CE EMC TEST REPORT

REPORT NO.: CE990712C14A
MODEL NO.: AHM85PS12, AHM85PS24 (Refer to item 3.1 for more details)
RECEIVED: Jun. 12, 2010
TESTED: Jul. 21 ~ Sep. 27, 2010

APPLICANT: XP Power Limited
ADDRESS: 401 Commonwealth Drive Haw Par Technocentre, Lobby B, #02-02, Singapore 149598

ISSUED BY: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
LAB ADDRESS: No. 19, Hwa Ya 2nd Rd., Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.
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## RELEASE CONTROL RECORD

<table>
<thead>
<tr>
<th>ISSUE NO.</th>
<th>REASON FOR CHANGE</th>
<th>DATE ISSUED</th>
</tr>
</thead>
</table>
1 CERTIFICATION

PRODUCT: AC/DC adaptor
BRAND: XP Power
MODEL NO.: AHM85PS12, AHM85PS24 (Refer to item 3.1 for more details)
APPLICANT: XP Power Limited
TESTED: Jul. 21 ~ Sep. 27, 2010
TEST SAMPLE: ENGINEERING SAMPLE
EN 55022:2010 +AC:2011, Class B
CISPR 22:2008, Class B
EN 55011:2009 +A1:2010, Group I, Class B
CISPR 11:2009 +A1:2010 ED. 5.1, Group I, Class B
EN 61000-3-3:2008
IEC 61000-3-3:2008
EN 55024:2010
IEC 61000-4-2:2008 ED. 3.2
IEC 61000-4-3:2010 ED. 3.2
IEC 61000-4-4:2012 ED. 3.2
IEC 61000-4-5:2005 ED. 2.0
IEC 61000-4-6:2008 ED. 3.0
IEC 61000-4-8:2009 ED. 2.0
IEC 61000-4-11:2004 ED. 2.0

The above equipment (Model: AHM85PS12, AHM85PS24) has been tested by Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample’s EMC characteristics under the conditions specified in this report.


APPROVED BY: David Liu / Senior Engineer, DATE: Aug. 14, 2013
2 SUMMARY OF TEST RESULTS

After estimating all the combination of every test mode, the result shown as below is the worst case.

The EUT has been tested according to the following specifications.

<table>
<thead>
<tr>
<th>Standard</th>
<th>Test Type</th>
<th>Result</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN 60601-1-2:2007 +AC:2010</td>
<td>Conducted emission test</td>
<td>PASS</td>
<td>Meet the requirement of limit Minimum passing margin is -17.51 dB at 0.306 MHz</td>
</tr>
<tr>
<td>EN 55022:2010 +AC:2011, Class B</td>
<td>Radiated emission test</td>
<td>PASS</td>
<td>Meet the requirement of limit Minimum passing margin is -4.61 dB at 155.25 MHz</td>
</tr>
<tr>
<td>CISPR 22:2008, Class B</td>
<td>Harmonic current emission test</td>
<td>PASS</td>
<td>Meets the requirements</td>
</tr>
<tr>
<td>EN 55011:2009 +A1:2010, Group I, Class B</td>
<td>Voltage fluctuations &amp; flicker tests</td>
<td>PASS</td>
<td>Meets the requirements</td>
</tr>
<tr>
<td>CISPR 11:2009 +A1:2010</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ED. 5.1, Group I, Class B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EN 61000-3-2:2006 +A1:2009, Class A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EN 61000-3-3:2008</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IEC 61000-3-3:2008</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Standard</th>
<th>Test Type</th>
<th>Result</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC 61000-4-2:2008 ED. 2.0</td>
<td>Electrostatic discharge immunity test</td>
<td>PASS</td>
<td>Meets the requirements</td>
</tr>
<tr>
<td>IEC 61000-4-3:2010 ED. 3.2</td>
<td>Radiated, radio-frequency, electromagnetic field immunity test</td>
<td>PASS</td>
<td>Meets the requirements</td>
</tr>
<tr>
<td>IEC 61000-4-4:2012 ED. 3.0</td>
<td>Electrical fast transient / burst immunity test</td>
<td>PASS</td>
<td>Meets the requirements</td>
</tr>
<tr>
<td>IEC 61000-4-5:2005 ED. 2.0</td>
<td>Surge immunity test</td>
<td>PASS</td>
<td>Meets the requirements</td>
</tr>
<tr>
<td>IEC 61000-4-6:2008 ED. 3.0</td>
<td>Immunity to conducted disturbances, induced by radio-frequency fields</td>
<td>PASS</td>
<td>Meets the requirements</td>
</tr>
<tr>
<td>IEC 61000-4-8:2009 ED. 2.0</td>
<td>Power frequency magnetic field immunity test.</td>
<td>PASS</td>
<td>Meets the requirements</td>
</tr>
<tr>
<td>IEC 61000-4-11:2004 ED. 2.0</td>
<td>Voltage dips, short interruptions and voltage variations immunity tests</td>
<td>PASS</td>
<td>Meets the requirements</td>
</tr>
</tbody>
</table>
## IMMUNITY (EN 55024:2010)

<table>
<thead>
<tr>
<th>Standard</th>
<th>Test Type</th>
<th>Result</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC 61000-4-2:2008 ED. 2.0</td>
<td>Electrostatic discharge immunity test</td>
<td>PASS</td>
<td>Meets the requirements of Performance Criterion A</td>
</tr>
<tr>
<td>IEC 61000-4-3:2010 ED. 3.2</td>
<td>Radiated, radio-frequency, electromagnetic field immunity test</td>
<td>PASS</td>
<td>Meets the requirements of Performance Criterion A</td>
</tr>
<tr>
<td>IEC 61000-4-4:2012 ED. 3.0</td>
<td>Electrical fast transient / burst immunity test</td>
<td>PASS</td>
<td>Meets the requirements of Performance Criterion A</td>
</tr>
<tr>
<td>IEC 61000-4-5:2005 ED. 2.0</td>
<td>Surge immunity test</td>
<td>PASS</td>
<td>Meets the requirements of Performance Criterion A</td>
</tr>
<tr>
<td>IEC 61000-4-6:2008 ED. 3.0</td>
<td>Immunity to conducted disturbances, induced by radio-frequency fields</td>
<td>PASS</td>
<td>Meets the requirements of Performance Criterion A</td>
</tr>
<tr>
<td>IEC 61000-4-8:2009 ED. 2.0</td>
<td>Power frequency magnetic field immunity test.</td>
<td>PASS</td>
<td>Meets the requirements of Performance Criterion A</td>
</tr>
<tr>
<td>IEC 61000-4-11:2004 ED. 2.0</td>
<td>Voltage dips, short interruptions and voltage variations immunity tests</td>
<td>PASS</td>
<td>Meets the requirements of Voltage Dips: Performance Criterion A Voltage Interruptions: Performance Criterion B</td>
</tr>
</tbody>
</table>

### 2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Frequency</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conducted emission</td>
<td>150kHz ~ 30MHz</td>
<td>2.44 dB</td>
</tr>
<tr>
<td>Radiated emission</td>
<td>30MHz ~ 1GHz</td>
<td>3.84 dB</td>
</tr>
</tbody>
</table>

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.
3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>AC/DC adaptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODEL NO.</td>
<td>AHM85PS12, AHM85PS24 (Refer to Note for more details)</td>
</tr>
<tr>
<td>S/N</td>
<td>Refer to Note for the more details</td>
</tr>
<tr>
<td>POWER SUPPLY</td>
<td>100-240Vac</td>
</tr>
<tr>
<td>DATA CABLE</td>
<td>NA</td>
</tr>
<tr>
<td>ACCESSORY DEVICE</td>
<td>NA</td>
</tr>
<tr>
<td>POWER LINE</td>
<td>DC 0.8 m shielded cable with 1 core</td>
</tr>
</tbody>
</table>

NOTE:
1. This report is issued as a duplicate report to the original BV ADT report no.: CE990712C14. The difference compared with original report is updating all standards to the latest version. Due to no effect on any test item, we did not re-test.
2. All models are listed as below.

<table>
<thead>
<tr>
<th>Brand</th>
<th>Model</th>
<th>S/N</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>XP Power</td>
<td>AHM85PSxx</td>
<td>-</td>
<td>where xx is any number represent output voltage</td>
</tr>
<tr>
<td></td>
<td>AHM85PS12</td>
<td>-</td>
<td>Input Power: 100-240Vac, 50/60Hz, 1.0-0.4A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Output Power: 12Vdc, 7.08A max</td>
</tr>
<tr>
<td></td>
<td>AHM85PS24</td>
<td>-</td>
<td>Input Power: 100-240Vac, 50/60Hz, 1.0-0.4A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Output Power: 24Vdc, 3.54A max</td>
</tr>
</tbody>
</table>

* The AHM85PS12 and AHM85PS24 were chosen for final tested.
3. The EUT's highest operating frequency is 100kHz, therefore the radiated emission is tested up to 1GHz.
4. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.
3.2 DESCRIPTION OF TEST MODES

Test modes are presented in the report as below

<table>
<thead>
<tr>
<th>Test Mode</th>
<th>Tested EUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>AHM85PS12</td>
</tr>
<tr>
<td>B</td>
<td>AHM85PS24</td>
</tr>
</tbody>
</table>

3.3 GENERAL DESCRIPTION OF THE APPLIED STANDARD

The EUT is a kind of ITE equipment, and according to the specification of the EUT declared by the manufacturer, it must comply with the requirements of the following standards:

EN 60601-1-2:2007 +AC:2010
EN 55022:2010 +AC:2011, Class B
CISPR 22:2008, Class B
EN 55011:2009 +A1:2010, Group I, Class B
CISPR 11:2009 +A1:2010 ED. 5.1, Group I, Class B
EN 61000-3-3:2008
IEC 61000-3-3:2008
EN 55024:2010
IEC 61000-4-2:2008 ED. 2.0
IEC 61000-4-3:2010 ED. 3.2
IEC 61000-4-4:2012 ED. 3.0
IEC 61000-4-5:2005 ED. 2.0
IEC 61000-4-6:2008 ED. 3.0
IEC 61000-4-8:2009 ED. 2.0
IEC 61000-4-11:2004 ED. 2.0

Note: The above IEC / EN basic standards are applied with latest version if customer has no special requirement.

All tests have been performed and recorded as per the above standards.
3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

For emission test

<table>
<thead>
<tr>
<th>NO.</th>
<th>PRODUCT</th>
<th>BRAND</th>
<th>MODEL NO.</th>
<th>SERIAL NO.</th>
<th>FCC ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DUMMY LOAD</td>
<td>ADT</td>
<td>L19A</td>
<td>L2-010021</td>
<td>NA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NO.</th>
<th>SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NA</td>
</tr>
</tbody>
</table>

NOTE: All power cords of the above support units are non-shielded (1.8 m).

For harmonics, flicker and immunity tests

<table>
<thead>
<tr>
<th>NO.</th>
<th>PRODUCT</th>
<th>BRAND</th>
<th>MODEL NO.</th>
<th>SERIAL NO.</th>
<th>FCC ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DUMMY LOAD</td>
<td>ADT</td>
<td>L19A</td>
<td>L2-010031</td>
<td>NA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NO.</th>
<th>PRODUCT</th>
<th>BRAND</th>
<th>MODEL NO.</th>
<th>SERIAL NO.</th>
<th>FCC ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>DIGITAL MULTIMETER</td>
<td>Pro’s Kit</td>
<td>MT-2007</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NO.</th>
<th>SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NA</td>
</tr>
<tr>
<td>2</td>
<td>NA</td>
</tr>
</tbody>
</table>

NOTE: All power cords of the above support units are non-shielded (1.8 m).
3.5 CONFIGURATION OF SYSTEM UNDER TEST

For emission test

(Power from AC mains)

*Test Table

For harmonics, flicker and immunity tests

(Power from AC mains)

*Test Table
4 EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

TEST STANDARD: EN 55011, CISPR 11, EN 55022, CISPR 22

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Class A (dBuV)</th>
<th>Class B (dBuV)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quasi-peak</td>
<td>Average</td>
</tr>
<tr>
<td>0.15-0.5</td>
<td>79</td>
<td>66</td>
</tr>
<tr>
<td>0.5-5</td>
<td>73</td>
<td>60</td>
</tr>
<tr>
<td>5-30</td>
<td>73</td>
<td>60</td>
</tr>
</tbody>
</table>

