



# FCC RADIO TEST REPORT

FCC ID : PU5-TP00107BUC  
Equipment : Notebook Computer  
Brand Name : Lenovo  
Model Name : TP00107BUC  
Applicant : Wistron Corporation  
21F, No. 88, Sec. 1, Hsin Tai Wu Rd., Hsichih  
Dist, New Taipei City 221, Taiwan  
Manufacturer : Wistron Corporation  
21F, No. 88, Sec. 1, Hsin Tai Wu Rd., Hsichih  
Dist, New Taipei City 221, Taiwan  
Standard : FCC 47 CFR Part 2, Part 27(D)

Equipment: Fibocom L860-GL tested inside of Lenovo Notebook Computer.

The product was received on Dec. 28, 2019 and testing was started from Jan. 26, 2020 and completed on Feb. 19, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this partial report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

*Louis Wu*

Approved by: Louis Wu

**SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory**

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan

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## History of this test report

| Report No. | Version | Description             | Issued Date   |
|------------|---------|-------------------------|---------------|
| FG9D2810C  | 01      | Initial issue of report | Mar. 03, 2020 |
|            |         |                         |               |
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|            |         |                         |               |

## Summary of Test Result

| Report Clause | Ref Std. Clause          | Test Items                                                    | Result (PASS/FAIL) | Remark                                    |
|---------------|--------------------------|---------------------------------------------------------------|--------------------|-------------------------------------------|
| 3.2           | §2.1046                  | Conducted Output Power and Effective Isotropic Radiated Power | Reporting only     | -                                         |
| -             | -                        | Peak-to-Average Ratio                                         | Not Required       | See Note                                  |
| -             | §27.50 (a)(3)            | EIRP Power Density                                            | Not Required       | See Note                                  |
| -             | §2.1049                  | Occupied Bandwidth                                            | Not Required       | See Note                                  |
| -             | §2.1051<br>§27.53 (a)(4) | Conducted Band Edge Measurement                               | Not Required       | See Note                                  |
| -             | §2.1051<br>§27.53 (a)(4) | Conducted Spurious Emission                                   | Not Required       | See Note                                  |
| -             | §2.1055<br>§27.54        | Frequency Stability<br>Temperature & Voltage                  | Not Required       | See Note                                  |
| 4.2           | §2.1053<br>§27.53 (a)(4) | Radiated Spurious Emission                                    | Pass               | Under limit<br>4.11 dB at<br>6924.000 MHz |

**Note:**

1. Not required means after assessing, test items are not necessary to carry out.
2. The module (Model: L860-GL) makes no difference after verifying output power, this report reuses test data from the module report.

**Declaration of Conformity:**

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

**Comments and Explanations:**

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

**Reviewed by: Wii Chang**

**Report Producer: Tina Chuang**

# 1 General Description

## 1.1 Product Feature of Equipment Under Test

| Product Feature                 |                     |
|---------------------------------|---------------------|
| Equipment                       | Notebook Computer   |
| Brand Name                      | Lenovo              |
| Model Name                      | TP00107BUC          |
| FCC ID                          | PU5-TP00107BUC      |
| EUT supports Radios application | WCDMA/HSPA/LTE/GNSS |
| EUT Stage                       | Production Unit     |

**Remark:**

1. The above EUT's information was declared by manufacturer.
2. Equipment: Fibocom L860-GL tested inside of Lenovo Notebook Computer.

| Antenna Information |              |                |           |              |
|---------------------|--------------|----------------|-----------|--------------|
| WWAN                |              |                |           | 3G&LTE (dBi) |
| Antenna             | Manufacturer | WNC            | Peak gain | 2.54         |
|                     | Part number  | 025.901FP.0001 | Type      | PIFA         |

## 1.2 Product Specification of Equipment Under Test

| Product Specification subjective to this standard |                                       |
|---------------------------------------------------|---------------------------------------|
| Tx Frequency                                      | LTE Band 30 : 2307.5 MHz ~ 2312.5 MHz |
| Rx Frequency                                      | LTE Band 30 : 2352.5 MHz ~ 2357.5 MHz |
| Bandwidth                                         | LTE Band 30 :5MHz / 10MHz             |
| Maximum Output Power to Antenna                   | LTE Band 30 :22.34 dBm                |
| Type of Modulation                                | QPSK / 16QAM / 64QAM                  |

## 1.3 Modification of EUT

No modifications are made to the EUT during all test items.



