

# Partial FCC RF Test Report

APPLICANT : LG Electronics INC  
EQUIPMENT : NoteBook Computer  
BRAND NAME : LG  
MODEL NAME : LGX14, LGX14A, X140, XB140, XD140  
FCC ID : BEJNT-LGX14C  
STANDARD : FCC Part 15 Subpart C §15.247  
CLASSIFICATION : Digital Transmission System (DTS)

This is a partial report which is only valid combined with the WLAN Module report (Brand Name: Realtek / Model Name: RTL8191SE, FCC ID: TX2-RTL8191SE).

The product was received on Mar. 05, 2010 and completely tested on Mar. 13, 2010. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown the compliance with the applicable technical standards.

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

Reviewed by:



Roy Wu / Manager



## **SPORTON INTERNATIONAL INC.**

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## TABLE OF CONTENTS

|                                                           |           |
|-----------------------------------------------------------|-----------|
| <b>REVISION HISTORY .....</b>                             | <b>3</b>  |
| <b>SUMMARY OF TEST RESULT .....</b>                       | <b>4</b>  |
| <b>1 GENERAL DESCRIPTION .....</b>                        | <b>5</b>  |
| 1.1 Applicant .....                                       | 5         |
| 1.2 Manufacturer .....                                    | 5         |
| 1.3 Feature of Equipment Under Test .....                 | 5         |
| 1.4 Testing Site .....                                    | 6         |
| 1.5 Applied Standards .....                               | 6         |
| 1.6 Ancillary Equipment List .....                        | 6         |
| <b>2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST .....</b> | <b>7</b>  |
| 2.1 Test Mode .....                                       | 7         |
| 2.2 Connection Diagram of Test System .....               | 8         |
| 2.3 RF Utility .....                                      | 9         |
| <b>3 TEST RESULT .....</b>                                | <b>10</b> |
| 3.1 Band Edges Measurement .....                          | 10        |
| 3.2 AC Conducted Emission Measurement .....               | 16        |
| 3.3 Radiated Emission Measurement .....                   | 20        |
| 3.4 Antenna Requirements .....                            | 47        |
| <b>4 LIST OF MEASURING EQUIPMENT .....</b>                | <b>48</b> |
| <b>5 UNCERTAINTY OF EVALUATION .....</b>                  | <b>49</b> |
| <b>APPENDIX A. PHOTOGRAPHS OF EUT</b>                     |           |
| <b>APPENDIX B. SETUP PHOTOGRAPHS</b>                      |           |



## REVISION HISTORY

| REPORT NO.   | VERSION | DESCRIPTION             | ISSUED DATE  |
|--------------|---------|-------------------------|--------------|
| FR030509-03A | Rev. 01 | Initial issue of report | May 18, 2010 |
|              |         |                         |              |
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|              |         |                         |              |
|              |         |                         |              |

## SUMMARY OF TEST RESULT

| Report Section | FCC Rule              | IC Rule   | Description                   | Limit                    | Result | Remark                                   |
|----------------|-----------------------|-----------|-------------------------------|--------------------------|--------|------------------------------------------|
| 3.2            | 15.207                | Gen 7.2.2 | AC Conducted Emission         | 15.207(a)                | Pass   | Under limit<br>11.4 dB at<br>0.190 MHz   |
| 3.3            | 15.247(d)             | A8.5      | Transmitter Radiated Emission | 15.209(a) &<br>15.247(d) | Pass   | Under limit<br>0.81 dB at<br>2487.65 MHz |
| 3.4            | 15.203 &<br>15.247(b) | A8.4      | Antenna Requirement           | N/A                      | Pass   | -                                        |

# 1 General Description

## 1.1 Applicant

LG Electronics INC

19-1, Cheongho-ri, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, 451-713, Korea

## 1.2 Manufacturer

LG Electronics INC

19-1, Cheongho-ri, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, 451-713, Korea

## 1.3 Feature of Equipment Under Test

| Product Feature & Specification   |                                                                                      |
|-----------------------------------|--------------------------------------------------------------------------------------|
| Equipment                         | NoteBook Computer                                                                    |
| Brand Name                        | LG                                                                                   |
| Model Name                        | LGX14, LGX14A, X140, XB140, XD140                                                    |
| FCC ID                            | BEJNT-LGX14C                                                                         |
| Tx/Rx Frequency Range             | 2400 MHz ~ 2483.5 MHz                                                                |
| Number of Channels                | 11                                                                                   |
| Carrier Frequency of Each Channel | $2412+(n-1)*5$ MHz; $n=1\sim11$                                                      |
| Channel Spacing                   | 5 MHz                                                                                |
| Antenna Type                      | PIFA Antenna                                                                         |
| Type of Modulation                | 802.11b : DSSS (BPSK / QPSK / CCK)<br>802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) |
| EUT Stage                         | Production Unit                                                                      |

### Remark:

1. For other wireless features of this EUT, test report will be issued separately.
2. This test report recorded only product characteristics and test results of Digital Transmission System (DTS).
3. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
4. The EUT parts listed with \* were all in the test configuration which were used for the test.

## 1.4 Testing Site

|                           |                                                                                                                                                              |           |                                |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------------------------|
| <b>Test Site</b>          | SPORTON INTERNATIONAL INC.                                                                                                                                   |           |                                |
| <b>Test Site Location</b> | No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park,<br>Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.<br>TEL: +886-3-3273456 / FAX: +886-3-3284978 |           |                                |
| <b>Test Site No.</b>      | <b>Sporton Site No.</b>                                                                                                                                      |           | <b>FCC/IC Registration No.</b> |
|                           | CO05-HY                                                                                                                                                      | 03CH07-HY | TW1022/4086B-1                 |

## 1.5 Applied Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 (Measurement Guidelines of DTS)
- ♦ ANSI C63.4-2003
- ♦ IC RSS-210 Issue 7

### Remark:

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

## 1.6 Ancillary Equipment List

| Item | Equipment          | Trade Name | Model Name  | FCC ID      | Data Cable        | Power Cord                                                 |
|------|--------------------|------------|-------------|-------------|-------------------|------------------------------------------------------------|
| 1.   | WLAN AP            | D-Link     | DIR-628     | KA2DIR628A2 | N/A               | Unshielded, 1.8 m                                          |
| 2.   | Notebook           | DELL       | Vostro 1510 | FCC DoC     | N/A               | AC I/P:<br>Unshielded, 1.2 m<br>DC O/P:<br>Shielded, 1.8 m |
| 3.   | LCD Monitor        | Lenovo     | 6135-AB1    | FCC DoC     | Shielded, 1.6 m   | Unshielded, 1.8 m                                          |
| 4.   | Bluetooth Earphone | Nokia      | BH-102      | PYAHS-107W  | N/A               | N/A                                                        |
| 5.   | Earphone           | Ergotech   | ET-E200     | FCC DoC     | Unshielded, 1.8 m | N/A                                                        |
| 6.   | iPod               | Apple      | A1285       | FCC DoC     | Shielded, 1.0 m   | N/A                                                        |

## 2 Test Configuration of Equipment Under Test

### 2.1 Test Mode

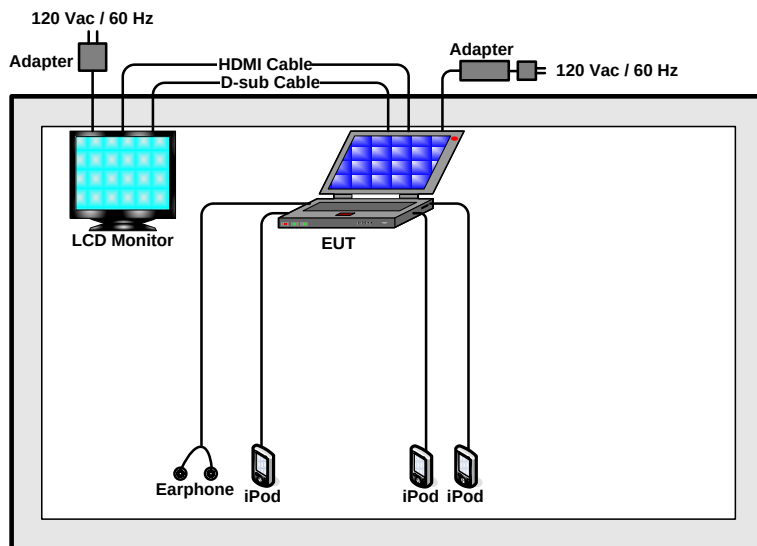
The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz), radiated emission (30 MHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The following tables are showing the test modes as the worst cases and recorded in this report.

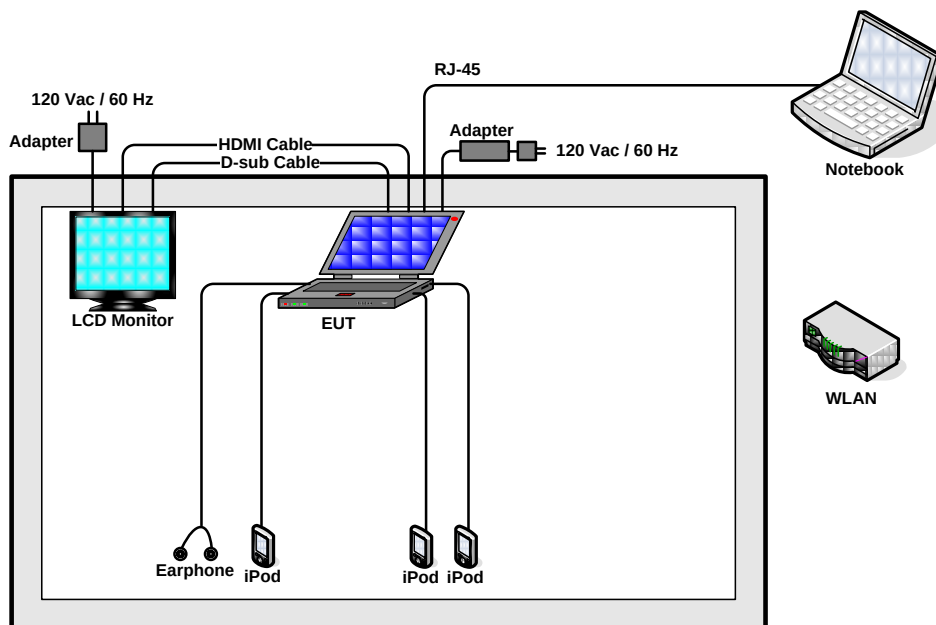
| Test Cases                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Item                                                                                                                                                                                                                                                                                                                                                                                          | 802.11b<br>(Modulation : DSSS)                                                                     | 802.11g/n<br>(Modulation : OFDM)                                                                                                                                                                                                                                                                                                                               |
| Radiated<br>TCs                                                                                                                                                                                                                                                                                                                                                                                    | Mode 1 : 802.11b CH01_2412 MHz<br>Mode 2 : 802.11b CH06_2437 MHz<br>Mode 3 : 802.11b CH11_2462 MHz | Mode 4: 802.11g_CH01_2412 MHz<br>Mode 5: 802.11g_CH06_2437 MHz<br>Mode 6: 802.11g_CH11_2462 MHz<br>Mode 7: 802.11n (BW 20M)_CH01_2412 MHz<br>Mode 8: 802.11n (BW 20M)_CH06_2437 MHz<br>Mode 9: 802.11n (BW 20M)_CH11_2462 MHz<br>Mode 10: 802.11n (BW 40M)_CH03_2422 MHz<br>Mode 11: 802.11n (BW 40M)_CH06_2437 MHz<br>Mode 12: 802.11n (BW 40M)_CH09_2452 MHz |
| AC<br>Conducted<br>Emission                                                                                                                                                                                                                                                                                                                                                                        | Mode 1 : GPRS850 Idle + WLAN Link + TC + Adapter                                                   |                                                                                                                                                                                                                                                                                                                                                                |
| <b>Remark:</b><br><br>1. TC stands for Test Configuration, and consists of iPod, monitor, earphone, and RJ-45.<br><br>2. Only the radiated emission and conducted emission of the laptop computer was performed in this report, and the conducted test cases can be referred to Realtek module report (FCC ID: TX2-RTL8191SE).<br><br>3. The mode 7~12 of Radiated TCs were verify band edge only. |                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                |

## 2.2 Connection Diagram of Test System

### <WLAN Tx Mode>



### <EUT with TC Mode>





## **2.3 RF Utility**

The programmed RF utility “Realtek 11n single chip PCIE WLAN MP Diagnostic Program” is installed in EUT to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testing. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

### 3 Test Result

#### 3.1 Band Edges Measurement

##### 3.1.1 Limit of Band Edges

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB.

