



EMC COMPLIANCE TEST REPORT

for

CPU Board

Trade Name : ADVANTECH
Model Number : PCM-9574 ; PCM-9574N
Serial Number : N/A
Report Number : 000224-E
Date : May 17, 2000
Regulations : See below

Standards	Results (Pass/Fail)
EN 55022: 1994 + A1: 1995 + A2: 1997 (Class A)	PASS
EN 61000-3-2: 1995 + A1: 1998 + A2: 1998	PASS
EN 61000-3-3: 1995	PASS
EN 50082-2: 1995	PASS
- EN 61000-4-2: 1995	PASS
- ENV 50140: 1994	PASS
- ENV 50204: 1996	PASS
- EN 61000-4-4: 1995	PASS
- ENV 50141: 1994	PASS
- EN 61000-4-8: 1993	N/A

Prepared for :

Advantech Co., Ltd.
4th FL., No. 108-3 Ming-Chuan Road, Hsin-Tien City,
Taipei Hsien, Taiwan, R.O.C.

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C&C Laboratory Co., Ltd.**



EC-Declaration of Conformity

For the following equipment:

CPU Board

(Product Name)

PCM-9574 ; PCM-9574N / ADVANTECH

(Model Designation / Trade name)

Advantech Co., Ltd.

(Manufacturer Name)

4th FL., No. 108-3 Ming-Chuan Road, Hsin-Tien City, Taipei Hsien, Taiwan, R.O.C.

(Manufacturer Address)

is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility Directive (89/336/EEC, Amended by 92/31/EEC & 93/68/EEC), For the evaluation regarding the Electromagnetic Compatibility (89/336/EEC, Amended by 92/31/EEC & 93/68/EEC), the following standards are applied:

☒ EN 55022: 1994 + A1: 1995 + A2: 1997 (Class A)

☒ EN 61000-3-2: 1995+A1: 1998+A2: 1998 ; EN 61000-3-3: 1995

☒ EN 50082-2: 1995

EN 61000-4-2: 1995 ; ENV 50140: 1994 ; ENV 50204: 1996 ; EN 61000-4-4: 1995
ENV 50141: 1994

The following manufacturer / importer or authorized representative established within the EUT is responsible for this declaration:

(Company Name)

(Company Address)

Person responsible for making this declaration:

(Name, Surname)

(Position / Title)

(Place)

(Date)

(Legal Signature)

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VERIFICATION OF COMPLIANCE

Equipment Under Test: CPU Board
Trade Name: ADVANTECH
Model Number: PCM-9574 ; PCM-9574N
Serial Number: N/A
EUT Powered during test: 230VAC/50Hz
Applicant: **Advantech Co., Ltd.**
4th FL., No. 108-3 Ming-Chuan Road, Hsin-Tien City,
Taipei Hsien, Taiwan, R.O.C.
Manufacturer: **Advantech Co., Ltd.**
4th FL., No. 108-3 Ming-Chuan Road, Hsin-Tien City,
Taipei Hsien, Taiwan, R.O.C.
Type of Test: EMC Directive 89/336/EEC for CE Marking
Technical Standards: EN 55022: 1994 + A1: 1995 + A2: 1997 (Class A)
EN 61000-3-2: 1995+A1: 1998+A2: 1998 ; EN 61000-3-3: 1995
EN 50082-2: 1995 (EN 61000-4-2: 1995, ENV 50140: 1994,
ENV 50141: 1994, EN 61000-4-4: 1995,
ENV 50204: 1996)
File Number: 000224-E
Date of test: May 6~8, 2000
Deviation: According to applicant declaration this EUT is a class A product, and to
market in industrial environment only.
Condition of Test Sample: Normal

The above equipment was tested by C&C Laboratory Co., Ltd. for compliance with the requirements set forth in EMC Directive 89/336/EEC and the Technical Standards mentioned above. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment and the level of the immunity endurance of the equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Approved by Authorized Signatory: _____
Kurt Chen / Q.A. Manager

GENERAL INFORMATION

Applicant: Advantech Co., Ltd.
4th FL., No. 108-3 Ming-Chuan Road, Hsin-Tien City,
Taipei Hsien, Taiwan, R.O.C.

Contact Person: John Chou

Manufacturer: Advantech Co., Ltd.
4th FL., No. 108-3 Ming-Chuan Road, Hsin-Tien City,
Taipei Hsien, Taiwan, R.O.C.

File Number: 000224-E

Date of Test: May 6~8, 2000

Equipment Under Test: CPU Board

Model Number: PCM-9574 ; PCM-9574N

Serial Number: N/A

Technical Standards: EN 55022: 1994 + A1: 1995 + A2: 1997 (Class A)
EN 61000-3-2: 1995+A1: 1998+A2: 1998 ; EN 61000-3-3: 1995
EN 50082-2: 1995 (EN 61000-4-2: 1995, ENV 50140: 1994,
ENV 50141: 1994, EN 61000-4-4: 1995,
ENV 50204: 1996)

**Frequency Range
(EN 55011):** 150Khz to 30MHz for Line Conducted Test
30MHz to 1000MHz for Radiated Emission Test

Test Site C & C LABORATORY CO., LTD.
No. 15, 14 Lin, Chi Twu Chi, Lu-Chu Hsiang
Taoyuan, Taiwan, R. O. C.

SYSTEM DESCRIPTION

EUT Test Program:

1. An EMI test software was loaded and executed under Windows environment.
2. The EMI test program sequentially exercised all I/O's of EUT.
3. A communicated software was loaded and executed on EUT to communicate with remote side equipment.
4. The EUT sends to and receives message from remote side, and filling the screen of monitor with upper case of "H" patterns.
5. Repeat step 2 to 4 throughout the test.

PRODUCT INFORMATION

Housing Type:	N/A	
EUT Power Rating:	DCV from Power Supply	
AC power during Test:	230VAC/50Hz	
Power Supply Manufacturer:	ADVANTECH	
Power Supply Model Number:	PS-55A	
AC Power Cord Type:	Unshielded, 1.8m (Detachable) to Power Supply	
DC Power Cable Type:	N/A	
CPU Manufacturer:	Intel	Type: Celeron 466 MHz
OSC/Clock Frequencies :	100 MHz	
Memory Capacity:		Installed: 32MB
HDD Manufacturer:	Traverstar	Model: DBCA-203240
Chassis Manufacturer:	ADVANTECH	Model: MBPC-300
VGA Card Type:	On Board	

I/O Port of EUT:

I/O PORT TYPES	Q'TY	TESTED WITH
1). Parallel Port	1	1
2). Serial Port	4	4
3). Video Port	1	1
4). PS/2 Keyboard Port	1	1
5). PS/2 Mouse	1	1
6). Microphone Port	1	1
7). Line-in Port	1	1
8). Earphone Port	2	2
9). LAN Port	1	1
10). USB Port	2	2

The difference between PCM-9574 and PCM-9574N, please see the table 1

M/N	Microphone Port	Line-in Port	Line-out Port
PCM-9574	Yes	Yes	Yes
PCM-9574N	No	No	No

Table 1

SUPPORT EQUIPMENT

No.	Equipment	Model #	Serial #	FCC ID	Trade Name	Data Cable	Power Cord
1)	Monitor (for EN55022 only)	GDM-17SE 2T	7145529	AK8GDM17SE2 T	SONY	Shielded, 1.8m with a core	Unshielded, 1.8m
1-1	Monitor	D2827A	KR92316215	C5F7NFCMC151 8X	HP	Shielded, 1.5m with two cores	Unshielded, 1.6m
2)	Modem	2400SE	94-364-176282	DK467GSM24	Computer Peripherals	Shielded, 1.8m	Unshielded, 1.5m
3)	Modem	2400	94-364-176272	DK467GSM24	Computer Peripherals	Shielded, 1.8m	Unshielded, 1.5m
4)	Printer	C2642A	MY8252C3GQ	B94C2642X	HP	Shielded, 1.8m	AC I/P: Unshielded, 0.8m DC O/P: Unshielded, 1.2m
5)	PS/2 Keyboard	E03633YLT W3-C	3722	CIGE03633	HP	Shielded, 1.8m with a core	N/A
6)	PS/2 Mouse	M-S42	LZA85004186	DZL211106	Aopen	Shielded, 1.8m	N/A
7)	Mouse	M-MM43	LZE94052771	DoC	LOGITECH	Shielded, 1.9m	N/A
8)	Mouse	MK-1279G	SL-A799109	E6QMOUSE x31	NEC	Shielded, 1.8m	N/A
9)	USB Mouse	M-BB48	LZE93050187	FCC DoC	Logitech	Shielded, 1.8m	N/A
10)	USB Mouse	M-BB48	LZE93050165	FCC DoC	Logitech	Shielded, 1.8m	N/A
11)	Headphone	ST-8	A9	N/A	KOKA	Unshielded, 2.0m	N/A
12)	Multimedia Headset	SX-M	A5-2	N/A	TOKYO	Unshielded, 1.8m	N/A
13)	Walkman	YX-328	W7	N/A	YING-KO	Unshielded, 1.8m	N/A
14)	HUB (Remote)	J2600A	SG43801953	N/A	HP	Unshielded, 20 m	N/A
15)	Notebook PC (Remote)	365	EXTENSA367T	FCC DoC	Acer	Shielded, 10m	N/A

Note: All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

Grounding: Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.

