



# FCC RF Test Report

**APPLICANT** : BlackBerry Limited  
**EQUIPMENT** : Smartphone  
**BRAND NAME** : BlackBerry  
**MODEL NAME** : RHE151LW  
**MARKETING NAME** : SQC100-2  
**FCC ID** : L6ARHE150LW  
**STANDARD** : 47 CFR Part 2, 22(H), 24(E), 27  
**CLASSIFICATION** : PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Jul. 15, 2014 and testing was completed on Oct. 04, 2014. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-C-2004 and the testing has shown the tested sample to be in compliance with the applicable technical standards.

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

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Reviewed by: Joseph Lin / Supervisor

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Approved by: Jones Tsai / Manager



## **SPORTON INTERNATIONAL INC.**

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FCC ID : L6ARHE150LW

Page Number : 1 of 46

Report Issued Date : Nov. 11, 2014

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## REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION             | ISSUED DATE   |
|------------|---------|-------------------------|---------------|
| FG471524B  | Rev. 01 | Initial issue of report | Nov. 11, 2014 |
|            |         |                         |               |
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## SUMMARY OF TEST RESULT

| Report Section | FCC Rule  | IC Rule  | Description   | Limit                               | Result        | Remark   |
|----------------|---|--|---|-------------------------------------|---------------|--|
| 3.1            | §2.1046   | RSS-Gen(4.8)<br>RSS-130(4.4)<br>RSS-132 (5.4)<br>RSS-133 (6.4)<br>RSS-139 (6.4)<br>RSS-199 (4.4) | Conducted Output Power  | Reporting Only                      | PASS          | -  |
| -              | §24.232(d)  | RSS-130(4.4)<br>RSS-132 (5.4)<br>RSS-133 (6.4)<br>RSS-139 (6.4)                                  | Peak-to-Average Ratio   | <13 dB                              | Not Performed | Please refer to Sporton Report No. : FG471420B |
| 3.2            | §22.913(a)(2)   | RSS-132(5.4)<br>SRSP-503(5.1.3)  | Effective Radiated Power (Band 5)                               | ERP < 7 Watt                        | PASS          | -  |
|                | §27.50(b)(10)<br>§27.50(c)(10)<br>§27.50(c)(9)                      | N/A  | Effective Radiated Power (Band 17)                              | ERP < 3 Watt                        |               |  |
|                | N/A   | RSS-130(4.4)   | Equivalent Isotropic Radiated Power (Band 17)                   | EIRP < 5 Watt                       |               |  |
|                | §24.232(c)<br>§27.50(h)(2)  | RSS-133 (6.4)<br>SRSP-510(5.1.2)<br>RSS-199 (4.4)  | Equivalent Isotropic Radiated Power (Band 2) (Band 7)           | EIRP < 2Watt                        |               |  |
|                | §27.50(d)(4)  | RSS-139 (6.4)<br>SRSP-513(5.1.2)   | Equivalent Isotropic Radiated Power (Band 4)                    | EIRP < 1Watt                        |               |  |
| 3.3            | §2.1053<br>§22.917(a)<br>§24.238(a)<br>§27.53(g)<br>§27.53(h)       | RSS-GEN(4.9)<br>RSS-132 (5.5)<br>RSS-133 (6.5.1)<br>RSS-130(4.6)<br>RSS-139 (6.5)                | Radiated Spurious Emission (Band 2) (Band 4) (Band 5) (Band 17) | < 43+10log <sub>10</sub> (P[Watts]) | PASS          | Under limit 10.40 dB at 10002.000 MHz          |
|                | §2.1053<br>§27.53(m)(4)   | RSS-GEN(4.9)<br>RSS-199 (4.5)  | Radiated Spurious Emission (Band 7)                             | < 55+10log <sub>10</sub> (P[Watts]) | PASS          |  |
| -              | §2.1049<br>§22.917(b)<br>§24.238(b)<br>§27.53(h)(3)<br>§27.53(m)(6) | RSS-GEN(4.6.1)<br>RSS-132 (3.1)<br>RSS-133 (3.1)<br>RSS-139 (3.1)<br>RSS-199 (4.2)               | Occupied Bandwidth  | Reporting Only                      | Not Performed | Please refer to Sporton Report No. : FG471420B |



| Report Section | FCC Rule  | IC Rule  | Description   | Limit                               | Result        | Remark   |
|----------------|---|--|---|-------------------------------------|---------------|--|
| -              | §2.1051<br>§22.917(a)<br>§24.238(a)<br>§27.53(g)<br>§27.53(h)<br>§27.53(m)(4) | RSS-GEN(4.9)<br>RSS-132 (5.5)<br>RSS-133 (6.5.1)<br>RSS-130(4.6)<br>RSS-139 (6.5)<br>RSS-199 (4.5) | Conducted Band Edge Measurement (Band 2) (Band 4) (Band 5) (Band 17) (Band 7) | $< 43+10\log_{10}(P[\text{Watt}])$  | Not Performed | Please refer to Sporton Report No. : FG471420B |
| -              | §2.1051<br>§22.917(a)<br>§24.238(a)<br>§27.53(g)<br>§27.53(h)                 | RSS-GEN(4.9)<br>RSS-132 (5.5)<br>RSS-133 (6.5.1)<br>RSS-130(4.6)<br>RSS-139 (6.5)                  | Conducted Spurious Emission (Band 2) (Band 4) (Band 5) (Band 17)              | $< 43+10\log_{10}(P[\text{Watts}])$ | Not Performed | Please refer to Sporton Report No. : FG471420B |
|                | §2.1051<br>§27.53(m)(4)   | RSS-GEN(4.9)<br>RSS-199 (4.5)  | Conducted Spurious Emission (Band 7)  | $< 55+10\log_{10}(P[\text{Watts}])$ | Not Performed | Please refer to Sporton Report No. : FG471420B |
| -              | §2.1055<br>§22.355  | RSS-GEN(4.7)<br>RSS-132(5.3)   | Frequency Stability Temperature & Voltage                                     | $< 2.5 \text{ ppm}$                 | Not Performed | Please refer to Sporton Report No. : FG471420B |
|                | §2.1055<br>§24.235<br>§27.54  | RSS-GEN(4.7)<br>RSS-133(6.3)<br>RSS-130(4.3)<br>RSS-139 (6.3)<br>RSS-199 (4.3)                     |   | within authorized band              |               |  |



# 1 General Description

## 1.1 Applicant

**BlackBerry Limited**

2300 University Street East, Waterloo, ON., CAN, N2K1A0

## 1.2 Manufacturer

**FIH Mobile Limited**

No.4, Mingsheng St., Tu-Cheng Dist., New Taipei City 23679, Taiwan

## 1.3 Product Feature of Equipment Under Test

| Product Feature                 |  |
|---------------------------------|--|
| Equipment                       | Smartphone   |
| Brand Name                      | BlackBerry   |
| Model Name                      | RHE151LW   |
| Marketing Name                  | SQC100-2   |
| FCC ID                          | L6ARHE150LW  |
| IMEI Code                       | 004401139984195  |
| EUT supports Radios application | GSM/EGPRS/WCDMA/HSPA/LTE/NFC<br>WLAN 11b/g/n HT20<br>WLAN 11a/n HT20/HT40<br>Bluetooth v4.0 EDR/LE |
| HW Version                      | PVT 2  |
| SW Version                      | BlackBerry 10.3.1.565/566  |
| EUT Stage                       | Identical Prototype  |

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.



### 1.4 Product Specification subjective to this standard

| Product Specification subjective to this standard |   |
|---|---|
| <b>Tx Frequency</b>                               | LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz<br>LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz<br>LTE Band 5 : 824.7 MHz ~ 848.3 MHz<br>LTE Band 7 : 2502.5 MHz ~ 2567.5 MHz<br>LTE Band 17 : 706.5 MHz ~ 713.5 MHz   |
| <b>Rx Frequency</b>                               | LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz<br>LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz<br>LTE Band 5 : 869.7 MHz ~ 893.3 MHz<br>LTE Band 7 : 2622.5MHz ~ 2687.5 MHz<br>LTE Band 17 : 736.5 MHz ~ 743.5 MHz  |
| <b>Bandwidth</b>                                  | LTE Band 2 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz<br>LTE Band 4 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz<br>LTE Band 5 : 1.4MHz / 3MHz / 5MHz / 10MHz<br>LTE Band 7 : 5MHz/ 10MHz / 15MHz / 20MHz<br>LTE Band 17 : 5MHz / 10MHz |
| <b>Maximum Output Power to Antenna</b>            | LTE Band 2 : 23.95 dBm<br>LTE Band 4 : 23.20 dBm<br>LTE Band 5 : 23.24 dBm<br>LTE Band 7 : 23.93 dBm<br>LTE Band 17 : 23.35 dBm   |
| <b>Antenna Type</b>                               | PIFA Antenna  |
| <b>Type of Modulation</b>                         | QPSK / 16QAM  |

### 1.5 Modification of EUT

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

### 1.6 Maximum ERP/EIRP Power

| FCC Rule | System      | Type of Modulation | BW      | Maximum ERP/EIRP |
|----------|-------------|--------------------|---------|------------------|
| Part 22  | LTE Band 5  | QPSK               | 1.4 MHz | 0.080 W          |
| Part 24  | LTE Band 2  | QPSK               | 15 MHz  | 0.198 W          |
| Part 27  | LTE Band 4  | QPSK               | 10MHz   | 0.275 W          |
| Part 27  | LTE Band 17 | QPSK               | 5MHz    | 0.052 W          |
| Part 27  | LTE Band 7  | QPSK               | 15MHz   | 0.196 W          |



### 1.7 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

|                           |   |           |
|---------------------------|---|-----------|
| <b>Test Site</b>          | SPORTON INTERNATIONAL INC.  |           |
| <b>Test Site Location</b> | No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park,<br>Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.<br>TEL: +886-3-327-3456<br>FAX: +886-3-328-4978 |           |
| <b>Test Site No.</b>      | <b>Sporton Site No.</b>   |           |
|                           | TH02-HY   | 03CH07-HY |

### 1.8 Applicable Standards

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

- ♦ 47 CFR Part 2, 22(H), 24(E), 27
- ♦ ANSI / TIA / EIA-603-C-2004
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v02r01
- ♦ KDB 648474 D03 Handset Wireless Chargers Battery Covers v01r02

**Remark:**

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.





## 2 Test Configuration of Equipment Under Test

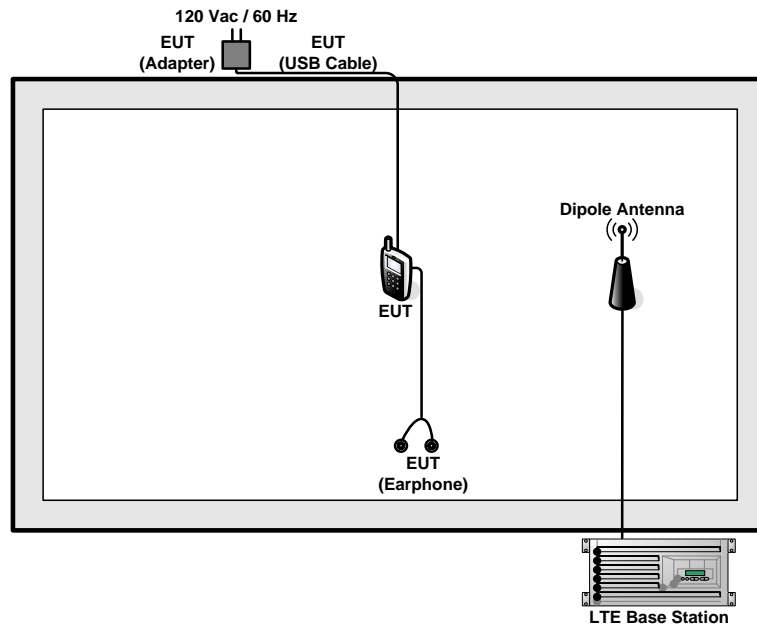
### 2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r01 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

