



# FCC RF Test Report

APPLICANT : Copeland Cold Chain LP.  
EQUIPMENT : GO Tracker 2.2  
BRAND NAME : Copeland  
MODEL NAME : GO Tracker 2.2  
FCC ID : AMH101020  
STANDARD : 47 CFR Part 2, 22(H), 24(E), 27(L), 27(F), 27(H)  
CLASSIFICATION : PCS Licensed Transmitter (PCB)  
TEST DATE(S) : May 13, 2024 ~ May 17, 2024

This product installed a RF module (Brand Name: Queclink, Model Name: QLC300NA, FCC ID: YQD-QLC300NA) during the test, only Conducted Power, ERP/EIRP and worse case of RSE from RF module report test items are tested in this report, all the other test results are leveraged from module RF report.

We, Sporton International Inc. (ShenZhen), would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown 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. (ShenZhen), the test report shall not be reproduced except in full.

Jason Jia

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Approved by: Jason Jia



**Sporton International Inc. (ShenZhen)**

**1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055**

**People's Republic of China**



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## REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION             | ISSUED DATE   |
|------------|---------|-------------------------|---------------|
| FG431808   | Rev. 01 | Initial issue of report | Jun. 05, 2024 |
|            |         |                         |               |
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|            |         |                         |               |
|            |         |                         |               |

## SUMMARY OF TEST RESULT

| Report Section | FCC Rule                                                                                   | Description                                                                    | Limit                               | Result      | Remark                               |
|----------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------|-------------|--------------------------------------|
| 3.4            | §2.1046                                                                                    | Conducted Output Power                                                         | -                                   | Report Only | -                                    |
|                | §22.913(a)(5)                                                                              | Effective Radiated Power (Band 5)                                              | ERP < 7 Watt                        | PASS        | -                                    |
|                | §27.50(b)(10)<br>§27.50(c)(10)                                                             | Effective Radiated Power (Band 12) (Band 13)                                   | ERP < 3 Watt                        | PASS        | -                                    |
|                | §24.232(c)                                                                                 | Equivalent Isotropic Radiated Power (Band 2)                                   | EIRP < 2Watt                        | PASS        | -                                    |
|                | §27.50(d)(4)                                                                               | Equivalent Isotropic Radiated Power (Band 4)                                   | EIRP < 1Watt                        | PASS        | -                                    |
| -              | §24.232(d)                                                                                 | Peak-to-Average Ratio                                                          | <13 dB                              | PASS        | 1                                    |
| -              | §2.1049                                                                                    | Occupied Bandwidth                                                             | -                                   | Report Only | 1                                    |
| -              | §2.1051<br>§22.917(a)<br>§24.238(a)<br>§27.53(c)(2)(4)<br>§27.53(g)<br>§27.53(h)           | Conducted Band Edge Measurement (Band 2) (Band 4) (Band 5) (Band 12) (Band 13) | < 43+10log <sub>10</sub> (P[Watts]) | PASS        | 1                                    |
| -              | §2.1051<br>§22.917(a)<br>§24.238(a)<br>§27.53(c)(2)<br>§27.53(g)<br>§27.53(h)              | Conducted Spurious Emission (Band 2) (Band 4) (Band 5) (Band 12) (Band 13)     | < 43+10log <sub>10</sub> (P[Watts]) | PASS        | 1                                    |
| -              | §2.1055<br>§22.355                                                                         | Frequency Stability<br>Temperature & Voltage                                   | < 2.5 ppm for Part 22               | PASS        | 1                                    |
|                | §2.1055<br>§24.235<br>§27.54                                                               |                                                                                | Within Authorized Band              |             |                                      |
| 4.4            | §2.1053<br>§22.917(a)<br>§24.238(a)<br>§27.53(c)(2)<br>§27.53(f)<br>§27.53(g)<br>§27.53(h) | Radiated Spurious Emission (Band 2) (Band 4) (Band 5) (Band 12) (Band 13)      | < 43+10log <sub>10</sub> (P[Watts]) | PASS        | Under limit 12.58 dB at 1564.500 MHz |

**Remark :**

- The conducted test items were leverage from module RF reports which can refer to Report No. FG371703.

**Conformity Assessment Condition:**

- The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
- The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty"

**Disclaimer:**

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.



# 1 General Description

## 1.1 Applicant

Copeland Cold Chain LP.

6223 N Discovery Way, Park Pointe Center 1 , Suite 120 Boise ID 83713 United States

## 1.2 Manufacturer

Queclink Wireless Solutions Co., Ltd.

No.30, Lane 500, Xinlong Road , Minhang District, Shanghai, China, 201101

## 1.3 Product Feature of Equipment Under Test

| Product Feature |                                               |
|-----------------|-----------------------------------------------|
| Equipment       | GO Tracker 2.2                                |
| Brand Name      | Copeland                                      |
| Model Name      | GO Tracker 2.2                                |
| FCC ID          | AMH101020                                     |
| SN Code         | Radiation:7800002284<br>Conducted: 7700000941 |
| HW Version      | V2.02                                         |
| SW Version      | R00A01V16                                     |
| EUT Stage       | Production Unit                               |

## 1.4 Product Specification of Equipment Under Test

| Standards-related Product Specification |                                                                                                                                                                                                                                                 |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tx Frequency                            | LTE Band 2 : 1850 MHz ~ 1910 MHz<br>LTE Band 4 : 1710 MHz ~ 1755 MHz<br>LTE Band 5 : 824 MHz ~ 849 MHz<br>LTE Band 12 : 699 MHz ~ 716 MHz<br>LTE Band 13 : 777 MHz ~ 787 MHz                                                                    |
| Rx Frequency                            | LTE Band 2 : 1930 MHz ~ 1990 MHz<br>LTE Band 4 : 2110 MHz ~ 2155 MHz<br>LTE Band 5 : 869 MHz ~ 894 MHz<br>LTE Band 12 : 729 MHz ~ 746 MHz<br>LTE Band 13 : 746 MHz ~ 756 MHz                                                                    |
| Bandwidth                               | 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 12 : 1.4MHz / 3MHz / 5MHz / 10MHz<br>LTE Band 13 : 5MHz / 10MHz |
| Maximum Output Power to Antenna         | LTE Band 2 : 23.30 dBm<br>LTE Band 4 : 22.92 dBm<br>LTE Band 5 : 23.20 dBm<br>LTE Band 12 : 23.17 dBm                                                                                                                                           |



|                    |                                                                                                                             |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------|
|                    | LTE Band 13 : 23.11 dBm                                                                                                     |
| Antenna Type       | PIFA Antenna                                                                                                                |
| Antenna Gain       | LTE Band 2 : 2.56 dBi<br>LTE Band 4 : 3.13 dBi<br>LTE Band 5 : 0.85 dBi<br>LTE Band 12 : 0.33 dBi<br>LTE Band 13 : 1.49 dBi |
| Type of Modulation | QPSK / 16QAM                                                                                                                |

Remark: This device support LTE category 1 bits.

## 1.5 Modification of EUT

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

## 1.6 Maximum ERP/EIRP

| LTE Band 2 |                       | QPSK            |                              | 16QAM           |                              |
|------------|-----------------------|-----------------|------------------------------|-----------------|------------------------------|
| BW (MHz)   | Frequency Range (MHz) | Maximum EIRP(W) | Emission Designator (99%OBW) | Maximum EIRP(W) | Emission Designator (99%OBW) |
| 1.4        | 1850.7 ~ 1909.3       | 0.3436          | -                            | 0.2805          | -                            |
| 3          | 1851.5 ~ 1908.5       | 0.3532          | -                            | 0.2818          | -                            |
| 5          | 1852.5 ~ 1907.5       | 0.3499          | -                            | 0.2805          | -                            |
| 10         | 1855.0 ~ 1905.0       | 0.3556          | -                            | 0.2891          | -                            |
| 15         | 1857.5 ~ 1902.5       | 0.3499          | -                            | 0.2805          | -                            |
| 20         | 1860.0 ~ 1900.0       | 0.3855          | -                            | 0.3097          | -                            |
| LTE Band 4 |                       | QPSK            |                              | 16QAM           |                              |
| BW (MHz)   | Frequency Range (MHz) | Maximum EIRP(W) | Emission Designator (99%OBW) | Maximum EIRP(W) | Emission Designator (99%OBW) |
| 1.4        | 1710.7 ~ 1754.3       | 0.3811          | -                            | 0.3443          | -                            |
| 3          | 1711.5 ~ 1753.5       | 0.3802          | -                            | 0.3420          | -                            |
| 5          | 1712.5 ~ 1752.5       | 0.3873          | -                            | 0.3396          | -                            |
| 10         | 1715.0 ~ 1750.0       | 0.3926          | -                            | 0.3508          | -                            |
| 15         | 1717.5 ~ 1747.5       | 0.3793          | -                            | 0.3467          | -                            |
| 20         | 1720.0 ~ 1745.0       | 0.4027          | -                            | 0.3184          | -                            |



