Certificate No. 24CTZ04026E01

CERTIFICATE OF CONFORMITY

Applicant	:	Shenzhen Sinco Technology Co., Limited.
Address	:	9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.
Manufacturer	:	Shenzhen Sinco Technology Co., Limited.
Address	:	9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.
Product	:	Electric toothbrush
Model No.	:	210
Trade Mark	:	N/A
Ratings	:	DC 5V Battery: DC 3.7V
Standard(s)	:	EN 55014-1: 2021; EN IEC 61000-3-2:2019+A1:2021 EN 61000-3-3:2013+A2:2021 EN 55014-2: 2021.
Report No.	:	CTZ2404026EEN01

The submitted sample of the above equipment has been tested and found to comply with the following European Directive: **EMC Directive - 2014/30/EU**

CE

Dongguan Zhongzhengtong Testing Technology Co., Ltd. CTZ CERTIFICATE

Allen Zou / Manager

Date of Issue: Apr 18, 2024

This certificate is part of the full test report(s) and should be read in conjunction with it. This certificate is based on an evaluation of one sample of above mentioned product. It does not imply assessment of the production of the product. This certificate is not permitted to be reproduced, except in full. The CE marking may only be used if all the relevant and effective European Directives are applicable.

Dongguan Zhongzhengtong Testing Technology Co., Ltd.
Room 206 and Room 208, No. 8, Guancheng Section, Guanlong Road, Guancheng Street, Dongguan, Guangdong, China
TEL: (+86)769-22261862

TEST REPORT

Applicant: **Address:**	**Shenzhen Sinco Technology Co., Limited.** **9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.**		
Manufacturer: **Address:**	**Shenzhen Sinco Technology Co., Limited.** **9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.**		
Factory: **Address:**	**Shenzhen Sinco Technology Co., Limited.** **9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.**		
E.U.T.:	**Electric toothbrush**		
Model Number:	**210**		
Test Model:	**210**		
Trade Name:	**N/A**		
Date of Receipt:	**Apr 8, 2024**	**Date of Test:**	**Apr 11, 2024**
Test Specification:	**EN IEC 55014-1:2021** **EN IEC 61000-3-2:2019+A1:2021** **EN 61000-3-3:2013+A2:2021** **EN IEC 55014-2: 2021**		
Test Result:	**The equipment under test was found to be compliance with the requirements of the standards applied.**		

Prepared by:

Jack

Jack Xiao /Engineer

Approved & Authorized Signer:

Dongguan Zhongzhengtong Testing Technology Co., Ltd. CERTIFICATE CTZ

Luke Li

Luke Li / Project Engineer

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 Dongguan Zhongzhengtong Testing Technology Co. , Ltd.

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Revision History of This Test Report		
Report Number	Description	Issued Date
CTZ2404026EEN01	Initial Issue	Apr 18, 2024

1. GENERAL PRODUCT INFORMATION

1.1. PRODUCT FUNCTION

Refer to Technical Construction Form and User Manual.

1.2. DIFFERENCE BETWEEN MODEL NUMBERS

N/A

1.3. TEST DESCRIPTION OF DEVICE (EUT)

Test Model	:	210
Rated Rating	:	DC 5V Battery: DC 3.7V
Operation Frequency	:	Below 108MHz (Declaration by applicant)

1.4. INDEPENDENT OPERATION MODES

Test Voltage: DC 5V

Test Mode: 1.Normal operation

Remark：This report only reflects the test data of the worst test mode.

2. TEST STANDARDS AND SITES

2.1. DESCRIPTION OF STANDARDS AND RESULTS

The EUT have been tested according to the applicable standards as referenced below.

EMISSION			
Standard	**Test Type**	**Result**	**Remarks**
EN IEC 55014-1: 2021	Mains Terminal Disturbance Voltage Test	N/A	Meets the requirements
	Disturbance Power Emissions Test	N/A	Meets the requirements
	Radiated Emission Test	PASS	Meets the requirements
EN IEC 61000-3-2:2019	Harmonic current emission	N/A	Meets the requirements
EN 61000-3-3:2013+A2:2021	Voltage fluctuations & flicker	N/A	Meets the requirements

IMMUNITY			
Standard	**Test Type**	**Result**	**Remarks**
EN 61000-4-2: 2009	Electrostatic discharge immunity test	PASS	Meets the requirements of Performance Criterion B
EN 61000-4-3: 2006+A2: 2010	Radio-frequency, electromagnetic field immunity test	N/A	Meets the requirements of Performance Criterion A
EN 61000-4-4: 2012	Electrical fast transient/ burst immunity test	N/A	Meets the requirements of Performance Criterion B
EN 61000-4-5: 2014	Surge immunity test	N/A	Meets the requirements of Performance Criterion B
EN 61000-4-6: 2014	Injected Currents immunity test	N/A	Meets the requirements of Performance Criterion A
EN 61000-4-8: 2010	Power frequency magnetic field immunity test	N/A	The EUT don't containing magnetic field sensitive components.
EN 61000-4-11: 2004	Voltage Dips and Interruptions	N/A	Meets the requirements of Performance Criterion B&C
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: 30% reduction – Performance Criteria **C**

Voltage dip: 60% reduction – Performance Criteria **C**

Voltage Interruption: 100% reduction – Performance Criteria **C**

(4) Appliances are deemed to comply in the frequency range from 300 MHz to 1 000 MHz if both of the following conditions (1) and 2)) are fulfilled:

1) all emission readings from the equipment under test shall be lower than the applicable limits reduced by the margin;

2) the maximum clock frequency shall be less than 30 MHz.

If either of condition 1) or 2) is not fulfilled, radiated measurements in the frequency range from 300 MHz to 1 000 MHz shall be conducted and the limits of Table 3 for that range applied. In any case the limits of Table 2a in the frequency range 30 MHz to 300 MHz shall be met.

2.2. LIST OF TEST AND MEASUREMENT INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Disturbance Voltage at the mains terminals					
EMI Test Receiver	R&S	ESR3	102124	Dec. 23, 2023	1 Year
Pulse Limiter	R&S	ESH3-Z2	357.8810.52	Dec. 22, 2023	1 Year
LISN	Schwarzbeck	NSLK.8127	8127-892	Mar. 16, 2024	1 year
Radiated electromagnetic-disturbances (30MHz to 1GHz)					
RF. Preamp. Amplifier	EMEC	EM330	060676	Dec. 22, 2023	1 Year
Broadband.Antenna	Schwarzbeck	9162	139	Apr. 13, 2021	3 Year
EMI.Test Receiver	R&S	ESVS30	829673/011	Dec. 23, 2023	1 Year
EXA.Signal analyzer	KEYSIGHT	MY56070465	N9010A	Dec. 23, 2023	1 Year
For electrostatic discharge immunity test					
ESD Generator	HAEFELY	ONYX16	181091	Jan. 10, 2024	1 Year
For Radio-frequency,electromagnetic field immunity test test					
Signal generator	R&S	SMC100A	105651	May. 21, 2023	1 Year
Power amplifier	PRANA	MT400	1507-1746	May. 21, 2023	1 Year
Power amplifier	PRANA	SV70	1602-1820	May. 21, 2023	1 Year
Trilog-boardband antenna	Schwarzbeck	STLP 9128E	9128ES-136	Oct. 09, 2021	3 Year
Horn antenna	Schwarzbeck	BBHA 9120E	BBHA9120E698	Oct. 09, 2021	3 Year
Power meter	R&S	NRP2	105155	May. 21, 2023	1 Year
For electrical fast transient/ burst/surge/ dips and short interruptions immunity test					
EFT Generator	HAEFELY	ECOMPACT4	175442	May. 21, 2023	1 Year
coupling clamp	Prima	EFT-CLAMP	LEP-E018	May. 21, 2023	1 Year
For injected currents susceptibility immunity test					
Signal Generator	Schloder	CDG6000-25	126A1310/2015	May. 21, 2023	1 Year
Attenuator	Schloder	CDG601000	201412100013	May. 21, 2023	1 Year
CDN	Schloder	CDN M2+M3	A2210297/2015	May. 21, 2023	1 Year

2.3. MEASUREMENT UNCERTAINTY

Parameter		UNCERTAINTY
Conducted Emission	Level accuracy (150kHz to 30MHz)	± 2.54 dB
Radiated Emission	Level accuracy (30MHz to 1000MHz, V) (30MHz to 1000MHz, H)	± 4.14 dB ± 4.25 dB
Radiated Emission	Level accuracy (above 1000MHz, Horizontal) (above 1000MHz, Vertical)	± 3.92 dB ± 3.96 dB
Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.		
• As Ulab in all applicable tests listed above are less than Ucispr according to CISPR 16-4-2:2003, • compliance is deemed to occur if no measured disturbance exceeds the disturbance limit; • non-compliance is deemed to occur if any measured disturbance exceeds the disturbance limit.		

2.4. TEST FACILITY

Test Location : Dongguan Zhongzhengtong Testing Technology Co. , Ltd.

Address : Room 206 and Room 208, No. 8, Guancheng Section, Guanlong Road, Guancheng Street, Dongguan, Guangdong, China

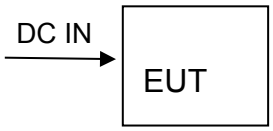
3. TEST SET-UP AND OPERATION MODES

3.1. PRINCIPLE OF CONFIGURATION SELECTION

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.
Immunity: The equipment under test (EUT) was configured to the representative operating mode and conditions.

3.2. BLOCK DIAGRAM OF TEST SET-UP

System Diagram of Connections Between EUT and Simulators



3.3. SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT

Product Type	Manufacturer	Model	Serial No.
/	/	/	/

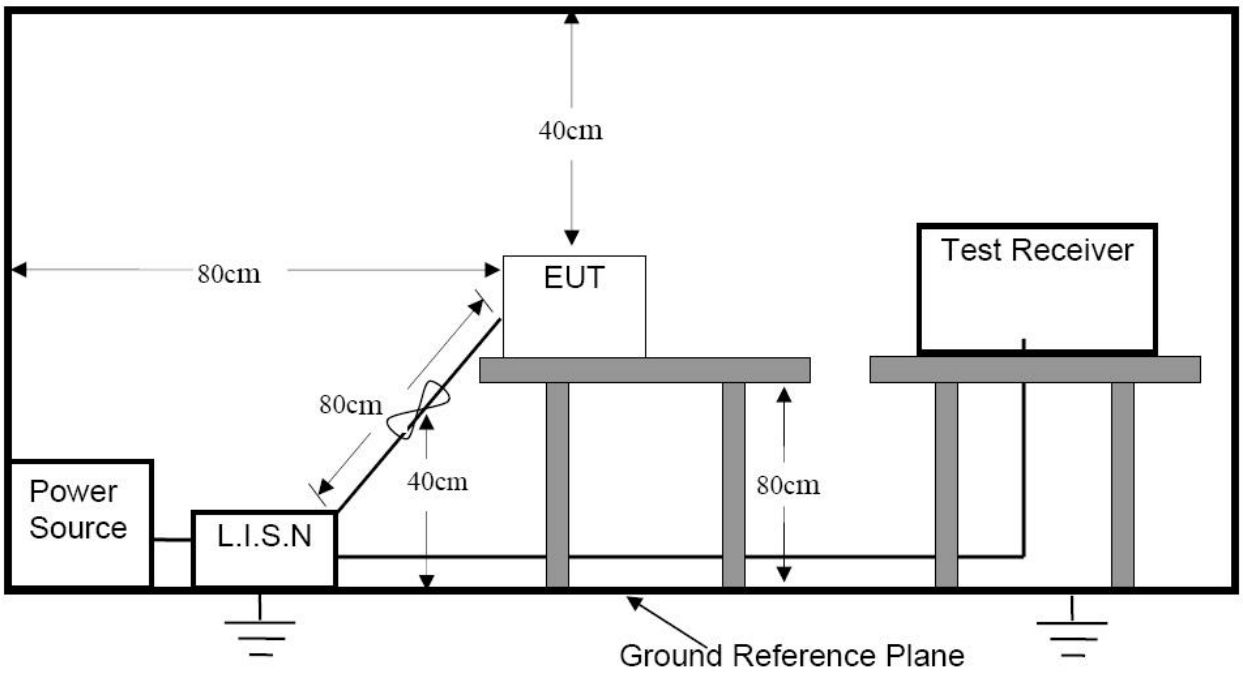
3.4. COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE

None.

4. EMISSION TEST RESULTS

4.1. CONDUCTED EMISSION AT THE MAINS TERMINALS TEST

4.1.1. Block Diagram of Test Setup



4.1.2. Limit

Limits for conducted disturbance at the mains ports.

Frequency range	Limits (dB(uV))	
(MHz)	Quasi-peak	Average
0.15 to 0.5	66-56	59-46
0.5 to 5	56	46
5 to 30	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

4.1.3. Test Procedure

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The test results of conducted emissions at mains ports are recorded of six worst margins for quasi-peak(mandatory) [and average (if necessary)] values against the limits at frequencies of interest unless the margin is 20 dB or greater.
Note: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

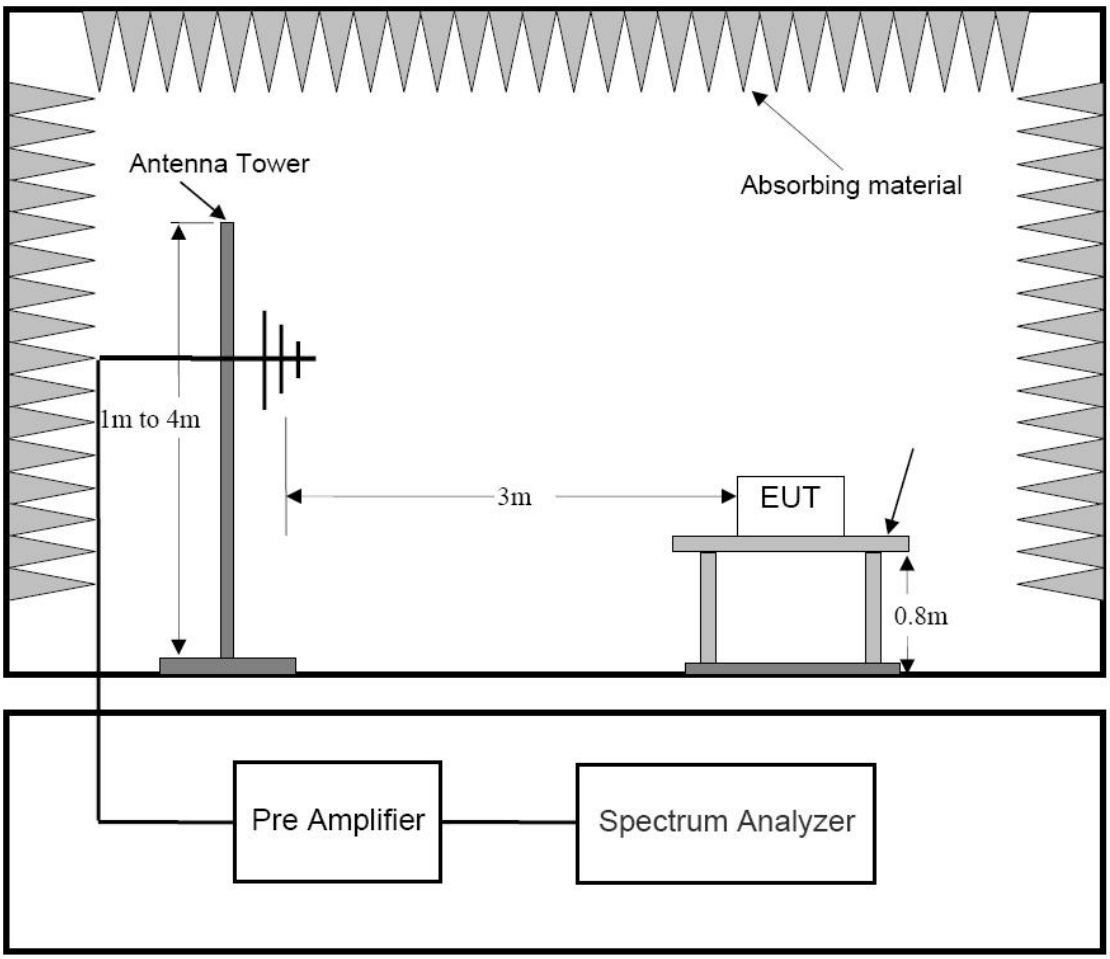
4.1.4. Test Results

N/A.

This test item is not applicable to this application.

4.2. RADIATED EMISSION TEST

4.2.1. Block Diagram of Test Setup



4.2.2. Limit

Limits of Radiated Emission Measurement(Below 1000MHz)

Frequency range MHz	Quasi-peak limits dB(uV/m)
30 to 230	40
230 to 1000	47
Note 1 The lower limit shall apply at the transition frequency. Note 2 Additional provisions may be required for cases where interference occurs.	

Limits of Radiated Emission Measurement (Above 1000MHz)

FREQUENCY (GHz)	(dBuV/m) (at 3m)	
	PEAK	AVERAGE
1 to 3	70	50
3 to 6	74	54

Frequency Range Of Radiated Measurement (For Unintentional Radiators)

Highest internal frequency (F_x)	Highest measured frequency
$F_x \leq 108$ MHz	1 GHz
108 MHz$< F_x \leq 500$ MHz	2 GHz
500 MHz$< F_x \leq 1$ GHz	5 GHz
$F_x > 1$ GHz	5 × F_x up to a maximum of 6 GHz

4.2.3. Test Procedure

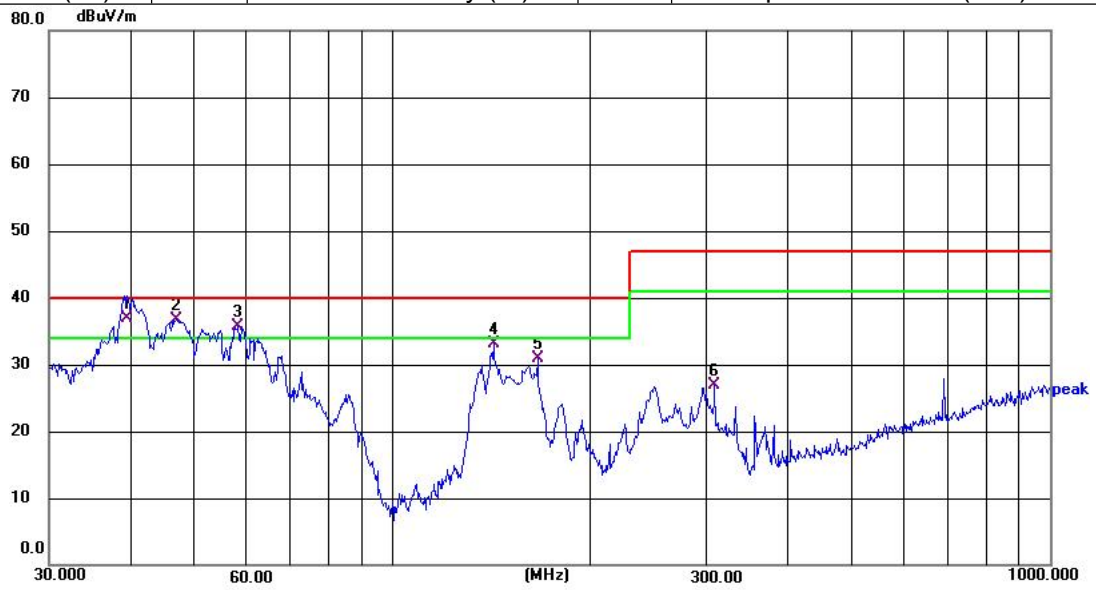
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The height of antenna is varied from 1 meter to 4 meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1GHz.

4.2.4. Test Results

PASS.

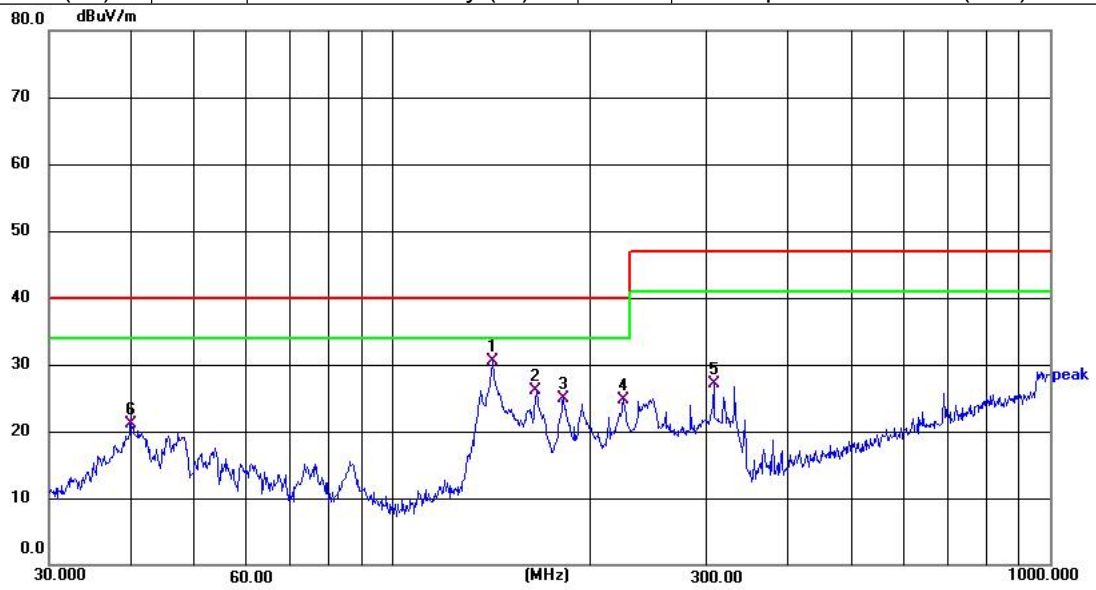
Please refer to the following pages of the worst case:

M/N		:	210			
Test Mode		:	Mode 1			
Test Phase		:	Vertical			
Test Voltage		:	DC 5V			
Temperature (°C):	23.7	Relative Humidity (%):		48	Atmospheric Pressure(kPa) :	101.6



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	39.4371	52.68	-15.78	36.90	40.00	-3.10	QP
2 !	46.8303	52.97	-16.21	36.76	40.00	-3.24	QP
3 !	58.2030	52.93	-17.22	35.71	40.00	-4.29	QP
4	142.3243	49.67	-16.57	33.10	40.00	-6.90	QP
5	166.0680	47.14	-16.22	30.92	40.00	-9.08	QP
6	308.9126	42.52	-15.53	26.99	47.00	-20.01	QP

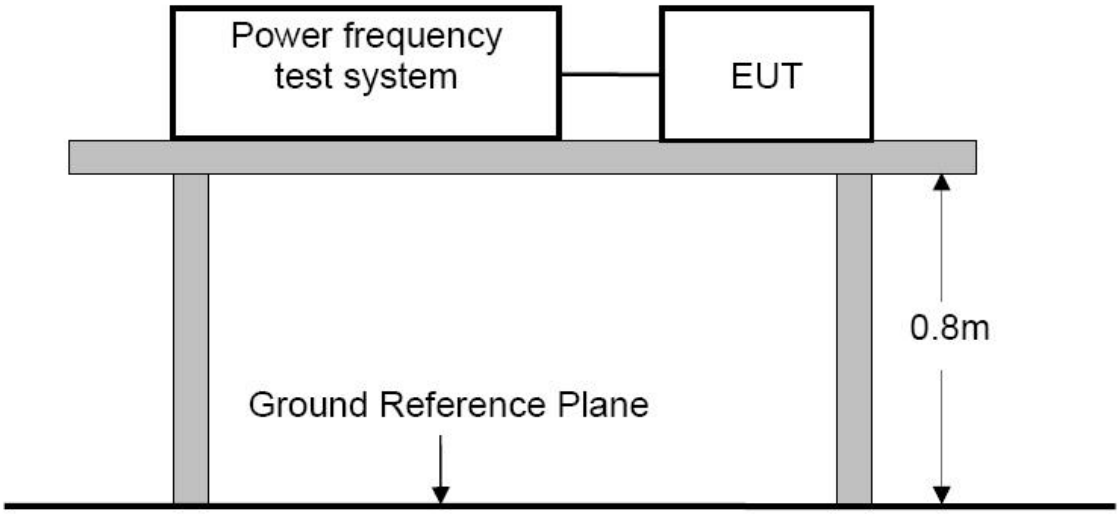
M/N		:	210			
Test Mode		:	Mode 1			
Test Phase		:	Horizontal			
Test Voltage		:	DC 5V			
Temperature (°C):	23.7	Relative Humidity (%):		48	Atmospheric Pressure(kPa) :	101.6



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	141.8262	47.15	-16.62	30.53	40.00	-9.47	QP
2	165.4866	42.33	-16.19	26.14	40.00	-13.86	QP
3	181.9202	43.15	-18.19	24.96	40.00	-15.04	QP
4	224.5193	43.73	-19.00	24.73	40.00	-15.27	QP
5	307.8313	42.61	-15.54	27.07	47.00	-19.93	QP
6	39.9942	36.83	-15.70	21.13	40.00	-18.87	QP

4.3. HARMONIC CURRENT EMISSIONS ON AC MAINS TEST

4.3.1. Block Diagram of Test Setup



4.3.2. Limits

Table 1 – Limits for Class A equipment

Harmonic order n	Maximum permissible harmonic current A
Odd harmonics	
3	2,30
5	1,14
7	0,77
9	0,40
11	0,33
13	0,21
$15 \le n \le 39$	$0,15 \frac{15}{n}$
Even harmonics	
2	1,08
4	0,43
6	0,30
$8 \le n \le 40$	$0,23 \frac{8}{n}$

Table 3 – Limits for Class D equipment

Harmonic order n	Maximum permissible harmonic current per watt mA/W	Maximum permissible harmonic current A
3	3,4	2,30
5	1,9	1,14
7	1,0	0,77
9	0,5	0,40
11	0,35	0,33
$13 \le n \le 39$ (odd harmonics only)	$\frac{3,85}{n}$	See Table 1

Table 2 – Limits for Class C equipment

Harmonic order n	Maximum permissible harmonic currrent expressed as a percentage of the input current at the fundamental frequency %
2	2
3	30 · λ *
5	10
7	7
9	5
11 ≤ n ≤ 39 (odd harmonics only)	3
* λ is the circuit power factor	

For the following categories of equipment limits are not specified in this edition of the standard.
Note 1: Equipment with a rated power of 75W or less, other than lighting equipment.

4.3.3. Test Procedure

The E.U.T. was put on the top of a wooden table 0.8m above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

The E.U.T. is classified as follows:
Class A:
Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment ,equipment not specified in one of the three other classes.
Class B:
Portable tools; Arc welding equipment which is not professional equipment.
Class C:
Lighting equipment.
Class D:
Equipment having a specified power less than or equal to 600W of the following types: Personal computers and personal computer monitors and television receivers.

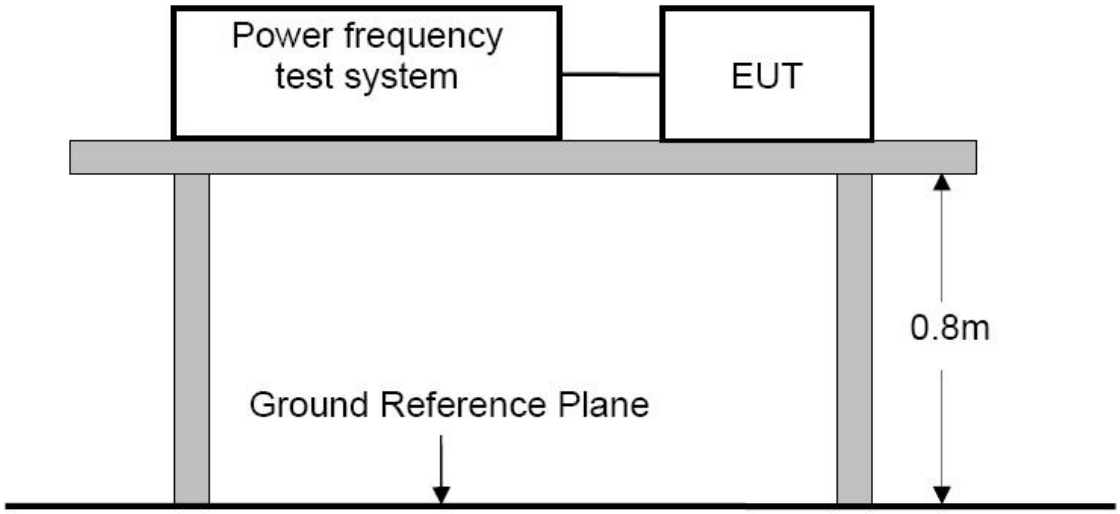
4.3.4. Test Results:

N/A.

This test item is not applicable to this application.

4.4. VOLTAGE FLUCTUATIONS AND FLICKER ON AC MAINS TEST

4.4.1. Block Diagram of Test Setup



4.4.2. Limits

Test Item	Limit
P_{st} (Short-term flicker indicator.)	1.0
P_{lt} (Long-term flicker indicator.)	0.65
$T_{d(t)}$(ms) (Maximum time that d(t) exceeds 3.3%)	500
d_{max}(%) (Maximum relative voltage change.)	4
d_c(%) (Relative steady-state voltage change)	3.3

4.4.3. Test Procedure

The E.U.T. was put on the top of a wooden table 0.8m above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.

4.4.4. Test Results

N/A.

This test item is not applicable to this application.

5. IMMUNITY TEST RESULT

5.1. DESCRIPTION OF PERFORMANCE CRITERIA:

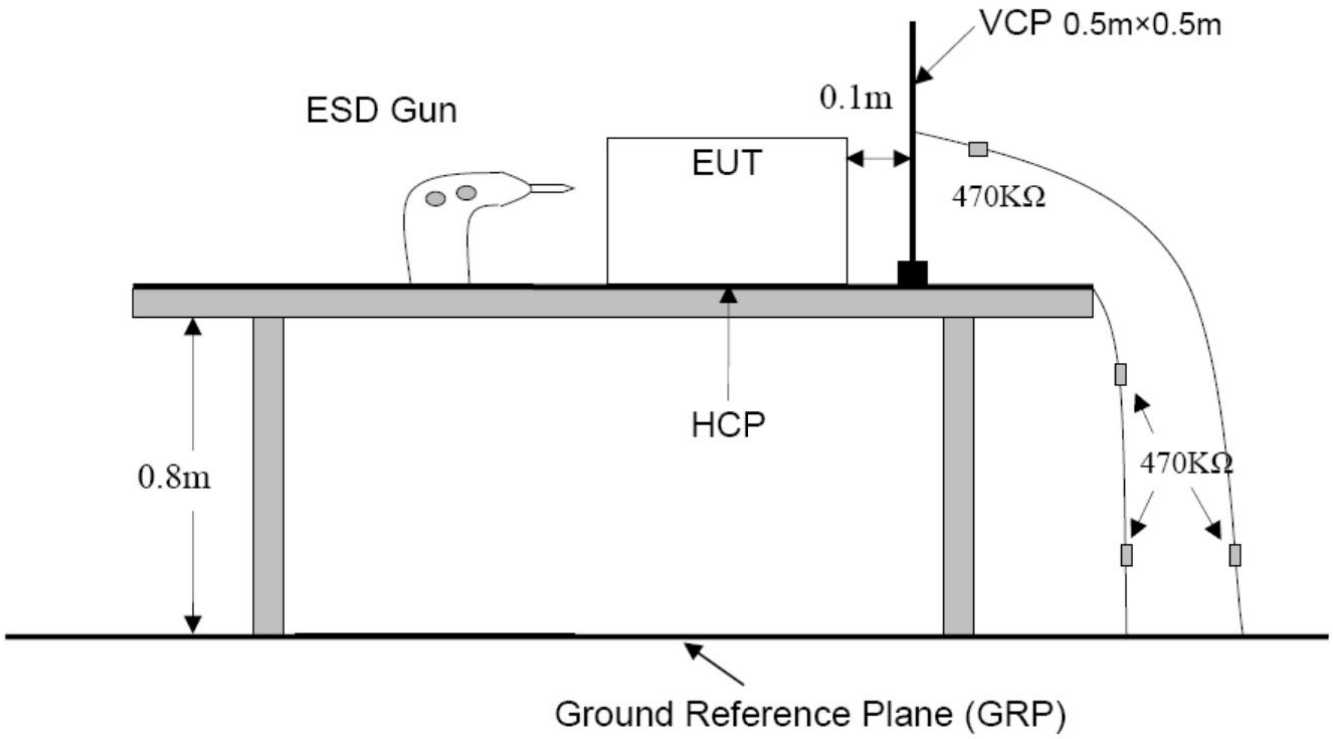
Performance criteria A
The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. 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 by what the user may reasonably expect from the equipment if used as intended.

Performance criteria 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. The performance level may be replaces by a permissible loss of performance.
During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. 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 by what the user may reasonably except from the equipment if used as intended.

Performance criteria 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. Functions, and/or information stored in non-volatile memory, or protected by a backup, shall not be lost.

5.2. ELECTROSTATIC DISCHARGE IMMUNITY TEST

5.2.1. Block Diagram of Test Setup



5.2.2. Test Standard and Severity Levels

Test Standard:

EN 55014-1：2021

(EN 61000-4-2: 2009 Air Discharge: Severity Level: 3, ± 8KV; Contact Discharge: Level: 2, ± 4KV)

Severity Levels:

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

5.2.3. Test Procedure

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 E.U.T.. After each discharge, the discharge electrode shall be removed from the E.U.T.. The generator is then re-triggered for a new single discharge and repeated (10 of each polarity) 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 Section Air Discharge except that the tip of the discharge electrode shall touch the E.U.T..

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 E.U.T. and 0.1m from the front of the E.U.T.. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

Indirect discharge for vertical coupling plane:

At least 10 single discharge (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 E.U.T.. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the E.U.T. are completely illuminated.

5.2.4. Test Results

PASS.

Please refer to the following page.

