



# CE TEST REPORT

FOR

Power Inverter

Model : HW-350XY

(X=A~Z or blank; Y=0~9, A~Z or blank )

Trade Name: Titan

Issued to

Titan Computer Co., Ltd.

25F, No. 27-8, Sec. 2, Jung-Jeng E. Road, Danshuei Jen, Taipei, Taiwan

Issue by

Global Certification Corp.

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<b>TABLE OF CONTENTS</b>	<b>2</b>
<b>1. GENERAL INFORMATION</b>	<b>4</b>
1.1 DESCRIPTION OF THE TESTED SAMPLES	5
1.2 I/O PORT OF THE EUT	5
1.3 TEST METHODOLOGY	5
1.4 DESCRIPTION OF THE SUPPORT EQUIPMENTS	6
1.5 FEATURES OF EUT	7
<b>2. INSTRUMENT AND CALIBRATION</b>	<b>8</b>
2.1 MEASURING INSTRUMENT CALIBRATION	8
2.2 TEST AND MEASUREMENT EQUIPMENT	8
2.3 TEST PERFORMED	10
2.4 APPENDIX	10
<b>3. CONDUCTED EMISSION MEASUREMENT</b>	<b>12</b>
3.1 TEST SET-UP	12
3.2 LIMIT	12
3.3 TEST PROCEDURE	12
3.4 TEST SPECIFICATION	13
3.5 RESULT	13
3.6 TEST DATA : N/A	13
<b>4. RADIATED EMISSION MEASUREMENT</b>	<b>14</b>
4.1 TEST SETUP	14
4.2 LIMIT	15
4.3 TEST PROCEDURE	15
4.4 TEST SPECIFICATION	15
4.5 RESULT: PASSED	15
4.6 TEST DATA	15
<b>5. POWER HARMONIC MEASUREMENT</b>	<b>16</b>
5.1 TEST SETUP	16
5.2 LIMIT OF HARMONIC CURRENT	16
5.3 TEST PROCEDURE	16
5.4 TEST SPECIFICATION	16
5.5 RESULT	16
5.6 TEST DATA	16
<b>6. VOLTAGE FLUCTUATIONS</b>	<b>17</b>
6.1 TEST SETUP	17
6.2 VOLTAGE FLUCTUATIONS TEST	17
6.3 TEST PROCEDURE	17
6.4 TEST SPECIFICATION	17
6.5 RESULT	17
6.6 TEST DATA	17
<b>7. ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)</b>	<b>18</b>
7.1 TEST PROCEDURE	18
7.2 TEST SETUP	18
7.3 TEST LEVEL	18
7.4 TEST RESULT.	19
<b>8. RADIATED EMISSION MEASUREMENT (RS)</b>	<b>20</b>
8.1 TEST SETUP	20



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8.2	TEST PROCEDURE-----	20
8.3	TEST LEVEL-----	20
8.4	TEST PROCEDURE -----	21
8.5	TEST RESULT -----	21
<b>9.</b>	<b>ELECTRICAL FAST TRANSIENT/BURST (EFT) -----</b>	<b>22</b>
9.1	TEST SETUP-----	22
9.2	TEST PROCEDURE-----	22
9.3	TEST PROCEDURE -----	22
9.4	TEST LEVEL-----	23
9.5	TEST RESULT -----	23
<b>10.</b>	<b>SURGE -----</b>	<b>24</b>
10.1	TEST SETUP-----	24
10.2	TEST PROCEDURE-----	24
10.3	TEST LEVEL-----	24
10.4	TEST PROCEDURE -----	24
10.5	TEST RESULT -----	25
<b>11.</b>	<b>IMMUNITY TEST TO CS CONDUCTED DISTURBANCE (CS) -----</b>	<b>26</b>
11.1	TEST SETUP-----	26
11.2	TEST PROCEDURE-----	26
11.3	TEST LEVEL-----	26
11.4	TEST PROCEDURE -----	26
11.5	TEST RESULT -----	27
<b>12.</b>	<b>POWER FREQUENCY MAGNETIC FIELD (MAGNETIC)-----</b>	<b>28</b>
12.1	TEST SETUP-----	28
12.2	TEST STANDARD -----	28
12.3	TEST LEVEL-----	28
12.4	TEST PROCEDURE -----	28
12.5	TEST RESULT -----	29
<b>13.</b>	<b>VOLTAGE DIPS AND INTERRUPTION MEASUREMENT -----</b>	<b>30</b>
13.1	TEST SETUP -----	30
13.2	TEST PROCEDURE-----	30
13.3	TEST LEVEL-----	31
13.4	TEST PROCEDURE -----	31
13.5	TEST RESULT -----	32
<b>14.</b>	<b>PERFORMANCE CRITERIA -----</b>	<b>33</b>
<b>15.</b>	<b>MODIFICATION LIST FOR EMC COMPLYING TEST-----</b>	<b>34</b>

**APPENDIX 1**

**PHOTOS OF TEST CONFIGURATION**

**APPENDIX 2**

**TEST DATA**

**PHOTOS OF EUT**



## **1. GENERAL INFORMATION**

**Applicant** : Titan Computer Co., Ltd.

**Address** : 25F, No. 27-8, Sec. 2, Jung-Jeng E. Road, Danshuei Jen, Taipei, Taiwan

**Manufacturer** : Titan Computer Co., Ltd.

**Address** : 25F, No. 27-8, Sec. 2, Jung-Jeng E. Road, Danshuei Jen, Taipei, Taiwan

**EUT** : Power Inverter

**Model Name** : HW-350XY

**Model Differences** : X=A~Z or blank; Y=0~9, A~Z or blank for marking purpose

**Measurement procedure used:**

**EMI :**

EN55022 CLASS B:1998/A1:2000/A2:2003

EN61000-3-2:2006

EN61000-3-3:1995/A1:2001/A2:2005

**EMS :**

EN55024:1998/A1:2001/A2:2003

IEC 61000-4-2 (2001)

IEC 61000-4-3 (2002)

IEC 61000-4-4 (2004)

IEC 61000-4-5 (2001)

IEC 61000-4-6 (2003) + A1 (2004)

IEC 61000-4-8 (2001)

IEC 61000-4-11 (2004)

### **Deviation from Applicable Standard**

**According to applicants declaration this EUT is a class B product**



## 1.1 DESCRIPTION OF THE TESTED SAMPLES

EUT

EUT Type : ☐Proto Type ☒Engineer Type ☐Mass Production  
Condition when received : ☒Good ☐Damage :  
EUT Name : Power Inverter  
Applicant : Titan Computer Co., Ltd.  
Manufacturer : Titan Computer Co., Ltd.  
Model Number : HW-350XY (X=A~Z or blank; Y=0~9, A~Z or blank)  
Serial Number : N/A  
FCC ID : N/A  
Used Power : ☐AC POWER ☒DC POWER  
Power From ☐N/A ☐Inside ☒Outside  
☐Adaptor ☒BATTERY ☐Power Supply ☐DC Power Source  
☐Support Unit PC  
Power Supply Type : ☐Switching ☒Linear  
Power Cord (Input) : DC 12 V 0 Hz 2 Pin 1.2 m Un-Shielded  
Power Cord (Output) : AC 230 V 50 Hz 3 Pin 1.8 m Un-Shielded

## 1.2 I/O PORT OF THE EUT

I/O port type	Q'ty	Tested with	Connect type	Note
1)N/A				

## 1.3 TEST METHODOLOGY

### EUT SYSTEM OPERATION

1. The EUT was configured according to EN55022 Class B
  2. All I/O ports were connected to the appropriate peripherals.
  3. Photos of test configuration please refer to appendix 1 or 1.4 Setup Diagram.
  4. Turn on all the power of EUT and peripheral.
  5. Perform the EMI testing procedures, and measure the maximum emission noise.
- All peripherals and cables are listed below (including internal device)



## **DECISION OF FINAL TEST MODE**

**1. The following test mode were scanned during the preliminary test:**

Mode 1: Full load 350W

Mode 2 : Half load 175W

**2. After the preliminary scan, the following test mode was found to produce the highest emission level.**

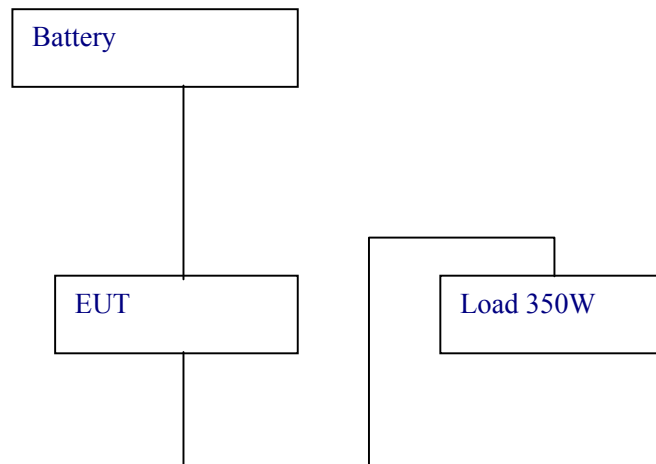
Radiation: Mode 1

Then, the EUT configuration and cable configuration of the above highest emission mode was chosen for all final test item

**3. EMS test mode is Mode 1**

## **1.4 DESCRIPTION OF THE SUPPORT EQUIPMENTS**

### **Setup Diagram**



See test photographs attached in appendix 1 for the actual connections between EUT and support equipment.



