

# **FCC / Certification Test Report**

**EverPro Technologies Company Ltd.**

**USB3.0 Hybrid Active Optical Cable**

**Model: EPU3HC-AXBXXYYM**

**FCC ID: 2ACI5-EPU3HC002**

**REPORT# 15WB1121022F Rev 0**

**Dec.25, 2015**

Prepared for:

**EverPro Technologies Company Ltd.**

**4# Guanshan Er Road, Wuhan 430073 P,R, China**

Prepared by:

**WASHINGTON TECHNOLOGY INTERNATIONAL LIMITED**

This report applies only to the sample evaluated prior to the preparation date stated above.

This report must be copied in its entirety, including all technical documents.

## **FCC / Certification Test Report**

**For the**  
**EverPro Technologies Company Ltd.**  
**USB3.0 Hybrid Active Optical Cable**  
**MODEL: EPU3HC-AXBXXYYM**  
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**WLL REPORT# 15WB1121022F Rev 0**  
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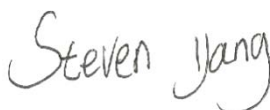
Prepared by:



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Henry guo

Reviewed by:



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Steven yang

## **Abstract**

This report has been prepared on behalf of EverPro Technologies Company Ltd. to document compliance with the limits for a Class B digital device required under Part 15 (7/2008) of the FCC Rules and Regulations This Federal Communication Commission (FCC) Test Report documents the test configuration and test results for the EverPro Technologies Company Ltd. USB3.0 HYBRID ACTIVE OPTICAL CABLE. Testing was performed on Audix Technology (Shenzhen) Co., Ltd. has been accepted by the FCC, the FCC Registration Number is 90454.

The EverPro Technologies Company Ltd. USB3.0 HYBRID ACTIVE OPTICAL CABLE complies with the FCC Part 15 requirements for a Class B device.

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## 1 Introduction

### 1.1 Compliance Statement

After the modifications listed in Section 2.7 were installed:

The EverPro Technologies Company Ltd. USB3.0 Hybrid Active Optical Cable complied with the requirements for a Class B digital device under Part 15 (2014) of the FCC Rules and Regulations

### 1.2 Test Scope Summary

Tests for radiated and conducted emissions were performed. All measurements were performed according to the 2009 version of ANSI C63.4. The measurement equipment conforms to ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation.

| Test Specification | Specific Description                          | Date Completed  | Result   | Test location                         | Modifications (Y/N) |
|--------------------|---|-----------------|----------|---------------------------------------|---------------------|
| 47 CFR Part 15.107 | Class B Conducted Emissions at the Mains Port | Dec.19, 2015    | Complied | Audix Technology (Shenzhen) Co., Ltd. | No                  |
| 47 CFR Part 15.109 | Class B Radiated Emissions                    | Dec.20~24, 2015 | Complied | Audix Technology (Shenzhen) Co., Ltd. | No                  |

### 1.3 Contract Information

Customer: EverPro Technologies Company Ltd.  
4# Guanshan Er Road, Wuhan 430073 P,R, China

## Abbreviations

|             |  |
|-------------|--|
| <b>A</b>    | <b>A</b> mpere   |
| <b>ac</b>   | <b>a</b> lternating <b>c</b> urrent                                  |
| <b>AM</b>   | <b>A</b> mplitude <b>M</b> odulation                                 |
| <b>Amps</b> | <b>A</b> mperes  |
| <b>b/s</b>  | <b>b</b> its per second  |
| <b>BW</b>   | <b>B</b> and <b>W</b> idth   |
| <b>CE</b>   | <b>C</b> onducted <b>E</b> mission                                   |
| <b>cm</b>   | <b>c</b> entimeter   |
| <b>CW</b>   | <b>C</b> ontinuous <b>W</b> ave                                      |
| <b>dB</b>   | <b>d</b> eci <b>B</b> el   |
| <b>dc</b>   | <b>d</b> irect <b>c</b> urrent                                       |
| <b>EMI</b>  | <b>E</b> lectromagnetic <b>I</b> nterference                         |
| <b>EUT</b>  | <b>E</b> quipment <b>U</b> nder <b>T</b> est                         |
| <b>FM</b>   | <b>F</b> requency <b>M</b> odulation                                 |
| <b>G</b>    | <b>g</b> iga - prefix for $10^9$ multiplier                          |
| <b>Hz</b>   | <b>H</b> ertz  |
| <b>IF</b>   | <b>I</b> ntermediate <b>F</b> requency                               |
| <b>k</b>    | <b>k</b> ilo - prefix for $10^3$ multiplier                          |
| <b>LISN</b> | <b>L</b> ine <b>I</b> mpedance <b>S</b> tabilization <b>N</b> etwork |
| <b>M</b>    | <b>M</b> ega - prefix for $10^6$ multiplier                          |
| <b>m</b>    | <b>m</b> eter  |
| <b>μ</b>    | <b>m</b> icro - prefix for $10^{-6}$ multiplier                      |
| <b>NB</b>   | <b>N</b> arrow <b>b</b> and  |
| <b>QP</b>   | <b>Q</b> uasi- <b>P</b> eak  |
| <b>RE</b>   | <b>R</b> adiated <b>E</b> missions                                   |
| <b>RF</b>   | <b>R</b> adio <b>F</b> requency                                      |
| <b>rms</b>  | <b>r</b> oot- <b>m</b> ean- <b>s</b> quare                           |
| <b>SN</b>   | <b>S</b> erial <b>N</b> umber  |
| <b>S/A</b>  | <b>S</b> pectrum <b>A</b> nalyzer                                    |
| <b>V</b>    | <b>V</b> olt   |

## 2 Equipment Under Test

### 2.1 EUT Identification

The results obtained relate only to the item(s) tested.

**Table 1: Overview of USB3.0 Hybrid Active Optical Cable, Equipment Under Test**

|                            |                                    |
|----------------------------|------------------------------------|
| <b>Model(s) Tested:</b>    | EPU3HC-A1B3K050M                   |
| <b>EUT Specifications:</b> | DC 5V from USB Port                |
|                            | Equipment Emissions Class: CLASS B |
| <b>Test Date(s):</b>       | Dec.20~24, 2015                    |

### 2.2 EUT Description

Product Name: USB3.0 Hybrid Active Optical Cable

Model No. : EPU3HC-A1B3K050M

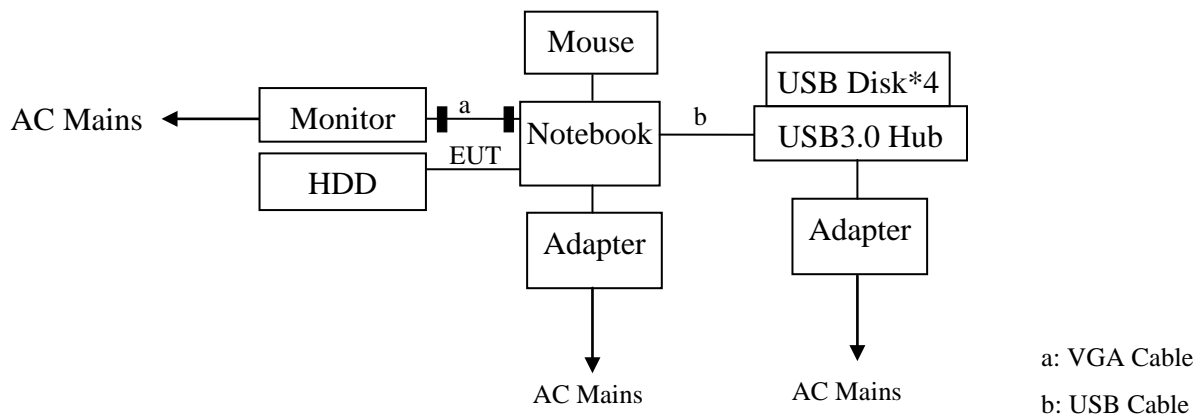
EUT Rated Voltage: DC 5V from USB Port

The USB3.0 Hybrid Active Optical Cable is Optical Cable with both side USB port to make long distance data transferring.

### 2.3 Test Configuration

The EverPro Technologies Company Ltd. USB3.0 Hybrid Active Optical Cable, Equipment Under Test (EUT), was operated with DC 5V from USB Port.

The USB3.0 Hybrid Active Optical Cable was configured as below:



**Figure 1: Test Configuration**



## 2.4 Equipment Configuration

The EUT was set up as outlined in Figure 1. The EUT was comprised of the following equipment. (All Modules, PCBs, etc. listed were considered as part of the EUT, as tested.)