TEST FACILITY

- Location:** No. 15, 14 Line, Chin Twu Chi, Lu Chu Hsiang, Taoyuan, Taiwan, R.O.C.
- Description:** There are three 3/10m open area test sites and three line conducted labs for final test, and one 3/10m open area test site for engineering lab. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 1992 and CISPR 22/EN 55022 requirements.
- Site Filing:** A site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046.
- Registration also was made with Voluntary Control Council for Interference (VCCI).
- Site Accreditation:** Accredited by NEMKO (Authorization #: ELA 124) for EMC & A2LA (Certificate #: 824.01) for Emission
- Also accredited by BSMI for the product category of Information Technology Equipment.
- Instrument Tolerance:** All measuring equipment is in accord with ANSI C63.4 and CISPR 22 requirements that meet industry regulatory agency and accreditation agency requirement.
- Ground Plane:** Two conductive reference ground planes were used during the Line Conducted Emission, one in vertical and the other in horizontal. The dimensions of these ground planes are as below. The vertical ground plane was placed distancing 40 cm to the rear of the wooden test table on where the EUT and the support equipment were placed during test. The horizontal ground plane projected 50 cm beyond the footprint of the EUT system and distanced 80 cm to the wooden test table. For Radiated Emission Test, one horizontal conductive ground plane extended at least 1m beyond the periphery of the EUT and the largest measuring antenna, and covered the entire area between the EUT and the antenna. It has no holes or gaps having longitudinal dimensions larger than one-tenth of a wavelength at the highest frequency of measurement up to 1GHz.
- Site # 1 & # 3 Line Conducted Test Site:** Vertical ground plane (2.2m x 2.2m)
Horizontal ground plane (2.5m x 2.5m)
- Site # 4 Line Conducted Test Site:** At Shielding Room

TEST EQUIPMENT LIST

Instrumentation: The following list contains equipment used at C & C Laboratory, Co., Ltd. for testing. The equipment conforms to the CISPR 16-1 / ANSI C63.2-1988 Specifications for Electromagnetic Interference and Field Strength Instrumentation from 10kHz to 1.0 / 2.0 GHz.

Equipment used during the tests:

Open Area Test Site: ☐ # 1 ; ☒ # 3 ; ☐ # 4

Open Area Test Site # 1					
EQUIPMENT TYPE	* MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. DUE
Spectrum Analyzer	ADVANTEST	R3261A	N/A	03/08/2000	03/07/2001
EMI Test Receiver	R&S	ESCS30	847793/012	11/06/1999	11/05/2000
PRE-AMP.	HP	8447F	2944A03748	10/22/1999	10/21/2000
Precision Dipole	R&S	HZ-12	846932/0004	06/16/1999	06/16/2000
Precision Dipole	R&S	HZ-13	846556/0008	06/16/1999	06/16/2000
Bilog Antenna	CHASE	CBL6112A	2309	02/13/2000	02/12/2001
Turn Table	EMCO	2081-1.21	N/A	N.C.R	N.C.R
Antenna Tower	EMCO	2075-2	9707-2604	N.C.R	N.C.R
Controller	EMCO	2090	N/A	N.C.R	N.C.R
RF Switch	ANRITSU	MP59B	N/A	N.C.R	N.C.R
Site NSA	C&C	N/A	N/A	11/10/1999	11/09/2000

Open Area Test Site # 3					
EQUIPMENT TYPE	* MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. DUE
Spectrum Analyzer	ADVANTEST	R3261C	71720533	10/25/1999	10/24/2000
Pre-Amplifier	HP	8447D	2944A09173	02/01/2000	01/31/2001
EMI Test Receiver	R&S	ESVS20	838804/004	12/24/1999	12/23/2000
Precision Dipole	R&S	HZ-12	846932/0004	06/16/1999	06/16/2000
Precision Dipole	R&S	HZ-13	846556/0008	06/16/1999	06/16/2000
Bilog Antenna	CHASE	CBL6112A	2179	11/27/1999	11/26/2000
Turn Table	EMCO	2081-1.21	9709-1885	N.C.R	N.C.R
Antenna Tower	EMCO	2075-2	9707-2060	N.C.R	N.C.R
Controller	EMCO	2090	9709-1256	N.C.R	N.C.R
RF Switch	ANRITSU	MP59B	N/A	N.C.R	N.C.R
Site NSA	C&C	N/A	N/A	01/30/2000	01/30/2001

Open Area Test Site # 4					
EQUIPMENT TYPE	* MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. DUE
Spectrum Analyzer	ADVANTEST	R3132	91700456	02/15/2000	02/14/2001
Pre-Amplifier	HP	8447F	2944A03748	10/22/1999	10/21/2000
EMI Test Receiver	R&S	ESVS10	846285/016	12/17/1999	12/16/2000
Precision Dipole	R&S	HZ-12	846932/0004	06/16/1999	06/16/2000
Precision Dipole	R&S	HZ-13	846556/0008	06/16/1999	06/16/2000
Bilog Antenna	CHASE	CBL 6112B	2462	01/13/2000	01/12/2001
Turn Table	Chance most	N/A	N/A	N.C.R	N.C.R
Antenna Tower	Chance most	N/A	N/A	N.C.R	N.C.R
Controller	Chance most	N/A	N/A	N.C.R	N.C.R
RF Switch	ANRITSU	MP59B	N/A	N.C.R	N.C.R
Site NSA	C&C Lab.	N/A	N/A	12/26/1999	12/25/2000

Conducted Emission Test Site: # 4

Conducted Emission Test Site # 4					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. DUE
EMI Test Receiver	R&S	ESHS10	843743/015	12/10/1999	12/09/2000
LISN	EMCO	3825/2	9003/1382	01/10/2000	01/09/2001
LISN	R&S	ESH2-Z5	843250/010	12/06/1999	12/05/2000

The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

TEST EQUIPMENT LIST

Power Harmonic & Voltage Fluctuation/Flicker Measurement Equipment				
MANUFACTURER / TYPE	MODEL NO.	SERIAL NO.	LAST CAL.	CAL. DUE
HAEFELY TRENCH Harmonic & Flicker Tester	PHF 555	080 419-25	Oct. 05, 1999	Oct.05, 2000

ESD Immunity Test Equipment				
Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
EMV SYSTEME/ ESD Generator	SESD 2000	812006	Nov. 19, 1999	Nov. 18, 2000

Radiated Electromagnetic Field Immunity Test Equipment				
Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
Maconi /Signal Generator	2022D	119246/003	Aug. 17, 1999	Aug. 16, 2000
M2S / Power Amplifier	A00181/1000	9801-112	N/A	N/A
M2S / Power Amplifier	AC8113/800-250A	9801-179	N/A	N/A
Wandel & Goltormann/ EM-Radiation Meter	EMR-30	L-0013	Jan. 13, 2000	Jan. 12, 2001
EMCO Power Antenna	3141	9712-1083	N/A	N/A

Fast Transients/Burst Immunity Test Equipment				
Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
HAEFELY TRENCH/ Fast Transients/Burst Generator	PEFT-JUNIOR	583 333-117	Aug. 18, 1999	Aug. 18, 2000

Conducted Immunity Test Equipment				
Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
Maconi /Signal Generator	2022D	119246/003	Aug. 17, 1999	Aug. 16, 2000
MEB / CDN M3	M3	3683	Sep. 09, 1999	Sep. 08, 2000
M2S / Power Amplifier	A00181/1000	9801-112	N/A	N/A

SECTION 1 EN 55022 (LINE CONDUCTED & RADIATED EMISSION)

MEASUREMENT PROCEDURE (PRELIMINARY LINE CONDUCTED EMISSION TEST)

- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per EN 55022 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per EN 55022.
- 3) All I/O cables were positioned to simulate typical actual usage as per EN 55022.
- 4) The EUT received AC power through a Line Impedance Stabilization Network (LISN) which supplied power source of 230VAC/50Hz and was grounded to the ground plane.
- 5) All support equipment received power from a second LISN supplying power of 110VAC/60Hz, if any.
- 6) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7) Analyzer / Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- 8) During the above scans, the emissions were maximized by cable manipulation.
- 9) The following test mode(s) were scanned during the preliminary test:

Mode(s):

1. 1280 x 1024 resolution
2. 1024 x 768 resolution
3. 640 x 480 resolution

- 10) After the preliminary scan, we found the following test mode producing the highest emission level.

Mode: 1.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

MEASUREMENT PROCEDURE (FINAL LINE CONDUCTED EMISSION TEST)

- 1) EUT and support equipment was set up on the test bench as per step 10 of the preliminary test.
- 2) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- 3) The test data of the worst case condition(s) was reported on the Summary Data page.

