EMC

TEST REPORT

REPORT NO. : CE87111102
MODEL NO. : AMPC-204
DATE OF TEST : Nov. 13 ~ Dec. 10, 1998

PREPARED FOR: AAEON TECHNOLOGY INC.

ADDRESS : 1F, NO. 6, ALLEY 6, LANE 45, PAO-HSIN RD.,
HSIN-TIEN CITY, TAIPEI, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION

NVLAP®
Accredited Laboratory

11F, NO.1, SEC.4, NAN-KING EAST RD.,
TAIPEI, TAIWAN, R.O.C.

TABLE OF CONTENTS

1. CERTIFICATION

Issue date: Dec. 12, 1998

Product	:	INDUSTRIAL COMPUTER	
Trade Name	:	AAEON	
Model No.	:	AMPC-204	
Applicant	:	AAEON TECHNOLOGY INC.	
Standard	:	EN 55022:1994+A1: 1995+A2: 1997, Class A	**EN 50082-2:1995**
		EN 61000-3-2: 1995, Class A	EN 61000-4-2:1995
		EN 61000-3-3: 1995	EN 61000-4-3:1996
			EN 61000-4-4:1995
			EN 61000-4-6:1996
			EN 61000-4-8:1993
			ENV 50204:1995

We hereby certify that one sample of the designation has been tested in our facility from Nov. 13 to Dec. 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.

TESTED BY: (Emission) Jackey Chang (Jackey Chang) DATE: 12/12/'98

TESTED BY: (Immunity) Dennis Chung (Dennis Chung) DATE: 12/12/'98

CHECKED BY: Ariel Hsieh (Ariel Hsieh) , DATE: 12/12/'98

APPROVED BY: (Harris W. Lai) , DATE: 12/12/'98

ADVANCE DATA TECHNOLOGY CORPORATION

NVLAP®
Accredited Laboratory

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	INDUSTRIAL COMPUTER
Model No.	:	AMPC-204
Power Supply Type	:	Switching
Power Cord	:	Nonshielded (1.8m)

Note: The EUT was tested with the following configuration:

	MODE 1	MODE 2	MODE 3
CPU BOARD	AAEON model: SBC-551	AAEON model: SBC-556	AAEON model: PCM-4335
CPU	INTEL PENTIUM MMX 233 MHz		STPC Client, DX-66
CHASSIS	AAEON, model: AMPC-204P		
HDD	SEAGATE, model: ST51270A		
SWITCHING POWER SUPPLY	ZIPPY, model: EP2-4150F		
Note: The Chassis includes the back plane , brand: AAEON, model: BP-204PSA.			

All data of the above three test modes are recorded individually in this report.

The EUT was tested with the following kind of processing speed of CPU:

- **MODE 1 & 2:**
  Intel Pentium MMX 233 — Speed: 233 MHz (the frequency of clock generator is 66 MHz)
- **MODE 3:**
  STPC Client DX-66, — Speed : 66 MHz (the frequency of clock generator is 66 MHz.

The following video resolution were used during the test:

- MODE 1 & 2: 1024x768 (256 color)
- MODE 3: 640x480 (16 color)

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 an office equipment and is classified as a light industry equipment. According to the manufacturer's request, the EUT was tested with the requirements of the following standards:

EN 55022:1994+A1: 1995+A2: 1997, Class A
EN 61000-3-2:1995, Class A
EN 61000-3-3:1995

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 50204:1995

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.	I/O Cable
1.	MONITOR	ADI	PD-959	730020U00100295	Shielded Signal (1.5m) Nonshielded Power (1.8m)
2.	USB KEYBOARD (for mode 1 & 2)	BTC	7932	D7A140017	Shielded Signal (1.8m)
3.	KEYBOARD	AAEON	KB-130	N/A	Shielded Signal (1.0m)
4.	USB MOUSE (for mode 1 & 2)	DEXIN	A3U800A	N/A	Shielded Signal (1.5m)
5.	MOUSE	LOGITECH	M-M30	LTR53500777	Shielded Signal (1.9m)
6.	PRINTER	HP	2225C+	3030S79116	Shielded Signal (1.5m) Nonshielded Power (1.8m)
7.	MODEM	ACEEX	1414	980020535	Shielded Signal (1.2m) Nonshielded Power (1.8m)
8.	PERSONAL COMPUTER (for mode 2 only)	IBM	6560-T7T	9983708	Nonshielded Power (1.8m)
9.	COLOR MONITOR (for mode 2 only)	ACER	7134T	M500233562	Shielded Signal (1.5m) Nonshielded Power (1.8m)
10.	KEYBOARD (for mode 2 only)	FORWARD	FDA-104GA	FDKB8110109	Nonshielded Signal (1.8m)
11.	MOUSE (for mode 2 only)	HP	M-S34	LZA72556273	Nonshielded Signal (1.8m)
12.	LAN CARD (for mode 2 only)	INTEL	S82555	00A0C9A6CB5252713	Shielded RJ45 Signal (10m)

Note: 1. (For mode 1 & 2 only) Support units 2 & 4 were connected to the USB ports of PC system.

2. (For mode 2 only) Support units 1-7 were set up as the SERVER PC system and communicated with support units 8-12 which acted as WORKSTATION and partners of communication system via a Lan cable (10m).

FOR IMMUNITY TEST

No	Product	Brand	Model No.	Serial No.	I/O Cable
1.	MONITOR	ADI	SM-5514A	521S030297A	Shielded Signal (1.5m) Nonshielded Power (1.8m)
2.	USB KEYBOARD (for mode 1 & 2)	BTC	7932	D7A140017	Shielded Signal (1.8m)
3.	KEYBOARD	AAEON	KB-130	N/A	Shielded Signal (1.0m)
4.	USB MOUSE (for mode 1 & 2)	AGILER	2900	N/A	Shielded Signal (1.8m)
5.	MOUSE	COMSYS	1300	507009797	Shielded Signal (1.4m)
6.	PRINTER	HP	C2145A	SG5N1601K	Shielded Signal (1.5m) Nonshielded Power (1.8m)
7.	MODEM	GVC	F-1128V1R6	96-191-113004	Shielded Signal (1.25m) Nonshielded Power (1.5m)
8.	PERSONAL COMPUTER (for mode 2 only)	IBM	6560-T7T	9983708	Nonshielded Power (1.8m)
9.	COLOR MONITOR (for mode 2 only)	ACER	7134T	M500233562	Shielded Signal (1.5m) Nonshielded Power (1.8m)
10.	KEYBOARD (for mode 2 only)	FORWARD	FDA-104GA	FDKB8110109	Nonshielded Signal (1.8m)
11.	MOUSE (for mode 2 only)	HP	M-S34	LZA72556273	Nonshielded Signal (1.8m)
12.	LAN CARD (for mode 2 only)	INTEL	S82555	00A0C9A6CB5252713	Shielded RJ45 Signal (10m)

Note: 1. (For mode 1 & 2 only) Support units 2 & 4 were connected to the USB ports of PC system.

2. (For mode 2 only) Support units 1-7 were set up as the SERVER PC system and communicated with support units 8-12 which acted as WORKSTATION and partners of communication system via a Lan cable (10m).

2.4 TEST SETUP

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

3. TEST INSTRUMENTS

3.1 TEST INSTRUMENTS (EMISSION)

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8594E	3412A01132	Sept. 24, 1999
CHASE Preamplifier	CPA9231A/4	3215	Nov. 1, 1999
ROHDE & SCHWARZ TEST RECEIVER	ESVS 30	841977/002	Jan. 08, 1999
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 25, 1999
CHASE BILOG Antenna	CBL6112	2074	Dec. 25, 1998
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	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.

CURRENT HARMONICS, VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

Description & Manufacturer	Model no.	Serial No.	Calibrated Until
KeyTek, Power Arb Waveform Generator	EP72HF	9508346	May 28, 1999
KIKUSUI AC SWITCHING POWER SUPPLY	PCR 4000L	9508355	May 28, 1999

Note: 1. 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. 9, 1999
KeyTek, ESD Simulator	MZ-15/EC	92022232	April 15, 1999
KeyTek, EFT Generator	CE-40	9508257	Sept. 8, 1999
KeyTek, Capacitive Clamp	CE-40-CCL	9508259	Sept. 8, 1999
ROHDE & SCHWARZ Signal Generator	SMY01	840490/009	Sept. 30, 1999
KALMUS Power Amplifier	LA1000V	091995-1	N/A
KALMUS Power Amplifier	757LC	091995-2	N/A
HOLADAY Field Probe	HI-4422	89915	Oct. 27, 1999
EMCO BiconiLog Antenna	3141	1001	N/A
FCC Coupling Decoupling Network	FCC-801-M3-25	48	N/A
FCC Coupling Decoupling Network	FCC-801-M2-25	20	N/A
FCC Coupling Decoupling Network	FCC-801-M1-25	17	N/A
COMTEST Compact Full Anechoic Chamber (7x3x3 m)	CFAC	ADT-S01	Aug. 4, 1999
HAEFELY Magnetic Field Tester	MAG 100.1	083794-06	N/A
COMBINOVA Magnetic Field Meter	MFM10	224	Aug. 26, 1999

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) dBuV/m	Class B (at 10m) 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.

4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Product Family Standard	:	EN 55022:1994+A1: 1995+A2: 1997, Class A
Frequency Range	:	0.15 - 30 MHz (Conducted Emission)
		30 - 1000 MHz (Radiated Emission)
Input Voltage	:	230 Vac, 50 Hz
Temperature	:	22 ℃
Humidity	:	63 %
Atmospheric Pressure	:	1015 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -3.4 dB at 0.156 MHz Minimum passing margin of radiated emission: -3.2 dB at 128.88 & 214.40 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. Industrial PC reads and writes messages from HDD.
4. Industrial PC sends and receives messages from WORKSTATION via a LAN cable. (for mode 2 only)
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 printer prints them on paper.
8. Repeat steps 2-8.

4.1.2 TEST DATA OF CONDUCTED EMISSION (A)

EUT: **INDUSTRIAL COMPUTER** MODEL: **AMPC-204**

MODE: **1**

6 dB Band Width: 10 kHz

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	63.6	58.6	65.90	62.6	79.0	66.0	-15.4	-7.4	-13.1	-3.4
0.246	50.5	-	53.9	-	79.0	66.0	-28.5	-	-25.1	-
3.540	26.5	-	25.3	-	66.0	60.0	-39.5	-	-40.7	-
7.682	33.1	-	32.4	-	66.0	60.0	-32.9	-	-33.6	-
12.000	44.9	-	45.4	-	66.0	60.0	-21.1	-	-20.6	-
25.058	37.1	-	36.7	-	73.0	60.0	-35.9	-	-36.3	-

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

HOT CO. Shielded Room 3

SM55022 CLASS A

Report No. CE37[illegible]

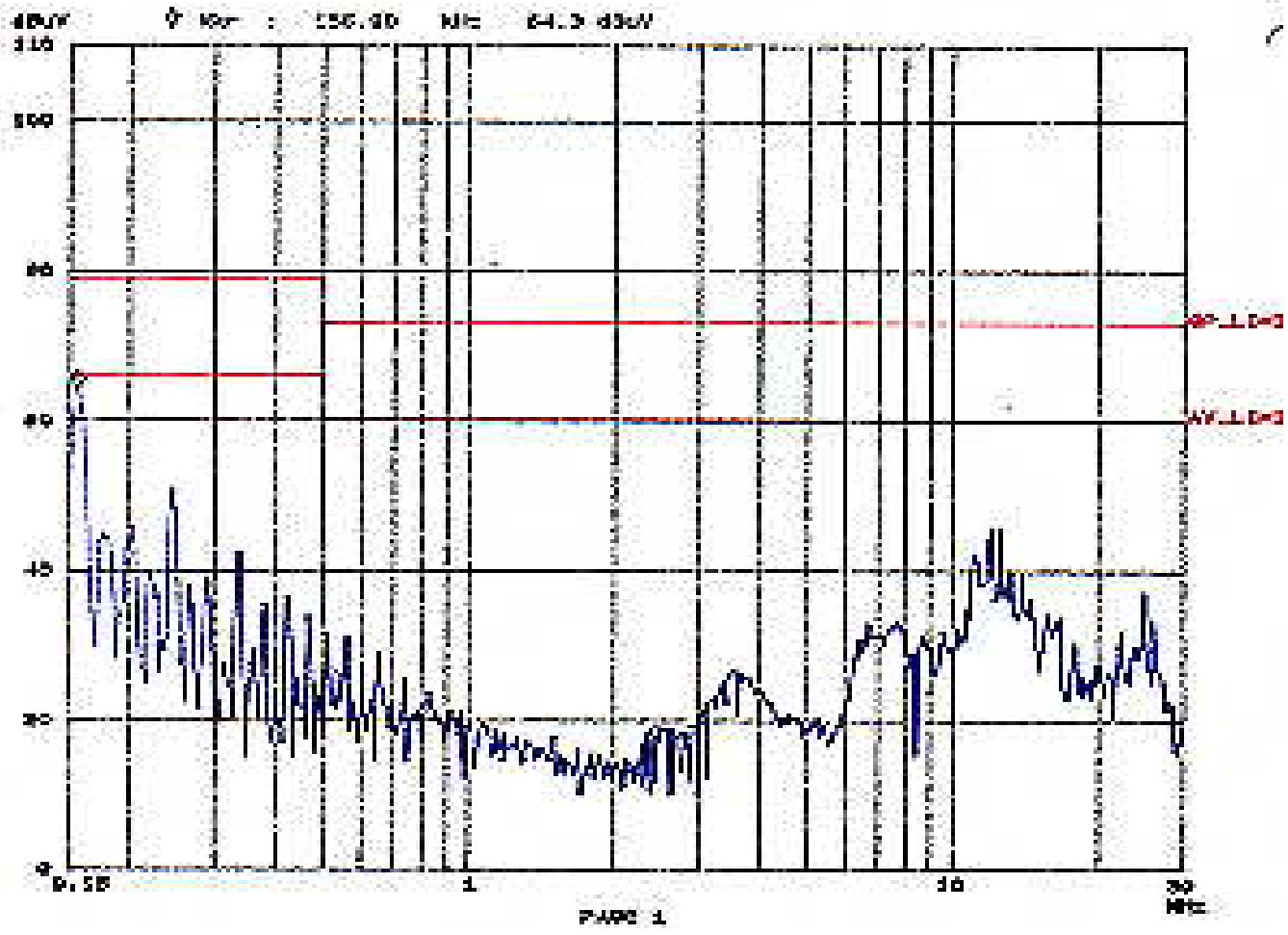
Page 1 > 1

Tested by Jackey Chang

EUT:	AMPS-304
Operator:	JACKEY_CHANG
Test Spec:	Line : L
Comment:	100-240VAC 60Hz FULL SYSTEM