NOTE: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

<table>
<thead>
<tr>
<th>DESCRIPTION &amp; MANUFACTURER</th>
<th>MODEL NO.</th>
<th>SERIAL NO.</th>
<th>DATE OF CALIBRATION</th>
<th>DUE DATE OF CALIBRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Receiver</td>
<td>ESCS30</td>
<td>100291</td>
<td>Dec. 16, 2009</td>
<td>Dec. 15, 2010</td>
</tr>
<tr>
<td>ROHDE &amp; SCHWARZ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RF signal cable</td>
<td>5D-FB</td>
<td>Cable-HYC01-01</td>
<td>Nov. 12, 2009</td>
<td>Nov. 11, 2010</td>
</tr>
<tr>
<td>Woken</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LISN ROHDE &amp; SCHWARZ</td>
<td>ESH3-Z5</td>
<td>835239/001</td>
<td>Feb., 10, 2010</td>
<td>Feb. 09, 2011</td>
</tr>
<tr>
<td>Software ADT</td>
<td>ADT_Cond_ V7.3.7</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.
4.1.3 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50μH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit - 20dB) was not reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.
4.1.5 TEST SETUP

Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.1.6 EUT OPERATING CONDITIONS

a. Placed the EUT on the testing table.
b. Set the EUT under full load.
4.1.7 TEST RESULTS (A)

INPUT POWER
230 Vac, 50 Hz

6dB BANDWIDTH
9 kHz

ENVIRONMENTAL CONDITIONS
25 deg. C, 52% RH, 980 hPa

PHASE
Line 1

TESTED BY
Daniel Lin

<table>
<thead>
<tr>
<th>No</th>
<th>Freq. [MHz]</th>
<th>Corr. Factor (dB)</th>
<th>Reading Value [dB (uV)]</th>
<th>Emission Level [dB (uV)]</th>
<th>Limit [dB (uV)]</th>
<th>Margin (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Q.P.</td>
<td>AV.</td>
<td>Q.P.</td>
<td>AV.</td>
</tr>
<tr>
<td>1</td>
<td>0.150</td>
<td>0.12</td>
<td>45.86</td>
<td>-</td>
<td>45.98</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>0.306</td>
<td>0.12</td>
<td>42.44</td>
<td>-</td>
<td>42.56</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>0.486</td>
<td>0.14</td>
<td>32.04</td>
<td>-</td>
<td>32.18</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>0.943</td>
<td>0.18</td>
<td>27.63</td>
<td>-</td>
<td>27.81</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>23.590</td>
<td>1.71</td>
<td>30.76</td>
<td>-</td>
<td>32.47</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>25.512</td>
<td>1.82</td>
<td>35.06</td>
<td>-</td>
<td>36.88</td>
<td>-</td>
</tr>
</tbody>
</table>

REMARKS:
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.
INPUT POWER  
230 Vac, 50 Hz  

6dB BANDWIDTH  
9 kHz  

ENVIRONMENTAL CONDITIONS  
25 deg. C, 52% RH, 980 hPa  

PHASE  
Line 2  

TESTED BY  
Daniel Lin  

<table>
<thead>
<tr>
<th>No</th>
<th>Freq. [MHz]</th>
<th>Corr. Factor (dB)</th>
<th>Reading Value [dB (uV)]</th>
<th>Emission Level [dB (uV)]</th>
<th>Limit [dB (uV)]</th>
<th>Margin (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Q.P. AV.</td>
<td>Q.P. AV.</td>
<td>Q.P. AV.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.166</td>
<td>0.10</td>
<td>43.95 - 44.05</td>
<td>65.18 - 55.18</td>
<td>-21.13 -</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.310</td>
<td>0.11</td>
<td>39.97 - 40.08</td>
<td>59.97 - 49.97</td>
<td>-19.89 -</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.416</td>
<td>0.12</td>
<td>28.48 - 28.60</td>
<td>57.54 - 47.54</td>
<td>-28.93 -</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.599</td>
<td>0.14</td>
<td>38.03 - 38.17</td>
<td>56.00 - 46.00</td>
<td>-17.83 -</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>13.605</td>
<td>0.82</td>
<td>23.12 - 23.94</td>
<td>60.00 - 50.00</td>
<td>-36.06 -</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>26.613</td>
<td>1.64</td>
<td>32.75 - 34.39</td>
<td>60.00 - 50.00</td>
<td>-25.61 -</td>
<td></td>
</tr>
</tbody>
</table>

REMARKS:  
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.  
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.  
3. The emission levels of other frequencies were very low against the limit.  
4. Margin value = Emission level - Limit value  
5. Correction factor = Insertion loss + Cable loss  
6. Emission Level = Correction Factor + Reading Value.
4.1.8 TEST RESULTS (B)

<table>
<thead>
<tr>
<th>INPUT POWER</th>
<th>230 Vac, 50 Hz</th>
<th>6dB BANDWIDTH</th>
<th>9 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVIRONMENTAL</td>
<td>25 deg. C, 52% RH,</td>
<td>PHASE</td>
<td>Line 1</td>
</tr>
<tr>
<td>CONDITIONS</td>
<td>980 hPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TESTED BY</td>
<td>Daniel Lin</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No</th>
<th>Freq. [MHz]</th>
<th>Corr. Factor (dB)</th>
<th>Reading Value [dB (uV)]</th>
<th>Emission Level [dB (uV)]</th>
<th>Limit [dB (uV)]</th>
<th>Margin (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Q.P.</td>
<td>AV.</td>
<td>Q.P.</td>
<td>AV.</td>
</tr>
<tr>
<td>1</td>
<td>0.150</td>
<td>0.12</td>
<td>47.07</td>
<td>-</td>
<td>47.19</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>0.173</td>
<td>0.12</td>
<td>42.09</td>
<td>-</td>
<td>42.21</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>0.236</td>
<td>0.11</td>
<td>40.77</td>
<td>-</td>
<td>40.88</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>0.341</td>
<td>0.12</td>
<td>31.84</td>
<td>-</td>
<td>31.96</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>0.556</td>
<td>0.14</td>
<td>27.68</td>
<td>-</td>
<td>27.82</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>23.844</td>
<td>1.72</td>
<td>33.48</td>
<td>-</td>
<td>35.20</td>
<td>-</td>
</tr>
</tbody>
</table>

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.

![Graph of test results](image-url)
**INPUT POWER**

230 Vac, 50 Hz

**6dB BANDWIDTH**

9 kHz

**ENVIRONMENTAL CONDITIONS**

25 deg. C, 52% RH, 980 hPa

**PHASE**

Line 2

**TESTED BY**

Daniel Lin

<table>
<thead>
<tr>
<th>No</th>
<th>Freq. [MHz]</th>
<th>Corr. Factor (dB)</th>
<th>Reading Value [dB (uV)]</th>
<th>Emission Level [dB (uV)]</th>
<th>Limit [dB (uV)]</th>
<th>Margin (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Q.P.</td>
<td>AV.</td>
<td>Q.P.</td>
<td>AV.</td>
</tr>
<tr>
<td>1</td>
<td>0.150</td>
<td>0.10</td>
<td>47.72</td>
<td>-</td>
<td>47.82</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>0.170</td>
<td>0.10</td>
<td>43.85</td>
<td>-</td>
<td>43.95</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>0.224</td>
<td>0.10</td>
<td>42.81</td>
<td>-</td>
<td>42.91</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>0.298</td>
<td>0.11</td>
<td>34.17</td>
<td>-</td>
<td>34.28</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>18.246</td>
<td>1.17</td>
<td>25.46</td>
<td>-</td>
<td>26.63</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>24.004</td>
<td>1.51</td>
<td>34.63</td>
<td>-</td>
<td>36.14</td>
<td>-</td>
</tr>
</tbody>
</table>

**REMARKS:**

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. ".": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.
# 4.2 RADIATED EMISSION MEASUREMENT

## 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

**TEST STANDARD:** EN 55011, CISPR 11, EN 55022, CISPR 22

### Frequency (MHz) & Emission Limits (Class A & Class B)

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Class A (at 10m)</th>
<th>Class B (at 10m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quasi-peak (dBuV/m)</td>
<td>Quasi-peak (dBuV/m)</td>
</tr>
<tr>
<td>30-230</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>230-1000</td>
<td>47</td>
<td>37</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Class A (at 3m)</th>
<th>Class B (at 3m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Peak (dBuV/m)</td>
<td>Average (dBuV/m)</td>
</tr>
<tr>
<td>1000-3000</td>
<td>76</td>
<td>56</td>
</tr>
<tr>
<td>3000-6000</td>
<td>80</td>
<td>60</td>
</tr>
</tbody>
</table>

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### FREQUENCY RANGE OF RADIATED MEASUREMENT

<table>
<thead>
<tr>
<th>Highest frequency generated or used within the EUT or on which the EUT operates or tunes (MHz)</th>
<th>Upper frequency of measurement range (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 108</td>
<td>1000</td>
</tr>
<tr>
<td>108-500</td>
<td>2000</td>
</tr>
<tr>
<td>500-1000</td>
<td>5000</td>
</tr>
<tr>
<td>Above 1000</td>
<td>Up to 5 times of the highest frequency or 6 GHz, whichever is less</td>
</tr>
</tbody>
</table>
### 4.2.2 TEST INSTRUMENTS

<table>
<thead>
<tr>
<th>DESCRIPTION &amp; MANUFACTURER</th>
<th>MODEL NO.</th>
<th>SERIAL NO.</th>
<th>DATE OF CALIBRATION</th>
<th>DUE DATE OF CALIBRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Receiver ROHDE &amp; SCHWARZ</td>
<td>ESIB7</td>
<td>100186</td>
<td>Dec. 11, 2009</td>
<td>Dec. 10, 2010</td>
</tr>
<tr>
<td>Test Receiver ROHDE &amp; SCHWARZ</td>
<td>ESIB7</td>
<td>100187</td>
<td>Sep. 18, 2009</td>
<td>Sep. 17, 2010</td>
</tr>
<tr>
<td>BILOG Antenna SCHWARZBECK</td>
<td>VULB9168</td>
<td>9168-149</td>
<td>Apr. 27, 2010</td>
<td>Apr. 26, 2011</td>
</tr>
<tr>
<td>Software ADT</td>
<td>ADT_Radiated_V 7.7.03.6</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Antenna Tower(V)</td>
<td>MFA-440</td>
<td>9707</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Antenna Tower(H)</td>
<td>MFA-440</td>
<td>970705</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Turn Table</td>
<td>DS430</td>
<td>50303</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Controller</td>
<td>MF7802</td>
<td>074</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Controller</td>
<td>MF7802</td>
<td>08093</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>RF signal cable EAST COST Microwave</td>
<td>HP 160S-29</td>
<td>NA</td>
<td>Feb. 12, 2010</td>
<td>Feb. 11, 2011</td>
</tr>
</tbody>
</table>

**NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 1.
3. The FCC Site Registration No. is 477732.
4. The IC Site Registration No. is IC 7450F-1.
5. The VCCI Site Registration No. is R-1893, G-113.
4.2.3 TEST PROCEDURE

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from 1 meter to 4 meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

NOTE: The resolution bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-Peak (QP) detection at frequency below 1 GHz.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.
4.2.5 TEST SETUP

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.2.6 EUT OPERATING CONDITIONS

Same as item 4.1.6.
### 4.2.7 TEST RESULTS (A)

**INPUT POWER**  
230 Vac, 50 Hz

**ENVIRONMENTAL CONDITIONS**  
24 deg. C, 64% RH, 980 hPa

**DETECTOR FUNCTION & BANDWIDTH**  
Quasi-Peak, 120 kHz

**FREQUENCY RANGE**  
30-1000 MHz

**TESTED BY**  
Mick Chou

### ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 M

<table>
<thead>
<tr>
<th>No.</th>
<th>Freq. (MHz)</th>
<th>Emission Level (dBuV/m)</th>
<th>Limit (dBuV/m)</th>
<th>Margin (dB)</th>
<th>Antenna Height (m)</th>
<th>Table Angle (Degree)</th>
<th>Raw Value (dBuV)</th>
<th>Correction Factor (dB/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>47.49</td>
<td>15.32 QP</td>
<td>30.00</td>
<td>-14.68</td>
<td>3.50 H</td>
<td>178</td>
<td>1.36</td>
<td>13.97</td>
</tr>
<tr>
<td>2</td>
<td>118.61</td>
<td>22.56 QP</td>
<td>30.00</td>
<td>-7.44</td>
<td>4.00 H</td>
<td>234</td>
<td>10.59</td>
<td>11.97</td>
</tr>
<tr>
<td>3</td>
<td>157.39</td>
<td>22.64 QP</td>
<td>30.00</td>
<td>-7.36</td>
<td>3.50 H</td>
<td>247</td>
<td>8.67</td>
<td>13.97</td>
</tr>
<tr>
<td>4</td>
<td>216.61</td>
<td>21.82 QP</td>
<td>30.00</td>
<td>-8.18</td>
<td>4.00 H</td>
<td>256</td>
<td>10.07</td>
<td>11.75</td>
</tr>
<tr>
<td>5</td>
<td>327.41</td>
<td>18.13 QP</td>
<td>37.00</td>
<td>-18.87</td>
<td>3.50 H</td>
<td>224</td>
<td>2.43</td>
<td>15.69</td>
</tr>
<tr>
<td>6</td>
<td>350.74</td>
<td>17.19 QP</td>
<td>37.00</td>
<td>-19.81</td>
<td>3.00 H</td>
<td>212</td>
<td>0.84</td>
<td>16.35</td>
</tr>
</tbody>
</table>

