



CE EMC

TEST REPORT

For

Panel PC

Model: PPC-153M

Trade Name: ADVANTECH

Issued for

Advantech Co., Ltd.

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

Issued by

COMPLIANCE CERTIFICATION SERVICES INC.

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TABLE OF CONTENTS

| | | |
|-----|--|----|
| 1 | TEST RESULT CERTIFICATION | 3 |
| 2 | EUT DESCRIPTION..... | 4 |
| 3 | TEST METHODOLOGY..... | 6 |
| 3.1 | EUT SYSTEM OPERATION..... | 6 |
| 3.2 | DECISION OF FINAL TEST MODE..... | 6 |
| 4 | SETUP OF EQUIPMENT UNDER TEST..... | 7 |
| 5 | FACILITIES AND ACCREDITATIONS..... | 8 |
| 5.1 | FACILITIES..... | 8 |
| 5.2 | LABORATORY ACCREDITATIONS AND LISTINGS | 9 |
| 6 | INSTRUMENT AND CALIBRATION..... | 10 |
| 6.1 | MEASURING INSTRUMENT CALIBRATION..... | 10 |
| 6.2 | TEST AND MEASUREMENT EQUIPMENT | 10 |
| 7 | LINE CONDUCTED & RADIATED EMISSION TEST..... | 13 |
| 7.1 | LIMIT | 13 |
| 7.2 | TEST PROCEDURE OF LINE CONDUCTED EMISSION..... | 14 |
| 7.3 | TEST PROCEDURE OF COMMON MODE CONDUCTED EMISSION FOR TELECOMMUNICATION PORT | 15 |
| 7.4 | TEST PROCEDURE OF RADIATED EMISSION..... | 16 |
| 7.5 | TEST RESULTS | 18 |
| 8 | POWER HARMONICS TEST..... | 22 |
| 9 | POWER VOLTAGE FLUCTUATION / FLICKER TEST | 24 |
| 10 | ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST | 26 |
| 11 | RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST | 31 |
| 12 | FAST TRANSIENTS/BURST IMMUNITY TEST..... | 33 |
| 13 | SURGE IMMUNITY TEST..... | 36 |
| 14 | CONDUCTED DISTRBANCE/INDUCED RADIO-FREQUENCY FIELD IMMUNITY TEST..... | 38 |
| 15 | POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST..... | 40 |
| 16 | VOLTAGE DIPS / SHORT INTERRUPTIONS | 42 |
| | APPENDIX I - PHOTOGRAPHS OF TEST SETUP | 45 |
| | APPENDIX II – TEST RESULT OF EN 61000-3-2/-3 | 55 |



1 TEST RESULT CERTIFICATION

Applicant: Advantech Co., Ltd.
No. 1, Alley 20, Lane 26, Rueiguang Road, Neihu District,
Taipei 114, Taiwan, R.O.C.

Manufacturer: Advantech Co., Ltd.
No. 1, Alley 20, Lane 26, Rueiguang Road, Neihu District,
Taipei 114, Taiwan, R.O.C.

Equipment Under Test: Panel PC

Trade Name: ADVANTECH

Model: PPC-153M

Detailed EUT Description: See Item 2 of this report

Date of Test: September 6 ~ 22, 2003

Deviation: None

| Applicable Standard | Class/Limit/Criterion | Test Result |
|--|----------------------------|-------------------------|
| EN 60601-1-2: 2001, including | | |
| EN 55011: 1998 + A1: 1999 | Class B | No non-compliance noted |
| IEC 61000-4-2: 2001 | See Item 10 of this report | No non-compliance noted |
| IEC 61000-4-3: 1995 | See Item 11 of this report | No non-compliance noted |
| IEC 61000-4-4: 1995 | See Item 12 of this report | No non-compliance noted |
| IEC 61000-4-5: 1995 | See Item 13 of this report | No non-compliance noted |
| IEC 61000-4-6: 1996 | See Item 14 of this report | No non-compliance noted |
| IEC 61000-4-8: 1993 | See Item 15 of this report | No non-compliance noted |
| IEC 61000-4-11: 1994 | See Item 16 of this report | No non-compliance noted |
| EN 61000-3-2:1995 + A1: 1998 + A2: 1998 | Class A/ D | No non-compliance noted |
| EN 61000-3-3:1995 | Limit | No non-compliance noted |
| Deviation from Applicable Standard | | |
| None | | |

The above equipment was tested by Compliance Certification Services Inc. for compliance with the requirements set forth in the EMC Directive 93/42/EEC 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:

Jonson Lee
Director of Linkou Laboratory
Compliance Certification Services Inc.

Reviewed by:

Jessie Wang
Section Manager of Linkou Laboratory
Compliance Certification Services Inc.



2 EUT DESCRIPTION

| | | | |
|--------------------------------------|-------------------------------|---------------|--------------------------|
| Product | Panel PC | | |
| Trade Name | ADVANTECH | | |
| Model | PPC-153M | | |
| Housing Type | Plastic | | |
| EUT Power Rating | 100-250VAC, 50-60Hz, 3A | | |
| AC Power Supply Manufacturer: | SKYNET | Model | SNP-8086M |
| AC Power Cord Type | Unshielded, 1.8m (Detachable) | | |
| CPU Manufacturer | Intel | Model: | Pentium III 1.26GHz |
| CPU Board Manufacturer | ADVANTECH | Model: | PCM-9672 |
| OSC/Clock Frequencies | 133MHz | | |
| Memory Capacity | 128MHz | | |
| HDD Manufacturer | IBM | Model | DJSA-210 IS20ABBA (10GB) |
| FDD Manufacturer | Y.E DATA | Model | YD-702J-6037J |
| CD-ROM Manufacturer | ASUS | Model | SCD-2400 |
| LCD Panel Manufacturer | CPT | Model | CLAA150XG01 |



I/O Port of EUT

| I/O Port Type | Q'TY | TESTED WITH |
|-------------------------------|-------------|--------------------|
| 1). Parallel Port | 1 | 1 |
| 2). Serial Port | 4 | 4 |
| 3). Video Port (VGA) | 1 | 1 |
| 4). PS/2 Keyboard/ Mouse Port | 1 | 1 |
| 5). Game Port | 1 | 1 |
| 6). Line In Port | 1 | 1 |
| 7). Line Out Port | 1 | 1 |
| 8). Microphone Port | 1 | 1 |
| 9). LAN Port | 1 | 1 |
| 10). USB Port | 2 | 2 |



3 TEST METHODOLOGY

3.1 EUT SYSTEM OPERATION

1. EMI test program was loaded and executed in Windows 98 mode.
2. The EMI test program sequentially exercised all I/O'S of EUT.
3. A communicated software was loaded and executed to communicate between EUT and remote side.
4. Test EUT receives message from remote side, and filling the screen of EUT and monitor with upper case of "H" patterns.
5. Repeat 2 to 4.

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

1024 × 768 Resolution -- 100Mbps

Mode 2

1024 × 768 Resolution-- 10Mbps

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

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 1 for the actual connections between EUT and support equipment.

Support Equipment

| No. | Equipment | Model # | Serial # | FCC ID | Trade Name | Data Cable | Power Cord |
|-----|---------------------------------------|------------|-----------------|------------|------------|-------------------------------|---|
| 1. | Monitor | 959NF | AQ19H2RT706137Y | FCC DoC | SAMSUNG | Shielded, 1.8m with two cores | Unshielded, 1.8m |
| 2. | Modem | DM-1414 | 0304012269 | IFAXDM1414 | ACEEX | Shielded, 1.8m | Unshielded, 1.8m |
| 3. | Modem | DM-1414 | 0304012270 | IFAXDM1414 | ACEEX | Shielded, 1.8m | Unshielded, 1.8m |
| 4. | Printer | 2225C | 2648S40021 | DK467GSM24 | HP | Shielded, 1.8m | Unshielded, 1.8m |
| 5. | PS/2 Keyboard (One to two adapter) | SK-2800C | B1C790BCPJCN6L | GYUR79SK | Compaq | Shielded, 1.8m | N/A |
| 6. | PS/2 Mouse (One to two adapter) | M-CAA43 | LZA11750827 | FCC DoC | Logitech | Shielded, 1.8m | N/A |
| 7. | USB Mouse | MO19UCA | 020440967 | FCC DoC | HP | Shielded, 1.8m | N/A |
| 8. | USB Mouse | MO19UCA | 020509282 | FCC DoC | HP | Shielded, 1.8m | N/A |
| 9. | Mouse | M-MM43 | LZE94052791 | FCC DoC | Logitech | Shielded, 1.8m | N/A |
| 10. | Mouse | M-MM43 | LZE94052771 | FCC DoC | Logitech | Shielded, 1.8m | N/A |
| 11. | Multimedia Earphone | Axis-301 | N/A | FCC DoC | Labtec | Unshielded, 1.25m | N/A |
| 12. | Walkman | RQ-L10 | HB004471 | FCC DoC | Panasonic | Unshielded, 1.8m | N/A |
| 13. | Microphone | DM-510 | N/A | N/A | KOKA | Unshielded, 2.8m | N/A |
| 14. | Joystick | G-ZA-PHI | PHB01600992 | FCC DoC | Logitech | Shielded, 1.8m | N/A |
| 15. | Printer (For PMPF) | STYLUS C60 | DR3K041995 | FCC DoC | EPSON | Shielded, 1.8m | Unshielded, 1.8m |
| 16. | Notebook PC (Remote) | M285 | NU2503544 | DoC | LEO | LAN Cable: Unshielded, 10m | AC Cable: Unshielded, 1.8m DC Cable: 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 Linkou Lab at No. 81-1, Lane 210, Bade Rd., 2, Luchu Hsiang, Taoyuan 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 | NVLAP | EN 55011, EN 55014-1, AS/NZS 1044, CNS 13783-1, EN 55022, CNS 13438, EN 61000-3-2, EN 61000-3-3, ANSI C63.4, FCC OST/MP-5, AS/NZS 3548 IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 |  200600-0 |
| USA | FCC | 3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements |  93105, 90471 |
| Japan | VCCI | 3/10 meter Open Area Test Sites and conducted test sites to perform radiated/conducted measurements |  R-393/1066/725/879 C-402/747/912 |
| Norway | NEMKO | EN 50081-1/2, EN 50082-1/2, IEC 61000-6-1/2, 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, EN 60601-1-2, EN 300 328-2, EN 300 422-2, EN 301 419-1, EN 301 489-01/03/07/08/09/17, EN 301 419-2/3, EN 300 454-2, EN 301 357-2 |  ELA 124a ELA 124b ELA 124c |
| Taiwan | CNLA | EN 300 328-1, EN 300 328-2, EN 300 220-1, EN 300 220-2, EN 300 220-3, 47 CFR FCC Part 15 Subpart C, EN 61000-3-2, EN 61000-3-3, CNS 13439, CNS 13783-1, CNS 14115, CNS 13438, AS/NZS 3548, CNS 13022-1, IEC 1000-4-3/4/5/6/8/11, CNS 13022-2/3 |  0 3 6 3 ILAC MRA |
| Taiwan | BSMI | CNS 13438, CNS 13783-1, CNS 13439, CNS 14115 |  SL2-IS-E-0014 / IN-E-0014 /A1-E-0014 /R1-E-0014 /R2-E-0014 /L1-E-0014 |
| Canada | Industry Canada | RSS212, Issue 1 |  IC 3991-3 IC 3991-4 |

