EMC

TEST REPORT

REPORT NO. : F88030401
MODEL NO. : PCM-4896
DATE OF TEST : March 04, 1999

PREPARED FOR: AAEON TECHNOLOGY INC.

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PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION

Accredited Laboratory

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TABLE OF CONTENTS

1. CERTIFICATION

Issue Date: March 08, 1999

Product	:	CPU BOARD
Trade Name	:	AAEON
Model No.	:	PCM-4896
Applicant	:	AAEON TECHNOLOGY INC.
Standard	:	FCC Part 15, Subpart B, Class A ANSI C63.4-1992 CISPR 22:1993+A1:1995+A2:1996

We hereby certify that one sample of the designation has been tested in our facility on March 04, 1999. 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.

The test results show that the EUT as described in this report is in compliance with the Class A limits of conducted and radiated emission of applicable standards.

TESTED BY : Alan Chang , DATE: 03/08/99
(Alan Chang)

CHECKED BY : Yemmy , DATE: 03/08/99
(Yemmy Soong)

APPROVED BY : Mike Su , DATE: 3/8/99.
(Mike Su)

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	CPU BOARD
Model No.	:	PCM-4896
Power Supply	:	Switching, DC (from PC)
Data Cable	:	NA

Note: During the test, the EUT was installed in a metal enclosure with a slot board to form an industrial PC. The Industrial PC includes the following:

* Chassis : AAEON, model: AIPC-110
* Switching power supply: EMACS, model: AX2-5250F
* FDD : MITSUMI, model: D353M3
* HDD : QUANTUM, 3.5 Series
* CPU : CYRIX MEDIA-GX 200 MHz

The EUT was tested under the CPU: 200 MHz, frequency of clock generator is 66.6 MHz and has a resolution up to 1024x768.

For more detailed features description, please refer to Manufacturer's Specification or User's Manual.

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

No	Product	Brand	Model No.	FCC ID	I/O Cable
1	COLOR MONITOR	ADI	PD-959	FCC DoC Approved	Nonshielded Signal (1.5m) Shielded Power (1.8m)
2	PRINTER	HP	2225C+	DSI6XU2225	Nonshielded Signal (1.4m) Shielded Power (1.2m)
3	MODEM x4	ACEEX	1414	IFAXDM1414	Shielded signal (1.2m) Nonshielded Power (1.2m)
4	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded Signal (1.4m)
5	MOUSE	DEXIN	A2P800A	NIYA2P800A	Shielded signal (1.5m)
6	USB KEYBOARD	BTC	7932	E5XKBUCP10410	Shielded Signal (1.5m)
7	USB MOUSE	DEXIN	A2U800A	NIYA2U800A	Shielded Signal (1.5m)
8	PC	IBM	6560-T7T	AN06260F	Nonshielded power (1.8m) Shielded Signal (1.8m)
9	MONITOR	ACER	7134T	JVP7134T	Shielded signal (1.3m) Nonshielded power (1.8m)
10	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Nonshielded signal (1.4m)
11	MOUSE	DEXIN	A2P800A	NIYA2P800A	Shielded signal (1.5m)
12	LAN CARD	INTEL	S82555	EJMNPDSPD035	NA

Note: Support unit 1~7 acted as SERVER PC and communicated with support unit 8-12 which acted as HOST PC and systems of communication partner via a UTP cable (10m).

2.3 TEST METHODOLOGY AND CONFIGURATION

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4: 1992. Radiated testing was performed at an antenna to EUT distance of 10 m on an open area test site.

Please refer to the photos of test configuration in Item 5.

