

# FCC TEST REPORT

**Product Name:** DP CONNECTING KIT(SMART CONTROLLER)  
**Trade Mark:** N/A  
**Model No.:** 2042811  
**Add. Model No.:** N/A  
**Report Number:** 180919023EMC-1  
**Test Standards:** FCC 47 CFR Part 15 Subpart B  
**Test Result:** PASS  
**Date of Issue:** October 18, 2018

Prepared for:

**LF Beauty Limited**  
2/F., HK Spinners Industrial Building, Phases I & II, 800 Cheung  
ShaWan Road, Kowloon, Hong Kong

Prepared by:

**Shenzhen UnionTrust Quality and Technology Co., Ltd.**  
16/F, Block A, Building 6, Baoneng Science and Technology Park,  
Qingxiang Road No.1, Longhua New District, Shenzhen, China  
**TEL: +86-755-2823 0888**  
**FAX: +86-755-2823 0886**

Tested by: Henry Lu  
Henry Lu  
Project Engineer

Reviewed by: Kevin Liang  
Kevin Liang  
Assistant Manager

Approved by: Billy Li  
Billy Li  
Technical Director

Date: October 18, 2018



**Shenzhen UnionTrust Quality and Technology Co., Ltd.**

Address: 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China  
Tel: +86-755-28230888 Fax: +86-755-28230886 E-mail: info@uttlab.com [Http://www.uttlab.com](http://www.uttlab.com)

**Version**

| Version No. | Date             | Description |
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## CONTENTS

|  |           |
|--|-----------|
| <b>1. GENERAL INFORMATION</b>                          | <b>4</b>  |
| <b>1.1 CLIENT INFORMATION</b>                          | <b>4</b>  |
| <b>1.2 EUT INFORMATION</b>                             | <b>4</b>  |
| 1.2.1 GENERAL DESCRIPTION OF EUT                       | 4         |
| 1.2.2 DESCRIPTION OF ACCESSORIES                       | 4         |
| <b>1.3 DESCRIPTION OF SUPPORT UNITS</b>                | <b>4</b>  |
| <b>1.4 TEST LOCATION</b>                               | <b>4</b>  |
| <b>1.5 TEST FACILITY</b>                               | <b>5</b>  |
| <b>1.6 DEVIATION FROM STANDARDS</b>                    | <b>5</b>  |
| <b>1.7 ABNORMALITIES FROM STANDARD CONDITIONS</b>      | <b>5</b>  |
| <b>1.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER</b> | <b>5</b>  |
| <b>1.9 MEASUREMENT UNCERTAINTY</b>                     | <b>5</b>  |
| <b>2. TEST SUMMARY</b>                                 | <b>6</b>  |
| <b>3. EQUIPMENT LIST</b>                               | <b>7</b>  |
| <b>4. TEST CONFIGURATION</b>                           | <b>8</b>  |
| <b>4.1 ENVIRONMENTAL CONDITIONS FOR TESTING</b>        | <b>8</b>  |
| 4.1.1 NORMAL OR EXTREME TEST CONDITIONS                | 8         |
| 4.1.2 RECORD OF NORMAL ENVIRONMENT                     | 8         |
| <b>4.2 TEST MODES</b>                                  | <b>8</b>  |
| <b>4.3 TEST SETUP</b>                                  | <b>8</b>  |
| 4.3.1 FOR RADIATED EMISSIONS TEST SETUP                | 8         |
| 4.3.2 FOR CONDUCTED EMISSIONS TEST SETUP               | 9         |
| <b>4.4 SYSTEM TEST CONFIGURATION</b>                   | <b>9</b>  |
| <b>5. REFERENCE DOCUMENTS FOR TESTING</b>              | <b>10</b> |
| <b>6. EMC REQUIREMENTS SPECIFICATION</b>               | <b>10</b> |
| <b>6.1 RADIATED EMISSION</b>                           | <b>10</b> |
| <b>6.2 CONDUCTED EMISSION</b>                          | <b>15</b> |
| <b>APPENDIX 1 PHOTOS OF TEST SETUP</b>                 | <b>18</b> |
| <b>APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS</b> | <b>18</b> |

## 1. GENERAL INFORMATION

### 1.1 CLIENT INFORMATION

|                                 |  |
|---------------------------------|--|
| <b>Applicant:</b>               | LF Beauty Limited  |
| <b>Address of Applicant:</b>    | 2/F., HK Spinners Industrial Building, Phases I & II, 800 Cheung ShaWan Road, Kowloon, Hong Kong |
| <b>Manufacturer:</b>            | LF Beauty Limited  |
| <b>Address of Manufacturer:</b> | 2/F., HK Spinners Industrial Building, Phases I & II, 800 Cheung ShaWan Road, Kowloon, Hong Kong |

### 1.2 EUT INFORMATION

#### 1.2.1 General Description of EUT

|   |  |
|---|--|
| <b>Product Name:</b>                      | DP CONNECTING KIT(SMART CONTROLLER)    |
| <b>Model No.:</b>                         | 2042811                                |
| <b>Add. Model No.:</b>                    | N/A                                    |
| <b>Trade Mark:</b>                        | N/A                                    |
| <b>DUT Stage:</b>                         | Production Unit                        |
| <b>Power Supply:</b>                      | 100-240 V~50/60 Hz                     |
| <b>Classification of digital devices:</b> | Class B                                |
| <b>Highest Internal Frequency:</b>        | 2.48 GHz                               |
| <b>Sample Received Date:</b>              | September 19, 2018                     |
| <b>Sample Tested Date:</b>                | September 19, 2018 to October 16, 2018 |

#### 1.2.2 Description of Accessories

None.

### 1.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested independently

### 1.4 TEST LOCATION

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#### Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China 518109  
 Telephone: +86 (0) 755 2823 0888  
 Fax: +86 (0) 755 2823 0886

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## 1.5 TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

**CNAS-Lab Code: L9069**

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

**IC-Registration No.: 21600-1**

The 3m Semi-anechoic chamber of Shenzhen UnionTrust Quality and Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 21600-1.

**A2LA-Lab Certificate No.: 4312.01**

Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

**FCC Accredited Lab.**

Designation Number: CN1194  
 Test Firm Registration Number: 259480

## 1.6 DEVIATION FROM STANDARDS

None.

