EMC

TEST REPORT

REPORT NO. : F87071009
MODEL NO. : PCM-5894A3.1, PCM-5892A3.1
DATE OF TEST : July 10, 1998

PREPARED FOR: AAEON TECHNOLOGY INC.

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PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION

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1. CERTIFICATION

Issue Date: July 15, 1998

Product	:	CPU BOARD
Trade Name	:	AAEON
Model No.	:	PCM-5894A3.1, PCM-5892A3.1
Applicant	:	AAEON TECHNOLOGY INC.
Standard	:	FCC Part 15, Subpart B, Class A
		ANSI C63.4-1992
		CISPR 22:1993+A1+A2

We hereby certify that one sample of the designation has been tested in our facility on July 10, 1998. 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.

PREPARED BY: Sharon Hsiung , DATE: 7/15/98
(Sharon Hsiung)

TESTED BY: John Liao , DATE: 7/15/98
(John Liao)

APPROVED BY: Mike Su , DATE: 7/15/98
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	CPU BOARD
Model No.	:	PCM-5894A3.1, PCM-5892A3.1
Power Supply	:	DC (from PC)
Data Cable	:	N/A

Note: The EUT has two model names, which are identical to each other in all aspects except for the following:

- MODEL: PCM-5894A3.1, with LCD function
- MODEL: PCM-5892A3.1, without LCD function

From the above models, model: PCM-5894A3.1 was selected as the representative for the test as it has the highest emission levels, and therefore its data is recorded in this report.

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: SEASONIC, model: SSG-250G
* FDD : TEAC, model: FD-235HF
* HDD : MAXTOR, 72700AP
* CPU : INTEL Pentium 233MHZ
* DIO Card: AAEON, model: PCM-3724

The EUT was tested under the CPU: 233 MHz, frequency of clock generator is 66.6 MHz.

For more detailed features description, please refer to ATTACHMENT 1 - TECHNICAL DESCRIPTION OF EUT and 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	C2145A	B94C2145X	Nonshielded Signal (1.9m) Shielded Power (2.1m)
3	MODEM x 4	ACEEX	1414	IFAXDM1414	Shielded signal (1.5m) Nonshielded Power (1.9m)
4	KEYBOARD	FORWARD	FDA-102D	F4Z4K3FDA-102D	Shielded Signal (2m)
5	MOUSE	HP	M-S34	DZL211029	Shielded signal (1.8m)
6	PC	IBM	6560-Y-T7T	AN06260F	Nonshielded power (1.8m) Shielded Signal (2m)
7	MONITOR	ADI	937G	BR8937G	Shielded signal (1.5m) Nonshielded power (1.8m)
8	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Nonshielded signal (1.2m)
9	MOUSE	DEXIN	A2P800A	NIYA2P800A	Shielded signal (1.5m)
10	HUB	3 COM	TP800	N/A	Nonshielded signal-- 10m to EUT; 2.0m to PC Shielded power (1.9m)

Note: Support unit 1~5 acted as SERVER PC and communicated with support unit 6-10 which acted as HOST PC and systems of communication partner via support unit 13.

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)

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	E4411A	US37360834	Sept. 28, 1998
CHASE Preamplifier	CPA9231A/4	3215	Oct. 31, 1998
HP Preamplifier	8347A	3307A01088	Sept. 4, 1998
ROHDE & SCHWARZ TEST RECEIVER	ESVS 30	841977/002	Jan. 8, 1999
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE BiLOG Antenna	CBL6112	2074	Dec. 25, 1998
EMCO Double Ridged Guide Antenna	3115	9312-4192	April 3, 1999
CHANCE Turn Table & Tower Controller	ACS-I	N/A	N/A
Open Field Test Site	Site 6	ADT-R06	Dec. 23, 1998

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.

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESHS30	828109/007	Aug. 4, 1998
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	892107/003	July 22, 1998
EMCO L.I.S.N.	3825/2	9504-2359	Aug. 1, 1998
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.