Note: No part of this report may be used to claim or imply product endorsement by CNLA, NVLAP 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

| Conducted Emission Test Site # 3 | | | | |
|----------------------------------|--------------|---------|---------------|-----------------|
| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
| EMI Test Receiver | R&S | ESHS30 | 828144/003 | 08/07/2004 |
| LISN | R&S | ESH2-Z5 | 843285/010 | 12/15/2003 |
| LISN | EMCO | 3825/2 | 9003-1628 | 07/27/2004 |

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

| Open Area Test Site # 4 | | | | |
|-------------------------|--------------|-----------|---------------|-----------------|
| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
| Spectrum Analyzer | ADVANTEST | R3132 | 91700456 | N.C.R |
| EMI Test Receiver | R&S | ESCS30 | 845552/030 | 02/17/2004 |
| Bilog Antenna | CHASE | CBL 6112B | 2462 | 01/10/2004 |
| Turn Table | Chance most | N/A | N/A | N.C.R |
| Antenna Tower | Chance most | N/A | N/A | N.C.R |
| Controller | Chance most | N/A | N/A | N.C.R |
| RF Switch | ANRITSU | MP59B | M51067 | N.C.R |
| Site NSA | C&C Lab. | N/A | N/A | 08/08/2004 |

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



| Power Harmonic & Voltage Fluctuation/Flicker Measurement (EN 61000-3-2&-3-3) | | | | |
|---|---------------------|--------------|----------------------|------------------------|
| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
| Harmonic & Flicker Tester | HAEFELY TRENCH | PHF555 | 080 419-25 | 10/13/2003 |

Equipment Used for Immunity Measurement

| ESD Test Site (EN 61000-4-2) | | | | |
|-------------------------------------|---------------------|--------------|----------------------|------------------------|
| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
| ESD Generator | SCHAFFNER | NSG438 | 170 | 02/26/2004 |

| Radiated Electromagnetic Field immunity test (61000-4-3) (80-1000MHz) | | | | | |
|--|-------------------------|---------------------|----------------------|------------------|-----------------|
| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. | CAL DUE. |
| Signal Generator | R&S | SMY01 | 840490/009 | 02/19/2003 | 02/18/2004 |
| Amplifier | KALMUS | LA1000V | 091995-1 | N/A | N/A |
| Amplifier | KALMUS | 757LC | 091995-2 | N/A | N/A |
| BiconiLog Antenna | EMCO | 3141 | 1001 | N/A | N/A |
| Anechoic Chamber | COMTEST Compact Full | CFAC | ADT-S01 | 08/11/2003 | 08/10/2004 |

| Radiated Electromagnetic Field immunity test (61000-4-3) (1400-2500MHz) | | | | | |
|--|-------------------------|---------------------|----------------------|------------------|-----------------|
| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. | CAL DUE. |
| Signal Generator | HP | E4422A | US37040138 | 07/11/2003 | 07/10/2004 |
| Amplifier | Amplifier Research | 80S1G3 | 304334 | N/A | N/A |
| E-Field Sensor 3GHz | W&G | TYP-8 | AD-0034 | 12/23/2002 | 12/22/2003 |
| EM Radiation Monitor | W&G | EMR-20 | AB-0039 | 12/23/2002 | 12/22/2003 |
| Power Sensor | R&S | NRV-Z5 | 837878/038 | 11/21/2002 | 11/20/2003 |
| Power Sensor | R&S | NRV-Z5 | 837878/039 | 11/21/2002 | 11/20/2003 |
| Power Meter | R&S | NRVD | 837794/040 | 11/21/2002 | 11/20/2003 |
| BiconiLog Antenna | EMCO | 3141 | 1001 | N/A | N/A |
| Anechoic Chamber | COMTEST Compact Full | CFAC | ADT-S01 | 08/11/2003 | 08/10/2004 |



| Fast Transients/Burst Test Site (61000-4-4) | | | | |
|--|---------------------|--------------|----------------------|------------------------|
| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
| Fast Transients/Burst Generator | HAEFELY TRENCH | PEFT- JUNIOR | 583 333-117 | 08/19/2004 |

| Surge Immunity Test Site (EN 61000-4-5) | | | | |
|--|---------------------|--------------|----------------------|------------------------|
| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
| Surge Tester | HAEFELY TRENCH | PSUGER 4010 | 583 334-71 | 08/19/2004 |

| CS Test Site (EN 61000-4-6) | | | | |
|------------------------------------|---------------------|--------------|----------------------|------------------------|
| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
| S.G. | R&S | SMY02 | 100094 | 08/05/2004 |
| Power Amplifier | ar | 500A100A | 300299 | N.C.R |
| CDN | Lüthi | 801-M3 | 1879 | 02/25/2004 |
| CDN | FRANKONIA | CDN-M2 | A3002010 | 04/27/2004 |
| CDN | SCHAFFNER | T400 | 16906 | 10/16/2003 |

| Power Frequency Magnetic Field Immunity Test Site (61000-4-8) | | | | |
|--|---------------------|--------------|----------------------|------------------------|
| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
| TRIAX ELF Magnetic Field Meter | F.W.BELL | 4090 | 9711 | 10/20/2003 |
| Clamp Meter | National | 300K | 11-5980 K | 11/18/2003 |
| Magnetic Field Tester | HAEFELY TRENCH | MAG 100.1 | 080 938-01 | N.C.R |

| Voltage Dips/Short Interruption and Voltage Variation Immunity Test Site (61000-4-11) | | | | |
|--|---------------------|--------------|----------------------|------------------------|
| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
| Dips/Interruption and Variations Simulator | HAEFELY TRENCH | PLINE 1610 | 080 344-05 | 03/27/2004 |



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 55011 (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 55011.
- All I/O cables were positioned to simulate typical actual usage as per EN 55011.
- The test equipment EUT installed received AC power, 230VAC/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) | Q.P. Raw (dBuV) | Average Raw (dBuV) | Q.P. Limit (dBuV) | Average Limit (dBuV) | Q.P. Margin (dB) | Average Margin (dB) | Note |
|-------------|-----------------|--------------------|-------------------|----------------------|------------------|---------------------|------|
| x.xx | 43.95 | --- | 56.00 | 46.00 | -12.05 | --- | L1 |

Freq. = Emission frequency in MHz
Raw dBuV = Uncorrected Analyzer/Receiver reading + Insertion loss of LISN, if it > 0.5 dB
Limit dBuV = Limit stated in standard
Margin dB = Reading in reference to limit
Note = Current carrying line of reading
“---“ = The emission level complied with the Average limits, with at least 2dB margin limits, so no further recheck.

Calculation Formula

Margin (dB) = RAW (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 1
10/100Mbps**

- 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 1



Data Sample:

| Freq. (MHz) | Q.P. Raw (dBuV) | AV. Raw (dBuV) | Q.P. Limit (dBuV) | AV. Limit (dBuV) | Q.P. Margin (dB) | AV. Margin (dB) | Note |
|-------------|-----------------|----------------|-------------------|------------------|------------------|-----------------|------|
| x.xx | 43.95 | --- | 87.00 | 74.00 | -43.05 | --- | --- |

- Freq.: Emission frequency
- Raw: Uncorrected Analyzer / Receiver reading
- Limit: Limit stated in standard
- Margin: Reading in reference to limit
- Note: Current carrying line of reading
- “-“: The emission level complied with the Average limits, with at least 2 dB margin, so no further recheck.

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 55011.
- All I/O cables were positioned to simulate typical usage as per EN 55011.
- The EUT received AC power source, 230VAC/50Hz, from the outlet socket under the turntable. All support equipment received power from another socket under the turntable.
- The antenna was placed at 10 meter away from the EUT as stated in EN 55011. 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.
- The test data of the worst-case condition(s) was recorded.

