



# FCC TEST REPORT

**REPORT NO.:** RF960806H04

**MODEL NO.:** RTU7300 USB

**RECEIVED:** Aug. 06, 2007

**TESTED:** Sep. 04 to 11, 2007

**ISSUED:** Sep. 14, 2007

**APPLICANT:** Realtek Semiconductor Corp.

**ADDRESS:** No. 2, Innovation Road II, Hsinchu Science  
Park, Hsinchu 300, Taiwan

**ISSUED BY:** Advance Data Technology Corporation

**TEST LOCATION:** No. 81-1, Lu Liao Keng, 9 Ling, Wu Lung  
Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien,  
Taiwan, R.O.C.

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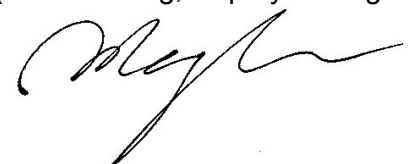
# 1 CERTIFICATION

**PRODUCT:** UWB USB Dongle  
**MODEL:** RTU7300 USB  
**BRAND:** Realtek  
**APPLICANT:** Realtek Semiconductor Corp.  
**TESTED:** Sep. 04 to 11, 2007  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**STANDARDS:** **FCC Part 15, Subpart F (Section 15.519)**  
ANSI C63.4-2003

The above equipment (model: RTU7300 USB) 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 :**  , **DATE:** Sep. 14, 2007  
( Midoli Peng, Specialist )

**TECHNICAL ACCEPTANCE :**  , **DATE:** Sep. 14, 2007  
Responsible for RF ( Hank Chung, Deputy Manager )

**APPROVED BY :**  , **DATE:** Sep. 14, 2007  
( May Chen, Deputy Manager )

## 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 -10.94dB at 0.728MHz.
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 -2.75dB at 799.90MHz..
15.209 15.519(d)	Radiated Emissions in GPS Band	PASS	Meet the requirement of limit. Minimum passing margin is -24.84dB at 1590.00MHz..
15.519(e)	Peak Emissions within a 50MHz Bandwidth	PASS	Meet the requirement of limit. Minimum passing margin is -0.51dB at 3960.00MHz.

### 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:

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

Measurement	Value
Conducted emissions	2.41 dB
Radiated emissions (30MHz-1GHz)	3.89 dB
Radiated emissions (1GHz -18GHz)	2.21 dB
Radiated emissions (18GHz -40GHz)	1.88 dB

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	UWB USB Dongle
<b>MODEL NO.</b>	RTU7300 USB
<b>FCC ID</b>	TX2RTU7300-UWB
<b>POWER SUPPLY</b>	DC 5V from host equipment
<b>MODULATION TECHNOLOGY</b>	MOFDM
<b>FREQUENCY RANGE</b>	3.1 to 4.8GHz (Supporting up to 3 MBOA sub-bands, 528MHz each)
<b>MAXIMUM OUTPUT POWER</b>	-24.95dBm (70.25 dBuV/m)
<b>ANTENNA TYPE</b>	Chip antenna with -0.5dBi (peak) & -5.9dBi (min. average)
<b>I/O PORTS</b>	USB
<b>DATA CABLE</b>	NA
<b>ASSOCIATED DEVICES</b>	NA

**NOTE:**

1. 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<Except for UWB Bandwidth Measurement and Peak Emission Measurement>.

### 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

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

Where **PLC**: Power Line Conducted Emission      **RE<1G**: Radiated Emission below 1GHz  
**RE≥1G**: Radiated Emission above 1GHz      **UB**:UBW Bandwidth  
**PE**: Peak Emission

#### **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
A	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 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
A	1 to 3	1, 2, 3	MOFDM



**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 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
A	1 to 3	1, 2, 3	MOFDM

**UWB BANDWIDTH MEASUREMENT:**

- 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
A	1 to 3	1, 2, 3	MOFDM
B	1 to 3	1	MOFDM
C	1 to 3	2	MOFDM
D	1 to 3	3	MOFDM

**PEAK EMISSION MEASUREMENT**

- 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
A	1 to 3	1, 2, 3	MOFDM
B	1 to 3	1	MOFDM
C	1 to 3	2	MOFDM
D	1 to 3	3	MOFDM



### **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

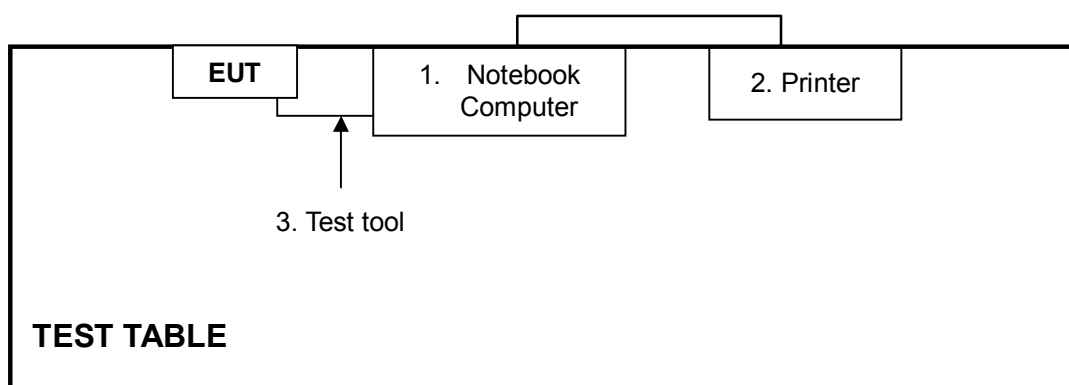
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook Computer	ASUS	A2400H	49NG038481	NA
2	Printer	HP	C2642A	MY79J1D00G	B94C2642X
3	TEST TOOL	NA	NA	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.6 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
3	NA

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

### 3.5 CONFIGURATION OF SYSTEM UNDER TEST





### **3.6 OPEARTIONAL LIMITATIONS**

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

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.

Client has been advised

## 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. 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	ESCS 30	847124/029	Mar. 28, 2008
Line-Impedance Stabilization Network(for EUT)	ENV-216	100071	Nov. 26, 2007
Line-Impedance Stabilization Network(for Peripheral)	ESH3-Z5	848773/004	Oct. 26, 2007
RF Cable (JETBAO)	RG233/U	Cable_CB_01	Dec. 09, 2007
Terminator	50	2	Oct. 30, 2007
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. B.
  3. The VCCI Con B Registration No. is C-2193.