**Table 2: Equipment Configuration**

| Slot # | Name / Description                 | Model Number     | Part Number | Serial Number | Revision |
|--------|------------------------------------|------------------|-------------|---------------|----------|
| 1.     | USB3.0 Hybrid Active Optical Cable | EPU3HC-A1B3K050M | /           | /             | /        |

## 2.5 Tested Supporting System Details

**Table 3: Tested Supporting System Details**

| Slot # | Port Identification | Connector Type         | Cable Length | Shielded (Y/N) | Termination Point |
|--------|---------------------|------------------------|--------------|----------------|-------------------|
| 1.     | VGA Cable           | Shielded; Detachable   | 1.5m         | Y              | AE                |
| 2.     | Power Cable         | Unshielded; Detachable | 1.5m         | N              | AE                |
| 3.     | USB Cable           | Shielded; Detachable   | 0.6m         | Y              | AE                |

## 2.6 Support Equipment

The following support equipment was used during testing:

|    | Description | ACS No.  | Manufacturer    | Model       | Serial Number            |
|----|-------------|--|-----------------|-------------|--------------------------|
| 1. | Notebook    | --   | LENOVO          | Lenovo B490 | --                       |
|    |             | Power Adapter: Manufacturer: LENOVO, M/N: ADLX90NCT3A<br>Power Cord: Unshielded, Detachable, 1.5m  |                 |             |                          |
| 2. | USB Mouse   | ACS-EMC-M08R   | DELL            | M-UARDEL7   | HS852130UO               |
|    |             | USB Cable: Shielded, Undetectable, 1.5m  |                 |             |                          |
| 3. | USB3.0 Hub  | --   | EVERPROSPE<br>R | EPU3H01AR   | --                       |
|    |             | USB Cable: Shielded, Detachable, 0.6m<br>Power Adapter: Manufacturer: LALIN, M/N: NL200120W1C2<br>Power Cord: Unshielded, Detachable, 1.5m |                 |             |                          |
| 4. | HDD         | --   | Seagate         | SRD00F1     | --                       |
| 5. | Monitor     | ACS-EMC-LM06R  | DELL            | 2407WFPb    | CN-0YY528-46633-764-1Y8S |
|    |             | VGA Cable: Shielded, Detachable, 1.5m<br>Power Cord: Unshielded, Detachable, 1.5m  |                 |             |                          |
| 6. | USB Disk*4  | --   | Somdisk         | SDCZ43      | --                       |

## **2.7 EUT Modifications**

None

## **2.8 Testing Algorithm**

The USB3.0 Hybrid Active Optical Cable was operated continuously by normal operating conditions.

## **2.9 Test Location**

NAME: Audix Technology (Shenzhen) Co., Ltd. by CNAS. The CNAS Registration No.: L4117.

the FCC Registration Number is 90454

Address: No. 6, Ke Feng Rd., 52 Block, Shenzhen Science & Industrial Park, Nantou, Shenzhen,  
Guangdong, China



**China National Accreditation Service for Conformity Assessment**

**LABORATORY ACCREDITATION CERTIFICATE**

**(Registration No. CNAS L4117 )**

**Audix Technology (Shenzhen) Co., Ltd.**

No.6, Kefeng Road, Block 52, Nantou Science & Industry Park,

Shenzhen, Guangdong, China

*is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence of testing.*

*The scope of accreditation is detailed in the attached appendices bearing the same registration number as above. The appendices form an integral part of this certificate.*

Date of Issue: 2013-02-04

Date of Expiry: 2016-02-03

Date of Initial Accreditation: 2009-07-16

Date of Update: 2013-02-04

Signed on behalf of China National Accreditation Service  
for Conformity Assessment

China National Accreditation Service for Conformity Assessment (CNAS) is authorized by Certification and Accreditation Administration of the People's Republic of China (CNCA) to operate the national accreditation schemes for conformity assessment. CNAS is the signatory to International Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (ILAC MRA) and Asia Pacific Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (APLAC MRA).

No.CNAS AL 2

0006379

## 2.10 Measurements

### 2.10.1 Measurement Method

All measurements herein were performed according to the 2009 version of ANSI C63.4. The measurement equipment conforms to ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation. Calibration checks are made periodically to verify proper performance of the measuring instrumentation.

## 2.11 Measurement Uncertainty

All results reported herein relate only to the equipment tested. The basis for uncertainty calculation uses ANSI/NCSL Z540-2-1997 with a type B evaluation of the standard uncertainty. Elements contributing to the standard uncertainty are combined using the method described in Equation 1 to arrive at the total standard uncertainty. The standard uncertainty is multiplied by the coverage factor to determine the expanded uncertainty which is generally accepted for use in commercial, industrial, and regulatory applications and when health and safety are concerned (see Equation 2). A coverage factor was selected to yield a 95% confidence in the uncertainty estimation.

**Equation 1: Standard Uncertainty**

$$u_c = \pm \sqrt{\frac{a^2}{div_a^2} + \frac{b^2}{div_b^2} + \frac{c^2}{div_c^2} + \dots}$$

where  $u_c$  = standard uncertainty

$a, b, c, \dots$  = individual uncertainty elements

$div_a, b, c$  = the individual uncertainty element divisor based on the probability distribution

divisor = 1.732 for rectangular distribution

divisor = 2 for normal distribution

divisor = 1.414 for trapezoid distribution

**Equation 2: Expanded Uncertainty**

$$U = ku_c$$

where U = expanded uncertainty  
k = coverage factor  
 $k \leq 2$  for 95% coverage (ANSI/NCSL Z540-2 Annex G)  
 $u_c$  = standard uncertainty

The measurement uncertainty complies with the maximum allowed uncertainty from CISPR 16-4-2. Measurement uncertainty is not used to adjust the measurements to determine compliance. The expanded uncertainty values for the various scopes in the WLL accreditation are provided in Table 4 below.

**Table 4: Expanded Uncertainty List**

| Scope                              | Standard(s) | Expanded Uncertainty |
|------------------------------------|-------------|----------------------|
| Conducted Emissions                | FCC Part 15 | 3.4 dB               |
| Radiated Emissions<br>(30MHz-1GHz) | FCC Part 15 | 2.6 dB               |
|                                    |             | 2.6 dB               |
|                                    |             | 3.0 dB               |
|                                    |             | 2.8 dB               |
| Radiated Emissions<br>(1GHz-18GHz) | FCC Part 15 | 6.3 dB               |
|                                    |             | 5.7 dB               |

### 3 Test Results

#### 3.1 Conducted Emissions

##### 3.1.1 Requirements

Test Arrangement: Table Top

Compliance Standard: FCC Part 15 (2014), Class B

| Compliance Limits |                            |                         |
|-------------------|----------------------------|-------------------------|
| Frequency         | Quasi-Peak Level<br>dB(μV) | Average Level<br>dB(μV) |
| 150kHz~500kHz     | 66 ~ 56                    | 56 ~ 46                 |
| 500kHz~5MHz       | 56                         | 46                      |
| 5MHz~30MHz        | 60                         | 50                      |

##### 3.1.2 Test Equipment

| Item | Equipment         | Manufacturer    | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|-------------------|-----------------|-----------|------------|-----------|---------------|
| 1.   | 1# Shielding Room | AUDIX           | N/A       | N/A        | Apr.17,15 | 1 Year        |
| 2.   | Test Receiver     | Rohde & Schwarz | ESCI      | 100842     | Apr.28,15 | 1 Year        |
| 3.   | L.I.S.N.#1        | Rohde & Schwarz | ESH2-Z5   | 100429     | Oct.18,15 | 1 Year        |
| 4.   | L.I.S.N.#2        | Kyoritsu        | K NW-403D | 8-1750-2   | Apr.28,15 | 1 Year        |
| 5.   | Terminator        | Hubersuhner     | 50Ω       | No.1       | Apr.28,15 | 1 Year        |
| 6.   | Terminator        | Hubersuhner     | 50Ω       | No.2       | Apr.28,15 | 1 Year        |
| 7.   | RF Cable          | MIYAZAKI        | 3D-2W     | No.1       | Apr.28,15 | 1Year         |
| 8.   | Coaxial Switch    | Anritsu         | MP59B     | 6200766906 | Apr.28,15 | 1 Year        |
| 9.   | Pulse Limiter     | Rohde & Schwarz | ESH3-Z2   | 101838     | Oct.17,15 | 1 Year        |
| 10.  | Test Software     | AUDIX           | E3        | 6.100913a  | N/A       | N/A           |

### 3.1.3 Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. #1). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4: 2009 on conducted Emission test.

