TEST REPORT
IEC 62133-2
Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications –
Part 2: Lithium systems

Report reference No. .....:	AOC250728006S
Tested by(name + signature) .....:	Alice Zhou
Approved by(name +signature) .....:	Robin Liu
Date of issue ..... ……:	2025-08-05
Contents .....:	28 pages

Testing laboratory	
Name.....:	Shenzhen AOCE Electronic Technology Service Co., Ltd.
Address .....:	Room 202, 2nd Floor, No.12th Building of Xinhe Tongfuyu Industrial Park, Fuhai Street, Baoan District, Shenzhen, Guangdong, China
Testing location .....:	As above
Client	
Name .....:	Dongguan Pinguan sports technology Co., LTD
Address .....:	Room 303, Building 3, No. 8, Shajingkeng Road, Liaobu Town, Dongguan City, Guangdong Province
Manufacturer	
Name……:	Dongguan Pinguan sports technology Co., LTD
Address……:	Room 303, Building 3, No. 8, Shajingkeng Road, Liaobu Town, Dongguan City, Guangdong Province
Test specification	
Standard .....:	IEC/EN 62133-2:2017 ; IEC/EN 62133-2:2017/AMD1 :2021
Test procedure .....:	Test report
Non-standard test method .....:	N/A
Test item Description.....:	Smart Li-Polymer Battery Pack
Trade Mark .....:	N/A
Model and/or type reference.....:	PG-8500
Rating(s)……:	Input: DC 5V 2A Output: DC 5V, 2A Capacity: 3.85V, 8500mAh

Summary of testing:	
Tests performed (name of test and test clause): 7.2.1 Continuous charging at constant voltage (cell); 7.2.2 Moulded case stress at high ambient temperature (battery); 7.2.2A Temperature cycling (cell and battery); 7.3.1 External short (cells); 7.3.2 External short (battery); 7.3.3 Free fall (cell and battery); 7.3.4 Thermal abuse (cell); 7.3.5 Crush (cell); 7.3.6 Overcharge (battery); 7.3.7 Forced discharge (cell); 7.3.8.1 Vibration (battery); 7.3.8.2 Mechanical shock (battery); 7.3.8A Low pressure (cell); 7.3.8B High rate charge (cell); 7.3.8C Free fall of batteries installed in the device; 7.3.8D Overcharge protection (battery); 7.3.9 Forced internal short circuit (cell). 8.2 Small cell and battery safety information. Tests are made with the number of cells and batteries specified in EN 62133-2:2017 (Second Edition) Table 2.	**Testing location:** Shenzhen AOCE Electronic Technology Service Co., Ltd. Room 202, 2nd Floor, No.12th Building of Xinhe Tongfuyu Industrial Park, Fuhai Street, Baoan District, Shenzhen, Guangdong, China
Summary of compliance with National Differences: European differences ☒ **The product fulfils the requirements of** EN 62133-2:2017/AMD1 :2021	

Test item particulars.....:	
Classification of installation and use.....:	To be defined in final product
Supply connection.....:	DC port
Recommend charging method declared by the manufacturer ..... :	Charging the battery with 2000mA constant current until 5.25V and then constant voltage until charging current reduces to 200mA at ambient 20°C±5°C Charging the battery with 1.7A constant current until 4.45V at ambient 0°C~45°C (for cell)
Discharge current (0,2 I_t A) ..... :	1.7A
Specified final voltage ..... :	3.2V
Chemistry ..... :	☐ nickel systems ..... ☒ lithium systems
Recommend of charging limit for lithium system	
Upper limit charging voltage per cell.....:	4.45 V
Maximum charging current.....:	4.25A (for cell) USB port: DC 5V/ 2A (for Smart Li-Polymer Battery Pack)
Charging temperature upper limit.....:	45°C
Charging temperature lower limit.....:	0°C
Polymer cell electrolyte type ..... :	☐ gel polymer ☐ solid polymer ☒ N/A
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 .....:	2025-06-11
Date (s) of performance of tests.....:	2025-06-11 to 2025-07-28

General remarks:

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 testing laboratory.
"(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.

Name and address of factory (ies) ..... :	Same as manufacturer.

General product information:

This battery is constructed with one lithium-ion cell

The main features of the battery are shown as below (clause 7.1.1):

Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Cut-off Voltage
PG-8500	8500mAh	5V	DC 5V 2A	DC 5V 2A	DC 5V 2A	DC 5V 2A	5V	3.2V

The main features of the cell in the battery are shown as below (clause 7.1.1):

Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Cut-off Voltage
145266	8500mAh	3.85V	1.6A	1.6A	4.25A	4.25A	4.45V	3.2V

The main features of the cell in the battery pack are shown as below (clause 7.1.2):

Model	Upper limit charge voltage	Taper-off current	Lower charge temperature	Upper charge temperature
145266	4.25V	100mA	0°C	45°C

Label:

Smart Li-Polymer Battery Pack
PG-8500

Input: DC 5V 2A

Output: DC 5V, 2A

Capacity: 3.85V, 8500mAh

Manufacturer: Dongguan Pinguan sports technology Co., LTD

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Clause	Requirement + Test	Result - Remark	Verdict
4	**Parameter measurement tolerances**		**P**
	Parameter measurement tolerances		P
5	**General safety considerations**		**P**
5.1	**General**		P
	Cells and batteries so designed and constructed that they are safe under conditions of both intended use and reasonably foreseeable misuse		P
5.2	**Insulation and wiring**		P
	The insulation resistance between the positive terminal and externally exposed metal surfaces of the battery (excluding evclectrical contact surfaces) is not less than 5 MΩ	No metal case exists.	N/A
	Insulation resistance (MΩ) ..... :		—
	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		P
	Orientation of wiring maintains adequate creepage and clearance distances between conductors		P
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse		P
5.3	**Venting**		P
	Battery cases and cells incorporate a pressure relief mechanism or are constructed so that they relieve excessive internal pressure at a value and rate that will preclude rupture, explosion and self-ignition	Venting mechanism exists on the narrow side of the pouch cell.	P
	Encapsulation used to support cells within an outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief		N/A
5.4	**Temperature/voltage/current management**		P
	Batteries are designed such that abnormal temperature rise conditions are prevented	Overcharge, over discharge, over current and short-circuit proof circuit used in this battery. See tests of clause 7.	P
	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer	See above.	P
	Batteries are provided with specifications and charging instructions for equipment manufacturers so that associated chargers are designed to maintain charging within the temperature, voltage and current limits specified	The charging limits specified in the manufacturer's specification.	P
5.5	**Terminal contacts**		P

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Clause	Requirement + Test	Result - Remark	Verdict
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current		P
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance	Electrode tab complied with the requirement.	P
	Terminal contacts are arranged to minimize the risk of short circuits	Complied.	P
5.6	**Assembly of cells into batteries**		P
5.6.1	General		P
	Each battery have an independent control and protection for current, voltage, temperature and any other parameter required for safety and to maintain the cells within their operating region	Protective circuit equipped on battery.	P
	This protection may be provided external to the battery such as within the charger or the end devices		N/A
	If protection is external to the battery, the manufacturer of the battery provide this safety relevant information to the external device manufacturer for implementation		N/A
	If there is more than one battery housed in a single battery case, each battery have protective circuitry that can maintain the cells within their operating regions		P
	Manufacturers of cells specify current, voltage and temperature limits so that the battery manufacturer/designer may ensure proper design and assembly	Current, voltage and temperature limits specified by cell manufacturer.	P
	Batteries that are designed for the selective discharge of a portion of their series connected cells incorporate circuitry to prevent operation of cells outside the limits specified by the cell manufacturer		N/A
	Protective circuit components added as appropriate and consideration given to the end-device application		P
	The manufacturer of the battery provide a safety analysis of the battery safety circuitry with a test report including a fault analysis of the protection circuit under both charging and discharging conditions confirming the compliance	Safety analysis report provide by manufacturer.	P
5.6.2	Design recommendation		P
	For the battery consisting of a single cell or a single cellblock, it is recommended that the charging voltage of the cell does not exceed the upper limit of the charging voltage specified in Table 2		P

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Clause	Requirement + Test	Result - Remark	Verdict
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks, it is recommended that the voltages of any one of the single cells or single cellblocks does not exceed the upper limit of the charging voltage, specified in Table 2, by monitoring the voltage of every single cell or the single cellblocks	Battery charging voltage: 4.45V/cell, not exceed 4.45V specified in Table 2.	P
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks, it is recommended that charging is stopped when the upper limit of the charging voltage is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks		N/A
	For batteries consisting of series-connected cells or cell blocks, nominal charge voltage not be counted as an overcharge protection		P
	For batteries consisting of series-connected cells or cell blocks, cells have closely matched capacities, be of the same design, be of the same chemistry and be from the same manufacturer		P
	It is recommended that the cells and cell blocks not discharged beyond the cell manufacturer's specified final voltage	Final voltage of battery: 3.2V/cell, not exceed the final voltage specified by cell manufacturer.	P
	For batteries consisting of series-connected cells or cell blocks, cell balancing circuitry incorporated into the battery management system		P
5.6.3	Mechanical protection for cells and components of batteries		P
	Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse	Mechanical protection for cell connections and control circuits provided.	P
	The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product	Build-in batteries, mechanical protection for cells should be provided by end product.	P
	The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as recommended by the cell manufacturer	To be evaluated in final system.	P
	For batteries intended for building into a portable end product, testing with the battery installed within the end product considered when conducting mechanical tests		N/A
5.7	**Quality plan**		P

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Clause	Requirement + Test	Result - Remark	Verdict
	The manufacturer prepares and implements a quality plan that defines procedures for the inspection of materials, components, cells and batteries and which covers the whole process of producing each type of cell or battery	Complied.	P
5.8	**Battery safety components**		P
	According annex F		P
6	**TYPE TEST AND SAMPLE SIZE**		**P**
	Tests are made with the number of cells or batteries specified in Table 1 using cells or batteries that are not more than six months old		P
	Coin cells with resistance ≤ 3 Ω (measured according annex D) are tested according table 1	Not coin cells.	N/A
	Unless otherwise specified, tests are carried out in an ambient temperature of 20 °C ± 5 °C	Tests are carried out at 20°C ± 5°C.	P
	The safety analysis of 5.6.1 identify those components of the protection circuit that are critical for short-circuit, overcharge and overdischarge protection		P
	When conducting the short-circuit test, consideration given to the simulation of any single fault condition that is likely to occur in the protecting circuit that would affect the short-circuit test		P
7	**SPECIFIC REQUIREMENTS AND TESTS**		**P**
7.1	**Charging procedure for test purposes**	Lithium system.	P
7.1.1	First procedure		P
	This charging procedure applies to subclauses other than those specified in 7.1.2		P
	Unless otherwise stated in this document, the charging procedure for test purposes is carried out in an ambient temperature of 20 °C ± 5 °C, using the method declared by the manufacturer		P
	Prior to charging, the battery have been discharged at 20 °C ± 5 °C at a constant current of 0,2 It A down to a specified final voltage		P
7.1.2	Second procedure		P
	This charging procedure applies only to 7.3.1, 7.3.4, 7.3.5, and 7.3.9		P