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

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

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
Above 1000	300	49.5	500	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 - 1000 MHz (Radiated Emission)
Input Voltage	:	120 Vac, 60 Hz
Temperature	:	30 ℃
Humidity	:	61 %
Atmospheric Pressure	:	997 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -2.9 dB at 0.156 MHz Minimum passing margin of radiated emission: -2.9 dB at 160.00 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 LAN 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-5894A3.1**

6 dB Bandwidth: 10 kHz

TEST PERSONNEL: John Liao

Freq.	L Level		N Level		Limit		Margin [dB (μV)]			
[MHz]	[dB (μV)]		[dB (μV)]		[dB (μV)]		L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.156	65.70	60.10	65.60	60.00	79.00	63.00	-13.3	-2.9	-13.4	-3.0
0.216	51.60	-	51.90	-	79.00	63.00	-27.4	-	-27.1	-
1.698	34.80	-	33.10	-	73.00	60.00	-38.2	-	-39.9	-
3.744	41.90	-	43.00	-	73.00	60.00	-31.1	-	-30.0	-
12.902	33.20	-	34.70	-	73.00	60.00	-39.8	-	-38.3	-
26.840	27.20	-	28.60	-	73.00	60.00	-45.8	-	-44.4	-

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

ADT CO. Shielded Room 3
CISPR 22 CLASS A

10. Jul 98 21:03

EUT: MODEL: PCH-6804
Test Spec: LISN : L
Comment: FULL SYSTEM

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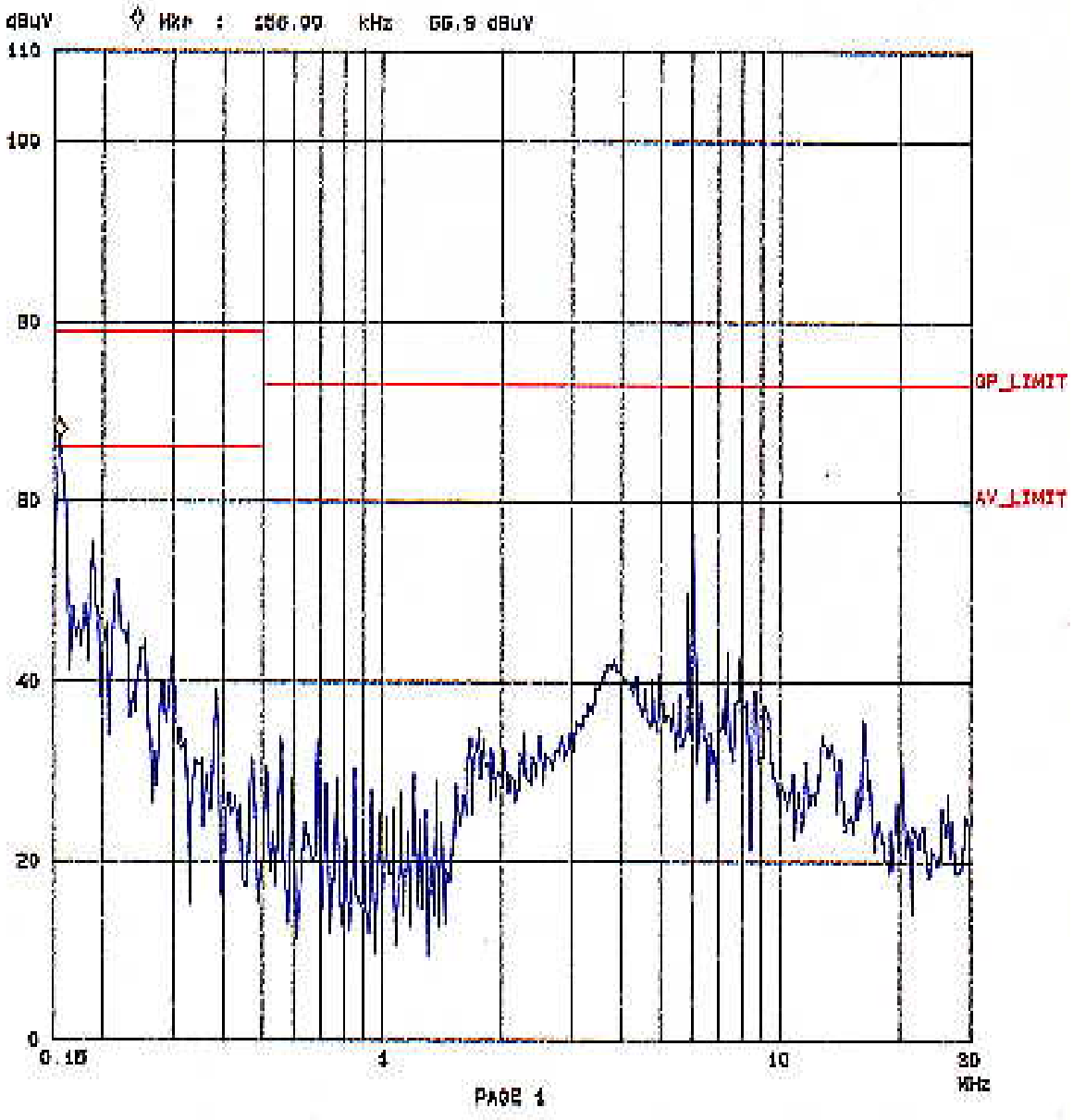
Tested by John Liu