| LTE Band 5  |                       | QPSK           |                              | 16QAM          |                              |
|-------------|-----------------------|----------------|------------------------------|----------------|------------------------------|
| BW (MHz)    | Frequency Range (MHz) | Maximum ERP(W) | Emission Designator (99%OBW) | Maximum ERP(W) | Emission Designator (99%OBW) |
| 1.4         | 824.7 ~ 848.3         | 0.1442         | -                            | 0.1119         | -                            |
| 3           | 825.5 ~ 847.5         | 0.1459         | -                            | 0.1122         | -                            |
| 5           | 826.5 ~ 846.5         | 0.1469         | -                            | 0.1140         | -                            |
| 10          | 829.0 ~ 844.0         | 0.1549         | -                            | 0.1151         | -                            |
| LTE Band 12 |                       | QPSK           |                              | 16QAM          |                              |
| BW (MHz)    | Frequency Range (MHz) | Maximum ERP(W) | Emission Designator (99%OBW) | Maximum ERP(W) | Emission Designator (99%OBW) |
| 1.4         | 699.7 ~ 715.3         | 0.1349         | -                            | 0.1194         | -                            |
| 3           | 700.5 ~ 714.5         | 0.1349         | -                            | 0.1211         | -                            |
| 5           | 701.5 ~ 713.5         | 0.1321         | -                            | 0.1191         | -                            |
| 10          | 704.0 ~ 711.0         | 0.1365         | -                            | 0.1222         | -                            |
| LTE Band 13 |                       | QPSK           |                              | 16QAM          |                              |
| BW (MHz)    | Frequency Range (MHz) | Maximum ERP(W) | Emission Designator (99%OBW) | Maximum ERP(W) | Emission Designator (99%OBW) |
| 5           | 779.5 ~ 784.5         | 0.1213         | -                            | 0.0946         | -                            |
| 10          | 782.0                 | 0.1758         | -                            | 0.0962         | -                            |

## 1.7 Testing Location

Sporton International Inc. (ShenZhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

|                           |                                                                                                                                                                         |                            |                                       |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------|
| <b>Test Firm</b>          | Sporton International Inc. (ShenZhen)                                                                                                                                   |                            |                                       |
| <b>Test Site Location</b> | 1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China<br>TEL: +86-755-86379589<br>FAX: +86-755-86379595 |                            |                                       |
| <b>Test Site No.</b>      | <b>Sporton Site No.</b>                                                                                                                                                 | <b>FCC Designation No.</b> | <b>FCC Test Firm Registration No.</b> |
|                           | TH01-SZ                                                                                                                                                                 | CN1256                     | 421272                                |

|                           |                                                                                                                                                                                                                 |                            |                                       |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------|
| <b>Test Firm</b>          | Sporton International Inc. (ShenZhen)                                                                                                                                                                           |                            |                                       |
| <b>Test Site Location</b> | 101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City, Guangdong Province 518103 People's Republic of China<br>TEL: +86-755-86066985 |                            |                                       |
| <b>Test Site No.</b>      | <b>Sporton Site No.</b>                                                                                                                                                                                         | <b>FCC Designation No.</b> | <b>FCC Test Firm Registration No.</b> |
|                           | 03CH03-SZ                                                                                                                                                                                                       | CN1256                     | 421272                                |

## 1.8 Test Software

| Item | Site      | Manufacturer | Name | Version     |
|------|-----------|--------------|------|-------------|
| 1.   | 03CH03-SZ | AUDIX        | E3   | 6.2009-8-24 |

## 1.9 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(L), 27(H), 27(F)
- ANSI C63.26-2015
- FCC KDB 971168 D01 Power Meas License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01

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



## 2 Test Configuration of Equipment Under Test

### 2.1 Test Mode

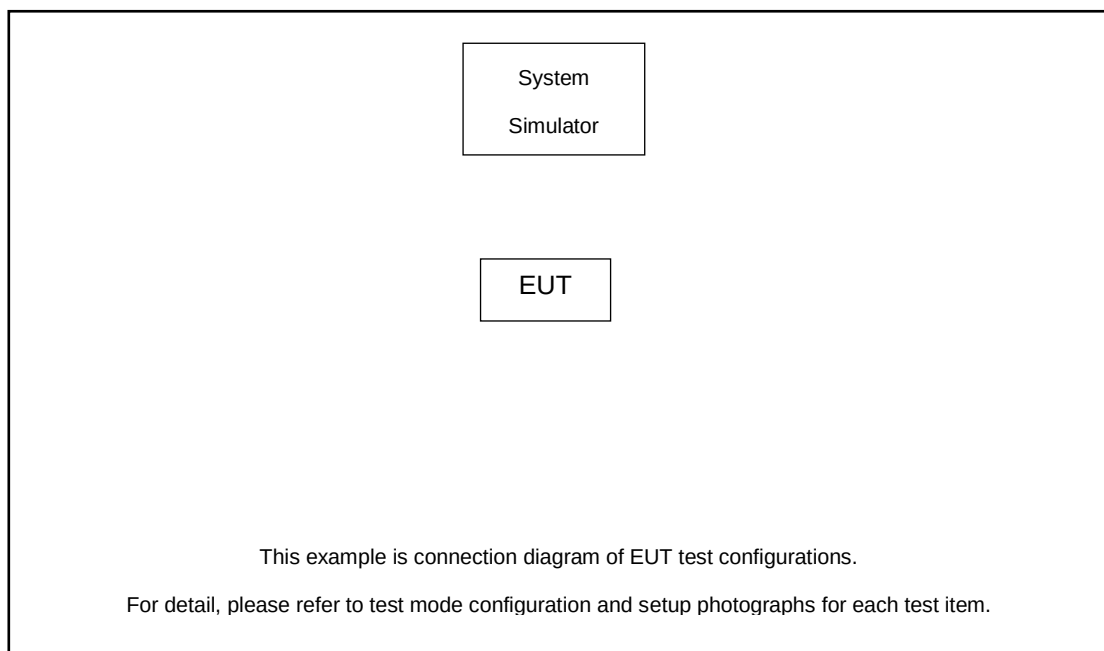
Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas License Digital Systems v03r01 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes(X/Y/Z Plane) to find the maximum emission(Y Plane).

#### LTE Category-1 bits:

| EUT Category 1 BRS         |                                                                                                                                                                                                                                                                                                                                                                                      |                 |   |   |    |    |    |            |       |       |      |      |      |              |   |   |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---|---|----|----|----|------------|-------|-------|------|------|------|--------------|---|---|
| Test Items                 | Band                                                                                                                                                                                                                                                                                                                                                                                 | Bandwidth (MHz) |   |   |    |    |    | Modulation |       |       | RB # |      |      | Test Channel |   |   |
|                            |                                                                                                                                                                                                                                                                                                                                                                                      | 1.4             | 3 | 5 | 10 | 15 | 20 | QPSK       | 16QAM | 64QAM | 1    | Half | Full | L            | M | H |
| Max. Output Power          | 2                                                                                                                                                                                                                                                                                                                                                                                    | v               | v | v | v  | v  | v  | v          | v     | -     | v    | v    | v    | v            | v | v |
|                            | 4                                                                                                                                                                                                                                                                                                                                                                                    | v               | v | v | v  | v  | v  | v          | v     | -     | v    | v    | v    | v            | v | v |
|                            | 5                                                                                                                                                                                                                                                                                                                                                                                    | v               | v | v | v  | -  | -  | v          | v     | -     | v    | v    | v    | v            | v | v |
|                            | 12                                                                                                                                                                                                                                                                                                                                                                                   | v               | v | v | v  | -  | -  | v          | v     | -     | v    | v    | v    | v            | v | v |
|                            | 13                                                                                                                                                                                                                                                                                                                                                                                   | -               | - | v | v  | -  | -  | v          | v     | -     | v    | v    | v    | v            | v | v |
| E.R.P / E.I.R.P            | 2                                                                                                                                                                                                                                                                                                                                                                                    | v               | v | v | v  | v  | v  | v          | v     | -     | v    | v    | v    | v            | v | v |
|                            | 4                                                                                                                                                                                                                                                                                                                                                                                    | v               | v | v | v  | v  | v  | v          | v     | -     | v    | v    | v    | v            | v | v |
|                            | 5                                                                                                                                                                                                                                                                                                                                                                                    | v               | v | v | v  | -  | -  | v          | v     | -     | v    | v    | v    | v            | v | v |
|                            | 12                                                                                                                                                                                                                                                                                                                                                                                   | v               | v | v | v  | -  | -  | v          | v     | -     | v    | v    | v    | v            | v | v |
|                            | 13                                                                                                                                                                                                                                                                                                                                                                                   | -               | - | v | v  | -  | -  | v          | v     | -     | v    | v    | v    | v            | v | v |
| Radiated Spurious Emission | 2                                                                                                                                                                                                                                                                                                                                                                                    | Worst Case      |   |   |    |    |    |            |       |       |      |      |      | v            | v | v |
|                            | 4                                                                                                                                                                                                                                                                                                                                                                                    | Worst Case      |   |   |    |    |    |            |       |       |      |      |      | v            | v | v |
|                            | 5                                                                                                                                                                                                                                                                                                                                                                                    | Worst Case      |   |   |    |    |    |            |       |       |      |      |      | v            | v | v |
|                            | 12                                                                                                                                                                                                                                                                                                                                                                                   | Worst Case      |   |   |    |    |    |            |       |       |      |      |      | v            | v | v |
|                            | 13                                                                                                                                                                                                                                                                                                                                                                                   | Worst Case      |   |   |    |    |    |            |       |       |      |      |      | v            | v | v |
| Note                       | 1. The mark "v " means that this configuration is chosen for testing<br>2. The mark "- " means that this bandwidth is not supported.<br>3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. |                 |   |   |    |    |    |            |       |       |      |      |      |              |   |   |

