# CE EMC

# TEST REPORT

**For**

**Micro ATX Board**

**Model: EMB-900M**

**Trade Name: AAEON**

Issued to

**AAEON Technology Inc.**
**5F, No.135, Lane 235, Pao Chiao Rd., Hsin-Tien City,**
**Taipei, Taiwan, R.O.C.**

Issued by

**Compliance Certification Services Inc.**
**Hsintien Lab.**
**No. 165, Chunghsen Road, Hsintien City**
**Taipei Hsien, Taiwan**
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# 1 TEST RESULT CERTIFICATION

| | |
|---|---|
| **Applicant:** | **AAEON Technology Inc.**<br>5F, No.135, Lane 235, Pao Chiao Rd., Hsin-Tien City, Taipei, Taiwan, R.O.C. |
| **Manufacturer:** | **AAEON Technology Inc.**<br>5F, No.135, Lane 235, Pao Chiao Rd., Hsin-Tien City, Taipei, Taiwan, R.O.C. |
| **Equipment Under Test:** | Micro ATX Board |
| **Trade Name:** | AAEON |
| **Model:** | EMB-900M |
| **Detailed EUT Description:** | See Item 2 of this report |
| **Date of Test:** | August 17, 2005 ~ September 04, 2005 |

| Applicable Standard | Class/Limit/Criterion | Test Result |
|---|---|---|
| **EN 55022: 1998 + A1: 2000 + A2: 2003** | Class A | No non-compliance noted |
| EN 61000-3-2: 2000 | Class A | No non-compliance noted |
| EN 61000-3-3: 1995 + A1: 2001 | Limit | No non-compliance noted |
| **EN 55024:1998 + A1: 2001 + A2: 2003, including** | | |
| IEC 61000-4-2: 1995 + A1: 1998 + A2: 2000 | Criterion B | No non-compliance noted |
| IEC 61000-4-3: 2002 + A1: 2002 | Criterion A | No non-compliance noted |
| IEC 61000-4-4: 1995 + A1: 2000 + A2: 2001 | Criterion B | No non-compliance noted |
| IEC 61000-4-5: 1995 + A1: 2000 | Criterion B | No non-compliance noted |
| IEC 61000-4-6: 1996 + A1: 2000 | Criterion A | No non-compliance noted |
| IEC 61000-4-8: 1993 + A1: 2000 | Criterion A | N/A |
| IEC 61000-4-11: 1994 + A1: 2000 | Criterion B/C/C | No non-compliance noted |
| **Deviation from Applicable Standard** | | |
| At the customers' request, we adopt the above standards. | | |

The above equipment was tested by Compliance Certification Services Inc. for compliance with the requirements set forth in the EMC Directive 89/336/EMC 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 and measurement uncertainties.

***Approved by:***

David Wang
Manager of Hsintien Laboratory
Compliance Certification Services Inc.

***Reviewed by:***

Vince Chiang
Assistant Manager of Hsintien Laboratory
Compliance Certification Services Inc.

# 2 EUT DESCRIPTION

| | |
|---|---|
| **Product** | Micro ATX Board |
| **Trade Name** | AAEON |
| **Model** | EMB-900M |
| **Housing Type** | N/A |
| **Power Adaptor Power Rating** | 3.3VDC/ 5VDC/ ±12VDC from Host PC |
| **AC Power During Test** | 230VAC / 50Hz to Host PC Power Supply |
| **Power Supply Manufacturer** | Seventeam |
| **Power Supply Model Number** | ST-300BLV |
| **AC Power Cord Type** | Unshielded, 1.8m (Detachable) to Host PC Power Supply |
| **OSC/Clock Frequencies** | 32.768kHz; 14.31818MHz; 25MHz |

**I/O PORT OF EUT**

| I/O PORT TYPE | Q'TY | TESTED WITH |
|---|---|---|
| 1). PIO Port | 1 | 1 |
| 2). PS/2 Keyboard Port | 1 | 1 |
| 3). PS/2 Mouse Port | 1 | 1 |
| 4). Video-Out Port (DVI) | 1 | 1 |
| 5). Audio In Port | 1 | 1 |
| 6). Microphone Port | 1 | 1 |
| 7). Earphone Port | 4 | 4 |
| 8). LAN Port | 2 | 2 |
| 9). USB Port | 4 | 4 |
| 10). OPTICAL FIBER Port | 2 | 2 |

***Note:*** *Client consigns only one model sample (Model Number is EMB-900M) to test.*

# 3 TEST METHODOLOGY

## 3.1 EUT SYSTEM OPERATION

1. Windows XP boots system.
2. Run Emctest.exe to activate all peripherals and display “H” pattern on monitor screen.
3. Run Winemc.exe and choose media player to play music.
4. Run Winemc.exe and choose “F:/ & G:/ & H:/ & I:/ & J:/ & K:/ & L:/ & I:/” to test USB 2.0 Port.
5. Press the start menu, select executive and type ping 192.168.0.2 –t (EUT), ping 192.168.0.1 –t (Server Notebook).

***Note:*** *Test program is self-repeating throughout the test.*

## 3.2 DECISION OF FINAL TEST MODE

1. The following test mode(s) were scanned during the preliminary test:

**Mode:**

**1. DVI TO D-SUB MODE**

2. After the preliminary scan, the following test mode(s) 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 items.

# 4 SETUP OF EQUIPMENT UNDER TEST

## Setup Diagram

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

## Support Equipment

### Host PC Devices:

| No | Equipment | Model # | Trade Name |
|---|---|---|---|
| 1. | CPU (3.20GHz) | Pentium4 | Intel |
| 2. | Memory (512MBX2) | DDR2-533 | ELPIDA |
| 3. | Power Supply | ST-300BLV | Seventeam |
| 4. | HDD | 2F040L0 | Maxtor |
| 5. | CD-ROM | CDU5211 | SONY |

## Peripherals Devices:

| No | Equipment | Model | Serial No. | FCC ID / BSMI ID | Trade Name | Data Cable | Power Cord |
|---|---|---|---|---|---|---|---|
| 1. | USB 2.0 HDD | F12-U | N/A | BSMI ID: 4912A002 | TeraSys | Shielded, 2.0m | N/A |
| 2. | USB 2.0 HDD | F12-U | N/A | BSMI ID: 4912A002 | TeraSys | Shielded, 2.0m | N/A |
| 3. | USB 2.0 HDD | F12-U | N/A | BSMI ID: 4912A002 | TeraSys | Shielded, 2.0m | N/A |
| 4. | USB 2.0 HDD | F12-U | N/A | BSMI ID: 4912A002 | TeraSys | Shielded, 2.0m | N/A |
| 5. | PS/2 Mouse | M071KC | 443029438 | DoC BSMI: R41108 | DELL | Shielded, 1.8m | N/A |
| 6. | PS/2 Keyboard | SK-8110 | N/A | DoC BSMI: T3A002 | DELL | Shielded, 1.8m | N/A |
| 7. | Ear. / Mic. | MSB301 | N/A | N/A | e-Sense | Unshielded, 1.8m | N/A |
| 8. | Player | RQ-L11LT | N/A | BSMI ID: 3912A162 | Panasonic | Unshielded, 1.0m | N/A |
| 9. | Earphone | MSB301 | N/A | N/A | e-Sense | Unshielded, 1.8m | N/A |
| 10. | USB 2.0 HDD | F12-U | N/A | BSMI ID: 4912A002 | TeraSys | Shielded, 2.0m | N/A |
| 11. | USB 2.0 HDD | F12-U | N/A | BSMI ID: 4912A002 | TeraSys | Shielded, 2.0m | N/A |
| 12. | USB 2.0 HDD | F12-U | N/A | BSMI ID: 4912A002 | TeraSys | Shielded, 2.0m | N/A |
| 13. | USB 2.0 HDD | F12-U | N/A | BSMI ID: 4912A002 | TeraSys | Shielded, 2.0m | N/A |
| 14. | Earphone | MSB301 | N/A | N/A | e-Sense | Unshielded, 1.8m | N/A |
| 15. | Earphone | MSB301 | N/A | N/A | e-Sense | Unshielded, 1.8m | N/A |
| 16. | Modem | 5JEG4033MKO | N/A | 5RJTAI-35500-M5-E | TOP-SOLUTION | Shielded, 1.8m | Unshielded, 1.8m |
| 17. | Modem | 5JEG4033MKO | N/A | 5RJTAI-35500-M5-E | TOP-SOLUTION | Shielded, 1.8m | Unshielded, 1.8m |
| 18. | Modem | 1414 | N/A | IFAXDM1414 | ACEEX | Shielded, 1.8m | Unshielded, 1.8m |
| 19. | Modem | 5JEG4033MKO | N/A | 5RJTAI-35500-M5-E | TOP-SOLUTION | Shielded, 1.8m | Unshielded, 1.8m |
| 20. | Monitor | GH17PS | GH17H4LT604715L | DoC BSMI ID: 3902B332 | SAMSUNG | Shielded, 1.8m with two cores | Unshielded, 1.8m |
| 21. | Printer | C20SX | N/A | BSMI ID: 3902E004 | EPSON | Shielded, 1.8m | Unshielded, 1.8m |
| 22. | Server Notebook | PP05L | 2464936188 | DoC BSMI: R33002 | DELL | Unshielded, 20m | Unshielded, 1.8m with a core |

***Note:*** *All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.*

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

# 5 FACILITIES AND ACCREDITATIONS

## 5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at CCS Taiwan Hsintien Lab at No. 165, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan.

The measurement facilities are constructed in conformance with the requirements of CISPR 16-1, ANSI C63.4 and other equivalent standards.

## 5.2 LABORATORY ACCREDITATIONS AND LISTINGS

The test facilities used to perform Electromagnetic compatibility tests are registered or accredited by the organizations listed in the following table which includes the recognized scope specifically.

| Country | Agency | Scope of Accreditation | Logo |
|---|---|---|---|
| USA | A2LA | CFR 47, FCC Part 15/18 using ANSI 63.4; AS/NZS 3548; VCCI V3; CNS 13438; CNS 13439; CNS 13783; CNS 14115; CISPR 11/EN 55011; CISPR 14-1/EN 55014-1; CISPR 15/EN 55015; CISPR 22/EN 55022; EN 50081-1/EN 61000-6-3; EN 50082-1/EN 61000-6-4; IEC/EN 61000-4-2, IEC/EN 61000-4-3, IEC/EN 61000-4-4, IEC/EN 61000-4-5, IEC/EN 61000-4-6, IEC/EN 61000-4-8, IEC/EN 61000-4-11, IEC/EN 61000-3-2, IEC/EN 61000-3-3; CISPR 24/EN 55024; CISPR 14-2/EN 55014-2; EN 50081-2/EN 61000-6-1; EN 50082-2/EN 61000-6-2. | ACCREDITED 824.01 |
| USA | FCC | 3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements | 250366 |
| Japan | VCCI | 3/10 meter Open Area Test Sites and Line Conducted Test Room to perform conducted/radiated measurements | VCCI R-1434/1630~4 C-1511/1882 |
| Norway | NEMKO | EN 50081-1/2, EN 50082-1/2, IEC 61000-6-1/2/3/4, EN 50091-2, EN 50130-4, EN 55011, EN 55013, EN 55014-1/2, EN 55015, EN 55022, EN 55024, EN 61000-3-2/3, EN 61326-1, IEC 61000-4-2/3/4/5/6/8/11, Cispr 16-1/2/3/4 | ELA 103 |
| Taiwan | CNLA | 47 CFR FCC Part 15 Subpart B, EN 61000-3-2, EN 61000-3-3, CNS 13439, CNS 13783-1, CNS 13438, AS/NZS 3548, VCCI, CNS 13022-1/2/3, EN 55022, EN 55013, EN 55014-1, EN 61000-4-2/3/4/5/6/8/11, ENV 50204, ENV 50141, ENV 50142 | CNLA 1108 ILAC MRA |
| Taiwan | BSMI | CNS 13438, CNS 13783-1, CNS 13439 | SL2-IN-E-0005 SL2-A1-E-0005 SL2-R1-E-0005 SL2-R2-E-0005 |
| Canada | Industry Canada | RSS212, Issue 1 | Canada IC 5742 |

***Note:*** *No part of this report may be used to claim or imply product endorsement by CNLA, A2LA or other government agency.*

# 6 INSTRUMENT AND CALIBRATION

## 6.1 MEASURING INSTRUMENT CALIBRATION

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

## 6.2 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 manual.

**Equipment Used for Emission Measurement**

| Open Area Test Site # I | | | | |
|---|---|---|---|---|
| **EQUIPMENT** | **MFR** | **MODEL** | **SERIAL NUMBER** | **CAL. DUE** |
| SITE NSA | CCS | I Site | N/A | 09/17/2005 |
| MEASURE RECEIVER | SCHAFFNER | SCR3501 | 338 | 06/27/2006 |
| SPECTRUM ANALYZER | ADVANTEST | R3132 | 120900008 | No Calibration Required |
| ANTENNA | SCHAFFNER | CBL 6112B | 2809 | 09/24/2005 |
| AMPLIFIER | MCL | ZKL-1R5 | 6511600436 | 03/06/2006 |
| CABLE | SUHNER | RG 214 | N-TYPE #Q2 | 02/18/2006 |
| THERMO-HYGRO METER | TFA | N/A | NO.2 | 11/09/2005 |
| DECOUPLING NETWORK | FCC | F-201-DCN-5-6MM | 22、24 | 08/24/2006 |

