# FCC RF Test Report

| | | |
|---|---|---|
| APPLICANT | : | Getac Technology Corporation |
| EQUIPMENT | : | Tablet |
| BRAND NAME | : | Getac |
| MODEL NAME | : | Z710 |
| MARKETING NAME | : | Z710 |
| FCC ID | : | QYLZ710 |
| STANDARD | : | FCC Part 15 Subpart C §15.247 |
| CLASSIFICATION | : | (DSS) Spread Spectrum Transmitter |

**The product was received on Jun. 20, 2012 and completely tested on Aug. 29, 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:**

Jones Tsai

**Jones Tsai / Manager**

Testing Laboratory 1190

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# REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|---|---|---|---|
| FR262032A | Rev. 01 | Initial issue of report | Sep. 05, 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 | ≥ 15Chs | Pass | - |
| 3.2 | 15.247(a)(1) | A8.1(b) | Hopping Channel Separation | ≥ 2/3 of 20dB BW | Pass | - |
| 3.3 | 15.247(a)(1) | A8.1(d) | Dwell Time of Each Channel | ≤ 0.4sec 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 | ≤ 1 w for 1Mbps<br>≤ 125 Mw for 2, 3Mbps | Pass | - |
| 3.6 | 15.247(d) | A8.5 | Conducted Band Edges | ≤ 20dBc | Pass | - |
| 3.7 | 15.247(d) | A8.5 | Conducted Spurious Emission | ≤ 20dBc | 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 4.32 dB at 34.860 MHz |
| 3.10 | 15.207 | Gen 7.2.4 | AC Conducted Emission | 15.207(a) | Pass | Under limit 9.40 dB at 0.150 MHz |
| 3.11 | 15.203 & 15.247(b) | A8.4 | Antenna Requirement | N/A | Pass | - |

# 1 General Description

## 1.1 Applicant

**Getac Technology Corporation**

5F., Building A, No. 209, Sec. 1, Nangang Rd., Nangang Dist., Taipei City 11568, Taiwan, R.O.C.

## 1.2 Manufacturer

**Getac Technology (Kunshan) Co., LTD.**

No. 269, No. 2 Avenue, Kunshan Comprehensive Free Trade Zone, Jiangsu Province, P.R.C.

## 1.3 Feature of Equipment Under Test

| Product Feature | |
|---|---|
| **Equipment** | Tablet |
| **Brand Name** | Getac |
| **Model Name** | Z710 |
| **Marketing Name** | Z710 |
| **FCC ID** | QYLZ710 |
| **Integrated Module** | Brand Name : Jorjin<br>Model Name : WG7310 |
| **EUT supports Radios application** | GSM/EGPRS/WCDMA/HSPA/<br>WLAN 11bgn / Bluetooth / RFID |
| **HW Version** | R0A |
| **SW Version** | G0.0621.09.MU2 |
| **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) : 10.09 dBm (0.0102 W)<br>Bluetooth EDR (2Mbps) : 9.74 dBm (0.0094 W)<br>Bluetooth EDR (3Mbps) : 10.47 dBm (0.0111 W) |
| **Antenna Type** | PIFA Antenna with gain 2.90 dBi |
| **Type of Modulation** | Bluetooth (1Mbps) : GFSK<br>Bluetooth 2.1 EDR (2Mbps) : $\pi$/4-DQPSK<br>Bluetooth 2.1 EDR (3Mbps) : 8-DPSK |

## 1.4 Testing Site

| Test Site | SPORTON INTERNATIONAL INC. | | | |
|---|---|---|---|---|
| Test Site Location | No. 52, Hwa Ya 1st 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. | System Simulator | R&S | CMU 200 | N/A | N/A | Unshielded, 1.8 m |
| 2. | WLAN AP | D-Link | DIR-628 | KA2DIR628A2 | N/A | Unshielded, 1.8 m |
| 3. | Bluetooth Base Station | R&S | CBT32 | N/A | N/A | Unshielded, 1.8 m |
| 4. | Car Battery | YUASA | 46B24R(S) | N/A | N/A | N/A |
| 5. | Notebook | DELL | Vostro 1510 | FCC DoC | N/A | AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m |
| 6. | LCD Monitor | Dell | U2410 | FCC DoC | Shielded, 1.6 m | Unshielded, 1.8 m |
| 7. | Bluetooth Earphone | Sony Ericsson | MW600 | PY7DDA-2029 | N/A | N/A |
| 8. | Earphone | Ergotech | ET-E200 | FCC DoC | Unshielded, 1.8 m | N/A |
| 9. | USB3.0 HD | WD | WDBAAR5000A BK-PESN | FCC DoC | Unshielded, 0.5 m | N/A |
| 10. | (USB) Mouse | DELL | MOC5UO | FCC DoC | Shielded, 1.8 m | N/A |
| 11. | iPod | Apple | A1285 | FCC DoC | Shielded, 1.0 m | N/A |
| 12. | iPod Earphone | Apple | N/A | FCC DoC | Unshielded, 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:

| Channel | Frequency | Bluetooth RF Output Power | | |
|---|---|---|---|---|
| | | Data Rate / Modulation | | |
| | | GFSK | π/4-DQPSK | 8-DPSK |
| | | 1Mbps | 2Mbps | 3Mbps |
| Ch00 | 2402MHz | 10.09 dBm | 9.74 dBm | **10.47 dBm** |
| Ch39 | 2441MHz | 9.99 dBm | 9.63 dBm | 10.28 dBm |
| Ch78 | 2480MHz | 9.67 dBm | 9.30 dBm | 9.91 dBm |

**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 3Mbps 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.

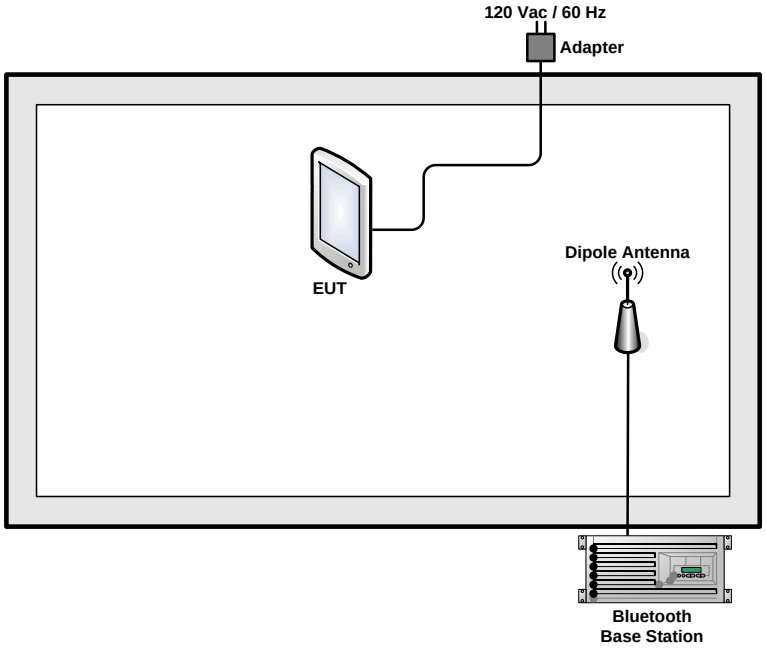
| Test Cases | | | |
|---|---|---|---|
| **Test Item** | **Data Rate / Modulation** | | |
| | **Bluetooth 1Mbps GFSK** | **Bluetooth EDR 2Mbps $\pi$/4-DQPSK** | **Bluetooth EDR 3Mbps 8-DPSK** |
| **Conducted TCs** | Mode 1: CH00_2402 MHz<br>Mode 2: CH39_2441 MHz<br>Mode 3: CH78_2480 MHz | Mode 4: CH00_2402 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 TCs** | Pretest | Pretest | Mode 1: CH00_2402 MHz + Adapter 1 <Fig. 1><br>Mode 2: CH39_2441 MHz + Adapter 1 <Fig. 1><br>Mode 3: CH78_2480 MHz + Adapter 1 <Fig. 1><br>Mode 4: CH78_2480 MHz + Docking 1 + Adapter 2 <Fig. 2><br>Mode5: CH78_2480 MHz + Docking 2 + Car Charger 12V <Fig. 3> |

| Test Cases | |
|---|---|
| **AC Conducted Emission** | Mode 1 :RFID On + TC1 <Fig. 4><br>Mode 2 :WCDMA Band II Idle + WLAN Link + Bluetooth Link + RFID On + Camera + TC2 <Fig. 5><br>Mode 3 :GSM1900 (GPRS 8) Idle + WLAN Link + Bluetooth Link + RFID On + MPEG4 + TC3 <Fig. 6><br>Mode 4 :GSM1900 (GPRS 8) Idle + WLAN Link + Bluetooth Link + RFID On + MPEG4 + TC4 <Fig. 7><br>Mode 5 :GSM1900 (GPRS 8) Idle + RFID On + MPEG4 + TC5 <Fig. 8><br>Mode 6 :WLAN Link + Bluetooth Link + Camera + TC2 <Fig. 9> |

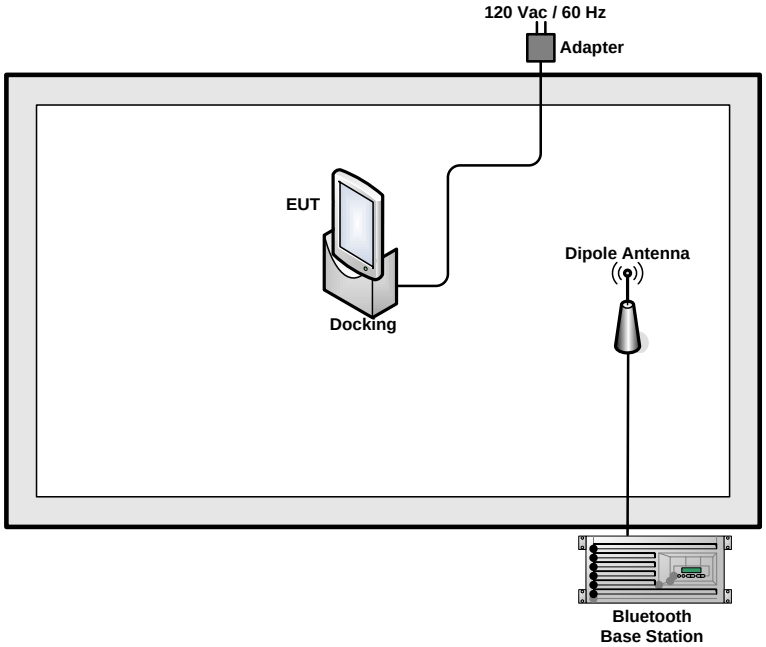
**Remark:**

1. TC1 stands for Test Configuration, and consists of USB Cable (Data Link with Notebook), Adapter 1, SD Card, and USB 3.0 HD.
2. TC2 stands for Test Configuration, and consists of SD Card, HDMI Cable, earphone, docking 1, RJ-45 Load, USB Cable (Link with Notebook), mouse, USB 3.0 HD, and adapter 2.
3. TC3 stands for Test Configuration, and consists of SD Card, HDMI Cable, earphone, docking 1, RJ-45 Link, USB Cable (Load with Notebook), mouse, USB 3.0 HD, and adapter 2.
4. TC4 stands for Test Configuration, and consists of SD Card, HDMI Cable, earphone, docking 2, RJ-45 Load, RS-232 Load, mouse, USB 3.0 HD, and car charger (12V).
5. TC5 stands for Test Configuration, and consists of SD Card, HDMI Cable, earphone, docking 2, RJ-45 Link, RS-232 Load, USB Load, mouse, USB 3.0 HD, and car charger (24V).
6. For radiated TCs, the data rate was set in 3Mbps due to the highest RF output power; only the data of these modes was reported.
7. For conducted emission, the worst case is mode 3; only the test data of this mode was reported.

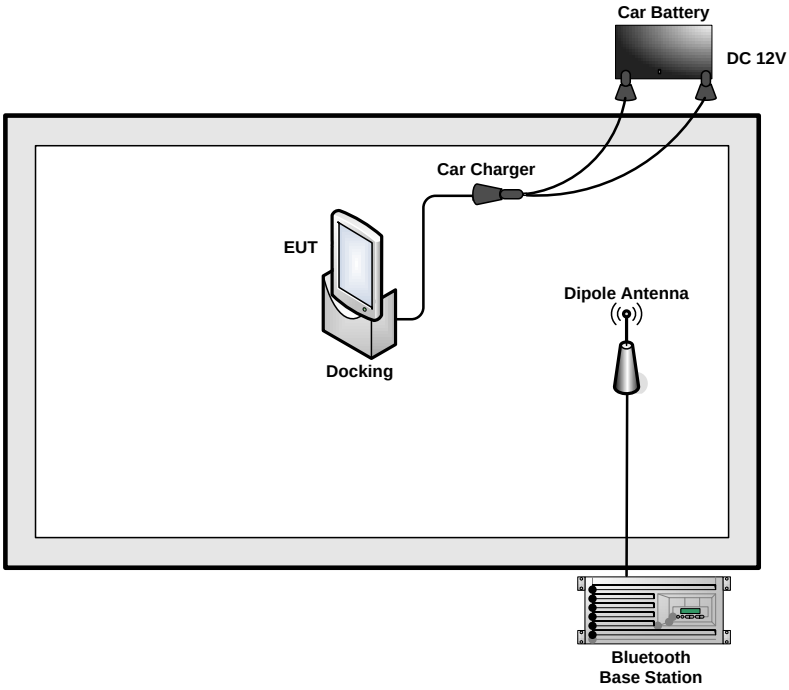
## 2.3 Connection Diagram of Test System



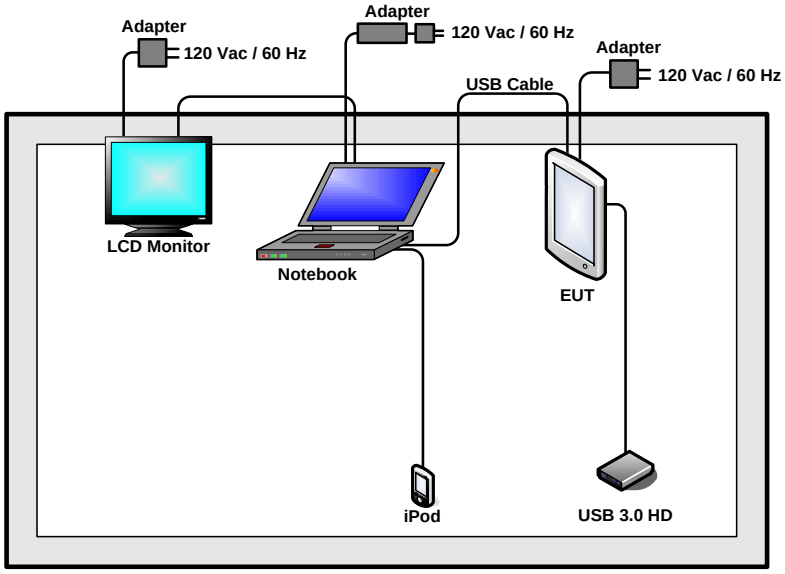

<Fig. 1>



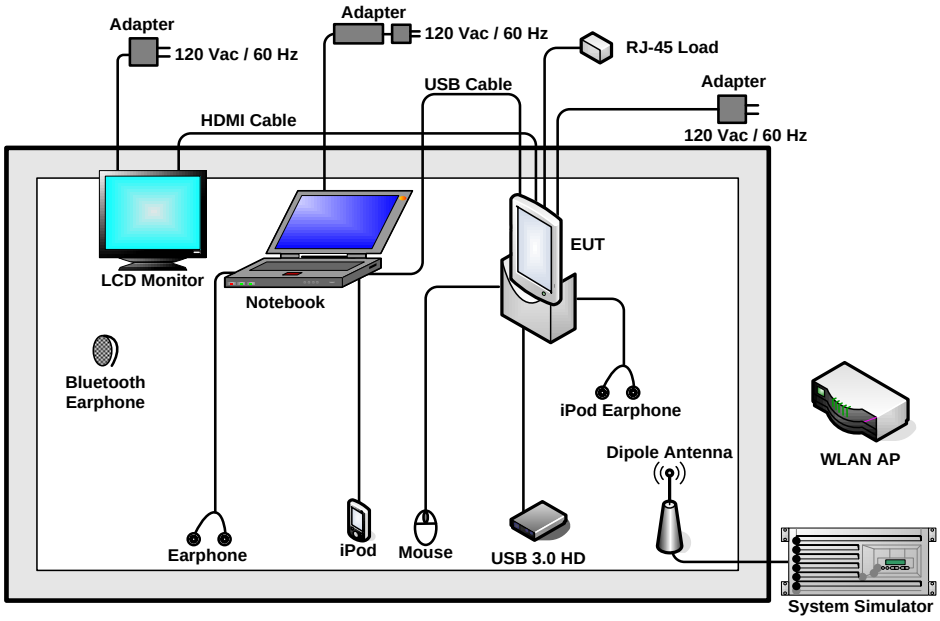

<Fig. 2>


Car Battery
DC 12V
Car Charger
EUT
Docking
Dipole Antenna
Bluetooth
Base Station

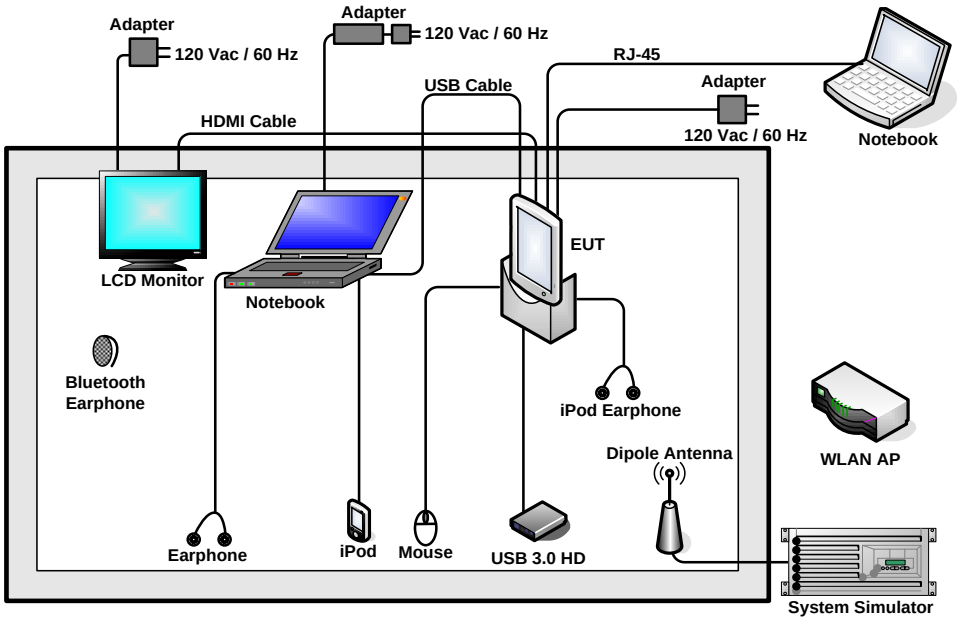
<Fig. 3>


Adapter
120 Vac / 60 Hz
Adapter
120 Vac / 60 Hz
Adapter
120 Vac / 60 Hz
USB Cable
LCD Monitor
Notebook
EUT
iPod
USB 3.0 HD

