CERTIFICATE OF COMPLIANCE

Certificate of Compliance

Certificate Number: ZHT-240515020C

Certificate's Holder **Zertifikatsinhaber**	:	**Zendure USA Inc.** **1765 E BAYSHORE RD # 201 EAST PALO ALTO, CA 94303-5501**
Manufacturer **Hersteller**	:	**ZENDURE TECHNOLOGY CO., LIMITED** **RM 517, NEW CITY CENTRE, 2 LEI YUE MUN ROAD, KWUN TONG, KOWLOON.HK**
Trade Mark **Warenzeichen**	:	ZENDURE SuperCharged
Product **Produkt**	:	**Add-on Battery AB2000S**
Model(s) **Modell**	:	**ZDAB2000S**
Test Standard **Prüfnorm**	:	**EN 55032:2015 + A11:2020** **EN 55035:2017 + A11:2020** **EN 61000-3-12:2011** **EN IEC 61000-3-11:2019**
Test Report No. **Bericht Nr**	:	**ZHT-240515020E**

This Certificate of Compliance is issued on a voluntary basis for electrical equipment below the voltage limits of EMC Directive 2014/30/EU. The essential requirements are fulfilled accordingly based on the technical specifications applicable at the time of issuance. It is only valid in connection with the test report.

CE

Guangdong Zhonghan Testing Technology Co., Ltd.
Manager
May 23, 2024

The information of the certificate can be checked through www.zht-lab.cn.
The CE mark which is shown on the certificate can only be used under the conditions that the products complete with all of the relevant Directives of EC Declaration of Conformity.
The Manufacturer should be responsible for the internal production control so that the products complied with the essential requirements of the above mentioned Directive(s). Certificate holder must notify all changes to the original certification laboratory of Guangdong Zhonghan Testing Technology Co., Ltd.

Guangdong Zhonghan Testing Technology Co., Ltd.
Address:Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China.
Tel.: +86-755-27782934 Http://www.zht-lab.cn E-mail:admin@zht-lab.cn

TEST REPORT

Report No.....	:	ZHT-240515020E
Product.....	:	Add-on Battery AB2000S
Trademark.....	:	ZENDURE SuperCharged
Model(s).....	:	ZDAB2000S
Applicant.....	:	Zendure USA Inc.
Address.....	:	1765 E BAYSHORE RD # 201 EAST PALO ALTO, CA 94303-5501
Manufacturer.....	:	ZENDURE TECHNOLOGY CO., LIMITED
Address.....	:	RM 517, NEW CITY CENTRE, 2 LEI YUE MUN ROAD, KWUN TONG, KOWLOON.HK
Prepared by.....	:	Guangdong Zhonghan Testing Technology Co., Ltd.
Address.....	:	Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Date of Receipt.....	:	May 15, 2024
Date of Test(s).....	:	No tests are involved in this report
Date of Issue.....	:	May 23, 2024
Test Standard(s).....	:	EN 55032:2015 + A11:2020 EN 55035:2017 + A11:2020 EN 61000-3-12:2011 EN IEC 61000-3-11:2019

In the configuration tested, the EUT complied with the standards specified above.

Tested by:

Kevin Yang/ Engineer

Reviewed by:

Baret Wu/ Director

Approved by:

Leo Li/ Manager

Note: The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report shall not be reproduced except in full, without prior written approval of ZHT. This document may be altered or revised by ZHT, personnel only, and shall be noted in the revision of the document.

Table of Contents

1. Revision History

Report No.	Issue Date	Description	Approved
ZHT-240515020E	May 23, 2024	Original	Valid
This report adds new product name and model name and exterior photograph on the basis of the original report ZHT-230829022E. The new product name and model name and exterior photograph do not affect the test results. No further tests were performed for EUT. All technical test data are based on the original report ZHT-230829022E			

2. Test Summary

Emission			
Requirement - Test	Test Method	Limit	Result
Conducted Emission	EN 55032:2015+A11:2020	Class B	N/A
Radiated Emission	EN 55032:2015+A11:2020	Class B	PASS
Immunity			
Requirement - Test	Test Method	Performance criteria	Result
Electrostatic discharges	EN 61000-4-2:2009	B	PASS
Continuous RF electromagnetic field disturbances	EN 61000-4-3:2020	A	PASS
Electrical fast transients/burst (EFT/B)	EN 61000-4-4:2012	B	N/A
Surges	EN 61000-4-5:2014	B	N/A
Continuous induced RF disturbances	EN 61000-4-6:2014	A	N/A
Power frequency magnetic fields	EN 61000-4-8:2010	A	N/A
Voltage dips and short interruptions	EN 61000-4-11:2020	B & C & C	N/A

Requirement - Test	Test Method	Limit	Result
Harmonic current emissions	EN 61000-3-12:2011	Class A	N/A
Voltage changes, voltage fluctuations and flicker	EN IEC 61000-3-11:2019	Clause 5	N/A

Remark: N/A is abbreviation for Not Applicable.

3. General Information

3.1. Description of EUT

Product:	Add-on Battery AB2000S
Model Name:	ZDAB2000S
Model Difference:	/
Rated Power Supply:	Capacity: 1920 Wh (40 Ah / 48 V) Input: 48 V⎓ 25 A, 1200 W Max Output: 48 V⎓ 25 A , 1200W Max
Normal Testing Voltage:	DC 48 V
DC Line	/
I/O Ports	Refer to User Manual
Highest Frequency Generated	Below 108 MHz

Note:

1) Other Accessory Device List and Details

Description	Manufacturer	Model	Note
Dummy Load	Dongguan Plit Technology Co., Ltd	BX9	AE
DC POWER SUPPLY	Sophpower Electronics Co., Ltd.	DSP100-100	AE

2) The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

3.2. Block diagram of EUT configuration

Mode 1

Mode 2

3.3. Test Mode

Pre - Test mode	Mode 1: Charging mode Mode 2: Discharging mode		
Final Test mode	Conducted Emission		N/A
	Radiated Emission	Below 1 GHz	Mode 2
		Above 1 GHz	N/A
	Harmonic current emissions		N/A
	Voltage changes, voltage fluctuations and flicker		N/A
	Electrostatic discharges		Mode 2
	Continuous RF electromagnetic field disturbances		Mode 2
	Electrical fast transients/burst (EFT/B)		N/A
	Surges		N/A
	Continuous induced RF disturbances		N/A
	Power frequency magnetic fields		N/A
	Voltage dips and short interruptions		N/A

* Only the final test mode is shown in the report

3.4. Test Site Environment

Test Item	Required (IEC 60068-1)		Actual
Radiated Emission	Temperature (°C)	15-35	24.0
	Humidity (%RH)	25-75	54
	Barometric pressure (mbar)	860-1060	1004
Electrostatic discharges	Temperature (°C)	15-35	24.0
	Humidity (%RH)	25-75	52.0
	Barometric pressure (mbar)	860-1060	1014
Continuous RF electromagnetic field disturbances	Temperature (°C)	15-35	24.1
	Humidity (%RH)	25-75	53.9
	Barometric pressure (mbar)	860-1060	1014

4. Facilities

4.1. Test Facility

Test site 1: Guangdong Zhonghan Testing Technology Co., Ltd.
Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Test site 2: Shenzhen Haiyun Testing Co., Ltd.
No. 2 Danzi North Road, Kengzi Street, Pingshan District, Shenzhen, Guangdong, China

4.2. Test Instruments

Radiated emissions Test (966 chamber)

Equipment	Manufacturer	Model	Last Cal.	Next Cal.
Receiver	R&S	ESCI	May 12, 2023	May 11, 2024
Amplifier	Schwarzbeck	BBV 9743 B	May 12, 2023	May 11, 2024
Amplifier	Schwarzbeck	BBV 9718 B	May 12, 2023	May 11, 2024
Bilog Antenna	Schwarzbeck	VULB9162	May 17, 2023	May 16, 2024
Horn Antenna	Schwarzbeck	BBHA9120D	May 17, 2023	May 16, 2024
966 Anechoic Chamber	EMToni	9m6m6m	Nov. 25, 2021	Nov. 24, 2024

Electrostatic discharge immunity Test

Equipment	Manufacturer	Model	Last Cal.	Next Cal.
ESD TEST Generator	HTEC	HESD16	May 12, 2023	May 11, 2024

Continuous RF electromagnetic field disturbances (site 2)

Equipment	Manufacturer	Model	Last Cal.	Next Cal.
Signal Generator	R&S	SMB100A	Oct. 16, 2022	Oct. 15, 2023
Signal Generator	R&S	SMR40	Oct. 16, 2022	Oct. 15, 2023
Power Amplifier	A&R	250W1000A	Oct. 16, 2022	Oct. 15, 2023
Power Amplifier	A&R	1150A100B	Oct. 16, 2022	Oct. 15, 2023
Power Amplifier	A&R	60S1G4	Oct. 16, 2022	Oct. 15, 2023
Communication antenna	Schwarzbeck	FPA3-0.8-6.0R/1329	Oct. 16, 2022	Oct. 15, 2023

4.3. Testing software

Project	Software name	Edition
Radiated Emission	EZ-EMC	FA-03A2 RE+

4.4. Measurement uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Value (dB)
Radiated Emission(30MHz~1GHz)	4.60
Radiated Emission(1GHz~6GHz)	4.30

Decision Rule

☒ Uncertainty is not included

☐ Uncertainty is included

5. Emission

5.1. Conducted Emission

5.1.1. Limit

A.C. Mains Conducted Interference Limit

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	46
5.0 - 30.0	73	60	60	50

Note:

(1) The lower limit shall apply at the transition frequencies.

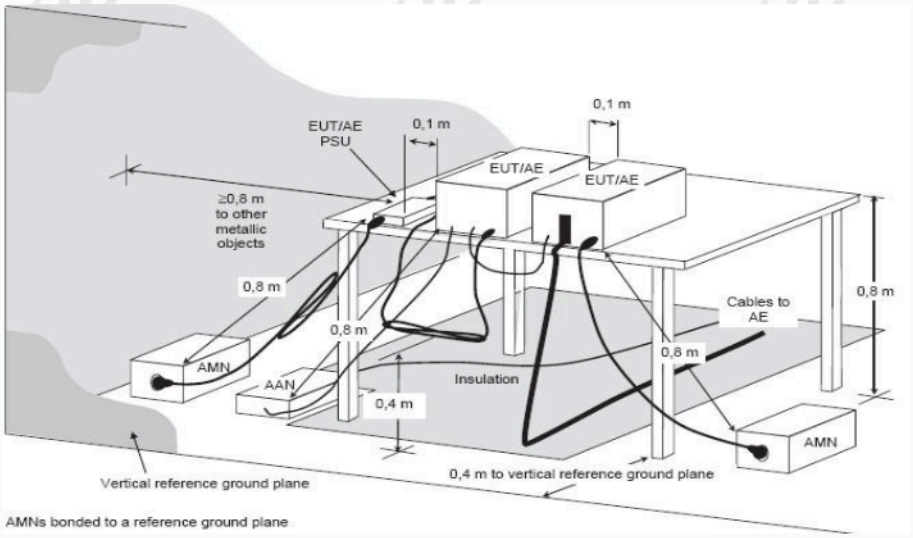
(2) The limit decreases in line with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

(3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

Telecommunication Port Asymmetric mode Conducted Interference Limit

Requirement (MHz)	Class A Equipment				Class B Equipment			
	Voltage Limit (dBμV)		Current Limit (dBμA)		Voltage Limit (dBμV)		Current Limit (dBμA)	
	QP	Avg.	QP	Avg.	QP	Avg.	QP	Avg.
0.15 to 0.50	97 to 87	84 to 74	53 to 43	40 to 30	84 to 74	74 to 64	40 to 30	30 to 20
0.50 to 30	87	74	43	30	74	64	30	20

5.1.2. Test setup



5.1.3. 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.

5.1.4. Test results

N/A

EUT is a battery product and is not applicable to this test item

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5.2. Radiated emissions

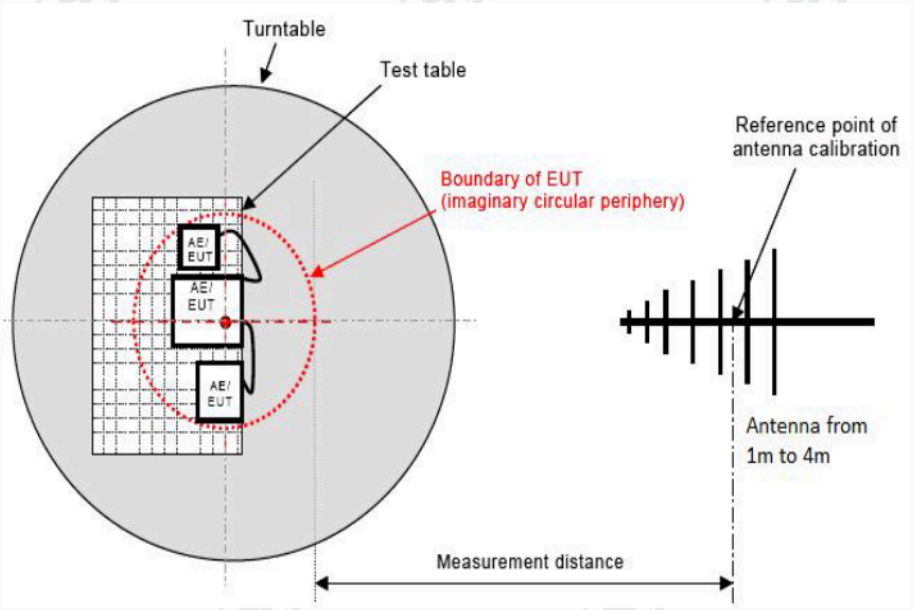
5.2.1. Limit

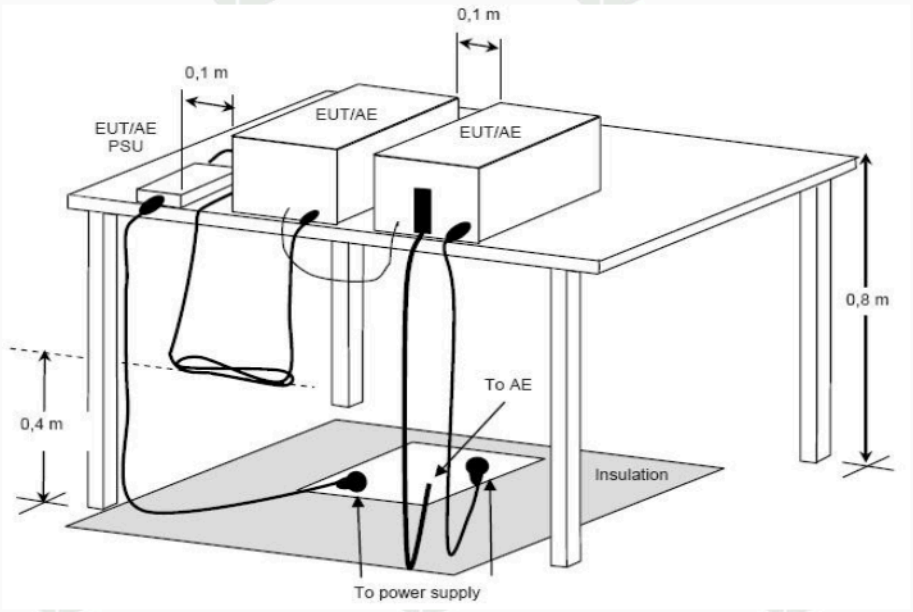
Table 2 - Radiated disturbance limits and testing methods – 30 MHz to 1 000 MHz

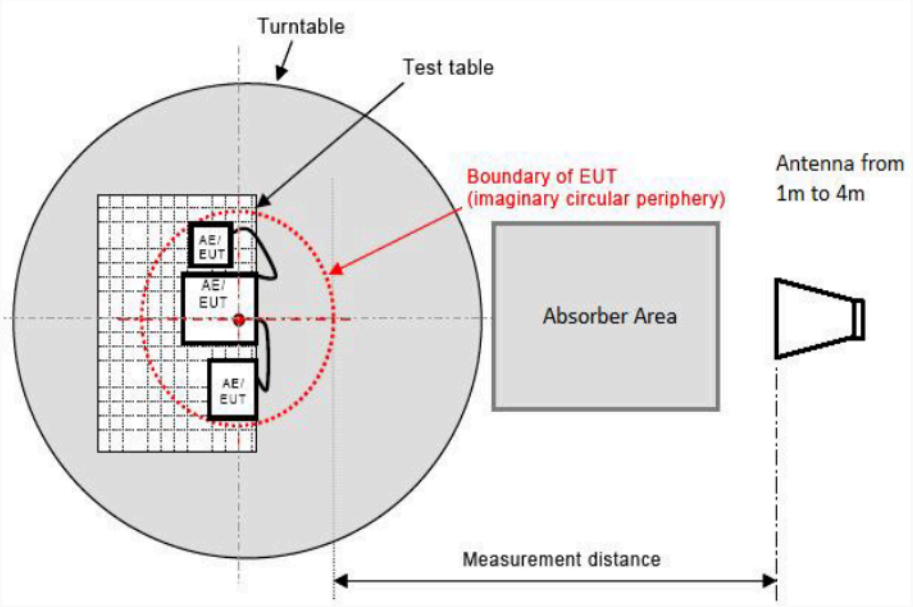
Frequency (MHz)	Quasi-peak limits at 3m dB(μV/m)
30-230	40
230-1000	47

5.2.2. Block diagram of test setup

Measurement distance







5.2.3. 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.

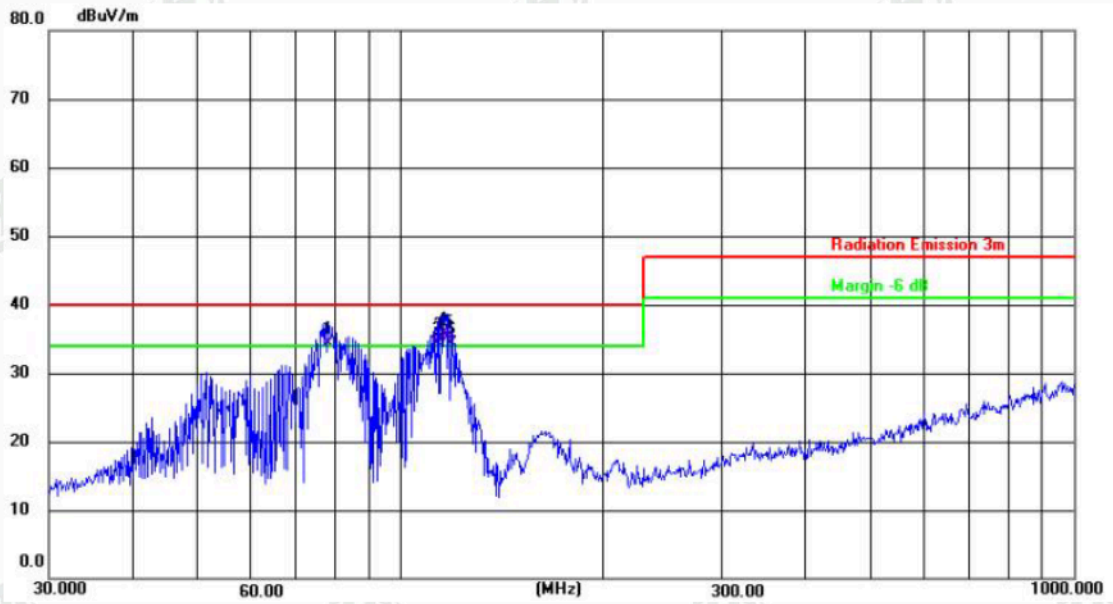
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1GHz.

5.2.4. Test results

PASS

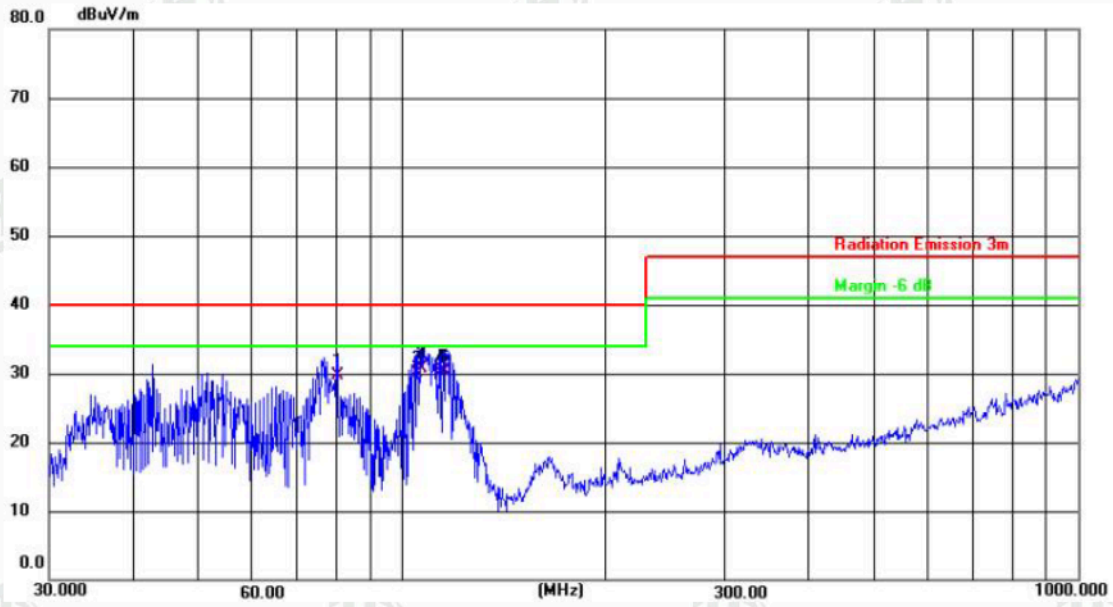
Please refer to pages 14 - 15 for data.

Polarization: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 !	78.1388	47.91	-13.70	34.21	40.00	-5.79	QP			P	
2 !	113.3162	46.26	-11.96	34.30	40.00	-5.70	QP			P	
3 !	114.1137	46.88	-12.05	34.83	40.00	-5.17	QP			P	
4 *	115.7256	47.96	-12.22	35.74	40.00	-4.26	QP			P	
5 !	117.7725	47.68	-12.45	35.23	40.00	-4.77	QP			P	
6 !	118.6013	46.75	-12.53	34.22	40.00	-5.78	QP			P	

Polarization: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	80.0805	43.71	-13.96	29.75	40.00	-10.25	QP			P	
2	105.2716	41.18	-11.10	30.08	40.00	-9.92	QP			P	
3 *	106.7587	42.05	-11.25	30.80	40.00	-9.20	QP			P	
4	114.1136	42.10	-12.05	30.05	40.00	-9.95	QP			P	
5	114.9167	42.44	-12.13	30.31	40.00	-9.69	QP			P	
6	115.7256	42.52	-12.22	30.30	40.00	-9.70	QP			P	

Note: Level=Reading + Factor
Margin=Level – Limit

5.3. Harmonic current emissions

5.3.1. Test Procedure

The EUT was placed on the top of a wooden table 0.8 meters above the ground and the EUT is supplied in series with power analyzer from a power source having the same normal voltage and frequency as the rated supply voltage and the equipment under test. And the rated voltage at the supply voltage of EUT of 0.94 times and 1.06 times shall be performed.

A definition of the normal load or of the conditions for adequate heat discharge can usually be found in the EN publication corresponding to the equipment under test.

Equipment may have several separately controlled circuits. Each circuit is considered as a single piece of equipment if it can be operated independently and separately from the other circuits.

5.3.2. Limit

Current emission limits for equipment other than balanced three-phase equipment

Minimum R_{sce}	Admissible individual harmonic current I_h/I_{ref} [a] %						Admissible harmonic parameters %	
	I_3	I_5	I_7	I_9	I_{11}	I_{13}	THC/I_{ref}	$PWHC/I_{ref}$
33	21,6	10,7	7,2	3,8	3,1	2	23	23
66	24	13	8	5	4	3	26	26
120	27	15	10	6	5	4	30	30
250	35	20	13	9	8	6	40	40
≥350	41	24	15	12	10	8	47	47
The relative values of even harmonics up to order 12 shall not exceed 16/h %. Even harmonics above order 12 are taken into account in THC and $PWHC$ in the same way as odd order harmonics. Linear interpolation between successive R_{sce} values is permitted.								
[a] I_{ref} = reference current; I_h = harmonic current component.								

5.3.3. Test Procedure

The EUT was placed on the top of a wooden table 0.8 meters above the ground and the EUT is supplied in series with power analyzer from a power source having the same normal voltage and frequency as the rated supply voltage and the equipment under test. And the rated voltage at the supply voltage of EUT of 0.94 times and 1.06 times shall be performed.

A definition of the normal load or of the conditions for adequate heat discharge can usually be found in the EN publication corresponding to the equipment under test.

Equipment may have several separately controlled circuits. Each circuit is considered as a single piece of equipment if it can be operated independently and separately from the other circuits.

5.3.4. Test Result

N/A

EUT is a battery product and is not applicable to this test item

5.4. Voltage changes, voltage fluctuations and flicker

5.4.1. Test Procedure

The EUT is supplied in series with power analyzer from a power source having the same normal voltage and frequency as the rated supply voltage and the equipment under test. And the rated voltage at the supply voltage of EUT of 0.94 times and 1.06 times shall be performed.

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.

During the flick measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

5.4.2. Limit

Test Item	Limit
Pst (Short-term flicker indicator.)	1.0
Plt (Long-term flicker indicator.)	0.65
Td(t)(ms) (Maximum time that d(t) exceeds 3.3%)	500
dmax(%) (Maximum relative voltage change.)	4
dc(%) (Relative steady-state voltage change)	3.3

5.4.3. Test Result

N/A

EUT is a battery product and is not applicable to this test item

6. Immunity

Performance criteria

Performance criterion **A**

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss 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 criterion **B**

The equipment shall continue to operate as intended after the test. No degradation of performance or loss function is allowed below a performance level specified by the manufacturer, when the equipment is used as intended. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from equipment if used as intended.

Performance criterion **C**

Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by operation of the controls.

6.1. Electrostatic discharges

6.1.1. Test Specification

Test Port	:	Enclosure port
Discharge Impedance	:	330 ohm / 150 pF
Discharge Mode	:	Single Discharge
Discharge Period	:	one second between each discharge

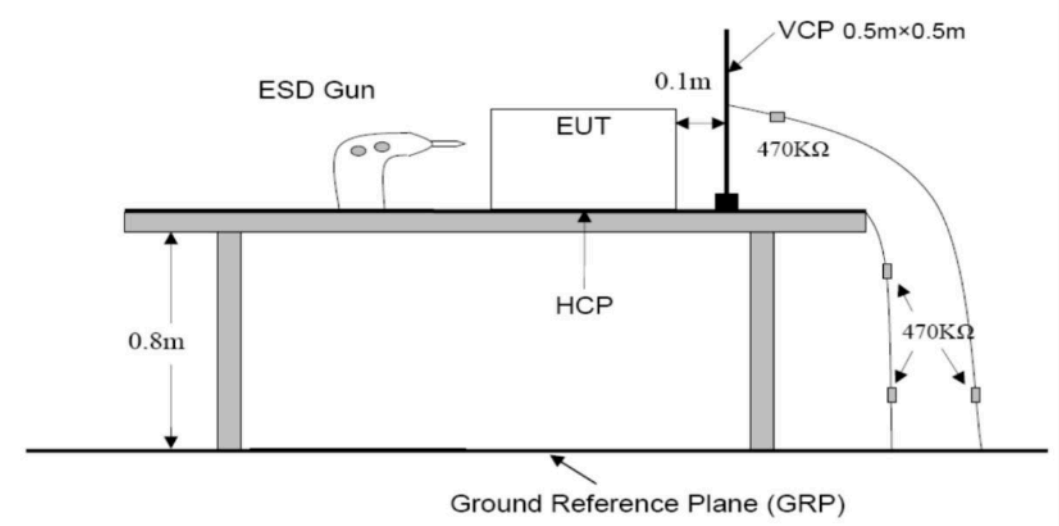
6.1.2. Test Levels and Performance Criterion

Test Standard
EN 55035:2017+A11:2020
(EN 61000-4-2: 2009)

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

Performance criterion: **B**

6.1.3. Test setup



6.1.4. 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.

6.1.5. Test Result

PASS

Test Point	Contact (C) Air (A)	Voltage (kV)	Performance Criterion	Result (Performance Criterion)
Indirect Discharge (HCP)	C	± 4	☐A ☒B	A
Indirect Discharge (VCP)	C	± 4	☐A ☒B	A
Conductive Surfaces	C	± 4	☐A ☒B	A
Slots, Apertures, and Insulating Surfaces	A	± 8	☐A ☒B	A

6.2. Continuous RF electromagnetic field disturbances

6.2.1. Test Specification

Test Port	:	Enclosure port
Step Size	:	1%
Modulation	:	1kHz, 80% AM
Dwell Time	:	1 second
Polarization	:	Horizontal & Vertical

6.2.2. Test Levels and Performance Criterion

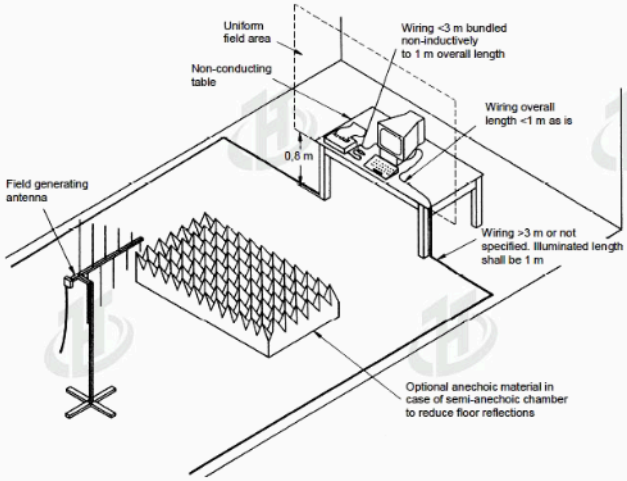
Test Standard
EN 55035:2017+A11:2020
(EN 61000-4-3:2020)

Characteristics	Test levels
Frequency range	80 MHz to 1 000 MHz, 1800 MHz, 2600 MHz, 3500 MHz, 5000 MHz
Test level	3 V/m (unmodulated)
Modulation	1 kHz, 80 % AM, sine wave

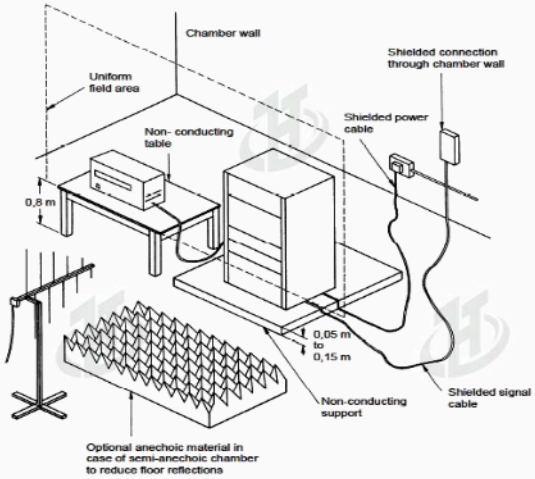
Performance criterion: **A**

6.2.3. Test setup

For table-top equipment



For floor standing equipment



6.2.4. Test Procedure

Measurement was performed in full-anechoic chamber.
Measurement procedure was applied according to EN 61000-4-3 clause 8.
The test method and equipment was specified by EN 61000-4-3.

6.2.5. Test Result

PASS

Frequency (MHz)	Polarization	Test level (V/m)	Modulation	Exposed location	Result (Performance Criterion)
80-1 000, 1 800, 2 600, 3 500, 5000	H & V	3	1 kHz, 80% AM, 1 % increment	All sides	A

6.3. Electrical fast transients/burst (EFT/B)

6.3.1. Test Specification

Test Port	:	input a.c. power port
Impulse Frequency	:	5 kHz
Impulse Wave-shape	:	5/50 ns
Burst Duration	:	15 ms
Burst Period	:	300 ms
Test Duration	:	2 minutes per polarity

6.3.2. Test Levels and Performance Criterion

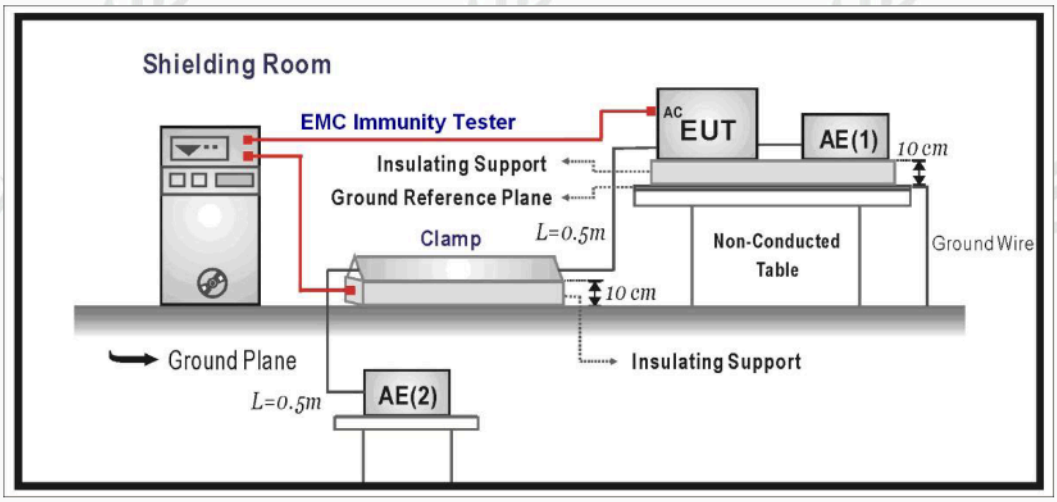
Test Standard
EN 55035:2017+A11:2020
(EN 61000-4-4: 2012)

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.

Performance criterion: **B**

6.3.3. Test setup



6.3.4. 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 AC mains power ports:

Changes to occur at 0 degree crossover point of the voltage waveform. If the EUT does not demonstrate compliance whentested with 0 degree switching, the test shall be repeated with the switching occurring at both 90 degrees and 270 degrees.If the EUT satisfies these alternative requirements, then it fulfils the requirements. This condition shall be recorded in thetest report.

For analogue/digital data ports:

Applicable only to ports which, according to the manufacturer's specification, support cable lengths greater than 3 m.

For DC network power ports:

Applicable only to ports which, according to the manufacturer's specification, support cable lengths greater than 3 m.

6.3.5. Test Result

N/A

EUT is a battery product and is not applicable to this test item

6.4. Surges

6.4.1. Test Specification

Test Port	:	input a.c. power port
Wave-Shape	:	Open Circuit Voltage - 1.2 / 50 us Short Circuit Current - 8 / 20 us
Pulse Repetition Rate	:	1 pulse / min.
Phase Angle	:	90° / 270°
Test Events	:	5 pulses (positive & negative) for each polarity

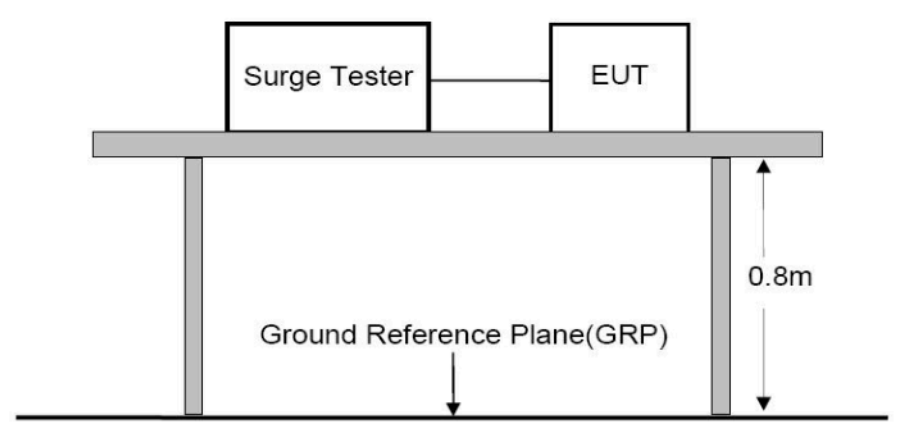
6.4.2. Test Levels and Performance Criterion

Test Standard
EN 55035:2017+A11:2020
(EN 61000-4-5: 2014)

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

Performance criterion: **B**

6.4.3. Test setup



6.4.4. 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.

6.4.5. Test Result

N/A

EUT is a battery product and is not applicable to this test item

6.5. Continuous induced RF disturbances

6.5.1. Test Specification

Test Port	:	input a.c. power port
Step Size	:	1%
Modulation	:	1kHz, 80% AM
Dwell Time	:	1 second

6.5.2. Test Levels and Performance Criterion

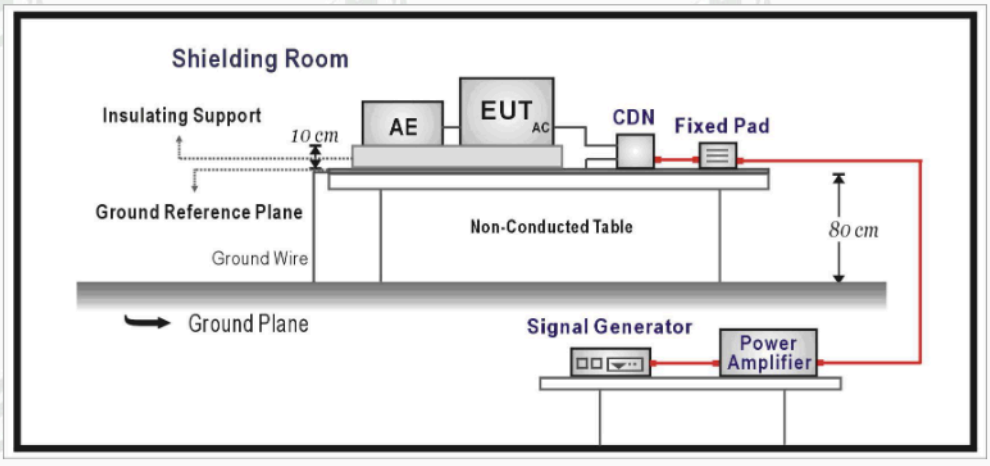
Test Standard
EN 55035:2017+A11:2020
(EN 61000-4-6: 2014)

Frequency ranges MHz	Test level V	Modulation	Performance criterion
0,15 to 10	3	80% AM (1kHz)	A
10 to 30	3 to 1	80% AM (1kHz)	A
30 to 80	1	80% AM (1kHz)	A

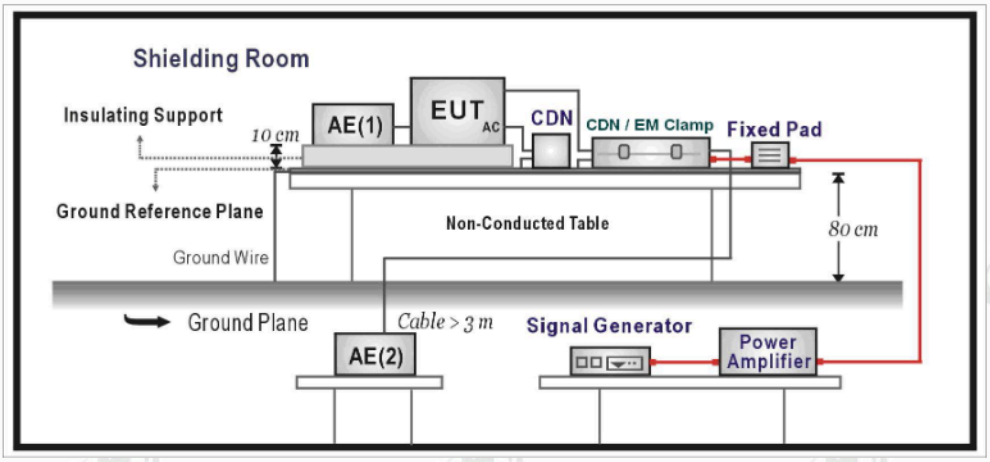
Performance criterion: **A**

6.5.3. Test setup

CDN Method



EM Clamp Method



6.5.4. 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 80 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*10-3decades/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.

6.5.5. Test Result

N/A

EUT is a battery product and is not applicable to this test item

6.6. Power frequency magnetic fields.

6.6.1. Test Levels and Performance Criterion

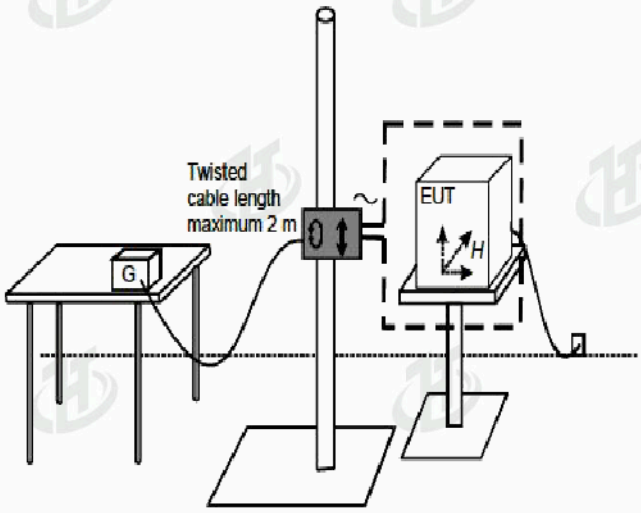
Test Standard
EN 55035:2017+A11:2020
(EN 61000-4-8:2010)

Characteristics	Test levels
Field frequency	50/60 Hz
Test level	1 A/m

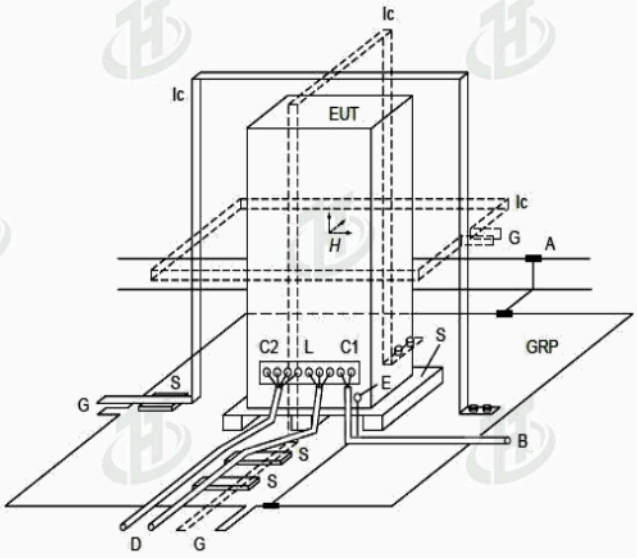
Performance criterion: **A**

6.6.2. Test setup

For table-top equipment



For floor standing equipment



6.6.3. Test Procedure

Measurement was performed in shielded room.
Measurement procedure was applied according to EN 61000-4-8 clause 8.
The test method and equipment was specified by EN 61000-4-8.