***Note:*** *The measurement uncertainty is less than +/- 3.36dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.*

| Conducted Emission Test Site # A | | | | |
|---|---|---|---|---|
| **EQUIPMENT** | **MFR** | **MODEL** | **SERIAL NUMBER** | **CAL. DUE** |
| TEST RECEIVER | R&S | ESHS20 | 840455/006 | 02/17/2006 |
| LISN (EUT) | SCHWARZBECK | NSLK 8127 | 8127382 | 01/03/2006 |
| LISN | SOLAR | 8012-50-R-24-BNC | 8305114 | 01/03/2006 |
| BNC CABLE | MIYAZAKI | 5D-FB | BNC A1 | 01/28/2006 |
| THERMO-HYGRO METER | TOP | HA-202 | 9303-1 | 03/02/2006 |
| ISN | FCC | FCC-TLISN-T4 | 20166 | 07/13/2006 |
| ISN | FCC | FCC-TLISN-T8-02 | 20169 | 07/13/2006 |

***Note:*** *The measurement uncertainty is less than +/- 2.83dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.*

| Power Harmonic & Voltage Fluctuation/Flicker Test Site (EN 61000-3-2&-3-3) | | | |
|---|---|---|---|
| **Manufacturer/Type** | **Model No.** | **Serial No.** | **Cal. Due** |
| Schaffner / Signal Conditioning Unit | CCN 1000-1 | 72122 | 12/05/2005 |
| Schaffner / 5KVA AC Power Source | NSG 1007 | 55131 | No Calibration Required |

**Equipment Used for Immunity Measurement**

| ESD Test Site (EN 61000-4-2) | | | |
|---|---|---|---|
| **Manufacturer/Type** | **Model No.** | **Serial No.** | **Cal. Due** |
| Schaffner / ESD Simulator | NSG 438 | 129 | 04/20/2006 |
| Sato / Aneroid Barometer | 7610-20 | 89090 | 09/07/2005 |
| TOP / Thermo-Hygro meter | HA-202 | 9303-1 | 03/02/2006 |

| Radiated Electromagnetic Field Immunity Test Site (EN 61000-4-3) | | | |
|---|---|---|---|
| **Manufacturer/Type** | **Model No.** | **Serial No.** | **Cal. Due** |
| Calibration of Field | Chamber#RS | RS3H-7 / RS3V-7 | 07/01/2006 |
| Agilent / Signal Generator | E4421B | MY43350597 | 05/16/2006 |
| AR / Electric Field Probe | FP6001 | 305650 | 02/03/2006 |
| Boonton / RF Voltmeter | 9200B | 328001AE | 02/23/2006 |
| BNC / Function Generator | 625A | 25451 | 02/17/2006 |
| AR / Amplifier | 100W1000M1 | 17564 | No Calibration Required |
| Werlatone Inc. / Direction Coupler | C2630 | 4121 | No Calibration Required |
| Frankonia / Broadband Antenna | BTA-M | 030001M | No Calibration Required |
| TOP / Thermo-Hygro meter | HA-202 | 9303-2 | 03/02/2006 |

| Fast Transients/Burst Test Site (EN 61000-4-4) | | | |
|---|---|---|---|
| **Manufacturer/Type** | **Model No.** | **Serial No.** | **Cal. Due** |
| Schaffner / EFT Generator | BEST EMC V2.3 | 200031A024SC | 11/09/2005 |
| Schaffner / Capacitive Clamp | N/A | N/A | No Calibration Required |

| Surge Immunity Test Site (EN 61000-4-5) | | | |
|---|---|---|---|
| **Manufacturer/Type** | **Model No.** | **Serial No.** | **Cal. Due** |
| Schaffner / Surger Generator | BEST EMC V2.3 | 200031A024SC | 11/09/2005 |
| Schaffner / Signal and Data Lines Coupling Network | CDN118 | 19328 | No Calibration Required |

| CS test (EN 61000-4-6) | | | |
|---|---|---|---|
| **Manufacturer/Type** | **Model No.** | **Serial No.** | **Cal. Due** |
| Schaffner / RF Generator | NSG 2070-1 | 1061 | 08/03/2006 |
| Schaffner / CDN | CDN M316 | 19600 | 08/02/2006 |
| Schaffner / CDN | CDN M216 | 19294 | 08/02/2006 |
| FCC / CDN | FCC-801-M3-16A | 99122 | 08/02/2006 |
| Schaffner / EM Clamp | KEMZ 801 | 19227 | 02/23/2006 |
| Schaffner / CDN | CDN T002 | 15881 | 01/13/2006 |
| FCC / CDN | FCC-801-T8-RJ45 | 04025 | 06/23/2006 |
| Schaffner / Attenuator | INA2070-1 | 2061 | No Calibration Required |
| FCC / CDN | FCC-801-T4-RJ45 | 04031 | 08/02/2006 |

| Power Frequency Magnetic Field Immunity test (EN 61000-4-8) | | | |
|---|---|---|---|
| **Manufacturer/Type** | **Model No.** | **Serial No.** | **Cal. Due** |
| Schaffner / Induction Coil Interface | INA 21141 | 6009 | No Calibration Required |
| Schaffner / 5KVA AC Power Source | NSG 1007 | 55131 | No Calibration Required |
| CHY/ TRMS Clamp Meter | 932C | 2K0900285 | 10/12/2005 |
| Sypris / Magnetic Field Meter | 4080 | 0247 | 01/19/2006 |

| Voltage Dips/Short Interruption and Voltage Variation Immunity test (EN 61000-4-11) | | | |
|---|---|---|---|
| **Manufacturer/Type** | **Model No.** | **Serial No.** | **Cal. Due** |
| Schaffner / Dips/Interruption/Variations Tester | BEST EMC V2.3 | 200031A024SC | 11/09/2005 |
| Protronix / Digital Power Meter | 1201 | 201091 | 08/24/2006 |

# 7 LINE CONDUCTED & RADIATED EMISSION TEST

## 7.1 LIMIT

**Maximum permissible level of Line Conducted Emission**

| FREQUENCY (MHz) | Class A (dBuV) | | Class B (dBuV) | |
|---|---|---|---|---|
| | Quasi-peak | Average | Quasi-peak | Average |
| 0.15 - 0.5 | 79 | 66 | 66 - 56 | 56 - 46 |
| 0.50 - 5.0 | 73 | 60 | 56 | 46 |
| 5.0 - 30.0 | 73 | 60 | 60 | 50 |

***Note:*** *The lower limit shall apply at the transition frequency.*

**Maximum permissible level of Common Mode Conducted Emission (Telecommunication Ports)**

**CLASS A**

| FREQUENCY (MHz) | Voltage Limit (dBuV) | | Current Limit (dBuA) | |
|---|---|---|---|---|
| | Quasi-peak | Average | Quasi-peak | Average |
| 0.15 - 0.5 | 97 – 87 | 84 - 74 | 53 – 43 | 40 – 30 |
| 0.5 - 30.0 | 87 | 74 | 43 | 30 |

**CLASS B**

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

***Note:*** *The lower limit shall apply at the transition frequency.*

**Maximum permissible level of Radiated Emission measured at 10 meter**

| FREQUENCY (MHz) | Class A (dBuV/m) | Class B (dBuV/m) |
|---|---|---|
| | Quasi-peak | Quasi-peak |
| 30 – 230 | 40 | 30 |
| 230 - 1000 | 47 | 37 |

***Note:*** *The lower limit shall apply at the transition frequency.*

## 7.2 TEST PROCEDURE OF LINE CONDUCTED EMISSION

**Procedure of Preliminary Test**

- The EUT was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per EN 55022 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- Support equipment, if needed, was placed as per EN 55022.
- All I/O cables were positioned to simulate typical actual usage as per EN 55022.
- The test system with EUT received AC power, 230V/50Hz, through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane.
- All support equipment received power from a second LISN.
- The EUT test program was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- During the above scans, the emissions were maximized by cable manipulation.
- The test mode(s) described in Item 3.2 were scanned during the preliminary test.
- After the preliminary scan, we found the test mode described in Item 3.2 producing the highest emission level.
- The EUT configuration and cable configuration of the above highest emission level were recorded for reference of the final test.

**Procedure of Final Test**

- EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.
- A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the Average limit in Q.P. mode, then the emission signal was re-checked using an Average detector.
- The test data of the worst-case condition(s) was recorded.

**Data Sample:**

| Freq. MHz | Read Level dBuV | Factor dB | Level dBuV | Limit dBuV | Over Limit dB | Reading Type (P/Q/A) | Line (L1/L2) |
|---|---|---|---|---|---|---|---|
| x.xx | 42.95 | 0.55 | 43.50 | 73 | -29.50 | Q | L1 |

Freq. = Emission frequency in MHz
Read Level = Uncorrected Analyzer/Receiver reading
Factor = Insertion loss of LISN + Cable Loss
Level = Read Level + Factor
Limit = Limit stated in standard
Over Limit = Reading in reference to limit
P = Peak Reading
Q = Quasi-peak Reading
A = Average Reading
L1 = Hot side
L2 = Neutral side

**Calculation Formula**

Over Limit (dB) = Level (dBuV) – Limit (dBuV)

## 7.3 TEST PROCEDURE OF COMMON MODE CONDUCTED EMISSION FOR TELECOMMUNICATION PORT

- Selecting ISN for unscreened cable or a current probe for screened cable to take measurement.
- The port of the EUT was connected to the remote side support equipment through the ISN/Current Probe and communication in normal condition.
- Making a overall range scan by using the test receiver controlled by controller and record at least six highest emissions for showing in the test report.
- Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- In case of measuring on the screened cable, the current limit shall be applied, otherwise the voltage limit should be applied.
- The following test mode(s) were scanned during the preliminary test:

**Mode(s):**

| | | |
|---|---|---|
| **1.** | **LAN 1** | **1Gbps** |
| **2.** | **LAN 2** | **10 Mbps** |
| **3.** | | **100 Mbps** |
| **4.** | | **1Gbps** |

- After the preliminary scan, we found the following test mode(s) producing the highest emission level and test data of the worst case was recorded.

**Mode 4.**

**Data Sample:**

| Freq. MHz | Read Level dBuV | Factor dB | Level dBuV | Limit dBuV | Over Limit dB | Reading Type (P/Q/A) |
|---|---|---|---|---|---|---|
| x.xx | 62.95 | 0.55 | 63.50 | 87 | -23.50 | Q |

Freq. = Emission frequency in MHz
Read Level = Uncorrected Analyzer/Receiver reading
Factor = Insertion loss of ISN + Cable Loss
Level = Read Level + Factor
Limit = Limit stated in standard
Over Limit = Reading in reference to limit
P = Peak Reading
Q = Quasi-peak Reading
A = Average Reading

**Calculation Formula**

Over Limit (dB) = Level (dBuV) – Limit (dBuV)

## 7.4 TEST PROCEDURE OF RADIATED EMISSION

**Procedure of Preliminary Test**

- The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- Support equipment, if needed, was placed as per EN 55022.
- All I/O cables were positioned to simulate typical usage as per EN 55022.
- The EUT received AC power source, 230V/50Hz, from the outlet socket under the turntable. All support equipment received power from another socket under the turntable.
- Mains cables, telephone lines or other connections to auxiliary equipment located outside the test are shall drape to the floor, be fitted with ferrite clamps or ferrite tubes placed on the floor at the point where the cable reaches the floor and then routed to the place where they leave the turntable. No. extension cords shall be used to mains receptacle.
- The antenna was placed at 10 meter away from the EUT as stated in EN 55022. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.
- The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

- The test mode(s) described in Item 3.2 were scanned during the preliminary test:
- After the preliminary scan, we found the test mode described in Item 3.2 producing the highest emission level.
- The EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the final test.

**Procedure of Final Test**

- EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.
- The Analyzer / Receiver scanned from 30MHz to 1000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Q.P. reading is presented.

