



# CE TEST REPORT

FOR

**16-port RS-232/422/485 Serial Device Server  
8-port RS-232/422/485 Serial Device Server**

**Model : EKI-1526, EKI-1528**

**Trade Name: Advantech**

Issued to

Advantech Co., Ltd.

No. 1, Alley 20, Lane 26, Rueiguang Road , Neihu District, Taipei 114, Taiwan, R.O.C.

Issued 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                                       | 6         |
| 1.2 I/O PORT OF THE EUT   | 7         |
| 1.3 TEST METHODOLOGY  | 7         |
| 1.4 DESCRIPTION OF THE SUPPORT EQUIPMENTS                                   | 8         |
| 1.5 FEATURES OF EUT : PLEASE REFER TO USER MANUAL OR PRODUCT SPECIFICATION. | 9         |
| <b>2. INSTRUMENT AND CALIBRATION</b>  | <b>10</b> |
| 2.1 MEASURING INSTRUMENT CALIBRATION  | 10        |
| 2.2 TEST AND MEASUREMENT EQUIPMENT  | 10        |
| 2.3 TEST PERFORMED  | 12        |
| 2.4 APPENDIX  | 12        |
| <b>3. CONDUCTED EMISSION MEASUREMENT</b>                                    | <b>14</b> |
| 3.1 TEST SET-UP   | 14        |
| 3.2 LIMIT   | 14        |
| 3.3 TEST PROCEDURE  | 14        |
| 3.4 TEST SPECIFICATION  | 15        |
| 3.5 RESULT: PASSED  | 15        |
| 3.6 TEST DATA:  | 15        |
| <b>4. RADIATED EMISSION MEASUREMENT</b>                                     | <b>16</b> |
| 4.1 TEST SETUP  | 16        |
| 4.2 LIMIT   | 17        |
| 4.3 TEST PROCEDURE  | 17        |
| 4.4 TEST SPECIFICATION  | 17        |
| 4.5 RESULT: PASSED  | 17        |
| 4.6 TEST DATA:  | 17        |
| <b>5. POWER HARMONIC MEASUREMENT</b>  | <b>18</b> |
| 5.1 TEST SETUP  | 18        |
| 5.2 LIMIT OF HARMONIC CURRENT   | 18        |
| 5.3 TEST PROCEDURE  | 18        |
| 5.4 TEST SPECIFICATION  | 18        |
| 5.5 RESULT: PASSED  | 18        |
| 5.6 TEST DATA:  | 18        |
| <b>6. VOLTAGE FLUCTUATIONS</b>  | <b>21</b> |
| 6.1 TEST SETUP  | 21        |
| 6.2 VOLTAGE FLUCTUATIONS TEST   | 21        |
| 6.3 TEST PROCEDURE  | 21        |
| 6.4 TEST SPECIFICATION  | 21        |
| 6.5 RESULT: PASSED  | 21        |
| 6.6 TEST DATA   | 21        |
| <b>7. ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)</b>                       | <b>23</b> |
| 7.1 TEST PROCEDURE  | 23        |
| 7.2 TEST SETUP  | 23        |
| 7.3 TEST LEVEL  | 23        |
| 7.4 TEST RESULT.  | 24        |
| <b>8. RADIATED EMISSION MEASUREMENT (RS)</b>                                | <b>25</b> |
| 8.1 TEST SETUP  | 25        |



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|            |   |           |
|------------|---|-----------|
| 8.2        | TEST PROCEDURE-----   | 25        |
| 8.3        | TEST LEVEL -----  | 25        |
| 8.4        | TEST PROCEDURE-----   | 26        |
| 8.5        | TEST RESULT -----   | 26        |
| <b>9.</b>  | <b>ELECTRICAL FAST TRANSIENT/BURST (EFT) -----</b>          | <b>27</b> |
| 9.1        | TEST SETUP -----  | 27        |
| 9.2        | TEST PROCEDURE-----   | 27        |
| 9.3        | TEST PROCEDURE-----   | 27        |
| 9.4        | TEST LEVEL -----  | 28        |
| 9.5        | TEST RESULT -----   | 28        |
| <b>10.</b> | <b>SURGE -----</b>  | <b>29</b> |
| 10.1       | TEST SETUP -----  | 29        |
| 10.2       | TEST PROCEDURE-----   | 29        |
| 10.3       | TEST LEVEL -----  | 29        |
| 10.4       | TEST PROCEDURE-----   | 29        |
| 10.5       | TEST RESULT -----   | 30        |
| <b>11.</b> | <b>IMMUNITY TEST TO CS CONDUCTED DISTURBANCE (CS) -----</b> | <b>31</b> |
| 11.1       | TEST SETUP -----  | 31        |
| 11.2       | TEST PROCEDURE-----   | 31        |
| 11.3       | TEST LEVEL -----  | 31        |
| 11.4       | TEST PROCEDURE-----   | 31        |
| 11.5       | TEST RESULT -----   | 32        |
| <b>12.</b> | <b>POWER FREQUENCY MAGNETIC FIELD (MAGNETIC)-----</b>       | <b>33</b> |
| 12.1       | TEST SETUP -----  | 33        |
| 12.2       | TEST STANDARD -----   | 33        |
| 12.3       | TEST LEVEL-----   | 33        |
| 12.4       | TEST PROCEDURE -----  | 33        |
| 12.5       | TEST RESULT -----   | 34        |
| <b>13.</b> | <b>VOLTAGE DIPS AND INTERRUPTION MEASUREMENT -----</b>      | <b>35</b> |
| 13.1       | TEST SETUP -----  | 35        |
| 13.2       | TEST PROCEDURE-----   | 35        |
| 13.3       | TEST LEVEL-----   | 36        |
| 13.4       | TEST PROCEDURE -----  | 36        |
| 13.5       | TEST RESULT -----   | 37        |
| <b>14.</b> | <b>PERFORMANCE CRITERIA -----</b>                           | <b>38</b> |
| <b>15.</b> | <b>MODIFICATION LIST FOR EMC COMPLYING TEST-----</b>        | <b>39</b> |

**APPENDIX 1**

**PHOTOS OF TEST CONFIGURATION**

**APPENDIX 2**

**TEST DATA**

**PHOTOS OF EUT**



## 1. GENERAL INFORMATION

**Applicant** : Advantech Co., Ltd.

**Address** : No. 1, Alley 20, Lane 26, Rueiguang Road , Neihu District, Taipei 114, Taiwan, R.O.C.

**Manufacturer** : Advantech Co., Ltd.

**Address** : No. 1, Alley 20, Lane 26, Rueiguang Road , Neihu District, Taipei 114, Taiwan, R.O.C.

**EUT** : 16-port RS-232/422/485 Serial Device Server 8-port RS-232/422/485 Serial Device Server

**Model Name** : EKI-1526, EKI-1528

**Model Differences** : The difference between series of models EKI-1526 and EKI-1528 are shown as below:

|                        | EKI-1526                                    | EKI-1528                                   |
|------------------------|---|--|
| Description            | 16-port RS-232/422/485 Serial Device Server | 8-port RS-232/422/485 Serial Device Server |
| Power Input            | 90 to 260 VAC                               | 90 to 260 VAC                              |
| Number of LAN ports    | 2   | 2  |
| Number of Serial ports | 16  | 8  |
| Serial Type            | RS-232/422/485                              | RS-232/422/485                             |
| Baud Rate              | 50 bps to 921.6 Kbps                        | 50 bps to 921.6 Kbps                       |
| PCB                    | EKI-1526                                    | As same as EKI-1526                        |

The PCB layout and circuit and EMI characteristic is similar. The model EKI-1526 is worst case, and the final test data were shown in this test report.



**Measurement procedure used:**

**EMI :**

EN55022 CLASS A:2006

EN55011:1998+A1:1999+A2:2000(Group1 class A)

EN 61000-6-4 (2001): CISPR 11 Class A (1990)

EN61000-3-2:2006

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

**EMS :**

EN55024:1998/A1:2001/A2:2003

EN61000-6-2:2005

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 A product, and to be market in industrial environment only.

The above equipment was tested by Global Certification Corp. for compliance with the requirements set forth in the EUROPEAN COUNCIL Directive 2004/108/EC and the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance.

This test report shall not be reproducing in part without written approval of Global Certification Corp.

**Approved By:**

Albert Tsai / Manager

**Issued Date:08.07.2008**



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## 1.1 DESCRIPTION OF THE TESTED SAMPLES

EUT

EUT Type : ☐Proto Type ☒Engineer Type ☐Mass Production  
Condition when received : ☒Good ☐Damage :  
EUT Name : 16-port RS-232/422/485 Serial Device Server  
8-port RS-232/422/485 Serial Device Server  
Applicant : Advantech Co., Ltd.  
Manufacturer : Advantech Co., Ltd.  
Model Number : EKI-1526, EKI-1528  
Serial Number : N/A  
FCC ID : N/A  
Receipt Date : 07/29/2008  
Used Power : ☒AC POWER ☐DC POWER  
Power From : ☐N/A ☒Inside ☐Outside  
☐Adaptor ☐BATTERY ☒Power board ☐DC Power Source  
☐Support Unit PC  
Power Supply Type : ☒Switching ☐Linear  
Power Cord (Input) : AC 230 V 50 Hz 3 Pin 1.8 m Un-Shielded  
The frequency of the EUT :  
OSC/Clock Frequencies : 14.74MHz, 33.33MHz



## **1.2 I/O PORT OF THE EUT**

| I/O port type   | Q'ty | Tested with | Connect type | Note     |
|-----------------|------|-------------|--------------|----------|
| 1) CONSOLE Port | 1    | 0           | Metal        | Floating |
| 2) RJ-45 Port   | 16   | 0           | Metal        | Floating |
| 3) LAN Port     | 2    | 2           | Metal        |          |

## **1.3 TEST METHODOLOGY**

### **EUT SYSTEM OPERATION**

1. The EUT was configured according to EN55022 Class A, EN55011 Class A and EN61000-6-4(CISPR11 Class A)
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. The remote PC1 links the remote PC2 and channels packet switching via EUT.
6. 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: 100Mbps