The bandwidth of the R&S Test Receiver ESCI was set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

### 3.1.4 Radiated Data Reduction and Reporting

To convert the raw spectrum analyzer radiated data into a form that can be compared with the FCC limits, it is necessary to account for various calibration factors that are supplied with the antennas and other measurement accessories. These factors are included into the antenna factor (AF) column of the table and in the cable factor (CF) column of the table. The AF (in dB/m) and the CF (in dB) is algebraically added to the raw Spectrum Analyzer Voltage in dBμV to obtain the Radiated Electric Field in dBμV/m. This logarithm amplitude is converted to a linear amplitude, then compared to the FCC limit. Example:

Spectrum Analyzer Voltage: VdBμV

Antenna Correction Factor: dB/m

Electric Field: EdBμV/m = V dBμV + AFdB/m + CFdB - GdB

To convert to linear units of measure: EdBV/m/20 Inv log

### 3.1.5 Test Data

The EUT USB3.0 Hybrid Active Optical Cable complied with the Class B Radiated Emissions requirements.

Table 5 provides the test results for radiated conducted emissions.

Photograph 1 and Photograph 2 show the radiated emission test configuration.

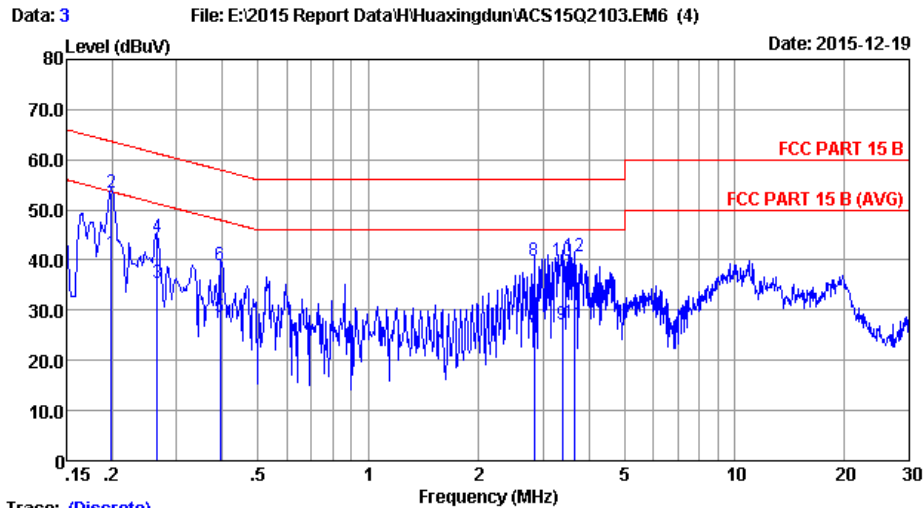
### 3.1.6 Areas of Concern

None.

Table 5: Conducted Emissions Test Data



No.6 Ke Feng Road,Block 52,  
ShenZhen Science & Industry Park  
Nantou,ShenZhen,GuangDong,China  
Tel:+86-755-26639495-7  
Fax:+86-755-26632877  
Postcode:518057



Trace: (Discrete)

Site no :1# Conduction Data No :3

Dis./Lisn :2015 ESH2-25 LINE

Limit :FCC PART 15 B

Env./Ins. :22.4°C/52%

Engineer :Alvis-Wu

EUT :USB3.0 Hybrid Active Optical Cable

Power Rating :DC 5V From PC Input AC 120V/60Hz

Test Mode :Data Transmitting

M/N:EPU3HC-A1B3XYYYM

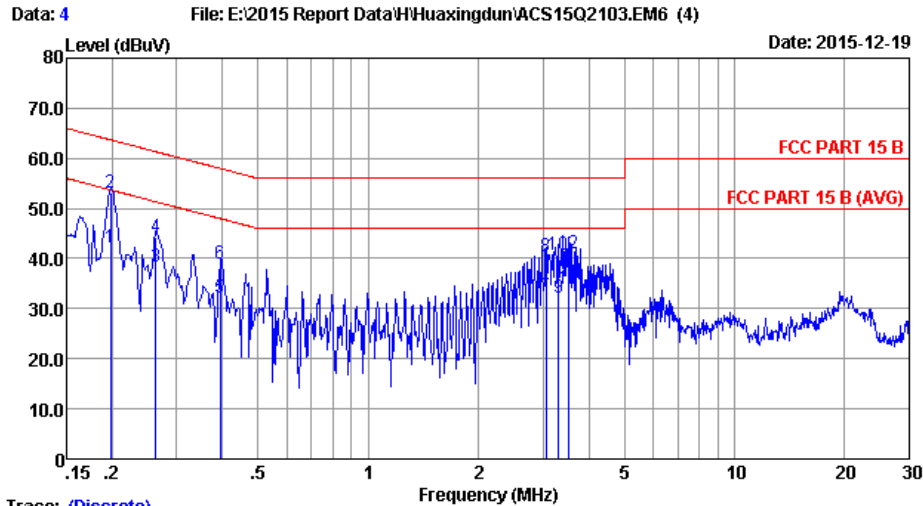
| No | Freq (MHz) | LISN Factor (dB) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuV) | Limits (dBuV) | Margin (dB) | Remark  |
|----|------------|------------------|-----------------|----------------|-----------------------|---------------|-------------|---------|
| 1  | 0.199      | 0.12             | 9.95            | 31.40          | 41.47                 | 53.65         | 12.18       | Average |
| 2  | 0.199      | 0.12             | 9.95            | 43.50          | 53.57                 | 63.65         | 10.08       | QP      |
| 3  | 0.266      | 0.12             | 9.94            | 25.31          | 35.37                 | 51.25         | 15.88       | Average |
| 4  | 0.266      | 0.12             | 9.94            | 34.47          | 44.53                 | 61.25         | 16.72       | QP      |
| 5  | 0.393      | 0.71             | 9.94            | 18.10          | 28.75                 | 47.99         | 19.24       | Average |
| 6  | 0.393      | 0.71             | 9.94            | 28.19          | 38.84                 | 57.99         | 19.15       | QP      |
| 7  | 2.839      | 0.21             | 9.98            | 16.50          | 26.69                 | 46.00         | 19.31       | Average |
| 8  | 2.839      | 0.21             | 9.98            | 29.78          | 39.97                 | 56.00         | 16.03       | QP      |
| 9  | 3.381      | 0.22             | 9.98            | 17.00          | 27.20                 | 46.00         | 18.80       | Average |
| 10 | 3.381      | 0.22             | 9.98            | 29.63          | 39.83                 | 56.00         | 16.17       | QP      |
| 11 | 3.642      | 0.22             | 9.99            | 17.20          | 27.41                 | 46.00         | 18.59       | Average |
| 12 | 3.642      | 0.22             | 9.99            | 30.50          | 40.71                 | 56.00         | 15.29       | QP      |

Remarks: 1.Emission Level=LISN Factor+Cable Loss(Include 10dB pulse limit)+Reading.  
2.If the average limit is met when using a quasi-peak detector.  
the EUT shall be deemed to meet both limits and measurement  
with average detector is unnecessary.





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Postcode:518057



Trace: (Discrete)  
Site no :1# Conduction Data No :4  
Dis./Lisn :2015 ESH2-Z5 NEUTRAL  
Limit :FCC PART 15 B  
Env./Ins. :22.4°C/52% Engineer :Alvis-Wu  
EUT :USB3.0 Hybrid Active Optical Cable  
Power Rating :DC 5V From PC Input AC 120V/60Hz  
Test Mode :Data Transmitting  
M/N: EPU3HC-A1B3XYMM

| No | Freq (MHz) | LISN Factor (dB) | Cable Loss (dB) | Reading (dBUV) | Emission Level (dBUV) | Limits (dBUV) | Margin (dB) | Remark  |
|----|------------|------------------|-----------------|----------------|-----------------------|---------------|-------------|---------|
| 1  | 0.198      | 0.12             | 9.95            | 32.20          | 42.27                 | 53.71         | 11.44       | Average |
| 2  | 0.198      | 0.12             | 9.95            | 43.20          | 53.27                 | 63.71         | 10.44       | QP      |
| 3  | 0.263      | 0.13             | 9.94            | 28.40          | 38.47                 | 51.34         | 12.87       | Average |
| 4  | 0.263      | 0.13             | 9.94            | 34.30          | 44.37                 | 61.34         | 16.97       | QP      |
| 5  | 0.393      | 0.14             | 9.94            | 22.10          | 32.18                 | 47.99         | 15.81       | Average |
| 6  | 0.393      | 0.14             | 9.94            | 29.03          | 39.11                 | 57.99         | 18.88       | QP      |
| 7  | 3.058      | 0.22             | 9.98            | 22.40          | 32.60                 | 46.00         | 13.40       | Average |
| 8  | 3.058      | 0.22             | 9.98            | 30.13          | 40.33                 | 56.00         | 15.67       | QP      |
| 9  | 3.310      | 0.23             | 9.98            | 21.90          | 32.11                 | 46.00         | 13.89       | Average |
| 10 | 3.310      | 0.23             | 9.98            | 30.53          | 40.74                 | 56.00         | 15.26       | QP      |
| 11 | 3.510      | 0.24             | 9.99            | 23.79          | 34.02                 | 46.00         | 11.98       | Average |
| 12 | 3.510      | 0.24             | 9.99            | 30.69          | 40.92                 | 56.00         | 15.08       | QP      |

Remarks: 1.Emission Level=LISN Factor+Cable Loss(Include 10dB pulse limit)+Reading.  
2.If the average limit is met when using a quasi-peak detector.  
the EUT shall be deemed to meet both limits and measurement  
with average detector is unnecessary.