| Test Items                 | Band   | Bandwidth (MHz) |   |   |    |    |    | Modulation |       | RB # |      |      | Test Channel |   |   |
|----------------------------|--|-----------------|---|---|----|----|----|------------|-------|------|------|------|--------------|---|---|
|                            |  | 1.4             | 3 | 5 | 10 | 15 | 20 | QPSK       | 16QAM | 1    | Half | Full | L            | M | H |
| Max. Output Power          | 2  | √               | √ | √ | √  | √  | √  | √          | √     | √    | √    | √    | √            | √ | √ |
|                            | 4  | √               | √ | √ | √  | √  | √  | √          | √     | √    | √    | √    | √            | √ | √ |
|                            | 5  | √               | √ | √ | √  | -  | -  | √          | √     | √    | √    | √    | √            | √ | √ |
|                            | 7  | -               | - | √ | √  | √  | √  | √          | √     | √    | √    | √    | √            | √ | √ |
|                            | 17   | -               | - | √ | √  | -  | -  | √          | √     | √    | √    | √    | √            | √ | √ |
| E.R.P./E.I.R.P.            | 2  |                 |   |   |    | √  |    | √          |       | √    |      |      | √            | √ | √ |
|                            | 4  |                 |   |   | √  |    |    | √          |       | √    |      |      | √            | √ | √ |
|                            | 5  | √               |   |   |    | -  | -  | √          |       | √    |      |      | √            | √ | √ |
|                            | 7  | -               | - |   |    | √  |    | √          |       | √    |      |      | √            | √ | √ |
|                            | 17   | -               | - | √ |    | -  | -  | √          |       | √    |      |      | √            | √ | √ |
| Radiated Spurious Emission | 2  | √               | √ | √ | √  | √  | √  | √          |       | √    |      |      | √            | √ | √ |
|                            | 4  | √               | √ | √ | √  | √  | √  | √          |       | √    |      |      | √            | √ | √ |
|                            | 5  | √               | √ | √ | √  | -  | -  | √          |       | √    |      |      | √            | √ | √ |
|                            | 7  | -               | - | √ | √  | √  | √  | √          |       | √    |      |      | √            | √ | √ |
|                            | 17   | -               | - | √ | √  | -  | -  | √          |       | √    |      |      | √            | √ | √ |
| Note                       | <ol style="list-style-type: none"> <li>The mark “√” means that this configuration is chosen for testing</li> <li>The mark “-” means that this bandwidth is not supported.</li> <li>For E.R.P./E.I.R.P. measurement, the widest bandwidth of each band is chosen for testing due to highest conducted power. Besides, the lowest bandwidth of each band is also measured for reporting only.</li> <li>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.</li> <li>All modes and data rates and positions were investigated, and found that EUT without the wireless power charger as the worst case test configuration.</li> </ol> |                 |   |   |    |    |    |            |       |      |      |      |              |   |   |

## 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.   | LTE Base Station | Anritsu    | MT8820C   | N/A    | N/A        | Unshielded, 1.8 m |

### 3 Test Result

#### 3.1 Conducted Output Power Measurement

##### 3.1.1 Description of the Conducted Output Power Measurement

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

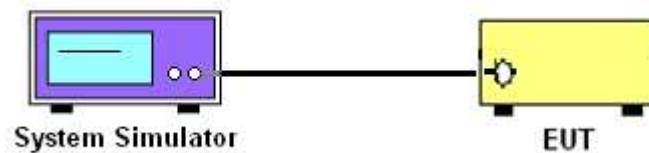
##### 3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

##### 3.1.3 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.

##### 3.1.4 Test Setup





### 3.1.5 Test Result of Conducted Output Power

<LTE Band 5 Conducted Power>

| BW [MHz]               | Modulation | RB Size | RB Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
|------------------------|------------|---------|-----------|-----------------------------------|--------------------------------------|------------------------------------|
| <b>Channel</b>         |            |         |           | <b>20450</b>                      | <b>20525</b>                         | <b>20600</b>                       |
| <b>Frequency (MHz)</b> |            |         |           | <b>829</b>                        | <b>836.5</b>                         | <b>844</b>                         |
| 10                     | QPSK       | 1       | 0         | 23.00                             | 23.10                                | 23.24                              |
| 10                     | QPSK       | 1       | 24        | 22.96                             | 23.06                                | 23.17                              |
| 10                     | QPSK       | 1       | 49        | 22.97                             | 23.03                                | 23.17                              |
| 10                     | QPSK       | 25      | 0         | 21.92                             | 22.00                                | 22.06                              |
| 10                     | QPSK       | 25      | 12        | 21.82                             | 21.93                                | 22.05                              |
| 10                     | QPSK       | 25      | 24        | 21.89                             | 21.98                                | 22.10                              |
| 10                     | QPSK       | 50      | 0         | 21.83                             | 21.89                                | 21.98                              |
| 10                     | 16QAM      | 1       | 0         | 22.00                             | 22.03                                | 22.18                              |
| 10                     | 16QAM      | 1       | 24        | 21.95                             | 22.05                                | 22.17                              |
| 10                     | 16QAM      | 1       | 49        | 21.99                             | 22.07                                | 22.17                              |
| 10                     | 16QAM      | 25      | 0         | 20.85                             | 20.92                                | 20.99                              |
| 10                     | 16QAM      | 25      | 12        | 20.85                             | 20.90                                | 21.06                              |
| 10                     | 16QAM      | 25      | 24        | 20.83                             | 20.90                                | 21.12                              |
| 10                     | 16QAM      | 50      | 0         | 20.79                             | 20.82                                | 20.95                              |
| <b>Channel</b>         |            |         |           | <b>20425</b>                      | <b>20525</b>                         | <b>20625</b>                       |
| <b>Frequency (MHz)</b> |            |         |           | <b>826.5</b>                      | <b>836.5</b>                         | <b>846.5</b>                       |
| 5                      | QPSK       | 1       | 0         | 22.96                             | 23.01                                | 23.19                              |
| 5                      | QPSK       | 1       | 12        | 22.95                             | 23.04                                | 23.21                              |
| 5                      | QPSK       | 1       | 24        | 22.94                             | 23.10                                | 23.19                              |
| 5                      | QPSK       | 12      | 0         | 21.96                             | 22.06                                | 22.25                              |
| 5                      | QPSK       | 12      | 6         | 21.86                             | 22.08                                | 22.21                              |
| 5                      | QPSK       | 12      | 11        | 21.95                             | 22.03                                | 22.22                              |
| 5                      | QPSK       | 25      | 0         | 21.80                             | 21.97                                | 22.17                              |
| 5                      | 16QAM      | 1       | 0         | 22.00                             | 21.98                                | 22.15                              |
| 5                      | 16QAM      | 1       | 12        | 21.99                             | 22.05                                | 22.25                              |
| 5                      | 16QAM      | 1       | 24        | 21.92                             | 22.04                                | 22.22                              |
| 5                      | 16QAM      | 12      | 0         | 20.94                             | 21.07                                | 21.17                              |
| 5                      | 16QAM      | 12      | 6         | 20.93                             | 21.09                                | 21.23                              |
| 5                      | 16QAM      | 12      | 11        | 21.02                             | 21.04                                | 21.23                              |
| 5                      | 16QAM      | 25      | 0         | 20.82                             | 20.96                                | 21.09                              |



| BW [MHz]               | Modulation | RB Size | RB Offset | Power (dBm)<br>Low<br>Ch. / Freq. | Power (dBm)<br>Middle<br>Ch. / Freq. | Power (dBm)<br>High<br>Ch. / Freq. |
|------------------------|------------|---------|-----------|-----------------------------------|--------------------------------------|------------------------------------|
| <b>Channel</b>         |            |         |           | <b>20415</b>                      | <b>20525</b>                         | <b>20635</b>                       |
| <b>Frequency (MHz)</b> |            |         |           | <b>825.5</b>                      | <b>836.5</b>                         | <b>847.5</b>                       |
| 3                      | QPSK       | 1       | 0         | 22.99                             | 23.00                                | 22.99                              |
| 3                      | QPSK       | 1       | 7         | 22.96                             | 22.97                                | 22.91                              |
| 3                      | QPSK       | 1       | 14        | 22.88                             | 22.92                                | 22.87                              |
| 3                      | QPSK       | 8       | 0         | 22.93                             | 22.88                                | 22.92                              |
| 3                      | QPSK       | 8       | 4         | 22.94                             | 22.96                                | 22.93                              |
| 3                      | QPSK       | 8       | 7         | 22.94                             | 22.95                                | 22.97                              |
| 3                      | QPSK       | 15      | 0         | 21.92                             | 21.99                                | 21.98                              |
| 3                      | 16QAM      | 1       | 0         | 21.95                             | 21.95                                | 21.95                              |
| 3                      | 16QAM      | 1       | 7         | 21.87                             | 21.89                                | 21.89                              |
| 3                      | 16QAM      | 1       | 14        | 21.83                             | 21.82                                | 21.87                              |
| 3                      | 16QAM      | 8       | 0         | 21.89                             | 21.98                                | 21.94                              |
| 3                      | 16QAM      | 8       | 4         | 21.70                             | 21.74                                | 21.79                              |
| 3                      | 16QAM      | 8       | 7         | 21.94                             | 21.91                                | 21.93                              |
| 3                      | 16QAM      | 15      | 0         | 20.98                             | 21.03                                | 20.97                              |
| <b>Channel</b>         |            |         |           | <b>20407</b>                      | <b>20525</b>                         | <b>20643</b>                       |
| <b>Frequency (MHz)</b> |            |         |           | <b>824.7</b>                      | <b>836.5</b>                         | <b>848.3</b>                       |
| 1.4                    | QPSK       | 1       | 0         | 23.02                             | 23.10                                | 23.18                              |
| 1.4                    | QPSK       | 1       | 2         | 22.98                             | 23.13                                | 23.22                              |
| 1.4                    | QPSK       | 1       | 5         | 22.97                             | 23.07                                | 23.23                              |
| 1.4                    | QPSK       | 3       | 0         | 22.98                             | 23.13                                | 23.17                              |
| 1.4                    | QPSK       | 3       | 1         | 23.01                             | 23.08                                | 23.20                              |
| 1.4                    | QPSK       | 3       | 2         | 23.01                             | 23.12                                | 23.23                              |
| 1.4                    | QPSK       | 6       | 0         | 22.02                             | 22.15                                | 22.24                              |
| 1.4                    | 16QAM      | 1       | 0         | 22.00                             | 22.05                                | 22.23                              |
| 1.4                    | 16QAM      | 1       | 2         | 21.95                             | 22.05                                | 22.19                              |
| 1.4                    | 16QAM      | 1       | 5         | 21.88                             | 22.11                                | 22.19                              |
| 1.4                    | 16QAM      | 3       | 0         | 21.99                             | 22.16                                | 22.20                              |
| 1.4                    | 16QAM      | 3       | 1         | 21.80                             | 22.10                                | 22.23                              |
| 1.4                    | 16QAM      | 3       | 2         | 21.99                             | 22.13                                | 22.26                              |
| 1.4                    | 16QAM      | 6       | 0         | 21.03                             | 21.12                                | 21.26                              |



