

## FCC Test Report (PART 24)

**Report No.:** RF170428E06-1

**FCC ID:** MCLT77W676

**Test Model:** T77W676

**Received Date:** Apr. 28, 2017

**Test Date:** June 12 to July 12, 2017

**Issued Date:** July 27, 2017

**Applicant:** HON HAI PRECISION IND. CO., LTD.

**Address:** 5F-1,5 Hsin-An Road Hsinchu, Science-Based Industrial Park Taiwan,  
R.O.C.

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Hsin Chu Laboratory

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**Test Lab (A):** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Hsin Chu Laboratory

**Test Location:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**Test Lab (B):** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Lin Kou Laboratories

**Test Location:** No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City  
33383, TAIWAN (R.O.C.)



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies. This report contains all test data (Except Effective radiated power and Radiated Spurious Emissions) that was produced under subcontract by Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories.

## Table of Contents

|                                                                 |            |
|-----------------------------------------------------------------|------------|
| <b>Release Control Record .....</b>                             | <b>3</b>   |
| <b>1 Certificate of Conformity .....</b>                        | <b>4</b>   |
| <b>2 Summary of Test Results .....</b>                          | <b>5</b>   |
| 2.1 Measurement Uncertainty .....                               | 5          |
| 2.2 Test Site and Instruments .....                             | 6          |
| <b>3 General Information .....</b>                              | <b>9</b>   |
| 3.1 General Description of EUT .....                            | 9          |
| 3.2 Configuration of System under Test .....                    | 14         |
| 3.2.1 Description Of Support Units .....                        | 15         |
| 3.3 Test Mode Applicability and Tested Channel Detail .....     | 16         |
| 3.4 EUT Operating Conditions .....                              | 20         |
| 3.5 General Description of Applied Standards .....              | 21         |
| <b>4 Test Types and Results .....</b>                           | <b>22</b>  |
| 4.1 Output Power Measurement .....                              | 22         |
| 4.1.1 Limits of Output Power Measurement .....                  | 22         |
| 4.1.2 Test Procedures .....                                     | 22         |
| 4.1.3 Test Setup .....                                          | 23         |
| 4.1.4 Test Results .....                                        | 24         |
| 4.2 Frequency Stability Measurement .....                       | 34         |
| 4.2.1 Limits of Frequency Stability Measurement .....           | 34         |
| 4.2.2 Test Procedure .....                                      | 34         |
| 4.2.3 Test Setup .....                                          | 34         |
| 4.2.4 Test Results (Subcontract Item) .....                     | 35         |
| 4.3 Occupied Bandwidth Measurement .....                        | 37         |
| 4.3.1 Test Procedure .....                                      | 37         |
| 4.3.2 Test Setup .....                                          | 37         |
| 4.3.3 Test Result (-26dB Bandwidth, Subcontract Item) .....     | 38         |
| 4.3.4 Test Result (Occupied Bandwidth, Subcontract Item) .....  | 43         |
| 4.4 Band Edge Measurement .....                                 | 48         |
| 4.4.1 Limits of Band Edge Measurement .....                     | 48         |
| 4.4.2 Test Setup .....                                          | 48         |
| 4.4.3 Test Procedures .....                                     | 48         |
| 4.4.4 Test Results (Subcontract Item) .....                     | 49         |
| 4.5 Peak to Average Ratio .....                                 | 62         |
| 4.5.1 Limits of Peak to Average Ratio Measurement .....         | 62         |
| 4.5.2 Test Setup .....                                          | 62         |
| 4.5.3 Test Procedures .....                                     | 62         |
| 4.5.4 Test Results (Subcontract Item) .....                     | 63         |
| 4.6 Conducted Spurious Emissions .....                          | 68         |
| 4.6.1 Limits of Conducted Spurious Emissions Measurement .....  | 68         |
| 4.6.2 Test Setup .....                                          | 68         |
| 4.6.3 Test Procedure .....                                      | 68         |
| 4.6.4 Test Results (Subcontract Item) .....                     | 69         |
| 4.7 Radiated Emission Measurement .....                         | 72         |
| 4.7.1 Limits of Radiated Emission Measurement .....             | 72         |
| 4.7.2 Test Procedure .....                                      | 72         |
| 4.7.3 Deviation from Test Standard .....                        | 72         |
| 4.7.4 Test Setup .....                                          | 73         |
| 4.7.5 Test Results .....                                        | 74         |
| <b>5 Pictures of Test Arrangements .....</b>                    | <b>99</b>  |
| <b>Appendix – Information on the Testing Laboratories .....</b> | <b>100</b> |

### Release Control Record

| Issue No.     | Description       | Date Issued   |
|---------------|-------------------|---------------|
| RF170428E06-1 | Original release. | July 27, 2017 |

## 1 Certificate of Conformity

**Product:** LTE Cat9 PCI Express M.2 Module

**Brand:** FOXCONN

**Test Model:** T77W676

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** HON HAI PRECISION IND. CO., LTD.

**Test Date:** June 12 to July 12, 2017

**Standards:** FCC Part 24

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report. This report contains all test data (Except Effective radiated power and Radiated Spurious Emissions) that was produced under subcontract by Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories.

**Prepared by :**  , **Date:** July 27, 2017  
Claire Kuan / Specialist

**Approved by :**  , **Date:** July 27, 2017  
May Chen / Manager

## 2 Summary of Test Results

| Applied Standard: FCC Part 24 & Part 2 |                                         |        |                                                                                   |
|----------------------------------------|-----------------------------------------|--------|-----------------------------------------------------------------------------------|
| FCC Clause                             | Test Item                               | Result | Remarks                                                                           |
| 2.1046<br>24.232                       | Equivalent Isotropically Radiated Power | PASS   | Meet the requirement of limit.                                                    |
| 2.1046<br>24.232(d)                    | Peak To Average Ratio                   | PASS   | Meet the requirement of limit.                                                    |
| 2.1055<br>24.235                       | Frequency Stability                     | PASS   | Meet the requirement of limit.                                                    |
| 2.1049<br>24.238(b)                    | Occupied Bandwidth                      | PASS   | Meet the requirement of limit.                                                    |
| 24.238(b)                              | Band Edge Measurements                  | PASS   | Meet the requirement of limit.                                                    |
| 2.1051<br>24.238                       | Conducted Spurious Emissions            | PASS   | Meet the requirement of limit.                                                    |
| 2.1053<br>24.238                       | Radiated Spurious Emissions             | PASS   | Meet the requirement of limit.<br>Minimum passing margin is -31.11dB at 16920MHz. |

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement                    | Frequency     | Expanded Uncertainty (k=2) ( $\pm$ ) |
|--------------------------------|---------------|--------------------------------------|
| Radiated Emissions up to 1 GHz | 30MHz ~ 1GHz  | 5.32 dB                              |
| Radiated Emissions above 1 GHz | 1GHz ~ 6GHz   | 5.14 dB                              |
|                                | 6GHz ~ 18GHz  | 5.04 dB                              |
|                                | 18GHz ~ 40GHz | 5.25 dB                              |

## 2.2 Test Site and Instruments

For radiated spurious emissions test:

| DESCRIPTION & MANUFACTURER                     | MODEL NO.                                                   | SERIAL NO.                    | CALIBRATED DATE                                 | CALIBRATED UNTIL                                |
|------------------------------------------------|-------------------------------------------------------------|-------------------------------|-------------------------------------------------|-------------------------------------------------|
| Test Receiver<br>Agilent                       | N9038A                                                      | MY50010156                    | Aug. 18, 2016                                   | Aug. 17, 2017                                   |
| Pre-Amplifier <sup>(*)</sup><br>EMCI           | EMC001340                                                   | 980142                        | Jan. 20, 2016                                   | Jan. 19, 2018                                   |
| Loop Antenna <sup>(*)</sup><br>Electro-Metrics | EM-6879                                                     | 264                           | Dec. 16, 2016                                   | Dec. 15, 2018                                   |
| RF Cable                                       | NA                                                          | LOOPCAB-001<br>LOOPCAB-002    | Jan. 17, 2017                                   | Jan. 16, 2018                                   |
| Pre-Amplifier<br>Mini-Circuits                 | ZFL-1000VH2B                                                | AMP-ZFL-05                    | May 06, 2017                                    | May 05, 2018                                    |
| Trilog Broadband Antenna<br>SCHWARZBECK        | VULB 9168                                                   | 9168-361                      | Dec. 29, 2016                                   | Dec. 28, 2017                                   |
| RF Cable                                       | 8D                                                          | 966-3-1<br>966-3-2<br>966-3-3 | Apr. 01, 2017                                   | Mar. 31, 2018                                   |
| Fixed attenuator<br>Mini-Circuits              | UNAT-5+                                                     | PAD-3m-3-01                   | Oct. 05, 2016                                   | Oct. 04, 2017                                   |
| Horn_Antenna<br>SCHWARZBECK                    | BBHA9120-D                                                  | 9120D-406                     | Dec. 28, 2016                                   | Dec. 27, 2017                                   |
| Pre-Amplifier<br>EMCI                          | EMC12630SE                                                  | 980384                        | Feb. 02, 2017                                   | Feb. 01, 2018                                   |
| RF Cable                                       | EMC104-SM-SM-1200<br>EMC104-SM-SM-2000<br>EMC104-SM-SM-5000 | 160922<br>150317<br>150322    | Feb. 02, 2017<br>Mar. 29, 2017<br>Mar. 29, 2017 | Feb. 01, 2018<br>Mar. 28, 2018<br>Mar. 28, 2018 |
| Spectrum Analyzer<br>Keysight                  | N9030A                                                      | MY54490520                    | July 29, 2016                                   | July 28, 2017                                   |
| Pre-Amplifier<br>EMCI                          | EMC184045SE                                                 | 980386                        | Feb. 02, 2017                                   | Feb. 01, 2018                                   |
| Horn_Antenna<br>SCHWARZBECK                    | BBHA 9170                                                   | BBHA9170608                   | Dec. 15, 2016                                   | Dec. 14, 2017                                   |
| RF Cable                                       | SUCOFLEX 102                                                | 36432/2<br>36433/2            | Jan. 15, 2017                                   | Jan. 14, 2018                                   |
| Software                                       | ADT_Radiated_V8.7.08                                        | NA                            | NA                                              | NA                                              |
| Antenna Tower & Turn Table<br>Max-Full         | MF-7802                                                     | MF780208406                   | NA                                              | NA                                              |
| Boresight Antenna Fixture                      | FBA-01                                                      | FBA-SIP01                     | NA                                              | NA                                              |

### Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. \*The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 3.
4. The FCC Site Registration No. is 147459
5. The CANADA Site Registration No. is 20331-1
6. Tested Date: June 21 to July 12, 2017

**For Radiated power test:**

| DESCRIPTION & MANUFACTURER                     | MODEL NO.                     | SERIAL NO.                          | CALIBRATED DATE | CALIBRATED UNTIL |
|------------------------------------------------|-------------------------------|-------------------------------------|-----------------|------------------|
| Spectrum Analyzer R&S                          | FSV40                         | 100964                              | June 28, 2016   | June 27, 2017    |
| Spectrum Analyzer Keysight                     | N9030A                        | MY54490570                          | July 06, 2016   | July 05, 2017    |
| AC Power Source Extech Electronics             | 6502                          | 1140503                             | NA              | NA               |
| Temperature & Humidity Chamber TERCHY          | MHU-225AU                     | 911033                              | Dec. 02, 2016   | Dec. 01, 2017    |
| DC Power Supply GOOD WILL INSTRUMENT CO., LTD. | GPC - 3030D                   | 7700087                             | NA              | NA               |
| ESG Vector signal generator Agilent            | E4438C                        | Y45094468/005<br>506 602 UK6<br>UNJ | Nov. 25, 2016   | Nov. 24, 2017    |
| Power meter Anritsu                            | ML2495A                       | 1014008                             | May 11, 2017    | May 10, 2018     |
| Power sensor Anritsu                           | MA2411B                       | 0917122                             | May 11, 2017    | May 10, 2018     |
| Software                                       | ADT_RF Test Software V6.6.5.4 | NA                                  | NA              | NA               |
| Digital Multimeter FLUKE                       | 87III                         | 73680266                            | Nov. 10, 2016   | Nov. 09, 2017    |

- NOTE:**
1. The test was performed in Oven room 1.
  2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  3. Tested Date: June 23, 2017

