

# Certificate of Conformity

Certificate Number: DLE-250526001C

**Applicant:** Qinhuangdao Darong glass products co.,ltd.  
No.324 Beihuan Road Haigang district Qinhuangdao City Hebei Province  
China

**Manufacturer:** Shenzhen Lampda Photoelectric Technology Co., Ltd.  
Room 601, Building 2, Huafeng Longgang International Students Industrial  
Park, Baolong 1st Road, Nanyue Community, Baolong Street, Shenzhen,  
Guangdong, China

**Product:** UV sterilizer water bottle

**Trade Mark:** VOXPURE

**Model No.:** MP-UV03

**Test Standard:** BS EN IEC 55014-1:2021  
BS EN IEC 61000-3-2:2019+A2:2024,  
BS EN 61000-3-3:2013+A1:2019+A2:2021  
BS EN IEC 55014-2:2021  
BS EN 61000-4-2:2009, BS EN IEC 61000-4-3:2020,  
BS EN 61000-4-4:2012, BS EN 61000-4-5:2014+A1:2017,  
BS EN IEC 61000-4-6:2023, BS EN IEC 61000-4-11:2020

The EUT described above has been tested by us with the listed standards and found in compliance with the EMC directive S.I. 2016 No. 1091. It is possible to use UKCA marking to demonstrate the compliance with this EMC directive. It is only valid in connection with the test report number: DLE-250526001R.

**UK  
CA**





# TEST REPORT

Applicant: Qinhuangdao Darong glass products co.,ltd.

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Manufacturer: Shenzhen Lampda Photoelectric Technology Co., Ltd.

Address: Room 601, Building 2, Huafeng Longgang International Students Industrial Park, Baolong 1st Road, Nanyue Community, Baolong Street, Shenzhen, Guangdong, China

EUT: UV sterilizer water bottle

Trade Mark: VOXPURE

Model Number: MP-UV03

Date of Receipt: May 26, 2025

Test Date: May 26, 2025 - May 29, 2025

Date of Report: May 29, 2025

Prepared By: Shenzhen DL Testing Technology Co., Ltd.

Address: 101-201, Comprehensive Building, Tongzhou Electronics Longgang Factory Area, No.1 Baolong Fifth Road, Baolong Community, Baolong Street, Longgang District, Shenzhen, China

Applicable Standards: BS EN IEC 55014-1:2021  
BS EN IEC 61000-3-2:2019+A2:2024, BS EN 61000-3-3:2013+A1:2019+A2:2021  
BS EN IEC 55014-2:2021  
BS EN 61000-4-2:2009, BS EN IEC 61000-4-3:2020, BS EN 61000-4-4:2012,  
BS EN 61000-4-5:2014+A1:2017, BS EN IEC 61000-4-6:2023,  
BS EN IEC 61000-4-11:2020

Test Result: Pass

Report Number: DLE-250526001R

Prepared (Engineer): Ken Tan

Reviewer (Supervisor): Jack Bu

Approved (Manager): Jade Yang



*This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.*

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**1. VERSION**

Version No.	Date	Description
00	May 29, 2025	Original

**2. TEST SUMMARY**

EMC Emission				
Standard	Test Item	Limit	Result	Remark
BS EN IEC 55014-1:2021	Conducted Emission at power ports	-----	N/A	
	Conducted Emission at load terminals	-----	N/A	
	Disturbance power Emission	-----	N/A	
	Radiated Emission below 1GHz	-----	PASS	
	Radiated Emission above 1GHz		N/A	
BS EN IEC 61000-3-2:2019+ A1:2021+A2:2024	Harmonic Current Emission	Class A or D	N/A <sup>NOTE (2)</sup>	
BS EN 61000-3-3:2013+ A1:2019+A2:2021	Voltage Fluctuations & Flicker	-----	N/A	
EMC Immunity				
Section BS EN IEC 55014-2:2021	Test Item	Performance Criteria	Result	Remark
BS EN 61000-4-2:2009	Electrostatic Discharge	B	PASS	
BS EN IEC 61000-4-3:2020	RF electromagnetic field	A	PASS	
BS EN 61000-4-4:2012	Fast transients	B	N/A	
BS EN 61000-4-5:2014 +A1:2017	Surges	B	N/A	
BS EN IEC 61000-4-6:2023	Injected Current	A	N/A	
BS EN IEC 61000-4-11:2020 +AC:2022	Volt. Interruptions Volt. Dips	C / C / C <sup>NOTE (3)</sup>	N/A	

**NOTE:**

(1) "N/A" denotes test is not applicable in this Test Report

(2) The power consumption of EUT is less than 75W and no Limits apply.

(3) Voltage dip: 70% reduction – Performance Criteria B

Voltage Interruptions: 30% reduction – Performance Criteria C

(4) Test Facility: Shenzhen DL Testing Technology Co., Ltd.

Address: 101-201, Comprehensive Building, Tongzhou Electronics Longgang Factory Area, No.1  
Baolong Fifth Road, Baolong Community, Baolong Street, Longgang District, Shenzhen, China



### 3. GENERAL INFORMATION

#### 3.1 Description of Device (EUT)

EUT: UV sterilizer water bottle

Trade Mark: VOXPURE

Model Number: MP-UV03

Test Model: MP-UV03

Model difference: N/A

Power Supply: DC 3.7V from battery  
DC 5V from charger

Highest Operating Frequency: ☒ Below 15MHz  
☐ Above 15MHz and below 200MHz  
☐ Above 200MHz

Classification of apparatus: ☐ Category I  
☒ Category II  
☐ Category III  
☐ Category IV  
☐ Category V

#### NOTE:

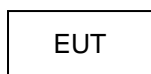
(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

(2) The EUT's all information provided by client.

#### 3.2 Tested System Details

None.

#### 3.3 Block Diagram of Test Set-up



#### 3.4 Test Mode Description

Mode1: On Mode

#### 3.5 Test Auxiliary Equipment

None.

#### 3.6 Test Uncertainty

Conducted Emission Uncertainty :  $\pm 2.56\text{dB}$

Radiated Emission Uncertainty :  $\pm 3.24\text{dB}$

**4. TEST INSTRUMENT USED****For Conducted Emission Test (843 Shielded Room)**

Equipment	Manufacturer	Model	Serial	Last Cal.	Next Cal.
843 Shielded Room	YIHENG	843 Room	843	Nov. 05, 2023	Nov. 04, 2026
EMI Receiver	R&S	ESR	101421	Nov. 01, 2024	Oct. 31, 2025
LISN	R&S	ENV216	102417	Nov. 01, 2024	Oct. 31, 2025
Clamp	COM-POWER	CLA-050	431072	Nov. 02, 2024	Nov. 01, 2025
3-Loop Antenna	DAZE	ZN30401	13021	Nov. 02, 2024	Nov. 01, 2025
ISN T8	Schwarzbeck	NTFM 8158	101135	Nov. 01, 2024	Oct. 31, 2025
ISN T5	Schwarzbeck	NTFM 8158	101136	Nov. 01, 2024	Oct. 31, 2025
843 Cable 1#	ChengYu	CE Cable	001	Nov. 01, 2024	Oct. 31, 2025
843 Cable 1#	ChengYu	CL Cable	002	Nov. 01, 2024	Oct. 31, 2025

**For Radiated Emission Test (966 chamber)**

Equipment	Manufacturer	Model	Serial	Last Cal.	Next Cal.
966 chamber	YIHENG	966 Room	966	Nov. 06, 2023	Nov. 05, 2026
Spectrum Analyzer	Agilent	E4408B	MY50140780	Nov. 01, 2024	Oct. 31, 2025
EMI Receiver	R&S	ESRP7	101393	Nov. 01, 2024	Oct. 31, 2025
Amplifier	Schwarzbeck	BBV9743B	00153	Nov. 01, 2024	Oct. 31, 2025
Amplifier	EMEC	EM01G8GA	00270	Nov. 01, 2024	Oct. 31, 2025
Broadband Trilog Antenna	Schwarzbeck	VULB9162	00306	Nov. 02, 2024	Nov. 01, 2025
Horn Antenna	Schwarzbeck	BBHA9120D	02139	Nov. 02, 2024	Nov. 01, 2025
966 Cable 1#	ChengYu	966	004	Nov. 01, 2024	Oct. 31, 2025
966 Cable 2#	ChengYu	966	003	Nov. 01, 2024	Oct. 31, 2025

**For Harmonic & Flicker Test (EMS --- site )**

Equipment	Manufacturer	Model	Serial	Last Cal.	Next Cal.
Harmonics, Flicker & power Analyser	LAPLACE INSTRUMENTS	AC2000A	311370	Nov. 01, 2024	Oct. 31, 2025
AC Power Supply	MToni	HPF5010	633659	Nov. 01, 2024	Oct. 31, 2025

**For Electrostatic Discharge Immunity Test ( EMS --- site )**

Equipment	Manufacturer	Model	Serial	Last Cal.	Next Cal.
ESD Tester	SCHLODER	SESD 230	17352	Nov. 02, 2024	Nov. 01, 2025

**For RF Field Strength Susceptibility Test (Other RS site)**

Equipment	Manufacturer	Model	Serial	Last Cal.	Next Cal.
Signal Generator	HP	SMB100A	1406600K02	Oct. 15, 2024	Oct. 14, 2025
Amplifier	BONN ELEKTRONIK	BLWAO810-250/100D	066454	Oct. 15, 2024	Oct. 14, 2025
Amplifier	BONN ELEKTRONIK	BLWA0840-5030 D	066453	Oct. 15, 2024	Oct. 14, 2025
RS Test Antenna	SKET	STLP 9129 Plus	202301/428	Oct. 15, 2024	Oct. 14, 2025
audio analyzer	R&S	UPL	16755	Oct. 15, 2024	Oct. 14, 2025
Antenna	EMCO	3108	9507-2534	Oct. 15, 2024	Oct. 14, 2025
Log-periodic Antenna	A&R	AT1080	16812	Oct. 15, 2024	Oct. 14, 2025
Power Sensor	R&S	Z11	116655	Oct. 15, 2024	Oct. 14, 2025
Power Sensor	R&S	Z11	121896	Oct. 15, 2024	Oct. 14, 2025
Horn Antenna	AINFO	JXTXLB-10180-SF	J2031090903006	Oct. 15, 2024	Oct. 14, 2025