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Clause	Requirement + Test	Result - Remark	Verdict
	After stabilization for 1 h and 4 h, respectively, at ambient temperature of highest test temperature and lowest test temperature, as specified in Table 2, cells are charged by using the upper limit charging voltage and maximum charging current, until the charging current is reduced to 0,05 It A, using a constant voltage charging method		P
7.2	**Intended use**		P
7.2.1	Continuous low-rate charging (cells)		P
	Fully charged cells are subjected for 7 days to a charge using the charging method for current and standard voltage specified by the cell manufacturer		P
	Results: No fire. No explosion. No leakage.....:	(See appended table 7.2.1)	P
7.2.2	Case stress at high ambient temperature (battery)		P
	Oven temperature (°C).....:		P
	Results: No physical distortion of the battery case resulting in exposure of internal protective components and cells		
7.3	**Reasonably foreseeable misuse**		P
7.3.1	External short-circuit (cell)		P
	The cells were tested until one of the following occurred:		P
	- 24 hours elapsed; or		P
	- The case temperature declined by 20 % of the maximum temperature rise		P
	Results: No fire. No explosion.....:	(See appended table 7.3.1)	P
7.3.2	External short-circuit (battery)		P
	The batteries were tested until one of the following occurred:		P
	- 24 hours elapsed; or		P
	- The case temperature declined by 20 % of the maximum temperature rise		N/A
	In case of rapid decline in short circuit current, the battery pack remained on test for an additional one hour after the current reached a low end steady state condition		N/A
	A single fault in the discharge protection circuit conducted on one to four (depending upon the protection circuit) of the five samples before conducting the short-circuit test		P
	A single fault applies to protective component parts such as MOSFET, fuse, thermostat or positive temperature coefficient (PTC) thermistor		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Results: No fire. No explosion..... :	(See appended table 7.3.2)	P
7.3.3	Free fall		P
	Results: No fire. No explosion.		P
7.3.4	Thermal abuse (cells)		P
	Oven temperature (°C) ..... :		P
	Results: No fire. No explosion		P
7.3.5	Crush (cells)		P
	The crushing force was released upon:		P
	- The maximum force of 13 kN ± 0,78 kN has been applied; or		P
	- An abrupt voltage drop of one-third of the original voltage has been obtained		P
	Results: No fire. No explosion..... :	(See appended table 7.3.5)	P
7.3.6	Over-charging of battery		P
	The supply voltage which is:		P
	- 1,4 times the upper limit charging voltage presented in Table A.1 (but not to exceed 6,0 V) for single cell/cell block batteries or		P
	- 1,2 times the upper limit charging voltage resented in Table A.1 per cell for series connected multi-cell batteries, and		N/A
	- Sufficient to maintain a current of 2,0 It A throughout the duration of the test or until the supply voltage is reached		P
	Test was continued until the temperature of the outer casing:		P
	- Reached steady state conditions (less than 10 °C change in 30-minute period); or		P
	- Returned to ambient		P
	Results: No fire. No explosion..... :	(See appended table 7.3.6)	P
7.3.7	Forced discharge (cells)		P
	If the discharge voltage reaches the negative value of upper limit charging voltage within the testing duration, the voltage is maintained at the negative value of the upper limit charging voltage by reducing the current for the remainder of the testing duration		P
	If the discharge voltage does not reach the negative value of upper limit charging voltage within the testing duration, the test is terminated at the end of the testing duration		N/A
	Results: No fire. No explosion..... :	(See appended table 7.3.7)	P

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Clause	Requirement + Test	Result - Remark	Verdict
7.3.8	Mechanical tests (batteries)		P
7.3.8.1	Vibration		P
	Results: No fire, no explosion, no rupture, no leakage or venting. ..... :	(See appended table 7.3.8.1)	P
7.3.9	Design evaluation – Forced internal short-circuit (cells)		P
	The cells complied with national requirement for .....:		—
	The pressing was stopped upon:		P
	- A voltage drop of 50 mV has been detected; or		P
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached		P
	Results: No fire ..... :	(See appended table 7.3.9)	P

8	**INFORMATION FOR SAFETY**		**P**
8.1	**General**		P
	Manufacturers of secondary cells ensure that information is provided about current, voltage and temperature limits of their products		P
	Manufacturers of batteries ensure that equipment manufacturers and, in the case of direct sales, end-users are provided with information to minimize and mitigate hazards		P
	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product		N/A
	As appropriate, any information relating to hazard avoidance resulting from a system analysis provided to the end user		N/A
	Do not allow children to replace batteries without adult supervision		P
8.2	**Small cell and battery safety information**		P
	The following warning language is to be provided with the information packaged with the small cells and batteries or equipment using them:		P
	- Keep small cells and batteries which are considered swallowable out of the reach of children		P
	- Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion		P
	- In case of ingestion of a cell or battery, seek medical assistance promptly		P

