

# FCC RF Test Report

APPLICANT : Partner Tech Corp  
EQUIPMENT : E-Menu  
BRAND NAME : PARTNER  
MODEL NAME : EM-70B  
FCC ID : NDPEM-70B  
STANDARD : FCC Part 15 Subpart C §15.247  
CLASSIFICATION : (DSS) Spread Spectrum Transmitter

The product was received on Jun. 06, 2012 and completely tested on Jul. 31, 2012. We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.

Reviewed by:



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Jones Tsai / Manager



**SPORTON INTERNATIONAL INC.**

No. 52, Hwa Ya 1<sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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## REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION             | ISSUED DATE   |
|------------|---------|-------------------------|---------------|
| FR260602A  | Rev. 01 | Initial issue of report | Aug. 20, 2012 |
|            |         |                         |               |
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## SUMMARY OF TEST RESULT

| Report Section | FCC Rule              | IC Rule   | Description                 | Limit                                                            | Result | Remark                                                        |
|----------------|-----------------------|-----------|-----------------------------|------------------------------------------------------------------|--------|---------------------------------------------------------------|
| 3.1            | 15.247(a)(1)          | A8.4(2)   | Number of Channels          | $\geq 15\text{Chs}$                                              | Pass   | -                                                             |
| 3.2            | 15.247(a)(1)          | A8.1(b)   | Hopping Channel Separation  | $\geq 2/3$ of 20dB BW                                            | Pass   | -                                                             |
| 3.3            | 15.247(a)(1)          | A8.1(d)   | Dwell Time of Each Channel  | $\leq 0.4\text{sec}$ in 31.6sec period                           | Pass   | -                                                             |
| 3.4            | 15.247(a)(1)          | A8.1(a)   | 20dB Bandwidth              | NA                                                               | Pass   | -                                                             |
| 3.5            | 15.247(b)(1)          | A8.1(b)   | Peak Output Power           | $\leq 1\text{ w}$ for 1Mbps<br>$\leq 125\text{ Mw}$ for 2, 3Mbps | Pass   | -                                                             |
| 3.6            | 15.247(d)             | A8.5      | Conducted Band Edges        | $\leq 20\text{dBc}$                                              | Pass   | -                                                             |
| 3.7            | 15.247(d)             | A8.5      | Conducted Spurious Emission | $\leq 20\text{dBc}$                                              | Pass   | -                                                             |
| 3.8            | 15.247(d)             | A8.5      | Radiated Band Edges         | 15.209(a) & 15.247(d)                                            | Pass   | -                                                             |
| 3.9            | 15.247(d)             | A8.5      | Radiated Spurious Emission  | 15.209(a) & 15.247(d)                                            | Pass   | Under limit<br>-0.15 dB at<br>4882.000 MHz                    |
| 3.10           | 15.207                | Gen 7.2.4 | AC Conducted Emission       | 15.207(a)                                                        | Pass   | Under limit<br>14.50 dB at<br>21.150 MHz<br>and<br>20.454 MHz |
| 3.11           | 15.203 &<br>15.247(b) | A8.4      | Antenna Requirement         | N/A                                                              | Pass   | -                                                             |

# 1 General Description

## 1.1 Applicant

**Partner Tech Corp**

10FL, 233-2, Baoqiao Road, Xindian, New Taipei City, Taiwan.

## 1.2 Manufacturer

**Partner Tech Corp**

10FL, 233-2, Baoqiao Road, Xindian, New Taipei City, Taiwan.

## 1.3 Feature of Equipment Under Test

| Product Feature                 |                              |
|---------------------------------|------------------------------|
| Equipment                       | E-Menu                       |
| Brand Name                      | PARTNER                      |
| Model Name                      | EM-70B                       |
| FCC ID                          | NDPEM-70B                    |
| Sample 1                        | EUT with White color         |
| Sample 2                        | EUT with Black color         |
| EUT supports Radios application | WLAN 11bgn / Bluetooth / NFC |
| HW Version                      | V1.5                         |
| SW Version                      | F2.04                        |
| EUT Stage                       | Production Unit              |

**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                             | 2402 MHz ~ 2480 MHz                                                                                                                                              |
| Number of Channels                                | 79                                                                                                                                                               |
| Carrier Frequency of Each Channel                 | 2402+n*1 MHz; n=0~78                                                                                                                                             |
| Maximum Output Power to Antenna                   | Bluetooth (1Mbps) : -0.13 dBm (0.0010 W)<br>Bluetooth EDR (2Mbps) : -1.13 dBm (0.0008 W)<br>Bluetooth EDR (3Mbps) : -0.65 dBm (0.0009 W)                         |
| Antenna Type                                      | PIFA Antenna with gain 3.70 dBi                                                                                                                                  |
| Type of Modulation                                | Bluetooth (1Mbps) : GFSK<br>Bluetooth 2.1 EDR (2Mbps) : $\pi$ /4-DQPSK<br>Bluetooth 2.1 EDR (3Mbps) : 8-DPSK<br>Bluetooth 3.0 EDR : GFSK, $\pi$ /4-DQPSK, 8-DPSK |

## 1.4 Testing Site

|                    |                                                                                                                                                              |         |           |                         |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------|-------------------------|
| Test Site          | SPORTON INTERNATIONAL INC.                                                                                                                                   |         |           |                         |
| Test Site Location | No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park,<br>Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.<br>TEL: +886-3-3273456 / FAX: +886-3-3284978 |         |           |                         |
| Test Site No.      | Sporton Site No.                                                                                                                                             |         |           | FCC/IC Registration No. |
|                    | TH02-HY                                                                                                                                                      | CO05-HY | 03CH05-HY | 722060/4086B-1          |

## 1.5 Applied Standards

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

- FCC Part 15 Subpart C §15.247
- FCC Public Notice DA 00-705
- 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.   | Bluetooth Base Station | R&S           | CBT32              | N/A         | N/A               | Unshielded, 1.8 m                                          |
| 2.   | WLAN AP                | D-Link        | DIR-628            | KA2DIR628A2 | N/A               | Unshielded, 1.8 m                                          |
| 3.   | Notebook               | DELL          | Latitude E6320     | FCC DoC     | N/A               | AC I/P:<br>Unshielded, 1.2 m<br>DC O/P:<br>Shielded, 1.8 m |
| 4.   | LCD Monitor            | Dell          | U2410              | FCC DoC     | Shielded, 1.6 m   | Unshielded, 1.8 m                                          |
| 5.   | USB HD                 | WD            | WDBAAR3200ABK-PESN | FCC DoC     | Unshielded, 0.5 m | N/A                                                        |
| 6.   | Bluetooth Earphone     | Sony Ericsson | MW600              | PY7DDA-2029 | N/A               | N/A                                                        |
| 7.   | iPod                   | Apple         | A1285              | FCC DoC     | Shielded, 1.0 m   | N/A                                                        |

## 2 Test Configuration of Equipment Under Test

### 2.1 RF Output Power

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

| Band       | Bluetooth RF Output Power |       |       |
|------------|---------------------------|-------|-------|
| Channel    | 00                        | 39    | 78    |
| Frequency  | 2402                      | 2441  | 2480  |
| Peak Power | -0.82                     | -0.13 | -0.30 |

**Remark:**

1. All the test data for each data rate were verified, but only the worst case was reported.
2. The data rate was set in 1Mbps for all the test items due to the highest RF output power.
3. The EUT is programmed to transmit signals continuously for all testing.



## 2.2 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: conduction (150 KHz to 30 MHz), radiation (9 KHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

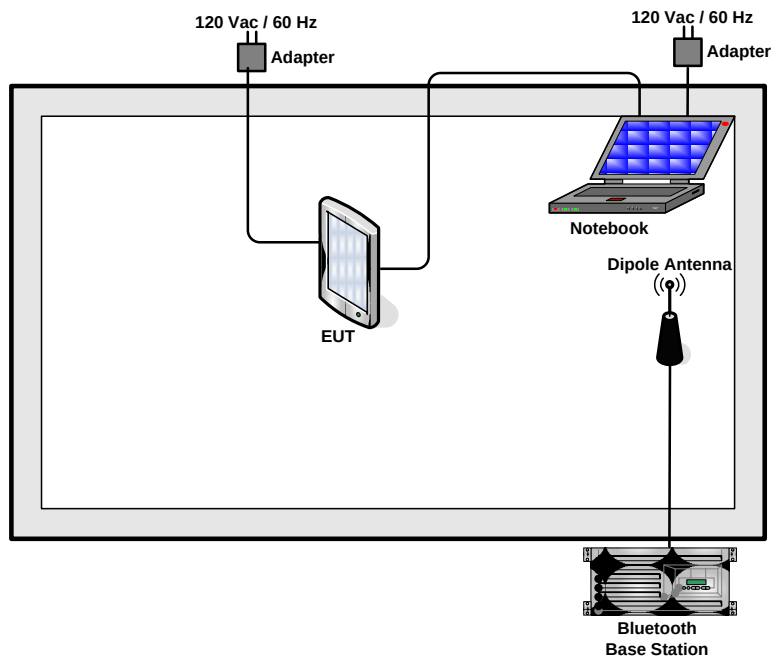
Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations.

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

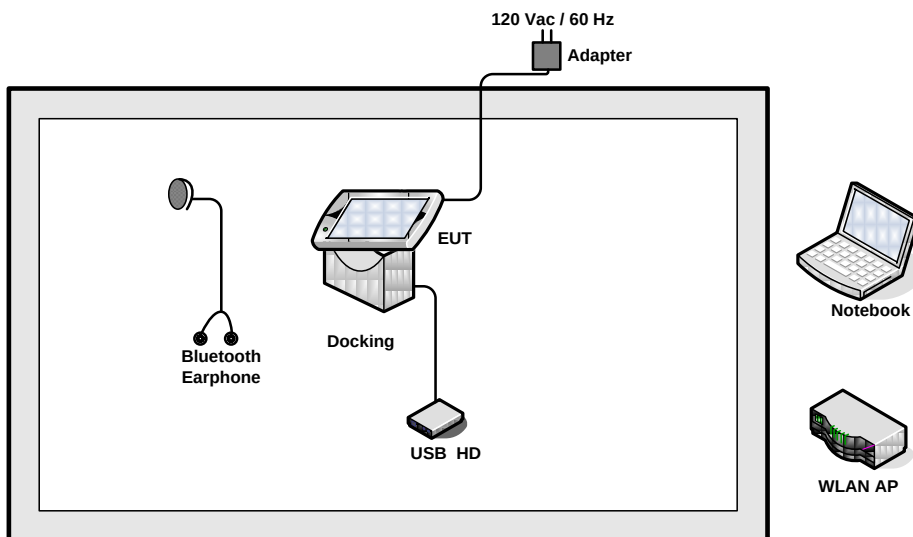
| Test Cases                                                                                                                         |                                                                                                                                                                                              |                                                                         |                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Test Item                                                                                                                          | Data Rate / Modulation                                                                                                                                                                       |                                                                         |                                                                         |
|                                                                                                                                    | Bluetooth 1Mbps<br>GFSK                                                                                                                                                                      | Bluetooth EDR 2Mbps<br>$\pi$ /4-DQPSK                                   | Bluetooth EDR 3Mbps<br>8-DPSK                                           |
| Conducted<br>TCs                                                                                                                   | Mode 1: CH00_2402 MHz<br>Mode 2: CH39_2441 MHz<br>Mode 3: CH78_2480 MHz                                                                                                                      | Mode 4: CH00_2402 MHz<br>Mode 5: CH39_2441 MHz<br>Mode 6: CH78_2480 MHz | Mode 7: CH00_2402 MHz<br>Mode 8: CH39_2441 MHz<br>Mode 9: CH78_2480 MHz |
| Radiated<br>TCs                                                                                                                    | Mode 1: CH00_2402 MHz<br>Mode 2: CH39_2441 MHz<br>Mode 3: CH78_2480 MHz                                                                                                                      | N/A                                                                     | N/A                                                                     |
| AC<br>Conducted<br>Emission                                                                                                        | Mode 1 :WLAN Link + Bluetooth Link + H-Pattern + USB Cable (Data Link with Notebook) + Adapter + SD Card + NFC On<br>Mode 2 :WLAN Link + Bluetooth Link + MPEG4 + Docking + NFC On + Adapter |                                                                         |                                                                         |
| Remark:                                                                                                                            |                                                                                                                                                                                              |                                                                         |                                                                         |
| 1. For radiated TCs, the data rate was set in 1Mbps due to the highest RF output power; only the data of these modes was reported. |                                                                                                                                                                                              |                                                                         |                                                                         |
| 2. For conducted emission, the worst case is mode 2; only the test data of this mode was reported.                                 |                                                                                                                                                                                              |                                                                         |                                                                         |
| 3. All test items were performance with Sample 2.                                                                                  |                                                                                                                                                                                              |                                                                         |                                                                         |

## 2.3 Connection Diagram of Test System

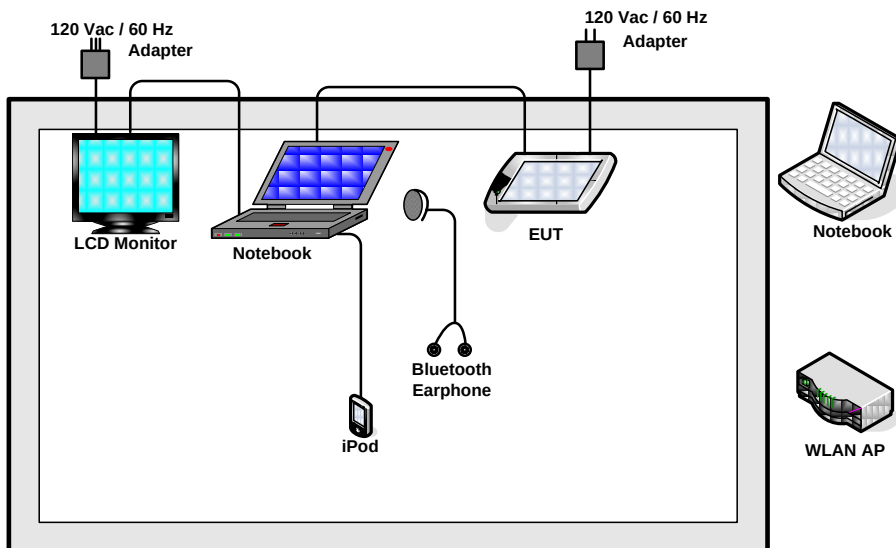
### <Bluetooth Tx Mode>



### <EUT with Docking Mode>



**<EUT with USB Cable (Link with Notebook) Mode>**



## 2.4 RF Utility

For Bluetooth function, the RF utility, "CMD" was installed in notebook which was programmed in order to make the EUT into the engineering modes to contact with Bluetooth base station for continuous transmitting and receiving signals.

### 3 Test Result

#### 3.1 Number of Channel Measurement

##### 3.1.1 Limits of Number of Hopping Frequency

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

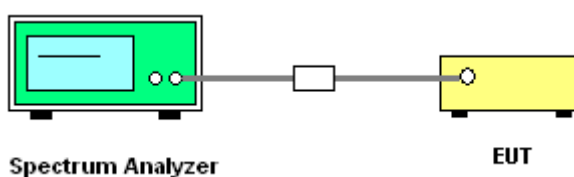
##### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

##### 3.1.3 Test Procedure

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The modulation types of EUT are irrelevant to number of hopping channels deviation.  
The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:  
Span = the frequency band of operation; RBW  $\geq$  1% of the span; VBW  $\geq$  RBW; Sweep = auto;  
Detector function = peak; Trace = max hold.
4. The number of hopping frequency used is defined as the device has the numbers of total channel.