6.6.4. Test Result

N/A

The product is not a magnetically sensitive device

6.7. Voltage dips and interruptions

6.7.1. Test Specification

Test Port	:	input a.c. power port
Phase Angle	:	0°, 180°
Test cycle	:	3 times

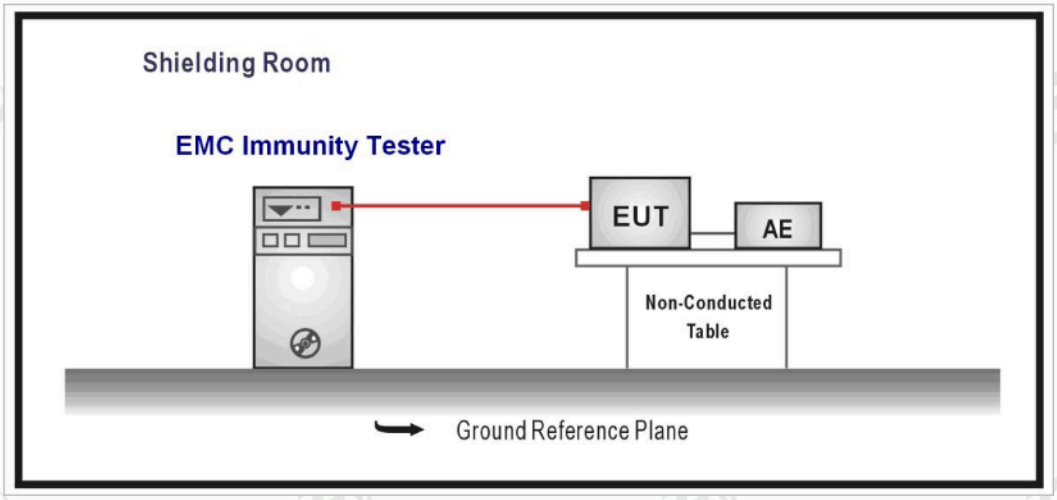
6.7.2. Test Levels and Performance Criterion

Test Standard
EN 55035:2017+A11:2020
(EN 61000-4-11: 2020)

Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)
< 5	95	0.5
70	30	25
< 5	95	250

Performance criterion: **B, C, C**

6.7.3. Test setup



6.7.4. Test Procedure

1. Set up the E.U.T. and test generator as shown on Section 6.7.3.
2. The interruptions is introduced at selected phase angles with specified duration.Record any degradation of performance.

6.7.5. Test Result

N/A

EUT is a battery product and is not applicable to this test item

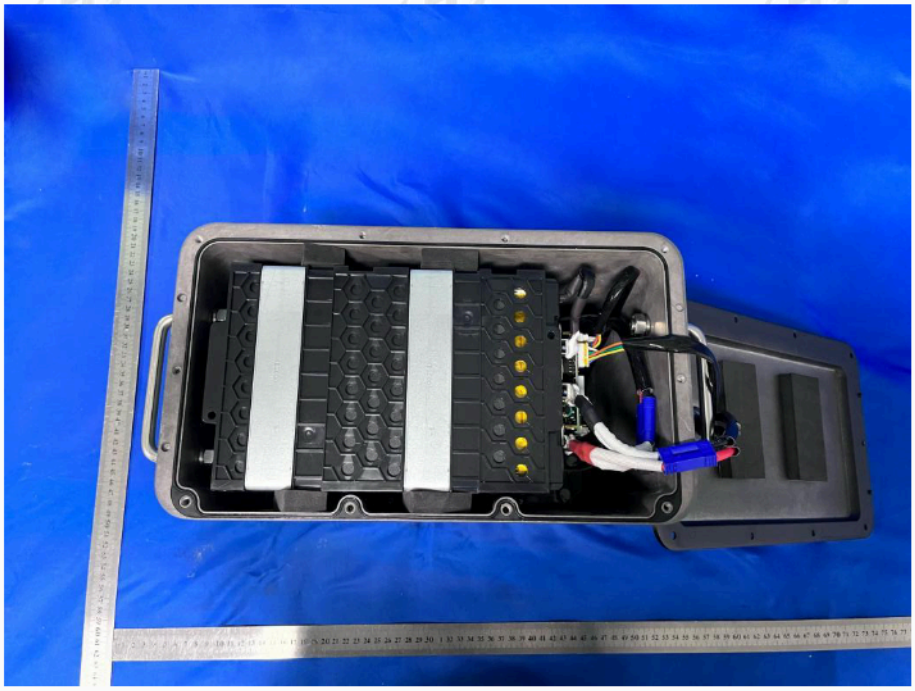
7. Photographs of EUT

EUT Photo 1

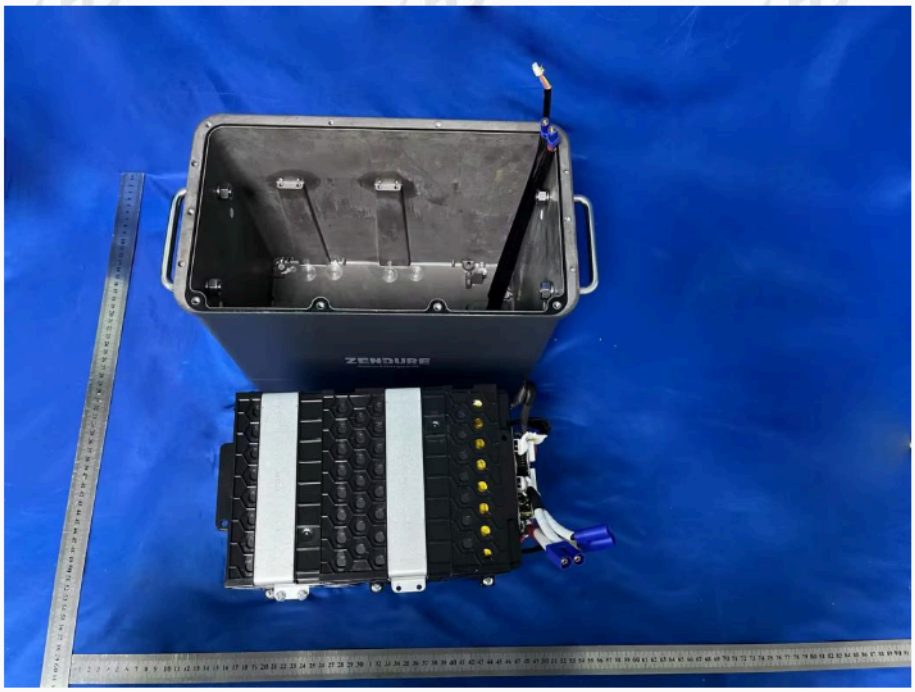
EUT Photo 2

EUT Photo 3

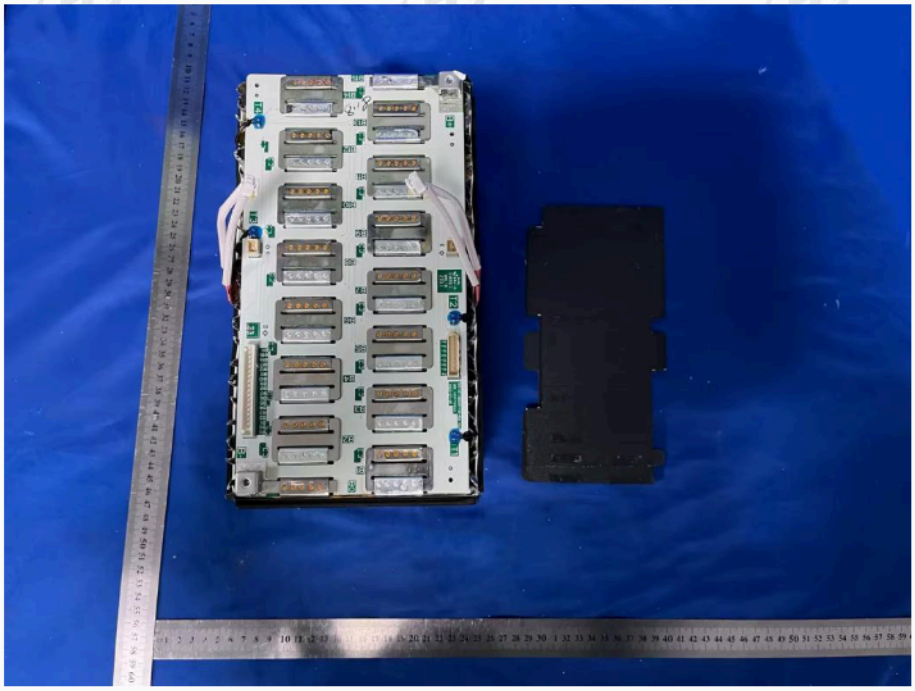
EUT Photo 4



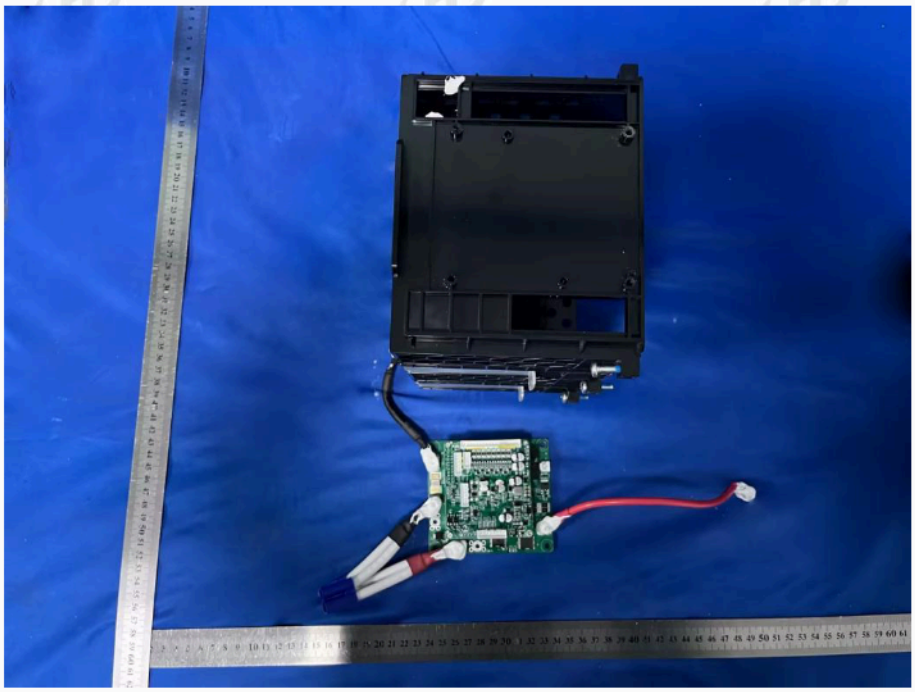
EUT Photo 5



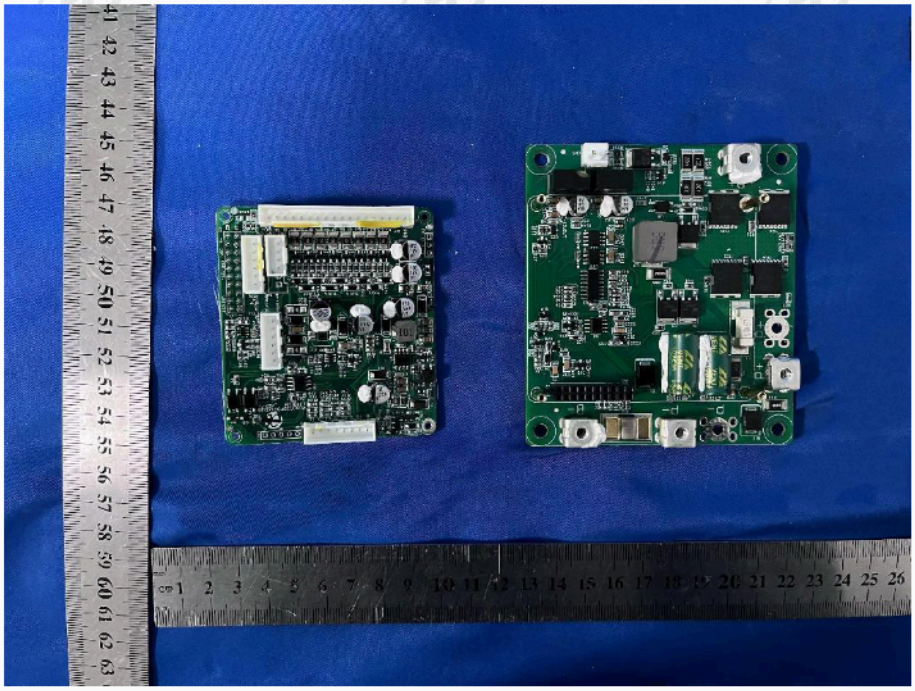
EUT Photo 6



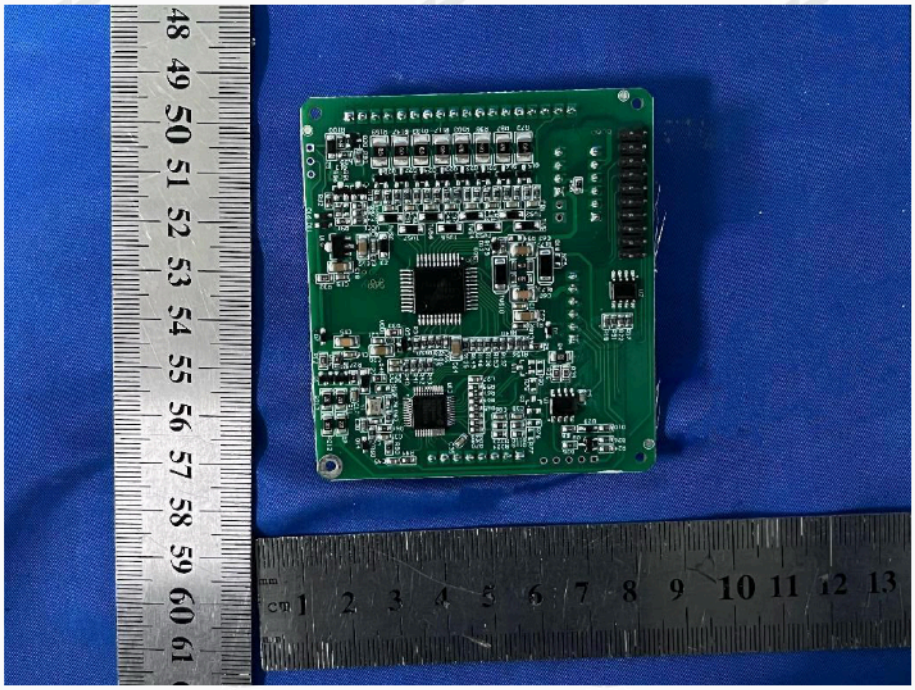
EUT Photo 7



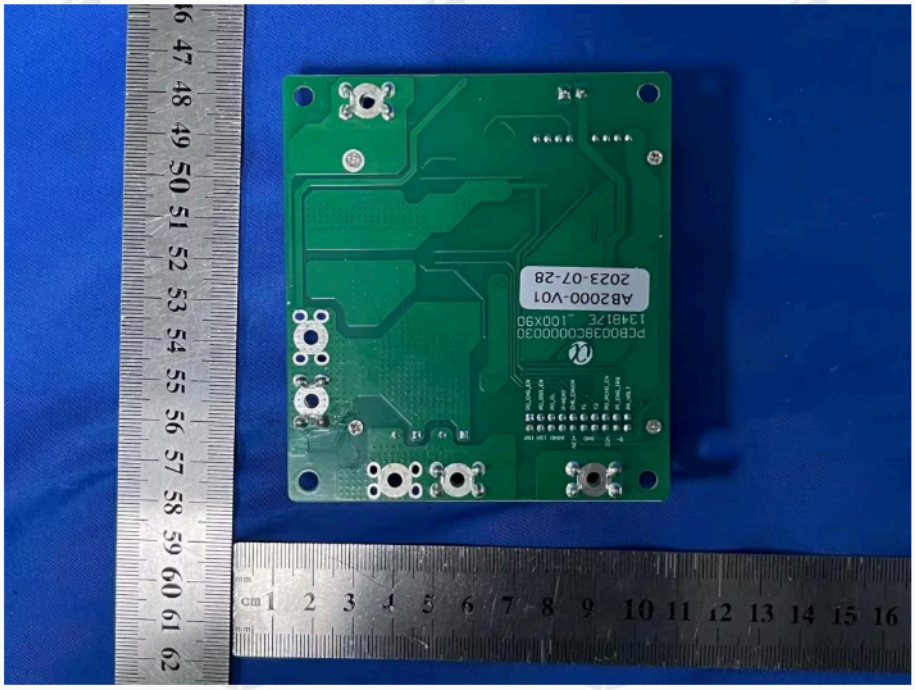
EUT Photo 8



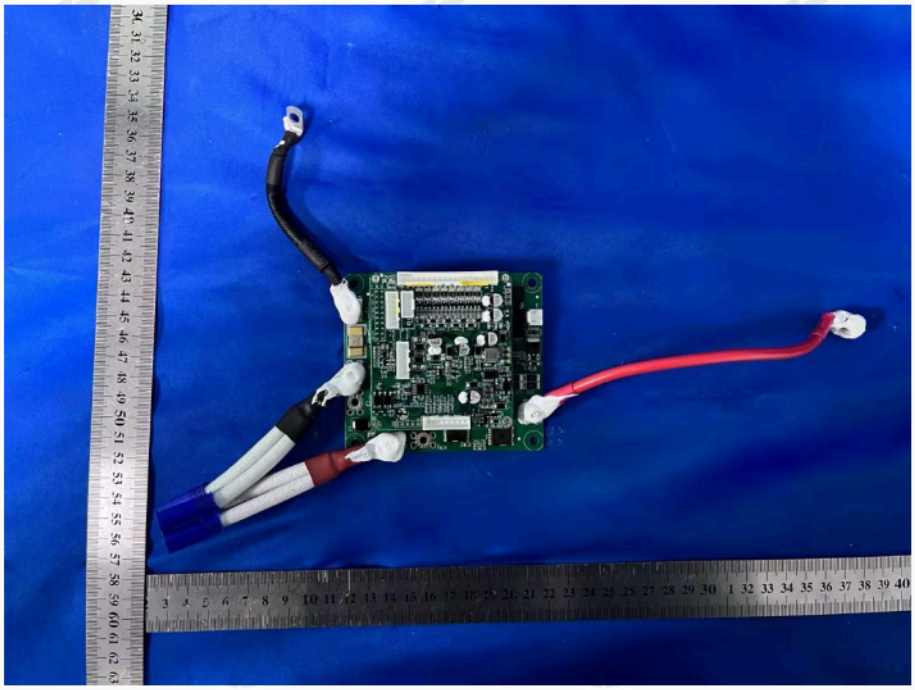
EUT Photo 9



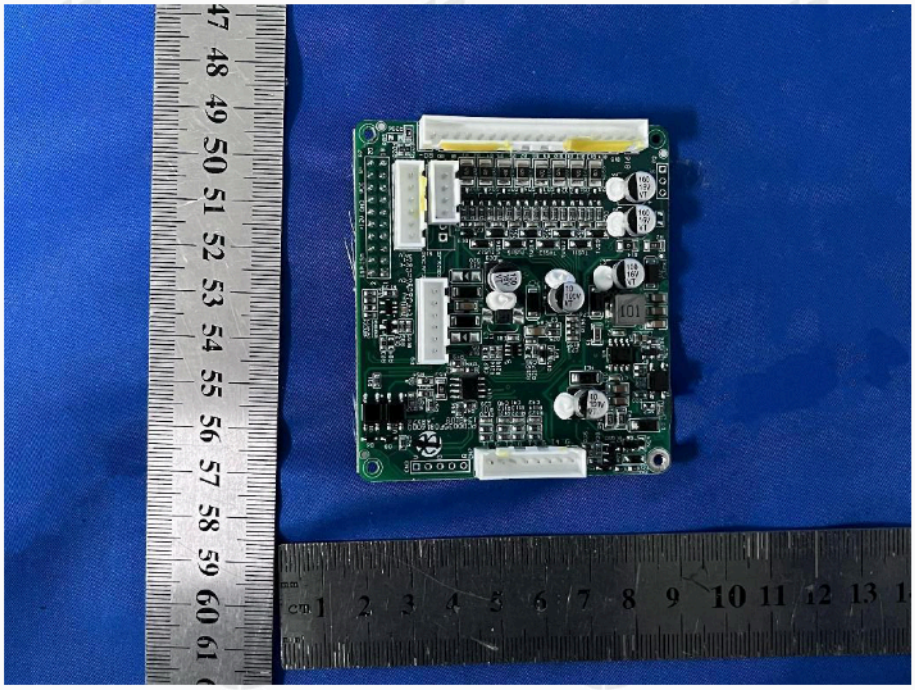
EUT Photo 10



EUT Photo 11

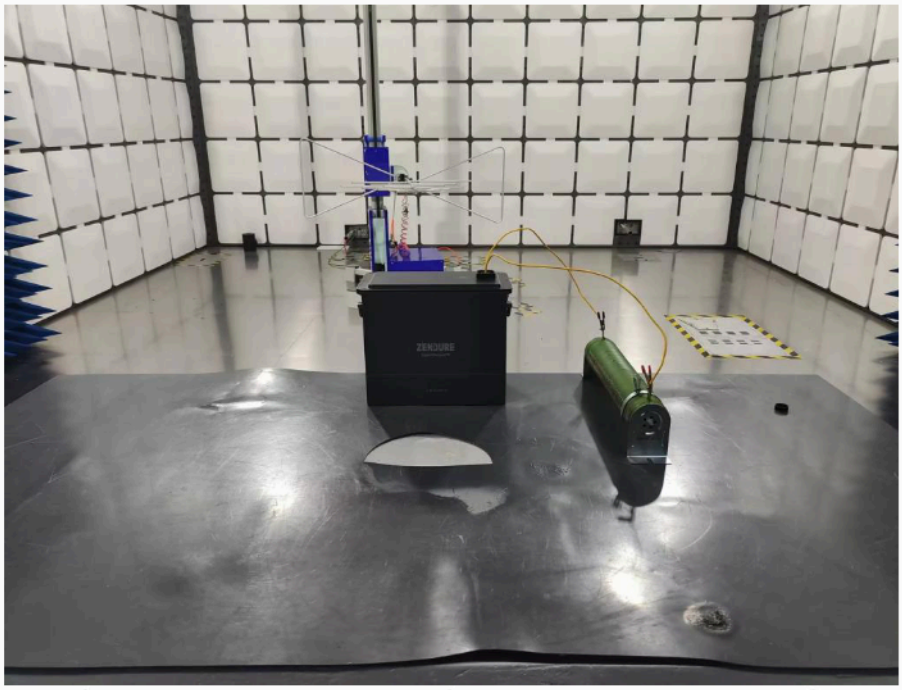


EUT Photo 12

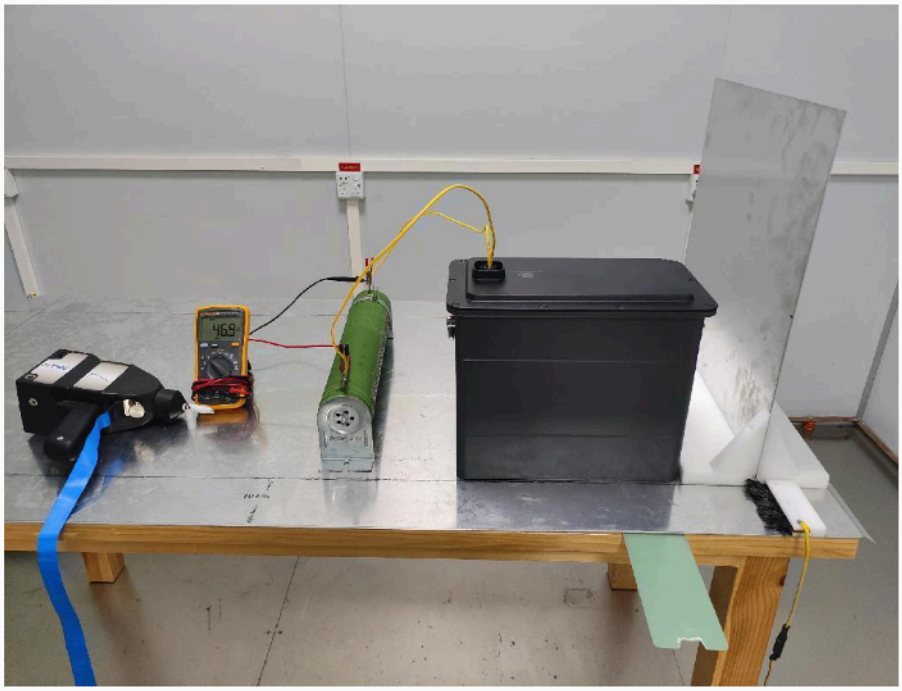


8. Test Setup Photographs

Radiated Emission



Electrostatic discharges



End of report

CERTIFICATE OF COMPLIANCE

Certificate of Compliance

Certificate Number: ZHT-240515021C

Certificate's Holder Zertifikatsinhaber	:	Zendure USA Inc. 1765 E BAYSHORE RD # 201 EAST PALO ALTO, CA 94303-5501
Manufacturer Hersteller	:	ZENDURE TECHNOLOGY CO., LIMITED RM 517, NEW CITY CENTRE, 2 LEI YUE MUN ROAD, KWUN TONG, KOWLOON.HK
Trade Mark Warenzeichen	:	ZENDURE SuperCharged
Product Produkt	:	Add-on Battery AB2000S
Model(s) Bezeichnung	:	ZDAB2000S
Test Standard Geprüft nach	:	EN IEC 62368-1:2020+A11:2020
Test Report No. Bericht Nr	:	ZHT-240515021S

This Certificate of Compliance is issued on a voluntary basis for electrical equipment below the voltage limits of LVD directive 2014/35/EU. The essential requirements are fulfilled accordingly based on the technical specifications applicable at the time of issuance. It is only valid in connection with the test report.

CE

Guangdong Zhonghan Testing Technology Co., Ltd.
Manager
May 22, 2024

The information of the certificate can be checked through www.zht-lab.cn.
The CE mark which is shown on the certificate can only be used under the conditions that the products complete with all of the relevant Directives of EC Declaration of Conformity.
The Manufacturer should be responsible for the internal production control so that the products complied with the essential requirements of the above mentioned Directive(s). Certificate holder must notify all changes to the original certification laboratory of Guangdong Zhonghan Testing Technology Co., Ltd.

Guangdong Zhonghan Testing Technology Co., Ltd.
Address: Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Tel.: +86-755-27782934 Http://www.zht-lab.cn E-mail:admin@zht-lab.cn

TEST REPORT
EN IEC 62368-1
Audio/video, information and communication technology equipment
Part 1: Safety requirements

Report Number.....:	ZHT-240515021S
Date of issue.....:	May 22, 2024
Total number of pages.....:	76 pages
Name of Testing Laboratory preparing the Report.....:	**Guangdong Zhonghan Testing Technology Co., Ltd.** Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Applicant's name.....:	**Zendure USA Inc.**
Address.....:	1765 E BAYSHORE RD # 201 EAST PALO ALTO, CA 94303-5501
Test specification:	
Standard.....:	EN IEC 62368-1:2020+A11:2020
Test procedure.....:	Test report
Non-standard test method.....:	N/A
TRF template used.....:	IECEE OD-2020-F1:2021, Ed.1.4
Test Report Form No.....:	IEC62368_1E
Test Report Form(s) Originator.....:	ZHT
Master TRF.....:	Dated 2022-04-14

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing Guangdong Zhonghan Testing Technology Co., Ltd. The authenticity of this Test Report and its contents can be verified by contacting the Guangdong Zhonghan Testing Technology Co., Ltd. responsible for this Test Report.

Test item description.....:	Add-on Battery AB2000S
Trade Mark.....:	ZENDURE SuperCharged
Manufacturer.....:	ZENDURE TECHNOLOGY CO., LIMITED RM 517, NEW CITY CENTRE, 2 LEI YUE MUN ROAD, KWUN TONG, KOWLOON.HK
Model/Type reference.....:	ZDAB2000S
Ratings.....:	See "Copy of marking plate"

Note: This report is based on ZHT-230829023S updated the product name and model name. Updated the product name do not affect the test result. The EUT is no further test has been performed. All technical testing data is based on the original report No. ZHT-230829023S.

	Original	Updated
Product name	Add-on Battery AB2000	Add-on Battery AB2000S
Model name	ZDAB2000	ZDAB2000S

Testing procedure and testing location:		
☒	**Testing Laboratory:**	Guangdong Zhonghan Testing Technology Co., Ltd.
Testing location/ address.....:		Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
☐	**Associated Testing Laboratory:**	
Testing location/ address.....:		
Tested by (name + signature).....:	Laney Xie	
Reviewed by (name + signature).....:	Summer Yang	
Approved by (name + signature).....:	Levi Lee	
☐	**Testing procedure: TMP/CTF Stage 1:**	
Testing location/ address.....:		
Tested by (name + signature).....:		
Approved by (name + signature).....:		
☐	**Testing procedure: WMT/CTF Stage 2:**	
Testing location/ address.....:		
Tested by (name + signature).....:		
Witnessed by (name + signature).....:		
Approved by (name + signature).....:		
☐	**Testing procedure: SMT/CTF Stage 3 or 4:**	
Testing location/ address.....:		
Tested by (name + signature).....:		
Witnessed by (name + signature).....:		
Approved by (name + signature).....:		
Supervised by (name + signature).....:		

List of Attachments (including a total number of pages in each attachment):
Attachment 1: 21 pages (National deviation)
Attachment 2: 7 pages (Photo)

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
EN IEC 62368-1:2020+A11:2020 The submitted samples were found to comply with the requirements of above specification.	Guangdong Zhonghan Testing Technology Co., Ltd. Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Summary of compliance with National Differences (List of countries addressed):
EU group differences

CENELEC member countries (EU group differences): Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

☒ **The product fulfils the requirements of EN IEC 62368-1:2020+A11:2020.**

Copy of marking plate:
The artwork below may be only a draft.

Remark on above marking:
1, The above markings are the minimum requirements required by the safety standard. For the final production samples, the additional markings which do not give rise to misunderstanding may be added.

Test item particulars:	
Product group ..... :	☒ end product ☐ built-in component
Classification of use by..... :	☒ Ordinary person ☒ Children likely present ☒ Instructed person ☒ Skilled person
Supply connection..... :	☐ AC mains ☐ DC mains ☒ not mains connected: ☒ ES1 ☐ ES2 ☐ ES3
Supply tolerance ..... :	☐ +10%/-10% ☐ +20%/-15% ☐ +____%/ -_____% ☒ None
Supply connection – type ..... :	☐ pluggable equipment type A - ☐ non-detachable supply cord ☐ appliance coupler ☐ direct plug-in ☐ pluggable equipment type B - ☐ non-detachable supply cord ☐ appliance coupler ☐ permanent connection ☐ mating connector ☒ other: Not directly connected to the mains
Considered current rating of protective device..... :	☐ ____A; Location: ☐ building ☐ equipment ☒ N/A
Equipment mobility..... :	☒ movable ☐ hand-held ☐ transportable ☐ direct plug-in ☐ stationary ☐ for building-in ☐ wall/ceiling-mounted ☐ SRME/rack-mounted ☐ other:
Overvoltage category (OVC) ..... :	☐ OVC I ☐ OVC II ☐ OVC III ☐ OVC IV ☒ other: Not directly connected to the mains
Class of equipment ..... :	☐ Class I ☐ Class II ☐ Class III ☒ Not classified ☐ other:
Special installation location ..... :	☒ N/A ☐ restricted access area ☐ outdoor location ☐ other:
Pollution degree (PD) ..... :	☐ PD 1 ☒ PD 2 ☐ PD 3
Manufacturer's specified T_{ma}..... :	55 °C ☐ Outdoor: minimum ___°C
IP protection class ..... :	☒ IPX0 ☐ IP___
Power systems ..... :	☐ TN ☐ TT ☐ IT - __ V_{L-L} ☒ not AC mains
Altitude during operation (m) ..... :	☒ 2000 m or less ☐ _____ m
Altitude of test laboratory (m) ..... :	☒ 2000 m or less ☐ _____ m
Mass of equipment (kg) ..... :	Appr. 21.8kg

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..... :	Aug. 28, 2023
Date (s) of performance of tests.....:	Aug. 28, 2023 – Sept. 06, 2023

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 and other remarks:

The product covered in this report is Add-on Battery AB2000S which is intended for indoor used.
Max. operating temperature required by manufacturer is 55°C.

OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS				
Clause	**Possible Hazard**			
5	Electrically-caused injury			
Class and Energy Source (e.g. ES3: Primary circuit)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
ES1: +48Vdc input	Ordinary	N/A	N/A	N/A
ES1: +48Vdc output				
ES1: Internal +54.75V Li-ion battery(15S2P)	Ordinary	N/A	N/A	N/A
6	Electrically-caused fire			
Class and Energy Source (e.g. PS2: 100 Watt circuit)	Material part (e.g. Printed board)	Safeguards		
		B	S	R
PS3	Enclosure	See 6.3	Metal material enclosure	N/A
PS3	PCB	See 6.3	Min. V-0	N/A
PS3	Battery (1pcs in series)	See 6.3	See 6.3, 6.4	N/A
PS3	Internal / external wiring	See 6.3	See 6.5	N/A
PS3	Other combustible components / materials	See 6.3	See 6.4.5, 6.4.6	N/A
7	Injury caused by hazardous substances			
Class and Energy Source (e.g. Ozone)	Body Part (e.g., Skilled)	Safeguards		
		B	S	R
Lithium-ion	Skilled	See Annex M	N/A	N/A
8	Mechanically-caused injury			
Class and Energy Source (e.g. MS3: Plastic fan blades)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
MS2: Equipment Mass	Ordinary	See 8.6 and 8.8	N/A	N/A
MS1: Sharp edges and corner	Ordinary	N/A	N/A	N/A
9	Thermal burn			
Class and Energy Source (e.g. TS1: Keyboard caps)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
TS1: All accessible parts	Ordinary	N/A	N/A	N/A
10	Radiation			
Class and Energy Source (e.g. RS1: PMP sound output)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
RS1: LED indicator light	Ordinary	N/A	N/A	N/A

Supplementary Information:
"B" – Basic Safeguard; "S" – Supplementary Safeguard; "R" – Reinforced Safeguard

ENERGY SOURCE DIAGRAM
Optional. Manufacturers are to provide the energy sources diagram identify declared energy sources and identifying the demarcations are between power sources. Recommend diagram be provided included in power supply and multipart systems. Insert diagram below. Example diagram designs are; Block diagrams; image(s) with layered data; mechanical drawings
☒ ES ☒ PS ☒ MS ☒ TS ☒ RS (See OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS)

EN 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4	**GENERAL REQUIREMENTS**		P
4.1.1	Acceptance of materials, components and subassemblies	(See appended Table 4.1.2.)	P
4.1.2	Use of components	Safeguard components are certified to IEC and/or national standards and are used correctly within their ratings.	P
4.1.3	Equipment design and construction		P
4.1.4	Specified ambient temperature for outdoor use (°C) ..... :		N/A
4.1.5	Constructions and components not specifically covered		N/A
4.1.8	Liquids and liquid filled components (LFC)		N/A
4.1.15	Markings and instructions	(See Annex F)	P
4.4.3	Safeguard robustness	See below	P
4.4.3.1	General		P
4.4.3.2	Steady force tests	(See Clause T.5)	P
4.4.3.3	Drop tests		N/A
4.4.3.4	Impact tests	(See Clause T.6)	P
4.4.3.5	Internal accessible safeguard tests		N/A
4.4.3.6	Glass impact tests		N/A
4.4.3.7	Glass fixation tests		N/A
	Glass impact test (1J)		N/A
	Push/pull test (10 N)		N/A
4.4.3.8	Thermoplastic material tests		N/A
4.4.3.9	Air comprising a safeguard		N/A
4.4.3.10	Accessibility, glass, safeguard effectiveness	All safeguard remains effective	P
4.4.4	Displacement of a safeguard by an insulating liquid		N/A
4.4.5	Safety interlocks		N/A
4.5	**Explosion**		P
4.5.1	General		P
4.5.2	No explosion during normal/abnormal operating condition	(See Clause B.2, B.3)	P
	No harm by explosion during single fault conditions	(See Clause B.4)	P
4.6	**Fixing of conductors**		N/A
	Fix conductors not to defeat a safeguard		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Compliance is checked by test.....:		N/A
4.7	**Equipment for direct insertion into mains socket–outlets**		N/A
4.7.2	Mains plug part complies with relevant standard... :		N/A
4.7.3	Torque (Nm)..... :		N/A
4.8	**Equipment containing coin/button cell batteries**		N/A
4.8.1	General		N/A
4.8.2	Instructional safeguard..... :		N/A
4.8.3	Battery compartment door/cover construction	Not such construction	N/A
	Open torque test		N/A
4.8.4.2	Stress relief test		N/A
4.8.4.3	Battery replacement test		N/A
4.8.4.4	Drop test		N/A
4.8.4.5	Impact test		N/A
4.8.4.6	Crush test		N/A
4.8.5	Compliance		N/A
	30N force test with test probe		N/A
	20N force test with test hook		N/A
4.9	**Likelihood of fire or shock due to entry of conductive object**		N/A
4.10	**Component requirements**		N/A
4.10.1	Disconnect Device		N/A
4.10.2	Switches and relays		N/A

5	**ELECTRICALLY-CAUSED INJURY**		P
5.2	**Classification and limits of electrical energy sources**		P
5.2.2	ES1, ES2 and ES3 limits		P
5.2.2.2	Steady-state voltage and current limits..... :	(See appended table 5.2)	P
5.2.2.3	Capacitance limits..... :		N/A
5.2.2.4	Single pulse limits.....:		N/A
5.2.2.5	Limits for repetitive pulses.....:		N/A
5.2.2.6	Ringing signals		N/A
5.2.2.7	Audio signals		N/A
5.3	**Protection against electrical energy sources**		N/A
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons		N/A
5.3.1 a)	Accessible ES1/ES2 derived from ES2/ES3 circuits		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.3.1 b)	Skilled persons not unintentional contact ES3 bare conductors		N/A
5.3.2.1	Accessibility to electrical energy sources and safeguards		N/A
	Accessibility to outdoor equipment bare parts		N/A
5.3.2.2	Contact requirements		N/A
	Test with test probe from Annex V		—
5.3.2.2 a)	Air gap – electric strength test potential (V)..... :		N/A
5.3.2.2 b)	Air gap – distance (mm) ..... :		N/A
5.3.2.3	Compliance		N/A
5.3.2.4	Terminals for connecting stripped wire		N/A
5.4	**Insulation materials and requirements**		N/A
5.4.1.2	Properties of insulating material		N/A
5.4.1.3	Material is non-hygroscopic		N/A
5.4.1.4	Maximum operating temperature for insulating materials..... :		N/A
5.4.1.5	Pollution degrees..... :		N/A
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound		N/A
5.4.1.5.3	Thermal cycling test		N/A
5.4.1.6	Insulation in transformers with varying dimensions		N/A
5.4.1.7	Insulation in circuits generating starting pulses		- - -
5.4.1.8	Determination of working voltage..... :		N/A
5.4.1.9	Insulating surfaces		N/A
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted		N/A
5.4.1.10.2	Vicat test..... :		- - -
5.4.1.10.3	Ball pressure test..... :		N/A
5.4.2	Clearances		N/A
5.4.2.1	General requirements		N/A
	Clearances in circuits connected to AC Mains, Alternative method		N/A
5.4.2.2	Procedure 1 for determining clearance		N/A
	Temporary overvoltage ..... :		—
5.4.2.3	Procedure 2 for determining clearance		N/A
5.4.2.3.2.2	a.c. mains transient voltage..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.2.3.2.3	d.c. mains transient voltage ..... :		—
5.4.2.3.2.4	External circuit transient voltage..... :		—
5.4.2.3.2.5	Transient voltage determined by measurement..... :		—
5.4.2.4	Determining the adequacy of a clearance using an electric strength test ..... :		N/A
5.4.2.5	Multiplication factors for clearances and test voltages ..... :		N/A
5.4.2.6	Clearance measurement..... :		N/A
5.4.3	Creepage distances		N/A
5.4.3.1	General		N/A
5.4.3.3	Material group..... :		- - -
5.4.3.4	Creepage distances measurement..... :		N/A
5.4.4	Solid insulation		N/A
5.4.4.1	General requirements		N/A
5.4.4.2	Minimum distance through insulation ..... :		N/A
5.4.4.3	Insulating compound forming solid insulation		N/A
5.4.4.4	Solid insulation in semiconductor devices		N/A
5.4.4.5	Insulating compound forming cemented joints		N/A
5.4.4.6	Thin sheet material		N/A
5.4.4.6.1	General requirements		N/A
5.4.4.6.2	Separable thin sheet material		N/A
	Number of layers (pcs) ..... :		N/A
5.4.4.6.3	Non-separable thin sheet material		- - -
	Number of layers (pcs) ..... :		- - -
5.4.4.6.4	Standard test procedure for non-separable thin sheet material..... :		- - -
5.4.4.6.5	Mandrel test		- - -
5.4.4.7	Solid insulation in wound components		- - -
5.4.4.9	Solid insulation at frequencies >30 kHz, E_P, K_R, d, V_{PW} (V)..... :		N/A
	Alternative by electric strength test, tested voltage (V), K_R..... :		N/A
5.4.5	Antenna terminal insulation		N/A
5.4.5.1	General		N/A
5.4.5.2	Voltage surge test		N/A
5.4.5.3	Insulation resistance (MΩ)..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Electric strength test.....:		N/A
5.4.6	Insulation of internal wire as part of supplementary safeguard		N/A
5.4.7	Tests for semiconductor components and for cemented joints		N/A
5.4.8	Humidity conditioning		N/A
	Relative humidity (%), temperature (°C), duration (h).....:		—
5.4.9	Electric strength test		N/A
5.4.9.1	Test procedure for type test of solid insulation.....:		N/A
5.4.9.2	Test procedure for routine test		N/A
5.4.10	Safeguards against transient voltages from external circuits		N/A
5.4.10.1	Parts and circuits separated from external circuits		N/A
5.4.10.2	Test methods		N/A
5.4.10.2.1	General		N/A
5.4.10.2.2	Impulse test.....:		N/A
5.4.10.2.3	Steady-state test.....:		N/A
5.4.10.3	Verification for insulation breakdown for impulse test.....:		N/A
5.4.11	Separation between external circuits and earth		N/A
5.4.11.1	Exceptions to separation between external circuits and earth		N/A
5.4.11.2	Requirements		N/A
	SPDs bridge separation between external circuit and earth		N/A
	Rated operating voltage U_{op} (V).....:		—
	Nominal voltage U_{peak} (V).....:		—
	Max increase due to variation ΔU_{sp} .....:		—
	Max increase due to ageing ΔU_{sa} .....:		—
5.4.11.3	Test method and compliance.....:		N/A
5.4.12	Insulating liquid		- - -
5.4.12.1	General requirements		N/A
5.4.12.2	Electric strength of an insulating liquid.....:		N/A
5.4.12.3	Compatibility of an insulating liquid.....:		N/A
5.4.12.4	Container for insulating liquid.....:		N/A
5.5	**Components as safeguards**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.5.1	General		N/A
5.5.2	Capacitors and RC units		N/A
5.5.2.1	General requirement		N/A
5.5.2.2	Safeguards against capacitor discharge after disconnection of a connector.....:		N/A
5.5.3	Transformers		N/A
5.5.4	Optocouplers		N/A
5.5.5	Relays		N/A
5.5.6	Resistors		N/A
5.5.7	SPDs		N/A
5.5.8	Insulation between the mains and an external circuit consisting of a coaxial cable.....:		N/A
5.5.9	Safeguards for socket-outlets in outdoor equipment		N/A
	RCD rated residual operating current (mA).....:		—
5.6	**Protective conductor**		N/A
5.6.2	Requirement for protective conductors		N/A
5.6.2.1	General requirements		N/A
5.6.2.2	Colour of insulation		N/A
5.6.3	Requirement for protective earthing conductors		N/A
	Protective earthing conductor size (mm^2) ..... :		—
	Protective earthing conductor serving as a reinforced safeguard		N/A
	Protective earthing conductor serving as a double safeguard		N/A
5.6.4	Requirements for protective bonding conductors		N/A
5.6.4.1	Protective bonding conductors		N/A
	Protective bonding conductor size (mm^2)..... :		—
5.6.4.2	Protective current rating (A)..... :		N/A
5.6.5	Terminals for protective conductors		N/A
5.6.5.1	Terminal size for connecting protective earthing conductors (mm).....:		N/A
	Terminal size for connecting protective bonding conductors (mm).....:		N/A
5.6.5.2	Corrosion		N/A
5.6.6	Resistance of the protective bonding system		N/A
5.6.6.1	Requirements		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.6.6.2	Test Method.....:		N/A
5.6.6.3	Resistance (Ω) or voltage drop.....:		N/A
5.6.7	Reliable connection of a protective earthing conductor		N/A
5.6.8	Functional earthing		N/A
	Conductor size (mm^2)..... :		N/A
	Class II with functional earthing marking ..... :		N/A
	Appliance inlet cl & cr (mm)..... :		N/A
5.7	**Prospective touch voltage, touch current and protective conductor current**		N/A
5.7.2	Measuring devices and networks		N/A
5.7.2.1	Measurement of touch current		N/A
5.7.2.2	Measurement of voltage		N/A
5.7.3	Equipment set-up, supply connections and earth connections		N/A
5.7.4	Unearthed accessible parts..... :		N/A
5.7.5	Earthed accessible conductive parts.....:		N/A
5.7.6	Requirements when touch current exceeds ES2 limits		N/A
	Protective conductor current (mA)..... :		N/A
	Instructional Safeguard.....:		N/A
5.7.7	Prospective touch voltage and touch current associated with external circuits		N/A
5.7.7.1	Touch current from coaxial cables		N/A
5.7.7.2	Prospective touch voltage and touch current associated with paired conductor cables		N/A
5.7.8	Summation of touch currents from external circuits		N/A
	a) Equipment connected to earthed external circuits, current (mA).....:		N/A
	b) Equipment connected to unearthed external circuits, current (mA).....:		N/A
5.8	**Backfeed safeguard in battery backed up supplies**		N/A
	Mains terminal ES..... :	ES1	N/A
	Air gap (mm)..... :		N/A

