

# FCC RF Test Report

**APPLICANT** : Huawei Technologies Co., Ltd.  
**EQUIPMENT** : HUAWEI Ascend G 301; HSDPA/UMTS/GSM/GPRS/EDGE  
Mobile Phone with Bluetooth  
**BRAND NAME** : HUAWEI  
**MODEL NAME** : HUAWEI U8816-51, U8816-51  
**FCC ID** : QISU8816-51  
**STANDARD** : FCC Part 15 Subpart C §15.247  
**CLASSIFICATION** : (DTS) Digital Transmission System

The product was received on Apr. 06, 2012 and completely tested on Apr. 27, 2012. We, SPORTON INTERNATIONAL (KUNSHAN) 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 (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:



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Jones Tsai / Manager



**SPORTON INTERNATIONAL (KUNSHAN) INC.**  
**No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.**



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## REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION             | ISSUED DATE   |
|------------|---------|-------------------------|---------------|
| FR240601B  | Rev. 01 | Initial issue of report | Jun. 08, 2012 |
|            |         |                         |               |
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|            |         |                         |               |

## SUMMARY OF TEST RESULT

| Report Section | FCC Rule              | Description                   | Limit                    | Result | Remark                                   |
|----------------|-----------------------|-------------------------------|--------------------------|--------|------------------------------------------|
| 3.1            | 15.247(a)(2)          | 6dB Bandwidth                 | $\geq 0.5\text{MHz}$     | Pass   | -                                        |
| 3.2            | 15.247(b)             | Power Output                  | $\leq 30\text{dBm}$      | Pass   | -                                        |
| 3.3            | 15.247(d)             | Frequency Band Edges          | $\leq 20\text{dBc}$      | Pass   | -                                        |
| 3.4            | 15.247(d)             | Spurious Emission             | $< 20\text{ dBc}$        | Pass   | -                                        |
| 3.5            | 15.247(e)             | Power Spectral Density        | $\leq 8\text{dBm}$       | Pass   | -                                        |
| 3.6            | 15.207                | AC Conducted Emission         | 15.207(a)                | Pass   | Under limit<br>7.96 dB at<br>0.660 MHz   |
| 3.7            | 15.247(d)             | Transmitter Radiated Emission | 15.209(a) &<br>15.247(d) | Pass   | Under limit<br>4.84 dB at<br>837.040 MHz |
| 3.8            | 15.203 &<br>15.247(b) | Antenna Requirement           | N/A                      | Pass   | -                                        |

# 1 General Description

## 1.1 Applicant

**Huawei Technologies Co., Ltd.**

Bantian, Longgang District, Shenzhen, 51829 Guangdong, P.R.China

## 1.2 Manufacturer

**Huawei Technologies Co., Ltd.**

Bantian, Longgang District, Shenzhen, 51829 Guangdong, P.R.China

## 1.3 Feature of Equipment Under Test

| Product Feature & Specification   |                                                                                                                 |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Equipment                         | HUAWEI Ascend G 301; HSDPA/UMTS/GSM/GPRS/EDGE Mobile Phone with Bluetooth                                       |
| Brand Name                        | HUAWEI                                                                                                          |
| Model Name                        | HUAWEI U8816-51, U8816-51                                                                                       |
| FCC ID                            | QISU8816-51                                                                                                     |
| Tx/Rx Frequency Range             | 2412 MHz ~ 2462 MHz                                                                                             |
| Number of Channels                | 11                                                                                                              |
| Carrier Frequency of Each Channel | 2412+(n-1)*5 MHz; n=1~11                                                                                        |
| Channel Spacing                   | 5 MHz                                                                                                           |
| Maximum Output Power to Antenna   | 802.11b : 16.98 dBm (0.0499 W)<br>802.11g : 21.15 dBm (0.1303 W)<br>802.11g/n (BW 20MHz) : 19.07 dBm (0.0807 W) |
| Duty Cycle                        | 802.11b : 100.00%<br>802.11g : 94.93%<br>802.11g/n (BW 20MHz) : 94.40%                                          |
| Antenna Type                      | Loop Antenna with gain -1.07 dBi                                                                                |
| HW Version                        | HD3U8815M                                                                                                       |
| SW Version                        | U8816-51V100R001C00B879                                                                                         |
| Type of Modulation                | 802.11b : DSSS (BPSK / QPSK / CCK)<br>802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)                            |
| EUT Stage                         | Identical Prototype                                                                                             |

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

## 1.4 Testing Site

|                    |                                                                                                                  |         |           |                         |
|--------------------|------------------------------------------------------------------------------------------------------------------|---------|-----------|-------------------------|
| Test Site          | SPORTON INTERNATIONAL (KUNSHAN) INC.                                                                             |         |           |                         |
| Test Site Location | No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.<br>TEL: +86-0512-5790-0158<br>FAX: +86-0512-5790-0958 |         |           |                         |
| Test Site No.      | Sporton Site No.                                                                                                 |         |           | FCC/IC Registration No. |
|                    | TH01-KS                                                                                                          | CO01-KS | 03CH01-KS | 149928/4086E-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 D01 DTS Meas. Guidance v01
- ANSI C63.4-2003

### Remark:

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

## 1.6 Ancillary Equipment List

| Item | Equipment          | Trade Name | Model Name | FCC ID       | Data Cable | Power Cord                                                 |
|------|--------------------|------------|------------|--------------|------------|------------------------------------------------------------|
| 1.   | System Simulator   | R&S        | CMU200     | N/A          | N/A        | Unshielded, 1.8 m                                          |
| 2.   | DC Power Supply    | GWINSTEK   | GPS-3030D  | N/A          | N/A        | Unshielded, 1.8 m                                          |
| 3.   | Bluetooth Earphone | Nokia      | BH-106     | QDS-BRCM1030 | N/A        | N/A                                                        |
| 4.   | Router             | D-Link     | DIR-855    | KA2DIR855A2  | N/A        | Unshielded, 1.8 m                                          |
| 5.   | Notebook           | DELL       | P08S       | QDS-BRCM1030 | N/A        | AC I/P:<br>Unshielded, 0.9 m<br>DC O/P:<br>Shielded, 1.8 m |
| 6.   | Notebook           | DELL       | PP42L      | N/A          | N/A        | AC I/P:<br>Unshielded, 0.8 m<br>DC O/P:<br>Shielded, 1.8 m |

## 2 Test Configuration of Equipment Under Test

### 2.1 Pre-Scanned RF Power

Preliminary tests were performed in different data rate as below table and the highest power data rates (11b, 11g, 11g/n (BW 20MHz) modes) were chosen for full test in the following sections to demonstrate compliance to the FCC limit line.

| 2.4GHz 802.11b mode |        |        |          |         |
|---------------------|--------|--------|----------|---------|
| Data Rate (MHz)     | 1M bps | 2M bps | 5.5M bps | 11M bps |
| Peak Power (dBm)    | 16.98  | 16.73  | 16.72    | 16.96   |

| 2.4GHz 802.11g mode |        |        |         |         |         |         |         |         |
|---------------------|--------|--------|---------|---------|---------|---------|---------|---------|
| Data Rate (MHz)     | 6M bps | 9M bps | 12M bps | 18M bps | 24M bps | 36M bps | 48M bps | 54M bps |
| Peak Power (dBm)    | 21.15  | 21.03  | 21.08   | 20.98   | 21.10   | 20.99   | 21.08   | 20.90   |

| 2.4GHz 802.11g/n (BW 20MHz) mode |       |       |       |       |       |       |       |       |
|----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Data Rate (MHz)                  | MCS0  | MCS1  | MCS2  | MCS3  | MCS4  | MCS5  | MCS6  | MCS7  |
| Peak Power (dBm)                 | 19.07 | 18.90 | 19.04 | 19.04 | 18.86 | 19.02 | 19.03 | 18.98 |

### 2.2 Maximum Peak Conducted Output Power:

| Band            | 2.4GHz 802.11b Peak Power (dBm) |       |       | 2.4GHz 802.11g Peak Power (dBm) |       |       |
|-----------------|---------------------------------|-------|-------|---------------------------------|-------|-------|
| Channel         | 1                               | 6     | 11    | 1                               | 6     | 11    |
| Frequency (MHz) | 2412                            | 2437  | 2462  | 2412                            | 2437  | 2462  |
| Peak Power      | 16.98                           | 16.63 | 16.05 | 21.15                           | 21.10 | 20.12 |

| Band            | 2.4GHz 802.11g/n (BW 20MHz) Peak Power (dBm) |       |       |
|-----------------|----------------------------------------------|-------|-------|
| Channel         | 1                                            | 6     | 11    |
| Frequency (MHz) | 2412                                         | 2437  | 2462  |
| Peak Power      | 19.07                                        | 18.66 | 18.06 |

#### Remark:

The data rates of WLAN 802.11b/g/n were set in 1Mbps for 802.11b, 6Mbps for 802.11g, and MCS0 for 802.11g/n (BW 20MHz) for all the test cases due to the highest RF output power.

## 2.3 Maximum Average Conducted Output Power:

| Band            | 2.4GHz 802.11b Average Power (dBm) |       |       | 2.4GHz 802.11g Average Power (dBm) |       |      |
|-----------------|------------------------------------|-------|-------|------------------------------------|-------|------|
| Channel         | 1                                  | 6     | 11    | 1                                  | 6     | 11   |
| Frequency (MHz) | 2412                               | 2437  | 2462  | 2412                               | 2437  | 2462 |
| Average Power   | 13.88                              | 13.60 | 13.13 | 11.81                              | 10.91 | 9.87 |

| Band            | 2.4GHz 802.11g/n (BW 20MHz) Average Power (dBm) |      |      |
|-----------------|-------------------------------------------------|------|------|
| Channel         | 1                                               | 6    | 11   |
| Frequency (MHz) | 2412                                            | 2437 | 2462 |
| Average Power   | 8.75                                            | 8.37 | 7.70 |

**Remark:**

1. The average power, which is used by the test method, AVG2, in DTS Meas. Guidance v01, is reporting only.
2. The EUT is programmed to transmit signals continuously.

## 2.4 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).

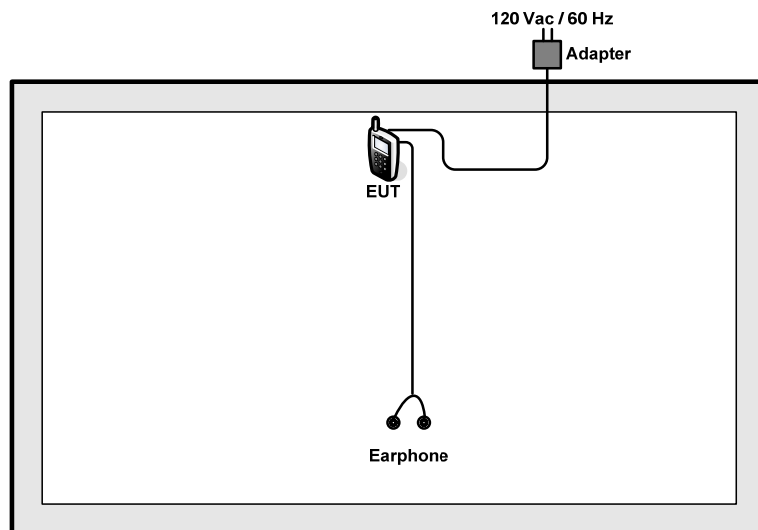
Pre-scanned tests were conducted to determine the final configuration from all possible combinations. Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations.

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

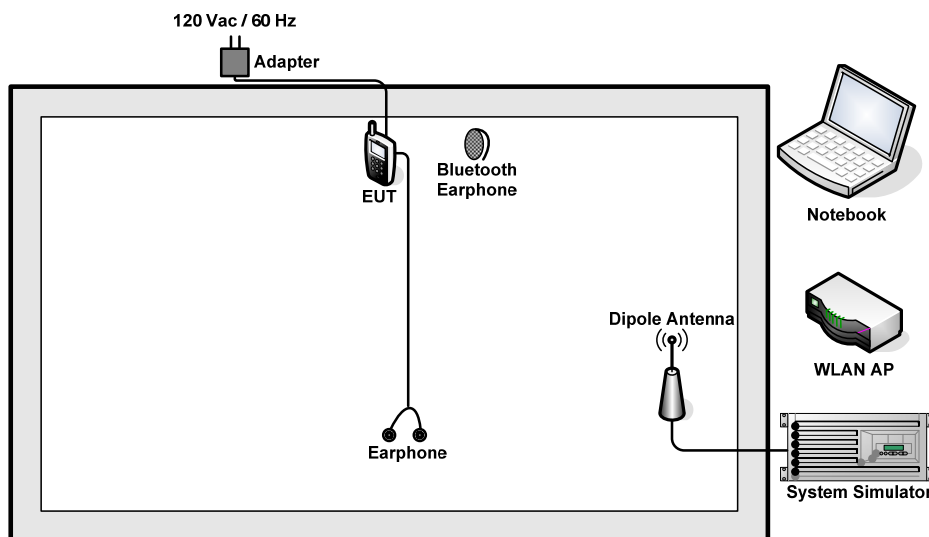
| Test Cases            |                                                                                                    |                                                                                                                                                                                                                                     |
|-----------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Item             | 802.11b<br>(Modulation : DSSS)                                                                     | 802.11g/n<br>(Modulation : OFDM)                                                                                                                                                                                                    |
| Conducted 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: 802.11g/n (BW 20M)_CH01_2412 MHz<br>Mode 8: 802.11g/n (BW 20M)_CH06_2437 MHz<br>Mode 9: 802.11g/n (BW 20M)_CH11_2462 MHz |
| Radiated 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: 802.11g/n (BW 20M)_CH01_2412 MHz<br>Mode 8: 802.11g/n (BW 20M)_CH06_2437 MHz<br>Mode 9: 802.11g/n (BW 20M)_CH11_2462 MHz |
| AC Conducted Emission | Mode 1 : GSM850 Idle + Bluetooth Link + WLAN Link + Adapter 6 + Earphone 1 + Camera + Battery 3    |                                                                                                                                                                                                                                     |

## 2.5 Connection Diagram of Test System

### <WLAN Tx Mode>



### <AC Conducted Emission Mode>



## 2.6 RF Utility

The programmed RF utility "Wifi test tool" 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 6dB Bandwidth Measurement

##### 3.1.1 Limit of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 KHz.

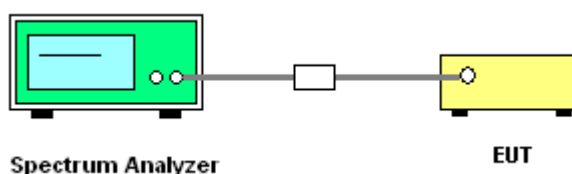
##### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

##### 3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 1-5% of the emission bandwidth (EBW). Set the Video bandwidth (VBW)  $\geq 3 * \text{RBW}$ . In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 KHz.
4. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

##### 3.1.4 Test Setup

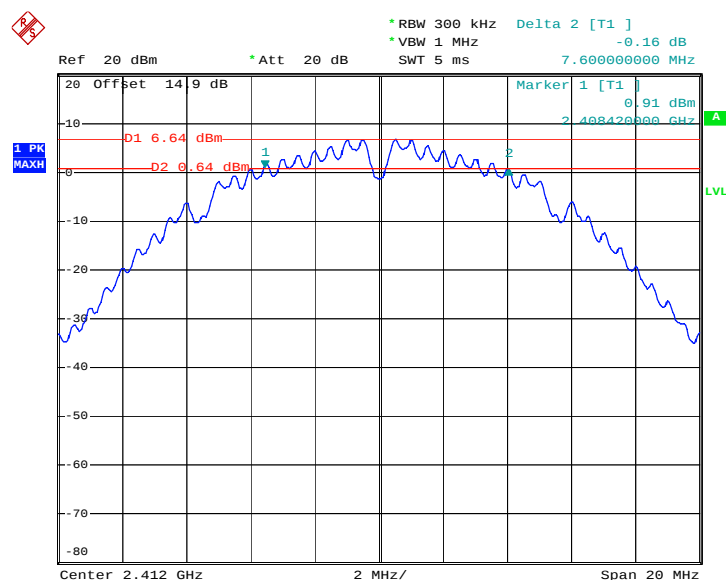


### 3.1.5 Test Result of 6dB Bandwidth

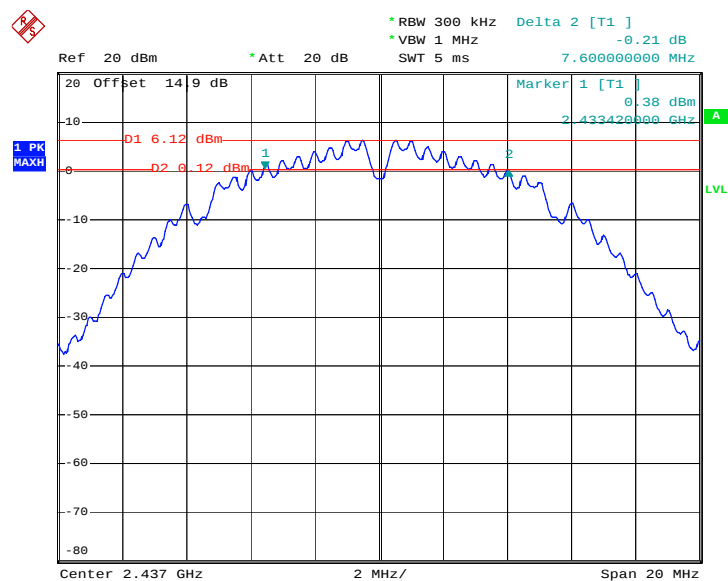
|                 |              |                     |        |
|-----------------|--------------|---------------------|--------|
| Test Mode :     | Mode 1, 2, 3 | Temperature :       | 23~24℃ |
| Test Engineer : | Zhi Lu       | Relative Humidity : | 47~48% |

| Channel | Frequency (MHz) | 802.11b<br>6dB Bandwidth (MHz) | 6dB Bandwidth<br>Min. Limit (MHz) | Pass/Fail |
|---------|-----------------|--------------------------------|-----------------------------------|-----------|
| 01      | 2412            | 7.60                           | 0.5                               | Pass      |
| 06      | 2437            | 7.60                           | 0.5                               | Pass      |
| 11      | 2462            | 7.60                           | 0.5                               | Pass      |

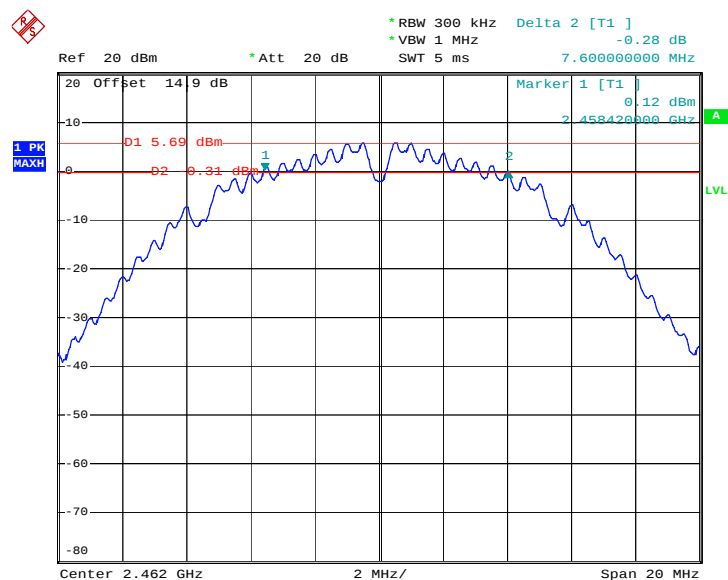
**Mode 1 : 6 dB Bandwidth Plot on 802.11b Channel 01**