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
**INPUT POWER**
230 Vac, 50 Hz

**ENVIRONMENTAL CONDITIONS**
24 deg. C, 64% RH, 980 hPa

**DETECTOR FUNCTION & BANDWIDTH**
Quasi-Peak, 120 kHz

**FREQUENCY RANGE**
30-1000 MHz

**TESTED BY**
Mick Chou

### ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 M

<table>
<thead>
<tr>
<th>No.</th>
<th>Freq. (MHz)</th>
<th>Emission Level (dBuV/m)</th>
<th>Limit (dBuV/m)</th>
<th>Margin (dB)</th>
<th>Antenna Height (m)</th>
<th>Table Angle (Degree)</th>
<th>Raw Value (dBuV)</th>
<th>Correction Factor (dB/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>37.78</td>
<td>17.70 QP</td>
<td>30.00</td>
<td>-12.30</td>
<td>1.00 V</td>
<td>96</td>
<td>3.47</td>
<td>14.22</td>
</tr>
<tr>
<td>2</td>
<td>76.65</td>
<td>23.71 QP</td>
<td>30.00</td>
<td>-6.29</td>
<td>2.00 V</td>
<td>3</td>
<td>13.39</td>
<td>10.32</td>
</tr>
<tr>
<td>3</td>
<td>90.26</td>
<td>22.35 QP</td>
<td>30.00</td>
<td>-7.66</td>
<td>1.50 V</td>
<td>342</td>
<td>12.30</td>
<td>10.05</td>
</tr>
<tr>
<td>4</td>
<td>131.08</td>
<td>24.54 QP</td>
<td>30.00</td>
<td>-5.46</td>
<td>1.50 V</td>
<td>244</td>
<td>11.26</td>
<td>13.28</td>
</tr>
<tr>
<td>5</td>
<td>155.25</td>
<td>25.39 QP</td>
<td>30.00</td>
<td>-4.61</td>
<td>3.50 V</td>
<td>199</td>
<td>10.94</td>
<td>14.46</td>
</tr>
<tr>
<td>6</td>
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<td>1.50 V</td>
<td>321</td>
<td>9.98</td>
<td>14.75</td>
</tr>
</tbody>
</table>

**REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4.2.8 TEST RESULTS (B)

- **INPUT POWER**: 230 Vac, 50 Hz
- **ENVIRONMENTAL CONDITIONS**: 24 deg. C, 64% RH, 980 hPa
- **DETECTOR FUNCTION & BANDWIDTH**: Quasi-Peak, 120 kHz
- **FREQUENCY RANGE**: 30-1000 MHz
- **TESTED BY**: Mick Chou

### ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 M

<table>
<thead>
<tr>
<th>No.</th>
<th>Freq. (MHz)</th>
<th>Emission Level (dBuV/m)</th>
<th>Limit (dBuV/m)</th>
<th>Margin (dB)</th>
<th>Antenna Height (m)</th>
<th>Table Angle (Degree)</th>
<th>Raw Value (dBuV)</th>
<th>Correction Factor (dB/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>110.52</td>
<td>22.04 QP</td>
<td>30.00</td>
<td>-7.96</td>
<td>4.00 H</td>
<td>240</td>
<td>11.03</td>
<td>11.01</td>
</tr>
<tr>
<td>2</td>
<td>154.26</td>
<td>22.30 QP</td>
<td>30.00</td>
<td>-7.70</td>
<td>4.00 H</td>
<td>242</td>
<td>8.43</td>
<td>13.86</td>
</tr>
<tr>
<td>3</td>
<td>187.45</td>
<td>19.58 QP</td>
<td>30.00</td>
<td>-10.42</td>
<td>4.00 H</td>
<td>354</td>
<td>7.79</td>
<td>11.79</td>
</tr>
<tr>
<td>4</td>
<td>212.73</td>
<td>23.31 QP</td>
<td>30.00</td>
<td>-6.69</td>
<td>4.00 H</td>
<td>257</td>
<td>11.73</td>
<td>11.58</td>
</tr>
<tr>
<td>5</td>
<td>272.99</td>
<td>17.75 QP</td>
<td>37.00</td>
<td>-19.25</td>
<td>3.50 H</td>
<td>180</td>
<td>3.76</td>
<td>13.99</td>
</tr>
<tr>
<td>6</td>
<td>333.25</td>
<td>20.27 QP</td>
<td>37.00</td>
<td>-16.73</td>
<td>2.50 H</td>
<td>219</td>
<td>4.41</td>
<td>15.86</td>
</tr>
</tbody>
</table>

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
INPUT POWER 230 Vac, 50 Hz

ENVIRONMENTAL CONDITIONS 24 deg. C, 64% RH, 980 hPa

DETECTOR FUNCTION & BANDWIDTH Quasi-Peak, 120 kHz

FREQUENCY RANGE 30-1000 MHz

TESTED BY Mick Chou

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 M**

<table>
<thead>
<tr>
<th>No.</th>
<th>Freq. (MHz)</th>
<th>Emission Level (dBUV/m)</th>
<th>Limit (dBUV/m)</th>
<th>Margin (dB)</th>
<th>Antenna Height (m)</th>
<th>Table Angle (Degree)</th>
<th>Raw Value (dBUV)</th>
<th>Correction Factor (dB/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>37.78</td>
<td>16.95 QP</td>
<td>30.00</td>
<td>-13.05</td>
<td>1.50 V</td>
<td>224</td>
<td>2.73</td>
<td>14.22</td>
</tr>
<tr>
<td>2</td>
<td>74.71</td>
<td>20.07 QP</td>
<td>30.00</td>
<td>-9.93</td>
<td>2.00 V</td>
<td>49</td>
<td>9.21</td>
<td>10.85</td>
</tr>
<tr>
<td>3</td>
<td>98.04</td>
<td>20.47 QP</td>
<td>30.00</td>
<td>-9.53</td>
<td>1.50 V</td>
<td>76</td>
<td>10.28</td>
<td>10.19</td>
</tr>
<tr>
<td>4</td>
<td>152.45</td>
<td>24.80 QP</td>
<td>30.00</td>
<td>-5.20</td>
<td>3.00 V</td>
<td>199</td>
<td>10.38</td>
<td>14.41</td>
</tr>
<tr>
<td>5</td>
<td>183.57</td>
<td>17.49 QP</td>
<td>30.00</td>
<td>-12.51</td>
<td>1.00 V</td>
<td>342</td>
<td>4.88</td>
<td>12.60</td>
</tr>
<tr>
<td>6</td>
<td>214.67</td>
<td>18.88 QP</td>
<td>30.00</td>
<td>-11.12</td>
<td>1.50 V</td>
<td>148</td>
<td>6.57</td>
<td>12.30</td>
</tr>
<tr>
<td>7</td>
<td>276.87</td>
<td>15.91 QP</td>
<td>37.00</td>
<td>-21.09</td>
<td>2.50 V</td>
<td>214</td>
<td>1.10</td>
<td>14.82</td>
</tr>
<tr>
<td>8</td>
<td>329.36</td>
<td>16.95 QP</td>
<td>37.00</td>
<td>-20.05</td>
<td>1.00 V</td>
<td>201</td>
<td>0.50</td>
<td>16.45</td>
</tr>
</tbody>
</table>

**REMARKS:**

1. Emission level(dBUV/m)=Raw Value(dBUV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4.3 HARMONICS CURRENT MEASUREMENT

4.3.1 LIMITS OF HARMONICS CURRENT MEASUREMENT

TEST STANDARD: IEC / EN 61000-3-2

<table>
<thead>
<tr>
<th>Limits for Class A equipment</th>
<th>Limits for Class D equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harmonics Order n</td>
<td>Max. permissible harmonics current A</td>
</tr>
<tr>
<td>Odd harmonics</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2.30</td>
</tr>
<tr>
<td>5</td>
<td>1.14</td>
</tr>
<tr>
<td>7</td>
<td>0.77</td>
</tr>
<tr>
<td>9</td>
<td>0.40</td>
</tr>
<tr>
<td>11</td>
<td>0.33</td>
</tr>
<tr>
<td>13</td>
<td>0.21</td>
</tr>
<tr>
<td>15&lt;=n&lt;=39</td>
<td>0.15x15/n</td>
</tr>
<tr>
<td>Even harmonics</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1.08</td>
</tr>
<tr>
<td>4</td>
<td>0.43</td>
</tr>
<tr>
<td>6</td>
<td>0.30</td>
</tr>
<tr>
<td>8&lt;=n&lt;=40</td>
<td>0.23x8/n</td>
</tr>
</tbody>
</table>

NOTE:  
1. Class A and Class D are classified according to item section 5 of EN 61000-3-2.
2. According to section 7 of EN 61000-3-2, the above limits for all equipment except for lighting equipment having an active input power > 75 W and no limits apply for equipment with an active input power up to and including 75 W.
4.3.2 TEST INSTRUMENTS

<table>
<thead>
<tr>
<th>DESCRIPTION &amp; MANUFACTURER</th>
<th>MODEL NO.</th>
<th>SERIAL NO.</th>
<th>DATE OF CALIBRATION</th>
<th>DUE DATE OF CALIBRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schaffner AC Power Source</td>
<td>NSG1007</td>
<td>55616</td>
<td>Nov. 12, 2009</td>
<td>Nov. 11, 2010</td>
</tr>
<tr>
<td>Schaffner Signal Conditioning Unit- Lumped Impedance</td>
<td>CCN1000-1-LR1</td>
<td>72224</td>
<td>Nov. 12, 2009</td>
<td>Nov. 11, 2010</td>
</tr>
<tr>
<td>Software</td>
<td>Schaffner Win 2100V3</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

NOTE: 1. The test was performed in Hwa Ya EMS Room.
       2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 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 classification of EUT is according to section 5 of EN 61000-3-2.
   The EUT is classified as follows:
   - Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.
   - Class B: Portable tools. Arc welding equipment which is not professional equipment.
   - Class C: Lighting equipment.
   - Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers, personal computer monitors and TV receivers.
c. 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.
4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

4.3.5 TEST SETUP

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.3.6 EUT OPERATING CONDITIONS

a. Set the EUT on full load.

b. Connected a resistor load to DC output port of EUT to make EUT have maximum power consumption and a multimeter was used to monitor voltage of output.
4.3.7 TEST RESULTS (A)

| FUNDAMENTAL VOLTAGE/AMPERE | 230.09 Vrms | 0.392 Amps |
| POWER FREQUENCY          | 50.00 Hz    |
| RATED POWER CONSUMPTION  | 85.2 W      |
| POWER FACTOR             | 0.919       |
| ENVIRONMENTAL CONDITIONS | 24 deg. C, 53% RH, 980 hPa |
| TESTED BY                | Ariel Lin   |

