# EMC TEST REPORT

| | | |
|---|---|---|
| **Application No.** | : | TB151011381 |
| **Applicant** | : | USC056 |
| **Equipment Under Test (EUT)** | | |
| EUT Name | : | USB Book-light |
| Model No. | : | PB-1342 |
| Series Model No. | : | N/A |
| Brand Name | : | |
| **Receipt Date** | : | 2015-10-30 |
| **Test Date** | : | 2015-10-30 to 2015-11-03 |
| **Issue Date** | : | 2015-11-03 |
| **Standards** | : | EN55015:2013<br>EN61547:2009 |
| **Conclusions** | : | **PASS**<br>In the configuration tested, the EUT complied with the standards specified above.<br>The EUT technically complies with the 2004/108/EC directive requirements. |
| **Test/Witness Engineer** | : | |
| **Approved & Authorized** | : | |

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.



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# 1. General Information

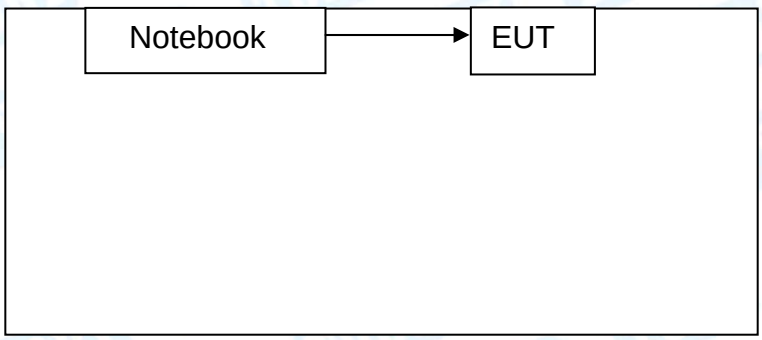
## 1.1. Client Information

| | | |
|---|---|---|
| Applicant | : | USC056 |
| Address | : | |
| Manufacturer | : | USC056 |
| Address | : | |

## 1.2. General Description of EUT (Equipment Under Test)

| | | |
|---|---|---|
| EUT Name | : | USB Book-light |
| Model No. | : | PB-1342 |
| Series Model No. | : | N/A |
| Brand Name | : | |
| Power Supply | : | DC 5V |
| **Remark:** / | | |

## 1.3. Block Diagram Showing the Configuration of System Tested




## 1.4. Description of Support Units

| Name | Model | S/N | Manufacturer | Used " √ " |
|---|---|---|---|---|
| Notebook | HP1505n | VNF3G06957 | HP | √ |

## 1.5. Performance Criterion

**Criterion A:** The equipment shall continue to operate as intended without operator intervention. No degradation of performance of loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

**Criterion B:** After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended.

**Criterion C:** Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

## 1.6. Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

**CNAS (L5813)**
The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

**FCC List No.: (811562)**
The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562.

**IC Registration No.: (11950A-1)**
The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.

May 22, 2014 certificated by TUV Rheinland(China) Co., Ltd. with TUV certificate No.: UA 50282953 0001 and report No.: 17026822 002. The certificate is valid until the next scheduled audit or up to 18 months, at the discretion of TUV Rhineland.

# 2. Test Results Summary

| Description of test item | Standards | Results |
|---|---|---|
| Conducted Disturbance at Mains Terminals | EN55015:2013 | N/A |
| Magnetic Emission | EN55015:2013 | Pass |
| Radiated Disturbance | EN55015:2013 | Pass |
| Harmonic Current Emissions | EN61000-3-2: 2014 | N/A |
| Voltage Fluctuation and Flicker | EN61000-3-3: 2013 | N/A |
| **Description of Test Item** | **Basic Standards** | **Results** |
| Electrostatic Discharge (ESD) | EN61000-4-2: 2009 | Pass |
| Radio-frequency, Continuous Radiated Disturbance | EN61000-4-3: 2006+A1:2008+ A2:2010 | Pass |
| EFT/B Immunity | EN61000-4-4: 2012 | N/A |
| Surge Immunity | EN61000-4-5: 2014 | N/A |
| Conducted RF Immunity | EN61000-4-6: 2014 | N/A |
| Power Frequency Magnetic Field | EN61000-4-8: 2010 | N/A |
| Voltage Dips and Interruptions, 100% Reduction | EN61000-4-11:2004 | N/A |
| Voltage Dips and Interruptions, 30% reduction | | N/A |

# 3. Test Equipment Used

| Radiation Emission Test | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Last Cal.** | **Cal.Due Date** |
| Spectrum Analyzer | Agilent | E4407B | MY45106456 | Sep.01, 2015 | Aug.31, 2016 |
| EMI Test Receiver | Rohde & Schwarz | ESCI | 100010/007 | Aug. 07, 2015 | Aug. 06, 2016 |
| Bilog Antenna | ETS-LINDGREN | 3142E | 00117537 | Mar.28, 2015 | Mar. 27, 2016 |
| Bilog Antenna | ETS-LINDGREN | 3142E | 00117542 | Mar.28, 2015 | Mar. 27, 2016 |
| Horn Antenna | ETS-LINDGREN | 3117 | 00143207 | Mar.28, 2015 | Mar. 27, 2016 |
| Horn Antenna | ETS-LINDGREN | 3117 | 00143209 | Mar.28, 2015 | Mar. 27, 2016 |
| Pre-amplifier | Sonoma | 310N | 185903 | Mar.28, 2015 | Mar. 27, 2016 |
| Pre-amplifier | HP | 8447B | 3008A00849 | Mar.28, 2015 | Mar. 27, 2016 |
| Cable | HUBER+SUHNER | 100 | SUCOFLEX | Mar.28, 2015 | Mar. 27, 2016 |
| Positioning Controller | ETS-LINDGREN | 2090 | N/A | N/A | N/A |
| **Discharge Immunity Test** | | | | | |
| **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Last Cal.** | **Cal.Due Date** |
| ESD Generator | HAFELY | PESD 1610 | H808671 | Mar.20, 2015 | Mar.19, 2016 |
| **Radiated Immunity Test** | | | | | |
| **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Last Cal.** | **Cal.Due Date** |
| Signal Generator | Rohde & Schwarz | SMT03 | 200754 | Mar.28, 2015 | Mar. 27, 2016 |
| Power Meter | Rohde & Schwarz | NRVD | 110562 | Feb. 10, 2015 | Feb. 09, 2016 |
| Voltage Probe | Rohde & Schwarz | URV5-Z2 | 12056 | Feb. 10, 2015 | Feb. 09, 2016 |
| Voltage Probe | Rohde & Schwarz | URV5-Z2 | 12074 | Feb. 10, 2015 | Feb. 09, 2016 |
| RF Amplifier | AR | 50S1G4A | 326720 | Feb. 10, 2015 | Feb. 09, 2016 |
| Bilog Antenna | ETS | 3142C | 00047662 | Feb. 10, 2015 | Feb. 09, 2016 |
| Horn Antenna | ARA | DRG-118A | 16554 | Feb. 10, 2015 | Feb. 09, 2016 |
| Audio Analyzer | Rohde & Schwarz | UPL 16 | SB2208 | Feb. 10, 2015 | Feb. 09, 2016 |
| Sound Level Calibrator | B&K | 4231 | 264516 | Feb. 10, 2015 | Feb. 09, 2016 |

