

FCC TEST REPORT

REPORT NO.: RF960320L12

MODEL NO.: DUB-1210

RECEIVED: Mar. 27, 2007

TESTED: Mar. 27 ~ Apr. 18, 2007

ISSUED: Apr. 23, 2007

APPLICANT: D-Link Corporation

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92708, U.S.A.

ISSUED BY: Advance Data Technology Corporation

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Taiwan, R.O.C.

TEST LOCATION: No. 19, Hwa Ya 2nd Rd., Kueishan, Taoyuan,
Taiwan, R.O.C.

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1 CERTIFICATION

PRODUCT: D-Link UWB Dongle DUB-1210 A1
MODEL: DUB-1210
BRAND: D-Link
APPLICANT: D-Link Corporation
TESTED: Mar. 27 ~ Apr. 18, 2007
TEST SAMPLE: ENGINEERING SAMPLE
STANDARDS: **FCC Part 15, Subpart F (Section 15.519)**
ANSI C63.4-2003

The above equipment (model: DUB-1210) have been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Rennie Wang , **DATE:** Apr. 23, 2007
Rennie Wang

TECHNICAL
ACCEPTANCE : Long Chen , **DATE:** Apr. 23, 2007
Responsible for RF Long Chen

APPROVED BY : Gary Chang , **DATE:** Apr. 23, 2007
Gary Chang / Supervisor

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC Part 15, Subpart F | | | |
|--|---|--------|--|
| Standard Section | Test Type and Limit | Result | REMARK |
| 15.207 | AC Power Conducted Emission | PASS | Meet the requirement of limit. Minimum passing margin is -13.54dB at 0.173MHz. |
| 15.519(b) | UWB Bandwidth | PASS | Meet the requirement of limit. |
| 15.209 15.519(c) | Radiated Emissions | PASS | Meet the requirement of limit. Minimum passing margin is -3.52dB at 3432.00MHz. |
| 15.209 15.519(d) | Radiated Emissions in GPS Band | PASS | Meet the requirement of limit. Minimum passing margin is -33.79dB at 1188.00MHz. |
| 15.519(e) | Peak Emissions within a 50MHz Bandwidth | PASS | Meet the requirement of limit. Minimum passing margin is -2.41dB at 3504.00MHz. |

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4:

| MEASUREMENT | FREQUENCY | UNCERTAINTY |
|---------------------|------------------|-------------|
| Conducted emissions | 9kHz~30MHz | 2.44 dB |
| Radiated emissions | 30MHz ~ 200MHz | 3.71 dB |
| | 200MHz ~ 1000MHz | 3.73 dB |
| | 1GHz ~ 18GHz | 2.26 dB |
| | 18GHz ~ 40GHz | 1.94 dB |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

| | |
|------------------------------|---|
| PRODUCT | D-Link UWB Dongle DUB-1210 A1 |
| MODEL NO. | DUB-1210 |
| FCC ID | KA2UB1210A1 |
| POWER SUPPLY | 5.0Vdc from host equipment |
| MODULATION TECHNOLOGY | MOFDM |
| FREQUENCY RANGE | 3.1 to 4.8GHz (Supporting up to 3 MBOA sub-bands, 528MHz each) |
| MAXIMUM OUTPUT POWER | -26.85dBm (68.35 dBuV/m) |
| ANTENNA TYPE | Printed antenna with 2dBi gain |
| I/O PORTS | USB |
| DATA CABLE | 0.15m shielded USB cable without core |
| ASSOCIATED DEVICES | NA |

NOTE:

The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

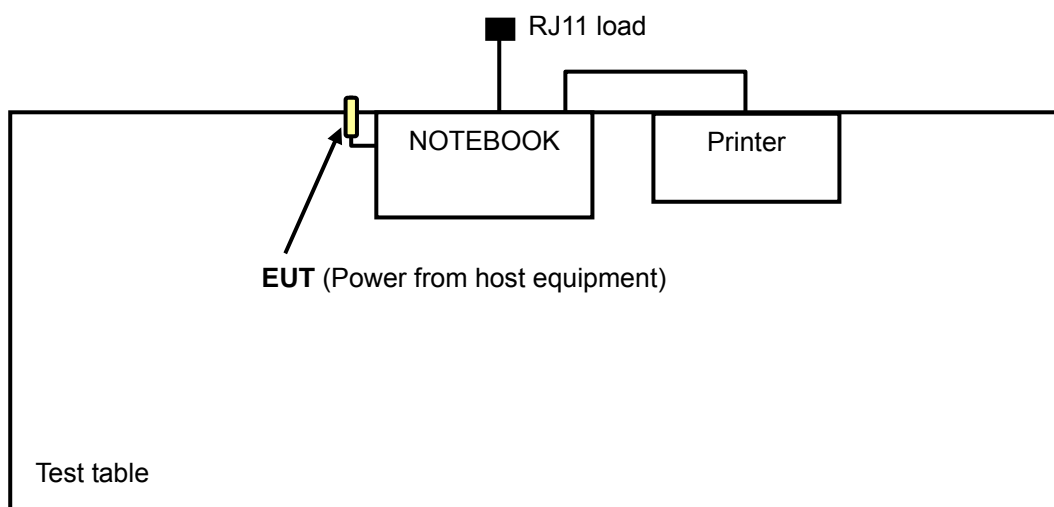
3.2 DESCRIPTION OF TEST MODES

Four transmission modes are provided to this EUT.

| MODE | SUB-BAND | FREQUENCY (MHZ) |
|------|----------|------------------|
| 1 | 1 | 3432 |
| 2 | 2 | 3960 |
| 3 | 3 | 4488 |
| 4 | 1, 2, 3 | 3432, 3960, 4488 |

NOTE: After pre-testing each mode, the combination mode (sub-band 1, 2, 3) was the worst situation and only the data was presented in the following sections.

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

| EUT configure mode | Applicable to | | | | | Description |
|--------------------------|---------------|-------|-------|----|----|------------------|
| | PLC | RE<1G | RE≥1G | UB | PE | |
| - | √ | √ | √ | √ | √ | Sub-band 1, 2, 3 |

Where **PLC**: Power Line Conducted Emission
RE≥1G: Radiated Emission above 1GHz
PE: Peak Emission

RE<1G: Radiated Emission below 1GHz
UB:UBW Bandwidth

POWER LINE CONDUCTED EMISSION TEST:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT configure mode | Available Sub-band | Tested Sub-band | Modulation Technology |
|--------------------------|-----------------------|--------------------|--------------------------|
| - | 1 to 3 | 1, 2, 3 | MOFDM |

RADIATED EMISSION TEST (BELOW 960 MHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT configure mode | Available Sub-band | Tested Sub-band | Modulation Technology | Axis |
|--------------------------|-----------------------|--------------------|--------------------------|------|
| - | 1 to 3 | 1, 2, 3 | MOFDM | Z |

RADIATED EMISSION TEST (ABOVE 960 MHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT configure mode | Available Sub-band | Tested Sub-band | Modulation Technology | Axis |
|--------------------|--------------------|-----------------|-----------------------|------|
| - | 1 to 3 | 1, 2, 3 | MOFDM | Z |

UWB BANDWIDTH MEASUREMENT:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT configure mode | Available Sub-band | Tested Sub-band | Modulation Technology | Axis |
|--------------------|--------------------|-----------------|-----------------------|------|
| - | 1 to 3 | 1, 2, 3 | MOFDM | Z |

PEAK EMISSION MEASUREMENT

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT configure mode | Available Sub-band | Tested Sub-band | Modulation Technology | Axis |
|--------------------|--------------------|-----------------|-----------------------|------|
| - | 1 to 3 | 1, 2, 3 | MOFDM | Z |

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a UWB product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart F. (15.519)

ANSI C63.4-2003

THE EVOLUTION OF MODERN UWB TECHNOLOGY

All test items have been performed and recorded as per the above standards.