**For other test items:**

| Description & Manufacturer                          | Model No.                    | Serial No.                     | Cal. Date     | Cal. Due      |
|-----------------------------------------------------|------------------------------|--------------------------------|---------------|---------------|
| Test Receiver<br>ROHDE & SCHWARZ                    | ESIB7                        | 100187                         | May 02, 2017  | May 01, 2018  |
| Spectrum Analyzer<br>ROHDE & SCHWARZ                | FSP40                        | 100041                         | Nov. 16, 2016 | Nov. 15, 2017 |
| BILOG Antenna<br>SCHWARZBECK                        | VULB9168                     | 9168-171                       | Dec. 28, 2016 | Dec. 27, 2017 |
| HORN Antenna<br>SCHWARZBECK                         | 9120D                        | 209                            | Dec. 27, 2016 | Dec. 26, 2017 |
| HORN Antenna<br>SCHWARZBECK                         | BBHA 9170                    | BBHA9170241                    | Dec. 14, 2016 | Dec. 13, 2017 |
| Preamplifier<br>Agilent                             | 8447D                        | 2944A10738                     | Aug. 22, 2016 | Aug. 21, 2017 |
| Preamplifier<br>Agilent                             | 8449B                        | 3008A01963                     | Aug. 22, 2016 | Aug. 21, 2017 |
| RF signal cable<br>HUBER+SUHNER                     | SUCOFLEX 104                 | Cable-CH3-03 (214378)          | Aug. 22, 2016 | Aug. 21, 2017 |
| RF signal cable<br>HUBER+SUHNER                     | SUCOFLEX 106                 | Cable-CH3-03<br>(309224+12738) | Aug. 22, 2016 | Aug. 21, 2017 |
| Software<br>BV ADT                                  | ADT_Radiated_<br>V7.6.15.9.4 | NA                             | NA            | NA            |
| Antenna Tower<br>inn-co GmbH                        | MA 4000                      | 013303                         | NA            | NA            |
| Antenna Tower Controller<br>BV ADT                  | AT100                        | AT93021702                     | NA            | NA            |
| Turn Table<br>BV ADT                                | TT100                        | TT93021702                     | NA            | NA            |
| Turn Table Controller<br>BV ADT                     | SC100                        | SC93021702                     | NA            | NA            |
| WIT Standard<br>Temperature And Humidity<br>Chamber | TH-4S-C                      | W981030                        | Jun. 07, 2017 | Jun. 06, 2018 |
| Mini-Circuits Power<br>Splitter                     | ZN2PD-9G                     | NA                             | Aug. 11, 2016 | Aug. 10, 2017 |
| JFW 20dB attenuation                                | 50HF-020-SMA                 | NA                             | NA            | NA            |

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.  
2. The test was performed in HwaYa Chamber 3.  
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.  
4. The FCC Site Registration No. is 988962.  
5. The IC Site Registration No. is IC 7450F-3.  
6. Tested Date: June 12 to 15, 2017

### 3 General Information

#### 3.1 General Description of EUT

|                     |                                           |                       |
|---------------------|-------------------------------------------|-----------------------|
| Product             | LTE Cat9 PCI Express M.2 Module           |                       |
| Brand               | FOXCONN                                   |                       |
| Test Model          | T77W676                                   |                       |
| Status of EUT       | ENGINEERING SAMPLE                        |                       |
| Power Supply Rating | DC 5V from host equipment                 |                       |
| Modulation Type     | WCDMA, HSDPA, HSUPA                       | BPSK                  |
|                     | LTE Band 2                                | QPSK, 16QAM           |
|                     | LTE Band 25                               | QPSK, 16QAM           |
| Operating Frequency | WCDMA, HSDPA, HSUPA                       | 1852.4MHz ~1907.6MHz  |
|                     | LTE Band 2                                | 1850.7MHz ~ 1909.3MHz |
|                     | LTE Band 25                               | 1850.7MHz ~ 1914.3MHz |
| Max. EIRP Power     | WCDMA                                     | 816.58mW(29.12dBm)    |
|                     | LTE Band 2<br>(Channel Bandwidth 1.4MHz)  | 582.1mW(27.65dBm)     |
|                     | LTE Band 2<br>(Channel Bandwidth 3MHz)    | 590.2mW(27.71dBm)     |
|                     | LTE Band 2<br>(Channel Bandwidth 5MHz)    | 580.76mW(27.64dBm)    |
|                     | LTE Band 2<br>(Channel Bandwidth 10MHz)   | 583.45mW(27.66dBm)    |
|                     | LTE Band 2<br>(Channel Bandwidth 15MHz)   | 597.04mW(27.76dBm)    |
|                     | LTE Band 2<br>(Channel Bandwidth 20MHz)   | 613.76mW(27.88dBm)    |
|                     | LTE Band 25<br>(Channel Bandwidth 1.4MHz) | 711.21mW(28.52dBm)    |
|                     | LTE Band 25<br>(Channel Bandwidth 3MHz)   | 717.79mW(28.56dBm)    |
|                     | LTE Band 25<br>(Channel Bandwidth 5MHz)   | 746.45mW(28.73dBm)    |
|                     | LTE Band 25<br>(Channel Bandwidth 10MHz)  | 743.02mW(28.71dBm)    |
|                     | LTE Band 25<br>(Channel Bandwidth 15MHz)  | 751.62mW(28.76dBm)    |
|                     | LTE Band 25<br>(Channel Bandwidth 20MHz)  | 737.9mW(28.68dBm)     |

|                     |                                           |                                 |
|---------------------|-------------------------------------------|---------------------------------|
| Emission Designator | WCDMA                                     | 4M20F9W                         |
|                     | LTE Band 2<br>(Channel Bandwidth 1.4MHz)  | QPSK: 1M09G7D<br>16QAM: 1M09D7W |
|                     | LTE Band 2<br>(Channel Bandwidth 3MHz)    | QPSK: 2M70G7D<br>16QAM: 2M70D7W |
|                     | LTE Band 2<br>(Channel Bandwidth 5MHz)    | QPSK: 4M49G7D<br>16QAM: 4M49D7W |
|                     | LTE Band 2<br>(Channel Bandwidth 10MHz)   | QPSK: 9M00G7D<br>16QAM: 8M99D7W |
|                     | LTE Band 2<br>(Channel Bandwidth 15MHz)   | QPSK: 13M6G7D<br>16QAM: 13M5D7W |
|                     | LTE Band 2<br>(Channel Bandwidth 20MHz)   | QPSK: 18M1G7D<br>16QAM: 18M1D7W |
|                     | LTE Band 25<br>(Channel Bandwidth 1.4MHz) | QPSK: 1M09G7D<br>16QAM: 1M09D7W |
|                     | LTE Band 25<br>(Channel Bandwidth 3MHz)   | QPSK: 2M70G7D<br>16QAM: 2M70D7W |
|                     | LTE Band 25<br>(Channel Bandwidth 5MHz)   | QPSK: 4M49G7D<br>16QAM: 4M49D7W |
|                     | LTE Band 25<br>(Channel Bandwidth 10MHz)  | QPSK: 8M97G7D<br>16QAM: 8M97D7W |
|                     | LTE Band 25<br>(Channel Bandwidth 15MHz)  | QPSK: 13M5G7D<br>16QAM: 13M5D7W |
|                     | LTE Band 25<br>(Channel Bandwidth 20MHz)  | QPSK: 18M0G7D<br>16QAM: 18M0D7W |
|                     | Antenna Type                              | Refer to Note                   |
| Antenna Connector   | Refer to Note                             |                                 |
| Accessory Device    | NA                                        |                                 |
| Data Cable Supplied | NA                                        |                                 |

Note:

1. The EUT is a WWAN device.
2. The antennas provided to the EUT, please refer to the following table:

| Antenna NO. | Brand  | Model           | Gain(dBi)<br>Including cable loss | Frequency range              | Antenna Type | Connector Type | Cable Length |
|-------------|--------|-----------------|-----------------------------------|------------------------------|--------------|----------------|--------------|
| 1           | TongDa | T-543-8201115-2 | 3.08<br>4.74                      | 791~960MHz<br>1447.9~1606MHz | PIFA         | I-PEX MHF IV   | 100mm        |
| 2           | TongDa | T-543-8201115-1 | 4.17                              | 698~803MHz                   | PIFA         | I-PEX MHF IV   | 100mm        |
| 3           | TongDa | T-543-8201115-3 | 5.99                              | 1710~2700MHz                 | PIFA         | I-PEX MHF IV   | 100mm        |
| 4           | HongBo | 260-23671       | -1.33                             | 703-748MHz                   | PIFA         | I-PEX MHF IV   | 315mm        |
|             |        |                 | -3.23                             | 815-830MHz                   |              |                |              |
|             |        |                 | -3.37                             | 832-862MHz                   |              |                |              |
|             |        |                 | -2.27                             | 824-849MHz                   |              |                |              |
|             |        |                 | -3.11                             | 880-915MHz                   |              |                |              |
|             |        |                 | -4.15                             | 1448-1463MHz                 |              |                |              |
|             |        |                 | -0.64                             | 1710-1785MHz                 |              |                |              |
|             |        |                 | 0.18                              | 1850-1915MHz                 |              |                |              |
|             |        |                 | 0.57                              | 1920-1980MHz                 |              |                |              |
|             | HongBo | 260-23672       | -3.71                             | 758-803MHz                   | PIFA         | I-PEX MHF IV   | 439mm        |
|             |        |                 | -0.95                             | 860-875MHz                   |              |                |              |
|             |        |                 | -3.07                             | 791-821MHz                   |              |                |              |
|             |        |                 | -0.97                             | 869-894MHz                   |              |                |              |
|             |        |                 | -3.5                              | 925-960MHz                   |              |                |              |
|             |        |                 | -5.32                             | 1496-1511MHz                 |              |                |              |
|             |        |                 | -0.09                             | 1805-1880MHz                 |              |                |              |
|             |        |                 | 0.16                              | 1930-1995MHz                 |              |                |              |
|             |        |                 | -0.8                              | 2110-2170MHz                 |              |                |              |

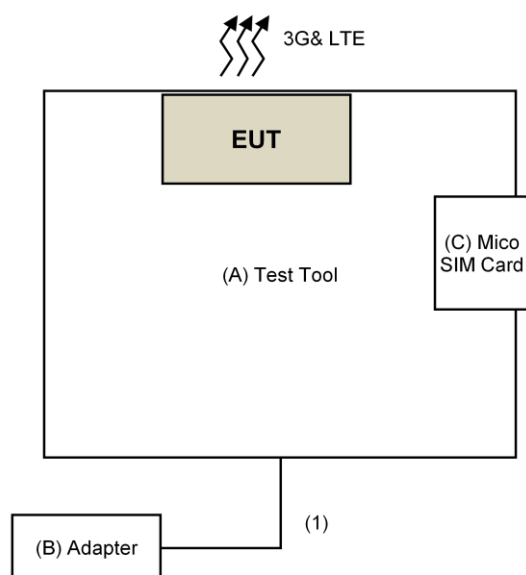
| Antenna NO. | Brand  | Model               | Gain(dBi)<br>Including<br>cable<br>loss | Frequency range | Antenna Type | Connector<br>Type | Cable<br>Length |
|-------------|--------|---------------------|-----------------------------------------|-----------------|--------------|-------------------|-----------------|
| 5           | SPEED  | F.0G.UH-6010-003-00 | -2.81                                   | 703-748MHz      | PIFA         | I-PEX MHF IV      | 315mm           |
|             |        |                     | -1.53                                   | 815-830MHz      |              |                   |                 |
|             |        |                     | -1.96                                   | 832-862MHz      |              |                   |                 |
|             |        |                     | -2.59                                   | 880-915MHz      |              |                   |                 |
|             |        |                     | -4.19                                   | 1448-1463MHz    |              |                   |                 |
|             |        |                     | 1.23                                    | 1710-1785MHz    |              |                   |                 |
|             |        |                     | 0.26                                    | 1850-1883MHz    |              |                   |                 |
|             |        |                     | 1.16                                    | 1915-1980MHz    |              |                   |                 |
|             | SPEED  | F.0G.UH-6010-004-00 | -2.67                                   | 758-803MHz      | PIFA         | I-PEX MHF IV      | 439mm           |
|             |        |                     | -2.42                                   | 791-821MHz      |              |                   |                 |
|             |        |                     | -2.33                                   | 860-894MHz      |              |                   |                 |
|             |        |                     | -0.58                                   | 925-960MHz      |              |                   |                 |
|             |        |                     | -0.17                                   | 1496-1511MHz    |              |                   |                 |
|             |        |                     | 0.83                                    | 1805-1880MHz    |              |                   |                 |
|             |        |                     | -2.72                                   | 1930-1995MHz    |              |                   |                 |
|             |        |                     | -1.67                                   | 2110-2170MHz    |              |                   |                 |
| 6           | HongBo | 260-23675           | -2.68                                   | 703-748MHz      | PIFA         | I-PEX MHF IV      | 363mm           |
|             |        |                     | -0.88                                   | 815-830MHz      |              |                   |                 |
|             |        |                     | -1.66                                   | 832-862MHz      |              |                   |                 |
|             |        |                     | -1.23                                   | 824-849MHz      |              |                   |                 |
|             |        |                     | 1.35                                    | 880-915MHz      |              |                   |                 |
|             |        |                     | 0.8                                     | 1448-1463MHz    |              |                   |                 |
|             |        |                     | 2.03                                    | 1710-1785MHz    |              |                   |                 |
|             |        |                     | 2.02                                    | 1850-1915MHz    |              |                   |                 |
|             | HongBo | 260-23676           | 0.57                                    | 1920-1980MHz    | PIFA         | I-PEX MHF IV      | 522mm           |
|             |        |                     | -2.86                                   | 758-803MHz      |              |                   |                 |
|             |        |                     | 0.51                                    | 860-875MHz      |              |                   |                 |
|             |        |                     | -1.19                                   | 791-821MHz      |              |                   |                 |
|             |        |                     | 0.48                                    | 869-894MHz      |              |                   |                 |
|             |        |                     | -2.29                                   | 925-960MHz      |              |                   |                 |
|             |        |                     | -4.52                                   | 1496-1511MHz    |              |                   |                 |
|             |        |                     | -0.09                                   | 1805-1880MHz    |              |                   |                 |
|             |        |                     | -0.22                                   | 1930-1995MHz    |              |                   |                 |
|             |        |                     | -0.42                                   | 2110-2170MHz    |              |                   |                 |

| Antenna NO. | Brand | Model               | Gain(dBi)<br>Including cable loss | Frequency range | Antenna Type | Connector Type | Cable Length |
|-------------|-------|---------------------|-----------------------------------|-----------------|--------------|----------------|--------------|
| 7           | SPEED | F.0G.UH-6011-003-00 | -3.21                             | 703-748MHz      | PIFA         | I-PEX MHF IV   | 363mm        |
|             |       |                     | -2.73                             | 815-830MHz      |              |                |              |
|             |       |                     | -2.48                             | 832-862MHz      |              |                |              |
|             |       |                     | -3.32                             | 880-915MHz      |              |                |              |
|             |       |                     | -1.86                             | 1448-1463MHz    |              |                |              |
|             |       |                     | -0.57                             | 1710-1785MHz    |              |                |              |
|             |       |                     | -0.63                             | 1850-1883MHz    |              |                |              |
|             |       |                     | 0.44                              | 1915-1980MHz    |              |                |              |
|             | SPEED | F.0G.UH-6011-004-00 | -4                                | 758-803MHz      | PIFA         | I-PEX MHF IV   | 522mm        |
|             |       |                     | -3.43                             | 791-821MHz      |              |                |              |
|             |       |                     | -1.22                             | 860-894MHz      |              |                |              |
|             |       |                     | -2.06                             | 925-960MHz      |              |                |              |
|             |       |                     | -1.83                             | 1496-1511MHz    |              |                |              |
|             |       |                     | 0.48                              | 1805-1880MHz    |              |                |              |
|             |       |                     | -0.2                              | 1930-1995MHz    |              |                |              |
|             |       |                     | -2.87                             | 2110-2170MHz    |              |                |              |

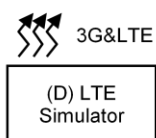
**Set 1~3** were chosen for final test.

3. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

### 3.2 Configuration of System under Test



Remote Site



### 3.2.1 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.

| ID | Product       | Brand    | Model No.   | Serial No. | FCC ID | Remarks            |
|----|---------------|----------|-------------|------------|--------|--------------------|
| A. | Test Tool     | Foxconn  | NA          | NA         | NA     | Supplied by client |
| B. | USB Adapter   | ASUS     | EXA1205UA   | NA         | NA     | Provided by Lab    |
| C. | Mico SIM Card | NA       | NA          | NA         | NA     | Provided by Lab    |
| D. | LTE Simulator | Keysight | E7515-10910 | NA         | NA     | Provided by Lab    |

Note:

1. All power cords of the above support units are non-shielded (1.8m).

| ID | Descriptions | Qty. | Length (m) | Shielding (Yes/No) | Cores (Qty.) | Remarks            |
|----|--------------|------|------------|--------------------|--------------|--------------------|
| 1. | USB Cable    | 1    | 1          | Yes                | 0            | Supplied by client |

### 3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports

The worst case was found when positioned on X-plane. Following channel(s) was (were) selected for the final test as listed below:

#### WCDMA II MODE

| Test Item                       | Available Channel | Tested Channel   | Mode  |
|---------------------------------|-------------------|------------------|-------|
| EIRP                            | 9262 to 9538      | 9262, 9400, 9538 | WCDMA |
| Frequency Stability             | 9262 to 9538      | 9400             | WCDMA |
| Occupied Bandwidth              | 9262 to 9538      | 9262, 9400, 9538 | WCDMA |
| Band Edge                       | 9262 to 9538      | 9262, 9538       | WCDMA |
| Peak to Average Ratio           | 9262 to 9538      | 9262, 9400, 9538 | WCDMA |
| Conducted Emission              | 9262 to 9538      | 9400             | WCDMA |
| Radiated Emission<br>Below 1GHz | 9262 to 9538      | 9400             | WCDMA |
| Radiated Emission<br>Above 1GHz | 9262 to 9538      | 9400             | WCDMA |

## LTE BAND 2 MODE

| TEST ITEM             | AVAILABLE CHANNEL | TESTED CHANNEL      | CHANNEL BANDWIDTH | MODULATION   | MODE                 |
|-----------------------|-------------------|---------------------|-------------------|--------------|----------------------|
| EIRP                  | 18607 to 19193    | 18607, 18900 19193  | 1.4MHz            | QPSK         | 1RB / 0 RB offset    |
|                       | 18615 to 19185    | 18615, 18900, 19185 | 3MHz              | QPSK         | 1RB / 0 RB offset    |
|                       | 18625 to 19175    | 18625, 18900, 19175 | 5MHz              | QPSK         | 1RB / 0 RB offset    |
|                       | 18650 to 19150    | 18650, 18900, 19150 | 10MHz             | QPSK         | 1RB / 0 RB offset    |
|                       | 18675 to 19125    | 18675, 18900, 19125 | 15MHz             | QPSK         | 1RB / 0 RB offset    |
|                       | 18700 to 19100    | 18700, 18900, 19100 | 20MHz             | QPSK         | 1RB / 0 RB offset    |
| Frequency Stability   | 18607 to 19193    | 18900               | 1.4MHz            | QPSK         | -                    |
|                       | 18615 to 19185    | 18900               | 3MHz              | QPSK         | -                    |
|                       | 18625 to 19175    | 18900               | 5MHz              | QPSK         | -                    |
|                       | 18650 to 19150    | 18900               | 10MHz             | QPSK         | -                    |
|                       | 18675 to 19125    | 18900               | 15MHz             | QPSK         | -                    |
|                       | 18700 to 19100    | 18900               | 20MHz             | QPSK         | -                    |
| Occupied Bandwidth    | 18607 to 19193    | 18607, 18900 19193  | 1.4MHz            | QPSK / 16QAM | Full RB              |
|                       | 18615 to 19185    | 18615, 18900, 19185 | 3MHz              | QPSK / 16QAM | Full RB              |
|                       | 18625 to 19175    | 18625, 18900, 19175 | 5MHz              | QPSK / 16QAM | Full RB              |
|                       | 18650 to 19150    | 18650, 18900, 19150 | 10MHz             | QPSK / 16QAM | Full RB              |
|                       | 18675 to 19125    | 18675, 18900, 19125 | 15MHz             | QPSK / 16QAM | Full RB              |
|                       | 18700 to 19100    | 18700, 18900, 19100 | 20MHz             | QPSK / 16QAM | Full RB              |
| Peak to Average Ratio | 18607 to 19193    | 18607, 18900 19193  | 1.4MHz            | QPSK / 16QAM | Full RB              |
|                       | 18615 to 19185    | 18615, 18900, 19185 | 3MHz              | QPSK / 16QAM | Full RB              |
|                       | 18625 to 19175    | 18625, 18900, 19175 | 5MHz              | QPSK / 16QAM | Full RB              |
|                       | 18650 to 19150    | 18650, 18900, 19150 | 10MHz             | QPSK / 16QAM | Full RB              |
|                       | 18675 to 19125    | 18675, 18900, 19125 | 15MHz             | QPSK / 16QAM | Full RB              |
|                       | 18700 to 19100    | 18700, 18900, 19100 | 20MHz             | QPSK / 16QAM | Full RB              |
| Band Edge             | 18607 to 19193    | 18607               | 1.4MHz            | QPSK         | 1 RB / 0 RB Offset   |
|                       |                   | 19193               |                   |              | 1 RB / 5 RB Offset   |
|                       |                   | 18607, 19193        |                   |              | 6 RB / 0 RB Offset   |
|                       | 18615 to 19185    | 18615               | 3MHz              | QPSK         | 1 RB / 0 RB Offset   |
|                       |                   | 19185               |                   |              | 1 RB / 14 RB Offset  |
|                       |                   | 18615, 19185        |                   |              | 15 RB / 0 RB Offset  |
|                       | 18625 to 19175    | 18625,              | 5MHz              | QPSK         | 1 RB / 0 RB Offset   |
|                       |                   | 19175               |                   |              | 1 RB / 24 RB Offset  |
|                       |                   | 18625, 19175        |                   |              | 25 RB / 0 RB Offset  |
|                       | 18650 to 19150    | 18650               | 10MHz             | QPSK         | 1 RB / 0 RB Offset   |
|                       |                   | 19150               |                   |              | 1 RB / 49 RB Offset  |
|                       |                   | 18650, 19150        |                   |              | 50 RB / 0 RB Offset  |
|                       | 18675 to 19125    | 18675,              | 15MHz             | QPSK         | 1 RB / 0 RB Offset   |
|                       |                   | 19125               |                   |              | 1 RB / 74 RB Offset  |
|                       |                   | 18675, 19125        |                   |              | 75 RB / 0 RB Offset  |
|                       | 18700 to 19100    | 18700.              | 20MHz             | QPSK         | 1 RB / 0 RB Offset   |
|                       |                   | 19100               |                   |              | 1 RB / 99 RB Offset  |
|                       |                   | 18700. 19100        |                   |              | 100 RB / 0 RB Offset |

| TEST ITEM           | AVAILABLE CHANNEL | TESTED CHANNEL | CHANNEL BANDWIDTH | MODULATION | MODE               |
|---------------------|-------------------|----------------|-------------------|------------|--------------------|
| Conducuted Emission | 18607 to 19193    | 18900          | 1.4MHz            | QPSK       | 1 RB / 0 RB Offset |
|                     | 18615 to 19185    | 18900          | 3MHz              | QPSK       | 1 RB / 0 RB Offset |
|                     | 18625 to 19175    | 18900          | 5MHz              | QPSK       | 1 RB / 0 RB Offset |
|                     | 18650 to 19150    | 18900          | 10MHz             | QPSK       | 1 RB / 0 RB Offset |
|                     | 18675 to 19125    | 18900          | 15MHz             | QPSK       | 1 RB / 0 RB Offset |
|                     | 18700 to 19100    | 18900          | 20MHz             | QPSK       | 1 RB / 0 RB Offset |
| Radiated Emission   | 18607 to 19193    | 18900          | 1.4MHz            | QPSK       | 1 RB / 0 RB Offset |
|                     | 18615 to 19185    | 18900          | 3MHz              | QPSK       | 1 RB / 0 RB Offset |
|                     | 18625 to 19175    | 18900          | 5MHz              | QPSK       | 1 RB / 0 RB Offset |
|                     | 18650 to 19150    | 18900          | 10MHz             | QPSK       | 1 RB / 0 RB Offset |
|                     | 18675 to 19125    | 18900          | 15MHz             | QPSK       | 1 RB / 0 RB Offset |
|                     | 18700 to 19100    | 18900          | 20MHz             | QPSK       | 1 RB / 0 RB Offset |

## LTE BAND 25 MODE

| TEST ITEM             | AVAILABLE CHANNEL | TESTED CHANNEL      | CHANNEL BANDWIDTH | MODULATION   | MODE                 |
|-----------------------|-------------------|---------------------|-------------------|--------------|----------------------|
| EIRP                  | 26047 to 26683    | 26047, 26365, 26683 | 1.4MHz            | QPSK         | 1RB / 0 RB offset    |
|                       | 26055 to 26675    | 26055, 26365, 26675 | 3MHz              | QPSK         | 1RB / 0 RB offset    |
|                       | 26065 to 26665    | 26065, 26365, 26665 | 5MHz              | QPSK         | 1RB / 0 RB offset    |
|                       | 26090 to 26640    | 26090, 26365, 26640 | 10MHz             | QPSK         | 1RB / 0 RB offset    |
|                       | 26115 to 26615    | 26115, 26365, 26615 | 15MHz             | QPSK         | 1RB / 0 RB offset    |
|                       | 26140 to 26590    | 26140, 26365, 26590 | 20MHz             | QPSK         | 1RB / 0 RB offset    |
| Frequency Stability   | 26047 to 26683    | 26365               | 1.4MHz            | QPSK         | -                    |
|                       | 26055 to 26675    | 26365               | 3MHz              | QPSK         | -                    |
|                       | 26065 to 26665    | 26365               | 5MHz              | QPSK         | -                    |
|                       | 26090 to 26640    | 26365               | 10MHz             | QPSK         | -                    |
|                       | 26115 to 26615    | 26365               | 15MHz             | QPSK         | -                    |
|                       | 26140 to 26590    | 26365               | 20MHz             | QPSK         | -                    |
| Occupied Bandwidth    | 26047 to 26683    | 26047, 26365, 26683 | 1.4MHz            | QPSK / 16QAM | Full RB              |
|                       | 26055 to 26675    | 26055, 26365, 26675 | 3MHz              | QPSK / 16QAM | Full RB              |
|                       | 26065 to 26665    | 26065, 26365, 26665 | 5MHz              | QPSK / 16QAM | Full RB              |
|                       | 26090 to 26640    | 26090, 26365, 26640 | 10MHz             | QPSK / 16QAM | Full RB              |
|                       | 26115 to 26615    | 26115, 26365, 26615 | 15MHz             | QPSK / 16QAM | Full RB              |
|                       | 26140 to 26590    | 26140, 26365, 26590 | 20MHz             | QPSK / 16QAM | Full RB              |
| Peak to Average Ratio | 26047 to 26683    | 26047, 26365, 26683 | 1.4MHz            | QPSK / 16QAM | Full RB              |
|                       | 26055 to 26675    | 26055, 26365, 26675 | 3MHz              | QPSK / 16QAM | Full RB              |
|                       | 26065 to 26665    | 26065, 26365, 26665 | 5MHz              | QPSK / 16QAM | Full RB              |
|                       | 26090 to 26640    | 26090, 26365, 26640 | 10MHz             | QPSK / 16QAM | Full RB              |
|                       | 26115 to 26615    | 26115, 26365, 26615 | 15MHz             | QPSK / 16QAM | Full RB              |
|                       | 26140 to 26590    | 26140, 26365, 26590 | 20MHz             | QPSK / 16QAM | Full RB              |
| Band Edge             | 18607 to 19193    | 26047               | 1.4MHz            | QPSK         | 1 RB / 0 RB Offset   |
|                       |                   | 26683               |                   |              | 1 RB / 5 RB Offset   |
|                       |                   | 26047, 26683        |                   |              | 6 RB / 0 RB Offset   |
|                       | 18615 to 19185    | 26055               | 3MHz              | QPSK         | 1 RB / 0 RB Offset   |
|                       |                   | 26675               |                   |              | 1 RB / 14 RB Offset  |
|                       |                   | 26055, 26675        |                   |              | 15 RB / 0 RB Offset  |
|                       | 18625 to 19175    | 26065               | 5MHz              | QPSK         | 1 RB / 0 RB Offset   |
|                       |                   | 26665               |                   |              | 1 RB / 24 RB Offset  |
|                       |                   | 26065, 26665        |                   |              | 25 RB / 0 RB Offset  |
|                       | 18650 to 19150    | 26090               | 10MHz             | QPSK         | 1 RB / 0 RB Offset   |
|                       |                   | 26640               |                   |              | 1 RB / 49 RB Offset  |
|                       |                   | 26090, 26640        |                   |              | 50 RB / 0 RB Offset  |
|                       | 18675 to 19125    | 26115               | 15MHz             | QPSK         | 1 RB / 0 RB Offset   |
|                       |                   | 26615               |                   |              | 1 RB / 74 RB Offset  |
|                       |                   | 26115, 26615        |                   |              | 75 RB / 0 RB Offset  |
|                       | 18700 to 19100    | 26140               | 20MHz             | QPSK         | 1 RB / 0 RB Offset   |
|                       |                   | 26590               |                   |              | 1 RB / 99 RB Offset  |
|                       |                   | 26140, 26590        |                   |              | 100 RB / 0 RB Offset |

