



中国认可  
国际互认  
检测  
TESTING  
CNAS L6478



# TEST REPORT

Reference No. .... : WTF19F03017206E  
 Applicant ..... : Mid Ocean Brands B.V.  
 Address ..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon,  
 Hong Kong  
 Manufacturer ..... : 114276  
 Product Name ..... : Desktop Lamp  
 Model No. .... : MO9690  
 Standards ..... : EN 55015:2013+A1:2015  
 EN 61547:2009  
 EN 55032:2015  
 EN 55024:2010+A1:2015  
 Date of Receipt sample .... : 2019-03-26  
 Date of Test ..... : 2019-03-28 to 2019-05-06  
 Date of Issue ..... : 2019-05-07  
 Test Report Form No. .... : WEO-55032A-01A  
 Test Result ..... : Pass

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

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Chen Yang / Manager

## 1 Test Summary

EMISSION				
Test Item	Test Standard	Class / Severity	Result	
Radiation Emission, 30MHz to 1000MHz	EN 55032:2015, EN 55015:2013+A1:2015	Table A.4 Clause 4.4.2	Pass	
Radiated electromagnetic disturbance, 9kHz to 30MHz	EN 55032:2015, EN 55015:2013+A1:2015	Clause 4.4.1	Pass	
IMMUNITY (EN 55024:2010+A1:2015,EN 61547:2009)				
Test Item	Test Method	Class / Severity	Performance Criteria	Result
Electrostatic Discharge(ESD)	IEC 61000-4-2:2008	±4 kV Contact ±8 kV Air	B	Pass
Radio-frequency electromagnetic fields (80MHz to 1GHz)	IEC 61000-4-3: 2006+A1:2007+A2:2010	3V/m, 80%, 1kHz, Amp. Mod.	A	Pass

Remark:

Pass

Test item meets the requirement

N/A

Test case does not apply to the test object

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### 3 General Information

#### 3.1 General Description of E.U.T.

**Product Name** ..... : Desktop Lamp  
**Model No.** ..... : MO9690  
**Remark**..... : ---

#### 3.2 Details of E.U.T.

**Technical Data**..... : Battery 3\*AA 1.5V or DC 5V by USB port

#### 3.3 Description of Support Units

The EUT has been tested as an independent unit. MO9690 is the test sample. All tests were performed in the condition of DC 5V input powered by USB port of Notebook.

#### 3.4 Standards Applicable for Testing

The tests were performed according to following standards:

EN 55015:2013+A1:2015	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
EN 61547:2009	Equipment for general lighting purposes — EMC immunity requirements
EN 55032:2015	Electromagnetic compatibility of multimedia equipment — Emission Requirements
EN 55024:2010+A1:2015	Information technology equipment — Immunity characteristics — Limits and methods of measurement.

### 3.5 Test Facility

The test facility has a test site registered with the following organizations:

- **ISED – Registration No.: 21895**

Waltek Services (Foshan) Co., Ltd. has been registered and fully described in a report filed with the Innovation, Science and Economic Development Canada (ISED). The acceptance letter from the ISED is maintained in our files. Registration ISED number: 21895, March 12, 2019

- **FCC – Registration No.: 820106**

Waltek Services (Foshan) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 820106, August 16, 2018

- **NVLAP – Lab Code: 600191-0**

Waltek Services (Foshan) Co., Ltd. EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 600191-0.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

### 3.6 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

Yes       No

If Yes, list the related test items and lab information:

Test items: ---

Lab information: ---

### 3.7 Abnormalities from Standard Conditions

None.

#### 4 Equipment Used during Test

Radiated electromagnetic disturbance(9kHz to 30MHz)					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EMI Test Receiver	R&S	ESCI	101178	Valid
2	Three Loops Antenna	SCHWARZBECK	HXYZ9170	213	Valid
Radiated Emission					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EMI Test Receiver	R&S	ESR7	101566	Valid
2.	Active Loop Antenna	SCHWARZBECK	FMZB1519B	00004	Valid
3.	Trilog Broadband Antenna	SCHWARZBECK	VULB 9162	9162-117	Valid
ESD					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	ESD Simulator	TESEQ	NSG437	521	Valid
Radio-frequency electromagnetic fields					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	RF Power Amplifier	OPHIR	5225F	1051/1712	Valid
2.	RF Power Amplifier	OPHIR	5293F	1051/171.	Valid
3.	Stacked double logarithmic periodic antenna	SCHWARZBECK	STLP9128E-SPECIAL	STLP9128E	Valid
4.	Stacked double logarithmic periodic antenna	SCHWARZBECK	STLP 9149	STLP 9149 #476	Valid
5.	RF signal generator	Agilent	N5181A	MY48080720	Valid

##### 4.1 Special Accessories and Auxiliary Equipment

Item	Equipment	Technical Data	Manufacturer	Model No.	Serial No.
1.	Notebook	AC 230V/50Hz	Lenovo	ThinkPad Edge E430	00426-OEM-8992662-00400

##### 4.2 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conducted Emission	150kHz~30MHz	±2.66dB	(1)
Radiated Emission	30MHz~1000MHz	±4.56dB	(1)

(1)This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

## 5 Emission Test Results

### 5.1 Radiated Electromagnetic Disturbance, 9kHz to 30MHz

**Test Requirement**..... : EN 55015 Clause 4.4.1  
**Test Method**..... : EN 55015 Clause 9.1  
**Test Result**..... : Pass  
**Frequency Range**..... : 9kHz to 30MHz  
**Class/Severity**..... : Table 3a of EN55015