![Harmonic Current RMS (Amps) vs Harmonic #](image-url)
<table>
<thead>
<tr>
<th>Harm #</th>
<th>Harms (avg) (A)</th>
<th>100% Limit (A)</th>
<th>Harms (max) (A)</th>
<th>150% Limit (A)</th>
<th>Test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.002</td>
<td>1.080</td>
<td>0.002</td>
<td>1.620</td>
<td>PASS</td>
</tr>
<tr>
<td>3</td>
<td>0.062</td>
<td>2.300</td>
<td>0.064</td>
<td>3.450</td>
<td>PASS</td>
</tr>
<tr>
<td>4</td>
<td>0.001</td>
<td>0.430</td>
<td>0.001</td>
<td>0.645</td>
<td>PASS</td>
</tr>
<tr>
<td>5</td>
<td>0.018</td>
<td>1.140</td>
<td>0.019</td>
<td>1.710</td>
<td>PASS</td>
</tr>
<tr>
<td>6</td>
<td>0.001</td>
<td>0.300</td>
<td>0.001</td>
<td>0.450</td>
<td>PASS</td>
</tr>
<tr>
<td>7</td>
<td>0.016</td>
<td>0.770</td>
<td>0.016</td>
<td>1.155</td>
<td>PASS</td>
</tr>
<tr>
<td>8</td>
<td>0.001</td>
<td>0.230</td>
<td>0.001</td>
<td>0.345</td>
<td>PASS</td>
</tr>
<tr>
<td>9</td>
<td>0.012</td>
<td>0.400</td>
<td>0.012</td>
<td>0.600</td>
<td>PASS</td>
</tr>
<tr>
<td>10</td>
<td>0.001</td>
<td>0.184</td>
<td>0.001</td>
<td>0.276</td>
<td>PASS</td>
</tr>
<tr>
<td>11</td>
<td>0.007</td>
<td>0.330</td>
<td>0.007</td>
<td>0.495</td>
<td>PASS</td>
</tr>
<tr>
<td>12</td>
<td>0.001</td>
<td>0.153</td>
<td>0.001</td>
<td>0.230</td>
<td>PASS</td>
</tr>
<tr>
<td>13</td>
<td>0.005</td>
<td>0.210</td>
<td>0.006</td>
<td>0.315</td>
<td>PASS</td>
</tr>
<tr>
<td>14</td>
<td>0.001</td>
<td>0.131</td>
<td>0.001</td>
<td>0.197</td>
<td>PASS</td>
</tr>
<tr>
<td>15</td>
<td>0.005</td>
<td>0.150</td>
<td>0.005</td>
<td>0.225</td>
<td>PASS</td>
</tr>
<tr>
<td>16</td>
<td>0.001</td>
<td>0.115</td>
<td>0.001</td>
<td>0.173</td>
<td>PASS</td>
</tr>
<tr>
<td>17</td>
<td>0.005</td>
<td>0.132</td>
<td>0.005</td>
<td>0.199</td>
<td>PASS</td>
</tr>
<tr>
<td>18</td>
<td>0.001</td>
<td>0.102</td>
<td>0.001</td>
<td>0.153</td>
<td>PASS</td>
</tr>
<tr>
<td>19</td>
<td>0.005</td>
<td>0.118</td>
<td>0.005</td>
<td>0.178</td>
<td>PASS</td>
</tr>
<tr>
<td>20</td>
<td>0.001</td>
<td>0.092</td>
<td>0.001</td>
<td>0.138</td>
<td>PASS</td>
</tr>
<tr>
<td>21</td>
<td>0.004</td>
<td>0.107</td>
<td>0.004</td>
<td>0.161</td>
<td>PASS</td>
</tr>
<tr>
<td>22</td>
<td>0.001</td>
<td>0.084</td>
<td>0.001</td>
<td>0.125</td>
<td>PASS</td>
</tr>
<tr>
<td>23</td>
<td>0.003</td>
<td>0.098</td>
<td>0.003</td>
<td>0.147</td>
<td>PASS</td>
</tr>
<tr>
<td>24</td>
<td>0.001</td>
<td>0.077</td>
<td>0.001</td>
<td>0.115</td>
<td>PASS</td>
</tr>
<tr>
<td>25</td>
<td>0.003</td>
<td>0.090</td>
<td>0.003</td>
<td>0.135</td>
<td>PASS</td>
</tr>
<tr>
<td>26</td>
<td>0.001</td>
<td>0.071</td>
<td>0.001</td>
<td>0.106</td>
<td>PASS</td>
</tr>
<tr>
<td>27</td>
<td>0.003</td>
<td>0.083</td>
<td>0.003</td>
<td>0.125</td>
<td>PASS</td>
</tr>
<tr>
<td>28</td>
<td>0.001</td>
<td>0.066</td>
<td>0.001</td>
<td>0.099</td>
<td>PASS</td>
</tr>
<tr>
<td>29</td>
<td>0.003</td>
<td>0.078</td>
<td>0.003</td>
<td>0.116</td>
<td>PASS</td>
</tr>
<tr>
<td>30</td>
<td>0.001</td>
<td>0.061</td>
<td>0.001</td>
<td>0.092</td>
<td>PASS</td>
</tr>
<tr>
<td>31</td>
<td>0.003</td>
<td>0.073</td>
<td>0.003</td>
<td>0.109</td>
<td>PASS</td>
</tr>
<tr>
<td>32</td>
<td>0.001</td>
<td>0.058</td>
<td>0.001</td>
<td>0.086</td>
<td>PASS</td>
</tr>
<tr>
<td>33</td>
<td>0.003</td>
<td>0.068</td>
<td>0.003</td>
<td>0.102</td>
<td>PASS</td>
</tr>
<tr>
<td>34</td>
<td>0.001</td>
<td>0.054</td>
<td>0.001</td>
<td>0.081</td>
<td>PASS</td>
</tr>
<tr>
<td>35</td>
<td>0.002</td>
<td>0.064</td>
<td>0.002</td>
<td>0.096</td>
<td>PASS</td>
</tr>
<tr>
<td>36</td>
<td>0.001</td>
<td>0.051</td>
<td>0.001</td>
<td>0.077</td>
<td>PASS</td>
</tr>
<tr>
<td>37</td>
<td>0.002</td>
<td>0.061</td>
<td>0.002</td>
<td>0.091</td>
<td>PASS</td>
</tr>
<tr>
<td>38</td>
<td>0.001</td>
<td>0.048</td>
<td>0.001</td>
<td>0.073</td>
<td>PASS</td>
</tr>
<tr>
<td>39</td>
<td>0.002</td>
<td>0.058</td>
<td>0.002</td>
<td>0.087</td>
<td>PASS</td>
</tr>
<tr>
<td>40</td>
<td>0.000</td>
<td>0.046</td>
<td>0.000</td>
<td>0.069</td>
<td>PASS</td>
</tr>
</tbody>
</table>

**NOTE:** Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.
### 4.3.8 TEST RESULTS (B)

<table>
<thead>
<tr>
<th><strong>FUNDAMENTAL VOLTAGE/AMPERE</strong></th>
<th>230.08 Vrms 0.409 Amps</th>
<th><strong>POWER FREQUENCY</strong></th>
<th>50.00 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RATED POWER CONSUMPTION</strong></td>
<td>89.3 W</td>
<td><strong>POWER FACTOR</strong></td>
<td>0.919</td>
</tr>
<tr>
<td><strong>ENVIRONMENTAL CONDITIONS</strong></td>
<td>24 deg. C, 51% RH, 980 hPa</td>
<td><strong>TESTED BY</strong></td>
<td>JN Chen</td>
</tr>
</tbody>
</table>

![Graph showing harmonic analysis](image-url)

**Current RMS (Amps)** vs **Harmonic #**

- Y-axis: Current RMS (Amps) from 0.0 to 3.5
- X-axis: Harmonic # from 4 to 40

- **Red Line**: Harmonic Analysis
- **Blue Line**: Measurement Data
<table>
<thead>
<tr>
<th>Harm #</th>
<th>Harms (avg) (A)</th>
<th>100% Limit (A)</th>
<th>Harms (max) (A)</th>
<th>150% Limit (A)</th>
<th>Test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.002</td>
<td>1.080</td>
<td>0.002</td>
<td>1.620</td>
<td>PASS</td>
</tr>
<tr>
<td>3</td>
<td>0.079</td>
<td>2.300</td>
<td>0.081</td>
<td>3.450</td>
<td>PASS</td>
</tr>
<tr>
<td>4</td>
<td>0.001</td>
<td>0.430</td>
<td>0.001</td>
<td>0.645</td>
<td>PASS</td>
</tr>
<tr>
<td>5</td>
<td>0.019</td>
<td>1.140</td>
<td>0.019</td>
<td>1.710</td>
<td>PASS</td>
</tr>
<tr>
<td>6</td>
<td>0.001</td>
<td>0.300</td>
<td>0.001</td>
<td>0.450</td>
<td>PASS</td>
</tr>
<tr>
<td>7</td>
<td>0.016</td>
<td>0.770</td>
<td>0.016</td>
<td>1.155</td>
<td>PASS</td>
</tr>
<tr>
<td>8</td>
<td>0.001</td>
<td>0.230</td>
<td>0.001</td>
<td>0.345</td>
<td>PASS</td>
</tr>
<tr>
<td>9</td>
<td>0.011</td>
<td>0.400</td>
<td>0.011</td>
<td>0.600</td>
<td>PASS</td>
</tr>
<tr>
<td>10</td>
<td>0.001</td>
<td>0.184</td>
<td>0.001</td>
<td>0.276</td>
<td>PASS</td>
</tr>
<tr>
<td>11</td>
<td>0.005</td>
<td>0.330</td>
<td>0.006</td>
<td>0.495</td>
<td>PASS</td>
</tr>
<tr>
<td>12</td>
<td>0.001</td>
<td>0.153</td>
<td>0.001</td>
<td>0.230</td>
<td>PASS</td>
</tr>
<tr>
<td>13</td>
<td>0.005</td>
<td>0.210</td>
<td>0.005</td>
<td>0.315</td>
<td>PASS</td>
</tr>
<tr>
<td>14</td>
<td>0.001</td>
<td>0.131</td>
<td>0.001</td>
<td>0.197</td>
<td>PASS</td>
</tr>
<tr>
<td>15</td>
<td>0.005</td>
<td>0.150</td>
<td>0.006</td>
<td>0.225</td>
<td>PASS</td>
</tr>
<tr>
<td>16</td>
<td>0.001</td>
<td>0.115</td>
<td>0.001</td>
<td>0.173</td>
<td>PASS</td>
</tr>
<tr>
<td>17</td>
<td>0.005</td>
<td>0.132</td>
<td>0.005</td>
<td>0.199</td>
<td>PASS</td>
</tr>
<tr>
<td>18</td>
<td>0.001</td>
<td>0.102</td>
<td>0.001</td>
<td>0.153</td>
<td>PASS</td>
</tr>
<tr>
<td>19</td>
<td>0.005</td>
<td>0.118</td>
<td>0.005</td>
<td>0.178</td>
<td>PASS</td>
</tr>
<tr>
<td>20</td>
<td>0.001</td>
<td>0.092</td>
<td>0.001</td>
<td>0.138</td>
<td>PASS</td>
</tr>
<tr>
<td>21</td>
<td>0.003</td>
<td>0.107</td>
<td>0.003</td>
<td>0.161</td>
<td>PASS</td>
</tr>
<tr>
<td>22</td>
<td>0.001</td>
<td>0.084</td>
<td>0.001</td>
<td>0.125</td>
<td>PASS</td>
</tr>
<tr>
<td>23</td>
<td>0.003</td>
<td>0.098</td>
<td>0.003</td>
<td>0.147</td>
<td>PASS</td>
</tr>
<tr>
<td>24</td>
<td>0.001</td>
<td>0.077</td>
<td>0.001</td>
<td>0.115</td>
<td>PASS</td>
</tr>
<tr>
<td>25</td>
<td>0.003</td>
<td>0.090</td>
<td>0.003</td>
<td>0.135</td>
<td>PASS</td>
</tr>
<tr>
<td>26</td>
<td>0.001</td>
<td>0.071</td>
<td>0.001</td>
<td>0.106</td>
<td>PASS</td>
</tr>
<tr>
<td>27</td>
<td>0.003</td>
<td>0.083</td>
<td>0.003</td>
<td>0.125</td>
<td>PASS</td>
</tr>
<tr>
<td>28</td>
<td>0.001</td>
<td>0.066</td>
<td>0.001</td>
<td>0.099</td>
<td>PASS</td>
</tr>
<tr>
<td>29</td>
<td>0.003</td>
<td>0.078</td>
<td>0.003</td>
<td>0.116</td>
<td>PASS</td>
</tr>
<tr>
<td>30</td>
<td>0.001</td>
<td>0.061</td>
<td>0.001</td>
<td>0.092</td>
<td>PASS</td>
</tr>
<tr>
<td>31</td>
<td>0.003</td>
<td>0.073</td>
<td>0.003</td>
<td>0.109</td>
<td>PASS</td>
</tr>
<tr>
<td>32</td>
<td>0.001</td>
<td>0.058</td>
<td>0.001</td>
<td>0.086</td>
<td>PASS</td>
</tr>
<tr>
<td>33</td>
<td>0.002</td>
<td>0.068</td>
<td>0.003</td>
<td>0.102</td>
<td>PASS</td>
</tr>
<tr>
<td>34</td>
<td>0.001</td>
<td>0.054</td>
<td>0.001</td>
<td>0.081</td>
<td>PASS</td>
</tr>
<tr>
<td>35</td>
<td>0.002</td>
<td>0.064</td>
<td>0.002</td>
<td>0.096</td>
<td>PASS</td>
</tr>
<tr>
<td>36</td>
<td>0.001</td>
<td>0.051</td>
<td>0.001</td>
<td>0.077</td>
<td>PASS</td>
</tr>
<tr>
<td>37</td>
<td>0.002</td>
<td>0.061</td>
<td>0.002</td>
<td>0.091</td>
<td>PASS</td>
</tr>
<tr>
<td>38</td>
<td>0.001</td>
<td>0.048</td>
<td>0.001</td>
<td>0.073</td>
<td>PASS</td>
</tr>
<tr>
<td>39</td>
<td>0.002</td>
<td>0.058</td>
<td>0.003</td>
<td>0.087</td>
<td>PASS</td>
</tr>
<tr>
<td>40</td>
<td>0.000</td>
<td>0.046</td>
<td>0.000</td>
<td>0.069</td>
<td>PASS</td>
</tr>
</tbody>
</table>