| TEST ITEM           | AVAILABLE CHANNEL | TESTED CHANNEL | CHANNEL BANDWIDTH | MODULATION | MODE              |
|---------------------|-------------------|----------------|-------------------|------------|-------------------|
| Conducuted Emission | 18607 to 19193    | 26365          | 1.4MHz            | QPSK       | 1RB / 0 RB offset |
|                     | 18615 to 19185    | 26365          | 3MHz              | QPSK       | 1RB / 0 RB offset |
|                     | 18625 to 19175    | 26365          | 5MHz              | QPSK       | 1RB / 0 RB offset |
|                     | 18650 to 19150    | 26365          | 10MHz             | QPSK       | 1RB / 0 RB offset |
|                     | 18675 to 19125    | 26365          | 15MHz             | QPSK       | 1RB / 0 RB offset |
|                     | 18700 to 19100    | 26365          | 20MHz             | QPSK       | 1RB / 0 RB offset |
| Radiated Emission   | 18607 to 19193    | 26365          | 1.4MHz            | QPSK       | 1RB / 0 RB offset |
|                     | 18615 to 19185    | 26365          | 3MHz              | QPSK       | 1RB / 0 RB offset |
|                     | 18625 to 19175    | 26365          | 5MHz              | QPSK       | 1RB / 0 RB offset |
|                     | 18650 to 19150    | 26365          | 10MHz             | QPSK       | 1RB / 0 RB offset |
|                     | 18675 to 19125    | 26365          | 15MHz             | QPSK       | 1RB / 0 RB offset |
|                     | 18700 to 19100    | 26365          | 20MHz             | QPSK       | 1RB / 0 RB offset |

**NOTE:**

All supported modulation types were evaluated. The Worst case of QPSK was selected. Therefore, the Output power, Frequency Stability, Emission Mask, Conducuted Emission and Radiated Emission were presented under QPSK mode only.

**Test Condition:**

| Test Item                       | Environmental Conditions | Input Power  | Tested By |
|---------------------------------|--------------------------|--------------|-----------|
| EIRP                            | 25deg. C, 63%RH          | 120Vac, 60Hz | Weiwei Lo |
| Frequency Stability             | 23deg. C, 68%RH          | 120Vac, 60Hz | Anson Lin |
| Occupied Bandwidth              | 23deg. C, 68%RH          | 120Vac, 60Hz | Anson Lin |
| Band Edge                       | 23deg. C, 68%RH          | 120Vac, 60Hz | Anson Lin |
| Peak to Average Ratio           | 23deg. C, 68%RH          | 120Vac, 60Hz | Anson Lin |
| Conducuted Emission             | 23deg. C, 68%RH          | 120Vac, 60Hz | Anson Lin |
| Radiated Emission<br>Below 1GHz | 25deg. C, 66%RH          | 120Vac, 60Hz | Weiwei Lo |
| Radiated Emission<br>Above 1GHz | 23deg. C, 68%RH          | 120Vac, 60Hz | Weiwei Lo |

### 3.4 EUT Operating Conditions

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

### **3.5 General Description of Applied Standards**

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC 47 CFR Part 2**

**FCC 47 CFR Part 24**

**KDB 971168 D01 Power Meas License Digital Systems v02r02**

**ANSI/TIA/EIA-603-D 2010**

**NOTE:** All test items have been performed and recorded as per the above standards.

## 4 Test Types and Results

### 4.1 Output Power Measurement

#### 4.1.1 Limits of Output Power Measurement

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

#### 4.1.2 Test Procedures

##### Conducted Power Measurement:

The EUT was set up for the maximum power with WCDMA & 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.

##### EIRP Measurement:

- a. All measurements were done at low, middle and high operational frequency range. Set the RBW  $\geq$  OBW and VBW  $\geq$  3xRBW.
- b. Substitution method is used for EIRP measurement. In the semi-anechoic chamber, EUT placed on the 0.8m/1.5m 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.
- c. The substitution 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 b. Record the power level of S.G
- d.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution antenna}$ .

Note: The worst case vertical or horizontal polarization have been investigated and reported in this report.

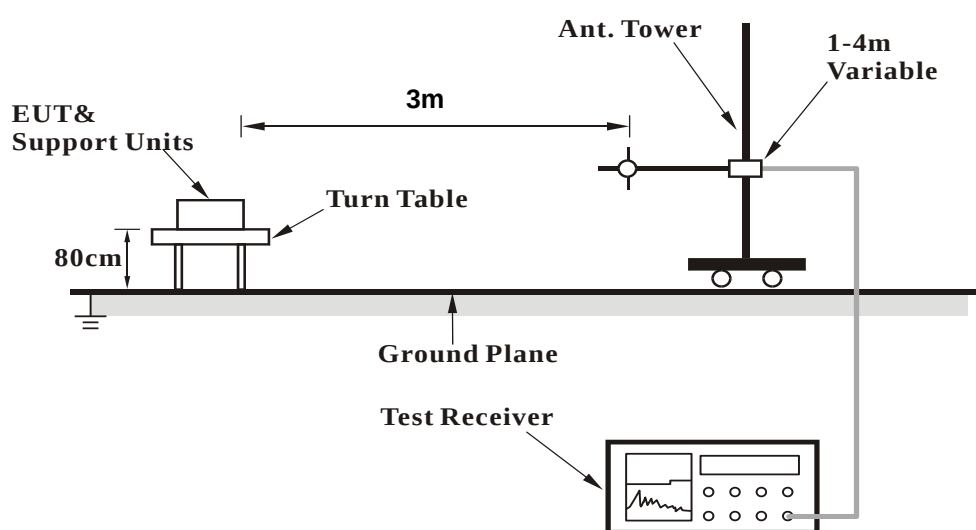
#### 4.1.3 Test Setup

##### CONDUCTED POWER MEASUREMENT:

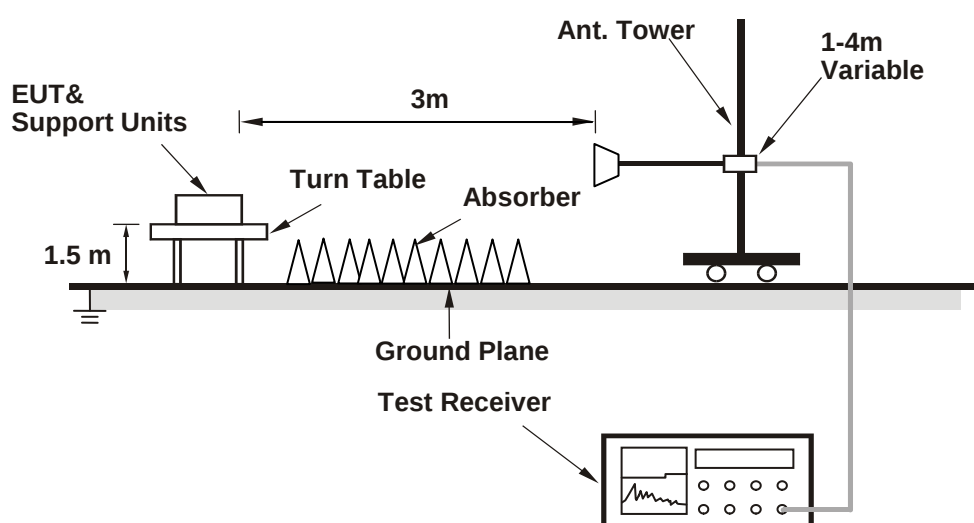


##### ERP/EIRP MEASUREMENT:

###### For ERP/EIRP below 1GHz



###### For ERP/EIRP above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 4.1.4 Test Results

#### CONDUCTED OUTPUT POWER (dBm)

##### (Subcontract Item)

| Band            | WCDMA II |        |        |
|-----------------|----------|--------|--------|
| Channel         | 9262     | 9400   | 9538   |
| Frequency (MHz) | 1852.4   | 1880.0 | 1907.6 |
| RMC             | 24.64    | 24.63  | 24.68  |
| HSDPA Subtest-1 | 23.58    | 23.56  | 23.60  |
| HSDPA Subtest-2 | 23.60    | 23.59  | 23.63  |
| HSDPA Subtest-3 | 23.17    | 23.15  | 23.29  |
| HSDPA Subtest-4 | 23.14    | 23.13  | 23.18  |
| HSUPA Subtest-1 | 23.60    | 23.59  | 23.63  |
| HSUPA Subtest-2 | 21.62    | 21.61  | 21.70  |
| HSUPA Subtest-3 | 22.62    | 22.60  | 22.65  |
| HSUPA Subtest-4 | 21.55    | 21.54  | 21.66  |
| HSUPA Subtest-5 | 23.61    | 23.60  | 23.65  |

## LTE Band 2

| Band / BW | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|-----------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|           |         |           | 18607  | 18900  | 19193   |               | 20407  | 20525  | 20643   |               |
|           |         |           | 1850.7 | 1880   | 1909.3  |               | 824.7  | 836.5  | 848.3   |               |
|           |         |           | MHz    | MHz    | MHz     |               | MHz    | MHz    | MHz     |               |
| 2 / 1.4M  | 1       | 0         | 24.22  | 24.37  | 23.97   | 0             | 23.25  | 23.43  | 22.98   | 1             |
|           | 1       | 2         | 23.43  | 23.70  | 23.26   | 0             | 22.50  | 22.70  | 22.30   | 1             |
|           | 1       | 5         | 23.32  | 23.51  | 23.11   | 0             | 22.27  | 22.50  | 22.34   | 1             |
|           | 3       | 0         | 23.80  | 24.01  | 23.39   | 0             | 22.88  | 23.04  | 22.36   | 1             |
|           | 3       | 1         | 23.57  | 23.85  | 23.29   | 0             | 22.64  | 22.81  | 22.23   | 1             |
|           | 3       | 3         | 23.50  | 23.70  | 23.21   | 0             | 22.51  | 22.70  | 22.19   | 1             |
|           | 6       | 0         | 22.88  | 23.09  | 22.42   | 1             | 21.83  | 22.10  | 21.59   | 2             |

| Band / BW | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|-----------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|           |         |           | 18615  | 18900  | 19185   |               | 18615  | 18900  | 19185   |               |
|           |         |           | 1851.5 | 1880   | 1908.5  |               | 1851.5 | 1880   | 1908.5  |               |
|           |         |           | MHz    | MHz    | MHz     |               | MHz    | MHz    | MHz     |               |
| 2 / 3M    | 1       | 0         | 24.28  | 24.44  | 24.03   | 0             | 23.31  | 23.48  | 23.05   | 1             |
|           | 1       | 7         | 23.67  | 23.77  | 23.44   | 0             | 22.59  | 22.76  | 22.35   | 1             |
|           | 1       | 14        | 23.35  | 23.57  | 23.07   | 0             | 22.25  | 22.59  | 22.24   | 1             |
|           | 8       | 0         | 22.84  | 23.10  | 22.69   | 1             | 21.80  | 22.05  | 21.52   | 2             |
|           | 8       | 3         | 22.77  | 22.94  | 22.49   | 1             | 21.69  | 21.90  | 21.35   | 2             |
|           | 8       | 7         | 22.59  | 22.84  | 22.34   | 1             | 21.52  | 21.77  | 21.27   | 2             |
|           | 15      | 0         | 22.94  | 23.20  | 22.80   | 1             | 22.03  | 22.14  | 21.74   | 2             |