Peak Scan Data Line CE Averaged

Frequencies					Receiver Settings			
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	DpAge
150K	490K	2K	10K	PK	0.02mS	10dBuV	OFF	00:00
490K	5M	2K	10K	PK	0.02mS	10dBuV	OFF	00:00
5M	30M	2K	10K	PK	0.05mS	10dBuV	OFF	00:00



PAGE 1

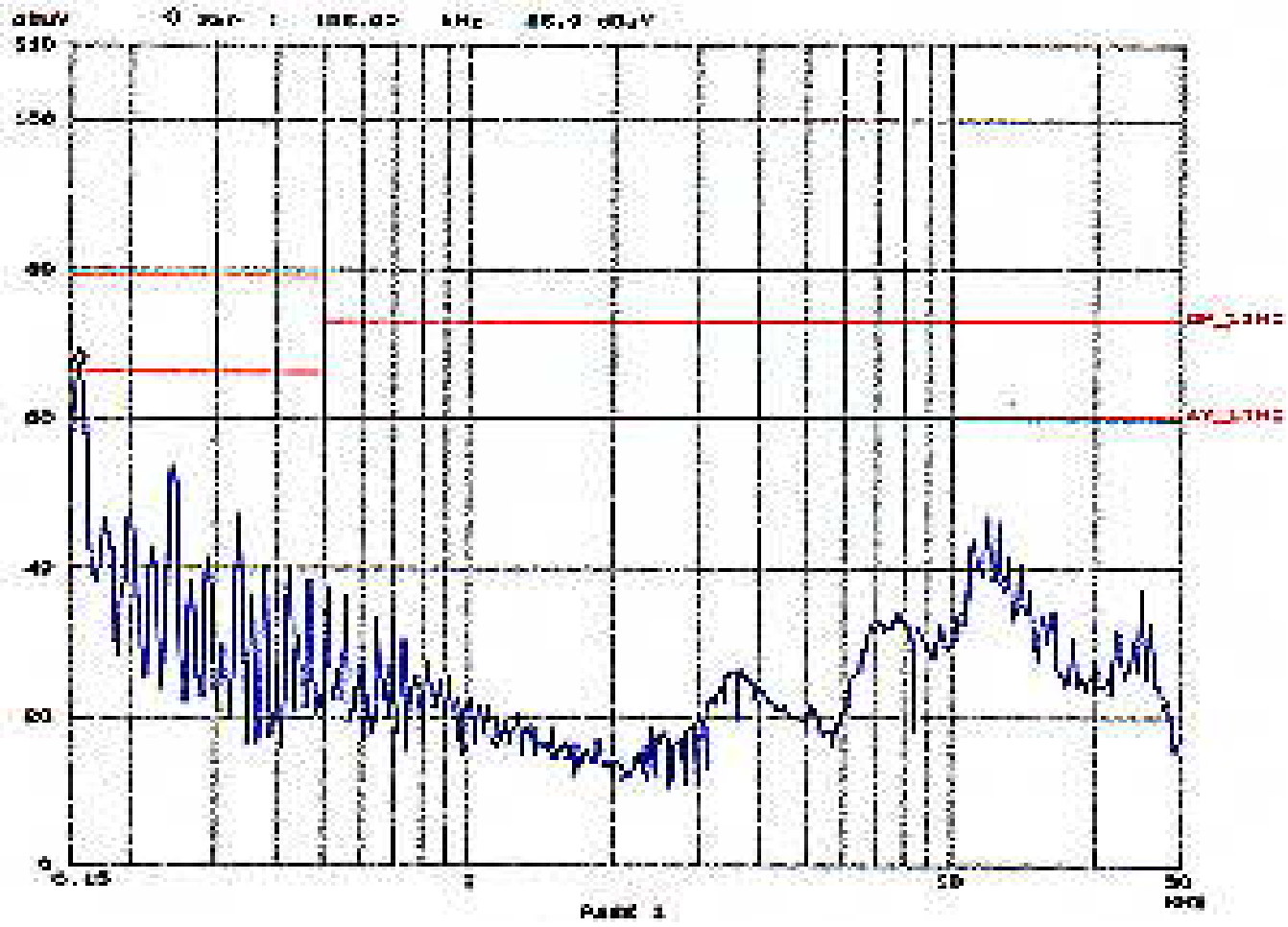
ADT CO. Shielded Room B
EN55022 CLASS A

Report No. CE97[illegible]
Page 1 of 2
Tested by Jackey Cheung

EUT: [illegible]
Operating: [illegible]
Test Mode: LINK : A
Comment: 100-0Mbps color
FULL SYSTEM

Final Scan Readings (3 Ranges)

Frequencies					Measurements					
Start	Stop	Step	IF Bw	Detector	M-Time	Angle	Pk-Lmt	Qp-Lmt	Comment
150k	450k	9k	10k	PK	0.05ms	1018LH	OFF	60dB	
450k	5M	9k	10k	PK	0.05ms	1018LH	OFF	60dB	
5M	30M	9k	10k	PK	0.05ms	1018LH	OFF	60dB	



4.1.3TEST DATA OF CONDUCTED EMISSION (B)

EUT: **INDUSTRIAL COMPUTER** MODEL: **AMPC-204**

MODE: **2**

6 dB Band Width: 10 kHz

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	63.7	58.3	65.3	61.3	79.0	66.0	-15.3	-7.7	-13.7	-4.7
0.246	52.4	-	54.9	-	79.0	66.0	-26.6	-	-24.1	-
0.738	29.6	-	28.0	-	73.0	60.0	-43.4	-	-45.0	-
3.860	26.4	-	26.8	-	73.0	60.0	-46.6	-	-46.2	-
8.360	37.6	-	33.4	-	73.0	60.0	-35.4	-	-39.6	-
23.12	38.2	-	41.1	-	73.0	60.0	-34.8	-	-31.9	-

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

EN55022 CLASS A

01. Dec 99 23:43

Report No. CE87[illegible]

Page [illegible]

Tested by [signature]

EUT: [illegible]

Operator: [illegible]

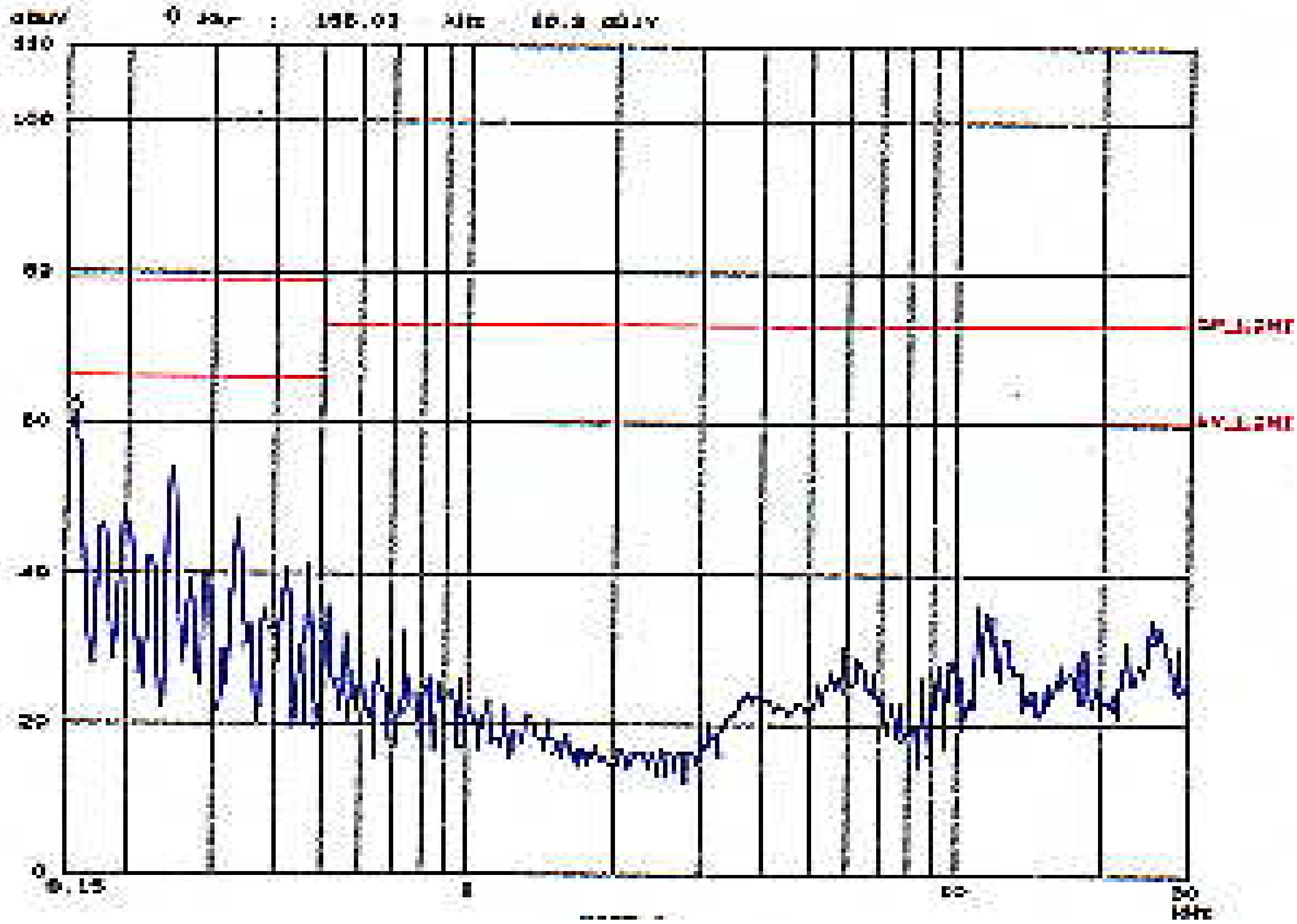
Test Spec: LINE : L

Comment: [illegible] CPU BOARD [illegible]

FULL SYSTEM

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150K	450K	2K	10K	PK	0.05ms	10dBLN	OFF	60dB
450K	5M	2K	10K	PK	0.05ms	10dBLN	OFF	60dB
5M	30M	5K	10K	PK	0.05ms	10dBLN	OFF	60dB