**For EFT /B, Surge, Voltage Dips Interruptions Test (EMS --- site )**

Equipment	Manufacturer	Model	Serial	Last Cal.	Next Cal.
Transient Comprehensive Immunity Test System	Graphtec	HVIP16T+HCO MPACT 5	192501+192202	Nov. 01, 2024	Oct. 31, 2025
Coupling Clamp	HTEC	001	0001	Nov. 01, 2024	Oct. 31, 2025

**For Injected Currents Susceptibility Test (EMS --- site )**

Equipment	Manufacturer	Model	Serial	Last Cal.	Next Cal.
C/S Test System	LIONCEL	RIS-6091-85	0191101	Nov. 01, 2024	Oct. 31, 2025
CDN	LIONCEL	CDN-M2-16	0191001	Nov. 01, 2024	Oct. 31, 2025
CDN	LIONCEL	CDN-M3-16	0191002	Nov. 01, 2024	Oct. 31, 2025
Injection Clamp	Frankonia	EMCL-20	18101728-0108	Nov. 01, 2024	Oct. 31, 2025
Attenuator	LIONCEL	100W 6dB DC-3GHz	0191003	Nov. 01, 2024	Oct. 31, 2025

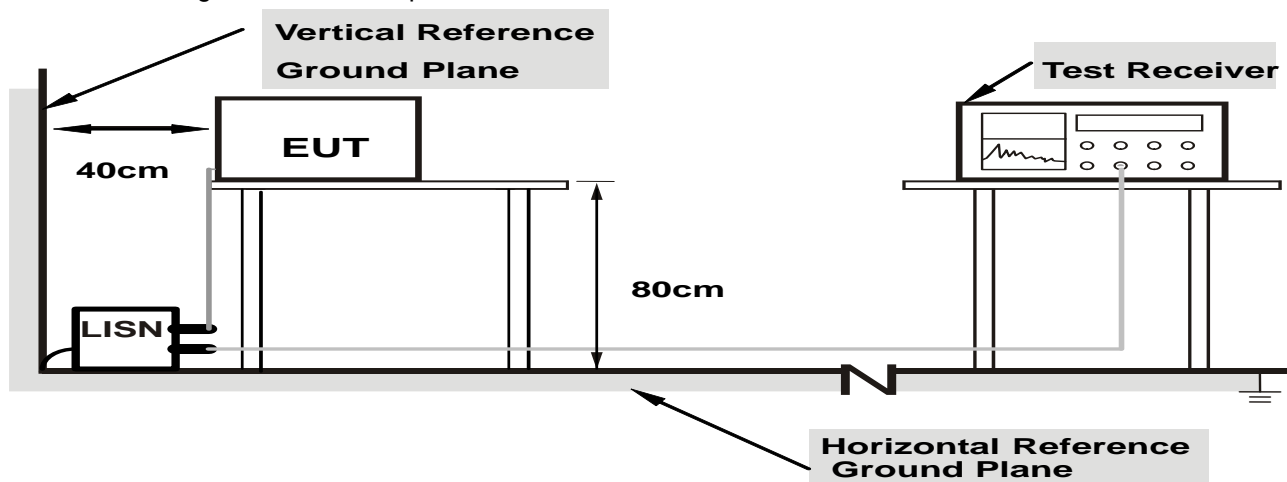
**Other**

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	FALA	EZ EMC	EMC-CON 3A1.1
2	EMC radiation test system	FALA	EZ EMC	FA-03A2
3	Harmonic test system	LAPLACE INSTRUMENTS	Harmonic	1.0.0.0
4	RF Immunity test system	LIONCEL	RF Immunity	1.8.0



## 5. CONDUCTED EMISSION AT THE MAINS TERMINALS TEST

### 5.1 Block Diagram of Test Setup



**Note: 1.**Support units were connected to second LISN.

**2.**Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

### 5.2 Test Standard and Limit

BS EN 55014-1

Frequency range	Mains ports		Auxiliary ports			
	Disturbance voltage		Disturbance voltage		Disturbance current	
1	2	3	4	5	6	7
MHz	Quasi-peak dB $\mu$ V	Average dB $\mu$ V	Quasi-peak dB $\mu$ V	Average dB $\mu$ V	Quasi-peak dB $\mu$ A	Average dB $\mu$ A
0.15 to 0.5	Decreasing linearly with the logarithm of the frequency from: 66 to 56		80	70	Decreasing linearly with the logarithm of the frequency from: 40 to 30	
0.5 to 5	56	46	74	64	30	20
5 to 30	60	50	74	64		

The lower limit applies at the transition frequencies.  
The test report shall state which test method was used and which limits were applied.



Wired network ports				
Frequency range MHz	Coupling device	Detector type	Class B voltage limits dBμV	Class B current limits dBμA
0.15 to 0.5	AAN	Quasi-peak	84 to 74	N/A
0.5 to 30			74	
0.15 to 0.5	AAN	Average	74 to 64	
0.5 to 30			64	
0.15 to 0.5	CVP and current probe	Quasi-peak	84 to 74	40 to 30
0.5 to 30			74	30
0.15 to 0.5	CVP and current probe	Average	74 to 64	30 to 20
0.5 to 30			64	20
0.15 to 0.5	Current Probe	Quasi-peak	N/A	40 to 30
0.5 to 30				30
0.15 to 0.5	Current Probe	Average		30 to 20
0.5 to 30				20

Notes: 1. \*Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

### 5.3 EUT Configuration on Test

The following equipment's are installed on conducted emission test to meet BS EN 55014-1 requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

### 5.4 Operating Condition of EUT

5.4.1 Setup the EUT and simulators as shown in Section 5.1.

5.4.2 Turn on the power of all equipment.

5.4.3 Let the EUT work in test modes and test it.



### 5.5 Test Procedure

The EUT is put on the ground and connected to the AC mains through a Artificial Mains Network (AMN). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission levels according to the **BS EN 55014-1** regulations during conducted emission test.

The bandwidth of the test receiver (R&S Test Receiver ESR) is set at 10KHz.

The frequency ranges from 150kHz to 30MHz is investigated.

### 5.6 Test Result

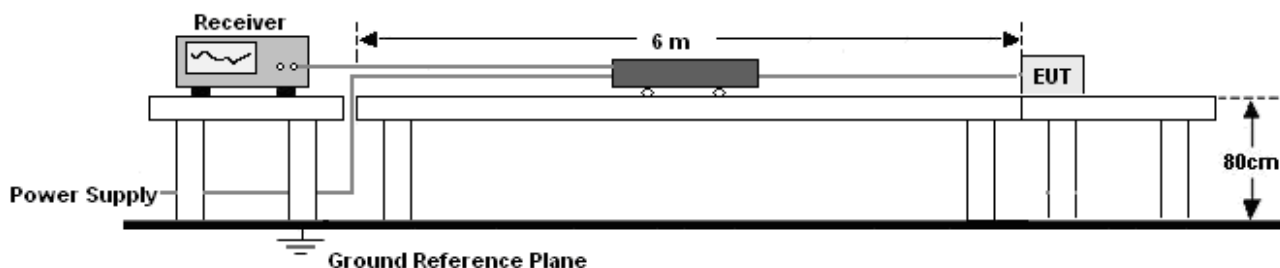
The EUT is powered by DC, no requirements for this item.

DL



## 6. DISTURBANCE POWER EMISSION TEST

### 6.1 Block Diagram of Test Setup



### 6.2 Test Standard and Limit

BS EN 55014-1

Frequency Range	General		Tools					
			$P \leq 700W$		$700W < P \leq 1000W$		$P > 1000W$	
1	2	3	4	5	6	7	8	9
MHz	Quasi-peak dBpW	Average dBpW	Quasi-peak dBpW	Average dBpW	Quasi-peak dBpW	Average dBpW	Quasi-peak dBpW	Average dBpW
30 to 300	Increasing linearly with the frequency from:							
	45 to 55	35 to 45	45 to 55	35 to 45	49 to 59	39 to 49	55 to 65	45 to 55

Notes: The limit Increasing linearly with the frequency from 30 to 300MHz.

### Margin when performing disturbance power Measurement in the frequency range 30 MHz to 300 MHz

Frequency	Margin Quasi-peak dB(pW)
MHz	Household and similar appliances / Tools
200 to 300	0 to 10

Note: The limit Increasing linearly with the frequency from 200 to 300MHz.

