

# FCC TEST REPORT

**REPORT NO.:** RF960121H01

**MODEL NO.:** C-X5A57

**RECEIVED:** Jan. 19, 2007

**TESTED:** Jan. 27 to 30, 2007

**ISSUED:** Feb. 01, 2007

**APPLICANT:** LOGITECH FAR EAST LTD.

**ADDRESS:** #2 Creation Rd. 4, Science-Based Ind. Park  
Hsinchu Taiwan, R.O.C.

**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,  
Taiwan, R.O.C.

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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.....	6
3.3	GENERAL DESCRIPTION OF APPLIED STANDARDS .....	6
3.4	DESCRIPTION OF SUPPORT UNITS.....	7
3.5	CONFIGURATION OF SYSTEM UNDER TEST .....	7
4	TEST PROCEDURES AND RESULTS .....	8
4.1	CONDUCTED EMISSION MEASUREMENT .....	8
4.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT .....	8
4.1.2	TEST INSTRUMENTS.....	8
4.1.3	TEST PROCEDURES.....	9
4.1.4	TEST SETUP.....	9
4.1.5	EUT OPERATING CONDITIONS.....	10
4.1.6	TEST RESULTS .....	11
4.2	RADIATED EMISSION MEASUREMENT .....	13
4.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT .....	13
4.2.2	TEST INSTRUMENTS.....	15
4.2.3	TEST PROCEDURES.....	16
4.2.4	DEVIATION FROM TEST STANDARD .....	16
4.2.5	TEST SETUP.....	17
4.2.6	EUT OPERATING CONDITIONS.....	17
4.2.7	TEST RESULTS .....	18
4.3	BAND EDGES MEASUREMENT.....	22
4.3.1	LIMITS OF BAND EDGES MEASUREMENT.....	22
4.3.2	TEST INSTRUMENTS.....	22
4.3.3	TEST PROCEDURE .....	22
4.3.4	DEVIATION FROM TEST STANDARD .....	22
4.3.5	EUT OPERATING CONDITION .....	22
4.3.6	TEST RESULTS .....	23
5	INFORMATION ON THE TESTING LABORATORIES .....	25
	APPENDIX-A .....	A-1

## 1 CERTIFICATION

**PRODUCT :** Cordless Precision("JediR" Receiver)  
**BRAND NAME :** Logitech  
**MODEL NO :** C-X5A57  
**TESTED:** Jan. 27 to 30, 2007  
**APPLICANT :** LOGITECH FAR EAST LTD.  
**STANDARDS :** 47 CFR Part 15, Subpart C (Section 15.249),  
ANSI C63.4-2003

The above equipment (Model: C-X5A57) 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 :** Carol Liao , **DATE:** Feb. 01, 2007  
( Carol Liao )

**TECHNICAL**  
**ACCEPTANCE :** Hank Chung , **DATE:** Feb. 01, 2007  
Responsible for RF ( Hank Chung )

**APPROVED BY :** May Chen , **DATE:** Feb. 01, 2007  
( May Chen, Deputy Manager )

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
Standard Paragraph	Test Type	Result	Remark
15.207	Conducted Emission Test	PASS	Minimum passing margin is -7.63dB at 0.150MHz
15.249	Radiated Emission Test	PASS	Minimum passing margin is -8.50dB at 800.03MHz
15.249	Band Edge Measurement	PASS	Meet the requirement of limit

### 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	2.26 dB
Radiated emissions (30MHz-1GHz)	3.46 dB
Radiated emissions (1GHz ~18GHz)	2.32 dB

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Cordless Precision("JediR" Receiver)
<b>MODEL NO.</b>	C-X5A57
<b>FCC ID</b>	JNZ212456
<b>POWER SUPPLY</b>	DC 5.0V from host equipment
<b>MODULATION TYPE</b>	FHSS(FSK)
<b>CARRIER FREQUENCY OF EACH CHANNEL</b>	2402MHz ~ 2480MHz
<b>NUMBER OF CHANNEL</b>	79
<b>ANTENNA TYPE</b>	PCB strip antenna with -0.33dBi antenna gain
<b>DATA CABLE</b>	NA
<b>INTERFACE</b>	USB
<b>ASSOCIATED DEVICES</b>	NA

**NOTE:**

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

### 3.2 DESCRIPTION OF TEST MODES

Seventy-nine channels are provided to this EUT.

