



Tel:+86-0760-8755 3128 URL: www.aoce-lab.com

Test Report

EN IEC 55015:2019+A11:2020

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

Report Reference No.: AOCE2511031866-E

Compiled by

(position+printed name+signature): File administrators Ca Lu

Supervised by

(position+printed name+signature): Technique principal Ca Lu

Approved by

(position+printed name+signature): Manager Sanji Guan

Date of issue: 2025-11-06

Laboratory Name: Zhongshan AOCE Testing Technology Co., Ltd.

Address: Disika, 1/F., No.42, Chang'an South Road, Henglan, Zhongshan, Guangdong, China

Testing location/ procedure: Full application of Harmonised standards ☒
Partial application of Harmonised standards ☐
Other standard testing methods ☐

Applicant's name: Zhongshan Yisong Lighting Technology Co., Ltd

Address: 2nd Floor, 3rd Floor, No.1 Shayuan Shuncheng Industrial Park, Haizhou Village, Guzhen Town, Zhongshan City Village, Guzhen Town, Zhongshan City, Guangdong Province

Test specification:

Standards: EN IEC 55015:2019+A11:2020
EN 61547: 2009

Test Report Form No: TRF.EN 55015B

TRF Originator: AOCE

Master TRF: Dated 2023-03

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Product Name: Mushroom lamp

Model/Type reference: YSTD-001

Ratings: 5.0VDC; 5W

Result: Pass

EMC -- TEST REPORT

Test Report No. : AOCE2511031866-E	2025-04-26 Date of issue
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Equipment under Test : Mushroom lamp

Trade Mark : N/A

Model / Type : YSTD-001

Listed Models : YSTD-002, YSTD-003, YSTD-004, YSTD-005, YSTD-006, YSTD-007, YSTD-008, YSTD-009, YSTD-010, YSTD-011, YSTD-012, YSTD-013, YSTD-014, YSTD-015, YSTD-016, YSTD-017, YSTD-018, YSTD-019, YSTD-020, YSTD-021, YSTD-022, YSTD-023, YSTD-024, YSTD-025, YSTD-026, YSTD-027, YSTD-028, YSTD-029, YSTD-030, YSTD-031, YSTD-032, YSTD-033, YSTD-034, YSTD-035, YSTD-036, YSTD-037, YSTD-038, YSTD-039, YSTD-040, YSTD-041, YSTD-042, YSTD-043, YSTD-044, YSTD-045, YSTD-046, YSTD-047, YSTD-048, YSTD-049, YSTD-050, YSTD-051, YSTD-052, YSTD-053, YSTD-054, YSTD-055, YSTD-056, YSTD-057, YSTD-058, YSTD-059, YSTD-060, YSTD-061, YSTD-062, YSTD-063, YSTD-064, YSTD-065, YSTD-066, YSTD-067, YSTD-068, YSTD-069, YSTD-070, YSTD-071, YSTD-072, YSTD-073, YSTD-074, YSTD-075, YSTD-076, YSTD-077, YSTD-078, YSTD-079, YSTD-080, YSTD-081, YSTD-082, YSTD-083, YSTD-084, YSTD-085, YSTD-086, YSTD-087, YSTD-088, YSTD-089, YSTD-090, YSTD-091, YSTD-092, YSTD-093, YSTD-094, YSTD-095, YSTD-096, YSTD-097, YSTD-098, YSTD-099, YSTD-100, YSTD-101, YSTD-102, YSTD-103, YSTD-104, YSTD-105, YSTD-106, YSTD-107, YSTD-108, YSTD-109, YSTD-110, YSTD-111, YSTD-112, YSTD-113, YSTD-114, YSTD-115, YSTD-116, YSTD-117, YSTD-118, YSTD-119, YSTD-120, YSTD-121, YSTD-122, YSTD-123, YSTD-124, YSTD-125, YSTD-126, YSTD-127, YSTD-128, YSTD-129, YSTD-130, YSTD-131, YSTD-132, YSTD-133, YSTD-134, YSTD-135, YSTD-136, YSTD-137, YSTD-138, YSTD-139, YSTD-140, YSTD-141, YSTD-142, YSTD-143, YSTD-144, YSTD-145, YSTD-146, YSTD-147, YSTD-148, YSTD-149, YSTD-150, YSTD-151, YSTD-152, YSTD-153, YSTD-154, YSTD-155, YSTD-156, YSTD-157, YSTD-158, YSTD-159, YSTD-160, YSTD-161, YSTD-162, YSTD-163, YSTD-164, YSTD-165, YSTD-166, YSTD-167, YSTD-168, YSTD-169, YSTD-170, YSTD-171, YSTD-172, YSTD-173, YSTD-174, YSTD-175, YSTD-176, YSTD-177, YSTD-178, YSTD-179, YSTD-180, YSTD-181, YSTD-182, YSTD-183, YSTD-184, YSTD-185, YSTD-186, YSTD-187, YSTD-188, YSTD-189, YSTD-190, YSTD-191, YSTD-192, YSTD-193, YSTD-194, YSTD-195, YSTD-196, YSTD-197, YSTD-198, YSTD-199, YSTD-200, YSTD-201, YSTD-202

Applicant : Zhongshan Yisong Lighting Technology Co., Ltd

Address : 2nd Floor, 3rd Floor, No.1 Shayuan Shuncheng Industrial Park, Haizhou Village, Guzhen Town, Zhongshan City Village, Guzhen Town, Zhongshan City, Guangdong Province

Manufacturer : Zhongshan Yisong Lighting Technology Co., Ltd

Address : 2nd Floor, 3rd Floor, No.1 Shayuan Shuncheng Industrial Park, Haizhou Village, Guzhen Town, Zhongshan City Village, Guzhen Town, Zhongshan City, Guangdong Province

Test Result according to the standards on page 5:	Pass
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

History of this test report

Report No.	Version	Description	Issued Date
AOCE2511031866-E	V1.0	Initial Issued Report	2025-11-06

Software version

Test item	Version
Conducted Disturbance	ES-K1 V1.71
Radiated Emission	ES-K1 V1.71
Magnetic Field Emission	ES-K1 V1.71

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1. TEST STANDARDS

The tests were performed according to following standards:

[EN IEC 55015:2019+A11:2020](#) 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

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample : 2025-11-01

Testing commenced on : 2025-11-01

Testing concluded on : 2025-11-06

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage : ☐ 230V / 50 Hz ☐ 120V / 60Hz
☐ 12 V DC ☐ 24 V DC
☒ Other (specified in blank below)

5.0V DC

2.3. Short description of the Equipment under Test (EUT)

The EUT is a Mushroom lamp .

Serial number: Prototype

2.4. EUT operation mode

The equipment under test was operated during the measurement under the following conditions:

Test program (customer specific)

Emission tests.....: According to EN 55015, searching for the highest disturbance.
Immunity tests.....: According to EN 61547, searching for the highest susceptibility.

2.5. EUT configuration:

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- o - supplied by the lab

2.6. Performance level

A functional description of performance criteria, during or as a consequence of the immunity testing, shall be provided by the manufacturer and noted in the test report.

The performance of lighting equipment shall be assessed by monitoring:

- the luminous intensity of the luminaire or of the lamp(s);
- the functioning of the control in the case of equipment which includes a regulating control or concerns the regulating control itself;
- the functioning of the starting device, if any.

Definition related to the performance level:

- based on the used product standard
- o based on the declaration of the manufacturer, requestor or purchaser

Criterion A:

During the test no change of the luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended.

Criterion B:

During the test the luminous intensity may change to any value. After the test the luminous intensity shall be restored to its initial value within 1 min.

Regulating controls need not function during the test, but after the test the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given.

Criterion C:

During and after the test any change of the luminous intensity is allowed and the lamp(s) may be extinguished . After the test , within 30 min, all functions shall return to normal if necessary by temporary interruption of the mains supply and/or operating the regulating control.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Zhongshan AOCE Testing Technology Co., Ltd.

Disika, 1/F., No.42, Chang'an South Road, Henglan, Zhongshan, Guangdong, China

There is one Shield Room and Two EMC Labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 15/EN 55015 requirements.

3.2. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	<u>15-35 ° C</u>
Humidity:	<u>30-60 %</u>
Atmospheric pressure:	<u>950-1050mbar</u>

3.3. Test Description

Emission Measurement		
Magnetic Field Emission	EN IEC 55015:2019+A11:2020	PASS
Conducted Disturbance	EN IEC 55015:2019+A11:2020	PASS
Radiation Emission	EN IEC 55015:2019+A11:2020	PASS
Harmonic Current	EN IEC 61000-3-2:2019+A1:2021	N/A
Voltage Fluctuation and Flicker	EN 61000-3-3: 2013+A1:2019+A2:2021	N/A
Immunity Measurement		
Electrostatic Discharge	EN 61547: 2009 IEC 61000-4-2: 2008	PASS
Electrical Fast Transient/Burst Test	EN 61547: 2009 IEC 61000-4-4: 2012	PASS
Surge Test	EN 61547: 2009 IEC 61000-4-5: 2017	PASS
Conducted Susceptibility Test	EN 61547: 2009 IEC 61000-4-6: 2013	PASS
Voltage Dips and Interruptions Test	EN 61547: 2009 IEC 61000-4-11: 2017	PASS

Remark:

1. The test result PASS and /or FAIL has no relationship with the measurement uncertainty.
2. “#” indicates the testing item(s) was(were) fulfilled by subcontracted lab .