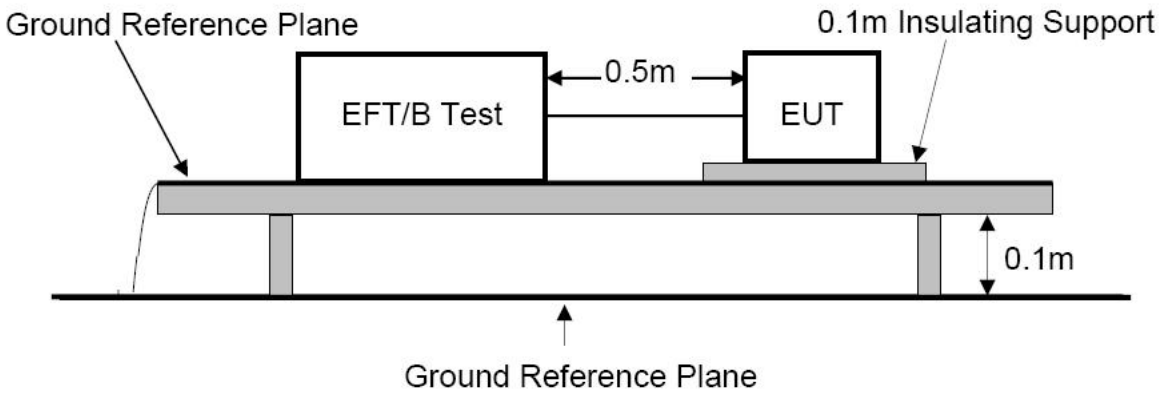
Ambient Condition:	Temp.: 24.1°C	R.H.: 51.3%	Air Pressure : 101.2kPa
Power Supply:	DC 5V	Required Performance Criterion : B	
Test level:	±2, 4 KV Contact Discharge; For each point positive 10 times and negative 10 times ±2, 4, 8 KV Air Discharge For each point positive 10 times and negative 10 times		
Tested mode:	Mode 1		

Test Point	Air Discharge	Contact Discharge	Performance Criterion	Result (Performance Criterion)
Enclosure	±8 KV	N/A	A	PASS
Slit	±8 KV	N/A	A	PASS
Surface metal	N/A	±4 KV	A	PASS
VCP	N/A	±4 KV	A	PASS
HCP	N/A	±4 KV	A	PASS

Note:N/A

5.3. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

5.3.1. Block Diagram of Test Setup



5.3.2. Test Standard and Severity Levels

Test Standard
EN 55014-2:2015(EN 61000-4-4: 2012, Severity Level, Level 2: 1KV)
Severity level

Open circuit output test voltage and repetition rate of the impulses				
Level	On power port, PE		On I/O (Input/Output) Signal data and control ports	
	Voltage peak KV	Repetition rate KHz	Voltage peak KV	Repetition rate KHz
1.	0.5	5 or 100	0.25	5 or 100
2.	1.0	5 or 100	0.5	5 or 100
3.	2.0	5 or 100	1.0	5 or 100
4.	4.0	5 or 100	2.0	5 or 100
X	Special	Special	Special	Special

Note 1 Use of 5 KHz repetition rates is traditional; however, 100 KHz is closer to reality. Product committees should determine which frequencies are relevant for specific products or product types.
Note 2 With some products, there may be no clear distinction, between power ports and I/O ports, in which case it is up to product committees to make this determination for test purposes.
Note 3 "X" is an open level. The level has to be specified in the dedicated equipment specification.

5.3.3. Test Procedure

The E.U.T. is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the E.U.T. by at least 0.1m on all sides and the minimum distance between E.U.T. and all other conductive structure, except the ground plane beneath the E.U.T., shall be more than 0.5m.

For input and output AC power ports:

The E.U.T. 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 minus.

For signal lines ports:

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

For DC ports:

It’s unnecessary to test.

5.3.4. Test Results

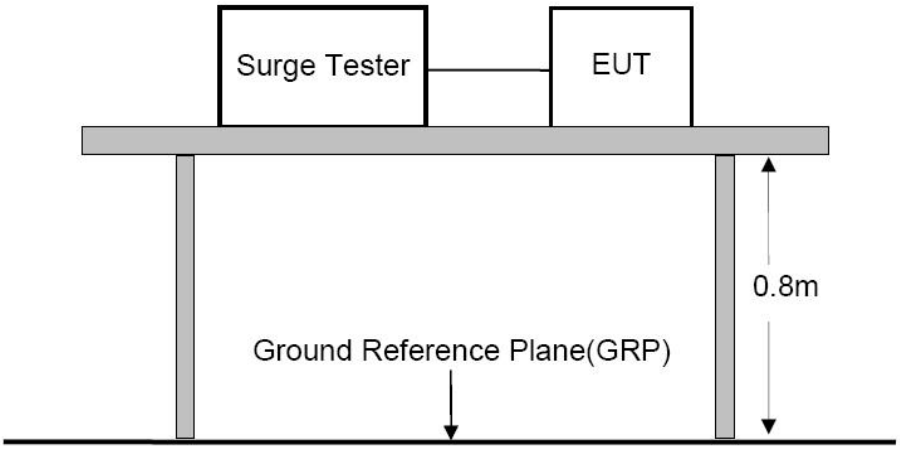
N/A.

This test item is not applicable to this application.

Ambient Condition:	Temp.: ℃	R.H.: %	Air Pressure: kPa
Power Supply:		Required Performance Criterion: B	
Test Specifications:	Repetition Frequency: 5kHz; Duration: 15ms; Period: 300ms		
Test mode:			
Line : □ AC Mains □ Signal line □ DC line Coupling : □ Direct □ Capacitive □ Capacitive			
Line	Test Voltage	Result (Performance Criterion)	
L	±1KV	N/A	
N	±1KV	N/A	
PE	±1KV	N/A	
L、N	±1KV	N/A	
L、PE	±1KV	N/A	
N、PE	±1KV	N/A	
L、N、PE	±1KV	N/A	
Signal line	0.5 KV	N/A	
DC line	0.5 KV	N/A	
Note:			

5.4. SURGE IMMUNITY TEST

5.4.1. Block Diagram of Test Setup



5.4.2. Test Standard and Severity Levels

Test Standard
EN 55014-2:2021(EN 61000-4-5: 2014, Severity Level: Line To Line, Level 2: 1.0KV, Line To Earth, Level 3: 2.0KV)
Severity level

Severity Level	Open-Circuit Test Voltage KV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

5.4.3. Test Procedure

1. Set up the E.U.T. and test generator as shown on Section 12.1.
2. For line to line coupling mode, provide a 1.0KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to E.U.T. selected points.
3. Five positive pulses Line-to-neutral at 90°phase,Five negative pulses Line-to-neutral at 270°phase. with a maximum 1/min repetition rate are conducted during test.
4. Different phase angles are done individually.
5. Record the E.U.T. operating situation during compliance test and decide the E.U.T. immunity criterion for above each test.

5.4.4. Test Results

N/A.
This test item is not applicable to this application.

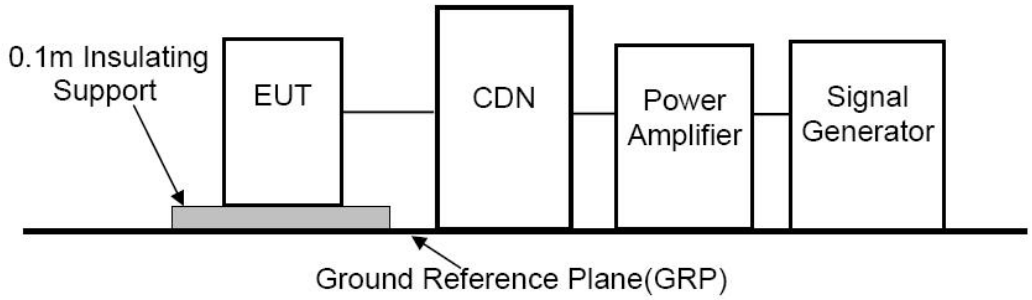
Ambient Condition:	Temp.: ℃	R.H.: %	Air Pressure: kPa
Power Supply:		Required Performance Criterion: B	
Test Specifications:	Voltage surge 1.2/50 us ; Current surge 8/20 us ; Five positive pulses Line-to-neutral at 90°phase, Five negative pulses Line-to-neutral at 270°phase.		
Test mode:	N/A		

Line	**Phase Angle**	**Test Voltage**	**Result** (Performance Criterion)
L-N	+90°	1KV	N/A
	-270°	1KV	N/A
L-PE	+90°	2KV	N/A
	-270°	2KV	
N-PE	+90°	2KV	N/A
	-270°	2KV	
Signal line	+90°	0.5KV	N/A
	-270°	0.5KV	
DC line	+90°	0.5KV	N/A
	-270°	0.5KV	

Note:Pass

5.5. INJECTED CURRENTS SUSCEPTIBILITY TEST

5.5.1. Block Diagram of Test Setup



5.5.2. Test Standard and Severity Levels

Test Standard
EN 55014-2:2021(EN 61000-4-6: 2014, 0.15MHz ~ 230MHz)
Severity level

Level	Field Strength V/m
0.15-230MHz	3

Note*: Where the amplitude of a test level varies over a given frequency range, it changes linearly with respect to the logarithm of the frequency.

5.5.3. Test Procedure

1. Set up the E.U.T., CDN and test generators as shown on Section 5.6.1.
2. Let the E.U.T. work in test mode and measure it.
3. The E.U.T. 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 about 0.3m from E.U.T.. Cables between CDN and E.U.T. 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 E.U.T. through CDN.
5. The E.U.T. operates within its operational mode(s) under intended climatic conditions after power on.
6. The frequency range is swept from 150 KHz to 230 MHz 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 $1.5*10^{-3}$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 E.U.T. operating situation during compliance testing and decide the E.U.T. immunity criterion.

5.5.4. Test Results

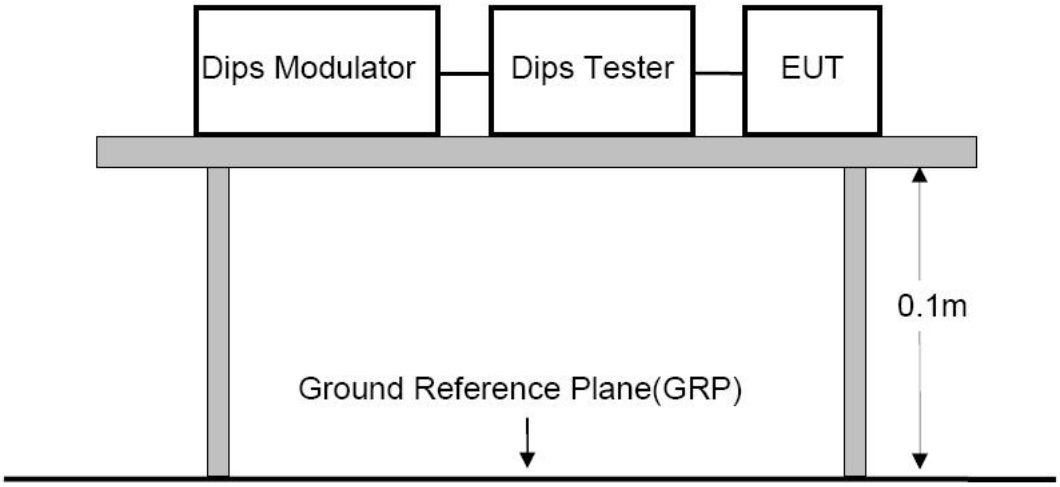
N/A.

This test item is not applicable to this application.

Ambient Condition:	Temp.: ℃	R.H.: %	Air Pressure: kPa
Power Supply:		Required Performance Criterion: A	
Test Specifications:	Modulation : 1KHz, 80%AM, Step Size : 1%, Dwell Time : 1s		
Test mode:			
Test Port	Frequency (MHz)	Level(V)	Result (Performance Criterion)
AC Mains	0.15~230	3	N/A
Note:			

5.6. VOLTAGE DIPS AND SHORT INTERRUPTIONS IMMUNITY TEST

5.6.1. Block Diagram of Test Setup



5.6.2. Test Standard and Severity Levels

Test Standard
EN 55014-2:2021(EN 61000-4-11: 2004)
Severity level

Test Level %U_T	Voltage dip and short interruptions %U_T	Duration (in period)
0	100	0.5 1 10 12 25 30
60	40	
30	70	

5.6.3. Test Procedure

1. Set up the E.U.T. and test generator as shown on Section 5.7.1.
2. The interruptions is introduced at selected phase angles with specified duration.Record any degradation of performance.

5.6.4. Test Results

N/A.

This test item is not applicable to this application.

Ambient Condition:	Temp.: ℃	R.H.: %	Air Pressure: kPa
Power Supply:		Required Performance Criterion: B & C	
Test Specifications:	0%UT, 0.5Cycle; 60%UT, 10/12Cycle; 30%UT,25/30Cycle		
Test mode:			
Test Level % UT	Duration (in period)	Result (Performance Criterion)	
0	0.5P	N/A	
60	10/12P	N/A	
30	25/30P	N/A	
Note :			

6. PHOTOGRAPHS OF THE EUT

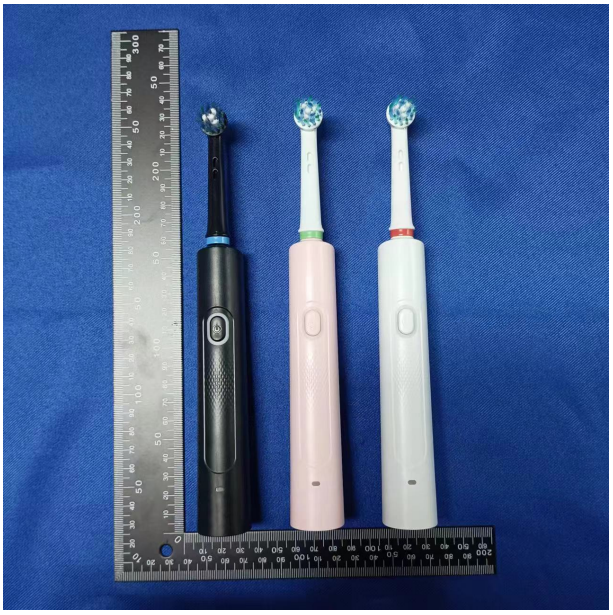


Figure 1. Overall view of unit

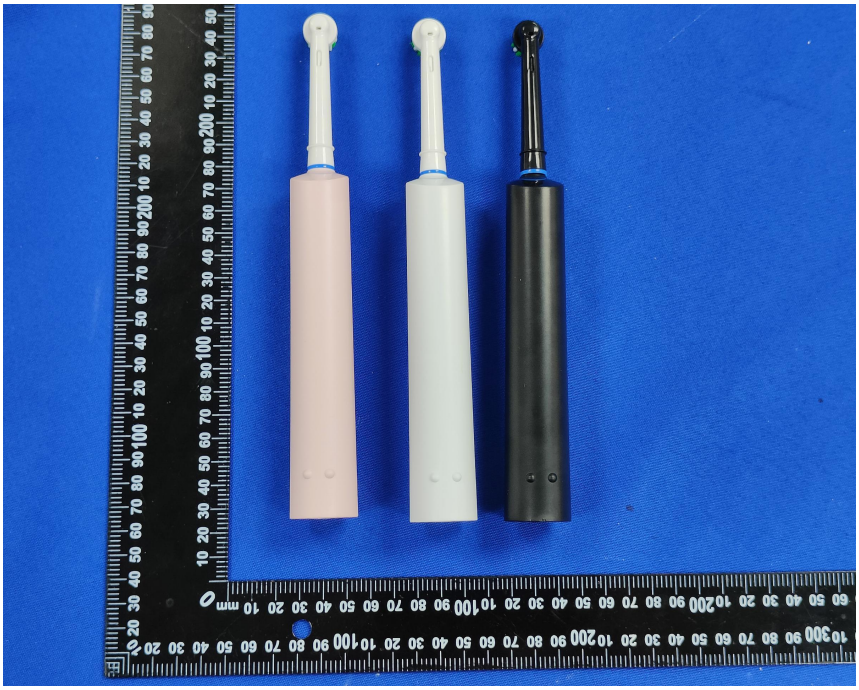


Figure 2. Overall view of unit

Figure 3. Overall view of unit

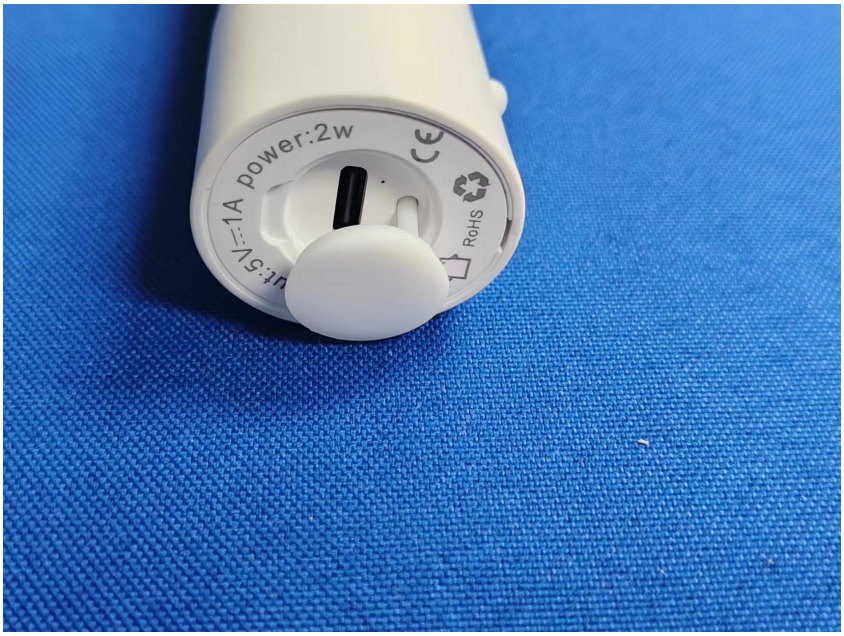


Figure 4. Overall view of unit

--END--

Certificate No. 24CTZ04026S02

VERIFICATION OF CONFORMITY

Applicant	:	Shenzhen Sinco Technology Co., Limited.
Address	:	9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.
Manufacture	:	Shenzhen Sinco Technology Co., Limited.
Address	:	9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.
Product	:	Electric toothbrush
Model No.	:	210
Trade Mark	:	--
Power Rating	:	Input: 5V⎓1A
Standard(s)	:	EN 60335-2-52:2003 + A11: 2010+ A1: 2008 used in conjunction with EN 60335-1:2012 + A11: 2014
Report No.	:	CTZ2404026SEN02

The EUT described above has been tested by us with the listed standards and found in compliance with the council LVD **directive 2014/35/EU**.It is possible to use CE marking to demonstrate the compliance with this LVD Directive. It is only valid in connection with the test report number: CTZ2310020SEN01.

CE

Allen Zou / Manager

Date of Issue: 2024-04-18

This certificate is part of the full test report(s) and should be read in conjunction with it. This certificate is based on an evaluation of one sample of above mentioned product. It does not imply assessment of the production of the product. This certificate is not permitted to be reproduced, except in full. The CE marking may only be used if all the relevant and effective European Directives are applicable.

Dongguan Zhongzhengtong Testing Technology Co., Ltd.
Room 206 and Room 208, No. 8, Guancheng Section, Guanlong Road, Guancheng Street, Dongguan, Guangdong, China
TEL: (+86)769-22261862

TEST REPORT
EN 60335-2-52
Household and similar electrical Appliances – Safety –
Part 2-25: Particular requirements for oral hygiene appliances

Report Number.....:	CTZ2404026SEN02
Date of issue .....:	Apr. 18, 2024
Testing Laboratory .....:	Dongguan Zhongzhengtong Testing Technology Co., Ltd.
Address.....:	Room 206 and Room 208, No. 8, Guancheng Section, Guanlong Road, Guancheng Street, Dongguan, Guangdong, China
Applicant's name:	Shenzhen Sinco Technology Co., Limited.
Address.....:	9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.
Test specification	
Standard .....:	EN 60335-2-52:2003 + A11: 2010+ A1: 2008 used in conjunction with EN 60335-1:2012 + A11: 2014
Test procedure .....:	CE-LVD
Non-standard test method .....:	N/A
Test Report Form	
Test Report Form No. .....:	EN 60335_1V
Test Report Form(s) Originator .....:	
Master TRF .....:	Dated 2014-02

Test item description.....:	Electric toothbrush
Trademark .....:	N/A
Manufacturer.....:	Shenzhen Sinco Technology Co., Limited.
Address.....:	9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.
Model/Type reference .....:	210
Ratings.....:	Input: 5V⎓1A

Testing procedure and testing location:	Dongguan Zhongzhengtong Testing Technology Co., Ltd. Room 206 and Room 208, No. 8, Guancheng Section, Guanlong Road, Guancheng Street, Dongguan, Guangdong, China
Tested by (name + signature) .....:	Arthur Liu
eviewed by (name + signature) .....:	Iverson Rao
Approved by (name + signature) .....:	Allen Zou

List of Attachments (including a total number of pages in each attachment):

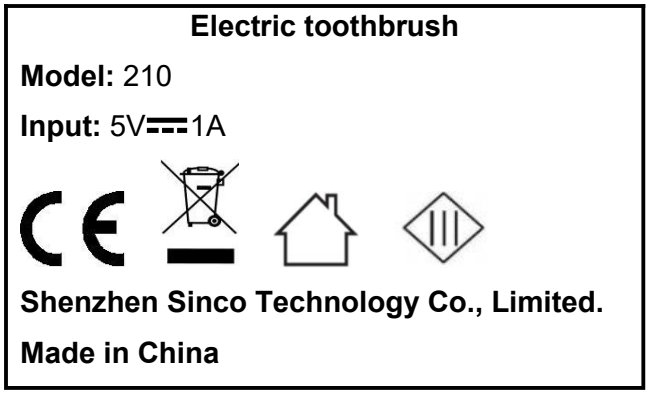
1. Photos: pages 56 to 59

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
EN 60335-2-52:2003 + A11: 2010+ A1: 2008 used in conjunction with EN 60335-1:2012 + A11: 2014 The submitted samples were found to comply with the requirements of above specification.	Dongguan Zhongzhengtong Testing Technology Co., Ltd. Room 206 and Room 208, No. 8, Guancheng Section, Guanlong Road, Guancheng Street, Dongguan, Guangdong, China

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.(Additional requirements for markings. See 1.7 NOTE)



Remark on above marking:

1, The height of CE symbols is more than 5 mm;

2, The height of WEEE symbols is more than 7 mm;

Test item particulars.....:	
Classification of installation and use .....:	Portable devices
Supply Connection .....:	Portable appliance for household
Possible test case verdicts:	
- test case does not apply to the test object .....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing..... :	
Date of receipt of test item..... :	Apr. 11 , 2024
Date (s) of performance of tests .....:	Apr. 11 , 2024 - Apr. 18, 2024

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....:	☐ **Yes** ☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

General product information:

1. The equipment is a Electric toothbrush,Portable appliance for household and indoor use only.
2. The test results in the report only apply to the tested sample.

EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
4	**GENERAL REQUIREMENT**		**P**
	Appliance shall be constructed so that in normal use they function safely so as to cause no danger to persons or surroundings, even in the event of carelessness that may occur in normal use		P
	In general this principle is achieved by fulfilling the relevant requirements specified in this standard and compliance is checked by carrying out all the relevant tests		P
5	**GENERAL CONDITIONS FOR THE TESTS**		**---**
	Unless otherwise specified, the tests are carried out in accordance with this clause		P
5.1	Tests according to this standard are type tests		P
5.2	Tests are carried out on a single appliance that shall withstand all the relevant tests		P
5.3	The tests are carried out in the order of the clauses		P
5.4	When testing appliances that are also supplied by other energies such as gas, the influence of their consumption has to be taken into account	No such construction	N
5.5	The tests are carried out with the appliance placed in the most unfavourable position that may occur in normal use.		P
5.6	If the setting can be altered by the user, tests shall be adjusted to their most unfavourable setting		P
5.7	Tests are carried out at a temperature of 20℃±25℃		P
5.8.1	For a.c. only, tested at rated frequency		N
5.8.2	For a.c./d.c., tested at the most unfavourable supply		P
5.8.3	For heating appliance, it operated at rated power input range		N
5.8.4	For appliances marked with a rated voltage range and rated power input		P
5.9	Alternative heating elements, the appliance is tested in the most unfavourable results		N
5.10	The tests are carried out on the appliance as supplied		P
5.11	Flexible cord appliance are tested with the appropriate flexible cord connected to the appliance		N
5.12	For heating appliance, only to heating elements without appreciable positive temperature coefficient of resistance		N

EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
5.13	Appliance with PTC heating elements are carried out at a voltage corresponding to the specified power input	No such PTC heating elements	N
5.14	If class 0l appliance or class I appliance have accessible metal parts that are not earthed, such parts are checked for class II construction	Class III Construction for Electric Toothbrush	N
5.15	If appliance have parts operating at safety extra- low voltage, such parts are checked for class III construction	Class III Construction for Electric Toothbrush	P
5.16	When testing electronic circuits, the supply is to be free from perturbations		N
5.17	Appliance powered by rechargeable batteries are tested in accordance with annex B		P
5.18	If liner and angular dimensions are specified without a tolerance, ISO2768-1 is applicable		P
6	**CLASSIFICATION**		---
6.1	Protection against electric shock: Class II, III	Class III	P
6.2	Class II appliances shall be at least IPX7 except that parts intended to be fixed, and transformers with pins for insertion into socket-outlets, shall be at least IPX4.		N
	Class III appliances shall be at least IPX4. However, if the rated voltage does not exceed 24 V, they may be IPX0.	IPX7	P
7	**MARKING**		---
7.1	Rated voltage or voltage range (V)	5VDC	P
	Single-phase appliances: 230 V covered (EN60335-1)		N
	Multi-phase appliances: 400 V covered (EN60335-1)		N
	Nature of supply		N
	Rated frequency or frequency range (Hz)		N
	Rated input or rated current		N
	Manufacturer's or responsible vendor's name, trademark or identification mark	See marking Label	P
	Model or type reference	See marking Label	P
	Symbol for Class II		N
	IP number	IPX7	P

EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
7.2	Warning for stationary appliances	Not stationary appliance	N
	Warning placed in vicinity of terminal cover		N
7.3	Range of rated values correctly marked		N
7.4	Voltage setting clearly discernible	No such setting	N
7.5	Marking of rated input for each rated voltage		N
	The power input is related to the mean value of the rated voltage range		N
	Marking for upper and lower limits of rated input		N
7.6	Correct symbols used		P
7.7	Correct connection diagram, fixed to the appliance	No connection diagram	N
7.8	Not for type Z attachment:		N
	- marking of terminals for the neutral conductor(N)		N
	- marking of protective earthing terminals		N
	- marking not placed on removable parts		N
	- marking of terminal for single-pole protective device		N
7.9	Marking or placing of switches which may cause a hazard		N
7.10	Indications of switches and regulating devices by use of figures, letters or other		P
	The figure 0 indicates only OFF position, unless no confusion with the OFF position		N
7.11	Indication for direction of adjustment of controls		N
7.12	Instructions for safe use provided	See installation instructions	P
	Statement in the instructions that the appliance must be disconnected from the supply		N
	This appliance is intended to be used in household and similar applications as:		P
	- staff kitchen areas in shops, offices and other working environments		N
	- farm houses		N
	- by clients in hotels, motels and other residential type environments		N
	- bed and breakfast type environments		N
7.12.1	The installation instructions shall state that parts that have to be fixed must be fixed so that they cannot fall into water, unless they are of IPX7 construction.(EN60335-2-52)	See installation instructions	P
7.12.2	Means for disconnection with contact separation at least 3 mm		N
	Stationary appliance with supply cord and plug: statement in the instructions that the appliance is so positioned that the plug is accessible		N
7.12.3	Insulation in contact with parts exceeding 50 K; instruction		P

EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
7.12.4	information with regard to built-in:	Not built-in appliance	N
	- dimensions of space		N
	- dimensions and position of support		N
	- ventilation openings		N
	- connection/interconnection plug accessible		N
7.12.5	Replacement cord, type X attachment		N
	Replacement cord, type Y attachment		N
	Replacement cord, type Z attachment		N
7.13	Instructions and other texts in an official language	English	P
7.14	Marking easily legible and durable	After testing, legible and durable	P
7.15	Marking on a main part	On the enclosure	P
	Marking clearly discernible from the outside		P
	Stationary appliance: name or trademark and model or type reference visible after installation		N
	Indication for switches and controls in vicinity of components; not on removable parts if misleading	Not make a misleading	N
7.16	Marking of a possible replaceable thermal link or fuse link clearly visible with regard to replacing the fuse link		N
8	**PROTECTION AGAINST ACCESS TO LIVE PARTS**		---
8.1	Adequate protection against accidental contact with live parts		P
8.1.1	All positions; detachable parts removed		P
	Removal of lamps: protection against contact with live parts	No such lamps	N
	Use of test finger: no contact with live parts	No hazards	P
8.1.2	Use of test probe 13 of IEC 61032 through openings in class 0 appliances and class II appliances: no contact with live parts		N
8.1.3	Use of test probe 41: no contact with live parts of visible glowing heating elements		N
8.1.4	Accessible part not considered live if:		N
	- extra-low a.c. voltage: peak values not exceeding 42,4 V		N
	- extra-low d.c. voltage: not exceeding 42,4 V		N
	- or separated from live parts by protective impedance, d.c. current not exceeding 2 mA		N
	- or separated from live parts by protective impedance, a.c. peak value not exceeding 0,7 mA		N
	- for peak value 42,4 V up to and including 450 V capacitance not exceeding 0,1 µF		N
	- for peak value 450 V up to and including 15 kV capacitance not exceeding 0,1 µF		N

EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
8.1.5	Live parts protected at least by basic insulation before installation or assembly: checked by inspection and the test of 8.1.1:		N
	- built-in appliances		N
	- fixed appliances		N
	- separate units		N
8.2	Class II appliances and constructions adequately protected against accidental contact with basic insulation and metal parts separated from live parts with only basic insulation		N
	Only possible to touch parts separated from live parts by double or reinforced insulation		N
10	**POWER INPUT AND CURRENT**		---
10.1	Power input at rated voltage and normal operating temperature not deviating from rated input by more than shown in table; measured power input (W); rated input (W); deviation	(see appended table10)	P
10.2	Current at normal operating temperature not deviating from rated current by more than shown in table; measured current at rated voltage under normal operation (A); rated current (A); deviation		N
11	**HEATING**		---
11.1	No excessive temperatures in normal use	Comply with requirements	P
11.2	Placing and mounting of appliance as described:		P
	- built-in		N
	- against a wall		N
	- suspended in still air		N
	- on the table		P
	- fixed to a ceiling		N
	- on its stand		N
11.3	Temperature rises determined by thermocouples or resistance method	By thermocouples method	P
	Temperature rises of windings determined by resistance method, unless		N
	The windings makes it determined by resistance method, unless		N
11.4	Heating appliances operated under normal operation at 1,15 times rated power input		N

EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
11.5	Motor operated appliances are operated under normal operation ,supply voltage at most unfavourable voltage between 0,94 and 1,06 times rated voltage		N
11.6	Combined appliances operated under normal operation at most unfavourable voltage between 0,94 and 1,06 times rated voltage	(see appended table 11.8)	P
11.7	Appliances are operated for five cycles, each cycle comprising an operating period of 3 min and a rest period of 1 min. During the rest period, the reservoir of oral irrigators is refilled.		N
11.8	Protective devices do not operate, however components in protective electronic circuits are allowed ti operate.		P
	Sealing compound not flowing out		P
	Temperatures not exceeding values in table 3	(see appended table 11.8)	P
13	**LEAKAGE CURRENT**		**P**
13.1	Leakage current not excessive and electric strength adequate		N
13.2	Leakage current measured by means of circuit described in Annex G		N
	Leakage current measurements		N
13.3	Electric strength test of insulation		N
	No breakdown during the test		N
14	**TRANSIENT OVERVOLTAGES**		**--**
	Impulse voltage test for each clearance having a value less than those specified in table 16.		N
	Impulse test voltage is specified in table 6 for rated impulse voltage given in table 15.		N
15	**MOISTURE RESISTANCE**		**P**
15.1	Enclosure provides the degree of moisture protection according to classification of appliance	IPX7	P
15.1.1	Appliance subjected to test as specified		P
	Withstand electric strength test specified in 16.3		P
	No trace of water on insulation which can result in a reduction of distances and clearances below values specified in 29.1		N
15.1.2	Hand-held appliance turned continuously through the most unfavourable positions during the test		N
	Built-in appliance installed according to the instruction		N
	Other appliances tested as specified		N
15.2	Spillage of liquid does not affect the electrical insulation		N

EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
	Appliances with type X attachment fitted with a flexible cord as described		N
	Appliances incorporating an appliance inlet tested with or without an connector, whichever is most unfavourable		N
	Detachable parts removed		N
	Overfilling test with additional amount of liquid, over a period of 1 min (l)		N
	Withstand electric strength test in 16.3		N
	No trace of water on insulation which can result in reduction of distances and clearances below values specified in 29.1		N
15.3	Humidity treatment for 48 h	25°C, 93%R.H., 48h	P
	Withstanding the test of Cl.16		P
16	**LEAKAGE CURRENT AND ELECTRIC STRENGTH**		**P**
16.1	No excessive leakage current and adequate insulation and electric strength (tests 16.2 and16.3)		P
16.2	Leakage current measurements		P
16.3	Electric strength tests (values in table 7)		P
17	**OVERLOAD PROTECTION OF TRANSFORMERS AND ASSOCIATED CIRCUITS**		**---**
	No excessive temperatures in transformer or associated circuits in event of short-circuits likely to occur in normal use		N
	Appliance supplied with 1,06 or 0,94 times rated voltage and the most unfavourable short-circuit or overload likely to occur in normal use applied		N
	Temperature rise of insulation of the conductors of safety extra-low voltage circuits not exceeding the relevant value specified in table 3 by more than 15 K		N
	Temperature of the winding not exceeding the value specified in table 6		N
	Fail-safe transformers complying with sub-clause 15.5 of IEC 61558-1		N
19	**ABNORMAL OPERATION**		**---**
19.1	Class II oral irrigators are also subjected to the test of 19.101.(EN60335-2-52)		N
19.2	The test is carried out without water in the reservoir. (EN60335-2-52)		--
19.3	Test of 19.2 repeated; test voltage (V): power input of 1,24 times rated power input		N
19.4	Test conditions as in Cl. 11, the power input being 1,15 times rated power input, any control limiting the temperature during tests of Cl. 11 short-circuited		N

EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
19.5	Test of 19.4 repeated on Class 0I and I appliances with tubular sheathed or embedded heating elements. No short-circuiting, but one end of the element connected to the elements sheath		N
	The test repeated with reversed polarity and the other end of the heating element connected to the sheath		N
	The testis not carried out on appliances intended to be permanently connected to fixed wiring and on appliances where an all-pole disconnection occurs during the test of 19.4.		N
	Appliance still operable and complying with 20.2		
	Appliance, other than Class III, withstands the electric strength test of 16.3, however, the test voltage being:		–
	- basic insulation for SELV: 500 V		
	- basic insulation: 1250 V		N
	- supplementary insulation: 1750 V		N
	- reinforced insulation: 3000 V		N
	The appliance does not undergo a dangerous malfunction, and		N
	no failure of protective electronic circuits, if the appliance is still operable		N
	Appliances tested with an electronic switch in the off position or in the stand-by mode, do not become operational		N
19.14	Appliances operated under the conditions of Clause 11. Contactors or relays contacts operating under the conditions of clause 11 short-circuited		N
19.15	For appliance incorporating a mains voltage selector switch, this switch is set to the lowest rated voltage position and the highest value of rated voltage is applied		N
19.101	The hose is punctured within the enclosure of the appliance at the most unfavourable location. Rubber hoses are punctured by means of a 0,8 mm diameter needle. Thermoplastic hoses are punctured by means of a 0,5 mm diameter heated needle, care being taken not to enlarge the hole. (EN60335-2-52)		N
	The appliance is operated as specified in Clause 11, but with water containing 1 % NaCl. During the last cycle of operation, the water pressure in the hose is increased to the maximum obtainable by blocking the water outlet. The pressure is then reduced to its normal value. (EN60335-2-52)		N

EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
	A vessel of insulating material is filled with the saline solution and the hand-held part of the appliance is immersed to a depth of approximately 100 mm. The appliance is operated without restricting the water flow until 30 s after the reservoir has emptied. During the test, the leakage current is measured, as specified in 13.2. It is measured between any pole of the supply and a rectangular stainless steel electrode, having dimensions approximately 250 mm x 50 mm, placed in the solution. (EN60335-2-52)		N
	The leakage current shall not exceed 0,5 mA. (EN60335-2-52)		N
20	**STABILITY AND MECHANICAL HAZARDS**		**---**
20.1	Adequate stability		N
	Tilting test through an angle of 10。(appliance placed on an inclined plane/horizontal plane); appliance does not overturn		N
	Tilting test repeated on appliances with heating elements, angle of inclination increased to 15。		N
	Possible heating test in overturned position; temperature rise does not exceed values shown in table 9		N
20.2	Moving parts adequately arranged or enclosed as to provide protection against personal injury		N
	Protective enclosures, guards and similar parts are non-detachable		N
	Adequate mechanical strength and fixing of protective enclosures		N
	Self-resetting thermal cut-outs and overcurrent protective devices not causing a hazard, if unexpectedly reclosed		N
21	**MECHANICAL STRENGTH**		**---**
21.1	Appliance has adequate mechanical strength and is constructed as to withstand rough handling	Comply with requirements	P
	No damage after three blows applied to various parts of the enclosure, impact energy 0,5 ± 0,04 J	0.5J, three blows, no hazards	P
	If necessary, supplementary or reinforced insulation subjected to the electric strength test of 16.3	After testing, no breakdown	P

	If necessary, repetition of groups of three blows on a new sample		N
21.2	Accessible parts of solid insulation have sufficient strength to prevent penetration by sharp implements		P
	EN 60335-2-52		
Clause	Requirement Test	Result - Remark	Verdict
	the insulation is tested as specified, unless		N
	the thickness of supplementary insulation is at least 1 mm and that of reinforced insulation is at least 2 mm.		N
22	**CONSTRUCTION**		**---**
22.1	Appliance marked with the first numeral of the IP system, relevant requirements of IEC 60529 are fulfilled	IPX7	P
22.2	Stationary appliance: means to provide all-pole disconnection from the supply provided, the following means being available:		N
	- a supply cord fitted with a plug		N
	- a switch complying with 24.3		N
	- a statement in the instruction sheet that a disconnection incorporated in the fixed wiring is to be provided		N
	- an appliance inlet		N
	Single-pole switches and single-pole protective devices for the disconnection of heating elements in single-phase permanently connected class I appliances, connected in the phase conductor		N
22.3	Appliance provided with pins: no undue strain on socket-outlets		N
	Applied torque not exceeding 0,25 Nm		N
22.4	Appliance for heating liquids and appliance causing undue vibration not provided with pins for insertion into socket-outlets		N
22.5	No risk of electric shock when touching the pins of the plug		P
22.6	Electrical insulation not affected by condensing water or leaking liquid		N
	Class II appliances and class II constructions shall not be affected if hose ruptures or a seal leaks.		N
22.7	Appliances containing liquid or gases in normal use shall be against the risk of excessive pressure		N
22.8	Electrical connections not subject to pulling during cleaning of compartments to which access can be gained without the aid of a tool, and that are likely to be cleaned in normal use		P
22.9	Insulation, internal wiring, windings, commutators and slip rings not exposed to oil, grease or similar substances		P
	Adequate insulating properties of oil or grease to which insulation is exposed	No such parts	N

22.10	Location or protection of reset buttons of non-self-resetting controls is so that accidental resetting is unlikely		N
22.11	Reliable fixing of non-detachable parts that provide the necessary degree of protection against electric shock, moisture or contact with moving parts		P
EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
	Obvious locked position of snap-in devices used for fixing such parts		P
	No deterioration of the fixing properties of snap-in devices used in parts which are likely to be removed during installation or servicing		P
	Tests as describe		N
22.12	Handles, knobs etc. fixed in a reliable manner		N
	Fixing in wrong position of handles, knobs etc. indicating position of switches or similar components not possible		N
	Axial force 15 N applied to parts, the shape being so that an axial pull is unlikely to be applied		N
	Axial force 30 N applied to parts, the shape being so that an axial pull is likely to be applied		N
22.13	Unlikely that handles, when gripped as in normal use, make the operators hand touch parts having a temperature rise exceeding the value specified for handles which are held for short periods only		N
22.14	No ragged or sharp edges creating a hazard for the user in normal use, or during user maintenance		P
	No exposed pointed ends of self tapping screws etc., liable to be touched by the user in normal use or during user maintenance		P
22.15	Storage hooks and the like for flexible cords smooth and well-rounded		N
22.16	Automatic cord reels cause no undue abrasion or damage to the sheath of the flexible cord, no breakage of conductors strands, no undue wear of contacts	No such device	N
	Cord reel tested with 6000 operations, as specified		N
	Electric strength test of 16.3, voltage of 1000 V applied		N
22.17	Spacers not removable from the outside by hand or by means of a screwdriver or a spanner	No such construction	N
22.18	Current-carrying parts and other metal parts resistant to corrosion under normal conditions of use		N
22.19	Driving belts not used as electrical insulation		N
22.20	Direct contact between live parts and thermal insulation effectively prevented, unless material used is non-corrosive, non-hygroscopic and non-combustible		N
22.21	Wood, cotton, silk, ordinary paper and fibrous or hygroscopic material not used as insulation, unless impregnated		P

22.22	Asbestos not used in the construction of the appliance	No asbestos	P
22.23	Oils containing polychlorinated biphenyl (PCB) not used		N
22.24	Bare heating elements adequately supported		N
	In case of rupture, the heating conductor is unlikely to come in contact with accessible metal parts		N
EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
22.25	Sagging heating conductors cannot come into contact with accessible metal parts	No such parts	N
22.26	The insulation between parts operating at safety extra-low voltage and other live parts complies with the requirements for double or reinforced insulation		P
22.27	Parts connected by protective impedance separated by double or reinforced insulation	No such protective impedance	N
22.28	Metal parts of Class II appliances conductively connected to gas pipes or in contact with water: separated from live parts by double or reinforced insulation	No such construction	N
22.29	Class II appliances permanently connected to fixed wiring so constructed that the required degree of access to live parts is maintained after installation		N
22.30	Parts serving as supplementary or reinforced insulation fixed so that they cannot be removed without being seriously damaged, or		N
	so constructed that they cannot be replaced in an incorrect position, and so that if they are omitted, the appliance is rendered inoperable or manifestly incomplete		N
22.31	Creepage distances and clearances over supplementary and reinforced insulation not reduced below values specified in 29.1 as a result of wear		N
	Creepage distances and clearances over supplementary or reinforced insulation not reduced to less than 50% of values specified in 29.1 if wires, screws etc. becomes loose		N
22.32	Supplementary and reinforced insulation designed or protected against deposition of dirt or dust		N
	Ceramic material not tightly sintered, similar material or beads alone not used as supplementary or reinforced insulation		N
	Supplementary insulation of natural or synthetic rubber resistant to ageing, or arranged and dimensioned so that creepage distances are not reduced below values specified in 29.1		N
	Oxygen bomb test at 70 °C for 96 h and 16 h at room temperature		N
	Insulating material in which heating conductors are embedded is considered to be basic insulation and not reinforced insulation		N

22.33	Conductive liquids that are or may become accessible in normal use are not in direct contact with live parts		N
	Electrodes not used for heating liquids		N
	Conductive liquids are not in direct contact with basic insulation or reinforced insulation in Class II constructions		N
EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
	Conductive liquids in direct contact with live parts shall not be in contact with reinforced insulation for Class II constructions		N
22.34	Shafts of operating knobs, handles, levers etc. not live, unless the shaft is not accessible when the part is removed		N
22.35	Handles, levers and knobs, held or actuated in normal use, not becoming live in the event of an insulation fault		N
	Such parts being of metal, and their shafts or fixings are likely to become live in the event of an insulation fault, they are either adequately covered by insulation material, or their accessible parts are separated from their shafts or fixings by supplementary insulation		N
	This requirement does not apply to handles, levers and knobs on stationary appliances other than those of electrical components, provided they are either reliably connected to an earthing terminal or earthing contact, or separated from live parts by earthed metal		N
22.36	Hand-held parts shall be class III construction having a working voltage not exceeding 24 V. (EN60335-2-52)		P
22.37	Capacitors in Class II appliances not connected to accessible metal parts, unless complying with 22.42		N
	Metal casings of capacitors in Class II appliances separated from accessible metal parts by supplementary insulation, unless complying with 22.42		N
22.38	Capacitors not connected between the contacts of a thermal cut-out		N
22.39	Lamp holders only used for the connection of lamps		N

22.40	Motor-operated appliances and combined appliances, intended to be moved while in operation or which have accessible moving parts, are fitted with a switch to control the motor		N
	The actuating member of this switch easily visible and accessible		N
22.41	Mercury switches mounted according to the requirement	No mercury components	P
22.42	Protective impedance consisting of at least two separate components	No such protective impedance	N
EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
	Values specified in 8.1.4 not exceeded if any one of the components is short-circuited or open-circuited		
22.43	Appliances adjustable for different voltages, accidental changing of the setting of the voltage unlikely to occur	No such device	N
22.44	Appliance enclosure not shaped and decorated so that the appliance is likely to be treated as a toy by children		P
22.45	When air is used as reinforced insulation. Due to deformation as a result of an external force applied to the enclosure, shall not be reduced below the values specified in 29.1.3.		N
22.46	Software used in protective electronic circuits is software class B or C		N
22.47	Appliances connected to the water mains withstand the water pressure expected in normal use		N
	No leakage from any part, including any inlet water hose		N
22.48	Appliances connected to the water mains constructed to prevent backsiphonage of non- potable water		N
22.49	For remote operation, the duration of operation shall be set before the appliance can be started unless the appliance switches off automatically at the end of a cycle or it can operate continuously without giving rise to a hazard.		N
22.50	Controls incorporated in the appliance, if any, shall take priority over controls actuated by remote operation		N
22.51	A control on the appliance shall be manually adjusted to the setting for remote operation before the appliance can be operated in this mode		N

22.52	Socket-outlets on appliances accessible to the user shall be in accordance with the socket-outlet system used in the country in which the appliance is sold.	No socket-outlets.	N
22.101	Class II appliances shall be constructed so that parts intended to be fixed can be fixed securely, unless they are classified at least IPX7. (EN60335-2-52)		N
23	**INTERNAL WIRING**		**---**
23.1	Wire ways smooth and free from sharp edges		N
	EN 60335-2-52		
Clause	Requirement Test	Result - Remark	Verdict
	Wires protected against contact with burrs, cooling fins etc.		N
	Wire holes in metal well rounded or provided with bushings		N
	Wiring effectively prevented from coming into contact with moving parts		N
23.2	Beads etc. on live wires cannot change their position, and are not resting on sharp edges or corners		N
	Beads inside flexible metal conduits contained within an insulating sleeve		N
23.3	Electrical connections and internal conductors movable relatively to each other not exposed to undue stress		N
	Flexible metallic tubes not causing damage to insulation of conductors		N
	Open-coil springs not used		N
	Adequate insulating lining provided inside a coiled spring, the turns of which touch one another		N
	No damage after 10 000 flexings		N
	Electric strength test, 1000 V between live parts and metal parts		N
23.4	Bare internal wiring sufficiently rigid and fixed		N
23.5	The basic insulation of internal wiring withstanding the electrical stress likely to occur in normal use		N
	No breakdown when a voltage of 2000 V is applied for 15 min between the conductor and metal foil wrapped around the insulation		N
23.6	Sleeving used as supplementary insulation on internal wiring retained in position by positive means		N
23.7	Only the colour combination green/yellow used for earthing conductors		N
23.8	Aluminium wires not used for internal wiring		N
23.9	No lead-tin soldering of stranded conductors where they are subject to contact pressure, unless		N
	Clamping means so constructed that there is no risk of bad contact due to cold flow of the solder		N

23.10	The insulation and sheath of internal wiring for the supply of magnetic valves and similar components incorporated in external hoses at least equivalent to light polyvinyl chloride sheathed flexible cord (code designation 60227 IEC 52)		N
24	**COMPONENTS**		---
24.1	Components comply with safety requirements in relevant IEC standards		P
	List of components	(see appended table 24.1)	P
EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
	Components not tested and found to comply with relevant IEC standard for the number of cycles specified are tested in accordance with 24.1.1 to 24.1.6		P
	Components not tested and found to comply with relevant IEC standard, components not marked or not used in accordance with its marking, tested under the conditions occurring in the appliance		P
	Small lampholders: compliance with requirements for E10 lampholders		N
24.1.1	Capacitors likely to be permanently subjected to the supply voltage and used for radio interference suppression or for voltage dividing, complying with IEC 60384-14, or tested according to Annex F		N
24.1.2	Isolating transformers and safety isolating transformers comply with IEC 61558-2-6		N
	Safety isolating transformers tested with the appliance comply with Annex G		N
	Appliance couplers for IPx0 appliances: compliance with IEC 320		N
	Automatic controls: compliance with IEC 730, unless tested with the appliance		N
	Other appliance couplers: compliance with IEC 309		N
24.1.3	Switches: compliance with IEC61058, unless tested with the appliance		N
24.1.4	Automatic controls complying with IEC 730: additional tests according to this standard and 11.3.5 to 11.3.8 and Cl. 17 of IEC 730 as type 1 controls, the cycles of operation being:		---
	-thermostats: 10 000		N
	-temperature limiters: 1000		N
	- self-resetting thermal cut-outs: 300		N
	-non-self-resetting thermal cut-outs: 30		N
	- energy regulators: 10 000		N
	- timers: 3 000		N
24.1.5	The relevant standard for appliance couplers is IEC 60320-1. However,		N

	For appliances classified higher than IPX0, the relevant standard is IEC 60320-2-3.		N
	The relevant standard for interconnection couplers is IEC 60320-2-2.		N
	For appliance couplers incorporating thermostats, thermal cut-outs or fuse in the connectors, compliance with test of part 2.		N
EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
24.1.6	The relevant standard for small lampholders similar to E10 lampholders is IEC 60238, the requirements for E10 lampholders being pplicable. However, they need not accept a lamp with an E10 cap complying with the current edition of Standard Sheet 7004-22 of IEC 60061-1.		N
24.2	No switches or automatic controls in flexible cords		P
	No devices causing the protective device in the fixed wiring to operate in the event of a fault in the appliance		N
	No thermal cut-outs which can be reset by soldering		N
24.3	Switch intended for all-pole disconnection of stationary appliances is directly connected to the supply terminals, having a contact separation of at least 3 mm in each pole		N
24.4	Plugs and socket-outlets for heating elements and extra-low voltage circuits, not interchangeable with plugs, and	No such constructions	N
	socket-outlets or with connectors and appliance inlets complying with IEC 83 or IEC 320, respectively		N
24.5	Capacitors in auxiliary of motor shall be marked with their rated voltage and rated capacitance and shall be used in according with these marking.		N
	Capacitors in appliances for which 30.2.3 is applicable , are permanently connected in serials with motor winding shall be of class p1 or p2 of IEC 60252.		N
24.6	Motors connected to the supply mains and having inadequate basic insulation for the rated voltage of the appliance, comply with the requirements of Annex F		N
	The components are listed on an appended table		N

24.7	Hose-sets for connection of appliances to the water mains, complying with IEC 61770 and supplied with the appliance		N
24.8	Motor running capacitors in appliances for which 30.2.3 is applicable and that are permanently connected in series with a motor winding shall not cause a hazard in the event of a capacitor failure.		N
	The requirement is considered to be met by one or more of the following conditions:		--
	EN 60335-2-52		
Clause	Requirement Test	Result - Remark	Verdict
	– the capacitors are of class of safety protection P2 according to IEC 60252-1;		N
	– the capacitors are housed within a metallic or ceramic enclosure that will prevent the emission of flame or molten material resulting from failure of the capacitor;		N
	– the distance of separation of the outer surface of the capacitor to adjacent non-metallic parts exceeds 50 mm;		N
	– adjacent non-metallic parts within 50 mm of the outer surface of the capacitor withstand the needle-flame test of Annex E;		N
	– adjacent non-metallic parts within 50 mm of the outer surface of the capacitor are classified as at least V-1 according to IEC 60695-11-10, provided that the test sample used for the classification was no thicker than the relevant part of the appliance.		N
25	**SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CORDS**		**---**
25.1	Appliance not intended for permanent connection to fixed wiring, means for connection to the supply:		N
	- supply cord fitted with a plug		N
	- an appliance inlet having at least the same degree of protection against moisture as required for the appliance		N
	- pins for insertion into socket-outlets		N
25.2	Appliance not provided with more than one means of connection to the supply		N
	Stationary appliance for multiple supply may be provided with more than one means of connection, provided electric strength test of 1250 V for 1 min between each means of connection causes no breakdown		N
25.3	Connection of supply wires for appliance intended to be permanently connected to fixed wiring possible after the appliance has been fixed to		N

	its support		
	Appliance provided with a set of terminals for the connection of cables or fixed wiring, cross-sectional areas specified in 26.2		N
	Appliance provided with a set of terminals allowing the connection of a flexible cord		N
	Appliance provided with a set of terminals and cable entries, conduit entries, knock-outs or glands, allowing connection of appropriate type of cable or conduit		N
	EN 60335-2-52		
Clause	Requirement Test	Result - Remark	Verdict
25.4	Cable and conduit entries, rated current of appliance not exceeding 16 A, dimensions according to table 8		N
	Introduction of conduit or cable does not affect the protection against electric shock or reduce creepage distances and clearances below values specified in 29.1		N
25.5	Method for assemble supply cord with the appliance:		---
	- type X attachment		N
	- type Y attachment		N
	- type Z attachment, if allowed in part 2		N
	Type X attachment: specially prepared cord		N
	Type X attachment not used for flat twin tinsel cord		N
	Type X attachment is not allowed for appliances classified IPX7. Type Z attachment is allowed. (EN60335-2-52)		N
25.6	Plugs fitted with only one flexible cord		N
	Supply cords of single-phase portable appliances having a rated current not exceeding 16 A, provided with a plug complying with the following Standard Sheets of IEC 83		N
	- for Class I appliances: Standard Sheet C2b, C3b or C4		N
	- for Class II appliances: Standard Sheet C5 or C6		N
25.7	Appliance supply cord not lighter than:		N
	- rubber sheathed (at least 60245 IEC 53)		N
	- polychloroprene sheathed (at least 60245 IEC 57)		N
	- cross-linked polyvinyl chloride sheathed (at least 60245 IEC 87)		N
	Polyvinyl chloride sheathed: Not used if they are likely to touch metal parts having a temperature rise exceeding 75K during the test of Clause 11.		N

	- light polyvinyl chloride sheathed cord (at least 60227 IEC 52), appliances not exceeding 3 kg		P
	- ordinary polyvinyl chloride sheathed cord (IEC60227 IEC 53), appliance exceeding 3 kg		N
	Heat resistant polyvinyl chloride sheathed: Not used for type X attachment other than specially prepared cords.		--
	- Heat-resistant light polyvinyl chloride sheathed cord (at least 60227 IEC 56), appliances not exceeding 3 kg		N
	- heat-resistant polyvinyl chloride sheathed cord (60227 IEC 57), other appliances		N
25.8	Nominal cross-sectional area of supply cords according to table 9; rated current (A); cross-sectional area (mm²) …… ..... :		N
EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
25.9	Supply cord not in contact with sharp points or edges		N
25.10	The supply cord with green/yellow core for earthing terminals of class I appliance		N
25.11	Conductors of supply cords not consolidated by lead-tin soldering where they are subject to contact pressure, unless		N
	clamping means so constructed that there is no risk of bad contacts due to cold flow of the solder		N
25.12	Moulding the cord to part of the enclosure does not damage the insulation of the supply cord		N
25.13	Inlet opening provided with a bushing, or is so constructed, that there is no risk of damage to the supply cord when introduced		N
	Unless the enclosure at the inlet opening is of insulation material, a non-detachable lining or bushing complying with 29.3 for supplementary insulation provided		N
	If unsheathed supply cord, a similar additional bushing or lining is required, unless		N
	the appliance is class 0		N
25.14	Supply cords adequately protected against excessive flexing		N
	Flexing test; applied force (N); number of flexings:		N
	The test does not result in:		---
	- short-circuit between the conductors		N
	- breakage of more than 10% of the strands of any conductor		N
	- separation of the conductor from its terminal		N
	- loosening of any cord guard		N
	- damage, within the meaning of the standard, to the cord or the cord guard		N
	- broken strands piercing the insulation and becoming accessible		N

25.15	Conductors of the supply cord relieved from strain, twisting and abrasion by use of cord anchorages		N
	The cord cannot be pushed into the appliance to such an extent that the cord or internal parts of the appliance can be damaged		N
	Pull and torque test of supply cord, values shown in table 10: pull (N); torque (Nm) (not on automatic cord reel)		N
	Max. 2 mm displacement of the cord, and conductors not moved more than 1 mm in the terminals		N
25.16	Cord anchorages for type X attachments so constructed and located that:		N
	- replacement of the cord is easily possible		N
	- it is clear how the relief from strain and the prevention of twisting are obtained		N
	- they are suitable for different types of cord		N
EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
	- cord cannot touch the clamping screws of cord anchorage if these screws are accessible, unless separated from		N
	- accessible metal parts by supplementary insulation		N
	- the cord is not clamped by a metal screw which bears directly on the cord		N
	- at least one part of the cord anchorage securely fixed to the appliance, unless part of a specially prepared cord		N
	- screws which have to be operated when replacing the cord do not fix any other component, if applicable		N
	- if labyrinths can be bypassed the test of 25.15 is nevertheless withstood		N
	- for Class 0, 0I and I appliances: they are of insulating material or are provided with an insulating lining, unless a failure of the insulation of the cord does not make accessible metal parts live		N
	- for Class II appliances: they are of insulating material, or if of metal, they are insulated from accessible metal parts by supplementary insulation		N
25.17	Adequate cord anchorages for type Y and Z attachment		N
25.18	Cord anchorages only accessible with the aid of a tool, or		N
	so constructed that the cord only can be fitted with the aid of a tool		N
25.19	Type X attachment, glands not used as cord anchorage in portable appliances		N
	Tying the cord into a knot or tying the cord with string not used		N
25.20	Conductors of the supply cord for type Y and Z attachment adequately be additionally		N

25.21	Space for supply cable for fixed wiring or supply cord for type X attachment constructed to permit checking of conductors with respect to correct positioning and connection before fitting any cover, no risk of damage, no contact with accessible metal parts if a conductor becomes loose, etc.		N
	For portable appliances, the uninsulated end of a conductor prevented from any contact with accessible metal parts, unless the end of the cord is such that the conductors are unlikely to slip free		N
25.22	Appliance inlet:		---
	- live parts not accessible during insertion or removal		N
	- connector can be inserted without difficulty		N
	- the appliance is not supported by the connector		N
	- is not for cold conditions if temperature rise of external metal parts exceeds 75 K, unless the supply cord is not likely to touch such metal parts		N
EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict
25.23	Interconnection cords comply with the requirements for the max. current during the test of cl. 11. not by the rated current of appliance;		N
	Thickness of insulation of the conductor may reduce if voltage of conductor is less than the rated voltage.		N
	If necessary, electric strength test of 16.3		N
	Interconnection cords for parts of class III construction are not required to comply with the requirements for supply cords. (EN60335-2-52)		N
25.24	Interconnection cords not detachable without the aid of a tool		N
25.25	The dimensions of pin compatible with the dimensions of the relevant socket-outlet.		N
	Dimensions of the pin and engagement fact are to be in accordance with IEC 60083.		N
	- they are suitable for different types of cord		N
	- cord cannot touch the clamping screws of cord anchorage if these screws are accessible, unless separated from		N
	- accessible metal parts by supplementary insulation		N
	- the cord is not clamped by a metal screw which bears directly on the cord		N
	- at least one part of the cord anchorage securely fixed to the appliance, unless part of a specially prepared cord		N
	- screws which have to be operated when replacing the cord do not fix any other component, if applicable		N
	- if labyrinths can be bypassed the test of 25.15 is nevertheless withstood		N

	- for Class 0, 0I and I appliances: they are of insulating material or are provided with an insulating lining, unless a failure of the insulation of the cord does not make accessible metal parts live		N
	- for Class II appliances: they are of insulating material, or if of metal, they are insulated from accessible metal parts by supplementary insulation		N
26	**TERMINALS FOR EXTERNAL CONDUCTORS**		**---**
26.1	Appliance provided with terminals or equally effective devices for connection of external conductors		N
	Terminals only accessible after removal of a non-detachable cover		N
	However, earthing terminals may be accessible if a tool is required to make the connections and means are provided to clamp the wire independently from its connection.		N
	EN 60335-2-52		
Clause	Requirement Test	Result - Remark	Verdict
26.2	Appliances with type X attachment and appliances for connection to fixed wiring provided with terminals in which connection is made by means of screws, nuts or equally effective devices		N
	Screws and nuts serve only to clamp supply conductors, except		N
	Internal conductors, if so arranged that they are unlikely to be displaced when fitting the supply conductors		N
	The conductor soldered shall be positioned or fixed, reliance is not placed upon the soldering alone to maintain it in position.		N
	Soldering alone used, barriers provided, creepage distances and clearances satisfactory if the conductor becomes free		N
26.3	Terminals for type X attachment and those for connection to fixed wiring so fixed that when tightening or loosening the clamping means:		N
	- the terminal does not loosen		N
	- internal wiring is not subjected to stress		N
	- creepage distances and clearances are not reduced below the values in 29		N
26.4	Terminals for type X attachment, no special preparation of conductors required, and so constructed and placed that conductors prevented from slipping out, except those with a specially prepared cord and those for connection to fixed wiring		N
26.5	Terminals for type X attachment, when a wire of a stranded conductor escapes there is no risk .		N

	Stranded conductor test, 8 mm insulation removed		N
26.6	Terminals for type X attachment and for connection to fixed wiring suitable for connection of conductors with required cross-sectional area according to table 13; rated current (A); nominal cross-sectional area (mm²):		N
	Terminals only suitable for a specially prepared cord		N
26.7	Terminals for type X attachment shall be accessible after removal of a cover or part of the enclosure		N
26.8	Terminals for the connection to fixed wiring located close to each other, including the earthing terminal		N
26.9	Terminals of the pillar type constructed and located as specified		N
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Clause	Requirement Test	Result - Remark	Verdict
26.10	Terminals with screw clamping and screwless terminals shall not be used for the connection of the conductors of flat twin tinsel cords unless the ends of the conductors are fitted with means suitable for use with screw terminals		N
	Pull test of 5 N to the connection		N
26.11	For type Y and Z attachment: soldered, welded, crimped and similar connections used		N
	For Class II appliances: the conductor so positioned or fixed that reliance is not placed on soldering, welding or crimping alone		N
	For Class II appliances: soldering, welding or crimping alone used, barriers provided, creepage distances and clearances satisfactory if the conductor becomes free		N
27	**PROVISION FOR EARTHING**		**---**
27.1	Accessible metal parts of Class 0I and I appliances, permanently and reliably connected to an earthing terminal		N
	Earthing terminals not connected to neutral terminal		N
	Class 0, II and III appliance have no provision for earthing		N
	Safety extra-low voltage circuits not be earthed unless they are protective extra-low voltage circuits		N
27.2	Terminals used for the connection of external equipotential bonding conductors allow connection of conductors of 2,5 to 6 mm², and		N
	do not provide earthing continuity between different parts of the appliance		N
	Conductors cannot be loosened without the aid of a tool		N

	Clamping means adequately secured against accidental loosening		N
27.3	Current-carrying conductors become taut before earthing conductor, if the cord slips out of the cord anchorage		N
27.4	No risk of corrosion resulting from contact between metal of earthing terminal and other metal		N
	Adequate resistance to corrosion of coated or uncoated parts providing earthing continuity, other than parts of a metal frame or enclosure		N
	Parts of steel providing earthing continuity provided at the essential areas with an electroplated coating, thickness at least 5 µm		N
	Adequate protection against rusting of parts of coated or uncoated steel, only intended to provide or transmit contact pressure		N
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Clause	Requirement Test	Result - Remark	Verdict
	In case of aluminium alloys precautions taken to avoid risk of corrosion		N
27.5	Low resistance of connection between earthing terminal and earthed metal parts		N
	Resistance not exceeding 0,1 Ω at the specified low-resistance test		N
27.6	In hand-held appliances printed conductors of printed circuit boards not used to provide earthing continuity		N
	In other appliances at least two tracks are used with independent soldering points, and		N
	- at least two tracks are used with independent soldering points and the appliance complies with 27.5 for each circuit, and		N
	- the material of the printed circuit board complies with IEC 60249-2-4 or IEC 60249-2-5		N
28	**SCREWS AND CONNECTIONS**		**---**
28.1	Fixings and electrical connections withstand mechanical stresses		N
	Screws not of soft metal liable to creep, such as zinc or aluminium		N
	Diameter of screws of insulating material min. 3 mm		N
	Screws of insulating material not used for any electrical connection		N
	Screws transmitting electrical contact only screwing into metal		N
	Screws not of insulating material if their replacement by a metal screw can impair supplementary or reinforced insulation		N
	Type X attachment, screws to be removed for replacement of supply cord, or for users maintenance, not of insulating material if their replacement by a metal screw can impair basic insulation		N

	Screws and nuts transmitting contact pressure subjected to torque test as specified, applying torque as shown in table 14		N
	The test is not carried out on screws and nuts transmitting contact pressure for earthing continuity provided at least two screws or nuts are used		N
28.2	Contact pressure not transmitted through insulating material liable to shrink or distort, unless shrinkage or distortion compensated		N
	This requirement does not apply to electrical connections in circuits carrying a current not exceeding 0,5 A		N

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Clause	Requirement Test	Result - Remark	Verdict
28.3	Space-threaded (sheet metal) screws only used for the connection of current-carrying parts if they clamp these parts directly in contact with each other		N
	Thread-cutting (self-tapping) screws not used for electrical connection of current-carrying parts, unless generating a full form standard machine screw thread		N
	Thread-cutting (self-tapping) screws not used if they are likely to be operated by the user or installer unless the thread is formed by a swaging action		N
	Thread-cutting and space-threaded screws used provide earthing continuity:		N
	- it is not necessary to disturb the connection in normal use		N
28.4	Screws and nuts making mechanical connection between different parts of the appliance, and also making electrical connection or providing earthing continuity secured against loosening		N
	Rivets for current-carrying connections subject to torsion secured against loosening		N

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Clause	Requirement Test	Result - Remark	Verdict
29	**CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH INSULATION**		---
	Clearances, creepage distances and solid insulation withstand electrical stress		N
	For coatings used on printed circuits boards to protect the microenvironment (Type 1 coating) or to provide basic insulation (Type 2 coating), annex J applies.		N
	For coatings used on printed circuits boards to protect the microenvironment (Type A) or to provide basic insulation (Type B), annex J applies		N
	The microenvironment is pollution degree 1 under Type A coating		N
	No creepage distance or clearance requirements under Type B coating		N
29.1	Clearances not less than the values specified in table 16, taking into account the rated impulse voltage for the overvoltage categories of table 15, unless		N
	for basic insulation and functional insulation they comply with the impulse voltage test of clause 14		N
	However, if the construction is affected by wear, distortion, movement of the parts or during assembly, the clearances for rated impulse voltages of 1500V and above are increased by 0,5 mm and the impulse voltage test is not applicable		N
	Impulse voltage test not applicable:		N
	- when the microenvironment is pollution degree 3		N
	- for basic insulation of class 0 and class 01 appliances		N
	Appliances are in overvoltage category II		N
	Clearances less than specified in table 16 not allowed for basic insulation of class 0 and class 0I appliances,		N
	or if pollution degree 3 is applicable		N
	Compliance is checked by inspection and measurements as specified		N
29.1.1	Clearances of basic insulation be sufficient to withstand the overvoltages , take into account the rated impulse voltage		N
	Clearance at the terminals of tubular sheathed heating elements may be reduced to 1mm if the microenvironment is pollution degree 1		N
	Lacquered conductors of windings considered to be bare conductors		N
29.1.2	Clearances of supplementary insulation not less than those specified for basic insulation in table 16		N

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Clause	Requirement Test	Result - Remark	Verdict
29.1.3	Clearances of reinforced insulation not less than those specified for basic insulation in table 16, but using the next higher step for rated impulse voltage		N
29.1.4	For functional insulation, the values of table 16 are applicable, unless		N
	the appliance complies with clause 19 with the functional insulation short-circuited		N
	Clearances at crossover points of lacquered conductors not measured		N
	Lacquered conductors of windings considered to be bare conductors		N
	However, clearances at crossover points are not measured		N
	Clearance between surfaces of PTC heating elements may be reduced to 1mm		N
	Lacquered conductors of windings assumed to be bare conductors, but the clearances specified in table 16 are reduced by 0.5mm for rated impulse voltages of at least 1500V		N
29.1.5	Appliances having higher working voltage than rated voltage, the voltage used for determining clearances from table 16 is the sum of the rated impulse voltage and the difference between the peak value of the working voltage and the peak value of the rated voltage		N
	f the secondary winding of a step-down transformer is earthed, or if there is an earthed screen between the primary and secondary windings, clearances of basic insulation on the secondary side not less than those specified in table 16, but using the next lower step for rated impulse voltage		N
	Circuits supplied with a voltage lower than rated voltage, clearances of functional insulation based on the working voltage used as the rated voltage in table 15		N
29.2	Creepage distances not less than those appropriate for the working voltage, take into account the material group and the pollution degree		N
	Pollution degree 2 applies, unless		N
	precautions taken to protect the insulation; pollution degree 1		N
	insulation subjected to conductive pollution; pollution degree 3		N
	Compliance checked by inspection and measurements as specified		N

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Clause	Requirement Test	Result - Remark	Verdict
29.2.1	Supplementary insulation applied in thin sheet form, other than mica or similar scaly material, consists of at least two layers, each of the layers withstands the electric strength test of 16.3 for supplementary insulation		N
	Reinforced insulation applied in thin sheet form, other than mica or similar scaly material, consists of at least three layers, and any two of the layers together withstand the electric strength test of 16.3 for reinforced insulation		N
29.2.2	Supplementary or reinforced insulation inaccessible and does not exceed the maximum permissible temperature values		N
	Supplementary or reinforced insulation, after conditioning as specified, withstands the electric strength test as specified in 16.3, both at the oven temperature and room temperature		N
29.2.3	Creepage distances of reinforced insulation shall be at least double those specified for basic insulation in table 17		N
29.2.4	Creepage distances of functional insulation not less than specified in table 18		N
	Creepage distances may be reduced if the appliance complies with clause 19 with the functional insulation short-circuited		N
29.3	Supplementary and reinforced insulation having adequate thickness, or a sufficient number of layers, to withstand the electrical stresses		N
	Compliance checked by:		N
	- measurement, in accordance with 29.3.1, or		N
	- an electric strength test in accordance with 29.3.2, or		N
	- an assessment of the thermal quality of the material combined with an electric strength test, in accordance with 29.3.3		N
29.3.1	Supplementary insulation having a thickness of at least 1 mm		N
	Reinforced insulation having a thickness of at least 2 mm		N
29.3.2	Each layer of material withstand the electric strength test of 16.3 for supplementary insulation		N
	Supplementary insulation consisting of at least 2 layers		N
	Reinforced insulation consisting of at least 3 layers		N
29.3.3	Dry heattest Bb of IEC 60068-2-2		N
	the electric strength test of 16.3		N