Mode 2: 10Mbps

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

Conduction: Mode 1

Radiation: Mode 1

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

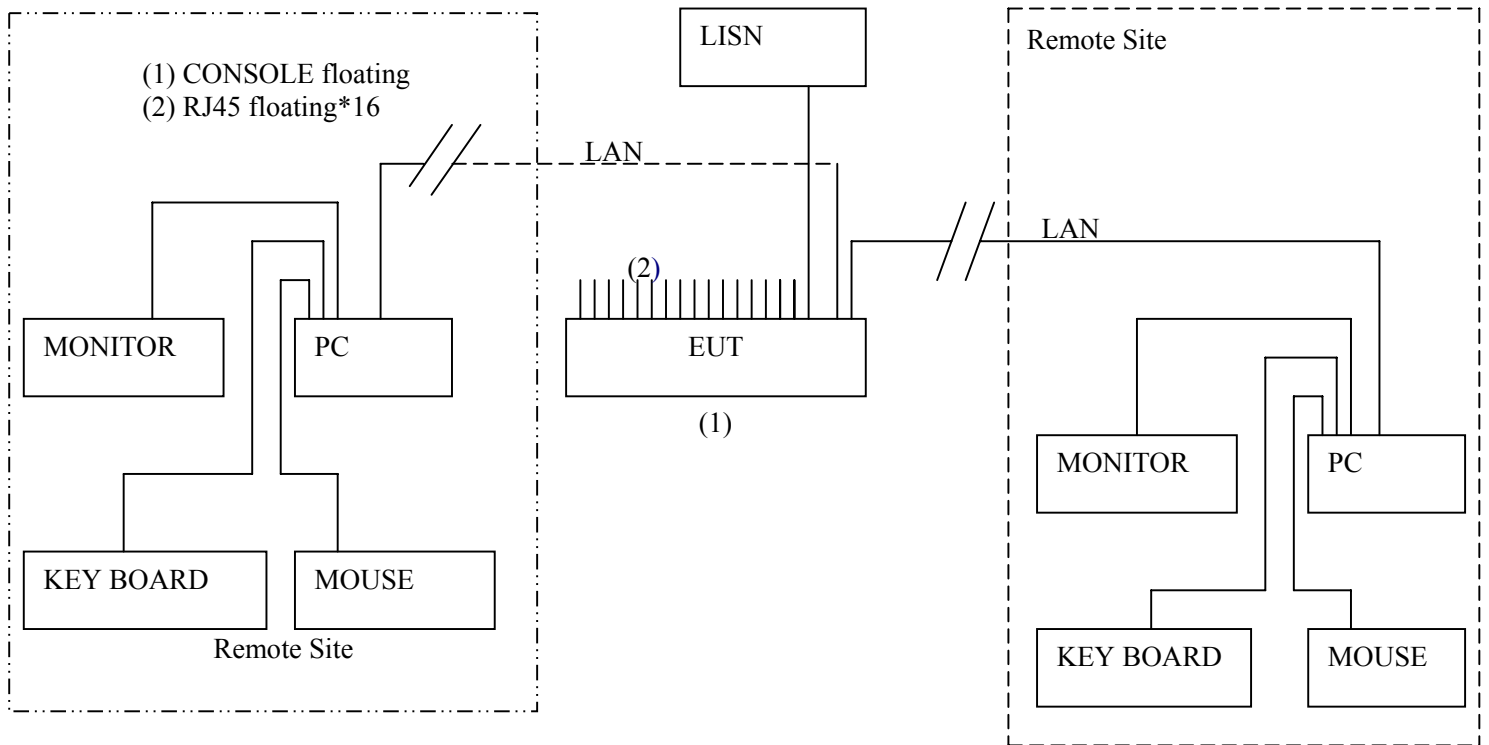
**3. HARMONICS / FLICKER and EMS test mode is Mode 1**



## 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/<br>BSMI ID         | Trade name | Data Cable           | Power Cord         |
| 01                        | PC        | M35             | 0545TDT0<br>0856  | R33142                     | Acer       | Unshielded<br>10m    | Unshielded<br>1.8m |
| 02                        | PC        | A13             | L3AB112           | R33B65                     | IBM        | Unshielded<br>10m    | Unshielded<br>1.8m |
| 03                        | MONITOR   | TFT22W90<br>PSA | E9377JA0<br>00166 | R33037                     | AOC        | Shielded<br>1.8M     | Unshielded<br>1.8m |
| 04                        | MONITOR   | V22ECBF         | 3M6U077<br>02009  | R31282                     | TATUNG     | Shielded<br>1.6M     | Unshielded<br>1.8m |
| 05                        | MOUSE     | M-S34           | HCA4170<br>0559   | DEL2110<br>29/4862A<br>011 | Logitech   | Shielded<br>1.8M~PS2 | N/A                |
| 06                        | MOUSE     | M-S34           | HCA4170<br>0532   | DEL2110<br>29/4862A<br>011 | Logitech   | Shielded<br>1.8M~PS2 | N/A                |
| 07                        | KEY BOARD | Y-SM46          | N/A               | T51160                     | Logitech   | Shielded<br>1.4M/ps2 | N/A                |





|                          |             |                       |                          |                        |            |                   |                 |
|--------------------------|-------------|-----------------------|--------------------------|------------------------|------------|-------------------|-----------------|
| 08                       | KEY BOARD   | RT7D00                | TH-0332TR-37171-16R-3087 | AQ6-7D0080COB/3892C595 | DELL       | Shielded 1.9M/PS2 | N/A             |
| INSIDE SUPPORT EQUIPMENT |             |                       |                          |                        |            |                   |                 |
| No.                      | Equipment   | Model                 | Serial No.               | FCC ID/BSMI ID         | Trade name | Data Cable        | Power Cord      |
| 01                       | Main Board  | EKI-1526/1328 A1 01-2 | 19C3152601               | DOC                    | N/A        | Unshielded 10m    | Unshielded 0.2m |
| 02                       | Power Board | N/A                   | AC77-02                  | DOC                    | N/A        | N/A               | Unshielded 0.2m |

**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             |
| Test Receiver                  | ROHDE & SCHWARZ | ESCI      | 100438      | Apr.29.2009          |                  |
| LISN                           | SCHAFFNER       | NNB41     | 03/10015    | Jun.10.2009          | For EUT          |
| LISN                           | EMCO            | 3825/2    | 9001-1589   | Apr.09.2009          | For Support Unit |
| RF CABLE                       | MIYAZAKI        | 5D-F8     | 002         | May.24.2009          |                  |
| 50ohm Terminal                 | N/A             | N/A       | TM003       | Apr,18,2009          |                  |
| Radiated Emission Measurement  |                 |           |             |                      |                  |
| Instrument                     | Manufacturer    | Model No. | Serial No.  | Calibration Due Date | Note             |
| Test Receiver                  | AFJ             | ER55R     | 55300508277 | May.20.2009          |                  |
| 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.18.2009          |                  |



|  |                     |                  |                   |                             |             |
|--|---------------------|------------------|-------------------|-----------------------------|-------------|
| EMC Analyzer   | AGILENT             | E7401A           | MY42000145        | May.23.2009                 |             |
| RF Cable   | BELDEN              | RG-8/U           | E037              | Jun.07.2009                 |             |
| Thermo-Hygro meter   | WISEWIND            | 4-IN-1           | 0412              | Apr.10.2009                 |             |
| <b>Power Harmonic Measurement and Voltage Fluctuations</b>     |                     |                  |                   |                             |             |
| <b>Instrument</b>  | <b>Manufacturer</b> | <b>Model No.</b> | <b>Serial No.</b> | <b>Calibration Due Date</b> | <b>Note</b> |
| 5KV AC POWER SOURCE  | SCHAFFNER           | NSG1007          | 55869             | DEC,28/2008                 |             |
| SIGNAL CONDITIONING  | SCHAFFNER           | CCN1000-1        | 72281             | DEC,28/2008                 |             |
| <b>EMS</b>   |                     |                  |                   |                             |             |
| <b>Instrument</b>  | <b>Manufacturer</b> | <b>Model No.</b> | <b>Serial No.</b> | <b>Calibration Due Date</b> | <b>Note</b> |
| <b>IEC61000-4-2</b>  |                     |                  |                   |                             |             |
| Thermo-Hygro meter   | WISEWIND            | N/A              | N/A               | APR.08.2009                 |             |
| ESD SIMULATOR  | NOISEKEN            | ESS-100L         | 6366876           | OCT.04.2008                 |             |
| <b>IEC61000-4-3</b>  |                     |                  |                   |                             |             |
| 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/29/2009                 |             |
| Power Amplifier  | SCHAFFNER           | CBA9413B         | 4039              | N/A                         |             |
| <b>IEC61000-4-4/ IEC61000-4-5/ IEC61000-4-8/ IEC61000-4-11</b> |                     |                  |                   |                             |             |
| 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.08.2009                 |             |



|                       |                   |             |          |             |  |
|-----------------------|-------------------|-------------|----------|-------------|--|
| ANTENNA               | EMC PARTNER<br>AG | MF-1000-1   | 117      | OCT.21.2008 |  |
| IEC61000-4-6          |                   |             |          |             |  |
| Decoupling<br>network | Frankonia         | M2+M3       | A3011055 | JUL.29.2009 |  |
| Decoupling<br>network | Frankonia         | RJ45        | A3023009 | JUL.29.2009 |  |
| EM Injection<br>Clamp | FCC               | F-203I-23MM | 471      | AUG.08.2009 |  |
| RF-GENERATOR          | SCHAFFNER         | NSG2070     | 1086     | SEP.09.2008 |  |

✂ 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 measurements are performed in a Global lab's room; The EUT was placed on non-conductive 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

Power to the EUT was provided through the LISN which has the Impedance (50ohm/50uH) vs. Frequency Characteristic in accordance with the standard. Powers to the LISNs were filtered to eliminate ambient signal interference and these filters were bonded to the ground plane. Peripheral equipment required to provide a functional system (support equipment) for EUT testing was powered from the second LISN through a ganged, metal power outlet box which is bonded to the ground plane at the LISN.

If the EUT is supplied with a flexible power cord, the power cord length in excess of the distance separating the EUT from the LISN shall be folded back and forth at the center of the lead so as to form a bundle not exceeding 40cm in length. If the EUT is provided with a permanently coiled power cord, bundling of the cord is not required. If the EUT is supplied without a power cord, the EUT shall be connected to the LISN by a power cord of the type specified by the manufacturer which shall not be longer than 1 meter. The excess power cord shall be bundled as described above. If a non-flexible power cord is provided with the EUT, it shall be cut to the length necessary to attach the EUT to the LISN and shall not be bundled.