3.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Zhongshan AOCE Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for AOCE laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Conducted Emission	9kHz ~ 30MHz	$\pm 2.84\text{dB}$	(1)
Magnetic Field Emission	9kHz ~ 30MHz	$\pm 2.46\text{dB}$	(1)
Radiation Emission CDNE	30MHz ~ 300MHz	$\pm 3.48\text{dB}$	(1)

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

3.5. Equipments Used during the Test

Conducted Susceptibility (CS) :						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	Conducted Disturbances test system	SCHLODER	CDG 6000	126A1348/2015	2025/07/01	2026/06/30
2	Attenuator	SCHLODER	CDG 60100	201411010011	2025/07/01	2026/06/30
3	CDN	SCHLODER	CDN M2+M3	A2210337/2015	2025/07/01	2026/06/30

Harmonic Current/ Voltage Fluctuation and Flicker						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	Purified Power Source	California Instruments	5000IX-CTS-400	N/A	2025/07/01	2026/06/30
2	Harmonic And Flicker Analyzer	California Instruments	CTS PACS-1	N/A	2025/07/01	2026/06/30

Radiated Emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	EMI Test Receiver	ROHDE & SCHWARZ	ESPI	1142.8007.03	2025/07/01	2026/06/30
2	CDNE	SCHWARZBECK	CDNE-M3	00222	2025/07/01	2026/06/30

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	EMI Test Receiver	ROHDE & SCHWARZ	ESPI	1142.8007.03	2025/07/01	2026/06/30
2	LISN	SCHWARZBECK	NSLK 8127	#825	2025/07/01	2026/06/30
3	10dB Limiter	Agilent	11947A	3107A03776	2025/07/01	2026/06/30

Electrical Fast Transient						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	Electrical Fast Transient test system	HTEC	HEFT 51	154901	2025/07/01	2026/06/30

Surge						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	Surge test system	HTEC	HCWG 51	155201	2025/07/01	2026/06/30

Voltage Dips						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	Voltage Dips test system	HTEC	HPFS 161P	155202	2025/07/01	2026/06/30

Electrostatic Discharge						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	ESD Simulator	HAEFELY	ONYX	176084	2025/07/01	2026/06/30

Magnetic Field Emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	EMI Test Receiver	ROHDE & SCHWARZ	ESPI	1142.8007.03	2025/07/01	2026/06/30
2	Triple-Loop Antenna	ZHINAN	ZN30401	13011	2025/07/01	2026/06/30

Power Frequency Magnetic Field Susceptibility						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	MAGNETIC COIL	HTEC Instruments Ltd.	HPFMF	154402	2025/07/01	2026/06/30

RF Field Strength Susceptibility						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	Signal generator	R&S	SMB 100A	102710	2025/07/01	2026/06/30
2	Power amplifier	BONN Elektronik	BLWA 0810-160/100D	149644	2025/07/01	2026/06/30
3	Isotropic Field Probe	Narda	EP-601	511WX30620	2025/07/01	2026/06/30
4	Log-periodic Antenna	SCHWARZBECK	STLP 9128D	078	2025/07/01	2026/06/30
5	Power Meter	FEANKONIA	PMS 1084	108B1289	2025/07/01	2026/06/30

4. TEST CONDITIONS AND RESULTS

4.1. Magnetic Field Emission

For test instruments and accessories used see section 3.5.

4.1.1. Description of the test location

Test location: SHIELD ROOM

4.1.2. Limits of disturbance

Frequency	Limit For Loop Diameter of 2m (dB μ A)
9 kHz ~ 70 kHz	88
70 kHz ~ 150 kHz	88 ~58
150 kHz ~ 3.0 MHz	58~22
3.0 MHz ~ 30 MHz	22

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

4.1.3. Description of the test set-up

4.1.3.1. Operating Condition

The EUT is ON during the test, and the results of the maximum emanation are recorded.

4.1.3.2. Test Configuration and Procedure

The magnetic component shall be measured by means of a loop antenna. The lighting equipment shall be placed in the center of the antenna.

The induced current in the loop antenna is measured by means of a current probe and the CISPR measuring receiver. By means of a coaxial switch, the three field directions can be measured in sequence.

4.1.4. Test result

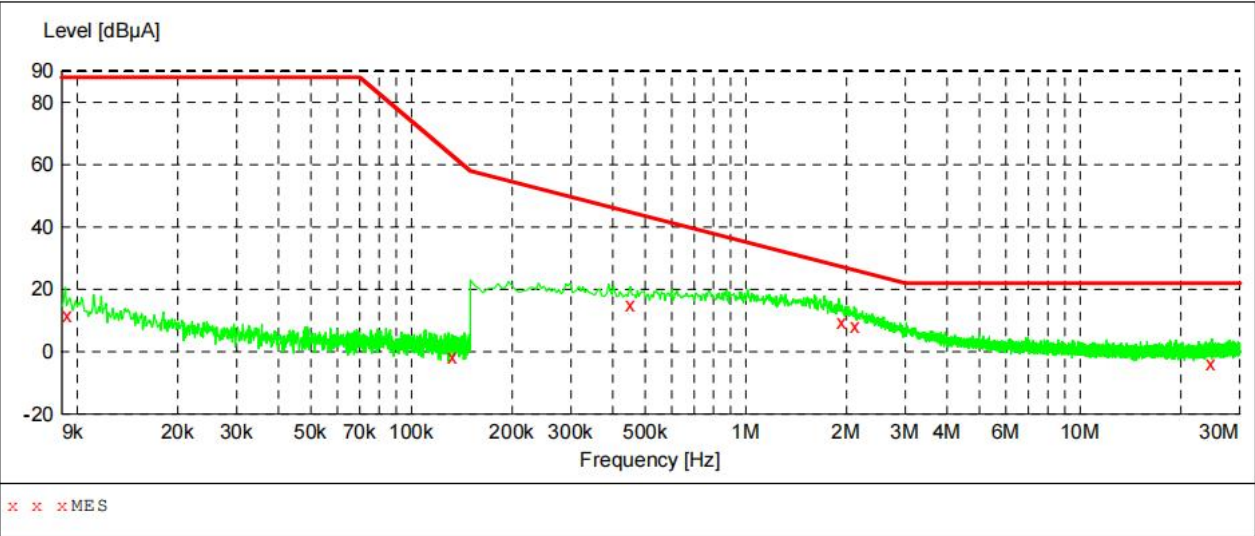
The requirements are **Fulfilled**

Band Width: 200Hz / 9kHz

Frequency Range: 9kHz to 150kHz / 150kHz to 30MHz

Remarks: The limits are kept. For detailed results, please see the following page(s).

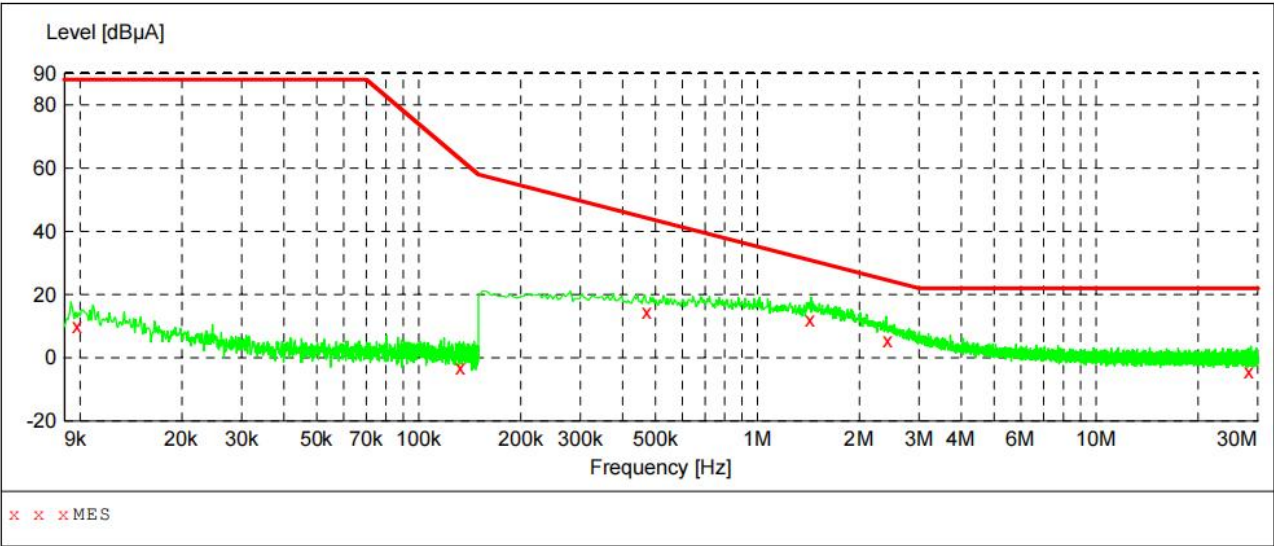
SCAN TABLE: "Magnetic test fin"
Short Description: EN55015 Triple Loop



MEASUREMENT RESULT:

Frequency MHz	Level dBµA	Transd dB	Limit dBµA	Margin dB	Det.	Loop	Azimuth deg
0.009400	11.70	0.0	88	76.3	QP	X	0.00
0.132900	-1.80	0.0	63	64.6	QP	X	0.00
0.451500	15.10	0.1	45	29.7	QP	X	0.00
1.932000	9.70	0.1	27	17.6	QP	X	0.00
2.130000	8.40	0.1	26	17.7	QP	X	0.00
24.625500	-3.90	0.2	22	25.9	QP	X	0.00