### 6.3 EUT Configuration on Test

The following equipment's are installed on conducted emission test to meet BS EN 55014-1 requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

### 6.4 Operating Condition of EUT

6.4.1 Setup the EUT and simulators as shown in Section 6.1.

6.4.2 Turn on the power of all equipment.

6.4.3 Let the EUT work in test modes and test it.



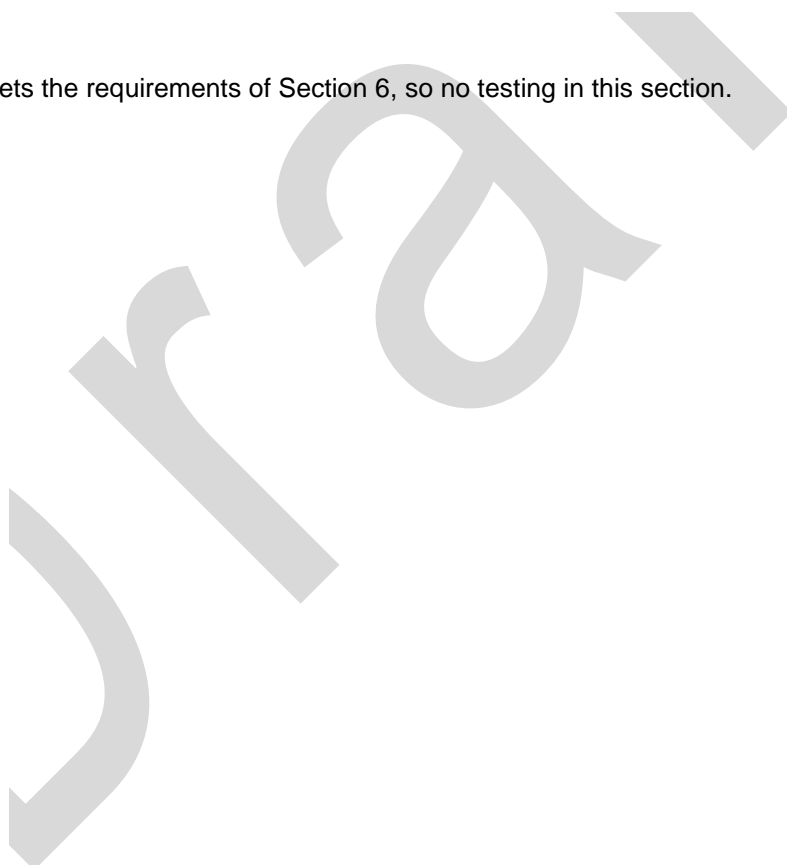
## 6.5 Test Procedure

- a. The absorbing clamp was placed around the lead to be measured, with its current transformer towards the equipment under test.
- b. All connectors having a connected lead shall be terminated in a manner representative of use.
- c. The absorbing clamp was applied successively to all leads whose length is 25cm or longer, unscreened or screened, which may be connected to the individual units of the equipment under test.
- d. The Product was placed on a nonconductive table of 0.8 m of height above the floor and at least 0.8m from other metallic objects and from any person. The lead to be measured shall be stretched in a straight horizontal line for length sufficient to accommodate the absorbing clamp.
- e. Pre-scans were performed with a quasi-peak detector and an average detector.
- f. At each test frequency the absorbing clamp shall be moved along the lead until the maximum value is found between a position adjacent to the equipment under test and a distance of about a half wavelength from it.

The bandwidth of the test receiver (R&S Test Receiver ESR) is set at 10KHz.

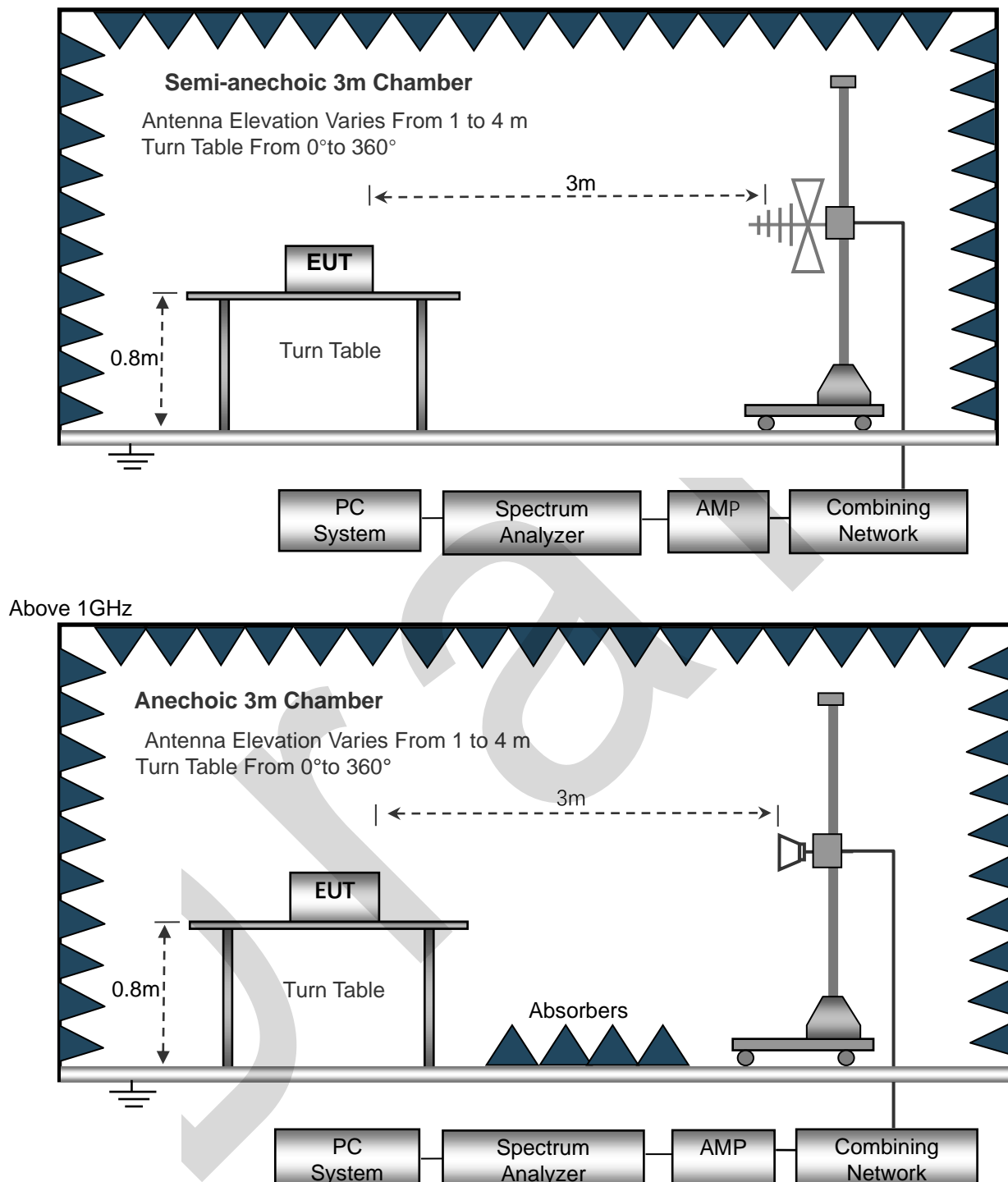
## 6.6 Test Result

The product meets the requirements of Section 6, so no testing in this section.



## 7. RADIATION EMISSION TEST

### 7.1 Block Diagram of Test Setup



### 7.2 Test Standard and Limit

BS EN 55014-1



## Below 1GHz

Frequency MHz	Distance (Meters)	Field Strengths Limits dB( $\mu$ V)/m
30~230	3	40.0
230~1000	3	47.0

## Above 1GHz

Frequency MHz	Distance (Meters)	Field Strengths Limits dB( $\mu$ V)/m	Detector
1000 ~ 3000	3	70.0	PEAK
1000 ~ 3000	3	50.0	AVERAGE
3000 ~ 6000	3	74.0	PEAK
3000 ~ 6000	3	54.0	AVERAGE

## Remark:

- (1) The smaller limit shall apply at the cross point between two frequency bands.
- (2) Distance refers to the distance in meters between the measuring instrument, antenna and the closed point of any part of the device or system.

## 7.3 EUT Configuration on Test

The BS EN 55014-1 regulations test method must be used to find the maximum emission during radiated emission test.

The configuration of EUT is the same as used in conducted emission test.

Please refer to Section 2.2.

## 7.4 Operating Condition of EUT

Same as conducted emission test, which is listed in Section 2.2 except the test set up replaced as Section 4.1.

## 7.5 Test Procedure

- 1) The radiated emissions test was conducted in a semi-anechoic chamber.
- 2) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
- 3) Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT.
- 4) The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.
- 5) The bandwidth setting on the field strength meter (R&S Test Receiver ESCI) is set at 120KHz.
- 6) The frequency range from 30MHz to 1000MHz is checked.

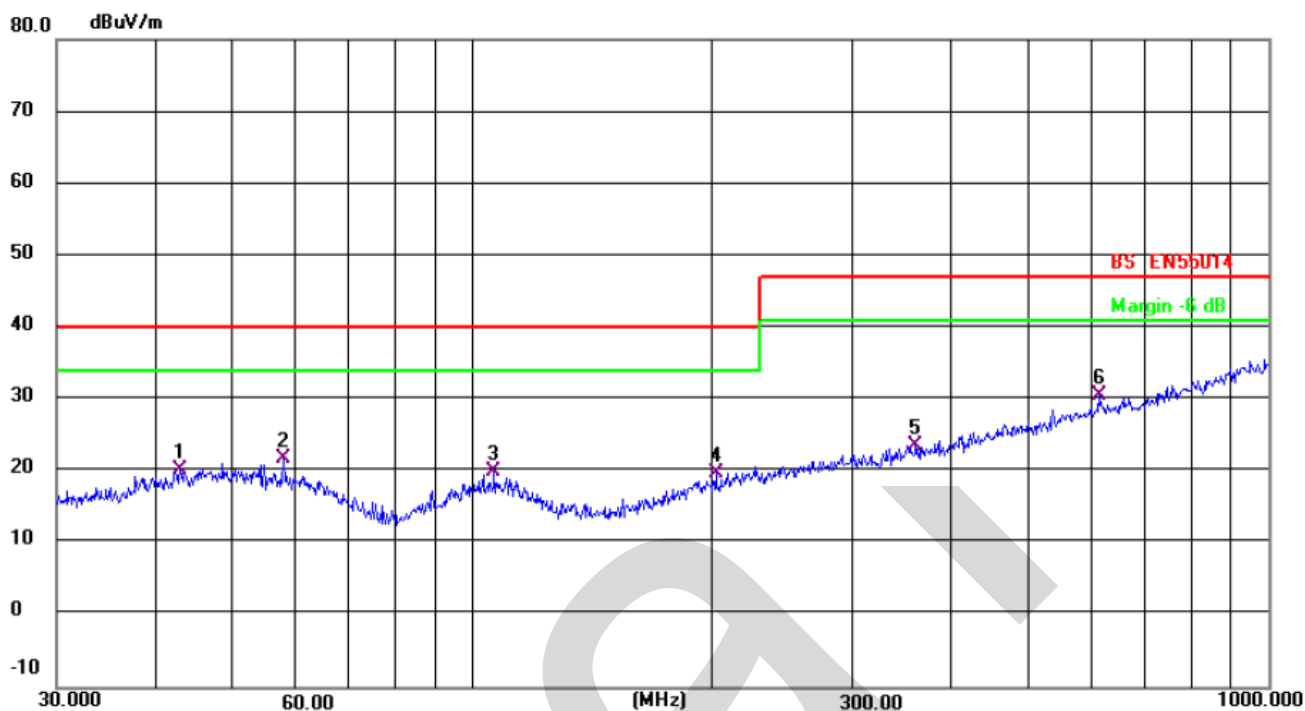
## 7.6 Test Result

PASS

Please refer to the following page.