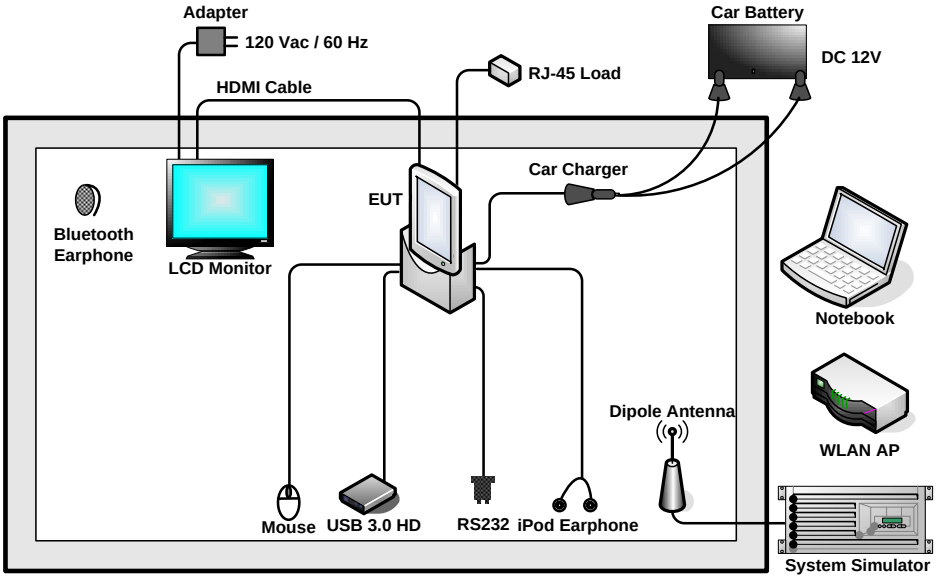
<Fig. 4>


Adapter
120 Vac / 60 Hz
Adapter
120 Vac / 60 Hz
RJ-45 Load
USB Cable
Adapter
120 Vac / 60 Hz
HDMI Cable
LCD Monitor
Notebook
EUT
Bluetooth Earphone
iPod Earphone
Dipole Antenna
WLAN AP
Earphone
iPod
Mouse
USB 3.0 HD
System Simulator

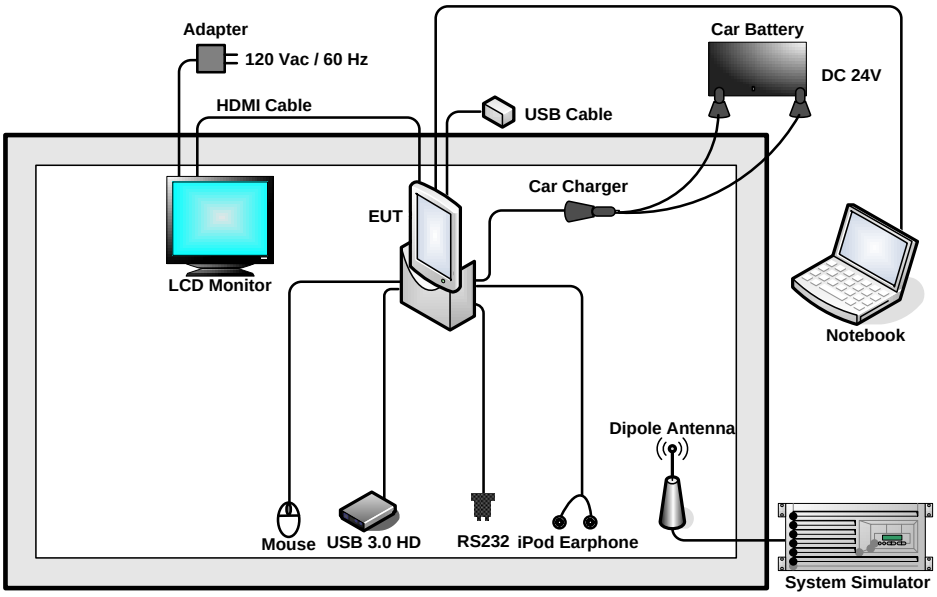
<Fig. 5>


Adapter
120 Vac / 60 Hz
Adapter
120 Vac / 60 Hz
RJ-45
USB Cable
Adapter
120 Vac / 60 Hz
Notebook
HDMI Cable
LCD Monitor
Notebook
EUT
Bluetooth Earphone
iPod Earphone
Dipole Antenna
WLAN AP
Earphone
iPod
Mouse
USB 3.0 HD
System Simulator

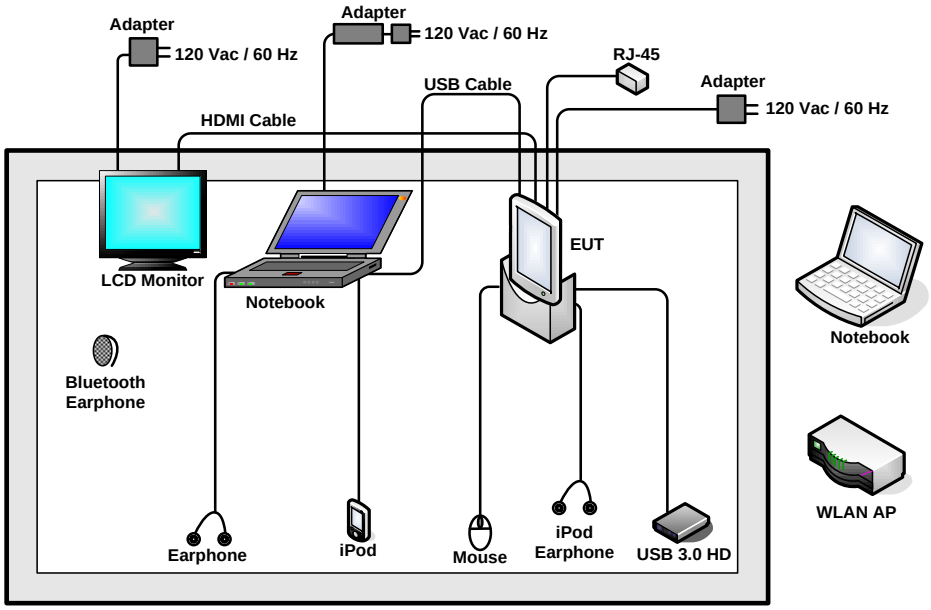
<Fig. 6>


Adapter
120 Vac / 60 Hz
HDMI Cable
RJ-45 Load
Car Battery
DC 12V
Car Charger
EUT
Bluetooth Earphone
LCD Monitor
Notebook
WLAN AP
Dipole Antenna
Mouse
USB 3.0 HD
RS232
iPod Earphone
System Simulator

**<Fig. 7>**


Adapter
120 Vac / 60 Hz
HDMI Cable
USB Cable
Car Battery
DC 24V
Car Charger
EUT
LCD Monitor
Notebook
Dipole Antenna
Mouse
USB 3.0 HD
RS232
iPod Earphone
System Simulator

**<Fig. 8>**




**<Fig. 9>**

## 2.4 RF Utility

For Bluetooth function, the RF utility, “Z710_BTEnterTestmode Tool” was installed in EUT 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.

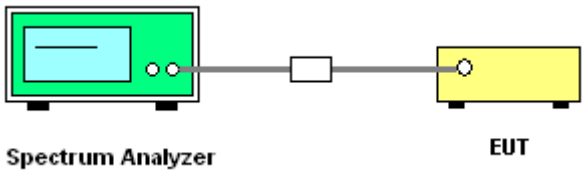
### 3.1.2 Measuring Instruments

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. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings: Span = the frequency band of operation; RBW ≥ 1% of the span; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
6. The number of hopping frequency used is defined as the number of total channel.

### 3.1.4 Test Setup

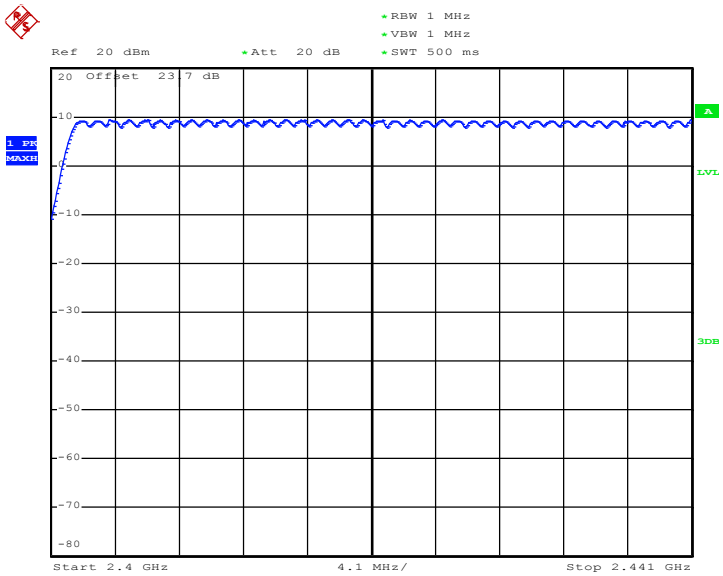



### 3.1.5 Test Result of Number of Hopping Frequency

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

| Number of Hopping Channels (Channel) | Limits (Channel) | Pass/Fail |
|---|---|---|
| 79 | > 15 | Pass |

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

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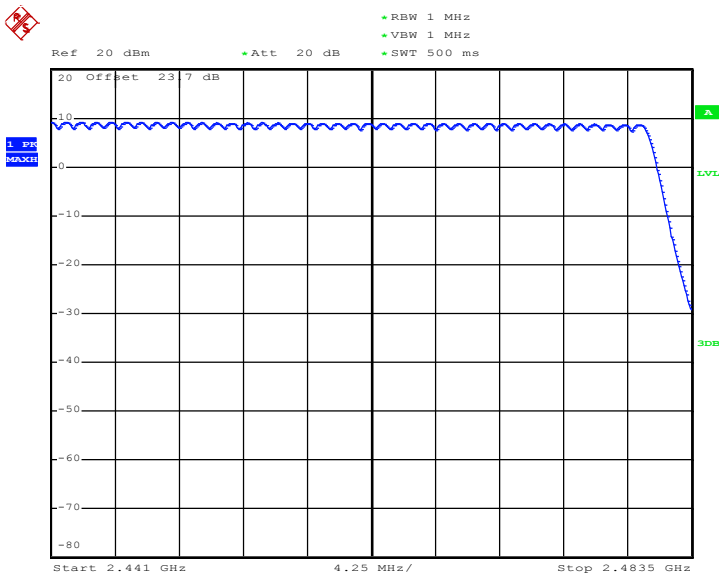



Date: 20.AUG.2012 22:52:19

## 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.

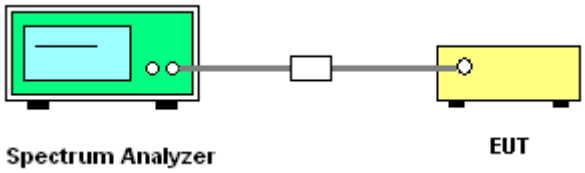
### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.2.3 Test Procedures

1. 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. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peaks of two adjacent channels; RBW ≥ 1% of the span; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.

### 3.2.4 Test Setup

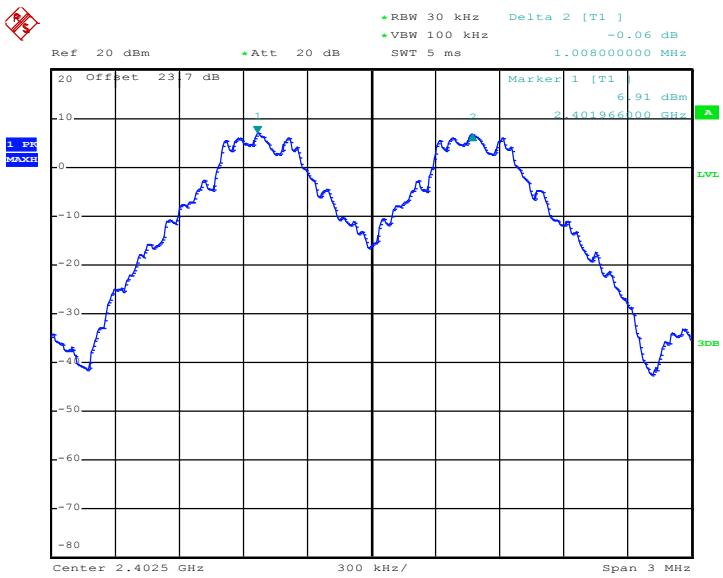


### 3.2.5 Test Result of Hopping Channel Separation

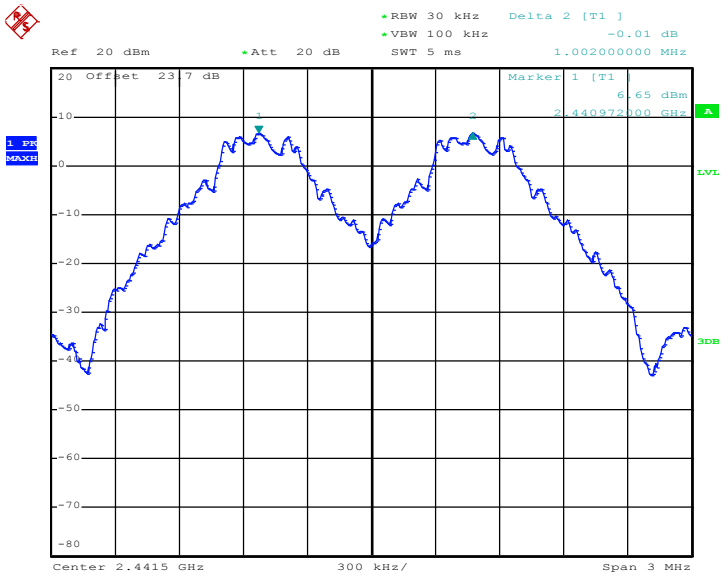
| Test Mode : | 1Mbps | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Book Lin | Relative Humidity : | 50~53% |

| Channel | Frequency (MHz) | Frequency Separation (MHz) | (2/3 of 20dB BW) Limits (MHz) | Pass/Fail |
|---|---|---|---|---|
| 00 | 2402 | 1.008 | 0.6027 | Pass |
| 39 | 2441 | 1.002 | 0.6000 | Pass |
| 78 | 2480 | 1.002 | 0.6000 | Pass |

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



## Channel Separation Plot on Channel 39 - 40

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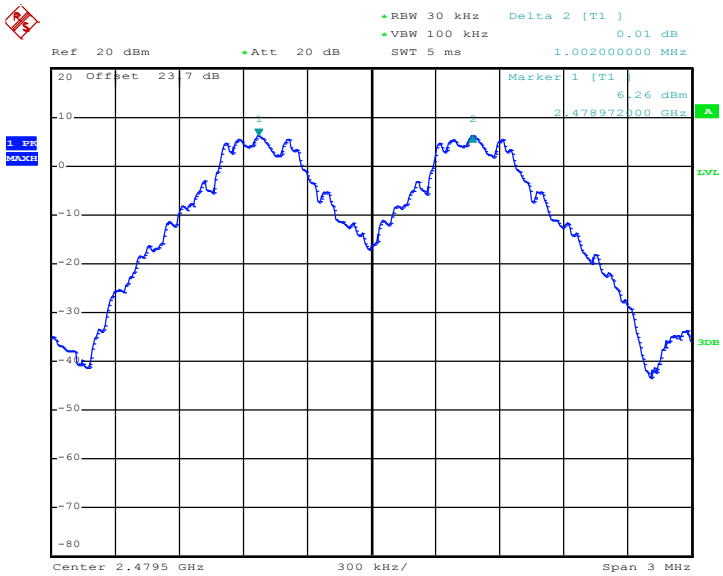
## Channel Separation Plot on Channel 77 - 78

