



# FCC RF Test Report

**APPLICANT** : Motorola Mobility, Inc.  
**EQUIPMENT** : GSM / EGPRS Mobile Phone  
**BRAND NAME** : Motorola  
**MODEL NAME / MARKETING NAME** : EX505 / MOTOGO! Slim with 3-CHIP  
**GPPD NUMBER** : 3413  
**FCC ID** : IHDT56NW2  
**STANDARD** : FCC Part 15 Subpart C §15.247  
**CLASSIFICATION** : (DTS) Digital Transmission System

The product was received on May 18, 2012 and completely tested on Jul. 17, 2012. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures 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:

Jones Tsai / Manager



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



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### SUMMARY OF TEST RESULT

| Report Section | FCC Rule           | IC Rule   | Description                 | Limit                          | Result | Remark                              |
|----------------|--------------------|-----------|-----------------------------|--------------------------------|--------|-------------------------------------|
| 3.1            | 15.247(a)(2)       | A8.2(a)   | 6dB Bandwidth               | $\geq 0.5\text{MHz}$           | Pass   | -                                   |
| 3.2            | 15.247(b)          | A8.4      | Power Output Measurement    | $\leq 30\text{dBm}$            | Pass   | -                                   |
| 3.3            | 15.247(e)          | A8.2(b)   | Power Spectral Density      | $\leq 8\text{dBm}/3\text{kHz}$ | Pass   | -                                   |
| 3.4            | 15.247(d)          | A8.5      | Conducted Band Edges        | $\leq 20\text{dBc}$            | Pass   | -                                   |
|                |                    |           | Conducted Spurious Emission |                                | Pass   | -                                   |
| 3.5            | 15.247(d)          | A8.5      | Radiated Band Edges         | 15.209(a) & 15.247(d)          | Pass   | -                                   |
|                |                    |           | Radiated Spurious Emission  |                                | Pass   | Under limit 3.67 dB at 2484.800 MHz |
| 3.6            | 15.207             | Gen 7.2.4 | AC Conducted Emission       | 15.207(a)                      | Pass   | Under limit 20.96 dB at 2.780 MHz   |
| 3.7            | 15.203 & 15.247(b) | A8.4      | Antenna Requirement         | N/A                            | Pass   | -                                   |

# 1 General Description

## 1.1 Applicant

**Motorola Mobility, Inc.**

No. 1, Wang Jing East Road, Chao Yang District, Beijing, 100102, P. R. China

## 1.2 Manufacturer

**Arima Communications Corp.**

6F., No. 866, Jhongjheng Rd., Jhonghe Dist., New Taipei City 23586, Taiwan

## 1.3 Feature of Equipment Under Test

| Product Feature                 |   |
|---------------------------------|---|
| Equipment                       | GSM / EGPRS Mobile Phone                            |
| Brand Name                      | Motorola  |
| Model Name / Marketing Name     | EX505 / MOTOGO! SLIM WITH 3-CHIP                    |
| FCC ID                          | IHDT56NW2   |
| EUT supports Radios application | GSM / EGPRS (Downlink Only) / WLAN 11bg / Bluetooth |
| HW Version                      | P2 for TA   |
| SW Version                      | JINQ_G_07.23.00RDT                                  |
| 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.

| Product Specification subjective to this standard |  |
|---|--|
| 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   |
| Maximum Output Power to Antenna                   | 802.11b : 19.95 dBm (0.0989 W)<br>802.11g : 23.18 dBm (0.2080 W)                   |
| Antenna Type                                      | IFA Antenna with gain -0.25 dBi  |
| Type of Modulation                                | 802.11b : DSSS (BPSK / QPSK / CCK)<br>802.11g : OFDM (BPSK / QPSK / 16QAM / 64QAM) |

## 1.4 Testing Site

|                           |  |         |           |                                |
|---------------------------|--|---------|-----------|--------------------------------|
| <b>Test Site</b>          | SPORTON INTERNATIONAL (KUNSHAN) INC.   |         |           |                                |
| <b>Test Site Location</b> | No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.<br>TEL: +86-0512-5790-0158<br>FAX: +86-0512-5790-0958 |         |           |                                |
| <b>Test Site No.</b>      | <b>Sporton Site No.</b>  |         |           | <b>FCC/IC Registration No.</b> |
|                           | 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
- ♦ FCC TCB Workshop 2012, April
- ♦ ANSI C63.4-2003 and ANSI C63.10-2009
- ♦ IC RSS-210 Issue 8
- ♦ IC RSS-Gen Issue 3

### 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        | CMU 200    | N/A         | N/A        | Unshielded, 1.8 m  |
| 2.   | DC Power Supply    | GWINSTEK   | GPS-3030D  | N/A         | N/A        | Unshielded, 1.8 m  |
| 3.   | WLAN AP            | D-Link     | DIR-855    | KA2DIR855A2 | N/A        | Unshielded, 1.8 m  |
| 4.   | Notebook           | DELL       | VOSTRO1450 | PPD-AR5B195 | N/A        | AC I/P:<br>Unshielded, 1.8 m<br>DC O/P:<br>Shielded, 1.8 m |
| 5.   | Bluetooth Earphone | Nokia      | BH-106     | QTLBH-106   | N/A        | N/A  |

## 2 Test Configuration of Equipment Under Test

### 2.1 Carrier Frequency Channel

| Frequency Band  | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|-----------------|---------|-------------|---------|-------------|
| 2400-2483.5 MHz | 1       | 2412        | 7       | 2442        |
|                 | 2       | 2417        | 8       | 2447        |
|                 | 3       | 2422        | 9       | 2452        |
|                 | 4       | 2427        | 10      | 2457        |
|                 | 5       | 2432        | 11      | 2462        |
|                 | 6       | 2437        |         |             |

### 2.2 RF Power

Preliminary tests were performed in different data rate and recorded the RF power output in the following table:

| Channel | Frequency | 2.4GHz 802.11b RF Power (dBm) |        |          |         |
|---------|-----------|-------------------------------|--------|----------|---------|
|         |           | DSSS Data Rate                |        |          |         |
|         |           | 1 Mbps                        | 2 Mbps | 5.5 Mbps | 11 Mbps |
| CH 01   | 2412 MHz  | 19.95                         | 19.91  | 19.73    | 19.72   |
| CH 06   | 2437 MHz  | 19.78                         | 19.71  | 19.44    | 19.55   |
| CH 11   | 2462 MHz  | 18.71                         | 18.48  | 18.18    | 18.45   |

| Channel | Frequency | 2.4GHz 802.11g RF Power (dBm) |        |         |         |         |         |         |         |
|---------|-----------|-------------------------------|--------|---------|---------|---------|---------|---------|---------|
|         |           | OFDM Data Rate                |        |         |         |         |         |         |         |
|         |           | 6 Mbps                        | 9 Mbps | 12 Mbps | 18 Mbps | 24 Mbps | 36 Mbps | 48 Mbps | 54 Mbps |
| CH 01   | 2412 MHz  | 23.12                         | 23.04  | 22.95   | 22.85   | 22.85   | 22.86   | 22.81   | 22.89   |
| CH 06   | 2437 MHz  | 23.18                         | 22.98  | 22.96   | 22.86   | 22.81   | 22.71   | 22.67   | 22.58   |
| CH 11   | 2462 MHz  | 22.56                         | 22.34  | 21.98   | 21.97   | 21.88   | 21.81   | 21.92   | 21.89   |

**Remark:** The EUT is programmed to transmit signals continuously for all testing.

### 2.3 Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and ANSI C63.10-2009 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).

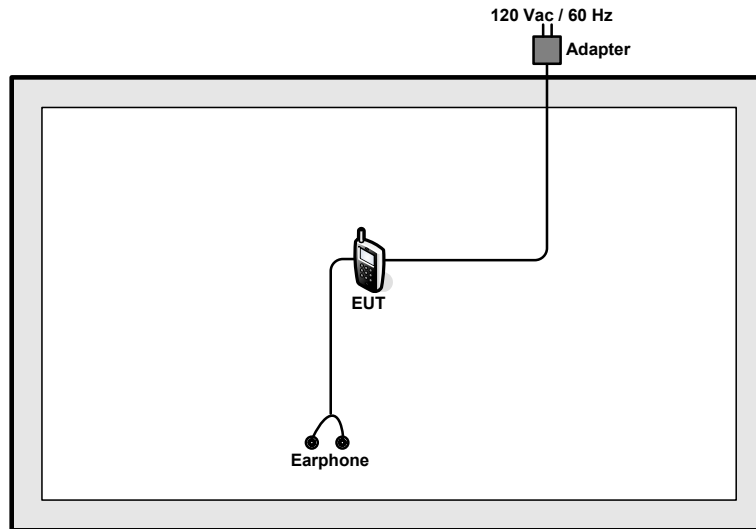
Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations.

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

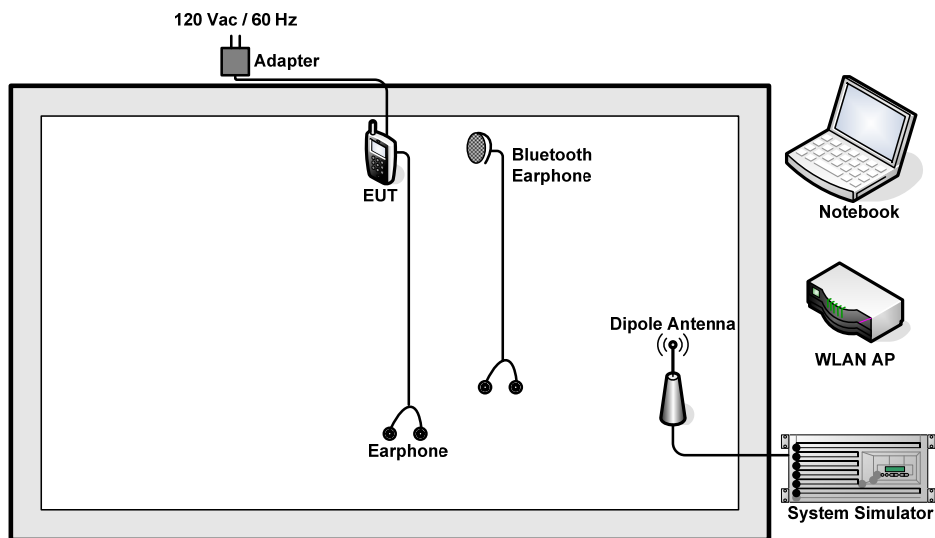
| Test Cases  |   |         |         |
|---|---|---------|---------|
| Test Item   | 802.11b (Modulation : DSSS)   |         |         |
|   | 802.11g (Modulation : OFDM)   |         |         |
| Conducted TCs   | Test Mode   | 802.11b | 802.11g |
|   | CH01  | 1       | 4       |
|   | CH06  | 2       | 5       |
|   | CH11  | 3       | 6       |
| Radiated TCs  | Test Mode   | 802.11b | 802.11g |
|   | CH01  | 1       | 4       |
|   | CH06  | 2       | 5       |
|   | CH11  | 3       | 6       |
| AC Conducted Emission   | Mode 1 : GSM850 Idle + Bluetooth Link + WLAN Link + Adapter + Earphone + Camera |         |         |
|   | Mode 2 : GSM1900 Idle + Bluetooth Link + WLAN Link + Adapter + Earphone + MPEG4 |         |         |
| <b>Remark:</b> The worst case of conducted emission is mode 2; only the test data of it was reported. |   |         |         |

## 2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



## 2.5 RF Utility

For WLAN function, key in “\* # 3646633 #” on the EUT directly. Then, the EUT will get into the engineering modes to contact with WLAN AP for continuous transmitting and receiving signals.

### 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.

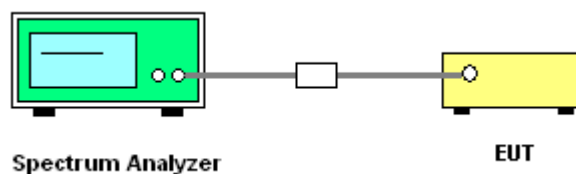
##### 3.1.2 Measuring Instruments

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 and TCB Workshop 2012, April.
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)  $\geq 3 * RBW$ . 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





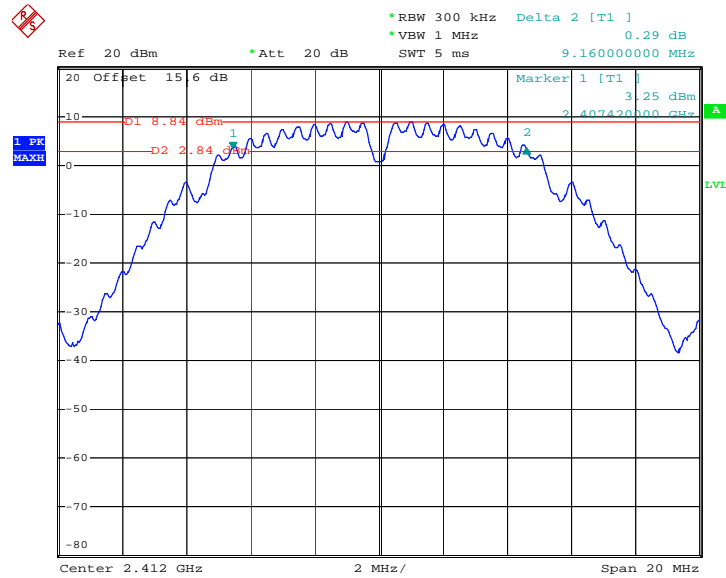
3.1.5 Test Result of 6dB Bandwidth

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

| Channel | Frequency (MHz) | 802.11b 6dB Bandwidth (MHz) | 6dB Bandwidth Min. Limit (MHz) | Pass/Fail |
|---------|-----------------|-----------------------------|--------------------------------|-----------|
| 01      | 2412            | 9.16                        | 0.5                            | Pass      |
| 06      | 2437            | 9.16                        | 0.5                            | Pass      |
| 11      | 2462            | 9.16                        | 0.5                            | Pass      |

