



Report No.SH16090036E02

# FCC EMC TEST REPORT

*Issued to*

**E3 Enterprise**

*For*

**Smart Home Products**

Model Name : E3PHONE  
Trade Name : E3  
Brand Name : E3  
Standard : 47 CFR Part 15 Subpart B  
ANSI C63.4-2014  
FCC ID : 2AD9UE3PHONE  
Test date : Nov.10,2016  
Issue date : Nov.12,2016

*by*

**Shanghai Skylabs Co., Ltd.**



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**Change History**

| Issue | Date        | Reason for change |
|-------|-------------|-------------------|
| 1.0   | Dec.02,2016 | First edition     |
|       |             |                   |
|       |             |                   |
|       |             |                   |
|       |             |                   |
|       |             |                   |



## 1. General Information

### 1.1 Applicant

**E3 Enterprise**

32F, Shinjuku Nonura Building, 1-26-2 NishiShinjuku, Shinjuku-Ku, Tokyo, Japan 163-0532

### 1.2 Manufacturer

**E3 Enterprise**

32F, Shinjuku Nonura Building, 1-26-2 NishiShinjuku, Shinjuku-Ku, Tokyo, Japan 163-0532



### 1.3 Description of EUT

EUT Type .....: Smart Home Products  
Brand Name.....: E3  
Trade Name .....: E3  
Model Name .....: E3PHONE  
Hardware Version.....: E3P\_PCB\_V1.0  
Software Version .....: V1.0  
Frequency Range..... Bluetooth; WIFI;FM  
Extreme Voltages.....: High: 5.3 V; Low:4.7 V; Norm: 5 V  
Charger  
Brand Name..... UNIFIVE  
Mode No..... UB310-0520  
Electrical Rating [Input]..... 100-240V, 0.25A  
Electrical Rating [Output] ..... 5V, 2A  
Manufacturer ..... Unifive Technology CO.,LTD  
Manufacturer Address ..... 5F,No.42,Keya Road,Daya District,Taichuang City 428,Taiwan

*For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.*



## 2. Facilities and Accreditations

### 2.1 Test Facility

Shanghai Skylabs Co., Ltd. Morlab Laboratory is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6644. A 9\*6\*6(m) fully anechoic chamber was used for the radiated spurious emissions test.

### 2.2 Environmental Conditions

Ambient temperature: 15~35°C

Relative humidity: 30~60%

Atmosphere pressure: 86-106kPa

### 2.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Conducted Emission:  $\pm 1.76\text{dB}$

Uncertainty of Radiated Emission:  $\pm 3.16\text{dB}$



## 2.4 List of Equipments Used

| Description                 | Manufacturer | Model              | Serial No.                     | Cal.Date   | Cal.Due |
|-----------------------------|--------------|--------------------|--------------------------------|------------|---------|
| Shielding Room              | CHENGYU      | 5m×4m×3m           | CR                             | 2016.09.15 | 2year   |
| EMI Test Receiver           | R&S          | ESCI7              | 100787                         | 2016.01.28 | 1year   |
| Artificial Mains<br>Network | TESEQ        | NNB 51             | 33285                          | 2016.01.28 | 1year   |
| 3m Semi-anechoic<br>Chamber | CHENGYU      | 9.2×6.25×6.15<br>m | SAR                            | 2016.09.15 | 2year   |
| Broadband Log Antenna       | Schwarzbeck  | VULB 9163          | 9163-561                       | 2016.07.25 | 2year   |
| Broadband Horn Antenna      | Schwarzbeck  | BBHA 9120 D        | 9120D-1033                     | 2016.07.25 | 2year   |
| Laptop                      | ACER         | Aspire 4376ZG      | LXPFY0C00<br>49352912216<br>01 | /          |         |
| Laptop Adapter              | LITEON       | PA-1650-22         | 9801016502                     | /          |         |
| USB Data Cable              | /            | /                  | /                              | /          |         |

**NOTE:**

*Equipments listed above have been calibrated and are in the period of validation.*



## 2.5 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart B:

| No. | Identity       | Document Title          |
|-----|----------------|-------------------------|
| 1   | 47 CFR Part 15 | Radio Frequency Devices |

Test detailed items/section required by FCC rules and results are as below:

| No. | Section         | Description        | Result |
|-----|-----------------|--------------------|--------|
| 1   | 15.107 (a)      | Conducted Emission | PASS   |
| 2   | 15.109 (a)      | Radiated Emission  | PASS   |
| 3   | ANSI C63.4-2014 | Radiated Emission  | PASS   |





### 3. Test Conditions Setting

#### 3.1 Test Mode

The EUT configuration of the emission tests was EUT + Charger.

