# FCC RADIO TEST REPORT

according to

47 CFR FCC Part 15 Subpart C § 15.247

| | | |
|---|---|---|
| **Equipment** | : | **Bluetooth USB Micro Adapter** |
| **Model No.** | : | **BT-330S** |
| **Brand Name** | : | **CC&C** |
| **Filing Type** | : | **New Application** |
| **Applicant** | : | **CC&C Technologies, Inc.**<br>8F,No.150,Jian Yi Rd.,Chung Ho City, Taipei County, Taiwan,R.O.C. |
| **FCC ID** | : | **PANBT330S** |
| **Manufacturer** | : | **CC&C Technologies, Inc.**<br>8F,No.150,Jian Yi Rd.,Chung Ho City, Taipei County, Taiwan,R.O.C. |
| **Received Date** | : | Nov. 27, 2007 |
| **Final Test Date** | : | Dec. 13, 2007 |

## Statement

**Test result included is only for the Bluetooth part of the product.**

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.4-2003** and **47 CFR FCC Part 15 Subpart C**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.

Testing Laboratory
1190
ILAC MRA

***SPORTON International Inc.***

*6F, No. 106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.*

# Table of Contents

# History of This Test Report

Original Issue Date: Dec. 13, 2007

Report No.: FR7N0911

■ No additional attachment.

☐ Additional attachment were issued as following record:

| Attachment No. | Issue Date | Description |
|---|---|---|
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# CERTIFICATE OF COMPLIANCE

according to

47 CFR FCC Part 15 Subpart C § 15.247

| | | |
|---|---|---|
| Equipment | : | Bluetooth USB Micro Adapter |
| Model No. | : | BT-330S |
| Brand Name | : | CC&C |
| Applicant | : | CC&C Technologies, Inc.<br>8F,No.150,Jian Yi Rd.,Chung Ho City, Taipei County, Taiwan,R.O.C. |

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Nov. 27, 2007 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Wayne Hsu 2.1.08

**Wayne Hsu**

# 1. SUMMARY OF THE TEST RESULT

| Applied Standard: 47 CFR FCC Part 15 Subpart C | | | | |
|---|---|---|---|---|
| **Part** | **Rule Section** | **Description of Test** | **Result** | **Under Limit** |
| 3.1 | 15.207 | AC Power Line Conducted Emissions | Complies | 12.02 dB |
| 3.2 | 15.247(b)(1) | Maximum Peak Conducted Output Power | Complies | 25.37 dB |
| 3.3 | 15.247(a)(1) | Hopping Channel Separation | Complies | - |
| 3.4 | 15.247(b)(1) | Number of Hopping Frequency | Complies | - |
| 3.5 | 15.247(a)(1) | Dwell Time | Complies | - |
| 3.6 | 15.247(d) | Radiated Emissions | Complies | 1.72 dB |
| 3.7 | 15.247(d) | Band Edge Emissions | Complies | 7.12 dB |
| 3.8 | 15.203 | Antenna Requirements | Complies | - |

| Test Items | Uncertainty | Remark |
|---|---|---|
| AC Power Line Conducted Emissions | ±2.3dB | Confidence levels of 95% |
| Maximum Peak Conducted Output Power | ±0.8dB | Confidence levels of 95% |
| Hopping Channel Separation | $\pm 8.5 \times 10^{-8}$ | Confidence levels of 95% |
| Radiated Emissions (9kHz~30MHz) | ±0.8dB | Confidence levels of 95% |
| Radiated Emissions (30MHz~1000MHz) | ±1.9dB | Confidence levels of 95% |
| Radiated / Band Edge Emissions (1GHz~18GHz) | ±1.9dB | Confidence levels of 95% |
| Radiated Emissions (18GHz~40GHz) | ±1.9dB | Confidence levels of 95% |
| Temperature | ±0.7℃ | Confidence levels of 95% |
| Humidity | ±3.2% | Confidence levels of 95% |
| DC / AC Power Source | ±1.4% | Confidence levels of 95% |

# 2. GENERAL INFORMATION

## 2.1. Product Details

EUT is a Bluetooth USB Micro Adapter with Bluetooth radio function. Only the radio detail of Bluetooth is shown in the table below. For more detailed features description, please refer to the manufacturer's specifications or user's manual.

| Items | Description |
|---|---|
| Power Type | 5VDC from host |
| Modulation | FHSS (GFSK / π/4-DQPSK / 8DPSK) |
| Data Rate (Mbps) | GFSK: 1 ; π/4-QPSK: 2 ; 8DPSK: 3 |
| Frequency Range | 2400 ~ 2483.5MHz |
| Channel Number | 79 |
| Channel Band Width (99%) | 1224 kHz |
| Conducted Output Power | 4.63 dBm |

## 2.2. Table for Filed Antenna

| Ant. | Antenna Type | Connector | Gain (dBi) |
|---|---|---|---|
| 1 | Printed Antenna | Fixed (On Board) | 2.07 |

## 2.3. Table for Carrier Frequencies

| Frequency Band | Channel No. | Frequency |
|---|---|---|
| 2400~2483.5MHz | 0 | 2402 MHz |
| | 1 | 2403 MHz |
| | : | : |
| | 38 | 2440 MHz |
| | 39 | 2441 MHz |
| | 40 | 2442 MHz |
| | : | : |
| | 77 | 2479 MHz |
| | 78 | 2480 MHz |

## 2.4. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

| Test Items | Mode | Data Rate | Channel | Antenna |
|---|---|---|---|---|
| AC Power Conducted Emissions | EDR | 3 Mbps | Hopping 0~78 | 1 |
| Max. Conducted Output Power | 8DPSK | 3 Mbps | 0/39/78 | NA |
| Hopping Channel Separation | 8DPSK | 3 Mbps | 0~1/39~40/77~78 | NA |
| Number of Hopping Frequency | 8DPSK | 3 Mbps | 0~78 | NA |
| Dwell Time | 3DH1/3DH3/3DH5 | 3 Mbps | 0/39/78 | NA |
| Radiated Emissions Below 1GHz | GFSK | 1 Mbps | 39 | 1 |
| Radiated Emissions Above 1GHz | GFSK | 1 Mbps | 0/39/78 | 1 |
| Band Edge Emissions | 8DPSK | 3 Mbps | 0/78 | 1 |

## 2.5. Table for Testing Locations

| Test Site No. | Site Category | Location | FCC Reg. No. | IC File No. | VCCI Reg. No |
|---|---|---|---|---|---|
| 03CH02-HY | SAC | Hwa Ya | 101377 | IC 4086B-1 | - |
| CO04-HY | Conduction | Hwa Ya | 101377 | IC 4086B-1 | - |
| TH01-HY | OVEN Room | Hwa Ya | - | - | - |

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC); Fully Anechoic Chamber (FAC).

## 2.6. Table for Supporting Units

| Support Unit | Brand | Model | FCC ID |
|---|---|---|---|
| Notebook | DELL | D505 | DoC |
| Mouse (USB) | Microsoft | 1004 | DoC |
| Modem | ACEEX | DM1414 | IFAXDM1414 |
| GSM Phone (Remote Workstation) | Sony Ericsson | Z520 | N/A |

## 2.7. Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

**Power Parameters of Bluetooth**

| Test Software Version | BlueTool | | |
|---|---|---|---|
| Frequency | 2402 MHz | 2441 MHz | 2480 MHz |
| Power Parameters | 0 | 0 | 0 |

## 2.8. EUT Operation during Test

All test items:

An executive program, EMCTEST.EXE under WIN XP, which generates a complete line of continuously repeating " H " pattern was used as the test software.

The program was executed as follows :

The NB sends " H" messages to the panel, and the panel displays " H " patterns on the screen.

The NB sends " H " messages to the modem.

AC Conducted and Radiated Emissions Below 1GHz Emissions test:

Executed "AWBCZU" to link with the remote workstation.

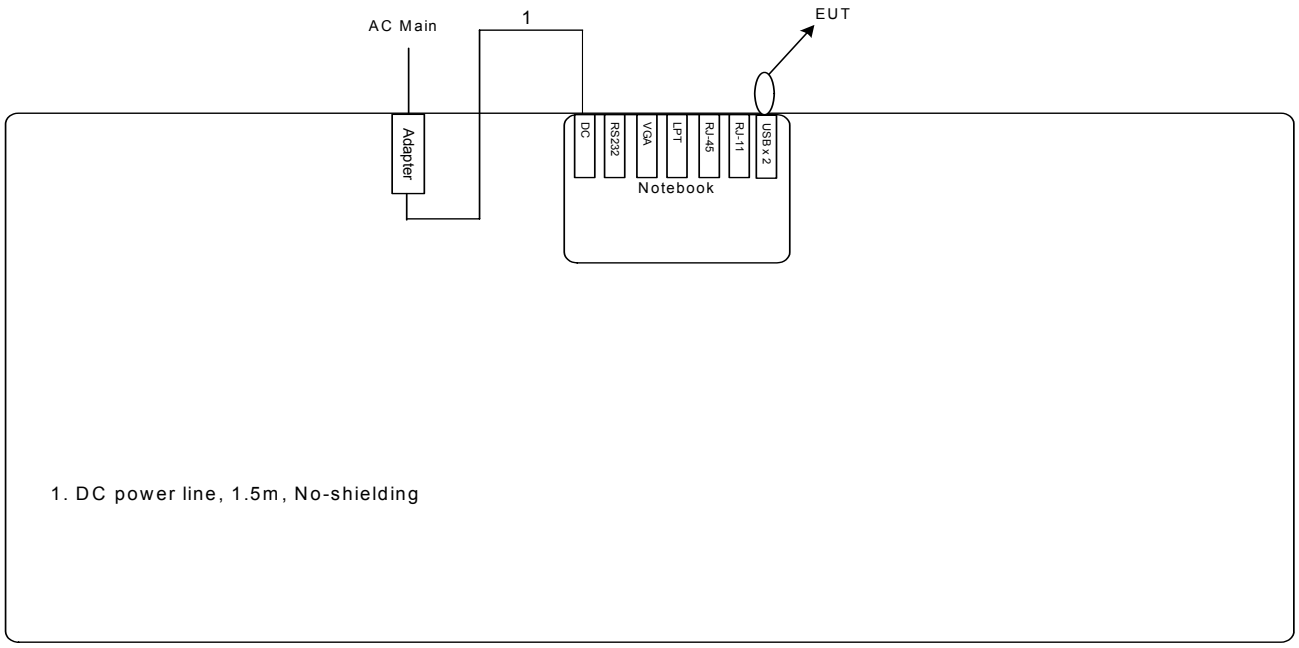
RF Conducted and Radiated Emissions Above 1GHz Emissions test:

Executed "BlueTool" to keep transmitting signals at fixed frequency.

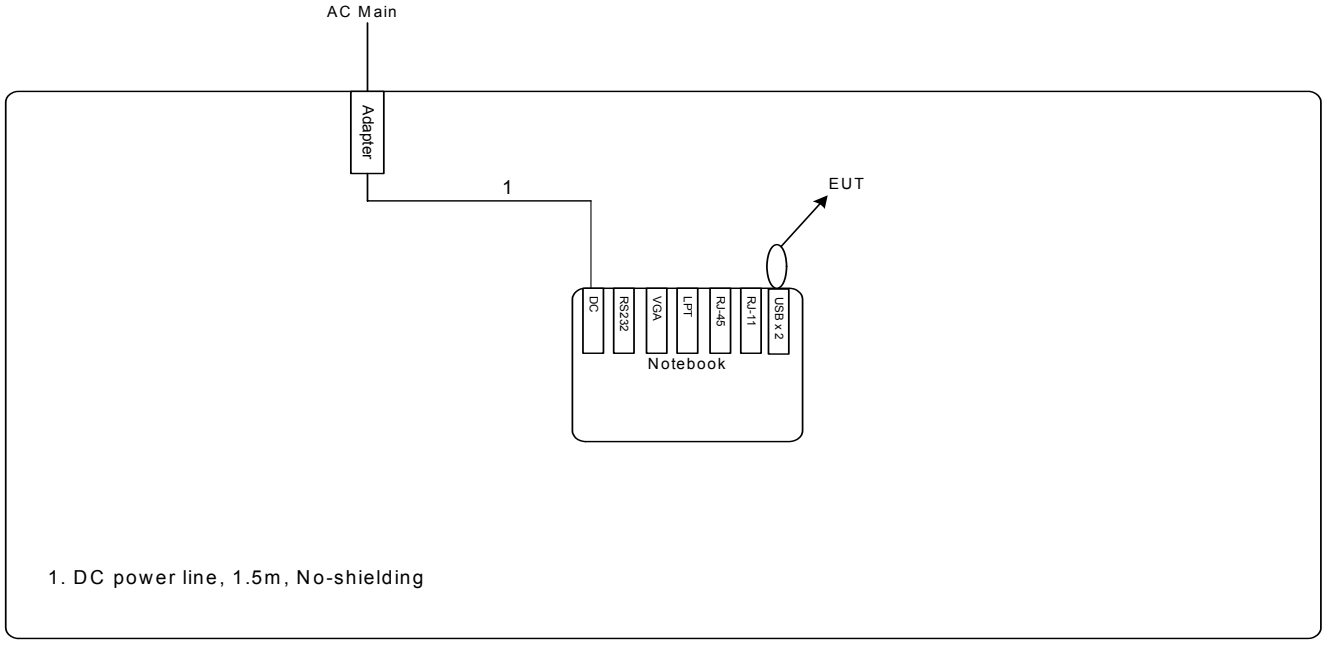
## 2.9. Test Configurations

### 2.9.1. Radiation Emissions Test Configuration

**For radiated emissions 9kHz~1GHz**




**For radiated emissions above 1GHz**



# 3. TEST RESULT

## 3.1. AC Power Line Conducted Emissions Measurement

### 3.1.1. Limit

For a Low-power Radio-frequency device which is designed to be connected to the 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 below limits table.