<LTE Band 2 Conducted Power>

| BW [MHz]               | Modulation | RB Size | RB Offset | Power (dBm) Low Ch. / Freq. | Power (dBm) Middle Ch. / Freq. | Power (dBm) High Ch. / Freq. |
|------------------------|------------|---------|-----------|-----------------------------|--------------------------------|------------------------------|
| <b>Channel</b>         |            |         |           | <b>18700</b>                | <b>18900</b>                   | <b>19100</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>1860</b>                 | <b>1880</b>                    | <b>1900</b>                  |
| 20                     | QPSK       | 1       | 0         | 23.28                       | 23.95                          | 23.92                        |
| 20                     | QPSK       | 1       | 49        | 23.31                       | 23.81                          | 23.74                        |
| 20                     | QPSK       | 1       | 99        | 23.43                       | 23.87                          | 23.45                        |
| 20                     | QPSK       | 50      | 0         | 22.11                       | 22.59                          | 22.75                        |
| 20                     | QPSK       | 50      | 24        | 22.12                       | 22.57                          | 22.63                        |
| 20                     | QPSK       | 50      | 49        | 22.18                       | 22.61                          | 22.46                        |
| 20                     | QPSK       | 100     | 0         | 22.19                       | 22.64                          | 22.68                        |
| 20                     | 16QAM      | 1       | 0         | 22.21                       | 22.65                          | 22.95                        |
| 20                     | 16QAM      | 1       | 49        | 22.29                       | 22.84                          | 22.71                        |
| 20                     | 16QAM      | 1       | 99        | 22.48                       | 22.93                          | 22.43                        |
| 20                     | 16QAM      | 50      | 0         | 21.14                       | 21.56                          | 21.76                        |
| 20                     | 16QAM      | 50      | 24        | 21.20                       | 21.53                          | 21.71                        |
| 20                     | 16QAM      | 50      | 49        | 21.24                       | 21.66                          | 21.57                        |
| 20                     | 16QAM      | 100     | 0         | 21.23                       | 21.66                          | 21.68                        |
| <b>Channel</b>         |            |         |           | <b>18675</b>                | <b>18900</b>                   | <b>19125</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>1857.5</b>               | <b>1880</b>                    | <b>1902.5</b>                |
| 15                     | QPSK       | 1       | 0         | 23.28                       | 23.66                          | 23.86                        |
| 15                     | QPSK       | 1       | 37        | 23.24                       | 23.81                          | 23.72                        |
| 15                     | QPSK       | 1       | 74        | 23.41                       | 23.94                          | 23.46                        |
| 15                     | QPSK       | 36      | 0         | 22.04                       | 22.70                          | 22.70                        |
| 15                     | QPSK       | 36      | 18        | 22.10                       | 22.63                          | 22.58                        |
| 15                     | QPSK       | 36      | 37        | 22.23                       | 22.73                          | 22.49                        |
| 15                     | QPSK       | 75      | 0         | 22.08                       | 22.61                          | 22.52                        |
| 15                     | 16QAM      | 1       | 0         | 22.22                       | 22.67                          | 22.78                        |
| 15                     | 16QAM      | 1       | 37        | 22.25                       | 22.81                          | 22.71                        |
| 15                     | 16QAM      | 1       | 74        | 22.39                       | 22.91                          | 22.47                        |
| 15                     | 16QAM      | 36      | 0         | 21.12                       | 21.60                          | 21.80                        |
| 15                     | 16QAM      | 36      | 18        | 21.18                       | 21.67                          | 21.63                        |
| 15                     | 16QAM      | 36      | 37        | 21.30                       | 21.71                          | 21.56                        |
| 15                     | 16QAM      | 75      | 0         | 21.13                       | 21.62                          | 21.54                        |



| BW [MHz]               | Modulation | RB Size | RB Offset | Power (dBm) Low Ch. / Freq. | Power (dBm) Middle Ch. / Freq. | Power (dBm) High Ch. / Freq. |
|------------------------|------------|---------|-----------|-----------------------------|--------------------------------|------------------------------|
| <b>Channel</b>         |            |         |           | <b>18650</b>                | <b>18900</b>                   | <b>19150</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>1855</b>                 | <b>1880</b>                    | <b>1905</b>                  |
| 10                     | QPSK       | 1       | 0         | 23.23                       | 23.81                          | 23.71                        |
| 10                     | QPSK       | 1       | 24        | 23.15                       | 23.82                          | 23.68                        |
| 10                     | QPSK       | 1       | 49        | 23.27                       | 23.90                          | 23.49                        |
| 10                     | QPSK       | 25      | 0         | 22.18                       | 22.78                          | 22.70                        |
| 10                     | QPSK       | 25      | 12        | 22.18                       | 22.79                          | 22.66                        |
| 10                     | QPSK       | 25      | 24        | 22.12                       | 22.77                          | 22.49                        |
| 10                     | QPSK       | 50      | 0         | 22.11                       | 22.58                          | 22.49                        |
| 10                     | 16QAM      | 1       | 0         | 22.19                       | 22.84                          | 22.69                        |
| 10                     | 16QAM      | 1       | 24        | 22.16                       | 22.81                          | 22.69                        |
| 10                     | 16QAM      | 1       | 49        | 22.19                       | 22.89                          | 22.40                        |
| 10                     | 16QAM      | 25      | 0         | 21.30                       | 21.70                          | 21.73                        |
| 10                     | 16QAM      | 25      | 12        | 21.13                       | 21.73                          | 21.64                        |
| 10                     | 16QAM      | 25      | 24        | 21.11                       | 21.75                          | 21.55                        |
| 10                     | 16QAM      | 50      | 0         | 21.13                       | 21.63                          | 21.56                        |
| <b>Channel</b>         |            |         |           | <b>18625</b>                | <b>18900</b>                   | <b>19175</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>1852.5</b>               | <b>1880</b>                    | <b>1907.5</b>                |
| 5                      | QPSK       | 1       | 0         | 23.19                       | 23.76                          | 23.67                        |
| 5                      | QPSK       | 1       | 12        | 23.27                       | 23.78                          | 23.58                        |
| 5                      | QPSK       | 1       | 24        | 23.12                       | 23.82                          | 23.48                        |
| 5                      | QPSK       | 12      | 0         | 22.31                       | 22.87                          | 22.69                        |
| 5                      | QPSK       | 12      | 6         | 22.26                       | 22.87                          | 22.61                        |
| 5                      | QPSK       | 12      | 11        | 22.29                       | 22.90                          | 22.54                        |
| 5                      | QPSK       | 25      | 0         | 22.22                       | 22.73                          | 22.47                        |
| 5                      | 16QAM      | 1       | 0         | 22.18                       | 22.82                          | 22.64                        |
| 5                      | 16QAM      | 1       | 12        | 22.25                       | 22.86                          | 22.57                        |
| 5                      | 16QAM      | 1       | 24        | 22.13                       | 22.89                          | 22.41                        |
| 5                      | 16QAM      | 12      | 0         | 21.34                       | 21.87                          | 21.75                        |
| 5                      | 16QAM      | 12      | 6         | 21.41                       | 21.83                          | 21.68                        |
| 5                      | 16QAM      | 12      | 11        | 21.36                       | 21.87                          | 21.66                        |
| 5                      | 16QAM      | 25      | 0         | 21.27                       | 21.70                          | 21.62                        |



| BW [MHz]               | Modulation | RB Size | RB Offset | Power (dBm) Low Ch. / Freq. | Power (dBm) Middle Ch. / Freq. | Power (dBm) High Ch. / Freq. |
|------------------------|------------|---------|-----------|-----------------------------|--------------------------------|------------------------------|
| <b>Channel</b>         |            |         |           | <b>18615</b>                | <b>18900</b>                   | <b>19185</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>1851.5</b>               | <b>1880</b>                    | <b>1908.5</b>                |
| 3                      | QPSK       | 1       | 0         | 23.18                       | 23.79                          | 23.58                        |
| 3                      | QPSK       | 1       | 7         | 23.28                       | 23.82                          | 23.53                        |
| 3                      | QPSK       | 1       | 14        | 23.25                       | 23.81                          | 23.46                        |
| 3                      | QPSK       | 8       | 0         | 22.29                       | 22.86                          | 22.62                        |
| 3                      | QPSK       | 8       | 4         | 22.31                       | 22.84                          | 22.58                        |
| 3                      | QPSK       | 8       | 7         | 22.34                       | 22.85                          | 22.51                        |
| 3                      | QPSK       | 15      | 0         | 22.30                       | 22.80                          | 22.50                        |
| 3                      | 16QAM      | 1       | 0         | 22.14                       | 22.77                          | 22.57                        |
| 3                      | 16QAM      | 1       | 7         | 22.20                       | 22.78                          | 22.50                        |
| 3                      | 16QAM      | 1       | 14        | 22.15                       | 22.80                          | 22.41                        |
| 3                      | 16QAM      | 8       | 0         | 21.25                       | 21.76                          | 21.61                        |
| 3                      | 16QAM      | 8       | 4         | 21.29                       | 21.76                          | 21.54                        |
| 3                      | 16QAM      | 8       | 7         | 21.29                       | 21.74                          | 21.54                        |
| 3                      | 16QAM      | 15      | 0         | 21.29                       | 21.81                          | 21.59                        |
| <b>Channel</b>         |            |         |           | <b>18607</b>                | <b>18900</b>                   | <b>19193</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>1850.7</b>               | <b>1880</b>                    | <b>1909.3</b>                |
| 1.4                    | QPSK       | 1       | 0         | 23.24                       | 23.80                          | 23.52                        |
| 1.4                    | QPSK       | 1       | 2         | 23.25                       | 23.85                          | 23.50                        |
| 1.4                    | QPSK       | 1       | 5         | 23.28                       | 23.84                          | 23.42                        |
| 1.4                    | QPSK       | 3       | 0         | 23.27                       | 23.85                          | 23.52                        |
| 1.4                    | QPSK       | 3       | 1         | 23.24                       | 23.83                          | 23.51                        |
| 1.4                    | QPSK       | 3       | 2         | 23.26                       | 23.80                          | 23.50                        |
| 1.4                    | QPSK       | 6       | 0         | 22.33                       | 22.85                          | 22.52                        |
| 1.4                    | 16QAM      | 1       | 0         | 22.17                       | 22.84                          | 22.51                        |
| 1.4                    | 16QAM      | 1       | 2         | 22.18                       | 22.83                          | 22.47                        |
| 1.4                    | 16QAM      | 1       | 5         | 22.20                       | 22.86                          | 22.43                        |
| 1.4                    | 16QAM      | 3       | 0         | 22.27                       | 22.92                          | 22.54                        |
| 1.4                    | 16QAM      | 3       | 1         | 22.23                       | 22.93                          | 22.55                        |
| 1.4                    | 16QAM      | 3       | 2         | 22.28                       | 22.92                          | 22.53                        |
| 1.4                    | 16QAM      | 6       | 0         | 21.33                       | 21.94                          | 21.63                        |





<LTE Band 4 Conducted Power>

| BW [MHz]               | Modulation | RB Size | RB Offset | Power (dBm) Low Ch. / Freq. | Power (dBm) Middle Ch. / Freq. | Power (dBm) High Ch. / Freq. |
|------------------------|------------|---------|-----------|-----------------------------|--------------------------------|------------------------------|
| <b>Channel</b>         |            |         |           | <b>20050</b>                | <b>20175</b>                   | <b>20300</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>1720</b>                 | <b>1732.5</b>                  | <b>1745</b>                  |
| 20                     | QPSK       | 1       | 0         | 23.20                       | 23.07                          | 23.06                        |
| 20                     | QPSK       | 1       | 49        | 23.00                       | 23.00                          | 23.02                        |
| 20                     | QPSK       | 1       | 99        | 23.01                       | 22.97                          | 22.94                        |
| 20                     | QPSK       | 50      | 0         | 21.93                       | 21.92                          | 21.90                        |
| 20                     | QPSK       | 50      | 24        | 21.88                       | 21.84                          | 21.91                        |
| 20                     | QPSK       | 50      | 49        | 21.84                       | 21.77                          | 21.83                        |
| 20                     | QPSK       | 100     | 0         | 21.91                       | 21.92                          | 21.87                        |
| 20                     | 16QAM      | 1       | 0         | 22.14                       | 22.12                          | 22.13                        |
| 20                     | 16QAM      | 1       | 49        | 22.05                       | 22.05                          | 22.09                        |
| 20                     | 16QAM      | 1       | 99        | 21.98                       | 22.01                          | 21.99                        |
| 20                     | 16QAM      | 50      | 0         | 20.88                       | 20.87                          | 20.86                        |
| 20                     | 16QAM      | 50      | 24        | 20.88                       | 20.80                          | 20.89                        |
| 20                     | 16QAM      | 50      | 49        | 20.82                       | 20.74                          | 20.81                        |
| 20                     | 16QAM      | 100     | 0         | 20.85                       | 20.90                          | 20.87                        |
| <b>Channel</b>         |            |         |           | <b>20025</b>                | <b>20175</b>                   | <b>20325</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>1717.5</b>               | <b>1732.5</b>                  | <b>1747.5</b>                |
| 15                     | QPSK       | 1       | 0         | 23.16                       | 23.07                          | 23.09                        |
| 15                     | QPSK       | 1       | 37        | 23.07                       | 23.03                          | 23.04                        |
| 15                     | QPSK       | 1       | 74        | 22.97                       | 22.96                          | 23.00                        |
| 15                     | QPSK       | 36      | 0         | 21.96                       | 22.01                          | 21.95                        |
| 15                     | QPSK       | 36      | 18        | 21.99                       | 21.91                          | 21.90                        |
| 15                     | QPSK       | 36      | 37        | 21.99                       | 21.86                          | 21.83                        |
| 15                     | QPSK       | 75      | 0         | 21.91                       | 21.84                          | 21.83                        |
| 15                     | 16QAM      | 1       | 0         | 22.20                       | 22.07                          | 22.08                        |
| 15                     | 16QAM      | 1       | 37        | 22.11                       | 22.07                          | 22.11                        |
| 15                     | 16QAM      | 1       | 74        | 22.01                       | 21.97                          | 21.97                        |
| 15                     | 16QAM      | 36      | 0         | 20.96                       | 20.92                          | 20.94                        |
| 15                     | 16QAM      | 36      | 18        | 20.97                       | 20.87                          | 20.91                        |
| 15                     | 16QAM      | 36      | 37        | 20.94                       | 20.86                          | 20.85                        |
| 15                     | 16QAM      | 75      | 0         | 20.87                       | 20.81                          | 20.82                        |



