CERTIFICATION

Applicant : American Power Conversion Holding Inc. Taiwan Branch
Address : 3F., No. 205, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan R.O.C.
Manufacturer : American Power Conversion Holding Inc. Taiwan Branch
Address : 3F., No. 205, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan R.O.C.
Description of EUT : Uninterruptible Power System
Trade Name : APC
Model Number : BN1500M2
Product Series :
BN1500MXXXXXXXXXX, BN1350MXXXXXXXXXX, BN1375MXXXXXXXXX,
BN1400MXXXXXXXXXX("X" can be 0-9, A-Z, ",-" or blank)
Type of Test : FCC Part 15 Subpart B
Technical Standard : Emission
FCC Part 15 Subpart B Class A or B
CISPR 22 : 2008 Class A or B
ANSI C63.4 : 2014
Report Number : HA170688-FD
Receipt Date : 29-JUN-2017
Issue Date : 26-JUL-2017
Test Result : Compliance

The above equipment was tested by HongAn TECHNOLOGY CO., LTD., for compliance with the requirement set forth in the FCC Rules and Regulation Part 15, Subpart B and the measurement procedures were based on ANSI C63.4.

Note :
1. The results of the test report relate only to the sample tested.
2. The test report shall not be reproduced without the written approval of HongAn TECHNOLOGY CO., LTD.

Approved by:

Adam Yang / Section Manager

HongAn TECHNOLOGY EMC Laboratory
NO.15-1, CWEISHUH KENG, CWEIPIN VILLAGE,
LINKOU DIST, NEW TAIPEI CITY, TAIWAN, R.O.C.
TEL : +886-2-26030362
FAX : +886-2-26019259
E-mail : hatlab@ms19.hinet.net

BSMI Registration No. : SL2-IN-E-0023,SL2-IS-E-0023,
SL2-A1-E-0023,SL2-R1-E-0023,
SL2-R2-E-0023,SL2-L1-E-0023
FCC Designation No. : TW1071, TW1163
TAF Accreditation No. : 1163
VCCI Registration No. : R-2156, C-2329, T-219, G-696
FCC COMPLIANCE TEST REPORT

Technical Statement of Conformity

in accordance with FCC Part 15 Subpart B

The Product

Equipment Under Test : BN1500M2
BN1500MXXXXXXXXXXX,
BN1350MXXXXXXXXXXX,

Model Number : BN1375MXXXXXXXXXXX,
BN1400MXXXXXXXXXXX

("X" can be 0-9, A-Z, "." or blank)

Product Series : HA170688-FD

Report Number : 26-JUL-2017

Issue Date : BR1500M2

Test Result : Compliance

is produced by

American Power Conversion Holding Inc. Taiwan Branch
3F., No. 205, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan R.O.C.

HongAn TECHNOLOGY CO., LTD.
HongAn TECHNOLOGY EMC Laboratory

NO.15-1, CWEISHUH KENG, CWEIPIN VILLAGE,
LINKOU DIST, NEW TAIPEI CITY,
TAIWAN, R. O. C.

TEL: +886-2-26030362
FAX: +886-2-26019259
E-mail: hatlab@ms19.hinet.net

BSMI Registration No.: SL2-IN-E-0023, SL2-A1-E-0023,
SL2-IS-E-0023, SL2-R1-E-0023,
SL2-R2-E-0023, SL2-L1-E-0023

FCC Designation No.: TW1071, TW1163
TAF Accreditation No.: 1163
VCCI Registration No.: R-2156, C-2329, T-219, G-696
# Contents

## 1 General Description

1.1 Description of Equipment Under Test 5
1.2 Test Facility 6
1.3 Test Instruments 6
1.4 Test Methodology 7
1.5 Auxiliary Equipments 7
1.6 Block Diagram 8
1.7 Identifying the Final Test Mode 8
1.8 Final Test Mode 8
1.9 Condition of Power Supply 8
1.10 EUT Configuration 8

## 2 Conducted Emission Test

2.1 Test Instruments 9
2.2 Test Configuration and Procedure 9
2.3 Conducted Limit 10
2.4 Test Result 10

## 3 Radiated Emission Test – Below 1 GHz

3.1 Test Instruments 15
3.2 Test Configuration and Procedure 15
3.3 Radiated Limit 16
3.4 Test Result 16

## 4 Radiated Emission Test – Above 1 GHz

4.1 Test Instruments 21
4.2 Test Configuration and Procedure 21
4.3 Test Limit 22
4.4 Test Result 22

## 5 Photographs of Test

5.1 Conducted Emission Test 23
5.2 Radiated Emission Test – Below 1 GHz 24

## 6 Photographs of EUT

25
Verification

Applicant: American Power Conversion Holding Inc. Taiwan Branch
Manufacturer: American Power Conversion Holding Inc. Taiwan Branch
Equipment Under Test: Uninterruptible Power System
Model Number: BN1500M2

