



EMC

TEST REPORT

REPORT NO. : CE89102305
MODEL NO. : PCA-6180XX
DATE OF TEST : Nov. 29 ~ Dec. 4, 2000
DATE OF RECEIPT : Oct. 23, 2000

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1. CERTIFICATION

Issue date: Dec. 14, 2000

Product : CPU BOARD
Trade Name : ADVANTECH
Model No. : PCA-6180XX
Applicant : ADVANTECH CO., LTD.
Standard : EN 55022: 1998, Class A

EN 50082-2: 1995

EN 61000-4-2: 1995

EN 61000-4-3: 1996

EN 61000-4-4: 1995

EN 61000-4-6: 1996

EN 61000-4-8: 1993

ENV 50204: 1996

We hereby certify that one sample (model: PCA-6180F) of the designation has been tested in our facility from Nov. 29 to Dec. 13, 2000. The test record, data evaluation and Equipment Under Test (EUT) configurations represent herein are true and accurate representation of the measurements of the sample's EMC characteristics under the conditions herein specified.

TESTED BY : _____ , DATE: _____
(Emission) (Alan Chang)

TESTED BY : _____ , DATE: _____
(Immunity) (Win Ching Lin)

CHECKED BY : _____ , DATE: _____
(Vickie Yu)

APPROVED BY : _____ , DATE: _____
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION



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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product : CPU BOARD
Model No. : PCA-6180XX
Power Supply : Switching, DC (from PC)
Data Cable : N/A

Note: The EUT is a CPU board which supports Pentium III CPU and deploys Intel 815E chipset and up to 512 MB SDRAM in three DIMM sockets. There are AGP/VGA card, PCI Ultra 160 SCSI controller and optional dual 10/100Base-T networking controller all on-board.

The EUT, which is installed in the industrial PC, was tested with the following configuration:

ITEM	BRAND	MODEL	REMARK
CPU	INTEL	PENTIUM III	533 MHz
HDD	IBM	DHEA-36481	4.8G
SCSI HDD	FUJITSU	MAJ3182MP	18GB
FDD	NEC	FD1231H	1.44MB
CD-ROM	CTX	CD-44X	44X
BACKPLANE	ADVANTECH	PCA-6114P4	NA
USB BOARD	ADVANTECH	PCA-6180PS2-A1	NA
POWER SUPPLY	DELTA	DPS-300PB-103	Rating: 115V-230V, 8A/4A 50/60 Hz +5V 25A +12V 14A +5VSB 1A +3.3V 15 -12V 0.8A -5V 0.5A

The VGA card is with resolution up to 1600 x 1200.

The “X” in the model: PCA-6180XX could be defined as 0 ~ 9, A ~ Z or blank according to customer’s requirement.

Model: PCA-6180F was chosen as representative model for the test.

For more detailed features description, please refer to manufacturer’s specification or User's Manual.



2.2 GENERAL DESCRIPTION OF APPLIED STANDARD

The EUT is a kind of Information Technology Equipment, which could be used in industrial area and according to the manufacturer's specifications, it was tested according to the following standards:

EN 55022: 1998, Class A

EN 50082-2: 1995

EN 61000-4-2: 1995

EN 61000-4-3: 1996

EN 61000-4-4: 1995

EN 61000-4-6: 1996

EN 61000-4-8: 1993

ENV 50204: 1996

All tests are performed and recorded as per above standards.



2.3 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 are used to form representative test configuration during the tests.

FOR EMISSION TEST

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	21" COLOR MONITOR	HP	D2846A	JP90512129	DOC
2	MODEM	ACEEX	1414	980020506	IFAXDM1414
3	MODEM	ACEEX	1414	980020569	IFAXDM1414
4	PRINTER	HP	2225C+	3123S97230	DSI6XU2225
5	PS/2 KEYBOARD	FORWARD	FDA-104GA	FDKB8110111	F4ZDA-104G
6	MOUSE	LOGITECH	M-S43	LZE00703197	DZL211106
7	USB KEYBOARD	SiliconGrapphis	SK-2502U	S990800271	GYUR58SK
8	USB MOUSE	DEXIN Corp.	A2U800A	71001820	NIYA2U800A
9	PERSONAL COMPUTER	IBM	2187-12W	1S218714ABN A001N	FCC DoC
10	Network adapter	INTEL	GD82559	009027A59277	DoC
11	19"COLOR MONITOR	HP	D2842A	KR93473116	BEJCB910
12	OFFICE CONNECT HUB	3COM	TP800	7YNR011412	FCC DoC
13	PS/2 KEYBOARD	FORWARD	FDA-104GA	FDKB8110117	F4ZDA-104G
14	MOUSE	LOGITECH	M-S43	LZE00703123	DZL211106

No.	Signal cable description
1	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core.
2	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
3	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
4	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.