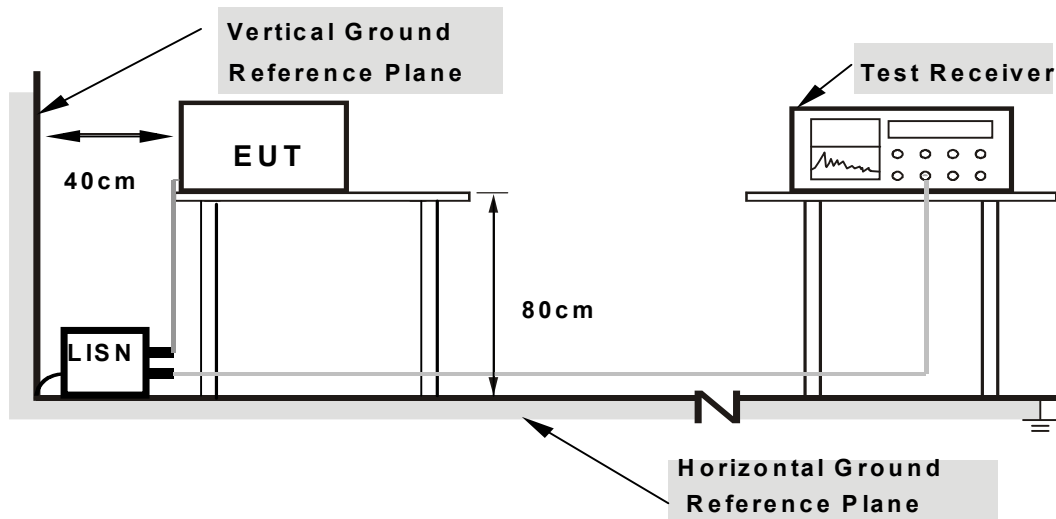
#### 4.1.3 TEST PROCEDURES

- 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 cm 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

- a. Plug the EUT into the support unit 1 (Notebook computer) and placed it on the testing table.
- b. The support unit 1 (Notebook computer) ran a test program "RTU7300" to enable EUT under transmission condition continuously at specific channel frequency.

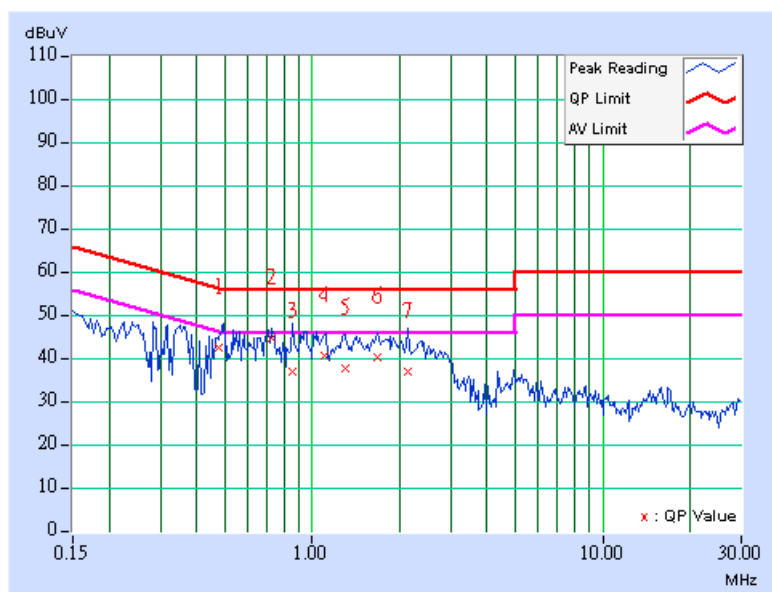
#### 4.1.7 TEST RESULTS

##### 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	27deg. C, 59%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Tony 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	0.479	0.40	42.17	-	42.57	-	56.35	46.35	-13.78	-
2	0.728	0.40	44.29	-	44.69	-	56.00	46.00	-11.31	-
3	0.853	0.40	36.58	-	36.98	-	56.00	46.00	-19.02	-
4	1.100	0.41	40.35	-	40.76	-	56.00	46.00	-15.24	-
5	1.295	0.43	37.32	-	37.75	-	56.00	46.00	-18.25	-
6	1.677	0.47	39.89	-	40.36	-	56.00	46.00	-15.64	-
7	2.134	0.51	36.48	-	36.99	-	56.00	46.00	-19.01	-

- 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.

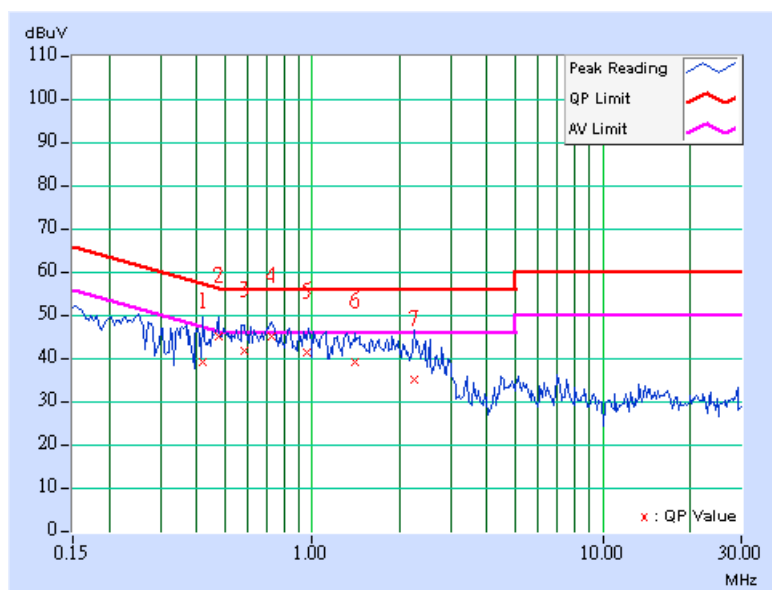




EUT TEST CONDITION		MEASUREMENT DETAIL	
SUB-BAND	1, 2, 3	PHASE	Line 2
MODULATION TECHNOLOGY	MOFDM	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	27deg. C, 59%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Tony Chen		

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	0.420	0.20	38.97	-	39.17	-	57.46	47.46	-18.28	-
2	0.474	0.21	44.66	-	44.87	-	56.44	46.44	-11.57	-
3	0.586	0.23	41.58	-	41.81	-	56.00	46.00	-14.19	-
4	<b>0.728</b>	<b>0.25</b>	<b>44.81</b>	-	<b>45.06</b>	-	<b>56.00</b>	<b>46.00</b>	<b>-10.94</b>	-
5	0.959	0.29	41.23	-	41.52	-	56.00	46.00	-14.48	-
6	1.412	0.34	38.84	-	39.18	-	56.00	46.00	-16.82	-
7	2.244	0.41	34.69	-	35.10	-	56.00	46.00	-20.90	-