## 1.4 Testing Site

|                    |                                                                     |                                            |
|--------------------|---------------------------------------------------------------------|--------------------------------------------|
| Test Site          | SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory |                                            |
| Test Site Location | No.52 , Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan          |                                            |
| Test Site No.      | Sporton Site No.                                                    |                                            |
|                    | TH05-HY                                                             | 03CH07-HY                                  |
| Test Engineer      | Jacky Wang                                                          | Jesse Wang, Stan Hsieh, Ken Wu and Nick Yu |
| Temperature        | 23~25°C                                                             | 20~23°C                                    |
| Relative Humidity  | 52~55%                                                              | 52~56%                                     |

**Note:** The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No. TW1190

## 1.5 Applied Standards

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

- ♦ ANSI C63.26-2015
- ♦ 47 CFR Part 2, Part 27(D)
- ♦ ANSI / TIA-603-E
- ♦ FCC KDB 971168 Power Meas License Digital Systems D01 v03r01
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01

**Remark:** All test items were verified and recorded according to the standards and without any deviation during the test.

## 2 Test Configuration of Equipment Under Test

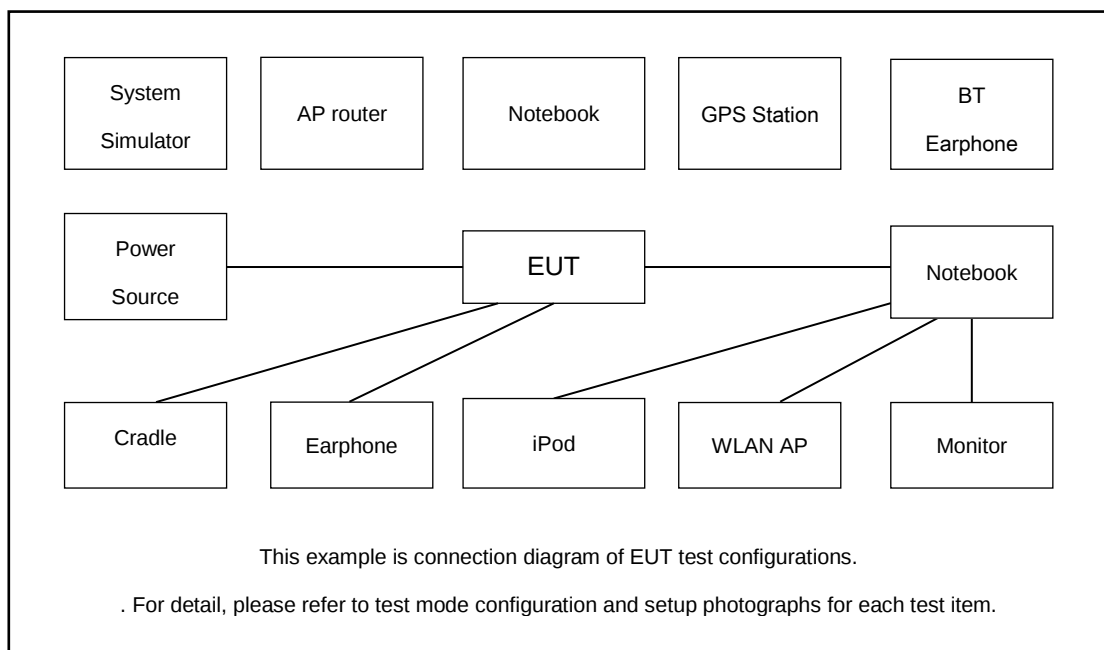
### 2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

| Test Items                 | Band                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Bandwidth (MHz) |   |   |    |    |    | Modulation |       |       | RB # |      |      | Test Channel |   |   |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---|---|----|----|----|------------|-------|-------|------|------|------|--------------|---|---|
|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.4             | 3 | 5 | 10 | 15 | 20 | QPSK       | 16QAM | 64QAM | 1    | Half | Full | L            | M | H |
| Max. Output Power          | 30                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -               | - | v | v  | -  | -  | v          | v     | v     | v    | v    | v    | v            | v | v |
| E.I.R.P                    | 30                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -               | - | v | v  | -  | -  | v          | v     | v     | v    | v    | v    | v            | v | v |
| Radiated Spurious Emission | 30                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Worst Case      |   |   |    |    |    |            |       |       |      |      |      | v            | v | v |
| Remark                     | 1. The mark “v “ means that this configuration is chosen for testing<br>2. The mark “-“ means that this bandwidth is not supported.<br>3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.<br>4. All the radiated test cases were performed with Adapter 1. |                 |   |   |    |    |    |            |       |       |      |      |      |              |   |   |

