EMC

TEST REPORT

REPORT NO. : CE89061908
MODEL NO. : MIC-3033/5-4R
DATE OF TEST : July 4 ~ 13, 2000

PREPARED FOR : ADVANTECH CO., LTD.

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PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION

Accredited Laboratory

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1. CERTIFICATION

Issue date: July 24, 2000

Product	:	5-slot CompactPCI enclosure with CT bus & Rear I/O	
Trade Name	:	ADVANTECH	
Model No.	:	MIC-3033/5-4R	
Applicant	:	ADVANTECH CO., LTD.	
Standard	:	EN 55022: 1994+A1: 1995+A2: 1997, Class A	**EN 50082-2: 1995**
		EN 60555-2: 1987	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 July 4 to 13, 2000. 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) : Kent Chen (Kent Chen) , DATE: 7/24/2000

TESTED BY (Immunity) : Win Ching Lin (Win Ching Lin) , DATE: 7/24/2000

CHECKED BY : (Yemmy Soong) , DATE: 7/24/2000

APPROVED BY : Mike Su (Mike Su) , DATE: 7/24/2000

ADVANCE DATA TECHNOLOGY CORPORATION

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	5-slot CompactPCI enclosure with CT bus & Rear I/O
Model No.	:	MIC-3033/5-4R
Power Supply Type	:	Switching
Power Cord	:	Nonshielded (1.8m)

Note: The EUT is a 4U-high enclosure, which can accommodates CompactPCI chassis with 5-slot backplane, fan tray module, redundant power supply and alarm module.

The EUT was pre-tested with the following modes of redundant power supply:

- Left Power supply
- Right Power supply
- Both Power supplies

The worst emission level was found when the EUT was tested with the following modes:

Emission Test	Conducted Test	Left Power supply
	Radiated Test	Both Power supply
	Harmonic & Flicker Test	Both Power supply
Immunity Test		Both Power supply

The EUT was tested together with other components to form an industrial system, the configurations are as below:

POWER SUPPLY	PRT, REDUNDANT 300W model: PRT300L
CPU BOARD	ADVANTECH, model: MIC-3365F-A
CPU	INTEL PENTIUM III 700 MHz
HDD	FUJITSU, model: MHD2021AT, 20 GB QUANTUM, model: CR6400AT, 6.4 GB
FDD	Y-E DATA, model: 702J-6037J TEAC, model: FD-234HF
DVD-ROM	TEAC, model: CD-224E

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	HP	D2846	JP92233134	Shielded Signal (1.8m) Nonshielded Power (1.8m)
2.	KEYBOARD	FORWARD	FDA-104GA	FDKB8110112	Shielded Signal (1.4m)
3.	USB KEYBOARD	BTC	7932	D7A140018	Shielded Signal (1.4m)
4.	MOUSE	LOGITECH	M-S43	LZE00703150	Shielded Signal (1.5m)
5.	USB MOUSE	LOGITECH	M-BB48	LZE93051057	Shielded Signal (1.5m)
6.	PRINTER	HP	2225C+	2445S60648	Shielded Signal (1.2m) Nonshielded Power (1.8m)
7.	MODEM x 3	ACEEX	1414	980020509 980020507 980020534	Shielded Signal (1.2m) Nonshielded Power (1.9m)
8.	PERSONAL COMPUTER	IBM	2156-D1N	BNA2561	Nonshielded Power (1.8m)
9.	COLOR MONITOR	ADI	PD-959	730020U00100274	Shielded Signal (1.8m) Nonshielded Power (1.8m)
10.	KEYBOARD	FORWARD	FDA-104GA	FDKB8110119	Shielded Signal (1.4m)
11.	MOUSE	LOGITECH	M-S43	LZE000703132	Shielded Signal (1.8m)
12.	HUB	3COM	TP800	7YNR001412	Nonshielded Power (1.8m)

Note: 1. Support unit 3 & 5 were connected to the USB ports.

2. 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 two STP cables (10m).

