

# CE EMC CERTIFICATION

according to

**European Standard EN 55022:1998/A1:2000 Class A,  
EN 61000-3-2:2000, EN 61000-3-3:1995/A1:2001 and  
EN 55024:1998/A1:2001 ( IEC 61000-4-2:1995,  
IEC 61000-4-3:1995, IEC 61000-4-4:1995, IEC 61000-4-5:1995,  
IEC 61000-4-6:1996, IEC 61000-4-8:1993, IEC 61000-4-11:1994 )**

Equipment : Meter

Model No. : MMS, MM1, MMX-1, MMX-A, MMX-AP, MMX-P,  
MMX-R, MM2X, MFRT, MR, MMX-RS, MC,  
MC726, MCT726, MCO726, MM2, MM2D, MMT,  
MAT, MMX-L, MMX-C

Applicant : **AXE Technology Corp.**  
No. 70, Lane 83, Hwa Chen Road,  
Hsing Chuang City, Taipei Hsien, Taiwan, R.O.C.

## I HEREBY CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **EUROPEAN COUNCIL DIRECTIVE 89/336/EEC**. The equipment was **passed** the test performed according to **European Standard EN 55022:1998/A1:2000 Class A, EN 61000-3-2:2000, EN 61000-3-3:1995/A1:2001 and EN 55024:1998/A1:2001 ( IEC 61000-4-2:1995, IEC 61000-4-3:1995, IEC 61000-4-4:1995, IEC 61000-4-5:1995, IEC 61000-4-6:1996, IEC 61000-4-8:1993, IEC 61000-4-11:1994 )**. The test was carried out on **Sep. 27, 2004** at SPORTON INTERNATIONAL INC. LAB.



Alex Chen

Manager

### **SPORTON INTERNATIONAL INC.**

6F, No. 106, Sec. 1, Hsin Tai Wu Rd.,  
Hsi Chih, Taipei Hsien, Taiwan, R.O.C.  
TEL:886-2-2696-2468  
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ISSUED DATE: Oct. 05, 2004

## **APPENDIX A. GENERAL DESCRIPTION OF EQUIPMENT UNDER TEST**

### **A.1. APPLICANT**

AXE Technology Corp.  
No. 70, Lane 83, Hwa Chen Road,  
Hsing Chuang City, Taipei Hsien, Taiwan, R.O.C.

### **A.2. APPLICANT**

Same as A.1.

### **A.3. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST**

Equipment : Meter  
Model No. : MMS, MM1, MMX-1, MMX-A, MMX-AP, MMX-P, MMX-R, MM2X,  
MFRT, MR,MMX-RS, MC, MC726, MCT726, MCO726, MM2,  
MM2D, MMT, MAT, MMX-L, MMX-C  
Trade Name : AXE  
Power Supply Type : Switching  
AC Power Cord : Non-Shielded, 1.75m, 3pin

### **A.4. FEATURE OF EQUIPMENT UNDER TEST**

- Please refer to user manual.

## **APPENDIX B. GENERAL INFORMATION OF TEST**

### **B.1. TEST FACILITY**

#### **< EMI >**

Test Site Location : No. 3, Lane 238, Kang Lo Street, Nei Hwu District,  
Taipei 11424, Taiwan, R.O.C..  
TEL : 886-2-2631-4739  
FAX : 886-2-2631-9740

Test Site No. : CO01-NH, OS01-NH

#### **< EMS >**

This test was carried out by SPORTON International Inc.

Test Site Location : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park,  
Kwei-Shan Hsiag, Tao Yuan Hsien, Taiwan, R.O.C.  
TEL : 886-3-327-3456  
FAX : 886-3-318-0055

### **B.2. TEST VOLTAGE**

230V/50Hz

### **B.3. STANDARD FOR METHODS OF MEASUREMENT**

EMI Test (conduction and radiation) : European Standard EN 55022 Class A  
Harmonics Test : European Standard EN 61000-3-2.  
Voltage Fluctuations Test : European Standard EN 61000-3-3.  
EMS Test : European Standard EN 55024.  
(ESD: IEC 61000-4-2, RS: IEC 61000-4-3, EFT: IEC 61000-4-4, SURGE: IEC 61000-4-5,  
CS: IEC 61000-4-6, Power Frequency Magnetic Field: IEC 61000-4-8, DIPS: IEC 61000-4-11)

### **B.4. TEST IN COMPLIANCE WITH**

EMI Test (conduction and radiation) : European Standard EN 55022 Class A  
Harmonics Test : European Standard EN 61000-3-2.  
Voltage Fluctuations Test : European Standard EN 61000-3-3.  
EMS Test : European Standard EN 55024.  
(ESD: IEC 61000-4-2, RS: IEC 61000-4-3, EFT: IEC 61000-4-4, SURGE: IEC 61000-4-5,  
CS: IEC 61000-4-6, Power Frequency Magnetic Field: IEC 61000-4-8, DIPS: IEC 61000-4-11)

### **B.5. FREQUENCY RANGE INVESTIGATED**

- a. Conducted emission test: from 150 kHz to 30 MHz
- b. Radiated emission test: from 30 MHz to 1,000 MHz
- c. Radio frequency electromagnetic field immunity test : 80-1000 MHz.