5	1.5 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
6	1.5 m foil shielded wire, terminated with PS2 connector via drain wire, w/o core.
7	2.5 m braid shielded wire, terminated with USB connector via drain wire, w/o core.
8	1.5 m foil shielded wire, terminated with USB connector via drain wire, w/o core.
9	NA
10	NA
11	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core.
12	NA
13	1.5 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
14	1.5 m foil shielded wire, terminated with PS2 connector via drain wire, w/o core.

Note: 1. All power cords of the above support units are non shielded (1.8m).
2. Support unit 7 & 8 were connected to the USB ports of EUT.
3. Support units 1-8 were set up as the SERVER PC system and communicated with support units 9-14, which acted as WORKSTATION and partners of communication system via a STP cable (10m).
4. Two USB cables (1.8m) were connected to the two USB ports of the EUT to form two open loop cables.

FOR IMMUNITY TEST

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	COLOR MONITOR	ACER	7254e	9171602003	JVP7254E
2	MODEM	GVC	F-1128V1R6	96-191-113003	DK4F1128VR6
3	MODEM	GVC	F-1128V1R6	96-191-113004	DK4F1128VR6
4	PRINTER	HP	C2145A	SG5BN160GY	B94C2145X
5	KEYBOARD	BTC	5121W	A00800775	E5XKB5121WT H0110
6	MOUSE	LOGITECH	M-S43	LZE00703283	DZL211106
7	USB MOUSE	LOGITECH	M-BB48	LZE00651079	DOC
8	USB KEYBOARD	SiliconGraphis	SK-2502U	S990800272	GYUR58SK
9	Personal Computer	NTI	PI I-233	P201096	FCC DoC
10	COLOR MONITOR	ACER	7254e	9171602008	JVP7254E
11	PS/2 KEYBOARD	HP	C3757A	C3757-60223	C1GE 03614
12	MOUSE	LOGITECH	M-S43	LZE00703084	DZL211106

13	Network adapter	INTEL	GD82559	009027A59648	EJMNPDALBA NY
14	OFFICE CONNECT HUB	3COM	TP800	7YNR011412	FCC DoC

No.	Signal cable description
1	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core.
2	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
3	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
4	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.
5	1.6 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
6	1.5 m foil shielded wire, terminated with PS2 connector via drain wire, w/o core.
7	1.8 m foil shielded wire, terminated with USB connector via drain wire, w/o core.
8	2.5 m braid shielded wire, terminated with USB connector via drain wire, w/o core.
9	NA
10	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core.
11	1.5 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
12	1.8 m foil shielded wire, terminated with PS2 connector via drain wire, w/o core.
13	NA
14	NA

Note: 1. All power cords of the above support units are non shielded (1.8m).
 2. Support unit 7 & 8 were connected to the USB ports of EUT.
 3. Support units 1-8 were set up as the SERVER PC system and communicated with support units 9-14, which acted as WORKSTATION and partners of communication system via a STP cable (10m).
 4. Two USB cables (1.8m) were connected to the two USB ports of the EUT to form two open loop cables.

2.4 TEST SETUP

Please refer to the photos of test configuration in Item 6.

3. TEST INSTRUMENTS

3.1 TEST INSTRUMENTS (EMISSION)

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESHS30	828109/007	July 6, 2001
ROHDE & SCHWARZ Artificial Mains Network	ESH3-Z5	839135/006	July 9, 2001
ROHDE & SCHWARZ 4-wire ISN	ENY41	835154/007	Apr. 26, 2001
EMCO-L.I.S.N.	3825/2	9204-1964	July 9, 2001
Shielded Room	Site 2	ADT-C02	NA

- Note: 1. The measurement uncertainty is less than $\pm 2.6\text{dB}$, which is calculated as per NAMA's 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.