- 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
ADVANTEST Spectrum Analyzer	R3271A	85060311	July 15, 2008
HP Pre_Amplifier	8449B	3008A01922	Sep. 18, 2007
ROHDE & SCHWARZ Test Receiver	ESCS30	100375	Sep. 20, 2007
CHASE Broadband Antenna	VULB 9168	138	July 26, 2008
Schwarzbeck Horn_Antenna	BBHA9120	D124	Jan. 01, 2008
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 25, 2008
TRILOG Broad Band Antenna	VULB 9168	138	July 26, 2008
RF Switches (ARNITSU)	CS-201	1565157	Aug. 13, 2008
RF CABLE (Chaintek)	SF102	22054-2	Nov. 14. 2007
RF Cable(RICHTEC)	9913-30M N-N Cable	STCCAB-30M-1 GHz	Aug. 13, 2008
Software	ADT_Radiated_V 7.6.15.7	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 4824A-3.

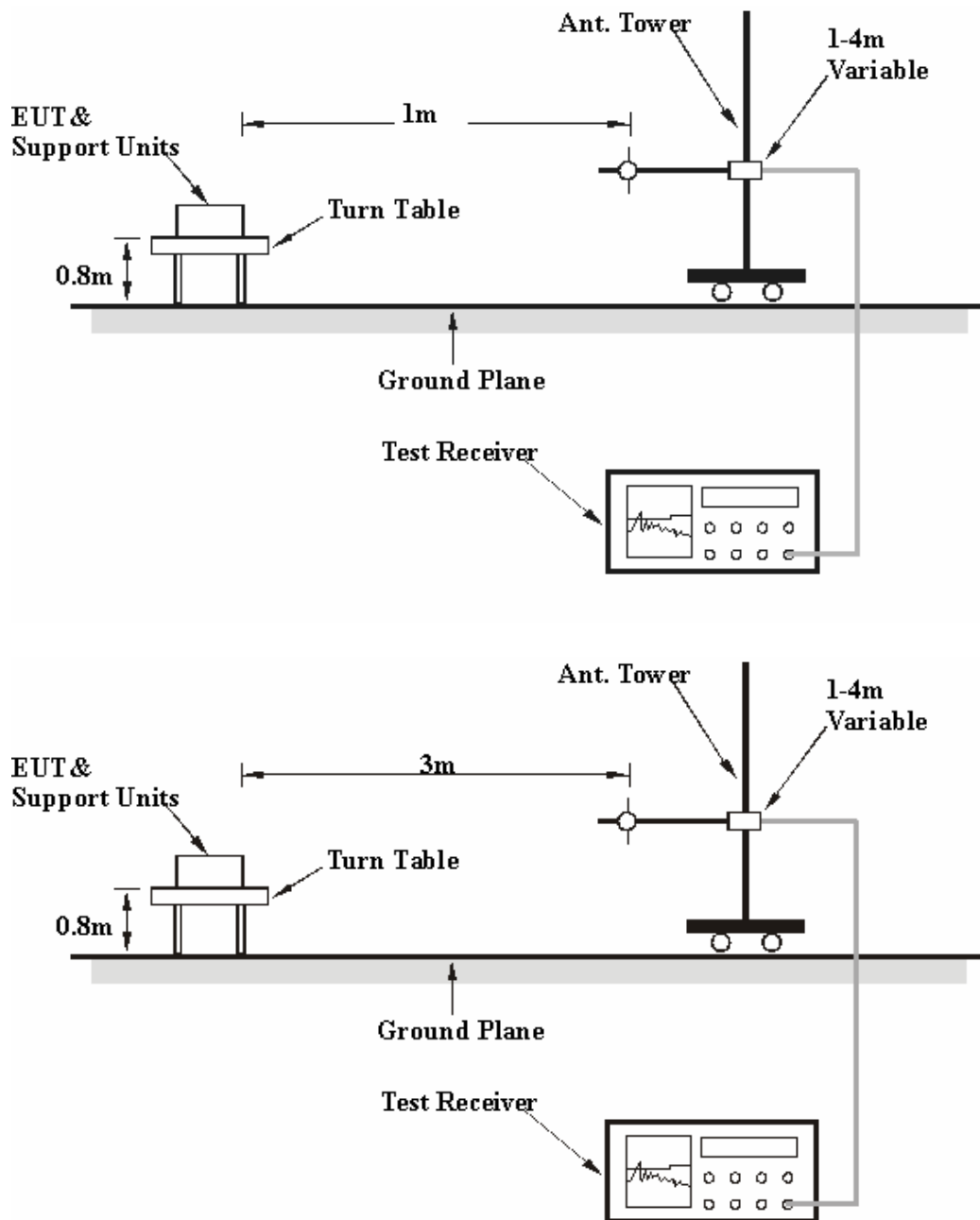
#### 4.2.4 TEST PROCEDURES

- 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 attached file (Test Setup Photo).

#### 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	28deg. C, 58%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Sky Liao		

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	144.02	24.52 QP	43.50	-18.98	1.49 H	256	10.95	13.57
2	240.02	38.37 QP	46.00	-7.63	1.00 H	302	25.02	13.35
3	344.06	35.78 QP	46.00	-10.22	1.01 H	341	18.47	17.31
4	462.02	28.94 QP	46.00	-17.06	1.42 H	127	8.15	20.79
5	479.98	42.73 QP	46.00	-3.27	1.67 H	190	21.48	21.25
6	528.01	33.97 QP	46.00	-12.03	1.36 H	193	11.38	22.59
7	660.02	28.25 QP	46.00	-17.75	1.30 H	41	3.07	25.18
8	792.02	27.64 QP	46.00	-18.36	1.20 H	45	0.11	27.53
9	924.01	32.56 QP	46.00	-13.44	1.10 H	317	3.22	29.34
10	960.00	34.78 QP	46.00	-11.22	1.00 H	144	4.89	29.89

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	51.24	31.65 QP	40.00	-8.35	1.00 V	133	16.71	14.94
2	144.67	31.90 QP	43.50	-11.60	1.00 V	97	18.30	13.60
3	200.35	31.74 QP	43.50	-11.76	1.00 V	130	20.12	11.62
4	240.00	27.34 QP	46.00	-18.66	1.00 V	240	14.00	13.34
5	432.30	36.38 QP	46.00	-9.62	1.00 V	255	16.42	19.96
6	480.01	33.48 QP	46.00	-12.52	1.00 V	69	12.23	21.25
7	601.10	35.28 QP	46.00	-10.72	1.00 V	78	10.79	24.49
8	660.10	27.96 QP	46.00	-18.04	1.28 V	343	2.77	25.19
9	799.90	43.25 QP	46.00	-2.75	1.26 V	277	15.69	27.56