## 2.2 Connection Diagram of Test System



## 2.3 Support Unit used in test configuration and system

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



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

| LTE Band 2 Channel and Frequency List |                        |        |        |         |
|---------------------------------------|------------------------|--------|--------|---------|
| BW [MHz]                              | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| 20                                    | Channel                | 18700  | 18900  | 19100   |
|                                       | Frequency              | 1860   | 1880   | 1900    |
| 15                                    | Channel                | 18675  | 18900  | 19125   |
|                                       | Frequency              | 1857.5 | 1880   | 1902.5  |
| 10                                    | Channel                | 18650  | 18900  | 19150   |
|                                       | Frequency              | 1855   | 1880   | 1905    |
| 5                                     | Channel                | 18625  | 18900  | 19175   |
|                                       | Frequency              | 1852.5 | 1880   | 1907.5  |
| 3                                     | Channel                | 18615  | 18900  | 19185   |
|                                       | Frequency              | 1851.5 | 1880   | 1908.5  |
| 1.4                                   | Channel                | 18607  | 18900  | 19193   |
|                                       | Frequency              | 1850.7 | 1880   | 1909.3  |

| LTE Band 4 Channel and Frequency List |                        |        |        |         |
|---------------------------------------|------------------------|--------|--------|---------|
| BW [MHz]                              | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| 20                                    | Channel                | 20050  | 20175  | 20300   |
|                                       | Frequency              | 1720   | 1732.5 | 1745    |
| 15                                    | Channel                | 20025  | 20175  | 20325   |
|                                       | Frequency              | 1717.5 | 1732.5 | 1747.5  |
| 10                                    | Channel                | 20000  | 20175  | 20350   |
|                                       | Frequency              | 1715   | 1732.5 | 1750    |
| 5                                     | Channel                | 19975  | 20175  | 20375   |
|                                       | Frequency              | 1712.5 | 1732.5 | 1752.5  |
| 3                                     | Channel                | 19965  | 20175  | 20385   |
|                                       | Frequency              | 1711.5 | 1732.5 | 1753.5  |
| 1.4                                   | Channel                | 19957  | 20175  | 20393   |
|                                       | Frequency              | 1710.7 | 1732.5 | 1754.3  |



| LTE Band 5 Channel and Frequency List |                        |        |        |         |
|---------------------------------------|------------------------|--------|--------|---------|
| BW [MHz]                              | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| 10                                    | Channel                | 20450  | 20525  | 20600   |
|                                       | Frequency              | 829    | 836.5  | 844     |
| 5                                     | Channel                | 20425  | 20525  | 20625   |
|                                       | Frequency              | 826.5  | 836.5  | 846.5   |
| 3                                     | Channel                | 20415  | 20525  | 20635   |
|                                       | Frequency              | 825.5  | 836.5  | 847.5   |
| 1.4                                   | Channel                | 20407  | 20525  | 20643   |
|                                       | Frequency              | 824.7  | 836.5  | 848.3   |

| LTE Band 12 Channel and Frequency List |                        |        |        |         |
|----------------------------------------|------------------------|--------|--------|---------|
| BW [MHz]                               | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| 10                                     | Channel                | 23060  | 23095  | 23130   |
|                                        | Frequency              | 704    | 707.5  | 711     |
| 5                                      | Channel                | 23035  | 23095  | 23155   |
|                                        | Frequency              | 701.5  | 707.5  | 713.5   |
| 3                                      | Channel                | 23025  | 23095  | 23165   |
|                                        | Frequency              | 700.5  | 707.5  | 714.5   |
| 1.4                                    | Channel                | 23017  | 23095  | 23173   |
|                                        | Frequency              | 699.7  | 707.5  | 715.3   |

| LTE Band 13 Channel and Frequency List |                        |        |        |         |
|----------------------------------------|------------------------|--------|--------|---------|
| BW [MHz]                               | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| 10                                     | Channel                | -      | 23230  | -       |
|                                        | Frequency              | -      | 782    | -       |
| 5                                      | Channel                | 23205  | 23230  | 23255   |
|                                        | Frequency              | 779.5  | 782    | 784.5   |

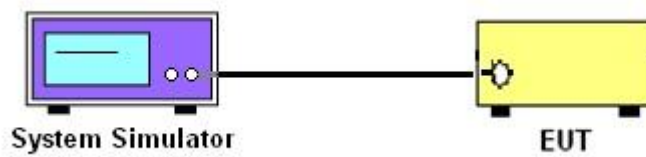
### 3 Conducted Test Items

#### 3.1 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.2 Test Setup

##### 3.2.1 Conducted Output Power



#### 3.3 Test Result of Conducted Test

Please refer to Appendix A.

### 3.4 Conducted Output Power and ERP/EIRP

#### 3.4.1 Description of the Conducted Output Power Measurement and ERP/EIRP 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.

The ERP of mobile transmitters must not exceed 7 Watts for LTE Band 5.

The ERP of mobile transmitters must not exceed 3 Watts for LTE Band 12 and Band 13.

The EIRP of mobile transmitters must not exceed 2 Watts for LTE Band 2.

The EIRP of mobile transmitters must not exceed 1 Watts for LTE Band 4.

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$ ,  $ERP = EIRP - 2.15$ , where