Data Sample:

| Freq. (MHz) | Raw Data (dBuV) | Corr. Factor (dB/m) | Emiss. Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) |
|--------------------|------------------------|----------------------------|------------------------------|------------------------|--------------------|
| xx.xx | 14.00 | 12.20 | 26.20 | 30.00 | -3.80 |

- Freq. = Emission frequency in MHz
- Raw Data (dBuV) = Uncorrected Analyzer / Receiver reading
- Corr. Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
- Emiss. Level (dBuV/m) = Raw reading converted to dBuV/m and CF added
- Limit (dBuV/m) = Limit stated in standard
- Margin (dB) = Reading in reference to limit
- P = Peak Reading
- Q = Quasi-peak Reading
- A = Average Reading

Calculation Formula

Margin (dB) = Emiss. Level (dBuV/m) – Limits (dBuV/m)
Emission Level (dBuV/m) = Raw Data (dBuV) + Corr. Factor (dB/m)



7.5 TEST RESULTS

Line Conducted Emission

Model: PPC-153M

Test Mode: Mode 1

Temperature: 29°C

Humidity: 61% RH

Tested by: George Kuo

Test Results: Passed

(The chart below shows the highest readings taken from the final data)

| FREQ MHz | Q.P. Raw dBuV | AVG Raw dBuV | Q.P. Limit dBuV | AVG Limit dBuV | Q.P. Margin dB | AVG Margin dB | NOTE |
|----------|---------------|--------------|-----------------|----------------|----------------|---------------|------|
| 0.155 | 50.20 | --- | 65.73 | 55.73 | -15.53 | --- | L1 |
| 1.862 | 35.40 | --- | 56.00 | 46.00 | -20.60 | --- | L1 |
| 3.272 | 35.60 | --- | 56.00 | 46.00 | -20.40 | --- | L1 |
| 3.914 | 34.20 | --- | 56.00 | 46.00 | -21.80 | --- | L1 |
| 6.733 | 27.60 | --- | 60.00 | 50.00 | -32.40 | --- | L1 |
| 8.462 | 28.40 | --- | 60.00 | 50.00 | -31.60 | --- | L1 |
| <hr/> | | | | | | | |
| 0.190 | 45.40 | --- | 64.04 | 54.04 | -18.64 | --- | L2 |
| 1.862 | 35.60 | --- | 56.00 | 46.00 | -20.40 | --- | L2 |
| 2.503 | 35.20 | --- | 56.00 | 46.00 | -20.80 | --- | L2 |
| 4.102 | 36.20 | --- | 56.00 | 46.00 | -19.80 | --- | L2 |
| 5.644 | 30.50 | --- | 60.00 | 50.00 | -29.50 | --- | L2 |
| 7.372 | 33.30 | --- | 60.00 | 50.00 | -26.70 | --- | L2 |

L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)

Note: “---” denotes the emission level was or more than 2dB below the Average limit, so no re-check anymore.



Common Mode Conducted Emission

Model: PPC-153M

Test Mode: Mode 1

Temperature: 30°C

Humidity: 60% RH

Tested by: Max Yan

Test Results: Passed

(The chart below shows the highest readings taken from the final data)

| FREQ MHz | Q.P. RAW dBuV | AVG RAW dBuV | Q.P. Limit dBuV | AVG Limit dBuV | Q.P. Margin dB | AVG Margin dB | NOTE |
|-------------|---------------------|--------------------|-----------------------|----------------------|----------------------|---------------------|---------|
| 0.150 | 60.90 | --- | 84.00 | 74.00 | -23.10 | --- | 10Base |
| 2.501 | 48.60 | --- | 74.00 | 64.00 | -25.40 | --- | 10Base |
| 6.252 | 55.00 | --- | 74.00 | 64.00 | -19.00 | --- | 10Base |
| 10.002 | 47.60 | --- | 74.00 | 64.00 | -26.40 | --- | 10Base |
| 10.603 | 49.70 | --- | 74.00 | 64.00 | -24.30 | --- | 10Base |
| 12.343 | 57.80 | --- | 74.00 | 64.00 | -16.20 | --- | 10Base |
| 16.230 | 56.50 | --- | 74.00 | 64.00 | -17.50 | --- | 100Base |
| 18.243 | 58.80 | --- | 74.00 | 64.00 | -15.20 | --- | 100Base |
| 19.708 | 58.90 | --- | 74.00 | 64.00 | -15.10 | --- | 100Base |
| 21.663 | 58.80 | --- | 74.00 | 64.00 | -15.20 | --- | 100Base |
| 23.129 | 61.10 | --- | 74.00 | 64.00 | -12.90 | --- | 100Base |
| 24.347 | 56.30 | --- | 74.00 | 64.00 | -17.70 | --- | 100Base |

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



Radiated Emission (A)

Model: PPC-153M

Test Mode: Mode 1

Temperature: 30°C

Detector Function: Quasi-peak.

Humidity: 60% RH

Antenna: Vertical at 10m

Tested by: Arno Hsieh

Test Results: Pass

(The chart below shows the highest readings taken from the final data)

| Freq. (MHz) | Raw Data (dBuV) | Corr. Factor (dB/m) | Emiss. Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) |
|----------------|-----------------------|---------------------------|-----------------------------|--------------------|----------------|
| 50.80 | 13.7 | 11.4 | 25.1 | 30.0 | -4.9 |
| 70.88 | 19.5 | 5.7 | 25.2 | 30.0 | -4.8 |
| 132.00 | 15.7 | 12.1 | 27.8 | 30.0 | -2.2 |
| 141.70 | 10.1 | 12.1 | 22.2 | 30.0 | -7.8 |
| 400.00 | 15.0 | 20.0 | 35.0 | 37.0 | -2.0 |
| 617.09 | 3.6 | 22.6 | 26.2 | 37.0 | -10.8 |



Radiated Emission (B)

Model: PPC-153M

Test Mode: Mode 1

Temperature: 30°C

Detector Function: Quasi-peak.

Humidity: 60% RH

Antenna: Horizontal at 10m

Tested by: Arno Hsieh

Test Results: Pass

(The chart below shows the highest readings taken from the final data)

| Freq. (MHz) | Raw Data (dBuV) | Corr. Factor (dB/m) | Emiss. Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) |
|----------------|-----------------------|---------------------------|-----------------------------|--------------------|----------------|
| 118.10 | 9.6 | 11.7 | 21.3 | 30.0 | -8.7 |
| 132.00 | 12.0 | 12.1 | 24.1 | 30.0 | -5.9 |
| 229.20 | 10.9 | 10.8 | 21.7 | 30.0 | -8.3 |
| 377.90 | 1.5 | 19.0 | 20.5 | 37.0 | -16.5 |
| 400.00 | 14.8 | 20.0 | 34.8 | 37.0 | -2.2 |
| 620.00 | 5.1 | 22.7 | 27.8 | 37.0 | -9.2 |



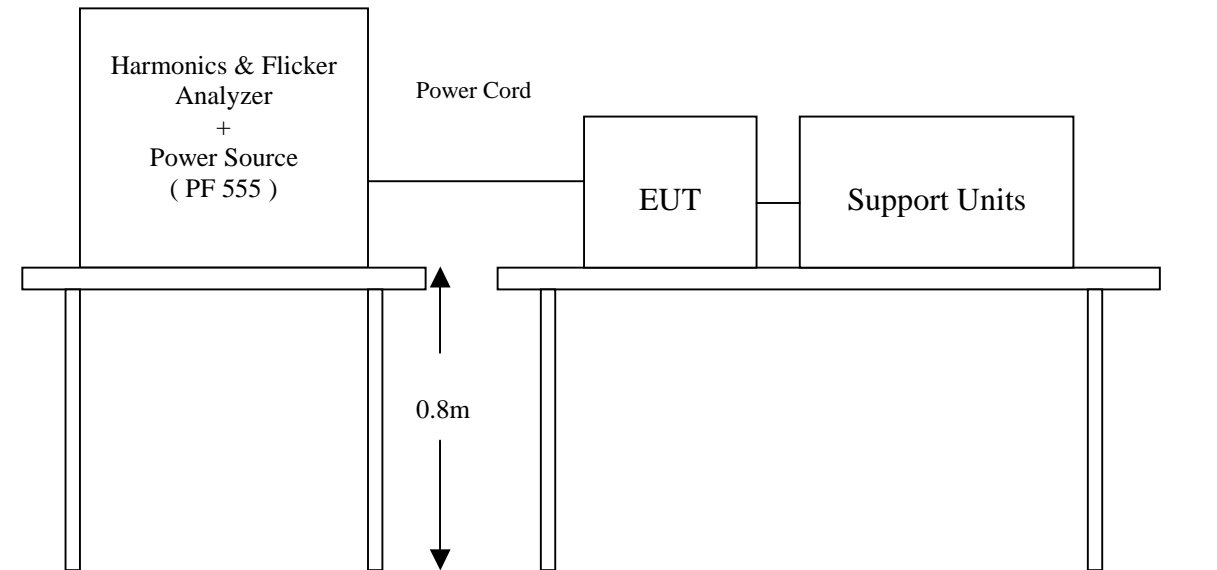
8 POWER HARMONICS TEST

Port : AC mains
Basic Standard : EN 61000-3-2 (1995 + A1: 1998 + A2: 1998)
Limits : CLASS A ; CLASS D
Tested by : Arno Hsieh
Temperature : 25 °C
Humidity : 41% RH

Limit:

| Limits for Class A equipment | | Limits for Class D equipment | | |
|------------------------------|--------------------------------------|------------------------------|--|--------------------------------------|
| Harmonics Order n | Max. permissible harmonics current A | Harmonics Order n | Max. permissible harmonics current per watt mA/W | Max. permissible harmonics current A |
| Odd harmonics | | Odd Harmonics only | | |
| 3 | 2.30 | 3 | 3.4 | 2.30 |
| 5 | 1.14 | 5 | 1.9 | 1.14 |
| 7 | 0.77 | 7 | 1.0 | 0.77 |
| 9 | 0.40 | 9 | 0.5 | 0.40 |
| 11 | 0.33 | 11 | 0.35 | 0.33 |
| 13 | 0.21 | 13 | 0.30 | 0.21 |
| 15<=n<=39 | 0.15x15/n | 15<=n<=39 | 3.85/n | 0.15x15/n |
| Even harmonics | | | | |
| 2 | 1.08 | | | |
| 4 | 0.43 | | | |
| 6 | 0.30 | | | |
| 8<=n<=40 | 0.23x8/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)