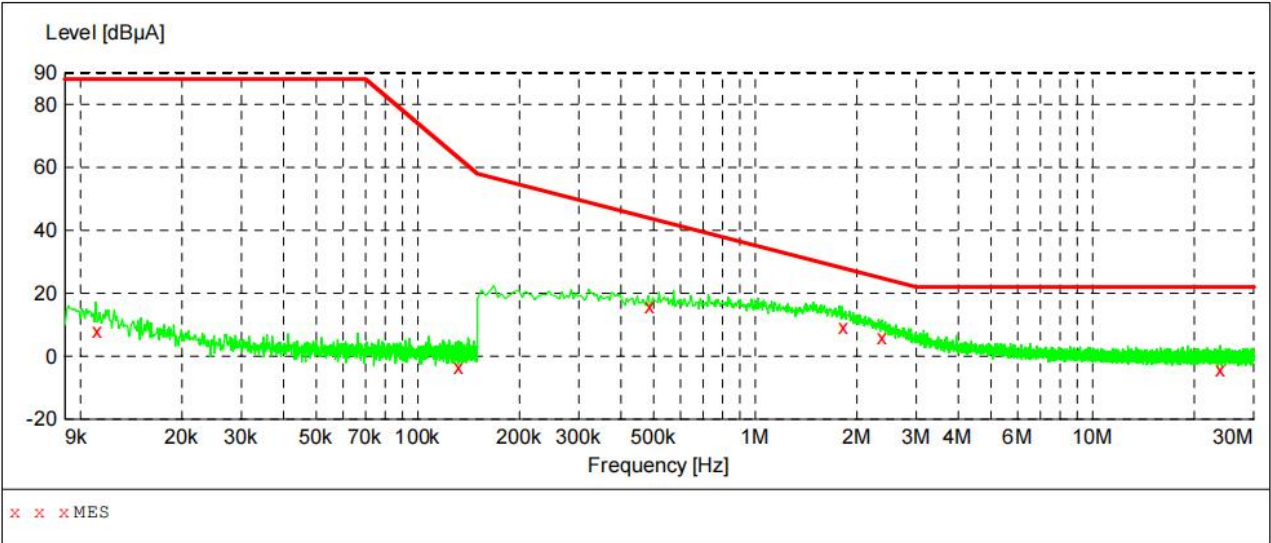
SCAN TABLE: "Magnetic test fin"
Short Description: EN55015 Triple Loop



MEASUREMENT RESULT:

Frequency MHz	Level dBµA	Transd dB	Limit dBµA	Margin dB	Det.	Loop	Azimuth deg
0.009800	10.10	0.0	88	77.9	QP	Y	0.00
0.133200	-3.20	0.0	63	65.9	QP	Y	0.00
0.474000	14.40	0.1	44	29.8	QP	Y	0.00
1.432500	12.10	0.1	31	18.8	QP	Y	0.00
2.427000	5.40	0.1	25	19.1	QP	Y	0.00
28.410000	-4.20	0.2	22	26.2	QP	Y	0.00

SCAN TABLE: "Magnetic test fin"
Short Description: EN55015 Triple Loop



MEASUREMENT RESULT:

Frequency MHz	Level dBµA	Transd dB	Limit dBµA	Margin dB	Det.	Loop	Azimuth deg
0.011200	8.10	0.0	88	79.9	QP	Z	0.00
0.132300	-3.40	0.0	63	66.3	QP	Z	0.00
0.487500	16.00	0.1	44	27.8	QP	Z	0.00
1.824000	9.50	0.1	28	18.5	QP	Z	0.00
2.373000	5.80	0.1	25	19.0	QP	Z	0.00
24.004500	-4.20	0.2	22	26.2	QP	Z	0.00

4.2. Conducted disturbance

For test instruments and accessories used see section 3.5.

4.2.1. Description of the test location

Test location: SHIELD ROOM

4.2.2. Limits of disturbance

Frequency Range	Limits (dBuV)	
	Quasi-Peak	Average
9 kHz ~ 50 kHz	110	—
50 kHz ~ 150 kHz	90~80	—
150 kHz ~ 0.5 MHz	66~56	56~46
0.5 MHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

4.2.3. Description of the test set-up

4.2.3.1. Operating Condition

The EUT is ON during the test, and the results of the maximum emanation are recorded.

4.2.3.2. Test Configuration and Procedure

The EUT was placed on a non-conductive table 0.8m above a reference ground plane. All power was connected to the EUT through an Artificial Mains Network (AMN). Conducted disturbance voltage measurements on mains lines were made at the output of the AMN. The AMN was placed 0.8m from the boundary of the EUT and bonded to the reference ground plane.

4.2.4. Test result

The requirements are **Fulfilled**

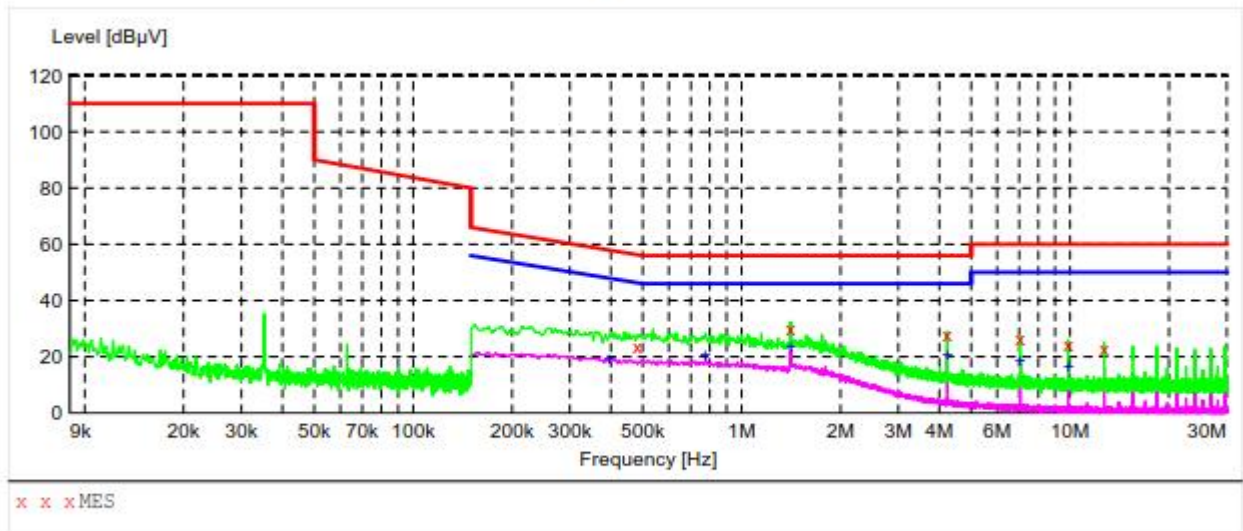
Band Width: 9kHz

Frequency Range: 9kHz to 30MHz

Remarks: The limits are kept. For detailed results, please see the following page(s).

SCAN TABLE: "Voltage (9K-30M) FIN"

Short Description: 9K-30M Voltage

**MEASUREMENT RESULT:**

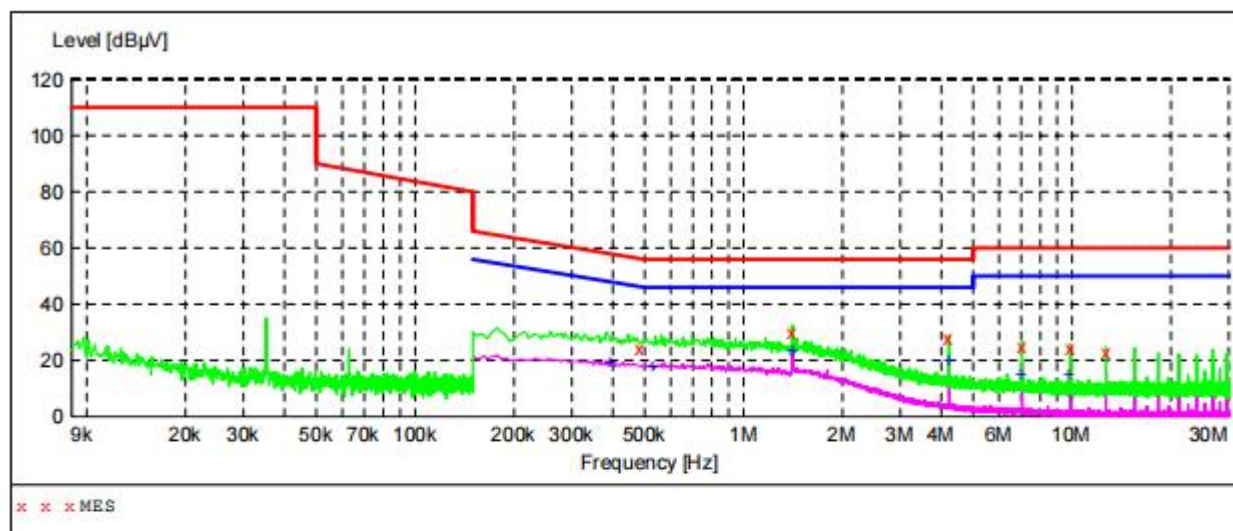
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.482000	23.60	10.1	56	32.7	QP	L1	GND
1.410000	30.20	10.1	56	25.8	QP	L1	GND
4.230000	27.90	10.1	56	28.1	QP	L1	GND
7.050000	26.10	10.1	60	33.9	QP	L1	GND
9.870000	24.50	10.1	60	35.5	QP	L1	GND
12.694000	22.60	10.1	60	37.4	QP	L1	GND

MEASUREMENT RESULT: "S221118001DL_fin2"

11/18/2022 10:41AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.394000	19.20	10.1	48	28.8	AV	L1	GND
0.774000	20.40	10.1	46	25.6	AV	L1	GND
1.410000	23.60	10.1	46	22.4	AV	L1	GND
4.230000	20.40	10.1	46	25.6	AV	L1	GND
7.050000	18.60	10.1	50	31.4	AV	L1	GND
9.870000	16.50	10.1	50	33.5	AV	L1	GND

SCAN TABLE: "Voltage (9K-30M)FIN"
 Short Description: 9K-30M Voltage



MEASUREMENT RESULT:

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.486000	24.00	10.1	56	32.2	QP	N	GND
1.410000	30.00	10.1	56	26.0	QP	N	GND
4.226000	27.70	10.1	56	28.3	QP	N	GND
7.042000	24.90	10.1	60	35.1	QP	N	GND
9.862000	24.20	10.1	60	35.8	QP	N	GND
12.682000	22.70	10.1	60	37.3	QP	N	GND

MEASUREMENT RESULT:

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.394000	19.30	10.1	48	28.7	AV	N	GND
0.530000	18.10	10.1	46	27.9	AV	N	GND
1.410000	23.40	10.1	46	22.6	AV	N	GND
4.226000	19.90	10.1	46	26.1	AV	N	GND
7.042000	15.20	10.1	50	34.8	AV	N	GND
9.862000	14.90	10.1	50	35.1	AV	N	GND

4.3. Radiation Emission

For test instruments and accessories used see section 3.5.