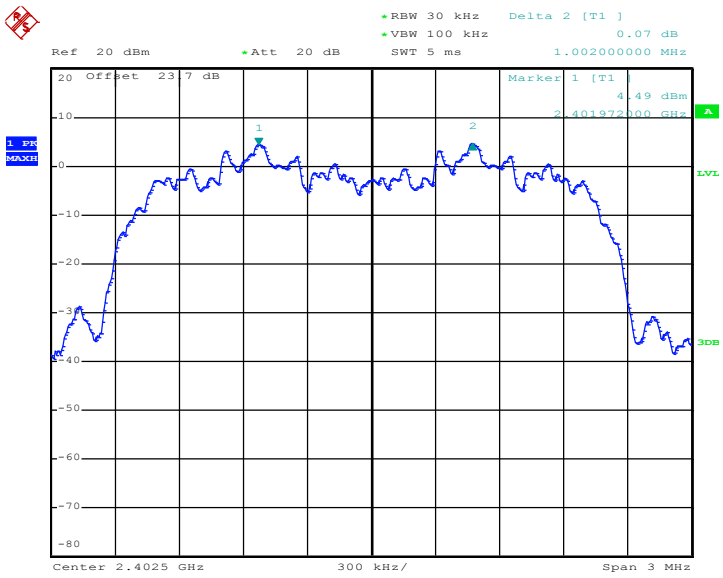



Date: 20.AUG.2012 22:10:22

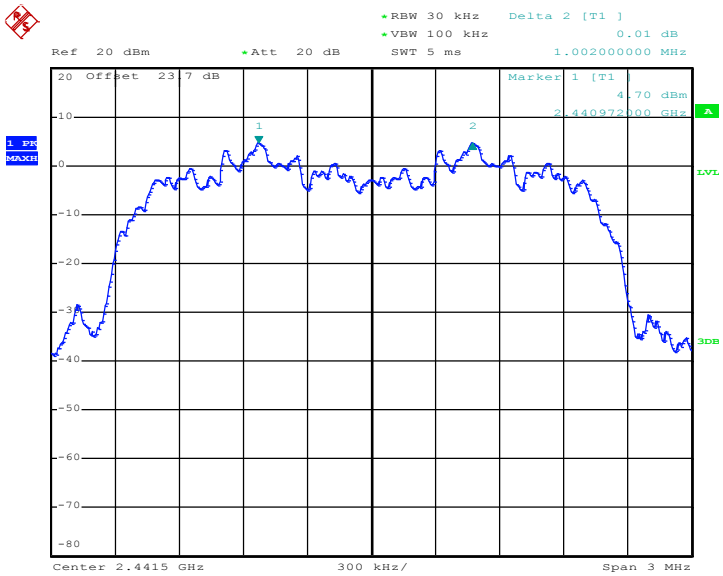
| Test Mode : | 2Mbps | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Book Lin | Relative Humidity : | 50~53% |

| Channel | Frequency (MHz) | Frequency Separation (MHz) | (2/3 of 20dB BW) Limits (MHz) | Pass/Fail |
|---|---|---|---|---|
| 00 | 2402 | 1.002 | 0.8800 | Pass |
| 39 | 2441 | 1.002 | 0.8800 | Pass |
| 78 | 2480 | 1.002 | 0.8840 | Pass |

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



## Channel Separation Plot on Channel 39 - 40

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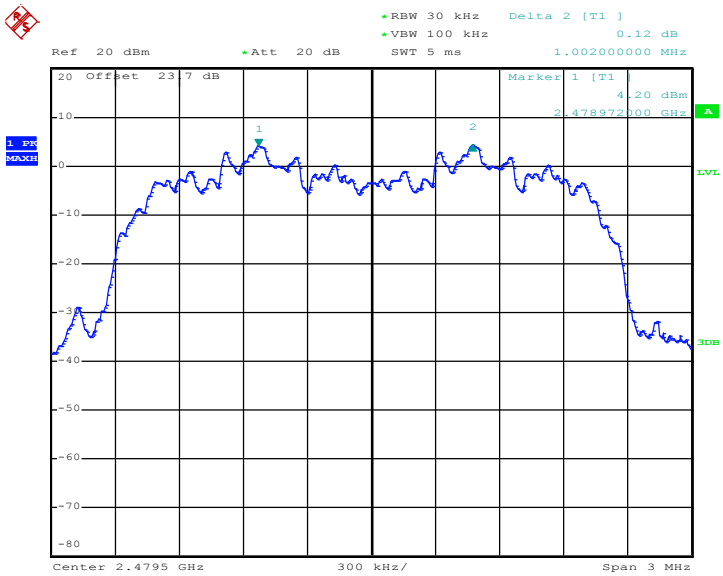
## Channel Separation Plot on Channel 77 - 78

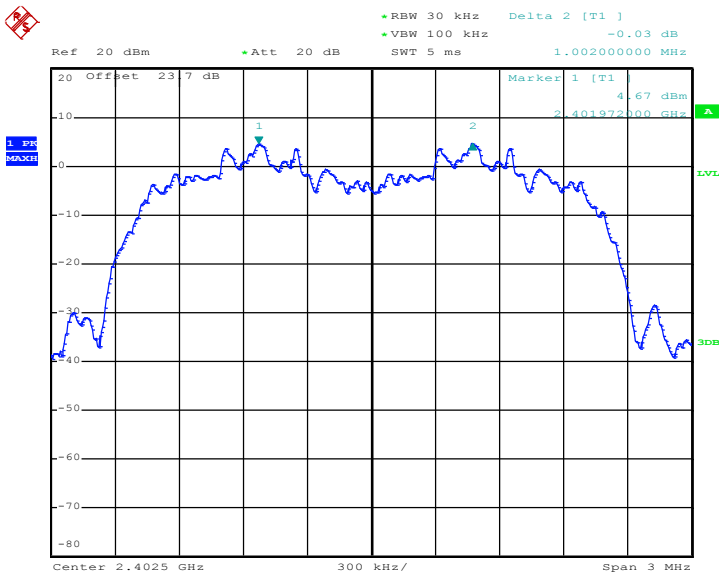



Date: 20.AUG.2012 22:02:20

| Test Mode : | 3Mbps | Temperature : | 24~26℃ |
|---|---|---|---|
| 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 | 0.8560 | Pass |
| 39 | 2441 | 1.002 | 0.8560 | Pass |
| 78 | 2480 | 1.008 | 0.8560 | Pass |

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

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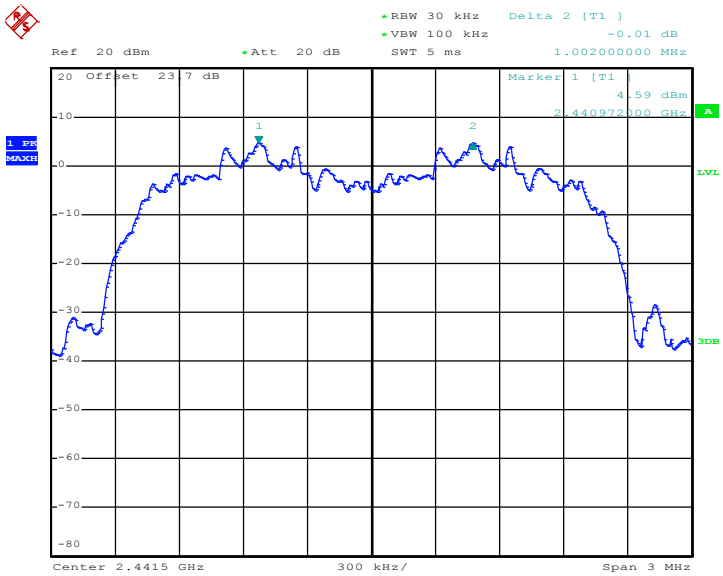
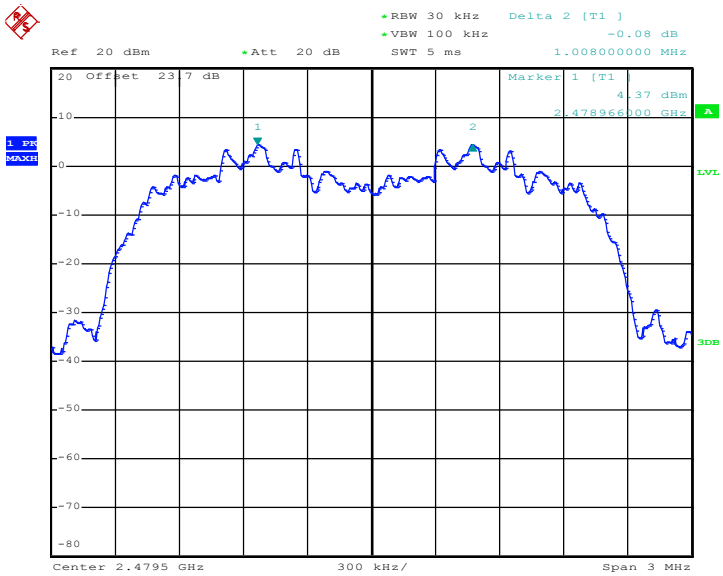
## Channel Separation Plot on Channel 39 - 40




Date: 20.AUG.2012 21:54:39

## Channel Separation Plot on Channel 77 - 78




Date: 20.AUG.2012 21:56:38

## 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 connector was connected to the spectrum analyzer through a low loss cable.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW ≥ RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.

### 3.3.4 Test Setup


### 3.3.5 Test Result of Dwell Time

| Test Mode : | 3DH1 | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Book Lin | Relative Humidity : | 50~53% |

| Package Mode | Average Hopping Channel | Package Transfer Time (usec) | Dwell Time (sec) | Limits (sec) | Pass/Fail |
|---|---|---|---|---|---|
| 3DH1 | 9.70 | 431.41 | 0.13 | 0.4 | Pass |

**Remark:**

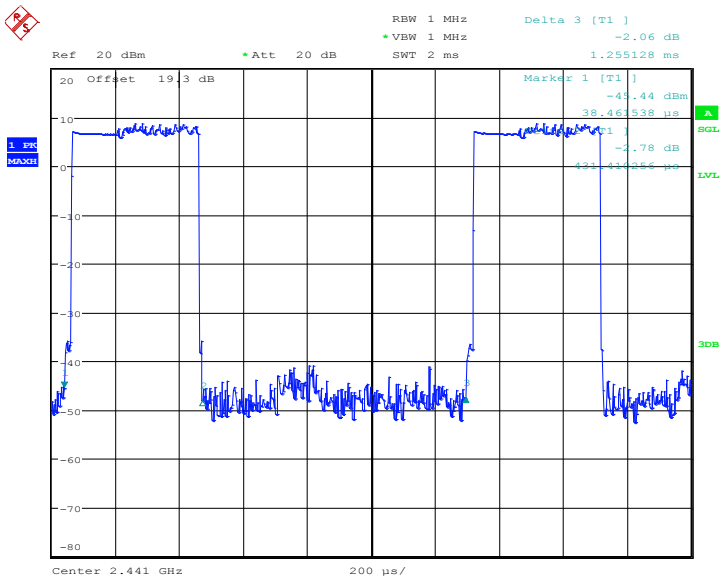
**1.** Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time

**2.** 79 channels come from the Hopping Channel number.

**3.** Average Hopping Channel = hops/sweep time

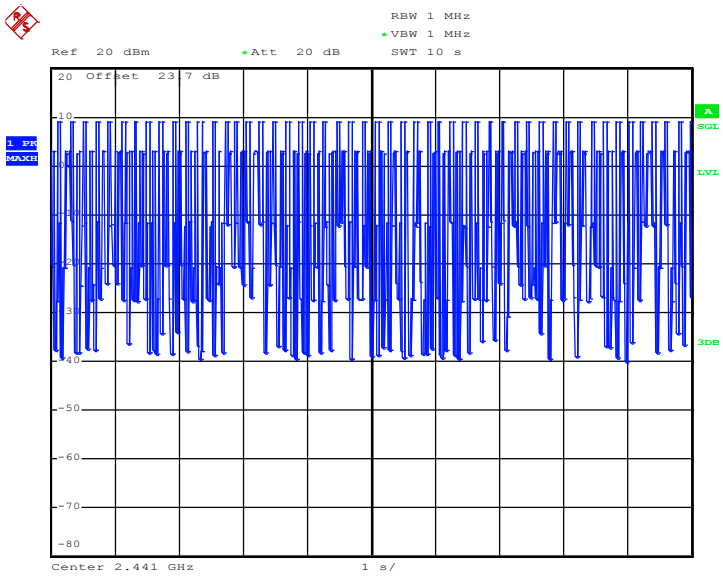
**4.** T: Package Transfer Time(us)

### 3DH1 Dwell Time (One Pulse) Plot on Channel 39




Date: 30.JUL.2012 16:30:14

### 3DH1 Dwell Time (Count Pulses) Plot on Channel 39




Date: 20.AUG.2012 22:35:46

# 3.4 20dB Bandwidth Measurement

## 3.4.1 Limit of 20dB Bandwidth

Reporting only

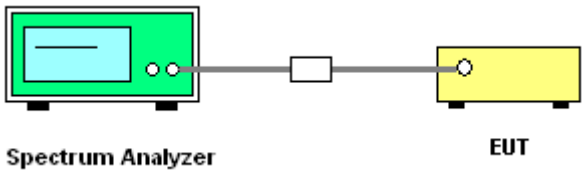
## 3.4.2 Measuring Instruments

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. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings:
   Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel;
   RBW ≥ 1% of the 20 dB bandwidth; VBW ≥ RBW; Sweep = auto; Detector function = peak;
   Trace = max hold.

## 3.4.4 Test Setup

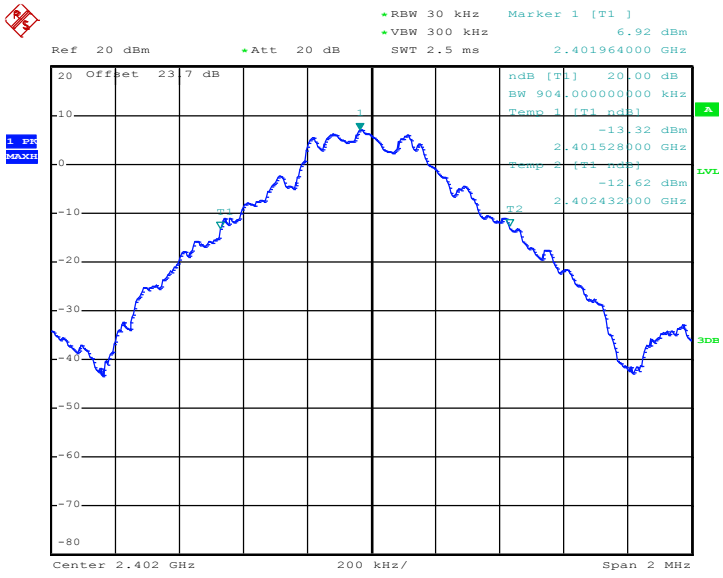


### 3.4.5 Test Result of 20dB Bandwidth

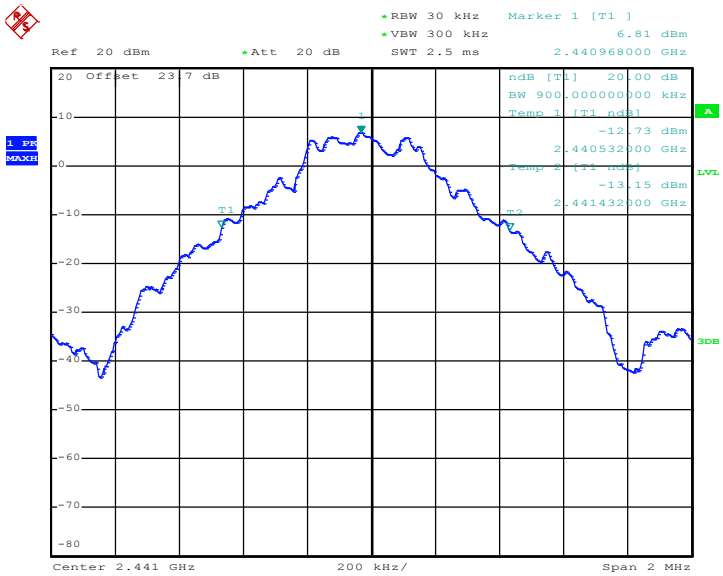
| Test Mode : | 1Mbps | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Book Lin | Relative Humidity : | 50~53% |

| Channel | Frequency (MHz) | 20dB Bandwidth (MHz) |
|---|---|---|
| 00 | 2402 | 0.904 |
| 39 | 2441 | 0.900 |
| 78 | 2480 | 0.900 |

**20 dB Bandwidth Plot on Channel 00**

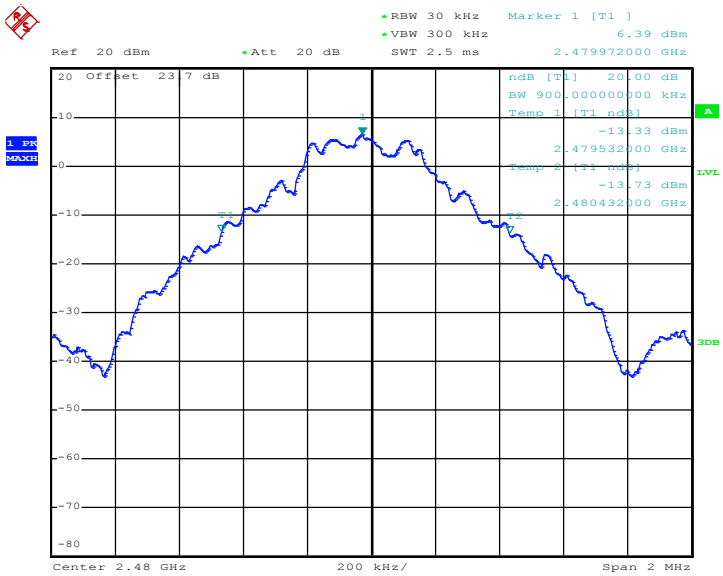


## 20 dB Bandwidth Plot on Channel 39




Date: 20.AUG.2012 22:11:24

## 20 dB Bandwidth Plot on Channel 78

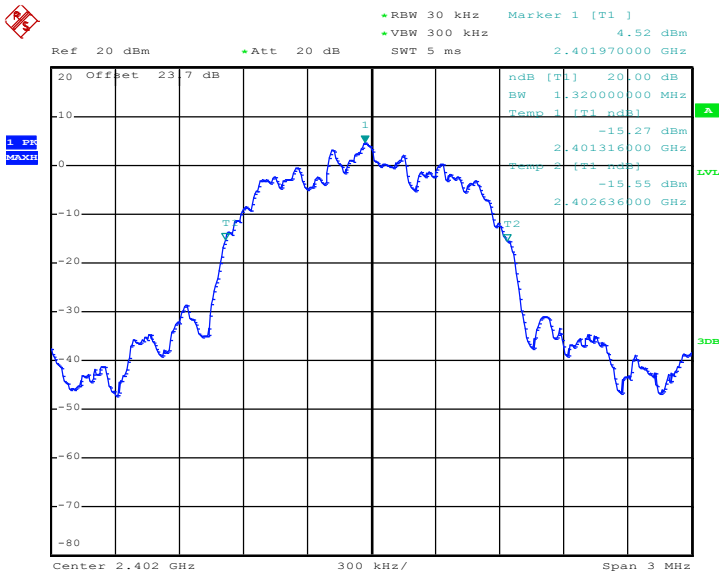



Date: 20.AUG.2012 22:11:42

| Test Mode : | 2Mbps | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Book Lin | Relative Humidity : | 50~53% |