| |
|--|
| <input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL |
|--|

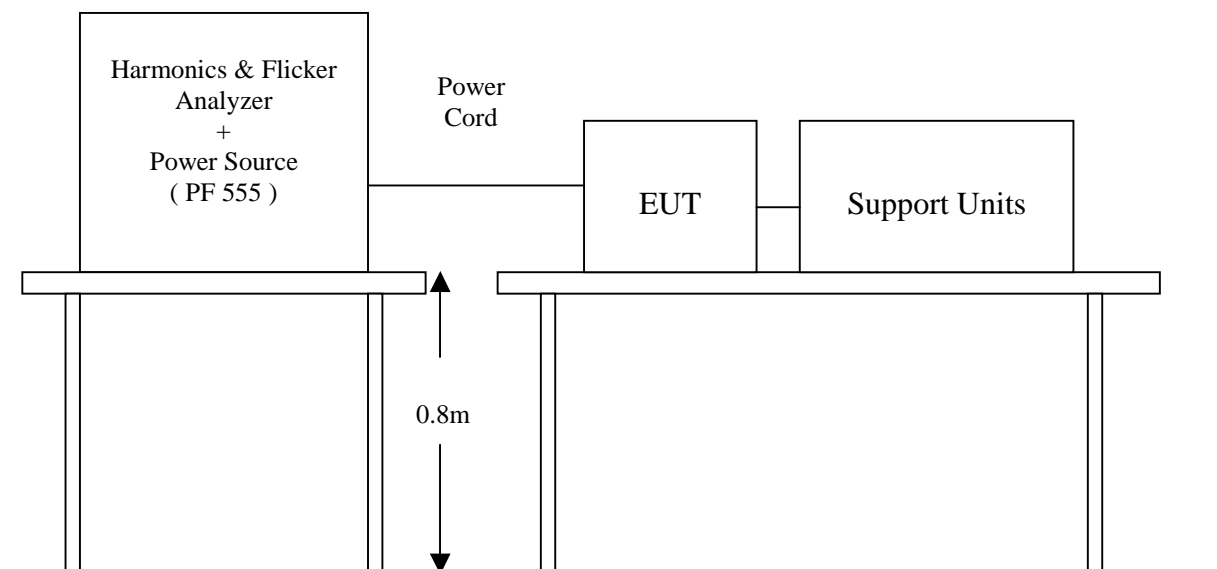
9 POWER VOLTAGE FLUCTUATION / FLICKER TEST

Port : AC mains
Basic Standard : EN 61000-3-3 (1995)
Limits : §5 of EN 61000-3-3
Tested by : Arno Hsieh
Temperature : 25 °C
Humidity : 41% RH

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) | 200 | T_{dt} means maximum time that dt exceeds 3 %. |
| d_{max} (%) | 4% | d_{max} means maximum relative voltage change. |
| dc (%) | 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 flicker 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)

** Continue

| Test Parameter | Measurement Value | Limit | Result |
|----------------------|-------------------|-------|--------|
| P _{st} | 0.001 | 1.0 | Pass |
| P _{lt} | 0.001 | 0.65 | Pass |
| T _{dt} (ms) | 0 | 200 | Pass |
| d _{max} (%) | 0% | 4% | Pass |
| dc (%) | 0% | 3% | Pass |

** Manual Switch

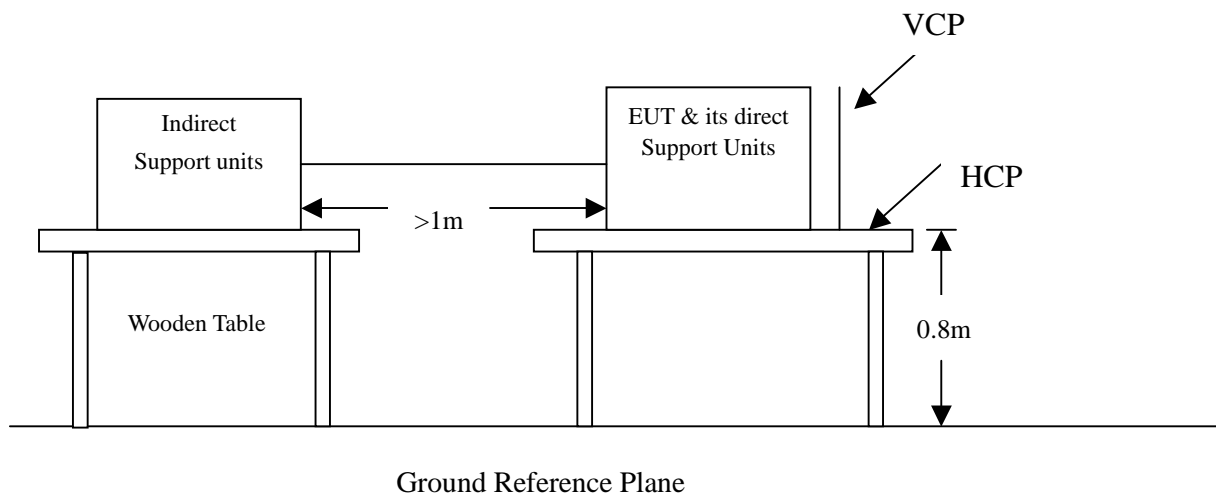
| Test Parameter | Measurement Value | Limit | Result |
|----------------------|-------------------|-------|--------|
| P _{st} | 0.009 | 1.0 | Pass |
| P _{lt} | 0.009 | 0.65 | Pass |
| T _{dt} (ms) | 0 | 200 | Pass |
| d _{max} (%) | 0% | 4% | Pass |
| dc (%) | 0% | 3% | Pass |

10 ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

| | |
|------------------------------|---|
| Port | : Enclosure |
| Basic Standard | : IEC/EN 61000-4-2 |
| Test Level | : $\pm 2, 4, 8$ kV (Air Discharge) : $\pm 2, 4, 6$ kV (Contact Discharge) : $\pm 2, 4, 6$ kV (Indirect Discharge) |
| Performance Criterion | : The Equipment or System shall be able to provide the essential performance and remain safe. |
| Tested by | : Arno Hsieh |
| Temperature | : 29°C |
| Humidity | : 54% RH |
| Pressure | : 1017mbar |

Block Diagram of Test Setup:

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





Test Procedure:

The electrostatic discharges were applied as follows:

| Amount of Discharges | Voltage | Coupling | Result (Pass/Fail) |
|----------------------|------------------|--------------------------------|--------------------|
| 10 / Point | $\pm 2, 4, 8$ kV | Air Discharge | Pass |
| 10 / Point | $\pm 2, 4, 6$ kV | Contact Discharge | Pass |
| 10 / Point | $\pm 2, 4, 6$ kV | Indirect Discharge HCP (Front) | Pass |
| 10 / Point | $\pm 2, 4, 6$ kV | Indirect Discharge VCP (Left) | Pass |
| 10 / Point | $\pm 2, 4, 6$ kV | Indirect Discharge VCP (Back) | N/A |
| 10 / Point | $\pm 2, 4, 6$ kV | Indirect Discharge VCP (Right) | Pass |

****For the tested points to EUT, please refer to attached page.**

(Blue Arrow Mark For Contact Discharge And Red Arrow Mark For Air Discharge)

Observation: No any function degraded during the tests.

Compliance Criteria:

Under the test conditions specified in 36.202, the EQUIPMENT or SYSTEM shall be able to provide the ESSENTIAL PERFORMANCE and remain safe. The following DEGRADATIONS associated with ESSENTIAL PERFORMANCE and safety shall not be allowed:

- Component failures
- Changes in programmable parameters
- Reset to factory defaults (manufacturer's presets)
- Chang of operating mode
- False alarms
- Cessation or interruption of any intended operation, even if accompanied by an alarm
- Initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an alarm
- Error of a displayed numerical value sufficiently large to affect diagnosis or treatment
- Noise on a waveform in which the noise is indistinguishable from physiologically-produced signals or the noise interferes with interpretation of physiologically-produced signals
- Artefact or distortion in an image in which the artefact is indistinguishable from physiologically-produced signals or the distortion interferes with interpretation of physiologically-produced signals
- Failure of automatic diagnosis or treatment EQUIPMENT and SYSTEMS to diagnose or treat, even if accompanied by an alarm.

For EQUIPMENT and SYSTEMS with multiple FUNCTIONS, the criteria apply to each FUNCTION, parameter and channel.

The EQUIPMENT or SYSTEM may exhibit DEGRADATION of performance (e.g. deviation from manufacturer's specifications) that does not affect ESSENTIAL PERFORMANCE or safety.