| BW [MHz]               | Modulation | RB Size | RB Offset | Power (dBm) Low Ch. / Freq. | Power (dBm) Middle Ch. / Freq. | Power (dBm) High Ch. / Freq. |
|------------------------|------------|---------|-----------|-----------------------------|--------------------------------|------------------------------|
| <b>Channel</b>         |            |         |           | <b>20000</b>                | <b>20175</b>                   | <b>20350</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>1715</b>                 | <b>1732.5</b>                  | <b>1750</b>                  |
| 10                     | QPSK       | 1       | 0         | 23.15                       | 23.07                          | 23.03                        |
| 10                     | QPSK       | 1       | 24        | 23.08                       | 22.99                          | 23.10                        |
| 10                     | QPSK       | 1       | 49        | 22.99                       | 23.01                          | 22.98                        |
| 10                     | QPSK       | 25      | 0         | 21.98                       | 22.04                          | 21.98                        |
| 10                     | QPSK       | 25      | 12        | 22.01                       | 21.99                          | 22.05                        |
| 10                     | QPSK       | 25      | 24        | 22.04                       | 21.94                          | 21.96                        |
| 10                     | QPSK       | 50      | 0         | 21.87                       | 21.82                          | 21.82                        |
| 10                     | 16QAM      | 1       | 0         | 22.11                       | 22.10                          | 22.07                        |
| 10                     | 16QAM      | 1       | 24        | 22.16                       | 22.07                          | 22.11                        |
| 10                     | 16QAM      | 1       | 49        | 22.01                       | 21.98                          | 21.99                        |
| 10                     | 16QAM      | 25      | 0         | 20.99                       | 20.96                          | 20.95                        |
| 10                     | 16QAM      | 25      | 12        | 20.94                       | 20.93                          | 21.03                        |
| 10                     | 16QAM      | 25      | 24        | 20.97                       | 20.93                          | 20.93                        |
| 10                     | 16QAM      | 50      | 0         | 20.83                       | 20.80                          | 20.85                        |
| <b>Channel</b>         |            |         |           | <b>19975</b>                | <b>20175</b>                   | <b>20375</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>1712.5</b>               | <b>1732.5</b>                  | <b>1752.5</b>                |
| 5                      | QPSK       | 1       | 0         | 23.14                       | 23.03                          | 23.16                        |
| 5                      | QPSK       | 1       | 12        | 23.09                       | 23.07                          | 23.13                        |
| 5                      | QPSK       | 1       | 24        | 23.12                       | 23.00                          | 23.05                        |
| 5                      | QPSK       | 12      | 0         | 22.19                       | 22.10                          | 22.16                        |
| 5                      | QPSK       | 12      | 6         | 22.09                       | 22.08                          | 22.16                        |
| 5                      | QPSK       | 12      | 11        | 22.08                       | 22.04                          | 22.08                        |
| 5                      | QPSK       | 25      | 0         | 22.02                       | 21.93                          | 22.01                        |
| 5                      | 16QAM      | 1       | 0         | 22.16                       | 22.08                          | 22.20                        |
| 5                      | 16QAM      | 1       | 12        | 22.15                       | 22.11                          | 22.11                        |
| 5                      | 16QAM      | 1       | 24        | 22.13                       | 22.04                          | 22.08                        |
| 5                      | 16QAM      | 12      | 0         | 21.20                       | 21.13                          | 21.12                        |
| 5                      | 16QAM      | 12      | 6         | 21.19                       | 21.08                          | 21.13                        |
| 5                      | 16QAM      | 12      | 11        | 21.12                       | 21.13                          | 21.05                        |
| 5                      | 16QAM      | 25      | 0         | 21.05                       | 20.93                          | 21.02                        |



| BW [MHz]               | Modulation | RB Size | RB Offset | Power (dBm) Low Ch. / Freq. | Power (dBm) Middle Ch. / Freq. | Power (dBm) High Ch. / Freq. |
|------------------------|------------|---------|-----------|-----------------------------|--------------------------------|------------------------------|
| <b>Channel</b>         |            |         |           | <b>19965</b>                | <b>20175</b>                   | <b>20385</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>1711.5</b>               | <b>1732.5</b>                  | <b>1753.5</b>                |
| 3                      | QPSK       | 1       | 0         | 23.14                       | 23.05                          | 23.10                        |
| 3                      | QPSK       | 1       | 7         | 23.13                       | 23.05                          | 23.03                        |
| 3                      | QPSK       | 1       | 14        | 23.10                       | 23.02                          | 23.04                        |
| 3                      | QPSK       | 8       | 0         | 22.24                       | 22.14                          | 22.17                        |
| 3                      | QPSK       | 8       | 4         | 22.18                       | 22.07                          | 22.07                        |
| 3                      | QPSK       | 8       | 7         | 22.17                       | 22.07                          | 22.09                        |
| 3                      | QPSK       | 15      | 0         | 22.10                       | 22.10                          | 22.02                        |
| 3                      | 16QAM      | 1       | 0         | 22.18                       | 22.09                          | 22.08                        |
| 3                      | 16QAM      | 1       | 7         | 22.13                       | 22.05                          | 22.01                        |
| 3                      | 16QAM      | 1       | 14        | 22.07                       | 22.05                          | 22.08                        |
| 3                      | 16QAM      | 8       | 0         | 21.18                       | 21.05                          | 21.09                        |
| 3                      | 16QAM      | 8       | 4         | 21.13                       | 21.02                          | 21.03                        |
| 3                      | 16QAM      | 8       | 7         | 21.13                       | 21.01                          | 21.01                        |
| 3                      | 16QAM      | 15      | 0         | 21.16                       | 21.04                          | 21.04                        |
| <b>Channel</b>         |            |         |           | <b>19957</b>                | <b>20175</b>                   | <b>20393</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>1710.7</b>               | <b>1732.5</b>                  | <b>1754.3</b>                |
| 1.4                    | QPSK       | 1       | 0         | 23.14                       | 23.03                          | 23.07                        |
| 1.4                    | QPSK       | 1       | 2         | 23.15                       | 23.12                          | 23.08                        |
| 1.4                    | QPSK       | 1       | 5         | 23.15                       | 23.09                          | 23.11                        |
| 1.4                    | QPSK       | 3       | 0         | 23.13                       | 23.04                          | 23.08                        |
| 1.4                    | QPSK       | 3       | 1         | 23.17                       | 23.11                          | 23.08                        |
| 1.4                    | QPSK       | 3       | 2         | 23.17                       | 23.09                          | 23.07                        |
| 1.4                    | QPSK       | 6       | 0         | 22.21                       | 22.09                          | 22.13                        |
| 1.4                    | 16QAM      | 1       | 0         | 22.18                       | 22.09                          | 22.05                        |
| 1.4                    | 16QAM      | 1       | 2         | 22.14                       | 22.08                          | 22.08                        |
| 1.4                    | 16QAM      | 1       | 5         | 22.13                       | 22.07                          | 22.05                        |
| 1.4                    | 16QAM      | 3       | 0         | 22.23                       | 22.14                          | 22.13                        |
| 1.4                    | 16QAM      | 3       | 1         | 22.25                       | 22.14                          | 22.11                        |
| 1.4                    | 16QAM      | 3       | 2         | 22.24                       | 22.14                          | 22.18                        |
| 1.4                    | 16QAM      | 6       | 0         | 21.25                       | 21.18                          | 21.20                        |



<LTE Band 7 Conducted Power>

| BW [MHz]               | Modulation | RB Size | RB Offset | Power (dBm) Low Ch. / Freq. | Power (dBm) Middle Ch. / Freq. | Power (dBm) High Ch. / Freq. |
|------------------------|------------|---------|-----------|-----------------------------|--------------------------------|------------------------------|
| <b>Channel</b>         |            |         |           | <b>20850</b>                | <b>21100</b>                   | <b>21350</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>2510</b>                 | <b>2535</b>                    | <b>2560</b>                  |
| 20                     | QPSK       | 1       | 0         | 23.50                       | 23.41                          | 23.92                        |
| 20                     | QPSK       | 1       | 49        | 23.38                       | 23.47                          | 23.47                        |
| 20                     | QPSK       | 1       | 99        | 23.10                       | 23.54                          | 23.30                        |
| 20                     | QPSK       | 50      | 0         | 22.54                       | 22.35                          | 22.51                        |
| 20                     | QPSK       | 50      | 24        | 22.48                       | 22.30                          | 22.40                        |
| 20                     | QPSK       | 50      | 49        | 22.23                       | 22.29                          | 22.45                        |
| 20                     | QPSK       | 100     | 0         | 22.18                       | 22.27                          | 22.57                        |
| 20                     | 16QAM      | 1       | 0         | 22.20                       | 22.39                          | 22.43                        |
| 20                     | 16QAM      | 1       | 49        | 22.39                       | 22.48                          | 22.47                        |
| 20                     | 16QAM      | 1       | 99        | 22.55                       | 22.55                          | 22.50                        |
| 20                     | 16QAM      | 50      | 0         | 21.29                       | 21.30                          | 21.85                        |
| 20                     | 16QAM      | 50      | 24        | 21.50                       | 21.24                          | 21.90                        |
| 20                     | 16QAM      | 50      | 49        | 21.30                       | 21.28                          | 21.87                        |
| 20                     | 16QAM      | 100     | 0         | 21.15                       | 21.25                          | 21.82                        |
| <b>Channel</b>         |            |         |           | <b>20825</b>                | <b>21100</b>                   | <b>21375</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>2507.5</b>               | <b>2535</b>                    | <b>2562.5</b>                |
| 15                     | QPSK       | 1       | 0         | 23.14                       | 23.42                          | 23.51                        |
| 15                     | QPSK       | 1       | 37        | 23.37                       | 23.49                          | 23.58                        |
| 15                     | QPSK       | 1       | 74        | 23.54                       | 23.47                          | 23.80                        |
| 15                     | QPSK       | 36      | 0         | 22.26                       | 22.34                          | 22.46                        |
| 15                     | QPSK       | 36      | 18        | 22.19                       | 22.33                          | 22.42                        |
| 15                     | QPSK       | 36      | 37        | 22.30                       | 22.37                          | 22.79                        |
| 15                     | QPSK       | 75      | 0         | 22.20                       | 22.29                          | 22.54                        |
| 15                     | 16QAM      | 1       | 0         | 22.13                       | 22.42                          | 22.48                        |
| 15                     | 16QAM      | 1       | 37        | 22.35                       | 22.44                          | 22.52                        |
| 15                     | 16QAM      | 1       | 74        | 22.40                       | 22.48                          | 22.93                        |
| 15                     | 16QAM      | 36      | 0         | 21.21                       | 21.29                          | 21.41                        |
| 15                     | 16QAM      | 36      | 18        | 21.18                       | 21.26                          | 21.41                        |
| 15                     | 16QAM      | 36      | 37        | 21.26                       | 21.30                          | 21.77                        |
| 15                     | 16QAM      | 75      | 0         | 21.14                       | 21.23                          | 21.40                        |