| Frequency (MHz) | QP Limit (dBuV) | AV Limit (dBuV) |
|---|---|---|
| 0.15~0.5 | 66~56 | 56~46 |
| 0.5~5 | 56 | 46 |
| 5~30 | 60 | 50 |

### 3.1.2. Measuring Instruments and Setting

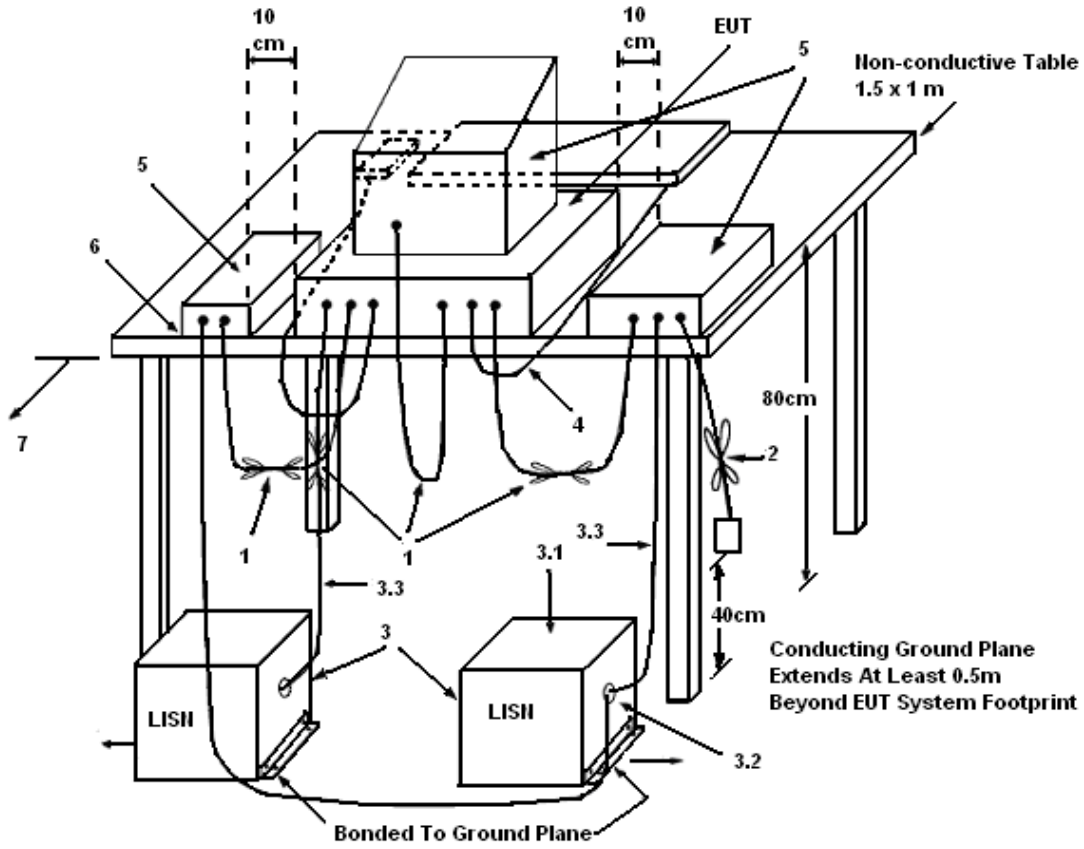
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

| Receiver Parameters | Setting |
|---|---|
| Attenuation | 10 dB |
| Start Frequency | 0.15 MHz |
| Stop Frequency | 30 MHz |
| IF Bandwidth | 9 KHz |

### 3.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 KHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

### 3.1.4. Test Setup Layout




LEGEND:

(1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

(2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

(3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, reference ground plane.

(3.1) All other equipment powered from additional LISN(s).

(3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.

(3.3) LISN at least 80 cm from nearest part of EUT chassis.

(4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.

(5) Non-EUT components of EUT system being tested.

(6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.

(7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

### 3.1.5. Test Deviation

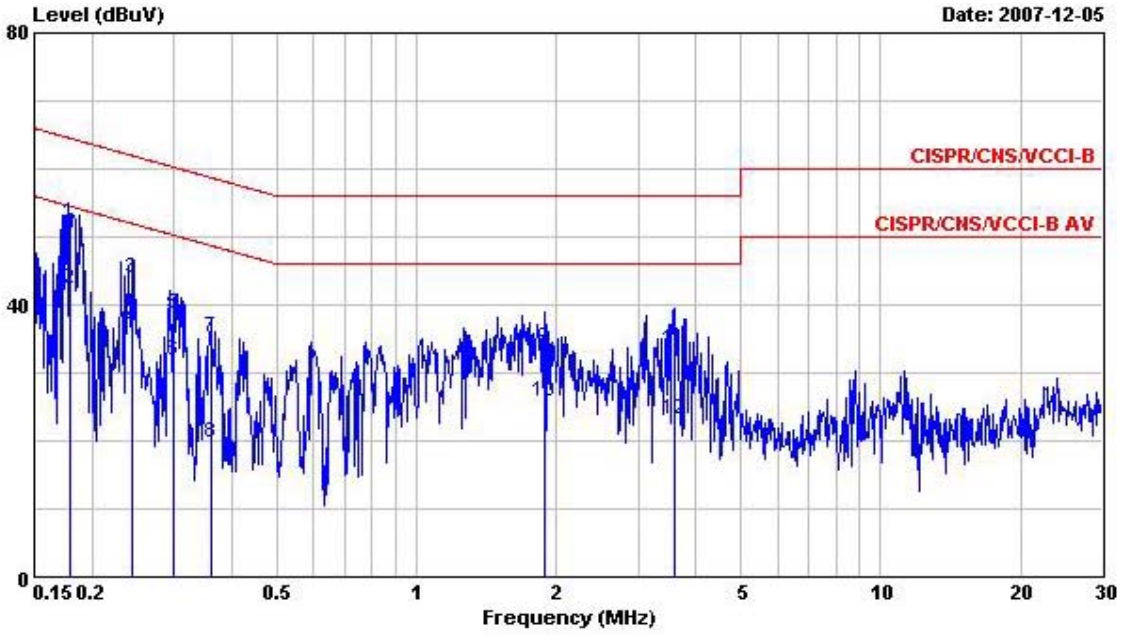
There is no deviation with the original standard.

### 3.1.6. EUT Operation during Test

The EUT was placed on the test table and programmed in normal function.

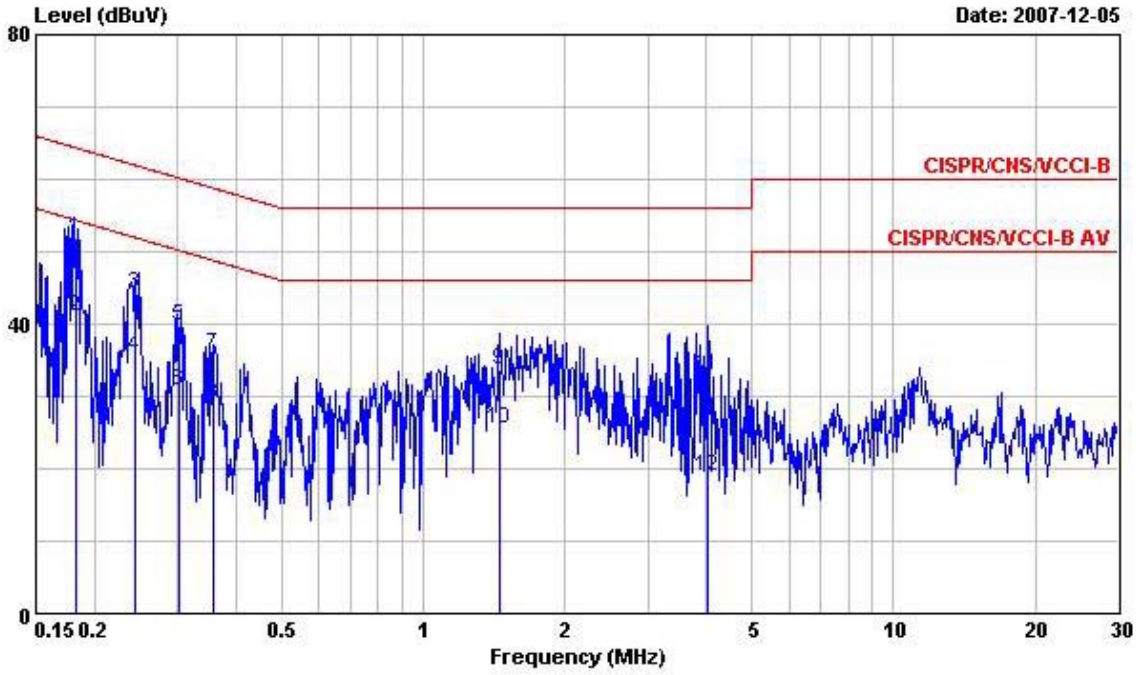
### 3.1.7. Results of AC Power Line Conducted Emissions Measurement

| **Test date** | Dec. 05, 2007 | **Test Site** | CO04-HY |
|---|---|---|---|
| **Temperature** | 20℃ | **Humidity** | 60% |
| **Test Engineer** | Steven | **Phase** | Line |
| **Configuration** | EDR | | |




| | Freq | Level | Over Limit | Limit Line | Read Level | LISN Factor | Cable Loss | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV | dBuV | dB | dB | |
| 1 | @0.1795150 | 52.10 | -12.41 | 64.51 | 51.86 | 0.10 | 0.14 | QP |
| 2 | @0.1795150 | 42.49 | -12.02 | 54.51 | 42.25 | 0.10 | 0.14 | Average |
| 3 | 0.2429320 | 44.06 | -17.94 | 62.00 | 43.66 | 0.10 | 0.30 | QP |
| 4 | @0.2429320 | 36.65 | -15.35 | 52.00 | 36.25 | 0.10 | 0.30 | Average |
| 5 | 0.2990730 | 38.70 | -21.57 | 60.27 | 38.12 | 0.10 | 0.48 | QP |
| 6 | 0.2990730 | 31.91 | -18.36 | 50.27 | 31.33 | 0.10 | 0.48 | Average |
| 7 | 0.3595520 | 35.33 | -23.41 | 58.74 | 34.59 | 0.10 | 0.64 | QP |
| 8 | 0.3595520 | 19.75 | -28.99 | 48.74 | 19.01 | 0.10 | 0.64 | Average |
| 9 | 1.890 | 33.62 | -22.38 | 56.00 | 33.09 | 0.10 | 0.43 | QP |
| 10 | 1.890 | 25.78 | -20.22 | 46.00 | 25.25 | 0.10 | 0.43 | Average |
| 11 | 3.600 | 33.47 | -22.53 | 56.00 | 33.03 | 0.10 | 0.34 | QP |
| 12 | 3.600 | 23.26 | -22.74 | 46.00 | 22.82 | 0.10 | 0.34 | Average |

| | | | |
|---|---|---|---|
| **Test date** | Dec. 05, 2007 | **Test Site** | CO04-HY |
| **Temperature** | 20℃ | **Humidity** | 60% |
| **Test Engineer** | Steven | **Phase** | Neutral |
| **Configuration** | EDR | | |




| | Freq | Level | Over Limit | Limit Line | Read Level | LISN Factor | Cable Loss | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV | dBuV | dB | dB | |
| 1 | @0.1828020 | 51.92 | -12.44 | 64.36 | 51.68 | 0.10 | 0.14 | QP |
| 2 | @0.1828020 | 41.09 | -13.27 | 54.36 | 40.85 | 0.10 | 0.14 | Average |
| 3 | 0.2443640 | 44.29 | -17.66 | 61.95 | 43.88 | 0.10 | 0.31 | QP |
| 4 | @0.2443640 | 35.62 | -16.33 | 51.95 | 35.21 | 0.10 | 0.31 | Average |
| 5 | 0.3025410 | 39.69 | -20.48 | 60.17 | 39.10 | 0.10 | 0.49 | QP |
| 6 | 0.3025410 | 30.88 | -19.29 | 50.17 | 30.29 | 0.10 | 0.49 | Average |
| 7 | 0.3576520 | 35.67 | -23.11 | 58.78 | 34.94 | 0.10 | 0.63 | QP |
| 8 | 0.3576520 | 28.82 | -19.96 | 48.78 | 28.09 | 0.10 | 0.63 | Average |
| 9 | 1.450 | 33.80 | -22.20 | 56.00 | 33.27 | 0.10 | 0.43 | QP |
| 10 | 1.450 | 25.65 | -20.35 | 46.00 | 25.12 | 0.10 | 0.43 | Average |
| 11 | 4.010 | 32.92 | -23.08 | 56.00 | 32.40 | 0.20 | 0.32 | QP |
| 12 | 4.010 | 18.83 | -27.17 | 46.00 | 18.31 | 0.20 | 0.32 | Average |

Note:

Level = Read Level + LISN Factor + Cable Loss.

## 3.2. Maximum Peak Output Power Measurement

### 3.2.1. Limit

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, the limit for peak output power is 30dBm. The limited has to be reduced by the amount in dB that the gain of the antenna exceed 6dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

### 3.2.2. Measuring Instruments and Setting

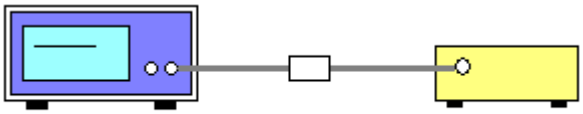
Please refer to section 4 of equipments list in this report. The following table is the setting of the power meter.

| Power Meter Parameter | Setting |
|---|---|
| Filter No. | Auto |
| Measurement time | 0.135 s ~ 26 s |
| Used Peak Sensor | NRV-Z32 (model 04) |

### 3.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Turn on the EUT and power meter and then record the peak power value.
3. Repeat above procedures on all channels needed to be tested.