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| NO. | PRODUCT | BRAND | MODEL NO. | SERIAL NO. | FCC ID |
|-----|-------------------|-------|-----------|------------|------------------|
| 1 | NOTEBOOK COMPUTER | HP | nx6215 | CND5390CMP | FCC DoC Approved |
| 2 | PRINTER | EPSON | LQ-300+ | DCGY047265 | FCC DoC Approved |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|-----|---|
| 1 | RJ11 cable |
| 2 | 1.2m shielded cable |

NOTE: All power cords of the above support units are non-shielded (1.8m).

3.5 OPEARTIONAL LIMATIIONS

FCC 47 CFR Section 15.519(a)(1)

- (1) A UWB device operating under the provisions of this section shall transmit only when it is sending information to an associated receiver. The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting.

Client has been advised and showed on users manual.

FCC 47 CFR Section 15.519(a)(2)

- (2) The use of antennas mounted on outdoor structures, *e.g.*, antennas mounted on the outside of a building or on a telephone pole, or any fixed outdoors infrastructure is prohibited. Antennas may be mounted only on the hand held UWB device.

The antenna used in this product is Printed antenna

FCC 47 CFR Section 15.519(a)(3)

- (3) UWB devices operating under the provisions of this section may operate indoors or outdoors.

4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dBμV) | |
|-----------------------------|------------------------|----------|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 | 56 to 46 |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|----------------------------------|-------------|----------------|------------------|
| Test Receiver ROHDE & SCHWARZ | ESCS30 | 100288 | Sep. 25, 2007 |
| RF signal cable Woken | 5D-FB | Cable-HYCO3-01 | Jan. 06, 2008 |
| LISN ROHDE & SCHWARZ | ESH2-Z5 | 100100 | Jan. 08, 2008 |
| LISN ROHDE & SCHWARZ | ESH3-Z5 | 100311 | Jan. 16, 2008 |
| Software ADT | ADT_Cond_V3 | NA | NA |

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 2.
 3. The VCCI Site Registration No. is C-2047.

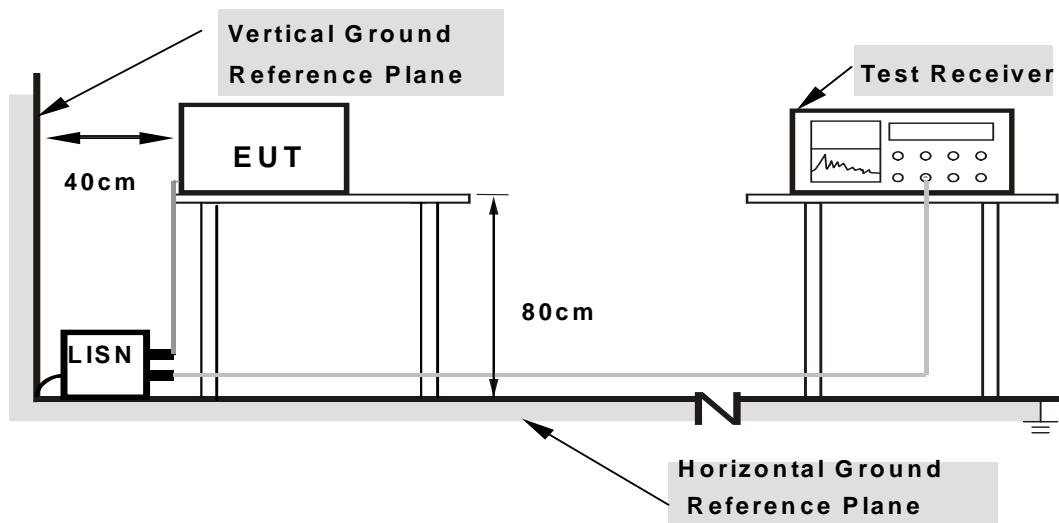
4.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under Limit - 20dB was not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

- Connected the EUT to the notebook and placed on a testing table.
- The notebook ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- The notebook sent "H" messages to its screen.
- The necessary accessories enable the system in full functions.

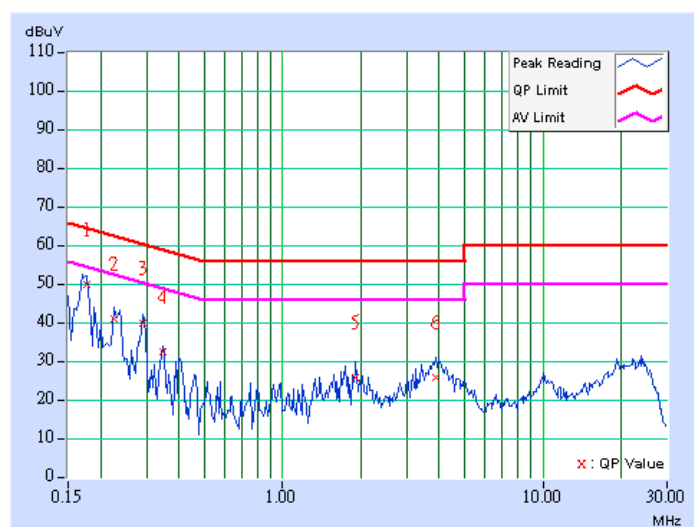
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-------------------------|----------------------|---------------|
| SUB-BAND | 1, 2, 3 | PHASE | Line 1 |
| MODULATION TECHNOLOGY | MOFDM | 6dB BANDWIDTH | 9 kHz |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 68%RH, 991hPa | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Morgan Chen | | |

| No | Freq. [MHz] | Corr. | Reading Value | | Emission Level | | Limit | | Margin | |
|----|----------------|--------|---------------|-----|----------------|-----|-----------|-------|--------|-----|
| | | Factor | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.177 | 0.10 | 49.89 | - | 49.99 | - | 64.61 | 54.61 | -14.62 | - |
| 2 | 0.224 | 0.10 | 40.66 | - | 40.76 | - | 62.66 | 52.66 | -21.90 | - |
| 3 | 0.291 | 0.10 | 39.82 | - | 39.92 | - | 60.51 | 50.51 | -20.59 | - |
| 4 | 0.345 | 0.10 | 32.46 | - | 32.56 | - | 59.07 | 49.07 | -26.51 | - |
| 5 | 1.914 | 0.21 | 25.79 | - | 26.00 | - | 56.00 | 46.00 | -30.00 | - |
| 6 | 3.863 | 0.28 | 25.77 | - | 26.05 | - | 56.00 | 46.00 | -29.95 | - |