##### 3.1.2 Measuring Instruments

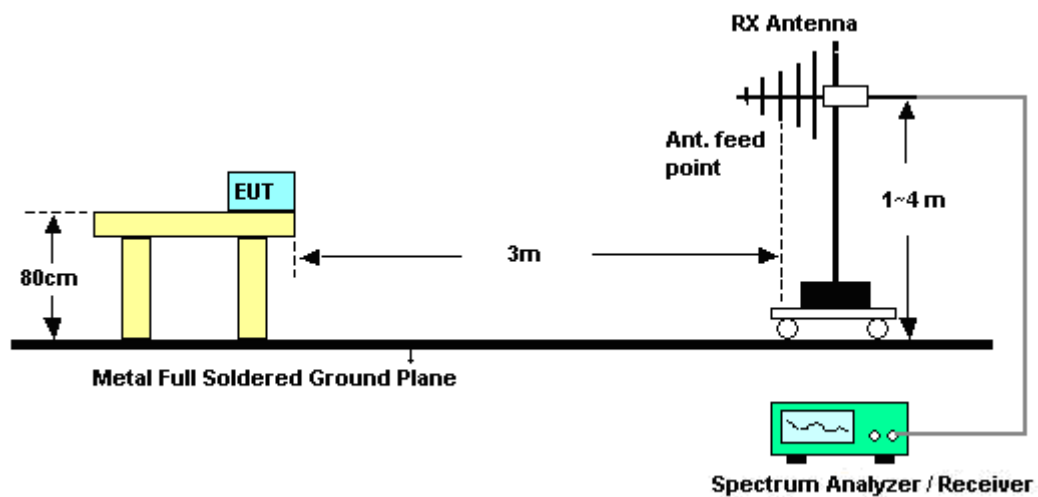
See list of measuring instruments of this test report.

##### 3.1.3 Test Procedures

1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW)  $\geq$  RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. Note: If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB.
3. Radiated emission test: Apply to band edge emissions that fall in the restricted bands listed in FCC Section 15.205. The maximum permitted average field strength is listed in FCC Section 15.209. A pre-amp is necessary for this measurement. For measurements above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep=Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation as in FCC Section 15.35(b) and (c).

### 3.1.4 Test Setup

<Radiated Band Edges>



### 3.1.5 Test Result of Radiated Band Edges

|                       |         |                            |        |
|-----------------------|---------|----------------------------|--------|
| <b>Test Mode :</b>    | Mode 1  | <b>Temperature :</b>       | 23~24℃ |
| <b>Test Band :</b>    | 802.11b | <b>Relative Humidity :</b> | 42~43% |
| <b>Test Channel :</b> | 01      | <b>Test Engineer :</b>     | Kay Wu |

| ANTENNA POLARITY : HORIZONTAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-------------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )          | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>( dBuV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2386.38                       | 50.93               | -23.07                  | 74                          | 47.49                     | 32.13                       | 5.46                    | 34.15                      | 108                  | 12                      | Peak    |
| 2386.38                       | 42.42               | -11.58                  | 54                          | 38.98                     | 32.13                       | 5.46                    | 34.15                      | 108                  | 12                      | Average |

| ANTENNA POLARITY : VERTICAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-----------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )        | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>( dBuV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2385.81                     | 47.84               | -26.16                  | 74                          | 44.4                      | 32.13                       | 5.46                    | 34.15                      | 100                  | 139                     | Peak    |
| 2385.81                     | 38.1                | -15.9                   | 54                          | 34.66                     | 32.13                       | 5.46                    | 34.15                      | 100                  | 139                     | Average |

|                       |         |                            |        |
|-----------------------|---------|----------------------------|--------|
| <b>Test Mode :</b>    | Mode 3  | <b>Temperature :</b>       | 23~24℃ |
| <b>Test Band :</b>    | 802.11b | <b>Relative Humidity :</b> | 42~43% |
| <b>Test Channel :</b> | 11      | <b>Test Engineer :</b>     | Kay Wu |

| ANTENNA POLARITY : HORIZONTAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-------------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )          | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>( dBuV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2483.5                        | 56.15               | -17.85                  | 74                          | 52.69                     | 32.27                       | 5.38                    | 34.19                      | 103                  | 17                      | Peak    |
| 2483.5                        | 49.65               | -4.35                   | 54                          | 46.19                     | 32.27                       | 5.38                    | 34.19                      | 103                  | 17                      | Average |

| ANTENNA POLARITY : VERTICAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-----------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )        | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>( dBuV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2483.5                      | 51.56               | -22.44                  | 74                          | 48.1                      | 32.27                       | 5.38                    | 34.19                      | 100                  | 134                     | Peak    |
| 2483.5                      | 42.76               | -11.24                  | 54                          | 39.3                      | 32.27                       | 5.38                    | 34.19                      | 100                  | 134                     | Average |



|                       |         |                            |        |
|-----------------------|---------|----------------------------|--------|
| <b>Test Mode :</b>    | Mode 4  | <b>Temperature :</b>       | 23~24℃ |
| <b>Test Band :</b>    | 802.11g | <b>Relative Humidity :</b> | 42~43% |
| <b>Test Channel :</b> | 01      | <b>Test Engineer :</b>     | Kay Wu |

| ANTENNA POLARITY : HORIZONTAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-------------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )          | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>( dBuV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2390                          | 61.04               | -12.96                  | 74                          | 57.61                     | 32.13                       | 5.46                    | 34.16                      | 103                  | 8                       | Peak    |
| 2390                          | 45.44               | -8.56                   | 54                          | 42.01                     | 32.13                       | 5.46                    | 34.16                      | 103                  | 8                       | Average |

| ANTENNA POLARITY : VERTICAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-----------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )        | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>( dBuV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2390                        | 54.89               | -19.11                  | 74                          | 51.46                     | 32.13                       | 5.46                    | 34.16                      | 102                  | 139                     | Peak    |
| 2390                        | 39.18               | -14.82                  | 54                          | 35.75                     | 32.13                       | 5.46                    | 34.16                      | 102                  | 139                     | Average |

|                       |         |                            |        |
|-----------------------|---------|----------------------------|--------|
| <b>Test Mode :</b>    | Mode 6  | <b>Temperature :</b>       | 23~24℃ |
| <b>Test Band :</b>    | 802.11g | <b>Relative Humidity :</b> | 42~43% |
| <b>Test Channel :</b> | 11      | <b>Test Engineer :</b>     | Kay Wu |

| ANTENNA POLARITY : HORIZONTAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-------------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )          | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>( dBuV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2483.5                        | 70.69               | -3.31                   | 74                          | 67.23                     | 32.27                       | 5.38                    | 34.19                      | 105                  | 18                      | Peak    |
| 2483.5                        | 52.36               | -1.64                   | 54                          | 48.9                      | 32.27                       | 5.38                    | 34.19                      | 105                  | 18                      | Average |

| ANTENNA POLARITY : VERTICAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-----------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )        | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>( dBuV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2483.5                      | 64.99               | -9.01                   | 74                          | 61.53                     | 32.27                       | 5.38                    | 34.19                      | 100                  | 133                     | Peak    |
| 2483.5                      | 46.3                | -7.7                    | 54                          | 42.84                     | 32.27                       | 5.38                    | 34.19                      | 100                  | 133                     | Average |



|                       |                    |                            |        |
|-----------------------|--------------------|----------------------------|--------|
| <b>Test Mode :</b>    | Mode 7             | <b>Temperature :</b>       | 23~24℃ |
| <b>Test Band :</b>    | 802.11n (BW 20MHz) | <b>Relative Humidity :</b> | 42~43% |
| <b>Test Channel :</b> | 01                 | <b>Test Engineer :</b>     | Kay Wu |

| ANTENNA POLARITY : HORIZONTAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-------------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )          | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>( dBuV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2390                          | 62.28               | -11.72                  | 74                          | 58.85                     | 32.13                       | 5.46                    | 34.16                      | 131                  | 342                     | Peak    |
| 2390                          | 41.77               | -12.23                  | 54                          | 38.34                     | 32.13                       | 5.46                    | 34.16                      | 131                  | 342                     | Average |

| ANTENNA POLARITY : VERTICAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-----------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )        | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>( dBuV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2390                        | 53.4                | -20.6                   | 74                          | 49.97                     | 32.13                       | 5.46                    | 34.16                      | 103                  | 138                     | Peak    |
| 2390                        | 37.62               | -16.38                  | 54                          | 34.19                     | 32.13                       | 5.46                    | 34.16                      | 103                  | 138                     | Average |

|                       |                    |                            |        |
|-----------------------|--------------------|----------------------------|--------|
| <b>Test Mode :</b>    | Mode 9             | <b>Temperature :</b>       | 23~24℃ |
| <b>Test Band :</b>    | 802.11n (BW 20MHz) | <b>Relative Humidity :</b> | 42~43% |
| <b>Test Channel :</b> | 11                 | <b>Test Engineer :</b>     | Kay Wu |

| ANTENNA POLARITY : HORIZONTAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-------------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )          | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>( dBuV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2483.5                        | 72.38               | -1.62                   | 74                          | 68.92                     | 32.27                       | 5.38                    | 34.19                      | 102                  | 14                      | Peak    |
| 2483.5                        | 52.77               | -1.23                   | 54                          | 49.31                     | 32.27                       | 5.38                    | 34.19                      | 102                  | 14                      | Average |

| ANTENNA POLARITY : VERTICAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-----------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )        | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>( dBuV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2483.5                      | 68.4                | -5.6                    | 74                          | 64.94                     | 32.27                       | 5.38                    | 34.19                      | 100                  | 133                     | Peak    |
| 2483.5                      | 48.18               | -5.82                   | 54                          | 44.72                     | 32.27                       | 5.38                    | 34.19                      | 100                  | 133                     | Average |



|                       |                    |                            |        |
|-----------------------|--------------------|----------------------------|--------|
| <b>Test Mode :</b>    | Mode 10            | <b>Temperature :</b>       | 23~24℃ |
| <b>Test Band :</b>    | 802.11n (BW 40MHz) | <b>Relative Humidity :</b> | 42~43% |
| <b>Test Channel :</b> | 03                 | <b>Test Engineer :</b>     | Kay Wu |

| ANTENNA POLARITY : HORIZONTAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-------------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )          | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>( dBuV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2387.9                        | 56.19               | -17.81                  | 74                          | 52.75                     | 32.13                       | 5.46                    | 34.15                      | 105                  | 14                      | Peak    |
| 2387.9                        | 42.97               | -11.03                  | 54                          | 39.53                     | 32.13                       | 5.46                    | 34.15                      | 105                  | 14                      | Average |

| ANTENNA POLARITY : VERTICAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-----------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )        | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>( dBuV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2388.85                     | 51.42               | -22.58                  | 74                          | 47.98                     | 32.13                       | 5.46                    | 34.15                      | 101                  | 114                     | Peak    |
| 2388.85                     | 39.34               | -14.66                  | 54                          | 35.9                      | 32.13                       | 5.46                    | 34.15                      | 101                  | 114                     | Average |

|                       |                    |                            |        |
|-----------------------|--------------------|----------------------------|--------|
| <b>Test Mode :</b>    | Mode 12            | <b>Temperature :</b>       | 23~24℃ |
| <b>Test Band :</b>    | 802.11n (BW 40MHz) | <b>Relative Humidity :</b> | 42~43% |
| <b>Test Channel :</b> | 09                 | <b>Test Engineer :</b>     | Kay Wu |

| ANTENNA POLARITY : HORIZONTAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-------------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )          | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>( dBuV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2487.65                       | 70.24               | -3.76                   | 74                          | 66.76                     | 32.3                        | 5.37                    | 34.19                      | 103                  | 13                      | Peak    |
| 2487.65                       | 53.19               | -0.81                   | 54                          | 49.71                     | 32.3                        | 5.37                    | 34.19                      | 103                  | 13                      | Average |

| ANTENNA POLARITY : VERTICAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-----------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )        | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>( dBuV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2488.22                     | 64.06               | -9.94                   | 74                          | 60.58                     | 32.3                        | 5.37                    | 34.19                      | 100                  | 133                     | Peak    |
| 2488.22                     | 46.58               | -7.42                   | 54                          | 43.1                      | 32.3                        | 5.37                    | 34.19                      | 100                  | 133                     | Average |

## 3.2 AC Conducted Emission Measurement

### 3.2.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

| Frequency of Emission<br>(MHz) | Conducted Limit (dBuV) |           |
|--------------------------------|------------------------|-----------|
|                                | Quasi-Peak             | Average   |
| 0.15-0.5                       | 66 to 56*              | 56 to 46* |
| 0.5-5                          | 56                     | 46        |
| 5-30                           | 60                     | 50        |

\*Decreases with the logarithm of the frequency.

