



# FCC TEST REPORT

**REPORT NO.:** RF970416H07-1

**MODEL NO.:** CTR500

**RECEIVED:** April 17, 2008

**TESTED:** May 30 to June 03, 2008

**ISSUED:** June 04, 2008

**APPLICANT:** Cradlepoint, Inc

**ADDRESS:** 1199 Shoreline Lane, Suite 301 Boise, ID 83702

**ISSUED BY:** Advance Data Technology Corporation

**LAB LOCATION:** No. 81-1, Lu Liao Keng, 9 Ling, Wu Lung Tsuen,  
Chiung Lin Hsiang, Hsin Chu Hsien,  
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## Table of Contents

1	CERTIFICATION .....	3
2	SUMMARY OF TEST RESULTS .....	4
2.1	MEASUREMENT UNCERTAINTY .....	4
3	GENERAL INFORMATION .....	5
3.1	GENERAL DESCRIPTION OF EUT .....	5
3.2	DESCRIPTION OF TEST MODES .....	7
3.3	TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL: .....	8
3.4	GENERAL DESCRIPTION OF APPLIED STANDARDS .....	10
3.5	DESCRIPTION OF SUPPORT UNITS.....	11
3.6	CONFIGURATION OF SYSTEM UNDER TEST .....	11
4	TEST TYPES AND RESULTS .....	12
4.1	CONDUCTED EMISSION MEASUREMENT .....	12
4.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT .....	12
4.1.2	TEST INSTRUMENTS.....	12
4.1.3	TEST PROCEDURES .....	13
4.1.4	TEST SETUP .....	13
4.1.5	EUT OPERATING CONDITIONS .....	14
4.1.6	TEST RESULTS .....	15
4.2	RADIATED EMISSION MEASUREMENT .....	17
4.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT .....	17
4.2.2	TEST INSTRUMENTS.....	18
4.2.3	TEST PROCEDURES .....	19
4.2.4	TEST SETUP .....	20
4.2.5	EUT OPERATING CONDITIONS .....	20
4.2.6	TEST RESULTS .....	21
4.2.7	TEST RESULTS .....	23
5	INFORMATION ON THE TESTING LABORATORIES .....	25
6	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB .....	26



# 1 CERTIFICATION

**PRODUCT :** CTR500  
**BRAND NAME :** Cradlepoint  
**MODEL NO. :** CTR500  
**TESTED :** May 30 to June 03, 2008  
**APPLICANT :** Cradlepoint, Inc  
**TEST SAMPLE :** PROTOTYPE  
**STANDARDS :** 47 CFR Part 15, Subpart C (Section 15.247)  
ANSI C63.4-2003

The above equipment (Model: CTR500) has 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 :** Sunny Wen , **DATE:** June 04, 2008  
( Sunny Wen, Specialist )

**TECHNICAL ACCEPTANCE :** Hank Chung , **DATE:** June 04, 2008  
Responsible for RF ( Hank Chung, Deputy Manager )

**APPROVED BY :** May Chen , **DATE:** June 04, 2008  
( May Chen, Deputy Manager )

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

<b>APPLIED STANDARD: 47 CFR Part 15, Subpart C</b>			
<b>Standard Section</b>	<b>Test Type and Limit</b>	<b>Result</b>	<b>REMARK</b>
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is -11.19 dB at 0.181 MHz
15.247(d)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -1.30 dB at 4824.00 MHz & 7236.00

### 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:

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

<b>Measurement</b>	<b>Value</b>
Conducted emissions	2.44 dB
Radiated emissions (30MHz-1GHz)	3.94 dB
Radiated emissions (1GHz -18GHz)	2.33 dB
Radiated emissions (18GHz -40GHz)	2.55 dB

