



EMC

TEST REPORT

REPORT NO. : CE89121306
MODEL NO. : MIC-3377D/M, MIC-3377/M
DATE OF TEST : Jan. 4 ~ Feb. 2, 2001
DATA OF RECEIPT : Feb. 5, 2001

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

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

This test report consists of 38 pages in total. It may be duplicated completely for legal use with the allowance of the applicant. It shall not be reproduced except in full, without the written approval of our laboratory. It should not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. government. The test result in the report only applies to the tested sample.



TABLE OF CONTENTS

1. CERTIFICATION	3
2. GENERAL INFORMATION.....	4
2.1 GENERAL DESCRIPTION OF EUT	4
2.2 GENERAL DESCRIPTION OF APPLIED STANDARD	5
2.3 DESCRIPTION OF SUPPORT UNITS	6
2.4 TEST SETUP	9
3. TEST INSTRUMENTS	10
3.1 TEST INSTRUMENTS (EMISSION)	10
3.2 TEST INSTRUMENTS (IMMUNITY).....	11
3.3 LIMITS OF CONDUCTED AND RADIATED EMISSION.....	12
4. TEST RESULTS (EMISSION).....	13
4.1 RADIO DISTURBANCE	13
4.1.1 EUT OPERATION CONDITION.....	13
4.1.2 TEST DATA OF CONDUCTED EMISSION (A).....	14
4.1.3 TEST DATA OF CONDUCTED EMISSION (B).....	16
4.1.4 TEST DATA OF TELECOMMUNICATION PORT VOLTAGE OF CONDUCTED EMISSION (A).....	16
4.1.5 TEST DATA OF TELECOMMUNICATION PORT VOLTAGE OF CONDUCTED EMISSION (B)	19
4.1.6 TEST DATA OF RADIATED EMISSION	20
5. TEST RESULTS (IMMUNITY)	22
5.1 GENERAL DESCRIPTION	22
5.2 PERFORMANCE CRITERIA DESCRIPTION.....	23
5.3 EUT OPERATION CONDITION.....	23
5.4 TEST RESULT OF ELECTROSTATIC DISCHARGE (ESD)	24
5.5 TEST RESULT OF RADIATED ELECTROMAGNETIC FIELDS (RS).....	25
5.6 TEST RESULT OF ELECTRICAL FAST TRANSIENT (EFT)	26
5.7 TEST RESULT OF CONDUCTED RADIO FREQUENCY DISTURBANCES (CS).....	27
5.8 TEST RESULT OF POWER FREQUENCY MAGNETIC FIELD.....	28
5.9 TEST RESULT OF RADIO-FREQUENCY ELECTROMAGNETIC	29
6. PHOTOGRAPHS OF THE TEST CONFIGURATION.....	30
7. APPENDIX - INFORMATION OF THE TESTING LABORATORY.....	38



1.

CERTIFICATION

Issue Date: Feb. 5, 2001

Product : 6U-size CompactPCI Master SBC with Pentium III/Celeron Processor
Trade Name : ADVANTECH
Model No. : MIC-3377D/M, MIC-3377/M
Applicant : ADVANTECH CO., LTD.
Standard : EN 55011: 1998 (Group 1, Class A) **EN 50082-2: 1995**
EN 55022: 1998, Class A 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 (Model: MIC-3377D/M) of the designation has been tested in our facility from Jan. 4 to Feb. 2, 2001. 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 : _____ , DATE: _____
(Emission) (Bill Chang)

TESTED BY : _____ , DATE: _____
(Immunity) (Dennis Chuang)

CHECKED BY : _____ , DATE: _____
(Vickie Yu)

APPROVED BY : _____ , DATE: _____
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product : 6U-sized CompactPCI Master SBC with
Pentium III/Celeron Processor
Model No. : MIC-3377D/M, MIC-3377/M
Power Supply Type : NA

Note: The EUT is a 6U-size CompactPCI all-in-one single board Pentium III/ Celeron CPU card which complies with PICMG 2.0 R2.1 CompactPCI specifications. Targeting performance-demanding applications like computer telephony and communications, the EUT accepts up to Pentium III 850 MHz processors and higher for optimum computing capability. Based on Intel's 440BX chipset, the EUT enhances its performance with 100 MHz front side bus. The EUT has many functions on a single board within a single-slot width, saving valuable CompactPCI slots for peripheral cards.

The EUT has two model names, which are identical to each other except for the following features:

MIC-3377/M	Single-slot 6U CompactPCI Socket 370 processor board with single PCI-to-PCI bridge, VGA/dual LAN/SCSI, utility CD-ROM disc, manual
MIC-3377D/M	Two-slot CompactPCI Socket 370 processor board with single PCI-to-PCI bridge, VGA/dual LAN/SCSI, utility CD-ROM disc, HDD and FDD mounting bracket, manual

From the above model names, model: MIC-3377D/M was selected as the representative for the test and its data is recorded in this report.

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

- ? Up Power supply
- ? Down Power supply
- ? Both Power supplies

The test data were recorded with Mode 1: Up Power supply & Mode 2: Down Power supply for **Conducted Test** and Both Power Supplies for **Radiated Test, Immunity Test**



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

COMPACT PCI ENCLOSURE	ADVANTECH, model: MIC-3031/14-1R
POWER SUPPLY	PRT, REDUNDANT 300W model: PRT300L
CPU	INTEL PENTIUM III 700 MHz
HDD	QUANTUM, model: QML15000LCA, 15 GB

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 55011: 1998 (Group 1, Class A)