6	**ELECTRICALLY- CAUSED FIRE**	P
6.2	**Classification of PS and PIS**	P

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Clause	Requirement + Test	Result - Remark	Verdict
6.2.2	Power source circuit classifications.....:	(See OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS)	P
6.2.3	Classification of potential ignition sources	See below.	P
6.2.3.1	Arcing PIS ..... :		N/A
6.2.3.2	Resistive PIS .....:	All conductors and devices are considered as Resistive PIS.	P
6.3	**Safeguards against fire under normal operating and abnormal operating conditions**		P
6.3.1	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials.....:	(See appended table 5.4.1.4, 6.3.2, 9.0, B.2.6)	P
	Combustible materials outside fire enclosure.....:		P
6.4	**Safeguards against fire under single fault conditions**		P
6.4.1	Safeguard method	Method by control of fire spread applied, fire enclosure provided.	P
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits		P
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits		N/A
6.4.3.1	Supplementary safeguards		N/A
6.4.3.2	Single Fault Conditions.....:		N/A
	Special conditions for temperature limited by fuse		N/A
6.4.4	Control of fire spread in PS1 circuits		N/A
6.4.5	Control of fire spread in PS2 circuits		P
6.4.5.2	Supplementary safeguards	Compliance detailed as follows: - Printed board: rated V-1 or VTM-1 min. class material. - Plastic enclosure: rated V-1 or VTM-1 min. class material. Other components other than PCB and wires are: - mounted on PCB rated V-1 or VTM-1 min., or - made of V-2, VTM-2 or HF2 min.	P

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Clause	Requirement + Test	Result - Remark	Verdict
6.4.6	Control of fire spread in PS3 circuits	Compliance detailed as follows: − Parts as in 6.4.5 above − Fire enclosure: metal enclosure used.	P
6.4.7	Separation of combustible materials from a PIS		N/A
6.4.7.2	Separation by distance		N/A
6.4.7.3	Separation by a fire barrier		N/A
6.4.8	Fire enclosures and fire barriers		P
6.4.8.2	Fire enclosure and fire barrier material properties	Equipment enclosure was evaluated as a fire enclosure.	P
6.4.8.2.1	Requirements for a fire barrier	Metal enclosure used.	P
6.4.8.2.2	Requirements for a fire enclosure	Metal enclosure used.	P
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier	No openings	P
6.4.8.3.1	Fire enclosure and fire barrier openings		N/A
6.4.8.3.2	Fire barrier dimensions		N/A
6.4.8.3.3	Top openings and properties	No openings	N/A
	Openings dimensions (mm)..... :		N/A
6.4.8.3.4	Bottom openings and properties	No openings	N/A
	Openings dimensions (mm)..... :		N/A
	Flammability tests for the bottom of a fire enclosure		N/A
	Instructional Safeguard..... :		N/A
6.4.8.3.5	Side openings and properties		N/A
	Openings dimensions (mm)..... :		N/A
6.4.8.3.6	Integrity of a fire enclosure, condition met: a), b) or c)..... :	Without cover or door that can be open	N/A
6.4.8.4	Separation of a PIS from a fire enclosure and a fire barrier distance (mm) or flammability rating..... :		N/A
6.4.9	Flammability of insulating liquid..... :		N/A
6.5	**Internal and external wiring**		P
6.5.1	General requirements	See below.	P
6.5.2	Requirements for interconnection to building wiring ..... :		N/A
6.5.3	Internal wiring size (mm^2) for socket-outlets..... :		N/A
6.6	**Safeguards against fire due to the connection to additional equipment**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
7	**INJURY CAUSED BY HAZARDOUS SUBSTANCES**		P
7.2	**Reduction of exposure to hazardous substances**		N/A
7.3	**Ozone exposure**		N/A
7.4	**Use of personal safeguards or personal protective equipment (PPE)**		N/A
	Personal safeguards and instructions..... :		—
7.5	**Use of instructional safeguards and instructions**		N/A
	Instructional safeguard (ISO 7010)..... :		—
7.6	**Batteries and their protection circuits**		P
8	**MECHANICALLY-CAUSED INJURY**		P
8.2	**Mechanical energy source classifications**		P
8.3	**Safeguards against mechanical energy sources**		P
8.4	**Safeguards against parts with sharp edges and corners**		P
8.4.1	Safeguards		N/A
	Instructional Safeguard..... :		N/A
8.4.2	Sharp edges or corners	Accessible edges and corners of the equipment are rounded and are classified as MS1.	P
8.5	**Safeguards against moving parts**		N/A
8.5.1	Fingers, jewellery, clothing, hair, etc., contact with MS2 or MS3 parts		N/A
	MS2 or MS3 part required to be accessible for the function of the equipment		N/A
	Moving MS3 parts only accessible to skilled person		N/A
8.5.2	Instructional safeguard..... :		N/A
8.5.4	Special categories of equipment containing moving parts		N/A
8.5.4.1	General		N/A
8.5.4.2	Equipment containing work cells with MS3 parts		N/A
8.5.4.2.1	Protection of persons in the work cell		N/A
8.5.4.2.2	Access protection override		N/A
8.5.4.2.2.1	Override system		N/A
8.5.4.2.2.2	Visual indicator		N/A
8.5.4.2.3	Emergency stop system		N/A
	Maximum stopping distance from the point of activation (m)..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Space between end point and nearest fixed mechanical part (mm)..... :		N/A
8.5.4.2.4	Endurance requirements		N/A
	Mechanical system subjected to 100 000 cycles of operation		N/A
	- Mechanical function check and visual inspection		N/A
	- Cable assembly.....:		N/A
8.5.4.3	Equipment having electromechanical device for destruction of media		N/A
8.5.4.3.1	Equipment safeguards		N/A
8.5.4.3.2	Instructional safeguards against moving parts..... :		N/A
8.5.4.3.3	Disconnection from the supply		N/A
8.5.4.3.4	Cut type and test force (N)..... :		N/A
8.5.4.3.5	Compliance		N/A
8.5.5	High pressure lamps	No such Lamps provided.	N/A
	Explosion test.....:		N/A
8.5.5.3	Glass particles dimensions (mm)..... :		N/A
8.6	**Stability of equipment**		P
8.6.1	General		P
	Instructional safeguard..... :		P
8.6.2	Static stability		P
8.6.2.2	Static stability test.....:	The equipment is placed on a plane at an angle of 10° from the horizontal and rotated slowly through an angle of 360° about its normal vertical axis, no dumping.	P
8.6.2.3	Downward force test		N/A
8.6.3	Relocation stability		N/A
	Wheels diameter (mm)..... :		—
	Tilt test		N/A
8.6.4	Glass slide test		N/A
8.6.5	Horizontal force test..... :		N/A
8.7	**Equipment mounted to wall, ceiling or other structure**		N/A
8.7.1	Mount means type.....:		N/A
8.7.2	Test methods		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test 1, additional downwards force (N).....:		N/A
	Test 2, number of attachment points and test force (N).....:		N/A
	Test 3 Nominal diameter (mm) and applied torque (Nm).....:		N/A
8.8	**Handles strength**		P
8.8.1	General		P
8.8.2	Handle strength test		P
	Number of handles.....:	2	—
	Force applied (N).....:		—
8.9	**Wheels or casters attachment requirements**		N/A
8.9.2	Pull test		N/A
8.10	**Carts, stands and similar carriers**		N/A
8.10.1	General		N/A
8.10.2	Marking and instructions.....:		N/A
8.10.3	Cart, stand or carrier loading test		N/A
	Loading force applied (N).....:		N/A
8.10.4	Cart, stand or carrier impact test		N/A
8.10.5	Mechanical stability		N/A
	Force applied (N).....:		—
8.10.6	Thermoplastic temperature stability		N/A
8.11	**Mounting means for slide-rail mounted equipment (SRME)**		N/A
8.11.1	General		N/A
8.11.2	Requirements for slide rails		N/A
	Instructional Safeguard.....:		N/A
8.11.3	Mechanical strength test		N/A
8.11.3.1	Downward force test, force (N) applied.....:		N/A
8.11.3.2	Lateral push force test		N/A
8.11.3.3	Integrity of slide rail end stops		N/A
8.11.4	Compliance		N/A
8.12	**Telescoping or rod antennas**		N/A
	Button/ball diameter (mm).....:		—

9	**THERMAL BURN INJURY**	P
9.2	**Thermal energy source classifications**	P

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Clause	Requirement + Test	Result - Remark	Verdict
9.3	**Touch temperature limits**		P
9.3.1	Touch temperatures of accessible parts..... :	(See appended table 9.3)	P
9.3.2	Test method and compliance		P
9.4	**Safeguards against thermal energy sources**		N/A
9.5	**Requirements for safeguards**		N/A
9.5.1	Equipment safeguard		N/A
9.5.2	Instructional safeguard..... :		N/A
9.6	**Requirements for wireless power transmitters**		—
9.6.1	General		N/A
9.6.2	Specification of the foreign objects		N/A
9.6.3	Test method and compliance.....:	(See appended table 9.6)	N/A
10	**RADIATION**		P
10.2	**Radiation energy source classification**		P
10.2.1	General classification	LED indication light: RS1	P
	Lasers.....:		—
	Lamps and lamp systems.....:		—
	Image projectors..... :		—
	X-Ray.....:		—
	Personal music player.....:		—
10.3	**Safeguards against laser radiation**		N/A
	The standard(s) equipment containing laser(s) comply.....:		N/A
10.4	**Safeguards against optical radiation from lamps and lamp systems (including LED types)**		P
10.4.1	General requirements	The luminance of LED indicator light is far less than 10000cd/m2. With reference to sub clause 4.1 of IEC 62471: 2006 no further test is necessary.	P
	Instructional safeguard provided for accessible radiation level needs to exceed		N/A
	Risk group marking and location.....:		N/A
	Information for safe operation and installation		N/A
10.4.2	Requirements for enclosures		N/A
	UV radiation exposure..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
10.4.3	Instructional safeguard..... :		N/A
10.5	**Safeguards against X-radiation**		N/A
10.5.1	Requirements		N/A
	Instructional safeguard for skilled persons..... :		—
10.5.3	Maximum radiation (pA/kg)..... :		—
10.6	**Safeguards against acoustic energy sources**		N/A
10.6.1	General		N/A
10.6.2	Classification		N/A
	Acoustic output $L_{Aeq,T}$, dB(A)..... :		N/A
	Unweighted RMS output voltage (mV)..... :		N/A
	Digital output signal (dBFS)..... :		N/A
10.6.3	Requirements for dose-based systems		N/A
10.6.3.1	General requirements		N/A
10.6.3.2	Dose-based warning and automatic decrease		N/A
10.6.3.3	Exposure-based warning and requirements		N/A
	30 s integrated exposure level (MEL30)..... :		N/A
	Warning for MEL ≥ 100 dB(A)..... :		N/A
10.6.4	Measurement methods		N/A
10.6.5	Protection of persons		N/A
	Instructional safeguards..... :		N/A
10.6.6	Requirements for listening devices (headphones, earphones, etc.)		N/A
10.6.6.1	Corded listening devices with analogue input		N/A
	Listening device input voltage (mV)..... :		N/A
10.6.6.2	Corded listening devices with digital input		N/A
	Max. acoustic output $L_{Aeq,T}$, dB(A)..... :		N/A
10.6.6.3	Cordless listening devices		N/A
	Max. acoustic output $L_{Aeq,T}$, dB(A)..... :		N/A

B	**NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS**		P
B.1	**General**		P
B.1.5	Temperature measurement conditions	(See appended table B.1.5)	P
B.2	**Normal operating conditions**		P

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Clause	Requirement + Test	Result - Remark	Verdict
B.2.1	General requirements..... :	(See Test Item Particulars and appended test tables)	P
	Audio Amplifiers and equipment with audio amplifiers..... :		N/A
B.2.3	Supply voltage and tolerances		N/A
B.2.5	Input test..... :	(See appended table B.2.5)	P
B.3	**Simulated abnormal operating conditions**		P
B.3.1	General		P
B.3.2	Covering of ventilation openings	No openings	N/A
	Instructional safeguard..... :		N/A
B.3.3	DC mains polarity test		N/A
B.3.4	Setting of voltage selector		N/A
B.3.5	Maximum load at output terminals	(See appended table B.3)	P
B.3.6	Reverse battery polarity		N/A
B.3.7	Audio amplifier abnormal operating conditions		N/A
B.3.8	Safeguards functional during and after abnormal operating conditions..... :	(See appended table B.3)	P
B.4	**Simulated single fault conditions**		P
B.4.1	General		P
B.4.2	Temperature controlling device		N/A
B.4.3	Blocked motor test		N/A
B.4.4	Functional insulation		P
B.4.4.1	Short circuit of clearances for functional insulation		P
B.4.4.2	Short circuit of creepage distances for functional insulation		P
B.4.4.3	Short circuit of functional insulation on coated printed boards		N/A
B.4.5	Short-circuit and interruption of electrodes in tubes and semiconductors		N/A
B.4.6	Short circuit or disconnection of passive components		N/A
B.4.7	Continuous operation of components		N/A
B.4.8	Compliance during and after single fault conditions ..... :	(See appended table B.4)	P
B.4.9	Battery charging and discharging under single fault conditions	(See Annex M)	P
C	**UV RADIATION**		N/A
C.1	**Protection of materials in equipment from UV radiation**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
C.1.2	Requirements		N/A
C.1.3	Test method		N/A
C.2	**UV light conditioning test**		N/A
C.2.1	Test apparatus..... :		N/A
C.2.2	Mounting of test samples		N/A
C.2.3	Carbon-arc light-exposure test		N/A
C.2.4	Xenon-arc light-exposure test		N/A
D	**TEST GENERATORS**		N/A
D.1	**Impulse test generators**		N/A
D.2	**Antenna interface test generator**		N/A
D.3	**Electronic pulse generator**		N/A
E	**TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS**		N/A
E.1	**Electrical energy source classification for audio signals**		N/A
	Maximum non-clipped output power (W)..... :		—
	Rated load impedance (Ω) ..... :		—
	Open-circuit output voltage (V)..... :		—
	Instructional safeguard..... :		—
E.2	**Audio amplifier normal operating conditions**		N/A
	Audio signal source type..... :		—
	Audio output power (W)..... :		—
	Audio output voltage (V)..... :		—
	Rated load impedance (Ω) ..... :		—
	Requirements for temperature measurement	(See Table B.1.5)	N/A
E.3	Audio amplifier abnormal operating conditions	(See Table B.3, B.4)	N/A
F	**EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS**		P
F.1	**General**		P
	Language ..... :	English	—
F.2	**Letter symbols and graphical symbols**		P
F.2.1	Letter symbols according to IEC60027-1		N/A
F.2.2	Graphic symbols according to IEC, ISO or manufacturer specific		P
F.3	**Equipment markings**		P

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Clause	Requirement + Test	Result - Remark	Verdict
F.3.1	Equipment marking locations	The equipment marking is located on the surface and is easily visible.	P
F.3.2	Equipment identification markings	See below.	P
F.3.2.1	Manufacturer identification .....:	See copy of marking plate	P
F.3.2.2	Model identification .....:	See copy of marking plate	P
F.3.3	Equipment rating markings	See copy of marking plate	P
F.3.3.1	Equipment with direct connection to mains		N/A
F.3.3.2	Equipment without direct connection to mains		P
F.3.3.3	Nature of the supply voltage.....:	See copy of marking plate	P
F.3.3.4	Rated voltage.....:	See copy of marking plate	P
F.3.3.5	Rated frequency.....:		N/A
F.3.3.6	Rated current or rated power.....:	See copy of marking plate	P
F.3.3.7	Equipment with multiple supply connections	Only one connection.	N/A
F.3.4	Voltage setting device	No voltage setting device.	N/A
F.3.5	Terminals and operating devices		N/A
F.3.5.1	Mains appliance outlet and socket-outlet markings .....:		N/A
F.3.5.2	Switch position identification marking.....:		N/A
F.3.5.3	Replacement fuse identification and rating markings .....:		N/A
	Instructional safeguards for neutral fuse.....:		N/A
F.3.5.4	Replacement battery identification marking..... :		N/A
F.3.5.5	Neutral conductor terminal		N/A
F.3.5.6	Terminal marking location		N/A
F.3.6	Equipment markings related to equipment classification		N/A
F.3.6.1	Class I equipment		N/A
F.3.6.1.1	Protective earthing conductor terminal.....:		N/A
F.3.6.1.2	Protective bonding conductor terminals .....:		N/A
F.3.6.2	Equipment class marking..... :		N/A
F.3.6.3	Functional earthing terminal marking..... :		N/A
F.3.7	Equipment IP rating marking..... :	IPX0	N/A
F.3.8	External power supply output marking.....:		N/A
F.3.9	Durability, legibility and permanence of marking	All markings required are easily discernible under normal lighting conditions.	P

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Clause	Requirement + Test	Result - Remark	Verdict
F.3.10	Test for permanence of markings	After rubbing test by water and petroleum spirit, the marking still legible; it is not easily possible to remove the marking plate and show no curling.	P
F.4	**Instructions**		P
	a)..... Information prior to installation and initial use		P
	b)..... Equipment for use in locations where children not likely to be present		N/A
	c)..... Instructions for installation and interconnection		N/A
	d)..... Equipment intended for use only in restricted access area		N/A
	e)..... Equipment intended to be fastened in place		N/A
	f)..... Instructions for audio equipment terminals		N/A
	g)..... Protective earthing used as a safeguard		N/A
	h)..... Protective conductor current exceeding ES2 limits		N/A
	i)..... Graphic symbols used on equipment		P
	j)..... Permanently connected equipment not provided with all-pole mains switch		N/A
	k)..... Replaceable components or modules providing safeguard function		N/A
	l)..... Equipment containing insulating liquid		N/A
	m)..... Installation instructions for outdoor equipment		N/A
F.5	Instructional safeguards		P
G	**COMPONENTS**		-
G.1	**Switches**		N/A
G.1.1	General		N/A
G.1.2	Ratings, endurance, spacing, maximum load		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.1.3	Test method and compliance		N/A
G.2	**Relays**		N/A
G.2.1	Requirements		N/A
G.2.2	Overload test		N/A
G.2.3	Relay controlling connectors supplying power to other equipment		N/A
G.2.4	Test method and compliance		N/A
G.3	**Protective devices**		N/A
G.3.1	Thermal cut-offs		N/A
	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)		N/A
	Thermal cut-outs tested as part of the equipment as indicated in c)		N/A
G.3.1.2	Test method and compliance		N/A
G.3.2	Thermal links		N/A
G.3.2.1	a) Thermal links tested separately according to IEC 60691 with specifics		N/A
	b) Thermal links tested as part of the equipment		N/A
G.3.2.2	Test method and compliance		N/A
G.3.3	PTC thermistors		N/A
G.3.4	Overcurrent protection devices		N/A
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.4		N/A
G.3.5.1	Non-resettable devices suitably rated and marking provided		N/A
G.3.5.2	Single faults conditions.....:		N/A
G.4	**Connectors**		N/A
G.4.1	Spacings		N/A
G.4.2	Mains connector configuration.....:		N/A
G.4.3	Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely		N/A
G.5	**Wound components**		N/A
G.5.1	Wire insulation in wound components		N/A
G.5.1.2	Protection against mechanical stress		N/A
G.5.2	Endurance test		N/A
G.5.2.1	General test requirements		N/A
G.5.2.2	Heat run test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test time (days per cycle)..... :		—
	Test temperature (°C)..... :		—
G.5.2.3	Wound components supplied from the mains		N/A
G.5.2.4	No insulation breakdown		N/A
G.5.3	Transformers		N/A
G.5.3.1	Compliance method..... :		N/A
	Position.....:		N/A
	Method of protection..... :		N/A
G.5.3.2	Insulation		N/A
	Protection from displacement of windings.....:		—
G.5.3.3	Transformer overload tests		N/A
G.5.3.3.1	Test conditions		N/A
G.5.3.3.2	Winding temperatures		N/A
G.5.3.3.3	Winding temperatures - alternative test method		N/A
G.5.3.4	Transformers using FIW		N/A
G.5.3.4.1	General		N/A
	FIW wire nominal diameter..... :		—
G.5.3.4.2	Transformers with basic insulation only		N/A
G.5.3.4.3	Transformers with double insulation or reinforced insulation..... :		N/A
G.5.3.4.4	Transformers with FIW wound on metal or ferrite core		N/A
G.5.3.4.5	Thermal cycling test and compliance		N/A
G.5.3.4.6	Partial discharge test		N/A
G.5.3.4.7	Routine test		N/A
G.5.4	Motors		N/A
G.5.4.1	General requirements		N/A
G.5.4.2	Motor overload test conditions		N/A
G.5.4.3	Running overload test		N/A
G.5.4.4.2	Locked-rotor overload test		N/A
	Test duration (days) ..... :		—
G.5.4.5	Running overload test for DC motors		N/A
G.5.4.5.2	Tested in the unit		N/A
G.5.4.5.3	Alternative method		N/A
G.5.4.6	Locked-rotor overload test for DC motors		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.5.4.6.2	Tested in the unit		N/A
	Maximum Temperature ..... :		N/A
G.5.4.6.3	Alternative method		N/A
G.5.4.7	Motors with capacitors		N/A
G.5.4.8	Three-phase motors		N/A
G.5.4.9	Series motors		N/A
	Operating voltage ..... :		—
G.6	**Wire Insulation**		N/A
G.6.1	General		N/A
G.6.2	Enamelled winding wire insulation		N/A
G.7	**Mains supply cords**		N/A
G.7.1	General requirements		N/A
	Type..... :		—
G.7.2	Cross sectional area (mm^2 or AWG)..... :		N/A
G.7.3	Cord anchorages and strain relief for non-detachable power supply cords		N/A
G.7.3.2	Cord strain relief		N/A
G.7.3.2.1	Requirements		N/A
	Strain relief test force (N)..... :		N/A
G.7.3.2.2	Strain relief mechanism failure		N/A
G.7.3.2.3	Cord sheath or jacket position, distance (mm)..... :		N/A
G.7.3.2.4	Strain relief and cord anchorage material		N/A
G.7.4	Cord Entry		N/A
G.7.5	Non-detachable cord bend protection		N/A
G.7.5.1	Requirements		N/A
G.7.5.2	Test method and compliance		N/A
	Overall diameter or minor overall dimension, *D* (mm)..... :		—
	Radius of curvature after test (mm)..... :		—
G.7.6	Supply wiring space		N/A
G.7.6.1	General requirements		N/A
G.7.6.2	Stranded wire		N/A
G.7.6.2.1	Requirements		N/A
G.7.6.2.2	Test with 8 mm strand		N/A
G.8	**Varistors**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.8.1	General requirements		N/A
G.8.2	Safeguards against fire		N/A
G.8.2.1	General		N/A
G.8.2.2	Varistor overload test		N/A
G.8.2.3	Temporary overvoltage test		N/A
G.9	**Integrated circuit (IC) current limiters**		N/A
G.9.1	Requirements		N/A
	IC limiter output current (max. 5A)..... :		—
	Manufacturers' defined drift ..... :		—
G.9.2	Test Program		N/A
G.9.3	Compliance		N/A
G.10	**Resistors**		N/A
G.10.1	General		N/A
G.10.2	Conditioning		N/A
G.10.3	Resistor test		N/A
G.10.4	Voltage surge test		N/A
G.10.5	Impulse test		N/A
G.10.6	Overload test		N/A
G.11	**Capacitors and RC units**		N/A
G.11.1	General requirements		N/A
G.11.2	Conditioning of capacitors and RC units		N/A
G.11.3	Rules for selecting capacitors		N/A
G.12	**Optocouplers**		N/A
	Optocouplers comply with IEC 60747-5-5 with specifics		N/A
	Type test voltage $V_{ini,a}$..... :		—
	Routine test voltage, $V_{ini,b}$..... :		—
G.13	**Printed boards**		P
G.13.1	General requirements		P
G.13.2	Uncoated printed boards		P
G.13.3	Coated printed boards		N/A
G.13.4	Insulation between conductors on the same inner surface		N/A
G.13.5	Insulation between conductors on different surfaces		N/A
	Distance through insulation..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Number of insulation layers (pcs) ..... :		—
G.13.6	Tests on coated printed boards		N/A
G.13.6.1	Sample preparation and preliminary inspection		N/A
G.13.6.2	Test method and compliance		N/A
G.14	**Coating on components terminals**		N/A
G.14.1	Requirements .....:	(See Clause G.13)	N/A
G.15	**Pressurized liquid filled components**		N/A
G.15.1	Requirements		N/A
G.15.2	Test methods and compliance		N/A
G.15.2.1	Hydrostatic pressure test		N/A
G.15.2.2	Creep resistance test		N/A
G.15.2.3	Tubing and fittings compatibility test		N/A
G.15.2.4	Vibration test		N/A
G.15.2.5	Thermal cycling test		N/A
G.15.2.6	Force test		N/A
G.15.3	Compliance		N/A
G.16	**IC including capacitor discharge function (ICX)**		N/A
G.16.1	Condition for fault tested is not required		N/A
	ICX with associated circuitry tested in equipment		N/A
	ICX tested separately		N/A
G.16.2	Tests		N/A
	Smallest capacitance and smallest resistance specified by ICX manufacturer for impulse test..... :		—
	Mains voltage that impulses to be superimposed on .....:		—
	Largest capacitance and smallest resistance for ICX tested by itself for 10000 cycles test.....:		—
G.16.3	Capacitor discharge test.....:		N/A
H	**CRITERIA FOR TELEPHONE RINGING SIGNALS**		N/A
H.1	**General**		N/A
H.2	**Method A**		N/A
H.3	**Method B**		N/A
H.3.1	Ringing signal		N/A
H.3.1.1	Frequency (Hz) ..... :		—
H.3.1.2	Voltage (V) .....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
H.3.1.3	Cadence; time (s) and voltage (V) .....:		—
H.3.1.4	Single fault current (mA):.....:		—
H.3.2	Tripping device and monitoring voltage		N/A
H.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N/A
H.3.2.2	Tripping device		N/A
H.3.2.3	Monitoring voltage (V).....:		N/A
J	**INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION**		N/A
J.1	**General**		N/A
	Winding wire insulation.....:		—
	Solid round winding wire, diameter (mm)..... :		N/A
	Solid square and rectangular (flatwise bending) winding wire, cross-sectional area (mm^2).....:		N/A
J.2/J.3	Tests and Manufacturing	(See separate test report)	—
K	**SAFETY INTERLOCKS**		N/A
K.1	**General requirements**		N/A
	Instructional safeguard..... :		N/A
K.2	**Components of safety interlock safeguard mechanism**		N/A
K.3	**Inadvertent change of operating mode**		N/A
K.4	**Interlock safeguard override**		N/A
K.5	**Fail-safe**		N/A
K.5.1	Under single fault condition		N/A
K.6	**Mechanically operated safety interlocks**		N/A
K.6.1	Endurance requirement		N/A
K.6.2	Test method and compliance.....:		N/A
K.7	**Interlock circuit isolation**		N/A
K.7.1	Separation distance for contact gaps & interlock circuit elements		N/A
	In circuit connected to mains, separation distance for contact gaps (mm).....:		N/A
	In circuit isolated from mains, separation distance for contact gaps (mm).....:		N/A
	Electric strength test before and after the test of K.7.2.....:		N/A
K.7.2	Overload test, Current (A)..... :		N/A
K.7.3	Endurance test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
K.7.4	Electric strength test		N/A
L	**DISCONNECT DEVICES**		N/A
L.1	**General requirements**	Not directly connected to the mains	N/A
L.2	**Permanently connected equipment**		N/A
L.3	**Parts that remain energized**		N/A
L.4	**Single-phase equipment**		N/A
L.5	**Three-phase equipment**		N/A
L.6	**Switches as disconnect devices**		N/A
L.7	**Plugs as disconnect devices**		N/A
L.8	**Multiple power sources**		N/A
	Instructional safeguard..... :		N/A
M	**EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS**		P
M.1	**General requirements**		P
M.2	**Safety of batteries and their cells**		P
M.2.1	Batteries and their cells comply with relevant IEC standards..... :	IEC 62619	P
M.3	**Protection circuits for batteries provided within the equipment**		P
M.3.1	Requirements		P
M.3.2	Test method		P
	Overcharging of a rechargeable battery	(See appended table M.3)	P
	Excessive discharging	(See appended table M.3)	P
	Unintentional charging of a non-rechargeable battery		N/A
	Reverse charging of a rechargeable battery		N/A
M.3.3	Compliance	(See appended table M.3)	P
M.4	**Additional safeguards for equipment containing a portable secondary lithium battery**		P
M.4.1	General		P
M.4.2	Charging safeguards		P
M.4.2.1	Requirements		P
M.4.2.2	Compliance.....:	(See appended table M.4.2)	P
M.4.3	Fire enclosure.....:	Metal enclosure used	P
M.4.4	Drop test of equipment containing a secondary lithium battery		P
M.4.4.2	Preparation and procedure for the drop test		P

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Clause	Requirement + Test	Result - Remark	Verdict
M.4.4.3	Drop, Voltage on reference and dropped batteries (V); voltage difference during 24 h period (%): .....:	After test, the voltage difference less than 5% in the 24H	P
M.4.4.4	Check of the charge/discharge function		P
M.4.4.5	Charge / discharge cycle test		P
M.4.4.6	Compliance		P
M.5	**Risk of burn due to short-circuit during carrying**		N/A
M.5.1	Requirement		N/A
M.5.2	Test method and compliance		N/A
M.6	**Safeguards against short-circuits**		P
M.6.1	External and internal faults		P
M.6.2	Compliance	Has been conducted on the battery as part of compliance with IEC 62619.	P
M.7	**Risk of explosion from lead acid and NiCd batteries**		N/A
M.7.1	Ventilation preventing explosive gas concentration		N/A
	Calculated hydrogen generation rate..... :		N/A
M.7.2	Test method and compliance		N/A
	Minimum air flow rate, Q (m^3/h).....:		N/A
M.7.3	Ventilation tests		N/A
M.7.3.1	General		N/A
M.7.3.2	Ventilation test – alternative 1		N/A
	Hydrogen gas concentration (%).....:		N/A
M.7.3.3	Ventilation test – alternative 2		N/A
	Obtained hydrogen generation rate.....:		N/A
M.7.3.4	Ventilation test – alternative 3		N/A
	Hydrogen gas concentration (%).....:		N/A
M.7.4	Marking.....:		N/A
M.8	**Protection against internal ignition from external spark sources of batteries with aqueous electrolyte**		N/A
M.8.1	General		N/A
M.8.2	Test method		N/A
M.8.2.1	General		N/A
M.8.2.2	Estimation of hypothetical volume V_Z (m^3/s)..... :		—
M.8.2.3	Correction factors..... :		—
M.8.2.4	Calculation of distance d (mm) .....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
M.9	**Preventing electrolyte spillage**		N/A
M.9.1	Protection from electrolyte spillage		N/A
M.9.2	Tray for preventing electrolyte spillage		N/A
M.10	Instructions to prevent reasonably foreseeable misuse		P
	Instructional safeguard..... :	Stated in user manual.	P
N	**ELECTROCHEMICAL POTENTIALS**		N/A
	Material(s) used..... :		—
O	**MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES**		N/A
	Value of *X* (mm)..... :		—
P	**SAFEGUARDS AGAINST CONDUCTIVE OBJECTS**		N/A
P.1	**General**	No openings.	N/A
P.2	**Safeguards against entry or consequences of entry of a foreign object**		N/A
P.2.1	General		N/A
P.2.2	Safeguards against entry of a foreign object		N/A
	Location and Dimensions (mm) ..... :		—
P.2.3	Safeguards against the consequences of entry of a foreign object		N/A
P.2.3.1	Safeguard requirements		N/A
	The ES3 and PS3 keep-out volume in Figure P.3 not applicable to transportable equipment		N/A
	Transportable equipment with metalized plastic parts..... :		N/A
P.2.3.2	Consequence of entry test..... :		N/A
P.3	**Safeguards against spillage of internal liquids**		N/A
P.3.1	General		N/A
P.3.2	Determination of spillage consequences		N/A
P.3.3	Spillage safeguards		N/A
P.3.4	Compliance		N/A
P.4	**Metallized coatings and adhesives securing parts**		N/A
P.4.1	General		N/A
P.4.2	Tests		N/A
	Conditioning, T_C (°C)..... :		—
	Duration (weeks)..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
Q	**CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING**		N/A
Q.1	**Limited power sources**		N/A
Q.1.1	Requirements		N/A
	a) Inherently limited output		N/A
	b) Impedance limited output		N/A
	c) Regulating network limited output	(See appended table Q.1)	N/A
	d) Overcurrent protective device limited output		N/A
	e) IC current limiter complying with G.9		N/A
Q.1.2	Test method and compliance.....:	(See appended table Q.1)	N/A
	Current rating of overcurrent protective device (A) .....:		N/A
Q.2	**Test for external circuits – paired conductor cable**		N/A
	Maximum output current (A) ..... :		N/A
	Current limiting method.....:		—
R	**LIMITED SHORT CIRCUIT TEST**		N/A
R.1	**General**		N/A
R.2	**Test setup**		N/A
	Overcurrent protective device for test..... :		—
R.3	**Test method**		N/A
	Cord/cable used for test..... :		—
R.4	**Compliance**		N/A
S	**TESTS FOR RESISTANCE TO HEAT AND FIRE**		N/A
S.1	**Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W**		N/A
	Samples, material.....:		—
	Wall thickness (mm).....:		—
	Conditioning (°C)..... :		—
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	- Material not consumed completely		N/A
	- Material extinguishes within 30s		N/A
	- No burning of layer or wrapping tissue		N/A
S.2	**Flammability test for fire enclosure and fire barrier integrity**		N/A
	Samples, material.....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Wall thickness (mm)..... :		—
	Conditioning (°C)..... :		—
S.3	**Flammability test for the bottom of a fire enclosure**		N/A
S.3.1	Mounting of samples		N/A
S.3.2	Test method and compliance		N/A
	Mounting of samples ..... :		—
	Wall thickness (mm)..... :		—
S.4	**Flammability classification of materials**		N/A
S.5	**Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power exceeding 4 000 W**		N/A
	Samples, material..... :		—
	Wall thickness (mm)..... :		—
	Conditioning (°C)..... :		—
T	**MECHANICAL STRENGTH TESTS**		P
T.1	**General**		P
T.2	**Steady force test, 10 N ..... :**		N/A
T.3	**Steady force test, 30 N ..... :**		N/A
T.4	**Steady force test, 100 N ..... :**		N/A
T.5	**Steady force test, 250 N ..... :**	(See appended table T.5)	P
T.6	**Enclosure impact test**	(See appended table T.6)	P
	Fall test		P
	Swing test		N/A
T.7	**Drop test ..... :**		N/A
T.8	**Stress relief test..... :**		N/A
T.9	**Glass Impact Test..... :**		N/A
T.10	**Glass fragmentation test**		N/A
	Number of particles counted..... :		N/A
T.11	**Test for telescoping or rod antennas**		N/A
	Torque value (Nm) ..... :		N/A
U	**MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION**		N/A
U.1	**General**		N/A
	Instructional safeguard :		N/A
U.2	**Test method and compliance for non-intrinsically protected CRTs**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
U.3	**Protective screen**		N/A
V	**DETERMINATION OF ACCESSIBLE PARTS**		N/A
V.1	**Accessible parts of equipment**		N/A
V.1.1	General		N/A
V.1.2	Surfaces and openings tested with jointed test probes		N/A
V.1.3	Openings tested with straight unjointed test probes		N/A
V.1.4	Plugs, jacks, connectors tested with blunt probe		N/A
V.1.5	Slot openings tested with wedge probe		N/A
V.1.6	Terminals tested with rigid test wire		N/A
V.2	**Accessible part criterion**		N/A
X	**ALTERNATIVE METHOD FOR DETERMINING CLEARANCES FOR INSULATION IN CIRCUITS CONNECTED TO AN AC MAINS NOT EXCEEDING 420 V PEAK (300 V RMS)**		N/A
	Clearance.....:		N/A
Y	**CONSTRUCTION REQUIREMENTS FOR OUTDOOR ENCLOSURES**		N/A
Y.1	**General**		N/A
Y.2	**Resistance to UV radiation**		N/A
Y.3	**Resistance to corrosion**		N/A
Y.3	**Resistance to corrosion**		N/A
Y.3.1	Metallic parts of outdoor enclosures are resistant to effects of water-borne contaminants by.....:		N/A
Y.3.2	Test apparatus		N/A
Y.3.3	Water – saturated sulphur dioxide atmosphere		N/A
Y.3.4	Test procedure.....:		N/A
Y.3.5	Compliance		N/A
Y.4	**Gaskets**		N/A
Y.4.1	General		N/A
Y.4.2	Gasket tests		N/A
Y.4.3	Tensile strength and elongation tests		N/A
	Alternative test methods.....:		N/A
Y.4.4	Compression test		N/A
Y.4.5	Oil resistance		N/A
Y.4.6	Securing means		N/A
Y.5	**Protection of equipment within an outdoor enclosure**		N/A
Y.5.1	General		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
Y.5.2	Protection from moisture		N/A
	Relevant tests of IEC 60529 or Y.5.3..... :		N/A
Y.5.3	Water spray test		N/A
Y.5.4	Protection from plants and vermin		N/A
Y.5.5	Protection from excessive dust		N/A
Y.5.5.1	General		N/A
Y.5.5.2	IP5X equipment		N/A
Y.5.5.3	IP6X equipment		N/A
Y.6	**Mechanical strength of enclosures**		N/A
Y.6.1	General		N/A
Y.6.2	Impact test..... :		N/A

EN 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.2	TABLE: Classification of electrical energy sources						P
Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters				ES Class
			U (V)	I (mA)	Type[1)]	Additional Info [2)]	
48V	DC input	Normal	48VDC	--	SS	--	ES1
		Abnormal – see table B.3, B.4 for detail	48VDC	--	SS	--	
		Single fault – see table B.3, B.4 for detail	48VDC	--	SS	--	
54.75V	Full battery	Normal	54.75V DC	--	SS	--	ES1
		Abnormal – see table B.3, B.4 for detail	54.75V DC	--	SS	--	
		Single fault – see table B.3, B.4 for detail	54.75V DC	--	SS	--	
Supplementary information: 1) Type: Steady state (SS), Capacitance (CP), Single pulse (SP), Repetitive pulses (RP), etc. 2) Additional Info: Frequency, Pulse duration, Pulse off time, Capacitance value, etc.							