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	CTR500
<b>MODEL NO.</b>	CTR500
<b>FCC ID</b>	UXX-CTR500
<b>POWER SUPPLY</b>	DC 5V from power adapter
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>MODULATION TECHNOLOGY</b>	DSSS, OFDM
<b>TRANSFER RATE</b>	802.11b: 11 / 5.5 / 2 / 1Mbps 802.11g: 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6Mbps
<b>FREQUENCY RANGE</b>	2412 ~ 2462MHz
<b>NUMBER OF CHANNEL</b>	11
<b>MAXIMUM OUTPUT POWER</b>	802.11b: 53.703mW 802.11g: 60.256mW
<b>ANTENNA TYPE</b>	Please see note 1
<b>DATA CABLE</b>	NA
<b>I/O PORT</b>	Ethernet Port (10/100Mbps) x 1, USB Port for 1XEV-DO x 1, Express card for 1XEV-DO Port x 1

#### NOTE:

1. There are two printed antennas provided to this EUT, and the following two dipole antennas are option:

Antenna	Antenna Type	Antenna Connector	Gain (dBi)	Function	Note
Antenna 1	Printed	NA	1	Only RX	Fixed
Antenna 2	Printed	I-PEX	1	TX / RX	
Antenna 3	Dipole	MMCX	2		
Antenna 4	Dipole	MMCX	5		For Option

From the above antennas, the worst cases were found in Antenna 2 & 4. Therefore only the test data of the modes were recorded in this report individually.

2. The EUT could be applied with one 3.5G 1XEV-DO Card and following two different models could be chosen; therefore emission tests are added for simultaneously transmit between wireless LAN and 3.5G 1XEV-DO function. The emission tests have been performed at the worst channel of both WLAN and 3.5G 1XEV-DO, and recorded in the report.

Interface	Brand name	Model name	FCC ID
Express card	SIERRA WIRELESS	AirCard 880E	N7NAC880E
USB port	SIERRA WIRELESS	COMPASS 597	N7NC597

From the above 3.5G 1XEV-DO cards, Model No.: AirCard 880E was selected for testing. Only one card can transmit on different interface for 1XEV-DO.

3. The EUT must be supplied with a power adapter and following three different models could be chosen:

Adapter 1	
<b>Brand:</b>	PHIHONG
<b>Model No.:</b>	PSA15R-050P
<b>Input power :</b>	AC 100-240V, 0.5A, 50/60Hz
<b>Output power :</b>	DC 5V, 3.0A Cable:1.9m/unshielded/with one core
Adapter 2	
<b>Brand:</b>	PHIHONG
<b>Model No.:</b>	PSA15R-050P
<b>Input power :</b>	AC 100-240V, 0.5A, 50/60Hz
<b>Output power :</b>	DC 5V, 3.0A Cable:1.9m/unshielded/without core
Adapter 3	
<b>Brand:</b>	Technics-gp
<b>Model No.:</b>	TESA1G-0503000
<b>Input power :</b>	AC100-240V, 50/60Hz, MAX 0.45A
<b>Output power :</b>	DC 5V, 2.5A Cable:1.8m/unshielded/without core

4. 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

Operated in 2400 ~ 2483.5MHz band:

Eleven channels are provided for 802.11b, 802.11g:

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

### 3.3 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

EUT configure mode	Applicable to			Description
	PLC	RE<1G	RE≥1G	
A	√	√	√	Co-located (*Note 1)

Where PLC: Power Line Conducted Emission RE<1G RE: Radiated Emission below 1GHz  
 RE≥1G: Radiated Emission above 1GHz

Note1: Pre-Scan has been conducted to determine the worst case mode from antenna power.

#### **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.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1	DSSS	DBPSK	1

- For conducted emissions, the EUT was pre-tested in chamber as the following test modes:

Test Mode	Description
Mode A	Adapter 1
Mode B	Adapter 2
Mode C	Adapter 3

The worst adapter was found in Adapter 2. Their test data were recorded in this report individually.

#### **Radiated Emission Test (Below 1 GHz):**

- 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.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1	DSSS	DBPSK	1

- For spurious emissions, the EUT was pre-tested in chamber as the following test modes:

Test Mode	Description
Mode A	Adapter 1
Mode B	Adapter 2
Mode C	Adapter 3

The worst adapter was found in Adapter 2. Their test data were recorded in this report individually.