#### 5.1.1 E.U.T. Operation

##### Operating Environment:

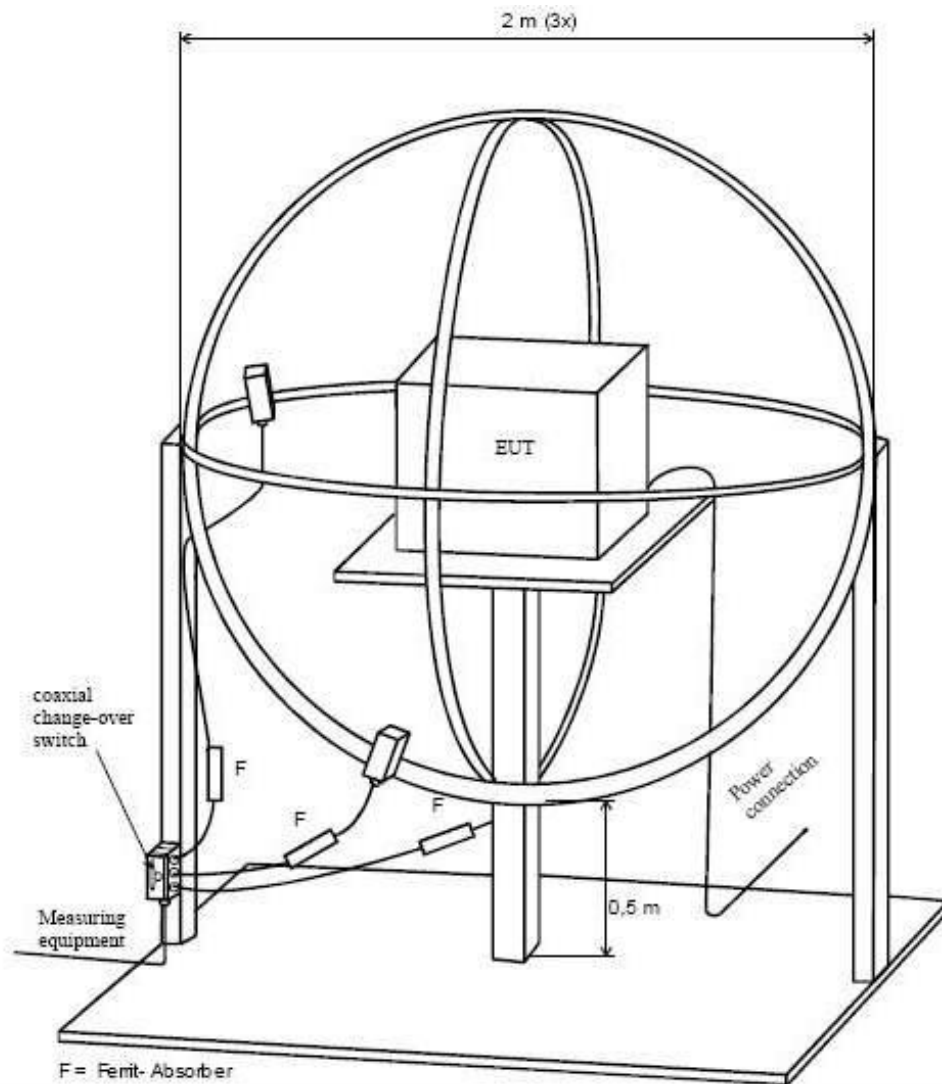
**Temperature** ..... : 24.8°C  
**Humidity**..... : 49.3%RH  
**Barometric Pressure**..... : 101.2kPa

##### EUT Operation:

**Input Voltage** ..... : DC 5V by USB port(with Notebook)  
**Operating Mode**..... : Darkest mode

### 5.1.2 Block Diagram of Test Setup

The Radiated Electromagnetic Disturbance (9kHz to 30MHz) test was performed in accordance with the EN 55015.



