

UL 2056 TEST REPORT

For
POWER BANK
Model: RPS-048L

Prepared for: [REDACTED]
[REDACTED]
[REDACTED]

Prepared by: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Report Number: NCT23030748XU3-1

Date of Test: [REDACTED]

Date of Issue: [REDACTED]

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Boris Lin



The results detailed in this test report relate only to the specific sample(s) tested. This report is not to be reproduced except in full, without written approval from NCT Testing Technology.

TEST REPORT UL 2056 Outline of Investigation for Safety of Lithium-ion POWER BANKs	
Report Number	NCT23030748XU3-1
Date of issue	2023-08-30
Total number of pages	28 pages
Test specification: Standard: UL 2056: 2020 Test procedure: Test Report Non-standard test method: N/A Test item description: POWER BANK Trade Mark: N/A	
Model/Type reference: RPS-048L Ratings: Input Type-C: 5V=2A Output USB: 5V=3A DC: 5V=3A Battery Capacity: 10000mAh, 3.85V, 38.5Wh Rated Capacity: 6000mAh	

Testing procedure and testing location:	
Testing Laboratory:	
A101, 1/F., &2F., B2, Fuqiao 6th Area, Xintian, Fuhai	
List of Attachments:	
Appendix 1: 3 pages of Photo Documentation	
Summary of testing:	
Tests performed (name of test and test clause): <u>Test items:</u> cl.6.2 Electrical insulation cl.6.7 Housings; cl.7.2.1 Rated capacity; cl.7.2.2 Specified operating region and temperature tests; cl.7.2.4 Vibration and mechanical shock; cl.7.3.1 External short-circuit and overload; cl.7.3.2 Overcharge.	Testing location: A101, 1/F., &2F., B2, Fuqiao 6th Area, Xintian, Fuhai
Copy of marking plate:	
POWER BANK 1ICP14/61/75 Model: RPS-048L Input Type-C: 5V$\equiv$2A Output USB: 5V$\equiv$3A DC: 5V$\equiv$3A Battery Capacity: 10000mAh, 3.85V, 38.5Wh Rated Capacity: 6000mAh Guangdong Roops Intelligent Technology Co., LTD YYYYMMDD Caution: Risk of Fire and Burns. Do Not Open, Crush, or Incinerate. Follow Manufacturer's Instructions.  XXX 株式会社	

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)
Designation	RPS-048L
Trade mark.....	N/A
Input rating	Type-C: 5V=2A
Output rating	Output USB: 5V=3A DC: 5V=3A
Built-in battery rated capacity	10000mAh
Output capacity	6000mAh
Work temperature range	Charge 10~40°C; Discharge 0~60°C
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	2023-07-28
Date (s) of performance of tests	2023-07-28 to 2023-08-30
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.	

General product information:

voltage electronic devices.

2). The Input and Output can be operated at the same time.

The Power bank mainly composed of:

-Circuit Module

-Enclosure plastic

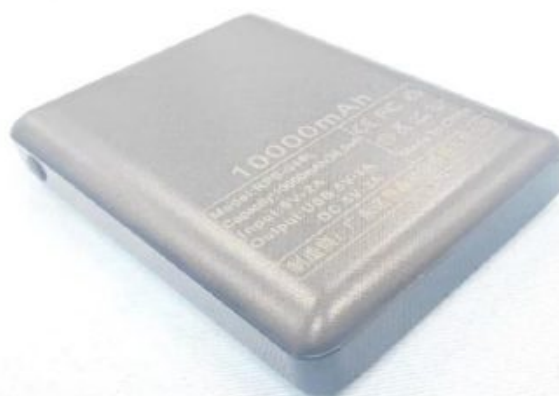
-Input port (Type-C), Output port (USB and DC).

Power bank electrical parameter:

Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Cut-off Voltage
RPS-048L	10000 mAh (Inner battery)	3.7V (Inner battery) Output: 5V	2A	3A	2A	3A	5V	3V

Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Cut-off Voltage
1376074	10000 mAh	3.85V	2000mA	2000mA	5000mA	10000mA	4.4V	3V