Fast Scan Settings (3 Ranges)

Frequencies				Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	450k	9k	20K	PK	0.05ms	10dBLN	OFF	80dB
450k	5M	9k	20K	PK	0.05ms	10dBLN	OFF	80dB
5M	30M	9k	20K	PK	0.05ms	10dBLN	OFF	80dB



ADT CO. Shielded Room 3
CISPR 22 CLASS A

10. Jul 98 20:07

EUT: MODEL: PCM-8664
Test Spec: LISN : N
Comment: FULL SYSTEM

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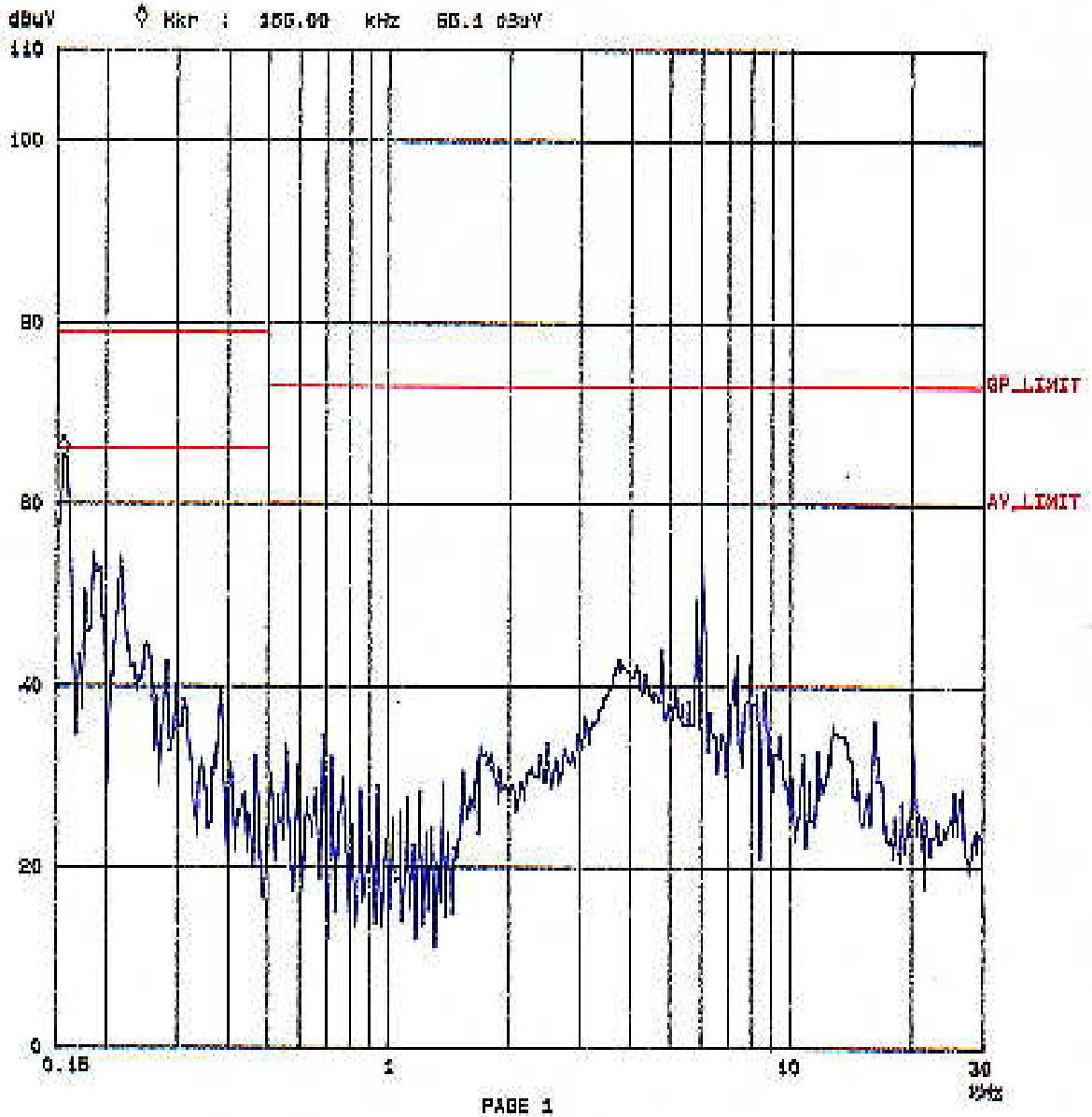
Tested by John Liao