Data Sample:

Freq. MHz	Q.P. Raw dBuV	Average Raw dBuV	Q.P. Limit dBuV	Average Limit dBuV	Q.P. Margin dB	Average Margin dB	Note
x.xx	39.2	---	79	66	-39.8	-26.8	L 1

Freq.	= Emission frequency in MHz
Raw dBuV	= Uncorrected Analyzer / Receiver reading
Limit dBuV	= Limit stated in standard
Margin dB	= Reading in reference to limit
Note	= Current carrying line of reading
“---”	= The emission level complied with the Average limits, with at least 2 dB margin, so no further recheck.

LINE CONDUCTED EMISSION LIMIT

Frequency	Maximum RF Line Voltage	
	Q.P.	AVERAGE
150kHz-500kHz	79dBuV	66dBuV
500kHz-5MHz	73dBuV	60dBuV
5MHz-30MHz	73dBuV	60dBuV

Note: The lower limit shall apply at the transition frequency.

MEASUREMENT PROCEDURE (PRELIMINARY RADIATED EMISSION TEST)

- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per EN 55022 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per EN 55022.
- 3) All I/O cables were positioned to simulate typical actual usage as per EN 55022.
- 4) The EUT received 230VAC/50Hz power source from the outlet socket under the turntable. All support equipment received 110VAC/60Hz power from another socket under the turntable, if any.
- 5) The antenna was placed at some given distance away from the EUT as stated in EN 55022. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
- 6) The Analyzer quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- 7) The following test mode(s) were scanned during the preliminary test:

Mode(s):

1. **1280 x 1024 resolution**
2. **1024 x 768 resolution**
3. **640 x 480 resolution**

- 8) After the preliminary scan, we found the following test mode producing the highest emission level.

Mode: 1.

Then, the EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for final testing.

MEASUREMENT PROCEDURE (FINAL RADIATED EMISSION TEST)

- 1) EUT and support equipment were set up on the turntable as per step 8 of the preliminary test.
- 2) The Analyzer / Receiver scanned from 30MHz to 1000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- 3) Recorded at least the six highest emissions. Emission frequency, amplitude, were recorded into a computer (The antenna position, polarization and turntable position were kept in raw data file) in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- 4) The test data of the worst case condition(s) was reported on the Summary Data page.

Data Sample:

Freq. (MHz)	Raw Data (dBuV/m)	Corr. Factor (dB)	Emiss. Level (dBuV/m)	Limits	Margin (dB)
xx.xx	14.0	11.2	26.2	40	-13.8

Freq.	= Emission frequency in MHz
Raw Data (dBuV/m)	= Uncorrected Analyzer / Receiver reading
Corr. Factor (dB)	= Correction factors of antenna factor and cable loss
Emiss. Level	= Raw reading converted to dBuV/m and CF added
Limit dBuV/m	= Limit stated in standard
Margin dB	= Reading in reference to limit

RADIATED EMISSION LIMIT

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m/ Q.P.)
30-230	10	40
230-1000	10	47

Note: The lower limit shall apply at the transition frequency.

BLOCK DIAGRAM OF TEST SETUP

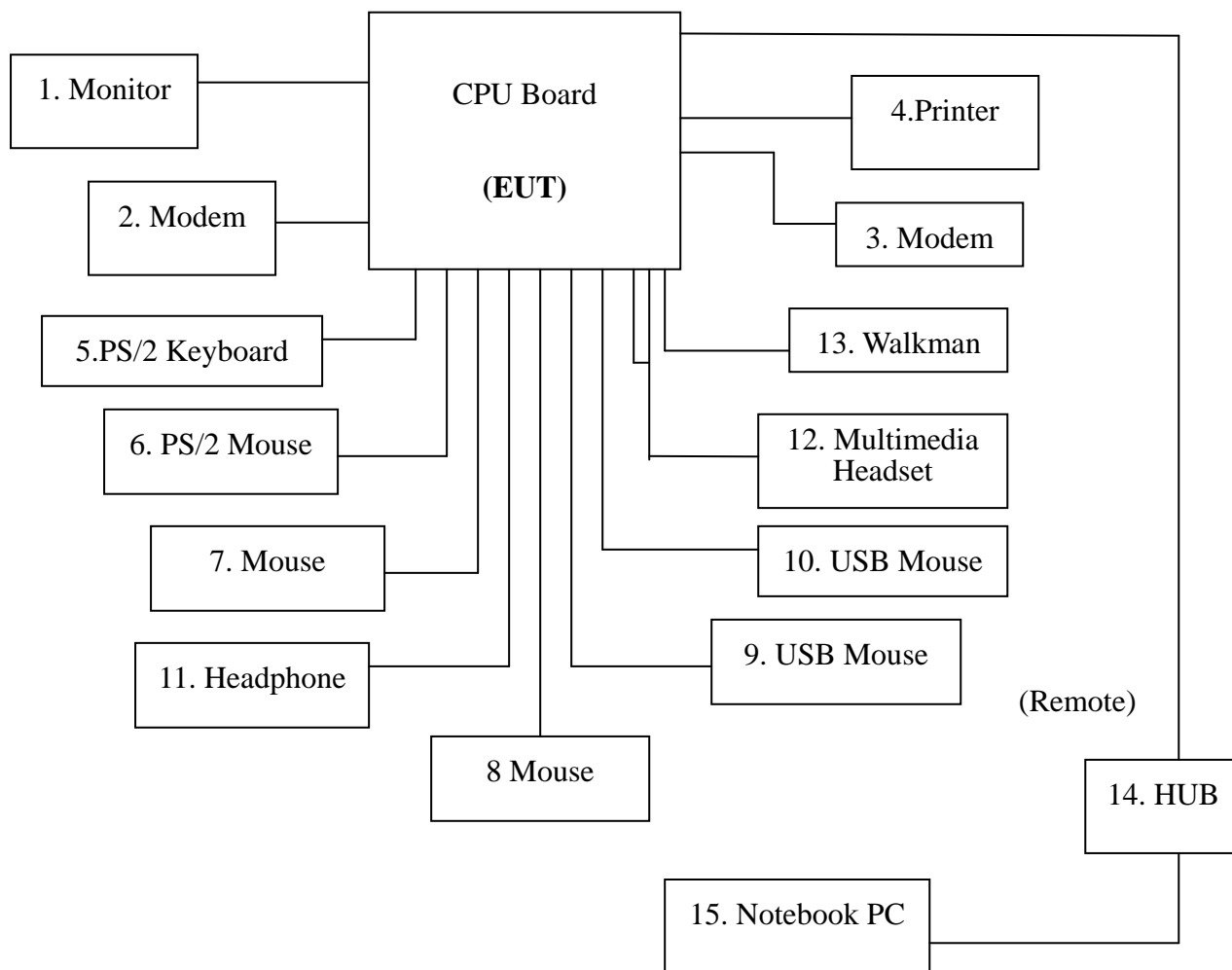
SYSTEM DIAGRAM OF CONNECTIONS BETWEEN EUT AND SIMULATORS

EUT: CPU Board

Trade Name: ADVANTECH

Model Number: PCM-9574

Power Cord: Unshielded, 1.8m



SUMMARY DATA

(LINE CONDUCTED TEST)

Model Number: PCM-9574

Location: Site # 4

Tested by: Gimmy Tsai

Test Mode: Mode 3

Test Results: Passed

Temperature: 25°C

Humidity: 70%RH

(The chart below shows the highest readings taken from the final data)

FREQ MHz	Q.P. Raw dBuV	AVG Raw dBuV	Q.P. Limit dBuV	AVG Limit dBuV	Q.P. Margin dB	AVG Margin dB	NOTE
0.212	45.2	---	79.0	66.0	-33.8	---	L1
9.333	25.4	---	73.0	60.0	-47.6	---	L1
14.628	33.2	---	73.0	60.0	-39.8	---	L1
15.603	39.2	---	73.0	60.0	-33.8	---	L1
16.582	39.5	---	73.0	60.0	-33.5	---	L1
17.765	34.7	---	73.0	60.0	-38.3	---	L1
0.214	48.2	---	79.0	66.0	-30.8	---	L2
5.998	38.4	---	73.0	60.0	-34.6	---	L2
14.633	38.1	---	73.0	60.0	-34.9	---	L2
16.158	44.5	---	73.0	60.0	-28.5	---	L2
16.579	44.8	---	73.0	60.0	-28.2	---	L2
17.772	39.4	---	73.0	60.0	-33.6	---	L2

L1 = Line One (Hot side) / L2 = Line Two (Neutral side)

****NOTE: “---” denotes the emission level was or more than 2dB below the Average limit, so no re-check anymore.**

SUMMARY DATA

(RADIATED EMISSION TEST)

Model Number: PCM-9574

Location: Site # 3

Tested by: Gimmy Tsai

Test Mode: Mode 1

Polar: Vertical -- 10m

Detector Function: Quasi-Peak

Test Results: Passed

Temperature: 27°C

Humidity: 67%RH

(The chart below shows the highest readings taken from the final data)