ADT COL Sn283660 Room 3

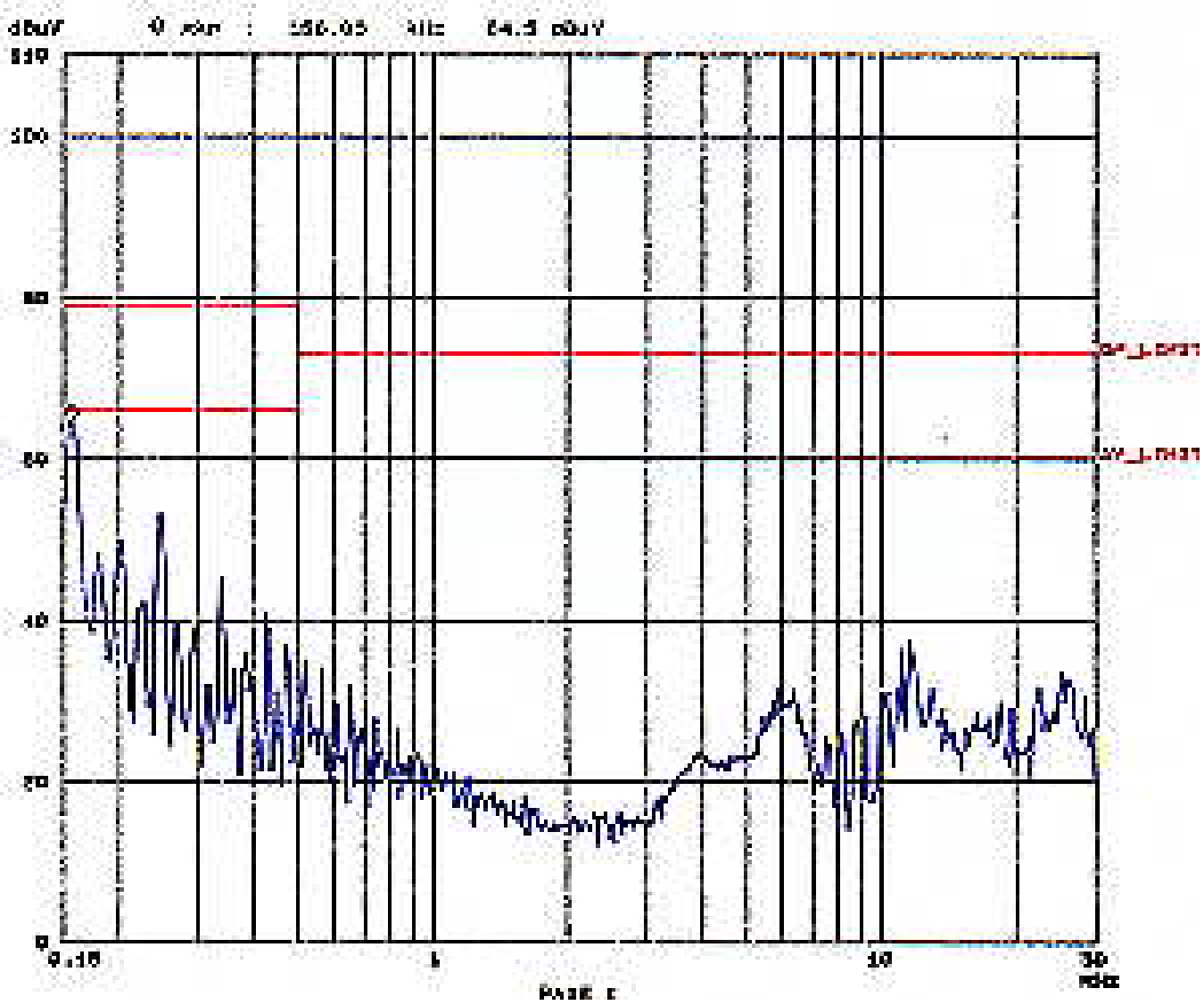
EN55022 CLASS A

Report No. CS87/1102
Page 17-2
Tested by Jacky Chung

EUT: AMPC-604
Operator: JHH
Test Spec: LINE : H
Comment: 350-604 CPU BOARD 1024/256 256 COLOR
FULL EXPAND

Scan Settings (1 Ranges)

Frequencies				Receiver Settings				
Start	Stop	Step	IF BW	Detector	MeasTime	Atten	Preamp	Offset
150k	450k	5k	10k	PK	0.05ms	10dB	OFF	0dB
450k	5M	25k	10k	PK	0.05ms	10dB	OFF	0dB
5M	30M	25k	10k	PK	0.05ms	10dB	OFF	0dB



4.1.4 TEST DATA OF CONDUCTED EMISSION (C)

EUT: **INDUSTRIAL COMPUTER** MODEL: **AMPC-204**

MODE: **3**

6 dB Band Width: 10 kHz

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	65.6	61.7	64.3	59.8	79.0	66.0	-13.4	-4.3	-14.7	-6.2
0.246	53.8	-	51.5	-	79.0	66.0	-25.2	-	-27.5	-
0.558	35.7	-	32.3	-	73.0	60.0	-37.3	-	-40.7	-
7.955	32.8	-	32.8	-	73.0	60.0	-40.2	-	-40.2	-
15.548	33.0	-	30.1	-	73.0	60.0	-40.0	-	-42.9	-
24.497	28.5	-	24.9	-	73.0	60.0	-44.5	-	-48.1	-

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

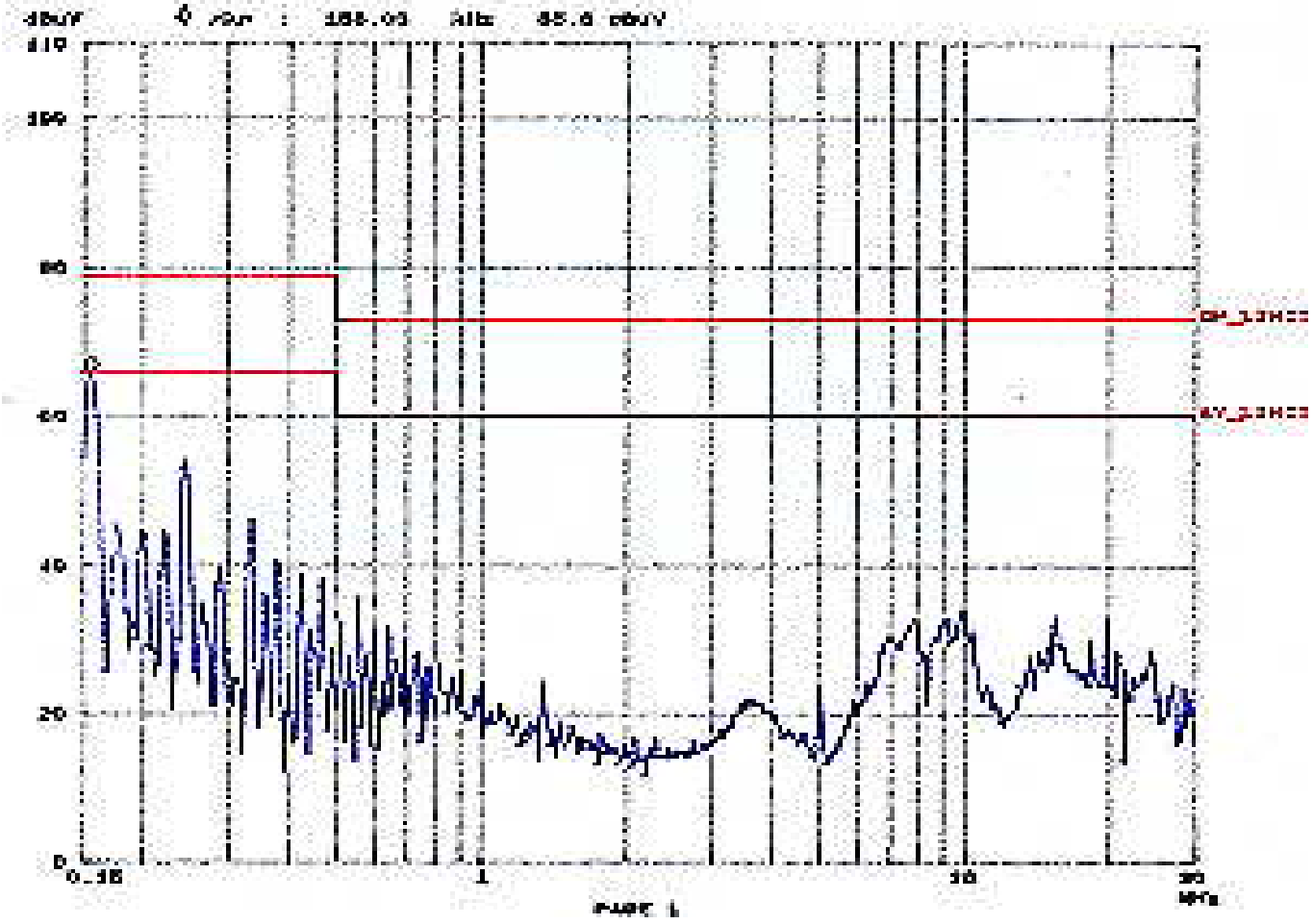
ADT CO. Shielded Room 3
EN55022 CLASS A

EUT: [illegible]
Operating: [illegible]
Test Source: [illegible]
Comment: [illegible]

Report No. CE[illegible]
Page 14-1
Tested by Jackey Cheung

Peak Scan Readings (3 Ranges)

Frequency			Measurement Settings					
Start	Stop	Step	IF BW	Detector	MeTime	Atten	Preamp	Options
150k	450k	5k	10k	Pk	0.1ms	10dB	Off	None
450k	0M	5k	10k	Pk	0.1ms	10dB	Off	None
0M	30M	5k	10k	Pk	0.1ms	10dB	Off	None



ADT CO. Shielded Room 3

27, Nov 98 15:53

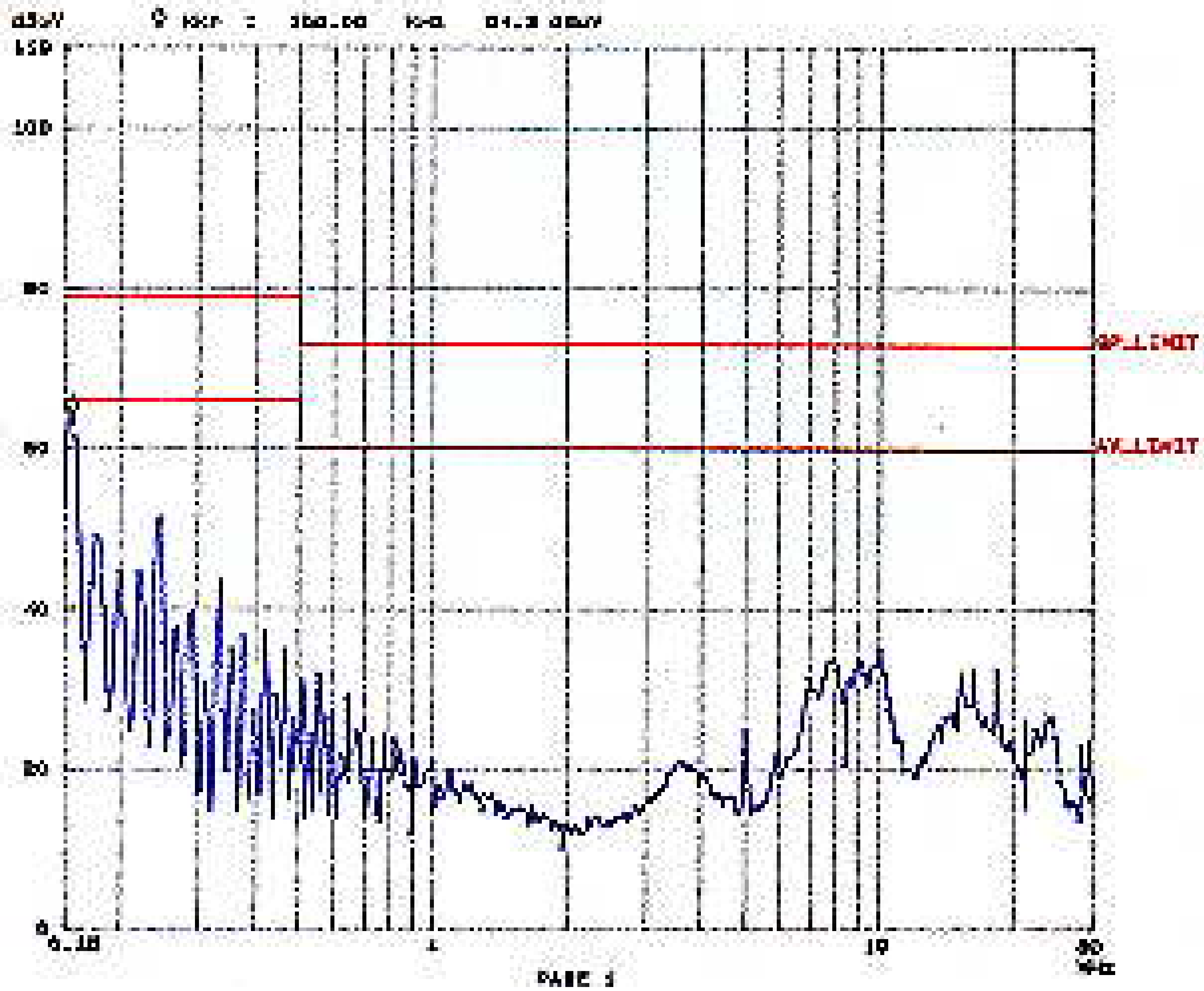
EN55022 CLASS A

EUT:	[illegible]
Operator:	JACKEY_CHANG
Test Spec:	LINE : N
Comment:	[illegible]
	FULL SYSTEM

Report No. CE871112 Page 14-2 Tested by Jackey Chang

Final Scan Settings (3 Ranges)

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150K	450K	5K	10K	PK	0.20ms	10dBLN	OFF	60dB
450K	5M	5K	10K	PK	[illegible]	[illegible]	OFF	60dB
5M	30M	5K	10K	PK	[illegible]	[illegible]	OFF	60dB