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Clause	Requirement + Test	Result - Remark	Verdict
9	**MARKING**		**P**
9.1	**Cell marking**		P
	Cells marked as specified in IEC 61960, except coin cells		P
	Coin cells whose external surface area is too small to accommodate the markings on the cells show the designation and polarity		P
	By agreement between the cell manufacturer and the battery and/or end product manufacturer, component cells used in the manufacture of a battery need not be marked		P
9.2	**Battery marking**		P
	Batteries marked as specified in IEC 61960, except for coin batteries		P
	Coin batteries whose external surface area is too small to accommodate the markings on the batteries show the designation and polarity. Batteries also marked with an appropriate caution statement		P
	Terminals have clear polarity marking on the external surface of the battery		P
	Batteries with keyed external connectors designed for connection to specific end products need not be marked with polarity markings if the design of the external connector prevents reverse polarity connections		P
9.3	**Caution for ingestion of small cells and batteries**		N/A
	Coin cells and batteries identified as small batteries according to 8.2 include a caution statement regarding the hazards of ingestion in accordance with 8.2		N/A
	When small cells and batteries are intended for direct sale in consumer-replaceable applications, caution for ingestion given on the immediate package		N/A
9.4	**Other information**		P
	Storage and disposal instructions		N/A
	Recommended charging instructions		P
10	**PACKAGING AND TRANSPORT**		**P**
	Packaging for coin cells not small enough to fit within the limits of the ingestion gauge of Figure 3		P

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Clause	Requirement + Test	Result - Remark	Verdict
	The materials and packaging design are chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of environmental contaminants		P

Annex A	**CHARGING AND DISCHARGING RANGE OF SECONDARY LITHIUM ION CELLS FOR SAFE USE**		**P**
A.1	**General**		P
A.2	**Safety of lithium-ion secondary battery**	Complied.	P
A.3	**Consideration on charging voltage**	Complied.	P
A.3.1	General		P
A.3.2	Upper limit charging voltage	4.45V	P
A.3.2.1	General		P
A.3.2.2	Explanation of safety viewpoint		P
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied	4.45V	P
A.4	**Consideration of temperature and charging current**		P
A.4.1	General		P
A.4.2	Recommended temperature range	See A.4.2.2.	P
A.4.2.1	General		P
A.4.2.2	Safety consideration when a different recommended temperature range is applied	Charging temperature for cell declared by client is:0-45°C	P
A.4.3	High temperature range	Charging high temperature declared by client is: 45°C.	P
A.4.3.1	General		P
A.4.3.2	Explanation of safety viewpoint		P
A.4.3.3	Safety considerations when specifying charging conditions in high temperature range		P
A.4.3.4	Safety consideration when specifying new upper limit in high temperature range		P
A.4.4	Low temperature range	Charging low temperature declared by client is: 0°C.	P
A.4.4.1	General		P
A.4.4.2	Explanation of safety viewpoint		P
A.4.4.3	Safety considerations, when specifying charging conditions in low temperature range		P
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range	0°C applied.	P

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Clause	Requirement + Test	Result - Remark	Verdict
A.4.5	Scope of the application of charging current		P
A.4.6	Consideration of discharge		P
A.4.6.1	General		P
A.4.6.2	Final discharge voltage and explanation of safety viewpoint		P
A.4.6.3	Discharge current and temperature range		P
A.4.6.4	Scope of application of the discharging current		P
A.5	**Sample preparation**		P
A.5.1	General		P
A.5.2	Insertion procedure for nickel particle to generate internal short		P
A.5.3	Disassembly of charged cell		P
A.5.4	Shape of nickel particle		P
A.5.5	Insertion of nickel particle to cylindrical cell		N/A
A.5.5.1	Insertion of nickel particle to winding core		N/A
A.5.5.2	Mark the position of nickel particle on the both end of winding core of the separator		N/A
A.5.6	Insertion of nickel particle to prismatic cell		P
A.6	**Experimental procedure of the forced internal short-circuit test**		P
A.6.1	Material and tools for preparation of nickel particle		P
A.6.2	Example of a nickel particle preparation procedure		N/A
A.6.3	Positioning (or placement) of a nickel particle		N/A
A.6.4	Damaged separator precaution		N/A
A.6.5	Caution for rewinding separator and electrode		N/A
A.6.6	Insulation film for preventing short-circuit		N/A
A.6.7	Caution when disassembling a cell		N/A
A.6.8	Protective equipment for safety		N/A
A.6.9	Caution in the case of fire during disassembling		N/A
A.6.10	Caution for the disassembling process and pressing the electrode core		N/A
A.6.11	Recommended specifications for the pressing device		N/A

ANNEX B	**RECOMMENDATIONS TO EQUIPMENT MANUFACTURERS AND BATTERY ASSEMBLERS**	N/A

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX C	**RECOMMENDATIONS TO THE END-USERS**	N/A

ANNEX D	**MEASUREMENT OF THE INTERNAL AC RESISTANCE FOR COIN CELLS**		N/A
D.1	**General**		N/A
D.2	**Method**		N/A
	A sample size of three coin cells is required for this measurement..... :	(See appended table D.2)	N/A
	Coin cells with an internal resistance of less than or equal to 3 Ω are subjected to the testing according to Clause 6 and Table 1		N/A
	Coin cells with an internal resistance greater than 3 Ω require no further testing		N/A