Date: 24.APR.2012 17:31:12

**Mode 2 : 6 dB Bandwidth Plot on 802.11b Channel 06**


Date: 24.APR.2012 17:35:17

**Mode 3 : 6 dB Bandwidth Plot on 802.11b Channel 11**


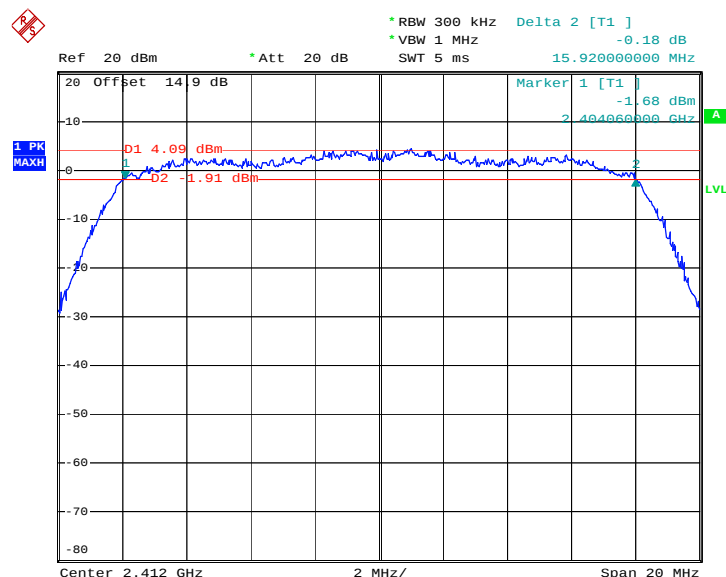
Date: 24.APR.2012 17:37:21



|                 |              |                     |         |
|-----------------|--------------|---------------------|---------|
| Test Mode :     | Mode 4, 5, 6 | Temperature :       | 23~24°C |
| Test Engineer : | Zhi Lu       | Relative Humidity : | 47~48%  |

| Channel | Frequency (MHz) | 802.11g<br>6dB Bandwidth (MHz) | 6dB Bandwidth<br>Min. Limit (MHz) | Pass/Fail |
|---------|-----------------|--------------------------------|-----------------------------------|-----------|
| 01      | 2412            | 15.92                          | 0.5                               | Pass      |
| 06      | 2437            | 15.84                          | 0.5                               | Pass      |
| 11      | 2462            | 15.92                          | 0.5                               | Pass      |

Mode 4 : 6 dB Bandwidth Plot on 802.11g Channel 01



Date: 24.APR.2012 17:40:37



Ref 20 dBm      \* Att 20 dB      \* RBW 300 kHz      Delta 2 [T1]      0.31 dB  
\* VBW 1 MHz      SWT 5 ms      15.84000000 MHz

20 Offset 14 9 dB

Marker 1 [T1]      -1.68 dBm  
2.429100000 GHz

1 PK MAX

D1 3.74 dBm

D2 -2.26 dBm

LVL

Center 2.437 GHz      2 MHz/      Span 20 MHz

Date: 24.APR.2012 17:42:48

\* RBW 300 kHz Delta 2 [T1]  
 \* VBW 1 MHz -0.14 dB  
 Ref 20 dBm \* Att 20 dB  
 SWT 5 ms 15.92000000 MHz

20 Offset 14 9 dB  
 Marker 1 [T1]  
 -2.52 dBm  
 2.45100000 GHz

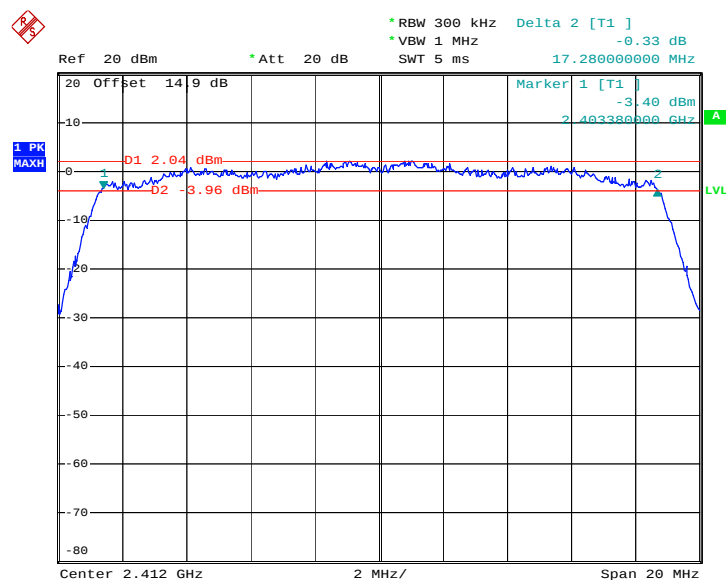
1 PK  
 MAXH  
 01 3.31 dBm  
 02 -2.69 dBm

Center 2.462 GHz  
 2 MHz/  
 Span 20 MHz

Date: 24.APR.2012 17:45:31

|                        |              |                            |        |
|------------------------|--------------|----------------------------|--------|
| <b>Test Mode :</b>     | Mode 7, 8, 9 | <b>Temperature :</b>       | 23~24℃ |
| <b>Test Engineer :</b> | Zhi Lu       | <b>Relative Humidity :</b> | 47~48% |

| Channel | Frequency (MHz) | 802.11g/n (BW 20MHz)<br>6dB Bandwidth (MHz) | 6dB Bandwidth<br>Min. Limit (MHz) | Pass/Fail |
|---------|-----------------|---------------------------------------------|-----------------------------------|-----------|
| 01      | 2412            | 17.28                                       | 0.5                               | Pass      |
| 06      | 2437            | 17.16                                       | 0.5                               | Pass      |
| 11      | 2462            | 17.28                                       | 0.5                               | Pass      |

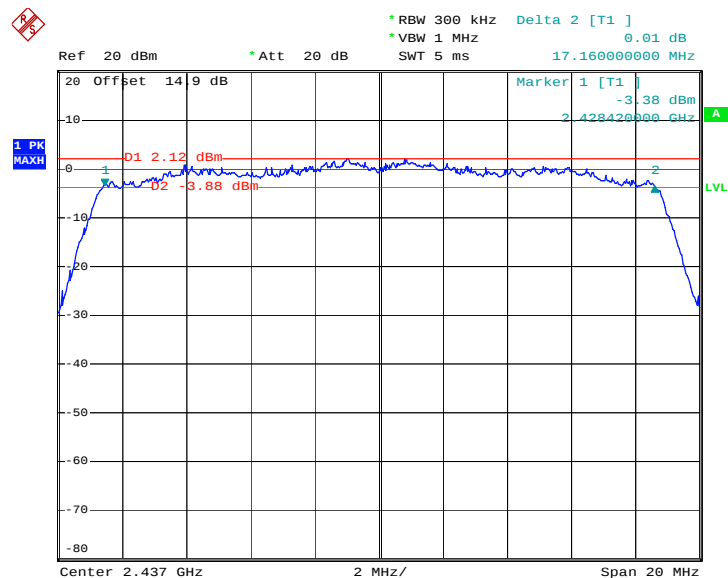
**Mode 7 : 6 dB Bandwidth Plot on 802.11g/n(BW 20MHz) Channel**
**01**


Date: 24.APR.2012 17:48:02



### Mode 8 : 6 dB Bandwidth Plot on 802.11g/n(BW 20MHz) Channel

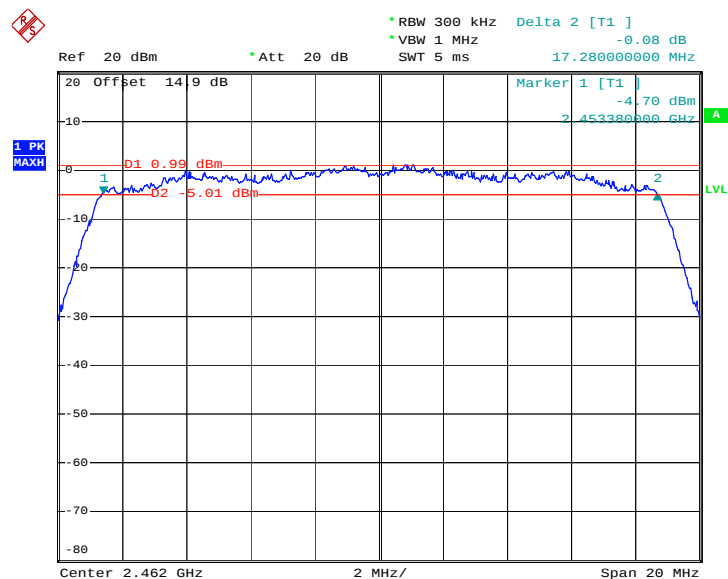
06



Date: 24.APR.2012 17:51:03

### Mode 9 : 6 dB Bandwidth Plot on 802.11g/n(BW 20MHz) Channel

11



Date: 24.APR.2012 17:54:01

## 3.2 Output Power Measurement

### 3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

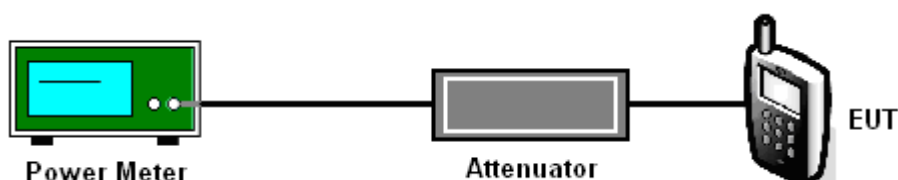
### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.2.3 Test Procedures

1. The testing follows the Measurement Procedure 7.2.1.3 Option 3(peak power meter method) of FCC KDB No. 558074 DTS Meas. Guidance DR01.
2. The RF output of EUT was connected to the power meter by a low loss cable
3. Measure the power by power meter.

### 3.2.4 Test Setup



### 3.2.5 Test Result of Output Power

|                        |              |                            |        |
|------------------------|--------------|----------------------------|--------|
| <b>Test Mode :</b>     | Mode 1, 2, 3 | <b>Temperature :</b>       | 23~24℃ |
| <b>Test Engineer :</b> | Zhi Lu       | <b>Relative Humidity :</b> | 47~48% |

| Channel | Frequency (MHz) | 802.11b<br>Peak Output Power (dBm) | Max. Limits (dBm) | Pass/Fail |
|---------|-----------------|------------------------------------|-------------------|-----------|
| 01      | 2412            | 16.98                              | 30                | Pass      |
| 06      | 2437            | 16.63                              | 30                | Pass      |
| 11      | 2462            | 16.05                              | 30                | Pass      |

|                        |              |                            |        |
|------------------------|--------------|----------------------------|--------|
| <b>Test Mode :</b>     | Mode 4, 5, 6 | <b>Temperature :</b>       | 23~24℃ |
| <b>Test Engineer :</b> | Zhi Lu       | <b>Relative Humidity :</b> | 47~48% |

| Channel | Frequency (MHz) | 802.11g<br>Peak Output Power (dBm) | Max. Limits (dBm) | Pass/Fail |
|---------|-----------------|------------------------------------|-------------------|-----------|
| 01      | 2412            | 21.15                              | 30                | Pass      |
| 06      | 2437            | 21.10                              | 30                | Pass      |
| 11      | 2462            | 20.12                              | 30                | Pass      |

|                        |              |                            |        |
|------------------------|--------------|----------------------------|--------|
| <b>Test Mode :</b>     | Mode 7, 8, 9 | <b>Temperature :</b>       | 23~24℃ |
| <b>Test Engineer :</b> | Zhi Lu       | <b>Relative Humidity :</b> | 47~48% |

| Channel | Frequency (MHz) | 802.11g/n (BW 20MHz)<br>Peak Output Power (dBm) | Max. Limits (dBm) | Pass/Fail |
|---------|-----------------|-------------------------------------------------|-------------------|-----------|
| 01      | 2412            | 19.07                                           | 30                | Pass      |
| 06      | 2437            | 18.66                                           | 30                | Pass      |
| 11      | 2462            | 18.06                                           | 30                | Pass      |

### 3.3 Band Edges Measurement

#### 3.3.1 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 Peak fundamental level of the transmitter. If the output power of this device was measured by instrument based on the use of RMS averaging over a time interval, the attenuation under this paragraph shall be 30 dB instead of 20 dB. Radiated emissions which fall in the restricted bands and which are close to band edge, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

#### 3.3.2 Measuring Instruments

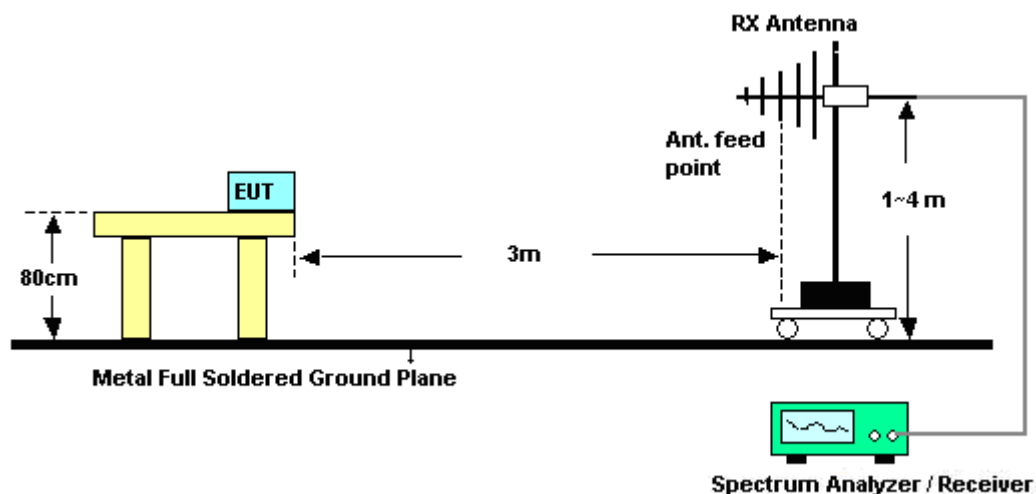
See list of measuring instruments of this test report.

#### 3.3.3 Test Procedures

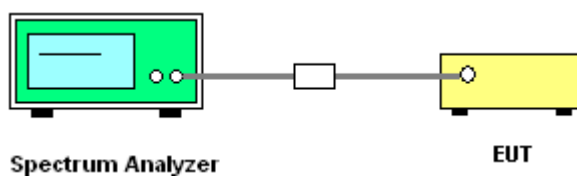
1. The testing follows the guidelines in ANSI C63.4-2003 and the Measurement Procedure of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. For Unwanted Emissions into Non-Restricted Frequency Bands:  
Conducted emission test: Set RBW = 100 KHz, Video bandwidth (VBW)  $\geq$  RBW. Out of the authorized frequency band emissions must be at least 20 dB lower than the highest emission level within the authorized band as measured with a 100 KHz RBW. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
3. For Unwanted Emissions into Restricted Frequency Bands:  
Radiated emission test: Apply to band edge emissions that falling on 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 measurement above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep=Auto. If the emission is pulsed, then modify the unit for continuous operation. Use the settings in this paragraph to correct the reading level by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation per 15.35(b) and (c).

### 3.3.4 Test Setup

#### <Radiated Band Edges>



#### <Conducted Band Edges>



### 3.3.5 Test Result of Radiated Band Edges

|                       |         |                            |              |
|-----------------------|---------|----------------------------|--------------|
| <b>Test Mode :</b>    | Mode 1  | <b>Temperature :</b>       | 21~22℃       |
| <b>Test Band :</b>    | 802.11b | <b>Relative Humidity :</b> | 42~43%       |
| <b>Test Channel :</b> | 01      | <b>Test Engineer :</b>     | Chenmy Cheng |

| ANTENNA POLARITY : HORIZONTAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-------------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )          | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | 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  |
| 2389.42                       | 51.28               | -22.72                  | 74                          | 49                        | 32.86                       | 3.47                    | 34.05                      | 100                  | 360                     | Peak    |
| 2389.42                       | 41.58               | -12.42                  | 54                          | 39.3                      | 32.86                       | 3.47                    | 34.05                      | 100                  | 360                     | Average |

| ANTENNA POLARITY : VERTICAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-----------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )        | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | 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  |
| 2383.53                     | 52.46               | -21.54                  | 74                          | 50.22                     | 32.83                       | 3.42                    | 34.01                      | 100                  | 93                      | Peak    |
| 2383.53                     | 43.34               | -10.66                  | 54                          | 41.1                      | 32.83                       | 3.42                    | 34.01                      | 100                  | 93                      | Average |

|                       |         |                            |              |
|-----------------------|---------|----------------------------|--------------|
| <b>Test Mode :</b>    | Mode 3  | <b>Temperature :</b>       | 21~22℃       |
| <b>Test Band :</b>    | 802.11b | <b>Relative Humidity :</b> | 42~43%       |
| <b>Test Channel :</b> | 11      | <b>Test Engineer :</b>     | Chenmy Cheng |

| ANTENNA POLARITY : HORIZONTAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-------------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )          | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | 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  |
| 2491.45                       | 52.37               | -21.63                  | 74                          | 49.83                     | 33.05                       | 3.72                    | 34.23                      | 100                  | 260                     | Peak    |
| 2491.45                       | 42.64               | -11.36                  | 54                          | 40.1                      | 33.05                       | 3.72                    | 34.23                      | 100                  | 260                     | Average |

| ANTENNA POLARITY : VERTICAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-----------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )        | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | 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  |
| 2491.64                     | 51.5                | -22.5                   | 74                          | 48.96                     | 33.05                       | 3.72                    | 34.23                      | 100                  | 93                      | Peak    |
| 2491.64                     | 43.63               | -10.37                  | 54                          | 41.09                     | 33.05                       | 3.72                    | 34.23                      | 100                  | 93                      | Average |

|                       |         |                            |              |
|-----------------------|---------|----------------------------|--------------|
| <b>Test Mode :</b>    | Mode 4  | <b>Temperature :</b>       | 21~22°C      |
| <b>Test Band :</b>    | 802.11g | <b>Relative Humidity :</b> | 42~43%       |
| <b>Test Channel :</b> | 01      | <b>Test Engineer :</b>     | Chenmy Cheng |

| ANTENNA POLARITY : HORIZONTAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-------------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )          | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | 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                          | 56.08               | -17.92                  | 74                          | 53.8                      | 32.86                       | 3.47                    | 34.05                      | 104                  | 268                     | Peak    |
| 2390                          | 44.38               | -9.62                   | 54                          | 42.1                      | 32.86                       | 3.47                    | 34.05                      | 104                  | 268                     | Average |

| ANTENNA POLARITY : VERTICAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-----------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )        | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | 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                        | 53.32               | -20.68                  | 74                          | 51.04                     | 32.86                       | 3.47                    | 34.05                      | 100                  | 0                       | Peak    |
| 2390                        | 43.08               | -10.92                  | 54                          | 40.8                      | 32.86                       | 3.47                    | 34.05                      | 100                  | 0                       | Average |

|                       |         |                            |              |
|-----------------------|---------|----------------------------|--------------|
| <b>Test Mode :</b>    | Mode 6  | <b>Temperature :</b>       | 21~22°C      |
| <b>Test Band :</b>    | 802.11g | <b>Relative Humidity :</b> | 42~43%       |
| <b>Test Channel :</b> | 11      | <b>Test Engineer :</b>     | Chenmy Cheng |

| ANTENNA POLARITY : HORIZONTAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-------------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )          | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | 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  |
| 2487.46                       | 58.86               | -15.14                  | 74                          | 56.37                     | 33.01                       | 3.68                    | 34.2                       | 100                  | 113                     | Peak    |
| 2487.46                       | 41.15               | -12.85                  | 54                          | 38.66                     | 33.01                       | 3.68                    | 34.2                       | 100                  | 113                     | Average |

| ANTENNA POLARITY : VERTICAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-----------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )        | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | 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                      | 56.01               | -17.99                  | 74                          | 53.52                     | 33.01                       | 3.68                    | 34.2                       | 100                  | 206                     | Peak    |
| 2483.5                      | 39.85               | -14.15                  | 54                          | 37.36                     | 33.01                       | 3.68                    | 34.2                       | 100                  | 206                     | Average |

|                       |                      |                            |              |
|-----------------------|----------------------|----------------------------|--------------|
| <b>Test Mode :</b>    | Mode 7               | <b>Temperature :</b>       | 21~22°C      |
| <b>Test Band :</b>    | 802.11g/n (BW 20MHz) | <b>Relative Humidity :</b> | 42~43%       |
| <b>Test Channel :</b> | 01                   | <b>Test Engineer :</b>     | Chenmy Cheng |

| ANTENNA POLARITY : HORIZONTAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-------------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )          | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | 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                          | 57.39               | -16.61                  | 74                          | 55.11                     | 32.86                       | 3.47                    | 34.05                      | 100                  | 29                      | Peak    |
| 2390                          | 40.79               | -13.21                  | 54                          | 38.51                     | 32.86                       | 3.47                    | 34.05                      | 100                  | 29                      | Average |

| ANTENNA POLARITY : VERTICAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-----------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )        | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | 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                        | 54.08               | -19.92                  | 74                          | 51.8                      | 32.86                       | 3.47                    | 34.05                      | 100                  | 0                       | Peak    |
| 2390                        | 39.46               | -14.54                  | 54                          | 37.18                     | 32.86                       | 3.47                    | 34.05                      | 100                  | 0                       | Average |

|                       |                      |                            |              |
|-----------------------|----------------------|----------------------------|--------------|
| <b>Test Mode :</b>    | Mode 9               | <b>Temperature :</b>       | 21~22°C      |
| <b>Test Band :</b>    | 802.11g/n (BW 20MHz) | <b>Relative Humidity :</b> | 42~43%       |
| <b>Test Channel :</b> | 11                   | <b>Test Engineer :</b>     | Chenmy Cheng |

