

EC Attestation of Conformity

No.: E8 97 04 23432 001



ADVANTECH CO., LTD.

4F., No.108-3, Ming Chuan Rd.,
Hsin Tien City, Taipei Hsien, Taiwan, R.O.C.

Item Identification: INFORMATION TECHNOLOGY EQUIPMENT
PCA-6145B, PCA-6145L

Item Description: CPU BOARD
±12 Vdc, ±5 Vdc
20 W, Protection class III

This equipment complies with the principal protection requirements of the EMC Directive (Directive 89/336/EEC relating to electromagnetic compatibility) based on a voluntary test.

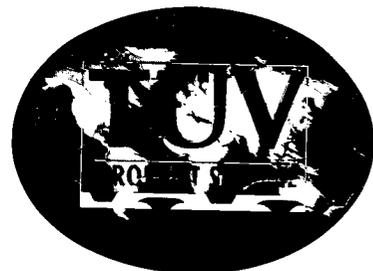
This attestation applies only to the particular sample of the product and its technical documentation provided for testing and certification. The detailed test results and all standards used as well as the operation mode are listed in

Test report no. 61286702001

Test standards: EN 50082-1/1992, EN 55022/1994 + A1/1995 (class A)

This attestation is released with the above mentioned attestation number by the Certification Body of TÜV PRODUCT SERVICE. It does not permit the use of a TÜV PRODUCT SERVICE certification mark.

After preparation of the necessary technical documentation as well as the conformity declaration the CE marking as shown below can be affixed on the equipment as stipulated in Article 10.1 of the Directive. Other relevant Directives have to be observed.



Organization unit:
Date:

TPEEMC/Le-ji
04-10-1997

J. Vesche

EMC EMISSION - TEST REPORT

Project Number : T722406 Date of Issue: 31 March 1997

Model / Serial No. : PCA-6145B, PCA-6145L

Product Type : CPU BOARD

Applicant : ADVANTECH CO., LTD.

Manufacturer : ADVANTECH CO., LTD.

License holder : ADVANTECH CO., LTD.

Address : Fl. 4, No. 108-3, Ming-Chou Road, Shing-Tien City,
: Taipei, Taiwan, R.O.C

Test Result : Positive Negative

Total pages including Appendices : 32

TÜV Product Service Asia Ltd. is a subcontractor to TÜV Product Service, GmbH according to the principles outlined in ISO/IEC Guide 25 and EN 45001.

TÜV Product Service Asia Ltd.. reports apply only to the specific samples tested under stated test conditions. Construction of the actual test samples has been documented. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. The manufacturer/importer is responsible to the Competent Authorities in Europe for any modifications made to the production units which result in non-compliance to the relevant regulations. TÜV Product Service Asia Ltd. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV Product Service Asia Ltd. issued reports.

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Environmental Conditions In The Laboratory:

	<u>Actual</u>
Temperature:	: 17 °C
Relative Humidity:	: 69 %
Atmospheric Pressure:	: 960 mBar

Power Supply Utilized:

Power supply system : 230VAC / 50Hz / ϕ

STATEMENT OF MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities that can account for a nominal measurement error of ± 4 dB. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Symbol Definitions:

- - Applicable
- - Not Applicable

Emissions Test Conditions: CONDUCTED EMISSIONS (Interference Voltage)

The *CONDUCTED EMISSIONS (INTERFERENCE VOLTAGE)* measurements were performed at the following test location:

- Test not applicable

■ - Test Area - Conduction test area

Test Equipment Used :

<u>Model Number</u>	<u>Manufacturer</u>	<u>Description</u>	<u>Serial Number</u>	<u>Cal. Date</u>
■ - 8546a	HP	Receiver RF Section		10/96
■ - 85460A	HP	RF Section		10/96
■ - 3850/2	EMCO	LISN		11/96
■ - KNW-407	KYORITSU	LISN		09/96
■ - MRI-2030	CORCOM	EMI Filter		N/A

Emissions Test Conditions: RADIATED EMISSIONS (Magnetic Field)

The *RADIATED EMISSIONS (MAGNETIC FIELD)* measurements were performed at the following test location:

- Test not applicable

- Test Area No. 1 - Anechoic ferrite lined shielded room (7.2 m x 3.6 m x 3.6 m)
- Test Area No. 2 - Shielded room 1: Bare shielded room (4.1 m x 2.9 m x 2.4 m)
- Test Area No. 4 - Laboratory open area
-

Testing was performed at a test distance of :

- 3 meters
- 30 meters

Test Equipment Used :

Model Number	Manufacturer	Description	Serial Number	Cal. Date
<input type="checkbox"/> - ESH-3 335.8017.56	Rhode & Schwarz	EMI Test Receiver	860905/015	7/95
<input type="checkbox"/> - SMV-11	RFT	EMI Test Receiver	06011	none
<input type="checkbox"/> - HP 8542E	Hewlett-Packard	EMI Receiver System	3520A00135 3427A00130	2/97
<input type="checkbox"/> - HFH 2-Z2	Rhode & Schwarz	Loop Antenna	87763/007	5/95
<input type="checkbox"/> -				
<input type="checkbox"/> -				

Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The *RADIATED EMISSIONS (ELECTRIC FIELD)* measurements, in the frequency range of 30 MHz-1000 MHz, were tested in a horizontal and vertical polarization at the following test location :

- Test not applicable

■ - Test Area - 3 m and 10 m Open Area Test Site, No. 30-1, Lin 6, Diing-Fwu Tsuen, Lin-Kou-Hsiang, Taipei Hsien, Taiwan, R.O.C.

Testing was performed at a test distance of :

- 3 meters
- - 10 meters

Test Equipment Used :

Model Number	Manufacturer	Description	Serial Number	Cal. Date
■ - 8568B	HP	Spectrum Analyzer Display		06/96
■ - 85650A	HP	Quasi-peak Adapter		06/96
■ - 8447D	HP	Amplifier		19/96
■ - cbl6111	CHASE	Bilog Antenna		04/96
■ - 1060-1.211	EMCO	Turn Table		N/A
■ - 1051-1.2	EMCO	Antenna Mast		N/A
■ - 3121C	EMCO	Dipole Antenna		10/96

Emissions Test Conditions: INTERFERENCE POWER

The *INTERFERENCE POWER* measurements were performed by using the absorbing clamp on the mains and interface cables in the frequency range 30 MHz - 300 MHz at the following test location :

- Test not applicable

- Test Area No. 1 - Anechoic ferrite lined shielded room (7.2 m x 3.6 m x 3.6 m)
- Test Area No. 4 - Laboratory open area
-

Test Equipment Used :

	Model Number	Manufacturer	Description	Serial Number	Cal. Date
<input type="checkbox"/> -	MDS-21	Rohde & Schwarz	Absorbing Clamp	821041	5/82
<input type="checkbox"/> -	ESVP 354.3000	Rhode & Schwarz	EMI Test Receiver	87299/050	10/95
<input type="checkbox"/> -	HP 8542E	Hewlett-Packard	EMI Receiver System	3520A00135 3427A00130	2/97
<input type="checkbox"/> -	TR 4132	Takeda Riken	Spectrum Analyzer	53950194	none
<input type="checkbox"/> -	BPA-1000	Electrometrics	Pre-amplifier	229	none
<input type="checkbox"/> -					

Emissions Test Conditions: CONDUCTED EMISSIONS (Harmonics and Flicker)

The *Harmonic Current Emissions and Voltage Fluctuations and Flicker* measurements were performed at the following test location :

- Test not applicable

■ - Test Area - EFT/Harmonics test area

Test Equipment Used :

Model Number	Manufacturer	Description	Serial Number	Cal. Date
■ - 6843A	HP	Harmonics/Flicker Test System		10/95

Equipment Under Test (EUT) Test Operation Mode - Emissions Tests :

The equipment under test was operated under the following conditions during emissions testing:

- Standby
- Test Program (H - Pattern)
- Test Program (Color Bar)
- Test Program (Customer Specified)
- Normal Operating Mode
- TEST MODE : INTEL 486DX4-100, 800x600, 31.5K
INTEL 486DX4-100, 1024x768, 87H, 36Kz

Configuration of the equipment under test:

- See Constructional Data Form in Appendix B - Page B2
- See Product Information Form(s) in Appendix B - Page B3

The following peripheral devices and interface cables were connected during the testing:

- MONITOR Type : OPTIQUEST / 4500DC
- KEYBAORD Type : DELL / AT101
- PRINTER Type : HP / 2225C
- MODEM Type : DATATRONICS / 1200CK
- MOUSE Type : LOGITECH / M-M35 (unshielded cable)
- Type :
- Type :
- Type :
- unshielded power cable
- unshielded cables
- shielded cables TUVPS.No.:
- customer specific cables
-
-

Emissions Test Results:

Conducted Emissions, 150 kHz - 30 MHz

- PASS - FAIL - NOT APPLICABLE

Minimum limit margin _____ 15.7 dB at _____ 24.00 MHz

Maximum limit exceeding _____ dB at _____ MHz

Remarks: MODE : INTEL 486DX4-100, 800x600, 31.5K

Radiated Emissions (Magnetic Field), 10 kHz - 30 MHz

- PASS - FAIL - NOT APPLICABLE

Minimum limit margin _____ dB at _____ MHz

Maximum limit exceeding _____ dB at _____ MHz

Remarks: _____

Radiated Emissions (Electric Field), 30 MHz - 1000 MHz

- PASS - FAIL - NOT APPLICABLE

Minimum limit margin _____ 4.08 dB at _____ 216 MHz

Maximum limit exceeding _____ dB at _____ MHz

Remarks: MODE : INTEL 486DX4-100, 1024x768, 87H, 36Kz

Polarity :Horizontal

Interference Power at the Mains and Interface Cables, 30 MHz - 300 MHz

- PASS - FAIL - NOT APPLICABLE

Minimum limit margin _____ dB at _____ MHz

Maximum limit exceeding _____ dB at _____ MHz

Remarks: _____

Harmonic Current Emissions and Voltage Fluctuations and Flicker

- PASS - FAIL - NOT APPLICABLE

Harmonic measurement exceeding limit _____ Above at _____ Harmonic

Flicker measurement exceeding limit _____ Above the _____ Requirement

Remarks: _____

GENERAL REMARKS:

SUMMARY:

All tests according to the regulations cited on page 3 were

- Performed
- Not Performed

The Equipment Under Test

- Fulfills the general approval requirements cited on page 3.
- Does not fulfill the general approval requirements cited on page 3.