Freq. (MHz)	Raw Data (dBuV/m)	Corr. Factor (dB)	Emiss. Level (dBuV/m)	Limits	Margin (dB)
32.36	19.6	17.9	37.5	40.0	-2.5
66.89	30.3	7.3	37.6	40.0	-2.4
75.57	28.9	8.4	37.3	40.0	-2.7
129.56	22.5	14.4	36.9	40.0	-3.1
140.34	23.0	14.3	37.3	40.0	-2.7
151.16	24.2	13.4	37.6	40.0	-2.4
216.60	23.8	12.9	36.7	40.0	-3.3
467.40	8.7	22.6	31.3	47.0	-15.7

SUMMARY DATA

(RADIATED EMISSION TEST)

Model Number: PCM-9574

Location: Site # 3

Tested by: Gimmy Tsai

Test Mode: Mode 1

Polar: Horizontal -- 10m

Detector Function: Quasi-Peak

Test Results: Passed

Temperature: 27°C

Humidity: 67%RH

(The chart below shows the highest readings taken from the final data)

Freq. (MHz)	Raw Data (dBuV/m)	Corr. Factor (dB)	Emiss. Level (dBuV/m)	Limits	Margin (dB)
32.80	18.1	17.8	35.9	40.0	-4.1
66.90	28.4	7.3	35.7	40.0	-4.3
75.60	26.1	8.4	34.5	40.0	-5.5
129.56	20.5	14.4	34.9	40.0	-5.1
140.55	20.8	14.3	35.1	40.0	-4.9
151.64	23.5	13.4	36.9	40.0	-3.1
216.88	21.0	12.9	33.9	40.0	-6.1
467.45	8.1	22.6	30.7	47.0	-16.3

SECTION 2 EN 61000-3-2 & EN 61000-3-3 (POWER HARMONICS & VOLTAGE FLUCTUATION/FLICKER)

POWER HARMONICS MEASUREMENT

Port : AC mains
Basic Standard : EN 61000-3-2: 1995+A1: 1998+A2: 1998
Limits : ☒ Class A, ☐ Class D
Tested by : Gimmy Tsai
Temperature : 27°C
Humidity : 45%

VOLTAGE FLUCTUATION/FLICKER MEASUREMENT

Port : AC mains
Basic Standard : EN 61000-3-3: 1995
Limits : §5 of EN 61000-3-3
Tested by : Gimmy Tsai
Temperature : 27°C
Humidity : 45%

```

graph TD
    APS[AC POWER SOURCE] --- PA[POWER ANALYZER]
    APS --- CPU[CPU Board (EUT)]
    CPU --- M1[1. Monitor]
    CPU --- M2[2. Modem]
    CPU --- K[5. PS/2 Keyboard]
    CPU --- M3[6. PS/2 Mouse]
    CPU --- M4[7. Mouse]
    CPU --- H[11. Headphone]
    CPU --- P[4. Printer]
    CPU --- M5[3. Modem]
    CPU --- W[13. Walkman]
    CPU --- MH[12. Multimedia Headset]
    CPU --- UM1[10. USB Mouse]
    CPU --- UM2[9. USB Mouse]
    CPU --- M8[8 Mouse]
    CPU --- HUB[14. HUB]
    HUB --- NBP[15. Notebook PC]
    HUB --- Remote((Remote))
  
```

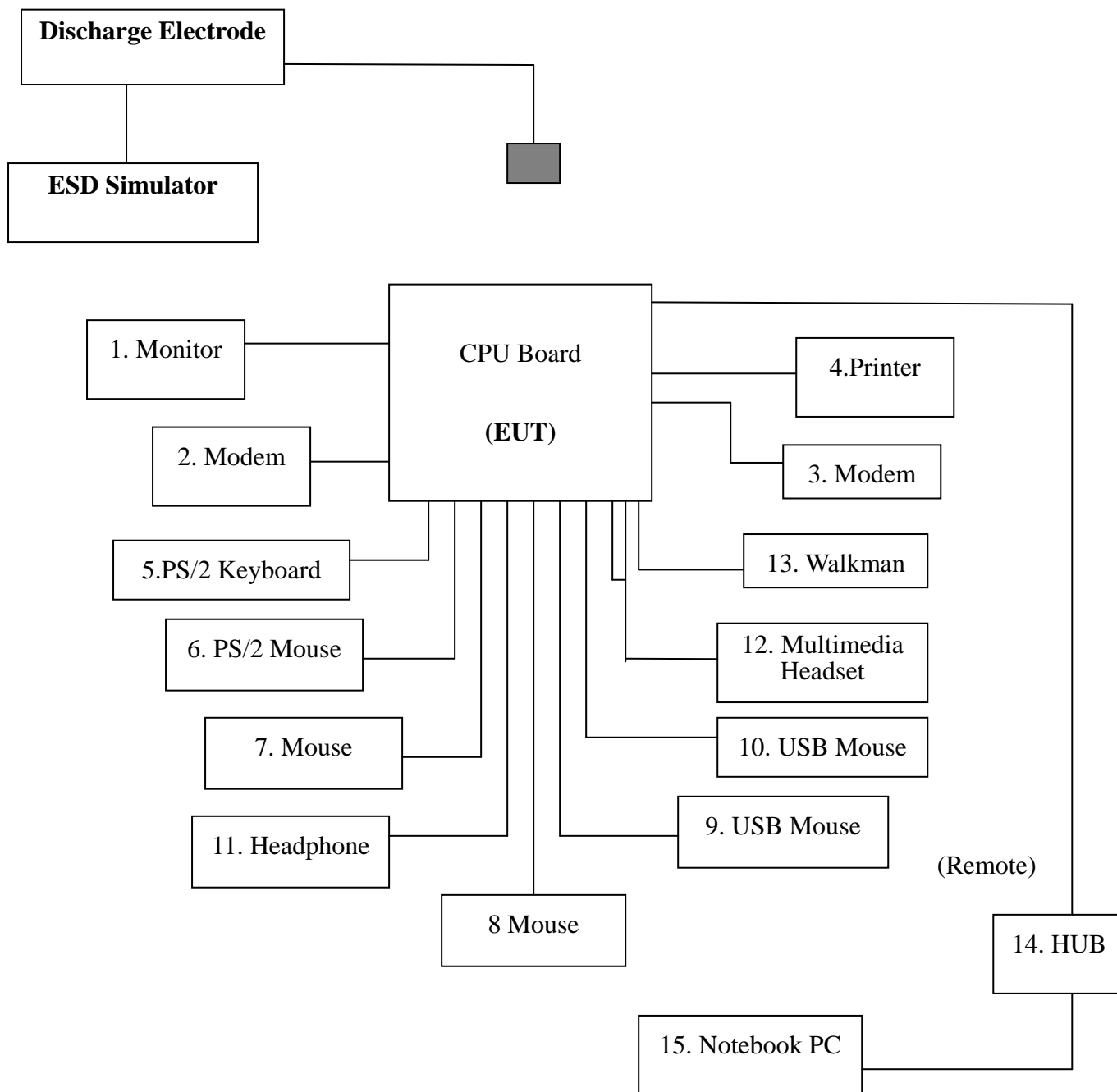
Please see the attached test data.

SECTION 3 EN 61000-4-2 (ELECTROSTATIC DISCHARGE)

ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

Port : Enclosure
Basic Standard : EN 61000-4-2
Requirements : $\pm 8\text{kV}$ (Air Discharge)
 $\pm 4\text{kV}$ (Contact Discharge)
 $\pm 4\text{kV}$ (Indirect Discharge)
Performance Criteria : B (Standard Required)
Tested by : Gimmy Tsai
Temperature/Humidity: 23°C / 50%

Block Diagram of Test Setup:



Test Procedure:

The electrostatic discharges were applied as follows:

Amount of Discharges	Voltage	Coupling	Result (Pass/Fail)
≥ 10 Point	$\pm 8\text{kV}$	Air Discharge	Pass
≥ 10 /Point	$\pm 4\text{kV}$	Contact Discharge	Pass
≥ 10 /Point	$\pm 4\text{kV}$	Indirect Discharge HCP (Front)	Pass
≥ 10 /Point	$\pm 4\text{kV}$	Indirect Discharge HCP (Left)	Pass
≥ 10 /Point	$\pm 4\text{kV}$	Indirect Discharge HCP (Back)	Pass
≥ 10 /Point	$\pm 4\text{kV}$	Indirect Discharge HCP (Right)	Pass
≥ 10 /Point	$\pm 4\text{kV}$	Indirect Discharge VCP (Front)	Pass
≥ 10 /Point	$\pm 4\text{kV}$	Indirect Discharge VCP (Left)	Pass
≥ 10 /Point	$\pm 4\text{kV}$	Indirect Discharge VCP (Back)	Pass
≥ 10 /Point	$\pm 4\text{kV}$	Indirect Discharge VCP (Right)	Pass

**** The tested points to EUT, please refer to attached pages.**

Performance & Result:

☒ **Criteria A:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance.