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

**NOTE:**

1. Below 1 GHz, the channel 0, 39, and 78 were pre-tested in chamber. The channel 0, worst case one, was chosen for final test.
2. Above 1 GHz, the channel 0, 39, and 78 were tested individually.

### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Cordless Precision("JediR" Receiver). According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**47 CFR Part 15, Subpart C (Section 15.249)**  
**ANSI C63.4: 2003**

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

### 3.4 DESCRIPTION OF SUPPORT UNITS

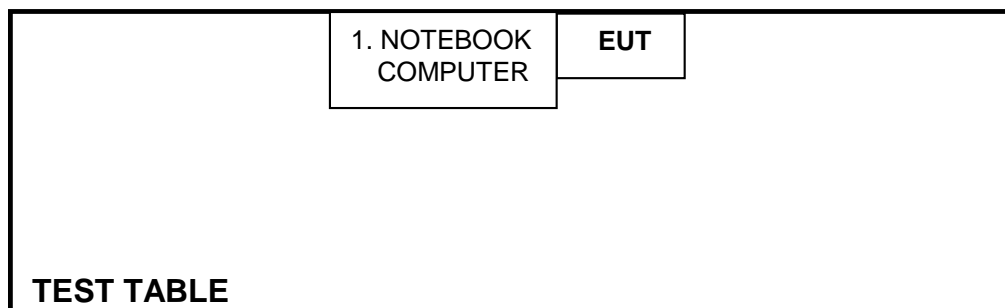
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP21L	CN-0GD366-70166-5 B3-09ZX	QDS-BRCM1016

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA

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

### 3.5 CONFIGURATION OF SYSTEM UNDER TEST



**NOTE:** 1. Please refer to the photos of test configuration in Item 5 also.

## 4 TEST PROCEDURES 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
Test Receiver	ESCS 30	847124/029	Dec. 14, 2007
Line-Impedance Stabilization Network(for EUT)	ENV-216	100071	Nov. 26, 2007
Line-Impedance Stabilization Network(for Peripheral)	KNW-407	8/1395/12	Aug. 15, 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

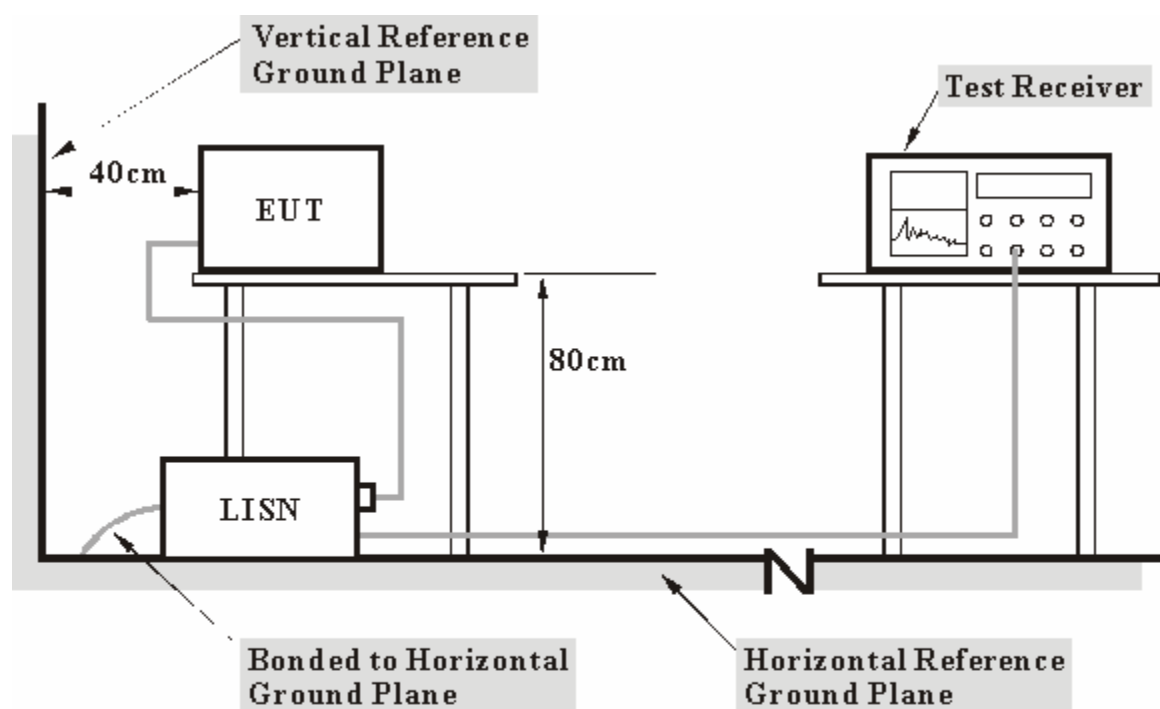
- NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in ADT Shielded Room No. B.
3. The VCCI Con B Registration No. is C-2193.