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 22, 1999
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	892107/003	July 20, 1999
EMCO L.I.S.N.	3825/2	9504-2359	July 20, 1999
Shielded Room	Site 3	ADT-C03	N/A

Note: 1. The measurement uncertainty is less than +/- 2.6dB, 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	8594E	3520A01861	Feb. 08, 2000
HP Preamplifier	8447D	2944A08118	June 28, 1999
HP Preamplifier	8347A	3307A01088	Sept. 9, 1999
ROHDE & SCHWARZ TEST RECEIVER	ESVS 10	840241/010	Sept. 10, 1999
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 25, 1999
CHASE BILOG Antenna	CBL6111A	1079	July 17, 1999
EMCO Double Ridged Guide Antenna	3115	9312-4192	April 3, 1999
CHANCE Turn Table	U200	9701	N/A
CHANCE Tower	AT-100	CM-A003	N/A
Open Field Test Site	Site 3	ADT-R03	July 16, 1999

Note: 1. The measurement uncertainty is less than +/- 3dB, 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 LIMITS OF CONDUCTED AND RADIATED EMISSION

LIMIT OF RADIATED EMISSION OF CISPR 22

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

* Detector Function: Quasi-Peak

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.

LIMIT OF CONDUCTED EMISSION OF CISPR 22

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.

4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Frequency Range	:	0.15 - 30 MHz (Conducted Emission)
		30 - 2000 MHz (Radiated Emission)
Input Voltage	:	120 Vac, 60 Hz
Temperature	:	25 degree
Humidity	:	58 %
Atmospheric Pressure	:	1000 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -17.7 dB at 0.192 MHz Minimum passing margin of radiated emission: -4.9 dB at 38.98 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 sends and receives messages to and from HOST PC via a UTP cable.
5. Industrial PC sends "H" messages to monitor and monitor display "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: **PCM-4896**

6 dB Bandwidth: 10 kHz

Freq.	L Level		N Level		Limit		Margin [dB (mV)]			
[MHz]	[dB (mV)]		[dB (mV)]		[dB (mV)]		L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.192	61.3	-	61.1	-	79.0	66.0	-17.7	-	-17.9	-
0.289	53.7	-	53.5	-	79.0	66.0	-25.3	-	-25.5	-
0.476	53.2	-	53.1	-	79.0	66.0	-25.8	-	-25.9	-
0.774	43.8	-	43.9	-	73.0	60.0	-29.2	-	-29.1	-
5.052	49.2	-	48.6	-	73.0	60.0	-23.8	-	-24.4	-
20.205	42.5	-	42.8	-	73.0	60.0	-30.5	-	-30.2	-

Remarks:
1. "*": Undetectable
2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
3. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
4. The emission levels of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value

4.4 TEST DATA OF RADIATED EMISSION

EUT: **CPU BOARD** MODEL: **PCM-4896**

ANT. POLARITY: Horizontal

DETECTOR FUNCTION AND BANDWIDTH: Quasi peak, 120 kHz (30-1000 MHz)
Peak, 1 MHz (1000 MHz-2000 MHz)

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

FREQUENCY RANGE: 1000-2000 MHz MEASURED DISTANCE: 3 M

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
45.48	13.3	16.9	30.2	40.0	-9.8
150.05	12.6	16.5	29.1	40.0	-10.9
168.03	11.5	15.8	27.3	40.0	-12.7
175.04	11.6	15.6	27.2	40.0	-12.8
178.99	11.7	19.8	31.5	40.0	-8.5
199.99	12.5	16.3	28.8	40.0	-11.2
215.99	13.2	19.7	32.9	40.0	-7.1
229.09	13.9	18.1	32.0	40.0	-8.0
343.65	17.5	23.0	40.5	47.0	-6.5
447.48	20.8	13.7	34.5	47.0	-12.5

REMARKS :
1. Emission level (dBuV/m) = Correction Factor(dB/m) +Meter Reading (dBuV).
2. Correction Factor(dB/m) = Ant. Factor(dB/m)+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: **PCM-4896**

ANT. POLARITY: Vertical

DETECTOR FUNCTION AND BANDWIDTH: Quasi peak, 120 kHz (30-1000 MHz)
Peak, 1 MHz (1000 MHz-2000 MHz)