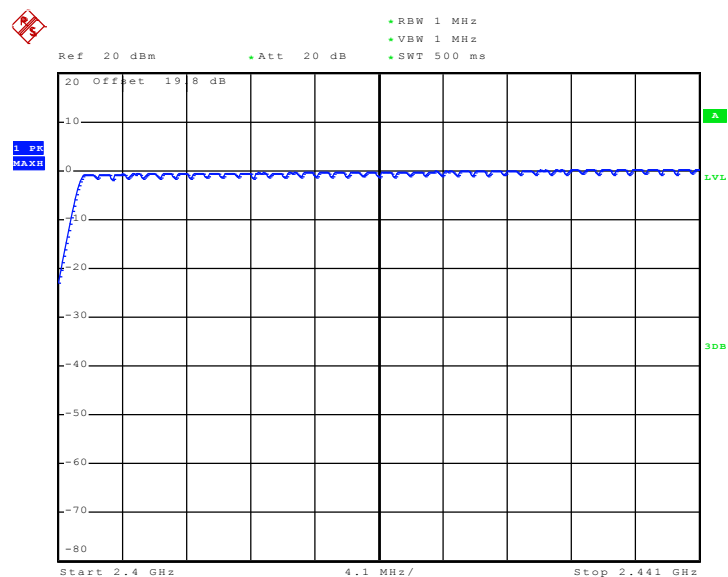
##### 3.1.4 Test Setup



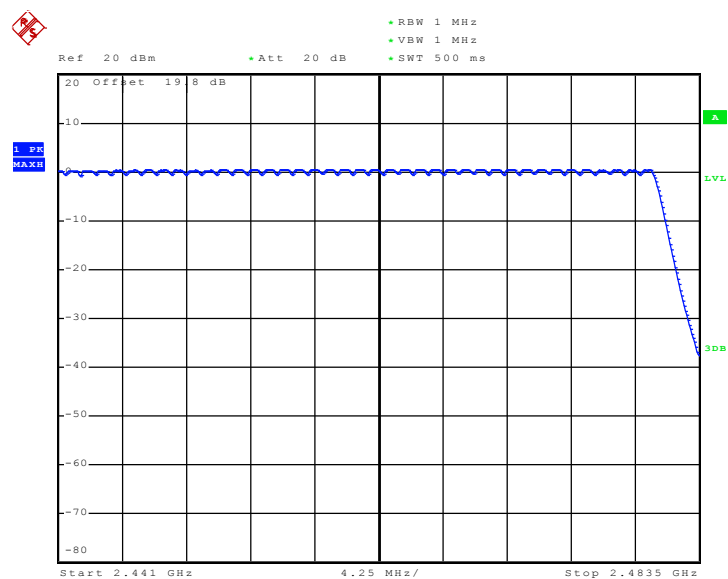
##### 3.1.5 Test Result of Number of Hopping Frequency

| Test Mode :                             | 1Mbps    | Temperature :       | 24~26°C   |
|-----------------------------------------|----------|---------------------|-----------|
| Test Engineer :                         | Book Lin | Relative Humidity : | 50~53%    |
| Number of Hopping Channels<br>(Channel) |          | Limits<br>(Channel) | Pass/Fail |
| 79                                      |          | > 15                | Pass      |

## Number of Hopping Channel Plot on Channel 00 - 78



Date: 30.JUN.2012 01:34:01



Date: 30.JUN.2012 01:40:07

## 3.2 Hopping Channel Separation Measurement

### 3.2.1 Limit of Hopping Channel Separation

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 KHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

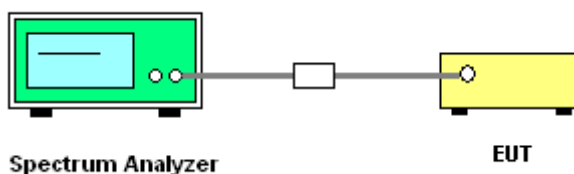
### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.2.3 Test Procedures

1. Please refer FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate and enable the hopping function of the EUT.
4. Use the following spectrum analyzer settings:  
Span = wide enough to capture the peaks of two adjacent channels; RBW  $\geq$  1% of the span;  
VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold.
5. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

### 3.2.4 Test Setup

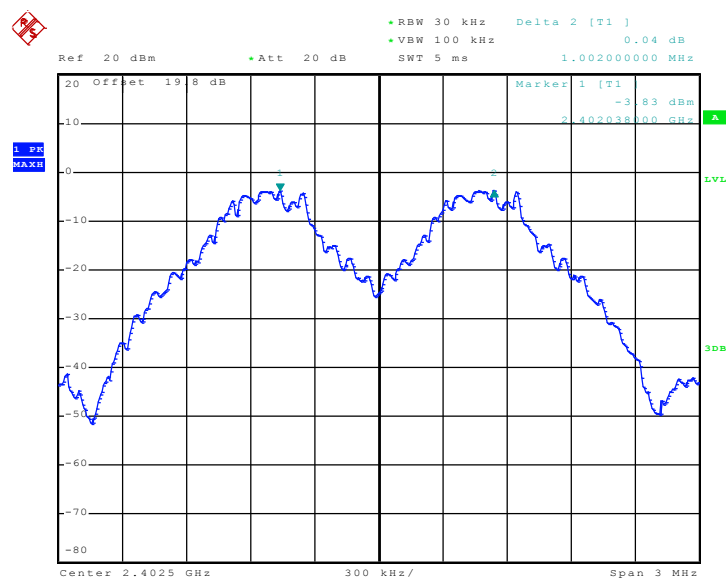


### 3.2.5 Test Result of Hopping Channel Separation

|                 |          |                     |         |
|-----------------|----------|---------------------|---------|
| Test Mode :     | 1Mbps    | Temperature :       | 24~26°C |
| Test Engineer : | Book Lin | Relative Humidity : | 50~53%  |

| Channel | Frequency (MHz) | Frequency Separation (MHz) | (2/3 of 20dB BW) Limits (MHz) | Pass/Fail |
|---------|-----------------|----------------------------|-------------------------------|-----------|
| 00      | 2402            | 1.002                      | 0.6400                        | Pass      |
| 39      | 2441            | 1.002                      | 0.6427                        | Pass      |
| 78      | 2480            | 1.002                      | 0.6427                        | Pass      |

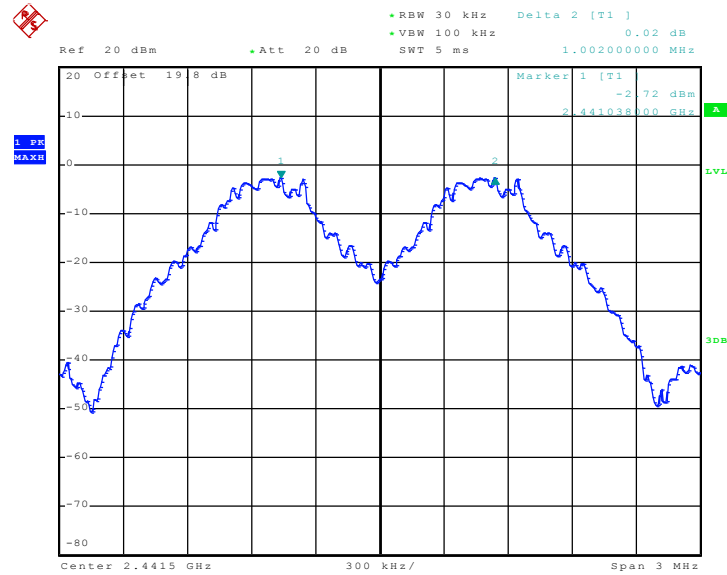
**Channel Separation Plot on Channel 00 - 01**



Date: 30.JUN.2012 00:48:12

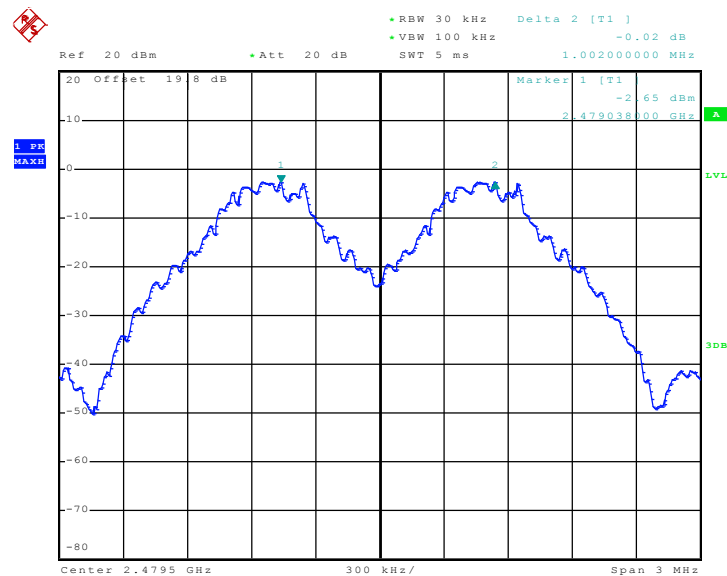


### Channel Separation Plot on Channel 39 - 40



Date: 30.JUN.2012 00:48:52

### Channel Separation Plot on Channel 77 - 78



Date: 30.JUN.2012 00:50:28



### 3.3 Dwell Time Measurement

#### 3.3.1 Limit of Dwell Time

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

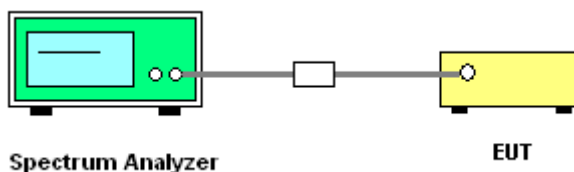
#### 3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.3.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate and enable the hopping function of the EUT.
4. The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:  
Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW  $\geq$  RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.
5. Use the marker-delta function to calculate the dwell time.

#### 3.3.4 Test Setup



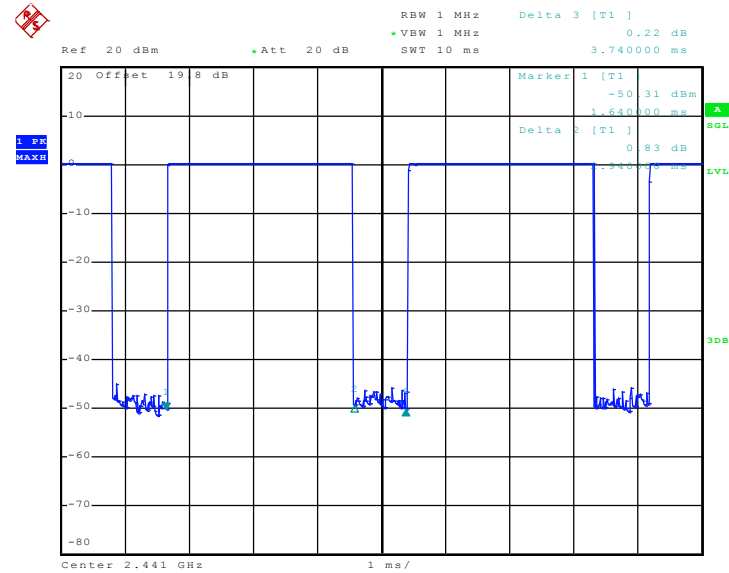
**3.3.5 Test Result of Dwell Time**

|                        |          |                            |        |
|------------------------|----------|----------------------------|--------|
| <b>Test Mode :</b>     | DH5      | <b>Temperature :</b>       | 24~26℃ |
| <b>Test Engineer :</b> | Book Lin | <b>Relative Humidity :</b> | 50~53% |

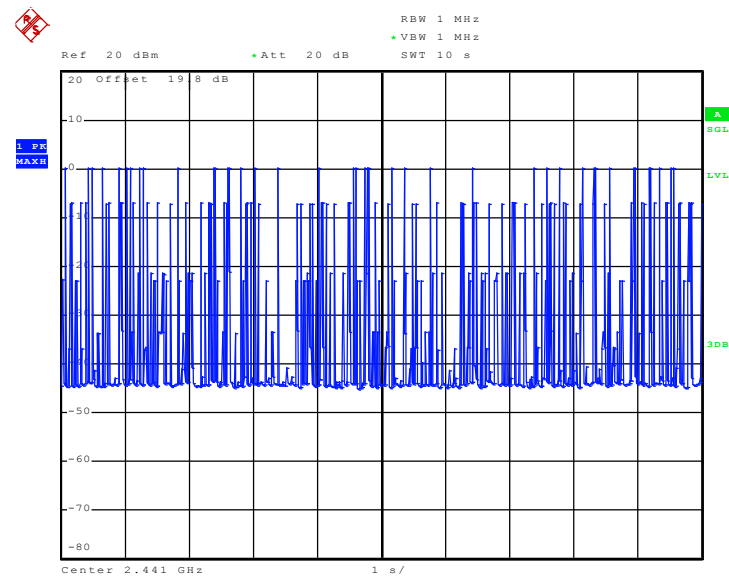
| Package Mode | Average Hopping Channel | Package Transfer Time (usec) | Dwell Time (sec) | Limits (sec) | Pass/Fail |
|--------------|-------------------------|------------------------------|------------------|--------------|-----------|
| DH5          | 3.50                    | 2940.00                      | 0.33             | 0.4          | Pass      |

**Remark:**

1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time
2. 79 channels come from the Hopping Channel number.
3. Average Hopping Channel = hops/sweep time
4. T: Package Transfer Time(us)

**DH5 Dwell Time (One Pulse) Plot on Channel 39**


Date: 29.JUN.2012 01:31:48

**DH5 Dwell Time (Count Pulses) Plot on Channel 39**


Date: 30.JUN.2012 01:25:24

### 3.4 20dB Bandwidth Measurement

#### 3.4.1 Limit of 20dB Bandwidth

Reporting only

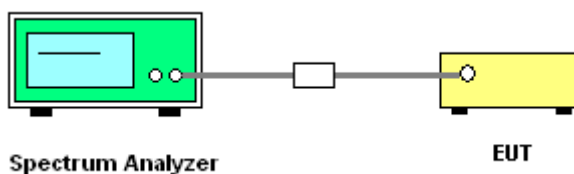
#### 3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.4.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. Use the following spectrum analyzer settings:  
Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel;  
RBW  $\geq$  1% of the 20 dB bandwidth; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak;  
Trace = max hold.
5. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

#### 3.4.4 Test Setup

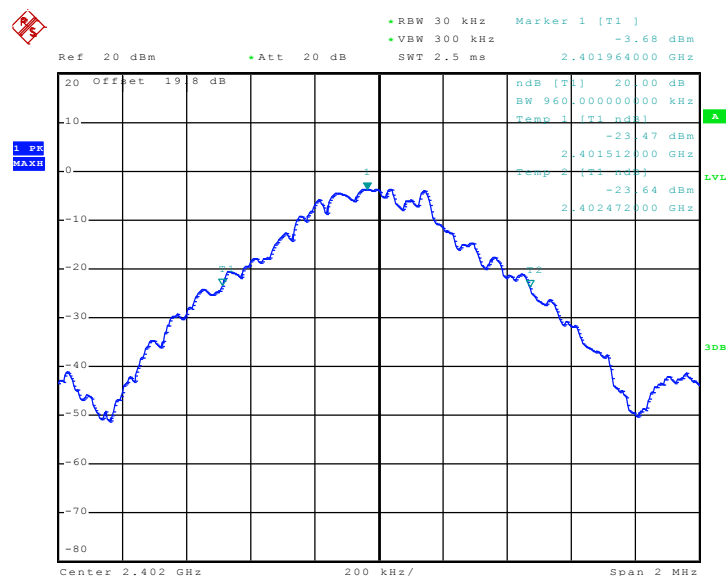


### 3.4.5 Test Result of 20dB Bandwidth

|                 |          |                     |        |
|-----------------|----------|---------------------|--------|
| Test Mode :     | 1Mbps    | Temperature :       | 24~26℃ |
| Test Engineer : | Book Lin | Relative Humidity : | 50~53% |

| Channel | Frequency (MHz) | 20dB Bandwidth (MHz) |
|---------|-----------------|----------------------|
| 00      | 2402            | 0.960                |
| 39      | 2441            | 0.964                |
| 78      | 2480            | 0.964                |

