FCC PART 15
TEST REPORT

Applicant : AAEON Technology Inc.
Equipment : Panel PC
Model : AMB-2051HT, AMB-2051HTT,
AMB-2021HT, AMB-2021HTT

Test Report Certification

Best Laboratory Co., Ltd.

No. 336, Ba Lian Rd., Sec. 1, Hsi Chih City, Taipei Hsien, Taiwan, R.O.C.
Tel: 886-2-2646-2899 Fax: 886-2-2646-2870

Applicant	: AAEON Technology Inc.
Address	: 5F, No.135, Lane 235, Pao Chiao Road, Hsin-Tien City, Taipei, Taiwan, R.O.C.
Equipment	: Panel PC
Model	: AMB-2051HT, AMB-2051HTT, AMB-2021HT, AMB-2021HTT
Device's Class	: Class A Device
Measurement Standard	: FCC Part 15.109(g)
Measurement Procedure	: CISPR 22; 1997
Operating Voltage	: 230VAC, 50Hz
Test Result	: **Compliance** (Detail showed in the test report)
Sample Received	: Jan 05, 2001
Test Date	: Jan 18, 2001
Report Number	: RE-A06-FC-159
Test Firm	: No. 336, Ba Lian Rd., Sec. 1, Hsi Chih City, Taipei Hsien, Taiwan, R.O.C.

Remark:

(1) The test report is only relating to the sample tested
(2) The test report shall not be reproduced except in full, without the written approval of Best Laboratory Co., Ltd.
(3) The test report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.
(4) The test result of this report are traceable to the national or international standards.

Prepared : ANN HUNG

Approved : JEFF CHIU (Title: Quality Department Manager)

Date Issued : Jan. 18. 2001

Contain

Exhibit A	**Label**
Exhibit B	**Test Report**
Exhibit C	**Photograph of EUT**

Exhibit A

LABEL

Size of Label

Long x Wide = 2.5cm x 1.25cm

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Model No.: AMB-2051HTT

Position of Label

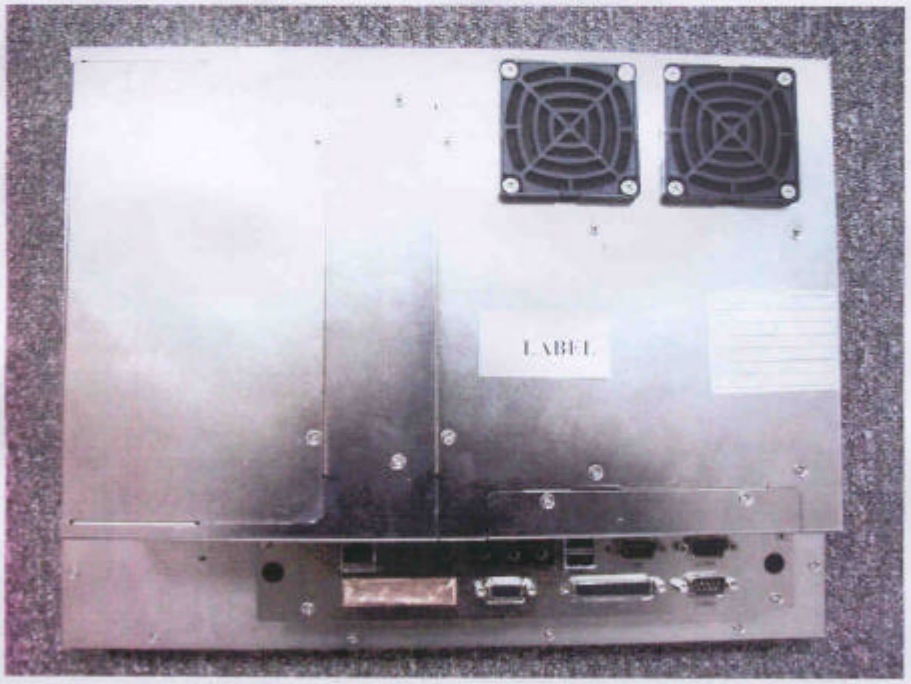


Exhibit B

Test Report

Contain

1. General Information

1.1 EUT Description

Applicant	: AAEON Technology Inc.
Address	: 5F, No.135, Lane 235, Pao Chiao Road, Hsin-Tien City, Taipei, Taiwan, R.O.C.
Equipment	: Panel PC
Model	: AMB-2051HT, AMB-2051HTT, AMB-2021HT, AMB-2021HTT
Device's Class	: Class A Device
Operation Voltage	: 230VAC, 50Hz
Output Ports	:

PS/2 Keyboard	: connect with a PS/2 keyboard which data cable is 120cm long, non-shielded, no ferrite bead.
PS/2 Mouse	: connected with A PS/2 mouse which data cable is 120cm long, non-shielded, no ferrite bead.
Serial # 1 Port	: connected with a external modem via one RS-232 cable that is 70cm long, non-shielded, no ferrite bead.
Serial # 2 Port	: connected with one RS-232 cable, which is 70cm long, non-shielded, no ferrite bead, left unterminal.
Serial # 3 Port	: connected with one RS-232 cable, which is 70cm long, non-shielded, no ferrite bead, left unterminal.
Parallel Port	: connected with one printer which data cable is 120cm long, shielded, no ferrite bead.
VGA Port	: via one 120cm long, shielded, with ferrite bead, data cable to the monitor.
USB Ports	: each one of the two USB ports is connected with one USB mouse which data cable is 120 cm long, shielded, no ferrite bead.
Microphone Port	: connected with one earphone set which data cable is 1.9 meters long, non-shielded, no ferrite bead.
Line-Out Port	: connected with one earphone set which data cable is 1.9 meters long, non-shielded, no ferrite bead.
Line-In Port	: connected with one walkman which data cable is 1.8 meters long, shielded, no ferrite bead
LAN Port	: via one RJ-45 cable, 25 meters long, non-shielded, no ferrite bead, to one LAN card installed in one PC located in far-end.
Power Port	: via a 180 cm long, non-shielded, no ferrite bead, power Cable to the AC power source.

1.2 Test System Detail

Monitor	**: HITACHI**
Model No.	: CM771U
Serial No.	: V0E001074
FCC ID	: DoC Approval
BSMI	: 3882A707
Power Type	: 100-240VAC, 50/60Hz, 1.5A, Switching
Power Cord	: 180cm long, non-shielded, no ferrite bead.
Data Cable	: 120cm long, shielded, with ferrite bead
Backshell	: Metal
Connected Port	: VGA Port

Keyboard	**: HP (Pavilion)**
Model No.	: SK-2506
Serial No.	: C0006002889
FCC ID	: DoC Approval
檢磁	: 3882A375
Power Type	: By PC
Data Cable	: 180cm long, shielded, no ferrite bead
Backshell	: Metal
Connected Port	: PS/2 Keyboard Port

Mouse	**: AT Tech**
Model No	: OK-520
Serial No.	: 990707032; 99070046
FCC ID	: DoC Approval
BSMI	: 3872B356
Power Type	: By PC
Data Cable	: 120cm long, non-shielded, no ferrite bead
Backshell	: Metal
Connected Port	: PS/2 Mouse Port

Modem	**: ACEEX**
Model No.	: XDM-9624
Serial No.	: 0017884
FCC ID	: IFAXDM-9624
Power Type	: 230VAC, 50Hz / 9VAC, 1A
Power Core	: 1.9meters long, non-shielded, no ferrite bead
Data Cable	: RS232, shielded, 1.2meters long, no ferrite bead RJ11C x 2, 7' long, non-shielded, no ferrite bead
Backshell	: Metal
Connected Port	: Serial #1 Port

Printer	**: Epson**
Model No.	: P950
Serial No.	: BW9Y113923
FCC ID	: DoC Approval
BSMI	: 3872P001
Power Type	: 230VAC, 50Hz, 0.4A
Power Core	: 165cm long, non-shielded, no ferrite bead
Data Cable	: 120cm long, shielded, no ferrite bead
Backshell	: Metal
Connected Port	: Parallel Port

USB Mouse	**: Logitech**
Model No.	: M-BB48
Serial No.	: LZE92250126, LZE92250247
FCC ID	: DoC Approval
BSMI	: 4872A221
Power Type	: By PC
Data Cable	: 120cm long, shielded, no ferrite bead
Backshell	: Metal
Connected Port	: USB Ports

Walkman	**: KOKA**
Model No.	: KW-250
Serial No.	: N/A
FCC ID	: DoC Approval
Power Type	: 9VDC
Data Cable	: 120cm long, shielded, no ferrite bead
Backshell	: Metal
Connected Port	: Line-in Port