# 4. Magnetic field emission Measurement

## 4.1. Test Standard and Limit

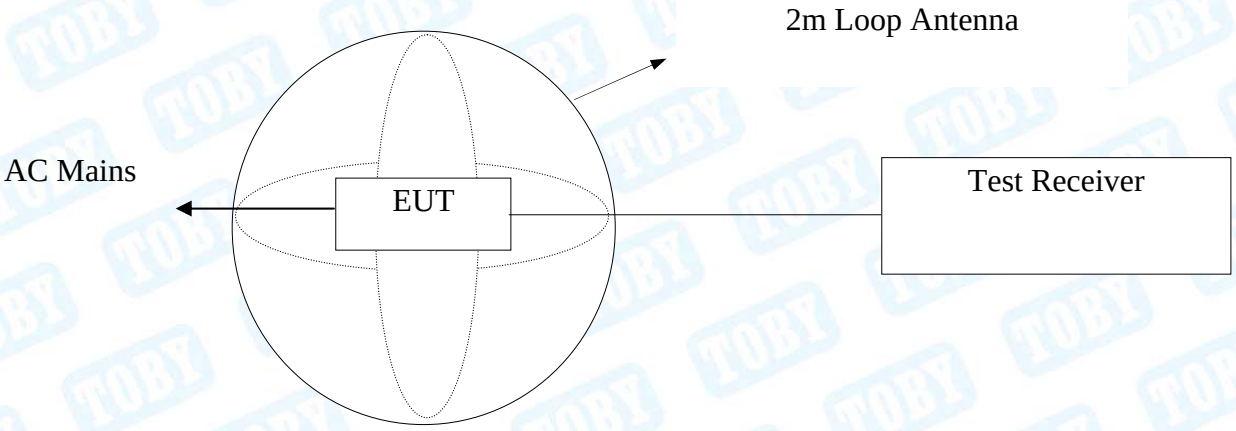
### 4.1.1. Test Standard

EN55015:2013.

### 4.1.2. Test Limit

| Frequency | | | Limits for loop diameter (dBμA) |
|---|---|---|---|
| | | | 2m |
| 9KHz | ~ | 70KHz | 88 |
| 70KHz | ~ | 150KHz | 88 ~ 58* |
| 150KHz | ~ | 2.2MHz | 58 ~ 26* |
| 2.2MHz | ~ | 3.0MHz | 58 |
| 3.0MHz | ~ | 30MHz | 22 |
| **Remark:** 1. At the transition frequency the lower limit applies.<br>2. * Decreasing linearly with logarithm of the frequency. | | | |

## 4.2. Test Setup




## 4.3. Test Procedure

The EUT is placed on a wood table in the center of a loop antenna. The induced current in the loop antenna is measured by means of a current probe and the test receiver. Three field components are checked by means of a coaxial switch.

The frequency range from 9KHz to 30MHz is investigated. The receiver is measured with the quasi-peak detector. For frequency band 9KHz to 150KHz, the bandwidth of the field strength meter is set at 200Hz. For frequency band 150KHz to 30MHz, the bandwidth is set at 9KHz.

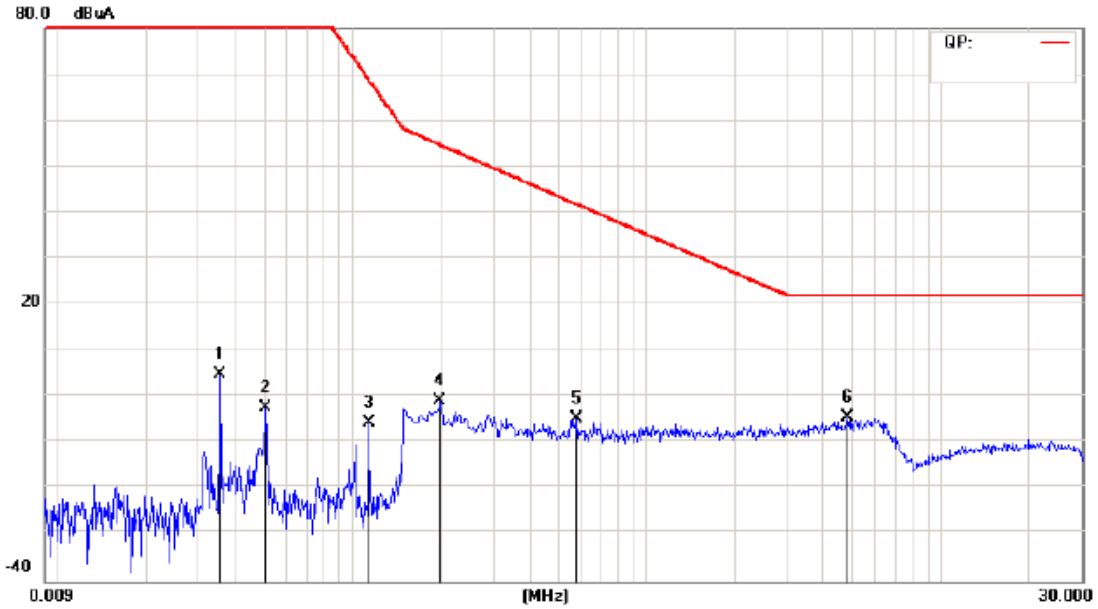
## 4.4. Test Condition

| | | |
|---|---|---|
| Temperature | : | 25 ℃ |
| Relative Humidity | : | 48 % |
| Pressure | : | 1010 hPa |
| Test Power | : | DC 5V |

## 4.5. Test Data

Please refer to the following pages.