### 3.2.4. Test Setup Layout




### 3.2.5. Test Deviation

There is no deviation with the original standard.

### 3.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 3.2.7. Test Result of Maximum Peak Output Power

| **Test date** | Dec. 07, 2007 | **Test Site** | TH01-HY |
|---|---|---|---|
| **Temperature** | 28℃ | **Humidity** | 58% |
| **Test Engineer** | Nan | **Configurations** | 8DPSK |

| **Channel** | **Frequency** | **Conducted Power (dBm)** | **Max. Limit (dBm)** | **Result** |
|---|---|---|---|---|
| 0 | 2402 MHz | 4.52 | 30.00 | **Complies** |
| 39 | 2441 MHz | 4.59 | 30.00 | **Complies** |
| 78 | 2480 MHz | 4.63 | 30.00 | **Complies** |

## 3.3. Hopping Channel Separation Measurement

### 3.3.1. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, 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.

### 3.3.2. Measuring Instruments and Setting

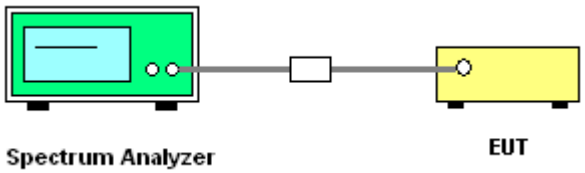
Please refer to section 4 of equipments list in this report. The following table is the setting of spectrum analyzer.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | > Measurement Bandwidth or Channel Separation |
| RB | 30 kHz (20dB Bandwidth) / 100 kHz (Channel Separation) |
| VB | 100 kHz (20dB Bandwidth) / 100 kHz (Channel Separation) |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

### 3.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for 20 dB bandwidth measurement.
3. The resolution bandwidth of 100 kHz and the video bandwidth of 300 kHz were utilised for channel separation measurement.

### 3.3.4. Test Setup Layout




### 3.3.5. Test Deviation

There is no deviation with the original standard.

### 3.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

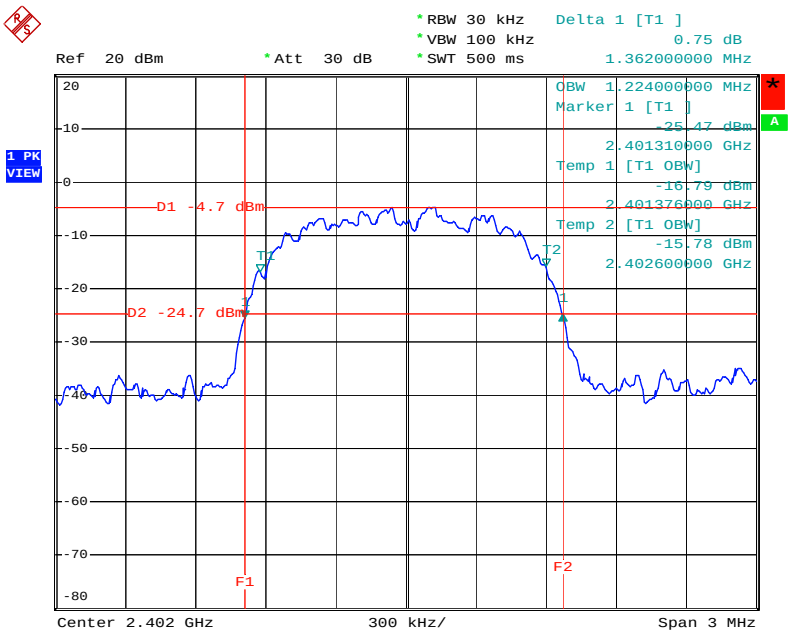
### 3.3.7. Test Result of Hopping Channel Separation

| | | | |
|---|---|---|---|
| **Test date** | Dec. 07, 2007 | **Test Site** | TH01-HY |
| **Temperature** | 28℃ | **Humidity** | 58% |
| **Test Engineer** | Nan | **Configurations** | 8DPSK |

| Frequency | Ch. Separation (MHz) | 20dB Bandwidth (kHz) | 99% Occupied Bandwidth (kHz) | Result |
|---|---|---|---|---|
| 2402 MHz | 1.00 | 1362.00 | 1224.00 | **Complies** |
| 2441 MHz | 1.00 | 1368.00 | 1224.00 | **Complies** |
| 2480 MHz | 1.00 | 1362.00 | 1224.00 | **Complies** |

**Ch. Separation Limits: >2/3 of 20dB bandwidth**

### 20 dB Bandwidth Plot on Channel 0 / 2402 MHz

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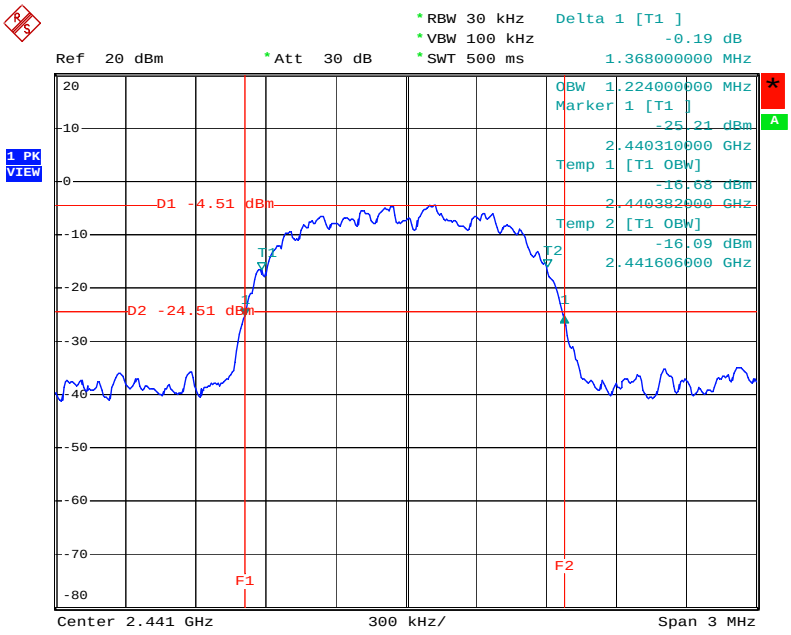
### 20 dB Bandwidth Plot on Channel 39 / 2441 MHz

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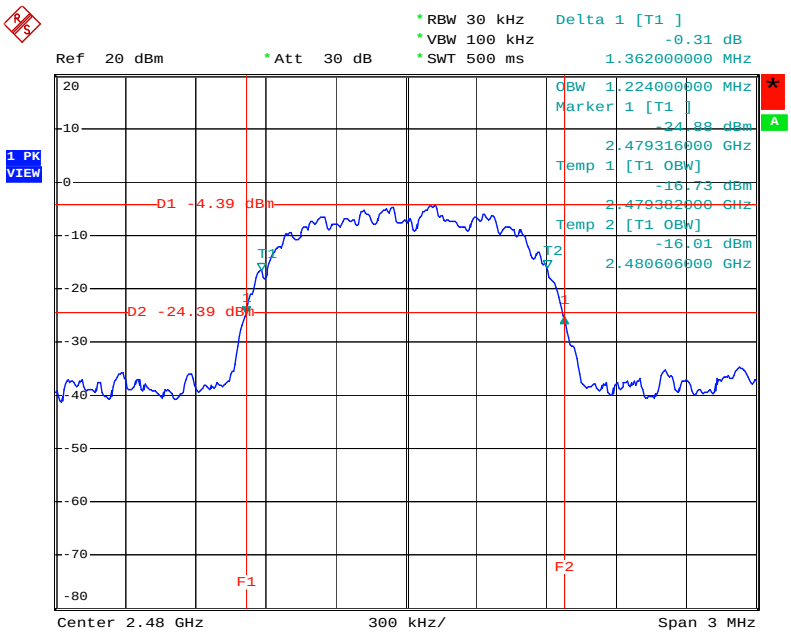
### 20 dB Bandwidth Plot on Channel 78 / 2480 MHz

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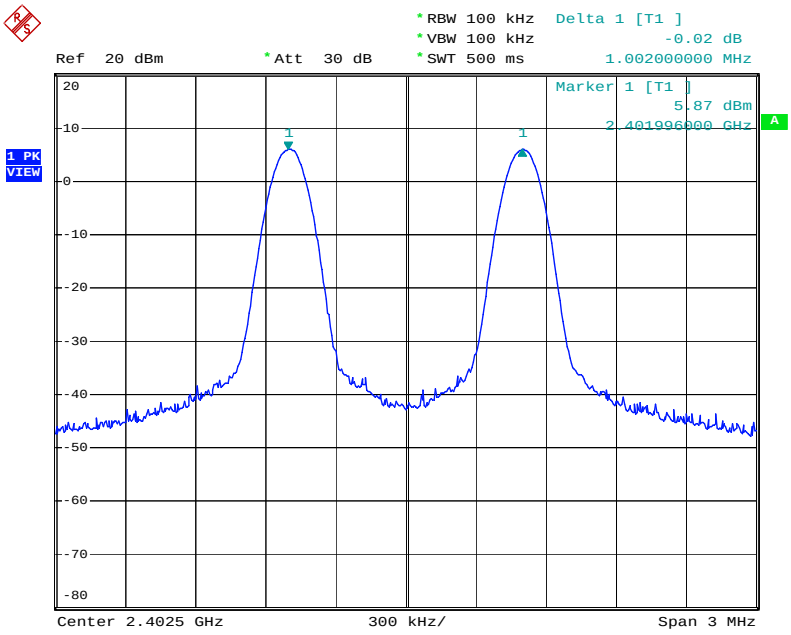
### Channel Separation Plot on Channel 0~1 / 2402 MHz ~ 2403 MHz

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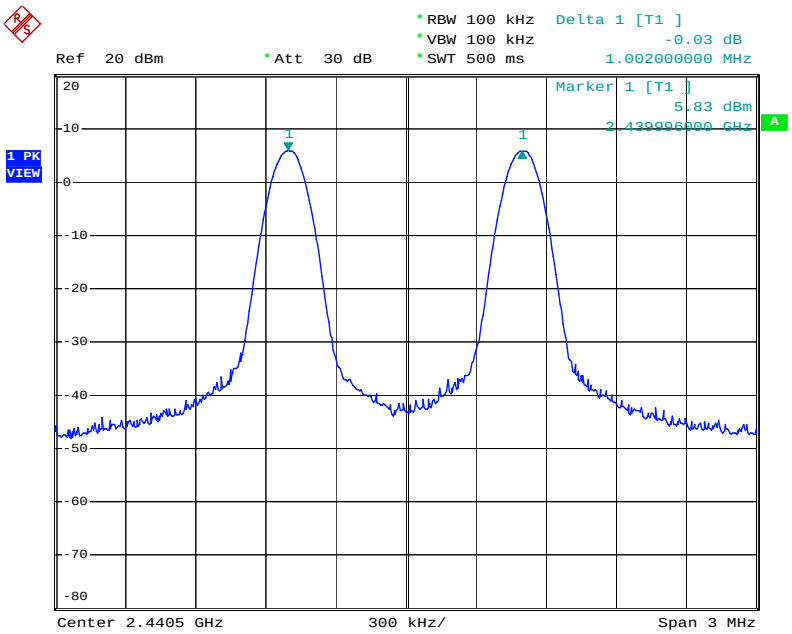
### Channel Separation Plot on Channel 39~40 / 2441 MHz ~ 2442 MHz

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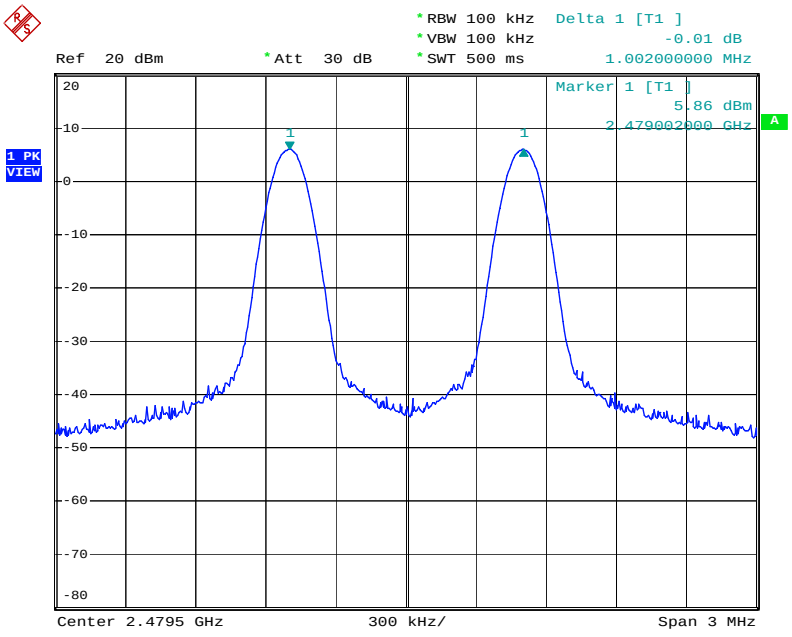
### Channel Separation Plot on Channel 77~78 / 2479 MHz ~ 2480 MHz

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## 3.4. Number of Hopping Frequency Measurement

### 3.4.1. Limit

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels.

### 3.4.2. Measuring Instruments and Setting

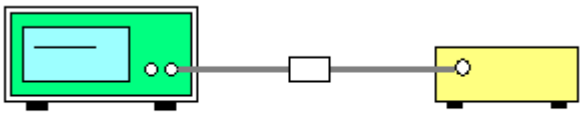
Please refer to section 4 of equipments list in this report. The following table is the setting of spectrum analyzer.

| Spectrum Parameters | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | > Operating Frequency Range |
| RB | 100 kHz |
| VB | 100 kHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

### 3.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. The resolution bandwidth of 100 kHz and the video bandwidth of 100 kHz were utilised.
3. Observe frequency hopping in 2400MHz~2483.5MHz, there are at least 75 non-overlapping channels.