**Photograph 1: Conducted Emissions Front**



**Photograph 2: Conducted Emissions Back**



## 3.2 Radiated Emissions

### 3.2.1 Requirements

Test Arrangement: Table Top

Compliance Standard: FCC Part 15 (2014), Class B (3 meter)

| FCC Compliance Limits |          |
|-----------------------|----------|
| Frequency             | Limits   |
| 30-88 MHz             | 40dBuV   |
| 88-216 MHz            | 43.5dBuV |
| 216-960 MHz           | 46dBuV   |
| >960MHz (3 meters)    | 74dBuV   |
| >960MHz (3 meters)    | 54dBuV   |

### 3.2.2 Test Equipment

For frequency range 30MHz~1000MHz (In 3m Anechoic Chamber)

| Item | Equipment      | Manufacturer    | Model No.       | Serial No.      | Last Cal. | Cal. Interval |
|------|----------------|-----------------|-----------------|-----------------|-----------|---------------|
| 1.   | 3#Chamber      | AUDIX           | N/A             | N/A             | Mar.28,15 | 1 Year        |
| 2.   | EMI Spectrum   | Agilent         | E4407B          | MY41440292      | Apr.28,15 | 1 Year        |
| 3.   | Test Receiver  | Rohde & Schwarz | ESVS10          | 834468/011      | Apr.28,15 | 1 Year        |
| 4.   | Amplifier      | HP              | 8447D           | 2648A04738      | Apr.28,15 | 1 Year        |
| 5.   | Bilog Antenna  | TESEQ           | CBL6112D        | 35375           | Jun.30,15 | 1 Year        |
| 6.   | RF Cable       | MIYAZAKI        | CFD400-NW(3.5M) | No.3            | Apr.28,15 | 1 Year        |
| 7.   | RF Cable       | MIYAZAKI        | CFD400-LW(22M)  | No.7            | Apr.28,15 | 1 Year        |
| 8.   | Coaxial Switch | Anritsu         | MP59B           | 6201397222      | Apr.28,15 | 1 Year        |
| 9.   | Test Software  | AUDIX           | E3              | 6.2009-5-21a(n) | N/A       | N/A           |

For frequency range above 1GHz (In 3m Anechoic Chamber)

| Item | Equipment         | Manufacturer | Model No.   | Serial No.       | Last Cal. | Cal. Interval |
|------|-------------------|--------------|-------------|------------------|-----------|---------------|
| 1.   | 3#Chamber         | AUDIX        | N/A         | N/A              | Mar.22,15 | 1 Year        |
| 2.   | Spectrum Analyzer | Agilent      | E4407B      | MY41440292       | Apr.28,15 | 1 Year        |
| 3.   | Horn Antenna      | ETC          | MCTD 1209   | DRH15F03006      | Feb.03,15 | 1 Year        |
| 4.   | Amplifier         | Agilent      | 83017A      | MY53270084       | May.25,15 | 1 Year        |
| 5.   | RF Cable          | Hubersuhner  | SUCOFLEX106 | 505238/6+28616/2 | Apr.28,15 | 1 Year        |
| 6.   | Test Software     | AUDIX        | E3          | 6.2009-5-21a(n)  | N/A       | N/A           |

### 3.2.3 Test Procedure

The requirements of FCC Part 15 (7/2012) call for the EUT to be placed on an 80 cm high 1 X 1.5 meters non-conductive motorized turntable for radiated testing on a 10-meter open field test site. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. Bi-conical and log periodic broadband antennas were mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters. The output of the antenna was connected to the input of the spectrum analyzer and the emissions in the frequency range of 30 MHz to 1 GHz were measured. The peripherals were placed on the table in accordance with ANSI C63.4-2009. Cables were varied in position to produce maximum emissions. Both the horizontal and vertical field components were measured.

The output from the antenna was connected, via a preamplifier, to the input of the spectrum analyzer. The detector function was set to quasi-peak or peak, as appropriate. Above 1GHz average measurement are recorded. The measurement bandwidth of the spectrum analyzer system was set to at least 120 kHz, with all post-detector filtering no less than 10 times the measurement bandwidth. Frequencies above 1GHz were performed using a measurement bandwidth of 1MHz with a video bandwidth setting of 10 Hz for the average measurement.

### 3.2.4 Radiated Data Reduction and Reporting

To convert the raw spectrum analyzer radiated data into a form that can be compared with the FCC limits, it is necessary to account for various calibration factors that are supplied with the antennas and other measurement accessories. These factors are included into the antenna factor (AF) column of the table and in the cable factor (CF) column of the table. The AF (in dB/m) and the CF (in dB) is algebraically added to the raw Spectrum Analyzer Voltage in dBμV to obtain the Radiated Electric Field in dBμV/m. This logarithm amplitude is converted to a linear amplitude, then compared to the FCC limit. Example:

Spectrum Analyzer Voltage: VdBμV

Antenna Correction Factor: dB/m

Electric Field: EdBμV/m = V dBμV + AFdB/m + CFdB - GdB

To convert to linear units of measure: EdBV/m/20 Inv log

### 3.2.5 Test Data

The EUT USB3.0 Hybrid Active Optical Cable complied with the Class B Radiated Emissions requirements.

Table 6 provides the test results for radiated conducted emissions.

Photograph 3 -5 shows the radiated emission test configuration.

### 3.2.6 Areas of Concern

None.

Table 6: Radiated Emission Test Data

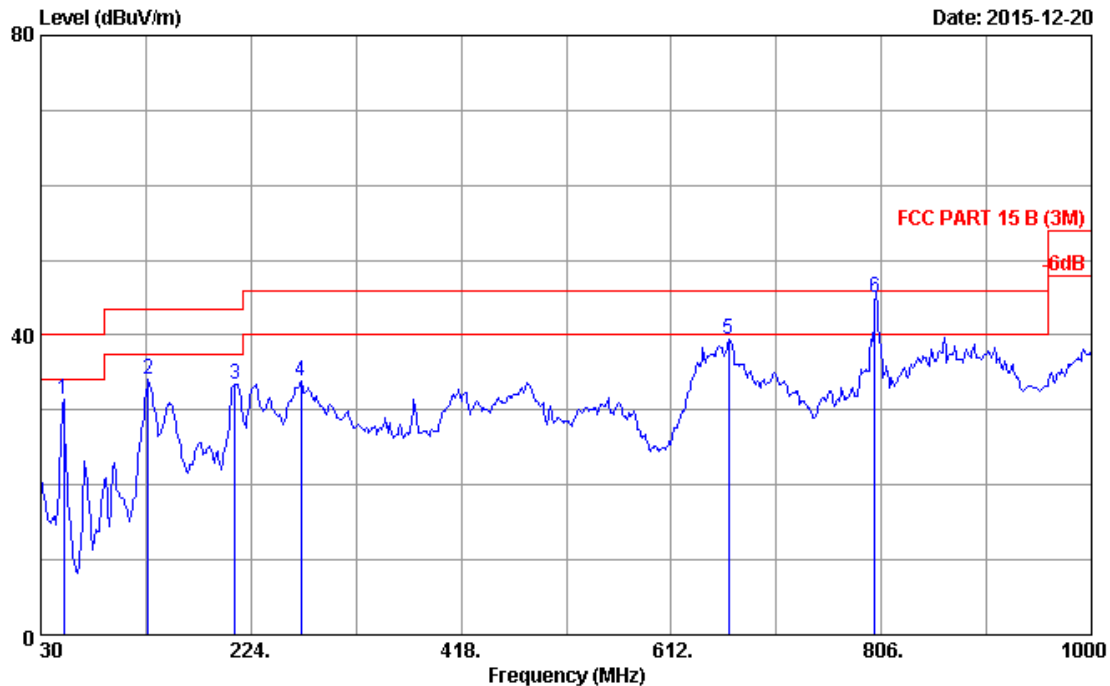


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Data: 17

File: E:\2015 Report Data\H\Huaxingdun\ACS15Q2103.EM6 (25)