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8590L	3544A01042	April 6, 2001
HP Preamplifier	8447D	2944A08313	Mar. 20, 2001
HP Preamplifier	8449B	3008A01201	Dec. 14, 2000
ROHDE & SCHWARZ TEST RECEIVER	ESVS 30	841977/008	Oct. 11, 2001
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2001
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Aug. 3, 2001
EMCO Double Ridged Guide Antenna	3115	9312-4192	March 29, 2001
CHASE BILOG Antenna	CBL6111A	1647	July 3, 2001
EMCO Turn Table	1016	1722	NA
EMCO Tower	1051	1825	NA
Open Field Test Site	Site 4	ADT-R04	June 9, 2001

- Note: 1. The measurement uncertainty is less than $\pm 3\text{dB}$, which is calculated as per NAMA's 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.

3.2 TEST INSTRUMENTS (IMMUNITY)

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
KeyTek, ESD Test System	2000	9105240/41	Aug. 10, 2001
KeyTek, ESD Simulator	MZ-15/EC	9902287	Feb. 28, 2001
KeyTek, EFT Generator	CE-40	9508257	Sept. 4, 2001
KeyTek, Capacitive Clamp	CE-40-CCL	9508259	Sept. 4, 2001
KeyTek, Control Center	E103	9508347	NA
KeyTek, Surge Combination Wave	E501A	9508349	Aug. 29, 2001
KeyTek, Surge Coupler/Decoupler	E551	9508350	Aug. 29, 2001
External Coupler /Decoupler	CM-TELCD	9926194	NA
I/O Signal Line Coupler/Decoupler	CM-110CD	9907177	NA
ROHDE & SCHWARZ Signal Generator	SMY01	840490/009	Aug. 13, 2001
KALMUS Power Amplifier	LA1000V	091995-1	NA
KALMUS Power Amplifier	757LC	091995-2	NA
HOLADAY Field Probe	HI-4422	89915	Aug. 14, 2001
EMCO BiconiLog Antenna	3141	1001	NA
FCC Coupling Decoupling Network	FCC-801-M3-25	48	NA
FCC Coupling Decoupling Network	FCC-801-M2-25	20	NA
FISCHER CUSTOM COMMUNICATIONS EM Injection Clamp	FCC-203I	50	NA
FCC Coupling Decoupling Network	FCC-801-M1-25	17	NA
BOONTON RF Voltage Meter	9200B	331801AE	Aug. 13, 2001
COMTEST Compact Full Anechoic Chamber (7x3x3 m)	CFAC	ADT-S01	Aug. 26, 2001
HAEFELY Magnetic Field Tester	MAG 100.1	083794-06	NA
COMBINOVA Magnetic Field Meter	MFM10	224	Oct. 30, 2001
KEYTEK Mains Interference Simulator	EMC Pro	9902207	Feb. 16, 2001
HAEFELY Mains Interference Simulator	PLINE 1610	083690-17	March 01, 2001

Note: The calibration interval of the above test instruments is 12 months.

And the calibrations are traceable to NML/ROC and NIST/USA.

3.3 LIMITS OF CONDUCTED AND RADIATED EMISSION

LIMIT OF RADIATED EMISSION OF EN 55022

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30 - 230	40	30
230 - 1000	47	37

- 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.

LIMIT OF CONDUCTED EMISSION OF EN 55022

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

- Note: (1) The lower limit shall apply at the transition frequencies.
 (2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz
 (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.

LIMIT OF CONDUCTED COMMON MODE DISTURBANCE AT TELECOMMUNICATION PORTS FOR CLASS B EQUIPMENT

FREQUENCY (MHz)	Voltage Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	84 - 74	74 - 64
0.5 - 30.0	74	64

- Note: (1) The lower limit shall apply at the transition frequencies.
 (2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz
 (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.



4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Product Family Standard : EN 55022: 1998, Class A
Frequency Range : 0.15 - 30 MHz (Conducted Emission)
30 - 1000 MHz (Radiated Emission)
Input Voltage : 230 Vac, 50 Hz (to PC)
Temperature : 25 Degree C
Humidity : 75 %
Atmospheric Pressure : 1003 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -28.35 dB at 0.208 MHz Minimum passing margin of telecommunication ports of conducted emission: -20.47 dB at 0.549 MHz Minimum passing margin of radiated emission: -2.3 dB at 132.85 MHz

4.2 EUT OPERATION CONDITION

1. Turn on the power of all equipments.
2. Industrial PC reads a test program to enable all functions.
3. Industrial PC reads and writes messages from HDD.
4. Industrial PC transmit and receives messages to and from WORKSTATION PC.
5. Industrial PC sends "H" messages to monitor and monitor displays "H" patterns on screen.
6. Industrial PC sends "H" messages to modem.
7. Industrial PC sends "H" messages to printer and the printer prints them on paper.
8. Repeat steps 2-8.