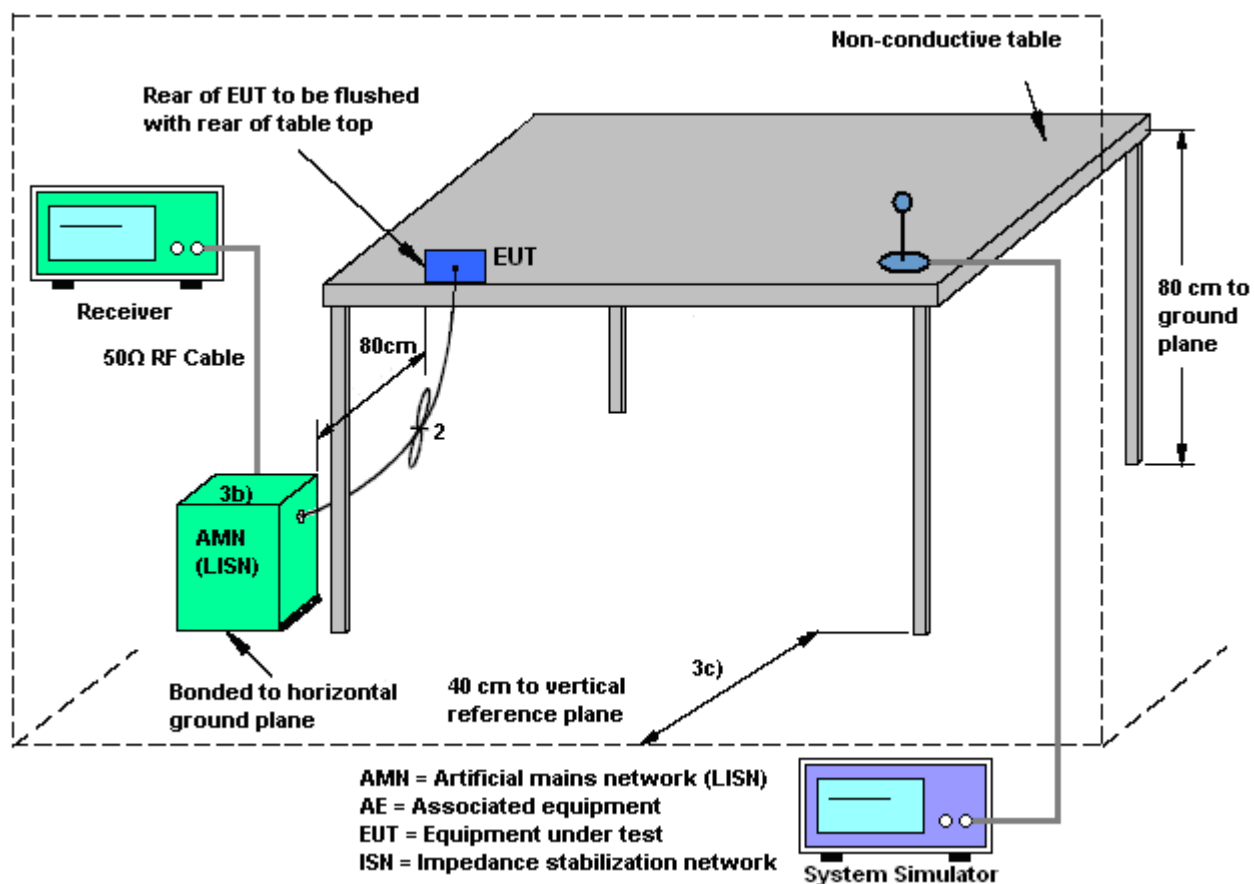
### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.2.3 Test Procedures

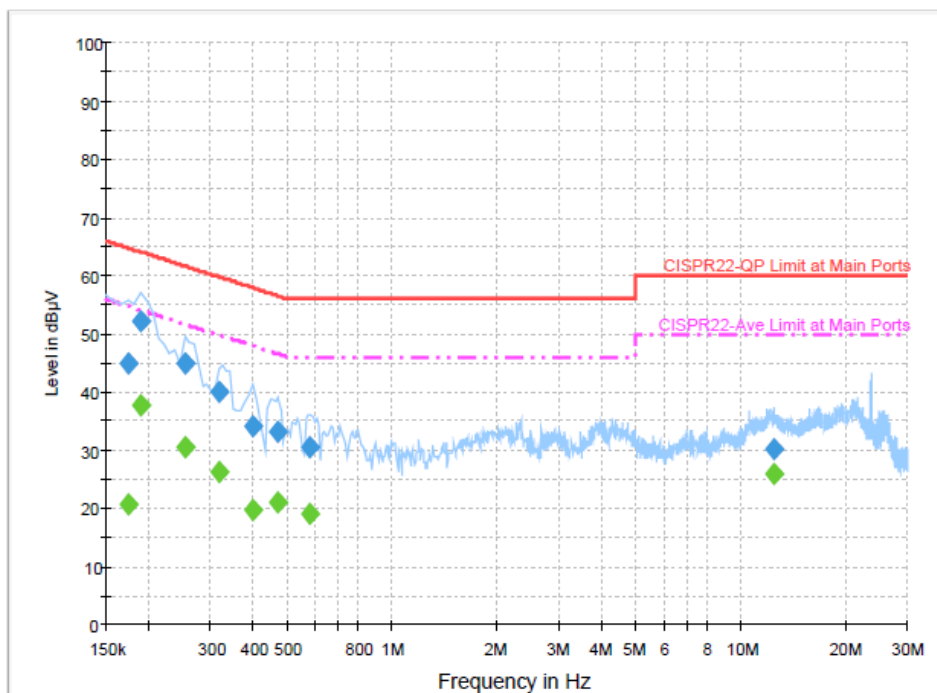
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 kHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

### 3.2.4 Test Setup



### 3.2.5 Test Result of AC Conducted Emission

|                        |                                                                                 |                            |         |
|------------------------|---------------------------------------------------------------------------------|----------------------------|---------|
| <b>Test Mode :</b>     | Mode 1                                                                          | <b>Temperature :</b>       | 20~22°C |
| <b>Test Engineer :</b> | Novic Jiang                                                                     | <b>Relative Humidity :</b> | 39~41%  |
| <b>Test Voltage :</b>  | 120Vac / 60Hz                                                                   | <b>Phase :</b>             | Line    |
| <b>Function Type :</b> | GPRS850 Idle + WLAN Link + TC + Adapter                                         |                            |         |
| <b>Remark :</b>        | All emissions not reported here are more than 10 dB below the prescribed limit. |                            |         |



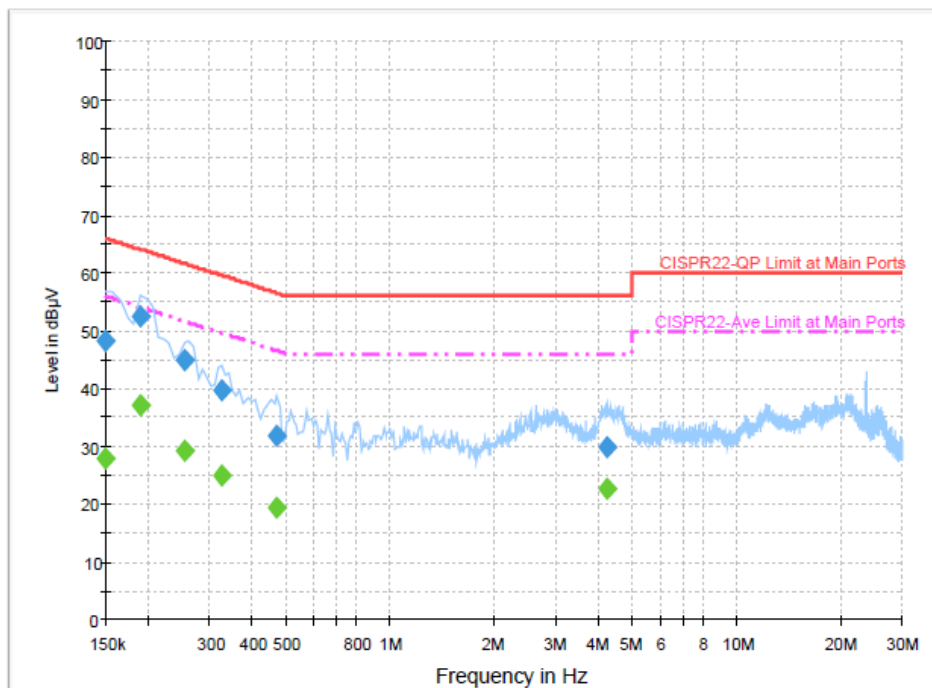
#### Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|------------------|--------|------|------------|-------------|--------------|
| 0.174000        | 45.0             | Off    | L1   | 19.5       | 19.8        | 64.8         |
| 0.190000        | 52.3             | Off    | L1   | 19.6       | 11.7        | 64.0         |
| 0.254000        | 45.0             | Off    | L1   | 19.4       | 16.6        | 61.6         |
| 0.318000        | 40.1             | Off    | L1   | 19.5       | 19.7        | 59.8         |
| 0.398000        | 34.0             | Off    | L1   | 19.5       | 23.9        | 57.9         |
| 0.470000        | 33.0             | Off    | L1   | 19.4       | 23.5        | 56.5         |
| 0.582000        | 30.4             | Off    | L1   | 19.5       | 25.6        | 56.0         |
| 12.414000       | 30.2             | Off    | L1   | 19.6       | 29.8        | 60.0         |

#### Final Result 2

| Frequency (MHz) | Average (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|----------------|--------|------|------------|-------------|--------------|
| 0.174000        | 20.8           | Off    | L1   | 19.5       | 34.0        | 54.8         |
| 0.190000        | 37.8           | Off    | L1   | 19.6       | 16.2        | 54.0         |
| 0.254000        | 30.3           | Off    | L1   | 19.4       | 21.3        | 51.6         |
| 0.318000        | 26.3           | Off    | L1   | 19.5       | 23.5        | 49.8         |
| 0.398000        | 19.5           | Off    | L1   | 19.5       | 28.4        | 47.9         |
| 0.470000        | 20.9           | Off    | L1   | 19.4       | 25.6        | 46.5         |
| 0.582000        | 18.9           | Off    | L1   | 19.5       | 27.1        | 46.0         |
| 12.414000       | 25.9           | Off    | L1   | 19.6       | 24.1        | 50.0         |

|                        |                                                                                 |                            |         |
|------------------------|---------------------------------------------------------------------------------|----------------------------|---------|
| <b>Test Mode :</b>     | Mode 1                                                                          | <b>Temperature :</b>       | 20~22°C |
| <b>Test Engineer :</b> | Novic Jiang                                                                     | <b>Relative Humidity :</b> | 39~41%  |
| <b>Test Voltage :</b>  | 120Vac / 60Hz                                                                   | <b>Phase :</b>             | Neutral |
| <b>Function Type :</b> | GPRS850 Idle + WLAN Link + TC + Adapter                                         |                            |         |
| <b>Remark :</b>        | All emissions not reported here are more than 10 dB below the prescribed limit. |                            |         |


**Final Result 1**

| Frequency (MHz) | QuasiPeak (dBμV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|--------|------|------------|-------------|--------------|
| 0.150000        | 48.2             | Off    | N    | 19.5       | 17.8        | 66.0         |
| 0.190000        | 52.6             | Off    | N    | 19.5       | 11.4        | 64.0         |
| 0.254000        | 44.8             | Off    | N    | 19.4       | 16.8        | 61.6         |
| 0.326000        | 39.6             | Off    | N    | 19.5       | 20.0        | 59.6         |
| 0.470000        | 31.9             | Off    | N    | 19.4       | 24.6        | 56.5         |
| 4.198000        | 29.9             | Off    | N    | 19.5       | 26.1        | 56.0         |