| BW [MHz]               | Modulation | RB Size | RB Offset | Power (dBm) Low Ch. / Freq. | Power (dBm) Middle Ch. / Freq. | Power (dBm) High Ch. / Freq. |
|------------------------|------------|---------|-----------|-----------------------------|--------------------------------|------------------------------|
| <b>Channel</b>         |            |         |           | <b>20800</b>                | <b>21100</b>                   | <b>21400</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>2505</b>                 | <b>2535</b>                    | <b>2565</b>                  |
| 10                     | QPSK       | 1       | 0         | 23.10                       | 23.38                          | 23.40                        |
| 10                     | QPSK       | 1       | 24        | 23.36                       | 23.44                          | 23.78                        |
| 10                     | QPSK       | 1       | 49        | 23.40                       | 23.44                          | 23.86                        |
| 10                     | QPSK       | 25      | 0         | 22.17                       | 22.41                          | 22.47                        |
| 10                     | QPSK       | 25      | 12        | 22.30                       | 22.38                          | 22.74                        |
| 10                     | QPSK       | 25      | 24        | 22.29                       | 22.39                          | 22.84                        |
| 10                     | QPSK       | 50      | 0         | 22.16                       | 22.23                          | 22.57                        |
| 10                     | 16QAM      | 1       | 0         | 22.15                       | 22.38                          | 22.39                        |
| 10                     | 16QAM      | 1       | 24        | 22.35                       | 22.45                          | 22.80                        |
| 10                     | 16QAM      | 1       | 49        | 22.37                       | 22.44                          | 22.70                        |
| 10                     | 16QAM      | 25      | 0         | 21.09                       | 21.32                          | 21.43                        |
| 10                     | 16QAM      | 25      | 12        | 21.23                       | 21.30                          | 21.62                        |
| 10                     | 16QAM      | 25      | 24        | 21.23                       | 21.34                          | 21.76                        |
| 10                     | 16QAM      | 50      | 0         | 21.15                       | 21.19                          | 21.59                        |
| <b>Channel</b>         |            |         |           | <b>20775</b>                | <b>21100</b>                   | <b>21425</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>2502.5</b>               | <b>2535</b>                    | <b>2567.5</b>                |
| 5                      | QPSK       | 1       | 0         | 23.16                       | 23.44                          | 23.71                        |
| 5                      | QPSK       | 1       | 12        | 23.31                       | 23.47                          | 23.93                        |
| 5                      | QPSK       | 1       | 24        | 23.32                       | 23.45                          | 23.90                        |
| 5                      | QPSK       | 12      | 0         | 22.30                       | 22.54                          | 22.91                        |
| 5                      | QPSK       | 12      | 6         | 22.23                       | 22.53                          | 22.97                        |
| 5                      | QPSK       | 12      | 11        | 22.44                       | 22.51                          | 22.88                        |
| 5                      | QPSK       | 25      | 0         | 22.17                       | 22.36                          | 22.83                        |
| 5                      | 16QAM      | 1       | 0         | 22.11                       | 22.42                          | 22.73                        |
| 5                      | 16QAM      | 1       | 12        | 22.22                       | 22.43                          | 22.87                        |
| 5                      | 16QAM      | 1       | 24        | 22.35                       | 22.43                          | 22.93                        |
| 5                      | 16QAM      | 12      | 0         | 21.32                       | 21.46                          | 21.90                        |
| 5                      | 16QAM      | 12      | 6         | 21.21                       | 21.46                          | 21.87                        |
| 5                      | 16QAM      | 12      | 11        | 21.36                       | 21.49                          | 21.89                        |
| 5                      | 16QAM      | 25      | 0         | 21.14                       | 21.36                          | 21.82                        |



<LTE Band 17 Conducted Power>

| BW [MHz]               | Modulation | RB Size | RB Offset | Power (dBm) Low Ch. / Freq. | Power (dBm) Middle Ch. / Freq. | Power (dBm) High Ch. / Freq. |
|------------------------|------------|---------|-----------|-----------------------------|--------------------------------|------------------------------|
| <b>Channel</b>         |            |         |           | <b>23780</b>                | <b>23790</b>                   | <b>23800</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>709</b>                  | <b>710</b>                     | <b>711</b>                   |
| 10                     | QPSK       | 1       | 0         | 23.06                       | 23.35                          | 23.10                        |
| 10                     | QPSK       | 1       | 24        | 23.16                       | 23.28                          | 23.25                        |
| 10                     | QPSK       | 1       | 49        | 23.28                       | 23.25                          | 23.28                        |
| 10                     | QPSK       | 25      | 0         | 22.09                       | 22.15                          | 22.08                        |
| 10                     | QPSK       | 25      | 12        | 22.12                       | 22.11                          | 22.16                        |
| 10                     | QPSK       | 25      | 24        | 22.24                       | 22.21                          | 22.19                        |
| 10                     | QPSK       | 50      | 0         | 22.04                       | 22.03                          | 22.11                        |
| 10                     | 16QAM      | 1       | 0         | 22.06                       | 22.08                          | 22.09                        |
| 10                     | 16QAM      | 1       | 24        | 22.16                       | 22.15                          | 22.25                        |
| 10                     | 16QAM      | 1       | 49        | 22.16                       | 22.26                          | 22.20                        |
| 10                     | 16QAM      | 25      | 0         | 21.08                       | 21.09                          | 21.00                        |
| 10                     | 16QAM      | 25      | 12        | 21.01                       | 21.08                          | 21.12                        |
| 10                     | 16QAM      | 25      | 24        | 21.08                       | 21.17                          | 21.08                        |
| 10                     | 16QAM      | 50      | 0         | 20.96                       | 20.94                          | 21.00                        |
| <b>Channel</b>         |            |         |           | <b>23755</b>                | <b>23790</b>                   | <b>23825</b>                 |
| <b>Frequency (MHz)</b> |            |         |           | <b>706.5</b>                | <b>710</b>                     | <b>713.5</b>                 |
| 5                      | QPSK       | 1       | 0         | 23.12                       | 23.16                          | 23.18                        |
| 5                      | QPSK       | 1       | 12        | 23.14                       | 23.19                          | 23.33                        |
| 5                      | QPSK       | 1       | 24        | 23.22                       | 23.32                          | 23.27                        |
| 5                      | QPSK       | 12      | 0         | 22.21                       | 22.18                          | 22.31                        |
| 5                      | QPSK       | 12      | 6         | 22.12                       | 22.25                          | 22.32                        |
| 5                      | QPSK       | 12      | 11        | 22.28                       | 22.22                          | 22.26                        |
| 5                      | QPSK       | 25      | 0         | 22.22                       | 22.18                          | 22.17                        |
| 5                      | 16QAM      | 1       | 0         | 22.07                       | 22.18                          | 22.17                        |
| 5                      | 16QAM      | 1       | 12        | 22.15                       | 22.17                          | 22.27                        |
| 5                      | 16QAM      | 1       | 24        | 22.20                       | 22.27                          | 22.21                        |
| 5                      | 16QAM      | 12      | 0         | 21.13                       | 21.19                          | 21.23                        |
| 5                      | 16QAM      | 12      | 6         | 21.18                       | 21.22                          | 21.31                        |
| 5                      | 16QAM      | 12      | 11        | 21.25                       | 21.22                          | 21.29                        |
| 5                      | 16QAM      | 25      | 0         | 21.12                       | 21.07                          | 21.09                        |

Note: maximum average power for LTE.



## 3.2 Effective Radiated Power and Equivalent Isotropic Radiated Power Measurement

### 3.2.1 Description of the ERP/EIRP Measurement

Effective radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r01. Mobile and portable (hand-held) stations operating are limited to average ERP of 7 watts with LTE band 5 and 3 watts with LTE band 17.

Equivalent isotropic radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r01. Mobile and portable (hand-held) stations operating are limited to average EIRP of 2 watts with LTE band 2 / 7 and 1 watt with LTE band 4.

### 3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

### 3.2.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r01 Section 5.2.1. and ANSI / TIA-603-C-2004 Section 2.2.17.
2. The EUT was placed on a turntable 1.5 meters high in a fully anechoic chamber.
3. The EUT was placed 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10.  $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$

$P_s$  (dBm) : Input power to substitution antenna.

$G_s$  (dBi or dBd) : Substitution antenna Gain.

$E_t = R_t + AF$

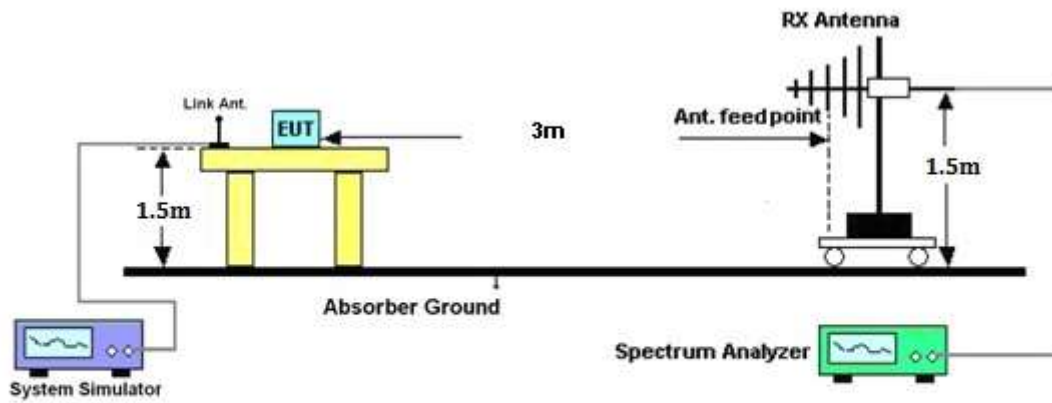
$E_s = R_s + AF$

AF (dB/m) : Receive antenna factor

$R_t$  : The highest received signal in spectrum analyzer for EUT.

$R_s$  : The highest received signal in spectrum analyzer for substitution antenna.

### 3.2.4 Test Setup







3.2.5 Test Result of ERP/EIRP

| LTE Band 2 / 15MHz |            |      |        |            |         |           |         |
|--------------------|------------|------|--------|------------|---------|-----------|---------|
| Channel            | Modulation | RB   |        | Horizontal |         | Vertical  |         |
|                    |            | Size | Offset | EIRP(dBm)  | EIRP(W) | EIRP(dBm) | EIRP(W) |
| Lowest             | QPSK       | 1    | 0      | 22.97      | 0.198   | 21.97     | 0.157   |
| Middle             |            | 1    | 0      | 22.94      | 0.197   | 21.99     | 0.158   |
| Highest            |            | 1    | 0      | 22.94      | 0.197   | 21.94     | 0.156   |
| Limit              | EIRP < 2W  |      |        | Result     |         | PASS      |         |

| LTE Band 5 / 1.4MHz |            |      |        |            |        |          |        |
|---------------------|------------|------|--------|------------|--------|----------|--------|
| Channel             | Modulation | RB   |        | Horizontal |        | Vertical |        |
|                     |            | Size | Offset | ERP(dBm)   | ERP(W) | ERP(dBm) | ERP(W) |
| Lowest              | QPSK       | 1    | 0      | 18.69      | 0.074  | 9.82     | 0.010  |
| Middle              |            | 1    | 0      | 18.82      | 0.076  | 9.42     | 0.009  |
| Highest             |            | 1    | 0      | 19.05      | 0.080  | 9.15     | 0.008  |
| Limit               | EIRP < 7W  |      |        | Result     |        | PASS     |        |

| LTE Band 17 / 5MHz |            |      |        |            |        |          |        |
|--------------------|------------|------|--------|------------|--------|----------|--------|
| Channel            | Modulation | RB   |        | Horizontal |        | Vertical |        |
|                    |            | Size | Offset | ERP(dBm)   | ERP(W) | ERP(dBm) | ERP(W) |
| Lowest             | QPSK       | 1    | 0      | 17.15      | 0.052  | 6.22     | 0.004  |
| Middle             |            | 1    | 0      | 17.16      | 0.052  | 8.29     | 0.007  |
| Highest            |            | 1    | 0      | 17.16      | 0.052  | 8.15     | 0.007  |
| Limit              | EIRP < 3W  |      |        | Result     |        | PASS     |        |



| LTE Band 4 / 10MHz |            |      |        |            |         |           |         |
|--------------------|------------|------|--------|------------|---------|-----------|---------|
| Channel            | Modulation | RB   |        | Horizontal |         | Vertical  |         |
|                    |            | Size | Offset | EIRP(dBm)  | EIRP(W) | EIRP(dBm) | EIRP(W) |
| Lowest             | QPSK       | 1    | 0      | 24.35      | 0.272   | 22.37     | 0.173   |
| Middle             |            | 1    | 0      | 24.34      | 0.272   | 22.77     | 0.189   |
| Highest            |            | 1    | 0      | 24.39      | 0.275   | 22.71     | 0.187   |
| Limit              | EIRP < 1W  |      |        | Result     |         | PASS      |         |

| LTE Band 7 / 15MHz |            |      |        |            |         |           |         |
|--------------------|------------|------|--------|------------|---------|-----------|---------|
| Channel            | Modulation | RB   |        | Horizontal |         | Vertical  |         |
|                    |            | Size | Offset | EIRP(dBm)  | EIRP(W) | EIRP(dBm) | EIRP(W) |
| Lowest             | QPSK       | 1    | 0      | 22.78      | 0.190   | 22.92     | 0.196   |
| Middle             |            | 1    | 0      | 22.49      | 0.178   | 22.61     | 0.182   |
| Highest            |            | 1    | 0      | 22.12      | 0.163   | 22.48     | 0.177   |
| Limit              | EIRP < 2W  |      |        | Result     |         | PASS      |         |



### **3.3 Radiated Spurious Emission Measurement**

#### **3.3.1 Description of Radiated Spurious Emission**

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. 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  $43 + 10 \log (P)$  dB.