ANNEX E	**PACKAGING AND TRANSPORT**	N/A

ANNEX F	**COMPONENT STANDARDS REFERENCES**	N/A

	TABLE: Critical components information				P
Object/part no.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity 1)
Cell	Dongguan Pinguan sports technology Co., LTD	145266	3.7V, 8500mAh, 32.72Wh	IEC 62133-2	Tested with appliance
- Electrolyte	Interchangeable	Interchangeable	$LiPF_6$ dissolved in organic solvent (DMC +EC)	--	--
- Separator	Interchangeable	Interchangeable	PP/PE/PP	--	--
-Anode	Interchangeable	Interchangeable	Graphite	--	--
-Cathode	Interchangeable	Interchangeable	Positive material LiCoO2	--	--
- Case	Interchangeable	Interchangeable	Al foil	--	--
Plastic frame	FORMOSA CHEMICALS & FIBRE CORP PLASTICS DIV	AC310(+)	V-0, 90°C, Min Thk: 1.6mm	UL 94	UL
Lead wire	DONGGUAN DANYANG ELECTRONIC WIRE CO LTD	3302	26AWG, 105°C, 30Vac	UL 758	UL
Connector (Plastics part)	ASAHI KASEI CORP	FG171	PA66, V-0, 130°C	UL 94	UL
PCB	SHEN ZHEN JIRUIDA CIRCUIT TECHNOLOGY CO LTD	JRD-SR	V-0, 130°C	UL 94 UL 796	UL
Breaker	Bourns KK	HC85AY-1	Trip Temperature: 85±5°C	UL 60730-1	UL E215638
IC (U1)	Texas Instruments Incorporated	BQ4050	V_{CU}: 4.45V±0.025V; V_{DL}: 2.75V±0.025V; T_{OPR}: -40~85°C	--	Tested with appliance
MOSFET (QD1, QD2, QC1, QC2)	Potens semiconductor corp.	PDC3960X	V_{DS}: 30V; V_{GS}: ±20V; I_D: 165A (Tc=25°C); Tstg: -55°C~+150°C	--	Tested with appliance
Supplementary information: **1) Provided evidence ensures the agreed level of compliance.**					

7.2.1	TABLE: Continuous charging at constant voltage (cells)			P
Sample no.	**Recommended charging voltage Vc (Vdc)**	**Recommended charging current I_{rec} (A)**	**OCV before test (Vdc)**	**Results**
Cell #1	4.25	1.7	4.222	P
Cell #2	4.25	1.7	4.222	P
Cell #3	4.25	1.7	4.224	P
Cell #4	4.25	1.7	4.225	P
Cell #5	4.25	1.7	4.224	P

Supplementary information:

- No fire or explosion
- No leakage
- Others (please explain)

7.3.1	TABLE: External short-circuit (cell)				P
Sample no.	**Ambient T (°C)**	**OCV before test (Vdc)**	**Resistance of circuit (mΩ)**	**Maximum case temperature rise ΔT (K)**	**Results**
Samples charged at charging temperature upper limit (45°C)					
Cell #1	45.0	4.23	74.4	91.2	P
Cell #2	45.0	4.25	72.4	92.9	P
Cell #3	45.0	4.24	75.4	92.2	P
Cell #4	45.0	4.24	73.4	93.3	P
Cell #5	45.0	4.26	72.4	88.8	P
Samples charged at charging temperature lower limit (0°C)					
Cell #6	0	4.23	76.4	98.8	P
Cell #7	0	4.22	78.4	94.8	P
Cell #8	0	4.24	74.4	95.4	P
Cell #9	0	4.23	79.4	96.8	P
Cell #10	0	4.24	73.4	102.2	P

Supplementary information:

- No fire or explosion
- Others (please explain)

7.3.2	TABLE: External short-circuit (battery)					P
Sample no.	**Ambient T (°C)**	**OCV before test (Vdc)**	**Resistance of circuit (mΩ)**	**Maximum case temperature rise ΔT (K)**	**Component single fault condition**	**Results**
Cell #11	23.5	5.02	77.2	24.1	MOSFET QD2	P

					S-C	
Cell #12	23.5	5.03	76.6	24.1	U4 pin 1-5 S-C	P
Cell #13	23.5	5.08	76.5	24.3	Breaker S-C	P
Cell #14	23.5	5.01	78.5	24.0	--	P
Cell #15	23.5	5.06	78.1	24.0	--	P
Cell #16	23.5	5.06	77.6	24.1	MOSFET QD2 S-C	P
Cell #17	23.5	5.02	79.2	24.1	U4 pin 1-5 S-C	P
Cell #18	23.5	5.01	77.5	24.3	Breaker S-C	P
Cell #19	23.5	5.05	78.2	24.0	--	P
Cell #20	23.5	5.05	77.3	24.1	--	P
Supplementary information: - No fire or explosion - Others (please explain)						

7.3.5	**TABLE: Crush (cells)**			**P**
Sample no.	**OCV before test (Vdc)**	**OCV at removal of crushing force (Vdc)**	**Maximum force applied to the cell during crush (kN)**	**Results**
Samples charged at charging temperature upper limit (45°C)				
Cell #1	4.25	4.25	13KN	P
Cell #2	4.24	4.24	13KN	P
Cell #3	4.25	4.25	13KN	P
Cell #4	4.24	4.24	13KN	P
Cell #5	4.25	4.25	13KN	P
Samples charged at charging temperature upper limit (0°C)				
Cell #6	4.25	4.25	13KN	P
Cell #7	4.24	4.24	13KN	P
Cell #8	4.23	4.23	13KN	P
Cell #9	4.24	4.24	13KN	P
Cell #10	4.24	4.24	13KN	P
Supplementary information: - No fire or explosion - Others (please explain)				

7.3.6	**TABLE: Over-charging of battery (for cell)**	**P**
Constant charging current (A).....:	**15**	**—**