### 2.2 Connection Diagram of Test System



## 2.3 Support Unit used in test configuration and system

| Item | Equipment        | Trade Name | Model No. | FCC ID       | Data Cable        | Power Cord        |
|------|------------------|------------|-----------|--------------|-------------------|-------------------|
| 1.   | System Simulator | Anritsu    | MT8820C   | N/A          | N/A               | Unshielded, 1.8 m |
| 2.   | iPod Earphone    | Apple      | N/A       | Verification | Unshielded, 1.0 m | N/A               |

## 2.4 Frequency List of Low/Middle/High Channels

| LTE Band 30 Channel and Frequency List |                        |        |        |         |
|----------------------------------------|------------------------|--------|--------|---------|
| BW [MHz]                               | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| 10                                     | Channel                | -      | 27710  | -       |
|                                        | Frequency              | -      | 2310   | -       |
| 5                                      | Channel                | 27685  | 27710  | 27735   |
|                                        | Frequency              | 2307.5 | 2310   | 2312.5  |

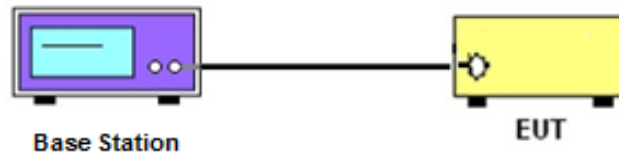
### 3 Conducted Test Items

#### 3.1 Measuring Instruments

See list of measuring instruments of this test report.

##### 3.1.1 Test Setup

##### 3.1.2 Conducted Output Power



##### 3.1.3 Test Result of Conducted Test

Please refer to Appendix A.

## 3.2 Conducted Output Power Measurement and EIRP Measurement

### 3.2.1 Description of the Conducted Output Power Measurement and EIRP Measurement

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$ , where

$P_T$  = transmitter output power in dBm

$G_T$  = gain of the transmitting antenna in dBi

$L_C$  = signal attenuation in the connecting cable between the transmitter and antenna in dB

### 3.2.2 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through the system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