Radiation Emission Test Data			
Temperature:	24.5°C	Relative Humidity:	54%
Pressure:	1009hPa	Polarization:	Horizontal
Test Voltage:	DC 3.7V	Test Mode:	Mode 1



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Margin dB	Detector
1		42.8998	27.76	-7.47	20.29	40.00	-19.71	QP
2		57.7962	29.41	-7.55	21.86	40.00	-18.14	QP
3		106.3850	28.91	-8.78	20.13	40.00	-19.87	QP
4		202.1005	28.92	-9.08	19.84	40.00	-20.16	QP
5		360.4476	28.37	-4.70	23.67	47.00	-23.33	QP
6	*	612.0642	29.41	1.10	30.51	47.00	-16.49	QP

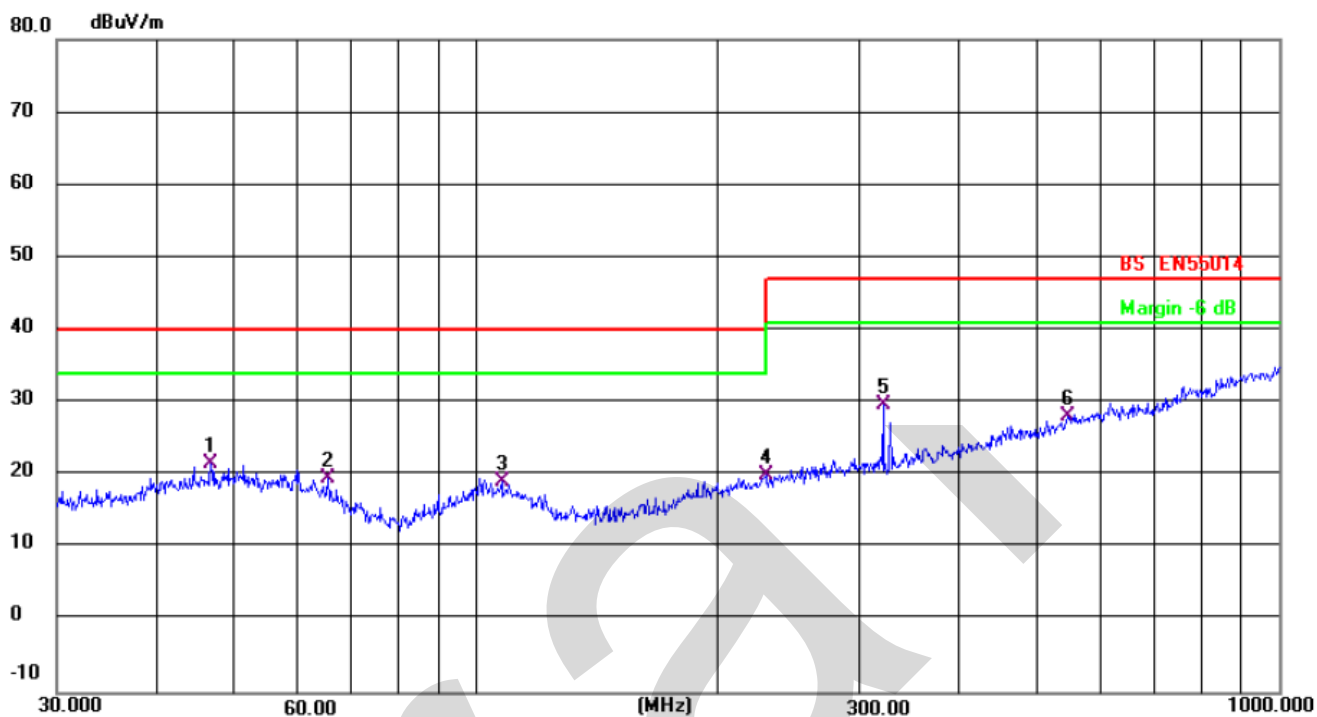
## Remark:

Correct Factor=Cable loss+Antenna factor-Preamplifier

Measurement Level = Reading Level + Correct Factor; Margin = Measurement Level- Limit;



Radiation Emission Test Data			
Temperature:	24.5°C	Relative Humidity:	54%
Pressure:	1009hPa	Polarization:	Vertical
Test Voltage:	DC 3.7V	Test Mode:	Mode 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		46.6664	28.05	-6.53	21.52	40.00	-18.48	QP
2		65.3432	28.68	-9.10	19.58	40.00	-20.42	QP
3		107.5101	28.06	-8.83	19.23	40.00	-20.77	QP
4		229.2931	28.07	-8.08	19.99	40.00	-20.01	QP
5	*	321.0608	35.58	-5.85	29.73	47.00	-17.27	QP
6		545.1826	28.43	-0.35	28.08	47.00	-18.92	QP

Remark:

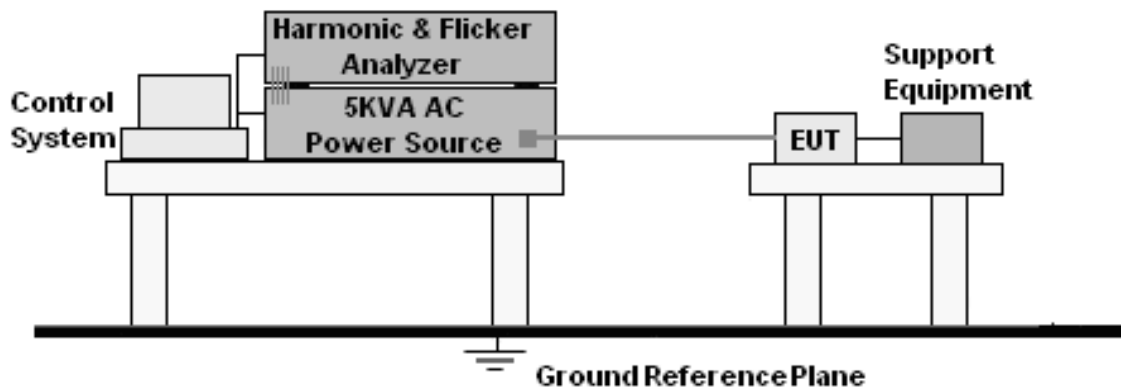
Correct Factor=Cable loss+Antenna factor-Preamplifier

Measurement Level = Reading Level + Correct Factor; Margin = Measurement Level- Limit;



## 8. HARMONIC CURRENT EMISSION TEST

### 8.1 Block Diagram of Test Setup



### 8.2 Test Standard

BS EN IEC 61000-3-2

IEC 555-2					
Table - I			Table - II		
Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Amperes)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Amperes)
Non Portable Tools or TV Receivers	Odd Harmonics		TV Receivers	Odd Harmonics	
	3	2.30		3	0.80
	5	1.14		5	0.60
	7	0.77		7	0.45
	9	0.40		9	0.30
	11	0.33		11	0.17
	13	0.21		13	0.12
	15≤n≤39	0.15 · 15/n		15≤n≤39	0.10 · 15/n
	Even Harmonics			Even Harmonics	
	2	1.08		2	0.30
	4	0.43		4	0.15
	8	0.30			
8≤n≤40	0.23 · 8/n		DC	0.05	

EN 61000-3-2/IEC 61000-3-2					
Equipment Category	Max. Permissible Harmonic Current (in Amperes)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in A) (mA/w)	
Class A	Same as Limits Specified in 4-2.1, Table - I, but only odd harmonics required	Class D	3	2.30	3.4
			5	1.14	1.9
			7	0.77	1.0
			9	0.40	0.5
			11	0.33	0.35
			$13 \leq n \leq 39$	see Table I	$3.85/n$
			only odd harmonics required		



### 8.3 Operating Condition of EUT

Setup the EUT as shown in Section 8.1.  
Turn on the power of all equipment.  
Let the EUT work in test mode and test it.

### 8.4 Test Procedure

The power cord of the EUT is connected to the output of the test system. Turn on the power of the EUT and use the test system to test the harmonic current level.

### 8.5 Test Results

The EUT is powered by DC, no requirements for this item.

DL



## 9. VOLTAGE FLUCTUATIONS & FLICKER TEST

### 9.1 Block Diagram of Test Setup

Same as Section 8.1.

### 9.2 Test Standard

BS EN 61000-3-3

### 9.3 Operating Condition of EUT

Same as Section 8.3. The power cord of the EUT is connected to the output of the test system. Turn on the power of the EUT and use the test system to test the harmonic current level.

#### Flicker Test Limit

Test items	Limits
Pst	1.0
dc	3.3%
Tmax	4.0%
dt	Not exceed 3.3% for 500ms

### 9.4 Test Procedure

The power cord of the EUT is connected to the output of the test system. Turn on the power of the EUT and use the test system to test the harmonic current level.