## 1.7 ABNORMALITIES FROM STANDARD CONDITIONS

None.

## 1.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

## 1.9 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product 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.

| No. | Item                            | Measurement Uncertainty |
|-----|---------------------------------|-------------------------|
| 1   | Conducted emission 9KHz-150KHz  | ±3.8 dB                 |
| 2   | Conducted emission 150KHz-30MHz | ±3.4 dB                 |
| 3   | Radiated emission 9KHz-30MHz    | ±4.9 dB                 |
| 4   | Radiated emission 30MHz-1GHz    | ±4.7 dB                 |
| 5   | Radiated emission 1GHz-18GHz    | ±5.1 dB                 |
| 6   | Radiated emission 18GHz-26GHz   | ±5.2 dB                 |
| 7   | Radiated emission 26GHz-40GHz   | ±5.2 dB                 |

## 2. TEST SUMMARY

| FCC 47 CFR Part 15 Subpart B Test Cases |                        |                 |        |
|---|------------------------|-----------------|--------|
| Test Item                               | Test Requirement       | Test Method     | Result |
| Conducted Emission                      | FCC 47 CFR Part 15.107 | ANSI C63.4-2014 | PASS   |
| Radiated Emission                       | FCC 47 CFR Part 15.109 | ANSI C63.4-2014 | PASS   |



### 3. EQUIPMENT LIST

| Radiated Emission Test Equipment List |                                  |              |           |                            |                         |                             |
|---------------------------------------|----------------------------------|--------------|-----------|----------------------------|-------------------------|-----------------------------|
| Used                                  | Equipment                        | Manufacturer | Model No. | Serial Number              | Cal. date (mm dd, yyyy) | Cal. Due date (mm dd, yyyy) |
| <input checked="" type="checkbox"/>   | 3M Chamber & Accessory Equipment | ETS-LINDGREN | 3M        | N/A                        | Dec. 20, 2015           | Dec. 19, 2018               |
| <input checked="" type="checkbox"/>   | Receiver                         | R&S          | ESIB26    | 100114                     | Dec. 10, 2017           | Dec. 10, 2018               |
| <input checked="" type="checkbox"/>   | Broadband Antenna                | ETS-LINDGREN | 3142E     | 00201566                   | Dec. 17, 2017           | Dec. 17, 2018               |
| <input checked="" type="checkbox"/>   | Preamplifier                     | HP           | 8447F     | 2805A02960                 | Dec. 10, 2017           | Dec. 10, 2018               |
| <input checked="" type="checkbox"/>   | Horn Antenna (Pre-amplifier)     | ETS-LINDGREN | 3117-PA   | 00201874                   | May 22, 2018            | May 22, 2019                |
| <input checked="" type="checkbox"/>   | Horn Antenna (Pre-amplifier)     | ETS-LINDGREN | 3116C-PA  | 00202652                   | Dec. 17, 2017           | Dec. 17, 2018               |
| <input checked="" type="checkbox"/>   | Multi device Controller          | ETS-LINDGREN | 7006-001  | 00160105                   | N/A                     | N/A                         |
| <input checked="" type="checkbox"/>   | Test Software                    | Audix        | e3        | Software Version: 9.160323 |                         |                             |

| Conducted Emission Test Equipment List |               |              |           |                            |                         |                             |
|--|---------------|--------------|-----------|----------------------------|-------------------------|-----------------------------|
| Used                                   | Equipment     | Manufacturer | Model No. | Serial Number              | Cal. date (mm dd, yyyy) | Cal. Due date (mm dd, yyyy) |
| <input checked="" type="checkbox"/>    | Receiver      | R&S          | ESR7      | 1316.3003K07-101181-K3     | Dec. 10, 2017           | Dec. 10, 2018               |
| <input checked="" type="checkbox"/>    | Pulse Limiter | R&S          | ESH3-Z2   | 0357.8810.54               | Dec. 10, 2017           | Dec. 10, 2018               |
| <input checked="" type="checkbox"/>    | LISN          | R&S          | ESH2-Z5   | 860014/024                 | Dec. 10, 2017           | Dec. 10, 2018               |
| <input checked="" type="checkbox"/>    | Test Software | Audix        | e3        | Software Version: 9.160323 |                         |                             |



## 4. TEST CONFIGURATION

### 4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

#### 4.1.1 Normal or Extreme Test Conditions

| Environment Parameter | Selected Values During Tests |                         |                       |
|-----------------------|------------------------------|-------------------------|-----------------------|
| Test Condition        | Ambient                      |                         |                       |
|                       | Temperature (°C)             | Voltage                 | Relative Humidity (%) |
| NT/NV                 | +15 to +35                   | 120V~60Hz and 240V~50Hz | 20 to 75              |

**Remark:**  
1) NV: Normal Voltage; NT: Normal Temperature

#### 4.1.2 Record of Normal Environment

| Test Item          | Temperature (°C) | Relative Humidity (%) | Pressure (Kpa) | Tested by    |
|--------------------|------------------|-----------------------|----------------|--------------|
| Conducted Emission | 26.4             | 40                    | 99.8           | Gemini Huang |
| Radiated Emission  | 25.9             | 55                    | 98.87          | Tony Kang    |