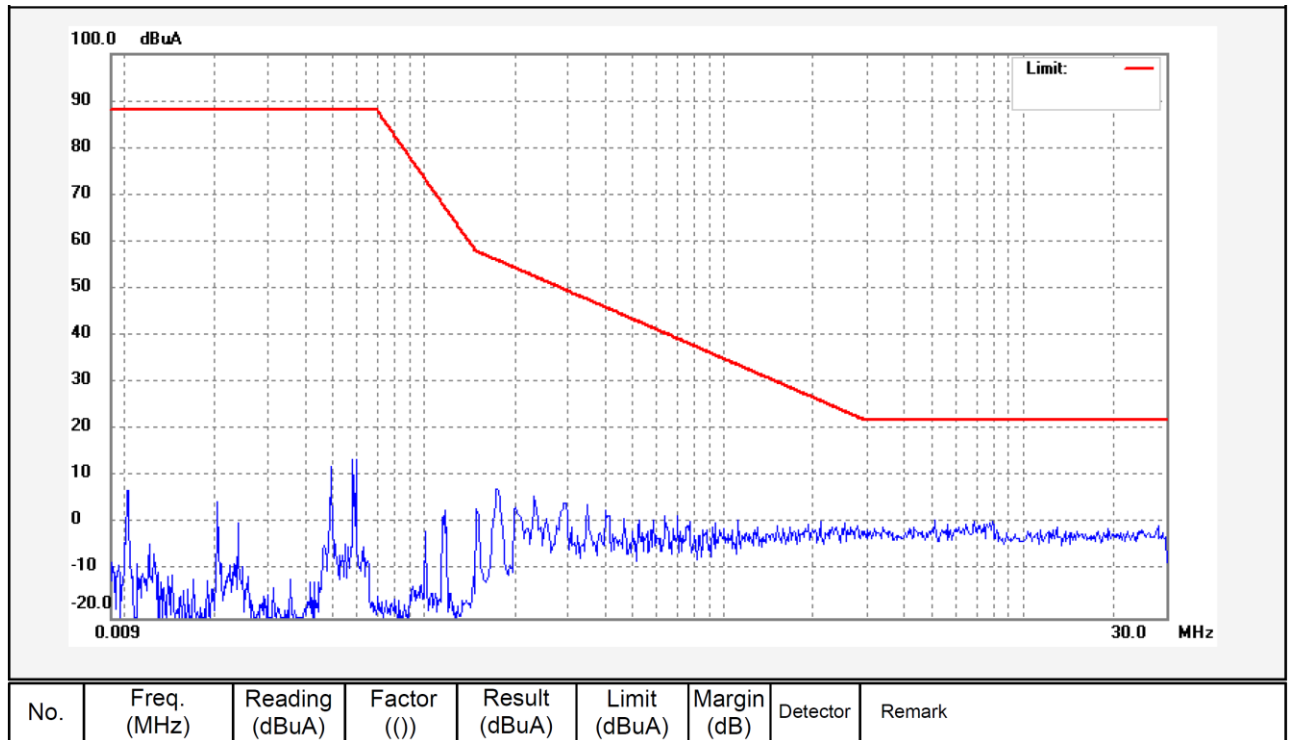
### 5.1.3 Measurement Data

According to the data in section 5.2.4, the EUT complied with the EN55015 standards.

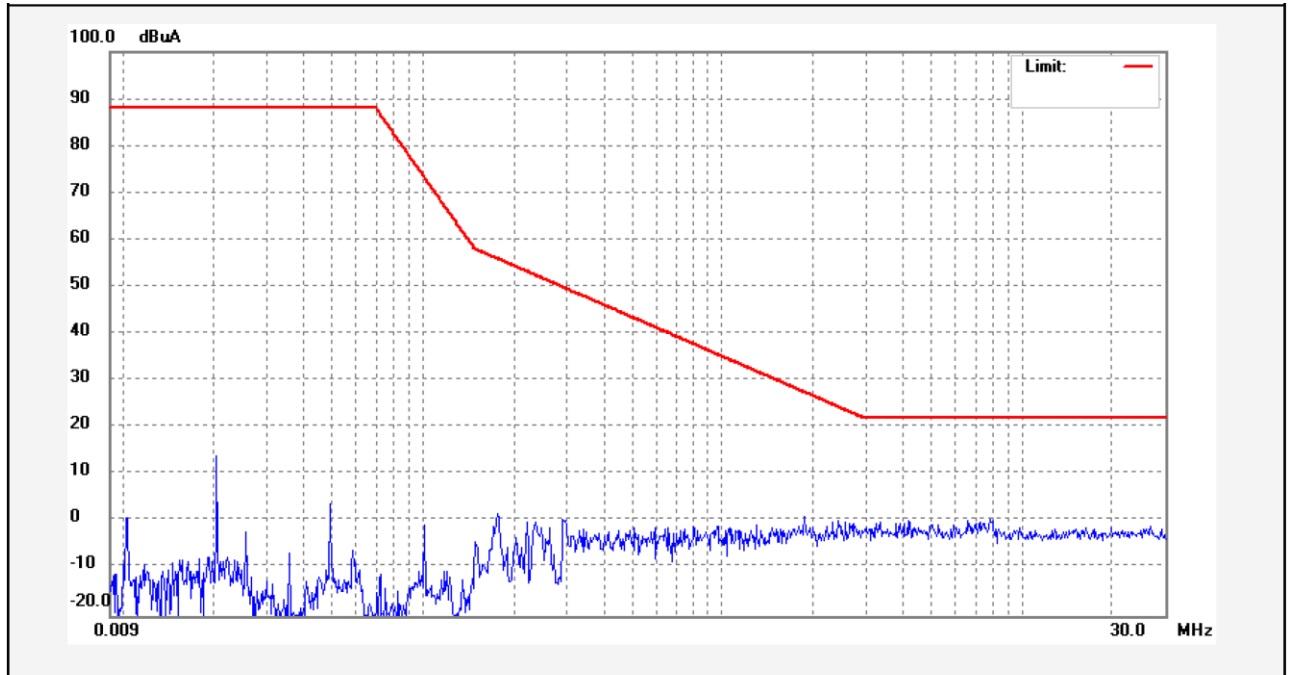


### 5.1.4 Radiated Electromagnetic Disturbance test data, 9kHz to 30MHz

Loop X :

