



EMC

TEST REPORT

REPORT NO. : CE87033103
MODEL NO. : PCA-6155V, PCA-6159H,
PCA-6159V, PCA-6159F
DATE OF TEST : April 1 ~ April 8, 1998

PREPARED FOR : ADVANTECH CO., LTD.

ADDRESS : FL. 4, NO. 108-3, MING-CHUAN ROAD,
SHING-TIEN CITY TAIPEI HSIEN, TAIWAN

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

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TAIPEI, TAIWAN, R.O.C.

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1.

CERTIFICATION

Issue date: April 14, 1998

Product : CPU BOARD
Trade Name : ADVANTECH
Model No. : PCA-6155V, PCA-6159H, PCA-6159V, PCA-6159F
Applicant : ADVANTECH CO., LTD.
Standard : EN 55022:1994, Class A **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

We hereby certify that one sample of the designation has been tested in our facility from April 1 to April 8, 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.

CHECKED BY : Sharon Hsiung, DATE: 4/14/98
(Sharon Hsiung)

APPROVED BY: Mike Su, DATE: 4/14/98
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	CPU BOARD
Model No.	:	PCA-6155V, PCA-6159H, PCA-6159V, PCA-6159F
Power Supply Type	:	DC (from PC)
Power Cord	:	N/A

Note: The EUT has four model names which are identical to each other in all aspects except for the following:

- Model: PCA-6155V, Pentium full-size CPU card with VGA, CRT, LCD, LAN, SCSI
- Model: PCA-6159H, Pentium full-size high drive CPU card with VGA CRT, LCD, LAN, SCSI
- Model: PCA-6159V, Pentium full-size CPU card with VGA
- Model: PCA-6159F, Pentium full-size CPU card with VGA, CRT, LAN, SCSI

From the above models, model: PCA-6155V and PCA-61589H were selected as representative models for the test, and its data is recorded in this report.

The EUT was tested with the following configuration:

- CHASIS: ADVANTECH, model: IPC-610
- CPU: Pentium 200, AMD, K6
- SCSI HDD: IBM, model: EI6007-A
- FDD: TEAC, model: FD-235HF
- POWER SUPPLY: SKYNET, model: ADT-925C

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

Intel Pentium 200 Speed: 200 MHz (the frequency of clock
generator is 66.6 MHz)

The video resolution of 1024x768 was used during the test.

For more detailed features description, please refer to manufacturer's specification or User's Manual.

2.2 GENERAL DESCRIPTION OF APPLIED STANDARD

According to the manufacturer's request, the EUT was tested with the requirements of the following standards:

EN 55022:1994, Class A

EN50 082-2:1995
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	COLOR MONITOR	ADI	937G	649015T00102095A	Shielded Signal (1.4m) Nonshielded Power (1.8m)
2	PRINTER	HP	2225C+	3208S05355	Shielded Signal (2.2m) Nonshielded Power (1.9m)
3	MODEM	DATATRONICS	1200CK	02-542193	Shielded Signal (1.2m) Nonshielded Power (1.9m)
4	MOUSE	LOGITECH	M-M30	LTR53500780	Shielded Signal (1.5m)
5	KEYBOARD	BTC	5139	853300109	Shielded Signal (1.8m)
6	USB KEYBOARD	BTC	7932	D7A140018	Shielded Signal (1.8m)
7	PERSONAL COMPUTER	ACER	PT75WB	TJ53521	Nonshielded Power (1.8m)
8	COLOR MONITOR	ADI	SM5514A	521S030303A	Shielded Signal (1.5m) Nonshielded Power (1.8m)
9	KEYBOARD	HP	C3757A	C3757A-60223	Shielded Signal (2m)
10	HUB	ACCTON	EN2040	N/A	Nonshielded Signal (10m)
11	LAN CARD	INTEL	PILA8465	N/A	Shielded Signal (1.8m)

Note: 1. One USB cables (1.8m) was connected to the USB ports of Industrial PC to form a open loop cable.

2. Industrial PC acted as SERVER PC and communicated with support unit 7-9 which acted as HOST PC and systems of communication via support unit 10 and 11.



FOR IMMUNITY TEST

No	Product	Brand	Model No.	Serial No.	I/O Cable
1	COLOR MONITOR	ACTION	MV-0951	N/A	Shielded Signal (1.4m) Nonshielded Power (1.4m)
2	PRINTER	HP	C2145A	SG5BN160GY	Shielded Signal (2.2m) Nonshielded Power (1.9m)
3	MODEM	GVC	F-1114V/R6	853E100	Shielded Signal (1.5m) Nonshielded Power (1.9m)
4	MOUSE	LOGITECH	M-M30	LTR53500777	Shielded Signal (1.9m)
5	KEYBOARD	HP	C3753A	L3753-60223	Shielded Signal (1.8m)
6	USB KEYBOARD	BTC	7932	L3753-60223	Shielded Signal (1.8m)
7	PERSONAL COMPUTER	ACER	PT75WB	TJ53521	Nonshielded Power (1.8m)
8	COLOR MONITOR	ADI	SM5514A	521S030303A	Shielded Signal (1.5m) Nonshielded Power (1.8m)
9	KEYBOARD	HP	C3757A	C3757A-60223	Shielded Signal (2m)
10	HUB	ACCTON	EN2040	N/A	Nonshielded Signal (10m)
11	LAN CARD	INTEL	PILA8465	N/A	Shielded Signal (1.8m)

Note: 1. One USB cables (1.8m) was connected to the USB ports of Industrial PC to form a open loop cable.

2. Industrial PC acted as SERVER PC and communicated with support unit 7-9 which acted as HOST PC and systems of communication via support unit 10 and 11.

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	3441A01439	Sept. 8, 1998
HP Preamplifier	8447D	2944A08485	April 26, 1998
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Aug. 22, 1998
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE BiLOG Antenna	CBL6112A	2221	Aug. 19, 1998
EMCO Turn Table	1060	1115	N/A
SHOSHIN Tower	AP-4701	A6Y005	N/A
Open Field Test Site	Site 5	ADT-R05	Aug. 18, 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	828765/002	July 31, 1998
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	828075/003	July 28, 1998
EMCO-L.I.S.N.	3825/2	90031627	July 28, 1998
Shielded Room	Site 5	ADT-C05	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.



3.2 TEST INSTRUMENTS (IMMUNITY)

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
KeyTek, ESD Test System	2000	9105240/41	Aug. 10, 1998
KeyTek, ESD Simulator	MZ-15/EC	92022232	June 11, 1998
KeyTek, EFT Generator	CE-40	9508257	Sept. 9, 1998
KeyTek, Capacitive Clamp	CE-40-CCL	9508259	Sept. 9, 1998
ROHDE & SCHWARZ Signal Generator	SMY01	840490/009	Sept. 29, 1998
KALMUS Power Amplifier	LA1000V	091995-1	N/A
KALMUS Power Amplifier	757LC	091995-2	N/A
HOLADAY Field Probe	HI-4422	89915	Oct. 12, 1998
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
BOONTON RF Voltage Meter	9200B	331801AE	Sept. 29, 1998
COMTEST Compact Full Anechoic Chamber (7x3x3 m)	CFAC	ADT-S01	Aug. 4, 1998
HAEFELY Magnetic Field Tester	MAG 100.1	083794-06	N/A
COMBINOVA Magnetic Field Meter	MFM10	224	June 5, 1998

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

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



4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Product Family Standard : EN 55 022, Class A
Frequency Range : 0.15 - 30 MHz (Conducted Emission)
30 - 1000 MHz (Radiated Emission)
Input Voltage : 230 Vac, 50 Hz
Temperature : 28 °C
Humidity : 59 %
Atmospheric Pressure : 1060 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -25.9 dB at 3.147 MHz
	Minimum passing margin of radiated emission: -3.4 dB at 31.00 MHz

4.1.1 EUT OPERATION CONDITION

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



4.1.2 TEST DATA OF CONDUCTED EMISSION (A)

EUT: CPU BOARD

MODEL: PCA-6155V

6 dB Band Width: 10 kHz

TEST PERSONNEL: John Liao

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
0.192	41.70	-	42.60	-	79.00	66.00	-37.3	-	-36.4	-
0.642	35.30	-	31.70	-	79.00	66.00	-43.7	-	-47.3	-
1.603	39.00	-	34.40	-	73.00	60.00	-34.0	-	-38.6	-
4.947	39.20	-	31.60	-	73.00	60.00	-33.8	-	-41.4	-
11.477	36.80	-	35.80	-	73.00	60.00	-36.2	-	-37.2	-
18.461	33.40	-	31.60	-	73.00	60.00	-39.6	-	-41.4	-

- Remarks:
1. "*": Undetectable
 2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 4. The emission level of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value