EN 55022: 1998, 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

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.	FCC ID
1	19"COLOR MONITOR	HP	D2842A	KR93473116	BEJCB910
2	MODEM	ACEEX	1414	980020569	IFAXDM1414
3	MODEM	ACEEX	1414	980020508	IFAXDM1414
4	MODEM	ACEEX	1414	980020510	IFAXDM1414
5	PS/2 KEYBOARD	FORWARD	FDA-104GA	FDKB8110127	F4ZDA-104G
6	PS/2 KEYBOARD	FORWARD	FDA-104GA	FDKB8110123	F4ZDA-104G
7	MOUSE	LOGITECH	M-S43	LZE000703165	DZL211106
8	USB MOUSE	LOGITECH	M-BB48	LZE00650843	DoC
9	PERSONAL COMPUTER	IBM	2187-12W	1S218714ABN A001N	FCC DoC
10	21" COLOR MONITOR	HP	D2846	JP92233133	DOC
11	PS/2 KEYBOARD	FORWARD	FDA-104GA	FDKB8110120	F4ZDA-104G
12	MOUSE	LOGITECH	M-S43	LZE00703197	DZL211106
13	HUB	ACCTON	EN2040	604014998 EN2040 144040-104	FCC DOC

No.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core.
2	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
3	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
4	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
5	1.5 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
6	1.5 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
7	1.5 m foil shielded wire, terminated with PS2 connector via drain wire, w/o core.
8	1.8 m foil shielded wire, terminated with PS2 connector via drain wire, w/o core.
9	NA
10	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core.
11	1.5 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
12	1.5 m foil shielded wire, terminated with PS2 connector via drain wire, w/o core.
13	NA

Note: 1. All power cords of the above support units are non shielded (1.8m).
 2. Support unit 7 & 8 were connected to the USB ports of EUT.
 3. Support units 1-8 were set up as the SERVER PC system and communicated with support units 9-13, which acted as WORKSTATION and partners of communication system via two STP cables (10m).

**FOR IMMUNITY TEST**

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	COLOR MONITOR	ACER	7254e	9171602008	JVP7254E
2	USB MOUSE	LOGITECH	M-BB48	LZE00651079	DOC
3	USB MOUSE	LOGITECH	M-BB48	LZE93051142	DOC
4	KEYBOARD	BTC	5121W	A00800771	E5XKB5121WTH0110
5	KEYBOARD	BTC	5121W	A00800775	E5XKB5121WTH0110
6	MODEM	ACEEX	1414	980020514	IFAXDM1414
7	MODEM	ACEEX	1414	980020511	IFAXDM1414
8	MODEM	ACEEX	1414	980020537	IFAXDM1414
9	PERSONAL COMPUTER	IBM	2156-D1N	BNA349G	FCC DoC APPROVED
10	COLOR MONITOR	ACER	7254e	9171602003	JVP7254E
11	MOUSE PS/2	HP	M-S34	S/N	DZL210582
12	PS/2 KEYBOARD	HP	C3757A	C3757-60223	C1GE 03614
13	Network adapter	INTEL	GD82559	009027A598FB	EJMNPDALBANY
14	OFFICE CONNECT HUB	3COM	TP800	7YNR011412	FCC DoC

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core.
2	1.8 m foil shielded wire, terminated with USB connector via drain wire, w/o core.
3	1.8 m foil shielded wire, terminated with USB connector via drain wire, w/o core.
4	1.6 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
5	1.6 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
6	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
7	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
8	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
9	NA
10	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core.
11	1.5 m foil shielded wire, terminated with PS2 connector via drain wire, w/o core.
12	1.5 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
13	NA
14	NA

Note: 1. All power cords of the above support units are non shielded (1.8m).
 2. Support unit 2 & 3 were connected to the USB ports of EUT.
 3. Support units 1-8 were set up as the SERVER PC system and communicated with support units 9-14, 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	ESHS30	828765/002	July 19, 2001
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	828075/003	July 19, 2001
ROHDE & SCHWARZ 4-wire ISN	ENY41	835154/007	Apr. 26, 2001
EMCO-L.I.S.N.	3825/2	90031627	July 19, 2001
Shielded Room	Site 5	ADT-C05	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	3544A01176	April 18, 2001
HP Preamplifier	8447D	2944A08485	April 26, 2001
HP Preamplifier	8449B	3008A01201	Dec. 13, 2001
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Aug. 3, 2001
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2001
CHASE BILOG Antenna	CBL6112A	2221	Aug. 4, 2001
EMCO Turn Table	1060	1115	NA
SHOSHIN Tower	AP-4701	A6Y005	NA
Open Field Test Site	Site 5	ADT-R05	July 28, 2001

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.

3.2 TEST INSTRUMENTS (IMMUNITY)

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
KeyTek, ESD Test System	2000	9105240/41	Aug. 10, 2001
KeyTek, ESD Simulator	MZ-15/EC	9902287	Feb. 28, 2001
KeyTek, EFT Generator	CE-40	9508257	Sept. 4, 2001
KeyTek, Capacitive Clamp	CE-40-CCL	9508259	Sept. 4, 2001
KeyTek, Control Center	E103	9508347	NA
KeyTek, Surge Combination Wave	E501A	9508349	Aug. 29, 2001
KeyTek, Surge Coupler/Decoupler	E551	9508350	Aug. 29, 2001
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. 13, 2001
KALMUS Power Amplifier	LA1000V	091995-1	NA
KALMUS Power Amplifier	757LC	091995-2	NA
HOLADAY Field Probe	HI-4422	89915	Aug. 14, 2001
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. 13, 2001
COMTEST Compact Full Anechoic Chamber (7x3x3 m)	CFAC	ADT-S01	Aug. 26, 2001
HAEFELY Magnetic Field Tester	MAG 100.1	083794-06	NA
COMBINOVA Magnetic Field Meter	MFM10	224	Oct. 30, 2001
KEYTEK Mains Interference Simulator	EMC Pro	9902207	Feb. 16, 2001
HAEFELY Mains Interference Simulator	PLINE 1610	083690-17	March 01, 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)	Class B (at 10m)
	dBuV/m	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.

LIMIT OF CONDUCTED COMMON MODE DISTURBANCE AT TELECOMMUNICATION PORTS FOR CLASS B EQUIPMENT

FREQUENCY (MHz)	Voltage Limit (dBuV)		Current Limit (dBuA)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	84 - 74	74 - 64	40 - 30	30 - 20
0.5 - 30.0	74	64	30	20

- Note: (1) The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.



