

FCC DoC TEST REPORT

REPORT NO. : D920612R01

MODEL NO. : CF-B-AG-01

RECEIVED : Jun. 11, 2003

TESTED : Jun. 09 to 12, 2003

APPLICANT : UNIVERSAL SCIENTIFIC INDUSTRIAL CO., LTD.

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Nan-Tou, Taiwan, R.O.C.

ISSUED BY : Advance Data Technology Corporation

LAB LOCATION : No. 81-1, Lu Liao Keng, 9 Ling, Wu Lung Tsuen,
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0536
ILAC MRA



Lab Code: 200376-0

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1 CERTIFICATION

PRODUCT : USI WLAN H2 CF Card
BRAND NAME : USI
MODEL NO : CF-B-AG-01
TEST ITEM : ENGINEERING SAMPLE
APPLICANT : UNIVERSAL SCIENTIFIC INDUSTRIAL CO., LTD.
STANDARDS : 47 CFR Part 15, Subpart B, Class B
ANSI C63.4-1992
ICES-003: 1997

We, **Advance Data Technology Corporation**, hereby certify that one sample (Model: CF-B-AG-01) of the designation has been tested in our facility from Jun. 09 to 12, 2003. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

PREPARED BY: Amanda Chu , **DATE:** Jun. 25, 2003
(Amanda Chu)

APPROVED BY: Eric Lin , **DATE:** Jun. 25, 2003
(Eric Lin, Manager)

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Remarks
47 CFR Part 15, Subpart B / CISPR 22, Class B	Conducted Test	PASS	Meets Class B Limit Minimum passing margin is -14.18 dB at 0.170 MHz
	Radiated Test	PASS	Meets Class B Limit Minimum passing margin is -10.90 dB at 66.50 MHz

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	USI WLAN H2 CF Card
MODEL NO.	CF-B-AG-01
POWER SUPPLY	5/ 3.3VDC from host equipment
POWER CORD	NA
DATA CABLE	NA
I/O PORTS	NA

Note:

1. For more detailed features description, please refer to the manufacturer's specifications or User's Manual.

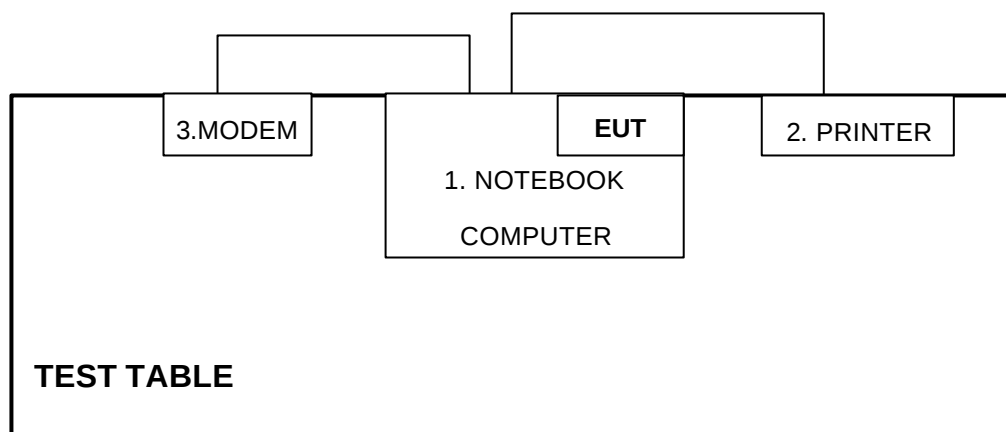
3.2 DESCRIPTION OF SUPPORT UNITS

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	PP01L	TW-09C748-12800-1	FCC DoC
2	Matrix Printer	EPSON	LQ-300+	DCGY017079	FCC DoC
3	MODEM	ACEEX	1414	0206026775	IFAXDM1414

No.	Signal cable description
1	NA
2	1.8 m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.
3	1.3 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.

Note: 1. All power cords of the above support units are unshielded (1.8m).