- 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
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	28deg. C, 68%RH, 991hPa
TESTED BY	Sky Liao		

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	6864.00	38.60	63.44	-24.84	1.00 H	5	-2.04	40.64
2	7920.00	41.50	63.44	-21.94	1.00 H	5	-1.37	42.87
3	8960.00	41.20	63.44	-22.24	1.00 H	5	-2.80	44.00
4	10296.00	42.80	63.44	-20.64	1.00 H	5	-2.70	45.50
5	11880.00	43.40	43.44	-0.04	1.00 H	5	-2.97	46.37
6	13440.00	43.00	43.44	-0.44	1.00 H	5	-4.07	47.07

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	6864.00	38.20	63.44	-25.24	1.05 V	22	-2.44	40.64
2	7920.00	41.20	63.44	-22.24	1.05 V	22	-1.67	42.87
3	8960.00	41.00	63.44	-22.44	1.05 V	22	-3.00	44.00
4	10296.00	42.60	63.44	-20.84	1.05 V	22	-2.90	45.50
5	11880.00	43.20	43.44	-0.24	1.05 V	22	-3.17	46.37
6	13440.00	42.60	43.44	-0.84	1.05 V	22	-4.47	47.07

- 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.



## EMISSIONS FROM DIGITAL CIRCUITRY

EUT TEST CONDITION		MEASUREMENT DETAIL	
SUB-BAND	1, 2, 3	FREQUENCY RANGE	Below 1GHz
MODULATION TECHNOLOGY	MOFDM	DETECTOR FUNCTION	Quasi - Peak
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	28deg. C, 58%RH, 991hPa
TESTED BY	Sky Liao		

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	990.00	37.93 QP	63.54	-25.61	1.04 H	6	8.06	29.92

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	990.00	38.74 QP	63.54	-24.80	1.20 V	26	8.82	29.92

### REMARKS:

1. Emission source vs. possible corresponding spurious:

Emission Source	Frequency (MHz)	Possible corresponding spurious CW tones (MHz) (X times harmonic)
DLL	330.00	990 (x3)

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
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	28deg. C, 66%RH, 991hPa
TESTED BY	Rex Huang		

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	53.70 PK	83.54	-29.84	1.00 H	10	26.36	27.34
2	1056.00	41.40 AV	63.54	-22.14	1.00 H	10	14.06	27.34
3	1188.00	40.80 PK	83.54	-42.74	1.00 H	4	13.28	27.52
4	1188.00	26.00 AV	63.54	-37.54	1.00 H	4	-1.52	27.52
5	1584.00	48.50 PK	83.54	-35.04	1.00 H	5	20.43	28.07
6	1584.00	35.50 AV	63.54	-28.04	1.00 H	5	7.43	28.07
7	1590.00	52.10 PK	83.54	-31.44	1.02 H	357	24.02	28.08
8	1590.00	36.10 AV	63.54	-27.44	1.02 H	357	8.02	28.08

**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)
PLL	264.00	1056 (x4)
XTAL of PHY	66.00	1056 (x16), 1188 (x18)
XTAL of MAC	30.00	1590 (x53)

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
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	28deg. C, 66%RH, 991hPa
TESTED BY	Sky Liao		

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	56.40 PK	83.54	-27.14	1.00 V	359	29.06	27.34
2	1056.00	44.60 AV	63.54	-18.94	1.00 V	359	17.26	27.34
3	1188.00	46.10 PK	83.54	-37.44	1.00 V	2	18.58	27.52
4	1188.00	31.20 AV	63.54	-32.34	1.00 V	2	3.68	27.52
5	1584.00	57.30 PK	83.54	-26.24	1.06 V	353	29.23	28.07
6	1584.00	38.40 AV	63.54	-25.14	1.06 V	353	10.33	28.07
7	1590.00	57.40 PK	83.54	-26.14	1.00 V	7	29.32	28.08
8	1590.00	38.70 AV	63.54	-24.84	1.00 V	7	10.62	28.08

**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)
PLL	264.00	1056 (x4)
XTAL of PHY	66.00	1056 (x16), 1188 (x18)
XTAL of MAC	30.00	1590 (x53)

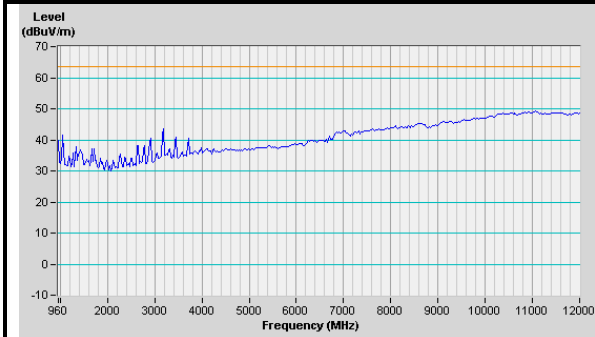
2. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)

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

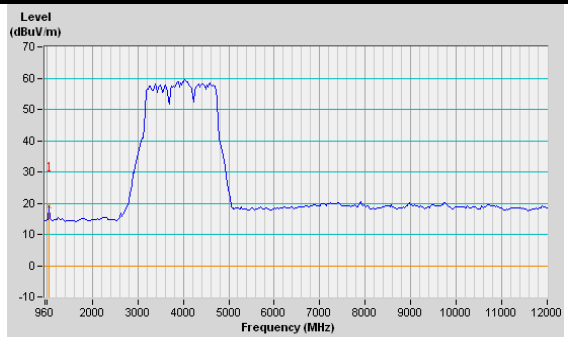
4. The other emission levels were very low against the limit.