**Data Sample:**

| Freq. MHz | Read Level dBuV | Factor dB/m | Level dBuV/m | Limit dBuV/m | Over Limit dB | Reading Type (P/Q/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|
| x.xx | 14.0 | 12.2 | 26.2 | 40 | -13.8 | Q | H |

Freq. = Emission frequency in MHz
Read Level = Uncorrected Analyzer/Receiver reading
Factor = Antenna Factor + Cable Loss + Attenuator (3/6/10dB) – Amplifier Gain
Level = Read Level + Factor
Limit = Limit stated in standard
Over Limit = Reading in reference to limit
P = Peak Reading
Q = Quasi-peak Reading
A = Average Reading
H = Antenna Polarization: Horizontal
V = Antenna Polarization: Vertical

**Calculation Formula**

Over Limit (dB) = Level (dBuV/m) – Limit (dBuV/m)

## 7.5 TEST RESULTS

**Line Conducted Emission**

**Model:** EMB-900M **Test Mode:** Mode 1

**Temperature:** 26°C **Humidity:** 46% RH

**Test Results:** Passed **Tested by:** Sam Su

(The chart below shows the highest readings taken from the final data, see **Appendix III** for details.)

| Six Highest Conducted Emission Readings | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Frequency Range Investigated** | | | | **150 kHz to 30 MHz** | | | |
| Freq (MHz) | Read Level (dBuV) | Factor (dB) | Level (dBuV) | Limit Line (dBuV) | Over Limit (dB) | Reading Type (P/Q/A) | Line (L1/L2) |
| **0.171** | **72.03** | **0.14** | **72.17** | **79.00** | **-6.83** | **P** | **L1** |
| **0.171** | **15.45** | **0.14** | **15.59** | **66.00** | **-50.41** | **A** | **L1** |
| **0.224** | **72.03** | **0.15** | **72.18** | **79.00** | **-6.82** | **P** | **L1** |
| **0.224** | **16.37** | **0.15** | **16.52** | **66.00** | **-49.48** | **A** | **L1** |
| **0.260** | **67.29** | **0.17** | **67.46** | **79.00** | **-11.54** | **P** | **L1** |
| **0.337** | **66.15** | **0.19** | **66.34** | **79.00** | **-12.66** | **P** | **L1** |
| **0.510** | **62.48** | **0.20** | **62.68** | **73.00** | **-10.32** | **P** | **L1** |
| **4.158** | **47.86** | **0.35** | **48.21** | **73.00** | **-24.79** | **P** | **L1** |
| **4.158** | **46.97** | **0.40** | **47.37** | **73.00** | **-25.63** | **P** | **L2** |

***NOTE:*** *The emission level was or more than 2dB below the Average limit, so no re-check anymore.*

**Common Mode Conducted Emission** **Test Mode:** Mode 4

| Six Highest Conducted Emission Readings | | | | | | |
|---|---|---|---|---|---|---|
| **Frequency Range Investigated** | | | **150 kHz to 30 MHz** | | | |
| Freq (MHz) | Read Level (dBuV) | Factor (dB) | Level (dBuV) | Limit Line (dBuV) | Over Limit (dB) | Reading Type (P/Q/A) |
| **0.201** | **55.43** | **9.77** | **65.20** | **94.58** | **-29.38** | **P** |
| **0.315** | **55.40** | **9.75** | **65.15** | **90.84** | **-25.69** | **P** |
| **0.419** | **57.44** | **9.75** | **67.19** | **88.46** | **-21.28** | **P** |
| **0.608** | **57.43** | **9.74** | **67.17** | **87.00** | **-19.83** | **P** |
| **0.871** | **55.65** | **9.74** | **65.39** | **87.00** | **-21.61** | **P** |
| **10.790** | **36.17** | **9.80** | **45.97** | **87.00** | **-41.03** | **P** |

**Radiated Emission**

**Model:** EMB-900M **Test Mode:** Mode 1

**Temperature:** 27°C **Humidity:** 45% RH

**Test Results:** Passed **Tested by:** Jimmy Chen

(The chart below shows the highest readings taken from the final data, see **Appendix III** for details.)

| Six Highest Radiated Emission Readings | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Frequency Range Investigated** | | | | **30 MHz to 1000 MHz at 10m** | | | |
| Freq (MHz) | Read Level (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Reading Type (P/Q/A) | Pol. (H/V) |
| **66.100** | **63.64** | **-26.89** | **36.75** | **40.00** | **-3.25** | **P** | **V** |
| **75.530** | **61.24** | **-25.90** | **35.34** | **40.00** | **-4.66** | **P** | **V** |
| **122.750** | **53.25** | **-19.83** | **33.42** | **40.00** | **-6.58** | **P** | **V** |
| **166.000** | **56.96** | **-21.22** | **35.74** | **40.00** | **-4.26** | **P** | **V** |
| **207.700** | **52.59** | **-20.90** | **31.69** | **40.00** | **-8.31** | **P** | **V** |
| **122.740** | **54.34** | **-19.83** | **34.51** | **40.00** | **-5.49** | **P** | **H** |

***NOTE:*** *None.*

# 8 POWER HARMONICS TEST

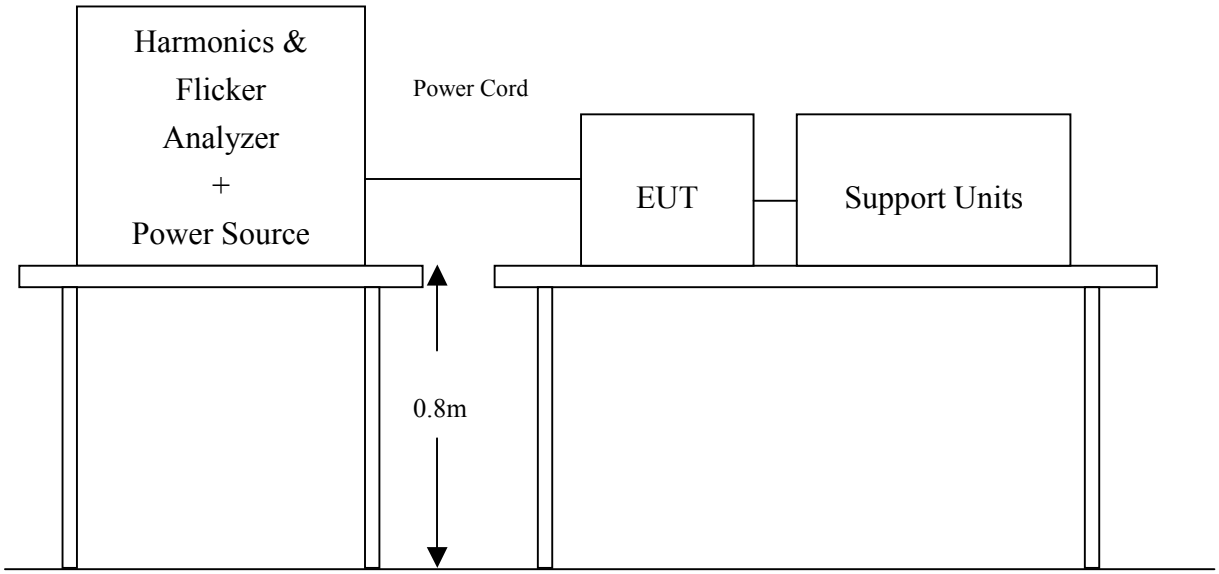
**Port** : AC Power Port
**Basic Standard** : EN 61000-3-2 (2000)
**Limits** : [V] CLASS A; [ ] CLASS D
**Tested by** : Mark Hsu
**Temperature** : 22°C
**Humidity** : 58%

## Limit:

| Limits for Class A equipment | |
|---|---|
| Harmonics Order n | Max. permissible harmonics current A |
| Odd harmonics | |
| 3 | 2.30 |
| 5 | 1.14 |
| 7 | 0.77 |
| 9 | 0.40 |
| 11 | 0.33 |
| 13 | 0.21 |
| 15<=n<=39 | 0.15x15/n |
| Even harmonics | |
| 2 | 1.08 |
| 4 | 0.43 |
| 6 | 0.30 |
| 8<=n<=40 | 0.23x8/n |

| Limits for Class D equipment | | |
|---|---|---|
| Harmonics Order n | Max. permissible harmonics current per watt mA/W | Max. permissible harmonics current A |
| Odd Harmonics only | | |
| 3 | 3.4 | 2.30 |
| 5 | 1.9 | 1.14 |
| 7 | 1.0 | 0.77 |
| 9 | 0.5 | 0.40 |
| 11 | 0.35 | 0.33 |
| 13 | 0.30 | 0.21 |
| 15<=n<=39 | 3.85/n | 0.15x15/n |
| | | |
| | | |
| | | |
| | | |
| | | |

## Block Diagram of Test Setup:




## Test Procedure:

a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

b. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

## Test Result: (See Appendix II for details)

| ☒ PASS ☐ FAIL |
|---|
| **Note:** None. |

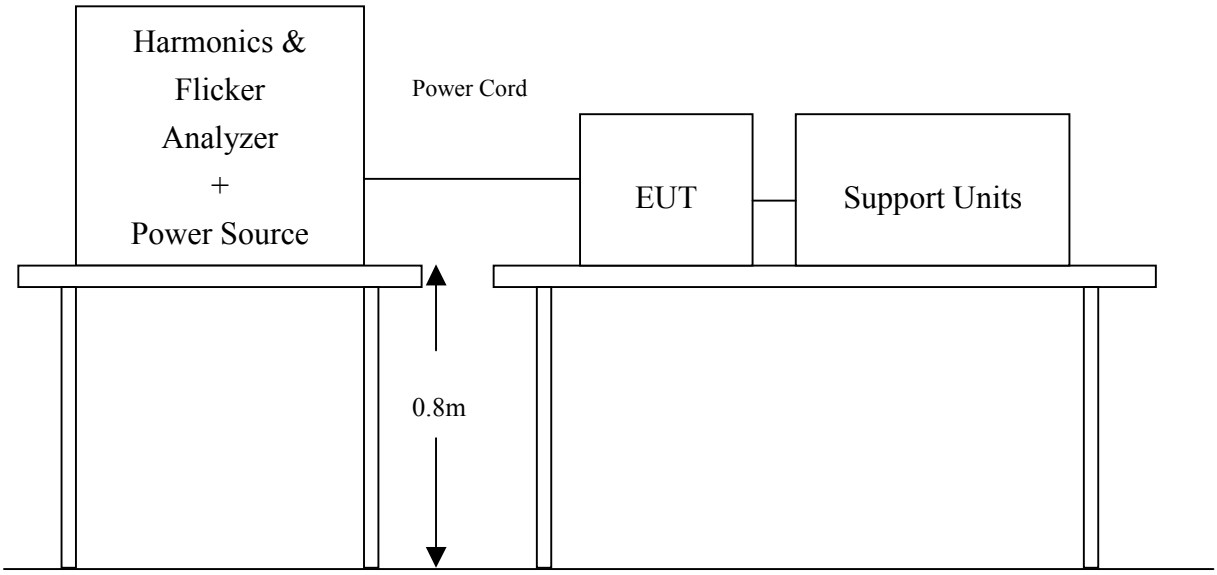
# 9 POWER VOLTAGE FLUCTUATION / FLICKER TEST

**Port** : AC Power Port
**Basic Standard** : EN 61000-3-3 (1995 + A1: 2001)
**Limits** : §5 of EN 61000-3-3
**Tested by** : Mark Hsu
**Temperature** : 22°C
**Humidity** : 58%

## Limit:

| TEST ITEM | LIMIT | REMARK |
|---|---|---|
| $P_{st}$ | 1.0 | $P_{st}$ means short-term flicker indicator. |
| $P_{lt}$ | 0.65 | $P_{lt}$ means long-term flicker indicator. |
| $T_{dt}$ (ms) | 500 | $T_{dt}$ means maximum time that dt exceeds 3.3 %. |
| $d_{max}$ (%) | 4% | $d_{max}$ means maximum relative voltage change. |
| dc (%) | 3.3% | dc means relative steady-state voltage change |

## Block Diagram of Test Setup:



## Test Procedure:

a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.

b. During the flick measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

## Test Result: (See Appendix II for details)

| TEST PARAMETER | MEASUREMENT VALUE | LIMIT | RESULT |
|---|---|---|---|
| $P_{st}$ | 0.001 | 1.0 | Pass |
| $P_{lt}$ | 0.001 | 0.65 | Pass |
| $T_{dt}$ (ms) | 0.0 | 500 | Pass |
| $d_{max}$ (%) | 0.00 | 4% | Pass |
| dc (%) | 0.00 | 3.3% | Pass |

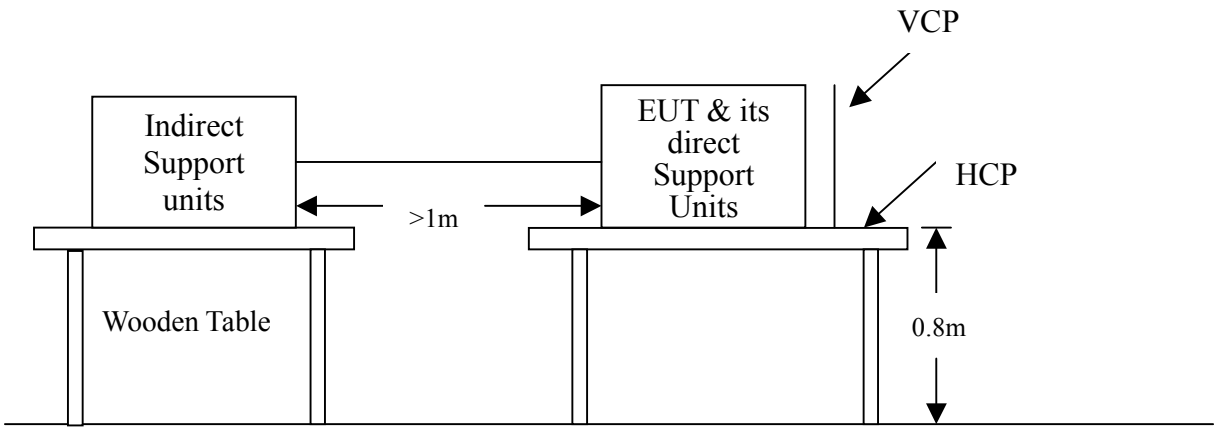
**Observation:** None.

