



EMC

TEST REPORT

REPORT NO. : ADT-F97022
MODEL NO. : SBC-590
DATE OF TEST : June 29, 1997

PREPARED FOR: AAEON TECHNOLOGY INC.

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1. CERTIFICATION

Issue Date: July 10, 1997

Product : CPU BOARD
Trade Name : AAEON
Model No. : SBC-590
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 June 29, 1997. 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: 7/10/97
(Sharon Hsiung)

TESTED BY: John Liao, DATE: 7/10/97
(John Liao)

APPROVED BY: Harris W. Lai, DATE: 7/10/97
(Harris W. Lai)

ADVANCE DATA TECHNOLOGY CORPORATION

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	CPU BOARD
Model No.	:	SBC-590
Power Supply	:	DC
Power Cord	:	N/A

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

- * Case: AAEMON, model: AIPC-110
- * Switching power supply: SEASONIC, model: SSG-250G
- * VGA Card: CARDEX, model: PCI-S3-765-B2

For more detailed features, 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	ACER	7134T	JVP7134T	Nonshielded Power Shielded signal
2	KEYBOARD	ZENITH	KB-5923	E8HKB-5923	Shielded signal
3	PRINTER	HP	2225C+	DSI6XU2225	Shielded signal Nonshielded Power
4	MODEM X 2	DATATRONICS	1200CK	E2O5OV1200CK	Shielded signal Nonshielded Power

Note: There is no ferrite core on the interface cable of all support units.

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.	Date of Calibration
HP Spectrum Analyzer	8594A	3144A00308	Aug. 27, 1996
HP Preamplifier	8447D	2944A08119	Jan. 17, 1997
ROHDE & SCHWARZ TEST RECEIVER	ESVP	893496/030	July 17, 1996
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 30, 1996
CHASE Bilog Antenna	CBL6112	2086	Dec. 28, 1996
EMCO Turn Table	1060	1195	N/A
EMCO Tower	1051	1263	N/A
Open Field Test Site	Site-2	ADT-R02	Oct. 1, 1996

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Date of Calibration
ROHDE & SCHWARZ Test Receiver	ESH3	893495/006	July 17, 1996
ROHDE & SCHWARZ Spectrum	EZM	893787/013	July 17, 1996
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	892107/003	July 25, 1996
EMCO-L.I.S.N.	3825/2	9204-1964	July 25, 1996
Shielding Room	Site 2	ADT-C02	N/A

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

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



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 : 28 °C
Humidity : 60 %
Atmospheric Pressure : 1060 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: 29.4 dB at 0.205 MHz
	Minimum passing margin of radiated emission: 13.4 dB at 37.50 MHz

4.1.1 EUT OPERATION CONDITION

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



3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION

LIMIT OF RADIATED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	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.