$P_T$  = transmitter output power in dBm

$G_T$  = gain of the transmitting antenna in dBi

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

#### 3.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the system simulator.

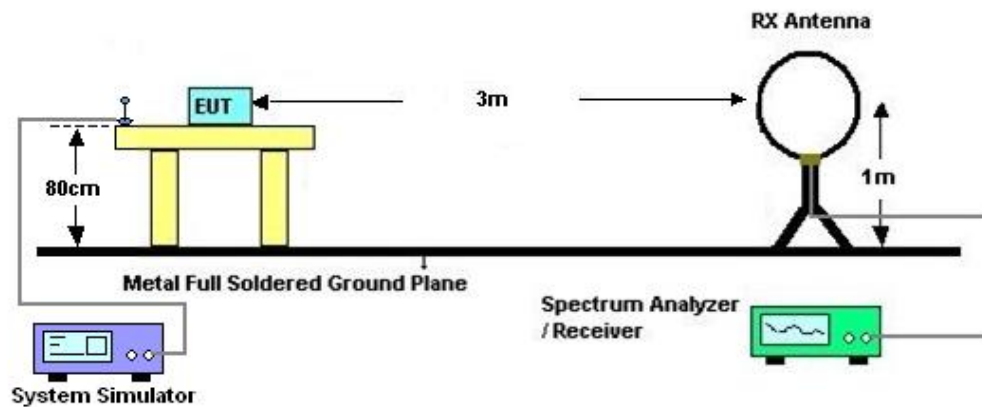
## 4 Radiated Test Items

### 4.1 Measuring Instruments

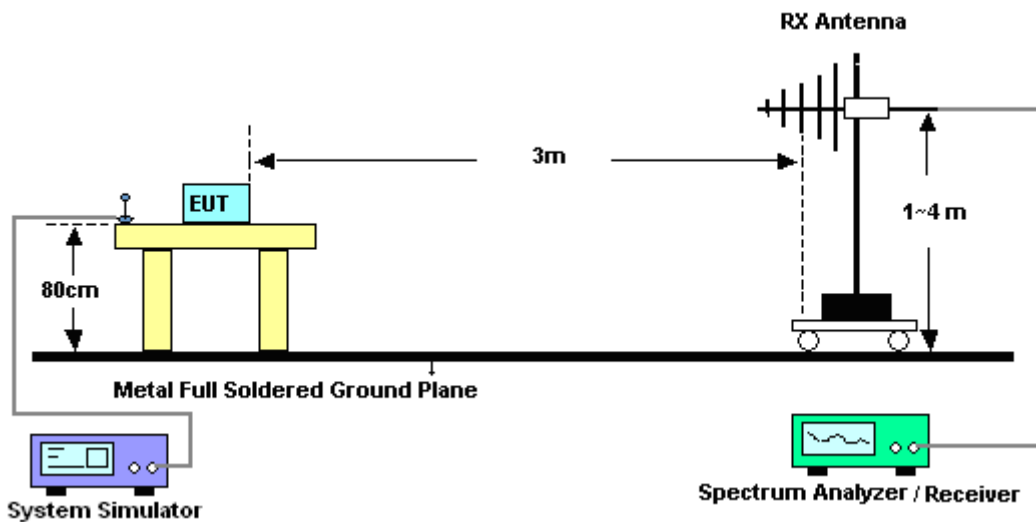
See list of measuring instruments of this test report.

### 4.2 Test Setup

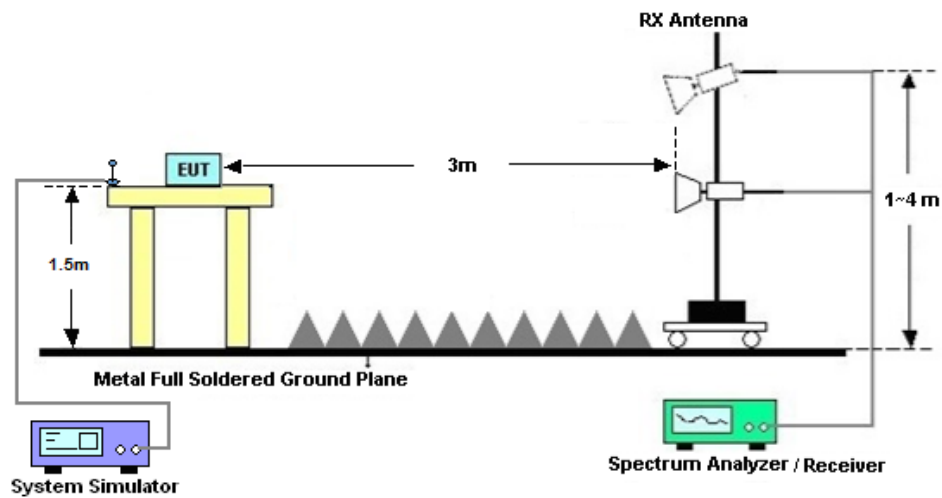
#### 4.2.1 For radiated test below 30MHz



#### 4.2.2 For radiated test from 30MHz to 1GHz



#### 4.2.3 For radiated test above 1GHz



#### 4.3 Test Result of Radiated Test

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

Please refer to Appendix B.

## 4.4 Radiated Spurious Emission

### 4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26. 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 LTE Band 13

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.

### 4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
6. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
7. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
8. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
9. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
10.  $\text{EIRP (dBm)} = \text{S.G. Power} - \text{Tx Cable Loss} + \text{Tx Antenna Gain}$
11.  $\text{ERP (dBm)} = \text{EIRP} - 2.15$
12. 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)  
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$   
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$   
 $= -13\text{dBm}.$



## 5 List of Measuring Equipment

| Instrument                | Manufacturer         | Model No.         | Serial No.         | Characteristics | Calibration Date | Test Date    | Due Date      | Remark                |
|---------------------------|----------------------|-------------------|--------------------|-----------------|------------------|--------------|---------------|-----------------------|
| Spectrum Analyzer         | R&S                  | FSV40             | 101078             | 10Hz~40GHz      | Apr. 09, 2024    | May 17, 2024 | Apr. 08, 2025 | Conducted (TH01-SZ)   |
| Power Divider             | TOJOIN               | PS-2SM-04<br>265  | 60.06.020.007<br>7 | 0.4GHz~26.5GHz  | Dec. 25, 2023    | May 17, 2024 | Dec. 24, 2024 | Conducted (TH01-SZ)   |
| EMI Test Receiver&SA      | KEYSIGHT             | N9038A            | MY54450083         | 20Hz~8.4GHz     | Apr. 09, 2024    | May 13, 2024 | Apr. 08, 2025 | Radiation (03CH03-SZ) |
| Loop Antenna              | R&S                  | HFH2-Z2           | 100354             | 9kHz~30MHz      | Jun. 28, 2022    | May 13, 2024 | Jun. 27, 2024 | Radiation (03CH03-SZ) |
| EXA Spectrum Analyzer     | KEYSIGHT             | N9010A            | MY55150246         | 10Hz~44GHz;     | Apr. 09, 2024    | May 13, 2024 | Apr. 08, 2025 | Radiation (03CH03-SZ) |
| Bilog Antenna             | TeseQ                | CBL6112D          | 35408              | 30MHz~2GHz      | Aug. 20, 2023    | May 13, 2024 | Aug. 19, 2025 | Radiation (03CH03-SZ) |
| Double Ridge Horn Antenna | SCHWARZBECK          | BBHA9120D         | 9120D-1355         | 1GHz~18GHz      | Apr. 09, 2024    | May 13, 2024 | Apr. 08, 2025 | Radiation (03CH03-SZ) |
| Amplifier                 | Burgeon              | BPA-530           | 102211             | 0.01Hz ~3000MHz | Oct. 18, 2023    | May 13, 2024 | Oct. 17, 2024 | Radiation (03CH03-SZ) |
| HF Amplifier              | MITEQ                | TTA1840-35<br>-HG | 1871923            | 18GHz~40GHz     | Jul. 07, 2023    | May 13, 2024 | Jul.06, 2024  | Radiation (03CH03-SZ) |
| SHF-EHF Horn              | com-power            | AH-840            | 101071             | 18Ghz-40GHz     | Apr. 09, 2024    | May 13, 2024 | Apr. 08, 2025 | Radiation (03CH03-SZ) |
| Amplifier                 | Agilent Technologies | 83017A            | MY39501302         | 500MHz~26.5GHz  | Dec. 27, 2023    | May 13, 2024 | Dec. 26, 2024 | Radiation (03CH03-SZ) |
| AC Power Source           | Chroma               | 61601             | 616010002729       | N/A             | Oct. 18, 2023    | May 13, 2024 | Oct. 17, 2024 | Radiation (03CH03-SZ) |
| Turn Table                | EM                   | EM1000            | N/A                | 0~360 degree    | NCR              | May 13, 2024 | NCR           | Radiation (03CH03-SZ) |
| Antenna Mast              | EM                   | EM1000            | N/A                | 1 m~4 m         | NCR              | May 13, 2024 | NCR           | Radiation (03CH03-SZ) |

NCR: No Calibration Required

## 6 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

### Uncertainty of Conducted Measurement

| Test Item       | Uncertainty |
|-----------------|-------------|
| Conducted Power | ±1.34 dB    |

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

|                                                                          |       |
|--------------------------------------------------------------------------|-------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2U_c(y)$ ) | 3.0dB |
|--------------------------------------------------------------------------|-------|

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

|                                                                          |       |
|--------------------------------------------------------------------------|-------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2U_c(y)$ ) | 3.6dB |
|--------------------------------------------------------------------------|-------|

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

|                                                                          |       |
|--------------------------------------------------------------------------|-------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2U_c(y)$ ) | 3.8dB |
|--------------------------------------------------------------------------|-------|