5.4.1.8	TABLE: Working voltage measurement				N/A
Location	RMS voltage (V)	Peak voltage (V)	Frequency (Hz)	Comments	
--	--	--	--	--	
Supplementary information:					

5.4.1.10.2	TABLE: Vicat softening temperature of thermoplastics			N/A
Method..... :		ISO 306 / B50		—
Object/ Part No./Material	Manufacturer/trademark	Thickness (mm)	T softening (°C)	
--	--	--	--	
Supplementary information:				

5.4.1.10.3	TABLE: Ball pressure test of thermoplastics				N/A
Allowed impression diameter (mm)..... :		≤ 2 mm			—
Object/Part No./Material	Manufacturer/trademark	Thickness (mm)	Test temperature (°C)	Impression diameter (mm)	

EN 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
--	--	--	--
Supplementary information:			

5.4.2, 5.4.3	TABLE: Minimum Clearances/Creepage distance							N/A
Clearance (cl) and creepage distance (cr) at/of/between:	U_p (V)	U_{rms} (V)	Freq [1] (Hz)	Required cl (mm)	cl (mm)	E.S. [2] (V)	Required cr (mm)	cr (mm)
--	--	--	--	--	--	--	--	--
Supplementary information: 1) Only for frequency above 30 kHz 2) Complete Electric Strength voltage (E.S. (V) when 5.4.2.4 applied)								

5.4.4.2	TABLE: Minimum distance through insulation			N/A
Distance through insulation (DTI) at/of	Peak voltage (V)	Insulation	Required DTI (mm)	Measured DTI (mm)
--	--	--	--	--
Supplementary information:				

5.4.4.9	TABLE: Solid insulation at frequencies >30 kHz						N/A
Insulation material	E_P	Frequency (kHz)	K_R	Thickness d (mm)	Insulation	V_{PW} (Vpk)	
--	--	--	--	--	--	--	
Supplementary information:							

5.4.9	TABLE: Electric strength tests			N/A
Test voltage applied between:	Voltage shape (Surge, Impulse, AC, DC, etc.)	Test voltage (V)	Breakdown Yes / No	
--	--	--	--	
Supplementary information:				

5.5.2.2	TABLE: Stored discharge on capacitors					N/A
Location	Supply voltage (V)	Operating and fault condition [1]	Switch position	Measured voltage (Vpk)	ES Class	
--	--	--	--	--	--	
Supplementary information:						

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Clause	Requirement + Test	Result - Remark	Verdict

X-capacitors installed for testing:
☐ bleeding resistor rating:
☐ ICX:
1) Normal operating condition (e.g., normal operation, or open fuse), SC= short circuit, OC= open circuit

5.6.6	TABLE: Resistance of protective conductors and terminations				N/A
Location		Test current (A)	Duration (min)	Voltage drop (V)	Resistance (Ω)
--		--	--	--	--
Supplementary information:					

5.7.4	TABLE: Unearthed accessible parts					N/A
Location	Operating and fault conditions	Supply Voltage (V)	Parameters			ES class
			Voltage (V_{rms} or V_{pk})	Current (A_{rms} or A_{pk})	Freq. (Hz)	
--	--	--	--	--	--	--
Supplementary information: Abbreviation: SC= short circuit; OC= open circuit						

5.7.5	TABLE: Earthed accessible conductive part			N/A
Supply voltage (V)..... :				—
Phase(s) ..... :	[ ] Single Phase; [ ] Three Phase: [ ] Delta [ ] Wye			—
Power Distribution System ..... :	☐ TN ☐ TT ☐ IT			—
Location	Fault Condition No in IEC 60990 clause 6.2.2	Touch current (mA)	Comment	
--	--	--	--	
Supplementary Information:				

5.8	TABLE: Backfeed safeguard in battery backed up supplies					N/A
Location	Supply voltage (V)	Operating and fault condition	Time (s)	Open-circuit voltage (V)	Touch current (A)	ES Class
--	--	--	--	--	--	--
Supplementary information: Abbreviation: SC= short circuit, OC= open circuit						

6.2.2	TABLE: Power source circuit classifications	P

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Clause	Requirement + Test	Result - Remark	Verdict

Location	Operating and fault condition	Voltage (V)	Current (A)	Max. Power[1)] (W)	Time (S)	PS class
Output	Normal operation	45.6	28.4	1295	5	PS3
Output	L3, SC	45.6	28.4	1295	5	PS3
Battery	Normal operation	38.2	83.3	3182	5	PS3

Supplementary information:
Abbreviation: SC= short circuit; OC= open circuit
1) Measured after 3 s for PS1 and measured after 5 s for PS2 and PS3.

6.2.3.1	**TABLE: Determination of Arcing PIS**	N/A

Location	Open circuit voltage after 3 s (Vpk)	Measured r.m.s current (A)	Calculated value	Arcing PIS? Yes / No
--	--	--	--	--

Supplementary information:

6.2.3.2	**TABLE: Determination of resistive PIS**	P

Location	Operating and fault condition	Dissipate power (W)	Resistive PIS? Yes / No
All circuits	--	--	Yes

Supplementary information:
Abbreviation: SC= short circuit; OC= open circuit

8.5.5	**TABLE: High pressure lamp**	N/A

Lamp manufacturer	Lamp type	Explosion method	Longest axis of glass particle (mm)	Particle found beyond 1 m Yes / No
--	--	--	--	--

Supplementary information:

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Clause	Requirement + Test	Result - Remark	Verdict

9.6	TABLE: Temperature measurements for wireless power transmitters								N/A
Supply voltage (V)..... :									—
Max. transmit power of transmitter (W)..... :									—
Foreign objects	w/o receiver and direct contact		with receiver and direct contact		with receiver and at distance of 2 mm		with receiver and at distance of 5 mm		
	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	
Steel disc									
Aluminium ring									
Aluminium foil									
Supplementary information:									

5.4.1.4, 9.3, B.1.5, B.2.6	TABLE: Temperature measurements					P
Supply voltage (V) :	48V charge	54.75V discharge	--	--		—
Ambient temperature during test Tamb (°C) :	55.0	55.0	--	--		—
Maximum measured temperature T of part/at:	T (°C)					Allowed T_{max} (°C)
DC inlet	74.7	64.6	--	--		120
Internal wire	102.7	98.5	--	--		200
EC4 body	102.5	89.4	--	--		105
PCB near U4	108.6	98.2	--	--		130
PCB near U1	107.4	97.3	--	--		130
PCB near U3	117.3	106.4	--	--		130
EC5 body	107.8	96.7	--	--		105
Battery	63.4	53.5	--	--		--
Ambient	55.0	55.0	--	--		--
Metal enclosure	38.4	38.6	--	--		60
Handle	25.3	25.3	--	--		60
Ambient	25.0	25.0	--	--		--

Temperature T of winding:	t_1 (°C)	R_1 (Ω)	t_2 (°C)	R_2 (Ω)	T (°C)	Allowed T_{max} (°C)	Insulation class
--	--	--	--	--	--	--	--
Supplementary information:							

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Clause	Requirement + Test	Result - Remark	Verdict

B.2.5	TABLE: Input test							P
U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status
48dc	--	26.72	25	1282.56	1200	--	--	Charge with empty battery
54.75 dc	--	25.3	25	1214.4	--	--	--	Discharge with full battery
Supplementary information:								

B.3, B.4	TABLE: Abnormal operating and fault condition tests						P
Ambient temperature T_{amb} (°C)..... :					25°C if not specified		—
Power source for EUT: Manufacturer, model/type, outputrating... :					--		—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation	
Battery	Over-Charging	48V	7hrs	--	--	Unit working as normal. No high temperature, no fire, no explosion, no leaks, no hazard.	
Battery	Over-Discharging	54.75V	7hrs	--	--	Unit working as normal. No high temperature, no fire, no explosion, no leaks, no hazard.	
D1	S-C	48V	30mins	-	-	Unit normal operation, no hazard.	
EC4	S-C	48V	30mins	-	-	Unit shutdown immediately and recoverable, no hazard.	
Supplementary information: Test table is provided to record abnormal and fault conditions for all applicable energy sources including Thermal burn injury. Column “Abnormal/Fault.” Specify if test condition by indicating “Abnormal” then the condition for a Clause B.3 test or “Single Fault” then the condition for Clause B.4. If the Abnormal/Fault test need do temperature test, the Record rise see Table 2.							

M.3	TABLE: Protection circuits for batteries provided within the equipment		P
Is it possible to install the battery in a reverse polarity position?.....		No	—
Equipment Specification	Charging		
	Voltage (V)	Current (A)	
	48	25	
Manufacturer/type	Battery specification		
	Non-rechargeable batteries	Rechargeable batteries	

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Clause	Requirement + Test	Result - Remark	Verdict

	Discharging current (A)	Unintentional charging current (A)	Charging		Discharging current (A)	Reverse charging current (A)
			Voltage (V)	Current (A)		
Normal condition	--	--	54.75	40	40	--
Note: The tests of M.3.2 are applicable only when above appropriate data is not available.						
Specified battery temperature (°C).....			Charger: 0~55 Discharger: -20~60			

Component No.	Fault condition	Charge / discharge mode	Test time	Temp. (°C)	Current (A)	Voltage (V)	Observation
Battery	Overcharge	Charge mode	7h	38.4 (Ambient: 25.0°C)	26.72	54	The voltage not exceed 54.75V, current not exceed 40A. Temperature of cell no over the maximum specified temperature. No explosion, no fire, no leakage
Battery	Over-discharge	Discharge mode	7h	38.5 (Ambient: 25.0°C)	25.3	54	The voltage not exceed 54.75V, current not exceed 40A. Temperature of cell no over the maximum specified temperature. No explosion, no fire, no leakage

Supplementary information:

Abbreviation: SC= short circuit; OC= open circuit; NL= no chemical leakage; NS= no spillage of liquid; NE= no explosion; NF= no emission of flame or expulsion of molten metal.

M.4.2	**TABLE: Charging safeguards for equipment containing a secondary lithium battery**	**P**
Maximum specified charging voltage (V)..... :	54.75	—
Maximum specified charging current (A) .....:	40	—
Highest specified charging temperature (°C) .....:	55	—
Lowest specified charging temperature (°C) .....:	0	—

Battery manufacturer/type	Operating and fault condition	Measurement			Observation
		Charging voltage (V)	Charging current (A)	Temp. (°C)	
Battery	Normal charge mode	54.75	0.124	0	The voltage not exceed 54.75V, current not exceed 40A. The cell charge rate

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Clause	Requirement + Test			Result - Remark	Verdict
					drop to 0.124A when the cell's temperature at 0°C. No explosion, no fire, no leakage
Battery	Normal charge mode	54.75	0	55	The voltage not exceed 54.75V, current not exceed 40A. The cell stop charge when the cell's temperature at 55°C. No explosion, no fire, no leakage
Supplementary information: Abbreviation: SC= short circuit; OC= open circuit; MSCV= maximum specified charging voltage; MSCC= maximum specified charging current; HSCT= highest specified charging temperature; LSCT= lowest specified charging temperature.					

Q.1	TABLE: Circuits intended for interconnection with building wiring (LPS)							N/A
Output Circuit	Condition	U_{oc} (V)	Time (s)	I_{sc} (A)		S (VA)		
				Meas.	Limit	Meas.	Limit	
Supplementary information: Abbreviation: SC= short circuit; OC= open circuit;								

T.2, T.3, T.4, T.5	TABLE: Steady force test					P
Part/Location	Material	Thickness (mm)	Probe	Force (N)	Test Duration (s)	Observation
Enclosure, top, side, bottom	Metal enclosure	--	--	250	5	No hazard
Supplementary information: --						

T.6, T.9	TABLE: Impact test			P
Location/part	Material	Thickness (mm)	Height (mm)	Observation
Enclosure, top, side, bottom	Metal enclosure	--	--	No hazard
Supplementary information:				

T.7	TABLE: Drop test			N/A
Location/part	Material	Thickness	Height	Observation

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Clause	Requirement + Test	Result - Remark	Verdict

		(mm)	(mm)	
Enclosure, top, side, bottom	Plastic enclosure	--	--	No hazard
Supplementary information: --				

T.8	TABLE: Stress relief test				N/A
Location/Part	Material	Thickness (mm)	Oven Temperature (°C)	Duration (h)	Observation
Supplementary information: --					

X	TABLE: Alternative method for determining minimum clearances distances		N/A
Clearance distanced between:	Peak of working voltage (V)	Required cl (mm)	Measured cl (mm)
--	--	--	--
Supplementary information:			

4.1.2	TABLE: Critical components information				P
Object / part No.	Manufacturer / trademark	Type / model	Technical data	Standard	Mark(s) of conformity[1)]
DC terminal	SABIC INNOVATIVE PLASTICS L L C	940(f1)	PC, V-1, 120°C, min. thickness 1.5mm	UL 94	UL E121562
PCB	SHANDONG JINBAO ELECTRONICS CO LTD	ZD-68(G)F	V-0, 130°C	UL 94 UL 796	UL E311922
(Alternative)	Interchangeable	Interchangeable	V-0 or better,130°C	VUL 94 UL 796	UL
Internal wire	DONGGUAN ZHONGZHEN ENERGY TECHNOLOGY CO.,LTD	3512	VW-1, 200°C, Min.28AWG, 600Vac	UL758	UL E355578
Internal wire	SHENZHEN MYSUN INSULATION MATERIALS CO LTD	3512	VW-1, 200°C, Min.28AWG, 600Vac	UL758	UL E239689

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Clause	Requirement + Test	Result - Remark	Verdict

NTC	Shenzhen Fuwen sense technology Co., Ltd	MF52B	100KΩ at 25°C, 120°C	EN IEC 62368-1	Test with appliance
Battery	Zendure Technology Co., Limited	78130198 20Ah	3.2Vdc, 20Ah, 64Wh	IEC 62619-2:2022	JPTUV-150825

Supplementary information:

1) Provided evidence ensures the agreed level of compliance. See OD-2039.

2) Description line content is optional. Main line description needs to clearly detail the component used for testing.

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Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT 1 TO TEST REPORT

IEC 62368-1

EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

(AUDIO/VIDEO, INFORMATION AND COMMUNICATION TECHNOLOGY EQUIPMENT - PART 1: SAFETY REQUIREMENTS)

Differences according to.....: EN IEC 62368-1:2020+A11:2020

Attachment Form No..... : EU_GD_IEC62368_1E

Attachment Originator.....: UL(Demko)

Master Attachment.....: 2021-02-04

	CENELEC COMMON MODIFICATIONS (EN)		--
	Clause numbers in the cells that are shaded light grey are clause references in EN IEC 62368-1:2020+A11:2020. All other clause numbers in that column, except for those in the paragraph below, refers to IEC 62368-1:2018. Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2018 are prefixed "Z".		--
	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZC (informative) A-deviations Annex ZD (informative) IEC and CENELEC code designations for flexible cords		--
1	**Modification to Clause 3.**		—
3.3.19	**Sound exposure** *Replace 3.3.19 of IEC 62368-1 with the following definitions:*		N/A
3.3.19.1	**momentary exposure level, MEL** metric for estimating 1 s sound exposure level from the HD 483-1 S2 test signal applied to both channels, based on EN 50332-1:2013, 4.2. Note 1 to entry: MEL is measured as A-weighted levels in dB. Note 2 to entry: See B.3 of EN 50332-3:2017 for additional information.		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
3.3.19.3	**sound exposure, *E*** A-weighted sound pressure (p) squared and integrated over a stated period of time, T Note 1 to entry: The SI unit is Pa^2 s. $E = \int_0^T p(t)^2 \, dt$		N/A
3.3.19.4	**sound exposure level, *SEL*** logarithmic measure of sound exposure relative to a reference value, E_0, typically the 1 kHz threshold of hearing in humans. Note 1 to entry: *SEL* is measured as A-weighted levels in dB. $SEL = 10 \lg\left(\frac{E}{E_0}\right)$ dB Note 2 to entry: See B.4 of EN 50332-3:2017 for additional information.		N/A
3.3.19.5	**digital signal level relative to full scale, dBFS** levels reported in dBFS are always r.m.s. Full scale level, 0 dBFS, is the level of a dc-free 997- Hz sine wave whose undithered positive peak value is positive digital full scale, leaving the code corresponding to negative digital full scale unused Note 1 to entry: It is invalid to use dBFS for non-r.m.s. levels. Because the definition of full scale is based on a sine wave, the level of signals with a crest factor lower than that of a sine wave may exceed 0 dBFS. In particular, square wave signals may reach +3,01 dBFS.		N/A
2	**Modification to Clause 10**		—
10.6	**Safeguards against acoustic energy sources** Replace 10.6 of IEC 62368-1 with the following:		N/A
10.6.1.1	**Introduction** **Safeguard** requirements for protection against long-term exposure to excessive sound pressure levels from personal music players closely coupled to the ear are specified below. Requirements for earphones and headphones intended for use with personal music players are also covered. A personal music player is a portable equipment		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	intended for use by an **ordinary person**, that: – is designed to allow the user to listen to audio or audiovisual content / material; and – uses a listening device, such as headphones or earphones that can be worn in or on or around the ears; and – has a player that can be body worn (of a size suitable to be carried in a clothing pocket) and is intended for the user to walk around with while in continuous use (for example, on a street, in a subway, at an airport, etc.). EXAMPLES Portable CD players, MP3 audio players, mobile phones with MP3 type features, PDAs or similar equipment. Personal music players shall comply with the requirements of either 10.6.2 or 10.6.3. NOTE 1 Protection against acoustic energy sources from telecom applications is referenced to ITU-T P.360. NOTE 2 It is the intention of the Committee to allow the alternative methods for now, but to only use the dose measurement method as given in 10.6.5 in future. Therefore, manufacturers are encouraged to implement 10.6.5 as soon as possible. Listening devices sold separately shall comply with the requirements of 10.6.6. These requirements are valid for music or video mode only. The requirements do not apply to: – professional equipment; NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment. – hearing aid equipment and other devices for assistive listening; – the following type of analogue personal music players: • long distance radio receiver (for example, a multiband radio receiver or world band radio receiver, an AM radio receiver), and • cassette player/recorder; NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies. – a player while connected to an external amplifier that does not allow the user to walk around while in use.		

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Clause	Requirement + Test	Result - Remark	Verdict
	For equipment that is clearly designed or intended primarily for use by children, the limits of the relevant toy standards may apply. The relevant requirements are given in EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply.		
10.6.1.2	**Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz** The amount of non-ionizing radiation is regulated by European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz). For intentional radiators, ICNIRP guidelines should be taken into account for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). For hand-held and body mounted devices, attention is drawn to EN 50360 and EN 50566.		N/A
10.6.2	**Classification of devices without the capacity to estimate sound dose**		N/A
10.6.2.1	**General** This standard is transitioning from short-term based (30 s) requirements to long-term based (40 hour) requirements. These clauses remain in effect only for devices that do not comply with sound dose estimation as stipulated in EN 50332-3. For classifying the acoustic output $L_{Aeq,T}$, measurements are based on the A-weighted equivalent sound pressure level over a 30 s period. For music where the average sound pressure (long term $L_{Aeq,T}$) measured over the duration of the song is lower than the average produced by the programme simulation noise, measurements may be done over the duration of the complete song. In this case, T becomes the duration of the song. NOTE Classical music, acoustic music and broadcast typically has an average sound pressure (long term $L_{Aeq,T}$) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the content and compare it with the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song does not exceed the required limit. For example, if the player is set with the programme simulation noise to 85 dB, but the average music level of the song is only 65 dB, there is no need to give a warning or ask an acknowledgement as long as the average sound		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	level of the song is not above the basic limit of 85 dB.		
10.6.2.2	**RS1 limits (to be superseded, see 10.6.3.2)** RS1 is a class 1 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 85 dB when playing the fixed "programme simulation noise" described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 27 mV (analogue interface) or -25 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1. – The RS1 limits will be updated for all devices as per 10.6.3.2.		N/A
10.6.2.3	**RS2 limits (to be superseded, see 10.6.3.3)** RS2 is a class 2 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or when the combination of player and listening device is known by other means such as setting or automatic 130 detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 100 dB(A) when playing the fixed "programme simulation noise" as described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 150 mV (analogue interface) or -10 dBFS (digital interface) when playing the fixed "programme simulation noise" as described in EN 50332-1.		N/A
10.6.2.4	**RS3 limits** RS3 is a class 3 acoustic energy source that exceeds RS2 limits.		N/A
10.6.3	**Classification of devices (new)**		N/A
10.6.3.1	**General** Previous limits (10.6.2) created abundant false negative and false positive PMP sound level warnings. New limits, compliant with The		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Commission Decision of 23 June 2009, are given below.		
10.6.3.2	**RS1 limits (new)** RS1 is a class 1 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 80 dB when playing the fixed "programme simulation noise" described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1.		N/A
10.6.3.3	**RS2 limits (new)** RS2 is a class 2 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the weekly sound exposure level, as described in EN 50332-3, shall be ≤ 80 dB when playing the fixed "programme simulation noise" described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output level, integrated over one week, as described in EN50332-3, shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1.		N/A
10.6.4	**Requirements for maximum sound exposure**		N/A
10.6.4.1	**Measurement methods** All volume controls shall be turned to maximum during tests. Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable.		N/A
10.6.4.2	**Protection of persons**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Except as given below, protection requirements for parts **accessible** to **ordinary persons**, **instructed persons** and **skilled persons** are given in 4.3. NOTE 1 Volume control is not considered a **safeguard.** Between RS2 and an **ordinary person**, the **basic safeguard** may be replaced by an **instructional safeguard** in accordance with Clause F.5, except that the **instructional safeguard** shall be placed on the equipment, or on the packaging, or in the instruction manual. Alternatively, the **instructional safeguard** may be given through the equipment display during use. The elements of the **instructional safeguard** shall be as follows: – element 1a: the symbol  , IEC 60417-6044 (2011-01) – element 2: “High sound pressure” or equivalent wording – element 3: “Hearing damage risk” or equivalent wording – element 4: “Do not listen at high volume levels for long periods.” or equivalent wording An **equipment safeguard** shall prevent exposure of an **ordinary person** to an RS2 source without intentional physical action from the **ordinary person** and shall automatically return to an output level not exceeding what is specified for an RS1 source when the power is switched off. The equipment shall provide a means to actively inform the user of the increased sound level when the equipment is operated with an output exceeding RS1. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an output exceeding RS1. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time. NOTE 2 Examples of means include visual or audible signals. Action from the user is always needed. NOTE 3 The 20 h listening time is the accumulative listening time, independent of how often and how long the personal music player has been switched off. A **skilled person** shall not be unintentionally exposed to RS3.		
10.6.5	**Requirements for dose-based systems**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
10.6.5.1	**General requirements** Personal music players shall give the warnings as provided below when tested according to EN 50332-3, using the limits from this clause. The manufacturer may offer optional settings to allow the users to modify when and how they wish to receive the notifications and warnings to promote a better user experience without defeating the safeguards. This allows the users to be informed in a method that best meets their physical capabilities and device usage needs. If such optional settings are offered, an administrator (for example, parental restrictions, business/educational administrators, etc.) shall be able to lock any optional settings into a specific configuration. The personal music player shall be supplied with easy to understand explanation to the user of the dose management system, the risks involved, and how to use the system safely. The user shall be made aware that other sources may significantly contribute to their sound exposure, for example work, transportation, concerts, clubs, cinema, car races, etc.		N/A
10.6.5.2	**Dose-based warning and requirements** When a dose of 100 % *CSD* is reached, and at least at every 100 % further increase of *CSD*, the device shall warn the user and require an acknowledgement. In case the user does not acknowledge, the output level shall automatically decrease to compliance with class RS1. The warning shall at least clearly indicate that listening above 100 % *CSD* leads to the risk of hearing damage or loss.		N/A
10.6.5.3	**Exposure-based requirements** With only dose-based requirements, cause and effect could be far separated in time, defying the purpose of educating users about safe listening practice. In addition to dose-based requirements, a PMP shall therefore also put a limit to the short-term sound level a user can listen at. The exposure-based limiter (EL) shall automatically reduce the sound level not to exceed 100 dB(A) or 150 mV integrated over the past 180 s, based on methodology defined in EN 50332-3. The EL settling time (time from starting level reduction to reaching target output) shall be 10		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	s or faster. Test of EL functionality is conducted according to EN 50332-3, using the limits from this clause. For equipment provided as a package (player with its listening device), the level integrated over 180 s shall be 100 dB or lower. For equipment provided with a standardized connector, the unweighted level integrated over 180 s shall be no more than 150 mV for an analogue interface and no more than -10 dBFS for a digital interface. NOTE In case the source is known not to be music (or test signal), the EL may be disabled.		
10.6.6	**Requirements for listening devices (headphones, earphones, etc.)**		N/A
10.6.6.1	**Corded listening devices with analogue input** With 94 dB L_{Aeq} acoustic pressure output of the listening device, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the input voltage of the listening device when playing the fixed "programme simulation noise" as described in EN 50332-1 shall be ≥ 75 mV. NOTE The values of 94 dB and 75 mV correspond with 85 dB and 27 mV or 100 dB and 150 mV.		N/A
10.6.6.2	**Corded listening devices with digital input** With any playing device playing the fixed "programme simulation noise" described in EN 50332-1, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the $L_{Aeq,T}$ acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS.		N/A
10.6.6.3	**Cordless listening devices** In cordless mode, – with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and – respecting the cordless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and – with volume and sound settings in the receiving device (for example, built-in volume level control, additional sound features like		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the above mentioned programme simulation noise, the $L_{Aeq,T}$ acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS.		
10.6.6.4	**Measurement method** *Measurements shall be made in accordance with EN 50332-2 as applicable.*		N/A
3	**Modification to the whole document**		—
	Delete all the "country" notes in the reference document according to the following list:		N/A

0.2.1	Note 1 and 2	1	Note 4 and 5	3.3.8.1	Note 2
3.3.8.3	Note 1	4.1.15	Note	4.7.3	Note 1 and 2
5.2.2.2	Note	5.4.2.3.2.2 Table 12	Note c	5.4.2.3.2.4	Note 1 and 3
5.4.2.3.2.4 Table 13	Note 2	5.4.2.5	Note 2	5.4.5.1	Note
5.4.10.2.1	Note	5.4.10.2.2	Note	5.4.10.2.3	Note
5.5.2.1	Note	5.5.6	Note	5.6.4.2.1	Note 2 and 3 and 4
5.6.8	Note 2	5.7.6	Note	5.7.7.1	Note 1 and Note 2
8.5.4.2.3	Note	10.2.1 Table 39	Note 3 and 4 and 5	10.5.3	Note 2
~~10.6.1~~	Note 3	F.3.3.6	Note 3	Y.4.1	Note
Y.4.5	Note				

4	**Modification to Clause 1**		—
1	***Add** the following note:* *NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU.*		P

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Clause	Requirement + Test	Result - Remark	Verdict
5	**Modification to 4.Z1**		—
4.Z1	***Add*** *the following new subclause after 4.9:* To protect against excessive current, short-circuits and earth faults in circuits connected to an a.c. **mains**, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c): a) except as detailed in b) and c), protective devices necessary to comply with the requirements of B.3.1 and B.4 shall be included as parts of the equipment; b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation; c) it is permitted for **pluggable equipment type B** or **permanently connected equipment**, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions. If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for **pluggable equipment type A** the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.		N/A
6	**Modification to 5.4.2.3.2.4**		—
5.4.2.3.2.4	***Add*** *the following to the end of this subclause:* The requirement for interconnection with **external circuit** is in addition given in EN 50491-3:2009.		N/A
7	**Modification to 10.2.1**		—
10.2.1	Add the following to [c] and [d] in table 39: For additional requirements, see 10.5.1.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

8	**Modification to 10.5.1**		—
10.5.1	***Add** the following after the first paragraph:* For RS 1 compliance is checked by measurement under the following conditions: In addition to the normal operating conditions, all controls adjustable from the outside by hand, by any object such as a tool or a coin, and those internal adjustments or pre-sets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made. NOTE Z1 Soldered joints and paint lockings are examples of adequate locking. The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm^2, at any point 10 cm from the outer surface of the apparatus. Moreover, the measurement shall be made under fault conditions causing an increase of the high voltage, provided an intelligible picture is maintained for 1 h, at the end of which the measurement is made. For RS1, the dose-rate shall not exceed 1 µSv/h taking account of the background level. NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996.		N/A
9	**Modification to G.7.1**		—
G.7.1	***Add** the following note:* NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD.		N/A

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10	**Modification to Bibliography**		—
	Add the following notes for the standards indicated: IEC 60130-9 NOTE Harmonized as EN 60130-9. IEC 60269-2 NOTE Harmonized as HD 60269-2. IEC 60309-1 NOTE Harmonized as EN 60309-1. IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series. IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4. IEC 60664-5 NOTE Harmonized as EN 60664-5. IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified). IEC 61508-1 NOTE Harmonized as EN 61508-1. IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1. IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4. IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6. IEC 61643-1 NOTE Harmonized as EN 61643-1. IEC 61643-21 NOTE Harmonized as EN 61643-21. IEC 61643-311 NOTE Harmonized as EN 61643-311. IEC 61643-321 NOTE Harmonized as EN 61643-321. IEC 61643-331 NOTE Harmonized as EN 61643-331.		N/A
11	**ADDITION OF ANNEXES**		—
ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		N/A
4.1.15	**Denmark, Finland, Norway** and **Sweden** To the end of the subclause the following is added: **Class I pluggable equipment type A** intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and **accessible** parts, have a marking stating that the equipment shall be connected to an earthed **mains** socket-outlet. The marking text in the applicable countries shall be as follows: In **Denmark**: “Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord.” In **Finland**: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan" In **Norway**: “Apparatet må tilkoples jordet stikkontakt” In **Sweden**: “Apparaten skall anslutas till jordat uttag”		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
4.7.3	**United Kingdom** To the end of the subclause the following is added: The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex		N/A
5.2.2.2	**Denmark** After the 2nd paragraph add the following: A warning (marking safeguard) for high touch current is required if the touch current exceeds the limits of 3,5 mA a.c. or 10 mA d.c.		N/A
5.4.11.1 and Annex G	**Finland and Sweden** To the end of the subclause the following is added: For separation of the telecommunication network from earth the following is applicable: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either • two layers of thin sheet material, each of which shall pass the electric strength test below, or • one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that clearances and creepage distances do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition • passes the tests and inspection criteria of 5.4.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 5.4.9 shall be performed using 1,5 kV), and • is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5 kV. It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2. A capacitor classified Y3 according to EN 60384-		N/A

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	14:2005, may bridge this insulation under the following conditions: • the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.11; • the additional testing shall be performed on all the test specimens as described in EN 60384-14; the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.		
5.5.2.1	**Norway** After the 3rd paragraph the following is added: Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V).		N/A
5.5.6	**Finland, Norway** and **Sweden** To the end of the subclause the following is added: Resistors used as **basic safeguard** or bridging **basic insulation** in **class I pluggable equipment type A** shall comply with G.10.1 and the test of G.10.2.		N/A
5.6.1	**Denmark** **Add** to the end of the subclause Due to many existing installations where the socket-outlets can be protected with fuses with higher rating than the rating of the socket-outlets the protection for pluggable equipment type A shall be an integral part of the equipment. *Justification:* In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse.		N/A
5.6.4.2.1	**Ireland and United Kingdom** After the indent for **pluggable equipment type A**, the following is added: – the **protective current rating** is taken to be 13 A, this being the largest rating of fuse used in the **mains** plug.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.6.4.2.1	**France** After the indent for **pluggable equipment type A**, the following is added: – in certain cases, the **protective current rating** of the circuit supplied from the mains is taken as 20 A instead of 16 A.		N/A
5.6.5.1	To the second paragraph the following is added: The range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current over 10 A and up to and including 13 A is: 1,25 mm^2 to 1,5 mm^2 in cross-sectional area.		N/A
5.6.8	**Norway** To the end of the subclause the following is added: Equipment connected with an earthed mains plug is classified as **class I equipment**. See the Norway marking requirement in 4.1.15. The symbol IEC 60417-6092, as specified in F.3.6.2, is accepted.		N/A
5.7.6	**Denmark** To the end of the subclause the following is added: The installation instruction shall be affixed to the equipment if the **protective conductor current** exceeds the limits of 3,5 mA a.c. or 10 mA d.c.		N/A
5.7.6.2	**Denmark** To the end of the subclause the following is added: The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA.		N/A
5.7.7.1	**Norway and Sweden** To the end of the subclause the following is added: The screen of the television distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system. It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by a retailer, for example. The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in: “Apparatus connected to the protective earthing of the building installation through the mains		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	connection or through other apparatus with a connection to protective earthing – and to a television distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a television distribution system therefore has to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)" NOTE In Norway, due to regulation for CATV-installations, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min. Translation to Norwegian (the Swedish text will also be accepted in Norway): "Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av apparater til kabel-TV nett installeres en galvanisk isolator mellom apparatet og kabel-TV nettet." Translation to Swedish: "Apparater som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av apparaten till kabel-TV nät galvanisk isolator finnas mellan apparaten och kabel-TV nätet.".		
8.5.4.2.3	**United Kingdom** Add the following after the 2nd dash bullet in 3rd paragraph: An emergency stop system complying with the requirements of IEC 60204-1 and ISO 13850 is required where there is a risk of personal injury.		N/A
B.3.1 and B.4	**Ireland and United Kingdom** The following is applicable: To protect against excessive currents and short-circuits in the primary circuit of direct plug-in equipment, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the direct plug-in equipment, until the requirements of Annexes B.3.1 and B.4		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	are met		
G.4.2	**Denmark** To the end of the subclause the following is added: Supply cords of single phase appliances having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1:2011. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a. If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a polyphase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2. Mains socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance DS 60884-2-D1:2011 standard sheet DKA 1-4a. Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c. Mains socket-outlets with earth shall be in compliance with DS 60884-2-D1:2011 Standard Sheet DK 1-3a, DK 1-1c, DK1-1d, DK 1-5a or DK 1-7a Justification: Heavy Current Regulations, Section 6c		N/A
G.4.2	**United Kingdom** To the end of the subclause the following is added: The plug part of direct plug-in equipment shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16, and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.		N/A
G.7.1	**United Kingdom** To the first paragraph the following is added: Equipment which is fitted with a flexible cable or cord and is designed to be connected to a mains		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	socket conforming to BS 1363 by means of that flexible cable or cord shall be fitted with a 'standard plug' in accordance with the Plugs and Sockets etc. (Safety) Regulations 1994, Statutory Instrument 1994 No. 1768, unless exempted by those regulations. NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.		
G.7.1	**Ireland** To the first paragraph the following is added: Apparatus which is fitted with a flexible cable or cord shall be provided with a plug in accordance with Statutory Instrument 525: 1997, "13 A Plugs and Conversion Adapters for Domestic Use Regulations: 1997. S.I. 525 provides for the recognition of a standard of another Member State which is equivalent to the relevant Irish Standard		N/A
G.7.2	**Ireland and United Kingdom** To the first paragraph the following is added: A power supply cord with a conductor of 1,25 mm2 is allowed for equipment which is rated over 10 A and up to and including 13 A.		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		—
10.5.2	**Germany** The following requirement applies: For the operation of any cathode ray tube intended for the display of visual images operating at an acceleration voltage exceeding 40 kV, authorization is required, or application of type approval (Bauartzulassung) and marking. *Justification*: German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM. **NOTE** Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int+49-531-592-6320, Internet: http://www.ptb.de		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

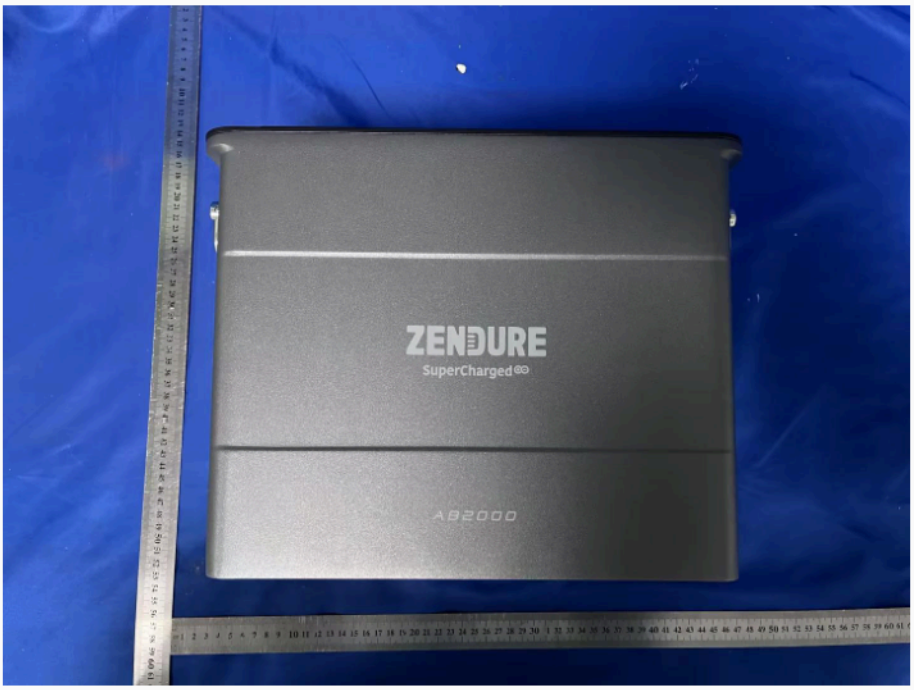
ZD	IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS (EN)	—

N/A

Type of flexible cord	Code designations	
	IEC	CENELEC
PVC insulated cords		
Flat twin tinsel cord	60227 IEC 41	H03VH-Y
Light polyvinyl chloride sheathed flexible cord	60227 IEC 52	H03VV-F H03VVH2-F
Ordinary polyvinyl chloride sheathed flexible cord	60227 IEC 53	H05VV-F H05VVH2-F
Rubber insulated cords		
Braided cord	60245 IEC 51	H03RT-F
Ordinary tough rubber sheathed flexible cord	60245 IEC 53	H05RR-F
Ordinary polychloroprene sheathed flexible cord	60245 IEC 57	H05RN-F
Heavy polychloroprene sheathed flexible cord	60245 IEC 66	H07RN-F
Cords having high flexibility		
Rubber insulated and sheathed cord	60245 IEC 86	H03RR-H
Rubber insulated, crosslinked PVC sheathed cord	60245 IEC 87	H03RV4-H
Crosslinked PVC insulated and sheathed cord	60245 IEC 88	H03V4V4-H
Cords insulated and sheathed with halogen-free thermoplastic compounds		
Light halogen-free thermoplastic insulated and sheathed flexible cords		H03Z1Z1-F H03Z1Z1H2-F
Ordinary halogen-free thermoplastic insulated and sheathed flexible cords		H05Z1Z1-F H05Z1Z1H2-F