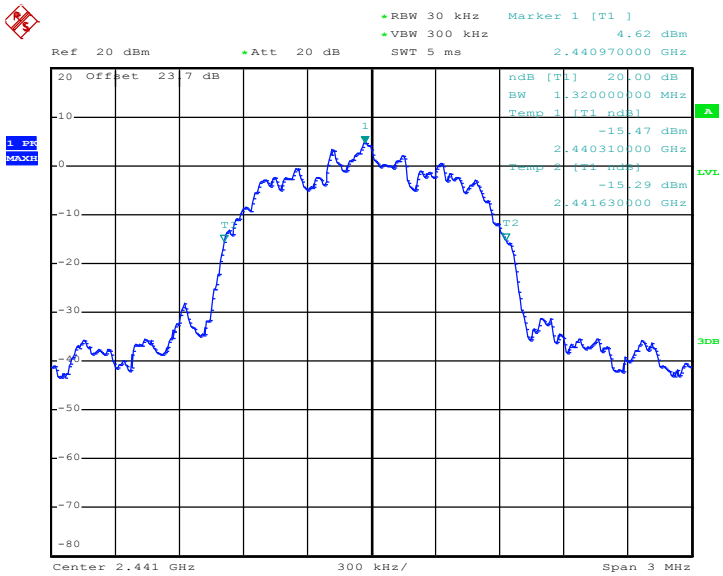
| Channel | Frequency (MHz) | 20dB Bandwidth (MHz) |
|---|---|---|
| 00 | 2402 | 1.320 |
| 39 | 2441 | 1.320 |
| 78 | 2480 | 1.326 |

**20 dB Bandwidth Plot on Channel 00**



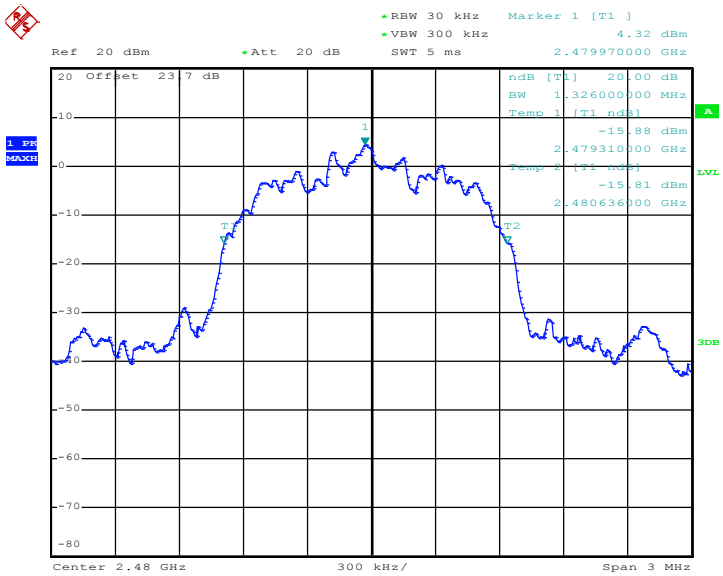

Date: 20.AUG.2012 22:12:04

## 20 dB Bandwidth Plot on Channel 39




Date: 20.AUG.2012 22:12:24

## 20 dB Bandwidth Plot on Channel 78

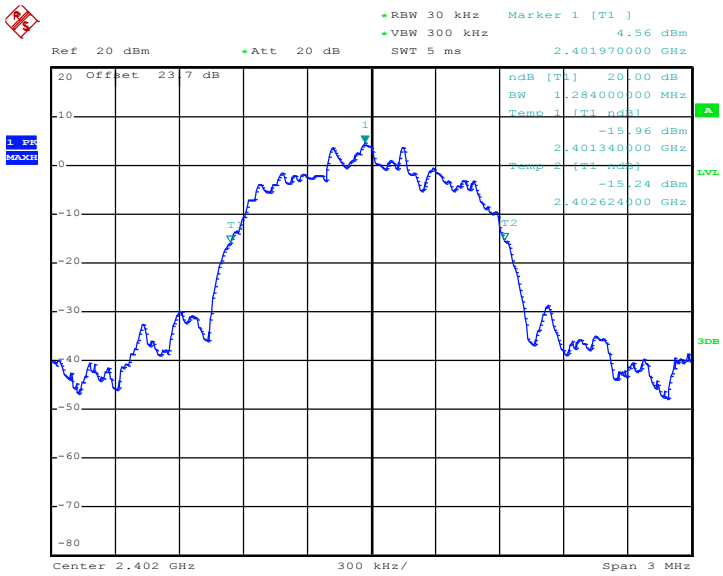



Date: 20.AUG.2012 22:12:57

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

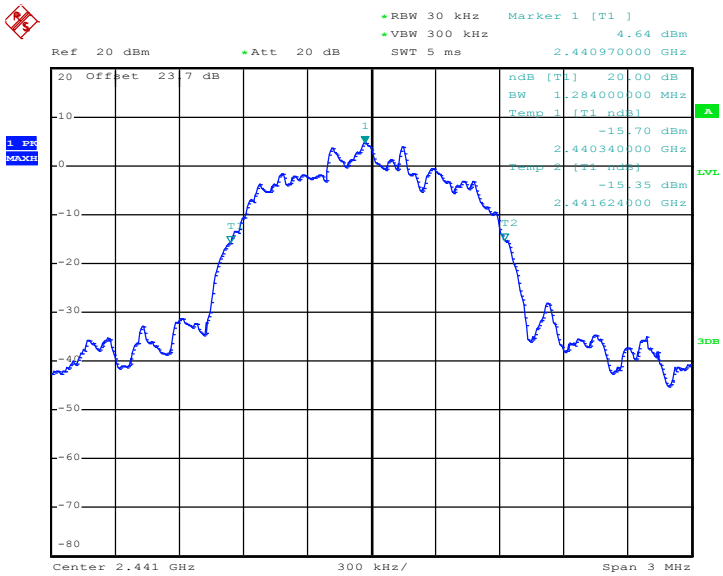
| Channel | Frequency (MHz) | 20dB Bandwidth (MHz) |
|---|---|---|
| 00 | 2402 | 1.284 |
| 39 | 2441 | 1.284 |
| 78 | 2480 | 1.284 |

**20 dB Bandwidth Plot on Channel 00**



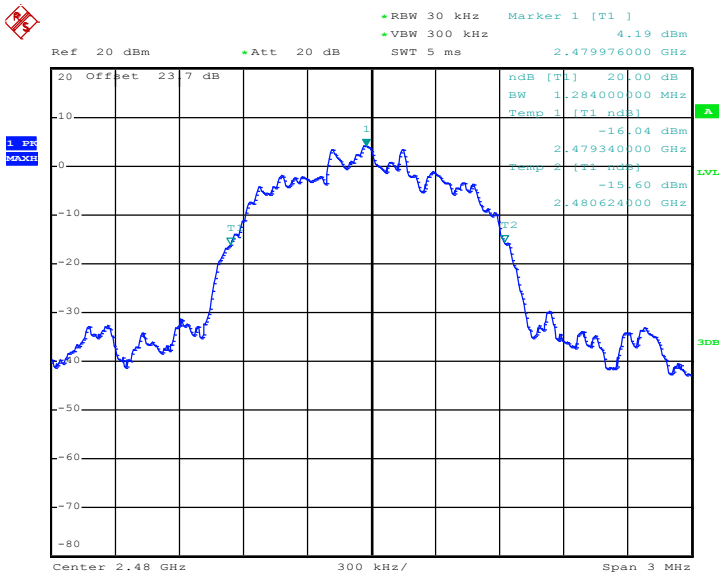

Date: 20.AUG.2012 22:13:32

## 20 dB Bandwidth Plot on Channel 39




Date: 20.AUG.2012 22:14:15

## 20 dB Bandwidth Plot on Channel 78




Date: 20.AUG.2012 22:14:44

## 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.

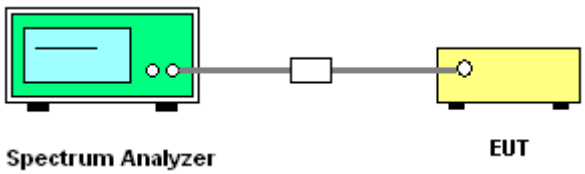
### 3.5.2 Measuring Instruments

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. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

### 3.5.4 Test Setup

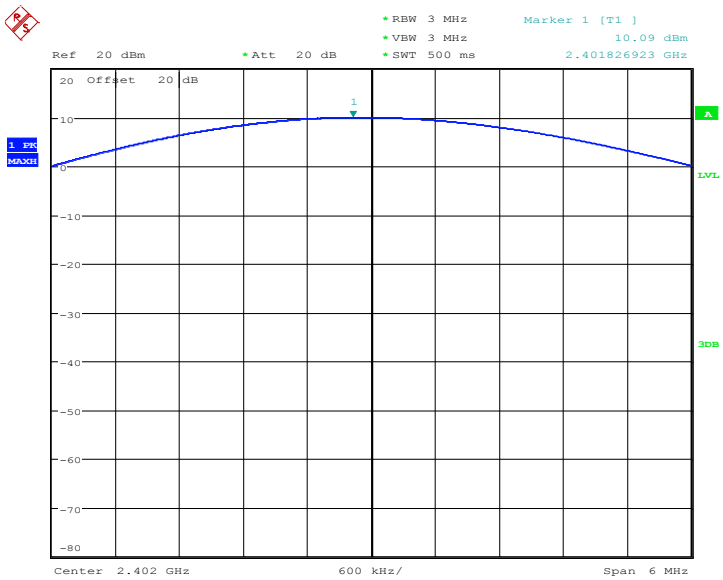


### 3.5.5 Test Result of Peak Output Power

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

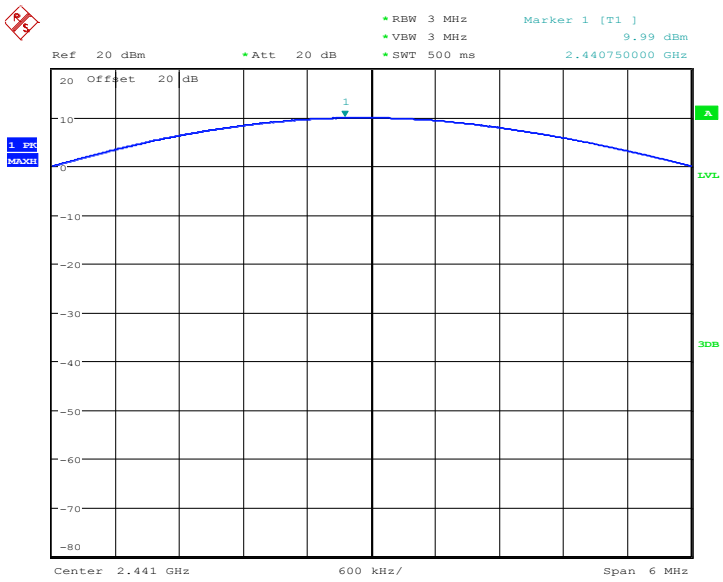
| Channel | Frequency (MHz) | RF Power (dBm) | | |
|---|---|---|---|---|
| | | GFSK | Max. Limits (dBm) | Pass/Fail |
| | | 1 Mbps | | |
| 00 | 2402 | 10.09 | 30.00 | Pass |
| 39 | 2441 | 9.99 | 30.00 | Pass |
| 78 | 2480 | 9.67 | 30.00 | Pass |

**Peak Output Power Plot on Channel 00**



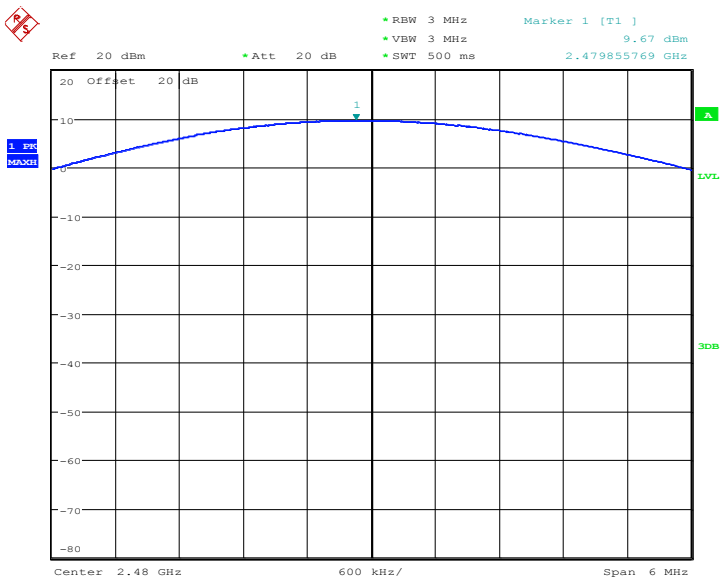

Date: 30.JUL.2012 16:43:45

## Peak Output Power Plot on Channel 39




Date: 30.JUL.2012 16:44:57

## Peak Output Power Plot on Channel 78

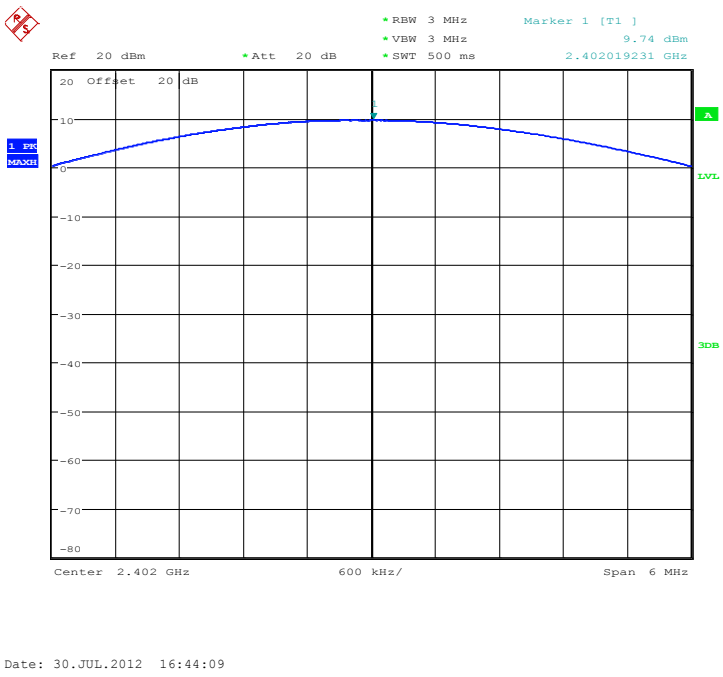



Date: 30.JUL.2012 16:46:09

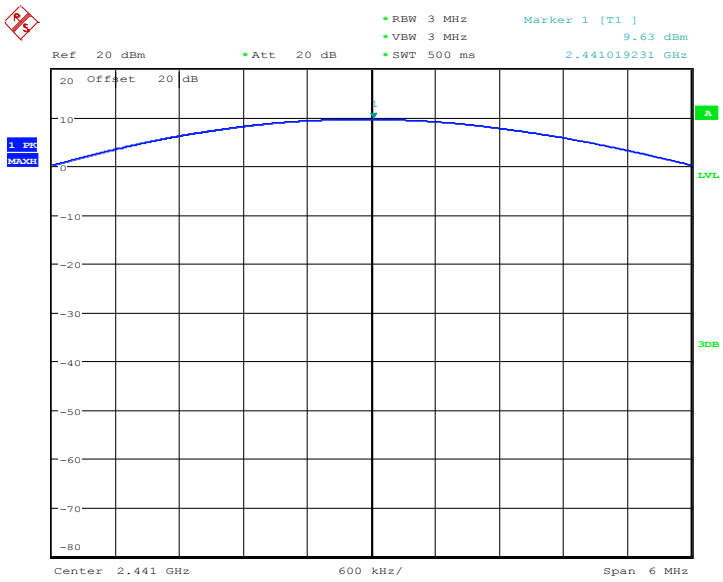
| Test Mode : | 2Mbps | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Book Lin | Relative Humidity : | 50~53% |

| Channel | Frequency (MHz) | RF Power (dBm) | | |
|---|---|---|---|---|
| | | π /4-DQPSK | Max. Limits | Pass/Fail |
| | | 2 Mbps | (dBm) | |
| 00 | 2402 | 9.74 | 20.97 | Pass |
| 39 | 2441 | 9.63 | 20.97 | Pass |
| 78 | 2480 | 9.30 | 20.97 | Pass |

