23.28   | 23.25     |
|               |            | 1       | 13        | 23.17     | 23.16   | 23.11     |
|               |            | 1       | 24        | 23.33     | 23.30   | 22.98     |
|               |            | 12      | 0         | 23.31     | 23.34   | 23.09     |
|               |            | 12      | 6         | 23.24     | 23.53   | 23.15     |
|               |            | 12      | 11        | 23.50     | 23.22   | 23.03     |
|               |            | 25      | 0         | 22.31     | 22.29   | 22.16     |
|               | 16QAM      | 1       | 0         | 21.56     | 21.83   | 21.64     |
|               |            | 1       | 13        | 21.82     | 21.68   | 21.86     |
|               |            | 1       | 24        | 21.43     | 21.62   | 21.45     |
|               |            | 12      | 0         | 21.62     | 22.04   | 21.76     |
|               |            | 12      | 6         | 21.79     | 21.82   | 21.64     |
|               |            | 12      | 11        | 21.48     | 22.01   | 21.53     |
|               |            | 25      | 0         | 21.16     | 21.25   | 21.23     |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH  | Mid CH  | High CH |
|---------------|------------|---------|-----------|---------|---------|---------|
|               |            |         |           | 18650CH | 18900CH | 19150CH |
|               |            |         |           | 1855MHz | 1880MHz | 1905MHz |
| 2 / 10M       | QPSK       | 1       | 0         | 23.35   | 23.42   | 23.28   |
|               |            | 1       | 25        | 23.32   | 23.13   | 23.31   |
|               |            | 1       | 49        | 23.19   | 23.72   | 23.21   |
|               |            | 25      | 0         | 23.31   | 23.69   | 23.49   |
|               |            | 25      | 13        | 23.42   | 23.50   | 23.17   |
|               |            | 25      | 25        | 23.29   | 23.32   | 23.02   |
|               |            | 50      | 0         | 22.15   | 22.26   | 22.09   |
|               | 16QAM      | 1       | 0         | 22.05   | 22.14   | 21.98   |
|               |            | 1       | 25        | 21.76   | 22.22   | 21.77   |
|               |            | 1       | 49        | 22.04   | 22.04   | 21.82   |
|               |            | 25      | 0         | 22.21   | 22.14   | 21.94   |
|               |            | 25      | 13        | 21.96   | 22.37   | 22.28   |
|               |            | 25      | 25        | 21.83   | 22.09   | 22.27   |
|               |            | 50      | 0         | 21.21   | 21.27   | 21.13   |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH    | Mid CH  | High CH   |
|---------------|------------|---------|-----------|-----------|---------|-----------|
|               |            |         |           | 18675CH   | 18900CH | 19125CH   |
|               |            |         |           | 1857.5MHz | 1880MHz | 1902.5MHz |
| 2 / 15M       | QPSK       | 1       | 0         | 23.14     | 23.23   | 23.21     |
|               |            | 1       | 38        | 22.95     | 23.08   | 22.94     |
|               |            | 1       | 74        | 23.33     | 23.30   | 23.14     |
|               |            | 36      | 0         | 23.06     | 23.06   | 22.97     |
|               |            | 36      | 18        | 23.02     | 23.42   | 23.30     |
|               |            | 36      | 39        | 23.35     | 23.46   | 22.91     |
|               |            | 75      | 0         | 22.16     | 22.30   | 22.11     |
|               | 16QAM      | 1       | 0         | 21.81     | 21.86   | 21.76     |
|               |            | 1       | 38        | 21.61     | 22.08   | 21.52     |
|               |            | 1       | 74        | 21.75     | 21.80   | 21.58     |
|               |            | 36      | 0         | 21.69     | 21.72   | 21.87     |
|               |            | 36      | 18        | 21.59     | 21.77   | 21.50     |
|               |            | 36      | 39        | 21.77     | 21.95   | 21.99     |
|               |            | 75      | 0         | 21.47     | 21.53   | 21.36     |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH  | Mid CH  | High CH |
|---------------|------------|---------|-----------|---------|---------|---------|
|               |            |         |           | 18700CH | 18900CH | 19100CH |
|               |            |         |           | 1860MHz | 1880MHz | 1900MHz |
| 2 / 20M       | QPSK       | 1       | 0         | 22.71   | 22.84   | 22.77   |
|               |            | 1       | 50        | 22.84   | 22.75   | 22.66   |
|               |            | 1       | 99        | 22.59   | 23.04   | 22.61   |
|               |            | 50      | 0         | 22.87   | 23.08   | 22.88   |
|               |            | 50      | 25        | 22.98   | 22.55   | 22.67   |
|               |            | 50      | 50        | 22.75   | 22.68   | 22.88   |
|               |            | 100     | 0         | 22.17   | 22.29   | 22.16   |
|               | 16QAM      | 1       | 0         | 21.54   | 21.70   | 21.63   |
|               |            | 1       | 50        | 21.84   | 21.56   | 21.65   |
|               |            | 1       | 99        | 21.35   | 21.96   | 21.83   |
|               |            | 50      | 0         | 21.82   | 21.69   | 21.74   |
|               |            | 50      | 25        | 21.73   | 21.90   | 21.75   |
|               |            | 50      | 50        | 21.76   | 21.40   | 21.50   |
|               |            | 100     | 0         | 21.33   | 21.50   | 21.26   |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH    | Mid CH    | High CH   |
|---------------|------------|---------|-----------|-----------|-----------|-----------|
|               |            |         |           | 26047CH   | 26365CH   | 26683CH   |
|               |            |         |           | 1850.7MHz | 1882.5MHz | 1914.3MHz |
| 25 / 1.4M     | QPSK       | 1       | 0         | 23.14     | 23.25     | 23.07     |
|               |            | 1       | 2         | 22.87     | 23.42     | 23.03     |
|               |            | 1       | 5         | 23.11     | 23.21     | 23.02     |
|               |            | 3       | 0         | 23.27     | 22.99     | 23.09     |
|               |            | 3       | 1         | 23.17     | 23.38     | 23.12     |
|               |            | 3       | 2         | 22.88     | 23.30     | 23.00     |
|               |            | 6       | 0         | 22.15     | 22.23     | 22.11     |
|               | 16QAM      | 1       | 0         | 22.06     | 22.21     | 21.98     |
|               |            | 1       | 2         | 22.19     | 22.45     | 21.70     |
|               |            | 1       | 5         | 22.10     | 22.33     | 21.73     |
|               |            | 3       | 0         | 22.09     | 22.31     | 22.05     |
|               |            | 3       | 1         | 21.85     | 22.15     | 22.18     |
|               |            | 3       | 2         | 21.99     | 22.31     | 22.10     |
|               |            | 6       | 0         | 21.36     | 21.50     | 21.43     |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH    | Mid CH    | High CH   |
|---------------|------------|---------|-----------|-----------|-----------|-----------|
|               |            |         |           | 26055CH   | 26365CH   | 26675CH   |
|               |            |         |           | 1851.5MHz | 1882.5MHz | 1913.5MHz |
| 25 / 3M       | QPSK       | 1       | 0         | 22.96     | 23.11     | 23.01     |
|               |            | 1       | 7         | 22.90     | 23.26     | 22.95     |
|               |            | 1       | 14        | 23.05     | 23.20     | 23.20     |
|               |            | 8       | 0         | 23.02     | 22.93     | 23.00     |
|               |            | 8       | 4         | 23.22     | 22.94     | 22.92     |
|               |            | 8       | 7         | 22.98     | 22.98     | 22.72     |
|               |            | 15      | 0         | 22.15     | 22.36     | 22.25     |
|               | 16QAM      | 1       | 0         | 21.87     | 22.02     | 21.96     |
|               |            | 1       | 7         | 21.85     | 21.78     | 22.07     |
|               |            | 1       | 14        | 21.79     | 21.84     | 22.02     |
|               |            | 8       | 0         | 21.89     | 22.22     | 21.68     |
|               |            | 8       | 4         | 22.06     | 22.21     | 21.98     |
|               |            | 8       | 7         | 21.86     | 22.21     | 22.22     |
|               |            | 15      | 0         | 21.23     | 21.40     | 21.33     |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH    | Mid CH    | High CH   |
|---------------|------------|---------|-----------|-----------|-----------|-----------|
|               |            |         |           | 26065CH   | 26365CH   | 26665CH   |
|               |            |         |           | 1852.5MHz | 1882.5MHz | 1912.5MHz |
| 25 / 5M       | QPSK       | 1       | 0         | 23.03     | 23.27     | 23.18     |
|               |            | 1       | 13        | 22.90     | 23.02     | 23.30     |
|               |            | 1       | 24        | 22.89     | 23.40     | 23.09     |
|               |            | 12      | 0         | 23.16     | 23.31     | 22.97     |
|               |            | 12      | 6         | 23.24     | 23.20     | 23.13     |
|               |            | 12      | 11        | 23.00     | 23.35     | 23.30     |
|               |            | 25      | 0         | 22.15     | 22.37     | 22.28     |
|               | 16QAM      | 1       | 0         | 21.53     | 21.72     | 21.66     |
|               |            | 1       | 13        | 21.61     | 21.51     | 21.95     |
|               |            | 1       | 24        | 21.67     | 21.62     | 21.73     |
|               |            | 12      | 0         | 21.66     | 21.62     | 21.52     |
|               |            | 12      | 6         | 21.32     | 21.94     | 21.75     |
|               |            | 12      | 11        | 21.64     | 21.85     | 21.71     |
|               |            | 25      | 0         | 21.21     | 21.50     | 21.33     |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH  | Mid CH    | High CH |
|---------------|------------|---------|-----------|---------|-----------|---------|
|               |            |         |           | 26090CH | 26365CH   | 26640CH |
|               |            |         |           | 1855MHz | 1882.5MHz | 1910MHz |
| 25 / 10M      | QPSK       | 1       | 0         | 23.15   | 23.35     | 23.21   |
|               |            | 1       | 25        | 23.15   | 23.55     | 23.42   |
|               |            | 1       | 49        | 23.34   | 23.61     | 23.20   |
|               |            | 25      | 0         | 23.04   | 23.38     | 23.08   |
|               |            | 25      | 13        | 22.93   | 23.39     | 23.27   |
|               |            | 25      | 25        | 23.00   | 23.11     | 23.26   |
|               |            | 50      | 0         | 22.46   | 22.35     | 22.27   |
|               | 16QAM      | 1       | 0         | 21.94   | 22.12     | 21.87   |
|               |            | 1       | 25        | 21.96   | 22.30     | 21.77   |
|               |            | 1       | 49        | 21.81   | 21.83     | 21.61   |
|               |            | 25      | 0         | 22.05   | 21.93     | 22.02   |
|               |            | 25      | 13        | 22.09   | 22.38     | 21.83   |
|               |            | 25      | 25        | 22.01   | 22.32     | 22.17   |
|               |            | 50      | 0         | 21.15   | 21.36     | 21.32   |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH    | Mid CH    | High CH   |
|---------------|------------|---------|-----------|-----------|-----------|-----------|
|               |            |         |           | 26115CH   | 26365CH   | 26615CH   |
|               |            |         |           | 1857.5MHz | 1882.5MHz | 1907.5MHz |
| 25 / 15M      | QPSK       | 1       | 0         | 23.43     | 23.65     | 23.38     |
|               |            | 1       | 38        | 23.43     | 23.42     | 23.17     |
|               |            | 1       | 74        | 23.48     | 23.65     | 23.24     |
|               |            | 36      | 0         | 23.22     | 23.82     | 23.36     |
|               |            | 36      | 18        | 23.65     | 23.57     | 23.24     |
|               |            | 36      | 39        | 23.25     | 23.88     | 23.55     |
|               |            | 75      | 0         | 22.05     | 22.30     | 22.17     |
|               | 16QAM      | 1       | 0         | 22.11     | 22.35     | 22.39     |
|               |            | 1       | 38        | 22.00     | 22.35     | 22.45     |
|               |            | 1       | 74        | 21.92     | 22.56     | 22.12     |
|               |            | 36      | 0         | 22.13     | 22.38     | 22.40     |
|               |            | 36      | 18        | 21.93     | 22.62     | 22.26     |
|               |            | 36      | 39        | 21.84     | 22.41     | 22.47     |
|               |            | 75      | 0         | 21.07     | 21.38     | 21.28     |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH  | Mid CH    | High CH |
|---------------|------------|---------|-----------|---------|-----------|---------|
|               |            |         |           | 26140CH | 26365CH   | 26590CH |
|               |            |         |           | 1860MHz | 1882.5MHz | 1905MHz |
| 25 / 20M      | QPSK       | 1       | 0         | 22.38   | 22.74     | 22.56   |
|               |            | 1       | 50        | 22.67   | 22.85     | 22.64   |
|               |            | 1       | 99        | 22.17   | 22.75     | 22.81   |
|               |            | 50      | 0         | 22.38   | 22.55     | 22.59   |
|               |            | 50      | 25        | 22.52   | 22.97     | 22.50   |
|               |            | 50      | 50        | 22.13   | 22.91     | 22.78   |
|               |            | 100     | 0         | 22.18   | 22.37     | 22.27   |
|               | 16QAM      | 1       | 0         | 21.59   | 21.76     | 21.62   |
|               |            | 1       | 50        | 21.75   | 21.94     | 21.51   |
|               |            | 1       | 99        | 21.55   | 21.87     | 21.88   |
|               |            | 50      | 0         | 21.76   | 21.50     | 21.50   |
|               |            | 50      | 25        | 21.43   | 21.56     | 21.42   |
|               |            | 50      | 50        | 21.78   | 21.80     | 21.39   |
|               |            | 100     | 0         | 21.16   | 21.35     | 21.27   |