4.3.1. Description of the test location

Test location: SHIELD ROOM

4.3.2. Limit of Radiation Emission

Frequency Range (MHz)	Limits (dBuV)
	Quasi-Peak
30 ~ 100	64 ~ 54
100 ~ 230	54
230 ~ 300	54 ~ 51

Note: (1) At the transition frequency, the lower limit applies.

(2) Increasing linearly with the logarithm of the frequency.

4.3.3. Description of the test set-up

4.3.3.1 Operating Condition

The EUT is ON during the test, and the results of the maximum emanation are recorded.

4.3.3.2 Test Configuration and Procedure

The EUT is positioned $100 \text{ mm} \pm 2 \text{ mm}$ above the RGP and supported by non-conductive material that has relative permittivity ϵ_r less than 1,05 (e.g. polystyrene foam). The edge of the RGP shall be at least 200 mm beyond the perimeter of the EUT.

A distance of $200 \text{ mm} \pm 20 \text{ mm}$ shall be maintained between the CDNE and EUT. The CDNE shall be positioned on the side of the EUT at which the cable under test is connected, to minimize the cable length. The cable shall not be meandered or bundled.

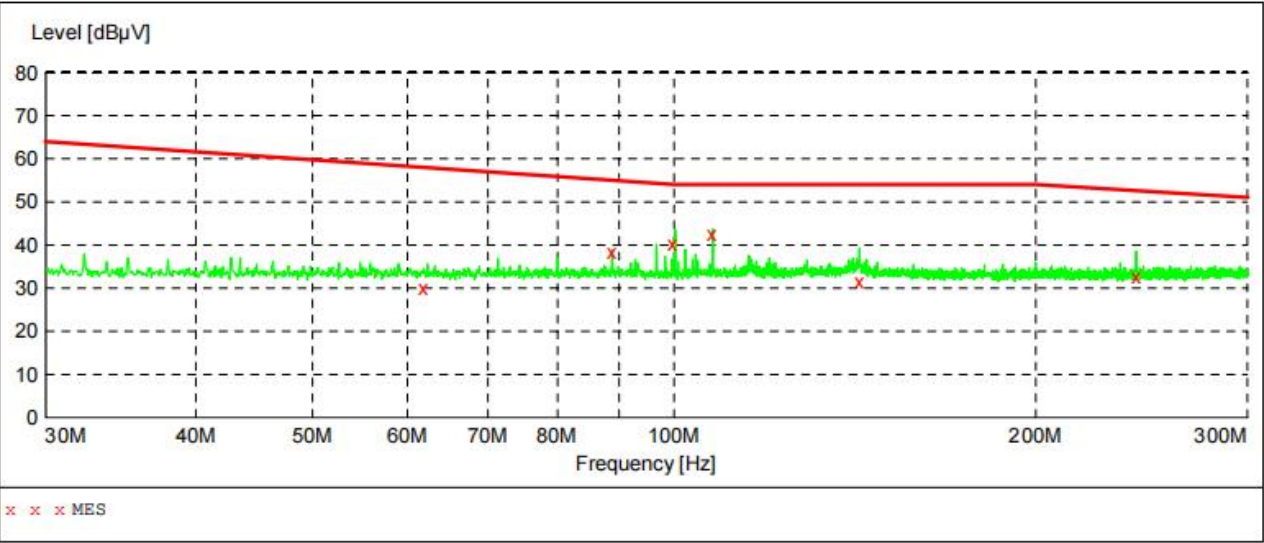
The cable connected to the EUT shall run down vertically from the EUT for a distance of about 30 mm to the RGP, and horizontally to the EUT port of the CDNE.

4.3.4. Test Result

The requirements are **Fulfilled**

Remarks: The limits are kept. For detailed results, please see the following page(s).

SCAN TABLE: "CDNE-SC (30M-300M) FIN"
Short Description: 30 - 300 MHz CDNE



MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
61.920000	29.90	19.8	58	28.1	QP	---	---
88.800000	38.40	19.8	55	16.6	QP	---	---
99.840000	40.40	19.7	54	13.6	QP	---	---
107.700000	42.60	19.7	54	11.4	QP	---	---
142.680000	31.60	19.6	54	22.4	QP	---	---
242.520000	32.60	19.6	53	20.0	QP	---	---

4.4. Harmonic current

The test is not applicable.

4.5. Voltage Fluctuation and Flicker

The test is not applicable.

4.6. Electrostatic discharge

For test instruments and accessories used see section 3.5.

4.6.1. Description of the test location and date

Test location: EMC Test Room

Date of test: 2025-11-06

Operator: Ca Lu

4.6.2. Severity levels of electrostatic discharge

4.6.2.1. Severity level: Contact Discharge at $\pm 4\text{kV}$ Air Discharge at $\pm 8\text{kV}$

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

4.6.2.2. Performance criterion: **B**

4.6.3. Description of the test set-up

4.6.3.1. Operating Condition

The EUT is ON during the test, and the results of the maximum susceptible results are recorded.

4.6.3.2. Test Configuration and Procedure:

Direct Discharge:

Air Discharge:

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

Contact Discharge:

- All the procedure shall be same as air discharge, except using the acute discharge tip. The top end of the Electrostatic Discharge simulator is touch the EUT all the time when the simulator is re-triggered for a new single discharge and repeated 10 times for each pre-selected test point.

Indirect Discharge:

- The vertical coupling plane(VCP) is placed 0.1m away from EUT. The top end of Electrostatic Discharge simulator should aim at the center of one border of the VCP for at least 10 times discharge.
- The top end of Electrostatic Discharge simulator should place at the point 0.1m away from EUT on the horizontal coupling plane(HCP). At least 10 times discharge should be done for every pre-selected point around EUT.

Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

Contact discharge voltage:

- 2 kV ■ 4 kV

Air discharge voltage:

- 2 kV ■ 4 kV ■ 8 kV

Number of discharges:

- ☒ 10 ☐ 25

Type of discharge:

- | | |
|--------------------|---------------------|
| Direct discharge | ■ Air discharge |
| | ■ Contact discharge |
| Indirect discharge | ■ Contact discharge |

Polarity:

- Positive ■ Negative

Discharge location:

- all external locations accessible by hand
- horizontal coupling plane (HCP)
- vertical coupling plane (VCP)

4.6.5. Test result

The requirements are **Fulfilled**

Performance Criterion: **B**

Remarks: During the test no deviation was detected to the selected operation mode(s).

4.7. Radiated, radio-frequency, electromagnetic field

For test instruments and accessories used see section 3.5.

4.7.1. Description of the test location and date

Test location: Subcontracted Lab

Date of test: 2023-04-19

Operator: Ca Lu

4.7.2. Severity levels of radiated, radio-frequency, electromagnetic field

4.7.2.1

Severity level: 3 V/m

Level	Field Strength (V/m)
1.	1
2.	3
3.	10
X	Special

4.7.2.2 Performance criterion: **A**

4.7.3. Description of the test set-up

4.7.3.1. Operating Condition

The EUT is ON during the test, and the results of the maximum susceptible results are recorded.

4.7.3.2. Test Configuration and Procedure

EUT is placed on a table which is 0.8 meter above ground. The center of the transmitting antenna mounted on an antenna mast is set 3 meter away from the EUT. During the test, each of four sides of EUT will face the transmitting antenna with the turntable cycled. Both horizontal and vertical polarization of the antenna are set on test and measured individually.

In order to judge the performance of the EUT, a set of monitor system is used.

Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

4.7.4. Test specification:

Frequency range:

■ 80 MHz to 1000 MHz

Field strength:

■ 3 V/m

EUT - antenna separation:

■ 3 m

Modulation:

■ AM: 80 %
■ sinusoidal 1000Hz

Frequency step:

■ 1 % with 3 s dwell time

Antenna polarisation:

■ horizontal ■ vertical

4.7.5. Test result

The requirements are **Fulfilled**

Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).

4.8. Electrical fast transients / Burst

The test is not applicable.

4.9. Surge

The test is not applicable.

4.10. Conducted disturbances induced by radio-frequency fields

The test is not applicable.

4.11. Magnetic Field Immunity

The test is not applicable.

4.12. Voltage Dips and Interruptions

The test is not applicable.