5. Margin value = Emission level – Limit value.

### TERMINATED ANTENNA PORT



### CONDUCTED ANTENNA PORT



### 4.3 RADIATED EMISSION MEASUREMENT (FOR 15.519 (d))

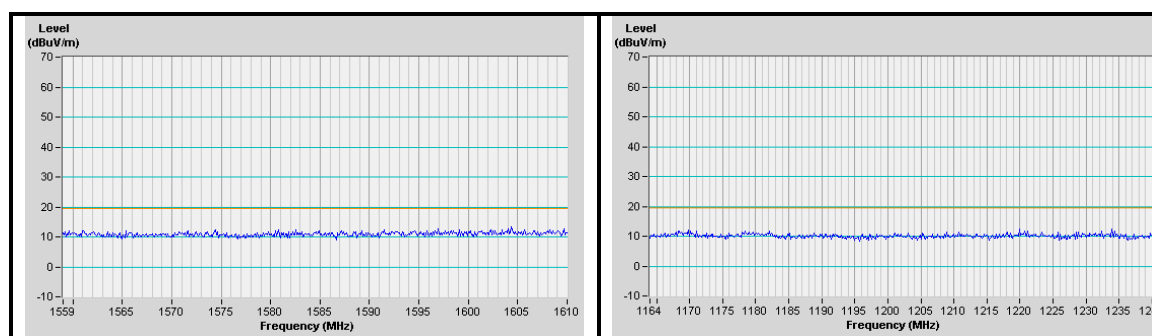
#### 4.3.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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:**
- 15.521(g) converted to a peak field strength level at 3 meters using  $E(\text{dBuV/m}) = P(\text{dBmEIRP}) + 95.2$ .
  - 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,  $\text{Limit (1m)} = \text{Limit (3m)} + 20\text{Log}(3/1) = \text{Limit (3m)} + 9.54$ .

#### 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 15.519

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
ADVANTEST Spectrum Analyzer	R3271A	85060311	July 15, 2008
HP Pre_Amplifier	8449B	3008A01922	Sep. 18, 2007
ROHDE & SCHWARZ Test Receiver	ESCS30	100375	Sep. 20, 2007
CHASE Broadband Antenna	VULB 9168	138	July 26, 2008
Schwarzbeck Horn_Antenna	BBHA9120	D124	Jan. 01, 2008
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 25, 2008
TRILOG Broad Band Antenna	VULB 9168	138	July 26, 2008
RF Switches (ARNITSU)	CS-201	1565157	Aug. 13, 2008
RF CABLE (Chaintek)	SF102	22054-2	Nov. 14. 2007
RF Cable(RICHTEC)	9913-30M N-N Cable	STCCAB-30M-1 GHz	Aug. 13, 2008
Software	ADT_Radiated_V 7.6.15.7	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 4824A-3.

#### 4.3.4 TEST PROCEDURES

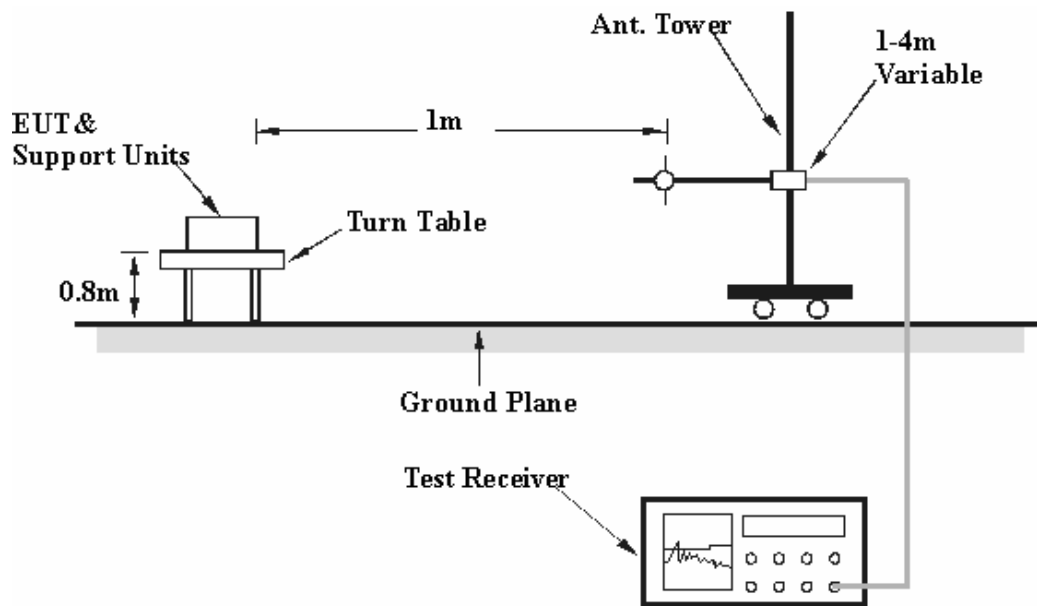
- e. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 1 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- f. The EUT was set 1 meter away from the interference-receiving antenna, which was mounted on 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 attached file (Test Setup Photo).

#### 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	28deg. C, 68%RH, 991hPa
TESTED BY	Sky Liao		

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	40.80 PK	83.54	-42.74	1.00 H	4	13.28	27.52
1	1188.00	26.00 AV	63.54	-37.54	1.00 H	4	-1.52	27.52
2	1584.00	48.50 PK	83.54	-35.04	1.00 H	5	20.43	28.07
2	1584.00	35.50 AV	63.54	-28.04	1.00 H	5	7.43	28.07
3	1590.00	52.10 PK	83.54	-31.44	1.02 H	357	24.02	28.08
3	1590.00	36.10 AV	63.54	-27.44	1.02 H	357	8.02	28.08

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	46.10 PK	83.54	-37.44	1.00 V	2	18.58	27.52
1	1188.00	31.20 AV	63.54	-32.34	1.00 V	2	3.68	27.52
2	1584.00	57.30 PK	83.54	-26.24	1.06 V	353	29.23	28.07
2	1584.00	38.40 AV	63.54	-25.14	1.06 V	353	10.33	28.07
3	1590.00	57.40 PK	83.54	-26.14	1.00 V	7	29.32	28.08
3	1590.00	38.70 AV	63.54	-24.84	1.00 V	7	10.62	28.08