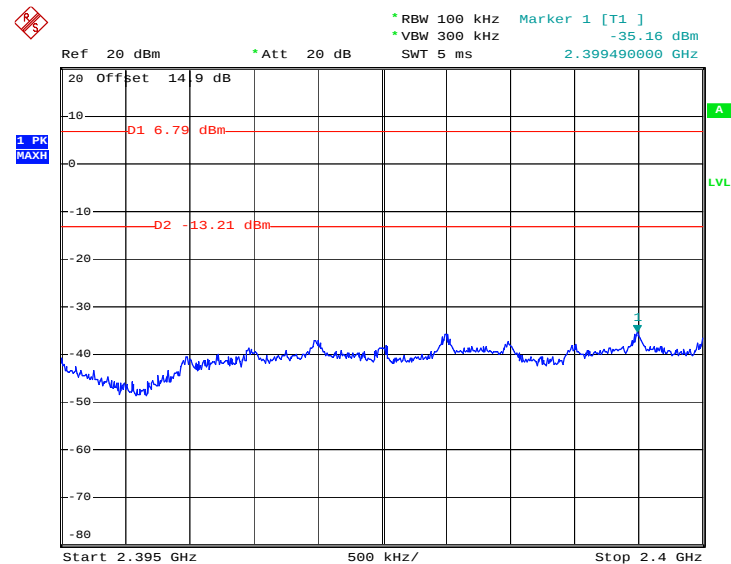
| ANTENNA POLARITY : HORIZONTAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-------------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )          | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | 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                        | 55.06               | -18.94                  | 74                          | 52.57                     | 33.01                       | 3.68                    | 34.2                       | 100                  | 305                     | Peak    |
| 2483.5                        | 40.21               | -13.79                  | 54                          | 37.72                     | 33.01                       | 3.68                    | 34.2                       | 100                  | 305                     | Average |

| ANTENNA POLARITY : VERTICAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-----------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )        | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | 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                      | 53.94               | -20.06                  | 74                          | 51.45                     | 33.01                       | 3.68                    | 34.2                       | 100                  | 20                      | Peak    |
| 2483.5                      | 39.36               | -14.64                  | 54                          | 36.87                     | 33.01                       | 3.68                    | 34.2                       | 100                  | 20                      | Average |

### 3.3.6 Test Plots of Conducted Band Edges

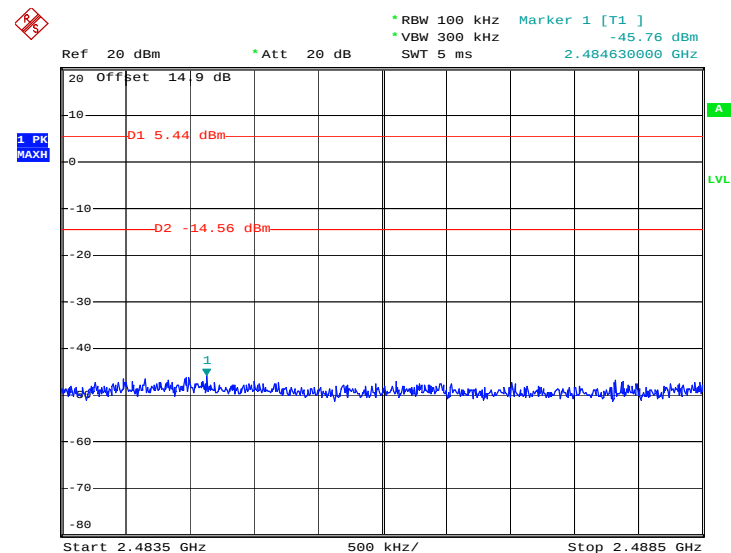
|                |              |                     |         |
|----------------|--------------|---------------------|---------|
| Test Mode :    | Mode 1 and 3 | Temperature :       | 23~24°C |
| Test Band :    | 802.11b      | Relative Humidity : | 47~48%  |
| Test Channel : | 01 and 11    | Test Engineer :     | Zhi Lu  |

#### Low Band Edge Plot on 802.11b Channel 01



Date: 24.APR.2012 10:45:18

#### High Band Edge Plot on 802.11b Channel 11

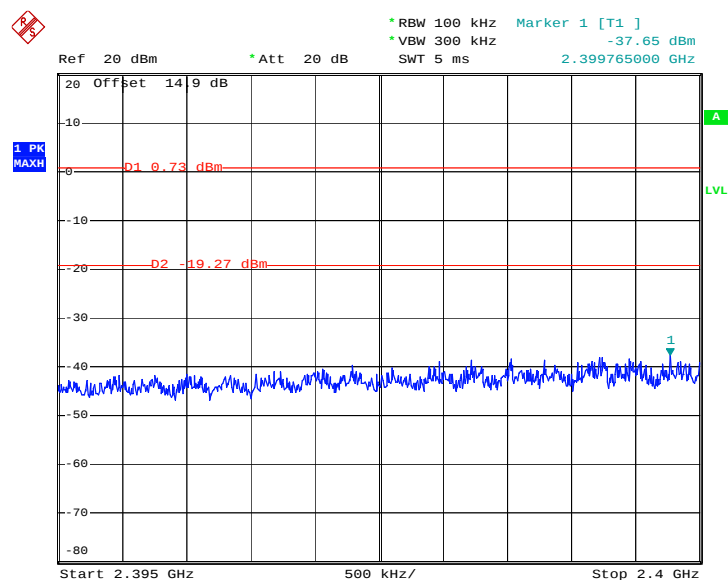


Date: 24.APR.2012 10:54:55



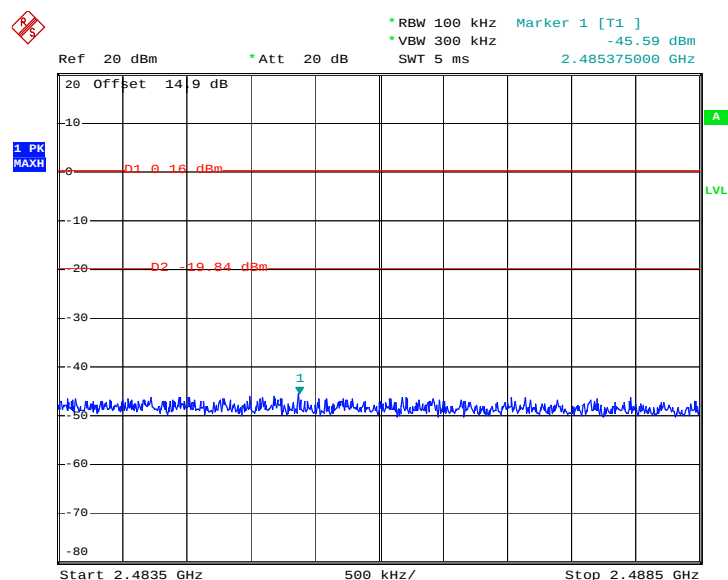
|                |              |                     |        |
|----------------|--------------|---------------------|--------|
| Test Mode :    | Mode 4 and 6 | Temperature :       | 23~24℃ |
| Test Band :    | 802.11g      | Relative Humidity : | 47~48% |
| Test Channel : | 01 and 11    | Test Engineer :     | Zhi Lu |

Low Band Edge Plot on 802.11g Channel 01



Date: 24.APR.2012 11:00:46

High Band Edge Plot on 802.11g Channel 11



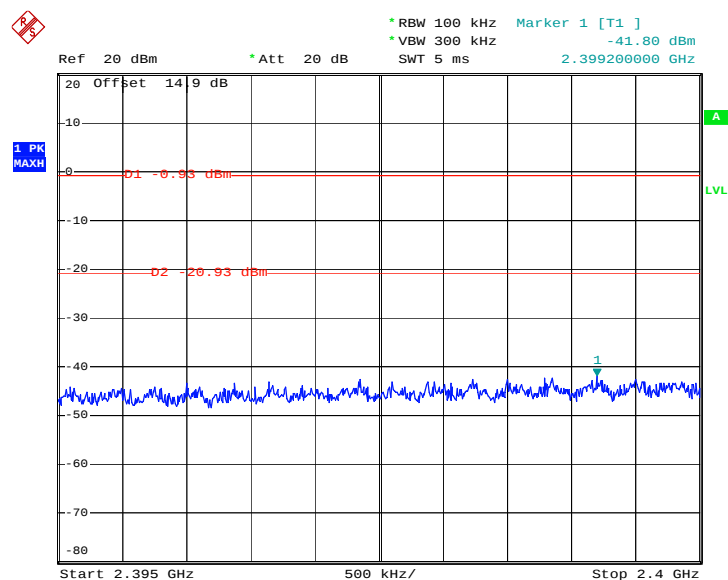
Date: 24.APR.2012 11:10:55



**Report No. : FR240601B**

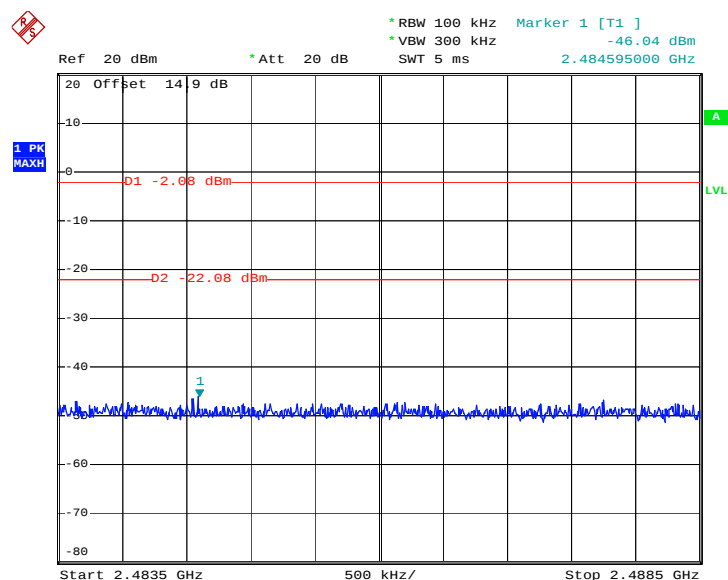
|                       |                      |                            |        |
|-----------------------|----------------------|----------------------------|--------|
| <b>Test Mode :</b>    | Mode 7 and 9         | <b>Temperature :</b>       | 23~24℃ |
| <b>Test Band :</b>    | 802.11g/n (BW 20MHz) | <b>Relative Humidity :</b> | 47~48% |
| <b>Test Channel :</b> | 01 and 11            | <b>Test Engineer :</b>     | Zhi Lu |

### Low Band Edge Plot on 802.11g/n (BW 20MHz) Channel 01



Date: 24.APR.2012 11:20:47

### High Band Edge Plot on 802.11g/n (BW 20MHz) Channel 11



Date: 24.APR.2012 11:29:52

### 3.4 Spurious Emission Measurement

#### 3.4.1 Limit of Spurious Emission Measurement

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

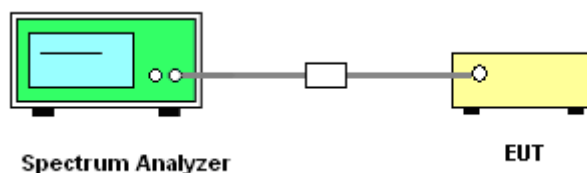
#### 3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.4.3 Test Procedure

1. The transmitter output was connected to the spectrum analyzer via a low lose cable. The path loss was compensated to the results for each measurement.
2. Set RBW = 100 KHz, Video bandwidth (VBW)  $\geq$  RBW, scan up through 10th harmonic. All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 KHz RBW.

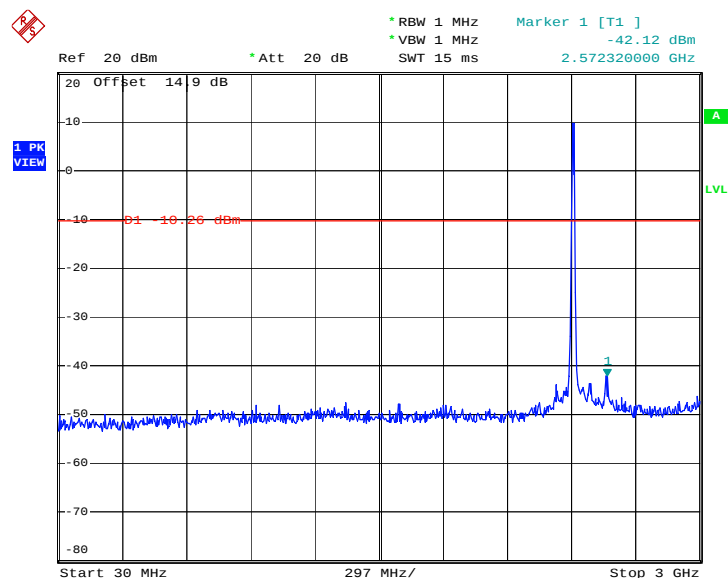
#### 3.4.4 Test Setup



### 3.4.5 Test Plots of Spurious Emission

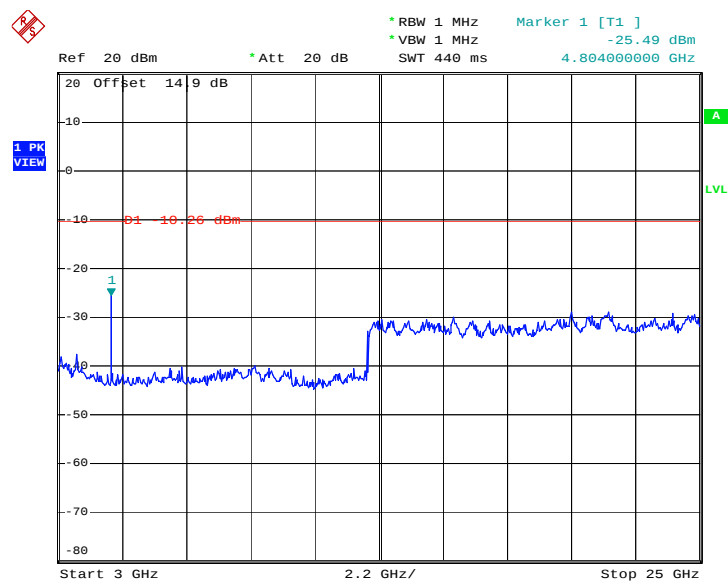
|                |         |                     |         |
|----------------|---------|---------------------|---------|
| Test Mode :    | Mode 1  | Temperature :       | 23~24°C |
| Test Band :    | 802.11b | Relative Humidity : | 47~48%  |
| Test Channel : | 01      | Test Engineer :     | Zhi Lu  |

#### Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 27.APR.2012 15:34:21

#### Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

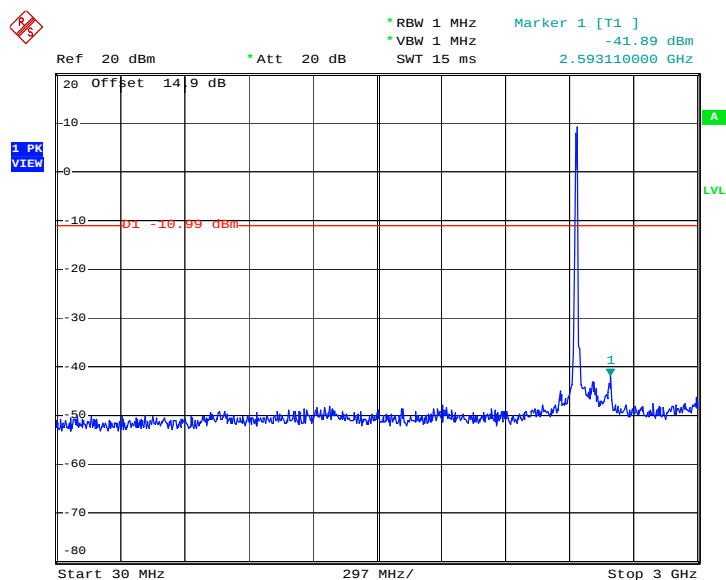


Date: 27.APR.2012 15:34:40



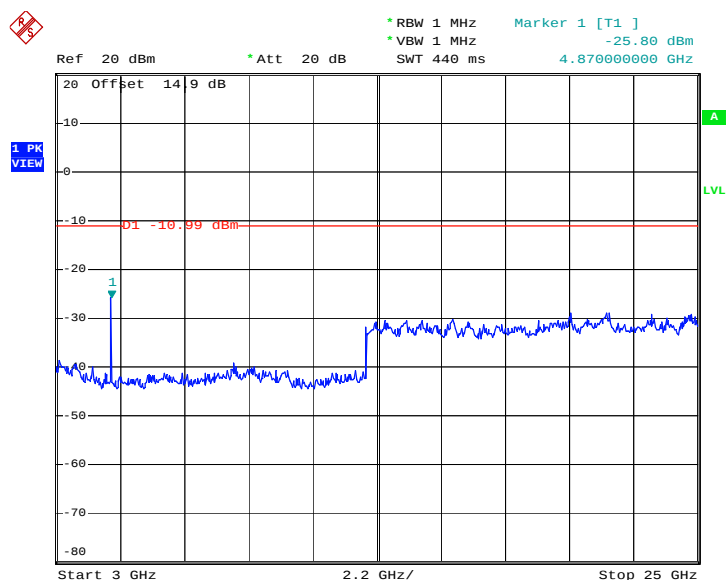
|                |         |                     |        |
|----------------|---------|---------------------|--------|
| Test Mode :    | Mode 2  | Temperature :       | 23~24℃ |
| Test Band :    | 802.11b | Relative Humidity : | 47~48% |
| Test Channel : | 06      | Test Engineer :     | Zhi Lu |