- For spurious emissions, the EUT was tested as the following test modes:

Test Mode	Description
Mode A	Adapter 2 + Dipole antenna
Mode B	Adapter 2 + Printed antenna



**Radiated Emission Test (Above 1 GHz):**

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.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1	DSSS	DBPSK	1

For spurious emissions, the EUT was pre-tested in chamber as the following test modes:

Test Mode	Description
Mode A	Adapter 1
Mode B	Adapter 2
Mode C	Adapter 3

The worst adapter was found in Adapter 2. Their test data were recorded in this report individually.

For spurious emissions, the EUT was tested as the following test modes:

Test Mode	Description
Mode A	Adapter 2 + Dipole antenna
Mode B	Adapter 2 + Printed antenna



### **3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS**

The EUT is a CTR500. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**47 CFR Part 15, Subpart C. (15.247)**  
**ANSI C63.4 : 2003**

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

### 3.5 DESCRIPTION OF SUPPORT UNITS

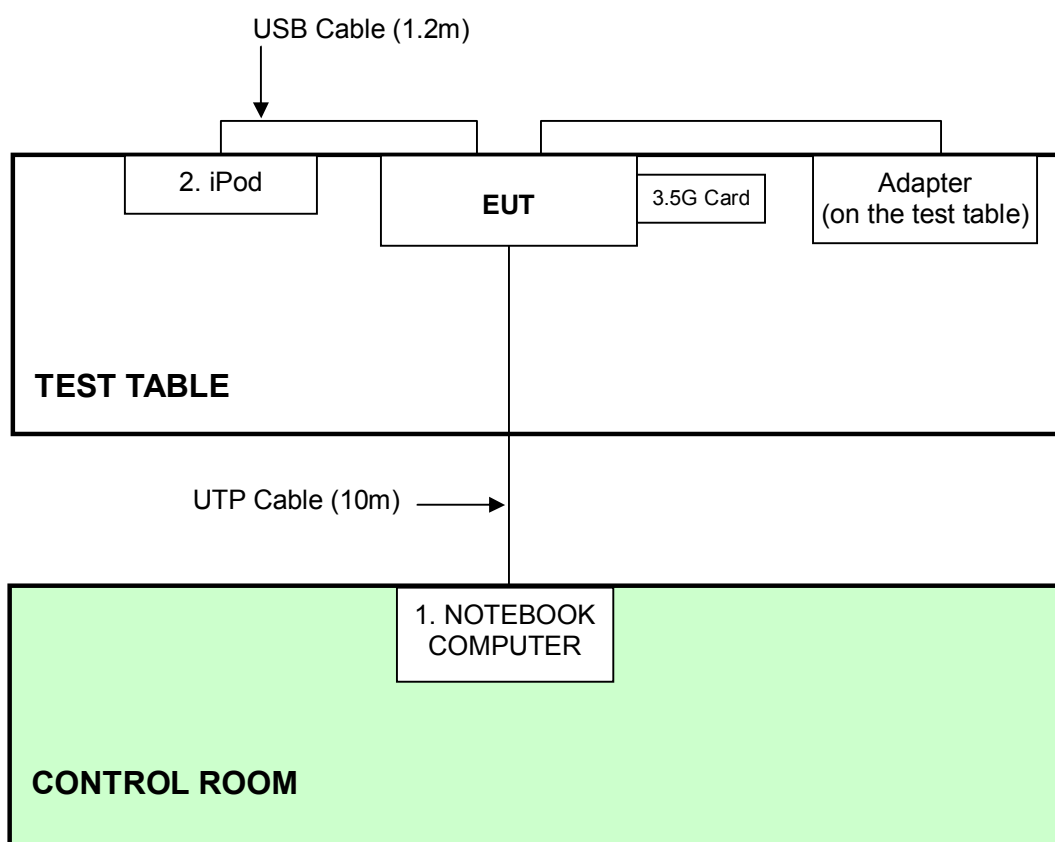
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP18L	6976685584	DoC
2	iPod	APPLE	A1199	YM712NHUVQ5	DoC