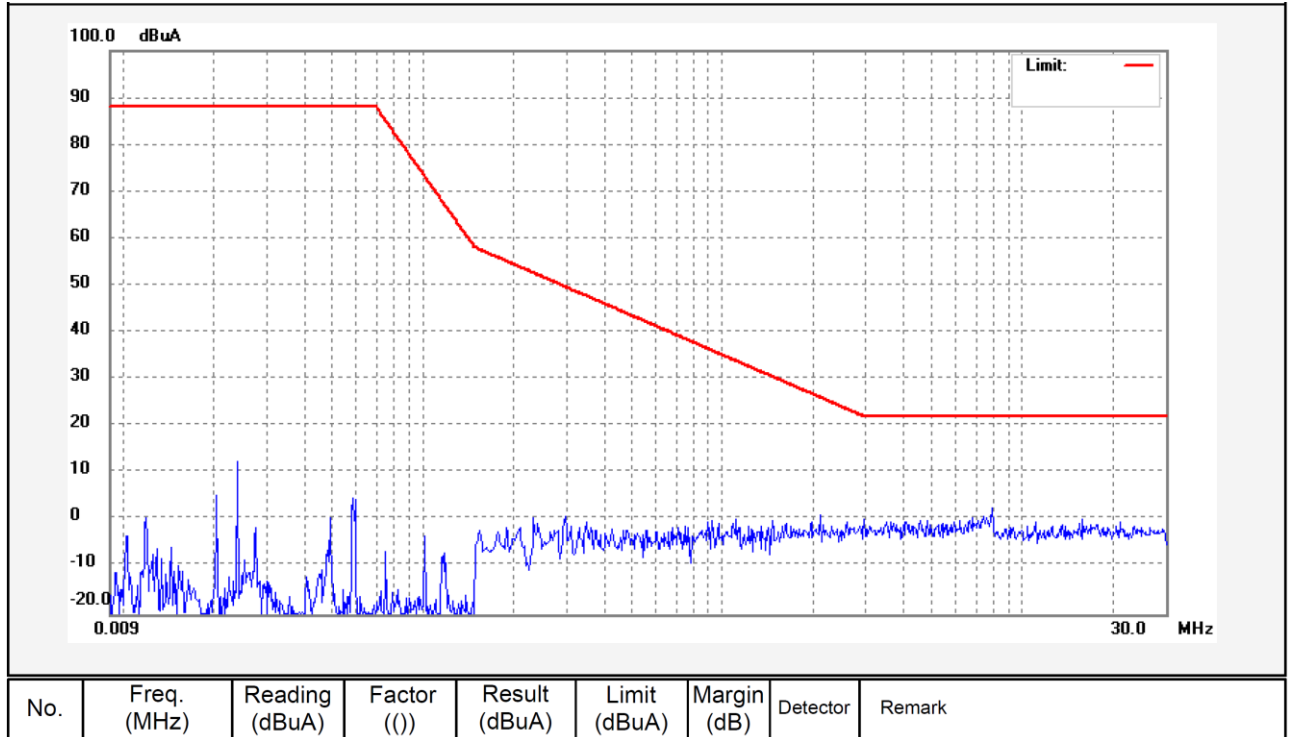


Loop Y :



No.	Freq. (MHz)	Reading (dBuA)	Factor (())	Result (dBuA)	Limit (dBuA)	Margin (dB)	Detector	Remark
-----	-------------	----------------	-------------	---------------	--------------	-------------	----------	--------

Loop Z :



**5.2 Radiated Emission**

- Test Requirement**..... : EN 55032, EN 55015
- Test Method**..... : EN 55032, Clause 10 of CISPR 22
- Test Limit**..... : Table A.4 of EN 55032, Table 3b of EN55015
- Test Result**..... : Pass
- Frequency Range**..... : 30MHz to 1000MHz
- Class**..... : Class B

**5.2.1 E.U.T. Operation**

**Operating Environment:**

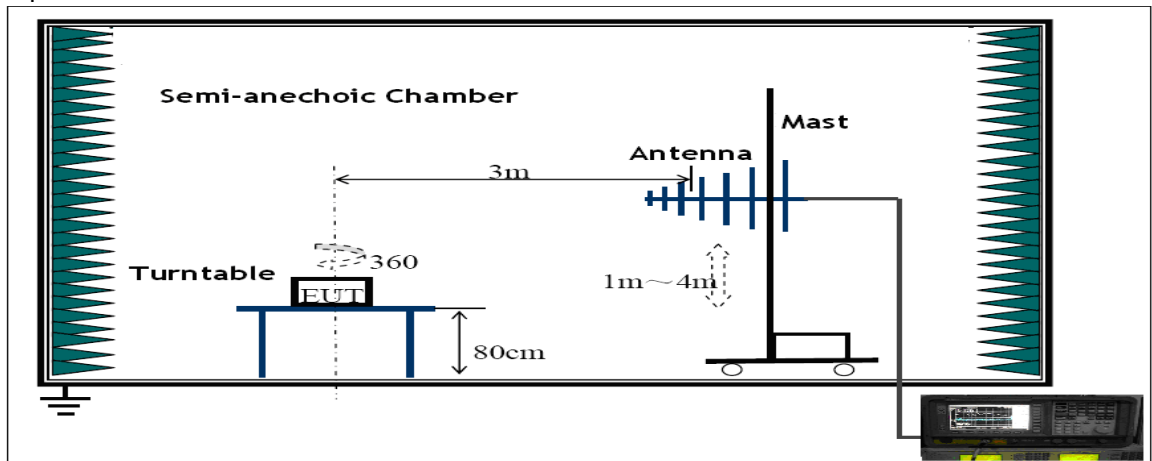
- Temperature** ..... : 25.2°C
- Humidity**..... : 50.0%RH
- Atmospheric Pressure**..... : 101.2 kPa

**EUT Operation:**

- Input Voltage** ..... : DC 5V by USB port(with Notebook)
- Operating Mode**..... : Darkest mode

**5.2.2 Block Diagram of Test Setup**

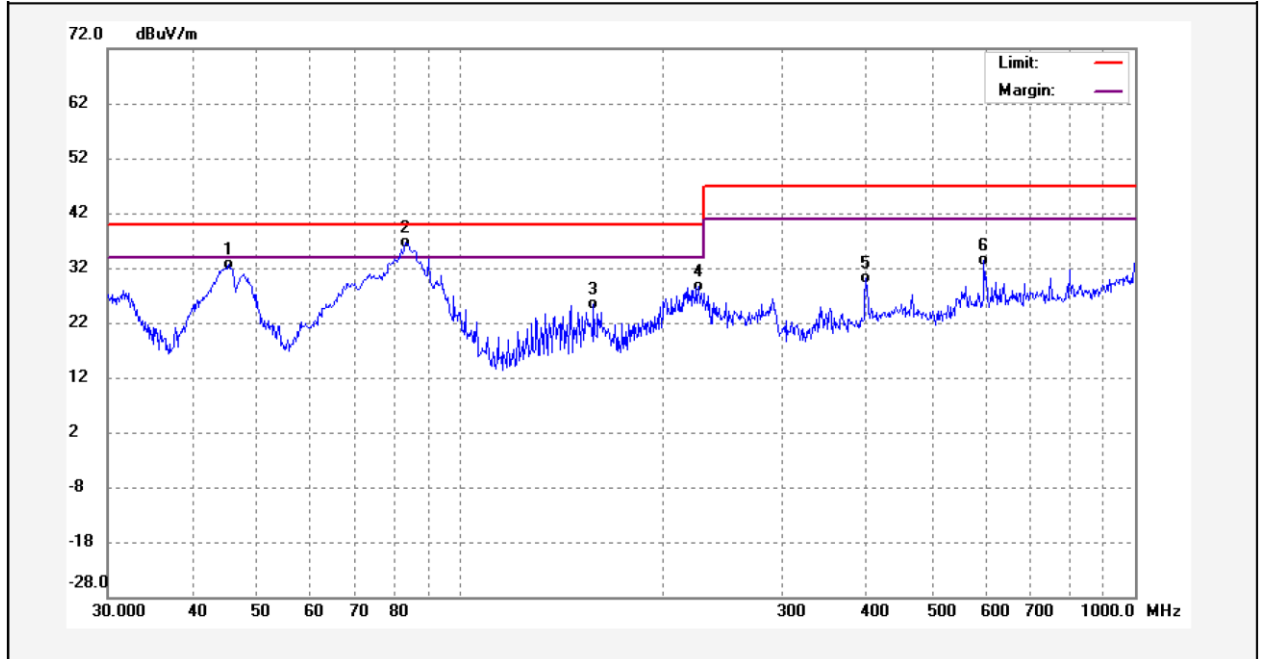
The Radiated Emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the CISPR 16-2-3.