**Support Equipment**

Peripherals Devices:

OUTSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID/ BSMI ID	Trade name	Data Cable	Power Cord
1.	Full Load	350W	N/A	DOC	GCC	N/A	Unshielded 1.8M
2.	Half Load	175W	N/A	DOC	GCC	N/A	Unshielded 1.8M
3.	Battery	55D23L	N/A	DOC	YUASA	N/A	Unshielded 1.2M

**Note:** All the above equipment/cable were placed in worse case position to maximize emission signals during emission test

**Grounding:** Grounding was in accordance with the manufacturer's requirement and conditions for the intended use.

**1.5 FEATURES OF EUT : PLEASE REFER TO USER MANUAL OR PRODUCT SPECIFICATION.**



## **2. INSTRUMENT AND CALIBRATION**

### **2.1 MEASURING INSTRUMENT CALIBRATION**

The measuring equipment utilized to perform the tests documented in the report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### **2.2 TEST AND MEASUREMENT EQUIPMENT**

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and. Other required standards.

Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.

**TABLE 1 LIST OF TEST AND MEASUREMENT EQUIPMENT**

Conducted Emission Measurement					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Due Date	Note
The EUT's power is from DC Power Source , so it is not necessary to be tested.					
Radiated Emission Measurement					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Due Date	Note
Test Receiver	AFJ	ER55R	55300508277	May.20.2008	
Bilog Antenna	SUNOL	JB1	A052104	SEP.30.2008	
Turn table	EMCO	2080	9508-1805	N/A	
Controller	EMCO	2090	9804-1328	N/A	
Amplifier	G.W	GAP-801	EF150001	Jul.18.2008	
EMC Analyzer	AGILENT	E7401A	MY42000145	May.23.2008	
RF Cable	BELDEN	RG-8/U	E037	Jun.07.2008	
Thermo-Hygro meter	WISEWIND	4-IN-1	0412	Apr.10.2008	
Power Harmonic Measurement and Voltage Fluctuations					





Instrument	Manufacturer	Model No.	Serial No.	Calibration Due Date	Note
<b>The EUT's power is from DC Power Source , so it is not necessary to be tested.</b>					
<b>EMS</b>					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Due Date	Note
IEC61000-4-2					
Thermo-Hygro meter	WISEWIND	N/A	N/A	OCT.04.2008	
ESD SIMULATOR	NOISEKEN	ESS-100L	6366876	OCT.04.2008	
IEC61000-4-3					
POWER METER	BOONTON	4231A	110602	SEP.09.2008	
Signal Generator	IFR	2023A	202305/561	SEP.06.2008	
Electric Field probe	ETS-LINDGREN	00029837	305650	MAY/29/2008	2 years
Power Amplifier	SCHAFFNER	CBA9413B	4039	N/A	
IEC61000-4-4/ IEC61000-4-5/ IEC61000-4-8/ IEC61000-4-11					
EMC Immunity Test System	EMC PARTNER AG	TRA2000IN6	739	OCT.21.2008	
EFT CLAMP	EMC PARTNER AG	CN-EFT1000	451	N/A	
TTIAXIAL ELF MAGNETIC FIELD METER	SYPRIS	4090	4090070316	Apr.13.2008	
ANTENNA	EMC PARTNER AG	MF-1000-1	117	OCT.21.2008	
IEC61000-4-6					
Decoupling network	Frankonia	M2+M3	A3011055	JUL.29.2008	
Decoupling network	Frankonia	RJ45	A3023009	N/A	
EM Injection Clamp	FCC	F-203I-23MM	471	AUG.08.2008	



CONDUCTED IMMUNITY TEST SYSTEM	Frankonia	CIT-10	10203233	SEP.11.2008	
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✧ Calibration interval of instruments listed above is one year

## **2.3 TEST PERFORMED**

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver which resolution bandwidth is set at 9KHz.

Radiated emissions were investigated over the frequency range from 30MHz to 1000MHz using a receiver which resolution bandwidth is set at 120KHz. Radiated measurement was performed at distance that from an antenna to EUT is 10 meters.

## **2.4 APPENDIX**

### **Appendix A: Measurement Procedure for Main Power Port Conducted Emissions**

The EUT's power is from DC Power Source , so it is not necessary to be tested.

### **Appendix B: Test Procedure for Radiated Emissions**

#### **Preliminary Measurements in the Anechoic Chamber**

The radiated emissions are initially measured in the anechoic chamber at a measurement distance of 3 meters. Desktop EUT are placed on a wooden stand 0.8 meter in height. The measurement antenna is 3 meters from the EUT. The test setup in anechoic chamber is the same as open site. The turntable rotated 360°. The antenna height is 1m. The primary objective of the radiated measurements in the anechoic chamber is to identify the frequency spectrum in the absence of the electromagnetic environment existing on the open test site. The frequencies can then be pre-selected on the open test site to obtain the corresponding amplitude. The initial scan is made with the spectrum analyzer in automatic sweep mode. The spectrum peaks are then measured manually to determine the exact frequencies.

#### **Measurements on the Open Site or Chamber**

The radiated emissions test will then be repeated on the open site or chamber to measure the amplitudes accurately and without the multiple reflections existing in the shielded room. The EUT and support equipments are set up on the turntable. Desktop EUT are set up on a wooden stand 0.8 meter above the ground.

For the initial measurements, the receiving antenna is varied from 1-4 meter height and is changed in the vertical plane from vertical to horizontal polarization at each frequency. Both reading are recorded with the quasi-peak detector with 120KHz bandwidth. For frequency

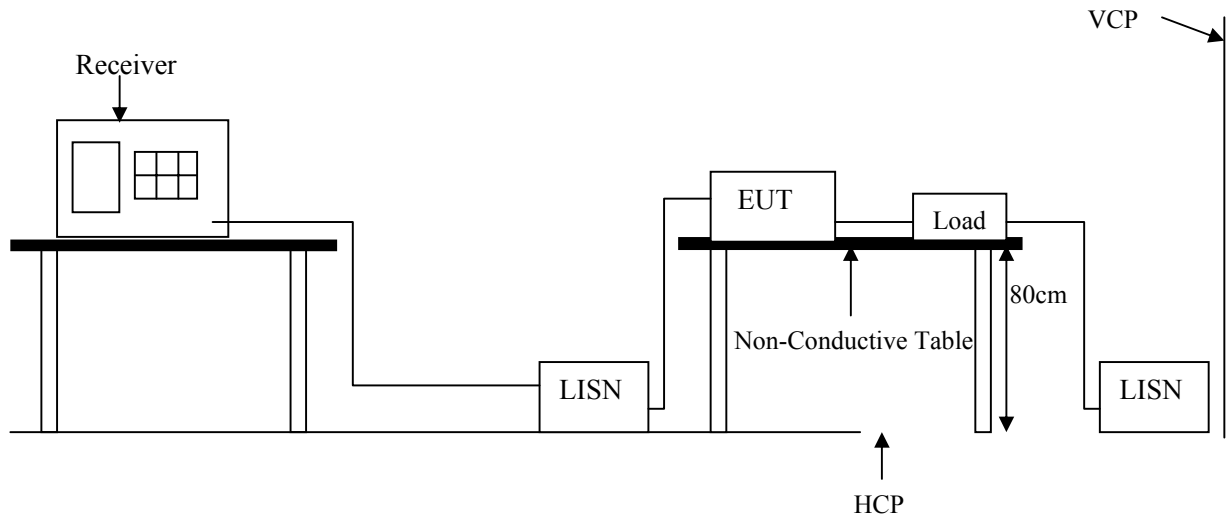


between 30 MHz and 1000MHz, the reading is recorded with peak detector or quasi-peak detector.