No	Product	Brand	Model No.	Serial No.	I/O Cable
1.	MONITOR	ACER	7254e	9171602008	Shielded Signal (1.5m) Nonshielded Power (1.8m)
2.	KEYBOARD	HP	C3758A	C3758-60223	Shielded Signal (1.8m)
3.	KEYBOARD	SGI	6511-BN	99P43810A	Shielded Signal (2.9m)
4.	MOUSE	LOGITECH	M-S43	LZE93501869	Shielded Signal (1.8m)
5.	MOUSE	DEXIN	A2U800A	71001821	Shielded Signal (1.5m)
6.	MODEM	GVC	F-1114V/R6	853E100	Shielded Signal (1.25m) Nonshielded Power (1.5m)
7.	MODEM	GVC	F-1128V1R6	96-191-113003	Shielded Signal (1.25m) Nonshielded Power (1.5m)
8.	MODEM	GVC	F-1128V1R6	96-191-113004	Shielded Signal (1.25m) Nonshielded Power (1.5m)
9.	STORAGE BOX	FUJITSU LTD	XSD2C18	NA	Shielded Signal (1.1m) Nonshielded Power (1.8m)
10.	NOTEBOOK COMPUTER	USI	UNI-812	97207-0112-029850E	Nonshielded Power (1.8m)
11.	HUB	BUFFALO	LSW10/100-8H	NA	Shielded Signal (1.8m)
12.	LAN CARD	3COM	3CCFE575BT	6NV1R89B7A	NA

Note: 1. Support units 1-9 were set up as the SERVER PC system and communicated with support units 10-12 which acted as WORKSTATION and partners of communication system via two STP cables (10m).

2.4 TEST SETUP

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

3. TEST INSTRUMENTS

3.1 TEST INSTRUMENTS (EMISSION)

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESH3	893495/006	July 7, 2000
ROHDE & SCHWARZ Spectrum Monitor	EZM	893787/013	July 8, 2000
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	892107/003	July 13, 2000
EMCO L.I.S.N.	3825/2	9504-2359	July 13, 2000
Shielded Room	Site 3	ADT-C03	NA

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS 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.

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8590L	3520A00667	Sept. 15, 2000
CHASE Preamplifier	CPA9231A/4	3215	Nov. 7, 2000
HP Preamplifier	8347A	3307A01088	Aug. 30, 2000
HP Preamplifier	8449B	3008A01201	Dec. 14, 2000
ROHDE & SCHWARZ TEST RECEIVER	ESVS10	846285/012	Dec. 28, 2000
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Aug. 30, 2000
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2000
CHASE BILOG Antenna	CBL6112	2074	Dec. 25, 2000
EMCO Double Ridged Guide Antenna	3115	9312-4192	March 29, 2001
CHANCE Turn Table & Tower Controller	ACS-I	NA	NA
Open Field Test Site	Site 6	ADT-R06	Dec. 24, 2000

Note: 1. The measurement uncertainty is less than +/- 3.0dB, which is calculated as per NAMAS 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	Mar. 29, 2001
KIKUSUI AC SWITCHING POWER SUPPLY	PCR 4000L	9508355	Mar. 29, 2001

Note: 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, 2000
KeyTek, ESD Simulator	MZ-15/EC	9902287	Feb. 28, 2001
KeyTek, EFT Generator	CE-40	9508257	Sept. 5, 2000
KeyTek, Capacitive Clamp	CE-40-CCL	9508259	Sept. 5, 2000
KeyTek, Control Center	E103	9508347	NA
KeyTek, Surge Combination Wave	E501A	9508349	Aug. 30, 2000
KeyTek, Surge Coupler/Decoupler	E551	9508350	Aug. 30, 2000
External Coupler /Decoupler	CM-TELCD	9926194	NA
I/O Signal Line Coupler/Decoupler	CM-110CD	9907177	NA
ROHDE & SCHWARZ Signal Generator	SMY01	840490/009	Aug. 19, 2000
KALMUS Power Amplifier	LA1000V	091995-1	NA
KALMUS Power Amplifier	757LC	091995-2	NA
HOLADAY Field Probe	HI-4422	89915	Aug. 12, 2000
EMCO BiconiLog Antenna	3141	1001	NA
FCC Coupling Decoupling Network	FCC-801-M3-25	48	NA
FCC Coupling Decoupling Network	FCC-801-M2-25	20	NA
FISCHER CUSTOM COMMUNICATIONS EM Injection Clamp	FCC-203I	50	NA
FCC Coupling Decoupling Network	FCC-801-M1-25	17	NA
BOONTON RF Voltage Meter	9200B	331801AE	Aug. 19, 2000
COMTEST Compact Full Anechoic Chamber (7x3x3 m)	CFAC	ADT-S01	Aug. 24, 2000
HAEFELY Magnetic Field Tester	MAG 100.1	083794-06	NA
COMBINOVA Magnetic Field Meter	MFM10	224	Oct. 29, 2000
KEYTEK Mains Interference Simulator	EMC Pro	9902207	Feb. 16, 2001