**EIRP Power (dBm):**

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH    | Mid CH  | High CH   |
|---------------|------------|---------|-----------|-----------|---------|-----------|
|               |            |         |           | 18607CH   | 18900CH | 19193CH   |
|               |            |         |           | 1850.7MHz | 1880MHz | 1909.3MHz |
| 2 / 1.4M      | QPSK       | 1       | 0         | 24.89     | 25.17   | 25.07     |
|               |            | 1       | 2         | 24.65     | 25.07   | 24.89     |
|               |            | 1       | 5         | 24.74     | 25.10   | 24.89     |
|               |            | 3       | 0         | 25.10     | 25.17   | 24.98     |
|               |            | 3       | 1         | 24.61     | 24.84   | 25.31     |
|               |            | 3       | 2         | 24.88     | 24.99   | 25.09     |
|               |            | 6       | 0         | 23.76     | 23.87   | 24.01     |
|               | 16QAM      | 1       | 0         | 23.80     | 23.66   | 23.60     |
|               |            | 1       | 2         | 23.98     | 23.71   | 23.72     |
|               |            | 1       | 5         | 23.87     | 23.81   | 23.83     |
|               |            | 3       | 0         | 23.63     | 23.95   | 23.73     |
|               |            | 3       | 1         | 24.08     | 23.78   | 23.50     |
|               |            | 3       | 2         | 23.99     | 23.98   | 23.77     |
|               |            | 6       | 0         | 23.08     | 22.85   | 23.10     |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH    | Mid CH  | High CH   |
|---------------|------------|---------|-----------|-----------|---------|-----------|
|               |            |         |           | 18615CH   | 18900CH | 19185CH   |
|               |            |         |           | 1851.5MHz | 1880MHz | 1908.5MHz |
| 2 / 3M        | QPSK       | 1       | 0         | 24.85     | 24.84   | 24.70     |
|               |            | 1       | 7         | 24.86     | 24.56   | 24.76     |
|               |            | 1       | 14        | 24.55     | 24.90   | 24.79     |
|               |            | 8       | 0         | 25.00     | 24.61   | 24.72     |
|               |            | 8       | 4         | 24.92     | 24.93   | 24.57     |
|               |            | 8       | 7         | 24.62     | 25.04   | 24.72     |
|               |            | 15      | 0         | 23.84     | 23.97   | 24.01     |
|               | 16QAM      | 1       | 0         | 23.77     | 23.95   | 23.60     |
|               |            | 1       | 7         | 23.57     | 23.92   | 23.51     |
|               |            | 1       | 14        | 24.00     | 24.12   | 23.4      |
|               |            | 8       | 0         | 23.85     | 23.72   | 23.55     |
|               |            | 8       | 4         | 24.04     | 23.81   | 23.34     |
|               |            | 8       | 7         | 23.62     | 24.10   | 23.49     |
|               |            | 15      | 0         | 22.65     | 22.70   | 23.10     |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH    | Mid CH  | High CH   |
|---------------|------------|---------|-----------|-----------|---------|-----------|
|               |            |         |           | 18625CH   | 18900CH | 19175CH   |
|               |            |         |           | 1852.5MHz | 1880MHz | 1907.5MHz |
| 2 / 5M        | QPSK       | 1       | 0         | 24.96     | 24.87   | 24.84     |
|               |            | 1       | 13        | 24.76     | 24.75   | 24.70     |
|               |            | 1       | 24        | 24.92     | 24.89   | 24.57     |
|               |            | 12      | 0         | 24.90     | 24.93   | 24.68     |
|               |            | 12      | 6         | 24.83     | 25.12   | 24.74     |
|               |            | 12      | 11        | 25.09     | 24.81   | 24.62     |
|               |            | 25      | 0         | 23.90     | 23.88   | 23.75     |
|               | 16QAM      | 1       | 0         | 23.15     | 23.42   | 23.23     |
|               |            | 1       | 13        | 23.41     | 23.27   | 23.45     |
|               |            | 1       | 24        | 23.02     | 23.21   | 23.04     |
|               |            | 12      | 0         | 23.21     | 23.63   | 23.35     |
|               |            | 12      | 6         | 23.38     | 23.41   | 23.23     |
|               |            | 12      | 11        | 23.07     | 23.60   | 23.12     |
|               |            | 25      | 0         | 22.75     | 22.84   | 22.82     |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH  | Mid CH  | High CH |
|---------------|------------|---------|-----------|---------|---------|---------|
|               |            |         |           | 18650CH | 18900CH | 19150CH |
|               |            |         |           | 1855MHz | 1880MHz | 1905MHz |
| 2 / 10M       | QPSK       | 1       | 0         | 24.94   | 25.01   | 24.87   |
|               |            | 1       | 25        | 24.91   | 24.72   | 24.90   |
|               |            | 1       | 49        | 24.78   | 25.31   | 24.80   |
|               |            | 25      | 0         | 24.90   | 25.28   | 25.08   |
|               |            | 25      | 13        | 25.01   | 25.09   | 24.76   |
|               |            | 25      | 25        | 24.88   | 24.91   | 24.61   |
|               |            | 50      | 0         | 23.74   | 23.85   | 23.68   |
|               | 16QAM      | 1       | 0         | 23.64   | 23.73   | 23.57   |
|               |            | 1       | 25        | 23.35   | 23.81   | 23.36   |
|               |            | 1       | 49        | 23.63   | 23.63   | 23.41   |
|               |            | 25      | 0         | 23.80   | 23.73   | 23.53   |
|               |            | 25      | 13        | 23.55   | 23.96   | 23.87   |
|               |            | 25      | 25        | 23.42   | 23.68   | 23.86   |
|               |            | 50      | 0         | 22.80   | 22.86   | 22.72   |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH    | Mid CH  | High CH   |
|---------------|------------|---------|-----------|-----------|---------|-----------|
|               |            |         |           | 18675CH   | 18900CH | 19125CH   |
|               |            |         |           | 1857.5MHz | 1880MHz | 1902.5MHz |
| 2 / 15M       | QPSK       | 1       | 0         | 24.73     | 24.82   | 24.80     |
|               |            | 1       | 38        | 24.54     | 24.67   | 24.53     |
|               |            | 1       | 74        | 24.92     | 24.89   | 24.73     |
|               |            | 36      | 0         | 24.65     | 24.65   | 24.56     |
|               |            | 36      | 18        | 24.61     | 25.01   | 24.89     |
|               |            | 36      | 39        | 24.94     | 25.05   | 24.50     |
|               |            | 75      | 0         | 23.75     | 23.89   | 23.70     |
|               | 16QAM      | 1       | 0         | 23.40     | 23.45   | 23.35     |
|               |            | 1       | 38        | 23.20     | 23.67   | 23.11     |
|               |            | 1       | 74        | 23.34     | 23.39   | 23.17     |
|               |            | 36      | 0         | 23.28     | 23.31   | 23.46     |
|               |            | 36      | 18        | 23.18     | 23.36   | 23.09     |
|               |            | 36      | 39        | 23.36     | 23.54   | 23.58     |
|               |            | 75      | 0         | 23.06     | 23.12   | 22.95     |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH  | Mid CH  | High CH |
|---------------|------------|---------|-----------|---------|---------|---------|
|               |            |         |           | 18700CH | 18900CH | 19100CH |
|               |            |         |           | 1860MHz | 1880MHz | 1900MHz |
| 2 / 20M       | QPSK       | 1       | 0         | 24.30   | 24.43   | 24.36   |
|               |            | 1       | 50        | 24.43   | 24.34   | 24.25   |
|               |            | 1       | 99        | 24.18   | 24.63   | 24.20   |
|               |            | 50      | 0         | 24.46   | 24.67   | 24.47   |
|               |            | 50      | 25        | 24.57   | 24.14   | 24.26   |
|               |            | 50      | 50        | 24.34   | 24.27   | 24.47   |
|               |            | 100     | 0         | 23.76   | 23.88   | 23.75   |
|               | 16QAM      | 1       | 0         | 23.13   | 23.29   | 23.22   |
|               |            | 1       | 50        | 23.43   | 23.15   | 23.24   |
|               |            | 1       | 99        | 22.94   | 23.55   | 23.42   |
|               |            | 50      | 0         | 23.41   | 23.28   | 23.33   |
|               |            | 50      | 25        | 23.32   | 23.49   | 23.34   |
|               |            | 50      | 50        | 23.35   | 22.99   | 23.09   |
|               |            | 100     | 0         | 22.92   | 23.09   | 22.85   |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH    | Mid CH    | High CH   |
|---------------|------------|---------|-----------|-----------|-----------|-----------|