##### **Mode 1: USB data transfer Mode**

In this test mode, the EUT with a TransFlash Card embedded is connected with a PC via a special USB cable supplied by applicant. During the measurement, a communication link was established between the EUT and a System Simulator (SS), simultaneously, the data is transmitting between the PC and the TransFlash Card of the EUT.

##### **Mode 2: Telecom work mode**

In this test mode, The EUT Communication between the telecommunication centres by Telephone line and Ethernet cable

##### **Mode 3: Headset Mode**

##### *NOTE:*

*All configurations and test modes are performed, only the worst case is recorded in this report.*



## 4. Emission Tests

### 4.1 Conducted Emission Measurement

#### 4.1.1 Limits of Conducted Emission:

According to FCC section 15.107, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 $\mu$ H/50 $\Omega$  line impedance stabilization network (LISN).

| Frequency (MHz) | CLASS B (dBuV) |         |
|-----------------|----------------|---------|
|                 | Quasi-peak     | Average |
| 0.15 - 0.5      | 66 - 56        | 56 - 46 |
| 0.50 - 5.0      | 56             | 46      |
| 5.0 - 30.0      | 60             | 50      |

**NOTE:**

(1) The lower limit shall apply at the band edges.

(2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

#### 4.1.2 Test Procedure

The EUT and support equipment, if needed, were set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor standing equipment, it is placed on the ground plane, which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

EUT connected to Class B Computer/Laptop via USB data cable and data exchange mode. The Computer/Laptop installed by US power 120V/60Hz, through a Line Impedance Stabilization Network (LISN), which was supplied power source and was grounded to the ground plane.

The test program of the EUT was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

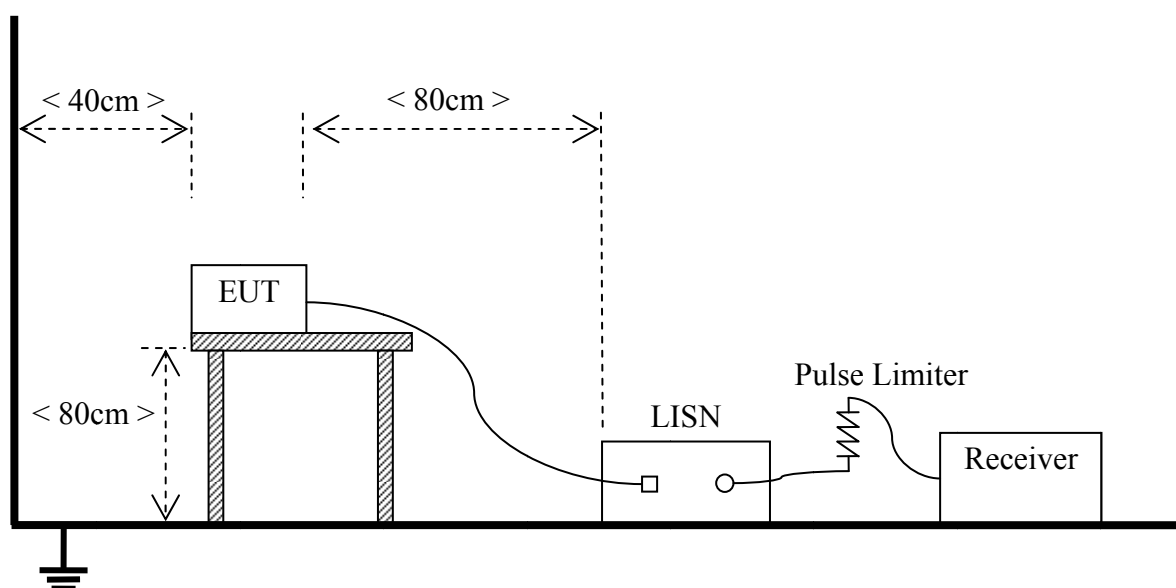
The test mode(s) described in Item 3.1 were scanned during the preliminary test.

After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.

The worst configuration of EUT and cable of the above highest emission level were recorded for reference of the final test.