BN1500MXXXXXXXXXX, BN1350MXXXXXXXXXX,
Product Series: BN1375MXXXXXXXXXX, BN1400MXXXXXXXXXX
("X" can be 0-9, A-Z, "," or blank)
Sample Received Date: 29-JUN-2017

Test Standards:

Emission:
FCC Part 15 Subpart B Class B
CISPR 22 : 2008 Class B
ANSI C63.4 : 2014

Remark
This report details the results of the test carried out on one sample. The test results are contained in this test report and HongAn Technology Co., Ltd. assumes full responsibility for the accuracy and completeness of these tests. This report shows the EUT is technically compliant with FCC Part 15 Subpart B and CISPR 22 Class B official requirements. The test procedure is in compliance with ANSI C63.4. This report applies to the above sample only and shall not be reproduced in part without written approval of HongAn Technology Co., Ltd..

Documented by: Mindy Liu / ADM. Dept. Staff  Date: 26-JUL-2017

Tested by: Tom Tang / ENG. Dept. Staff  Date: 20-JUN-2017

Approved by: Adam Yang / SEC. Manager  Date: 26-JUL-2017
### Summary of Test Result

<table>
<thead>
<tr>
<th>Test Standard</th>
<th>Test Item</th>
<th>Test Result</th>
<th>Remark</th>
</tr>
</thead>
</table>
| **FCC Part15 Subpart B CISPR22 Class B ANSI C63.4** | Conducted Emission | Pass | Highest Emission- Line mode  
L: 3.99MHz, A.V.26.42dBuV, Margin 19.58 dBuV  
N: 0.55MHz, Q.P.24.18dBuV, Margin -21.82 dBuV  
Highest Emission- Battery mode  
L: 4.67MHz, A.V.21.79dBuV, Margin -24.21 dBuV  
N: 2.01MHz, A.V.21.56dBuV, Margin -24.44 dBuV |
| **FCC Part15 Subpart B CISPR22 Class B ANSI C63.4** | Radiated Emission (Below 1GHz) | Pass | Highest Emission- Line mode  
H: 214.31MHz, 21.68dBuV, Margin -8.32 dB  
Antenna Height 393 cm, Turntable Angle 111°  
V: 30.40MHz, 26.28dBuV, Margin -3.72 dB  
Antenna Height 100 cm, Turntable Angle 62°  
Highest Emission- Battery mode  
H: 192.00MHz, 22.27dBuV, Margin -7.73 dB  
Antenna Height 395 cm, Turntable Angle 77°  
V: 32.20MHz, 26.63dBuV, Margin -3.37 dB  
Antenna Height 100 cm, Turntable Angle 102° |
| **FCC Part15 Subpart B CISPR22 Class B ANSI C63.4** | Radiated Emission (Above 1GHz) | N/A | The highest frequency of the internal sources of the EUT is less than 108MHz, the measurement shall only be made up to 1GHz. Hence, the test item is not required. |

### Measurement Uncertainty

The following measurement uncertainty has been calculated for Emission Tests performed on the EUT as specified in CISPR 16-4-2:

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conducted Emission</td>
<td>± 4.35dB</td>
</tr>
<tr>
<td>Radiated Emission Below 1GHz</td>
<td>± 5.64dB</td>
</tr>
<tr>
<td>Radiated Emission Above 1GHz</td>
<td>± 4.91dB</td>
</tr>
</tbody>
</table>

This reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k = 2$, providing a level of confidence of approximately 95%.
# General Description

## Description of Equipment Under Test

<table>
<thead>
<tr>
<th>Equipment Under Test</th>
<th>Uninterruptible Power System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Number</td>
<td>BN1500M2</td>
</tr>
<tr>
<td>Product Series</td>
<td>BN1500MXXXXXXXXXXX, BN1350MXXXXXXXXXXX, BN1375MXXXXXXXXXXX, BN1400MXXXXXXXXXXX (&quot;X&quot; can be 0-9, A-Z, &quot;,&quot; or blank)</td>
</tr>
<tr>
<td>Applicant</td>
<td>American Power Conversion Holding Inc. Taiwan Branch</td>
</tr>
<tr>
<td>Address of Applicant</td>
<td>3F., No. 205, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan R.O.C.</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>American Power Conversion Holding Inc. Taiwan Branch</td>
</tr>
<tr>
<td>Address of Manufacturer</td>
<td>3F., No. 205, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan R.O.C.</td>
</tr>
</tbody>
</table>

### Power Supply

- **AC 120V**
  - Shielded
  - Non-Shielded
  - Detachable, m
  - Un-Detachable, 1.8m
  - w/ Ferrite Core
  - w/o Ferrite Core

### I/O Port

- USB Type (A*1+C*1) or A*2, Gigabit*2, Surge*4, Battery+Surge*6, Cable In *1, Cable Out *1, Data port*1.