The Tested Points of EUT

Photo 1 of 5



Photo 2 of 5



The Tested Points of EUT

Photo 3 of 5



Photo 4 of 5





The Tested Points of EUT

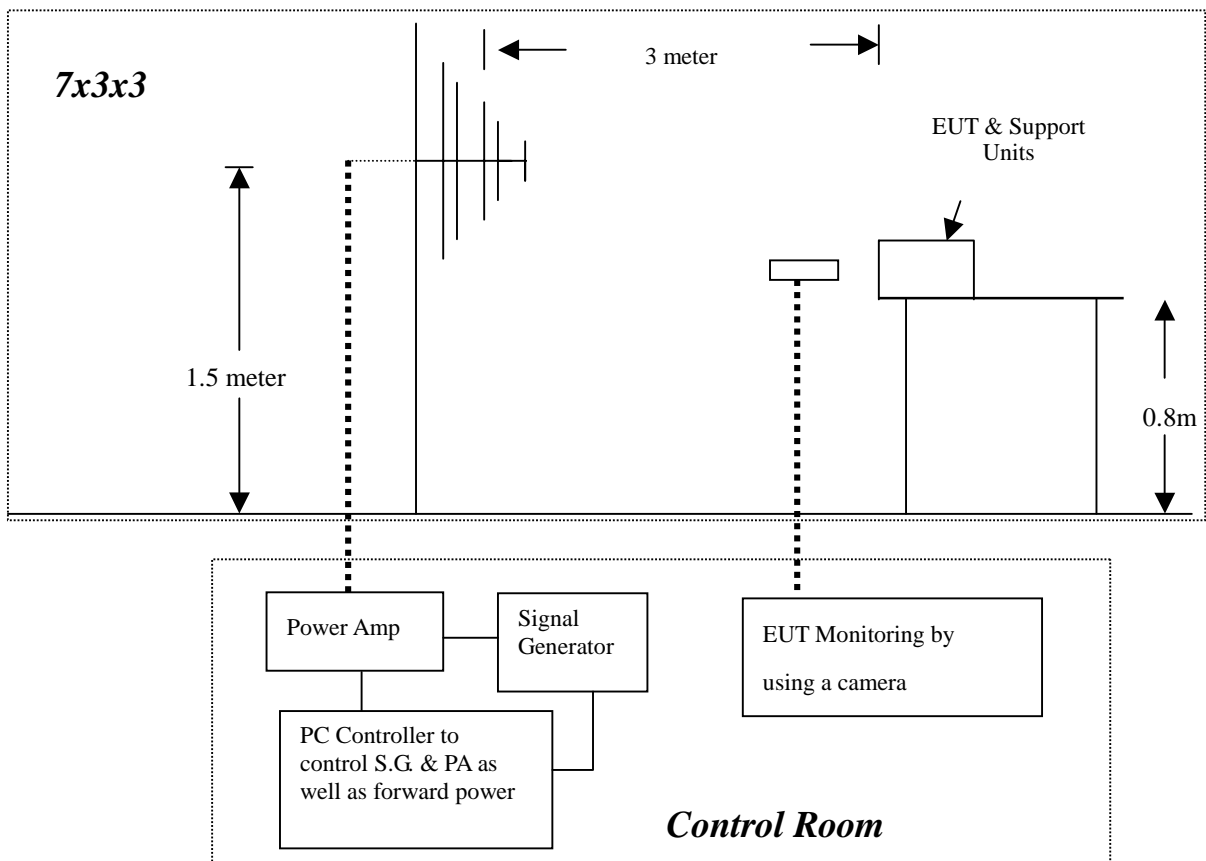
Photo 5 of 5



11 RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

| | |
|------------------------------|---|
| Port | : Enclosure |
| Basic Standard | : IEC/EN 61000-4-3 |
| Requirements | : 10 V/m / with 80% AM. 1kHz Modulation. |
| Performance Criterion | : The Equipment or System shall be able to provide the essential performance and remain safe. |
| Tested by | : Arno Hsieh |
| Temperature | : 29°C |
| Humidity | : 63% RH |
| Pressure | : 1017mbar |

Block Diagram of Test Setup:





Test Procedure:

Frequency Range 80MHz ~ 2500MHz
Steps : 1 % of fundamental
Dwell Time : 3 sec

| Range (MHz) | Field | Modulation | Polarity | Position | Result (Pass/Fail) |
|-------------|--------|------------|----------|----------|--------------------|
| 80-2500 | 10 V/m | No | H | 0 | Pass |
| 80-2500 | 10 V/m | No | V | 0 | Pass |
| 80-2500 | 10 V/m | No | H | 90 | Pass |
| 80-2500 | 10 V/m | No | V | 90 | Pass |
| 80-2500 | 10 V/m | No | H | 180 | Pass |
| 80-2500 | 10 V/m | No | V | 180 | Pass |
| 80-2500 | 10 V/m | No | H | 270 | Pass |
| 80-2500 | 10 V/m | No | V | 270 | Pass |

Observation: No any function degraded during the tests.

Compliance Criteria:

Under the test conditions specified in 36.202, the EQUIPMENT or SYSTEM shall be able to provide the ESSENTIAL PERFORMANCE and remain safe. The following DEGRADATIONS associated with ESSENTIAL PERFORMANCE and safety shall not be allowed:

- Component failures
- Changes in programmable parameters
- Reset to factory defaults (manufacturer’s presets)
- Chang of operating mode
- False alarms
- Cessation or interruption of any intended operation, even if accompanied by an alarm
- Initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an alarm
- Error of a displayed numerical value sufficiently large to affect diagnosis or treatment
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- Artefact or distortion in an image in which the artefact is indistinguishable from physiologically-produced signals or the distortion interferes with interpretation of physiologically-produced signals
- Failure of automatic diagnosis or treatment EQUIPMENT and SYSTEMS to diagnose or treat, even if accompanied by an alarm.

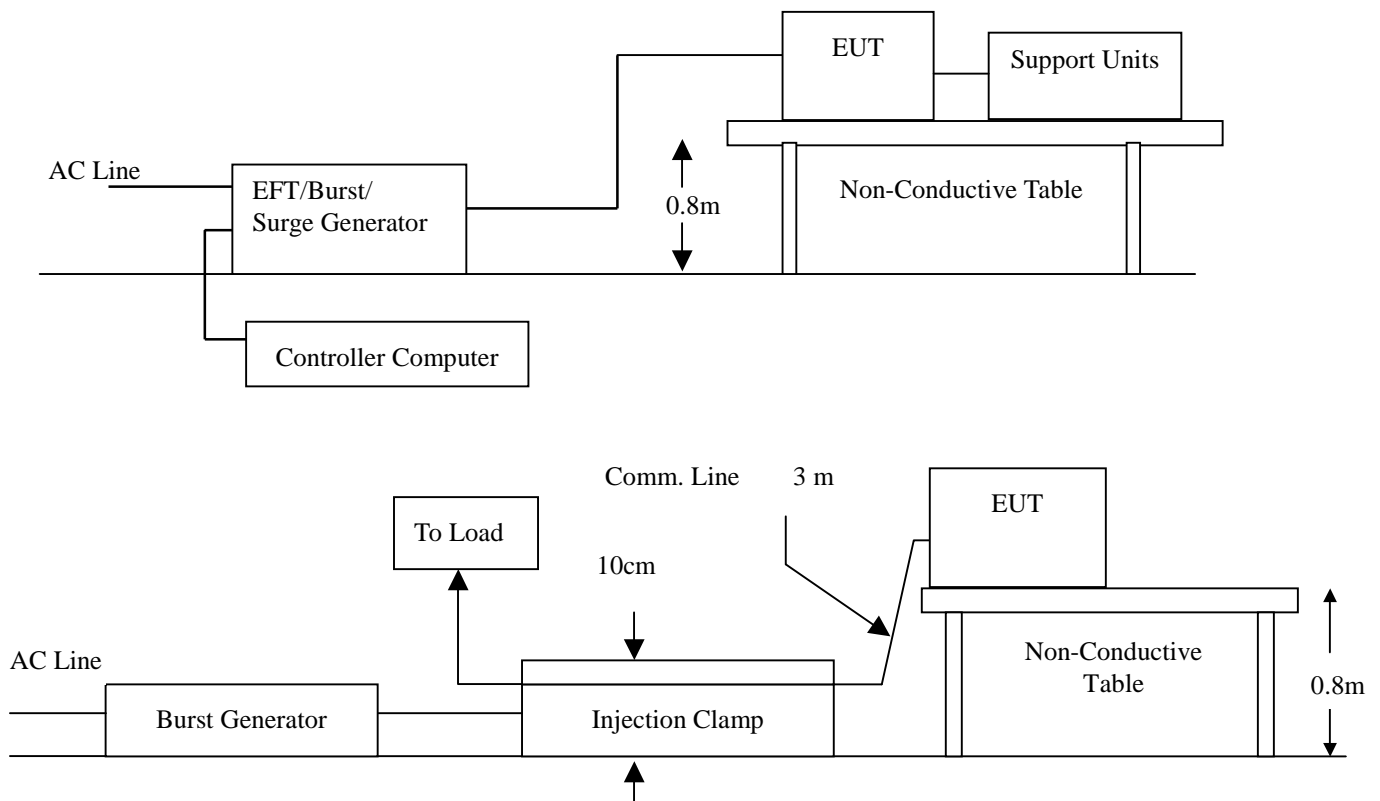
For EQUIPMENT and SYSTEMS with multiple FUNCTIONS, the criteria apply to each FUNCTION, parameter and channel.

The EQUIPMENT or SYSTEM may exhibit DEGRADATION of performance (e.g. deviation from manufacturer’s specifications) that does not affect ESSENTIAL PERFORMANCE or safety.

12 FAST TRANSIENTS/BURST IMMUNITY TEST

- Port** : On Power Supply Lines and LAN Cable
- Basic Standard** : IEC/EN 61000-4-4
- Requirements** : ± 2 kV for Power Supply Line
 ± 1 kV for LAN Cable
- Performance Criterion** : The Equipment or System shall be able to provide the essential performance and remain safe.
- Tested by** : Arno Hsieh
- Temperature** : 29°C
- Humidity** : 54% RH
- Pressure** : 1017mbar

Block Diagram of Test Setup:





Test Procedure:

Impulse Frequency : 5kHz
Tr/Th : 5/50ns
Burst Duration : 15ms
Burst Period : 3Hz

| Inject Line | Voltage kV | Inject Method | Result (Pass/Fail) |
|--------------------------|------------|---------------|--------------------|
| L | ± 2 | Direct | Pass |
| N | ± 2 | Direct | Pass |
| PE | ± 2 | Direct | Pass |
| L + N | ± 2 | Direct | Pass |
| L + PE | ± 2 | Direct | Pass |
| N + PE | ± 2 | Direct | Pass |
| L + N + PE | ± 2 | Direct | Pass |
| RJ45 Port (LAN Cable) | ± 1 | Clamp | Pass |

Observation: No any function degraded during the tests.



Compliance Criteria:

Under the test conditions specified in 36.202, the EQUIPMENT or SYSTEM shall be able to provide the ESSENTIAL PERFORMANCE and remain safe. The following DEGRADATIONS associated with ESSENTIAL PERFORMANCE and safety shall not be allowed:

- Component failures
- Changes in programmable parameters
- Reset to factory defaults (manufacturer's presets)
- Change of operating mode
- False alarms
- Cessation or interruption of any intended operation, even if accompanied by an alarm
- Initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an alarm
- Error of a displayed numerical value sufficiently large to affect diagnosis or treatment
- Noise on a waveform in which the noise is indistinguishable from physiologically-produced signals or the noise interferes with interpretation of physiologically-produced signals
- Artefact or distortion in an image in which the artefact is indistinguishable from physiologically-produced signals or the distortion interferes with interpretation of physiologically-produced signals
- Failure of automatic diagnosis or treatment EQUIPMENT and SYSTEMS to diagnose or treat, even if accompanied by an alarm.