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

4 EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

- NOTES:** (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
ROHDE & SCHWARZ Test Receiver	ESCS 30	847124/029	Nov. 17, 2003
ROHDE & SCHWARZ LISN (for EUT)	ESHS-Z5	848773/004	Nov. 13, 2003
KYORITSU LISN (for peripheral)	KNW-407	8/1395/12	Jul. 23, 2003
RF Cable (JETBAO)	RG233/U	Cable_CA_01	Jul. 03, 2003
Terminator(for KYORITSU)	50	3	Apr. 11, 2004
Software	Cond-V2e	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.

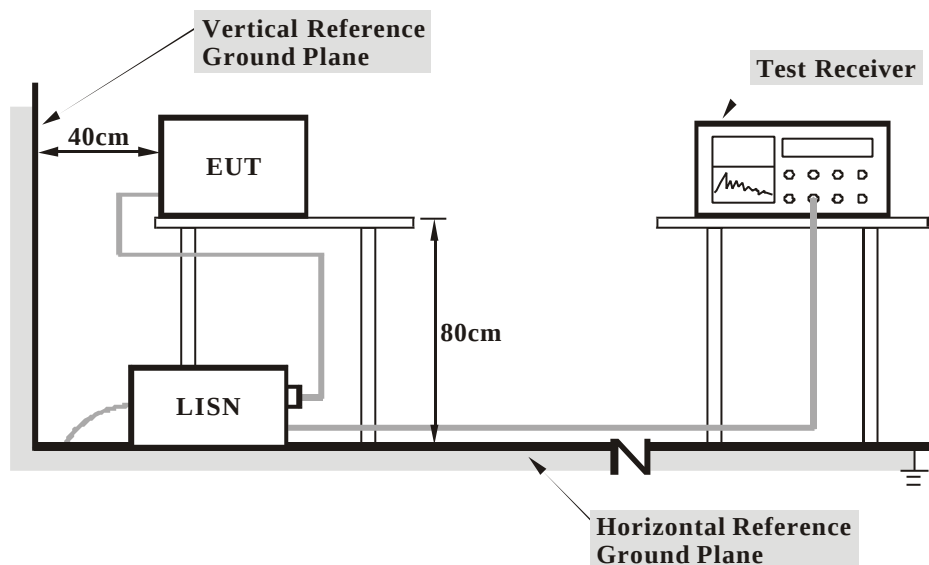
4.1.3 TEST PROCEDURE

- 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.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 20dB under the prescribed limits could not be reported.

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 support units.

For the actual test configuration, please refer to the related Item - Photographs of the Test Configuration.

4.1.6 EUT OPERATING CONDITIONS

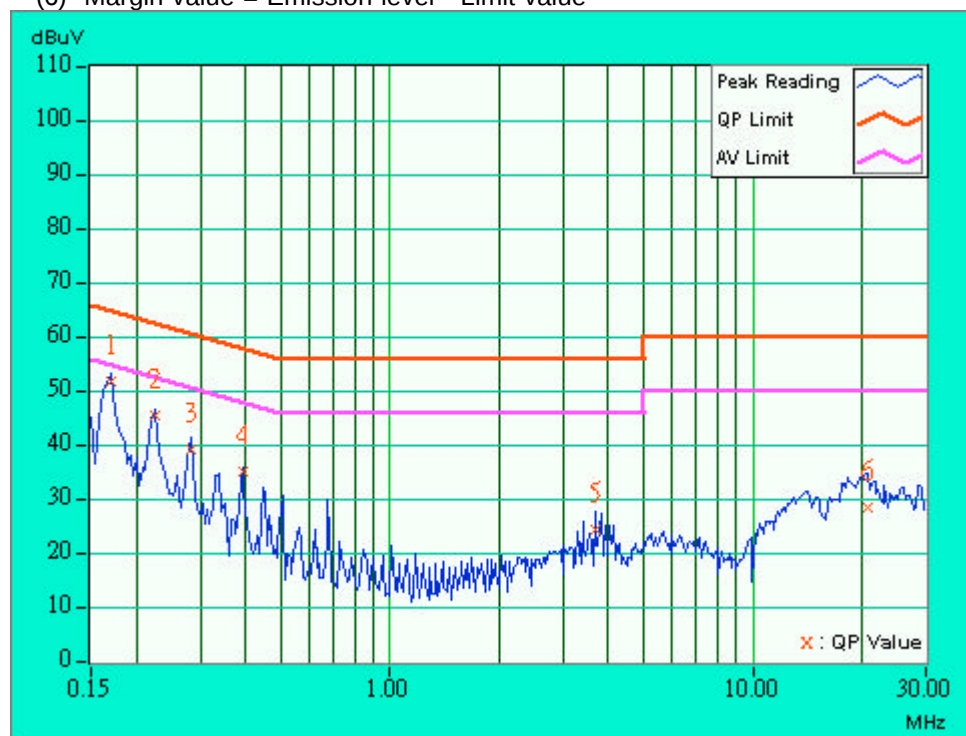
1. Plug the EUT into the support unit 1 (Notebook computer) which placed on a testing table.
2. The support unit 1 (Notebook computer) ran a test program to enable EUT under transmission condition continuously at specific channel frequency.