#### 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)
XTAL of MAC	30.00	1590 (x57)

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

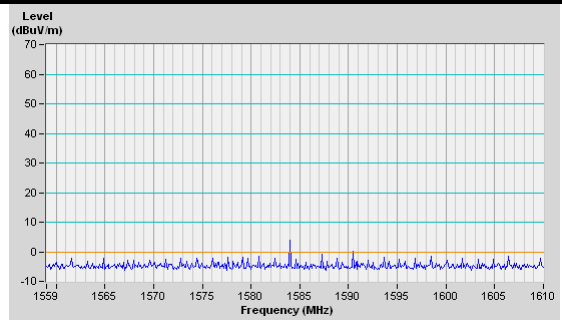
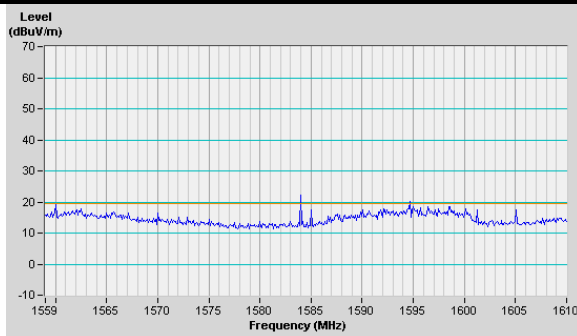
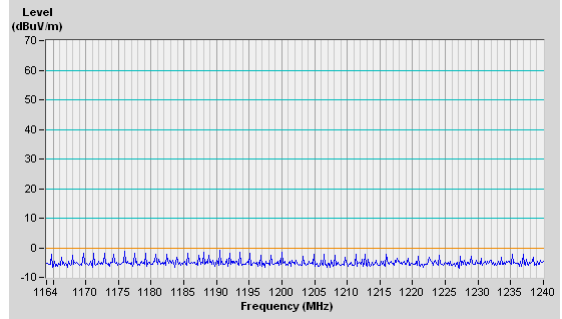
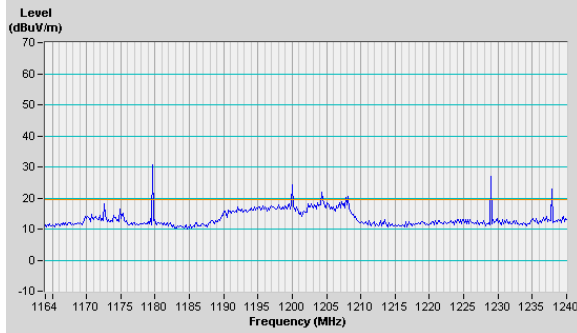
3. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)

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.



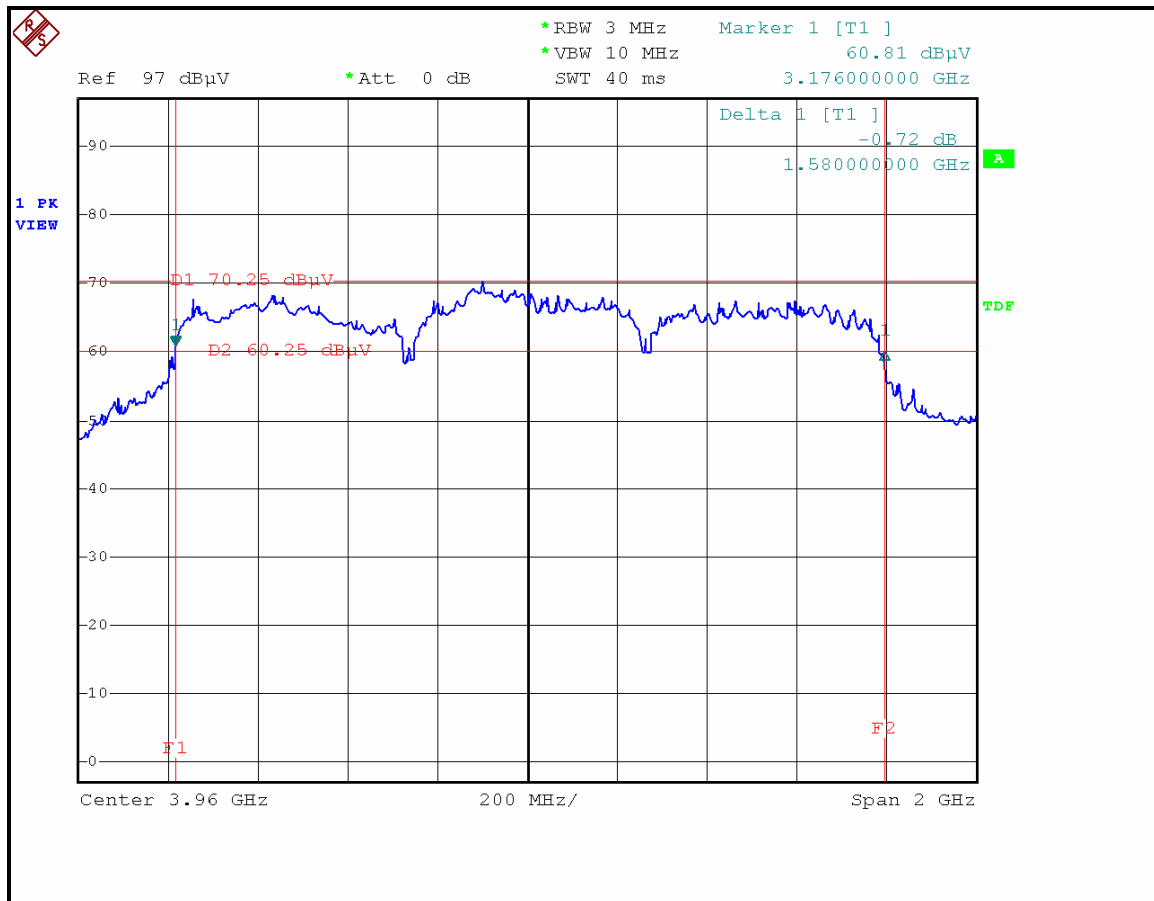
#### 4.4.8 TEST RESULTS

##### TEST MODE A (SUB-BAND 1, 2, 3)

<b>MODULATION TECHNOLOGY</b>	MOFDM	<b>ENVIRONMENTAL CONDITIONS</b>	26deg.C, 66%RH, 991hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TESTED BY</b>	Sky Liao

F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	F <sub>C</sub> =(F <sub>L</sub> +F <sub>H</sub> )/2 (MHz)	LIMIT (MHz)	PASS/FAIL
3176.00	4756.00	3966.00	Between 3100.00 ~ 10600.00	PASS