No.	Signal cable description
1	NA
2	NA

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

### 3.6 CONFIGURATION OF SYSTEM UNDER TEST



## 4 TEST TYPES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB $\mu$ V)	
	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. All emanations from a class 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

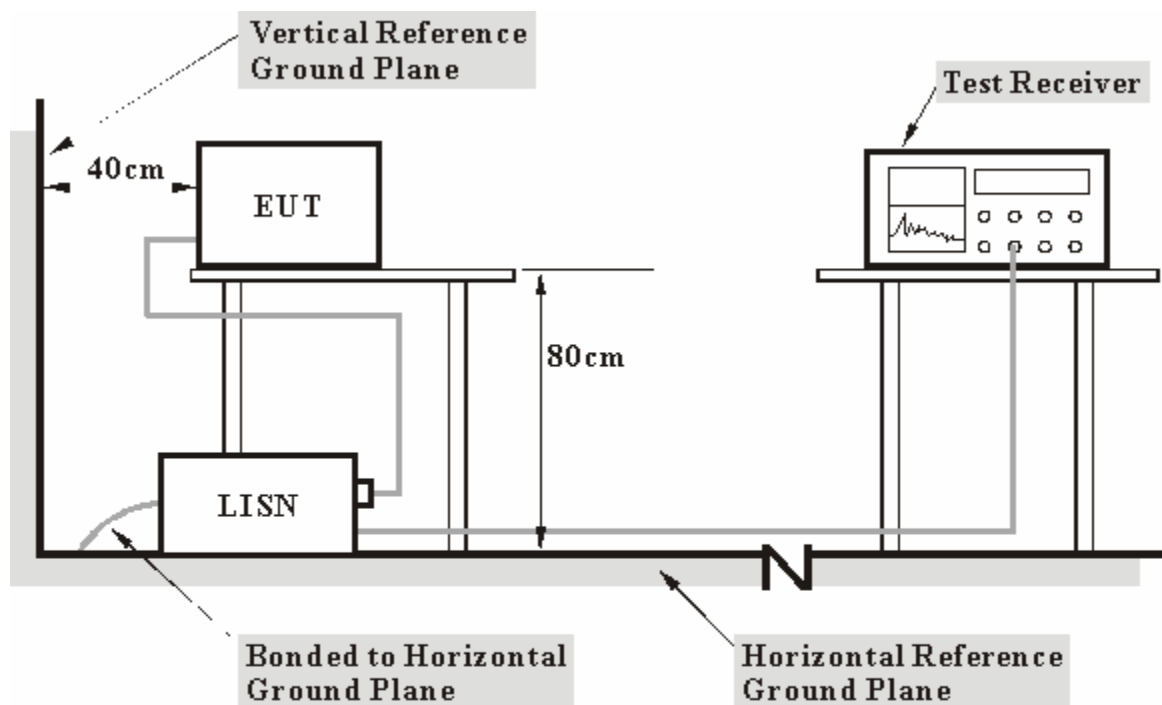
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 10, 2009
Line-Impedance Stabilization Network(for EUT)	KNW-407	8-1395-12	Aug. 19, 2008
Line-Impedance Stabilization Network(for Peripheral)	ENV-216	100072	Nov. 08, 2008
RF Cable (JETBAO)	RG5B/U-6m	COACAB-9KHz-3 0MHz	Aug. 15, 2008
50 ohms Terminator	50	3	Nov. 15, 2008
Software	ADT_Cond_V7.3.2	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 ADT Shielded Room No. A.  
 3. The VCCI Con A Registration No. is C-817.