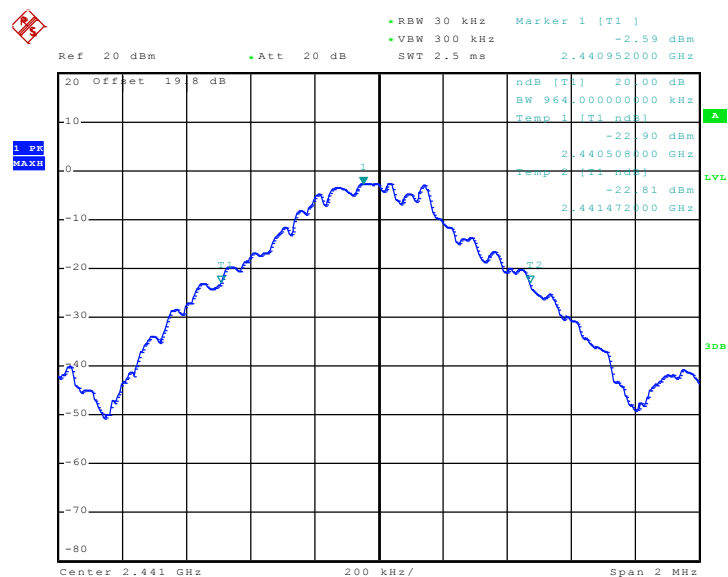
**20 dB Bandwidth Plot on Channel 00**



Date: 30.JUN.2012 01:03:03

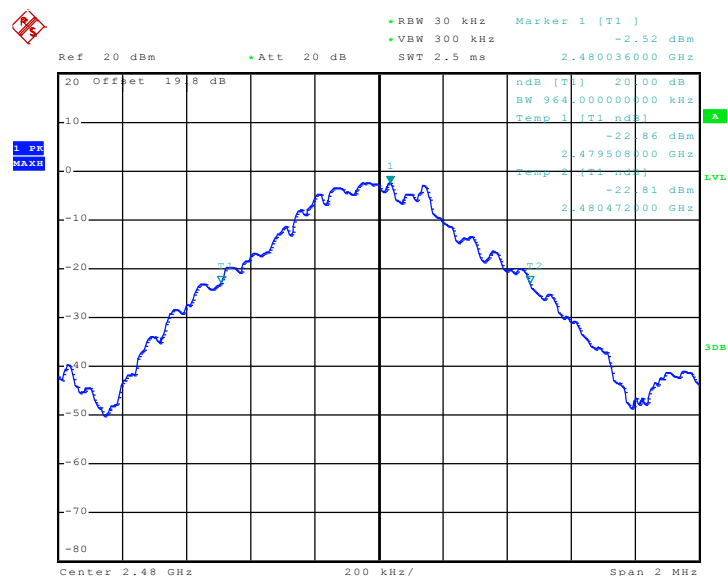


### 20 dB Bandwidth Plot on Channel 39



Date: 30.JUN.2012 01:03:28

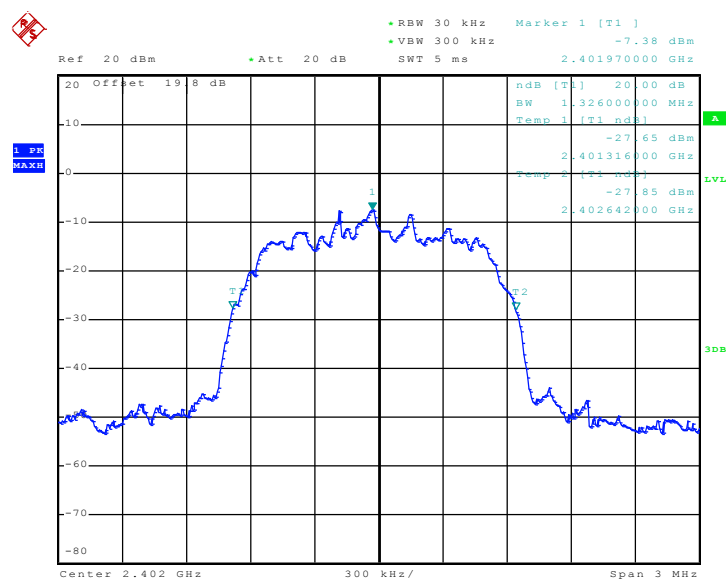
### 20 dB Bandwidth Plot on Channel 78



Date: 30.JUN.2012 01:04:02



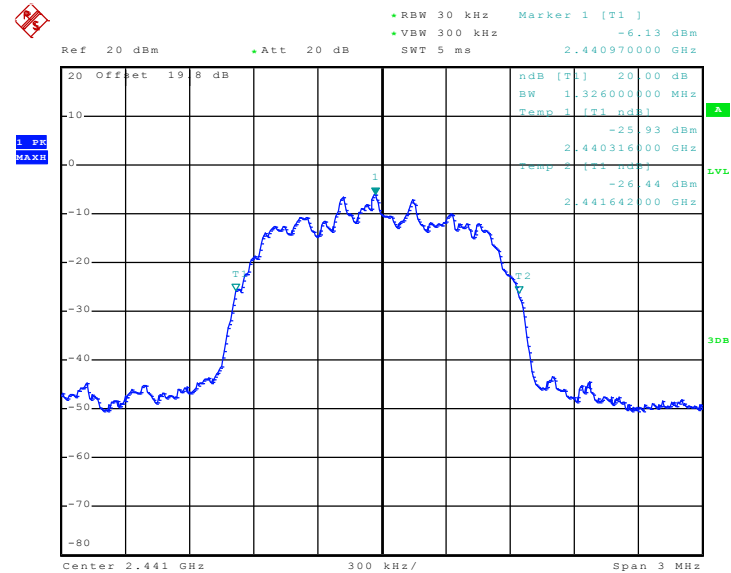
| Channel | Frequency (MHz) | 20dB Bandwidth (MHz) |
|---------|-----------------|----------------------|
| 00      | 2402            | 1.326                |
| 39      | 2441            | 1.326                |
| 78      | 2480            | 1.326                |



Date: 30.JUN.2012 01:04:24

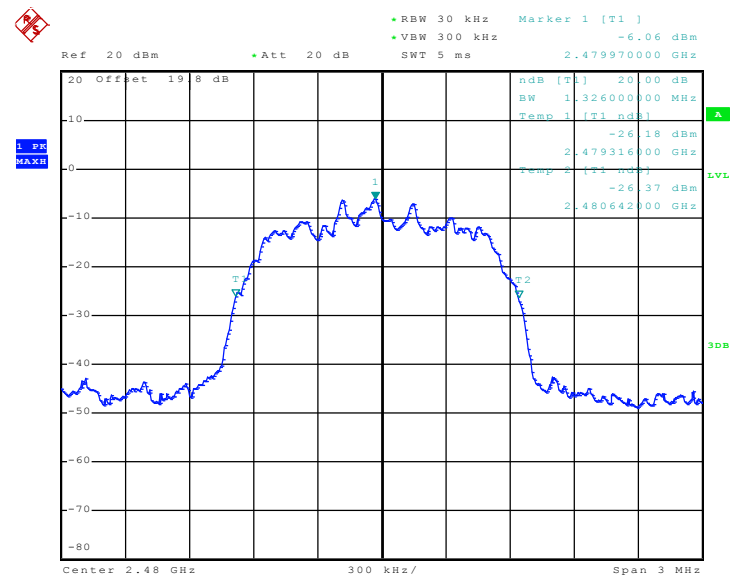


### 20 dB Bandwidth Plot on Channel 39



Date: 30.JUN.2012 01:04:50

### 20 dB Bandwidth Plot on Channel 78



Date: 30.JUN.2012 01:06:05

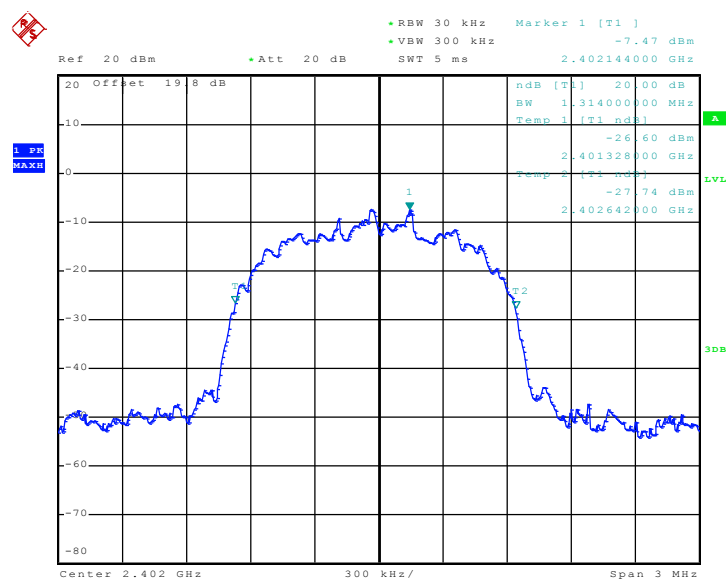




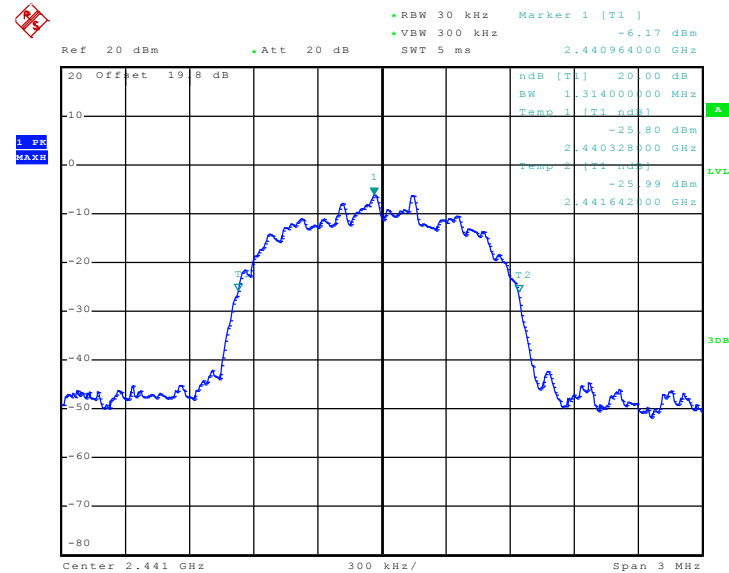
|                 |          |                     |         |
|-----------------|----------|---------------------|---------|
| Test Mode :     | 3Mbps    | Temperature :       | 24~26°C |
| Test Engineer : | Book Lin | Relative Humidity : | 50~53%  |

| Channel | Frequency (MHz) | 20dB Bandwidth (MHz) |
|---------|-----------------|----------------------|
| 00      | 2402            | 1.314                |
| 39      | 2441            | 1.314                |
| 78      | 2480            | 1.320                |

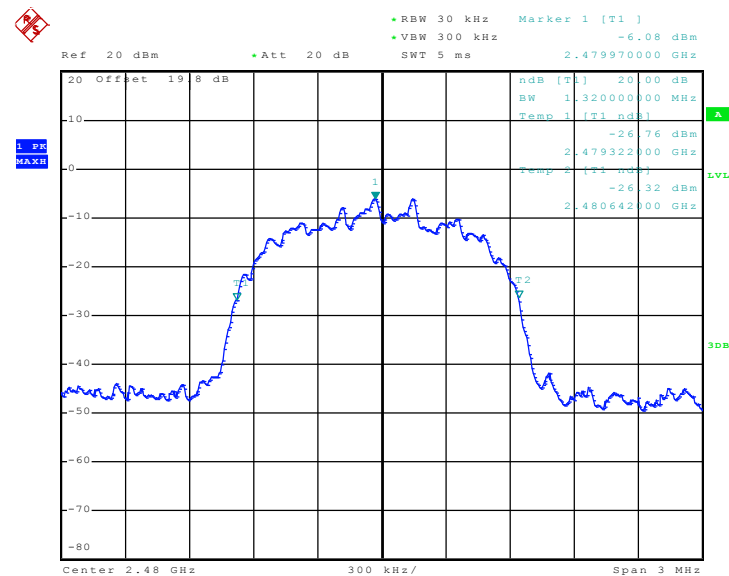
### 20 dB Bandwidth Plot on Channel 00



Date: 30.JUN.2012 01:06:20

**20 dB Bandwidth Plot on Channel 39**


Date: 30.JUN.2012 01:06:49

**20 dB Bandwidth Plot on Channel 78**


Date: 30.JUN.2012 01:07:41

### 3.5 Peak Output Power Measurement

#### 3.5.1 Limit of Peak Output Power

Section 15.247 (b) The maximum peak conducted output power of the intentional radiator shall not exceed the following: (1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band 0.125 watts. The power limit for 1Mbps is 1watt, and for 2Mbps, and 3Mbps are 0.125 watts.

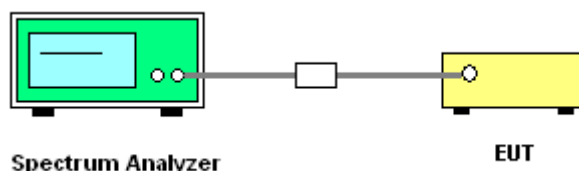
#### 3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.5.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.

#### 3.5.4 Test Setup

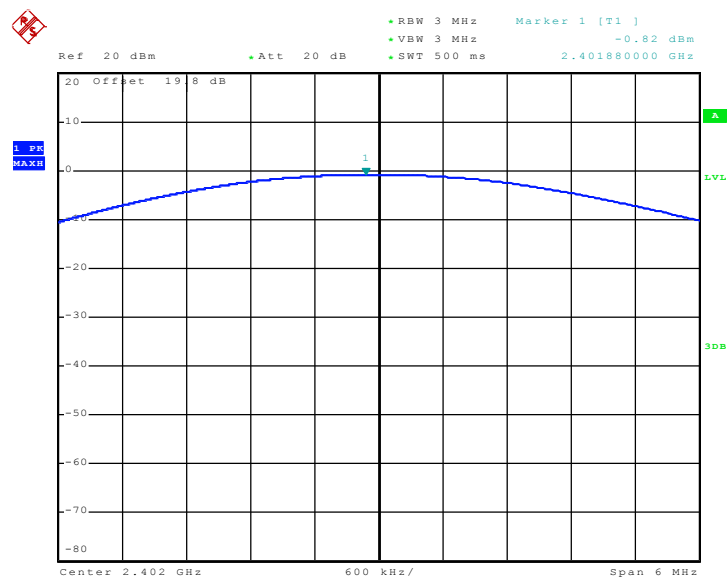


#### 3.5.5 Test Result of Peak Output Power

|                 |          |                     |        |  |
|-----------------|----------|---------------------|--------|--|
| Test Mode :     | 1Mbps    | Temperature :       | 24~26℃ |  |
| Test Engineer : | Book Lin | Relative Humidity : | 50~53% |  |

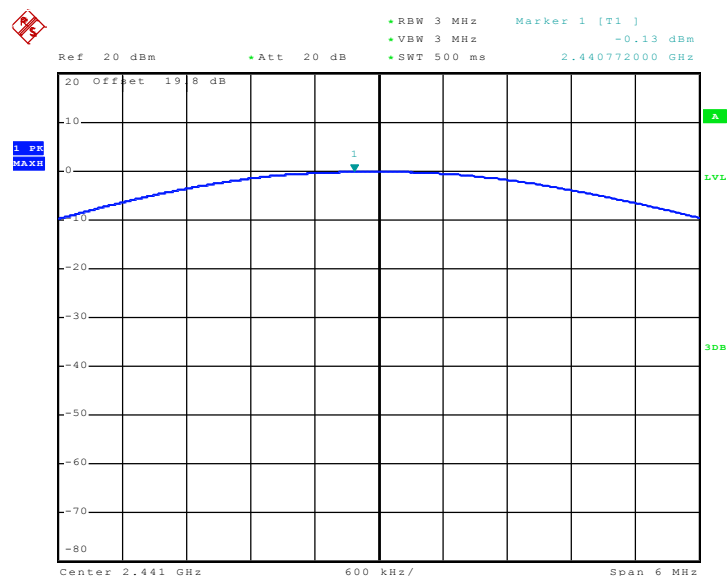
| Channel | Frequency<br>(MHz) | RF Power (dBm) |                      |           |
|---------|--------------------|----------------|----------------------|-----------|
|         |                    | GFSK           | Max. Limits<br>(dBm) | Pass/Fail |
|         |                    | 1 Mbps         |                      |           |
| 00      | 2402               | -0.82          | 30.00                | Pass      |
| 39      | 2441               | -0.13          | 30.00                | Pass      |
| 78      | 2480               | -0.30          | 30.00                | Pass      |

### Peak Output Power Plot on Channel 00



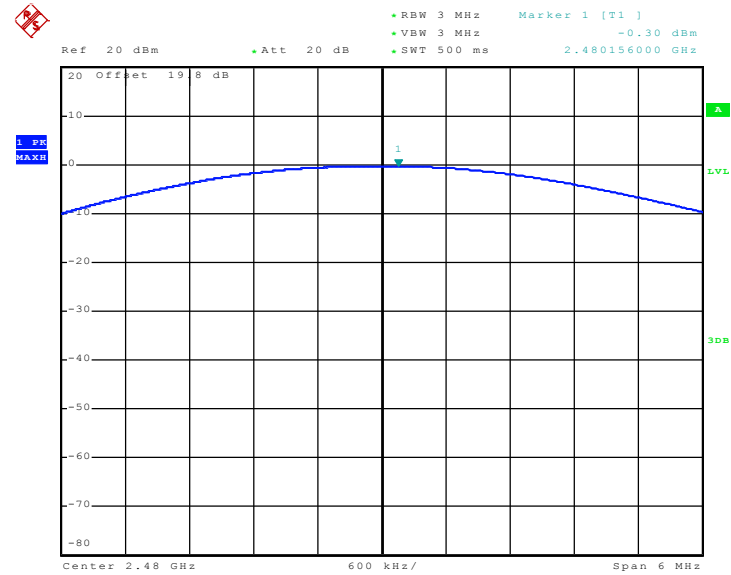
Date: 29.JUN.2012 01:20:57

### Peak Output Power Plot on Channel 39



Date: 29.JUN.2012 01:22:15

**Peak Output Power Plot on Channel 78**



Date: 29.JUN.2012 01:23:34

## 3.6 Conducted Band Edges Measurement

### 3.6.1 Limit of Band Edges

In any 100 KHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

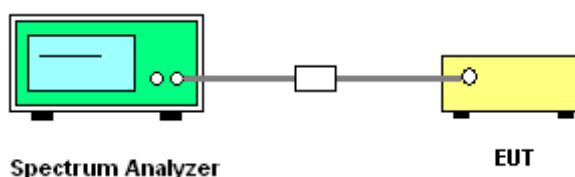
### 3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.6.3 Test Procedures

1. The testing follows the guidelines in Band-edge Compliance of RF Conducted Emissions of FCC Public Notice DA 00-705 Measurement Guidelines.
2. Set RBW = 300KHz ( $\geq 1\%$  span=30MHz ), VBW = 300KHz ( $\geq$  RBW). Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 300k Hz RBW. Note: If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB.
3. In case the emission is fail due to the used RBW / VBW is too wide, marker-delta method of FCC Public Notice DA 00-705 will be followed.
4. Enable hopping function of the EUT and repeat step 2. and 3.