UWB Bandwidth = F<sub>H</sub> - F<sub>L</sub>=1580MHz

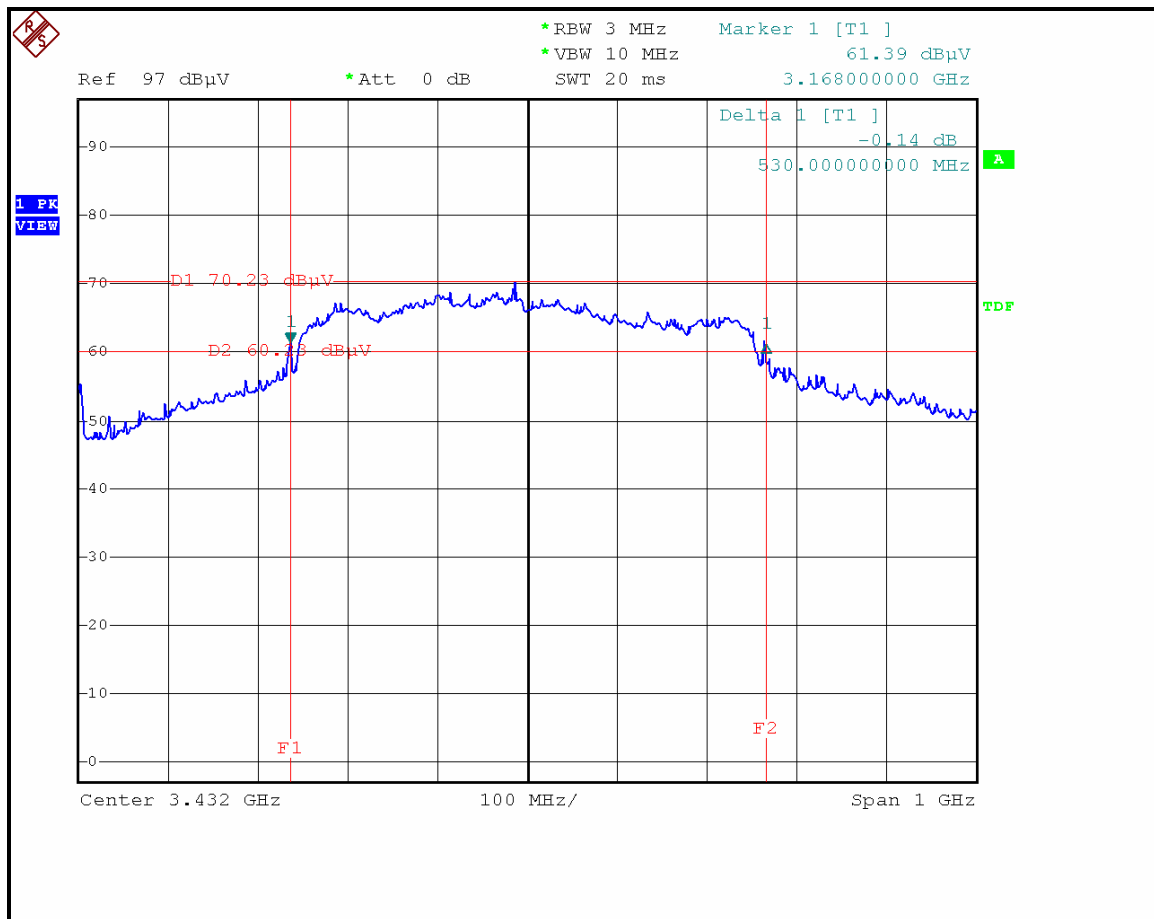


### TEST MODE B (SUB-BAND 1)

<b>MODULATION TECHNOLOGY</b>	MOFDM	<b>ENVIRONMENTAL CONDITIONS</b>	26deg.C, 66%RH, 991hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TESTED BY</b>	Sky Liao

F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	F <sub>C</sub> =(F <sub>L</sub> +F <sub>H</sub> )/2 (MHz)	LIMIT (MHz)	PASS/FAIL
3168.00	3698.00	3433.00	Between 3100.00 ~ 10600.00	PASS

UWB Bandwidth = F<sub>H</sub> - F<sub>L</sub>=530MHz



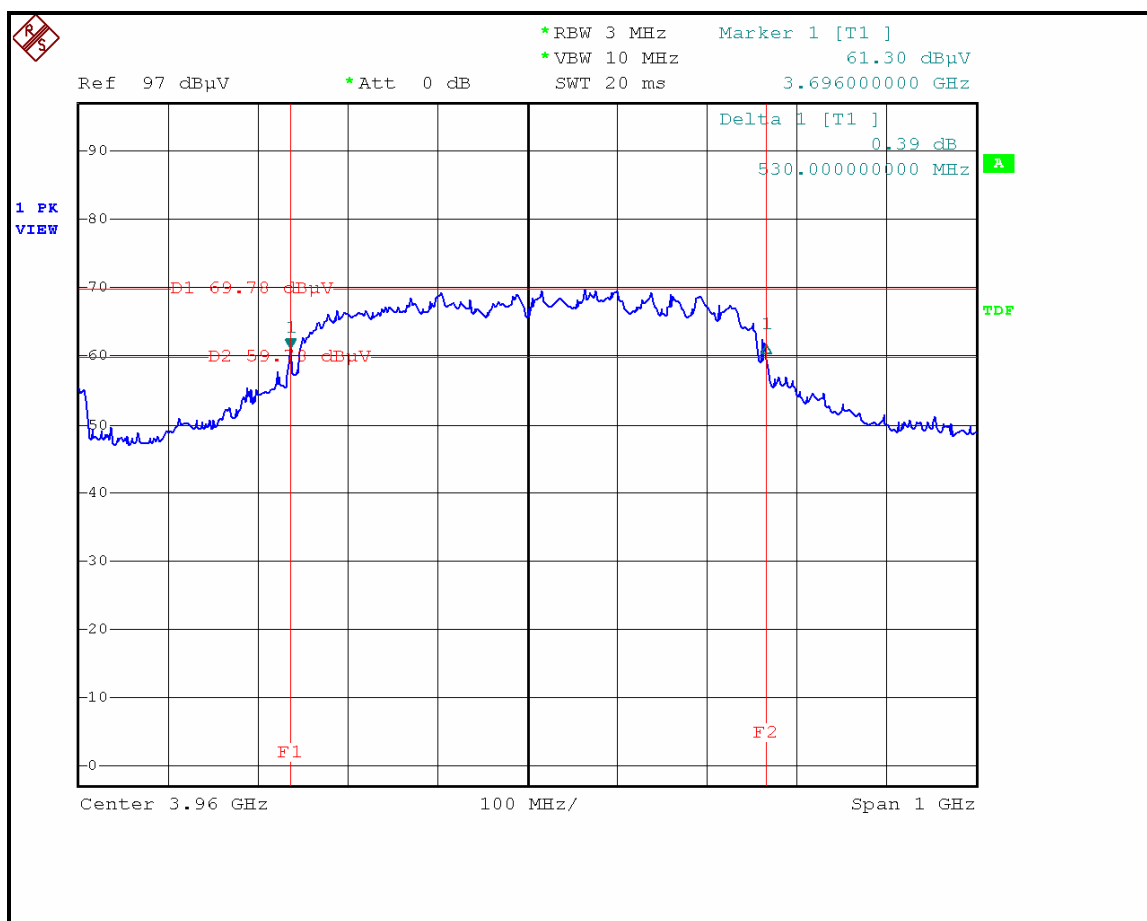


### TEST MODE C (SUB-BAND 2)

<b>MODULATION TECHNOLOGY</b>	MOFDM	<b>ENVIRONMENTAL CONDITIONS</b>	26deg.C, 66%RH, 991hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TESTED BY</b>	Sky Liao