**Final Result 2**

| Frequency (MHz) | Average (dBμV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|----------------|--------|------|------------|-------------|--------------|
| 0.150000        | 28.0           | Off    | N    | 19.5       | 28.0        | 56.0         |
| 0.190000        | 37.0           | Off    | N    | 19.5       | 17.0        | 54.0         |
| 0.254000        | 29.1           | Off    | N    | 19.4       | 22.5        | 51.6         |
| 0.326000        | 24.9           | Off    | N    | 19.5       | 24.7        | 49.6         |
| 0.470000        | 19.3           | Off    | N    | 19.4       | 27.2        | 46.5         |
| 4.198000        | 22.5           | Off    | N    | 19.5       | 23.5        | 46.0         |

### 3.3 Radiated Emission Measurement

#### 3.3.1 Limit of Radiated Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

| Frequency<br>(MHz) | Field Strength<br>(microvolts/meter) | Measurement Distance<br>(meters) |
|--------------------|--------------------------------------|----------------------------------|
| 0.009 – 0.490      | 2400/F(kHz)                          | 300                              |
| 0.490 – 1.705      | 24000/F(kHz)                         | 30                               |
| 1.705 – 30.0       | 30                                   | 30                               |
| 30 – 88            | 100                                  | 3                                |
| 88 – 216           | 150                                  | 3                                |
| 216 - 960          | 200                                  | 3                                |
| Above 960          | 500                                  | 3                                |

#### 3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

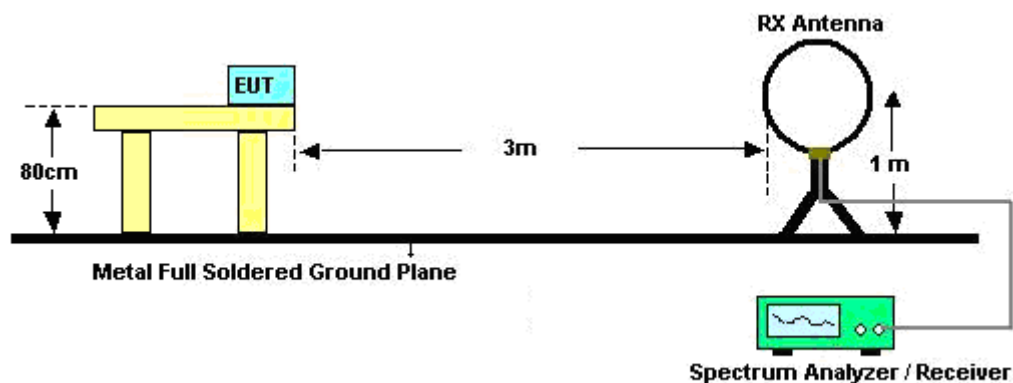
#### 3.3.3

#### 3.3.4 Test Procedures

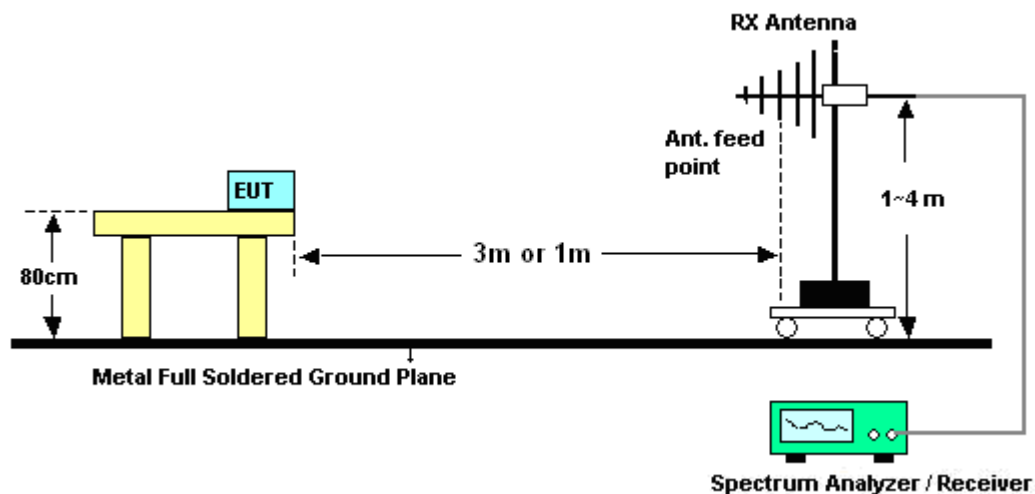
- The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
- Use the following spectrum analyzer settings:
  - Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for  $f \geq 1$  GHz, 100 kHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold.
  - Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.  
Distance extrapolation factor =  $20 \log (\text{specific distance [3m]} / \text{test distance [1m]})$  (dB)
- Follow the guidelines in ANSI C63.4-2003 with respect to maximizing the emission by rotating the EUT, measuring the emission for three EUT orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for this test in order to get the good signal level.

### 3.3.5 Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz



**3.3.6 Test Results of Radiated Emissions (9 kHz ~ 30 MHz)**

|                 |        |                     |        |  |
|-----------------|--------|---------------------|--------|--|
| Test Engineer : | Kay Wu | Temperature :       | 23~24℃ |  |
|                 |        | Relative Humidity : | 42~43% |  |

| Frequency<br>(MHz) | Level<br>(dBuV) | Over Limit<br>(dB) | Limit Line<br>(dBuV) | Remark   |
|--------------------|-----------------|--------------------|----------------------|----------|
| -                  | -               | -                  | -                    | See Note |

**Note:**

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =  $40 \log (\text{specific distance} / \text{test distance})$  (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

**3.3.7 Test Result of Radiated Emission (30 MHz ~ 10<sup>th</sup> Harmonic)**

|                        |                                                       |                            |            |
|------------------------|-------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 1                                                | <b>Temperature :</b>       | 23~24℃     |
| <b>Test Channel :</b>  | 01                                                    | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2412 MHz is Fundamental Signals which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 80.22                | 20.06               | -19.94                  | 40                          | 43.19                   | 7.57                        | 1                       | 31.7                       | -                    | -                       | Peak    |
| 193.89               | 23.4                | -20.1                   | 43.5                        | 44.46                   | 8.87                        | 1.68                    | 31.61                      | -                    | -                       | Peak    |
| 295.14               | 39.99               | -6.01                   | 46                          | 55.91                   | 13.39                       | 2.1                     | 31.41                      | -                    | -                       | Peak    |
| 300                  | 36.75               | -9.25                   | 46                          | 52.56                   | 13.46                       | 2.13                    | 31.4                       | -                    | -                       | Peak    |
| 370.7                | 42.77               | -3.23                   | 46                          | 56.25                   | 15.34                       | 2.44                    | 31.26                      | 100                  | 66                      | Peak    |
| 635.3                | 29.04               | -16.96                  | 46                          | 36.31                   | 20.34                       | 3.36                    | 30.97                      | -                    | -                       | Peak    |
| 2386.38              | 42.42               | -11.58                  | 54                          | 38.98                   | 32.13                       | 5.46                    | 34.15                      | 108                  | 12                      | Average |
| 2386.38              | 50.93               | -23.07                  | 74                          | 47.49                   | 32.13                       | 5.46                    | 34.15                      | 108                  | 12                      | Peak    |
| 2412                 | 101.82              | -                       | -                           | 98.38                   | 32.16                       | 5.44                    | 34.16                      | 108                  | 12                      | Average |
| 2412                 | 105.42              | -                       | -                           | 101.98                  | 32.16                       | 5.44                    | 34.16                      | 108                  | 12                      | Peak    |
| 2492                 | 48.6                | -25.4                   | 74                          | 45.13                   | 32.3                        | 5.37                    | 34.2                       | 108                  | 12                      | Peak    |
| 2492                 | 39.84               | -14.16                  | 54                          | 36.37                   | 32.3                        | 5.37                    | 34.2                       | 108                  | 12                      | Average |
| 8316                 | 53.21               | -20.79                  | 74                          | 42.26                   | 36                          | 10.05                   | 35.1                       | 100                  | 21                      | Peak    |
| 8316                 | 39.58               | -14.42                  | 54                          | 28.63                   | 36                          | 10.05                   | 35.1                       | 100                  | 21                      | Average |

|                        |                                                       |                            |          |
|------------------------|-------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 1                                                | <b>Temperature :</b>       | 23~24℃   |
| <b>Test Channel :</b>  | 01                                                    | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2412 MHz is Fundamental Signals which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 30.81                | 26.6                | -13.4                   | 40                          | 38.7                    | 18.95                       | 0.65                    | 31.7                       | -                    | -                       | Peak    |
| 92.37                | 24.02               | -19.48                  | 43.5                        | 45.43                   | 9.17                        | 1.12                    | 31.7                       | -                    | -                       | Peak    |
| 166.62               | 22.63               | -20.87                  | 43.5                        | 42.83                   | 9.89                        | 1.54                    | 31.63                      | -                    | -                       | Peak    |
| 371.4                | 42.59               | -3.41                   | 46                          | 56.04                   | 15.36                       | 2.45                    | 31.26                      | 100                  | 55                      | Peak    |
| 634.6                | 33.55               | -12.45                  | 46                          | 40.83                   | 20.33                       | 3.36                    | 30.97                      | -                    | -                       | Peak    |
| 808.2                | 35.34               | -10.66                  | 46                          | 39.88                   | 22.29                       | 3.87                    | 30.7                       | -                    | -                       | Peak    |
| 2385.81              | 38.1                | -15.9                   | 54                          | 34.66                   | 32.13                       | 5.46                    | 34.15                      | 100                  | 139                     | Average |
| 2385.81              | 47.84               | -26.16                  | 74                          | 44.4                    | 32.13                       | 5.46                    | 34.15                      | 100                  | 139                     | Peak    |
| 2412                 | 98.73               | -                       | -                           | 95.29                   | 32.16                       | 5.44                    | 34.16                      | 100                  | 139                     | Average |
| 2412                 | 102.3               | -                       | -                           | 98.86                   | 32.16                       | 5.44                    | 34.16                      | 100                  | 139                     | Peak    |
| 2494                 | 45.96               | -28.04                  | 74                          | 42.49                   | 32.3                        | 5.37                    | 34.2                       | 100                  | 139                     | Peak    |
| 2494                 | 36.55               | -17.45                  | 54                          | 33.08                   | 32.3                        | 5.37                    | 34.2                       | 100                  | 139                     | Average |
| 8262                 | 53.26               | -20.74                  | 74                          | 42.34                   | 36                          | 10.02                   | 35.1                       | 100                  | 248                     | Peak    |
| 8262                 | 39.45               | -14.55                  | 54                          | 28.53                   | 36                          | 10.02                   | 35.1                       | 100                  | 248                     | Average |