ADT CO. SITE 5

EN55022 CLASS A

01. Apr 98 11:51

EUT: MODEL: PCA-6155V

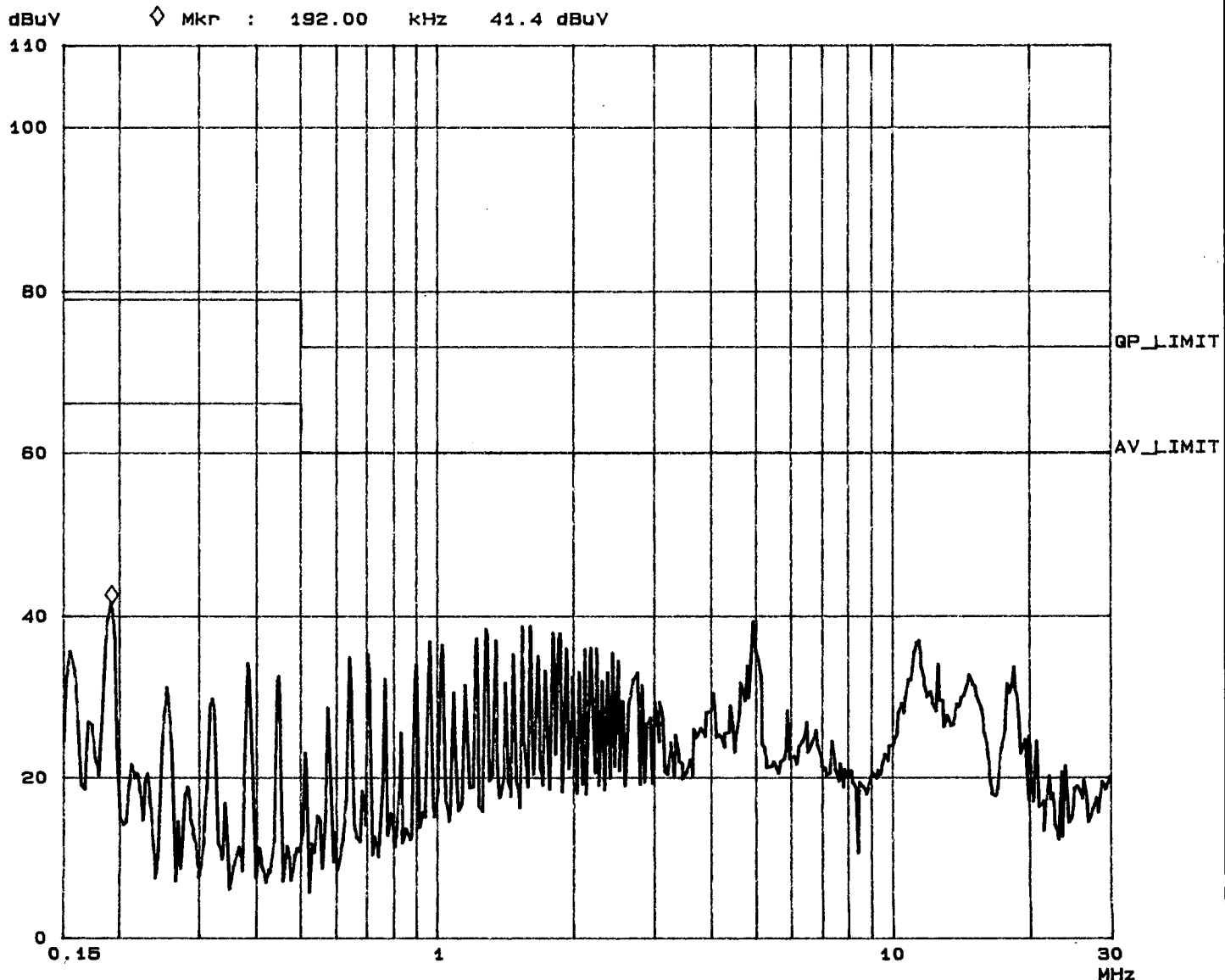
Test Spec: LISN : L

Comment: 230V AC/50Hz

FULL SYSTEM

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	450k	3k	10K	PK	0.05ms	10dBLN	OFF	60dB
450k	5M	3k	10K	PK	0.05ms	10dBLN	OFF	60dB
5M	30M	3k	10K	PK	0.05ms	10dBLN	OFF	60dB



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Tested by John Liao

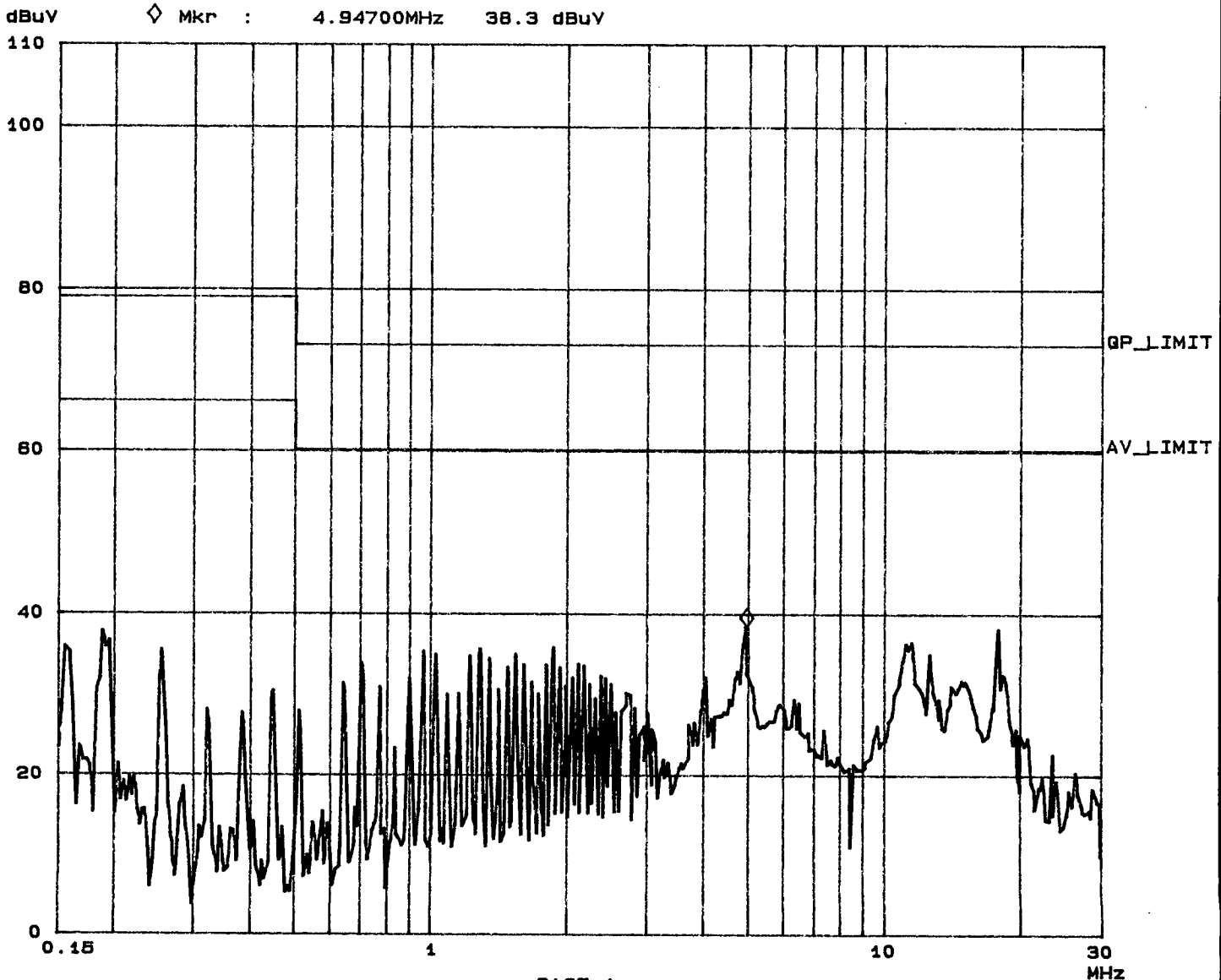
ADT CO. SITE 5
EN55022 CLASS A

01. Apr 98 11:56

EUT: MODEL: PCA-6155V
Test Spec: LISN : N
Comment: 230V AC/50Hz
FULL SYSTEM

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	450k	3k	10k	PK	0.05ms	10dB	OFF	60dB
450k	5M	3k	10k	PK	0.05ms	10dB	OFF	60dB
5M	30M	3k	10k	PK	0.05ms	10dB	OFF	60dB





4.1.3 TEST DATA OF CONDUCTED EMISSION (B)

EUT: CPU BOARD

MODEL: PCA-6159H

6 dB Band Width: 10 kHz

TEST PERSONNEL: John Liao

Freq. [MHz]	L Level [dB (μV)]		N Level [dB (μV)]		Limit [dB (μV)]		Margin [dB (μV)]			
							L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.186	44.50	-	46.20	-	79.00	66.00	-34.5	-	-32.8	-
0.370	36.20	-	33.20	-	79.00	66.00	-42.8	-	-45.8	-
1.790	36.60	-	34.30	-	73.00	60.00	-36.4	-	-38.7	-
3.147	47.10	-	38.80	-	73.00	60.00	-25.9	-	-34.2	-
12.014	39.30	-	37.60	-	73.00	60.00	-33.7	-	-35.4	-
29.513	28.10	-	26.70	-	73.00	60.00	-44.9	-	-46.3	-

- 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 level of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value