4.3 TEST DATA OF CONDUCTED EMISSION

EUT: **CPU BOARD**

MODEL: **PCA-6180F**

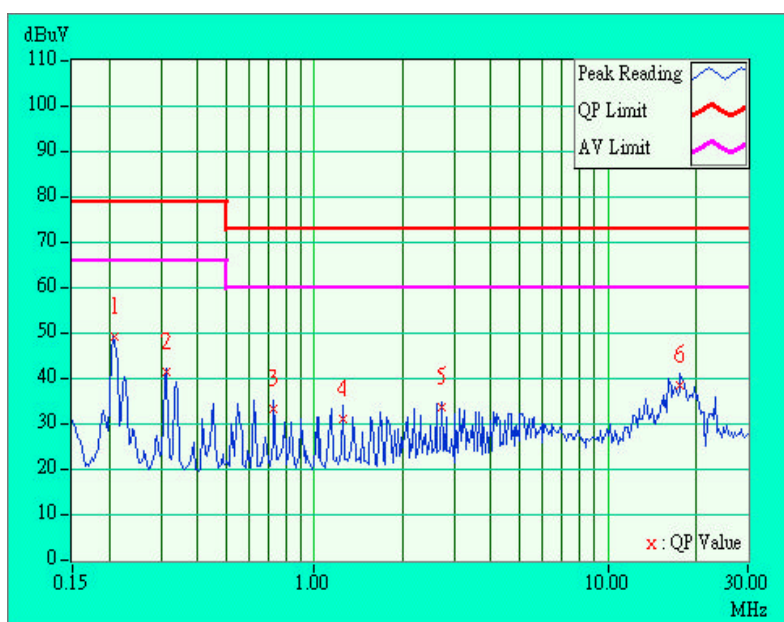
6 dB Bandwidth: **10 kHz**

PHASE: **LINE (L)**

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.
0.208	0.20	49.30	-	49.50	-	79.00	66.00	-29.50	-
0.312	0.20	41.34	-	41.54	-	79.00	66.00	-37.46	-
0.729	0.20	33.51	-	33.71	-	73.00	60.00	-39.29	-
1.248	0.20	30.96	-	31.16	-	73.00	60.00	-41.84	-
2.711	0.27	33.74	-	34.01	-	73.00	60.00	-38.99	-
17.693	1.05	38.50	-	39.55	-	73.00	60.00	-33.45	-

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. Emission Level = Correction Factor + Reading Value.



TEST DATA OF CONDUCTED EMISSION

EUT: **CPU BOARD**

MODEL: **PCA-6180F**

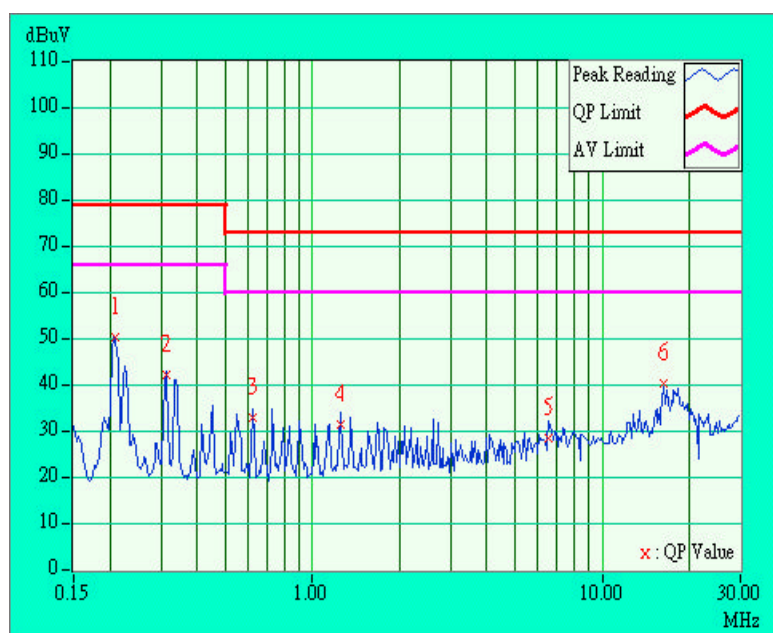
6 dB Bandwidth: **10 kHz**

PHASE: **NEUTRAL (N)**

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.
0.208	0.20	50.45	-	50.65	-	79.00	66.00	-28.35	-
0.312	0.20	42.26	-	42.46	-	79.00	66.00	-36.54	-
0.626	0.20	32.91	-	33.11	-	73.00	60.00	-39.89	-
1.248	0.20	31.36	-	31.56	-	73.00	60.00	-41.44	-
6.568	0.49	28.40	-	28.89	-	73.00	60.00	-44.11	-
16.226	0.92	40.40	-	41.32	-	73.00	60.00	-31.68	-

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. Emission Level = Correction Factor + Reading Value.