**Peak Output Power Plot on Channel 00**

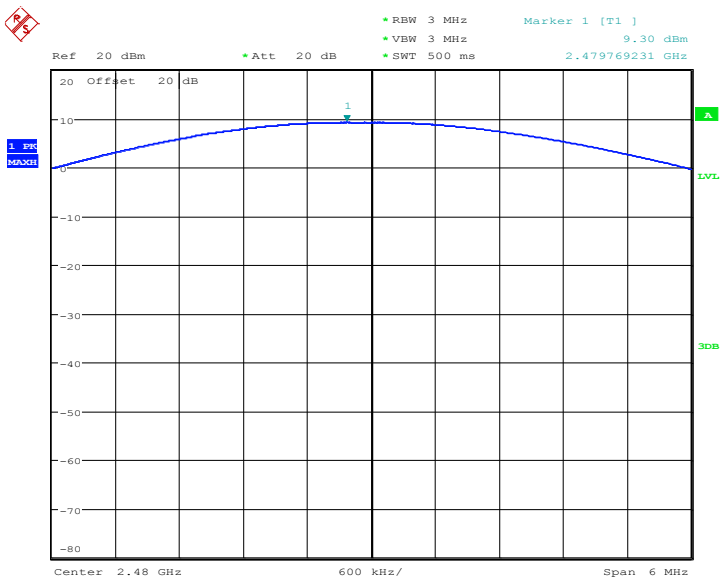


## Peak Output Power Plot on Channel 39




Date: 30.JUL.2012 16:45:21

## Peak Output Power Plot on Channel 78

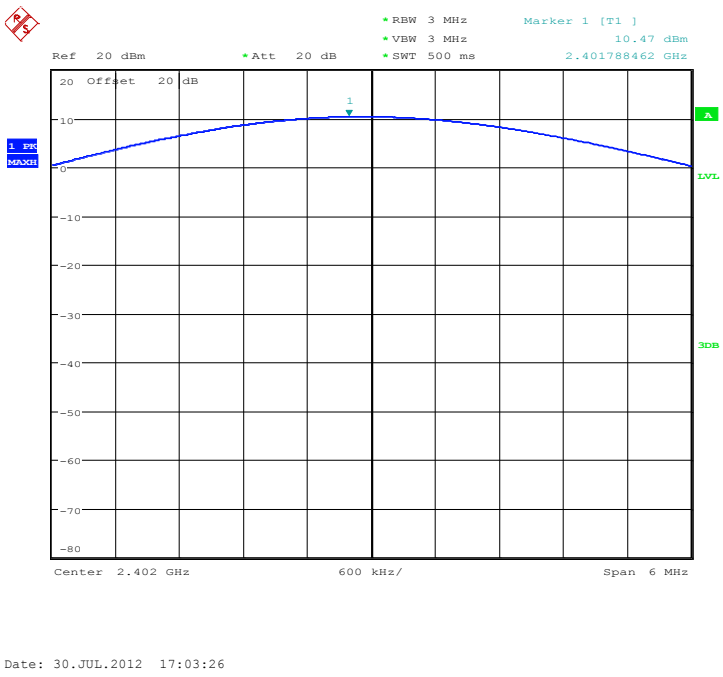



Date: 30.JUL.2012 16:46:33

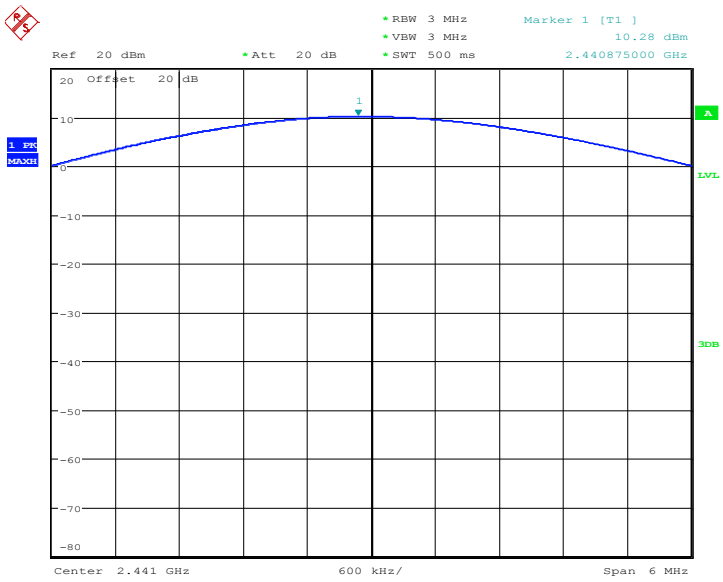
| Test Mode : | 3Mbps | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Book Lin | Relative Humidity : | 50~53% |

| Channel | Frequency (MHz) | RF Power (dBm) | | |
|---|---|---|---|---|
| | | 8-DPSK | Max. Limits | Pass/Fail |
| | | 3 Mbps | (dBm) | |
| 00 | 2402 | 10.47 | 20.97 | Pass |
| 39 | 2441 | 10.28 | 20.97 | Pass |
| 78 | 2480 | 9.91 | 20.97 | Pass |

**Peak Output Power Plot on Channel 00**

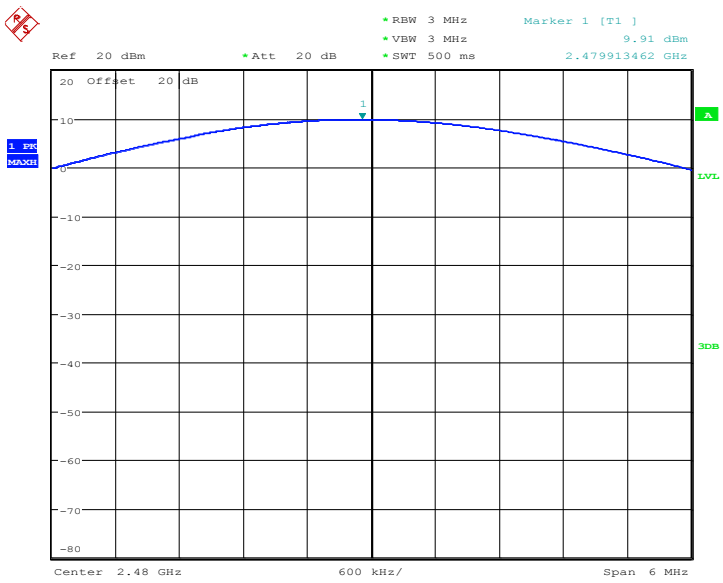


## Peak Output Power Plot on Channel 39




Date: 30.JUL.2012 16:45:45

## Peak Output Power Plot on Channel 78




Date: 30.JUL.2012 16:46:58

## 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.

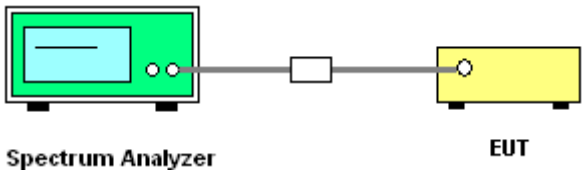
### 3.6.2 Measuring Instruments

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 to the maximum power setting and enable the EUT transmit continuously.
3. Set RBW = 300KHz (≥ 1% span=30MHz ), VBW = 300KHz (≥ 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.
4. Enable hopping function of the EUT and then repeat step 2. and 3.
5. Record the results in the test report.

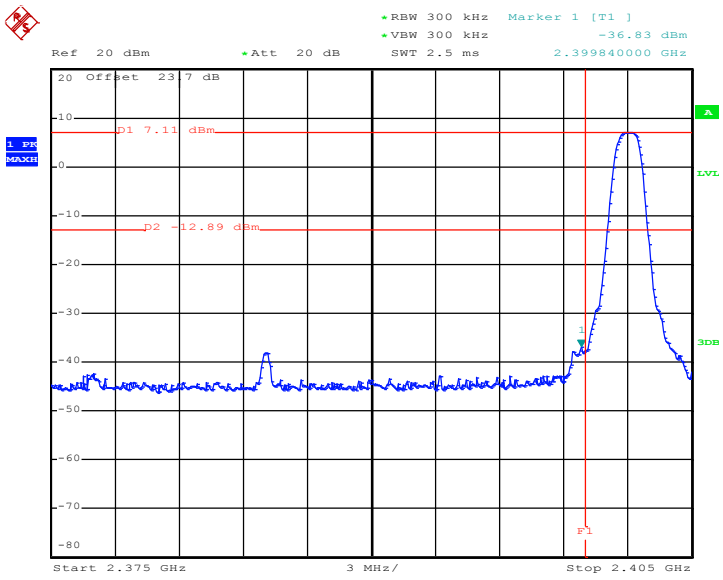
### 3.6.4 Test Setup



## 7.6.5 Test Result of Conducted Band Edges

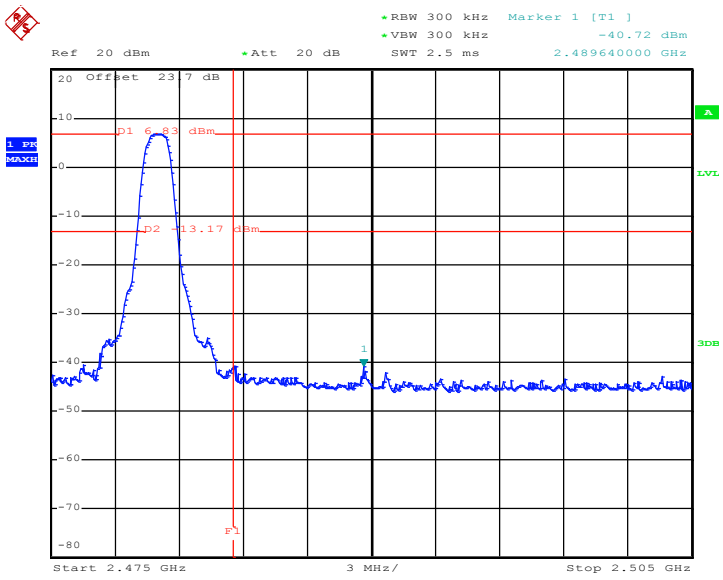
| | | | |
|---|---|---|---|
| **Test Mode :** | 3Mbps | **Temperature :** | 24~26℃ |
| **Test Channel :** | 00 and 78 | **Relative Humidity :** | 50~53% |
| | | **Test Engineer :** | Book Lin |

**Low Band Edge Plot on Channel 00**




Date: 20.AUG.2012 22:19:38

**High Band Edge Plot on Channel 78**

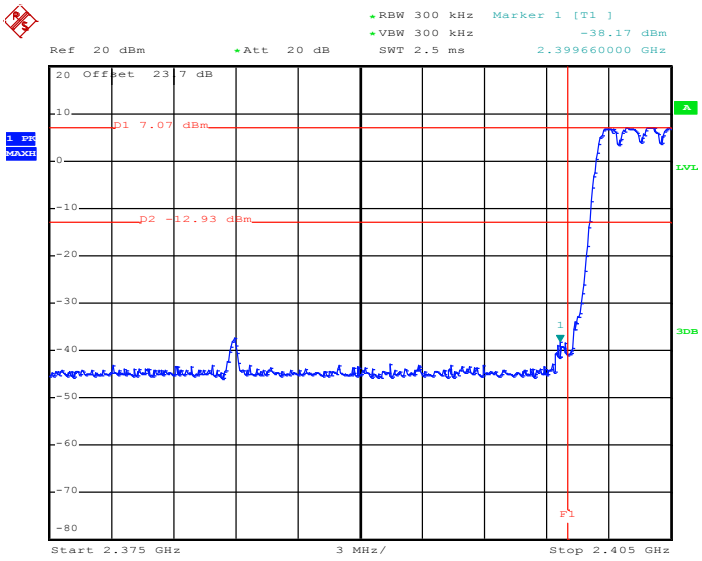



Date: 20.AUG.2012 22:20:44

## 7.6.6 Test Result of Conducted Hopping Mode Band Edges

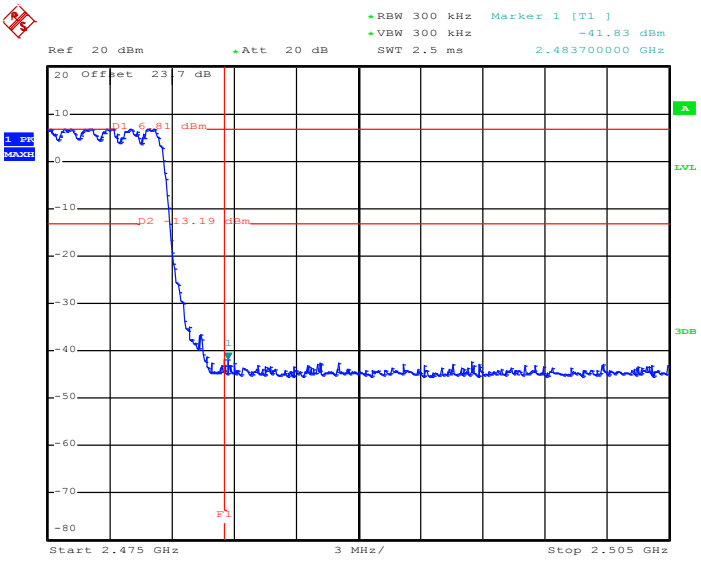
| Test Mode : | 3Mbps | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Book Lin | Relative Humidity : | 50~53% |

### Hopping Mode Low Band Edge Plot




Date: 21.AUG.2012 00:31:24

### Hopping Mode High Band Edge Plot




Date: 21.AUG.2012 00:54:13

# 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

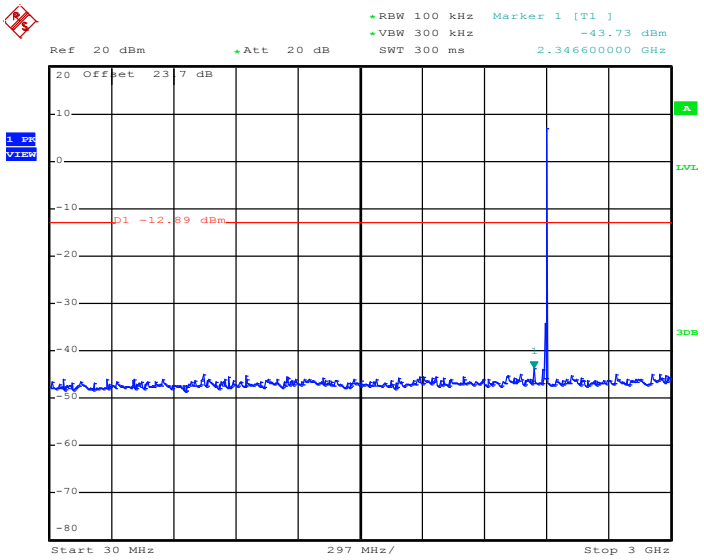
1. The testing follows the guidelines in Spurious RF Conducted Emissions of FCC Public Notice DA 00-705 Measurement Guidelines
2. The transmitter output was connected to the spectrum analyzer via a low lose cable.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 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.
5. Record the results in the test report.

## 3.7.4 Test Setup

### 3.7.5 Test Result

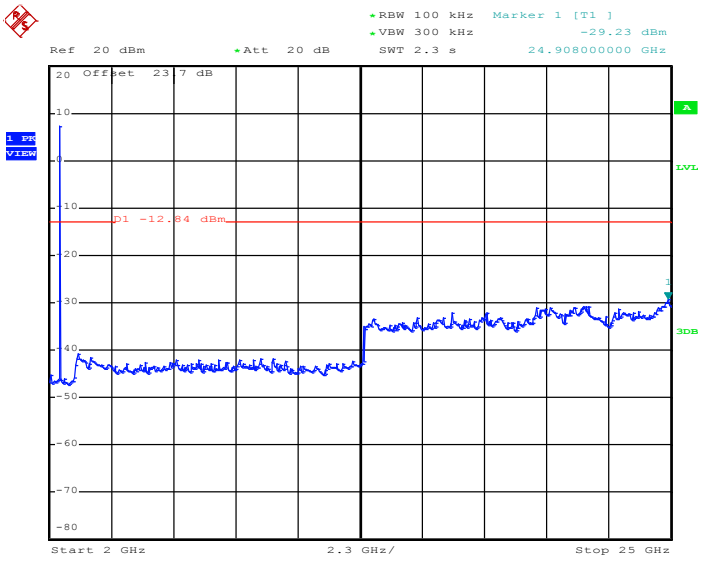
| Test Mode : | 3Mbps | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Channel : | 00 | Relative Humidity : | 50~53% |
| | | Test Engineer : | Book Lin |

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




Date: 20.AUG.2012 22:27:28

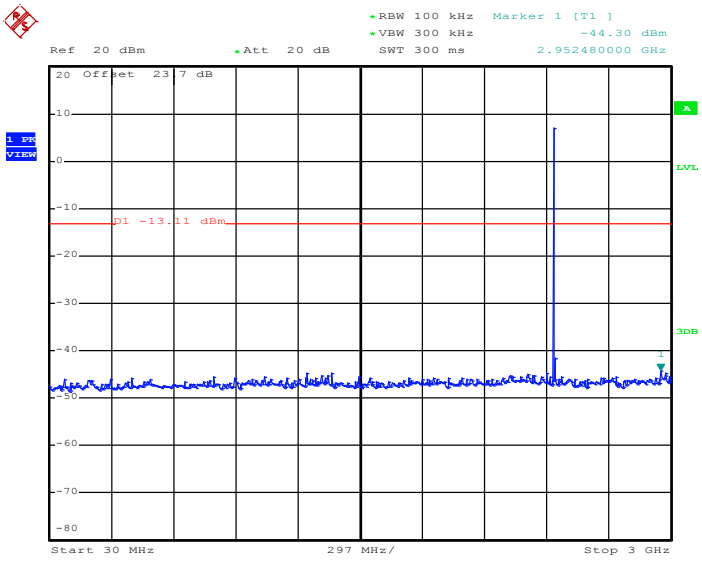
**Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz**




Date: 20.AUG.2012 22:28:22

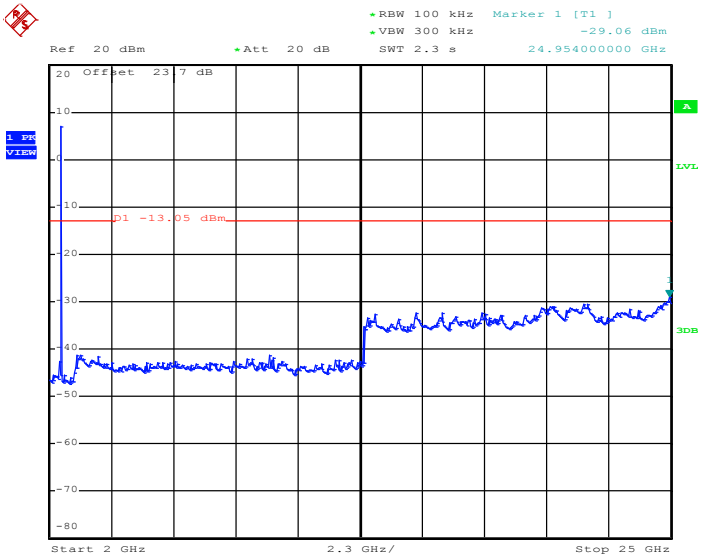
| Test Mode : | 3Mbps | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Channel : | 39 | Relative Humidity : | 50~53% |
| | | Test Engineer : | Book Lin |