### 9.5 Test Results

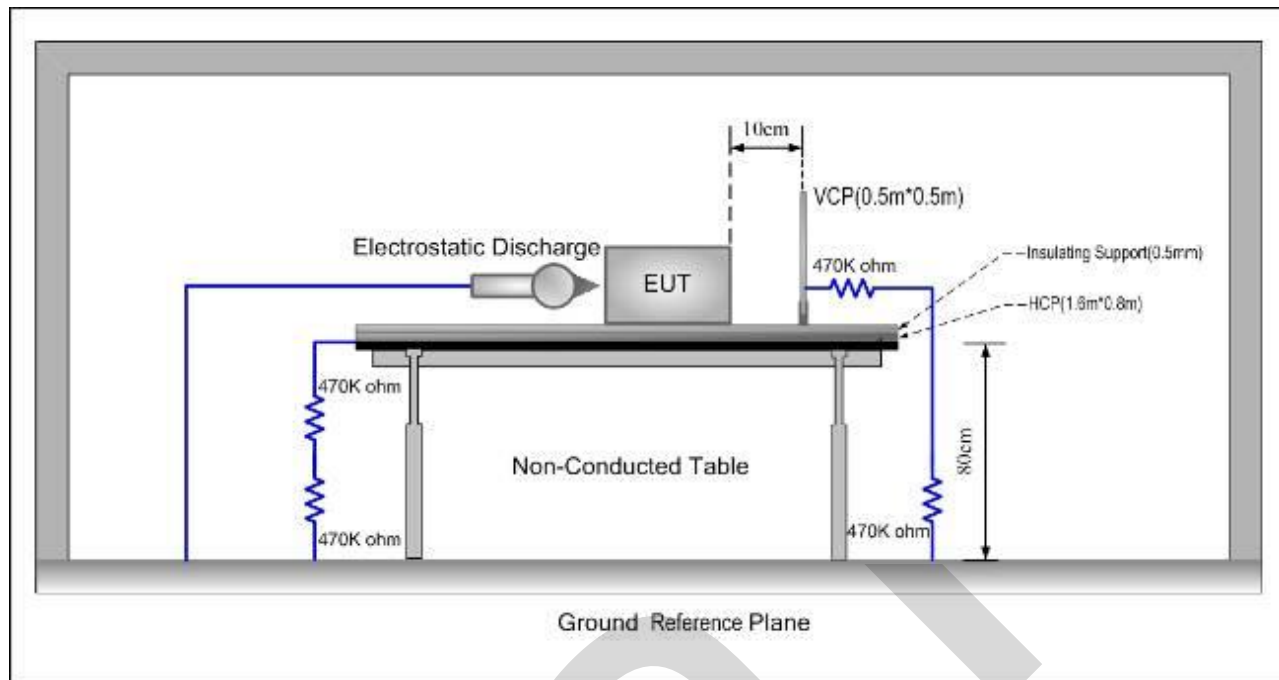
The EUT is powered by DC, no requirements for this item.

**10. IMMUNITY TEST OF GENERAL THE PERFORMANCE CRITERIA**

Product Standard	BS EN 55014-2
<b>CRITERION A</b>	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
<b>CRITERION B</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.
<b>CRITERION C</b>	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.

## 11. ELECTROSTATIC DISCHARGE IMMUNITY TEST

### 11.1 Block Diagram of Test Setup



### 11.2 Test Standard

BS EN 55014-2, BS EN 61000-4-2

### 11.3 Severity Levels and Performance Criterion

Severity Level: 3 / Air Discharge:  $\pm 8\text{KV}$

Level: 2 / Contact Discharge:  $\pm 4\text{KV}$

Performance criterion: B

### 11.4 Test Procedure

- Electrostatic discharges were applied only to those points and surfaces of the Product that are accessible to users during normal operation.
- The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
- The time interval between two successive single discharges was at least 1 second.
- The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the Product.
- Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- Air discharges were applied with the round discharge tip of the discharge electrode approaching the Product as fast as possible (without causing mechanical damage) to touch the Product. After each discharge, the ESD generator was removed from the Product and re-triggered for a new single discharge. The test was repeated until all discharges were complete.
- At least ten single discharges (in the most sensitive polarity) were applied to the Horizontal Coupling Plane at points on each side of the Product. The ESD generator was positioned vertically at a distance of 0.1 meters from the Product with the discharge electrode touching the HCP.
- At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical



edge of the Vertical Coupling Plane in sufficiently different positions that the four faces of the Product were completely illuminated. The VCP (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the Product.

#### 11.5 Test Results

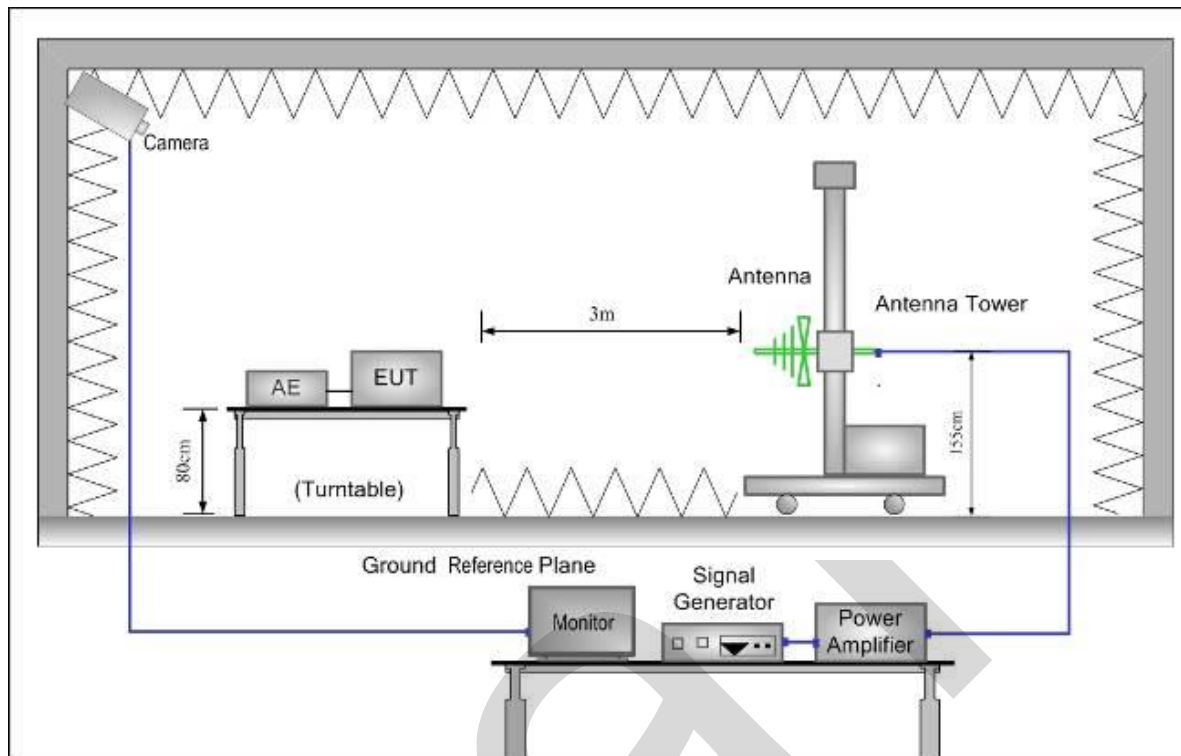
PASS

Please refer to the following page.

Electrostatic Discharge Test Data					
Temperature:		25.1 °C		Humidity:	
Power Supply :		DC 3.7V		Test Mode:	
Discharge Method	Discharge Position	Voltage (±kV)	Min. No. of Discharge per polarity (Each Point)	Required Level	Result
	Conductive Surfaces	4	10	B	Pass
	Indirect Discharge HCP	4	10	B	Pass
	Indirect Discharge VCP	4	10	B	Pass
Air Discharge	Slots, Apertures, and Insulating Surfaces	8	10	B	Pass
Note: N/A					

## 12 RF FIELD STRENGTH SUSCEPTIBILITY TEST

### 12.1 Block Diagram of Test Setup



### 12.2 Test Standard

BS EN 55014-2, BS EN IEC 61000-4-3

### 12.3 Severity Levels and Performance Criterion

Severity Level 2, 3V / m

Performance criterion: A

### 12.4 Test Procedure

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



All the scanning conditions are as follows:

Condition of Test	Remarks
Fielded Strength	3 V/m (Severity Level 2)
Radiated Signal	Modulated
Scanning Frequency	80 – 1000 MHz
Dwell time of radiated	0.0015 decade/s
Waiting Time	1 Sec.

#### 12.5 Test Results

PASS

Please refer to the following page.