☐ **Criteria B:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐ **Criteria C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

****Observation:** No any function degraded during the tests.

The Tested Points of EUT

(Photo 1 of 2)



(Photo 2 of 2)



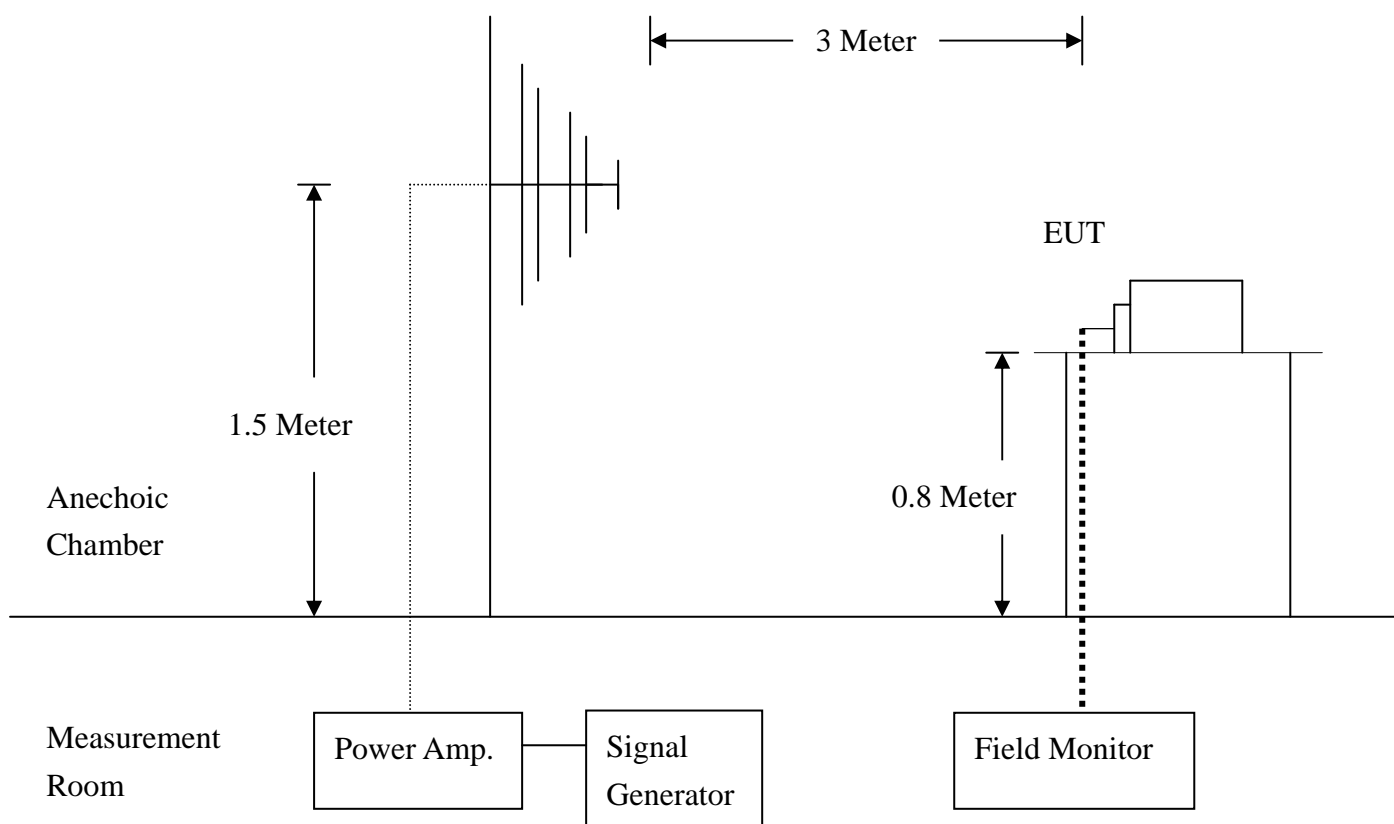
SECTION 4 ENV 50140 (RADIATED ELECTROMAGNETIC FIELD)

RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

Port : Enclosure
Basic Standard : ENV 50140
Requirements : 10 V/m / Modulated
Performance Criteria : A (Standard Required)
Tested by : Gimmy Tsai
Temperature : 23°C
Humidity : 50%

Block Diagram of Test Setup:

Same as Section 3 EN 61000-4-2 Test Setup:



Test Procedure:

Frequency Range : 80MHz-1000MHz

Frequency Step : 1% of fundamental

Dwell Time : 3 sec

Range (MHz)	Field	Modulation	Polarity	Position (°)	Result (Pass/Fail)
80-1000	10V	Yes	H	0	Pass
80-1000	10V	Yes	V	0	Pass
80-1000	10V	Yes	H	90	Pass
80-1000	10V	Yes	V	90	Pass
80-1000	10V	Yes	H	180	Pass
80-1000	10V	Yes	V	180	Pass
80-1000	10V	Yes	H	270	Pass
80-1000	10V	Yes	V	270	Pass

Performance & Result:

☒ **Criteria A:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance.

☐ **Criteria B:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐ **Criteria C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

****Observation:** No any function degraded during the tests.

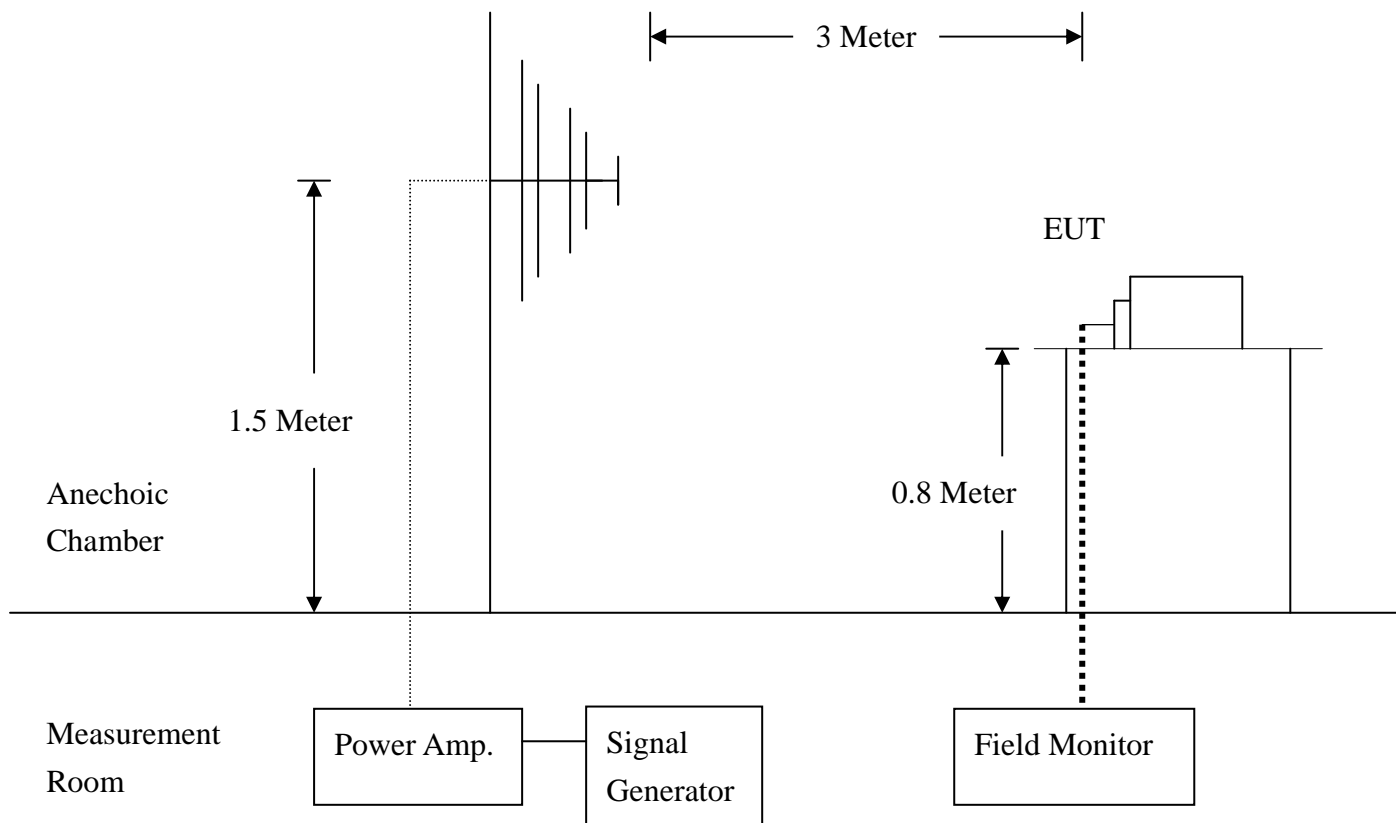
SECTION 5 ENV 50204 (RADIATED ELECTROMAGNETIC FIELD FROM DIGITAL TELEPHONES)