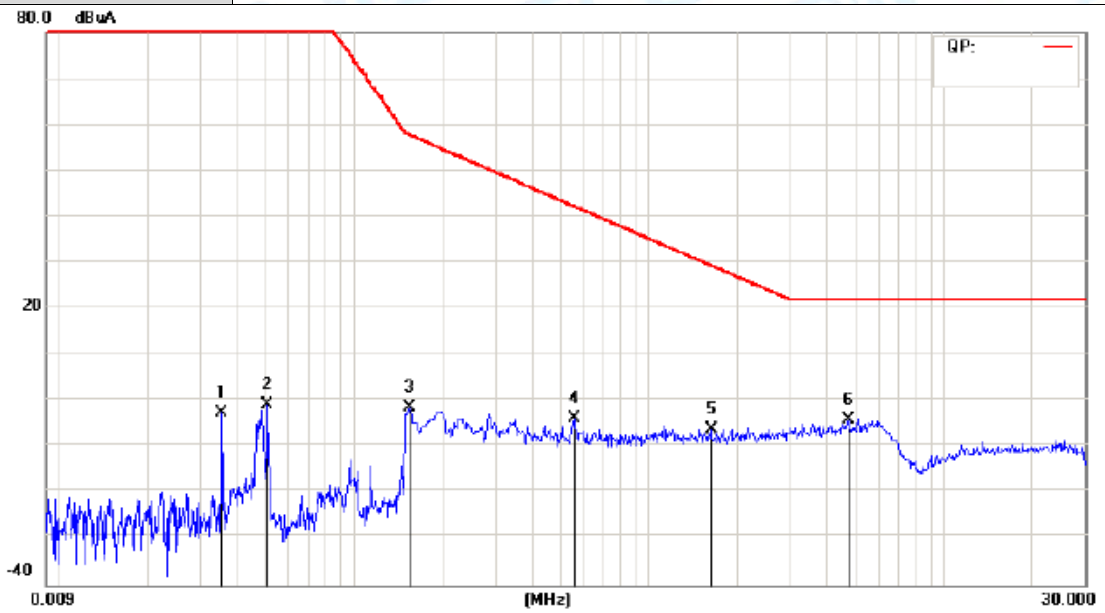
| EUT: | USB Book-light | Model Name : | PB-1342 |
|---|---|---|---|
| Temperature: | 25 ℃ | Relative Humidity: | 55% |
| Test Voltage: | DC 5V | | |
| Polarization | X Direction | | |
| Test Mode: | Normal Mode | | |
| Remark: | | | |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuA | dB | dBuA | dBuA | dB | Detector |
| 1 | | 0.0355 | -16.01 | 20.84 | 4.83 | 88.00 | -83.17 | peak |
| 2 | | 0.0507 | -23.16 | 20.77 | -2.39 | 88.00 | -90.39 | peak |
| 3 | | 0.1133 | -25.18 | 19.51 | -5.67 | 69.03 | -74.70 | peak |
| 4 | | 0.1980 | -21.11 | 20.18 | -0.93 | 54.66 | -55.59 | peak |
| 5 | | 0.5780 | -25.46 | 20.78 | -4.68 | 41.79 | -46.47 | peak |
| 6 | * | 4.8220 | -26.57 | 22.03 | -4.54 | 22.00 | -26.54 | peak |

**Emission Level= Read Level+ Correct Factor**

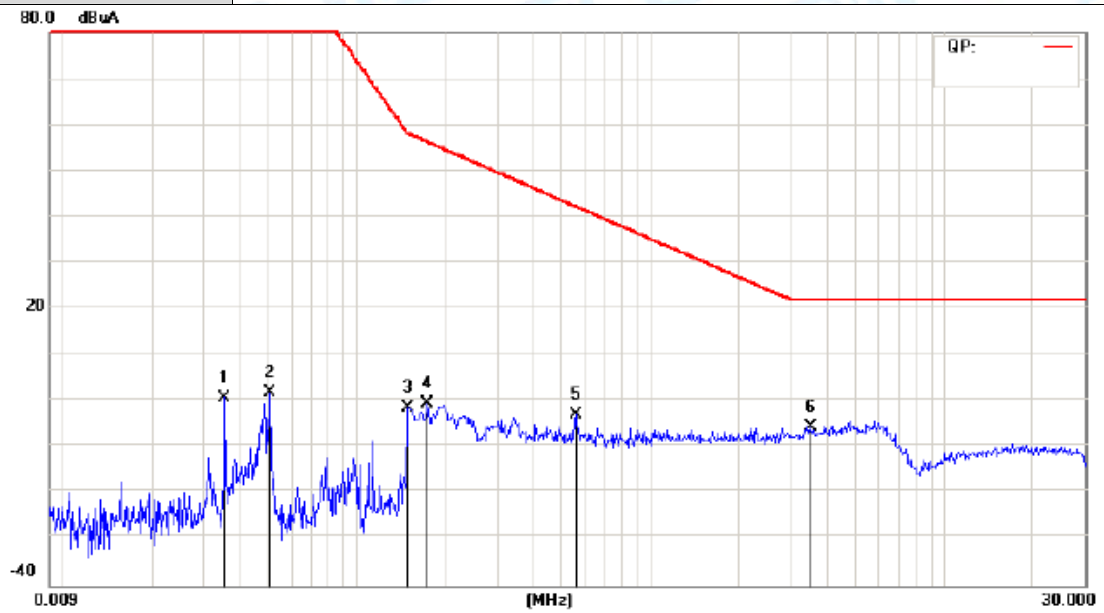
| EUT: | USB Book-light | Model Name : | PB-1342 |
|---|---|---|---|
| Temperature: | 25 ℃ | Relative Humidity: | 55% |
| Test Voltage: | DC 5V | | |
| Polarization | Y Direction | | |
| Test Mode: | Normal Mode | | |
| Remark: | | | |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuA | dB | dBuA | dBuA | dB | Detector |
| 1 | | 0.0355 | -20.31 | 17.71 | -2.60 | 88.00 | -90.60 | peak |
| 2 | | 0.0507 | -18.65 | 17.69 | -0.96 | 88.00 | -88.96 | peak |
| 3 | | 0.1539 | -21.24 | 19.73 | -1.51 | 57.68 | -59.19 | peak |
| 4 | | 0.5580 | -24.52 | 20.68 | -3.84 | 42.21 | -46.05 | peak |
| 5 | | 1.6300 | -27.09 | 20.88 | -6.21 | 29.33 | -35.54 | peak |
| 6 | * | 4.7300 | -26.35 | 22.26 | -4.09 | 22.00 | -26.09 | peak |