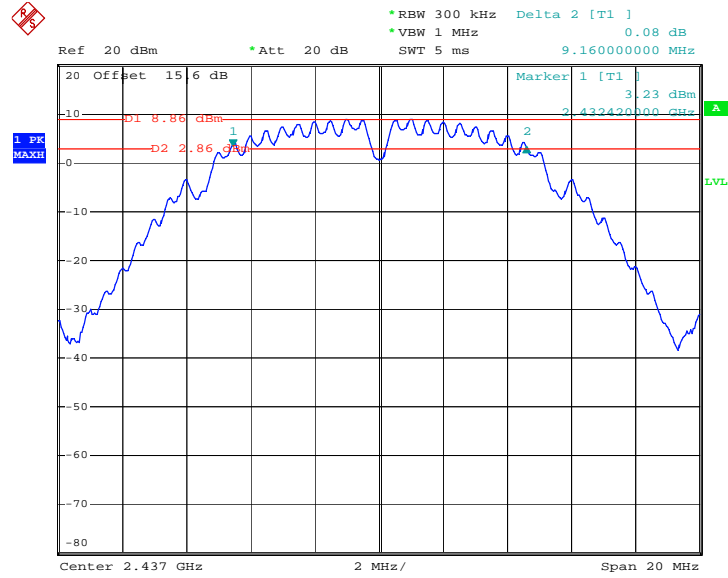
6 dB Bandwidth Plot on 802.11b Channel 01



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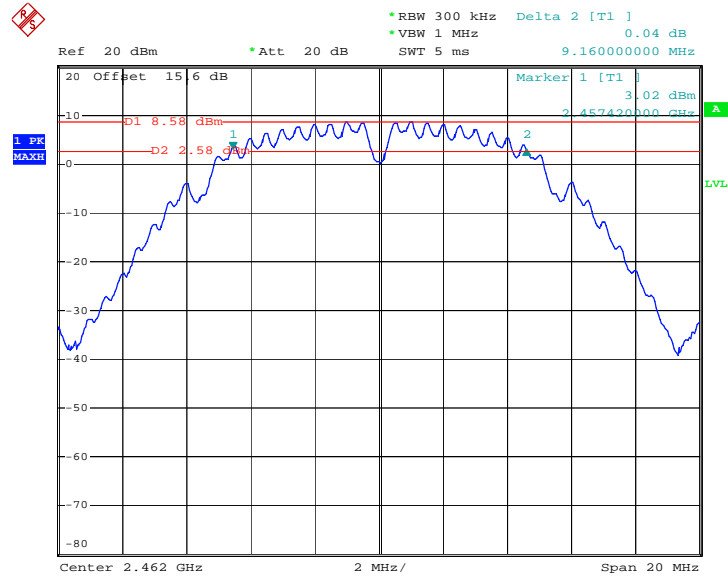


6 dB Bandwidth Plot on 802.11b Channel 06



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6 dB Bandwidth Plot on 802.11b Channel 11



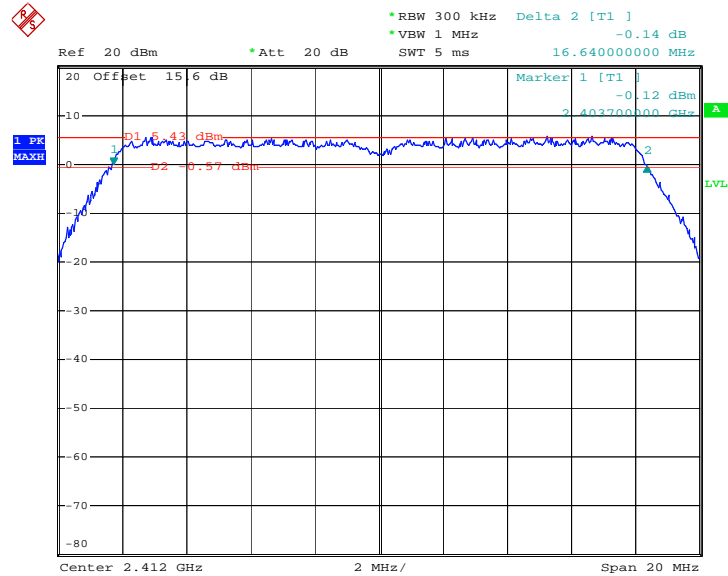
Date: 16.JUL.2012 22:01:06



|                 |         |                     |         |
|-----------------|---------|---------------------|---------|
| Test Mode :     | 802.11g | Temperature :       | 23~24°C |
| Test Engineer : | Zhi Lu  | Relative Humidity : | 47~48%  |

| Channel | Frequency (MHz) | 802.11g 6dB Bandwidth (MHz) | 6dB Bandwidth Min. Limit (MHz) | Pass/Fail |
|---------|-----------------|-----------------------------|--------------------------------|-----------|
| 01      | 2412            | 16.64                       | 0.5                            | Pass      |
| 06      | 2437            | 16.60                       | 0.5                            | Pass      |
| 11      | 2462            | 16.64                       | 0.5                            | Pass      |

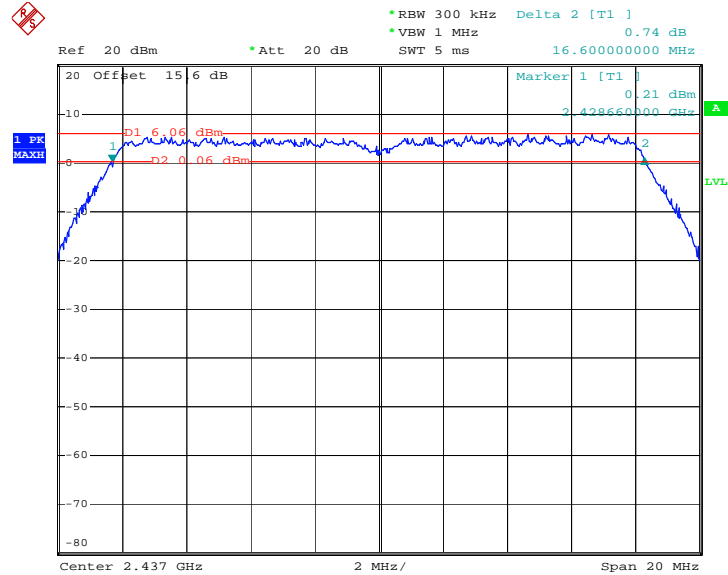
6 dB Bandwidth Plot on 802.11g Channel 01



Date: 16.JUL.2012 22:05:05

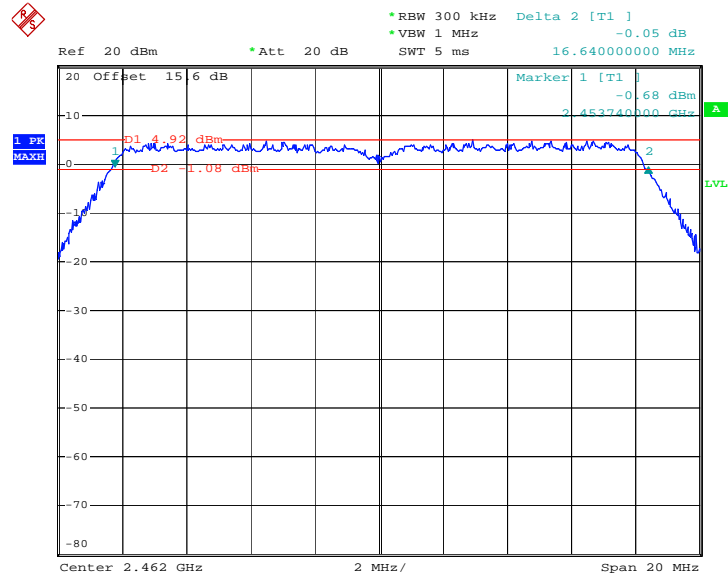


### 6 dB Bandwidth Plot on 802.11g Channel 06



Date: 16.JUL.2012 22:08:15

### 6 dB Bandwidth Plot on 802.11g Channel 11



Date: 16.JUL.2012 22:19:23

## 3.2 Output Power Measurement

### 3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz and 5725-5850MHz, 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.

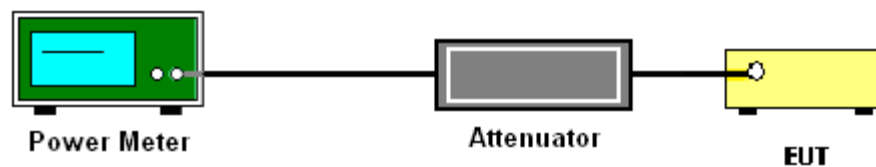
### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance and TCB Workshop 2012, April.
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 Peak Output Power

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

| Channel | Frequency (MHz) | 802.11b Peak Output Power (dBm) | Max. Limits (dBm) | Pass/Fail |
|---------|-----------------|---------------------------------|-------------------|-----------|
| 01      | 2412            | 19.95                           | 30                | Pass      |
| 06      | 2437            | 19.78                           | 30                | Pass      |
| 11      | 2462            | 18.71                           | 30                | Pass      |

|                 |         |                     |         |
|-----------------|---------|---------------------|---------|
| Test Mode :     | 802.11g | Temperature :       | 23~24°C |
| Test Engineer : | Zhi Lu  | Relative Humidity : | 47~48%  |

| Channel | Frequency (MHz) | 802.11g Peak Output Power (dBm) | Max. Limits (dBm) | Pass/Fail |
|---------|-----------------|---------------------------------|-------------------|-----------|
| 01      | 2412            | 23.12                           | 30                | Pass      |
| 06      | 2437            | 23.18                           | 30                | Pass      |
| 11      | 2462            | 22.56                           | 30                | Pass      |



3.2.6 Test Result of Average output Power (Reporting Only)

|                 |         |                     |         |
|-----------------|---------|---------------------|---------|
| Test Mode :     | 802.11b | Temperature :       | 23~24°C |
| Test Engineer : | Zhi Lu  | Relative Humidity : | 47~48%  |
| Duty Cycle:     | 100%    | Duty Factor:        | 0.00dB  |

| Channel | Frequency (MHz) | 802.11b Average Output Power (dBm) |
|---------|-----------------|------------------------------------|
| 01      | 2412            | 16.68                              |
| 06      | 2437            | 16.59                              |
| 11      | 2462            | 15.14                              |

|                 |         |                     |         |
|-----------------|---------|---------------------|---------|
| Test Mode :     | 802.11g | Temperature :       | 23~24°C |
| Test Engineer : | Zhi Lu  | Relative Humidity : | 47~48%  |
| Duty Cycle:     | 100%    | Duty Factor:        | 0.00dB  |

| Channel | Frequency (MHz) | 802.11g Average Output Power (dBm) |
|---------|-----------------|------------------------------------|
| 01      | 2412            | 12.98                              |
| 06      | 2437            | 13.26                              |
| 11      | 2462            | 11.56                              |

### 3.3 Power Spectral Density Measurement

#### 3.3.1 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.

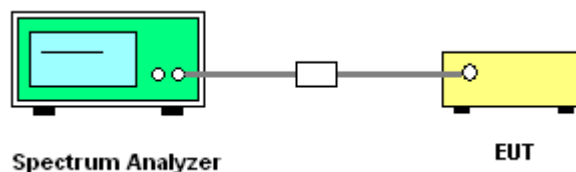
#### 3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.3.3 Test Procedures

1. The testing follows Measurement Procedure 5.3.1 (Peak PSD) of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.
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  $BWCF = 10\log(3\text{ kHz}/100\text{ kHz} = -15.2\text{ dB})$ .

#### 3.3.4 Test Setup



### 3.3.5 Test Result of Power Spectral Density

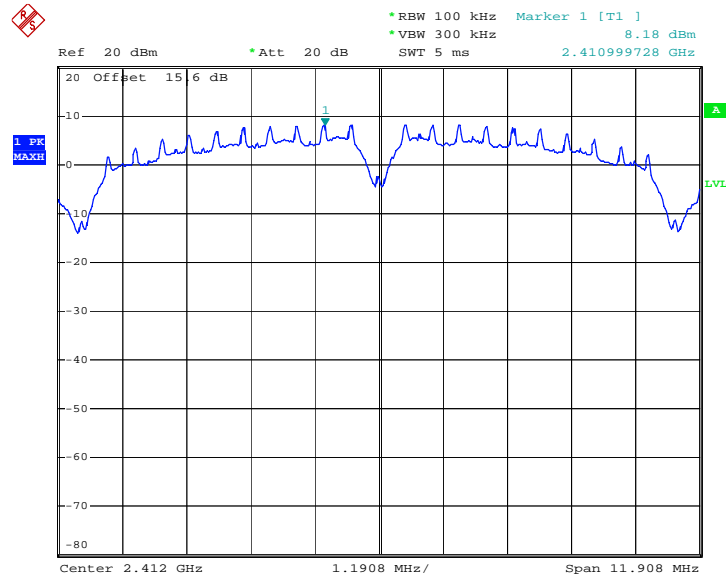
|                 |         |                     |         |
|-----------------|---------|---------------------|---------|
| Test Mode :     | 802.11b | Temperature :       | 23~24°C |
| Test Engineer : | Zhi Lu  | Relative Humidity : | 47~48%  |

| Channel | Frequency (MHz) | 802.11b Power Density     |                | Max. Limits (dBm) | Pass/Fail |
|---------|-----------------|---------------------------|----------------|-------------------|-----------|
|         |                 | Measured PSD/100KHz (dBm) | PSD/3KHz (dBm) |                   |           |
| 01      | 2412            | 8.18                      | -7.02          | 8                 | Pass      |
| 06      | 2437            | 8.39                      | -6.81          | 8                 | Pass      |
| 11      | 2462            | 8.24                      | -6.96          | 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. Power Density/ 3kHz (dBm) = Measured power density/ 100KHz (dBm) + BWCF (dB)