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Clause	Requirement Test	Result - Remark	Verdict
	If the temperature rise during the tests of Clause 19 does not exceed the value specified in Table 3, the test of IEC 60068-2-2 is not carried out		N
29.3.Z1	Accessible reinforced insulation consists of a single layer, thickness comply with table Z.1		N
30	**RESISTANCE TO HEAT, FIRE AND TRACKING**		---
30.1	External parts of non-metallic material,		P
	parts supporting live parts, and		N
	thermoplastic material providing supplementary or reinforced insulation,		N
	sufficiently resistant to heat		P
	Ball-pressure test according to IEC 60695-10-2		N
	External parts: at 40 T plus the maximum temperature rise determined during the test of clause 11, or at 75 T, whichever is the higher; temperature (T):		N
	Parts supporting live parts: at 40T plus the maximum temperature rise determined during the test of clause 11, or at 125T, whichever is the higher; temperature (T):	Approval components and tested 125 °C on PCB	P
	Parts of thermoplastic material providing supplementary or reinforced insulation, 25T plus the maximum temperature rise determined during clause 19, if higher; temperature (T):		N
30.2	Relevant parts of non-metallic material adequately resistant to ignition and spread of fire		P
30.2.1	Glow-wire test of IEC 60695-2-11 at 550℃, unless	Tested at 650 °C on plastic enclosure of toothbrush	P
	The material is classified at HB40 according to IEC 60695-11-10		N
	Parts for which the glow-wire test cannot be carried out meet the requirements in ISO9772 for category HBF material		N
30.2.2	appliances operated while attended, parts of insulating material supporting current-carrying connections and parts within a distance of 3mm subjected to the glow-wire test of IEC60695-2-11 at a temperature of :		P
	- 750℃, for connections carrying a current exceeding 0,5A during normal operation		N
	- 650℃, for other connections	Tested at 650 °c on plastic enclosure	P
	Test not applicable to conditions as specified		N
30.2.3	Appliances operated while unattended, tested as specified in 30.2.3.1 and 30.2.3.2		N
	Test not applicable to conditions as specified		N
30.2.3.1	Parts of insulating material supporting Connections carrying a current exceeding 0.2A during normal operation, and		N

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Clause	Requirement Test	Result - Remark	Verdict
	parts of insulating material within a distance of 3mm,		N
	having a glow-wire flammability index of at least 850。C according to IEC 60695-2-12		N
30.2.3.2	Parts of insulating material supporting current-carrying connections, and		N
	parts of insulating material within a distance of 3mm,		N
	subjected to glow-wire test of IEC 60695-2-11		N
	Test not carried out on material having a glow-wire ignition temperature according to IEC 60695- 2-13 as specified		N
	Glow-wire test of IEC 60695-2-11, the temperature being:		N
	-750。C, for connections carrying a current exceeding 0,2A during normal operation		N
	-650。C, for other connections		N
	Parts that during the test produce a flame persisting longer than 2 s, tested as specified		N
	If a flame persists longer than 2 s during the test, parts above the connection, as specified, subjected to the needle-flame test of annex E, unless		N
	the material is classified as V-0 or V-1 according to IEC 60695-11-10		N
30.2.4	Parts of non-metallic material within a distance of 50 mm from parts not withstand the tests of 30.2.2 or 30.2.3, subjected to the needle-flame test of Annex M	Approval components and tested on PCB	P
31	**RESISTANCE TO RUSTING**		---
	Relevant ferrous parts adequately protected against rusting		P
32	**RADIATION, TOXICITY AND SIMILAR HAZARDS**		---
	Appliance does not emit harmful radiation		N
	Appliance does not present a toxic or similar hazard		N
A	**ANNEX A (INFORMATIVE) ROUTINE TESTS**		---
	Appliance does not present a toxic or similar hazard		N

B	**ANNEX B (NORMAIVE) APPLIANCES POWERED BY RECHARGERABLE BATTERIES**		---
	The following modifications to this standard are applicable for appliances powered by batteries that are recharged in the appliance		P
	This annex does not apply to battery chargers		N

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Clause	Requirement Test	Result - Remark	Verdict
3.1.9	Appliance operated under the following conditions:		P
	-the appliance, supplied by its fully charged battery, operated as specified in relevant part 2		P
	-the battery is charged, the battery being initially discharged to such an extent that the appliance cannot operate		P
	-if possible, the appliance is supplied from the supply mains through its battery charger, the battery being initially discharged to such an extent that the appliance cannot operate. The appliance is operated as specified in relevant part 2		P
	The following modifications to this standard are applicable for appliances powered by batteries that are recharged in the appliance		P
	If the appliance incorporates inductive coupling between two parts that are detachable from each other, the appliance is supplied from the supply mains with the detachable part removed		N
3.6.2	Part to be removed in order to discard the battery is not considered to be detachable		P
5.101	Supplied from mains, tested as motor-operated		P
7.1	Battery compartment for batteries intended to be replaced by the user, marked with battery voltage and polarity of the terminals	Cannot Replaced Battery	N
7.12	The instructions for appliances incorporating batteries intended to be replaced by the user includes required information		N
	Details about how to remove batteries containing materials hazardous to the environment given		N
7.15	Marking placed on the part of the appliance connected to the supply mains		N
8.2	Appliances having batteries that according to the instruction may be replaced by the user need only have basic insulation between live parts and the inner surface of the battery compartment		N
	If the appliance can be operated without batteries, double or reinforced insulation required		N
11.7	The battery is charged for the period described	24h	P
19.1	Appliances subjected to tests of 19.101, 19.102 and 19.103		P
19.B.101	Appliances supplied at rated voltage for 168 h, the battery being continually charged	Continuous charging 168h	P

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Clause	Requirement Test	Result - Remark	Verdict
19.B.102	Short-circuiting of the terminals of the battery, being fully charged, for appliances having batteries that can be removed without the aid of a tool	Cannot Replaced Battery	N
19.B.103	Appliances having batteries replaceable by the user supplied at rated voltage under normal operation with the battery removed or in any position allowed by the construction	Cannot Replaced Battery	N
21.101	Appliances having pins for insertion into socketoutlets have adequate mechanical strength, checked according to procedure 2 of IEC 68-2-32		N
	Part of the appliance incorporating the pins subjected to the free fall test, procedure 2,of IEC 60068-2-32, the number of falls being:		N
	- 100, the mass of part does not exceed 250 g		N
	- 50, the mass of part exceeds 250 g		N
	After the test, the requirements of 8.1, 15.1.1, 16.3 and clause 29 are met		N
22.3	Appliances having pins for insertion into socket-outlets tested as fully assembled as possible		N
25.13	An additional lining or bushing not required for interconnection cords operating at safety extra-low voltage		N
30.2	For parts of the appliance connected to the supply mains during the charging period, 30.2.3 applies		N
	For other parts, 30.2.2 applies		N
C	**ANNEX C (NORMATIVE) AGEING TEST ON MOTORS**		---
	Tests , as described, carried out when doubt with regard to the temperature classification of the insulation of a motor winding		N
	The value of p in table C.1 is 2000,		N

D	**ANNEX D(NORMATIVE) ALTERNATIVE REQUIREMENTS FOR PROTECTED MOTORS**		---
	Applicable to appliances having motors that incorporate thermal motor protectors		N

E	**ANNEX E(NORMATIVE) NEEDLE-FLAME TEST**		---
	Needle-flame test carried out in accordance with IEC 60950-2-2, with the following modifications:		N
5	Severities		---

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Clause	Requirement Test	Result - Remark	Verdict
	The duration of application of the test flame is 30s±1s		N
8	Test procedure		---
8.2	The specimen so arranged that the flame can be applied to a vertical or horizontal edge as shown in the examples of figure 1		N
8.4	The first paragraph does not apply.		N
	If possible, the flame is applied at least 10 mm from a corner		
8.5	The test is carried out on one specimen		N
	If the specimen does not withstand the test, the test may be repeated on two further specimens, both withstanding the test		N
10	Evaluation of test results		---
	The duration of burning not exceeding 30s		N
	However, for printed circuit boards, the duration of burning not exceeding 15s		N

F	**ANNEX F (NORMATIVE) CAPACITORS**		**---**
	Capacitors likely to be permanently subjected to the supply voltage, and used for radio interference suppression or voltage dividing, comply with the following clauses of IEC 60384-14, with the following modifications:		N
1.5	Terminology		---
1.5.3	Class X capacitors tested according to subclass X2		N
1.5.4	This subclause is applicable		N
1.6	Marking		N
	Items a) and b) are applicable		N
3.4	Approval testing		---
3.4.3.2	Table II is applicable as described		N
4.1	Visual examination and check of dimensions		---
	This subclause is applicable		N
4.2	Electrical tests		N
4.2.1	This subclause is applicable		N
4.2.5	This subclause is applicable		N

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Clause	Requirement Test	Result - Remark	Verdict
4.2.5.2	Only table IX is applicable		N
	Values for test A apply		N
	However, for capacitors in heating appliances the values for test B or C apply		N
4.12	Damp heat, steady-state		N
	This subclause is applicable		N
	Only insulation resistance and voltage proof are checked		N
4.13	Impulse voltage		N
	This subclause is applicable		N
4.14	Endurance		N
	Subclauses 4.14.1, 4.14.3, 4.14.4 and 4.14.7 applicable		N
4.14.7	Only insulation resistance and voltage proof are checked		N
	Visual examination, no visible damage		N
4.17	Passive flammability test		N
	This subclause is applicable		N
4.18	Active flammability test		N

G	**ANNEX G(NORMATIVE) SAFETY ISOLATING TRANSFORMERS**		---
	The following modifications to this standard are applicable for safety isolating transformers:		N
7	Marking and instructions		---
7.1	Transformers for specific use marked with:		---
	-name, trademark or identification mark of the manufacturer or responsible vendor		N
	-model or type reference		N
17	Overload protection of transformers and associated circuits		---
	Fail-safe transformers comply with subclause 15.5 of IEC 61558-1		N
22	Construction		---
	Subclauses 19.1 and 19.1.2 of IEC 61558-2-6 are applicable		N
29	Clearances, creepage distances and solid insulation		---
29.129.2 and 29.3	The distances specified in items 2a, 2c and 3 in table 13 of IEC 61558-1 apply		N

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Clause	Requirement Test	Result - Remark	Verdict
H	ANNEX H(NORMATIVE) SWITCHES		---
	Switches comply with the following clauses of IEC 61058-1, as modified:		---
	-the tests of IEC 61058-1 carried out under the conditions occurring in the appliance		N
	-before being tested, switches are operated 20 times without load		N
8	Marking and documentation		---
	Switches are not required to be marked		N
	However, switches that can be tested separately from the appliance marked with the manufacturer's name or trade mark and the type reference		N
13	Mechanism		---
	The tests may be carried out on a separate sample		N
15	Not applicable		N
15.1	Not applicable		N
15.2	Not applicable		N
15.3	Applicable for full disconnection and micro-disconnection		N
17	Endurance		---
	Compliance is checked on three separate appliances or switches		N
	For 17.2.4.4, the number of cycles is 10000, unless otherwise specified in 24.1.3 of the relevant part 2 of IEC 60335		N
	Switches for operation under no load and which can be operated only by a tool and switches operated by hand that are interlocked so that they cannot be operated under load, are not subjected to the tests		N
	Subclause 17.2.5.2 is not applicable		N
	Temperature rise of the terminals not more than 30K above the temperature rise measured in clause 11 of IEC 60335-1		N
20	Clearances, creepage distances, solid insulation and coatings of rigid printed board assemblies		---

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Clause	Requirement Test	Result - Remark	Verdict

	This clause is applicable to clearances and creepage distances for functional insulation, across full disconnection and micro-disconnection, as stated in table 24		N

I	**ANNEX I(NORMATIVE) MOTORS HAVING BASIC INSULATION THAT IS INADEQUATE FOR THE RATED VOLTAGE OF THE APPLIANCE**		---
	The following modifications to this standard are applicable for motors having basic insulation that is inadequate for the rated voltage of the appliance:		N
8	Protection against access to live parts		---
8.1	Metal parts of the motor are considered to be bare live parts		N
11	Heating		---
11.3	Temperature rise of the body of the motor is determined instead of the temperature rise of the windings		N
11.8	Temperature rise of the body of the motor, where in contact with insulating material, not exceeding values in table 3 for the relevant insulating material		N
16	Leakage current and electric strength		---
16.3	Insulation between live parts of the motor and its other metal parts not subjected to the test		N
19	Abnormal operation		---
19.1	The tests of 19.7 to 19.9 not carried out		N
19.01	Appliance operated at rated voltage with each of the following fault conditions:		N
	- short circuit of the terminals of the motor, including any capacitor incorporated in the motor circuit		N
	- short circuit of each diode of the rectifier		N
	- open circuit of the supply to the motor		N
	- open circuit of any parallel resistor, the motor being in operation		N
	Only one fault simulated at a time, the tests carried out consecutively		N
22	Construction		N
22.101	For class I appliances incorporating a motor supplied by a rectifier circuit, the d.c. circuit being insulated from accessible parts of the appliance by double or reinforced insulation		N
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Clause	Requirement Test	Result - Remark	Verdict
	Compliance checked by the tests specified for double and reinforced insulation		N

J	**ANNEX J(NORMATIVE) COATED PRINTED CIRCUIT BOARDS**		**---**
	Testing of protective coatings of printed circuit boards carried out in accordance with IEC 60664-3 with the following modifications:		N
6.6	Climatic sequence		---
	When production samples are used, three samples of the printed circuit board are tested		N
6.6.1	Cold		---
	The testis carried out at -25℃		N
6.6.3	Rapid change of temperature		---
	Severity 1 is specified		N
6.8.6	Partial discharge extinction voltage		N
	Type A coatings not subjected to a artial discharge test		N
6.9	Additional tests		---
	This subclause is not applicable		N

K	**ANNEX K(NORMATIVE) OVERVOLTAGE CATEGORIES**		**---**
	The information on overvoltage categories is extracted from IEC 60664-1		N
	Overvoltage category is a numeral defining a transient overvoltage condition		N
	Equipment of overvoltage category IV is for use at the origin of the installation		N
	Equipment of overvoltage category III is equipment in fixed installations and for cases where the reliability and the availability of the equipment is subject to special requirements		N
	Equipment of overvoltage category II is energy consuming equipment to be supplied from the fixed installation		N
	If such equipment is subjected to special requirements with regard to reliability and availability, overvoltage category III applies		N
	Equipment of overvoltage category I is equipment for connection to circuit in which measures are taken to limit transient overvoltages to an appropriate low level		N
EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict

	ANNEX L(INFORMATIVE) GUIDANCE FOR THE MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES		---
	Sequences for the determination of clearances and creepage distances	Class III appliance	N
M	**ANNEX M(NORMATIVE) POLLUTION DEGREE**		**---**
	The information on pollution degrees is extracted from IEC 60664-1		P
	Pollution		---
	The microenvironment determines the effect of pollution on the insulation, taking into account the microenvironment		P
	Means may be provided to reduce pollution at the insulation by effective enclosures or similar		P
	Minimum clearances specified where pollution may be present in the microenvironment		P
	Degrees of pollution in the microenvironment		---
	For evaluating creepage distances, the following degrees of pollution in the microenvironment are established:		---
	-pollution degree 1: no pollution or only dry, non-conductive pollution occurs. The pollution has no influence		N
	-pollution degree 2: only non-conductive pollution occurs, except that occasionally a temporary conductivity caused by condensation is to be except		N
	-pollution degree 3: conductive pollution occurs or dry non-conductive pollution occurs that becomes conductive due to condensation that is to be expected		P
	-pollution degree 4: the pollution generates persistent conductivity caused by conductive dust or by rain or snow		N

N	**ANNEX N(NORMATIVE) PROOF TRACKING TEST**		**---**
	The proof tracking test is carried out in accordance with IEC 60112 with the following modifications:		N
7	Test apparatus		N
7.3	Test solutions		N
	Test solution A is used		N
10	Determination of proof tracking index (PTI)		N
	EN 60335-2-52		
Clause	Requirement Test	Result - Remark	Verdict

10.1	Procedure		---
	The proof vltage is 100V, 175V, 400V or 600V		N
	Last paragraph of clause 3 applies		N
	The testis carried out on five specimens		N
	In case of doubt, additional test with voltage reduced by 25V, the number of drops increased to 100		N
10.2	Report		---
	The report stating if the PTI value was based on a test using 100 drops with a test voltage of (PTI-25)V		N
O	**ANNEX O(INFORMATIVE) SELECTION AND SEQUENCE OF THE TESTS OF CLAUSE 30**		**---**
	Description of tests for determination of resistance to heat and fire		P
P	**GUIDANCE FOR THE APPLICATION OF THIS STANDARD TO APPLIANCES USED IN WARM DAMP EQUABLE CLIMATES**		**---**
	Modifications applicable for class 0 and 01 appliances having a rated voltage exceeding 150V, intended to be used in countries having a warm damp equable climate and that are marked WDaE		N
	Modifications may also be applied to class 1 appliances having a rated voltage exceeding 150V, intended to be used in countries having a warm damp equable climate and that are marked WdaE, if liable to be connected to a supply mains that excludes the protective earthing conductor		N
5	General conditions for the tests		N
5.7	The ambient temperature for clauses 11 and 13 is 40^{+3}_{0} ℃		N
7	Marking and instructions		N
7.1	The appliance marked with the letters WDaE		N
7.12	The instructions state that the appliance is to be supplied through a RCD having a rated residual operating current not exceeding 30 mA		N
	The instructions state that the appliance is considered to be suitable for use in countries having a warm damp equable climate, but may also be used in other countries		N
11	Heating		N
11.8	Values of table 3 are reduced by 15K		N
13	Leakage current and electric strength at operating temperature		N
13.2	The leakage current for class I appliances not exceeding 0,5 mA		N
15	Moisture resistance		N
EN 60335-2-52			
Clause	Requirement Test	Result - Remark	Verdict

15.3	The value of t is 37℃		N
16	Leakage current and electric strength		N
16.2	The leakage current for class I appliances not exceeding 0,5 mA		N
19	Abnormal operation		N
19.13	The leakage current test of 16.2 is applied in addition to the electric strength test of 16.3		N

Q	**ANNEX Q (INFORMATIVE) SEQUENCE OF TESTS FOR THE EVALUATION OF ELECTRONIC CIRCUITS**		**---**
	Description of tests for appliances incorporating electronic circuits		N
R	**ANNEX R (NORMATIVE) SOFTWARE EVALUATION**		**N**
	Software evaluated in accordance with the following clauses of Annex H of IEC 60730-1, as modified		N
H.2	Definitions		N
	Only definitions H.2.16 to H.2.20 applicable		N
H.7	Information		N
	Only footnotes 12) to 18) of Table 7.2, as modified, applicable		N
H.11.12	Controls using software		N
	All the subclauses of H.11.12, as modified, except H.11.12.6 and H.11.12.6.1, applicable		N
H.11.12.7	Delete text		N
H.11.12.7 . 1	For appliances using software class C having a single channel with self-test and monitoring structure, the manufacturer provides the measures necessary to address the fault/errors in safety related segments and data		N
H.11.12.8	Software fault/error detection occurs before compliance with 19.13 of IEC 60335-1 is impaired		N
H.11.12.8 . 1	Replace text		N
H.11.12.13	Software and safety related hardware under its control initializes and terminates before compliance with 19.13 of IEC 60335-1 is impaired		N

ZA	**ANNEX ZA (NORMATIVE) SPECIAL NATIONAL CONDITIONS (EN)**		**--**
7.12	DENMARK: Requirements regarding marking tag of power supply cord and connection of earthing wire for class I appliances delivered without a plug (EN)		N

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Clause	Requirement Test	Result - Remark	Verdict

19.5	NORWAY: The test is also applicable to appliances intended to be permanently connected to fixed wiring (EN)		N
22.2	FRANCE, NORWAY: The second paragraph of this subclause, dealing with single-phase, permanently connected class I appliances having heating elements, is not applicable due to the supply system (EN)		N
25.6	BELGIUM, FRANCE, SPAIN, UNITED KINGDOM: Plugs according to standard sheet C2b not allowed (EN)		N
	AUSTRIA, FINLAND, GERMANY, ICELAND, IRELAND, ITALY, LUXEMBOURG, NETHERLANDS, NORWAY, PORTUGAL, SPAIN, SWEDEN, SWITZERLAND, UNITED KINGDOM: Plugs according to standard sheet C3b not allowed (EN)		N
	DENMARK: Supply cords of single-phase portable appliances having a rated current not exceeding 13 A provided with a plug according to the following: (EN)		N
	Class I appliances: Section 107-2-D1, ed.3 1998, Standard Sheet DK 2-1a (EN)		N
	For appliances covered by a Part 2 of EN 60335, also plugs in accordance with Section 107-2-D1, ed.3, 1998, Standard Sheet C2b, C3b or C4 are allowed (EN)		N
	Class II appliances: Section 107-2-D1, ed.3 1998, Standard Sheet C1b, C5, C6, DKA 2-1a and DKA 2-1b (EN)		N
	Stationary single-phase appliances, having a rated current not exceeding 13 A, and provided with a supply cord and a plug, the plug is in accordance with the requirements above (EN)		N
	Multi-phase appliances and single-phase appliances having a rated current exceeding 13 A, and provided with a supply cord and a plug, the plug is in accordance with the requirements below: (EN)		N
	Class I appliances: Section 107-2-D1, Standard Sheet DK 6-1a / EN 60309-2, Standard Sheet 2- II,2-IV (EN)		N
	Class II appliances: Section 107-2-D1, Standard Sheet DK 6-1a / EN 60309-2, Standard Sheet 2- II, 2-IV, the earthing contact not being connected (EN)		N
	The current for the plug not exceeding the values specified; standard sheet (no.); current (A) (EN)……..:		N
	IRELAND: Only plugs according to Standard Sheets B2 and C5 allowed (see also Annex ZB) (EN)		N

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Clause	Requirement Test	Result - Remark	Verdict

	ITALY: Only plugs listed in CENELEC Report R0BT-005:2001 allowed (EN)		N
	SPAIN: For appliances for household use, only the following plugs are allowed: (EN)		N
	according to UNE 20315: ESC 10-1b, C2b, C4, C6 or ESB 25-5b (EN)		N
	according to UNE-EN 50075 (EN)		N
	SWITZERLAND: supply cords of portable household and similar electrical appliances having a rated current not exceeding 10 A, provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets: (EN)		N
	SEV 6532-2.1991, plug type 15, 3P+N+PE, 250/400 V, 10 A (EN)		N
	SEV 6533-2.1991, plug type 11, L+N, 250 V, 10 A (EN)		N
	SEV 6534-2.1991 plug type 12, L+N+PE, 250 V, 10 A (EN)		N
	UNITED KINGDOM: Only plugs according to Standard Sheets B2 and C5 allowed (see also Annex ZB) (EN)		N
25.8	IRELAND, UNITED KINGDOM: replacement of figures (rated current/cross-sectional area) in the table (EN)		N
29.3	GERMANY: Third dashed item not applicable for appliances where the insulation is accessible. Additional measures, such as a multi-layered insulation or adequate thickness, taken. (EN)		N
ZB	ANNEX ZB (INFORMATIVE) A-DEVIATIONS (EN)		--
4	SWITZERLAND: Information about batteries with carbon-zinc and alkali-manganese (EN)		N

7.1	ITALY: The voltage is 220 V/380 V (EN)		N
25.6	IRELAND: These regulations apply to all plugs for domestic use at a voltage of not less than 200 V and allow only plugs complying with I.S. 401:1997, or equivalent, to be fitted to domestic appliances. (EN)		N
	UNITED KINGDOM: These regulations apply to all plugs for domestic use at a voltage of not less than 200 V and allow only plugs to BS 1363 to be fitted to domestic appliances. It also allows plugs to BS 4573 and standard sheet C5 to be fitted to shavers and toothbrushes. (EN)		N
ZC	**ANNEX ZC (NORMATIVE) NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIRCORRESPONDING EUROPEAN PUBLICATIONS (EN)**		--
	This Standard incorporates provisions from the publications listed (EN)		N
ZD	ANNEX ZD (INFORMATIVE) IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS (EN)		--

	A list of code designations for different types of flexible cords (EN)		N
EMF	ANNEX EMF		N
	The tested product also complies to the requirements of EN 62233:2008		N
	Limit.....100%		N

10.1	TABLE: Power input deviation				N
Input deviation of/at:	P rated (W)	P measured (W)	dP	Required dP	Remark
--	--	--	--	--	--

10.2	TABLE : Current deviation				P
Current deviation of/at:	I rated (A)	I measured (A)	dI	Required dI	Remark
5Vdc	0.5	0.325	-35%	+20%	--

11.8	TABLE: Heating test, thermocouples		P
	Test voltage (V).....	1.20 x 5.0Vdc =6.0Vdc	—
	Ambient (°C).....	25.0	—

Thermocouple locations	dT (K)		Max. dT (K)
Switch button	8.1	--	60
Toothbrush body	9.2	--	60
lithium battery body	9.3	--	For reference only
PCB near U2	15.8	--	105 (130-25)
Motors surface	16.3	--	For reference only
PCB near U3	16.5	--	105 (130-25)
Plastic enclosure near battery	11.2	--	cl.30
Plastic enclosure outside	8.9	--	60
Test corner	2.2	--	65
Ambient	25.0	--	--

13.2	TABLE: Leakage current		N
	Heating appliances: 1.15 x rated input..... :	--	—
	Motor-operated and combined appliances: 1.06 x rated voltage.....:	--	—

Leakage current between	I (mA)	Max. allowed I (mA)
L/N and enclosure	--	--

13.3	TABLE: Electric strength		P
Test voltage applied between:		Voltage (V)	Breakdown (Yes/No)
Input –enclosure plastic with metal foil		500V	No
Note: with external power adapter			

16.2	TABLE: Leakage current		N
	Single phase appliances: 1.06 x rated voltage ..... :	--	—

	Three phase appliances 1.06 x rated voltage divided by √3:.....:	--	—

Leakage current between	I (mA)	Max. allowed I (mA)
L/N and enclosure	--	--

16.3	TABLE: Electric strength	N

Test voltage applied between:	Voltage (V)	Breakdown (Yes/No)
L/N and enclosure	--	--

Note: with external power adapter

17	TABLE: Overload protection, temperature rise		N
temperature rise of part/at:		T (°C)	Max. T (°C)
--		--	--
--		--	--

19.7	TABLE: Abnormal operation, locked rotor/moving parts				N
	Test voltage (V).....:			--	--
	Ambient, t1 (°C).....:			--	--
	Ambient, t2 (°C).....:			--	--
temperature rise of winding	R1 (Ω)	R2 (Ω)	dT (K)	T (°C)	Max. T (°C)
--	--	--	--	--	--
--	--	--	--	--	--

19.13	TABLE: Abnormal operation, (charger output S-C)				N
	ambient temperature (°C)..... :		See blow		--
Thermocouple locations	Cl. 19.11.2 dT(K)	Cl. 19.3 dT(K)	Cl. 19.6 dT(K)	Max. dT(K)	
--	--	--	--	--	
supplementary information					

19.B.101	TABLE: Over Charge Test	P
Test conditions	Appliances are supplied at rated voltage for 168 h, the battery being continually charged during this period.	--

Result		Verdict
- Chemical leaks	No	P
- Explosion of the battery	No	P
- Emission of flame or expulsion of molten metal	No	P

24.1	TABLE: Components				P
object part No.	manufacturer/trade mark	type/model	technical data	standard	mark(s) of conformity
Plastic enclosure	Chi Mei Corporation	PA-757(+)	HB, ABS, Min.85 °C,Min.1.5 mm thickness	UL94	UL E56070
AlternativePlastic enclosure	Interchangeable	Interchangeable	Min.85 °C,Min.1. 5 mm thickness	UL94	UL
PCB	Interchangeable	Interchangeable	Min V-0 or better, Min. 130 °C	UL94	UL
Lithium battery	Interchangeable	Interchangeable	3.7V 800mAh	IEC 62133	VDE

28.1	TABLE: Threaded part torque test		N
Threaded part identification	Diameter of thread (mm)	Column number (I, II, or III)	Applied torque (Nm)
Enclosure fixing screw	--	--	--

29.1	TABLE: Clearances					N
	Overvoltage category……:		II			
		Type of insulation:				
Rated impulse voltage (v):	Min. cl (mm)	Basic	Functional	Supplementary	Reinforced	Verdict / Remark
330	0.5*					N/A
500	0.5*					N/A
800	0.5*					N/A
1500	0.5*/**					N/A
2500	1.5**					N/A
4000	3.0**					N/A
6000	5.5**					N/A
8000	8.0**					N/A
10000	11.0**					N/A

*) The value is increased to 0,8mm for pollution degree 3

**) If the construction is affected by wear, distortion, movement of the parts or during assembly, the value is increased by 0,5 mm.

29.1	TABLE: Clearances Overvoltage category					N
Rated impulse voltage (V)	Min. cl (mm)	Type of insulation				Verdict
		Basic	Functional	Supplementary	Reinforced	
330	0.5	--	--	--	--	N

550	0.5	--	--	--	--	N
800	0.5	--	--	--	--	N
1500	0.5	--	--	--	--	N
2500	1.5	--	--	--	--	N
4000	3.0	--	--	--	--	N
6000	5.5	--	--	--	--	N
8000	8.0	--	--	--	--	N
10000	11	--	--	--	--	N
supplementary information:						

29.2	TABLE: Creepage distances, basic, supplementary and reinforced insulation									N
Working voltage(V)	Creepage distance (mm)Pollution degree									
	1	2			3			Type of insulation		
		Material group			Material group					
		I	II	IIIA /IIIB	I	II	IIIA/IIIB	B)	S)	R)	Verdict
=50	0.2	0.6	0.9	1.2	1.5	1.7	1.9				N/A
=50	0.2	0.6	0.9	1.2	1.5	1.7	1.9				N/A
=50	0.4	1.2	1.8	2.4	3.0	3.4	3.8				N/A
>50 and =125	0.3	0.8	1.1	1.5	1.9	2.1	2.4				N/A
>50 and =125	0.3	0.8	1.1	1.5	1.9	2.1	2.4				N/A
>50 and =125	0.6	1.6	2.2	3.0	3.8	4.2	4.8				N/A
>125 and =250	0.6	1.3	1.8	2.5	3.2	3.6	4.0				N/A
>125 and =250	0.6	1.3	1.8	2.5	3.2	3.6	4.0				N/A
>125 and =250	1.2	2.6	3.6	5.0	6.4	7.2	8.0				N/A
>250 and =400	1.0	2.0	2.8	4.0	5.0	5.6	6.3				N/A
>250 and =400	1.0	2.0	2.8	4.0	5.0	5.6	6.3				N/A
>250 and =400	2.0	4.0	5.6	8.0	10.0	11.2	12.6				N/A
>400 and =500	1.3	2.5	3.6	5.0	6.3	7.1	8.0				N/A
>400 and =500	1.3	2.5	3.6	5.0	6.3	7.1	8.0				N/A
>400 and =500	2.6	5.0	7.2	10.0	12.6	14.2	16.0				N/A
>500 and =800	1.8	3.2	4.5	6.3	8.0	9.0	10.0				N/A
>500 and =800	1.8	3.2	4.5	6.3	8.0	9.0	10.0				N/A
>500 and =800	3.6	6.4	9.0	12.6	16.0	18.0	20.0				N/A
>800 and =1000	2.4	4.0	5.6	8.0	10.0	11.0	12.5				N/A
>800 and =1000	2.4	4.0	5.6	8.0	10.0	11.0	12.5				N/A
>800 and =1000	4.8	8.0	11.2	16.0	20.0	22.0	25.0				N/A
>1000 and =1250	3.2	5.0	7.1	10.0	12.5	14.0	16.0				N/A
>1000 and =1250	3.2	5.0	7.1	10.0	12.5	14.0	16.0				N/A
>1000 and =1250	6.4	10.0	14.2	20.0	25.0	28.0	32.0				N/A
>1250 and =1600	4.2	6.3	9.0	12.5	16.0	18.0	20.0				N/A

>1250 and =1600	4.2	6.3	9.0	12.5	16.0	18.0	20.0		N/A
>1250 and =1600	8.4	12.6	18.0	25.0	32.0	36.0	40.0		N/A
>1600 and =2000	5.6	8.0	11.0	16.0	20.0	22.0	25.0		N/A
>1600 and =2000	5.6	8.0	11.0	16.0	20.0	22.0	25.0		N/A
>1600 and =2000	11.2	16.0	22.0	32.0	40.0	44.0	50.0		N/A
>2000 and =2500	7.5	10.0	14.0	20.0	25.0	28.0	32.0		N/A
>2000 and =2500	7.5	10.0	14.0	20.0	25.0	28.0	32.0		N/A
>2000 and =2500	15.0	20.0	28.0	40.0	50.0	56.0	64.0		N/A
>2500 and =3200	10.0	12.5	18.0	25.0	32.0	36.0	40.0		N/A
>2500 and =3200	10.0	12.5	18.0	25.0	32.0	36.0	40.0		N/A
>2500 and =3200	20.0	25.0	36.0	50.0	64.0	72.0	80.0		N/A
>3200 and =4000	12.5	16.0	22.0	32.0	40.0	45.0	50.0		N/A
>3200 and =4000	12.5	16.0	22.0	32.0	40.0	45.0	50.0		N/A
>3200 and =4000	25.0	32.0	44.0	64.0	80.0	90.0	100.0		N/A
>4000 and =5000	16.0	20.0	28.0	40.0	50.0	56.0	63.0		N/A
>4000 and =5000	16.0	20.0	28.0	40.0	50.0	56.0	63.0		N/A
>4000 and =5000	32.0	40.0	56.0	80.0	100.0	112.0	126.0		N/A
>5000 and =6300	20.0	25.0	36.0	50.0	63.0	71.0	80.0		N/A
>5000 and =6300	20.0	25.0	36.0	50.0	63.0	71.0	80.0		N/A
>5000 and =6300	40.0	50.0	72.0	100.0	126.0	142.0	160.0		N/A
>6300 and =8000	25.0	32.0	45.0	63.0	80.0	90.0	100.0		N/A
>6300 and =8000	25.0	32.0	45.0	63.0	80.0	90.0	100.0		N/A
>6300 and =8000	50.0	64.0	90.0	126.0	160.0	180.0	200.0		N/A
>8000 and =10000	32.0	40.0	56.0	80.0	100.0	110.0	125.0		N/A
>8000 and =10000	32.0	40.0	56.0	80.0	100.0	110.0	125.0		N/A
>8000 and =10000	64.0	80.0	112.0	160.0	200.0	220.0	250.0		N/A
>10000 and =12500	40.0	50.0	71.0	100.0	125.0	140.0	160.0		N/A
>10000 and =12500	40.0	50.0	71.0	100.0	125.0	140.0	160.0		N/A
>10000 and =12500	80.0	100.0	142.0	200.0	250.0	280.0	320.0		N/A

*), B = Basic , S = Supplementary and R = Reinforced
B: between L and N
S: between Internal wire and accessible plastic enclosure
R: between live parts and accessible plastic enclosure