|                        |                                                       |                            |            |
|------------------------|-------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 2                                                | <b>Temperature :</b>       | 23~24℃     |
| <b>Test Channel :</b>  | 06                                                    | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2437 MHz is Fundamental Signals which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 79.41                | 20.01               | -19.99                  | 40                          | 43.23                   | 7.48                        | 1                       | 31.7                       | -                    | -                       | Peak    |
| 193.89               | 23.18               | -20.32                  | 43.5                        | 44.24                   | 8.87                        | 1.68                    | 31.61                      | -                    | -                       | Peak    |
| 291.9                | 36.2                | -9.8                    | 46                          | 52.18                   | 13.35                       | 2.09                    | 31.42                      | -                    | -                       | Peak    |
| 300                  | 37.12               | -8.88                   | 46                          | 52.93                   | 13.46                       | 2.13                    | 31.4                       | -                    | -                       | Peak    |
| 369.3                | 42.85               | -3.15                   | 46                          | 56.36                   | 15.31                       | 2.44                    | 31.26                      | 100                  | 117                     | Peak    |
| 872.6                | 31.36               | -14.64                  | 46                          | 35.09                   | 22.92                       | 4.05                    | 30.7                       | -                    | -                       | Peak    |
| 2390                 | 44.28               | -29.72                  | 74                          | 40.85                   | 32.13                       | 5.46                    | 34.16                      | 100                  | 340                     | Peak    |
| 2390                 | 33.35               | -20.65                  | 54                          | 29.92                   | 32.13                       | 5.46                    | 34.16                      | 100                  | 340                     | Average |
| 2437                 | 105.1               | -                       | -                           | 101.64                  | 32.22                       | 5.41                    | 34.17                      | 100                  | 340                     | Peak    |
| 2437                 | 101.4               | -                       | -                           | 97.94                   | 32.22                       | 5.41                    | 34.17                      | 100                  | 340                     | Average |
| 2484                 | 47.43               | -26.57                  | 74                          | 43.97                   | 32.27                       | 5.38                    | 34.19                      | 100                  | 340                     | Peak    |
| 2484                 | 36.03               | -17.97                  | 54                          | 32.57                   | 32.27                       | 5.38                    | 34.19                      | 100                  | 340                     | Average |
| 8313                 | 53.34               | -20.66                  | 74                          | 42.39                   | 36                          | 10.05                   | 35.1                       | 100                  | 142                     | Peak    |
| 8313                 | 39.39               | -14.61                  | 54                          | 28.44                   | 36                          | 10.05                   | 35.1                       | 100                  | 142                     | Average |



|                        |                                                       |                            |          |
|------------------------|-------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 2                                                | <b>Temperature :</b>       | 23~24℃   |
| <b>Test Channel :</b>  | 06                                                    | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2437 MHz is Fundamental Signals which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 82.65                | 23.3                | -16.7                   | 40                          | 46.15                   | 7.83                        | 1.02                    | 31.7                       | -                    | -                       | Peak    |
| 92.37                | 25.07               | -18.43                  | 43.5                        | 46.48                   | 9.17                        | 1.12                    | 31.7                       | -                    | -                       | Peak    |
| 295.14               | 31.02               | -14.98                  | 46                          | 46.94                   | 13.39                       | 2.1                     | 31.41                      | -                    | -                       | Peak    |
| 371.4                | 42.72               | -3.28                   | 46                          | 56.17                   | 15.36                       | 2.45                    | 31.26                      | 100                  | 221                     | Peak    |
| 477.8                | 31.25               | -14.75                  | 46                          | 41.79                   | 17.72                       | 2.86                    | 31.12                      | -                    | -                       | Peak    |
| 637.4                | 33.55               | -12.45                  | 46                          | 40.79                   | 20.35                       | 3.37                    | 30.96                      | -                    | -                       | Peak    |
| 2390                 | 44.15               | -29.85                  | 74                          | 40.72                   | 32.13                       | 5.46                    | 34.16                      | 100                  | 141                     | Peak    |
| 2390                 | 33.02               | -20.98                  | 54                          | 29.59                   | 32.13                       | 5.46                    | 34.16                      | 100                  | 141                     | Average |
| 2437                 | 102.68              | -                       | -                           | 99.22                   | 32.22                       | 5.41                    | 34.17                      | 100                  | 141                     | Peak    |
| 2437                 | 98.87               | -                       | -                           | 95.41                   | 32.22                       | 5.41                    | 34.17                      | 100                  | 141                     | Average |
| 2484                 | 44.33               | -29.67                  | 74                          | 40.87                   | 32.27                       | 5.38                    | 34.19                      | 100                  | 141                     | Peak    |
| 2484                 | 32.87               | -21.13                  | 54                          | 29.41                   | 32.27                       | 5.38                    | 34.19                      | 100                  | 141                     | Average |
| 4874                 | 55.27               | -18.73                  | 74                          | 47.57                   | 34.35                       | 7.85                    | 34.5                       | 102                  | 0                       | Peak    |
| 4874                 | 51.41               | -2.59                   | 54                          | 43.71                   | 34.35                       | 7.85                    | 34.5                       | 102                  | 0                       | Average |
| 8358                 | 52.71               | -21.29                  | 74                          | 41.72                   | 36                          | 10.09                   | 35.1                       | 100                  | 119                     | Peak    |
| 8358                 | 40.43               | -13.57                  | 54                          | 29.44                   | 36                          | 10.09                   | 35.1                       | 100                  | 119                     | Average |

|                        |                                                       |                            |            |
|------------------------|-------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 3                                                | <b>Temperature :</b>       | 23~24°C    |
| <b>Test Channel :</b>  | 11                                                    | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2462 MHz is Fundamental Signals which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 79.41                | 20.2                | -19.8                   | 40                          | 43.42                   | 7.48                        | 1                       | 31.7                       | -                    | -                       | Peak    |
| 230.61               | 29.72               | -16.28                  | 46                          | 48.99                   | 10.43                       | 1.84                    | 31.54                      | -                    | -                       | Peak    |
| 294.06               | 39.27               | -6.73                   | 46                          | 55.2                    | 13.38                       | 2.1                     | 31.41                      | -                    | -                       | Peak    |
| 369.3                | 42.34               | -3.66                   | 46                          | 55.85                   | 15.31                       | 2.44                    | 31.26                      | 100                  | 337                     | Peak    |
| 637.4                | 27.85               | -18.15                  | 46                          | 35.09                   | 20.35                       | 3.37                    | 30.96                      | -                    | -                       | Peak    |
| 872.6                | 31.48               | -14.52                  | 46                          | 35.21                   | 22.92                       | 4.05                    | 30.7                       | -                    | -                       | Peak    |
| 2374                 | 46.36               | -27.64                  | 74                          | 42.93                   | 32.11                       | 5.47                    | 34.15                      | 103                  | 17                      | Peak    |
| 2374                 | 35.72               | -18.28                  | 54                          | 32.29                   | 32.11                       | 5.47                    | 34.15                      | 103                  | 17                      | Average |
| 2462                 | 109.2               | -                       | -                           | 105.74                  | 32.24                       | 5.4                     | 34.18                      | 103                  | 17                      | Peak    |
| 2462                 | 105.25              | -                       | -                           | 101.79                  | 32.24                       | 5.4                     | 34.18                      | 103                  | 17                      | Average |
| 2483.5               | 49.65               | -4.35                   | 54                          | 46.19                   | 32.27                       | 5.38                    | 34.19                      | 103                  | 17                      | Average |
| 2483.5               | 56.15               | -17.85                  | 74                          | 52.69                   | 32.27                       | 5.38                    | 34.19                      | 103                  | 17                      | Peak    |
| 4924                 | 51.41               | -22.59                  | 74                          | 43.65                   | 34.37                       | 7.89                    | 34.5                       | 100                  | 221                     | Peak    |
| 4924                 | 47.65               | -6.35                   | 54                          | 39.89                   | 34.37                       | 7.89                    | 34.5                       | 100                  | 221                     | Average |
| 8316                 | 52.94               | -21.06                  | 74                          | 41.99                   | 36                          | 10.05                   | 35.1                       | 133                  | 44                      | Peak    |
| 8316                 | 39.72               | -14.28                  | 54                          | 28.77                   | 36                          | 10.05                   | 35.1                       | 133                  | 44                      | Average |



|                        |                                                       |                            |          |
|------------------------|-------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 3                                                | <b>Temperature :</b>       | 23~24°C  |
| <b>Test Channel :</b>  | 11                                                    | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2462 MHz is Fundamental Signals which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 31.62                | 25.99               | -14.01                  | 40                          | 38.63                   | 18.4                        | 0.66                    | 31.7                       | -                    | -                       | Peak    |
| 92.37                | 24.16               | -19.34                  | 43.5                        | 45.57                   | 9.17                        | 1.12                    | 31.7                       | -                    | -                       | Peak    |
| 166.62               | 22.97               | -20.53                  | 43.5                        | 43.17                   | 9.89                        | 1.54                    | 31.63                      | -                    | -                       | Peak    |
| 371.4                | 42.09               | -3.91                   | 46                          | 55.54                   | 15.36                       | 2.45                    | 31.26                      | 100                  | 66                      | Peak    |
| 634.6                | 33.6                | -12.4                   | 46                          | 40.88                   | 20.33                       | 3.36                    | 30.97                      | -                    | -                       | Peak    |
| 808.2                | 35.82               | -10.18                  | 46                          | 40.36                   | 22.29                       | 3.87                    | 30.7                       | -                    | -                       | Peak    |
| 2374                 | 44.59               | -29.41                  | 74                          | 41.16                   | 32.11                       | 5.47                    | 34.15                      | 100                  | 134                     | Peak    |
| 2374                 | 34.46               | -19.54                  | 54                          | 31.03                   | 32.11                       | 5.47                    | 34.15                      | 100                  | 134                     | Average |
| 2462                 | 105.88              | -                       | -                           | 102.42                  | 32.24                       | 5.4                     | 34.18                      | 100                  | 134                     | Peak    |
| 2462                 | 102.45              | -                       | -                           | 98.99                   | 32.24                       | 5.4                     | 34.18                      | 100                  | 134                     | Average |
| 2483.5               | 42.76               | -11.24                  | 54                          | 39.3                    | 32.27                       | 5.38                    | 34.19                      | 100                  | 134                     | Average |
| 2483.5               | 51.56               | -22.44                  | 74                          | 48.1                    | 32.27                       | 5.38                    | 34.19                      | 100                  | 134                     | Peak    |
| 4924                 | 54.91               | -19.09                  | 74                          | 47.15                   | 34.37                       | 7.89                    | 34.5                       | 100                  | 0                       | Peak    |
| 4924                 | 51.08               | -2.92                   | 54                          | 43.32                   | 34.37                       | 7.89                    | 34.5                       | 100                  | 0                       | Average |
| 8397                 | 52.98               | -21.02                  | 74                          | 41.97                   | 36                          | 10.11                   | 35.1                       | 114                  | 136                     | Peak    |
| 8397                 | 39                  | -15                     | 54                          | 27.99                   | 36                          | 10.11                   | 35.1                       | 114                  | 136                     | Average |



|                        |                                                       |                            |            |
|------------------------|-------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 4                                                | <b>Temperature :</b>       | 23~24℃     |
| <b>Test Channel :</b>  | 01                                                    | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2412 MHz is Fundamental Signals which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 79.41                | 19.98               | -20.02                  | 40                          | 43.2                    | 7.48                        | 1                       | 31.7                       | -                    | -                       | Peak    |
| 193.89               | 23.98               | -19.52                  | 43.5                        | 45.04                   | 8.87                        | 1.68                    | 31.61                      | -                    | -                       | Peak    |
| 292.98               | 39.17               | -6.83                   | 46                          | 55.12                   | 13.37                       | 2.09                    | 31.41                      | -                    | -                       | Peak    |
| 301.4                | 37.34               | -8.66                   | 46                          | 53.09                   | 13.51                       | 2.14                    | 31.4                       | -                    | -                       | Peak    |
| 371.4                | 42.62               | -3.38                   | 46                          | 56.07                   | 15.36                       | 2.45                    | 31.26                      | 100                  | 221                     | Peak    |
| 872.6                | 33.82               | -12.18                  | 46                          | 37.55                   | 22.92                       | 4.05                    | 30.7                       | -                    | -                       | Peak    |
| 2390                 | 45.44               | -8.56                   | 54                          | 42.01                   | 32.13                       | 5.46                    | 34.16                      | 103                  | 8                       | Average |
| 2390                 | 61.04               | -12.96                  | 74                          | 57.61                   | 32.13                       | 5.46                    | 34.16                      | 103                  | 8                       | Peak    |
| 2412                 | 96.4                | -                       | -                           | 92.96                   | 32.16                       | 5.44                    | 34.16                      | 103                  | 8                       | Average |
| 2412                 | 105.22              | -                       | -                           | 101.77                  | 32.19                       | 5.43                    | 34.17                      | 103                  | 8                       | Peak    |
| 2484                 | 47.55               | -26.45                  | 74                          | 44.09                   | 32.27                       | 5.38                    | 34.19                      | 103                  | 8                       | Peak    |
| 2484                 | 37.26               | -16.74                  | 54                          | 33.8                    | 32.27                       | 5.38                    | 34.19                      | 103                  | 8                       | Average |
| 8457                 | 54.33               | -19.67                  | 74                          | 43.27                   | 36                          | 10.16                   | 35.1                       | 100                  | 216                     | Peak    |
| 8457                 | 39.58               | -14.42                  | 54                          | 28.52                   | 36                          | 10.16                   | 35.1                       | 100                  | 216                     | Average |