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 27.APR.2012 15:35:30

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

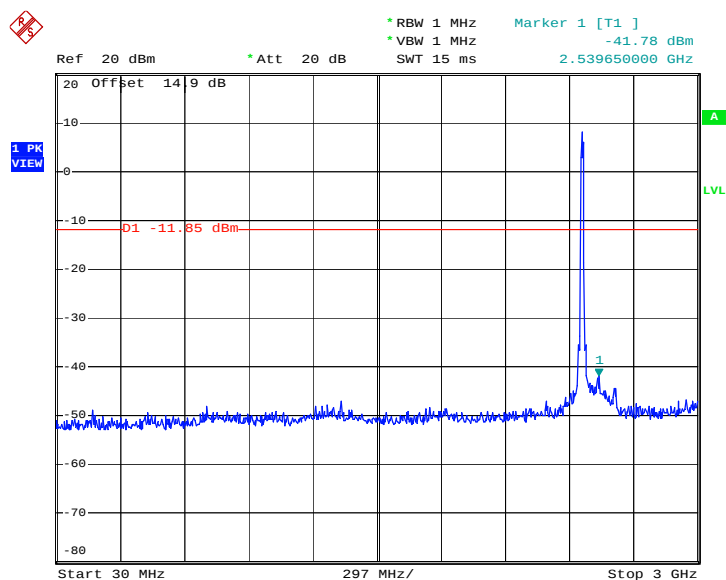


Date: 27.APR.2012 15:35:49



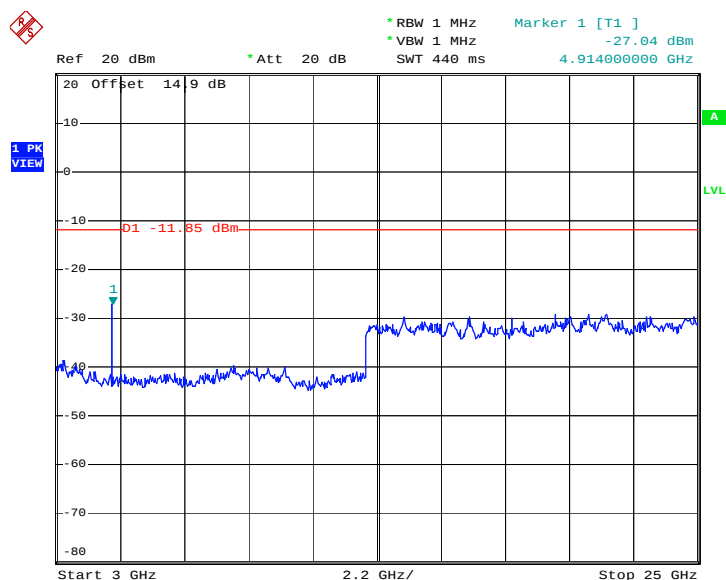
|                |         |                     |        |
|----------------|---------|---------------------|--------|
| Test Mode :    | Mode 3  | Temperature :       | 23~24℃ |
| Test Band :    | 802.11b | Relative Humidity : | 47~48% |
| Test Channel : | 11      | Test Engineer :     | Zhi Lu |

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



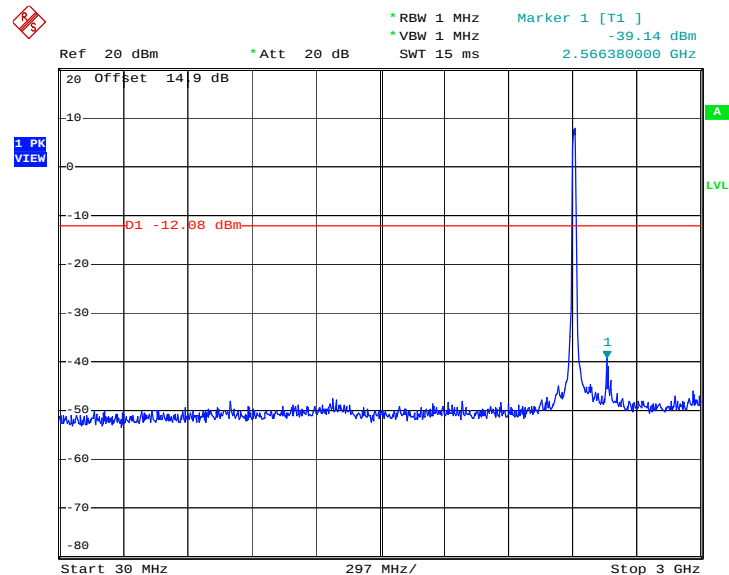
Date: 27.APR.2012 15:36:23

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

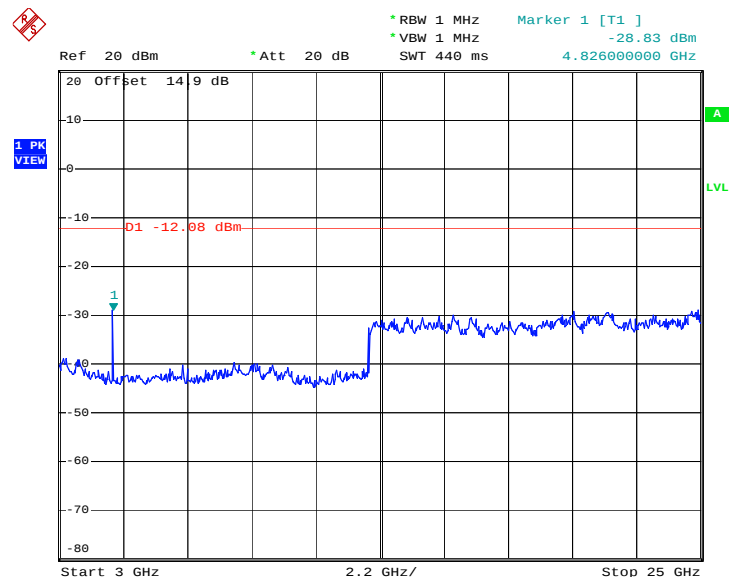


Date: 27.APR.2012 15:36:42

|                |         |                     |        |
|----------------|---------|---------------------|--------|
| Test Mode :    | Mode 4  | Temperature :       | 23~24℃ |
| Test Band :    | 802.11g | Relative Humidity : | 47~48% |
| Test Channel : | 01      | Test Engineer :     | Zhi Lu |

**Conducted Spurious Emission Plot between 30MHz ~ 3 GHz**


Date: 27.APR.2012 15:50:50

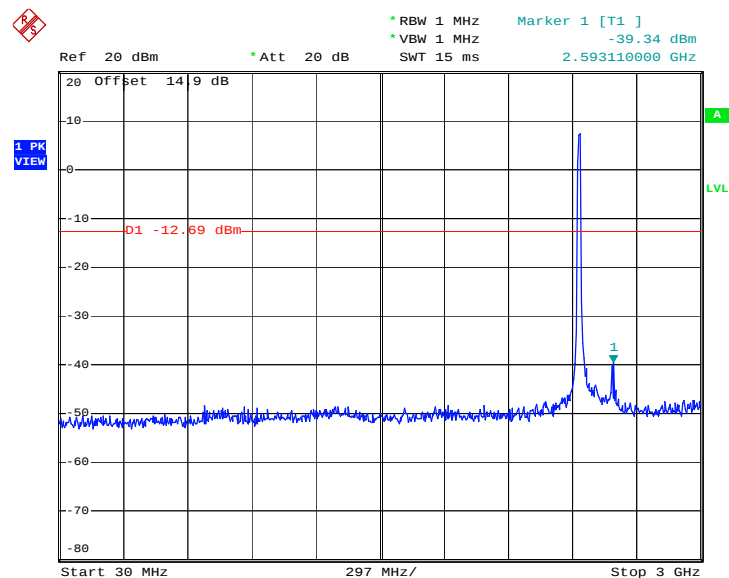
**Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz**


Date: 27.APR.2012 15:51:09



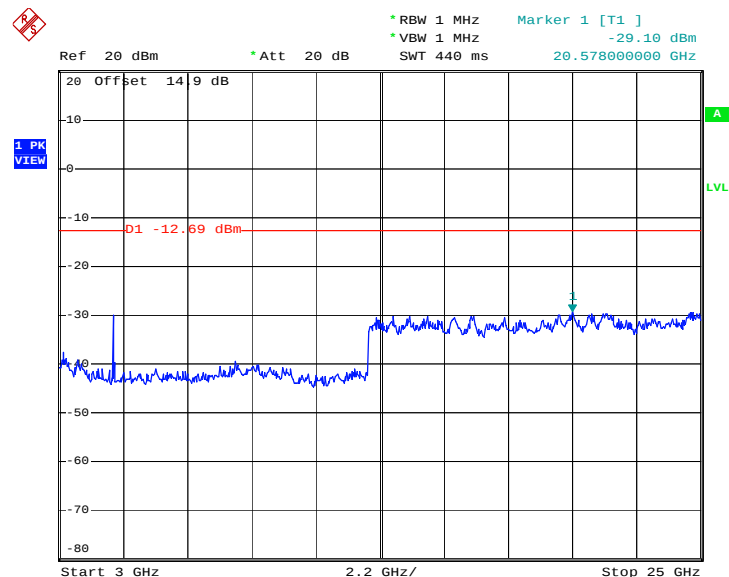
|                |         |                     |        |
|----------------|---------|---------------------|--------|
| Test Mode :    | Mode 5  | Temperature :       | 23~24  |
| Test Band :    | 802.11g | Relative Humidity : | 47~48  |
| Test Channel : | 06      | Test Engineer :     | Zhi Lu |

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 27.APR.2012 15:49:17

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

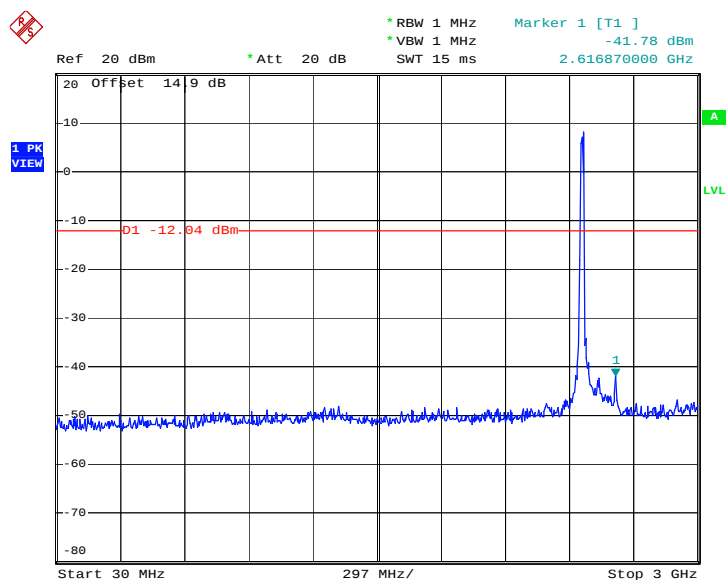


Date: 27.APR.2012 15:49:36



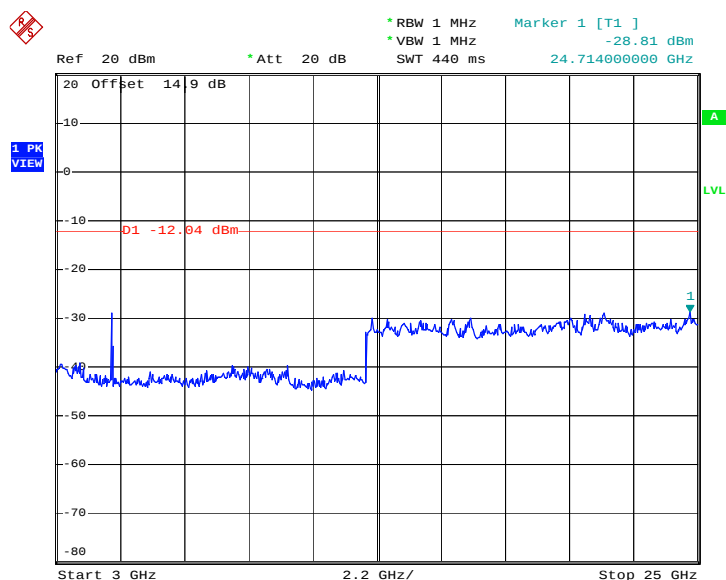
|                |         |                     |        |
|----------------|---------|---------------------|--------|
| Test Mode :    | Mode 6  | Temperature :       | 23~24℃ |
| Test Band :    | 802.11g | Relative Humidity : | 47~48% |
| Test Channel : | 11      | Test Engineer :     | Zhi Lu |

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



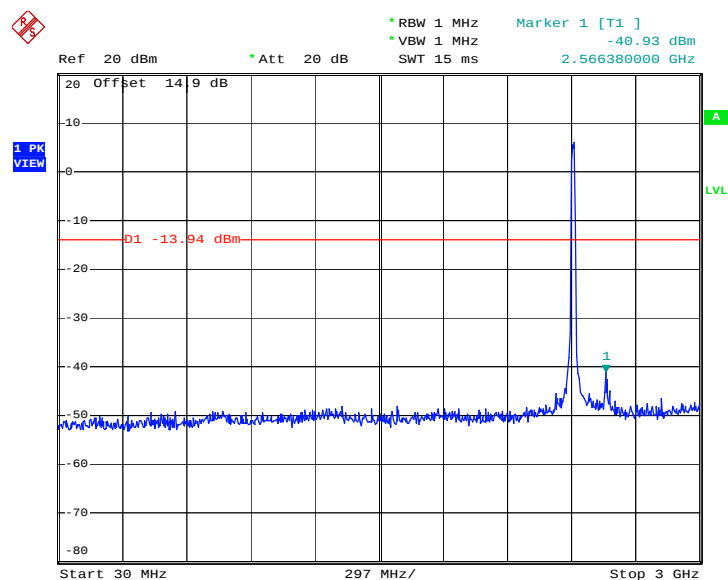
Date: 27.APR.2012 15:49:59

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

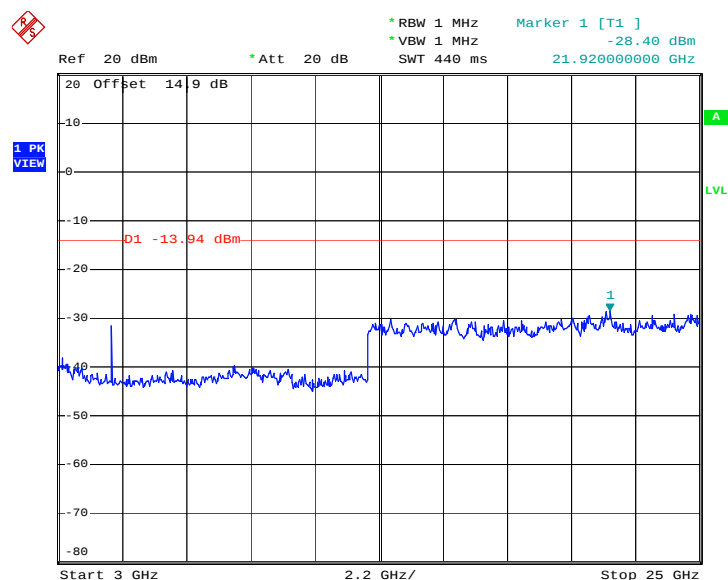


Date: 27.APR.2012 15:50:17

|                |                      |                     |        |
|----------------|----------------------|---------------------|--------|
| Test Mode :    | Mode 7               | Temperature :       | 23~24℃ |
| Test Band :    | 802.11g/n (BW 20MHz) | Relative Humidity : | 47~48% |
| Test Channel : | 01                   | Test Engineer :     | Zhi Lu |

**Conducted Spurious Emission Plot between 30MHz ~ 3 GHz**


Date: 27.APR.2012 15:42:16

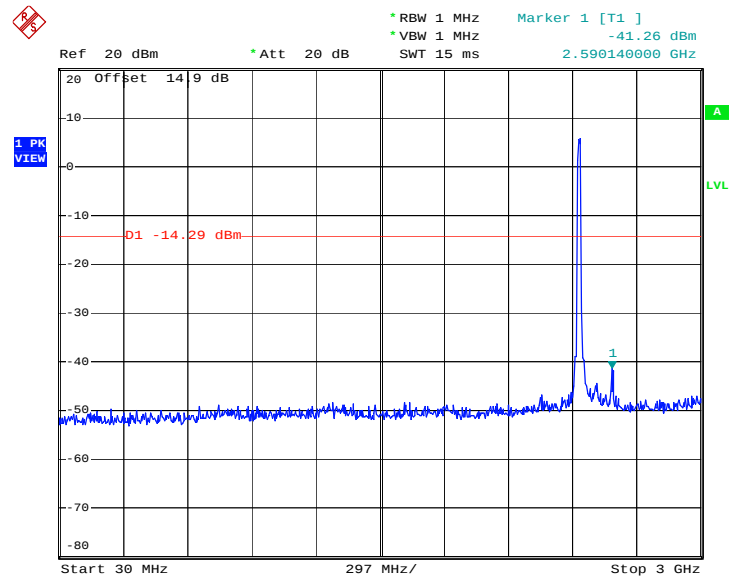
**Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz**


Date: 27.APR.2012 15:42:35



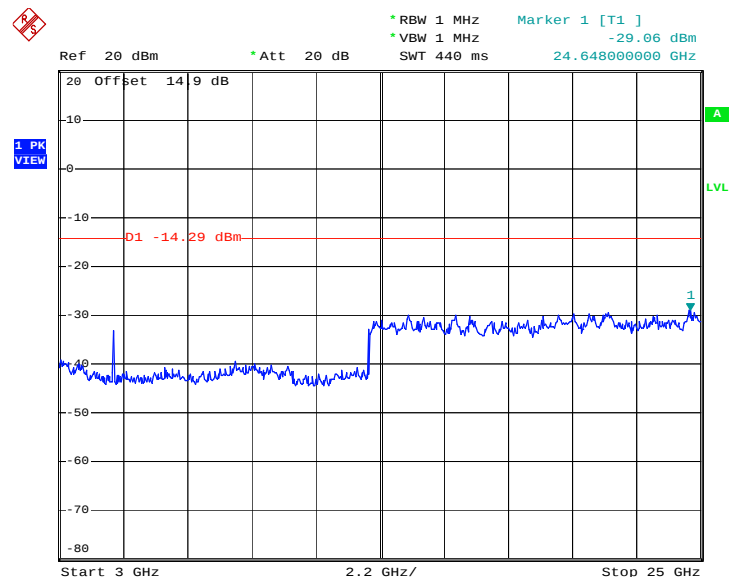
|                |                      |                     |        |
|----------------|----------------------|---------------------|--------|
| Test Mode :    | Mode 8               | Temperature :       | 23~24℃ |
| Test Band :    | 802.11g/n (BW 20MHz) | Relative Humidity : | 47~48% |
| Test Channel : | 06                   | Test Engineer :     | Zhi Lu |

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 27.APR.2012 15:43:54

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

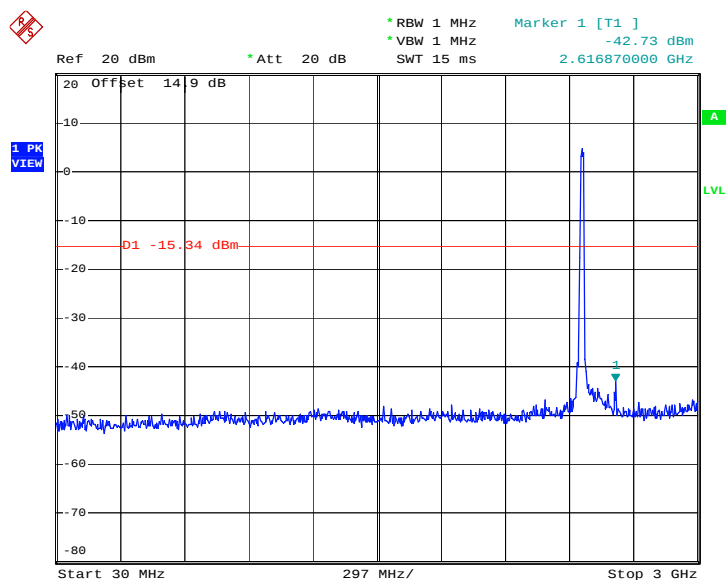


Date: 27.APR.2012 15:44:13



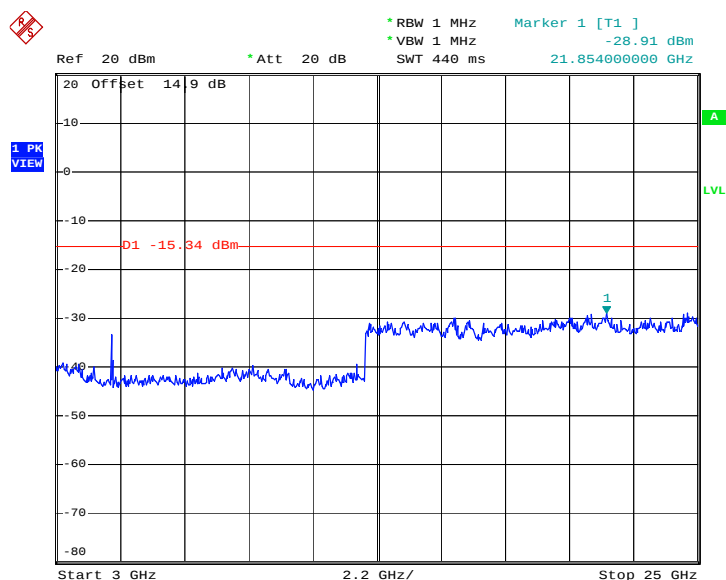
|                |                      |                     |        |
|----------------|----------------------|---------------------|--------|
| Test Mode :    | Mode 9               | Temperature :       | 23~24℃ |
| Test Band :    | 802.11g/n (BW 20MHz) | Relative Humidity : | 47~48% |
| Test Channel : | 11                   | Test Engineer :     | Zhi Lu |

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 27.APR.2012 15:45:08

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 27.APR.2012 15:45:26

### 3.5 Power Spectral Density Measurement

#### 3.5.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3KHz band at any time interval of continuous transmission.

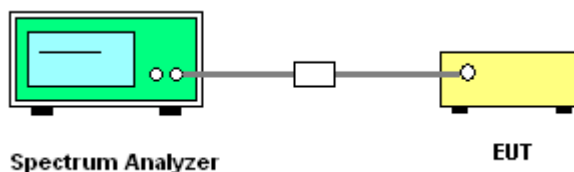
#### 3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.5.3 Test Procedures

1. The testing follows Measurement Procedure PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Record the measurement data derived from spectrum analyzer.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 KHz. Video bandwidth (VBW)  $\geq$  300 KHz In order to make an accurate measurement, set the span to 5-30% greater than Emission Bandwidth (EBW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
6. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(3\text{ kHz}/100\text{ kHz} = -15.2\text{ dB})$ .