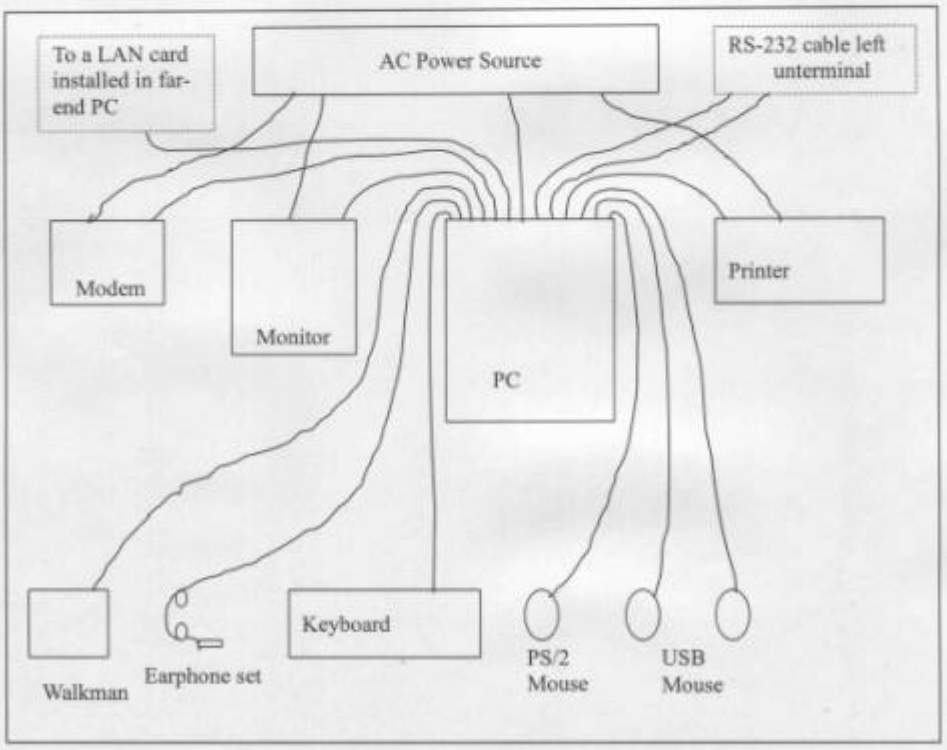
Earphone set	**: KOKA**
Model No.	: MS-321
Serial No.	: N/A
FCC ID	: DoC Approval
Data Cable	: 145cm long, non-shielded, no ferrite bead
Backshell	: Metal
Connected Port	: Microphone & Line-Out Port

1.3 EUT Configuration

(1) The power port of EUT is connected with the AC power source via a power cable.
(2) The PS/2 keyboard port of EUT is connected with a PS/2 keyboard.
(3) The PS/2 mouse port of EUT is connected with a PS/2 mouse.
(4) The parallel port of EUT is connected with a printer.
(5) The serial #1 port of EUT is connected with an external modem.
(6) The serial #2 ~ #3 port of EUT are each connected with an RS-232 cable left unterminal.
(7) The VGA port of EUT is connected with a monitor.
(8) The LAN port of EUT is connected with a LAN card installed in one PC located in far-end via one HUB.
(9) Each one of the two USB ports is connected with one USB mouse.
(10) The Line-In port of EUT is connected with one Walkman.
(11) The microphone and Line-Out port is connected with one earphone set.

(***PS: Please refers to the Photograph***)

Drawing of Configuration



1.4 EUT Exercise Software

The testing software is provided by the applicant.

It is designed to exercise the EUT in a manner similar to a typical use. The software will send an " H " pattern to the monitor and the " H " pattern will be shown on the monitor. It would be also sent to the parallel port and the printer will print out the " H " pattern. At the same time, the mouse and keyboard will be in continuously self-test mode and responded to the EUT. The LAN port will be continuos to receive and transmit the data, The LAN card will be continuos to receive and transmit the data to the LAN port. The Walkman will be continuous to transmit the sound to the EUT. The software will enable all functions of EUT.

1.5 Test Performed

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver which bandwidth is set at 9KHz.

Radiated emissions were invested over the frequency range from 30MHz to 1000MHz using a receiver which bandwidth is set at 120KHz. Radiated measurement was performed at distance that from an antenna to EUT is 10 meters.

The testing result of pretest was shown out that the " Testing " mode is worse than the " Standby " mode. So, the final measurement was made on the " Testing " mode.

When the measurement was taken, there are three video resolution modes tested: 400 * 800, 640 * 480, 1024 * 768.

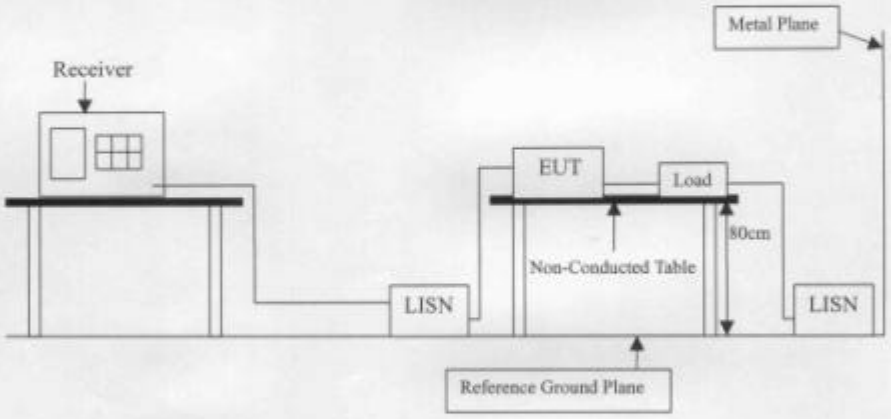
2 Conducted Emission Measurement

2.1 Test Equipment

No.	Instrument	Manufacture	Model	Serial No.	Last Calibrate
1.	LISN (EUT)	Rolf Heine	NNB-2/16Z	99084	Dec. 14, 1999
2.	LISN (AXE)	Rolf Heine	NNB-2/16Z	99086	Dec. 14, 1999
3.	EMI Receiver	Rohde & Schwarz	ESI 7	830154/001	Nov. 22, 1999
4.	50Ω Terminator	Amphenol	46650-51	N/A	Mar. 10, 2000
5.	RF Cable	Belden	M17/158	MIL-C-17	Jan. 20, 2000

Remark: All equipment upon which need to calibrated are with calibration period of 1 year.

2.2 Test Set-Up



2.3 Limit

CISPR 22

Frequency	Limit (dBμV)			
	Class A		Class B	
MHz	QP	Avg.	QP	Avg.
0.15 ~ 0.50	79	66	66 ~ 56	56 ~ 46
0.50 ~ 5.0	73	60	56	46
5.0 ~ 30.0	73	60	60	50

FCC Part 15

Frequency	Limit (dBμV)	
	Class A	Class B
MHz	QP	QP
0.50 ~ 1.705	60	48.0
1.705 ~ 30	69.5	48.0

Remark: In the above table, the tighter limit applies at the band edges.

2.4 Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). It provides a 50 ohm / 50 μH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm / 50 μH coupling impedance with 50 ohm termination. (Please refers to the block diagram of the test setup and photograph.)

Both sides of AC line are checked for the maximum conducted emission interference. In order to find the maximum emissions, the relating positions of equipment and all of the interference cables must be changed according to CISPR 22: 1997 regulation: The measurement procedure on conducted emission interference.

The resolution bandwidth of the field strength meter (Rohde & Schwarz) is set at 9KHz.

2.5 Test Specification

According to the CISPR 22: 1997

2.6 Test Result

The emissions that come from the EUT were below the specified limits. The worst case of conducted emissions measurement are shown in the appendix A. The acceptance criterion was met and the EUT has pass the measurement.

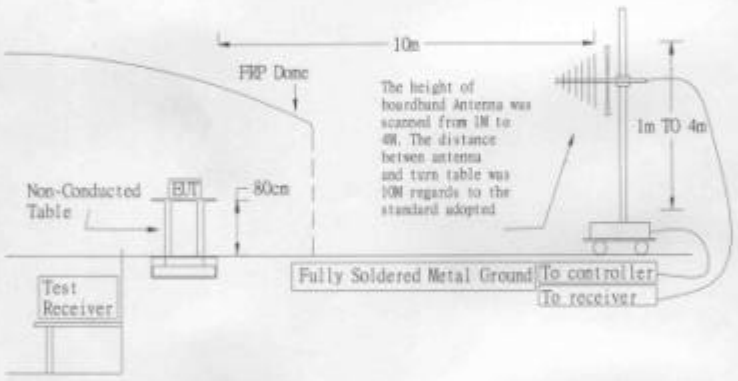
3. Radiated Emission Measurement

3.1 Test Equipment List

No.	Instrument	Manufacture	Model	Serial No.	Last Calibrate
1.	Antenna	Mess-Elektronik	VULB 9160	9160-3078	Jan. 19, 2000
2.	EMI Receiver	Rohde & Schwarz	ESI 7	830154/001	Nov. 22, 1999
3.	RF Cable	Adventest	AD-N-CA-01	2000-0220	Apr. 01, 2000
4.	OATS	Bestlab	N/A	OATS#1	Mat 30, 2000

Remark: All equipment upon which need to calibrated are with calibration period of 1 year.

3.2 Test Setup



3.3 Limit

CISPR 22

Frequency	Class A		Class B	
MHz	Distance (Meter)	Limit (dBμV)	Distance (Meter)	Limit (dBμV)
30 ~ 230	10	40	10	30
230 ~ 1000	10	47	10	37

FCC Part 15

Frequency	Class A		Class B	
MHz	Distance (Meter)	Limit (dBμV)	Distance (Meter)	Limit (dBμV)
30 ~ 88	10	39	3	40
88 ~ 216	10	43.5	3	43.5
216 ~ 960	10	46.5	3	46
960 Above	10	49.5	3	54

Remark: In the above table, the tighter limit applies at the band edges

3.4 Test Procedure

The EUT and its simulators are placed on turn table, non-ducted and wooden, which is 0.8 meter above ground. The turn table rotates 360 degree to determine the position of the maximum emission level. The EUT was positioned such that distance from antenna to the EUT is 10 meters.

The antenna is moved up and down between 1 meter to 4 meter to receive the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interference cables must be manipulated according to CISPR 22: 1997 regulation: the test procedure of the radiated emission measurement.