$F_L$ (MHz)	$F_H$ (MHz)	$F_C=(F_L+F_H)/2$ (MHz)	LIMIT (MHz)	PASS/FAIL
3696.00	4226.00	3961.00	Between 3100.00 ~ 10600.00	PASS

UWB Bandwidth =  $F_H - F_L = 530\text{MHz}$





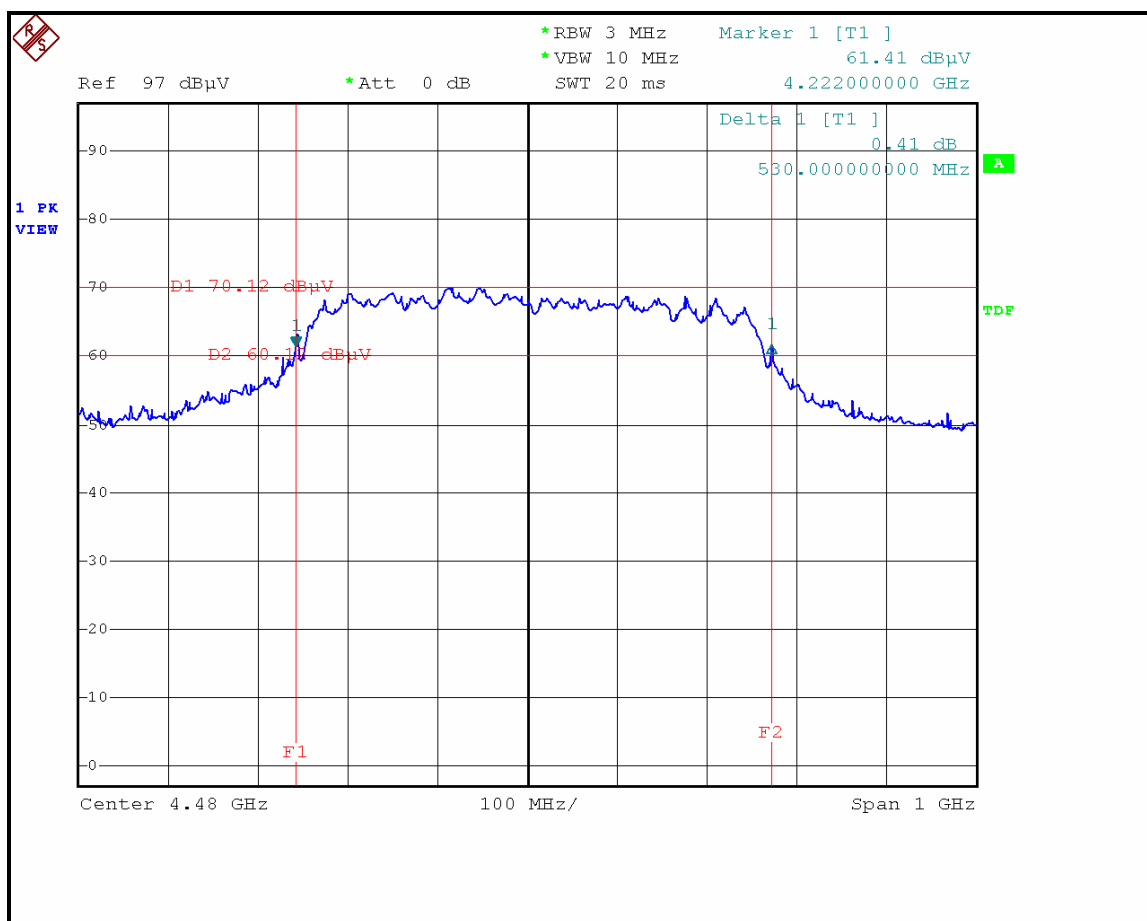


### TEST MODE C (SUB-BAND 3)

<b>MODULATION TECHNOLOGY</b>	MOFDM	<b>ENVIRONMENTAL CONDITIONS</b>	26deg.C, 66%RH, 991hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TESTED BY</b>	Sky Liao

F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	F <sub>C</sub> =(F <sub>L</sub> +F <sub>H</sub> )/2 (MHz)	LIMIT (MHz)	PASS/FAIL
4222.00	4752.00	4487.00	Between 3100.00 ~ 10600.00	PASS

UWB Bandwidth = F<sub>H</sub> - F<sub>L</sub>=530MHz





## 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  $-24.44$ dBm

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

<b>MODULATION TECHNOLOGY</b>	MOFDM	<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 60%RH, 991hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TESTED BY</b>	Sky Liao

#### TEST MODE A(SUB-BAND 1, 2, 3)

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	3432.00	63.77 PK	70.76	-6.99	1.36 H	27	31.31	32.46
1	3432.00	68.31 PK	70.76	-2.45	1.25 V	15	35.85	32.46
2	3960.00	67.20 PK	70.76	-3.56	1.36 H	27	33.39	33.81
<b>2</b>	<b>3960.00</b>	<b>70.25 PK</b>	<b>70.76</b>	<b>-0.51</b>	<b>1.25 V</b>	<b>15</b>	<b>36.44</b>	<b>33.81</b>
3	4480.00	65.00 PK	70.76	-5.76	1.36 H	27	30.12	34.88
3	4480.00	68.50 PK	70.76	-2.26	1.25 V	15	33.62	34.88

#### TEST MODE A(SUB-BAND 1)

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	3432.00	68.85 PK	70.76	-1.91	1.16 H	205	36.39	32.46
1	3432.00	70.23 PK	70.76	-0.53	1.10 V	209	37.77	32.46

#### TEST MODE A(SUB-BAND 2)

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	3960.00	67.90 PK	70.76	-2.86	1.18 H	230	34.09	33.81
1	3960.00	69.78 PK	70.76	-0.98	1.36 V	183	35.97	33.81

#### TEST MODE A(SUB-BAND 3)

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	4480.00	67.90 PK	70.76	-2.86	1.18 H	230	33.02	34.88
1	4480.00	67.78 PK	70.76	-2.98	1.36 V	183	32.90	34.88

## **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 Chip antenna without antenna connector. The Gain of the antenna is -0.5dBi (peak) & -5.9dBi (min. average)

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## 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>	PSB , 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).  
If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab:**  
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Fax: 886-2-26051924

**Hsin Chu EMC/RF Lab:**  
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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](http://www.adt.com.tw)

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.