#### 3.5.4 Test Setup



### 3.5.5 Test Result of Power Spectral Density

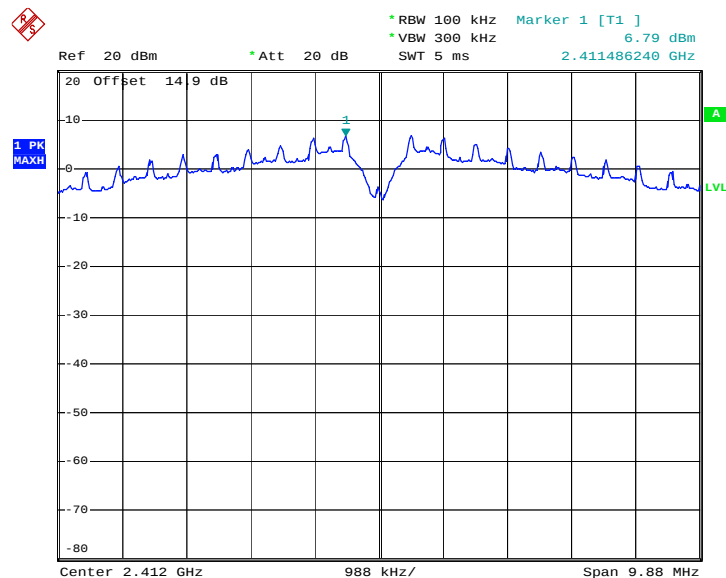
|                        |              |                            |        |
|------------------------|--------------|----------------------------|--------|
| <b>Test Mode :</b>     | Mode 1, 2, 3 | <b>Temperature :</b>       | 23~24℃ |
| <b>Test Engineer :</b> | Zhi Lu       | <b>Relative Humidity :</b> | 47~48% |

| Channel | Frequency (MHz) | 802.11b Power Density     |                | Max. Limits (dBm) | Pass/Fail |
|---------|-----------------|---------------------------|----------------|-------------------|-----------|
|         |                 | Measured PSD/100KHz (dBm) | PSD/3KHz (dBm) |                   |           |
| 01      | 2412            | 6.79                      | -8.41          | 8                 | Pass      |
| 06      | 2437            | 6.09                      | -9.11          | 8                 | Pass      |
| 11      | 2462            | 5.44                      | -9.76          | 8                 | Pass      |

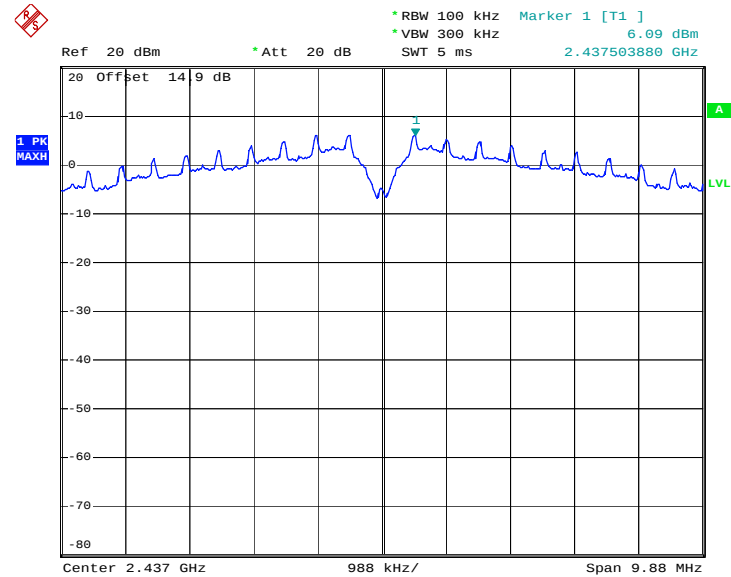
**Note:**

1. Measured power density (dBm) has offset with cable loss.
2.  $BWCF (dB) = 10 \log (3k/100k) = -15.2 \text{ dB}$
3.  $\text{Power Density/ 3kHz (dBm)} = \text{Measured power density/ 100KHz (dBm)} + BWCF (dB)$

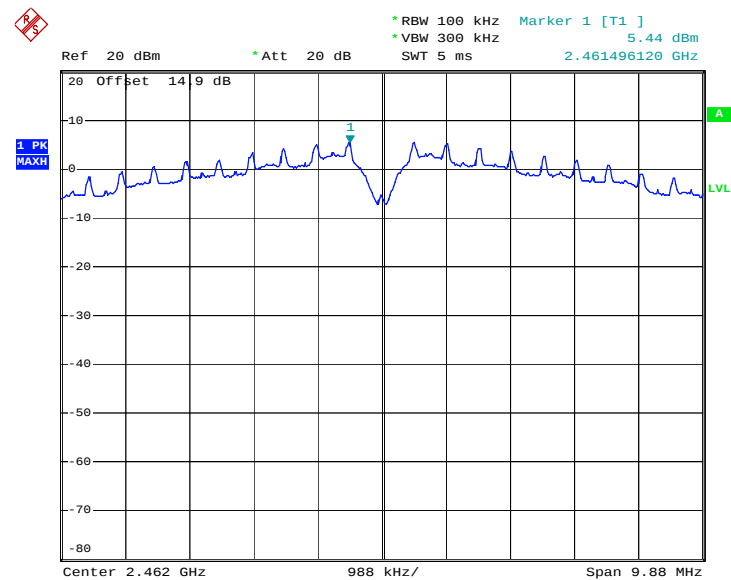
#### Mode 1 : PSD Plot on 802.11b Channel 01



Date: 24.APR.2012 10:44:18

**Mode 2 : PSD Plot on 802.11b Channel 06**


Date: 24.APR.2012 10:50:56

**Mode 3 : PSD Plot on 802.11b Channel 11**


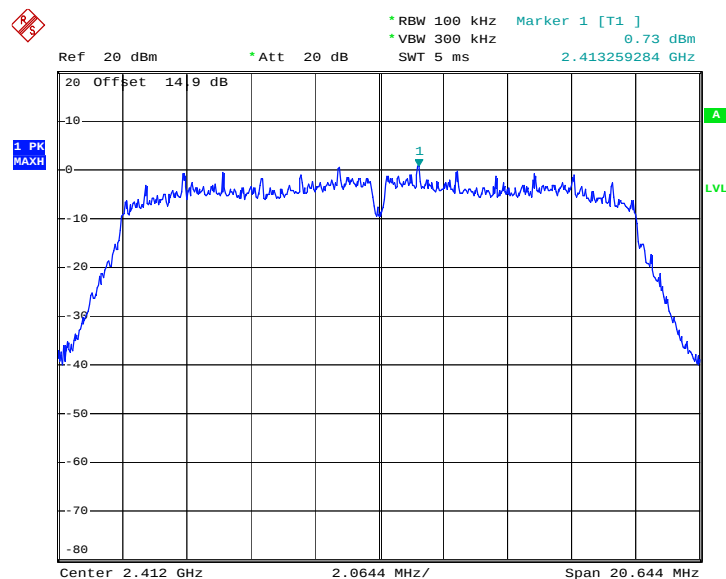
Date: 24.APR.2012 10:54:17

|                        |              |                            |        |
|------------------------|--------------|----------------------------|--------|
| <b>Test Mode :</b>     | Mode 4, 5, 6 | <b>Temperature :</b>       | 23~24℃ |
| <b>Test Engineer :</b> | Zhi Lu       | <b>Relative Humidity :</b> | 47~48% |

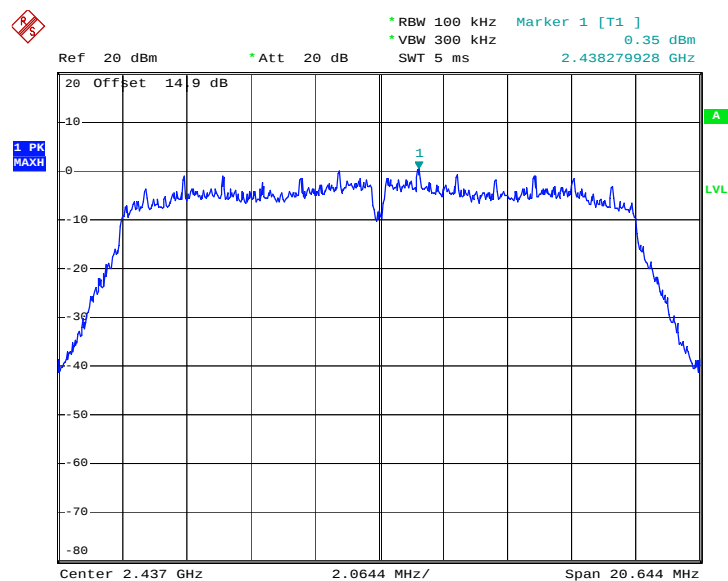
| Channel | Frequency (MHz) | 802.11g Power Density     |                | Max. Limits (dBm) | Pass/Fail |
|---------|-----------------|---------------------------|----------------|-------------------|-----------|
|         |                 | Measured PSD/100KHz (dBm) | PSD/3KHz (dBm) |                   |           |
| 01      | 2412            | 0.73                      | -14.47         | 8                 | Pass      |
| 06      | 2437            | 0.35                      | -14.85         | 8                 | Pass      |
| 11      | 2462            | 0.16                      | -15.04         | 8                 | Pass      |

**Note:**

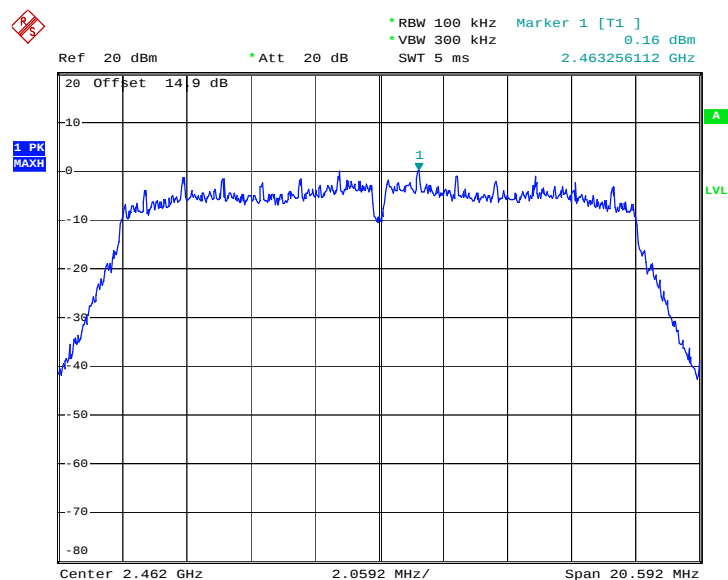
1. Measured power density (dBm) has offset with cable loss.
2.  $BWCF (dB) = 10 \log (3k/100k) = -15.2 \text{ dB}$
3.  $\text{Power Density/ 3KHz (dBm)} = \text{Measured power density/ 100KHz (dBm)} + BWCF (dB)$

**Mode 4 : PSD Plot on 802.11g Channel 01**


Date: 24.APR.2012 11:00:07

**Mode 5 : PSD Plot on 802.11g Channel 06**


Date: 24.APR.2012 11:04:55

**Mode 6 : PSD Plot on 802.11g Channel 11**


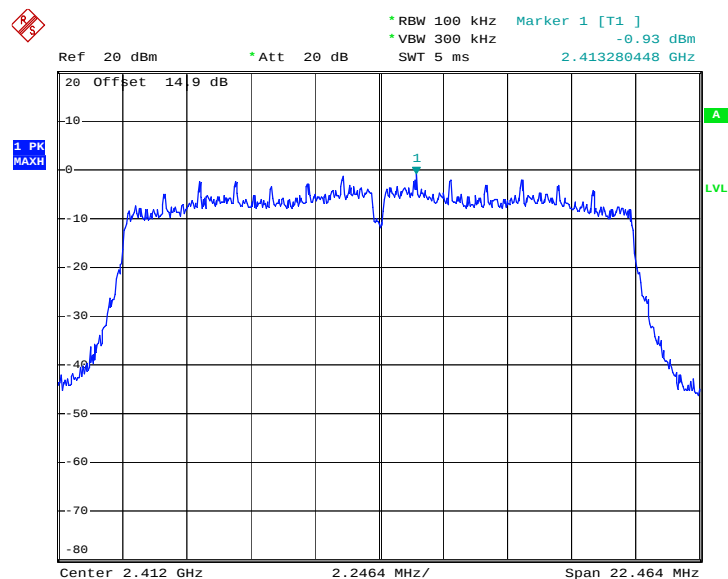
Date: 24.APR.2012 11:10:25

|                        |              |                            |        |
|------------------------|--------------|----------------------------|--------|
| <b>Test Mode :</b>     | Mode 7, 8, 9 | <b>Temperature :</b>       | 23~24℃ |
| <b>Test Engineer :</b> | Zhi Lu       | <b>Relative Humidity :</b> | 47~48% |

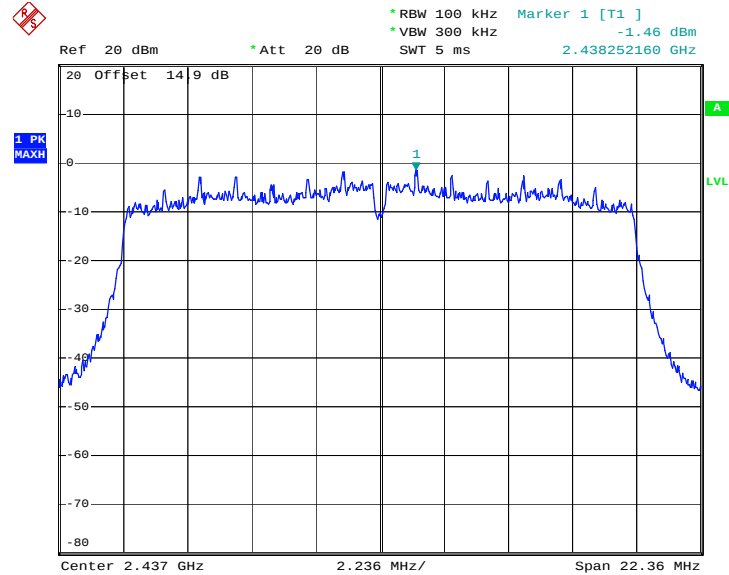
| Channel | Frequency (MHz) | 802.11g/n (BW 20MHz) Power Density |                | Max. Limits (dBm) | Pass/Fail |
|---------|-----------------|------------------------------------|----------------|-------------------|-----------|
|         |                 | Measured PSD/100KHz (dBm)          | PSD/3KHz (dBm) |                   |           |
| 01      | 2412            | -0.93                              | -16.13         | 8                 | Pass      |
| 06      | 2437            | -1.46                              | -16.66         | 8                 | Pass      |
| 11      | 2462            | -2.08                              | -17.28         | 8                 | Pass      |

**Note:**

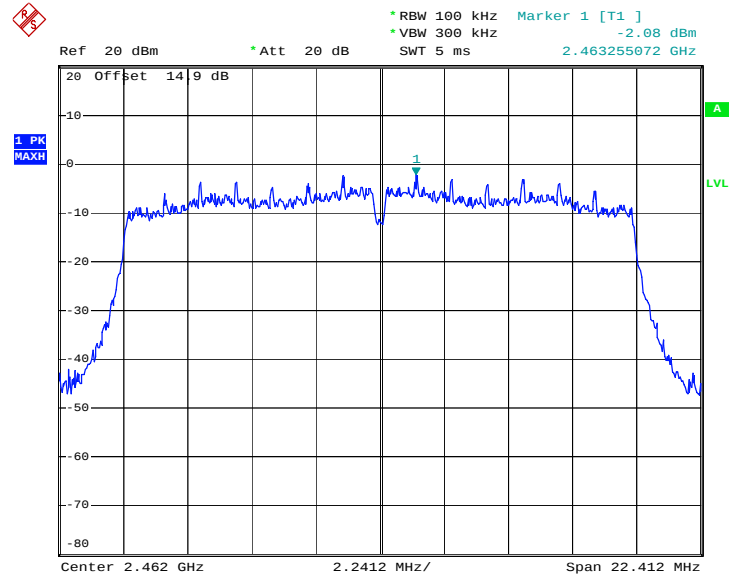
1. Measured power density (dBm) has offset with cable loss.
2.  $BWCF (dB) = 10 \log (3k/100k) = -15.2 \text{ dB}$
3.  $\text{Power Density/ 3KHz (dBm)} = \text{Measured power density/ 100KHz (dBm)} + BWCF (dB)$