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	:	27 degree C
Humidity	:	69 %
Atmospheric Pressure	:	998 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -18.2 dB at 0.156 MHz Minimum passing margin of radiated emission: -7.1 dB at 200.48 MHz

4.1.1 EUT OPERATION CONDITION

1. Turn on the power of all equipment.
2. Industrial Computer runs a test program to enable all functions.
3. Industrial Computer reads and writes messages from FDD and HDD.
4. Industrial Computer sends and receives messages from WORKSTATION via two STP cables.
5. Industrial Computer sends "H" messages to monitor and monitor displays "H" patterns on screen.
6. Industrial Computer sends "H" messages to modem.
7. Industrial Computer sends "H" messages to printer, and the printer prints them on paper.
8. Repeat steps 3-8.

4.1.2 TEST DATA OF CONDUCTED EMISSION

EUT: **5-slot CompactPCI enclosure with CT bus & Rear I/O**

MODEL: **MIC-3033/5-4R** MODE: **Left Power Supply**

6 dB Bandwidth: 10 kHz PHASE: LINE (L)

Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.156	0.2	60.6	-	60.8	-	79.0	66.0	-18.2	-
0.263	0.2	46.5	-	46.7	-	79.0	66.0	-32.3	-
0.575	0.2	23.7	-	23.9	-	73.0	60.0	-49.1	-
8.910	0.3	28.8	-	29.1	-	73.0	60.0	-43.9	-
15.371	1.0	26.2	-	27.2	-	73.0	60.0	-45.8	-
28.096	1.6	37.3	-	38.9	-	73.0	60.0	-34.1	-

Remarks:
1. "*": Undetectable
2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
3. "-": The Quasi-peak emission level 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
6. Emission Level = Correction Factor + Reading Value.

TEST DATA OF CONDUCTED EMISSION

EUT: **5-slot CompactPCI enclosure with CT bus & Rear I/O**

MODEL: **MIC-3033/5-4R** MODE: **Left Power Supply**

6 dB Bandwidth: 10 kHz PHASE: NEUTRAL (N)

Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.156	0.2	60.5	-	60.7	-	79.0	66.0	-18.3	-
0.263	0.2	46.1	-	46.3	-	79.0	66.0	-32.7	-
0.575	0.2	22.9	-	23.1	-	73.0	60.0	-49.9	-
8.910	0.3	19.9	-	20.2	-	73.0	60.0	-52.8	-
15.371	0.7	27.6	-	28.3	-	73.0	60.0	-44.7	-
28.096	1.3	36.3	-	37.6	-	73.0	60.0	-35.4	-

Remarks:
1. "*": Undetectable
2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
3. "-": The Quasi-peak emission level 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
6. Emission Level = Correction Factor + Reading Value.