# 10 ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

| | | |
|---|---|---|
| **Port** | **:** | Enclosure |
| **Basic Standard** | **:** | IEC/EN 61000-4-2 |
| **Test Level** | **:** | ± 8 kV (Air Discharge) |
| | | ± 4 kV (Contact Discharge) |
| | | ± 4 kV (Indirect Discharge) |
| **Performance Criterion** | **:** | B (Standard Required) |
| **Tested by** | **:** | Mark Hsu |
| **Temperature** | **:** | 22°C |
| **Humidity** | **:** | 58% |
| **Pressure** | **:** | 1013mbar |

## Block Diagram of Test Setup:

(The 470 k ohm resistors are installed per standard requirement.)




Ground Reference Plane

## Test Procedure:

1. The EUT was located 0.1 m minimum from all sides of the HCP.
2. The indirect support units were located 1 m minimum away from the EUT, but direct support unit was/were located at same location as EUT on the HCP and keep at a distance of 10 cm with EUT.
3. As per the requirement of EN 55024; applying direct contact discharge at the sides other than front of EUT at minimum 50 discharges (25 positive and 25 negative) if applicable, can't be applied direct contact discharge side of EUT then the indirect discharge shall be applied. One of the test points shall be subjected to at least 50 indirect discharge (contact) to the front edge of horizontal coupling plane.
4. Other parts of EUT where it is not possible to perform contact discharge then selecting appropriate points of EUT for air discharge, a minimum of 10 single air discharges shall be applied.
5. The application of ESD to the contact of open connectors is not required.
6. The EUT direct connection units also need to be applied ESD at the port of EUT cable connected.
7. Putting a mark on EUT to show tested points. The following test condition was followed during the tests.

***Note:*** *As per IEC/EN 61000-4-2, two 470k bleed resistors cable is connected between the EUT and HCP during the test applicable for power ungrounded or battery operating unit only.*

The electrostatic discharges were applied as follows:

| Amount of discharge | Voltage | Coupling | Result (Pass/Fail) |
|---|---|---|---|
| Mini 10 /Point | ± 8 kV | Air Discharge | Pass |
| Mini 25 /Point | ± 4 kV | Contact Discharge | Pass |
| Mini 25 /Point | ± 4 kV | Indirect Discharge HCP (Front) | Pass |
| Mini 25 /Point | ± 4 kV | Indirect Discharge VCP (Right) | Pass |
| Mini 25 /Point | ± 4 kV | Indirect Discharge VCP (Left) | Pass |
| Mini 25 /Point | ± 4 kV | Indirect Discharge VCP (Back) | Pass |

## Performance & Result:

☒ **Criterion A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☐ **Criterion B:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

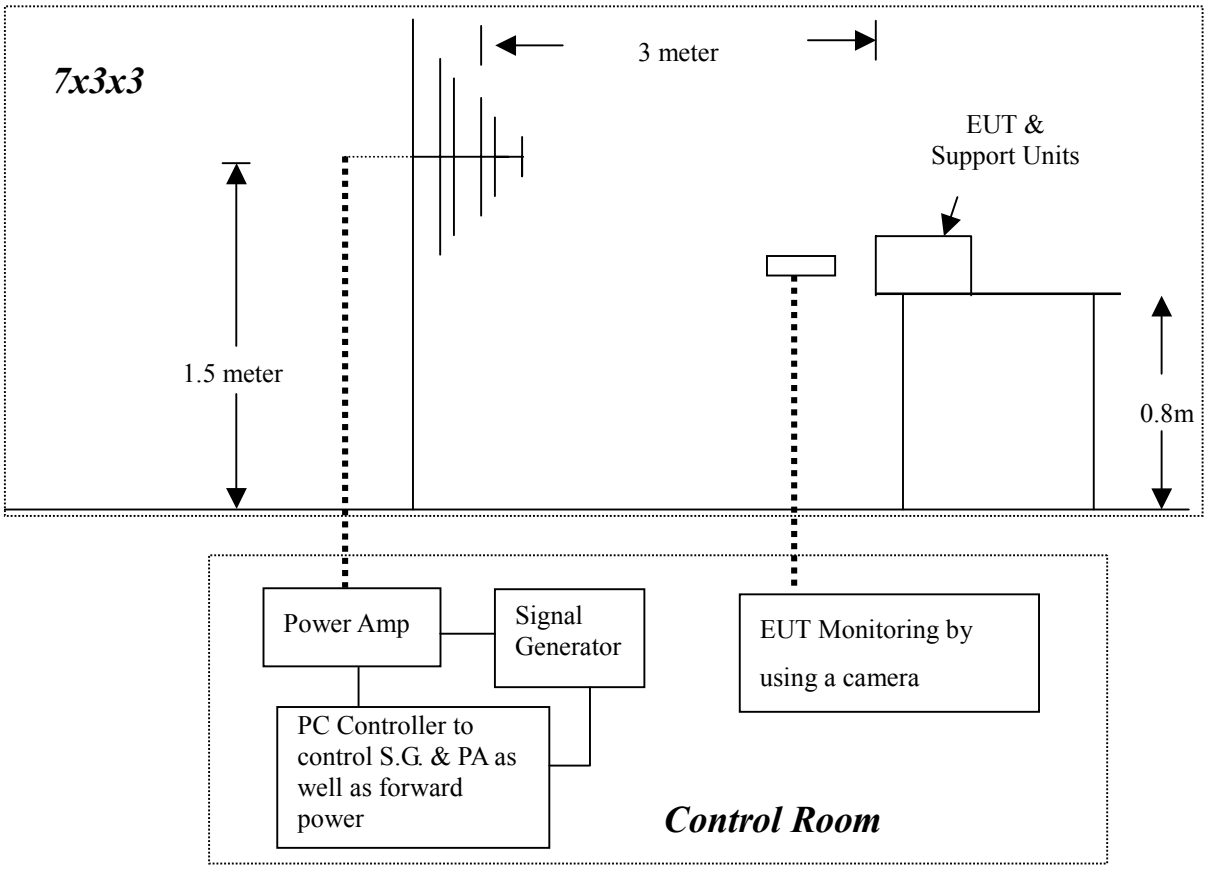
☐ **Criterion C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

| ☒ **PASS** ☐ **FAIL** |
|---|
| **Observation:** No function degraded during the tests. |

# 11 RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

| | | |
|---|---|---|
| **Port** | **:** | Enclosure |
| **Basic Standard** | **:** | IEC/EN 61000-4-3 |
| **Requirements** | **:** | 3 V/m / with 80% AM. 1kHz Modulation. |
| **Performance Criterion** | **:** | A (Standard Required) |
| **Tested by** | **:** | Mark Hsu |
| **Temperature** | **:** | 22°C |
| **Humidity** | **:** | 58% |
| **Pressure** | **:** | 1013mbar |

## Block Diagram of Test Setup:



## Test Procedure:

1. The EUT and support units were located at the edge of supporting table keep 3 meter away from transmitting antenna, it just the calibrated square area of field uniformity.
2. Adjusting the cables to be exposed to the electromagnetic filed as possible.
3. Performing a Radiated Emission Scan in range of 80 to 1000 MHz prior to do RS test and records the more higher emission frequencies for the reference of RS test, due to antenna effectiveness.
4. Adjusting the monitoring camera to monitor the "H" message as clear as possible.
5. Setting the testing parameters of RS test software per IEC 61000-4-3.
6. Referring to the tested data of step 3 to performing the RS test from 80 to 1000 MHz.
7. Recording the test result in following table.
8. Changing the EUT to the other side and repeat step 3 to 6, until 4 sides of EUT were verified.

**IEC 61000-4-3 Final test conditions:**
Test level : 3V/m
Steps : 1 % of fundamental
Dwell Time : 3 sec

| Range (MHz) | Field | Modulation | Polarity | Position (°) | Result (Pass/Fail) |
|---|---|---|---|---|---|
| 80-1000 | 3V/m | Yes | H | Front | Pass |
| 80-1000 | 3V/m | Yes | V | Front | Pass |
| 80-1000 | 3V/m | Yes | H | Right | Pass |
| 80-1000 | 3V/m | Yes | V | Right | Pass |
| 80-1000 | 3V/m | Yes | H | Back | Pass |
| 80-1000 | 3V/m | Yes | V | Back | Pass |
| 80-1000 | 3V/m | Yes | H | Left | Pass |
| 80-1000 | 3V/m | Yes | V | Left | Pass |

## Performance & Result:

☒ **Criterion A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☐ **Criterion B:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

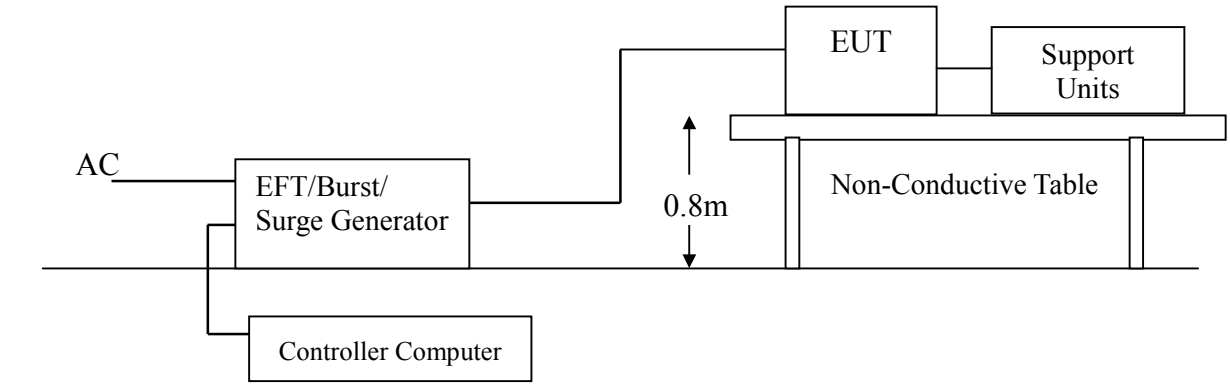
☐ **Criterion C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

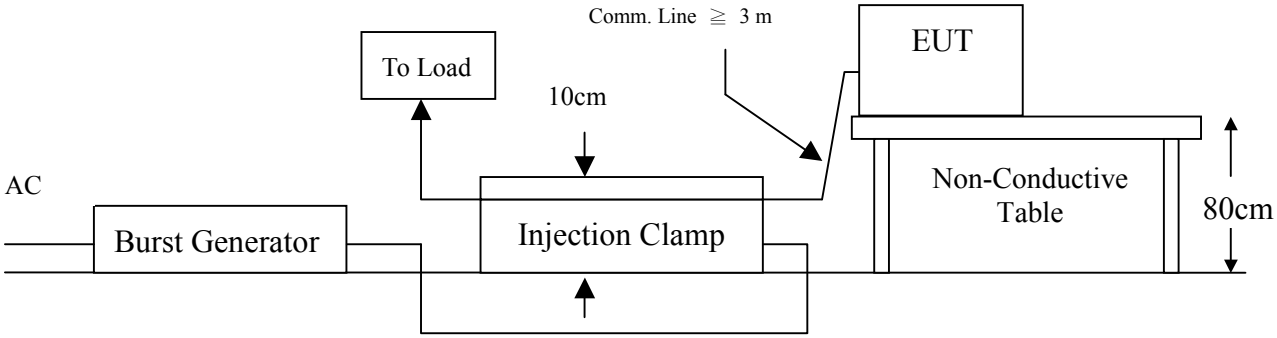
| ☒ **PASS** ☐ **FAIL** |
|---|
| **Observation:** No function degraded during the tests. |

# 12 FAST TRANSIENTS/BURST IMMUNITY TEST

| | | |
|---|---|---|
| **Port** | : | AC Power Port and RJ45 Port |
| **Basic Standard** | : | IEC/EN 61000-4-4 |
| **Requirements** | : | ± 1 kV for AC Power Port<br>± 0.5 kV for RJ45 Port |
| **Performance Criteria** | : | B (Standard Required) |
| **Tested by** | : | Mark Hsu |
| **Temperature** | : | 22°C |
| **Humidity** | : | 58% |
| **Pressure** | : | 1013mbar |

## Block Diagram of Test Setup:




## Test Procedure:

1. The EUT and support units were located on a wooden table 0.8 m away from ground reference plane.
2. A 1.0 meter long power cord was attached to EUT during the test.
3. The length of communication cable between communication port and clamp was keeping within 1 meter.
4. Injected test voltage to the EUT ports from minimum to standard request or client request.
5. Recorded the test result as shown in following table.