ADT CO. SITE 5
EN55022 CLASS A

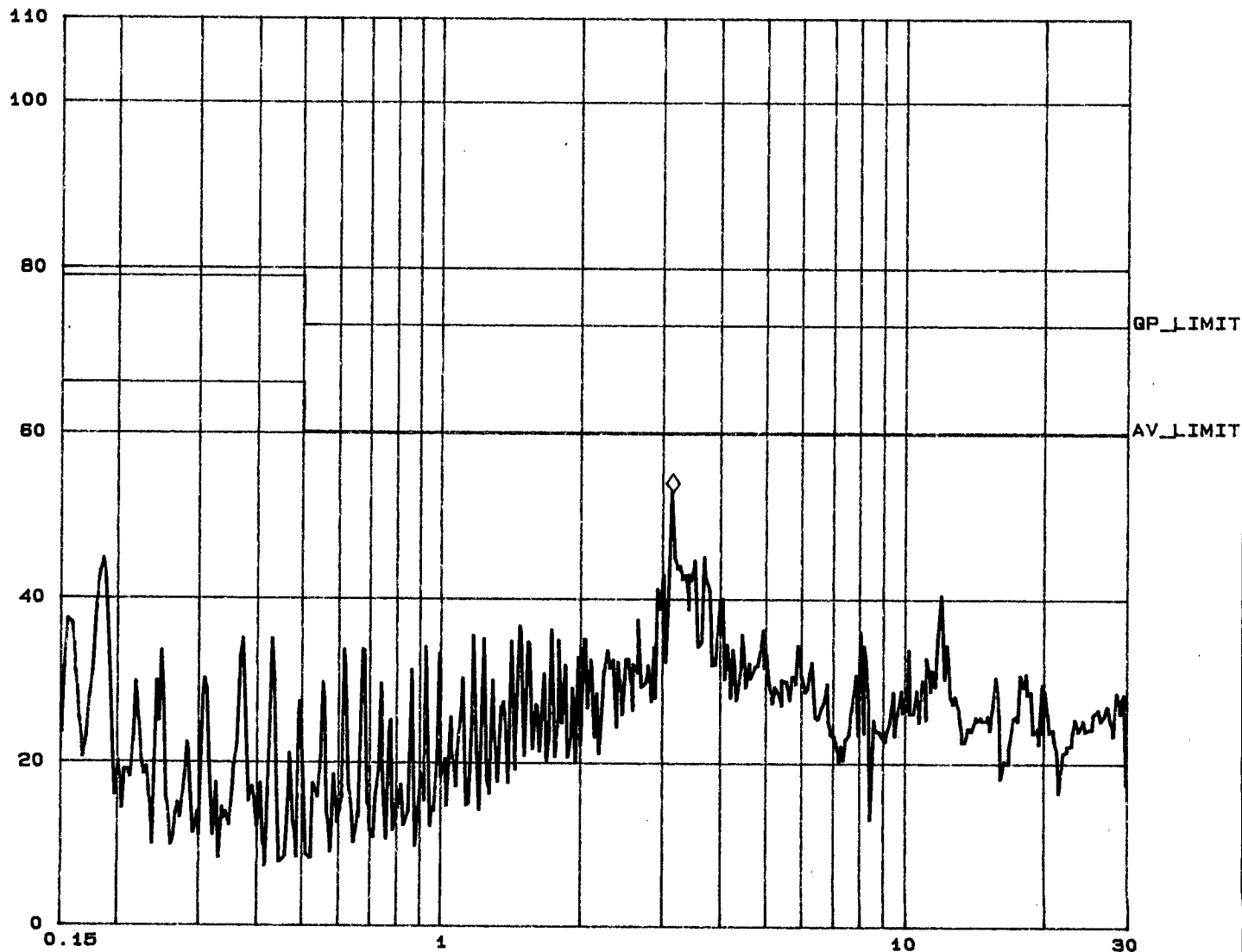
01, Apr 98 14:11

EUT: MODEL: PCA-6159H
Test Spec: LISN : L
Comment: 230V AC/50Hz
FULL SYSTEM

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	450k	3k	10k	PK	0.05ms	10dB	OFF	60dB
450k	5M	3k	10k	PK	0.05ms	10dB	OFF	60dB
5M	30M	3k	10k	PK	0.05ms	10dB	OFF	60dB

dBuV ◇ Mkr : 3.14100MHz 52.9 dBuV



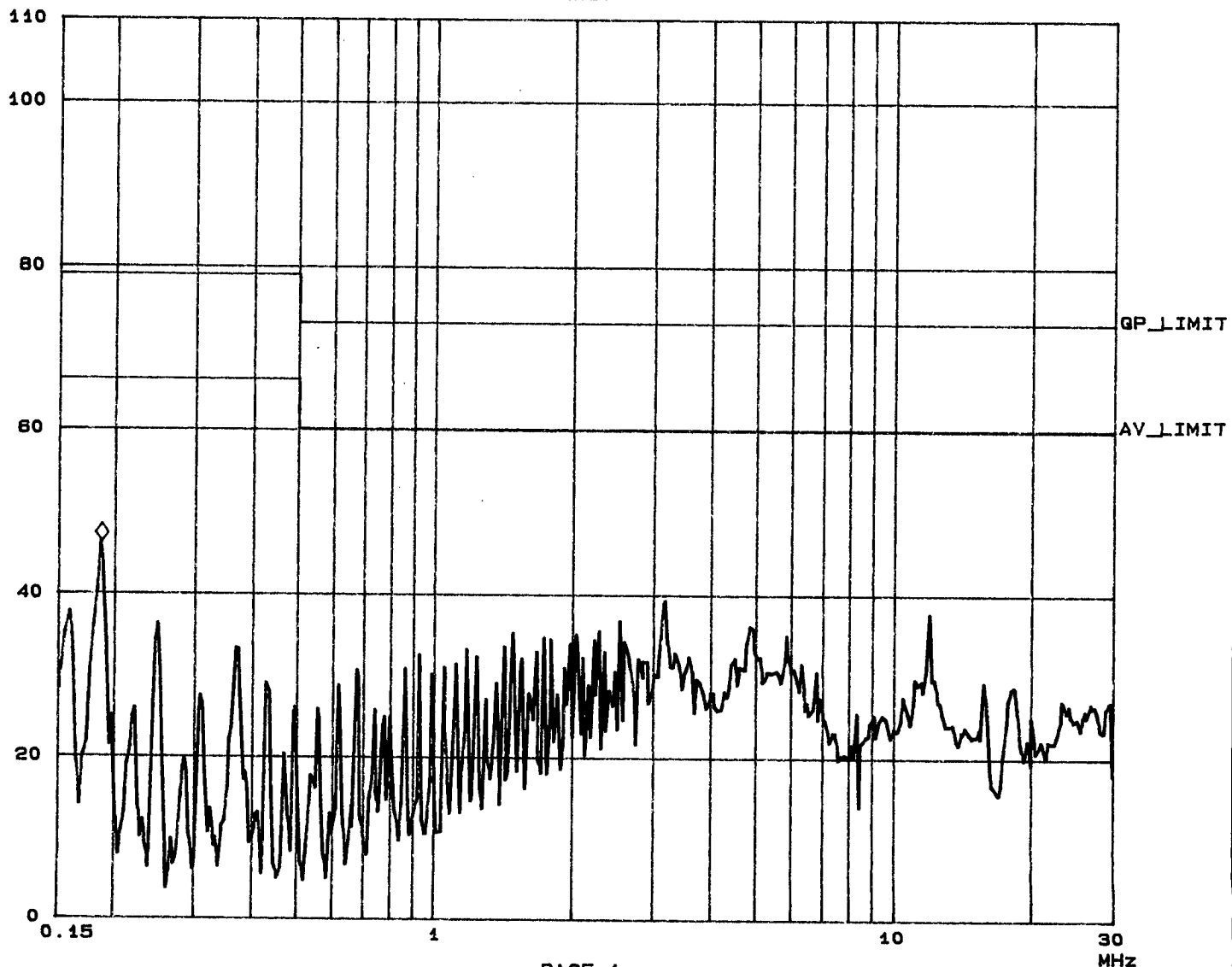
01. Apr 98 14:06

ADT CO. SITE 5
EN55022 CLASS AEUT: MODEL: PCA-6159H
Test Spec: LIGN : N
Comment: 230V AC/50Hz
FULL SYSTEM

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	450k	3k	10k	PK	0.05ms	10dBLN	OFF	60dB
450k	5M	3k	10k	PK	0.05ms	10dBLN	OFF	60dB
5M	30M	3k	10k	PK	0.05ms	10dBLN	OFF	60dB

dBuV ◇ Mkr : 186.00 kHz 46.2 dBuV





4.1.4 TEST DATA OF RADIATED EMISSION (A)

EUT: CPU BOARD

MODEL: PCA-6155V

ANTENNA: CHASE BILOG CBL6112A

POLARITY: Horizontal

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

TEST PERSONNEL: John Liao

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
167.76	12.2	8.0	20.2	40.0	-19.8
200.56	13.0	15.2	28.2	40.0	-11.8
264.55	17.6	19.9	37.5	47.0	-9.5
300.81	17.1	19.4	36.5	47.0	-10.5
367.68	19.0	10.5	29.5	47.0	-17.5
434.50	21.5	16.5	38.0	47.0	-9.0
467.94	22.3	16.3	38.6	47.0	-8.4

- 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 (A)

EUT: CPU BOARD

MODEL: PCA-6155V

ANTENNA: CHASE BILOG CBL6112A

POLARITY: Vertical

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

TEST PERSONNEL: John Liao

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
31.00	17.7	18.9	36.6	40.0	-3.4
167.13	12.4	16.2	28.6	40.0	-11.4
192.06	12.8	17.5	30.3	40.0	-9.7
200.58	13.7	18.6	32.3	40.0	-7.7
367.80	17.6	9.9	27.5	47.0	-19.5
434.53	20.1	18.9	39.0	47.0	-8.0
467.93	21.7	14.7	36.4	47.0	-10.6

- 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



4.1.5 TEST DATA OF RADIATED EMISSION (B)

EUT: CPU BOARD

MODEL: PCA-6159H

ANTENNA: CHASE BILOG CBL6112A

POLARITY: Horizontal

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

TEST PERSONNEL:

John Liao

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
168.12	12.2	14.9	27.1	40.0	-12.9
200.55	13.0	13.1	26.1	40.0	-13.9
216.17	14.1	16.2	30.3	40.0	-9.7
300.84	17.1	14.7	31.8	47.0	-15.2
336.23	18.0	14.7	32.7	47.0	-14.3
367.70	19.0	17.9	36.9	47.0	-10.1
401.10	20.2	22.0	42.2	47.0	-4.8
802.20	26.6	8.7	35.3	47.0	-11.7

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 (B)

EUT: CPU BOARD

MODEL: PCA-6159H

ANTENNA: CHASE BILOG CBL6112A

POLARITY: Vertical

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

TEST PERSONNEL: John Liao

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.00	17.9	8.8	26.7	40.0	-13.3
117.00	12.8	15.0	27.8	40.0	-12.2
168.12	12.3	16.8	29.1	40.0	-10.9
176.31	11.7	19.5	31.2	40.0	-8.8
201.48	13.7	16.4	30.1	40.0	-9.9
216.15	14.5	17.3	31.8	40.0	-8.2
222.15	14.9	14.5	29.4	40.0	-10.6
300.82	18.0	19.9	37.9	47.0	-9.1
312.20	17.8	13.8	31.6	47.0	-15.4
367.69	17.6	17.6	35.2	47.0	-11.8