4.1.3 TEST DATA OF RADIATED EMISSION

EUT: **5-slot CompactPCI enclosure with CT bus & Rear I/O**

MODEL: **MIC-3033/5-4R** MODE: **Both Power Supply**

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)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
117.02	12.8	12.5	25.3	40.0	-14.7	400	217
143.01	11.9	12.8	24.7	40.0	-15.3	400	177
149.51	11.6	17.3	28.9	40.0	-11.1	400	203
200.46	10.7	20.7	31.4	40.0	-8.6	400	283
233.87	12.9	20.6	33.5	47.0	-13.5	328	129
300.69	15.3	19.8	35.1	47.0	-11.9	231	286
334.10	16.2	13.2	29.4	47.0	-17.6	303	189
501.16	19.6	15.9	35.5	47.0	-11.5	184	310

REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+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

EUT: **5-slot CompactPCI enclosure with CT bus & Rear I/O**

MODEL: **MIC-3033/5-4R** MODE: **Both Power Supply**

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)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
52.01	8.7	17.8	26.5	40.0	-13.5	100	307
84.52	8.8	18.9	27.7	40.0	-12.3	100	97
110.53	12.4	17.6	30.0	40.0	-10.0	100	154
117.02	12.8	16.8	29.6	40.0	-10.4	100	209
149.53	11.6	17.5	29.1	40.0	-10.9	100	202
175.54	10.7	18.8	29.5	40.0	-10.5	100	54
200.48	10.7	22.2	32.9	40.0	-7.1	100	344
233.88	12.9	25.0	37.9	47.0	-9.1	100	349
334.11	16.2	15.6	31.8	47.0	-15.2	100	240
501.16	19.6	17.3	36.9	47.0	-10.1	347	351

REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+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 60555-2
Input Voltage	:	230Vac, 50Hz
Temperature	:	25 degree C
Humidity	:	60 %
Atmospheric Pressure	:	1000 mbar

TEST RESULT	Remarks
PASS	MODEL: MIC-3033/5-4R

4.2.1 EUT OPERATION CONDITION

Same as item **4.1.1**

4.2.2 MEASUREMENT DATA OF HARMONICS TEST

EUT: **5-slot CompactPCI enclosure with CT bus & Rear I/O**

MODEL: **MIC-3033/5-4R** MODE: **Both Power Supply**

Fundamental Voltage : 229.632 Vrms Power Factor : 0.481
Amperes : 0.723 Arms
Frequency : 50 Hz
Power Consumption : 79.857 W

Harm. Order	Reading Data (A)	Limit (A)
1	-	-
3	0.32	2.30
5	0.30	1.14
7	0.26	0.77
9	0.23	0.40
11	0.19	0.33
13	0.15	0.21
15	0.12	0.15
17	0.09	0.13
19	0.07	0.12
21	0.04	0.11
23	0.03	0.10
25	0.02	0.09
27	0.02	0.08
29	0.02	0.08
31	0.02	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	0.01	1.08
4	0.01	0.43
6	0.01	0.30
8	0.01	0.23
10	0.01	0.18
12	0.01	0.15
14	0.01	0.13
16	0.01	0.11
18	0.01	0.10
20	0.01	0.09
22	0.01	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	:	25 degree C
Humidity	:	60 %
Atmospheric Pressure	:	1000 mbar

TEST RESULT	Remarks
PASS	The measured reading data is too low against the limit.

4.3.1 EUT OPERATION CONDITION

Same as item **4.1.1**.

4.3.2 TEST DATA OF VOLTAGE FLUCTUATIONS AND FLICKER

EUT: **5-slot CompactPCI enclosure with CT bus & Rear I/O**

MODEL: **MIC-3033/5-4R** MODE: **Both Power Supply**

Input Voltage : 229.632 Vrms Input Amperes : 0.723 Arms

Power Frequency: 50 Hz Observation period (Tp): 2 hour

Test Parameter	Measurement Value	Limitation	Remark
Pst	0.089	1.0	pass
Plt	0.039	0.65	pass
Tdt (ms)	0	200	pass
dmax (%)	0	4%	pass
dc (%)	0	3%	pass

Note: (1) Plt means long-term flicker indicator
(2) Pst means short-term flicker indicator
(3) dc means relative steady-state voltage change
(4) dmax means maximum relative voltage change
(5) Tdt means maximum time that dt exceeds 3 %