4.4 TEST DATA OF TELECOMMUNICATION PORT VOLTAGE OF CONDUCTED EMISSION (A)

EUT: **CPU BOARD**

MODEL: **PCA-6180F**

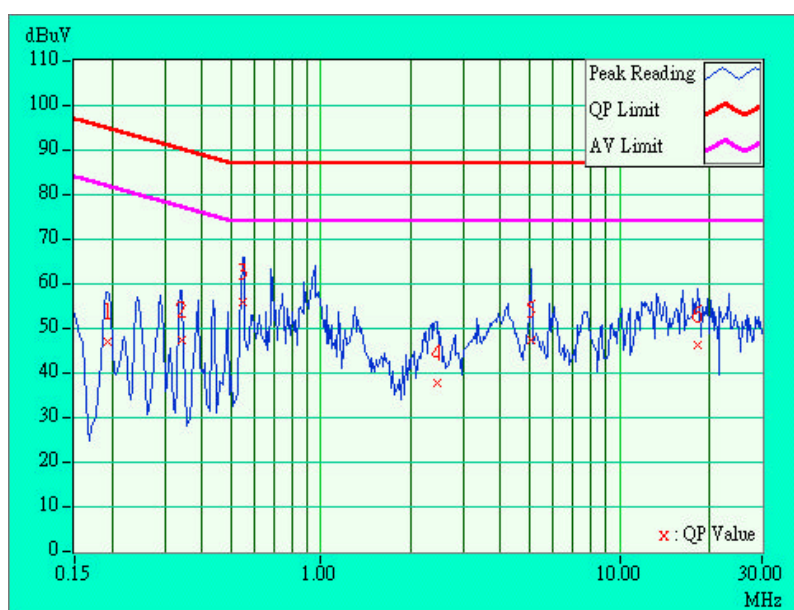
6 dB Bandwidth: 10 kHz

PHASE: TELECOMMUNICATION PORT-LAN 1

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.
0.195	10.68	46.86	-	57.54	-	94.84	81.84	-37.30	-
0.341	10.65	47.41	-	58.06	-	90.17	77.17	-32.12	-
0.549	10.60	55.93	-	66.53	-	87.00	74.00	-20.47	-
2.442	10.52	37.68	-	48.20	-	87.00	74.00	-38.80	-
5.075	10.62	47.24	-	57.86	-	87.00	74.00	-29.14	-
18.245	10.64	46.44	-	57.08	-	87.00	74.00	-29.92	-

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. Emission Level = Correction Factor + Reading Value.



TEST DATA OF TELECOMMUNICATION PORT VOLTAGE OF CONDUCTED EMISSION (B)