| Band / BW | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|-----------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|           |         |           | 18625  | 18900  | 19175   |               | 18625  | 18900  | 19175   |               |
|           |         |           | 1852.5 | 1880   | 1907.5  |               | 1852.5 | 1880   | 1907.5  |               |
|           |         |           | MHz    | MHz    | MHz     |               | MHz    | MHz    | MHz     |               |
| 2 / 5M    | 1       | 0         | 24.34  | 24.49  | 24.09   | 0             | 23.37  | 23.54  | 23.10   | 1             |
|           | 1       | 12        | 23.54  | 23.81  | 23.40   | 0             | 22.73  | 22.84  | 22.31   | 1             |
|           | 1       | 24        | 23.35  | 23.62  | 23.12   | 0             | 22.49  | 22.61  | 22.04   | 1             |
|           | 12      | 0         | 23.02  | 23.16  | 22.80   | 1             | 22.01  | 22.16  | 21.76   | 2             |
|           | 12      | 6         | 22.90  | 23.02  | 22.57   | 1             | 21.78  | 21.97  | 21.46   | 2             |
|           | 12      | 13        | 22.69  | 22.90  | 22.47   | 1             | 21.71  | 21.86  | 21.44   | 2             |
|           | 25      | 0         | 22.96  | 23.24  | 22.74   | 1             | 22.10  | 22.24  | 21.60   | 2             |

| Band / BW | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|-----------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|           |         |           | 18650  | 18900  | 19150   |               | 18650  | 18900  | 19150   |               |
|           |         |           | 1855   | 1880   | 1905    |               | 1855   | 1880   | 1905    |               |
|           |         |           | MHz    | MHz    | MHz     |               | MHz    | MHz    | MHz     |               |
| 2 / 10M   | 1       | 0         | 24.38  | 24.53  | 24.13   | 0             | 23.44  | 23.59  | 23.19   | 1             |
|           | 1       | 24        | 23.68  | 23.87  | 23.44   | 0             | 22.85  | 22.93  | 22.56   | 1             |
|           | 1       | 49        | 23.47  | 23.71  | 23.29   | 0             | 22.51  | 22.75  | 22.22   | 1             |
|           | 25      | 0         | 23.10  | 23.25  | 22.87   | 1             | 22.09  | 22.28  | 21.84   | 2             |
|           | 25      | 12        | 22.93  | 23.12  | 22.72   | 1             | 21.98  | 22.11  | 21.65   | 2             |
|           | 25      | 25        | 22.80  | 23.02  | 22.63   | 1             | 21.74  | 22.02  | 21.59   | 2             |
|           | 50      | 0         | 23.12  | 23.38  | 22.91   | 1             | 22.19  | 22.35  | 21.95   | 2             |

| Band / BW | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|-----------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|           |         |           | 18675  | 18900  | 19125   |               | 18675  | 18900  | 19125   |               |
|           |         |           | 1857.5 | 1880   | 1902.5  |               | 1857.5 | 1880   | 1902.5  |               |
|           |         |           | MHz    | MHz    | MHz     |               | MHz    | MHz    | MHz     |               |
| 2 / 15M   | 1       | 0         | 24.44  | 24.59  | 24.21   | 0             | 23.49  | 23.64  | 23.25   | 1             |
|           | 1       | 37        | 23.81  | 23.94  | 23.53   | 0             | 22.87  | 23.00  | 22.62   | 1             |
|           | 1       | 74        | 23.63  | 23.78  | 23.41   | 0             | 22.73  | 22.82  | 22.50   | 1             |
|           | 36      | 0         | 23.18  | 23.38  | 22.90   | 1             | 22.18  | 22.38  | 21.87   | 2             |
|           | 36      | 19        | 23.08  | 23.26  | 22.87   | 1             | 22.01  | 22.23  | 21.77   | 2             |
|           | 36      | 39        | 22.95  | 23.16  | 22.76   | 1             | 21.97  | 22.12  | 21.72   | 2             |
|           | 75      | 0         | 23.32  | 23.45  | 23.00   | 1             | 22.29  | 22.48  | 21.93   | 2             |

| Band / BW | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|-----------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|           |         |           | 18700  | 18900  | 19100   |               | 18700  | 18900  | 19100   |               |
|           |         |           | 1860   | 1880   | 1900    |               | 1860   | 1880   | 1900    |               |
|           |         |           | MHz    | MHz    | MHz     |               | MHz    | MHz    | MHz     |               |
| 2 / 20M   | 1       | 0         | 24.50  | 24.64  | 24.27   | 0             | 23.54  | 23.69  | 23.31   | 1             |
|           | 1       | 50        | 23.95  | 24.02  | 23.65   | 0             | 22.92  | 23.05  | 22.64   | 1             |
|           | 1       | 99        | 23.78  | 23.86  | 23.44   | 0             | 22.69  | 22.88  | 22.49   | 1             |
|           | 50      | 0         | 23.29  | 23.48  | 23.08   | 1             | 22.38  | 22.48  | 22.05   | 2             |
|           | 50      | 25        | 23.20  | 23.36  | 22.99   | 1             | 22.17  | 22.34  | 21.97   | 2             |
|           | 50      | 50        | 23.05  | 23.28  | 22.94   | 1             | 22.02  | 22.26  | 21.89   | 2             |
|           | 100     | 0         | 23.43  | 23.55  | 23.15   | 1             | 22.43  | 22.56  | 22.12   | 2             |

## LTE Band 25

| Band / BW | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|-----------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|           |         |           | 26047  | 26365  | 26683   |               | 26047  | 26365  | 26683   |               |
|           |         |           | 1850.7 | 1882.5 | 1914.3  |               | 1850.7 | 1882.5 | 1914.3  |               |
|           |         |           | MHz    | MHz    | MHz     |               | MHz    | MHz    | MHz     |               |
| 25 / 1.4M | 1       | 0         | 23.77  | 24.10  | 24.15   | 0             | 22.86  | 23.14  | 23.20   | 1             |
|           | 1       | 2         | 23.62  | 23.93  | 24.00   | 0             | 22.72  | 23.00  | 23.08   | 1             |
|           | 1       | 5         | 23.49  | 23.72  | 23.88   | 0             | 22.54  | 22.81  | 22.90   | 1             |
|           | 3       | 0         | 23.66  | 23.91  | 24.08   | 0             | 22.58  | 22.92  | 23.00   | 1             |
|           | 3       | 1         | 23.55  | 23.87  | 23.95   | 0             | 22.47  | 22.87  | 22.95   | 1             |
|           | 3       | 3         | 23.47  | 23.78  | 23.87   | 0             | 22.40  | 22.74  | 22.81   | 1             |
|           | 6       | 0         | 22.25  | 22.58  | 22.63   | 1             | 21.24  | 21.56  | 21.68   | 2             |

| Band / BW | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|-----------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|           |         |           | 26055  | 26365  | 26675   |               | 26055  | 26365  | 26675   |               |
|           |         |           | 1851.5 | 1882.5 | 1913.5  |               | 1851.5 | 1882.5 | 1913.5  |               |
|           |         |           | MHz    | MHz    | MHz     |               | MHz    | MHz    | MHz     |               |
| 25 / 3M   | 1       | 0         | 23.84  | 24.15  | 24.20   | 0             | 22.90  | 23.17  | 23.23   | 1             |
|           | 1       | 7         | 23.69  | 23.98  | 24.10   | 0             | 22.71  | 23.03  | 23.11   | 1             |
|           | 1       | 14        | 23.63  | 23.82  | 23.92   | 0             | 22.54  | 22.87  | 22.94   | 1             |
|           | 8       | 0         | 22.61  | 22.90  | 22.99   | 1             | 21.56  | 21.82  | 22.00   | 2             |
|           | 8       | 3         | 22.52  | 22.84  | 22.87   | 1             | 21.46  | 21.77  | 21.86   | 2             |
|           | 8       | 7         | 22.44  | 22.76  | 22.81   | 1             | 21.41  | 21.66  | 21.77   | 2             |
|           | 15      | 0         | 22.41  | 22.69  | 22.76   | 1             | 21.36  | 21.63  | 21.71   | 2             |

| Band / BW | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|-----------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|           |         |           | 26065  | 26365  | 26665   |               | 26065  | 26365  | 26665   |               |
|           |         |           | 1852.5 | 1882.5 | 1912.5  |               | 1852.5 | 1882.5 | 1912.5  |               |
|           |         |           | MHz    | MHz    | MHz     |               | MHz    | MHz    | MHz     |               |
| 25 / 5M   | 1       | 0         | 23.97  | 24.21  | 24.26   | 0             | 22.98  | 23.26  | 23.31   | 1             |
|           | 1       | 12        | 23.85  | 24.07  | 24.17   | 0             | 22.83  | 23.13  | 23.21   | 1             |
|           | 1       | 24        | 23.62  | 23.93  | 24.03   | 0             | 22.58  | 22.94  | 23.07   | 1             |
|           | 12      | 0         | 22.70  | 22.98  | 23.06   | 1             | 21.68  | 21.97  | 22.12   | 2             |
|           | 12      | 6         | 22.66  | 22.93  | 23.02   | 1             | 21.62  | 21.90  | 21.95   | 2             |
|           | 12      | 13        | 22.58  | 22.83  | 22.88   | 1             | 21.56  | 21.83  | 21.90   | 2             |
|           | 25      | 0         | 22.56  | 22.78  | 22.85   | 1             | 21.50  | 21.78  | 21.83   | 2             |

| Band / BW | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|-----------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|           |         |           | 26090  | 26365  | 26640   |               | 26090  | 26365  | 26640   |               |
|           |         |           | 1855   | 1882.5 | 1910    |               | 1855   | 1882.5 | 1910    |               |
|           |         |           | MHz    | MHz    | MHz     |               | MHz    | MHz    | MHz     |               |
| 25 / 10M  | 1       | 0         | 24.38  | 24.53  | 24.13   | 0             | 23.44  | 23.59  | 23.19   | 1             |
|           | 1       | 24        | 23.68  | 23.87  | 23.44   | 0             | 22.85  | 22.93  | 22.56   | 1             |
|           | 1       | 49        | 23.47  | 23.71  | 23.29   | 0             | 22.51  | 22.75  | 22.22   | 1             |
|           | 25      | 0         | 23.10  | 23.25  | 22.87   | 1             | 22.09  | 22.28  | 21.84   | 2             |
|           | 25      | 12        | 22.93  | 23.12  | 22.72   | 1             | 21.98  | 22.11  | 21.65   | 2             |
|           | 25      | 25        | 22.80  | 23.02  | 22.63   | 1             | 21.74  | 22.02  | 21.59   | 2             |
|           | 50      | 0         | 23.12  | 23.38  | 22.91   | 1             | 22.19  | 22.35  | 21.95   | 2             |

| Band / BW | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|-----------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|           |         |           | 26115  | 26365  | 26615   |               | 26115  | 26365  | 26615   |               |
|           |         |           | 1857.5 | 1882.5 | 1907.5  |               | 1857.5 | 1882.5 | 1907.5  |               |
|           |         |           | MHz    | MHz    | MHz     |               | MHz    | MHz    | MHz     |               |
| 25 / 15M  | 1       | 0         | 24.12  | 24.31  | 24.36   | 0             | 23.13  | 23.36  | 23.41   | 1             |
|           | 1       | 37        | 23.98  | 24.21  | 24.29   | 0             | 22.96  | 23.23  | 23.29   | 1             |
|           | 1       | 74        | 23.90  | 24.09  | 24.19   | 0             | 22.86  | 23.09  | 23.15   | 1             |
|           | 36      | 0         | 22.96  | 23.20  | 23.33   | 1             | 22.00  | 22.19  | 22.30   | 36            |
|           | 36      | 19        | 22.92  | 23.16  | 23.22   | 1             | 21.91  | 22.14  | 22.22   | 36            |
|           | 36      | 39        | 22.88  | 23.10  | 23.14   | 1             | 21.82  | 22.07  | 22.12   | 36            |
|           | 75      | 0         | 22.86  | 23.05  | 23.12   | 1             | 21.81  | 22.03  | 22.07   | 75            |

| Band / BW | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|-----------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|           |         |           | 26140  | 26365  | 26590   |               | 26140  | 26365  | 26590   |               |
|           |         |           | 1860   | 1882.5 | 1905    |               | 1860   | 1882.5 | 1905    |               |
|           |         |           | MHz    | MHz    | MHz     |               | MHz    | MHz    | MHz     |               |
| 25 / 20M  | 1       | 0         | 24.18  | 24.37  | 24.41   | 0             | 23.21  | 23.42  | 23.46   | 1             |
|           | 1       | 50        | 24.08  | 24.27  | 24.36   | 0             | 23.08  | 23.32  | 23.39   | 1             |
|           | 1       | 99        | 24.00  | 24.16  | 24.21   | 0             | 23.01  | 23.18  | 23.24   | 1             |
|           | 50      | 0         | 23.18  | 23.30  | 23.38   | 1             | 22.17  | 22.30  | 22.35   | 2             |
|           | 50      | 25        | 23.08  | 23.27  | 23.30   | 1             | 22.05  | 22.27  | 22.32   | 2             |
|           | 50      | 50        | 23.03  | 23.22  | 23.26   | 1             | 21.98  | 22.22  | 22.27   | 2             |
|           | 100     | 0         | 23.00  | 23.19  | 23.24   | 1             | 21.95  | 22.19  | 22.23   | 2             |

## EIRP POWER

### WCDMA

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|-----------|----------|
| 9262    | 1852.4          | H                    | 22.34     | 6.63                  | 28.97     | 788.86   |
| 9400    | 1880            | H                    | 22.44     | 6.68                  | 29.12     | 816.58   |
| 9538    | 1907.6          | H                    | 22.33     | 6.73                  | 29.06     | 805.38   |

Note: The worst case vertical or horizontal polarization have been investigated and find the worst is horizontal.