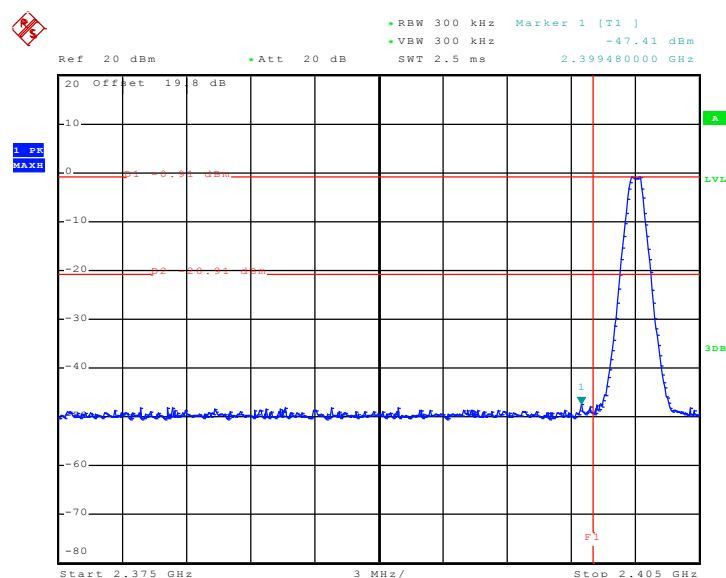
### 3.6.4 Test Setup



### 3.6.5 Test Result of Conducted Band Edges

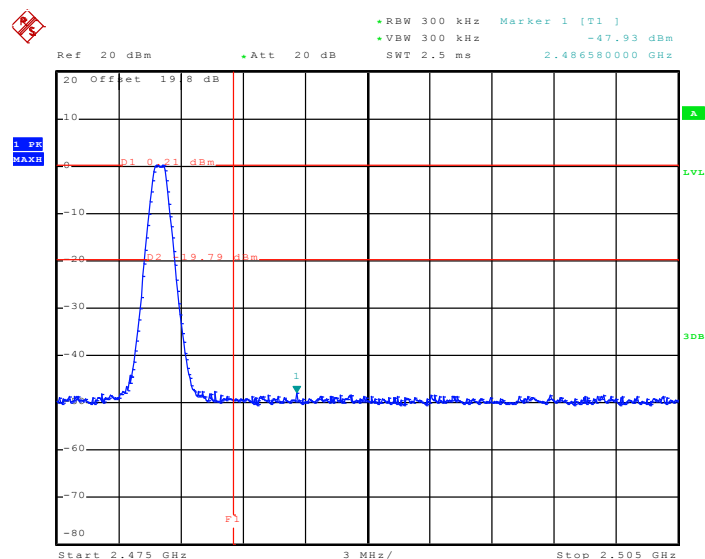
|                |           |                     |          |
|----------------|-----------|---------------------|----------|
| Test Mode :    | 1Mbps     | Temperature :       | 24~26℃   |
| Test Channel : | 00 and 78 | Relative Humidity : | 50~53%   |
|                |           | Test Engineer :     | Book Lin |

**Low Band Edge Plot on Channel 00**



Date: 30.JUN.2012 01:08:34

**High Band Edge Plot on Channel 78**



Date: 30.JUN.2012 01:09:37

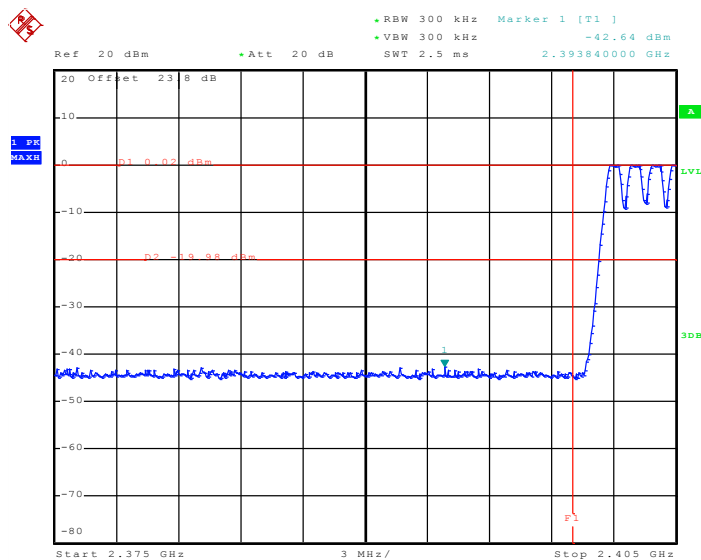




### 3.6.6 Test Result of Conducted Hopping Mode Band Edges

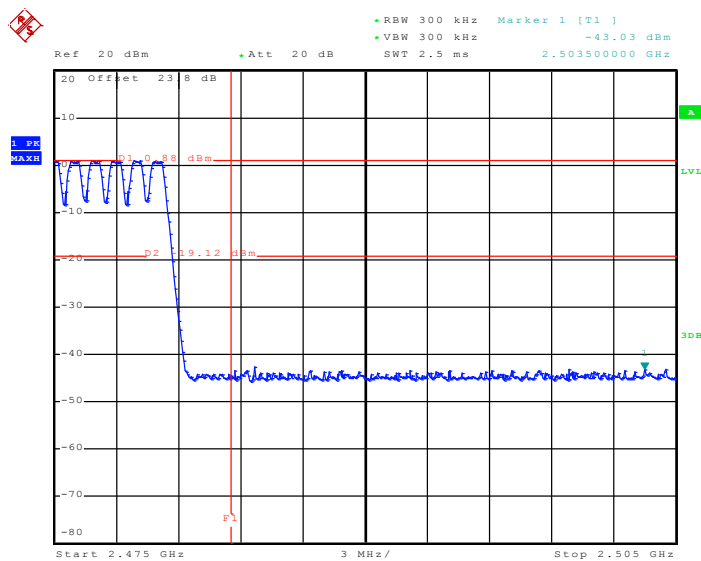
|                 |          |                     |         |
|-----------------|----------|---------------------|---------|
| Test Mode :     | 1Mbps    | Temperature :       | 24~26°C |
| Test Engineer : | Book Lin | Relative Humidity : | 50~53%  |

#### Hopping Mode Low Band Edge Plot



Date: 31.JUL.2012 20:45:31

#### Hopping Mode High Band Edge Plot



Date: 31.JUL.2012 20:48:15



### 3.7 Conducted Spurious Emission Measurement

#### 3.7.1 Limit of Spurious Emission Measurement

In any 100 KHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

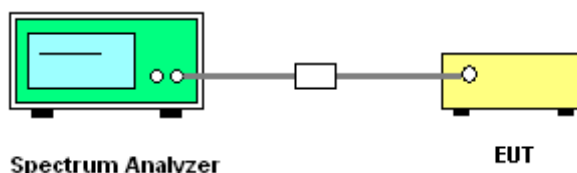
#### 3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.7.3 Test Procedure

1. The testing follows the guidelines in Spurious RF Conducted Emissions of FCC Public Notice DA 00-705 Measurement Guidelines
2. The transmitter output was connected to the spectrum analyzer via a low lose cable.
3. Set RBW = 100 KHz, VBW = 300KHz, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 KHz RBW.

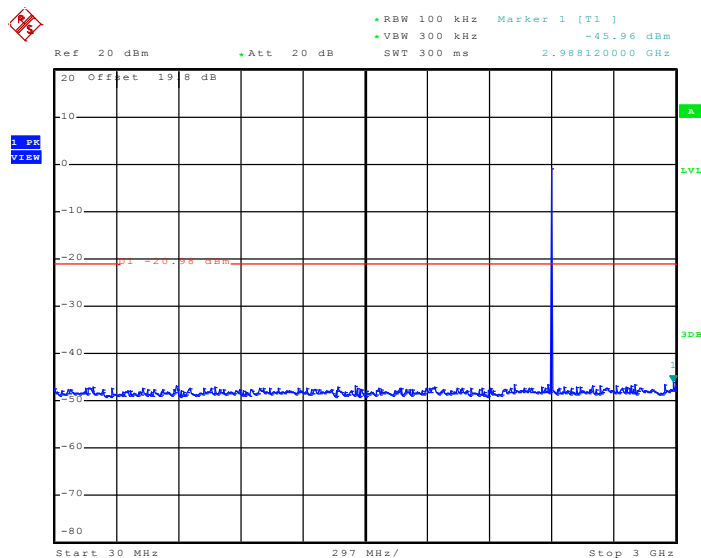
#### 3.7.4 Test Setup



### 3.7.5 Test Result

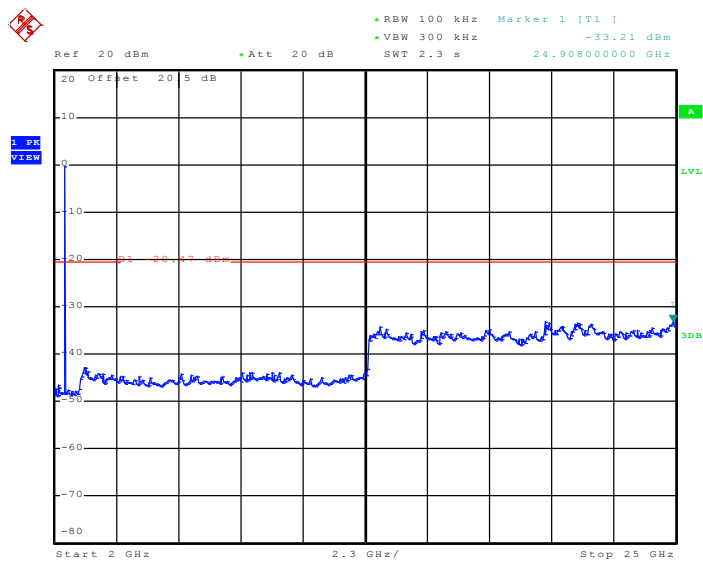
|                |       |                     |          |
|----------------|-------|---------------------|----------|
| Test Mode :    | 1Mbps | Temperature :       | 24~26℃   |
| Test Channel : | 00    | Relative Humidity : | 50~53%   |
|                |       | Test Engineer :     | Book Lin |

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



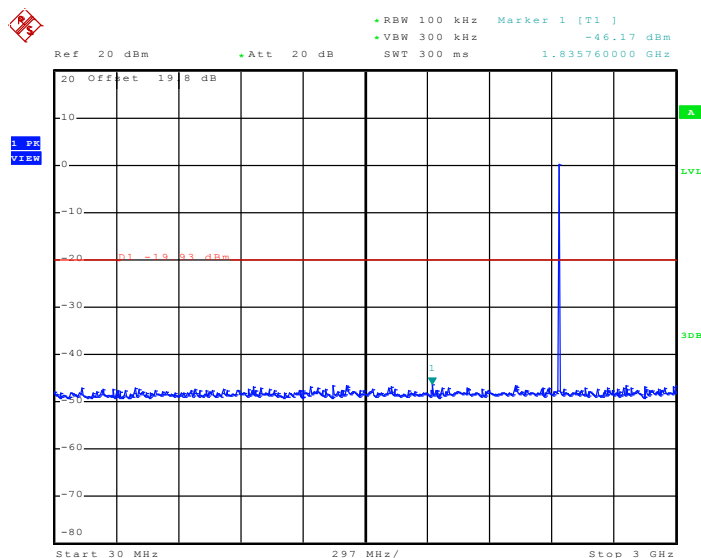
Date: 30.JUN.2012 01:19:42

#### Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz

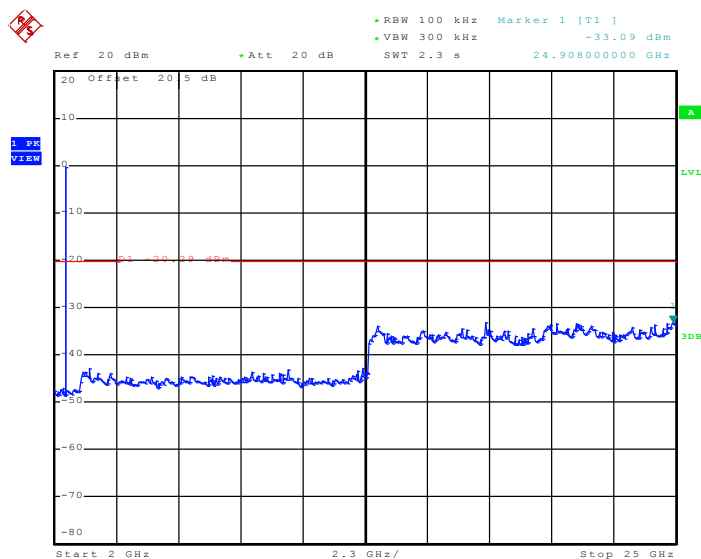


Date: 30.JUN.2012 01:20:34

|                |       |                     |          |
|----------------|-------|---------------------|----------|
| Test Mode :    | 1Mbps | Temperature :       | 24~26°C  |
| Test Channel : | 39    | Relative Humidity : | 50~53%   |
|                |       | Test Engineer :     | Book Lin |

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


Date: 30.JUN.2012 01:21:26

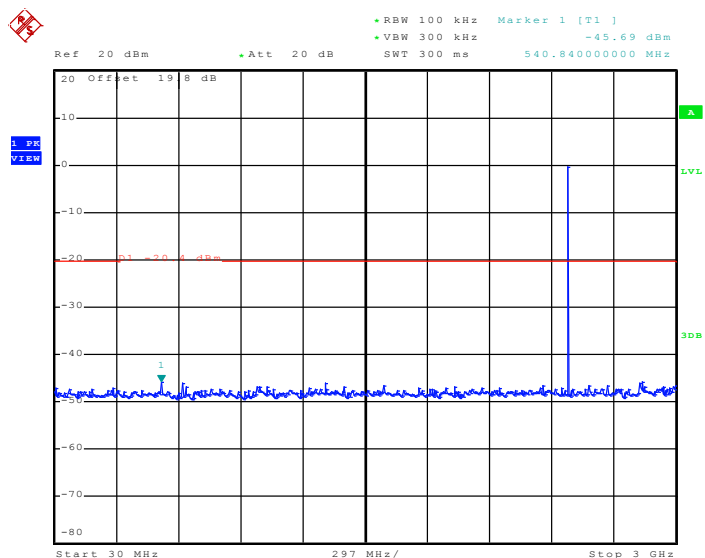
**Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz**


Date: 30.JUN.2012 01:22:18

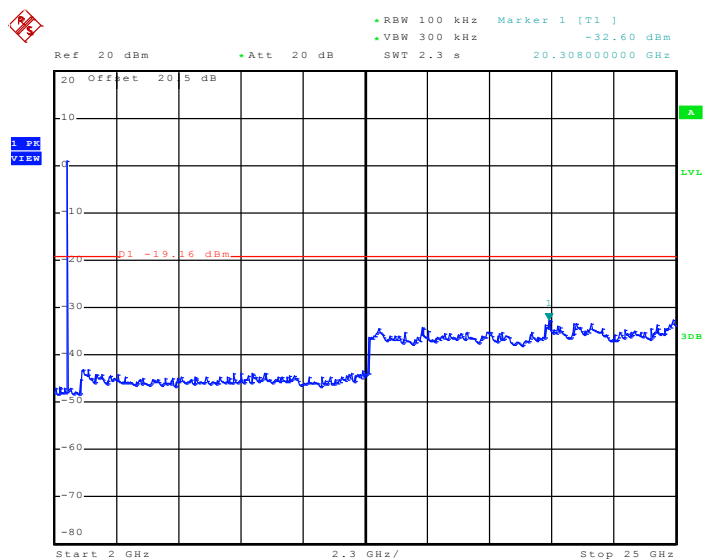




|                |       |                     |          |
|----------------|-------|---------------------|----------|
| Test Mode :    | 1Mbps | Temperature :       | 24~26°C  |
| Test Channel : | 78    | Relative Humidity : | 50~53%   |
|                |       | Test Engineer :     | Book Lin |

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

Date: 30.JUN.2012 01:23:10

**Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz**

Date: 30.JUN.2012 01:24:02





## 3.8 Radiated Band Edges Measurement

### 3.8.1 Limit of Radiated Band Edges

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. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

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

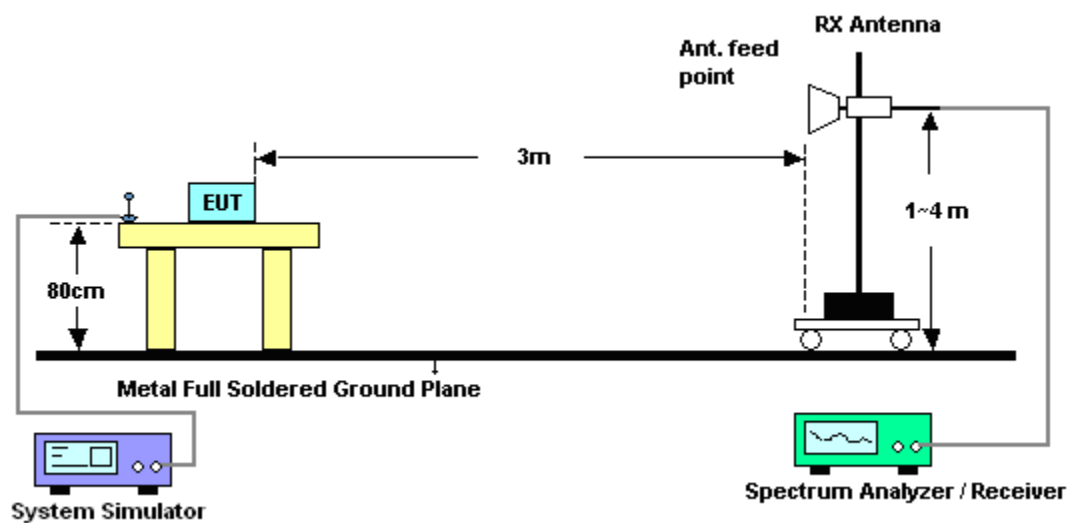
### 3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.8.3 Test Procedures

1. The testing follows the guidelines in Spurious Radiated Emissions of FCC Public Notice DA 00-705 Measurement Guidelines 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. Applies to band edge emissions that fall in the restricted bands listed in FCC Section 15.205. The maximum permitted average field strength is listed in FCC Section 15.209. A pre-amp is necessary for this measurement. For measurements above 1 GHz, set RBW = 1MHz, VBW = 1MHz, Sweep: Auto for Peak; set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto for Average. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation. See FCC Section 15.35(b) and (c).