- 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



5. TEST RESULTS (IMMUNITY)

5.1 GENERAL DESCRIPTION

Basic Standard	:	EN 61000-4-2	(Electrostatic Discharge Test, ESD)
	:	EN 61000-4-3	(Radiated Radio-Frequency Disturbance Test, RS)
	:	EN 61000-4-4	(Electrical Fast Transient/Burst Test, EFT)
	:	EN 61000-4-6	(Conducted Radio Frequency Disturbances Test, CS)
	:	EN 61000-4-8	(Power Frequency Magnetic Field Test)
	:	ENV 50204	(Radio-Frequency Electromagnetic Field, Pulse modulated)
Generic Standard	:	EN 50 082-2	
Input Voltage	:	230 Vac, 50 Hz	
Temperature	:	18 °C	
Humidity	:	59 %	
Atmospheric Pressure	:	1060 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 Personnel : Thomas Tuny

Test Result		Remarks
Criterion A	PASS	Model: PCA-6155V
Criterion A	PASS	Model: PCA-6159H

OBSERVATION DESCRIPTION

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

Description of test point:

1. All screws
2. All I/O connector
3. Metal case
4. FDD
5. Front panel control switch

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. Left side
3. Right side
4. Rear 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 Personnel :

Thomas Tung

Test Result		Remarks
Criterion A	PASS	Model: PCA-6155V
Criterion A	PASS	Model: PCA-6159H

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 - 1 kV
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 Personnel :

Thomas Jung

Test Result		Remarks
Criterion A	PASS	Model: PCA-6155V
Criterion A	PASS	Model: PCA-6159H

OBSERVATION DESCRIPTION (Model: PCA-6155V)

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

OBSERVATION DESCRIPTION (Model: PCA-6195H)

Test Point	Polarity	Test Level (kV)	Result
L1	+/-	2	Note 1
L2	+/-	2	Note 1
GND	+/-	2	Note 1
Signal/Control Line	+/-	1	Note 1

Description of test result:

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



5.7 TEST RESULT OF CONDUCTED RADIO FREQUENCY DISTURBANCES (CS)

Basic Standard : EN 61000-4-6
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 Personnel : Thomas Tung

Test Result		Remarks
Criterion A	PASS	Model: PCA-6155V
Criterion A	PASS	Model: PCA-6159H

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 Personnel : Thomas Tung

Test Result		Remarks
Criterion A	PASS	Model: PCA-6155V
Criterion A	PASS	Model: PCA-6159H

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 Personnel :

Thomas Tury

Test Result		Remarks
Criterion A	PASS	Model: PCA-6155V
Criterion A	PASS	Model: PCA-6159H

Note: Four sides of PC system are verified separately.

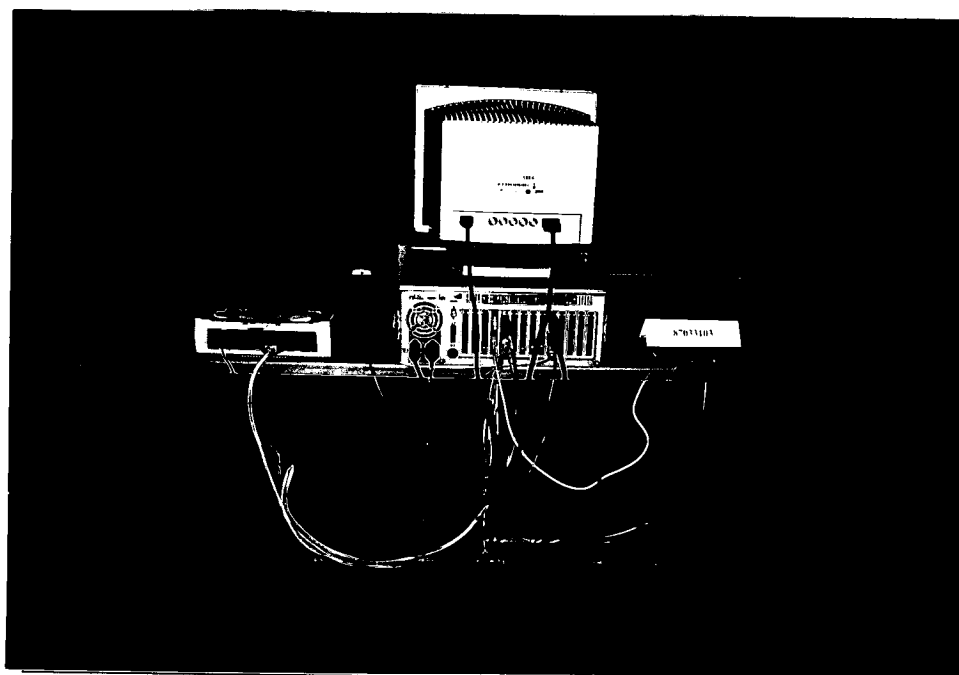
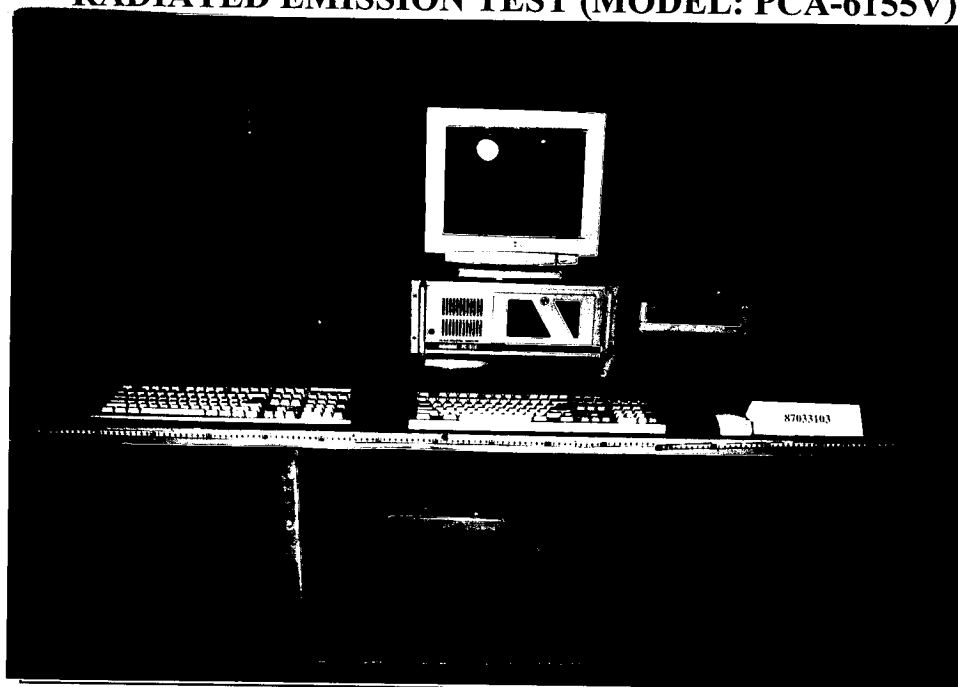
OBSERVATION DESCRIPTION

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



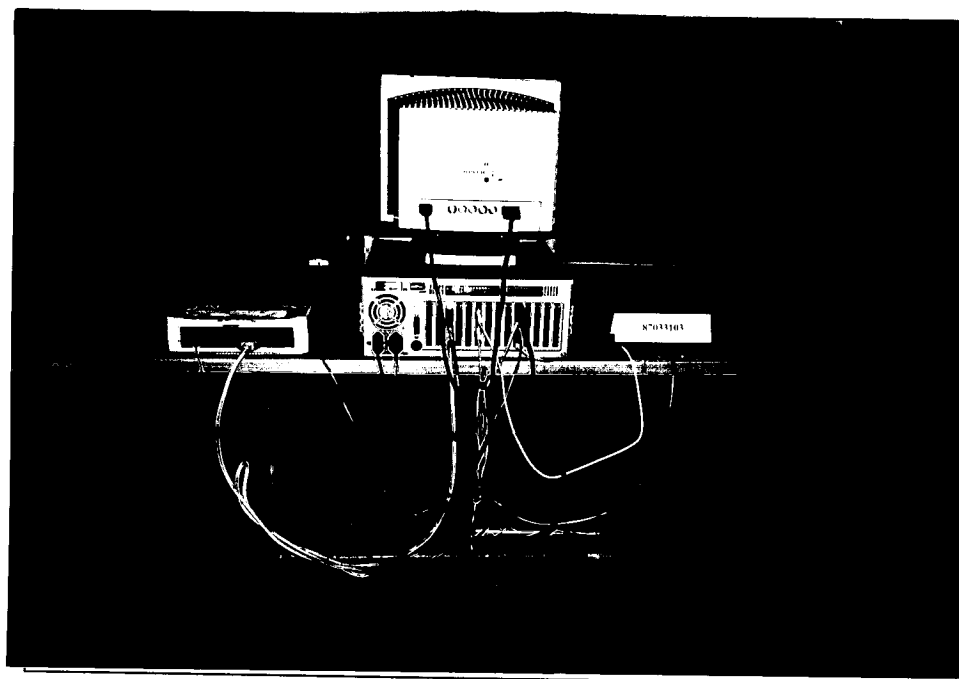
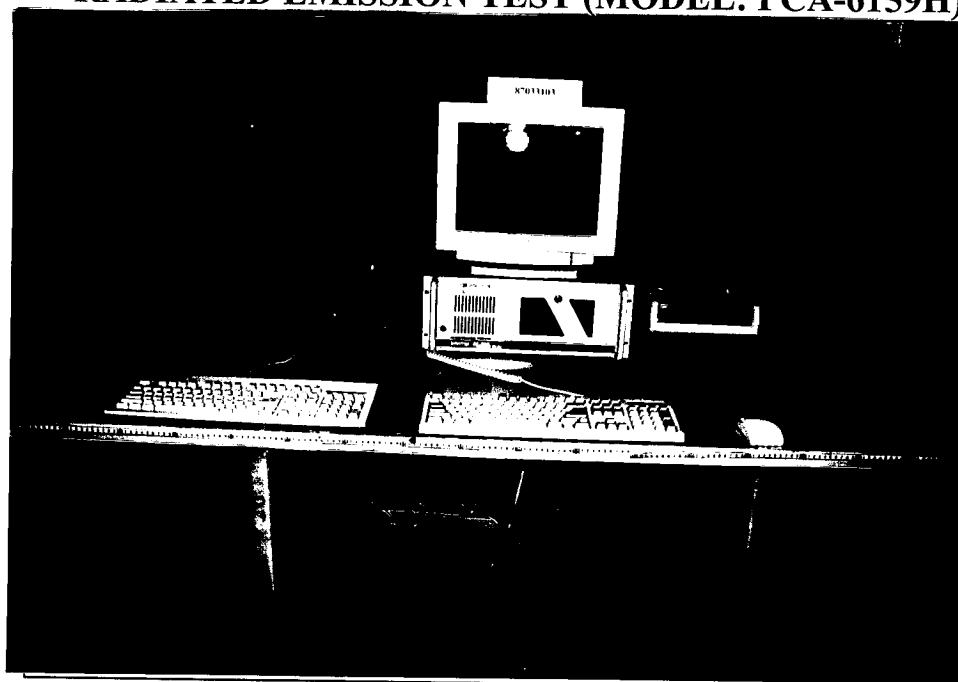
6. PHOTOGRAPHS OF THE TEST CONFIGURATION