|               |            |         |           | 26047CH   | 26365CH   | 26683CH   |
|               |            |         |           | 1850.7MHz | 1882.5MHz | 1914.3MHz |
| 25 / 1.4M     | QPSK       | 1       | 0         | 24.73     | 24.84     | 24.66     |
|               |            | 1       | 2         | 24.46     | 25.01     | 24.62     |
|               |            | 1       | 5         | 24.70     | 24.80     | 24.61     |
|               |            | 3       | 0         | 24.86     | 24.58     | 24.68     |
|               |            | 3       | 1         | 24.76     | 24.97     | 24.71     |
|               |            | 3       | 2         | 24.47     | 24.89     | 24.59     |
|               |            | 6       | 0         | 23.74     | 23.82     | 23.70     |
|               | 16QAM      | 1       | 0         | 23.65     | 23.8      | 23.57     |
|               |            | 1       | 2         | 23.78     | 24.04     | 23.29     |
|               |            | 1       | 5         | 23.69     | 23.92     | 23.32     |
|               |            | 3       | 0         | 23.68     | 23.9      | 23.64     |
|               |            | 3       | 1         | 23.44     | 23.74     | 23.77     |
|               |            | 3       | 2         | 23.58     | 23.90     | 23.69     |
|               |            | 6       | 0         | 22.95     | 23.09     | 23.02     |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH    | Mid CH    | High CH   |
|---------------|------------|---------|-----------|-----------|-----------|-----------|
|               |            |         |           | 26055CH   | 26365CH   | 26675CH   |
|               |            |         |           | 1851.5MHz | 1882.5MHz | 1913.5MHz |
| 25 / 3M       | QPSK       | 1       | 0         | 24.55     | 24.70     | 24.60     |
|               |            | 1       | 7         | 24.49     | 24.85     | 24.54     |
|               |            | 1       | 14        | 24.64     | 24.79     | 24.79     |
|               |            | 8       | 0         | 24.61     | 24.52     | 24.59     |
|               |            | 8       | 4         | 24.81     | 24.53     | 24.51     |
|               |            | 8       | 7         | 24.57     | 24.57     | 24.31     |
|               |            | 15      | 0         | 23.74     | 23.95     | 23.84     |
|               | 16QAM      | 1       | 0         | 23.46     | 23.61     | 23.55     |
|               |            | 1       | 7         | 23.44     | 23.37     | 23.66     |
|               |            | 1       | 14        | 23.38     | 23.43     | 23.61     |
|               |            | 8       | 0         | 23.48     | 23.81     | 23.27     |
|               |            | 8       | 4         | 23.65     | 23.80     | 23.57     |
|               |            | 8       | 7         | 23.45     | 23.80     | 23.81     |
|               |            | 15      | 0         | 22.82     | 22.99     | 22.92     |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH    | Mid CH    | High CH   |
|---------------|------------|---------|-----------|-----------|-----------|-----------|
|               |            |         |           | 26065CH   | 26365CH   | 26665CH   |
|               |            |         |           | 1852.5MHz | 1882.5MHz | 1912.5MHz |
| 25 / 5M       | QPSK       | 1       | 0         | 24.62     | 24.86     | 24.77     |
|               |            | 1       | 13        | 24.49     | 24.61     | 24.89     |
|               |            | 1       | 24        | 24.48     | 24.99     | 24.68     |
|               |            | 12      | 0         | 24.75     | 24.90     | 24.56     |
|               |            | 12      | 6         | 24.83     | 24.79     | 24.72     |
|               |            | 12      | 11        | 24.59     | 24.94     | 24.89     |
|               |            | 25      | 0         | 23.74     | 23.96     | 23.87     |
|               | 16QAM      | 1       | 0         | 23.12     | 23.31     | 23.25     |
|               |            | 1       | 13        | 23.20     | 23.1      | 23.54     |
|               |            | 1       | 24        | 23.26     | 23.21     | 23.32     |
|               |            | 12      | 0         | 23.25     | 23.21     | 23.11     |
|               |            | 12      | 6         | 22.91     | 23.53     | 23.34     |
|               |            | 12      | 11        | 23.23     | 23.44     | 23.30     |
|               |            | 25      | 0         | 22.80     | 23.09     | 22.92     |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH  | Mid CH    | High CH   |
|---------------|------------|---------|-----------|---------|-----------|-----------|
|               |            |         |           | 26090CH | 26365CH   | 26640CH   |
|               |            |         |           | 1855MHz | 1882.5MHz | 1910.0MHz |
| 25 / 10M      | QPSK       | 1       | 0         | 24.74   | 24.94     | 24.80     |
|               |            | 1       | 25        | 24.74   | 25.14     | 25.01     |
|               |            | 1       | 49        | 24.93   | 25.20     | 24.79     |
|               |            | 25      | 0         | 24.63   | 24.97     | 24.67     |
|               |            | 25      | 13        | 24.52   | 24.98     | 24.86     |
|               |            | 25      | 25        | 24.59   | 24.70     | 24.85     |
|               |            | 50      | 0         | 24.05   | 23.94     | 23.86     |
|               | 16QAM      | 1       | 0         | 23.53   | 23.71     | 23.46     |
|               |            | 1       | 25        | 23.55   | 23.89     | 23.36     |
|               |            | 1       | 49        | 23.40   | 23.42     | 23.20     |
|               |            | 25      | 0         | 23.64   | 23.52     | 23.61     |
|               |            | 25      | 13        | 23.68   | 23.97     | 23.42     |
|               |            | 25      | 25        | 23.60   | 23.91     | 23.76     |
|               |            | 50      | 0         | 22.74   | 22.95     | 22.91     |

| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH    | Mid CH    | High CH   |
|---------------|------------|---------|-----------|-----------|-----------|-----------|
|               |            |         |           | 26115CH   | 26365CH   | 26615CH   |
|               |            |         |           | 1857.5MHz | 1882.5MHz | 1907.5MHz |
| 25 / 15M      | QPSK       | 1       | 0         | 25.02     | 25.24     | 24.97     |
|               |            | 1       | 38        | 25.02     | 25.01     | 24.76     |
|               |            | 1       | 74        | 25.07     | 25.24     | 24.83     |
|               |            | 36      | 0         | 24.81     | 25.41     | 24.95     |
|               |            | 36      | 18        | 25.24     | 25.16     | 24.83     |
|               |            | 36      | 39        | 24.84     | 25.47     | 25.14     |
|               |            | 75      | 0         | 23.64     | 23.89     | 23.76     |
|               | 16QAM      | 1       | 0         | 23.70     | 23.94     | 23.98     |
|               |            | 1       | 38        | 23.59     | 23.94     | 24.04     |
|               |            | 1       | 74        | 23.51     | 24.15     | 23.71     |
|               |            | 36      | 0         | 23.72     | 23.97     | 23.99     |
|               |            | 36      | 18        | 23.52     | 24.21     | 23.85     |
|               |            | 36      | 39        | 23.43     | 24.00     | 24.06     |
|               |            | 75      | 0         | 22.66     | 22.97     | 22.87     |

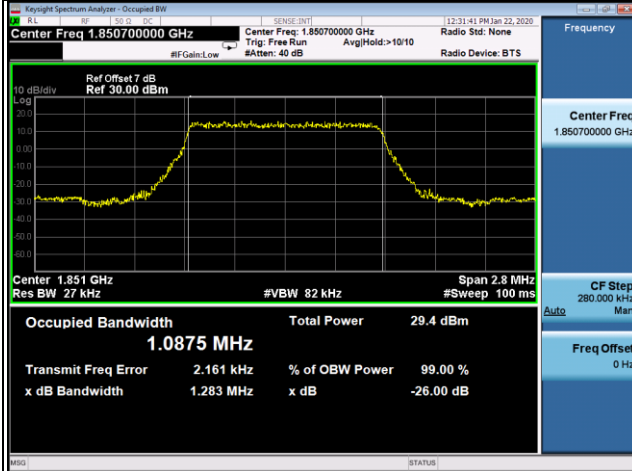
| LTE Band / BW | Modulation | RB Size | RB Offset | Low CH  | Mid CH    | High CH |
|---------------|------------|---------|-----------|---------|-----------|---------|
|               |            |         |           | 26140CH | 26365CH   | 26590CH |
|               |            |         |           | 1860MHz | 1882.5MHz | 1905MHz |
| 25 / 20M      | QPSK       | 1       | 0         | 23.97   | 24.33     | 24.15   |
|               |            | 1       | 50        | 24.26   | 24.44     | 24.23   |
|               |            | 1       | 99        | 23.76   | 24.34     | 24.40   |
|               |            | 50      | 0         | 23.97   | 24.14     | 24.18   |
|               |            | 50      | 25        | 24.11   | 24.56     | 24.09   |
|               |            | 50      | 50        | 23.72   | 24.50     | 24.37   |
|               |            | 100     | 0         | 23.77   | 23.96     | 23.86   |
|               | 16QAM      | 1       | 0         | 23.18   | 23.35     | 23.21   |
|               |            | 1       | 50        | 23.34   | 23.53     | 23.10   |
|               |            | 1       | 99        | 23.14   | 23.46     | 23.47   |
|               |            | 50      | 0         | 23.35   | 23.09     | 23.09   |
|               |            | 50      | 25        | 23.02   | 23.15     | 23.01   |
|               |            | 50      | 50        | 23.37   | 23.39     | 22.98   |
|               |            | 100     | 0         | 22.75   | 22.94     | 22.86   |