The interconnecting cables were arranged and moved to get the maximum measurement. Both the line of power cord, hot and neutral, was measured.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

## **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.

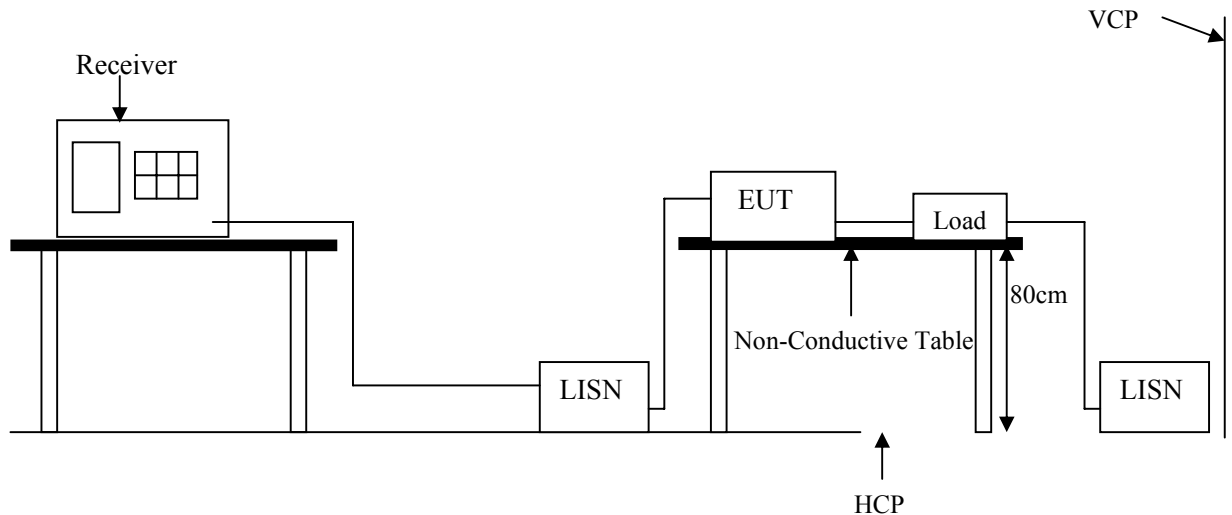
For the initial measurements, the receiving antenna is varied from 1-4 meter height and is changed in the vertical plane from vertical to horizontal polarization at each frequency. Both reading are recorded with the quasi-peak detector with 120 KHz bandwidth. For frequency between 30 MHz and 1000MHz, 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<br>(MHz) | CLASS A      |                   | CLASS B      |                   |
|--------------------------|--------------|-------------------|--------------|-------------------|
|                          | QP<br>dB(uV) | Average<br>dB(uV) | QP<br>dB(uV) | Average<br>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 regulations: The measurement procedure on conducted emission interference.

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



### **3.4 TEST SPECIFICATION**

According to EN 55022/2006

According to EN 55011:1998+A1:1999+A2:2002(Group1 class A)

According to EN 61000-6-4 (2001): CISPR 11 Class A (1990)

### **3.5 RESULT: PASSED**

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

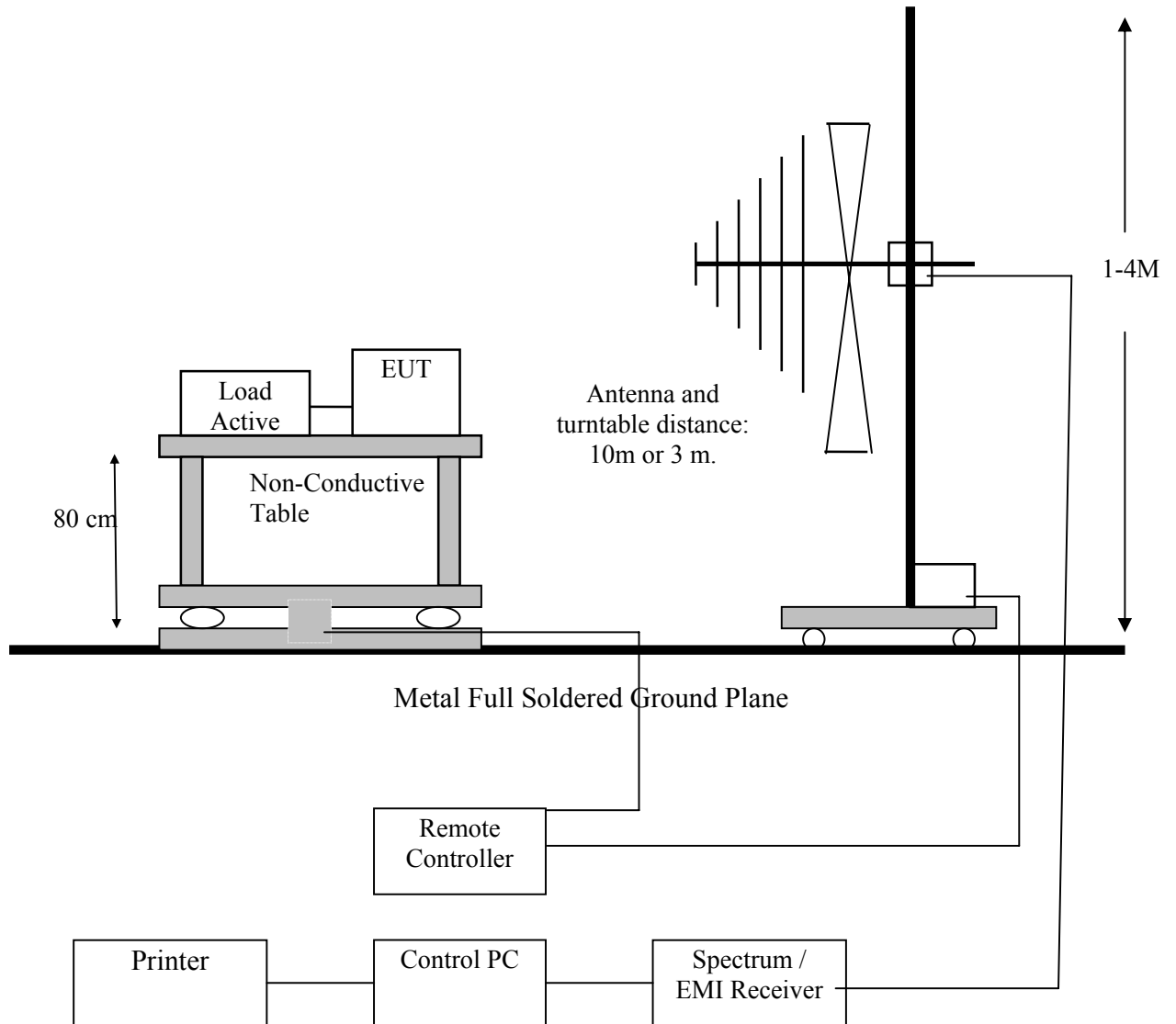
|                       |                           |
|-----------------------|---------------------------|
| Frequency Range:      | 150KHz--30MHz             |
| Detector Function:    | Quasi-Peak / Average Mode |
| Resolution Bandwidth: | 9KHz                      |

### **3.6 TEST DATA:**

**Please refer to appendix 2**

## 4. RADIATED EMISSION MEASUREMENT

### 4.1 TEST SETUP







#### **4.2 LIMIT**

| Frequency  | Class A             |                       | Class B             |                       |
|------------|---------------------|-----------------------|---------------------|-----------------------|
| MHz        | Distance<br>(Meter) | Limit<br>dB $\mu$ V/m | Distance<br>(Meter) | Limit<br>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 polarizations 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 120 KHz when the frequency range is below 1GHz

#### **4.4 TEST SPECIFICATION**

According to EN 55022/2006

According to EN 55011:1998+A1:1999+A2:2002(Group1 class A)

According to EN 61000-6-4 (2001): CISPR 11 Class A (1990)

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

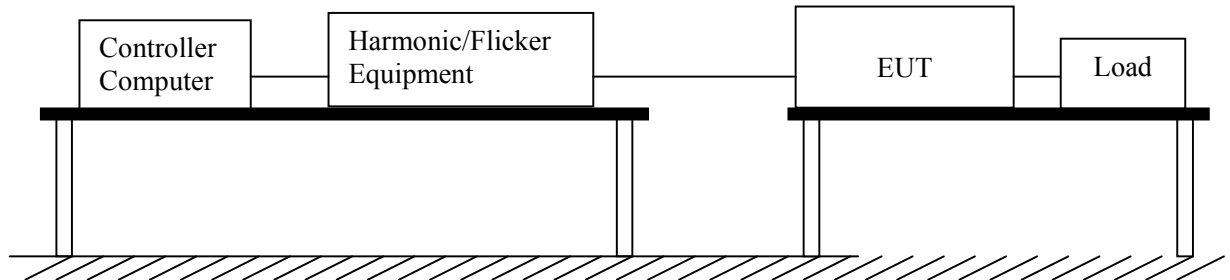
#### **4.6 TEST DATA:**

**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 ≤ n ≤ 40     | 0.23 x 8/n                                    |
| 11             | 0.33  |                |   |
| 13             | 0.21  |                |   |
| 15 ≤ n ( 39    | 0.15 x 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: PASSED**