5. Photos of the EUT



Photo 1 YSTD-001



Photo 2 YSTD-001

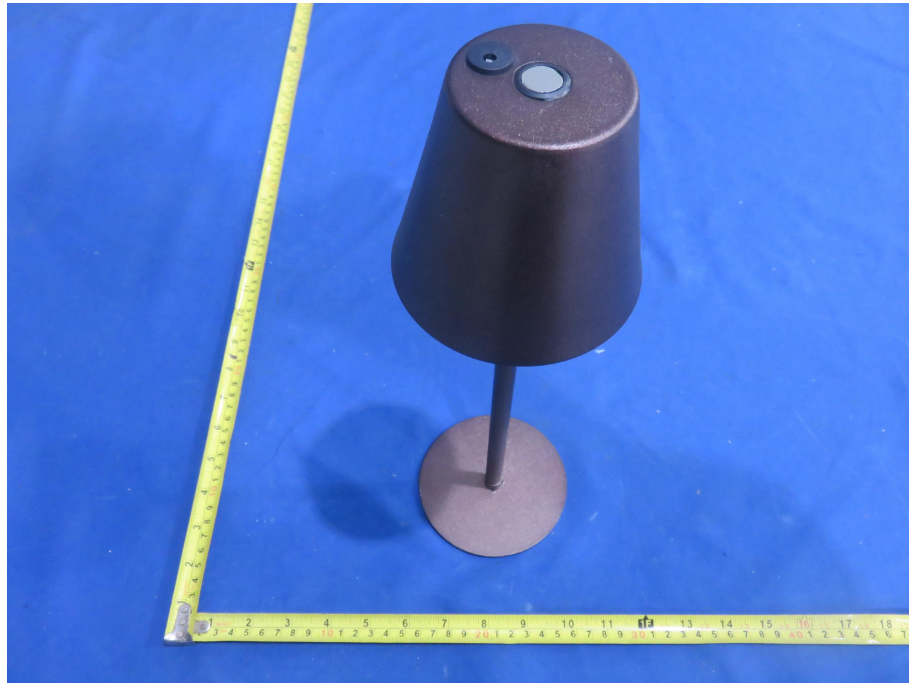


Photo 3 BZTD-001



Photo 4 BZTD-001

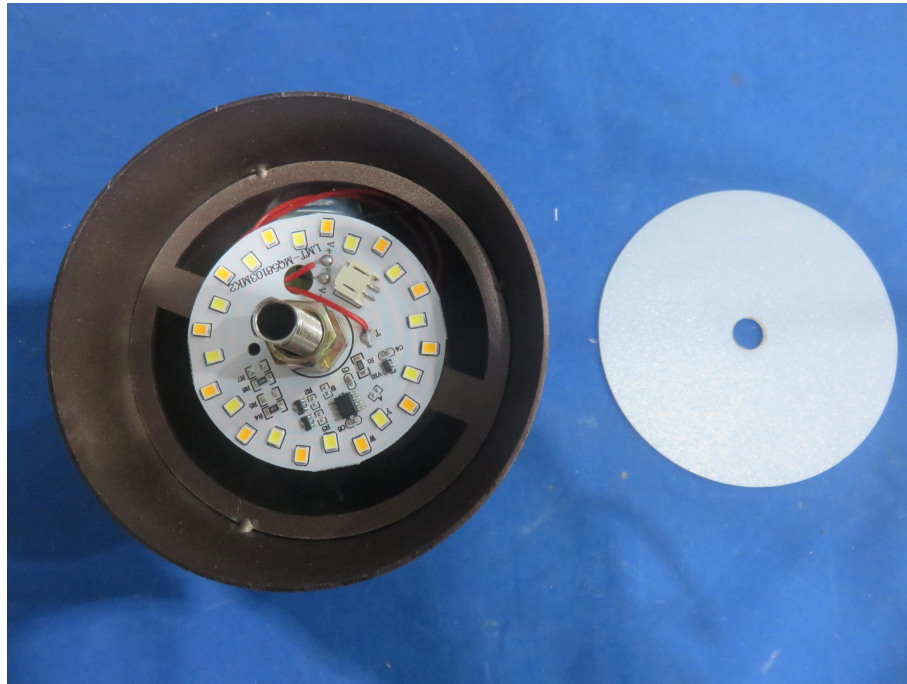


Photo 5 BZTD-001



Photo 6 BZTD-001

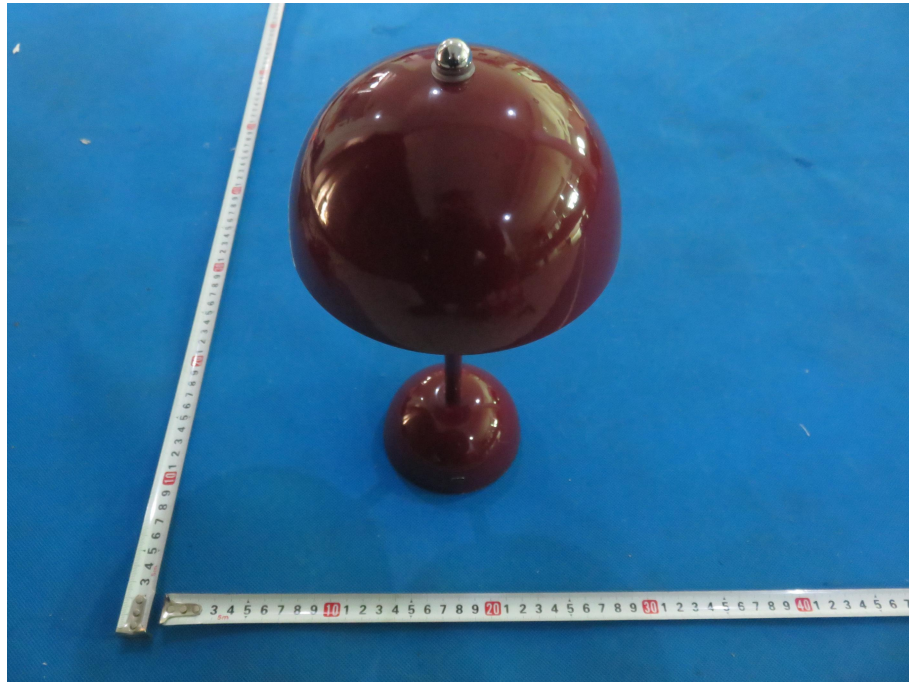


Photo 7 Overview for BZTD-063

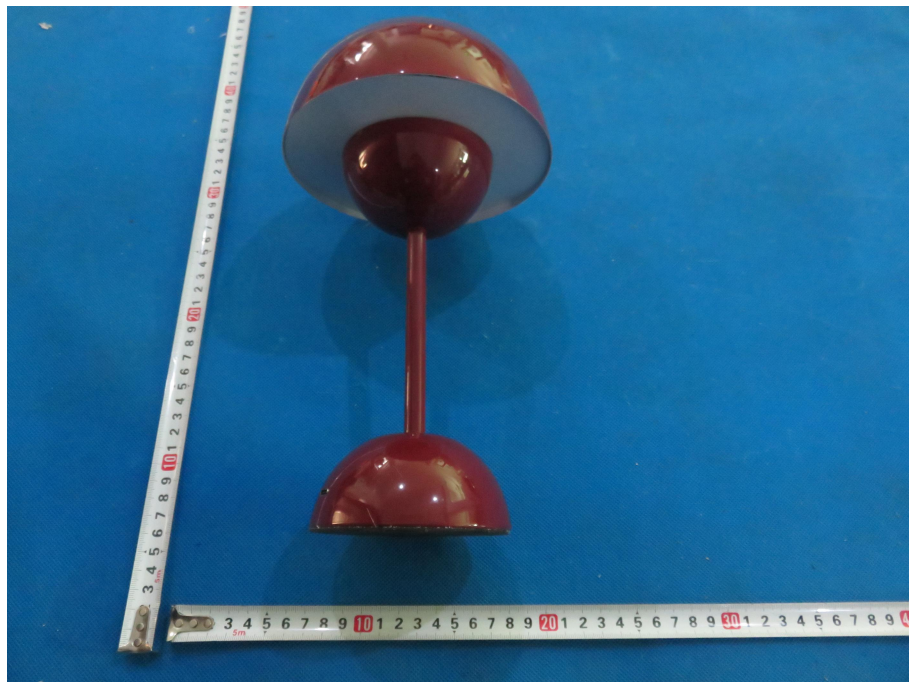


Photo 8 Overview for BZTD-063

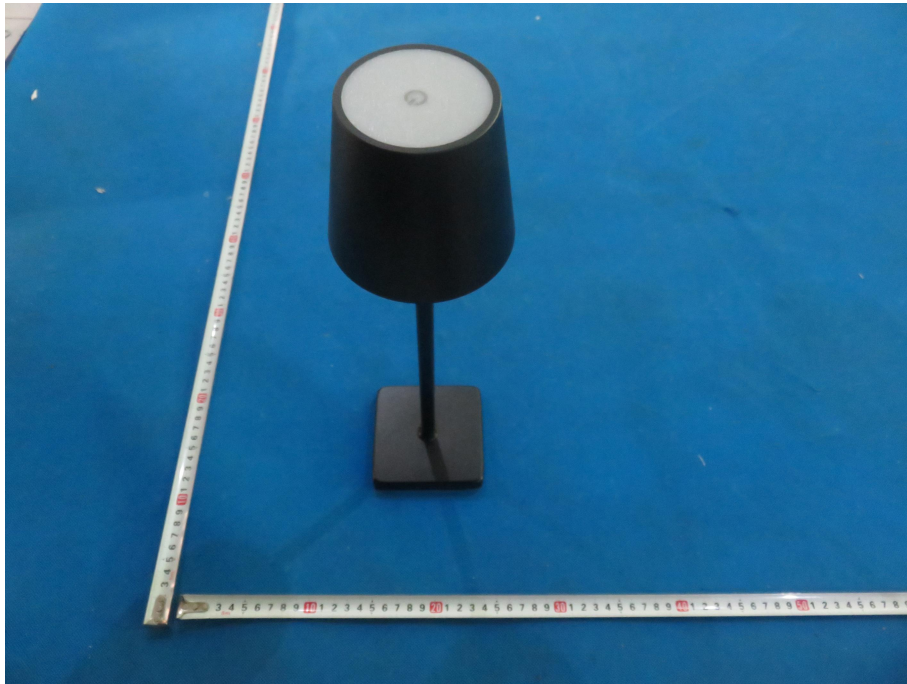


Photo 9 Overview for BZTD-005

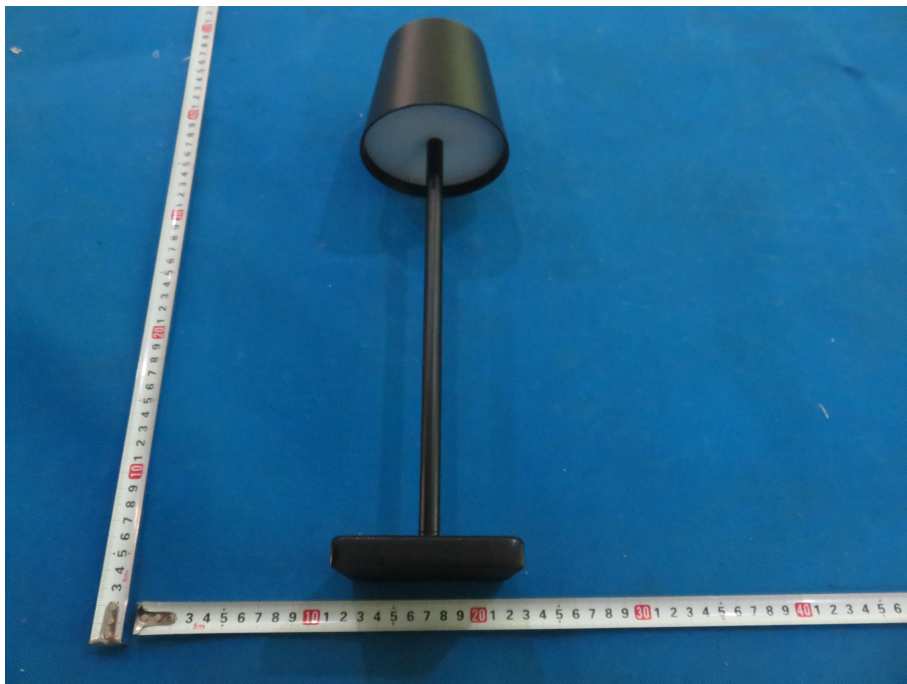


Photo 10 Overview for BZTD-005