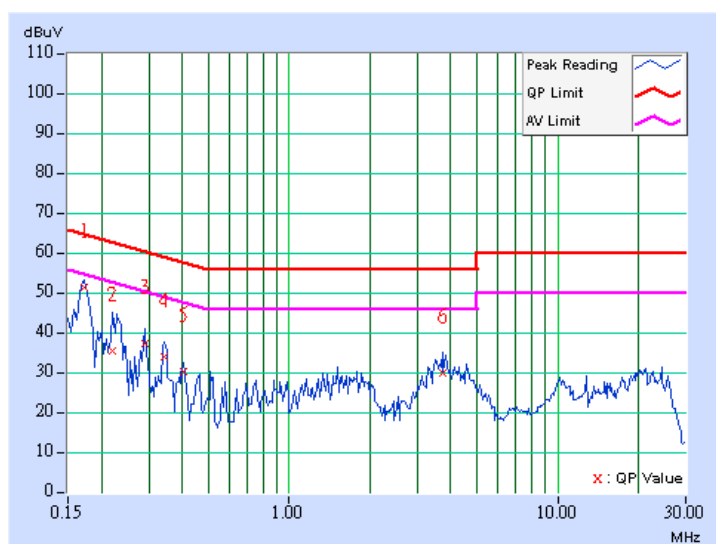
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-------------------------|----------------------|---------------|
| SUB-BAND | 1, 2, 3 | PHASE | Line 2 |
| MODULATION TECHNOLOGY | MOFDM | 6dB BANDWIDTH | 9 kHz |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 68%RH, 991hPa | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Morgan Chen | | |

| No | Freq. | Corr. | Reading Value | | Emission Level | | Limit | | Margin | |
|----|-------|--------|---------------|-----|----------------|-----|-----------|-------|--------|-----|
| | | Factor | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.173 | 0.10 | 51.15 | - | 51.25 | - | 64.79 | 54.79 | -13.54 | - |
| 2 | 0.220 | 0.10 | 35.21 | - | 35.31 | - | 62.81 | 52.81 | -27.50 | - |
| 3 | 0.291 | 0.10 | 37.18 | - | 37.28 | - | 60.51 | 50.51 | -23.23 | - |
| 4 | 0.341 | 0.10 | 33.98 | - | 34.08 | - | 59.17 | 49.17 | -25.09 | - |
| 5 | 0.404 | 0.10 | 30.15 | - | 30.25 | - | 57.77 | 47.77 | -27.52 | - |
| 6 | 3.711 | 0.27 | 29.78 | - | 30.05 | - | 56.00 | 46.00 | -25.95 | - |

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



4.2 RADIATED EMISSION MEASUREMENT (FOR 15.519 (c))

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The radiated emissions at or below 960MHz from a device operating under the provisions of this section shall not exceed the emission levels in Section 15.209.

| FREQUENCIES (MHz) | FIELD STRENGTH (mV/m) | MEASUREMENT DISTANCE (m) |
|-------------------|-----------------------|--------------------------|
| 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 |

NOTE: 1. The lower limit shall apply at the transition frequencies.

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

The radiated emissions above 960MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1MHz:

| FREQUENCY IN MHz | EIRP IN dBm | dBuV/m@3m | dBuV/m@1m |
|------------------|-------------|-----------|-----------|
| 960 ~ 1,610 | -75.3 | 19.9 | 29.44 |
| 1,610 ~ 1,990 | -63.3 | 31.9 | 41.44 |
| 1,990 ~ 3,100 | -61.3 | 33.9 | 43.44 |
| 3,100 ~ 10,600 | -41.3 | 53.9 | 63.44 |
| Above 10600 | -61.3 | 33.9 | 43.44 |

Transfer rules follow 15.521(g),15.31(f)(1).

15.521(c) Emissions from digital circuitry used to enable the operation of the UWB transmitter shall comply with the limits in Section 15.209 of this chapter, rather than the limits specified in this subpart.

NOTE: Use conducted measurement to determine emissions is from digital circuitry or not.

Emissions from digital circuitry follow 15.209 else 15.519

The radiated emissions from a device operating under the provisions of this section shall not exceed the emission levels in Section 15.209.

| FREQUENCY IN MHz | dBuV/m@3m | dBuV/m@1m |
|------------------|------------|------------|
| | Quasi Peak | Quasi Peak |
| 216 ~ 960 | 46.00 | 55.54 |
| 960 ~ 1000 | 54.00 | 63.54 |

| FREQUENCY IN MHz | dBuV/m@3m | | dBuV/m@1m | |
|------------------|-----------|---------|-----------|---------|
| Above 1000 | Peak | Average | Peak | Average |
| | 74.00 | 54.00 | 83.54 | 63.54 |

4.2.2 INSTRUMENT SETUP VALUE AND MEASUREMENT DISTANCE

| FREQUENCY RANGE | RESOLUTION BANDWIDTH | VIDEO BANDWIDTH | DETECTOR | MEASUREMENT DISTANCE |
|-----------------|----------------------|-----------------|------------|----------------------|
| Below 960MHz | 120kHz | 120kHz | Quasi Peak | 3 meters |
| Above 960MHz | 1MHz | 3MHz | RMS | 1 meter |

4.2.3 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|-------------------|-------------|------------------|
| Test Receiver ROHDE & SCHWARZ | ESI7 | 100033 | May 22, 2007 |
| Spectrum Analyzer ROHDE & SCHWARZ | FSP40 | 100025 | Oct. 05, 2007 |
| BILOG Antenna SCHWARZBECK | VULB9168 | 9168-160 | May 31, 2007 |
| HORN Antenna SCHWARZBECK | 9120D | 9120D-209 | Jun. 27, 2007 |
| HORN Antenna SCHWARZBECK | BBHA 9170 | BBHA9170243 | Dec. 28, 2007 |
| Preamplifier Agilent | 8447D | 2944A10633 | Oct. 26, 2007 |
| Preamplifier Agilent | 8449B | 3008A01964 | Oct. 26, 2007 |
| RF signal cable HUBER+SUHNNER | SUCOFLEX 104 | 238137/4 | Dec. 11, 2007 |
| RF signal cable HUBER+SUHNNER | SUCOFLEX 104 | 233233/4 | Nov. 14, 2007 |
| Software ADT. | ADT_Radiated_V7.6 | NA | NA |
| Antenna Tower inn-co GmbH | MA 4000 | 013303 | NA |
| Antenna Tower Controller inn-co GmbH | CO2000 | 017303 | NA |
| Turn Table ADT. | TT100. | TT93021703 | NA |
| Turn Table Controller ADT. | SC100. | SC93021703 | NA |

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 3.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The VCCI Site Registration No. is R-237.
5. The IC Site Registration No. is IC3789B-3.