### 3.8.4 Test Setup



**3.8.5 Test Result of Radiated Band Edges**

|                       |       |                            |          |
|-----------------------|-------|----------------------------|----------|
| <b>Test Mode :</b>    | 1Mbps | <b>Temperature :</b>       | 20~22°C  |
| <b>Test Channel :</b> | 00    | <b>Relative Humidity :</b> | 40~42%   |
|                       |       | <b>Test Engineer :</b>     | David Ke |

| 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  |
| 2320.62                       | 52.35               | -21.65                  | 74                          | 51.76                   | 31.96                       | 4.53                    | 35.9                       | 102                  | 143                     | Peak    |
| 2320.35                       | 37.27               | -16.73                  | 54                          | 36.68                   | 31.96                       | 4.53                    | 35.9                       | 102                  | 143                     | 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  |
| 2322.33                     | 48.28               | -25.72                  | 74                          | 47.69                   | 31.96                       | 4.53                    | 35.9                       | 104                  | 244                     | Peak    |
| 2322.42                     | 35.83               | -18.17                  | 54                          | 35.24                   | 31.96                       | 4.53                    | 35.9                       | 104                  | 244                     | Average |

|                       |       |                            |          |
|-----------------------|-------|----------------------------|----------|
| <b>Test Mode :</b>    | 1Mbps | <b>Temperature :</b>       | 20~22°C  |
| <b>Test Channel :</b> | 78    | <b>Relative Humidity :</b> | 40~42%   |
|                       |       | <b>Test Engineer :</b>     | David Ke |

| ANTENNA POLARITY : HORIZONTAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-------------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )          | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2483.5                        | 63.29               | -10.71                  | 74                          | 62.37                     | 32.09                       | 4.64                    | 35.81                      | 100                  | 125                     | Peak    |
| 2483.5                        | 35.22               | -18.78                  | 54                          | 34.3                      | 32.09                       | 4.64                    | 35.81                      | 100                  | 125                     | Average |

**Summary results of marker-delta method:**

| Test mode           | Maximum field<br>strength of the<br>fundamental emission<br>(dBμV/m) | Delta<br>Result<br>(dB) | Average<br>Result<br>(dBμV/m) | Average<br>Limit<br>(dBμV/m) | Margin<br>(dB) | Result |
|---------------------|----------------------------------------------------------------------|-------------------------|-------------------------------|------------------------------|----------------|--------|
| Single Carrier Mode | 90.93                                                                | 59.39                   | 31.54                         | 54                           | -22.46         | Pass   |
| Hopping Mode        | 90.93                                                                | 55.71                   | 35.22                         | 54                           | -18.78         | Pass   |

**Note :** Average result = Maximum field strength – Delta result

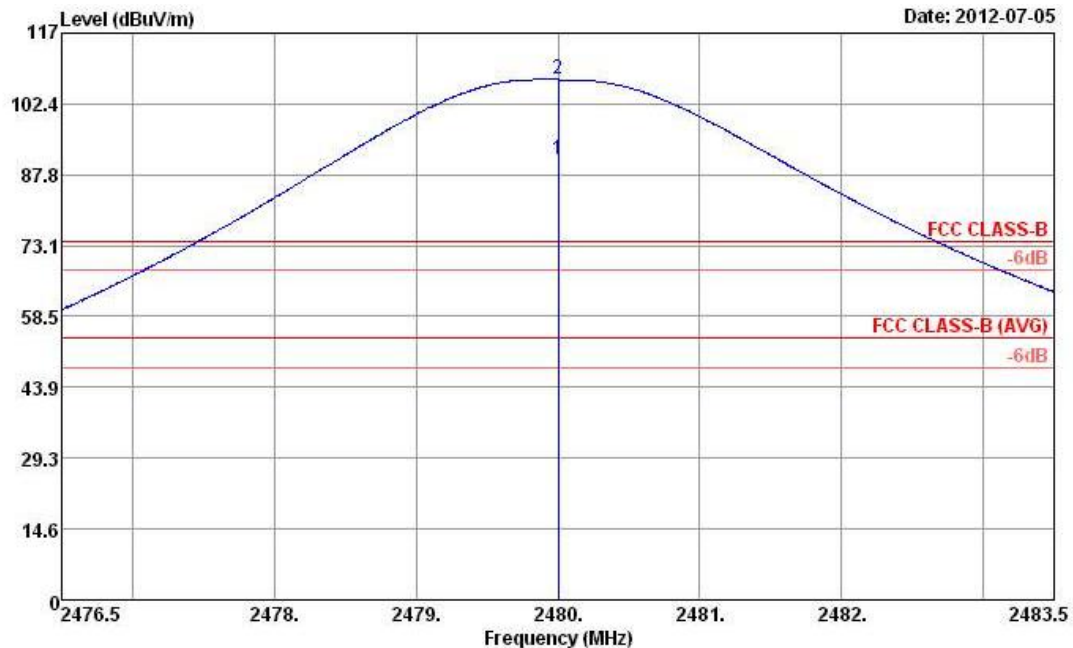
| ANTENNA POLARITY : VERTICAL |                     |                         |                             |                           |                             |                         |                            |                      |                         |         |
|-----------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency<br>( MHz )        | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
| 2483.5                      | 63.11               | -10.89                  | 74                          | 62.19                     | 32.09                       | 4.64                    | 35.81                      | 101                  | 242                     | Peak    |
| 2483.5                      | 36.23               | -17.77                  | 54                          | 35.31                     | 32.09                       | 4.64                    | 35.81                      | 101                  | 242                     | Average |

**Summary results of marker-delta method:**

| Test mode           | Maximum field<br>strength of the<br>fundamental emission<br>(dBμV/m) | Delta<br>Result<br>(dB) | Average<br>Result<br>(dBμV/m) | Average<br>Limit<br>(dBμV/m) | Margin<br>(dB) | Result |
|---------------------|----------------------------------------------------------------------|-------------------------|-------------------------------|------------------------------|----------------|--------|
| Single Carrier Mode | 91.02                                                                | 59.86                   | 31.16                         | 54                           | -22.84         | Pass   |
| Hopping Mode        | 91.02                                                                | 54.79                   | 36.23                         | 54                           | -17.77         | Pass   |

**Note :** Average result = Maximum field strength – Delta result

|                 |          |                     |            |
|-----------------|----------|---------------------|------------|
| Test Mode :     | 1Mbps    | Temperature :       | 20~22°C    |
| Test Channel :  | 78       | Relative Humidity : | 40~42%     |
| Test Engineer : | David Ke | Polarization :      | Horizontal |

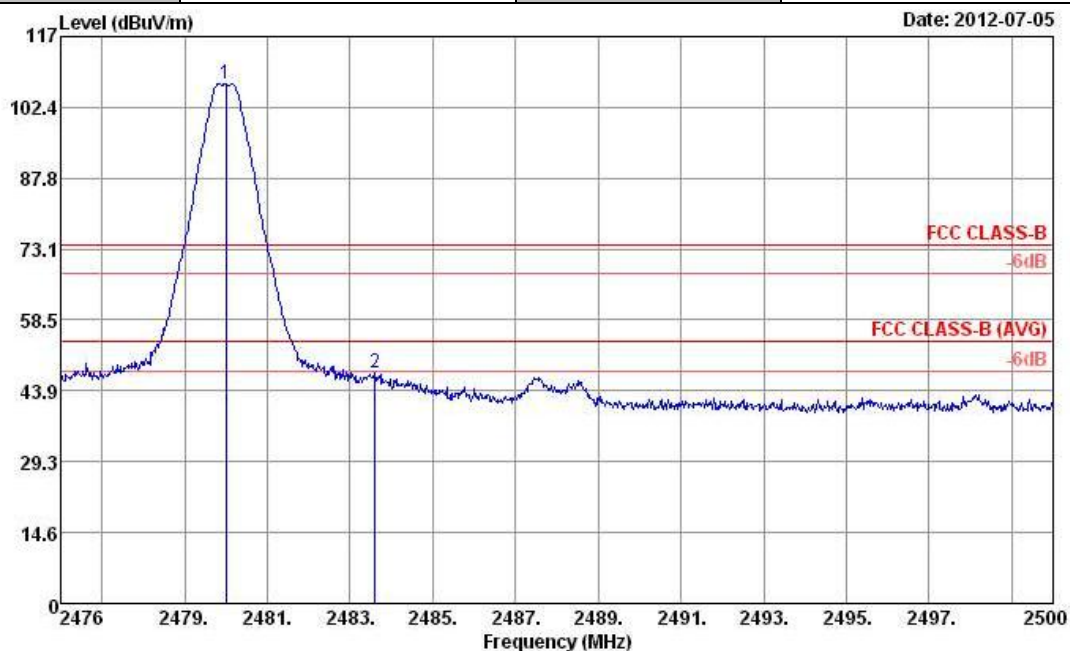


Site : 03CH05-HY  
Condition : FCC CLASS-B 3m HF\_ANT\_110810 HORIZONTAL

|     | Freq    | Level  | Over Limit | Limit Line | ReadAntenna Level | Antenna Factor | Cable Loss | Preamplifier | A/Pos | T/Pos | Remark  |
|-----|---------|--------|------------|------------|-------------------|----------------|------------|--------------|-------|-------|---------|
|     | MHz     | dBuV/m | dB         | dBuV/m     | dBuV              | dB/m           | dB         | dB           | cm    | deg   |         |
| 1 * | 2480.00 | 90.93  | 36.93      | 54.00      | 90.01             | 32.09          | 4.64       | 35.81        | 100   | 125   | Average |
| 2 * | 2480.00 | 107.42 | 33.42      | 74.00      | 106.50            | 32.09          | 4.64       | 35.81        | 100   | 125   | Peak    |

\* Maximum field strength of the fundamental emission

|                 |          |                     |            |
|-----------------|----------|---------------------|------------|
| Test Mode :     | Mode 3   | Temperature :       | 20~22°C    |
| Test Channel :  | 78       | Relative Humidity : | 40~42%     |
| Test Engineer : | David Ke | Polarization :      | Horizontal |

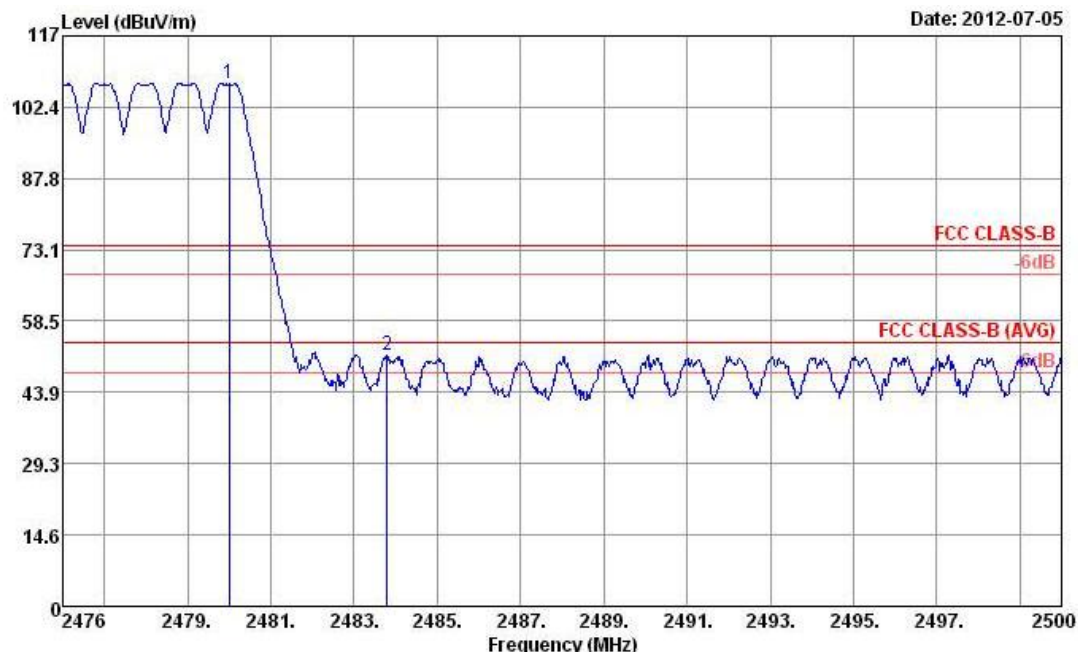


Site : 03CH05-HY  
Condition : FCC CLASS-B 3m HF\_ANT\_110810 HORIZONTAL

|     | Freq    | Level  | Over Limit | Limit Line | ReadAntenna Level | Cable Preamp Loss | Factor | A/Pos | T/Pos | Remark   |
|-----|---------|--------|------------|------------|-------------------|-------------------|--------|-------|-------|----------|
|     | MHz     | dBuV/m | dB         | dBuV/m     | dBuV              | dB/m              | dB     | dB    | cm    | deg      |
| 1 * | 2480.00 | 107.13 | 33.13      | 74.00      | 106.21            | 32.09             | 4.64   | 35.81 | 100   | 125 Peak |
| 2   | 2483.61 | 47.74  | -26.26     | 74.00      | 46.82             | 32.09             | 4.64   | 35.81 | 100   | 125 Peak |

\* Marker-Delta Method (RBW/VBW=100KHz): 59.39 dB , single carrier Mode

|                 |          |                     |            |
|-----------------|----------|---------------------|------------|
| Test Mode :     | Mode 3   | Temperature :       | 20~22°C    |
| Test Channel :  | 78       | Relative Humidity : | 40~42%     |
| Test Engineer : | David Ke | Polarization :      | Horizontal |



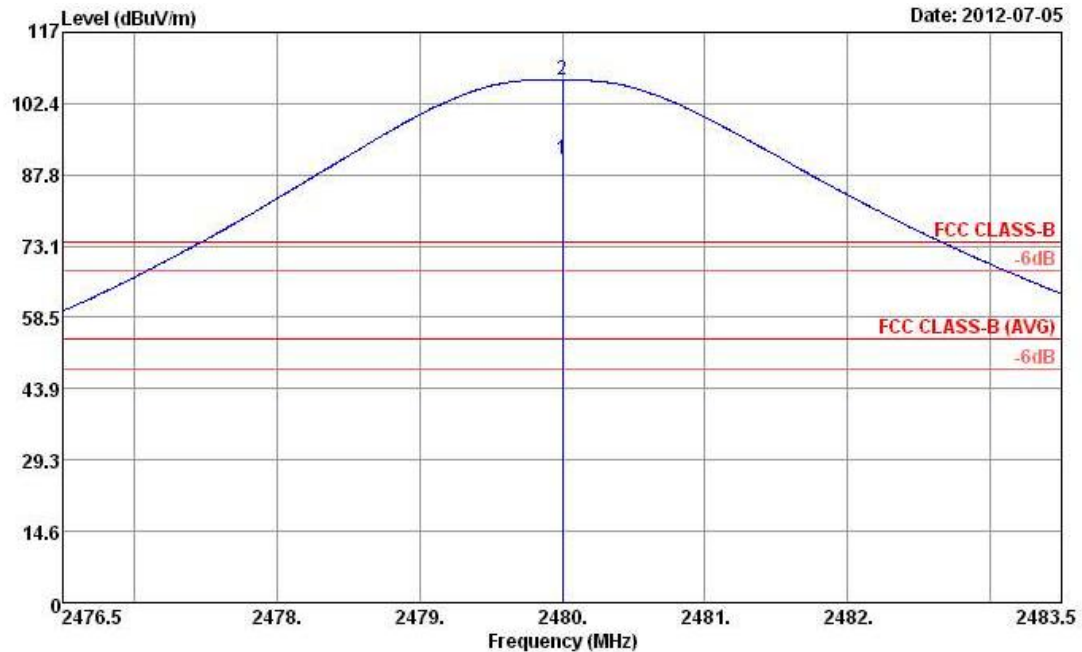
Site : 03CH05-HY  
Condition : FCC CLASS-B 3m HF\_ANT\_110810 HORIZONTAL

|     | Freq    | Level  | Over   | Limit  | ReadAntenna | Cable | Preamp | A/Pos | T/Pos | Remark   |
|-----|---------|--------|--------|--------|-------------|-------|--------|-------|-------|----------|
|     | MHz     | dBuV/m | Limit  | Line   | Level       | Loss  | Factor |       |       |          |
|     |         |        | dB     | dBuV/m | dBuV        | dB/m  | dB     | dB    | cm    | deg      |
| 1 * | 2480.00 | 107.09 | 33.09  | 74.00  | 106.17      | 32.09 | 4.64   | 35.81 | 100   | 125 Peak |
| 2   | 2483.80 | 51.38  | -22.62 | 74.00  | 50.46       | 32.09 | 4.64   | 35.81 | 100   | 125 Peak |