#### 4.1.3 TEST PROCEDURES

- a. The EUT/HOST was placed 0.4 meters from the conducting wall of the shielded room with EUT/HOST 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/HOST were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

#### 4.1.4 TEST SETUP



- Note:**
1. Support units were connected to second LISN.
  2. Both of LISNs (AMIN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

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

#### 4.1.5 EUT OPERATING CONDITIONS

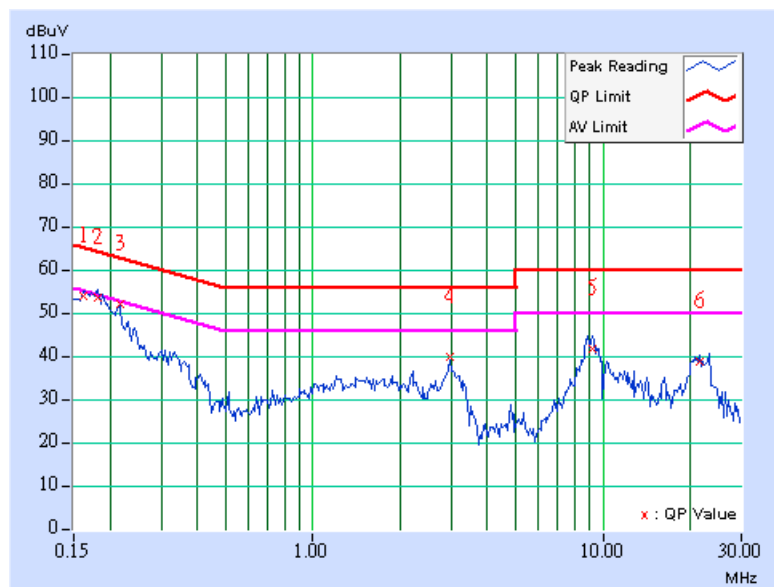
1. Placed the EUT on testing table.
2. Prepared other computer systems (support unit 1) to act as communication partners and placed them outside of testing area.
3. The communication partners run test program “Web Site” to enable EUT under transmission/receiving condition continuously via UTP cable.
4. The 3.5G card transmit

#### 4.1.6 TEST RESULTS

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line (L)
MODULATION TYPE	DBPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	1Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 70%RH, 970hPa	TESTED BY	Andy Ho

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	0.35	53.22	-	53.57	-	65.38	55.38	-11.80	-
2	<b>0.181</b>	<b>0.35</b>	<b>52.89</b>	-	<b>53.24</b>	-	<b>64.43</b>	<b>54.43</b>	<b>-11.19</b>	-
3	0.216	0.32	51.28	-	51.60	-	62.96	52.96	-11.36	-
4	2.963	0.34	38.97	-	39.31	-	56.00	46.00	-16.69	-
5	9.176	0.53	40.88	-	41.41	-	60.00	50.00	-18.59	-
6	21.605	0.90	37.99	-	38.89	-	60.00	50.00	-21.11	-

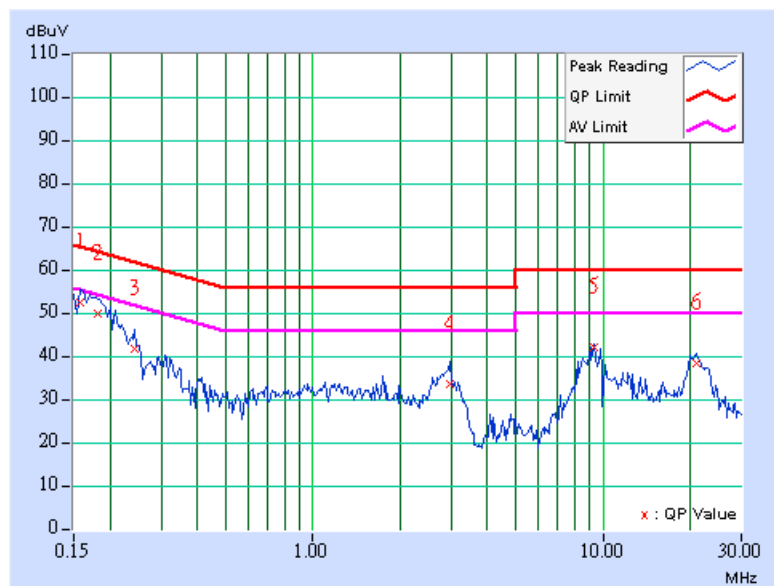
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Neutral (N)
MODULATION TYPE	DBPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	1Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 70%RH, 970hPa	TESTED BY	Andy Ho