For Band 7

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  $55 + 10 \log (P)$  dB.

For LTE Band,17

For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to  $-70$  dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and  $-80$  dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

#### **3.3.2 Measuring Instruments**

The measuring equipment is listed in the section 4 of this test report.



### 3.3.3 Test Procedures

1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was 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 one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from  $43 + 10\log(P)$ dB below the transmitter power P(Watts)  
= P(W)- [43 + 10log(P)] (dB)  
= [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)  
= -13dBm.

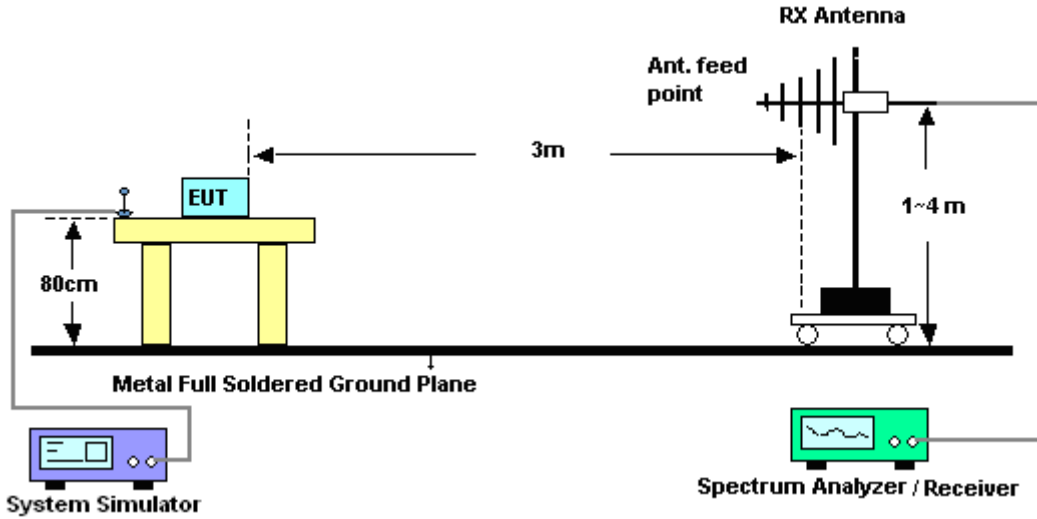
For Band 7

The limit line is derived from  $55 + 10\log(P)$ dB below the transmitter power P(Watts)

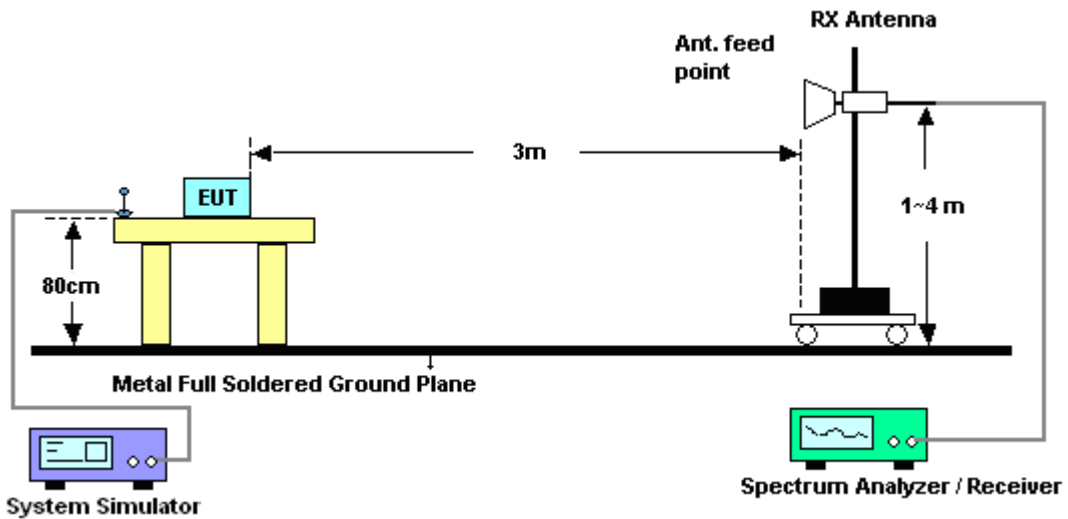
11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (dBm) = EIRP - 2.15

### 3.3.4 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz





3.3.5 Test Result of Field Strength of Spurious Radiated

<Low Channel>

| <b>Band :</b>          | LTE Band 5   |                  |                         |                           | <b>Temperature :</b>       | 23~25°C                    |                               |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|----------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 3MHz QPSK RB Size 1 Offset 0   |                  |                         |                           | <b>Relative Humidity :</b> | 46~48%                     |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           | <b>Polarization :</b>      | Horizontal                 |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                            |                            |                               |                         |        |
| 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 ) | Result |
| 1648                   | -45.74   | -13              | -32.74                  | -57.23                    | -47.5                      | 0.98                       | 4.89                          | H                       | Pass   |
| 2472                   | -50.72   | -13              | -37.72                  | -66.51                    | -52.6                      | 1.28                       | 5.32                          | H                       | Pass   |
| 3296                   | -51.29   | -13              | -38.29                  | -67.88                    | -54.7                      | 1.54                       | 7.10                          | H                       | Pass   |

| <b>Band :</b>          | LTE Band 5   |                  |                         |                           | <b>Temperature :</b>       | 23~25°C                    |                               |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|----------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 3MHz QPSK RB Size 1 Offset 0   |                  |                         |                           | <b>Relative Humidity :</b> | 46~48%                     |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           | <b>Polarization :</b>      | Vertical                   |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                            |                            |                               |                         |        |
| 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 ) | Result |
| 1648                   | -43.74   | -13              | -30.74                  | -57.67                    | -45.5                      | 0.98                       | 4.89                          | V                       | Pass   |
| 2472                   | -51.42   | -13              | -38.42                  | -67.01                    | -53.3                      | 1.28                       | 5.32                          | V                       | Pass   |
| 3296                   | -49.69   | -13              | -36.69                  | -67.11                    | -53.1                      | 1.54                       | 7.10                          | V                       | Pass   |



<Middle Channel>

| Band :               | LTE Band 5   |                  |                         |                           |                          | Temperature :              | 23~25°C                       |                         |        |  |
|----------------------|--|------------------|-------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|--|
| Test Mode :          | 3MHz QPSK RB Size 1 Offset 0   |                  |                         |                           |                          | Relative Humidity :        | 46~48%                        |                         |        |  |
| Test Engineer :      | Ken Wu and Derreck Chen  |                  |                         |                           |                          | Polarization :             | Horizontal                    |                         |        |  |
| Remark :             | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                          |                            |                               |                         |        |  |
| 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 ) | Result |  |
| 1672                 | -50.12   | -13              | -37.12                  | -61.78                    | -51.8                    | 0.99                       | 4.82                          | H                       | Pass   |  |
| 2505                 | -49.94   | -13              | -36.94                  | -65.51                    | -51.9                    | 1.29                       | 5.40                          | H                       | Pass   |  |
| 3340                 | -51.51   | -13              | -38.51                  | -67.79                    | -55.1                    | 1.55                       | 7.30                          | H                       | Pass   |  |

| Band :               | LTE Band 5   |                  |                         |                           |                          | Temperature :              | 23~25°C                       |                         |        |  |
|----------------------|--|------------------|-------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|--|
| Test Mode :          | 3MHz QPSK RB Size 1 Offset 0   |                  |                         |                           |                          | Relative Humidity :        | 46~48%                        |                         |        |  |
| Test Engineer :      | Ken Wu and Derreck Chen  |                  |                         |                           |                          | Polarization :             | Vertical                      |                         |        |  |
| Remark :             | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                          |                            |                               |                         |        |  |
| 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 ) | Result |  |
| 1672                 | -47.22   | -13              | -34.22                  | -60.86                    | -48.9                    | 0.99                       | 4.82                          | V                       | Pass   |  |
| 2505                 | -50.34   | -13              | -37.34                  | -66.56                    | -52.3                    | 1.29                       | 5.40                          | V                       | Pass   |  |
| 3340                 | -49.21   | -13              | -36.21                  | -67.17                    | -52.8                    | 1.55                       | 7.30                          | V                       | Pass   |  |



<High Channel>

| <b>Band :</b>          | LTE Band 5   |                  |                         |                           |                          | <b>Temperature :</b>       | 23~25°C                       |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 3MHz QPSK RB Size 1 Offset 0   |                  |                         |                           |                          | <b>Relative Humidity :</b> | 46~48%                        |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           |                          | <b>Polarization :</b>      | Horizontal                    |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                          |                            |                               |                         |        |
| 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 ) | Result |
| 1688                   | -44.07   | -13              | -31.07                  | -55.43                    | -45.7                    | 1.00                       | 4.77                          | H                       | Pass   |
| 2538                   | -51.22   | -13              | -38.22                  | -67.05                    | -53.2                    | 1.30                       | 5.43                          | H                       | Pass   |
| 3384                   | -51.03   | -13              | -38.03                  | -67.63                    | -54.8                    | 1.57                       | 7.49                          | H                       | Pass   |

| <b>Band :</b>          | LTE Band 5   |                  |                         |                           |                          | <b>Temperature :</b>       | 23~25°C                       |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 3MHz QPSK RB Size 1 Offset 0   |                  |                         |                           |                          | <b>Relative Humidity :</b> | 46~48%                        |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           |                          | <b>Polarization :</b>      | Vertical                      |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                          |                            |                               |                         |        |
| 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 ) | Result |
| 1692                   | -40.98   | -13              | -27.98                  | -54.88                    | -42.6                    | 1.00                       | 4.76                          | V                       | Pass   |
| 2538                   | -50.72   | -13              | -37.72                  | -66.73                    | -52.7                    | 1.30                       | 5.43                          | V                       | Pass   |
| 3384                   | -49.43   | -13              | -36.43                  | -67.47                    | -53.2                    | 1.57                       | 7.49                          | V                       | Pass   |