5. TEST RESULTS (IMMUNITY)

5.1 GENERAL DESCRIPTION

Generic Standard	:	EN 50082-2: 1995	
Basic Standard Specification and Performance Criteria	:	EN 61000-4-2	(Electrostatic Discharge, ESD, 8kV air discharge, 4kV Contact discharge, Performance Criterion B)
		EN 61000-4-3	(Radio-Frequency Electromagnetic Field Susceptibility Test, RS, 80-1000 MHz, 10V/m, 80% AM (1kHz), Performance Criterion A)
		EN 61000-4-4	(Electrical Fast Transient/Burst, EFT, Power line: 2kV, Signal line: 1kV, Performance Criterion B)
		EN 61000-4-6	(Conducted Radio Frequency Disturbances Test, CS, 0.15-80 MHz, 10V/m, 80% AM, 1kHz, Performance Criterion A)
		EN 61000-4-8	(Power Frequency Magnetic Field Test, 50 Hz, 30A/m, Performance Criterion A)
		ENV 50204	(Radio-Frequency Electromagnetic Field, Pulse modulated, 900+/-5 MHz, 10V/m, 50 % duty cycle, Rep. Frequency 200 Hz, Performance Criterion A)
Input Voltage	:	230 Vac, 50 Hz	
Temperature	:	25 degree C	
Humidity	:	60 %	
Atmospheric Pressure	:	1000 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 20 times at each test point
Discharge Mode	:	Single Discharge
Discharge Period	:	1 second minimum

Test Result		Remarks
Criterion A	**PASS**	MODEL: MIC-3033/5-4R

OBSERVATION DESCRIPTION

Direct Application			Test Result	
Discharge Level (kV)	Polarity (+/-)	Test Point	Contact Discharge	Air Discharge
8	+/-	1 ~ 7, 8, 9	NA	Note 1
4	+/-	1, 6, 7	Note 1	NA

Description of test point:

1. Junction of case
2. LED
3. Switches
4. All I/O ports
5. AC in
6. Screws
7. Metal board
8. CD-ROM
9. FDD

Indirect Application			Test Result	
Discharge Level (kV)	Polarity (+/-)	Test Point	Horizontal Coupling Plane	Vertical Coupling Plane
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 Result		Remarks
Criterion A	**PASS**	MODEL: MIC-3033/5-4R

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 / Th	:	5/50 ns
Burst Duration	:	15 ms
Burst Period	:	300 ms
Test Duration	:	Not less than 1 min.

Test Result		Remarks
Criterion B	**PASS**	MODEL: MIC-3033/5-4R

OBSERVATION DESCRIPTION

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

Description of test result:

Note: 1. The transmission of data was interrupted but self-recoverable after 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), Clamp Injection

Test Result		Remarks
Criterion A	**PASS**	MODEL: MIC-3033/5-4R

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**	MODEL: MIC-3033/5-4R

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**	MODEL: MIC-3033/5-4R

Note: Four sides of EUT are verified separately.