### 4.1.3 Test Setup



### 4.1.4 Test Result

Test Verdict Recorded for Suspicious Points:

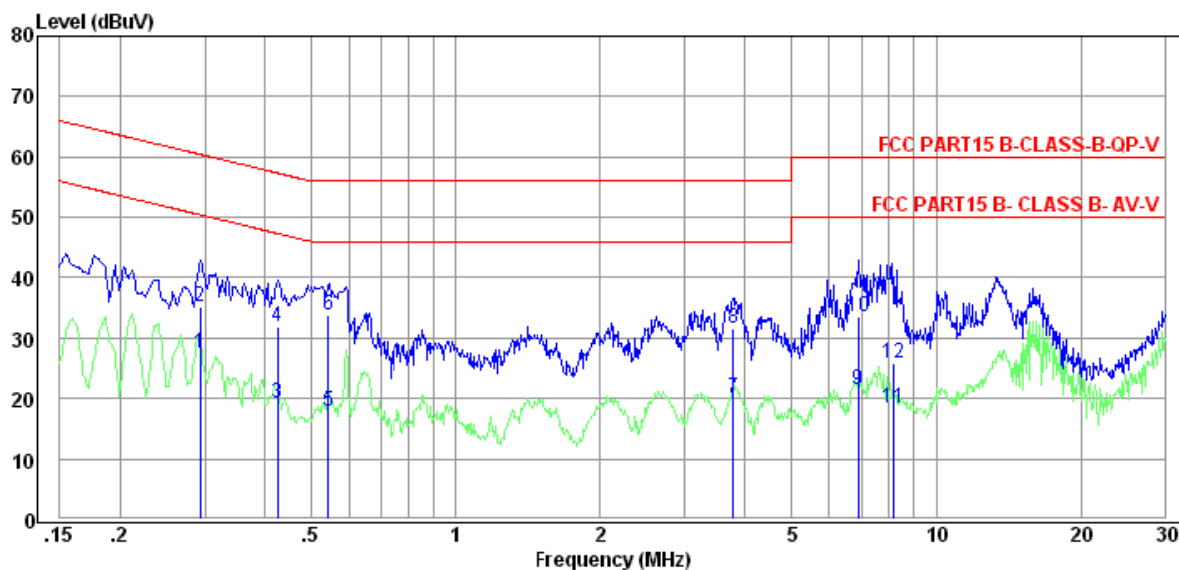
**The worst case is Mode 1: USB data transfer Mode**

| Line    | Freq<br>MHz | Result<br>dBuV | Limit<br>dBuV | Margin<br>dB |
|---------|-------------|----------------|---------------|--------------|
| Average | 0.29        | 27.54          | 50.41         | 22.87        |
| QP      | 0.29        | 35.25          | 60.41         | 25.16        |
| Average | 0.43        | 19.38          | 47.31         | 27.93        |
| QP      | 0.43        | 31.82          | 57.31         | 25.49        |
| Average | 0.54        | 17.98          | 46.00         | 28.02        |
| QP      | 0.54        | 33.88          | 56.00         | 22.12        |
| Average | 3.78        | 20.04          | 46.00         | 25.96        |
| QP      | 3.78        | 31.73          | 56.00         | 24.27        |
| Average | 6.89        | 21.50          | 50.00         | 28.50        |
| QP      | 6.89        | 33.66          | 60.00         | 26.34        |
| Average | 8.15        | 18.35          | 50.00         | 31.65        |
| QP      | 8.15        | 25.74          | 60.00         | 34.26        |