The bandwidth set on the field strength is 120KHz when the frequency range is below 1GHz

3.5 Test Specification

According to CISPR 22: 1997

3.6 Test Result

The emissions that come from the EUT were below the specified limits. The worst case of conducted emissions measurement are shown in the appendix A. The acceptance criterion was met and the EUT has pass the measurement.

4. Modification List for EMC Complying Test

The modification list for Model: AMB-2051 is as below:

1. The cable that from J12 of main board to CN13 of back panel (No. TB-908C) was covered by conductive shielding gasket (TennRich International Corp.)

2. The hole in the rear part of case was sealed by double side conductive copper sheet (TennRich International Corp.)

3. The outlet of USB connector and RJ-45 connector were covered by double side conductive copper sheet (TennRich International Corp.). then, soldering three finger of copper finger strip on the copper sheet on the top side of connectors, which is used to enhance grounding.

4. TC 35 = 10μf, 50V

5. Add a SMD capacitor, 4.7μf, at the pin 25, pin 27 and pin 26, pin 28 of J18 of connector board.

6. Add two capacitors (10μf, 25V) at the pin 27 and pin 30 of J18 of connector board.

7. The cable that connected with CN1 of LCD signal pad was winded with one ferrite core (King Core Electronics Inc., A5 FS 38 x 0.35 x 10)

8. The cable that connected with CN10 of LCD signal pad was winded with one ferrite core (King Core Electronics Inc., A5 FPC 25 x 2.8 x 12)

9. The cable that connected with CN1, CN3 and CN6 of connector pad was winded two ferrite cores (King Core Electronics Inc., A5 FPC 25 x 2.8 x 12)

*** **Remark:**

Please refers to the Exhibit C: Photograph of EUT

5. Appendix

Appendix A: Summary of Test Result

Appendix B: The test photograph of EUT

Appendix A: Summary of Test Result

The test result in the emission and immunity were performed according to the requirement of measurement standard and procedures. Best Laboratory is assumed full responsibility for the accuracy and completeness of these measurements. The Test data of the emissions and immunity are listed as the appendix data.

All these tests are were carried out with the EUT in normal operation, which was defined as:

******* EMC Test Result: The EUT has been pass the all measurements. *******

The uncertainty is calculated in accordance with NAMAS NIS 81, the total uncertainty for this test is as follows:

⇒ Emission Test

- Uncertainty in the Conducted Emission Test: <±2.0dB
- Uncertainty in the Field Strength measurement: <±4.0dB

Conducted Emission Test

Date Measurement Performed: Jan 17, 2001
EUT : Panel PC
Testing Mode : 1024 x 768
Temperature : 22°C
Humidity : 74%RH

Line 1:

Frequency	Corrected Amplitude (dBμV/m)			Limit (dBμV/m)		Margin
(KHz)	Peak	QP	Avg.	QP	Avg.	dB
178.050	52.33	*.**	*.**	79.00	66.00	-13.67
212.050	46.62	*.**	*.**	79.00	66.00	-19.38
283.450	41.39	*.**	*.**	79.00	66.00	-24.61
388.850	38.64	*.**	*.**	79.00	66.00	-27.36
603.900	36.90	*.**	*.**	73.00	60.00	-23.10
818.100	38.25	*.**	*.**	73.00	60.00	-21.75
***						

Line 2:

Frequency	Corrected Amplitude (dBμV/m)			Limit (dBμV/m)		Margin
(KHz)	Peak	QP	Avg.	QP	Avg.	dB
176.350	52.17	*.**	*.**	79.00	66.00	-13.83
213.750	48.57	*.**	*.**	79.00	66.00	-17.43
247.750	42.86	*.**	*.**	79.00	66.00	-23.14
286.850	40.67	*.**	*.**	79.00	66.00	-25.33
320.000	39.84	*.**	*.**	79.00	66.00	-26.16
389.700	39.80	*.**	*.**	79.00	66.00	-26.20
***						

*** Remark: The above corrected amplitudes are all under the average limit. ***

Field Strength Test

Date Measurement Performed: Jan 17, 2001
EUT : Panel PC
Testing Mode : 1024 x 768
Polarity : Vertical
Temperature : 27°C
Humidity : 73%RH

Frequency (MHz)	Reading Amplitude (dBμV/m)	Table Degree (°)	Antenna Height (Meter)	Correction Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
162.488	20.39	196	1.00	13.28	33.67	40.00	-6.33
168.976	21.87	155	1.00	12.81	34.69	40.00	-5.31
175.480	28.89	50	1.00	12.15	35.43	40.00	-4.57
181.952	26.32	70	1.00	11.48	37.80	40.00	-2.20
188.477	20.47	250	1.00	10.86	31.33	40.00	-8.67
194.974	24.90	184	1.00	10.43	35.33	40.00	-4.67
201.437	19.27	226	1.00	10.15	29.42	40.00	-10.58
207.966	29.95	173	1.00	10.14	39.56	40.00	-0.44
214..380	23.59	228	2.00	10.34	33.93	40.00	-6.07
240.470	29.20	186	1.00	11.80	40.99	47.00	-6.01
272.950	23.98	165	1.00	12.76	36.74	47.00	-10.26

Remark:
1. The " Correction Factor " contains antenna factor, cable loss.
2. The formula of " Corrected Amplitude " is as follow"
   Reading Amplitude + Correction Factor = Corrected Amplitude.

Field Strength Measurement

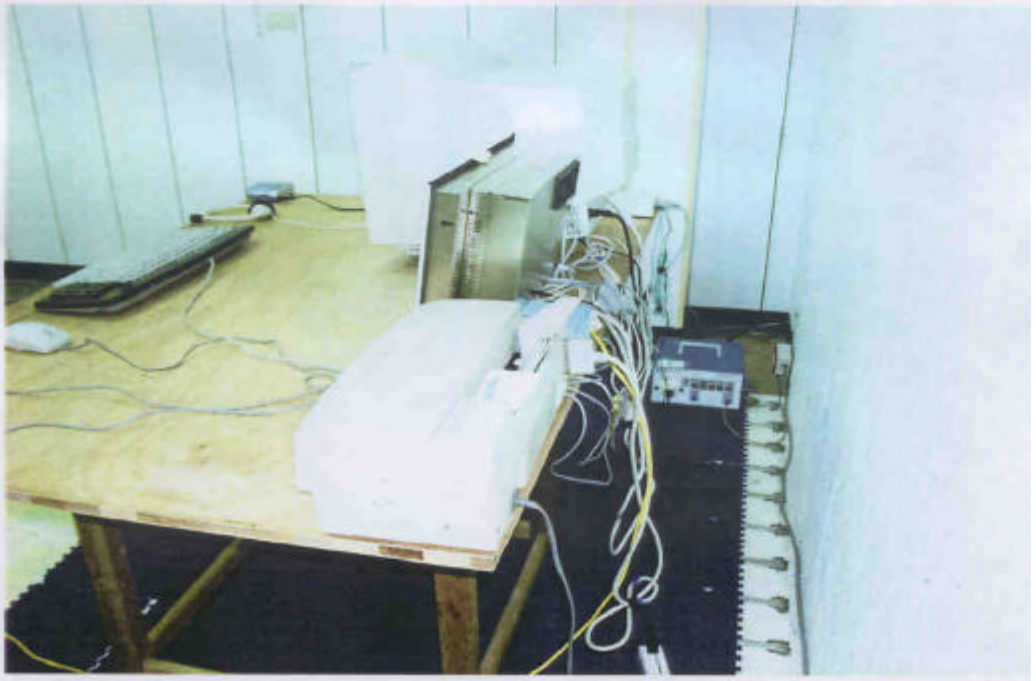
Date Measurement Performed: Jan 17, 2001
EUT : Panel PC
Testing Mode : 1024 x 768
Polarity : Horizontal
Temperature : 27°C
Humidity : 73%RH

Frequency (MHz)	Reading Amplitude (dBμV/m)	Table Degree (°)	Antenna Height (Meter)	Correction Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
33.510	12.33	360	2.00	11.19	23.52	40.00	-16.48
100.200	20.44	83	4.00	9.68	30.12	40.00	-9.88
129.990	17.66	153	4.00	12.06	29.72	40.00	-10.28
162.300	7.90	326	4.00	13.29	21.19	40.00	-18.81
194.700	5.38	305	4.00	10.45	15.83	40.00	-24.17
812.399	3.66	331	1.00	24.09	27.76	47.00	-19.24
974.100	-1.70	191	2.00	25.96	24.26	47.00	-22.74
***							