RADIATED EMISSION TEST (MODEL: PCA-6155V)



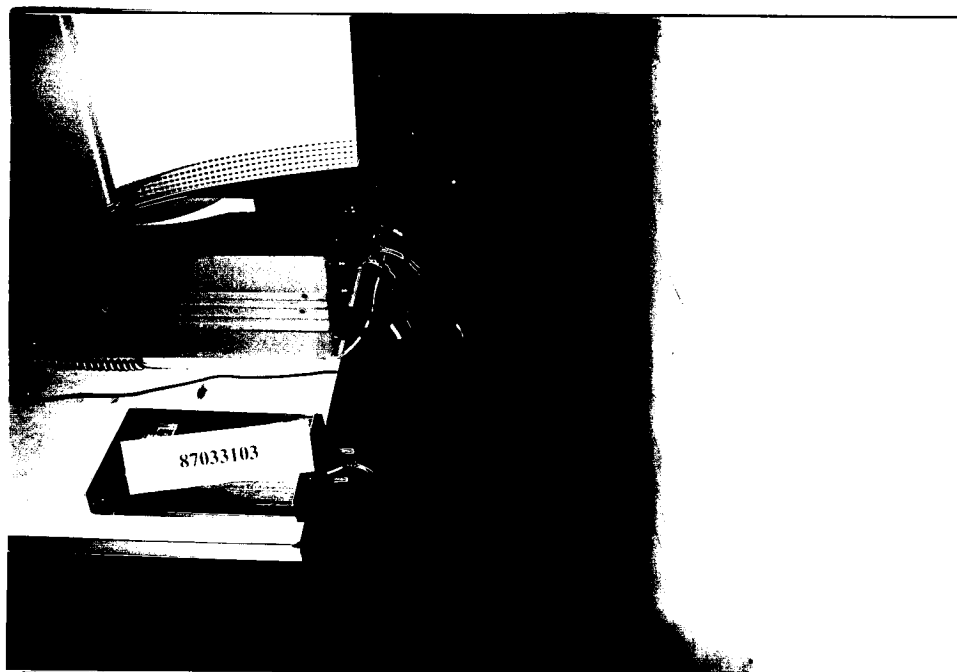


RADIATED EMISSION TEST (MODEL: PCA-6159H)



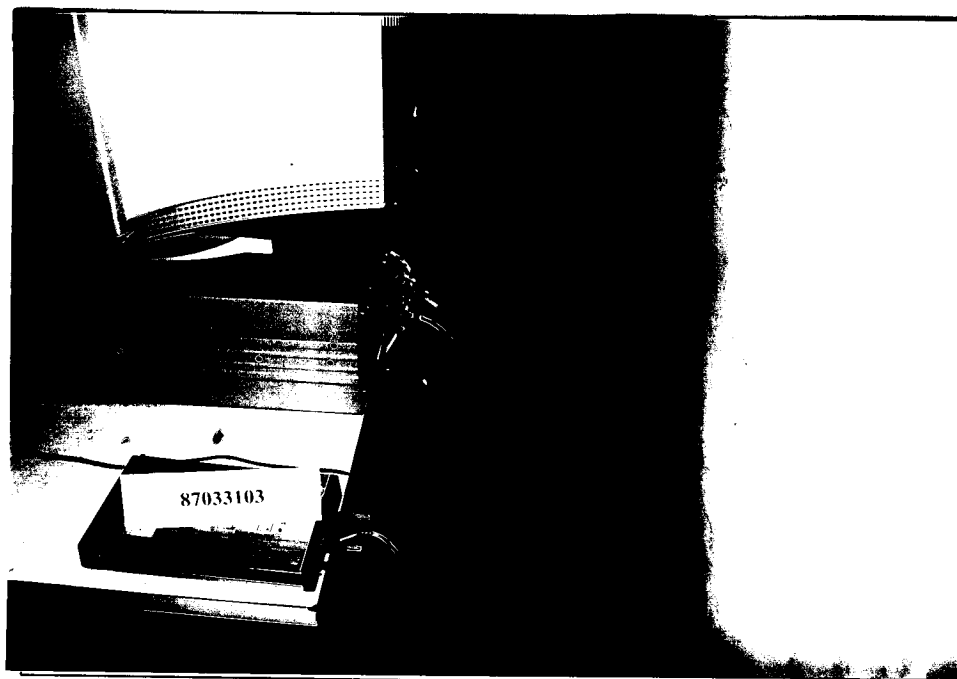


CONDUCTED EMISSION TEST (MODEL: PCA-6155V)



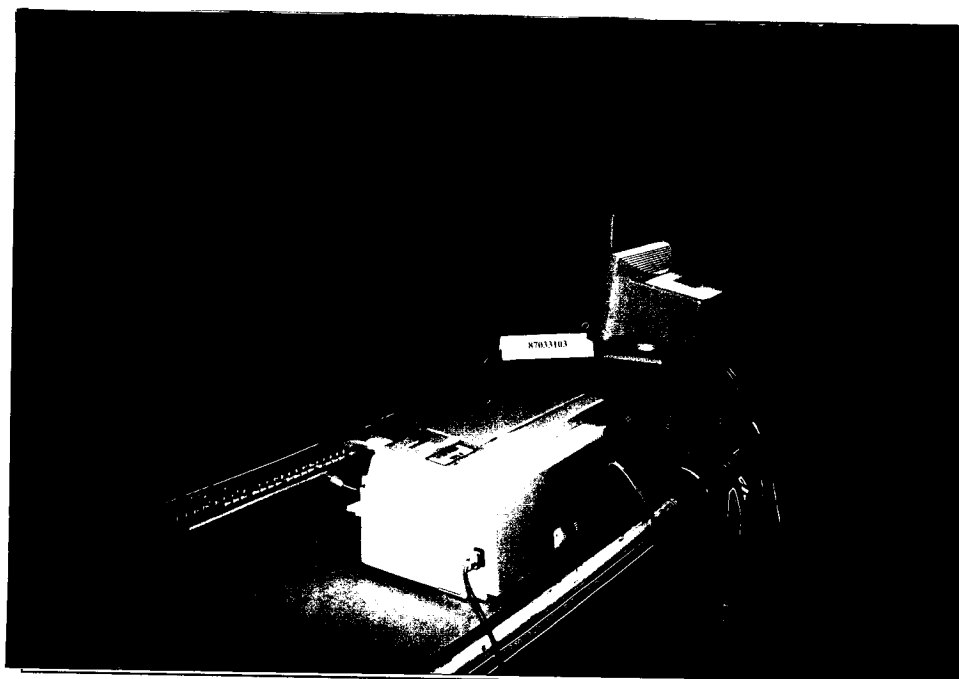
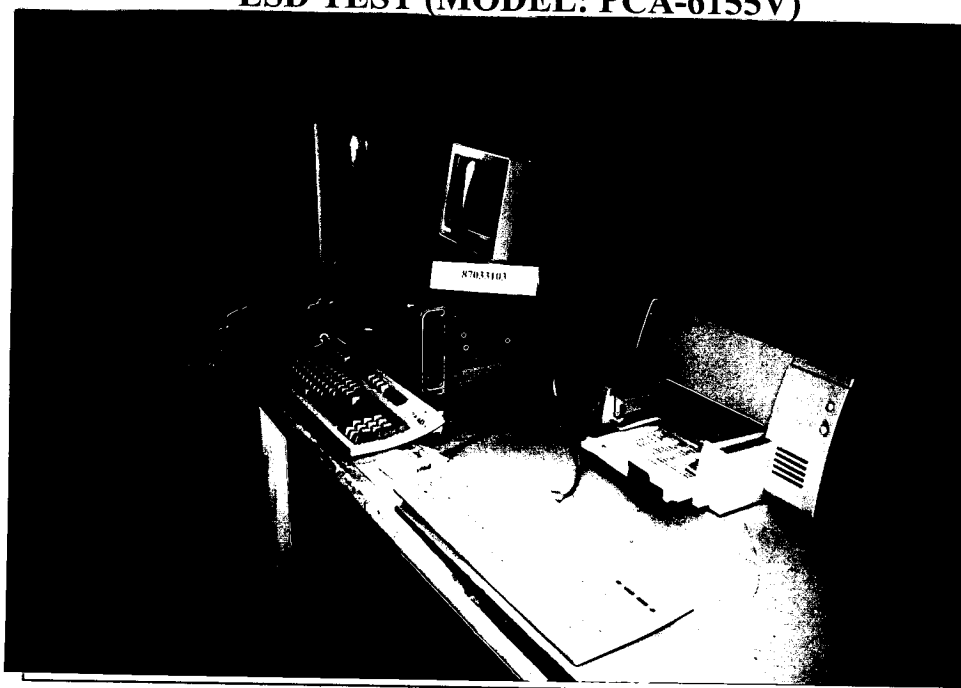