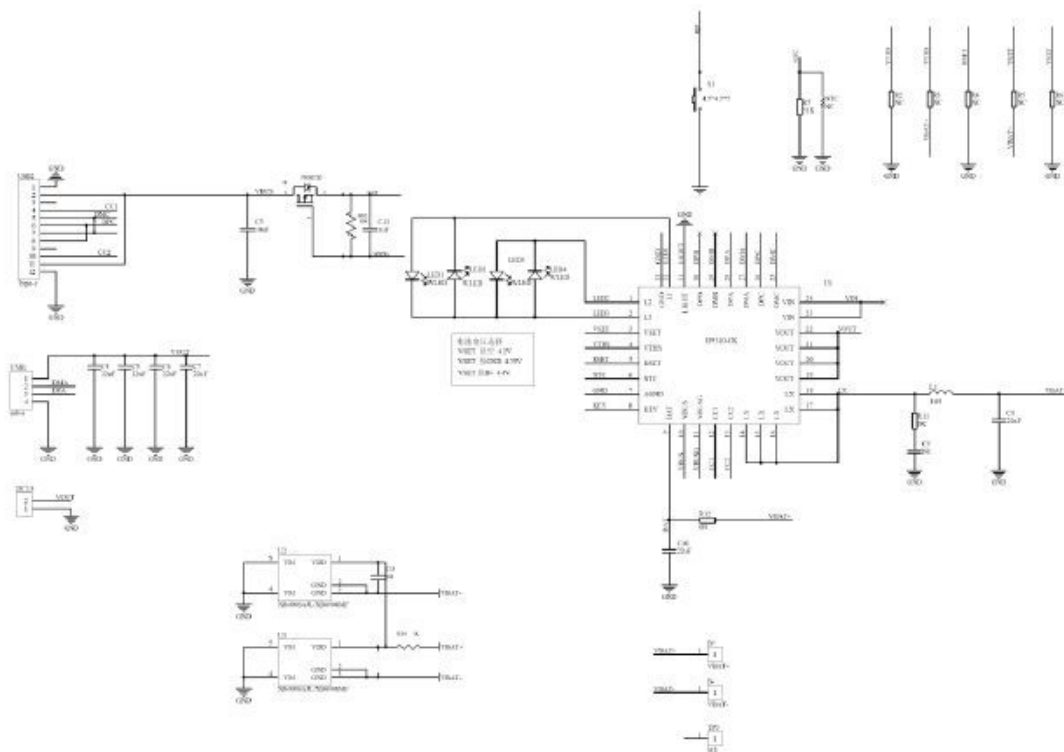
Construction: (Unit: mm)



T: Max17.0mm	W: Max65.5mm	L: Max96.0mm
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Battery (Unit: mm)

Circuit diagram:



UL 2056: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
6	Construction		P
6.1	General		P
	Power banks shall be so designed and constructed so as to reduce the risk of fire, electric shock or injury hazards. Compliance is checked by the requirements of 6.2 to 6.8.		P
	For removeable power banks integrated into luggage, carrying cases, bags, packs, etc., the power bank shall also be designed and constructed to allow for installation and removal from the luggage, carrying case, bag, pack, etc. without the use of a tool and without damaging the power bank. Appropriate means of securing the power bank shall be provided in the luggage, carrying case, bag, pack, etc. without damaging the power bank or interfering with the safe operation of the power bank.		N/A
6.2	Electrical insulation		P
	Electrical insulation shall withstand the electrical stress likely to occur during intended use.		P
	Compliance is checked by the following tests:		P
	The insulation resistance of a power bank electrical housing shall not be less than 5 MΩ when measured 60 s after application of DC voltage of approximately 500 V applied between any terminal and		P
			N/A
			P
	The insulation shall withstand without breakdown an AC voltage having a frequency of 50 Hz or 60 Hz or DC voltage applied between current carrying parts and accessible parts, non-metallic parts being covered with metal foil. The values of the test voltages are specified in Table 6.1.		P

UL 2056: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
	The insulation voltage rating of cable(s) supplied with the power bank and of internal wiring shall not be less than 60 V as evidenced by a marking on the insulation or in the cable / wiring		P
	Electrical insulation shall not exceed its marked temperature rating or, if not marked, the Relative Thermal Index (RTI) for the material in question. Compliance is checked by the test of 7.2.2.		P
6.3	Electrical conductors		P
	Wires within a power bank housing, or those integral with luggage, carrying cases, etc., and not in a low power circuit shall be protected so similar edges which may cause damage to their insulation.		P
	A low power circuit is considered to be points closest to the battery or any power input source at which the maximum power delivered to an adjustable resistor, connected between the point to be investigated and the opposite pole of the battery or power input source, does not exceed 15 W at the end of 5 s. The part of the circuit farther from the battery or power input source than a low-power point is considered to be a low-power circuit.		N/A
	Wireways shall be smooth and free from sharp edges		P
	Holes in metal through which insulated wires pass shall have smooth well-rounded surfaces or be provided with bushings.		N/A
			N/A
	Bare internal wiring or other current-carrying parts shall be rigid and fixed so that, in normal use, electrical short-circuit is unlikely to occur. Except for integral traces of a printed circuit or battery, compliance is checked by the following test:		N/A