## **APPENDIX B - OCCUPIED BANDWIDTH**

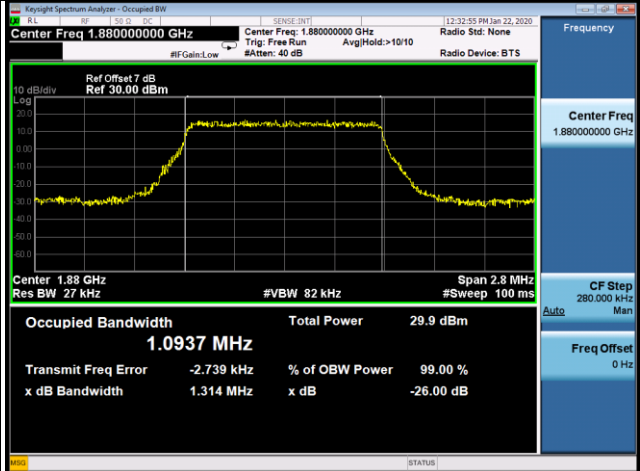
| LTE Band 2_1.4M |                 |                              |         |                 |                              |
|-----------------|-----------------|------------------------------|---------|-----------------|------------------------------|
| QPSK            |                 |                              | 16QAM   |                 |                              |
| Channel         | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |
| 18607           | 1850.7          | 1.0875                       | 18607   | 1850.7          | 1.0884                       |
| 18900           | 1880            | 1.0937                       | 18900   | 1880            | 1.0914                       |
| 19193           | 1909.3          | 1.1032                       | 19193   | 1909.3          | 1.0941                       |
| Channel         | Frequency (MHz) | 26dB Bandwidth (MHz)         | Channel | Frequency (MHz) | 26dB Bandwidth (MHz)         |
| 18607           | 1850.7          | 1.2830                       | 18607   | 1850.7          | 1.3070                       |
| 18900           | 1880            | 1.3140                       | 18900   | 1880            | 1.2910                       |
| 19193           | 1909.3          | 1.3010                       | 19193   | 1909.3          | 1.2910                       |

## Spectrum Plot

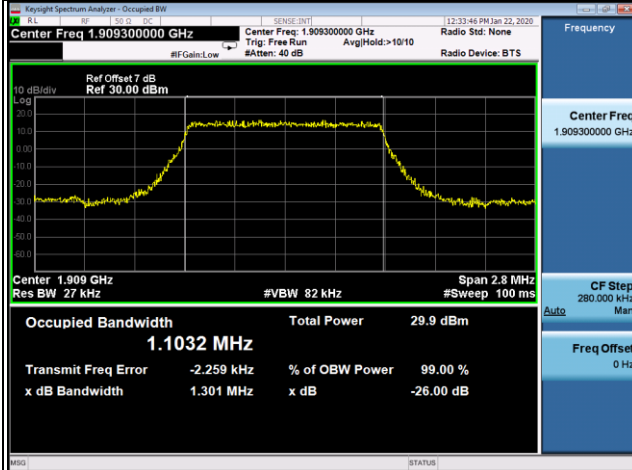
### QPSK-18607



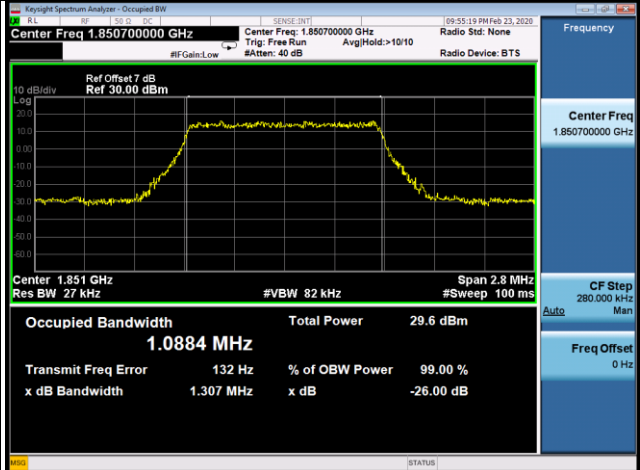
### QPSK-18900



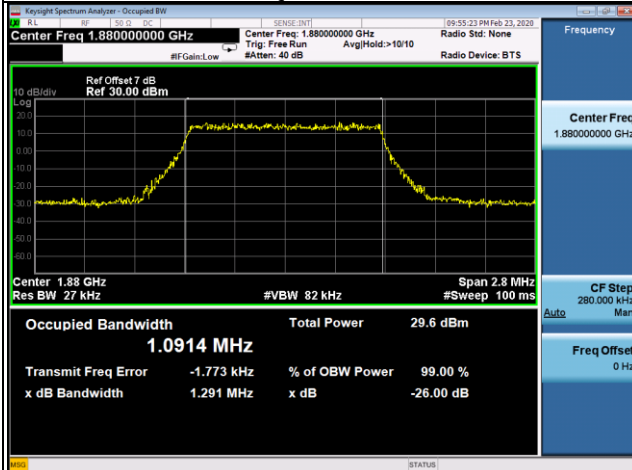
### QPSK-19193



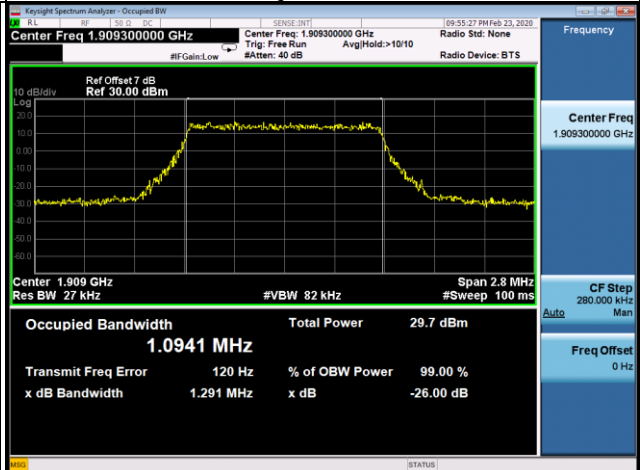
### 16QAM-18607



### 16QAM-18900



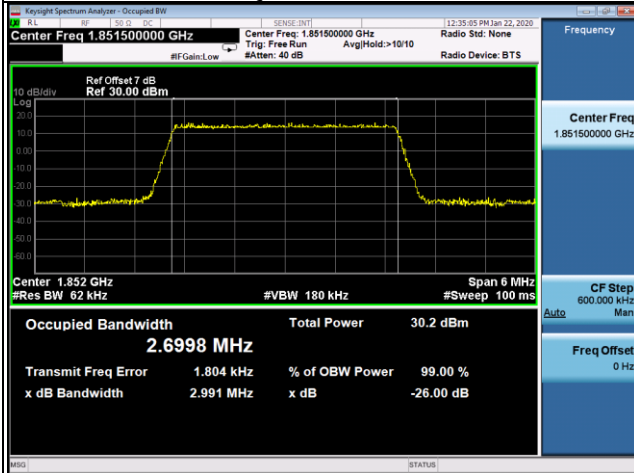
### 16QAM-19193



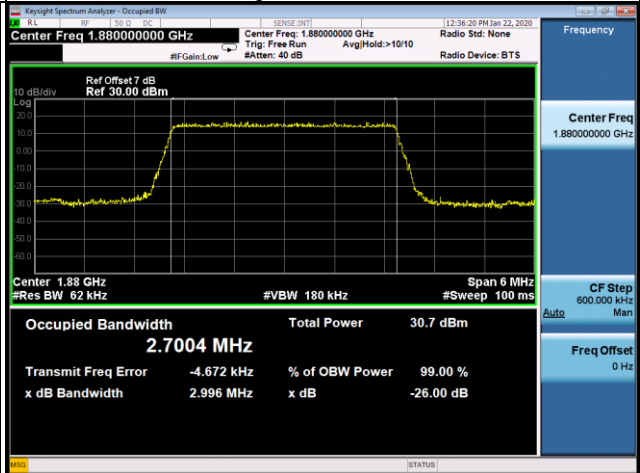
| LTE Band 2_3M |                 |                              |         |                 |                              |
|---------------|-----------------|------------------------------|---------|-----------------|------------------------------|
| QPSK          |                 |                              | 16QAM   |                 |                              |
| Channel       | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |
| 18615         | 1851.5          | 2.6998                       | 18615   | 1851.5          | 2.7044                       |
| 18900         | 1880            | 2.7004                       | 18900   | 1880            | 2.6978                       |
| 19185         | 1908.5          | 2.7006                       | 19185   | 1908.5          | 2.6979                       |
| Channel       | Frequency (MHz) | 26dB Bandwidth (MHz)         | Channel | Frequency (MHz) | 26dB Bandwidth (MHz)         |
| 18615         | 1851.5          | 2.9910                       | 18615   | 1851.5          | 2.9780                       |
| 18900         | 1880            | 2.9960                       | 18900   | 1880            | 2.9830                       |
| 19185         | 1908.5          | 2.9830                       | 19185   | 1908.5          | 2.9990                       |