**NOTE:** Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.
4.4 VOLTAGE FLUCTUATION AND FLICKS MEASUREMENT

4.4.1 LIMITS OF VOLTAGE FLUCTUATION AND FLICKS MEASUREMENT

TEST STANDARD: IEC / EN 61000-3-3

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Limit</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pst</td>
<td>1.0</td>
<td>Pst means short-term flicker indicator.</td>
</tr>
<tr>
<td>Plt</td>
<td>0.65</td>
<td>Plt means long-term flicker indicator.</td>
</tr>
<tr>
<td>Tdt (ms)</td>
<td>500</td>
<td>Tdt means maximum time that dt exceeds 3.3 %.</td>
</tr>
<tr>
<td>dmax (%)</td>
<td>4%</td>
<td>dmax means maximum relative voltage change.</td>
</tr>
<tr>
<td>dc (%)</td>
<td>3.3%</td>
<td>dc means relative steady-state voltage change.</td>
</tr>
</tbody>
</table>

4.4.2 TEST INSTRUMENTS

<table>
<thead>
<tr>
<th>DESCRIPTION &amp; MANUFACTURER</th>
<th>MODEL NO.</th>
<th>SERIAL NO.</th>
<th>DATE OF CALIBRATION</th>
<th>DUE DATE OF CALIBRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schaffner AC Power Source</td>
<td>NSG1007</td>
<td>55616</td>
<td>Nov. 12, 2009</td>
<td>Nov. 11, 2010</td>
</tr>
<tr>
<td>Schaffner Signal Conditioning Unit- Lumped Impedance</td>
<td>CCN1000-1-LR1</td>
<td>72224</td>
<td>Nov. 12, 2009</td>
<td>Nov. 11, 2010</td>
</tr>
<tr>
<td>Software</td>
<td>Schaffner Win 2100V3</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

NOTE: 1. The test was performed in Hwa Ya EMS Room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 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.
4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 TEST SETUP

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.4.6 EUT OPERATING CONDITIONS

Same as item 4.3.6.
4.4.7 TEST RESULTS (A)

<table>
<thead>
<tr>
<th>FUNDAMENTAL VOLTAGE/AMPERE</th>
<th>229.87 Vrms</th>
<th>0.392 Amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER FREQUENCY</td>
<td>50.00 Hz</td>
<td></td>
</tr>
<tr>
<td>ENVIRONMENTAL CONDITIONS</td>
<td>24 deg. C, 51% RH, 980 hPa</td>
<td></td>
</tr>
<tr>
<td>POWER FACTOR</td>
<td>0.919</td>
<td></td>
</tr>
<tr>
<td>OBSERVATION PERIOD (Tp)</td>
<td>10 mins</td>
<td>TESTED BY</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JN Chen</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Parameter</th>
<th>Measurement Value</th>
<th>Limit</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>P&lt;sub&gt;st&lt;/sub&gt;</td>
<td>0.064</td>
<td>1.0</td>
<td>PASS</td>
</tr>
<tr>
<td>P&lt;sub&gt;L&lt;/sub&gt;</td>
<td>0.028</td>
<td>0.65</td>
<td>PASS</td>
</tr>
<tr>
<td>T&lt;sub&gt;dt&lt;/sub&gt; (ms)</td>
<td>0</td>
<td>500</td>
<td>PASS</td>
</tr>
<tr>
<td>d&lt;sub&gt;max&lt;/sub&gt; (%)</td>
<td>0</td>
<td>4%</td>
<td>PASS</td>
</tr>
<tr>
<td>dc (%)</td>
<td>0</td>
<td>3.3%</td>
<td>PASS</td>
</tr>
</tbody>
</table>

**NOTE:**
1. P<sub>st</sub> means short-term flicker indicator.
2. P<sub>L</sub> means long-term flicker indicator.
3. T<sub>dt</sub> means maximum time that dt exceeds 3.3 %.
4. d<sub>max</sub> means maximum relative voltage change.
5. dc means relative steady-state voltage change.
4.4.8 TEST RESULTS (B)

<table>
<thead>
<tr>
<th>FUNDAMENTAL VOLTAGE/AMPERE</th>
<th>Measurement Value</th>
<th>Limit</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER FREQUENCY</td>
<td>50.00 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENVIRONMENTAL CONDITIONS</td>
<td>24 deg. C, 51% RH, 980 hPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OBSERVATION PERIOD (Tp)</td>
<td>10 mins</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POWER FACTOR</td>
<td>0.919</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TESTED BY</td>
<td>JN Chen</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Parameter</th>
<th>Measurement Value</th>
<th>Limit</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_{st}$</td>
<td>0.064</td>
<td>1.0</td>
<td>PASS</td>
</tr>
<tr>
<td>$P_{lt}$</td>
<td>0.028</td>
<td>0.65</td>
<td>PASS</td>
</tr>
<tr>
<td>$T_{dt}$ (ms)</td>
<td>0</td>
<td>500</td>
<td>PASS</td>
</tr>
<tr>
<td>$d_{max}$ (%)</td>
<td>0</td>
<td>4%</td>
<td>PASS</td>
</tr>
<tr>
<td>$dc$ (%)</td>
<td>0</td>
<td>3.3%</td>
<td>PASS</td>
</tr>
</tbody>
</table>

NOTE: 1. $P_{st}$ means short-term flicker indicator.
2. $P_{lt}$ means long-term flicker indicator.
3. $T_{dt}$ means maximum time that $dt$ exceeds 3.3 %.
4. $d_{max}$ means maximum relative voltage change.
5. $dc$ means relative steady-state voltage change.
### 5 IMMUNITY TEST

#### 5.1 GENERAL DESCRIPTION OF EN 60601-1-2

<table>
<thead>
<tr>
<th>Basic Standard, specification requirement</th>
<th>EN 60601-1-2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IEC 61000-4-2</strong></td>
<td>Electrostatic Discharge – ESD: 8 kV air discharge, 6 kV contact discharge</td>
</tr>
<tr>
<td><strong>IEC 61000-4-3</strong></td>
<td>Radio-Frequency Electromagnetic Field Susceptibility Test – RS: 80 MHz - 2500 MHz,  3 V/m, 80% AM (1 kHz)</td>
</tr>
<tr>
<td><strong>IEC 61000-4-4</strong></td>
<td>Electrical Fast Transient/Burst - EFT, Power line: 2 kV, Signal line: 1 kV</td>
</tr>
<tr>
<td><strong>IEC 61000-4-5</strong></td>
<td>Surge Immunity Test: 1.2/50 µs Open Circuit Voltage, 8/20 µs Short Circuit Current, Power Line – line to line: 1 kV, line to earth: 2 kV</td>
</tr>
<tr>
<td><strong>IEC 61000-4-6</strong></td>
<td>Conducted Radio Frequency Disturbances Test – CS: 0.15 MHz - 80 MHz, 3 Vrms, 80% AM, 1 kHz</td>
</tr>
<tr>
<td><strong>IEC 61000-4-8</strong></td>
<td>Power Frequency Magnetic Field Test, 50, 60 Hz, 3 A/m</td>
</tr>
<tr>
<td><strong>IEC 61000-4-11</strong></td>
<td>Voltage Dips: 1. &gt;95% reduction – 0.5 period 2. 60% reduction – 5 periods 3. 30% reduction – 25 periods Interruption: 1. &gt;95% reduction – 5000 ms</td>
</tr>
<tr>
<td>Product Standard</td>
<td>EN 60601-1-2</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------</td>
</tr>
<tr>
<td><strong>IEC 61000-4-2</strong></td>
<td>Electrostatic Discharge – ESD: ±2KV, ±4KV, ±8KV (Air Discharge); Meet Performance Criterion A ±2KV, ±4KV, ±6KV (Direct Contact Discharge); Meet Performance Criterion A ±2KV, ±4KV, ±6KV (Indirect Contact Discharge); Meet Performance Criterion A</td>
</tr>
<tr>
<td><strong>IEC 61000-4-3</strong></td>
<td>Radio-Frequency Electromagnetic Field Susceptibility Test – RS: 80 ~ 1000 MHz; 10V/m, 80% AM (1KHz sine); Meet Performance Criterion A 80 ~ 2500 MHz; 10V/m, 80% AM (1KHz sine); Meet Performance Criterion A</td>
</tr>
<tr>
<td><strong>IEC 61000-4-4</strong></td>
<td>Electrical Fast Transient/Burst - EFT, ±0.5KV, ±1KV, ±2KV; Power Line. Meet Performance Criterion A</td>
</tr>
<tr>
<td><strong>IEC 61000-4-5</strong></td>
<td>Surge Immunity Test: 1.2/50 µs Open Circuit Voltage, 8/20 µs Short Circuit Current, ±0.5KV, ±1KV, ±2KV (Line to Earth) ±0.5KV, ±1KV, ±2KV (Neutral to Earth) ±0.5KV, ±1KV (Lines to Neutral)</td>
</tr>
<tr>
<td><strong>IEC 61000-4-6</strong></td>
<td>Conducted Radio Frequency Disturbances Test – CS: 0.15 ~ 80 MHz; 10Vrm, 80% AM (1KHz sine); Meet Performance Criterion A</td>
</tr>
<tr>
<td><strong>IEC 61000-4-8</strong></td>
<td>Power Frequency Magnetic Field Test, 50/60 Hz, 10A/m</td>
</tr>
<tr>
<td>Customer requirement</td>
<td>IEC 61000-4-11</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>
### 5.2 GENERAL DESCRIPTION OF EN 55024

<table>
<thead>
<tr>
<th>Product Standard</th>
<th>EN 55024</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC 61000-4-2</td>
<td>Electrostatic Discharge – ESD: 8 kV air discharge, 4 kV contact discharge, Performance Criterion B</td>
</tr>
<tr>
<td>IEC 61000-4-3</td>
<td>Radio-Frequency Electromagnetic Field Susceptibility Test – RS: 80-1000 MHz, 3 V/m, 80% AM (1 kHz), Performance Criterion A</td>
</tr>
<tr>
<td>IEC 61000-4-4</td>
<td>Electrical Fast Transient/Burst - EFT AC power line: 1 kV, DC power line: 0.5 kV, Signal line: 0.5 kV, Performance Criterion B</td>
</tr>
<tr>
<td>IEC 61000-4-5</td>
<td>Surge Immunity Test: 1.2/50 µs Open Circuit Voltage, 8/20 µs Short Circuit Current AC power line: line to line 1 kV, line to earth 2 kV, DC power line: line to earth 0.5 kV, Signal line: 1 kV, Performance Criterion B</td>
</tr>
<tr>
<td>IEC 61000-4-6</td>
<td>Conducted Radio Frequency Disturbances Test – CS: 0.15-80 MHz, 3 Vrms, 80% AM, 1 kHz, Performance Criterion A</td>
</tr>
<tr>
<td>IEC 61000-4-8</td>
<td>Power Frequency Magnetic Field Test, 50 Hz, 1 A/m, Performance Criterion A</td>
</tr>
<tr>
<td>IEC 61000-4-11</td>
<td>Voltage Dips: 1. &gt;95% reduction -0.5 period, Performance Criterion B 2. 30% reduction – 25 periods, Performance Criterion C Voltage Interruptions: 1. &gt;95% reduction – 250 periods, Performance Criterion C</td>
</tr>
<tr>
<td>Customer requirement</td>
<td>Product Standard</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------</td>
</tr>
<tr>
<td></td>
<td>IEC 61000-4-2</td>
</tr>
<tr>
<td></td>
<td>IEC 61000-4-3</td>
</tr>
<tr>
<td></td>
<td>IEC 61000-4-4</td>
</tr>
<tr>
<td></td>
<td>IEC 61000-4-5</td>
</tr>
<tr>
<td></td>
<td>IEC 61000-4-6</td>
</tr>
<tr>
<td></td>
<td>IEC 61000-4-8</td>
</tr>
<tr>
<td>Customer requirement</td>
<td>IEC 61000-4-11</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------</td>
</tr>
<tr>
<td><strong>Product Standard</strong></td>
<td><strong>EN 55024</strong></td>
</tr>
<tr>
<td>Voltage Dips:</td>
<td></td>
</tr>
<tr>
<td>1. 70% (30% dip) UT for 500ms, Performance Criteria A, 230V full load &amp; derated to 80% with 100V AC, Performance Criteria B with no derating</td>
<td></td>
</tr>
<tr>
<td>2. 40% (60% dip) UT for 100ms, Performance Criteria A, 230V full load &amp; derated to 15% with 100V AC, Performance Criteria B with no derating</td>
<td></td>
</tr>
<tr>
<td>3. &lt;5% (100% dip) UT for 10ms, Performance Criteria A</td>
<td></td>
</tr>
<tr>
<td>4. &lt;5% (100% interruption) UT for 5000ms, Performance Criteria B</td>
<td></td>
</tr>
</tbody>
</table>
5.3 GENERAL COMPLIANCE CRITERIA DESCRIPTION

5.3.1 PERFORMANCE CRITERIA OF EN 60601-1-2

Under the test conditions specified in EN 60601-1-2 item 6.2, the ME EQUIPMENT or ME SYSTEM shall be able to provide the BASIC SAFETY and ESSENTIAL PERFORMANCE. The following DEGRADATIONS, if associated with BASIC SAFETY and ESSENTIAL PERFORMANCE, 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 would interfere with diagnosis, treatment or monitoring;
- artefact or distortion in an image in which the artefact would interfere with diagnosis, treatment or monitoring;
- failure of automatic diagnosis or treatment ME EQUIPMENT and ME SYSTEMS to diagnose or treat, even if accompanied by an alarm.