EUT: **CPU BOARD**

MODEL: **PCA-6180F**

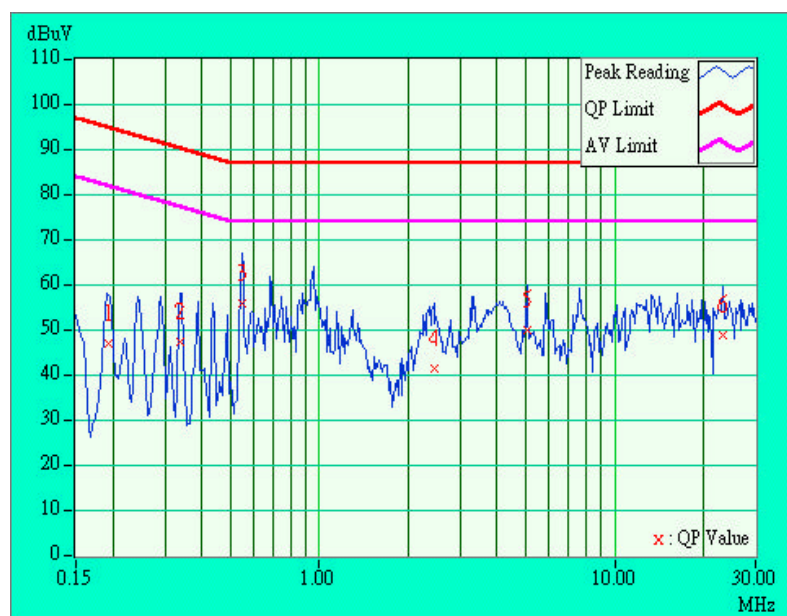
6 dB Bandwidth: 10 kHz

PHASE: TELECOMMUNICATION PORT-LAN 2

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.
0.194	10.68	46.92	-	57.60	-	94.85	81.85	-37.24	-
0.340	10.65	47.43	-	58.08	-	90.20	77.20	-32.13	-
0.549	10.60	55.83	-	66.43	-	87.00	74.00	-20.57	-
2.442	10.52	41.41	-	51.93	-	87.00	74.00	-35.07	-
5.075	10.62	50.04	-	60.66	-	87.00	74.00	-26.34	-
23.129	10.66	48.96	-	59.62	-	87.00	74.00	-27.38	-

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. Emission Level = Correction Factor + Reading Value.





4.5 TEST DATA OF RADIATED EMISSION

EUT: **CPU BOARD**

MODEL: **PCA-6180F**

ANT. POLARITY: Horizontal

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
42.15	14.2	16.2	30.4	40.0	-9.6	400	190
124.56	13.3	20.2	33.5	40.0	-6.5	400	297
126.73	13.3	16.8	30.1	40.0	-9.9	400	261
132.88	13.5	16.5	30.0	40.0	-10.0	400	44
152.03	12.4	20.9	33.3	40.0	-6.7	400	159
354.78	17.0	21.7	38.7	47.0	-8.3	191	67
398.58	18.7	19.6	38.3	47.0	-8.7	204	229
456.10	19.4	19.9	39.3	47.0	-7.7	243	140
658.85	23.2	16.6	39.8	47.0	-7.2	165	143

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



TEST DATA OF RADIATED EMISSION

EUT: **CPU BOARD**

MODEL: **PCA-6180F**

ANT. POLARITY: Vertical

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
34.65	17.3	17.0	34.3	40.0	-5.7	100	209
45.85	12.4	21.1	33.5	40.0	-6.5	100	358
54.20	8.7	26.8	35.5	40.0	-4.5	100	286
116.28	12.9	16.2	29.1	40.0	-10.9	129	340
125.03	13.3	22.3	35.6	40.0	-4.4	100	141
132.85	13.5	24.2	37.7	40.0	-2.3	100	332
152.05	12.4	20.3	32.7	40.0	-7.3	100	235
172.25	11.0	21.3	32.3	40.0	-7.7	100	32
200.01	10.5	25.1	35.6	40.0	-4.4	100	88
398.55	18.7	21.6	40.3	47.0	-6.7	400	358
658.79	23.2	14.2	37.4	47.0	-9.6	329	345

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

5. TEST RESULTS (IMMUNITY)

5.1 GENERAL DESCRIPTION

Generic Standard	:	EN 50082-2: 1995
Basic Standard and Performance Criteria	:	EN 61000-4-2 (Electrostatic Discharge, ESD, 8kV air discharge, 4kV Contact discharge, Performance Criterion B)
		EN 61000-4-3 (Radio-Frequency Electromagnetic Field Susceptibility Test, RS, 80-1000 MHz, 10V/m, 80% AM (1kHz), Performance Criterion A)
		EN 61000-4-4 (Electrical Fast Transient/Burst, EFT, Power line: 2kV, Signal line: 1kV, Performance Criterion B)
		EN 61000-4-6 (Conducted Radio Frequency Disturbances Test, CS, 0.15-80 MHz, 10V, 80% AM, 1kHz, Performance Criterion A)
		EN 61000-4-8 (Power Frequency Magnetic Field Test, 50 Hz, 30A/m, Performance Criterion A)
		ENV 50204 (Radio-Frequency Electromagnetic Field, Pulse modulated, 900+/-5 MHz, 10V/m, 50 % duty cycle, Rep. Frequency 200 Hz, Performance Criterion A)
Input Voltage	:	230 Vac, 50 Hz (to PC)
Temperature	:	24 Degree C
Humidity	:	55 %
Atmospheric Pressure	:	1004 mbar

5.2 PERFORMANCE CRITERIA DESCRIPTION

Criterion A -	The apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.
Criterion B -	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.
Criterion C -	Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

5.3 EUT OPERATION CONDITION

Industrial PC runs a test program to access FDD/HDD/MODEM/PRINTER sequentially and shows the result on monitor screen.