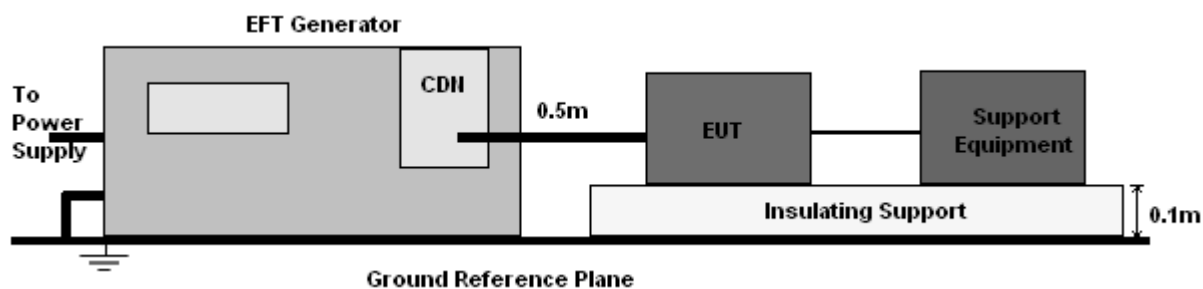
R/S Test Data				
Temperature:	25.1℃	Humidity:	55%	
Power Supply:	DC 3.7V	Test Mode:	Mode1	
Criterion:	A	Steps	1 %	
Frequency (MHz)	Position	Field Strength (V/m)	Required Level	Result
80 – 1000	Front, Right, Back, Left	3	A	Pass
Note: N/A				



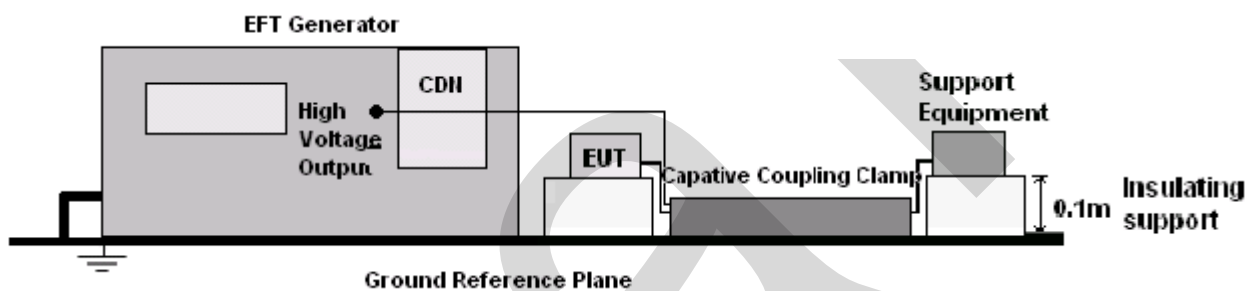
### 13 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

#### 13.1 Block Diagram of EUT Test Setup

For input a.c. / d.c. power port:



For signal lines and control lines:



#### 13.2 Test Standard

BS EN 55014-2, BS EN 61000-4-4

#### 13.3 Severity Levels and Performance Criterion

Severity Level 2 at 1KV, Pulse Rise time & Duration: 5 nS / 50 nS

Performance criterion: B

#### 13.4 Test Procedure

EUT shall be placed 0.8m high above the ground reference plane which is a min.1m\*1m metallic sheet with 0.65mm minimum thickness. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m

For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 minutes.

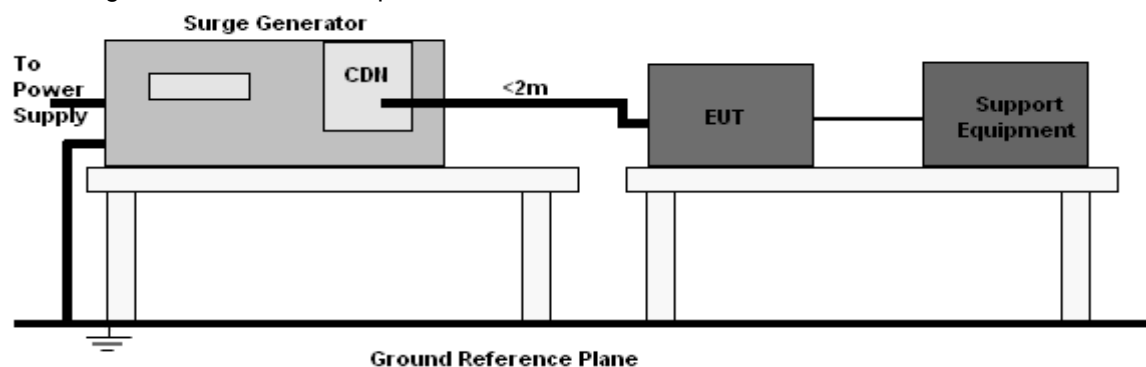
#### 13.5 Test Results

The EUT is powered by DC, no requirements for this item.



## 14 SURGE TEST

### 14.1 Block Diagram of EUT Test Setup



### 14.2 Test Standard

BS EN 55014-2, BS EN 61000-4-5

### 14.3 Severity Levels and Performance Criterion

Severity Level: Line to Line, Level 2 at 1KV;

Severity Level: Line to Earth, Level 3 at 2KV.

Performance criterion: B

### 14.4 Test Procedure

- 1) Set up the EUT and test generator as shown on section 11.1
- 2) For line-to-line coupling mode, provide a 1KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
- 3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 4) Different phase angles are done individually.
- 5) Repeat procedure 2) to 4) except the open-circuit test voltage change from 1KV to 2KV for line to earth coupling mode test.
- 6) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

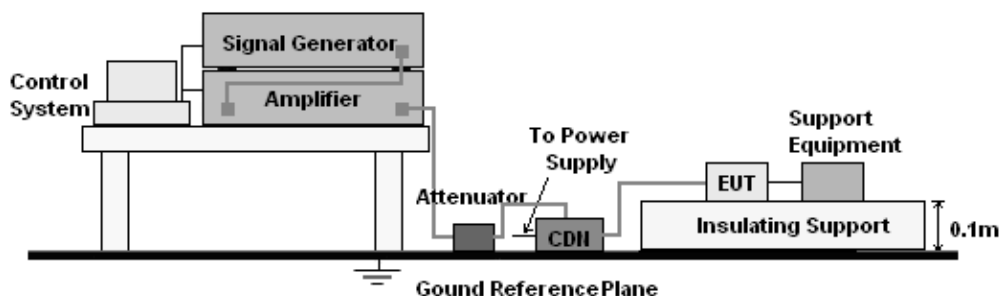
### 14.5 Test Result

The EUT is powered by DC, no requirements for this item.

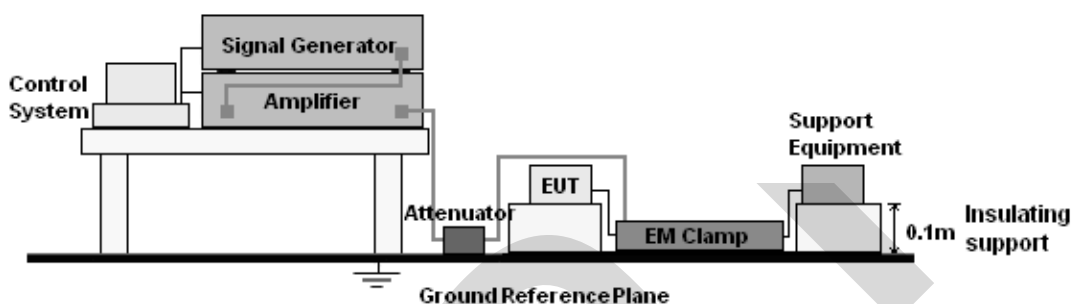
## 15 INJECTED CURRENTS SUSCEPTIBILITY TEST

### 15.1 Block Diagram of EUT Test Setup

For input a.c. / d.c. power port:



For signal lines and control lines:



### 15.2 Test Standard

BS EN 55014-2, BS EN IEC 61000-4-6

### 15.3 Severity Levels and Performance Criterion

Severity Level 2: 3V( rms ), 150KHz ~ 80MHz

Performance criterion: A

### 15.4 Test Procedure

- 1) Set up the EUT, CDN and test generator as shown on section 12.1
- 2) Let EUT work in test mode and measure.
- 3) The EUT and supporting equipments are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane at above 0.1-0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 150KHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave
- 7) The rate of sweep shall not exceed  $1.5 \times 10^{-3}$  decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 8) Recording the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

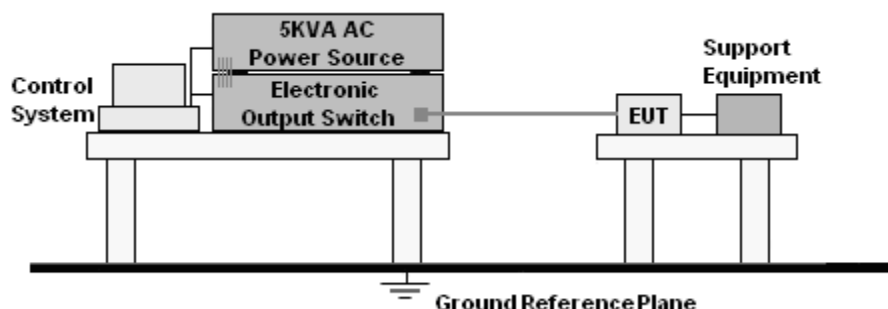
### 15.5 Test Result

The EUT is powered by DC, no requirements for this item.



## 16 VOLTAGE DIPS AND INTERRUPTIONS TEST

### 16.1 Block Diagram of EUT Test Setup



### 16.2 Test Standard

BS EN 55014-2, BS EN IEC 61000-4-11

### 16.3 Severity Levels and Performance Criterion

Input and Output AC Power Ports.

- ☒ Voltage Dips.
- ☒ Voltage Interruptions.