#### 4.1.3 TEST PROCEDURES

- 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.
- Both lines of the power mains connected to the EUT/HOST were checked for maximum conducted interference.
- 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:**
- Support units were connected to second LISN.
  - Both of LISNs (AMN) 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

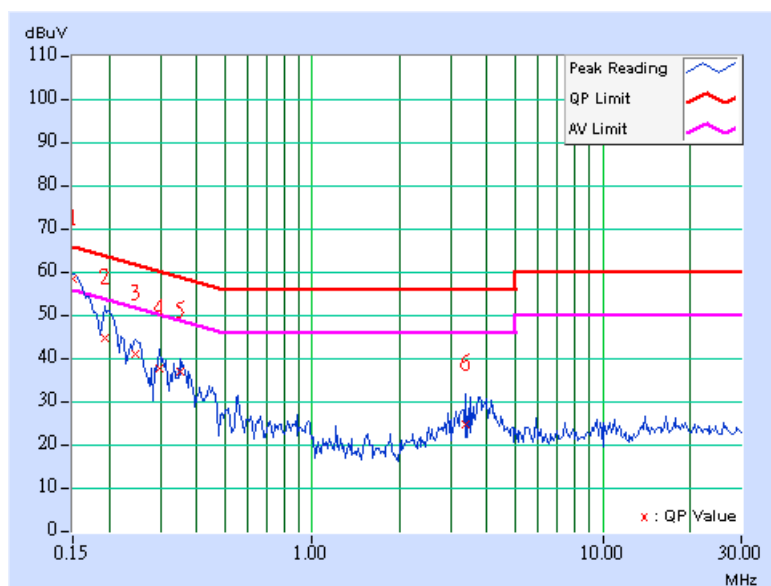
- a. Plug the EUT into the support unit 1 (Notebook computer) which placed on a testing table.
- b. To press the reconnect button of the EUT to enable EUT under transmission/receiving condition continuously.

#### 4.1.6 TEST RESULTS

<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>6DB BANDWIDTH</b>	9 kHz
<b>ENVIRONMENTAL CONDITIONS</b>	16 deg. C, 63%RH, 980 hPa	<b>PHASE</b>	Line (L)
<b>TESTED BY</b>	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	0.150	9.60	48.77	34.04	58.37	43.64	66.00	56.00	-7.63	-12.36
2	0.193	9.60	34.99	-	44.59	-	63.91	53.91	-19.32	-
3	0.248	9.60	31.31	-	40.91	-	61.84	51.84	-20.93	-
4	0.298	9.60	27.95	-	37.55	-	60.29	50.29	-22.74	-
5	0.349	9.60	27.18	-	36.78	-	58.98	48.98	-22.20	-
6	3.391	9.70	15.02	-	24.72	-	56.00	46.00	-31.28	-