<Low Channel>

| <b>Band :</b>          | LTE Band 2   |                  |                         |                           | <b>Temperature :</b>       | 23~25°C                    |                               |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|----------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 10MHz QPSK RB Size 1 Offset 0  |                  |                         |                           | <b>Relative Humidity :</b> | 46~48%                     |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           | <b>Polarization :</b>      | Horizontal                 |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                            |                            |                               |                         |        |
| Frequency<br>( MHz )   | EIRP<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 ) | Result |
| 3700                   | -45.55   | -13              | -32.55                  | -63.15                    | -52.12                     | 1.67                       | 8.24                          | H                       | Pass   |
| 5550                   | -46.55   | -13              | -33.55                  | -69.06                    | -53.62                     | 2.65                       | 9.72                          | H                       | Pass   |
| 7400                   | -33.85   | -13              | -20.85                  | -63.17                    | -42.99                     | 2.46                       | 11.60                         | H                       | Pass   |

| <b>Band :</b>          | LTE Band 2   |                  |                         |                           | <b>Temperature :</b>       | 23~25°C                    |                               |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|----------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 10MHz QPSK RB Size 1 Offset 0  |                  |                         |                           | <b>Relative Humidity :</b> | 46~48%                     |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           | <b>Polarization :</b>      | Vertical                   |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                            |                            |                               |                         |        |
| Frequency<br>( MHz )   | EIRP<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 ) | Result |
| 3700                   | -46.60   | -13              | -33.60                  | -65.36                    | -53.17                     | 1.67                       | 8.24                          | V                       | Pass   |
| 5550                   | -47.11   | -13              | -34.11                  | -69.55                    | -54.18                     | 2.65                       | 9.72                          | V                       | Pass   |
| 7400                   | -34.17   | -13              | -21.17                  | -63.02                    | -43.31                     | 2.46                       | 11.60                         | V                       | Pass   |



<Middle Channel>

| <b>Band :</b>          | LTE Band 2   |                  | <b>Temperature :</b>       | 23~25°C                   |                          |                            |                               |                         |        |
|------------------------|--|------------------|----------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 10MHz QPSK RB Size 1 Offset 0  |                  | <b>Relative Humidity :</b> | 46~48%                    |                          |                            |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  | <b>Polarization :</b>      | Horizontal                |                          |                            |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                            |                           |                          |                            |                               |                         |        |
| Frequency<br>( MHz )   | EIRP<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 ) | Result |
| 3749                   | -46.65   | -13              | -33.65                     | -64.61                    | -53.27                   | 1.68                       | 8.30                          | H                       | Pass   |
| 5625                   | -44.38   | -13              | -31.38                     | -67.58                    | -51.43                   | 2.70                       | 9.75                          | H                       | Pass   |
| 7500                   | -33.92   | -13              | -20.92                     | -63.98                    | -43.29                   | 2.43                       | 11.80                         | H                       | Pass   |

| <b>Band :</b>          | LTE Band 2   |                  | <b>Temperature :</b>       | 23~25°C                   |                          |                            |                               |                         |        |
|------------------------|--|------------------|----------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 10MHz QPSK RB Size 1 Offset 0  |                  | <b>Relative Humidity :</b> | 46~48%                    |                          |                            |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  | <b>Polarization :</b>      | Vertical                  |                          |                            |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                            |                           |                          |                            |                               |                         |        |
| Frequency<br>( MHz )   | EIRP<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 ) | Result |
| 3749                   | -46.69   | -13              | -33.69                     | -65.62                    | -53.31                   | 1.68                       | 8.30                          | V                       | Pass   |
| 5625                   | -45.44   | -13              | -32.44                     | -68.3                     | -52.49                   | 2.70                       | 9.75                          | V                       | Pass   |
| 7500                   | -32.90   | -13              | -19.90                     | -62.78                    | -42.27                   | 2.43                       | 11.80                         | V                       | Pass   |



<High Channel>

| <b>Band :</b>          | LTE Band 2   |                  |                         |                           | <b>Temperature :</b>       | 23~25°C                    |                               |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|----------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 10MHz QPSK RB Size 1 Offset 0  |                  |                         |                           | <b>Relative Humidity :</b> | 46~48%                     |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           | <b>Polarization :</b>      | Horizontal                 |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                            |                            |                               |                         |        |
| Frequency<br>( MHz )   | EIRP<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 ) | Result |
| 3798                   | -41.70   | -13              | -28.70                  | -60                       | -46.21                     | 1.70                       | 8.36                          | H                       | Pass   |
| 5700                   | -44.93   | -13              | -31.93                  | -68.28                    | -49.82                     | 2.74                       | 9.78                          | H                       | Pass   |
| 7600                   | -37.97   | -13              | -24.97                  | -66.62                    | -45.28                     | 2.40                       | 11.86                         | H                       | Pass   |

| <b>Band :</b>          | LTE Band 2   |                  |                         |                           | <b>Temperature :</b>       | 23~25°C                    |                               |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|----------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 10MHz QPSK RB Size 1 Offset 0  |                  |                         |                           | <b>Relative Humidity :</b> | 46~48%                     |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           | <b>Polarization :</b>      | Vertical                   |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                            |                            |                               |                         |        |
| Frequency<br>( MHz )   | EIRP<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 ) | Result |
| 3798                   | -43.70   | -13              | -30.70                  | -62.53                    | -48.21                     | 1.70                       | 8.36                          | V                       | Pass   |
| 5700                   | -45.48   | -13              | -32.48                  | -68.39                    | -50.37                     | 2.74                       | 9.78                          | V                       | Pass   |
| 7600                   | -36.93   | -13              | -23.93                  | -65.24                    | -44.24                     | 2.40                       | 11.86                         | V                       | Pass   |



<Low Channel>

| <b>Band :</b>          | LTE Band 4   |                  | <b>Temperature :</b>       | 23~25°C                   |                          |                            |                               |                         |        |
|------------------------|--|------------------|----------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 1.4MHz QPSK RB Size 1 Offset 0   |                  | <b>Relative Humidity :</b> | 46~48%                    |                          |                            |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  | <b>Polarization :</b>      | Horizontal                |                          |                            |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                            |                           |                          |                            |                               |                         |        |
| Frequency<br>( MHz )   | EIRP<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 ) | Result |
| 3420                   | -50.45   | -13              | -37.45                     | -66.77                    | -56.52                   | 1.58                       | 7.65                          | H                       | Pass   |
| 5130                   | -47.00   | -13              | -34.00                     | -67.37                    | -54.29                   | 2.41                       | 9.70                          | H                       | Pass   |
| 6840                   | -39.25   | -13              | -26.25                     | -67.45                    | -47.22                   | 2.64                       | 10.61                         | H                       | Pass   |

| <b>Band :</b>          | LTE Band 4   |                  | <b>Temperature :</b>       | 23~25°C                   |                          |                            |                               |                         |        |
|------------------------|--|------------------|----------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 1.4MHz QPSK RB Size 1 Offset 0   |                  | <b>Relative Humidity :</b> | 46~48%                    |                          |                            |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  | <b>Polarization :</b>      | Vertical                  |                          |                            |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                            |                           |                          |                            |                               |                         |        |
| Frequency<br>( MHz )   | EIRP<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 ) | Result |
| 3420                   | -49.09   | -13              | -36.09                     | -66.92                    | -55.16                   | 1.58                       | 7.65                          | V                       | Pass   |
| 5130                   | -44.90   | -13              | -31.90                     | -65.74                    | -52.19                   | 2.41                       | 9.70                          | V                       | Pass   |
| 6840                   | -39.53   | -13              | -26.53                     | -66.99                    | -47.5                    | 2.64                       | 10.61                         | V                       | Pass   |



<Middle Channel>

| <b>Band :</b>          | LTE Band 4   |                  | <b>Temperature :</b>       | 23~25°C                   |                          |                            |                               |                         |        |
|------------------------|--|------------------|----------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 1.4MHz QPSK RB Size 1 Offset 0   |                  | <b>Relative Humidity :</b> | 46~48%                    |                          |                            |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  | <b>Polarization :</b>      | Horizontal                |                          |                            |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                            |                           |                          |                            |                               |                         |        |
| Frequency<br>( MHz )   | EIRP<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 ) | Result |
| 3462                   | -50.71   | -13              | -37.71                     | -67.75                    | -56.95                   | 1.59                       | 7.83                          | H                       | Pass   |
| 5195                   | -44.26   | -13              | -31.26                     | -65.8                     | -51.51                   | 2.45                       | 9.70                          | H                       | Pass   |
| 6927                   | -38.07   | -13              | -25.07                     | -66.73                    | -46.17                   | 2.61                       | 10.71                         | H                       | Pass   |

| <b>Band :</b>          | LTE Band 4   |                  | <b>Temperature :</b>       | 23~25°C                   |                          |                            |                               |                         |        |
|------------------------|--|------------------|----------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 1.4MHz QPSK RB Size 1 Offset 0   |                  | <b>Relative Humidity :</b> | 46~48%                    |                          |                            |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  | <b>Polarization :</b>      | Vertical                  |                          |                            |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                            |                           |                          |                            |                               |                         |        |
| Frequency<br>( MHz )   | EIRP<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 ) | Result |
| 3462                   | -49.87   | -13              | -36.87                     | -67.84                    | -56.11                   | 1.59                       | 7.83                          | V                       | Pass   |
| 5195                   | -42.83   | -13              | -29.83                     | -63.64                    | -50.08                   | 2.45                       | 9.70                          | V                       | Pass   |
| 6927                   | -38.75   | -13              | -25.75                     | -66.71                    | -46.85                   | 2.61                       | 10.71                         | V                       | Pass   |



<High Channel>

| <b>Band :</b>          | LTE Band 4   |                  | <b>Temperature :</b>       | 23~25°C                   |                          |                            |                               |                         |        |
|------------------------|--|------------------|----------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 1.4MHz QPSK RB Size 1 Offset 0   |                  | <b>Relative Humidity :</b> | 46~48%                    |                          |                            |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  | <b>Polarization :</b>      | Horizontal                |                          |                            |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                            |                           |                          |                            |                               |                         |        |
| Frequency<br>( MHz )   | EIRP<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 ) | Result |
| 3504                   | -50.75   | -13              | -37.75                     | -67.51                    | -57.15                   | 1.61                       | 8.00                          | H                       | Pass   |
| 5260                   | -46.10   | -13              | -33.10                     | -67.58                    | -53.31                   | 2.49                       | 9.70                          | H                       | Pass   |
| 7014                   | -40.00   | -13              | -27.00                     | -69.01                    | -48.24                   | 2.59                       | 10.83                         | H                       | Pass   |

| <b>Band :</b>          | LTE Band 4   |                  | <b>Temperature :</b>       | 23~25°C                   |                          |                            |                               |                         |        |
|------------------------|--|------------------|----------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 1.4MHz QPSK RB Size 1 Offset 0   |                  | <b>Relative Humidity :</b> | 46~48%                    |                          |                            |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  | <b>Polarization :</b>      | Vertical                  |                          |                            |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                            |                           |                          |                            |                               |                         |        |
| Frequency<br>( MHz )   | EIRP<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 ) | Result |
| 3504                   | -49.00   | -13              | -36.00                     | -66.95                    | -55.4                    | 1.61                       | 8.00                          | V                       | Pass   |
| 5260                   | -42.07   | -13              | -29.07                     | -63.82                    | -49.28                   | 2.49                       | 9.70                          | V                       | Pass   |
| 7014                   | -40.90   | -13              | -27.90                     | -68.25                    | -49.14                   | 2.59                       | 10.83                         | V                       | Pass   |



<Low Channel>

| <b>Band :</b>          | LTE Band 7   |                  |                         |                           |                          | <b>Temperature :</b>       | 23~25°C                       |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 5MHz QPSK RB Size 1 Offset 0   |                  |                         |                           |                          | <b>Relative Humidity :</b> | 46~48%                        |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           |                          | <b>Polarization :</b>      | Horizontal                    |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                          |                            |                               |                         |        |
| 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 ) | Result |
| 4998                   | -45.14   | -25              | -20.14                  | -65.43                    | -52.5                    | 2.34                       | 9.70                          | H                       | Pass   |
| 7500                   | -37.73   | -25              | -12.73                  | -67.83                    | -47.1                    | 2.43                       | 11.80                         | H                       | Pass   |
| 10002                  | -37.70   | -25              | -12.70                  | -69.08                    | -47.2                    | 2.70                       | 12.20                         | H                       | Pass   |

| <b>Band :</b>          | LTE Band 7   |                  |                         |                           |                          | <b>Temperature :</b>       | 23~25°C                       |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 5MHz QPSK RB Size 1 Offset 0   |                  |                         |                           |                          | <b>Relative Humidity :</b> | 46~48%                        |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           |                          | <b>Polarization :</b>      | Vertical                      |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                          |                            |                               |                         |        |
| 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 ) | Result |
| 4998                   | -48.24   | -25              | -23.24                  | -68.61                    | -55.6                    | 2.34                       | 9.70                          | V                       | Pass   |
| 7500                   | -36.43   | -25              | -11.43                  | -66.14                    | -45.8                    | 2.43                       | 11.80                         | V                       | Pass   |
| 10002                  | -35.40   | -25              | -10.40                  | -65.98                    | -44.9                    | 2.70                       | 12.20                         | V                       | Pass   |