### 5.2.3 Radiated Emission Test Data

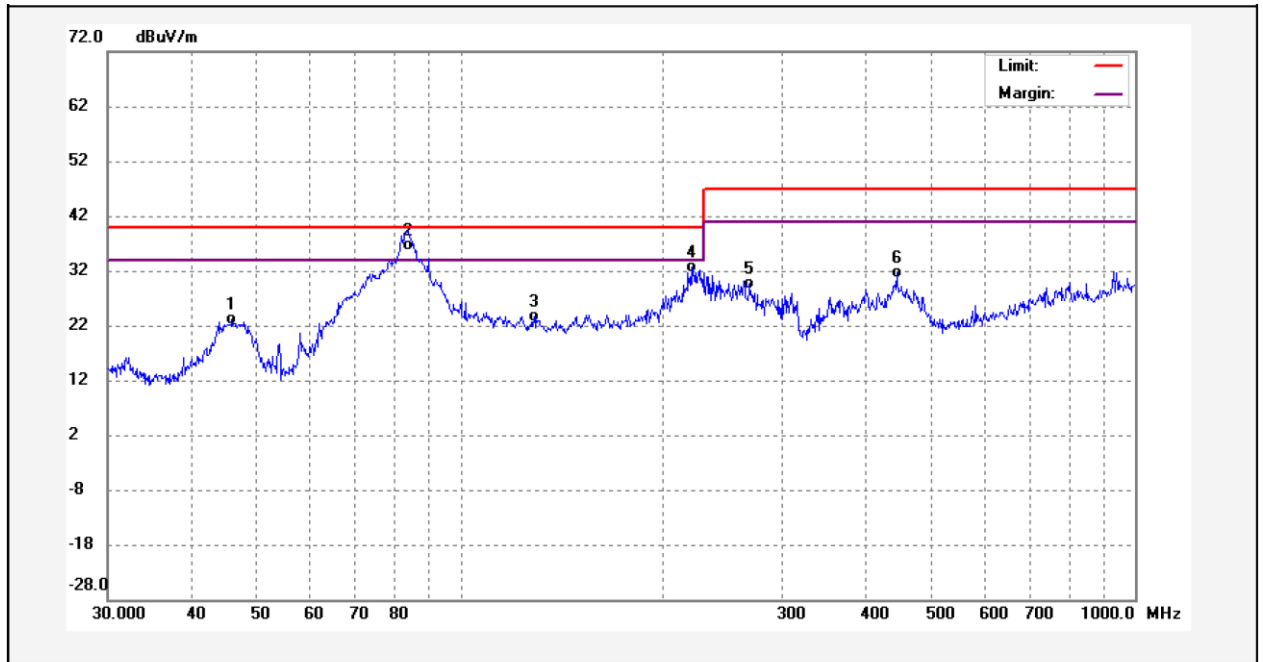
According to the data in section 5.2.4, the EUT complied with the EN 55032 standards.

#### Vertical Polarization



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	45.3755	18.47	14.20	32.67	40.00	-7.33	QP	
2	82.9385	26.51	10.07	36.58	40.00	-3.42	QP	
3	157.5588	14.44	10.86	25.30	40.00	-14.70	QP	
4	225.3080	13.55	15.11	28.66	40.00	-11.34	QP	
5	399.0302	11.68	18.49	30.17	47.00	-16.83	QP	
6	597.2234	10.90	22.42	33.32	47.00	-13.68	QP	

### Horizontal Polarization



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	45.8553	8.60	14.61	23.21	40.00	-16.79	QP	
2	83.7309	27.03	9.54	36.57	40.00	-3.43	QP	
3	128.5630	13.26	10.31	23.57	40.00	-16.43	QP	
4	219.8449	19.07	13.57	32.64	40.00	-7.36	QP	
5	268.4853	14.10	15.45	29.55	47.00	-17.45	QP	
6	443.2943	12.33	19.37	31.70	47.00	-15.30	QP	

## 6 Immunity Test Results

### 6.1 Performance Criteria

**Performance criterion A:** The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

**Performance criterion B:** The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however, no change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

**Performance criterion C:** Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

For further details, please refer to EN 55024.