Radiated Electromagnetic Field From Digital Telephones Immunity Test

Port : Enclosure
Basic Standard : ENV 50204
Requirements : 10 V/m, with modulated
Performance Criteria : A (Standard Required)
Tested by : Gimmy Tsai
Temperature : 23°C
Humidity : 50%

Block Diagram of Test Setup:

Same as Section 3 EN 61000-4-2 Test Setup:



Test Procedure:

Spot Frequency : 900 MHz \pm 5MHz

Modulated Frequency : 200 Hz

Duty cycle : 50%

Range (MHz)	Field	Modulation	Polarity	Position (°)	Result (Pass/Fail)
900 \pm 5	10V	Yes	H	0	Pass
900 \pm 5	10V	Yes	V	0	Pass
900 \pm 5	10V	Yes	H	90	Pass
900 \pm 5	10V	Yes	V	90	Pass
900 \pm 5	10V	Yes	H	180	Pass
900 \pm 5	10V	Yes	V	180	Pass
900 \pm 5	10V	Yes	H	270	Pass
900 \pm 5	10V	Yes	V	270	Pass

Performance & Result:

- ☒ **Criteria A:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance.
- ☐ **Criteria B:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
- ☐ **Criteria C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

****Observation:** No any function degraded during the tests.

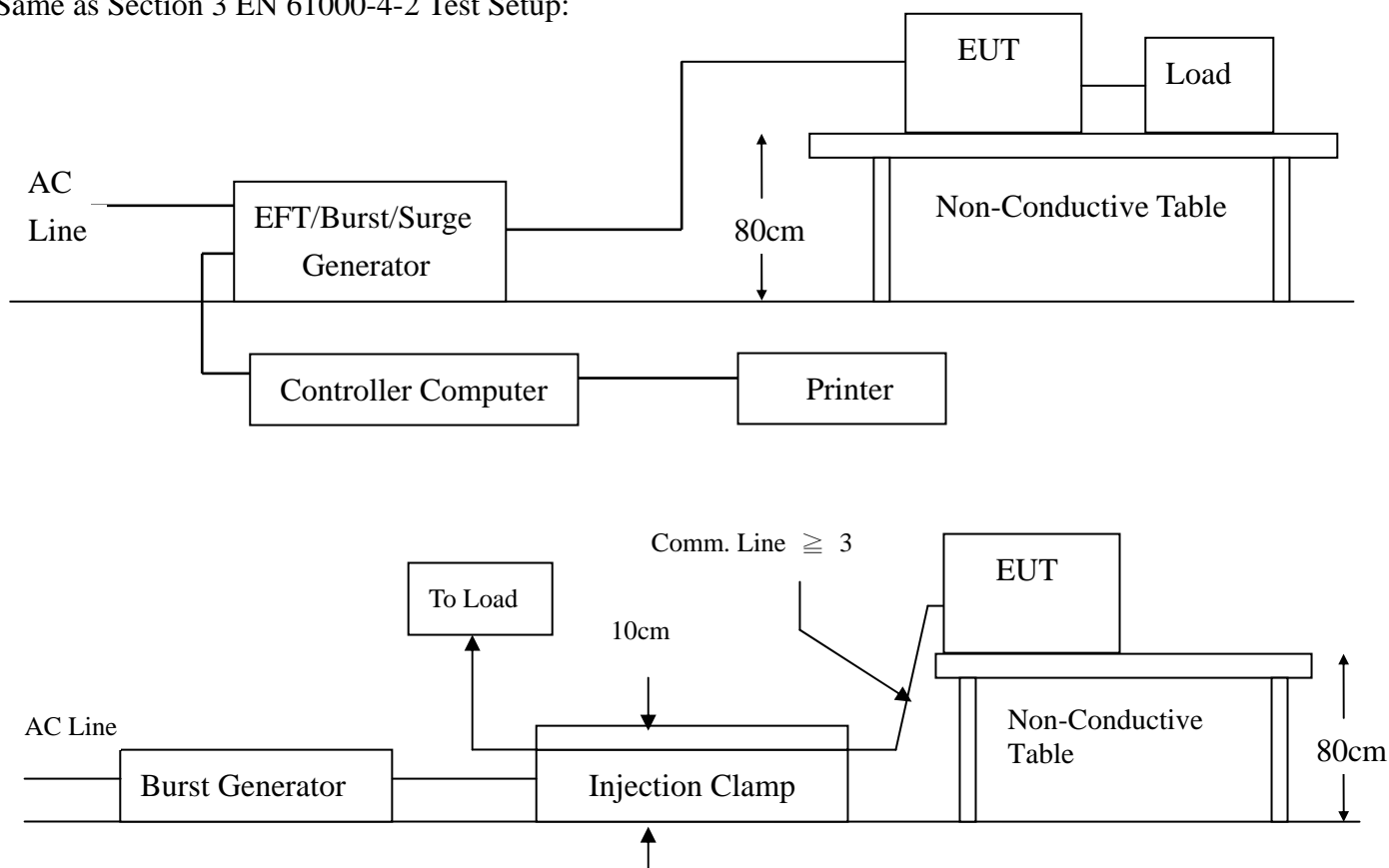
SECTION 6 EN 61000-4-4 (FAST TRANSIENTS/BURST)

FAST TRANSIENTS/BURST IMMUNITY TEST

Port	: On Power Port
Basic Standard	: EN 61000-4-4
Requirements	: $\pm 2\text{kV}$ for Power Supply Lines $\pm 1\text{kV}$ for Data Cable
Performance Criteria	: B (Standard require)
Tested by	: Gimmy Tsai
Temperature	: 23°C
Humidity	: 50%

Block Diagram of Test Setup:

Same as Section 3 EN 61000-4-2 Test Setup:



Test Procedure:

Impulse Frequency: 5kHz

Tr/Tn: 5/50ns

Burst Duration: 15ms

Burst Period: 3Hz

Inject Line	Voltage kV	Inject Method	Result (Pass/Fail)
L1	± 2	Direct	Pass
N	± 2	Direct	Pass
PE	± 2	Direct	Pass
L1 + N	± 2	Direct	Pass
L1 + PE	± 2	Direct	Pass
N + PE	± 2	Direct	Pass
L1 + N + PE	± 2	Direct	Pass
LAN	± 1	Clamp	Pass

Performance & Result:

☒ **Criteria A:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance.

☐ **Criteria B:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐ **Criteria C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

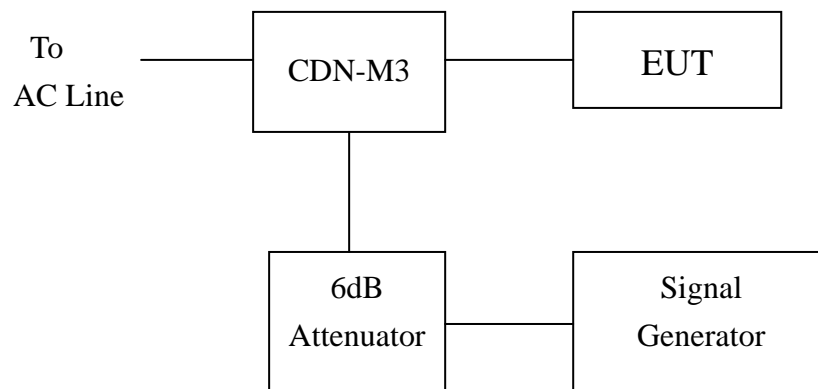
****Observation:** No any function degraded during the tests.

SECTION 7 ENV 50141 (CONDUCTED DISTURBANCE/INDUCED BY RADIO-FREQUENCY FIELD)

Port : Power cord
Basic Standard : ENV 50141
Requirements : 10 V with Modulated
Injection Method : CDN-M3
Performance Criteria : A
Tested by : Gimmy Tsai
Temperature : 23°C
Humidity : 50%

Block Diagram of Test Setup:

Same as Section 3 EN 61000-4-2 Test Setup:



Test Procedure:

Frequency Range : 0.15MHz-80MHz

Frequency Step : 1% of fundamental

Dwell Time : 3 sec

Range (MHz)	Field	Modulation	Result (Pass/Fail)
0.15-80	10V	Yes	Pass

Performance & Result:

☒ **Criteria A:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance.