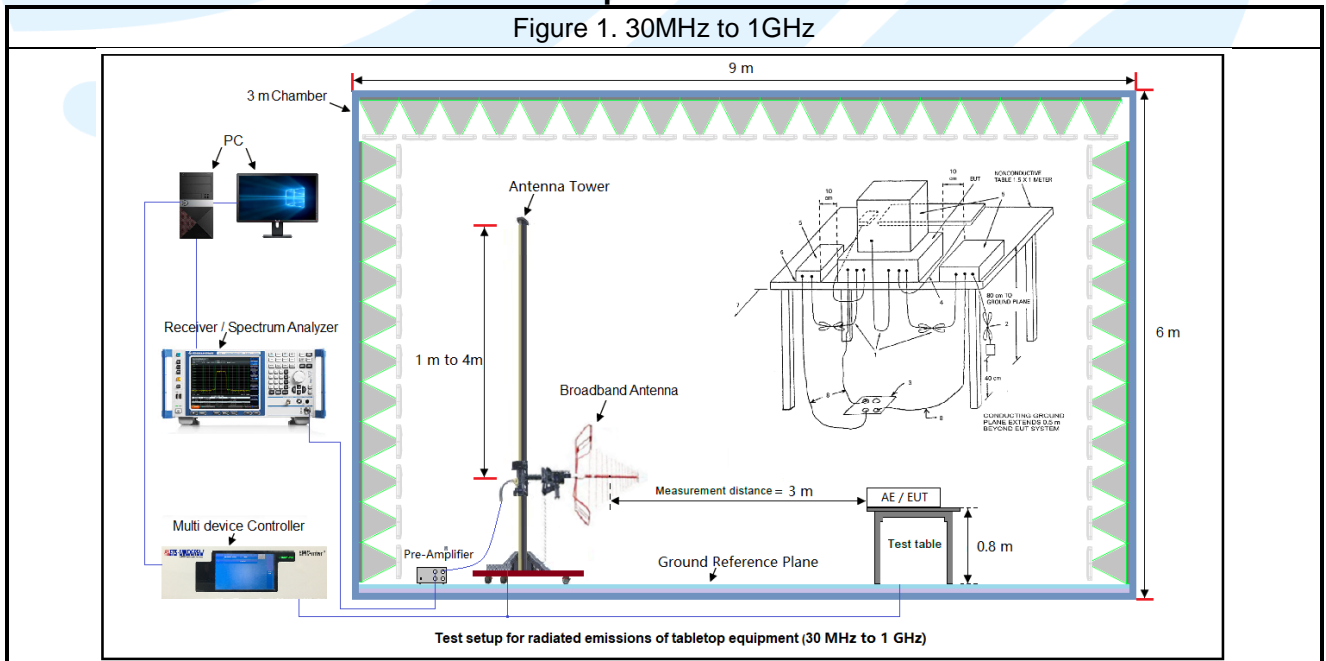
## 4.2 TEST MODES

| Test Item          | EMI Test Modes  |
|--------------------|---|
| Radiated Emission  | <b>Mode 1: GPRS 900 LINK + Charging form Adapter (AC 120V)</b><br><b>Mode 2: BLE LINK + Charging form Adapter (AC 120V)</b><br><b>Mode 3: WAN (RJ45) + Charging form Adapter (AC 120V)</b><br>Mode 4: Worse from Mode 1~3 + Charging form Adapter (AC 240V) |
| Conducted Emission | Mode 1: GPRS 900 LINK + Charging form Adapter (AC 120V)<br>Mode 2: BLE LINK + Charging form Adapter (AC 120V)<br>Mode 3: WAN (RJ45) + Charging form Adapter (AC 120V)<br><b>Mode 4: Worse from Mode 1~3 + Charging form Adapter (AC 240V)</b>               |

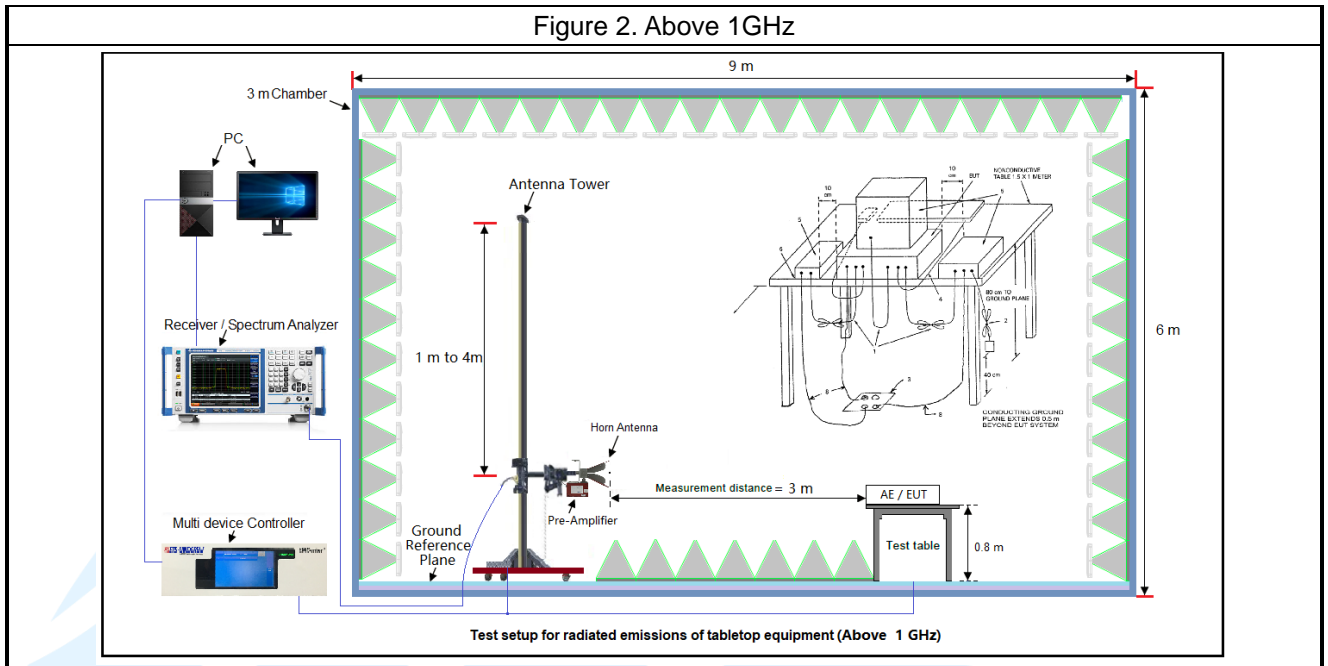
**Remark:** 1. The above test modes in boldface were the worst cases, only the test data of these modes were reported.  
2. Two USB ports were not evaluated in this report because the manufacturer did not open their functionality.