## 6.2 Electrostatic Discharge(ESD)

Test Requirement .....	: EN 55024, EN 61547
Test Method .....	: IEC 61000-4-2
Test Result .....	: Pass
Discharge Impedance .....	: $330\Omega$ / 150pF
Discharge Voltage .....	: Air Discharge: $\pm 8\text{kV}$ Contact Discharge: $\pm 4\text{kV}$ HCP & VCP: $\pm 4\text{kV}$
Polarity.....	: Positive & Negative
Number of Discharge .....	: Minimum 10 times at each test point
Discharge Mode.....	: Single Discharge
Discharge Period .....	: 1 second minimum

### 6.2.1 E.U.T. Operation

#### Operating Environment:

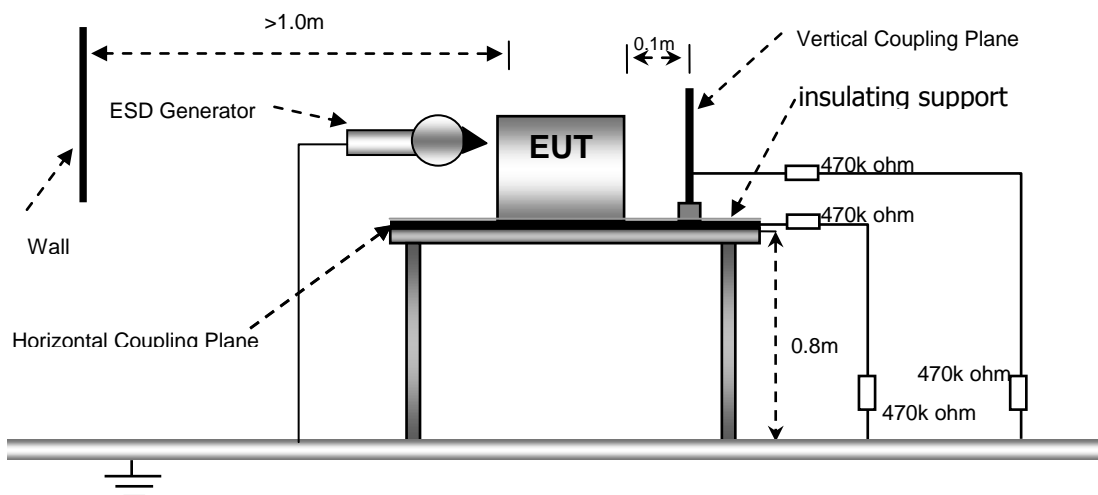
Temperature.....	: 21.3°C
Humidity .....	: 53.4%RH
Atmospheric Pressure .....	: 101.1kPa

#### EUT Operation:

Input Voltage.....	: Battery 4.5V; DC 5V by USB port(with Notebook)
Operating Mode .....	: On mode

### 6.2.2 Block Diagram of Test Setup

The ESD test was performed in accordance with the IEC 61000-4-2.





### 6.2.3 Direct Discharge Test Results

Observations :                      Test points : 1. All Exposed Surface & Seams;  
2. All metallic part

Direct Discharge			Test Results	
Applied Voltage (kV)	Performance Criterion	Test Point	Contact Discharge	Air Discharge
±8	B	1	N/A	Pass*
±4	B	2	Pass*	N/A

Remark: \* During the test no deviation was detected to the selected operation mode(s)

### 6.2.4 Indirect Discharge Test Results

Observations :                      Test points : 1. All sides.

Indirect Discharge			Test Results	
Applied Voltage (kV)	Performance Criterion	Test Point	Horizontal Coupling	Vertical Coupling
±4	B	1	Pass*	Pass*

Remark: \* During the test no deviation was detected to the selected operation mode(s)

### 6.3 Radio-frequency electromagnetic fields, 80MHz to 1GHz

Test Requirement .....	: EN 55024, EN 61547
Test Method .....	: IEC 61000-4-3
Test Result .....	: Pass
Frequency Range .....	: 80MHz to 1GHz
Test level .....	: 3V/m
Modulation .....	: 80%, 1kHz Amplitude Modulation.
Face of EUT .....	: Front, Back, Left, Right
Antenna polarisation ..	: Horizontal& Vertical

#### 6.3.1 E.U.T. Operation

##### Operating Environment:

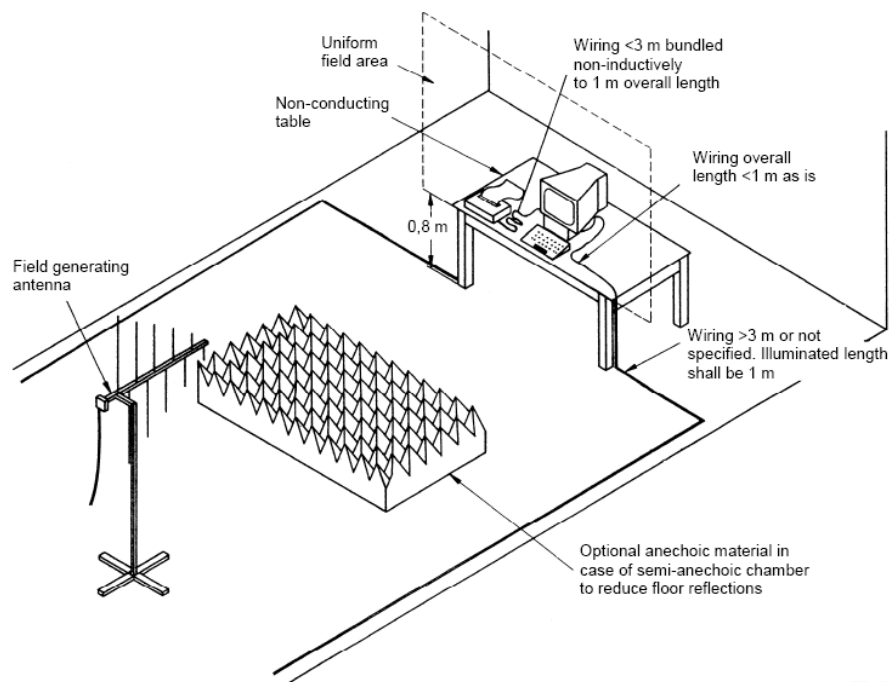
Temperature.....	: 24.5°C
Humidity .....	: 60.7%RH
Barometric Pressure .....	: 100.3kPa

##### EUT Operation:

Input Voltage.....	: Battery 4.5V; DC 5V by USB port(with Notebook)
Operating Mode .....	: On mode

#### 6.3.2 Block Diagram of Setup

The Radio-frequency electromagnetic fields Immunity test was performed in accordance with the IEC 61000-4-3.