At the highest amplitudes observed, the EUT is rotated in the horizontal plane while changing the antenna polarization in the vertical plane to maximize the reading. The interconnecting cables were arranged and moved to get the maximum measurement. Once the maximum reading is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings.

### 3. CONDUCTED EMISSION MEASUREMENT

#### 3.1 TEST SET-UP



#### 3.2 LIMIT

Frequency range (MHz)	CLASS A		CLASS B	
	QP dB(uV)	Average dB(uV)	QP dB(uV)	Average dB(uV)
0.15-0.5	79 dBuV	66 dBuV	66 - 56 dBuV	56 - 46 dBuV
0.5-5.0	73 dBuV	60 dBuV	56 dBuV	46 dBuV
5.0-30.0	73 dBuV	60 dBuV	60 dBuV	50 dBuV

Remark: In the above table, the tighter limit applies at the band edges.

#### 3.3 TEST PROCEDURE

The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). It provides a 50 ohm / 50  $\mu$ H coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm / 50  $\mu$ H coupling impedance with 50 ohm termination. (Please refer to the block diagram of the test setup and photograph.)

Both sides of AC line are checked for the maximum conducted emission interference. In order to find the maximum emissions, the relating positions of equipment and all of the interference cables must be changed according to EN 55022/1998 regulation: The measurement procedure on conducted emission interference.

The resolution bandwidth of the field strength meter is set at 9KHz



### **3.4 TEST SPECIFICATION**

According to EN 55022/1998+A1:2000+A2:2003

### **3.5 RESULT : THE EUT'S POWER IS FROM DC POWER SOURCE , SO IT IS NOT NECESSARY TO BE TESTED.**

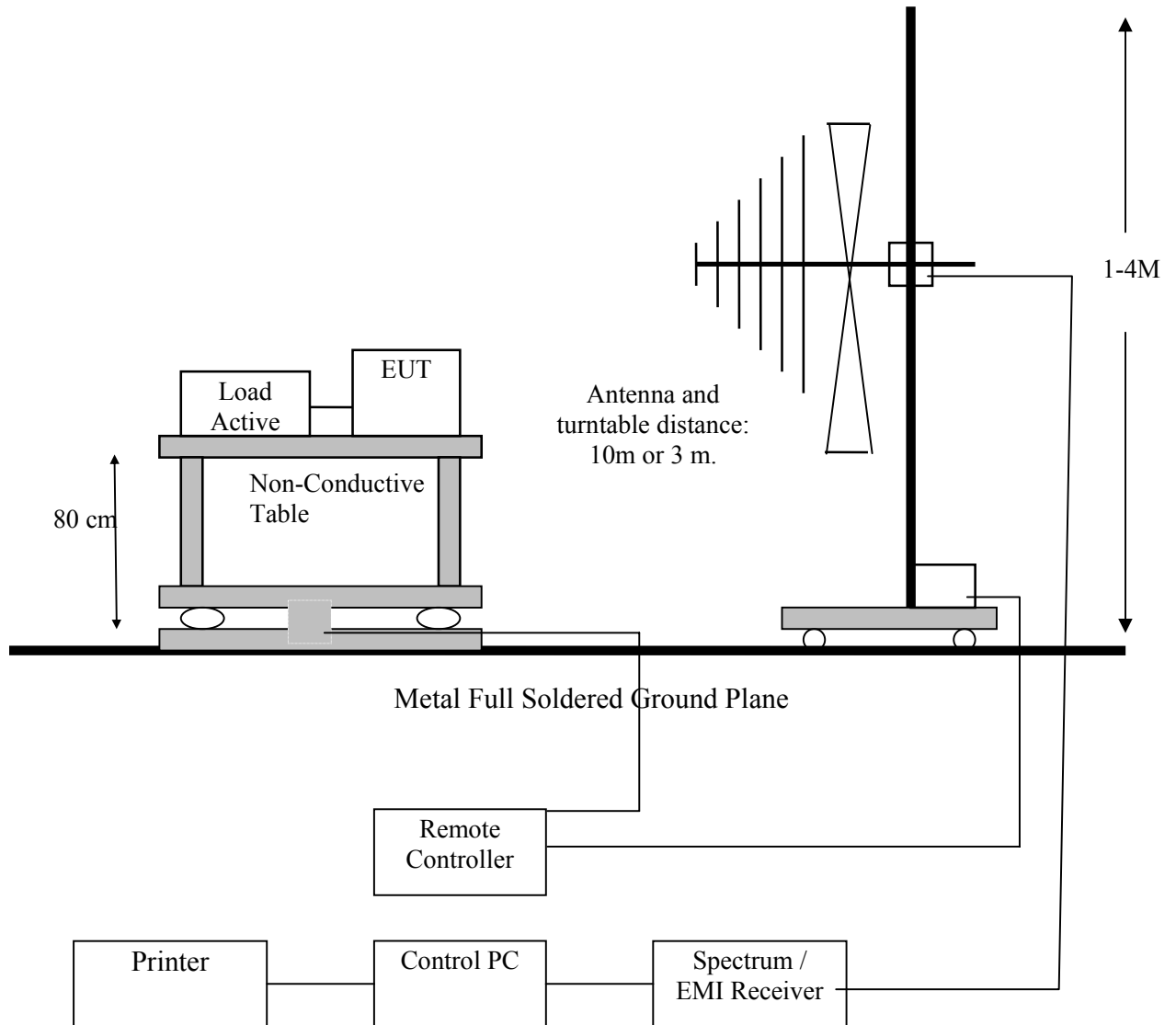
EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	150KHz--30MHz
Detector Function:	Quasi-Peak / Average Mode
Resolution Bandwidth:	9KHz

### **3.6 TEST DATA : N/A**

## 4. RADIATED EMISSION MEASUREMENT

### 4.1 TEST SETUP





#### **4.2 LIMIT**

Frequency	Class A		Class B	
MHz	Distance (Meter)	Limit dB $\mu$ V/m	Distance (Meter)	Limit dB $\mu$ V/m
30 ~ 230	10	40	10	30
230 ~ 1000	10	47	10	37

Remark: In the above table, the tighter limit applies at the band edges

#### **4.3 TEST PROCEDURE**

The EUT and its simulators are placed on turn table, non-conductive and wooden table, which is 0.8 meter above ground. The turn table rotates 360 degree to determine the position of the maximum emission level. The EUT was positioned such that distance from antenna to the EUT is 10 meters.

The antenna is moved up and down between 1 meter to 4 meter to receive the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interference cables must be manipulated according to EN 55022/1998 regulation: the test procedure of the radiated emission measurement.

The bandwidth set on the field strength is 120KHz when the frequency range is below 1GHz

#### **4.4 TEST SPECIFICATION**

According to EN 55022/1998+A1:2000+A2:2003

#### **4.5 RESULT: PASSED**

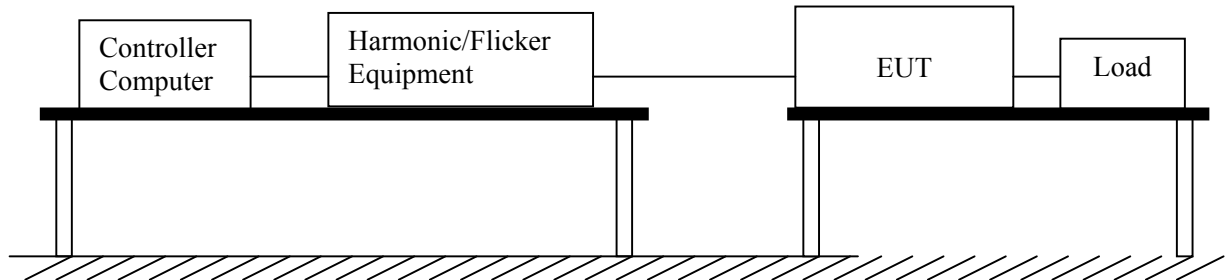
#### **4.6 TEST DATA:**

**Please refer to appendix 2**



## **5. POWER HARMONIC MEASUREMENT**

### **5.1 TEST SETUP**



### **5.2 LIMIT OF HARMONIC CURRENT**

Limit of Harmonic Currents

Harmonic Order	Maximum Permissible Harmonic Current (Ampere)	Harmonic Order	Maximum Permissible Harmonic Current (Ampere)
Odd Harmonic		Even Harmonic	
3	2.30	2	1.08
5	1.14	4	0.43
7	0.77	6	0.30
9	0.40	$8 \leq n \leq 40$	$0.23 \times 8/n$
11	0.33		
13	0.21		
$15 \leq n \leq 39$	$0.15 \times 15/n$		

### **5.3 TEST PROCEDURE**

The EUT is supplied in series with power analyzer from a power source has the same normal voltage and frequency as the rated supply voltage and the equipment under test. The rated voltage at the supply voltage of EUT of 0.94 times and 1.06 times shall be performed.