#### LTE Band 2 / 1.4M

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|-----------|----------|
| 18607   | 1850.7          | H                    | 20.54     | 6.63                  | 27.17     | 521.19   |
| 18900   | 1880            | H                    | 20.97     | 6.68                  | 27.65     | 582.10   |
| 19193   | 1909.3          | H                    | 20.66     | 6.73                  | 27.39     | 548.28   |

Note: The worst case vertical or horizontal polarization have been investigated and find the worst is horizontal.

#### LTE Band 2 / 3M

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|-----------|----------|
| 18615   | 1851.5          | H                    | 20.60     | 6.63                  | 27.23     | 528.45   |
| 18900   | 1880            | H                    | 21.03     | 6.68                  | 27.71     | 590.20   |
| 19185   | 1908.5          | H                    | 20.75     | 6.73                  | 27.48     | 559.76   |

Note: The worst case vertical or horizontal polarization have been investigated and find the worst is horizontal.

#### LTE Band 2 / 5M

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|-----------|----------|
| 18625   | 1852.5          | H                    | 20.65     | 6.63                  | 27.28     | 534.56   |
| 18900   | 1880            | H                    | 20.96     | 6.68                  | 27.64     | 580.76   |
| 19175   | 1907.5          | H                    | 20.78     | 6.73                  | 27.51     | 563.64   |

Note: The worst case vertical or horizontal polarization have been investigated and find the worst is horizontal.

#### LTE Band 2 / 10M

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|-----------|----------|
| 18650   | 1855            | H                    | 20.67     | 6.64                  | 27.31     | 538.27   |
| 18900   | 1880            | H                    | 20.98     | 6.68                  | 27.66     | 583.45   |
| 19150   | 1905            | H                    | 20.86     | 6.73                  | 27.59     | 574.12   |

Note: The worst case vertical or horizontal polarization have been investigated and find the worst is horizontal.

#### LTE Band 2 / 15M

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|-----------|----------|
| 18675   | 1857.5          | H                    | 20.85     | 6.64                  | 27.49     | 561.05   |
| 18900   | 1880            | H                    | 21.08     | 6.68                  | 27.76     | 597.04   |
| 19125   | 1902.5          | H                    | 21.00     | 6.72                  | 27.72     | 591.56   |

Note: The worst case vertical or horizontal polarization have been investigated and find the worst is horizontal.

#### LTE Band 2 / 20M

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|-----------|----------|
| 18700   | 1860            | H                    | 20.93     | 6.65                  | 27.58     | 572.80   |
| 18900   | 1880            | H                    | 21.01     | 6.68                  | 27.69     | 587.49   |
| 19100   | 1900            | H                    | 21.16     | 6.72                  | 27.88     | 613.76   |

Note: The worst case vertical or horizontal polarization have been investigated and find the worst is horizontal.

#### LTE Band 25 / 1.4M

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|-----------|----------|
| 26047   | 1850.7          | H                    | 21.82     | 6.63                  | 28.45     | 699.84   |
| 26365   | 1882.5          | H                    | 21.84     | 6.68                  | 28.52     | 711.21   |
| 26683   | 1914.3          | H                    | 21.64     | 6.73                  | 28.37     | 687.07   |

Note: The worst case vertical or horizontal polarization have been investigated and find the worst is horizontal.

#### LTE Band 25 / 3M

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|-----------|----------|
| 26055   | 1851.5          | H                    | 21.86     | 6.63                  | 28.49     | 706.32   |
| 26365   | 1882.5          | H                    | 21.88     | 6.68                  | 28.56     | 717.79   |
| 26675   | 1913.5          | H                    | 21.58     | 6.73                  | 28.31     | 677.64   |

Note: The worst case vertical or horizontal polarization have been investigated and find the worst is horizontal.

#### LTE Band 25 / 5M

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|-----------|----------|
| 26065   | 1852.5          | H                    | 21.95     | 6.63                  | 28.58     | 721.11   |
| 26365   | 1882.5          | H                    | 22.05     | 6.68                  | 28.73     | 746.45   |
| 26665   | 1912.5          | H                    | 21.69     | 6.73                  | 28.42     | 695.02   |

Note: The worst case vertical or horizontal polarization have been investigated and find the worst is horizontal.

#### LTE Band 25 / 10M

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|-----------|----------|
| 26090   | 1855            | H                    | 21.98     | 6.64                  | 28.62     | 727.78   |
| 26365   | 1882.5          | H                    | 22.03     | 6.68                  | 28.71     | 743.02   |
| 26640   | 1910            | H                    | 21.58     | 6.73                  | 28.31     | 677.64   |

Note: The worst case vertical or horizontal polarization have been investigated and find the worst is horizontal.

#### LTE Band 25 / 15M

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|-----------|----------|
| 26115   | 1857.5          | H                    | 22.05     | 6.64                  | 28.69     | 739.61   |
| 16365   | 1882.5          | H                    | 22.08     | 6.68                  | 28.76     | 751.62   |
| 16615   | 1907.5          | H                    | 21.80     | 6.72                  | 28.52     | 711.21   |

Note: The worst case vertical or horizontal polarization have been investigated and find the worst is horizontal.

#### LTE Band 25 / 20M

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|-----------|----------|
| 26140   | 1860            | H                    | 21.97     | 6.65                  | 28.62     | 727.78   |
| 26365   | 1882.5          | H                    | 22.00     | 6.68                  | 28.68     | 737.90   |
| 26590   | 1905            | H                    | 21.70     | 6.72                  | 28.42     | 695.02   |

Note: The worst case vertical or horizontal polarization have been investigated and find the worst is horizontal.

## 4.2 Frequency Stability Measurement

### 4.2.1 Limits of Frequency Stability Measurement

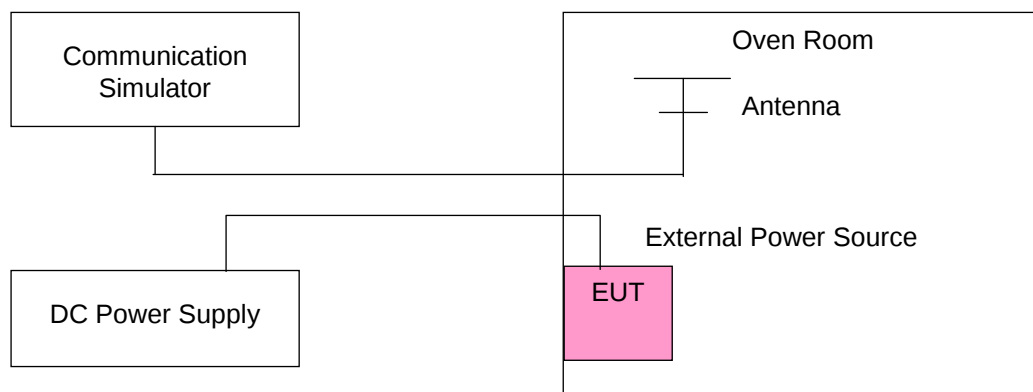
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### 4.2.2 Test Procedure

- 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.
- 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.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5$  °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.

**NOTE:** The frequency error was recorded frequency error from the communication simulator.

### 4.2.3 Test Setup



#### 4.2.4 Test Results (Subcontract Item)

##### WCDMA

##### Frequency Error vs. Voltage

| Voltage (Volts) | Frequency Error (ppm) | Limit (ppm) |
|-----------------|-----------------------|-------------|
|                 | WCDMA                 |             |
| 3.3             | 0.001                 | 2.5         |
| 2.805           | 0.002                 | 2.5         |
| 3.795           | 0.001                 | 2.5         |

##### Frequency Error vs. Temperature.

| TEMP. (°C) | Frequency Error (ppm) | Limit (ppm) |
|------------|-----------------------|-------------|
|            | WCDMA                 |             |
| -30        | 0.001                 | 2.5         |
| -20        | 0.001                 | 2.5         |
| -10        | 0.001                 | 2.5         |
| 0          | 0.002                 | 2.5         |
| 10         | 0.002                 | 2.5         |
| 20         | -0.001                | 2.5         |
| 30         | -0.002                | 2.5         |
| 40         | -0.001                | 2.5         |
| 50         | -0.001                | 2.5         |

## LTE

### Frequency Error vs. Voltage

| Voltage<br>(Volts) | Frequency Error (ppm) |       |       |       |       |       |             |       |       |       |       |       | Limit<br>(ppm) |
|--------------------|-----------------------|-------|-------|-------|-------|-------|-------------|-------|-------|-------|-------|-------|----------------|
|                    | LTE Band 2            |       |       |       |       |       | LTE Band 25 |       |       |       |       |       |                |
|                    | 1.4MHz                | 3MHz  | 5MHz  | 10MHz | 15MHz | 20MHz | 1.4MHz      | 3MHz  | 5MHz  | 10MHz | 15MHz | 20MHz |                |
| 3.3                | 0.002                 | 0.002 | 0.001 | 0.002 | 0.001 | 0.002 | 0.001       | 0.001 | 0.001 | 0.002 | 0.001 | 0.001 | 2.5            |
| 2.805              | 0.001                 | 0.001 | 0.002 | 0.001 | 0.002 | 0.001 | 0.002       | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 2.5            |
| 3.795              | 0.001                 | 0.002 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001       | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 2.5            |

### Frequency Error vs. Temperature

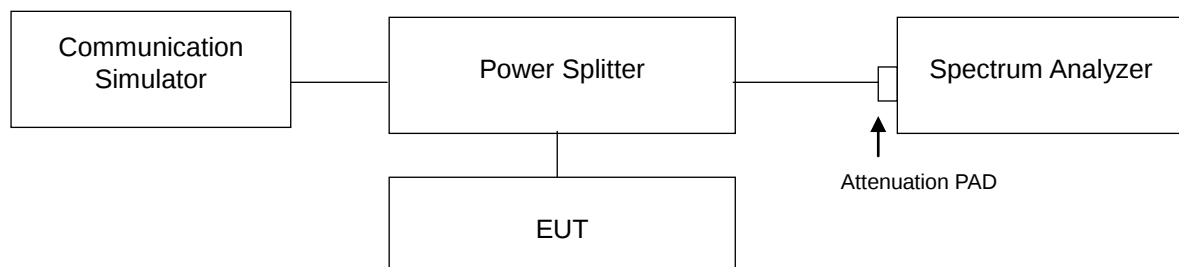
| Temp.<br>(°C) | Frequency Error (ppm) |        |        |        |        |        |             |        |        |        |        |        | Limit<br>(ppm) |
|---------------|-----------------------|--------|--------|--------|--------|--------|-------------|--------|--------|--------|--------|--------|----------------|
|               | LTE Band 5            |        |        |        |        |        | LTE Band 26 |        |        |        |        |        |                |
|               | 1.4MHz                | 3MHz   | 5MHz   | 10MHz  | 15MHz  | 20MHz  | 1.4MHz      | 3MHz   | 5MHz   | 10MHz  | 15MHz  | 20MHz  |                |
| -30           | 0.001                 | 0.002  | 0.001  | 0.002  | 0.001  | 0.002  | 0.001       | 0.002  | 0.001  | 0.001  | 0.001  | 0.002  | 2.5            |
| -20           | 0.001                 | 0.001  | 0.002  | 0.001  | 0.002  | 0.002  | 0.001       | 0.001  | 0.002  | 0.001  | 0.002  | 0.002  | 2.5            |
| -10           | 0.001                 | 0.001  | 0.001  | 0.002  | 0.001  | 0.001  | 0.002       | 0.001  | 0.002  | 0.001  | 0.002  | 0.002  | 2.5            |
| 0             | 0.002                 | 0.001  | 0.001  | 0.002  | 0.001  | 0.002  | 0.001       | 0.001  | 0.002  | 0.001  | 0.001  | 0.002  | 2.5            |
| 10            | 0.001                 | 0.001  | 0.001  | 0.001  | 0.001  | 0.001  | 0.001       | 0.002  | 0.001  | 0.002  | 0.002  | 0.002  | 2.5            |
| 20            | -0.001                | -0.002 | -0.002 | -0.001 | -0.001 | -0.001 | -0.001      | -0.001 | -0.001 | -0.002 | -0.001 | -0.001 | 2.5            |
| 30            | -0.001                | -0.002 | -0.001 | -0.001 | -0.002 | -0.002 | -0.002      | -0.001 | -0.002 | -0.001 | -0.001 | -0.001 | 2.5            |
| 40            | -0.001                | -0.002 | -0.002 | -0.001 | -0.002 | -0.002 | -0.001      | -0.002 | -0.001 | -0.001 | -0.001 | -0.001 | 2.5            |
| 50            | -0.001                | -0.002 | -0.002 | -0.001 | -0.002 | -0.001 | -0.001      | -0.002 | -0.002 | -0.001 | -0.002 | -0.001 | 2.5            |