4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Product Family Standard : EN 55011: 1998, (Group I, Class A)
Frequency Range : 0.15 - 30 MHz (Conducted Emission)
30 - 1000 MHz (Radiated Emission)
Input Voltage : 230 Vac, 50 Hz
Temperature : 28 Degree C
Humidity : 69 %
Atmospheric Pressure : 998 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -23.36 dB at 17.695 MHz Minimum passing margin of conducted emission (telecommunication voltage port): -27.16 dB at 23.128 MHz Minimum passing margin of radiated emission: -8.3 dB at 51.32 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 (A)

EUT: **6U-size CompactPCI Master SBC with Pentium III/Celeron Processor**

MODEL: **MIC-3377D/M**

MODE: **Up Power Supply**

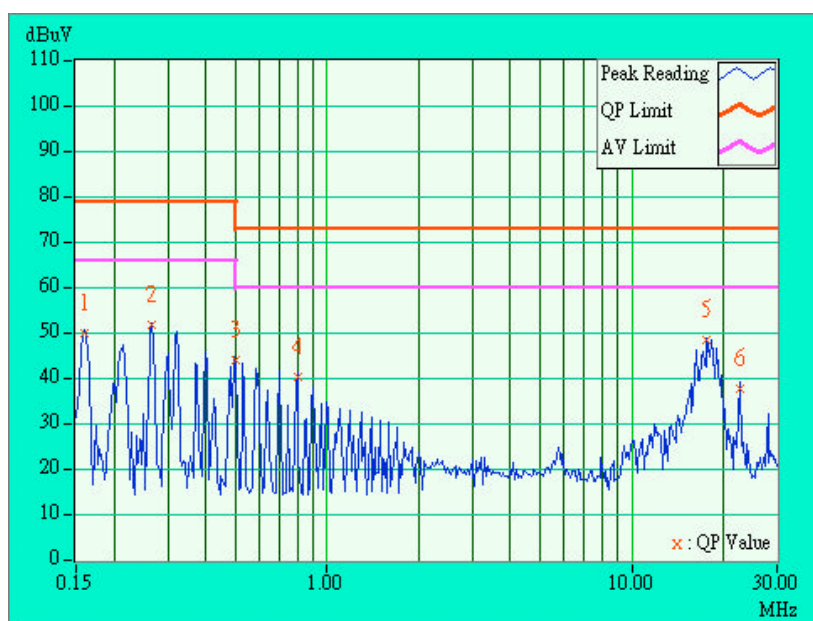
6 dB Bandwidth: **10 kHz**

PHASE: **LINE (L)**

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.160	0.16	49.85	-	50.01	-	79.00	66.00	-28.99	-
2	0.267	0.20	51.68	-	51.88	-	79.00	66.00	-27.12	-
3	0.500	0.20	44.08	-	44.28	-	73.00	60.00	-28.72	-
4	0.799	0.20	40.47	-	40.67	-	73.00	60.00	-32.33	-
5	17.695	1.05	48.40	-	49.45	-	73.00	60.00	-23.55	-
6	22.569	1.25	37.70	-	38.95	-	73.00	60.00	-34.05	-

Remarks:

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



TEST DATA OF CONDUCTED EMISSION (A)

EUT: **6U-size CompactPCI Master SBC with Pentium III/Celeron Processor**

MODEL: **MIC-3377D/M**

MODE: **Up Power Supply**

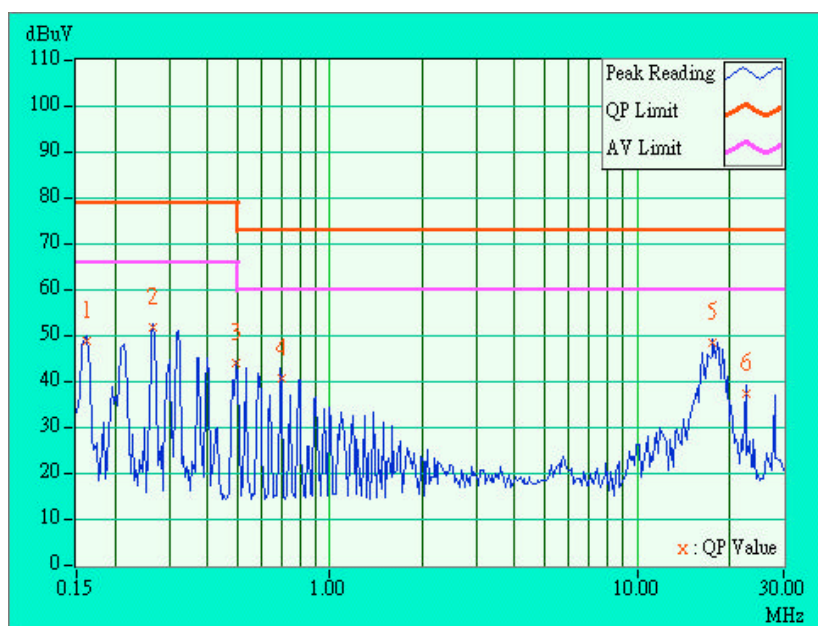
6 dB Bandwidth: **10 kHz**

PHASE: **NEUTRAL (N)**

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.161	0.16	48.99	-	49.15	-	79.00	66.00	-29.85	-
2	0.266	0.20	51.89	-	52.09	-	79.00	66.00	-26.91	-
3	0.498	0.20	44.22	-	44.42	-	79.00	66.00	-34.58	-
4	0.696	0.20	40.90	-	41.10	-	73.00	60.00	-31.90	-
5	17.695	0.95	48.69	-	49.64	-	73.00	60.00	-23.36	-
6	22.569	1.15	37.42	-	38.57	-	73.00	60.00	-34.43	-

Remarks:

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



4.1.3 TEST DATA OF CONDUCTED EMISSION (B)

EUT: **6U-size CompactPCI Master SBC with Pentium III/Celeron Processor**

MODEL: **MIC-3377D/M**

MODE: **Down Power Supply**

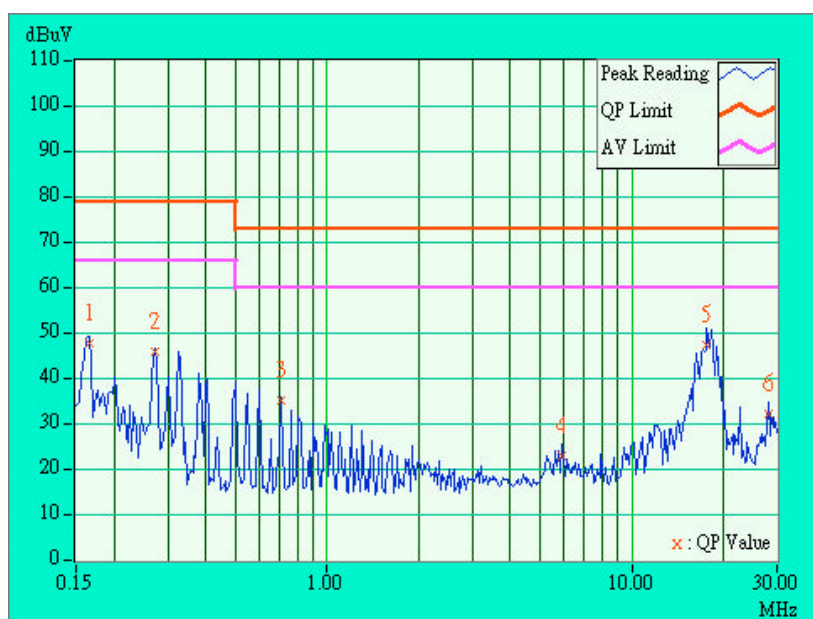
6 dB Bandwidth: **10 kHz**

PHASE: **LINE (L)**

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.165	0.17	47.81	-	47.98	-	79.00	66.00	-31.02	-
2	0.273	0.20	46.06	-	46.26	-	79.00	66.00	-32.74	-
3	0.705	0.20	35.15	-	35.35	-	73.00	60.00	-37.65	-
4	5.909	0.50	22.78	-	23.28	-	73.00	60.00	-49.72	-
5	17.694	1.05	47.58	-	48.63	-	73.00	60.00	-24.37	-
6	28.011	1.52	32.09	-	33.61	-	73.00	60.00	-39.39	-

Remarks:

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



TEST DATA OF CONDUCTED EMISSION (B)

EUT: **6U-size CompactPCI Master SBC with Pentium III/Celeron Processor**

MODEL: **MIC-3377D/M**

MODE: **Down Power Supply**

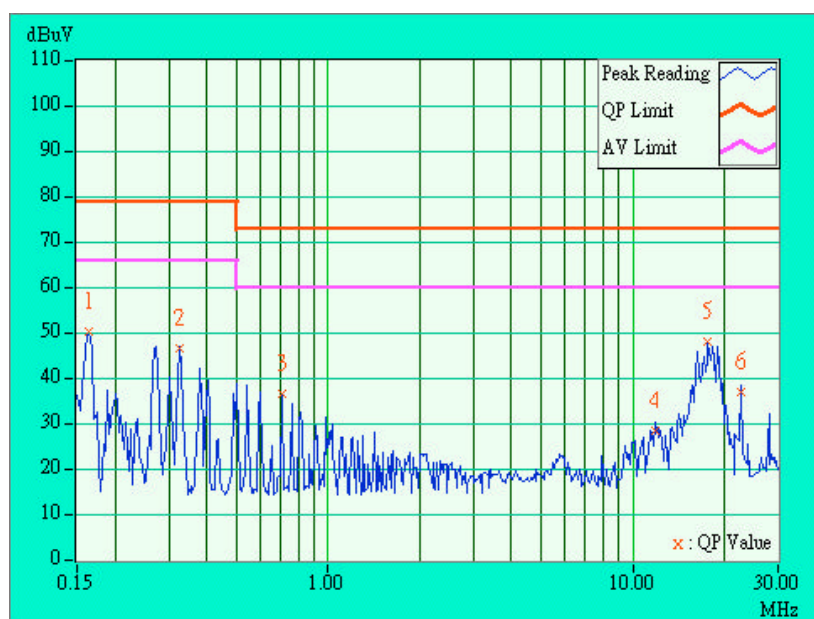
6 dB Bandwidth: **10 kHz**

PHASE: **NEUTRAL (N)**

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.164	0.16	50.19	-	50.35	-	79.00	66.00	-28.65	-
2	0.327	0.20	46.70	-	46.90	-	79.00	66.00	-32.10	-
3	0.706	0.20	36.72	-	36.92	-	73.00	60.00	-36.08	-
4	11.893	0.71	28.60	-	29.31	-	73.00	60.00	-43.69	-
5	17.694	0.95	48.02	-	48.97	-	73.00	60.00	-24.03	-
6	22.569	1.15	37.18	-	38.33	-	73.00	60.00	-34.67	-

Remarks:

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



4.1.4 TEST DATA OF TELECOMMUNICATION PORT VOLTAGE OF CONDUCTED EMISSION (A)

EUT: 6U-size CompactPCI Master SBC with Pentium III/Celeron Processor

MODEL: MIC-3377D/M

MODE: Up Power Supply

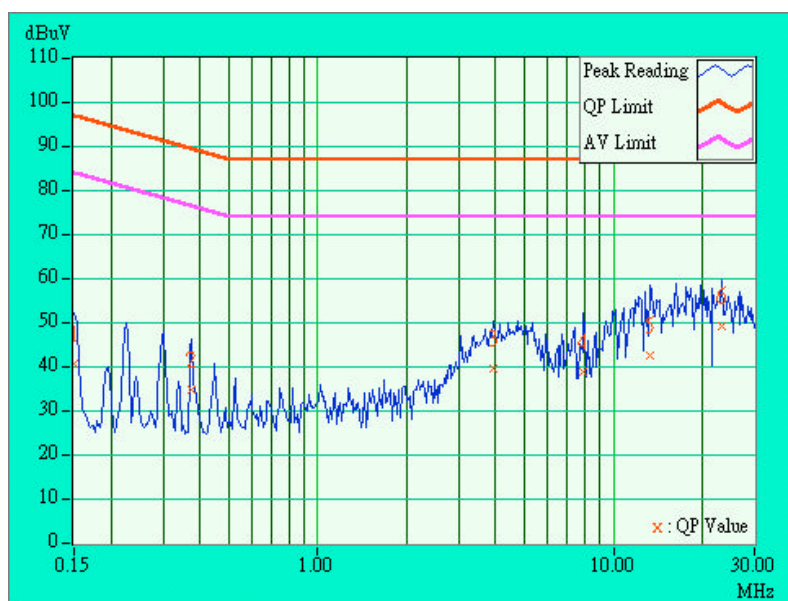
6 dB Band Width: 10 kHz

PHASE: RJ45 - TELECOMMUNICATION PORTS

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	10.65	40.88	-	51.53	-	96.98	83.98	-45.45	-
2	0.373	10.64	34.83	-	45.47	-	89.43	76.43	-43.96	-
3	3.953	10.60	39.59	-	50.19	-	87.00	74.00	-36.81	-
4	7.920	10.61	38.86	-	49.47	-	87.00	74.00	-37.53	-
5	13.362	10.67	42.68	-	53.35	-	87.00	74.00	-33.65	-
6	23.128	10.66	49.18	-	59.84	-	87.00	74.00	-27.16	-

Remarks:

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



4.1.5 TEST DATA OF TELECOMMUNICATION PORT VOLTAGE OF CONDUCTED EMISSION (B)

EUT: **6U-size CompactPCI Master SBC with Pentium III/Celeron Processor**

MODEL: **MIC-3377D/M**

MODE: **Down Power Supply**

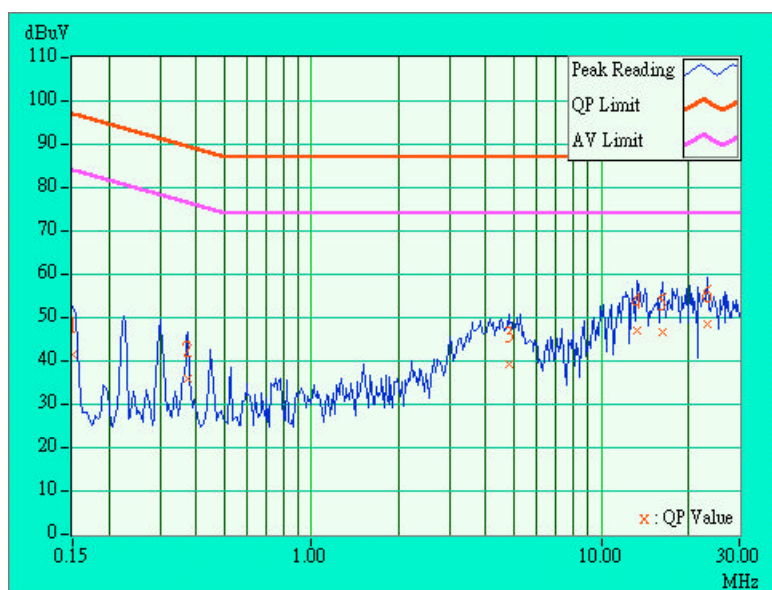
6 dB Band Width: **10 kHz**

PHASE: **RJ45 - TELECOMMUNICATION PORTS**

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	10.65	41.65	-	52.30	-	97.00	84.00	-44.70	-
2	0.374	10.64	35.97	-	46.61	-	89.42	76.42	-42.81	-
3	4.795	10.61	39.09	-	49.70	-	87.00	74.00	-37.30	-
4	13.357	10.67	46.99	-	57.66	-	87.00	74.00	-29.34	-
5	16.226	10.68	46.58	-	57.26	-	87.00	74.00	-29.74	-
6	23.128	10.66	48.34	-	59.00	-	87.00	74.00	-28.00	-

Remarks:

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





4.1.6 TEST DATA OF RADIATED EMISSION

EUT: **6U-size CompactPCI Master SBC with Pentium III/Celeron Processor**

MODEL: **MIC-3377D/M**

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**

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	53.20	27.8 QP	40.00	-12.20	3.51H	341	46.66	6.02	2.08	27.00	18.89
2	144.05	24.4 QP	40.00	-15.60	4.00H	60	38.37	10.43	2.58	27.00	14.00
3	166.61	31.1 QP	40.00	-8.90	4.00H	322	46.46	8.98	2.62	27.00	15.40
4	180.57	25.7 QP	40.00	-14.30	4.00H	140	41.38	8.62	2.66	27.00	15.72
5	201.08	26.1 QP	40.00	-13.90	4.00H	159	41.78	8.54	2.79	27.00	15.66
6	234.33	29.0 QP	47.00	-18.00	4.00H	332	42.64	10.47	2.85	27.00	13.68
7	266.58	25.4 QP	47.00	-21.60	4.00H	272	37.41	12.04	2.95	27.00	12.00
8	301.68	34.5 QP	47.00	-12.50	2.33H	279	45.78	12.59	3.11	27.00	11.30
9	468.90	29.3 QP	47.00	-17.70	1.98H	90	36.50	16.41	3.39	27.00	7.19
10	594.35	30.9 QP	47.00	-16.10	3.59H	170	36.75	17.66	3.54	27.00	5.80
11	899.01	28.3 QP	47.00	-18.70	4.00H	111	30.96	19.57	4.78	27.00	2.65

- REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) – Correction Factor(dB)
 2. Correction Factor(dB) = Pre-Amplifier Factor (dB) - Antenna Factor (dB) - Cable Factor (dB)
 3. Pre-Amplifier Factor (dB) = 0, when the test receiver is used to read the value and because it did not use the Pre-Amplifier.
 4. The other emission levels were very low against the limit.
 5. Margin value = Emission level – Limit value.