## Spectrum Plot

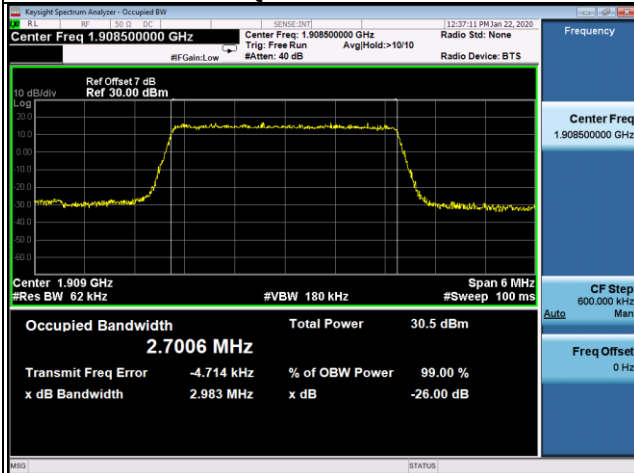
### QPSK-18615



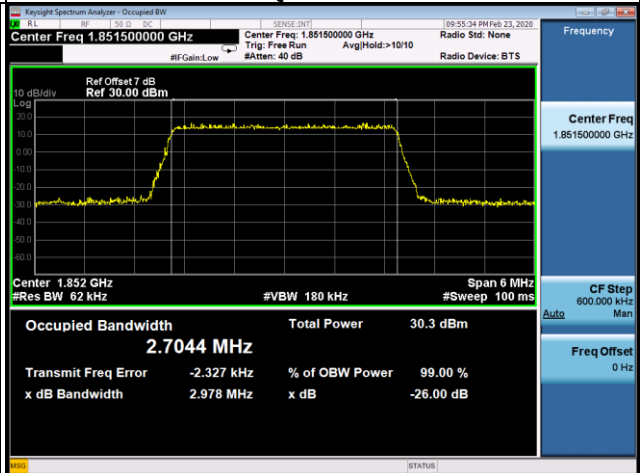
### QPSK-18900



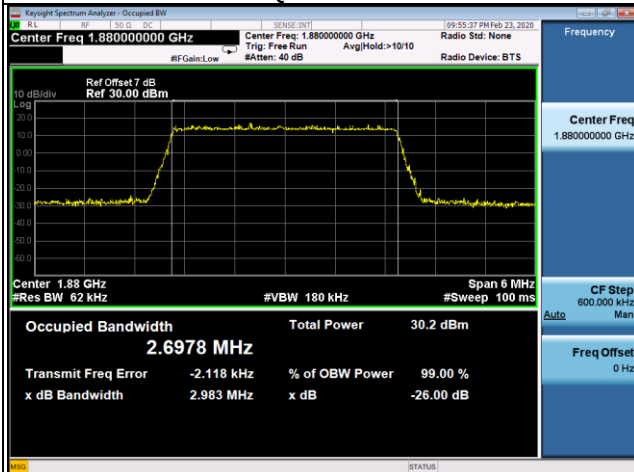
### QPSK-19185



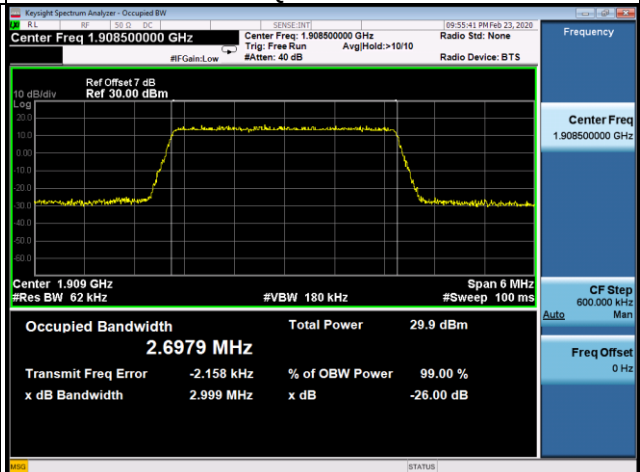
### 16QAM-18615



### 16QAM-18900



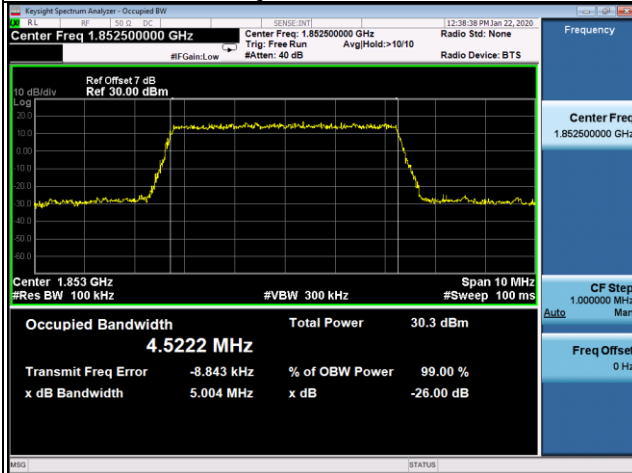
### 16QAM-19185



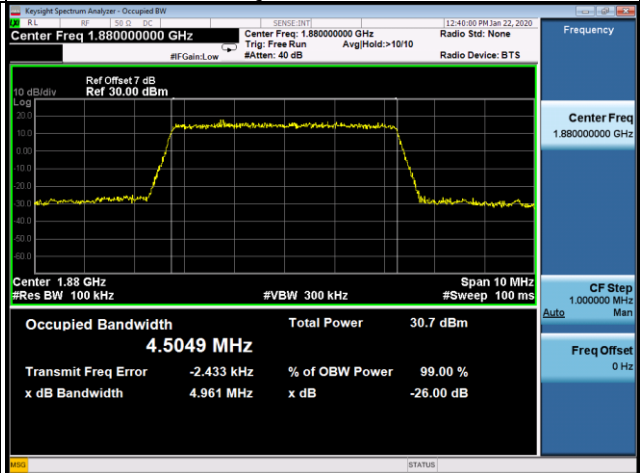
| LTE Band 2_5M |                 |                              |         |                 |                              |
|---------------|-----------------|------------------------------|---------|-----------------|------------------------------|
| QPSK          |                 |                              | 16QAM   |                 |                              |
| Channel       | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |
| 18625         | 1852.5          | 4.5222                       | 18625   | 1852.5          | 4.4952                       |
| 18900         | 1880            | 4.5049                       | 18900   | 1880            | 4.4929                       |
| 19175         | 1907.5          | 4.5025                       | 19175   | 1907.5          | 4.4938                       |
| Channel       | Frequency (MHz) | 26dB Bandwidth (MHz)         | Channel | Frequency (MHz) | 26dB Bandwidth (MHz)         |
| 18625         | 1852.5          | 5.0040                       | 18625   | 1852.5          | 5.0350                       |
| 18900         | 1880            | 4.9610                       | 18900   | 1880            | 4.9620                       |
| 19175         | 1907.5          | 4.9660                       | 19175   | 1907.5          | 4.9380                       |