Supply voltage (Vdc).....:	4.55	—

Sample no.	OCV before charging (Vdc)	Total charging time (minute)	Maximum outer case temperature (°C)	Results
Cell #1	3.62	60	24.6	P
Cell #2	3.63	60	24.7	P
Cell #3	3.63	60	24.5	P
Cell #4	3.62	60	24.4	P
Cell #5	3.62	60	24.7	P
Cell #6	3.63	60	24.3	P
Cell #7	3.64	60	24.5	P
Cell #8	3.62	60	24.4	P
Cell #9	3.63	60	24.5	P
Cell #10	3.62	60	24.8	P

Supplementary information:

- No fire or explosion
- Others (please explain)

7.3.6	TABLE: Over-charging of battery (for Smart Li-Polymer Battery Pack)	P
Constant charging current (A).....:	20	—
Supply voltage (Vdc).....:	5.89	—

Sample no.	OCV before charging (Vdc)	Total charging time (minute)	Maximum outer case temperature (°C)	Results
Cell #21	5.05	60	24.8	P
Cell #22	5.03	60	24.7	P
Cell #23	5.06	60	25.0	P
Cell #24	5.04	60	24.8	P
Cell #25	5.05	60	24.7	P

Supplementary information:

- No fire or explosion
- Others (please explain)

7.3.7	TABLE: Forced discharge (cells)	P

Sample no.	OCV before application of reverse charge (Vdc)	Measured reverse charge I_t (A)	Lower limit discharge voltage (Vdc)	Results
Cell #1	3.45	1.7	3.0	P
Cell #2	3.44	1.7	3.0	P
Cell #3	3.42	1.7	3.0	P
Cell #4	3.44	1.7	3.0	P
Cell #5	3.44	1.7	3.0	P

Supplementary information:
- No fire or explosion - Others (please explain)

7.3.8.1	**TABLE: Vibration**				**P**
Sample no.	**OCV before test (Vdc)**	**OCV after test (Vdc)**	**Mass before test (g)**	**Mass after test (g)**	**Results**
Cell #12	5.08	5.08	*	*	P
Cell #13	5.06	5.06	*	*	P
Cell #14	5.09	5.09	*	*	P
Supplementary information: - No fire or explosion - No rupture - No leakage - No venting - Others (please explain) *Test with the equipment					

7.3.8.2	**TABLE: Mechanical shock**				**P**
Sample no.	**OCV before test (Vdc)**	**OCV after test (Vdc)**	**Mass before test (g)**	**Mass after test (g)**	**Results**
Cell #15	5.02	5.02	*	*	P
Cell #16	5.02	5.02	*	*	P
Cell #17	5.03	5.03	*	*	P
Supplementary information: - No fire or explosion - No rupture - No leakage - No venting - Others (please explain) *Test with the equipment					

7.3.9	**TABLE: Forced internal short circuit (cells)**				**P**
Sample no.	**Chamber ambient T (°C)**	**OCV before test (Vdc)**	**Particle location [1)]**	**Maximum applied pressure (N)**	**Results**
Samples charged at charging temperature upper limit					
Cell #20	45	4.25	1	400	P
Cell #21	45	4.24	1	400	P
Cell #22	45	4.26	1	400	P
Cell #23	45	4.24	1	400	P
Cell #24	45	4.25	1	400	P
Samples charged at charging temperature lower limit					

Cell #25	0	4.24	1	400	P
Cell #26	0	4.23	1	400	P
Cell #27	0	4.22	1	400	P
Cell #28	0	4.24	1	400	P
Cell #29	0	4.25	1	400	P

Supplementary information:

[1)] Identify one of the following:
1: Nickel particle inserted between positive and negative (active material) coated area.
2: Nickel particle inserted between positive aluminium foil and negative active material coated area.

- No fire or explosion
- Others (please explain)

D.2	**TABLE: Internal AC resistance for coin cells**			**N/A**
Sample no.	**Ambient T (°C)**	**Store time (h)**	**Resistance Rac (Ω)**	**Results [1)]**

Supplementary information:

[1)] Coin cells with internal resistance less than or equal to 3 Ω, see test result on corresponding tables