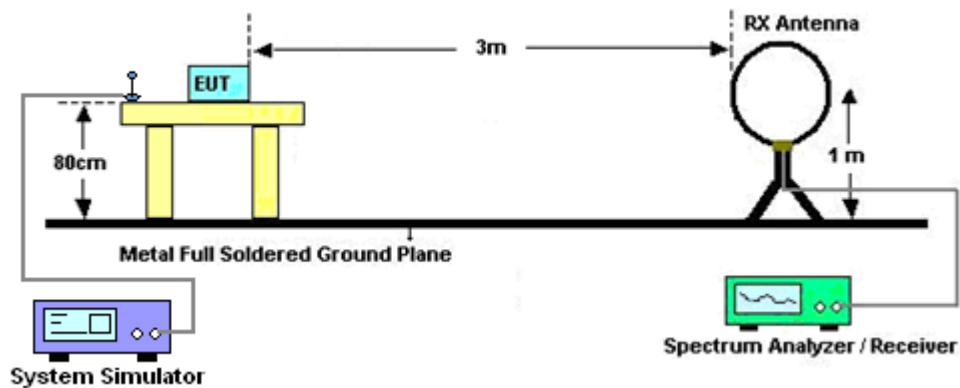
## 4 Radiated Test Items

### 4.1 Measuring Instruments

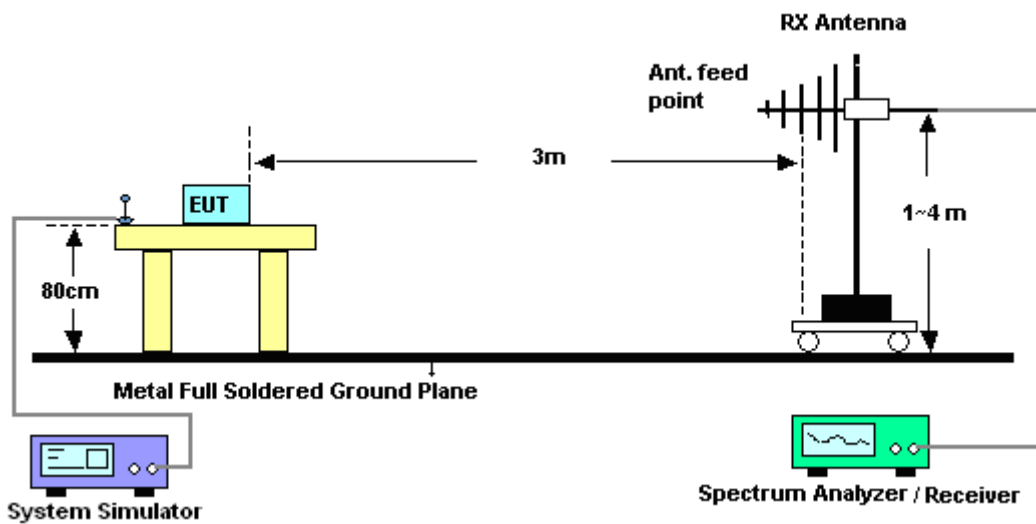
See list of measuring instruments of this test report.

#### 4.1.1 Test Setup

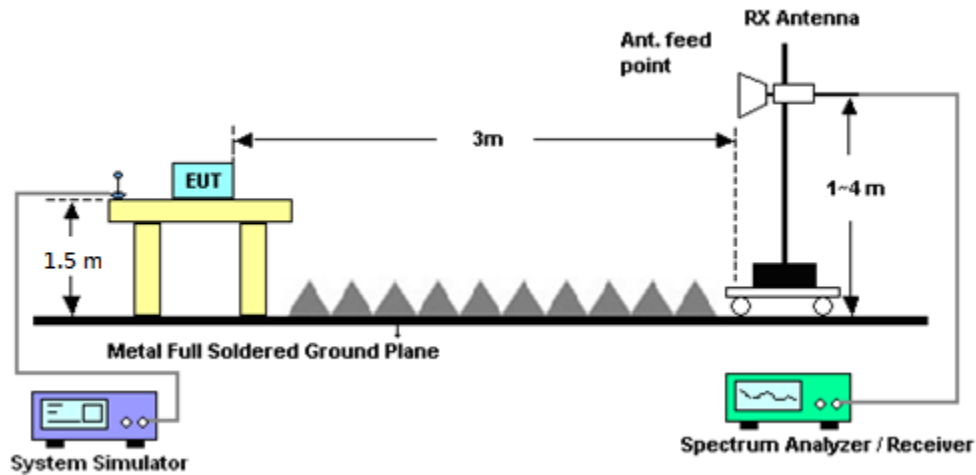
For radiated emissions below 30MHz



For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



#### 4.1.2 Test Result of Radiated Test

Please refer to Appendix B.

**Note:**

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

## 4.2 Radiated Spurious Emission Measurement

### 4.2.1 Description of Radiated Spurious Emission Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least  $70 + 10 \log(P)$  dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

### 4.2.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI / TIA-603-E Section 2.2.12.

1. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
5. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.

$$\text{EIRP (dBm)} = \text{S.G. Power} - \text{Tx Cable Loss} + \text{Tx Antenna Gain}$$

$$\text{ERP (dBm)} = \text{EIRP} - 2.15$$

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

The limit line is derived from  $70 + 10\log(P)$ dB below the transmitter power P(Watts)

$$= P(W) - [70 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [70 + 10\log(P)] \text{ (dB)}$$