### **B.6. TEST DISTANCE**

- a. The test distance of radiated emission test from antenna to EUT is 10 M.
- b. The test distance of radio frequency electromagnetic field immunity test from antenna to EUT is 3 M.

**APPENDIX C. TEST RESULT**

**C.1. CONDUCTED POWERLINE**

The CONDUCTED EMISSION test was passed at

Frequency ( MHz )	Line or Neutral	Meter Reading		Limits		Margin	
		Q.P. ( dBuV )	A.V. ( dBuV )	Q.P. ( dBuV )	A.V. ( dBuV )	Q.P. ( dB )	A.V. ( dB )
8.713	L	51.97	13.97	73.00	60.00	-21.03	-46.03

**C.2. RADIATED EMISSION**

The RADIATED EMISSION test was passed at

Frequency ( MHz )	Polarity	Limits (dBuV/m)	Emission (dBuV/m)	Margin ( dB )	Antenna High	TurnTable Degree
45.400	V	40.00	29.65	-10.35	1m	200°

### **C.3. HARMONICS**

As specified on clause 7 and figure Z1 of EN 61000-3-2:2000, the limits are not specified for equipment with a rated power of 75W or less.

The EUT meets the above condition, so it conforms to EN 61000-3-2.

### **C.4. VOLTAGE FLUCTUATIONS AND FLICKER**

Urms = 228.9V    Freq = 50.000    Range: 0.25 A  
Irms = 0.016A    Ipk = 0.031A    cf = 1.985  
P = 2.123W    Pap = 3.633VA    pf = 0.584

Test - Time : 1 x 10min = 10min ( 100 %)

LIN (Line Impedance Network) : SLIN 0.24ohm +j0.15ohm N:0.16ohm +j0.10ohm

Limits : Plt : 0.65    Pst : 1.00  
          dmax : 4.00 %    dc : 3.30 %  
          dtLim : 3.30 %    dt>Lim: 500ms

Test completed, Result: PASSED

Plt = 0.072

	Pst	P50s	P10s	P3s	P1s	P0.1s	dmax	dc	dt>Lim
1	0.072	0.010	0.010	0.010	0.010	0.010	0.000	0.000	0.000

**C.5. ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)**

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : B
- Required performance criteria : B
- Observation : During the test, the voltage varied slightly. After the test, the equipment continued to operate as intended without operator intervention.

**C.6. RADIO FREQUENCY ELECTROMAGNETIC FIELD IMMUNITY TEST (RS)**

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : A
- Required performance criteria : A
- Observation : Normal

**C.7. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT/BURST)**

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : B
- Required performance criteria : B
- Observation : During the test, the voltage varied slightly. After the test, the equipment continued to operate as intended without operator intervention.

**C.8. SURGE IMMUNITY TEST**

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : A
- Required performance criteria : B
- Observation : Normal

**C.9. CONDUCTED DISTURBANCES INDUCED BY RADIO-FREQUENCY FIELD**

**IMMUNITY TEST ( CS )**

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : A
- Required performance criteria : A
- Observation : Normal

**C.10. POWER FREQUENCY MAGNETIC FIELD IMMUNITY TESTS**

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : A
- Required performance criteria : A
- Observation : Normal

**C.11. VOLTAGE DIPS, SHORT INTERRUPTIONS AND VOLTAGE VARIATIONS**

**IMMUNITY TESTS**

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : C for voltage interruption, A for voltage dips
- Required performance criteria : C for voltage interruption, B/C for voltage dips
- Observation : After the interruption, the power of EUT reset automatically.