## 4.3 TEST SETUP

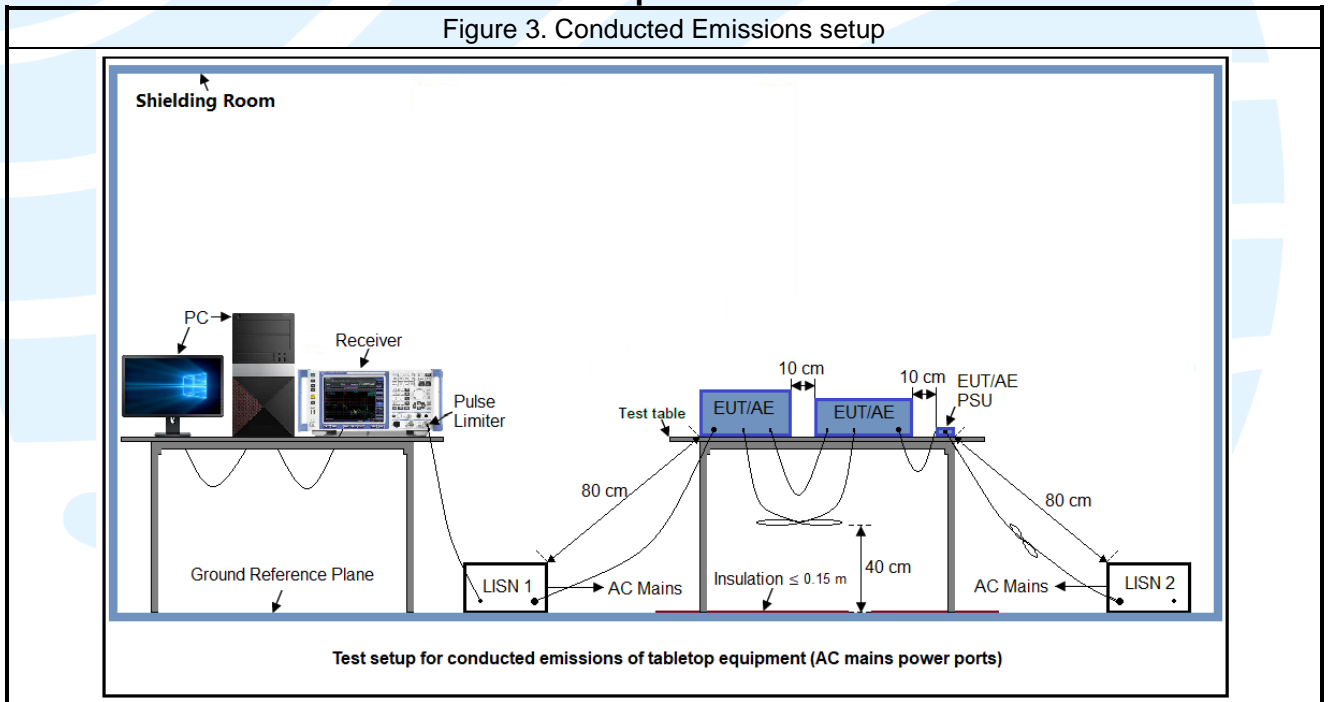
### 4.3.1 For Radiated Emissions test setup







**4.3.2 For Conducted Emissions test setup**



**4.4 SYSTEM TEST CONFIGURATION**

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1 MHz or greater for frequencies above 1000MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic (according to KDB 896810 D02 SDoC FAQ v01r01) of the highest fundamental frequency or to 40 GHz, whichever is lower.

## 5. REFERENCE DOCUMENTS FOR TESTING

| No. | Identity                                 | Document Title  |
|-----|--|---|
| 1   | FCC 47 CFR Part15 Subpart B              | Unintentional Radiators   |
| 2   | ANSI C63.4-2014                          | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz |
| 3   | KDB 174176 D01 Line Conducted FAQ v01r01 | AC power-line conducted emission frequency asked questions  |
| 4   | KDB 896810 D02 SDoC FAQ v01r02           | Supplier's Declaration of Conformity frequency asked questions  |

## 6. EMC REQUIREMENTS SPECIFICATION

### 6.1 RADIATED EMISSION

**Test Requirement:** FCC 47 CFR Part 15.109

**Test Method:** ANSI C63.4-2014

**Receiver Setup:**

| Frequency: (f) (MHz)    | Detector type | Measurement receiver bandwidth |         |
|-------------------------|---------------|--------------------------------|---------|
|                         |               | RBW                            | VBW     |
| $30 \leq f \leq 1\,000$ | Quasi Peak    | 120 kHz                        | 300 kHz |
| $f \geq 1000$           | Peak          | 1 MHz                          | 3 MHz   |
|                         | Average       | 1 MHz                          | 3 MHz   |

**Measured frequency range**

| Highest frequency generated or used in the device or on which the device operates or tunes (MHz) | Upper frequency of measurement range (MHz)                           |
|--|--|
| Below 1.705  | 30.  |
| 1.705-108  | 1000.  |
| 108-500  | 2000.  |
| 500-1000   | 5000.  |
| Above 1000   | 5th harmonic of the highest frequency or 40 GHz, whichever is lower. |

**Limits:**

Limits for Class B devices

| Frequency (MHz) | limits at 3m (dB $\mu$ V/m) |             |             |
|-----------------|-----------------------------|-------------|-------------|
|                 | QP Detector                 | PK Detector | AV Detector |
| 30-88           | 40.0                        | --          | --          |
| 88-216          | 43.5                        | --          | --          |
| 216-960         | 46.0                        | --          | --          |
| 960 to 1000     | 54.0                        | --          | --          |
| Above 1000      | --                          | 74.0        | 54.0        |

**Remark:**

- The lower limit shall apply at the transition frequencies.
- Emission level (dB $\mu$ V/m) = 20 log Emission level ( $\mu$ V/m).
- For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

**Test Setup:** Refer to section 4.3.1 for details.

**Test Procedures:**

- From 30 MHz to 1GHz test procedure as below:

### Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: info@uttlab.com

[Http://www.uttlab.com](http://www.uttlab.com)

- 1) The Product was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
- 2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- 3) For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