Testing Start Date: Feb. 25, 1997

Testing End Date: Feb. 28, 1997

Tested by: Mark Chen.

EMC Test Engineer

Reviewed by: Tommy Rau

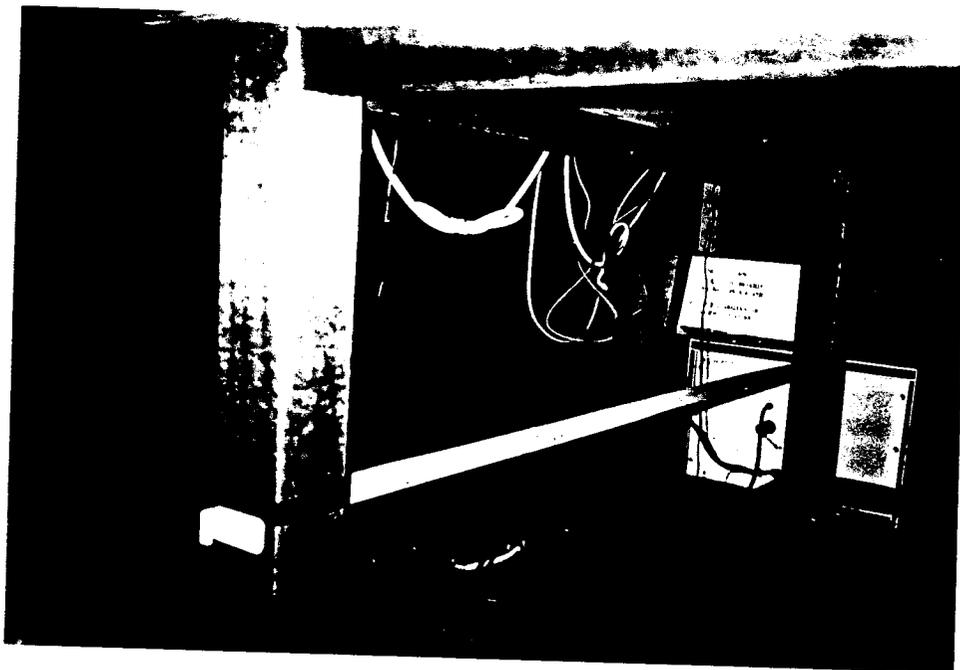
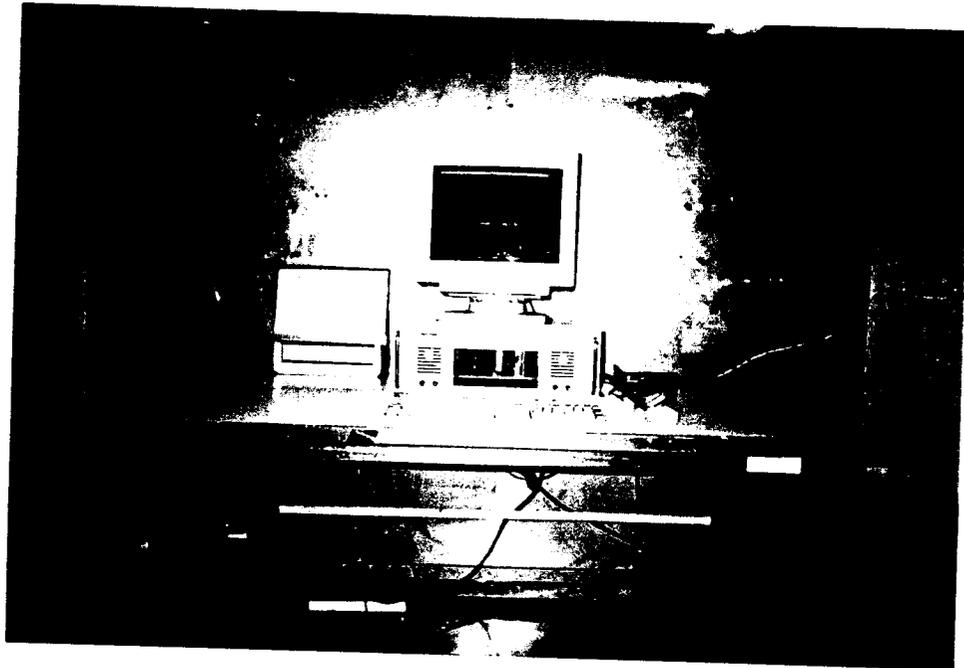
EMC Laboratory Manager

Witnessed by: Joseph L.

TUV Test Engineer

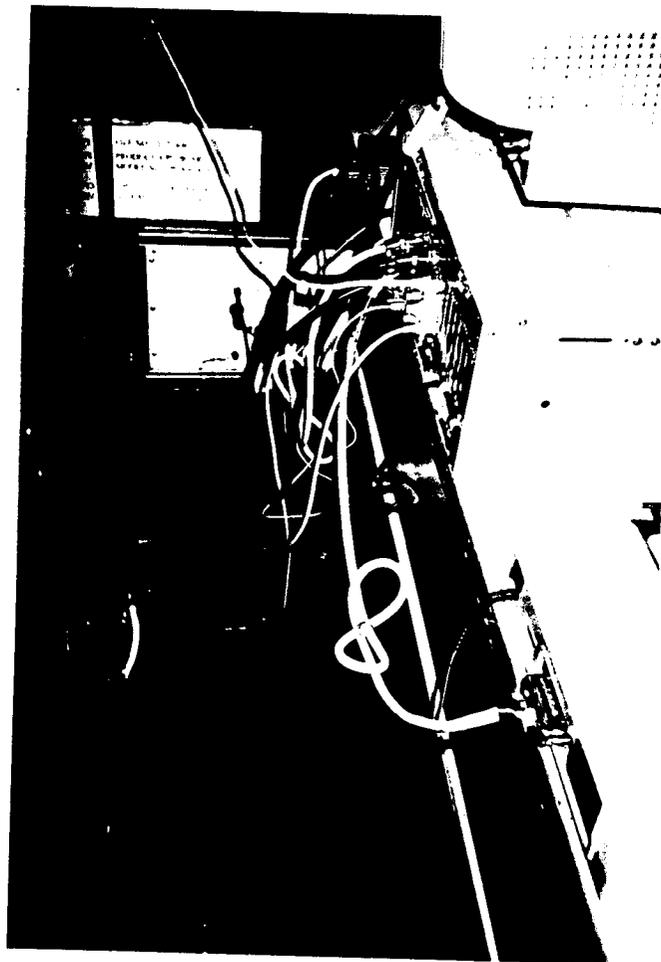
Photograph of Test Setup:
Conducted Emissions 150 kHz - 30 MHz