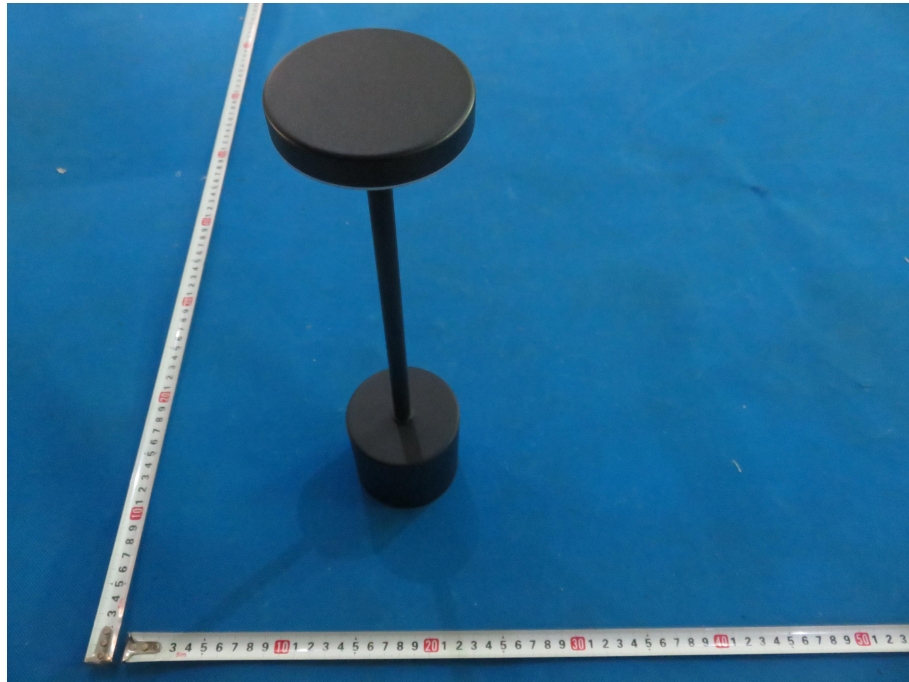


Photo 11 Overview for BZTD-007



Photo 12 Overview for BZTD-007

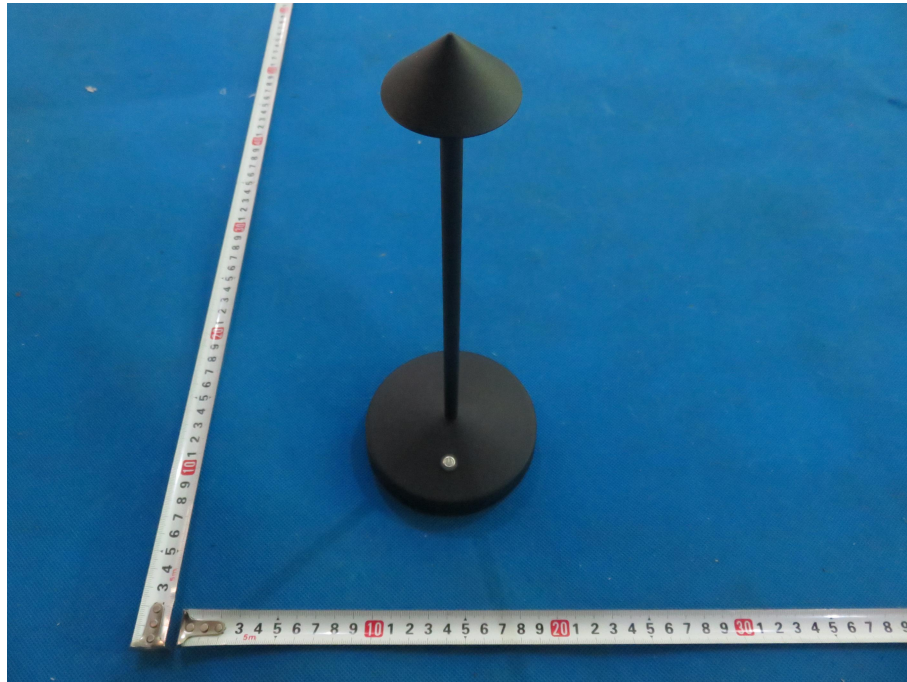


Photo 13 Overview for BZTD-062



Photo 14 Overview for BZTD-062

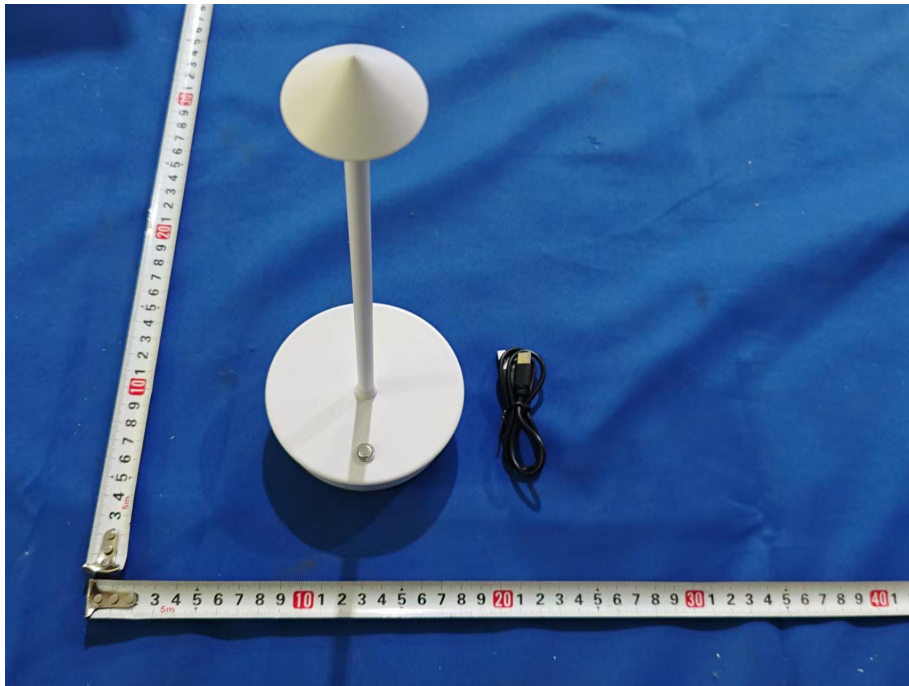


Photo 15 ttl-004

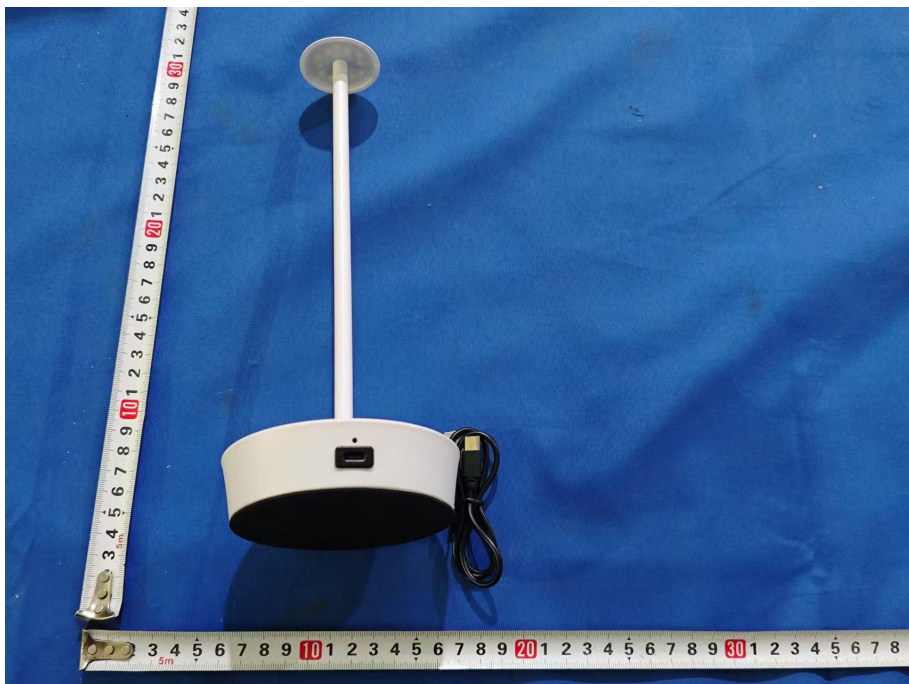


Photo 16 ttl-004

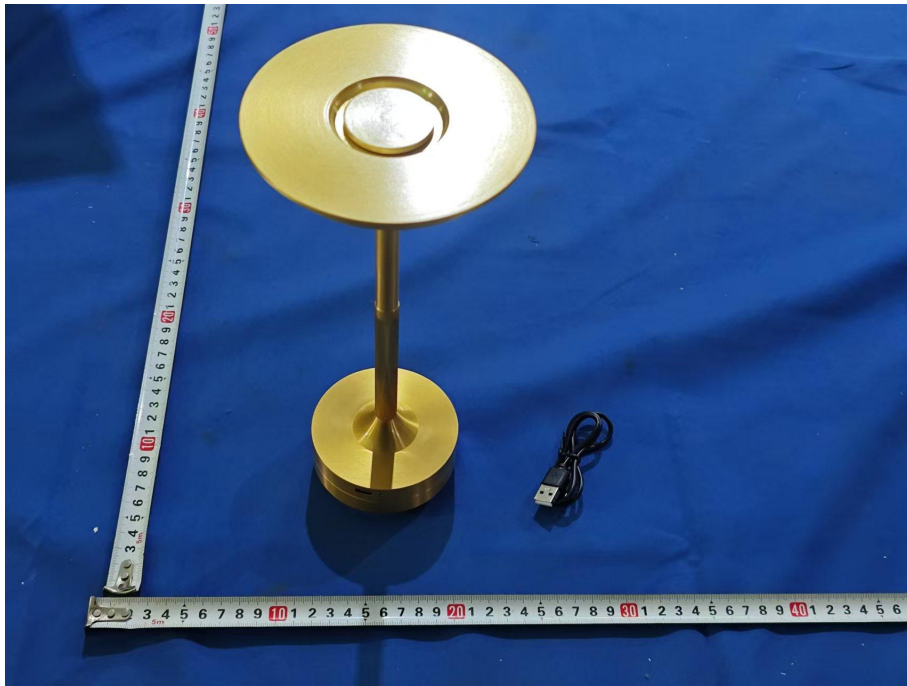


Photo 17 ttl-004



Photo 18 ttl-001

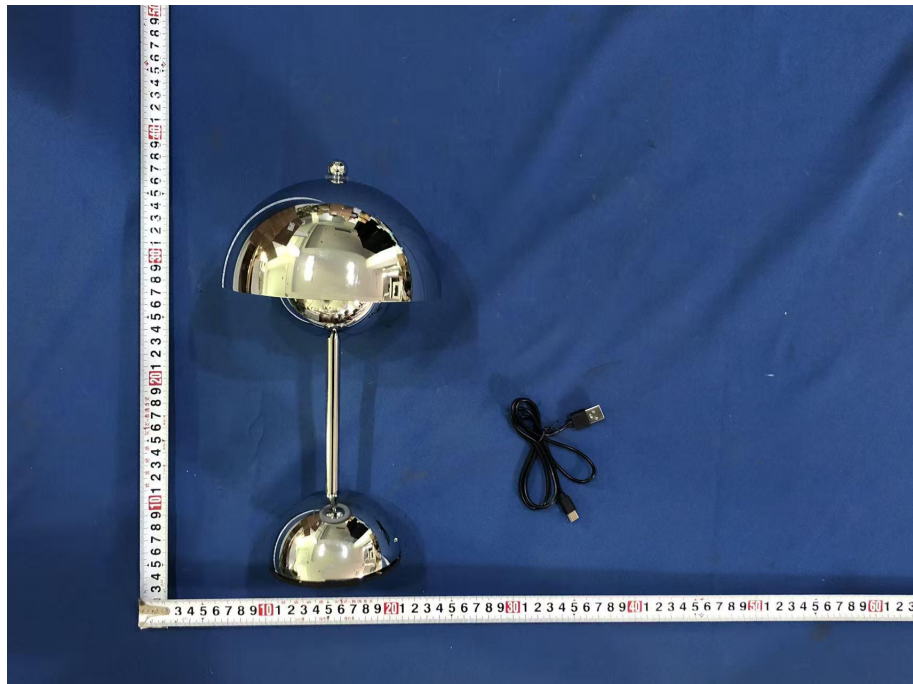


Photo 19