|                        |                                                       |                            |          |
|------------------------|-------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 4                                                | <b>Temperature :</b>       | 23~24℃   |
| <b>Test Channel :</b>  | 01                                                    | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2412 MHz is Fundamental Signals which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 30.81                | 26.32               | -13.68                  | 40                          | 38.42                   | 18.95                       | 0.65                    | 31.7                       | -                    | -                       | Peak    |
| 92.37                | 24.74               | -18.76                  | 43.5                        | 46.15                   | 9.17                        | 1.12                    | 31.7                       | -                    | -                       | Peak    |
| 294.06               | 31.59               | -14.41                  | 46                          | 47.52                   | 13.38                       | 2.1                     | 31.41                      | -                    | -                       | Peak    |
| 369.3                | 42.08               | -3.92                   | 46                          | 55.59                   | 15.31                       | 2.44                    | 31.26                      | 100                  | 64                      | Peak    |
| 637.4                | 32.84               | -13.16                  | 46                          | 40.08                   | 20.35                       | 3.37                    | 30.96                      | -                    | -                       | Peak    |
| 808.2                | 35.67               | -10.33                  | 46                          | 40.21                   | 22.29                       | 3.87                    | 30.7                       | -                    | -                       | Peak    |
| 2390                 | 39.18               | -14.82                  | 54                          | 35.75                   | 32.13                       | 5.46                    | 34.16                      | 102                  | 139                     | Average |
| 2390                 | 54.89               | -19.11                  | 74                          | 51.46                   | 32.13                       | 5.46                    | 34.16                      | 102                  | 139                     | Peak    |
| 2412                 | 92.74               | -                       | -                           | 89.3                    | 32.16                       | 5.44                    | 34.16                      | 102                  | 139                     | Average |
| 2412                 | 101.49              | -                       | -                           | 98.05                   | 32.16                       | 5.44                    | 34.16                      | 102                  | 139                     | Peak    |
| 2494                 | 46.35               | -27.65                  | 74                          | 42.88                   | 32.3                        | 5.37                    | 34.2                       | 102                  | 139                     | Peak    |
| 2494                 | 33.36               | -20.64                  | 54                          | 29.89                   | 32.3                        | 5.37                    | 34.2                       | 102                  | 139                     | Average |
| 8319                 | 52.71               | -21.29                  | 74                          | 41.75                   | 36                          | 10.06                   | 35.1                       | 124                  | 211                     | Peak    |
| 8319                 | 39.24               | -14.76                  | 54                          | 28.28                   | 36                          | 10.06                   | 35.1                       | 124                  | 211                     | Average |



|                        |                                                       |                            |            |
|------------------------|-------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 5                                                | <b>Temperature :</b>       | 23~24℃     |
| <b>Test Channel :</b>  | 06                                                    | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2437 MHz is Fundamental Signals which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 30                   | 21.41               | -18.59                  | 40                          | 32.96                   | 19.51                       | 0.64                    | 31.7                       | -                    | -                       | Peak    |
| 79.41                | 19.83               | -20.17                  | 40                          | 43.05                   | 7.48                        | 1                       | 31.7                       | -                    | -                       | Peak    |
| 294.33               | 39.44               | -6.56                   | 46                          | 55.36                   | 13.39                       | 2.1                     | 31.41                      | -                    | -                       | Peak    |
| 369.3                | 42.55               | -3.45                   | 46                          | 56.06                   | 15.31                       | 2.44                    | 31.26                      | 100                  | 28                      | Peak    |
| 528.2                | 27.82               | -18.18                  | 46                          | 37.15                   | 18.71                       | 3.03                    | 31.07                      | -                    | -                       | Peak    |
| 872.6                | 31.77               | -14.23                  | 46                          | 35.5                    | 22.92                       | 4.05                    | 30.7                       | -                    | -                       | Peak    |
| 2390                 | 44.27               | -29.73                  | 74                          | 40.84                   | 32.13                       | 5.46                    | 34.16                      | 101                  | 339                     | Peak    |
| 2390                 | 33.63               | -20.37                  | 54                          | 30.2                    | 32.13                       | 5.46                    | 34.16                      | 101                  | 339                     | Average |
| 2437                 | 106.21              | -                       | -                           | 102.76                  | 32.22                       | 5.41                    | 34.18                      | 101                  | 339                     | Peak    |
| 2437                 | 97.37               | -                       | -                           | 93.91                   | 32.22                       | 5.41                    | 34.17                      | 101                  | 339                     | Average |
| 2484                 | 50.71               | -23.29                  | 74                          | 47.25                   | 32.27                       | 5.38                    | 34.19                      | 101                  | 339                     | Peak    |
| 2484                 | 38.34               | -15.66                  | 54                          | 34.88                   | 32.27                       | 5.38                    | 34.19                      | 101                  | 339                     | Average |
| 8139                 | 51.83               | -22.17                  | 74                          | 41                      | 36                          | 9.93                    | 35.1                       | 100                  | 76                      | Peak    |
| 8139                 | 39.55               | -14.45                  | 54                          | 28.72                   | 36                          | 9.93                    | 35.1                       | 100                  | 76                      | Average |

|                        |                                                       |                            |          |
|------------------------|-------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 5                                                | <b>Temperature :</b>       | 23~24℃   |
| <b>Test Channel :</b>  | 06                                                    | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2437 MHz is Fundamental Signals which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 31.62                | 26.09               | -13.91                  | 40                          | 38.73                   | 18.4                        | 0.66                    | 31.7                       | -                    | -                       | Peak    |
| 92.37                | 24.73               | -18.77                  | 43.5                        | 46.14                   | 9.17                        | 1.12                    | 31.7                       | -                    | -                       | Peak    |
| 298.65               | 30.33               | -15.67                  | 46                          | 46.16                   | 13.45                       | 2.12                    | 31.4                       | -                    | -                       | Peak    |
| 371.4                | 42.83               | -3.17                   | 46                          | 56.28                   | 15.36                       | 2.45                    | 31.26                      | 100                  | 31                      | Peak    |
| 637.4                | 36.26               | -9.74                   | 46                          | 43.5                    | 20.35                       | 3.37                    | 30.96                      | -                    | -                       | Peak    |
| 808.2                | 35.38               | -10.62                  | 46                          | 39.92                   | 22.29                       | 3.87                    | 30.7                       | -                    | -                       | Peak    |
| 2366                 | 44.46               | -29.54                  | 74                          | 41.04                   | 32.08                       | 5.49                    | 34.15                      | 100                  | 141                     | Peak    |
| 2366                 | 32.31               | -21.69                  | 54                          | 28.89                   | 32.08                       | 5.49                    | 34.15                      | 100                  | 141                     | Average |
| 2437                 | 102.34              | -                       | -                           | 98.88                   | 32.22                       | 5.41                    | 34.17                      | 100                  | 141                     | Peak    |
| 2437                 | 93.58               | -                       | -                           | 90.12                   | 32.22                       | 5.41                    | 34.17                      | 100                  | 141                     | Average |
| 2484                 | 45.12               | -28.88                  | 74                          | 41.66                   | 32.27                       | 5.38                    | 34.19                      | 100                  | 141                     | Peak    |
| 2484                 | 33.55               | -20.45                  | 54                          | 30.09                   | 32.27                       | 5.38                    | 34.19                      | 100                  | 141                     | Average |
| 8316                 | 53.27               | -20.73                  | 74                          | 42.32                   | 36                          | 10.05                   | 35.1                       | 134                  | 310                     | Peak    |
| 8316                 | 40.06               | -13.94                  | 54                          | 29.11                   | 36                          | 10.05                   | 35.1                       | 134                  | 310                     | Average |



|                        |                                                       |                            |            |
|------------------------|-------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 6                                                | <b>Temperature :</b>       | 23~24℃     |
| <b>Test Channel :</b>  | 11                                                    | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2462 MHz is Fundamental Signals which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 79.41                | 19.86               | -20.14                  | 40                          | 43.08                   | 7.48                        | 1                       | 31.7                       | -                    | -                       | Peak    |
| 193.62               | 23.82               | -19.68                  | 43.5                        | 44.88                   | 8.87                        | 1.68                    | 31.61                      | -                    | -                       | Peak    |
| 291.09               | 39.42               | -6.58                   | 46                          | 55.42                   | 13.34                       | 2.08                    | 31.42                      | -                    | -                       | Peak    |
| 300                  | 37.24               | -8.76                   | 46                          | 53.05                   | 13.46                       | 2.13                    | 31.4                       | -                    | -                       | Peak    |
| 369.3                | 42.14               | -3.86                   | 46                          | 55.65                   | 15.31                       | 2.44                    | 31.26                      | 100                  | 221                     | Peak    |
| 872.6                | 32.49               | -13.51                  | 46                          | 36.22                   | 22.92                       | 4.05                    | 30.7                       | -                    | -                       | Peak    |
| 2382                 | 44.83               | -29.17                  | 74                          | 41.4                    | 32.11                       | 5.47                    | 34.15                      | 105                  | 18                      | Peak    |
| 2382                 | 34.12               | -19.88                  | 54                          | 30.69                   | 32.11                       | 5.47                    | 34.15                      | 105                  | 18                      | Average |
| 2462                 | 107.18              | -                       | -                           | 103.72                  | 32.24                       | 5.4                     | 34.18                      | 105                  | 18                      | Peak    |
| 2462                 | 98.45               | -                       | -                           | 94.99                   | 32.24                       | 5.4                     | 34.18                      | 105                  | 18                      | Average |
| 2483.5               | 52.36               | -1.64                   | 54                          | 48.9                    | 32.27                       | 5.38                    | 34.19                      | 105                  | 18                      | Average |
| 2483.5               | 70.69               | -3.31                   | 74                          | 67.23                   | 32.27                       | 5.38                    | 34.19                      | 105                  | 18                      | Peak    |
| 8307                 | 53.46               | -20.54                  | 74                          | 42.51                   | 36                          | 10.05                   | 35.1                       | 100                  | 265                     | Peak    |
| 8307                 | 39.83               | -14.17                  | 54                          | 28.88                   | 36                          | 10.05                   | 35.1                       | 100                  | 265                     | Average |



|                        |                                                       |                            |          |
|------------------------|-------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 6                                                | <b>Temperature :</b>       | 23~24℃   |
| <b>Test Channel :</b>  | 11                                                    | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2462 MHz is Fundamental Signals which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 31.62                | 26.71               | -13.29                  | 40                          | 39.35                   | 18.4                        | 0.66                    | 31.7                       | -                    | -                       | Peak    |
| 83.46                | 23.34               | -16.66                  | 40                          | 46.05                   | 7.96                        | 1.03                    | 31.7                       | -                    | -                       | Peak    |
| 299.46               | 32.09               | -13.91                  | 46                          | 47.9                    | 13.46                       | 2.13                    | 31.4                       | -                    | -                       | Peak    |
| 369.3                | 42.4                | -3.6                    | 46                          | 55.91                   | 15.31                       | 2.44                    | 31.26                      | 100                  | 111                     | Peak    |
| 637.4                | 33.62               | -12.38                  | 46                          | 40.86                   | 20.35                       | 3.37                    | 30.96                      | -                    | -                       | Peak    |
| 808.2                | 36.15               | -9.85                   | 46                          | 40.69                   | 22.29                       | 3.87                    | 30.7                       | -                    | -                       | Peak    |
| 2380                 | 43.76               | -30.24                  | 74                          | 40.33                   | 32.11                       | 5.47                    | 34.15                      | 100                  | 133                     | Peak    |
| 2380                 | 32.84               | -21.16                  | 54                          | 29.41                   | 32.11                       | 5.47                    | 34.15                      | 100                  | 133                     | Average |
| 2462                 | 103.55              | -                       | -                           | 100.09                  | 32.24                       | 5.4                     | 34.18                      | 100                  | 133                     | Peak    |
| 2462                 | 94.75               | -                       | -                           | 91.29                   | 32.24                       | 5.4                     | 34.18                      | 100                  | 133                     | Average |
| 2483.5               | 46.3                | -7.7                    | 54                          | 42.84                   | 32.27                       | 5.38                    | 34.19                      | 100                  | 133                     | Average |
| 2483.5               | 64.99               | -9.01                   | 74                          | 61.53                   | 32.27                       | 5.38                    | 34.19                      | 100                  | 133                     | Peak    |
| 8412                 | 53.58               | -20.42                  | 74                          | 42.56                   | 36                          | 10.12                   | 35.1                       | 124                  | 321                     | Peak    |
| 8412                 | 40.22               | -13.78                  | 54                          | 29.2                    | 36                          | 10.12                   | 35.1                       | 124                  | 321                     | Average |