### Data Cable

- Data Cable
  - Shielded
  - Non-Shielded
  - Detachable, 1.8m
  - Un-Detachable
  - w/ Ferrite Core
  - w/o Ferrite Core
  - Coaxial Cable
  - Shielded
  - Non-Shielded
  - Detachable, 0.9m
  - Un-Detachable
  - w/ Ferrite Core
  - w/o Ferrite Core

### Dimensions

- 368 cm (L) X 1000 cm (W) X 2600 cm (H)

### Highest Frequency of the Internal Source

- less than 108MH

### Position

- Table-top / Floor-standing

### Intended Function

- The EUT is a Uninterruptible Power System.

### Product Variance

- The EUT is the most advanced model within the series. HongAn is only responsible for the test result of the main test sample.
1.2 Test Facility

All the Conducted and Radiated Emission Tests are performed at No. 15-1, Cweishuh Keng, Cweipin Village, Linkou, New Taipei City, Taiwan, R.O.C.

1.3 Test Instruments

Instruments Used for Emission Measurement

<table>
<thead>
<tr>
<th>Instrument Name</th>
<th>Manufacture</th>
<th>Model Number</th>
<th>Serial Number</th>
<th>Last Cal. Date</th>
<th>Next Cal. Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>LISN</td>
<td>EMCO</td>
<td>3810/2NM</td>
<td>9702-1819</td>
<td>07- Jul -2017</td>
<td>07- Jul -2018</td>
</tr>
<tr>
<td>LISN</td>
<td>Rolf Heine Hochfrequenztechnik</td>
<td>NNB-4/32T</td>
<td>00001</td>
<td>08-Mar-2017</td>
<td>08-Mar-2018</td>
</tr>
<tr>
<td>RF Current Probe</td>
<td>FCC</td>
<td>F-33-4</td>
<td>53</td>
<td>26-May-2017</td>
<td>26-May-2018</td>
</tr>
<tr>
<td>Impedance Stabilization Network (ISN)</td>
<td>TESEQ</td>
<td>ISN T800</td>
<td>30838</td>
<td>18-Aug-2016</td>
<td>18-Aug-2017</td>
</tr>
<tr>
<td>EMI Receiver</td>
<td>R&amp;S</td>
<td>ESCI</td>
<td>100931</td>
<td>21-Jul-2016</td>
<td>21-Jul-2017</td>
</tr>
<tr>
<td>Spectrum Analyzer</td>
<td>R&amp;S</td>
<td>FSV 30</td>
<td>101629</td>
<td>11-Jan-2017</td>
<td>11-Jan-2018</td>
</tr>
<tr>
<td>Preamplifier</td>
<td>CHASE</td>
<td>CPA 9231A</td>
<td>0405</td>
<td>24-Aug-2016</td>
<td>24-Aug-2017</td>
</tr>
<tr>
<td>Preamplifier</td>
<td>HD</td>
<td>HD17187</td>
<td>004</td>
<td>22-May-2017</td>
<td>22-May-2018</td>
</tr>
<tr>
<td>Bilog Antenna</td>
<td>TESEQ</td>
<td>CBL6111D</td>
<td>25769</td>
<td>13-Feb-2017</td>
<td>13-Feb-2018</td>
</tr>
<tr>
<td>Double-Ridged Waveguide Horn</td>
<td>EMCO</td>
<td>3115</td>
<td>9912-5992</td>
<td>22-May-2017</td>
<td>22-May-2018</td>
</tr>
</tbody>
</table>

※ The test equipments used are calibrated and can be traced to National ITRI and International Standards.
1.4 Test Methodology

All Conducted and Radiated Emission Tests were performed according to the procedures stated in ANSI C63.4 as indicated in FCC Part 15 Subpart B Sec. 15.31. Deviations from the test standards as below description: N/A

1.5 Auxiliary Equipments

1.5.1 Provided by HongAn Technology Co., Ltd. for Emission Test.

<table>
<thead>
<tr>
<th>No.</th>
<th>Equipment</th>
<th>Model No.</th>
<th>Serial No.</th>
<th>EMC Approved</th>
<th>Brand</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Data Cable Power Cable</td>
</tr>
<tr>
<td>01</td>
<td>Notebook</td>
<td>PP2090</td>
<td>CNU3480M1R</td>
<td></td>
<td>Hewlett Packard</td>
<td>AC to Adapter Unshielded*1.8m</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CE Mark, FCC DoC, BSMI ID R33001</td>
<td></td>
<td>Adapter to Notebook Unshielded*1.8m</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Notebook</td>
<td>G42-352TX</td>
<td>CNF0347B16</td>
<td></td>
<td>Hewlett Packard</td>
<td>AC to Adapter Unshielded*1m</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CE Mark, FCC DoC, BSMI ID R33001</td>
<td></td>
<td>Adapter Notebook Unshielded<em>1.8m with EMI core</em>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>Notebook</td>
<td>X553M</td>
<td>N/A</td>
<td></td>
<td>ASUS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CE Mark, FCC DoC, BSMI ID R31018</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>04</td>
<td>LAMP*3</td>
<td>200W</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>LAMP*1</td>
<td>250W</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>06</td>
<td>USB Type-C&amp;A Cable</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Shielded; Detachable, 1 m; w/o Ferrite Core</td>
</tr>
<tr>
<td>07</td>
<td>Gigabit Cable*2</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Shielded; Detachable, 3 m; w/o Ferrite Core</td>
</tr>
<tr>
<td>08</td>
<td>Power Cable*10</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Non-Shielded; Detachable, 1.8m w/o Ferrite Core</td>
</tr>
</tbody>
</table>