Attachment 2: Photos of the product

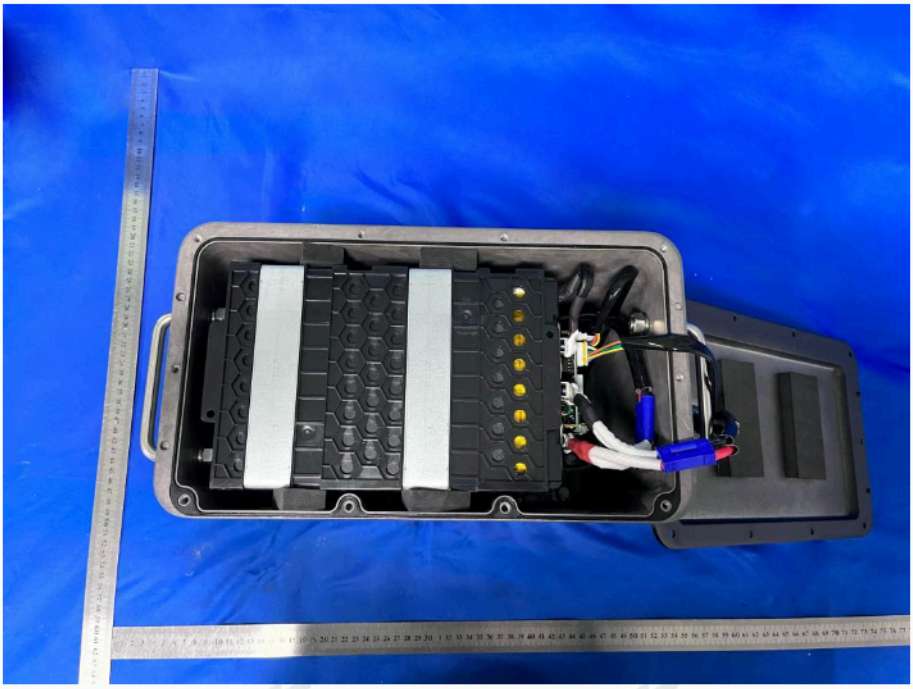
EUT Photo 1



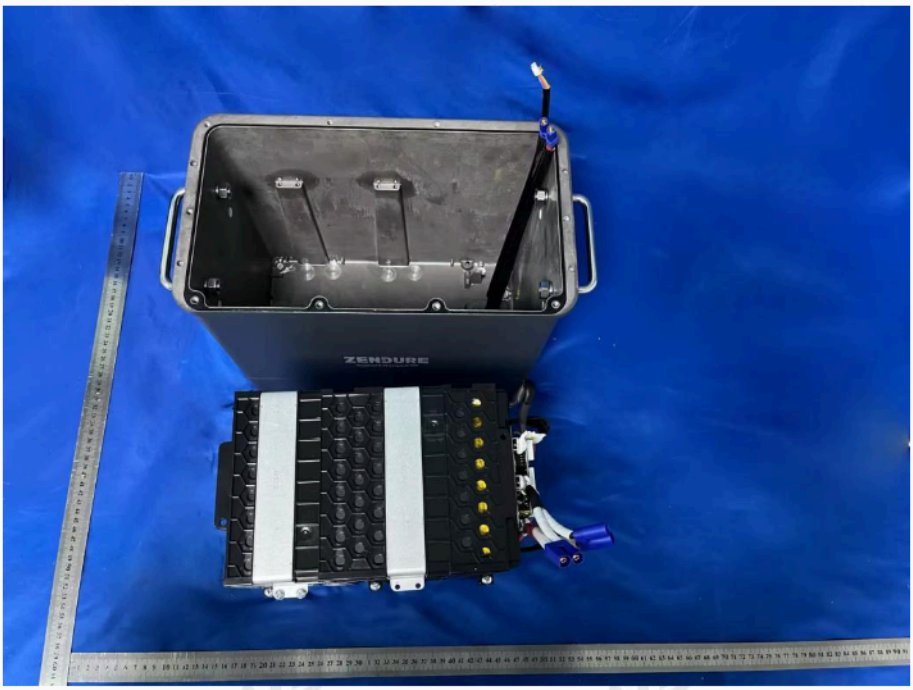
EUT Photo 2

EUT Photo 3

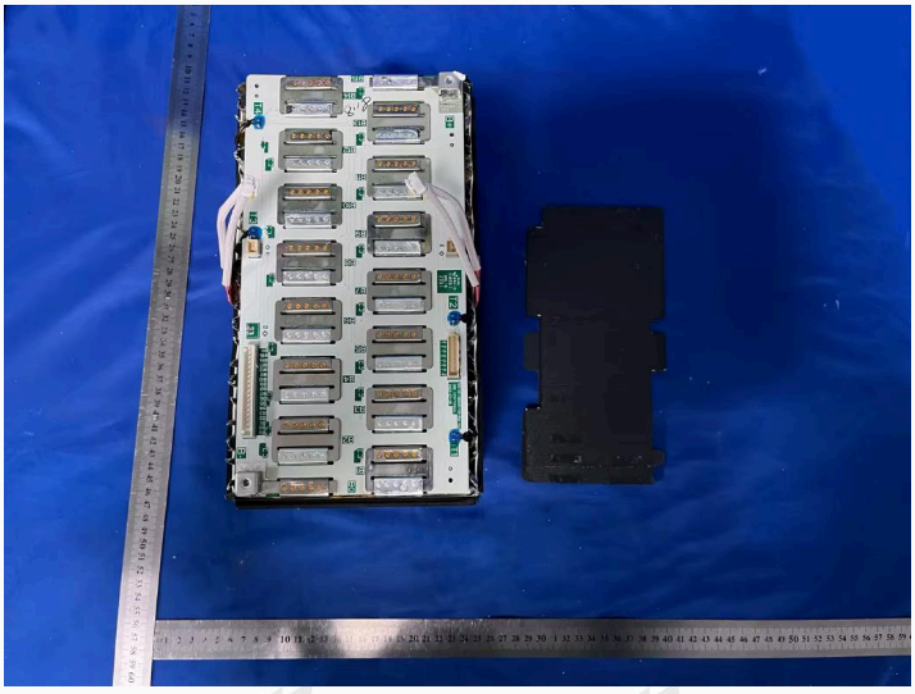
EUT Photo 4



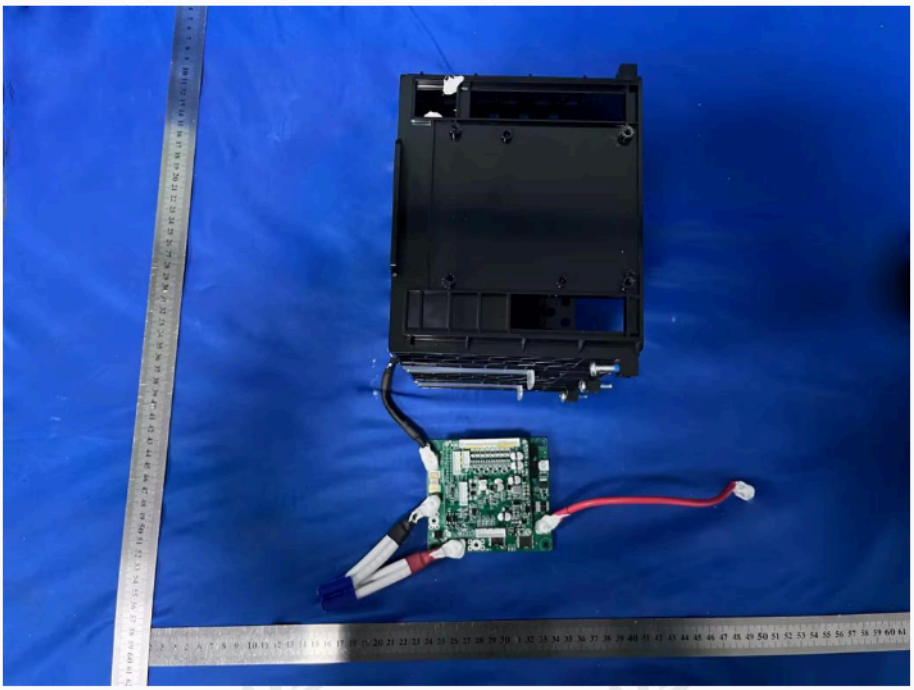
EUT Photo 5



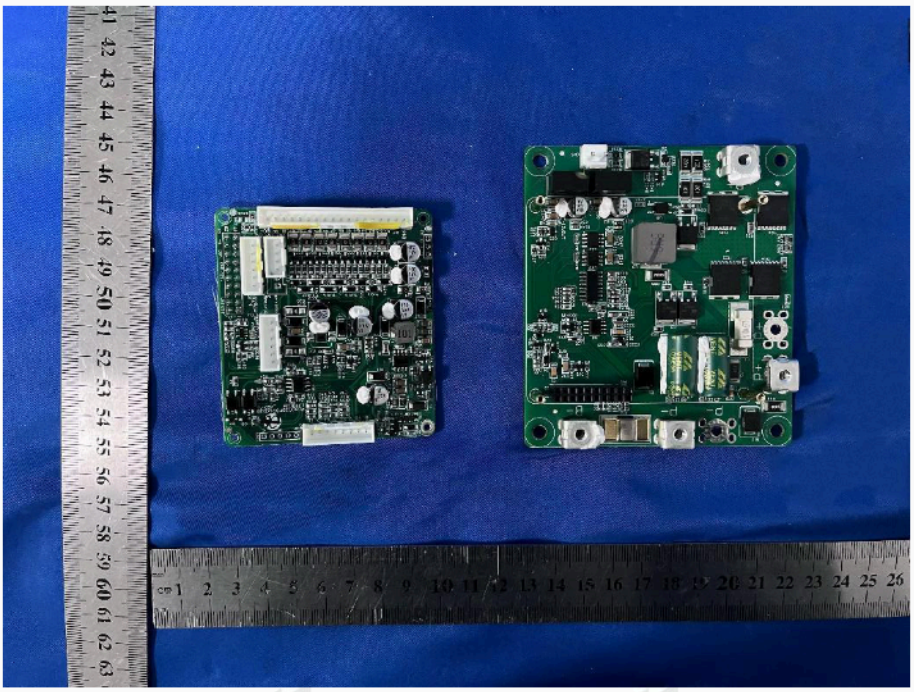
EUT Photo 6



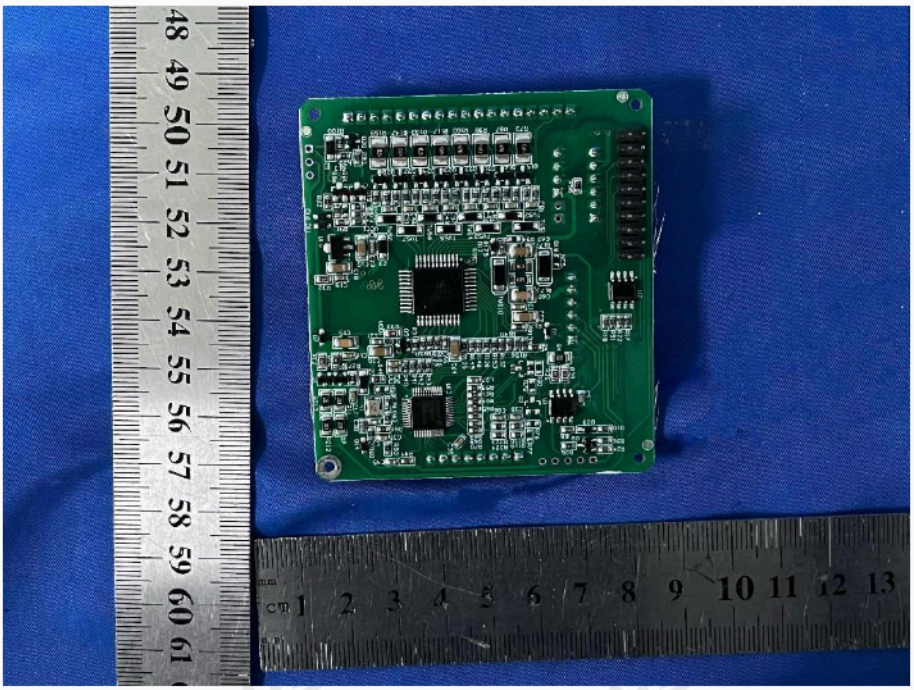
EUT Photo 7



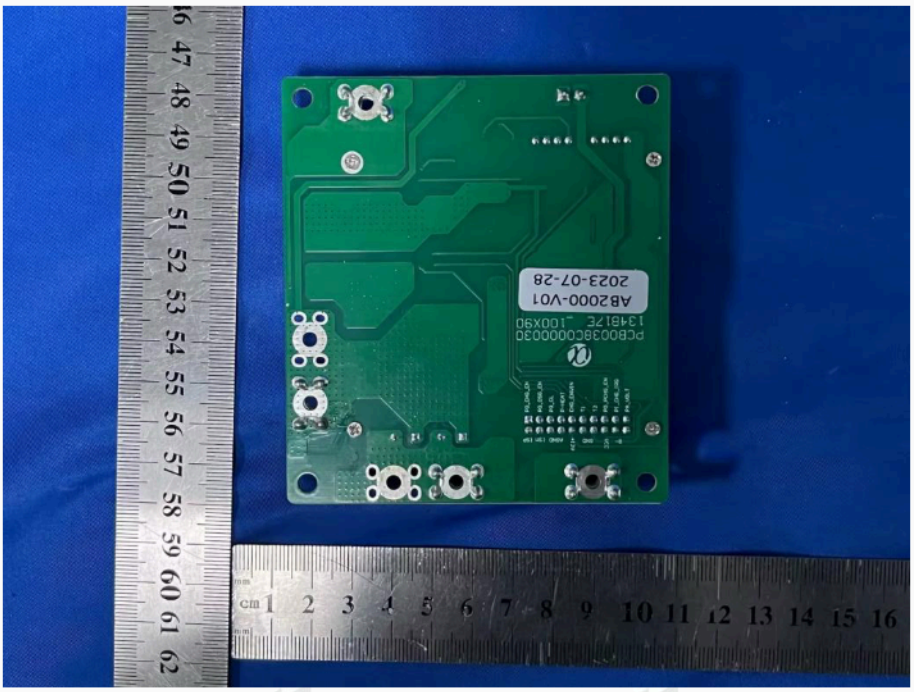
EUT Photo 8



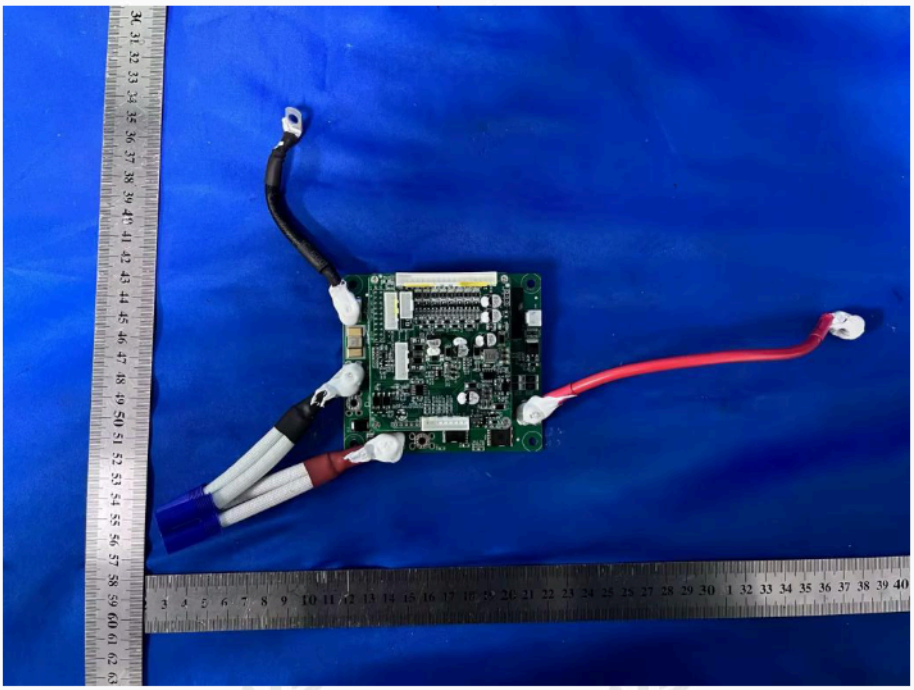
EUT Photo 9



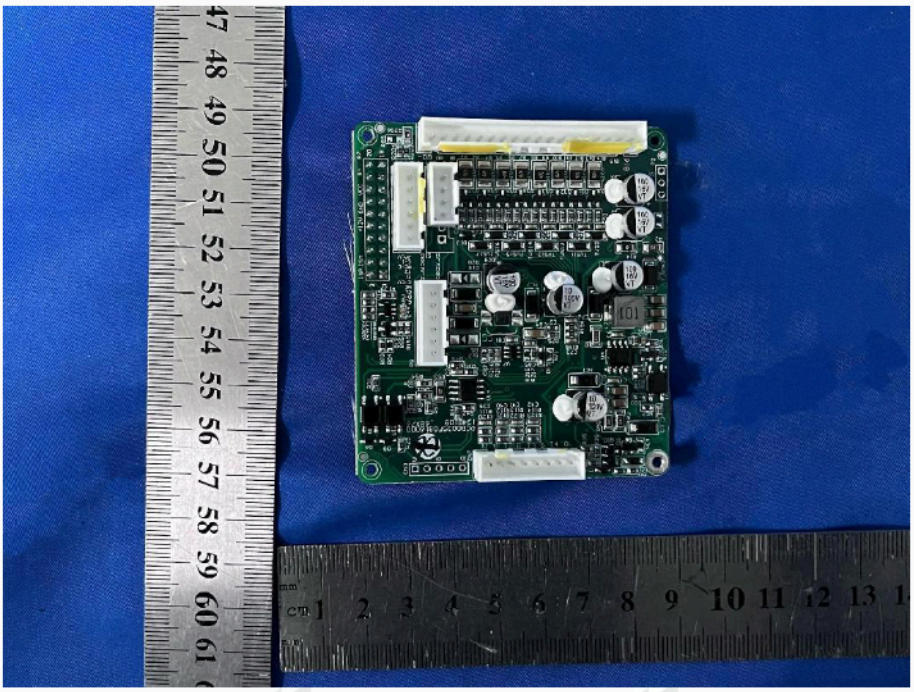
EUT Photo 10



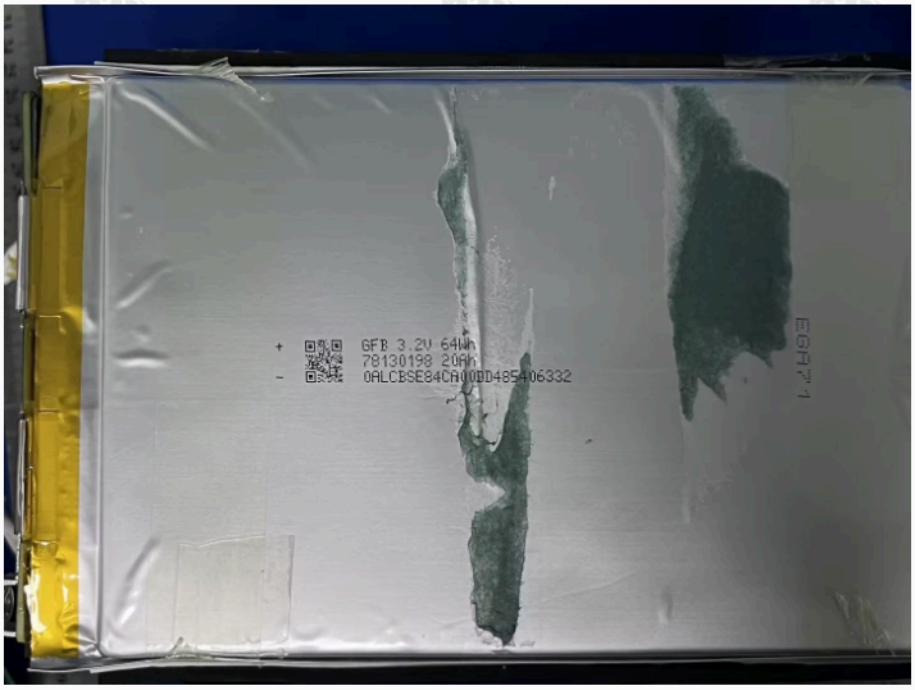
EUT Photo 11



EUT Photo 12



EUT Photo 13



EUT Photo 14

※※※※※ **END OF REPORT** ※※※※※

中国认可
国际互认
检验
INSPECTION
CNAS IB0810

道 路 货 物 运 输 条 件 鉴 定 书

Identification and Classification Report for Road Transport of Goods

危险货物 Dangerous goods	
货物名称 Name of Goods	扩展电源AB2000S ZDAB2000S 48V 40Ah 1920Wh Add-on Battery AB2000S ZDAB2000S 48V 40Ah 1920Wh
报告编号 SN of Report	240810160616-23
委托方 Client	征途科技有限公司 ZENDURE TECHNOLOGY CO., LIMITED
生效日期 Effective Date	2024.08.07
有效期至 Date of Expire	2024.12.31

诺诚（深圳）安全科技有限公司

NRCC (Shenzhen) Safety Technology Co., Ltd.

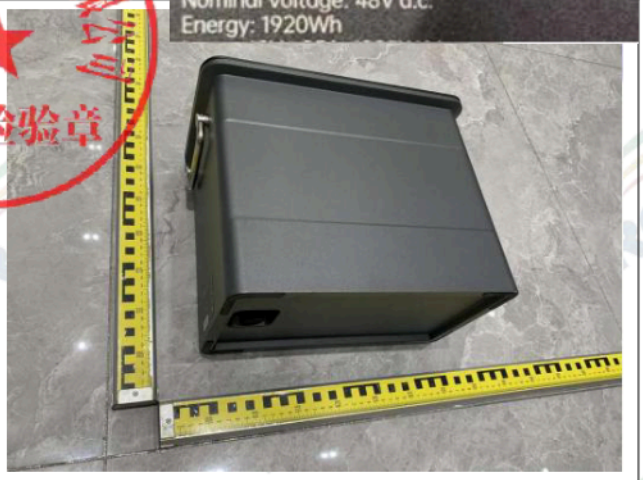
(应急管理部化学品登记中心旗下检测检验机构)

(Testing and Inspection Body affiliated to the National Registration Center for Chemicals, MEM)

货物名称 /Name of Goods	中文 /Chinese	扩展电源 AB2000S ZDAB2000S 48V 40Ah 1920Wh /Add-on Battery AB2000S ZDAB2000S 48V 40Ah 1920Wh			
	英文 /English				
委托方 /Client	征途科技有限公司 /ZENDURE TECHNOLOGY CO., LIMITED				
制造商 /Manufacturer	征途科技有限公司 /ZENDURE TECHNOLOGY CO., LIMITED				
包装信息 /Package Information	包件内电池数量 /Battery Number inside Each Package	1PC	包件内电池净重 /Battery Net Weight of Each Package	21.663kg	
	包件尺寸 /Size of Package	L*W*H=(450×280×435)mm	包件整箱毛重 /Gross Weight of Each Package	25.0kg	
电池信息 /Battery Information	电池类型 /Type of Battery	锂离子电池 /Li-ion Battery	型号 /Model	ZDAB2000S	
	商标 /Trade Mark	ZENDURE	放置方式 /Placement	单独包装 /Single	
鉴别依据 /Identification Criteria	《危险货物道路运输规则》(JT/T 617-2018) */Regulations Concerning Road Transportation of Dangerous Goods (JT/T 617--2018)*				
鉴定结论 /Classification Conclusion	UN 编号(UN No.) :	UN3480			
	运输专用名称(PSN):	Lithium ion batteries			
	危险货物类别(Class or Div.) :	9			
	包装等级(PG):	II			
	分类代码(Classification Code):	M4			
	签发日期 /Issuing Date	2024 年 08 月 07 日			
备注 /Comment	包装必须达到 II 级包装的性能标准。 /Packages must meet Packing Group II performance standard.				
审批人 /Approver		主检员 /Appraiser		报告签发（盖章） /Stamp	

检验项目名称 /Items of Inspection	检验结果 /Inspection Results
锂电池额定瓦特小时数为 1920Wh。 /Watt-hour rating of the battery is 1920Wh.	＞100Wh
锂电池通过联合国《试验和标准手册》第 III 部分 38.3 测试。 /Each battery is of a type proved to meet the requirements of each test in the United Nations Manual of Tests and Criteria, Part III, sub-section 38.3.	符合 /Conform
锂电池包装件通过 1.2 米跌落试验。 /Each package is capable of withstanding a 1.2m drop test.	不适用 /Not applicable
锂电池完全封装在内包装内，位于坚固的外包装中。 /Lithium cells and batteries are packed in inner packages that completely enclose the cell or battery and placed in a strong outer packaging.	符合 /Conform
每个电池和电池芯配备安全排气装置，并采用有效方法装配，以防止逆向电流（例如： 二极管、 保险丝等）。 /Each cell and battery incorporates a safety venting device, and equipped with effective means as necessary to prevent dangerous reverse current flow(e.g. diodes, fuses, etc).	符合 /Conform
电池或电芯加以保护，防止短路，设备必须采取措施防止意外启动。 /The batteries or cells are protected to avoid short circuit, and equipment shall take measures to avoid unintentional start.	符合 /Conform
锂电池按照规定的质量管理体系进行制造。 /Batteries were manufactured under a quality management programme.	符合 /Conform
锂电池不属于召回电池，不属于废弃和回收电池。 /The lithium batteries don't belong to batteries returned to the manufacturer for safety reasons, are not waste or recycled lithium batteries.	符合 /Conform
锂电池每个包装件上均有锂电池标记。 /Each package is marked with lithium battery mark.	不适用 /Not applicable
备注 /Comment	本鉴定书所述锂电池已通过联合国《试验和标准手册》（第七修订版及修正 1）第 III 部分 38.3 小节相应测试要求。 /Lithium batteries listed in this report are of the types proven to meet the requirements of each applicable test in the United Nations Manual of Tests and Criteria (7th revised edition and amendment 1), Part III, sub-section 38.3.
	UN38.3 报告由深圳诺测检测技术有限公司提供，报告编号为 NCT24020708XB1-1。 /Test report of UN38.3 is supplied by Shenzhen NCT Testing Technology Co., Ltd. and the report number is NCT24020708XB1-1.

电池外观/Picture of the Battery



包装件外观/Picture of the Package

说　明

NOTE

1. 本鉴定书仅供货运部门确定货物运输条件使用。

   This report is only used to confirm the transport condition for carrier.

2. 本报告无审批人签字或诺诚（深圳）安全科技有限公司（以下简称"实验室"）签章无效。

   This report is invalid until signed by the approver and sealed by the NRCC (Shenzhen) Safety Technology Co., Ltd. (Hereinafter referred to as "the Laboratory").

3. 本报告经伪造、篡改、删除、部分复制均无效。

   This report is invalid with any unauthorized altered, forgery, falsification or partial replication.

4. 必要时需要委托方向实验室提供完成货物运输鉴定相关的附加测试报告（原件）或数据资料，并对其真实性负责；委托方提供的试验数据应按照国家标准或者国际标准规定的试验方法获得。

   If necessary, clients' submitting additional testing reports (original copy) or data related to goods transport classification to the laboratory is required, and the client should bear liability for the authenticity of those information; the testing data submitted by client should be obtained by testing methods regulated by national standards or international standards.

5. 为保证鉴定结论符合最新的法规要求，本报告本年度内有效。

   Since the latest regulation compliance concerning of the report conclusion, the report is only valid within this year.

6. 本报告的鉴定结论仅在申请委托方提交的委托资料和样品真实的情况下有效，鉴定结论与样品名称及其他同类物质的鉴定结论无关。

   This report is only valid to the conclusion under the precondition that client submitted real entrusted materials and samples, and the conclusion result is not relevant with other materials sharing same name or congeners.

7. 如电池的生产工艺、原材料、组分等因素有较大改变，可能使其危险性发生改变时，应重新进行鉴定；当鉴定报告所依据的法规、标准发生变化时，其鉴定结论可能发生变化，应重新进行鉴定。

   When significant changing of manufacturing process, materials, components, or other factors of the battery may change its hazard classification, this battery should be identified again; If relative regulations or standards update, the conclusions may change, and the batteries should be identified again.

8. 本报告中英文内容出现不一致时，以中文内容为准。

   Should there be any inconsistencies between Chinese and English content in this report, the Chinese version shall prevail.

9. 可访问 www.nrccsafety.com，或通过电话、电邮查询报告真伪。

   Visiting www.nrccsafety.com, or contact us by telephone, email could check report authenticity.

**********结束 /End**********

ZENDURE TECHNOLOGY CO., LIMITED
Address:RM 517，NEW CITY CENTRE, 2 LEI YUE MUN ROAD,
KWUN TONG, KOWLOON.HK
Tel: 650-796-1903

EU Declaration of Conformity

Product : Add-on Battery AB2000S
Model : ZDAB2000S

Product photo :

We, ZENDURE TECHNOLOGY CO., LIMITED herewith declare under our sole responsibility that the above-mentioned product meets the provisions of the following EC Council Directives and Standards. All supporting documentation is retained under the premises of the manufacturer.

Directives:

2014/30/EU (EMC)
2014/35/EU (LVD)
2011/65/EU (RoHS)
2015/863/EU (RoHS)

Product Safety and Performance Standard(s):

EN IEC 62368-1:2020+A11:2020

EMC Standards:

EN 55032:2015+A11:2020
EN 55035: 2017+A11:2020
EN IEC 61000-3-2: 2019+A1:2021
EN 61000-3-3: 2013 +A1:2019+A2:2021

RoHS Standards: IEC 62321-3-1:2013
IEC 62321-4:2013+AMD1:2017
IEC 62321-5:2013
IEC 62321-6:2015
IEC 62321-7-1:2015
IEC 62321-7-2:2017
IEC 62321-8:2017

European Authorized Representative:
Zendure DE GmbH
Hoferstraße 9B, 71636 Ludwigsburg

Signed for and on behalf of:

Augus xiong	Certification Engineer	2024.8.4
Sign and steel	Position	Date of issue

TEST REPORT

Applicant : Zendure USA Inc.

Address: 1765 E BAYSHORE RD # 201 EAST PALO ALTO, CA 94303-5501

The following sample(s) and sample information was/were submitted and identified by client as:

Sample Name: Add-on Battery AB2000S

Model/Style/Item #: ZDAB2000S

Brand/Customer: ZENDURE SuperCharged

Receiving Date: 31-Aug-2023

Test Period: From 31-Aug-2023 to 6-Sep-2023

Add Information: -

Report Summary

#	Test item(s)	Reference Standard/Method	Result
1	The 235 substances in the Candidate List of Substances of Very High Concern (SVHC) for Authorisation published by European Chemicals Agency (ECHA), regarding the Regulation (EC) No. 1907/2006: Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)	In-house method, determined by GC/MS, LC/MS/MS, ICP-OES, UV-Vis, HPLC and IC	**PASS**

****

Signed for and on behalf of STS

Mark Mai
(Technical Director)

GUANGZHOU DEPUHUA TEST SERVICES CO., LTD. TESTING SERVICES

TEST REPORT

Result:

Substances Name	CAS No.	Result (%)		Limit (%)
		1	2	
All tested SVHC in candidate list	-	N.D.	N.D.	0.1
Conclusion	-	**PASS**	**PASS**	-

1. Full list - Substances of Very High Concern (SVHC)

In-house method, determined by GC/MS, LC/MS/MS, ICP-OES, UV-Vis, HPLC and IC

Compound		CAS No.	RL (%)
1	4,4'-Diaminodiphenylmethane(MDA)	101-77-9	0.01
2	5-tert-butyl-2,4,6-trinitro-m-xylene	81-15-2	0.01
3	Alkanes,C10-13,chloro (Short Chain Chlorinated Paraffins)	85535-84-8	0.01
4	Anthracene	120-12-7	0.01
5	Benzyl butyl phthalate (BBP)	85-68-7	0.01
6	Bis(2-ethyl(hexyl)phthalate) (DEHP)	117-81-7	0.01
7	Bis(tributyltin) oxide (TBTO)	56-35-9	0.01
8	Cobalt dichloride **	7646-79-9	0.01
9	Diarsenic pentaoxide **	1303-28-2	0.01
10	Diarsenic trioxide **	1327-53-3	0.01
11	Dibutyl phthalate (DBP)	84-74-2	0.01
12	Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified	25637-99-4 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8)	0.01

13	Lead hydrogen arsenate **	7784-40-9	0.01
14	Sodium dichromate**	7789-12-0 10588-01-9	0.01
15	Triethyl arsenate**	15606-95-8	0.01
16	2,4-Dinitrotoluene	121-14-2	0.01
17	Acrylamide	79-06-1	0.01
18	Anthracene oil	90640-80-5	0.01
19	Anthracene oil, anthracene paste	90640-81-6	0.01
20	Anthracene oil, anthracene paste, anthracene fraction	91995-15-2	0.01
21	Anthracene oil, anthracene paste, distn. lights	91995-17-4	0.01
22	Anthracene oil, anthracene-low	90640-82-7	0.01
23	Diisobutyl phthalate (DIBP)	84-69-5	0.01
24	Lead chromate **	7758-97-6	0.01
25	Lead chromate molybdate sulphate red (C.I. Pigment Red 104) **	12656-85-8	0.01
26	Lead sulfochromate yellow (C.I. Pigment Yellow 34) **	1344-37-2	0.01
27	Pitch, coal tar, high temp	65996-93-2	0.01
28	Tris(2-chloroethyl) phosphate	115-96-8	0.01
29	Ammonium dichromate **	7789-09-5	0.01
30	Boric acid **	10043-35-3 11113-50-1	0.01
31	Disodium tetraborate, anhydrous **	1330-43-4 12179-04-3 1303-96-4	0.01
32	Potassium chromate **	7789-00-6	0.01
33	Potassium Dichromate **	7778-50-9	0.01
34	Sodium chromate **	7775-11-3	0.01
35	Tetraborate disodium heptaoxide,hydrous **	12267-73-1	0.01
36	Trichloroethylene	79-01-6	0.01
37	2-Ethoxyethanol	110-80-5	0.01

38	2-Methoxyethanol	109-86-4	0.01
39	Chromic acid** Dichromic acid** Oligomers of chromic acid and dichromic acid**	7738-94-5 13530-68-2 --	0.01
40	Chromium trioxide**	1333-82-0	0.01
41	Cobalt(II) carbonate **	513-79-1	0.01
42	Cobalt(II) diacetate **	71-48-7	0.01
43	Cobalt(II) dinitrate **	10141-05-6	0.01
44	Cobalt(II) sulphate **	10124-43-3	0.01
45	1,2,3-Trichloropropane	96-18-4	0.01
46	1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)	71888-89-6	0.01
47	1,2-Benzenedicarboxylicacid, di-C7-11-branched and linearalkyl esters (DHNUP)*	68515-42-4	0.01
48	1-methyl-2-pyrrolidone	872-50-4	0.01
49	2-Ethoxyethyl acetate	111-15-9	0.01
50	Hydrazine	7803-57-8; 302-01-2	0.01
51	Strontium chromate**	7789-06-2	0.01
52	1,2-Dichloroethane	107-06-2	0.01
53	2,2'-dichloro-4,4'-methylenedianiline (MOCA)	101-14-4	0.01
54	2-Methoxyaniline; o-Anisidene	90-04-0	0.01
55	4-(1,1,3,3-tetramethylbutyl) phenol, (4-tert-Octylphenol)	140-66-9	0.01
56	Aluminosilicate Refractory Ceramic Fibres(RCF) **	--	0.01
57	Arsenic acid**	7778-39-4	0.01
58	Bis(2-methoxyethyl) ether	111-96-6	0.01
59	Bis(2-methoxyethyl) phthalate (DMEP)	117-82-8	0.01
60	Calcium arsenate**	7778-44-1	0.01
61	Dichromium tris(chromate) **	24613-89-6	0.01
62	Formaldehyde, oligomeric reaction products with aniline (technical MDA)	25214-70-4	0.01

63	Lead diazide Lead azide**	13424-46-9	0.01
64	Lead dipicrate**	6477-64-1	0.01
65	Lead styphnate**	15245-44-0	0.01
66	N,N-dimethylacetamide (DMAC)	127-19-5	0.01
67	Pentazinc chromate octahydroxide**	49663-84-5	0.01
68	Phenolphthalein	77-09-8	0.01
69	Potassium hydroxyoctaoxodizi ncatedichromate **	11103-86-9	0.01
70	Trilead diarsenate**	3687-31-8	0.01
71	Zirconia Aluminosilicate Refractory Ceramic Fibres (Zr-RCF) **	--	0.01
72	[4-[[4-anilino-1-naphthy][4-(dimethylamino) phenyl]methylene] cyclohexa-2, 5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Blue 26)	2580-56-5	0.01
73	[4-[4,4’-bis (dimethylamino) benzhydrylidene]cyclohexa-2,5-dien-1-ylidene]dimethylammonium chloride (C.I. Basic Violet 3)	548-62-9	0.01
74	1,2-bis(2-methoxyethoxy)ethane (TEGDME; triglyme)	112-49-2	0.01
75	1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)	110-71-4	0.01
76	4,4'-bis(dimethylamino) benzophenone (Michler’s Ketone)	90-94-8	0.01
77	4,4'-bis(dimethylamino)-4''- (methylamino)trityl alcohol	561-41-1	0.01
78	Diboron trioxide**	1303-86-2	0.01
79	Formamide	75-12-7	0.01
80	Lead (II) bis (methanesulfonate)**	17570-76-2	0.01
81	N,N,N',N'-tetramethyl -4,4'- methylenedianiline (Michler'sbase)	101-61-1	0.01
82	TGIC(1,3,5-tris(oxiranylmethyl)-1,3,5-triazine-2,4,6(1H,3H,5H)-trione)	2451-62-9	0.01
83	α，α-Bis[4-(dimethylamino)phenyl]-4 (phenylamino)naphthalene-1-methanol (C.I. Solvent Blue 4)	6786-83-0	0.01
84	β-TGIC (1,3,5-tris[(2S and 2R)-2,3- epoxypropyl]-1,3,5-triazine-2,4,6- (1H,3H,5H)-trione)	59653-74-6	0.01
85	[Phthalato(2-)]dioxotrilead (dibasic lead phthalate)**	69011-06-9	0.01

86	1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	84777-06-0	0.01
87	1,2-Diethoxyethane	629-14-1	0.01
88	1-Bromopropane; n-propyl bromide	106-94-5	0.01
89	3-Ethyl-2-methyl-2-(3-methylbutyl)- 1,3-oxazolidine	143860-04-2	0.01
90	4-(1,1,3,3-tetramethylbutyl) phenol, Ethoxylated- covering well-defined substances and UVCB substances, polymers and homologues	--	0.01
91	4,4'-Methylenedi-o-toluidine	838-88-0	0.01
92	4,4'-Oxydianiline and its salts	101-80-4	0.01
93	4-Aminoazobenzene; 4-Phenylazoaniline	60-09-3	0.01
94	4-Methyl-m-phenylenediamine (2,4- toluene-diamine)	95-80-7	0.01
95	4-Nonylphenol, branched and linear-subsrtances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, covering also UVCB-and well- defined substances which include any of the individual isomers or a combination thereof	--	0.01
96	6-Methoxy-m-toluidine (p- cresidine)	120-71-8	0.01
97	Acetic acid, lead salt, basic**	51404-69-4	0.01
98	Biphenyl-4-ylamine	92-67-1	0.01
99	Decabromodiphenyl ether (DecaBDE)	1163-19-5	0.01
100	Cyclohexane-1,2-dicarboxylic Anhydride (Hexahydrophthalic anhydride - HHPA)	85-42-7, 13149-00-3, 14166-21-3	0.01
101	Diazene-1,2-dicarboxamide (C,C'-azodi(formamide))	123-77-3	0.01
102	Dibutyltin dichloride (DBTC)	683-18-1	0.01
103	Diethyl sulphate	64-67-5	0.01
104	Diisopentylphthalate (DIPP)	605-50-5	0.01
105	Dimethyl sulphate	77-78-1	0.01
106	Dinoseb	88-85-7	0.01
107	Dioxobis(stearato)trilead**	12578-12-0	0.01

108	Fatty acids, C16-18, lead salts**	91031-62-8	0.01
109	Furan	110-00-9	0.01
110	Henicosafluoroundecanoic acid	2058-94-8	0.01
111	Heptacosafluorotetradecanoic acid	376-06-7	0.01
112	Hexahydromethylphthalic anhydride, Hexahydro-4-methylphthalic anhydride, Hexahydro-1-methylphthalic anhydride, Hexahydro-3-methylphthalic anhydride	25550-51-0, 19438-60-9, 48122-14-1, 57110-29-9	0.01
113	Lead bis(tetrafluoroborate)**	13814-96-5	0.01
114	Lead cyanamidate**	20837-86-9	0.01
115	Lead dinitrate**	10099-74-8	0.01
116	Lead oxide (Lead monoxide)**	1317-36-8	0.01
117	Lead oxide sulfate (basic lead sulfate)**	12036-76-9	0.01
118	Lead tetroxide (orange lead)**	1314-41-6	0.01
119	Lead titanium trioxide**	12060-00-3	0.01
120	Lead Titanium Zirconium Oxide**	12626-81-2	0.01
121	Methoxy acetic acid	625-45-6	0.01
122	Propylene oxide; 1,2-epoxypropane; methyloxirane	75-56-9	0.01
123	N,N-dimethylformamide; dimethylformamide	68-12-2	0.01
124	N-methylacetamide	79-16-3	0.01
125	N-pentyl-isopentylphthalate	776297-69-9	0.01
126	o-Aminoazotoluene	97-56-3	0.01
127	o-Toluidine; 2- Aminotoluene	95-53-4	0.01
128	Pentacosafluorotridecanoic acid	72629-94-8	0.01
129	Pentalead tetraoxide sulphate**	12065-90-6	0.01
130	Pyrochlore, antimony lead yellow**	8012-00-8	0.01
131	Silicic acid, barium salt, lead-doped**	68784-75-8	0.01

132	Silicic acid, lead salt**	11120-22-2	0.01
133	Sulfurous acid, lead salt, dibasic**	62229-08-7	0.01
134	Tetraethyllead**	78-00-2	0.01
135	Tetralead trioxide sulphate**	12202-17-4	0.01
136	Tricosafluorododecanoic acid	307-55-1	0.01
137	Basic lead carbonate(trilead bis(carbonate)dihydroxide) **	1319-46-6	0.01
138	Trilead dioxide phosphonate**	12141-20-7	0.01
139	4-Nonylphenol (branched and linear) ethoxy ether	-	0.01
140	APEO	3825-26-1	0.01
141	Cadmium oxide**	1306-19-0	0.01
142	Cd	7440-43-9	0.01
143	DPP	131-18-0	0.01
144	PFOA	335-67-1	0.01
145	Cadmium sulphide**	1306-23-6	0.01
146	Dihexyl phthalate	84-75-3	0.01
147	Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28)	573-58-0	0.01
148	Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo] -5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38)	1937-37-7	0.01
149	Imidazolidine-2-thione (2-imidazoline-2-thiol)	96-45-7	0.01
150	Lead di(acetate) **	301-04-2	0.01
151	Trixylyl phosphate	25155-23-1	0.01
152	1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	68515-50-4	0.01
153	Cadmium chloride**	10108-64-2	0.01
154	Sodium perborate; perboric acid, sodium salt**	-	0.01
155	Sodium peroxometaborate**	7632-04-4	0.01

156	2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	25973-55-1	0.01
157	2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	3846-71-7	0.01
158	2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate; DOTE	15571-58-1	0.01
159	Reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE)	-	0.01
160	Cadmium fluoride**	7790-79-6	0.01
161	Cadmium sulphate**	10124-36-4; 31119-53-6	0.01
162	1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyldiesters with ⩾ 0.3% of dihexyl phthalate (EC No. 201-559-5)	68515-51-5, 68648-93-1	0.01
163	5-sec-butyl-2-(2,4-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [1], 5-sec-butyl-2-(4,6-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [2] [covering any of the individual isomers of [1] and [2] or any combination thereof]	-	0.01
164	Nitrobenzene	98-95-3	0.01
165	2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327)	3864-99-1	0.01
166	2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350)	36437-37-3	0.01
167	1,3-propanesultone	1120-71-4	0.01
168	Perfluorononan-1-oic-acid and its sodium and ammonium salts	375-95-1 21049-39-8 4149-60-4	0.01
169	Benzo[def]chrysene (Benzo[a]pyrene)	50-32-8	0.01
170	4,4'-isopropylidenediphenol (bisphenol A)	80-05-7	0.01
171	4-heptylphenol, branched and linear (4-HPbl)	/	0.01
172	Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts	335-76-2 3830-45-3 3108-42-7	0.01
173	p-(1,1-dimethylpropyl)phenol (PTAP)	80-46-6	0.01
174	Perfluorohexane-1-sulphonic acid and its salts(PFHXS)	/	0.01

175	Chrysene	218-01-9 1719-03-5	0.01
176	Benz[a]anthracene	56-55-3 1718-53-2	0.01
177	Cadmium nitrate **	10325-94-7 10022-68-1	0.01
178	Cadmium hydroxide **	21041-95-2	0.01
179	Cadmium carbonate **	513-78-0	0.01
180	Dechlorane Plus(TM)	-	0.01
181	Reaction products of 1,3,4-thiadiazolidine-2,5-dithione, formaldehyde and 4-heptylphenol, branched and linear (RP-HP) [with ⩾0.1% w/w 4-heptylphenol, branched and linear]	-	0.01
182	Octamethylcyclotetrasiloxane (D4)	556-67-2	0.01
183	Decamethylcyclopentasiloxane (D5)	541-02-6	0.01
184	Dodecamethylcyclohexasiloxane (D6)	540-97-6	0.01
185	Lead	7439-92-1	0.01
186	Disodium octaborate**	12008-41-2	0.01
187	Benzo[ghi]perylene	191-24-2	0.01
188	Terphenyl hydrogenated	61788-32-7	0.01
189	Ethylenediamine (EDA)	107-15-3	0.01
190	Benzene-1,2,4-tricarboxylic acid 1,2 anhydride (trimellitic anhydride) (TMA)	552-30-7	0.01
191	Dicyclohexyl phthalate (DCHP)	84-61-7	0.01
192	Pyrene	129-00-0; 1718-52-1	0.01
193	Phenanthrene	85-01-8	0.01
194	Fluoranthene	206-44-0; 93951-69-0	0.01
195	Benzo[k]fluoranthene	207-08-9	0.01
196	2,2-bis(4'-hydroxyphenyl)-4-met hylpentane	6807-17-6	0.01
197	1,7,7-trimethyl-3-(phenylmethylene)bicyclo[2.2.1]heptan-2-one	15087-24-8	0.01
198	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)propionic acid,	-	0.01