Pictures

Fig.1

Fig.2

Pictures

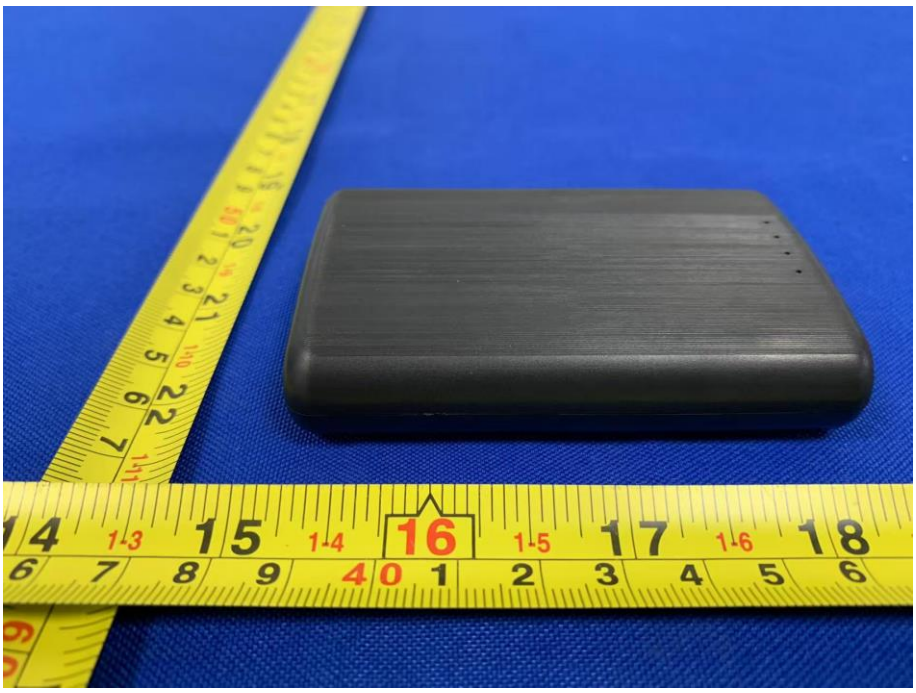

Fig.3

Fig.4

Pictures

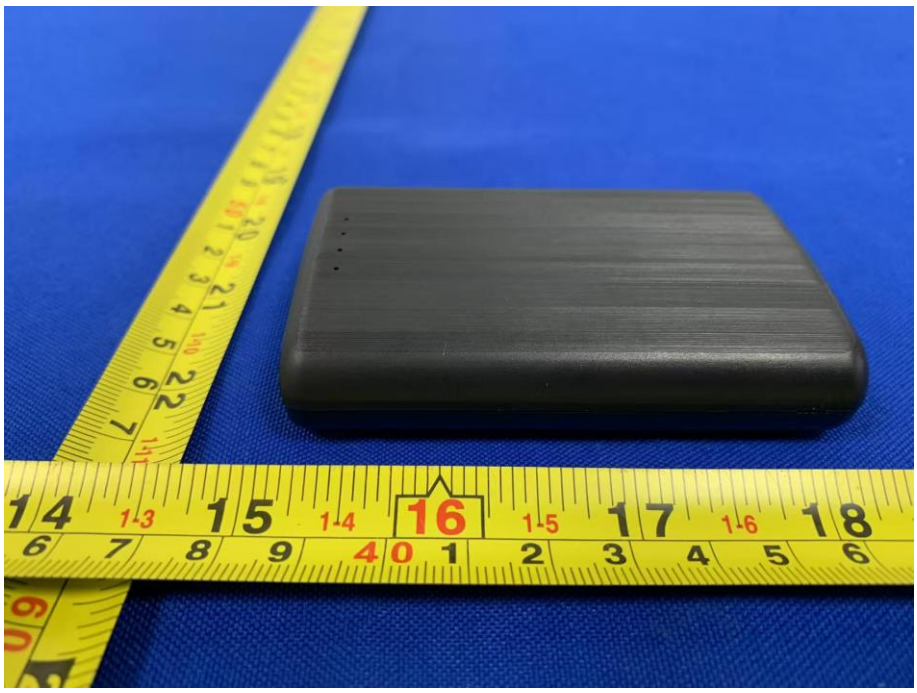

Fig.5

Fig.6

Pictures

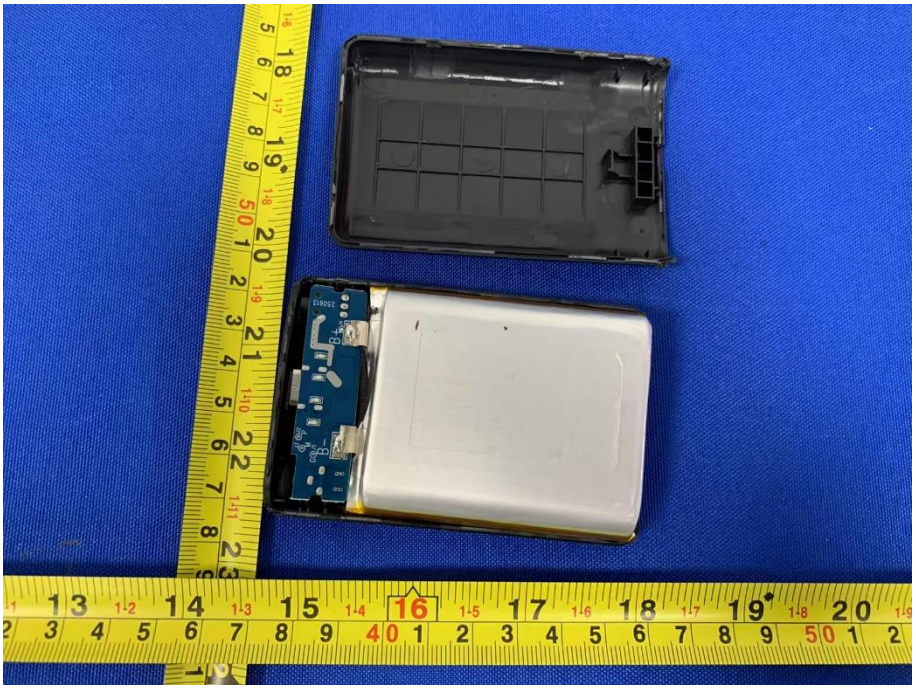