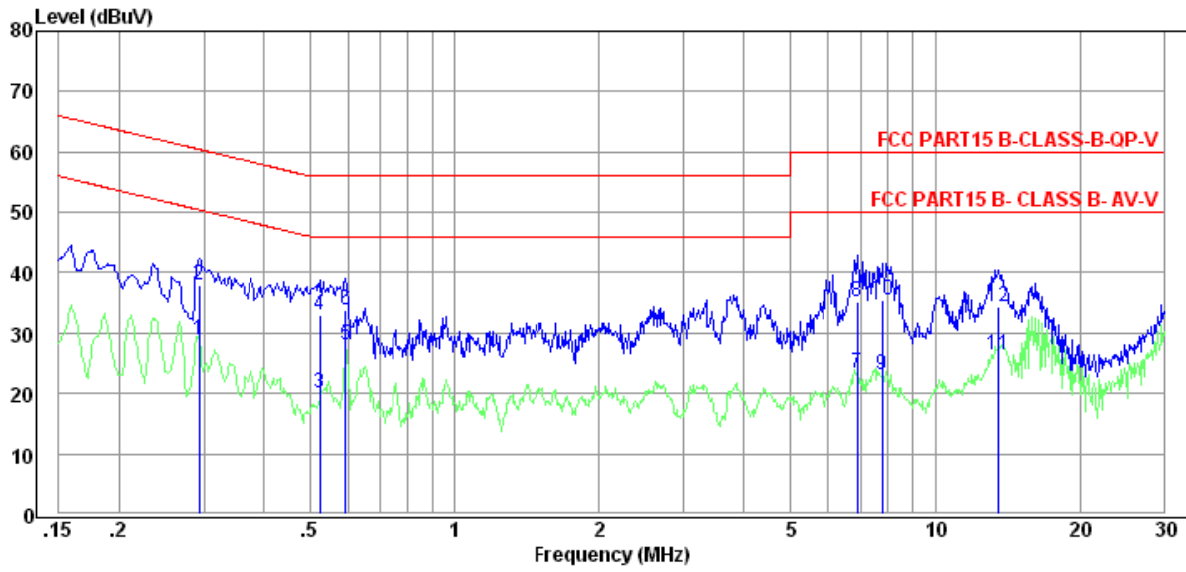


| Neutral | Freq<br>MHz | Result<br>dBuV | Limit<br>dBuV | Margin<br>dB |
|---------|-------------|----------------|---------------|--------------|
| Average | 0.29        | 28.76          | 50.43         | 21.67        |
| QP      | 0.29        | 37.91          | 60.43         | 22.52        |
| Average | 0.52        | 20.04          | 46.00         | 25.96        |
| QP      | 0.52        | 33.02          | 56.00         | 22.98        |
| Average | 0.59        | 28.08          | 46.00         | 17.92        |
| QP      | 0.59        | 33.80          | 56.00         | 22.20        |
| Average | 6.90        | 23.42          | 50.00         | 26.58        |
| QP      | 6.90        | 35.07          | 60.00         | 24.93        |
| Average | 7.78        | 23.03          | 50.00         | 26.97        |
| QP      | 7.78        | 35.52          | 60.00         | 24.48        |
| Average | 13.62       | 26.31          | 50.00         | 23.69        |
| QP      | 13.62       | 34.27          | 60.00         | 25.73        |

Test Plot:



(Plot A: L Phase)



(Plot B: N Phase)



## 4.2 Radiated Emission Measurement

### 4.2.1 Limits of Radiated Emission

According to FCC section 15.109, the field strength of radiated emissions from unintentional radiators at a certain distance shall not exceed the following values:

| Frequency (MHz) | Field Strength CLASS B (at 3m) |                          |
|-----------------|--------------------------------|--------------------------|
|                 | $\mu\text{V/m}$                | $\text{dB}\mu\text{V/m}$ |
| 30 - 88         | 100                            | 40.0                     |
| 88 - 216        | 150                            | 43.5                     |
| 216 - 960       | 200                            | 46.0                     |
| Above 960       | 500                            | 54.0                     |

**NOTE:**

- (1) Field Strength ( $\text{dB}\mu\text{V/m}$ ) =  $20 \cdot \log[\text{Field Strength } (\mu\text{V/m})]$ .
- (2) In the emission tables above, the tighter limit applies at the band edges.

Frequency range of radiated measurements (For unintentional radiators)

| 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. |

**Note:**

The highest frequency is 2480MHz, So 5<sup>th</sup> harmonic is 12.40GHz, the frequency range is from 30MHz to 13GHz



#### 4.2.2 Test Procedure

The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is a floor standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.

Support equipment, if needed, was placed as per ANSI C63.4.

All I/O cables were positioned to simulate typical usage as per ANSI C63.4.

The EUT received AC power source from the outlet socket under the turntable. All support equipment power received from another socket under the turntable.

The antenna was placed at 3 or 10 meter away from the EUT as stated in ANSI C63.4. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.