$$= -40\text{dBm}.$$



## 5 List of Measuring Equipment

| Instrument                | Manufacturer    | Model No.                   | Serial No.                      | Characteristics       | Calibration Date | Test Date                   | Due Date      | Remark                |
|---------------------------|-----------------|-----------------------------|---------------------------------|-----------------------|------------------|-----------------------------|---------------|-----------------------|
| LTE Base Station          | Anritsu         | MT8820C                     | 6201107509                      | -                     | Jul. 03, 2019    | Jan. 26, 2020               | Jul. 02, 2020 | Conducted (TH05-HY)   |
| Bilog Antenna             | TESEQ           | CBL 6111D & 00800N1D01 N-06 | 35419 & 03                      | 30MHz~1GHz            | Apr. 30, 2019    | Feb. 11, 2020~Feb. 19, 2020 | Apr. 29, 2020 | Radiation (03CH07-HY) |
| Bilog Antenna             | TESEQ           | CBL 6111D & N-6-06          | 35414 & AT-N0602                | 30MHz~1GHz            | Oct. 12, 2019    | Feb.11, 2020 ~ Feb.19, 2020 | Oct. 11, 2020 | Radiation (03CH07-HY) |
| Double Ridge Horn Antenna | ESCO            | 3117                        | 00075962                        | 1GHz ~ 18GHz          | Dec. 06, 2019    | Feb. 11, 2020~Feb. 19, 2020 | Dec. 05, 2020 | Radiation (03CH07-HY) |
| Horn Antenna              | ESCO            | 3117                        | 00066584                        | 1GHz ~18GHz           | Sep. 25, 2019    | Feb. 11, 2020~Feb. 19, 2020 | Sep. 24, 2020 | Radiation (03CH07-HY) |
| SHF-EHF Horn Antenna      | SCHWARZBECK     | BBHA 9170                   | BBHA9170576                     | 18GHz~40GHz           | May 14, 2019     | Feb. 11, 2020~Feb. 19, 2020 | May 13, 2020  | Radiation (03CH07-HY) |
| SHF-EHF Horn Antenna      | SCHWARZBECK     | BBHA 9170                   | BBHA9170251                     | 18GHz~40GHz           | Dec. 06, 2019    | Feb. 11, 2020~Feb. 19, 2020 | Dec. 06, 2020 | Radiation (03CH07-HY) |
| Spectrum Analyzer         | Agilent         | N9030A                      | MY52350276                      | 3Hz~44GHz             | Apr. 02, 2019    | Feb. 11, 2020~Feb. 19, 2020 | Apr. 01, 2020 | Radiation (03CH07-HY) |
| Spectrum Analyzer         | Keysight        | N9010A                      | MY54200486                      | 10Hz~44GHz            | Oct. 28, 2019    | Feb. 11, 2020~Feb. 19, 2020 | Oct. 27, 2020 | Radiation (03CH07-HY) |
| Preamplifier              | MITEQ           | AMF-7D-0010 1800-30-10P     | 1590075                         | 1GHz~18GHz            | Apr. 24, 2019    | Feb. 11, 2020~Feb. 19, 2020 | Apr. 23, 2020 | Radiation (03CH07-HY) |
| Preamplifier              | COM-POWER       | PA-103A                     | 161241                          | 10MHz~1GHz            | May 20, 2019     | Feb. 11, 2020~Feb. 19, 2020 | May 19, 2020  | Radiation (03CH07-HY) |
| Preamplifier              | Agilent         | 8449B                       | 3008A02362                      | 1GHz~26.5GHz          | Nov. 01, 2019    | Feb. 11, 2020~Feb. 19, 2020 | Oct. 31, 2020 | Radiation (03CH07-HY) |
| Preamplifier              | EMEC            | EM18G40G                    | 060715                          | 18GHz~40GHz           | Dec. 13, 2019    | Feb. 11, 2020~Feb. 19, 2020 | Dec. 12, 2020 | Radiation (03CH07-HY) |
| Filter                    | Microwave       | H1G013G1                    | SN477215                        | 1GHz High Pass Filter | Nov. 01, 2019    | Feb. 11, 2020~Feb. 19, 2020 | Oct. 31, 2020 | Radiation (03CH07-HY) |
| Filter                    | Microwave       | H3G018G1                    | SN477220                        | 3GHz High Pass Filter | Nov. 01, 2019    | Feb. 11, 2020~Feb. 19, 2020 | Oct. 31, 2020 | Radiation (03CH07-HY) |
| Filter                    | Wainwright      | WHNX7.0-26.5G-6SS           | SN7                             | 7GHz High Pass Filter | Aug. 22, 2019    | Feb. 11, 2020~Feb. 19, 2020 | Aug. 21, 2020 | Radiation (03CH07-HY) |
| RF Cable                  | HUBER + SUHNER  | SUCOFLEX 104                | MY28655/4, MY24971/4, MY15682/4 | 30MHz~1GHz            | Feb. 26, 2019    | Feb. 11, 2020~Feb. 19, 2020 | Feb. 25, 2020 | Radiation (03CH07-HY) |
| RF Cable                  | HUBER + SUHNER  | SUCOFLEX 104                | MY28655/4, MY24971/4, MY15682/4 | 1GHz~18GHz            | Feb. 26, 2019    | Feb. 11, 2020~Feb. 19, 2020 | Feb. 25, 2020 | Radiation (03CH07-HY) |
| RF Cable                  | HUBER + SUHNER  | SUCOFLEX 102                | MY2858/2                        | 18GHz~40GHz           | Feb. 26, 2019    | Feb. 11, 2020~Feb. 19, 2020 | Feb. 25, 2020 | Radiation (03CH07-HY) |
| Antenna Mast              | Max-Full        | MFA520BS                    | N/A                             | 1m~4m                 | N/A              | Feb. 11, 2020~Feb. 19, 2020 | N/A           | Radiation (03CH07-HY) |
| Turn Table                | ChainTek        | Chaintek 3000               | N/A                             | 0~360 Degree          | N/A              | Feb. 11, 2020~Feb. 19, 2020 | N/A           | Radiation (03CH07-HY) |
| Signal Generator          | Rohde & Schwarz | SMF100A                     | 101107                          | 100kHz~40GHz          | Aug. 27, 2019    | Feb. 11, 2020~Feb. 19, 2020 | Aug. 26, 2020 | Radiation (03CH07-HY) |
| Software                  | Audix           | E3 6.2009-8-24              | 80504004656H                    | N/A                   | N/A              | Feb. 11, 2020~Feb. 19, 2020 | N/A           | Radiation (03CH07-HY) |