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

The ME EQUIPMENT and ME SYSTEM may exhibit DEGRADATION of performance (e.g. deviation from MANUFACTURER’S specifications) that does not affect BASIC SAFETY or ESSENTIAL PERFORMANCE.
5.3.2 PERFORMANCE CRITERIA OF EN 55024

According to Clause 7.1 of EN 55024 standard, the following describes the general performance criteria.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Criterion A</strong></td>
<td>The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.</td>
</tr>
<tr>
<td><strong>Criterion B</strong></td>
<td>After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomenon below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state if stored data is allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.</td>
</tr>
<tr>
<td><strong>Criterion C</strong></td>
<td>Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer’s instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</td>
</tr>
</tbody>
</table>

5.4 EUT OPERATING CONDITION

Same as item 4.3.6.
5.5 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

5.5.1 TEST SPECIFICATION

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Standard</td>
<td>IEC 61000-4-2</td>
</tr>
<tr>
<td>Discharge Impedance</td>
<td>330 ohm / 150 pF</td>
</tr>
<tr>
<td>Discharge Voltage</td>
<td>Air Discharge: 2, 4, 8 kV (Direct)</td>
</tr>
<tr>
<td></td>
<td>Contact Discharge: 2, 4, 6 kV (Indirect)</td>
</tr>
<tr>
<td>Polarity</td>
<td>Positive &amp; Negative</td>
</tr>
<tr>
<td>Number of Discharge</td>
<td>Air Discharge: min. 20 times at each test point</td>
</tr>
<tr>
<td></td>
<td>Contact Discharge: min. 200 times in total</td>
</tr>
<tr>
<td>Discharge Mode</td>
<td>Single Discharge</td>
</tr>
<tr>
<td>Discharge Period</td>
<td>1 second minimum</td>
</tr>
</tbody>
</table>

5.5.2 TEST INSTRUMENTS

<table>
<thead>
<tr>
<th>DESCRIPTION &amp; MANUFACTURER</th>
<th>MODEL NO.</th>
<th>SERIAL NO.</th>
<th>DATE OF CALIBRATION</th>
<th>DUE DATE OF CALIBRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30//DM-150/330</td>
<td>-rfci</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: 1. The test was performed in Hwa Ya ESD Room No. 2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
5.5.3 TEST PROCEDURE

The discharges shall be applied in two ways:

a. Contact discharges to the conductive surfaces and coupling planes:

The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges. If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.

b. Air discharges at slots and apertures and insulating surfaces:

On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur. Such points are tested using the air discharge method. This investigation should be restricted to those area normally handled by the user. A minimum of 10 single air discharges shall be applied to the selected test point for each such area.

The basic test procedure was in accordance with IEC 61000-4-2:

a. Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during normal operation.

b. The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.

c. The time interval between two successive single discharges was at least 1 second.

d. The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the EUT.

e. Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.

f. Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were complete.

g. At least ten single discharges (in the most sensitive polarity) were applied to the Horizontal Coupling Plane at points on each side of the EUT. The ESD generator was positioned horizontally at a distance of 0.1 meters from the EUT with the discharge electrode touching the HCP.

h. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the EUT.
5.5.4 DEVIATION FROM TEST STANDARD

The requirement followed by the client’s specification.

5.5.5 TEST SETUP

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

NOTE:

TABLE-TOP EQUIPMENT
The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940kΩ total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT
The equipment under test was installed in a representative system as described in section 7 of IEC 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.
5.5.6 TEST RESULTS (A)

<table>
<thead>
<tr>
<th>INPUT POWER</th>
<th>ENVIRONMENTAL CONDITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>230 Vac, 50 Hz</td>
<td>23 deg. C, 54% RH 1014 hPa</td>
</tr>
</tbody>
</table>

TESTED BY JN Chen

### TEST RESULTS OF DIRECT APPLICATION

<table>
<thead>
<tr>
<th>Discharge Level (kV)</th>
<th>Polarity</th>
<th>Test Point</th>
<th>Contact Discharge</th>
<th>Air Discharge</th>
<th>Performance Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>2, 4, 8</td>
<td>+/-</td>
<td>1-4</td>
<td>NA</td>
<td>NOTE</td>
<td>A PASS</td>
</tr>
</tbody>
</table>

**Description of test point:** Please refer to following photos for representative mark only.
1. Junction of case  
2. LED  
3. AC input plug  
4. DC connector

### TEST RESULTS OF INDIRECT APPLICATION

<table>
<thead>
<tr>
<th>Discharge Level (kV)</th>
<th>Polarity</th>
<th>Test Point</th>
<th>Contact Discharge</th>
<th>Air Discharge</th>
<th>Performance Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>2, 4, 6</td>
<td>+/-</td>
<td>4 sides</td>
<td>NOTE</td>
<td>NOTE</td>
<td>A PASS</td>
</tr>
</tbody>
</table>

**Description of test point:**
1. Front side  
2. Rear side  
3. Right side  
4. Left side

**NOTE:** There was no change compared with initial operation during and after the test.
5.5.7 TEST RESULTS (B)

<table>
<thead>
<tr>
<th>INPUT POWER</th>
<th>ENVIRONMENTAL CONDITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>230 Vac, 50 Hz</td>
<td>23 deg. C, 54% RH 1014 hPa</td>
</tr>
</tbody>
</table>

TESTED BY: JN Chen

### TEST RESULTS OF DIRECT APPLICATION

<table>
<thead>
<tr>
<th>Discharge Level (kV)</th>
<th>Polarity</th>
<th>Test Point</th>
<th>Contact Discharge</th>
<th>Air Discharge</th>
<th>Performance Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>2, 4, 8</td>
<td>+/-</td>
<td>1-4</td>
<td>NA</td>
<td>NOTE</td>
<td>EN 55024</td>
</tr>
</tbody>
</table>

Description of test point: Please refer to following photos for representative mark only.
1. Junction of case 2. LED 3. AC input plug 4. DC connector

### TEST RESULTS OF INDIRECT APPLICATION

<table>
<thead>
<tr>
<th>Discharge Level (kV)</th>
<th>Polarity</th>
<th>Test Point</th>
<th>Contact Discharge</th>
<th>Air Discharge</th>
<th>Performance Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>2, 4, 6</td>
<td>+/-</td>
<td>4 sides</td>
<td>NOTE</td>
<td>NOTE</td>
<td>EN 55024</td>
</tr>
</tbody>
</table>

Description of test point:

NOTE: There was no change compared with initial operation during and after the test.
5.6 RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST (RS)

5.6.1 TEST SPECIFICATION

<table>
<thead>
<tr>
<th>Basic Standard:</th>
<th>IEC 61000-4-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range:</td>
<td>80 MHz ~ 2500 MHz</td>
</tr>
<tr>
<td>Field Strength:</td>
<td>10 V/m</td>
</tr>
<tr>
<td>Modulation:</td>
<td>1 kHz Sine Wave, 80%, AM Modulation</td>
</tr>
<tr>
<td>Frequency Step:</td>
<td>1 % of preceding frequency value</td>
</tr>
<tr>
<td>Polarity of Antenna:</td>
<td>Horizontal and Vertical</td>
</tr>
<tr>
<td>Antenna Height:</td>
<td>1.5 m</td>
</tr>
<tr>
<td>Dwell Time:</td>
<td>3 seconds</td>
</tr>
</tbody>
</table>

5.6.2 TEST INSTRUMENTS

<table>
<thead>
<tr>
<th>DESCRIPTION &amp; MANUFACTURER</th>
<th>MODEL NO.</th>
<th>SERIAL NO.</th>
<th>DATE OF CALIBRATION</th>
<th>DUE DATE OF CALIBRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boonton RF Power Meter</td>
<td>4232A-01-02</td>
<td>107402</td>
<td>Apr. 27, 2010</td>
<td>Apr. 26, 2011</td>
</tr>
<tr>
<td>R&amp;S Signal Generator</td>
<td>SML03</td>
<td>101499</td>
<td>Dec. 04, 2009</td>
<td>Dec. 03, 2010</td>
</tr>
<tr>
<td>LOG ANTENNA</td>
<td>AT5080ANT</td>
<td>303730</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Amplifier</td>
<td>60S1G3M1</td>
<td>308049</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Amplifier RF TEST SYSCTRLR</td>
<td>SC1000M1</td>
<td>308057</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Amplifier</td>
<td>150W1000</td>
<td>322011</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Amplifier</td>
<td>DC7144A</td>
<td>307880</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>POWER SENSOR</td>
<td>51011-EMC</td>
<td>33105</td>
<td>Apr. 27, 2010</td>
<td>Apr. 26, 2011</td>
</tr>
<tr>
<td>POWER SENSOR</td>
<td>51011-EMC</td>
<td>33107</td>
<td>Apr. 27, 2010</td>
<td>Apr. 26, 2011</td>
</tr>
<tr>
<td>Software</td>
<td>ADT_RS_V450</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

NOTE:
1. The test was performed in Hwa Ya RS Room 1.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The transmit antenna was located at a distance of 2.0 meters from the EUT. (For frequency range 80MHz ~ 1GHz).
4. The transmit antenna was located at a distance of 1.5 meters from the EUT. (For frequency range 1GHz ~ 3GHz).
5.6.3 TEST PROCEDURE

The test procedure was in accordance with IEC 61000-4-3.

a. The testing was performed in a modified semi-anechoic chamber.

b. The frequency range is swept from 80 MHz to 2500 MHz, with the signal 80% amplitude modulated with a 1 kHz sinewave.

c. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0.5s.

d. The field strength level was 10 V/m.

e. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

5.6.4 DEVIATION FROM TEST STANDARD

The requirement followed by the client's specification.
5.6.5 TEST SETUP

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

NOTE:

TABLETOP EQUIPMENT
The EUT installed in a representative system as described in section 7 of IEC 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR STANDING EQUIPMENT
The EUT installed in a representative system as described in section 7 of IEC 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.
### 5.6.6 TEST RESULTS (A), (B)

<table>
<thead>
<tr>
<th>INPUT POWER</th>
<th>ENVIRONMENTAL CONDITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>230 Vac, 50 Hz</td>
<td>23 deg. C, 54% RH</td>
</tr>
<tr>
<td></td>
<td>1014 hPa</td>
</tr>
</tbody>
</table>

**TESTED BY**: Andy Chang

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Polarity</th>
<th>Azimuth</th>
<th>Field Strength (V/m)</th>
<th>Observation</th>
<th>Performance Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>80-2500</td>
<td>V&amp;H</td>
<td>0, 90, 180, 270</td>
<td>10</td>
<td>NOTE</td>
<td>EN 55024</td>
</tr>
</tbody>
</table>

**NOTE**: There was no change compared with initial operation during and after the test.
5.7 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT)

5.7.1 TEST SPECIFICATION

<table>
<thead>
<tr>
<th>Basic Standard:</th>
<th>IEC 61000-4-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Voltage:</td>
<td>Power line: 0.5, 1, 2 kV</td>
</tr>
<tr>
<td>Polarity:</td>
<td>Positive &amp; Negative</td>
</tr>
<tr>
<td>Impulse Frequency:</td>
<td>100 kHz: only for signal lines of xDSL equipment</td>
</tr>
<tr>
<td></td>
<td>5 kHz: others</td>
</tr>
<tr>
<td>Impulse Waveshape:</td>
<td>5/50 ns</td>
</tr>
<tr>
<td>Burst Duration:</td>
<td>15 ms</td>
</tr>
<tr>
<td>Burst Period:</td>
<td>300 ms</td>
</tr>
<tr>
<td>Test Duration:</td>
<td>1 min.</td>
</tr>
</tbody>
</table>

5.7.2 TEST INSTRUMENTS

<table>
<thead>
<tr>
<th>DESCRIPTION &amp; MANUFACTURER</th>
<th>MODEL NO.</th>
<th>SERIAL NO.</th>
<th>DATE OF CALIBRATION</th>
<th>DUE DATE OF CALIBRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMC-Partner EFT Generator</td>
<td>TRA2000EFT-C1</td>
<td>623</td>
<td>Apr. 30, 2010</td>
<td>Apr. 29, 2011</td>
</tr>
<tr>
<td>EMC-Partner Capacitive Coupling clamp</td>
<td>CN-EFT1000</td>
<td>364</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>EFT Adapter WONPRO</td>
<td>WA</td>
<td>EF1Ada-001</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Software</td>
<td>EMC-Partner GENECS</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

NOTE: 1. The test was performed in Hwa Ya EFT Room.  
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

5.7.3 TEST PROCEDURE

a. Both positive and negative polarity discharges were applied.

b. The distance between any coupling devices and the EUT should be (0.5 − 0/+0.1) m for table-top equipment testing, and (1.0 ± 0.1) m for floor standing equipment.

c. The duration time of each test sequential was 1 minute.

d. The transient/burst waveform was in accordance with IEC 61000-4-4, 5/50ns.
5.7.4 DEVIATION FROM TEST STANDARD

No deviation.