Fig.7

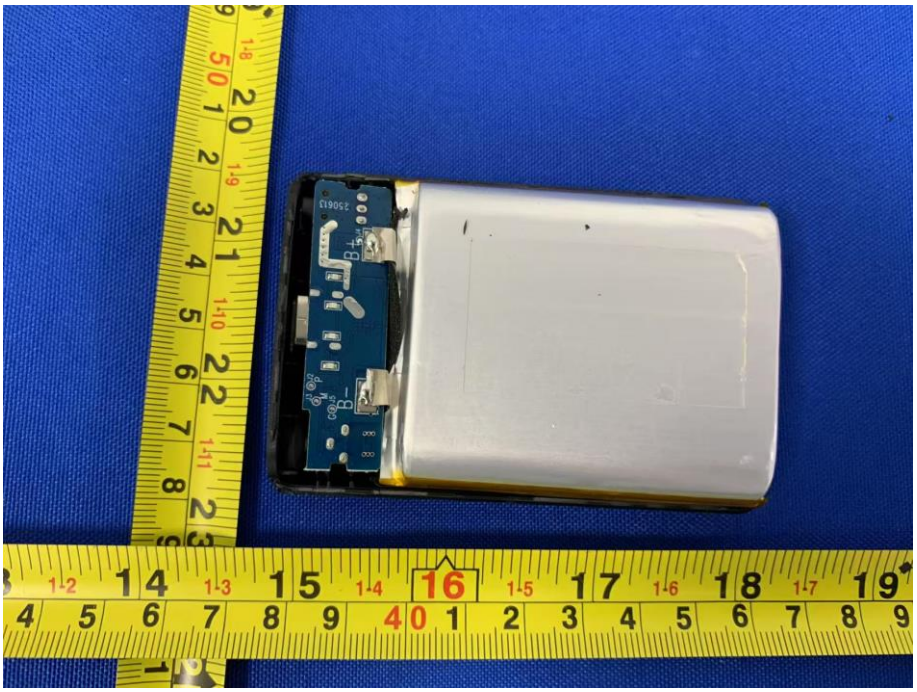

Fig.8

Pictures

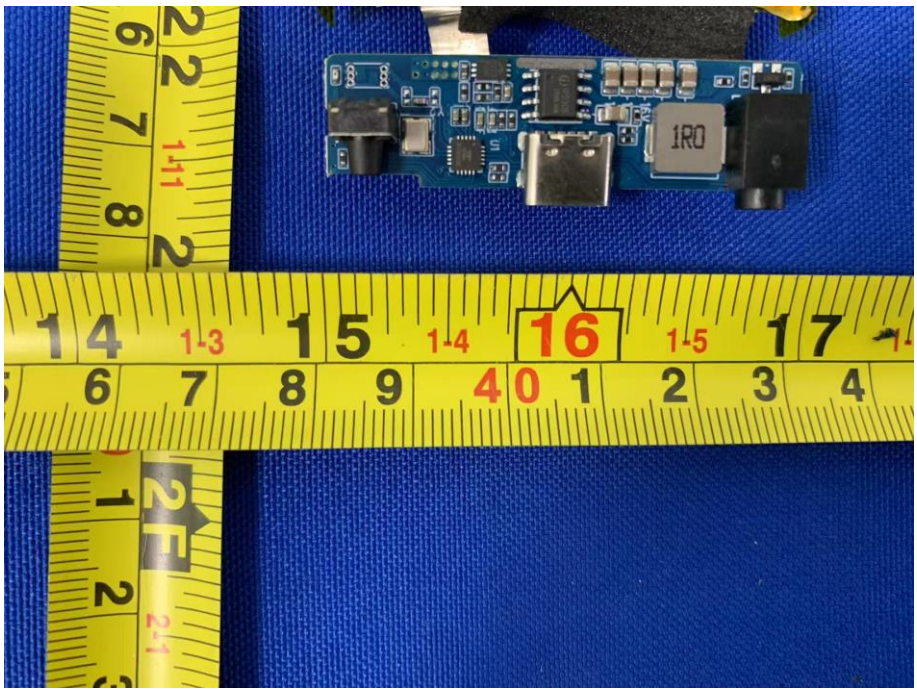

Fig.9

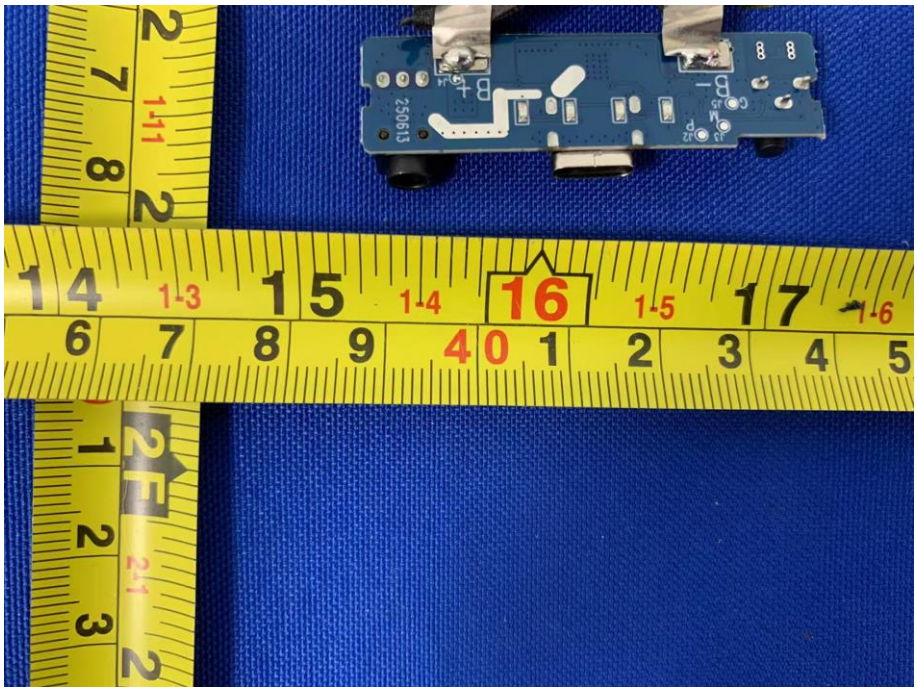

Fig.10

Pictures

Fig.11