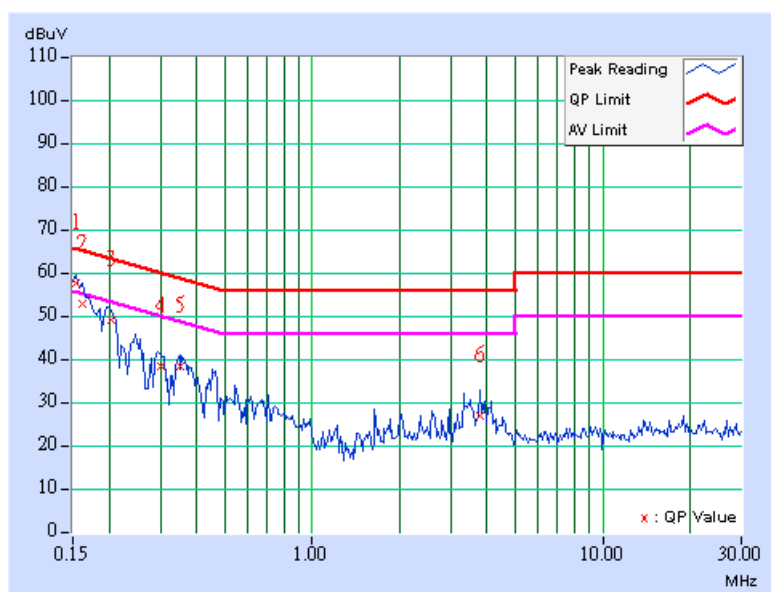
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>6dB BANDWIDTH</b>	9 kHz
<b>ENVIRONMENTAL CONDITIONS</b>	16 deg. C, 63%RH, 980 hPa	<b>PHASE</b>	Neutral (N)
<b>TESTED BY</b>	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	0.154	9.60	48.23	34.26	57.83	43.86	65.79	55.79	-7.96	-11.93
2	0.162	9.60	43.20	-	52.80	-	65.38	55.38	-12.58	-
3	0.204	9.60	39.46	-	49.06	-	63.47	53.47	-14.41	-
4	0.302	9.60	28.74	-	38.34	-	60.18	50.18	-21.84	-
5	0.349	9.60	28.95	-	38.55	-	58.98	48.98	-20.43	-
6	3.785	9.70	17.42	-	27.12	-	56.00	46.00	-28.88	-

- 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

According to 15.249 the field strength of emissions from intentional radiators operated under these frequencies bands shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBuV/m)	
	Peak	Average
2400 ~ 2483.5	114	94
	Field Strength of Harmonics (dBuV/m)	
	74	54

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

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	$2400/F(\text{kHz})$	300
0.490-1.705	$24000/F(\text{kHz})$	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	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 03, 2007
*HP Pre_Amplifier	8449B	3008A01922	Sep. 18, 2007
*ROHDE & SCHWARZ Test Receiver	ESVS 30	841977/002	Oct. 30, 2007
*CHASE Broadband Antenna	CBL6111C	2730	Jun. 08, 2007
*Schwarzbeck Horn_Antenna	BBHA9120-D1	D123	Sep. 25, 2007
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 04, 2008
SCHWARZBECK Biconical Antenna	VHBA9123	459	Jun. 08, 2009
SCHWARZBECK Periodic Antenna	UPA6108	1148	Jun. 08, 2009
*RF Switches	MP59B	6100175593	Jul. 17, 2007
*RF Cable(CHASE)	9913-30M N-N Cable	STBCAB-30M-1 GHz	Jul. 17, 2007
*Software	ADT_Radiated_V 5.14	NA	NA
*CHANCE MOST Antenna Tower	AT-100	CM-A007	NA
*CHANCE MOST Turn Table	TC-008	CM-T007	NA
*CORCOM AC Filter	MRI2030	024/019	NA

- Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Periodic Antenna) and the calibrations are traceable to NML/ROC and NIST/USA.
2. \* = These equipment are used for the final measurement.
3. 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.
4. The test was performed in ADT Open Site No. B.
5. The VCCI Site Registration No. is R-847.
6. The FCC Site Registration No. is 92753.
7. The CANADA Site Registration No. is IC 4824A-2.

### 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:**

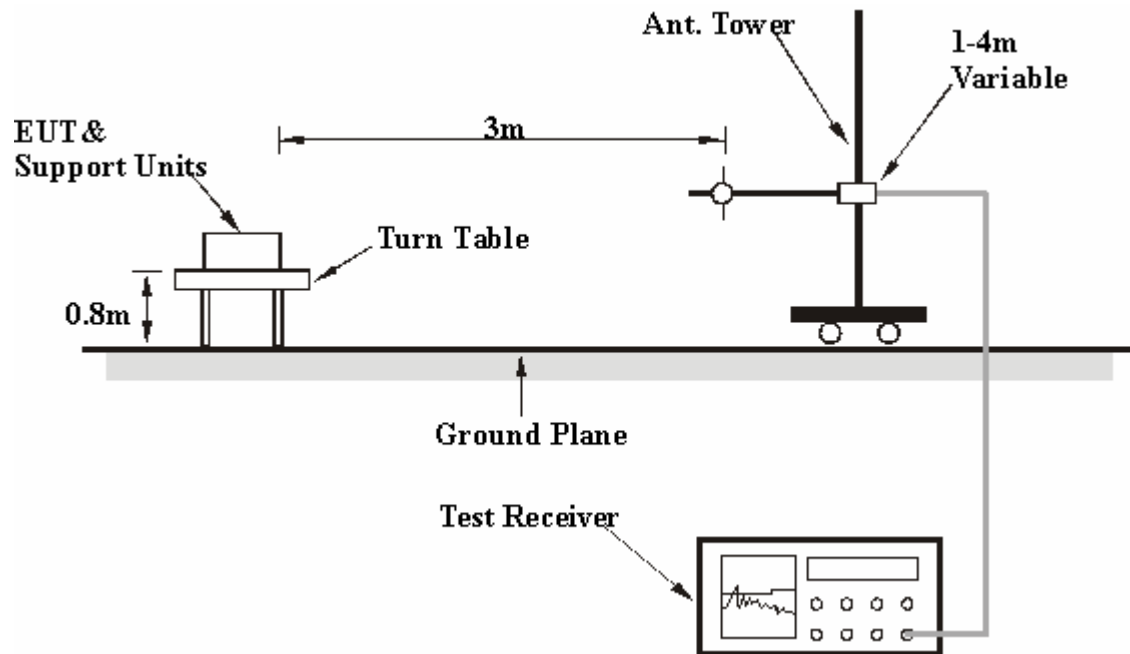
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency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

### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation



#### 4.2.5 TEST SETUP



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

#### 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.5

#### 4.2.7 TEST RESULTS

<b>MODE</b>	Channel 0	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>FREQUENCY RANGE</b>	30-1000 MHz	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Quasi-Peak, 120kHz
<b>ENVIRONMENTAL CONDITIONS</b>	17 deg. C, 67%RH, 980 hPa	<b>TESTED BY</b>	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	160.02	29.40 QP	43.50	-14.10	1.76 H	287	17.40	12.00
2	240.03	31.30 QP	46.00	-14.70	1.50 H	82	17.90	13.40
3	400.02	30.80 QP	46.00	-15.20	1.31 H	342	11.50	19.30
4	480.03	33.00 QP	46.00	-13.00	1.11 H	260	11.60	21.40
5	639.98	34.70 QP	46.00	-11.30	1.37 H	46	10.60	24.10
6	<b>800.03</b>	<b>37.50 QP</b>	<b>46.00</b>	<b>-8.50</b>	<b>1.25 H</b>	<b>60</b>	<b>11.30</b>	<b>26.20</b>
7	959.99	37.30 QP	46.00	-8.70	1.08 H	334	8.00	29.20

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	159.99	29.10 QP	43.50	-14.40	1.00 V	352	17.10	12.00
2	240.02	31.20 QP	46.00	-14.80	1.00 V	213	17.80	13.40
3	400.02	29.80 QP	46.00	-16.20	1.00 V	276	10.50	19.30
4	480.00	36.40 QP	46.00	-9.60	1.00 V	159	15.00	21.40
5	640.05	34.30 QP	46.00	-11.70	1.51 V	41	10.20	24.10
6	799.95	36.40 QP	46.00	-9.60	1.33 V	188	10.20	26.20
7	960.00	37.10 QP	46.00	-8.90	1.04 V	328	7.80	29.20

- 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.

<b>MODE</b>	Channel 0	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>FREQUENCY RANGE</b>	1000~25000MHz	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Peak (PK) Average (AV) 1 MHz
<b>ENVIRONMENTAL CONDITIONS</b>	18 deg. C, 68%RH, 980 hPa	<b>TESTED BY</b>	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	2390.00	41.70 PK	74.00	-32.30	1.37 H	348	9.80	31.90
1	2390.00	11.90 AV	54.00	-42.10	1.37 H	348	-20.00	31.90
2	*2402.00	94.90 PK	114.00	-19.10	1.37 H	348	62.90	32.00
2	*2402.00	63.10 AV	94.00	-30.90	1.37 H	348	31.10	32.00
3	4804.00	47.70 PK	74.00	-26.30	1.43 H	174	11.80	35.90
3	4804.00	17.90 AV	54.00	-36.10	1.43 H	174	-18.00	35.90
4	7206.00	55.80 PK	74.00	-18.20	1.57 H	89	13.60	42.10
4	7206.00	26.00 AV	54.00	-28.00	1.57 H	89	-16.20	42.10