**Emission Level= Read Level+ Correct Factor**

| | | | |
|---|---|---|---|
| **EUT:** | USB Book-light | **Model Name :** | PB-1342 |
| **Temperature:** | 25 ℃ | **Relative Humidity:** | 55% |
| **Test Voltage:** | DC 5V | | |
| **Polarization** | Z Direction | | |
| **Test Mode:** | Normal Mode | | |
| **Remark:** | | | |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuA | dB | dBuA | dBuA | dB | Detector |
| 1 | | 0.0355 | -18.72 | 19.52 | 0.80 | 88.00 | -87.20 | peak |
| 2 | | 0.0506 | -16.96 | 18.81 | 1.85 | 88.00 | -86.15 | peak |
| 3 | | 0.1500 | -21.23 | 19.70 | -1.53 | 57.99 | -59.52 | peak |
| 4 | | 0.1740 | -20.47 | 19.89 | -0.58 | 56.21 | -56.79 | peak |
| 5 | | 0.5580 | -23.57 | 20.66 | -2.91 | 42.21 | -45.12 | peak |
| 6 | * | 3.4980 | -26.86 | 21.35 | -5.51 | 22.00 | -27.51 | peak |

**Emission Level= Read Level+ Correct Factor**

# 5. Radiated Disturbance Test

## 5.1. Test Standard and Limit

### 5.1.1. Test Standard

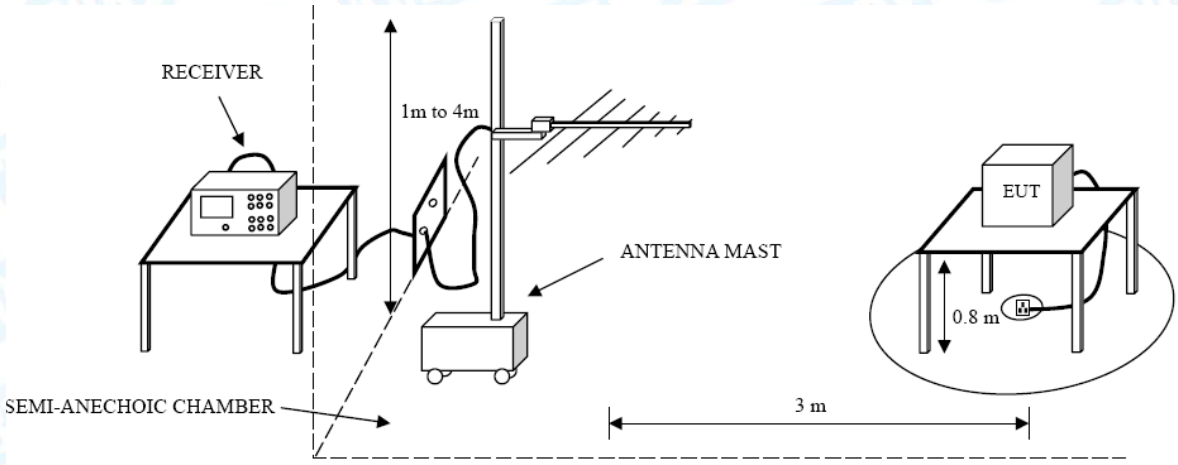
EN55015:2013

### 5.1.2. Test Limit

Radiated Disturbance Test Limit (Class B)

| Frequency | Limit (dBμV/m) |
|---|---|
| | Quasi-peak Level |
| 30MHz~230MHz | 40 |
| 230MHz~300MHz | 47 |
| **Remark:** 1. The lower limit shall apply at the transition frequency.<br>2. The test distance is 3m. | |

## 5.2. Test Setup




## 5.3. Test Procedure

The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m. The table was rotated 360 degrees to determine the position of the highest radiation.

The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

The initial step in collecting radiated emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode

measurement performed.