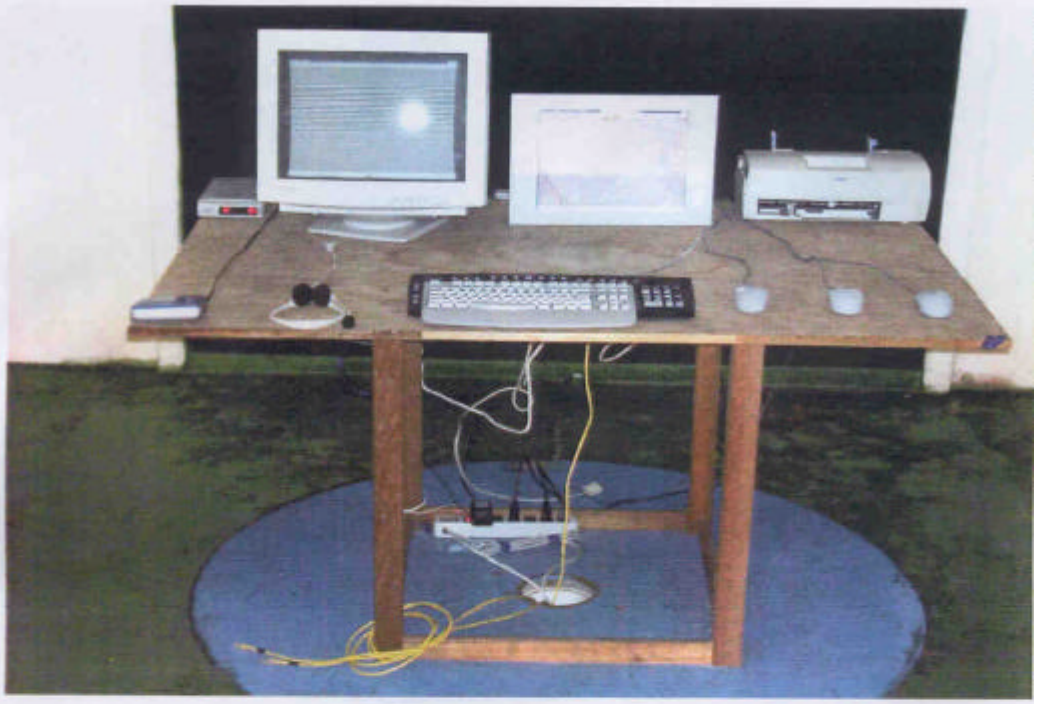
Remark:
1. The " Correction Factor " contains antenna factor, cable loss.
2. The formula of " Corrected Amplitude " is as follow"
   Reading Amplitude + Correction Factor = Corrected Amplitude.

Appendix B: The Test Photograph of EUT

The Photograph of Conducted Emission Test



The Photograph of Radiated Emission Test



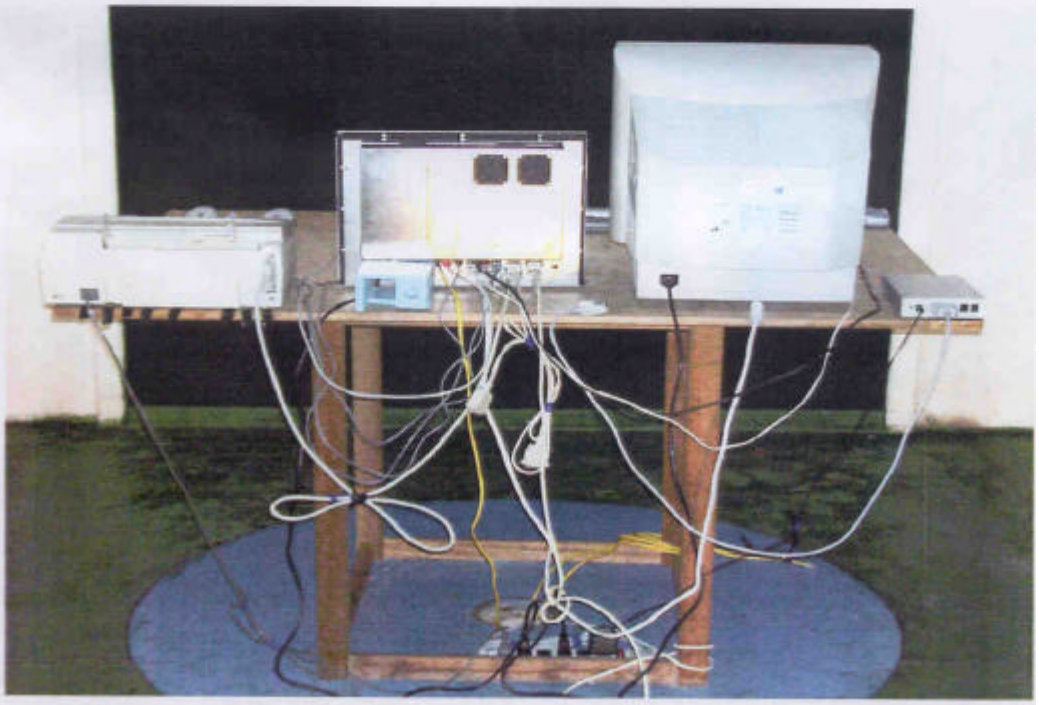
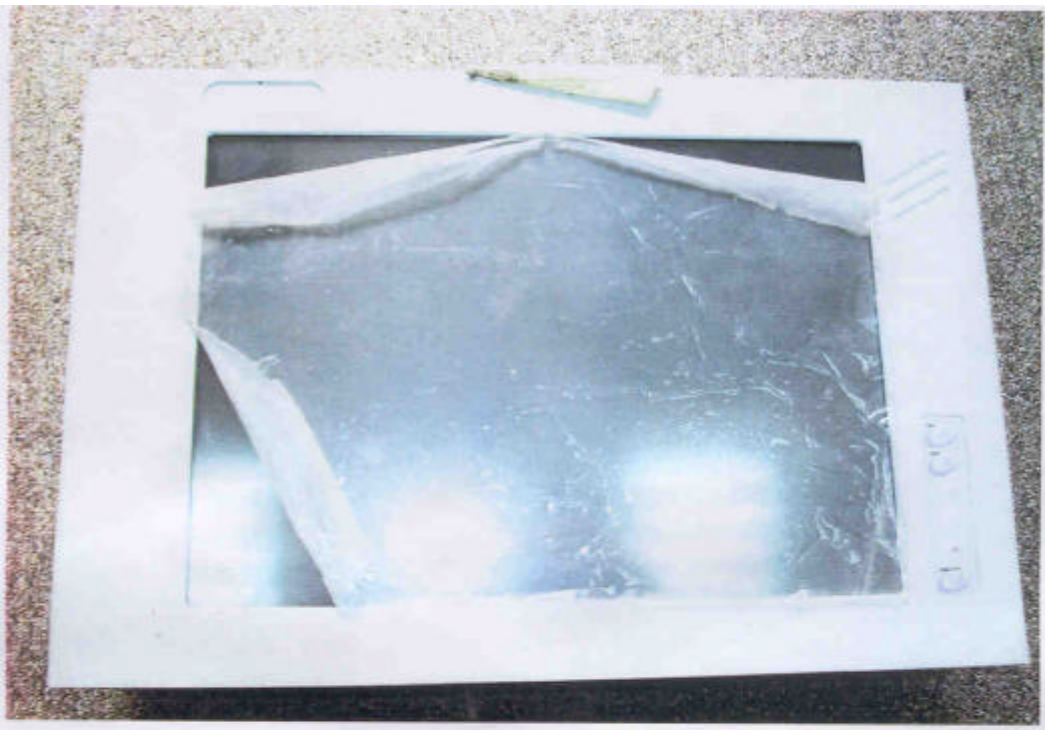
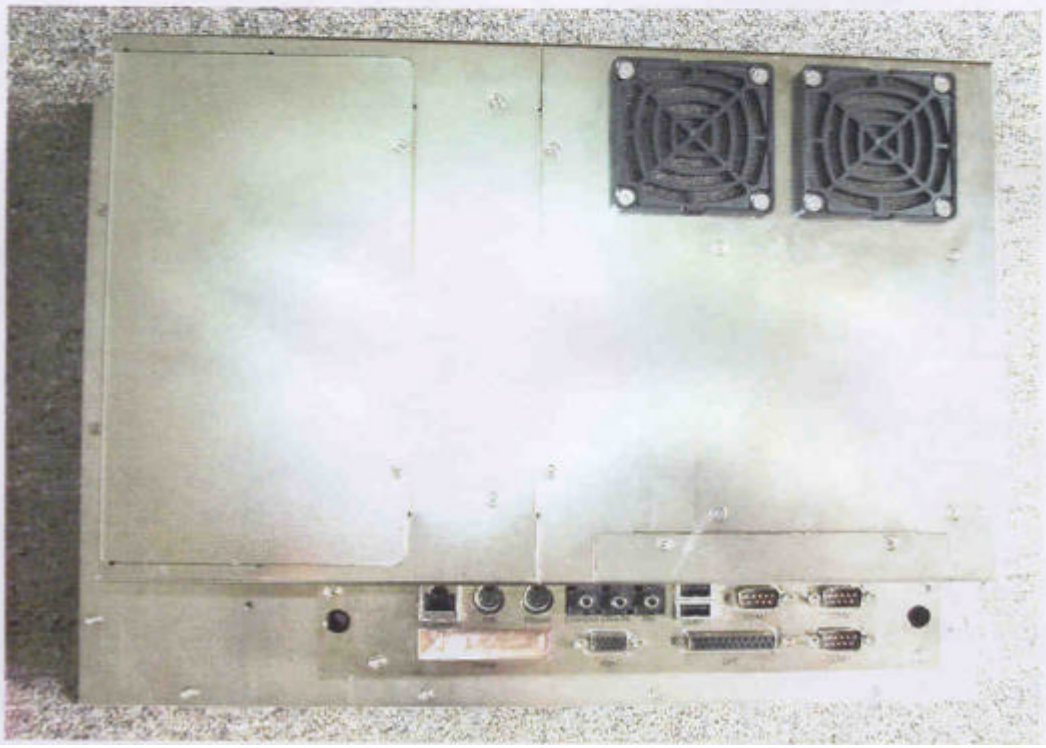
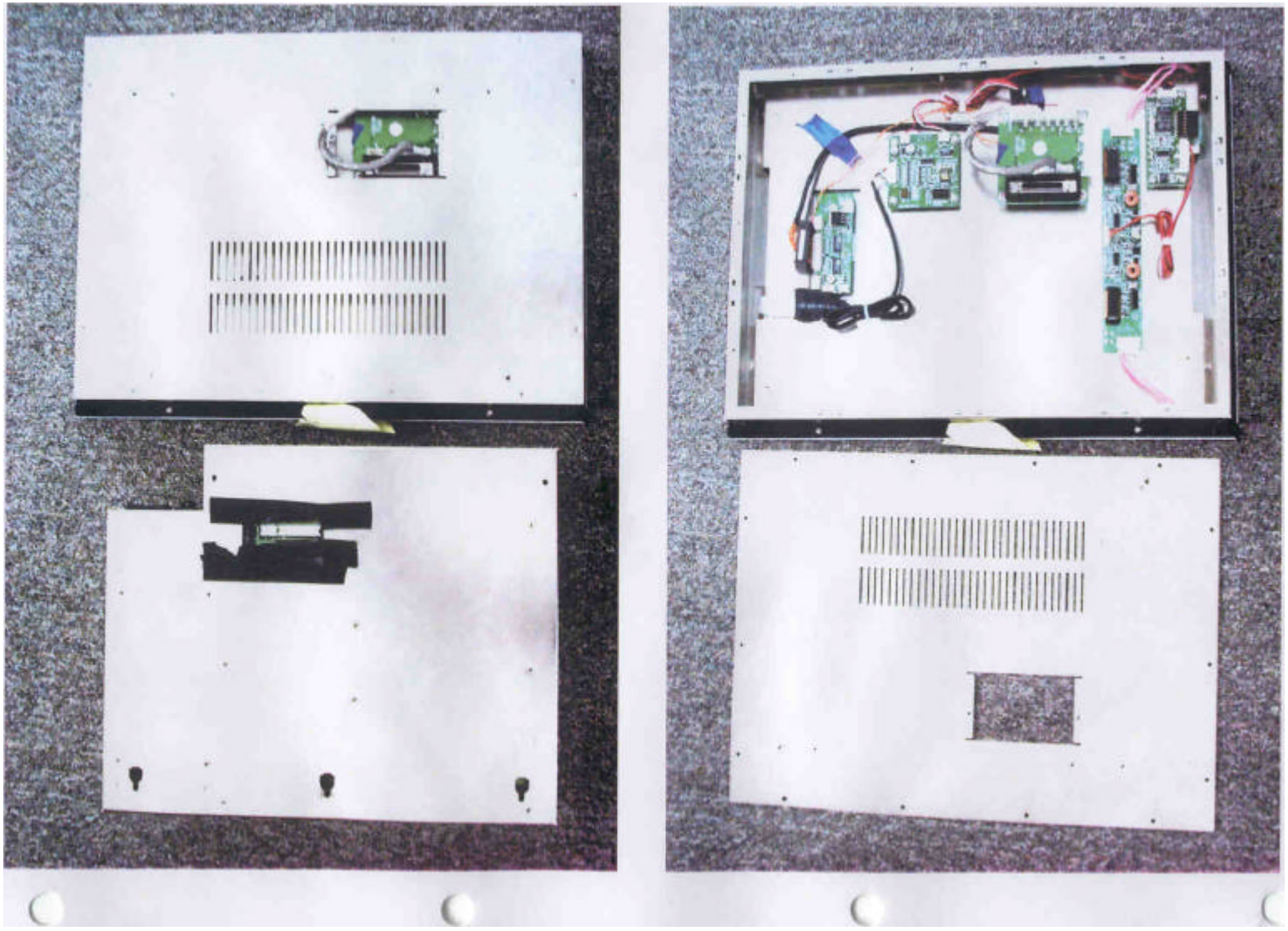
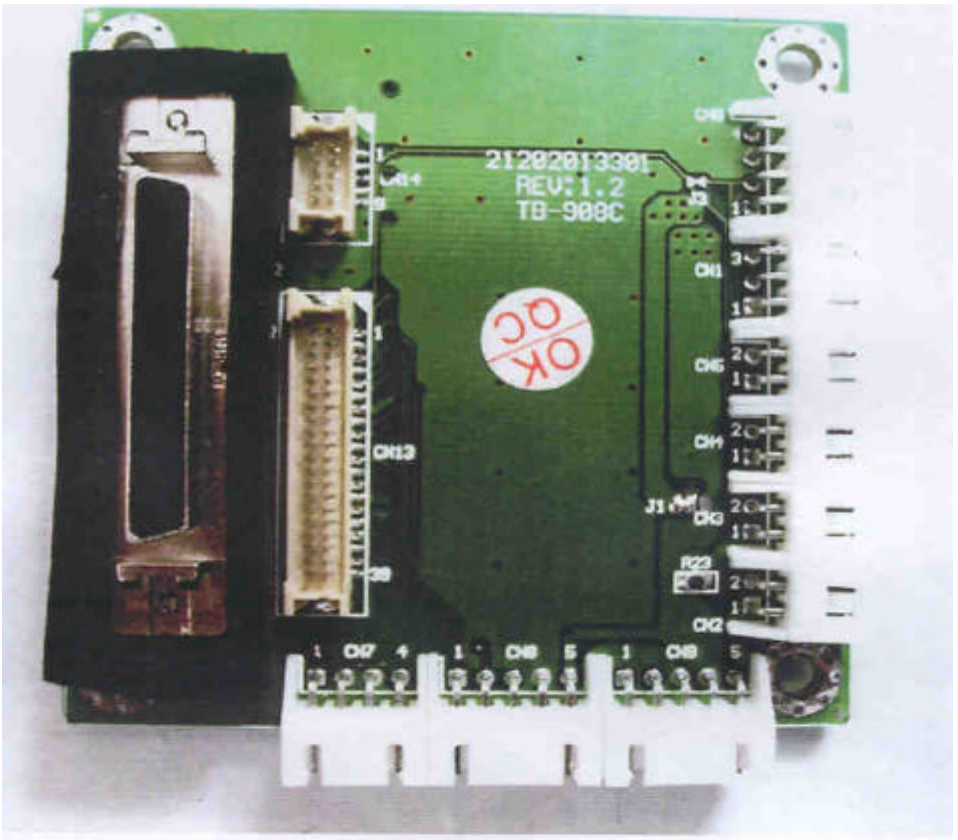