### 3.4.4. Test Setup Layout



### 3.4.5. Test Deviation

There is no deviation with the original standard.

### 3.4.6. EUT Operation during Test

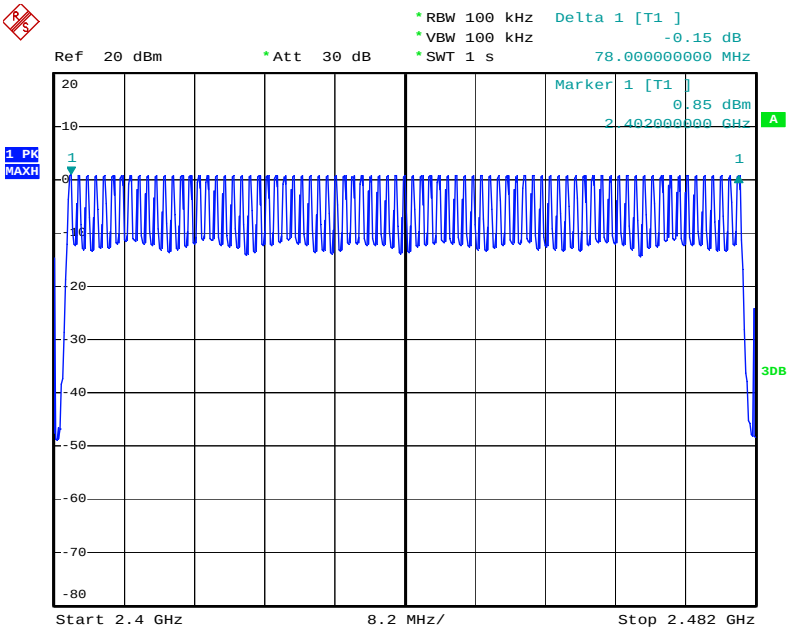
The EUT was programmed to be in continuously transmitting mode.

### 3.4.7. Test Result of Number of Hopping Frequency

| | | | |
|---|---|---|---|
| **Test date** | Dec. 10, 2007 | **Test Site** | TH01-HY |
| **Temperature** | 28℃ | **Humidity** | 58% |
| **Test Engineer** | Nan | **Configurations** | 8DPSK |

| Modulation Type | Channel No. | Frequency (MHz) | Hopping Ch. (Channels) | Min. Limit (Channels) | Test Result |
|---|---|---|---|---|---|
| 8DPSK | 0 ~ 78 | 2402 ~ 2480 | 79 | 75 | **Complies** |

**Number of Hopping Channel Plot on Channel 0~78 / 2402 MHz ~ 2480 MHz**



## 3.5. Dwell Time Measurement

### 3.5.1. Limit

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

### 3.5.2. Measuring Instruments and Setting

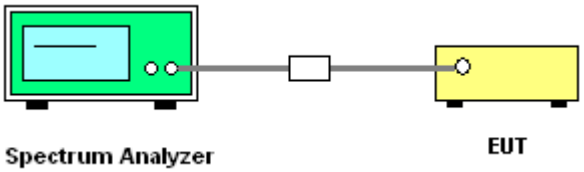
Please refer to section 4 of equipments list in this report. The following table is the setting of spectrum analyzer.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | 0 MHz |
| RB | 1000 kHz |
| VB | 1000 kHz |
| Detector | Peak |
| Trace | Single Trigger |

### 3.5.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser
2. Set RBW of spectrum analyzer to 1000kHz and VBW to 1000kHz.
3. Use a video trigger with the trigger level set to enable triggering only on full pulses.
4. Sweep Time is more than once pulse time.
5. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
6. Measure the maximum time duration of one single pulse.
7. Set the EUT for 3DH5, 3DH3 and 3DH1 packet transmitting.
8. Measure the maximum time duration of one single pulse.
9. 3DH5 Packet permit maximum 1600/ 79 / 6 = 3.37 hops per second in each channel (5 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 3.37 x 31.6 = 106.6 within 31.6 seconds
10. 3DH3 Packet permit maximum 1600 / 79 / 4 = 5.06 hops per second in each channel (3 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 5.06 x 31.6 = 160 within 31.6 seconds.
11. 3DH1 Packet permit maximum 1600 / 79 /2 = 10.12 hops per second in each channel (1 time slot RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 10.12 x 31.6 = 320 within 31.6 seconds.

### 3.5.4. Test Setup Layout




### 3.5.5. Test Deviation

There is no deviation with the original standard.

### 3.5.6. EUT Operation during Test

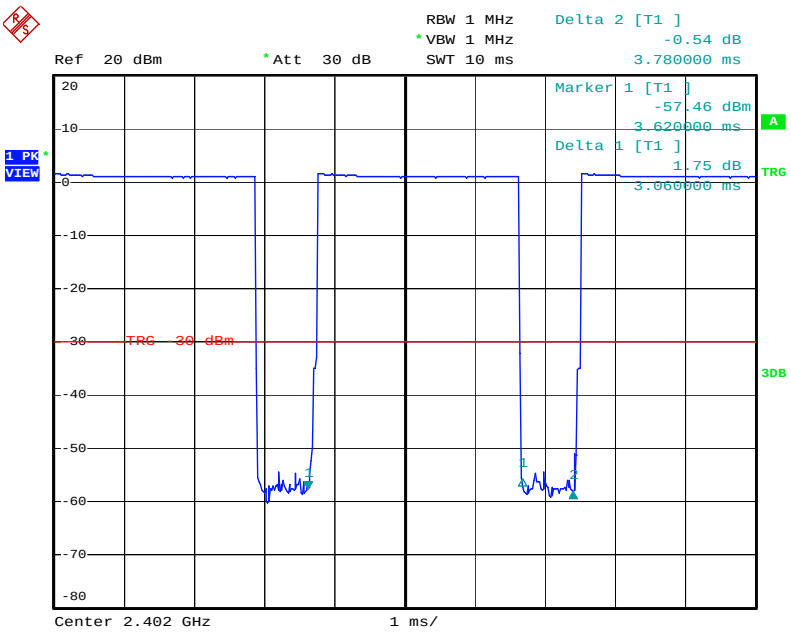
The EUT was programmed to be in continuously transmitting mode.

### 3.5.7. Test Result of Dwell Time

| **Test date** | Dec. 11, 2007 | **Test Site** | TH01-HY |
|---|---|---|---|
| **Temperature** | 28℃ | **Humidity** | 58% |
| **Test Engineer** | Nan | **Configurations** | 3DH1, 3DH3, 3DH5 |

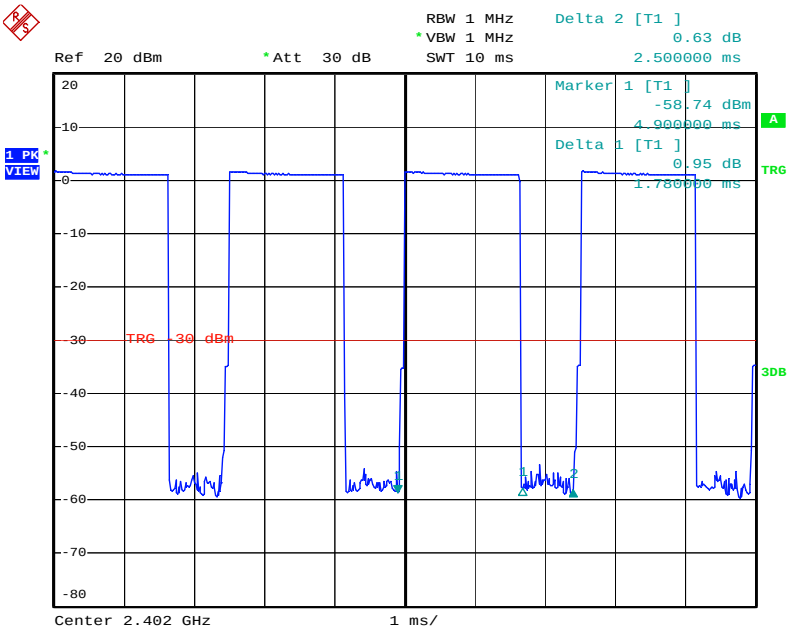
| Data Packet | Frequency | Pulse Duration (ms) | Dwell Time (s) | Limits (s) | Test Result |
|---|---|---|---|---|---|
| 3DH5 | 2402 MHz | 3.0600 | 0.3264 | 0.4000 | **Complies** |
| 3DH3 | 2402 MHz | 1.7800 | 0.2848 | 0.4000 | **Complies** |
| 3DH1 | 2402 MHz | 0.5200 | 0.1664 | 0.4000 | **Complies** |
| 3DH5 | 2441 MHz | 3.0400 | 0.3243 | 0.4000 | **Complies** |
| 3DH3 | 2441 MHz | 1.7800 | 0.2848 | 0.4000 | **Complies** |
| 3DH1 | 2441 MHz | 0.5200 | 0.1664 | 0.4000 | **Complies** |
| 3DH5 | 2480 MHz | 3.0400 | 0.3243 | 0.4000 | **Complies** |
| 3DH3 | 2480 MHz | 1.7800 | 0.2848 | 0.4000 | **Complies** |
| 3DH1 | 2480 MHz | 0.5400 | 0.1728 | 0.4000 | **Complies** |