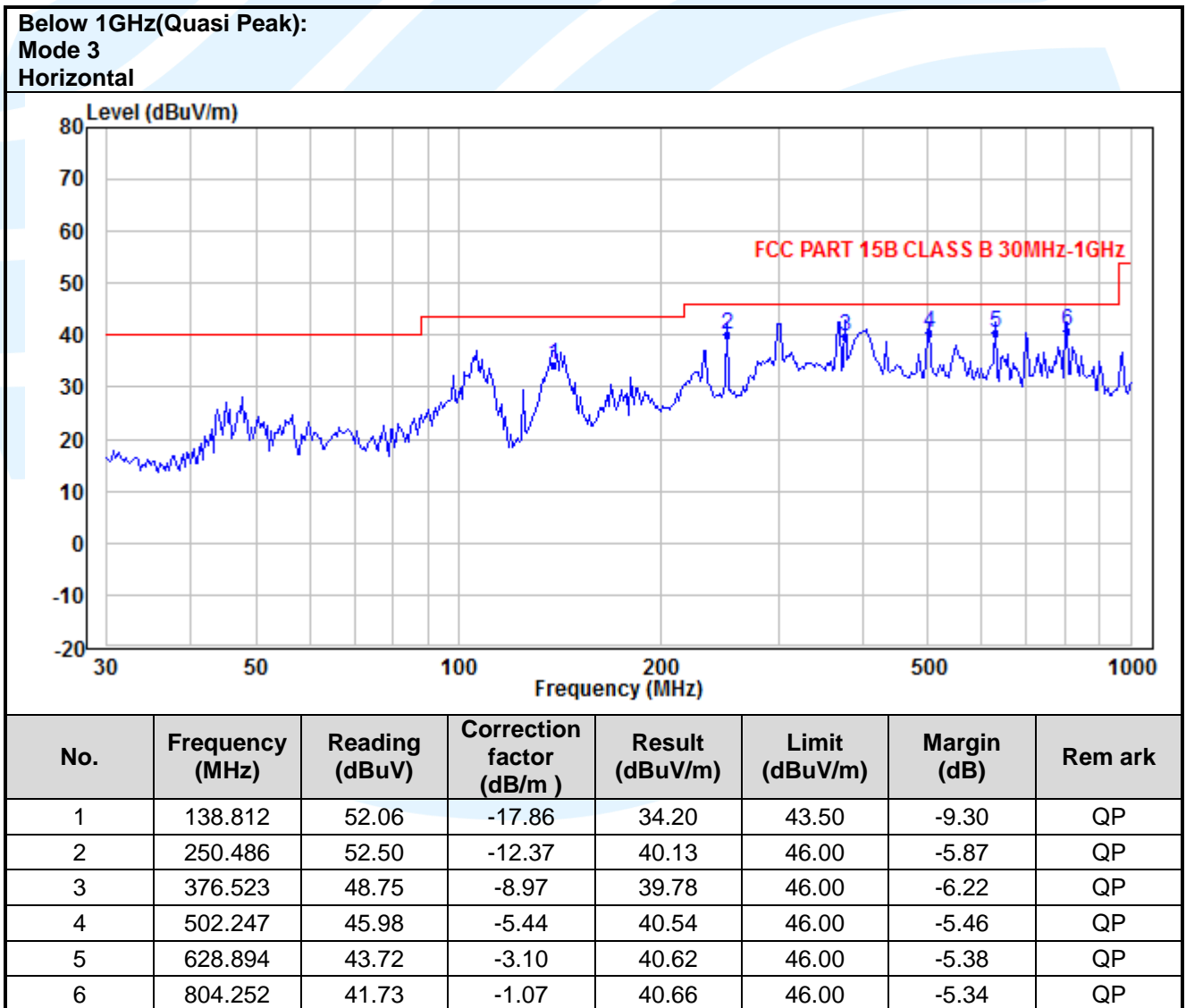
2. Above 1GHz test procedure as below:

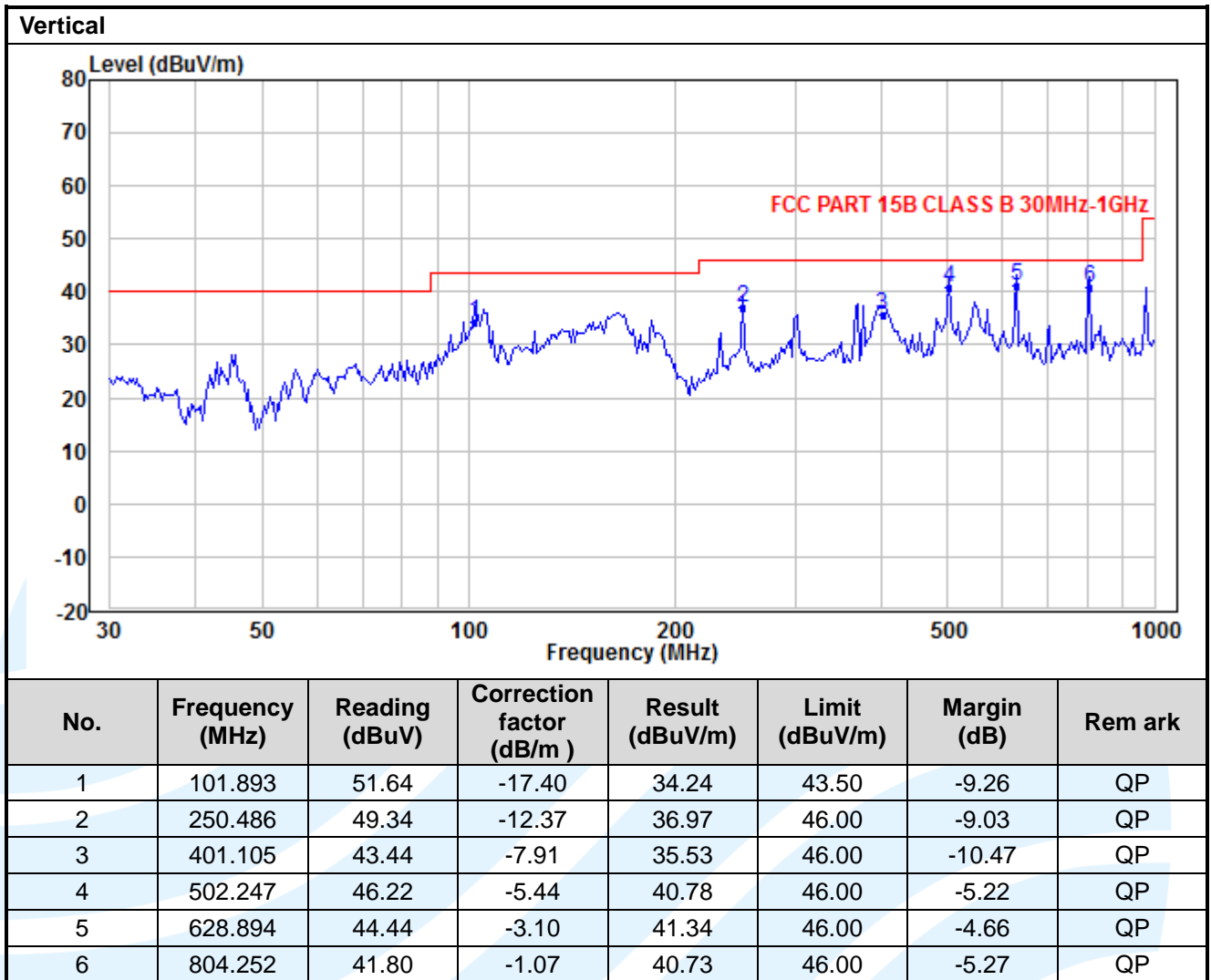
- 1) The Product was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
- 2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- 3) For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