Exhibit C
Photograph of EUT





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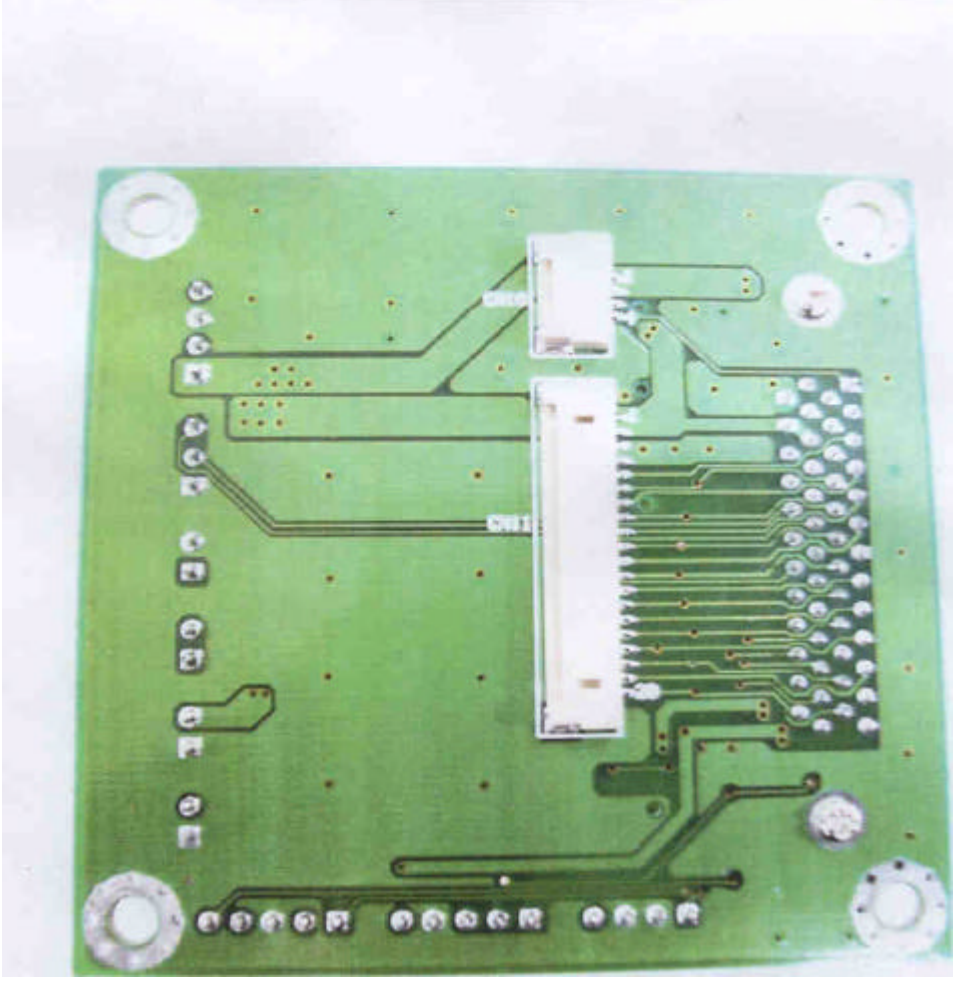