Environmental Phenomena	Test Specification	Units	Performance Criterion
Voltage Dips	100 0.5	% Reduction period	C
	60 10	% Reduction period	C
	30 25	% Reduction period	C

### 16.4 Test Procedure

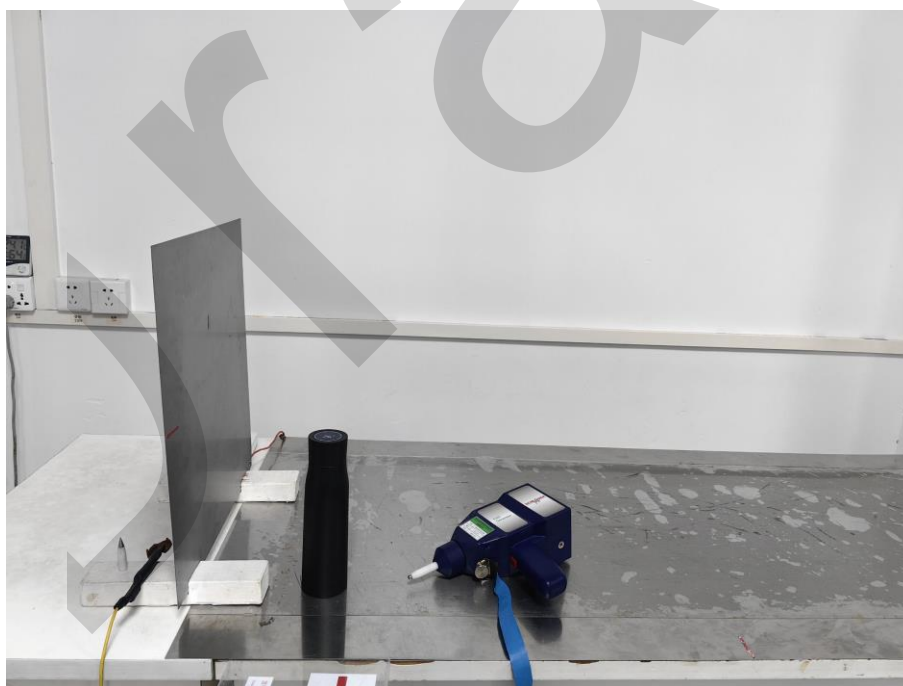
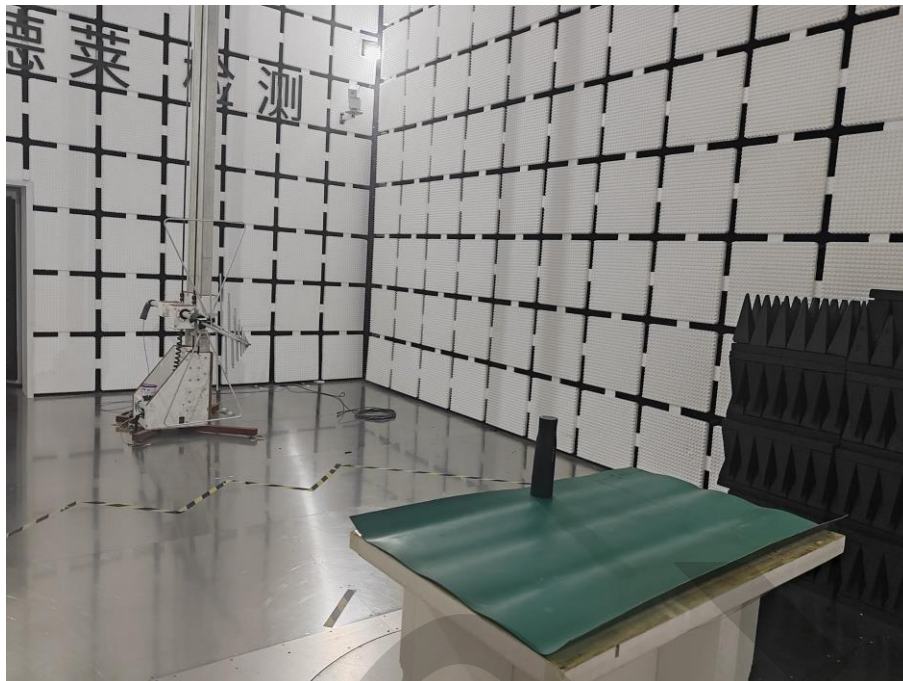
- 1) Set up the EUT and test generator as shown on section 14.1
- 2) The interruption is introduced at selected phase angles with specified duration. There is a 3mins minimum interval between each test event.
- 3) After each test a full functional check is performed before the next test.
- 4) Repeat procedures 2 & 3 for voltage dips, only the level and duration is changed.
- 5) Record any degradation of performance.

### 16.5 Test Result

The EUT is powered by DC, no requirements for this item.



## 17 SETUP PHOTOGRAPHS

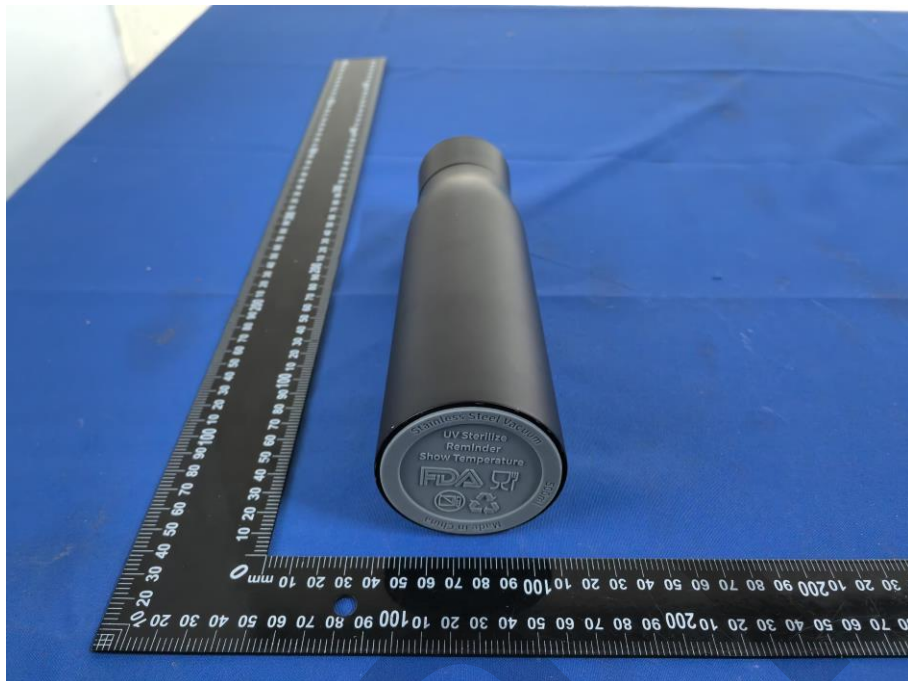


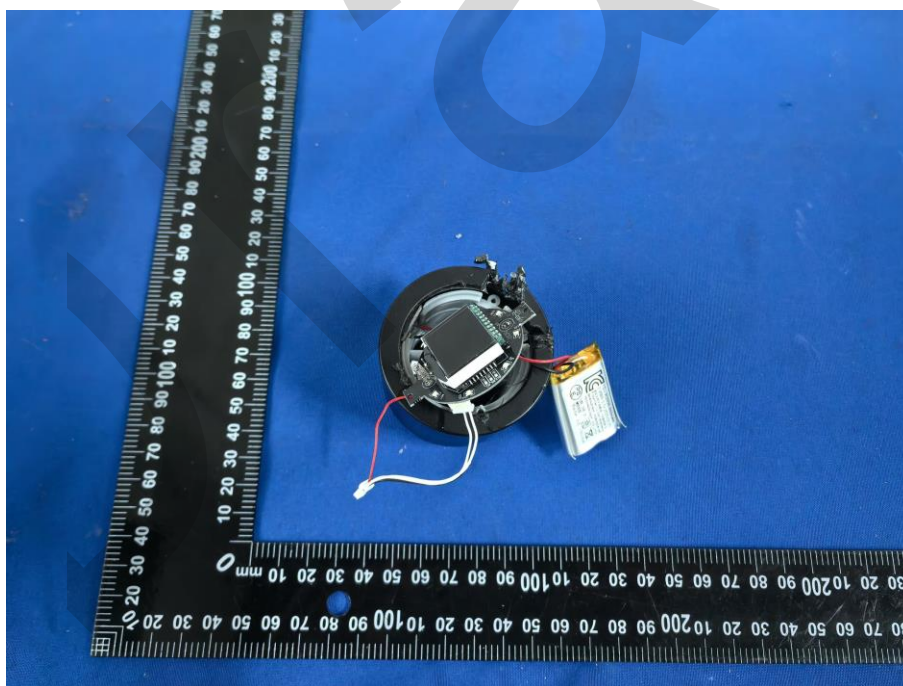
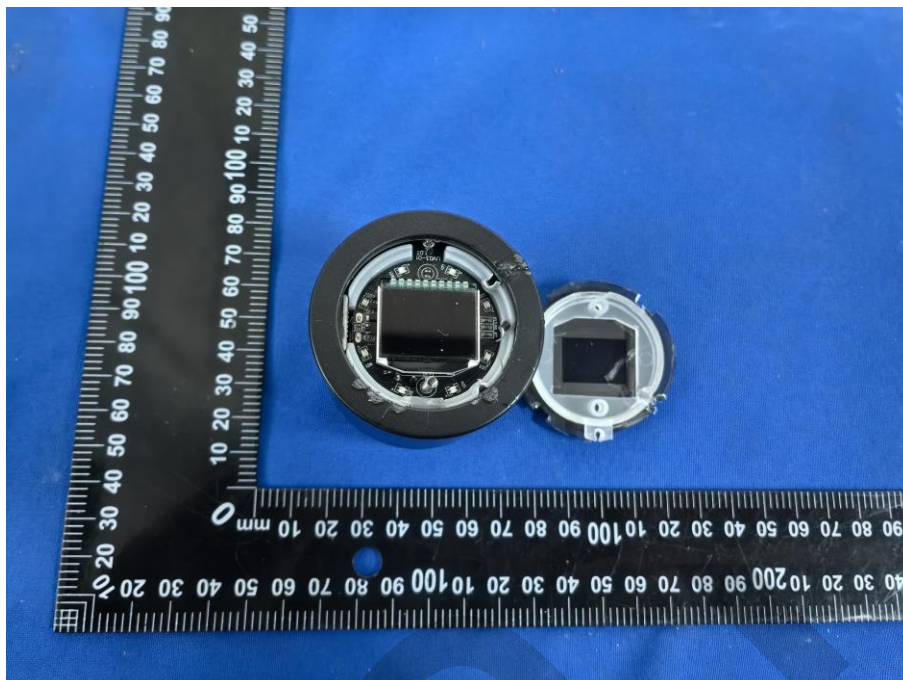