### **5.4 TEST SPECIFICATION**

According to EN 61000-3-2/2006 Class D

### **5.5 RESULT : THE EUT'S POWER IS FROM DC POWER SOURCE , SO IT IS NOT NECESSARY TO BE TESTED.**

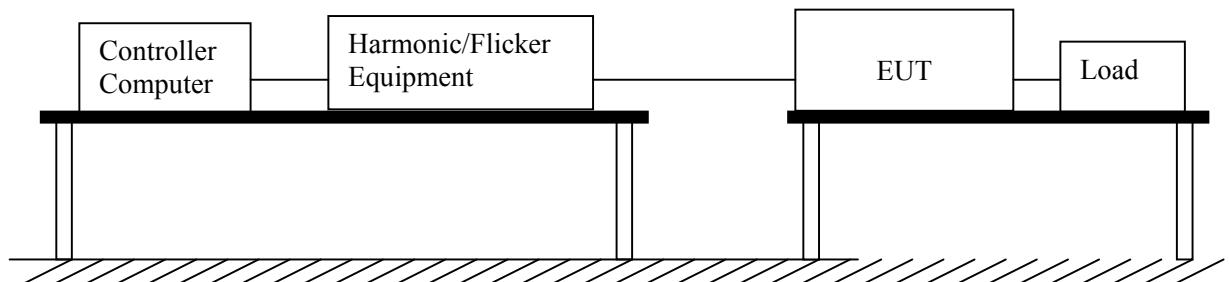
### **5.6 TEST DATA : N/A**





## **6. VOLTAGE FLUCTUATIONS**

### **6.1 TEST SETUP**



### **6.2 VOLTAGE FLUCTUATIONS TEST**

Port:	AC mains
Basic Standard:	EN61000-3-3/AS/ AS/NZS 61000.3.3 (Details referred to Sec 2.2)
Test Procedure	Refer to GCC
Observation period:	For Pst 10min
	For Plt 2 hours

### **6.3 TEST PROCEDURE**

The EUT is supplied in series with reference impedance from a power source with the voltage and frequency as the nominal supply voltage and frequency of the EUT.

### **6.4 TEST SPECIFICATION**

EN 61000-3-3/1995+A1:2001+A2:2005

### **6.5 RESULT : THE EUT'S POWER IS FROM DC POWER SOURCE , SO IT IS NOT NECESSARY TO BE TESTED.**

### **6.6 TEST DATA : N/A**

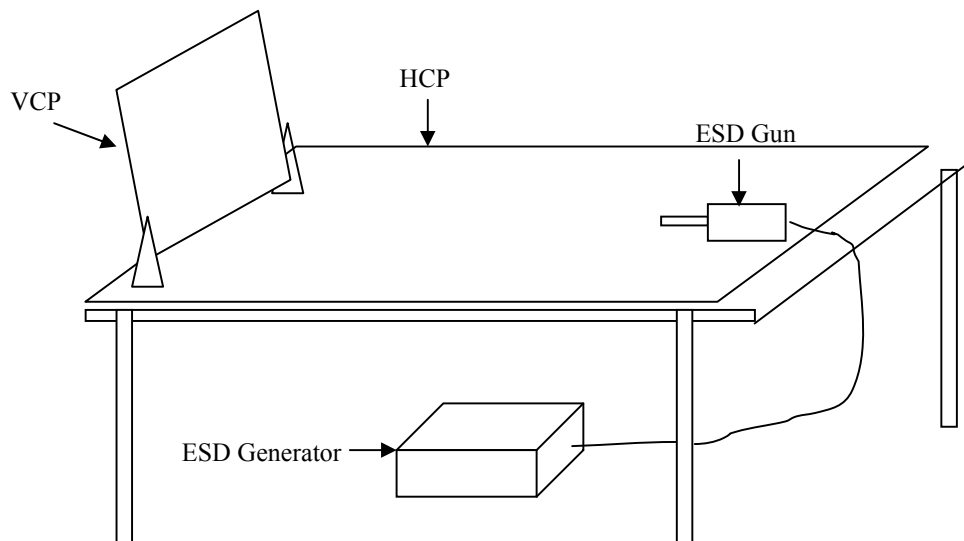
## 7. ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

### 7.1 TEST PROCEDURE

According To IEC 61000-4-2 (2001)

According To EN 55024 (1998) + A1 (2001) + A2 (2003)

### 7.2 TEST SETUP



### 7.3 TEST LEVEL

Item	Test Specification	Unit	Performance Criteria
Enclosure Room	$\pm 2, 4, 8$ (Air Discharge)	KV (Charge Voltage)	B
Electrostatic Discharge	$\pm 2, 4$ (Contact Discharge)		
Time between test	1	sec	

Number of test : 10 Discharges / Test point / Polarity / Level

Particular requirements : at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points.

When the measurement was taken, The ESD discharger was performed in single discharge. For the single discharge time between successive single discharges will keep on one second. It was at least ten single discharges with positive and negative at the same selected pointed. The selected pointed, which was performed with electrostatic discharge, was marked on the red label on the EUT

Indirect applicant of discharge to the EUT

Vertical Coupling Plane (VCP)

The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to , and positioned at a distance 0.1m from, the EUT, with the discharge electrode touching the coupling plane.



The four faces of the EUT will be performed with electrostatic discharge. It was at least ten singles discharges with positive and negative at the same selected point.

Horizontal Coupling Plane (HCP)

The coupling plane is placed under the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the discharge electrode touching the coupling.

The four faces of the EUT will be performed with electrostatic discharge. It was at least ten single discharges with positive and negative at the same selected pointed.

#### **7.4 TEST RESULT.**

Model : EP-350WXY

Mode : Full load

Temperature : 21°C , Humidity : 58 % RH

Test Point	Air Discharge	Contact Discharge	Performance Criteria	Result
HCP	----	±2, 4KV	A	<b>PASSED</b>
VCP	----	±2, 4KV	A	<b>PASSED</b>
CASE	±2, 4, 8KV	±2, 4KV	A	<b>PASSED</b>
LED	±2, 4, 8KV	±2, 4KV	A	<b>PASSED</b>
SCREWS	±2, 4, 8KV	±2, 4KV	A	<b>PASSED</b>
Power Switch	±2, 4, 8KV	±2, 4KV	A	<b>PASSED</b>
AC SOCKET	±2, 4, 8KV	±2, 4KV	A	<b>PASSED</b>
DC SOCKET	±2, 4, 8KV	±2, 4KV	A	<b>PASSED</b>

Final Result : **PASSED**

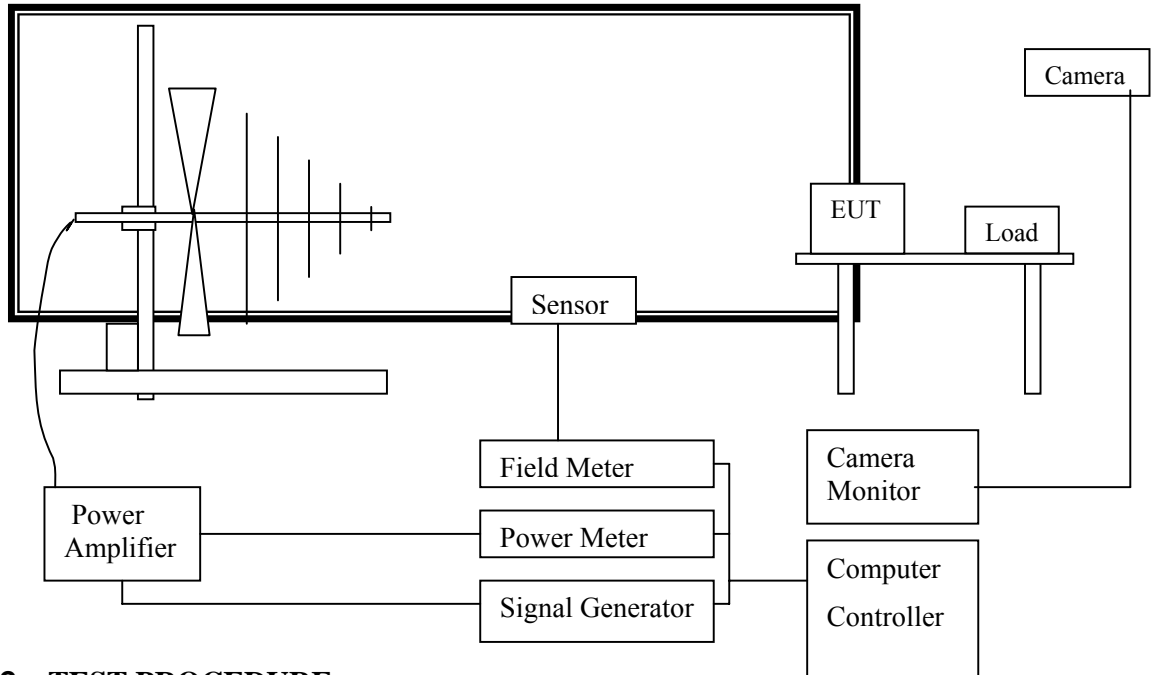
Remark :