CONDUCTED EMISSION TEST (MODEL: PCA-6159H)



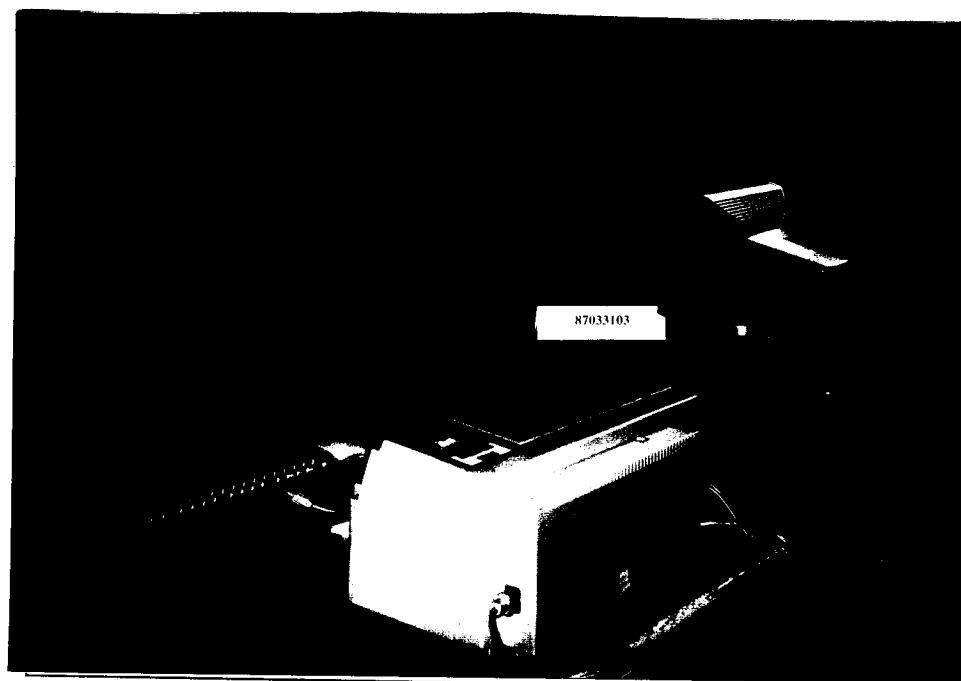
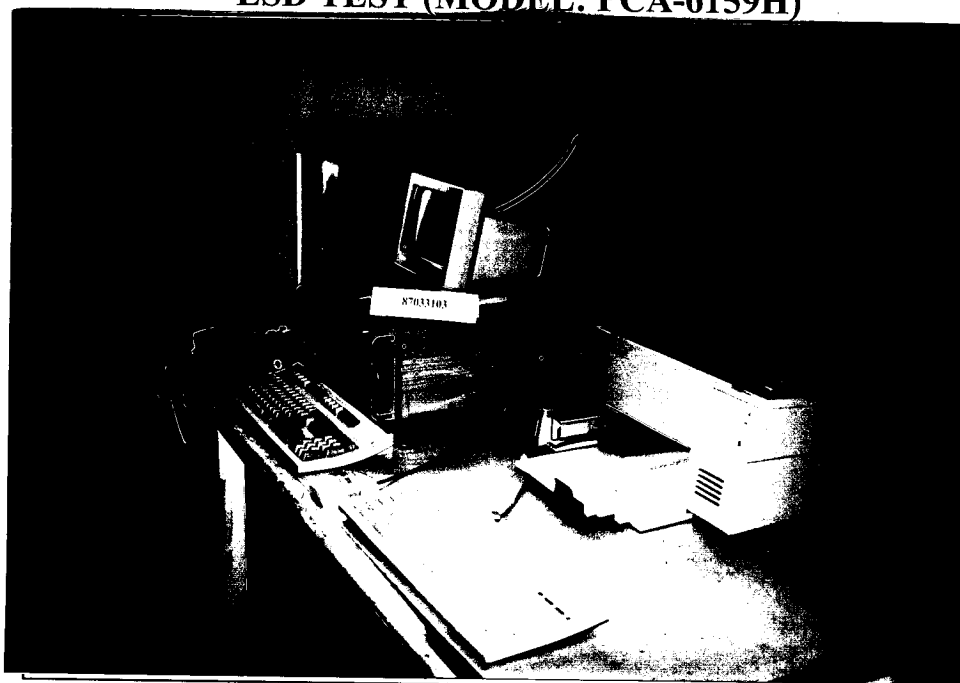


ESD TEST (MODEL: PCA-6155V)



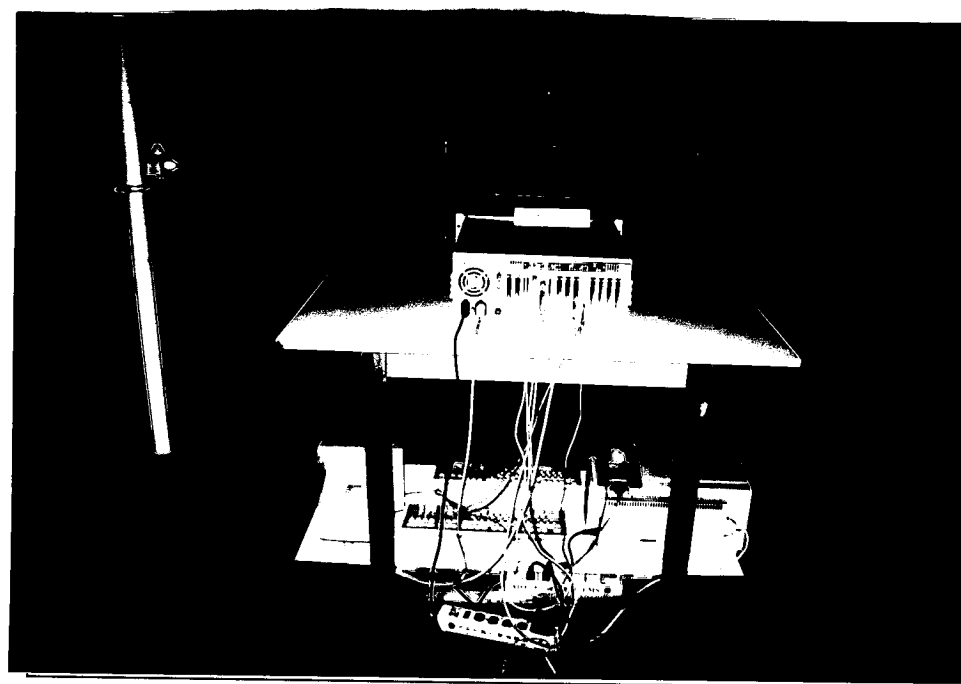
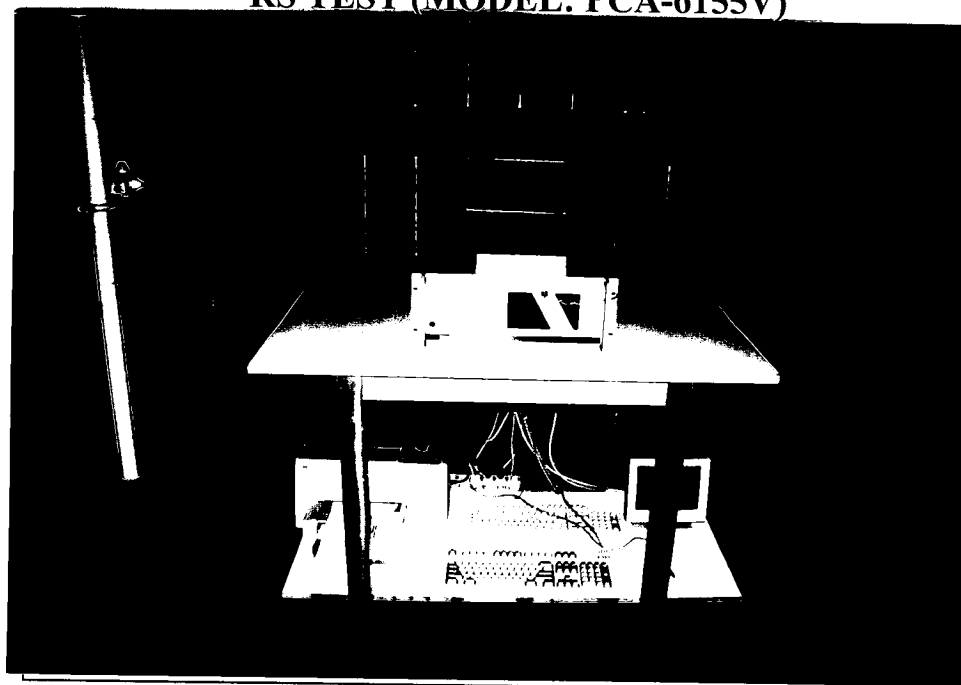


ESD TEST (MODEL: PCA-6159H)