4.1.7 TEST RESULTS

EUT	USI WLAN H2 CF Card		
MODEL	CF-B-AG-01	PHASE	Line (L)
INPUT POWER	120Vac, 60Hz	6DB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	27 deg. C, 62%RH, 964 hPa	TESTED BY	Tony Chen

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	0.170	0.10	50.70	-	50.80	-	64.98	54.98	-14.18	-
2	0.224	0.10	44.39	-	44.49	-	62.66	52.66	-18.17	-
3	0.283	0.10	38.23	-	38.33	-	60.73	50.73	-22.40	-
4	0.392	0.10	34.34	-	34.44	-	58.02	48.02	-23.58	-
5	3.695	0.18	23.52	-	23.70	-	56.00	46.00	-32.30	-
6	20.699	1.03	27.39	-	28.42	-	60.00	50.00	-31.58	-

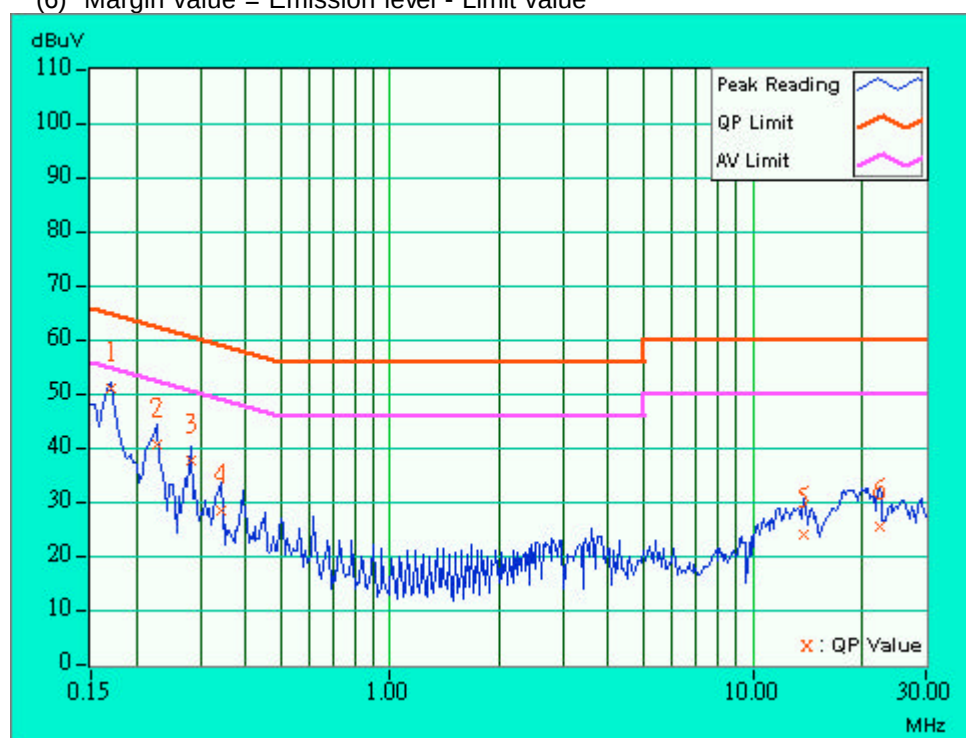
- NOTES: (1) "-": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction Factor = Insertion loss + Cable loss
(6) Margin value = Emission level - Limit value