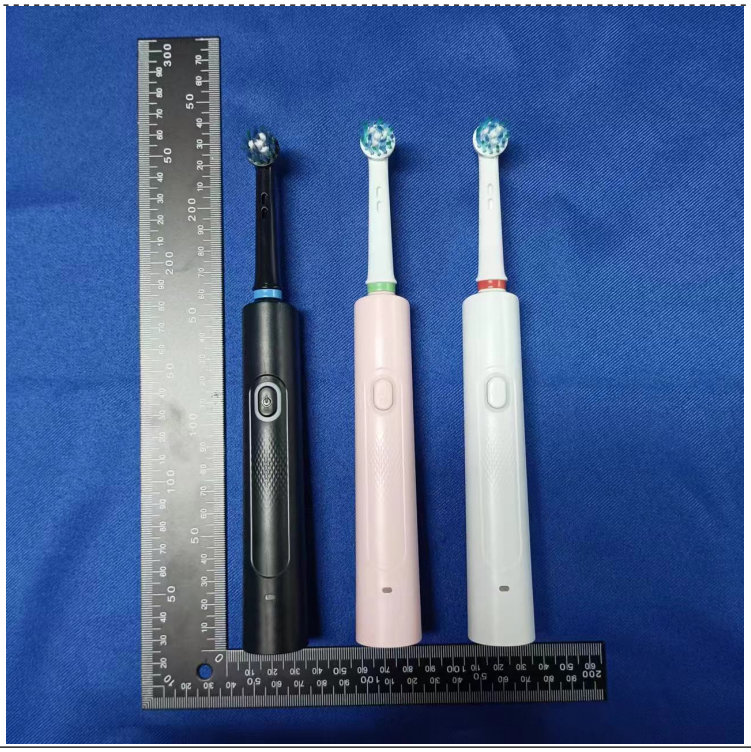
29.2	TABLE: Creepage distances, functional insulation							N
Working voltage(V)	Creepage distance (mm) Pollution degree							
	1	2			3			
		Material group			Material group			
		I	II	III a / III b	I	II	III a / III b	verdict / remark
=50	0.2	0.6	0.8	1.1	1.4	1.6	1.8	N/A
>50 and = 125	0.3	0.7	1.0	1.4	1.8	2.0	2.2	N/A
>125 and = 250	0.4	1.0	1.4	2.0	2.5	2.8	3.2	N/A
>250 and = 400	0.8	1.6	2.2	3.2	4.0	4.5	5.0	N/A
>400 and = 500	1.0	2.0	2.8	4.0	5.0	5.6	6.3	N/A
>500 and = 800	1.8	3.2	4.5	6.3	8.0	9.0	10.0	N/A
>800 and = 1000	2.4	4.0	5.6	8.0	10.0	11.0	12.5	N/A
>1000 and =1250	3.2	5.0	7.1	10.0	12.5	14.0	16.0	N/A
>1250 and = 1600	4.2	6.3	9.0	12.5	16.0	18.0	20.0	N/A
>1600 and = 2000	5.6	8.0	11.0	16.0	20.0	22.0	25.0	N/A
>2000 and = 2500	7.5	10.0	14.0	20.0	25.0	28.0	32.0	N/A
>2500 and = 3200	10.0	12.5	18.0	25.0	32.0	36.0	40.0	N/A
>3200 and = 4000	12.5	16.0	22.0	32.0	40.0	45.0	50.0	N/A
>4000 and = 5000	16.0	20.0	28.0	40.0	50.0	56.0	63.0	N/A
>5000 and = 6300	20.0	25.0	36.0	50.0	63.0	71.0	80.0	N/A
>6300 and = 8000	25.0	32.0	45.0	63.0	80.0	90.0	100.0	N/A
>8000 and = 10000	32.0	40.0	56.0	80.0	100.0	110.0	125.0	N/A
>10000 and = 12500	40.0	50.0	71.0	100.0	125.0	140.0	160.0	N/A
supplementary information:								

TABLE 30	RESISTANCE TO HEAT, FIRE AND TRACKING (appended table)													N
Component	Manufacturer	Type	Ball pressure test				Tracking test [CTI/PTI]	Glow wire test					Needleflame test	Verdict
			75℃	cl. 11 +40 ℃	125 ℃	cl. 19 +25 ℃		GWT 550℃	GWT 650℃	GWT 750℃	GWT 850℃	GWIT		
--	--	-	--	--	--	--	--	--	--	--	--	--	--	--

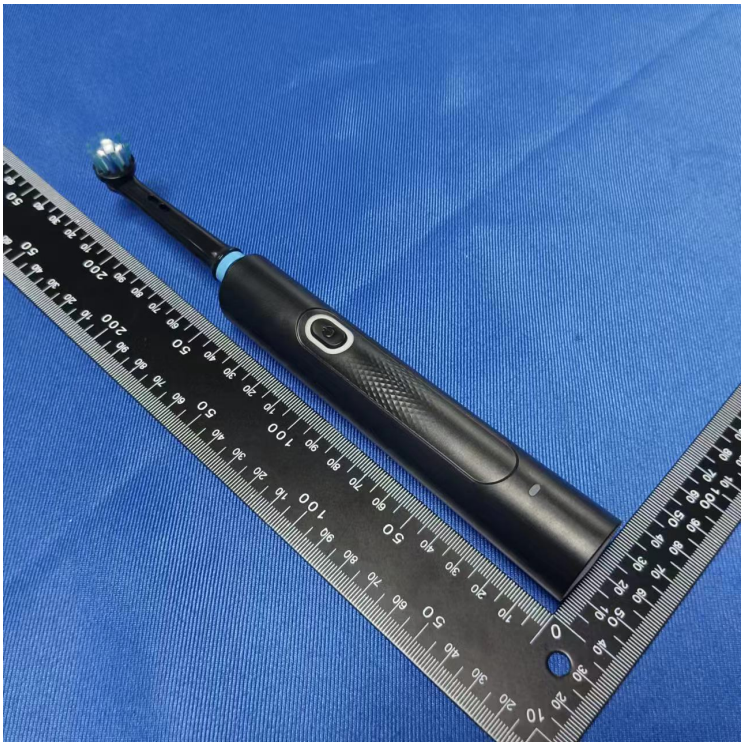
Remark:
1. Allowed impression diameter is ≤2.0mm for ball pressure test ;
2. According to the clause 30.1, the test is done at 550°C and no flame appears;
3. According to the clause 30.2.3.1, the test is done at 850°C and no flame duration 30s in the test.
4. According to the clause 30.2.3.2, the testis done at 750°C and no flame appears in the test. No need to do the needle flame test.
5. According to the clause 30.2.3.2, the testis done at 750°C and needle flame is not necessary since the ti is not more than 2s.
6. According to the clause 30.2.3.2, the component has operating current less than 0,2A during normal operation. No flame appears in the glow wire test at 650° C. No need to do the needle flame test.

Details of: Overall view

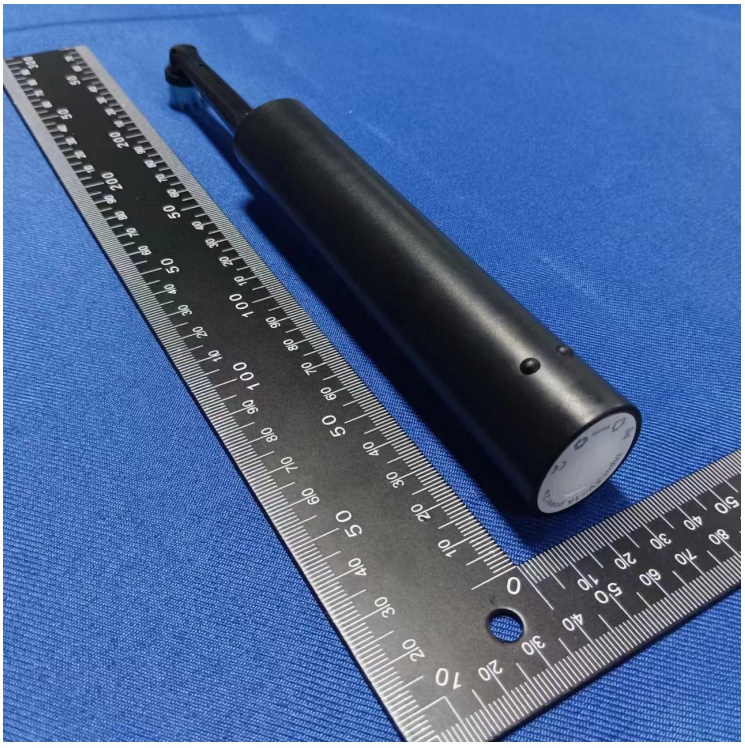
Details of: Overall view



Details of: Overall view

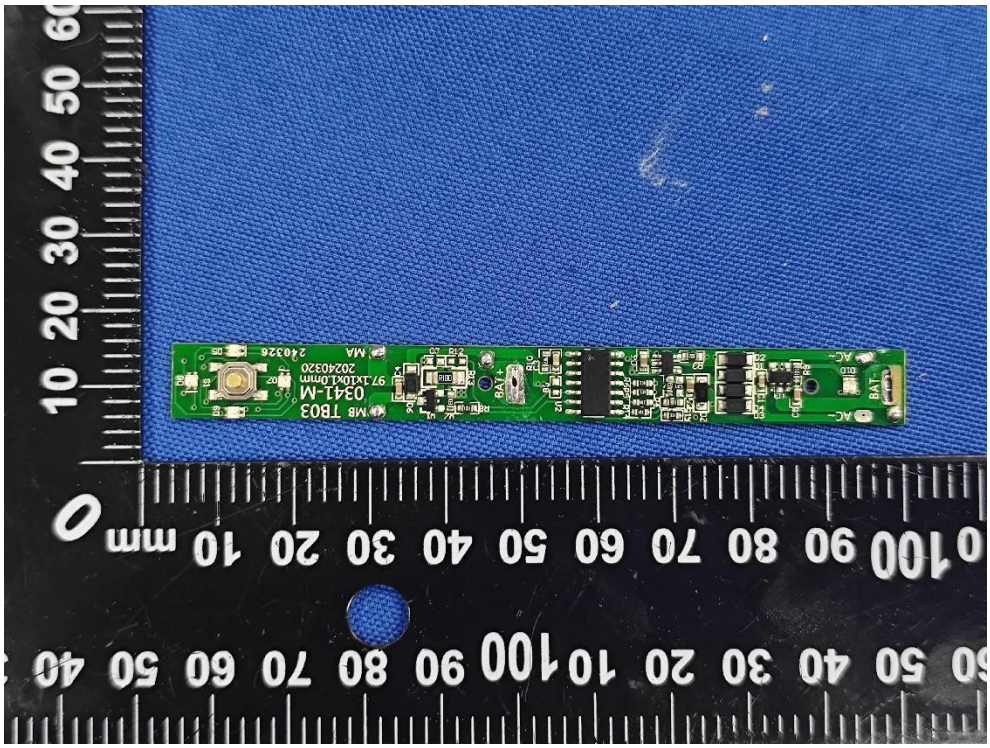


Details of: Overall view

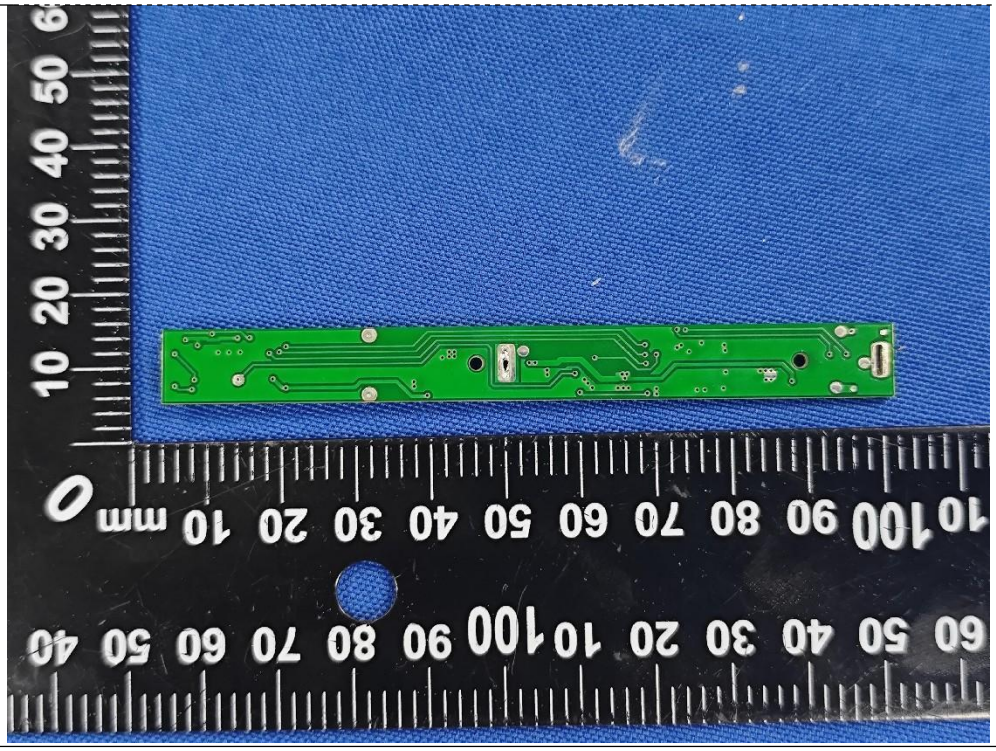


Details of: Internal view

Details of: PCB trace view



Details of: PCB trace view



※※※※※ **END OF REPORT** ※※※※※

Certificate No. 24CTZ11102E03

Supplier's Declaration of Conformity

Applicant	:	Shenzhen Sinco Technology Co., Limited.
Address	:	9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.
Manufacture	:	Shenzhen Sinco Technology Co., Limited.
Address	:	9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.
Product	:	Electric toothbrush
Model No.	:	210
Ratings	:	5VDC Battery: 3.7VDC
Trade Mark	:	N/A
Standard(s)	:	47 CFR FCC Part 15, Subpart B ANSI C63.4:2014
Report No.	:	CTZ2411102EFC03

The device bearing the trade name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified. (Refer to Test Report if any modifications were made for compliance) .

Dongguan Zhongzhengtong Testing Technology Co., Ltd.

Allen Zou / Manager

Date of Issue: Nov 26, 2024

This certificate of conformity is based on a single evaluation of the submitted sample(s) of the above mentioned product. It does not imply an assessment of the whole production and other relevant Directives have to be observed.

Dongguan Zhongzhengtong Testing Technology Co., Ltd.

Room 206 and Room 208, No. 8, Guancheng Section, Guanlong Road, Guancheng Street, Dongguan, Guangdong, China

TEL: (+86)769-22261862

FCC TEST REPORT

Applicant: **Address:**	**Shenzhen Sinco Technology Co., Limited.** **9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.**		
Manufacturer: **Address:**	**Shenzhen Sinco Technology Co., Limited.** **9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.**		
Factory: **Address:**	**Shenzhen Sinco Technology Co., Limited.** **9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.**		
E.U.T.:	**Electric toothbrush**		
Model Number:	**210**		
Test Model :	**210**		
Trade mark:	**N/A**		
Date of Receipt:	**Nov 23, 2024**	**Date of Test:**	**Nov 25, 2024**
Test Specification:	**47 CFR FCC Part 15, Subpart B** **ANSI C63.4:2014**		
Test Result:	**The equipment under test was found to be compliance with the requirements of the standards applied.**		

Prepared by:

Allen Zou / Manager

Approved & Authorized Signer:

Luke Li / Project Engineer

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 Dongguan Zhongzhengtong Testing Technology Co. , Ltd.

TABLE OF CONTENTS

Revision History of This Test Report		
Report Number	Description	Issued Date
CTZ2411102EFC03	Initial Issue	Nov 26, 2024

1. GENERAL PRODUCT INFORMATION

1.1. PRODUCT FUNCTION

Refer to Technical Construction Form and User Manual.

1.2. DIFFERENCE BETWEEN MODEL NUMBERS

N/A

1.3. TEST DESCRIPTION OF DEVICE (EUT)

Test Model	:	210
Rated Output	:	5VDC Battery: 3.7VDC
Operation Frequency	:	Below 108MHz (Declaration by applicant)

1.4. INDEPENDENT OPERATION MODES

Test Voltage:	3.7VDC or 5VDC
Test Mode:	1. Normal operation 2. Charging

Remark：This test report only reflects the data of the worst test mode

2. TEST STANDARDS AND SITES

2.1. DESCRIPTION OF STANDARDS AND RESULTS

The EUT have been tested according to the applicable standards as referenced below.

EMISSION			
Standard	**Test Type**	**Result**	**Remarks**
47 CFR FCC Part 15, Subpart B ANSI C63.4:2014	Mains Terminal Disturbance Voltage Test	PASS	Meets the requirements.
	Radiated Emission Test	PASS	Meets the requirements.

2.2. LIST OF TEST AND MEASUREMENT INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Disturbance Voltage at the mains terminals					
EMI Test Receiver	R&S	ESR3	102124	Dec. 23, 2023	1 Year
Pulse Limiter	R&S	ESH3-Z2	357.8810.52	Dec. 22, 2023	1 Year
LISN	Schwarzbeck	NSLK.8127	8127-892	Mar. 16, 2024	1 year
Radiated electromagnetic-disturbances					
RF. Preamp. Amplifier	EMEC	EM330	060676	Dec. 22, 2023	1 Year
Broadband.Antenna	Schwarzbeck	9163	139	Apr. 13, 2023	3 Year
EMI.Test Receiver	R&S	ESVS30	829673/011	Dec. 23, 2023	1 Year
EXA.Signal analyzer	KEYSIGHT	MY56070465	N9010A	Dec. 23, 2023	1 Year

2.3. MEASUREMENT UNCERTAINTY

Parameter		UNCERTAINTY
Conducted Emission	Level accuracy (150kHz to 30MHz)	± 2.54 dB
Radiated Emission	Level accuracy (30MHz to 1000MHz, V) (30MHz to 1000MHz, H)	± 4.14 dB ± 4.25 dB
Radiated Emission	Level accuracy (above 1000MHz, Horizontal) (above 1000MHz, Vertical)	± 3.92 dB ± 3.96 dB
Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.		
• As Ulab in all applicable tests listed above are less than Ucispr according to CISPR 16-4-2:2003, • compliance is deemed to occur if no measured disturbance exceeds the disturbance limit; • non-compliance is deemed to occur if any measured disturbance exceeds the disturbance limit.		

2.4. TEST FACILITY

Test Location : Dongguan Zhongzhengtong Testing Technology Co. , Ltd.

Address : Room 206 and Room 208, No. 8, Guancheng Section, Guanlong Road, Guancheng Street, Dongguan, Guangdong, China

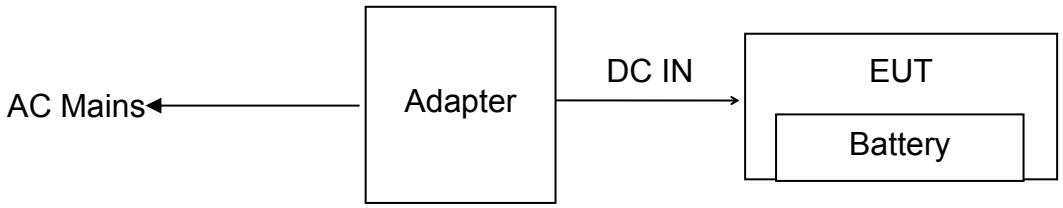
3. TEST SET-UP AND OPERATION MODES

3.1. PRINCIPLE OF CONFIGURATION SELECTION

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.
Immunity: The equipment under test (EUT) was configured to the representative operating mode and conditions.

3.2. BLOCK DIAGRAM OF TEST SET-UP

System Diagram of Connections Between EUT and Simulators



3.3. SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT

Product Type	Manufacturer	Model	Serial No.
/	/	/	/

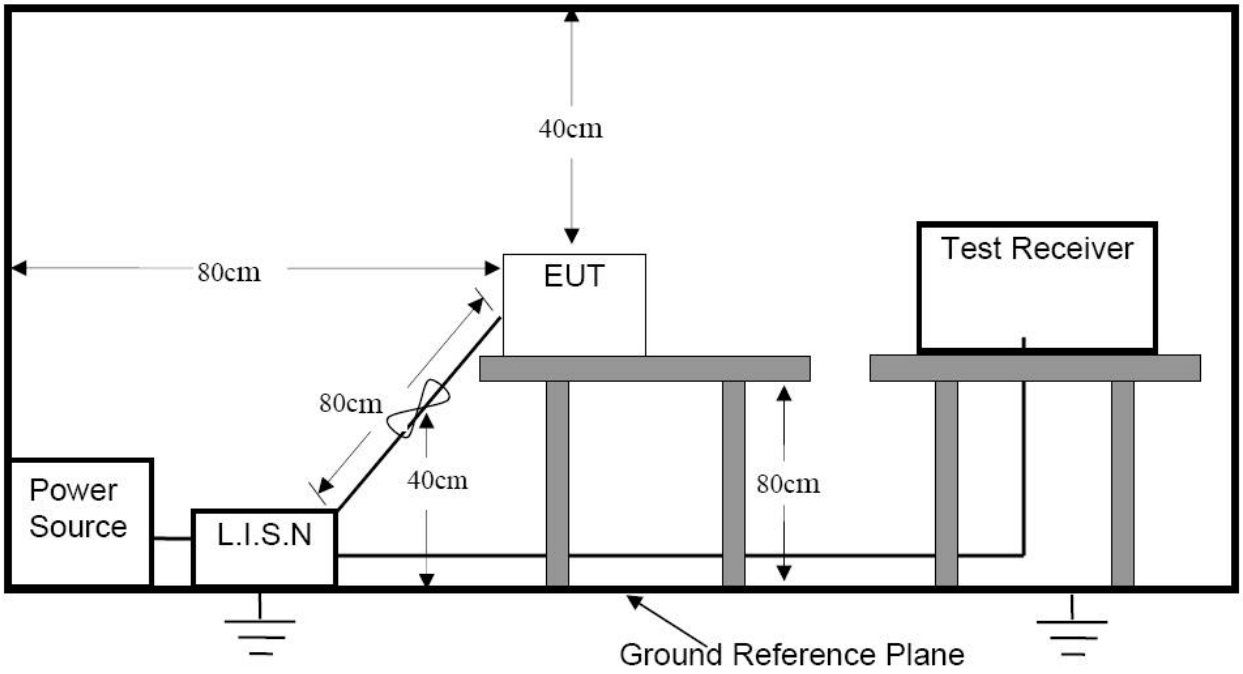
3.4. COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE

None.

4. EMISSION TEST RESULTS

4.1. CONDUCTED EMISSION AT THE MAINS TERMINALS TEST

4.1.1. Block Diagram of Test Setup



4.1.2. Limit

Limits Of Conducted Emission(Mains Port)(Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	☐ Class A (dBuV)		☒ Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79	66	66 - 56	56 - 46
0.50 -5.0	73	60	56.00	46
5.0 -30.0	73	60	60.00	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

4.1.3. Test Procedure

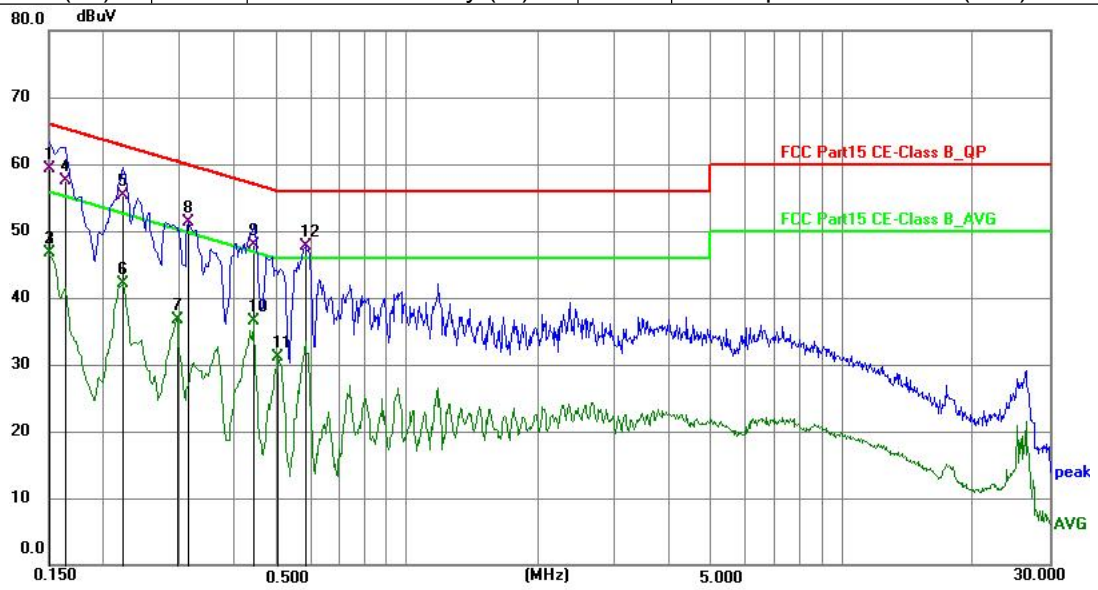
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The test results of conducted emissions at mains ports are recorded of six worst margins for quasi-peak(mandatory) [and average (if necessary)] values against the limits at frequencies of interest unless the margin is 20 dB or greater.
Note: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.1.4. Test Results

PASS.

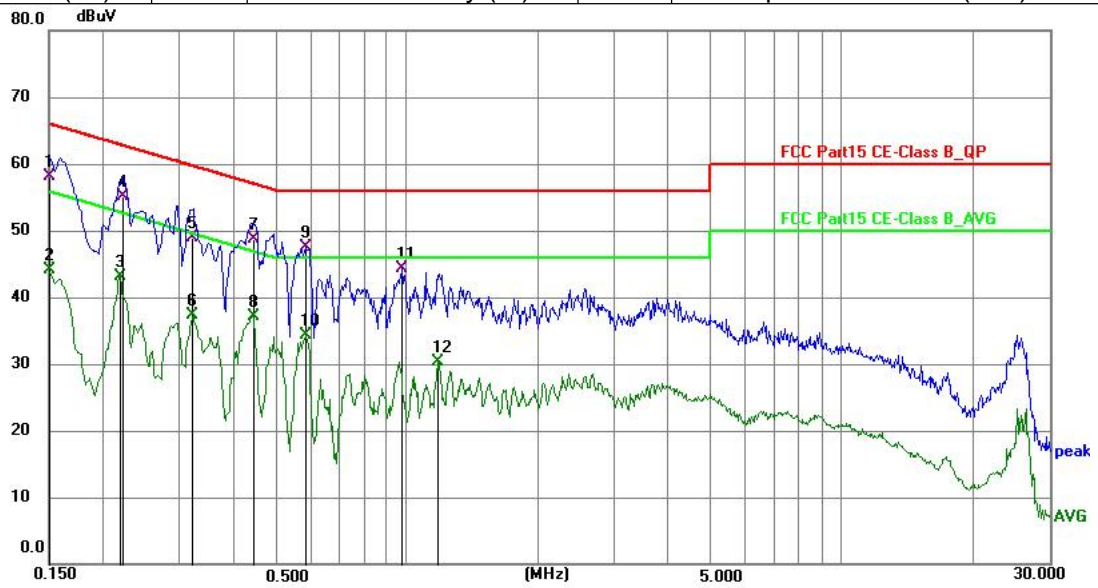
Please refer to the following pages of the worst case:

M/N		:	210			
Test Mode		:	Mode 2			
Test Phase		:	Power Line; Live			
Test Voltage		:	5VDC			
Temperature (°C):	24	Relative Humidity (%):		53	Atmospheric Pressure(kPa) :	101.5



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1 *	0.1500	49.89	9.51	59.40	66.00	-6.60	QP	P	
2	0.1500	37.18	9.51	46.69	56.00	-9.31	AVG	P	
3	0.1500	37.18	9.51	46.69	56.00	-9.31	AVG	P	
4	0.1635	48.04	9.56	57.60	65.28	-7.68	QP	P	
5	0.2220	45.60	9.70	55.30	62.74	-7.44	QP	P	
6	0.2220	32.34	9.70	42.04	52.74	-10.70	AVG	P	
7	0.2940	27.04	9.68	36.72	50.41	-13.69	AVG	P	
8	0.3120	41.66	9.67	51.33	59.92	-8.59	QP	P	
9	0.4425	38.27	9.63	47.90	57.01	-9.11	QP	P	
10	0.4425	26.79	9.63	36.42	47.01	-10.59	AVG	P	
11	0.5055	21.47	9.62	31.09	46.00	-14.91	AVG	P	
12	0.5820	37.96	9.66	47.62	56.00	-8.38	QP	P	

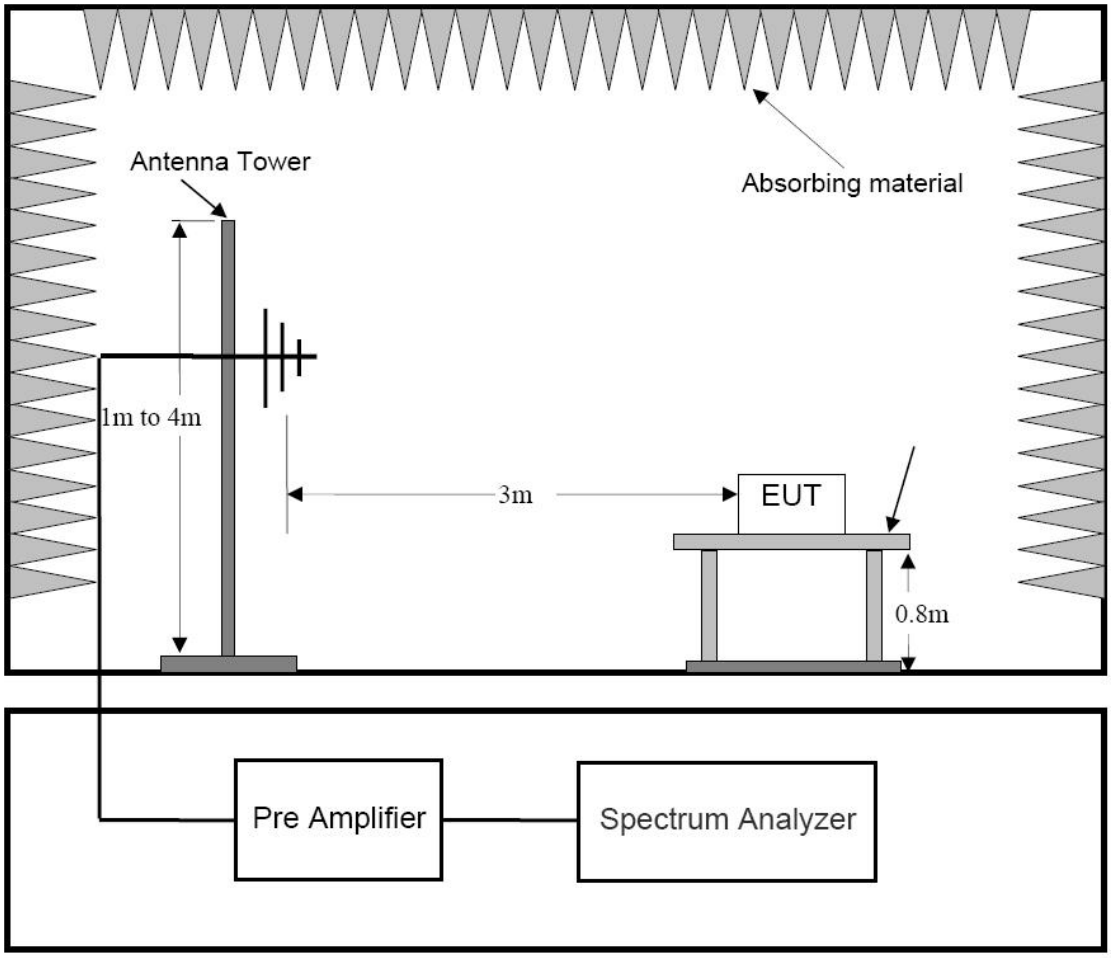
M/N		:	210			
Test Mode		:	Mode 2			
Test Phase		:	Power Line; Neutral			
Test Voltage		:	5VDC			
Temperature (°C):	24	Relative Humidity (%):		53	Atmospheric Pressure(kPa) :	101.5



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	48.69	9.51	58.20	66.00	-7.80	QP	P	
2	0.1500	34.59	9.51	44.10	56.00	-11.90	AVG	P	
3	0.2175	33.45	9.70	43.15	52.91	-9.76	AVG	P	
4 *	0.2220	45.40	9.70	55.10	62.74	-7.64	QP	P	
5	0.3209	39.33	9.67	49.00	59.68	-10.68	QP	P	
6	0.3209	27.70	9.67	37.37	49.68	-12.31	AVG	P	
7	0.4425	39.17	9.63	48.80	57.01	-8.21	QP	P	
8	0.4425	27.44	9.63	37.07	47.01	-9.94	AVG	P	
9	0.5820	37.93	9.66	47.59	56.00	-8.41	QP	P	
10	0.5820	24.62	9.66	34.28	46.00	-11.72	AVG	P	
11	0.9780	34.74	9.53	44.27	56.00	-11.73	QP	P	
12	1.1760	20.81	9.56	30.37	46.00	-15.63	AVG	P	

4.2. RADIATED EMISSION TEST

4.2.1. Block Diagram of Test Setup



4.2.2. Limit

Limits of Radiated Emission Measurement(Below 1000MHz)

Frequency (MHz)	□Class A (at 10m)		☒Class B (at 3m)	
	(uV/m)	(dBuV/m)	(uV/m)	(dBuV/m)
30-88	90	39	100	40
88-216	150	43.5	150	43.5
216-960	2003	46.4	200	46
Above 960	300	49.5	500	54

Limits of Radiated Emission Measurement (Above 1000MHz)

Frequency (GHz)	□Class A (dBuV/m) (at 3m)		□Class B (dBuV/m) (at 3m)	
	Peak	Average	Peak	Average
1 ~ 6	80	60	74	54

Frequency Range Of Radiated Measurement (For Unintentional Radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705-108	1000
108-500	2000
500-1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

NOTE:
(1) The limit for radiated test was performed according to FCC Part 15;
(2) The tighter limit applies at the band edges;
(3) Emission level (dBuV/m)= 20log Emission level (uV/m).
3m Emission level=10m Emission level +20log(10m/3m);
(4) The bandwidth of the Receiver is set at 120 kHz.
(5) The test result calculated as following:
Measurement Value=Reading Level+Correct Factor.
Correct Factor=Antenna Factor+Cable Loss-Amplifier Gain(if use),
Margin Level = Measurement Value - Limit Value.