## 6 Uncertainty of Evaluation

### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

|                                                                          |      |
|--------------------------------------------------------------------------|------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2U_c(y)$ ) | 3.23 |
|--------------------------------------------------------------------------|------|

### Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

|                                                                          |      |
|--------------------------------------------------------------------------|------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2U_c(y)$ ) | 3.63 |
|--------------------------------------------------------------------------|------|

### Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

|                                                                          |      |
|--------------------------------------------------------------------------|------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2U_c(y)$ ) | 4.70 |
|--------------------------------------------------------------------------|------|



## Appendix A. Test Results of Conducted Test

### Conducted Output Power(Average power)

| LTE Band 30 Maximum Average Power [dBm] |         |           |        |        |        |         |
|-----------------------------------------|---------|-----------|--------|--------|--------|---------|
| BW [MHz]                                | RB Size | RB Offset | Mod    | Lowest | Middle | Highest |
| 10                                      | 1       | 0         | QPSK   |        | 22.34  |         |
| 10                                      | 1       | 25        |        |        | 22.28  |         |
| 10                                      | 1       | 49        |        |        | 22.23  |         |
| 10                                      | 25      | 0         |        |        | 21.45  |         |
| 10                                      | 25      | 12        |        |        | 21.38  |         |
| 10                                      | 25      | 25        |        |        | 21.20  |         |
| 10                                      | 50      | 0         |        |        | 21.32  |         |
| 10                                      | 1       | 0         | 16-QAM | -      | 21.62  | -       |
| 10                                      | 1       | 25        |        |        | 21.70  |         |
| 10                                      | 1       | 49        |        |        | 21.65  |         |
| 10                                      | 25      | 0         |        |        | 20.38  |         |
| 10                                      | 25      | 12        |        |        | 20.43  |         |
| 10                                      | 25      | 25        |        |        | 20.27  |         |
| 10                                      | 50      | 0         |        |        | 20.35  |         |
| 10                                      | 1       | 0         | 64-QAM |        | 20.40  |         |
| 10                                      | 1       | 25        |        |        | 20.55  |         |
| 10                                      | 1       | 49        |        |        | 20.50  |         |
| 10                                      | 25      | 0         |        |        | 19.42  |         |
| 10                                      | 25      | 12        |        |        | 19.47  |         |
| 10                                      | 25      | 25        |        |        | 19.31  |         |
| 10                                      | 50      | 0         |        |        | 19.40  |         |
| 5                                       | 1       | 0         | QPSK   | 22.25  | 22.27  | 22.33   |
| 5                                       | 1       | 12        |        | 22.21  | 22.18  | 22.27   |
| 5                                       | 1       | 24        |        | 22.19  | 22.20  | 22.23   |
| 5                                       | 12      | 0         |        | 21.38  | 21.39  | 21.41   |
| 5                                       | 12      | 7         |        | 21.30  | 21.38  | 21.33   |
| 5                                       | 12      | 13        |        | 21.13  | 21.12  | 21.10   |
| 5                                       | 25      | 0         |        | 21.22  | 21.27  | 21.27   |
| 5                                       | 1       | 0         | 16-QAM | 21.53  | 21.59  | 21.54   |
| 5                                       | 1       | 12        |        | 21.67  | 21.66  | 21.64   |
| 5                                       | 1       | 24        |        | 21.65  | 21.62  | 21.55   |
| 5                                       | 12      | 0         |        | 20.33  | 20.36  | 20.30   |
| 5                                       | 12      | 7         |        | 20.42  | 20.37  | 20.38   |
| 5                                       | 12      | 13        |        | 20.17  | 20.27  | 20.18   |
| 5                                       | 25      | 0         |        | 20.34  | 20.30  | 20.25   |
| 5                                       | 1       | 0         | 64-QAM | 20.30  | 20.39  | 20.32   |
| 5                                       | 1       | 12        |        | 20.55  | 20.46  | 20.52   |
| 5                                       | 1       | 24        |        | 20.43  | 20.40  | 20.40   |
| 5                                       | 12      | 0         |        | 19.33  | 19.40  | 19.36   |
| 5                                       | 12      | 7         |        | 19.37  | 19.45  | 19.47   |
| 5                                       | 12      | 13        |        | 19.21  | 19.26  | 19.22   |
| 5                                       | 25      | 0         |        | 19.40  | 19.32  | 19.36   |