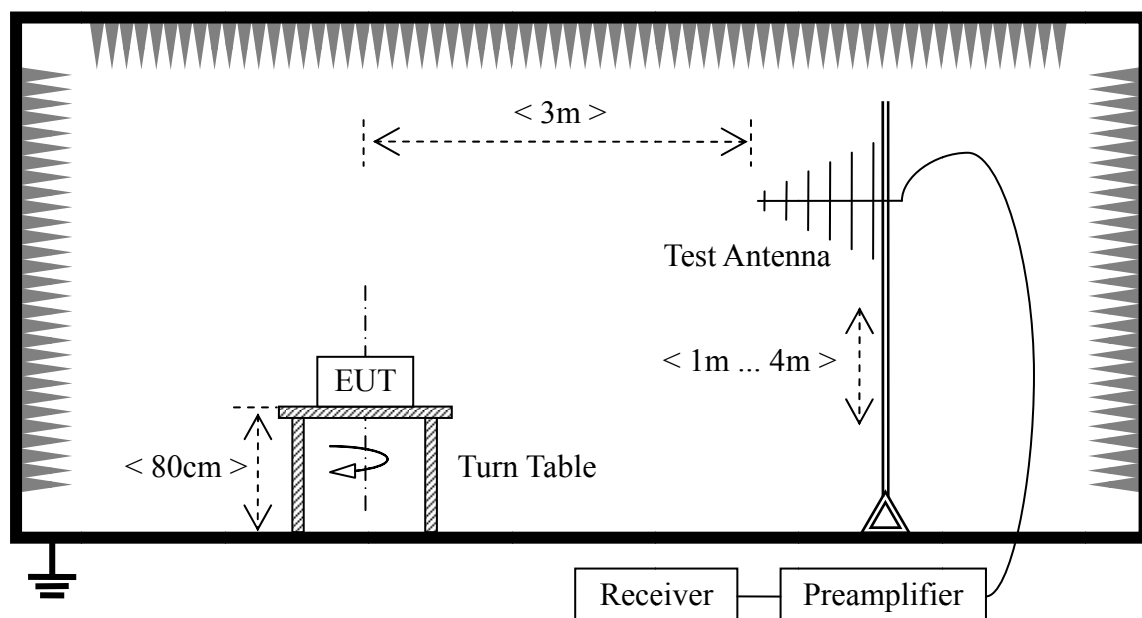
The Analyzer / Receiver quickly scanned from 30MHz to 40GHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

The test mode(s) described in Item 3.1 were scanned during the preliminary test:

After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.

The worst configuration of EUT and cable of the above highest emission level were recorded for reference of the final test

#### 4.2.3 Test Setup



**The worst case is Mode 1: USB data transfer Mode**

Test Verdict Recorded for Suspicious Points (30MHz~13GHz): Antenna Vertical

| Frequency (MHz) | Result (dBuV) | Limit Line (dBuV) | Margin (dB) | Antenna Polarization | Detector | Result |
|-----------------|---------------|-------------------|-------------|----------------------|----------|--------|
| 33.21           | 33.52         | 40.00             | 6.48        | Vertical             | QP       | PASS   |
| 37.16           | 35.79         | 40.00             | 4.21        | Vertical             | QP       | PASS   |
| 125.89          | 27.55         | 43.50             | 15.95       | Vertical             | QP       | PASS   |
| 1064.72         | 20.05         | 54.00             | 33.95       | Vertical             | Average  | PASS   |
| 1491.17         | 19.83         | 54.00             | 34.17       | Vertical             | Average  | PASS   |
| 1593.38         | 21.98         | 54.00             | 32.02       | Vertical             | Average  | PASS   |
| 2659.93         | 22.74         | 54.00             | 31.26       | Vertical             | Average  | PASS   |