1.5.2 Provided by the Manufacturer

N/A
1.6 Block Diagram

![Block Diagram Image]

1.7 Identifying the Final Test Mode

1. Line mode (Full load).
2. Battery mode (Full load).

Note: The additional power cords do not increase the disturbance level by 2dB. Therefore, the Final EMC Assessment was performed for the Line mode and Battery mode.

1.8 Final Test Mode

1. Line mode (Full load).
2. Battery mode (Full load).

1.9 Condition of Power Supply

AC 120V; 60 Hz

1.10 EUT Configuration

1. Setup the EUT and peripheral as shown in Section 1.6.
2. Turn on the power of all equipments.
3. Activate the selected Final Test Mode shown in Sec. 1.8.
2 Conducted Emission Test

2.1 Test Instruments

Refer to Sec. 1.3 Test Instruments.

2.2 Test Configuration and Procedure

Table-top Equipment

- The EUT was placed on a non-conductive table which was 80 cm above the horizontal coupling plane. The rear of the EUT was 40 cm from the vertical coupling plane.
- The excess interface cables were folded at the cable center into a bundle no longer than 40 cm, so that the bundles were on the table.
- The EUT was connected to the main power through a L.I.S.N. This set up provided 50 ohm / 50 \( \mu \)H coupling impedance for the measuring equipment.
- All auxiliary equipment received power from a second L.I.S.N.
- The conducted emissions were measured between the Line Phase and the PE ground and between the Neutral Phase and the PE ground using an EMI Receiver.
- The values were recorded.
2.3 Conducted Limit

FCC Part 15 B / CISPR 22

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>□ Class A</th>
<th>☑ Class B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q.P. (Quasi-Peak)</td>
<td>A.V. (Average)</td>
</tr>
<tr>
<td>0.15 to 0.50</td>
<td>79</td>
<td>66</td>
</tr>
<tr>
<td>0.50 to 5.0</td>
<td>73</td>
<td>60</td>
</tr>
<tr>
<td>5.0 to 30</td>
<td>73</td>
<td>60</td>
</tr>
</tbody>
</table>

2.4 Test Result

PASS
The final tests data are shown on the following page(s).
Conducted Emission Test Data- Line mode

Test Date: 18-JUL-2017  Power Line: Line
Temperature: 26°C  Humidity: 56%

Remark:
1. All readings are Quasi-Peak and Average values.
2. Result = Reading + C.F
3. Margin = Result – Limit
Conducted Emission Test Data- Line mode