## Appendix A. Test Results of Conducted Test

### Conducted Output Power(Average power) and ERP/EIRP

#### LTE Band 2

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | EIRP(W) |        |        |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------|--------|--------|
| Channel         |            |         |           | 18700                 | 18900                    | 19100                  |         |        |        |
| Frequency (MHz) |            |         |           | 1860                  | 1880                     | 1900                   | L       | M      | H      |
| 20              | QPSK       | 1       | 0         | 22.45                 | 21.87                    | 23.10                  | 0.3170  | 0.2773 | 0.3681 |
| 20              | QPSK       | 1       | 49        | 22.01                 | 22.69                    | 22.29                  | 0.2864  | 0.3350 | 0.3055 |
| 20              | QPSK       | 1       | 99        | 21.58                 | 23.30                    | 22.18                  | 0.2594  | 0.3855 | 0.2979 |
| 20              | QPSK       | 50      | 0         | 21.18                 | 21.18                    | 21.60                  | 0.2366  | 0.2366 | 0.2606 |
| 20              | QPSK       | 50      | 24        | 21.09                 | 21.60                    | 21.35                  | 0.2317  | 0.2606 | 0.2460 |
| 20              | QPSK       | 50      | 50        | 20.73                 | 22.00                    | 20.71                  | 0.2133  | 0.2858 | 0.2123 |
| 20              | QPSK       | 100     | 0         | 20.64                 | 21.87                    | 20.63                  | 0.2089  | 0.2773 | 0.2084 |
| 20              | 16QAM      | 1       | 0         | 21.61                 | 21.49                    | 22.35                  | 0.2612  | 0.2541 | 0.3097 |
| Channel         |            |         |           | 18675                 | 18900                    | 19125                  | EIRP(W) |        |        |
| Frequency (MHz) |            |         |           | 1857.5                | 1880                     | 1902.5                 | L       | M      | H      |
| 15              | QPSK       | 1       | 0         | 22.88                 | 22.55                    | 22.38                  | 0.3499  | 0.3243 | 0.3119 |
| 15              | 16QAM      | 1       | 0         | 21.92                 | 21.65                    | 21.59                  | 0.2805  | 0.2636 | 0.2600 |
| Channel         |            |         |           | 18650                 | 18900                    | 19150                  | EIRP(W) |        |        |
| Frequency (MHz) |            |         |           | 1855                  | 1880                     | 1905                   | L       | M      | H      |
| 10              | QPSK       | 1       | 0         | 22.95                 | 22.64                    | 22.45                  | 0.3556  | 0.3311 | 0.3170 |
| 10              | 16QAM      | 1       | 0         | 22.05                 | 21.74                    | 21.67                  | 0.2891  | 0.2692 | 0.2649 |
| Channel         |            |         |           | 18625                 | 18900                    | 19175                  | EIRP(W) |        |        |
| Frequency (MHz) |            |         |           | 1852.5                | 1880                     | 1907.5                 | L       | M      | H      |
| 5               | QPSK       | 1       | 0         | 22.88                 | 22.49                    | 22.31                  | 0.3499  | 0.3199 | 0.3069 |
| 5               | 16QAM      | 1       | 0         | 21.92                 | 21.68                    | 21.60                  | 0.2805  | 0.2655 | 0.2606 |
| Channel         |            |         |           | 18615                 | 18900                    | 19185                  | EIRP(W) |        |        |
| Frequency (MHz) |            |         |           | 1851.5                | 1880                     | 1908.5                 | L       | M      | H      |
| 3               | QPSK       | 1       | 0         | 22.92                 | 22.54                    | 22.38                  | 0.3532  | 0.3236 | 0.3119 |
| 3               | 16QAM      | 1       | 0         | 21.94                 | 21.60                    | 21.56                  | 0.2818  | 0.2606 | 0.2582 |
| Channel         |            |         |           | 18607                 | 18900                    | 19193                  | EIRP(W) |        |        |
| Frequency (MHz) |            |         |           | 1850.7                | 1880                     | 1909.3                 | L       | M      | H      |
| 1.4             | QPSK       | 1       | 0         | 22.80                 | 22.53                    | 22.41                  | 0.3436  | 0.3228 | 0.3141 |
| 1.4             | 16QAM      | 1       | 0         | 21.92                 | 21.68                    | 21.64                  | 0.2805  | 0.2655 | 0.2630 |



## LTE Band 4

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | EIRP(W) |        |        |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------|--------|--------|
| Channel         |            |         |           | 20050                 | 20175                    | 20300                  |         |        |        |
| Frequency (MHz) |            |         |           | 1720                  | 1732.5                   | 1745                   | L       | M      | H      |
| 20              | QPSK       | 1       | 0         | 21.82                 | 22.16                    | 22.26                  | 0.3126  | 0.3381 | 0.3459 |
| 20              | QPSK       | 1       | 49        | 21.41                 | 22.92                    | 20.88                  | 0.2844  | 0.4027 | 0.2518 |
| 20              | QPSK       | 1       | 99        | 22.60                 | 21.26                    | 20.88                  | 0.3741  | 0.2748 | 0.2518 |
| 20              | QPSK       | 50      | 0         | 20.36                 | 21.71                    | 20.71                  | 0.2234  | 0.3048 | 0.2421 |
| 20              | QPSK       | 50      | 24        | 20.63                 | 21.84                    | 20.07                  | 0.2377  | 0.3141 | 0.2089 |
| 20              | QPSK       | 50      | 50        | 21.21                 | 21.30                    | 19.66                  | 0.2716  | 0.2773 | 0.1901 |
| 20              | QPSK       | 100     | 0         | 21.12                 | 21.26                    | 19.56                  | 0.2661  | 0.2748 | 0.1858 |
| 20              | 16QAM      | 1       | 0         | 21.31                 | 21.10                    | 21.90                  | 0.2780  | 0.2649 | 0.3184 |
| Channel         |            |         |           | 20025                 | 20175                    | 20325                  | EIRP(W) |        |        |
| Frequency (MHz) |            |         |           | 1717.5                | 1732.5                   | 1747.5                 | L       | M      | H      |
| 15              | QPSK       | 1       | 0         | 21.92                 | 22.66                    | 20.88                  | 0.3199  | 0.3793 | 0.2518 |
| 15              | 16QAM      | 1       | 0         | 21.53                 | 22.27                    | 19.95                  | 0.2924  | 0.3467 | 0.2032 |
| Channel         |            |         |           | 20000                 | 20175                    | 20350                  | EIRP(W) |        |        |
| Frequency (MHz) |            |         |           | 1715                  | 1732.5                   | 1750                   | L       | M      | H      |
| 10              | QPSK       | 1       | 0         | 22.02                 | 22.81                    | 21.02                  | 0.3273  | 0.3926 | 0.2600 |
| 10              | 16QAM      | 1       | 0         | 21.60                 | 22.32                    | 20.10                  | 0.2972  | 0.3508 | 0.2104 |
| Channel         |            |         |           | 19975                 | 20175                    | 20375                  | EIRP(W) |        |        |
| Frequency (MHz) |            |         |           | 1712.5                | 1732.5                   | 1752.5                 | L       | M      | H      |
| 5               | QPSK       | 1       | 0         | 21.94                 | 22.75                    | 20.89                  | 0.3214  | 0.3873 | 0.2523 |
| 5               | 16QAM      | 1       | 0         | 21.54                 | 22.18                    | 20.05                  | 0.2931  | 0.3396 | 0.2080 |
| Channel         |            |         |           | 19965                 | 20175                    | 20385                  | EIRP(W) |        |        |
| Frequency (MHz) |            |         |           | 1711.5                | 1732.5                   | 1753.5                 | L       | M      | H      |
| 3               | QPSK       | 1       | 0         | 21.95                 | 22.67                    | 20.91                  | 0.3221  | 0.3802 | 0.2535 |
| 3               | 16QAM      | 1       | 0         | 21.54                 | 22.21                    | 19.99                  | 0.2931  | 0.3420 | 0.2051 |
| Channel         |            |         |           | 19950                 | 20175                    | 20393                  | EIRP(W) |        |        |
| Frequency (MHz) |            |         |           | 1710                  | 1732.5                   | 1754.3                 | L       | M      | H      |
| 1.4             | QPSK       | 1       | 0         | 21.90                 | 22.68                    | 20.94                  | 0.3184  | 0.3811 | 0.2553 |
| 1.4             | 16QAM      | 1       | 0         | 21.55                 | 22.24                    | 19.95                  | 0.2938  | 0.3443 | 0.2032 |