### 3DH5 Dwell Time Plot on Channel 0 / 2402 MHz



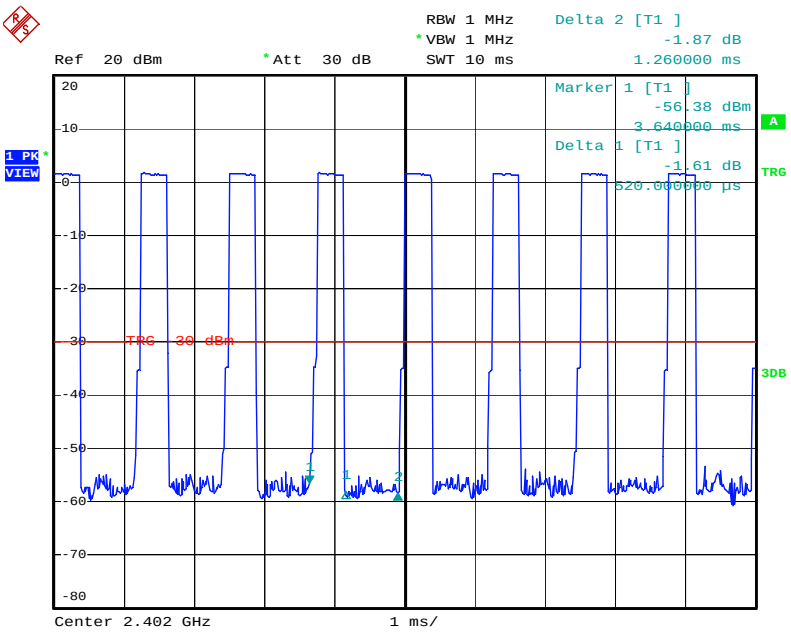

Date: 11.DEC.2007 17:30:13

### 3DH3 Dwell Time Plot on Channel 0 / 2402 MHz



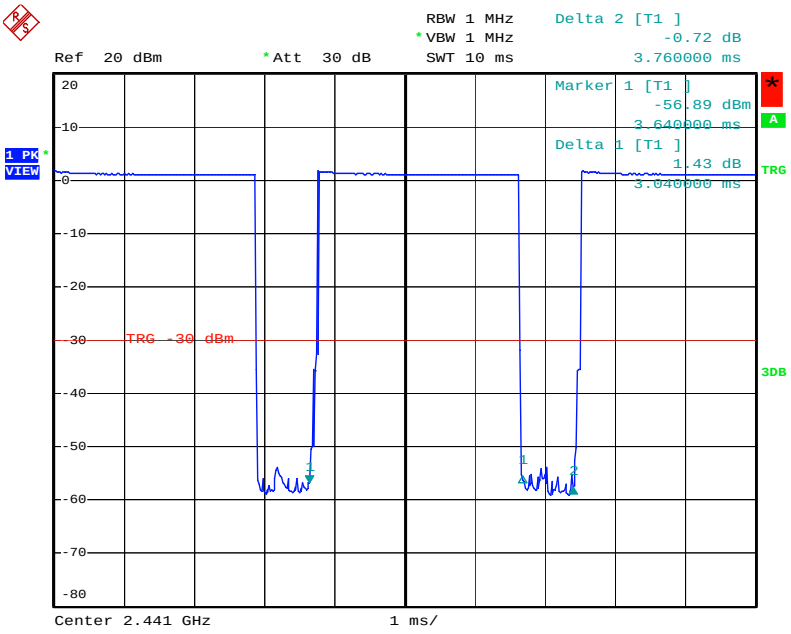

Date: 11.DEC.2007 17:33:23

### 3DH1 Dwell Time Plot on Channel 0 / 2402 MHz



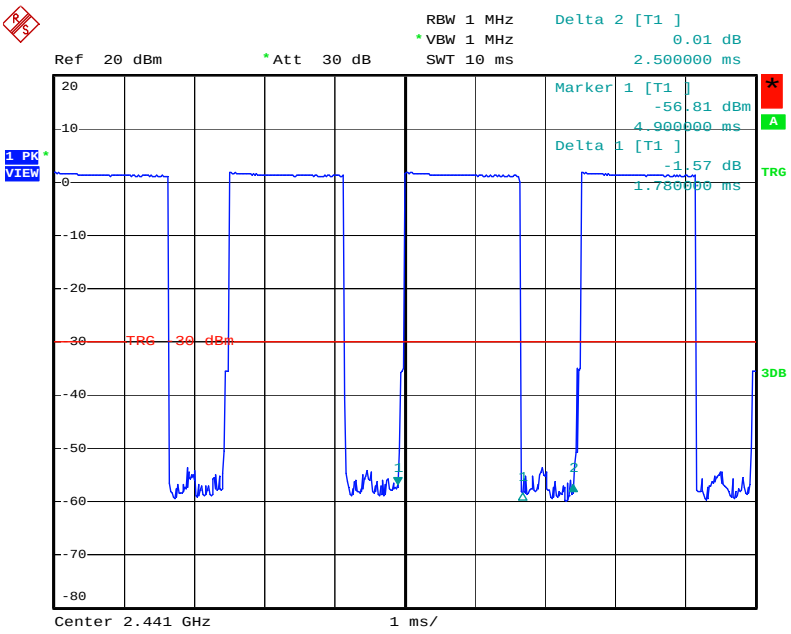

Date: 11.DEC.2007 17:32:47

### 3DH5 Dwell Time Plot on Channel 39 / 2441 MHz



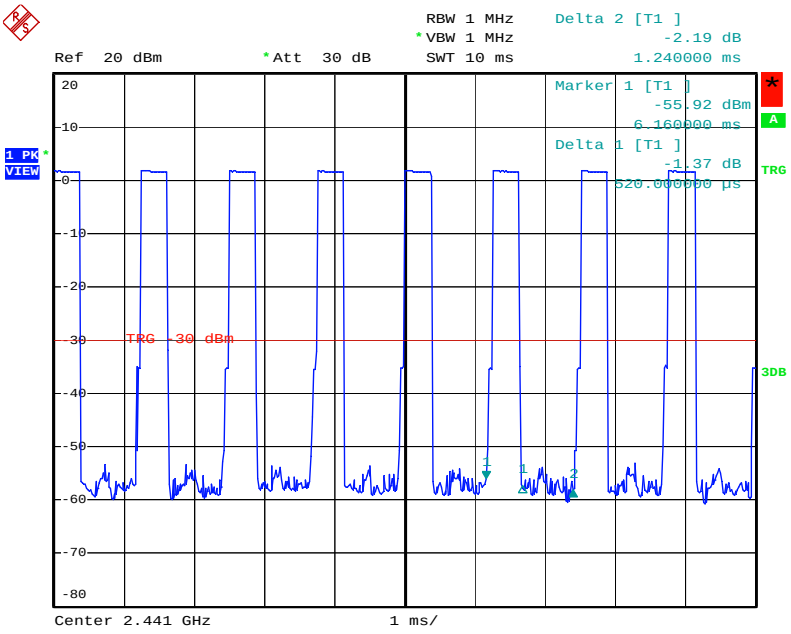

Date: 11.DEC.2007 17:35:23

### 3DH3 Dwell Time Plot on Channel 39 / 2441 MHz



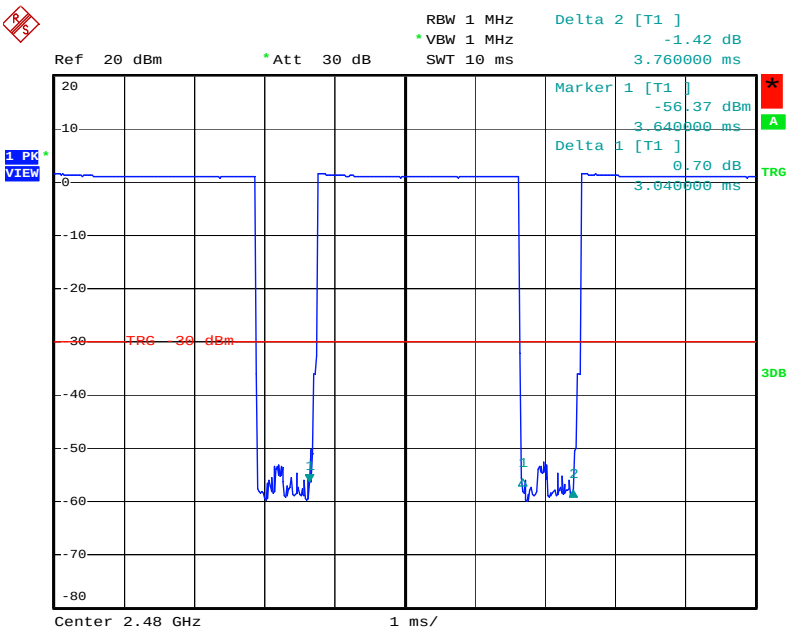

Date: 11.DEC.2007 17:34:43

### 3DH1 Dwell Time Plot on Channel 39 / 2441 MHz



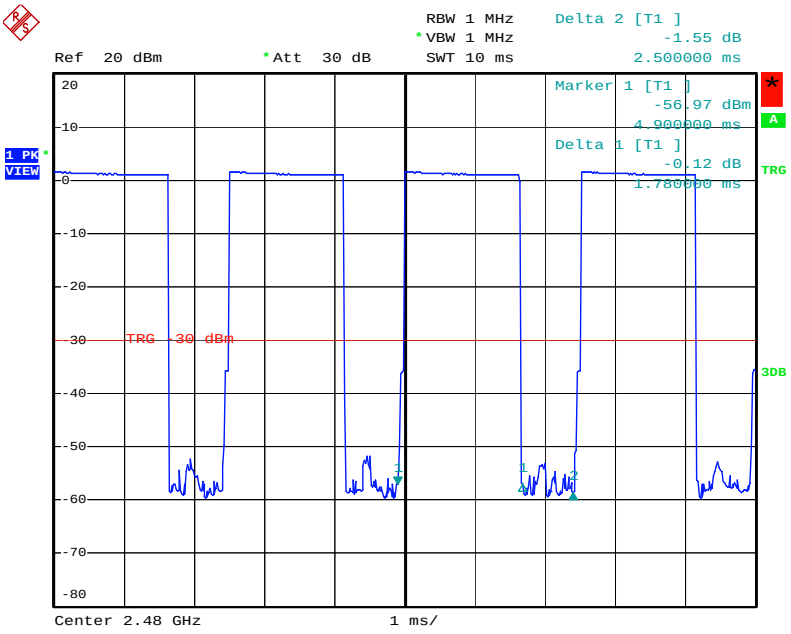

Date: 11.DEC.2007 17:34:11

### 3DH5 Dwell Time Plot on Channel 78 / 2480 MHz



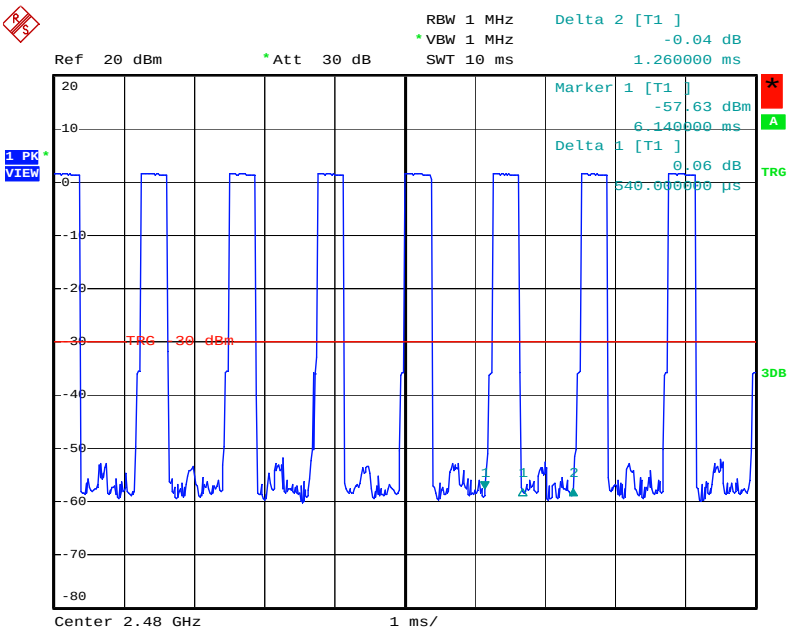

Date: 11.DEC.2007 17:37:01

### 3DH3 Dwell Time Plot on Channel 78 / 2480 MHz




Date: 11.DEC.2007 17:36:29

### 3DH1 Dwell Time Plot on Channel 78 / 2480 MHz




Date: 11.DEC.2007 17:35:52

## 3.6. Radiated Emissions Measurement

### 3.6.1. Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

| Frequencies (MHz) | Field Strength (micorvolts/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 |

### 3.6.2. Measuring Instruments and Setting

Please refer to section 4 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start Frequency | 1000 MHz |
| Stop Frequency | 10th carrier harmonic |
| RB / VB (Emission in restricted band) | 1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average |
| RB / VB (Emission in non-restricted band) | 1000KHz / 1000KHz for peak |

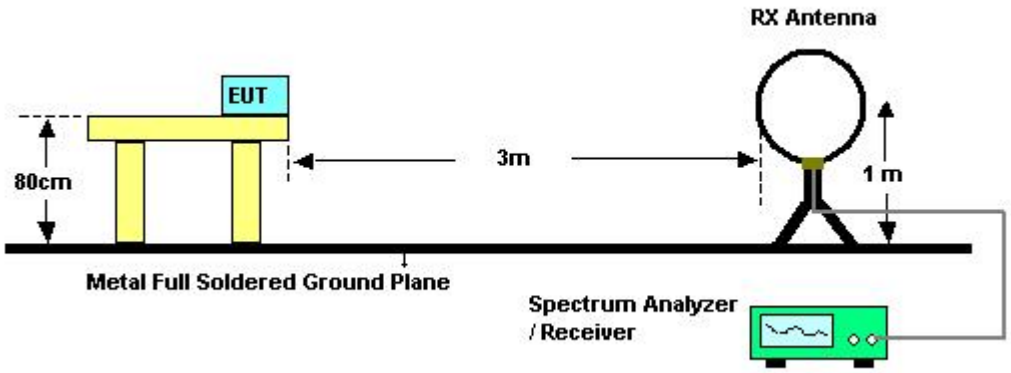
| Receiver Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start ~ Stop Frequency | 9kHz~150kHz / RB 200Hz for QP |
| Start ~ Stop Frequency | 150kHz~30MHz / RB 9kHz for QP |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB 120kHz for QP |

### 3.6.3. Test Procedures

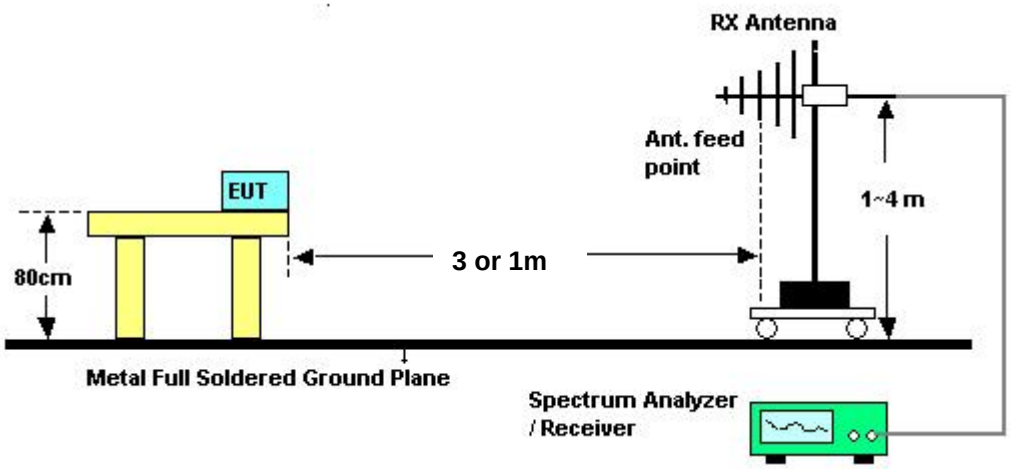
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

### 3.6.4. Test Setup Layout

**For radiated emissions below 30MHz**




**For radiated emissions above 30MHz**




Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

### 3.6.5. Test Deviation

There is no deviation with the original standard.