☐ **Criteria B:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

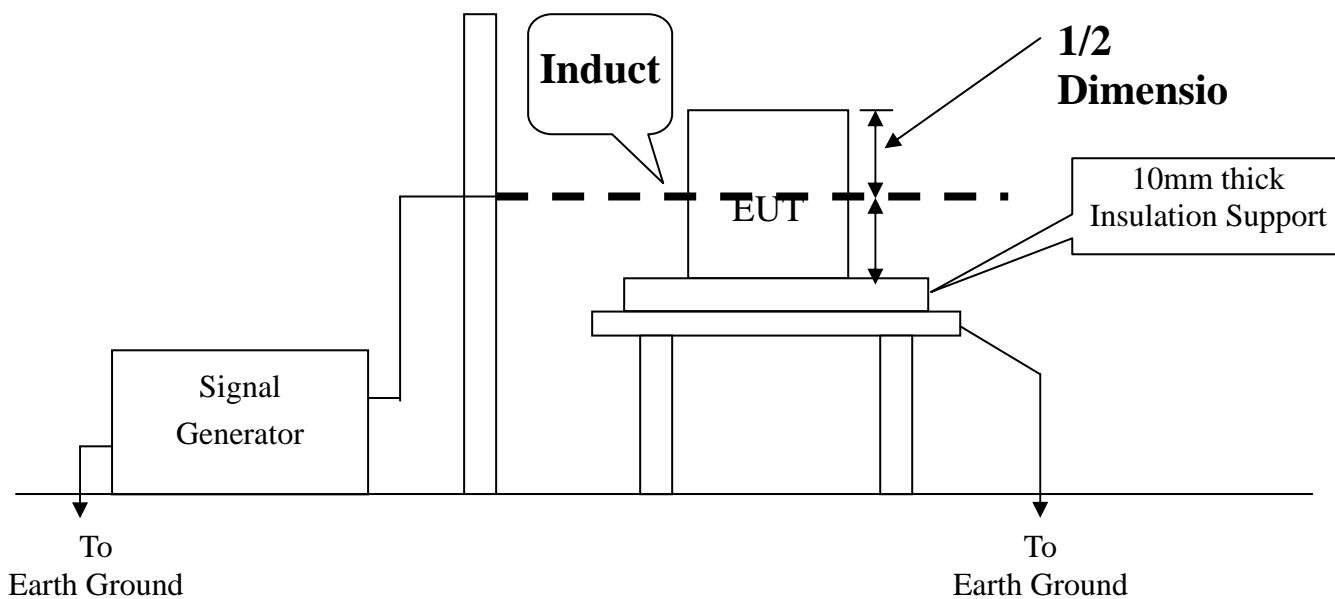
☐ **Criteria C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

****Observation:** No any function degraded during the tests.

SECTION 8 EN 61000-4-8 (POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST)

Port : Enclosure
Basic Standard : EN 61000-4-8
Requirements : 3 A/m
Performance Criteria : A (Standard Required)
Temperature : N/A
Humidity : N/A

Block Diagram of Test Setup:



Test Procedure:

Field Strength: 3A/m
Power Freq.: 50Hz
Orientation: X, Y, Z

Orientation	Field	Result (Pass/Fail)	Remark

****Note:** Not applicable, because no any component can be influenced by power magnetic fields.

Performance & Result:

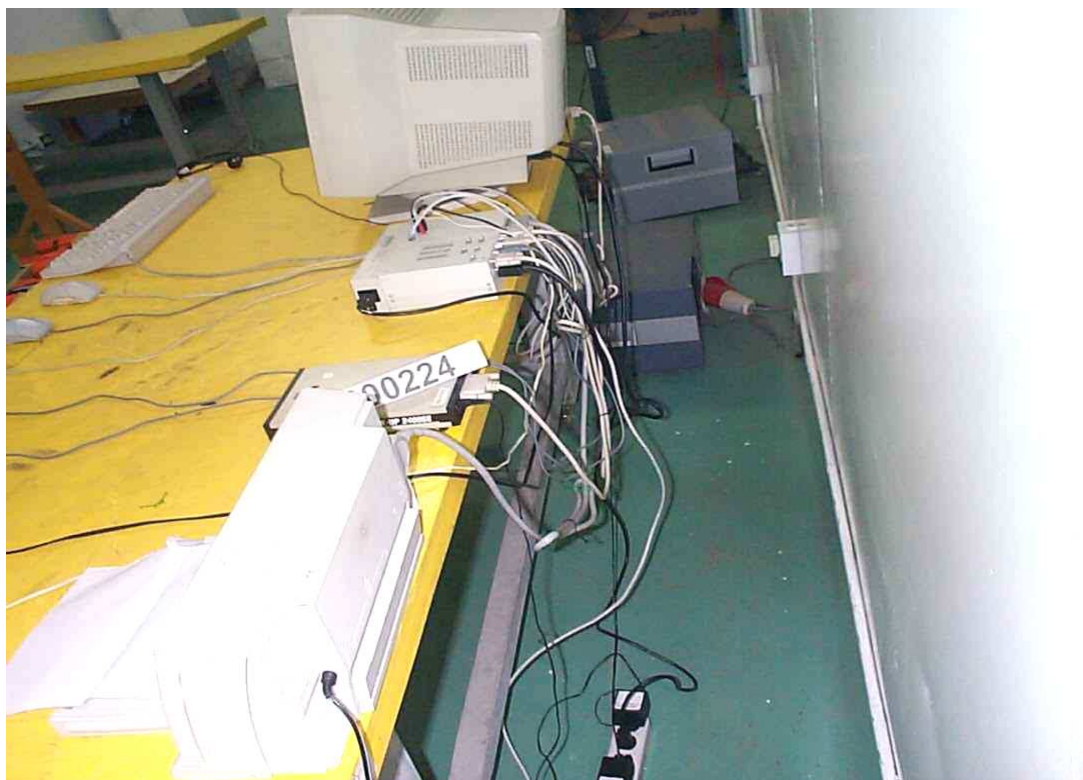
- ☐ **Criteria A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
- ☐ **Criteria B:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
- ☐ **Criteria C:** Temporary loss of function is allowed, provided the functions self-recoverable or can be restored by the operation of controls.

****Observation:** N/A

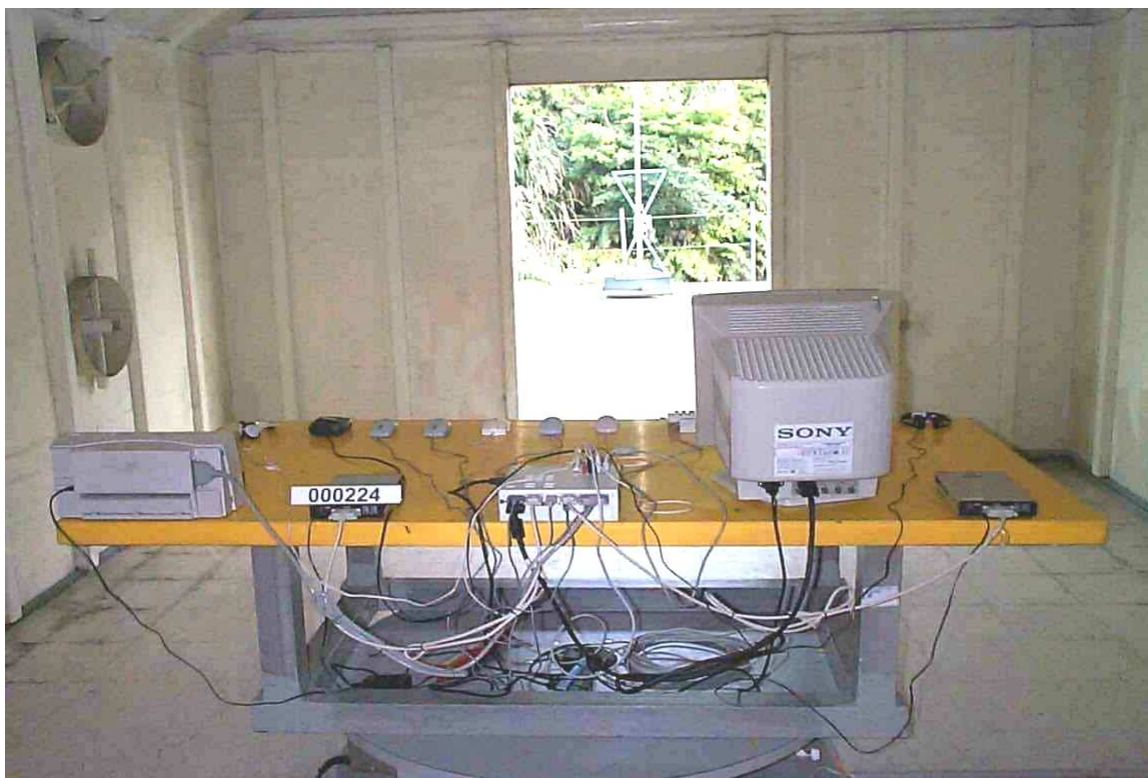
APPENDIX 1

PHOTOGRAPHS OF TEST SETUP

LINE CONDUCTED EMISSION TEST (EN 55022)



RADIATED EMISSION TEST (EN 55022)



POWER HARMONIC & VOLTAGE FLUCTUATION / FLICKER TEST (EN 61000-3-2, EN 61000-3-3)