	Its salts and its acyl halides (covering any of their individual isomers and combinations thereof)		
199	4-tert-butylphenol	98-54-4	0.01
200	2-methoxyethyl acetate	110-49-6	0.01
201	Tris(4-nonylphenyl,branched and linear) phosphate(TNPP) with≥0.1% W/W of 4-nonylphenol, branched and linear(4-NP)	-	0.01
202	Perfluorobutane sulfonic acid (PFBS) and its salts	-	0.01
203	Diisohexyl phthalate	71850-09-4	0.01
204	2-methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one	71868-10-5	0.01
205	2-benzyl-2-dimethylamino-4'-morpholinobutyrophenone	119313-12-1	0.01
206	1-vinylimidazole	1072-63-5	0.01
207	2-methylimidazole	693-98-1	0.01
208	Butyl 4-hydroxybenzoate	94-26-8	0.01
209	Dibutylbis(pentane-2,4-dionato-O,O')tin	22673-19-4	0.01
210	Bis(2-(2-methoxyethoxy)ethyl)ether	143-24-8	0.01
211	Dioctyltin dilaurate, stannane, dioctyl-, bis(coco acyloxy) derivs., and any other stannane, dioctyl-, bis(fatty acyloxy) derivs. wherein C12 is the predominant carbon number of the fatty acyloxy moiety	-	0.01
212	1,4-dioxane	123-91-1	0.01
213	2,2-bis(bromomethyl)propane1,3-diol(BMP) 2,2-dimethylpropan-1-ol, tribromo derivative/3-bromo-2,2bis(bromomethyl)-1-propanol (TBNPA) 2,3-dibromo-1-propanol (2,3-DBPA)	3296-90-0 36483-57-5/1522-92-5 96-13-9	0.01
214	2-(4-tert-butylbenzyl)propionaldehydeand its individual stereoisomers	-	0.01
215	4,4'-(1-methylpropylidene)bisphenol;(bisphenol B)	77-40-7	0.01
216	Glutaral	111-30-8	0.01
217	Medium-chain chlorinated paraffins(MCCP) [UVCB substances consisting ofmore than or equal to 80% linearchloroalkanes with carbon chain lenathswithin the range from C14 to C17]	-	0.01
218	Orthoboric acid, sodium salt	13840-56-7	0.01

219	Phenol, alkylation products (mainly in paraposition) with C12-rich branched or linear alkyl chains from oligomerisation, covering any individual isomers and/ or combinations thereof (PDDP)	-	0.01
220	(±)-1,7,7-trimethyl-3-[(4-methylphenyl)methylene]bicyclo[2.2.1]heptan-2-one covering any of the individual isomers and/or combinations thereof (4-MBC)	-	0.01
221	6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol	119-47-1	0.01
222	S-(tricyclo(5.2.1.0'2,6)deca-3-en-8(or 9)-yl O-(isopropyl or isobutyl or 2-ethylhexyl) O-(isopropyl or isobutyl or 2-ethylhexyl) phosphorodithioate	255881-94-8	0.01
223	tris(2-methoxyethoxy)vinylsilane	1067-53-4	0.01
224	N-hydroxymethyl acrylamide	924-42-5	0.01
225	1,1'-[ethane-1,2-diylbisoxy]bis[2,4,6-tribromobenzene]	37853-59-1	0.01
226	2,2',6,6'-tetrabromo-4,4'-isopropylide nediphenol	79-94-7	0.01
227	4,4'-sulphonyldiphenol	80-09-1	0.01
228	Barium diboron tetraoxide	13701-59-2	0.01
229	Bis(2-ethylhexyl tetrabromophthalate Covering any of the individual isomers and / or combinations thereof	-	0.01
230	Isobutyl 4-hydroxybenzoate	4247-02-3	0.01
231	Melamine	108-78-1	0.01
232	Perfluoroheptanoic acid and its salts	-	0.01
233	reaction mass of 2,2,3,3,5,5,6,6 -octafluoro-4-(1,1,1,2,3,3,3-heptafluoroprop an-2-yl)morpholine and 2,2,3,3, 5,5,6,6-octafluoro-4-(heptafluoropropyl) morpholine	-	0.01
234	Bis(4-chlorophenyl) sulphone	80-07-9	0.01
235	Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	75980-60-8	0.01

Note:

- RL: Report limit
- N.D.: Not detected (result is less than RL)
- - *The detected DHNUP are consisted of six phthalates which CAS number is 85507-79-5, 68515-44-6, 68515-45-7, 111381-89-6, 111381-90-9 and 111381-91-0 according to the Annex 15 of REACH.
  - **According to the 5.2.1 item of the forth version of ECHA "Guidance on requirements for substances in articles", 2017, if the selected test methods only show the existence of certain elements rather than the existence of substances, additional measurements may be taken to screen for the existence of a substances in a sample(s) when necessary.
  - Report Results: as in most cases, the measurements will identify the chemical constituents in the sample(s) but not necessarily "the

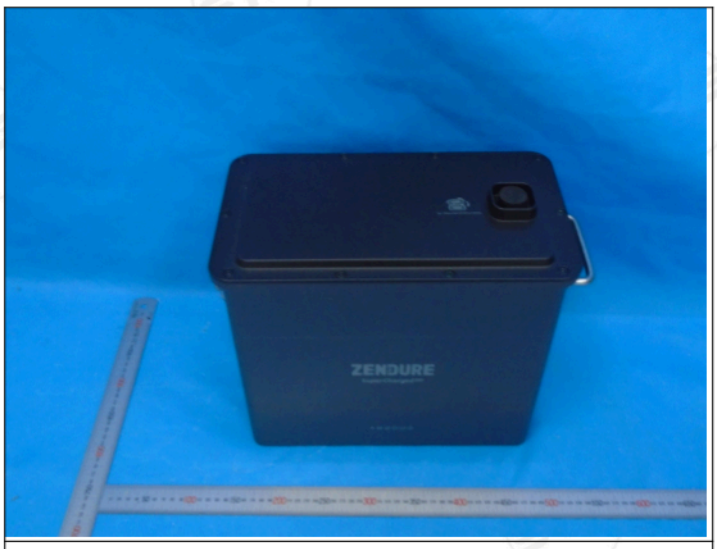
substance" which were originally used to produce the article, professional consultations, product information, testing processes, features of materials, characteristics of the SVHC and chemical analysis etc shall be used to obtain the assessments results according to the 5.2 item of the forth version of ECHA "Guidance on requirements for substances in articles", 2017.
- Report Limit: Obtained from the uncertainty, the 0.1% threshold and the ECHA "Guidance on requirements for substances in articles".

Material List:

Material #	Position / Sample Description
1	Non-metal
2	Metal

NOTE: All test data was copied from report STSGZ2308313037E

Photo(s):



Product Photo

<<< <<< END OF REPORT >>> >>>

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Certificate • 認証証書 • 인증서 • diplômes • CertificadO • Свидетельство

Certification of Product Declarations

Application of the Council Directive 2011/65/EU and its amendment directive (EU) 2015/863 on the restriction of the use of certain hazardous substances in the electrical and electronic equipment

Certificate No.: C-STSGZ2405163023E

Product Name	:	Add-on Battery AB2000S
Model(s) No.	:	ZDAB2000S
Series Model	:	-
Brand Name		ZENDURE SuperCharged
Holder	:	Zendure USA Inc.
Address	:	1765 E BAYSHORE RD # 201 EAST PALO ALTO, CA 94303-5501
Standard(s)	:	IEC 62321-3-1:2013 IEC 62321-4:2013+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.	:	STSGZ2405163023E

Validation of the certificate are subject to:

- The compliance to the surveillance requirements

- Conditions of restriction as stipulated in the test report

The applicant of the certificate is authorized to use this certificate in connection with EC declaration of conformity to the Directive. The certificate is only applicable to the equipment described above.

RoHS

Approved by:

21-May-2024 Chemical Test Manager

GUANGZHOU DEPUHUA TEST SERVICES CO.,LTD TESTING SERVICES

Guangzhou Depuhua Test Services Co., Ltd.
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Guangzhou: www.stsgz.com

TEST REPORT

Applicant : Zendure USA Inc.

Address: 1765 E BAYSHORE RD # 201 EAST PALO ALTO, CA 94303-5501

The following sample(s) and sample information was/were submitted and identified by client as:

Sample Name: Add-on Battery AB2000S

Model/Style/Item #: ZDAB2000S

Brand/Customer: ZENDURE SuperCharged

Receiving Date: 31-Aug-2023

Test Period: From 31-Aug-2023 to 6-Sep-2023

Add Information: -

Test Summary:

#	Test Item(s)	Reference Standard/Method	Result
1	Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs, PBDEs, DBP, BBP, DEHP and DIBP EU RoHS Directive 2011/65/EU and its amendment directives (EU) 2015/863 (RoHS)	IEC 62321-3-1:2013 IEC 62321-4:2013+A1:2017 IEC 62321-5:2013 IEC 62321-6:2015 IEC 62321-7-1:2015 IEC 62321-7-2:2017 IEC 62321-8:2017	**PASS**

****

Signed for and on behalf of STS

Mark Mai
(Technical Director)

GUANGZHOU DEPUHUA TEST SERVICES CO., LTD
STS TESTING SERVICES

Guangzhou Depuhua Test Services Co. Ltd.
A301&A401, 3/F.&4/F., Xinghui Building, Guanqiao, Shilou, Panyu District, Guangzhou, Guangdong, China e-mail：stsgz@stsapp.com
Phone: +86 (0)20-6664 1688 Fax：+86 (0)20-6664 1699 Web://www.stsgz.com

Result:

1.1 EU RoHS Directive 2011/65/EU and its amendment directives on XRF

IEC 62321-3-1:2013, Screening by X-ray Fluorescence Spectroscopy (XRF)

Seq. No.	Tested Part(s)	Results				
		Pb	Cd	Hg	Cr	Br
1	Black soft plastic，lid	BL	BL	BL	BL	BL
2	Black coating，lid	BL	BL	BL	BL	BL
3	SIlvery metal,lid	BL	BL	BL	BL	NA
4	Grey coating，bottom	BL	BL	BL	BL	BL
5	Silvery metal,bottom	BL	BL	BL	BL	NA
6	Silvery metal,handle	BL	BL	BL	BL	NA
7	Silvery metal,handle holder	BL	BL	BL	BL	NA
8	Black soft plastic with white fiber,wire cover	BL	BL	BL	BL	BL
9	Yellow soft plastic,wire jacket	BL	BL	BL	BL	BL
10	Orange soft plastic,wire jacket	BL	BL	BL	BL	BL
11	White soft plastic,wire jacket	BL	BL	BL	BL	BL
12	Green soft plastic,wire jacket	BL	BL	BL	BL	BL
13	Blue soft plastic,wire jacket	BL	BL	BL	BL	BL
14	Red soft plastic,thick wire jacket	BL	BL	BL	BL	BL
15	Black soft plastic,thick wire jacket	BL	BL	BL	BL	BL
16	Golden metal,contact pin	X	BL	BL	BL	NA
17	Silvery metal,solder	BL	BL	BL	BL	NA
18	Black foam,cushion	BL	BL	BL	BL	X
19	White printed black soft plastic heat shrink tube	BL	BL	BL	BL	BL
20	Black printed red soft plastic heat shrink tube	BL	BL	BL	BL	BL
21	Multicolor plated silvery metal,plate	BL	BL	BL	X	NA
22	Black body,IC	BL	BL	BL	BL	BL
23	Black body,resistor	BL	BL	BL	BL	BL

24	Brown body,capacitor	BL	BL	BL	BL	BL
25	Black body,audion	BL	BL	BL	BL	BL
26	Black body,diode	BL	BL	BL	BL	BL
27	Black magnet,cover	BL	BL	BL	BL	NA
28	Coppery enameled wire	BL	BL	BL	BL	BL
29	Green PCB	BL	BL	BL	BL	X
30	Silvery metal,solder	BL	BL	BL	BL	NA

Remark:

(1) Results were obtained by XRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-Vis (for Cr(VI)) and GC-MS (for PBBs, PBDEs) are recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-3-1:2013.

Element	Unit	Non-metal	Metal	Composite Material
Cd	mg/kg	BL≤70-3σ< X <130+3σ≤OL	BL≤70-3σ< X <130+3σ≤OL	BL≤50-3σ< X <150+3σ≤OL
Pb	mg/kg	BL≤700-3σ< X <1300+3σ≤OL	BL≤700-3σ< X <1300+3σ≤ OL	BL≤500-3σ< X <1500+3σ≤OL
Hg	mg/kg	BL≤700-3σ< X <1300+3σ≤OL	BL≤700-3σ< X <1300+3σ≤OL	BL≤500-3σ< X <1500+3σ≤OL
Cr	mg/kg	BL≤700-3σ< X	BL≤700-3σ< X	BL≤500-3σ< X
Br	mg/kg	BL≤300-3σ< X	--	BL≤250-3σ< X

Note:

BL = Below Limit

OL = Over Limit

X = Inconclusive

NA = Not Applicable

(2) The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.

(3) The maximum permissible limit is quoted from the document 2011/65/EU and its amendment directives (EU) 2015/863 :

RoHS Restricted Substances	Maximum Concentration Value (mg/kg) (by weight in homogenous materials)
Cadmium (Cd)	100
Lead (Pb)	1000
Mercury (Hg)	1000
Hexavalent Chromium (Cr(VI))	1000
Polybrominated biphenyls (PBBs)	1000
Polybrominated diphenyl ethers (PBDEs)	1000

(4) Disclaimers:

This XRF Screening report is for reference purposes only. The applicant shall make its/his/her own judgment as to whether the information provided in this XRF screening report is sufficient for its/his/her purposes. The result shown in this XRF screening report will differ based on various factors, including but not limited to, the sample size, thickness, area, surface flatness, equipment parameters and matrix effect(e.g. plastic, rubber, metal, glass, ceramic etc.). Further wet chemical pre-treatment with relevant chemical equipment analysis are required to obtain quantitative data.

(5) The selection of test portions was recommended by the client and the conclusion of chemical test is only for the selected portions.

1.2 Hexavalent Chromium (Cr(VI))

Metal: IEC 62321-7-1:2015, extracted by boiling water and analyzed by UV-Vis
Non-metal: IEC 62321-7-2:2017, alkaline digested and analyzed by UV-Vis

Compound		Material	Limit	RL
		21		
1	Hexavalent Chromium (Cr(VI))	Negative	#	-
	Conclusion	**PASS**	-	-

Remark(s) (a) ug/cm^2: microgram per square centimeter
(b) RL: Report Limit
(c) Negative = Sample Cr(VI) concentration is less than 0.10 ug/cm^2
Positive = Sample Cr(VI) concentration is greater than 0.13 ug/cm^2
(d) # = Positive indicates the presence of Cr(VI) on the tested areas and result be regarded as conflict with RoHS requirement.
Negative indicates the absence of Cr(VI) on the tested areas and result be regarded as no conflict with RoHS requirement.

1.3 Lead Content (Pb)

IEC62321-5:2013, acid digested and determined by AAS

Compound		Material	Limit (mg/kg)	RL (mg/kg)
		16		
1	Lead (Pb)	27939	1000	10
	Conclusion	**PASS***	**-**	**-**

Remark(s): (a) * = Copper alloy containing up to 4% lead by weight
(b) mg/kg: milligrams per kilogram
(c) RL: Report limit
(d) N.D.: Not detected (result is less than RL)

1.4 Polybrominated Biphenyls and Polybrominated Diphenyl Ethers (PBBs and PBDEs)

IEC 62321-6:2015, solvent extract and determined by GC/MS

Compound		Material		Limit (mg/kg)	RL (mg/kg)
		18	29		
1	Monobromo biphenyl	N.D.	N.D.	-	50
2	Dibromo biphenyl	N.D.	N.D.	-	50
3	Tribromo biphenyl	N.D.	N.D.	-	50
4	Tetrabromo biphenyl	N.D.	N.D.	-	50
5	Pentabromo biphenyl	N.D.	N.D.	-	50
6	Hexabromo biphenyl	N.D.	N.D.	-	50
7	Heptabromo biphenyl	N.D.	N.D.	-	50
8	Octabromo biphenyl	N.D.	N.D.	-	50
9	Nonabromo biphenyl	N.D.	N.D.	-	50
10	Decabromo biphenyl	N.D.	N.D.	-	50
11	Monobromo diphenyl ether	N.D.	N.D.	-	50
12	Dibromo diphenyl ether	N.D.	N.D.	-	50
13	Tribromo diphenyl ether	N.D.	N.D.	-	50

14	Tetrabromo diphenyl ether	N.D.	N.D.	-	50
15	Pentabromo diphenyl ether	N.D.	N.D.	-	50
16	Hexabromo diphenyl ether	N.D.	N.D.	-	50
17	Heptabromo diphenyl ether	N.D.	N.D.	-	50
18	Octabromo diphenyl ether	N.D.	N.D.	-	50
19	Nonabromo diphenyl ether	N.D.	N.D.	-	50
20	Decabromo diphenyl ether	N.D.	N.D.	-	50
21	Sum of PBBs	N.D.	N.D.	1000	-
22	Sum of PBDEs	N.D.	N.D.	1000	-
	Conclusion	**PASS**	**PASS**	-	-

Remark(s): (a) mg/kg: milligram per kilogram
(b) RL: Report limit
(c) N.D.: Not detected (result is less than RL)

1.5 Phthalates – (DBP, BBP, DEHP, DIBP)

IEC 62321-8:2017, Solvent extract and determined by GC/MS

Compound			Material				Limit (%)	RL(%)
			1	2+4	8	9+10+11		
1	DBP	Dibutylphthalate CAS# 84-74-2	N.D.	N.D.	N.D.	N.D.	0.1	0.005
2	BBP	Benzylbutylphthalate CAS# 85-68-7	N.D.	N.D.	N.D.	N.D.	0.1	0.005
3	DEHP	Diethylhexylphthalate CAS# 117-81-7	N.D.	N.D.	N.D.	N.D.	0.1	0.005
4	DIBP	Diisobutyl phthalate CAS# 84-69-5	N.D.	N.D.	N.D.	N.D.	0.1	0.005
	Conclusion		**PASS**	**PASS**	**PASS**	**PASS**	-	-

Compound			Material				Limit (%)	RL(%)
			12+13	14+15	18	19+20		
1	DBP	Dibutylphthalate CAS# 84-74-2	N.D.	N.D.	N.D.	N.D.	0.1	0.005

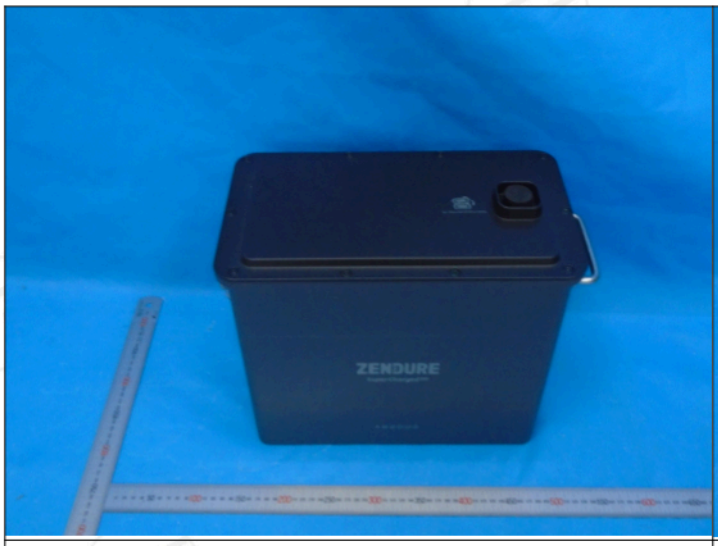
2	BBP	Benzylbutylphthalate CAS# 85-68-7	N.D.	N.D.	N.D.	N.D.	0.1	0.005
3	DEHP	Diethylhexylphthalate CAS# 117-81-7	N.D.	N.D.	N.D.	N.D.	0.1	0.005
4	DIBP	Diisobutyl phthalate CAS# 84-69-5	N.D.	N.D.	N.D.	N.D.	0.1	0.005
	Conclusion		**PASS**	**PASS**	**PASS**	**PASS**	-	-

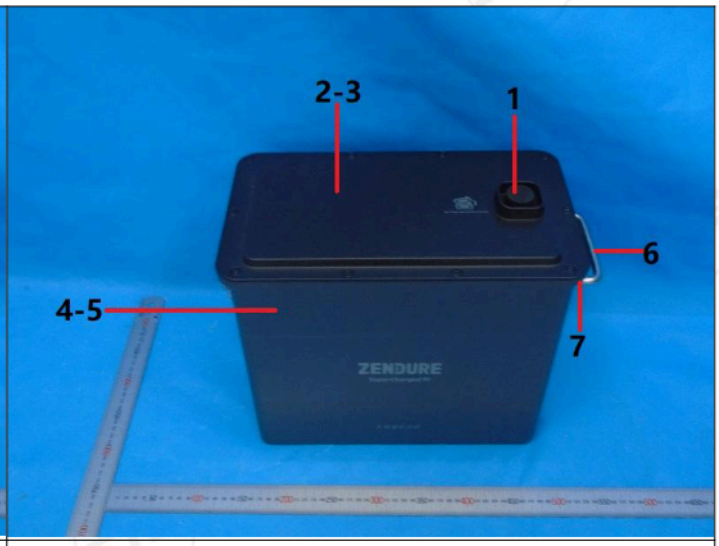
Compound			**Material**				**Limit (%)**	**RL(%)**
			22+23+24	**25+26**	**28**	**29**		
1	DBP	Dibutylphthalate CAS# 84-74-2	N.D.	N.D.	N.D.	N.D.	0.1	0.005
2	BBP	Benzylbutylphthalate CAS# 85-68-7	N.D.	N.D.	N.D.	N.D.	0.1	0.005
3	DEHP	Diethylhexylphthalate CAS# 117-81-7	N.D.	N.D.	N.D.	N.D.	0.1	0.005
4	DIBP	Diisobutyl phthalate CAS# 84-69-5	N.D.	N.D.	N.D.	N.D.	0.1	0.005
	Conclusion		**PASS**	**PASS**	**PASS**	**PASS**	-	-

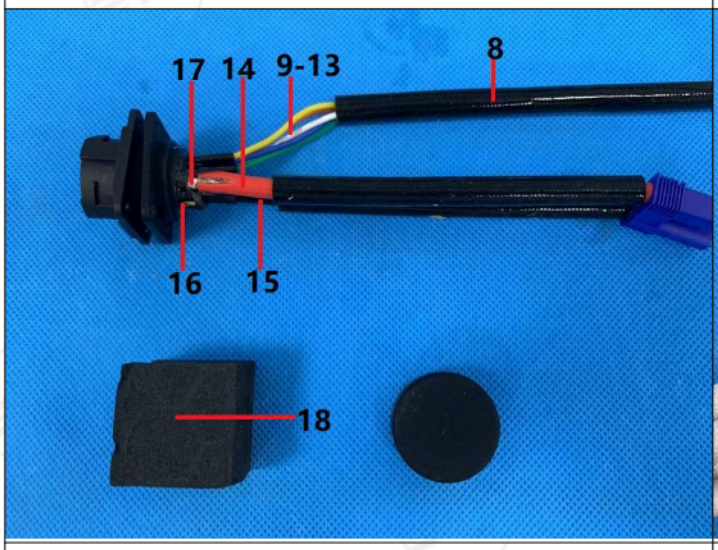
Remark(s): (a) RL: Report limit
(b) N.D.: Not detected (result is less than RL)

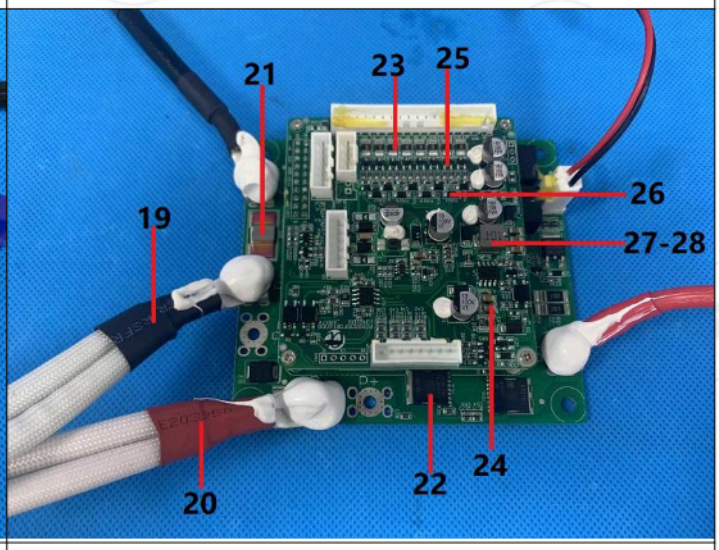
NOTE: All test data was copied from report STSGZ2308313036E

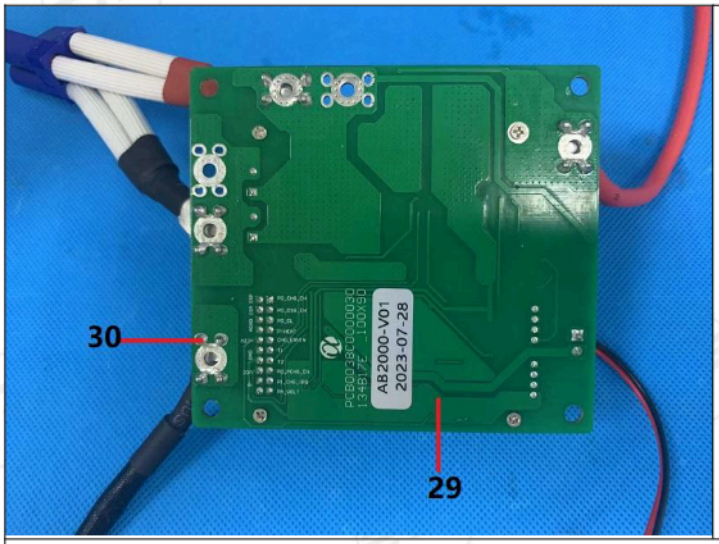
Photo(s):











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Product Photo

<<<<<< END OF REPORT >>>>>>

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9. 该测试报告的支持数据和信息本公司保存 10 年。个别评审机构有特别要求的,检测数据和报告的保存期可依情况变动。一旦超过上述提交的保存期限,数据和信息将被处理掉。任何情况下,本公司不必提供任何被处理的过期数据或信息。即使本公司事先被告知可能会发生相关的损害,本公司在任何情况下也不必承担任何损害,包括(但不限于)补偿性赔偿、利润损失、数据遗失、或任何形式的特殊损害、附带损害、间接损害、从属损害或任何违反约定、违反承诺、侵权(包括疏忽)、产品责任或其他原因的惩罚性损害。
Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of ten years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

10. 报告的签发记录可通过登录 www.stsgz.com 查询。如需进一步查询报告有效性或核实报告，需与本公司联系。
Issuance records of the Report are available on the internet at www.stsgz.com. Further enquiry of validity or verification of the Report should be addressed to the company.

Prüfbericht - Produkte
Test Report - Products

TÜVRheinland®

Prüfbericht-Nr.: *Test report no.:*	CN24EL5D 001	**Auftrags-Nr.:** *Order no.:*	168488152	Seite 1 von 15 *Page 1 of 15*
Kunden-Referenz-Nr.: *Client reference no.:*	2308497	**Auftragsdatum:** *Order date:*	2024-06-02	
Auftraggeber: *Client:*	Zendure USA Inc. 1765 E BAYSHORE RD # 201 EAST PALO ALTO CA 94303-5501 USA			
Prüfgegenstand: *Test item:*	Li-ion Battery (Add-on Battery)			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	ZDAB2000S			
Auftrags-Inhalt: *Order content:*	Test report			
Prüfgrundlage: *Test specification:*	ANSI/CAN/UL 1973:2022			

Wareneingangsdatum: *Date of sample receipt:*	2024-06-03
Prüfmuster-Nr.: *Test sample no:*	ATSP2405047B A-001
Prüfzeitraum: *Testing period:*	2024-06-04 to 2024-06-05
Ort der Prüfung: *Place of testing:*	See page 4 for details.
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.
Prüfergebnis*: *Test result*:*	Pass

erstellt von: *created by:*		**genehmigt von:** *authorized by:*	
Datum: *Date:* 2024-06-25	Jason Zhu	**Ausstellungsdatum:** *Issue date:* 2024-06-25	Corney Zhang
Stellung */ Position:*	Project Engineer	**Stellung** */ Position:*	Reviewer

Sonstiges */ Other:* This report only evaluates cl. 42 Single Cell Failure Design Tolerance.
This report includes Attachment 1: Photo documentation (2 pages).

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
* Legend:	*P(ass) = passed a.m. test specification(s)*	*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. *The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system.* *Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.*
2	Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben. Informationen zur Verifizierung der Authentizität unserer Dokumente erhalten Sie über folgenden Link: Einführung in digitale Signaturen *As contractually agreed, this document has been signed digitally only. TUV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TUV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged. For information on verifying the authenticity of our documents, please visit the following link: Introduction to Digital Signature*
3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. *Test clauses with remark of * are subcontracted to qualified subcontractors and descripted under the respective test clause in the report.* *Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.*
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnisen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. *The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the “Zero Guard Band Rule” and “Simple Acceptance” in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.*

TEST REPORT
ANSI/CAN/UL 1973
Batteries for Use in Stationary and Motive Auxiliary Power Applications

Report reference No.....:	CN24EL5D 001
Date of issue .....:	see cover page
Total number of pages .....:	see cover page
Testing Laboratory.....:	**TÜV Rheinland (Shenzhen) Ltd.**
Address .....:	1F East & 2-4F, Cybio Technology Building No. 1, No. 16, Kejibei 2nd Road, High-Tech Industrial Park North, Nanshan District, 518057 Shenzhen P.R.China
Manufacturer's name .....:	ZENDURE TECHNOLOGY CO., LIMITED
Address .....:	RM 517, NEW CITY CENTRE, 2 LEI YUE MUN ROAD, KWUN TONG, KOWLOON.HK
Test specification:	
Standard .....:	UL 1973:2022
Test procedure .....:	Test report
Non-standard test method.....:	N/A
Test Report Form No.....:	UL1973_1D
Test Report Form(s) Originator ....:	TÜV Rheinland (Shenzhen)
Master TRF .....:	Dated 2022-03
Test item description .....:	Add-on Battery
Trade Mark.....:	N/A
Model/Type reference.....:	ZDAB2000S
Ratings.....:	48V, 40Ah, 1920Wh

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

Attachment 1: Photo documentation (2 pages);

Summary of testing:

Test items:

cl. 42	Single Cell Failure Design Tolerance

The DUT was complied with the requirements of UL 1973:2022.

Test Location:

ATS Electronic Technology Co., Ltd
3/F, Building A, No. 1 Hedong Three Road, Jinxia Community, Changan Town, Dongguan City, Guangdong, China

Test item particulars:	
Information about the product needed to establish a correct test program, such as product mobility, type of power connections and similar.	(Test item particulars are selected by the TRF Originator base on the requirements in the standard)
Equipment application ..... :	Stationary
Connection to the mains..... :	Permanent connection, not directly connected to the mains
Mains supply tolerance (%) or absolute mains supply values ..... :	N/A
Cell/Battery Type..... :	Lithium-ion Cell Used
Battery Voltage Range ..... :	37.5VDC to 54.75VDC
Installation/Use environment ..... :	N/A
Overvoltage Category ..... :	N/A
Pollution Degree..... :	N/A
IP protection class ..... :	N/A
Altitude during operation (m) ..... :	N/A
Altitude of test laboratory (m)..... :	N/A
Possible test case verdicts:	
Test case does not apply to the test object .....:	N(/A)
Test object does meet the requirement:	P(ass)
Test object does not meet the requirement .....:	F(ail)
Testing:	
Date of receipt of test item.....:	2024-06-03
Date(s) of performance of tests ....:	2024-06-04 to 2024-06-05
General remarks:	
This report shall not be reproduced, except in full, without the written approval of the testing laboratory. The test results presented in this report relate only to the object tested. "(see remark #)" refers to a remark 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.**	
Factory Location / Address: **Guangdong Huichuang New Energy Co.,Ltd.** No. 17, Jiaolian Houde Road, Wanjiang Street, Dongguan City, Guangdong, P.R. China	

General product information and other remarks:

Setup of module:

The module was consisted of 15 cells (15S2P). All cells in the pack were numbered as below picture. External heating method was used to initiate thermal runaway in the module. One PID sheet heater, rated 110V ac/195 W, size 150 x 100 x 1±0.33 mm, was fitted on cell.

Multiple thermocouples, Type K, 24AWG, were attached between the cells and under the heating surface. Temperature of both sides were monitored during test. See Figure 1 for the detail locations.

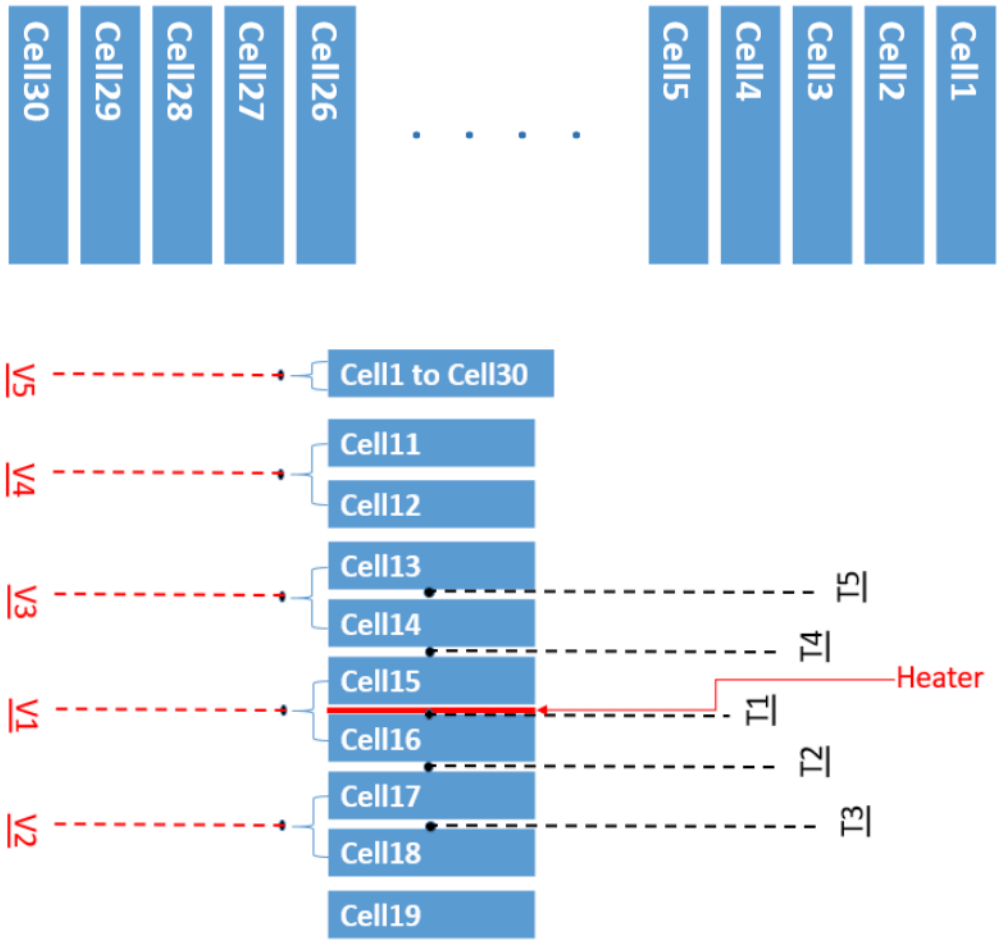


Figure 1. Cell number of module & Location of heater and thermocouple

The main features of the battery system and cell are shown as below:

Name	Battery module
Model Designation	ZDAB2000S
Rated Capacity, Ah	40
Nominal voltage, V d.c.	48
Charging current (Std.), A	25
Charging current (Max.), A	25
Standard Full Charging Voltage (V d.c.)	54.75
Upper limit Charging Voltage (V d.c.)	54.75
End of Charging Current, A	/
Continuous Discharge current (Std.), A	25
Continuous Discharge current (Max.), A	25
Discharge End Point Voltage (V d.c.)	37.5
Charging temperature range(°C)	0 ~ 55
Discharging Temperature range(°C)	-20 ~ 60
Structure	15S2P

Construction unit(mm):

Battery module (Unit: mm)

UL 1973			
Clause	Requirement + Test	Result - Remark	Verdict

ENVIRONMENTAL TESTS			
42	**Single Cell Failure Design Tolerance**		**P**
42.1	**General**		**P**
42.1.1	There have been field incidents with various battery technologies that have been attributed to a cell failure, which led to a hazardous event. The cell failures in these incidents were the result of either manufacturing defects or insufficient cell or battery design or a combination of both. Since there is a possibility that a cell may fail within a battery system, the battery system shall be designed to prevent a single cell failure from propagating to the extent that there is fire external to the DUT or an explosion.		P
42.1.2	The cell failure mechanism used for this testing shall reflect what is known or anticipated to occur in the field for a given technology. If the cell failure mechanism cannot be exactly replicated, a close simulation of what is known to occur in the field through the use of an external stress such as applied heating or mechanical force shall be utilized for the test. Examples of methods to simulate a single cell failure are outlined in Appendix F. Multiple tests and possible multiple failure methods may need to be conducted as part of the analysis before a final methodology for testing is determined.		P
42.2	**Single cell failure design tolerance (lithium ion)**		**P**
42.2.1	A lithium ion battery system shall be designed to mitigate a single cell failure leading to a thermal runaway of that cell. With lithium ion batteries, it is often the effects of propagation to surrounding cells due to the heating effect of the initial cell failure that leads to hazardous events. The DUT (e.g. battery pack or module) shall be designed to prevent a single cell thermal runaway failure from creating a significant hazard as evidenced by fire propagation outside of the DUT and/or an explosion.		P

UL 1973			
Clause	Requirement + Test	Result - Remark	Verdict
42.2.2	Any number of methods can be used to produce a single cell thermal runaway failure. For example, thermal runaway in cells can be achieved through the use of heaters, nail penetration, overcharge, etc. The testing agency is responsible for selecting and demonstrating an appropriate method for inducing thermal runaway. It is recommended to evaluate a candidate method first using a small subassembly of cells to evaluate the cell failure and effects to surrounding cells. During an effort to establish a suitable failure method, temperatures should be taken on the cell casings, and voltages measured for information purposes. See Appendix F for guidance on several methods of inducing cell failure. The method chosen shall be agreed upon by the testing agency.		P
42.2.3	The details of the method used when analyzing the cell's reaction that can impact the results are to be documented. For example, if heating the cell to achieve failure: e.g. the type of heater and its dimensions, location on the cell where the heater is placed and how it is placed, maximum temperature attained including temperature ramp rate, length of time until reaction, temperatures on cell and voltage, state of charge of the cell at the beginning of the heating phase, etc. The test article shall be representative of the actual battery configuration and any modifications should not significantly impact the test results. For example, if overcharge is to be carried out, the heat conduction path between tabs shall not be hindered as that may reduce the severity of the test.		P

UL 1973			
Clause	Requirement + Test	Result - Remark	Verdict
42.2.4	Once a suitable method of cell failure has been determined, the fully charged DUT (MOSOC per 8.1) shall be subjected to the single cell failure tolerance test, which consists of inducing a fault in one internal cell that is within the DUT, until cell failure resulting in thermal runaway as defined in 6.58 occurs, and determining whether or not that failure produces a significant external hazard or whether or not that failure does not cause the failure of neighboring cells. If cascading occurs, the cascading shall not propagate beyond the DUT. Prior to choosing the specific cell to fail, an analysis of the DUT design to determine the cell location considered to have the greatest potential to lead to a significant external hazard shall be conducted, taking into consideration the cell's proximity to other cells and materials that may lead to potential for propagation. If it can impact the results, the sample shall be at the maximum specified temperature during charging and operation with some tolerance as necessary for movement of the sample outside of the chamber during testing, but within ±5°C (±9°F). Once the thermal runaway is initiated, the mechanism used to create thermal runaway is shut off or stopped and the DUT is subjected to a 24-h observation period. *Exception No. 1: Testing may be repeated on another sample with a cell in a different location within the DUT if it is not clear which location represents the worst case scenario. The location of the failed cell shall be documented for each test.* *Exception No. 2: Testing may be conducted on a representative subassembly consisting of one or more modules and surrounding representative environment, if it can be demonstrated that there is no propagation beyond the subassembly. When testing at the module or subassembly level, consideration needs to be made of the vulnerability to combustion of those components surrounding the module in the final assembly. Temperatures on DUT external surfaces and surfaces of parts in contact with or near the DUT in the final assembly, shall be monitored to determine if excessive temperature on these adjacent parts could result in a potential for propagation within the full battery system. If there are excessive temperatures on the surfaces that may lead to potential for propagation, testing shall be repeated with all adjacent components in place of a complete battery system.*		p
42.2.5	Temperatures on the failed cell and surrounding cells are to be monitored and reported for information purposes.		P

UL 1973			
Clause	Requirement + Test	Result - Remark	Verdict
42.2.6	As a result of the testing of 42.2, there shall be no fire propagating from the DUT or explosion of the DUT.		P
42.3	**Single cell failure design tolerance (other technologies)**	**Lithium-ion cell.**	**N/A**
42.3.1	Other technologies such as lithium metal, sodium sulfur, sodium nickel chloride, and lead acid where there may not be enough field data regarding their tolerance to single cell failure events, are to be subjected to a single cell failure test method similar to 42.2, except as modified as noted below. The failure mechanism for these technologies may be different than that of lithium ion and thermal runaway may or may not result from the cell failure. Similar to lithium ion, when choosing a cell failure technique, it should be representative of what can occur in the field for the particular technology. The failure mechanism chosen shall consider failures due to potential cell manufacturing defects for that technology and/or cell and battery design deficiencies that could lead to latent failures of the cell, and that would not be evident under the individual cell safety testing.		N/A
42.3.2	For other technologies, similarly as with lithium ion, it is recommended to evaluate a candidate method first using a small subassembly of cells to evaluate the cell failure and effects to surrounding cells. During an effort to establish a suitable failure method, temperatures should be taken on the cell casings, and voltages measured for information purposes. See Appendix F for guidance on several methods of inducing cell failure. The method chosen shall be agreed upon by the testing agency.		N/A

UL 1973			
Clause	Requirement + Test	Result - Remark	Verdict
42.3.3	When a suitable worse case representative method for cell failure has been determined, the DUT is to be subjected to the internal cell failure occurring in the location within the DUT considered most vulnerable to the potential for propagation. The DUT shall be in a condition that reflects its operating parameters at the worst moment such a failure could occur. For example, the DUT shall be at its nominal operating temperature. During the test, temperatures shall be monitored in critical locations such as adjoining cells during the test to record the rise in temperature due to the internal failure. If no thermal runaway occurs as a result of the single cell failure, the test is stopped when the DUT temperature has stabilized or reaches ambient room temperature, and the DUT is subjected to a 24-h observation period. If a thermal runaway is initiated, the mechanism used to create thermal runaway is shut off or stopped and the DUT is subjected to a 24-h observation period. *Exception No. 1: Testing may be repeated on another sample with a cell in a different location within the DUT if it is not clear which location tested represented the worst case scenario. The location of the failed cell is to be documented for each test.* *Exception No. 2: Testing may be conducted on a representative subassembly consisting of one or more modules and surrounding representative environment, if it can be demonstrated that there is no propagation beyond the subassembly. When testing at the module or subassembly level, consideration needs to be made of the vulnerability to combustion of those components surrounding the modules in the final assembly.*		N/A
42.3.4	As a result of the testing per 42.3.3, there shall be no fire propagating from the DUT or explosion of the DUT.		N/A
42.3.5	Temperatures on the failed cell and surrounding cells, external enclosure surfaces of the DUT and the supporting surface are to be monitored and reported for information purposes. The number of cells that fail due to propagation from the triggering cell shall be documented.		N/A

UL 1973			
Clause	Requirement + Test	Result - Remark	Verdict

Cl. 42	TABLEL: Single Cell Failure Design Tolerance					P
Sample No.	Initial OCV, V	Location of Failed Cell	Max Temp Measured on Failed cell, °C	Maximum Temp on Adjacent Cells °C	Maximum Temp on DUT enclosure, °C	Results
ATSP2005047BA-001	50.105	Cell 1 to Cell 30	641.0	562.3	138.7	1
Result Key						

Supplementary information:

Results:

1 – Thermal runaway did occur but fire did not propagate outside of the DUT and it did not explode.