**Photos of test configuration please refer to appendix 1.**



## **8. RADIATED EMISSION MEASUREMENT (RS)**

### **8.1 TEST SETUP**



### **8.2 TEST PROCEDURE**

According To IEC 61000-4-3 (2002)

According To EN 55024 (1998) + A1 (2001) + A2 (2003)

### **8.3 TEST LEVEL**

Item	Test Specification	Unit	Performance Criteria
Radio –Frequency	80~1000	MHz	A
Electromagnetic Field	<b>3</b>	V/m (unmodulated, rms)	
Amplitude Modulated	80	%AM (1KHz)	



#### 8.4 TEST PROCEDURE

The EUT and load, which are placed on a wooden table that the height is 0.8 meter above ground, are placed with one coincident with the calibration plane such that the distance from antenna to the EUT is 3 meters.

Both horizontal and vertical polarization of the antenna position and four sides of the EUT are set on measurement. In order to judge the EUT performance, a CCD camera is used to monitor the situation of EUT.

All the scanning conditions are as follows:

Condition of Test	Remarks
1. Field Strength	3 V/M; Level 2
2. Radiated Signal	AM 80% modulated with 1KHz
3. Scanning Frequencies	80MHz ~ 1000MHz
4. Dwell Time	3 seconds
5. Frequency step size	1%
6. The rate of swept of frequency	$1.5 \times 10^{-3}$ decades/s
7. Antenna Polarity	HORIZONTAL & VERTICAL
8. The four sides of EUT are tested	FRONT, REAR, RIGHT, LEFT

#### 8.5 TEST RESULT

Model : EP-350WXY

Mode : Full load

Temperature : 21°C , Humidity : 68 % RH

ANT SIDE	3V HORIZONTAL	3V VERTICAL	RESULT
FRONT	A	A	<b>PASSED</b>
REAR	A	A	<b>PASSED</b>
RIGHT	A	A	<b>PASSED</b>
LEFT	A	A	<b>PASSED</b>

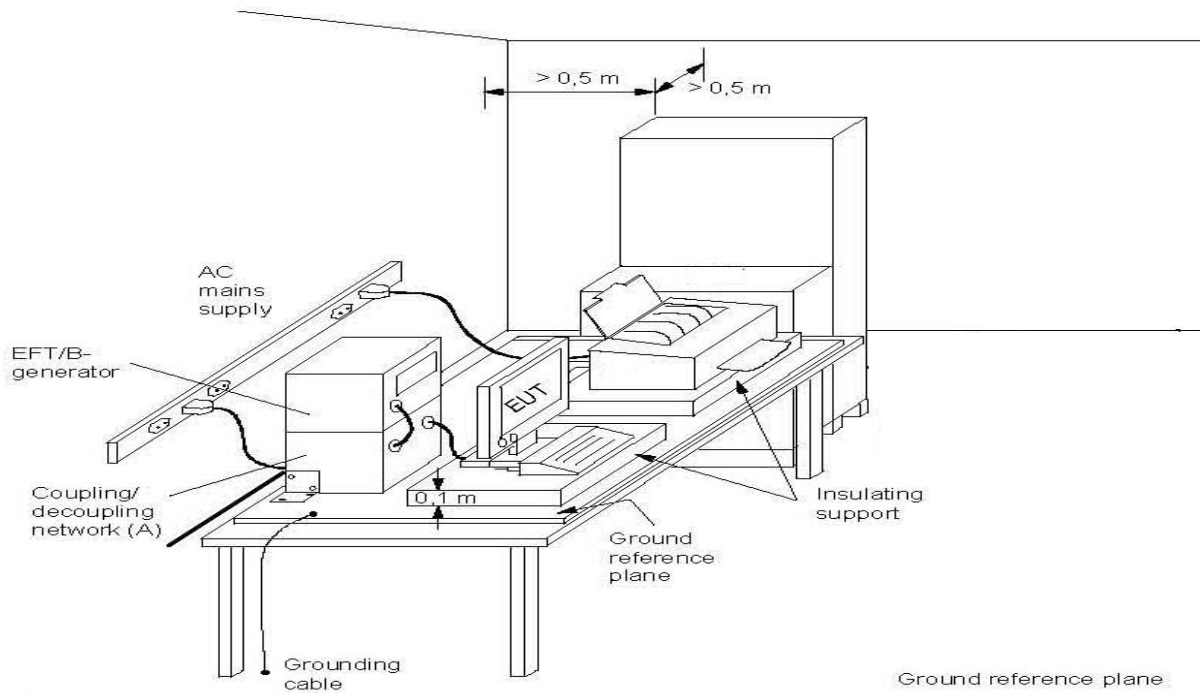
Final Result : **PASSED**

Remark :

**Photos of test configuration please refer to appendix 1.**

## 9. ELECTRICAL FAST TRANSIENT/BURST (EFT)

### 9.1 TEST SETUP



### 9.2 TEST PROCEDURE

According To IEC 61000-4-4 (2004)

According To EN 55024 (1998) + A1 (2001) + A2 (2003)

### 9.3 TEST PROCEDURE

The EUT and load are placed on a wooden table that is 0.8meter height above a metal ground plane dimension is 1m x 1m and thickness is at least 0.2mm. It also projected beyond the EUT by at lease 0.1meter on all sides.

For Input and Output AC power or DC Input and DC Output Power Ports:

The EUT is connected with the power mains through a coupling device that directly couples the EFT interference signal.

Each of the line and nature conductors is impressed with burst noise for 1 minute.

For Functional Earth Port:

The EUT is connected to the power mains through a coupling device that directly couples the EFT interference signal. The protective earth line (PE) is impressed with burst noise for 1 minute.

The length of power cord between the coupling device and the EUT shall be 1 meter.

For signal Lines and Control Lines Test:

The EFT interference signal is through a coupling clamp device couples to the signal and control lines of the EUT with burst noise for 1 minute.



#### 9.4 TEST LEVEL

Item	Test Specification	Unit	Performance Criteria
Test Voltage	±0.5, ±1	KV (Peak)	B
Pulse Rise time & Duration	5/50	Tr/Ts (ns)	
Pulse Repetition	100	Rep. Frequency (KHz)	
Coupling of power line	L, N, L+N		

#### 9.5 TEST RESULT

Model : EP-350WXY

Mode : Full load

Temperature : 23°C , Humidity : 64 % RH

Power Line			
TEST VOLTAGE	L	N	L+N
±0.5KV	A	A	A
±1KV	A	A	A

Final Result : **PASSED**

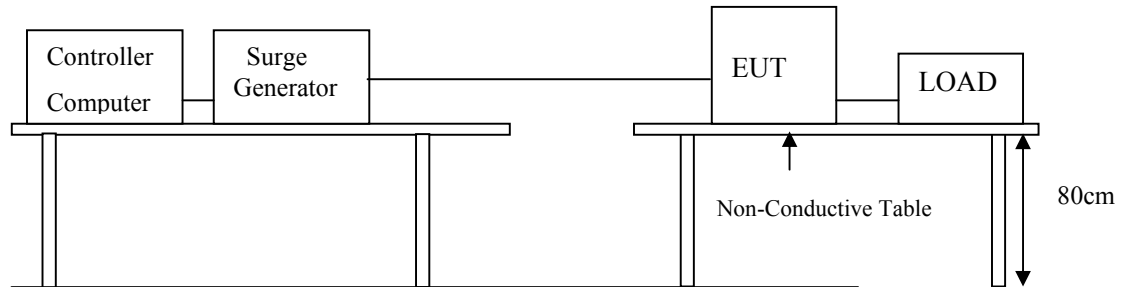
Remark :

**Photos of test configuration please refer to appendix 1.**



## 10. SURGE

### 10.1 TEST SETUP



### 10.2 TEST PROCEDURE

According To IEC 61000-4-5 (2001)

According To EN 55024 (1998) + A1 (2001) + A2 (2003)

### 10.3 TEST LEVEL

Item		Test Specification	Unit	Performance Criteria
DC Input and DC Output Power Ports				
	Surge	1.2/50(8/20)	Tr/Ts ((s)	B
	Line to Ground	$\pm 0.5$	KV	
	Line to Line	$\pm 0.5$	KV	
AC Input and AC Output Power Ports				
	Surge	1.2/50(8/20)	Tr/Ts ((s)	B
	Line to Ground	$\pm 2$	KV	
	Line to Line	$\pm 1$	KV	
Polarity		POSITIVE / NEGATIVE		
Phase shifting in a range between 0°to 360°				

### 10.4 TEST PROCEDURE

The EUT and its load are placed on a table which is 0.8 meter height above a metal ground plane dimension is 1 meter x 1 meter and the thickness is 0.5 mm. It's also projected beyond the EUT at least 0.1 meter on all sides. The length of power cord between the coupling device and the EUT shall be 2meter or less.