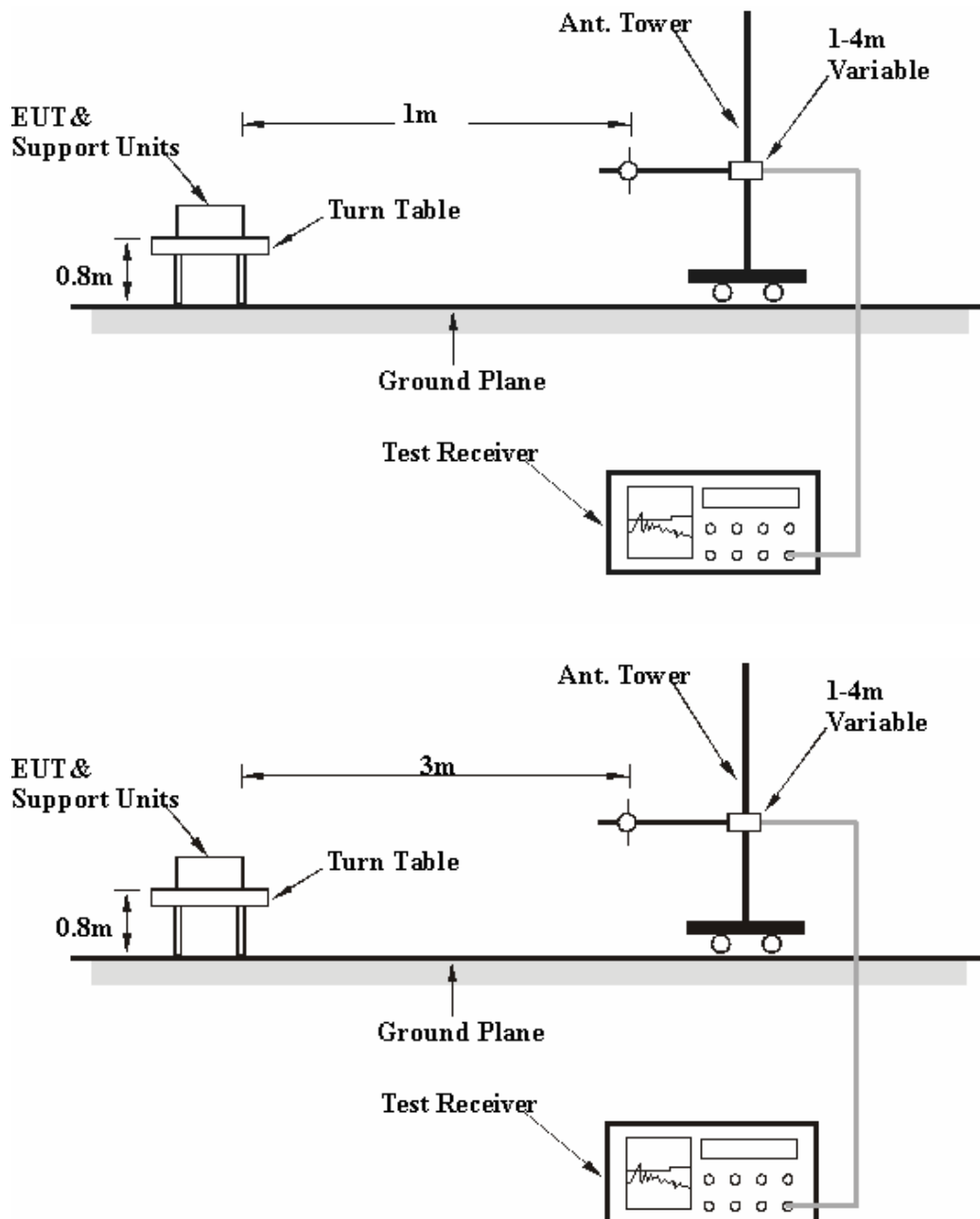
4.2.4 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 1, 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

4.2.5 DEVIATION FROM TEST STANDARD

No deviation

4.2.6 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.2.7 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.8 TEST RESULTS

RADIATED BELOW 960MHz WORST-CASE DATA

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-------------------------|----------------------|---------------|
| SUB-BAND | 1, 2, 3 | FREQUENCY RANGE | Below 960MHz |
| MODULATION TECHNOLOGY | MOFDM | DETECTOR FUNCTION | Quasi-Peak |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 68%RH, 991hPa | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Dean Wang | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 113.87 | 32.34 QP | 43.50 | -11.16 | 1.50 H | 295 | 20.45 | 11.89 |
| 2 | 199.60 | 32.34 QP | 43.50 | -11.16 | 1.00 H | 10 | 21.05 | 11.29 |
| 3 | 283.47 | 33.85 QP | 46.00 | -12.15 | 1.00 H | 49 | 19.10 | 14.75 |
| 4 | 330.06 | 34.76 QP | 46.00 | -11.24 | 1.00 H | 58 | 18.82 | 15.94 |
| 5 | 600.30 | 28.69 QP | 46.00 | -17.31 | 1.25 H | 88 | 6.23 | 22.46 |
| 6 | 732.63 | 30.01 QP | 46.00 | -15.99 | 1.25 H | 145 | 4.86 | 25.14 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 113.87 | 29.27 QP | 43.50 | -14.23 | 1.25 V | 22 | 17.38 | 11.89 |
| 2 | 249.92 | 29.03 QP | 46.00 | -16.97 | 1.50 V | 118 | 15.54 | 13.49 |
| 3 | 466.11 | 29.20 QP | 46.00 | -16.80 | 1.25 V | 166 | 9.51 | 19.69 |
| 4 | 486.61 | 31.21 QP | 46.00 | -14.79 | 1.25 V | 193 | 11.16 | 20.05 |
| 5 | 734.49 | 32.69 QP | 46.00 | -13.31 | 1.50 V | 163 | 7.49 | 25.20 |
| 6 | 864.95 | 31.24 QP | 46.00 | -14.76 | 1.25 V | 148 | 4.09 | 27.15 |

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.