### 3.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 3.6.7. Results of Radiated Emissions (9kHz~30MHz)

| | | | |
|---|---|---|---|
| **Test date** | Nov. 27, 2007 | **Test Site** | 03CH02-HY |
| **Temperature** | 26.1℃ | **Humidity** | 54% |
| **Test Engineer** | Murphy | | |

| Freq. (MHz) | Level (dBuV) | Over Limit (dB) | Limit Line (dBuV) | Remark |
|---|---|---|---|---|
| - | - | - | - | See Note |

Note:

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

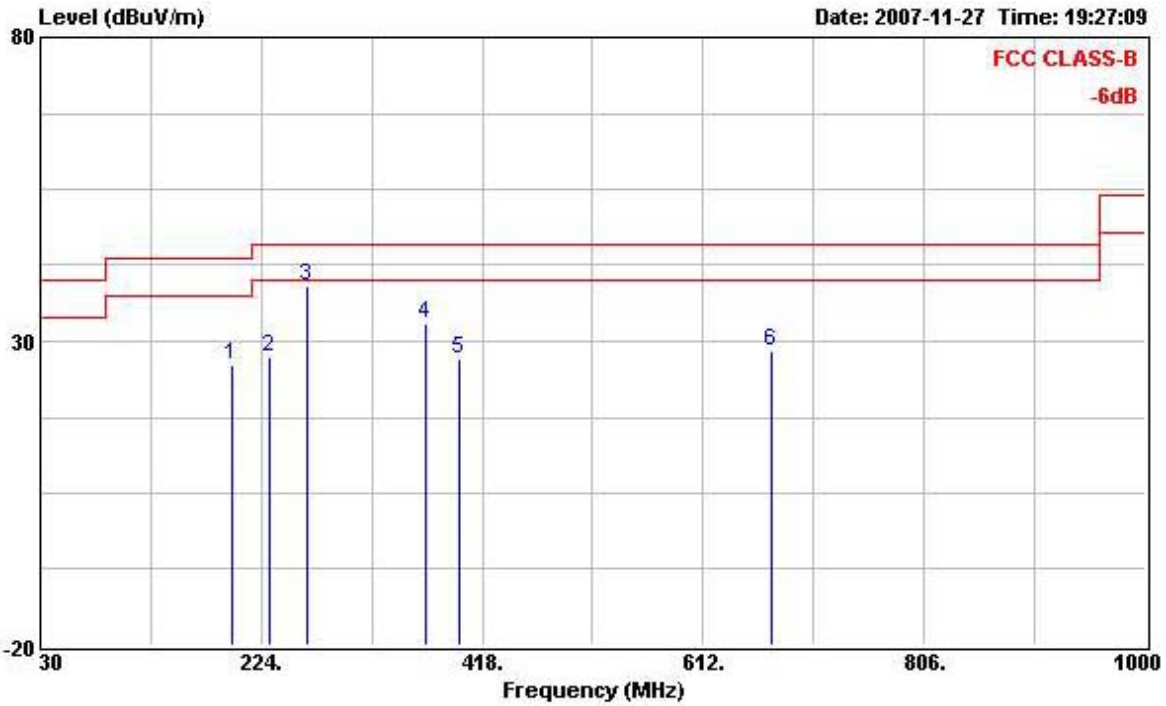
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

### 3.6.8. Results of Radiated Emissions (30MHz~1GHz)

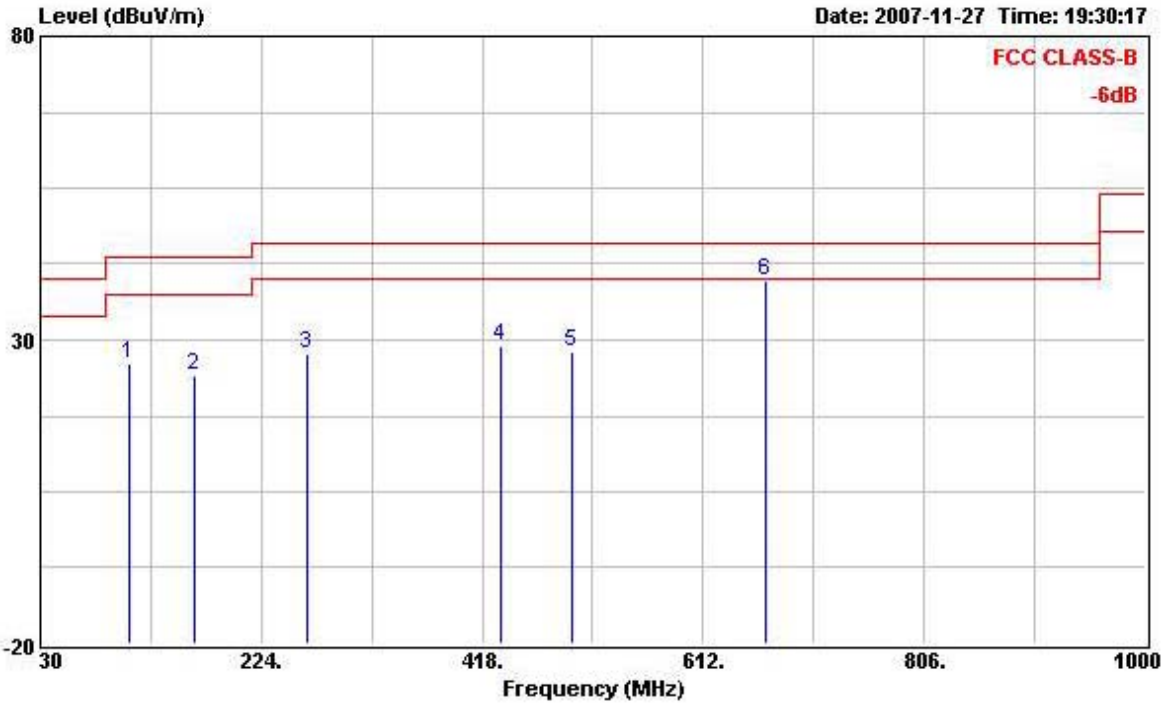
| | | | |
|---|---|---|---|
| **Test date** | Nov. 27, 2007 | **Test Site** | 03CH02-HY |
| **Temperature** | 26.1℃ | **Humidity** | 54% |
| **Test Engineer** | Murphy | **Configurations** | Channel 39 |

***Horizontal***




| | Freq | Level | Over Limit | Limit Line | Read Level | Cable Loss | Remark | Ant Pos | Table Pos | Preamp Factor | Probe Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | | cm | deg | dB | dB |
| 1 | 198.780 | 26.22 | -17.28 | 43.50 | 42.70 | 2.84 | Peak | --- | --- | 30.60 | 11.28 |
| 2 | 231.760 | 27.45 | -18.55 | 46.00 | 42.60 | 2.99 | Peak | --- | --- | 30.54 | 12.40 |
| 3 | 264.740 | 39.15 | -6.85 | 46.00 | 53.19 | 3.22 | Peak | --- | --- | 30.47 | 13.21 |
| 4 | 367.560 | 32.82 | -13.18 | 46.00 | 44.61 | 3.73 | Peak | --- | --- | 30.27 | 14.75 |
| 5 | 398.600 | 27.01 | -18.99 | 46.00 | 38.07 | 3.90 | Peak | --- | --- | 30.20 | 15.24 |
| 6 | 672.140 | 28.43 | -17.57 | 46.00 | 33.38 | 5.14 | Peak | --- | --- | 29.31 | 19.22 |

***Vertical***




| | Freq | Level | Over Limit | Limit Line | Read Level | Cable Loss | Remark | Ant Pos | Table Pos | Preamp Factor | Probe Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | | cm | deg | dB | dB |
| 1 | 107.600 | 25.95 | -17.55 | 43.50 | 42.52 | 2.10 | Peak | --- | --- | 30.78 | 12.11 |
| 2 | 165.800 | 24.11 | -19.39 | 43.50 | 41.91 | 2.57 | Peak | --- | --- | 30.67 | 10.30 |
| 3 | 264.740 | 27.60 | -18.40 | 46.00 | 41.64 | 3.22 | Peak | --- | --- | 30.47 | 13.21 |
| 4 | 433.520 | 29.18 | -16.82 | 46.00 | 39.33 | 4.01 | Peak | --- | --- | 30.10 | 15.94 |
| 5 | 497.540 | 28.17 | -17.83 | 46.00 | 36.58 | 4.26 | Peak | --- | --- | 29.91 | 17.24 |
| 6 | 666.320 | 39.68 | -6.32 | 46.00 | 44.58 | 5.14 | QP | --- | --- | 29.33 | 19.29 |

Note:

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

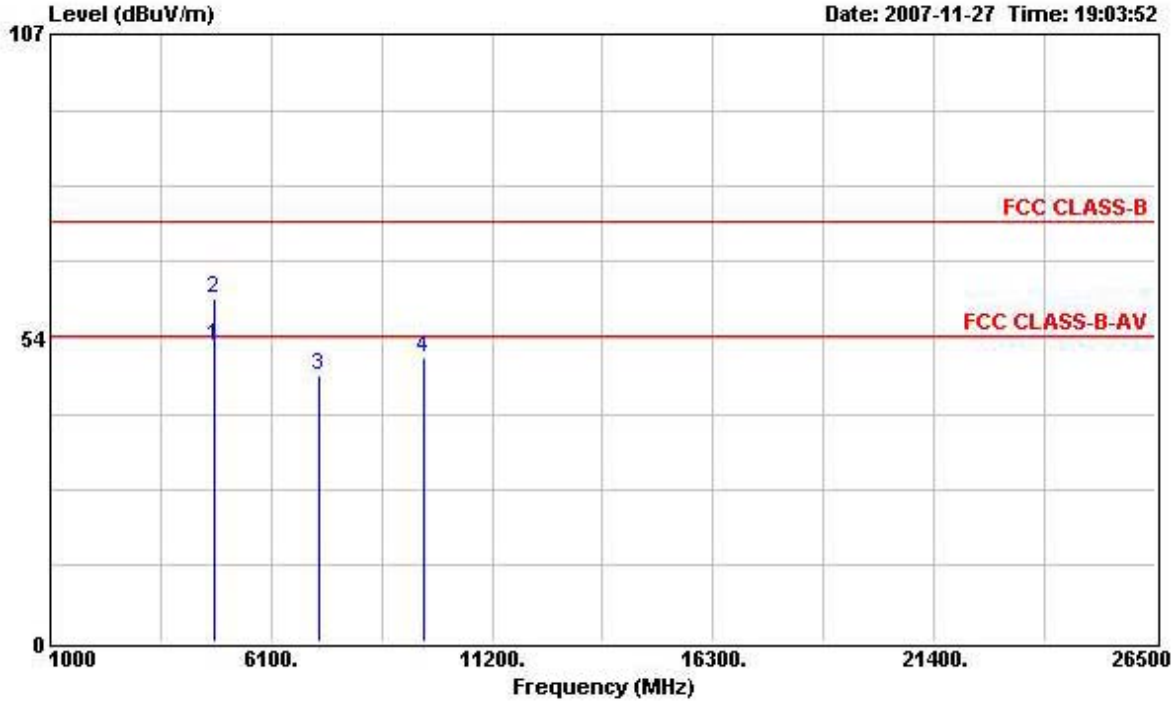
Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

### 3.6.9. Results for Radiated Emissions (1GHz~10th Harmonic)

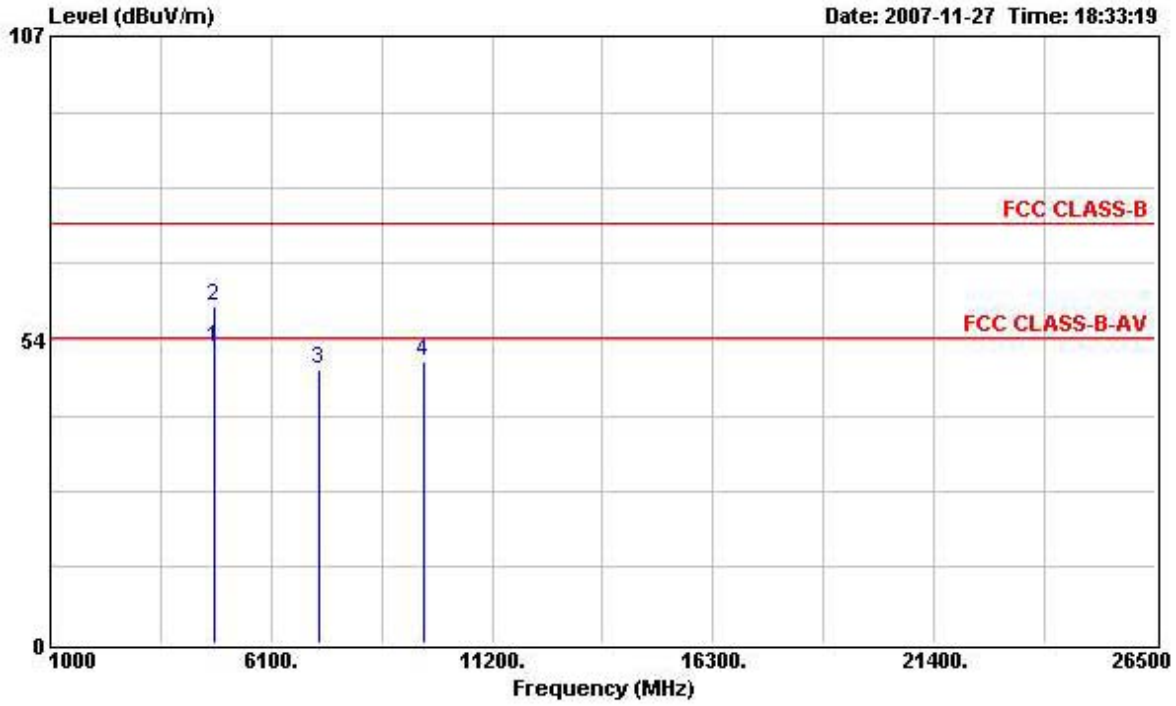
| Test date | Nov. 27, 2007 | Test Site | 03CH02-HY |
|---|---|---|---|
| Temperature | 26.1℃ | Humidity | 54% |
| Test Engineer | Murphy | Configurations | Channel 0 |

***Horizontal***




| | Freq | Level | Over Limit | Limit Line | Read Level | Cable Loss | Remark | Ant Pos | Table Pos | Preamp Factor | Probe Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | | cm | deg | dB | dB |
| 1 | 4806.000 | 51.98 | -2.02 | 54.00 | 49.35 | 4.57 | Average | --- | --- | 34.94 | 33.00 |
| 2 | 4806.000 | 60.48 | -13.52 | 74.00 | 57.85 | 4.57 | Peak | --- | --- | 34.94 | 33.00 |
| 3 | 7204.000 | 46.88 | -7.12 | 54.00 | 40.56 | 5.62 | Average | --- | --- | 35.24 | 35.94 |
| 4 | 9608.000 | 50.10 | -3.90 | 54.00 | 41.52 | 6.34 | Average | --- | --- | 35.70 | 37.94 |