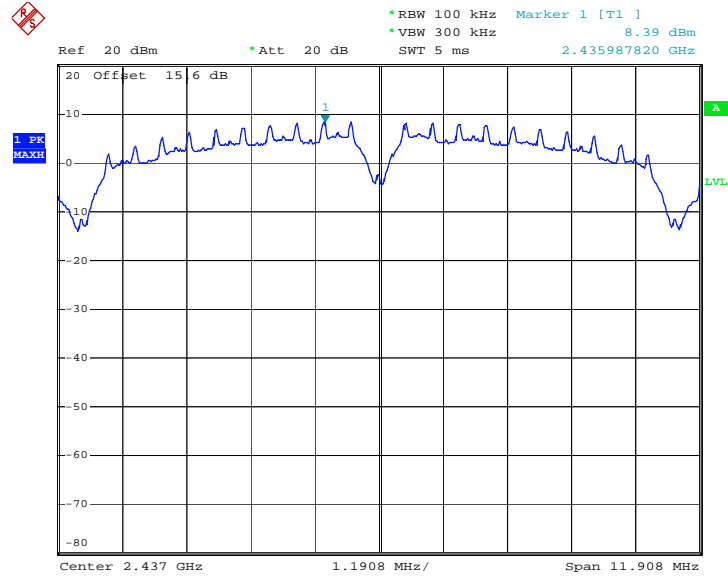
**PSD Plot on 802.11b Channel 01**



Date: 16.JUL.2012 21:53:11

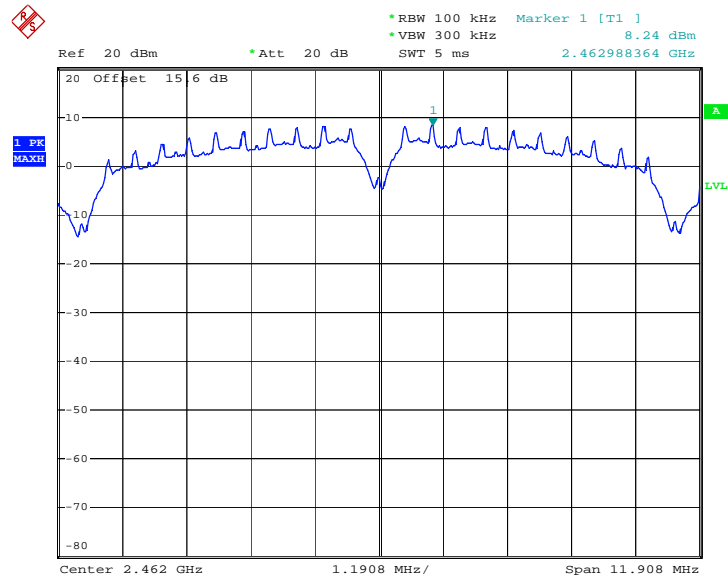


PSD Plot on 802.11b Channel 06



Date: 16.JUL.2012 21:57:13

PSD Plot on 802.11b Channel 11



Date: 16.JUL.2012 22:01:25



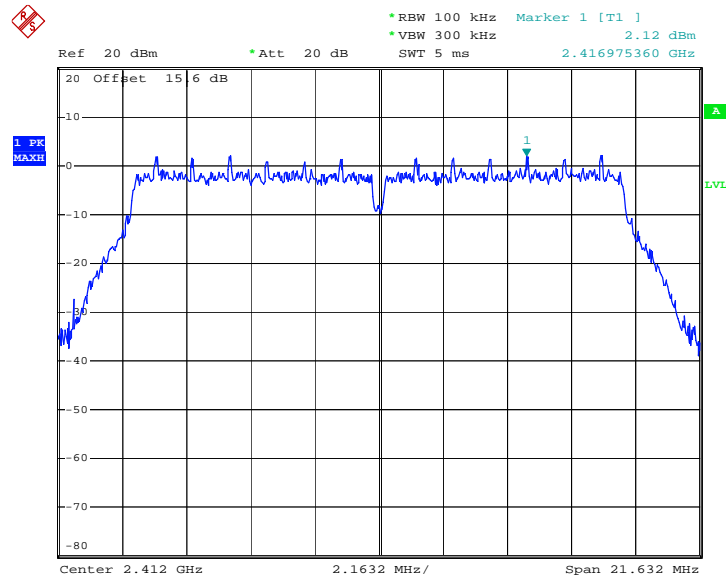
|                 |         |                     |         |
|-----------------|---------|---------------------|---------|
| Test Mode :     | 802.11g | Temperature :       | 23~24°C |
| Test Engineer : | Zhi Lu  | Relative Humidity : | 47~48%  |

| Channel | Frequency (MHz) | 802.11g Power Density     |                | Max. Limits (dBm) | Pass/Fail |
|---------|-----------------|---------------------------|----------------|-------------------|-----------|
|         |                 | Measured PSD/100KHz (dBm) | PSD/3KHz (dBm) |                   |           |
| 01      | 2412            | 2.12                      | -13.08         | 8                 | Pass      |
| 06      | 2437            | 2.20                      | -13.00         | 8                 | Pass      |
| 11      | 2462            | 1.14                      | -14.06         | 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. Power Density/ 3KHz (dBm)= Measured power density/ 100KHz (dBm) + BWCF (dB)

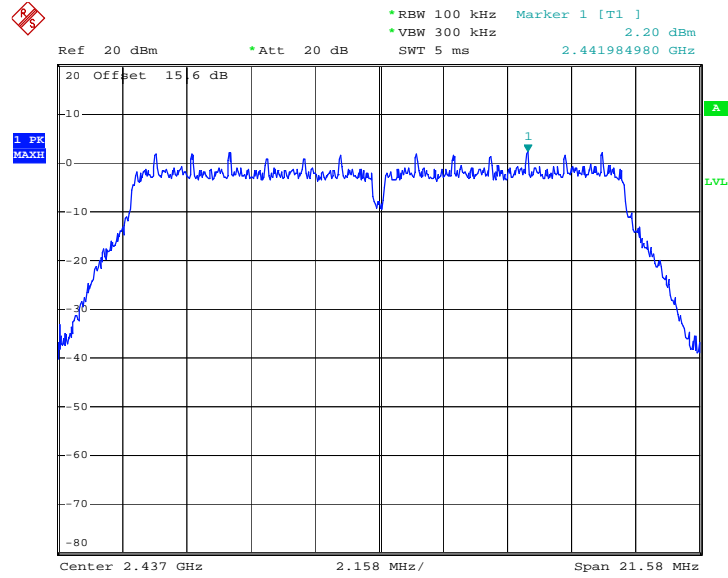
PSD Plot on 802.11g Channel 01



Date: 16.JUL.2012 22:05:25

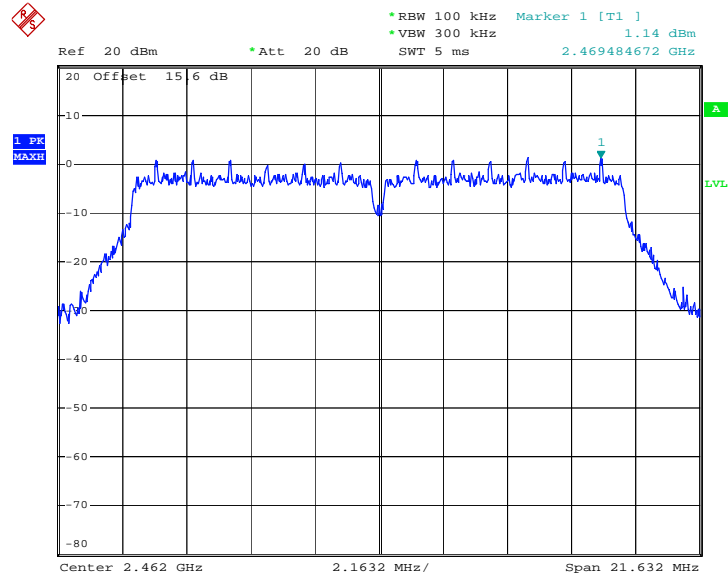


PSD Plot on 802.11g Channel 06



Date: 16.JUL.2012 22:08:35

PSD Plot on 802.11g Channel 11



Date: 16.JUL.2012 22:19:43

## 3.4 Conducted Band Edges and Spurious Emission Measurement

### 3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

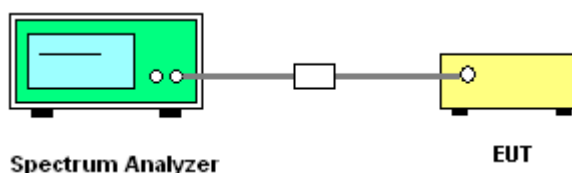
### 3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.4.3 Test Procedures

1. The testing follows the guidelines in the Measurement Procedure of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.
2. Set RBW = 100 KHz, VBW=300 KHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz, when maximum peak conducted output power procedure is used. The attenuation is set to 30dB, when maximum conducted output power procedure is used.

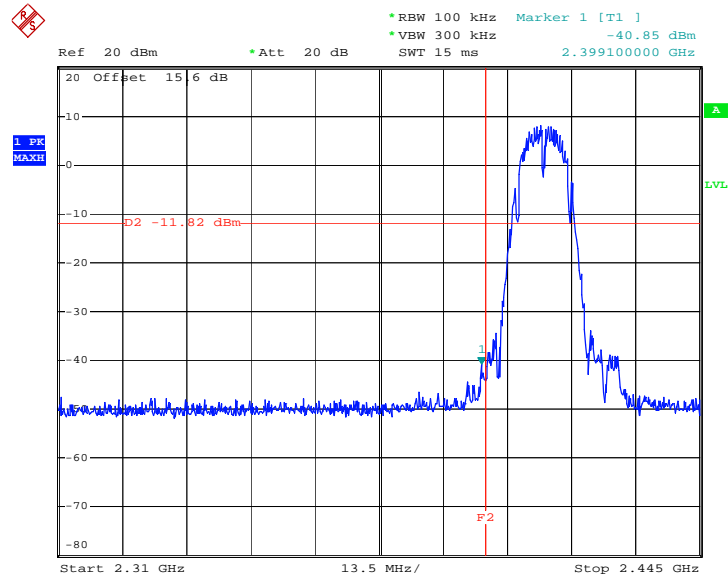
### 3.4.4 Test Setup



### 3.4.5 Test Plots of Conducted Band Edges

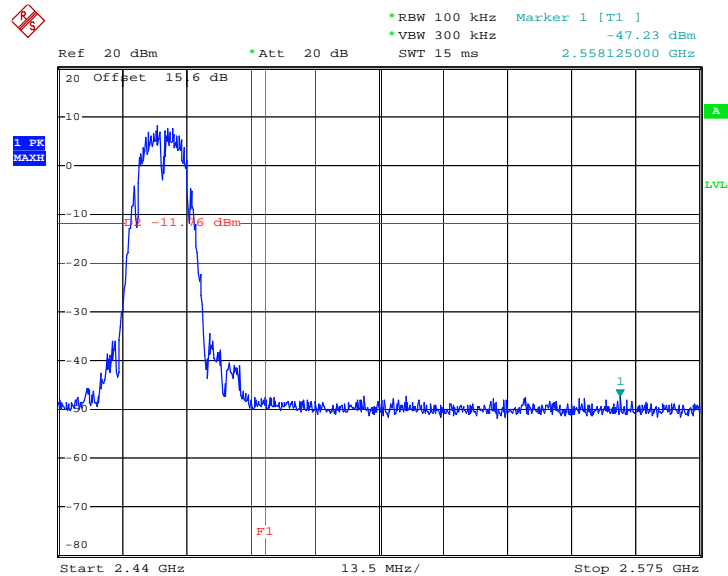
|                |              |                     |         |
|----------------|--------------|---------------------|---------|
| Test Mode :    | 802.11b      | Temperature :       | 23~24°C |
| Test Band :    | Low and High | Relative Humidity : | 47~48%  |
| Test Channel : | 01 and 11    | Test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

Low Band Edge Plot on 802.11b Channel 01



Date: 16.JUL.2012 21:55:14

High Band Edge Plot on 802.11b Channel 11

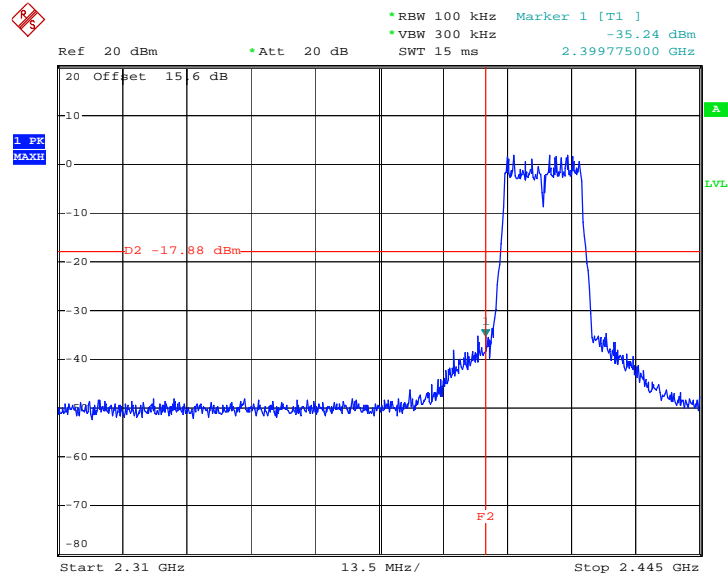


Date: 16.JUL.2012 22:02:12



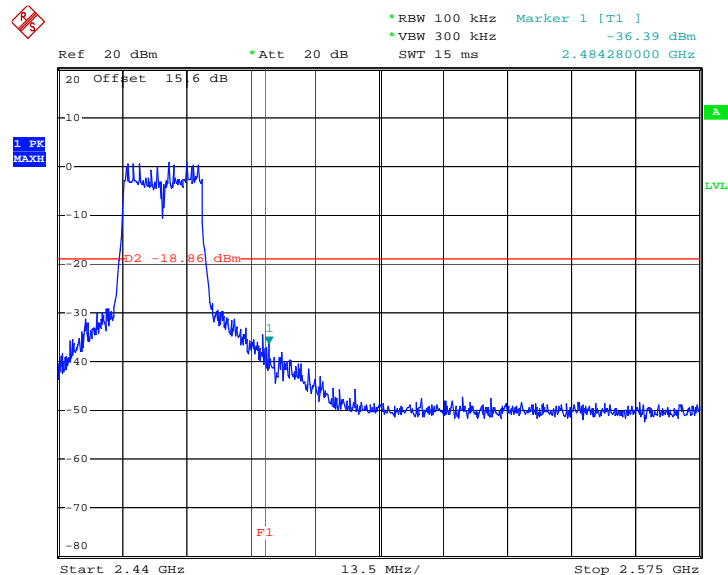
|                |              |                     |         |
|----------------|--------------|---------------------|---------|
| Test Mode :    | 802.11g      | Temperature :       | 23~24°C |
| Test Band :    | Low and High | Relative Humidity : | 47~48%  |
| Test Channel : | 01 and 11    | Test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