RADIATED ABOVE 960MHz DATA

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-------------------------|----------------------|----------------|
| SUB-BAND | 1, 2, 3 | FREQUENCY RANGE | 960MHz ~ 40GHz |
| MODULATION TECHNOLOGY | MOFDM | DETECTOR FUNCTION | RMS |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 60%RH, 991hPa | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Dean Wang | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 1 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 1848.00 | 34.21 | 41.44 | -7.23 | 1.05 H | 236 | 3.77 | 30.44 |
| 2 | 1920.00 | 33.28 | 41.44 | -8.16 | 1.02 H | 246 | 2.81 | 30.47 |
| 3 | 2112.00 | 33.51 | 43.44 | -9.93 | 1.07 H | 221 | 2.45 | 31.06 |
| 4 | 2907.00 | 35.21 | 43.44 | -8.23 | 1.00 H | 126 | 1.46 | 33.75 |
| 5 | 3168.00 | 52.45 | 63.44 | -10.99 | 1.06 H | 203 | 18.07 | 34.38 |
| 6 | 3432.00 | 48.72 | 63.44 | -14.72 | 1.00 H | 125 | 13.52 | 35.20 |
| 7 | 3960.00 | 48.03 | 63.44 | -15.41 | 1.00 H | 65 | 11.10 | 36.93 |
| 8 | 4488.00 | 47.11 | 63.44 | -16.33 | 1.00 H | 106 | 9.15 | 37.97 |
| 9 | 6864.00 | 46.04 | 63.44 | -17.40 | 1.00 H | 21 | 1.28 | 44.76 |
| 10 | 7920.00 | 48.09 | 63.44 | -15.35 | 1.00 H | 126 | 1.31 | 46.78 |
| 11 | 8976.00 | 48.59 | 63.44 | -14.85 | 1.00 H | 105 | 1.30 | 47.29 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 1 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 1848.00 | 35.35 | 41.44 | -6.09 | 1.02 V | 16 | 4.19 | 31.16 |
| 2 | 1920.00 | 36.60 | 41.44 | -4.84 | 1.00 V | 2 | 5.33 | 31.27 |
| 3 | 2112.00 | 36.16 | 43.44 | -7.28 | 1.00 V | 65 | 4.31 | 31.85 |
| 4 | 2907.00 | 39.65 | 43.44 | -3.79 | 1.00 V | 123 | 5.09 | 34.56 |
| 5 | 3168.00 | 55.83 | 63.44 | -7.61 | 1.03 V | 336 | 20.72 | 35.11 |
| 6 | 3432.00 | 59.92 | 63.44 | -3.52 | 1.19 V | 0 | 24.25 | 35.67 |
| 7 | 3960.00 | 59.31 | 63.44 | -4.13 | 1.00 V | 25 | 21.80 | 37.51 |
| 8 | 4488.00 | 58.45 | 63.44 | -4.99 | 1.00 V | 29 | 19.50 | 38.96 |
| 9 | 6864.00 | 46.58 | 63.44 | -16.86 | 1.00 V | 126 | 0.48 | 46.10 |
| 10 | 7920.00 | 49.33 | 63.44 | -14.11 | 1.00 V | 256 | 1.82 | 47.51 |
| 11 | 8976.00 | 48.82 | 63.44 | -14.62 | 1.00 V | 286 | 0.82 | 48.00 |

RMARKS: 1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

EMISSIONS FROM DIGITAL CIRCUITRY

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-------------------------|----------------------|----------------|
| SUB-BAND | 1, 2, 3 | FREQUENCY RANGE | Above 1GHz |
| MODULATION TECHNOLOGY | MOFDM | DETECTOR FUNCTION | Peak / Average |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH, 991hPa | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Dean Wang | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 1 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 1056.00 | 46.88 PK | 83.54 | -36.66 | 1.00 H | 201 | 17.67 | 29.21 |
| 1 | 1056.00 | 41.56 AV | 63.54 | -21.98 | 1.00 H | 201 | 12.35 | 29.21 |
| 2 | 1122.00 | 44.86 PK | 83.54 | -38.68 | 1.00 H | 187 | 15.49 | 29.37 |
| 2 | 1122.00 | 32.85 AV | 63.54 | -30.69 | 1.00 H | 187 | 3.48 | 29.37 |
| 3 | 1188.00 | 38.01 PK | 83.54 | -45.53 | 1.02 H | 195 | 8.44 | 29.57 |
| 3 | 1188.00 | 28.35 AV | 63.54 | -35.19 | 1.02 H | 195 | -1.22 | 29.57 |
| 4 | 1320.00 | 42.63 PK | 83.54 | -40.91 | 1.00 H | 182 | 12.76 | 29.87 |
| 4 | 1320.00 | 29.95 AV | 63.54 | -33.59 | 1.00 H | 182 | 0.08 | 29.87 |
| 5 | 1584.00 | 38.58 PK | 83.54 | -44.96 | 1.00 H | 65 | 8.22 | 30.36 |
| 5 | 1584.00 | 29.14 AV | 63.54 | -34.40 | 1.00 H | 65 | -1.22 | 30.36 |

REMARKS:

1. Emission source vs. possible corresponding spurious:

| Emission Source | Frequency (MHz) | Possible corresponding spurious CW tones (MHz) (X times harmonic) |
|-----------------|-----------------|--|
| PLL | 1056.00 | 1056 (x1) |
| PLL | 528.00 | 1056 (x2), 1584 (x3) |
| DLL | 330.00 | 1320 (x4) |
| PLL | 264.00 | 1056 (x4) |
| XTAL of PHY | 66.00 | 1056 (x16), 1122 (x17), 1188 (x18) |

2. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)

3. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)

4. The other emission levels were very low against the limit.

5. Margin value = Emission level – Limit value.

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-------------------------|----------------------|----------------|
| SUB-BAND | 1, 2, 3 | FREQUENCY RANGE | Above 1GHz |
| MODULATION TECHNOLOGY | MOFDM | DETECTOR FUNCTION | Peak / Average |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH, 991hPa | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Dean Wang | | |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 1 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 1056.00 | 50.49 PK | 83.54 | -33.05 | 1.00 V | 173 | 21.28 | 29.21 |
| 1 | 1056.00 | 44.97 AV | 63.54 | -18.57 | 1.00 V | 173 | 15.76 | 29.21 |
| 2 | 1122.00 | 47.12 PK | 83.54 | -36.42 | 1.00 V | 185 | 17.75 | 29.37 |
| 2 | 1122.00 | 35.89 AV | 63.54 | -27.65 | 1.00 V | 185 | 6.52 | 29.37 |
| 3 | 1188.00 | 38.95 PK | 83.54 | -44.59 | 1.00 V | 26 | 9.38 | 29.57 |
| 3 | 1188.00 | 29.75 AV | 63.54 | -33.79 | 1.00 V | 26 | 0.18 | 29.57 |
| 4 | 1320.00 | 45.95 PK | 83.54 | -37.59 | 1.00 V | 172 | 16.08 | 29.87 |
| 4 | 1320.00 | 32.21 AV | 63.54 | -31.33 | 1.00 V | 172 | 2.34 | 29.87 |
| 5 | 1584.00 | 39.24 PK | 83.54 | -44.30 | 1.00 V | 65 | 8.88 | 30.36 |
| 5 | 1584.00 | 29.70 AV | 63.54 | -33.84 | 1.00 V | 65 | -0.66 | 30.36 |

REMARKS:

1. Emission source vs. possible corresponding spurious:

| Emission Source | Frequency (MHz) | Possible corresponding spurious CW tones (MHz) (X times harmonic) |
|-----------------|-----------------|--|
| PLL | 1056.00 | 1056 (x1) |
| PLL | 528.00 | 1056 (x2), 1584 (x3) |
| DLL | 330.00 | 1320 (x4) |
| PLL | 264.00 | 1056 (x4) |
| XTAL of PHY | 66.00 | 1056 (x16), 1122 (x17), 1188 (x18) |

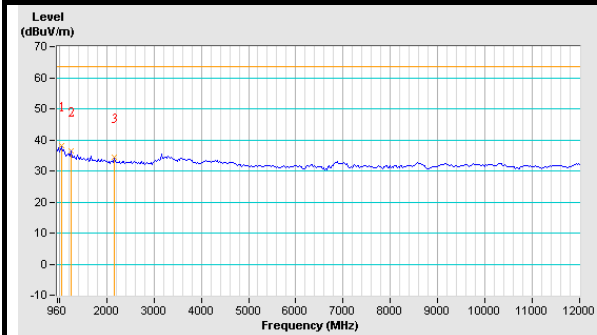
2. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)

3. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)

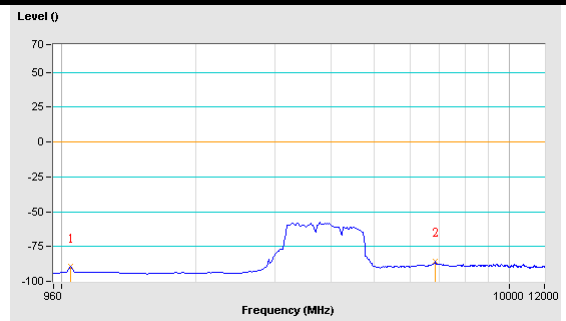
4. The other emission levels were very low against the limit.