- Test not applicable



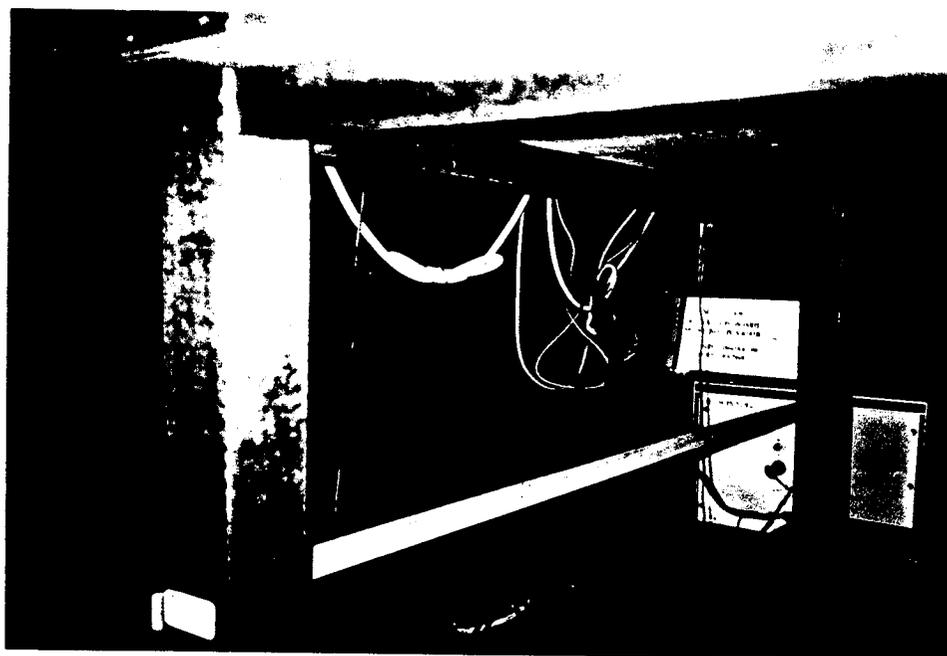
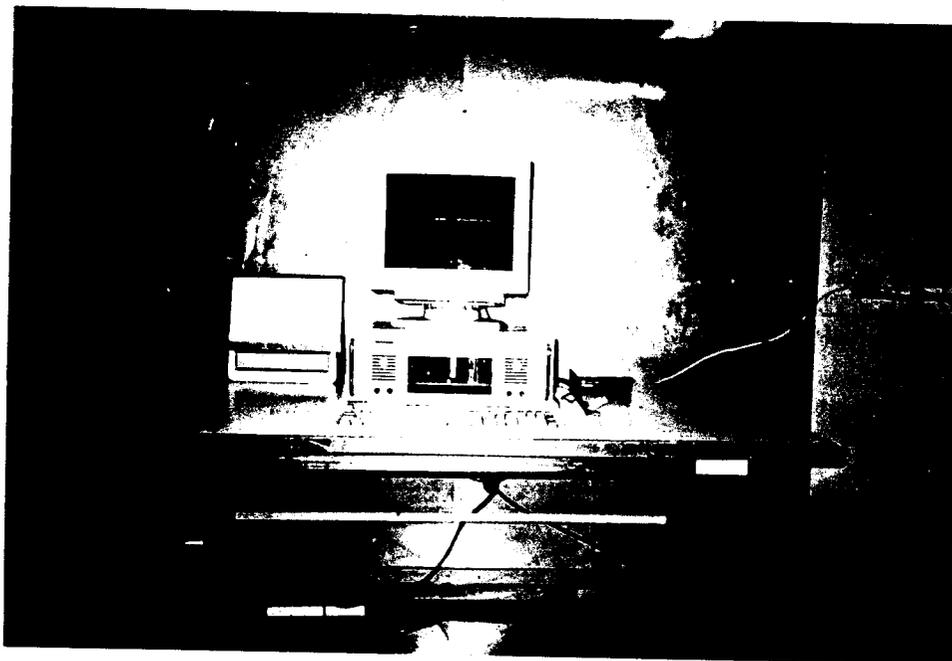
Photograph of Test Setup:
Conducted Emissions 150 kHz - 30 MHz

- Test not applicable



Photograph of Test Setup:
Conducted Emissions 150 kHz - 30 MHz

- Test not applicable



Photograph of Test Setup:
Conducted Emissions 150 kHz - 30 MHz

- Test not applicable

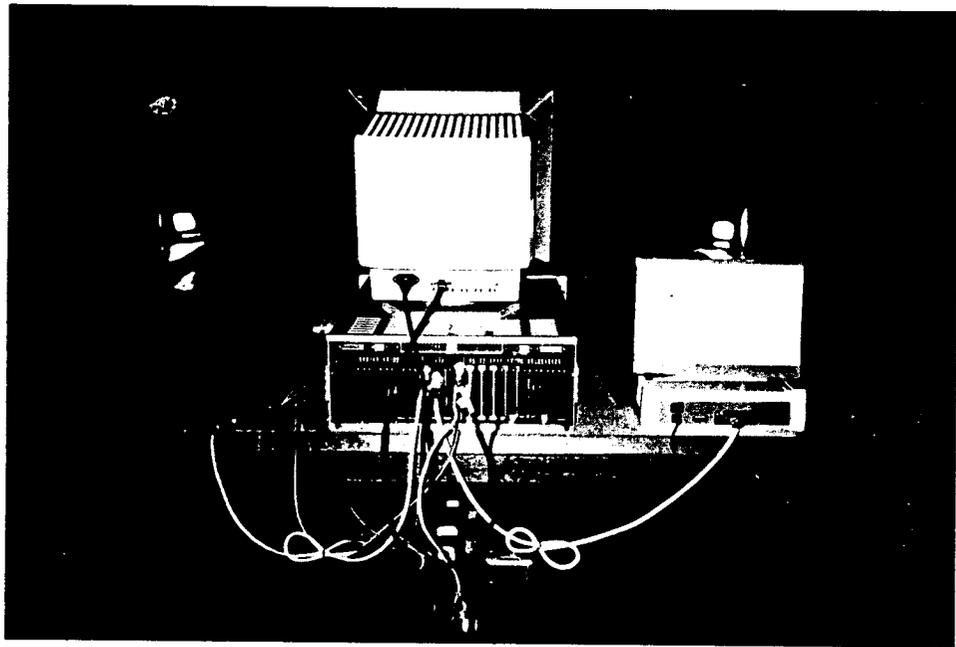


Photograph of Test Setup:
Inteference Power 30 MHz - 300 MHz

■ - Test not applicable

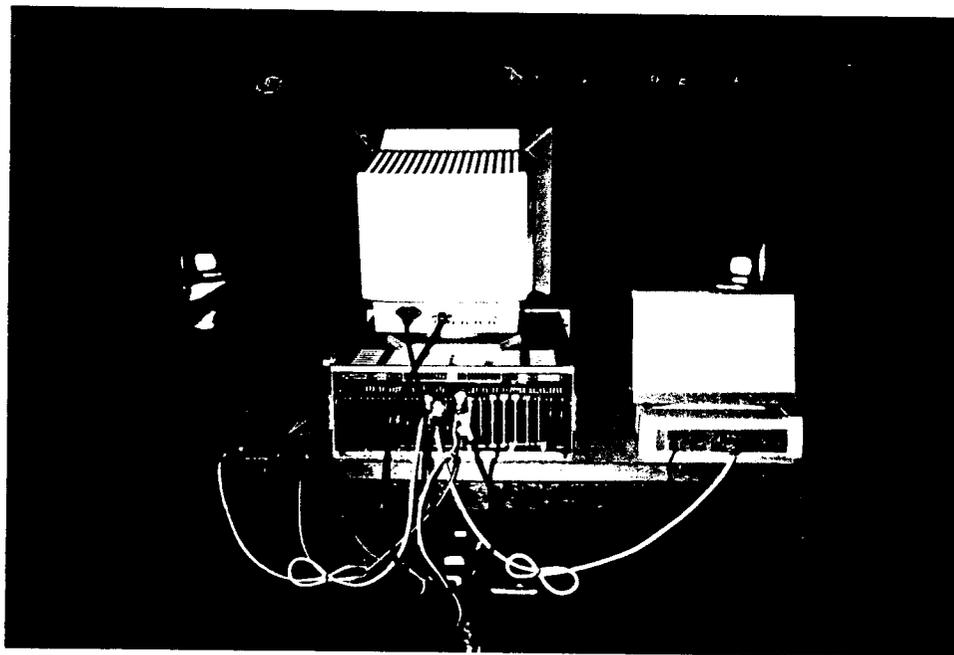
Photograph of Test Setup:
Radiated Emissions 30 MHz - 1000 MHz

- Test not applicable



Photograph of Test Setup:
Radiated Emissions 30 MHz - 1000 MHz

- Test not applicable



Photograph of Test Setup:
Harmonic Current/Voltage Fluctuations and Flicker

- Test not applicable

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Photograph of Test Setup:
Harmonic Current/Voltage Fluctuations and Flicker

■ - Test not applicable

EMC IMMUNITY - TEST REPORT

Project Number : T722406 Date of Issue: 26 March 1997

Model / Serial No. : PCA-6145B, PCA-6145L

Product Type : CPU BOARD

Applicant : ADVANTECH CO., LTD.

Manufacturer : ADVANTECH CO., LTD.

License holder : ADVANTECH CO., LTD.

Address : Fl. 4, No. 108-3, Ming-Chou Road, Shing-Tien City,
: Taipei, Taiwan, R.O.C

Test Result : Positive Negative

Total pages including
Appendices 31

TÜV Product Service Asia Ltd. is a subcontractor to TÜV Product Service, GmbH according to the principles outlined in ISO/IEC Guide 25 and EN 45001.

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IMMUNITY TEST REGULATIONS :

The immunity tests were performed according to the following regulations :

■ - EMC - Directive 89/336/EEC and its amendments

-
- - EN 50082-1 / 1992
 - - prEN 50082-1 / 8.1994
 - - EN 50082-2 / 1995
 - - EN 55020 / 1993
 - - EN 55104 / 1995
 - - EN 60601-1-2 / 1993

-
- - IEC 601-1-2 / 1993
 - - IEC 801-2 / 1991
 - - IEC 801-3 / 1984
 - - IEC 801-4 / 1988
 - - prIEC 801-5 / 1993
 - - prIEC 801-6 / 1993

- - IEC 1000-4-2 / 1995
- - IEC 1000-4-3 / 1995
- - IEC 1000-4-4 / 1995
- - IEC 1000-4-5 / 1995
- - prIEC 1000-4-6 / 5.1995
- - IEC 1000-4-8 / 1993
- - IEC 1000-4-11 / 1994

- - ENV 50140 / 1993
- - ENV 50141 / 1993
- - ENV 50204

- - EN 61000-4-2
- - EN 61000-4-4
- - EN 61000-4-5
- - EN 61000-4-11

Note: For undated references, the latest edition of the publication at the time of testing (including amendments) was applied.