### **5.6 TEST DATA:**



## Harmonics – Class-D per Ed. 3.0 (2005-11)(Run time)

EUT: Equipment Under Test

Tested by: JEFF

Test category: Class-D per Ed. 3.0 (2005-11) (European limits) Test Margin: 100

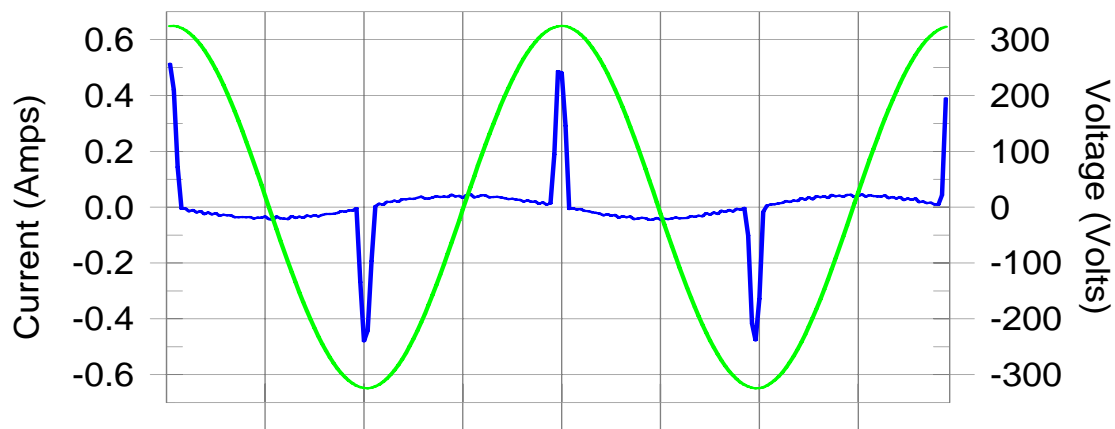
Test date: 2008/8/5

Comment: EKI-1526

Customer: ADVANTECH

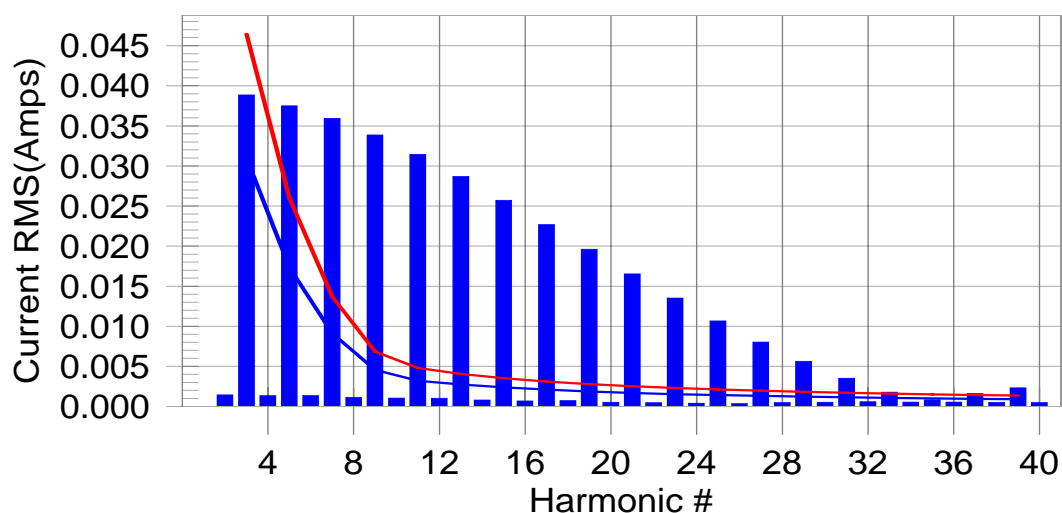
Test Result: N/L Source qualification: Normal

### Current & voltage waveforms



### Harmonics and Class D limit line

### European Limits



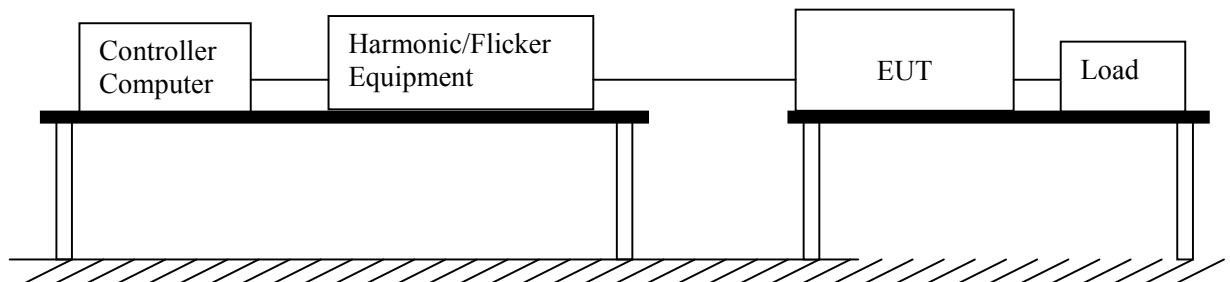
Test result: N/L Worst harmonic was #0 with 0.00% of the limit.





## **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<br>(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: PASSED**

### **6.6 TEST DATA**



## Flicker Test Summary per EN/IEC61000-3-3 (Run time)

EUT: Equipment Under Test  
Test category: All parameters (European limits)  
Test date: 2008/8/5  
Comment: EKI-1526  
Customer: ADVANTECH

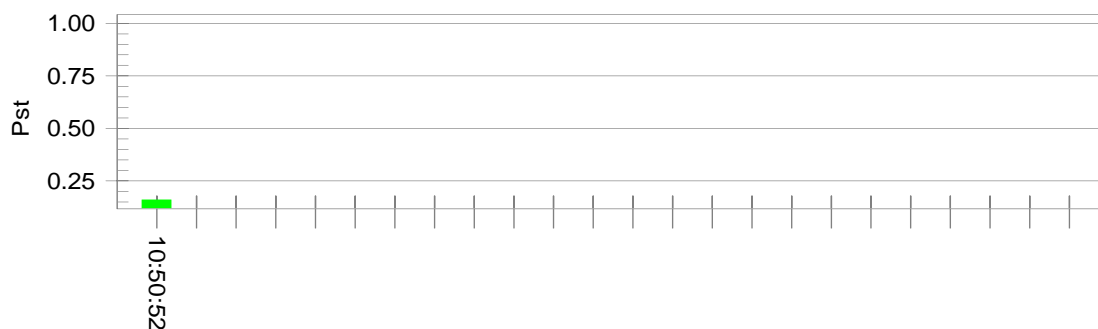
Tested by: JEFF  
Test Margin: 100

Test Result: Pass

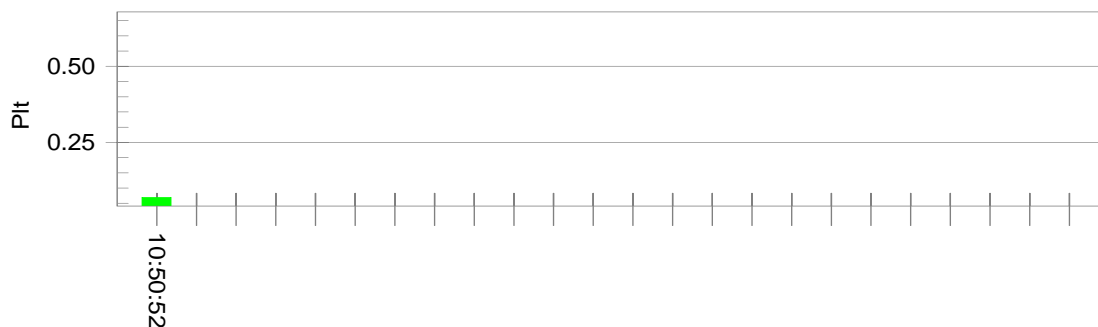
Status: Test Completed

Pst<sub>i</sub> and limit line

European Limits



Plt and limit line



**Parameter values recorded during the test:**

|                                 |        |                  |            |
|---------------------------------|--------|------------------|------------|
| Vrms at the end of test (Volt): | 229.40 |                  |            |
| Highest dt (%):                 | 0.00   | Test limit (%):  | 3.30 Pass  |
| Time(mS) > dt:                  | 0.0    | Test limit (mS): | 500.0 Pass |
| Highest dc (%):                 | 0.00   | Test limit (%):  | 3.30 Pass  |
| Highest dmax (%):               | 0.00   | Test limit (%):  | 4.00 Pass  |
| Highest Pst (10 min. period):   | 0.160  | Test limit:      | 1.000 Pass |
| Highest Plt (2 hr. period):     | 0.070  | Test limit:      | 0.650 Pass |

## 7. ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

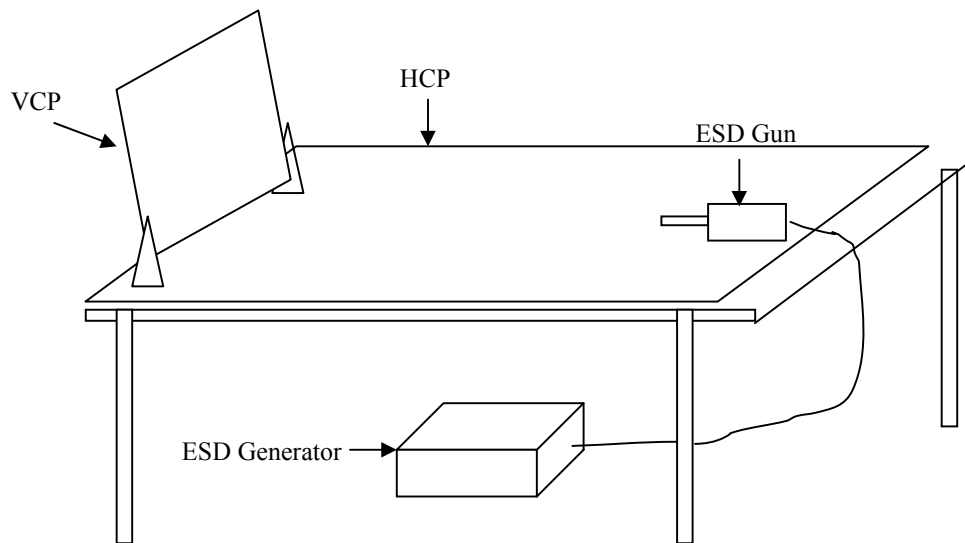
### 7.1 TEST PROCEDURE

According To IEC 61000-4-2 (2001)

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

According To EN61000-6-2:2005

### 7.2 TEST SETUP



### 7.3 TEST LEVEL

| Item                    | Test Specification             | Unit                   | Performance Criteria |
|-------------------------|--------------------------------|------------------------|----------------------|
| Enclosure Room          | $\pm 2, 4, 8$ (Air Discharge)  | KV<br>(Charge Voltage) | B                    |
| Electrostatic Discharge | $\pm 2, 4$ (Contact Discharge) |                        |                      |
| Time between test       | <u>1</u>                       | 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: EKI-1526

Mode: 100Mbps

Temperature: 25°C , Humidity: 55 % RH

| Test Point   | Air Discharge | Contact Discharge | Performance Criteria | Result        |
|--------------|---------------|-------------------|----------------------|---------------|
| HCP          | ----          | ±2, 4KV           | B                    | <b>PASSED</b> |
| VCP          | ----          | ±2, 4KV           | B                    | <b>PASSED</b> |
| CASE         | ±2, 4, 8KV    | ±2, 4KV           | B                    | <b>PASSED</b> |
| I/O PORTS    | ±2, 4, 8KV    | ±2, 4KV           | B                    | <b>PASSED</b> |
| LED          | ±2, 4, 8KV    | ±2, 4KV           | B                    | <b>PASSED</b> |
| SCREWS       | ±2, 4, 8KV    | ±2, 4KV           | B                    | <b>PASSED</b> |
| Power Switch | ±2, 4, 8KV    | ±2, 4KV           | B                    | <b>PASSED</b> |

Final Result : **PASSED**

Remark : During the test, the data packages are stops to write and read. After the test, EUT resume automatically.