5. Margin value = Emission level – Limit value.

TERMINATED ANTENNA PORT



CONDUCTED ANTENNA PORT



4.3 RADIATED EMISSION MEASUREMENT (FOR 15.519 (d))

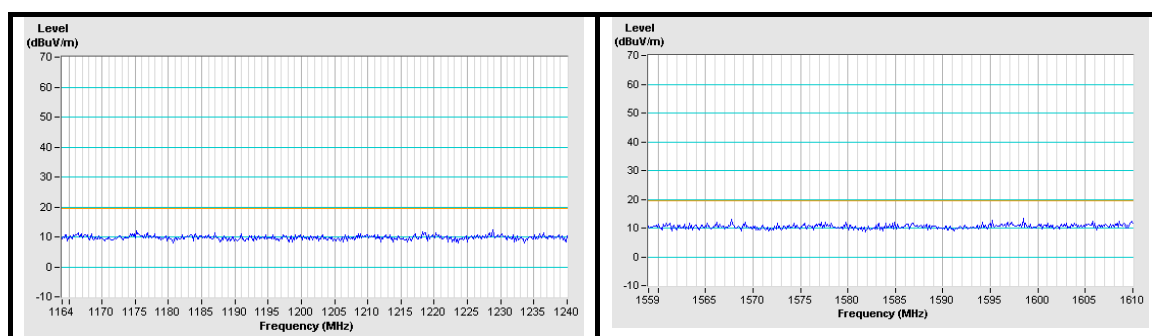
4.3.1 LIMITS OF RADIATED EMISSION MEASUREMENT

| FREQUENCY IN MHz | EIRP IN dBm | dBuV/m@3m | dBuV/m@1m |
|------------------|-------------|-----------|-----------|
| 1,164 ~ 1,240 | -85.3 | 9.9 | 19.44 |
| 1,559 ~ 1,610 | -85.3 | 9.9 | 19.44 |

Transfer rules follow 15.521(g), 15.31(f)(1).

- NOTE:** 1. 15.521(g) converted to a peak field strength level at 3 meters using $E(\text{dBuV/m}) = P(\text{dBmEIRP}) + 95.2$.
2. 15.31(f)(1) When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade, Measurement distance moves from 3m to 1m, Limit (1m) = Limit (3m) + $20\log(3/1) = \text{Limit (3m)} + 9.54$.

Instrument Noise Floor



15.521(c) Emissions from digital circuitry used to enable the operation of the UWB transmitter shall comply with the limits in Section 15.209 of this chapter, rather than the limits specified in this subpart.

- NOTE:** Use conducted measurement to determine emissions is from digital circuitry or not.
Emissions from digital circuitry follow 15.209 else 15.517

The radiated emissions above 1000MHz from a device operating under the provisions of this section shall not exceed the emission levels in Section 15.209.

| FREQUENCY IN MHz | dBuV/m@3m | | dBuV/m@1m | |
|------------------|-----------|---------|-----------|---------|
| | Peak | Average | Peak | Average |
| Above 1000 | 74.00 | 54.00 | 83.54 | 63.54 |

4.3.2 INSTRUMENT SETUP VALUE AND MEASUREMENT DISTANCE

UWB transmitters operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz:

| FREQUENCY RANGE | RESOLUTION BANDWIDTH | VIDEO BANDWIDTH | DETECTOR | MEASUREMENT DISTANCE |
|-----------------|----------------------|-----------------|----------|----------------------|
| 1,164 ~ 1,240 | *10kHz | 30kHz | RMS | 1 meter |
| 1,559 ~ 1,610 | *10kHz | 30kHz | RMS | 1 meter |

NOTE: *reference The Evolution of Modern UWB Technology.

4.3.3 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|-------------------|-------------|------------------|
| Test Receiver ROHDE & SCHWARZ | ESI7 | 100033 | May 22, 2007 |
| Spectrum Analyzer ROHDE & SCHWARZ | FSP40 | 100025 | Oct. 05, 2007 |
| BILOG Antenna SCHWARZBECK | VULB9168 | 9168-160 | May 31, 2007 |
| HORN Antenna SCHWARZBECK | 9120D | 9120D-209 | Jun. 27, 2007 |
| HORN Antenna SCHWARZBECK | BBHA 9170 | BBHA9170243 | Dec. 28, 2007 |
| Preamplifier Agilent | 8447D | 2944A10633 | Oct. 26, 2007 |
| Preamplifier Agilent | 8449B | 3008A01964 | Oct. 26, 2007 |
| RF signal cable HUBER+SUHNNER | SUCOFLEX 104 | 238137/4 | Dec. 11, 2007 |
| RF signal cable HUBER+SUHNNER | SUCOFLEX 104 | 233233/4 | Nov. 14, 2007 |
| Software ADT. | ADT_Radiated_V7.6 | NA | NA |
| Antenna Tower inn-co GmbH | MA 4000 | 013303 | NA |
| Antenna Tower Controller inn-co GmbH | CO2000 | 017303 | NA |
| Turn Table ADT. | TT100. | TT93021703 | NA |
| Turn Table Controller ADT. | SC100. | SC93021703 | NA |

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 3.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The VCCI Site Registration No. is R-237.
5. The IC Site Registration No. is IC3789B-3.