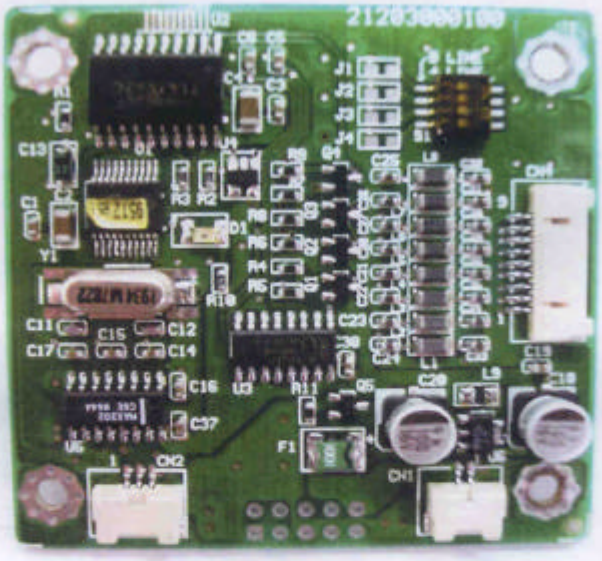
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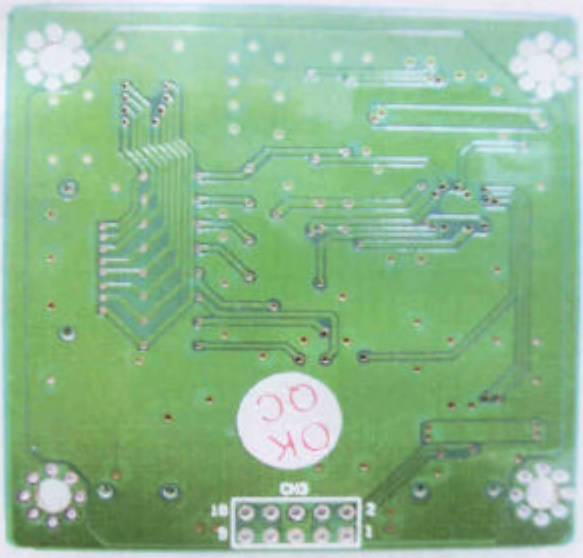
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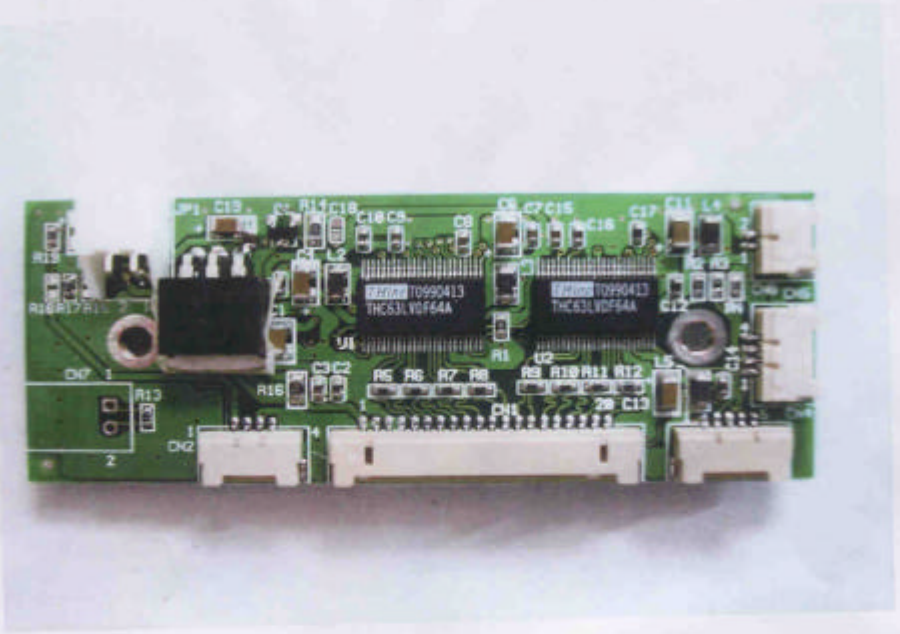
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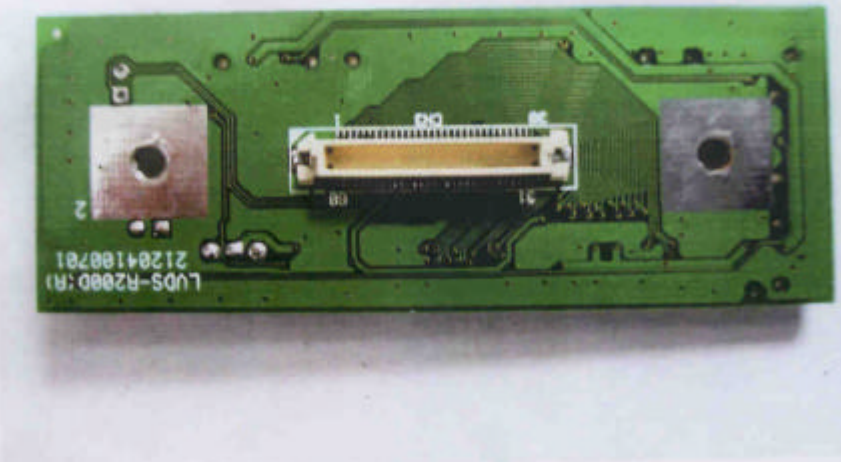
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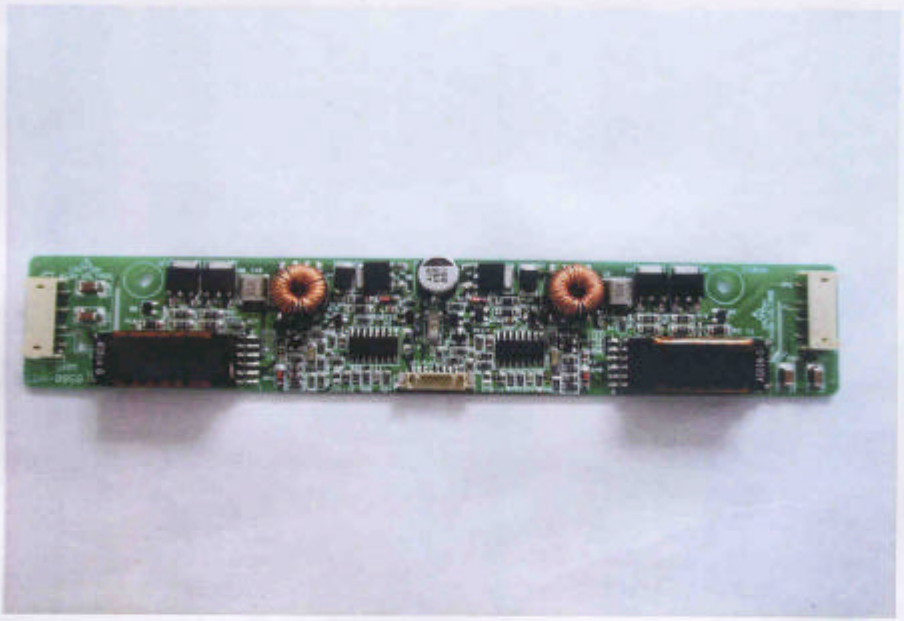