Date: 2015-12-20



Site no. : 3m Chamber Data no. : 17  
Dis. / Ant. : 3m 2015 CBL6112D 35375 Ant. pol. : HORIZONTAL  
Limit : FCC PART 15 B (3M)  
Env. / Ins. : 22.1°C/50% Engineer : Brown  
EUT : USB3.0 Hybrid Active Optical Cable  
Power rating : DC 5V From PC Input AC 120V/60Hz  
Test Mode : Data Transmitting  
M/N:EPU3HC-A1B3XYYM

| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1   | 51.340         | 9.06                     | 0.81                  | 21.52             | 31.39                         | 40.00              | 8.61           | QP     |
| 2   | 128.940        | 13.31                    | 1.21                  | 19.52             | 34.04                         | 43.50              | 9.46           | QP     |
| 3   | 209.450        | 10.83                    | 1.54                  | 21.15             | 33.52                         | 43.50              | 9.98           | QP     |
| 4   | 270.560        | 13.70                    | 1.79                  | 18.31             | 33.80                         | 46.00              | 12.20          | QP     |
| 5   | 665.350        | 19.95                    | 2.93                  | 16.54             | 39.42                         | 46.00              | 6.58           | QP     |
| 6   | 799.990        | 21.10                    | 3.26                  | 20.60             | 44.96                         | 46.00              | 1.04           | QP     |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
2. The emission levels that are 20dB below the official limit are not reported.

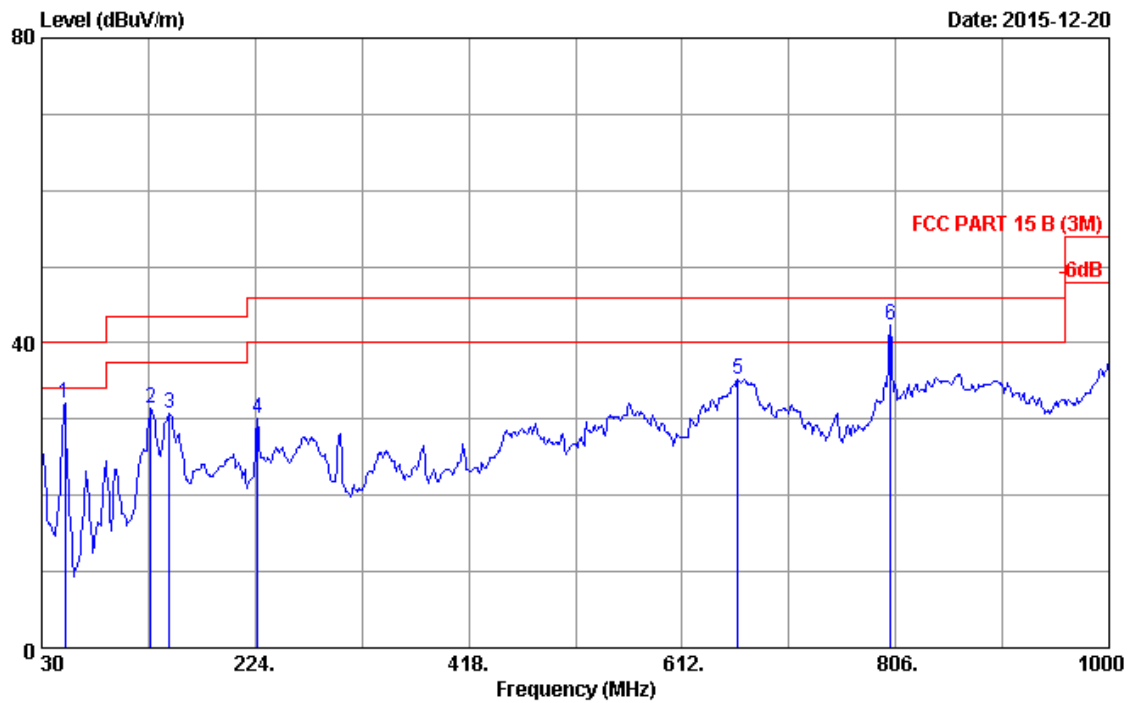


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Data: 16

File: E:\2015 Report Data\H\Huaxingdun\ACS15Q2103.EM6 (25)

Date: 2015-12-20



Site no. : 3m Chamber Data no. : 16  
Dis. / Ant. : 3m 2015 CBL6112D 35375 Ant. pol. : VERTICAL  
Limit : FCC PART 15 B (3M)  
Env. / Ins. : 22.1°C/50% Engineer : Brown  
EUT : USB3.0 Hybrid Active Optical Cable  
Power rating : DC 5V From PC Input AC 120V/60Hz  
Test Mode : Data Transmitting  
M/N:EPU3HC-A1B3XYYYM

| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1   | 51.340         | 9.06                     | 0.81                  | 22.31             | 32.18                         | 40.00              | 7.82           | QP     |
| 2   | 128.940        | 13.31                    | 1.21                  | 16.91             | 31.43                         | 43.50              | 12.07          | QP     |
| 3   | 146.400        | 11.70                    | 1.29                  | 17.80             | 30.79                         | 43.50              | 12.71          | QP     |
| 4   | 225.940        | 11.30                    | 1.60                  | 17.20             | 30.10                         | 46.00              | 15.90          | QP     |
| 5   | 662.440        | 19.92                    | 2.93                  | 12.32             | 35.17                         | 46.00              | 10.83          | QP     |
| 6   | 801.150        | 21.09                    | 3.26                  | 18.02             | 42.37                         | 46.00              | 3.63           | QP     |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
2. The emission levels that are 20dB below the official limit are not reported.

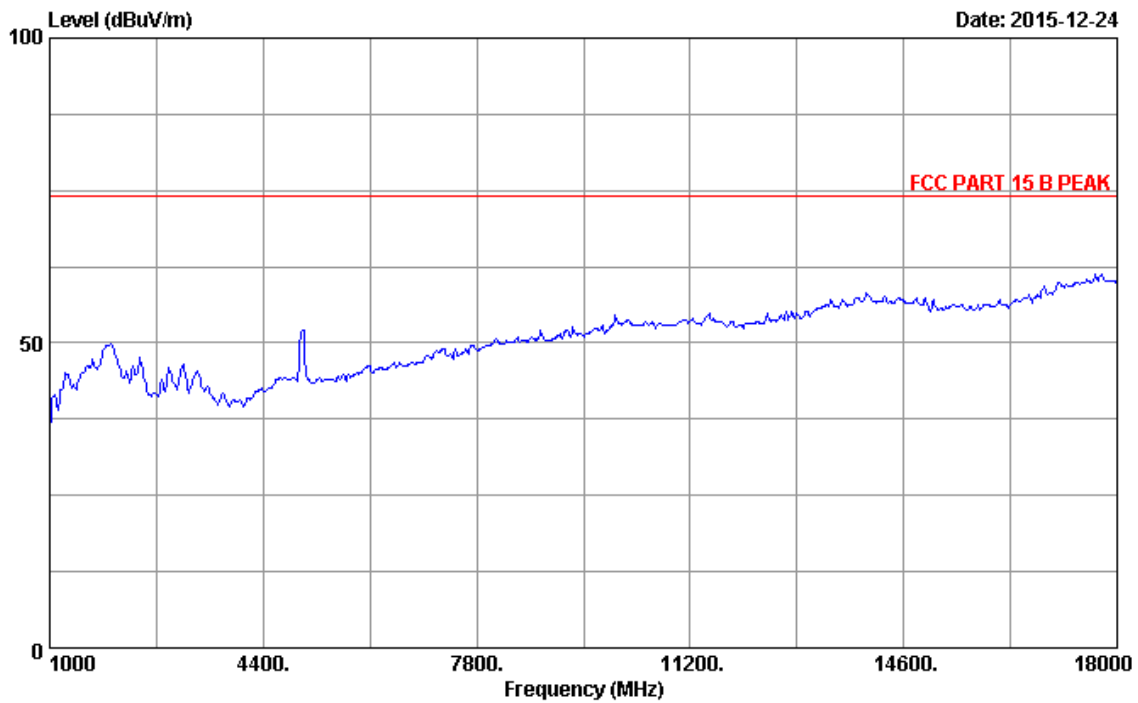


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Data: 20

File: E:\2015 Report Data\H\Huaxingdun\ACS15Q2103.EM6 (25)