Low Band Edge Plot on 802.11g Channel 01



Date: 16.JUL.2012 22:06:03

High Band Edge Plot on 802.11g Channel 11



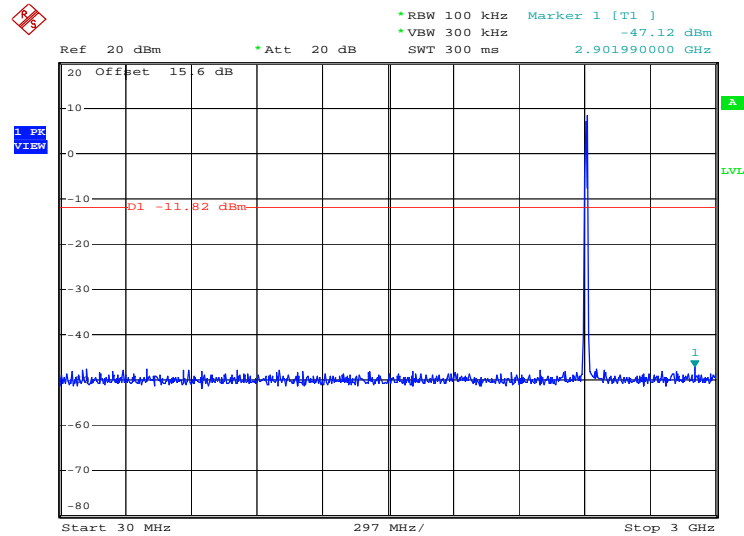
Date: 16.JUL.2012 22:20:41

### 3.4.6 Test Plots of Spurious Emission

|                |                         |                     |         |
|----------------|-------------------------|---------------------|---------|
| Test Mode :    | 802.11b                 | Temperature :       | 23~24°C |
| Test Band :    | 30MHz-3GHz and 2G-25GHz | Relative Humidity : | 47~48%  |
| Test Channel : | 01, 06, 11              | Test Engineer :     | Zhi Lu  |

#### 802.11b 30 MHz~3 GHz

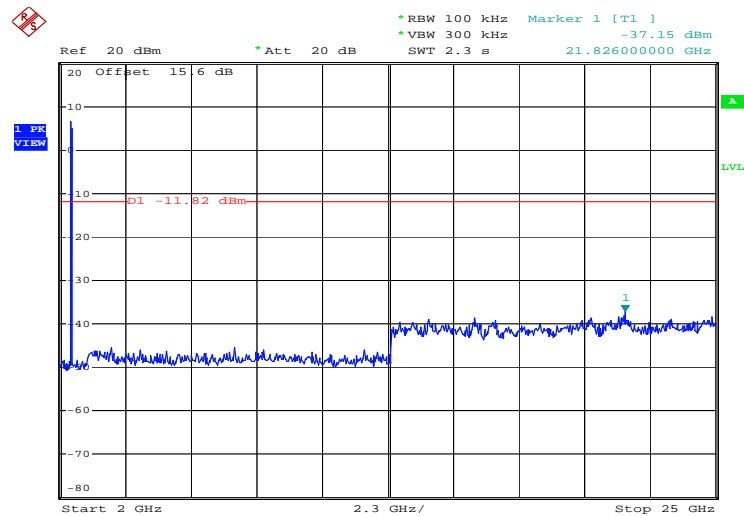
#### Conducted Spurious Emission Plot on Channel 01



Date: 16.JUL.2012 21:55:42

#### 802.11b 2 GHz~25 GHz

#### Conducted Spurious Emission Plot on Channel 01

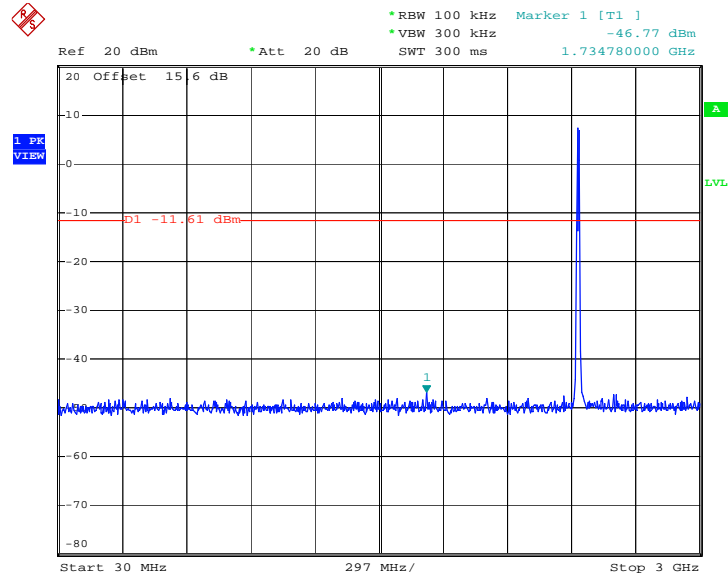


Date: 16.JUL.2012 21:56:00



802.11b 30 MHz~3 GHz

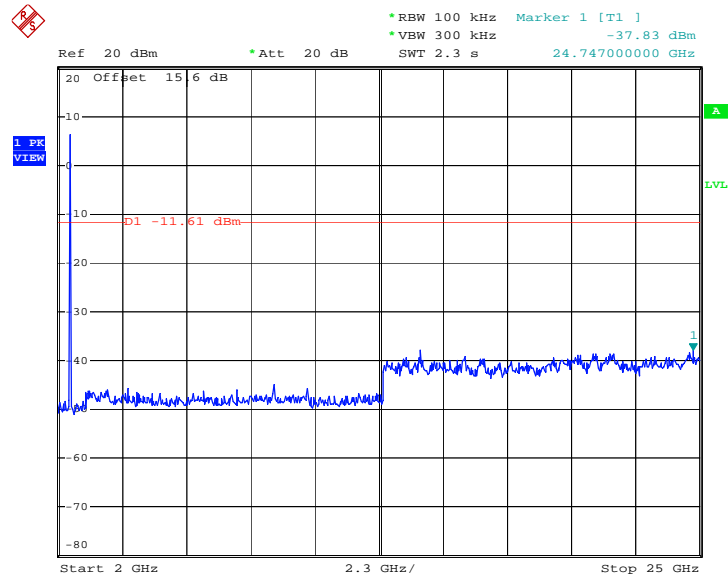
Conducted Spurious Emission Plot on Channel 06



Date: 16.JUL.2012 21:58:16

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

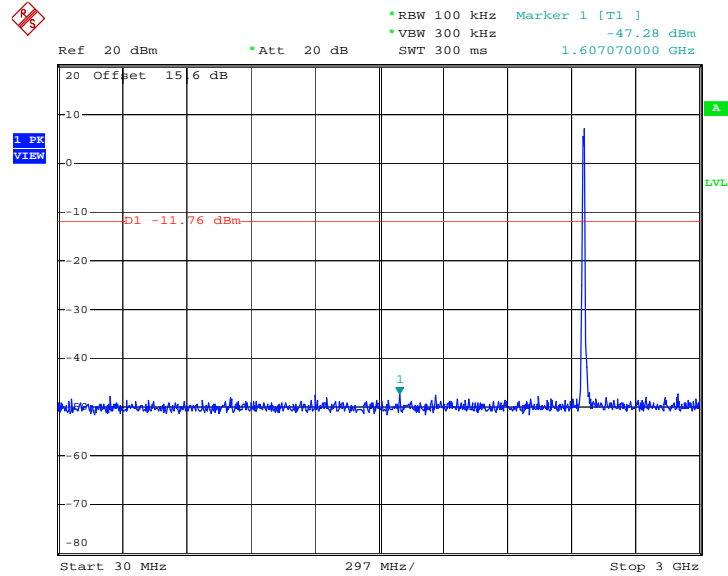


Date: 16.JUL.2012 21:58:34



802.11b 30 MHz~3 GHz

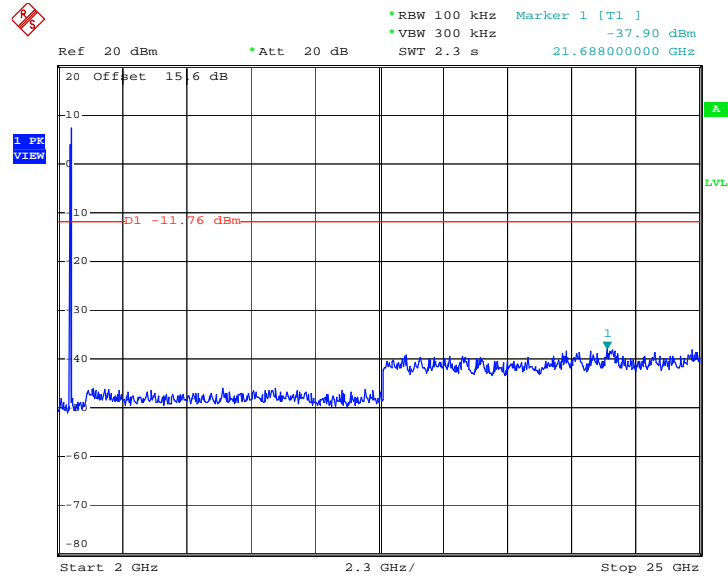
Conducted Spurious Emission Plot on Channel 11



Date: 16.JUL.2012 22:02:35

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11



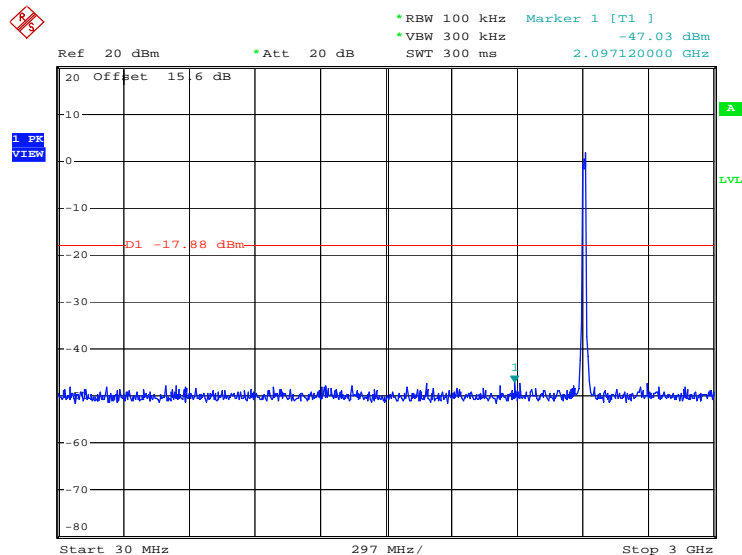
Date: 16.JUL.2012 22:02:54



|                |                         |                     |         |
|----------------|-------------------------|---------------------|---------|
| Test Mode :    | 802.11g                 | Temperature :       | 23~24°C |
| Test Band :    | 30MHz-3GHz and 2G-25GHz | Relative Humidity : | 47~48%  |
| Test Channel : | 01, 06, 11              | Test Engineer :     | Zhi Lu  |

802.11g 30 MHz~3 GHz

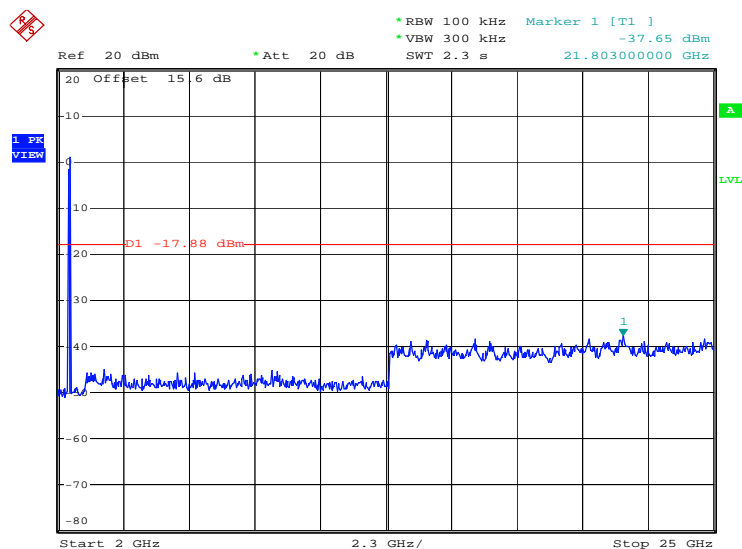
Conducted Spurious Emission Plot on Channel 01



Date: 16.JUL.2012 22:06:29

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 01

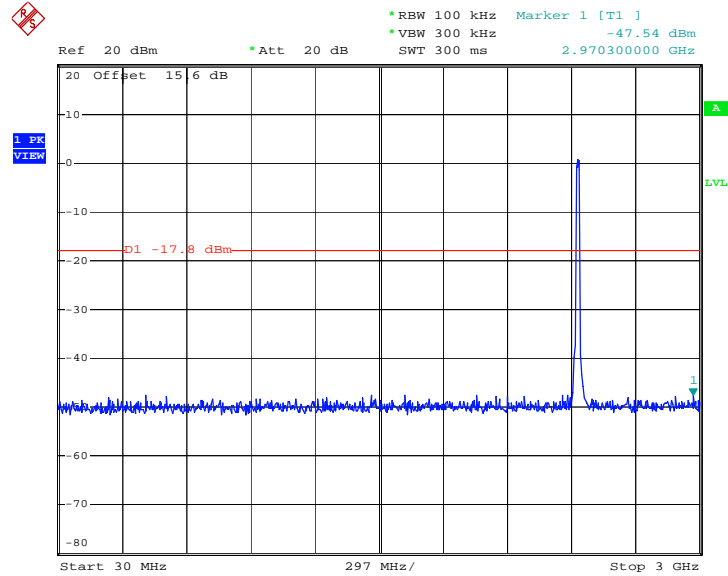


Date: 16.JUL.2012 22:06:48



802.11g 30 MHz~3 GHz

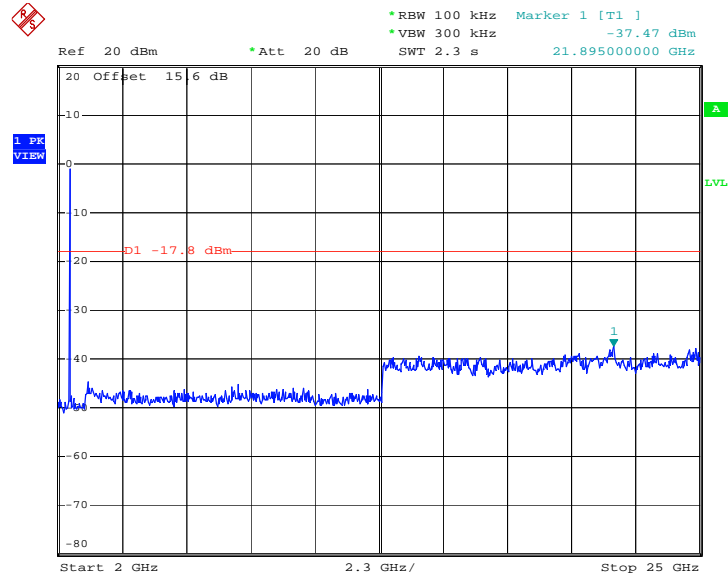
Conducted Spurious Emission Plot on Channel 06