5.7.5 TEST SETUP

NOTE:
(A): location for supply line coupling
(B): location for signal lines coupling

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.
5.7.6 TEST RESULTS (A), (B)

<table>
<thead>
<tr>
<th>INPUT POWER</th>
<th>ENVIRONMENTAL CONDITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>230 Vac, 50 Hz</td>
<td>23 deg. C, 54% RH, 1014 hPa</td>
</tr>
</tbody>
</table>

TESTED BY: JN Chen

<table>
<thead>
<tr>
<th>Test Point</th>
<th>Polarity</th>
<th>Test Level (kV)</th>
<th>Observation</th>
<th>Performance Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>+/-</td>
<td>0.5, 1, 2</td>
<td>NOTE</td>
<td>EN 55024 A PASS</td>
</tr>
<tr>
<td>L2</td>
<td>+/-</td>
<td>0.5, 1, 2</td>
<td>NOTE</td>
<td>EN 60601-1-2 A PASS</td>
</tr>
<tr>
<td>PE</td>
<td>+/-</td>
<td>0.5, 1, 2</td>
<td>NOTE</td>
<td>A PASS</td>
</tr>
<tr>
<td>L1-L2-PE</td>
<td>+/-</td>
<td>0.5, 1, 2</td>
<td>NOTE</td>
<td>A PASS</td>
</tr>
</tbody>
</table>

NOTE: There was no change compared with initial operation during and after the test.
5.8 SURGE IMMUNITY TEST

5.8.1 TEST SPECIFICATION

<table>
<thead>
<tr>
<th>Basic Standard:</th>
<th>IEC 61000-4-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wave-Shape:</td>
<td>Combination Wave for power lines</td>
</tr>
<tr>
<td></td>
<td>1.2/50 µs Open Circuit Voltage</td>
</tr>
<tr>
<td></td>
<td>8/20 µs Short Circuit Current</td>
</tr>
<tr>
<td></td>
<td>10/700 µs Wave for signal lines</td>
</tr>
<tr>
<td></td>
<td>10/700 µs Open Circuit Voltage</td>
</tr>
<tr>
<td>Test Voltage:</td>
<td>Power line: 0.5, 1, 2 kV</td>
</tr>
<tr>
<td>Polarity:</td>
<td>Positive/Negative</td>
</tr>
<tr>
<td>Phase Angle:</td>
<td>0°/90°/180°/270°</td>
</tr>
<tr>
<td>Pulse Repetition Rate:</td>
<td>60 sec.</td>
</tr>
<tr>
<td>Number of Tests:</td>
<td>5 positive and 5 negative at selected points</td>
</tr>
</tbody>
</table>

5.8.2 TEST INSTRUMENTS

<table>
<thead>
<tr>
<th>DESCRIPTION &amp; MANUFACTURER</th>
<th>MODEL NO.</th>
<th>SERIAL NO.</th>
<th>DATE OF CALIBRATION</th>
<th>DUE DATE OF CALIBRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modular Impulse Generator</td>
<td>MIG0603IN3</td>
<td>352</td>
<td>Aug. 30, 2010</td>
<td>Aug. 29, 2011</td>
</tr>
<tr>
<td>EMC-Partner Modular</td>
<td>CDN UTP8</td>
<td>011</td>
<td>Aug. 30, 2010</td>
<td>Aug. 29, 2011</td>
</tr>
<tr>
<td>Surge Adapter WONPRO</td>
<td>WA</td>
<td>SU1 Ada-001</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

NOTE: 1. The test was performed in Hwa Ya Surge Room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
5.8.3 TEST PROCEDURE

a. For EUT power supply:

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

For double-insulated products without PE or external earth connections, the test shall be done in a similar way as for grounded products but without adding any additional external grounded connections. If there are no other possible connections to earth, line-to-ground tests may be omitted.

b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:

The surge is applied to the lines via the capacitive coupling. The coupling / decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

c. For test applied to unshielded symmetrically operated interconnection / telecommunication lines of EUT:

The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

5.8.4 DEVIATION FROM TEST STANDARD

No deviation.
5.8.5 TEST SETUP

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.
### 5.8.6 TEST RESULTS (A), (B)

<table>
<thead>
<tr>
<th>INPUT POWER</th>
<th>ENVIRONMENTAL CONDITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>230 Vac, 50 Hz</td>
<td>23 deg. C, 54% RH, 1014 hPa</td>
</tr>
</tbody>
</table>

**TESTED BY** JN Chen

**AC/DC power port**

<table>
<thead>
<tr>
<th>Voltage (kV)</th>
<th>Test Point</th>
<th>Polarity</th>
<th>0°</th>
<th>90°</th>
<th>180°</th>
<th>270°</th>
<th>Performance Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5, 1</td>
<td>L1-L2</td>
<td>+/-</td>
<td>NOTE</td>
<td>NOTE</td>
<td>NOTE</td>
<td>NOTE</td>
<td>A PASS</td>
</tr>
<tr>
<td>0.5, 1, 2</td>
<td>L1-PE</td>
<td>+/-</td>
<td>NOTE</td>
<td>NOTE</td>
<td>NOTE</td>
<td>NOTE</td>
<td>A PASS</td>
</tr>
<tr>
<td>0.5, 1, 2</td>
<td>L2-PE</td>
<td>+/-</td>
<td>NOTE</td>
<td>NOTE</td>
<td>NOTE</td>
<td>NOTE</td>
<td>A PASS</td>
</tr>
</tbody>
</table>

**NOTE:** There was no change compared with initial operation during and after the test.
5.9 IMMUNITY TO CONDUCTED DISTURBANCES INDUCED BY RF FIELDS (CS)

5.9.1 TEST SPECIFICATION

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Standard:</td>
<td>IEC 61000-4-6</td>
</tr>
<tr>
<td>Frequency Range:</td>
<td>0.15 MHz ~ 80 MHz</td>
</tr>
<tr>
<td>Voltage Level:</td>
<td>10 Vrms</td>
</tr>
<tr>
<td>Modulation:</td>
<td>1 kHz Sine Wave, 80%, AM Modulation</td>
</tr>
<tr>
<td>Frequency Step:</td>
<td>1 % of preceding frequency value</td>
</tr>
<tr>
<td>Coupling Device:</td>
<td>CDN-M3 (3 wires)</td>
</tr>
<tr>
<td>Dwell Time:</td>
<td>3 seconds</td>
</tr>
</tbody>
</table>
## 5.9.2 test instruments

<table>
<thead>
<tr>
<th>Description &amp; Manufacturer</th>
<th>Model No.</th>
<th>Serial No.</th>
<th>Date of Calibration</th>
<th>Due Date of Calibration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M/N:FCC-801-M2-25A</td>
<td>03049</td>
<td>Nov. 08, 2009</td>
<td>Nov. 07, 2010</td>
</tr>
<tr>
<td></td>
<td>M/N:FCC-801-M3-25A</td>
<td>03050</td>
<td>Nov. 08, 2009</td>
<td>Nov. 07, 2010</td>
</tr>
<tr>
<td></td>
<td>M/N:FCC-801-M3-25A</td>
<td>03056</td>
<td>Nov. 08, 2009</td>
<td>Nov. 07, 2010</td>
</tr>
<tr>
<td></td>
<td>M/N:FCC-801-M3-25A</td>
<td>03057</td>
<td>Nov. 08, 2009</td>
<td>Nov. 07, 2010</td>
</tr>
<tr>
<td></td>
<td>P/N:FCC-801-T4</td>
<td>03031</td>
<td>Nov. 08, 2009</td>
<td>Nov. 07, 2010</td>
</tr>
<tr>
<td></td>
<td>P/N:FCC-801-T8</td>
<td>03032</td>
<td>Nov. 08, 2009</td>
<td>Nov. 07, 2010</td>
</tr>
<tr>
<td>EMI Injection Clamp</td>
<td>P/N:F-203I-23MM</td>
<td>434</td>
<td>Nov. 08, 2009</td>
<td>Nov. 07, 2010</td>
</tr>
<tr>
<td>Amplifier Research Power Amplifier</td>
<td>75A250AM2</td>
<td>307804</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Boonton 4232ARF Power Meter</td>
<td>4232A-01-02</td>
<td>104302</td>
<td>Nov. 10, 2009</td>
<td>Nov. 09, 2010</td>
</tr>
<tr>
<td>R&amp;S Signal Generator</td>
<td>SML 03</td>
<td>101499</td>
<td>Dec. 04, 2009</td>
<td>Dec. 03, 2010</td>
</tr>
<tr>
<td>Software</td>
<td>ADT_CS_V37</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Power Sensor</td>
<td>51011-EMC</td>
<td>30028</td>
<td>Nov. 10, 2009</td>
<td>Nov. 09, 2010</td>
</tr>
<tr>
<td>Power Sensor</td>
<td>51011-EMC</td>
<td>33029</td>
<td>Nov. 10, 2009</td>
<td>Nov. 09, 2010</td>
</tr>
</tbody>
</table>

**Note:**
1. The test was performed in Hwa Ya CS Room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
5.9.3 TEST PROCEDURE

a. The EUT shall be tested within its intended operating and climatic conditions.

b. An artificial hand was placed on the hand-held accessory and connected to the ground reference plane.

c. One of the CDNs not used for injection was terminated with $50\,\Omega$, providing only one return path. All other CDNs were coupled as decoupling networks.

d. The frequency range is swept from 150 kHz to 80 MHz, using the signal level established during the setting process and with a disturbance signal of 80 % amplitude. The signal is modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or the switch coupling devices as necessary. Where the frequency is swept incrementally, the step size shall not exceed 1% of the preceding frequency value.

e. The dwell time of the amplitude modulated carrier at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0.5 s. The sensitive frequencies (e.g. clock frequencies) shall be analyzed separately.

f. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.

5.9.4 DEVIATION FROM TEST STANDARD

The requirement followed by the client's specification.
5.9.5 TEST SETUP

**Note:**

1. The EUT clearance from any metallic obstacles shall be at least 0.5 m.
2. Interconnecting cables (≤ 1 m) belonging to the EUT shall remain on the insulating support.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

**NOTE:**

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.
5.9.6 TEST RESULTS (A), (B)

<table>
<thead>
<tr>
<th>INPUT POWER</th>
<th>230 Vac, 50 Hz</th>
<th>ENVIRONMENTAL CONDITIONS</th>
<th>23 deg. C, 56% RH 1014 hPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>TESTED BY</td>
<td>Andy Chang</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency Band (MHz)</th>
<th>Applied Voltage (Vrms)</th>
<th>Tested Line</th>
<th>Injection Method</th>
<th>Observation</th>
<th>Performance Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.15-80</td>
<td>10</td>
<td>Power</td>
<td>CDN-M3</td>
<td>NOTE</td>
<td>EN 55024   EN 60601-1-2</td>
</tr>
</tbody>
</table>

**NOTE:** There was no change compared with initial operation during and after the test.
5.10 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

5.10.1 TEST SPECIFICATION

| Basic Standard: | IEC 61000-4-8 |
| Frequency Range: | 50 & 60 Hz |
| Field Strength:  | 10 A/m |
| Observation Time: | 1 minute |
| Inductance Coil: | Rectangular type, 1mx1m |

5.10.2 TEST INSTRUMENTS

<table>
<thead>
<tr>
<th>DESCRIPTION &amp; MANUFACTURER</th>
<th>MODEL NO.</th>
<th>SERIAL NO.</th>
<th>DATE OF CALIBRATION</th>
<th>DUE DATE OF CALIBRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schaffner Induction Coil Interface</td>
<td>INA2141</td>
<td>6015</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Schaffner AC Power Source</td>
<td>NSG1007</td>
<td>55616</td>
<td>Nov. 12, 2009</td>
<td>Nov. 11, 2010</td>
</tr>
<tr>
<td>Schaffner INA702 Coil</td>
<td>INA702</td>
<td>111</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Software</td>
<td>Schaffner Win 2120V3</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

NOTE: 1. The test was performed in Hwa Ya EMS Room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