**Mode 7 : PSD Plot on 802.11g/n (BW 20MHz) Channel 01**


Date: 24.APR.2012 11:20:07

**Mode 8 : PSD Plot on 802.11g/n (BW 20MHz) Channel 06**


Date: 24.APR.2012 11:25:05

**Mode 9 : PSD Plot on 802.11g/n (BW 20MHz) Channel 11**


Date: 24.APR.2012 11:29:12

### 3.6 AC Conducted Emission Measurement

#### 3.6.1 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.

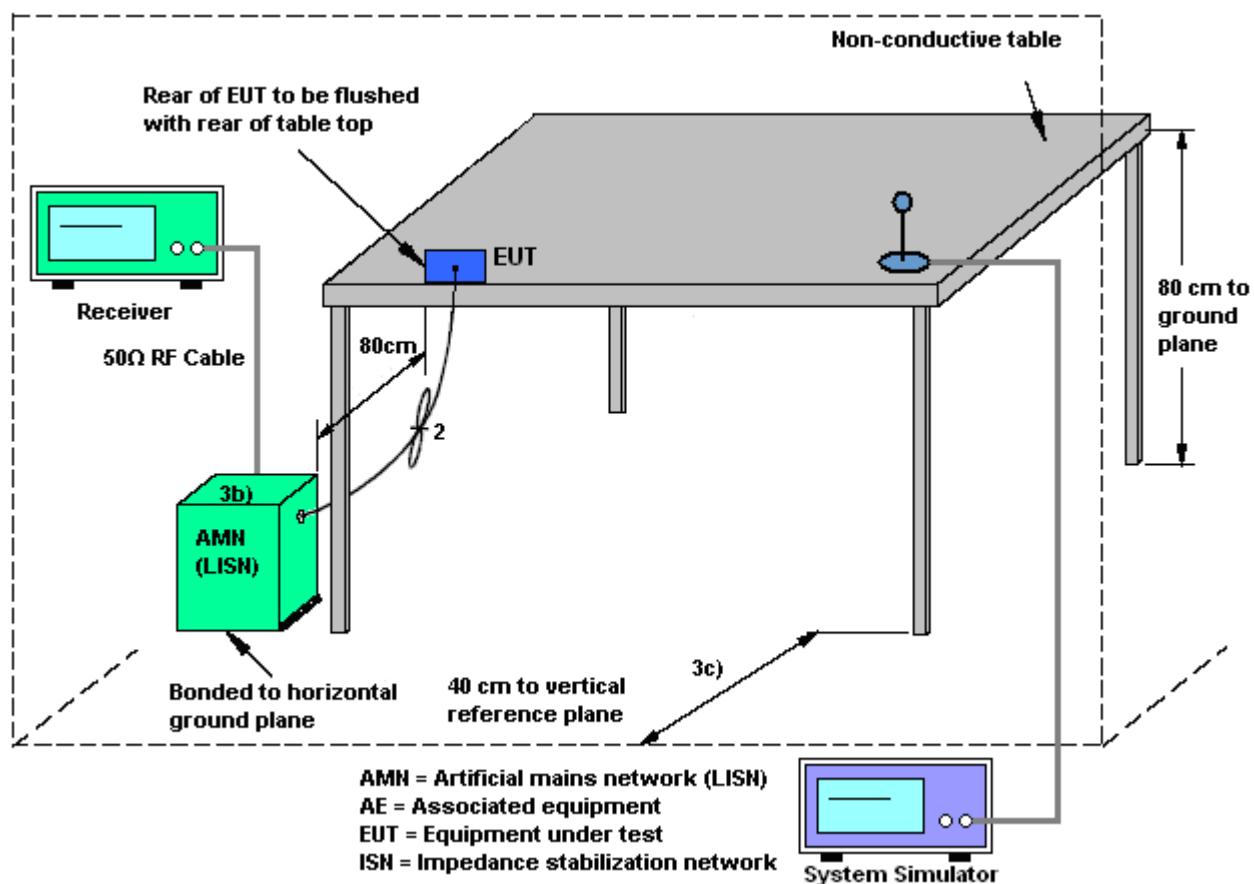
#### 3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.6.3 Test Procedures

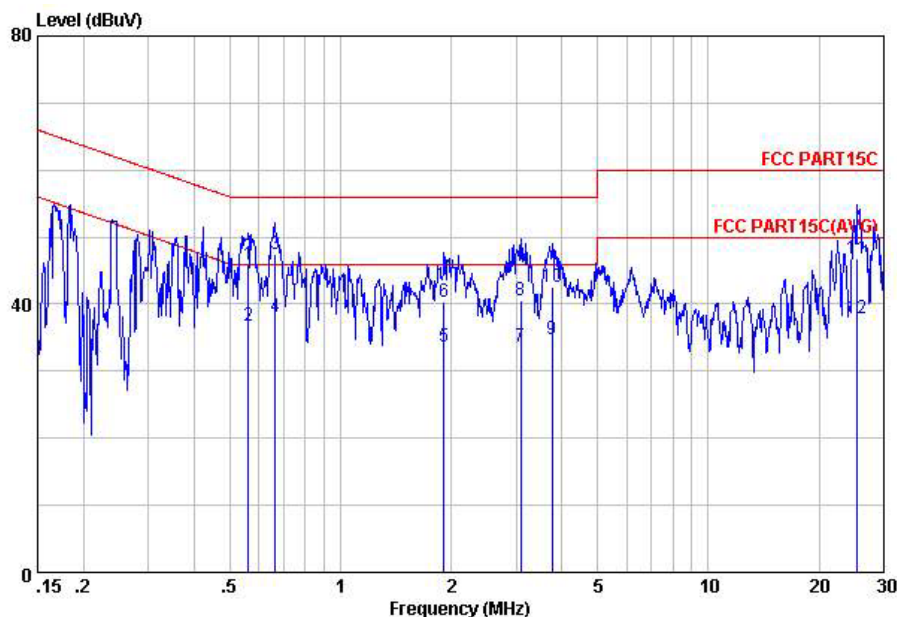
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (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.

### 3.6.4 Test Setup



### 3.6.5 Test Result of AC Conducted Emission

|                        |                                                                                        |                            |        |
|------------------------|----------------------------------------------------------------------------------------|----------------------------|--------|
| <b>Test Mode :</b>     | Mode 1                                                                                 | <b>Temperature :</b>       | 19~20℃ |
| <b>Test Engineer :</b> | Tom Wang                                                                               | <b>Relative Humidity :</b> | 39~40% |
| <b>Test Voltage :</b>  | 120Vac / 60Hz                                                                          | <b>Phase :</b>             | Line   |
| <b>Function Type :</b> | GSM850 Idle + Bluetooth Link + WLAN Link + Adapter 6 + Earphone 1 + Camera + Battery 3 |                            |        |
| <b>Remark :</b>        | All emissions not reported here are more than 10 dB below the prescribed limit.        |                            |        |

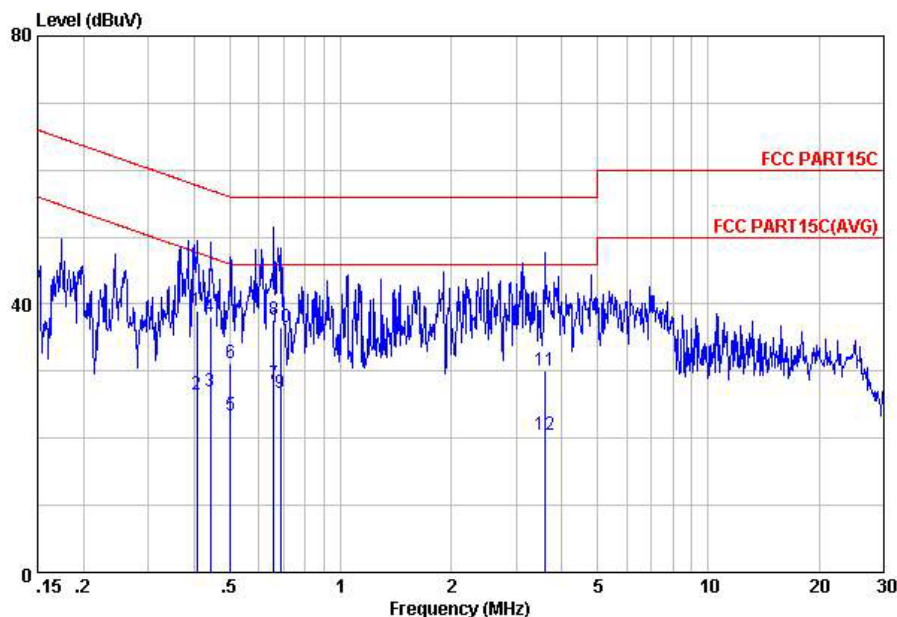


Site : C001-KS  
Condition: FCC PART15C LISN-100807 LINE

mode : Mode 1

|    | Freq  | Level | Over   | Limit | Read  | LISN   | Cable |         |
|----|-------|-------|--------|-------|-------|--------|-------|---------|
|    | MHz   | dBuV  | Limit  | Line  | Level | Factor | Loss  | Remark  |
|    |       |       | dB     | dBuV  | dBuV  | dB     | dB    |         |
| 1  | 0.56  | 45.83 | -10.17 | 56.00 | 35.69 | -0.08  | 10.22 | QP      |
| 2  | 0.56  | 36.83 | -9.17  | 46.00 | 26.69 | -0.08  | 10.22 | Average |
| 3  | 0.66  | 47.54 | -8.46  | 56.00 | 37.40 | -0.09  | 10.23 | QP      |
| 4  | 0.66  | 38.04 | -7.96  | 46.00 | 27.90 | -0.09  | 10.23 | Average |
| 5  | 1.91  | 33.61 | -12.39 | 46.00 | 23.40 | -0.11  | 10.32 | Average |
| 6  | 1.91  | 40.31 | -15.69 | 56.00 | 30.10 | -0.11  | 10.32 | QP      |
| 7  | 3.09  | 33.65 | -12.35 | 46.00 | 23.40 | -0.12  | 10.37 | Average |
| 8  | 3.09  | 40.65 | -15.35 | 56.00 | 30.40 | -0.12  | 10.37 | QP      |
| 9  | 3.76  | 34.76 | -11.24 | 46.00 | 24.51 | -0.13  | 10.38 | Average |
| 10 | 3.76  | 42.46 | -13.54 | 56.00 | 32.21 | -0.13  | 10.38 | QP      |
| 11 | 25.46 | 46.85 | -13.15 | 60.00 | 35.99 | 0.20   | 10.66 | QP      |
| 12 | 25.46 | 37.95 | -12.05 | 50.00 | 27.09 | 0.20   | 10.66 | Average |

|                        |                                                                                        |                            |         |
|------------------------|----------------------------------------------------------------------------------------|----------------------------|---------|
| <b>Test Mode :</b>     | Mode 1                                                                                 | <b>Temperature :</b>       | 19~20°C |
| <b>Test Engineer :</b> | Tom Wang                                                                               | <b>Relative Humidity :</b> | 39~40%  |
| <b>Test Voltage :</b>  | 120Vac / 60Hz                                                                          | <b>Phase :</b>             | Neutral |
| <b>Function Type :</b> | GSM850 Idle + Bluetooth Link + WLAN Link + Adapter 6 + Earphone 1 + Camera + Battery 3 |                            |         |
| <b>Remark :</b>        | All emissions not reported here are more than 10 dB below the prescribed limit.        |                            |         |



Site : C001-KS  
Condition: FCC PART15C LISN-100807 NEUTRAL

mode : Mode 1

|    | Freq | Level | Over   | Limit | Read  | LISN   | Cable | Remark  |
|----|------|-------|--------|-------|-------|--------|-------|---------|
|    | MHz  | dBuV  | Limit  | Line  | Level | Factor | Loss  |         |
|    |      |       | dB     | dBuV  | dBuV  | dB     | dB    |         |
| 1  | 0.41 | 38.91 | -18.82 | 57.73 | 28.80 | -0.08  | 10.19 | QP      |
| 2  | 0.41 | 26.51 | -21.22 | 47.73 | 16.40 | -0.08  | 10.19 | Average |
| 3  | 0.44 | 26.92 | -20.10 | 47.02 | 16.80 | -0.08  | 10.20 | Average |
| 4  | 0.44 | 38.02 | -19.00 | 57.02 | 27.90 | -0.08  | 10.20 | QP      |
| 5  | 0.50 | 23.33 | -22.67 | 46.00 | 13.20 | -0.08  | 10.21 | Average |
| 6  | 0.50 | 31.13 | -24.87 | 56.00 | 21.00 | -0.08  | 10.21 | QP      |
| 7  | 0.66 | 28.05 | -17.95 | 46.00 | 17.90 | -0.08  | 10.23 | Average |
| 8  | 0.66 | 37.75 | -18.25 | 56.00 | 27.60 | -0.08  | 10.23 | QP      |
| 9  | 0.69 | 26.75 | -19.25 | 46.00 | 16.60 | -0.08  | 10.23 | Average |
| 10 | 0.69 | 36.55 | -19.45 | 56.00 | 26.40 | -0.08  | 10.23 | QP      |
| 11 | 3.58 | 30.16 | -25.84 | 56.00 | 19.90 | -0.12  | 10.38 | QP      |
| 12 | 3.58 | 20.46 | -25.54 | 46.00 | 10.20 | -0.12  | 10.38 | Average |

### 3.7 Radiated Emission Measurement

#### 3.7.1 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                                |

#### 3.7.2 Measuring Instruments

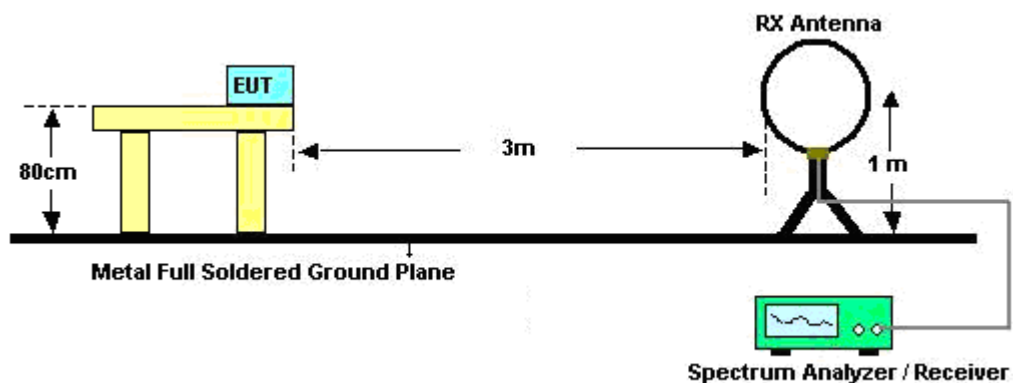
See list of measuring instruments of this test report.

#### 3.7.3 Test Procedures

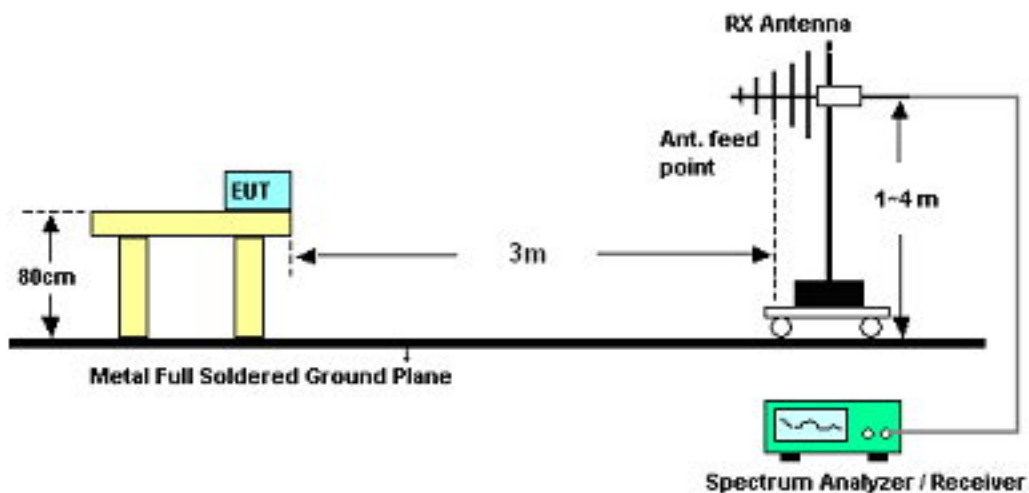
1. Use the following spectrum analyzer settings:
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Set RBW = 1 MHz for  $f \geq 1$  GHz, 100 KHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold;
  - (3) Measurement above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB per decade from 3m to 1m.  
Distance extrapolation factor =  $20 \log (\text{specific distance [3m]} / \text{test distance [1m]})$  (dB)
2. Maximize the emission by rotating the EUT for three orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines in ANSI C63.4-2003.

### 3.7.4 Test Setup

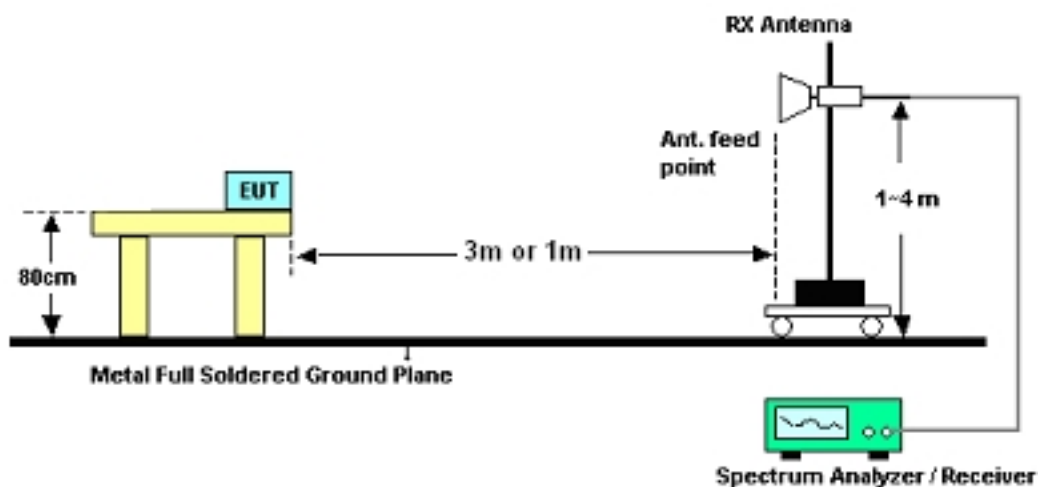
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