Date: 16.JUL.2012 22:09:51

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

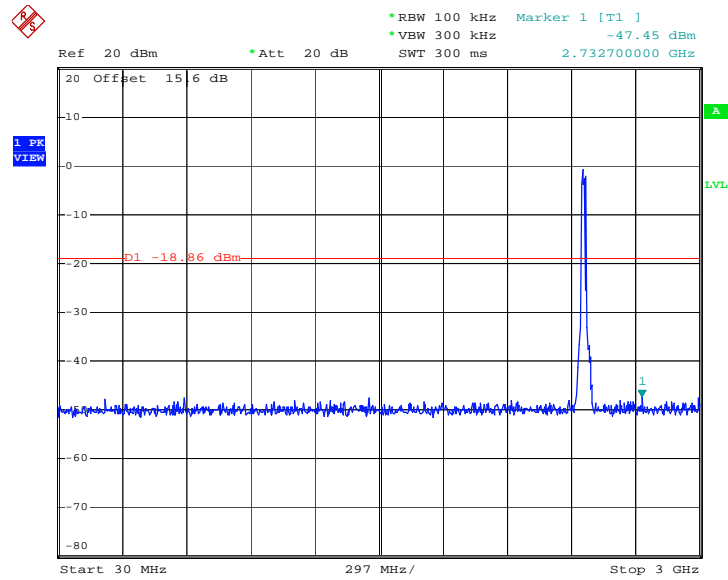


Date: 16.JUL.2012 22:10:10



### 802.11g 30 MHz~3 GHz

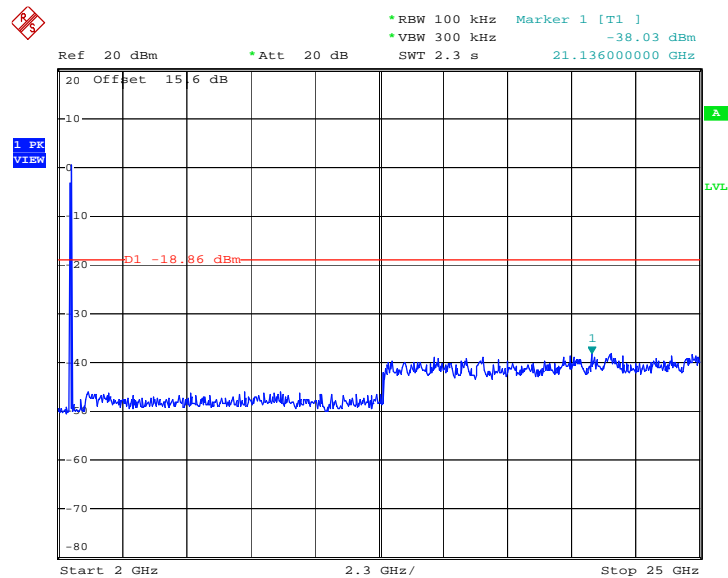
#### Conducted Spurious Emission Plot on Channel 11



Date: 16.JUL.2012 22:21:06

### 802.11g 2 GHz~25 GHz

#### Conducted Spurious Emission Plot on Channel 11



Date: 16.JUL.2012 22:21:25



### 3.5 Radiated Emission Measurement

#### 3.5.1 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 (MHz) | Field Strength (microvolts/meter) | Measurement Distance (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                             |

#### 3.5.2 Measuring Instruments

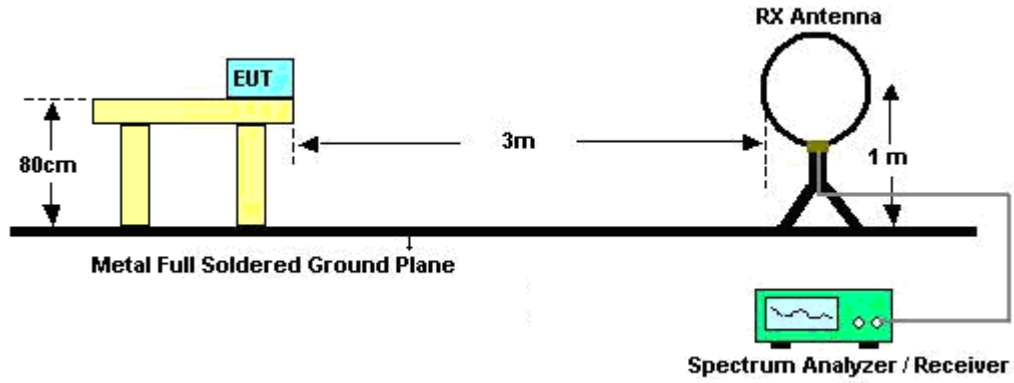
See list of measuring instruments of this test report.

### 3.5.3 Test Procedures

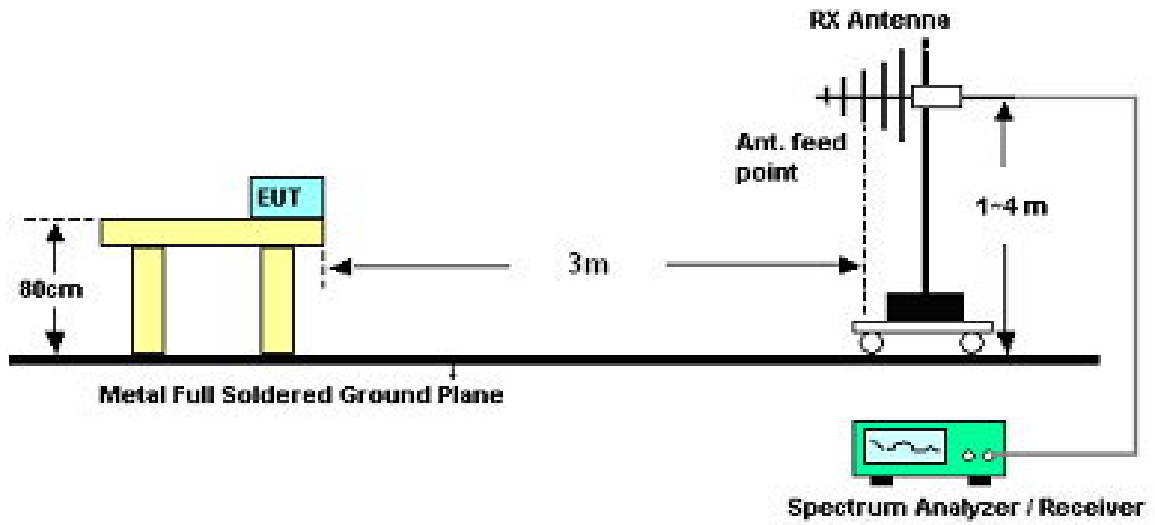
1. The testing follows TCB Workshop 2012, April and fulfills ANSI C63.4-2003 and the guidelines in ANSI C63.10-2009 test site requirement. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. 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.
2. The EUT was placed on a turntable with 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving Antenna, which was mounted on the top of a variable height Antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest radiation.
5. 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;
6. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
7. If the emission level of the EUT measured by the peak detector is more than 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported

### 3.5.4 Test Setup

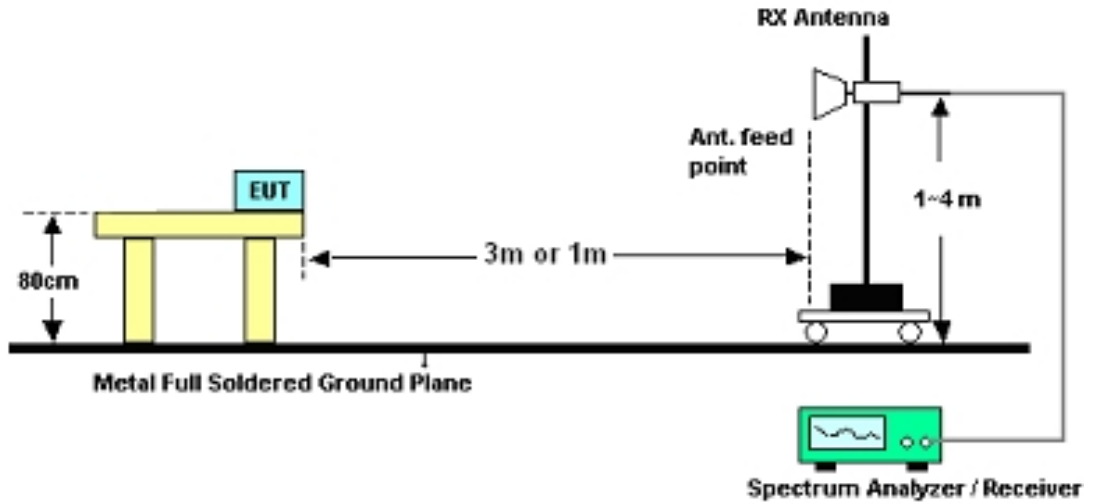
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



### 3.5.5 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.



3.5.6 Test Result of Radiated Band Edges

|                |         |                     |         |
|----------------|---------|---------------------|---------|
| Test Mode :    | 802.11b | Temperature :       | 19~20°C |
| Test Band :    | Low     | Relative Humidity : | 42~43%  |
| Test Channel : | 01      | Test Engineer :     | Jack Li |

| 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  |
| 2388.66                       | 51.52               | -22.48                  | 74                          | 49.24                     | 32.86                       | 3.47                    | 34.05                      | 126                  | 217                     | Peak    |
| 2388.66                       | 36.86               | -17.14                  | 54                          | 34.58                     | 32.86                       | 3.47                    | 34.05                      | 126                  | 217                     | 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  |
| 2388.85                     | 51.02               | -22.98                  | 74                          | 48.74                     | 32.86                       | 3.47                    | 34.05                      | 164                  | 117                     | Peak    |
| 2388.85                     | 37.55               | -16.45                  | 54                          | 35.27                     | 32.86                       | 3.47                    | 34.05                      | 164                  | 117                     | Average |

|                |         |                     |         |
|----------------|---------|---------------------|---------|
| Test Mode :    | 802.11b | Temperature :       | 19~20°C |
| Test Band :    | High    | Relative Humidity : | 42~43%  |
| Test Channel : | 11      | Test Engineer :     | Jack Li |

| 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  |
| 2484.04                       | 55.15               | -18.85                  | 74                          | 52.66                     | 33.01                       | 3.68                    | 34.2                       | 100                  | 345                     | Peak    |
| 2484.04                       | 46.91               | -7.09                   | 54                          | 44.42                     | 33.01                       | 3.68                    | 34.2                       | 100                  | 345                     | 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  |
| 2483.66                     | 53.16               | -20.84                  | 74                          | 50.67                     | 33.01                       | 3.68                    | 34.2                       | 100                  | 344                     | Peak    |
| 2483.66                     | 43.99               | -10.01                  | 54                          | 41.5                      | 33.01                       | 3.68                    | 34.2                       | 100                  | 344                     | Average |



|                |         |                     |         |
|----------------|---------|---------------------|---------|
| Test Mode :    | 802.11g | Temperature :       | 19~20°C |
| Test Band :    | Low     | Relative Humidity : | 42~43%  |
| Test Channel : | 01      | Test Engineer :     | Jack Li |

| 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  |
| 2389.23                       | 68.75               | -5.25                   | 74                          | 66.47                     | 32.86                       | 3.47                    | 34.05                      | 200                  | 42                      | Peak    |
| 2389.23                       | 46.66               | -7.34                   | 54                          | 44.38                     | 32.86                       | 3.47                    | 34.05                      | 200                  | 42                      | 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  |
| 2389.61                     | 68.3                | -5.7                    | 74                          | 66.02                     | 32.86                       | 3.47                    | 34.05                      | 172                  | 13                      | Peak    |
| 2389.61                     | 45.84               | -8.16                   | 54                          | 43.56                     | 32.86                       | 3.47                    | 34.05                      | 172                  | 13                      | Average |

|                |         |                     |         |
|----------------|---------|---------------------|---------|
| Test Mode :    | 802.11g | Temperature :       | 19~20°C |
| Test Band :    | High    | Relative Humidity : | 42~43%  |
| Test Channel : | 11      | Test Engineer :     | Jack Li |

| 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  |
| 2484.8                        | 70.33               | -3.67                   | 74                          | 67.84                     | 33.01                       | 3.68                    | 34.2                       | 101                  | 70                      | Peak    |
| 2484.8                        | 47.1                | -6.9                    | 54                          | 44.61                     | 33.01                       | 3.68                    | 34.2                       | 101                  | 70                      | 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  |
| 2483.66                     | 69.24               | -4.76                   | 74                          | 66.75                     | 33.01                       | 3.68                    | 34.2                       | 188                  | 358                     | Peak    |
| 2483.66                     | 44.21               | -9.79                   | 54                          | 41.72                     | 33.01                       | 3.68                    | 34.2                       | 188                  | 358                     | Average |