4.2.3. Test Procedure

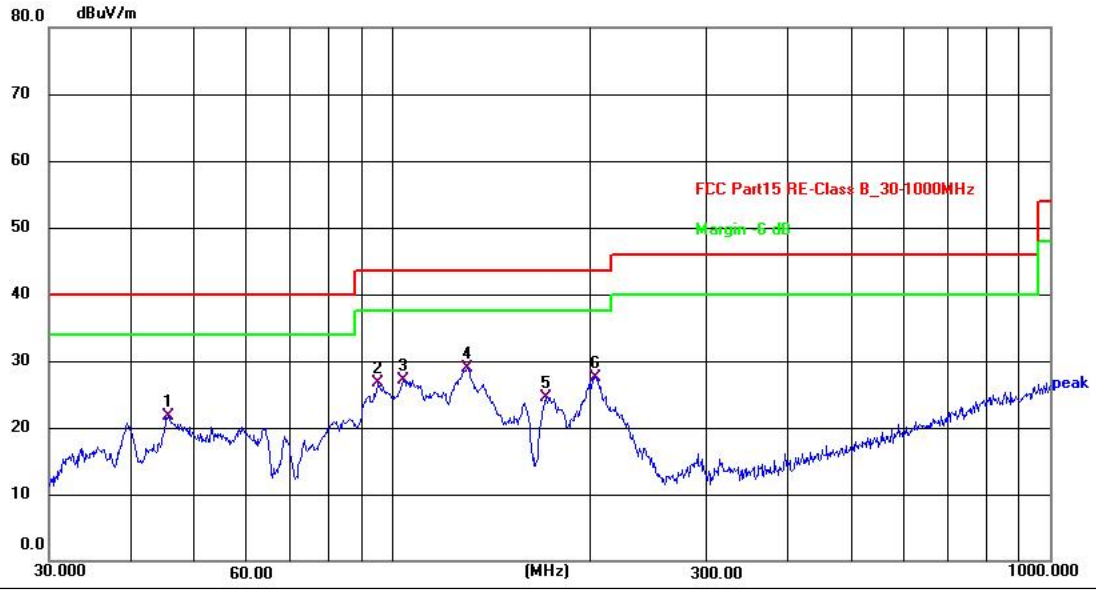
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The height of antenna is varied from 1 meter to 4 meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1GHz.

4.2.4. Test Results

PASS.

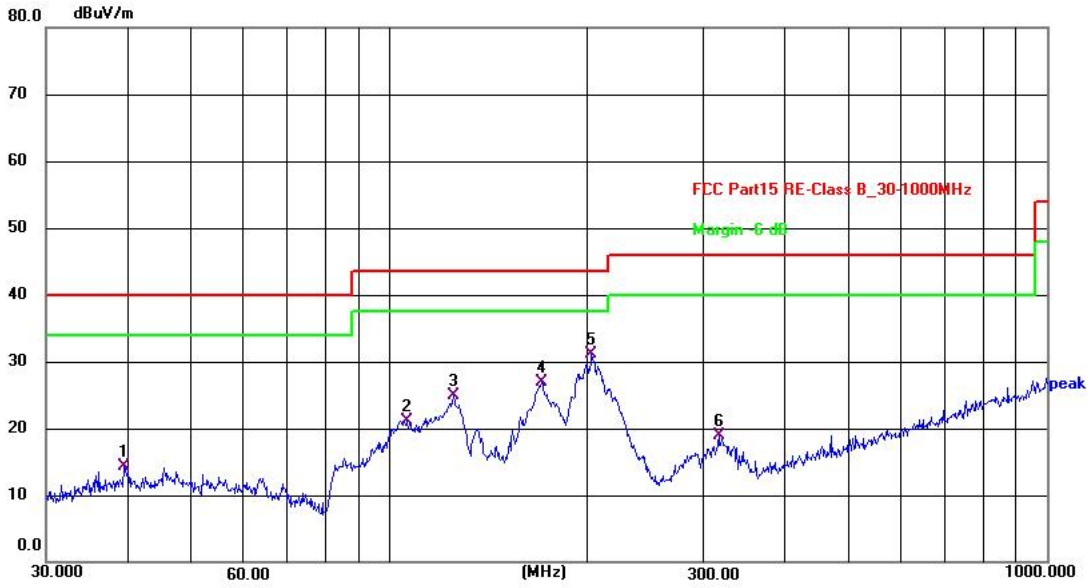
Please refer to the following pages of the worst case:

M/N	:	210			
Test Mode	:	Mode 1			
Test Phase	:	Vertical			
Test Voltage	:	3.7VDC			
Temperature (°C):	20	Relative Humidity (%):	51	Atmospheric Pressure(kPa) :	101.6



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	45.5348	37.68	-16.02	21.66	40.00	-18.34	QP
2	95.0930	46.72	-19.99	26.73	43.50	-16.77	QP
3	103.8055	46.71	-19.65	27.06	43.50	-16.44	QP
4 *	129.9226	46.52	-17.63	28.89	43.50	-14.61	QP
5	171.3926	41.21	-16.64	24.57	43.50	-18.93	QP
6	203.5228	46.67	-19.10	27.57	43.50	-15.93	QP

M/N		:	210			
Test Mode		:	Mode 1			
Test Phase		:	Horizontal			
Test Voltage		:	3.7VDC			
Temperature (°C):	20	Relative Humidity (%):		51	Atmospheric Pressure(kPa) :	101.6



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	39.4371	30.16	-15.78	14.38	40.00	-25.62	QP
2	106.3850	40.56	-19.38	21.18	43.50	-22.32	QP
3	125.0066	42.85	-17.90	24.95	43.50	-18.55	QP
4	170.1948	43.39	-16.44	26.95	43.50	-16.55	QP
5 *	202.8104	50.29	-19.09	31.20	43.50	-12.30	QP
6	316.5890	34.42	-15.44	18.98	46.00	-27.02	QP

5. PHOTOGRAPHS OF THE EUT

Figure 1. Overall view of unit

Figure 2. Overall view of unit

Figure 3. Overall view of unit

--END--

FCC TEST REPORT

Applicant: **Address:**	**Shenzhen Sinco Technology Co., Limited.** **9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.**		
Manufacturer: **Address:**	**Shenzhen Sinco Technology Co., Limited.** **9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.**		
Factory: **Address:**	**Shenzhen Sinco Technology Co., Limited.** **9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.**		
E.U.T.:	**Electric toothbrush**		
Model Number:	**210**		
Test Model :	**210**		
Trade mark:	**N/A**		
Date of Receipt:	**Apr 8, 2024**	**Date of Test:**	**Apr 11, 2024**
Test Specification:	**47 CFR FCC Part 15, Subpart B, 2019**		
Test Result:	**The equipment under test was found to be compliance with the requirements of the standards applied.**		

Prepared by:

Jack

Jack Xiao /Engineer

Approved & Authorized Signer:

Dongguan Zhongzhengtong Testing Technology Co., Ltd. CERTIFICATE CTZ

Luke

Luke Li / Project Engineer

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 Dongguan Zhongzhengtong Testing Technology Co. , Ltd.

TABLE OF CONTENTS

Revision History of This Test Report		
Report Number	Description	Issued Date
CTZ2404026EFC04	Initial Issue	Apr 18, 2024

1. GENERAL PRODUCT INFORMATION

1.1. PRODUCT FUNCTION

Refer to Technical Construction Form and User Manual.

1.2. DIFFERENCE BETWEEN MODEL NUMBERS

N/A

1.3. TEST DESCRIPTION OF DEVICE (EUT)

Test Model	:	210
Rated Output	:	DC 5V Battery: DC 3.7V
Operation Frequency	:	Below 108MHz (Declaration by applicant)

1.4. INDEPENDENT OPERATION MODES

Test Voltage: DC 5V

Test Mode: 1.Normal operation

Remark：This test report only reflects the data of the worst test mode

2. TEST STANDARDS AND SITES

2.1. DESCRIPTION OF STANDARDS AND RESULTS

The EUT have been tested according to the applicable standards as referenced below.

EMISSION			
Standard	**Test Type**	**Result**	**Remarks**
47 CFR FCC Part 15, Subpart B, Class B，2019	Mains Terminal Disturbance Voltage Test	PASS	Meets the requirements.
	Radiated Emission Test	PASS	Meets the requirements.

2.2. LIST OF TEST AND MEASUREMENT INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Disturbance Voltage at the mains terminals					
EMI Test Receiver	R&S	ESR3	102124	Dec. 23, 2023	1 Year
Pulse Limiter	R&S	ESH3-Z2	357.8810.52	Dec. 22, 2023	1 Year
LISN	Schwarzbeck	NSLK.8127	8127-892	Mar. 16, 2024	1 year
Radiated electromagnetic-disturbances					
RF. Preamp. Amplifier	EMEC	EM330	060676	Dec. 22, 2023	1 Year
Broadband.Antenna	Schwarzbeck	9163	139	Apr. 13, 2023	3 Year
EMI.Test Receiver	R&S	ESVS30	829673/011	Dec. 23, 2023	1 Year
EXA.Signal analyzer	KEYSIGHT	MY56070465	N9010A	Dec. 23, 2023	1 Year

2.3. MEASUREMENT UNCERTAINTY

Parameter		UNCERTAINTY
Conducted Emission	Level accuracy (150kHz to 30MHz)	± 2.54 dB
Radiated Emission	Level accuracy (30MHz to 1000MHz, V) (30MHz to 1000MHz, H)	± 4.14 dB ± 4.25 dB
Radiated Emission	Level accuracy (above 1000MHz, Horizontal) (above 1000MHz, Vertical)	± 3.92 dB ± 3.96 dB
Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.		
• As Ulab in all applicable tests listed above are less than Ucispr according to CISPR 16-4-2:2003, • compliance is deemed to occur if no measured disturbance exceeds the disturbance limit; • non-compliance is deemed to occur if any measured disturbance exceeds the disturbance limit.		

2.4. TEST FACILITY

Test Location : Dongguan Zhongzhengtong Testing Technology Co. , Ltd.

Address : Room 206 and Room 208, No. 8, Guancheng Section, Guanlong Road, Guancheng Street, Dongguan, Guangdong, China

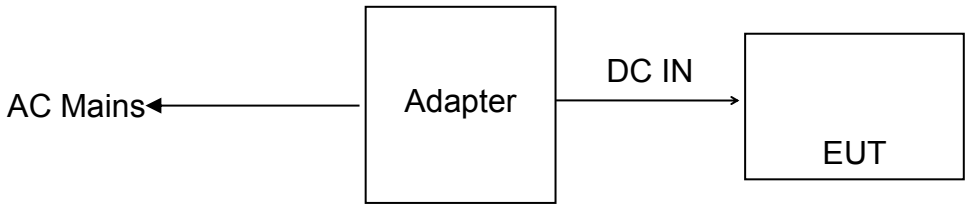
3. TEST SET-UP AND OPERATION MODES

3.1. PRINCIPLE OF CONFIGURATION SELECTION

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.
Immunity: The equipment under test (EUT) was configured to the representative operating mode and conditions.

3.2. BLOCK DIAGRAM OF TEST SET-UP

System Diagram of Connections Between EUT and Simulators



3.3. SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT

Product Type	Manufacturer	Model	Serial No.
/	/	/	/

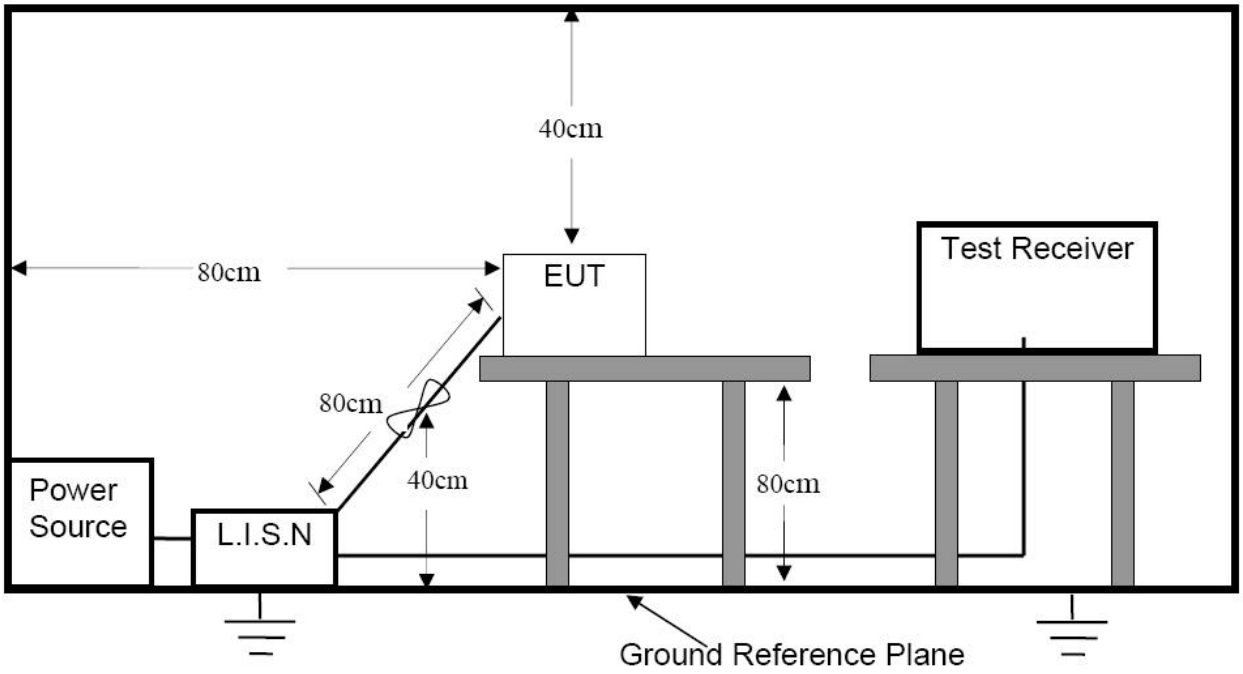
3.4. COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE

None.

4. EMISSION TEST RESULTS

4.1. CONDUCTED EMISSION AT THE MAINS TERMINALS TEST

4.1.1. Block Diagram of Test Setup



4.1.2. Limit

Limits Of Conducted Emission(Mains Port)(Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	☐ Class A (dBuV)		☒ Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79	66	66 - 56	56 - 46
0.50 -5.0	73	60	56.00	46
5.0 -30.0	73	60	60.00	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

4.1.3. Test Procedure

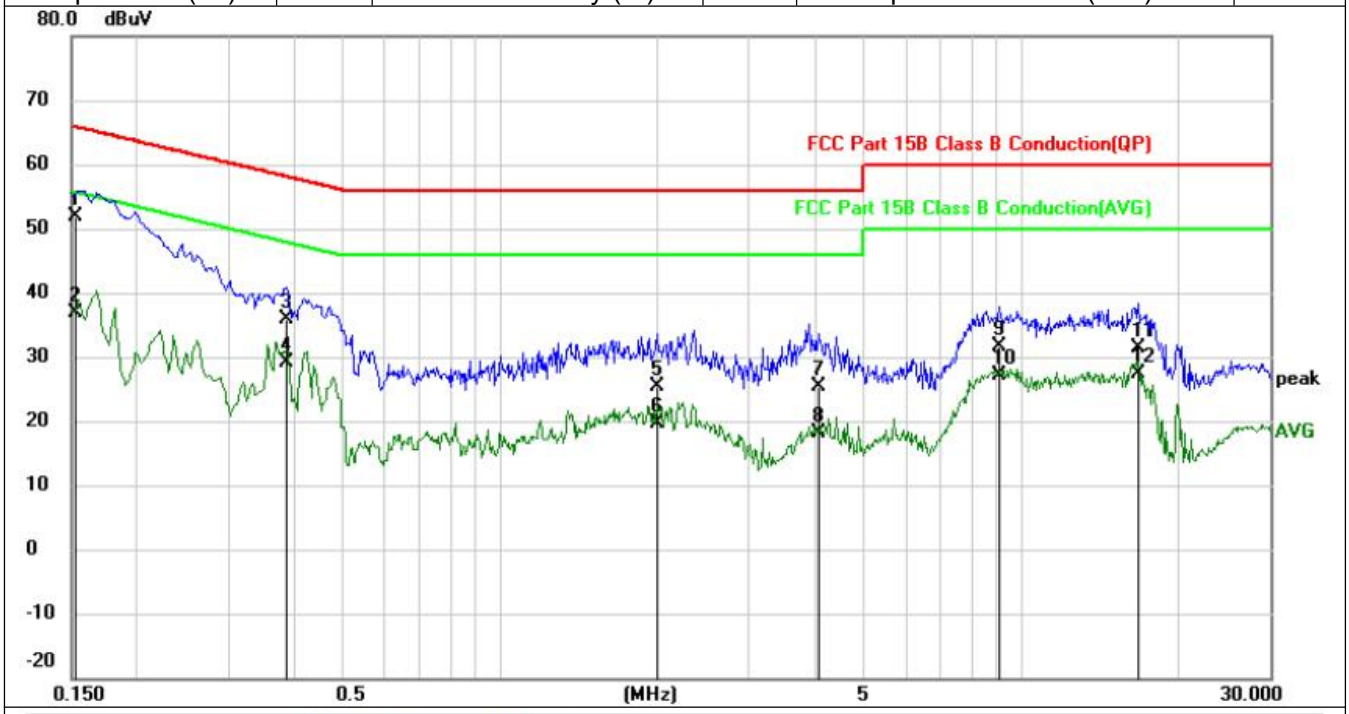
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The test results of conducted emissions at mains ports are recorded of six worst margins for quasi-peak(mandatory) [and average (if necessary)] values against the limits at frequencies of interest unless the margin is 20 dB or greater.
Note: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.1.4. Test Results

PASS.

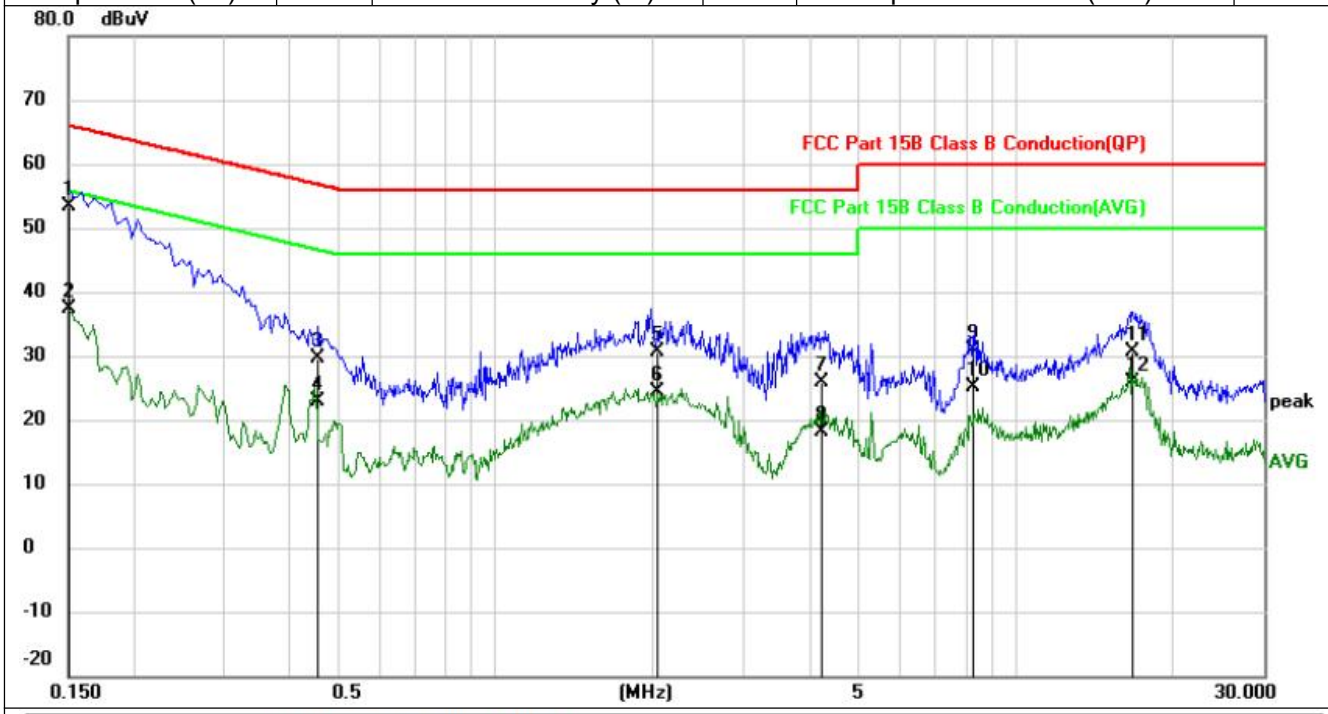
Please refer to the following pages of the worst case:

M/N		:	210			
Test Mode		:	Mode 1			
Test Phase		:	Power Line; Live			
Test Voltage		:	DC 5V			
Temperature (°C):	21.7	Relative Humidity (%):		51.2	Atmospheric Pressure(kPa) :	101.2



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1521	41.84	10.04	51.88	65.88	-14.00	QP	
2		0.1521	26.75	10.04	36.79	55.88	-19.09	AVG	
3		0.3856	25.73	10.05	35.78	58.16	-22.38	QP	
4		0.3856	19.15	10.05	29.20	48.16	-18.96	AVG	
5		2.0146	15.22	10.13	25.35	56.00	-30.65	QP	
6		2.0146	9.49	10.13	19.62	46.00	-26.38	AVG	
7		4.0818	15.12	10.16	25.28	56.00	-30.72	QP	
8		4.0818	7.87	10.16	18.03	46.00	-27.97	AVG	
9		9.1241	21.34	10.34	31.68	60.00	-28.32	QP	
10		9.1241	16.74	10.34	27.08	50.00	-22.92	AVG	
11		16.7857	20.39	11.06	31.45	60.00	-28.55	QP	
12		16.7857	16.44	11.06	27.50	50.00	-22.50	AVG	

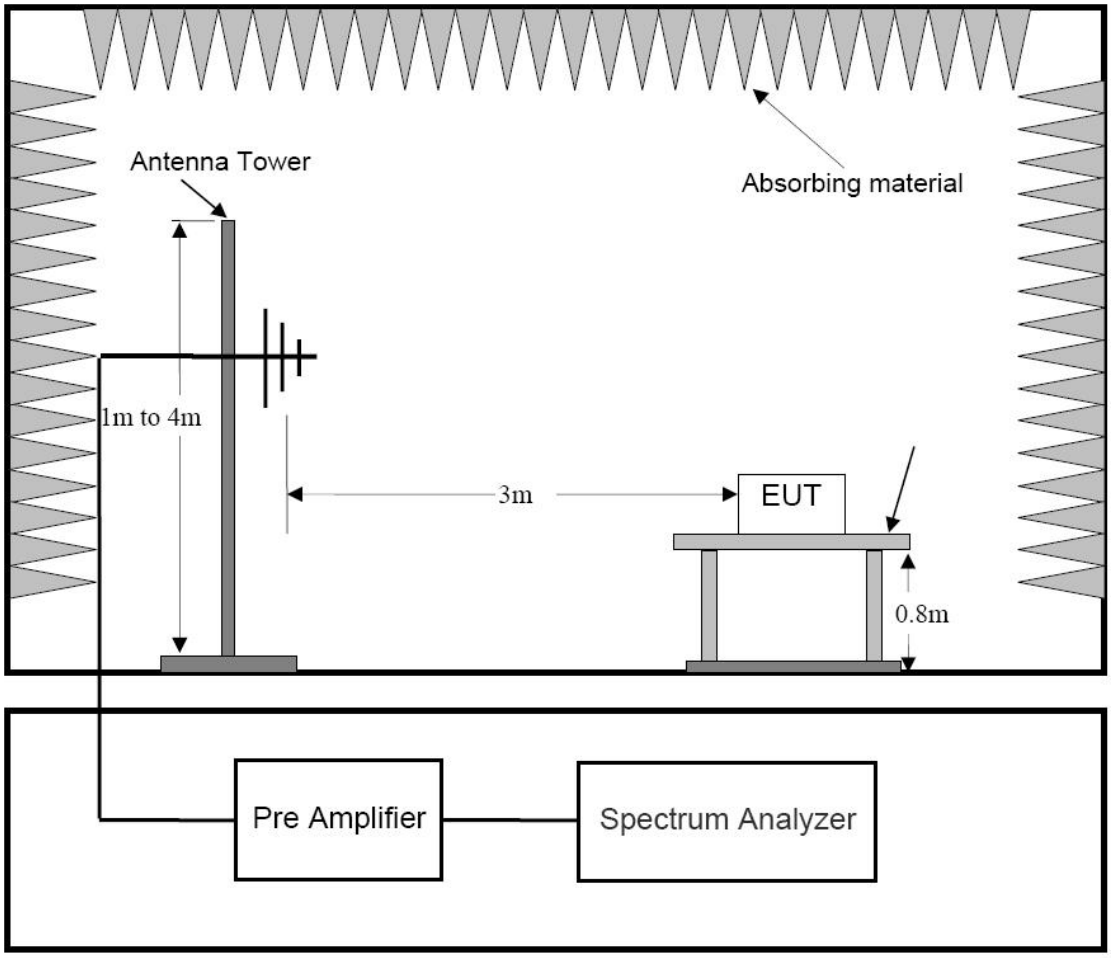
M/N		:	210			
Test Mode		:	Mode 1			
Test Phase		:	Power Line; Neutral			
Test Voltage		:	DC 5V			
Temperature (°C):	21.7	Relative Humidity (%):		51.2	Atmospheric Pressure(kPa) :	101.2



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1508	43.27	10.04	53.31	65.96	-12.65	QP	
2		0.1508	27.38	10.04	37.42	55.96	-18.54	AVG	
3		0.4542	19.69	10.04	29.73	56.80	-27.07	QP	
4		0.4542	12.80	10.04	22.84	46.80	-23.96	AVG	
5		2.0429	20.58	10.13	30.71	56.00	-25.29	QP	
6		2.0429	14.22	10.13	24.35	46.00	-21.65	AVG	
7		4.2322	15.82	10.16	25.98	56.00	-30.02	QP	
8		4.2322	7.91	10.16	18.07	46.00	-27.93	AVG	
9		8.2761	20.47	10.31	30.78	60.00	-29.22	QP	
10		8.2761	14.94	10.31	25.25	50.00	-24.75	AVG	
11		16.8584	19.68	11.05	30.73	60.00	-29.27	QP	
12		16.8584	14.73	11.05	25.78	50.00	-24.22	AVG	

4.2. RADIATED EMISSION TEST

4.2.1. Block Diagram of Test Setup



4.2.2. Limit

Limits of Radiated Emission Measurement(Below 1000MHz)

Frequency (MHz)	☐ Class A (at 10m)		☒ Class B (at 3m)	
	(uV/m)	(dBuV/m)	(uV/m)	(dBuV/m)
30-88	90	39	100	40
88-216	150	43.5	150	43.5
216-960	210	46.4	200	46
Above 960	300	49.5	500	54

Limits of Radiated Emission Measurement (Above 1000MHz)

Frequency (GHz)	☐ Class A (dBuV/m) (at 3m)		☐ Class B (dBuV/m) (at 3m)	
	Peak	Average	Peak	Average
1 ~ 6	80	60	74	54

Frequency Range Of Radiated Measurement (For Unintentional Radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705-108	1000
108-500	2000
500-1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

NOTE:
(1) The limit for radiated test was performed according to FCC Part 15;
(2) The tighter limit applies at the band edges;
(3) Emission level (dBuV/m)= 20log Emission level (uV/m).
3m Emission level=10m Emission level +20log(10m/3m);
(4) The bandwidth of the Receiver is set at 120 kHz.
(5) The test result calculated as following:
Measurement Value=Reading Level+Correct Factor.
Correct Factor=Antenna Factor+Cable Loss-Amplifier Gain(if use),
Margin Level = Measurement Value - Limit Value.

4.2.3. Test Procedure

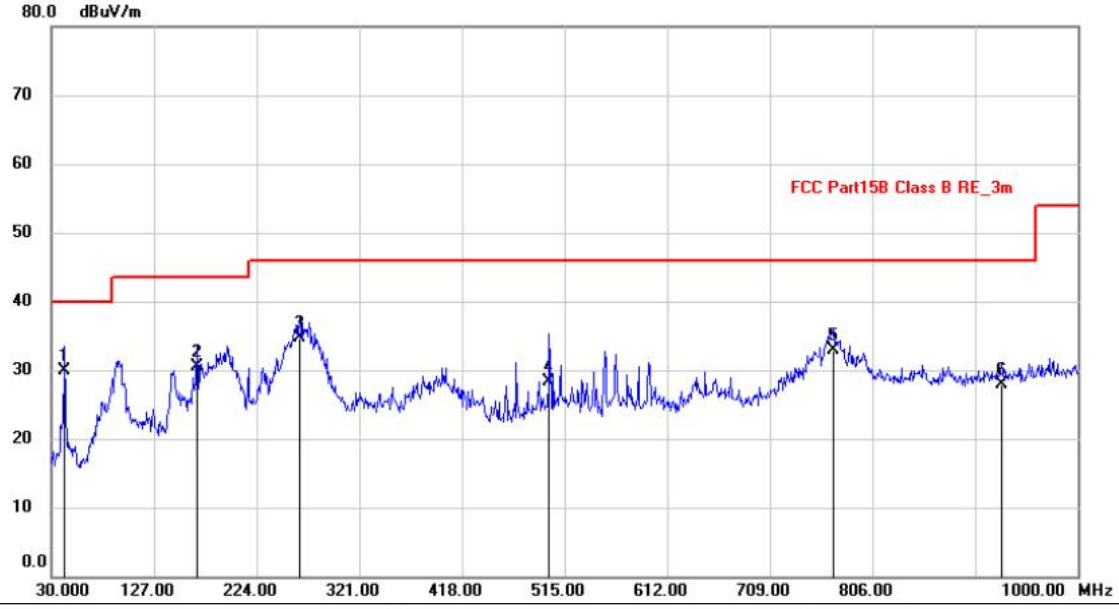
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The height of antenna is varied from 1 meter to 4 meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1GHz.

4.2.4. Test Results

PASS.

Please refer to the following pages of the worst case:

M/N		:	210			
Test Mode		:	Mode 1			
Test Phase		:	Vertical			
Test Voltage		:	DC 5V			
Temperature (°C):	21.7	Relative Humidity (%):		51.2	Atmospheric Pressure(kPa) :	101.2



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	42.4900	46.90	-16.90	30.00	40.00	-10.00	QP			
2		167.7400	50.09	-19.59	30.50	43.50	-13.00	QP			
3		264.7400	50.24	-15.60	34.64	46.00	-11.36	QP			
4		500.4500	38.73	-10.38	28.35	46.00	-17.65	QP			
5		769.1400	38.52	-5.57	32.95	46.00	-13.05	QP			
6		928.2200	31.71	-3.72	27.99	46.00	-18.01	QP			

M/N		:	210			
Test Mode		:	Mode 1			
Test Phase		:	Horizontal			
Test Voltage		:	DC 5V			
Temperature (°C):	21.7	Relative Humidity (%):		51.2	Atmospheric Pressure(kPa) :	101.2

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		42.6100	34.88	-16.91	17.97	40.00	-22.03	QP			
2		190.0500	48.80	-18.63	30.17	43.50	-13.33	QP			
3	*	260.2400	51.60	-15.89	35.71	46.00	-10.29	QP			
4		398.6000	41.57	-12.69	28.88	46.00	-17.12	QP			
5		647.8900	33.85	-7.39	26.46	46.00	-19.54	QP			
6		769.1400	38.14	-5.57	32.57	46.00	-13.43	QP			

5. PHOTOGRAPHS OF THE EUT

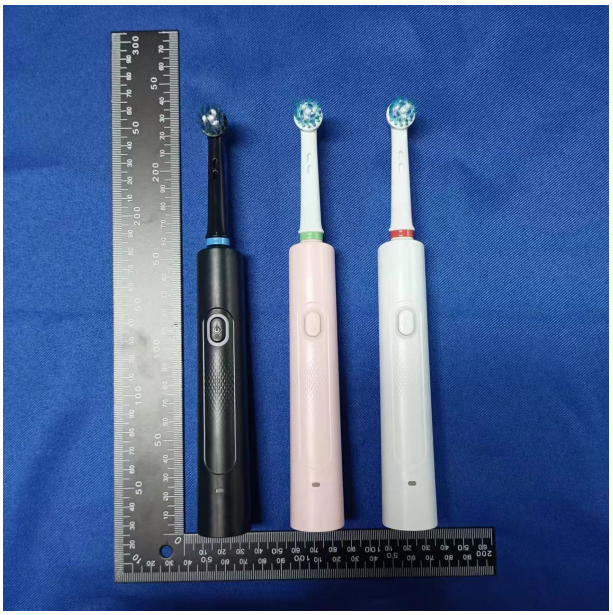


Figure 1. Overall view of unit

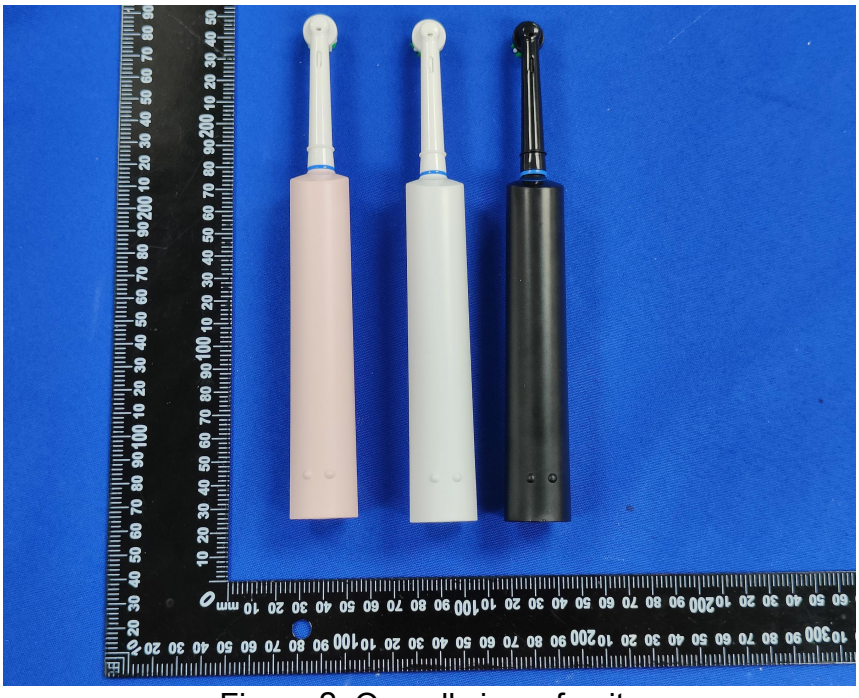


Figure 2. Overall view of unit

Figure 3. Overall view of unit

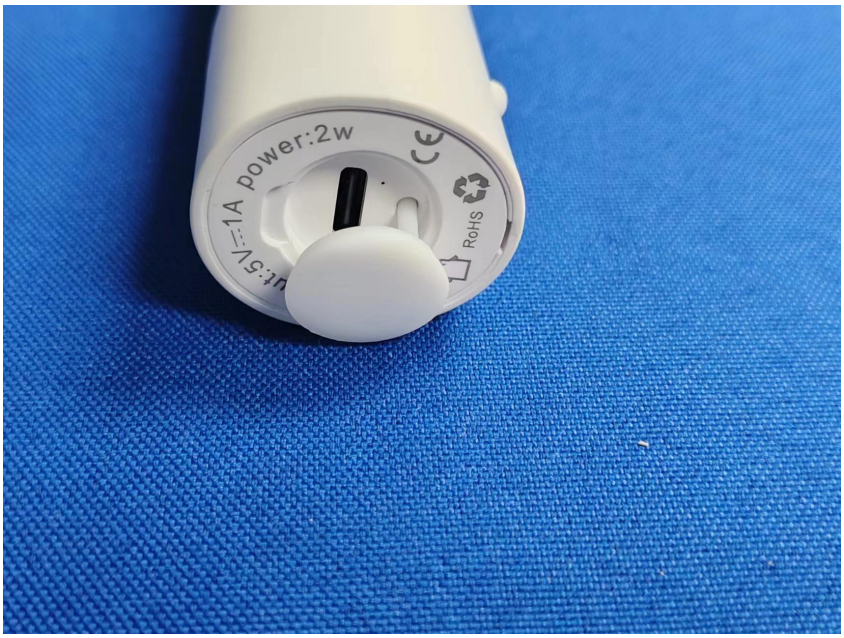


Figure 4. Overall view of unit

--END--

Certificate No. 24CTZ11102R04

VERIFICATION OF CONFORMITY

The following products have been tested by us andfound compliance with the RoHS Directive 2011/65/EU Annex II amending Annex (EU) 2015/863 of CE Directive.
This Certificate of Conformity is hereby issued to the product designated below:

Applicant	:	Shenzhen Sinco Technology Co., Limited.
Address	:	9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.
Manufacturer	:	Shenzhen Sinco Technology Co., Limited.
Address	:	9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.
Product	:	Electric toothbrush
Model No.	:	210
Trade Mark	:	N/A
Standard(s)	:	IEC 62321-1:2013, IEC 62321-2:2021 IEC 62321-3-1:2013 IEC62321-4: 2013+A1:2017, IEC 62321-5:2013 IEC 62321-6:2015, IEC 62321-7-1: 2015 IEC 62321-7-2: 2017, IEC 62321-8: 2017
Report No.	:	CTZ2411102ERO04

The device bearing the trade name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified. (Refer to Test Report if any modifications were made for compliance) .