## LTE Band 5

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | ERP(W) |        |        |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|--------|--------|--------|
| Channel         |            |         |           | 20450                 | 20525                    | 20600                  |        |        |        |
| Frequency (MHz) |            |         |           | 829                   | 836.5                    | 844                    | L      | M      | H      |
| 10              | QPSK       | 1       | 0         | 22.21                 | 22.34                    | 23.03                  | 0.1233 | 0.1271 | 0.1489 |
| 10              | QPSK       | 1       | 25        | 21.83                 | 23.20                    | 21.88                  | 0.1130 | 0.1549 | 0.1143 |
| 10              | QPSK       | 1       | 49        | 22.86                 | 22.64                    | 22.30                  | 0.1432 | 0.1361 | 0.1259 |
| 10              | QPSK       | 25      | 0         | 20.57                 | 21.82                    | 21.26                  | 0.0845 | 0.1127 | 0.0991 |
| 10              | QPSK       | 25      | 12        | 20.88                 | 22.18                    | 20.94                  | 0.0908 | 0.1225 | 0.0920 |
| 10              | QPSK       | 25      | 25        | 21.01                 | 21.89                    | 20.87                  | 0.0935 | 0.1146 | 0.0906 |
| 10              | QPSK       | 50      | 0         | 20.93                 | 21.95                    | 20.89                  | 0.0918 | 0.1161 | 0.0910 |
| 10              | 16QAM      | 1       | 0         | 21.76                 | 21.88                    | 21.91                  | 0.1112 | 0.1143 | 0.1151 |
| Channel         |            |         |           | 20425                 | 20525                    | 20625                  | ERP(W) |        |        |
| Frequency (MHz) |            |         |           | 826.5                 | 836.5                    | 846.5                  | L      | M      | H      |
| 5               | QPSK       | 1       | 0         | 22.13                 | 22.32                    | 22.97                  | 0.1211 | 0.1265 | 0.1469 |
| 5               | 16QAM      | 1       | 0         | 21.72                 | 21.82                    | 21.87                  | 0.1102 | 0.1127 | 0.1140 |
| Channel         |            |         |           | 20415                 | 20525                    | 20635                  | ERP(W) |        |        |
| Frequency (MHz) |            |         |           | 825.5                 | 836.5                    | 847.5                  | L      | M      | H      |
| 3               | QPSK       | 1       | 0         | 22.17                 | 22.19                    | 22.94                  | 0.1222 | 0.1227 | 0.1459 |
| 3               | 16QAM      | 1       | 0         | 21.62                 | 21.74                    | 21.80                  | 0.1076 | 0.1107 | 0.1122 |
| Channel         |            |         |           | 20407                 | 20525                    | 20643                  | ERP(W) |        |        |
| Frequency (MHz) |            |         |           | 824.7                 | 836.5                    | 848.3                  | L      | M      | H      |
| 1.4             | QPSK       | 1       | 0         | 22.13                 | 22.27                    | 22.89                  | 0.1211 | 0.1250 | 0.1442 |
| 1.4             | 16QAM      | 1       | 0         | 21.62                 | 21.78                    | 21.79                  | 0.1076 | 0.1117 | 0.1119 |



## LTE Band 12

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | ERP(W) |        |        |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|--------|--------|--------|
| Channel         |            |         |           | 23060                    | 23095                       | 23130                     |        |        |        |
| Frequency (MHz) |            |         |           | 704                      | 707.5                       | 711                       | L      | M      | H      |
| 10              | QPSK       | 1       | 0         | 23.17                    | 22.68                       | 22.37                     | 0.1365 | 0.1219 | 0.1135 |
| 10              | QPSK       | 1       | 25        | 22.68                    | 22.56                       | 23.16                     | 0.1219 | 0.1186 | 0.1361 |
| 10              | QPSK       | 1       | 49        | 22.78                    | 22.93                       | 22.57                     | 0.1247 | 0.1291 | 0.1189 |
| 10              | QPSK       | 25      | 0         | 21.71                    | 21.30                       | 21.57                     | 0.0975 | 0.0887 | 0.0944 |
| 10              | QPSK       | 25      | 12        | 21.71                    | 21.56                       | 21.97                     | 0.0975 | 0.0942 | 0.1035 |
| 10              | QPSK       | 25      | 25        | 21.41                    | 21.80                       | 21.73                     | 0.0910 | 0.0995 | 0.0979 |
| 10              | QPSK       | 50      | 0         | 21.81                    | 21.41                       | 21.53                     | 0.0998 | 0.0910 | 0.0935 |
| 10              | 16QAM      | 1       | 0         | 22.69                    | 22.22                       | 21.51                     | 0.1222 | 0.1096 | 0.0931 |
| Channel         |            |         |           | 23035                    | 23095                       | 23155                     | ERP(W) |        |        |
| Frequency (MHz) |            |         |           | 701.5                    | 707.5                       | 713.5                     | L      | M      | H      |
| 5               | QPSK       | 1       | 0         | 23.03                    | 22.54                       | 22.26                     | 0.1321 | 0.1180 | 0.1107 |
| 5               | 16QAM      | 1       | 0         | 22.58                    | 22.15                       | 21.43                     | 0.1191 | 0.1079 | 0.0914 |
| Channel         |            |         |           | 23025                    | 23095                       | 23165                     | ERP(W) |        |        |
| Frequency (MHz) |            |         |           | 700.5                    | 707.5                       | 714.5                     | L      | M      | H      |
| 3               | QPSK       | 1       | 0         | 23.12                    | 22.56                       | 22.34                     | 0.1349 | 0.1186 | 0.1127 |
| 3               | 16QAM      | 1       | 0         | 22.65                    | 22.16                       | 21.36                     | 0.1211 | 0.1081 | 0.0899 |
| Channel         |            |         |           | 23017                    | 23095                       | 23173                     | ERP(W) |        |        |
| Frequency (MHz) |            |         |           | 699.7                    | 707.5                       | 715.3                     | L      | M      | H      |
| 1.4             | QPSK       | 1       | 0         | 23.12                    | 22.66                       | 22.34                     | 0.1349 | 0.1213 | 0.1127 |
| 1.4             | 16QAM      | 1       | 0         | 22.59                    | 22.15                       | 21.45                     | 0.1194 | 0.1079 | 0.0918 |

**LTE Band 13**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | ERP(W) |        |        |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|--------|--------|--------|
| Channel         |            |         |           | 23230                 |                          |                        |        |        |        |
| Frequency (MHz) |            |         |           | 782                   |                          |                        |        | M      |        |
| 10              | QPSK       | 1       | 0         |                       | 21.52                    |                        |        | 0.1219 |        |
| 10              | QPSK       | 1       | 25        |                       | 23.11                    |                        |        | 0.1758 |        |
| 10              | QPSK       | 1       | 49        |                       | 21.59                    |                        |        | 0.1239 |        |
| 10              | QPSK       | 25      | 0         |                       | 21.28                    |                        |        | 0.1153 |        |
| 10              | QPSK       | 25      | 12        |                       | 22.44                    |                        |        | 0.1507 |        |
| 10              | QPSK       | 25      | 25        |                       | 21.85                    |                        |        | 0.1315 |        |
| 10              | QPSK       | 50      | 0         |                       | 22.08                    |                        |        | 0.1387 |        |
| 10              | 16QAM      | 1       | 0         |                       | 20.49                    |                        |        | 0.0962 |        |
| Channel         |            |         |           | 23205                 | 23230                    | 23255                  | ERP(W) |        |        |
| Frequency (MHz) |            |         |           | 779.5                 | 782                      | 784.5                  | L      | M      | H      |
| 5               | QPSK       | 1       | 0         | 21.50                 | 21.38                    | 21.47                  | 0.1213 | 0.1180 | 0.1205 |
| 5               | 16QAM      | 1       | 0         | 20.42                 | 20.40                    | 20.37                  | 0.0946 | 0.0942 | 0.0935 |



## Appendix B. Test Results of Radiated Test

### Radiated Spurious Emission

|                 |              |                     |         |
|-----------------|--------------|---------------------|---------|
| Test Engineer : | Shunping You | Temperature :       | 22~25°C |
|                 |              | Relative Humidity : | 48~52%  |