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

|                 |  |                     |            |
|-----------------|--|---------------------|------------|
| Test Mode :     | 802.11b  | Temperature :       | 19~20°C    |
| Test Channel :  | 01   | Relative Humidity : | 42~43%     |
| Test Engineer : | Jack Li  | Polarization :      | Horizontal |
| Remark :        | 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                | 20.82               | -19.18                  | 40                          | 33.36                   | 17.29                       | 0.25                    | 30.08                      | -                    | -                       | Peak    |
| 207.51               | 20.33               | -23.17                  | 43.5                        | 40.39                   | 9.34                        | 0.6                     | 30                         | -                    | -                       | Peak    |
| 501.42               | 23.53               | -22.47                  | 46                          | 35.08                   | 17.22                       | 0.96                    | 29.73                      | -                    | -                       | Peak    |
| 807.94               | 24.37               | -21.63                  | 46                          | 32.79                   | 19.93                       | 1.25                    | 29.6                       | -                    | -                       | Peak    |
| 875.84               | 25.76               | -20.24                  | 46                          | 33.55                   | 20.48                       | 1.29                    | 29.56                      | -                    | -                       | Peak    |
| 939.86               | 36.3                | -9.7                    | 46                          | 43.81                   | 20.69                       | 1.33                    | 29.53                      | 100                  | 251                     | Peak    |
| 2388.66              | 51.52               | -22.48                  | 74                          | 49.24                   | 32.86                       | 3.47                    | 34.05                      | 126                  | 217                     | Peak    |
| 2388.66              | 36.86               | -17.14                  | 54                          | 34.58                   | 32.86                       | 3.47                    | 34.05                      | 126                  | 217                     | Average |
| 2412                 | 103.2               | -                       | -                           | 100.87                  | 32.89                       | 3.52                    | 34.08                      | 102                  | 66                      | Peak    |
| 2412                 | 99.07               | -                       | -                           | 96.74                   | 32.89                       | 3.52                    | 34.08                      | 102                  | 66                      | Average |
| 2486.89              | 50.72               | -23.28                  | 74                          | 48.23                   | 33.01                       | 3.68                    | 34.2                       | 144                  | 332                     | Peak    |
| 2486.89              | 37.81               | -16.19                  | 54                          | 35.32                   | 33.01                       | 3.68                    | 34.2                       | 144                  | 332                     | Average |



|                        |  |                            |          |
|------------------------|--|----------------------------|----------|
| <b>Test Mode :</b>     | 802.11b  | <b>Temperature :</b>       | 19~20°C  |
| <b>Test Channel :</b>  | 01   | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Jack Li  | <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                   | 22.47               | -17.53                  | 40                          | 34.29                   | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 88.2                 | 21.74               | -21.76                  | 43.5                        | 43.06                   | 8.3                         | 0.38                    | 30                         | -                    | -                       | Peak    |
| 567.38               | 24.71               | -21.29                  | 46                          | 34.82                   | 18.53                       | 1.02                    | 29.66                      | -                    | -                       | Peak    |
| 706.09               | 23.84               | -22.16                  | 46                          | 33.07                   | 19.35                       | 1.13                    | 29.71                      | -                    | -                       | Peak    |
| 876.81               | 25.27               | -20.73                  | 46                          | 33.06                   | 20.48                       | 1.29                    | 29.56                      | -                    | -                       | Peak    |
| 939.86               | 37.05               | -8.95                   | 46                          | 44.56                   | 20.69                       | 1.33                    | 29.53                      | 179                  | 312                     | Peak    |
| 2388.85              | 51.02               | -22.98                  | 74                          | 48.74                   | 32.86                       | 3.47                    | 34.05                      | 164                  | 117                     | Peak    |
| 2388.85              | 37.55               | -16.45                  | 54                          | 35.27                   | 32.86                       | 3.47                    | 34.05                      | 164                  | 117                     | Average |
| 2412                 | 102.61              | -                       | -                           | 100.28                  | 32.89                       | 3.52                    | 34.08                      | 194                  | 0                       | Peak    |
| 2412                 | 98.27               | -                       | -                           | 95.94                   | 32.89                       | 3.52                    | 34.08                      | 194                  | 0                       | Average |
| 2498.86              | 49.65               | -24.35                  | 74                          | 47.11                   | 33.05                       | 3.72                    | 34.23                      | 120                  | 34                      | Peak    |
| 2498.86              | 37.15               | -16.85                  | 54                          | 34.61                   | 33.05                       | 3.72                    | 34.23                      | 120                  | 34                      | Average |



|                 |  |                     |            |
|-----------------|--|---------------------|------------|
| Test Mode :     | 802.11b  | Temperature :       | 19~20°C    |
| Test Channel :  | 06   | Relative Humidity : | 42~43%     |
| Test Engineer : | Jack Li  | Polarization :      | Horizontal |
| Remark :        | 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                   | 21.32               | -18.68                  | 40                          | 33.14                   | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 506.27               | 23.09               | -22.91                  | 46                          | 34.55                   | 17.31                       | 0.96                    | 29.73                      | -                    | -                       | Peak    |
| 591.63               | 23.55               | -22.45                  | 46                          | 33.53                   | 18.59                       | 1.06                    | 29.63                      | -                    | -                       | Peak    |
| 824.43               | 24.58               | -21.42                  | 46                          | 32.78                   | 20.16                       | 1.26                    | 29.62                      | -                    | -                       | Peak    |
| 874.87               | 25.62               | -20.38                  | 46                          | 33.42                   | 20.48                       | 1.29                    | 29.57                      | -                    | -                       | Peak    |
| 939.86               | 36.36               | -9.64                   | 46                          | 43.87                   | 20.69                       | 1.33                    | 29.53                      | 200                  | 355                     | Peak    |
| 2339.83              | 50.71               | -23.29                  | 74                          | 48.54                   | 32.78                       | 3.33                    | 33.94                      | 135                  | 176                     | Peak    |
| 2339.83              | 37.63               | -16.37                  | 54                          | 35.46                   | 32.78                       | 3.33                    | 33.94                      | 135                  | 176                     | Average |
| 2437                 | 105.5               | -                       | -                           | 103.1                   | 32.95                       | 3.6                     | 34.15                      | 101                  | 49                      | Peak    |
| 2437                 | 101.03              | -                       | -                           | 98.63                   | 32.95                       | 3.6                     | 34.15                      | 101                  | 49                      | Average |
| 2489.93              | 50.72               | -23.28                  | 74                          | 48.18                   | 33.05                       | 3.72                    | 34.23                      | 111                  | 208                     | Peak    |
| 2489.93              | 38.57               | -15.43                  | 54                          | 36.03                   | 33.05                       | 3.72                    | 34.23                      | 111                  | 208                     | Average |



|                        |  |                            |          |
|------------------------|--|----------------------------|----------|
| <b>Test Mode :</b>     | 802.11b  | <b>Temperature :</b>       | 19~20°C  |
| <b>Test Channel :</b>  | 06   | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Jack Li  | <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  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 30                   | 21.3                | -18.7                   | 40                          | 33.12                   | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 103.72               | 25.43               | -18.07                  | 43.5                        | 43.96                   | 11.01                       | 0.42                    | 29.96                      | -                    | -                       | Peak    |
| 374.35               | 22.8                | -23.2                   | 46                          | 36.65                   | 15.21                       | 0.83                    | 29.89                      | -                    | -                       | Peak    |
| 567.38               | 23.28               | -22.72                  | 46                          | 33.39                   | 18.53                       | 1.02                    | 29.66                      | -                    | -                       | Peak    |
| 768.17               | 23.94               | -22.06                  | 46                          | 32.42                   | 19.88                       | 1.2                     | 29.56                      | -                    | -                       | Peak    |
| 939.86               | 37.03               | -8.97                   | 46                          | 44.54                   | 20.69                       | 1.33                    | 29.53                      | 122                  | 203                     | Peak    |
| 2370.42              | 50.28               | -23.72                  | 74                          | 48.04                   | 32.83                       | 3.42                    | 34.01                      | 115                  | 237                     | Peak    |
| 2370.42              | 37.4                | -16.6                   | 54                          | 35.16                   | 32.83                       | 3.42                    | 34.01                      | 115                  | 237                     | Average |
| 2437                 | 103.59              | -                       | -                           | 101.19                  | 32.95                       | 3.6                     | 34.15                      | 104                  | 356                     | Peak    |
| 2437                 | 99.21               | -                       | -                           | 96.81                   | 32.95                       | 3.6                     | 34.15                      | 104                  | 356                     | Average |
| 2484.61              | 50.16               | -23.84                  | 74                          | 47.67                   | 33.01                       | 3.68                    | 34.2                       | 200                  | 144                     | Peak    |
| 2484.61              | 37                  | -17                     | 54                          | 34.51                   | 33.01                       | 3.68                    | 34.2                       | 200                  | 144                     | Average |



|                        |  |                            |            |
|------------------------|--|----------------------------|------------|
| <b>Test Mode :</b>     | 802.11b  | <b>Temperature :</b>       | 19~20°C    |
| <b>Test Channel :</b>  | 11   | <b>Relative Humidity :</b> | 42~43%     |
| <b>Test Engineer :</b> | Jack Li  | <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                   | 20.9                | -19.1                   | 40                          | 32.72                   | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 312.27               | 25.76               | -20.24                  | 46                          | 41.67                   | 13.3                        | 0.74                    | 29.95                      | -                    | -                       | Peak    |
| 746.83               | 23.24               | -22.76                  | 46                          | 31.73                   | 19.88                       | 1.18                    | 29.55                      | -                    | -                       | Peak    |
| 812.79               | 25.2                | -20.8                   | 46                          | 33.56                   | 19.98                       | 1.26                    | 29.6                       | -                    | -                       | Peak    |
| 873.9                | 24.92               | -21.08                  | 46                          | 32.73                   | 20.48                       | 1.29                    | 29.58                      | -                    | -                       | Peak    |
| 939.86               | 36.01               | -9.99                   | 46                          | 43.52                   | 20.69                       | 1.33                    | 29.53                      | 113                  | 216                     | Peak    |
| 2326.34              | 51.05               | -22.95                  | 74                          | 48.92                   | 32.76                       | 3.27                    | 33.9                       | 103                  | 360                     | Peak    |
| 2326.34              | 37.29               | -16.71                  | 54                          | 35.16                   | 32.76                       | 3.27                    | 33.9                       | 103                  | 360                     | Average |
| 2462                 | 105.31              | -                       | -                           | 102.86                  | 32.98                       | 3.64                    | 34.17                      | 101                  | 342                     | Peak    |
| 2462                 | 99.39               | -                       | -                           | 96.94                   | 32.98                       | 3.64                    | 34.17                      | 101                  | 342                     | Average |
| 2484.04              | 55.15               | -18.85                  | 74                          | 52.66                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 345                     | Peak    |
| 2484.04              | 46.91               | -7.09                   | 54                          | 44.42                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 345                     | Average |



|                        |  |                            |          |
|------------------------|--|----------------------------|----------|
| <b>Test Mode :</b>     | 802.11b  | <b>Temperature :</b>       | 19~20°C  |
| <b>Test Channel :</b>  | 11   | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Jack Li  | <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                   | 20.98               | -19.02                  | 40                          | 32.8                    | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 88.2                 | 21.28               | -22.22                  | 43.5                        | 42.6                    | 8.3                         | 0.38                    | 30                         | -                    | -                       | Peak    |
| 570.29               | 24.14               | -21.86                  | 46                          | 34.23                   | 18.54                       | 1.03                    | 29.66                      | -                    | -                       | Peak    |
| 796.3                | 24.08               | -21.92                  | 46                          | 32.57                   | 19.85                       | 1.25                    | 29.59                      | -                    | -                       | Peak    |
| 876.81               | 24.2                | -21.8                   | 46                          | 31.99                   | 20.48                       | 1.29                    | 29.56                      | -                    | -                       | Peak    |
| 939.86               | 36.26               | -9.74                   | 46                          | 43.77                   | 20.69                       | 1.33                    | 29.53                      | 200                  | 344                     | Peak    |
| 2373.65              | 50.12               | -23.88                  | 74                          | 47.88                   | 32.83                       | 3.42                    | 34.01                      | 122                  | 316                     | Peak    |
| 2373.65              | 35.39               | -18.61                  | 54                          | 33.15                   | 32.83                       | 3.42                    | 34.01                      | 122                  | 316                     | Average |
| 2462                 | 102.4               | -                       | -                           | 99.95                   | 32.98                       | 3.64                    | 34.17                      | 104                  | 360                     | Peak    |
| 2462                 | 96.95               | -                       | -                           | 94.5                    | 32.98                       | 3.64                    | 34.17                      | 104                  | 360                     | Average |
| 2483.66              | 53.16               | -20.84                  | 74                          | 50.67                   | 33.01                       | 3.68                    | 34.2                       | 100                  | 344                     | Peak    |
| 2483.66              | 43.99               | -10.01                  | 54                          | 41.5                    | 33.01                       | 3.68                    | 34.2                       | 100                  | 344                     | Average |



|                 |  |                     |            |
|-----------------|--|---------------------|------------|
| Test Mode :     | 802.11g  | Temperature :       | 19~20°C    |
| Test Channel :  | 01   | Relative Humidity : | 42~43%     |
| Test Engineer : | Jack Li  | Polarization :      | Horizontal |
| Remark :        | 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                   | 21.67               | -18.33                  | 40                          | 33.49                   | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 467.47               | 22.99               | -23.01                  | 46                          | 35.27                   | 16.57                       | 0.92                    | 29.77                      | -                    | -                       | Peak    |
| 747.8                | 23.47               | -22.53                  | 46                          | 31.96                   | 19.88                       | 1.18                    | 29.55                      | -                    | -                       | Peak    |
| 806                  | 24.36               | -21.64                  | 46                          | 32.8                    | 19.91                       | 1.25                    | 29.6                       | -                    | -                       | Peak    |
| 875.84               | 25.31               | -20.69                  | 46                          | 33.1                    | 20.48                       | 1.29                    | 29.56                      | -                    | -                       | Peak    |
| 939.86               | 37.62               | -8.38                   | 46                          | 45.13                   | 20.69                       | 1.33                    | 29.53                      | 199                  | 338                     | Peak    |
| 2389.23              | 68.75               | -5.25                   | 74                          | 66.47                   | 32.86                       | 3.47                    | 34.05                      | 200                  | 42                      | Peak    |
| 2389.23              | 46.66               | -7.34                   | 54                          | 44.38                   | 32.86                       | 3.47                    | 34.05                      | 200                  | 42                      | Average |
| 2412                 | 102.74              | -                       | -                           | 100.41                  | 32.89                       | 3.52                    | 34.08                      | 130                  | 44                      | Peak    |
| 2412                 | 89.01               | -                       | -                           | 86.68                   | 32.89                       | 3.52                    | 34.08                      | 130                  | 44                      | Average |
| 2484.99              | 50.29               | -23.71                  | 74                          | 47.8                    | 33.01                       | 3.68                    | 34.2                       | 114                  | 237                     | Peak    |
| 2484.99              | 37.4                | -16.6                   | 54                          | 34.91                   | 33.01                       | 3.68                    | 34.2                       | 114                  | 237                     | Average |