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




Date: 20.AUG.2012 22:29:15

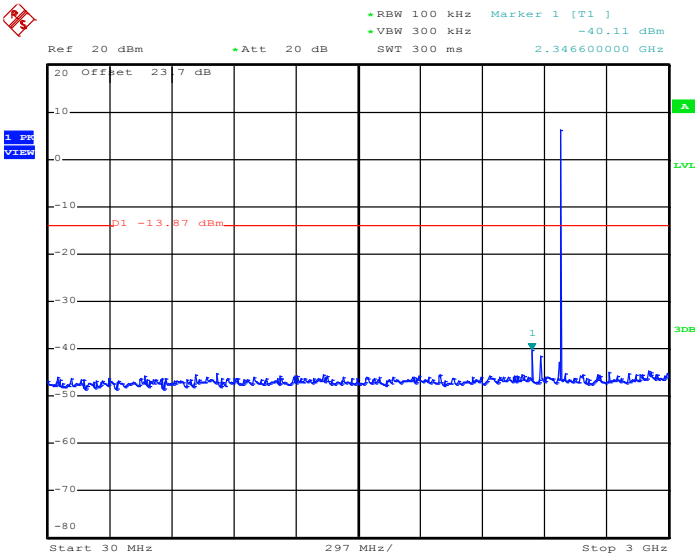
**Conducted Spurious Emission Plot between 2 GHz ~ 25 GHz**




Date: 20.AUG.2012 22:30:11

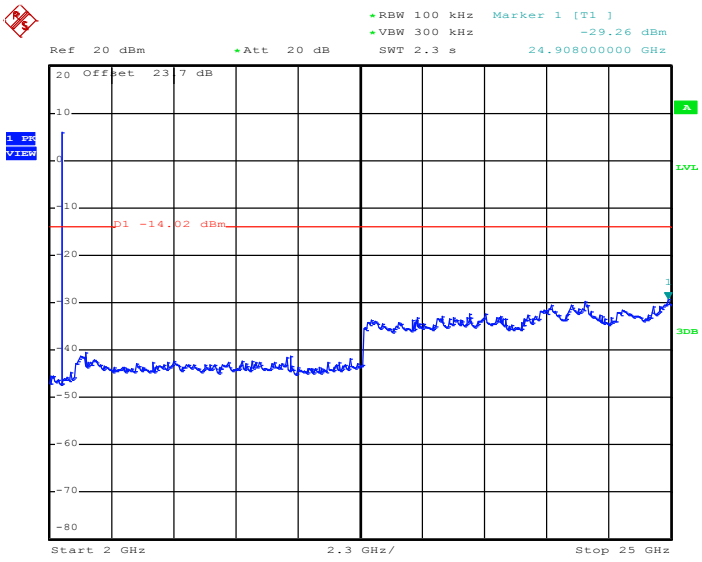
| | | | |
|---|---|---|---|
| **Test Mode :** | 3Mbps | **Temperature :** | 24~26℃ |
| **Test Channel :** | 78 | **Relative Humidity :** | 50~53% |
| | | **Test Engineer :** | Book Lin |

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




Date: 20.AUG.2012 22:31:05

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




Date: 20.AUG.2012 22:31:59

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

### 3.8.2 Measuring Instruments

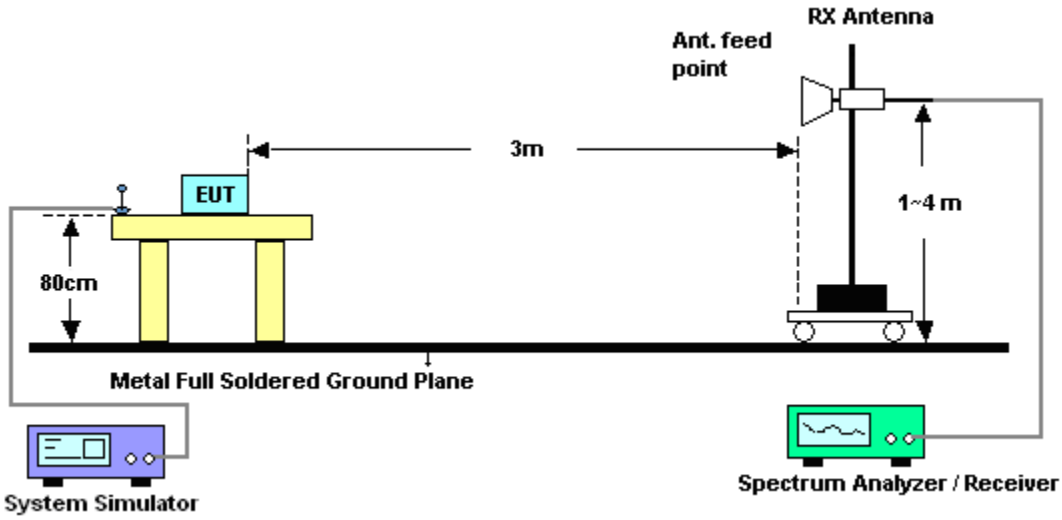
See list of measuring instruments of this test report.

### 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.
2. The EUT was placed on a turntable with 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. 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.
5. Set to the maximum power setting and enable the EUT transmit continuously.
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, RBW=1MHz for f>1GHz ; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak
   (3) For average measurement: use duty cycle correction factor method.
   Duty cycle = On time/100 milliseconds
   On time = $N_1*L_1+N_2*L_2+...+N_{n-1}*LN_{n-1}+N_n*L_n$
   Where $N_1$ is number of type 1 pulses, $L_1$ is length of type 1 pulses, etc.
   Average Level = Peak Level + 20*log(Duty cycle)
7. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

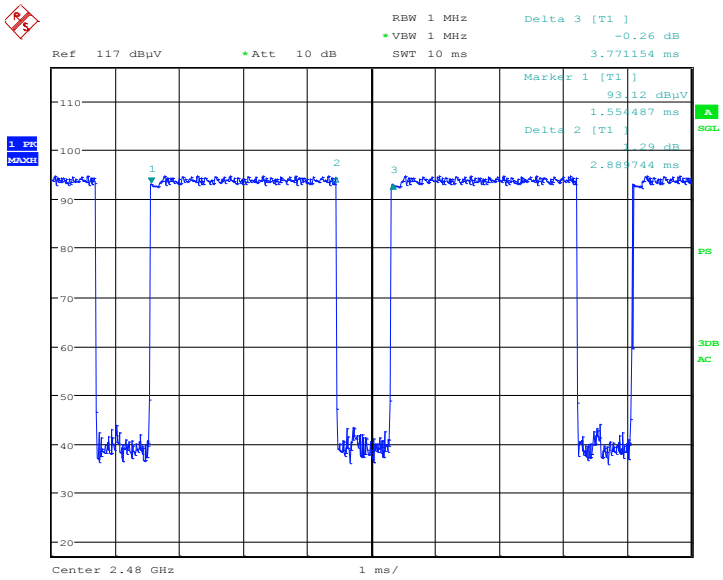
Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.5dB) derived from 20log (dwell time/100ms).
For example: Average level = 45.61dBuV/m – 24.5 (dB) = 21.11dBuV/m.

### 3.8.4 Test Setup



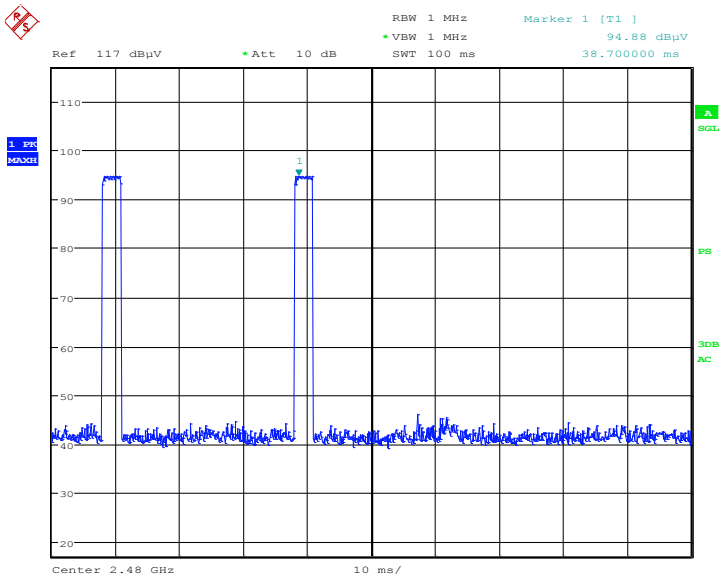
## 3.8.5 Duty cycle correction factor for average measurement

### 3DH5 on time/100ms (One Pulse) Plot on Channel 39




Date: 23.AUG.2012 05:11:23

### 3DH5 on time/100ms (Count Pulses) Plot on Channel 39




Date: 23.AUG.2012 05:07:33

Note: Duty cycle = on time/100 milliseconds = 2 * 2.890 / 100 = 5.78 %

Duty cycle correction factor = 20*log(Duty cycle) = -24.76 dB

### 3.8.6 Test Result of Radiated Band Edges

**<EUT with Adapter 1>**

| | | | |
|---|---|---|---|
| **Test Mode :** | 3Mbps | **Temperature :** | 22~23°C |
| **Test Channel :** | 00 | **Relative Humidity :** | 50~52% |
| | | **Test Engineer :** | David Yang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Frequency ( MHz )** | **Level ( dBµV/m )** | **Over Limit ( dB )** | **Limit Line ( dBµV/m )** | **Read Level (dBµV)** | **Antenna Factor ( dB )** | **Cable Loss ( dB )** | **Preamp Factor ( dB )** | **Ant Pos ( cm )** | **Table Pos ( deg )** | **Remark** |
| 2371.65 | 61.85 | -12.15 | 74 | 61 | 32.16 | 4.57 | 35.88 | 192 | 299 | Peak |
| 2371.65 | 37.09 | -16.91 | 54 | - | - | - | - | - | - | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Frequency ( MHz )** | **Level ( dBµV/m )** | **Over Limit ( dB )** | **Limit Line ( dBµV/m )** | **Read Level (dBµV)** | **Antenna Factor ( dB )** | **Cable Loss ( dB )** | **Preamp Factor ( dB )** | **Ant Pos ( cm )** | **Table Pos ( deg )** | **Remark** |
| 2371.74 | 53.79 | -20.21 | 74 | 52.94 | 32.16 | 4.57 | 35.88 | 190 | 12 | Peak |
| 2371.74 | 29.03 | -24.97 | 54 | - | - | - | - | - | - | Average |

Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.5dB) derived from 20log (dwell time/100ms).

For example: Average level = 61.85dBuV/m – 24.76 (dB) = 37.09dBuV/m.

| | | | |
|---|---|---|---|
| **Test Mode :** | 3Mbps | **Temperature :** | 22~23°C |
| **Test Channel :** | 78 | **Relative Humidity :** | 50~52% |
| | | **Test Engineer :** | David Yang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Frequency ( MHz )** | **Level ( dBµV/m )** | **Over Limit ( dB )** | **Limit Line ( dBµV/m )** | **Read Level (dBµV)** | **Antenna Factor ( dB )** | **Cable Loss ( dB )** | **Preamp Factor ( dB )** | **Ant Pos ( cm )** | **Table Pos ( deg )** | **Remark** |
| 2483.5 | 65.07 | -8.93 | 74 | 63.96 | 32.28 | 4.64 | 35.81 | 182 | 308 | Peak |
| 2483.5 | 40.31 | -13.69 | 54 | - | - | - | - | - | - | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Frequency ( MHz )** | **Level ( dBµV/m )** | **Over Limit ( dB )** | **Limit Line ( dBµV/m )** | **Read Level (dBµV)** | **Antenna Factor ( dB )** | **Cable Loss ( dB )** | **Preamp Factor ( dB )** | **Ant Pos ( cm )** | **Table Pos ( deg )** | **Remark** |
| 2483.5 | 57.22 | -16.78 | 74 | 56.11 | 32.28 | 4.64 | 35.81 | 100 | 217 | Peak |
| 2483.5 | 32.46 | -21.54 | 54 | - | - | - | - | - | - | Average |

**<EUT with Docking 1 and Adapter 2>**

| | | | |
|---|---|---|---|
| **Test Mode :** | 3Mbps | **Temperature :** | 22~23°C |
| **Test Channel :** | 78 | **Relative Humidity :** | 50~52% |
| | | **Test Engineer :** | David Yang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Frequency ( MHz )** | **Level ( dBµV/m )** | **Over Limit ( dB )** | **Limit Line ( dBµV/m )** | **Read Level (dBµV)** | **Antenna Factor ( dB )** | **Cable Loss ( dB )** | **Preamp Factor ( dB )** | **Ant Pos ( cm )** | **Table Pos ( deg )** | **Remark** |
| 2483.5 | 62.51 | -11.49 | 74 | 61.4 | 32.28 | 4.64 | 35.81 | 100 | 116 | Peak |
| 2483.5 | 37.75 | -16.25 | 54 | - | - | - | - | - | - | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Frequency ( MHz )** | **Level ( dBµV/m )** | **Over Limit ( dB )** | **Limit Line ( dBµV/m )** | **Read Level (dBµV)** | **Antenna Factor ( dB )** | **Cable Loss ( dB )** | **Preamp Factor ( dB )** | **Ant Pos ( cm )** | **Table Pos ( deg )** | **Remark** |
| 2483.5 | 59.39 | -14.61 | 74 | 58.28 | 32.28 | 4.64 | 35.81 | 100 | 28 | Peak |
| 2483.5 | 34.63 | -19.37 | 54 | - | - | - | - | - | - | Average |

Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.5dB) derived from 20log (dwell time/100ms).

For example: Average level = 62.51dBuV/m – 24.76 (dB) = 37.75dBuV/m.

**<EUT with Docking 2 and Car Charger 12V>**

| | | | |
|---|---|---|---|
| **Test Mode :** | 3Mbps | **Temperature :** | 22~23°C |
| **Test Channel :** | 78 | **Relative Humidity :** | 50~52% |
| | | **Test Engineer :** | David Yang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Frequency ( MHz )** | **Level ( dBµV/m )** | **Over Limit ( dB )** | **Limit Line ( dBµV/m )** | **Read Level (dBµV)** | **Antenna Factor ( dB )** | **Cable Loss ( dB )** | **Preamp Factor ( dB )** | **Ant Pos ( cm )** | **Table Pos ( deg )** | **Remark** |
| 2483.5 | 64.9 | -9.1 | 74 | 63.79 | 32.28 | 4.64 | 35.81 | 123 | 58 | Peak |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Frequency ( MHz )** | **Level ( dBµV/m )** | **Over Limit ( dB )** | **Limit Line ( dBµV/m )** | **Read Level (dBµV)** | **Antenna Factor ( dB )** | **Cable Loss ( dB )** | **Preamp Factor ( dB )** | **Ant Pos ( cm )** | **Table Pos ( deg )** | **Remark** |
| 2483.52 | 59.8 | -14.2 | 74 | 58.69 | 32.28 | 4.64 | 35.81 | 185 | 203 | Peak |

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

### 3.9.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.9.3 Test Procedures

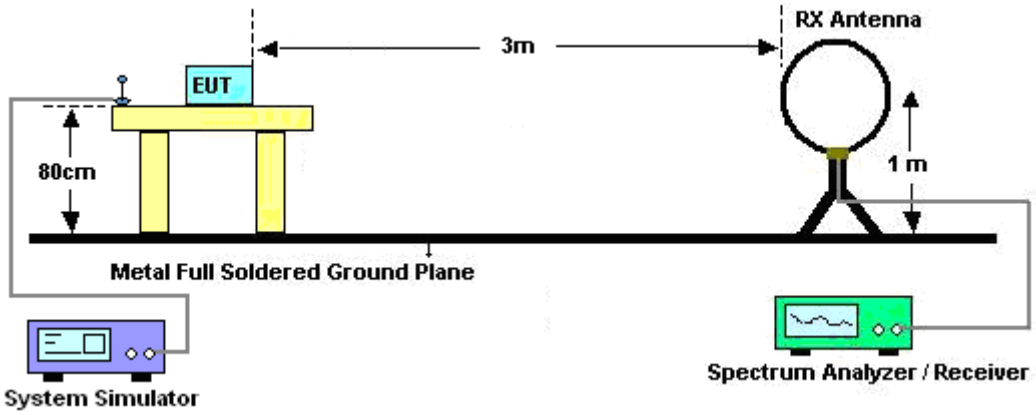
1. The testing follows the guidelines in Spurious Radiated Emissions of FCC Public Notice DA 00-705 Measurement Guidelines and fulfills ANSI C63.4-2003 and the guidelines in ANSI C63.10-2009 test site requirement.
2. The EUT was placed on a turntable with 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. 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.
5. Set to the maximum power setting and enable the EUT transmit continuously.
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, RBW=1MHz for f>1GHz ; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak
   (3) For average measurement: use duty cycle correction factor method.
   Duty cycle = On time/100 milliseconds
   On time = $N_1*L_1+N_2*L_2+...+N_{n-1}*LN_{n-1}+N_n*L_n$
   Where $N_1$ is number of type 1 pulses, $L_1$ is length of type 1 pulses, etc.
   Average Level = Peak Level + 20*log(Duty cycle)
7. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
8. For measurement below 1GHz, 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 by using the quasi-peak detector will be reported.

Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.5dB) derived from 20log (dwell time/100ms).