Date: 2015-12-24



|              |                                      |           |              |
|--------------|--------------------------------------|-----------|--------------|
| Site no.     | : 3m Chamber                         | Data no.  | : 20         |
| Dis. / Ant.  | : 3m 2015 MCTD1209-3006              | Ant. pol. | : HORIZONTAL |
| Limit        | : FCC PART 15 B PEAK                 |           |              |
| Env. / Ins.  | : 25.1°C/51%                         | Engineer  | : Brown      |
| EUT          | : USB3.0 Hybrid Active Optical Cable |           |              |
| Power rating | : DC 5V From PC Input AC 120V/60Hz   |           |              |
| Test Mode    | : Data Transmitting                  |           |              |
|              | M/N:EPU3HC-A1B3XYYYM                 |           |              |

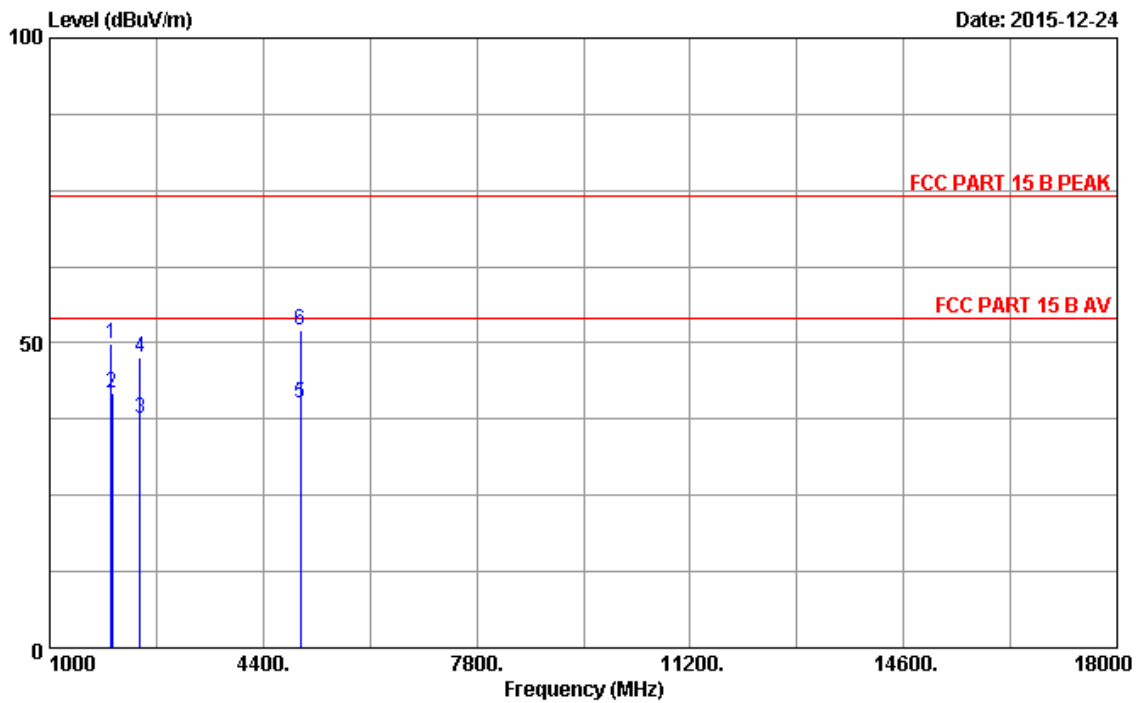


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Data: 21

File: E:\2015 Report Data\H\Huaxingdun\ACS15Q2103.EM6 (25)

Date: 2015-12-24



Site no. : 3m Chamber Data no. : 21  
Dis. / Ant. : 3m 2015 MCTD1209-3006 Ant. pol. : HORIZONTAL  
Limit : FCC PART 15 B PEAK  
Env. / Ins. : 25.1°C/51% Engineer : Brown  
EUT : USB3.0 Hybrid Active Optical Cable  
Power rating : DC 5V From PC Input AC 120V/60Hz  
Test Mode : Data Transmitting  
M/N: EPU3HC-A1B3XYYYM

| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark  |
|-----|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|---------|
| 1   | 1985.86        | 27.14                    | 2.73                  | 34.70                 | 54.64             | 49.81                         | 74.00              | 24.19          | Peak    |
| 2   | 1986.50        | 27.15                    | 2.73                  | 34.70                 | 46.63             | 41.81                         | 54.00              | 12.19          | Average |
| 3   | 2444.75        | 28.09                    | 2.75                  | 34.51                 | 41.25             | 37.58                         | 54.00              | 16.42          | Average |
| 4   | 2445.80        | 28.09                    | 2.75                  | 34.51                 | 51.25             | 47.58                         | 74.00              | 26.42          | Peak    |
| 5   | 4993.85        | 33.99                    | 4.15                  | 34.20                 | 36.14             | 40.08                         | 54.00              | 13.92          | Average |
| 6   | 4997.50        | 34.00                    | 4.15                  | 34.17                 | 48.14             | 52.12                         | 74.00              | 21.88          | Peak    |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading  
-Amp factor.  
2. The emission levels that are 20dB below the official  
limit are not reported.



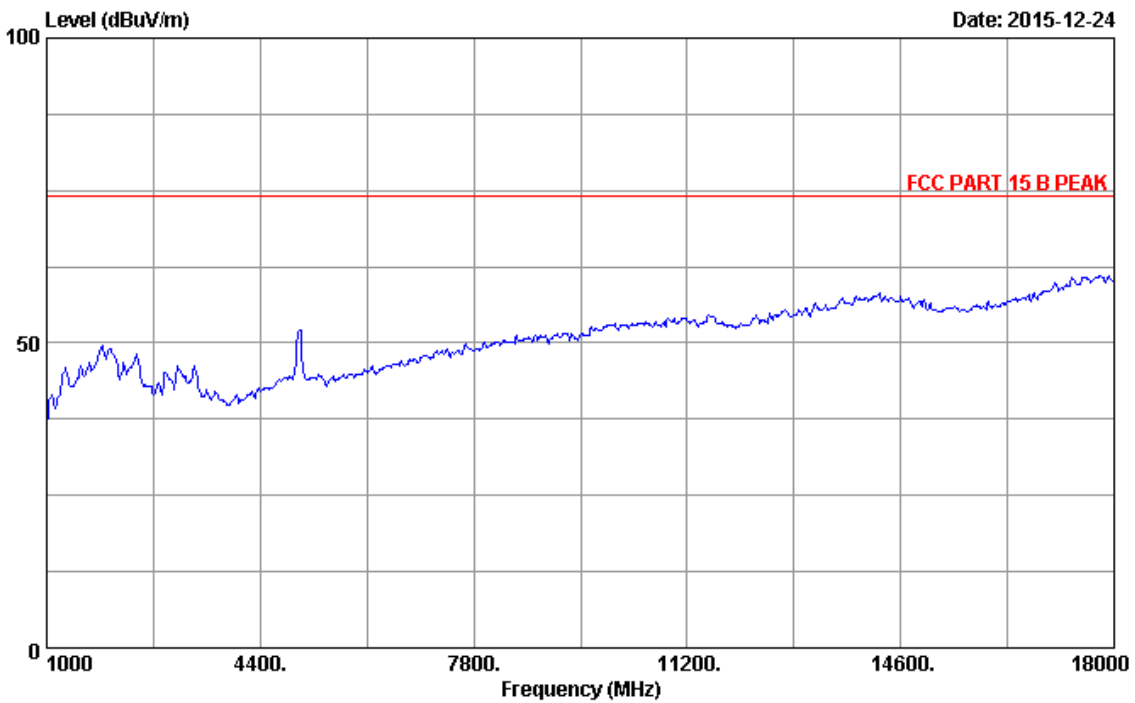


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Data: 22

File: E:\2015 Report Data\H\Huaxingdun\ACS15Q2103.EM6 (25)