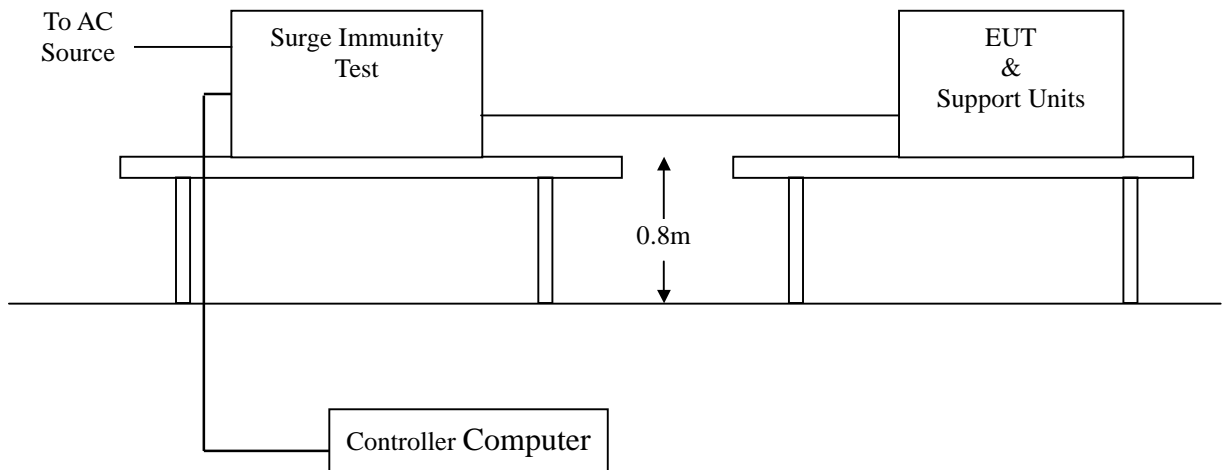
For EQUIPMENT and SYSTEMS with multiple FUNCTIONS, the criteria apply to each FUNCTION, parameter and channel.

The EQUIPMENT or SYSTEM may exhibit DEGRADATION of performance (e.g. deviation from manufacturer's specifications) that does not affect ESSENTIAL PERFORMANCE or safety.

13 SURGE IMMUNITY TEST

- Port** : Power Cord and LAN Cable
- Basic Standard** : IEC/EN 61000-4-5
- Requirements** : $\pm 0.5, 1 \text{ kV}$ (Line to Line)
 $\pm 0.5, 1, 2 \text{ kV}$ (Line to Ground)
- Performance Criteria** : The Equipment or System shall be able to provide the essential performance and remain safe.
- Tested by** : Arno Hsieh
- Temperature** : 29°C
- Humidity** : 54% RH
- Pressure** : 1017mbar

Block Diagram of Test Setup:





Test Procedure:

Voltage Waveform : 1.2/50 *us*
Current Waveform : 8/20 *us*
Polarity : Positive/Negative
Phase angle : 0°, 90°, 270°
Number of Test : 5

| Coupling Line | Voltage (kV) | Polarity | Coupling Method | Result (Pass/Fail) |
|---------------|--------------|----------|-----------------|--------------------|
| L1-L2 | 0.5, 1 | Positive | Capacitive | Pass |
| L1-PE | 0.5, 1, 2 | Positive | Capacitive | Pass |
| L2-PE | 0.5, 1, 2 | Positive | Capacitive | Pass |
| L1-L2 | 0.5, 1 | Negative | Capacitive | Pass |
| L1-PE | 0.5, 1, 2 | Negative | Capacitive | Pass |
| L2-PE | 0.5, 1, 2 | Negative | Capacitive | Pass |

Observation: No any function degraded during the tests.

Compliance Criteria:

Under the test conditions specified in 36.202, the EQUIPMENT or SYSTEM shall be able to provide the ESSENTIAL PERFORMANCE and remain safe. The following DEGRADATIONS associated with ESSENTIAL PERFORMANCE and safety shall not be allowed:

- Component failures
- Changes in programmable parameters
- Reset to factory defaults (manufacturer’s presets)
- Chang of operating mode
- False alarms
- Cessation or interruption of any intended operation, even if accompanied by an alarm
- Initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an alarm
- Error of a displayed numerical value sufficiently large to affect diagnosis or treatment
- Noise on a waveform in which the noise is indistinguishable from physiologically-produced signals or the noise interferes with interpretation of physiologically-produced signals
- Artefact or distortion in an image in which the artefact is indistinguishable from physiologically-produced signals or the distortion interferes with interpretation of physiologically-produced signals
- Failure of automatic diagnosis or treatment EQUIPMENT and SYSTEMS to diagnose or treat, even if accompanied by an alarm.

For EQUIPMENT and SYSTEMS with multiple FUNCTIONS, the criteria apply to each FUNCTION, parameter and channel.

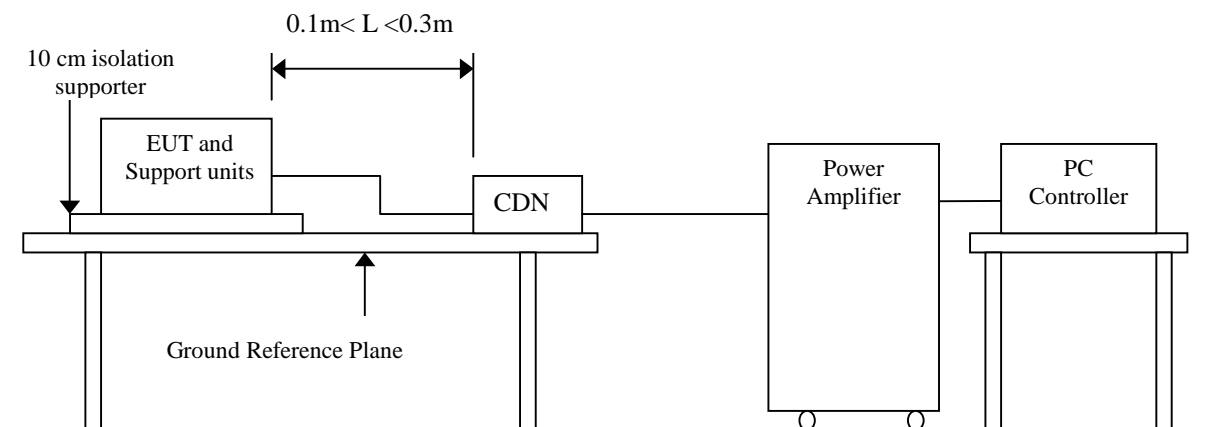
The EQUIPMENT or SYSTEM may exhibit DEGRADATION of performance (e.g. deviation from manufacturer’s specifications) that does not affect ESSENTIAL PERFORMANCE or safety.

14 CONDUCTED DISTURBANCE/INDUCED RADIO-FREQUENCY FIELD IMMUNITY TEST

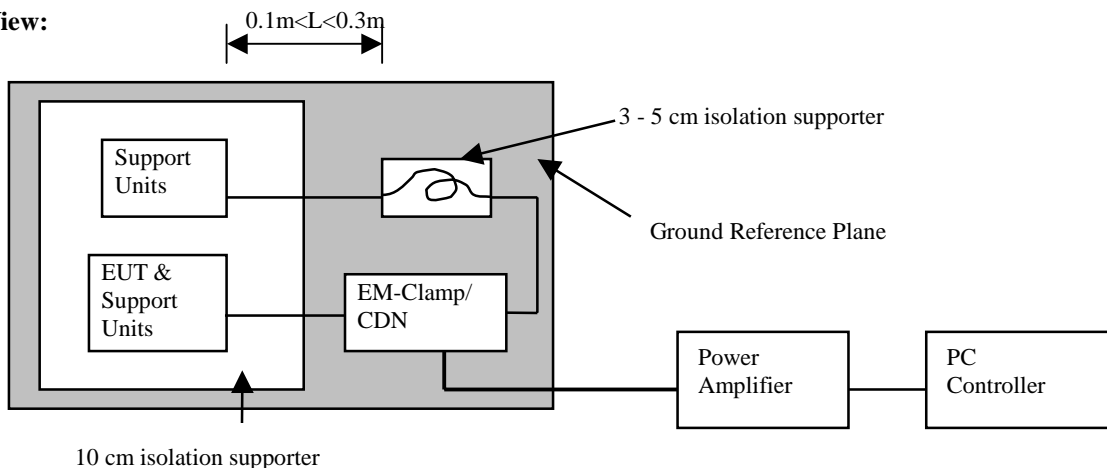
| | |
|------------------------------|---|
| Port | : AC Port and LAN Cable |
| Basic Standard | : IEC/EN 61000-4-6 |
| Requirements | : 10 V with 80% AM. 1kHz Modulation. |
| Injection Method | : CDN-M3 for Power Cord CDN-T4 for LAN Cable |
| Performance Criterion | : The Equipment or System shall be able to provide the essential performance and remain safe. |
| Tested by | : Arno Hsieh |
| Temperature | : 29°C |
| Humidity | : 54% RH |
| Pressure | : 1017mbar |

Block Diagram of Test Setup:

Side View:



Top View:





Test Procedure:

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

| Range (MHz) | Field | Modulation | Result (Pass/Fail) |
|-------------|-------|------------|--------------------|
| 0.15-80 | 10 V | Yes | Pass |

Observation: No any function degraded during the tests.

Compliance Criteria:

Under the test conditions specified in 36.202, the EQUIPMENT or SYSTEM shall be able to provide the ESSENTIAL PERFORMANCE and remain safe. The following DEGRADATIONS associated with ESSENTIAL PERFORMANCE and safety shall not be allowed:

- Component failures
- Changes in programmable parameters
- Reset to factory defaults (manufacturer’s presets)
- Chang of operating mode
- False alarms
- Cessation or interruption of any intended operation, even if accompanied by an alarm
- Initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an alarm
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- Failure of automatic diagnosis or treatment EQUIPMENT and SYSTEMS to diagnose or treat, even if accompanied by an alarm.