Environmental Conditions In The Laboratory:

	<u>Actual</u>
Temperature:	: 20°C
Relative Humidity:	: 52%
Atmospheric Pressure:	: 960 mBar

Power Supply Utilized:

Power supply system : 230VAC / 50Hz / ϕ

STATEMENT OF MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities that can account for a nominal measurement error of ± 4 dB. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Symbol Definitions:

- - Applicable
- - Not Applicable

Immunity Test Conditions: RADIATED ELECTROMAGNETIC FIELDS

The immunity against *RADIATED ELECTROMAGNETIC FIELDS* exposure was performed in the following location:

- Test not applicable

■ - Test Area No. 1 - Anechoic ferrite lined shielded room (4 m x 5 m x 7 m)

Test Equipment Used :

Model Number	Manufacturer	Description	Serial Number	Cal. Date
■ - 100W 1000M3	AR	Amplifier		N/A
■ - 75W 75A220	AR	Amplifier		06/96
■ - FP3000A	AR	Isotropic Field Probe		N/A
■ - CP3000	AR	IEEE-488 Interface		N/A
■ - 200	EMC Automation	System Interface		N/A
■ - 438A	EMC Automation	Power Meter		N/A
■ - CVV-01	EMC Automation	Video Camera controller		09/96
■ - 8648A	HP	Signal Generator		09/96
■ - SMX	R&S	Signal Generator		06/96
■ - CBL6121A	CHASE	Antenna		06/96

Test Specification:

Frequency Range: ■ - 27 MHz - 500 MHz □ - 26 MHz - 1000 MHz
 □ - 9 kHz - 27 MHz □ - 80 MHz - 1000 MHz

Field Strength: □ - 1 V/m □ - 3 V/m
 ■ - 10 V/m □ - _ V/m

Distance Antenna - EUT: □ - 1 m ■ - 3 m

Test Specification (continued):

Modulation:

- AM : ___ % ___ kHz
- FM : ___ kHz dev. ___ kHz
- sine wave:
- unmodulated
- Pulse ON/OFF Duty Cycle: ___ %

Step:

- ≤ 0.015 decades / sec - 1%

Polarization of Antenna:

- Horizontal - Vertical

Result :

- No degradation of function - Met Criterion A
- Distortion of function - Met Criterion B
- Error of function - Met Criterion C
- Loss of function - Unrecoverable Failure

Remarks: _____

Immunity Test Conditions: FAST TRANSIENTS (BURST), continued

Location of Coupling:

name of lines: ETHERNET BNC CABLE
type of lines: - shielded - unshielded
status of lines: - passive - active
kind of transmission: - analog - digital
length of lines: _____

name of lines: _____
type of lines: - shielded - unshielded
status of lines: - passive - active
kind of transmission: - analog - digital
length of lines: _____

name of lines: _____
type of lines: - shielded - unshielded
status of lines: - passive - active
kind of transmission: - analog - digital
length of lines: _____

Result :

- No degradation of function - Met Criterion A
- Distortion of function - Met Criterion B
- Error of function - Met Criterion C
- Loss of function - Unrecoverable Failure

Remarks: _____

Immunity Test Conditions: SURGE TRANSIENTS, continued

Location of Coupling:

name of lines: _____
type of lines: - shielded - unshielded
status of lines: - passive - active
kind of transmission: - analog - digital
length of lines: _____

name of lines: _____
type of lines: - shielded - unshielded
status of lines: - passive - active
kind of transmission: - analog - digital
length of lines: _____

name of lines: _____
type of lines: - shielded - unshielded
status of lines: - passive - active
kind of transmission: - analog - digital
length of lines: _____

Result:

- | | |
|---|-------------------------|
| <input type="checkbox"/> - No degradation of function | - Met Criterion A |
| <input type="checkbox"/> - Distortion of function | - Met Criterion B |
| <input type="checkbox"/> - Error of function | - Met Criterion C |
| <input type="checkbox"/> - Loss of function | - Unrecoverable Failure |

Remarks: _____

Immunity Test Conditions: CONDUCTED DISTURBANCE

The immunity against *CONDUCTED DISTURBANCE* events, induced by radio frequency fields above 9 kHz, was performed in the following test location:

- Test not applicable

- Test Area No. 1 - Anechoic ferrite lined shielded room (7.2 m x 3.6 m x 3.6 m)
- Test Area No. 2 - Shielded room 1: Bare shielded room (4.1 m x 2.9 m x 2.4 m)
- Test Area No. 3 - Shielded room 2: Bare shielded room (4.0 m x 3.0 m x 2.0 m)
-

Test Equipment Used :

Model Number	Manufacturer	Description	Serial Number	Cal. Date
<input type="checkbox"/> - CDN M2 35A	Erika Fiedler	Coupling/Decoupling Network	none	02.97
<input type="checkbox"/> - CDN M3 32A	Erika Fiedler	Coupling/Decoupling Network	none	02.97
<input type="checkbox"/> - -----	-----	Coupling/Decoupling Network	-----	-----
<input type="checkbox"/> - -----	-----	Calibration Fixture	--	-----
<input type="checkbox"/> - DC6180	Amplifier Research.	Directional Coupler	17669	12.96
<input type="checkbox"/> - DC2500	Amplifier Research.	Directional Coupler	18063	03.97
<input type="checkbox"/> - -----	Bird	Attenuator (16 dB/500 W)	---	N/A
<input type="checkbox"/> -		Attenuator		
<input type="checkbox"/> - 185	Wavetek	Sweep Generator	256487	05.97
<input type="checkbox"/> - SMY01	Rohde & Schwarz	Signal Generator	1062.5502.11	04.98
<input type="checkbox"/> - 500A100	Amplifier Research	Power Amplifier	18118	N/A
<input type="checkbox"/> - 200W1000M7A	Amplifier Research	Power Amplifier	18025	N/A
<input type="checkbox"/> - 436A	Hewlett Packard	Power Meter	2330A15762	11.96
<input type="checkbox"/> - 8482A	Hewlett Packard	Power Sensor	2652A18943	05.97
<input type="checkbox"/> - 9200C	Boonton	RF Voltmeter	353501AA	05.97

Test Specification:

Frequency Range:

- 0,15 MHz - 230 MHz

- 0,15 MHz - 80 MHz

Voltage Level (EMF):

- 1 V

- 3 V

- 10 V

- __ V

Modulation:

- AM :

__ % __ kHz

- FM :

__ kHz dev. __ kHz

- sine wave:

- unmodulated

- Pulse

ON/OFF

Duty Cycle: __ %

Step:

- <= 0.015 decades / sec

Immunity Test Conditions: CONDUCTED DISTURBANCE, continued

Location of Coupling:

name of lines: _____
 type of lines: - shielded - unshielded
 status of lines: - passive - active
 kind of transmission: - analog - digital
 length of lines: _____

name of lines: _____
 type of lines: - shielded - unshielded
 status of lines: - passive - active
 kind of transmission: - analog - digital
 length of lines: _____

name of lines: _____
 type of lines: - shielded - unshielded
 status of lines: - passive - active
 kind of transmission: - analog - digital
 length of lines: _____

Result :
 - No degradation of function - Met Criterion A
 - Distortion of function - Met Criterion B
 - Error of function - Met Criterion C
 - Loss of function - Unrecoverable Failure

Remarks: _____

Immunity Test Conditions: RF FREQUENCY MAGNETIC FIELD

The immunity against *RF FREQUENCY MAGNETIC FIELD* exposure, induced by radio frequency fields above 9 kHz, was performed in the following test location:

- Test not applicable

- Test Area No. 1 - Anechoic ferrite lined shielded room (7.2 m x 3.6 m x 3.6 m)
- Test Area No. 2 - Shielded room 1: Bare shielded room (4.1 m x 2.9 m x 2.4 m)
- Test Area No. 3 - Shielded room 2: Bare shielded room (4.0 m x 3.0 m x 2.0 m)
-

Test Equipment Used :

Model Number	Manufacturer	Description	Serial Number	Cal. Date
<input type="checkbox"/> -				
<input type="checkbox"/> -				
<input type="checkbox"/> -				
<input type="checkbox"/> -				
<input type="checkbox"/> -				

Test Specification:

- Frequency Range: - 50 Hz - 60 Hz - 400 Hz
- Field level (EMF): - 1 A/m - 3 A/m - 10 A/m
- 30 A/m - 100 A/m - ___ A/m
- Short Field (1-3 sec): - 300 A/m - 1000 A/m - ___ A/m
- Duration: - ___ seconds
- Axis of Orientation: - X-axis - Y-axis - Z-axis

Result :

- No degradation of function - Met Criterion A
- Distortion of function - Met Criterion B
- Error of function - Met Criterion C
- Loss of function - Unrecoverable Failure

Remarks: _____

Immunity Test Conditions: VOLTAGE DIPS, INTERRUPTIONS & VARIATIONS

The immunity against *VOLTAGE DIPS, INTERRUPTIONS & VARIATIONS* events, induced by radio frequency fields above 9 kHz, was performed in the following test location:

- Test not applicable

- Test Area No. 1 - Anechoic ferrite lined shielded room (7.2 m x 3.6 m x 3.6 m)
- Test Area No. 2 - Shielded room 1: Bare shielded room (4.1 m x 2.9 m x 2.4 m)
- Test Area No. 3 - Shielded room 2: Bare shielded room (4.0 m x 3.0 m x 2.0 m)
-