IEC 034/06

### 6.3.3 Test Results

Frequency	Face of EUT	Antenna polarisation	Test Level	Step Size	Dwell Time	Performance Criterion	Result
80 to 1000MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
80 to 1000MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*

Remark:

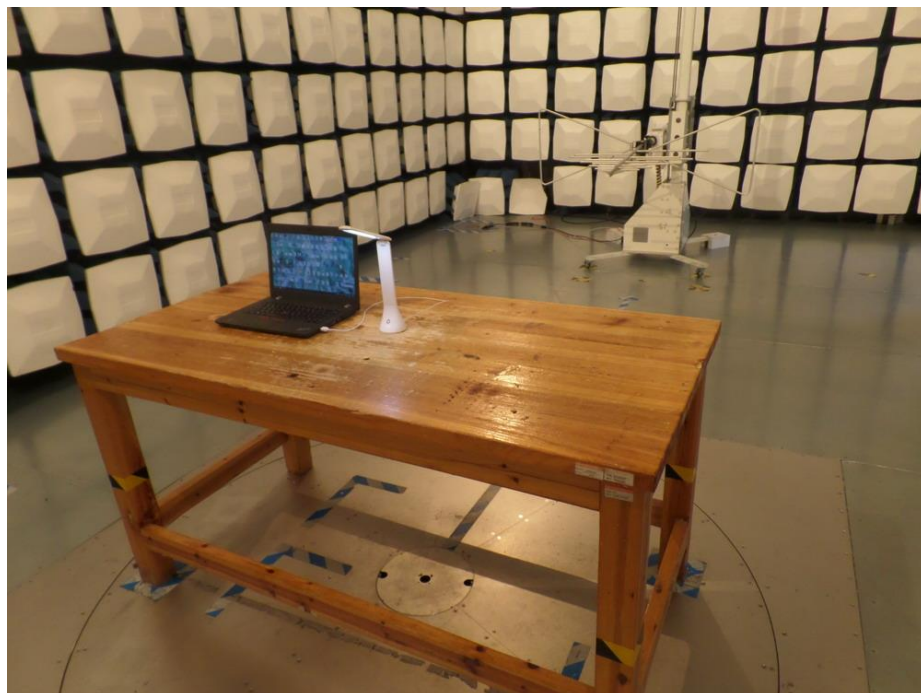
- \* During the test no deviation was detected to the selected operation mode(s)

## 7 Photographs – Test Setup

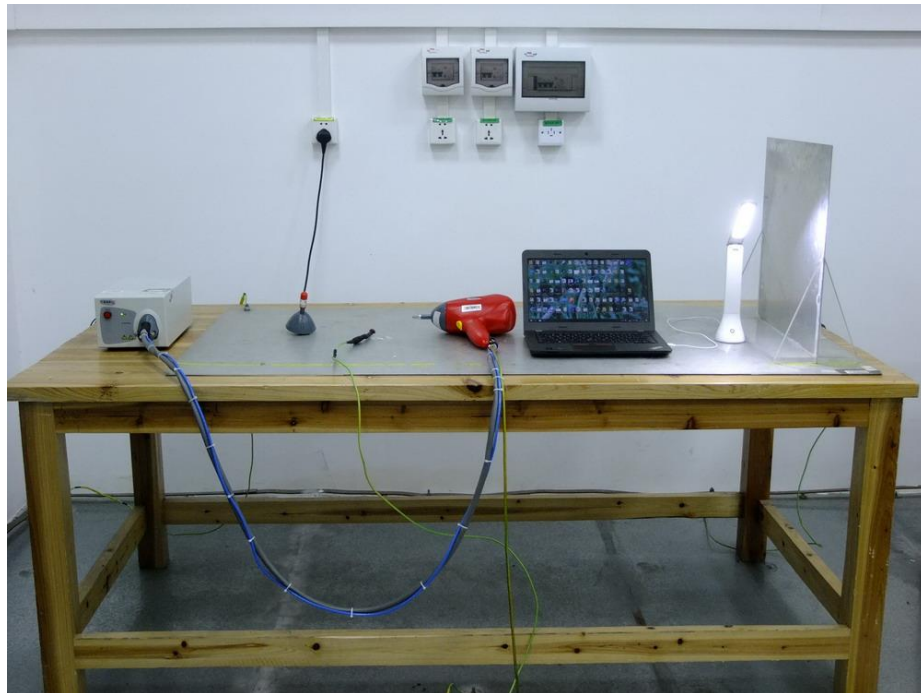
### 7.1 Photograph – Radiated electromagnetic disturbance Test Setup, 9kHz to 30MHz