## Spectrum Plot

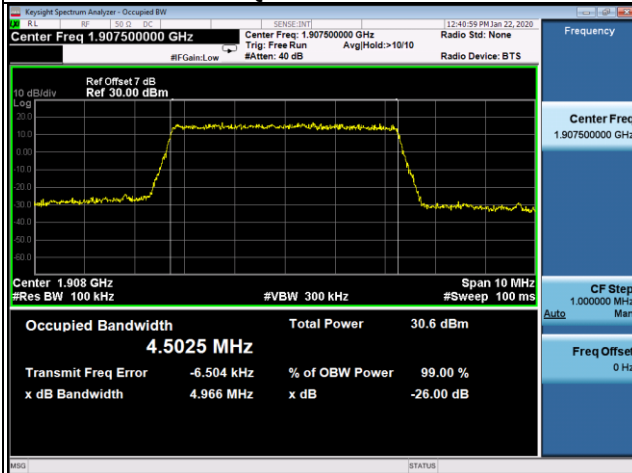
### QPSK-18625



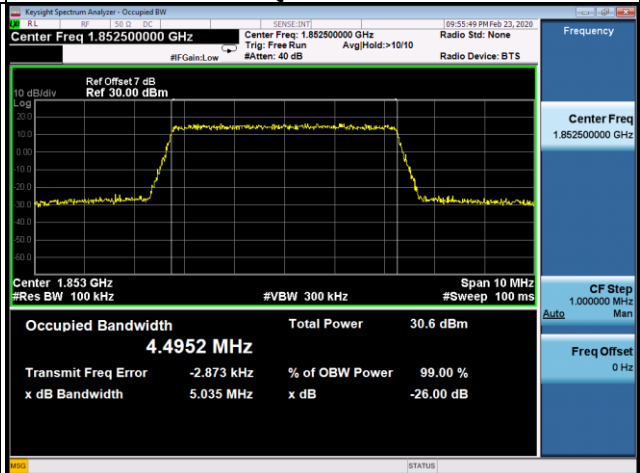
### QPSK-18900



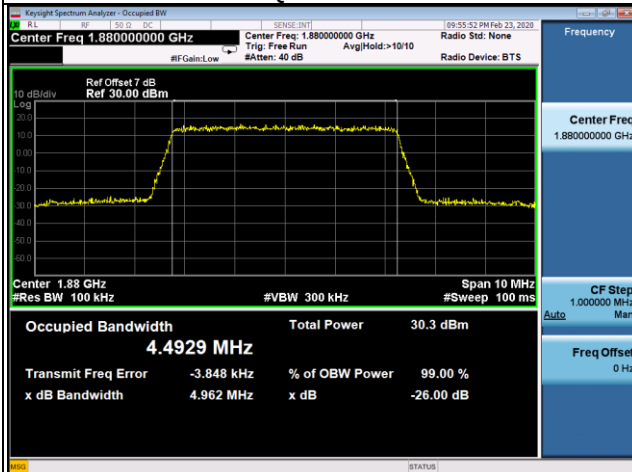
### QPSK-19175



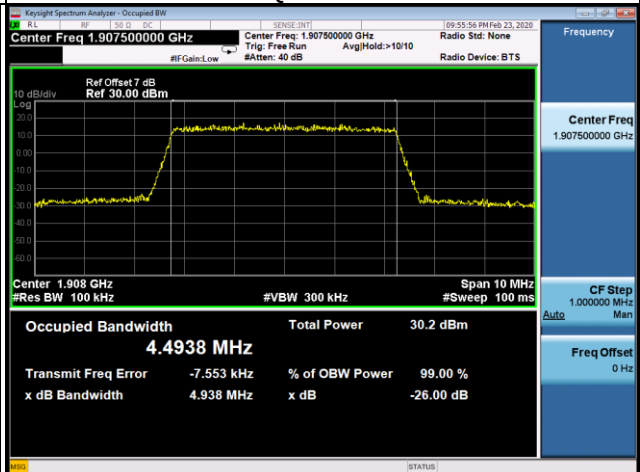
### 16QAM-18625



### 16QAM-18900



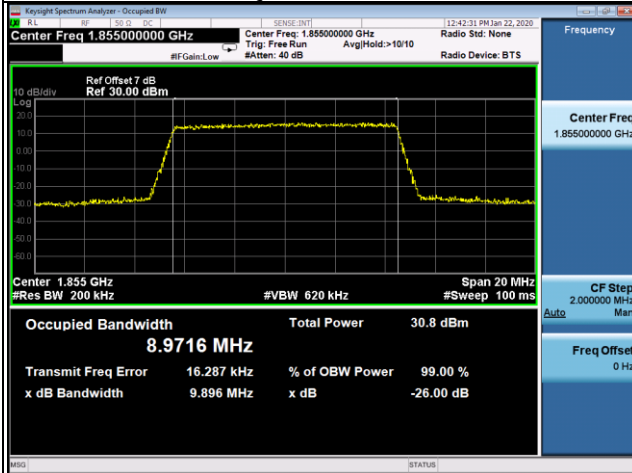
### 16QAM-19175



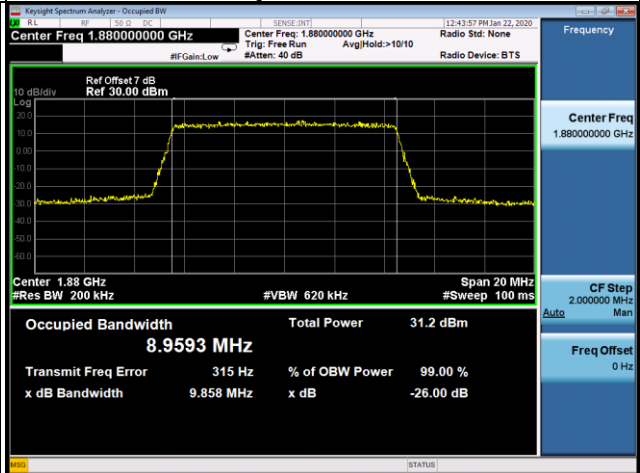
| LTE Band 2_10M |                 |                              |         |                 |                              |
|----------------|-----------------|------------------------------|---------|-----------------|------------------------------|
| QPSK           |                 |                              | 16QAM   |                 |                              |
| Channel        | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |
| 18650          | 1855            | 8.9716                       | 18650   | 1855            | 8.9635                       |
| 18900          | 1880            | 8.9593                       | 18900   | 1880            | 8.9482                       |
| 19150          | 1905            | 8.9685                       | 19150   | 1905            | 8.9710                       |
| Channel        | Frequency (MHz) | 26dB Bandwidth (MHz)         | Channel | Frequency (MHz) | 26dB Bandwidth (MHz)         |
| 18650          | 1855            | 9.8960                       | 18650   | 1855            | 9.8430                       |
| 18900          | 1880            | 9.8580                       | 18900   | 1880            | 9.9320                       |
| 19150          | 1905            | 9.8820                       | 19150   | 1905            | 9.8700                       |

## Spectrum Plot

### QPSK-18650



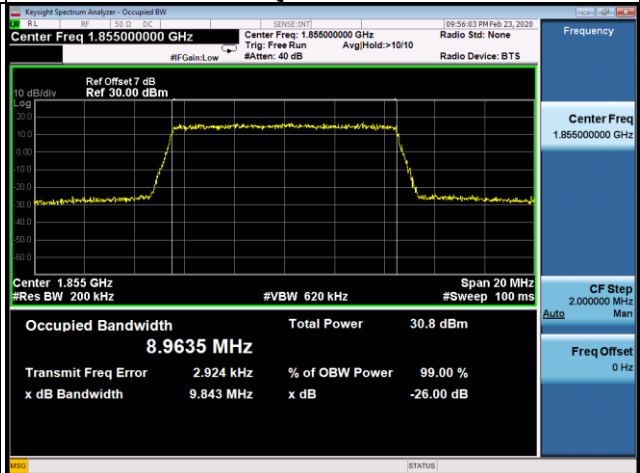
### QPSK-18900



### QPSK-19150



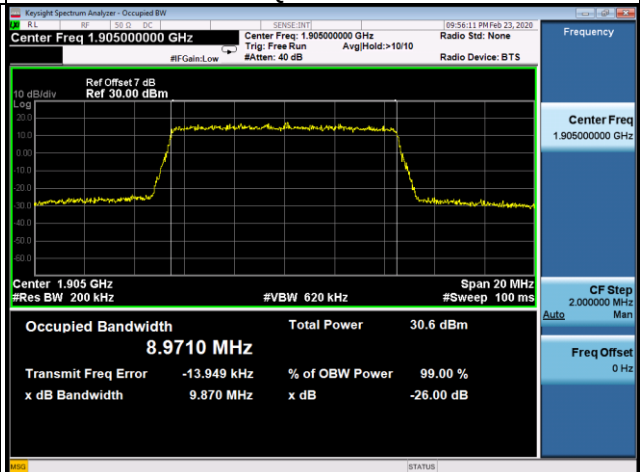
### 16QAM-18650



### 16QAM-18900



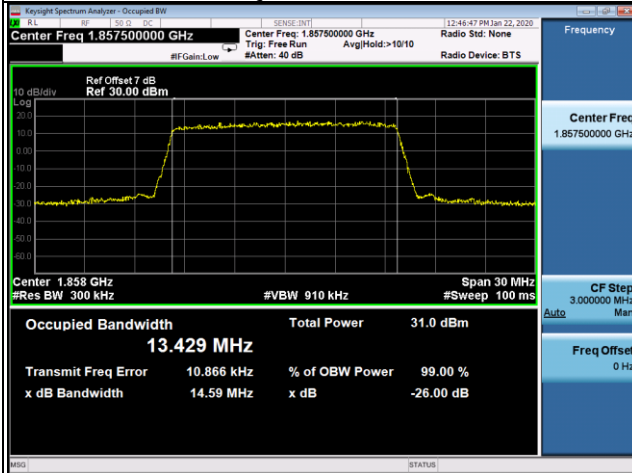
### 16QAM-19150



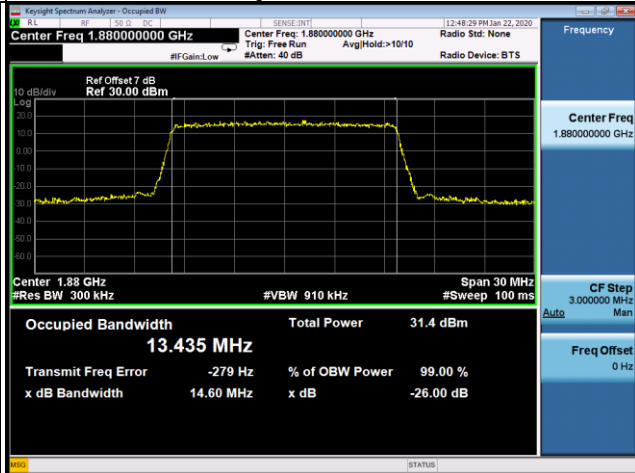
| LTE Band 2_15M |                 |                              |         |                 |                              |
|----------------|-----------------|------------------------------|---------|-----------------|------------------------------|
| QPSK           |                 |                              | 16QAM   |                 |                              |
| Channel        | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |
| 18675          | 1857.5          | 13.4290                      | 18675   | 1857.5          | 13.4220                      |
| 18900          | 1880            | 13.4350                      | 18900   | 1880            | 13.4180                      |
| 19125          | 1902.5          | 13.3630                      | 19125   | 1902.5          | 13.3860                      |
| Channel        | Frequency (MHz) | 26dB Bandwidth (MHz)         | Channel | Frequency (MHz) | 26dB Bandwidth (MHz)         |
| 18675          | 1857.5          | 14.5900                      | 18675   | 1857.5          | 14.6500                      |
| 18900          | 1880            | 14.6000                      | 18900   | 1880            | 14.7100                      |
| 19125          | 1902.5          | 14.6000                      | 19125   | 1902.5          | 14.5800                      |