\* Marker-Delta Method (RBW/VBW=100KHz): 55.71 dB , Hopping Mode



|                 |          |                     |          |
|-----------------|----------|---------------------|----------|
| Test Mode :     | Mode 3   | Temperature :       | 20~22°C  |
| Test Channel :  | 78       | Relative Humidity : | 40~42%   |
| Test Engineer : | David Ke | Polarization :      | Vertical |

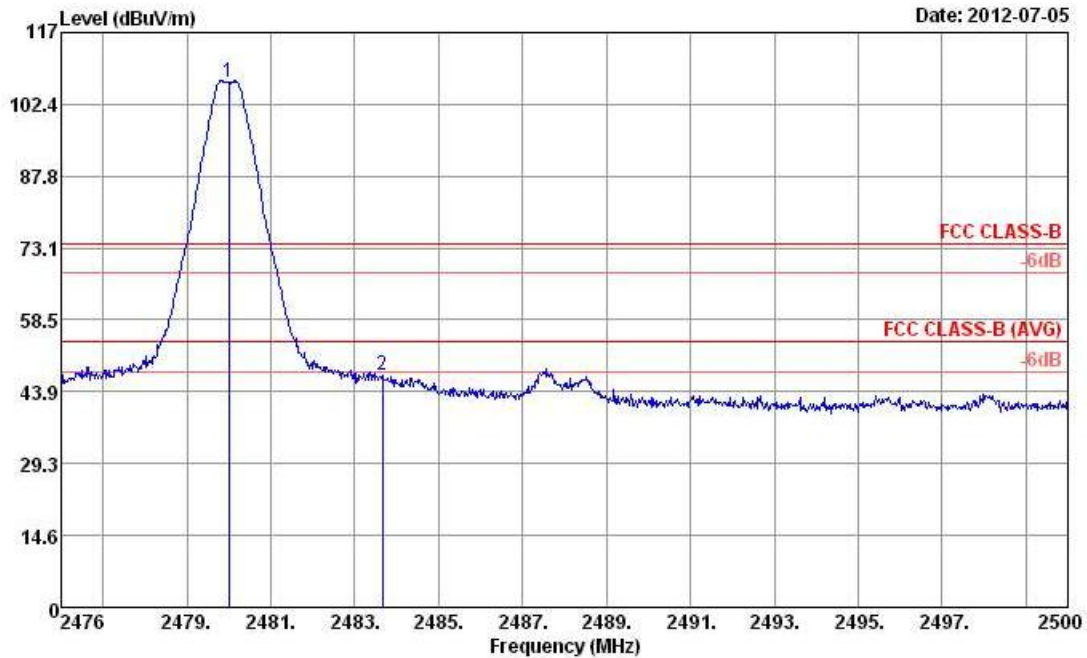


Site : 03CH05-HY  
Condition : FCC CLASS-B 3m HF\_ANT\_110810 VERTICAL

|     | Freq    | Level  | Over  | Limit | ReadAntenna | Cable | Preamp | A/Pos | T/Pos | Remark      |
|-----|---------|--------|-------|-------|-------------|-------|--------|-------|-------|-------------|
|     | MHz     | dBuV/m | Limit | Line  | Level       | Loss  | Factor | cm    | deg   |             |
| 1 * | 2480.00 | 91.02  | 37.02 | 54.00 | 90.10       | 32.09 | 4.64   | 35.81 | 101   | 242 Average |
| 2 * | 2480.00 | 107.29 | 33.29 | 74.00 | 106.37      | 32.09 | 4.64   | 35.81 | 101   | 242 Peak    |

\* Maximum field strength of the fundamental emission

|                 |          |                     |          |
|-----------------|----------|---------------------|----------|
| Test Mode :     | Mode 3   | Temperature :       | 20~22°C  |
| Test Channel :  | 78       | Relative Humidity : | 40~42%   |
| Test Engineer : | David Ke | Polarization :      | Vertical |



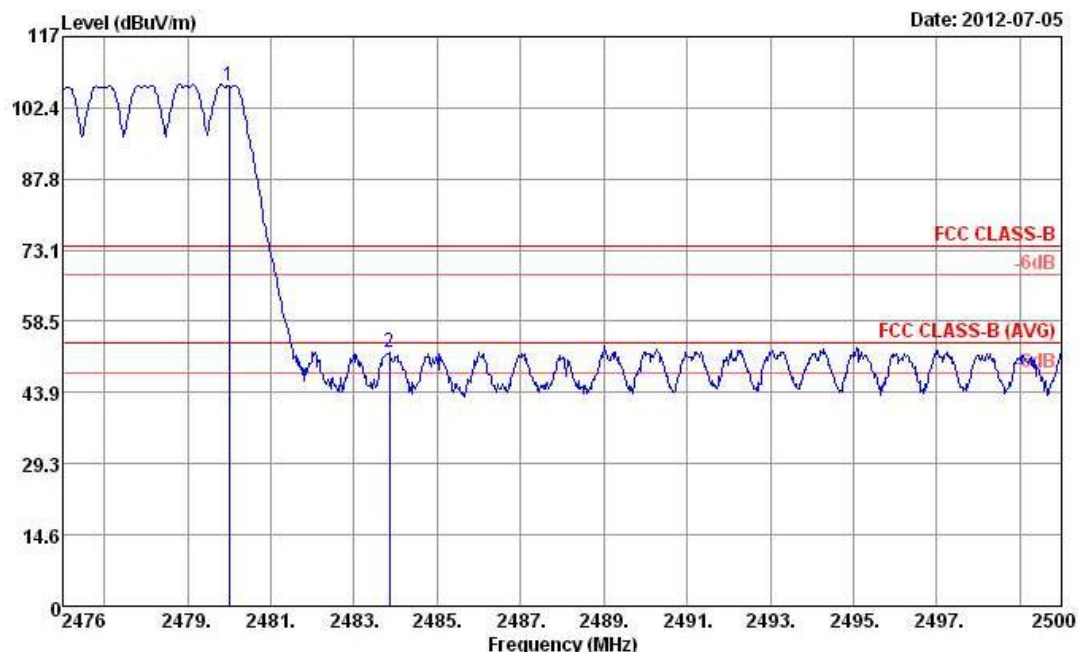
Site : 03CH05-HY  
Condition : FCC CLASS-B 3m HF\_ANT\_110810 VERTICAL

|     | Freq    | Level  | Over Limit | Limit Line | ReadAntenna Level | Antenna Factor | Cable Loss | Preamplifier | A/Pos | T/Pos | Remark |
|-----|---------|--------|------------|------------|-------------------|----------------|------------|--------------|-------|-------|--------|
|     | MHz     | dBuV/m | dB         | dBuV/m     | dBuV              | dB/m           | dB         | dB           | cm    | deg   |        |
| 1 * | 2480.00 | 107.00 | 33.00      | 74.00      | 106.08            | 32.09          | 4.64       | 35.81        | 101   | 242   | Peak   |
| 2   | 2483.66 | 47.14  | -26.86     | 74.00      | 46.22             | 32.09          | 4.64       | 35.81        | 101   | 242   | Peak   |

\* Marker-Delta Method (RBW/VBW=100KHz): 59.86 dB , single carrier Mode



|                 |          |                     |          |
|-----------------|----------|---------------------|----------|
| Test Mode :     | Mode 3   | Temperature :       | 20~22°C  |
| Test Channel :  | 78       | Relative Humidity : | 40~42%   |
| Test Engineer : | David Ke | Polarization :      | Vertical |



Site : 03CH05-HY  
Condition : FCC CLASS-B 3m HF\_ANT\_110810 VERTICAL

|     | Freq    | Level  | Over   | Limit | ReadAntenna | Cable | Preamp | A/Pos | T/Pos | Remark   |
|-----|---------|--------|--------|-------|-------------|-------|--------|-------|-------|----------|
|     | MHz     | dBuV/m | Limit  | Line  | Level       | Loss  | Factor | cm    | deg   |          |
| 1 * | 2480.00 | 106.80 | 32.80  | 74.00 | 105.88      | 32.09 | 4.64   | 35.81 | 101   | 242 Peak |
| 2   | 2483.85 | 52.01  | -21.99 | 74.00 | 51.09       | 32.09 | 4.64   | 35.81 | 101   | 242 Peak |

\* Marker-Delta Method (RBW/VBW=100KHz): 54.79 dB , Hopping Mode

### 3.9 Radiated Spurious Emission Measurement

#### 3.9.1 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. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

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

#### 3.9.2 Measuring Instruments

See list of measuring instruments of this test report.

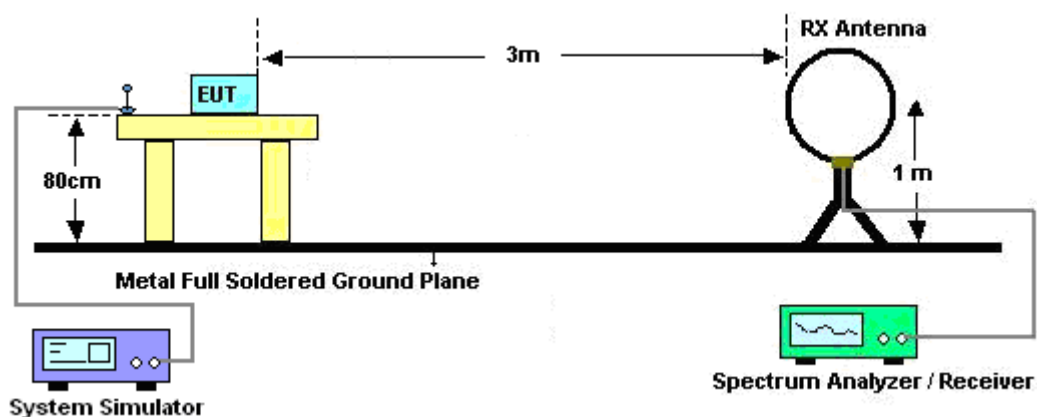
### 3.9.3 Test Procedures

1. The testing follows the guidelines in Spurious Radiated Emissions of FCC Public Notice DA 00-705 Measurement Guidelines and fulfills ANSI C63.4-2003 and the guidelines in ANSI C63.10-2009 test site requirement.
2. 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 in ANSI C63.4-2003 and ANSI C63.10-2009.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. The table was rotated 360 degrees to determine the position of the highest radiation.
6. Use the following spectrum analyzer settings:
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Set RBW=100 KHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak; Set RBW = 1MHz, VBW = 10 Hz, Sweep = auto for average.
7. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
8. 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.

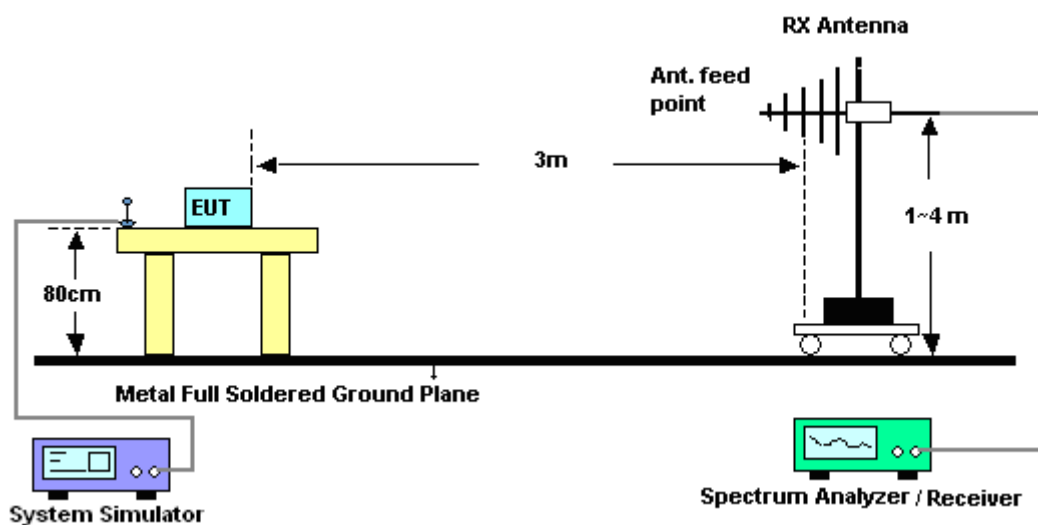
Note: The average measurement for Bluetooth may calculate from the peak level corrected with duty cycle correction factor, derived from the appropriate duty cycle calculation per 15.35(b) and (c). The result by calculation method is no worse than direct measurement by using VBW=10Hz.

### 3.9.4 Test Setup

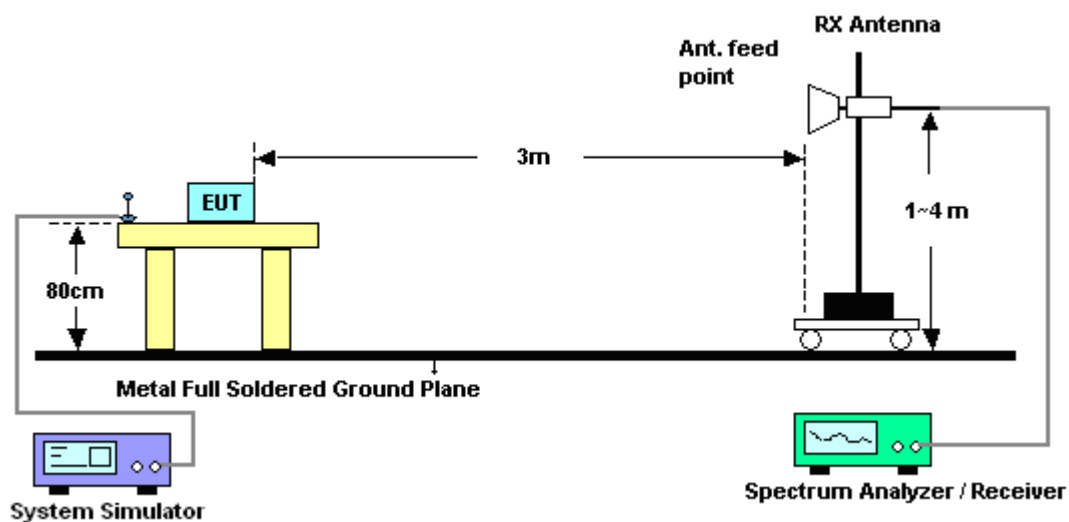
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