5.5 TEST RESULT OF RADIATED ELECTROMAGNETIC FIELDS (RS)

Basic Standard : EN 61000-4-3
Frequency range : 80 MHz - 1000 MHz
Field strength : 10 V/m
Modulation : 1kHz Sine Wave, 80%, AM Modulation
Frequency step : 1 % of fundamental
Polarity of Antenna : Horizontal and Vertical
Test distance : 3 m
Antenna height : 1.5m
Dwell Time : at least 3 seconds

Test Result		Remarks
Criterion A	PASS	Model: PCA-6180F

Note: Four sides of EUT are verified separately.

OBSERVATION DESCRIPTION

There is no change compared with initial operation during the test.



5.6 TEST RESULT OF ELECTRICAL FAST TRANSIENT (EFT)

Basic Standard : EN 61000-4-4
Test Voltage : Power Line - 2 kV (to PC)
Signal/Control Line - 1 kV
Polarity : Positive/Negative
Impulse Frequency : 5 kHz
Tr / Tn : 5/50 ns
Burst Duration : 15 ms
Burst Period : 300 ms
Test Duration : Not less than 1 min.

Test Result		Remarks
Criterion A	PASS	Model: PCA-6180F

OBSERVATION DESCRIPTION

Test Point	Polarity	Test Level (kV)	Result
L1	+/-	2	Note 1
L2	+/-	2	Note 1
GND	+/-	2	Note 1
Signal/Control Line	+/-	1	Note 1

Description of test result:

Note 1: There was no change compared to initial operation during the test.



5.7 TEST RESULT OF CONDUCTED RADIO FREQUENCY

DISTURBANCES (CS)

Basic Standard : EN 61000-4-6
Frequency range : 0.15 MHz - 80 MHz
Field strength : 10 V
Modulation : 1kHz Sine Wave, 80%, AM Modulation
Frequency step : 1 % of fundamental
Coupled cable : Power Mains, Unshielded
Coupling device : CDN-M3 (3 wires), Clamp
Dwell Time : at least 3 seconds

Test Result		Remarks
Criterion A	PASS	Model: PCA-6180F

OBSERVATION DESCRIPTION

There was no change compared with initial operation during the test.



5.8 TEST RESULT OF POWER FREQUENCY MAGNETIC FIELD

Basic Standard : EN 61000-4-8
Frequency range : 50 Hz
Field strength : 30 A/m
Observation Time : 1 minute
Inductance coil : Rectangular type, 1mx1m

Test Result		Remarks
Criterion A	PASS	Model: PCA-6180F

OBSERVATION DESCRIPTION

There was no change compared with initial operation during the test.



5.9 TEST RESULT OF RADIO-FREQUENCY ELECTROMAGNETIC FIELD, PULSE MODULATED

Basic Standard : ENV 50204
Frequency range : 900 +/- 5 MHz
Field strength : 10 V/m
Modulation : 200Hz, Square Wave, 50% Duty Cycle
Dewell Time : 30 second
Polarity of Antenna : Horizontal and Vertical
Test distance : 3 m

Test Result		Remarks
Criterion A	PASS	Model: PCA-6180F

Note: Four sides of EUT are verified separately.

OBSERVATION DESCRIPTION

There was no change compared with initial operation during the test.