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.158	0.37	51.88	-	52.25	-	65.58
2	0.181	0.37	48.97	-	49.34	-	64.43	54.43	-15.09	-
3	0.244	0.30	40.92	-	41.22	-	61.97	51.97	-20.75	-
4	2.970	0.34	32.77	-	33.11	-	56.00	46.00	-22.89	-
5	9.304	0.52	41.25	-	41.77	-	60.00	50.00	-18.23	-
6	21.133	0.88	37.79	-	38.67	-	60.00	50.00	-21.33	-

- 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

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



#### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ADVANTEST Spectrum Analyzer	R3271A	85060311	July 15, 2008
HP Pre_Amplifier	8449B	3008A01922	Oct. 04, 2008
ROHDE & SCHWARZ Test Receiver	ESCS30	100375	Mar. 31, 2009
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	July 26, 2008
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 16, 2008
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 27, 2009
R&S Loop Antenna	HFH2-Z2	100070	Jan. 13, 2009
RF Switches (ARNITSU)	CS-201	1565157	Aug. 13, 2008
RF CABLE (Chaintek)	SF102	22054-2	Dec. 06. 2008
RF Cable(RICHTEC)	9913-30M N-N Cable	STCCAB-30M-1 GHz	Aug. 13, 2008
Software	ADT_Radiated_V 7.6.15.8	NA	NA
CHANCE MOST Antenna Tower	AT-100	0203	NA
CHANCE MOST Turn Table	TT-100	0203	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 horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: R3271A) are used only for the measurement of emission frequency above 1GHz if tested.  
 3. The test was performed in ADT Open Site No. C.  
 4. The FCC Site Registration No. is 656396.  
 5. The VCCI Site Registration No. is R-1626.  
 6. The CANADA Site Registration No. is IC 3789C-3.

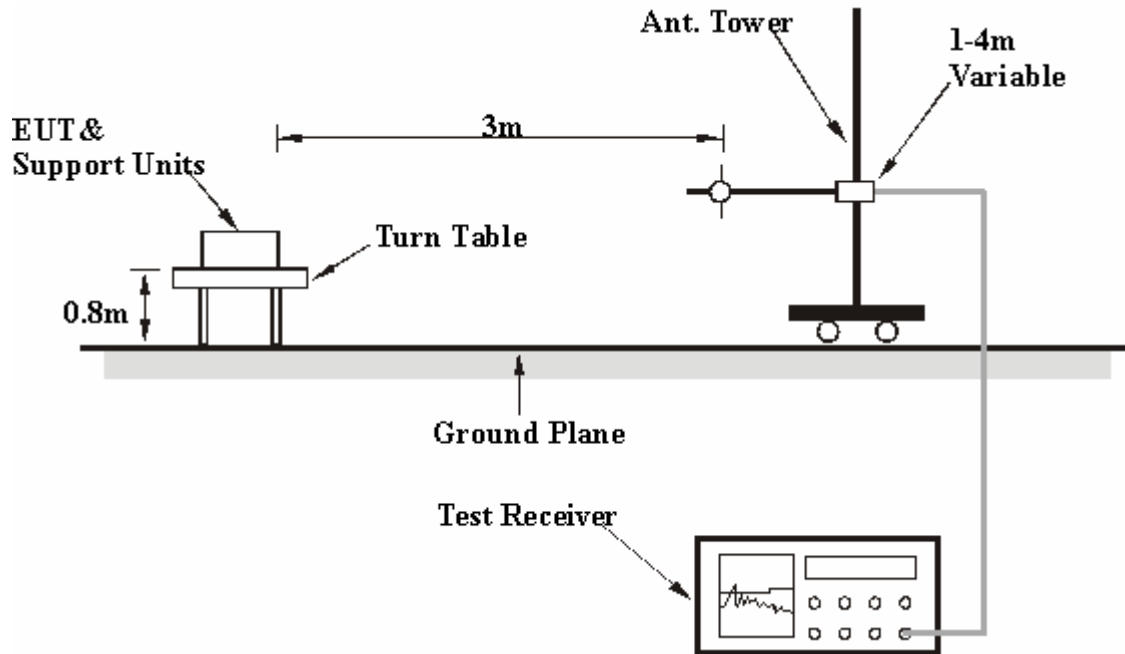
#### 4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