Test Equipment Used :

Model Number	Manufacturer	Description	Serial Number	Cal. Date
<input type="checkbox"/> - NSG 1003	Schaffner	Mains Drop out Simulator	-----	-----
<input type="checkbox"/> - TDS 524A	Tektronix	Oscilloscope	B020238	11.96
<input type="checkbox"/> - TDS 320	Tektronix	Oscilloscope	B012544	-----

Test Specification:

Nominal Mains Voltage (V_{NOM}): - 230 Vac - ___ Vac - ___ Vdc

Level of Reduction (dip): - 10 mS at 30% of V_{NOM}
 - 100 mS at 60% of V_{NOM}
 - _____

Duration of Interruption ($>.95 \cdot V_{NOM}$): - 5000 mS - _____ mS

Voltage Fluctuation: - $V_{NOM} + 10\%$ - $V_{NOM} - 10\%$

Result :

- No degradation of function - Met Criterion A
- Distortion of function - Met Criterion B
- Error of function - Met Criterion C
- Loss of function - Unrecoverable Failure

Remarks: _____

Equipment Under Test (EUT) Test Operation Mode - Immunity Tests :

The equipment under test was operated under the following conditions during immunity testing :

- Standby
- Test Program (H - Pattern)
- Test Program (Color Bar)
- Test Program (Customer Specified)
- Normal Operating Mode
- TEST MODE : INTEL 486DX4-100, 800x600, 31.5K
INTEL 486DX4-100, 1024x768, 87H, 36Kz

Configuration of the equipment under test:

- See Constructional Data Form in Appendix B - Page B2
- See Product Information Form(s) in Appendix B - Page B2

The following peripheral devices and interface cables were connected during the testing:

- MONITOR Type : SONY / GDM-17SE2T
- KEYBAORD Type : DELL / AT101
- PRINTER Type : HP / 2225C
- MODEM Type : DATATRONICS / 2400C
- MOUSE Type : LOGITECH / M-M35 (unshielded cable)
- Type :
- Type :
- Type :
- unshielded power cable
- unshielded cables
- shielded cables TUVPS.No.: _____
- customer specific cables
- _____
- _____

GENERAL REMARKS:

SUMMARY:

All tests according to the regulations cited on page 3 were

- Performed
- Not Performed

The Equipment Under Test

- Fulfills the general approval requirements cited on page 3.
- Does not fulfill the general approval requirements cited on page 3.

Testing Start Date: March 03, 1997

Testing End Date: March 13, 1997

Tested by:
Mark Chen
EMC Test Engineer

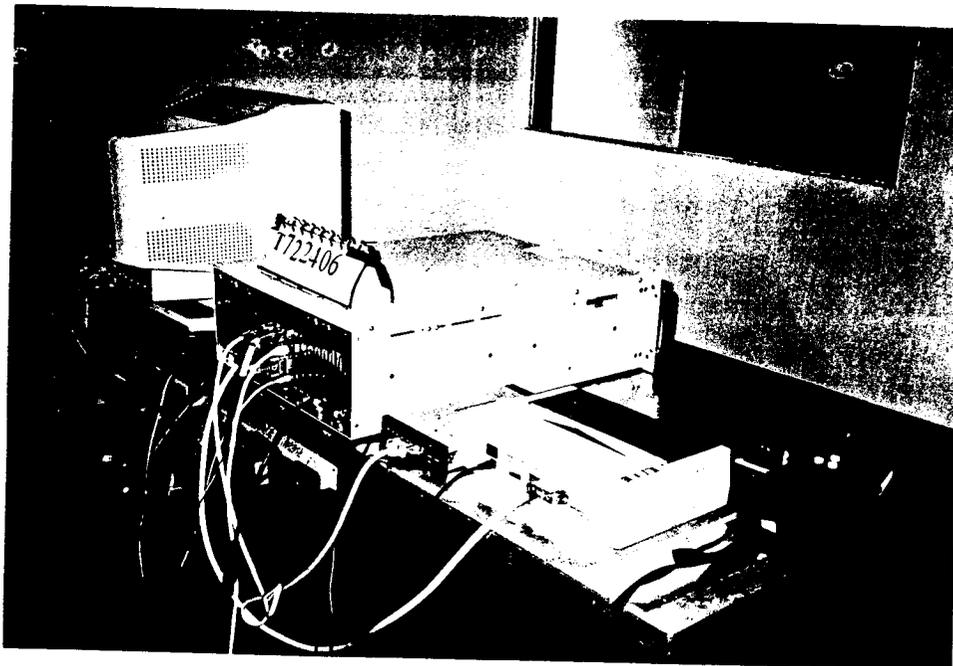
Reviewed by:
Tommy Rau
EMC Laboratory Manager

Witnessed by:
Joseph L...
TUV Test Engineer

Photograph of Test Setup:
Electrostatic Discharge (ESD)

- Test not applicable

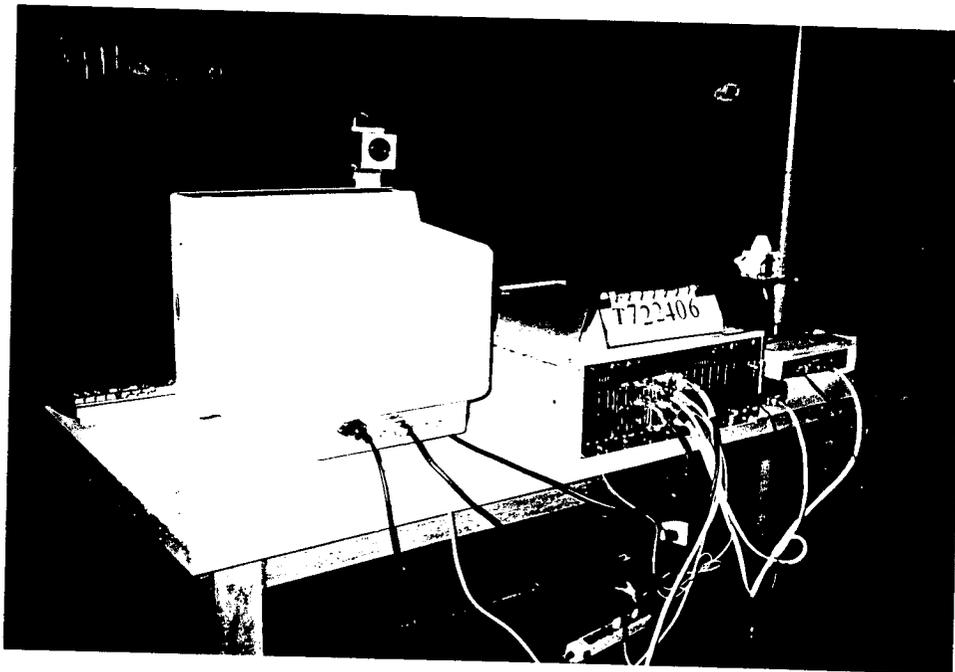
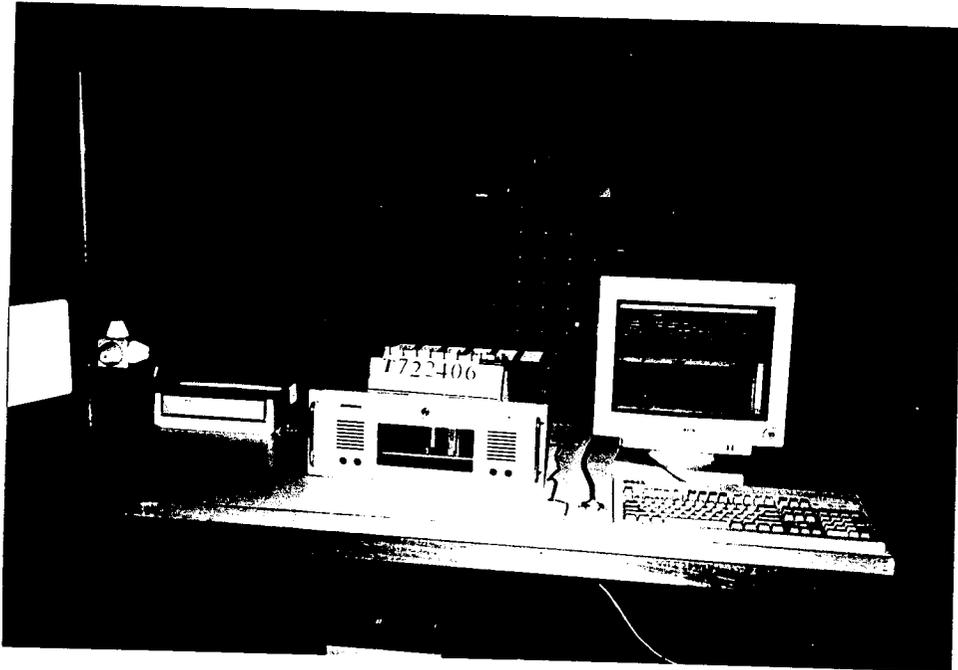
IEC 801-2