**APPENDIX D. TEST INSTRUMENT**

**D.1. EMI**

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Monitor	R&S	EZM	894987/011	9KHz – 1.3GHz	Aug. 13, 2004	Conduction (CO01-NH)
Test Receiver	R&S	ESH3	893495/013	9 KHz - 30 MHz	Aug. 10, 2004	Conduction (CO01-NH)
LISN	Rolf Heine	NNB-2/16Z	99079	9 KHz - 30 MHz	Dec. 25, 2003	Conduction (CO01-NH)
LISN	KYORITSU	KNW-407	8-1010-15	9 KHz - 30 MHz	Nov. 28, 2003	Conduction (CO01-NH)
Power Filter	CORCOM	MR12030	N/A	30A*2	N/A	Conduction (CO01-NH)
RF Cable-CON	Suhner Switzerland	RG223/U	CB004	9KHz~30MHz	Dec. 18, 2003	Conduction (CO01-NH)
Open Area Test Site	SPORTON	OATS-10	OS01-NH	30MHz~1GHz 10m	Mar. 13, 2004	Radiation (OS01-NH)
Spectrum Analyzer	HP	8568B	3634A03000	100Hz – 1.5GHz	Nov. 28, 2003	Radiation (OS01-NH)
Quasi-peak Adapter	HP	85650A	2521A00821	9KHz -1GHz	Apr. 12, 2004	Radiation (OS01-NH)
Amplifier	HP	8447D	2944A06292	0.1MHz ~ 1.3GHz	Mar. 15, 2004	Radiation (OS01-NH)
Bilog Antenna	SCHAFFNER	CBL6111C	2738	30MHz - 1GHz	Jan. 03, 2004	Radiation (OS01-NH)
Turn Table	EMCO	1060-1.211	9507-1805	0 ~ 360 degree	N/A	Radiation (OS01-NH)
Antenna Mast	EMCO	1051-1.2	9503-1876	1 m - 4 m	N/A	Radiation (OS01-NH)
RF Cable-R10m	BELDEN	RG8/U	CB001	30MHz~1GHz	Dec. 13, 2003	Radiation (OS01-NH)

Calibration Interval of instruments listed above is one year.

**D.2. EMS**

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
ESD Simulator	KEYTEK	MZ-15/EC	0406338	Air: 0 KV - 15 KV Contact: 0 KV -8KV	Jul. 16, 2004	ESD
Antenna	CHASE	CBL6121A	1027	26 MHz - 1 GHz	Dec. 08, 2003	RS01
Field Strength Monitoring Antennas (Probe)	AR	FP3000A	16077	0.1 MHz - 1 GHz	Aug. 12, 2004	RS
RS immunity Test system	HP	EMS test System	2062	80 MHz - 1 GHz 3V/m, 10v/m	Dec. 08, 2003	RS
Amplifier	AR	100W 1000M3	16060	80 MHz - 1 GHz	Dec. 08, 2003	RS
Power Meter	EMC Automation	438A	3513U04050	100 KHz -4.2 GHz	Dec. 08, 2003	RS
Signal Generator	HP	8648A	3426A00771	100 KHz - 1 GHz	Dec. 04, 2003	RS
Power Sensor	HP	8481D	3318A13140	100 KHz - 1 GHz	Dec. 08, 2003	RS
Power Sensor	HP	8482A	3318A26464	100 KHz - 1 GHz	Dec. 08, 2003	RS
Attenuator	HP	8491A	53603	100 KHz - 1 GHz	Dec. 08, 2003	RS
EFT Generator	EMC -PARTNER	TRANSIENT -2000	TRA2000-376	0KV - 4.4 KV	Apr. 29, 2004	EFT
SURGE Generator	EMC -PARTNER	TRANSIENT -2000	TRA2000-376	0 KV -6 KV/2 0KV-500V/12	Apr. 29, 2004	SURGE
Conducted Immunity Test System	FRANKONIA	CIT-10	102C3115	100KHz ~ 266MHz	Apr. 08, 2004	CS
Conducted Immunity Test System Amplifier	A.R	75A220	16980	15~230MHz FM1KHz80 % 75W	Apr. 09, 2004	CS
Coupling and Decoupling Network	FRANKONIA	CDN M2	A30020007	150KHz ~ 230MHz	Apr. 10, 2004	CS
Magnetic Generator	FCC (KEYTEK)	F-1000-4-8-G-125A	03007	30A//CONTINUOUS 100A/2Hrs 230A/30SEC	Apr. 13, 2004	PFMF
Magnetic field Immunity Loop	FCC (KEYTEK)	F-1000-4-8/9/10-L-M	03003	30A//CONTINUOUS 100A/2Hrs 230A/30SEC	Apr. 13, 2004	PFMF
DIP Generator	EMC -PARTNER	TRANSIENT -2000	TRA2000-376	230VA/50Hz/60Hz 0%Open/5S 0%Short/5S 40%/0.10S 70%/0.01S	Apr. 29, 2004	DIP
Harmonic/Flicker Test System	EMC PARTNER	Harmonics -1000	HAR1000-41	4000VA 16A PEAK	Nov. 18, 2003	Harmonics, Flicker

Calibration Interval of instruments listed above is one year.