### 3.9.5 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.

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

|                        |                                                                                                                                                                                                                                                  |                            |            |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | 1Mbps                                                                                                                                                                                                                                            | <b>Temperature :</b>       | 20~22°C    |
| <b>Test Channel :</b>  | 00                                                                                                                                                                                                                                               | <b>Relative Humidity :</b> | 40~42%     |
| <b>Test Engineer :</b> | David Ke                                                                                                                                                                                                                                         | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 1. 2402 MHz is fundamental signal which can be ignored.<br>2. 7206 MHz, 9608MHz and 16814 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level. For example,<br>108.01 dBuV/m - 20dB = 88.01dBuV/m. |                            |            |

| 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 ) | Preamplifier<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------------|----------------------|-------------------------|---------|
| 2320.35              | 37.27               | -16.73                  | 54                          | 36.68                   | 31.96                       | 4.53                    | 35.9                             | 102                  | 143                     | Average |
| 2320.62              | 52.35               | -21.65                  | 74                          | 51.76                   | 31.96                       | 4.53                    | 35.9                             | 102                  | 143                     | Peak    |
| 2402                 | 91.51               | -                       | -                           | 90.77                   | 32.02                       | 4.58                    | 35.86                            | 102                  | 143                     | Average |
| 2402                 | 108.01              | -                       | -                           | 107.27                  | 32.02                       | 4.58                    | 35.86                            | 102                  | 143                     | Peak    |
| 2484                 | 37.91               | -16.09                  | 54                          | 36.99                   | 32.09                       | 4.64                    | 35.81                            | 102                  | 143                     | Average |
| 2484                 | 52.5                | -21.5                   | 74                          | 51.58                   | 32.09                       | 4.64                    | 35.81                            | 102                  | 143                     | Peak    |
| 4804                 | 52.37               | -1.63                   | 54                          | 71.09                   | 33.84                       | 6.5                     | 59.06                            | 103                  | 330                     | Average |
| 4804                 | 60.64               | -13.36                  | 74                          | 79.35                   | 33.84                       | 6.51                    | 59.06                            | 103                  | 330                     | Peak    |
| 7206                 | 48.29               | -39.72                  | 88.01                       | 62.25                   | 35.6                        | 8.25                    | 57.81                            | 100                  | 0                       | Peak    |
| 9608                 | 60.47               | -27.54                  | 88.01                       | 70.42                   | 36.54                       | 9.48                    | 55.97                            | 100                  | 0                       | Peak    |
| 12010                | 47.69               | -26.31                  | 74                          | 54.28                   | 38.72                       | 10.6                    | 55.91                            | 100                  | 0                       | Peak    |
| 16814                | 50.06               | -37.95                  | 88.01                       | 52.7                    | 41.27                       | 12.27                   | 56.18                            | 100                  | 0                       | Peak    |



|                        |                                                                                                                                                                                                          |                            |          |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | 1Mbps                                                                                                                                                                                                    | <b>Temperature :</b>       | 20~22°C  |
| <b>Test Channel :</b>  | 00                                                                                                                                                                                                       | <b>Relative Humidity :</b> | 40~42%   |
| <b>Test Engineer :</b> | David Ke                                                                                                                                                                                                 | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 1. 2402 MHz is fundamental signal which can be ignored.<br>2. 7206 MHz, 9608 MHz, 14412 MHz and 16814 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level. |                            |          |

| 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  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 2322.33              | 48.28               | -25.72                  | 74                          | 47.69                   | 31.96                       | 4.53                    | 35.9                       | 104                  | 244                     | Peak    |
| 2322.42              | 35.83               | -18.17                  | 54                          | 35.24                   | 31.96                       | 4.53                    | 35.9                       | 104                  | 244                     | Average |
| 2402                 | 90.1                | -                       | -                           | 89.36                   | 32.02                       | 4.58                    | 35.86                      | 104                  | 244                     | Average |
| 2402                 | 106                 | -                       | -                           | 105.26                  | 32.02                       | 4.58                    | 35.86                      | 104                  | 244                     | Peak    |
| 2484                 | 38.07               | -15.93                  | 54                          | 37.15                   | 32.09                       | 4.64                    | 35.81                      | 104                  | 244                     | Average |
| 2484                 | 53.54               | -20.46                  | 74                          | 52.62                   | 32.09                       | 4.64                    | 35.81                      | 104                  | 244                     | Peak    |
| 4804                 | 53.2                | -0.8                    | 54                          | 71.92                   | 33.84                       | 6.5                     | 59.06                      | 112                  | 332                     | Average |
| 4804                 | 62.19               | -11.81                  | 74                          | 80.9                    | 33.84                       | 6.51                    | 59.06                      | 112                  | 332                     | Peak    |
| 7206                 | 49.21               | -36.79                  | 86                          | 63.17                   | 35.6                        | 8.25                    | 57.81                      | 100                  | 0                       | Peak    |
| 9608                 | 54.51               | -31.49                  | 86                          | 64.46                   | 36.54                       | 9.48                    | 55.97                      | 100                  | 0                       | Peak    |
| 12010                | 48.08               | -25.92                  | 74                          | 54.67                   | 38.72                       | 10.6                    | 55.91                      | 100                  | 0                       | Peak    |
| 14412                | 49.08               | -36.92                  | 86                          | 55.31                   | 39.44                       | 11.47                   | 57.14                      | 100                  | 0                       | Peak    |
| 16814                | 50.3                | -35.7                   | 86                          | 52.94                   | 41.27                       | 12.27                   | 56.18                      | 100                  | 0                       | Peak    |

|                        |                                                                                                                                                                                                          |                            |            |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | 1Mbps                                                                                                                                                                                                    | <b>Temperature :</b>       | 20~22°C    |
| <b>Test Channel :</b>  | 39                                                                                                                                                                                                       | <b>Relative Humidity :</b> | 40~42%     |
| <b>Test Engineer :</b> | David Ke                                                                                                                                                                                                 | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 1. 2441 MHz is fundamental signal which can be ignored.<br>2. 2524 MHz, 9764 MHz, 14646 MHz and 17087 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level. |                            |            |

| 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  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 221.16               | 36.44               | -9.56                   | 46                          | 56.46                   | 9.39                        | 1.54                    | 30.95                      | -                    | -                       | Peak    |
| 238.71               | 37.12               | -8.88                   | 46                          | 55.17                   | 11.28                       | 1.61                    | 30.94                      | -                    | -                       | Peak    |
| 277.86               | 38.09               | -7.91                   | 46                          | 54.6                    | 12.92                       | 1.73                    | 31.16                      | -                    | -                       | Peak    |
| 719.3                | 39.34               | -6.66                   | 46                          | 45.25                   | 21.6                        | 2.69                    | 30.2                       | 143                  | 350                     | Peak    |
| 831.3                | 36.08               | -9.92                   | 46                          | 39.8                    | 23.12                       | 2.89                    | 29.73                      | -                    | -                       | Peak    |
| 914.6                | 33.16               | -12.84                  | 46                          | 36.43                   | 23.74                       | 3.02                    | 30.03                      | -                    | -                       | Peak    |
| 2358                 | 38.04               | -15.96                  | 54                          | 37.37                   | 31.99                       | 4.57                    | 35.89                      | 100                  | 140                     | Average |
| 2358                 | 52.81               | -21.19                  | 74                          | 52.14                   | 31.99                       | 4.57                    | 35.89                      | 100                  | 140                     | Peak    |
| 2441                 | 91.77               | -                       | -                           | 90.93                   | 32.06                       | 4.61                    | 35.83                      | 100                  | 140                     | Average |
| 2441                 | 108.48              | -                       | -                           | 107.64                  | 32.06                       | 4.61                    | 35.83                      | 100                  | 140                     | Peak    |
| 2498                 | 35.66               | -18.34                  | 54                          | 34.72                   | 32.1                        | 4.64                    | 35.8                       | 100                  | 140                     | Average |
| 2498                 | 47.6                | -26.4                   | 74                          | 46.66                   | 32.1                        | 4.64                    | 35.8                       | 100                  | 140                     | Peak    |
| 2524                 | 51.89               | -36.59                  | 88.48                       | 50.81                   | 32.15                       | 4.72                    | 35.79                      | 100                  | 0                       | Peak    |
| 4882                 | 52.84               | -1.16                   | 54                          | 71.36                   | 33.82                       | 6.54                    | 58.88                      | 112                  | 321                     | Average |
| 4882                 | 60.88               | -13.12                  | 74                          | 79.4                    | 33.82                       | 6.54                    | 58.88                      | 112                  | 321                     | Peak    |
| 7323                 | 48.17               | -25.83                  | 74                          | 62.16                   | 35.6                        | 8.42                    | 58.01                      | 100                  | 0                       | Peak    |
| 9764                 | 55.6                | -32.88                  | 88.48                       | 65.23                   | 36.76                       | 9.5                     | 55.89                      | 100                  | 0                       | Peak    |
| 12205                | 48.97               | -25.03                  | 74                          | 55.55                   | 38.91                       | 10.6                    | 56.09                      | 100                  | 0                       | Peak    |
| 14646                | 48.18               | -40.3                   | 88.48                       | 54.15                   | 39.63                       | 11.55                   | 57.15                      | 100                  | 0                       | Peak    |
| 17087                | 48.91               | -39.57                  | 88.48                       | 51.52                   | 41.45                       | 12.41                   | 56.47                      | 100                  | 0                       | Peak    |

|                        |                                                                                                                                                                                                      |                            |          |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | 1Mbps                                                                                                                                                                                                | <b>Temperature :</b>       | 20~22°C  |
| <b>Test Channel :</b>  | 39                                                                                                                                                                                                   | <b>Relative Humidity :</b> | 40~42%   |
| <b>Test Engineer :</b> | David Ke                                                                                                                                                                                             | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 1. 2441 MHz is fundamental signal which can be ignored.<br>2. 2524 MHz, 9764 MHz, 14646 MHz and 17087 are not within a restricted band, and its limit line is 20dB below the highest emission level. |                            |          |

| 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  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 55.38                | 33.97               | -6.03                   | 40                          | 58.18                   | 6.5                         | 0.83                    | 31.54                      | 105                  | 247                     | Peak    |
| 219.54               | 31.39               | -14.61                  | 46                          | 51.51                   | 9.29                        | 1.54                    | 30.95                      | -                    | -                       | Peak    |
| 239.79               | 32.61               | -13.39                  | 46                          | 50.54                   | 11.4                        | 1.62                    | 30.95                      | -                    | -                       | Peak    |
| 721.4                | 34.91               | -11.09                  | 46                          | 40.75                   | 21.67                       | 2.69                    | 30.2                       | -                    | -                       | Peak    |
| 831.3                | 32.45               | -13.55                  | 46                          | 36.17                   | 23.12                       | 2.89                    | 29.73                      | -                    | -                       | Peak    |
| 914.6                | 32.65               | -13.35                  | 46                          | 35.92                   | 23.74                       | 3.02                    | 30.03                      | -                    | -                       | Peak    |
| 2358                 | 37.28               | -16.72                  | 54                          | 36.61                   | 31.99                       | 4.57                    | 35.89                      | 105                  | 223                     | Average |
| 2358                 | 51.38               | -22.62                  | 74                          | 50.71                   | 31.99                       | 4.57                    | 35.89                      | 105                  | 223                     | Peak    |
| 2441                 | 90.47               | -                       | -                           | 89.63                   | 32.06                       | 4.61                    | 35.83                      | 105                  | 223                     | Average |
| 2441                 | 106.22              | -                       | -                           | 105.38                  | 32.06                       | 4.61                    | 35.83                      | 105                  | 223                     | Peak    |
| 2498                 | 36.06               | -17.94                  | 54                          | 35.12                   | 32.1                        | 4.64                    | 35.8                       | 105                  | 223                     | Average |
| 2498                 | 49.04               | -24.96                  | 74                          | 48.1                    | 32.1                        | 4.64                    | 35.8                       | 105                  | 223                     | Peak    |
| 2524                 | 53.7                | -32.52                  | 86.22                       | 52.62                   | 32.15                       | 4.72                    | 35.79                      | 100                  | 0                       | Peak    |
| 4882                 | 53.85               | -0.15                   | 54                          | 72.37                   | 33.82                       | 6.54                    | 58.88                      | 134                  | 327                     | Average |
| 4882                 | 62.52               | -11.48                  | 74                          | 81.04                   | 33.82                       | 6.54                    | 58.88                      | 134                  | 327                     | Peak    |
| 7323                 | 49.7                | -24.3                   | 74                          | 63.69                   | 35.6                        | 8.42                    | 58.01                      | 100                  | 0                       | Peak    |
| 9764                 | 51.46               | -34.76                  | 86.22                       | 61.09                   | 36.76                       | 9.5                     | 55.89                      | 100                  | 0                       | Peak    |
| 12205                | 47.79               | -26.21                  | 74                          | 54.37                   | 38.91                       | 10.6                    | 56.09                      | 100                  | 0                       | Peak    |
| 14646                | 47.35               | -38.87                  | 86.22                       | 53.32                   | 39.63                       | 11.55                   | 57.15                      | 100                  | 0                       | Peak    |
| 17087                | 49.65               | -36.57                  | 86.22                       | 52.32                   | 41.44                       | 12.41                   | 56.52                      | 100                  | 0                       | Peak    |

|                        |                                                                                                                                                                                                          |                            |            |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | 1Mbps                                                                                                                                                                                                    | <b>Temperature :</b>       | 20~22°C    |
| <b>Test Channel :</b>  | 78                                                                                                                                                                                                       | <b>Relative Humidity :</b> | 40~42%     |
| <b>Test Engineer :</b> | David Ke                                                                                                                                                                                                 | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | 1. 2480 MHz is fundamental signal which can be ignored.<br>2. 2568 MHz, 9920 MHz, 14880 MHz and 17360 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level. |                            |            |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 2390                 | 37.63               | -16.37                  | 54                          | 36.89                   | 32.02                       | 4.58                    | 35.86                      | 100                  | 125                     | Average |
| 2390                 | 52.45               | -21.55                  | 74                          | 51.71                   | 32.02                       | 4.58                    | 35.86                      | 100                  | 125                     | Peak    |
| 2480                 | 90.93               | -                       | -                           | 90.01                   | 32.09                       | 4.64                    | 35.81                      | 100                  | 125                     | Average |
| 2480                 | 107.36              | -                       | -                           | 106.44                  | 32.09                       | 4.64                    | 35.81                      | 100                  | 125                     | Peak    |
| 2483.5               | 35.22               | -18.78                  | 54                          | 34.3                    | 32.09                       | 4.64                    | 35.81                      | 100                  | 125                     | Average |
| 2483.5               | 63.29               | -10.71                  | 74                          | 62.37                   | 32.09                       | 4.64                    | 35.81                      | 100                  | 125                     | Peak    |
| 2568                 | 49.89               | -37.47                  | 87.36                       | 48.73                   | 32.19                       | 4.76                    | 35.79                      | 100                  | 0                       | Peak    |
| 4960                 | 52.9                | -1.1                    | 54                          | 71.17                   | 33.81                       | 6.57                    | 58.65                      | 100                  | 333                     | Average |
| 4960                 | 61.09               | -12.91                  | 74                          | 79.36                   | 33.81                       | 6.57                    | 58.65                      | 100                  | 333                     | Peak    |
| 7440                 | 46.62               | -27.38                  | 74                          | 60.6                    | 35.6                        | 8.63                    | 58.21                      | 100                  | 0                       | Peak    |
| 9920                 | 52.94               | -34.42                  | 87.36                       | 62.23                   | 37                          | 9.51                    | 55.8                       | 100                  | 0                       | Peak    |
| 12400                | 48.31               | -25.69                  | 74                          | 54.88                   | 39.11                       | 10.61                   | 56.29                      | 100                  | 0                       | Peak    |
| 14880                | 48.99               | -38.37                  | 87.36                       | 54.94                   | 39.68                       | 11.7                    | 57.33                      | 100                  | 0                       | Peak    |
| 17360                | 51.71               | -35.65                  | 87.36                       | 54.75                   | 41.29                       | 12.88                   | 57.21                      | 100                  | 0                       | Peak    |

|                        |                                                                                                                                                                                                          |                            |          |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | 1Mbps                                                                                                                                                                                                    | <b>Temperature :</b>       | 20~22°C  |
| <b>Test Channel :</b>  | 78                                                                                                                                                                                                       | <b>Relative Humidity :</b> | 40~42%   |
| <b>Test Engineer :</b> | David Ke                                                                                                                                                                                                 | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | 1. 2480 MHz is fundamental signal which can be ignored.<br>2. 2568 MHz, 9920 MHz, 14880 MHz and 17360 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level. |                            |          |

| Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | Antenna<br>Factor<br>( dB ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Remark  |
|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| 2390                 | 36.39               | -17.61                  | 54                          | 35.65                   | 32.02                       | 4.58                    | 35.86                      | 101                  | 242                     | Average |
| 2390                 | 49.24               | -24.76                  | 74                          | 48.5                    | 32.02                       | 4.58                    | 35.86                      | 101                  | 242                     | Peak    |
| 2480                 | 91.02               | -                       | -                           | 90.1                    | 32.09                       | 4.64                    | 35.81                      | 101                  | 242                     | Average |
| 2480                 | 107.25              | -                       | -                           | 106.33                  | 32.09                       | 4.64                    | 35.81                      | 101                  | 242                     | Peak    |
| 2483.5               | 36.23               | -17.77                  | 54                          | 35.31                   | 32.09                       | 4.64                    | 35.81                      | 101                  | 242                     | Average |
| 2483.5               | 63.11               | -10.89                  | 74                          | 62.19                   | 32.09                       | 4.64                    | 35.81                      | 101                  | 242                     | Peak    |
| 2568                 | 53.02               | -34.23                  | 87.25                       | 51.86                   | 32.19                       | 4.76                    | 35.79                      | 100                  | 0                       | Peak    |
| 4960                 | 53.68               | -0.32                   | 54                          | 71.95                   | 33.81                       | 6.57                    | 58.65                      | 100                  | 338                     | Average |
| 4960                 | 62.38               | -11.62                  | 74                          | 80.65                   | 33.81                       | 6.57                    | 58.65                      | 100                  | 338                     | Peak    |
| 7440                 | 46.86               | -27.14                  | 74                          | 60.84                   | 35.6                        | 8.63                    | 58.21                      | 100                  | 0                       | Peak    |
| 9920                 | 50.53               | -36.72                  | 87.25                       | 59.82                   | 37                          | 9.51                    | 55.8                       | 100                  | 0                       | Peak    |
| 12400                | 48.98               | -25.02                  | 74                          | 55.55                   | 39.11                       | 10.61                   | 56.29                      | 100                  | 0                       | Peak    |
| 14880                | 48.21               | -39.04                  | 87.25                       | 54.16                   | 39.67                       | 11.7                    | 57.32                      | 100                  | 0                       | Peak    |
| 17360                | 49.58               | -37.67                  | 87.25                       | 52.62                   | 41.29                       | 12.88                   | 57.21                      | 100                  | 0                       | Peak    |

### 3.10 AC Conducted Emission Measurement

#### 3.10.1 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 (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.