Dongguan Zhongzhengtong Testing Technology Co., Ltd. CTZ CERTIFICATE

Allan Zou / Manager
Date of Issue: Nov 26, 2024

This certificate of conformity is based on a single evaluation of the submitted sample(s) of the above mentioned product. It does not imply an assessment of the whole production and other relevant Directives have to be observed.

Dongguan Zhongzhengtong Testing Technology Co., Ltd.
Room 206 and Room 208, No. 8, Guancheng Section, Guanlong Road, Guancheng Street, Dongguan, Guangdong, China
TEL: (+86)769-22261862

Test Report issued under the responsibility of:

Report Number	:	CTZ2411102ERO04
Applicant	:	Shenzhen Sinco Technology Co., Limited.
Address	:	9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.
Manufacturer	:	Shenzhen Sinco Technology Co., Limited.
Address	:	9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.
Product Name	:	Electric toothbrush
Model Number	:	210
Trademark	:	N/A
Date of Receipt	:	Nov 23, 2024
Test Date	:	Nov 25, 2024
Date of Report	:	Nov 26, 2024
Test Result	:	Please refer to next page(s).
Test Request	:	Please refer to next page(s).

General disclaimer:

The test results presented in this report relate only to the object tested.

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Prepared by(Test Engineer):
Luke Li

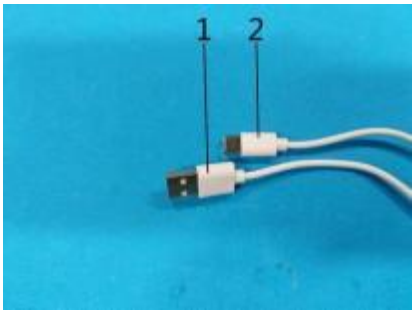
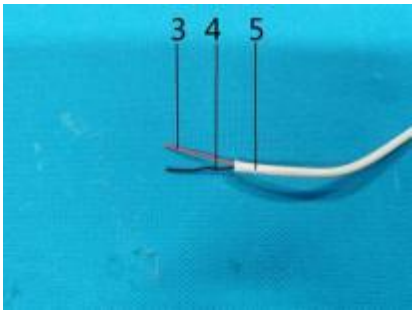
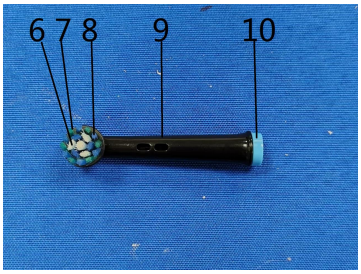
Reviewer(Supervisor):
Iverson Rao

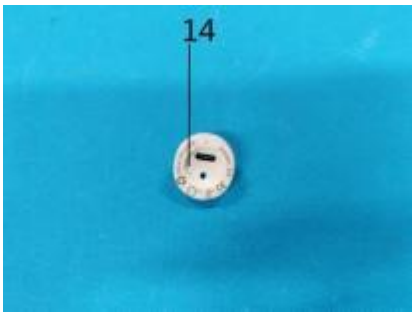
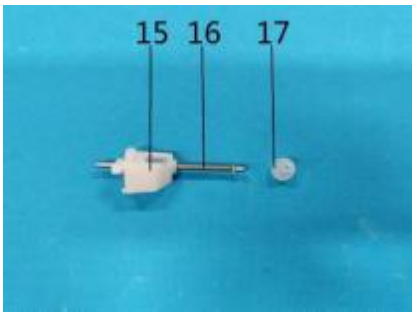
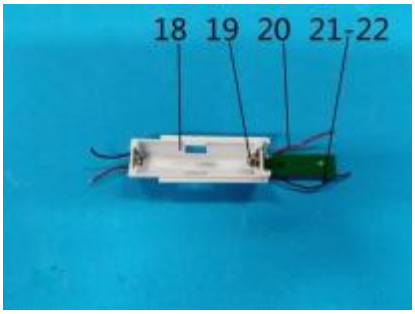
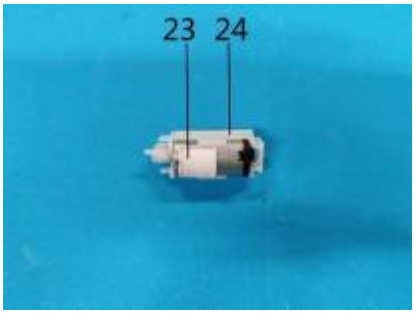
Approved(Manager):
Allen Zou

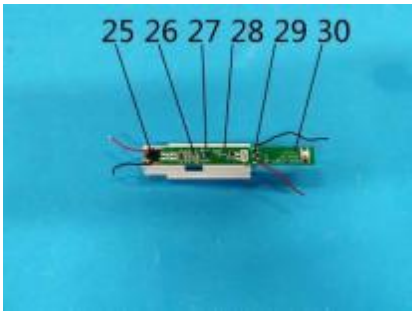
Summary of Test Results (Tested parts are required partially by client):

TEST REQUEST	CONCLUSION
RoHS Directive 2011/65/EU and its subsequent amendments Directive (EU) 2015/863	
(1) To determine Lead (Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls (PBBs) and Polybrominated DiphenylEthers (PBDEs) content by screening test and chemical test	**PASS**
(2) To determine Phthalates (DBP, BBP, DEHP, DIBP) content by chemical test	**PASS**

Test Material List

Material No.	Description (Location)	Photo(s) of tested materials
1	White soft plastic (handle, USB)	
2	White soft plastic (handle)	
3	Red soft plastic (wire jacket)	
4	Black soft plastic (wire jacket)	
5	White soft plastic (cable jacket)	
6	white plastic (brushing)	
7	green plastic (brushing)	
8	blue plastic (brushing)	
9	White plastic (pole)	
10	Blue plastic (ring)	
11	White transparent plastic (Key border)	
12	Black plastic (Key)	
13	Black plastic (pole)	

Material No.	Description (Location)	Photo(s) of tested materials
14	White plastic with black printing (base)	
15	White plastic	
16	Silvery metal (shaft)	
17	Translucent soft plastic	
18	White plastic	
19	Silvery metal (spring)	
20	Red soft plastic (wire jacket)	
21	Black soft plastic (wire jacket)	
22	Silvery metal (core)	
23	White adhesive foam	
24	White plastic (shell)	

Material No.	Description (Location)	Photo(s) of tested materials
25	black adhesive foam	
26	Black body (resistor)	
27	Black body (IC)	
28	Black body (triode)	
29	Brown body (capacitor)	
30	Green PCB	

Remark: The test result(s) of Material No. 3~ No. 5 is(are) shown retest result, and the retest sample(s) was(were) provided by client on Oct. 31, 2024.

Test Result(s):

(1) Lead (Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls (PBBs) and Polybrominated DiphenylEthers (PBDEs)

Test Method: IEC62321-3-1: 2013, IEC62321-4: 2013+A1:2017, IEC62321-5: 2013, IEC62321-6: 2015,IEC 62321-7-1:2015, IEC 62321-7-2: 2017, analyzed by EDXRF & ICP-OES & GC-MS & UV-Vis.

No.	EDXRF Result (1)					Chemical Result (2) (mg/kg)	Remark(3)	Conclusion
	Pb	Cd	Hg	Cr	Br			
1	BL	BL	BL	BL	BL	-	-	PASS
2	BL	BL	BL	BL	BL	-	-	PASS
3	BL	BL	BL	BL	BL	-	Oct. 31, 2024	PASS
4	BL	BL	BL	BL	BL	-	Oct. 31, 2024	PASS
5	BL	BL	BL	BL	BL	-	Oct. 31, 2024	PASS
6	BL	BL	BL	BL	BL	-	-	PASS
7	BL	BL	BL	BL	BL	-	-	PASS
8	BL	BL	BL	BL	BL	-	-	PASS
9	BL	BL	BL	BL	BL	-	-	PASS
10	BL	BL	BL	BL	BL	-	-	PASS
11	BL	BL	BL	BL	BL	-	-	PASS

No.	EDXRF Result (1)					Chemical Result (2) (mg/kg)	Remark(3)	Conclusion
	Pb	Cd	Hg	Cr	Br			
12	BL	BL	BL	BL	BL	-	-	PASS
13	BL	BL	BL	BL	BL	-	-	PASS
14	BL	BL	BL	BL	BL	-	-	PASS
15	BL	BL	BL	BL	BL	-	-	PASS
16	BL	BL	BL	BL	NA	-	-	PASS
17	BL	BL	BL	BL	BL	-	-	PASS
18	BL	BL	BL	BL	BL	-	-	PASS
19	BL	BL	BL	BL	NA	-	-	PASS
20	BL	BL	BL	BL	BL	-	-	PASS
21	BL	BL	BL	BL	BL	-	-	PASS
22	BL	BL	BL	BL	NA	-	-	PASS
23	BL	BL	BL	BL	BL	-	-	PASS
24	BL	BL	BL	BL	BL	-	-	PASS
25	BL	BL	BL	BL	BL	-	-	PASS
26	BL	BL	BL	BL	BL	-	-	PASS
27	BL	BL	BL	BL	BL	-	-	PASS
28	BL	BL	BL	BL	BL	-	-	PASS
29	BL	BL	BL	BL	BL	-	-	PASS
30	BL	BL	BL	BL	BL	-	-	PASS

Remark:

(1) ①Results are obtained by EDXRF for primary screening, and further wet chemical testing by ICP-OES (for Cd, Pb, Hg), UV-VIS (for Cr(VI)) and GC/MS (for PBBs, PBDEs) is recommended to be performed, if an inconclusive result was found (as "X" in below table) (unit: mg/kg).

②OL = Over Limit, BL = Below Limit, X = Inconclusive, NA = Not Applicable.

③The EDXRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.

Element	Polymer	Metal	Composite Materials
Cd	BL ≤(70-3σ)< X <(130+3σ)≤ OL	BL ≤(70-3σ)< X <(130+3σ)≤ OL	LOD < X <(150+3σ)≤ OL
Pb	BL ≤(700-3σ)< X <(1300+3σ)≤ OL	BL ≤(700-3σ)< X <(1300+3σ)≤ OL	BL ≤(500-3σ)< X <(1500+3σ)≤ OL
Hg	BL ≤(700-3σ)< X <(1300+3σ)≤ OL	BL ≤(700-3σ)< X <(1300+3σ)≤ OL	BL ≤(500-3σ)< X <(1500+3σ)≤ OL
Br	BL ≤ (300-3σ)< X	NA	BL ≤ (250-3σ)< X
Cr	BL ≤ (700-3σ)< X	BL ≤ (700-3σ)< X	BL ≤ (500-3σ)< X

Units and limits in EU RoHS Directive 2011/65/EU:

Element	Pb	Cd	Hg	Cr(VI)	PBBs(single)	PBDEs(single)
Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit	1000	100	1000	1000	1000	1000

(2) ① mg/kg = ppm = 0.0001%, N.D. = Not Detected (Less than MDL).

②Unit and MDL (Method detection limit) in wet chemical test.

Element	Pb	Cd	Hg	Cr(VI)	PBBs(single)	PBDEs(single)
Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MDL	2	2	2	8	5	5

③According to IEC 62321-7-1:2015, result on Cr(VI) for metal sample is shown as Positive/Negative. Negative = Absence of Cr(VI) coating, Positive = Presence of Cr(VI) coating.

Storage condition and production date of the tested sample are unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

④According to IEC 62321-3-1:2013, this column represents the results of wet chem test.

(3) This column represents the exempted decoration of material or other related testing sample's information.

(2) Phthalates (DBP, BBP, DEHP, DIBP) content

Test Method: IEC 62321-8: 2017, analyzed by gas chromatographic- mass spectrometer (GC-MS).

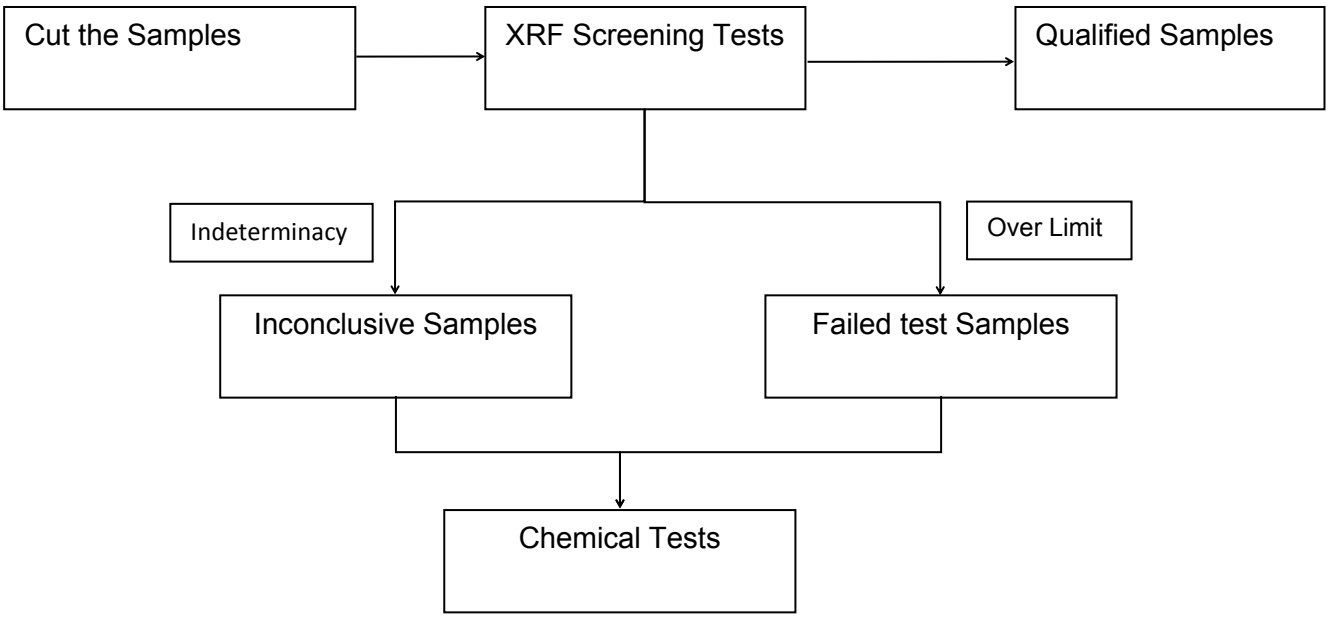
Substances	DBP	BBP	DEHP	DIBP	Conclusion
CAS No.	84-74-2	85-68-7	117-81-7	84-69-5	
Limit (mg/kg)	1000	1000	1000	1000	
MDL (mg/kg)	20	20	20	20	
Material No.	Result (mg/kg)				
1	N.D.	N.D.	N.D.	N.D.	PASS
2	N.D.	N.D.	N.D.	N.D.	PASS
3	N.D.	N.D.	N.D.	N.D.	PASS
4	N.D.	N.D.	N.D.	N.D.	PASS
5	N.D.	N.D.	N.D.	N.D.	PASS
6	N.D.	N.D.	N.D.	N.D.	PASS
7	N.D.	N.D.	N.D.	N.D.	PASS
8	N.D.	N.D.	N.D.	N.D.	PASS
9	N.D.	N.D.	N.D.	N.D.	PASS
10	N.D.	N.D.	N.D.	N.D.	PASS
11	N.D.	N.D.	N.D.	N.D.	PASS
12	N.D.	N.D.	N.D.	N.D.	PASS
13	N.D.	N.D.	N.D.	N.D.	PASS
14	N.D.	N.D.	N.D.	N.D.	PASS
15	N.D.	N.D.	N.D.	N.D.	PASS
17	N.D.	N.D.	N.D.	N.D.	PASS
18	N.D.	N.D.	N.D.	N.D.	PASS
20	N.D.	N.D.	N.D.	N.D.	PASS
21	N.D.	N.D.	N.D.	N.D.	PASS
23	N.D.	N.D.	N.D.	N.D.	PASS
24	N.D.	N.D.	N.D.	N.D.	PASS
25	N.D.	N.D.	N.D.	N.D.	PASS

Substances	DBP	BBP	DEHP	DIBP	Conclusion
CAS No.	84-74-2	85-68-7	117-81-7	84-69-5	
Limit (mg/kg)	1000	1000	1000	1000	
MDL (mg/kg)	20	20	20	20	
Material No.	Result (mg/kg)				
26	N.D.	N.D.	N.D.	N.D.	PASS
27	N.D.	N.D.	N.D.	N.D.	PASS
28	N.D.	N.D.	N.D.	N.D.	PASS
29	N.D.	N.D.	N.D.	N.D.	PASS
30	N.D.	N.D.	N.D.	N.D.	PASS

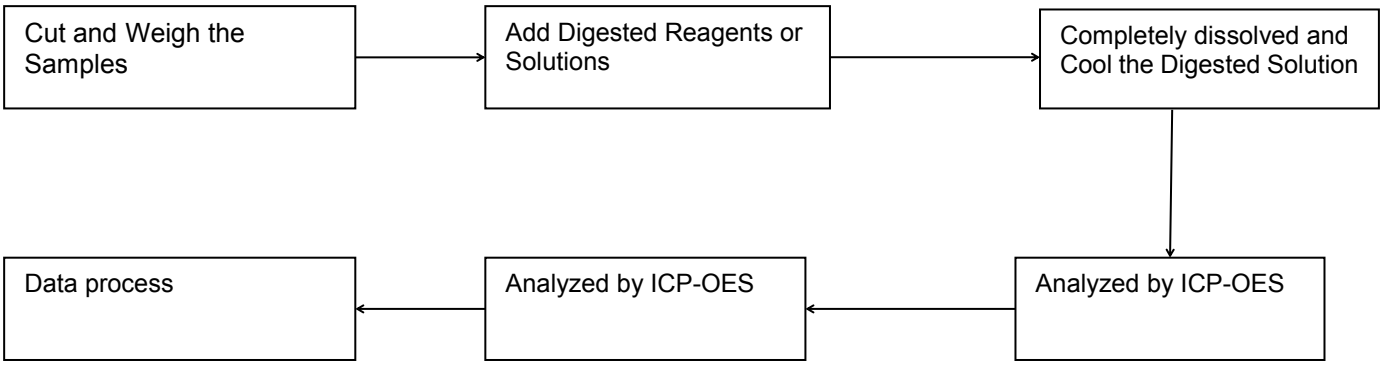
Note: 1. mg/kg = milligram per kilogram (ppm).
2. MDL= method detection limit.
3. N.D.=not detected(less than MDL).

Test Process Flow

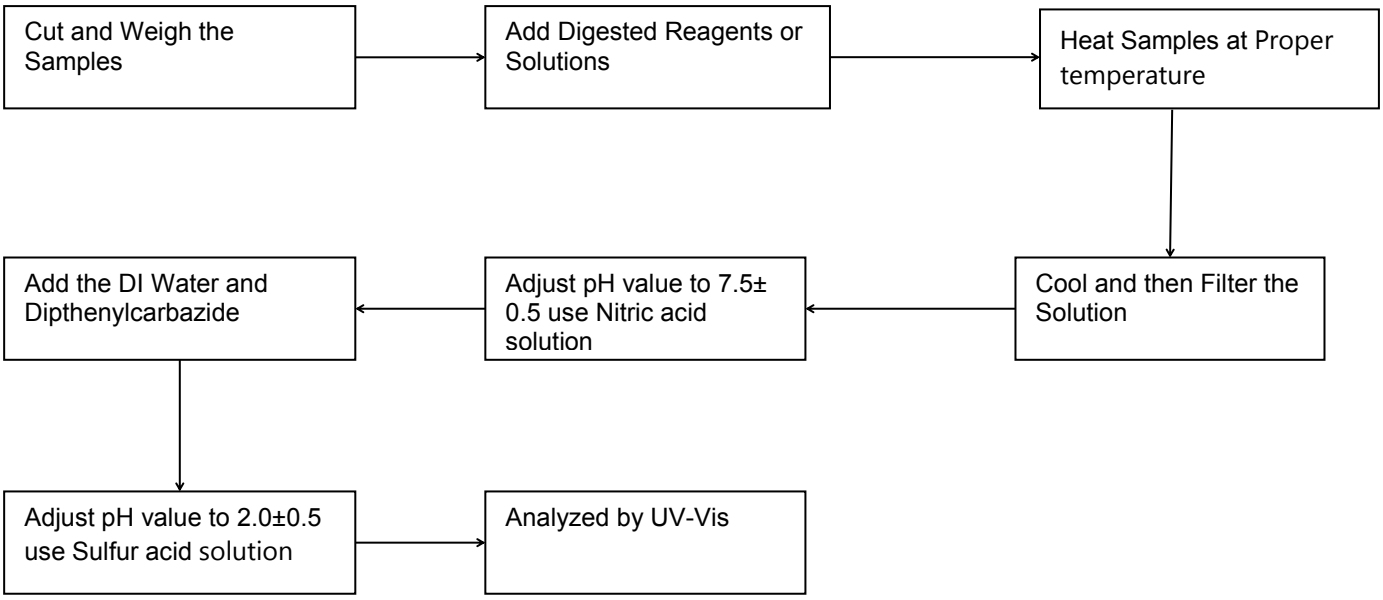
1. XRF scan



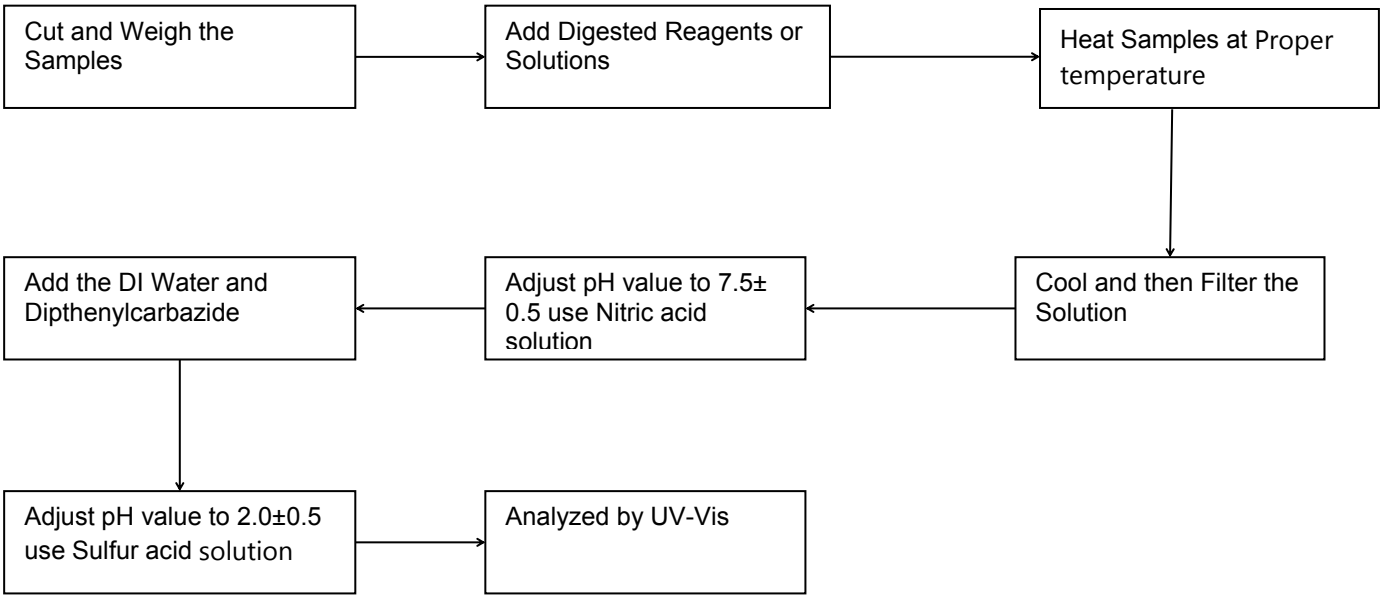
2. Lead, Cadmium, Mercury



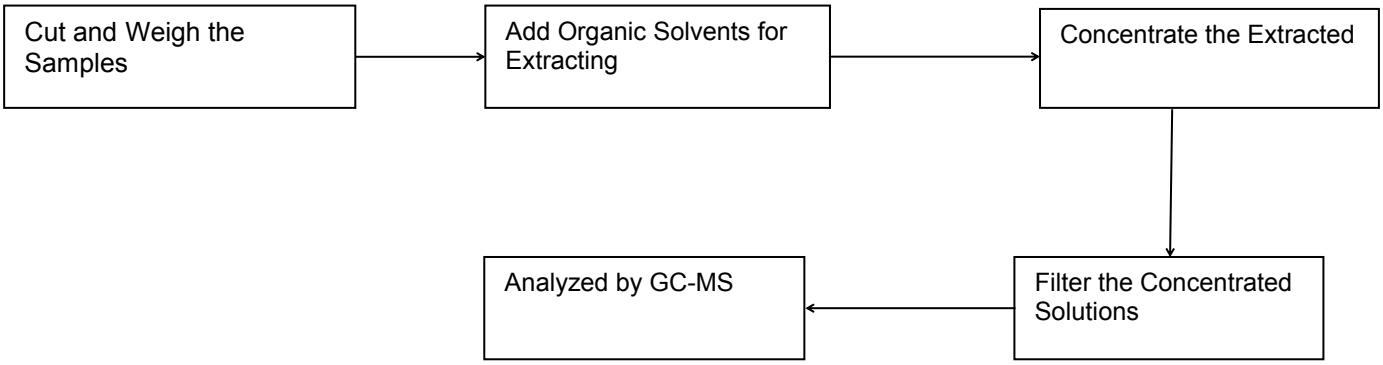
3. Hexavalent Chromium (Non-metal)



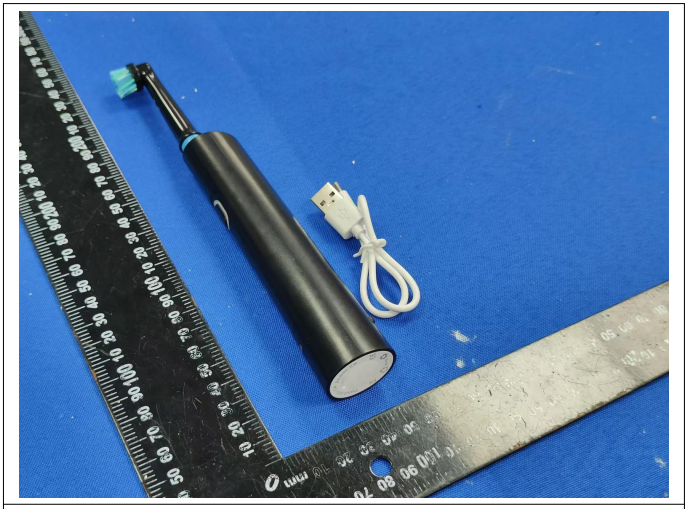
Hexavalent Chromium (Metal)



4. PBBs & PBDEs, Phthalates

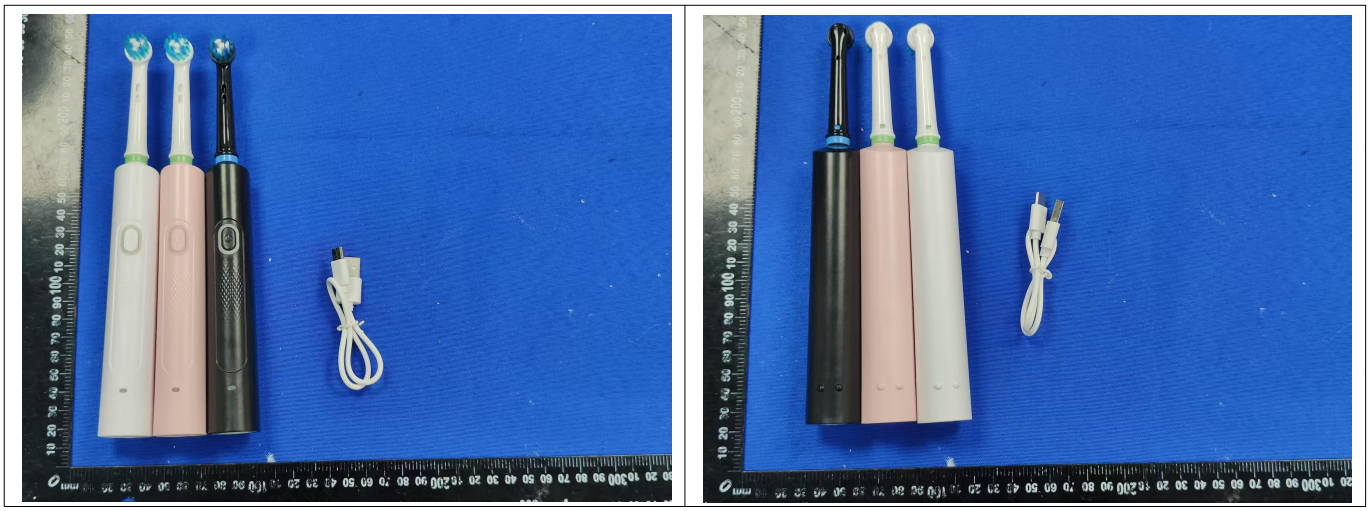


Photo(s) of Sample:



Main test

The following photo(s) is(are) provided by the customer:



*****End of Report*****

Test Report

Applicant	:	Shenzhen Sinco Technology Co., Limited.
Address	:	9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.
Manufacturer	:	Shenzhen Sinco Technology Co., Limited.
Address	:	9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.

The following sample(s) was /were submitted and identified on behalf of the clients as :

Sample Name	:	electric toothbrush
Sample Model	:	210
Sample Received Date	:	Apr.18, 2024
Testing Period	:	Apr.18, 2024 To Apr.23, 2024
Test Requested	:	As specified by client, for compliance with Food and Drug Administration.
Test Method	:	Please refer to next page(s).
Test Result	:	Please refer to next page(s).

Signed for and on behalf of

Andy

Andy Zheng
Technical Director

Dongguan True Safety Testing Co., Ltd. Approve

Dongguan True Safety Testing Co., Ltd.
Room 201, No.20, East of Houjie Avenue, Houjie, Dongguan, Guangdong, China
Tel:+86-0769-85088050 Fax:+86-0769-81221086 E-mail: :tst@tst-test.com Http:www.tst-test.com

Test Report

Sample Description:

No.	Material
1	Brush bristles(PA6)

Test Result: (No.1)

Test Method: As specified in FDA 21 CFR 177. 1500

Test item	Test method	Result	Limit
Density	21 CFR 177. 1500	1.229g/cm^3	1.15±0.15 g/cm^3
Melting Point	21 CFR 177. 1500	419 ℉	392-446 ℉

Test item	Test Condition	Result	Limit
Solubility	Boiling 4.2 mol/L HCl	Dissolve after 1 hour	Dissolve after 1 hour

Maximum extractable fraction in selected solvents

Simulant Used	Test Condition	Result(%)	Limit(%)
Water	150℉, 2 hr	0.28	1.0
95% ethyl alcohol	150℉, 2 hr	1.2	2.0
Ethyl acetate	150℉, 2 hr	0.56	1.0
Benzene	150℉, 2 hr	0.06	1.0
Note: % = percent by weight			

Dongguan True Safety Testing Co., Ltd.
Room 201, No.20, East of Houjie Avenue, Houjie, Dongguan, Guangdong, China
Tel:+86-0769-85088050 Fax:+86-0769-81221086 E-mail: :tst@tst-test.com Http:www.tst-test.com

Sample pictures:

***** End of Report *****

Dongguan True Safety Testing Co., Ltd.
Room 201, No.20, East of Houjie Avenue, Houjie, Dongguan, Guangdong, China
Tel:+86-0769-85088050 Fax:+86-0769-81221086 E-mail: :tst@tst-test.com Http:www.tst-test.com

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国际互认
检测
TESTING
CNAS L4065

Report No.:
报告编号：HNHY20220607U03-1

UN38.3 TEST REPORT
UN38.3 检 测 报 告

Product Name: **产品名称：**	Cylindrical Lithium-ion Rechargeable Cell 圆柱形锂离子可充电电池
Model and Parameters: **型号参数：**	IMR14500-600mAh, 3.7V, 600mAh, 2.22Wh
Test Classification: **检测类别：**	Commission test 委托检测
Issue Date: **签发日期：**	2024-08-19

Tested by/测试	**Reviewed by/审核**	**Approved by/批准**
Weihao Li		
Test Engineer	Audit Engineer	Approval Engineer

Guangzhou MCM Certification & Testing Co., Ltd.