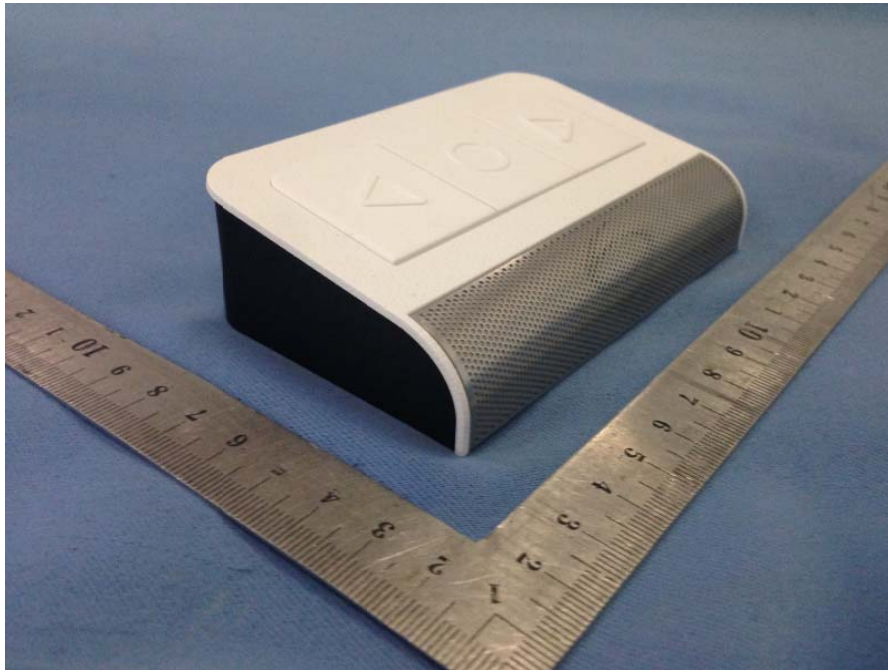
Test Verdict Recorded for Suspicious Points (30MHz~13GHz): Antenna Horizontal

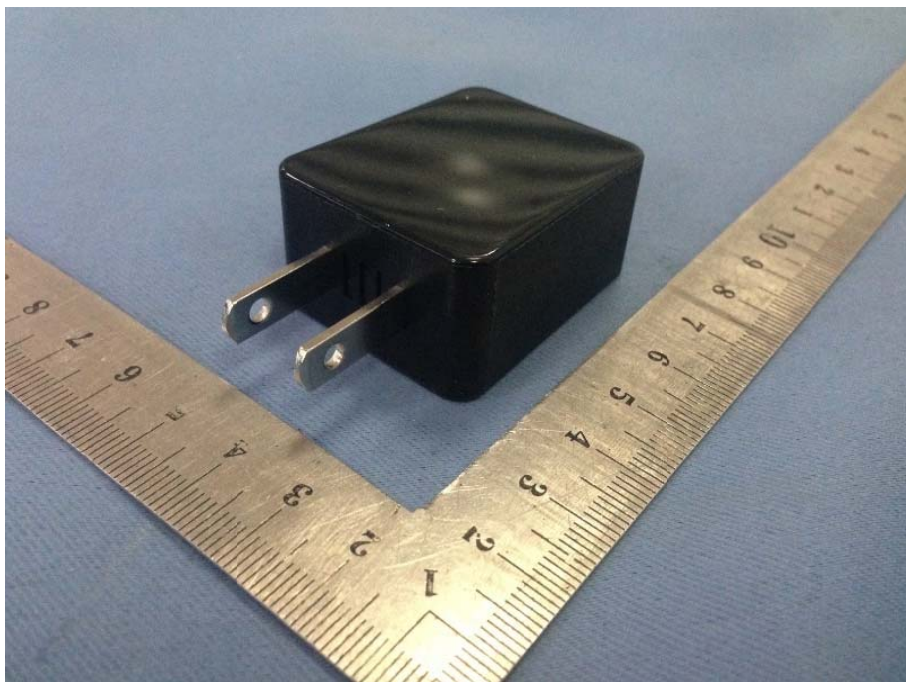
| Frequency (MHz) | Level (dBuV) | Limit Line (dBuV) | Margin (dB) | Antenna Polarization | Detector | Result |
|-----------------|--------------|-------------------|-------------|----------------------|----------|--------|
| 87.42           | 19.03        | 40.00             | 20.97       | Horizontal           | QP       | PASS   |
| 225.31          | 27.02        | 46.00             | 18.98       | Horizontal           | QP       | PASS   |
| 325.60          | 28.86        | 46.00             | 17.14       | Horizontal           | QP       | PASS   |
| 1064.72         | 20.43        | 54.00             | 33.57       | Horizontal           | Average  | PASS   |
| 1198.38         | 19.79        | 54.00             | 34.21       | Horizontal           | Average  | PASS   |
| 2659.93         | 20.86        | 54.00             | 33.14       | Horizontal           | Average  | PASS   |
| 4997.81         | 26.71        | 54.00             | 27.29       | Horizontal           | Average  | PASS   |