Photograph of Test Setup:
Radiated Electromagnetic Field

- Test not applicable

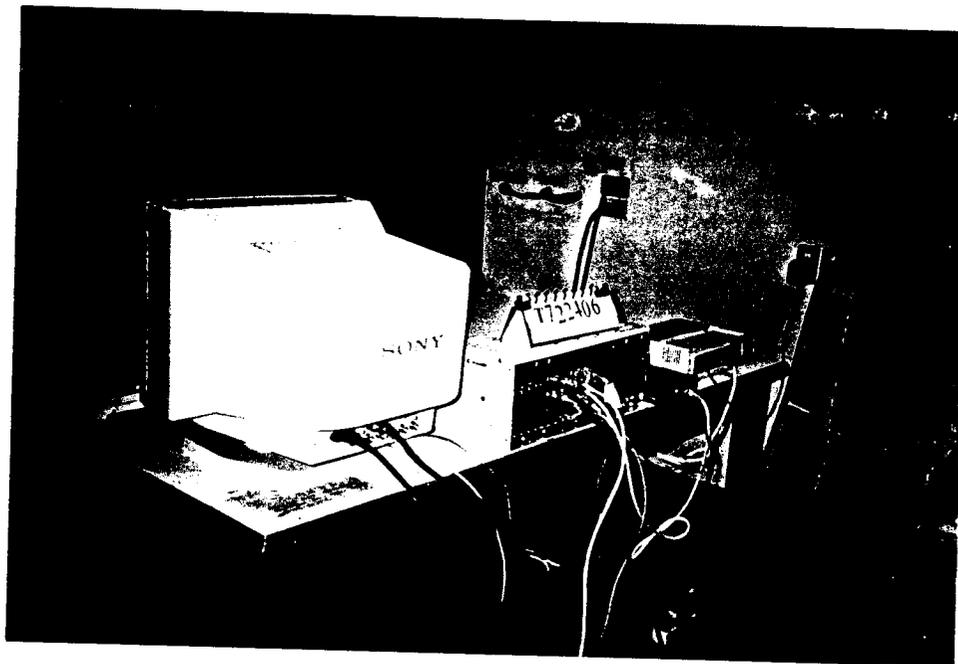
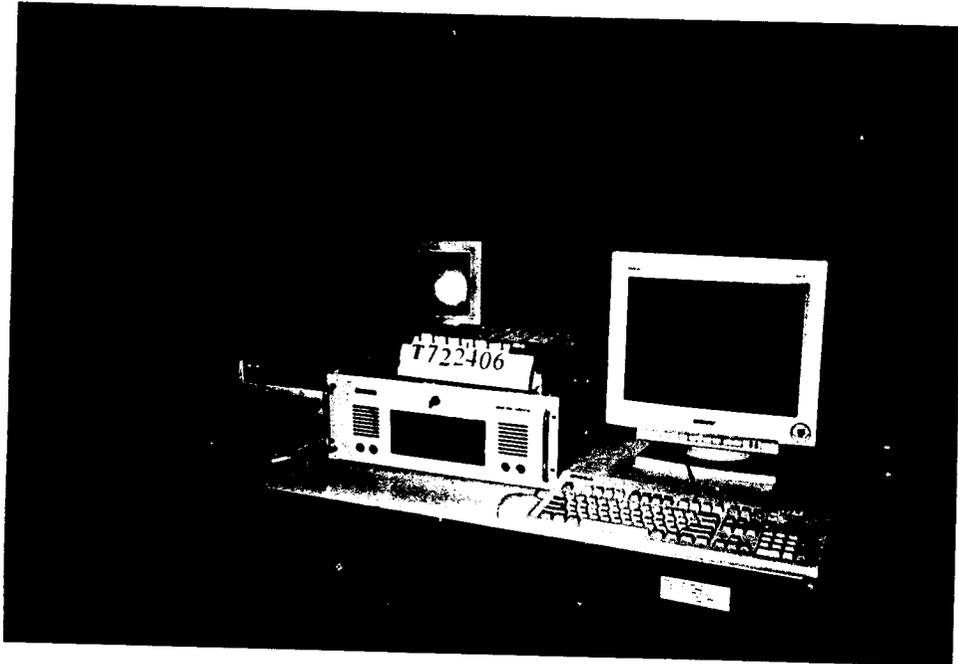
IEC 801-3



Photograph of Test Setup:
Fast transients (BURST)

- Test not applicable

IEC 801-4



Photograph of Test Setup:
Fast transients (BURST)

- Test not applicable

IEC 801-4



Photograph of Test Setup:
SURGE transients

■ - Test not applicable

IEC 801-5
IEC 1000-4-5
EN 61000-4-5

Photograph of Test Setup:
Conducted disturbance

■ - Test not applicable

IEC 801-6
IEC 1000-4-6
ENV 50141

Photograph of Test Setup:
Voltage Dips, Interruptions & Variations

■ - Test not applicable

IEC 1000-4-11
EN 61000-11

Appendix A

ESD Test Point Map,

Test Data Sheets

and

Test Setup Drawing(s)

1. ESD TEST DATA

- Performance Criteria : A
- Level : 3 for Air discharge,
2 for Contact discharge
- Tested Voltage : $\pm 2 / \pm 4 / \pm 8$ KV for Air discharge,
 $\pm 2 / \pm 4$ KV FOR CONTACT DISCHARGE
- Temperature : 20 ° C
- Relative Humidity : 52 %
- Test Date : March 03, 1997

1.1. TEST POINTS

1.1.1. TEST RESULT OF AIR DISCHARGE

TEST POINT	VOLTAGE	TESTED NO.	OBSERVATION	RESULT
BRACKET	$\pm 2 / \pm 4 / \pm 8$ KV	BY 10	NORMAL	<u>PASS</u>
VGA PORT	$\pm 2 / \pm 4 / \pm 8$ KV	BY 10	NORMAL	<u>PASS</u>
COM1 PORT	$\pm 2 / \pm 4 / \pm 8$ KV	BY 10	NORMAL	<u>PASS</u>
PS/2 KEYBOARD PORT	$\pm 2 / \pm 4 / \pm 8$ KV	BY 10	NORMAL	<u>PASS</u>
TP PORT	$\pm 2 / \pm 4 / \pm 8$ KV	BY 10	NORMAL	<u>PASS</u>

1.1.2. TEST RESULT OF CONTACT DISCHARGE

POLARITY	VOLTAGE	TESTED NO.	OBSERVATION	RESULT
HORIZONTAL(AT FRONT)	$\pm 2 / \pm 4$ KV	BY 10	NORMAL	<u>PASS</u>
HORIZONTAL (AT LEFT)	$\pm 2 / \pm 4$ KV	BY 10	NORMAL	<u>PASS</u>
HORIZONTAL (AT RIGHT)	$\pm 2 / \pm 4$ KV	BY 10	NORMAL	<u>PASS</u>
HORIZONTAL (AT REAR)	$\pm 2 / \pm 4$ KV	BY 10	NORMAL	<u>PASS</u>
VERTICAL (AT FRONT)	$\pm 2 / \pm 4$ KV	BY 10	NORMAL	<u>PASS</u>
VERTICAL (AT LEFT)	$\pm 2 / \pm 4$ KV	BY 10	NORMAL	<u>PASS</u>
VERTICAL (AT RIGHT)	$\pm 2 / \pm 4$ KV	BY 10	NORMAL	<u>PASS</u>
VERTICAL (AT REAR)	$\pm 2 / \pm 4$ KV	BY 10	NORMAL	<u>PASS</u>
BRACKET	$\pm 2 / \pm 4$ KV	BY 10	NORMAL	<u>PASS</u>
VGA CONNECTOR	$\pm 2 / \pm 4$ KV	BY 10	NORMAL	<u>PASS</u>
COM1 PORT	$\pm 2 / \pm 4$ KV	BY 10	NORMAL	<u>PASS</u>
PS/2 KEYBOARD PORT	$\pm 2 / \pm 4$ KV	BY 10	NORMAL	<u>PASS</u>

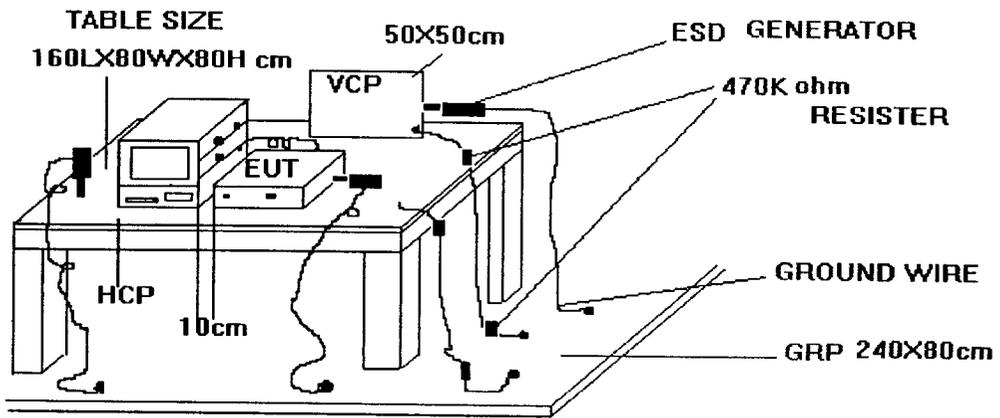
2. RS TEST DATA

- Performance Criteria : A.
- Level : 3
- Frequency Range : 27 to 500 MHz
- Field Strength : 10 V/m (Unmodulated)
- Temperature : 19 ° C
- Relative Humidity : 64 %
- Test Date : March 03, 1997