For Input and Output AC Power or DC Input and DC Output Power Ports:





The EUT is connected to the power mains through a coupling device that directly couples the Surge interference signal.

The Surge noise shall be applied synchronized to the voltage phase at 0(, 90(, 180(, 270( and the peak value of the AC voltage wave. (Positive and Negative)

Each of line-earth and line-line is impressed with a sequence of five surge voltages with interval of 1 minute.

#### **10.5 TEST RESULT**

Model : EP-350WXY

Mode : Full load

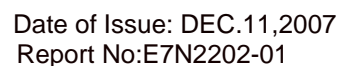
Temperature : 23°C , Humidity : 64 % RH

Environmental Phenomena	Test Specification	Units	Performance Criteria
Line to Line	±0.5	KV (Charge Voltage)	A
Line to Earth	±0.5	KV (Charge Voltage)	A

Final Result : **PASSED**

Remark :

**Photos of test configuration please refer to appendix 1.**





All scanning frequencies conditions are as following:

Condition of Test	Remarks
EN 61000-4-6/2003+A1:2004	
1. Field Strength	3 V/M; Level 2
2. Radiated Signal	AM 80% modulated with 1KHz
3. Scanning Frequencies	0.15MHz ~ 80MHz
4. Dwell Time	3 seconds
5. Frequency step size $\Delta f$	1%
6. The rate of swept of frequency	$1.5 \times 10^{-3}$ decades/s

### 11.5 TEST RESULT

Model: EP-350WXY

Mode: Full load

Temperature: 23 °C , Humidity : 64 % RH

TEST Specification	Unit	Performance Criteria
0.15 - 80	MHz	A
3	V	
80	% AM (1KHz)	

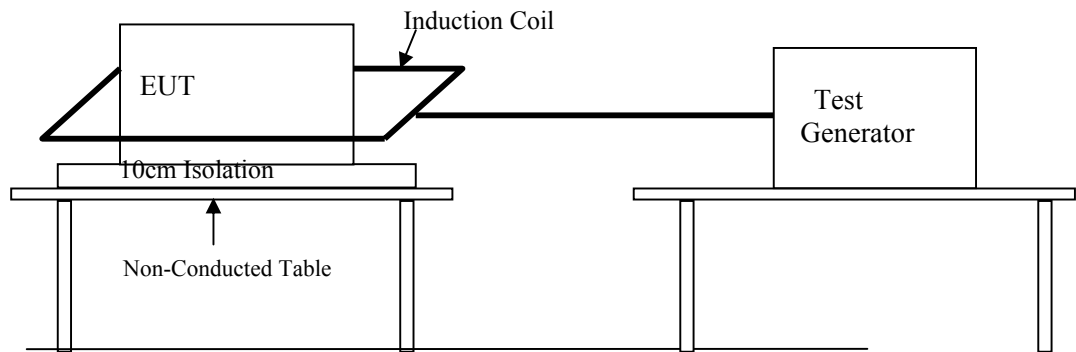
Final Result: **PASSED**

Remark:

**Photos of test configuration please refer to appendix 1.**

## **12. POWER FREQUENCY MAGNETIC FIELD (MAGNETIC)**

### **12.1 TEST SETUP**



### **12.2 TEST STANDARD**

According To IEC 61000-4-8 (2001)

According To EN 55024 (1998) + A1 (2001) + A2 (2003)

### **12.3 TEST LEVEL**

Item	Test Specification	Unit	Performance Criteria
Power-Frequency	50	Hz	A
Magnetic Field	1	A/M	

### **12.4 TEST PROCEDURE**

The EUT and its load are placed on a table that is 0.8 meter above the metal ground plane dimension is at least 1 meter x 1 meter. The test magnetic field shall be placed at least than 3 meter distance from the induction coil.

The test magnetic field shall be applied by the immersion method to the EUT. The induction coil shall be rotated by 90° in order to expose the EUT to the test field with different orientation (X, Y, Z orientation).



## 12.5 TEST RESULT

Model: EP-350WXY

Test Mode: Full load

Temperature: 23°C , Humidity: 64 % RH

Environmental Phenomena	Test Specification	Units	Performance Criteria
Magnetic Field	1	A/m	A

Final Result: **PASSED**

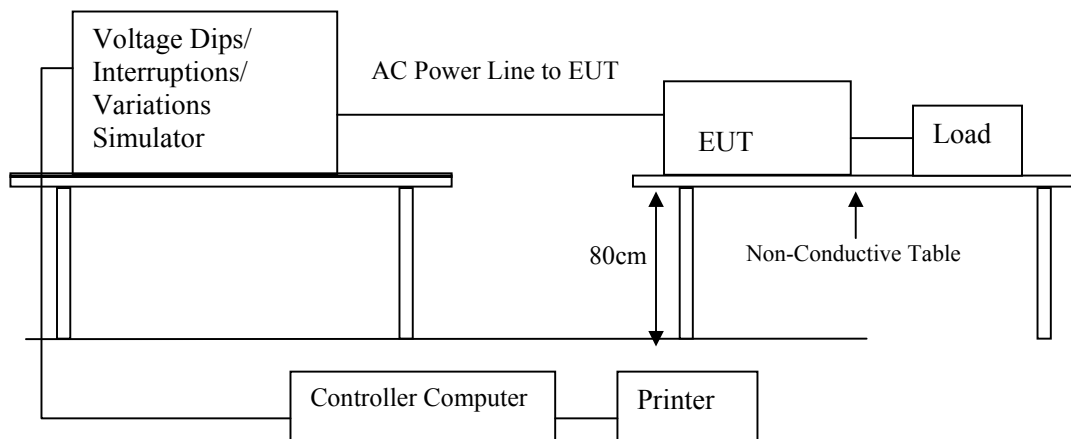
Remark:

**Photos of test configuration please refer to appendix 1.**



## **13. VOLTAGE DIPS AND INTERRUPTION MEASUREMENT**

### **13.1 TEST SETUP**



### **13.2 TEST PROCEDURE**

According To IEC 61000-4-11 (2004)

According To EN 55024 (1998) + A1 (2001) + A2 (2003)



### 13.3 TEST LEVEL

Class <sup>a</sup>	Test level and durations for voltage dips				
Class 1	Case-by-case according to the equipment requirements				
Class 2	0 % during 1/2 cycle	0 % during 1 cycle	70 % during 25/30 <sup>c</sup> cycles		
Class 3	0 % during 1/2 cycle	0 % during 1 cycle	40 % during 10/12 <sup>c</sup> cycles	70 % during 25/30 <sup>c</sup> cycles	80 % during 250/300 <sup>c</sup> cycles
Class X <sup>b</sup>	X	X	X	X	X
a: Classes as per IEC 61000-2-4.					
b: To be defined by product committee. For equipment connected directly or indirectly to the public network, the levels must not be less severe than Class 2.					
c: "25/30 cycles" means "25 cycles for 50 Hz test" and "30 cycles for 60 Hz test".					

Class <sup>a</sup>	Test level and durations for short interruptions (t <sub>s</sub> ) (50Hz / 60Hz)
Class 1	Case-by-case according to the equipment requirements
Class 2	0 % during 250/300 <sup>c</sup> cycles
Class 3	0 % during 250/300 <sup>c</sup> cycles
Class X <sup>b</sup>	X
a: Classes as per IEC 61000-2-4.	
b: To be defined by product committee. For equipment connected directly or indirectly to the public network, the levels must not be less severe than Class 2.	
c: "250/300 cycles" means "250 cycles for 50 Hz test" and "300 cycles for 60 Hz test".	