EUT	USI WLAN H2 CF Card		
MODEL	CF-B-AG-01	PHASE	Neutral (N)
INPUT POWER	120Vac, 60Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	27 deg. C, 62%RH, 964 hPa	TESTED BY	Tony Chen

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	0.170	0.10	50.42	-	50.52	-	64.98	54.98	-14.46	-
2	0.228	0.10	40.00	-	40.10	-	62.52	52.52	-22.42	-
3	0.283	0.10	36.91	-	37.01	-	60.73	50.73	-23.72	-
4	0.341	0.10	27.54	-	27.64	-	59.17	49.17	-31.53	-
5	13.828	0.58	23.45	-	24.03	-	60.00	50.00	-35.97	-
6	22.340	0.79	24.93	-	25.72	-	60.00	50.00	-34.28	-

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT FOR FREQUENCY BELOW 1000 MHZ

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
30 – 88	90	39.1	100	40.0
88 – 216	150	43.5	150	43.5
216 – 960	210	46.4	200	46.0
960 – 1000	300	49.5	500	54.0

LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHZ

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80.0	60.0	74.0	54.0

- Note: (1) The lower limit shall apply at the transition frequencies.
 (2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
 (3) All emanation 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.

TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
HP Spectrum Analyzer	8594ER	3829U04676	Jul. 14, 2003
ADVANTEST Spectrum Analyzer	R3271A	85060311	May 21, 2004
CHASE RF Pre_Amplifier	CPA9232	1057	Apr. 24, 2004
HP Pre_Amplifier	8449B	3008A01281	June 27, 2004
ROHDE & SCHWARZ Test Receiver	ESVS 10	849231 /019	Nov. 03, 2003
CHASE Broadband Antenna	CBL6111c	2730	Jul 17, 2003
Schwarzbeck Horn_Antenna	BBHA9120-D1	D123	Jul. 31, 2003
SCHWARZBECK Tunable Dipole Antenna	UHAP	897	Mar. 07, 2005
SCHWARZBECK Tunable Dipole Antenna	VHAP	880	Mar. 07, 2005
RF Switches (ARNITSU)	CS-201	1565157	Jul. 29, 2003
RF CABLE (Chaintek) 1GHz-20GHz	Ak 9515-D	001	Aug, 20.2003
RF Cable(RICHTEC)	9913-30M	STCCAB-30M- 1GHz-021	Nov. 5, 2003
Software	AS60P8	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 (36 months for Tunable Dipole 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 and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The test was performed in ADT Open Site No. C.
5. The FCC Site Registration No. is 656396.
6. The VCCI Site Registration No. is R-1626.

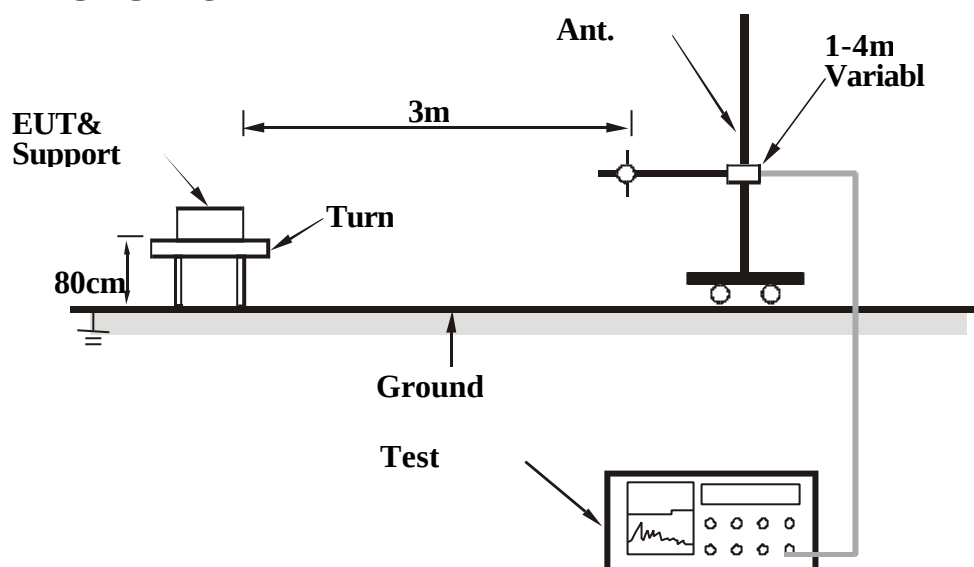
4.2.2 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10-meter open field 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 polarization's 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 rotating 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 the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.
- g. For measurement of frequency above 1000 MHz, the EUT was set 3 meters away from the interference antenna and the detect function was set to Peak or Average.