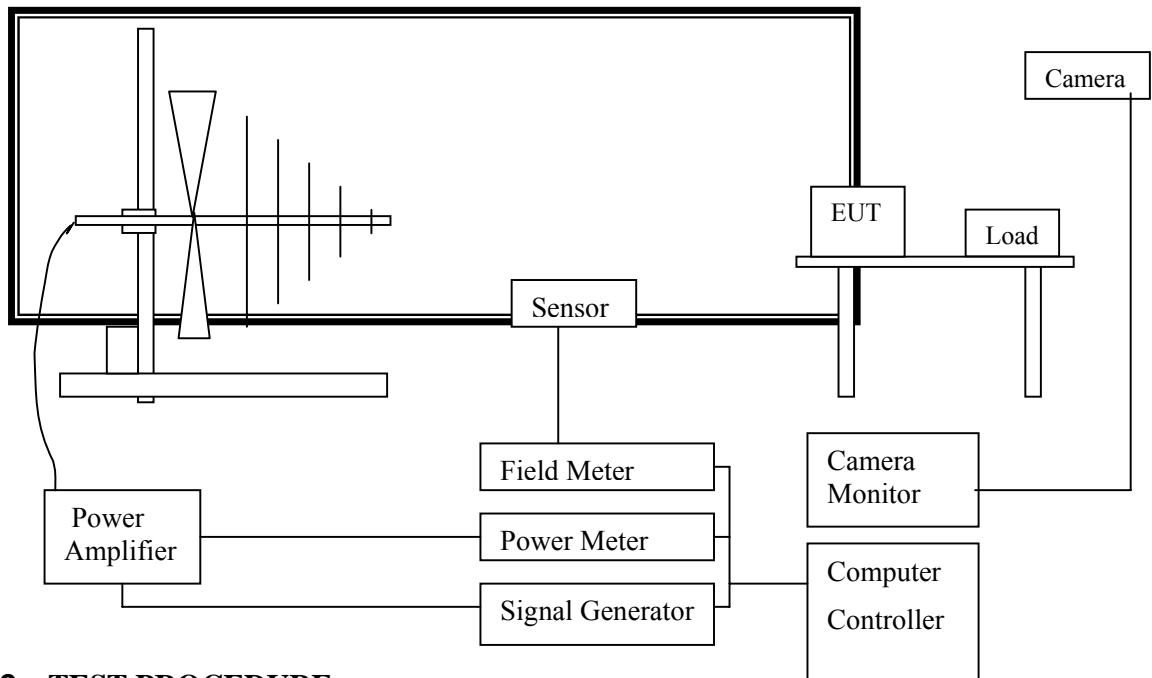
**Photos of test configuration please refer to appendix 1.**





## **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)

According To EN61000-6-2:2005

### **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)             |                      |

| Item                  | Test Specification | Unit                   | Performance Criteria |
|-----------------------|--------------------|------------------------|----------------------|
| Radio –Frequency      | 80~1000            | MHz                    | A                    |
| Electromagnetic Field | <b>10</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 and 10 V/M; Level 2 and 3    |
| 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: EKI-1526

Mode: 100Mbps

Temperature: 25°C , Humidity: 55 % RH

| ANT<br>SIDE | 3V and 10V<br>HORIZONTAL | 3V and 10V<br>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> |

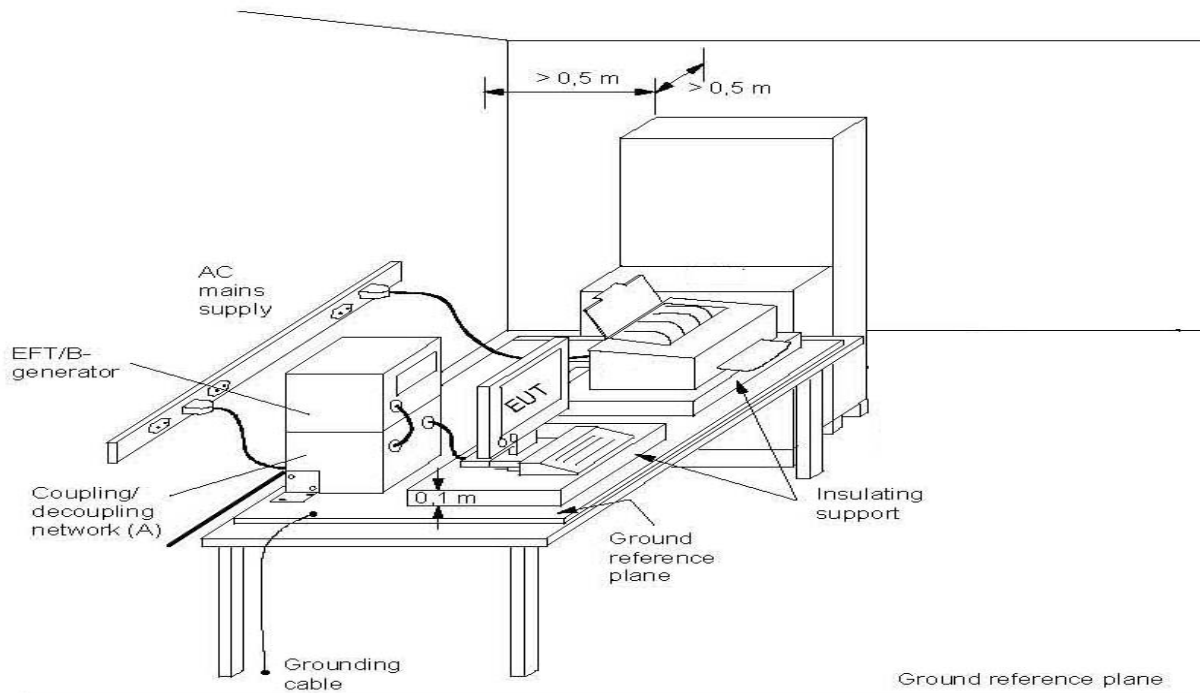
Final Result: **PASSED**

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)

According To EN61000-6-2:2005

### 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               | $\pm 0.5, \pm 1, \pm 2$           | KV (Peak)            | B                    |
| Pulse Rise time & Duration | 5/50                              | Tr/Ts (ns)           |                      |
| Pulse Repetition           | 100                               | Rep. Frequency (KHz) |                      |
| Coupling of power line     | L, N, PE, L+N, L+PE, N+PE, L+N+PE |                      |                      |
|                            |                                   |                      |                      |

#### 9.5 TEST RESULT

Model: EKI-1526

Mode: 100Mbps

Temperature: 25°C , Humidity: 55 % RH

| Power Line   |   |   |    |     |      |      |        |
|--------------|---|---|----|-----|------|------|--------|
| TEST VOLTAGE | L | N | PE | L+N | L+PE | N+PE | L+N+PE |
| $\pm 0.5KV$  | A | A | A  | A   | A    | A    | A      |
| $\pm 1KV$    | A | A | A  | A   | A    | A    | A      |
| $\pm 2KV$    | B | B | B  | B   | B    | B    | B      |

| Signal Control Line |                      |
|---------------------|----------------------|
| TEST VOLTAGE        | Performance Criteria |
| $\pm 0.25KV$        | A                    |
| $\pm 0.5KV$         | A                    |
| $\pm 1KV$           | A                    |

Final Result: **PASSED**

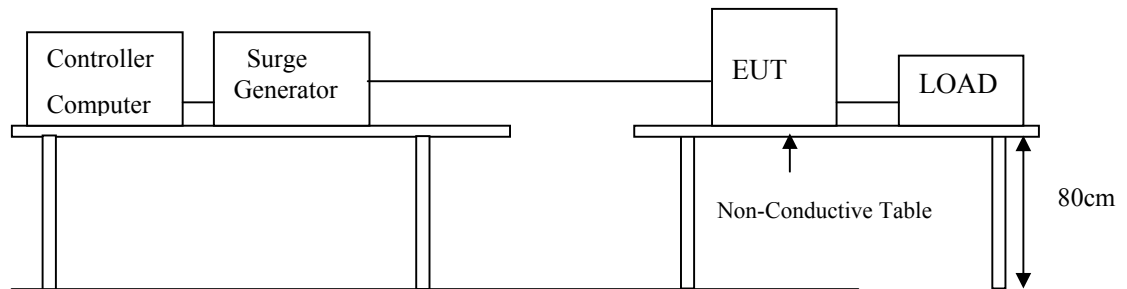
Remark: During the test, the data packages are stops to write and read. After the test, EUT resume automatically.

**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)  
According To EN61000-6-2:2005

### 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: EKI-1526

Mode: 100Mbps

Temperature: 25°C , Humidity: 55 % RH

| Environmental Phenomena | Test Specification | Units               | Performance Criteria |
|-------------------------|--------------------|---------------------|----------------------|
| Line to Line            | ±1                 | KV (Charge Voltage) | A                    |
| Line to Earth           | ±2                 | KV (Charge Voltage) | A                    |

Final Result: **PASSED**

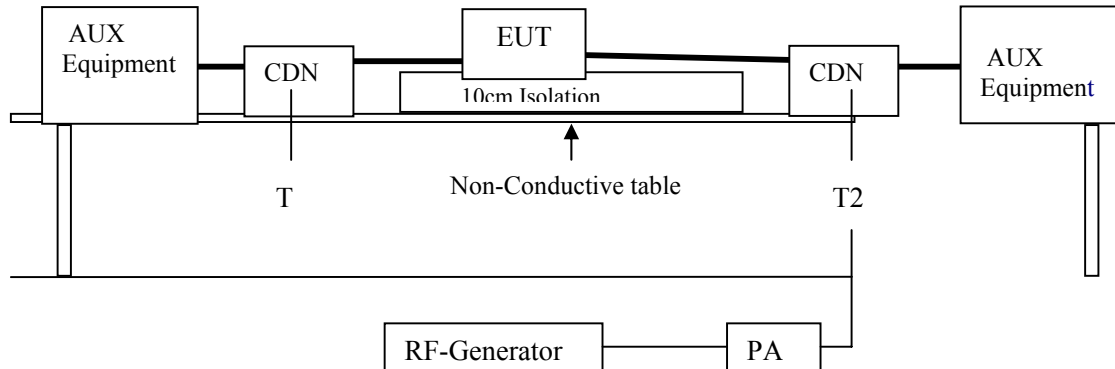
Remark:

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



## 11. IMMUNITY TEST TO CS CONDUCTED DISTURBANCE (CS)

### 11.1 TEST SETUP



### 11.2 TEST PROCEDURE

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

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

According To EN61000-6-2:2005

### 11.3 TEST LEVEL

| Item   | Test Specification | Unit                 | Performance Criteria |
|--|--------------------|----------------------|----------------------|
| Ports for Signal Lines and Data Buses, not involved in process control, etc.       |                    |                      |                      |
| Radio-Frequency  | 0.15 ~ 80          | MHz                  | A                    |
| Common Mode  | 3 / 10             | V (rms, Unmodulated) |                      |
| Amplitude Modulated  | 80                 | %AM (1KHz)           |                      |
|  | 150                | Source Impedance     |                      |
| Ac Input and AC Output and DC Input and DC output Ports and Functional Earth Ports |                    |                      |                      |
| Radio-Frequency  | 0.15 ~ 80          | MHz                  |                      |
| Common Mode  | 3 / 10             | V (rms, Unmodulated) | A                    |
| Amplitude Modulated  | 80                 | %AM (1KHz)           |                      |
|  | 150                | Source Impedance     |                      |

### 11.4 TEST PROCEDURE

The EUT are placed on a table which is 0.8meter height and a ground reference plane on the table, the EUT are placed upon table and use a 10cm insulation between the EUT and ground reference plane.