#### 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	2390.00	43.10 PK	74.00	-30.90	1.40 V	310	11.20	31.90
1	2390.00	13.30 AV	54.00	-40.70	1.40 V	310	-18.60	31.90
2	*2402.00	96.30 PK	114.00	-17.70	1.40 V	310	64.30	32.00
2	*2402.00	66.50 AV	94.00	-27.50	1.40 V	310	34.50	32.00
3	4804.00	48.10 PK	74.00	-25.90	1.34 V	206	12.20	35.90
3	4804.00	18.30 AV	54.00	-35.70	1.34 V	206	-17.60	35.90
4	7206.00	54.80 PK	74.00	-19.20	1.50 V	172	12.60	42.10
4	7206.00	25.00 AV	54.00	-29.00	1.50 V	172	-17.20	42.10

#### 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. Margin value = Emission level - Limit value
4. " \* " : Fundamental frequency
5. The other emission levels were very low against the limit.

<b>MODE</b>	Channel 39	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>FREQUENCY RANGE</b>	1000~25000MHz	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Peak (PK) Average (AV) 1 MHz
<b>ENVIRONMENTAL CONDITIONS</b>	18 deg. C, 68%RH, 980 hPa	<b>TESTED BY</b>	Rex Huang

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>								
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	*2441.00	96.20 PK	114.00	-17.80	1.37 H	347	64.10	32.10
1	*2441.00	66.40 AV	94.00	-27.60	1.37 H	347	34.30	32.10
2	4882.00	48.10 PK	74.00	-25.90	1.40 H	162	12.00	36.10
2	4882.00	18.30 AV	54.00	-35.70	1.40 H	162	-17.80	36.10
3	7323.00	55.60 PK	74.00	-18.40	1.62 H	94	13.00	42.60
3	7323.00	25.80 AV	54.00	-28.20	1.62 H	94	-16.80	42.60

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>								
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	*2441.00	98.80 PK	114.00	-15.20	1.39 V	308	66.70	32.10
1	*2441.00	69.00 AV	94.00	-25.00	1.39 V	308	36.90	32.10
2	4882.00	48.80 PK	74.00	-25.20	1.41 V	195	12.70	36.10
2	4882.00	19.00 AV	54.00	-35.00	1.41 V	195	-17.10	36.10
3	7323.00	55.50 PK	74.00	-18.50	1.53 V	169	12.90	42.60
3	7323.00	25.70 AV	54.00	-28.30	1.53 V	169	-16.90	42.60

**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. Margin value = Emission level - Limit value
4. " \* " : Fundamental frequency
5. The other emission levels were very low against the limit.

<b>MODE</b>	Channel 78	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>FREQUENCY RANGE</b>	1000~25000MHz	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Peak (PK) Average (AV) 1 MHz
<b>ENVIRONMENTAL CONDITIONS</b>	18 deg. C, 68%RH, 980 hPa	<b>TESTED BY</b>	Rex Huang

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>								
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	*2480.00	96.50 PK	114.00	-17.50	1.38 H	349	64.20	32.30
1	*2480.00	66.70 AV	94.00	-27.30	1.38 H	349	34.40	32.30
2	2483.50	52.90 PK	74.00	-21.10	1.38 H	349	20.60	32.30
2	2483.50	23.10 AV	54.00	-30.90	1.38 H	349	-9.20	32.30
3	4960.00	47.70 PK	74.00	-26.30	1.45 H	153	11.40	36.30
3	4960.00	17.90 AV	54.00	-36.10	1.45 H	153	-18.40	36.30
4	7440.00	57.20 PK	74.00	-16.80	1.52 H	77	14.20	43.00
4	7440.00	27.40 AV	54.00	-26.60	1.52 H	77	-15.60	43.00

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>								
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	*2480.00	98.50 PK	114.00	-15.50	1.38 V	307	66.20	32.30
1	*2480.00	68.70 AV	94.00	-25.30	1.38 V	307	36.40	32.30
2	2483.50	54.90 PK	74.00	-19.10	1.38 V	307	22.60	32.30
2	2483.50	25.10 AV	54.00	-28.90	1.38 V	307	-7.20	32.30
3	4960.00	48.70 PK	74.00	-25.30	1.39 V	185	12.40	36.30
3	4960.00	18.90 AV	54.00	-35.10	1.39 V	185	-17.40	36.30
4	7440.00	56.20 PK	74.00	-17.80	1.51 V	166	13.20	43.00
4	7440.00	26.40 AV	54.00	-27.60	1.51 V	166	-16.60	43.00

#### 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. Margin value = Emission level - Limit value
4. " \* " : Fundamental frequency
5. The other emission levels were very low against the limit.