PAGE 1

4.1.5 TEST DATA OF RADIATED EMISSION (A)

EUT: **INDUSTRIAL COMPUTER** MODEL: **AMPC-204**

MODE: **1** 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/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
86.71	11.2	16.9	28.1	40.0	-11.9
133.66	13.9	18.7	32.6	40.0	-7.4
142.00	12.9	17.8	30.7	40.0	-9.3
167.06	10.9	20.2	31.1	40.0	-8.9
172.62	10.9	19.8	30.7	40.0	-9.3
178.19	10.8	22.5	33.3	40.0	-6.7
180.98	10.7	20.8	31.5	40.0	-8.5
186.56	10.6	21.5	32.1	40.0	-7.9
200.48	10.5	20.2	30.7	40.0	-9.3
217.18	12.1	22.1	34.2	40.0	-5.8
245.05	14.7	11.5	26.2	47.0	-20.8
300.69	16.2	14.2	30.4	47.0	-16.6
334.13	17.0	19.7	36.7	47.0	-10.3
467.77	19.8	11.2	31.0	47.0	-16.0
567.99	22.3	11.1	33.4	47.0	-13.6

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 (A)

EUT: **INDUSTRIAL COMPUTER** MODEL: **AMPC-204**

MODE: **1** 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/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
75.75	7.5	19.4	26.9	40.0	-13.1
124.34	14.1	13.3	27.4	40.0	-12.6
172.62	10.6	23.4	34.0	40.0	-6.0
175.48	10.2	24.1	34.3	40.0	-5.7
178.21	9.9	26.4	36.3	40.0	-3.7
186.55	10.4	26.1	36.5	40.0	-3.5
189.33	10.7	24.4	35.1	40.0	-4.9
192.12	11.0	24.1	35.1	40.0	-4.9
194.91	11.3	23.0	34.3	40.0	-5.7
200.49	11.9	24.4	36.3	40.0	-3.7
206.04	12.1	24.3	36.4	40.0	-3.6
208.87	12.2	24.3	36.5	40.0	-3.5
214.40	12.5	24.3	36.8	40.0	-3.2
217.20	12.6	23.2	35.8	40.0	-4.2
225.53	13.0	20.0	33.0	40.0	-7.0
231.16	13.2	11.7	24.9	47.0	-22.1
334.12	17.0	16.1	33.1	47.0	-13.9

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

4.1.6 TEST DATA OF RADIATED EMISSION (B)

EUT: **INDUSTRIAL COMPUTER** MODEL: **AMPC-204**

MODE: **2** 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/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
78.23	9.8	17.9	27.7	40.0	-12.3
124.24	15.1	2.5	17.6	40.0	-22.4
133.64	13.9	9.7	23.6	40.0	-16.4
141.92	12.9	12.6	25.5	40.0	-14.5
143.20	12.7	13.1	25.8	40.0	-14.2
157.49	11.3	10.6	21.9	40.0	-18.1
166.90	10.9	9.9	20.8	40.0	-19.2
194.81	10.5	8.4	18.9	40.0	-21.1
200.45	10.5	11.6	22.1	40.0	-17.9
207.94	11.2	7.2	18.4	40.0	-21.6
207.94	11.2	7.5	18.7	40.0	-21.3
244.88	14.7	12.9	27.6	47.0	-19.4

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 (B)

EUT: **INDUSTRIAL COMPUTER** MODEL: **AMPC-204**

MODE: **2** 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/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
77.98	7.6	24.1	31.7	40.0	-8.3
119.73	14.3	11.9	26.2	40.0	-13.8
133.63	13.6	15.5	29.1	40.0	-10.9
143.20	13.2	17.7	30.9	40.0	-9.1
166.91	11.4	18.3	29.7	40.0	-10.3
194.81	11.3	13.1	24.4	40.0	-15.6
200.36	11.9	22.0	33.9	40.0	-6.1
207.94	12.2	20.2	32.4	40.0	-7.6
220.93	12.8	14.3	27.1	40.0	-12.9
246.93	13.9	21.6	35.5	47.0	-11.5
344.38	17.5	10.8	28.3	47.0	-18.7
370.38	18.3	14.4	32.7	47.0	-14.3

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

4.1.7 TEST DATA OF RADIATED EMISSION (C)

EUT: **INDUSTRIAL COMPUTER** MODEL: **AMPC-204**

MODE: **3** 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/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
128.88	14.5	22.3	36.8	40.0	-3.2
132.05	14.1	19.3	33.4	40.0	-6.6
136.03	13.6	19.4	33.0	40.0	-7.0
157.50	11.3	23.9	35.2	40.0	-4.8
198.07	10.5	10.1	20.6	40.0	-19.4
200.46	10.5	19.3	29.8	40.0	-10.2
202.07	10.6	18.3	28.9	40.0	-11.1
229.10	13.2	20.3	33.5	40.0	-6.5
243.42	14.5	19.2	33.7	47.0	-13.3
319.99	16.7	14.6	31.3	47.0	-15.7

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 (C)

EUT: **INDUSTRIAL COMPUTER** MODEL: **AMPC-204**

MODE: **3** 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/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
60.31	8.2	17.6	25.8	40.0	-14.2
128.87	13.9	21.0	34.9	40.0	-5.1
132.04	13.7	21.7	35.4	40.0	-4.6
157.51	12.4	24.6	37.0	40.0	-3.0
171.80	10.7	22.3	33.0	40.0	-7.0
186.15	10.3	24.5	34.8	40.0	-5.2
198.06	11.6	17.4	29.0	40.0	-11.0
229.08	13.1	16.8	29.9	40.0	-10.1
319.97	16.3	24.9	41.2	47.0	-5.8

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

4.2 DISTURBANCE IN SUPPLY SYSTEM

Product Family Standard: EN 61000-3-2, Class A
Input Voltage : 230Vac, 50Hz
Temperature : 23 ℃
Humidity : 56 %
Atmospheric Pressure : 1010 mbar

TEST RESULT	Remarks
PASS	MODE: 1
PASS	MODE: 2
PASS	MODE: 3

Note: Meet the requirement of Class A limit. Class A or Class D is classified by test instruments automatically.

4.2.1 EUT OPERATION CONDITION

Same as item **4.1.1**.

4.2.2 MEASUREMENT DATA OF HARMONICS TEST (A)

EUT: **INDUSTRIAL PC** MODEL: **AMPC-204**

MODE: 1

Fundamental Voltage : 230.156 Vrms
Amperes : 0.403 Arms
Frequency: 50 Hz

Power Consumption : 43.305 W

Harm. Order	Reading Data (A)	Limit (A)
1	-	-
3	0.17	2.30
5	0.16	1.14
7	0.15	0.77
9	0.13	0.40
11	0.11	0.33
13	0.09	0.21
15	0.07	0.15
17	0.05	0.13
19	0.04	0.12
21	0.03	0.11
23	0.02	0.10
25	0.02	0.09
27	0.02	0.08
29	0.02	0.08
31	0.01	0.07
33	0.01	0.07
35	0.01	0.06
37	0.01	0.06
39	0.01	0.06

Harm. Order	Reading Data (A)	Limit (A)
2	0.00	1.08
4	0.00	0.43
6	0.00	0.30
8	0.00	0.23
10	0.00	0.18
12	0.00	0.15
14	0.00	0.13
16	0.00	0.11
18	0.00	0.10
20	0.00	0.09
22	0.00	0.08
24	0.00	0.08
26	0.00	0.07
28	0.00	0.07
30	0.00	0.06
32	0.00	0.06
34	0.00	0.05
36	0.00	0.05
38	0.00	0.05
40	0.00	0.05

Note: Steady state values on AC mains are recorded in the table.

4.2.3 MEASUREMENT DATA OF HARMONICS TEST (B)

EUT: **INDUSTRIAL PC** MODEL: **AMPC-204**

MODE: **2**

Fundamental Voltage : 230.139 Vrms
Amperes : 0.421 Arms
Frequency: 50 Hz

Power Consumption : 44.809 W

Harm. Order	Reading Data (A)	Limit (A)
1	-	-
3	0.18	2.30
5	0.17	1.14
7	0.15	0.77
9	0.14	0.40
11	0.12	0.33
13	0.10	0.21
15	0.08	0.15
17	0.06	0.13
19	0.04	0.12
21	0.03	0.11
23	0.02	0.10
25	0.02	0.09
27	0.02	0.08
29	0.02	0.08
31	0.02	0.07
33	0.02	0.07
35	0.01	0.06
37	0.01	0.06
39	0.01	0.06

Harm. Order	Reading Data (A)	Limit (A)
2	0.00	1.08
4	0.00	0.43
6	0.00	0.30
8	0.00	0.23
10	0.00	0.18
12	0.00	0.15
14	0.00	0.13
16	0.00	0.11
18	0.00	0.10
20	0.00	0.09
22	0.00	0.08
24	0.00	0.08
26	0.00	0.07
28	0.00	0.07
30	0.00	0.06
32	0.00	0.06
34	0.00	0.05
36	0.00	0.05
38	0.00	0.05
40	0.00	0.05

Note: Steady state values on AC mains are recorded in the table.

4.2.4 MEASUREMENT DATA OF HARMONICS TEST (C)

EUT: **INDUSTRIAL PC** MODEL: **AMPC-204**

MODE: **3**

Fundamental Voltage : 229.914 Vrms
Amperes : 0.279 Arms
Frequency: 50 Hz

Power Consumption : 29.430 W

Harm. Order	Reading Data (A)	Limit (A)
1	-	-
3	0.11	2.30
5	0.11	1.14
7	0.10	0.77
9	0.09	0.40
11	0.08	0.33
13	0.07	0.21
15	0.06	0.15
17	0.04	0.13
19	0.03	0.12
21	0.02	0.11
23	0.02	0.10
25	0.01	0.09
27	0.01	0.08
29	0.01	0.08
31	0.01	0.07
33	0.01	0.07
35	0.01	0.06
37	0.01	0.06
39	0.00	0.06

Harm. Order	Reading Data (A)	Limit (A)
2	0.00	1.08
4	0.00	0.43
6	0.00	0.30
8	0.00	0.23
10	0.00	0.18
12	0.00	0.15
14	0.00	0.13
16	0.00	0.11
18	0.00	0.10
20	0.00	0.09
22	0.00	0.08
24	0.00	0.08
26	0.00	0.07
28	0.00	0.07
30	0.00	0.06
32	0.00	0.06
34	0.00	0.05
36	0.00	0.05
38	0.00	0.05
40	0.00	0.05

Note: Steady state values on AC mains are recorded in the table.

4.3 VOLTAGE FLUCTUATIONS AND FLICKER

Basic Standard	:	EN 61000-3-3
Input Voltage	:	230Vac, 50Hz
Temperature	:	23 ℃
Humidity	:	56 %
Atmospheric Pressure	:	1010 mbar

TEST RESULT	Remarks
PASS	MODE: 1
PASS	MODE: 2
PASS	MODE: 3

4.3.1 EUT OPERATION CONDITION

Same as item **4.1.1**.

4.3.2 TEST DATA OF VOLTAGE FLUCTUATIONS AND FLICKER (A)

EUT: **INDUSTRIAL PC** MODEL: **AMPC-204**

MODE: **1**

Input Voltage : 230.156 Vrms Input Amperes : 0.403 Arms

Power Factor : 0.466 Power Frequency: 50 Hz

Observation period (Tp): 2 hour

The measured data are too low against the limit and therefore they are not reported.

4.3.3 TEST DATA OF VOLTAGE FLUCTUATIONS AND FLICKER (B)

EUT: **INDUSTRIAL PC** MODEL: **AMPC-204**

MODE: **2**

Input Voltage : 230.139 Vrms Input Amperes : 0.421 Arms

Power Factor : 0.463 Power Frequency: 50 Hz

Observation period (Tp): 2 hour

The measured data are too low against the limit and therefore they are not reported.

4.3.4 TEST DATA OF VOLTAGE FLUCTUATIONS AND FLICKER (C)

Input Voltage : 229.914 Vrms

Input Amperes : 0.279 Arms

Power Factor : 0.458

Power Frequency: 50 Hz

Observation period (Tp): 2 hour

The measured data are too low against the limit and therefore they are not reported.

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 Criteria B)
		EN 61000-4-3	(Radio-Frequency Electromagnetic Field Susceptibility Test, RS, 80-1000 MHz, 10V/m, 80% AM (1kHz), Performance Criteria A)
		EN 61000-4-4	(Electrical Fast Transient/Burst, EFT, Power line: 2kV, Signal line: 1kV, Performance Criteria B)
		EN 61000-4-6	(Conducted Radio Frequency Disturbances Test, CS, 0.15-80 MHz, 10V, 80% AM, 1kHz, Performance Criteria A)
		EN 61000-4-8	(Power Frequency Magnetic Field Test, 50 Hz, 30A/m, Performance Criteria A)
		ENV 50204	(Radio-Frequency Electromagnetic Field, Pulse modulated, 900+/-5 MHz, 10V/m, 50 % duty cycle, 200 Rep. Frequency Hz, Performance Criteria A)
Input Voltage	:	230 Vac, 50 Hz	
Temperature	:	23 ℃	
Humidity	:	56 %	
Atmospheric Pressure	:	1010 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

Same as item **4.1.1**.