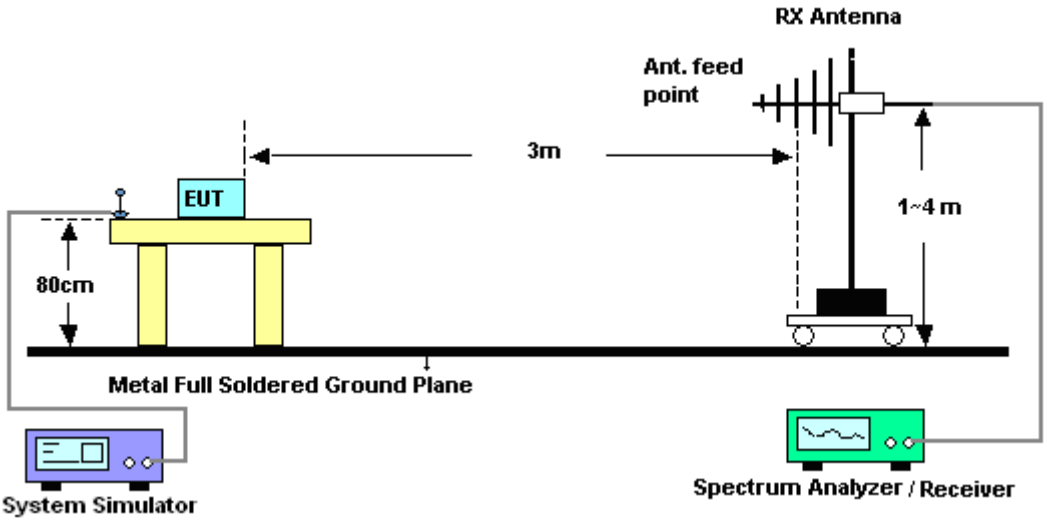
For example: Average level = 45.61dBuV/m – 24.5 (dB) = 21.11dBuV/m.

### 3.9.4 Test Setup

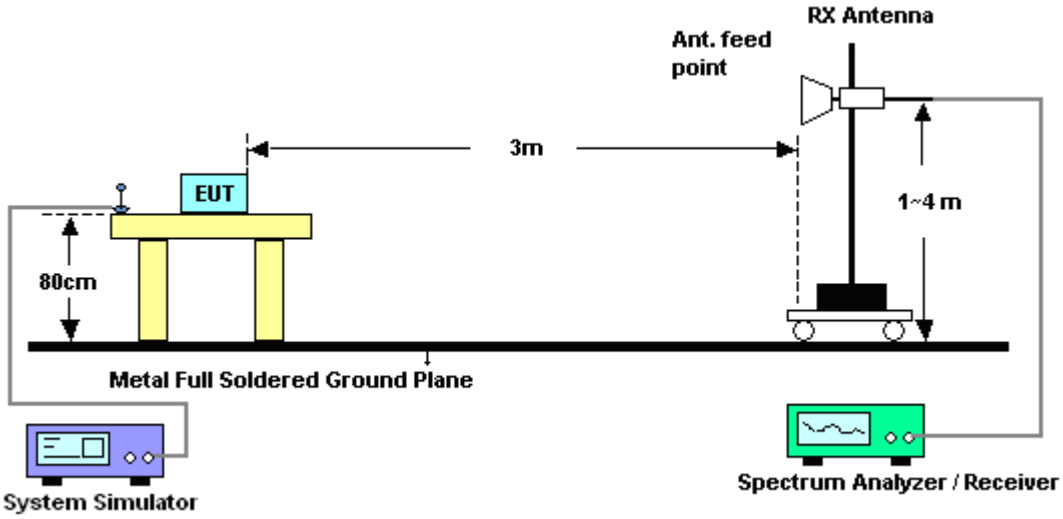
**For radiated emissions below 30MHz**




**For radiated emissions from 30MHz to 1GHz**



**For radiated emissions above 1GHz**

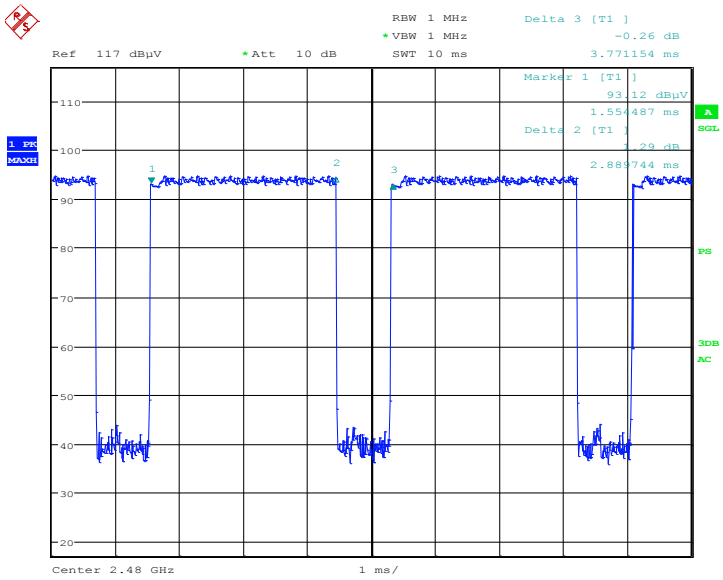



## 3.9.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

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.

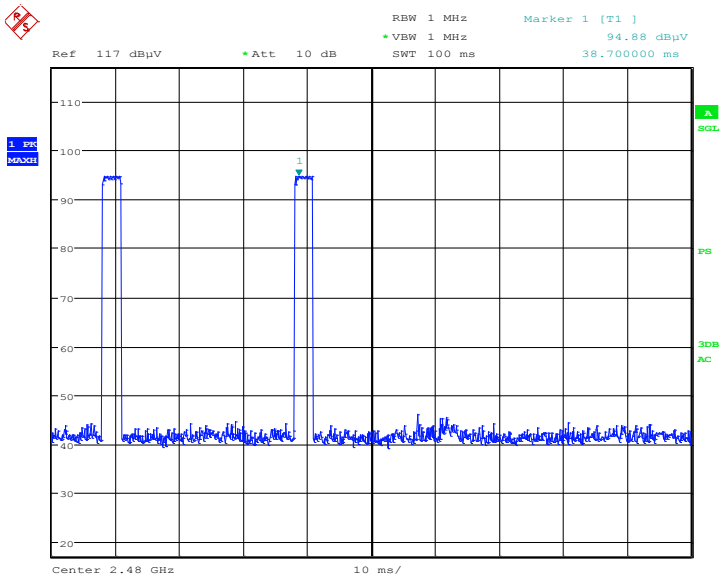
## 3.9.6 Duty cycle correction factor for average measurement

### 3DH5 on time/100ms (One Pulse) Plot on Channel 39




Date: 23.AUG.2012 05:11:23

### 3DH5 on time/100ms (Count Pulses) Plot on Channel 39




Date: 23.AUG.2012 05:07:33

Note: Duty cycle = on time/100 milliseconds = 2 * 2.890 / 100 = 5.78 %

Duty cycle correction factor = 20*log(Duty cycle) = -24.76 dB

## 3.9.7 Test Result of Radiated Emission (30 MHz ~ 10th Harmonic)

**<EUT with Adapter 1>**

| | | | |
|---|---|---|---|
| **Test Mode :** | 3Mbps | **Temperature :** | 22~23°C |
| **Test Channel :** | 00 | **Relative Humidity :** | 50~52% |
| **Test Engineer :** | David Yang | **Polarization :** | Horizontal |
| **Remark :** | 1. 2402 MHz is fundamental signal which can be ignored.<br>2. 7206 MHz and 9606 MHz are not within the restricted band, and there's limit line are 20dB below the highest emission level. For example, 107.63 dBuV/m - 20dB = 87.63dBuV/m. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2402 | 107.63 | - | - | 106.73 | 32.18 | 4.58 | 35.86 | 192 | 299 | Peak |
| 2402 | 82.87 | - | - | - | - | - | - | - | - | Average |
| 7206 | 47.67 | -39.96 | 87.63 | 61.17 | 36.06 | 8.25 | 57.81 | 100 | 0 | Peak |
| 9606 | 48.06 | -39.57 | 87.63 | 57.53 | 37.02 | 9.48 | 55.97 | 100 | 0 | Peak |

Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.5dB) derived from 20log (dwell time/100ms).

For example: Average level = 45.61dBuV/m – 24.5 (dB) = 21.11dBuV/m.

| | | | |
|---|---|---|---|
| **Test Mode :** | 3Mbps | **Temperature :** | 22~23°C |
| **Test Channel :** | 00 | **Relative Humidity :** | 50~52% |
| **Test Engineer :** | David Yang | **Polarization :** | Vertical |
| **Remark :** | 2402 MHz is fundamental signal which can be ignored. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2402 | 101.55 | - | - | 100.65 | 32.18 | 4.58 | 35.86 | 190 | 12 | Peak |
| 2402 | 76.79 | - | - | | | | | | | Average |

| Test Mode : | 3Mbps | Temperature : | 22~23°C |
|---|---|---|---|
| Test Channel : | 39 | Relative Humidity : | 50~52% |
| Test Engineer : | David Yang | Polarization : | Horizontal |
| Remark : | 1. 2441 MHz is fundamental signal which can be ignored.<br>2. 9762 MHz is not within a restricted band. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2441 | 107.35 | - | - | 106.33 | 32.24 | 4.61 | 35.83 | 102 | 304 | Peak |
| 2441 | 82.59 | - | - | - | - | - | - | - | - | Average |
| 7323 | 48.21 | -25.79 | 74 | 61.77 | 36.03 | 8.42 | 58.01 | 100 | 0 | Peak |
| 7323 | 23.45 | -30.55 | 54 | - | - | - | - | - | - | Average |
| 9762 | 47.41 | -39.94 | 87.35 | 56.59 | 37.21 | 9.5 | 55.89 | 100 | 0 | Peak |

| Test Mode : | 3Mbps | Temperature : | 22~23°C |
|---|---|---|---|
| Test Channel : | 39 | Relative Humidity : | 50~52% |
| Test Engineer : | David Yang | Polarization : | Vertical |
| Remark : | 2441 MHz is fundamental signal which can be ignored. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2441 | 100.81 | - | - | 99.79 | 32.24 | 4.61 | 35.83 | 184 | 10 | Peak |
| 2441 | 76.05 | - | - | - | - | - | - | - | - | Average |

| | | | |
|---|---|---|---|
| **Test Mode :** | 3Mbps | **Temperature :** | 22~23°C |
| **Test Channel :** | 78 | **Relative Humidity :** | 50~52% |
| **Test Engineer :** | David Yang | **Polarization :** | Horizontal |
| **Remark :** | 1. 2480 MHz is fundamental signal which can be ignored.<br>2. 9918 MHz is not within a restricted band. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 36.75 | 26.52 | -13.48 | 40 | 42.23 | 15.16 | 0.74 | 31.61 | 188 | 67 | Peak |
| 113.7 | 26.76 | -16.74 | 43.5 | 45.46 | 11.6 | 1.17 | 31.47 | - | - | Peak |
| 198.75 | 28.22 | -15.28 | 43.5 | 48.84 | 9.04 | 1.46 | 31.12 | - | - | Peak |
| 398 | 30.08 | -15.92 | 46 | 43.36 | 15.9 | 2.01 | 31.19 | - | - | Peak |
| 454.7 | 30.15 | -15.85 | 46 | 41.69 | 17.3 | 2.15 | 30.99 | - | - | Peak |
| 682.9 | 30 | -16 | 46 | 37.09 | 20.46 | 2.63 | 30.18 | - | - | Peak |
| 2480 | 108.38 | - | - | 107.27 | 32.28 | 4.64 | 35.81 | 182 | 308 | Peak |
| 2480 | 83.62 | - | - | - | - | - | - | - | - | Average |
| 7440 | 48.14 | -25.86 | 74 | 61.71 | 36.01 | 8.63 | 58.21 | 100 | 0 | Peak |
| 7440 | 23.38 | -30.62 | 54 | - | - | - | - | - | - | Average |
| 9918 | 46.32 | -42.06 | 88.38 | 55.19 | 37.42 | 9.51 | 55.8 | 100 | 0 | Peak |

| | | | |
|---|---|---|---|
| **Test Mode :** | 3Mbps | **Temperature :** | 22~23°C |
| **Test Channel :** | 78 | **Relative Humidity :** | 50~52% |
| **Test Engineer :** | David Yang | **Polarization :** | Vertical |
| **Remark :** | 2480 MHz is fundamental signal which can be ignored. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 34.86 | 35.68 | -4.32 | 40 | 50.17 | 16.4 | 0.74 | 31.63 | 100 | 221 | Peak |
| 104.25 | 27.33 | -16.17 | 43.5 | 46.99 | 10.7 | 1.12 | 31.48 | - | - | Peak |
| 193.62 | 30.16 | -13.34 | 43.5 | 51.04 | 8.78 | 1.45 | 31.11 | - | - | Peak |
| 398 | 30.75 | -15.25 | 46 | 44.03 | 15.9 | 2.01 | 31.19 | - | - | Peak |
| 568.8 | 32.44 | -13.56 | 46 | 40.92 | 19.97 | 2.36 | 30.81 | - | - | Peak |
| 910.4 | 33.02 | -12.98 | 46 | 36.39 | 23.63 | 3.02 | 30.02 | - | - | Peak |
| 2480 | 100.78 | - | - | 99.67 | 32.28 | 4.64 | 35.81 | 100 | 217 | Peak |
| 2480 | 76.02 | - | - | - | - | - | - | - | - | Average |

**<EUT with Docking 1 and Adapter 2>**

| | | | |
|---|---|---|---|
| **Test Mode :** | 3Mbps | **Temperature :** | 22~23°C |
| **Test Channel :** | 78 | **Relative Humidity :** | 50~52% |
| **Test Engineer :** | David Yang | **Polarization :** | Horizontal |
| **Remark :** | 1. 2480 MHz is fundamental signal which can be ignored.<br>2. 14880 MHz is not within a restricted band. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 31.35 | 30.32 | -9.68 | 40 | 42.13 | 19.12 | 0.71 | 31.64 | - | - | Peak |
| 204.96 | 30.44 | -13.06 | 43.5 | 50.97 | 9.15 | 1.48 | 31.16 | - | - | Peak |
| 236.82 | 36.28 | -9.72 | 46 | 54.57 | 11.04 | 1.61 | 30.94 | - | - | Peak |
| 341.3 | 37.34 | -8.66 | 46 | 52.46 | 14.14 | 1.88 | 31.14 | 170 | 302 | Peak |
| 398 | 33.04 | -12.96 | 46 | 46.32 | 15.9 | 2.01 | 31.19 | - | - | Peak |
| 568.8 | 30.08 | -15.92 | 46 | 38.56 | 19.97 | 2.36 | 30.81 | - | - | Peak |
| 2480 | 106.07 | - | - | 104.96 | 32.28 | 4.64 | 35.81 | 100 | 116 | Peak |
| 2480 | 81.31 | - | - | - | - | - | - | - | - | Average |
| 7440 | 47.96 | -26.04 | 74 | 61.53 | 36.01 | 8.63 | 58.21 | 100 | 0 | Peak |
| 7440 | 23.2 | -30.8 | 54 | - | - | - | - | - | - | Average |
| 12399 | 47.76 | -26.24 | 74 | 54.21 | 39.23 | 10.61 | 56.29 | 100 | 0 | Peak |
| 12399 | 23 | -31 | 54 | - | - | - | - | - | - | Average |
| 14880 | 49.81 | -36.26 | 86.07 | 55.31 | 40.12 | 11.7 | 57.32 | 100 | 0 | Peak |

| Test Mode : | 3Mbps | Temperature : | 22~23°C |
|---|---|---|---|
| Test Channel : | 78 | Relative Humidity : | 50~52% |
| Test Engineer : | David Yang | Polarization : | Vertical |
| Remark : | 2480 MHz is fundamental signal which can be ignored. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 31.35 | 34.53 | -5.47 | 40 | 46.34 | 19.12 | 0.71 | 31.64 | 100 | 152 | Peak |
| 202.26 | 28.61 | -14.89 | 43.5 | 49.15 | 9.13 | 1.47 | 31.14 | - | - | Peak |
| 227.37 | 31.37 | -14.63 | 46 | 50.8 | 9.93 | 1.57 | 30.93 | - | - | Peak |
| 341.3 | 34.72 | -11.28 | 46 | 49.84 | 14.14 | 1.88 | 31.14 | - | - | Peak |
| 398 | 33.99 | -12.01 | 46 | 47.27 | 15.9 | 2.01 | 31.19 | - | - | Peak |
| 568.8 | 33.08 | -12.92 | 46 | 41.56 | 19.97 | 2.36 | 30.81 | - | - | Peak |
| 2480 | 102.89 | - | - | 101.78 | 32.28 | 4.64 | 35.81 | 100 | 28 | Peak |
| 2480 | 78.13 | - | - | - | - | - | - | - | - | Average |
| 7440 | 44.99 | -29.01 | 74 | 58.56 | 36.01 | 8.63 | 58.21 | 100 | 0 | Peak |
| 7440 | 20.23 | -33.77 | 54 | - | - | - | - | - | - | Average |