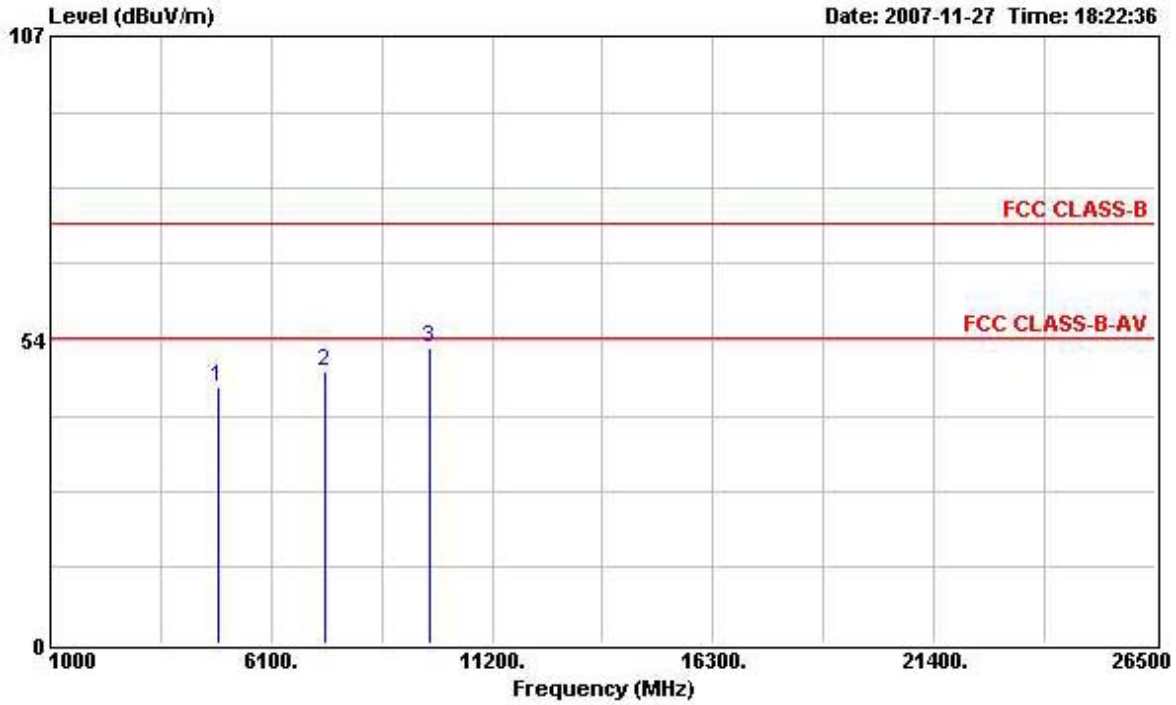
***Vertical***




| | Freq | Level | Over Limit | Limit Line | Read Level | Cable Loss | Remark | Ant Pos | Table Pos | Preamp Factor | Probe Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | | cm | deg | dB | dB |
| 1 | 4806.000 | 52.03 | -1.97 | 54.00 | 49.40 | 4.57 | Average | --- | --- | 34.94 | 33.00 |
| 2 | 4806.000 | 59.51 | -14.49 | 74.00 | 56.88 | 4.57 | Peak | --- | --- | 34.94 | 33.00 |
| 3 | 7204.000 | 48.24 | -5.76 | 54.00 | 41.92 | 5.62 | Average | --- | --- | 35.24 | 35.94 |
| 4 | 9608.000 | 49.70 | -4.30 | 54.00 | 41.12 | 6.34 | Average | --- | --- | 35.70 | 37.94 |

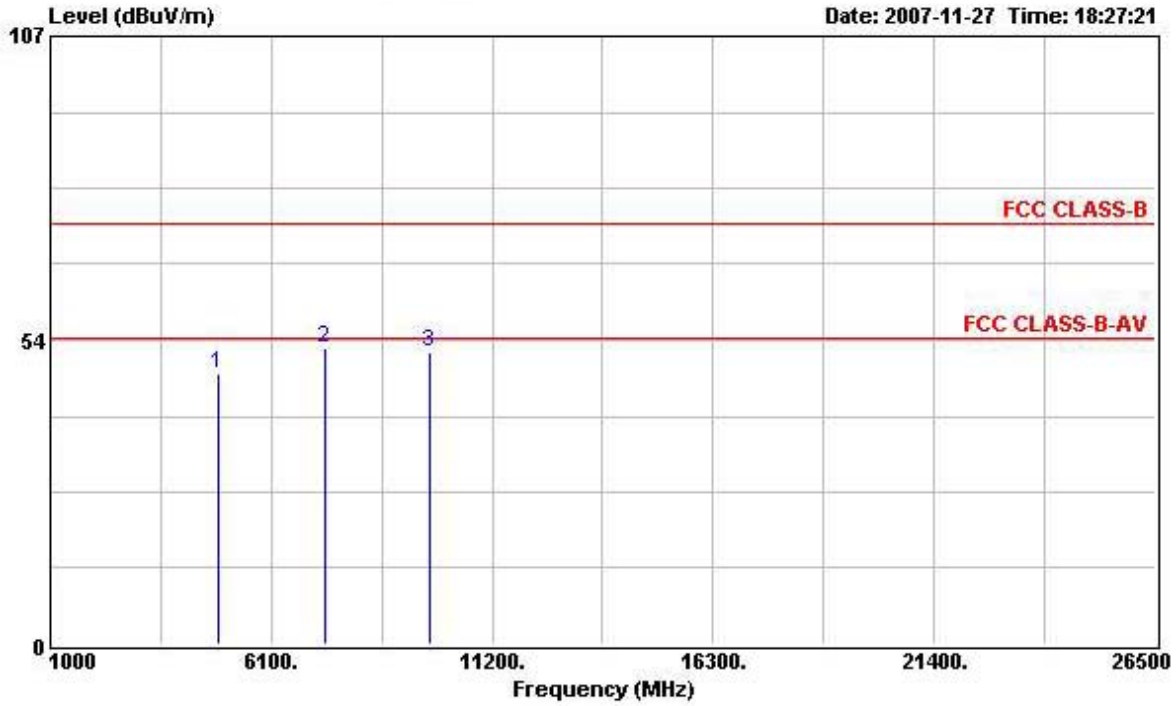
| | | | |
|---|---|---|---|
| **Test date** | Nov. 27, 2007 | **Test Site** | 03CH02-HY |
| **Temperature** | 26.1℃ | **Humidity** | 54% |
| **Test Engineer** | Murphy | **Configurations** | Channel 39 |

***Horizontal***




| | Freq | Level | Over Limit | Limit Line | Read Level | Cable Loss | Remark | Ant Pos | Table Pos | Preamp Factor | Probe Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | | cm | deg | dB | dB |
| 1 | 4884.000 | 45.03 | -8.97 | 54.00 | 42.21 | 4.64 | Average | --- | --- | 34.93 | 33.11 |
| 2 | 7320.000 | 47.80 | -6.20 | 54.00 | 41.17 | 5.64 | Average | --- | --- | 35.26 | 36.25 |
| 3 | 9766.000 | 52.28 | -1.72 | 54.00 | 43.61 | 6.36 | Average | --- | --- | 35.70 | 38.01 |

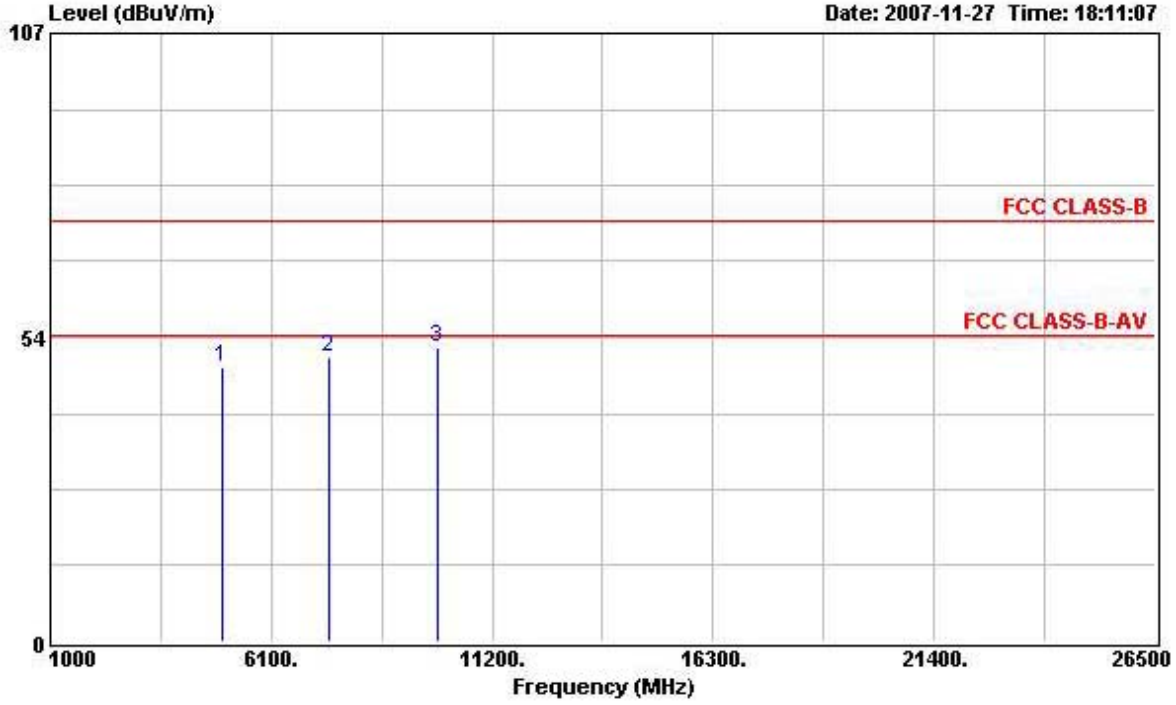
***Vertical***




| | Freq | Level | Over Limit | Limit Line | Read Level | Cable Loss | Remark | Ant Pos | Table Pos | Preamp Factor | Probe Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | | cm | deg | dB | dB |
| 1 | 4884.000 | 47.68 | -6.32 | 54.00 | 44.86 | 4.64 | Average | --- | --- | 34.93 | 33.11 |
| 2 | 7324.000 | 52.19 | -1.81 | 54.00 | 45.56 | 5.64 | Average | --- | --- | 35.26 | 36.25 |
| 3 | 9768.000 | 51.57 | -2.43 | 54.00 | 42.90 | 6.36 | Average | --- | --- | 35.70 | 38.01 |

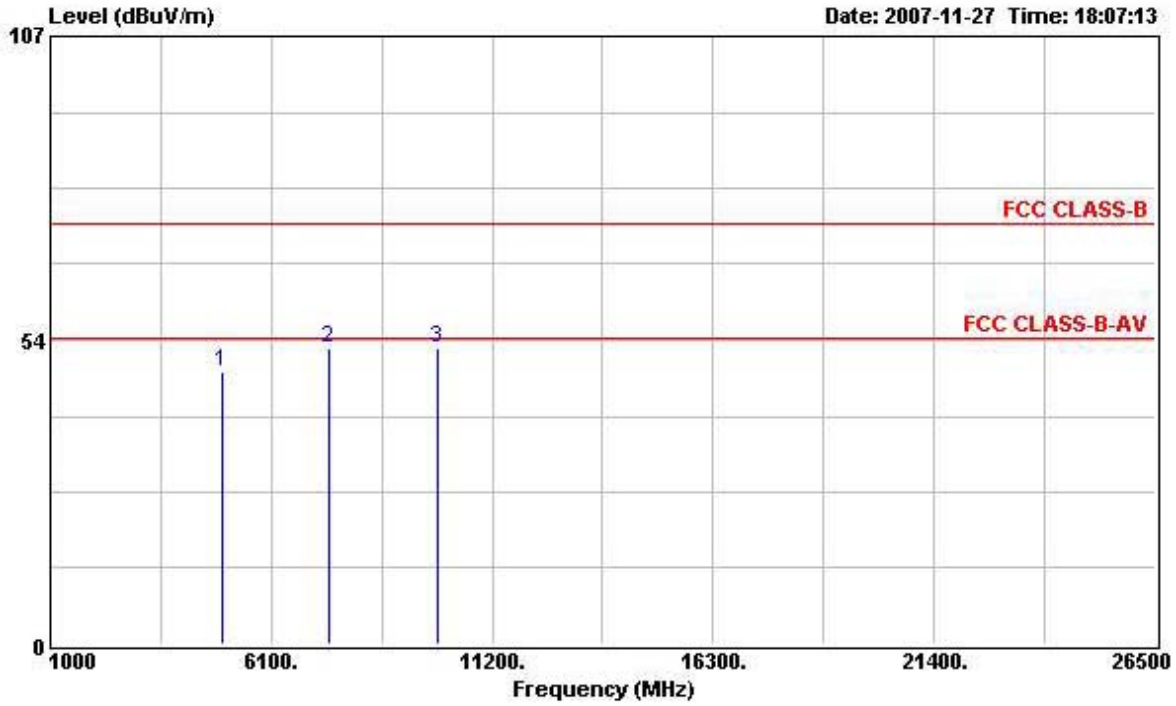
| | | | |
|---|---|---|---|
| **Test date** | Nov. 27, 2007 | **Test Site** | 03CH02-HY |
| **Temperature** | 26.1℃ | **Humidity** | 54% |
| **Test Engineer** | Murphy | **Configurations** | Channel 78 |

***Horizontal***




| | Freq | Level | Over Limit | Limit Line | Read Level | Cable Loss | Remark | Ant Pos | Table Pos | Preamp Factor | Probe Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | | cm | deg | dB | dB |
| 1 | 4960.000 | 48.26 | -5.74 | 54.00 | 45.21 | 4.72 | Average | --- | --- | 34.91 | 33.24 |
| 2 | 7440.000 | 49.92 | -4.08 | 54.00 | 42.99 | 5.65 | Average | --- | --- | 35.29 | 36.57 |
| 3 | 9919.000 | 51.81 | -2.19 | 54.00 | 43.05 | 6.39 | Average | --- | --- | 35.70 | 38.07 |

***Vertical***




| | Freq | Level | Over Limit | Limit Line | Read Level | Cable Loss | Remark | Ant Pos | Table Pos | Preamp Factor | Probe Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | | cm | deg | dB | dB |
| 1 | 4964.000 | 48.04 | -5.96 | 54.00 | 44.99 | 4.72 | Average | --- | --- | 34.91 | 33.24 |
| 2 | 7442.000 | 52.08 | -1.92 | 54.00 | 45.15 | 5.65 | Average | --- | --- | 35.29 | 36.57 |
| 3 | 9919.000 | 52.15 | -1.85 | 54.00 | 43.39 | 6.39 | Average | --- | --- | 35.70 | 38.07 |

Note:

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

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

## 3.7. Band Edge Emissions Measurement

### 3.7.1. Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

| Frequencies (MHz) | Field Strength (micorvolts/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 |

### 3.7.2. Measuring Instruments and Setting

Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | 100 MHz |
| RB / VB (Emission in restricted band) | 1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average |
| RB / VB (Emission in non-restricted band) | 100 KHz /100 KHz for Peak |

### 3.7.3. Test Procedures

1. The test procedure is the same as section 3.5.3, only the frequency range investigated is limited to 100MHz around bandedges.
2. In case the emission is fail due to the used RB/VB is too wide, marker-delta method of FCC Public Notice DA00-705 will be followed.