### 3.7.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

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

|                        |                                                      |                            |            |
|------------------------|------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 1                                               | <b>Temperature :</b>       | 21~22℃     |
| <b>Test Channel :</b>  | 01                                                   | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2412 MHz is fundamental signal which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 104.69               | 30.22               | -13.28                  | 43.5                        | 48.61                   | 11.15                       | 0.42                    | 29.96                      | -                    | -                       | Peak    |
| 179.38               | 22.75               | -20.75                  | 43.5                        | 43.6                    | 8.47                        | 0.56                    | 29.88                      | -                    | -                       | Peak    |
| 388.9                | 29.57               | -16.43                  | 46                          | 42.84                   | 15.74                       | 0.84                    | 29.85                      | -                    | -                       | Peak    |
| 824.43               | 35.41               | -10.59                  | 46                          | 43.61                   | 20.16                       | 1.26                    | 29.62                      | -                    | -                       | Peak    |
| 878.75               | 28.38               | -17.62                  | 46                          | 36.17                   | 20.47                       | 1.29                    | 29.55                      | -                    | -                       | Peak    |
| 939.86               | 36.09               | -9.91                   | 46                          | 43.6                    | 20.69                       | 1.33                    | 29.53                      | 100                  | 0                       | Peak    |
| 2389.42              | 51.28               | -22.72                  | 74                          | 49                      | 32.86                       | 3.47                    | 34.05                      | 100                  | 360                     | Peak    |
| 2389.42              | 41.58               | -12.42                  | 54                          | 39.3                    | 32.86                       | 3.47                    | 34.05                      | 100                  | 360                     | Average |
| 2412                 | 103.04              | -                       | -                           | 100.71                  | 32.89                       | 3.52                    | 34.08                      | 100                  | 0                       | Peak    |
| 2412                 | 98.47               | -                       | -                           | 96.14                   | 32.89                       | 3.52                    | 34.08                      | 100                  | 0                       | Average |
| 2484.8               | 51.59               | -22.41                  | 74                          | 49.1                    | 33.01                       | 3.68                    | 34.2                       | 100                  | 0                       | Peak    |
| 2484.8               | 39.99               | -14.01                  | 54                          | 37.5                    | 33.01                       | 3.68                    | 34.2                       | 100                  | 0                       | Average |

|                        |                                                      |                            |          |
|------------------------|------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 1                                               | <b>Temperature :</b>       | 21~22℃   |
| <b>Test Channel :</b>  | 01                                                   | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2412 MHz is fundamental signal which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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                   | 25.36               | -14.64                  | 40                          | 37.18                   | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 88.2                 | 22.67               | -20.83                  | 43.5                        | 43.99                   | 8.3                         | 0.38                    | 30                         | -                    | -                       | Peak    |
| 414.12               | 27.35               | -18.65                  | 46                          | 40.25                   | 16.07                       | 0.85                    | 29.82                      | -                    | -                       | Peak    |
| 824.43               | 30.96               | -15.04                  | 46                          | 39.16                   | 20.16                       | 1.26                    | 29.62                      | -                    | -                       | Peak    |
| 895.24               | 31.29               | -14.71                  | 46                          | 39.03                   | 20.45                       | 1.3                     | 29.49                      | -                    | -                       | Peak    |
| 935.98               | 32.31               | -13.69                  | 46                          | 39.85                   | 20.67                       | 1.32                    | 29.53                      | 100                  | 0                       | Peak    |
| 2383.53              | 52.46               | -21.54                  | 74                          | 50.22                   | 32.83                       | 3.42                    | 34.01                      | 100                  | 93                      | Peak    |
| 2383.53              | 43.34               | -10.66                  | 54                          | 41.1                    | 32.83                       | 3.42                    | 34.01                      | 100                  | 93                      | Average |
| 2412                 | 105.35              | -                       | -                           | 103.02                  | 32.89                       | 3.52                    | 34.08                      | 100                  | 95                      | Peak    |
| 2412                 | 101.26              | -                       | -                           | 98.93                   | 32.89                       | 3.52                    | 34.08                      | 100                  | 95                      | Average |
| 2489.17              | 51.36               | -22.64                  | 74                          | 48.82                   | 33.05                       | 3.72                    | 34.23                      | 100                  | 96                      | Peak    |
| 2489.17              | 41.04               | -12.96                  | 54                          | 38.5                    | 33.05                       | 3.72                    | 34.23                      | 100                  | 96                      | Average |

|                        |                                                      |                            |            |
|------------------------|------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 2                                               | <b>Temperature :</b>       | 21~22℃     |
| <b>Test Channel :</b>  | 06                                                   | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2437 MHz is fundamental signal which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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                   | 19.84               | -20.16                  | 40                          | 31.66                   | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 94.99                | 16.58               | -26.92                  | 43.5                        | 36.35                   | 9.8                         | 0.4                     | 29.97                      | -                    | -                       | Peak    |
| 176.47               | 23.34               | -20.16                  | 43.5                        | 43.96                   | 8.71                        | 0.56                    | 29.89                      | -                    | -                       | Peak    |
| 389.87               | 29.81               | -16.19                  | 46                          | 43.05                   | 15.77                       | 0.84                    | 29.85                      | -                    | -                       | Peak    |
| 827.34               | 33.57               | -12.43                  | 46                          | 41.71                   | 20.22                       | 1.27                    | 29.63                      | 100                  | 286                     | Peak    |
| 935.98               | 32.02               | -13.98                  | 46                          | 39.56                   | 20.67                       | 1.32                    | 29.53                      | -                    | -                       | Peak    |
| 2390                 | 49.76               | -24.24                  | 74                          | 47.48                   | 32.86                       | 3.47                    | 34.05                      | 100                  | 210                     | Peak    |
| 2390                 | 38.88               | -15.12                  | 54                          | 36.6                    | 32.86                       | 3.47                    | 34.05                      | 100                  | 210                     | Average |
| 2437                 | 101.94              | -                       | -                           | 99.54                   | 32.95                       | 3.6                     | 34.15                      | 100                  | 200                     | Peak    |
| 2437                 | 96.5                | -                       | -                           | 94.1                    | 32.95                       | 3.6                     | 34.15                      | 100                  | 200                     | Average |
| 2483.5               | 49.03               | -24.97                  | 74                          | 46.54                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 200                     | Peak    |
| 2483.5               | 39.99               | -14.01                  | 54                          | 37.5                    | 33.01                       | 3.68                    | 34.2                       | 100                  | 200                     | Average |

|                        |                                                      |                            |          |
|------------------------|------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 2                                               | <b>Temperature :</b>       | 21~22℃   |
| <b>Test Channel :</b>  | 06                                                   | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2437 MHz is fundamental signal which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 47.46                | 27.43               | -12.57                  | 40                          | 48.79                   | 8.5                         | 0.27                    | 30.13                      | -                    | -                       | Peak    |
| 182.29               | 21.24               | -22.26                  | 43.5                        | 42.15                   | 8.42                        | 0.56                    | 29.89                      | -                    | -                       | Peak    |
| 408.3                | 27.61               | -18.39                  | 46                          | 40.54                   | 16.04                       | 0.85                    | 29.82                      | -                    | -                       | Peak    |
| 824.43               | 33.68               | -12.32                  | 46                          | 41.88                   | 20.16                       | 1.26                    | 29.62                      | -                    | -                       | Peak    |
| 895.24               | 36.2                | -9.8                    | 46                          | 43.94                   | 20.45                       | 1.3                     | 29.49                      | 100                  | 0                       | Peak    |
| 935.98               | 34.58               | -11.42                  | 46                          | 42.12                   | 20.67                       | 1.32                    | 29.53                      | -                    | -                       | Peak    |
| 2390                 | 48.64               | -25.36                  | 74                          | 46.36                   | 32.86                       | 3.47                    | 34.05                      | 100                  | 310                     | Peak    |
| 2390                 | 37.88               | -16.12                  | 54                          | 35.6                    | 32.86                       | 3.47                    | 34.05                      | 100                  | 310                     | Average |
| 2437                 | 101.89              | -                       | -                           | 99.49                   | 32.95                       | 3.6                     | 34.15                      | 100                  | 303                     | Peak    |
| 2437                 | 98.01               | -                       | -                           | 95.61                   | 32.95                       | 3.6                     | 34.15                      | 100                  | 303                     | Average |
| 2483.5               | 49.54               | -24.46                  | 74                          | 47.05                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 300                     | Peak    |
| 2483.5               | 36.92               | -17.08                  | 54                          | 34.43                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 300                     | Average |

|                        |                                                      |                            |            |
|------------------------|------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 3                                               | <b>Temperature :</b>       | 21~22℃     |
| <b>Test Channel :</b>  | 11                                                   | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2462 MHz is fundamental signal which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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                   | 19.79               | -20.21                  | 40                          | 31.61                   | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 175.5                | 22.89               | -20.61                  | 43.5                        | 43.43                   | 8.8                         | 0.55                    | 29.89                      | -                    | -                       | Peak    |
| 390.84               | 30.49               | -15.51                  | 46                          | 43.71                   | 15.79                       | 0.84                    | 29.85                      | -                    | -                       | Peak    |
| 443.22               | 26.51               | -19.49                  | 46                          | 39.14                   | 16.27                       | 0.89                    | 29.79                      | -                    | -                       | Peak    |
| 824.43               | 34.15               | -11.85                  | 46                          | 42.35                   | 20.16                       | 1.26                    | 29.62                      | 100                  | 0                       | Peak    |
| 943.74               | 31.29               | -22.71                  | 54                          | 38.78                   | 20.71                       | 1.33                    | 29.53                      | -                    | -                       | Peak    |
| 2390                 | 49.48               | -24.52                  | 74                          | 47.2                    | 32.86                       | 3.47                    | 34.05                      | 100                  | 260                     | Peak    |
| 2390                 | 36.91               | -17.09                  | 54                          | 34.63                   | 32.86                       | 3.47                    | 34.05                      | 100                  | 260                     | Average |
| 2462                 | 100.53              | -                       | -                           | 98.08                   | 32.98                       | 3.64                    | 34.17                      | 100                  | 260                     | Peak    |
| 2462                 | 95.85               | -                       | -                           | 93.4                    | 32.98                       | 3.64                    | 34.17                      | 100                  | 260                     | Average |
| 2491.45              | 52.37               | -21.63                  | 74                          | 49.83                   | 33.05                       | 3.72                    | 34.23                      | 100                  | 260                     | Peak    |
| 2491.45              | 42.64               | -11.36                  | 54                          | 40.1                    | 33.05                       | 3.72                    | 34.23                      | 100                  | 260                     | Average |

|                        |                                                      |                            |          |
|------------------------|------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 3                                               | <b>Temperature :</b>       | 21~22℃   |
| <b>Test Channel :</b>  | 11                                                   | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2462 MHz is fundamental signal which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 30.97                | 23.44               | -16.56                  | 40                          | 35.98                   | 17.29                       | 0.25                    | 30.08                      | -                    | -                       | Peak    |
| 88.2                 | 21.86               | -21.64                  | 43.5                        | 43.18                   | 8.3                         | 0.38                    | 30                         | -                    | -                       | Peak    |
| 411.21               | 27.03               | -18.97                  | 46                          | 39.95                   | 16.05                       | 0.85                    | 29.82                      | -                    | -                       | Peak    |
| 824.43               | 32.55               | -13.45                  | 46                          | 40.75                   | 20.16                       | 1.26                    | 29.62                      | -                    | -                       | Peak    |
| 899.12               | 33.18               | -12.82                  | 46                          | 40.91                   | 20.45                       | 1.3                     | 29.48                      | -                    | -                       | Peak    |
| 935.98               | 33.36               | -12.64                  | 46                          | 40.9                    | 20.67                       | 1.32                    | 29.53                      | 100                  | 326                     | Peak    |
| 2390                 | 49.27               | -24.73                  | 74                          | 46.99                   | 32.86                       | 3.47                    | 34.05                      | 100                  | 100                     | Peak    |
| 2390                 | 40.4                | -13.6                   | 54                          | 38.12                   | 32.86                       | 3.47                    | 34.05                      | 100                  | 100                     | Average |
| 2462                 | 101.85              | -                       | -                           | 99.4                    | 32.98                       | 3.64                    | 34.17                      | 100                  | 100                     | Peak    |
| 2462                 | 97.48               | -                       | -                           | 95.03                   | 32.98                       | 3.64                    | 34.17                      | 100                  | 100                     | Average |
| 2491.64              | 43.63               | -10.37                  | 54                          | 41.09                   | 33.05                       | 3.72                    | 34.23                      | 100                  | 93                      | Average |
| 2491.64              | 51.5                | -22.5                   | 74                          | 48.96                   | 33.05                       | 3.72                    | 34.23                      | 100                  | 93                      | Peak    |

|                        |                                                      |                            |            |
|------------------------|------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 4                                               | <b>Temperature :</b>       | 21~22℃     |
| <b>Test Channel :</b>  | 01                                                   | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2412 MHz is fundamental signal which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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                   | 20.4                | -19.6                   | 40                          | 32.22                   | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 175.5                | 19.3                | -24.2                   | 43.5                        | 39.84                   | 8.8                         | 0.55                    | 29.89                      | -                    | -                       | Peak    |
| 389.87               | 30.39               | -15.61                  | 46                          | 43.63                   | 15.77                       | 0.84                    | 29.85                      | -                    | -                       | Peak    |
| 431.58               | 27.47               | -18.53                  | 46                          | 40.19                   | 16.2                        | 0.88                    | 29.8                       | -                    | -                       | Peak    |
| 824.43               | 31.69               | -14.31                  | 46                          | 39.89                   | 20.16                       | 1.26                    | 29.62                      | -                    | -                       | Peak    |
| 935.98               | 33.33               | -12.67                  | 46                          | 40.87                   | 20.67                       | 1.32                    | 29.53                      | 100                  | 0                       | Peak    |
| 2390                 | 56.08               | -17.92                  | 74                          | 53.8                    | 32.86                       | 3.47                    | 34.05                      | 104                  | 268                     | Peak    |
| 2390                 | 44.38               | -9.62                   | 54                          | 42.1                    | 32.86                       | 3.47                    | 34.05                      | 104                  | 268                     | Average |
| 2412                 | 101.48              | -                       | -                           | 99.15                   | 32.89                       | 3.52                    | 34.08                      | 100                  | 108                     | Peak    |
| 2412                 | 88.17               | -                       | -                           | 85.84                   | 32.89                       | 3.52                    | 34.08                      | 100                  | 108                     | Average |
| 2483.5               | 48.34               | -25.66                  | 74                          | 45.85                   | 33.01                       | 3.68                    | 34.2                       | 103                  | 260                     | Peak    |
| 2483.5               | 37.39               | -16.61                  | 54                          | 34.9                    | 33.01                       | 3.68                    | 34.2                       | 103                  | 260                     | Average |

|                        |                                                      |                            |          |
|------------------------|------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 4                                               | <b>Temperature :</b>       | 21~22℃   |
| <b>Test Channel :</b>  | 01                                                   | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2412 MHz is fundamental signal which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 30.97                | 22.54               | -17.46                  | 40                          | 35.08                   | 17.29                       | 0.25                    | 30.08                      | -                    | -                       | Peak    |
| 88.2                 | 21.77               | -21.73                  | 43.5                        | 43.09                   | 8.3                         | 0.38                    | 30                         | -                    | -                       | Peak    |
| 172.59               | 17.77               | -25.73                  | 43.5                        | 38.11                   | 9.01                        | 0.55                    | 29.9                       | -                    | -                       | Peak    |
| 410.24               | 26.06               | -19.94                  | 46                          | 38.98                   | 16.05                       | 0.85                    | 29.82                      | -                    | -                       | Peak    |
| 824.43               | 32.88               | -13.12                  | 46                          | 41.08                   | 20.16                       | 1.26                    | 29.62                      | 100                  | 109                     | Peak    |
| 944.71               | 32.58               | -21.42                  | 54                          | 40.08                   | 20.71                       | 1.33                    | 29.54                      | -                    | -                       | Peak    |
| 2390                 | 53.32               | -20.68                  | 74                          | 51.04                   | 32.86                       | 3.47                    | 34.05                      | 100                  | 0                       | Peak    |
| 2390                 | 43.08               | -10.92                  | 54                          | 40.8                    | 32.86                       | 3.47                    | 34.05                      | 100                  | 0                       | Average |
| 2412                 | 101.24              | -                       | -                           | 98.91                   | 32.89                       | 3.52                    | 34.08                      | 100                  | 0                       | Peak    |
| 2412                 | 89.97               | -                       | -                           | 87.64                   | 32.89                       | 3.52                    | 34.08                      | 100                  | 0                       | Average |
| 2483.5               | 37.69               | -16.31                  | 54                          | 35.2                    | 33.01                       | 3.68                    | 34.2                       | 100                  | 0                       | Average |
| 2483.5               | 48.55               | -25.45                  | 74                          | 46.06                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 0                       | Peak    |

|                        |                                                      |                            |            |
|------------------------|------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 5                                               | <b>Temperature :</b>       | 21~22℃     |
| <b>Test Channel :</b>  | 06                                                   | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2437 MHz is fundamental signal which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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                   | 20.77               | -19.23                  | 40                          | 32.59                   | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 175.5                | 19.43               | -24.07                  | 43.5                        | 39.97                   | 8.8                         | 0.55                    | 29.89                      | -                    | -                       | Peak    |
| 386.96               | 29.48               | -16.52                  | 46                          | 42.81                   | 15.68                       | 0.84                    | 29.85                      | -                    | -                       | Peak    |
| 454.86               | 25.58               | -20.42                  | 46                          | 38.11                   | 16.36                       | 0.9                     | 29.79                      | -                    | -                       | Peak    |
| 837.04               | 35.32               | -10.68                  | 46                          | 43.33                   | 20.37                       | 1.27                    | 29.65                      | 100                  | 0                       | Peak    |
| 943.74               | 32.44               | -21.56                  | 54                          | 39.93                   | 20.71                       | 1.33                    | 29.53                      | -                    | -                       | Peak    |
| 2344.39              | 50.09               | -23.91                  | 74                          | 47.92                   | 32.78                       | 3.33                    | 33.94                      | 100                  | 10                      | Peak    |
| 2344.39              | 36.46               | -17.54                  | 54                          | 34.29                   | 32.78                       | 3.33                    | 33.94                      | 100                  | 10                      | Average |
| 2437                 | 99.42               | -                       | -                           | 97.02                   | 32.95                       | 3.6                     | 34.15                      | 100                  | 18                      | Peak    |
| 2437                 | 87.03               | -                       | -                           | 84.63                   | 32.95                       | 3.6                     | 34.15                      | 100                  | 18                      | Average |
| 2486.51              | 50.33               | -23.67                  | 74                          | 47.84                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 0                       | Peak    |
| 2486.51              | 37.65               | -16.35                  | 54                          | 35.16                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 0                       | Average |

|                        |                                                      |                            |          |
|------------------------|------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 5                                               | <b>Temperature :</b>       | 21~22℃   |
| <b>Test Channel :</b>  | 06                                                   | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2437 MHz is fundamental signal which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 41.64                | 30.42               | -9.58                   | 40                          | 49.29                   | 10.95                       | 0.26                    | 30.08                      | 100                  | 0                       | Peak    |
| 88.2                 | 22.5                | -21                     | 43.5                        | 43.82                   | 8.3                         | 0.38                    | 30                         | -                    | -                       | Peak    |
| 389.87               | 25.72               | -20.28                  | 46                          | 38.96                   | 15.77                       | 0.84                    | 29.85                      | -                    | -                       | Peak    |
| 550.89               | 21.73               | -24.27                  | 46                          | 31.91                   | 18.5                        | 1                       | 29.68                      | -                    | -                       | Peak    |
| 837.04               | 26.04               | -19.96                  | 46                          | 34.05                   | 20.37                       | 1.27                    | 29.65                      | -                    | -                       | Peak    |
| 943.74               | 33.05               | -20.95                  | 54                          | 40.54                   | 20.71                       | 1.33                    | 29.53                      | -                    | -                       | Peak    |
| 2344.58              | 50.36               | -23.64                  | 74                          | 48.19                   | 32.78                       | 3.33                    | 33.94                      | 100                  | 110                     | Peak    |
| 2344.58              | 36.73               | -17.27                  | 54                          | 34.56                   | 32.78                       | 3.33                    | 33.94                      | 100                  | 110                     | Average |
| 2437                 | 98.05               | -                       | -                           | 95.65                   | 32.95                       | 3.6                     | 34.15                      | 100                  | 23                      | Peak    |
| 2437                 | 84.55               | -                       | -                           | 82.15                   | 32.95                       | 3.6                     | 34.15                      | 100                  | 23                      | Average |
| 2492.4               | 49.84               | -24.16                  | 74                          | 47.3                    | 33.05                       | 3.72                    | 34.23                      | 100                  | 209                     | Peak    |
| 2492.4               | 37.16               | -16.84                  | 54                          | 34.62                   | 33.05                       | 3.72                    | 34.23                      | 100                  | 209                     | Average |

|                        |                                                      |                            |            |
|------------------------|------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 6                                               | <b>Temperature :</b>       | 21~22℃     |
| <b>Test Channel :</b>  | 11                                                   | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2462 MHz is fundamental signal which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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                   | 20.91               | -19.09                  | 40                          | 32.73                   | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 169.68               | 19.25               | -24.25                  | 43.5                        | 39.42                   | 9.2                         | 0.54                    | 29.91                      | -                    | -                       | Peak    |
| 386.96               | 29.45               | -16.55                  | 46                          | 42.78                   | 15.68                       | 0.84                    | 29.85                      | -                    | -                       | Peak    |
| 422.85               | 27.78               | -18.22                  | 46                          | 40.59                   | 16.13                       | 0.87                    | 29.81                      | -                    | -                       | Peak    |
| 837.04               | 26.68               | -19.32                  | 46                          | 34.69                   | 20.37                       | 1.27                    | 29.65                      | -                    | -                       | Peak    |
| 935.98               | 34.66               | -11.34                  | 46                          | 42.2                    | 20.67                       | 1.32                    | 29.53                      | 100                  | 0                       | Peak    |
| 2390                 | 50.33               | -23.67                  | 74                          | 48.05                   | 32.86                       | 3.47                    | 34.05                      | 100                  | 0                       | Peak    |
| 2390                 | 36.79               | -17.21                  | 54                          | 34.51                   | 32.86                       | 3.47                    | 34.05                      | 100                  | 0                       | Average |
| 2462                 | 100.12              | -                       | -                           | 97.67                   | 32.98                       | 3.64                    | 34.17                      | 100                  | 261                     | Peak    |
| 2462                 | 87.57               | -                       | -                           | 85.12                   | 32.98                       | 3.64                    | 34.17                      | 100                  | 261                     | Average |
| 2487.46              | 58.86               | -15.14                  | 74                          | 56.37                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 113                     | Peak    |
| 2487.46              | 41.15               | -12.85                  | 54                          | 38.66                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 113                     | Average |