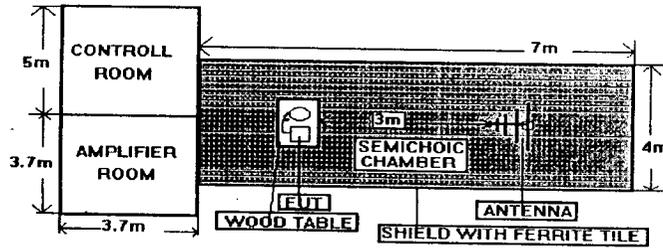
3. EFT TEST DATA

- Performance Criteria : A
- Level : on Power Supply -- 3
on I/O signal, data and control line -- 3
- Test Voltage : on Power Supply -- 0.5 / 1.0 / 2.0 KV
on I/O signal, data and control line -- 0.25 / 0.50 / 1.00 KV
- Temperature : 19 ° C
- Relative Humidity : 64 %
- Test Date : March 03, 1997

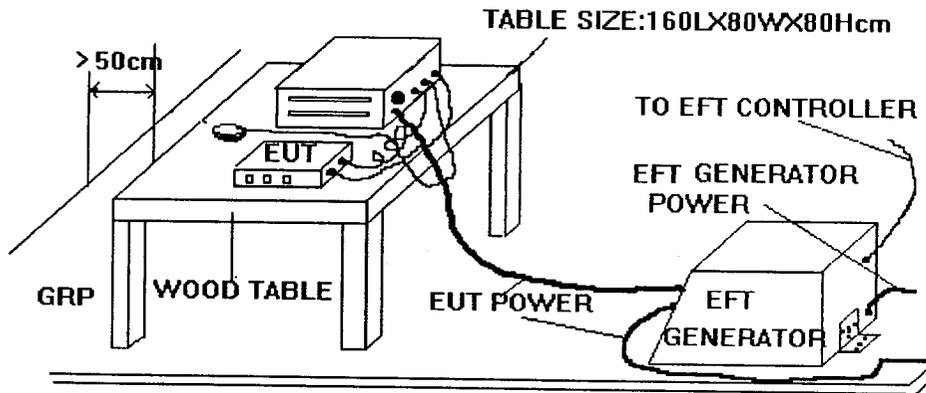
4. ESD TEST SETUP



5. RS TEST SETUP



6. EFT TEST SETUP



Appendix A

Test Data Sheets

and

Test Setup Drawing(s)

1. TEST RESULT OF AC POWERLINE CONDUCTED EMISSION

- Frequency Range of Test : from 0.15 MHz to 30 MHz
- Temperature : 24 °C
- Relative Humidity : 63 % RH
- Test Date : Feb. 28, 1997

1.1. TEST FOR INTEL 486DX4-100, 800x600, 31.5K

The Conducted Emission test of LINE was passed at minimum margin

0.29 MHz / 63.20 dBuV.

Frequency (MHz)	LINE or NEUTRAL	Meter Reading				Limits				Margin	
		Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dB)	A.V. (dB)
0.19	L	61.10	57.60	1135.01	758.58	79.00	66.00	8912.51	1995.26	-17.90	-8.40
0.19	N	60.70	57.70	1083.93	767.36	79.00	66.00	8912.51	1995.26	-18.30	-8.30
0.29	L	63.20	63.00	1445.44	1412.54	79.00	66.00	8912.51	1995.26	-15.80	-3.00
0.29	N	62.70	62.70	1364.58	1364.58	79.00	66.00	8912.51	1995.26	-16.30	-3.30
24.01	L	56.60	43.90	676.08	156.68	79.00	66.00	8912.51	1995.26	-22.40	-22.10
24.01	N	57.30	45.20	732.82	181.97	79.00	66.00	8912.51	1995.26	-21.70	-20.80

1.2. TEST FOR INTEL 486DX4-100, 1024x768, 87H, 36Kz

The Conducted Emission test of LINE was passed at minimum margin

0.29 MHz / 63.10 dBuV.

Frequency (MHz)	LINE or NEUTRAL	Meter Reading				Limits				Margin	
		Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dB)	A.V. (dB)
0.19	L	60.80	57.60	1096.48	758.58	79.00	66.00	8912.51	1995.26	-18.20	-8.40
0.19	N	60.60	57.50	1071.52	749.89	79.00	66.00	8912.51	1995.26	-18.40	-8.50
0.29	L	63.10	62.90	1428.89	1396.37	79.00	66.00	8912.51	1995.26	-15.90	-3.10
0.29	N	62.90	62.90	1396.37	1396.37	79.00	66.00	8912.51	1995.26	-16.10	-3.10
24.01	L	57.80	45.30	776.25	184.08	79.00	66.00	8912.51	1995.26	-21.20	-20.70
24.01	N	57.10	45.90	716.14	197.24	79.00	66.00	8912.51	1995.26	-21.90	-20.10

2. TEST RESULT OF RADIATED EMISSION (ELECTRIC FIELD)

- Test Distance : 10 M
- Temperature : 22 °C
- Relative Humidity : 65 % RH
- Test Date :Feb. 25, 1997
- Equipment meets the technical specifications of EN 55022
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Sample Calculation at 50.06 MHz
Corrected Reading = 7.98 + 1.20 + 23.13 = 32.31 (dBuV/m)

2.1. TEST FOR INTEL 486DX4-100, 800x600, 31.5K

The Radiated Emission test was passed at minimum margin 133.87 MHz / 34.97 dBuV.

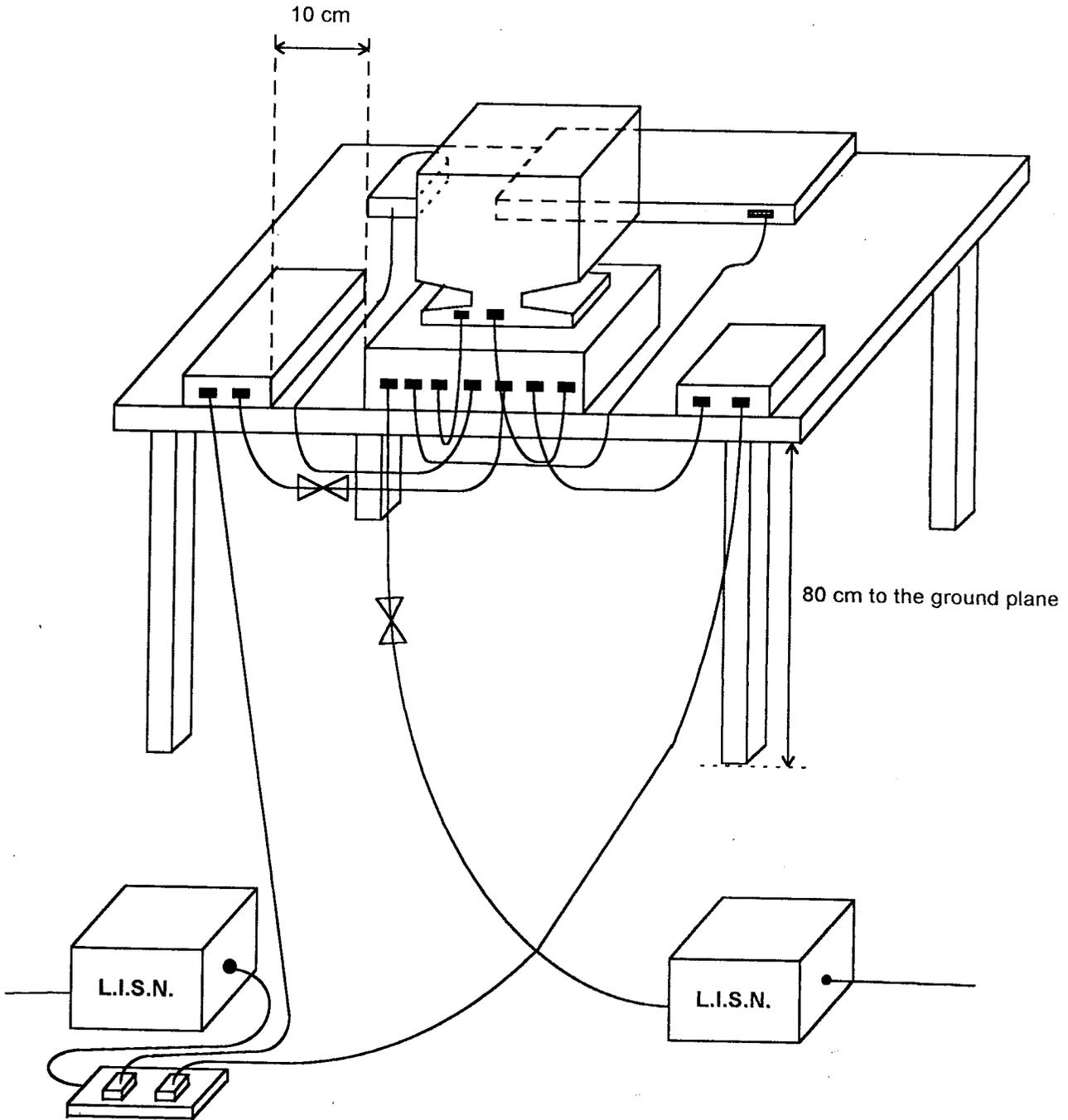
Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV/m) (uV/m)	Emission (dBuV/m)	Level (uV/m)	Margin (dB)
50.06	V	7.98	1.20	23.13	40.00 100	32.31	41.26	-7.69
110.24	H	10.43	1.90	20.18	40.00 100	32.51	42.22	-7.49
111.60	V	10.62	1.88	16.91	40.00 100	29.42	29.58	-10.58
133.87	V	11.39	2.18	21.39	40.00 100	34.97	56.04	-5.03
176.37	V	9.27	2.02	20.32	40.00 100	31.61	38.06	-8.39
200.00	H	9.10	2.30	22.68	40.00 100	34.08	50.58	-5.92