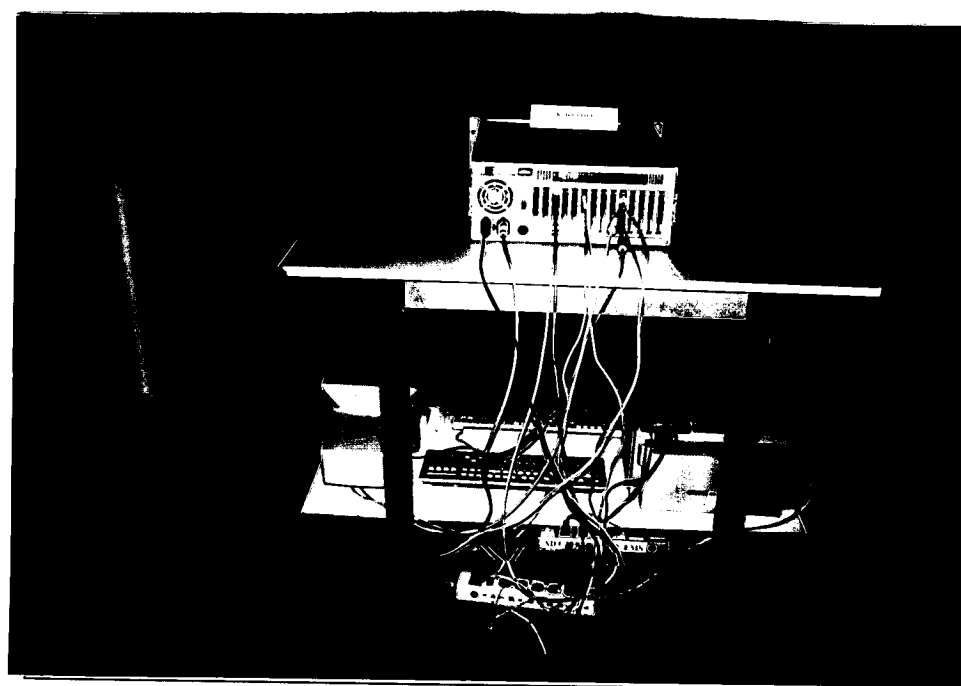
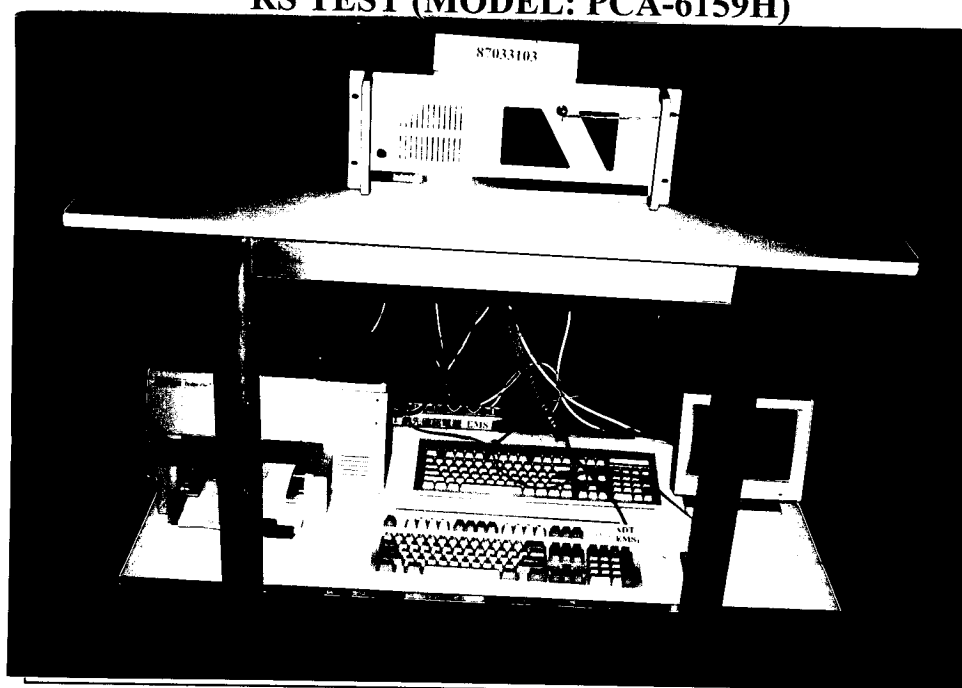


RS TEST (MODEL: PCA-6155V)





RS TEST (MODEL: PCA-6159H)



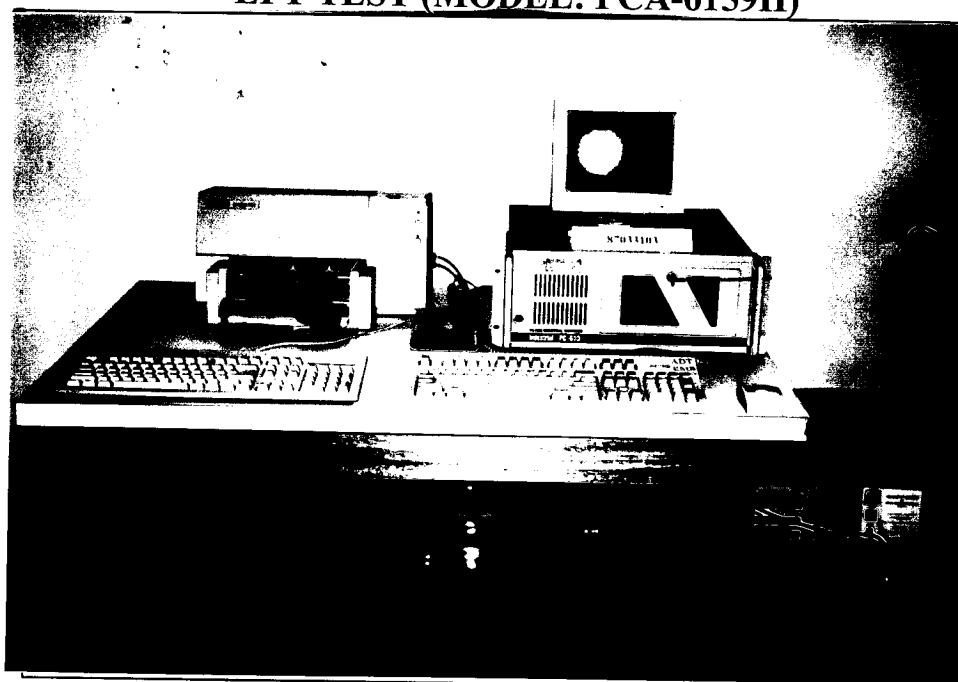


EFT TEST (MODEL: PCA-6155V)

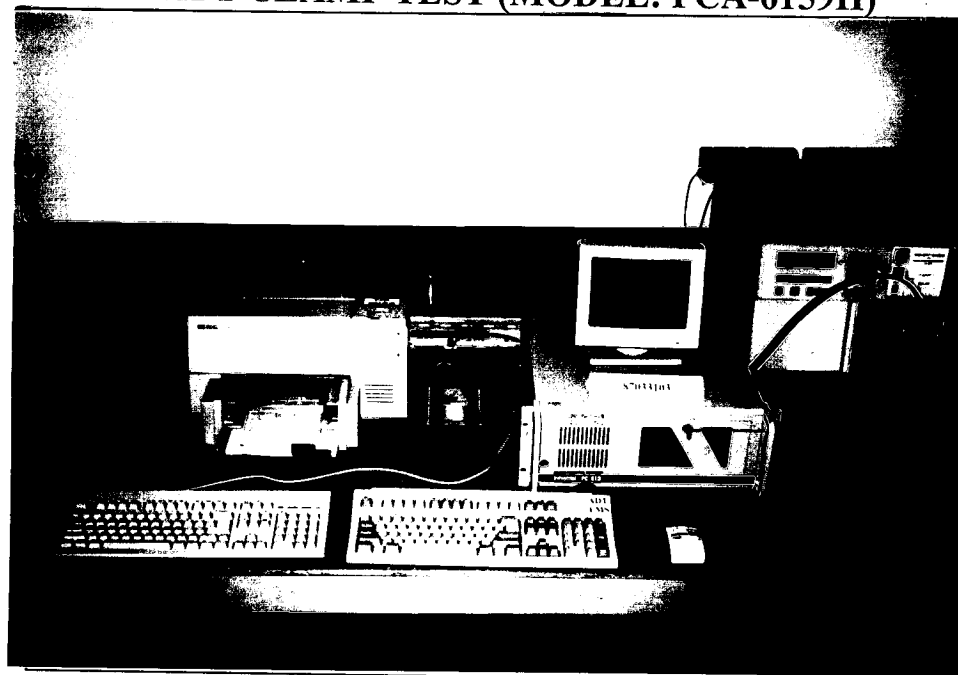




EFT TEST (MODEL: PCA-6159H)



EFT CLAMP TEST (MODEL: PCA-6159H)





CONDUCTED SUSCEPTIBILITY TEST (MODEL: PCA-6155V)

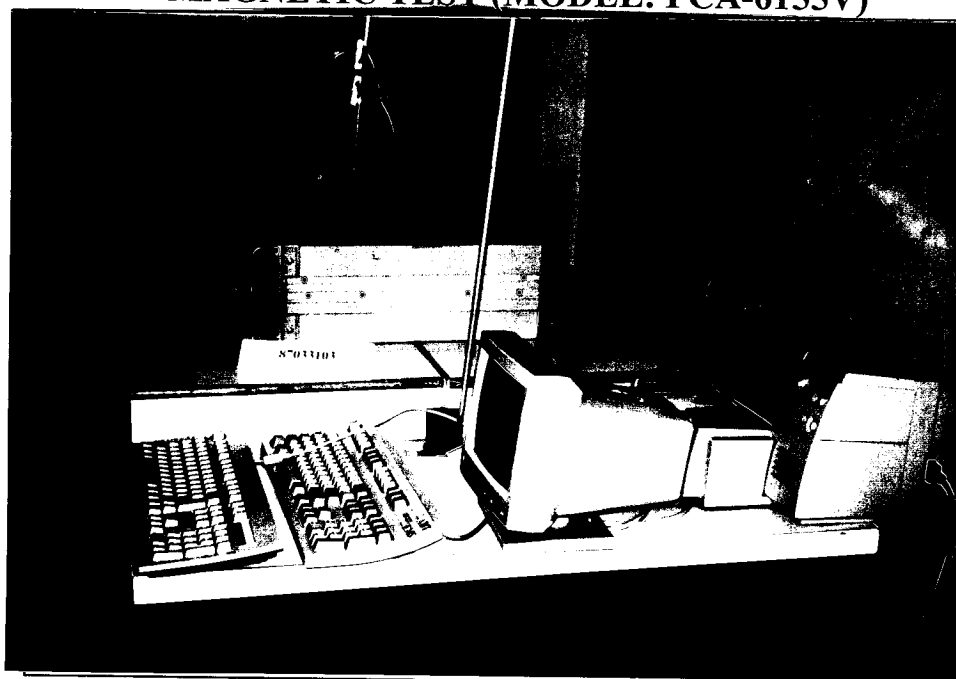


CONDUCTED SUSCEPTIBILITY TEST (MODEL: PCA-6159H)