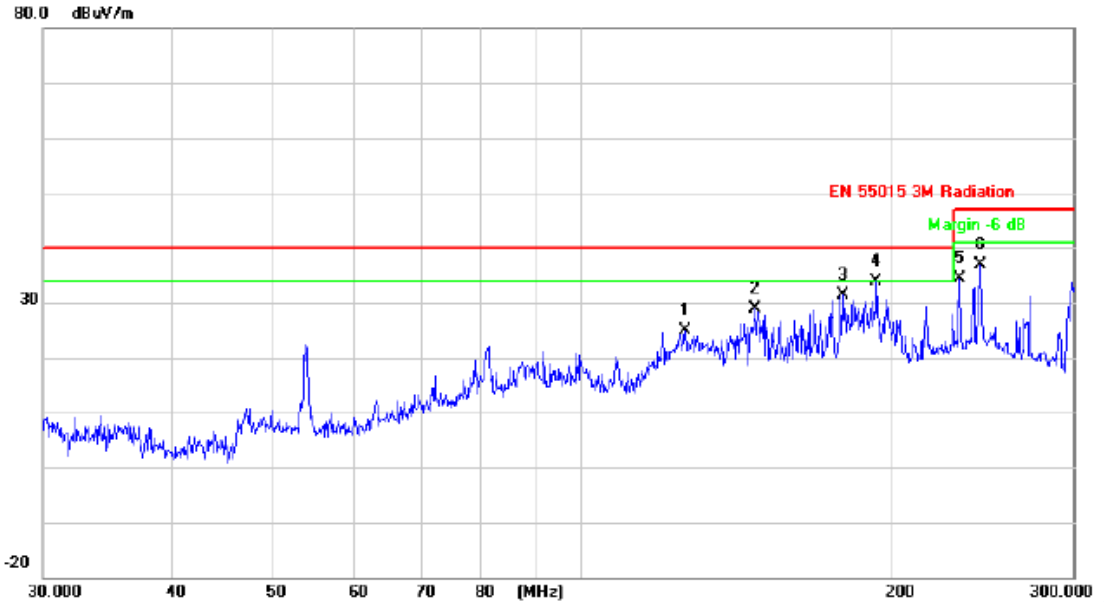
## 5.4. Test Condition

| | | |
|---|---|---|
| Temperature | : | 25 ℃ |
| Relative Humidity | : | 48 % |
| Pressure | : | 1010 hPa |
| Test Power | : | DC 5V |

## 5.5. Test Data

Please refer to the following pages.

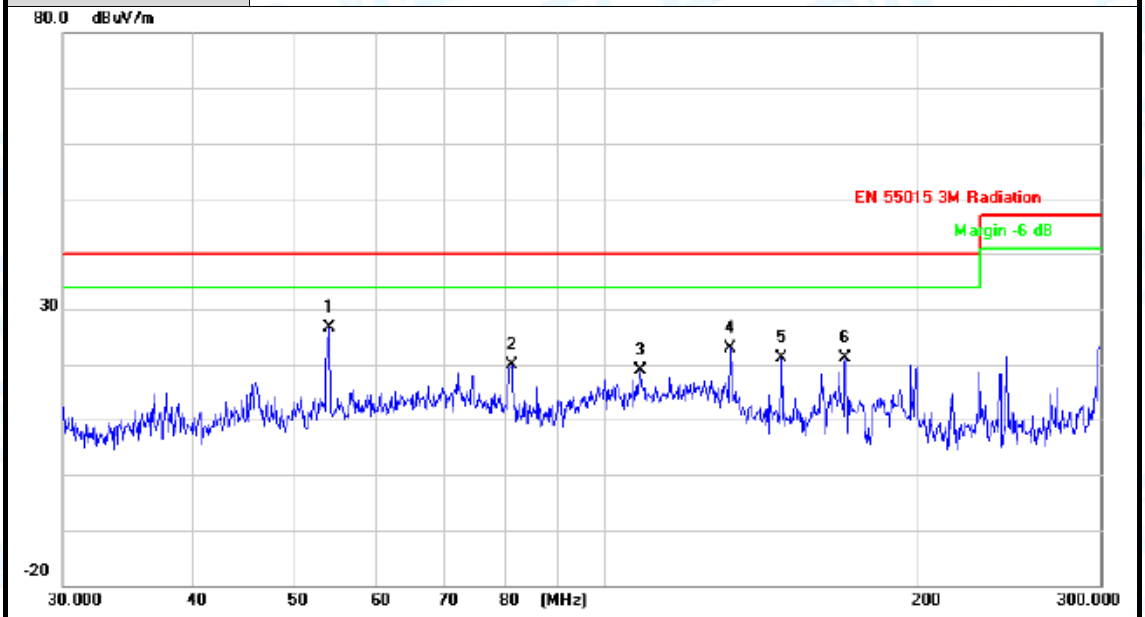
| EUT: | USB Book-light | Model Name : | PB-1342 |
|---|---|---|---|
| Temperature: | 25 ℃ | Relative Humidity: | 55% |
| Test Voltage: | DC 5V | | |
| Ant. Pol. | Horizontal | | |
| Test Mode: | Normal Mode | | |
| Remark: | | | |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 125.9277 | 47.15 | -22.31 | 24.84 | 40.00 | -15.16 | peak |
| 2 | | 147.2724 | 50.19 | -21.39 | 28.80 | 40.00 | -11.20 | peak |
| 3 | | 179.1106 | 52.05 | -20.62 | 31.43 | 40.00 | -8.57 | peak |
| 4 | * | 193.2508 | 54.71 | -20.74 | 33.97 | 40.00 | -6.03 | peak |
| 5 | | 232.8741 | 53.26 | -18.93 | 34.33 | 47.00 | -12.67 | peak |
| 6 | | 243.8492 | 55.23 | -18.41 | 36.82 | 47.00 | -10.18 | peak |

**Emission Level= Read Level+ Correct Factor**

| EUT: | USB Book-light | Model Name : | PB-1342 |
|---|---|---|---|
| Temperature: | 25 ℃ | Relative Humidity: | 55% |
| Test Voltage: | DC 5V | | |
| Ant. Pol. | Vertical | | |
| Test Mode: | Normal Mode | | |
| Remark: | | | |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | * | 54.0905 | 51.17 | -24.45 | 26.72 | 40.00 | -13.28 | peak |
| 2 | | 81.1188 | 43.14 | -23.21 | 19.93 | 40.00 | -20.07 | peak |
| 3 | | 108.1736 | 40.77 | -21.86 | 18.91 | 40.00 | -21.09 | peak |
| 4 | | 131.8625 | 44.97 | -22.14 | 22.83 | 40.00 | -17.17 | peak |
| 5 | | 147.9521 | 42.39 | -21.34 | 21.05 | 40.00 | -18.95 | peak |
| 6 | | 170.2634 | 42.40 | -21.16 | 21.24 | 40.00 | -18.76 | peak |