#### 4.2.4 TEST SETUP



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

#### 4.2.5 EUT OPERATING CONDITIONS

Same as 4.1.5

## 4.2.6 TEST RESULTS

### BELOW 1GHz WORST-CASE DATA : 802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 59%RH 970hPa	TESTED BY	Frank Liu
TEST MODE	Adapter 2 + Dipole antenna		

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	200.00	28.99 QP	43.50	-14.51	1.00 H	217	16.96	12.03
2	250.00	37.17 QP	46.00	-8.83	1.00 H	247	24.34	12.83
3	300.00	30.70 QP	46.00	-15.30	1.09 H	122	14.11	16.59
4	400.00	35.22 QP	46.00	-10.78	1.00 H	307	17.17	18.05
5	500.00	32.10 QP	46.00	-13.90	1.08 H	114	11.05	21.05
6	625.00	31.60 QP	46.00	-14.40	1.00 H	149	7.60	24.00
7	750.04	36.65 QP	46.00	-9.35	1.00 H	7	9.39	27.26
8	875.04	32.72 QP	46.00	-13.28	1.00 H	117	3.65	29.07
9	1000.04	35.37 QP	54.00	-18.63	1.08 H	264	4.84	30.53
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	69.11	29.59 QP	40.00	-10.41	1.00 V	24	17.43	12.16
2	250.00	35.76 QP	46.00	-10.24	1.10 V	258	22.93	12.83
3	300.00	26.68 QP	46.00	-19.32	1.45 V	11	10.09	16.59
4	400.00	29.56 QP	46.00	-16.44	1.00 V	334	11.51	18.05
5	500.00	27.24 QP	46.00	-18.76	1.10 V	180	6.19	21.05
6	625.01	31.52 QP	46.00	-14.48	1.00 V	102	7.52	24.00
7	750.01	34.60 QP	46.00	-11.40	1.00 V	149	7.34	27.26
8	875.05	32.35 QP	46.00	-13.65	1.10 V	159	3.28	29.07
9	1000.05	35.52 QP	54.00	-18.48	1.12 V	301	4.99	30.53

- 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.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 59%RH 970hPa	TESTED BY	Frank Liu
TEST MODE	Adapter 2 + Printed antenna		

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	250.00	30.75 QP	46.00	-15.25	1.15 H	72	17.92	12.83
2	400.00	34.75 QP	46.00	-11.25	1.00 H	313	16.70	18.05
3	500.00	29.29 QP	46.00	-16.71	1.70 H	61	8.24	21.05
4	625.00	32.66 QP	46.00	-13.34	1.46 H	280	8.66	24.00
5	750.04	36.16 QP	46.00	-9.84	1.56 H	116	8.90	27.26
6	875.04	31.52 QP	46.00	-14.48	1.58 H	21	2.45	29.07
7	1000.04	33.53 QP	54.00	-20.47	1.00 H	47	3.00	30.53
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	50.30	30.98 QP	40.00	-9.02	1.00 V	21	15.10	15.88
2	250.00	33.55 QP	46.00	-12.45	1.00 V	260	20.72	12.83
3	400.00	33.09 QP	46.00	-12.91	1.07 V	1	15.04	18.05
4	500.00	27.93 QP	46.00	-18.07	1.08 V	68	6.88	21.05
5	750.02	34.94 QP	46.00	-11.06	1.15 V	313	7.68	27.26
6	875.02	30.18 QP	46.00	-15.82	1.31 V	323	1.11	29.07
7	1000.02	34.04 QP	54.00	-19.96	1.09 V	304	3.51	30.53

- 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.