TEST DATA OF RADIATED EMISSION

EUT: **6U-size CompactPCI Master SBC with Pentium III/Celeron Processor**

MODEL: **MIC-3377D/M**

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**

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	51.32	31.7 QP	40.00	-8.30	0.99V	111	50.02	6.60	2.08	27.00	18.32
2	134.03	24.7 QP	40.00	-15.30	0.99V	93	38.26	10.90	2.54	27.00	13.56
3	160.96	29.6 QP	40.00	-10.40	0.99V	149	44.89	9.10	2.61	27.00	15.29
4	166.56	26 QP	40.00	-14.00	0.99V	199	41.40	8.98	2.62	27.00	15.40
5	180.56	25.4 QP	40.00	-14.60	0.99V	183	41.12	8.62	2.66	27.00	15.72
6	195.60	25.0 QP	40.00	-15.00	1.00V	240	40.78	8.46	2.76	27.00	15.78
7	201.11	22.5 QP	40.00	-17.50	0.99V	220	38.16	8.54	2.79	27.00	15.66
8	301.80	33.4 QP	47.00	-13.60	1.03V	317	44.70	12.59	3.11	27.00	11.30
9	502.75	31.2 QP	47.00	-15.80	1.59V	255	37.55	16.97	3.68	27.00	6.35

- REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) – Correction Factor(dB)
 2. Correction Factor(dB) = Pre-Amplifier Factor (dB) - Antenna Factor (dB) - Cable Factor (dB)
 3. Pre-Amplifier Factor (dB) = 0, when the test receiver is used to read the value and because it did not use the Pre-Amplifier.
 4. The other emission levels were very low against the limit.
 5. Margin value = Emission level – Limit value.

5. TEST RESULTS (IMMUNITY)

5.1 GENERAL DESCRIPTION

Generic Standard	:	EN 50082-2: 1995
Basic Standard	:	EN 61000-4-2 (Electrostatic Discharge, ESD, 8kV air discharge, 4kV Contact discharge, Performance Criterion B)
Specification and Performance Criteria	:	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, 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, 50 % duty cycle, Rep. Frequency 200 Hz, Performance Criterion A)
Input Voltage	:	230 Vac, 50 Hz
Temperature	:	17 Degree C
Humidity	:	52 %
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-3377D/M

OBSERVATION DESCRIPTION

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

Description of test point: (Please refer to ESD test photo)

- | | |
|------------------|--------------------|
| 1. ALL I/O ports | 2. All LEDs |
| 3. All screws | 4. I/O Metal board |

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
Antenna height : 1.5m
Dwell Time : at least 3 seconds

Test Result		Remarks
Criterion A	PASS	Model: MIC-3377D/M

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-3377D/M

OBSERVATION DESCRIPTION

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. The transmission of data was interrupted during the test, 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
Modulation : 1kHz Sine Wave, 80%, AM Modulation
Frequency step : 1 % of fundamental
Coupled cable : Power Mains, Unshielded
Coupling device : Clamp Injection
Dwell Time : at least 3 seconds

Test Result		Remarks
Criterion A	PASS	Model: MIC-3377D/M

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-3377D/M

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
Modulation : 200Hz, Square Wave, 50% Duty Cycle
Dwell Time : 30 second
Polarity of Antenna : Horizontal and Vertical
Test distance : 3 m
Dwell Time : at least 3 seconds

Test Result		Remarks
Criterion A	PASS	Model: MIC-3377D/M

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

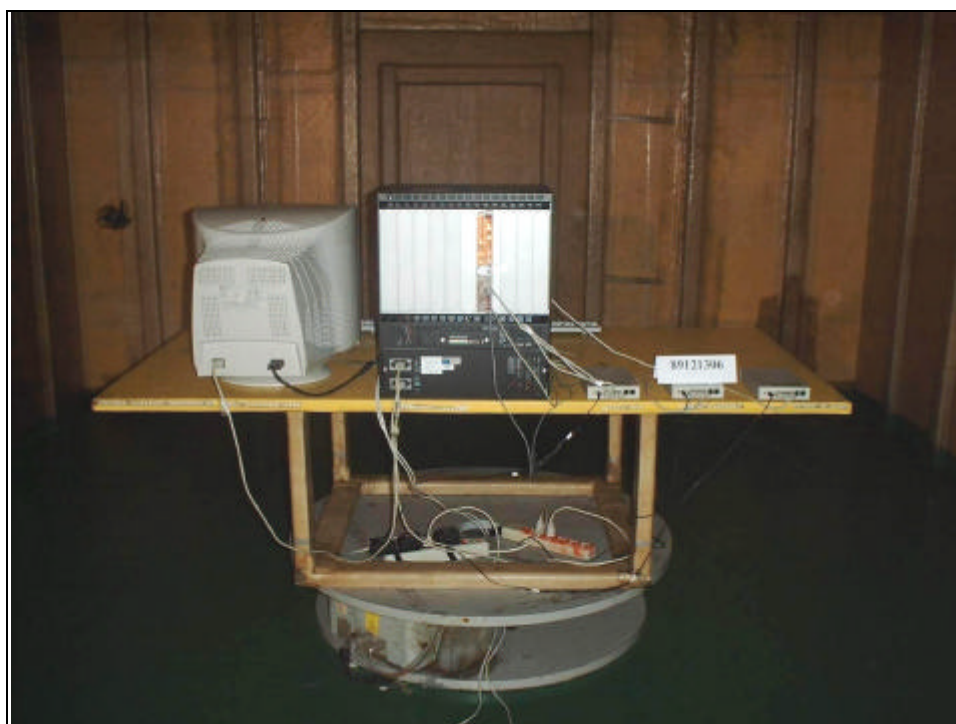
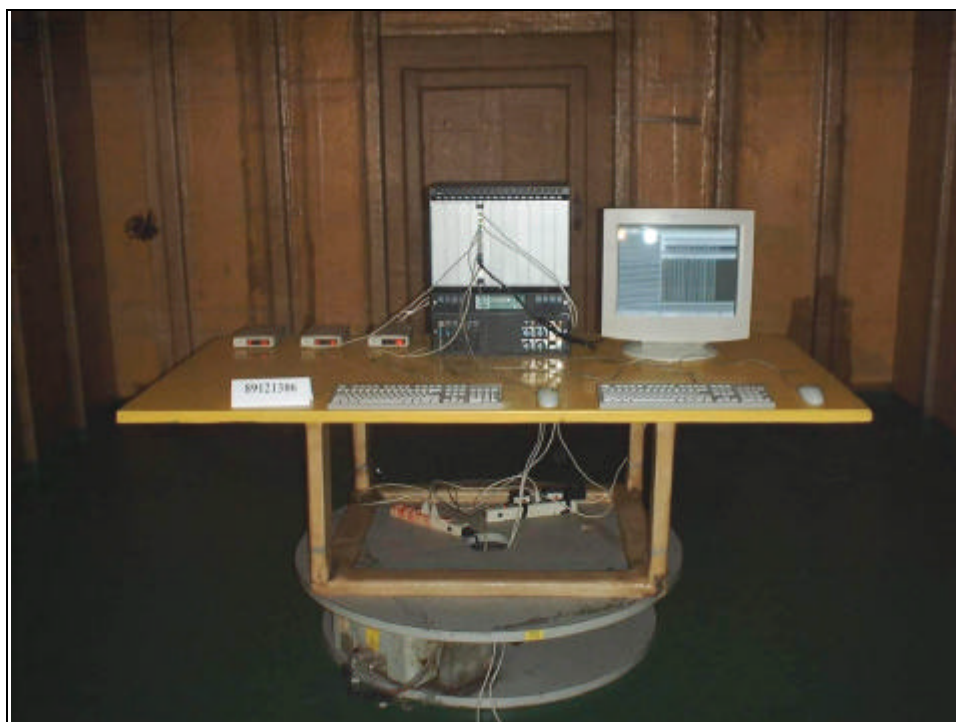
CONDUCTED EMISSION TEST