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

The EUT is connected to the power mains through a coupling and decoupling networks for Power supply lines. It also directly couples the disturbance signal into EUT.

Use CDN-M2 for two wires or CDN-3 for three wires.

For Signal Lines and Control Lines Test:

The disturbance signal is through a coupling and decoupling networks (CDN) or EM-clamp



device couples to the signal and control lines of the EUT.  
All scanning frequencies conditions are as following:

| Condition of Test                 | Remarks                        |
|-----------------------------------|--------------------------------|
| EN 61000-4-6/2003+A1:2004         |                                |
| 1. Field Strength                 | 3 and 10 V/M; Level 2 and 3    |
| 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: EKI-1526

Mode: 100Mbps

Temperature: 25 °C , Humidity: 55 % RH

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

| TEST Specification | Unit        | Performance Criteria |
|--------------------|-------------|----------------------|
| 0.15 - 80          | MHz         | A                    |
| 10                 | V           |                      |
| 80                 | % AM (1KHz) |                      |

Final Result: **PASSED**

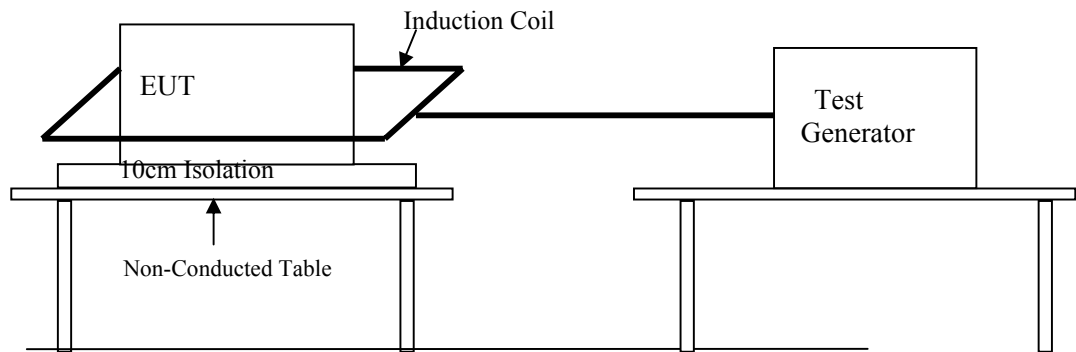
Remark:

**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)  
According To EN61000-6-2:2005

### 12.3 TEST LEVEL

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

| Item            | Test Specification | Unit | Performance Criteria |
|-----------------|--------------------|------|----------------------|
| Power-Frequency | 50                 | Hz   | A                    |
| Magnetic Field  | 30                 | 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: EKI-1526

Test Mode: 100Mbps

Temperature: 25°C , Humidity: 55 % RH

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

| Environmental Phenomena | Test Specification | Units | Performance Criteria |
|-------------------------|--------------------|-------|----------------------|
| Magnetic Field          | 30                 | A/m   | A                    |

Final Result: **PASSED**

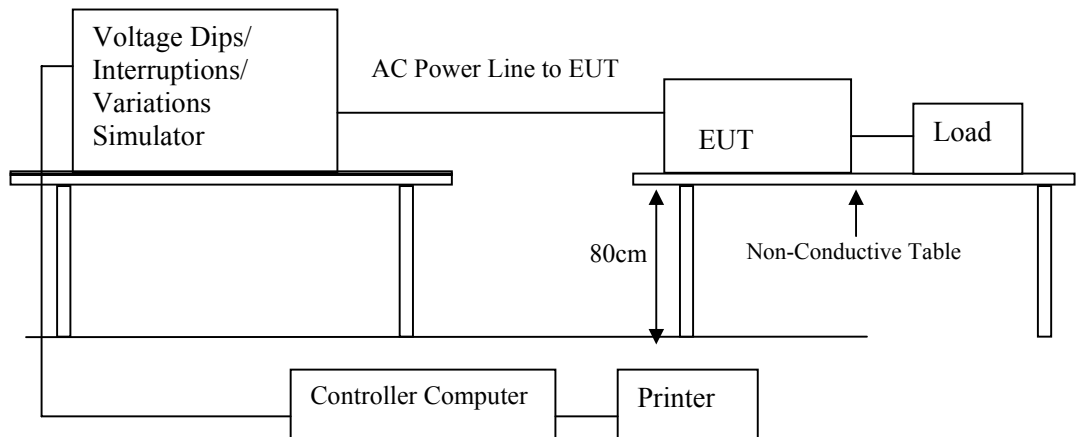
Remark:

**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)  
According To EN61000-6-2:2005



### 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<br>1/2 cycle                              | 0 % during<br>1 cycle | 70 % during 25/30 <sup>c</sup> cycles    |  |  |
| Class 3   | 0 % during<br>1/2 cycle                              | 0 % during<br>1 cycle | 40 % during<br>10/12 <sup>c</sup> cycles | 70 % during<br>25/30 <sup>c</sup> cycles | 80 % during<br>250/300 <sup>c</sup> cycles |
| Class X <sup>b</sup>  | X  | X                     | X  | X  | X  |
| a: Classes as per IEC 61000-2-4.<br>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.<br>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.<br>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.<br>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

Model: EKI-1526

Mode: 100Mbps

Temperature: 25°C , Humidity: 55 % RH

| Environmental Phenomena        | Test Specification | Units               | Performance Criteria |
|--------------------------------|--------------------|---------------------|----------------------|
| Voltage Dips                   | 30<br>1/2          | % during<br>Periods | A                    |
|                                | 60<br>5            | % during<br>Periods | C                    |
|                                | 60<br>50           | % during<br>Periods | C                    |
| Voltage Short<br>Interruptions | > 95<br>250        | % during<br>Periods | C                    |

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

Final Result: **PASSED**

Remark :

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



#### **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 passing 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)             | ±0.2           |
| Cable loss  | Normal (k=2)             | ±0.2           |
| AMN insertion loss  | Rectangular              | ±0.2           |
| RCV/SPA specification   | Rectangular              | ±0.9           |
| combined standard uncertainty $U_e(y)$                                | normal                   | ±1.0           |
| Measuring uncertainty for a level of confidence of 95%<br>$U=2U_e(y)$ | normal (k=2)             | ±2.0           |

### Uncertainty of Radiated Emission Measurement

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



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## **Appendix 1**

### **PHOTOS OF TEST CONFIGURATION**





**Global Certification Corp.**  
**CONDUCTED POWER LINE TEST**

Report No. : E872903



Front View



Rear View



**RADIATED EMISSION TEST**



Front View



Rear View





**Global Certification Corp.**

Report No. : E872903

**HARMONICS & VOLTAGE FLUCTUATIONS TEST**

**SURGE IMMUNITY TEST**

**VOLTAGE DIPS, SHORT INTERRUPTIONS IMMUNITY TEST**



**ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST**





**Global Certification Corp.**

Report No. : E872903

**ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)**



**POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST**







**Global Certification Corp.**

Report No. : E872903

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



**CS CONDUCTED DISTURBANCE IMMUNITY TEST**





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## **Appendix 2**

### **TEST DATA**



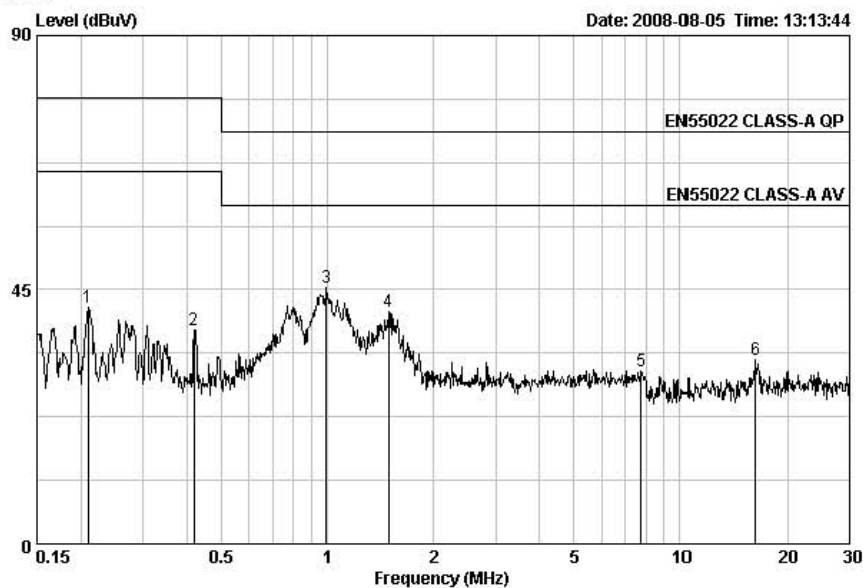
## Test Data Of Conducted Emission Measurement (LINE)



環球認證有限公司  
Global Certification Corp.