2.2. TEST FOR INTEL 486DX4-100, 1024x768, 87H, 36Kz

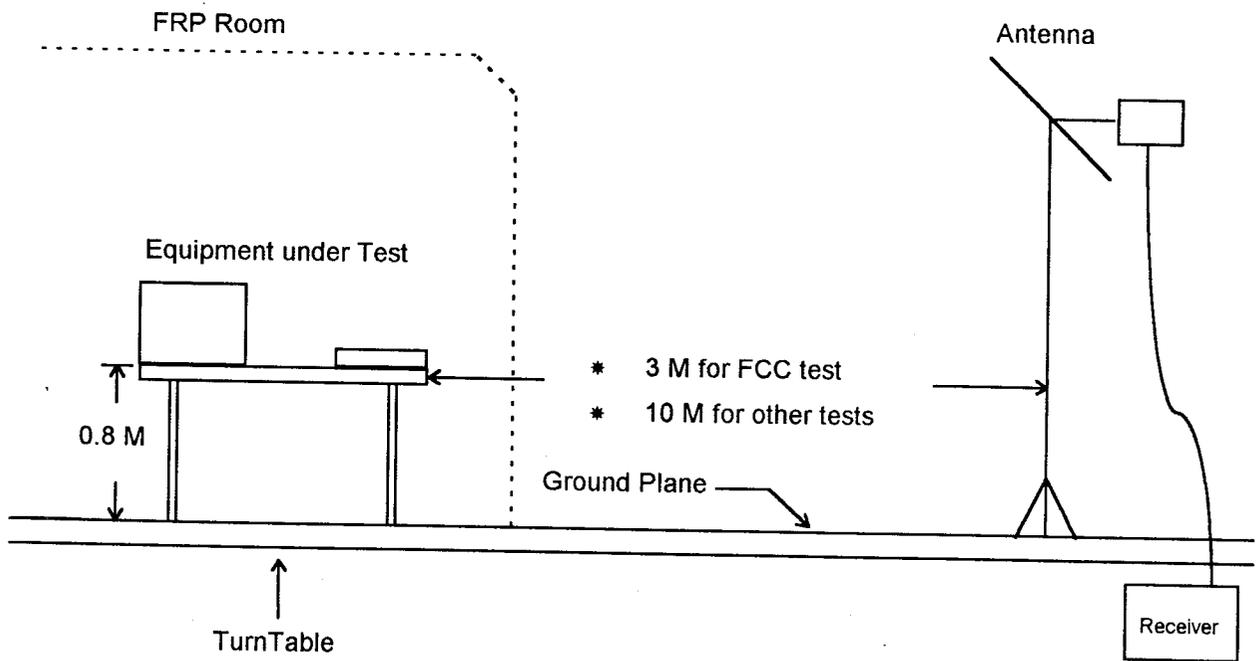
The Radiated Emission test was passed at minimum margin 216.00 MHz / 35.92 dBuV.

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV/m) (uV/m)	Emission (dBuV/m)	Level (uV/m)	Margin (dB)
114.57	V	11.04	1.85	21.12	40.00 100	34.01	50.18	-5.99
114.66	V	11.05	1.85	22.62	40.00 100	35.53	59.77	-4.47
133.36	V	11.37	2.20	21.09	40.00 100	34.66	54.08	-5.34
192.01	H	9.06	2.18	23.50	40.00 100	34.74	54.58	-5.26
200.00	H	9.10	2.30	23.08	40.00 100	34.48	52.97	-5.52
216.00	H	9.36	2.43	24.14	40.00 100	35.92	62.52	-4.08

3. TEST SETUP DRAWING OF CONDUCTED EMISSION



4. TEST SETUP DRAWING OF RADIATED EMISSION



TÜV PRODUCT SERVICE ASIA LTD.

5F., No.4, Lane 609, Chung Hsin Rd., Sec.5,
 San Chung City, Taipei Hsien, Taiwan, R.O.C.
 Tel: +886-2-999-3950; Fax: +886-2-999-3949



Constructional Data Form For EMC/TELECOM Testing

Applicant: Advantech Co., Ltd.
 (Company Name)
4F., No.108-3, Ming Chuan Rd., Hsin Tien City, Taipei Hsien, Taiwan.
 (Address)

Manufacturer: Advantech Co., Ltd.
 (Company Name)
3F., No.168, Lien Cheng Rd., Chung Ho City, Taipei Hsien, Taiwan. R.O.C.
 (Address)

Type of equipment: CPU Board

Model designation: PCA-6145B, PCA-6145L Serial no. _____

Rated voltage: ± 12VDC, ± 5VDC
 Rated frequency: _____
 Rated input current: _____
 Protection class: _____

Type of interference (please tick the applicable):
 Broad band interference
 Narrow band interference
 Click interference

Operation mode (s): _____
 Repetition frequencies (please tick the applicable):
 < 10kHz; > 10kHz;

Sources of interference: CLK Generator
 (e.g. motor, switch mode power supply, quartz oscillator etc.)

Internal frequencies: 14.318MHz, 24MHz, 33MHz, 66MHz
 (e.g. clock frequency, deflection frequency, switching frequency)

RFI suppression components: N.A.

Measures for electromagnetic shielding: Metal Enclosure, Shielding Cable

External interfacess and connections: Shielding

Technical parameters: N.A.

Adjustable parameters: N.A.

Kind of modulation, carrier frequencies: N.A.

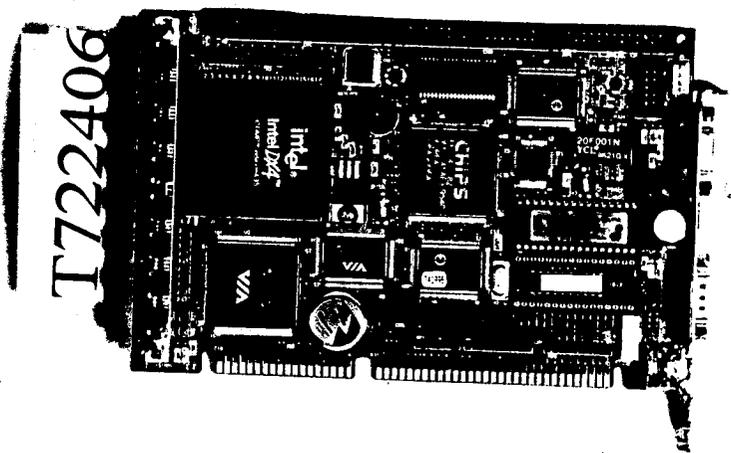
Wave length, modulation frequencies: N.A.

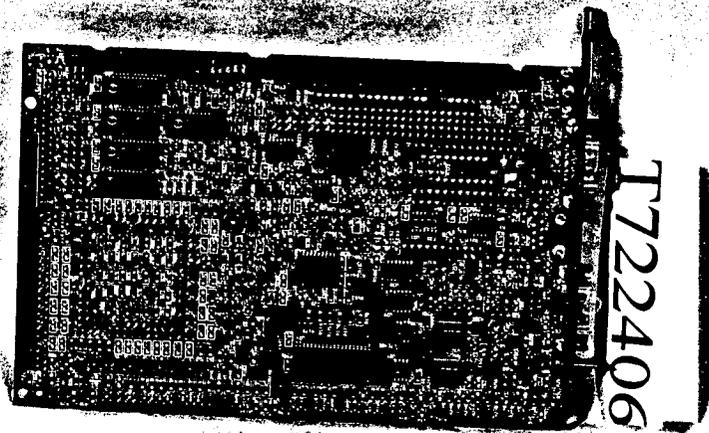
(Date)

Authorized Signature
 (Applicant's authorized signature)

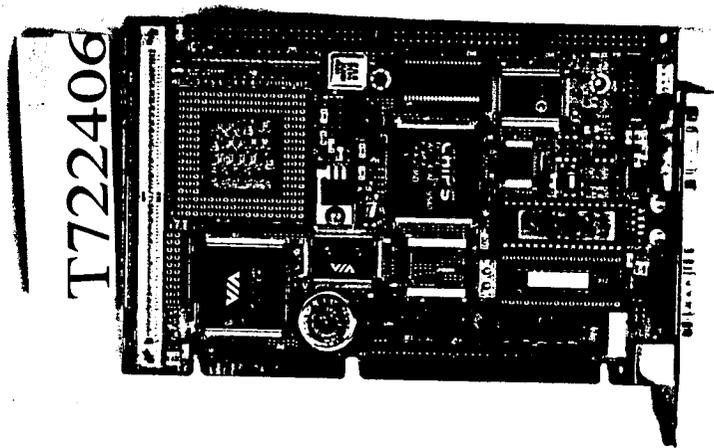
Appendix C

Constructional Photographs





T722406



T722406