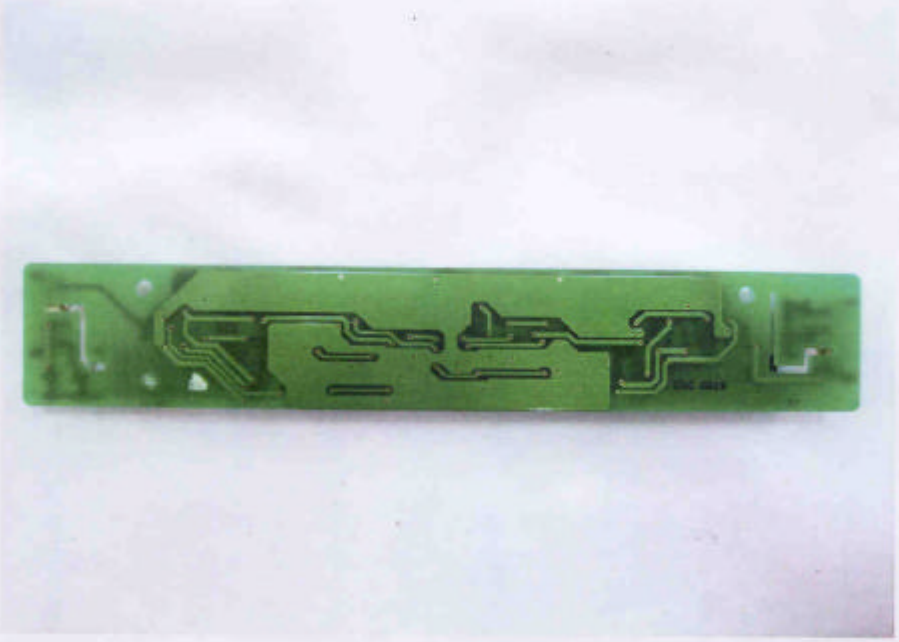

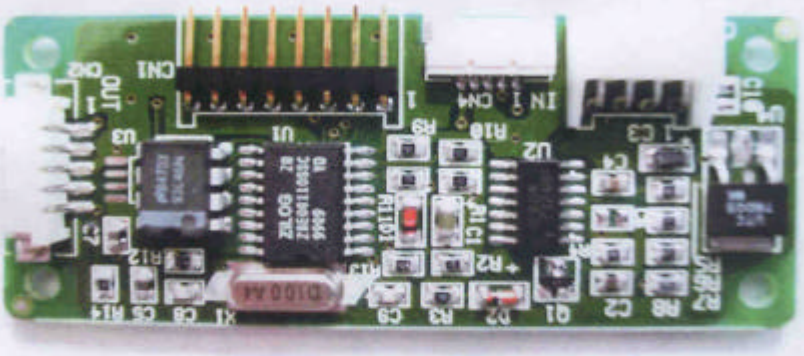
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R1
R2
R3
R4
R5
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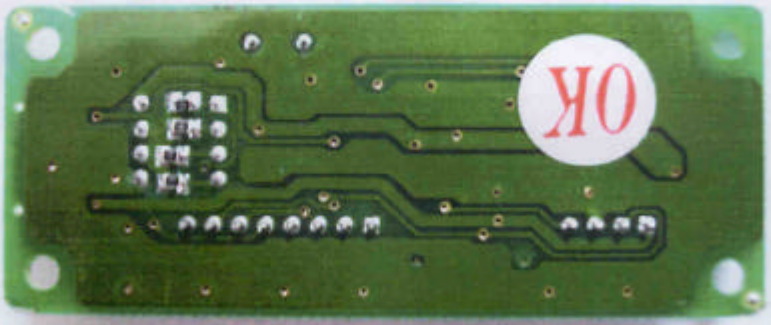
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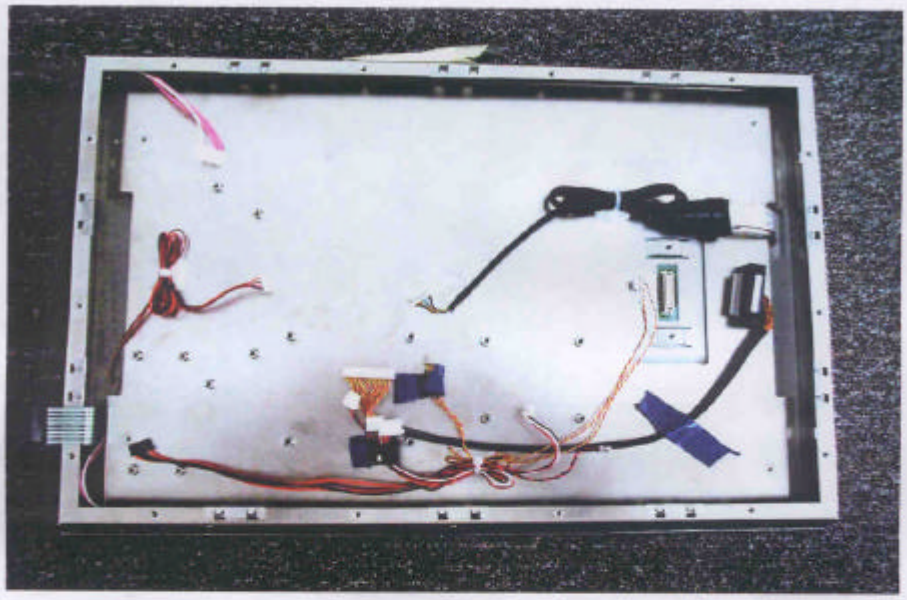

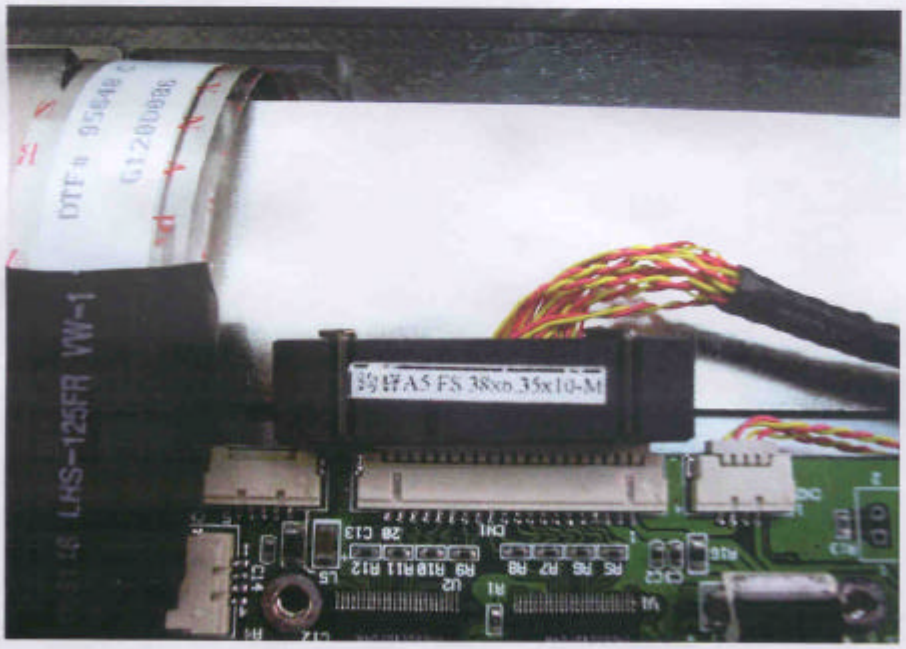
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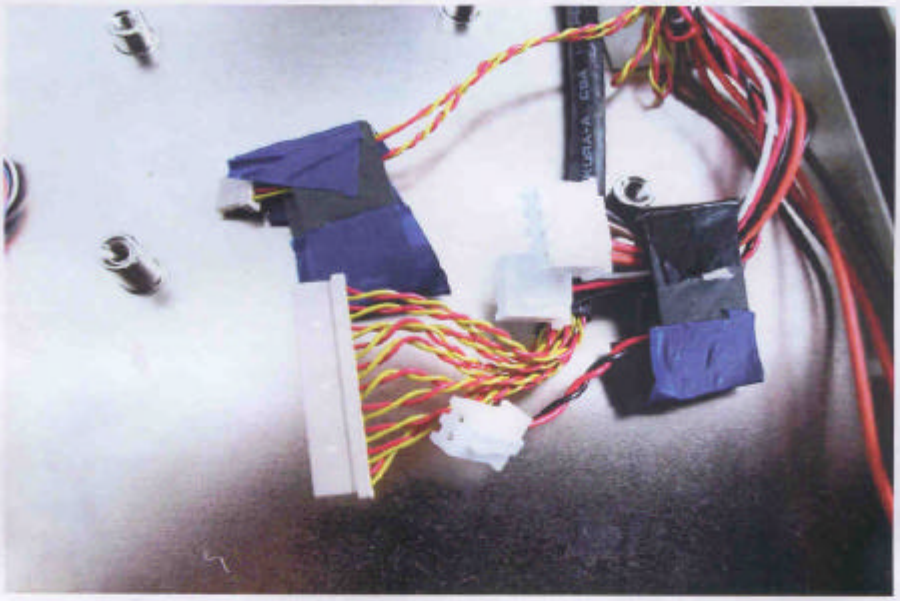

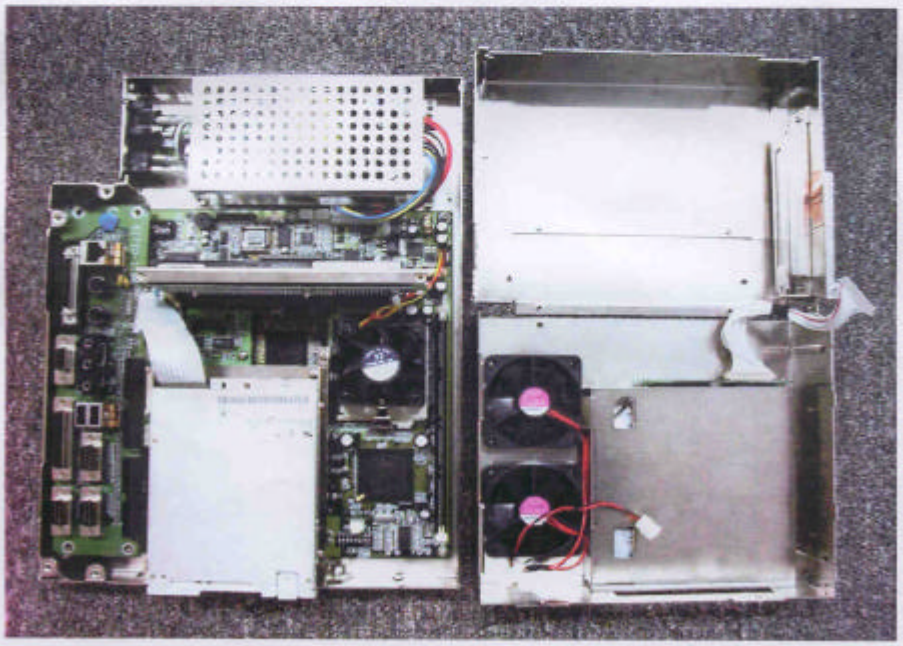

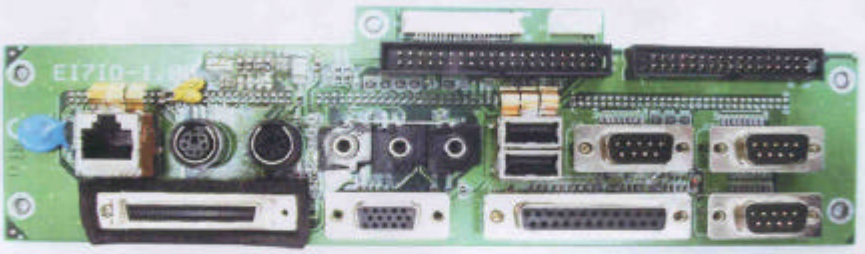

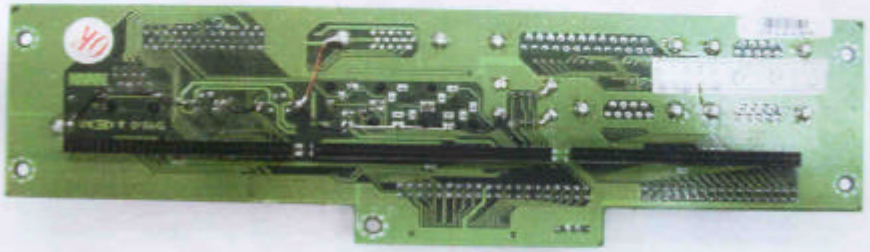


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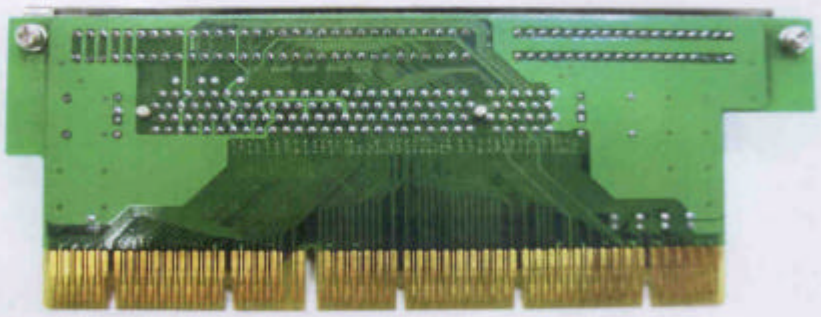