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	450k	3k	10k	PK	0.05ms	10dBLN	OFF	60dB
450k	5M	3k	10k	PK	0.05ms	10dBLN	OFF	60dB
5M	30M	3k	10k	PK	0.05ms	10dBLN	OFF	60dB



4.4 TEST DATA OF RADIATED EMISSION

EUT: **CPU BOARD** MODEL: **PCM-5894A3.1**

ANTENNA: CHASE BILOG CBL 6112/EMCO Horn 3115

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

TEST PERSONNEL: John Liao

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
118.69	15.5	9.6	25.1	40.0	-14.9
120.33	15.6	15.6	31.2	40.0	-8.8
150.00	12.1	20.4	32.5	40.0	-7.5
200.50	10.5	23.0	33.5	40.0	-6.5
201.70	10.6	13.4	24.0	40.0	-16.0
213.34	11.7	15.5	27.2	40.0	-12.8
240.61	14.2	24.2	38.4	47.0	-8.6
292.39	16.1	21.2	37.3	47.0	-9.7
750.00	23.8	13.4	37.2	47.0	-9.8

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-5894A3.1**

ANTENNA: CHASE BILOG CBL 6112/EMCO Horn 3115

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

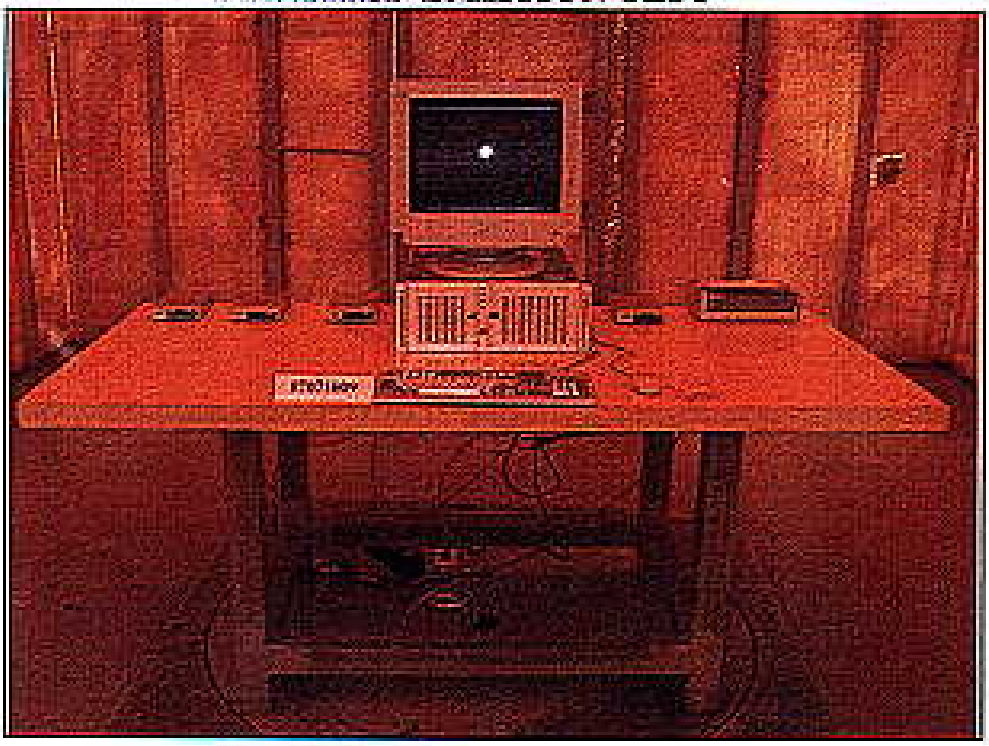
TEST PERSONNEL: John Liao

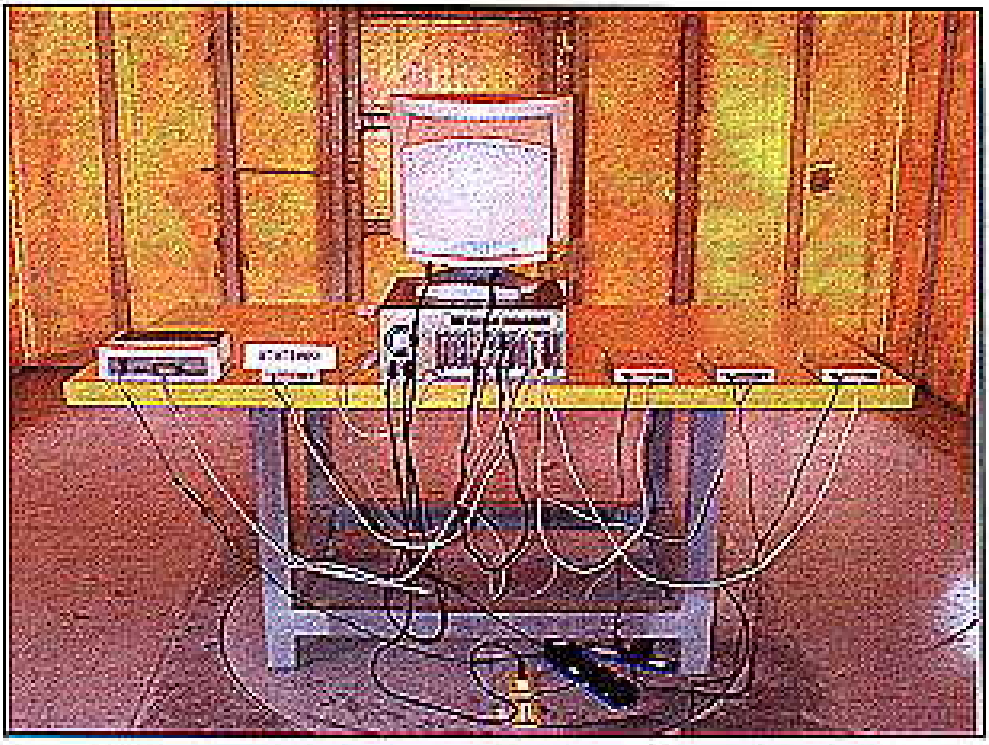
Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
66.28	7.5	27.3	34.8	40.0	-5.2
120.30	14.2	21.9	36.1	40.0	-3.9
121.95	14.2	17.3	31.5	40.0	-8.5
149.99	12.8	23.2	36.0	40.0	-4.0
160.00	12.3	24.8	37.1	40.0	-2.9
199.97	11.8	17.9	29.7	40.0	-10.3
200.51	11.9	21.4	33.3	40.0	-6.7
749.99	23.4	9.4	32.8	47.0	-14.2