5.4 TEST RESULT OF ELECTROSTATIC DISCHARGE (ESD)

Basic Standard	:	EN 61000-4-2
Discharge Impedance	:	330 ohm / 150 pF
Discharge Voltage	:	Air Discharge - 8 kV (Direct)
		Contact Discharge - 4 kV (Direct/Indirect)
Polarity	:	Positive/Negative
Number of Discharge	:	Minimum 10 times at each test point
Discharge Mode	:	Single Discharge
Discharge Period	:	1-second minimum

Test Result		Remarks
Criterion A	**PASS**	MODE: **1**
Criterion A	**PASS**	MODE: **2**
Criterion A	**PASS**	MODE: **3**

OBSERVATION DESCRIPTION

Direct Application			Test Result	
Discharge Level (kV)	Polarity (+/-)	Test Point	Contact Discharge	Air Discharge
8	+/-	1~ 6	N/A	Note 1
4	+/-	1 ~ 3,5,6	Note 1	N/A

Description of test point:

1. All I/O ports
2. All screws
3. Metal case
4. All openings
5. Keyboard
6. All LEDs

Indirect Application			Test Result	
Discharge Level (kV)	Polarity (+/-)	Test Point	Horizontal Coupling	Vertical Coupling
4	+/-	1 ~ 4	Note 1	Note 1

Description of test point:

1. Front side
2. Rear side
3. Right side
4. Left side

Description of test result:

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

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

Test Result		Remarks
Criterion A	**PASS**	MODE: **1**
Criterion A	**PASS**	MODE: **2**
Criterion A	**PASS**	MODE: **3**

Note: Four sides of EUT are verified separately.

Description of test result:

There was 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
		Signal/Control Line - N/A
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**	MODE: **1**
Criterion A	**PASS**	MODE: **2**
Criterion A	**PASS**	MODE: **3**

OBSERVATION DESCRIPTION

Test Point	Polarity	Test Level (kV)	Result
L1	+/−	2	Note 1
L2	+/−	2	Note 1
GND	+/−	2	Note 1

Description of test result:

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

Frequency range	:	0.15 MHz - 80 MHz
Field strength	:	10 V/m
Modulation	:	1kHz Sine Wave, 80%, AM Modulation
Frequency step	:	1 % of fundamental
Coupled cable	:	Power Mains, Unshielded
Coupling device	:	CDN-M3 (3 wires)

Test Result		Remarks
Criterion A	**PASS**	MODE: **1**
Criterion A	**PASS**	MODE: **2**
Criterion A	**PASS**	MODE: **3**

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	:	50Hz
Field strength	:	30 A/m
Observation Time	:	1 minute
Inductance coil	:	Rectangular type, 1mx1m

Test Result		Remarks
Criterion A	**PASS**	MODE: **1**
Criterion A	**PASS**	MODE: **2**
Criterion A	**PASS**	MODE: **3**

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**	MODE: **1**
Criterion A	**PASS**	MODE: **2**
Criterion A	**PASS**	MODE: **3**

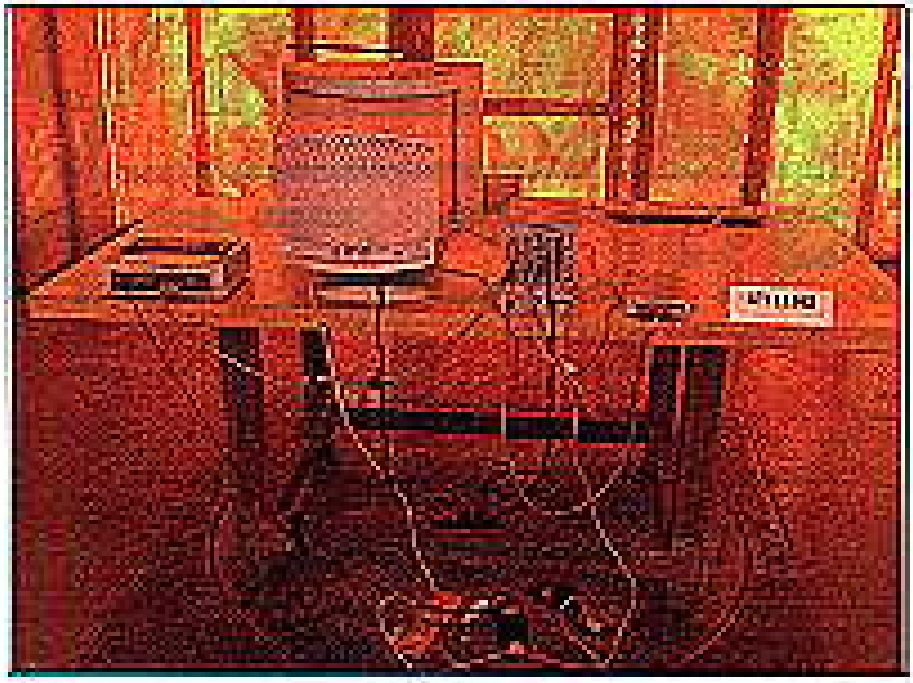
Note: Four sides of EUT are verified separately.

OBSERVATION DESCRIPTION

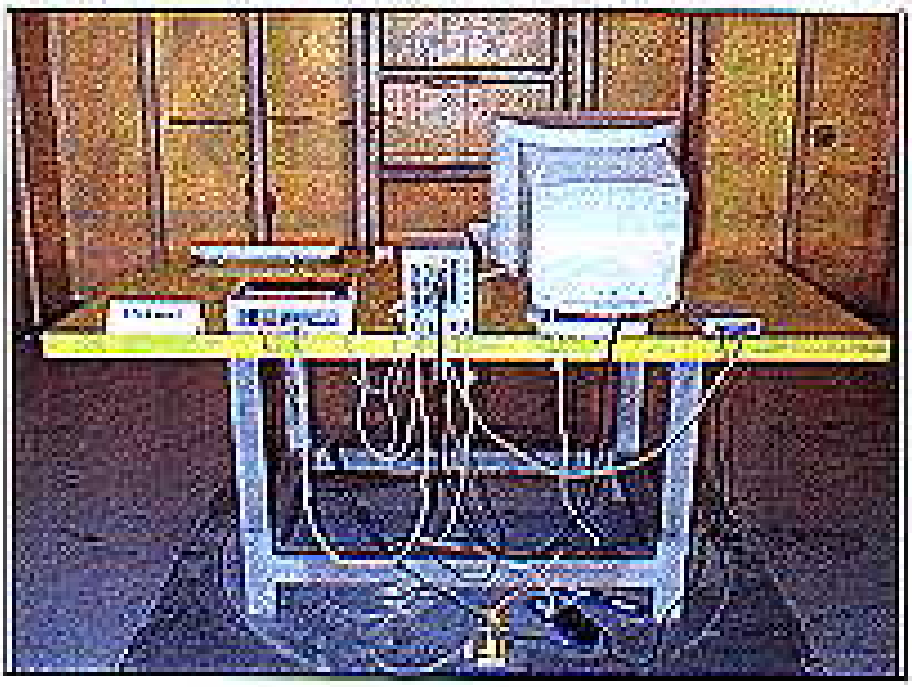
There was no change compared with initial operation during the test.

6. PHOTOGRAPHS OF THE TEST CONFIGURATION

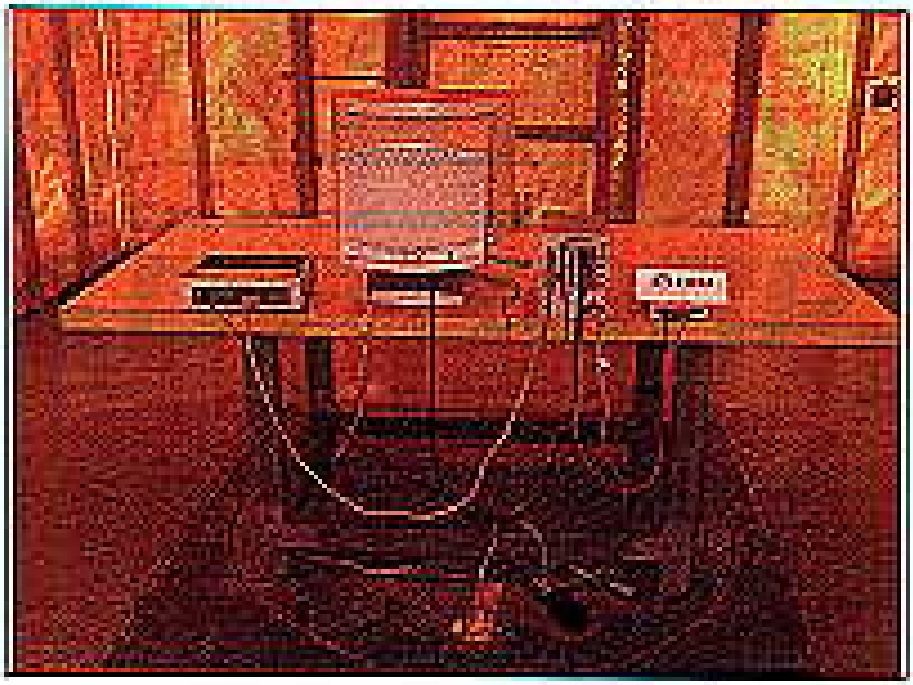
RADIATED EMISSION TEST (MODE 1)



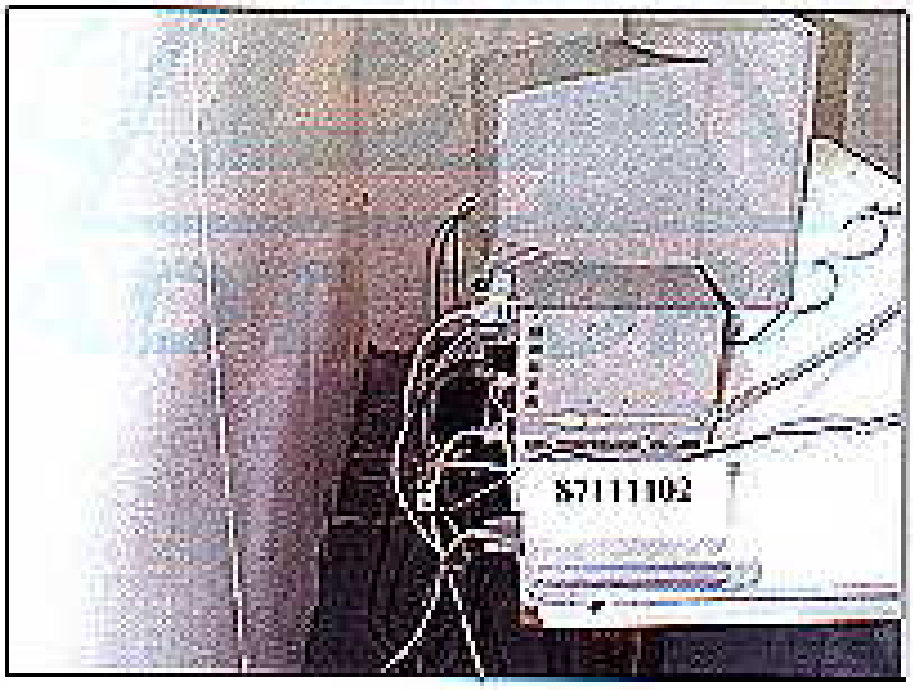
RADIATED EMISSION TEST (MODE 2)



RADIATED EMISSION TEST (MODE 3)



CONDUCTED EMISSION TEST (MODE 1)



CONDUCTED EMISSION TEST (MODE 2)

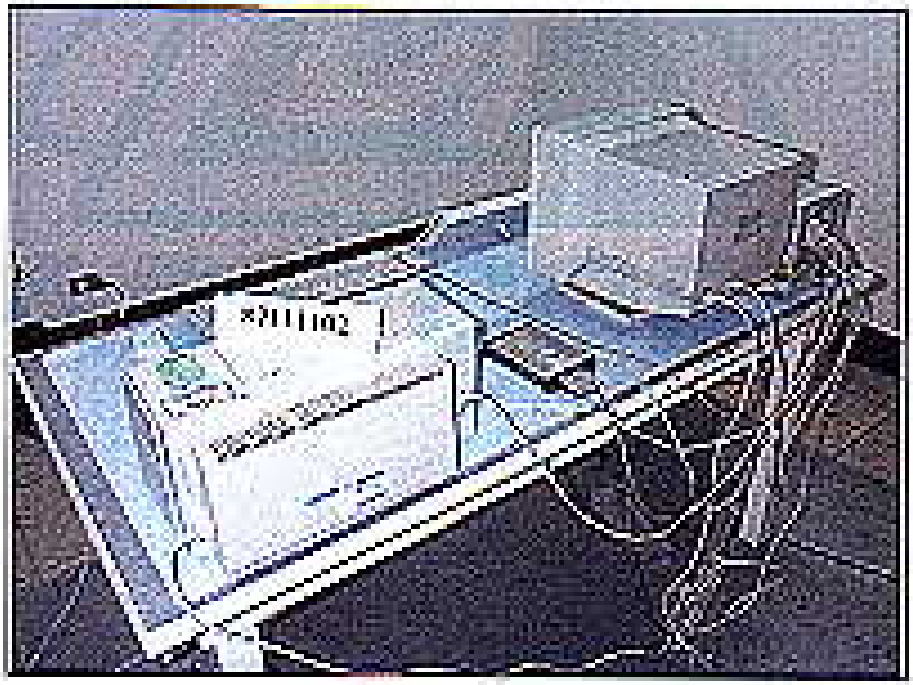
CONDUCTED EMISSION TEST (MODE 3)