|                        |                                                       |                            |            |
|------------------------|-------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 7                                                | <b>Temperature :</b>       | 23~24°C    |
| <b>Test Channel :</b>  | 01                                                    | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2412 MHz is Fundamental Signals which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 2390                 | 41.77               | -12.23                  | 54                          | 38.34                   | 32.13                       | 5.46                    | 34.16                      | 131                  | 342                     | Average |
| 2390                 | 62.28               | -11.72                  | 74                          | 58.85                   | 32.13                       | 5.46                    | 34.16                      | 131                  | 342                     | Peak    |
| 2412                 | 94.32               | -                       | -                           | 90.88                   | 32.16                       | 5.44                    | 34.16                      | 131                  | 342                     | Average |
| 2412                 | 103.55              | -                       | -                           | 100.11                  | 32.16                       | 5.44                    | 34.16                      | 131                  | 342                     | Peak    |
| 2486                 | 46.79               | -27.21                  | 74                          | 43.33                   | 32.27                       | 5.38                    | 34.19                      | 131                  | 342                     | Peak    |
| 2486                 | 36.4                | -17.6                   | 54                          | 32.94                   | 32.27                       | 5.38                    | 34.19                      | 131                  | 342                     | Average |



|                        |                                                       |                            |          |
|------------------------|-------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 7                                                | <b>Temperature :</b>       | 23~24°C  |
| <b>Test Channel :</b>  | 01                                                    | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2412 MHz is Fundamental Signals which can be ignored. |                            |          |

| <b>Frequency<br/>( MHz )</b> | <b>Level<br/>( dBuV/m )</b> | <b>Over<br/>Limit<br/>( dB )</b> | <b>Limit<br/>Line<br/>( dBuV/m )</b> | <b>Read<br/>Level<br/>(dBuV)</b> | <b>Antenna<br/>Factor<br/>( dB )</b> | <b>Cable<br/>Loss<br/>( dB )</b> | <b>Preamp<br/>Factor<br/>( dB )</b> | <b>Ant<br/>Pos<br/>( cm )</b> | <b>Table<br/>Pos<br/>( deg )</b> | <b>Remark</b> |
|------------------------------|-----------------------------|----------------------------------|--------------------------------------|----------------------------------|--------------------------------------|----------------------------------|-------------------------------------|-------------------------------|----------------------------------|---------------|
| 2390                         | 37.62                       | -16.38                           | 54                                   | 34.19                            | 32.13                                | 5.46                             | 34.16                               | 103                           | 138                              | Average       |
| 2390                         | 53.4                        | -20.6                            | 74                                   | 49.97                            | 32.13                                | 5.46                             | 34.16                               | 103                           | 138                              | Peak          |
| 2412                         | 91.44                       | -                                | -                                    | 88                               | 32.16                                | 5.44                             | 34.16                               | 103                           | 138                              | Average       |
| 2412                         | 101.09                      | -                                | -                                    | 97.65                            | 32.16                                | 5.44                             | 34.16                               | 103                           | 138                              | Peak          |
| 2486                         | 44.56                       | -29.44                           | 74                                   | 41.1                             | 32.27                                | 5.38                             | 34.19                               | 103                           | 138                              | Peak          |
| 2486                         | 32.57                       | -21.43                           | 54                                   | 29.11                            | 32.27                                | 5.38                             | 34.19                               | 103                           | 138                              | Average       |



|                        |                                                       |                            |            |
|------------------------|-------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 8                                                | <b>Temperature :</b>       | 23~24°C    |
| <b>Test Channel :</b>  | 06                                                    | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2437 MHz is Fundamental Signals which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 2324                 | 44.61               | -29.39                  | 74                          | 41.21                   | 32.02                       | 5.51                    | 34.13                      | 102                  | 339                     | Peak    |
| 2324                 | 32.29               | -21.71                  | 54                          | 28.89                   | 32.02                       | 5.51                    | 34.13                      | 102                  | 339                     | Average |
| 2437                 | 105.33              | -                       | -                           | 101.88                  | 32.22                       | 5.41                    | 34.18                      | 102                  | 339                     | Peak    |
| 2437                 | 96.19               | -                       | -                           | 92.73                   | 32.22                       | 5.41                    | 34.17                      | 102                  | 339                     | Average |
| 2484                 | 49.73               | -24.27                  | 74                          | 46.27                   | 32.27                       | 5.38                    | 34.19                      | 102                  | 339                     | Peak    |
| 2484                 | 37.69               | -16.31                  | 54                          | 34.23                   | 32.27                       | 5.38                    | 34.19                      | 102                  | 339                     | Average |



|                        |                                                       |                            |          |
|------------------------|-------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 8                                                | <b>Temperature :</b>       | 23~24°C  |
| <b>Test Channel :</b>  | 06                                                    | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2437 MHz is Fundamental Signals which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 2390                 | 44.38               | -29.62                  | 74                          | 40.95                   | 32.13                       | 5.46                    | 34.16                      | 102                  | 115                     | Peak    |
| 2390                 | 33.58               | -20.42                  | 54                          | 30.15                   | 32.13                       | 5.46                    | 34.16                      | 102                  | 115                     | Average |
| 2437                 | 101.04              | -                       | -                           | 97.59                   | 32.19                       | 5.43                    | 34.17                      | 102                  | 115                     | Peak    |
| 2437                 | 91.88               | -                       | -                           | 88.42                   | 32.22                       | 5.41                    | 34.17                      | 102                  | 115                     | Average |
| 2484                 | 47.37               | -26.63                  | 74                          | 43.91                   | 32.27                       | 5.38                    | 34.19                      | 102                  | 115                     | Peak    |
| 2484                 | 34.86               | -19.14                  | 54                          | 31.4                    | 32.27                       | 5.38                    | 34.19                      | 102                  | 115                     | Average |



|                        |                                                       |                            |            |
|------------------------|-------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 9                                                | <b>Temperature :</b>       | 23~24°C    |
| <b>Test Channel :</b>  | 11                                                    | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2462 MHz is Fundamental Signals which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 2348                 | 45.56               | -28.44                  | 74                          | 42.15                   | 32.05                       | 5.5                     | 34.14                      | 102                  | 14                      | Peak    |
| 2348                 | 33.1                | -20.9                   | 54                          | 29.69                   | 32.05                       | 5.5                     | 34.14                      | 102                  | 14                      | Average |
| 2462                 | 106.55              | -                       | -                           | 103.09                  | 32.24                       | 5.4                     | 34.18                      | 102                  | 14                      | Peak    |
| 2462                 | 96.98               | -                       | -                           | 93.52                   | 32.24                       | 5.4                     | 34.18                      | 102                  | 14                      | Average |
| 2483.5               | 52.77               | -1.23                   | 54                          | 49.31                   | 32.27                       | 5.38                    | 34.19                      | 102                  | 14                      | Average |
| 2483.5               | 72.38               | -1.62                   | 74                          | 68.92                   | 32.27                       | 5.38                    | 34.19                      | 102                  | 14                      | Peak    |



|                        |                                                       |                            |          |
|------------------------|-------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 9                                                | <b>Temperature :</b>       | 23~24°C  |
| <b>Test Channel :</b>  | 11                                                    | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2462 MHz is Fundamental Signals which can be ignored. |                            |          |

| <b>Frequency<br/>( MHz )</b> | <b>Level<br/>( dBuV/m )</b> | <b>Over<br/>Limit<br/>( dB )</b> | <b>Limit<br/>Line<br/>( dBuV/m )</b> | <b>Read<br/>Level<br/>(dBuV)</b> | <b>Antenna<br/>Factor<br/>( dB )</b> | <b>Cable<br/>Loss<br/>( dB )</b> | <b>Preamp<br/>Factor<br/>( dB )</b> | <b>Ant<br/>Pos<br/>( cm )</b> | <b>Table<br/>Pos<br/>( deg )</b> | <b>Remark</b> |
|------------------------------|-----------------------------|----------------------------------|--------------------------------------|----------------------------------|--------------------------------------|----------------------------------|-------------------------------------|-------------------------------|----------------------------------|---------------|
| 2388                         | 44.52                       | -29.48                           | 74                                   | 41.08                            | 32.13                                | 5.46                             | 34.15                               | 100                           | 133                              | Peak          |
| 2388                         | 32.94                       | -21.06                           | 54                                   | 29.5                             | 32.13                                | 5.46                             | 34.15                               | 100                           | 133                              | Average       |
| 2462                         | 104.13                      | -                                | -                                    | 100.67                           | 32.24                                | 5.4                              | 34.18                               | 100                           | 133                              | Peak          |
| 2462                         | 94.9                        | -                                | -                                    | 91.44                            | 32.24                                | 5.4                              | 34.18                               | 100                           | 133                              | Average       |
| 2483.5                       | 48.18                       | -5.82                            | 54                                   | 44.72                            | 32.27                                | 5.38                             | 34.19                               | 100                           | 133                              | Average       |
| 2483.5                       | 68.4                        | -5.6                             | 74                                   | 64.94                            | 32.27                                | 5.38                             | 34.19                               | 100                           | 133                              | Peak          |



|                        |                                                       |                            |            |
|------------------------|-------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 10                                               | <b>Temperature :</b>       | 23~24°C    |
| <b>Test Channel :</b>  | 03                                                    | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2422 MHz is Fundamental Signals which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 2387.9               | 42.97               | -11.03                  | 54                          | 39.53                   | 32.13                       | 5.46                    | 34.15                      | 105                  | 14                      | Average |
| 2387.9               | 56.19               | -17.81                  | 74                          | 52.75                   | 32.13                       | 5.46                    | 34.15                      | 105                  | 14                      | Peak    |
| 2422                 | 91                  | -                       | -                           | 87.55                   | 32.19                       | 5.43                    | 34.17                      | 105                  | 14                      | Average |
| 2422                 | 99.87               | -                       | -                           | 96.42                   | 32.19                       | 5.43                    | 34.17                      | 105                  | 14                      | Peak    |
| 2484                 | 49.36               | -24.64                  | 74                          | 45.9                    | 32.27                       | 5.38                    | 34.19                      | 105                  | 14                      | Peak    |
| 2484                 | 37.27               | -16.73                  | 54                          | 33.81                   | 32.27                       | 5.38                    | 34.19                      | 105                  | 14                      | Average |



|                        |                                                       |                            |          |
|------------------------|-------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 10                                               | <b>Temperature :</b>       | 23~24℃   |
| <b>Test Channel :</b>  | 03                                                    | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2422 MHz is Fundamental Signals which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 2388.85              | 39.34               | -14.66                  | 54                          | 35.9                    | 32.13                       | 5.46                    | 34.15                      | 101                  | 114                     | Average |
| 2388.85              | 51.42               | -22.58                  | 74                          | 47.98                   | 32.13                       | 5.46                    | 34.15                      | 101                  | 114                     | Peak    |
| 2422                 | 86.15               | -                       | -                           | 82.7                    | 32.19                       | 5.43                    | 34.17                      | 101                  | 114                     | Average |
| 2422                 | 96.03               | -                       | -                           | 92.58                   | 32.19                       | 5.43                    | 34.17                      | 101                  | 114                     | Peak    |
| 2494                 | 44.79               | -29.21                  | 74                          | 41.32                   | 32.3                        | 5.37                    | 34.2                       | 101                  | 114                     | Peak    |
| 2494                 | 33.58               | -20.42                  | 54                          | 30.11                   | 32.3                        | 5.37                    | 34.2                       | 101                  | 114                     | Average |