OBSERVATION DESCRIPTION

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

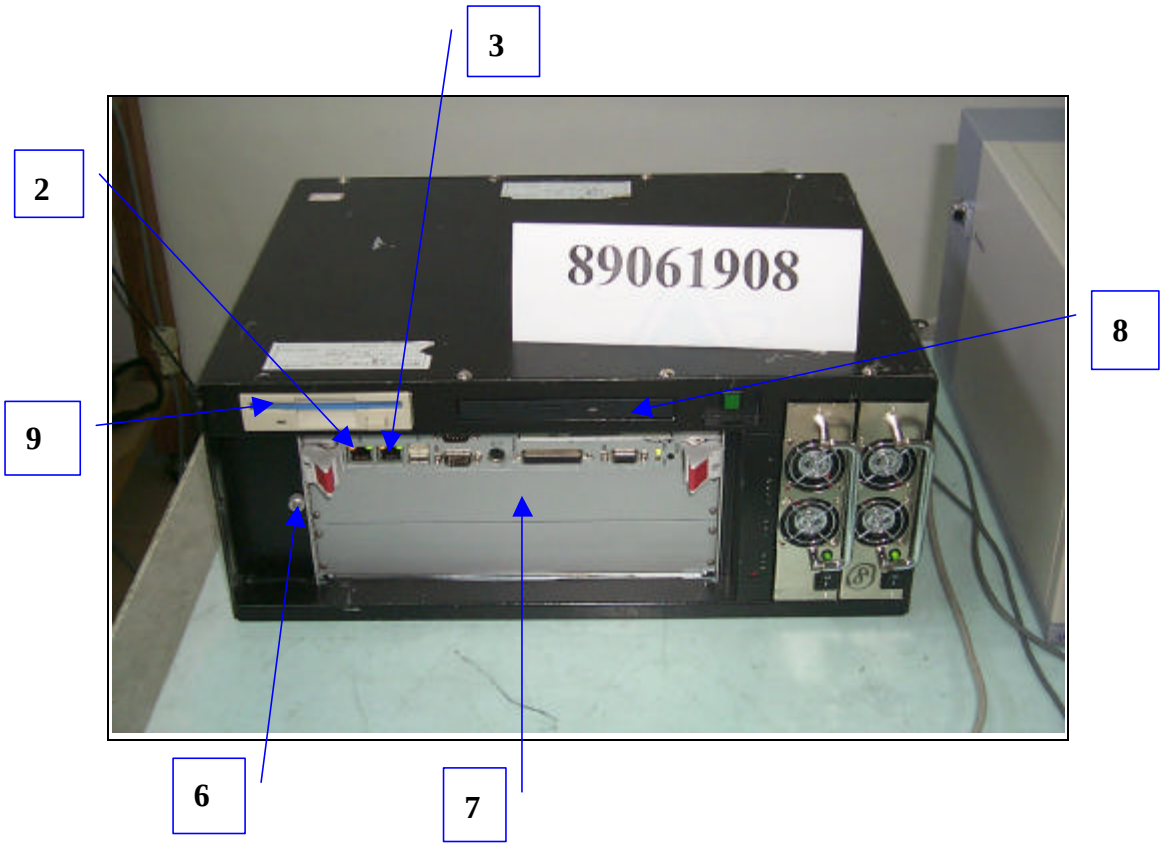
6. PHOTOGRAPHS OF THE TEST CONFIGURATION