2 –Thermal runaway did not occur, there was no explosion or fire outside of the DUT

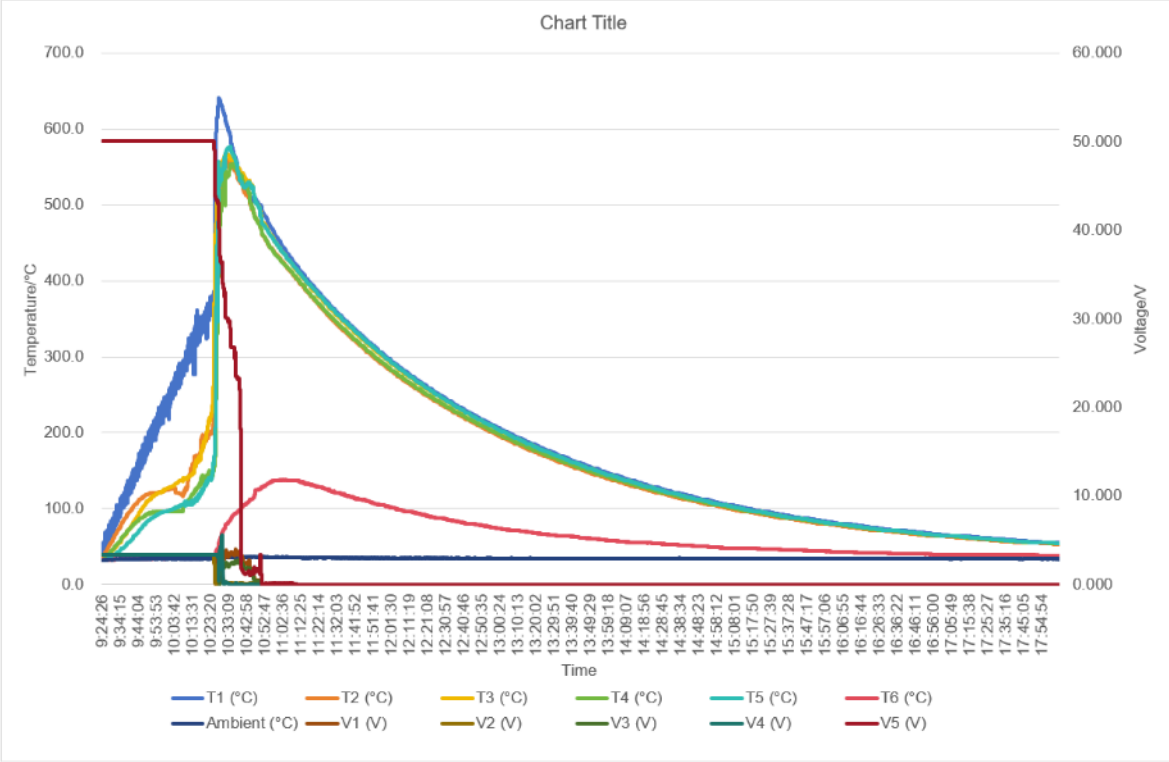
3 – Thermal runaway occurred and fire propagated outside of the DUT.

4 – Thermal runaway occurred and the sample exploded.

5 - Other

UL 1973			
Clause	Requirement + Test	Result - Remark	Verdict

Test Curve:



Thermocouple no.	Location	Maximum temp. or vol.
T1	Between cell 16 and Heater	641.0
T2	Between cell 16 and cell 17	562.3
T3	Between cell 17 and cell 18	567.7
T4	Between cell 14 and cell 15	554.0
T5	Between cell 13 and cell 14	577.4
T6	Top side of Enclosure	138.7
T7	Ambient	37.1

Voltage no.	Name	Voltage
V1	Voltage of cell 15 and cell 16	3.341 V to 0 V
V2	Voltage of cell 17 and cell 18	3.341 V to 0 V
V3	Voltage of cell 13 and cell 14	3.340 V to 0 V
V4	Voltage of cell 11 and cell 12	3.341 V to 0 V
V5	Voltage of battery module	50.105 V to 0 V

Remark: N/A

--End of Report--

Attachment 1 Photo Documentation

Product: Li-ion Battery (Add-on Battery)

Type Designation: ZDAB2000S

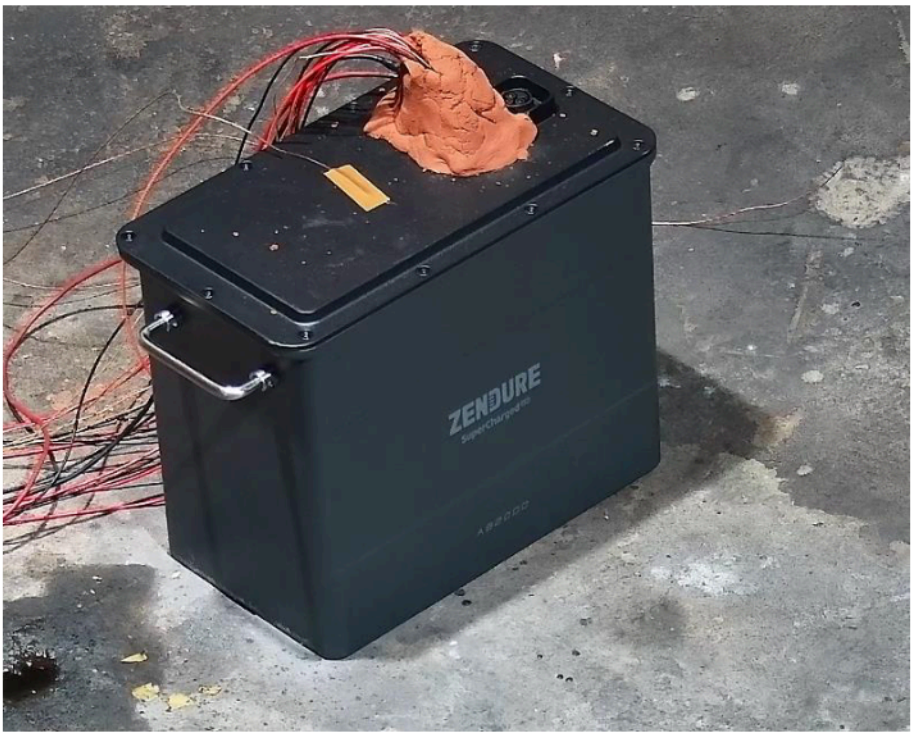


Figure 1 Before test 1

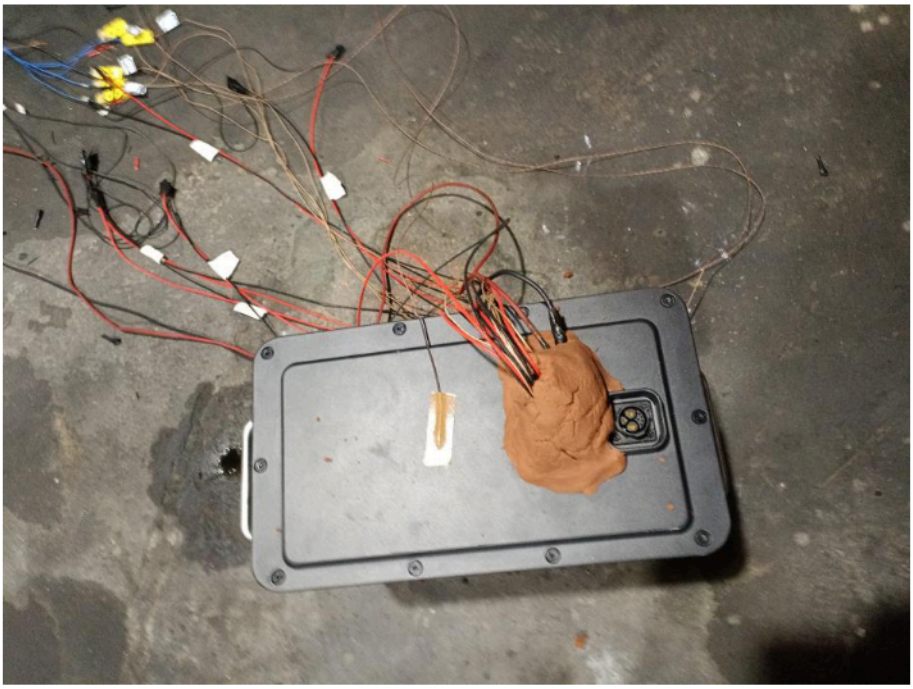


Figure 2 Before test 2

Product: Li-ion Battery (Add-on Battery)

Type Designation: ZDAB2000S

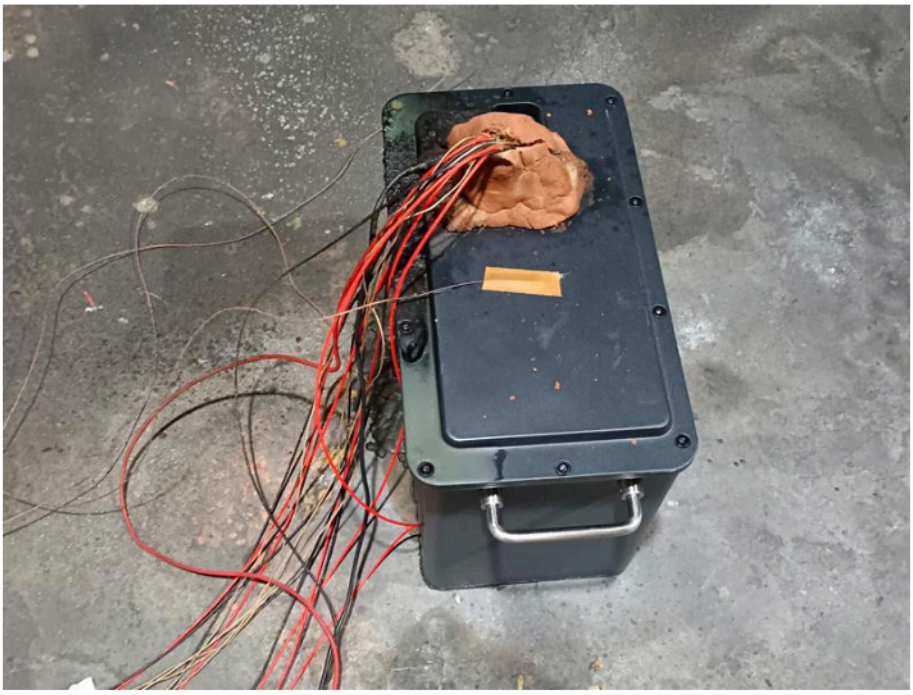


Figure 3 After test

危险货物
Dangerous Goods

货物运输条件鉴定报告书
Report for Safe Transport of Goods

货物名称：	扩展电源 AB2000S ZDAB2000S 48V, 40000mAh, 1920Wh
Name of Goods:	Add-on Battery AB2000S ZDAB2000S 48V, 40000mAh, 1920Wh
委托单位：	征途科技有限公司
Commission by:	ZENDURE TECHNOLOGY CO., LIMITED
运输方式：	海运
Transportation:	Marine

Shenzhen ZKT Technology Co., Ltd.

货物运输条件鉴定报告书
Report for Safe Transport of Goods

货物名称 Goods name	中文 Chinese	扩展电源 AB2000S ZDAB2000S 48V, 40000mAh, 1920Wh				
	英文 English	Add-on Battery AB2000S ZDAB2000S 48V, 40000mAh, 1920Wh				
委托单位 Consignor		征途科技有限公司 ZENDURE TECHNOLOGY CO., LIMITED				
制造商 Manufacturer		征途科技有限公司 ZENDURE TECHNOLOGY CO., LIMITED				
检查方法、程序 Inspection method and procedure		《国际海运危险货物规则》(41-22 版) International Maritime Dangerous Goods Code (Amdt.41-22)				
样品外观 Appearance		黑色近长方体电池，尺寸L×W×T: 345.0mm×180.0mm×276.0mm Approximate black cuboid battery, size L×W×T: 345.0mm×180.0mm×276.0mm				
包装信息 Package information		电池数量 Battery number	1PCS	包装件毛重 weight of the package	25kg	
		包装件尺寸 Package Dimensions	45.0*28.0*43.5cm	电池净重 net weight of batteries	21.663kg	
电池信息 Battery information		类型 Type	锂离子电池 Li-ion Battery			
		型号 Model	ZDAB2000S			
		额定能量 Nominal energy	1920Wh			
		放置方式 Placement	电池单独包装; Batteries packaged separatelyt;			
设备信息 Equipment information	名称 Name	/	型号 Model	/	商标 Trade mark	ZENDURE

鉴定结论 IDENTIFICATION CONCLUSION

1. 该样品为锂离子电池，已通过UN38.3 测试。
This sample is lithium ion battery. Each battery is proved to meet the Requirements tests in the UN Manual of Tests and Criteria, Part Ⅲ, subsection 38.3.
2. 根据IMDG规定该物质分类识别为第9类（或项）危险品, UN编号: UN3480。
According to IMDG this substance is classified as dangerous goods Class (or division) 9, UN number: UN3480

样品接收日期(Accepted date): 2024-05-20　　签发日期(Issue date): 2024-05-21

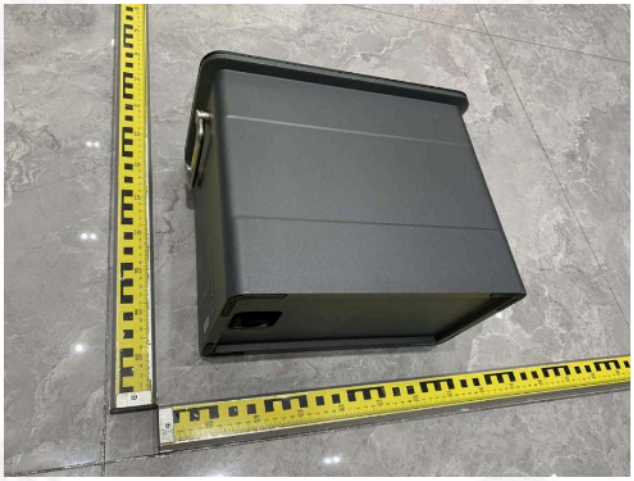
备注 Comments	电池或电芯必须加以保护,防止短路,设备必须采取措施防止意外启动 Batteries or cells must be protected so as to prevent short circuits, and the equipment must be equipped with an effective means of preventing accidental activation.

编制 Compiler:	黄燕琴 Peter Huang	审核 Checker:	龚俊宇 Simon Gong	批准 Approver:	深圳市中检检测技术有限公司 检测专用章

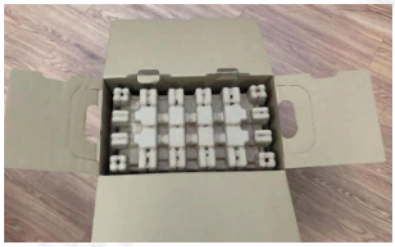
序号 No.	检查结果及其他事项 Inspection results and other things
1	本报告所述锂电池无明显安全缺陷，不属于因安全原因召回的锂电池。 Lithium cells and batteries listed in this report have no significant defect, and they are not the defective cells or batteries returned to the manufacturer for safety reasons.
2	本报告所述锂电池已通过联合国《实验和标准手册》第Ⅲ部分38.3 小节相应测试要求，测试报告由深圳市中凯检测技术有限公司提供，报告编号: S03A23070471U00201。 Lithium cells and batteries listed in this report are of the types proven to meet the requirements of each applicable test in the UN Manual of Tests and Criteria, Part Ⅲ, subsection 38.3, test report is provided by Shenzhen ZKT Technology Co., Ltd. Report number: S03A23070471U00201.
3	除安装在设备中外，电芯和电池须装在完全将其封闭的内包装内。电芯或电池须加以防护以免发生短路。这包括防止在同一包装内与可能导致短路的导电材料接触。内包装须装在符合IMDG CODE 第4.1.1.1、4.1.1.2 和4.1.1.5 段规定的坚实的外包装内。 Cells and batteries, except when installed in equipment, shall be packed in inner packages that completely enclose the cell or battery. Cells and batteries shall be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit. The inner packages shall be packed in strong outer packages which conform to the provisions of 4.1.1.1, 4.1.1.2, and 4.1.1.5.
4	安装在设备中的电芯和电池须加以保护以避免损坏和短路，该设备须配备有效的防止意外激活装置。如果电池安装在设备内，该设备须被包装在坚实的外包装内，该外包装由具有足够强度的材料建造并且设计与其容量的拟定用途相适应，除非内含这些电池的设备能够提供等效的保护。 Cells and batteries when installed in equipment shall be protected from damage and short circuit, and the equipment shall be equipped with an effective means of preventing accidental activation .When batteries are installed in equipment, the equipment shall be packed in strong outer packages constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.
5	每批托运货物必须附带一份包括以下内容的文件: ---- 标明包装件内装有锂离子电芯或电池。 ---- 标明包装件必须小心轻放，如果包装件损坏，有着火的危险。 ---- 标明如果包装件受到损坏，必须遵守的特别程序，包括检查和必要时重新包装。 ---- 应急电话号码。 Each consignment must be accompanied with a document with an indication that: ---- The package contains lithium ion cells or batteries. ---- The package must be handled with care and that a flammability hazard exists if the package is damaged. ---- Special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary. ---- A telephone number for additional information.
6	除电池被安装在设备中或与设备合装在一起外，包件件毛重必须不超过30kg。 Except when batteries are installed in or packed with equipment, packages shall not exceed 30kg gross mass.

图片 (Photo):

样品 Samples：



包装 Package：



注意事项

Important Notice

1. 本鉴定书依据本年度《国际海运危险货物规则》，委托人(托运人或代理人)提供的物品及其运输信息出具。

   This certification is issued according to 《International Maritime Dangerous Goods》 published in the current year, the information of the goods and its shipment provided by the applicant (shipper or his agent).

2. 本鉴定书的鉴定结论仅对客户所送样品负责。由于客户提供的样品及其信息不真实而导致的一切后果均由客户负责。

   The conclusion of this certification is responsible only for the sample provided by the applicant. The applicant should undertake the law responsibility that result from providing untruth sample and untruth information.

3. 本鉴定书不考虑国家及经营人差异。

   The certification takes no account of the state and operator variations.

4. 本鉴定报告书涂改无效。

   This report is invalid if altered.

5. 本鉴定报告书无负责人、审核人签名无效。

   This report is invalid without the signatures of Approved and testing engineer.

6. 本鉴定报告书从 2024 年 01 月 09 日到 2024 年 12 月 31 日有效。

   The report is valid from 2024.01.09 to 2024.12.31.

MSDS Report

申请商： **Prepared For :**	征途科技有限公司 ZENDURE TECHNOLOGY CO.,LIMITED 香港九龙观塘鲤鱼门道二号新城工商中心 517 室 RM 517, NEW CITY CENTRE, 2 LEI YUE MUN ROAD, KWUN TONG, KOWLOON. HK
产品名称： **Product Name:**	扩展电源 AB2000S Add-on Battery AB2000S
型号: **Model**	ZDAB2000S
参数: **Rating(s):**	48V, 40000mAh, 1920Wh
重量 **Weight:**	21663g
尺寸: **Dimension**	T×W×T: 345.0mm×180.0mm×276.0mm
编制单位： **Prepared By :**	Shenzhen ZKT Technology Co., Ltd. 深圳市中凯检测技术有限公司 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China 中国广东省深圳市宝安区福海街道塘尾社区工业大道 6 号 B 栋 1 楼 101
报告编号: **Report No.**	ZKT-240523L5686S

编写: **Written by** _____

批准: **Approved by** _____

审核: **Inspected by** _____

日期: **Date** May 21, 2024

深圳市中凯检测技术有限公司 检测专用章

化学品安全技术说明书
Material Safety Data Sheet

第一部分 化学品及企业标识

Section 1- Chemical Product & Company Identification

产品名称：扩展电源 AB2000S

Product Name: Add-on Battery AB2000S

制造商：征途科技有限公司

Manufacture: ZENDURE TECHNOLOGY CO.,LIMITED

地址：香港九龙观塘鲤鱼门道二号新城工商中心 517 室

Address: RM 517, NEW CITY CENTRE, 2 LEI YUE MUN ROAD, KWUN TONG, KOWLOON. HK

联系人 ***Contact Person:*** /

电话 ***Tel:*** +86-18002190960

传真 ***Fax:*** /

应急电话 ***Emergency Tel:*** +86-18002190960

邮箱 ***E-mail:*** kang.xiong@zendure.com

项目号 ***Item Code:*** ZKT-240523L5686S

第二部分 危险性概述

Section 2- Hazards Identification

危险性描述 **Hazard Description**	正常使用没有危险，不能拆解、打开或分解电池，里面的材料或成分是有害的。 Not dangerous with normal use. Do not dismantle, open or shred the battery ingredients contained within or their ingredients products could be harmful.
接触途径 **Primary Route(s) of Exposure**	吸入、食入、皮肤接触、眼睛接触。 Inhalation, Ingestion, Skin contact and Eye contact.
潜在健康影响 **Potential Health Effects**	**吸入：**破裂的电池散发出来的气雾会引起呼吸道刺激。 **Inhalation:** Vapors or mists from a ruptured battery may cause respiratory irritation. **食入：**电池的组成成分或原料可以导致嘴，食道和胃肠道的严重化学烧伤。 **Ingestion:** The battery ingredients contained within or their ingredients products can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract. **皮肤：**皮肤接触到电池的内部化学材料可能会导致严重的刺激或烧伤皮肤。 **Skin:** Skin contact with contents of an open battery can cause severe irritation or burns to the skin. **眼睛：**眼睛接触到电池的内部化学材料可能会导致严重的刺激或烧伤眼睛。 **Eye:** Eye contact with contents of an open battery can cause severe irritation or burns to the eye.

第三部分 成分/组成信息

Section 3- Composition/Information on Ingredients

化学名称 **Chemical Name**	**浓度或浓度范围(%)** **Concentration or concentration ranges (%)**	**CAS 号（化学文摘索引登记号）** **CAS Number**
钴酸锂 Lithium Cobalt Oxide	35-38	12190-79-3
石墨 Graphite	20-22	7782-42-5
铜 Copper	9-10	7440-50-8
铝 Aluminum	5-6	7429-90-5
碳酸乙烯酯 Ethylene carbonate	14-16	96-49-1
聚丙烯 Polypropylene	5-6	9003-07-0
碳酸甲乙酯 Carbonate, methyl ethyl	4-5	623-53-0
六氟磷酸锂 Phosphate(1-), hexafluoro-, lithium	5-6	21324-40-3

注意：CAS 号是化学文摘服务注册号。

Note: CAS number is Chemical Abstract Service Registry Number.

N/A =不适用。

N/A=Not apply.

第四部分 急救措施

Section 4- First Aid Measures

吸入 **Inhalation**	移除污染源或者将受害者移至新鲜空气处。寻求医生建议。 Remove source of contamination or move victim to fresh air. Obtain medical advice.
食入 **Ingestion**	立即用清水漱口，在专业人士的指导下催吐，速就医。 Please rinse mouth thoroughly with water. Induce vomiting under the guidance of professional personage. Please seek medical treatment in time.
皮肤接触 **Skin contact**	脱下已污染衣服，用大量的水冲洗至少 15 分钟，速就医。 Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid.
眼睛接触 **Eye contact**	用流动水冲洗 15 分钟，如刺激持续发生，请求助于医生。 Irrigate with flowing water for 15 minutes. If irritation persists, consult a physician.

第五部分 消防措施

Section 5- Fire Fighting Measures

危险特性 **Characteristics of Hazard**	火灾时可释放有害浓烟、气体或者蒸汽。 Toxic fumes, gases or vapors may evolve on burning.
燃烧产生的危险物品 **Hazardous Combustion Products**	一氧化碳，二氧化碳，锂氧化物烟气等。 Carbon monoxide, carbon dioxide, lithium oxide fumes and so on.
灭火方法及灭火剂 **Fire-extinguishing Methods and Extinguishing Media**	请使用水，干燥沙等合适的灭火介质。 Please use water, dry sand and other proper fire extinguishing media.
灭火注意事项 **Attention in Fire-extinguishing**	消防人员须佩戴防毒面具、穿全身消防服。 The firemen should put on antigas masks and full fire-fighting suits.

第六部分 泄露应急处理

Section 6- Accidental Release Measures

个人预防措施、防护装备和应急程序 **Personal Precautions, protective equipment, and emergency procedures**	限制区域，直到完成清理工作。请勿触摸泄漏的材料。穿戴适当的个人防护设备，如第 8 部分所示。 Restrict access to area until completion of clean-up. Do not touch the spilled material. Wear adequate personal protective equipment as indicated in Section 8.
环境保护措施 **Environmental Precautions**	防止物质污染土壤和进入下水道或水道。 Prevent material from contaminating soil and from entering sewers or waterways.
方法和材料控制 **Methods and materials for Containment**	出于安全，阻止泄漏，可以用干砂或沙土来遏制液体泄露，立即清理泄漏。 Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately.
清理的方法和材料 **Methods and materials for cleaning up**	用惰性吸收剂(干砂或沙土)吸收溢出的材料。污染物转移到可吸收废物的容器。收集所有受污染的吸收剂和根据第 13 部分的指令处置。用洗涤剂和水清洁污染区域，收集所有受污染的洗涤水进行适当处置。 Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water; collect all contaminated wash water for proper disposal.

第七部分 操作处置与储存

Section 7- Handling and Storage

操作 **Handling**	不要以让接头短路的方式对电池进行操作。不要打开，分解，挤压或燃烧电池。 Don't handing the batteries in manner that allows terminals to short circuit. Do not open, disassemble, crush or burn battery.
储存 **Storage**	如果电池长期存放超过 3 个月，建议定期对电池充电。 If the battery is subject to storage for such a long term as more than 3 months, it is recommended to recharge the battery periodically. 长期存储: -10℃～35℃，相对湿度 60±25% Long period storage: -10℃～35℃, 60±25%R.H 不要将电池随意丢在盒子或抽屉里，以免电池之间或电池与其他金属物质发生短路。 Do not storage the battery haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects. 储存在小孩接触不到的地方。 Keep out of reach of children.

	不要将电池暴露在火源和热源附近，避免在阳光直射下存储。 Do not expose the battery to heat or fire. Avoid storage in direct sunlight. 不要与氧化和酸性物质存储在一起。 Do not store together with oxidizing and acidic materials.

第八部分 接触控制和个体防护

Section 8 - Exposure Controls/Personal Protection

工程控制 **Engineering Controls**	操作未破损的电池，没有工程控制要求。对于破损的电池，个人防护用品应包括化学品防护手套和安全眼镜。 No engineering controls are required for handling batteries that have not been damaged. Personal protective equipments for damaged batteries should include chemical resistant gloves and safety glasses.
Personal Protective Equipment **个人防护设备**	呼吸保护：当电池排气阀打开时，应尽量使通风设备开至最大，避免将打开排气阀的电芯局限在某一狭窄空间内。正常操作条件下，呼吸保护是不必要的。正常使用条件下不必考虑。 Respiratory Protection: In case of battery venting, provide as much ventilation as possible. Avoid confined areas with venting cell cores. Respiratory Protection is not necessary under conditions of normal use. Not necessary under conditions of normal use. 防护手套：正常使用条件下不必考虑。 Protective Gloves: Not necessary under conditions of normal use. 其他防护服装或设备：正常使用条件下不必考虑。 Other Protective Clothing or Equipment: Not necessary under conditions of normal use. 当电池排气阀打开时，应做好个人防护：呼吸防护，防护手套，防护服装和有护边的安全玻璃罩都是要准备的。 Personal Protection is recommended for venting battery: Respiratory Protection, Protective Gloves, Protective Clothing and safety glass with side shields.

第九部分 理化特性

Section 9- Physical and Chemical Properties

物理状态 **Physical State**	形态：固体 Form: Solid
	颜色：黑色 Color: Black
	气味：无气味 Odour: Odorless
变化条件: **Change in condition**	
pH，有浓度指示 **pH, with indication of the concentration**	无数据可提供 No data is available
熔点/凝固点 **Melting point/freezing point**	无数据可提供 No data is available
沸点，初沸点 **Boiling Point, initial boiling point**	无数据可提供 No data is available
闪点 **Flash Point**	无数据可提供 No data is available
上/下燃烧或爆炸限值 **Upper/lower flammability or explosive limits**	无数据可提供 No data is available
蒸汽压 **Vapor Pressure**	无数据可提供 No data is available
蒸汽密度: (空气= 1)Vapor **Density: (Air = 1)**	无数据可提供 No data is available
密度/相对密度 **Density/relative density**	无数据可提供 No data is available
水溶性 **Solubility in Water**	不能溶解 Insoluble
正辛醇/水分配系数 **n-octanol/water partition coefficient**	无数据可提供 No data is available
自燃温度	无数据可提供

Auto-ignition temperature	No data is available
分解温度 **Decomposition temperature**	无数据可提供 No data is available
溴阈 **Odout threshold**	无数据可提供 No data is available
蒸发速率 **Evaporation rate**	无数据可提供 No data is available
易燃性（土壤，气体） **Flammability (soil, gas)**	无数据可提供 No data is available
粘度 **Viscosity**	无数据可提供 No data is available

第十部分 稳定性和反应性

Section 10 – Stability and Reactivity

稳定性 **Stability**	常温常压下稳定。 Stable under normal temperatures and pressures.
应避免的条件 **Conditions to Avoid**	加热 70°C 以上或焚烧、变形、毁坏、粉碎、拆卸、过充电、短路，长时间暴露在潮湿的条件下。 Heat above 70°C or Incinerate, Deform, Mutilate, Crush, Disassemble, Overcharge, Short circuit, Expose over a long period to humid conditions.
危害分解物 **Hazardous Decomposition Products**	有毒烟雾，并可能形成过氧化物。 Toxic Fumes, and may form peroxides.
危险反应的可能性 **Possibility of Hazardous Reaction**	如果发生泄露，避免与强氧化剂，无机酸，强碱，卤代烃接触。 If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons.

第十一部分 毒理学信息

Section 11 – Toxicological Information

刺激 **Irritation**	内部物质暴露的情况下，蒸汽烟雾可能对眼睛和皮肤产生刺激性。 In the event of exposure to internal contents, vapor fumes may be very irritating to the eyes and skin.
致敏	无数据可提供

Sensitization	No data is available
再生毒性 **Reproductive Toxicity**	无数据可提供 No data is available
协同材料毒理学 **Toxicologically Synergistic Materials**	无数据可提供 No data is available

第十二部分 生态学信息

Section 12-Ecological Information

通用信息 **General note**	不允许未稀释或大量的产品到达地下水、水道或污水系统。 Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
化学产品在环境/可能的环境预期的行为的一种生态毒性 **Anticipated behavior of a chemical product in environment/possible environmental impact/ ecotoxicity**	无数据可提供 No data is available
土壤中移动性 **Mobility in soil**	无数据可提供 No data is available
持久性和降解性 **Persistence and Degradability**	无数据可提供 No data is available

第十三部分 废弃处置

Section 13 – Disposal Considerations

废弃处置方法 **Waste Treatment**	建议遵照国家和地方法规处置或再利用。 Recycle or dispose of in accordance with government, state & local regulations.
废弃注意事项 **Attention for Waste Treatment**	废电池不能被当做普通垃圾。不能扔进火中或置于高温下。不能解体，刺穿，破碎或类似的处理。最好的办法是回收利用。 Deserted batteries couldn't be treated as ordinary trash. Couldn't be thrown into fire or placed in high temperature. Couldn't be dissected, pierced, crushed or treated similarly. Best way is recycling.

Section 14 – Transport Information

第十四部分 运输信息

本报告适用于海运，空运和陆运

This report applies to by sea, by air and by land;

该锂离子电池（型号：ZDAB2000S）经过测试符合联合国《关于危险货物运输的建议书 实验和标准手册》第三部分，第 38.3 章节的要求。

The Li-ion Battery (model: ZDAB2000S) tested according to the requirements of the UNITED NATIONS "Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria" Part III, subsection 38.3;

该锂离子电池做了防短路保护。包括防止与同一封装内的导电材料接触可能导致的短路。

The Li-ion Battery was protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to short circuit;

包装应足以避免在运输，处理和堆放期间的机械损坏。

The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking.

包装必须小心处理，如果包装损坏，存在易燃危险。

The package must be handled with care and that a flammability hazard exists if the package is damaged.

该移动电源可以根据 2024 年 IATA 危险物品规则第 65 版包装指令 965 第 IA 部分或包装指令 966～967 第 I 部分运输。

The Power bank can be shipped by air in according to Section IA of PACKING INSTRUCTION 965, or Section I of PACKING INSTRUCTION 966～967 of the 2024 IATA Dangerous Goods regulations 65th Edition.

关于运输，引用和考虑了以下法规：

With regard to transport, the following regulations are cited and considered:

- 国际民用航空组织（ICAO）技术细则。
- The International Civil Aviation Organization (ICAO) Technical Instructions.
- 国际航空运输协会（IATA）危险物品规则。
- The International Air transport Association (IATA) Dangerous Goods Regulations.

锂电池的 UN 编号：UN3480 或 UN3481

UN number of lithium battery: UN3480 or UN3481;

UN 合适的运输名称/描述（技术名称）：锂离子电池，锂离子电池内置于设备中或锂离子电池与设备包装在一起;

UN Proper shipping name/Description (technical name): Lithium ion batteries or Lithium ion batteries contained in equipment or Lithium ion batteries packed with equipment;

UN 分类（运输危险类别）：9 类危险品（包装指令 965 第 IA 部分）或者 不适用（包装指令 966~967 第 I 部分）

UN Classification (Transport hazard class): Class 9 (PI965 Section IA) or N/A (PI966~967 Section I)

- 国际海运危险货物（IMDG）规则。
- The International Maritime Dangerous Goods (IMDG) Code.

锂电池的 UN 编号：UN3480 或 UN3481

UN number of lithium battery: UN3480 or UN3481

UN 合适的运输名称/描述（技术名称）：锂离子电池，锂离子电池内置于设备中或锂离子电池与设备包装在一起;

UN Proper shipping name/Description (technical name): Lithium ion batteries or Lithium ion batteries contained in equipment or Lithium ion batteries packed with equipment;

UN 分类（运输危险类别）：9 类危险品

UN Classification (Transport hazard class): Class 9

海洋污染物（Y / N）：N

Marine pollutant(Y/N): N

海运按照 IMO IMDG Code (inc Amdt 41-22) 可按危险货物条件办理。

The battery is classified as dangerous goods according to IMO IMDG Code (inc Amdt 41-22).

需要符合这些特殊条款：国际海运危险货物规则（IMDG）188, 230, 348, 384.

Need to meet the Special Provision: International maritime dangerous goods code (IMDG) 188, 230, 348, 384.

第十五部分 法规信息

Section 15 – Regulatory Information

《危险物品规则》

《Dangerous Goods Regulations》

《危险货物运输的建议模型规定》

《Recommendations on the Transport of Dangerous Goods Model Regulations》

《国际海上危险货物运输》

《International Maritime Dangerous Goods》

《危险货物安全运输技术指南》

《Technical Instructions for the Safe Transport of Dangerous Goods》

《危险货物分类与代码》

《Classification and code of dangerous goods》

《职业安全与健康法案》(OSHA)

《Occupational Safety and Health Act》(OSHA)

《有毒物质控制法》（TSCA）

《Toxic Substance Control Act》(TSCA)

《消费者产品安全法案》（CPSA）

《Consumer Product Safety Act》(CPSA)

《联邦环境污染控制法》（FEPCA）

《Federal Environmental Pollution Control Act》(FEPCA)

《石油污染法》（OPA）

《The Oil Pollution Act》(OPA)

《超级基金修正案和再授权法案 TitleⅢ(302/311/312/313)》(SARA)

《Superfund Amendments and Reauthorization Act TitleⅢ(302/311/312/313)》(SARA)

《资源保护和恢复法案》（RCRA）

《Resource Conservation and Recovery Act》(RCRA)

《安全饮用水法》（CWA）

《Safety Drinking Water Act》(CWA)

《加州 65 号提案》

《California Proposition 65》

《联邦条例》(CFR)

《Code of Federal Regulations》(CFR)

欧盟电池指令(2006/66/EC, 2013/56/EU)

EU Battery Directive (2006/66/EC, 2013/56/EU)

关于化学品的注册、评估、授权和限制(EC)第 1907/2006 号规例

Regulation (EC) No. 1907/2006 on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)

符合所有联邦、州和地方法律。

In accordance with all Federal, State and local laws.

第十六部分 其他信息

Section 16 – Additional Information

在我们看来上面的信息是准确的，这是我们目前能提供的最佳的信息。但是，对于这些信息，我们不对商品的性能做任何明示的或者暗示的保证，我们也不对使用这些信息造成的后果担负任何责任。 用户应当自己调查研究后决定这些信息是否适用于他们的特定用途。尽管在该文档里提出了合理的预警，但是这仅仅只是给您做参考，考量和调查。这份化学品安全技术说明书提供了安全处理和使用该产品的指南，但是它没有，也不能对所有可能发生的情景提出建议，所以您需要根据您对该产品的特定使用情况来决定是否需要其他的预防措施。

此处所包含的数据/信息作为普通版本已经审核并批准，但是本文档不包含出口控制信息。

The information above is believed to be accurate and represents the best information currently available to us. However, we makes no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. This material safety data sheet provides guidelines for the safe handling and use of this product; it does not and cannot advise on all possible situations, therefore, your specific use of this product should be evaluated to determine if additional precautions are required.

The data/information contained herein has been reviewed and approved for general release on the basis that this document contains no export controlled information.

******End of report 报告结束******

NCT Technology

UN38.3 检测报告

UN38.3 Test Report

Client 委托方	ZENDURE TECHNOLOGY CO., LIMITED 征途科技有限公司
Add. of Client 委托方地址	RM 517, NEW CITY CENTRE, 2 LEI YUE MUN ROAD, KWUN TONG, KOWLOON.HK 香港九龙观塘鲤鱼门道二号新城工商中心 517 室
Samples Description 样品名称	Add-on Battery AB2000S 扩展电源 AB2000S
Model/Type 型号规格	ZDAB2000S
Testing Laboratory 测试机构	Shenzhen NCT Testing Technology Co., Ltd. 深圳诺测检测技术有限公司 B2A101/B2A201/B2A202, Fuqiao 6th Area, Xintian, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China 广东省深圳市宝安区福海街道新田社区富桥六区 B2A101, B2A201, B2A202 Phone number 电话号码: +86-755-23218380 Email 邮箱: sales@nct-testing.com Website 网址: http://www.ncttesting.cn
Report No. 报告编号	NCT24020708XB1-1
Issued Date 发行日期	2024.05.20
Test Conclusion 测试结论: **Shown in the Conclusion of test report.** 见检测报告结论页.	

Tested by主检人: Michael Lei — Michael Lei

Approved by 批准人: Boris Lin — Boris Lin

Inspected by 审核人: Hely Wang — Hely Wang

Seal of NCT (盖章)

Date of Issue 签发日期: 2024.05.20

Ⅰ、Sample Description 样品描述

Product Name 产品名称	Add-on Battery AB2000S 扩展电源 AB2000S	**Sample Model** 样品型号	ZDAB2000S
Manufacturer 制造商	ZENDURE TECHNOLOGY CO., LIMITED 征途科技有限公司		
Address 地址	RM 517, NEW CITY CENTRE, 2 LEI YUE MUN ROAD, KWUN TONG, KOWLOON.HK 香港九龙观塘鲤鱼门道二号新城工商中心 517 室		
Factory 工厂	Guangdong Huichuang NewPower Co.,Ltd. 广东汇创新能源有限公司		
Address 地址	No. 17 Houde Road, Jiaolian Community, Dongguan City, Guangdong Province, the People's Republic of China 中华人民共和国广东省东莞市滘联社区厚德路 17 号		
Manufacturer's contact information 制造商联系信息	**Phone number** 电话号码	**Email address** 电子邮箱地址	**Website** 网址
	+86-18002190960	kang.xiong@zendure.com	--

Trade Mark 商标	ZENDURE SuperCharged	**Cell Shape** 电芯形状	Prismatic 棱柱形	**Battery Size** 电池尺寸 (L×W×T)	(345.0×180.0×276.0)mm
Nominal Voltage 标称电压	48V	**Rated Capacity** 额定容量	40Ah 1920Wh	**Limited Charge Voltage** 充电限制电压	54V
Standard Charge Current 标准充电电流	20A	**Maximum Continuous Charge Current** 最大持续充电电流	40A	**End Charge Current** 结束充电电流	2A
Cut-off Voltage 放电截止电压	37.5	**Standard Discharge Current** 标准放电电流	20A	**Maximum Discharge Current** 最大放电电流	40A
Cells Number 组成电芯数量	30PCS		**Cell Model** 电芯型号	78130198	
Sample Mass 样品重量	21663g		**Sample Physical description** 样品物理形态	Approximate Black Cuboid 黑色近长方体	
Receiving Date 接收日期	2023.08.04		**Completing Date** 完成日期	2023.09.04	

备注：该报告基于原案件号为 NCT23034776XB1-1 的 UN38.3 报告，变更了标签。

Remarks: This report is based on the original UN38.3 report by NCT (Report No.: NCT23034776XB1-1), changed the label.