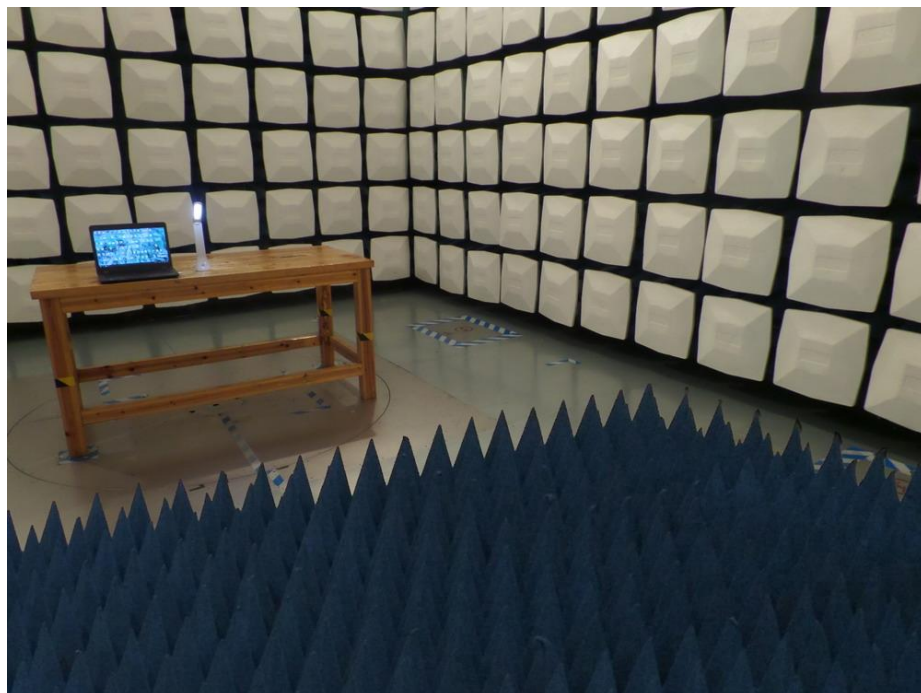
### 7.2 Photograph –Radiated Emission Test Setup



### 7.3 Photograph –ESD Test Setup



### 7.4 Photograph - Radiated immunity Test Setup



## 8 Photographs – Constructional Details

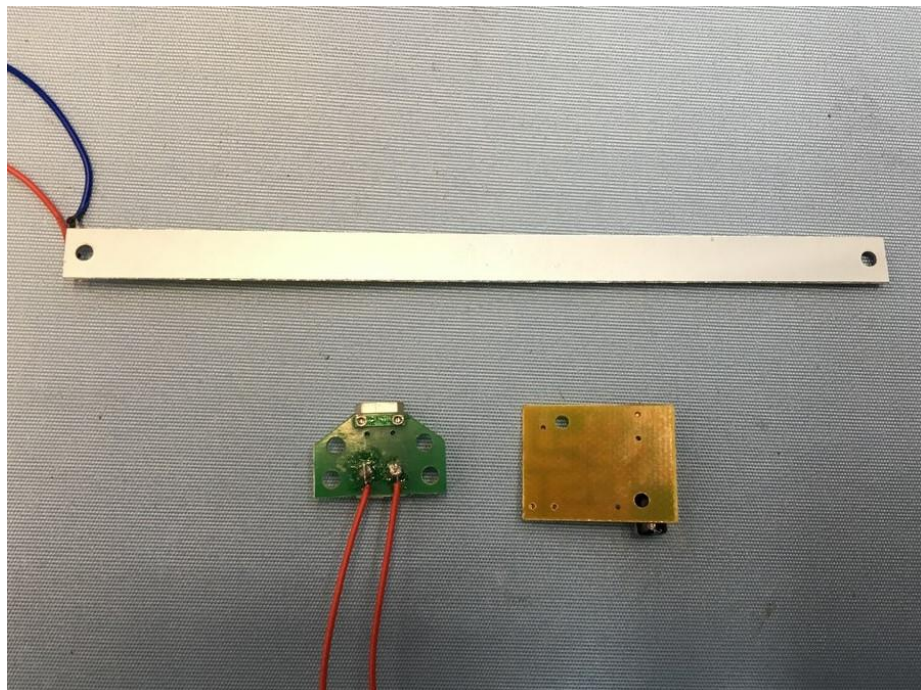
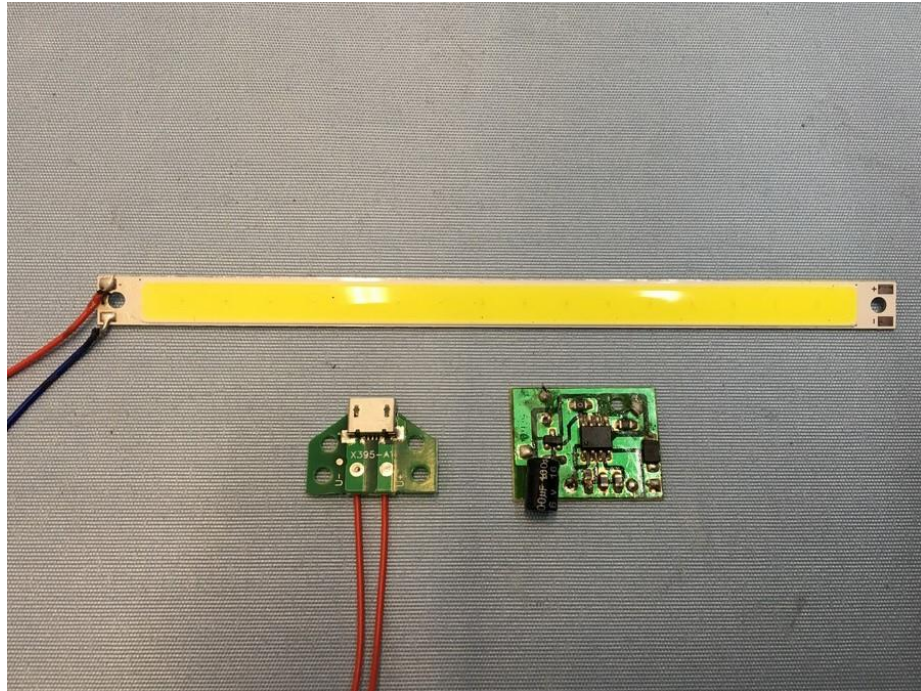
### 8.1 EUT – Front View



### 8.2 EUT –Back View



### 8.3 EUT –PCB Photos



===== End of Report =====