### 4.3 Occupied Bandwidth Measurement

#### 4.3.1 Test Procedure

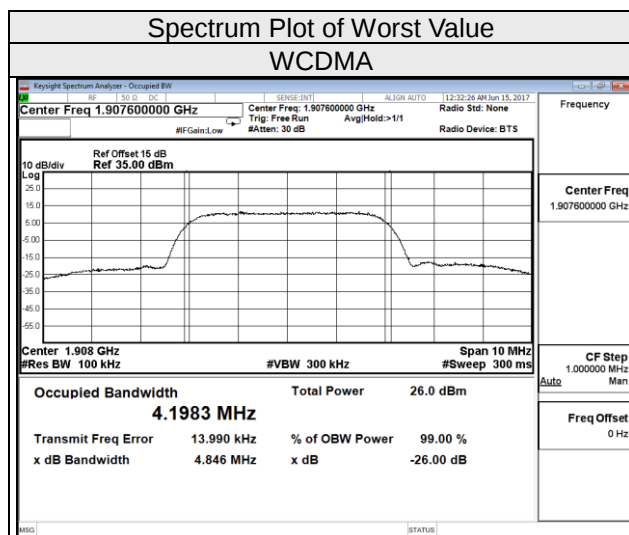
All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied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

#### 4.3.2 Test Setup



#### 4.3.3 Test Result (-26dB Bandwidth, Subcontract Item)

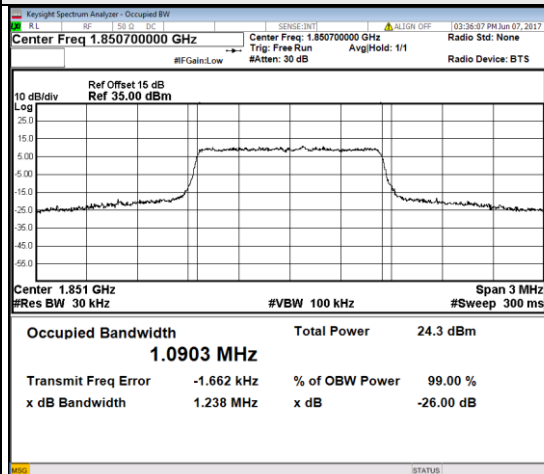
| Channel | FREQ.<br>(MHz) | -26dB Bandwidth (MHz) |
|---------|----------------|-----------------------|
|         |                | WCDMA                 |
| 9262    | 1852.4         | 4.84                  |
| 9400    | 1880.0         | 4.77                  |
| 9538    | 1907.6         | 4.85                  |



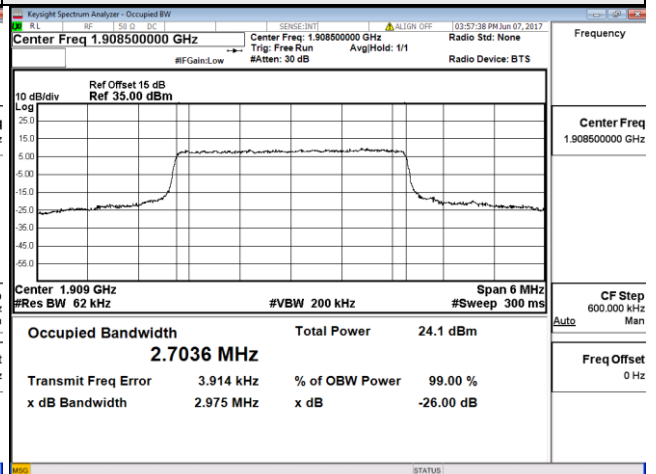
| LTE Band 2               |                 |                       |       |                         |                 |                       |       |
|--------------------------|-----------------|-----------------------|-------|-------------------------|-----------------|-----------------------|-------|
| Channel Bandwidth 1.4MHz |                 |                       |       | Channel Bandwidth 3MHz  |                 |                       |       |
| Channel                  | Frequency (MHz) | -26dB Bandwidth (MHz) |       | Channel                 | Frequency (MHz) | -26dB Bandwidth (MHz) |       |
|                          |                 | QPSK                  | 16QAM |                         |                 | QPSK                  | 16QAM |
| 18607                    | 1850.7          | 1.24                  | 1.23  | 18615                   | 1851.5          | 2.95                  | 2.96  |
| 18900                    | 1880            | 1.22                  | 1.22  | 18900                   | 1880            | 2.94                  | 2.94  |
| 19193                    | 1909.3          | 1.22                  | 1.22  | 19185                   | 1907.5          | 2.98                  | 2.96  |
| Channel Bandwidth 5MHz   |                 |                       |       | Channel Bandwidth 10MHz |                 |                       |       |
| Channel                  | Frequency (MHz) | -26dB Bandwidth (MHz) |       | Channel                 | Frequency (MHz) | -26dB Bandwidth (MHz) |       |
|                          |                 | QPSK                  | 16QAM |                         |                 | QPSK                  | 16QAM |
| 18625                    | 1852.5          | 4.82                  | 4.82  | 18650                   | 1855            | 9.56                  | 9.59  |
| 18900                    | 1880            | 4.82                  | 4.81  | 18900                   | 1880            | 9.53                  | 9.53  |
| 19175                    | 1907.5          | 4.85                  | 4.83  | 19150                   | 1905            | 10.25                 | 9.64  |
| Channel Bandwidth 15MHz  |                 |                       |       | Channel Bandwidth 20MHz |                 |                       |       |
| Channel                  | Frequency (MHz) | -26dB Bandwidth (MHz) |       | Channel                 | Frequency (MHz) | -26dB Bandwidth (MHz) |       |
|                          |                 | QPSK                  | 16QAM |                         |                 | QPSK                  | 16QAM |
| 18675                    | 1857.5          | 14.42                 | 14.28 | 18700                   | 1860            | 20.03                 | 19.11 |
| 18900                    | 1880            | 14.42                 | 14.30 | 18900                   | 1880            | 19.55                 | 19.11 |
| 19125                    | 1902.5          | 20.18                 | 16.70 | 19100                   | 1900            | 25.33                 | 21.91 |

## Spectrum Plot of Worst Value

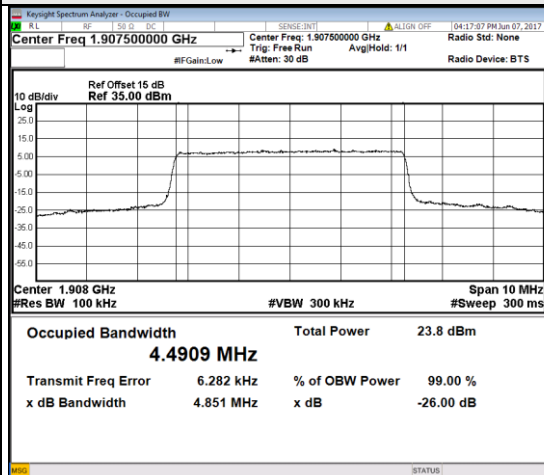
### 1.4MHz / QPSK



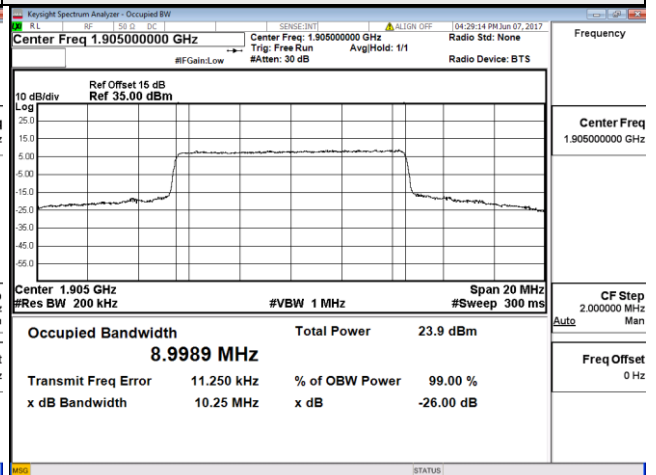
### 3MHz / QPSK



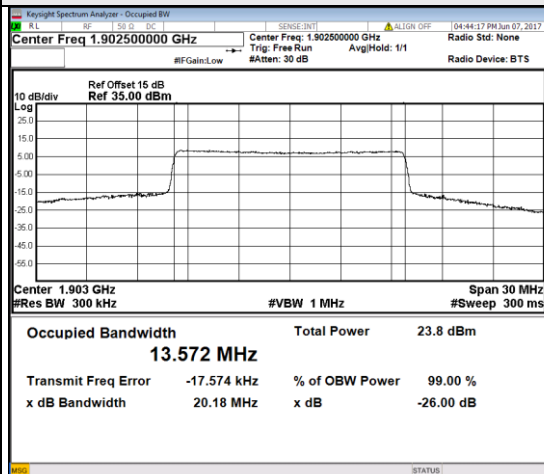
### 5MHz / QPSK



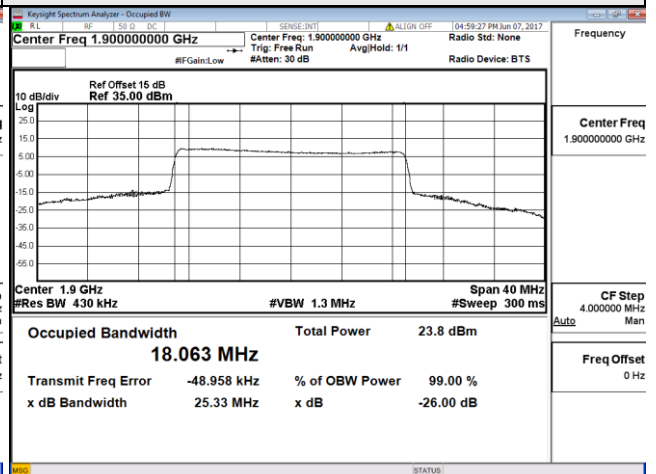
### 10MHz / QPSK



### 15MHz / QPSK



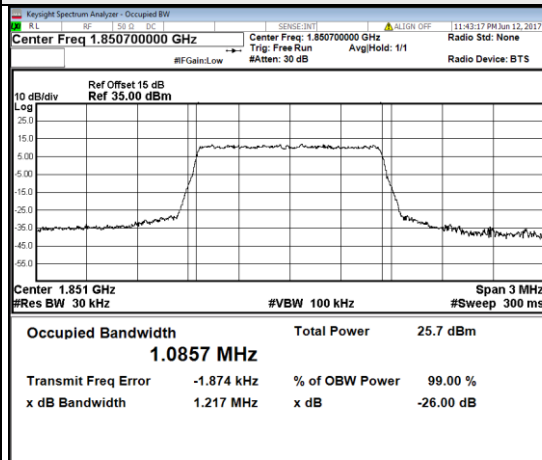
### 20MHz / QPSK



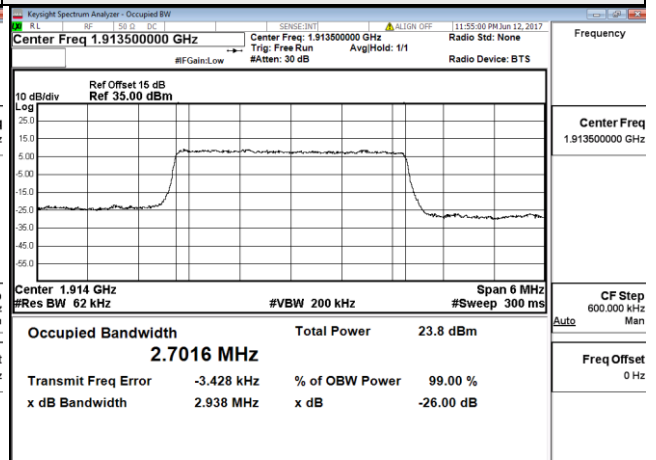
| LTE Band 25              |                 |                       |       |                         |                 |                       |       |
|--------------------------|-----------------|-----------------------|-------|-------------------------|-----------------|-----------------------|-------|
| Channel Bandwidth 1.4MHz |                 |                       |       | Channel Bandwidth 3MHz  |                 |                       |       |
| Channel                  | Frequency (MHz) | -26dB Bandwidth (MHz) |       | Channel                 | Frequency (MHz) | -26dB Bandwidth (MHz) |       |
|                          |                 | QPSK                  | 16QAM |                         |                 | QPSK                  | 16QAM |
| 26047                    | 1850.7          | 1.22                  | 1.21  | 26055                   | 1851.5          | 2.91                  | 2.93  |
| 26365                    | 1882.5          | 1.22                  | 1.21  | 26365                   | 1882.5          | 2.91                  | 2.93  |
| 26683                    | 1914.3          | 1.22                  | 1.21  | 26675                   | 1913.5          | 2.94                  | 2.93  |
| Channel Bandwidth 5MHz   |                 |                       |       | Channel Bandwidth 10MHz |                 |                       |       |
| Channel                  | Frequency (MHz) | -26dB Bandwidth (MHz) |       | Channel                 | Frequency (MHz) | -26dB Bandwidth (MHz) |       |
|                          |                 | QPSK                  | 16QAM |                         |                 | QPSK                  | 16QAM |
| 26065                    | 1852.5          | 4.82                  | 4.81  | 26090                   | 1855            | 9.50                  | 9.53  |
| 26365                    | 1882.5          | 4.80                  | 4.80  | 26365                   | 1882.5          | 9.51                  | 9.52  |
| 26665                    | 1912.5          | 4.82                  | 4.81  | 26640                   | 1910            | 9.51                  | 9.53  |
| Channel Bandwidth 15MHz  |                 |                       |       | Channel Bandwidth 20MHz |                 |                       |       |
| Channel                  | Frequency (MHz) | -26dB Bandwidth (MHz) |       | Channel                 | Frequency (MHz) | -26dB Bandwidth (MHz) |       |
|                          |                 | QPSK                  | 16QAM |                         |                 | QPSK                  | 16QAM |
| 26615                    | 1857.5          | 14.28                 | 14.25 | 26140                   | 1860            | 19.07                 | 19.07 |
| 26365                    | 1882.5          | 14.25                 | 14.25 | 26365                   | 1882.5          | 19.07                 | 19.06 |
| 26615                    | 1907.5          | 14.26                 | 14.24 | 26590                   | 1905            | 19.14                 | 19.07 |