**Test conditions:**

Impulse Frequency : 5kHz
Tr/Th : 5/50ns
Burst Duration : 15ms
Burst Period : 300ms

| Inject Line | Voltage kV | Inject Method | Result (Pass/Fail) |
|---|---|---|---|
| L | ± 1 | Direct | Pass |
| N | ± 1 | Direct | Pass |
| PE | ± 1 | Direct | Pass |
| L + N | ± 1 | Direct | Pass |
| L + PE | ± 1 | Direct | Pass |
| N + PE | ± 1 | Direct | Pass |
| L + N + PE | ± 1 | Direct | Pass |
| RJ45 | ± 0.5 | Clamp | Pass |

## Performance & Result:

☒ **Criterion A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☐ **Criterion B:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

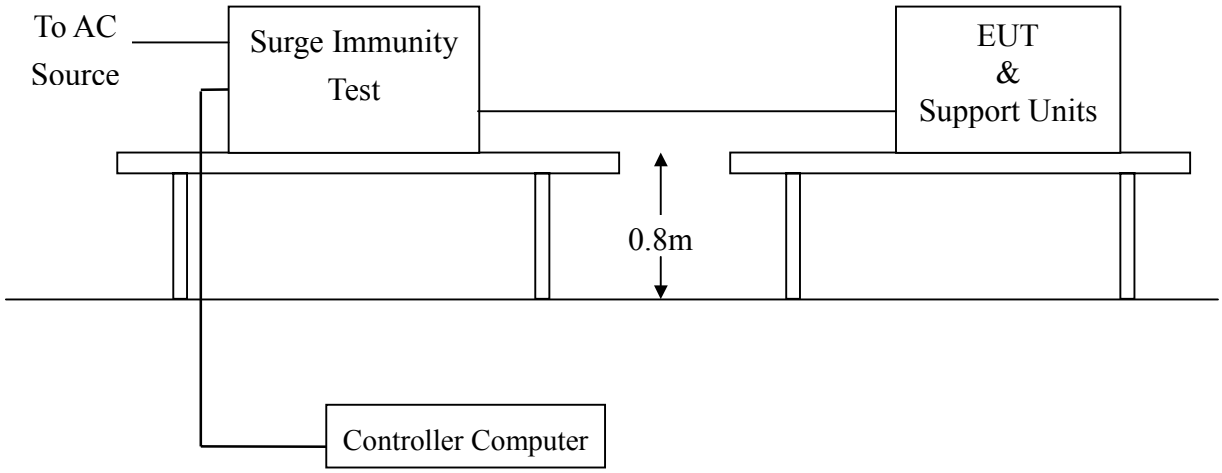
☐ **Criterion C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

| ☒ **PASS** ☐ **FAIL** |
|---|
| **Observation:** No function degraded during the tests. |

# 13 SURGE IMMUNITY TEST

| | | |
|---|---|---|
| **Port** | : | AC Power Port |
| **Basic Standard** | : | IEC/EN 61000-4-5 |
| **Requirements** | : | ± 1 kV (Line to Line) for AC Power Port<br>± 2 kV (Line to Ground) for AC Power Port |
| **Performance Criteria** | : | B (Standard Required) |
| **Tested by** | : | Mark Hsu |
| **Temperature** | : | 22°C |
| **Humidity** | : | 58% |
| **Pressure** | : | 1013mbar |

## Block Diagram of Test Setup:




## Test Procedure:

1. The EUT and support units were located on a wooden table 0.8 m away from ground floor.
2. Injected test voltage to the EUT ports from minimum to standard request or client request.
3. Recorded the test result as shown in following table.

**Test conditions:**

Voltage Waveform : 1.2/50 *u*s
Current Waveform : 8/20 *u*s
Polarity : Positive/Negative
Phase angle : $0^o$, $90^o$, $270^o$
Number of Test : 5

| Coupling Line | Voltage (kV) | Polarity | Coupling Method | Result (Pass/Fail) |
|---|---|---|---|---|
| L1-L2 | 1 | Positive | Capacitive | Pass |
| L1-PE | 2 | Positive | Capacitive | Pass |
| L2-PE | 2 | Positive | Capacitive | Pass |
| L1-L2 | 1 | Negative | Capacitive | Pass |
| L1-PE | 2 | Negative | Capacitive | Pass |
| L2-PE | 2 | Negative | Capacitive | Pass |

## Performance & Result:

☒ **Criterion A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☐ **Criterion B:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

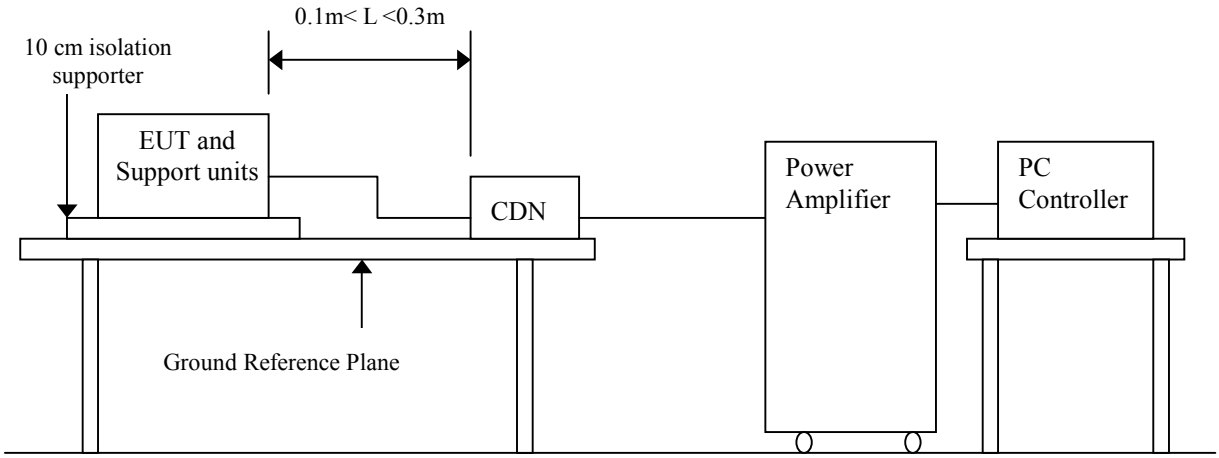
☐ **Criterion C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

| ☒ **PASS** ☐ **FAIL** |
|---|
| **Observation:** Where normal functioning of LAN can't be achieved because of the impact of CDN on the EUT, no test be required. |

# 14 CONDUCTED DISTRBANCE/INDUCED RADIO-FREQUENCY FIELD IMMUNITY TEST

| | | |
|---|---|---|
| **Port** | **:** | AC Power Port and RJ45 Port |
| **Basic Standard** | **:** | IEC/EN 61000-4-6 |
| **Requirements** | **:** | 3 V, with 80% AM. 1kHz Modulation. |
| **Injection Method** | **:** | CDN-M3 for AC Power Port<br>CDN-T4 & T8 for RJ45 Port |
| **Performance Criterion** | **:** | A (Standard Required) |
| **Tested by** | **:** | Mark Hsu |
| **Temperature** | **:** | 22°C |
| **Humidity** | **:** | 58% |
| **Pressure** | **:** | 1013mbar |

## Block Diagram of Test Setup:




## Test Procedure:

1. The EUT and support units were located at a ground reference plane with the interposition of a 0.1 m thickness insulating support and the CDN was located on GRP directly.
2. Set the testing parameters of CS test software as per IEC/EN 61000-4-6.
3. Recorded the test result in following table.

**Test conditions:**

Frequency Range : 0.15MHz-80MHz
Frequency Step : 1% of fundamental
Dwell Time : 3 sec

| Range (MHz) | Field | Modulation | Result (Pass/Fail) |
|---|---|---|---|
| 0.15-80 | 3V | Yes | Pass |

## Performance & Result:

☒ **Criterion A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☐ **Criterion B:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

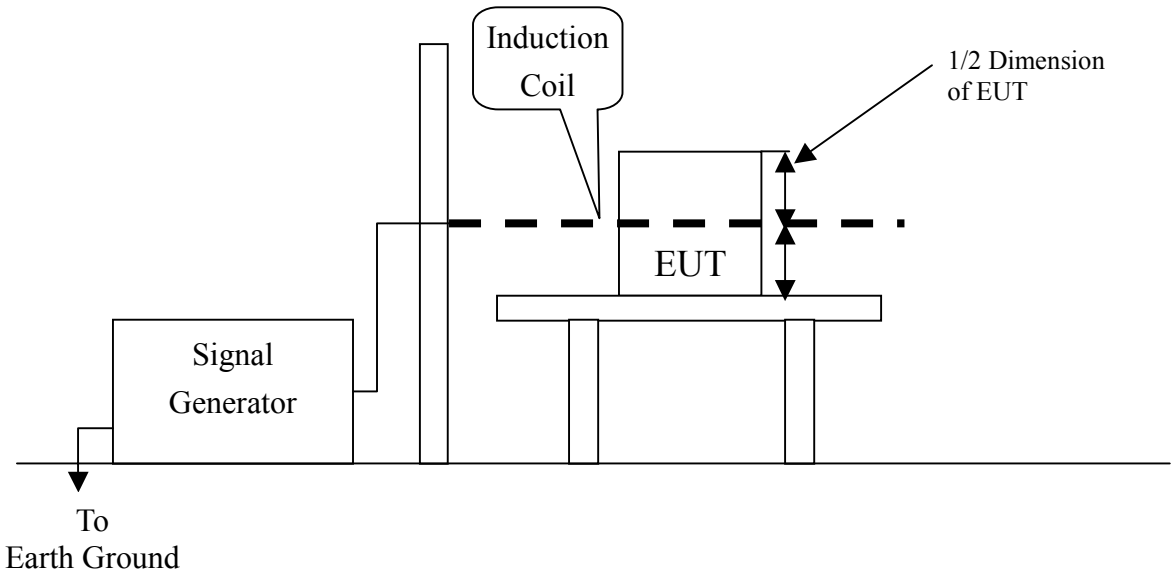
☐ **Criterion C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

| ☒ **PASS** ☐ **FAIL** |
|---|
| **Observation:** No function degraded during the tests. |

# 15 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

| | | |
|---|---|---|
| **Port** | **:** | Enclosure |
| **Basic Standard** | **:** | IEC/EN 61000-4-8 |
| **Requirements** | **:** | 1 A/m |
| **Performance Criterion** | **:** | A (Standard Required) |
| **Tested by** | **:** | N/A |
| **Temperature** | **:** | N/A |
| **Humidity** | **:** | N/A |
| **Pressure** | **:** | N/A |

## Block Diagram of Test Setup:




## Test Procedure:

1. The EUT and support units were located on Ground Reference Plane with the interposition of a 0.1 m thickness insulation support.
2. Put the induction coil on horizontal direction. ( X direction )
3. Recorded the test result as shown in following table.
4. Rotated the induction coil by 90$^{o}$ ( Y direction ) then repeat step 3.
5. Rotated the induction coil by 90 $^{o}$ ( Z direction ) then repeat step 3.