### 4.3 BAND EDGES MEASUREMENT

#### 4.3.1 LIMITS OF BAND EDGES MEASUREMENT

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

#### 4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 15, 2007

**NOTE:**

- 1.The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
- 2.The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

#### 4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation

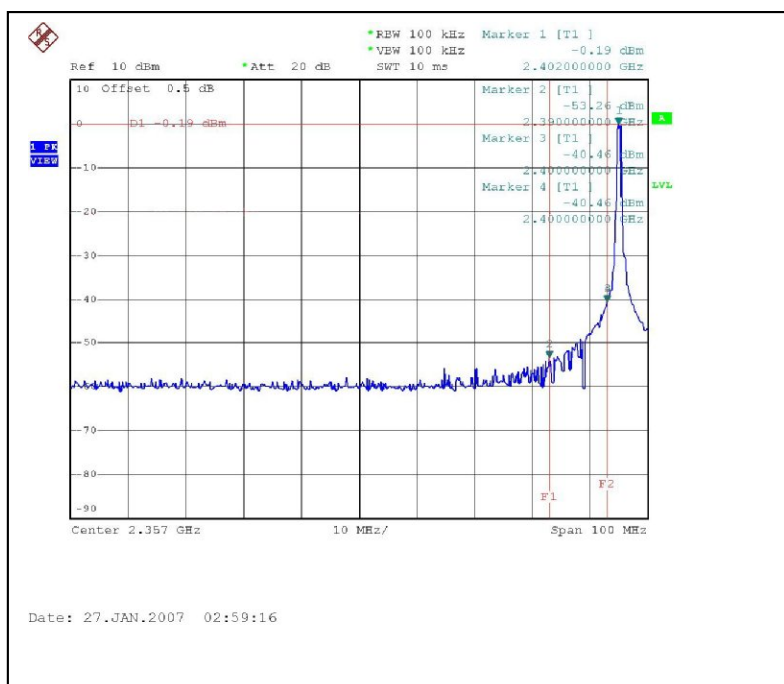
#### 4.3.5 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

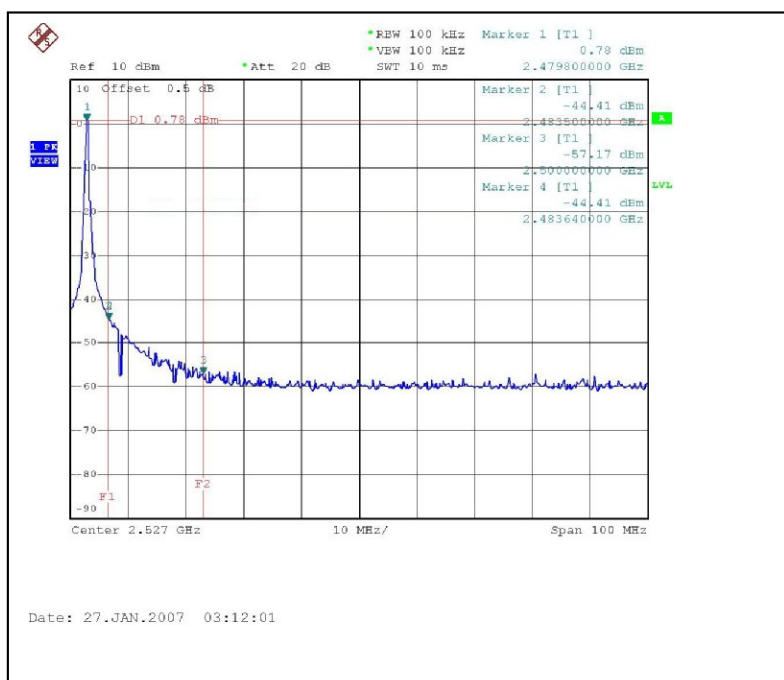
### 4.3.6 TEST RESULTS

Emissions radiated outside of the specified frequency bands, please refer pages form 13 to 21 for met the requirement of the general radiated emission limits in § 15.209.