4.1.2 TEST DATA OF CONDUCTED EMISSION (A)

EUT: CPU BOARD

MODEL: SBC-570

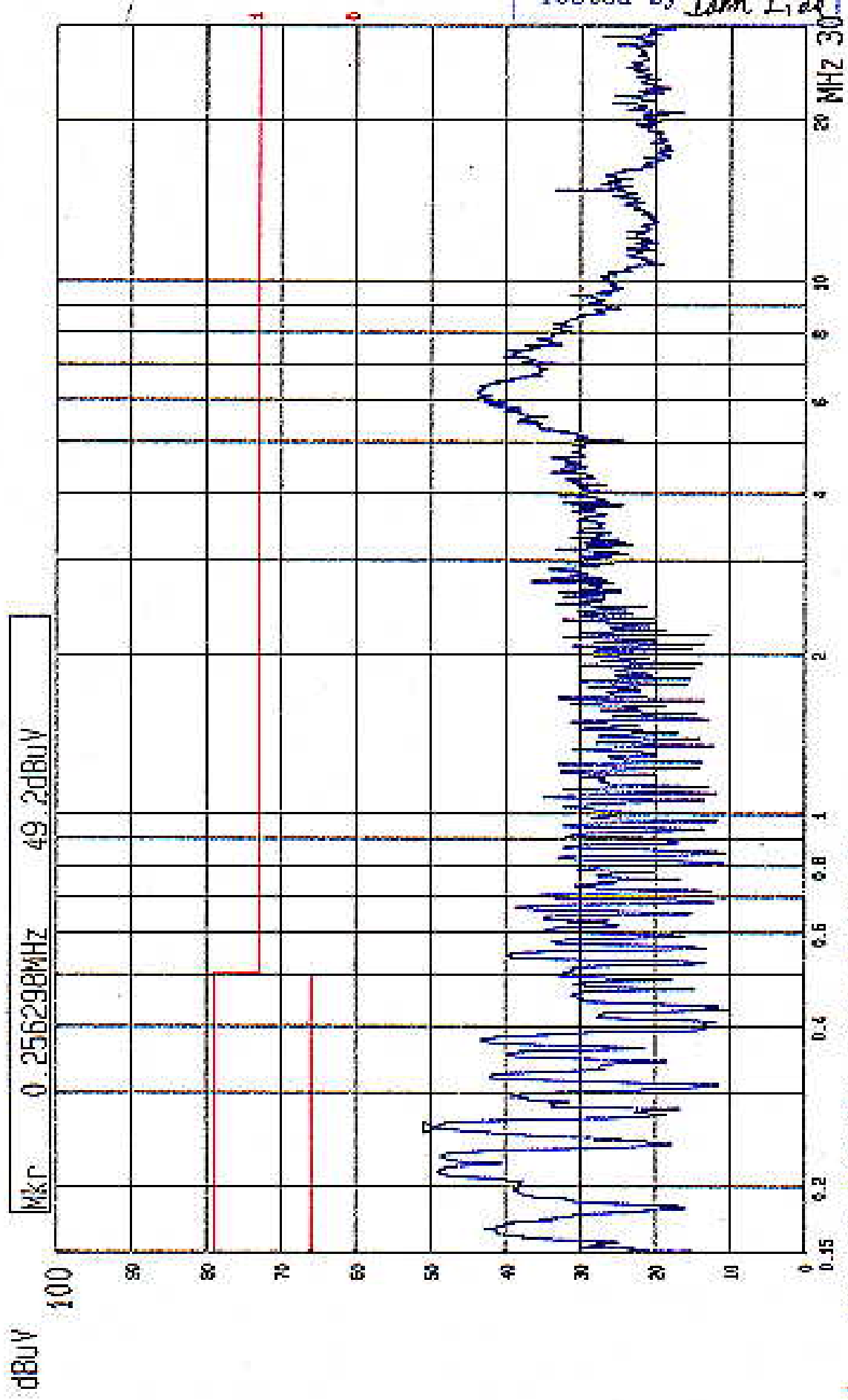
CPU: Pentium 166 MHz

6 dB Band Width: 10 kHz

TEST PERSONNEL: John Liad

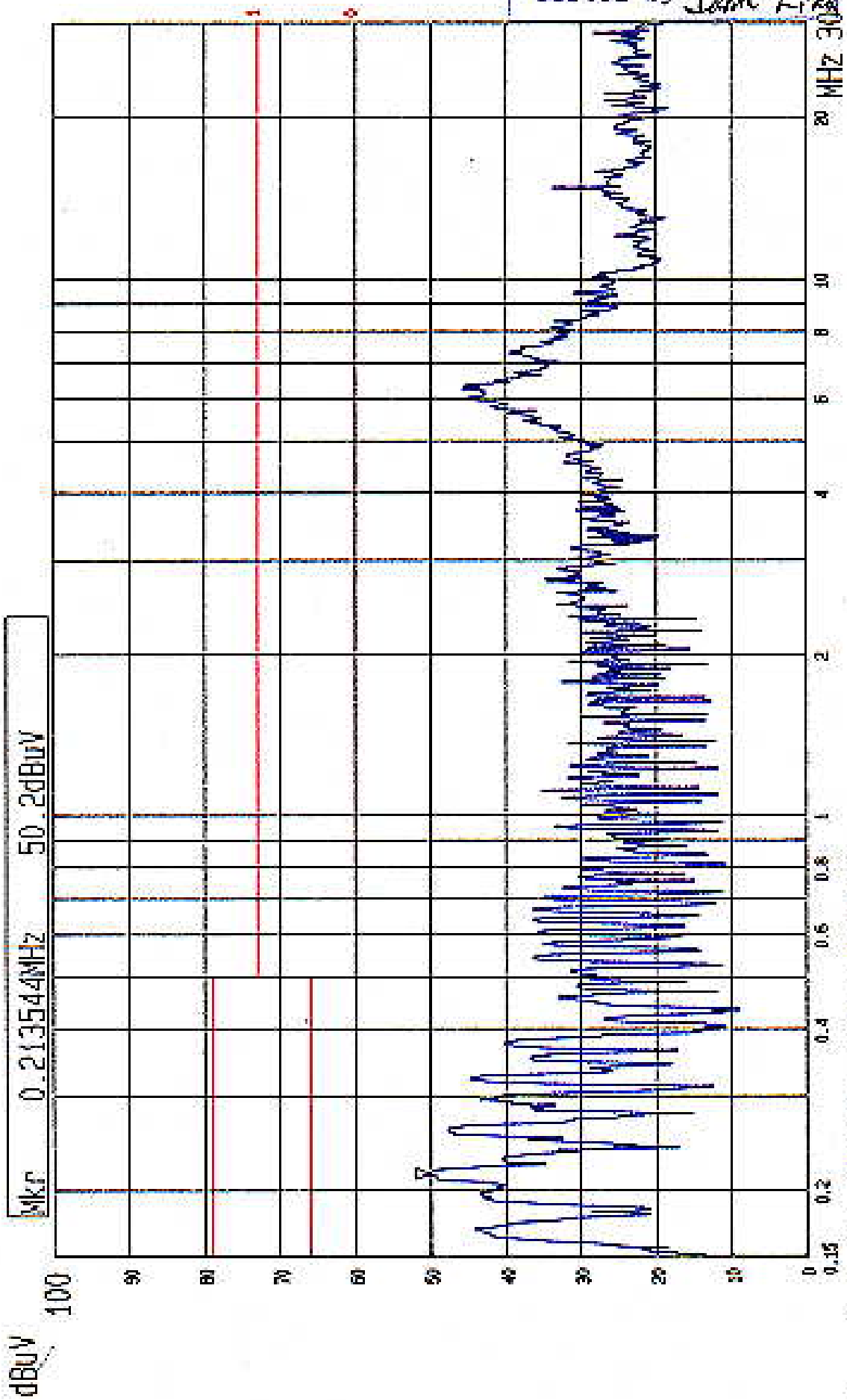
Freq. [MHz]	L1 Level		N Level		Limit		Margin [dB (μV)]			
	QP	AV	QP	AV	QP	AV	L1		N	
0.157	40.80	-	41.50	-	79.00	66.00	38.2	-	37.5	-
0.205	48.60	-	49.60	-	79.00	66.00	30.4	-	29.4	-
0.251	48.90	-	46.90	-	79.00	66.00	30.1	-	32.1	-
0.283	39.20	-	42.30	-	79.00	66.00	39.8	-	36.7	-
0.534	38.70	-	36.50	-	73.00	60.00	34.3	-	36.5	-
6.229	39.70	-	41.00	-	73.00	60.00	33.3	-	32.0	-

- 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 level of other frequencies were very low against the limit.



MkF 0.256298MHz 49.2dBuV

--- Date 29 JUN '97 Time 11:08:14
CISPA 22 CLASS A CONDUCTION TEST (PEAK VALUE) ADT CORP.
MODEL : SBC-590 LISN: L



---- Date 29 JUN '97 Time 11:04:34
CISPR 22 CLASS A CONDUCTION TEST (PEAK VALUE)
MODEL : SBC-590 LISN: N

ADT CORP.