**Test conditions:**

Field Strength: 1A/m
Power Freq.: 50Hz
Orientation: X, Y, Z

| Orientation | Field | Result (Pass/Fail) | Remark |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

## Performance & Result:

☐ **Criterion A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☐ **Criterion B:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐ **Criterion C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

| ☐ **PASS** ☐ **FAIL** |
|---|
| **Observation:** The EUT is not containing any component that is susceptible to a 50 Hz or 60 Hz magnetic field. Therefore, this requirement is not applicable to the EUT. |

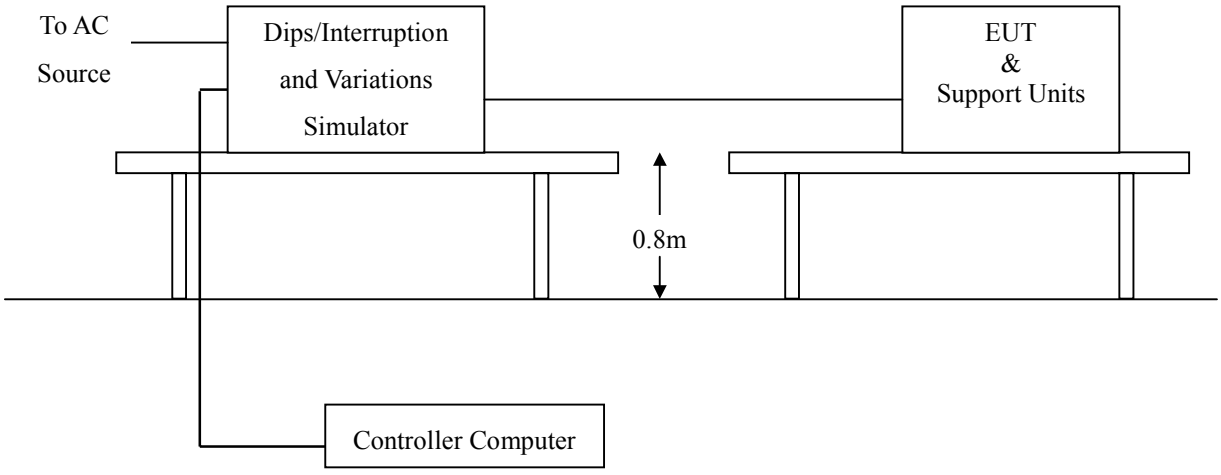
# 16 VOLTAGE DIPS / SHORT INTERRUPTIONS

**Port** : AC Power Port
**Basic Standard** : IEC/EN 61000-4-11
**Requirement** : PHASE ANGLE 0, 45, 90, 135, 180, 225, 270, 315 degrees
**Test Interval** : Min. 10 sec.
**Tested by** : Mark Hsu
**Temperature** : 22°C
**Humidity** : 58%
**Pressure** : 1013mbar

| | Test Level % $U_T$ | Reduction (%) | Duration ( periods ) | Performance Criterion |
|---|---|---|---|---|
| **Voltage Dips** | <5 | >95 | 0.5 | B |
| | 70 | 30 | 25 | C |

| | Test Level % $U_T$ | Reduction (%) | Duration ( periods ) | Performance Criterion |
|---|---|---|---|---|
| **Voltage Interruptions** | <5 | >95 | 250 | C |

## Block Diagram of Test Setup:




## Test Procedure:

1. The EUT and support units were located on a wooden table, 0.8 m away from ground floor.
2. Set the parameter of tests and then Performed the test software of test simulator.
3. Changed Condition to occur at 0 degree crossover point of the voltage waveform.
4. Recorded the test result in test record form.

**Test conditions:**

The duration with a sequence of three dips/interruptions with interval of 10 sec. minimum (Between each test event)

**Voltage Dips:**

| Test Level % $U_T$ | Reduction (%) | Duration (periods) | Observation | Meet Performance Criterion |
|---|---|---|---|---|
| 0 | 100 | 0.5 | Normal | A |
| 70 | 30 | 25 | Normal | A |

**Voltage Interruptions:**

| Test Level % $U_T$ | Reduction (%) | Duration (periods) | Observation | Meet Performance Criterion |
|---|---|---|---|---|
| 0 | 100 | 250 | EUT shut down, but can be auto recovered as the events disappear. | C |

**Note:** "Normal" means no any functions degrade during and after the test.

## Performance & Result:

**Criterion A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

**Criterion B:** The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

**Criterion C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

| ☒ **PASS** ☐ **FAIL** |
|---|
| **Observation:** No function degraded during the tests. |

# APPENDIX I - PHOTOGRAPHS OF TEST SETUP

## LINE CONDUCTED EMISSION TEST (EN 55022)

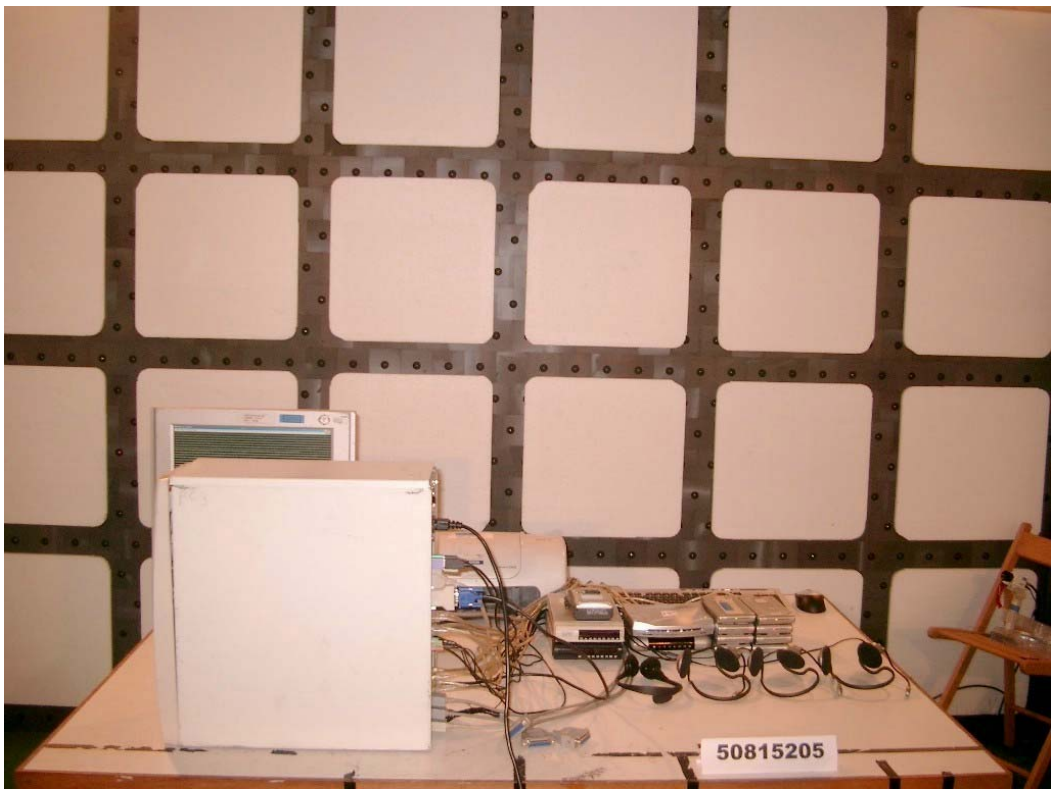

# COMMON MODE CONDUCTED EMISSION TEST


## RADIATED EMISSION TEST


## POWER HARMONIC & VOLTAGE FLUCTUATION / FLICKER TEST


## ELECTROSTATIC DISCHARGE TEST

## RADIATED ELECTROMAGNETIC FIELD TEST




## FAST TRANSIENTS/BURST TEST

## FAST TRANSIENTS/BURST TEST (IEC 61000-4-4 FOR I/O)


## SURGE IMMUNITY TEST

## CONDUCTED DISTURBANCE, INDUCED BY RADIO-FREQUENCY FIELDS TEST

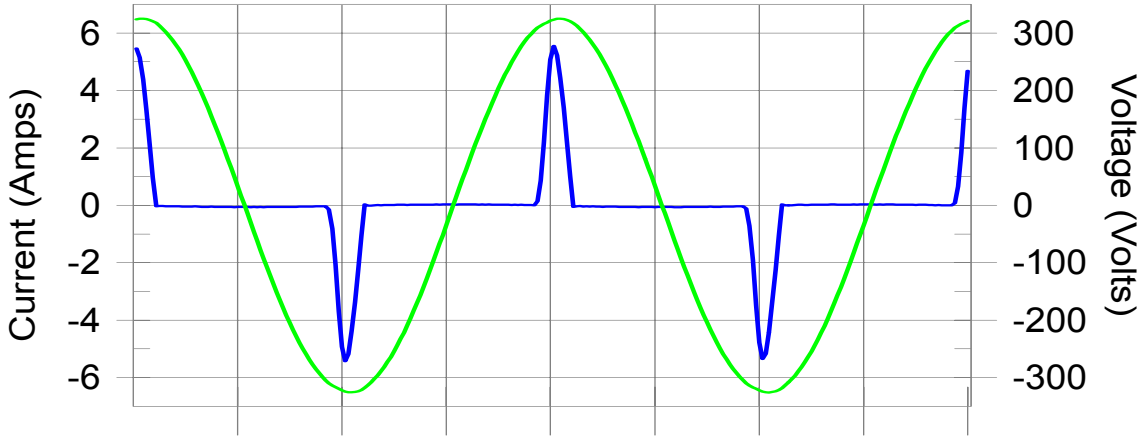

## CONDUCTED DISTURBANCE, INDUCED BY RADIO-FREQUENCY FIELDS TEST (IEC 61000-4-6 FOR I/O)

# VOLTAGE DIPS / INTERRUPTION TEST

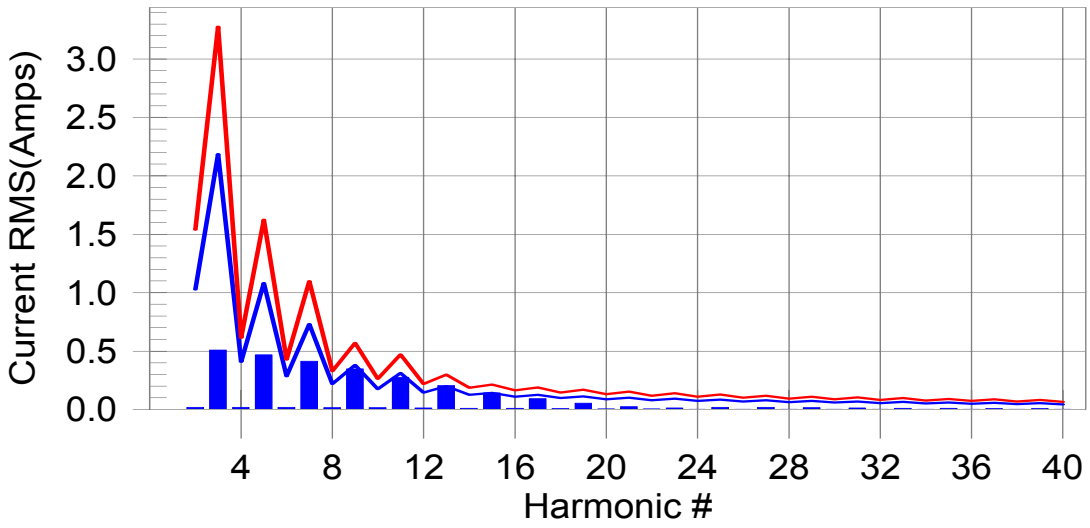
# APPENDIX II – TEST RESULT OF EN 61000-3-2/-3

**Test Result: Pass** **Source qualification: Normal**

**Current & voltage waveforms**




**Harmonics and Class A limit line** **European Limits**




**Test result: Pass** **Worst harmonic was #13 with 68.80 % of the limit.**

**Test Result: Pass** **Source qualification: Normal**
**THC(A): 0.961** **I-THD(pk%): 211.983** **POHC(A): N/A** **POHC Limit(A): N/A**
**Highest parameter values during test:**

| | | | |
|---|---|---|---|
| **V_RMS (Volts):** | **230.03** | | |
| **I_Peak (Amps):** | **5.544** | **I_RMS (Amps):** | **1.395** |
| **I_Fund (Amps):** | **0.726** | **Crest Factor:** | **5.082** |
| **Power (Watts):** | **164** | **Power Factor:** | **0.512** |