Date: 2015-12-24



|              |                                      |           |            |
|--------------|--------------------------------------|-----------|------------|
| Site no.     | : 3m Chamber                         | Data no.  | : 22       |
| Dis. / Ant.  | : 3m 2015 MCTD1209-3006              | Ant. pol. | : VERTICAL |
| Limit        | : FCC PART 15 B PEAK                 |           |            |
| Env. / Ins.  | : 25.1°C/51%                         | Engineer  | : Brown    |
| EUT          | : USB3.0 Hybrid Active Optical Cable |           |            |
| Power rating | : DC 5V From PC Input AC 120V/60Hz   |           |            |
| Test Mode    | : Data Transmitting                  |           |            |
|              | M/N:EPU3HC-A1B3XYYYM                 |           |            |

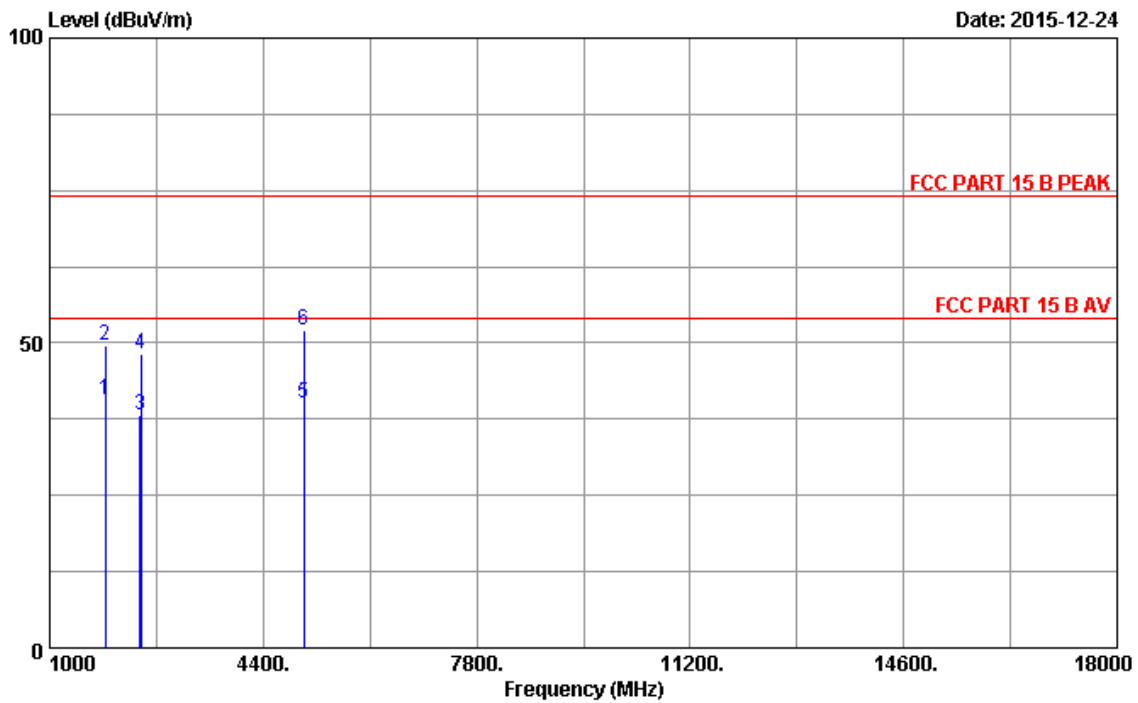


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Data: 23

File: E:\2015 Report Data\H\Huaxingdun\ACS15Q2103.EM6 (25)

Date: 2015-12-24



Site no. : 3m Chamber Data no. : 23  
Dis. / Ant. : 3m 2015 MCTD1209-3006 Ant. pol. : VERTICAL  
Limit : FCC PART 15 B PEAK  
Env. / Ins. : 25.1°C/51% Engineer : Brown  
EUT : USB3.0 Hybrid Active Optical Cable  
Power rating : DC 5V From PC Input AC 120V/60Hz  
Test Mode : Data Transmitting  
M/N:EPU3HC-A1B3XYYYM

| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark  |
|-----|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|---------|
| 1   | 1884.85        | 26.74                    | 2.67                  | 34.81                 | 46.04             | 40.64                         | 54.00              | 13.36          | Average |
| 2   | 1885.74        | 26.74                    | 2.67                  | 34.81                 | 55.04             | 49.64                         | 74.00              | 24.36          | Peak    |
| 3   | 2445.86        | 28.09                    | 2.75                  | 34.51                 | 41.92             | 38.25                         | 54.00              | 15.75          | Average |
| 4   | 2446.94        | 28.09                    | 2.75                  | 34.51                 | 51.93             | 48.26                         | 74.00              | 25.74          | Peak    |
| 5   | 5045.74        | 33.93                    | 4.17                  | 34.14                 | 36.09             | 40.05                         | 54.00              | 13.95          | Average |
| 6   | 5046.48        | 33.93                    | 4.17                  | 34.14                 | 48.09             | 52.05                         | 74.00              | 21.95          | Peak    |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading  
-Amp factor.  
2. The emission levels that are 20dB below the official  
limit are not reported.

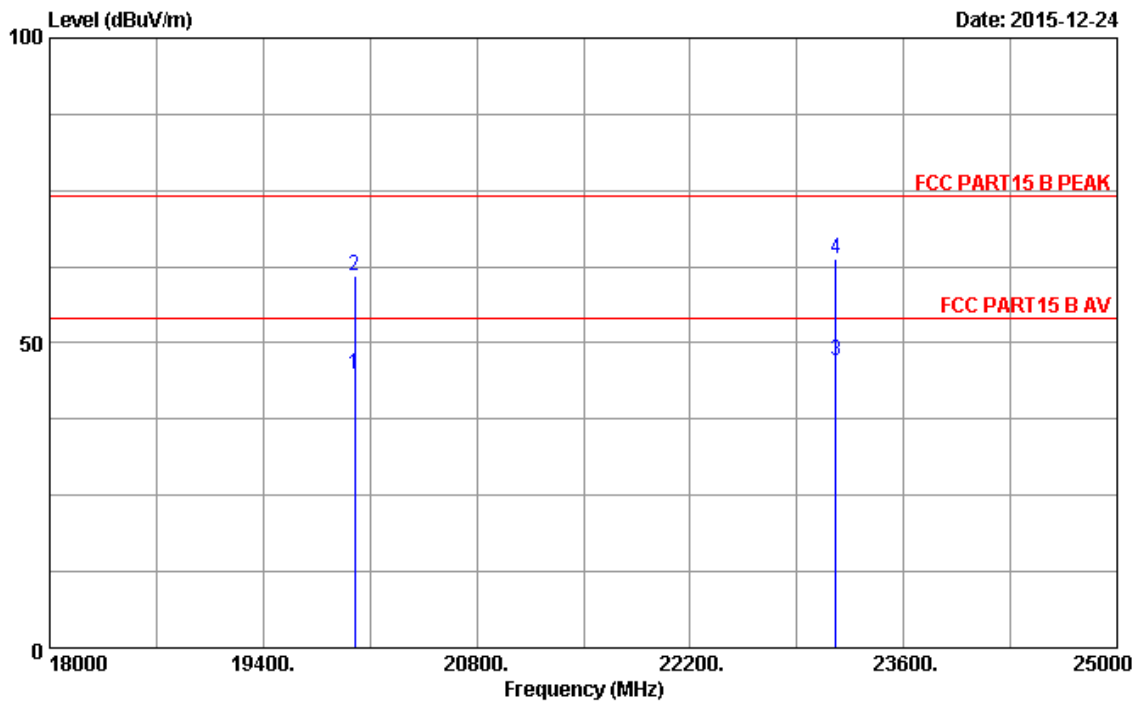


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Data: 25

File: E:\2015 Report Data\H\Huaxingdun\ACS15Q2103.EM6 (25)

Date: 2015-12-24



Site no. : 3m Chamber Data no. : 25  
Dis. / Ant. : 3m 2015 MCTD1209 3006 Ant. pol. : HORIZONTAL  
Limit : FCC PART15 B PEAK  
Env. / Ins. : 25.1°C/51% Engineer : Brown  
EUT : USB3.0 Hybrid Active Optical Cable  
Power rating : DC 5V From PC Input AC 120V/60Hz  
Test Mode : Data Transmitting  
M/N: EPU3HC-A1B3XYVM

| No.       | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark  |
|-----------|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|---------|
| 120000.00 |                | 44.50                    | 9.50                  | 29.62                 | 20.40             | 44.78                         | 54.00              | 9.22           | Average |
| 220000.00 |                | 44.50                    | 9.50                  | 29.62                 | 36.50             | 60.88                         | 74.00              | 13.12          | Peak    |
| 323154.20 |                | 45.70                    | 11.26                 | 29.67                 | 19.79             | 47.08                         | 54.00              | 6.92           | Average |
| 423154.20 |                | 45.70                    | 11.26                 | 29.67                 | 36.59             | 63.88                         | 74.00              | 10.12          | Peak    |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading  
-Amp factor.  
2. The emission levels that are 20dB below the official  
limit are not reported.