**Emission Level= Read Level+ Correct Factor**

# 6. Electrostatic Discharge Immunity Test

## 6.1. Test Requirements

### 6.1.1. Test Standard

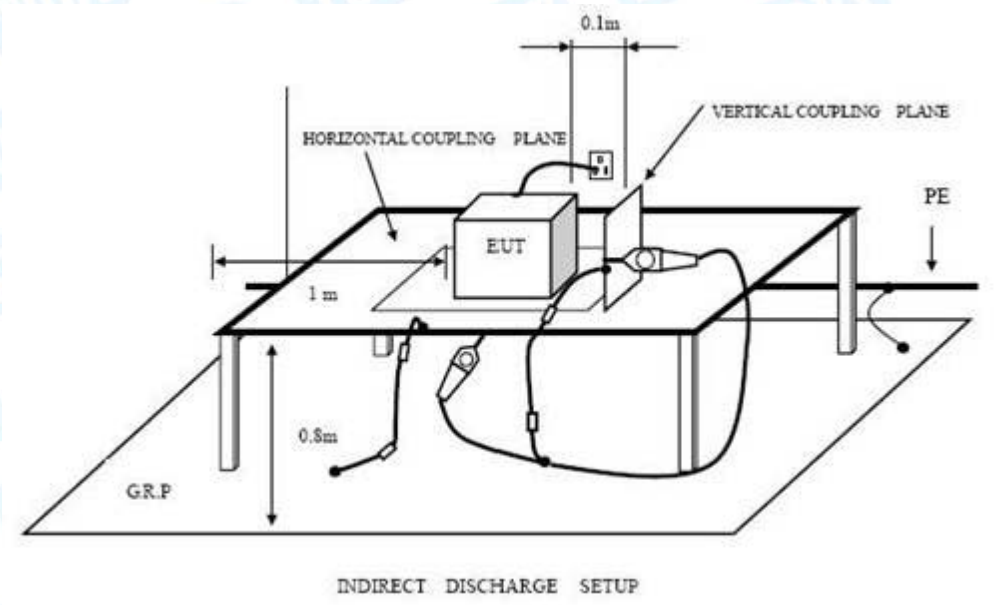
EN 61547: 2009 (EN 61000-4-2:2009)

### 6.1.2. Test Level

| Level | Test Voltage Contact Discharge (kV) | Test Voltage Air Discharge (kV) |
|---|---|---|
| 1 | ±2 | ±2 |
| 2 | ±4 | ±4 |
| 3 | ±6 | ±8 |
| 4 | ±8 | ±15 |
| X | Special | Special |

### 6.1.3. Performance criterion: **B**

## 6.2. Test Setup




INDIRECT DISCHARGE SETUP

## 6.3. Test Procedure

### 6.3.1. Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then

re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

6.3.2. Contact Discharge:

All the procedure shall be same as air discharge. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

6.3.3. Indirect discharge for horizontal coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

6.3.4. Indirect discharge for vertical coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

## 6.4. Test Data

Please refer to the following page.

# Electrostatic Discharge Test Result

| | | | |
|---|---|---|---|
| EUT : | USB Book-light | M/N : | PB-1342 |
| Temperature : | 22℃ | Humidity : | 50% |
| Power supply : | DC 5V | Test Mode : | ON |

Criterion: B

Air Discharge: ±8Kv Contact Discharge: ±4Kv

For each point positive 10 times and negative 10 times discharge.

| **Location** | **Kind**<br>A-Air Discharge<br>C-Contact Discharge | **Result** |
|---|---|---|
| Slots | A | PASS |
| Nonconductive Enclosure | A | PASS |
| Port | A | PASS |
| Conductive Enclosure | C | PASS |
| HCP | C | PASS |
| VCP of front | C | PASS |
| VCP of rear | C | PASS |
| VCP of left | C | PASS |
| VCP of right | C | PASS |
| | | |

**Remark:**

# 7. Radiated Electromagnetic Field Immunity Test

## 7.1. Test Requirements

### 7.1.1. Test Standard

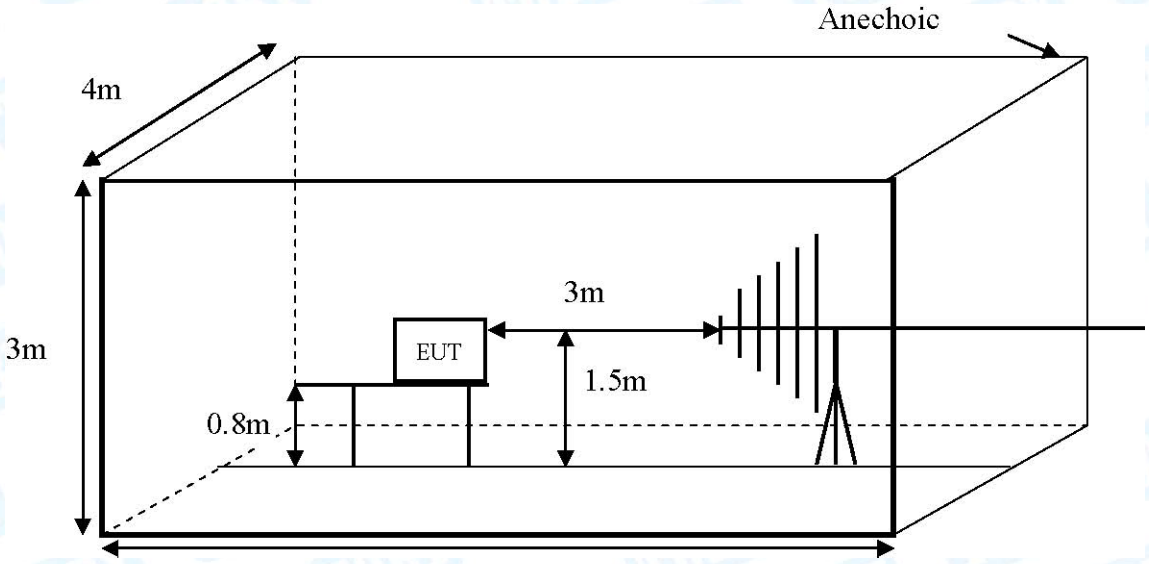
EN 61547: 2009 (EN 61000-4-3:2006+A1:2008+A2:2010)

### 7.1.2. Test Level

| Level | Field Strength V/m |
|---|---|
| 1 | 1 |
| 2 | 3 |
| 3 | 10 |
| X | Special |

### 7.1.3. Performance criterion: **A**

## 7.2. Test Setup




## 7.3. Test Procedure

The EUT are placed on a table, which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna, which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna is set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually.