<Middle Channel>

| <b>Band :</b>          | LTE Band 7   |                  |                         |                           |                          | <b>Temperature :</b>       | 23~25°C                       |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 5MHz QPSK RB Size 1 Offset 0   |                  |                         |                           |                          | <b>Relative Humidity :</b> | 46~48%                        |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           |                          | <b>Polarization :</b>      | Horizontal                    |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                          |                            |                               |                         |        |
| 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 ) | Result |
| 5064                   | -46.77   | -25              | -21.77                  | -67.47                    | -54.1                    | 2.37                       | 9.70                          | H                       | Pass   |
| 7598                   | -38.64   | -25              | -13.64                  | -67.78                    | -48.1                    | 2.40                       | 11.86                         | H                       | Pass   |
| 10130                  | -41.54   | -25              | -16.54                  | -73.01                    | -51.1                    | 2.70                       | 12.25                         | H                       | Pass   |

| <b>Band :</b>          | LTE Band 7   |                  |                         |                           |                          | <b>Temperature :</b>       | 23~25°C                       |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 5MHz QPSK RB Size 1 Offset 0   |                  |                         |                           |                          | <b>Relative Humidity :</b> | 46~48%                        |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           |                          | <b>Polarization :</b>      | Vertical                      |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                          |                            |                               |                         |        |
| 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 ) | Result |
| 5064                   | -47.17   | -25              | -22.17                  | -67.93                    | -54.5                    | 2.37                       | 9.70                          | V                       | Pass   |
| 7598                   | -39.44   | -25              | -14.44                  | -68.64                    | -48.9                    | 2.40                       | 11.86                         | V                       | Pass   |
| 10130                  | -41.24   | -25              | -16.24                  | -71.73                    | -50.8                    | 2.70                       | 12.25                         | V                       | Pass   |





<High Channel>

| <b>Band :</b>          | LTE Band 7   |                  |                         |                           |                          | <b>Temperature :</b>       | 23~25°C                       |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 5MHz QPSK RB Size 1 Offset 0   |                  |                         |                           |                          | <b>Relative Humidity :</b> | 46~48%                        |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           |                          | <b>Polarization :</b>      | Horizontal                    |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                          |                            |                               |                         |        |
| 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 ) | Result |
| 5130                   | -47.01   | -25              | -22.01                  | -68.12                    | -54.3                    | 2.41                       | 9.70                          | H                       | Pass   |
| 7695                   | -42.55   | -25              | -17.55                  | -71.15                    | -52.1                    | 2.37                       | 11.92                         | H                       | Pass   |
| 10260                  | -36.29   | -25              | -11.29                  | -68.33                    | -45.9                    | 2.69                       | 12.30                         | H                       | Pass   |

| <b>Band :</b>          | LTE Band 7   |                  |                         |                           |                          | <b>Temperature :</b>       | 23~25°C                       |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 5MHz QPSK RB Size 1 Offset 0   |                  |                         |                           |                          | <b>Relative Humidity :</b> | 46~48%                        |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           |                          | <b>Polarization :</b>      | Vertical                      |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                          |                            |                               |                         |        |
| 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 ) | Result |
| 5130                   | -48.81   | -25              | -23.81                  | -69.7                     | -56.1                    | 2.41                       | 9.70                          | V                       | Pass   |
| 7698                   | -36.75   | -25              | -11.75                  | -65.41                    | -46.3                    | 2.37                       | 11.92                         | V                       | Pass   |
| 10260                  | -38.59   | -25              | -13.59                  | -69.16                    | -48.2                    | 2.69                       | 12.30                         | V                       | Pass   |



<Low Channel>

| <b>Band :</b>          | LTE Band 17  |                  |                         |                           | <b>Temperature :</b>       | 23~25°C                    |                               |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|----------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 10MHz QPSK RB Size 1 Offset 0  |                  |                         |                           | <b>Relative Humidity :</b> | 46~48%                     |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           | <b>Polarization :</b>      | Horizontal                 |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                            |                            |                               |                         |        |
| 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 ) | Result |
| 1408                   | -54.49   | -13              | -41.49                  | -62.93                    | -56.20                     | 0.87                       | 4.73                          | H                       | Pass   |
| 2112                   | -54.98   | -13              | -41.98                  | -66.04                    | -55.90                     | 1.17                       | 4.24                          | H                       | Pass   |
| 2816                   | -53.19   | -13              | -40.19                  | -66.84                    | -55.30                     | 1.39                       | 5.65                          | H                       | Pass   |

| <b>Band :</b>          | LTE Band 17  |                  |                         |                           | <b>Temperature :</b>       | 23~25°C                    |                               |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|----------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 10MHz QPSK RB Size 1 Offset 0  |                  |                         |                           | <b>Relative Humidity :</b> | 46~48%                     |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           | <b>Polarization :</b>      | Vertical                   |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                            |                            |                               |                         |        |
| 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 ) | Result |
| 1408                   | -53.59   | -13              | -40.59                  | -64.18                    | -55.30                     | 0.87                       | 4.73                          | V                       | Pass   |
| 2112                   | -52.78   | -13              | -39.78                  | -65.91                    | -53.70                     | 1.17                       | 4.24                          | V                       | Pass   |
| 2816                   | -51.89   | -13              | -38.89                  | -67.14                    | -54.00                     | 1.39                       | 5.65                          | V                       | Pass   |



<Middle Channel>

| <b>Band :</b>          | LTE Band 17  |                  |                         |                           |                          | <b>Temperature :</b>       | 23~25°C                       |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 10MHz QPSK RB Size 1 Offset 0  |                  |                         |                           |                          | <b>Relative Humidity :</b> | 46~48%                        |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           |                          | <b>Polarization :</b>      | Horizontal                    |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                          |                            |                               |                         |        |
| 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 ) | Result |
| 1408                   | -54.19   | -13              | -41.19                  | -63.00                    | -55.90                   | 0.87                       | 4.73                          | H                       | Pass   |
| 2115                   | -54.88   | -13              | -41.88                  | -66.18                    | -55.80                   | 1.17                       | 4.25                          | H                       | Pass   |
| 2820                   | -54.09   | -13              | -41.09                  | -67.51                    | -56.20                   | 1.39                       | 5.66                          | H                       | Pass   |

| <b>Band :</b>          | LTE Band 17  |                  |                         |                           |                          | <b>Temperature :</b>       | 23~25°C                       |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 10MHz QPSK RB Size 1 Offset 0  |                  |                         |                           |                          | <b>Relative Humidity :</b> | 46~48%                        |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           |                          | <b>Polarization :</b>      | Vertical                      |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                          |                            |                               |                         |        |
| 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 ) | Result |
| 1408                   | -54.29   | -13              | -41.29                  | -64.82                    | -56.00                   | 0.87                       | 4.73                          | V                       | Pass   |
| 2115                   | -52.38   | -13              | -39.38                  | -65.60                    | -53.30                   | 1.17                       | 4.25                          | V                       | Pass   |
| 2820                   | -52.09   | -13              | -39.09                  | -66.93                    | -54.20                   | 1.39                       | 5.66                          | V                       | Pass   |



<High Channel>

| <b>Band :</b>          | LTE Band 17  |                  |                         |                           | <b>Temperature :</b>       | 23~25°C                    |                               |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|----------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 10MHz QPSK RB Size 1 Offset 0  |                  |                         |                           | <b>Relative Humidity :</b> | 46~48%                     |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           | <b>Polarization :</b>      | Horizontal                 |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                            |                            |                               |                         |        |
| 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 ) | Result |
| 1416                   | -56.05   | -13              | -43.05                  | -64.36                    | -57.80                     | 0.87                       | 4.78                          | H                       | Pass   |
| 2118                   | -54.97   | -13              | -41.97                  | -66.32                    | -55.90                     | 1.17                       | 4.25                          | H                       | Pass   |
| 2824                   | -52.18   | -13              | -39.18                  | -65.84                    | -54.30                     | 1.39                       | 5.66                          | H                       | Pass   |

| <b>Band :</b>          | LTE Band 17  |                  |                         |                           | <b>Temperature :</b>       | 23~25°C                    |                               |                         |        |
|------------------------|--|------------------|-------------------------|---------------------------|----------------------------|----------------------------|-------------------------------|-------------------------|--------|
| <b>Test Mode :</b>     | 10MHz QPSK RB Size 1 Offset 0  |                  |                         |                           | <b>Relative Humidity :</b> | 46~48%                     |                               |                         |        |
| <b>Test Engineer :</b> | Ken Wu and Derreck Chen  |                  |                         |                           | <b>Polarization :</b>      | Vertical                   |                               |                         |        |
| <b>Remark :</b>        | Spurious emissions within 30-10th harmonic were found more than 20dB below limit line. |                  |                         |                           |                            |                            |                               |                         |        |
| 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 ) | Result |
| 1416                   | -54.75   | -13              | -41.75                  | -65.38                    | -56.50                     | 0.87                       | 4.78                          | V                       | Pass   |
| 2118                   | -51.17   | -13              | -38.17                  | -64.21                    | -52.10                     | 1.17                       | 4.25                          | V                       | Pass   |
| 2824                   | -51.68   | -13              | -38.68                  | -66.78                    | -53.80                     | 1.39                       | 5.66                          | V                       | Pass   |



## 4 List of Measuring Equipment

| Instrument                | Manufacturer    | Model No.     | Serial No.     | Characteristics   | Calibration Date | Test Date                       | Due Date      | Remark                |
|---------------------------|-----------------|---------------|----------------|-------------------|------------------|---------------------------------|---------------|-----------------------|
| LTE Base Station          | Anritsu         | MT8820C       | 6201026480     | 30MHz~2.7GHz SISO | Jan. 07, 2014    | Oct. 02, 2014                   | Jan. 06, 2015 | Conducted (TH02-HY)   |
| Spectrum Analyzer         | Rohde & Schwarz | FSV30         | 101749         | 10Hz ~ 30GHz      | Feb. 10, 2014    | Oct. 03, 2014~<br>Oct. 04, 2014 | Feb. 09, 2015 | Radiation (03CH07-HY) |
| Bilog Antenna             | Schaffner       | CBL6111C      | 2726           | 30MHz ~ 1GHz      | Oct. 10, 2013    | Oct. 03, 2014~<br>Oct. 04, 2014 | Oct. 09, 2014 | Radiation (03CH07-HY) |
| Double Ridge Horn Antenna | ESCO            | 3117          | 75962          | 1GHz~18GHz        | Aug. 19, 2014    | Oct. 03, 2014~<br>Oct. 04, 2014 | Aug.18, 2015  | Radiation (03CH07-HY) |
| Preamplifier              | COM-POWER       | PA-103A       | 161241         | 10 MHz ~ 1000MHz  | Mar. 17, 2014    | Oct. 03, 2014~<br>Oct. 04, 2014 | Mar. 16, 2015 | Radiation (03CH07-HY) |
| Preamplifier              | Agilent         | 8449B         | 3008A02362     | 1 GHz~26.5 GHz    | Nov. 29, 2013    | Oct. 03, 2014~<br>Oct. 04, 2014 | Nov. 28, 2014 | Radiation (03CH07-HY) |
| Turn Table                | ChainTek        | ChainTek 3000 | N/A            | 0 ~ 360 degree    | N/A              | Oct. 03, 2014~<br>Oct. 04, 2014 | N/A           | Radiation (03CH07-HY) |
| Antenna Mast              | ChainTek        | M-400-0       | 114/8000604 /L | N/A               | N/A              | Oct. 03, 2014~<br>Oct. 04, 2014 | N/A           | Radiation (03CH07-HY) |
| SHF-EHF Horn Antenna      | SCHWARZBEC K    | BBHA 9170     | BBHA91702 51   | 15GHz- 40GHz      | Oct. 02, 2014    | Oct. 03, 2014~<br>Oct. 04, 2014 | Oct. 01, 2015 | Radiation (03CH07-HY) |



## 5 Uncertainty of Evaluation

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

|   |      |
|---|------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 4.50 |
|---|------|