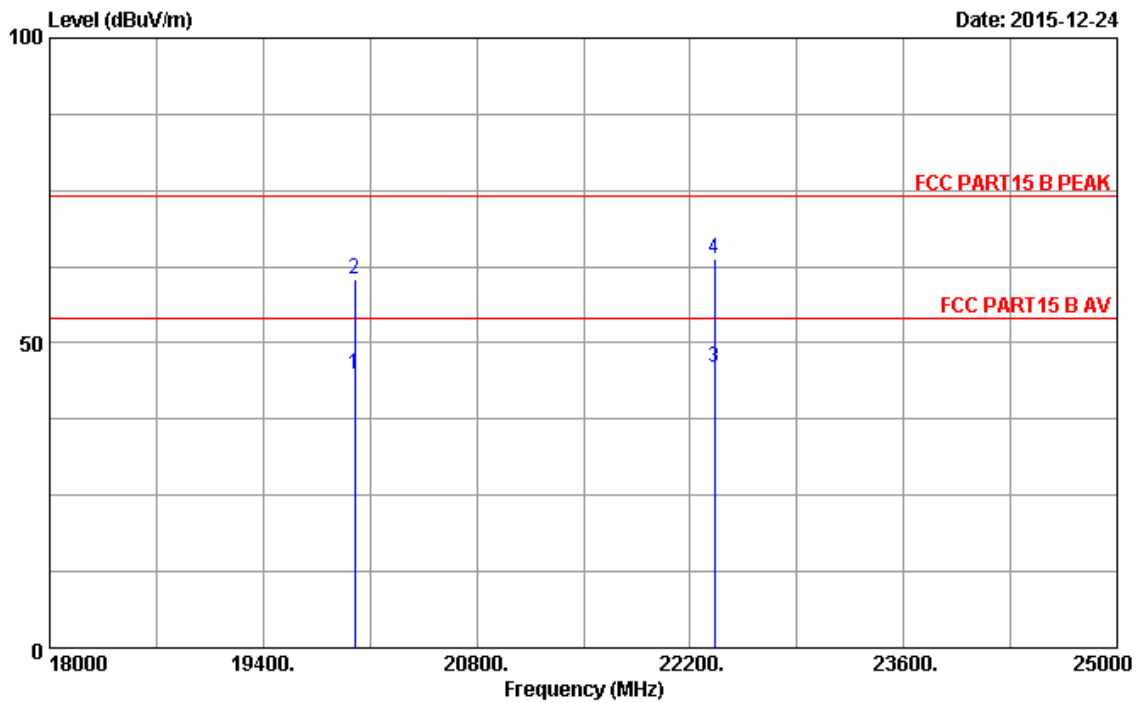


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Data: 24

File: E:\2015 Report Data\H\Huaxingdun\ACS15Q2103.EM6 (25)

Date: 2015-12-24



Site no. : 3m Chamber Data no. : 24  
Dis. / Ant. : 3m 2015 MCTD1209 3006 Ant. pol. : VERTICAL  
Limit : FCC PART15 B PEAK  
Env. / Ins. : 25.1°C/51% Engineer : Brown  
EUT : USB3.0 Hybrid Active Optical Cable  
Power rating : DC 5V From PC Input AC 120V/60Hz  
Test Mode : Data Transmitting  
M/N:EPU3HC-A1B3XYVM

| No.       | Freq. | Ant.   | Cable | Amp    | Emission |          |          |        |         |
|-----------|-------|--------|-------|--------|----------|----------|----------|--------|---------|
|           | (MHz) | Factor | Loss  | factor | Reading  | Level    | Limits   | Margin | Remark  |
|           |       | (dB/m) | (dB)  | (dB)   | (dBuV)   | (dBuV/m) | (dBuV/m) | (dB)   |         |
| 120000.00 |       | 44.50  | 9.50  | 29.62  | 20.50    | 44.88    | 54.00    | 9.12   | Average |
| 220000.00 |       | 44.50  | 9.50  | 29.62  | 36.10    | 60.48    | 74.00    | 13.52  | Peak    |
| 322358.20 |       | 45.41  | 10.88 | 30.41  | 20.11    | 45.99    | 54.00    | 8.01   | Average |
| 422358.20 |       | 45.41  | 10.88 | 30.41  | 37.81    | 63.69    | 74.00    | 10.31  | Peak    |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading  
-Amp factor.  
2. The emission levels that are 20dB below the official  
limit are not reported.

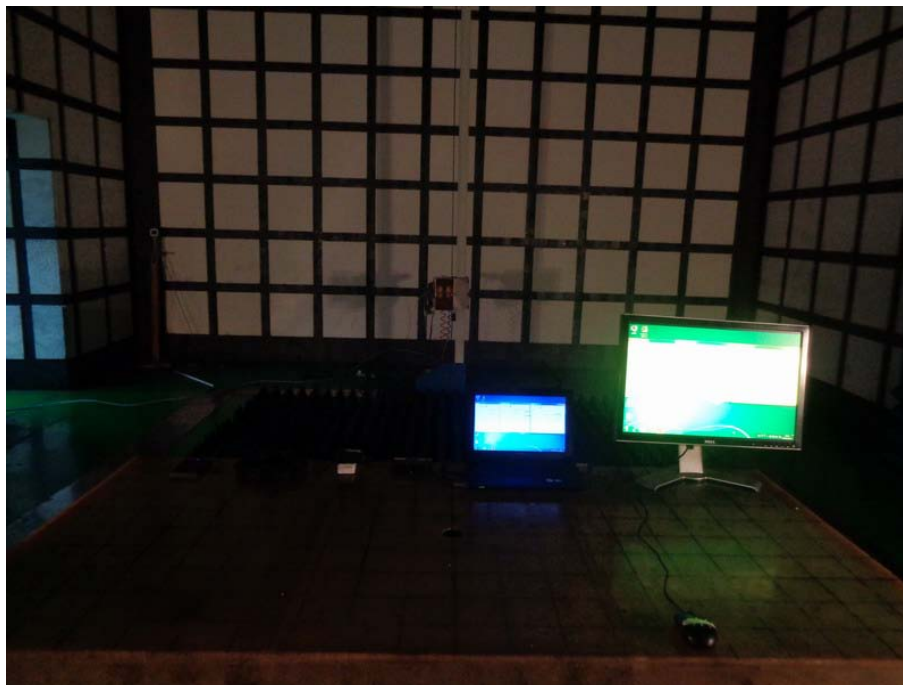
**Photograph 3: Radiated Emission Test Configuration, (Below 1GHz) Front**



**Photograph 4: Radiated Emission Test Configuration, (Below 1GHz) Back**



**Photograph 5: Radiated Emission Test Configuration, (Above 1GHz) Front**



## 4 Labeling Requirements

Each digital device which has been verified as complying with the Class B limits shall have permanently attached in a conspicuous location for the user to observe, a label with the following statement:

**This device complies with Part 15 of the FCC Rules.**  
**Operation is subject to the following two conditions:**  
**(1) This device may not cause harmful interference,**  
**and (2) this device must accept any interference**  
**received, including interference that may cause**  
**undesired operation.**

### 4.1 Information to User

The following warning or similar statement shall be provided in a conspicuous location in the operator's manual so that the user of a Class B digital device is aware of its interference potential. Additional information about corrective measures may also be provided to the user at the manufacturer's option.

**NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:**

- o Reorient or relocate the receiving antenna**
- o Increase the separation between the equipment and receiver**
- o Connect the equipment into an outlet on a circuit different from that to which the receiver is connected**
- o Consult the dealer or an experienced radio/TV technician for help**

The instruction manual for a Class B digital device that is separately marketed shall also include sufficient information to insure that the complete system is capable of complying with the requirements for a Class B digital device. The manual should also caution the user that changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment. Finally, the manual should instruct the user to use any special accessories, i.e. shielded cables, necessary for compliance with the standards.

In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required above may be included in the manual in that alternative form, provided that the user can be reasonably expected to have the capability to access information in that form.

-----The End-----