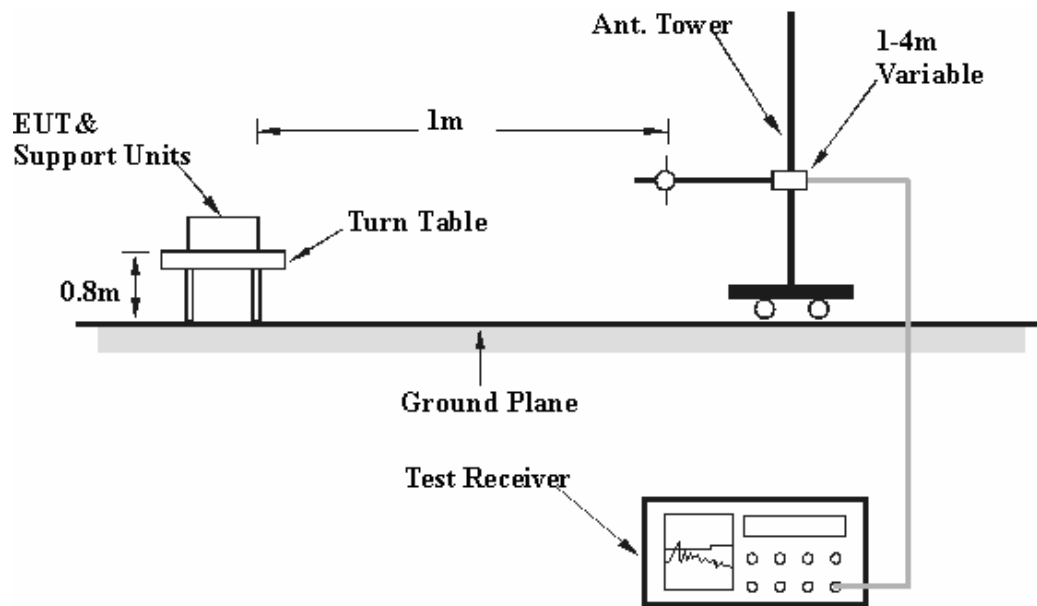
4.3.4 TEST PROCEDURES

- e. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 1 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- f. The EUT was set 1 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- g. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- h. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

4.3.5 DEVIATION FROM TEST STANDARD

No deviation

4.3.6 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.3.7 EUT OPERATING CONDITIONS

Same as 4.1.6

4.3.8 TEST RESULTS

EMISSIONS FROM DIGITAL CIRCUITRY

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|-----------------------|---------------|--------------------------|-------------------------|
| SUB-BAND | 1, 2, 3 | FREQUENCY RANGE | Above 1GHz |
| MODULATION TECHNOLOGY | MOFDM | DETECTOR FUNCTION | Peak / Average |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | ENVIRONMENTAL CONDITIONS | 25deg. C, 60%RH, 991hPa |
| TESTED BY | Dean Wang | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 1 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 1188.00 | 38.01 PK | 83.54 | -45.53 | 1.02 H | 195 | 8.44 | 29.57 |
| 1 | 1188.00 | 28.35 AV | 63.54 | -35.19 | 1.02 H | 195 | -1.22 | 29.57 |
| 2 | 1584.00 | 38.58 PK | 83.54 | -44.96 | 1.00 H | 65 | 8.22 | 30.36 |
| 2 | 1584.00 | 29.14 AV | 63.54 | -34.40 | 1.00 H | 65 | -1.22 | 30.36 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 1 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 1188.00 | 38.95 PK | 83.54 | -44.59 | 1.00 V | 26 | 9.38 | 29.57 |
| 1 | 1188.00 | 29.75 AV | 63.54 | -33.79 | 1.00 V | 26 | 0.18 | 29.57 |
| 2 | 1584.00 | 39.24 PK | 83.54 | -44.30 | 1.00 V | 65 | 8.88 | 30.36 |
| 2 | 1584.00 | 29.70 AV | 63.54 | -33.84 | 1.00 V | 65 | -0.66 | 30.36 |

REMARKS:

1. Emission source vs. possible corresponding spurious:

| Emission Source | Frequency (MHz) | Possible corresponding spurious CW tones (MHz) (X times harmonic) |
|-----------------|-----------------|---|
| PLL | 528.00 | 1584 (x3) |
| XTAL of PHY | 66.00 | 1188 (x18) |

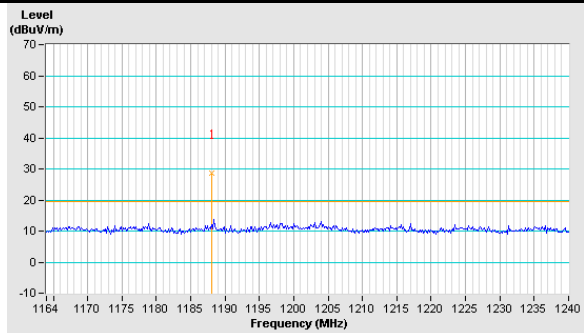
2. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)

3. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)

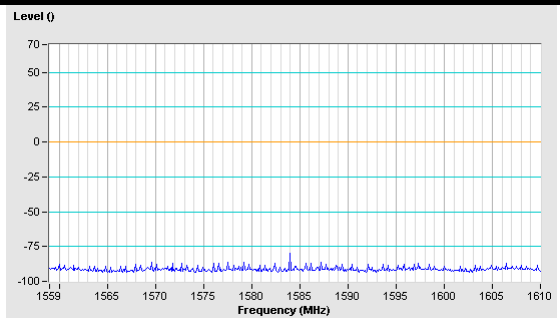
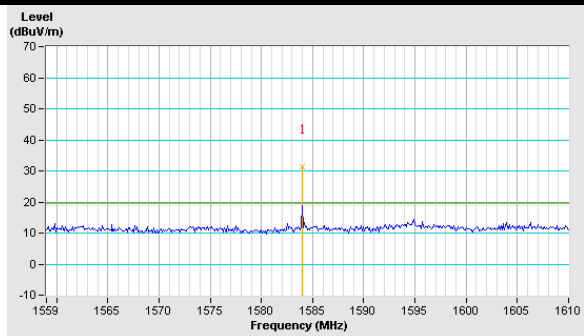
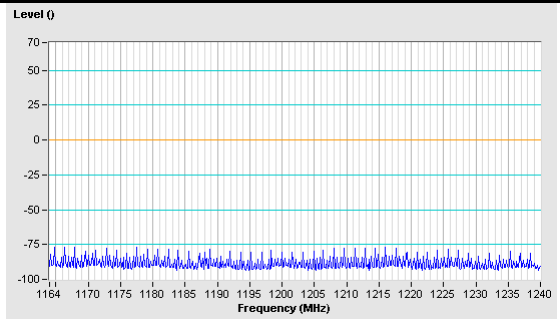
4. The other emission levels were very low against the limit.

5. Margin value = Emission level – Limit value.

TERMINATED ANTENNA PORT



CONDUCTED ANTENNA PORT



4.4 UWB BANDWIDTH MEASUREMENT

4.4.1 LIMITS OF UWB BANDWIDTH MEASUREMENT

The UWB bandwidth of a UWB system operating under the provisions of this section must be contained between 3100 MHz and 10,600 MHz.

4.4.2 INSTRUMENT SETUP VALUE AND MEASUREMENT DISTANCE

| FREQUENCY RANGE | RESOLUTION BANDWIDTH | VIDEO BANDWIDTH | DETECTOR | MEASUREMENT DISTANCE |
|-----------------|----------------------|-----------------|----------|----------------------|
| 3,100 ~ 10,600 | 1MHz | 3MHz | Peak | 3 meters |

4.4.3 TEST INSTRUMENT

Same as Item 4.2.3

4.4.4 TEST PROCEDURE

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The Spectrum Analyzer system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- The UWB Bandwidth is measured at the 10 dB point (F_L , F_H).