## Annex A Photos of the EUT









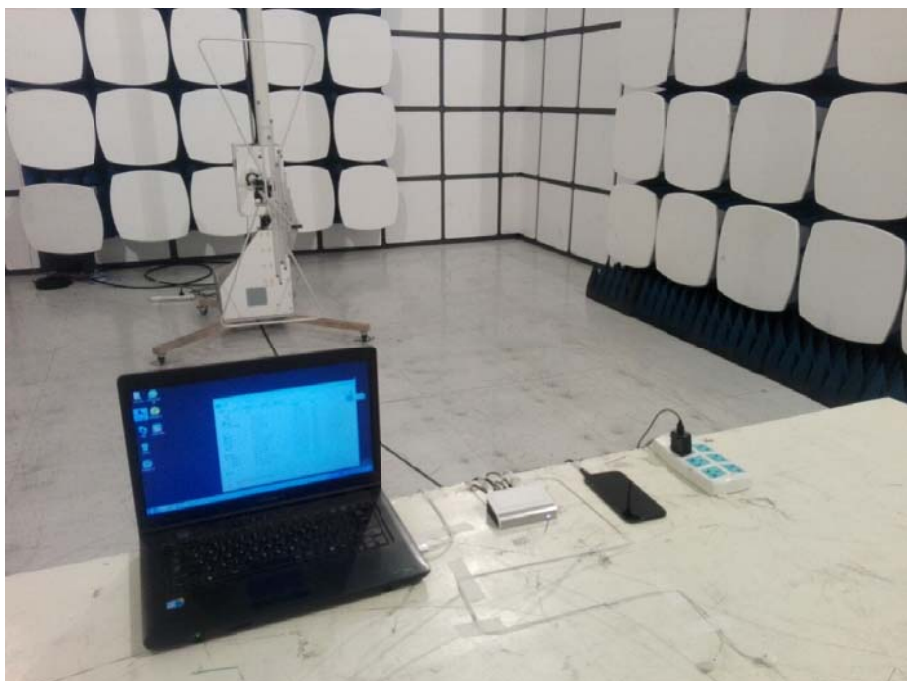


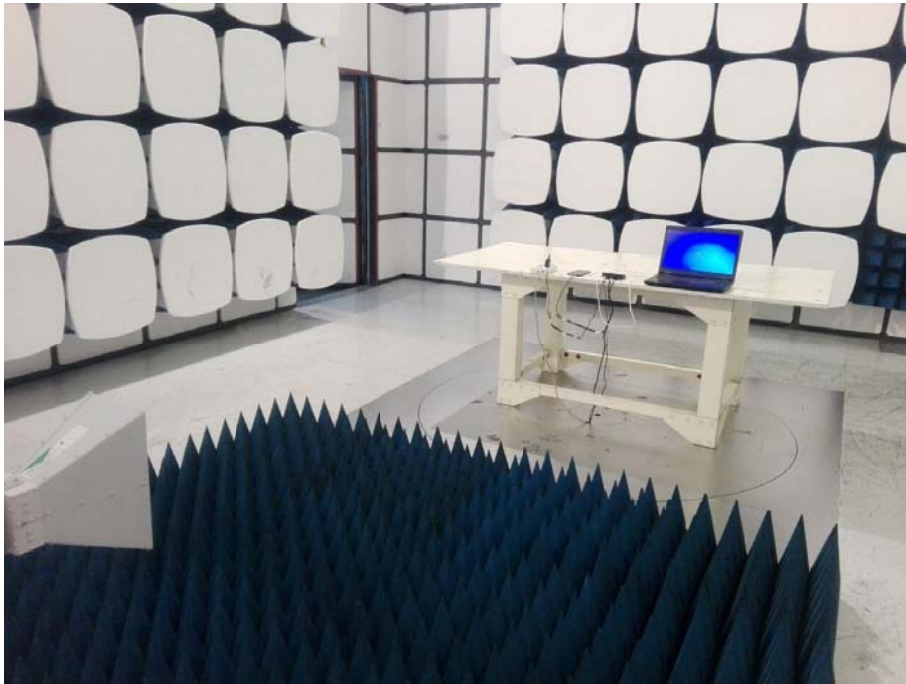
## Annex B Photos of Test Setup

### 1. Conducted Emission



### 2. Radiated Emission





\*\* END OF REPORT \*\*