<table>
<thead>
<tr>
<th>No.</th>
<th>Freq MHz</th>
<th>Reading dBμV</th>
<th>C.F dB</th>
<th>Result dBμV</th>
<th>Limit dBμV</th>
<th>Margin dB</th>
<th>Power Line</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.55</td>
<td>17.02</td>
<td>0.16</td>
<td>17.18</td>
<td>46.00</td>
<td>-28.82</td>
<td>NEUTRAL</td>
<td>Average</td>
</tr>
<tr>
<td>2</td>
<td>0.55</td>
<td>24.02</td>
<td>0.16</td>
<td>24.18</td>
<td>46.00</td>
<td>-21.82</td>
<td>NEUTRAL</td>
<td>QP</td>
</tr>
<tr>
<td>3</td>
<td>1.26</td>
<td>15.46</td>
<td>0.21</td>
<td>15.67</td>
<td>46.00</td>
<td>-30.33</td>
<td>NEUTRAL</td>
<td>Average</td>
</tr>
<tr>
<td>4</td>
<td>1.26</td>
<td>26.46</td>
<td>0.21</td>
<td>26.67</td>
<td>58.00</td>
<td>-29.33</td>
<td>NEUTRAL</td>
<td>Average</td>
</tr>
<tr>
<td>5</td>
<td>1.87</td>
<td>20.91</td>
<td>0.25</td>
<td>21.16</td>
<td>46.00</td>
<td>-24.84</td>
<td>NEUTRAL</td>
<td>Average</td>
</tr>
<tr>
<td>6</td>
<td>1.87</td>
<td>26.91</td>
<td>0.25</td>
<td>27.16</td>
<td>58.00</td>
<td>-28.84</td>
<td>NEUTRAL</td>
<td>QP</td>
</tr>
<tr>
<td>7</td>
<td>2.13</td>
<td>23.09</td>
<td>0.25</td>
<td>23.34</td>
<td>46.00</td>
<td>-22.66</td>
<td>NEUTRAL</td>
<td>Average</td>
</tr>
<tr>
<td>8</td>
<td>2.13</td>
<td>29.81</td>
<td>0.25</td>
<td>30.06</td>
<td>58.00</td>
<td>-25.94</td>
<td>NEUTRAL</td>
<td>QP</td>
</tr>
<tr>
<td>9</td>
<td>4.11</td>
<td>16.74</td>
<td>0.35</td>
<td>17.09</td>
<td>48.00</td>
<td>-28.91</td>
<td>NEUTRAL</td>
<td>Average</td>
</tr>
<tr>
<td>10</td>
<td>4.11</td>
<td>24.74</td>
<td>0.35</td>
<td>25.09</td>
<td>58.00</td>
<td>-30.91</td>
<td>NEUTRAL</td>
<td>QP</td>
</tr>
<tr>
<td>11</td>
<td>7.33</td>
<td>23.65</td>
<td>0.53</td>
<td>24.18</td>
<td>50.00</td>
<td>-25.82</td>
<td>NEUTRAL</td>
<td>Average</td>
</tr>
<tr>
<td>12</td>
<td>7.33</td>
<td>30.95</td>
<td>0.53</td>
<td>31.48</td>
<td>60.00</td>
<td>-28.52</td>
<td>NEUTRAL</td>
<td>QP</td>
</tr>
</tbody>
</table>

Remark:
1. All readings are Quasi-Peak and Average values.
2. Result = Reading + C.F
3. Margin = Result – Limit
Conducted Emission Test Data - Battery mode

<table>
<thead>
<tr>
<th>No.</th>
<th>Freq MHz</th>
<th>Reading dBµV</th>
<th>C.F dB</th>
<th>Result dBµV</th>
<th>Limit dBµV</th>
<th>Margin dB</th>
<th>Power Line</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.73</td>
<td>20.84</td>
<td>0.19</td>
<td>21.03</td>
<td>46.00</td>
<td>-24.97</td>
<td>LINE</td>
<td>Average</td>
</tr>
<tr>
<td>2</td>
<td>0.73</td>
<td>28.84</td>
<td>0.19</td>
<td>29.03</td>
<td>56.00</td>
<td>-26.97</td>
<td>LINE</td>
<td>QP</td>
</tr>
<tr>
<td>3</td>
<td>1.52</td>
<td>18.60</td>
<td>0.24</td>
<td>18.84</td>
<td>46.00</td>
<td>-27.16</td>
<td>LINE</td>
<td>Average</td>
</tr>
<tr>
<td>4</td>
<td>1.52</td>
<td>29.54</td>
<td>0.24</td>
<td>29.78</td>
<td>56.00</td>
<td>-26.22</td>
<td>LINE</td>
<td>QP</td>
</tr>
<tr>
<td>5</td>
<td>1.99</td>
<td>17.20</td>
<td>0.26</td>
<td>17.46</td>
<td>46.00</td>
<td>-28.54</td>
<td>LINE</td>
<td>Average</td>
</tr>
<tr>
<td>6</td>
<td>1.99</td>
<td>27.67</td>
<td>0.26</td>
<td>27.93</td>
<td>56.00</td>
<td>-28.07</td>
<td>LINE</td>
<td>QP</td>
</tr>
<tr>
<td>7</td>
<td>2.93</td>
<td>19.75</td>
<td>0.32</td>
<td>20.07</td>
<td>46.00</td>
<td>-25.93</td>
<td>LINE</td>
<td>Average</td>
</tr>
<tr>
<td>8</td>
<td>2.93</td>
<td>27.75</td>
<td>0.32</td>
<td>28.07</td>
<td>56.00</td>
<td>-27.93</td>
<td>LINE</td>
<td>QP</td>
</tr>
<tr>
<td>9</td>
<td>4.67</td>
<td>21.37</td>
<td>0.42</td>
<td>21.79</td>
<td>46.00</td>
<td>-24.21</td>
<td>LINE</td>
<td>Average</td>
</tr>
<tr>
<td>10</td>
<td>4.67</td>
<td>25.37</td>
<td>0.42</td>
<td>25.79</td>
<td>56.00</td>
<td>-30.21</td>
<td>LINE</td>
<td>QP</td>
</tr>
<tr>
<td>11</td>
<td>19.85</td>
<td>19.27</td>
<td>1.17</td>
<td>20.44</td>
<td>50.00</td>
<td>-29.56</td>
<td>LINE</td>
<td>Average</td>
</tr>
<tr>
<td>12</td>
<td>19.85</td>
<td>27.19</td>
<td>1.17</td>
<td>28.36</td>
<td>60.00</td>
<td>-31.64</td>
<td>LINE</td>
<td>QP</td>
</tr>
</tbody>
</table>