|                 |  |                     |          |
|-----------------|--|---------------------|----------|
| Test Mode :     | 802.11g  | Temperature :       | 19~20°C  |
| Test Channel :  | 01   | Relative Humidity : | 42~43%   |
| Test Engineer : | Jack Li  | Polarization :      | Vertical |
| Remark :        | 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                   | 22.05               | -17.95                  | 40                          | 33.87                   | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 88.2                 | 21.91               | -21.59                  | 43.5                        | 43.23                   | 8.3                         | 0.38                    | 30                         | -                    | -                       | Peak    |
| 321.97               | 21.39               | -24.61                  | 46                          | 36.96                   | 13.62                       | 0.76                    | 29.95                      | -                    | -                       | Peak    |
| 571.26               | 23.13               | -22.87                  | 46                          | 33.22                   | 18.54                       | 1.03                    | 29.66                      | -                    | -                       | Peak    |
| 832.19               | 24.83               | -21.17                  | 46                          | 32.9                    | 20.3                        | 1.27                    | 29.64                      | -                    | -                       | Peak    |
| 939.86               | 36.54               | -9.46                   | 46                          | 44.05                   | 20.69                       | 1.33                    | 29.53                      | 101                  | 26                      | Peak    |
| 2389.61              | 68.3                | -5.7                    | 74                          | 66.02                   | 32.86                       | 3.47                    | 34.05                      | 172                  | 13                      | Peak    |
| 2389.61              | 45.84               | -8.16                   | 54                          | 43.56                   | 32.86                       | 3.47                    | 34.05                      | 172                  | 13                      | Average |
| 2412                 | 101.58              | -                       | -                           | 99.25                   | 32.89                       | 3.52                    | 34.08                      | 160                  | 360                     | Peak    |
| 2412                 | 88.38               | -                       | -                           | 86.05                   | 32.89                       | 3.52                    | 34.08                      | 160                  | 360                     | Average |
| 2485.94              | 49.79               | -24.21                  | 74                          | 47.3                    | 33.01                       | 3.68                    | 34.2                       | 123                  | 150                     | Peak    |
| 2485.94              | 37.11               | -16.89                  | 54                          | 34.62                   | 33.01                       | 3.68                    | 34.2                       | 123                  | 150                     | Average |



|                 |  |                     |            |
|-----------------|--|---------------------|------------|
| Test Mode :     | 802.11g  | Temperature :       | 19~20°C    |
| Test Channel :  | 06   | Relative Humidity : | 42~43%     |
| Test Engineer : | Jack Li  | Polarization :      | Horizontal |
| Remark :        | 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                   | 21.44               | -18.56                  | 40                          | 33.26                   | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 311.3                | 21.31               | -24.69                  | 46                          | 37.25                   | 13.27                       | 0.74                    | 29.95                      | -                    | -                       | Peak    |
| 473.29               | 24.1                | -21.9                   | 46                          | 36.23                   | 16.7                        | 0.93                    | 29.76                      | -                    | -                       | Peak    |
| 778.84               | 24.55               | -21.45                  | 46                          | 33.03                   | 19.87                       | 1.22                    | 29.57                      | -                    | -                       | Peak    |
| 879.72               | 25.86               | -20.14                  | 46                          | 33.65                   | 20.47                       | 1.29                    | 29.55                      | -                    | -                       | Peak    |
| 939.86               | 38.64               | -7.36                   | 46                          | 46.15                   | 20.69                       | 1.33                    | 29.53                      | 100                  | 33                      | Peak    |
| 2389.23              | 59.56               | -14.44                  | 74                          | 57.28                   | 32.86                       | 3.47                    | 34.05                      | 200                  | 158                     | Peak    |
| 2389.23              | 39.3                | -14.7                   | 54                          | 37.02                   | 32.86                       | 3.47                    | 34.05                      | 200                  | 158                     | Average |
| 2437                 | 103.32              | -                       | -                           | 100.92                  | 32.95                       | 3.6                     | 34.15                      | 102                  | 54                      | Peak    |
| 2437                 | 89.35               | -                       | -                           | 86.95                   | 32.95                       | 3.6                     | 34.15                      | 102                  | 54                      | Average |
| 2488.41              | 59.74               | -14.26                  | 74                          | 57.2                    | 33.05                       | 3.72                    | 34.23                      | 146                  | 229                     | Peak    |
| 2488.41              | 40.69               | -13.31                  | 54                          | 38.15                   | 33.05                       | 3.72                    | 34.23                      | 146                  | 229                     | Average |



|                 |  |                     |          |
|-----------------|--|---------------------|----------|
| Test Mode :     | 802.11g  | Temperature :       | 19~20°C  |
| Test Channel :  | 06   | Relative Humidity : | 42~43%   |
| Test Engineer : | Jack Li  | Polarization :      | Vertical |
| Remark :        | 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  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 44.55                | 22.45               | -17.55                  | 40                          | 42.71                   | 9.6                         | 0.27                    | 30.13                      | -                    | -                       | Peak    |
| 88.2                 | 21.76               | -21.74                  | 43.5                        | 43.08                   | 8.3                         | 0.38                    | 30                         | -                    | -                       | Peak    |
| 570.29               | 23.83               | -22.17                  | 46                          | 33.92                   | 18.54                       | 1.03                    | 29.66                      | -                    | -                       | Peak    |
| 719.67               | 23.86               | -22.14                  | 46                          | 32.85                   | 19.52                       | 1.15                    | 29.66                      | -                    | -                       | Peak    |
| 875.84               | 26.24               | -19.76                  | 46                          | 34.03                   | 20.48                       | 1.29                    | 29.56                      | -                    | -                       | Peak    |
| 939.86               | 38.46               | -7.54                   | 46                          | 45.97                   | 20.69                       | 1.33                    | 29.53                      | 103                  | 224                     | Peak    |
| 2387.9               | 57.67               | -16.33                  | 74                          | 55.39                   | 32.86                       | 3.47                    | 34.05                      | 131                  | 206                     | Peak    |
| 2387.9               | 39.04               | -14.96                  | 54                          | 36.76                   | 32.86                       | 3.47                    | 34.05                      | 131                  | 206                     | Average |
| 2437                 | 101.55              | -                       | -                           | 99.15                   | 32.95                       | 3.6                     | 34.15                      | 105                  | 352                     | Peak    |
| 2437                 | 88.12               | -                       | -                           | 85.72                   | 32.95                       | 3.6                     | 34.15                      | 105                  | 352                     | Average |
| 2485.56              | 60.52               | -13.48                  | 74                          | 58.03                   | 33.01                       | 3.68                    | 34.2                       | 200                  | 37                      | Peak    |
| 2485.56              | 39.47               | -14.53                  | 54                          | 36.98                   | 33.01                       | 3.68                    | 34.2                       | 200                  | 37                      | Average |



|                 |  |                     |            |
|-----------------|--|---------------------|------------|
| Test Mode :     | 802.11g  | Temperature :       | 19~20°C    |
| Test Channel :  | 11   | Relative Humidity : | 42~43%     |
| Test Engineer : | Jack Li  | Polarization :      | Horizontal |
| Remark :        | 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                   | 20.21               | -19.79                  | 40                          | 32.03                   | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 235.64               | 20.73               | -25.27                  | 46                          | 38.64                   | 11.29                       | 0.65                    | 29.85                      | -                    | -                       | Peak    |
| 471.35               | 22.57               | -23.43                  | 46                          | 34.77                   | 16.65                       | 0.92                    | 29.77                      | -                    | -                       | Peak    |
| 821.52               | 25.09               | -20.91                  | 46                          | 33.34                   | 20.11                       | 1.26                    | 29.62                      | -                    | -                       | Peak    |
| 876.81               | 30.52               | -15.48                  | 46                          | 38.31                   | 20.48                       | 1.29                    | 29.56                      | -                    | -                       | Peak    |
| 951.5                | 39.38               | -6.62                   | 46                          | 46.85                   | 20.74                       | 1.33                    | 29.54                      | 120                  | 273                     | Peak    |
| 2389.61              | 50.87               | -23.13                  | 74                          | 48.59                   | 32.86                       | 3.47                    | 34.05                      | 122                  | 203                     | Peak    |
| 2389.61              | 33.52               | -20.48                  | 54                          | 31.24                   | 32.86                       | 3.47                    | 34.05                      | 122                  | 203                     | Average |
| 2462                 | 102.99              | -                       | -                           | 100.54                  | 32.98                       | 3.64                    | 34.17                      | 100                  | 68                      | Peak    |
| 2462                 | 87.99               | -                       | -                           | 85.54                   | 32.98                       | 3.64                    | 34.17                      | 100                  | 68                      | Average |
| 2484.8               | 70.33               | -3.67                   | 74                          | 67.84                   | 33.01                       | 3.68                    | 34.2                       | 101                  | 70                      | Peak    |
| 2484.8               | 47.1                | -6.9                    | 54                          | 44.61                   | 33.01                       | 3.68                    | 34.2                       | 101                  | 70                      | Average |



|                        |  |                            |          |
|------------------------|--|----------------------------|----------|
| <b>Test Mode :</b>     | 802.11g  | <b>Temperature :</b>       | 19~20°C  |
| <b>Test Channel :</b>  | 11   | <b>Relative Humidity :</b> | 42~43%   |
| <b>Test Engineer :</b> | Jack Li  | <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                   | 21.28               | -18.72                  | 40                          | 33.1                    | 18                          | 0.26                    | 30.08                      | -                    | -                       | Peak    |
| 51.34                | 21.4                | -18.6                   | 40                          | 44.04                   | 7.21                        | 0.28                    | 30.13                      | -                    | -                       | Peak    |
| 88.2                 | 21.67               | -21.83                  | 43.5                        | 42.99                   | 8.3                         | 0.38                    | 30                         | -                    | -                       | Peak    |
| 553.8                | 23.81               | -22.19                  | 46                          | 33.98                   | 18.51                       | 1                       | 29.68                      | -                    | -                       | Peak    |
| 875.84               | 29.19               | -16.81                  | 46                          | 36.98                   | 20.48                       | 1.29                    | 29.56                      | -                    | -                       | Peak    |
| 951.5                | 39.92               | -6.08                   | 46                          | 47.39                   | 20.74                       | 1.33                    | 29.54                      | 200                  | 0                       | Peak    |
| 2325.39              | 50.91               | -23.09                  | 74                          | 48.78                   | 32.76                       | 3.27                    | 33.9                       | 200                  | 122                     | Peak    |
| 2325.39              | 34.44               | -19.56                  | 54                          | 32.31                   | 32.76                       | 3.27                    | 33.9                       | 200                  | 122                     | Average |
| 2462                 | 98.65               | -                       | -                           | 96.2                    | 32.98                       | 3.64                    | 34.17                      | 187                  | 360                     | Peak    |
| 2462                 | 84.34               | -                       | -                           | 81.89                   | 32.98                       | 3.64                    | 34.17                      | 187                  | 360                     | Average |
| 2483.66              | 69.24               | -4.76                   | 74                          | 66.75                   | 33.01                       | 3.68                    | 34.2                       | 188                  | 358                     | Peak    |
| 2483.66              | 44.21               | -9.79                   | 54                          | 41.72                   | 33.01                       | 3.68                    | 34.2                       | 188                  | 358                     | Average |

## 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.

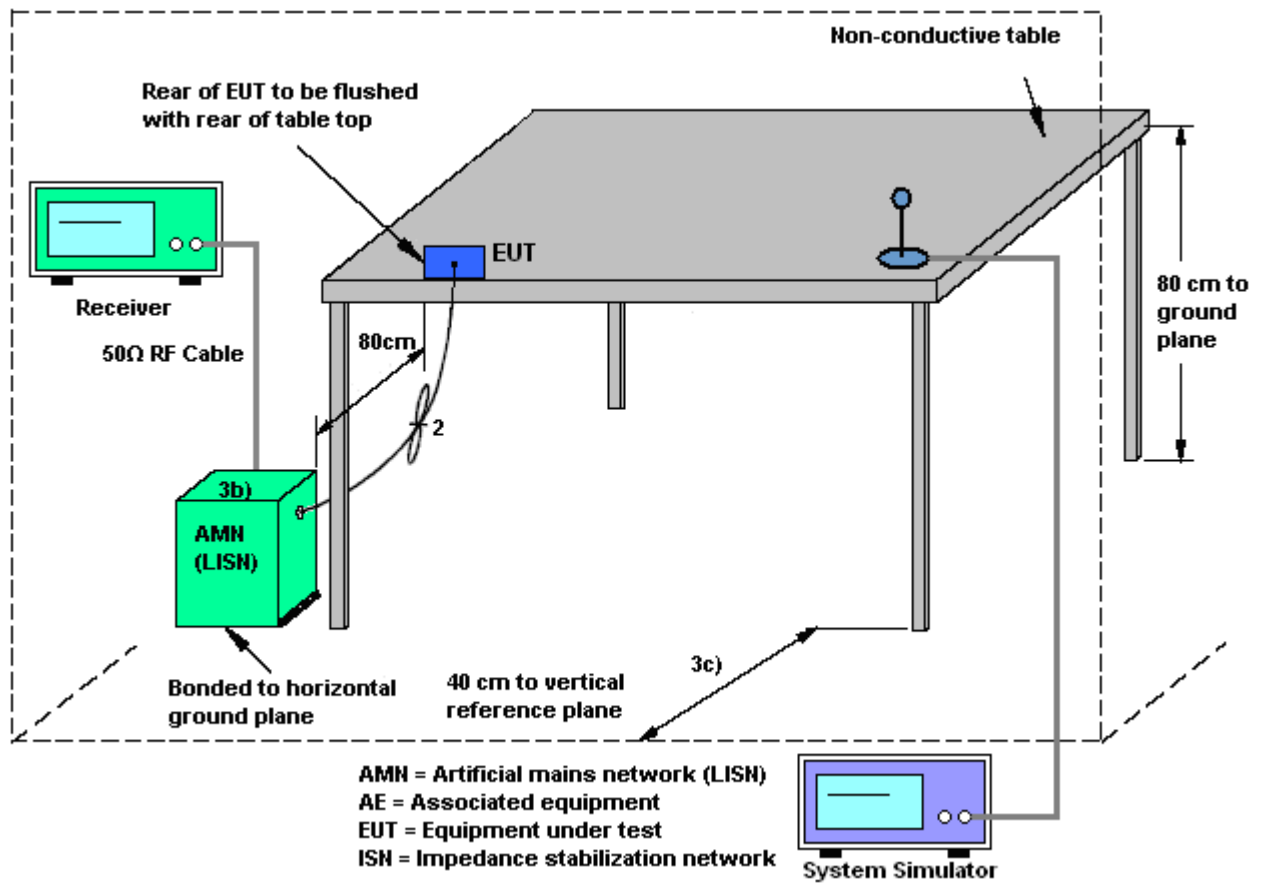
### 3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.6.3 Test Procedures