HARMONICS EMISSION TEST & VOLTAGE FLUCTUATIONS AND FLICKER TEST (MODE 1)

HARMONICS EMISSION TEST & VOLTAGE FLUCTUATIONS AND FLICKER TEST (MODE 2)

HARMONICS EMISSION TEST &
VOLTAGE FLUCTUATIONS AND FLICKER TEST
(MODE 3)

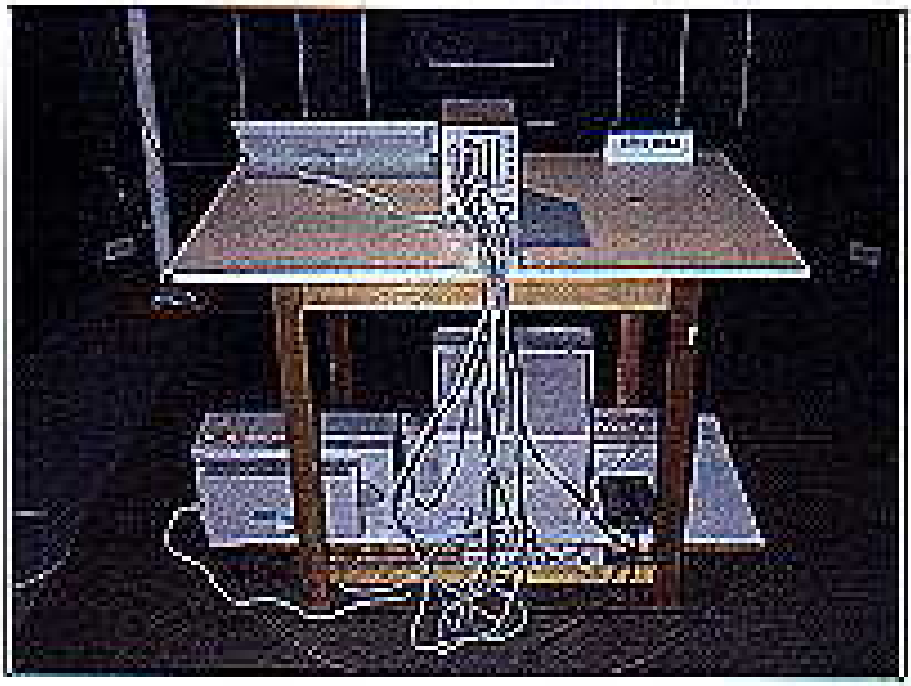
ESD TEST (MODE 1)



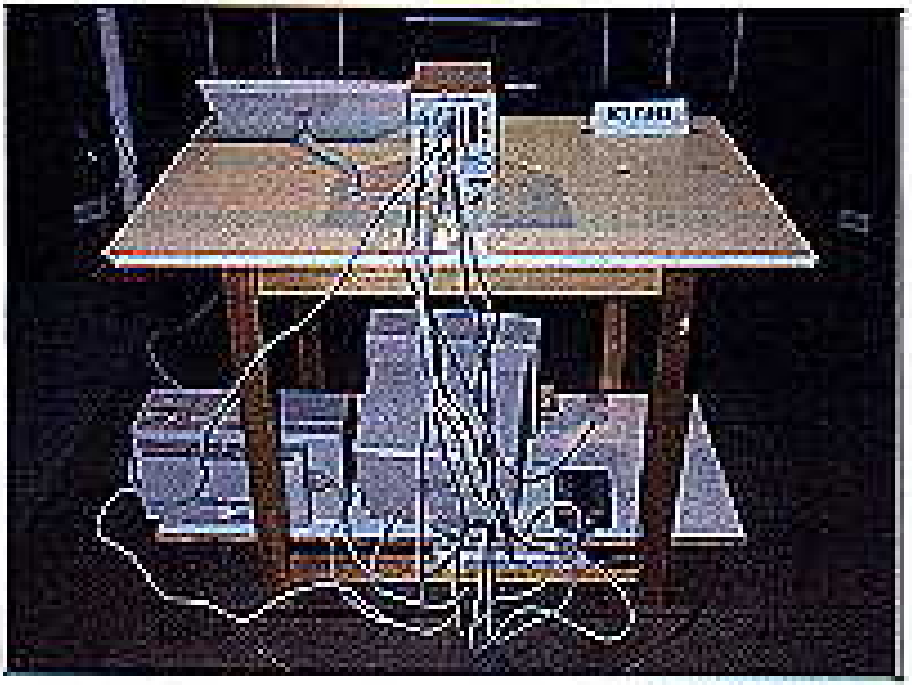
ESD TEST (MODE 2)

ESD TEST (MODE 3)

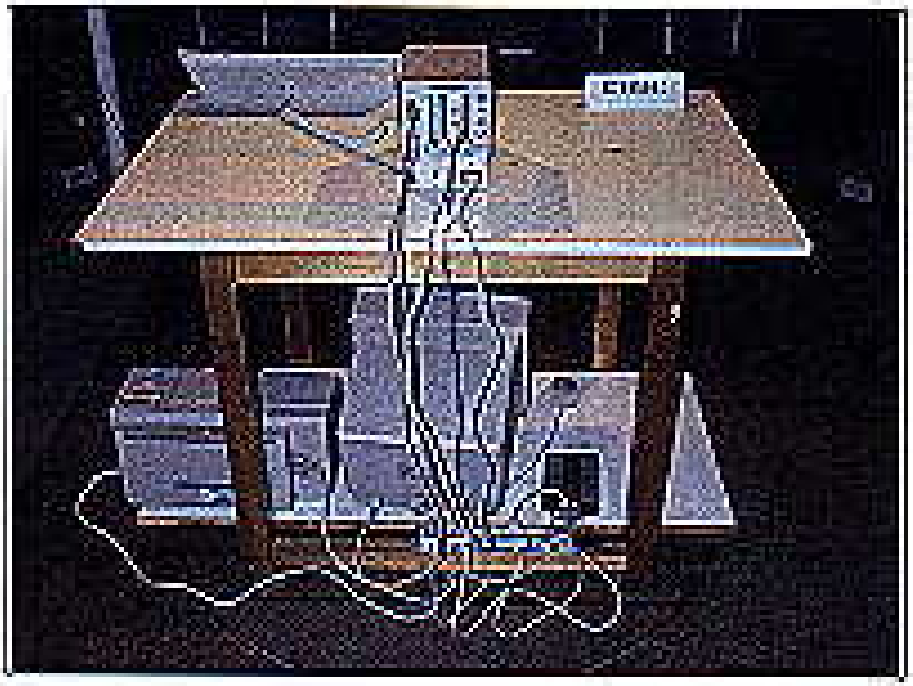
RS TEST (MODE I)



RS TEST (MODE 2)



RS TEST (MODE 3)



EFT TEST (MODE 1)

EFT TEST (MODE 2)

EFT TEST (MODE 3)

CONDUCTED SUSCEPTIBILITY TEST (MODE 1)

CONDUCTED SUSCEPTIBILITY TEST (MODE 2)

CONDUCTED SUSCEPTIBILITY TEST (MODE 3)

MAGNETIC TEST (MODE 1)

MAGNETIC TEST (MODE 2)

MAGNETIC TEST (MODE 3)

7. 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:

• USA	FCC, UL, NVLAP
• Germany	TUV Rheinland
	TUV Product Service
• Japan	VCCI
• New Zealand	BFS
• Norway	NEMKO
• U.K.	INCHCAPE, SGS
• R.O.C.	BCIQ

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:

Lin Kou EMC Lab.:
Tel: 886-2-26032180
Fax: 886-2-26022943

Lin Kou Safety Lab:
Tel: 886-2-26093195
Fax: 886-2-26093184

Hsin Chu EMC Lab:
Tel: 886-35-935343
Fax: 886-35-935342

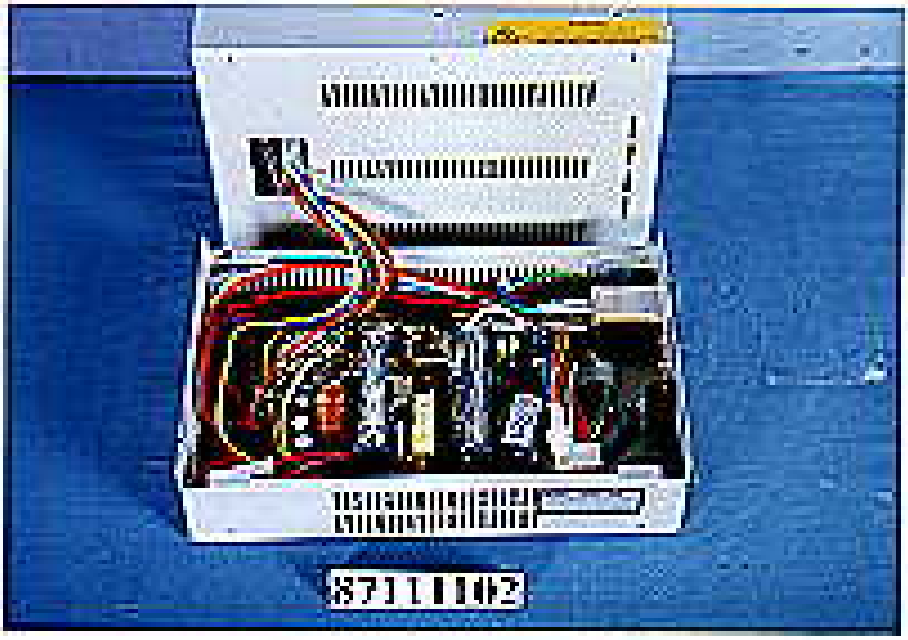
Design Center:
Tel: 886-2-26093195
Fax: 886-2-26093184

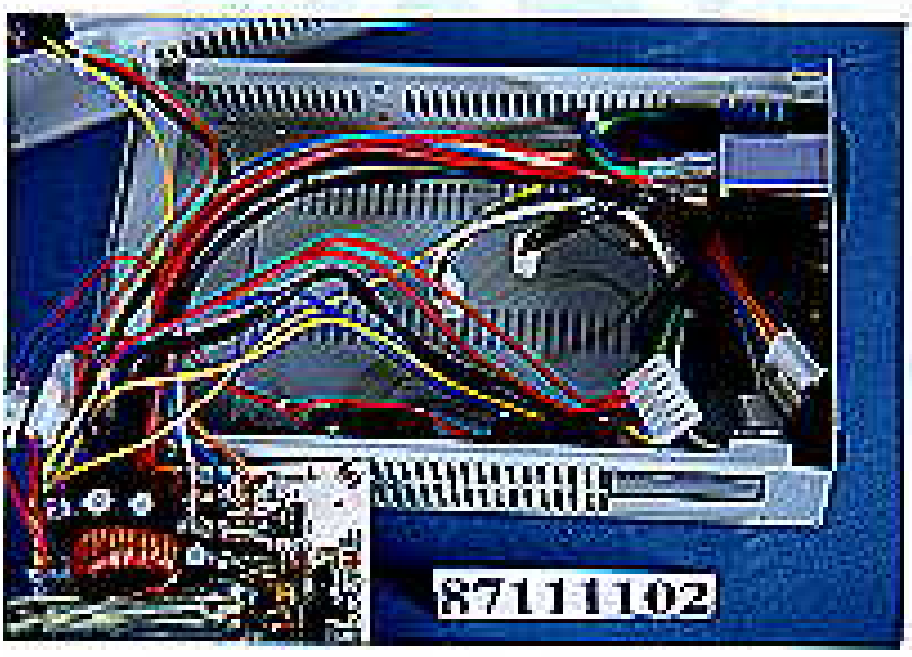
E-mail: service@mail.adt.com.tw
http://www.adt.com.tw