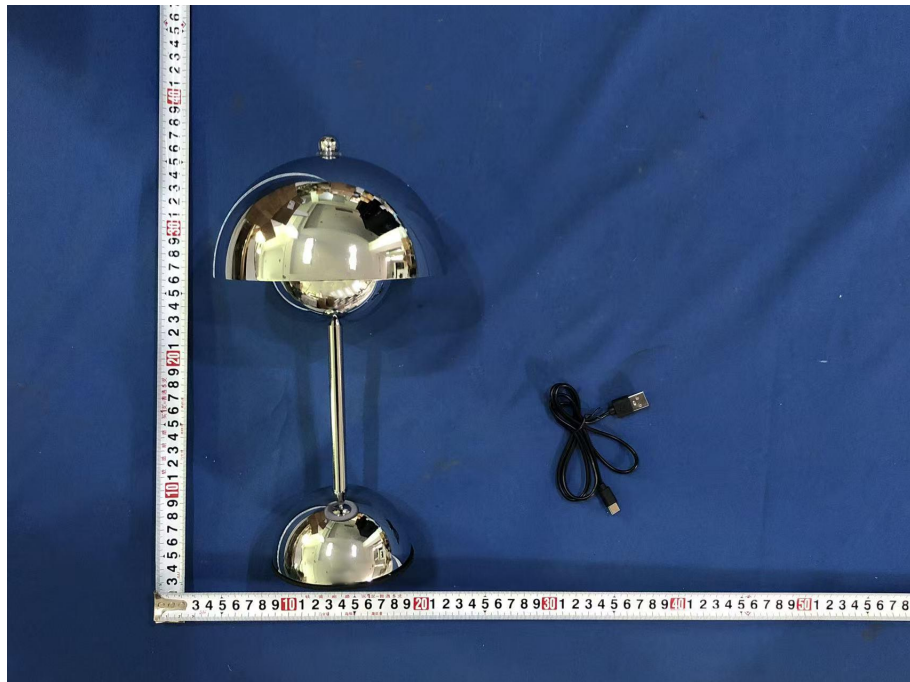


Photo 20



Photo 21



Photo 22

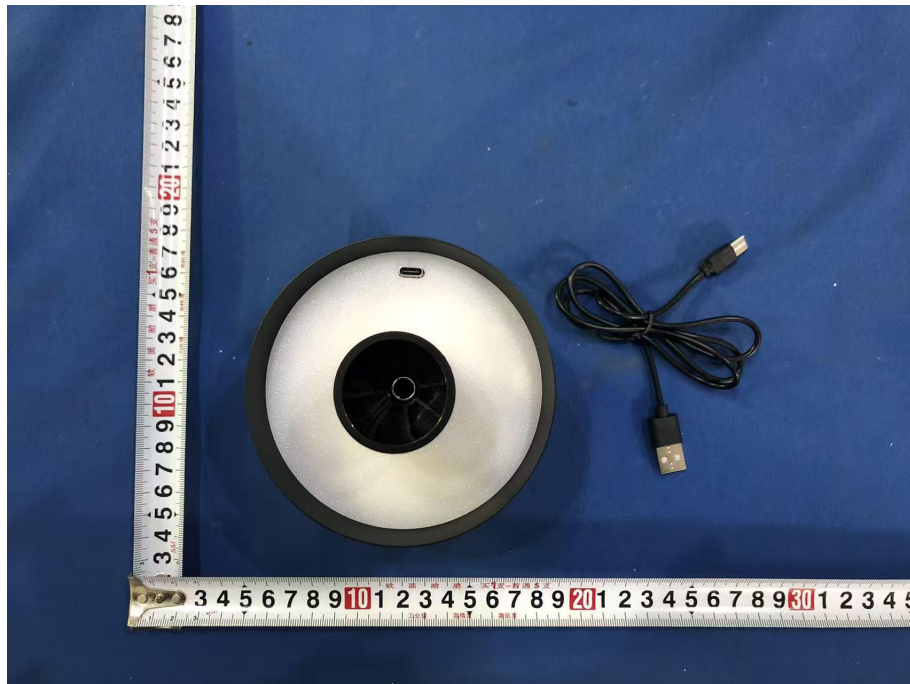


Photo 23



Photo 24



Photo 25

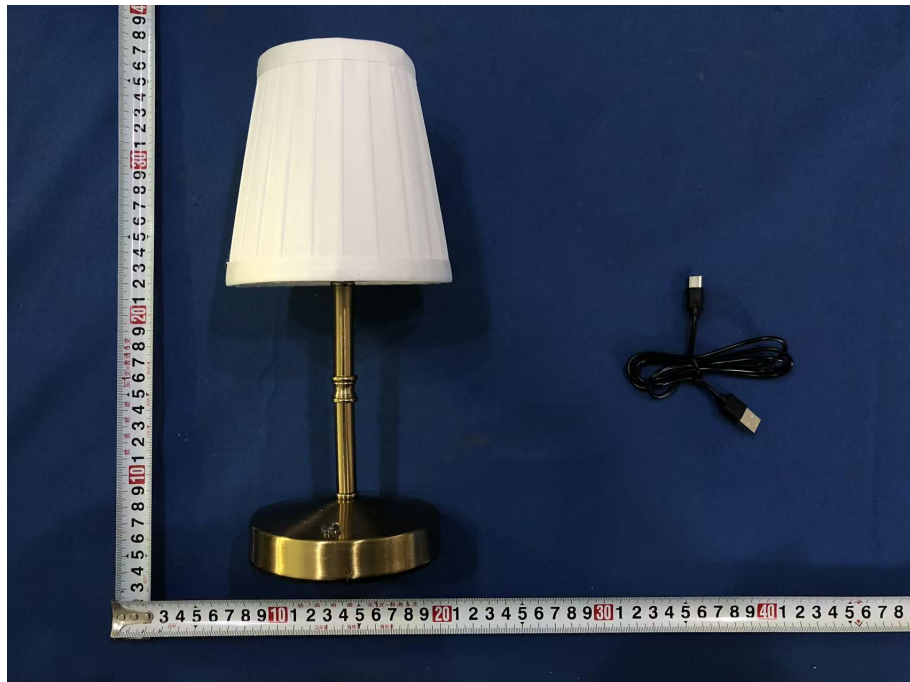


Photo 26



Photo 27



Photo 28



Photo 29



Photo 30

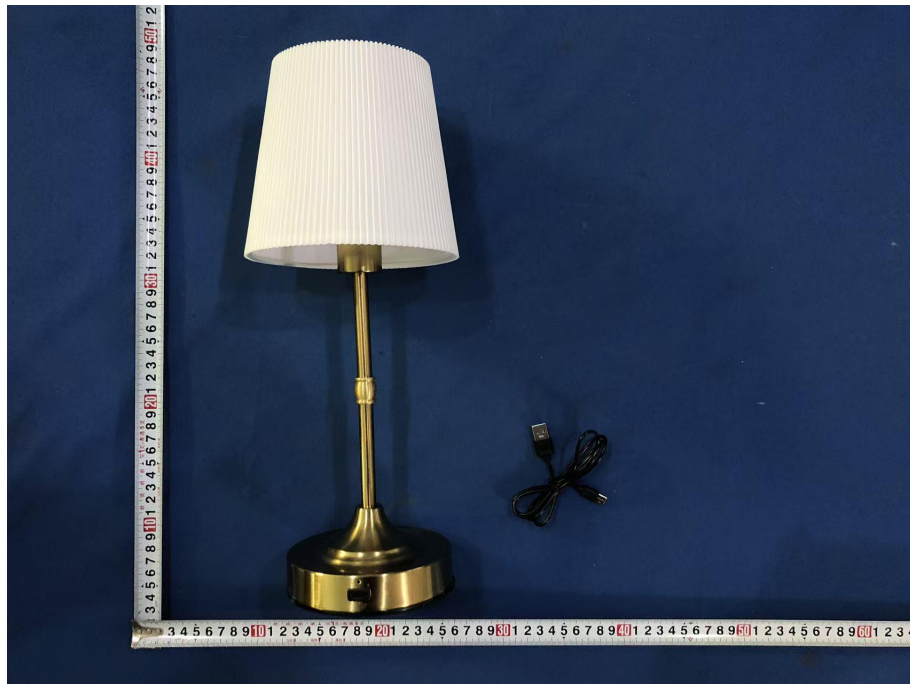


Photo 31



Photo 32



Photo 33



Photo 34



Photo 35



Photo 36

**Photo 37****Photo 38**



Photo 39



Photo 40



Photo 41



Photo 42

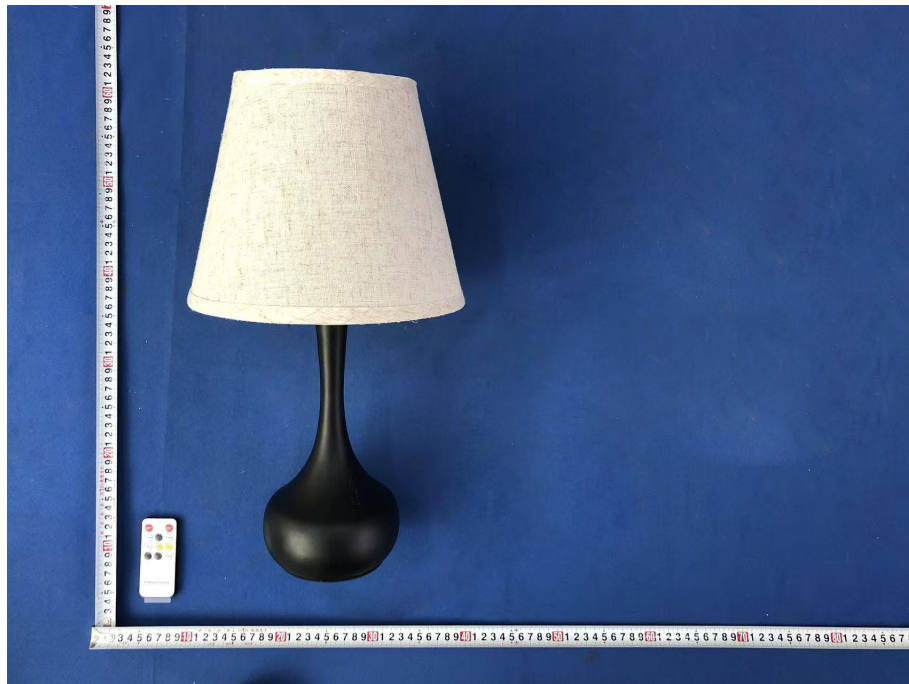
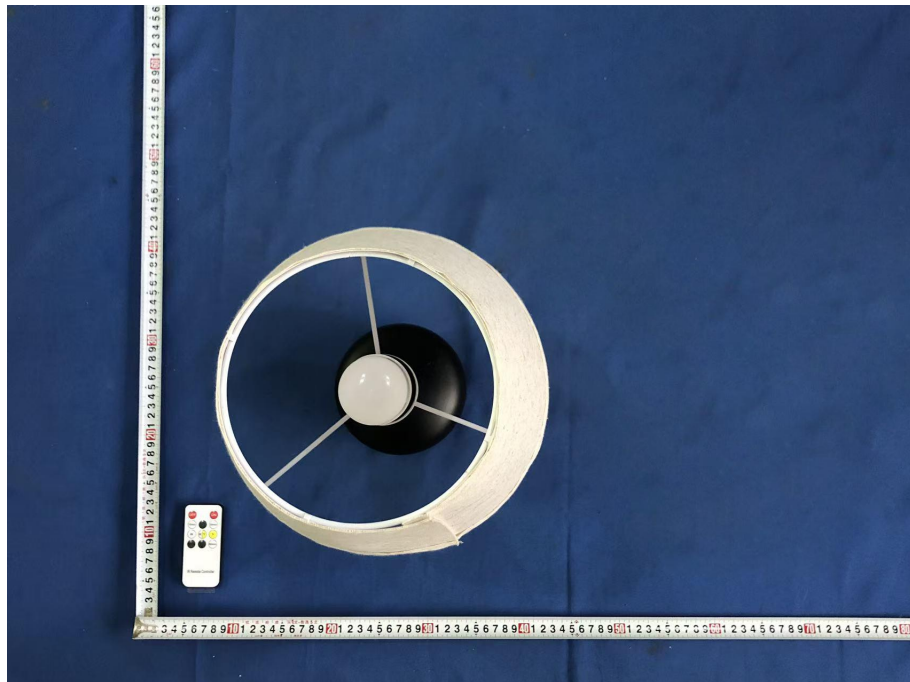
**Photo 43****Photo 44**



Photo 45



Photo 46

----- End The Report -----

STATEMENT

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

If you have any objection to this report, please submit it to the test unit within 15 days from the date of receipt of the report.

Test Laboratory: Zhongshan AOCE Testing Technology Co., Ltd.

Address: Disika, 1/F., No.42, Chang'an South Road, Henglan, Zhongshan, Guangdong, China

TEL: +86-760-87553128

URL: www.aoce-lab.com

E-Mail: guanlilin@aoce-lab.com