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

RADIATED EMISSION TEST





CONDUCTED EMISSION TEST

6. ATTACHMENT I - TECHNICAL DESCRIPTION OF EUT

SPECIFICATIONS:

* CPU	INTEL Pentium 233MHZ
* BIOS	Award 256KB FLASH BIOS
* Chipset	SiS 5582/ SiS5598
* Super I/O Chipset	UMC 8669F, Fully 16-bit I/O decoded
* 2nd Level Cache	On board 526KB pipeline burst 2nd level cache. Can be upgraded to 512KB by factory
* RAM memory	8MB to 128MB, Two 72-pin SIMM socket on board
* IDE hard disk drive interface:	Supports up to two hard disk dtives. BIOS auto detect. Supports PIO mode 4 and Bus Master. Also supports Multi-Word DMA and Ultra DMA / 33
* Floppy disk drive interface:	Supports up to two floppy disk drives, 5.25" (360KB and 1.2MB) and / or 3.5" (720KB, 1.44MB and 2.88MB)
* Multi-mode parallel port:	Configured to LPT1, LPT2, LPT3 or disabled. Supports SPP, ECP and EPP
* Serial ports	Three RS-232 and one RS-232/422/485 serial ports. Ports can be configured as COM1, COM2, COM3, COM4 or disabled individually. Four 16C550 serial UART's. IR connector reserved for future use.
* Keyboard/mouse connector:	8 pin connector supports standard PC/AT keyboard and PS/2 mouse
* USB ports	Dual USB port on board
* Real Time Clock/Calendar:	Dallas DS-12887 or equivalent with quartz oscillator, powered by lithium battery for data retention of up to 10 years.