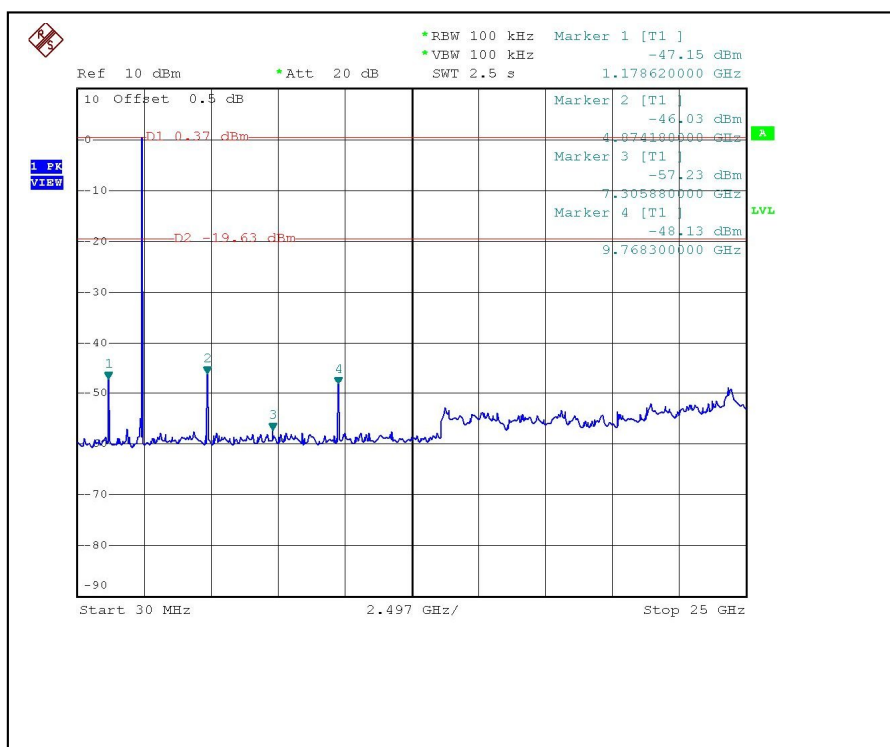
CH0



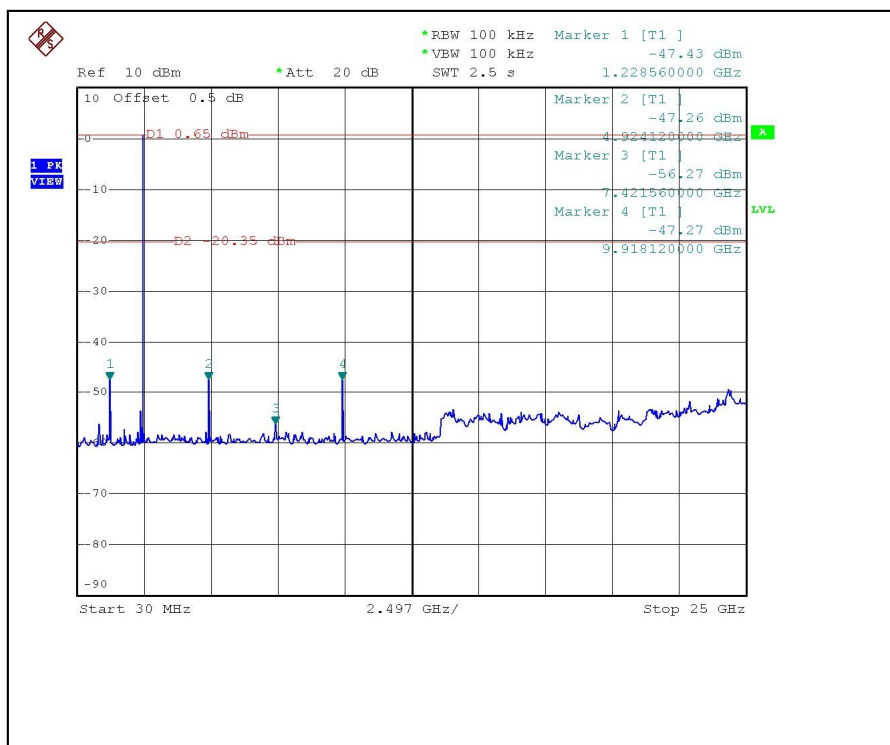
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## 5 INFORMATION ON THE TESTING LABORATORIES

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>	CNLA, 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:**

Tel: 886-2-26052180

Fax: 886-2-26052943

**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

**Email:** [service@adt.com.tw](mailto:service@adt.com.tw)

**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.

## **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.