## Appendix B. Test Results of EIRP and Radiated Test

### EIRP

#### <Reporting Only>

| LTE Band 30 / 5MHz (Average) (GT - LC = -0.31 dB) |       |      |        |             |               |           |         |
|---------------------------------------------------|-------|------|--------|-------------|---------------|-----------|---------|
| Channel                                           | Mode  | RB   |        | Conducted   |               | EIRP      |         |
|                                                   |       | Size | Offset | Power (dBm) | Power (Watts) | EIRP(dBm) | EIRP(W) |
| Lowest                                            | QPSK  | 1    | 0      | 22.25       | 0.1679        | 21.94     | 0.1563  |
| Middle                                            |       | 1    | 0      | 22.27       | 0.1687        | 21.96     | 0.1570  |
| Highest                                           |       | 1    | 0      | 22.33       | 0.1710        | 22.02     | 0.1592  |
| Lowest                                            | 16QAM | 1    | 12     | 21.67       | 0.1469        | 21.36     | 0.1368  |
| Middle                                            |       | 1    | 12     | 21.66       | 0.1466        | 21.35     | 0.1365  |
| Highest                                           |       | 1    | 12     | 21.64       | 0.1459        | 21.33     | 0.1358  |
| Lowest                                            | 64QAM | 1    | 12     | 20.55       | 0.1135        | 20.24     | 0.1057  |
| Middle                                            |       | 1    | 12     | 20.46       | 0.1112        | 20.15     | 0.1035  |
| Highest                                           |       | 1    | 12     | 20.52       | 0.1127        | 20.21     | 0.1050  |

| LTE Band 30 / 10MHz (Average) (GT - LC = -0.31 dB) |       |      |        |             |               |           |         |
|----------------------------------------------------|-------|------|--------|-------------|---------------|-----------|---------|
| Channel                                            | Mode  | RB   |        | Conducted   |               | EIRP      |         |
|                                                    |       | Size | Offset | Power (dBm) | Power (Watts) | EIRP(dBm) | EIRP(W) |
| Lowest                                             | QPSK  | -    | -      | -           | -             | -         | -       |
| Middle                                             |       | 1    | 0      | 22.34       | 0.1714        | 22.03     | 0.1596  |
| Highest                                            |       | -    | -      | -           | -             | -         | -       |
| Lowest                                             | 16QAM | -    | -      | -           | -             | -         | -       |
| Middle                                             |       | 1    | 25     | 21.70       | 0.1479        | 21.39     | 0.1377  |
| Highest                                            |       | -    | -      | -           | -             | -         | -       |
| Lowest                                             | 64QAM | -    | -      | -           | -             | -         | -       |
| Middle                                             |       | 1    | 25     | 20.55       | 0.1135        | 20.24     | 0.1057  |
| Highest                                            |       | -    | -      | -           | -             | -         | -       |