| LTE Band 2 / 20MHz / QPSK |                      |                 |                  |                         |                         |                          |                            |                             |                       |
|---------------------------|----------------------|-----------------|------------------|-------------------------|-------------------------|--------------------------|----------------------------|-----------------------------|-----------------------|
| Channel                   | 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) |
| Lowest                    | 3702.18              | -46.47          | -13              | -33.47                  | -61.01                  | -53.23                   | 5.82                       | 12.58                       | H                     |
|                           | 5553.27              | -61.15          | -13              | -48.15                  | -78.68                  | -66.87                   | 7.28                       | 13.00                       | H                     |
|                           | 7404.36              | -55.24          | -13              | -42.24                  | -77.95                  | -58.40                   | 8.32                       | 11.48                       | H                     |
|                           | 3702.18              | -44.61          | -13              | -31.61                  | -59.44                  | -51.37                   | 5.82                       | 12.58                       | V                     |
|                           | 5553.27              | -58.58          | -13              | -45.58                  | -76.16                  | -64.30                   | 7.28                       | 13.00                       | V                     |
|                           | 7404.36              | -55.55          | -13              | -42.55                  | -78.3                   | -58.71                   | 8.32                       | 11.48                       | V                     |
| Middle                    | 3742.18              | -41.25          | -13              | -28.25                  | -55.88                  | -48.00                   | 5.85                       | 12.60                       | H                     |
|                           | 5613.27              | -56.16          | -13              | -43.16                  | -73.88                  | -61.96                   | 7.30                       | 13.10                       | H                     |
|                           | 7484.36              | -55.93          | -13              | -42.93                  | -78.34                  | -59.08                   | 8.35                       | 11.50                       | H                     |
|                           | 3742.18              | -45.38          | -13              | -32.38                  | -60.22                  | -52.13                   | 5.85                       | 12.60                       | V                     |
|                           | 5613.27              | -56.18          | -13              | -43.18                  | -73.81                  | -61.98                   | 7.30                       | 13.10                       | V                     |
|                           | 7484.36              | -56.09          | -13              | -43.09                  | -78.43                  | -59.24                   | 8.35                       | 11.50                       | V                     |
| Highest                   | 3782.18              | -44.39          | -13              | -31.39                  | -59.09                  | -51.13                   | 5.88                       | 12.62                       | H                     |
|                           | 5673.27              | -57.78          | -13              | -44.78                  | -75.65                  | -63.59                   | 7.32                       | 13.13                       | H                     |
|                           | 7564.36              | -55.12          | -13              | -42.12                  | -77.32                  | -58.28                   | 8.38                       | 11.54                       | H                     |
|                           | 3782.18              | -44.45          | -13              | -31.45                  | -59.28                  | -51.19                   | 5.88                       | 12.62                       | V                     |
|                           | 5673.27              | -56.62          | -13              | -43.62                  | -74.46                  | -62.43                   | 7.32                       | 13.13                       | V                     |
|                           | 7564.36              | -55.79          | -13              | -42.79                  | -77.81                  | -58.95                   | 8.38                       | 11.54                       | V                     |

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



| LTE Band 4 / 20MHz / QPSK |                      |                 |                  |                         |                         |                          |                            |                             |                       |
|---------------------------|----------------------|-----------------|------------------|-------------------------|-------------------------|--------------------------|----------------------------|-----------------------------|-----------------------|
| Channel                   | 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) |
| Lowest                    | 3422.18              | -54.38          | -13              | -41.38                  | -66.64                  | -61.26                   | 5.60                       | 12.48                       | H                     |
|                           | 5133.27              | -56.95          | -13              | -43.95                  | -74.44                  | -62.63                   | 7.10                       | 12.78                       | H                     |
|                           | 6844.36              | -58.78          | -13              | -45.78                  | -79.23                  | -62.17                   | 8.38                       | 11.77                       | H                     |
|                           | 3422.18              | -54.00          | -13              | -41.00                  | -66.82                  | -60.88                   | 5.60                       | 12.48                       | V                     |
|                           | 5133.27              | -57.69          | -13              | -44.69                  | -75.12                  | -63.37                   | 7.10                       | 12.78                       | V                     |
|                           | 6844.36              | -58.08          | -13              | -45.08                  | -78.29                  | -61.47                   | 8.38                       | 11.77                       | V                     |
| Middle                    | 3447.18              | -54.05          | -13              | -41.05                  | -66.59                  | -60.90                   | 5.65                       | 12.50                       | H                     |
|                           | 5170.77              | -57.80          | -13              | -44.80                  | -75.33                  | -63.47                   | 7.13                       | 12.80                       | H                     |
|                           | 6894.36              | -58.63          | -13              | -45.63                  | -79.31                  | -62.03                   | 8.40                       | 11.80                       | H                     |
|                           | 3447.18              | -54.40          | -13              | -41.40                  | -67.49                  | -61.25                   | 5.65                       | 12.50                       | V                     |
|                           | 5170.77              | -57.29          | -13              | -44.29                  | -74.77                  | -62.96                   | 7.13                       | 12.80                       | V                     |
|                           | 6894.36              | -58.81          | -13              | -45.81                  | -79.4                   | -62.21                   | 8.40                       | 11.80                       | V                     |
| Highest                   | 3472.18              | -59.58          | -13              | -46.58                  | -72.40                  | -66.42                   | 5.68                       | 12.52                       | H                     |
|                           | 5208.27              | -58.75          | -13              | -45.75                  | -76.21                  | -64.42                   | 7.15                       | 12.82                       | H                     |
|                           | 6944.36              | -58.57          | -13              | -45.57                  | -79.48                  | -62.00                   | 8.42                       | 11.85                       | H                     |
|                           | 3472.18              | -55.22          | -13              | -42.22                  | -68.59                  | -62.06                   | 5.68                       | 12.52                       | V                     |
|                           | 5208.27              | -60.43          | -13              | -47.43                  | -77.84                  | -66.10                   | 7.15                       | 12.82                       | V                     |
|                           | 6944.36              | -58.58          | -13              | -45.58                  | -79.54                  | -62.01                   | 8.42                       | 11.85                       | V                     |

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



| LTE Band 5 / 10MHz / QPSK |                      |                |                  |                         |                         |                          |                            |                             |                       |
|---------------------------|----------------------|----------------|------------------|-------------------------|-------------------------|--------------------------|----------------------------|-----------------------------|-----------------------|
| Channel                   | Frequency<br>( MHz ) | ERP<br>( dBm ) | Limit<br>( dBm ) | Over<br>Limit<br>( dB ) | SPA<br>Reading<br>(dBm) | S.G.<br>Power<br>( dBm ) | TX Cable<br>loss<br>( dB ) | TX Antenna<br>Gain<br>(dBi) | Polarization<br>(H/V) |
| Lowest                    | 1649.18              | -49.04         | -13              | -36.04                  | -55.30                  | -52.27                   | 3.98                       | 9.36                        | H                     |
|                           | 2473.77              | -56.05         | -13              | -43.05                  | -66.40                  | -59.60                   | 4.85                       | 10.55                       | H                     |
|                           | 3298.36              | -54.94         | -13              | -41.94                  | -67.35                  | -59.87                   | 5.50                       | 12.58                       | H                     |
|                           | 4122.95              | -61.83         | -13              | -48.83                  | -77.41                  | -66.30                   | 5.98                       | 12.60                       | H                     |
|                           | 1649.18              | -42.97         | -13              | -29.97                  | -49.11                  | -46.20                   | 3.98                       | 9.36                        | V                     |
|                           | 2473.77              | -51.72         | -13              | -38.72                  | -62.43                  | -55.27                   | 4.85                       | 10.55                       | V                     |
|                           | 3298.36              | -50.72         | -13              | -37.72                  | -63.59                  | -55.65                   | 5.50                       | 12.58                       | V                     |
|                           | 4122.95              | -60.39         | -13              | -47.39                  | -76.08                  | -64.86                   | 5.98                       | 12.60                       | V                     |
| Middle                    | 1664.18              | -43.72         | -13              | -30.72                  | -49.97                  | -46.97                   | 4.00                       | 9.40                        | H                     |
|                           | 2496.27              | -57.61         | -13              | -44.61                  | -67.90                  | -61.18                   | 4.88                       | 10.60                       | H                     |
|                           | 3328.36              | -53.52         | -13              | -40.52                  | -65.69                  | -58.45                   | 5.52                       | 12.60                       | H                     |
|                           | 4160.45              | -62.53         | -13              | -49.53                  | -78.19                  | -67.00                   | 6.00                       | 12.62                       | H                     |
|                           | 1664.18              | -40.24         | -13              | -27.24                  | -46.26                  | -43.49                   | 4.00                       | 9.40                        | V                     |
|                           | 2496.27              | -53.29         | -13              | -40.29                  | -63.92                  | -56.86                   | 4.88                       | 10.60                       | V                     |
|                           | 3328.36              | -52.81         | -13              | -39.81                  | -65.39                  | -57.74                   | 5.52                       | 12.60                       | V                     |
|                           | 4160.45              | -61.32         | -13              | -48.32                  | -77.15                  | -65.79                   | 6.00                       | 12.62                       | V                     |
| Highest                   | 1679.18              | -44.91         | -13              | -31.91                  | -51.19                  | -48.08                   | 4.10                       | 9.42                        | H                     |
|                           | 2518.77              | -58.35         | -13              | -45.35                  | -68.63                  | -61.93                   | 4.90                       | 10.63                       | H                     |
|                           | 3358.36              | -54.85         | -13              | -41.85                  | -66.87                  | -59.77                   | 5.55                       | 12.62                       | H                     |
|                           | 4197.95              | -62.99         | -13              | -49.99                  | -78.78                  | -67.47                   | 6.02                       | 12.65                       | H                     |
|                           | 1679.18              | -40.16         | -13              | -27.16                  | -46.18                  | -43.33                   | 4.10                       | 9.42                        | V                     |
|                           | 2518.77              | -55.41         | -13              | -42.41                  | -66.02                  | -58.99                   | 4.90                       | 10.63                       | V                     |
|                           | 3358.36              | -54.89         | -13              | -41.89                  | -67.33                  | -59.81                   | 5.55                       | 12.62                       | V                     |
|                           | 4197.95              | -61.46         | -13              | -48.46                  | -77.42                  | -65.94                   | 6.02                       | 12.65                       | V                     |