5.10.3 TEST PROCEDURE

a. The equipment is configured and connected to satisfy its functional requirements.
b. The power supply, input and output circuits shall be connected to the sources of power supply, control and signal.
c. The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

5.10.4 DEVIATION FROM TEST STANDARD

The requirement followed by the client's specification.
5.10.5 TEST SETUP

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

NOTE:

TABLETOP EQUIPMENT
The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

FLOOR-STANDING EQUIPMENT
The equipment shall be subjected to the test magnetic field by using induction coils of suitable dimensions. The test shall be repeated by moving and shifting the induction coils, in order to test the whole volume of the EUT for each orthogonal direction. The test shall be repeated with the coil shifted to different positions along the side of the EUT, in steps corresponding to 50 % of the shortest side of the coil. The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.
5.10.6 TEST RESULTS (A), (B)

<table>
<thead>
<tr>
<th>INPUT POWER</th>
<th>230 Vac, 50 Hz</th>
<th>ENVIRONMENTAL CONDITIONS</th>
<th>23 deg. C, 54% RH 1014 hPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>TESTED BY</td>
<td>JN Chen</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Direction</th>
<th>Field Strength @50&amp;60Hz (A/m)</th>
<th>Observation</th>
<th>Performance Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>X - Axis</td>
<td>10</td>
<td>NOTE</td>
<td>A PASS</td>
</tr>
<tr>
<td>Y - Axis</td>
<td>10</td>
<td>NOTE</td>
<td>A PASS</td>
</tr>
<tr>
<td>Z - Axis</td>
<td>10</td>
<td>NOTE</td>
<td>A PASS</td>
</tr>
</tbody>
</table>

**NOTE:** There was no change compared with the initial operation during the test.
5.11 VOLTAGE DIP/SHORT INTERRUPTIONS/VOLTAGE VARIATIONS (DIP) IMMUNITY TEST

5.11.1 TEST SPECIFICATION

| Standard: | EN 60601-1-2 |
| Basic Standard: | IEC 61000-4-11 |
| Test Levels: | Voltage Dips: |
| | 1. >95% reduction – 0.5 period |
| | 2. 60% reduction – 5 periods |
| | 3. 30% reduction – 25 periods |
| Interruption: | 1. >95% reduction – 5000 ms |
| Test Duration Time: | 3 test events in sequence |
| Interval between Event: | 10 seconds |
| Phase Angle: | 0°/180° |

| Standard: | EN 55024 |
| Basic Standard: | IEC 61000-4-11 |
| Test Levels: | Voltage Dips: |
| | 1. >95% reduction – 0.5 period |
| | 2. 30% reduction – 25 periods |
| Voltage Interruptions: | 1. >95% reduction – 250 periods |
| Test Duration Time: | 3 test events in sequence |
| Interval between Event: | 10 seconds |
| Phase Angle: | 0°/180° |

5.11.2 TEST INSTRUMENTS

<table>
<thead>
<tr>
<th>DESCRIPTION &amp; MANUFACTURER</th>
<th>MODEL NO.</th>
<th>SERIAL NO.</th>
<th>DATE OF CALIBRATION</th>
<th>DUE DATE OF CALIBRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schaffner AC Power Source</td>
<td>NSG1007</td>
<td>55616</td>
<td>Nov. 12, 2009</td>
<td>Nov. 11, 2010</td>
</tr>
<tr>
<td>Schaffner Signal Conditioning Unit- Lumped Impedance</td>
<td>CCN1000-1-LR1</td>
<td>72224</td>
<td>Nov. 12, 2009</td>
<td>Nov. 11, 2010</td>
</tr>
<tr>
<td>Software</td>
<td>Schaffner Win 2100V3</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

NOTE: 1. The test was performed in Hwa Ya EMS Room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
5.11.3 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of 3 dips/interruptions with intervals of 10s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

5.11.4 DEVIATION FROM TEST STANDARD

The requirement is according to client’s specification. Compliance lever may be lower than immunity test lever while the device is powered by 100Vac/50Hz, the ME equipment may required be powered from stabled mains power quality.

5.11.5 TEST SETUP

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.
5.11.6 TEST RESULTS (A), (B)

| INPUT POWER | 100-240 Vac, 50 Hz |
| ENVIRONMENTAL CONDITIONS | 23 deg. C, 54% RH 1014 hPa |
| TESTED BY | JN Chen |
| STANDARD | EN 60601-1-2 |

### INPUT: 230Vac, 50Hz

<table>
<thead>
<tr>
<th>Voltage dips (%)</th>
<th>Duration (Period)</th>
<th>Duration (ms)</th>
<th>Total Events (time)</th>
<th>Observation</th>
<th>Performance Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;95</td>
<td>0.5</td>
<td>-</td>
<td>3</td>
<td>NOTE 1</td>
<td>PASS</td>
</tr>
<tr>
<td>60</td>
<td>5</td>
<td>-</td>
<td>3</td>
<td>NOTE 1</td>
<td>PASS</td>
</tr>
<tr>
<td>30</td>
<td>25</td>
<td>-</td>
<td>3</td>
<td>NOTE 1</td>
<td>PASS</td>
</tr>
<tr>
<td>&gt;95</td>
<td>-</td>
<td>5000</td>
<td>3</td>
<td>NOTE 2, 3</td>
<td>PASS</td>
</tr>
</tbody>
</table>

### INPUT: 100Vac, 50Hz

<table>
<thead>
<tr>
<th>Voltage dips (%)</th>
<th>Duration (Period)</th>
<th>Duration (ms)</th>
<th>Total Events (time)</th>
<th>Observation</th>
<th>Performance Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;95</td>
<td>0.5</td>
<td>-</td>
<td>3</td>
<td>NOTE 1</td>
<td>PASS</td>
</tr>
<tr>
<td>60</td>
<td>5</td>
<td>-</td>
<td>3</td>
<td>NOTE 1</td>
<td>PASS (15% load)</td>
</tr>
<tr>
<td>30</td>
<td>25</td>
<td>-</td>
<td>3</td>
<td>NOTE 1</td>
<td>PASS (80% load)</td>
</tr>
<tr>
<td>&gt;95</td>
<td>-</td>
<td>5000</td>
<td>3</td>
<td>NOTE 2, 3</td>
<td>PASS</td>
</tr>
</tbody>
</table>

### INPUT: 240Vac, 50Hz

<table>
<thead>
<tr>
<th>Voltage dips (%)</th>
<th>Duration (Period)</th>
<th>Duration (ms)</th>
<th>Total Events (time)</th>
<th>Observation</th>
<th>Performance Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;95</td>
<td>0.5</td>
<td>-</td>
<td>3</td>
<td>NOTE 1</td>
<td>PASS</td>
</tr>
<tr>
<td>60</td>
<td>5</td>
<td>-</td>
<td>3</td>
<td>NOTE 1</td>
<td>PASS</td>
</tr>
<tr>
<td>30</td>
<td>25</td>
<td>-</td>
<td>3</td>
<td>NOTE 1</td>
<td>PASS</td>
</tr>
<tr>
<td>&gt;95</td>
<td>-</td>
<td>5000</td>
<td>3</td>
<td>NOTE 2, 3</td>
<td>PASS</td>
</tr>
</tbody>
</table>

NOTE:

1. There was no change compared with the initial operation during the test.
2. The EUT lost power and function during the test, but could self-recover to the initial operation after the test.
3. If the user of the ME equipment requires continued operation during power mains interruption, other then the test condition specified above, it is recommended that the ME equipment be powered from an uninterruptible power supply.
### INPUT POWER
100-240 Vac, 50 Hz

### ENVIRONMENTAL CONDITIONS
23 deg. C, 54% RH 1014 hPa

### TESTED BY
JN Chen

### STANDARD
EN 55024

---

#### Ut: 230Vac, 50Hz

<table>
<thead>
<tr>
<th>Voltage Dips (% Reduction)</th>
<th>Duration (Period)</th>
<th>Total Events (time)</th>
<th>Observation</th>
<th>Performance Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;95</td>
<td>0.5</td>
<td>3</td>
<td>NOTE 1</td>
<td>A</td>
</tr>
<tr>
<td>30</td>
<td>25</td>
<td>3</td>
<td>NOTE 1</td>
<td>A</td>
</tr>
<tr>
<td>&gt;95</td>
<td>250</td>
<td>3</td>
<td>NOTE 2, 3</td>
<td>B</td>
</tr>
</tbody>
</table>

#### Ut: 100Vac, 50Hz

<table>
<thead>
<tr>
<th>Voltage Dips (% Reduction)</th>
<th>Duration (Period)</th>
<th>Total Events (time)</th>
<th>Observation</th>
<th>Performance Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;95</td>
<td>0.5</td>
<td>3</td>
<td>NOTE 1</td>
<td>A</td>
</tr>
<tr>
<td>30</td>
<td>25</td>
<td>3</td>
<td>NOTE 1</td>
<td>A</td>
</tr>
<tr>
<td>&gt;95</td>
<td>250</td>
<td>3</td>
<td>NOTE 2, 3</td>
<td>B</td>
</tr>
</tbody>
</table>

#### Ut: 240Vac, 50Hz

<table>
<thead>
<tr>
<th>Voltage Dips (% Reduction)</th>
<th>Duration (Period)</th>
<th>Total Events (time)</th>
<th>Observation</th>
<th>Performance Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;95</td>
<td>0.5</td>
<td>3</td>
<td>NOTE 1</td>
<td>A</td>
</tr>
<tr>
<td>30</td>
<td>25</td>
<td>3</td>
<td>NOTE 1</td>
<td>A</td>
</tr>
<tr>
<td>&gt;95</td>
<td>250</td>
<td>3</td>
<td>NOTE 2, 3</td>
<td>B</td>
</tr>
</tbody>
</table>

**NOTE:**
1. There was no change compared with the initial operation during the test.
2. The EUT lost power and function during the test, but could self-recover to the initial operation after the test.
3. If the user of the ME equipment requires continued operation during power mains interruption, other than the test condition specified above, it is recommended that the ME equipment be powered from an uninterruptible power supply.
INPUT POWER 100-240 Vac, 50 Hz

ENVIRONMENTAL CONDITIONS 23 deg. C, 54% RH 1014 hPa

TESTED BY JN Chen

OPERATING CONDITION Refer to manufacturer's spec.

### Ut: 230Vac, 50Hz

<table>
<thead>
<tr>
<th>Voltage dips (%)</th>
<th>Duration (Period)</th>
<th>Total Events (time)</th>
<th>Observation</th>
<th>Performance Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;95</td>
<td>0.5</td>
<td>3</td>
<td>NOTE 1</td>
<td>A (Full Load)</td>
</tr>
<tr>
<td>60</td>
<td>5</td>
<td>3</td>
<td>NOTE 1</td>
<td>A (Full Load)</td>
</tr>
<tr>
<td>30</td>
<td>25</td>
<td>3</td>
<td>NOTE 1</td>
<td>A (Full Load)</td>
</tr>
<tr>
<td>&gt;95</td>
<td>250</td>
<td>3</td>
<td>NOTE 2, 3</td>
<td>B (Full Load)</td>
</tr>
</tbody>
</table>

### Ut: 100Vac, 50Hz

<table>
<thead>
<tr>
<th>Voltage dips (%)</th>
<th>Duration (Period)</th>
<th>Total Events (time)</th>
<th>Observation</th>
<th>Performance Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;95</td>
<td>0.5</td>
<td>3</td>
<td>NOTE 1</td>
<td>A (Full Load)</td>
</tr>
<tr>
<td>60</td>
<td>5</td>
<td>3</td>
<td>NOTE 2, 3</td>
<td>B (Full Load)</td>
</tr>
<tr>
<td>30</td>
<td>25</td>
<td>3</td>
<td>NOTE 2, 3</td>
<td>B (Full Load)</td>
</tr>
<tr>
<td>&gt;95</td>
<td>250</td>
<td>3</td>
<td>NOTE 2, 3</td>
<td>B (Full Load)</td>
</tr>
</tbody>
</table>

**NOTE:**

1. There was no change compared with the initial operation during the test.
2. The EUT lost power during the test, but could self-recover to the initial operation after the test.
3. If the user of the ME equipment requires continued operation during power mains interruption, other then the test condition specified above, it is recommended that the ME equipment be powered from an uninterruptible power supply.
6 PHOTOGRAPHS OF THE TEST CONFIGURATION

Conducted Emission Test
Radiated Emission Test
Harmonics Emission Test & Voltage Fluctuation and Flicker Test

ESD Test
RS Test

EFT Test
Magnetic Test

Voltage Dip and Interruption Test
7 INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab**
Tel: 886-2-26052180  
Fax: 886-2-26051924

**Hsin Chu EMC/RF Lab**
Tel: 886-3-5935343  
Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety/Telecom Lab**
Tel: 886-3-3183232  
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com  
Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

--- END ---