### 3.7.4. Test Setup Layout

This test setup layout is the same as that shown in section 3.6.4.

### 3.7.5. Test Deviation

There is no deviation with the original standard.

### 3.7.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 3.7.7. Test Result of Band Edge and Fundamental Emissions

| Test date | Nov. 27, 2007 | Test Site | 03CH02-HY |
|---|---|---|---|
| Temperature | 26.1℃ | Humidity | 54% |
| Test Engineer | Murphy | Configurations | Channel 0, 78 |

**Channel 0**

| | Freq | Level | Over Limit | Limit Line | Read Level | Cable Loss | Remark | Ant Pos | Table Pos | Preamp Factor | Probe Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | | cm | deg | dB | dB |
| 1 | 2323.300 | 56.93 | -17.07 | 74.00 | 25.95 | 2.96 | Peak | --- | --- | 0.00 | 28.02 |
| 2 X | 2402.340 | 94.02 | | | 62.81 | 3.00 | Peak | --- | --- | 0.00 | 28.21 |
| 1 | 2338.690 | 44.54 | -9.46 | 54.00 | 13.51 | 2.96 | Average | --- | --- | 0.00 | 28.07 |
| 2 X | 2402.340 | 90.77 | | | 59.56 | 3.00 | Average | --- | --- | 0.00 | 28.21 |

**Channel 78**

| | Freq | Level | Over Limit | Limit Line | Read Level | Cable Loss | Remark | Ant Pos | Table Pos | Preamp Factor | Probe Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | | cm | deg | dB | dB |
| 1 X | 2480.620 | 93.94 | | | 62.43 | 3.06 | Peak | --- | --- | 0.00 | 28.45 |
| 2 | 2483.660 | 66.88 | -7.12 | 74.00 | 35.37 | 3.06 | Peak | --- | --- | 0.00 | 28.45 |
| 1 X | 2480.620 | 91.01 | | | 59.50 | 3.06 | Average | --- | --- | 0.00 | 28.45 |
| 2 | 2483.660 | 41.94 | -12.06 | 54.00 | 10.43 | 3.06 | Average | --- | --- | 0.00 | 28.45 |

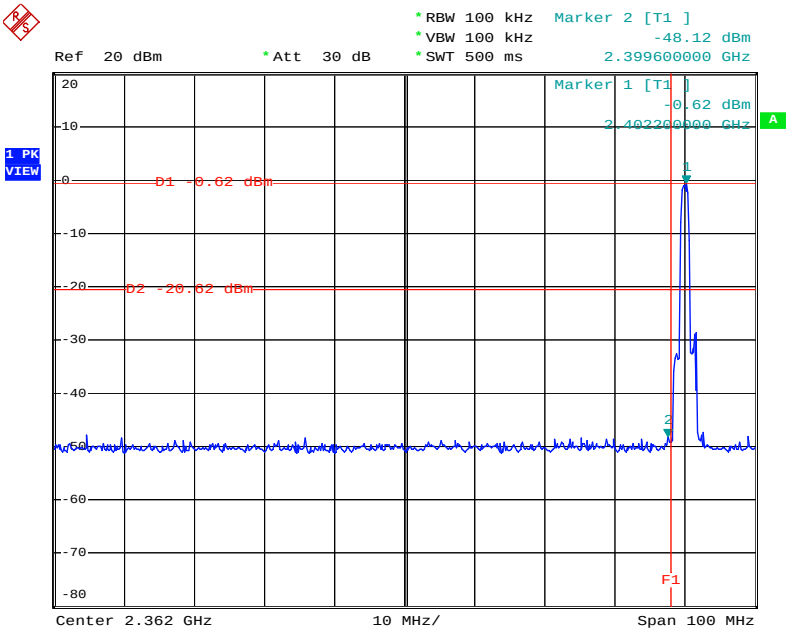
Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

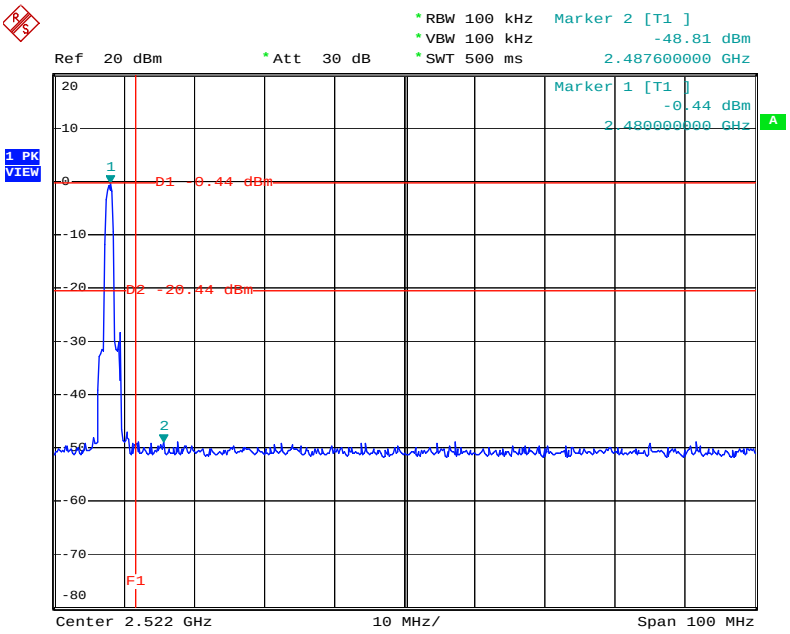
### For Emission not in Restricted Band

### Low Band Edge Plot on Channel 0 / 2402 MHz




Date: 7.DEC.2007 01:52:44

### High Band Edge Plot on Channel 78 / 2480 MHz




Date: 7.DEC.2007 01:54:58

## 3.8. Antenna Requirements

### 3.8.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. 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 provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

### 3.8.2. Antenna Connector Construction

Please refer to section 2.2 in this test report; antenna connector complied with the requirements.

# 4. LIST OF MEASURING EQUIPMENTS

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|---|---|---|---|---|---|---|
| EMC Receiver | R&S | ESCS 30 | 100359 | 9kHz – 2.75GHz | Mar. 01, 2007 | Conduction (CO04-HY) |
| LISN | MessTec | NNB-2/16Z | 99079 | 9kHz – 30MHz | Mar. 31, 2007 | Conduction (CO04-HY) |
| LISN (Support Unit) | EMCO | 3810/2NM | 9703-1839 | 9kHz – 30MHz | Mar. 22, 2007 | Conduction (CO04-HY) |
| RF Cable-CON | UTIFLEX | 3102-26886-4 | CB049 | 9kHz – 30MHz | Apr. 20, 2007 | Conduction (CO04-HY) |
| ISN | SCHAFFNER | ISN T400 | 21653 | 9kHz –30MHz | May 09, 2007 | Conduction (CO04-HY) |
| EMI Filter | LINDGREN | LRE-2030 | 2651 | < 450 Hz | N/A | Conduction (CO04-HY) |
| Isolation Transformer | Erika Fiedler OHG | D-65396 Walluf | 58 | 45MHz-2.15GHz | N/A | Conduction (CO04-HY) |
| 3m Semi Anechoic Chamber | SIDT FRANKONIA | SAC-3M | 03CH02-HY | 30 MHz - 1 GHz 3m | May 14, 2007 | Radiation (03CH02-HY) |
| Amplifier | ADVANTEST | BB525C | CH300001 | 9 kHz - 2 GHz | Dec. 05, 2007 | Radiation (03CH02-HY) |
| Spectrum Analyzer | R&S | FSP40 | 100305/040 | 9 kHz - 40GHz | Dec. 15, 2006 | Radiation (03CH02-HY) |
| Receiver | SCHAFFNER | SCR3501 | 416 | 9 kHz - 1 GHz | Feb. 15, 2007 | Radiation (03CH02-HY) |
| Bilog Antenna | SCHAFFNER | CBL61128 | 2723 | 30 MHz - 2 GHz | Nov. 28, 2007 | Radiation (03CH02-HY) |
| Turn Table | HD | DS 420 | 420/649/00 | 0 - 360 degree | N/A | Radiation (03CH02-HY) |
| Antenna Mast | HD | MA 240 | 240/559/00 | 1 m - 4 m | N/A | Radiation (03CH02-HY) |
| RF Cable-R03m | Jye Bao | RG142 | CB020 | 30 MHz - 1 GHz | Dec. 08, 2007 | Radiation (03CH02-HY) |
| Amplifier | Agilent | 8449B | 3008A20373 | 1GHz – 26.5 GHz | Jul. 09, 2007 | Radiation (03CH02-HY) |
| Spectrum Analyzer | R&S | FSP30 | 100023 | 9kHz ~ 30GHz | Dec. 17, 2006 | Conducted (TH01-HY) |
| Power Meter | R&S | NRVS | 100444 | DC ~ 40GHz | Jun. 27, 2007 | Conducted (TH01-HY) |
| Power Sensor | R&S | NRV-Z51 | 100458 | DC ~ 30GHz | Jun. 27, 2007 | Conducted (TH01-HY) |
| Power Sensor | R&S | NRV-Z32 | 100057 | 30MHz ~ 6GHz | Jun. 27, 2007 | Conducted (TH01-HY) |
| DC Power Source | G.W. | GPC-6030D | C671845 | DC 1V ~ 60V | Mar. 03, 2007 | Conducted (TH01-HY) |
| Temp. and Humidity Chamber | KSON | THS-C3L | 612 | N/A | Oct. 01, 2007 | Conducted (TH01-HY) |
| RF CABLE-1m | Jye Bao | RG142 | CB034-1m | 20MHz ~ 7GHz | Dec. 01, 2007 | Conducted (TH01-HY) |
| RF CABLE-2m | Jye Bao | RG142 | CB035-2m | 20MHz ~ 1GHz | Dec. 01, 2007 | Conducted (TH01-HY) |
| Vector Signal Generator | R&S | SMU200A | 102098 | 100kHz ~ 6GHz | Nov. 13, 2007 | Conducted (TH01-HY) |
| Signal Generator | R&S | SMR40 | 100116 | 10MHz ~ 40GHz | Mar. 07, 2007 | Conducted (TH01-HY) |

Note: Calibration Interval of instruments listed above is one year.

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|---|---|---|---|---|---|---|
| AC Power Source | HPC | HPA-500W | HPA-9100024 | AC 0 ~ 300V | May 04, 2007* | Conducted (TH01-HY) |

Note: Calibration Interval of instruments listed above is two year.

# 5. TEST LOCATION

| | | |
|---|---|---|
| SHIJR | ADD | : 6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C. |
| | TEL | : 886-2-2696-2468 |
| | FAX | : 886-2-2696-2255 |
| HWA YA | ADD | : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. |
| | TEL | : 886-3-327-3456 |
| | FAX | : 886-3-318-0055 |
| LINKOU | ADD | : No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C |
| | TEL | : 886-2-2601-1640 |
| | FAX | : 886-2-2601-1695 |
| DUNGHU | ADD | : No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C. |
| | TEL | : 886-2-2631-4739 |
| | FAX | : 886-2-2631-9740 |
| JUNGHE | ADD | : 7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C. |
| | TEL | : 886-2-8227-2020 |
| | FAX | : 886-2-8227-2626 |
| NEIHU | ADD | : 4Fl., No. 339, Hsin Hu 2nd Rd., Taipei 114, Taiwan, R.O.C. |
| | TEL | : 886-2-2794-8886 |
| | FAX | : 886-2-2794-9777 |
| JHUBEI | ADD | : No.8, Lane 728, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. |
| | TEL | : 886-3-656-9065 |
| | FAX | : 886-3-656-9085 |

# 6. TAF CERTIFICATE OF ACCREDITATION

Certificate No. : L1190-070110

財團法人全國認證基金會
Taiwan Accreditation Foundation

## Certificate of Accreditation

This is to certify that

**Sporton International Inc.**
**EMC & Wireless Communications Laboratory**
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

**is accredited in respect of laboratory**

| | | |
|---|---|---|
| **Accreditation Criteria** | : | ISO/IEC 17025:2005 |
| **Accreditation Number** | : | 1190 |
| **Originally Accredited** | : | December 15, 2003 |
| **Effective Period** | : | January 10, 2007 to January 09, 2010 |
| **Accredited Scope** | : | Testing Field, see described in the Appendix |
| **Specific Accreditation Program** | : | Accreditation Program for Designated Testing Laboratory for Commodities Inspection<br>Accreditation Program for Telecommunication Equipment Testing Laboratory |

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : January 10, 2007

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The Appendix forms an integral part of this Certificate, which shall be invalid when used without the Appendix.