**Radiated Spurious Emission****LTE Band 30**

| LTE Band 30 / 5MHz / QPSK |                      |                |                  |                         |                         |                          |                            |                             |                       |
|---------------------------|----------------------|----------------|------------------|-------------------------|-------------------------|--------------------------|----------------------------|-----------------------------|-----------------------|
| Channel                   | Frequency<br>( MHz ) | ERP<br>( dBm ) | Limit<br>( dBm ) | Over<br>Limit<br>( dB ) | SPA<br>Reading<br>(dBm) | S.G.<br>Power<br>( dBm ) | TX Cable<br>loss<br>( dB ) | TX Antenna<br>Gain<br>(dBi) | Polarization<br>(H/V) |
| Lowest                    | 4610                 | -57.39         | -40              | -17.39                  | -79.33                  | -64.2                    | 2.11                       | 8.92                        | H                     |
|                           | 6915                 | -54.22         | -40              | -14.22                  | -81.14                  | -62.3                    | 2.62                       | 10.70                       | H                     |
|                           | 9220                 | -51.12         | -40              | -11.12                  | -81.38                  | -61.2                    | 2.53                       | 12.61                       | H                     |
|                           | 4610                 | -57.99         | -40              | -17.99                  | -79.99                  | -64.8                    | 2.11                       | 8.92                        | V                     |
|                           | 6915                 | -54.52         | -40              | -14.52                  | -81.38                  | -62.6                    | 2.62                       | 10.70                       | V                     |
|                           | 9220                 | -50.22         | -40              | -10.22                  | -81.53                  | -60.3                    | 2.53                       | 12.61                       | V                     |
| Middle                    | 4614                 | -57.39         | -40              | -17.39                  | -79.49                  | -64.2                    | 2.11                       | 8.93                        | H                     |
|                           | 6924                 | -54.41         | -40              | -14.41                  | -81.19                  | -62.5                    | 2.62                       | 10.71                       | H                     |
|                           | 9234                 | -50.53         | -40              | -10.53                  | -81.34                  | -60.6                    | 2.53                       | 12.61                       | H                     |
|                           | 4614                 | -57.49         | -40              | -17.49                  | -79.6                   | -64.3                    | 2.11                       | 8.93                        | V                     |
|                           | 6924                 | -44.11         | -40              | -4.11                   | -71.13                  | -52.2                    | 2.62                       | 10.71                       | V                     |
|                           | 9234                 | -50.03         | -40              | -10.03                  | -81.05                  | -60.1                    | 2.53                       | 12.61                       | V                     |
| Highest                   | 4620                 | -56.68         | -40              | -16.68                  | -78.93                  | -63.5                    | 2.12                       | 8.94                        | H                     |
|                           | 6930                 | -47.00         | -40              | -7.00                   | -74.03                  | -55.1                    | 2.61                       | 10.72                       | H                     |
|                           | 9240                 | -50.73         | -40              | -10.73                  | -81                     | -60.8                    | 2.53                       | 12.60                       | H                     |
|                           | 4620                 | -57.68         | -40              | -17.68                  | -79.86                  | -64.5                    | 2.12                       | 8.94                        | V                     |
|                           | 6930                 | -54.20         | -40              | -14.20                  | -81.17                  | -62.3                    | 2.61                       | 10.72                       | V                     |
|                           | 9240                 | -50.03         | -40              | -10.03                  | -81.15                  | -60.1                    | 2.53                       | 12.60                       | V                     |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



| LTE Band 30 / 10MHz / QPSK |                      |                |                  |                         |                         |                          |                            |                             |                       |
|----------------------------|----------------------|----------------|------------------|-------------------------|-------------------------|--------------------------|----------------------------|-----------------------------|-----------------------|
| Channel                    | Frequency<br>( MHz ) | ERP<br>( dBm ) | Limit<br>( dBm ) | Over<br>Limit<br>( dB ) | SPA<br>Reading<br>(dBm) | S.G.<br>Power<br>( dBm ) | TX Cable<br>loss<br>( dB ) | TX Antenna<br>Gain<br>(dBi) | Polarization<br>(H/V) |
| Middle                     | 4610                 | -57.99         | -40              | -17.99                  | -80.29                  | -64.8                    | 2.11                       | 8.92                        | H                     |
|                            | 6918                 | -55.02         | -40              | -15.02                  | -81.83                  | -63.1                    | 2.62                       | 10.70                       | H                     |
|                            | 9220                 | -51.52         | -40              | -11.52                  | -81.69                  | -61.6                    | 2.53                       | 12.61                       | H                     |
|                            | 4610                 | -58.29         | -40              | -18.29                  | -80.53                  | -65.1                    | 2.11                       | 8.92                        | V                     |
|                            | 6918                 | -49.82         | -40              | -9.82                   | -76.58                  | -57.9                    | 2.62                       | 10.70                       | V                     |
|                            | 9220                 | -50.72         | -40              | -10.72                  | -81.73                  | -60.8                    | 2.53                       | 12.61                       | V                     |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.