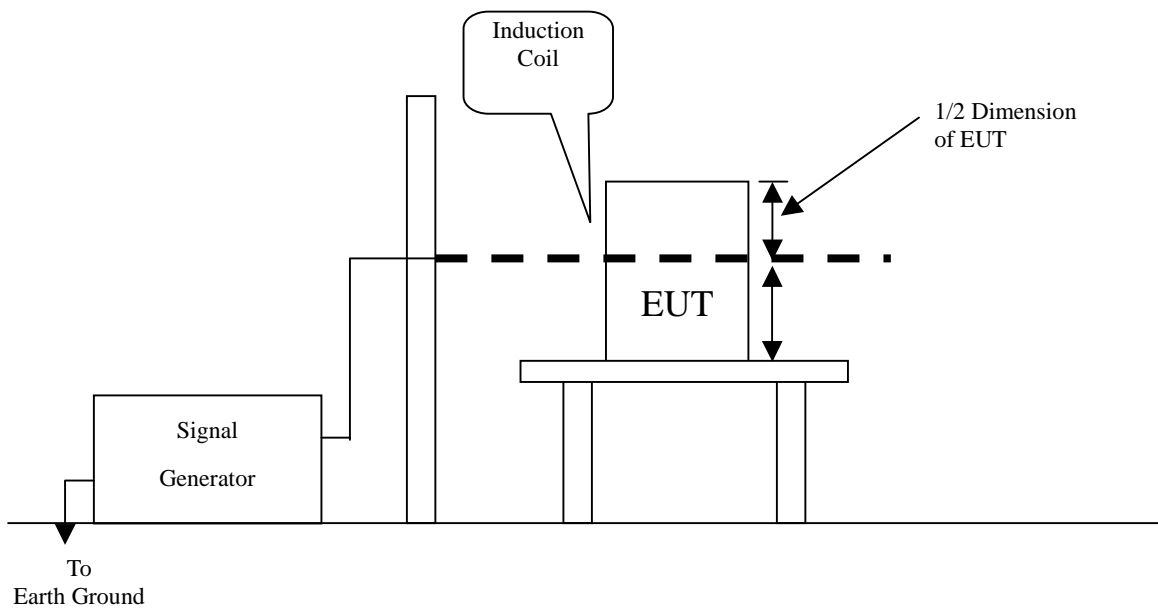
For EQUIPMENT and SYSTEMS with multiple FUNCTIONS, the criteria apply to each FUNCTION, parameter and channel.

The EQUIPMENT or SYSTEM may exhibit DEGRADATION of performance (e.g. deviation from manufacturer’s specifications) that does not affect ESSENTIAL PERFORMANCE or safety.

15 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

- Port** : Enclosure
- Basic Standard** : IEC/EN 61000-4-8
- Requirements** : 3 A/m
- Performance Criterion** : The Equipment or System shall be able to provide the essential performance and remain safe.
- Tested by** : Arno Hsieh
- Temperature** : 29°C
- Humidity** : 54% RH
- Pressure** : 1017mbar

Block Diagram of Test Setup:





Test Procedure:

Field Strength : 3A/m
Power Freq. : 50Hz
Orientation : X, Y, Z

| Orientation | Field | Result (Pass/Fail) | Remark |
|-------------|-------|--------------------|--------|
| X | 3A/m | Pass | |
| Y | 3A/m | Pass | |
| Z | 3A/m | Pass | |

Observation: No any function degraded during the tests.

Compliance Criteria:

Under the test conditions specified in 36.202, the EQUIPMENT or SYSTEM shall be able to provide the ESSENTIAL PERFORMANCE and remain safe. The following DEGRADATIONS associated with ESSENTIAL PERFORMANCE and safety shall not be allowed:

- Component failures
- Changes in programmable parameters
- Reset to factory defaults (manufacturer’s presets)
- Chang of operating mode
- False alarms
- Cessation or interruption of any intended operation, even if accompanied by an alarm
- Initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an alarm
- Error of a displayed numerical value sufficiently large to affect diagnosis or treatment
- Noise on a waveform in which the noise is indistinguishable from physiologically-produced signals or the noise interferes with interpretation of physiologically-produced signals
- Artefact or distortion in an image in which the artefact is indistinguishable from physiologically-produced signals or the distortion interferes with interpretation of physiologically-produced signals
- Failure of automatic diagnosis or treatment EQUIPMENT and SYSTEMS to diagnose or treat, even if accompanied by an alarm.

For EQUIPMENT and SYSTEMS with multiple FUNCTIONS, the criteria apply to each FUNCTION, parameter and channel.

The EQUIPMENT or SYSTEM may exhibit DEGRADATION of performance (e.g. deviation from manufacturer’s specifications) that does not affect ESSENTIAL PERFORMANCE or safety.

16 VOLTAGE DIPS / SHORT INTERRUPTIONS

Port : AC mains

Basic Standard : IEC/EN 61000-4-11

Requirement : PHASE ANGLE 0, 45, 90, 135, 180, 225, 270, 315 degrees

| Voltage Dips | Test Level % U_T | Reduction (%) | Duration (periods) |
|--------------|-----------------------|------------------|-------------------------|
| | <5 | >95 | 0.5 |
| | 40 | 60 | 5 |
| | 70 | 30 | 25 |

| Voltage Interruptions | Test Level % U_T | Reduction (%) | Duration (periods) |
|-----------------------|-----------------------|------------------|-------------------------|
| | <5 | >95 | 250 |

Test Interval : Min. 10 sec.

Performance Criteria : The Equipment or System shall be able to provide the essential performance and remain safe.

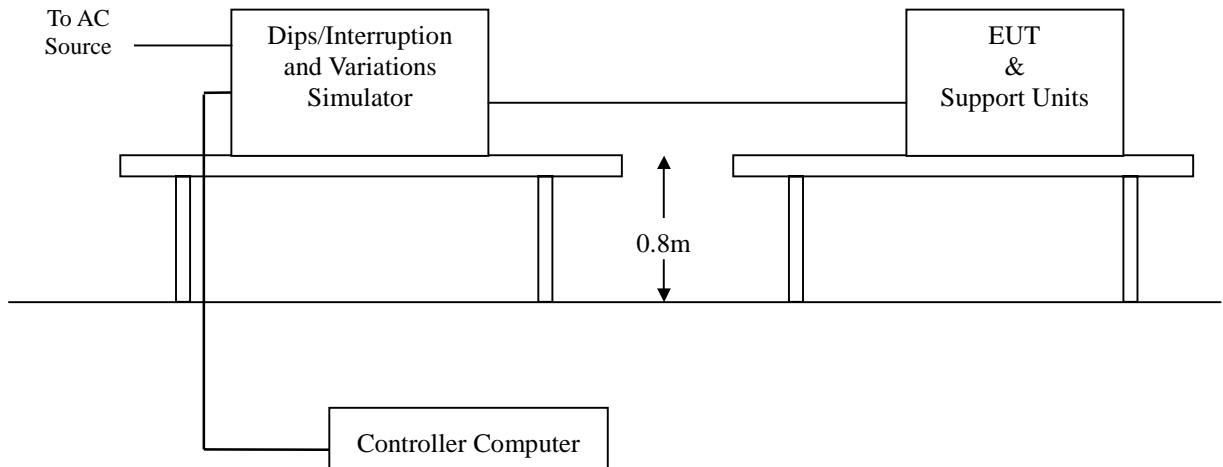
Tested by : Arno Hsieh

Temperature : 29 °C

Humidity : 54% RH

Pressure : 1017mbar

Block Diagram of Test Setup:



**Test Procedure:**

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

Voltage Dips:

| Test Level % U _T | Reduction (%) | Duration (periods) | Observation | Result |
|--------------------------------|------------------|-------------------------|-------------|--------|
| 0 | 100 | 0.5 | Normal | PASS |
| 40 | 60 | 5 | Normal | PASS |
| 70 | 30 | 25 | Normal | PASS |

Voltage Interruptions:

| Test Level % U _T | Reduction (%) | Duration (periods) | Observation | Result |
|--------------------------------|------------------|-------------------------|---|--------|
| 0 | 100 | 250 | EUT shut down, but can be auto recovered as the events disappear. | PASS |

Note:

1. Normal - No any functions degrade during and after the test.
2. For Voltage Interruption, EQUIPMENT and SYSTEMS are allowed a deviation from the requirements of 36.202.1 j) at the IMMUNITY TEST LEVEL specified in Table 211, provided the EQUIPMENT or SYSTEM remains safe, experiences no component failures and is restorable to the pre-test state with OPERATOR intervention. Determination of compliance is based upon performance of the EQUIPMENT or SYSTEM during and after application of the test sequence.

Observation: No any function degraded during the tests.



Compliance Criteria:

Under the test conditions specified in 36.202, the EQUIPMENT or SYSTEM shall be able to provide the ESSENTIAL PERFORMANCE and remain safe. The following DEGRADATIONS associated with ESSENTIAL PERFORMANCE and safety shall not be allowed:

- Component failures
- Changes in programmable parameters
- Reset to factory defaults (manufacturer's presets)
- Chang of operating mode
- False alarms
- Cessation or interruption of any intended operation, even if accompanied by an alarm
- Initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an alarm
- Error of a displayed numerical value sufficiently large to affect diagnosis or treatment
- Noise on a waveform in which the noise is indistinguishable from physiologically-produced signals or the noise interferes with interpretation of physiologically-produced signals
- Artefact or distortion in an image in which the artefact is indistinguishable from physiologically-produced signals or the distortion interferes with interpretation of physiologically-produced signals
- Failure of automatic diagnosis or treatment EQUIPMENT and SYSTEMS to diagnose or treat, even if accompanied by an alarm.

For EQUIPMENT and SYSTEMS with multiple FUNCTIONS, the criteria apply to each FUNCTION, parameter and channel.

The EQUIPMENT or SYSTEM may exhibit DEGRADATION of performance (e.g. deviation from manufacturer's specifications) that does not affect ESSENTIAL PERFORMANCE or safety.