**<EUT with Docking 2 and Car Charger 12V>**

| | | | |
|---|---|---|---|
| **Test Mode :** | 3Mbps | **Temperature :** | 22~23°C |
| **Test Channel :** | 78 | **Relative Humidity :** | 50~52% |
| **Test Engineer :** | David Yang | **Polarization :** | Horizontal |
| **Remark :** | 2480 MHz is fundamental signal which can be ignored. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 32.97 | 28.76 | -11.24 | 40 | 41.91 | 17.76 | 0.72 | 31.63 | 115 | 341 | Peak |
| 165 | 28.38 | -15.12 | 43.5 | 48.07 | 10.1 | 1.36 | 31.15 | - | - | Peak |
| 195.51 | 25.55 | -17.95 | 43.5 | 46.36 | 8.86 | 1.45 | 31.12 | - | - | Peak |
| 341.3 | 32.98 | -13.02 | 46 | 48.1 | 14.14 | 1.88 | 31.14 | - | - | Peak |
| 398 | 32.56 | -13.44 | 46 | 45.84 | 15.9 | 2.01 | 31.19 | - | - | Peak |
| 568.8 | 31.19 | -14.81 | 46 | 39.67 | 19.97 | 2.36 | 30.81 | - | - | Peak |
| 2480 | 108.69 | - | - | 107.58 | 32.28 | 4.64 | 35.81 | 123 | 58 | Peak |
| 2480 | 83.93 | - | - | - | - | - | - | - | - | Average |
| 4962 | 42.63 | -31.37 | 74 | 60.42 | 34.29 | 6.57 | 58.65 | 100 | 0 | Peak |
| 4962 | 17.87 | -36.13 | 54 | - | - | - | - | - | - | Average |
| 7440 | 47.32 | -26.68 | 74 | 60.89 | 36.01 | 8.63 | 58.21 | 100 | 0 | Peak |
| 7440 | 22.56 | -31.44 | 54 | - | - | - | - | - | - | Average |

| Test Mode : | 3Mbps | Temperature : | 22~23°C |
|---|---|---|---|
| Test Channel : | 78 | Relative Humidity : | 50~52% |
| Test Engineer : | David Yang | Polarization : | Vertical |
| Remark : | 2480 MHz is fundamental signal which can be ignored. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 32.97 | 32.03 | -7.97 | 40 | 45.18 | 17.76 | 0.72 | 31.63 | 105 | 78 | Peak |
| 66.72 | 22.03 | -17.97 | 40 | 46.61 | 6.06 | 0.89 | 31.53 | - | - | Peak |
| 195.78 | 27.06 | -16.44 | 43.5 | 47.87 | 8.86 | 1.45 | 31.12 | - | - | Peak |
| 341.3 | 34.29 | -11.71 | 46 | 49.41 | 14.14 | 1.88 | 31.14 | - | - | Peak |
| 398 | 32.75 | -13.25 | 46 | 46.03 | 15.9 | 2.01 | 31.19 | - | - | Peak |
| 960.1 | 36.98 | -17.02 | 54 | 39.03 | 24.9 | 3.1 | 30.05 | - | - | Peak |
| 2480 | 103.4 | - | - | 102.29 | 32.28 | 4.64 | 35.81 | 185 | 203 | Peak |
| 2480 | 78.64 | - | - | - | - | - | - | - | - | Average |

# 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.

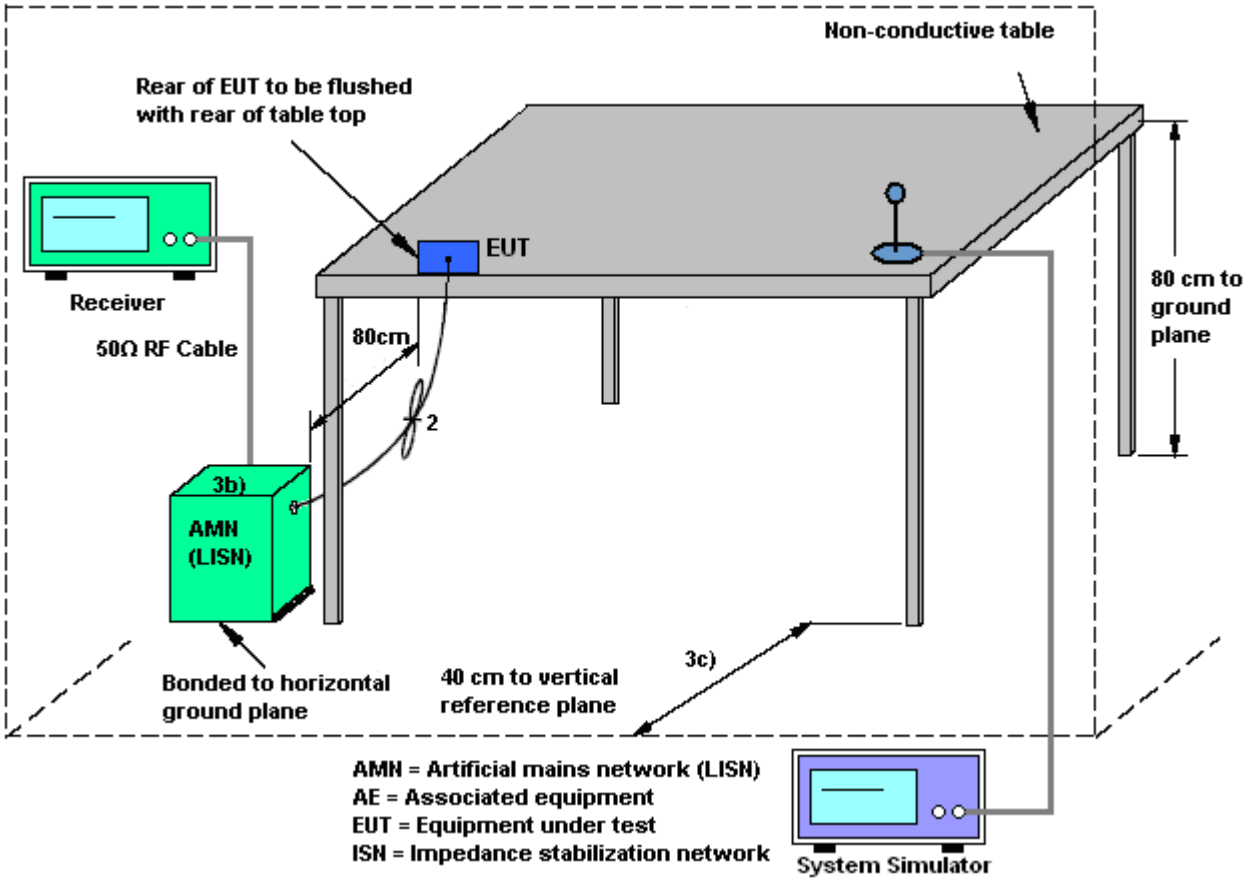
## 3.10.2 Measuring Instruments

See list of measuring instruments of this test report.

## 3.10.3 Test Procedures

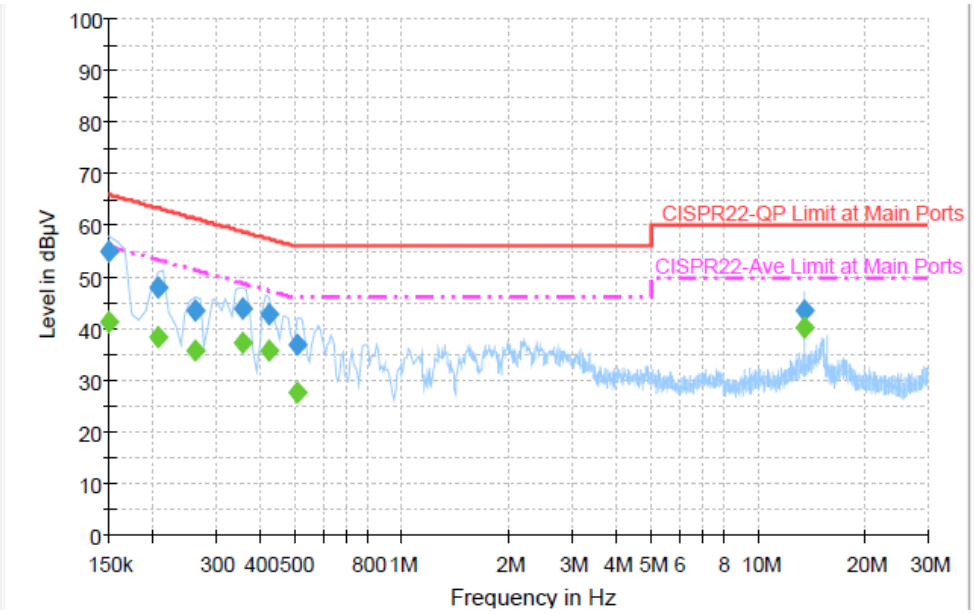
1. The test follows the guidelines in ANSI C63.4-2003 and ANSI C63.10-2009 test site requirement.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line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



## 3.10.5 Test Result of AC Conducted Emission

| | | | |
|---|---|---|---|
| **Test Mode :** | Mode 3 | **Temperature :** | 20~22℃ |
| **Test Engineer :** | Kai-Chun Chu | **Relative Humidity :** | 49~51% |
| **Test Voltage :** | 120Vac / 60Hz | **Phase :** | Line |
| **Function Type :** | GSM1900 (GPRS 8) Idle + WLAN Link + Bluetooth Link + RFID On + MPEG4 + TC3 | | |
| **Remark :** | All emissions not reported here are more than 10 dB below the prescribed limit.<br>13.558 MHz is fundamental signal of RFID/NFC which can be ignored. | | |



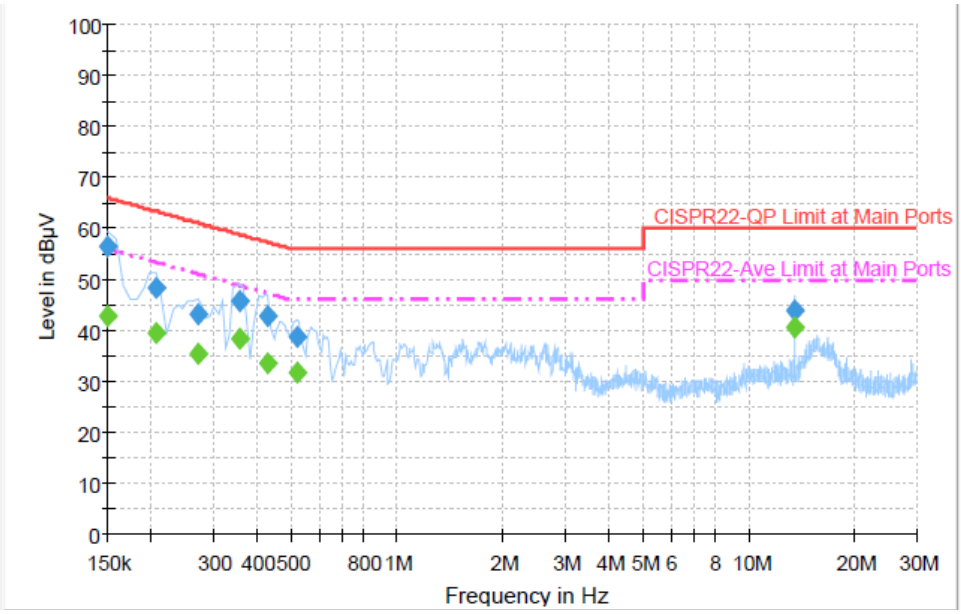

**Final Result : Quasi-Peak**

| Frequency (MHz) | Quasi-Peak (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.150000 | 54.8 | Off | L1 | 19.4 | 11.2 | 66.0 |
| 0.206000 | 48.1 | Off | L1 | 19.4 | 15.3 | 63.4 |
| 0.262000 | 43.4 | Off | L1 | 19.4 | 18.0 | 61.4 |
| 0.358000 | 43.8 | Off | L1 | 19.4 | 15.0 | 58.8 |
| 0.422000 | 43.0 | Off | L1 | 19.4 | 14.4 | 57.4 |
| 0.510000 | 37.0 | Off | L1 | 19.4 | 19.0 | 56.0 |
| 13.558000 | 43.4 | Off | L1 | 19.8 | 16.6 | 60.0 |

**Final Result : Average**

| Frequency (MHz) | Average (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.150000 | 41.2 | Off | L1 | 19.4 | 14.8 | 56.0 |
| 0.206000 | 38.4 | Off | L1 | 19.4 | 15.0 | 53.4 |
| 0.262000 | 35.6 | Off | L1 | 19.4 | 15.8 | 51.4 |
| 0.358000 | 37.3 | Off | L1 | 19.4 | 11.5 | 48.8 |
| 0.422000 | 35.7 | Off | L1 | 19.4 | 11.7 | 47.4 |
| 0.510000 | 27.6 | Off | L1 | 19.4 | 18.4 | 46.0 |
| 13.558000 | 40.2 | Off | L1 | 19.8 | 9.8 | 50.0 |

| Test Mode : | Mode 3 | Temperature : | 20~22℃ |
|---|---|---|---|
| Test Engineer : | Kai-Chun Chu | Relative Humidity : | 49~51% |
| Test Voltage : | 120Vac / 60Hz | Phase : | Neutral |
| Function Type : | GSM1900 (GPRS 8) Idle + WLAN Link + Bluetooth Link + RFID On + MPEG4 + TC3 | | |
| Remark : | All emissions not reported here are more than 10 dB below the prescribed limit.<br>13.558 MHz is fundamental signal of RFID/NFC which can be ignored. | | |




**Final Result : Quasi-Peak**

| Frequency (MHz) | Quasi-Peak (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.150000 | 56.6 | Off | N | 19.4 | 9.4 | 66.0 |
| 0.206000 | 48.4 | Off | N | 19.4 | 15.0 | 63.4 |
| 0.270000 | 43.3 | Off | N | 19.4 | 17.8 | 61.1 |
| 0.358000 | 45.6 | Off | N | 19.4 | 13.2 | 58.8 |
| 0.430000 | 42.9 | Off | N | 19.4 | 14.4 | 57.3 |
| 0.518000 | 38.8 | Off | N | 19.4 | 17.2 | 56.0 |
| 13.558000 | 43.9 | Off | N | 19.9 | 16.1 | 60.0 |

**Final Result : Average**

| Frequency (MHz) | Average (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.150000 | 42.8 | Off | N | 19.4 | 13.2 | 56.0 |
| 0.206000 | 39.6 | Off | N | 19.4 | 13.8 | 53.4 |
| 0.270000 | 35.4 | Off | N | 19.4 | 15.7 | 51.1 |
| 0.358000 | 38.3 | Off | N | 19.4 | 10.5 | 48.8 |
| 0.430000 | 33.7 | Off | N | 19.4 | 13.6 | 47.3 |
| 0.518000 | 31.6 | Off | N | 19.4 | 14.4 | 46.0 |
| 13.558000 | 40.8 | Off | N | 19.9 | 9.2 | 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 | Jul. 30, 2012 ~ Aug. 21, 2012 | Jun. 05, 2013 | Conducted (TH02-HY) |
| Bluetooth Base Station | R&S | CBT32 | 100519 | N/A | Jun. 05, 2012 | Jul. 30, 2012 ~ Aug. 21, 2012 | Jun. 06, 2013 | Conducted (TH02-HY) |
| Spectrum Analyzer | R&S | ESU26 | 100390 | 20Hz ~ 26.5GHz | Dec. 22, 2011 | Aug. 23, 2012 ~ Aug. 24, 2012 | Dec. 21, 2012 | Radiation (03CH05-HY) |
| Bilog Antenna | SCHAFFNER | CBL6111C | 2725 | 30MHz ~ 2GHz | Oct. 22, 2011 | Aug. 23, 2012 ~ Aug. 24, 2012 | Oct. 21, 2012 | Radiation (03CH05-HY) |
| Turn Table | HD | Deis HD 2000 | 420/611 | 0 ~ 360 degree | N/A | Aug. 23, 2012 ~ Aug. 24, 2012 | N/A | Radiation (03CH05-HY) |
| Antenna Mast | HD | MA 240 | 240/666 | 1 m ~ 4 m | N/A | Aug. 23, 2012 ~ Aug. 24, 2012 | N/A | Radiation (03CH05-HY) |
| Horn Antenna | ESCO | 3117 | 66584 | 1GHz~18GHz | Aug. 10, 2012 | Aug. 23, 2012 ~ Aug. 24, 2012 | Aug. 09, 2013 | Radiation (03CH05-HY) |
| Pre Amplifier | COM-POWER | PA-103A | 161075 | 10Hz ~ 1000MHz Gain:32dB | Feb. 27, 2012 | Aug. 23, 2012 ~ Aug. 24, 2012 | Feb. 26, 2013 | Radiation (03CH05-HY) |
| Pre Amplifier | MITEQ | AMF-7D-00101800-30-10P | 159087 | 1GHz~18GHz | Feb. 27, 2012 | Aug. 23, 2012 ~ Aug. 24, 2012 | Feb. 26, 2013 | Radiation (03CH05-HY) |
| Pre Amplifier | Agilent | 8449B | 3008A01917 | 1GHz~26.5GHz | Aug. 30, 2011 | Aug. 23, 2012 ~ Aug. 24, 2012 | Aug. 29, 2012 | Radiation (03CH05-HY) |
| SHF-EHF Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA9170251 | 15GHz ~ 40GHz | Oct. 21, 2011 | Aug. 23, 2012 ~ Aug. 24, 2012 | Oct. 20, 2012 | Radiation (03CH05-HY) |
| Bluetooth Base Station | R&S | CBT32 | 100519 | N/A | Jun. 05, 2012 | Aug. 23, 2012 ~ Aug. 24, 2012 | Jun. 06, 2013 | Radiation (03CH05-HY) |
| Loop Antenna | R&S | HFH2-Z2 | 860004/001 | 9KHz ~ 30MHz | Jul. 03, 2012 | Aug. 23, 2012 ~ Aug. 24, 2012 | Jul. 02, 2014 | Radiation (03CH05-HY) |
| EMI Test Receiver | R&S | ESCS 30 | 100356 | 9KHz ~ 2.75GHz | Oct. 27, 2011 | Jul. 13, 2012 ~ Aug. 29, 2012 | Oct. 26, 2012 | Conduction (CO05-HY) |
| Two-LISN | R&S | ENV216 | 11-100081 | 9KHz ~ 30MHz | Dec. 09, 2011 | Jul. 13, 2012 ~ Aug. 29, 2012 | Dec. 08, 2012 | Conduction (CO05-HY) |
| Two-LISN | R&S | ENV216 | 11-100080 | 9KHz ~ 30MHz | Dec. 06, 2011 | Jul. 13, 2012 ~ Aug. 29, 2012 | Dec. 05, 2012 | Conduction (CO05-HY) |
| AC Power Source | APC | APC-1000W | N/A | N/A | N/A | Jul. 13, 2012 ~ Aug. 29, 2012 | N/A | Conduction (CO05-HY) |
| System Simulator | R&S | CMU200 | 117997 | N/A | Aug. 22, 2011 | Jul. 13, 2012 ~ Aug. 29, 2012 | Aug. 21, 2013 | Conduction (CO05-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 EP262032 as below.