### 13.4 TEST PROCEDURE

The EUT and its load are placed on a wooden table which is 0.8 meter above a metal ground plane which dimension is 1 meter x 1 meter, the thickness is 0.65mm. It projected beyond the EUT by at least 0.1 meter on all sides. The power cord shall be used the shortest power cord as specified by the manufacturer.

For Voltage Dips / Interruption Test:

The EUT is connected to the power mains through a coupling device that directly couples to the Voltage Dips and Interruption Generator.

The EUT shall be tested for 30% voltage dips of supplied voltage and duration time is 10ms, for 60% voltage dips of supplied voltage and duration time is 100ms with a sequence of three voltage dips with intervals of 10 seconds, and for 95% voltage interruption of supplied voltage and the duration time is 5000ms with a sequence of three voltage interruptions with intervals of 10 seconds.

Voltage phase shifting are shall occur at 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315° of the voltage.



### 13.5 TEST RESULT

Environmental Phenomena	Test Specification	Units	Performance Criteria
Voltage Dips	0 1/2	% during Cycle	A
	0 1	% during Cycle	C
	70 25	% during Cycles	C
Voltage Short Interruptions	0 250	% during Cycles	C

Final Result: **The EUT's power is from DC Power Source , so it is not necessary to be tested.**

Remark :





#### **14. PERFORMANCE CRITERIA**

- A. The apparatus shall continue to operate as intended during and 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.
- 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. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
- C. Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.



## 15. MODIFICATION LIST FOR EMC COMPLYING TEST

The modification is solely made by the applicant.

Appendix

Appendix A: Summary of Test Result

\*\*\*\* EMC Test Result: The EUT has been pass the all measurements. \*\*\*\*

The uncertainty is calculated in accordance with CISPR16-4-2, the total uncertainty for this test is as follows:

### Uncertainty of Conducted Emission Measurement

Contribution	Probability Distribution	150KHz – 30MHz
Receiver reading	Normal (k=2)	$\pm 0.2$
Cable loss	Normal (k=2)	$\pm 0.2$
AMN insertion loss	Rectangular	$\pm 0.2$
RCV/SPA specification	Rectangular	$\pm 0.9$
combined standard uncertainty $U_e(y)$	normal	$\pm 1.0$
Measuring uncertainty for a level of confidence of 95% $U=2U_e(y)$	normal (k=2)	$\pm 2.0$

### Uncertainty of Radiated Emission Measurement

Contribution	Probability Distribution	30MHz~1GHz
Receiver reading	Normal (k=2)	$\pm 0.5$
Cable loss calibration	Normal (k=2)	$\pm 0.3$
Antenna factor calibration	Rectangular	$\pm 1.5$
Pre Amplifier Gain calibration	Rectangular	$\pm 0.5$
RCV/SPA specification	Rectangular	$\pm 0.9$
combined standard uncertainty $U_e(y)$	normal	$\pm 1.1$
Measuring uncertainty for a level of confidence of 95% $U=2U_e(y)$	normal (k=2)	$\pm 2.2$



## **Appendix 1**

### **PHOTOS OF TEST CONFIGURATION**



**RADIATED EMISSION TEST**



Front View



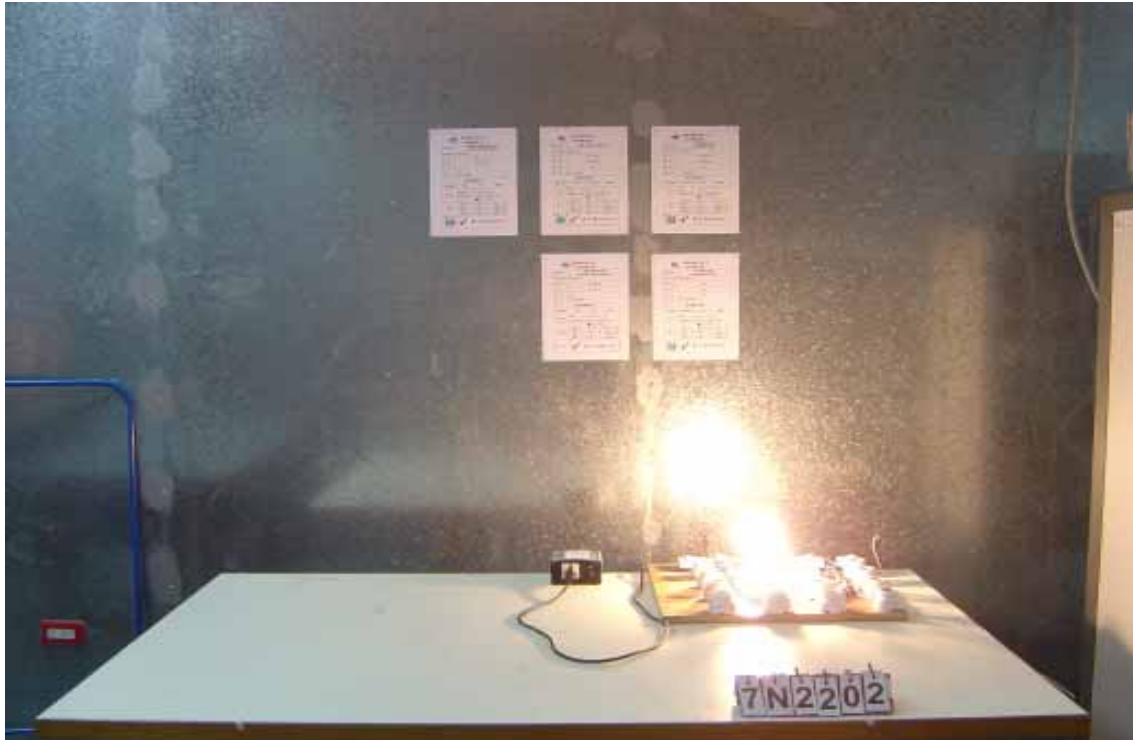
Rear View



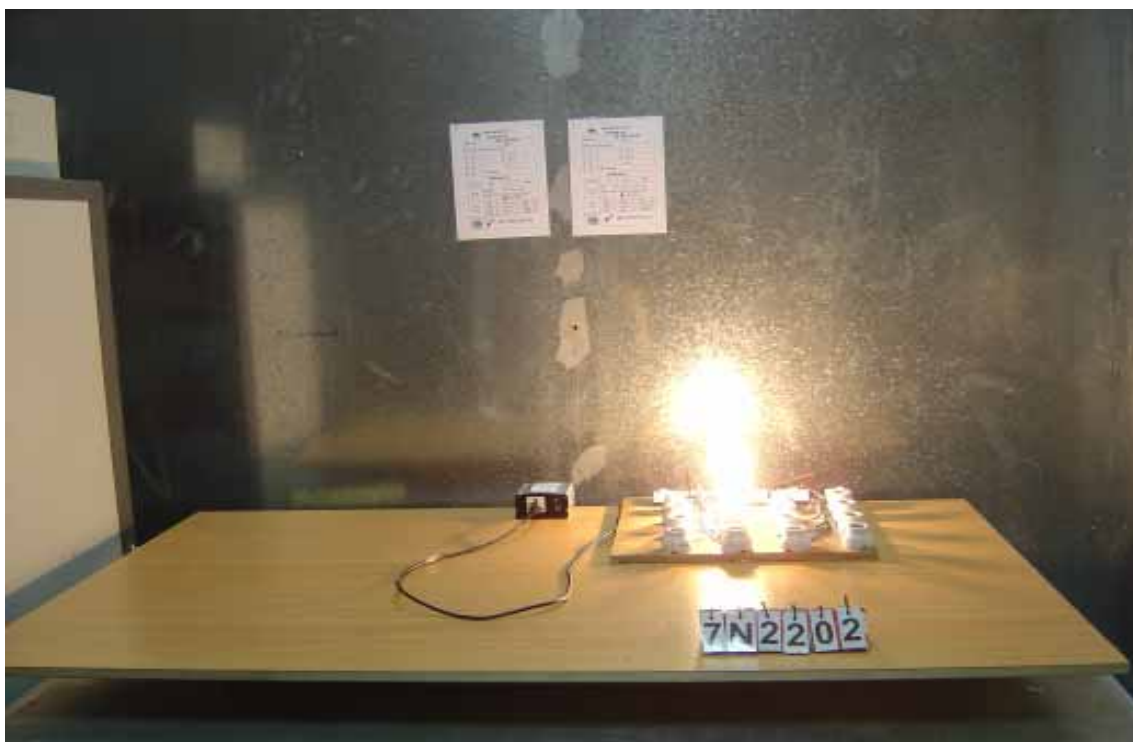
**HARMONICS & VOLTAGE FLUCTUATIONS TEST**