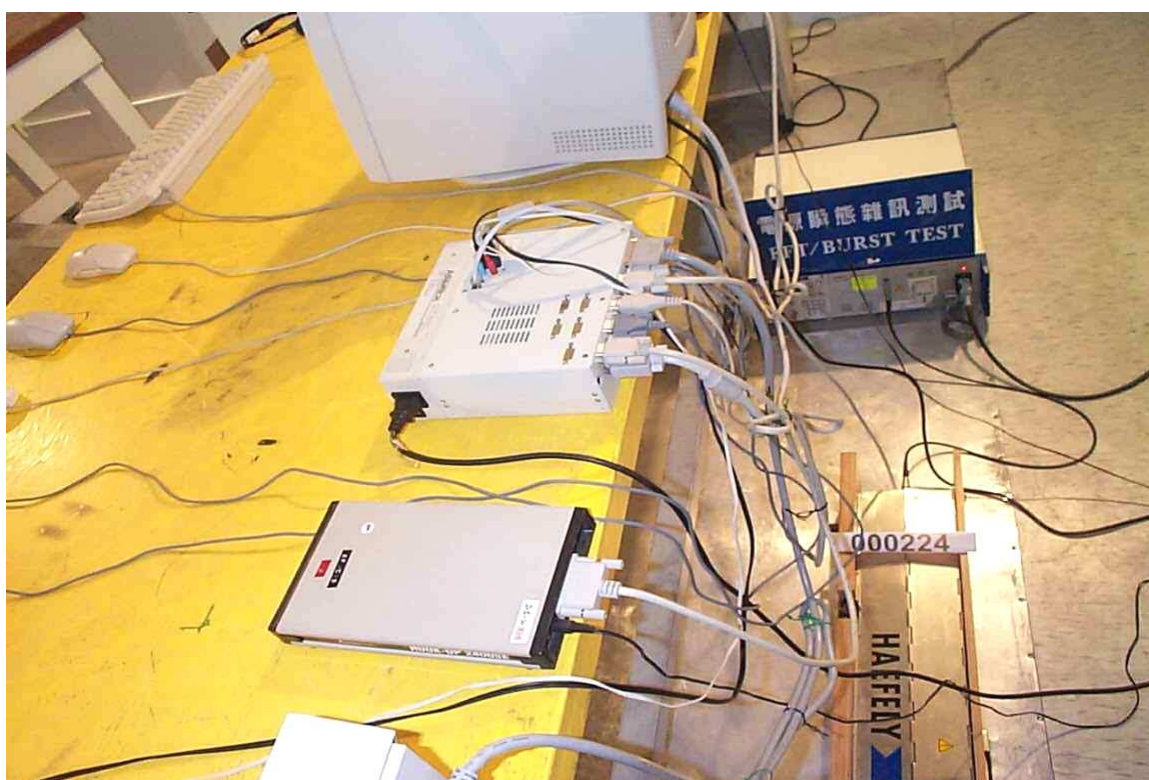
ELECTROSTATIC DISCHARGE TEST (EN 61000-4-2)



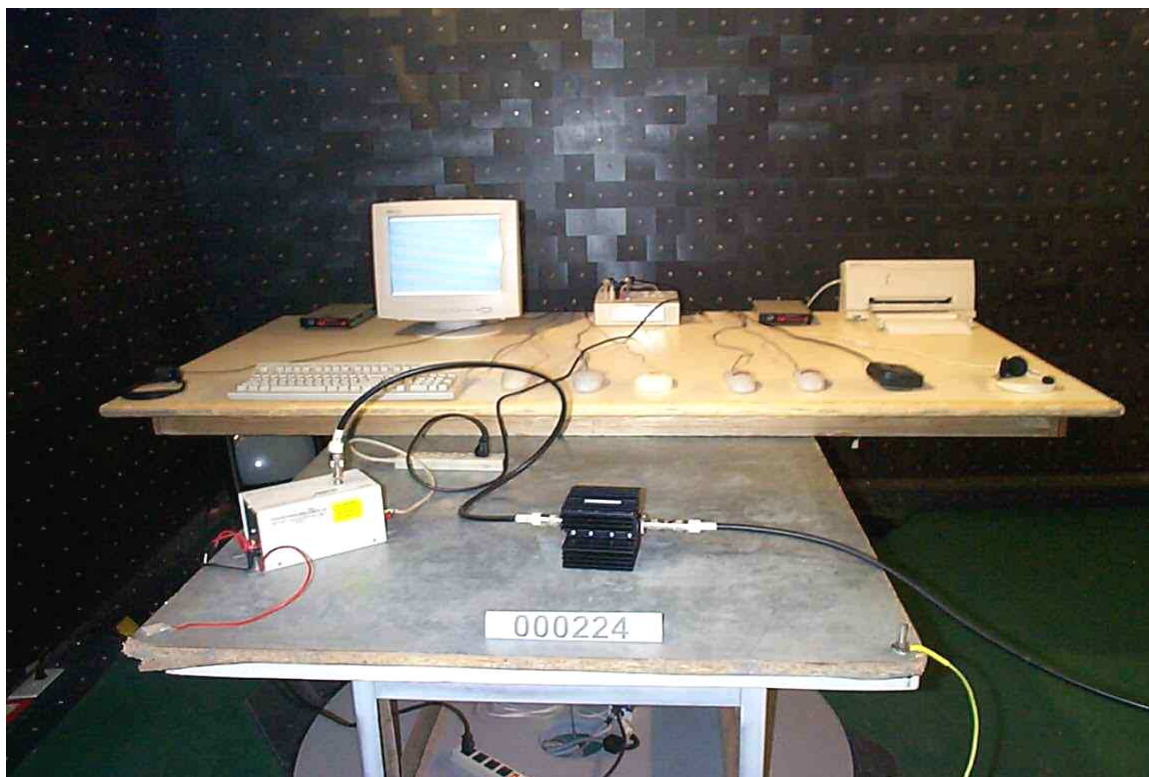
RADIATED ELECTROMAGNETIC FIELD (ENV 50140 & ENV 50204)



FAST TRANSIENTS/BURST TEST (EN 61000-4-4)



CONDUCTED DISTURBANCE, INDUCED BY RADIO-FREQUENCY FIELDS TEST (ENV 50141)



APPENDIX 2

PHOTOGRAPHS OF EUT

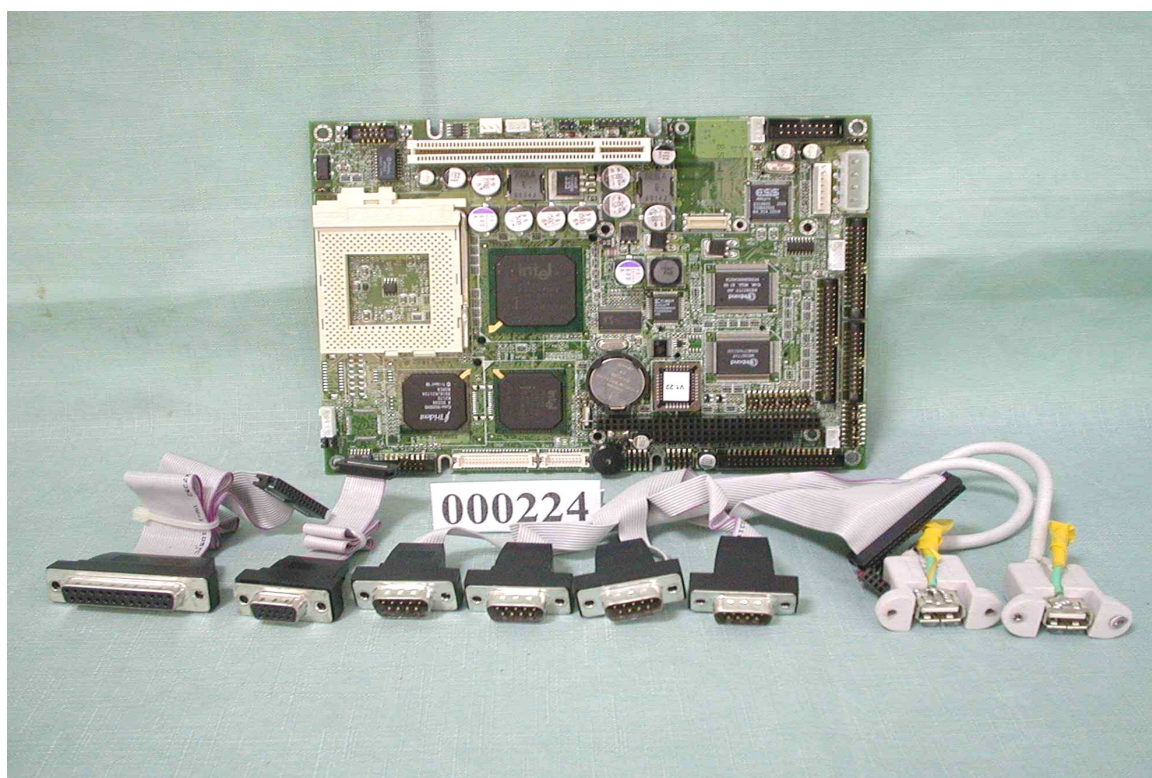
Front View of PC



Rear View of PC



Front View of EUT (Model No. : PCM-9574)



Rear View of EUT (Model No. : PCM-9574)