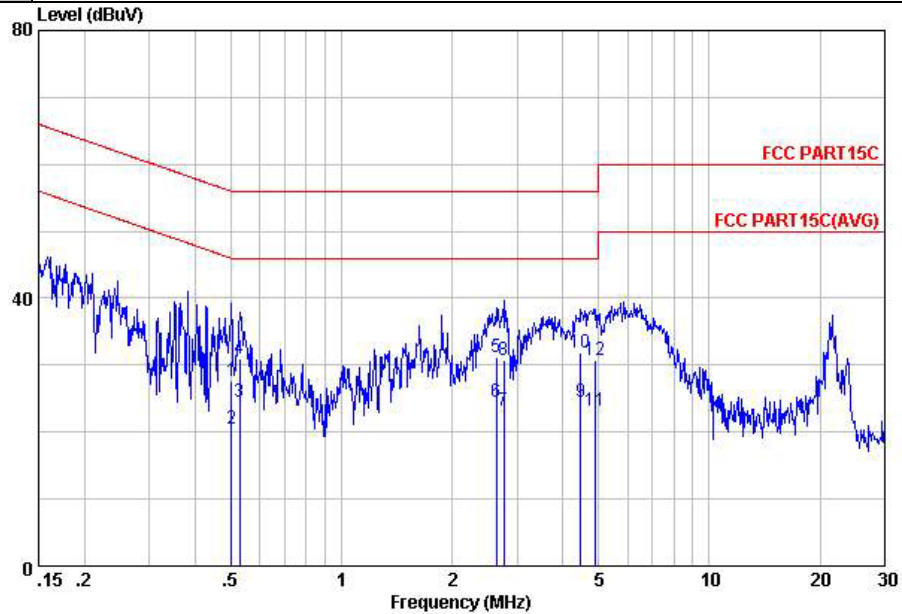
1. The testing follows the guidelines in ANSI C63.4-2003 and ANSI C63.10-2009.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance 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

|                 |   |                     |         |
|-----------------|---|---------------------|---------|
| Test Mode :     | Mode 2  | Temperature :       | 19~20°C |
| Test Engineer : | Tom Wang  | Relative Humidity : | 39~40%  |
| Test Voltage :  | 120Vac / 60Hz   | Phase :             | Line    |
| Function Type : | GSM1900 Idle + Bluetooth Link + WLAN Link + Adapter + Earphone + MPEG4          |                     |         |
| Remark :        | All emissions not reported here are more than 10 dB below the prescribed limit. |                     |         |



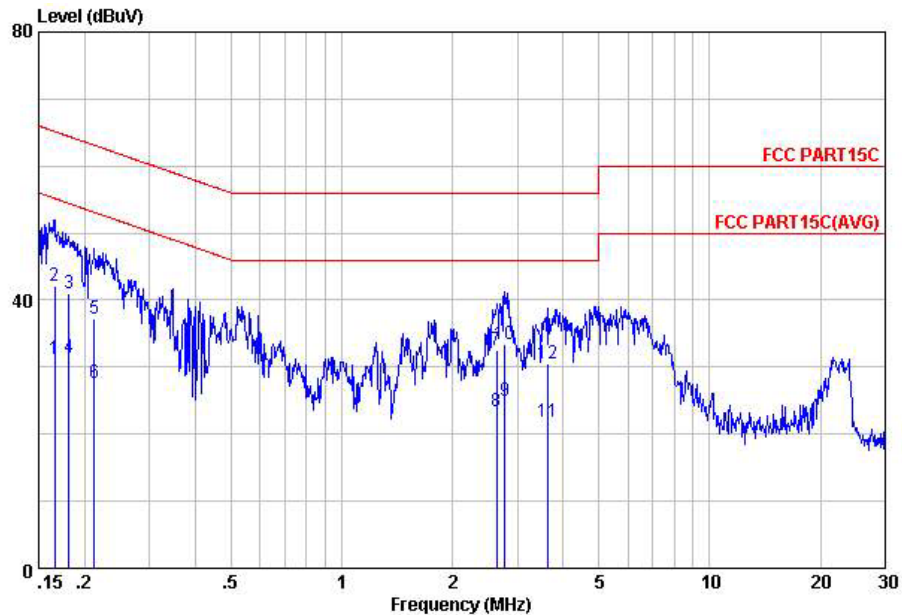
Site : C001-KS  
 Condition: FCC PART15C LISN-111230 LINE

mode : Mode 2

|    | Freq | Level | Over   | Limit | Read  | LISN   | Cable | Remark  |
|----|------|-------|--------|-------|-------|--------|-------|---------|
|    | MHz  | dBuV  | Limit  | Line  | Level | Factor | Loss  |         |
|    |      |       | dB     | dBuV  | dBuV  | dB     | dB    |         |
| 1  | 0.50 | 27.64 | -28.36 | 56.00 | 17.10 | -0.08  | 10.62 | QP      |
| 2  | 0.50 | 20.54 | -25.46 | 46.00 | 10.00 | -0.08  | 10.62 | Average |
| 3  | 0.53 | 24.54 | -21.46 | 46.00 | 13.99 | -0.08  | 10.63 | Average |
| 4  | 0.53 | 30.94 | -25.06 | 56.00 | 20.39 | -0.08  | 10.63 | QP      |
| 5  | 2.64 | 31.13 | -24.87 | 56.00 | 20.50 | -0.11  | 10.74 | QP      |
| 6  | 2.64 | 24.53 | -21.47 | 46.00 | 13.90 | -0.11  | 10.74 | Average |
| 7  | 2.76 | 23.24 | -22.76 | 46.00 | 12.60 | -0.12  | 10.76 | Average |
| 8  | 2.76 | 30.64 | -25.36 | 56.00 | 20.00 | -0.12  | 10.76 | QP      |
| 9  | 4.48 | 24.61 | -21.39 | 46.00 | 13.90 | -0.13  | 10.84 | Average |
| 10 | 4.48 | 31.91 | -24.09 | 56.00 | 21.20 | -0.13  | 10.84 | QP      |
| 11 | 4.90 | 23.22 | -22.78 | 46.00 | 12.50 | -0.13  | 10.85 | Average |
| 12 | 4.90 | 30.72 | -25.28 | 56.00 | 20.00 | -0.13  | 10.85 | QP      |



|                 |   |                     |         |
|-----------------|---|---------------------|---------|
| Test Mode :     | Mode 2  | Temperature :       | 19~20°C |
| Test Engineer : | Tom Wang  | Relative Humidity : | 39~40%  |
| Test Voltage :  | 120Vac / 60Hz   | Phase :             | Neutral |
| Function Type : | GSM1900 Idle + Bluetooth Link + WLAN Link + Adapter + Earphone + MPEG4          |                     |         |
| Remark :        | All emissions not reported here are more than 10 dB below the prescribed limit. |                     |         |



Site : C001-KS  
 Condition: FCC PART15C LISN-111230 NEUTRAL

mode : Mode 2

|    | Freq | Level | Over   | Limit | Read  | LISN   | Cable | Remark  |
|----|------|-------|--------|-------|-------|--------|-------|---------|
|    | MHz  | dBuV  | Limit  | Line  | Level | Factor | Loss  |         |
|    |      |       | dB     | dBuV  | dBuV  | dB     | dB    |         |
| 1  | 0.17 | 31.23 | -23.93 | 55.16 | 20.90 | -0.08  | 10.41 | Average |
| 2  | 0.17 | 42.03 | -23.13 | 65.16 | 31.70 | -0.08  | 10.41 | QP      |
| 3  | 0.18 | 40.99 | -23.43 | 64.42 | 30.61 | -0.08  | 10.46 | QP      |
| 4  | 0.18 | 31.39 | -23.03 | 54.42 | 21.01 | -0.08  | 10.46 | Average |
| 5  | 0.21 | 37.14 | -25.96 | 63.10 | 26.70 | -0.07  | 10.51 | QP      |
| 6  | 0.21 | 27.54 | -25.56 | 53.10 | 17.10 | -0.07  | 10.51 | Average |
| 7  | 2.64 | 32.43 | -23.57 | 56.00 | 21.80 | -0.11  | 10.74 | QP      |
| 8  | 2.64 | 23.33 | -22.67 | 46.00 | 12.70 | -0.11  | 10.74 | Average |
| 9  | 2.78 | 25.04 | -20.96 | 46.00 | 14.40 | -0.12  | 10.76 | Average |
| 10 | 2.78 | 33.34 | -22.66 | 56.00 | 22.70 | -0.12  | 10.76 | QP      |
| 11 | 3.64 | 21.89 | -24.11 | 46.00 | 11.19 | -0.12  | 10.82 | Average |
| 12 | 3.64 | 30.49 | -25.51 | 56.00 | 19.79 | -0.12  | 10.82 | QP      |



## **3.7 Antenna Requirements**

### **3.7.1 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.

### **3.7.2 Antenna Connected Construction**

Non-standard connector used.

### **3.7.3 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    | Jul. 07, 2012~<br>Jul. 16, 2012 | Dec. 29, 2012 | Conducted<br>(TH01-KS)   |
| Power Meter               | Agilent      | E4416A    | MY45101555       | N/A             | Aug. 23, 2011    | Jul. 07, 2012~<br>Jul. 16, 2012 | Aug. 22, 2012 | Conducted<br>(TH01-KS)   |
| Power Sensor              | Agilent      | E9327A    | MY44421198       | N/A             | Aug. 23, 2011    | Jul. 07, 2012~<br>Jul. 16, 2012 | Aug. 22, 2012 | Conducted<br>(TH01-KS)   |
| DC Power Supply           | GWINSTEK     | GPS-3030D | E1884515         | N/A             | Aug. 23, 2011    | Jul. 07, 2012~<br>Jul. 16, 2012 | Aug. 22, 2012 | Conducted<br>(TH01-KS)   |
| Thermal Chamber           | Ten Billion  | TTC-B3S   | TBN-960502       | N/A             | Dec. 30, 2011    | Jul. 07, 2012~<br>Jul. 16, 2012 | Dec. 29, 2012 | Conducted<br>(TH01-KS)   |
| EMI Test Receiver         | R&S          | ESCI      | 100534           | 9kHz~3GHz       | Nov. 09, 2011    | Jul. 07, 2012~<br>Jul. 17, 2012 | Nov. 08, 2012 | Radiation<br>(03CH01-KS) |
| Spectrum Analyzer         | R&S          | FSP40     | 100319           | 9kHz~40GHz      | Dec. 30, 2011    | Jul. 07, 2012~<br>Jul. 17, 2012 | Dec. 29, 2012 | Radiation<br>(03CH01-KS) |
| Bilog Antenna             | SCHAFFNER    | CBL6112D  | 23182            | 25MHz~2GHz      | Dec. 08, 2011    | Jul. 07, 2012~<br>Jul. 17, 2012 | Dec. 07, 2012 | Radiation<br>(03CH01-KS) |
| Loop Antenna              | R&S          | HFH2-Z2   | 860004/00        | 9 kHz~30 MHz    | Jul. 28, 2011    | Jul. 07, 2012~<br>Jul. 17, 2012 | Jul. 27, 2012 | Radiation<br>(03CH01-KS) |
| Double Ridge Horn Antenna | EMCO         | 3117      | 00075959         | 1GHz~18GHz      | Jan. 06, 2012    | Jul. 07, 2012~<br>Jul. 17, 2012 | Jan. 05, 2013 | Radiation<br>(03CH01-KS) |
| Amplifier                 | Wireless     | FPA-6592G | 060004           | 30MHz~2GHz      | Dec. 30, 2011    | Jul. 07, 2012~<br>Jul. 17, 2012 | Dec. 29, 2012 | Radiation<br>(03CH01-KS) |
| Amplifier                 | Agilent      | 8449B     | 3008A02370       | 1GHz~26.5GHz    | Dec. 30, 2011    | Jul. 07, 2012~<br>Jul. 17, 2012 | Dec. 29, 2012 | Radiation<br>(03CH01-KS) |
| Active Horn Antenna       | com-power    | AHA-118   | 701023           | 1GHz~18GHz      | Nov. 07, 2011    | Jul. 07, 2012~<br>Jul. 17, 2012 | Nov. 06, 2012 | Radiation<br>(03CH01-KS) |
| SHF-EHF Horn              | Schwarzbeck  | BBHA 9170 | BBHA170249       | 15GHz~40GHz     | Oct. 11, 2011    | Jul. 07, 2012~<br>Jul. 17, 2012 | Oct.10, 2012  | Radiation<br>(03CH01-KS) |
| EMI Receiver              | R&S          | ESCI7     | 100768           | 9kHz~7GHz       | Jun. 01, 2012    | Jul. 03, 2012                   | May 31, 2013  | Conduction<br>(CO01-KS)  |
| LISN                      | MessTec      | AN3016    | 60103            | 9kHz~30MHz      | Dec. 30, 2011    | Jul. 03, 2012                   | Dec. 29, 2012 | Conduction<br>(CO01-KS)  |
| LISN                      | MessTec      | AN3016    | 60105            | 9kHz~30MHz      | Dec. 30, 2011    | Jul. 03, 2012                   | Dec. 29, 2012 | Conduction<br>(CO01-KS)  |
| AC Power Source           | Chroma       | 61602     | ABP0000008<br>11 | N/A             | Nov. 16, 2011    | Jul. 03, 2012                   | Nov. 15, 2012 | Conduction<br>(CO01-KS)  |
| System Simulator          | R&S          | CMU200    | 837587/066       | 2G Full-Band    | Dec. 30, 2011    | Jul. 03, 2012                   | Dec. 29, 2012 | Conduction<br>(CO01-KS)  |



## 5 Uncertainty of Evaluation

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

|   |      |
|---|------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 2.54 |
|---|------|

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

|   |      |
|---|------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 4.72 |
|---|------|

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

|   |      |
|---|------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 2.26 |
|---|------|