4.4.5 DEVIATION FROM TEST STANDARD

No deviation

4.4.6 TEST SETUP

Same as Item 4.2.6

4.4.7 EUT OPERATING CONDITIONS

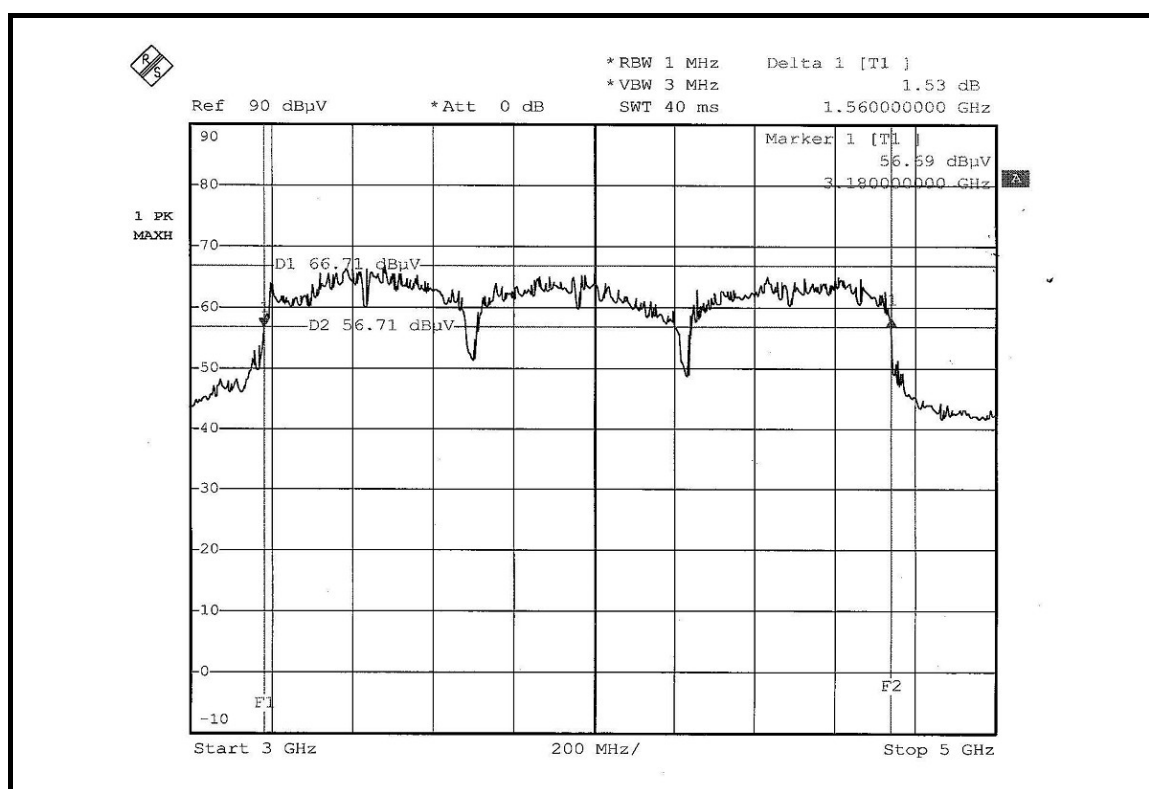
The software provided by client to enable the EUT under transmission condition continuously.

4.4.8 TEST RESULTS

| | | | |
|------------------------------|---------------|---------------------------------|------------------------|
| MODULATION TECHNOLOGY | MOFDM | ENVIRONMENTAL CONDITIONS | 26deg.C, 66%RH, 991hPa |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | TESTED BY | Morgan Chen |

| F_L (MHz) | F_H (MHz) | $F_C = (F_L + F_H)/2$ (MHz) | LIMIT (MHz) | PASS/FAIL |
|-------------|-------------|-----------------------------|----------------------------|-----------|
| 3180.00 | 4740.00 | 3960.00 | Between 3100.00 ~ 10600.00 | PASS |

UWB Bandwidth = $F_H - F_L = 1560\text{MHz}$



4.5 PEAK EMISSION WITHIN A 50MHz BANDWIDTH

4.5.1 LIMITS OF PEAK EMISSION

The Maximum Peak Output Power Measurement is 0dBm(RBW=50MHz)

If a resolution bandwidth other than 50 MHz is Employed, the peak EIRP limit shall be $20 \log (RBW/50)$ dBm where RBW is the resolution bandwidth in megahertz that is employed. The resolution bandwidth used to make the peak measurement was 3 MHz, resulting in a limit of -24.44dBm

This may be converted to a peak field strength level at 3 meters using

$$E(\text{dBuV/m}) = P(\text{dBm EIRP}) + 95.2 = -24.44 + 95.2 = 70.76.$$

4.5.2 INSTRUMENT SETUP VALUE AND MEASUREMENT DISTANCE

RADIATED EMISSIONS 15.519 (e):

| FREQUENCY RANGE | RESOLUTION BANDWIDTH | VIDEO BANDWIDTH | DETECTOR | MEASUREMENT DISTANCE |
|-----------------|----------------------|-----------------|----------|----------------------|
| 3,100 ~ 10,600 | 3MHz | 10MHz | *Peak | 3 meters |

NOTE: *reference The Evolution of Modern UWB Technology

4.5.3 TEST INSTRUMENTS

Same as 4.2.3

4.5.4 TEST PROCEDURE

Same as 4.2.4

4.5.5 DEVIATION FROM TEST STANDARD

No deviation

4.5.6 TEST SETUP

Same as Item 4.2.6

4.5.7 EUT OPERATING CONDITIONS

Same as 4.1.6

4.5.8 TEST RESULTS

| | | | |
|------------------------------|---------------|---------------------------------|-------------------------|
| MODULATION TECHNOLOGY | MOFDM | ENVIRONMENTAL CONDITIONS | 20deg. C, 68%RH, 991hPa |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | TESTED BY | Dean Wang |

| ANTENNA POLARITY & TEST DISTANCE AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (Db/m) |
| 1 | 3328.00 | 58.06 PK | 70.76 | -12.70 | 1.00 H | 53 | 22.56 | 35.50 |
| 2 | 3912.00 | 58.79 PK | 70.76 | -11.97 | 1.00 H | 53 | 21.48 | 37.31 |
| 3 | 4500.00 | 57.22 PK | 70.76 | -13.54 | 1.00 H | 53 | 18.23 | 38.99 |
| 1 | 3504.00 | 68.35 PK | 70.76 | -2.41 | 1.06 V | 256 | 32.59 | 35.76 |
| 2 | 3812.00 | 67.32 PK | 70.76 | -3.44 | 1.06 V | 256 | 30.32 | 37.00 |
| 3 | 4540.00 | 67.11 PK | 70.76 | -3.65 | 1.06 V | 256 | 27.96 | 39.15 |

4.6 ANTENNA REQUIREMENT

4.6.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, 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.

4.6.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Printed antenna without antenna connector. The maximum Gain of the antenna is 2dBi.

5 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025

| | |
|--------------------|-----------------------|
| USA | FCC, UL |
| Germany | TUV Rheinland |
| Japan | VCCI |
| Norway | NEMKO |
| Canada | INDUSTRY CANADA , CSA |
| R.O.C. | CNLA, BSMI, NCC |
| Netherlands | Telefication |
| Singapore | PSB , GOST-ASIA(MOU) |
| Russia | CERTIS(MOU) |

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml.
If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3185050

Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.

APPENDIX-A

MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.