4.1.3 TEST DATA OF RADIATED EMISSION(A)

EUT: CPU BOARD

MODEL: SBC-570

CPU: Pentium 166 MHz

ANTENNA: CHASE BILOG CBL 6112

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: Jehn Liao

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
75.06	7.9	11.0	18.9	40.0	-21.1
108.41	13.6	5.1	18.7	40.0	-21.3
125.09	13.4	8.0	21.4	40.0	-18.6
133.43	13.4	5.7	19.1	40.0	-20.9
171.84	11.0	4.5	15.5	40.0	-24.5
190.85	10.9	11.3	22.2	40.0	-17.8
200.13	10.9	10.9	21.8	40.0	-18.2
205.23	11.3	8.6	19.9	40.0	-20.1

- 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.



TEST DATA OF RADIATED EMISSION (A)

EUT: CPU BOARD

MODEL: SBC-570

CPU: Pentium 166 MHz

ANTENNA: CHASE BILOG CBL 6112

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)	Limits (dBuV/m)	Margin (dB)
37.50	14.6	12.0	26.6	40.0	-13.4
51.57	9.0	9.2	18.2	40.0	-21.8
80.94	8.9	14.0	22.9	40.0	-17.1
108.42	12.2	10.0	22.2	40.0	-17.8
125.10	13.3	11.6	24.9	40.0	-15.1
133.42	13.4	9.5	22.9	40.0	-17.1
200.16	12.2	13.3	25.5	40.0	-14.5
205.27	12.3	4.0	16.3	40.0	-23.7
433.65	19.2	1.6	20.8	47.0	-26.2

- 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.



5. PHOTOGRAPHS OF THE TEST CONFIGURATION WITH MINIMUM MARGIN

RADIATED EMISSION TEST





CONDUCTED EMISSION TEST





6. ATTACHMENT I - TECHNICAL DESCRIPTION OF EUT SPECIFICATIONS:

* CPU	Pentium 166 MHz
* Bus interface	ISA and PCI (PC/AT) bus
* Data bus	64 bit
* Processing ability	64 bit
* Chipset	VT 82C575/82C576/82C577
* RAM memory	1 MB to 128 MB. Uses four 72-pin SIMM sockets supporting EDO RAM
* L2 Cache memory size	256KB/512KB 2 nd level cache memory (Support pipeline burst SRAM module)
* Shadow RAM memory	Supports system and video BIOS shadow memory
* Feature connector	26-pin header for external VGA display
* Enhanced IDE hard disk	Fast PCI bus, supports up to four enhanced IDE (ATA-2)
* Driver interface	Large hard disk drives or other enhanced IDE devices. Supports mode 3 and mode 4 hard disks.
* Floppy disk drive interface	Supports up to two floppy disk drives, 5.25" and/or 3.5"
* Bidirectional parallel port	Configurable to LPT1, LPT2, LPT3 or disabled. Supports SPP/EPP/ECP standards
* Serial ports	Two serial RS-232 ports; use 16C550 UARTs with 16-byte FIFO buffer. Supports speeds up to 115 Kbps. Ports can be individually configured from COM1 to COM4 or disabled
* BIOS	Award BIOS
* Watchdog timer	Can generate a system reset or IRQ15. The time interval is software selectable from 1 to 64 seconds
* PC/104	104-pin connector for a 16-bit bus
* DMA channels	7
* Interrupt levels	15
* Keyboard or PS/2 mouse	A 6-pin mini DIN keyboard connector is located on the mounting bracket for easy access to the keyboard and PS/2 mouse
* Bus speed	8 MHz for ISA bus



* Max. power requirements	+5V@5A
* Power supply voltage	+5V (4.75V to 5.25V)
* Operating temperature	0 to 60 °C
* Board size	13.3"(L) x 4.8"(W)
* Board weight	0.5 kg