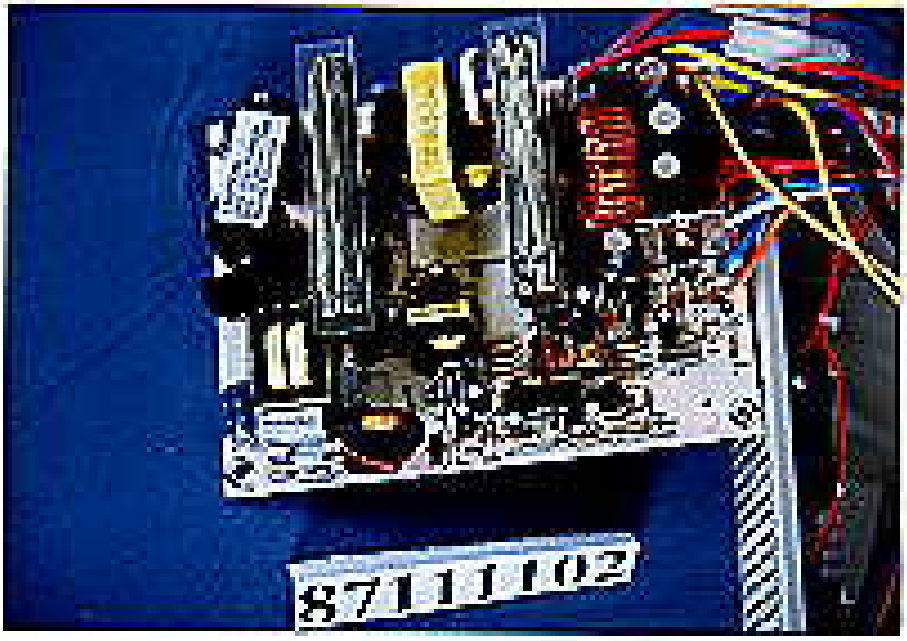
CONSTRUCTION PHOTOS OF EUT

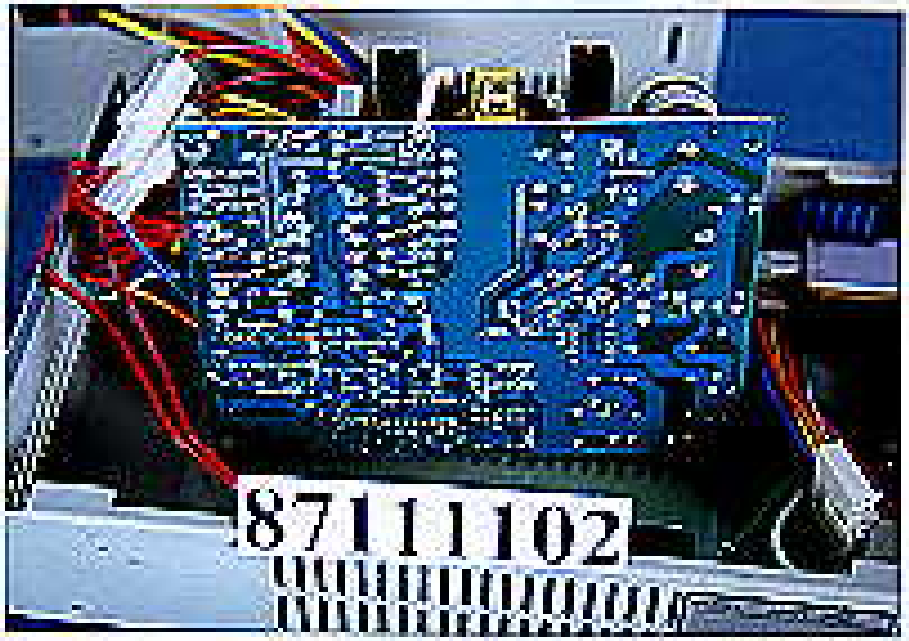

8711102


8711102

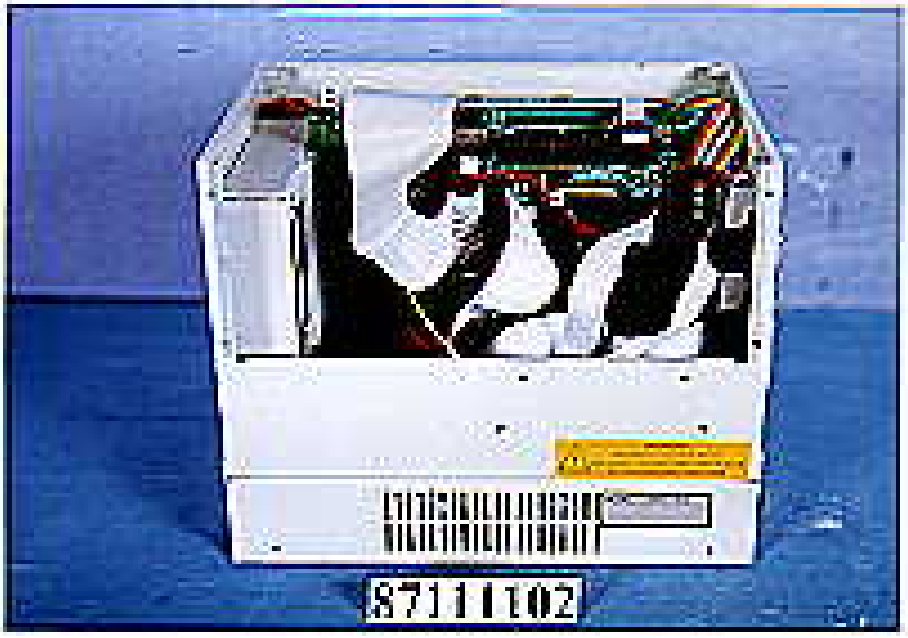

8711102

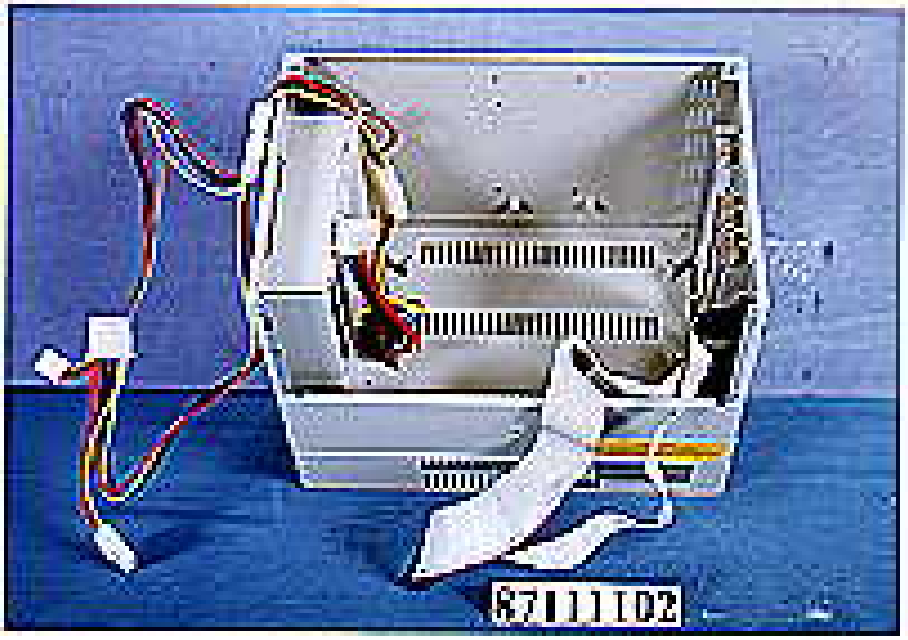

8711102

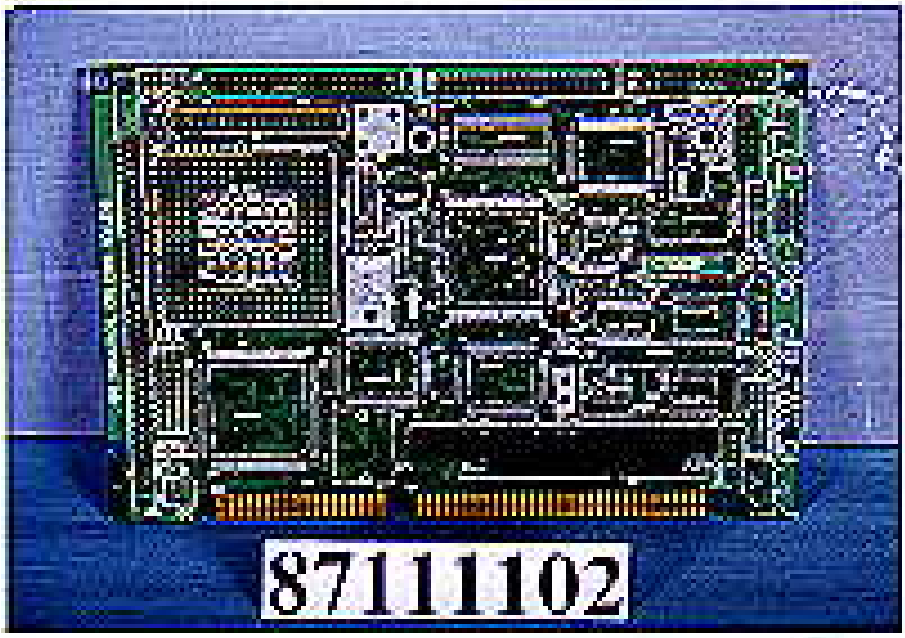

8711102

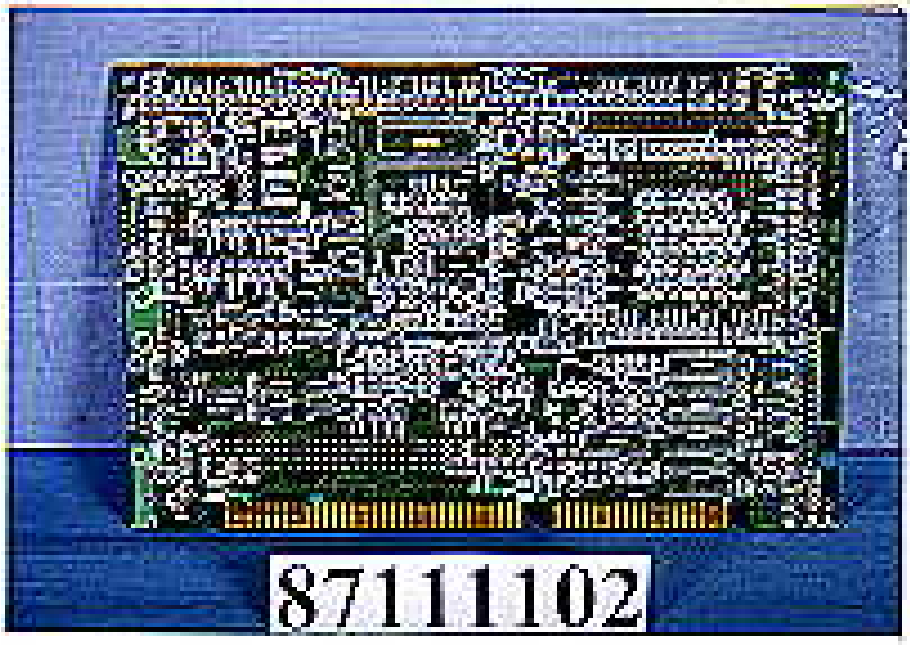

8711102


87111102

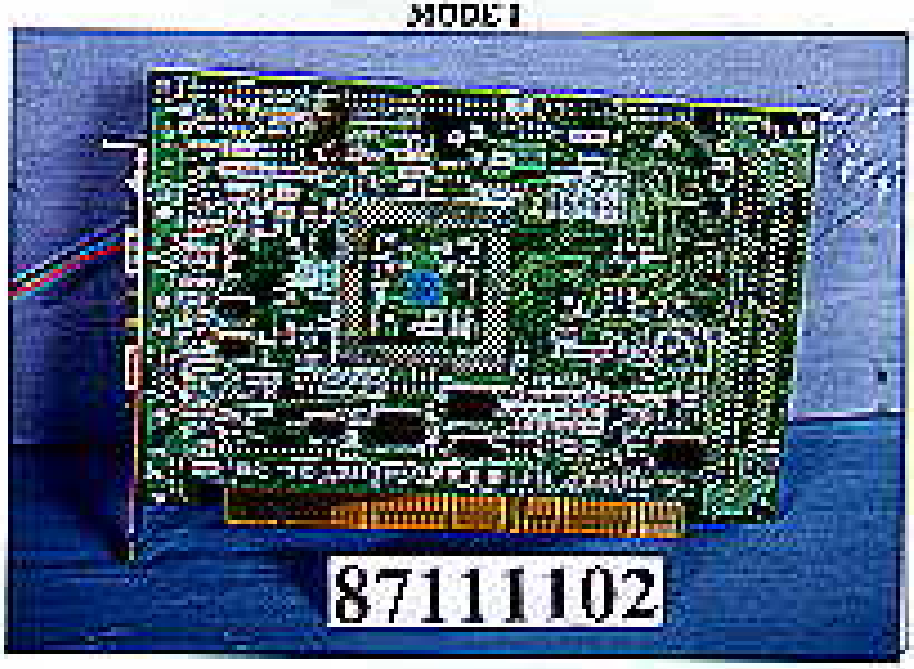

87111102