| Harm# | Harms(avg) | 100%Limit | %of Limit | Harms(max) | 150%Limit | %of Limit | Status |
|---|---|---|---|---|---|---|---|
| 2 | 0.012 | 1.026 | 1.1 | 0.021 | 1.539 | 1.33 | Pass |
| 3 | 0.425 | 2.185 | 19.5 | 0.510 | 3.278 | 15.56 | Pass |
| 4 | 0.011 | 0.409 | 2.8 | 0.020 | 0.613 | 3.28 | Pass |
| 5 | 0.394 | 1.083 | 36.4 | 0.469 | 1.625 | 28.90 | Pass |
| 6 | 0.011 | 0.285 | 3.9 | 0.019 | 0.428 | 4.49 | Pass |
| 7 | 0.350 | 0.732 | 47.9 | 0.413 | 1.097 | 37.68 | Pass |
| 8 | 0.010 | 0.219 | 4.7 | 0.018 | 0.328 | 5.37 | Pass |
| 9 | 0.298 | 0.380 | 78.4 | 0.347 | 0.570 | 60.89 | Pass |
| 10 | 0.009 | 0.175 | 5.3 | 0.016 | 0.262 | 6.01 | Pass |
| 11 | 0.242 | 0.314 | 77.1 | 0.276 | 0.470 | 58.70 | Pass |
| 12 | 0.008 | 0.145 | 5.6 | 0.014 | 0.219 | 6.22 | Pass |
| 13 | 0.185 | 0.200 | 92.8 | 0.206 | 0.299 | 68.80 | Pass |
| 14 | 0.007 | 0.124 | 5.6 | 0.011 | 0.187 | 6.06 | Pass |
| 15 | 0.132 | 0.143 | 92.9 | 0.142 | 0.214 | 66.39 | Pass |
| 16 | 0.006 | 0.109 | 5.2 | 0.009 | 0.164 | 5.62 | Pass |
| 17 | 0.086 | 0.125 | 68.8 | 0.093 | 0.189 | 49.34 | Pass |
| 18 | 0.004 | 0.097 | 4.6 | 0.007 | 0.145 | 4.95 | Pass |
| 19 | 0.049 | 0.112 | 43.4 | 0.054 | 0.169 | 31.84 | Pass |
| 20 | 0.003 | 0.087 | 3.8 | 0.005 | 0.131 | 4.15 | Pass |
| 21 | 0.021 | 0.102 | 20.9 | 0.024 | 0.153 | 15.62 | Pass |
| 22 | 0.002 | 0.079 | 3.0 | 0.004 | 0.119 | 3.40 | Pass |
| 23 | 0.005 | 0.093 | 5.9 | 0.012 | 0.140 | 8.79 | Pass |
| 24 | 0.002 | 0.073 | 2.2 | 0.003 | 0.109 | 2.96 | Pass |
| 25 | 0.015 | 0.086 | 17.5 | 0.020 | 0.128 | 15.27 | Pass |
| 26 | 0.001 | 0.067 | 1.7 | 0.003 | 0.101 | 2.65 | Pass |
| 27 | 0.018 | 0.079 | 22.9 | 0.020 | 0.119 | 17.20 | Pass |
| 28 | 0.001 | 0.063 | 1.3 | 0.002 | 0.094 | 2.43 | Pass |
| 29 | 0.017 | 0.074 | 22.7 | 0.017 | 0.110 | 15.82 | Pass |
| 30 | 0.001 | 0.058 | 1.1 | 0.002 | 0.087 | 2.28 | Pass |
| 31 | 0.013 | 0.069 | 19.0 | 0.014 | 0.104 | 13.74 | Pass |
| 32 | 0.001 | 0.055 | 1.0 | 0.002 | 0.082 | 2.15 | Pass |
| 33 | 0.010 | 0.065 | 15.0 | 0.011 | 0.097 | 11.21 | Pass |
| 34 | 0.000 | 0.051 | 1.0 | 0.002 | 0.077 | 2.06 | Pass |
| 35 | 0.008 | 0.061 | 12.6 | 0.009 | 0.091 | 9.77 | Pass |
| 36 | 0.001 | 0.049 | 1.1 | 0.002 | 0.073 | 2.06 | Pass |
| 37 | 0.007 | 0.058 | 12.4 | 0.008 | 0.086 | 9.43 | Pass |
| 38 | 0.001 | 0.046 | 1.2 | 0.001 | 0.069 | 2.13 | Pass |
| 39 | 0.007 | 0.055 | 12.7 | 0.008 | 0.083 | 9.50 | Pass |
| 40 | 0.001 | 0.044 | 1.2 | 0.001 | 0.066 | 2.14 | Pass |

**Test Result: Pass** **Source qualification: Normal**

**Highest parameter values during test:**

| | | | |
|---|---|---|---|
| **Voltage (Vrms):** | **230.03** | | |
| **I_Peak (Amps):** | **5.544** | **I_RMS (Amps):** | **1.395** |
| **I_Fund (Amps):** | **0.726** | **Crest Factor:** | **5.082** |
| **Power (Watts):** | **164** | **Power Factor:** | **0.512** |

| Harm# | Harmonics V-rms | Limit V-rms | % of Limit | Status |
|---|---|---|---|---|
| 2 | 0.124 | 0.460 | 27.03 | OK |
| 3 | 0.471 | 2.069 | 22.75 | OK |
| 4 | 0.052 | 0.460 | 11.23 | OK |
| 5 | 0.129 | 0.919 | 14.04 | OK |
| 6 | 0.034 | 0.460 | 7.30 | OK |
| 7 | 0.204 | 0.690 | 29.61 | OK |
| 8 | 0.033 | 0.460 | 7.10 | OK |
| 9 | 0.151 | 0.460 | 32.88 | OK |
| 10 | 0.016 | 0.460 | 3.40 | OK |
| 11 | 0.164 | 0.230 | 71.18 | OK |
| 12 | 0.025 | 0.230 | 10.68 | OK |
| 13 | 0.142 | 0.230 | 61.71 | OK |
| 14 | 0.014 | 0.230 | 6.21 | OK |
| 15 | 0.113 | 0.230 | 49.01 | OK |
| 16 | 0.016 | 0.230 | 7.06 | OK |
| 17 | 0.086 | 0.230 | 37.18 | OK |
| 18 | 0.022 | 0.230 | 9.76 | OK |
| 19 | 0.053 | 0.230 | 23.20 | OK |
| 20 | 0.016 | 0.230 | 6.93 | OK |
| 21 | 0.030 | 0.230 | 13.09 | OK |
| 22 | 0.021 | 0.230 | 9.12 | OK |
| 23 | 0.070 | 0.230 | 30.47 | OK |
| 24 | 0.019 | 0.230 | 8.48 | OK |
| 25 | 0.043 | 0.230 | 18.68 | OK |
| 26 | 0.019 | 0.230 | 8.44 | OK |
| 27 | 0.041 | 0.230 | 17.76 | OK |
| 28 | 0.011 | 0.230 | 4.99 | OK |
| 29 | 0.035 | 0.230 | 15.32 | OK |
| 30 | 0.017 | 0.230 | 7.57 | OK |
| 31 | 0.027 | 0.230 | 11.60 | OK |
| 32 | 0.012 | 0.230 | 5.06 | OK |
| 33 | 0.015 | 0.230 | 6.44 | OK |
| 34 | 0.007 | 0.230 | 3.16 | OK |
| 35 | 0.032 | 0.230 | 14.02 | OK |
| 36 | 0.007 | 0.230 | 2.91 | OK |
| 37 | 0.019 | 0.230 | 8.47 | OK |
| 38 | 0.005 | 0.230 | 2.22 | OK |
| 39 | 0.014 | 0.230 | 5.94 | OK |
| 40 | 0.007 | 0.230 | 3.25 | OK |

**Test Result: Pass** **Status: Test Completed**

**$Pst_i$ and limit line** **European Limits**


**Time is too short for Plt plot**

**Parameter values recorded during the test:**

| | | | | |
|---|---|---|---|---|
| **Vrms at the end of test (Volt):** | **229.35** | | | |
| **Highest dt (%):** | **0.00** | **Test limit (%):** | **3.14** | **Pass** |
| **Time(mS) > dt:** | **0.0** | **Test limit (mS):** | **500.0** | **Pass** |
| **Highest dc (%):** | **0.00** | **Test limit (%):** | **3.14** | **Pass** |
| **Highest dmax (%):** | **0.00** | **Test limit (%):** | **3.80** | **Pass** |
| **Highest Pst (10 min. period):** | **0.001** | **Test limit:** | **0.950** | **Pass** |
| **Highest Plt (2 hr. period):** | **0.001** | **Test limit:** | **0.617** | **Pass** |

# APPENDIX III - TEST RESULT OF FINAL DATAS

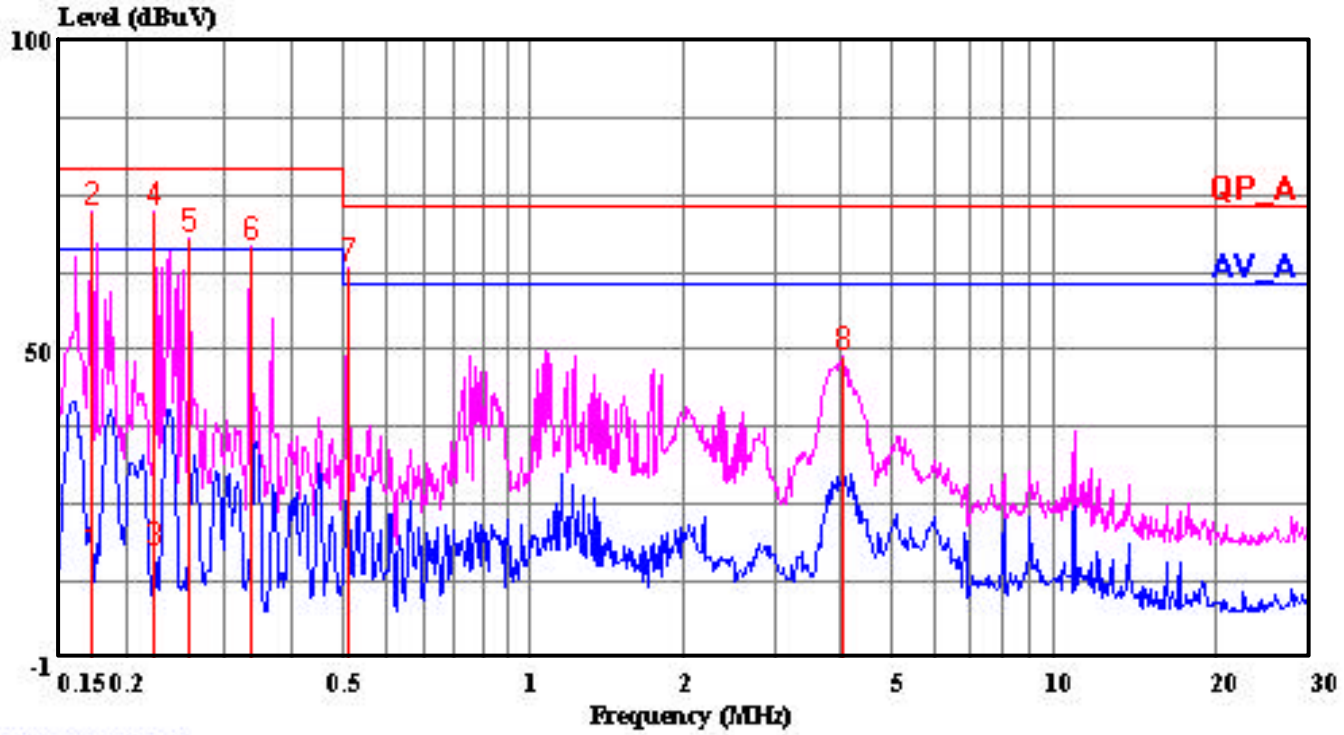
## Conducted Emission Plot

## Radiated Emission Data

COMPLIANCE Engineering Service, Inc.
FCC,VCCI,CISPR,CE
UL,CSA,TUV

No. 199, Chung Sheng Road,
Hsin Tien City, Taipei,
Taiwan, R.O.C.
Tel:02-2217-0894 Fax:02-2217-1029

Data#: 19 File#: 50815205CA.EMI Date: 2005-08-31 Time: 15:20:03




(Conduction A)

Trace: 2 1 Ref Trace:

Condition: LINE
Report No. : 50815205
Test Engr. : SAM SU
Company : AAEON Technology Inc.
EUT : EMB-900M
Test Config : EUT / ALL PERIPHERALS
Type of Test: EN 55022 CLASS A
Mode of Op. : DVI TO D-SUB MODE



| | Freq | Read Level | Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV | dBuV | dB | |
| 1 | 0.171 | 15.45 | 0.14 | 15.59 | 66.00 | -50.41 | Average |
| 2 | 0.171 | 72.03 | 0.14 | 72.17 | 79.00 | -6.83 | Peak |
| 3 | 0.224 | 16.37 | 0.15 | 16.52 | 66.00 | -49.48 | Average |
| 4 | 0.224 | 72.03 | 0.15 | 72.18 | 79.00 | -6.82 | Peak |
| 5 | 0.260 | 67.29 | 0.17 | 67.46 | 79.00 | -11.54 | Peak |
| 6 | 0.337 | 66.15 | 0.19 | 66.34 | 79.00 | -12.66 | Peak |
| 7 | 0.510 | 62.48 | 0.20 | 62.68 | 73.00 | -10.32 | Peak |
| 8 | 4.158 | 47.86 | 0.35 | 48.21 | 73.00 | -24.79 | Peak |

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FCC,VCCI,CISPR,CE
UL,CSA,TUV