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

FREQUENCY RANGE: 1000-2000 MHz MEASURED DISTANCE: 3 M

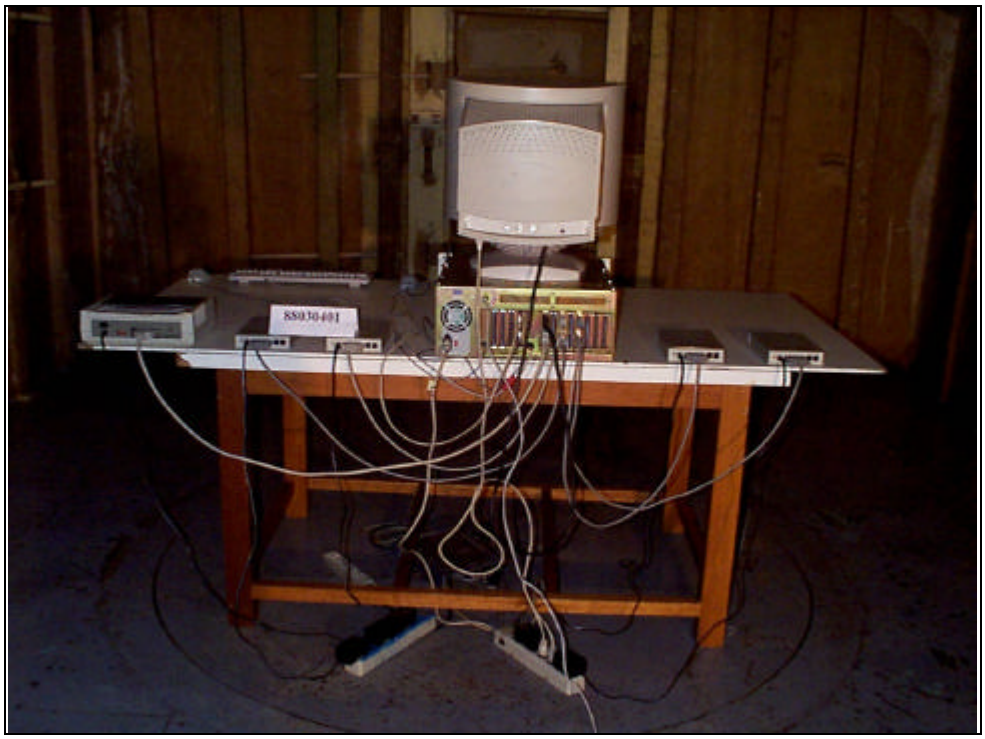
Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
38.98	14.7	20.4	35.1	40.0	-4.9
45.49	12.5	16.7	29.2	40.0	-10.8
52.05	7.6	27.0	34.6	40.0	-5.4
77.95	7.9	23.2	31.1	40.0	-8.9
149.98	12.3	16.4	28.7	40.0	-11.3
168.03	11.4	19.2	30.6	40.0	-9.4
184.25	11.8	18.4	30.2	40.0	-9.8
186.13	11.8	16.3	28.1	40.0	-11.9
343.64	18.0	22.4	40.4	47.0	-6.6
447.30	21.2	10.5	31.7	47.0	-15.3

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

5. PHOTOGRAPHS OF THE TEST CONFIGURATION WITH MINIMUM MARGIN

CONDUCTED EMISSION TEST

RADIATED EMISSION TEST



6. APPENDIX - INFORMATION OF THE TESTING LABORATORY

Information of the testing laboratory

We, ADT Corp., is 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, UL, NVLAP
● Germany	TUV Rheinland
	TUV Product Service
● Japan	VCCI
● New Zealand	RFS
● Norway	NEMKO, DNV
● U.K.	INCHCAPE, SGS
● R.O.C.	BSMI

Enclosed please find some certificates of our laboratory obtained from approval agencies. If you have any comments, please feel free to contact us with the following:

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