Global Certification Corp.  
No.112-3, Sec.2, Siangjhang Rd.  
Sijhih City, Taipei County 221, Taiwan  
TEL:886-2-26426992 FAX:886-2-26487450  
WebSite: <http://www.gcc.tw>

Data: 3



Site : Conduction Test Site 1  
Condition : EN55022 CLASS-A QP LINE RBW:9KHz VBW:300KHz SWT:0.10sec  
EUT : EKI-1526  
MODE : AC 230V / 50Hz  
MEMO :

|   | Freq  | Level | Over   | Limit | LISN   | Cable |        |
|---|-------|-------|--------|-------|--------|-------|--------|
|   | MHz   | dBuV  | Limit  | Line  | Factor | Loss  | Remark |
|   | MHz   | dBuV  | dB     | dBuV  | dB     | dB    |        |
| 1 | 0.21  | 41.82 | -37.18 | 79.00 | 10.10  | 0.03  | Peak   |
| 2 | 0.42  | 37.91 | -41.09 | 79.00 | 10.10  | 0.05  | Peak   |
| 3 | 0.99  | 45.44 | -27.56 | 73.00 | 10.10  | 0.09  | Peak   |
| 4 | 1.49  | 41.07 | -31.93 | 73.00 | 10.10  | 0.11  | Peak   |
| 5 | 7.77  | 30.62 | -42.38 | 73.00 | 10.10  | 0.23  | Peak   |
| 6 | 16.23 | 32.48 | -40.52 | 73.00 | 10.03  | 0.33  | Peak   |



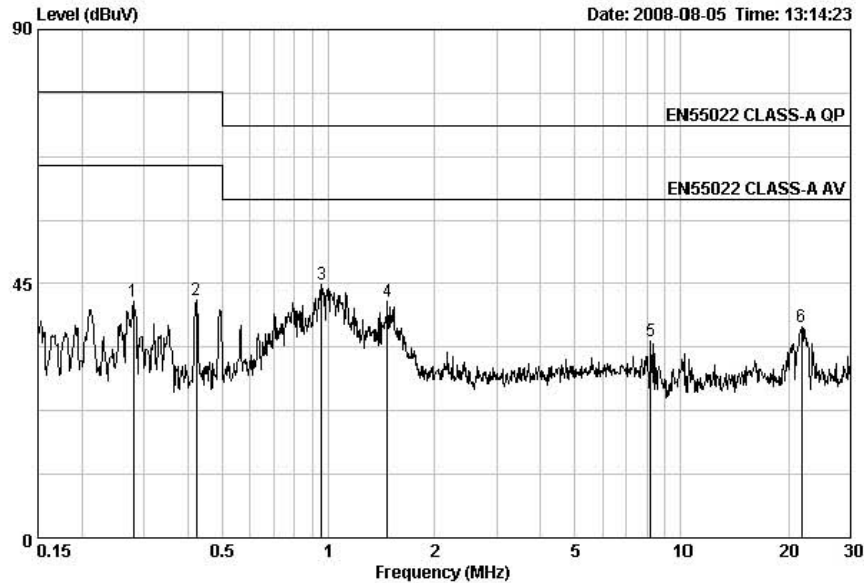
## Test Data Of Conducted Emission Measurement (NATURAL)



環球認證有限公司  
Global Certification Corp.

Global Certification Corp.  
No.112-3, Sec.2, Siangjhang Rd.  
Sijhih City, Taipei County 221, Taiwan  
TEL:886-2-26426992 FAX:886-2-26487450  
WebSite: <http://www.gcc.tw>

Data: 4



Site : Conduction Test Site 1  
Condition : EN55022 CLASS-A QP NEUTRAL RBW:9KHz VBW:300KHz SWT:0.10sec  
EUT : EKI-1526  
MODE : AC 230V / 50Hz  
MEMO :

|   | Freq  | Level | Over   | Limit | LISN   | Cable |        |
|---|-------|-------|--------|-------|--------|-------|--------|
|   | MHz   | dBuV  | Limit  | Line  | Factor | Loss  | Remark |
|   |       |       | dB     | dBuV  | dB     | dB    |        |
| 1 | 0.28  | 41.83 | -37.17 | 79.00 | 10.10  | 0.04  | Peak   |
| 2 | 0.42  | 42.19 | -36.81 | 79.00 | 10.10  | 0.05  | Peak   |
| 3 | 0.96  | 44.90 | -28.10 | 73.00 | 10.10  | 0.09  | Peak   |
| 4 | 1.47  | 41.75 | -31.25 | 73.00 | 10.10  | 0.11  | Peak   |
| 5 | 8.19  | 34.87 | -38.13 | 73.00 | 10.28  | 0.24  | Peak   |
| 6 | 21.83 | 37.30 | -35.70 | 73.00 | 10.34  | 0.37  | Peak   |





## 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 : 872903

Data : #1

Date: 2008/08/05

Time: 下午 02:09:45

Unit : dB  $\mu$ V/m



Site : Open site #1

Limit: EN55022, CISPR22, CNS13438 Class A

Company:

EUT:

Model : EKI-1526

Note: 100Mbps

Polarization: **Horizontal**

Power: AC 230V / 50Hz

Distance: 10m RBW: 100 KHz

Temperature: 30 °C

Humidity: 60 %

Sweep Time: 300 ms

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dB $\mu$ V | Correct<br>Factor<br>dB | Measure-<br>ment<br>dB $\mu$ V/m | Limit<br>dB $\mu$ V/m | Over<br>dB | Antenna<br>Height<br>cm | Table<br>Degree |         |
|-----|-----|--------------|--------------------------------|-------------------------|----------------------------------|-----------------------|------------|-------------------------|-----------------|---------|
|     |     |              |                                |                         |                                  |                       | Detector   |                         | degree          | Comment |
| 1   |     | 113.3250     | 23.18                          | 6.07                    | 29.25                            | 40.00                 | -10.75     | peak                    | 0               |         |
| 2   | *   | 250.6750     | 35.42                          | 4.76                    | 40.18                            | 47.00                 | -6.82      | peak                    | 0               |         |
| 3   |     | 500.4500     | 20.95                          | 12.11                   | 33.06                            | 47.00                 | -13.94     | peak                    | 0               |         |
| 4   |     | 599.8750     | 20.87                          | 13.40                   | 34.27                            | 47.00                 | -12.73     | peak                    | 0               |         |
| 5   |     | 699.3000     | 18.06                          | 15.29                   | 33.35                            | 47.00                 | -13.65     | peak                    | 0               |         |
| 6   |     | 725.9750     | 16.42                          | 15.56                   | 31.98                            | 47.00                 | -15.02     | peak                    | 0               |         |

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

●Reference Only

Receiver:

Spectrum Analyzer: E7401A

Antenna: A052104-071001(10M)

Engineer Signature: JEFF

Amplifier: AMP-EF150001 070719

File : 872903\Data : #1

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

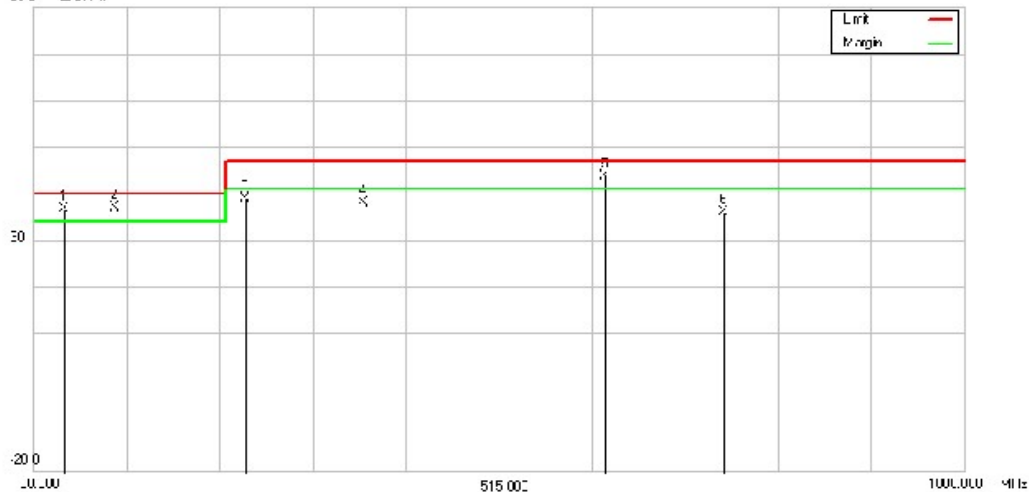
### Radiated Emission Measurement

File : 872903  
E01 : dB  $\mu$ V/m

Data : #2

Date: 2008/08/05

Time: 下午 02:19:56



Site : Open site #1

Limit: EN55022, CISPR22, CNS13438 Class A

Company:

EUT:

Model : EKI-1526

Note: 100Mbps

Polarization: **Vertical**

Power: AC 230V / 50Hz

Distance: 10m RBW: 100 KHz

Temperature: 30 °C

Humidity: 60 %

Sweep Time: 300 ms

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dB $\mu$ V | Correct<br>Factor<br>dB | Measure-<br>ment<br>dB $\mu$ V/m | Limit<br>dB $\mu$ V/m | Over<br>dB | Antenna<br>Height<br>cm | Table<br>Degree |         |
|-----|-----|--------------|--------------------------------|-------------------------|----------------------------------|-----------------------|------------|-------------------------|-----------------|---------|
|     |     |              |                                |                         |                                  |                       | Detector   |                         | degree          | Comment |
| 1   | !   | 61.5250      | 37.08                          | -0.49                   | 36.59                            | 40.00                 | -3.41      | QP                      | 0               |         |
| 2   | *   | 113.6000     | 30.85                          | 6.10                    | 36.95                            | 40.00                 | -3.05      | peak                    | 0               |         |
| 3   |     | 250.6750     | 34.12                          | 4.76                    | 38.88                            | 47.00                 | -8.12      | peak                    | 0               |         |
| 4   |     | 374.3500     | 29.07                          | 8.78                    | 37.85                            | 47.00                 | -9.15      | peak                    | 0               |         |
| 5   | !   | 626.5500     | 29.44                          | 14.09                   | 43.53                            | 47.00                 | -3.47      | peak                    | 0               |         |
| 6   |     | 750.2250     | 20.08                          | 15.80                   | 35.88                            | 47.00                 | -11.12     | peak                    | 0               |         |

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

●Reference Only

Receiver:

Spectrum Analyzer: E7401A

Antenna: A052104-071001(10M)