Remark:
1. All readings are Quasi-Peak and Average values.
2. Result = Reading + C.F
3. Margin = Result – Limit
Conducted Emission Test Data - Battery mode

Test Date : 18-JUL-2017  Power Line : Neutral
Temperature : 26°C  Humidity : 56%

Remark:
1. All readings are Quasi-Peak and Average values.
2. Result = Reading + C.F
3. Margin = Result – Limit

<table>
<thead>
<tr>
<th>No.</th>
<th>Freq MHz</th>
<th>Reading dBμV</th>
<th>C.F dB</th>
<th>Result dBμV</th>
<th>Limit dBμV</th>
<th>Margin dB</th>
<th>Power Line</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.68</td>
<td>16.66</td>
<td>0.17</td>
<td>16.83</td>
<td>48.00</td>
<td>-29.17</td>
<td>NEUTRAL</td>
<td>Average</td>
</tr>
<tr>
<td>2</td>
<td>0.68</td>
<td>25.66</td>
<td>0.17</td>
<td>25.83</td>
<td>56.00</td>
<td>-30.17</td>
<td>NEUTRAL</td>
<td>QP</td>
</tr>
<tr>
<td>3</td>
<td>1.29</td>
<td>20.57</td>
<td>0.21</td>
<td>20.78</td>
<td>48.00</td>
<td>-25.22</td>
<td>NEUTRAL</td>
<td>Average</td>
</tr>
<tr>
<td>4</td>
<td>1.29</td>
<td>26.57</td>
<td>0.21</td>
<td>26.78</td>
<td>56.00</td>
<td>-29.22</td>
<td>NEUTRAL</td>
<td>QP</td>
</tr>
<tr>
<td>5</td>
<td>2.01</td>
<td>21.31</td>
<td>0.25</td>
<td>21.56</td>
<td>48.00</td>
<td>-24.44</td>
<td>NEUTRAL</td>
<td>Average</td>
</tr>
<tr>
<td>6</td>
<td>2.01</td>
<td>27.31</td>
<td>0.25</td>
<td>27.56</td>
<td>56.00</td>
<td>-28.44</td>
<td>NEUTRAL</td>
<td>QP</td>
</tr>
<tr>
<td>7</td>
<td>3.16</td>
<td>20.41</td>
<td>0.31</td>
<td>20.72</td>
<td>48.00</td>
<td>-25.28</td>
<td>NEUTRAL</td>
<td>Average</td>
</tr>
<tr>
<td>8</td>
<td>3.16</td>
<td>24.19</td>
<td>0.31</td>
<td>24.50</td>
<td>56.00</td>
<td>-31.50</td>
<td>NEUTRAL</td>
<td>QP</td>
</tr>
<tr>
<td>9</td>
<td>4.62</td>
<td>18.72</td>
<td>0.38</td>
<td>19.10</td>
<td>48.00</td>
<td>-26.90</td>
<td>NEUTRAL</td>
<td>Average</td>
</tr>
<tr>
<td>10</td>
<td>4.62</td>
<td>28.72</td>
<td>0.38</td>
<td>29.10</td>
<td>56.00</td>
<td>-26.90</td>
<td>NEUTRAL</td>
<td>QP</td>
</tr>
<tr>
<td>11</td>
<td>6.84</td>
<td>21.82</td>
<td>0.51</td>
<td>22.33</td>
<td>50.00</td>
<td>-27.67</td>
<td>NEUTRAL</td>
<td>Average</td>
</tr>
<tr>
<td>12</td>
<td>6.84</td>
<td>26.82</td>
<td>0.51</td>
<td>27.33</td>
<td>60.00</td>
<td>-32.67</td>
<td>NEUTRAL</td>
<td>QP</td>
</tr>
</tbody>
</table>
3 Radiated Emission Test – Below 1 GHz

3.1 Test Instruments

Refer to Sec. 1.3 Test Instruments.

3.2 Test Configuration and Procedure

Table-top Equipment

- The EUT was placed on a non-conductive turntable which was 80cm above the horizontal ground plane. The EUT was set 10m (or 3m) away from the receiving antenna that was mounted on a non-conductive mast.
- Main cables draped to the ground plane and were routed to the mains power outlet. The mains power outlet was bonded to and did not protrude above the ground plane.
- The antenna was adjusted between 1m and 4m in height above the ground plane and the Antenna-to-EUT azimuth was also varied during the measurements to find the top 6 maximum meter readings within the frequency range limit as indicated in Sec 3.3.
- The radiated emissions were measured when the Antenna-to-EUT polarization was set horizontally and vertically.
- The values were recorded.
3.3 Radiated Limit