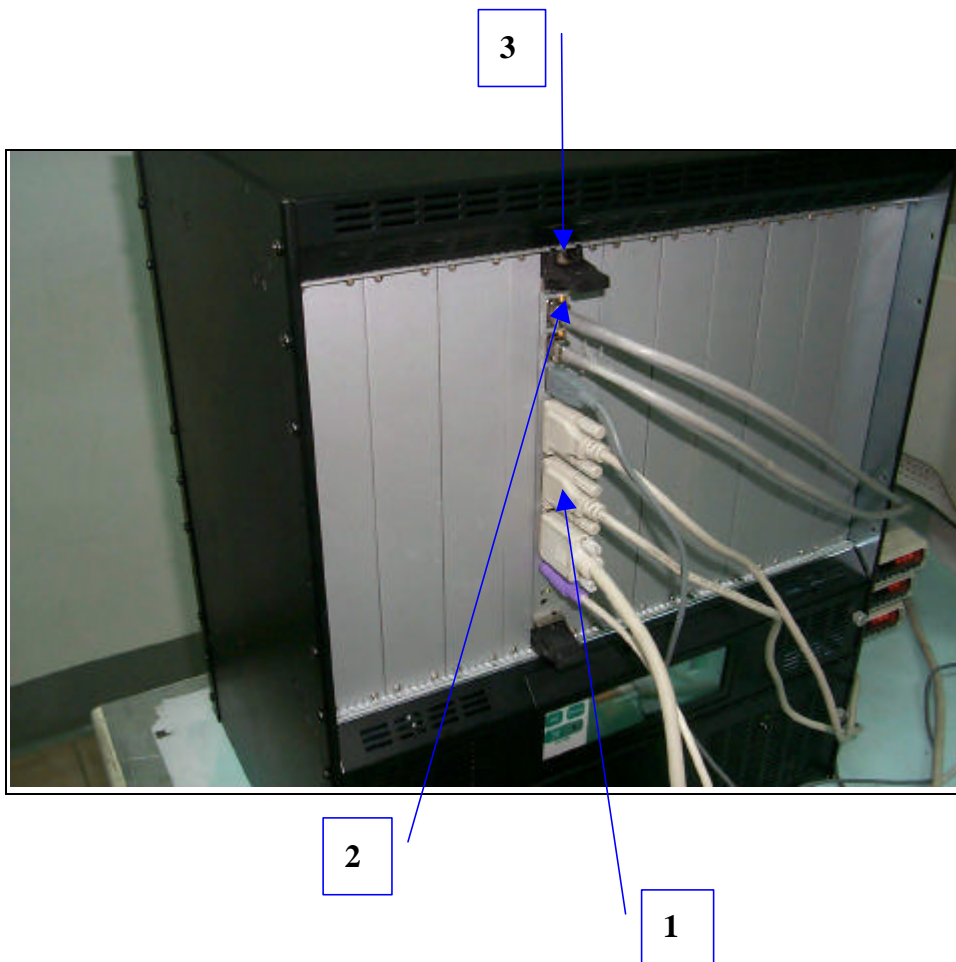
TELECOMMUNICATION PORT - RJ45 VOLTAGE OF CONDUCTED EMISSION TEST

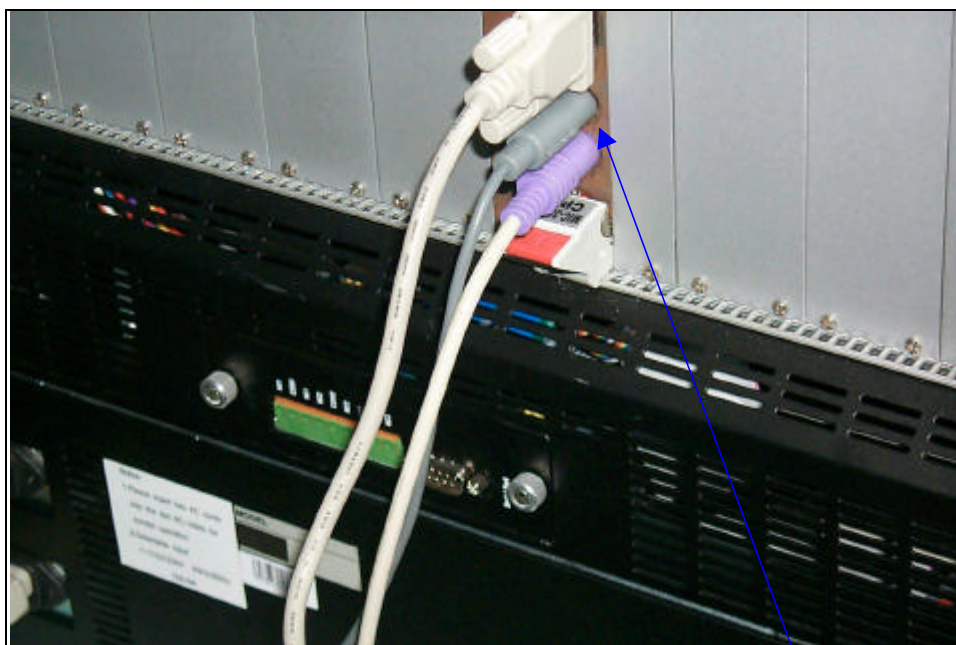


RADIATED EMISSION TEST



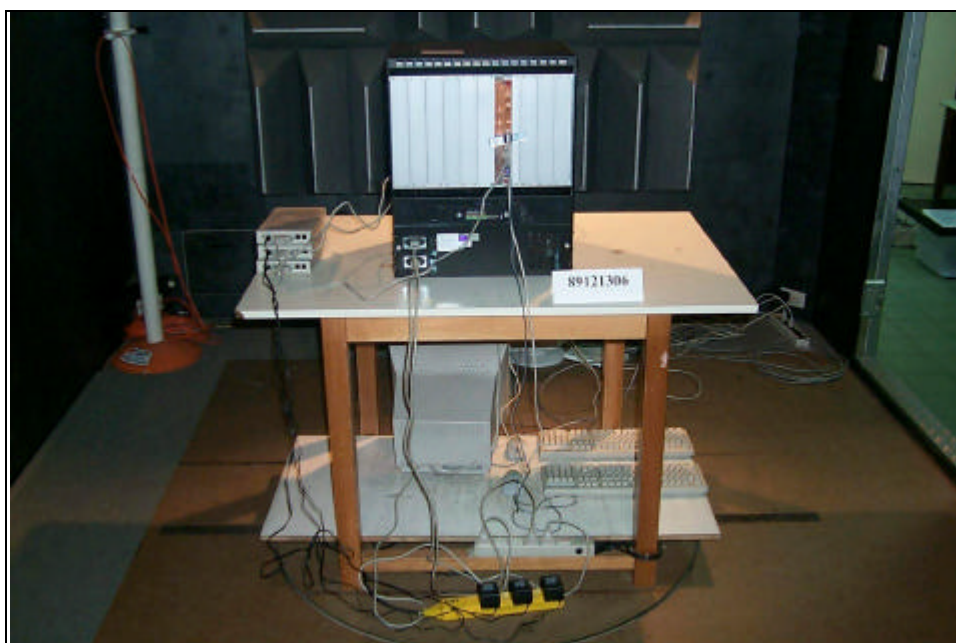
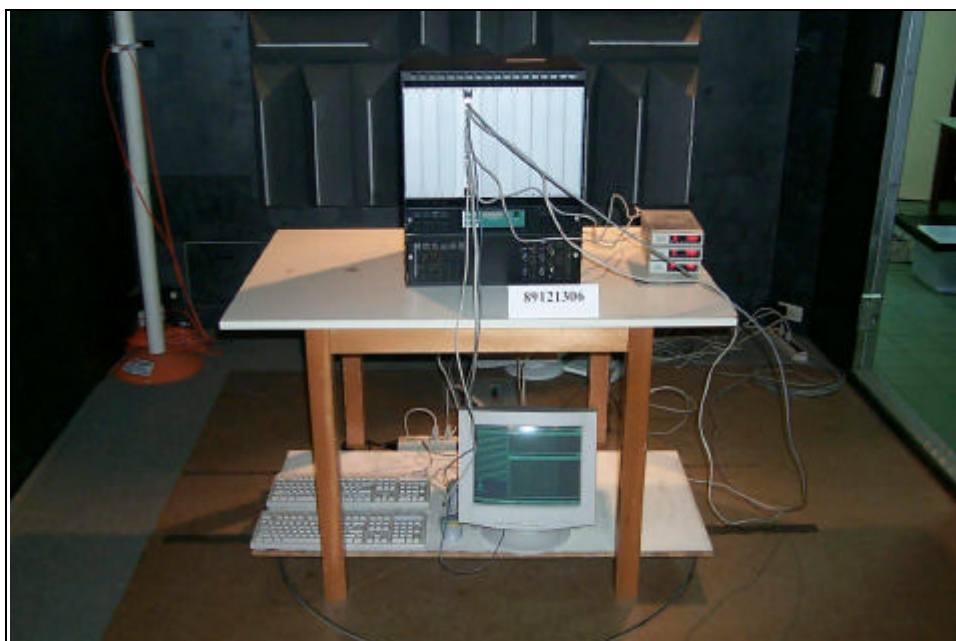
ESD TEST





4

RS & PULSE MODULATION TEST



EFT TEST



EFT CLAMP 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, NVLAP
✍ Germany	TUV Rheinland
✍ Japan	VCCI
✍ New Zealand	RFS
✍ Norway	NEMKO, DNV
✍ U.K.	INCHCAPE
✍ R.O.C.	BSMI

Copies of accreditation certificates of our laboratory obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml.
If you have any comments, please feel free to contact us at the following:

Lin Kou EMC Lab.:
Tel: 886-2-26052180
Fax: 886-2-26052943

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

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

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

E-mail: service@mail.adt.com.tw
Web Site: www.adt.com.tw