## Spectrum Plot of Worst Value

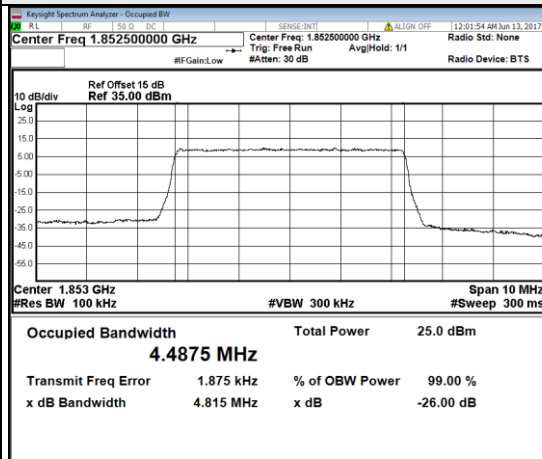
### 1.4MHz / QPSK



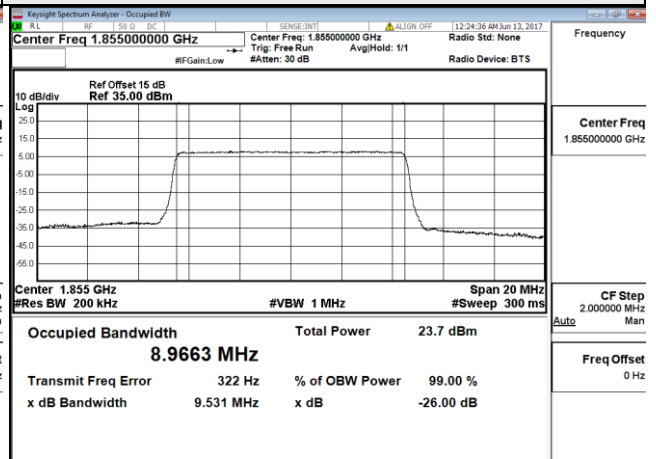
### 3MHz / QPSK



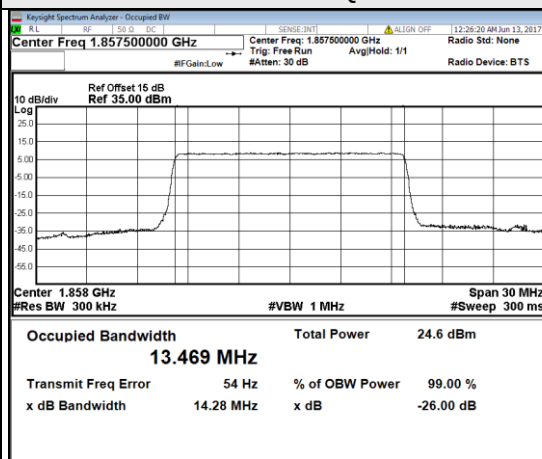
### 5MHz / QPSK



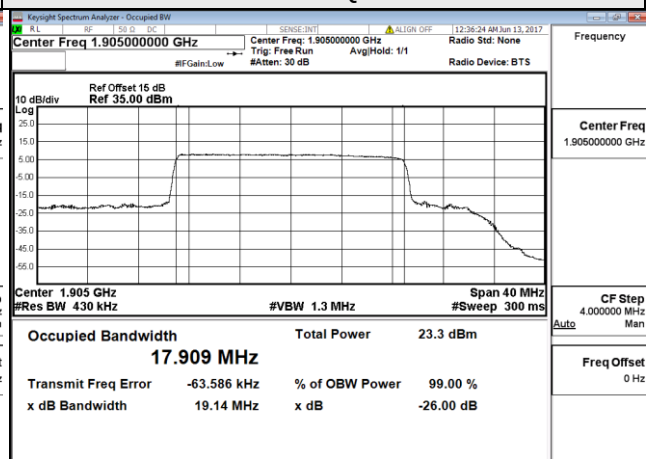
### 10MHz / 16QAM



### 15MHz / QPSK

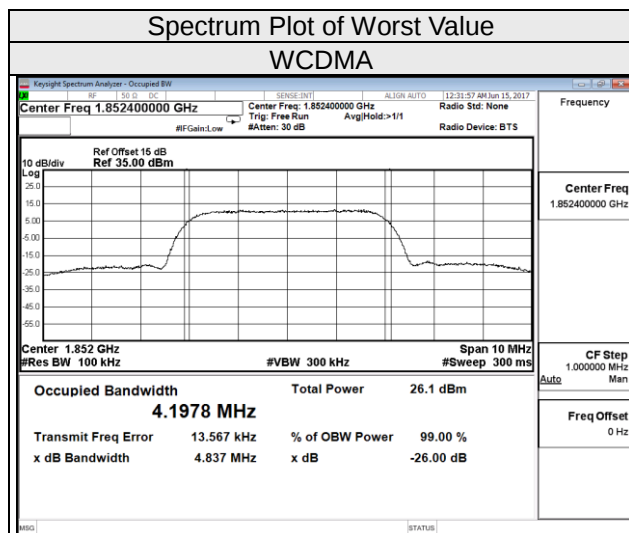


### 20MHz / QPSK



#### 4.3.4 Test Result (Occupied Bandwidth, Subcontract Item)

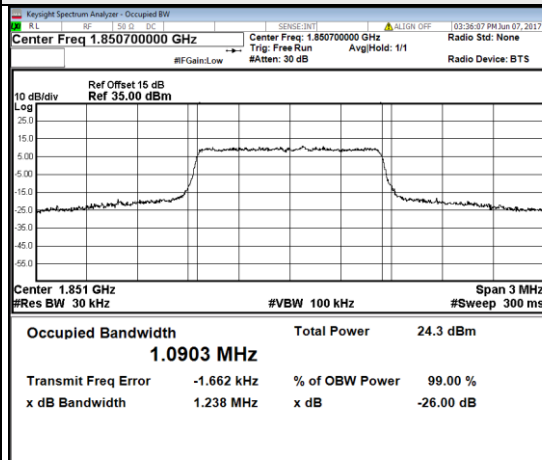
| Channel | FREQ.<br>(MHz) | 99% Occupied Bandwidth<br>(MHz) |
|---------|----------------|---------------------------------|
|         |                | WCDMA                           |
| 9262    | 1852.4         | 4.20                            |
| 9400    | 1880.0         | 4.18                            |
| 9538    | 1907.6         | 4.20                            |



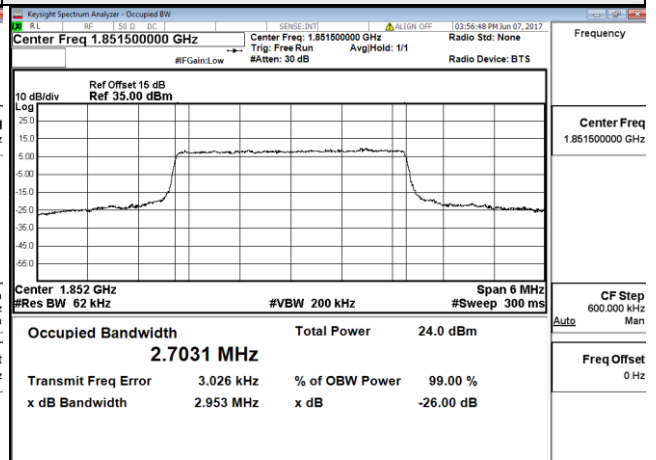
| LTE Band 2               |                 |                              |       |                         |                 |                              |       |
|--------------------------|-----------------|------------------------------|-------|-------------------------|-----------------|------------------------------|-------|
| Channel Bandwidth 1.4MHz |                 |                              |       | Channel Bandwidth 3MHz  |                 |                              |       |
| Channel                  | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |       | Channel                 | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |       |
|                          |                 | QPSK                         | 16QAM |                         |                 | QPSK                         | 16QAM |
| 18607                    | 1850.7          | 1.09                         | 1.09  | 18615                   | 1851.5          | 2.70                         | 2.70  |
| 18900                    | 1880            | 1.09                         | 1.09  | 18900                   | 1880            | 2.70                         | 2.70  |
| 19193                    | 1909.3          | 1.09                         | 1.09  | 19185                   | 1907.5          | 2.70                         | 2.70  |
| Channel Bandwidth 5MHz   |                 |                              |       | Channel Bandwidth 10MHz |                 |                              |       |
| Channel                  | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |       | Channel                 | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |       |
|                          |                 | QPSK                         | 16QAM |                         |                 | QPSK                         | 16QAM |
| 18625                    | 1852.5          | 4.49                         | 4.49  | 18650                   | 1855            | 8.97                         | 8.97  |
| 18900                    | 1880            | 4.49                         | 4.49  | 18900                   | 1880            | 8.98                         | 8.98  |
| 19175                    | 1907.5          | 4.49                         | 4.49  | 19150                   | 1905            | 9.00                         | 8.99  |
| Channel Bandwidth 15MHz  |                 |                              |       | Channel Bandwidth 20MHz |                 |                              |       |
| Channel                  | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |       | Channel                 | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |       |
|                          |                 | QPSK                         | 16QAM |                         |                 | QPSK                         | 16QAM |
| 18675                    | 1857.5          | 13.45                        | 13.43 | 18700                   | 1860            | 17.90                        | 17.91 |
| 18900                    | 1880            | 13.52                        | 13.50 | 18900                   | 1880            | 18.05                        | 18.04 |
| 19125                    | 1902.5          | 13.57                        | 13.54 | 19100                   | 1900            | 18.06                        | 18.05 |

## Spectrum Plot of Worst Value

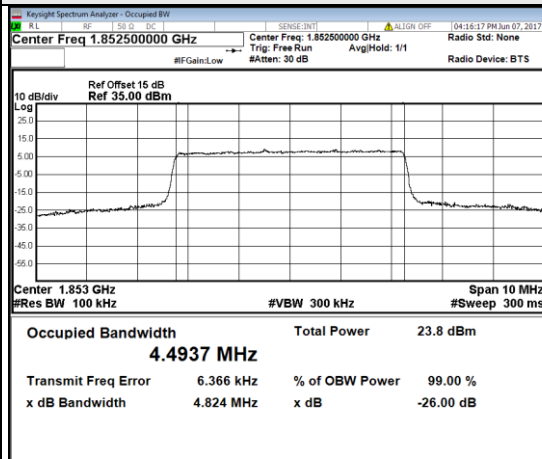
### 1.4MHz / QPSK



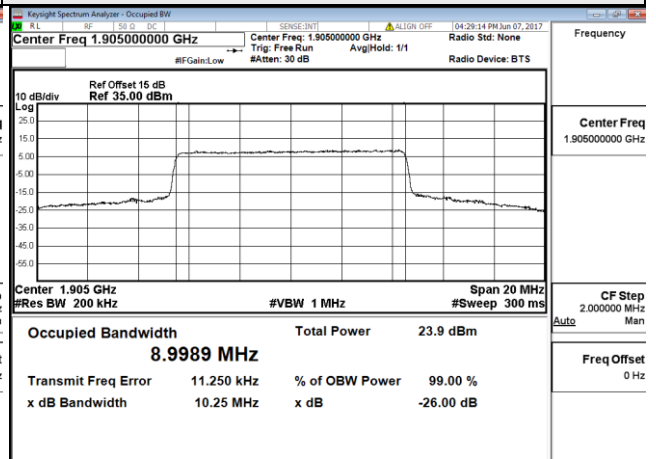
### 3MHz / QPSK



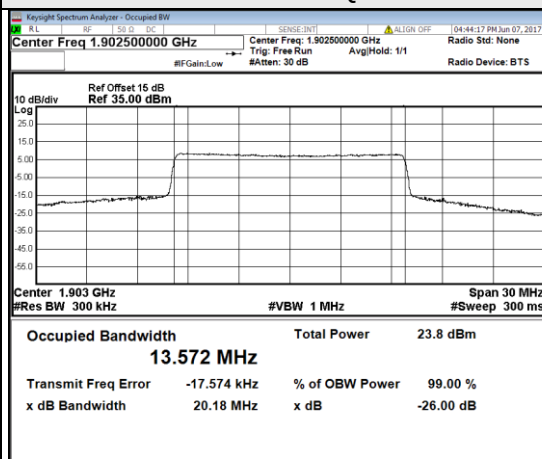
### 5MHz / QPSK



### 10MHz / QPSK



### 15MHz / QPSK



### 20MHz / QPSK