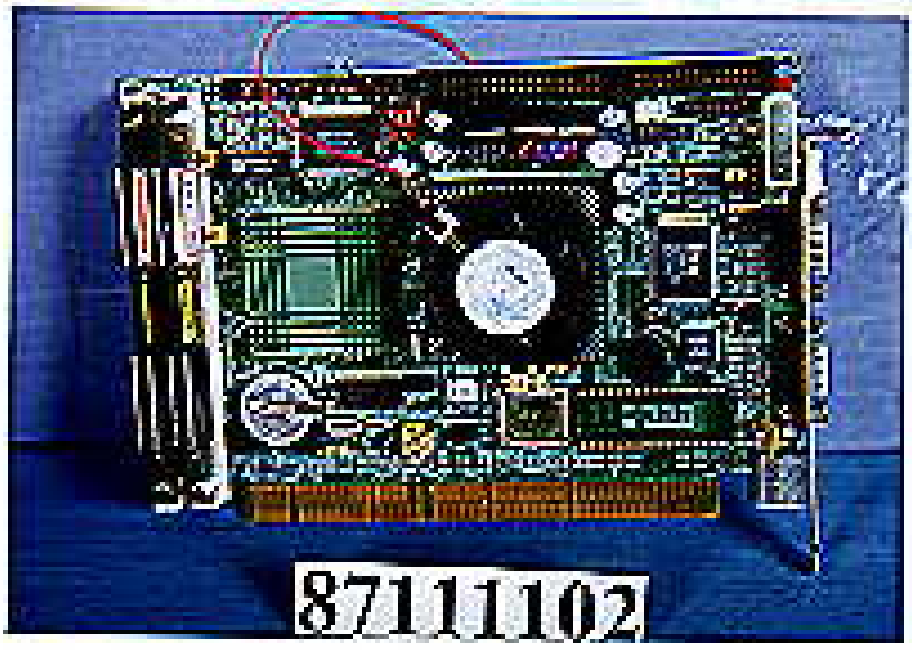

87111102


8711102

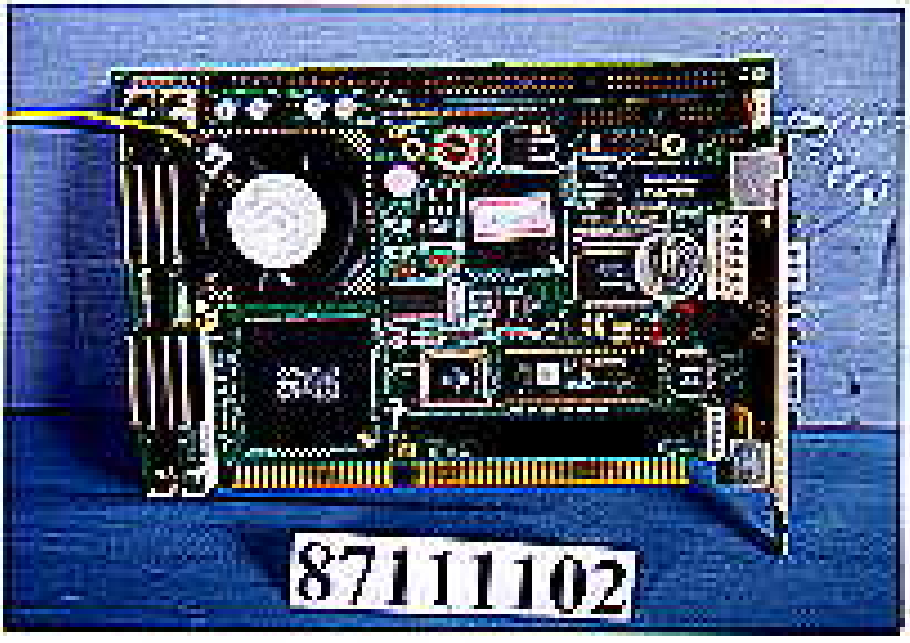

8711102

MODEL

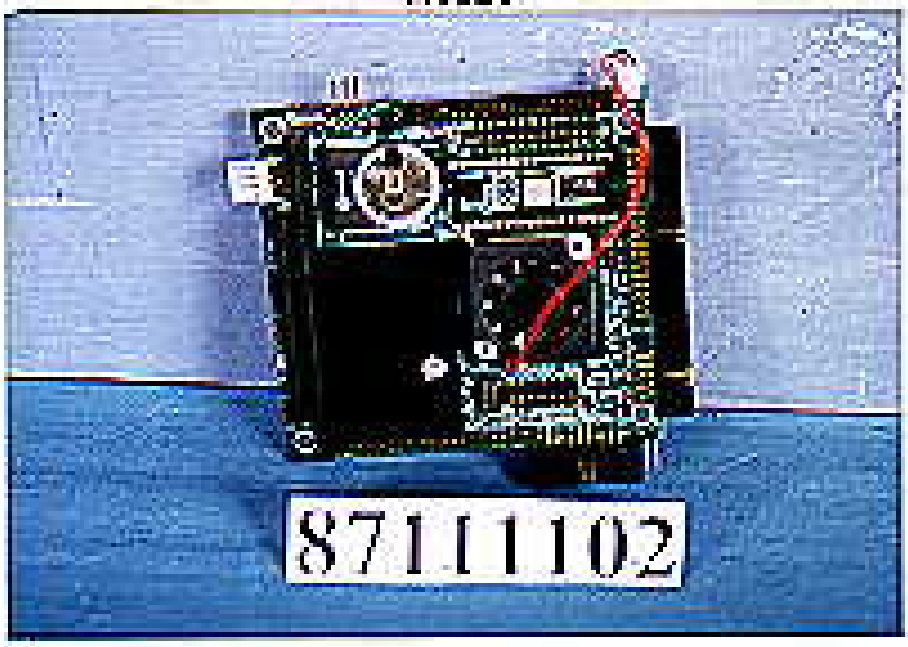


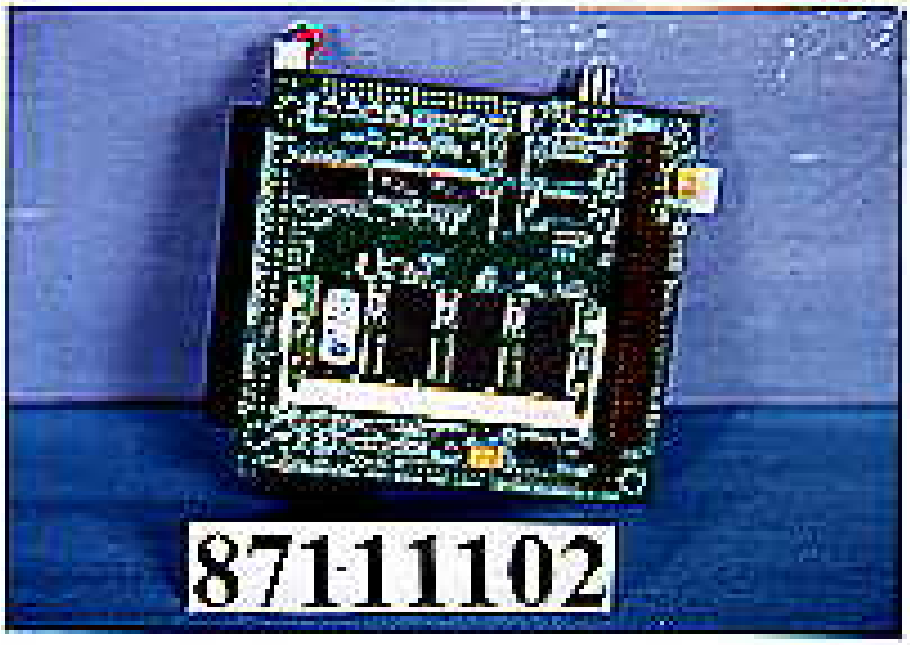


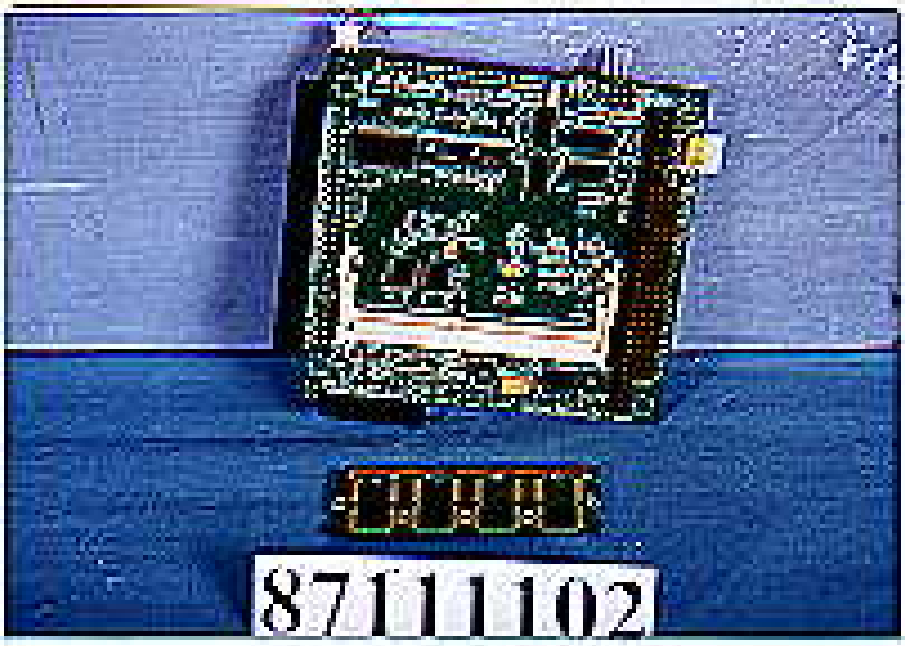
MODE 3

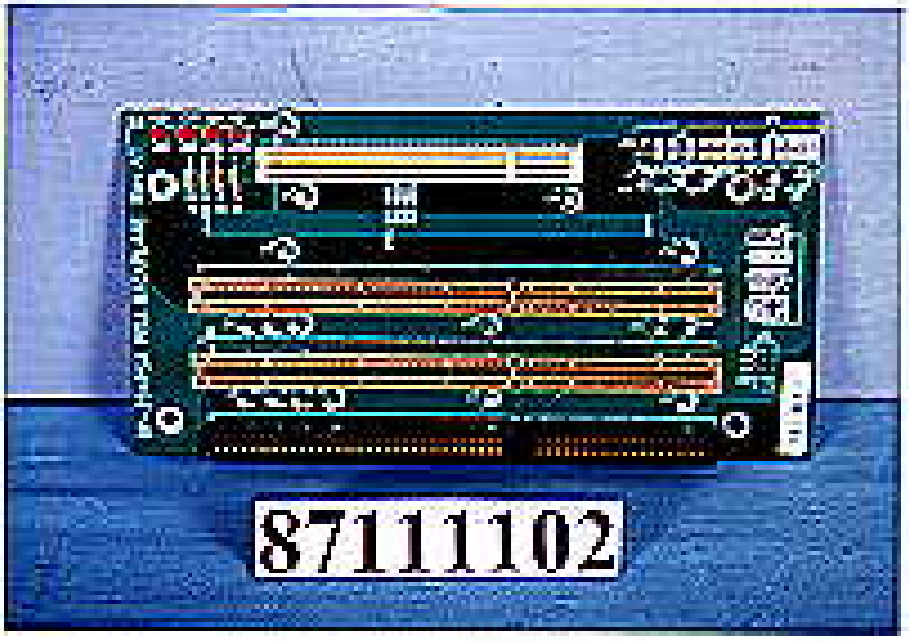


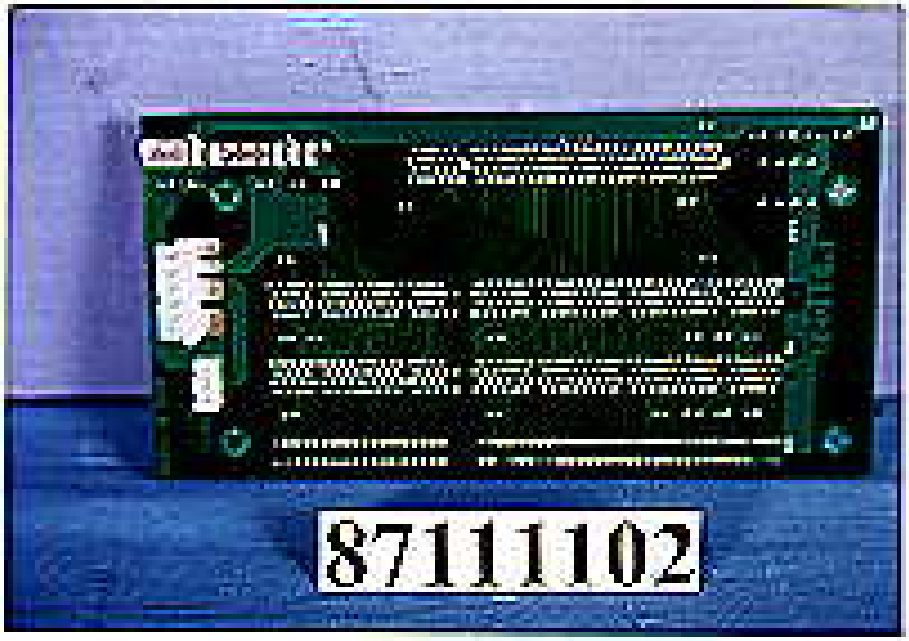
MODE 3






87111102


8711102


8711102


87111102


87111102