#### 4.2.7 TEST RESULTS

##### 802.11b DSSS MODULATION - adapter 2 + Dipole antenna

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 17.5GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 59%RH 970hPa	TESTED BY	Rex Huang

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	2288.00	44.70 PK	74.00	-29.30	1.00 H	300	14.82	29.88
2	2288.00	35.81 AV	54.00	-18.19	1.00 H	300	5.93	29.88
3	4824.00	56.12 PK	74.00	-17.88	1.80 H	177	20.33	35.79
4	4824.00	52.43 AV	54.00	-1.57	1.00 H	177	16.64	35.79
5	7236.00	52.92 PK	74.00	-21.08	1.38 H	70	11.32	41.60
6	7236.00	39.80 AV	54.00	-14.20	1.38 H	70	-1.80	41.60
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	2288.00	52.33 PK	74.00	-21.67	1.44 V	260	22.45	29.88
2	2288.00	48.72 AV	54.00	-5.28	1.44 V	260	18.84	29.88
3	4824.00	56.70 PK	74.00	-17.30	1.50 V	100	20.91	35.79
4	<b>4824.00</b>	<b>52.70 AV</b>	<b>54.00</b>	<b>-1.30</b>	<b>1.50 V</b>	<b>100</b>	<b>16.91</b>	<b>35.79</b>
5	7236.00	53.80 PK	74.00	-20.20	1.20 V	122	12.20	41.60
6	7236.00	40.90 AV	54.00	-13.10	1.20 V	122	-0.70	41.60

- 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.



**802.11b DSSS MODULATION – adapter 2 + Printed antenna**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 17.5GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 59%RH 970hPa	TESTED BY	Rex Huang

**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	2288.00	45.11 PK	74.00	-28.89	1.77 H	82	15.23	29.88
2	2288.00	39.73 AV	54.00	-14.27	1.77 H	82	9.85	29.88
3	4824.00	54.82 PK	74.00	-19.18	1.90 H	287	19.03	35.79
4	4824.00	51.83 AV	54.00	-2.17	1.90 H	287	16.04	35.79
5	7236.00	60.20 PK	74.00	-13.80	1.40 H	41	18.60	41.60
6	7236.00	52.70 AV	54.00	-1.30	1.40 H	41	11.10	41.60

**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	2288.00	48.22 PK	74.00	-25.78	1.29 V	30	18.34	29.88
2	2288.00	45.27 AV	54.00	-8.73	1.29 V	30	15.39	29.88
3	4824.00	53.77 PK	74.00	-20.23	1.25 V	237	17.98	35.79
4	4824.00	51.40 AV	54.00	-2.60	1.25 V	237	15.61	35.79
5	7236.00	59.11 PK	74.00	-14.89	1.70 V	34	17.51	41.60
6	7236.00	50.11 AV	54.00	-3.89	1.70 V	34	8.51	41.60

- 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.





## 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:

<b>USA</b>	FCC, UL, A2LA
<b>Germany</b>	TUV Rheinland
<b>Japan</b>	VCCI
<b>Norway</b>	NEMKO
<b>Canada</b>	INDUSTRY CANADA, CSA
<b>R.O.C.</b>	TAF, BSMI, NCC
<b>Netherlands</b>	Telefication
<b>Singapore</b>	GOST-ASIA (MOU)
<b>Russia</b>	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](http://www.adt.com.tw/index.5/phtml).

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



## **6 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.