4.2.3 DEVIATION FROM TEST STANDARD

No deviation

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 4.1.6

4.2.6 TEST RESULTS

EUT	USI WLAN H2 CF Card		
MODEL	CF-B-AG-01	FREQUENCY RANGE	30-1000 MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 56%RH, 964 hPa	TESTED BY	Eric Lee

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	119.94	18.6 QP	43.50	-24.90	1.26 H	49	7.10	11.50
2	120.38	23.8 QP	43.50	-19.70	1.32 H	163	12.20	11.50
3	131.51	28.2 QP	43.50	-15.30	1.14 H	323	16.40	11.80
4	263.54	25.8 QP	46.00	-20.20	1.49 H	301	11.70	14.10
5	395.76	24.6 QP	46.00	-21.40	1.02 H	201	7.60	16.90
6	397.15	26.1 QP	46.00	-19.90	1.22 H	78	9.10	17.00
7	440.38	26.5 QP	46.00	-19.50	1.51 H	139	8.50	18.00
8	625.18	32.4 QP	46.00	-13.60	1.42 H	28	10.60	21.70
9	650.34	34.4 QP	46.00	-11.60	1.03 H	75	12.40	22.00
10	672.45	34.0 QP	46.00	-12.00	1.44 H	191	11.90	22.20

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	52.00	23.0 QP	40.00	-17.00	1.26 V	231	15.40	7.60
2	66.50	29.1 QP	40.00	-10.90	1.11 V	89	23.60	5.50
3	157.75	28.7 QP	43.50	-14.80	1.12 V	203	18.30	10.40
4	176.00	21.6 QP	43.50	-21.90	1.14 V	78	12.50	9.20
5	220.00	28.7 QP	46.00	-17.30	1.27 V	110	19.30	9.40
6	373.99	26.3 QP	46.00	-19.70	1.43 V	0	10.10	16.20
7	439.78	26.9 QP	46.00	-19.10	1.86 V	39	8.90	18.00
8	484.21	20.1 QP	46.00	-25.90	1.17 V	327	1.10	19.00
9	528.12	30.1 QP	46.00	-15.90	1.47 V	221	10.40	19.60
10	593.96	31.4 QP	46.00	-14.60	1.00 V	215	10.40	21.00
11	748.00	34.4 QP	46.00	-11.60	1.55 V	2	10.60	23.80

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
 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	USI WLAN H2 CF Card		
MODEL	CF-B-AG-01	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) Average (AV) 1MHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 59%RH, 964 hPa	TESTED BY	Eric Lee

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	4924.00	45.8 PK	74.00	-28.20	1.02 H	47	9.10	36.70
2	9848.00	51.6 PK	74.00	-22.40	1.09 H	122	7.20	44.40
2	9848.00	41.1 AV	54.00	-12.90	1.09 H	122	-3.30	36.70

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	4924.00	46.3 PK	74.00	-27.70	1.25 V	154	9.60	36.70
2	9848.00	51.4 PK	74.00	-22.60	1.25 V	266	7.10	44.40
2	9848.00	40.7 AV	54.00	-13.30	1.25 V	266	-3.60	36.70

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
 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. The limit value is defined as per 15.247
 6. “ * ” : Fundamental frequency

RADIATED EMISSION TEST





6 APPENDIX - INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC and Safety consultation. Our laboratories are accredited by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

USA	FCC, NVLAP, UL
Germany	TUV Rheinland
Japan	VCCI
New Zealand	MoC
Norway	NEMKO
Canada	INDUSTRY CANADA
R.O.C.	CNLA, BSMI

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

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