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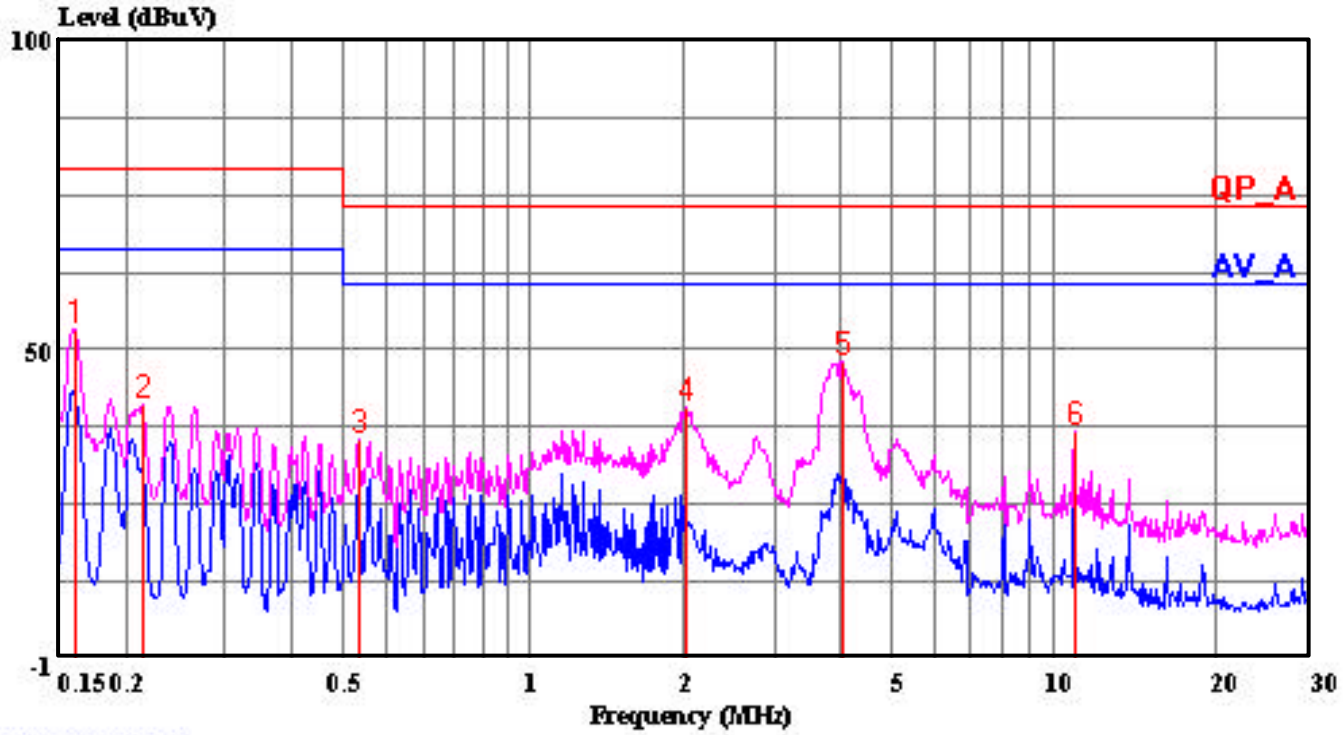
Taiwan, R.O.C.
Tel:02-2217-0894 Fax:02-2217-1029

Data#: 20 File#: 50815205CA.EMI Date: 2005-08-31 Time: 15:20:53




(Conduction A)

Trace: 4 3 Ref Trace:

Condition: NEUTRAL
Report No. : 50815205
Test Engr. : SAM SU
Company : AAEON Technology Inc.
EUT : EMB-900M
Test Config : EUT / ALL PERIPHERALS
Type of Test: EN 55022 CLASS A
Mode of Op. : DVI TO D-SUB MODE



| | Freq | Read Level | Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV | dBuV | dB | |
| 1 | 0.160 | 52.59 | 0.13 | 52.72 | 79.00 | -26.28 | Peak |
| 2 | 0.213 | 40.41 | 0.13 | 40.54 | 79.00 | -38.46 | Peak |
| 3 | 0.532 | 34.79 | 0.21 | 35.00 | 73.00 | -38.00 | Peak |
| 4 | 2.133 | 39.78 | 0.32 | 40.10 | 73.00 | -32.90 | Peak |
| 5 | 4.158 | 46.97 | 0.40 | 47.37 | 73.00 | -25.63 | Peak |
| 6 | 11.080 | 35.16 | 0.98 | 36.14 | 73.00 | -36.86 | Peak |

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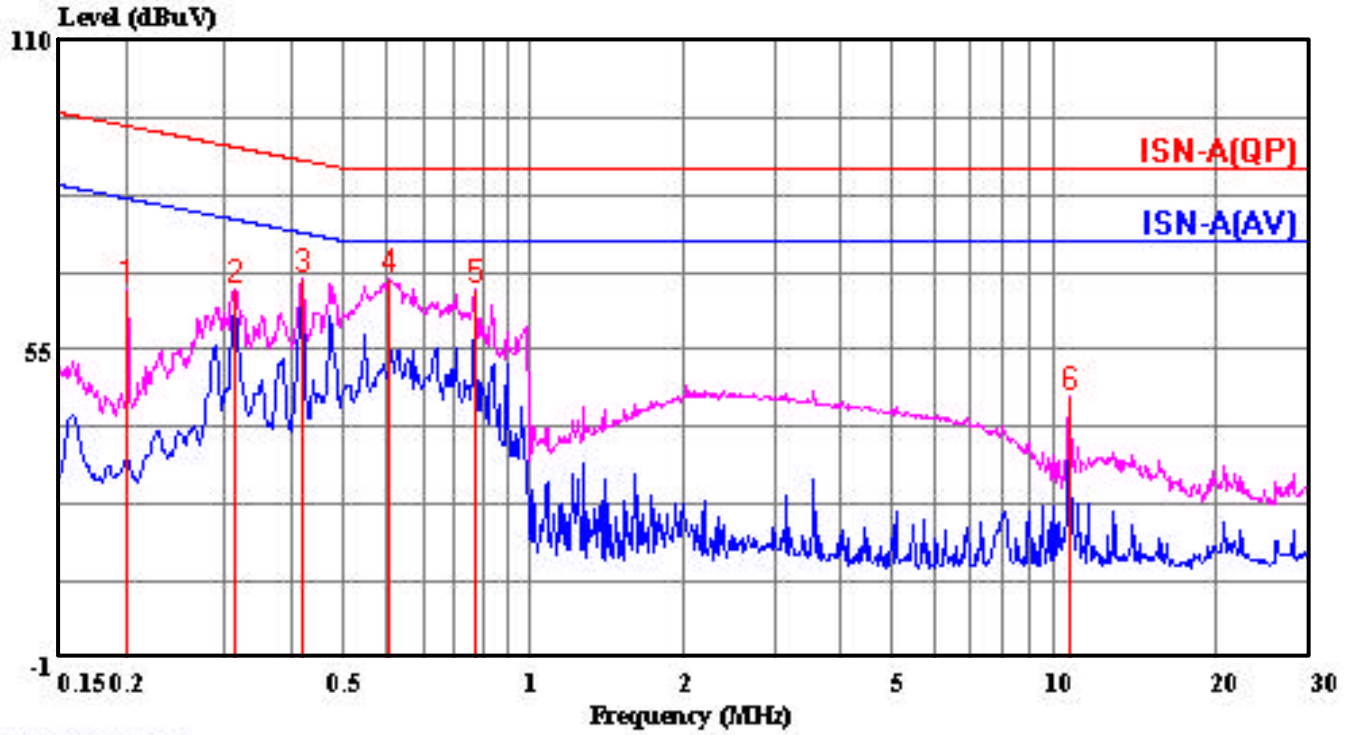
Taiwan, R.O.C.
Tel:02-2217-0894 Fax:02-2217-1029

Data#: 21 File#: 50815205CA.EMI Date: 2005-08-31 Time: 15:24:45




(Conduction A)

Trace: 10 9 Ref Trace:

Condition: COMMON MODE
Report No. : 50815205
Test Engr. : SAM SU
Company : AAEON Technology Inc.
EUT : EMB-900M
Test Config : EUT / ALL PERIPHERALS
Type of Test: EN 55022 CLASS A
Mode of Op. : LAN 2 / 1 Gbps / WORST



| | Freq | Read Level | Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV | dBuV | dB | |
| 1 | 0.201 | 55.43 | 9.77 | 65.20 | 94.58 | -29.38 | Peak |
| 2 | 0.315 | 55.40 | 9.75 | 65.15 | 90.84 | -25.69 | Peak |
| 3 | 0.419 | 57.44 | 9.75 | 67.19 | 88.46 | -21.28 | Peak |
| 4 | 0.608 | 57.43 | 9.74 | 67.17 | 87.00 | -19.83 | Peak |
| 5 | 0.871 | 55.65 | 9.74 | 65.39 | 87.00 | -21.61 | Peak |
| 6 | 10.790 | 36.17 | 9.80 | 45.97 | 87.00 | -41.03 | Peak |

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No. 199, Chung Sheng Road,
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Taiwan, R.O.C.
Tel:02-2217-0894 Fax:02-2217-1029

Data#: 1 File#: 50815205-I.EMI Date: 2005-08-17 Time: 16:09:58
Site#I

Condition: VERTICAL /10M
Report No. : 50815205
Test Engr. : JIMMY CHEN
Company : AAEON Technology Inc.
EUT : EMB-900M
Test Config : EUT / ALL PERIPHERALS
Type of Test: EN 55022 CLASS A
Mode of Op. : DVI TO D-SUB MODE



| | Freq | Read Level | Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | |
| 1 | 37.770 | 49.53 | -19.87 | 29.66 | 40.00 | -10.34 | Peak |
| 2 | 45.640 | 45.64 | -24.07 | 21.57 | 40.00 | -18.43 | Peak |
| 3 | 56.650 | 52.89 | -26.60 | 26.29 | 40.00 | -13.71 | Peak |
| 4 | 66.100 | 63.64 | -26.89 | 36.75 | 40.00 | -3.25 | Peak |
| 5 | 75.530 | 61.24 | -25.90 | 35.34 | 40.00 | -4.66 | Peak |
| 6 | 120.070 | 46.19 | -19.84 | 26.35 | 40.00 | -13.65 | Peak |
| 7 | 122.750 | 53.25 | -19.83 | 33.42 | 40.00 | -6.58 | Peak |
| 8 | 125.110 | 49.66 | -19.91 | 29.76 | 40.00 | -10.25 | Peak |
| 9 | 166.000 | 56.96 | -21.22 | 35.74 | 40.00 | -4.26 | Peak |
| 10 | 169.930 | 47.23 | -21.36 | 25.88 | 40.00 | -14.13 | Peak |
| 11 | 207.700 | 52.59 | -20.90 | 31.69 | 40.00 | -8.31 | Peak |
| 12 | 233.380 | 51.16 | -18.86 | 32.30 | 47.00 | -14.70 | Peak |
| 13 | 250.020 | 43.06 | -17.53 | 25.53 | 47.00 | -21.47 | Peak |
| 14 | 400.020 | 45.32 | -12.76 | 32.56 | 47.00 | -14.44 | Peak |
| 15 | 432.080 | 40.27 | -11.75 | 28.52 | 47.00 | -18.48 | Peak |
| 16 | 480.020 | 40.96 | -10.46 | 30.50 | 47.00 | -16.50 | Peak |

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No. 199, Chung Sheng Road,
Hsin Tien City, Taipei,
Taiwan, R.O.C.
Tel:02-2217-0894  Fax:02-2217-1029

Data#: 2  File#: 50815205-I.EMI  Date: 2005-08-17  Time: 16:37:34
Site#I

Condition: HORIZONTAL
Report No.  : 50815205
Test Engr.  : JIMMY CHEN
Company  : AAEON Technology Inc.
EUT  : EMB-900M
Test Config : EUT / ALL PERIPHERALS
Type of Test: EN 55022 CLASS A
Mode of Op. : DVI TO D-SUB MODE



| | Freq | Read Level | Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | |
| 1 | 56.650 | 48.66 | -26.60 | 22.06 | 40.00 | -17.94 | Peak |
| 2 | 56.650 | 53.21 | -26.60 | 26.61 | 40.00 | -13.39 | Peak |
| 3 | 66.090 | 55.69 | -26.89 | 28.80 | 40.00 | -11.20 | Peak |
| 4 | 75.530 | 56.36 | -25.90 | 30.46 | 40.00 | -9.54 | Peak |
| 5 | 113.310 | 46.12 | -20.28 | 25.84 | 40.00 | -14.16 | Peak |
| 6 | 122.740 | 54.34 | -19.83 | 34.51 | 40.00 | -5.49 | Peak |
| 7 | 169.930 | 47.36 | -21.36 | 26.01 | 40.00 | -14.00 | Peak |
| 8 | 207.720 | 50.26 | -20.90 | 29.36 | 40.00 | -10.64 | Peak |
| 9 | 233.380 | 51.40 | -18.86 | 32.54 | 47.00 | -14.46 | Peak |
| 10 | 250.030 | 47.82 | -17.53 | 30.29 | 47.00 | -16.71 | Peak |
| 11 | 300.030 | 43.27 | -16.09 | 27.18 | 47.00 | -19.82 | Peak |
| 12 | 400.050 | 42.44 | -12.76 | 29.68 | 47.00 | -17.32 | Peak |
| 13 | 480.070 | 45.26 | -10.46 | 34.80 | 47.00 | -12.20 | Peak |
| 14 | 500.060 | 48.32 | -9.96 | 38.36 | 47.00 | -8.64 | Peak |