## Spectrum Plot

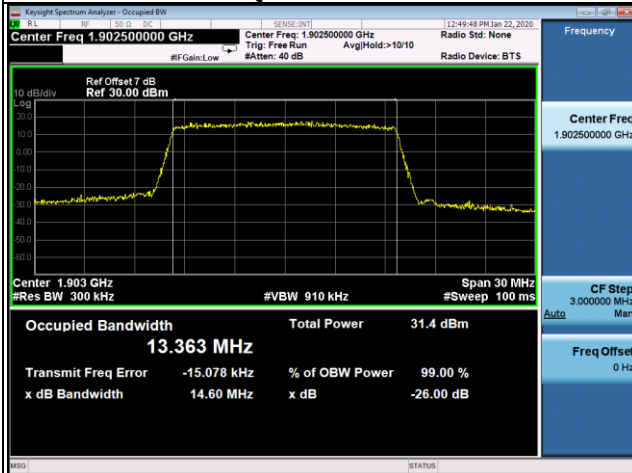
### QPSK-18675



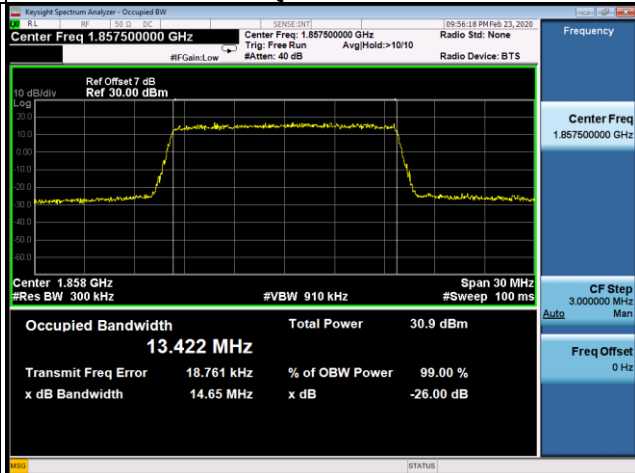
### QPSK-18900



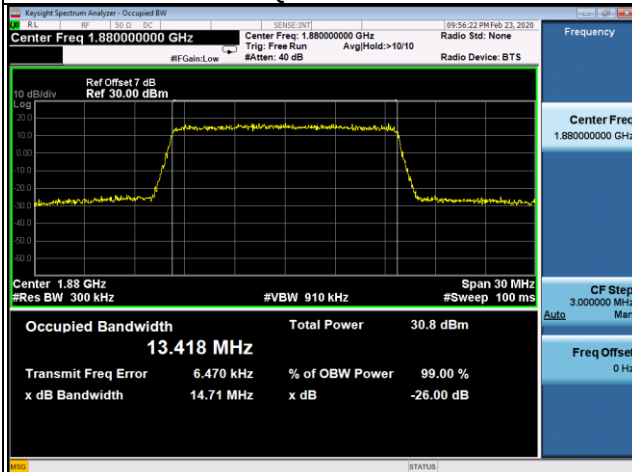
### QPSK-19125



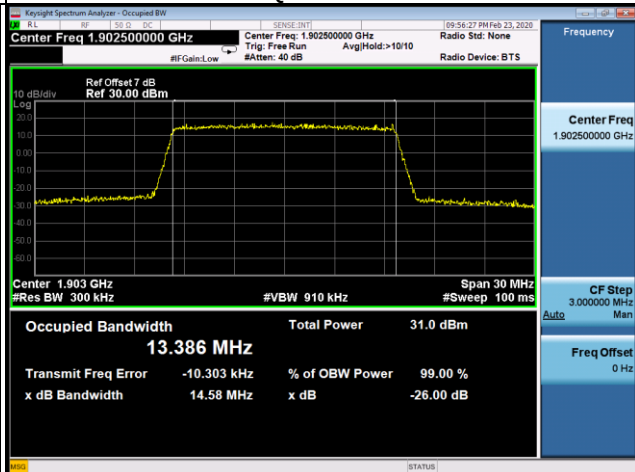
### 16QAM-18675



### 16QAM-18900



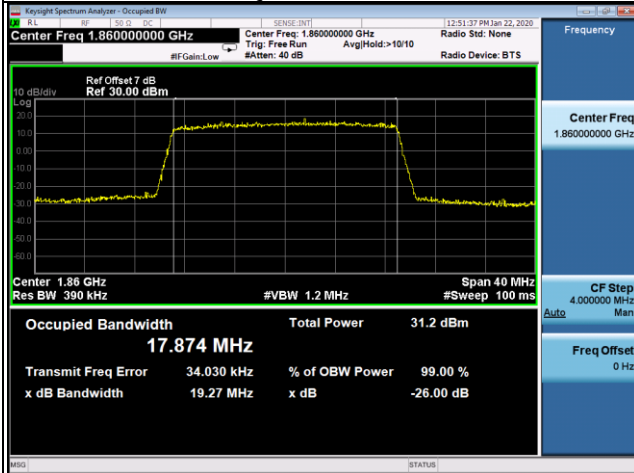
### 16QAM-19125



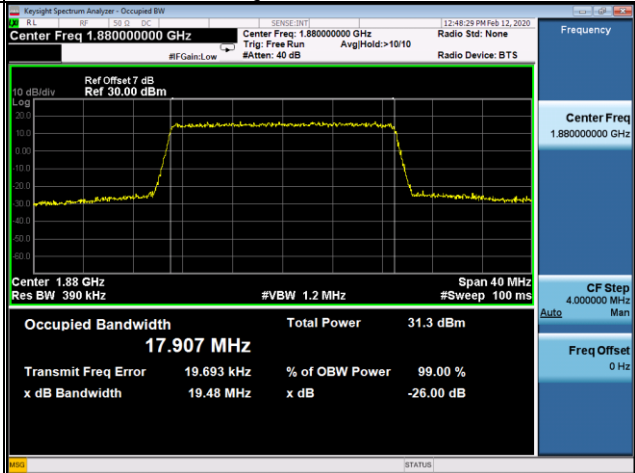
| LTE Band 2_20M |                 |                              |         |                 |                              |
|----------------|-----------------|------------------------------|---------|-----------------|------------------------------|
| QPSK           |                 |                              | 16QAM   |                 |                              |
| Channel        | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |
| 18700          | 1860            | 17.8740                      | 18700   | 1860            | 17.8830                      |
| 18900          | 1880            | 17.9070                      | 18900   | 1880            | 17.8760                      |
| 19100          | 1900            | 17.8370                      | 19100   | 1900            | 17.8510                      |
| Channel        | Frequency (MHz) | 26dB Bandwidth (MHz)         | Channel | Frequency (MHz) | 26dB Bandwidth (MHz)         |
| 18700          | 1860            | 19.2700                      | 18700   | 1860            | 19.2600                      |
| 18900          | 1880            | 19.4800                      | 18900   | 1880            | 19.3700                      |
| 19100          | 1900            | 19.4300                      | 19100   | 1900            | 19.4300                      |

## Spectrum Plot

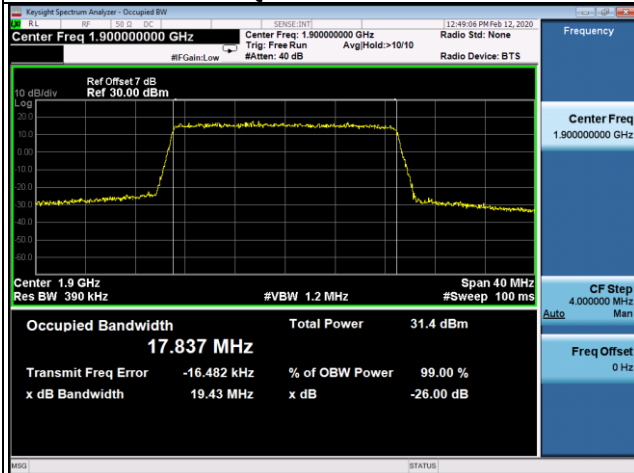
### QPSK-18700



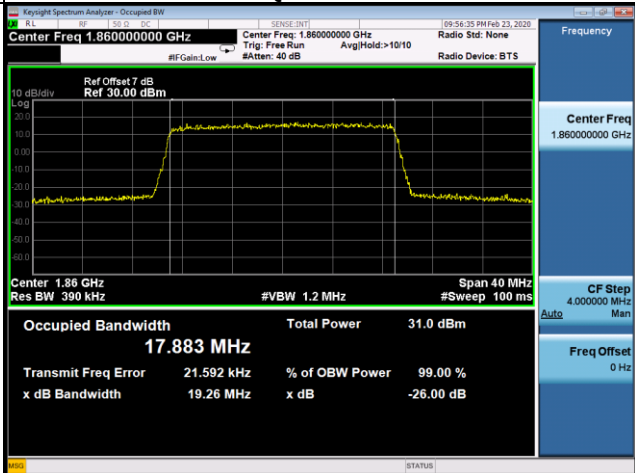
### QPSK-18900



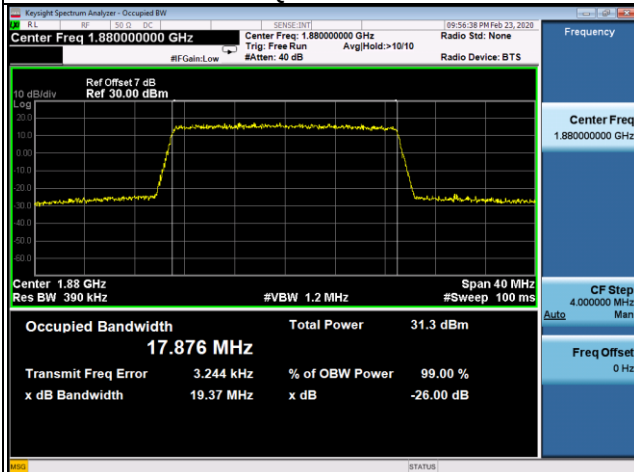
### QPSK-19100



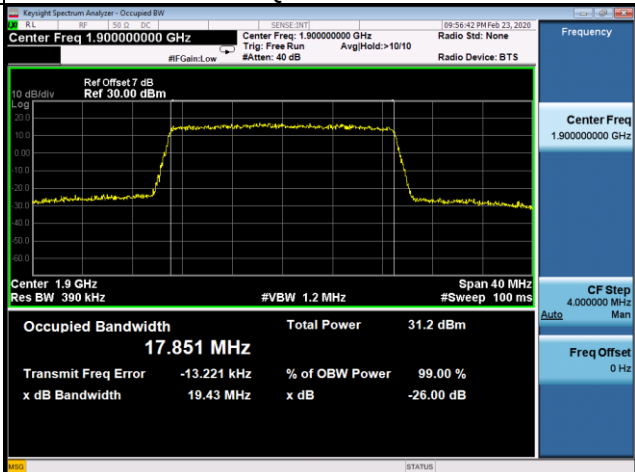
### 16QAM-18700



### 16QAM-18900



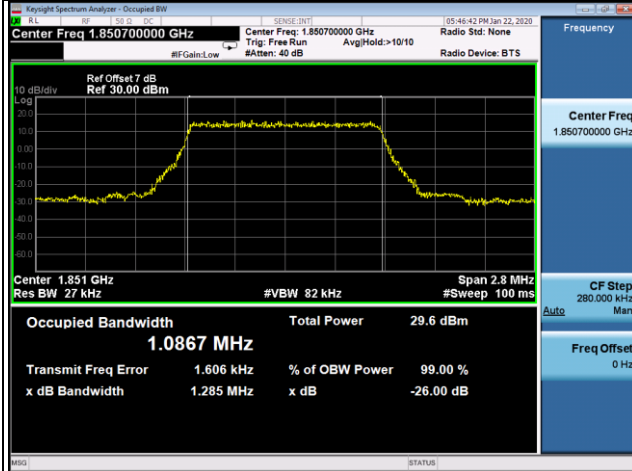
### 16QAM-19100



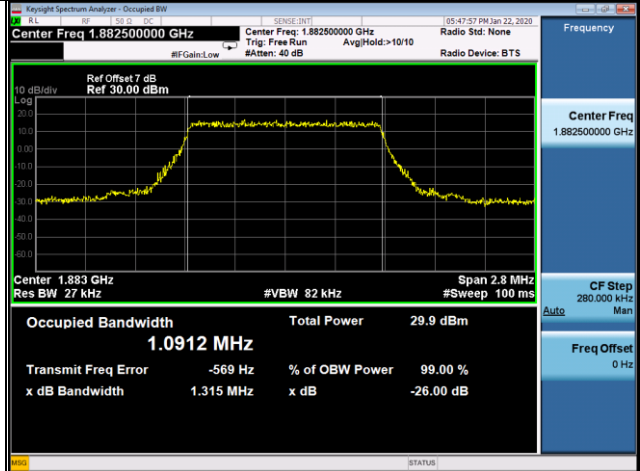
| LTE Band 25_1.4M |                 |                              |         |                 |                              |
|------------------|-----------------|------------------------------|---------|-----------------|------------------------------|
| QPSK             |                 |                              | 16QAM   |                 |                              |
| Channel          | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |
| 26047            | 1850.7          | 1.0867                       | 26047   | 1850.7          | 1.0897                       |
| 26365            | 1882.5          | 1.0912                       | 26365   | 1882.5          | 1.0977                       |
| 26683            | 1914.3          | 1.1018                       | 26683   | 1914.3          | 1.0903                       |
| Channel          | Frequency (MHz) | 26dB Bandwidth (MHz)         | Channel | Frequency (MHz) | 26dB Bandwidth (MHz)         |
| 26047            | 1850.7          | 1.2850                       | 26047   | 1850.7          | 1.3030                       |
| 26365            | 1882.5          | 1.3150                       | 26365   | 1882.5          | 1.2970                       |
| 26683            | 1914.3          | 1.3140                       | 26683   | 1914.3          | 1.3020                       |