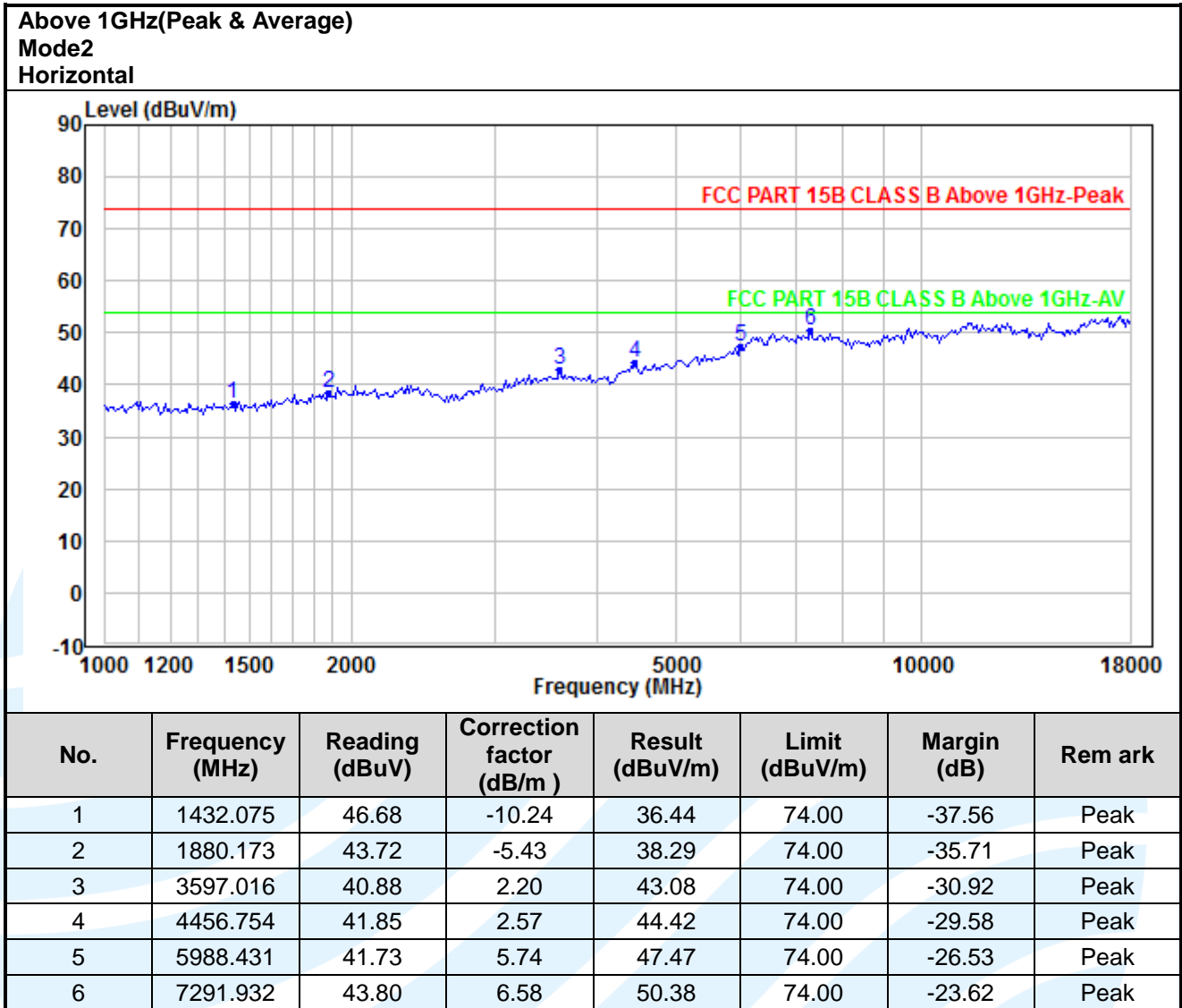
**Equipment Used:** Refer to section 3 for details.