|                        |                                                       |                            |            |
|------------------------|-------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 11                                               | <b>Temperature :</b>       | 23~24°C    |
| <b>Test Channel :</b>  | 06                                                    | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2437 MHz is Fundamental Signals which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 2390                 | 50.86               | -23.14                  | 74                          | 47.43                   | 32.13                       | 5.46                    | 34.16                      | 101                  | 352                     | Peak    |
| 2390                 | 37.85               | -16.15                  | 54                          | 34.42                   | 32.13                       | 5.46                    | 34.16                      | 101                  | 352                     | Average |
| 2437                 | 100.17              | -                       | -                           | 96.71                   | 32.24                       | 5.4                     | 34.18                      | 101                  | 352                     | Peak    |
| 2437                 | 91.05               | -                       | -                           | 87.59                   | 32.22                       | 5.41                    | 34.17                      | 101                  | 352                     | Average |
| 2484                 | 60.43               | -13.57                  | 74                          | 56.97                   | 32.27                       | 5.38                    | 34.19                      | 101                  | 352                     | Peak    |
| 2484                 | 43.82               | -10.18                  | 54                          | 40.36                   | 32.27                       | 5.38                    | 34.19                      | 101                  | 352                     | Average |



|                        |                                                       |                            |          |
|------------------------|-------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 11                                               | <b>Temperature :</b>       | 23~24°C  |
| <b>Test Channel :</b>  | 06                                                    | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2437 MHz is Fundamental Signals which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 2390                 | 52.05               | -21.95                  | 74                          | 48.62                   | 32.13                       | 5.46                    | 34.16                      | 104                  | 116                     | Peak    |
| 2390                 | 38.68               | -15.32                  | 54                          | 35.25                   | 32.13                       | 5.46                    | 34.16                      | 104                  | 116                     | Average |
| 2437                 | 97                  | -                       | -                           | 93.55                   | 32.22                       | 5.41                    | 34.18                      | 104                  | 116                     | Peak    |
| 2437                 | 88.2                | -                       | -                           | 84.74                   | 32.22                       | 5.41                    | 34.17                      | 104                  | 116                     | Average |
| 2484                 | 56.59               | -17.41                  | 74                          | 53.13                   | 32.27                       | 5.38                    | 34.19                      | 104                  | 116                     | Peak    |
| 2484                 | 41.74               | -12.26                  | 54                          | 38.28                   | 32.27                       | 5.38                    | 34.19                      | 104                  | 116                     | Average |



|                        |                                                       |                            |            |
|------------------------|-------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 12                                               | <b>Temperature :</b>       | 23~24°C    |
| <b>Test Channel :</b>  | 09                                                    | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2452 MHz is Fundamental Signals which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBuV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBuV/m ) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 2388                 | 47.21               | -26.79                  | 74                          | 43.77                   | 32.13                       | 5.46                    | 34.15                      | 103                  | 13                      | Peak    |
| 2388                 | 35.41               | -18.59                  | 54                          | 31.97                   | 32.13                       | 5.46                    | 34.15                      | 103                  | 13                      | Average |
| 2452                 | 102.34              | -                       | -                           | 98.88                   | 32.24                       | 5.4                     | 34.18                      | 103                  | 13                      | Peak    |
| 2452                 | 92.84               | -                       | -                           | 89.39                   | 32.22                       | 5.41                    | 34.18                      | 103                  | 13                      | Average |
| 2487.65              | 70.24               | -3.76                   | 74                          | 66.76                   | 32.3                        | 5.37                    | 34.19                      | 103                  | 13                      | Peak    |
| 2487.65              | 53.19               | -0.81                   | 54                          | 49.71                   | 32.3                        | 5.37                    | 34.19                      | 103                  | 13                      | Average |



|                        |                                                       |                            |          |
|------------------------|-------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 12                                               | <b>Temperature :</b>       | 23~24°C  |
| <b>Test Channel :</b>  | 09                                                    | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Kay Wu                                                | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2452 MHz is Fundamental Signals which can be ignored. |                            |          |

| <b>Frequency<br/>( MHz )</b> | <b>Level<br/>( dBuV/m )</b> | <b>Over<br/>Limit<br/>( dB )</b> | <b>Limit<br/>Line<br/>( dBuV/m )</b> | <b>Read<br/>Level<br/>(dBuV)</b> | <b>Antenna<br/>Factor<br/>( dB )</b> | <b>Cable<br/>Loss<br/>( dB )</b> | <b>Preamp<br/>Factor<br/>( dB )</b> | <b>Ant<br/>Pos<br/>( cm )</b> | <b>Table<br/>Pos<br/>( deg )</b> | <b>Remark</b> |
|------------------------------|-----------------------------|----------------------------------|--------------------------------------|----------------------------------|--------------------------------------|----------------------------------|-------------------------------------|-------------------------------|----------------------------------|---------------|
| 2388                         | 45.38                       | -28.62                           | 74                                   | 41.94                            | 32.13                                | 5.46                             | 34.15                               | 100                           | 133                              | Peak          |
| 2388                         | 33.75                       | -20.25                           | 54                                   | 30.31                            | 32.13                                | 5.46                             | 34.15                               | 100                           | 133                              | Average       |
| 2452                         | 99.15                       | -                                | -                                    | 95.69                            | 32.24                                | 5.4                              | 34.18                               | 100                           | 133                              | Peak          |
| 2452                         | 90.25                       | -                                | -                                    | 86.8                             | 32.22                                | 5.41                             | 34.18                               | 100                           | 133                              | Average       |
| 2488.22                      | 64.06                       | -9.94                            | 74                                   | 60.58                            | 32.3                                 | 5.37                             | 34.19                               | 100                           | 133                              | Peak          |
| 2488.22                      | 46.58                       | -7.42                            | 54                                   | 43.1                             | 32.3                                 | 5.37                             | 34.19                               | 100                           | 133                              | Average       |

## **3.4 Antenna Requirements**

### **3.4.1 Standard Applicable**

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

### **3.4.2 Antenna Connected Construction**

The antennas type used in this product is PIFA Antenna without connector and it is considered to meet antenna requirement.

### **3.4.3 Antenna Gain**

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

## 4 List of Measuring Equipment

| Instrument                | Manufacturer | Model No. | Serial No.  | Characteristics       | Calibration Date | Due Date      | Remark                |
|---------------------------|--------------|-----------|-------------|-----------------------|------------------|---------------|-----------------------|
| EMI Test Receive          | R&S          | ESCS 30   | 100356      | 9KHz ~ 2.75GHz        | Aug. 05, 2009    | Aug. 04, 2010 | Conduction (CO05-HY)  |
| Two-LISN                  | R&S          | ENV216    | 11-100081   | 9kHz~30MHz            | Nov. 30, 2009    | Nov. 29, 2010 | Conduction (CO05-HY)  |
| Two-LISN                  | R&S          | ENV216    | 11-100080   | 9kHz~30MHz            | Nov. 23, 2009    | Nov. 22, 2010 | Conduction (CO05-HY)  |
| AC Power Source           | APC          | APC-1000W | N/A         | N/A                   | N/A              | N/A           | Conduction (CO05-HY)  |
| Bilog Antenna             | SCHAFFNER    | CBL6111C  | 2726        | 30MHz ~ 1GHz          | Oct. 31, 2009    | Oct. 30, 2010 | Radiation (03CH07-HY) |
| Spectrum Analyzer         | R&S          | FSP       | 101067      | 9KHz ~ 30GHz          | Dec. 04, 2009    | Dec. 03, 2010 | Radiation (03CH07-HY) |
| Double Ridge Horn Antenna | ESCO         | 3117      | 00075962    | 1GHz ~ 18GHz          | Aug. 20, 2009    | Aug. 19, 2010 | Radiation (03CH07-HY) |
| SHF-EHF Horn Antenna      | SCHWARZBECK  | BBHA 9170 | BBHA9170251 | 15GHz- 40GHz          | Oct. 14, 2009    | Oct. 13, 2010 | Radiation (03CH07-HY) |
| Pre Amplifier             | Agilent      | 8449B     | 3008A02362  | 1GHz~ 26.5GHz         | Dec.09,2009      | Dec. 08, 2010 | Radiation (03CH07-HY) |
| Pre Amplifier             | COM-POWER    | PA-103A   | 161241      | 10-1000MHz.32 dB.GAIN | Mar. 27, 2009    | Mar. 26, 2010 | Radiation (03CH07-HY) |
| Loop Antenna              | R&S          | HFH2-Z2   | 860004/001  | 9 KHz~30 MHz          | May 22, 2008     | May 21, 2010  | Radiation (03CH07-HY) |

## 5 Uncertainty of Evaluation

### Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

| Contribution                                                                             | Uncertainty of $X_i$ |                          | $u(X_i)$ |
|------------------------------------------------------------------------------------------|----------------------|--------------------------|----------|
|                                                                                          | dB                   | Probability Distribution |          |
| Receiver Reading                                                                         | 0.10                 | Normal (k=2)             | 0.05     |
| Cable Loss                                                                               | 0.10                 | Normal (k=2)             | 0.05     |
| AMN Insertion Loss                                                                       | 2.50                 | Rectangular              | 0.63     |
| Receiver Specification                                                                   | 1.50                 | Rectangular              | 0.43     |
| Site Imperfection                                                                        | 1.39                 | Rectangular              | 0.80     |
| Mismatch                                                                                 | +0.34 / -0.35        | U-Shape                  | 0.24     |
| <b>Combined Standard Uncertainty <math>U_c(y)</math></b>                                 | <b>1.13</b>          |                          |          |
| <b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b> | <b>2.26</b>          |                          |          |

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

| Contribution                                                                             | Uncertainty of $X_i$ |                          | $u(X_i)$ |
|------------------------------------------------------------------------------------------|----------------------|--------------------------|----------|
|                                                                                          | dB                   | Probability Distribution |          |
| Receiver Reading                                                                         | 0.41                 | Normal (k=2)             | 0.21     |
| Antenna Factor Calibration                                                               | 0.83                 | Normal (k=2)             | 0.42     |
| Cable Loss Calibration                                                                   | 0.25                 | Normal (k=2)             | 0.13     |
| Pre-Amplifier Gain Calibration                                                           | 0.27                 | Normal (k=2)             | 0.14     |
| RCV/SPA Specification                                                                    | 2.50                 | Rectangular              | 0.72     |
| Antenna Factor Interpolation for Frequency                                               | 1.00                 | Rectangular              | 0.29     |
| Site Imperfection                                                                        | 1.43                 | Rectangular              | 0.83     |
| Mismatch                                                                                 | +0.39 / -0.41        | U-Shape                  | 0.28     |
| <b>Combined Standard Uncertainty <math>U_c(y)</math></b>                                 | <b>1.27</b>          |                          |          |
| <b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b> | <b>2.54</b>          |                          |          |

**Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)**

| Contribution                                                                                                                        | Uncertainty of $X_i$ |                          | $u(X_i)$ | $C_i$ | $C_i * u(X_i)$ |
|-------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------|----------|-------|----------------|
|                                                                                                                                     | dB                   | Probability Distribution |          |       |                |
| Receiver Reading                                                                                                                    | $\pm 0.10$           | Normal (k=2)             | 0.10     | 1     | 0.10           |
| Antenna Factor Calibration                                                                                                          | $\pm 1.70$           | Normal (k=2)             | 0.85     | 1     | 0.85           |
| Cable Loss Calibration                                                                                                              | $\pm 0.50$           | Normal (k=2)             | 0.25     | 1     | 0.25           |
| Receiver Correction                                                                                                                 | $\pm 2.00$           | Rectangular              | 1.15     | 1     | 1.15           |
| Antenna Factor Directional                                                                                                          | $\pm 1.50$           | Rectangular              | 0.87     | 1     | 0.87           |
| Site Imperfection                                                                                                                   | $\pm 2.80$           | Triangular               | 1.14     | 1     | 1.14           |
| Mismatch<br>Receiver VSWR $\Gamma_1 = 0.197$<br>Antenna VSWR $\Gamma_2 = 0.194$<br>Uncertainty = $20\text{Log}(1-\Gamma_1\Gamma_2)$ | +0.34 / -0.35        | U-Shape                  | 0.244    | 1     | 0.244          |
| <b>Combined Standard Uncertainty<br/><math>U_c(y)</math></b>                                                                        | <b>2.36</b>          |                          |          |       |                |
| <b>Measuring Uncertainty for a<br/>Level of Confidence of 95%<br/>(<math>U = 2U_c(y)</math>)</b>                                    | <b>4.72</b>          |                          |          |       |                |



## **Appendix A. Photographs of EUT**

Please refer to Sporton report number EP030509-03 as below.