|                        |                                                      |                            |          |
|------------------------|------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 6                                               | <b>Temperature :</b>       | 21~22℃   |
| <b>Test Channel :</b>  | 11                                                   | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2462 MHz is fundamental signal which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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                   | 22.79               | -17.21                  | 40                          | 34.61                   | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 88.2                 | 22.68               | -20.82                  | 43.5                        | 44                      | 8.3                         | 0.38                    | 30                         | -                    | -                       | Peak    |
| 411.21               | 26.05               | -19.95                  | 46                          | 38.97                   | 16.05                       | 0.85                    | 29.82                      | -                    | -                       | Peak    |
| 717.73               | 21.97               | -24.03                  | 46                          | 31                      | 19.49                       | 1.15                    | 29.67                      | -                    | -                       | Peak    |
| 837.04               | 30.95               | -15.05                  | 46                          | 38.96                   | 20.37                       | 1.27                    | 29.65                      | 100                  | 52                      | Peak    |
| 944.71               | 33.77               | -20.23                  | 54                          | 41.27                   | 20.71                       | 1.33                    | 29.54                      | -                    | -                       | Peak    |
| 2366.81              | 50.57               | -23.43                  | 74                          | 48.36                   | 32.81                       | 3.38                    | 33.98                      | 100                  | 0                       | Peak    |
| 2366.81              | 36.52               | -17.48                  | 54                          | 34.31                   | 32.81                       | 3.38                    | 33.98                      | 100                  | 0                       | Average |
| 2462                 | 97.15               | -                       | -                           | 94.7                    | 32.98                       | 3.64                    | 34.17                      | 100                  | 19                      | Peak    |
| 2462                 | 84.3                | -                       | -                           | 81.85                   | 32.98                       | 3.64                    | 34.17                      | 100                  | 19                      | Average |
| 2483.5               | 56.01               | -17.99                  | 74                          | 53.52                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 206                     | Peak    |
| 2483.5               | 39.85               | -14.15                  | 54                          | 37.36                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 206                     | Average |

|                        |                                                      |                            |            |
|------------------------|------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 7                                               | <b>Temperature :</b>       | 21~22℃     |
| <b>Test Channel :</b>  | 01                                                   | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2412 MHz is fundamental signal which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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                   | 20.57               | -19.43                  | 40                          | 32.39                   | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 97.9                 | 17.85               | -25.65                  | 43.5                        | 37.26                   | 10.15                       | 0.41                    | 29.97                      | -                    | -                       | Peak    |
| 386.96               | 29.04               | -16.96                  | 46                          | 42.37                   | 15.68                       | 0.84                    | 29.85                      | -                    | -                       | Peak    |
| 717.73               | 22.14               | -23.86                  | 46                          | 31.17                   | 19.49                       | 1.15                    | 29.67                      | -                    | -                       | Peak    |
| 837.04               | 36.8                | -9.2                    | 46                          | 44.81                   | 20.37                       | 1.27                    | 29.65                      | 100                  | 32                      | Peak    |
| 935.98               | 34.13               | -11.87                  | 46                          | 41.67                   | 20.67                       | 1.32                    | 29.53                      | -                    | -                       | Peak    |
| 2390                 | 57.39               | -16.61                  | 74                          | 55.11                   | 32.86                       | 3.47                    | 34.05                      | 100                  | 29                      | Peak    |
| 2390                 | 40.79               | -13.21                  | 54                          | 38.51                   | 32.86                       | 3.47                    | 34.05                      | 100                  | 29                      | Average |
| 2412                 | 100.9               | -                       | -                           | 98.57                   | 32.89                       | 3.52                    | 34.08                      | 100                  | 186                     | Peak    |
| 2412                 | 87.94               | -                       | -                           | 85.61                   | 32.89                       | 3.52                    | 34.08                      | 100                  | 186                     | Average |
| 2484.99              | 49.8                | -24.2                   | 74                          | 47.31                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 0                       | Peak    |
| 2484.99              | 37.12               | -16.88                  | 54                          | 34.63                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 0                       | Average |

|                        |                                                      |                            |          |
|------------------------|------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 7                                               | <b>Temperature :</b>       | 21~22℃   |
| <b>Test Channel :</b>  | 01                                                   | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2412 MHz is fundamental signal which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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                   | 23.32               | -16.68                  | 40                          | 35.14                   | 18                          | 0.26                    | 30.08                      |                      |                         | Peak    |
| 113.42               | 26.67               | -16.83                  | 43.5                        | 44.4                    | 11.8                        | 0.44                    | 29.97                      |                      |                         | Peak    |
| 265.71               | 23.21               | -22.79                  | 46                          | 40.14                   | 12.27                       | 0.68                    | 29.88                      |                      |                         | Peak    |
| 401.51               | 26.29               | -19.71                  | 46                          | 39.27                   | 16.01                       | 0.84                    | 29.83                      |                      |                         | Peak    |
| 849.65               | 35.32               | -10.68                  | 46                          | 43.19                   | 20.51                       | 1.28                    | 29.66                      | 100                  | 201                     | Peak    |
| 935.98               | 34.19               | -11.81                  | 46                          | 41.73                   | 20.67                       | 1.32                    | 29.53                      |                      |                         | Peak    |
| 2390                 | 54.08               | -19.92                  | 74                          | 51.8                    | 32.86                       | 3.47                    | 34.05                      | 100                  | 0                       | Peak    |
| 2390                 | 39.46               | -14.54                  | 54                          | 37.18                   | 32.86                       | 3.47                    | 34.05                      | 100                  | 0                       | Average |
| 2412                 | 96.68               | -                       | -                           | 94.35                   | 32.89                       | 3.52                    | 34.08                      | 100                  | 209                     | Peak    |
| 2412                 | 83.93               | -                       | -                           | 81.6                    | 32.89                       | 3.52                    | 34.08                      | 100                  | 209                     | Average |
| 2491.45              | 50.27               | -23.73                  | 74                          | 47.73                   | 33.05                       | 3.72                    | 34.23                      | 100                  | 63                      | Peak    |
| 2491.45              | 37.05               | -16.95                  | 54                          | 34.51                   | 33.05                       | 3.72                    | 34.23                      | 100                  | 63                      | Average |

|                        |                                                      |                            |            |
|------------------------|------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 8                                               | <b>Temperature :</b>       | 21~22℃     |
| <b>Test Channel :</b>  | 06                                                   | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2437 MHz is fundamental signal which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 88.2                 | 23.04               | -20.46                  | 43.5                        | 44.36                   | 8.3                         | 0.38                    | 30                         | -                    | -                       | Peak    |
| 113.42               | 26.67               | -16.83                  | 43.5                        | 44.4                    | 11.8                        | 0.44                    | 29.97                      | -                    | -                       | Peak    |
| 265.71               | 23.21               | -22.79                  | 46                          | 40.14                   | 12.27                       | 0.68                    | 29.88                      | -                    | -                       | Peak    |
| 401.51               | 26.29               | -19.71                  | 46                          | 39.27                   | 16.01                       | 0.84                    | 29.83                      | -                    | -                       | Peak    |
| 837.04               | 41.16               | -4.84                   | 46                          | 49.17                   | 20.37                       | 1.27                    | 29.65                      | 100                  | 0                       | Peak    |
| 935.98               | 34.19               | -11.81                  | 46                          | 41.73                   | 20.67                       | 1.32                    | 29.53                      | -                    | -                       | Peak    |
| 2372.13              | 50.42               | -23.58                  | 74                          | 48.18                   | 32.83                       | 3.42                    | 34.01                      | 100                  | 91                      | Peak    |
| 2372.13              | 36.89               | -17.11                  | 54                          | 34.65                   | 32.83                       | 3.42                    | 34.01                      | 100                  | 91                      | Average |
| 2437                 | 101.49              | -                       | -                           | 99.09                   | 32.95                       | 3.6                     | 34.15                      | 100                  | 188                     | Peak    |
| 2437                 | 89.25               | -                       | -                           | 86.85                   | 32.95                       | 3.6                     | 34.15                      | 100                  | 188                     | Average |
| 2487.65              | 50.86               | -23.14                  | 74                          | 48.32                   | 33.05                       | 3.72                    | 34.23                      | 100                  | 101                     | Peak    |
| 2487.65              | 37.37               | -16.63                  | 54                          | 34.83                   | 33.05                       | 3.72                    | 34.23                      | 100                  | 101                     | Average |

|                        |                                                      |                            |          |
|------------------------|------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 8                                               | <b>Temperature :</b>       | 21~22℃   |
| <b>Test Channel :</b>  | 06                                                   | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2437 MHz is fundamental signal which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 52.31                | 26.63               | -13.37                  | 40                          | 49.46                   | 7.01                        | 0.29                    | 30.13                      | -                    | -                       | Peak    |
| 88.2                 | 21.7                | -21.8                   | 43.5                        | 43.02                   | 8.3                         | 0.38                    | 30                         | -                    | -                       | Peak    |
| 175.5                | 18.44               | -25.06                  | 43.5                        | 38.98                   | 8.8                         | 0.55                    | 29.89                      | -                    | -                       | Peak    |
| 404.42               | 25.76               | -20.24                  | 46                          | 38.73                   | 16.02                       | 0.84                    | 29.83                      | -                    | -                       | Peak    |
| 849.65               | 30.17               | -15.83                  | 46                          | 38.04                   | 20.51                       | 1.28                    | 29.66                      | -                    | -                       | Peak    |
| 935.98               | 33.49               | -12.51                  | 46                          | 41.03                   | 20.67                       | 1.32                    | 29.53                      | 100                  | 0                       | Peak    |
| 2334.7               | 49.96               | -24.04                  | 74                          | 47.79                   | 32.78                       | 3.33                    | 33.94                      | 100                  | 18                      | Peak    |
| 2334.7               | 36.98               | -17.02                  | 54                          | 34.81                   | 32.78                       | 3.33                    | 33.94                      | 100                  | 18                      | Average |
| 2437                 | 95.34               | -                       | -                           | 92.94                   | 32.95                       | 3.6                     | 34.15                      | 100                  | 116                     | Peak    |
| 2437                 | 82.75               | -                       | -                           | 80.35                   | 32.95                       | 3.6                     | 34.15                      | 100                  | 116                     | Average |
| 2496.58              | 49.94               | -24.06                  | 74                          | 47.4                    | 33.05                       | 3.72                    | 34.23                      | 100                  | 206                     | Peak    |
| 2496.58              | 37.07               | -16.93                  | 54                          | 34.53                   | 33.05                       | 3.72                    | 34.23                      | 100                  | 206                     | Average |

|                        |                                                      |                            |            |
|------------------------|------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 9                                               | <b>Temperature :</b>       | 21~22℃     |
| <b>Test Channel :</b>  | 11                                                   | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 2462 MHz is fundamental signal which can be ignored. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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                   | 20.09               | -19.91                  | 40                          | 31.91                   | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 95.96                | 17.84               | -25.66                  | 43.5                        | 37.5                    | 9.91                        | 0.4                     | 29.97                      | -                    | -                       | Peak    |
| 392.78               | 29.64               | -16.36                  | 46                          | 42.8                    | 15.84                       | 0.84                    | 29.84                      | -                    | -                       | Peak    |
| 425.76               | 27.46               | -18.54                  | 46                          | 40.24                   | 16.16                       | 0.87                    | 29.81                      | -                    | -                       | Peak    |
| 849.65               | 31                  | -15                     | 46                          | 38.87                   | 20.51                       | 1.28                    | 29.66                      | -                    | -                       | Peak    |
| 935.98               | 33.59               | -12.41                  | 46                          | 41.13                   | 20.67                       | 1.32                    | 29.53                      | 100                  | 0                       | Peak    |
| 2385.62              | 50.49               | -23.51                  | 74                          | 48.21                   | 32.86                       | 3.47                    | 34.05                      | 100                  | 201                     | Peak    |
| 2385.62              | 36.91               | -17.09                  | 54                          | 34.63                   | 32.86                       | 3.47                    | 34.05                      | 100                  | 201                     | Average |
| 2462                 | 99.29               | -                       | -                           | 96.84                   | 32.98                       | 3.64                    | 34.17                      | 100                  | 166                     | Peak    |
| 2462                 | 86.76               | -                       | -                           | 84.31                   | 32.98                       | 3.64                    | 34.17                      | 100                  | 166                     | Average |
| 2483.5               | 55.06               | -18.94                  | 74                          | 52.57                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 305                     | Peak    |
| 2483.5               | 40.21               | -13.79                  | 54                          | 37.72                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 305                     | Average |

|                        |                                                      |                            |          |
|------------------------|------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 9                                               | <b>Temperature :</b>       | 21~22℃   |
| <b>Test Channel :</b>  | 11                                                   | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Chenmy Cheng                                         | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 2462 MHz is fundamental signal which can be ignored. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | 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                   | 21.98               | -18.02                  | 40                          | 33.8                    | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 88.2                 | 22.07               | -21.43                  | 43.5                        | 43.39                   | 8.3                         | 0.38                    | 30                         | -                    | -                       | Peak    |
| 175.5                | 17.38               | -26.12                  | 43.5                        | 37.92                   | 8.8                         | 0.55                    | 29.89                      | -                    | -                       | Peak    |
| 398.6                | 24.62               | -21.38                  | 46                          | 37.63                   | 15.98                       | 0.84                    | 29.83                      | -                    | -                       | Peak    |
| 849.65               | 29.42               | -16.58                  | 46                          | 37.29                   | 20.51                       | 1.28                    | 29.66                      | 100                  | 0                       | Peak    |
| 944.71               | 33.53               | -20.47                  | 54                          | 41.03                   | 20.71                       | 1.33                    | 29.54                      | -                    | -                       | Peak    |
| 2388.47              | 50.17               | -23.83                  | 74                          | 47.89                   | 32.86                       | 3.47                    | 34.05                      | 100                  | 0                       | Peak    |
| 2388.47              | 36.63               | -17.37                  | 54                          | 34.35                   | 32.86                       | 3.47                    | 34.05                      | 100                  | 0                       | Average |
| 2462                 | 96.08               | -                       | -                           | 93.63                   | 32.98                       | 3.64                    | 34.17                      | 100                  | 281                     | Peak    |
| 2462                 | 83.32               | -                       | -                           | 80.87                   | 32.98                       | 3.64                    | 34.17                      | 100                  | 281                     | Average |
| 2483.5               | 53.94               | -20.06                  | 74                          | 51.45                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 20                      | Peak    |
| 2483.5               | 39.36               | -14.64                  | 54                          | 36.87                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 20                      | Average |

## 3.8 Antenna Requirements

### 3.8.1 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.

### 3.8.2 Antenna Connected Construction

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

### 3.8.3 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 | Test Date                     | Due Date      | Remark                |
|---------------------------|--------------|-----------|--------------|-----------------|------------------|-------------------------------|---------------|-----------------------|
| Spectrum Analyzer         | R&S          | FSP40     | 100319       | 9kHz~40GHz      | Dec. 30, 2011    | Apr. 24, 2012 ~ Apr. 27, 2012 | Dec. 29, 2012 | Conducted (TH01-KS)   |
| Power Meter               | Agilent      | E4416A    | MY45101555   | N/A             | Aug. 23, 2011    | Apr. 24, 2012 ~ Apr. 27, 2012 | Aug. 22, 2012 | Conducted (TH01-KS)   |
| Power Sensor              | Agilent      | E9327A    | MY44421198   | N/A             | Aug. 23, 2011    | Apr. 24, 2012 ~ Apr. 27, 2012 | Aug. 22, 2012 | Conducted (TH01-KS)   |
| DC Power Supply           | GWINSTEK     | GPS-3030D | E1884515     | N/A             | Aug. 23, 2011    | Apr. 24, 2012 ~ Apr. 27, 2012 | Aug. 22, 2012 | Conducted (TH01-KS)   |
| EMI Receiver              | R&S          | ESCI7     | 100768       | 9kHz~7GHz       | Jun. 02, 2011    | Apr. 20, 2012                 | Jun. 01, 2012 | Conduction (CO01-KS)  |
| LISN                      | MessTec      | AN3016    | 60103        | 9kHz~30MHz      | Dec. 30, 2011    | Apr. 20, 2012                 | Dec. 29, 2012 | Conduction (CO01-KS)  |
| LISN                      | MessTec      | AN3016    | 60105        | 9kHz~30MHz      | Dec. 30, 2011    | Apr. 20, 2012                 | Dec. 29, 2012 | Conduction (CO01-KS)  |
| AC Power Source           | Chroma       | 61602     | ABP000000811 | N/A             | Nov. 16, 2011    | Apr. 20, 2012                 | Nov. 15, 2012 | Conduction (CO01-KS)  |
| System Simulator          | R&S          | CMU200    | 837587/066   | Full-Band       | Dec. 30, 2011    | Apr. 20, 2012                 | Dec. 29, 2012 | Conduction (CO01-KS)  |
| EMI Test Receiver         | R&S          | ESCI      | 100534       | 9kHz~3GHz       | Nov. 09, 2011    | Apr. 27, 2012                 | Nov. 08, 2012 | Radiation (03CH01-KS) |
| Spectrum Analyzer         | R&S          | FSP40     | 100319       | 9kHz~40GHz      | Dec. 30, 2011    | Apr. 27, 2012                 | Dec. 29, 2012 | Radiation (03CH01-KS) |
| Bilog Antenna             | SCHAFFNER    | CBL6112D  | 23182        | 25MHz~2GHz      | Dec. 08, 2011    | Apr. 27, 2012                 | Dec. 07, 2012 | Radiation (03CH01-KS) |
| Loop Antenna              | R&S          | HFH2-Z2   | 860004/00    | 9 kHz~30 MHz    | Jul. 28, 2011    | Apr. 27, 2012                 | Jul. 27, 2012 | Radiation (03CH01-KS) |
| Double Ridge Horn Antenna | EMCO         | 3117      | 00075959     | 1GHz~18GHz      | Jan. 06, 2012    | Apr. 27, 2012                 | Jan. 05, 2013 | Radiation (03CH01-KS) |
| Amplifier                 | Wireless     | FPA-6592G | 060004       | 30MHz~2GHz      | Dec. 30, 2011    | Apr. 27, 2012                 | Dec. 29, 2012 | Radiation (03CH01-KS) |
| Amplifier                 | Agilent      | 8449B     | 3008A02370   | 1GHz~26.5GHz    | Dec. 30, 2011    | Apr. 27, 2012                 | Dec. 29, 2012 | Radiation (03CH01-KS) |
| Active Horn Antenna       | com-power    | AHA-118   | 701023       | 1GHz~18GHz      | Nov. 07, 2011    | Apr. 27, 2012                 | Nov. 06, 2012 | Radiation (03CH01-KS) |
| SHF-EHF Horn              | Schwarzbeck  | BBHA 9170 | BBHA170249   | 15GHz~40GHz     | Oct. 11, 2011    | Apr. 27, 2012                 | Oct.10, 2012  | Radiation (03CH01-KS) |

## 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>          |                          |          |       |                |