广州邦禾检测技术有限公司

General Information
基本信息

Application Information/申请信息：	
Applicant: 申请单位：	Henan Hengyi lithium energy technology Co., Ltd 河南恒一锂能科技有限公司
Address: 申请单位地址：	Building 3, Xinhua Industrial Park, Longmen Avenue, Xinhua District, Pingdingshan City, Henan, P.R.China 中国河南平顶山市新华区龙门大道新华区产业园 3 号楼
Contact Information: 联系方式：	Tel: 13525016357 E-mail: 714739771@qq.com
General Information/基本信息：	
Product Name: 产品名称：	Cylindrical Lithium-ion Rechargeable Cell 圆柱形锂离子可充电电池
Product Classification: 产品分类：	Rechargeable Lithium Ion Cell 可充电锂离子电芯
Trade Mark: 商标名称：	--
Model and Parameters: 型号参数：	IMR14500-600mAh, 3.7V, 600mAh, 2.22Wh
Manufacturer: 制造单位：	Henan Hengyi lithium energy technology Co., Ltd 河南恒一锂能科技有限公司
Address: 制造单位地址：	Building 3, Xinhua Industrial Park, Longmen Avenue, Xinhua District, Pingdingshan City, Henan, P.R.China 中国河南平顶山市新华区龙门大道新华区产业园 3 号楼
Contact Information: 联系方式：	Tel: 13525016357 E-mail: 714739771@qq.com
Factory: 生产单位：	Henan Hengyi lithium energy technology Co., Ltd 河南恒一锂能科技有限公司
Address: 生产单位地址：	Building 3, Xinhua Industrial Park, Longmen Avenue, Xinhua District, Pingdingshan City, Henan, P.R.China 中国河南平顶山市新华区龙门大道新华区产业园 3 号楼
Testing Laboratory/测试实验室：	
Laboratory: 测试单位：	Guangzhou MCM Certification & Testing Co., Ltd. 广州邦禾检测技术有限公司
Address: 测试单位地址：	Building 2 No. 45 Zhong Er Section of Shiguang Road, Zhongcun Street, Panyu District, Guangzhou City, Guangdong Province, China. 中国 广东省广州市番禺区钟村街市广路钟二路段 45 号 2 栋
Testing Location: 测试实验室地址：	No.13, Zhong San Section, ShiGuang Road, Panyu District, Guangzhou City, Guangdong Province, China. 中国 广东省广州市番禺区市广路钟三路段 13 号之一
Test Standard/测试标准：	
Standard Used: 使用标准：	Manual of Tests and Criteria ST/SG/AC.10/11/Rev.7/Amend.1, section 38.3 《试验和标准手册》 ST/SG/AC.10/11/Rev.7/Amend.1, section 38.3
Deviation Description: 偏差描述：	None

Product Information/产品信息：

The cell consists of the positive electrode plate, negative electrode plate, separator, electrolyte and case. The positive and negative electrode plates are housed in the case in the state being separated by the separator.
电芯由正极、负极、隔膜、电解液和外壳组成，正负极在封装前被隔膜所隔离。

Label/标签：

Technical Parameters/技术参数：

		Cell	Battery
Model 型号		IMR14500-600mAh	--
Rated Capacity 额定容量	(mAh)	600	--
Nominal Voltage 标称电压	(V)	3.7	--
Standard Charge Current 标准充电电流	(mA)	120	--
Standard Discharge Current 标准放电电流	(mA)	120	--
Maximum Charge Current 最大充电电流	(mA)	300	--
Maximum Discharge Current 最大放电电流	(mA)	300	--
Maximum Charge Voltage 最大充电电压	(V)	4.2	--
Cut-Off Voltage 放电截至电压	(V)	3.0	--

Remark/备注：

Replaced the original report HNHY20220607U03, 2022-07-19 issued.
取代原报告 HNHY20220607U03, 2022-07-19 签发。

Test Conclusion 测试结论				
Clause 条款	**Test item 测试项目**	**Sample No. 样品编号**	**Test Result 测试结论**	**Remark 备注**
38.3.4.1	Altitude simulation 高度模拟	C1#~C10#	P	/
38.3.4.2	Thermal test 温度循环测试		P	/
38.3.4.3	Vibration 振动		P	/
38.3.4.4	Shock 冲击		P	/
38.3.4.5	External short circuit 外部短路		P	/
38.3.4.6	Impact 撞击	/	N/A	/
	Crush 挤压	C11#~C20#	P	/
38.3.4.7	Overcharge 过度充电	/	N/A	/
38.3.4.8	Forced discharge 强制放电	C21#~C40#	P	/

Ambient Temperature:
环境温度：
20 ± 5°C

Receipt Date:
接收日期：
2022-06-07

Test Date:
测试时间：
2022-06-09 ～ 2022-06-22

Test Conclusion/测试结论：

The Cylindrical Lithium-ion Rechargeable Cells submitted by Henan Hengyi lithium energy technology Co., Ltd have passed the test items of Manual of Test and Criteria ST/SG/AC.10/11/Rev.7/Amend.1, section 38.3.

由河南恒一锂能科技有限公司送检的圆柱形锂离子可充电电池符合《试验和标准手册》ST/SG/AC.10/11/Rev.7/Amend.1, section 38.3 的要求。

Seal:
检测专用章：

Manual of Tests and Criteria ST/SG/AC.10/11/Rev.7/Amend.1, section 38.3 《试验和标准手册》ST/SG/AC.10/11/Rev.7/Amend.1, section 38.3			
Clause 条款	**Requirement + Test 要求+测试方法**	**Result - Remark 备注-结果**	**Verdict 判断**
38.3.2	**Scope 范围**		**P**
	All cell types shall be subjected to tests T.1 to T.6 and T.8. 所有电芯类型应该进行 T.1 到 T.6 和 T.8。		P
	All non-rechargeable battery types, including those composed of previously tested cells, shall be subjected to tests T.1 to T.5. 所有不可充电电池，包括由测试合格的电芯组成的电池应该进行 T.1 到 T.5。		N/A
	All rechargeable battery types, including those composed of previously tested cells, shall be subjected to tests T.1 to T.5 and T.7. 所有可充电电池，包括由测试合格的电芯组成的电池应该进行 T.1 到 T.5，以及 T.7 的测试。		N/A
	In addition, rechargeable single cell batteries with overcharge protection shall be subjected to test T.7. 另外，有过充保护的可充单电芯电池应该进行 T.7 的测试。		N/A
	A component cell that is not transported separately from the battery it is part of needs only to be tested according to tests T.6 and T.8. 不单独运输的作为配件的电芯进行 T.6 和 T.8 的测试。		N/A
	A component cell that is transported separately from the battery it is part of needs only to be tested according to tests T.1 to T.6 and T.8. 单独运输的作为配件的电芯进行 T.1 到 T.6，以及 T.8 的测试。		P
	A cell or battery that is an integral part of the equipment it is intended to power that is transported only when installed in the equipment may be in accordance with the applicable tests when installed in the equipment. 作为设备组成部分的用作设备电源的电芯或电池，如果只能在设备中运输，可按照装在设备中的适用测试要求进行试验。	Cells may be shipped separately 电芯可能单独运输	N/A
38.3.3(d)	Batteries or single cell batteries not equipment with battery overcharge protection that are design for use only as a component in another battery or in equipment, which affords such protection, are not subjected to the requirement of T.7. 未安装过充电保护装置、按设计要求只能在另一个带过充保护装置的电池组或设备中的电芯或单电芯电池，无需 T.7 试验。	Cell only, without overcharge protection 仅为电芯，不含过充保护	P

Manual of Tests and Criteria ST/SG/AC.10/11/Rev.7/Amend.1, section 38.3 《试验和标准手册》ST/SG/AC.10/11/Rev.7/Amend.1, section 38.3			
Clause 条款	**Requirement + Test 要求+测试方法**	**Result - Remark 备注-结果**	**Verdict 判断**
38.3.3(f)	When testing a battery assembly in which the aggregate lithium content of all anodes when fully charged, is not more than 500g, or in the case of a lithium battery, with a Watt-hour rating of not more than 6200Wh, that is assembled from batteries that have passed all applicable tests, one assembled battery in a fully charged state shall be tested under tests T3, T4 and T5, and in addition, test T7 in the case of a rechargeable battery. 当试验集成电池时，如果集成电池在完全充电时所有阳极的合计锂含量不大于 500g，或在锂离子电池组的情况下，额定瓦特-小时不超过 6200Wh 时，并且是用通过所有试验的电池集合而成的，须对一个完全充电状态的集成电池做试验 T.3、T.4 和 T5，另外，如果是可充电电池，则还需进行 T.7 试验。	Not battery assembly 非集成电池	N/A
38.3.3(g)	When batteries that have passed all applicable tests are electrically connected to form battery in which the aggregate lithium content of all anodes, when fully charged more than 500g, or in the case of a lithium ion battery, with a Watt-hour rating of more than 6200Wh, the assembled battery does not need to be tested if the assembled battery is of a type that has been verified as preventing: - Overcharge; - Short circuits; and - Over discharge between the batteries. 对于已通过所有适用试验的若干电池组成的集成电池，如在完全充电时所有阳极的总锂含量超过 500g，或在锂离子电池的情况下，如额定的瓦特-小时数超过 6200Wh 时，当集成电池如经过验证属于可防止下列情况，即无需进行试验： - 过充电； - 短路；且 - 电池之间的过放。	Not battery assembly 非集成电池	N/A
	For an assembled battery not equipped with overcharge protection that is designed for use only as a component in another battery, in equipment, or in a vehicle, which affords such protection: - the overcharge protection shall be verified at the battery, equipment or vehicle level, as appropriate, and - the use of charging systems without overcharge protection shall be prevented through a physical system or process controls. 用于未配备过充保护装置的集成电池，该集成电池仅作为提供过充保护的另一电池、设备或车辆的组件使用 -过充保护应在电池、设备或车辆级别进行验证 -应通过物理系统或过程控制来防止使用无过充保护的充电系统。		N/A
38.3.4	**Procedure 程序**		**P**

Manual of Tests and Criteria ST/SG/AC.10/11/Rev.7/Amend.1, section 38.3 《试验和标准手册》ST/SG/AC.10/11/Rev.7/Amend.1, section 38.3			
Clause 条款	**Requirement + Test 要求+测试方法**	**Result - Remark 备注-结果**	**Verdict 判断**
	Test T.1 to T.5 shall be conducted in sequence on the same cell or battery. 小型电芯或电池应按顺序进行试验 T.1 至 T.5。 Test T.6 and T.8 shall be conducted using not otherwise tested cells or batteries. 试验 T.6 和 T.8 应使用未试验过的电芯或电池。 Test T.7 may be conducted using undamaged batteries previously used in tests T.1 to T.5 for purpose of testing on cycled batteries. 试验 T.7 可以使用原先在试验 T.1 至 T.5 中使用过的未损坏电池进行。	Complied. 符合	P
38.3.4.1	**Altitude Simulation 高度模拟**		**P**
	Test samples shall be stored at a pressure of 11.6kPa or less for at least six hour at ambient temperature (20±5°C). 试验电芯和电池在环境温度(20±5°C)下，储存在小于等于 11.6kPa 的压力下至少 6 小时。		P
	Results: no leakage, no venting, no disassembly, no rupture, no fire, and the open circuit voltage drop not less than 90%. 试验结果：无泄漏、无排气、无解体、无破裂、无着火和开路电压降不低于 90%。	See the TABLE: 38.3.4.1	P
	The requirement relating to voltage is not applicable to test cells and batteries at fully discharge states. 测试电压的要求不适用于完全放电的电芯和电池。		N/A
38.3.4.2	**Thermal Test 温度试验**		**P**
	Test cells and batteries are to be stored for at least six hours at a test temperature equal to 72±2°C, followed by storage for at least six hours at a test temperature equal to -40±2°C, The maximum time interval between test temperature extremes is 30 minutes, This procedure is to be repeated until 10 total cycles are complete, after which all test cells and batteries are to be stored for 24 hours at ambient temperature (20±5°C). For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12hours. 将电芯和电池在温度为 72±2°C 的条件下贮存不少于 6 个小时；然后，在温度-40±2°C 条件下贮存不少于 6 个小时；两个温度间的间隔最长为 30min,重复操作上述步骤到 10 次；然后，在环境温度为 20±5°C 的条件下放置 24 个小时。 大电芯和大电池储存时间至少 12h。	6h applied on 72±2°C and -40±2°C	P
	Results: no leakage, no venting, no disassembly, no rupture, no fire, and the open circuit voltage drop not less than 90%. 试验结果：无泄漏、无排气、无解体、无破裂、无着火和开路电压降不低于 90%。	See the TABLE: 38.3.4.2	P

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Clause 条款	**Requirement + Test 要求+测试方法**	**Result - Remark 备注-结果**	**Verdict 判断**
	The requirement relating to voltage is not applicable to test cells and batteries at fully discharge states. 测试电压的要求不适用于完全放电的电芯和电池。		N/A
38.3.4.3	**Vibration 振动**		**P**
	For cells and small batteries: from 7 Hz a peak acceleration of 1gn is maintained until 18 Hz reached. The amplitude is then maintained at 0.8mm (1.6mm total excursion) and the frequency increased until a peak acceleration of 8gn occurs (approximately 50Hz). A peak acceleration of 8gn is then maintained until the frequency is increased to 200Hz. 对于电芯和小电池：保持峰值加速度 1gn，从 7Hz 到 18Hz。然后振幅保持在 0.8mm（总偏移量为 1.6mm），增加频率，直到峰值加速度达到 8gn（约 50Hz）。然后保持 8gn 的峰值加速度，直到频率增加到 200Hz。		P
	For large batteries: from 7 Hz to a peak acceleration of 1gn is maintained until 18 Hz reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 2gn occurs (approximately 25 Hz). A peak acceleration of 2gn is then maintained until the frequency is increased to 200 Hz. 对于大电池：保持峰值加速度 1gn，从 7Hz 到 18Hz。然后振幅保持在 0.8mm（总偏移量为 1.6mm），增加频率，直到峰值加速度达到 2gn（约 25Hz）。然后保持 2gn 的峰值加速度，直到频率增加到 200Hz。		N/A
	Results: no leakage, no venting, no disassembly, no rupture, no fire, and the open circuit voltage drop not less than 90%. 试验结果：无泄漏、无排气、无解体、无破裂、无着火和开路电压降不低于 90%。	See the TABLE: 38.3.4.3	P
	The requirement relating to voltage is not applicable to test cells and batteries at fully discharge states. 测试电压的要求不适用于完全放电的电芯和电池。		N/A
38.3.4.4	**Shock 冲击**		**P**
	Each cell shall be subjected to a half-sine shock of peak acceleration of 150gn and pulse duration of 6 milliseconds. Alternatively, large cells may be subjected to a half-sine shock of peak acceleration of 50gn and pulse duration of 11 milliseconds. 每一个电芯应承受峰值加速度为 150gn、脉宽为 6 毫秒的半正弦冲击。或者，大电芯可以按峰值加速度为 50gn、脉宽为 11 毫秒的半正弦冲击。	6ms, 150gn applied.	P

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Clause 条款	**Requirement + Test 要求+测试方法**	**Result - Remark 备注-结果**	**Verdict 判断**
	Each battery shall be subjected to a half-sine shock of peak acceleration depending on the mass of the battery. The pulse duration shall be 6 milliseconds for small batteries and 11 milliseconds for large batteries. 每个电池应承受的峰值加速度取决于电池的质量。小电池的脉宽应为 6 毫秒，大电池的脉宽应为 11 毫秒。		N/A
	- For small battery, smaller one of 150gn or $\sqrt{100850/mass}$		N/A
	- For large battery, smaller one of 50gn or $\sqrt{30000/mass}$		N/A
	Each cell or battery shall be subjected to three shocks in the positive direction and to three shocks in the negative direction in each of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks. 每一个电芯或电池在安装位置的 3 个垂直的轴向的正方向和负方向各进行 3 次冲击，总共 18 次。		P
	Results: no leakage, no venting, no disassembly, no rupture, no fire, and the open circuit voltage drop not less than 90%. 试验结果：无泄漏、无排气、无解体、无破裂、无着火和开路电压降不低于 90%。	See the TABLE: 38.3.4.4	P
	The requirement relating to voltage is not applicable to test cells and batteries at fully discharge states. 测试电压的要求不适用于完全放电的电芯和电池。		N/A
38.3.4.5	**External Short Circuit 外部短路**		**P**
	The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature of 57±4°C, measured on the external case. 待测电芯或电池应加热一段时间，以稳定均衡在 57±4°C 的温度，并测量外壳上的温度。		P
	The exposure time shall be at least 6 hours for small cells and small batteries, and 12 hours for large cells and large batteries. 小电芯或小电池的暴露/加热时间应至少为 6 小时，大电芯或大电池的暴露/加热时间应至少为 12 小时。		P
	Then the cell or battery at 57± 4°C shall be subjected to one short circuit condition with a total external resistance of less than 0.1 ohm. 然后，在 57±4°C 下的电芯或电池应经受一次短路，外部线路总的电阻小于 0.1 欧姆。	See the TABLE: 38.3.4.5	P

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Clause 条款	**Requirement + Test 要求+测试方法**	**Result - Remark 备注-结果**	**Verdict 判断**
	This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 57 ± 4°C, or in the case of the large batteries, has decreased by half of the maximum temperature increase observed during the test and remains below that value. 在电芯或电池外部外壳温度恢复到 57±4°C 后，短路状态继续持续至少一小时，或对于大电池的情况下，降至试验期间观察到的最大温升的一半，并保持在该值以下。		P
	The short circuit and cooling down phases shall be conducted at least at ambient temperature. 短路和冷却阶段应至少在环境温度下进行。		P
	Results: external case temperature does not exceed 170°C and there is no disassembly, no rupture and no fire during the test and within six hours after the test. 试验结果：外部温度不超过 170°C，试验期间和试验后 6 小时内，无解体、破裂或起火现象。	See the TABLE: 38.3.4.5	P
38.3.4.6	**Impact, Crush 撞击，挤压**		**P**
38.3.4.6.2	**Impact 撞击**		**N/A**
	Applicable to cylindrical cells not less than 18.0 mm in diameter. 适用于直径不小于 18.0 mm 的圆柱型电芯。	Cylindrical cell, diameter is less than 18.0mm 圆柱形电芯，直径小于 18.0mm	N/A
	The test cell is placed on a flat smooth surface. A stainless steel bar (type 316 or equivalent) (Ø 15.8 mm ±0.1mm, length: ≥60 mm or of the longest dimension of the cell, whichever is greater) is placed across the centre of the test sample. 试验电芯放置平坦表面上。一根直径为 15.8± 0.1 毫米，长度至少 6 厘米（或该电芯的最大尺寸，以较大者为准）的 316 型不锈钢棒横放在样品的中心。		N/A
	A mass of 9.1 kg ±0.1 kg is dropped from a height of 61cm± 2.5cm at the intersection of the bar and the test sample in a controlled manner using a near frictionless, vertical sliding track or channel with minimal drag on the falling mass. 一个重达 9.1 ± 0.1 千克的铁锤从 61±2.5 厘米高处以几乎无摩擦和零拉力的姿态沿垂直轨道或通道跌落至不锈钢棒与样品的交结点上。		N/A
	The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the steel bar lying across the centre of the test sample. Each sample is to be subjected to only a single impact. 被撞击的测试样品的长轴平行于平面，并与横放在样品中心的不锈钢棒垂直，每只样品只经受一次撞击。		N/A
38.3.4.6.3	**Crush 挤压**		**P**

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Clause 条款	**Requirement + Test 要求+测试方法**	**Result - Remark 备注-结果**	**Verdict 判断**
	Applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18.0 mm in diameter. 适用于棱柱形、袋形、硬币/纽扣式电池和直径小于 18.0 mm 的圆柱型电芯。	Cylindrical cell, diameter is less than 18.0mm 圆柱形电芯，直径小于 18.0mm	P
	A cell or component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5cm/s at the first point of contact. 在两个平面间对电芯或元件电芯进行挤压，挤压在第一个接触点的速度约为 1.5cm/s 。		P
	The crushing is to be continued until the first of the three options below is reached. (a) The applied force reaches 13kN±0.78kN; (b) The voltage of the cell drops by at least 100 mV; or (c) The cell is deformed by 50% or more of its original thickness. Once the maximum pressure has been obtained, the voltage drops by 100mV or more, or the cell is deformed by at least 50% of its original thickness, the pressure shall be released. 直到发生下述三个条件中的任一条件： (a) 作用力达到 13kN±0.78kN； (b) 电芯电压下降至少 100mV；或 (c) 电芯厚度和最初比较变形 50%以上。 一旦达到最大压力，电压降超过 100 mV 或者电芯变形至少 50%，压力应该解除。	The crushing force is released until condition (a) was reached. 作用力达到了条件(a)时压力解除。	P
	A prismatic or pouch cell shall be crushed by applying the force to the widest side. 棱形或袋装电芯应该在宽面施加挤压力 A button/coin cell shall be crushed by applying the force on its flat surface. 纽扣/硬币电芯应该在平面施加挤压力 For cylindrical cells, the crush force shall be applied perpendicular to longitudinal axis. 圆柱型电芯应该在长轴的垂直方向施加挤压力。		P
	Each test cell or component cell is to be subjected to one crushed only. The test sample shall be observed for a further 6h. The test shall be conducted using test cell or component cells that have not previously been subjected to others tests. 每一个测试的电芯或元件电芯只进行一次挤压，测试后再观察 6h。用于测试的电芯或元件电芯之前没有进行过其它的测试。		P
38.3.4.6.4	**Result of Impact and Crush /撞击和挤压试验结果**		**P**

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Clause 条款	**Requirement + Test 要求+测试方法**	**Result - Remark 备注-结果**	**Verdict 判断**
	Results: External temperature does not exceed 170°C and there is no disassembly and no fire during the test and within six hours after this test. 试验结果：外部温度不超过 170°C，试验期间和试验后 6 小时内，无解体或起火现象。	See the TABLE: 38.3.4.6	P
38.3.4.7	**Overcharge 过度充电**		**N/A**
	Applicable to rechargeable lithium cell/battery with overcharge protection. 适用于具有过充电保护功能的可充电锂电芯/电池。	Without overcharge protection 不含过充保护装置	N/A
	The charge current shall be twice the manufacturers' recommended maximum continuous charge current. 充电电流应为制造商推荐的最大持续充电电流的两倍。		N/A
	- When the manufacturer's recommended charge voltage is not more than 18V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22V. 制造商建议的充电电压不大于 18 伏时，实验的最小电压应是电池组最大充电电压的两倍或 22 伏两者中的较小者。		N/A
	- When the manufacturer's recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1.2 times maximum charge voltage. 制造商建议的充电电压大于 18 伏时，实验的最小电压应是最大充电电压的 1.2 倍。		N/A
	Tests are to be at ambient temperature. The duration of the test shall be 24 hours. 测试在室温下进行，测试时间为 24h。		N/A
	Results: there is no disassembly and no fire during the test and within seven days after this test. 试验结果：试验期间和试验后 7 天内，无解体或起火现象。	See the TABLE: 38.3.4.7	N/A
38.3.4.8	**Forced Discharge 强制放电**		**P**
	Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12V D.C, power supply at an initial current equal to the maximum discharge current specified by the manufacturer. 在环境温度下，将单个电芯连接在 12V 的直流电源上进行强制放电，此直流电源提供给每个电芯的初始电流为制造厂指定的最大放电电流。		P
	Results: there is no disassembly and no fire during the test and within seven days after this test. 试验结果：试验期间和试验后 7 天，无解体或起火现象。	See the TABLE: 38.3.4.8	P

TABLE: 38.3.4.1 Altitude simulation 高度模拟							P
Sample No.	Before Test		After Test		Mass loss (%)	Residual OCV (%)	Results
	Mass(g)	OCV(V)	Mass(g)	OCV(V)			
Fully charged at first cycle							
C1#	18.942	4.16	18.941	4.16	0.005	100.00	O
C2#	18.912	4.16	18.912	4.15	0.000	99.76	O
C3#	19.120	4.15	19.120	4.15	0.000	100.00	O
C4#	18.811	4.15	18.811	4.15	0.000	100.00	O
C5#	18.827	4.16	18.826	4.15	0.005	99.76	O
Fully charged after 25 cycles							
C6#	18.665	4.15	18.665	4.14	0.000	99.76	O
C7#	18.775	4.15	18.774	4.15	0.005	100.00	O
C8#	18.891	4.16	18.891	4.16	0.000	100.00	O
C9#	18.516	4.15	18.516	4.15	0.000	100.00	O
C10#	18.522	4.16	18.522	4.16	0.000	100.00	O
Results: O = no leakage, no venting, no disassembly, no rupture, no fire, and the open circuit voltage drop not less than 90%							

TABLE: 38.3.4.2 Thermal test 温度试验							P
Sample No.	Before Test		After Test		Mass loss (%)	Residual OCV (%)	Results
	Mass(g)	OCV(V)	Mass(g)	OCV(V)			
Fully charged at first cycle							
C1#	18.941	4.16	18.936	4.07	0.026	97.84	O
C2#	18.912	4.15	18.908	4.08	0.021	98.31	O
C3#	19.120	4.15	19.114	4.07	0.031	98.07	O
C4#	18.811	4.15	18.806	4.08	0.027	98.31	O
C5#	18.826	4.15	18.820	4.09	0.032	98.55	O
Fully charged after 25 cycles							
C6#	18.665	4.14	18.659	4.07	0.032	98.31	O
C7#	18.774	4.15	18.770	4.09	0.021	98.55	O
C8#	18.891	4.16	18.886	4.08	0.026	98.08	O
C9#	18.516	4.15	18.511	4.09	0.027	98.55	O
C10#	18.522	4.16	18.516	4.09	0.032	98.32	O
Results: O = no leakage, no venting, no disassembly, no rupture, no fire, and the open circuit voltage drop not less than 90%							

TABLE: 38.3.4.3 Vibration 振动							P
Sample No.	Before Test		After Test		Mass loss (%)	Residual OCV (%)	Results
	Mass(g)	OCV(V)	Mass(g)	OCV(V)			
Fully charged at first cycle							
C1#	18.936	4.07	18.936	4.07	0.000	100.00	O
C2#	18.908	4.08	18.908	4.07	0.000	99.75	O
C3#	19.114	4.07	19.113	4.07	0.005	100.00	O
C4#	18.806	4.08	18.806	4.08	0.000	100.00	O
C5#	18.820	4.09	18.820	4.09	0.000	100.00	O
Fully charged after 25 cycles							
C6#	18.659	4.07	18.657	4.07	0.011	100.00	O
C7#	18.770	4.09	18.770	4.09	0.000	100.00	O
C8#	18.886	4.08	18.885	4.08	0.005	100.00	O
C9#	18.511	4.09	18.509	4.08	0.011	99.76	O
C10#	18.516	4.09	18.516	4.08	0.000	99.76	O
Results: O = no leakage, no venting, no disassembly, no rupture, no fire, and the open circuit voltage drop not less than 90%							

TABLE: 38.3.4.4 Shock 冲击							P
Sample No.	Before Test		After Test		Mass loss (%)	Residual OCV (%)	Results
	Mass(g)	OCV(V)	Mass(g)	OCV(V)			
Fully charged at first cycle							
C1#	18.936	4.07	18.935	4.07	0.005	100.00	O
C2#	18.908	4.07	18.908	4.07	0.000	100.00	O
C3#	19.113	4.07	19.113	4.06	0.000	99.75	O
C4#	18.806	4.08	18.804	4.08	0.011	100.00	O
C5#	18.820	4.09	18.820	4.08	0.000	99.76	O
Fully charged after 25 cycles							
C6#	18.657	4.07	18.657	4.07	0.000	100.00	O
C7#	18.770	4.09	18.769	4.08	0.005	99.76	O
C8#	18.885	4.08	18.885	4.08	0.000	100.00	O
C9#	18.509	4.08	18.509	4.08	0.000	100.00	O
C10#	18.516	4.08	18.516	4.08	0.000	100.00	O
Results: O = no leakage, no venting, no disassembly, no rupture, no fire, and the open circuit voltage drop not less than 90%							

TABLE: 38.3.4.5 External Short-circuit 外部短路				P
Sample No.	**Ambient(ºC) (At 57± 4ºC)**	**Testing resistance (mΩ)**	**Max. External Temperature(ºC)**	**Results**
Fully charged at first cycle				
C1#	57.1	86.4	132.1	O
C2#	57.1	87.1	127.6	O
C3#	57.1	88.3	129.7	O
C4#	57.1	89.5	134.3	O
C5#	57.1	87.6	131.2	O
Fully charged after 25 cycles				
C6#	57.3	85.8	135.6	O
C7#	57.3	84.7	124.5	O
C8#	57.3	87.5	128.4	O
C9#	57.3	85.6	130.6	O
C10#	57.3	86.9	134.8	O
Results: O = no disassembly, no rupture, no fire during the test and within six hours after the test.				

TABLE: 38.3.4.6 Impact 撞击					N/A
TABLE: 38.3.4.6 Crush 挤压					P
Sample No.	**Max. External Temperature(ºC)**	**Results**	**Sample No.**	**Max. External Temperature(ºC)**	**Results**
50% of the design rated capacity at first cycle			50% of the design rated capacity after 25 cycles		
C11#	24.4	O	C16#	24.5	O
C12#	23.9	O	C17#	23.8	O
C13#	24.3	O	C18#	23.6	O
C14#	23.7	O	C19#	24.1	O
C15#	24.6	O	C20#	24.2	O
Results: O = no disassembly, no fire during the test and within six hours after this test.					

TABLE: 38.3.4.7 Overcharge 过度充电					N/A
The test current = /					-
The test voltage = /					-
Sample No.	OCV(V)	Results	Sample No.	OCV(V)	Results
/			/		
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/
Results: O = no disassembly, no fire during the test and within seven days after this test.					

TABLE: 38.3.4.8 Forced discharge 强制放电					P
Sample No.	OCV(V)	Results	Sample No.	OCV(V)	Results
Fully discharged at first cycle			Fully discharged after 25 cycles		
C21#	3.395	O	C31#	3.414	O
C22#	3.401	O	C32#	3.386	O
C23#	3.389	O	C33#	3.383	O
C24#	3.393	O	C34#	3.394	O
C25#	3.396	O	C35#	3.412	O
C26#	3.408	O	C36#	3.388	O
C27#	3.411	O	C37#	3.403	O
C28#	3.387	O	C38#	3.407	O
C29#	3.395	O	C39#	3.379	O
C30#	3.397	O	C40#	3.387	O
Results: O = no disassembly, no fire during the test and within seven days after this test.					

Photos of the Cell
电芯照片

Front view /前视图

Side view /侧视图

-- End of Report --

Important Note
注意事项

1. This test report is invalid without the special testing seal and cross-page seal of Guangzhou MCM Certification & Testing Co., Ltd.
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5. Objection to this test report must be submitted to Guangzhou MCM Certification & Testing Co., Ltd. within 15 days after the publication of the report.
   若对此检测报告有异议，必须在报告发布之日起十五天内向广州邦禾检测技术有限公司提出。
6. This test report is only responsible for the received samples.
   本检测报告仅对收到的样品负责。
7. The test items in this report are not in the scope of CMA. They do not have the impartial function.
   本报告检测项目不在 CMA 范围内，不具备对社会证明作用。
8. As for the test results, “N/A” means “Not applicable”, “P” means “Pass” and “F” means “Fail”.
   本检测结果中“N/A”表示“不适用”，“P”表示“通过”，“F”表示“不通过”。

Testing Lab.:	Guangzhou MCM Certification & Testing Co., Ltd.
检测单位：	广州邦禾检测技术有限公司
Address:	Building 2 No. 45 Zhong Er Section of Shiguang Road, Zhongcun Street, Panyu
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锂电池 UN38.3 试验概要 Lithium Battery Test Summary

项目编号：HNHY20220607UG03-1

单位信息 Company Information					
委托单位 Consignor	河南恒一锂能科技有限公司 中国河南平顶山市新华区龙门大道新华区产业园 3 号楼 电话/Tel：13525016357　　邮箱/Mail：714739771@qq.com 网址/Website: /				
生产单位 Manufacturer	河南恒一锂能科技有限公司 中国河南平顶山市新华区龙门大道新华区产业园 3 号楼 电话/Tel：13525016357　　邮箱/Mail：714739771@qq.com 网址/Website: /				
测试单位 Test Lab	广州邦禾检测技术有限公司 中国 广东省广州市番禺区钟村街市广路钟二路段 45 号 2 栋 电话/Tel：4008-368-355　　邮箱/Mail：service@mcmtek.com 网址/Website: https://www.mcmtek.com				
电池信息 Battery Information					
名称 Name	圆柱形锂离子可充电电池 Cylindrical Lithium-ion Rechargeable Cell		电池/电芯类别 Battery/Cell Classification	锂离子电芯 Li-ion Cell	
型号 Type	IMR14500-600mAh		商标 Trademark	/	
额定电压 Normal Voltage	3.7V		额定容量 Rated Capacity	600mAh	
额定能量 Watt-hour rating	2.22Wh		外观/Appearance	蓝色，圆柱形 Blue, Cylindrical	
质量/Mass	18.8g		锂含量/Li Content	不适用 N/A	
测试信息 Test Information					
测试报告编号 Test Report Number	HNHY20220607U03-1		测试报告签发日期 Date of Test Report	2024-08-19	
测试标准 Edition of UN Manual of Tests and Criteria Used	联合国《试验和标准手册》（第 7 版修订 1）38.3 节 UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.7/Amend1/Subsection 38.3				
T.1：高度模拟 Altitude Simulation	通过 Pass	T.2：温度试验 Thermal Test	通过 Pass	T.3：振动 Vibration	通过 Pass
T.4：冲击 Shock	通过 Pass	T.5：外部短路 External Short Circuit	通过 Pass	T.6：撞击/挤压 Impact/Crush	通过 Pass
T.7：过度充电 Overcharge	不适用 N/A	T.8：强制放电 Forced Discharge	通过 Pass	/	
UN38.3.3(f)	不适用 N/A		UN38.3.3(g)	不适用 N/A	
签名 Signatory 职务 Title	检验员		签发日期 Issued Date	2024-08-19	

Test Report issued under the responsibility of:

TEST REPORT

Report No.	:	CTZ2411039SIP28
Date of issue	:	Nov. 04, 2024
Test Item	:	IP67 Test
Client	:	Shenzhen Sinco Technology Co., Limited.
Address	:	9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.
Sample Model	:	210
Trade Mark	:	--
Tested by (name + signature)	:	Toby Zhang
Checked by (name + signature)	:	Iverson Rao
Approved by (name + signature)	:	Allen Zou

General disclaimer:

The test results presented in this report relate only to the object tested.

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Tel: (+86)769-22261862 Web: www.zztjc.com

Content

1. Sample Information

Sample Name	electric toothbrush
Sample Model	210
Sample No.	2411039-28
Sample Size	/
Weight Of Sample	/
Sample Quantity	1 PCS
Manufacturer	Shenzhen Sinco Technology Co., Limited.
Address	9F,Building A,Industrial park of Tongfuyu, Shajing Town, Bao'an District, Shenzhen City, China.
Sample Source	Commissioned units send sample
Inspection Type	Commissioning test
Sample Description	Sample appearance is good

2. Test Results

Test Items	Test Results
IP6X Test	After test, the function of the sample is normal.
IPX7 Test	After test, the function of the sample is normal.

3. IP67 Test

3.1 Laboratory Environment

Ambient temperature: 24.7°C Relative humidity: 56%RH

3.2 Test Information

Sample No.	Received Date	Date Of Test(s)
2411039-28	Oct. 24, 2024	Oct. 24, 2024~ Oct. 31, 2024

3.3 Test Equipment

Test Equipment	Equipment Model	Calibration Date
Dust proof test chamber	JY-SC-1000	Apr. 13, 2024
Water proof test system	XM-IP	Apr. 13, 2024

3.4 Test Standard

Test according to IEC 60529: 1989+AMD1: 1999+AMD2:2013 CSVDegrees of protection provided by Enclosure (IP code).

3.5 Test Conditions

3.5.1 IP6X Test

The amount of talc powder in the test chamber is per cubic meter metric test chamber volume 2kg, talc powder filtered by metal square sieve, wire diameter 50μm, sieve hole size is 75μm, test for 8 hours.

3.5.2 IPX7 Test

Waterlogging depths: 1.0m, test time: 30min

Note: Before and after the test, the sample was energized for functional check.

3.6 Test Photos

Before test

1#

After IP6X test

1#

After IPX7 test

1#

End of report