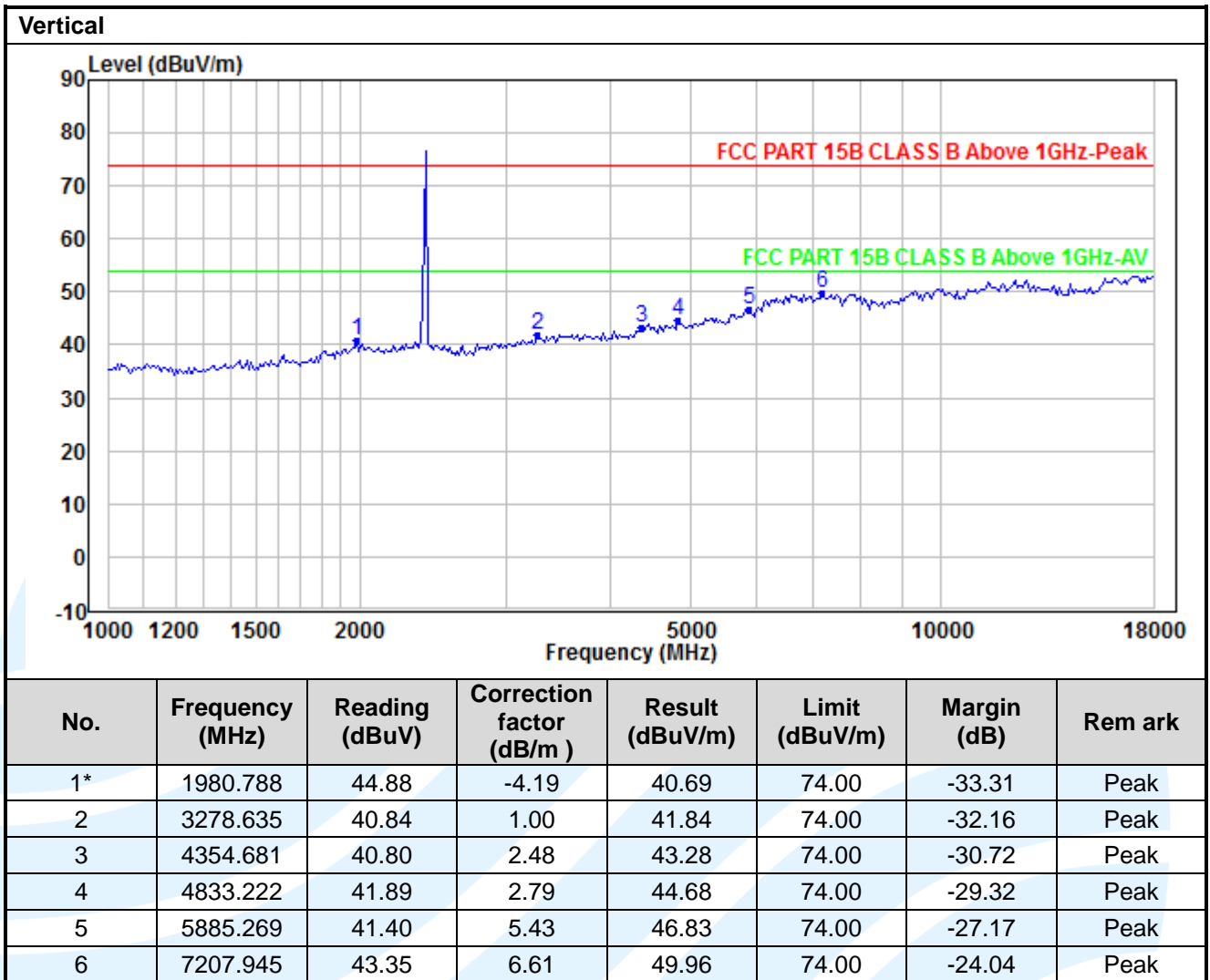
**Test Result:** Pass

**The measurement data as follows:**









Remark:

1. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.
2. All possible modes of operation were investigated. Only the worst case emissions reported.
3. Margin = Result – Limit

## 6.2 CONDUCTED EMISSION

**Test Requirement:** FCC 47 CFR Part 15.107

**Test Method:** ANSI C63.4-2014

**Limits:**

Limits for Class B devices

| Frequency range (MHz) | Limits (dB(μV)) |          |
|-----------------------|-----------------|----------|
|                       | Quasi-peak      | Average  |
| 0,15 to 0,50          | 66 to 56        | 56 to 46 |
| 0,50 to 5             | 56              | 46       |
| 5 to 30               | 60              | 50       |

**Remark:**

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

**Test Setup:** Refer to section 4.3.2 for details.

**Test Procedures:**

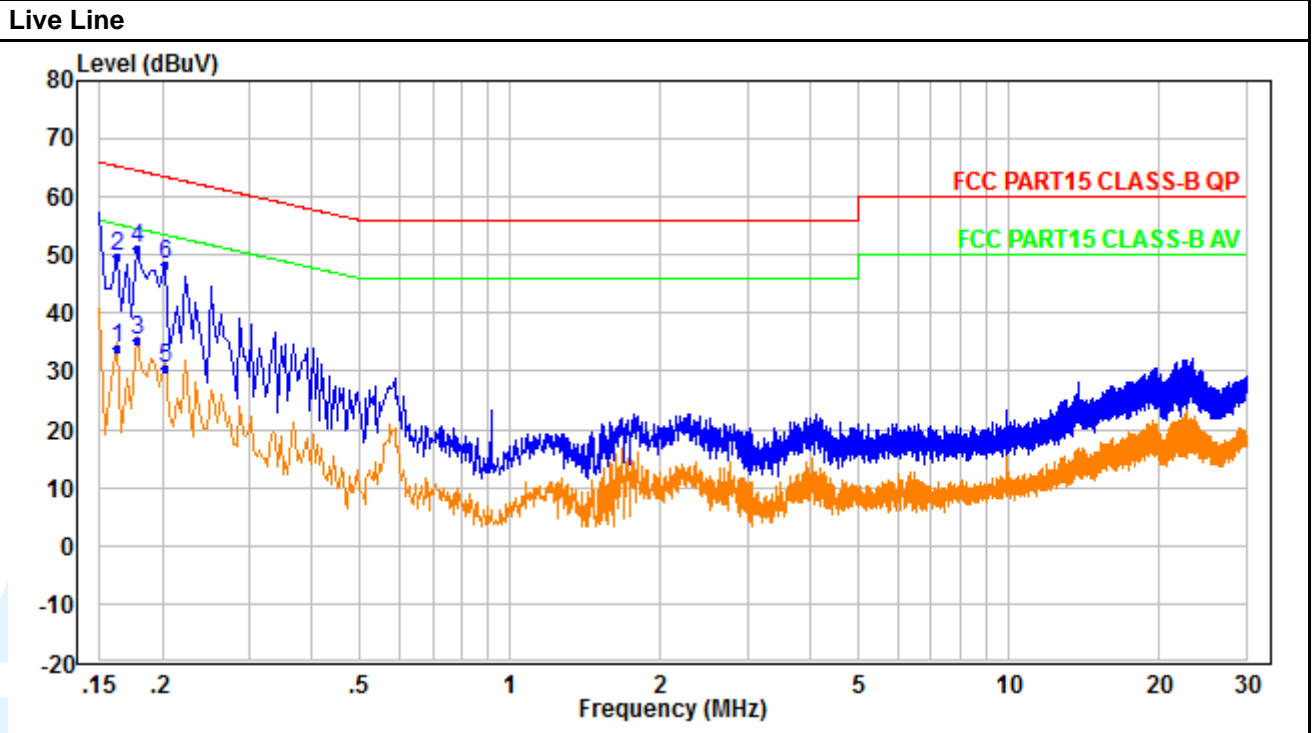
- 1) The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
- 2) The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
- 3) For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