APPENDIX I - PHOTOGRAPHS OF TEST SETUP

LINE CONDUCTED EMISSION TEST (EN 55011)





COMMON MODE CONDUCTED EMISSION (EN 55011)



RADIATED EMISSION TEST (EN 55011)





POWER HARMONIC & VOLTAGE FLUCTUATION / FLICKER TEST





ELECTROSTATIC DISCHARGE TEST





RADIATED ELECTROMAGNETIC FIELD TEST



FAST TRANSIENTS/BURST TEST





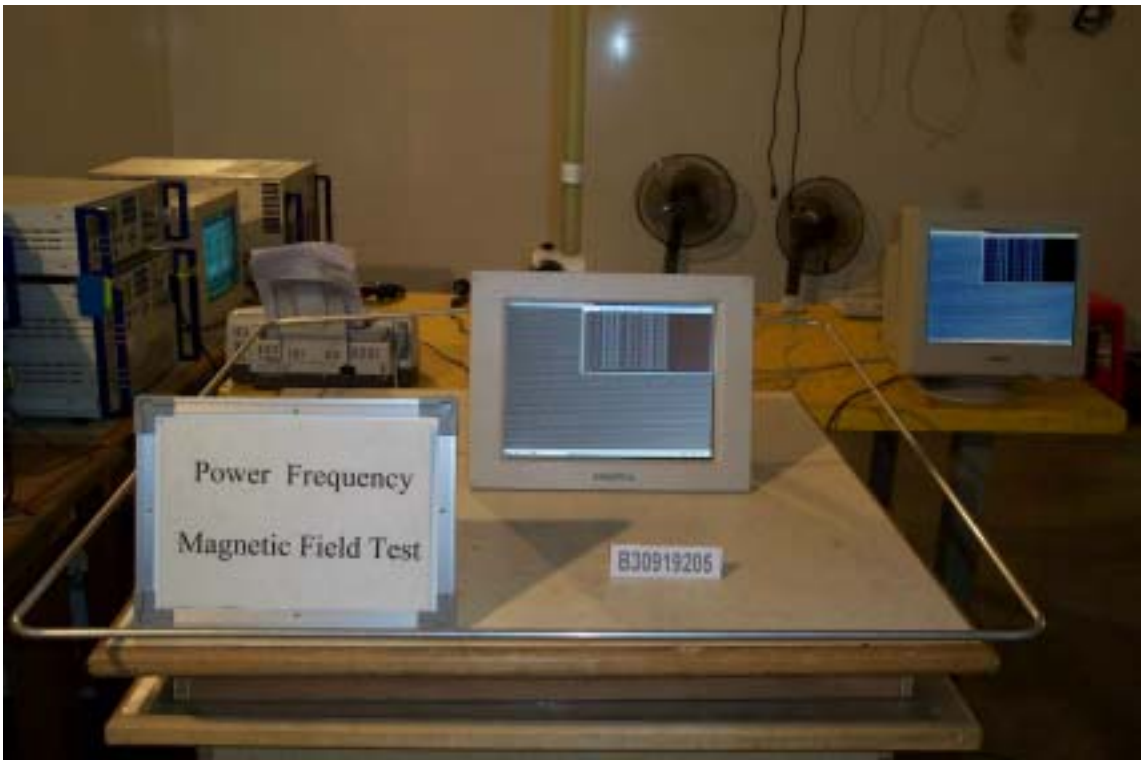
SURGE IMMUNITY TEST



CONDUCTED DISTURBANCE, INDUCED BY RADIO-FREQUENCY FIELDS TEST



POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST



VOLTAGE DIPS / INTERRUPTION TEST





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

EN 61000-3-2 TEST REPORT 2003/9/16 01:29 PM

Unit: Panel PC

Model No.: PPC-153M

Remarks: Temp: 25 °C Humid: 41%

Operator: Arno Hsieh

=====

TEST SETUP

| | | | |
|------------------|-----------|---------------|--------------|
| Test Freq.: | 50.00 Hz. | Test Voltage: | 230.0 vac |
| Waveform : | SINE | Test Time: | 2.5 min. |
| Classification : | CLASS A | Test Type: | STEADY-STATE |

| | | | |
|-------------------|-----|-----------|-------|
| Prog. Zo Enabled: | YES | Prog. Zo: | 0.000 |
|-------------------|-----|-----------|-------|

| | |
|--|--------|
| Motor Driven with Phase Angle Control: | NO |
| Impedance selected: | DIRECT |

| | |
|------------------------|------------------------|
| Synthetic R+L Enabled: | NO |
| Resistance: 0.380 Ohms | Inductance: 460.000 uH |

MAX WATTS: 65.2W



TEST DATA

Result: PASS

Harmonic Current Results

| Hn | AMPS | LO Limit | HI Limit | Result |
|----|-------|----------|----------|--------|
| 0 | 0.000 | 0.000 | 0.000 | PASS |
| 1 | 0.296 | NaN | NaN | PASS |
| 2 | 0.001 | 1.080 | 1.080 | PASS |
| 3 | 0.262 | 2.300 | 2.300 | PASS |
| 4 | 0.001 | 0.430 | 0.430 | PASS |
| 5 | 0.243 | 1.140 | 1.140 | PASS |
| 6 | 0.001 | 0.300 | 0.300 | PASS |
| 7 | 0.220 | 0.770 | 0.770 | PASS |
| 8 | 0.001 | 0.230 | 0.230 | PASS |
| 9 | 0.191 | 0.400 | 0.400 | PASS |
| 10 | 0.001 | 0.184 | 0.184 | PASS |
| 11 | 0.160 | 0.330 | 0.330 | PASS |
| 12 | 0.001 | 0.153 | 0.153 | PASS |
| 13 | 0.127 | 0.210 | 0.210 | PASS |
| 14 | 0.001 | 0.131 | 0.131 | PASS |
| 15 | 0.095 | 0.150 | 0.150 | PASS |
| 16 | 0.001 | 0.115 | 0.115 | PASS |
| 17 | 0.065 | 0.132 | 0.132 | PASS |
| 18 | 0.001 | 0.102 | 0.102 | PASS |
| 19 | 0.041 | 0.118 | 0.118 | PASS |
| 20 | 0.001 | 0.092 | 0.092 | PASS |



| | | | | |
|----|-------|-------|-------|------|
| 21 | 0.024 | 0.107 | 0.107 | PASS |
| 22 | 0.001 | 0.084 | 0.084 | PASS |
| 23 | 0.019 | 0.098 | 0.098 | PASS |
| 24 | 0.001 | 0.077 | 0.077 | PASS |
| 25 | 0.022 | 0.090 | 0.090 | PASS |
| 26 | 0.000 | 0.071 | 0.071 | PASS |
| 27 | 0.025 | 0.083 | 0.083 | PASS |
| 28 | 0.001 | 0.066 | 0.066 | PASS |
| 29 | 0.025 | 0.078 | 0.078 | PASS |
| 30 | 0.000 | 0.061 | 0.061 | PASS |
| 31 | 0.022 | 0.073 | 0.073 | PASS |
| 32 | 0.000 | 0.058 | 0.058 | PASS |
| 33 | 0.017 | 0.068 | 0.068 | PASS |
| 34 | 0.000 | 0.054 | 0.054 | PASS |
| 35 | 0.012 | 0.064 | 0.064 | PASS |
| 36 | 0.001 | 0.051 | 0.051 | PASS |
| 37 | 0.008 | 0.061 | 0.061 | PASS |
| 38 | 0.001 | 0.048 | 0.048 | PASS |
| 39 | 0.007 | 0.058 | 0.058 | PASS |
| 40 | 0.001 | 0.046 | 0.046 | PASS |

END OF REPORT



EN 61000-3-3 TEST REPORT 2003/9/16 02:03 PM

Unit: Panel PC

Model No.: PPC-153M (Continue)

Remarks: Temp: 25 °C Humid: 41%

Operator: Arno Hsieh

=====

TEST SETUP

Test Freq.: 50.00 Hz. Test Voltage: 230.0 vac

Waveform : SINE

Test Time: 10.0 min. Tshort: 10.0 min.

Prog. Zo Enabled: YES Prog. Zo: 0.000

Voltage Change less than once per Hour: NO

Impedance selected: DIRECT

Synthetic R+L Enabled: NO

Resistance: 0.380 Ohms Inductance: 460.000 uH



TEST DATA

Result: PASS

| | EUT Data | Limit | Result | Test Enabled |
|-------------------|----------|-------|--------|--------------|
| Pst max | 0.001 | 1.00 | PASS | true |
| Plt max | 0.001 | 0.65 | PASS | true |
| dc % | 0.00 | 3.00 | PASS | true |
| dmax % | 0.00 | 4.00 | PASS | true |
| d(t) sec. | 0.00 | 0.20 | PASS | true |
| Power Source Data | | | | |
| Source Pst max | 0.020 | 0.400 | PASS | true |
| % THD | 0.03 | 3.000 | PASS | true |

END OF REPORT



EN 61000-3-3 TEST REPORT 2003/9/16 02:19 PM

Unit: Panel PC

Model No.: PPC-153M (Manual Switch)

Remarks: Temp: 25 °C Humid: 41%

Operator: Arno Hsieh

=====

TEST SETUP

Test Freq.: 50.00 Hz. Test Voltage: 230.0 vac

Waveform : SINE

Test Time: 10.0 min. Tshort: 10.0 min.

Prog. Zo Enabled: YES Prog. Zo: 0.000

Voltage Change less than once per Hour: NO

Impedance selected: DIRECT

Synthetic R+L Enabled: NO

Resistance: 0.380 Ohms Inductance: 460.000 uH



TEST DATA

Result: PASS

| | EUT Data | Limit | Result | Test Enabled |
|-------------------|----------|-------|--------|--------------|
| Pst max | 0.009 | 1.00 | PASS | true |
| Plt max | 0.009 | 0.65 | PASS | true |
| dc % | 0.00 | 3.00 | PASS | true |
| dmax % | 0.00 | 4.00 | PASS | true |
| d(t) sec. | 0.00 | 0.20 | PASS | true |
| Power Source Data | | | | |
| Source Pst max | 0.020 | 0.400 | PASS | true |
| % THD | 0.03 | 3.000 | PASS | true |

END OF REPORT