☐ FCC Part 15 Subpart B

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Field Strength (µV/m)</th>
<th>Quasi-Peak (dBµV/m)</th>
<th>Field Strength (µV/m)</th>
<th>Quasi-Peak (dBµV/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 to 88</td>
<td>90</td>
<td>39.0</td>
<td>100</td>
<td>40.0</td>
</tr>
<tr>
<td>88 to 216</td>
<td>150</td>
<td>43.5</td>
<td>150</td>
<td>43.5</td>
</tr>
<tr>
<td>216 to 960</td>
<td>210</td>
<td>46.5</td>
<td>200</td>
<td>46.0</td>
</tr>
<tr>
<td>Above 960</td>
<td>300</td>
<td>49.5</td>
<td>500</td>
<td>54.0</td>
</tr>
</tbody>
</table>

Emission Level (dBµV/m) = 20 Log Emission Level (µV/m)

Refer to FCC Part 15 Subpart B clause 15.109(g):
As an alternative to the radiated emission limits shown in paragraphs (a) and (b) of this section, digital devices may be shown to comply with the standards contained in Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, “Information Technology Equipment—Radio Disturbance Characteristics—Limits and Methods of Measurement”.

☒ CISPR 22

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Quasi-Peak (dBµV/m)</th>
<th>Quasi-Peak (dBµV/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 to 230</td>
<td>40.0</td>
<td>30.0</td>
</tr>
<tr>
<td>230 to 1000</td>
<td>47.0</td>
<td>37.0</td>
</tr>
</tbody>
</table>

3.4 Test Result

PASS

The final tests data are shown on the following page(s).
Radiated Emission Test Data- Line mode

Test Date : 18-JUL-2017  Polarization : Horizontal
Temperature : 26℃  Humidity : 56%

Remark:
1. All readings are Quasi-Peak values.
2. Result = Reading + C.F
3. Margin = Result – Limit

<table>
<thead>
<tr>
<th>No.</th>
<th>Freq (MHz)</th>
<th>Reading (dBuV)</th>
<th>C.F (dB)</th>
<th>Result (dBuV/m)</th>
<th>Limit (dBuV/m)</th>
<th>Margin (dB)</th>
<th>Height (cm)</th>
<th>Angle (deg)</th>
<th>Antenna Pol.</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>61.92</td>
<td>34.61</td>
<td>-16.99</td>
<td>17.62</td>
<td>30.00</td>
<td>-12.38</td>
<td>400</td>
<td>201</td>
<td>HORIZONTAL</td>
<td>QP</td>
</tr>
<tr>
<td>2</td>
<td>86.43</td>
<td>34.69</td>
<td>-14.65</td>
<td>20.04</td>
<td>30.00</td>
<td>-9.96</td>
<td>399</td>
<td>173</td>
<td>HORIZONTAL</td>
<td>QP</td>
</tr>
<tr>
<td>3</td>
<td>109.32</td>
<td>33.56</td>
<td>-12.00</td>
<td>21.56</td>
<td>30.00</td>
<td>-8.44</td>
<td>397</td>
<td>121</td>
<td>HORIZONTAL</td>
<td>QP</td>
</tr>
<tr>
<td>4</td>
<td>144.06</td>
<td>32.59</td>
<td>-11.49</td>
<td>21.10</td>
<td>30.00</td>
<td>-8.90</td>
<td>396</td>
<td>89</td>
<td>HORIZONTAL</td>
<td>QP</td>
</tr>
<tr>
<td>5</td>
<td>191.92</td>
<td>36.86</td>
<td>-13.73</td>
<td>23.13</td>
<td>30.00</td>
<td>-6.87</td>
<td>395</td>
<td>79</td>
<td>HORIZONTAL</td>
<td>QP</td>
</tr>
<tr>
<td>6</td>
<td>214.31</td>
<td>34.95</td>
<td>-13.27</td>
<td>21.68</td>
<td>30.00</td>
<td>-8.32</td>
<td>393</td>
<td>111</td>
<td>HORIZONTAL</td>
<td>QP</td>
</tr>
</tbody>
</table>
Radiated Emission Test Data - Line mode

Test Date: 18-JUL-2017  Polarization: Vertical
Temperature: 26°C  Humidity: 56%RH

Remark:
1. All readings are Quasi-Peak values.
2. Result = Reading + C.F
3. Margin = Result – Limit
Radiated Emission Test Data - Battery mode

Test Date : 18-JUL-2017  
Temperature : 26°C  
Humidity : 56% 

Remark:
1. All readings are Quasi-Peak values.
2. Result = Reading + C.F 
3. Margin = Result – Limit 