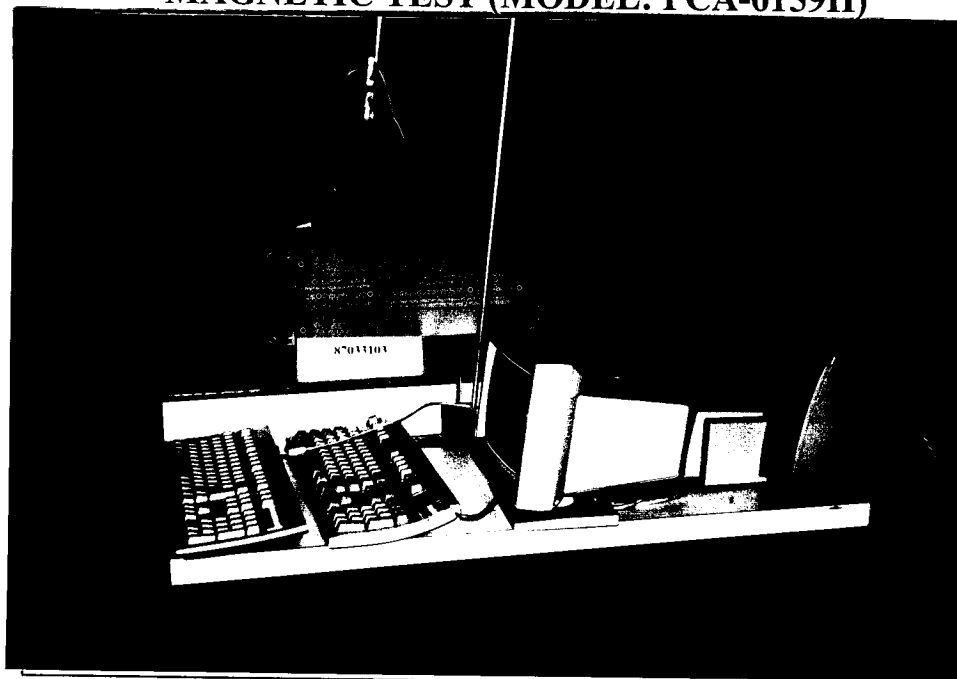




MAGNETIC TEST (MODEL: PCA-6155V)



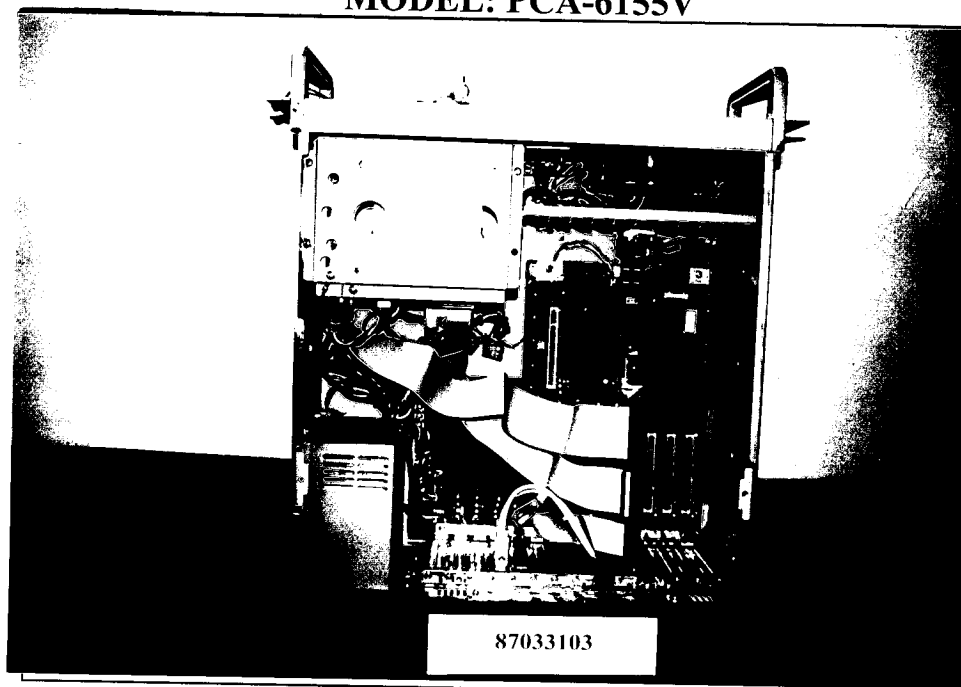
MAGNETIC TEST (MODEL: PCA-6159H)

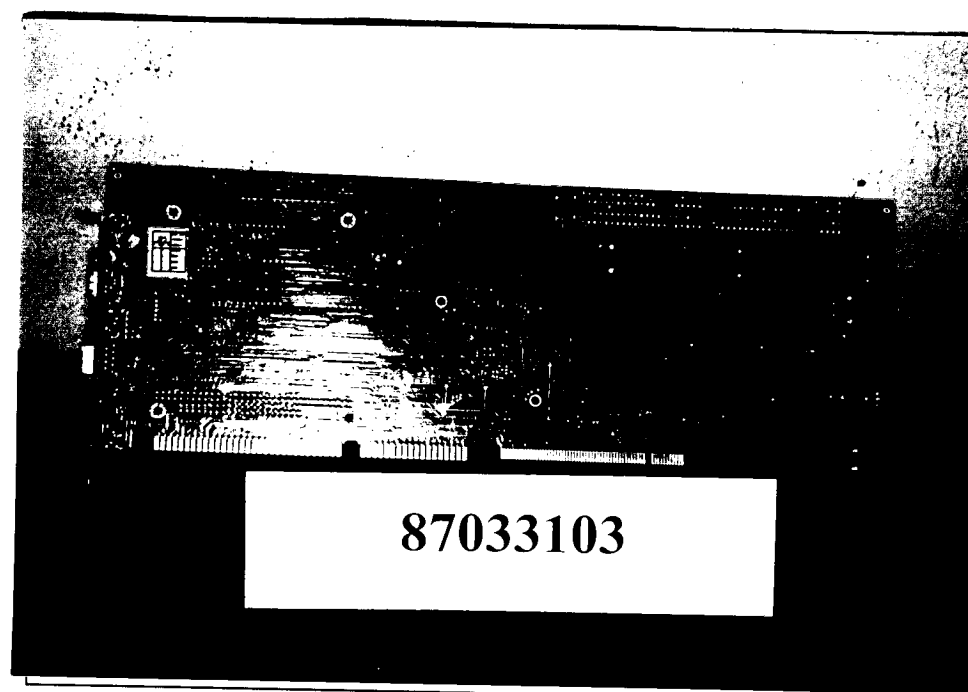
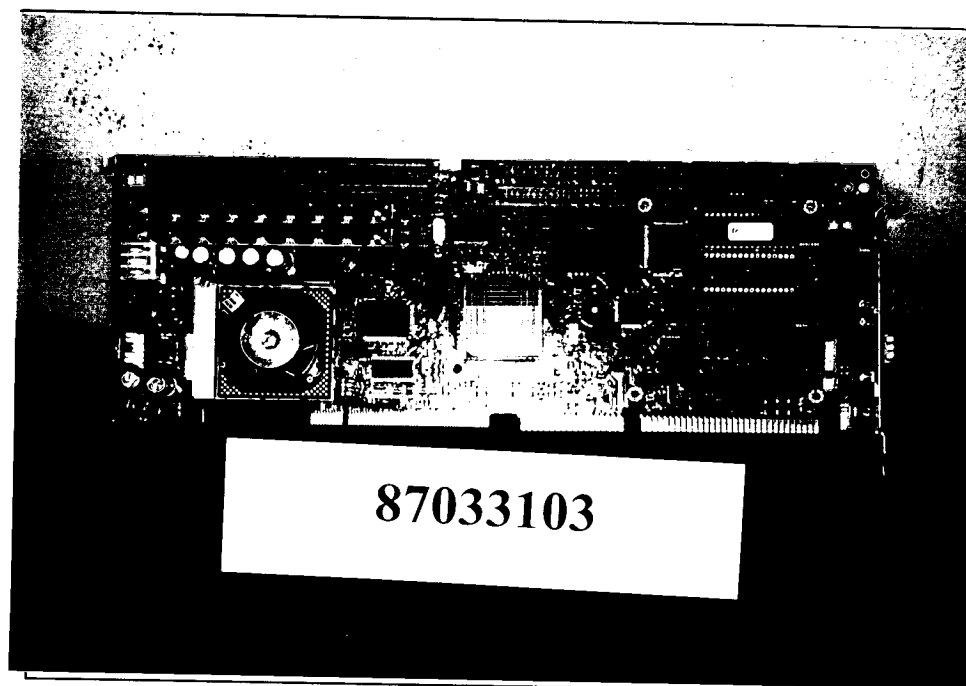




7. CONSTRUCTION PHOTOS OF EUT

MODEL: PCA-6155V







MODEL: PCA-6159H