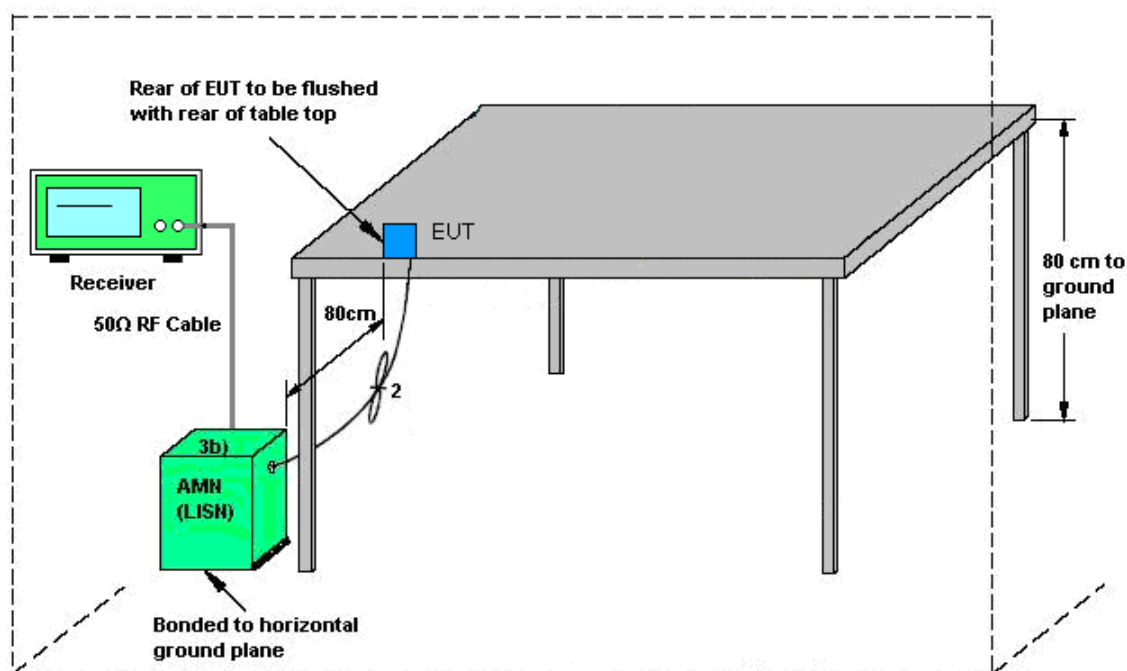
#### 3.10.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.10.3 Test Procedures

1. Please follow the guidelines in ANSI C63.4-2003 and ANSI C63.10-2009 test site requirement.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room 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.

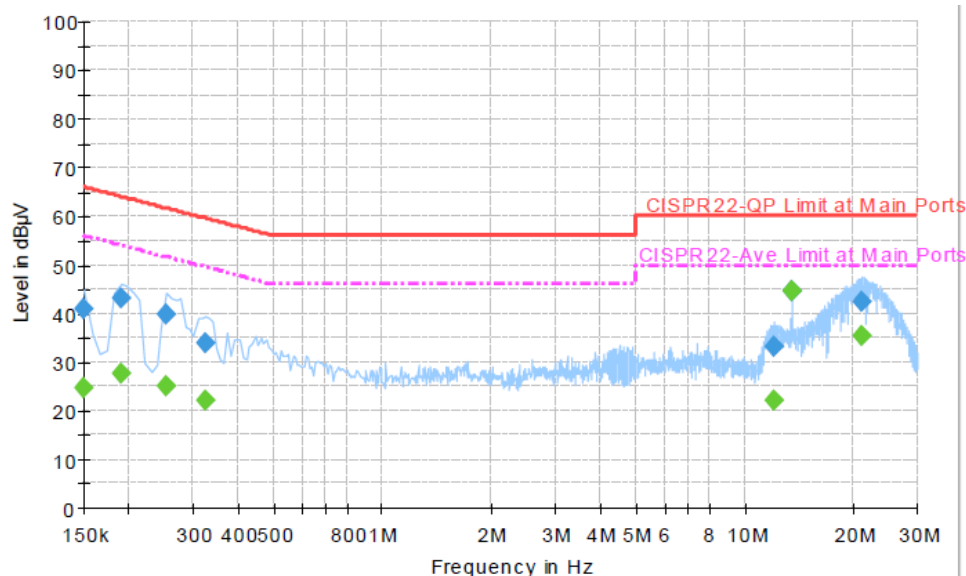
### 3.10.4 Test Setup



AMN = Artificial mains network (LISN)  
 AE = Associated equipment  
 EUT = Equipment under test  
 ISN = Impedance stabilization network

### 3.10.5 Test Result of AC Conducted Emission

|                        |                                                                                                                                                 |                            |        |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------|
| <b>Test Mode :</b>     | Mode 2                                                                                                                                          | <b>Temperature :</b>       | 21~22℃ |
| <b>Test Engineer :</b> | Kai-Chun Chu                                                                                                                                    | <b>Relative Humidity :</b> | 50~51% |
| <b>Test Voltage :</b>  | 120Vac / 60Hz                                                                                                                                   | <b>Phase :</b>             | Line   |
| <b>Function Type :</b> | WLAN Link + Bluetooth Link + MPEG4 + Docking + NFC On + Adapter                                                                                 |                            |        |
| <b>Remark :</b>        | All emissions not reported here are more than 10 dB below the prescribed limit.<br>13.56 MHz is fundamental signal of NFC which can be ignored. |                            |        |



#### Final Result : Quasi-Peak

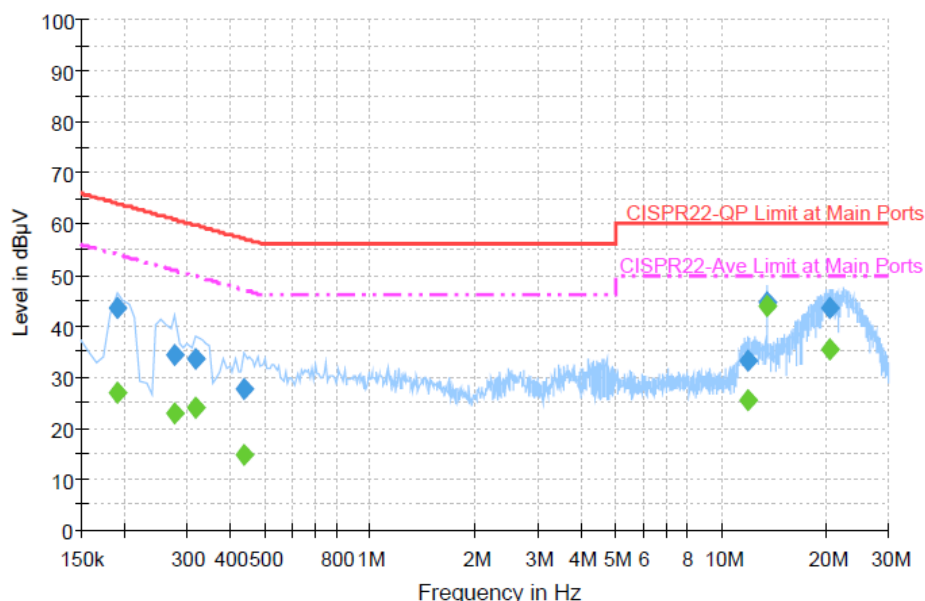
| Frequency (MHz) | Quasi-Peak (dBμV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|-------------------|--------|------|------------|-------------|--------------|
| 0.150000        | 40.8              | Off    | L1   | 19.4       | 25.2        | 66.0         |
| 0.190000        | 43.2              | Off    | L1   | 19.4       | 20.8        | 64.0         |
| 0.254000        | 40.0              | Off    | L1   | 19.5       | 21.6        | 61.6         |
| 0.326000        | 33.9              | Off    | L1   | 19.4       | 25.7        | 59.6         |
| 12.094000       | 33.2              | Off    | L1   | 19.8       | 26.8        | 60.0         |
| 13.566000       | 44.7              | Off    | L1   | 19.8       | 15.3        | 60.0         |
| 21.150000       | 42.5              | Off    | L1   | 19.9       | 17.5        | 60.0         |

#### Final Result : Average

| Frequency (MHz) | Average (dBμV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|----------------|--------|------|------------|-------------|--------------|
| 0.150000        | 24.8           | Off    | L1   | 19.4       | 31.2        | 56.0         |
| 0.190000        | 27.7           | Off    | L1   | 19.4       | 26.3        | 54.0         |
| 0.254000        | 25.0           | Off    | L1   | 19.5       | 26.6        | 51.6         |
| 0.326000        | 22.2           | Off    | L1   | 19.4       | 27.4        | 49.6         |
| 12.094000       | 22.0           | Off    | L1   | 19.8       | 28.0        | 50.0         |
| 13.566000       | 44.5           | Off    | L1   | 19.8       | 5.5         | 50.0         |
| 21.150000       | 35.5           | Off    | L1   | 19.9       | 14.5        | 50.0         |



|                        |                                                                                                                                                 |                            |         |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------|
| <b>Test Mode :</b>     | Mode 2                                                                                                                                          | <b>Temperature :</b>       | 21~22°C |
| <b>Test Engineer :</b> | Kai-Chun Chu                                                                                                                                    | <b>Relative Humidity :</b> | 50~51%  |
| <b>Test Voltage :</b>  | 120Vac / 60Hz                                                                                                                                   | <b>Phase :</b>             | Neutral |
| <b>Function Type :</b> | WLAN Link + Bluetooth Link + MPEG4 + Docking + NFC On + Adapter                                                                                 |                            |         |
| <b>Remark :</b>        | All emissions not reported here are more than 10 dB below the prescribed limit.<br>13.56 MHz is fundamental signal of NFC which can be ignored. |                            |         |


**Final Result : Quasi-Peak**

| Frequency (MHz) | Quasi-Peak (dBμV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|-------------------|--------|------|------------|-------------|--------------|
| 0.190000        | 43.5              | Off    | N    | 19.4       | 20.5        | 64.0         |
| 0.278000        | 34.4              | Off    | N    | 19.4       | 26.5        | 60.9         |
| 0.318000        | 33.6              | Off    | N    | 19.4       | 26.2        | 59.8         |
| 0.438000        | 27.5              | Off    | N    | 19.4       | 29.6        | 57.1         |
| 11.950000       | 33.2              | Off    | N    | 19.8       | 26.8        | 60.0         |
| 13.558000       | 44.6              | Off    | N    | 19.9       | 15.4        | 60.0         |
| 20.454000       | 43.6              | Off    | N    | 20.0       | 16.4        | 60.0         |

**Final Result : Average**

| Frequency (MHz) | Average (dBμV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|----------------|--------|------|------------|-------------|--------------|
| 0.190000        | 27.0           | Off    | N    | 19.4       | 27.0        | 54.0         |
| 0.278000        | 22.9           | Off    | N    | 19.4       | 28.0        | 50.9         |
| 0.318000        | 23.9           | Off    | N    | 19.4       | 25.9        | 49.8         |
| 0.438000        | 14.8           | Off    | N    | 19.4       | 32.3        | 47.1         |
| 11.950000       | 25.3           | Off    | N    | 19.8       | 24.7        | 50.0         |
| 13.558000       | 44.0           | Off    | N    | 19.9       | 6.0         | 50.0         |
| 20.454000       | 35.5           | Off    | N    | 20.0       | 14.5        | 50.0         |



## **3.11 Antenna Requirements**

### **3.11.1 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. 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.

### **3.11.2 Antenna Connected Construction**

Non-standard connector used.

### **3.11.3 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                      | 100055          | 9kHz~40GHz                  | Jun. 06, 2012    | Jun. 29, 2012~<br>Jul. 31, 2012 | Jun. 05, 2013 | Conducted (TH02-HY)   |
| Power Meter            | Anritsu      | ML2495A                    | 0932001         | N/A                         | Sep. 18, 2011    | Jun. 29, 2012~<br>Jul. 31, 2012 | Sep. 17, 2012 | Conducted (TH02-HY)   |
| Power Sensor           | Anritsu      | MA2411B                    | 0846202         | N/A                         | Sep. 18, 2011    | Jun. 29, 2012~<br>Jul. 31, 2012 | Sep. 17, 2012 | Conducted (TH02-HY)   |
| Bluetooth Base Station | R&S          | CBT32                      | 100519          | N/A                         | Jun. 05, 2012    | Jun. 29, 2012~<br>Jul. 31, 2012 | Jun. 06, 2013 | Conducted (TH02-HY)   |
| EMI Test Receiver      | R&S          | ESCS 30                    | 100356          | 9KHz ~ 2.75GHz              | Oct. 27, 2011    | Jul. 26, 2012                   | Oct. 26, 2012 | Conduction (CO05-HY)  |
| Two-LISN               | R&S          | ENV216                     | 11-100081       | 9KHz ~ 30MHz                | Dec. 09, 2011    | Jul. 26, 2012                   | Dec. 08, 2012 | Conduction (CO05-HY)  |
| Two-LISN               | R&S          | ENV216                     | 11-100080       | 9KHz ~ 30MHz                | Dec. 06, 2011    | Jul. 26, 2012                   | Dec. 05, 2012 | Conduction (CO05-HY)  |
| AC Power Source        | APC          | APC-1000W                  | N/A             | N/A                         | N/A              | Jul. 26, 2012                   | N/A           | Conduction (CO05-HY)  |
| Spectrum Analyzer      | R&S          | ESU26                      | 100390          | 20Hz ~ 26.5GHz              | Dec. 22, 2011    | Jul. 05, 2012                   | Dec. 21, 2012 | Radiation (03CH05-HY) |
| Bilog Antenna          | SCHAFFNER    | CBL6111C                   | 2725            | 30MHz ~ 2GHz                | Oct. 22, 2011    | Jul. 05, 2012                   | Oct. 21, 2012 | Radiation (03CH05-HY) |
| Turn Table             | HD           | Deis HD 2000               | 420/611         | 0 ~ 360 degree              | N/A              | Jul. 05, 2012                   | N/A           | Radiation (03CH05-HY) |
| Antenna Mast           | HD           | MA 240                     | 240/666         | 1 m ~ 4 m                   | N/A              | Jul. 05, 2012                   | N/A           | Radiation (03CH05-HY) |
| Horn Antenna           | ESCO         | 3117                       | 66584           | 1GHz ~ 18GHz                | Aug. 04, 2011    | Jul. 05, 2012                   | Aug. 03, 2012 | Radiation (03CH05-HY) |
| Pre Amplifier          | COM-POWER    | PA-103A                    | 161075          | 10Hz ~ 1000MHz<br>Gain:32dB | Feb. 27, 2012    | Jul. 05, 2012                   | Feb. 26, 2013 | Radiation (03CH05-HY) |
| Pre Amplifier          | MITEQ        | AMF-7D-0010<br>1800-30-10P | 159087          | 1GHz~18GHz                  | Feb. 27, 2012    | Jul. 05, 2012                   | Feb. 26, 2013 | Radiation (03CH05-HY) |
| Pre Amplifier          | Agilent      | 8449B                      | 3008A0191<br>7  | 1GHz~26.5GHz                | Aug. 30, 2011    | Jul. 05, 2012                   | Aug. 29, 2012 | Radiation (03CH05-HY) |
| SHF-EHF Horn Antenna   | SCHWARZBECK  | BBHA 9170                  | BBHA9170<br>251 | 15GHz ~ 40GHz               | Oct. 21, 2011    | Jul. 05, 2012                   | Oct. 20, 2012 | Radiation (03CH05-HY) |
| Loop Antenna           | R&S          | HFH2-Z2                    | 860004/001      | 9 kHz~30 MHz                | Jul. 29, 2010    | Jul. 05, 2012                   | Jul. 28, 2012 | Radiation (03CH05-HY) |
| EMI TEST RECEIVER      | R&S          | ESCI 7                     | 100724          | 9kHz~7GHz                   | Aug. 22, 2011    | Jul. 05, 2012                   | Aug. 21, 2012 | Radiation (03CH05-HY) |
| Spectrum Analyzer      | R&S          | FSP30                      | 101067          | 9KHz ~ 30GHz                | Dec. 06, 2011    | Jul. 05, 2012                   | Dec. 05, 2012 | Radiation (03CH05-HY) |
| Bluetooth Base Station | R&S          | CBT32                      | 100522          | N/A                         | Feb. 09, 2012    | Jul. 05, 2012                   | Feb. 08, 2014 | Radiation (03CH05-HY) |

## 5 Uncertainty of Evaluation

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

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

### 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 |
|-------------------------------------------------------------------------|------|



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

Please refer to Sporton report number EP260602 as below.