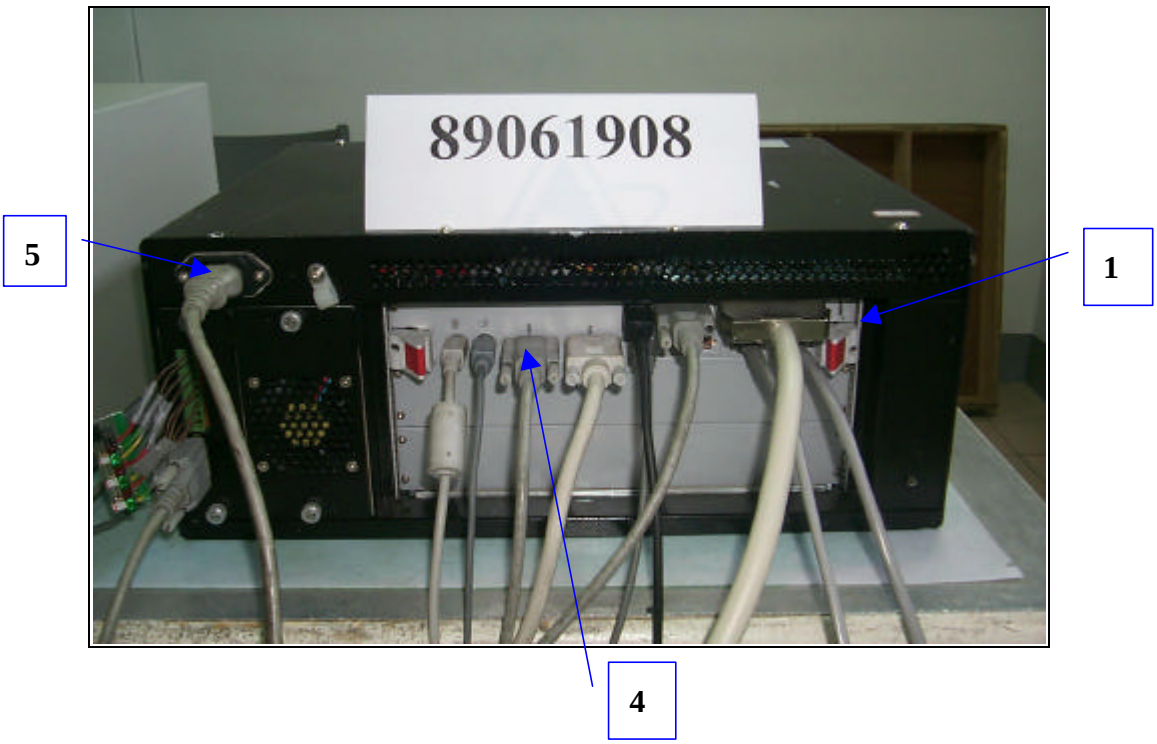
CONDUCTED EMISSION TEST

RADIATED EMISSION TEST

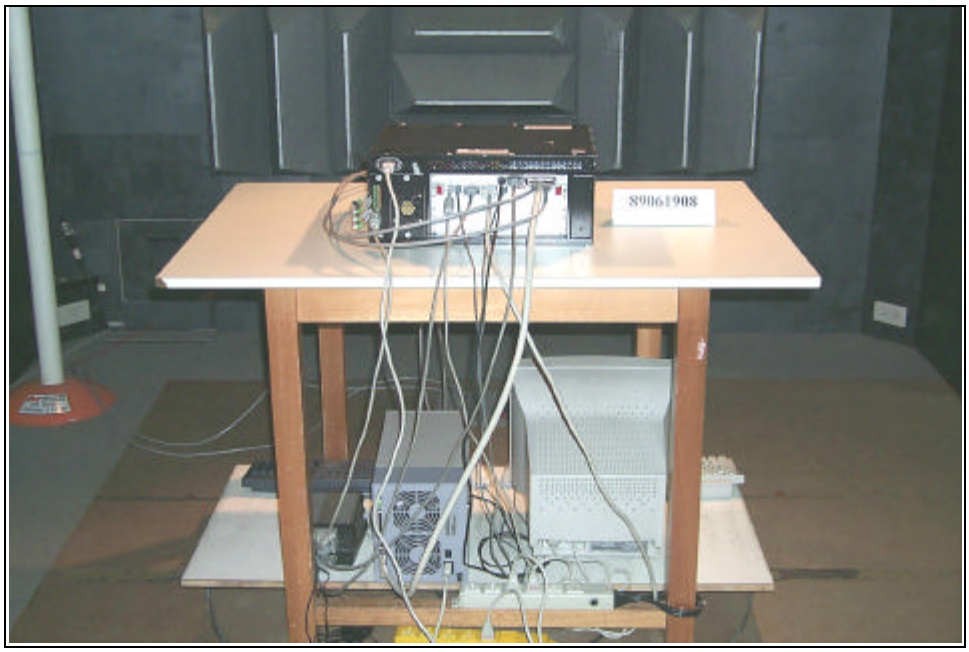
HARMONICS EMISSION TEST &
VOLTAGE FLUCTUATIONS AND FLICKER TEST

ESD TEST




89061908
5
1
4

RS TEST



EFT TEST

EFT CLAMP TEST

CONDUCTED SUSCEPTIBILITY TEST

CONDUCTED SUSCEPTIBILITY CLAMP TEST

MAGNETIC TEST

7. APPENDIX - INFORMATION OF THE TESTING LABORATORY

Information of the testing laboratory

We, ADT Corp., are founded in 1988, to provide our best service in EMC and Safety consultation. Our laboratory is accredited by the following approval agencies according to ISO/IEC Guide 25 or EN 45001:

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

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:

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