**Equipment Used:** Refer to section 3 for details.

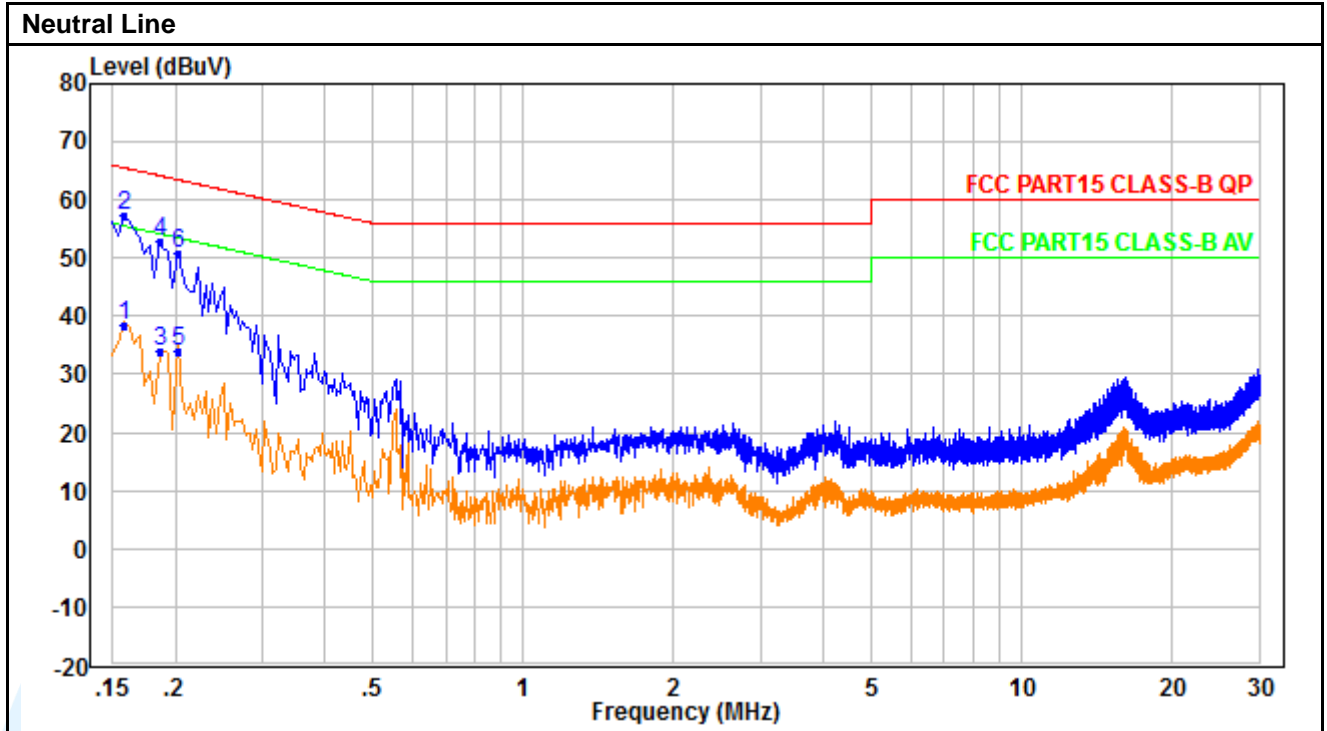
**Test Result:** Pass



The measurement data as follows:  
 Quasi Peak and Average:  
 Mode 4



| No. | Frequency (MHz) | Reading (dBUV) | Correction factor (dB) | Result (dBUV) | Limit (dBUV) | Margin (dB) | Remark  |
|-----|-----------------|----------------|------------------------|---------------|--------------|-------------|---------|
| 1   | 0.162           | 23.66          | 10.18                  | 33.84         | 55.36        | -21.52      | Average |
| 2   | 0.162           | 39.64          | 10.18                  | 49.82         | 65.36        | -15.54      | QP      |
| 3   | 0.178           | 25.09          | 10.19                  | 35.28         | 54.58        | -19.30      | Average |
| 4   | 0.178           | 41.07          | 10.19                  | 51.26         | 64.58        | -13.32      | QP      |
| 5   | 0.202           | 20.29          | 10.21                  | 30.50         | 53.53        | -23.03      | Average |
| 6   | 0.202           | 38.29          | 10.21                  | 48.50         | 63.53        | -15.03      | QP      |



| No. | Frequency (MHz) | Reading (dBUV) | Correction factor (dB) | Result (dBUV) | Limit (dBUV) | Margin (dB) | Remark  |
|-----|-----------------|----------------|------------------------|---------------|--------------|-------------|---------|
| 1   | 0.158           | 28.28          | 10.21                  | 38.49         | 55.57        | -17.08      | Average |
| 2   | 0.158           | 47.27          | 10.21                  | 57.48         | 65.57        | -8.09       | QP      |
| 3   | 0.186           | 23.76          | 10.24                  | 34.00         | 54.21        | -20.21      | Average |
| 4   | 0.186           | 42.74          | 10.24                  | 52.98         | 64.21        | -11.23      | QP      |
| 5   | 0.202           | 23.69          | 10.26                  | 33.95         | 53.53        | -19.58      | Average |
| 6   | 0.202           | 40.68          | 10.26                  | 50.94         | 63.53        | -12.59      | QP      |

**Remark:**

1. An initial pre-scan was performed on the Phase and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

**APPENDIX 1 PHOTOS OF TEST SETUP**

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

**APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS**

Refer to Appendix 2 for EUT external and internal photos.

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\*\*\*\*\* End of Report \*\*\*\*\*

The test report is effective only with both signature and specialized stamp. The result(s) shown in this report refer only to the sample(s) tested. Without written approval of UnionTrust, this report can't be reproduced except in full.

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