<table>
<thead>
<tr>
<th>No.</th>
<th>Freq</th>
<th>Reading</th>
<th>C.F</th>
<th>Result</th>
<th>Limit</th>
<th>Margin</th>
<th>Height</th>
<th>Angle</th>
<th>Antenna</th>
<th>Pol</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>83.47</td>
<td>37.17</td>
<td>-15.06</td>
<td>22.11</td>
<td>30.00</td>
<td>-7.89</td>
<td>400</td>
<td>88</td>
<td>HORIZONTAL</td>
<td>GP</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>109.32</td>
<td>30.89</td>
<td>-12.00</td>
<td>18.89</td>
<td>30.00</td>
<td>-11.11</td>
<td>397</td>
<td>162</td>
<td>HORIZONTAL</td>
<td>GP</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>184.97</td>
<td>31.45</td>
<td>-13.72</td>
<td>17.73</td>
<td>30.00</td>
<td>-12.27</td>
<td>399</td>
<td>91</td>
<td>HORIZONTAL</td>
<td>GP</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>192.00</td>
<td>36.00</td>
<td>-13.73</td>
<td>22.27</td>
<td>30.00</td>
<td>-7.73</td>
<td>395</td>
<td>77</td>
<td>HORIZONTAL</td>
<td>GP</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>222.80</td>
<td>35.01</td>
<td>-12.90</td>
<td>22.11</td>
<td>30.00</td>
<td>-7.89</td>
<td>393</td>
<td>39</td>
<td>HORIZONTAL</td>
<td>GP</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>230.52</td>
<td>31.22</td>
<td>-12.11</td>
<td>19.11</td>
<td>37.00</td>
<td>-17.89</td>
<td>391</td>
<td>121</td>
<td>HORIZONTAL</td>
<td>GP</td>
<td></td>
</tr>
</tbody>
</table>

Remark : 1. All readings are Quasi-Peak values. 
2. Result = Reading + C.F 
3. Margin = Result – Limit
Radiated Emission Test Data - Battery mode

Test Date: 18-JUL-2017  |  Polarization: Vertical
Temperature: 26°C  |  Humidity: 56%RH

Remark:
1. All readings are Quasi-Peak values.
2. Result = Reading + C.F
3. Margin = Result – Limit
4 Radiated Emission Test – Above 1GHz

4.1 Test Instruments

Refer to Sec. 1.3 Test Instruments.

4.2 Test Configuration and Procedure

Table-top Equipment

- The EUT was placed on a non-conductive turntable which was 80cm above the horizontal ground plane. The EUT was set 3m away from the receiving antenna that was mounted on a non-conductive mast.
- Main cables draped to the ground plane and were routed to the mains power outlet. The mains power outlet was bonded to and did not protrude above the ground plane.
- The antenna was adjusted between 1m and 4m in height above the ground plane and the Antenna-to-EUT azimuth was also varied during the measurements to find the top 6 maximum meter readings within the frequency range limit as indicated in Sec 4.3.
- The radiated emissions were measured when the Antenna-to-EUT polarization was set horizontally and vertically.
- The values were recorded.
4.3 Test Limit

**FCC Part 15 Subpart B**

<table>
<thead>
<tr>
<th>Frequency GHz</th>
<th>Class A at 10m</th>
<th>Class B at 3m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Field Strength ($\mu$V/m)</td>
<td>Average (dB$\mu$V/m)</td>
</tr>
<tr>
<td>Above 1GHz</td>
<td>300</td>
<td>49.5</td>
</tr>
</tbody>
</table>

Note:
1. The lower limit shall apply at the transition frequencies.
2. Emission level (dB$\mu$V/m) = 20 log Emission level ($\mu$V/m).
3. The measurement above 1GHz is at close-in 3m, and determine the limit $L_2$ corresponding to the close-in distance $d_2$ by applying the following relation: $L_2 = L_1(d_1/d_2)$, where $L_1$ is the specified limit in microvolts per meter ($\mu$V/m) at the distance $d_1(10m)$, $L_2$ is the new limit for distance $d_2(3m)$.

So the new Class A limit above 1GHz at 3m is as following table:

<table>
<thead>
<tr>
<th>Frequency GHz</th>
<th>Class A at 3m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average (dB$\mu$V/m)</td>
</tr>
<tr>
<td>Above 1GHz</td>
<td>60</td>
</tr>
</tbody>
</table>

4.4 Test Result

*Not applicable*

※The highest frequency of the internal sources of the EUT is less than 108MHz. Hence, above 1GHz Radiated Measurement shall not be made.
5 Photographs of Test

5.1 Conducted Emission Test

Front View

Rear View
5.2 Radiated Emission Test – Below 1 GHz

Front View

Rear View
6 Photographs of EUT

Front View of EUT

Rear View of EUT
Inside View of EUT

Front View of EUT's PCB 1
Rear View of the PCB 2

Front View of the PCB 3
Rear View of the PCB 3

Front View of the PCB 4
Rear View of the PCB 4

Front View of the PCB 5
Rear View of the PCB 5

Front View of the PCB 6
View of the EUT Battery label

View of the Transformer
View of the Transformer label

View of the Coaxial cable
View of the data cable