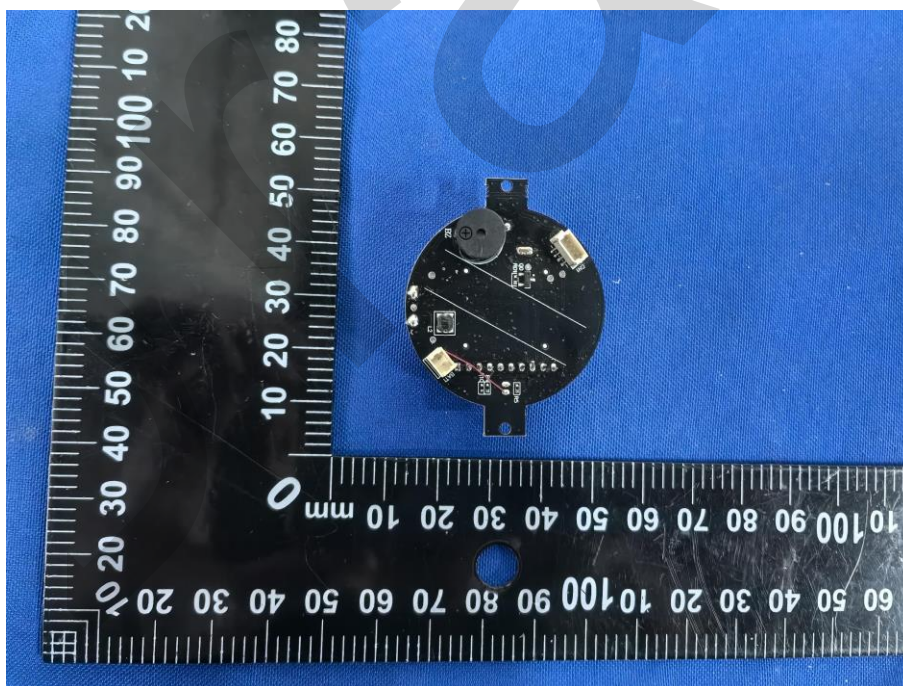
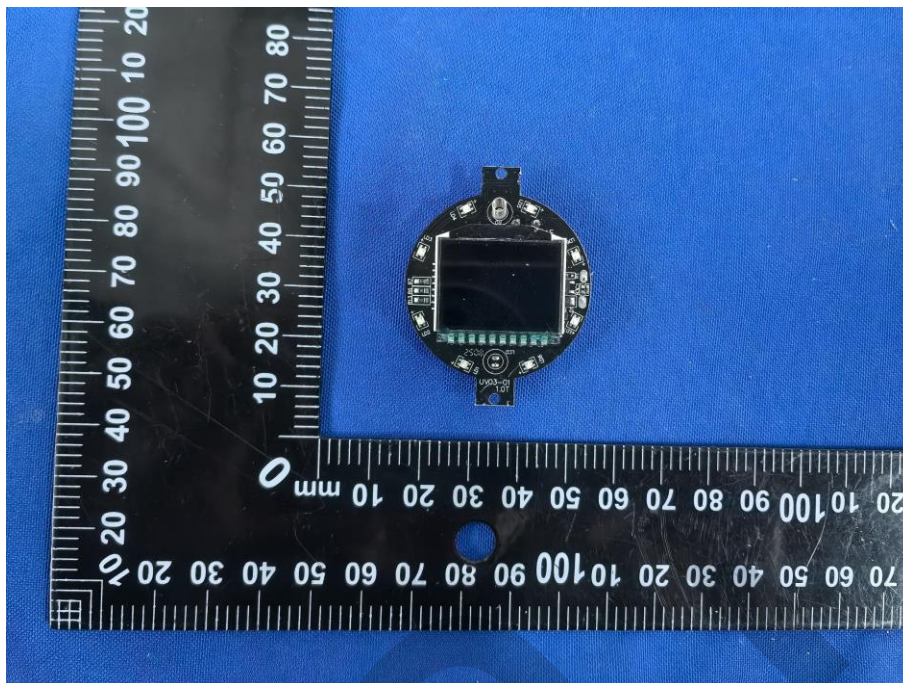
## 18 EUT PHOTOGRAPHS

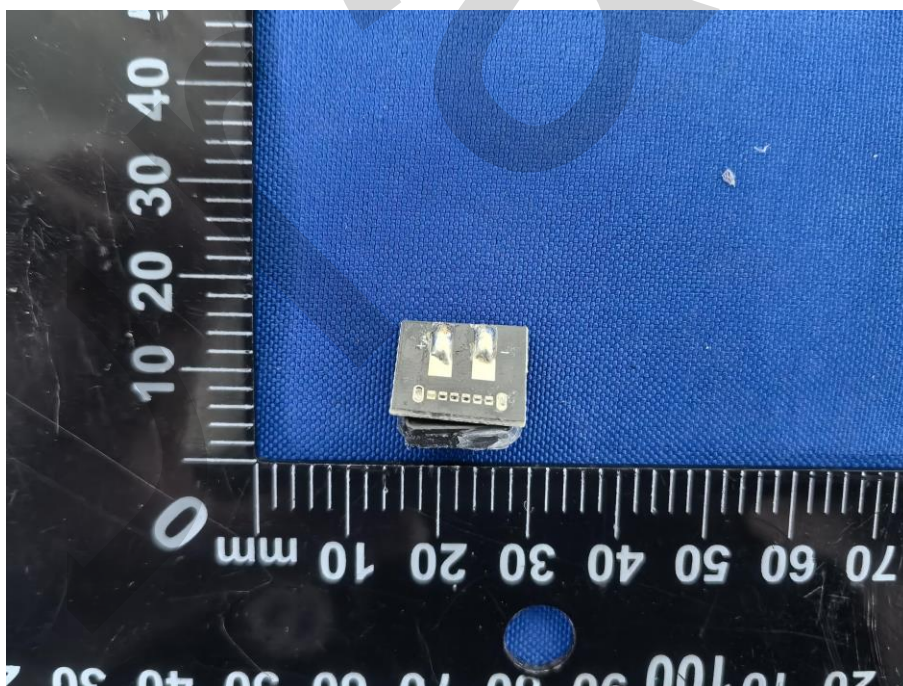
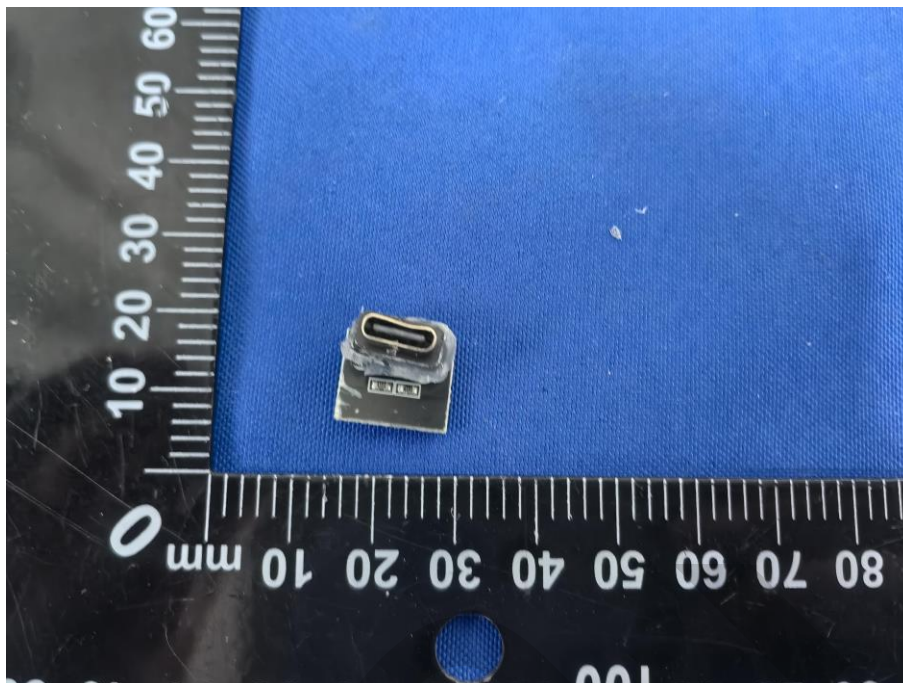


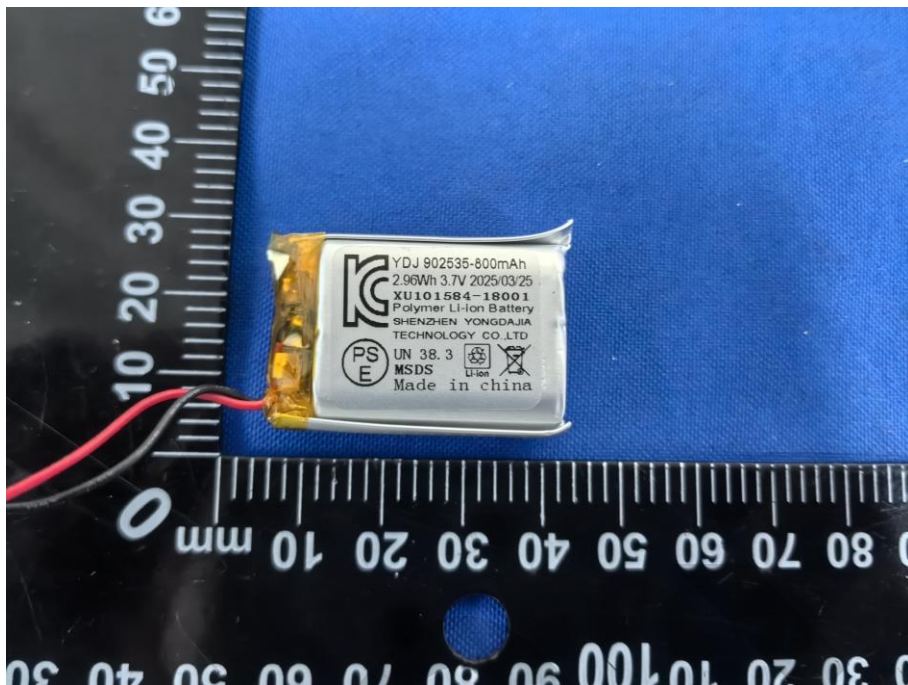












\*\*\*\*\* END OF REPORT \*\*\*\*\*