Engineer Signature: JEFF

Amplifier: AMP-EF150001 070719

File : 872903\Data : #2

Page: 1



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**PHOTO OF EUT**

**PHOTOS OF EUT**



**PHOTO OF EUT**



Front View of EUT



Rear View of EUT





**PHOTO OF EUT**



Front View of I/O



Rear View of I/O



**PHOTO OF EUT**

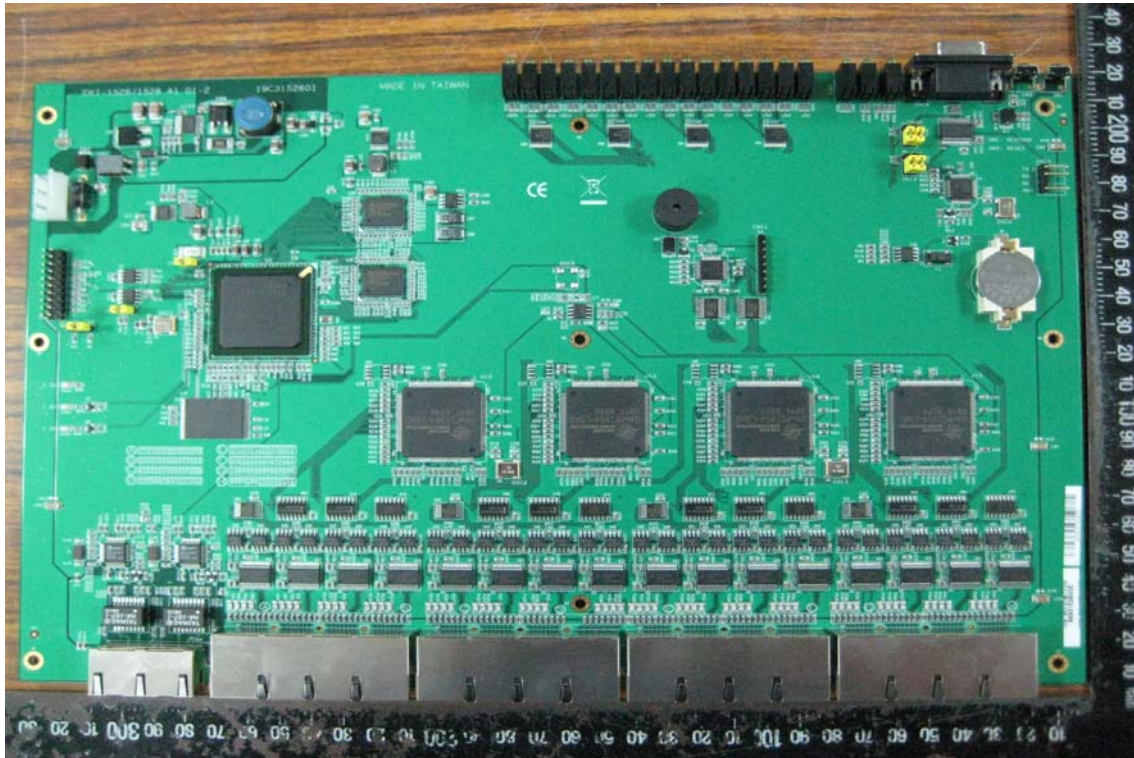


Inside View of EUT

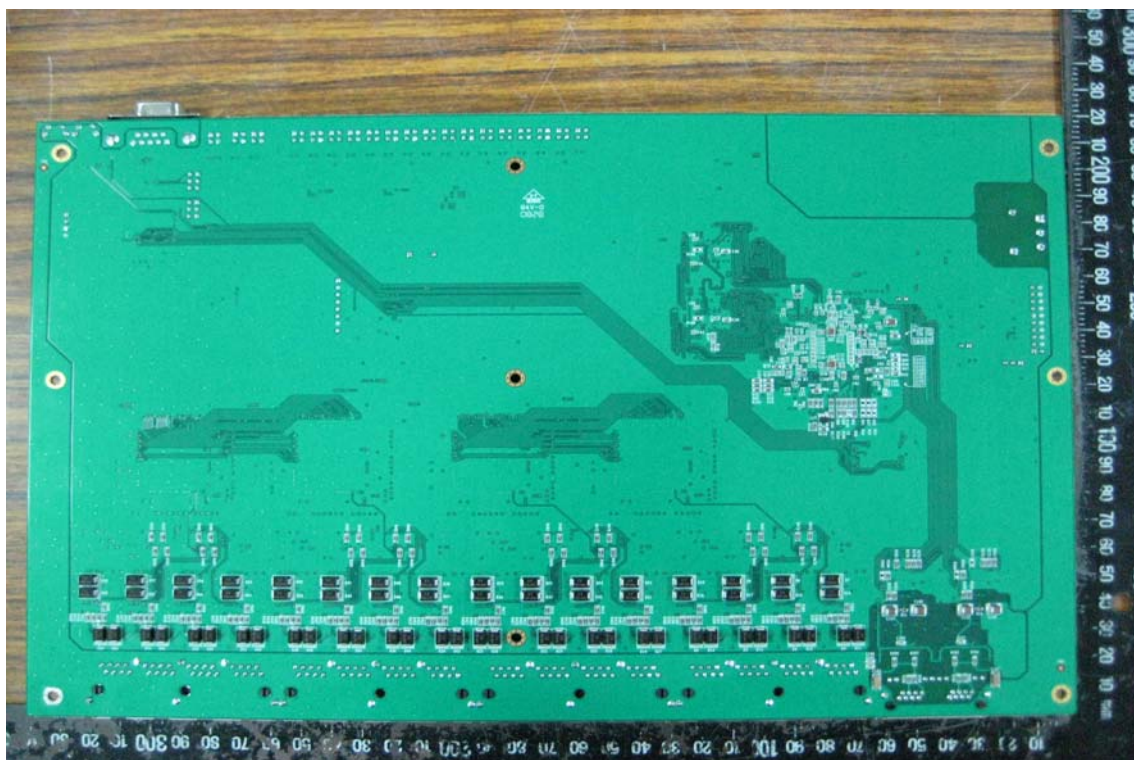




**PHOTO OF EUT**



Component Side of Main Board

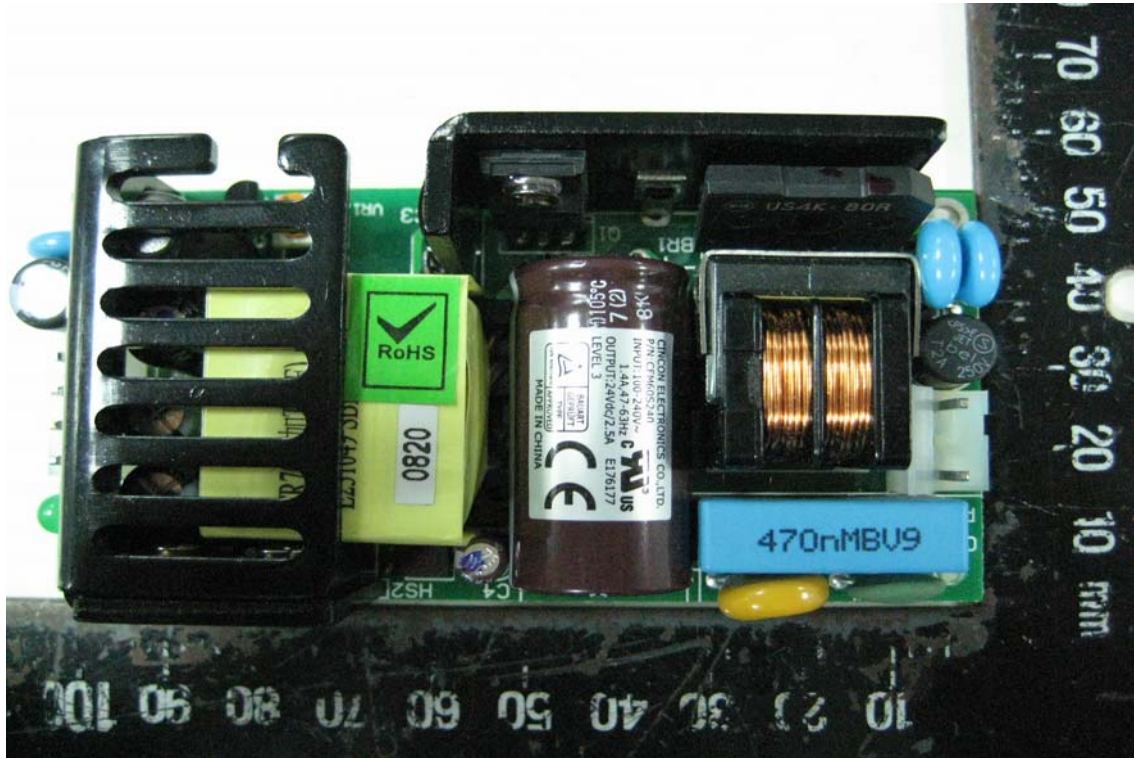


Solder Side of Main Board

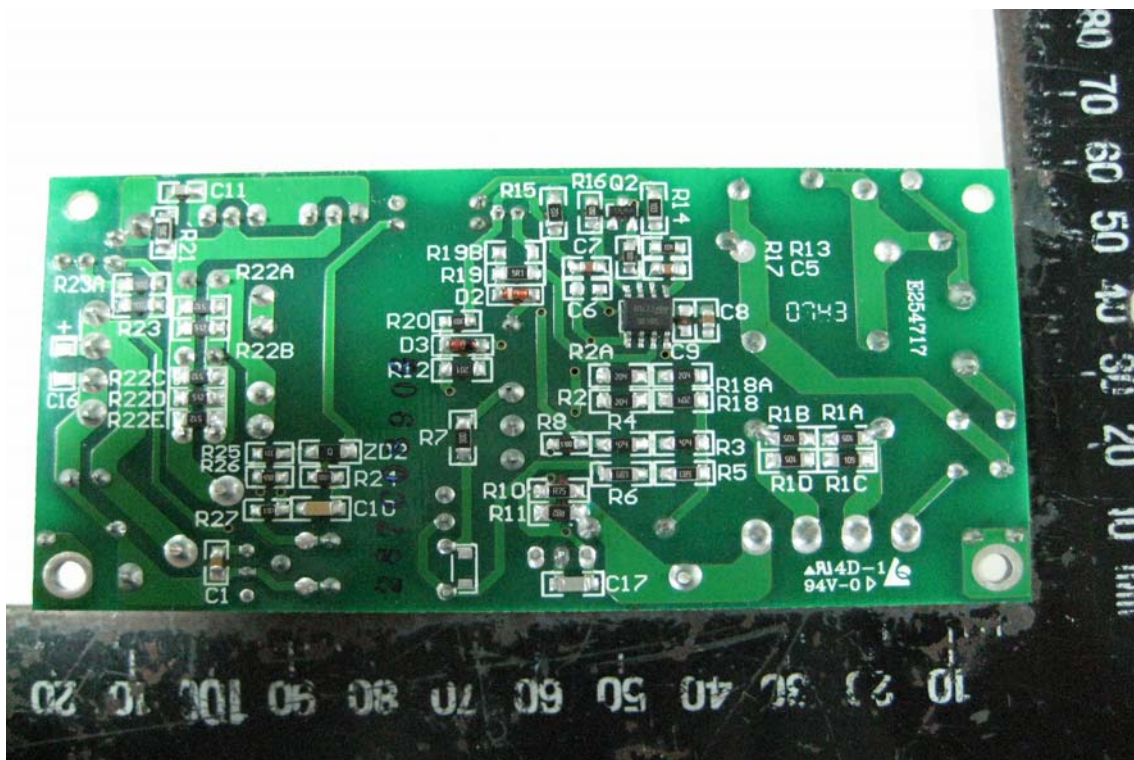




PHOTO OF EUT



Front View of Power Board



Rear View of Power Board