Ⅱ、Standard 标准

UNITED NATIONS "Manual of Tests and Criteria" (ST/SG/AC.10/11/Rev.7+Amend.1 Section 38.3)
联合国《试验和标准手册》第七修订版及修正 1 第 38.3 节。

Ⅲ、Test Item 测试项目

T.1. ☒Altitude simulation 高度模拟
T.2. ☒Thermal test 温度试验
T.3. ☒Vibration 振动
T.4. ☒Shock 冲击
T.5. ☒External short circuit 外部短路
T.6. ☒Impact 撞击/ ☐Crush 挤压
T.7. ☒Overcharge 过充电
T.8. ☒Forced discharge 强制放电

Ⅳ、Test Method and Requirement 测试方法和要求

Tests T.1 to T.5 shall be conducted in sequence on the same cell or battery. Tests T.6 and T.8 shall be conducted using not otherwise tested cells. Test T.7 may be conducted using undamaged batteries previously used in tests T.1 to T.5 for purposes of testing on cycled batteries.

用相同的电芯或电池按照顺序进行试验 T.1 至 T.5。试验 T.6 至 T.8 用没有进行其他试验的电芯。试验 T7 可以使用原先在试验 T1 至 T5 中使用过的未损坏的电池进行，以便测试交替充电放电的电池。

Batteries of B1#~B2# 、B5#~B6# are full charged after one cycle;
Batteries of B3#~B4# 、B7#~B8# are full charged after twenty-five cycles;
Component cells of C1#~C5# are 50% charged after one cycle;
Component cells of C6#~C10# are 50% charged after twenty-five cycles;
Component cells of C11#~C20# are full discharged after one cycle;
Component cells of C21#~C30# are full discharged after twenty-five cycles;
Test environment condition: ambient temperature: 15-25℃, ambient humidity: 40-70%
电池 B1#~B2# , B5#~B6#为 1 次循环满电状态；
电池 B3#~B4#, B7#~B8#为 25 次循环满电状态；
组成电芯 C1#~C5#为 1 次循环后 50%充电状态；
组成电芯 C6#~C10#为 25 次循环后 50%充电状态；
组成电芯 C11#~C20#为 1 次循环完全放电状态；
组成电芯 C21#~C30#为 25 次循环完全放电状态；
试验环境条件：环境温度：15-25℃，环境湿度：40-70%

In order to quantify the mass loss, the following procedure is provided:

Mass loss (%) = (M1-M2)/M1 x 100

质量损失的量化值，可用以下公式计算：

质量损失(%)=(M1-M2)/M1×100

Where M1 is the mass before the test and M2 is the mass after the test. When mass loss does not exceed the values in Table below, it shall be considered as "no mass loss".

式中：M1 是试验前的质量，M2 是试验后的质量。如果质量损失不超过下表所列的数值，应视为“无质量损失”。

Mass M of cell or battery 电芯或电池的质量	Mass loss limit 质量损失限值
M＜1g	0.5%
1g≤M≤75g	0.2%
M＞75g	0.1%

Leakage means the visible escape of electrolyte or other material from a cell or battery or the loss of material (except battery casing, handling devices or labels) from a cell or battery such that the loss of mass exceeds the values in Table above.

渗漏系指可以看到的电解液或者其他物质从电芯或者电池中漏出，或电芯或电池中的物质损失（不包括电池外壳、搬运装置、或标签），失去的质量超过上表所列的数值。

In test T.1 to T.4, cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

在测试 T.1 至 T.4 中，电芯和电池须满足无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。

T.1. Altitude simulation 高度模拟

Test method 测试方法

Test cells and batteries are stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature (20±5℃).

试验电芯和电池被放置在压力等于或低于 11.6 kPa 和环境温度(20±5℃)下存放至少 6 小时。

Requirement 要求

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。

T.2. Thermal test 温度试验

Test method 测试方法

Test cells and batteries are to be stored for at least six hours at a test temperature equal to 72±2℃, followed by storage for at least six hours at a test temperature equal to -40±2℃. 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℃). For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours.

试验电芯和电池放置在试验温度等于 72±2℃的条件下存放至少 6 小时，接着再在试验温度等于-40±2℃的条件下存放至少 6 小时。两个极端试验温度之间的最大时间间隔为 30 分钟。此程序重复进行，共完成 10 次循环，接着将所有试验电芯和电池在环境温度(20±5℃)下存放 24 小时。对于大型电芯和电池，暴露于极端试验温度的时间至少应为 12 小时。

Requirement 要求

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture

and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。

T.3. Vibration 振动

Test method 测试方法

Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.

电芯和电池紧固于振动台台面，但不得造成电芯变形，并能准确可靠地传播振动。振动应是正弦波形，对数扫描频率在 7 Hz 和 200 Hz 之间，再回到 7 Hz，跨度为 15 分钟。这一振动过程须对三个互相垂直的电芯安装方位的每一方向重复进行 12 次，总共为时 3 小时。其中一个振动方向必须与端面垂直。

The logarithmic frequency sweep shall differ for cells and batteries with a gross mass of not more than 12 kg (cells and small batteries), and for batteries with a gross mass of more than 12 kg (large batteries).

作对数式频率扫描，对电芯和总质量不超过 12 千克的电池（电芯和小型电池），和对质量超过 12 千克的电池（大型电池）有所不同。

For cells and small batteries : from 7 Hz a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 gn occurs (approximately 50 Hz). A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz.

对电芯和小型电池：从 7 Hz 开始，保持 1 gn 的最大加速度，直到频率达到 18 Hz。然后将振幅保持在 0.8mm（总位移 1.6mm），并增加频率直到峰值加速度达到 8 gn（频率约为 50 Hz）。将峰值加速度保持在 8 gn 直到频率增加到 200 Hz。

For large batteries : from 7 Hz a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 2 gn occurs (approximately 25 Hz). A peak acceleration of 2 gn is then maintained until the frequency is increased to 200 Hz.

对大型电池：从 7 Hz 开始，保持 1 gn 的最大加速度，直到频率达到 18 Hz。然后将振幅保持在 0.8mm（总位移 1.6mm），并增加频率直到峰值加速度达到 2 gn（频率约为 25Hz）。将峰值加速度保持在 2 gn 直到频率增加到 200 Hz。

Requirement 要求

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。

T.4. Shock 冲击

Test method 测试方法

Test cells and batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery.

试验电芯和电池用刚性支架紧固在试验装置上，支架支撑着每个试验电池的所有安装面。

Each cell shall be subjected to a half-sine shock of peak acceleration of 150 gn and pulse duration of 6 milliseconds. Alternatively, large cells may be subjects to a half-sine shock of peak acceleration of 50 gn and pulse duration of 11 milliseconds.

每个电芯须经受峰值加速度 150 gn 和脉冲持续时间 6 ms 的半正弦波冲击。不过，大型电芯须经受峰值

加速度 50 gn 和脉冲持续时间 11 ms 的半正弦波冲击。

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. The formulas below are provided to calculate the appropriate minimum peak accelerations.

每个电池须经受半正弦波冲击，峰值加速度需要根据电池的重量来决定。小型电池的脉冲持续时间为 6 ms，大型电池的脉冲持续时间为 11ms。下面的公式是用来计算合适的最小峰值加速度。

Battery	Minimum peak acceleration	Pulse duration
Small batteries	150 g_n or result of formula $Acceleration(g_n) = \sqrt{\left(\frac{100850}{mass^*}\right)}$ whichever is smaller	6 ms
Large batteries	50 g_n or result of formula $Acceleration(g_n) = \sqrt{\left(\frac{30000}{mass^*}\right)}$ whichever is smaller	11 ms

* Mass is expressed in kilograms.

电池	最小峰值加速度	脉冲持续时间
小型电池	150 gn 或计算结果中取最小的值 加速度（gn）= $\sqrt{(\frac{100850}{mass})}$	6ms
大型电池	50 gn 或计算结果中取最小的值 加速度（gn）= $\sqrt{(\frac{30000}{mass})}$	11 ms

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.

每个电芯或电池须在三个互相垂直的电芯或电池安装方位的正方向经受三次冲击，接着在反方向经受三次冲击，总共经受 18 次冲击。

Requirement 要求

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。

T.5. External short circuit 外部短路

Test method 测试方法

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℃, measured on the external case. This period of time depends on the size and design of the cell or battery and should be assessed and documented. If this assessment is not feasible, the exposure time shall be at least 6 hours for small cells and small batteries, and 12 hours for large cells and large batteries. Then the cell or battery at 57± 4℃ shall be subjected to one short circuit condition with a total external resistance of less than 0.1 ohm.

试验电芯或电池需要加热一段时间，以使其外壳温度均匀稳定地达到 57±4℃。加热时间的长短是由电芯或电池的尺寸和设计来决定的，这个加热时间需要评估并记录。如果这个加热时间不好评估的话，对于小电

芯和小电池需要在此温度下放置至少 6 个小时，对于大电芯和大电池至少放置 12 个小时。然后使电芯或电池在 57±4℃下经受总外电阻小于 0.1Ω 的短路条件。

This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 57±4℃, 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.

短路测试持续到电芯或电池外壳温度回到 57±4℃后至少持续 1 小时，针对大电池，外壳温度需要下降到测试过程中监控到的最大温度的一半以下。

The short circuit and cooling down phases shall be conducted at least at ambient temperature.

短路测试和冷却阶段至少应该在环境温度下进行。

Requirement 要求

Cells and batteries meet this requirement if their external temperature does not exceed 170℃ and there is no disassembly, no rupture and no fire during the test and within six hours after test.

电芯和电池外壳温度不超过 170℃，并且在试验过程中及试验后 6 小时内无解体、无破裂，无起火。

T.6. Impact / Crush 撞击/挤压

Test procedure – Impact (applicable to cylindrical cells not less than 18.0 mm in diameter)

测试步骤 – 撞击（适用于直径大于等于 18.0 毫米以上的圆柱形电芯）

The test sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm ± 0.1mm diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, Type 316 stainless steel bar is to be placed across the centre of the sample. A 9.1 kg ± 0.1 kg mass is to be dropped from a height of 61 ± 2.5 cm at the intersection of the bar and sample in a controlled manner using a near frictionless, vertical sliding track or channel with minimal drag on the falling mass. The vertical track or channel used to guide the falling mass shall be oriented 90 degrees from the horizontal supporting surface.

试样电芯或电芯组件放在平坦光滑表面上，一根 316 型不锈钢棒横放在试样中心，钢棒直径 15.8 毫米±0.1 毫米，长度至少 6 厘米，或电芯最长端的尺度，取二者之长者。将一块 9.1 千克±0.1 千克的重锤从 61±2.5 厘米高度跌落到钢棒和试样交叉处，使用一个几乎没有摩擦的、对落体重锤阻力最小的垂直轨道或管道加以控制。垂直轨道或管道用于引导落锤沿与水平支撑表面呈 90 度落下。

The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8 mm ± 0.1mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.

受撞击的试样，纵轴应与平坦表面平行并与横放在试样中心的直径 15.8±0.1 毫米弯曲表面的纵轴垂直。每一试样只经受一次撞击。

Test procedure – Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18.0 mm in diameter)

测试步骤– 挤压（适用于棱柱形，袋状，硬币/纽扣电芯和圆柱形电芯直径小于 18.0 毫米）

A cell or component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5 cm/s at the first point of contact. The crushing is to be continued until the first of the three options below is reached.

将电芯或电芯组件放在两个平面之间挤压，挤压力度逐渐加大，在第一个接触点上的速度大约为 1.5 cm/s。挤压持续进行，直到出现以下三种情况之一：

(a) The applied force reaches 13 kN ± 0.78 kN;

(b) The voltage of the cell drops by at least 100 mV;

(c) The cell is deformed by 50% or more of its original thickness.

(a)施加的力达到 13 kN ± 0.78 kN；

(b)电芯的电压下降至少 100mV；

(c)电芯形变达到原始厚度的 50%或更多。

Once the maximum pressure has been obtained, the voltage drops by 100 mV or more, or the cell is deformed by at least 50% of its original thickness, the pressure shall be released.

一旦达到最大压力、电压下降 100mV 或更多，或电芯形变至少达到原始厚度的 50%，即可解除压力。

A prismatic or pouch cell shall be crushed by applying the force to the widest side. A button/coin cell shall be crushed by applying the force on its flat surfaces. For cylindrical cells, the crush force shall be applied perpendicular to the longitudinal axis.

棱柱形或袋装电芯须从最宽的面施压。纽扣/硬币形电芯应从其平坦表面施压。圆柱形电芯应从与纵轴垂直的方向施压。

Each test cell or component cell is to be subjected to one crush only. The test sample shall be observed for a further 6 h. The test shall be conducted using test cells or component cells that have not previously been subjected to other tests.

每个试样电芯或电芯组件只做一次挤压试验。试样须继续观察 6 小时。试验须使用之前未做过其他试验的试样电芯或电芯组件进行。

Requirement 要求

Cell and component cells meet this requirement if their external temperature does not exceed 170℃ and there is no disassembly and no fire during the test and within six hours after test.

电芯和电芯组件外壳温度不超过 170℃，并且在试验过程中及试验后 6 小时内无解体，无起火。

T.7. Overcharge 过充电

Test method 测试方法

The charge current shall be twice the manufacturer's recommended maximum continuous charge current. The minimum voltage of the test shall be as follows:

充电电流为制造商推荐的最大持续充电电流的两倍。试验的最小电压如下：

(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.

(b) When the manufacturer's recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage.

(a) 制造商推荐的充电电压不大于 18 伏时，试验的最小电压应是电池最大充电电压的两倍或 22 伏两者中的较小者。

(b) 制造商推荐的充电电压大于 18 伏时，试验的最小电压应是电池最大充电电压的 1.2 倍。

Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours.

试验应在环境温度下进行。进行试验的时间应为 24 小时。

Requirement 要求

Rechargeable batteries meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

充电电池应在试验过程中和试验后 7 天内无解体，无起火。

T.8. Forced discharge 强制放电

Test method 测试方法

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.

每个电芯在环境温度下与 12V 直流电电源串联在起始电流等于制造商给定的最大放电电流的条件下强制放电。

The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell is forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere).

试样电芯与一个适当大小的电阻负载串联以调节到规定大小的放电电流。每个电芯的放电时间（单位为 h）

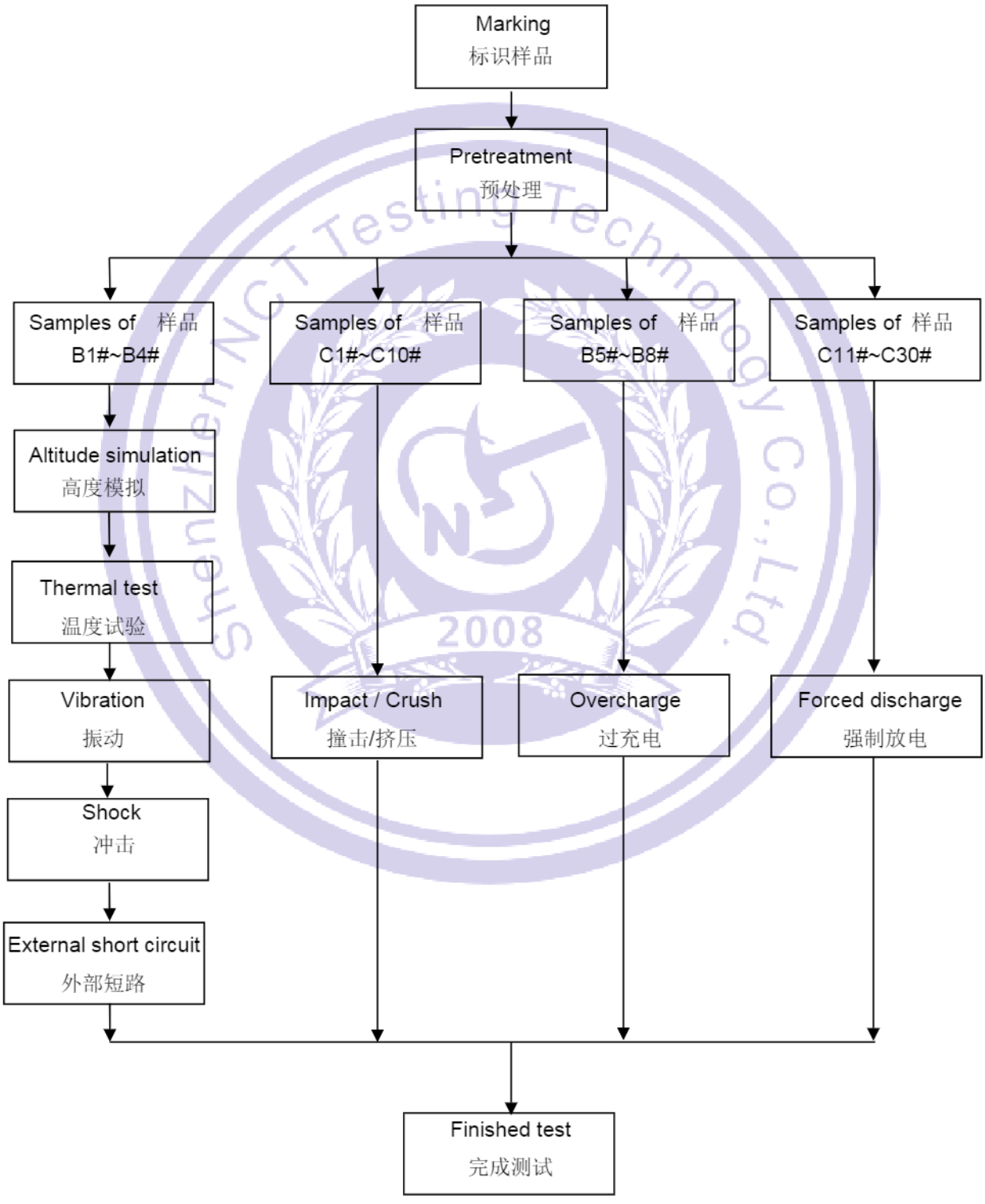
等于电芯的额定容量除以试验初始放电电流（单位 A）。

Requirement 要求

Primary or rechargeable cells meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

原电芯或充电电芯应在试验过程中和试验后 7 天内无解体，无起火。

Ⅴ、Test Procedure 测试流程



Ⅵ、Test Data 测试数据

T.1. Altitude simulation 高度模拟

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 1 次循环后满电状态	B1#	21663	51.756	21662	51.726	0.005	99.942	Pass 合格
	B2#	21636	51.615	21636	51.592	0.000	99.955	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B3#	21625	51.711	21624	51.679	0.005	99.938	Pass 合格
	B4#	21649	51.642	21649	51.615	0.000	99.948	Pass 合格

Notes 注释: Atmospheric pressure 大气压强:1.013×10^{5}Pa, Ambient temperature 环境温度: 23.2℃
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。

T.2. Thermal test 温度试验

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 1 次循环后满电状态	B1#	21662	51.726	21660	51.393	0.009	99.356	Pass 合格
	B2#	21636	51.592	21635	51.267	0.005	99.370	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B3#	21624	51.679	21622	51.348	0.009	99.360	Pass 合格
	B4#	21649	51.615	21646	51.282	0.014	99.355	Pass 合格

Notes 注释: Atmospheric pressure 大气压强:1.013×10^{5}Pa, Ambient temperature 环境温度: 23.1℃
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。

T.3. Vibration 振动

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 1 次循环后满电状态	B1#	21660	51.393	21659	51.365	0.005	99.946	Pass 合格
	B2#	21635	51.267	21635	51.235	0.000	99.938	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B3#	21622	51.348	21621	51.323	0.005	99.951	Pass 合格
	B4#	21646	51.282	21646	51.252	0.000	99.941	Pass 合格

Notes 注释: Atmospheric pressure 大气压强:1.013×10^5Pa, Ambient temperature 环境温度: 23.5℃
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。

T.4. Shock 冲击

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 1 次循环后满电状态	B1#	21659	51.365	21659	51.330	0.000	99.932	Pass 合格
	B2#	21635	51.235	21635	51.210	0.000	99.951	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B3#	21621	51.323	21620	51.291	0.005	99.938	Pass 合格
	B4#	21646	51.252	21645	51.225	0.005	99.947	Pass 合格

Notes 注释: Atmospheric pressure 大气压强:1.013×10^5Pa, Ambient temperature 环境温度: 23.6℃
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。

T.5. External short circuit 外部短路

The state of cells 样品状态	No. 编号	External Peak temperature(℃) 电池表面最高温度(℃)	Status 结果
Full charged after one cycle 1 次循环后满电状态	B1#	57.9	Pass 合格
	B2#	57.5	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B3#	58.3	Pass 合格
	B4#	58.1	Pass 合格
Notes 注释: Atmospheric pressure 大气压强:1.013×10^{5}Pa, Ambient temperature 环境温度: 23.4℃ There is no disassembly, no rupture and no fire during the test and within six hours after test. 电池在测试中和测试后 6 小时内未解体、未破裂，未起火。			

T.6. Crush 挤压

The state of cells 样品状态	No. 编号	External Peak temperature(℃) 电池表面最高温度(℃)	Status 结果
50% charged after one cycle 1 次循环后 50%充电状态	C1#	23.4	Pass 合格
	C2#	24.2	Pass 合格
	C3#	23.5	Pass 合格
	C4#	23.9	Pass 合格
	C5#	24.1	Pass 合格
50% charged after twenty-five cycles 25 次循环后 50%充电状态	C6#	23.7	Pass 合格
	C7#	24.3	Pass 合格
	C8#	23.8	Pass 合格
	C9#	24.2	Pass 合格
	C10#	23.6	Pass 合格
Notes 注释: Atmospheric pressure 大气压强:1.013×10^{5}Pa, Ambient temperature 环境温度: 23.2℃ There is no disassembly and no fire during the test and within six hours after test. 电芯在测试中和测试后 6 小时内未解体、未起火。			

T.7. Overcharge 过充电

The state of cells 样品状态	No. 编号	Status 结果
Full charged after one cycle 1 次循环后满电状态	B5#	Pass 合格
	B6#	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B7#	Pass 合格
	B8#	Pass 合格
Notes 注释: Atmospheric pressure 大气压强:1.013×10^5Pa, Ambient temperature 环境温度: 23.3℃ There is no disassembly and no fire during the test and within seven days after the test. 电池在测试中和测试后 7 天内未解体，未起火。		

T.8. Forced discharge 强制放电

The state of cells 样品状态	No. 编号	Status 结果
Full discharged after one cycle 1 次循环完全放电状态	C11#	Pass 合格
	C12#	Pass 合格
	C13#	Pass 合格
	C14#	Pass 合格
	C15#	Pass 合格
	C16#	Pass 合格
	C17#	Pass 合格
	C18#	Pass 合格
	C19#	Pass 合格
	C20#	Pass 合格
Full discharged after twenty-five cycles 25 次循环完全放电状态	C21#	Pass 合格
	C22#	Pass 合格
	C23#	Pass 合格
	C24#	Pass 合格
	C25#	Pass 合格
	C26#	Pass 合格
	C27#	Pass 合格
	C28#	Pass 合格

	C29#	Pass 合格
	C30#	Pass 合格

Notes 注释: Atmospheric pressure 大气压强:1.013×10^5Pa, Ambient temperature 环境温度: 23.4℃
There is no disassembly and no fire during the test and within seven days after the test.
电芯在测试中和测试后 7 天内未解体，未起火。

Ⅶ、Conclusion 结论

No. 编号	Test item 测试项目	Sample number 样品数量	Test reference 测试参考	Conclusion 结论
1	Altitude simulation 高度模拟	B1#~B4#	UN Manual of Test and Criteria, part Ⅲ, subsection 38.3.4.1 UN 试验和标准手册,第Ⅲ部分,第 38.3.4.1 节	Pass 合格
2	Thermal test 温度试验		UN Manual of Test and Criteria, part Ⅲ, subsection 38.3.4.2 UN 试验和标准手册,第Ⅲ部分,第 38.3.4.2 节	Pass 合格
3	Vibration 振动		UN Manual of Test and Criteria, part Ⅲ, subsection 38.3.4.3 UN 试验和标准手册,第Ⅲ部分,第 38.3.4.3 节	Pass 合格
4	Shock 冲击		UN Manual of Test and Criteria, part Ⅲ, subsection 38.3.4.4 UN 试验和标准手册,第Ⅲ部分,第 38.3.4.4 节	Pass 合格
5	External short circuit 外部短路		UN Manual of Test and Criteria, part Ⅲ, subsection 38.3.4.5 UN 试验和标准手册,第Ⅲ部分,第 38.3.4.5 节	Pass 合格
6	Impact/Crush 撞击/挤压	C1#~C10#	UN Manual of Test and Criteria, part Ⅲ, subsection 38.3.4.6 UN 试验和标准手册,第Ⅲ部分,第 38.3.4.6 节	Pass 合格
7	Overcharge 过度充电	B5#~B8#	UN Manual of Test and Criteria, part Ⅲ, subsection 38.3.4.7 UN 试验和标准手册,第Ⅲ部分,第 38.3.4.7 节	Pass 合格
8	Forced discharge 强制放电	C11#~C30#	UN Manual of Test and Criteria, part Ⅲ, subsection 38.3.4.8 UN 试验和标准手册,第Ⅲ部分,第 38.3.4.8 节	Pass 合格

The submitted samples were complied with the stated requirements of UN manual of test and criteria, part Ⅲ, subsection 38.3, the test result is qualified.

经检测，提交的测试样品均符合 UN38.3 的要求，测试结论为合格。

Ⅷ、Photo of The Sample 样品图片

Model 型号: ZDAB2000S

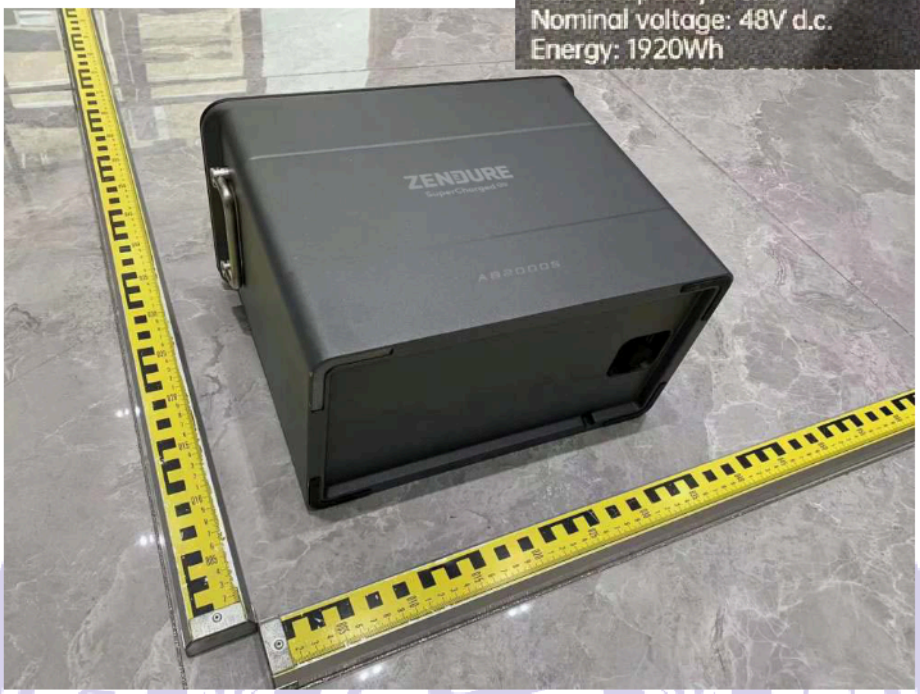


Photo 1 Front 正面

Photo 2 Rear 反面

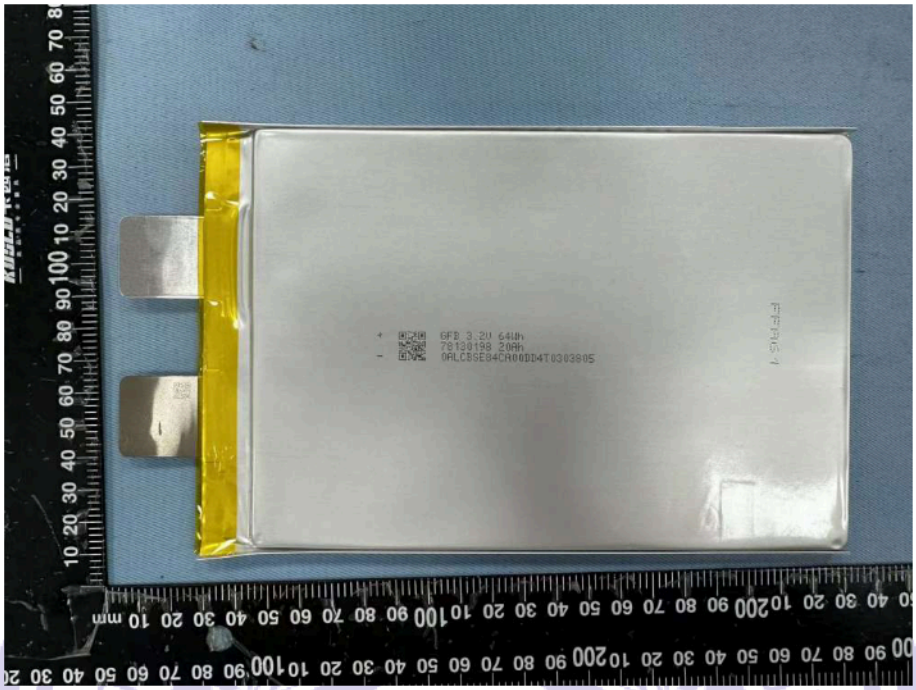


Photo 3 Internal Cell 内部电芯

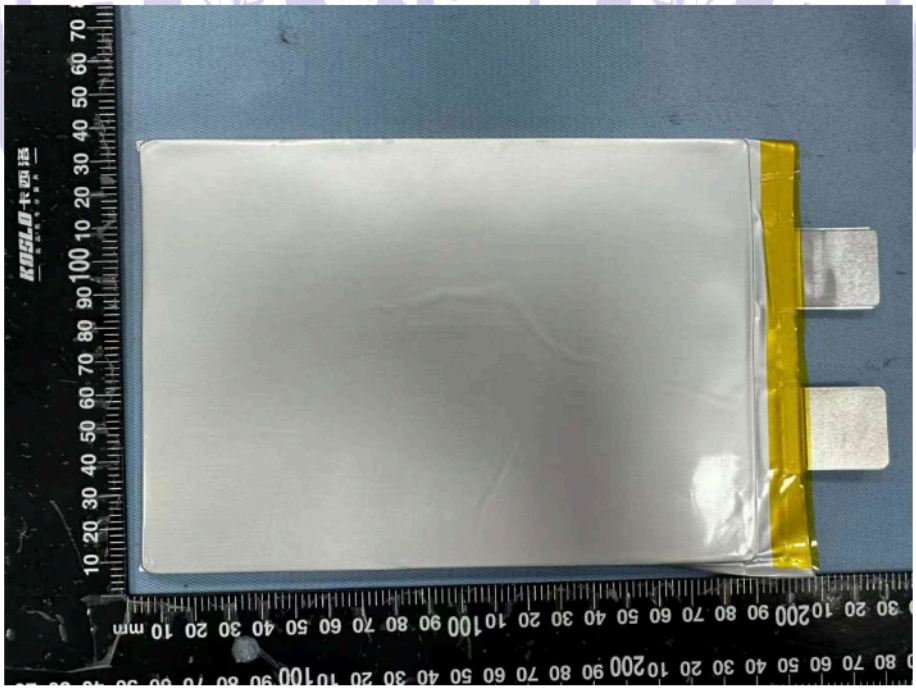


Photo 4 Internal Cell 内部电芯

注意事项

Important Notice

1. The test report is invalid without the official stamp of NCT.
   本报告书无 NCT 盖章无效.
2. Nobody is allowed to photocopy or partly photocopy this test report without written permission of NCT.
   未经 NCT 书面同意，不得复制或部分地复制本报告书。
3. The test report is invalid without the signatures of Ratifier, Reviewer and Testing engineer.
   本报告书无批准人、审核人、及主检人签名无效。
4. The report is invalid when anything of following happens – illegal transfer, reproduce, embezzlement, imposture, modification or tampering in any media form.
   私自转让、复制、盗用、冒用、涂改、或以任何媒体形式篡改的报告书无效。
5. Objections to the test report must be submitted to NCT within 15 days.
   对报告书若有异议，应于收到报告之日起 15 天内向本公司提出。
6. The test report is valid for the tested samples only.
   本报告仅对测试样品有效。
7. The Chinese contents in this report are only for reference.
   本报告中的中文内容仅供参考。

******End of Report 报告结束******

UN38.3 测试概要/ UN38.3 Test Summary

单位信息 Company Information	
Consignor 委托单位	ZENDURE TECHNOLOGY CO., LIMITED 征途科技有限公司 RM 517, NEW CITY CENTRE, 2 LEI YUE MUN ROAD, KWUN TONG, KOWLOON.HK 香港九龙观塘鲤鱼门道二号新城工商中心 517 室 Tel/电话: +86-18002190960 Mail/邮箱: kang.xiong@zendure.com
Manufacturer 制造商	ZENDURE TECHNOLOGY CO., LIMITED 征途科技有限公司 RM 517, NEW CITY CENTRE, 2 LEI YUE MUN ROAD, KWUN TONG, KOWLOON.HK 香港九龙观塘鲤鱼门道二号新城工商中心 517 室 Tel/电话: +86-18002190960 Mail/邮箱: kang.xiong@zendure.com
Test Lab 测试单位	Shenzhen NCT Testing Technology Co., Ltd. 深圳诺测检测技术有限公司 B2A101/B2A201/B2A202, Fuqiao 6th Area, Xintian, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China 广东省深圳市宝安区福海街道新田社区富桥六区 B2A101, B2A201, B2A202 Tel/电话：+86-755-23218380, Mail/邮箱：sales@nct-testing.com Website/网址: http://www.ncttesting.cn

电池信息 Battery Information			
Name 名称	Add-on Battery AB2000S 扩展电源 AB2000S	**Battery/Cell Classification** 电池/电芯类别	Multi-cell Li-ion battery pack 多电芯锂离子电池组
Model 型号	ZDAB2000S	**Appearance** 外观	Approximate Black Cuboid 黑色近长方体
Basic parameter 基本参数	48V, 40Ah	**Sample Mass** 样品重量	21663g
Rated Energy 额定能量	1920Wh	**Lithium Content** 锂含量	N/A 不适用

测试信息 Test Information			
Test Report No. 测试报告编号	NCT24020708XB1-1	**Issue Date of Test Report** 测试报告签发时间	2024.05.20
Test Reference 测试依据	UNITED NATIONS “Manual of Tests and Criteria” (ST/SG/AC.10/11/Rev.7+Amend.1 Section 38.3) 联合国《试验和标准手册》第七修订版及修正 1 第 38.3 节。		

T1: Altitude simulation 高度模拟	Pass 合格	**T2: Thermal test** 温度试验	Pass 合格	**T3: Vibration** 振动	Pass 合格
T4: Shock 冲击	Pass 合格	**T5: External short circuit** 外部短路	Pass 合格	**T6 重物冲击 Impact**	Pass 合格
T7: Overcharge 过度充电	Pass 合格	**T8: Forced discharge** 强制放电	Pass 合格	**UN38.3.3(f)**	N/A 不适用
				UN38.3.3(g)	N/A 不适用
Signature 签名 **Technical Director 技术总监**		Boris Lin 林博谟	**Issue Date** 签发日期	2024.05.20	

中国认可
检验
INSPECTION
CNAS IB0078

危险物品
DANGEROUS GOODS

航空运输危险性鉴别报告

Identification and Classification Report for Air Transport of Goods

此报告本年度有效
有效期至2024年12月31日

报告编号：
Issued No.: PEKGZ202405224250WY080001

生效日期：
Effective Date: 2024.05.23

委托单位：征途科技有限公司

Applicant: ZENDURE TECHNOLOGY CO., LIMITED

物品名称：扩展电源AB2000S ZDAB2000S 48V 40Ah 1920Wh

Name of Goods: Add-on Battery AB2000S ZDAB2000S 48V 40Ah 1920Wh

北京迪捷姆空运技术开发有限公司

Beijing DGM Air Transport Technology Development Co.,Ltd.

报 告 书 使 用 约 定

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项目编号 Item No.		PEKGZ202405224250	签发日期 Issued Date	2024. 05. 23
鉴别目的 Identification Purpose		是否属于航空运输危险物品 Dangerous Goods or not restricted	鉴别日期 Identification Date	2024. 05. 23
鉴别依据 Identification Criteria		IATA DGR 65th, 2024		
物品名称 Name of Goods	中文 Chinese	扩展电源AB2000S ZDAB2000S 48V 40Ah 1920Wh		
	英文 English	Add-on Battery AB2000S ZDAB2000S 48V 40Ah 1920Wh		
生产厂家 Manufacturer		征途科技有限公司 ZENDURE TECHNOLOGY CO., LIMITED		
件数 Pieces			注：本栏内容为托运人或其代理人在使用本报告书时候填写的运输信息，不属于鉴定内容。运输信息与报告书的关联性以及实际运输货物与报告书的一致性由托运人或其代理人保证，如发生任何不一致由托运人或其代理人承担全部责任。 （请认真填写本栏内容，并盖章） 负责人：　　联系方式：	
运单号 Air waybill No.				
目的港 Destination				
物品信息 Nature of the goods		该样品为黑色近长方体电池。 型号：ZDAB2000S 尺寸：（345×180×276）mm 每包装件中电池/电芯数量：1 每包装件中电池/电芯净重：21.663kg 该电池已经做好防短路措施并装入坚固的外包装内。 该锂电池不属于召回电池，不属于废弃和回收电池，并按照DGR3.9.2.6.1(e)规定的质量体系进行制造 根据委托方所提供的声明：本报告所述锂离子电池（或电芯）交付运输时，其荷电状态不超过设计额定容量的30%。 （注：单块电池的重量约为21663g。） This sample is black almost cuboid battery. Model: ZDAB2000S Size: （345×180×276）mm Number of batteries / cells per package: 1 Net quantity of batteries/cells per package: 21.663kg Batteries have been protected so as to prevent short circuits and packed in strong rigid outer packagings. The lithium batteries don' t belong to batteries returned to the manufacturer for safety reasons, are not waste lithium batteries and not lithium batteries being shipped for recycling or disposal, are manufactured under a quality management program as described in 3.9.2.6.1(e). Lithium ion cells and batteries must be offered for transport at a state of charge(SoC) not exceeding 30% of their rated design capacity.		

项目编号 Item No.		PEKGZ202405224250
物品名称 Name of Goods	中文 Chinese	扩展电源AB2000S ZDAB2000S 48V 40Ah 1920Wh
	英文 English	Add-on Battery AB2000S ZDAB2000S 48V 40Ah 1920Wh
鉴别结论 Conclusions		该物品为锂离子/聚合物电池，单独包装。额定瓦特小时为1920Wh。已通过 UN38.3 测试。 参考有关资料，根据DGR有关规定，该物质分类识别为第9类（或项）危险品，UN3480。 This goods is lithium ion/polymer battery, packed individually. Watt-hour rating is 1920Wh. Each battery is of a type proved to meet the Requirements of each test in the UN MANUAL OF TESTS AND CRITERIA, Part III, sub-section 38.3. According to IATA DGR this substance is classified as dangerous goods Class (or division) 9, UN3480.

运输危险性建议 Suggestion for Transport	UN/ID 编号 UN/ID No.	运输专用名称 Proper Shipping Name	类或项 Class or Div. (次要危险性) (Subsidiary Risk)	包装等级 Packing Group
	UN3480	Lithium ion batteries	9	/

包装说明 Packing Inst.	客货机 Passenger and Cargo Aircraft	Forbidden
	仅限货机 Cargo Aircraft only	965，IA
注意事项 Remarks	包装必须达到II级包装的性能标准 Packagings must meet Packing Group II performance standards.	

主检员 Prepared by: 李子华　审核人 Checked by: 毕亿亿　批准人 Approved by:

报告单位（盖章） Stamp

制单： 王义

北京迪捷姆空运技术开发有限公司

项目编号：PEKGZ202405224250

物品名称：扩展电源 AB2000S ZDAB2000S 48V 40Ah 1920Wh

电池/电芯 Battery / Cell:

包装件 Package:

锂电池 UN38.3 试验概要 Lithium Battery Test Summary

项目编号：PEKGZ202405224250

单位信息 Company Information	
委托单位 Consignor	征途科技有限公司/ZENDURE TECHNOLOGY CO., LIMITED 香港九龙观塘鲤鱼门道二号新城工商中心 517 室/RM 517, NEW CITY CENTRE, 2 LEI YUE MUN ROAD, KWUN TONG, KOWLOON.HK 电话/Tel：+86-18002190960 邮箱/Mail：kang.xiong@zendure.com 网址/Website:/
生产单位 Manufacturer	征途科技有限公司/ZENDURE TECHNOLOGY CO., LIMITED 香港九龙观塘鲤鱼门道二号新城工商中心 517 室/RM 517, NEW CITY CENTRE, 2 LEI YUE MUN ROAD, KWUN TONG, KOWLOON.HK 电话/Tel：+86-18002190960 邮箱/Mail：kang.xiong@zendure.com 网址/Website:/
测试单位 Test Lab	深圳诺测检测技术有限公司 Shenzhen NCT Testing Technology Co., Ltd. 广东省深圳市宝安区福海街道新田社区富桥六区 B2A101,B2A201,B2A202 B2A101/B2A201/B2A202, Fugiao 6th Area, Xintian, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China 电话/Tel：+86-755-23218380 邮箱/Mail：sales@nct-testing.com 网址/Website:http://www.ncttesting.cn

电池信息 Battery Information			
名称 Name	扩展电源 AB2000S Add-on Battery AB2000S	电池/电芯类别 Battery/Cell Classification	锂离子电池 Li-ion Battery
型号 Type	ZDAB2000S	商标 Trademark	ZENDURE
额定电压 Normal Voltage	48V	额定容量 Rated Capacity	40Ah
额定能量 Watt-hour rating	1920Wh	外观/Appearance	黑色近长方体 Approximate Black Cuboid
质量/Mass	21663g	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	NCT24020708XB1-1		测试报告签发日期 Date of Test Report	2024-05-20	
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	通过 Pass	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	2024-05-22	

此扫描件有效