In order to judge the EUT performance, a camera is used to monitor its screen.

All the scanning conditions are as following:

| Condition of Test | Remark |
|---|---|
| Fielded strength | 3V/m (Severity Level 2) |
| Radiated signal | Modulated |
| Scanning frequency | 80-1000MHz |
| Sweep time of radiated | 0.0015 Decade/s |
| Dwell time | 1 Sec. |

## 7.4. Test Data

Please refer to the following page.

# RF Field Strength Susceptibility Test Results

| | | | | | |
|---|---|---|---|---|---|
| EUT | : | USB Book-light | M/N | : | PB-1342 |
| Temperature | : | 22℃ | Humidity | : | 50% |
| Power supply | : | DC 5V | Test Mode | : | ON |

Criterion: A

Modulation: Unmodulated

Pulse: AM 1KHz 80%

| | Frequency Range 1 | | Frequency Range 2 | |
|---|---|---|---|---|
| | 80~1000MHz | | | |
| | Horizontal | Vertical | Horizontal | Vertical |
| Front | PASS | PASS | / | / |
| Right | PASS | PASS | / | / |
| Rear | PASS | PASS | / | / |
| Left | PASS | PASS | / | / |

**Remark:**

# 8. Photographs - Constructional Details

**Photo 1 Appearance of EUT**

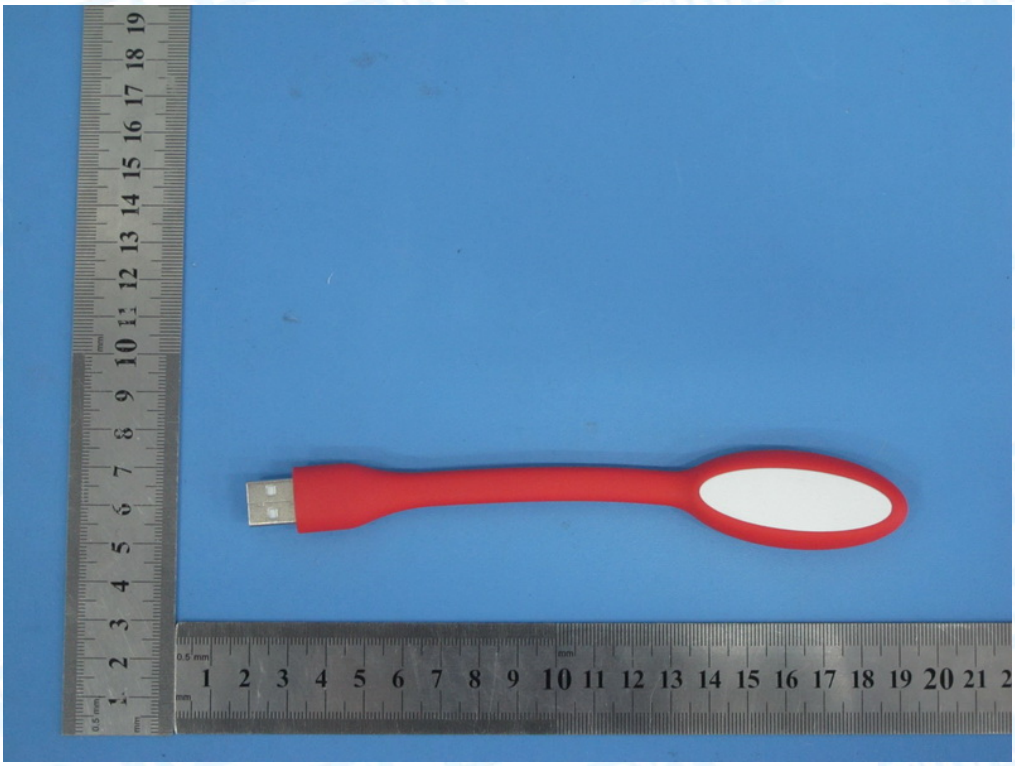


**Photo 2 Appearance of EUT**

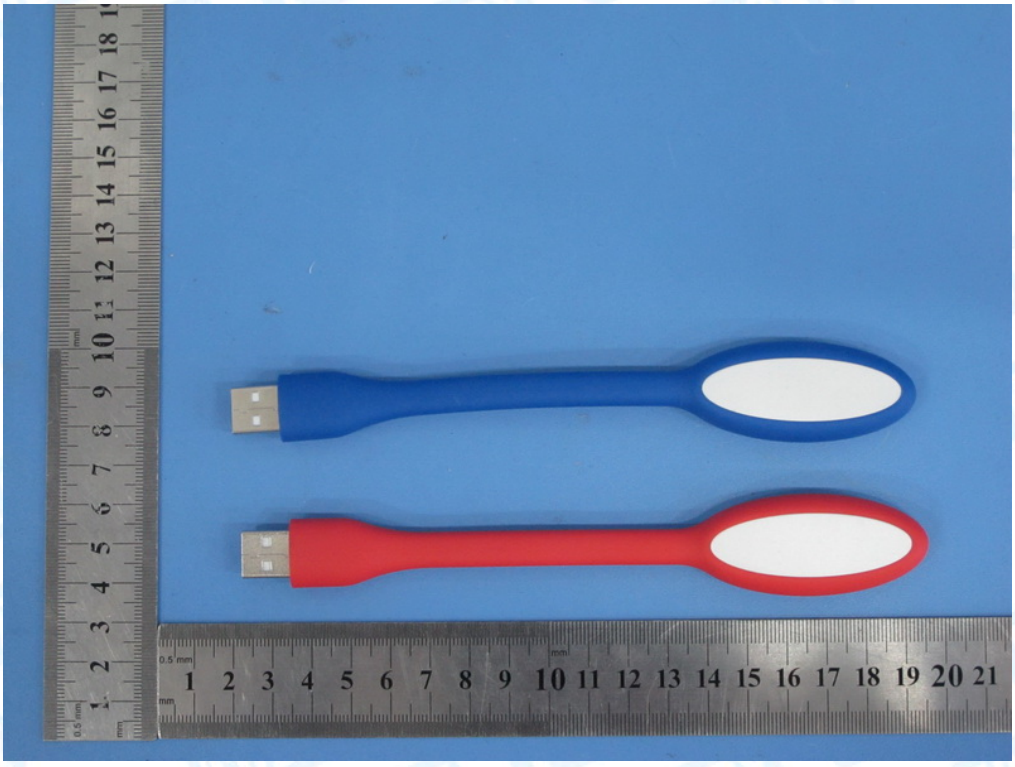
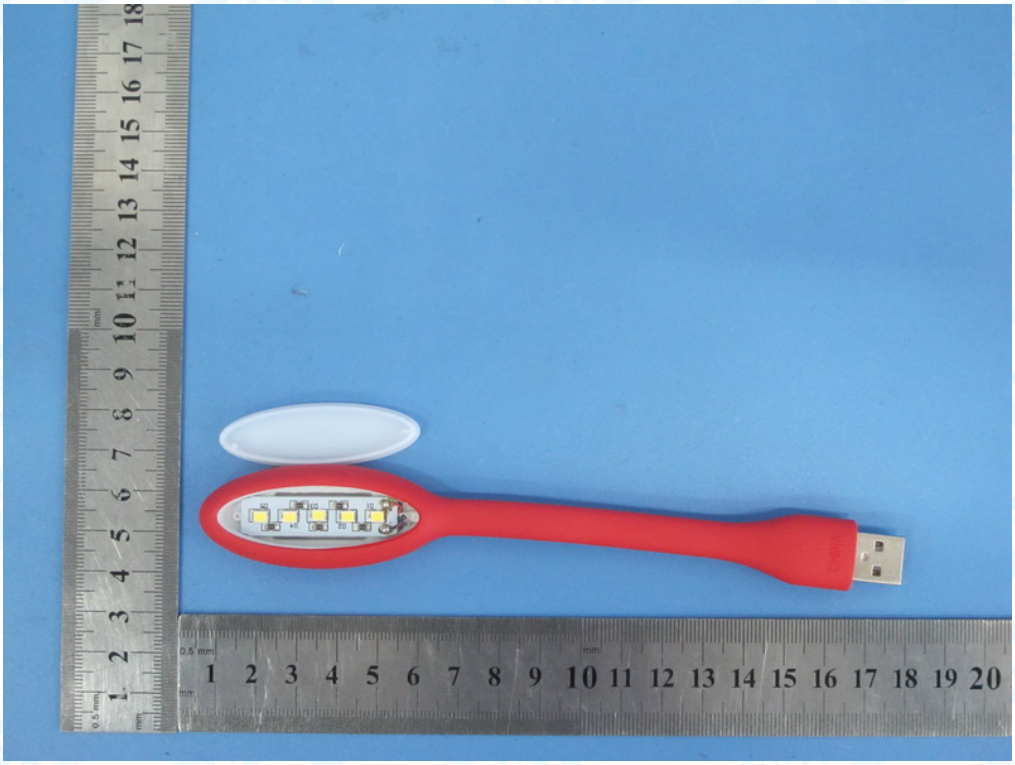


**Photo 3 Internal of EUT**



# 9. Photographs - Test Setup

**Photo 1 Magnetic Field Emission Test Setup**

**Photo 2 Radiated Emission Test Setup**

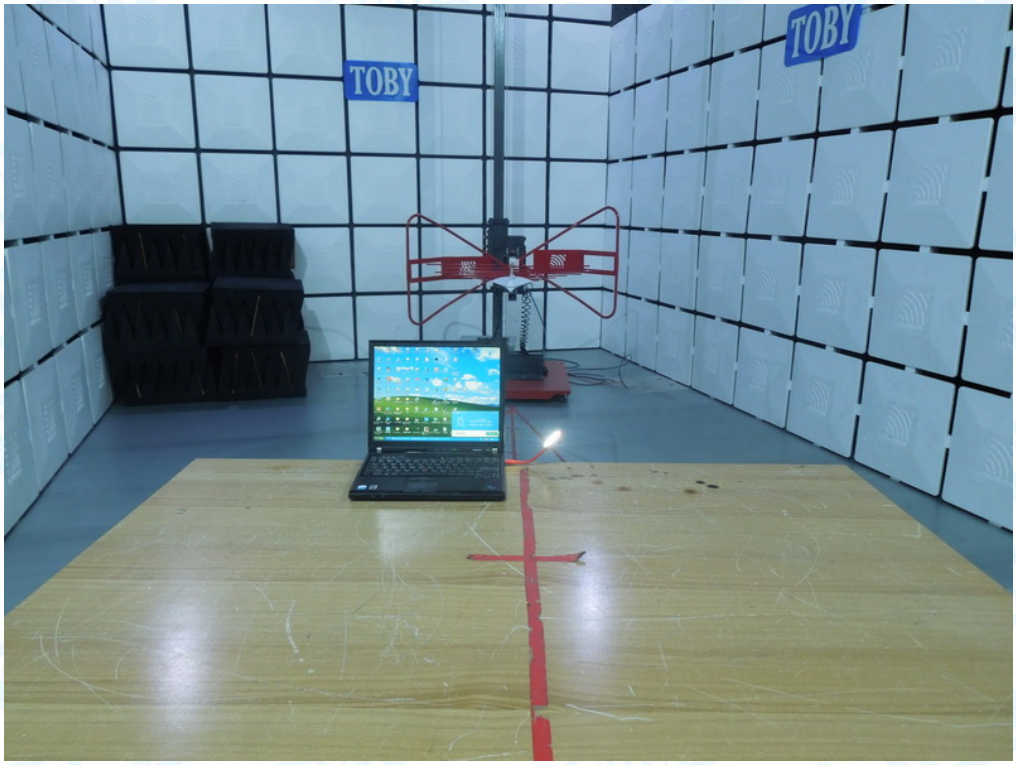


**Photo 3 Electrostatic Discharge Test Setup**