**SURGE IMMUNITY TEST**

**VOLTAGE DIPS, SHORT INTERRUPTIONS IMMUNITY TEST**



**ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST**

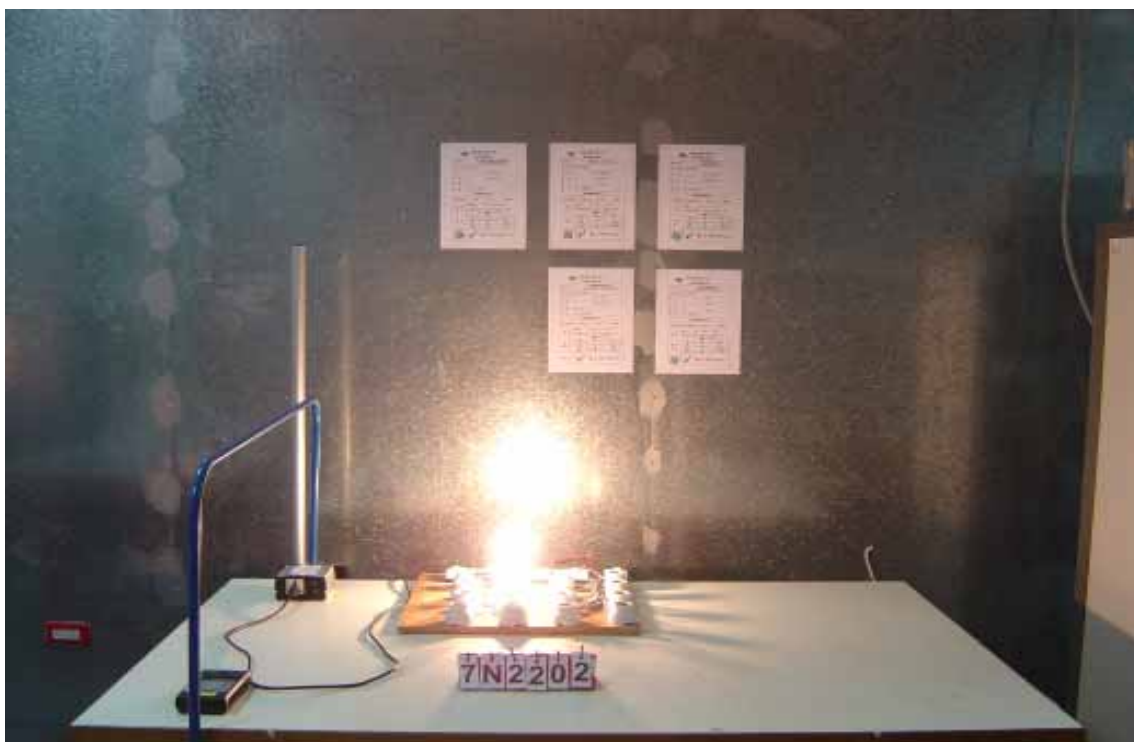




**ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)**



**POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST**







**RADIO FREQUENCY ELECTROMAGNETIC FIELD IMMUNITY  
TEST (RS)**



**CS CONDUCTED DISTURBANCE IMMUNITY TEST**





## **Appendix 2 TEST DATA**



**Test Data Of Radiated Emission Measurement (Horizontal)**

環球認證有限公司  
Global Certification Corp.

Address: No.112-3, Shiang Chang Rd., Sec.2,  
Hsi Chin, Taipei Hsien 221, Taiwan, R.O.C.  
Tel: 02-26426992 Fax: 02-26487450

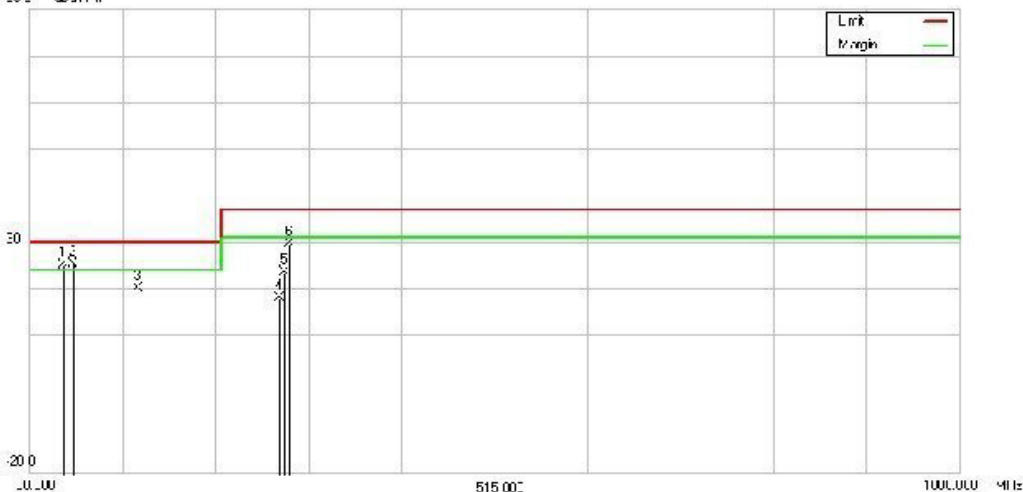
**Radiated Emission Measurement**

File : 7N2202  
EO : dBuV/m

Data : #2

Date: 2007/11/27

Time: 下午 03:35:59



Site: Open site #1

Limit: EN55022, CISPR22, CNS13438 Class B

Company: Elite Power

EUT: Please refer to page1 of report

Model: HW-350XY

Note: FULL LOAD

Polarization: **Horizontal**

Power: DC 12V

Distance: 10m RBW: 120 KHz

Temperature: 20 °C

Humidity: 76 %

Sweep Time: 100 ms

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1	!	64.9200	25.22	-0.26	24.96	30.00	-5.04	peak	0	
2	*	74.1400	25.16	-0.07	25.09	30.00	-4.91	QP	0	
3		142.5200	14.38	5.54	19.92	30.00	-10.08	peak	0	
4		291.9000	11.09	6.67	17.76	37.00	-19.24	peak	0	
5		295.7800	16.73	6.73	23.46	37.00	-13.54	peak	0	
6		299.4500	22.69	6.79	29.48	37.00	-7.52	peak	0	

\*: Maximum data    x: Over limit    !: over margin

●: Reference Only

Receiver:

Spectrum Analyzer: E7401A

Antenna: A052104-071001(10M)

Engineer Signature: ALAN

Amplifier: AMP-EF150001 070719

File : 7N2202\Data : #2

Page: 1



## Test Data Of Radiated Emission Measurement (Vertical)



環球認證有限公司  
Global Certification Corp.

Address: No.112-3, Shiang Chang Rd., Sec.2,  
Hsi Chin, Taipei Hsien 221, Taiwan, R.O.C.  
Tel: 02-26426992 Fax: 02-26487450

### Radiated Emission Measurement

File : 7N2202  
EO : dBuV/m

Data : #3

Date: 2007/11/27

Time: 下午 03:48:17



Site: Open site #1

Limit: EN55022, CISPR22, CNS13438 Class B

Company: Elite Power

EUT: Please refer to page1 of report

Model: HW-350XY

Note: FULL LOAD

Polarization: **Vertical**

Power: DC 12V

Distance: 10m RBW: 120 KHz

Temperature: 20 °C

Humidity: 76 %

Sweep Time: 100 ms

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1	!	30.0000	12.14	12.60	24.74	30.00	-5.26	peak	0	
2	*	64.9200	26.33	-0.26	26.07	30.00	-3.93	QP	0	
3		214.3000	4.28	3.64	7.92	30.00	-22.08	peak	0	
4		233.7000	6.09	4.48	10.57	37.00	-26.43	peak	0	
5		295.7800	11.77	6.73	18.50	37.00	-18.50	peak	0	
6		299.4500	22.55	6.79	29.34	37.00	-7.66	peak	0	

\*: Maximum data x: Over limit !: over margin

●: Reference Only

Receiver:

Spectrum Analyzer: E7401A

Antenna: A052104-071001(10M)

Engineer Signature: ALAN

Amplifier: AMP-EF150001 070719

File : 7N2202\Data : #3

Page: 1