## Spectrum Plot

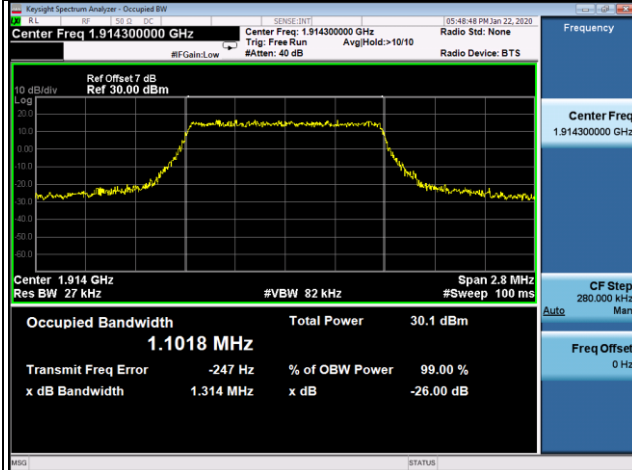
### QPSK-26047



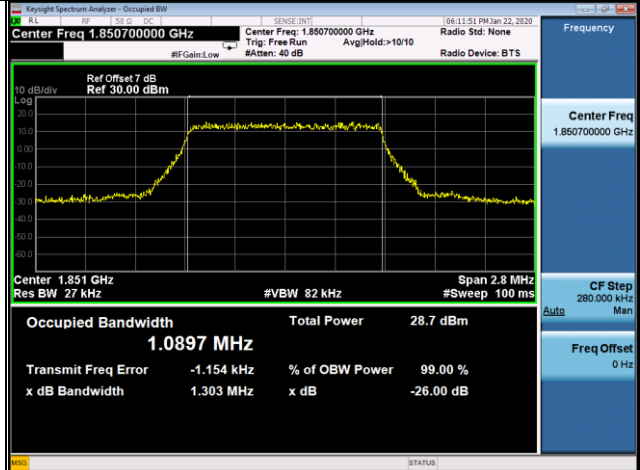
### QPSK-26365



### QPSK-26683



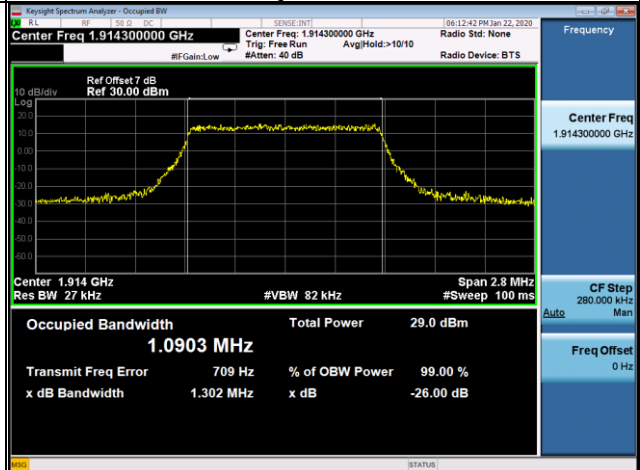
### 16QAM-26047



### 16QAM-26365



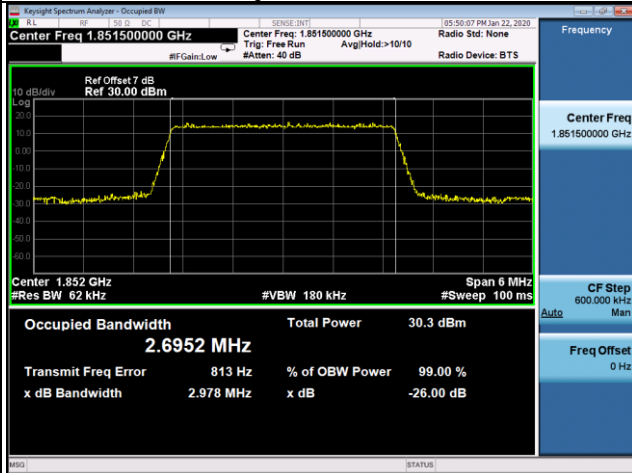
### 16QAM-26683



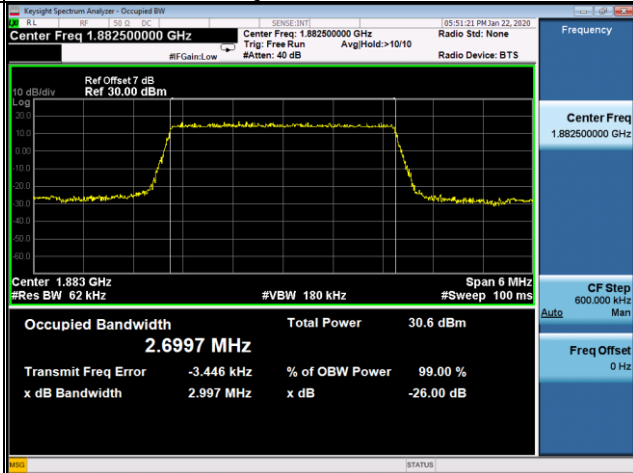
| LTE Band 25_3M |                 |                              |         |                 |                              |
|----------------|-----------------|------------------------------|---------|-----------------|------------------------------|
| QPSK           |                 |                              | 16QAM   |                 |                              |
| Channel        | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |
| 26055          | 1851.5          | 2.6952                       | 26055   | 1851.5          | 2.6981                       |
| 26365          | 1882.5          | 2.6997                       | 26365   | 1882.5          | 2.7010                       |
| 26675          | 1913.5          | 2.6948                       | 26675   | 1913.5          | 2.6973                       |
| Channel        | Frequency (MHz) | 26dB Bandwidth (MHz)         | Channel | Frequency (MHz) | 26dB Bandwidth (MHz)         |
| 26055          | 1851.5          | 2.9780                       | 26055   | 1851.5          | 2.9880                       |
| 26365          | 1882.5          | 2.9970                       | 26365   | 1882.5          | 2.9970                       |
| 26675          | 1913.5          | 2.9690                       | 26675   | 1913.5          | 2.9930                       |

## Spectrum Plot

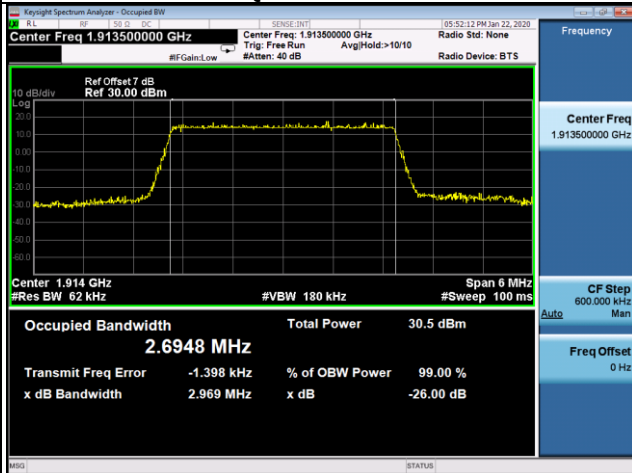
### QPSK-26055



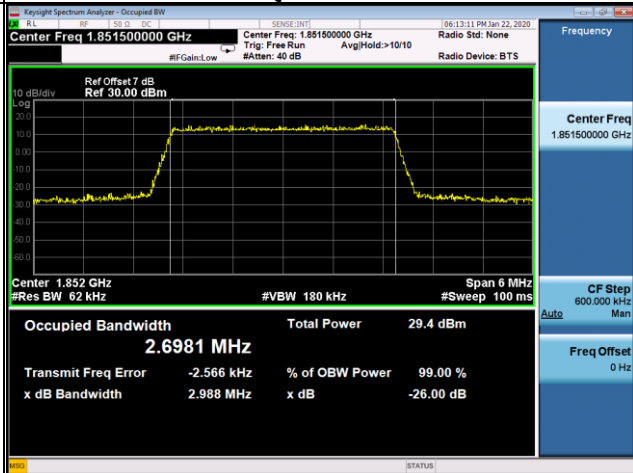
### QPSK-26365



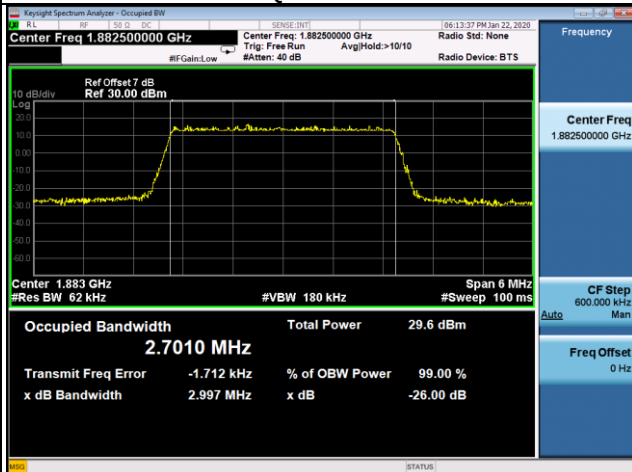
### QPSK-26675



### 16QAM-26055



### 16QAM-26365



### 16QAM-26675