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



| LTE Band 12 / 10MHz / QPSK |                      |                |                  |                         |                         |                          |                            |                             |                       |
|----------------------------|----------------------|----------------|------------------|-------------------------|-------------------------|--------------------------|----------------------------|-----------------------------|-----------------------|
| Channel                    | Frequency<br>( MHz ) | ERP<br>( dBm ) | Limit<br>( dBm ) | Over<br>Limit<br>( dB ) | SPA<br>Reading<br>(dBm) | S.G.<br>Power<br>( dBm ) | TX Cable<br>loss<br>( dB ) | TX Antenna<br>Gain<br>(dBi) | Polarization<br>(H/V) |
| Lowest                     | 1399                 | -49.12         | -13              | -36.12                  | -57.26                  | -52.35                   | 3.98                       | 9.36                        | H                     |
|                            | 2098.5               | -54.50         | -13              | -41.50                  | -64.08                  | -58.05                   | 4.85                       | 10.55                       | H                     |
|                            | 2798                 | -59.35         | -13              | -46.35                  | -71.33                  | -64.28                   | 5.50                       | 12.58                       | H                     |
|                            | 3496                 | -63.02         | -13              | -50.02                  | -76.11                  | -67.49                   | 5.98                       | 12.60                       | H                     |
|                            | 1399                 | -50.42         | -13              | -37.42                  | -58.62                  | -53.65                   | 3.98                       | 9.36                        | V                     |
|                            | 2098.5               | -54.79         | -13              | -41.79                  | -64.75                  | -58.34                   | 4.85                       | 10.55                       | V                     |
|                            | 2798                 | -57.82         | -13              | -44.82                  | -70.04                  | -62.75                   | 5.50                       | 12.58                       | V                     |
|                            | 3496                 | -62.04         | -13              | -49.04                  | -75.67                  | -66.51                   | 5.98                       | 12.60                       | V                     |
| Middle                     | 1406                 | -47.66         | -13              | -34.66                  | -55.74                  | -50.91                   | 4.00                       | 9.40                        | H                     |
|                            | 2109                 | -55.97         | -13              | -42.97                  | -65.73                  | -59.54                   | 4.88                       | 10.60                       | H                     |
|                            | 2812                 | -59.77         | -13              | -46.77                  | -71.79                  | -64.70                   | 5.52                       | 12.60                       | H                     |
|                            | 3512                 | -63.40         | -13              | -50.40                  | -76.69                  | -67.87                   | 6.00                       | 12.62                       | H                     |
|                            | 1406                 | -49.07         | -13              | -36.07                  | -57.23                  | -52.32                   | 4.00                       | 9.40                        | V                     |
|                            | 2109                 | -54.63         | -13              | -41.63                  | -64.76                  | -58.20                   | 4.88                       | 10.60                       | V                     |
|                            | 2812                 | -61.49         | -13              | -48.49                  | -73.75                  | -66.42                   | 5.52                       | 12.60                       | V                     |
|                            | 3512                 | -62.37         | -13              | -49.37                  | -76.19                  | -66.84                   | 6.00                       | 12.62                       | V                     |
| Highest                    | 1413                 | -48.66         | -13              | -35.66                  | -56.66                  | -51.83                   | 4.10                       | 9.42                        | H                     |
|                            | 2119.5               | -57.03         | -13              | -44.03                  | -66.99                  | -60.61                   | 4.90                       | 10.63                       | H                     |
|                            | 2826                 | -59.41         | -13              | -46.41                  | -71.47                  | -64.33                   | 5.55                       | 12.62                       | H                     |
|                            | 3536                 | -62.15         | -13              | -49.15                  | -75.71                  | -66.63                   | 6.02                       | 12.65                       | H                     |
|                            | 1413                 | -46.42         | -13              | -33.42                  | -54.50                  | -49.59                   | 4.10                       | 9.42                        | V                     |
|                            | 2119.5               | -53.68         | -13              | -40.68                  | -64.01                  | -57.26                   | 4.90                       | 10.63                       | V                     |
|                            | 2826                 | -58.01         | -13              | -45.01                  | -70.32                  | -62.93                   | 5.55                       | 12.62                       | V                     |
|                            | 3536                 | -62.22         | -13              | -49.22                  | -76.30                  | -66.70                   | 6.02                       | 12.65                       | V                     |

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



| LTE Band 13 / 5MHz / QPSK |                   |             |               |                   |                   |                    |                      |                       |                    |
|---------------------------|-------------------|-------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel                   | Frequency ( MHz ) | ERP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Lowest                    | 1554.5            | -59.61      | -13           | -46.61            | -66.45            | -62.84             | 3.98                 | 9.36                  | H                  |
|                           | 2331.75           | -50.28      | -13           | -37.28            | -61.09            | -53.83             | 4.85                 | 10.55                 | H                  |
|                           | 3109              | -53.20      | -13           | -40.20            | -66.05            | -58.13             | 5.50                 | 12.58                 | H                  |
|                           | 1554.5            | -59.22      | -13           | -46.22            | -66.26            | -62.45             | 3.98                 | 9.36                  | V                  |
|                           | 2331.75           | -49.52      | -13           | -36.52            | -60.72            | -53.07             | 4.85                 | 10.55                 | V                  |
|                           | 3109              | -53.10      | -13           | -40.10            | -66.45            | -58.03             | 5.50                 | 12.58                 | V                  |
| Middle                    | 1559.5            | -57.56      | -42.15        | -15.41            | -64.34            | -60.81             | 4.00                 | 9.40                  | H                  |
|                           | 2339.25           | -50.73      | -13           | -37.73            | -61.52            | -54.30             | 4.88                 | 10.60                 | H                  |
|                           | 3119              | -53.59      | -13           | -40.59            | -66.48            | -58.52             | 5.52                 | 12.60                 | H                  |
|                           | 1559.5            | -55.69      | -42.15        | -13.54            | -62.68            | -58.94             | 4.00                 | 9.40                  | V                  |
|                           | 2339.25           | -49.03      | -13           | -36.03            | -60.21            | -52.60             | 4.88                 | 10.60                 | V                  |
|                           | 3119              | -52.22      | -13           | -39.22            | -65.62            | -57.15             | 5.52                 | 12.60                 | V                  |
| Highest                   | 1564.5            | -57.00      | -42.15        | -14.85            | -63.72            | -60.17             | 4.10                 | 9.42                  | H                  |
|                           | 2346.75           | -57.48      | -13           | -44.48            | -68.23            | -61.06             | 4.90                 | 10.63                 | H                  |
|                           | 3129              | -53.54      | -13           | -40.54            | -66.46            | -58.46             | 5.55                 | 12.62                 | H                  |
|                           | 1564.5            | -54.73      | -42.15        | -12.58            | -61.67            | -57.90             | 4.10                 | 9.42                  | V                  |
|                           | 2346.75           | -54.84      | -13           | -41.84            | -65.98            | -58.42             | 4.90                 | 10.63                 | V                  |
|                           | 3129              | -53.22      | -13           | -40.22            | -66.67            | -58.14             | 5.55                 | 12.62                 | V                  |

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

| LTE Band 13 / 10MHz / QPSK |                   |             |               |                   |                   |                    |                      |                       |                    |
|----------------------------|-------------------|-------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel                    | Frequency ( MHz ) | ERP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Middle                     | 1559.5            | -58.73      | -42.15        | -16.58            | -65.51            | -61.98             | 4.00                 | 9.40                  | H                  |
|                            | 2339.25           | -49.18      | -13           | -36.18            | -59.97            | -52.75             | 4.88                 | 10.60                 | H                  |
|                            | 3119              | -51.46      | -13           | -38.46            | -64.35            | -56.39             | 5.52                 | 12.60                 | H                  |
|                            | 1559.5            | -59.29      | -42.15        | -17.14            | -66.28            | -62.54             | 4.00                 | 9.40                  | V                  |
|                            | 2339.25           | -49.30      | -13           | -36.30            | -60.48            | -52.87             | 4.88                 | 10.60                 | V                  |
|                            | 3119              | -53.35      | -13           | -40.35            | -66.75            | -58.28             | 5.52                 | 12.60                 | V                  |

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