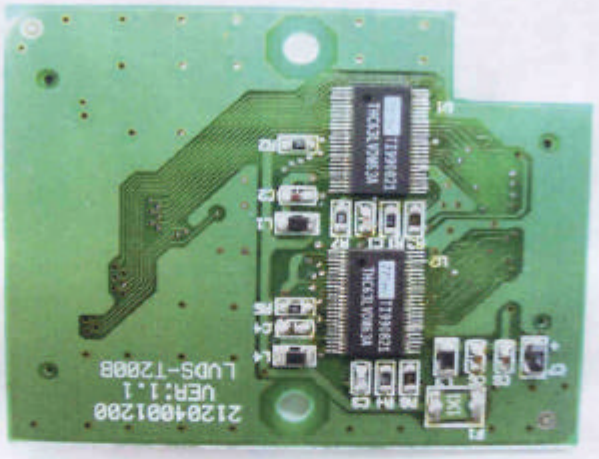
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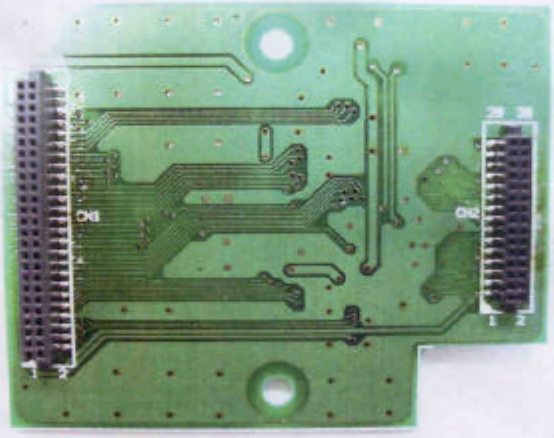

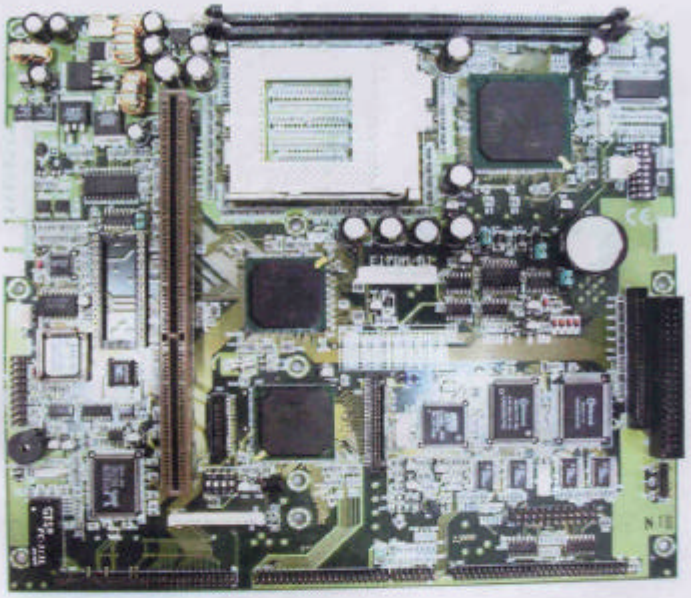

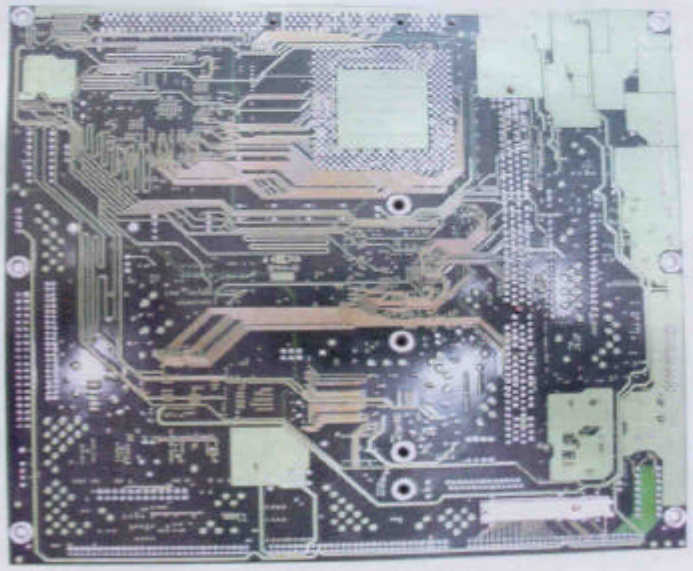

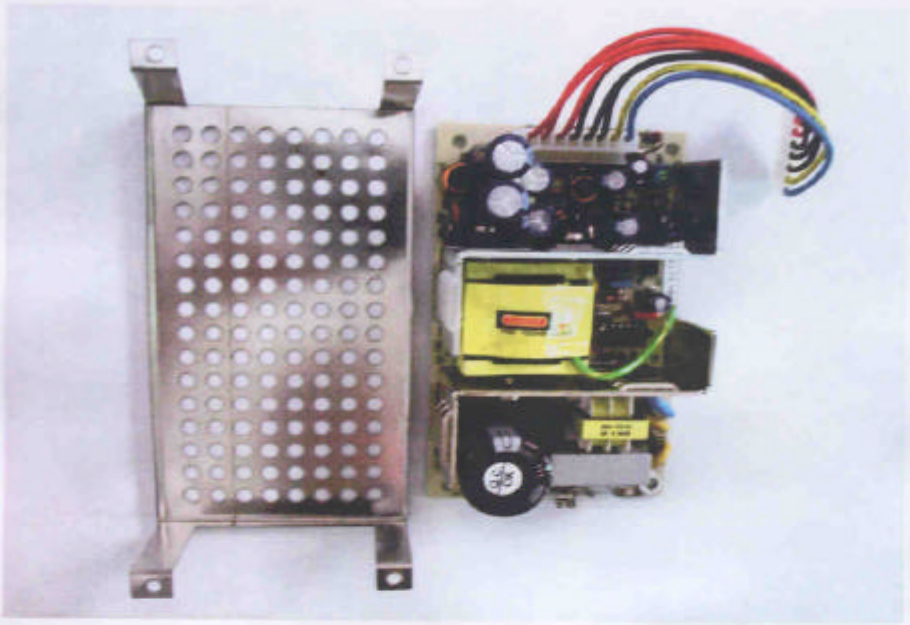

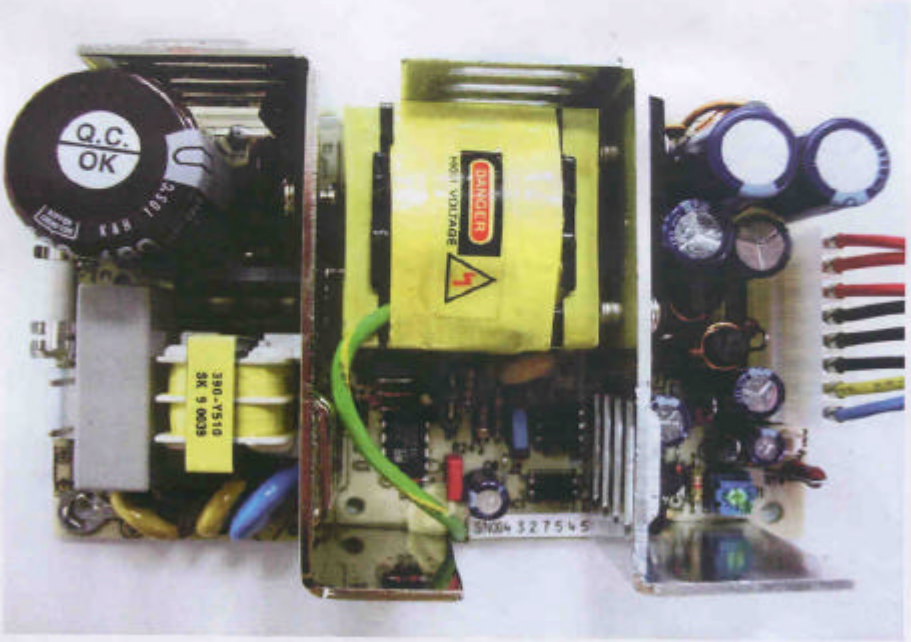
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