6. PHOTOGRAPHS OF THE TEST CONFIGURATION

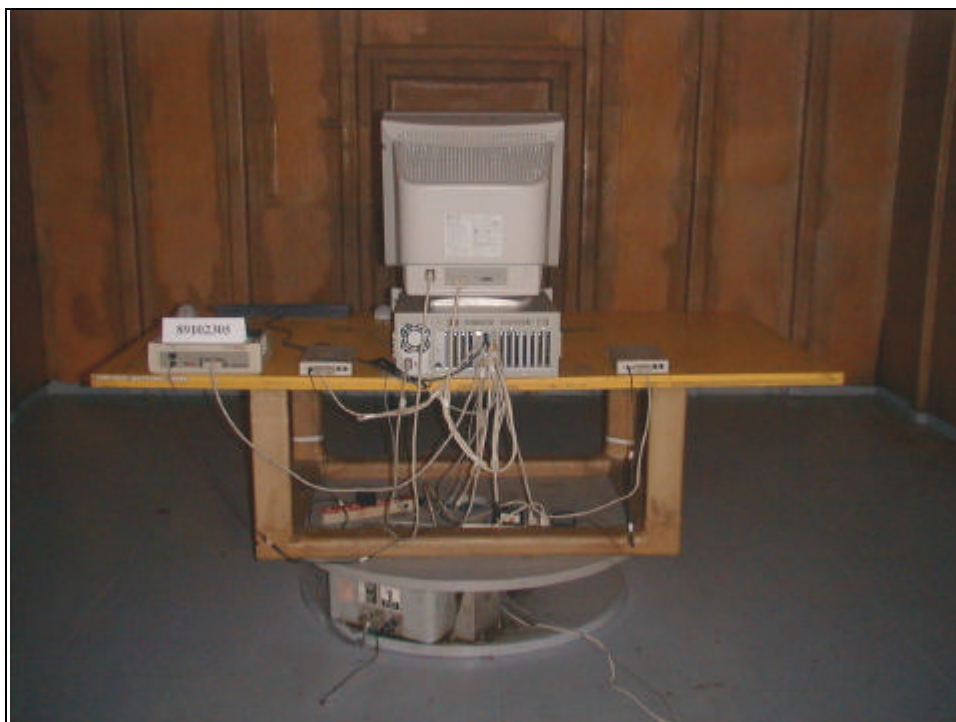
CONDUCTED EMISSION TEST



TELECOMMUNICATION PORT – LAN VOLTAGE OF CONDUCTED EMISSION TEST



RADIATED EMISSION TEST



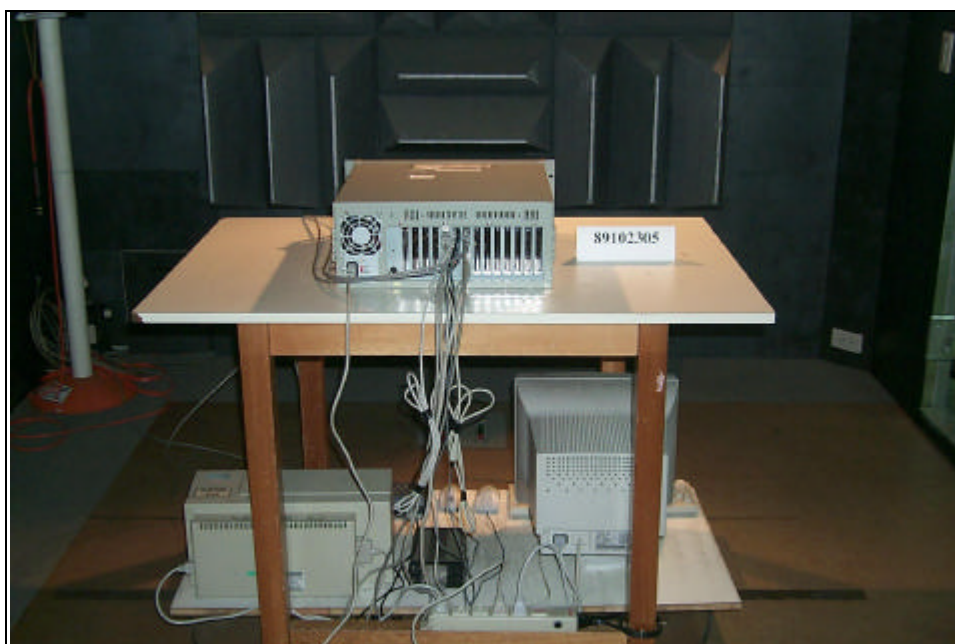
ESD TEST



1

2

RS & PULSE MODULATION TEST



EFT TEST



EFT CLAMP TEST



CONDUCTED SUSCEPTIBILITY TEST



CONDUCTED SUSCEPTIBILITY CLAMP TEST



MAGNETIC TEST





7. APPENDIX - INFORMATION OF THE TESTING LABORATORY

Information of the testing laboratory

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

● USA	FCC, NVLAP
● Germany	TUV Rheinland
● Japan	VCCI
● New Zealand	RFS
● Norway	NEMKO, DNV
● U.K.	INCHCAPE
● R.O.C.	BSMI

Copies of accreditation certificates of our laboratory 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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Fax: 886-2-26052943

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