UL 2056: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
	Bare current carrying parts are subjected to a steady force of 10 N $\pm$ 1 N, applied by the test probe 11 of IEC 61032. Such parts shall not come conductive parts after application of the force.		N/A
6.4	Internal electrical connections		P
	The mechanical integrity of internal electrical connections shall be sufficient to accommodate conditions of intended use.		P
	Solder alone is not considered a reliable means of connection.		P
	Screws used for electrical connections shall screw into metal.		N/A
	Screws and nuts that make a mechanical connection between different parts of a power bank shall be secured against loosening if they also make electrical connections. Compliance is checked by inspection and manual test.		N/A
6.5	External electrical connections		P
	External electrical connectors shall comply with the physical specification for one of the types of USB connectors (USB types A, B, micro A, micro B, or C) as described in the IEC 62680 series of standards.		P
6.6	Terminal contacts and other electrical connections		P
	Terminal contacts and other electrical connections shall be arranged so as to minimize the risk of short-circuits, such as using keyed connectors. Compliance is checked by inspection, and if necessary, by applying a steady force of 10 $\pm$ 1 N, by the test probe 11 of IEC 61032.		P
6.7	Housings		P

UL 2056: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
	The housing of a power bank shall have adequate mechanical strength and be constructed to provide mechanical protection for [REDACTED] [REDACTED] shall additionally withstand such rough handling that may be expected in normal use without exposing sharp edges of broken glass or otherwise impairing compliance with the requirements of this outline of investigation.		P
	The housing shall not be capable of being opened by simple tools, such as a screwdriver. It shall be ultrasonically welded, secured by single use or tamper-proof screws, or secured by adhesives complying with the adhesive requirements of UL 746C. Compliance is checked by inspection and the tests of 7.2.4 and as follows.		P
	Each of five fully charged power banks is dropped three times from a height of 1.0 m onto [REDACTED] [REDACTED] samples are dropped so as to obtain impacts in random orientations. Each sample is then placed on a flat horizontal surface for a minimum of 1 h.	Tested complied.	P
	If the power bank is still operational, one charge and discharge cycle is conducted on the operational sample in accordance with the method declared by manufacturer.		P
	The power bank housing and any internal compartments for the cells shall be designed to [REDACTED] [REDACTED] during charging and discharging as specified by [REDACTED]		P
	The non-metallic housing of a power bank shall be resistant to heat. Compliance is checked by inspection, and for polymeric materials, the following test.	Tested complied.	P

UL 2056: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
	Fully charged power banks are placed for 7 h in an air circulating oven at a temperature of +70°C ±2°C, according to the procedure in 7.1. After conditioning, the samples are removed from the [REDACTED] when the housings are examined for evidence of distortion, separation of sections or openings that impair compliance with this outline of investigation.		P
	The non-metallic housing of a power bank shall be resistant to fire. Compliance is checked by the 20 mm (3/4 inch) Flame Test in UL 746C.		N/A
	The 20 mm (3/4 inch) Flame Test is not carried out if the housing is comprised of material classified for flammability as minimum V-1 according to UL 94.	V-0 used.	P
6.8	Temperature/voltage/current management		P
	Power banks shall be designed to operate such that the temperature, voltage and current limits [REDACTED] operating region) are not exceeded. See the [REDACTED] systems) of UL 1642, or the operating region requirements and examples in the Annex for Charging and Discharging Range of Secondary Lithium Ion Cells for Safe Use of UL 62133-2.		P
	Batteries shall have an independent control and protection for current, voltage, temperature and any other parameter required for safety and shall maintain the cells within their operating region.		P
	Batteries designed for the selective discharge of a portion of their series connected cells shall incorporate circuitry to prevent operation of cells [REDACTED] Compliance is checked by reviewing the protection circuit module (PCM) of the battery and the test of 7.2.2.		N/A
	[REDACTED] not exceed the upper limit of the charging [REDACTED] the case where the portable electronic devices or similar devices have the equivalent function.	Not exceed the upper limit of the charging voltage 4.4V	P

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Clause	Requirement + Test	Result - Remark	Verdict
	The protection circuit module shall function, under intended use conditions of charging and discharging, as follows:		P
	not exceed the upper limit of the charging shall be stopped before the upper limit of the charging voltage is exceeded;		P
			P
	- For batteries consisting of series-connected •closely matched capacities; •the same design; •the same chemistry; and		N/A
	-For the battery consisting of series-connected		N/A
	-For power banks with an integral photovoltaic (PV) feature, charge control shall be incorporated such that battery backfeed to the PV circuit components is prevented. Compliance is checked by reviewing the protection circuit module (PCM) of battery, and by the test of 7.2.2.		N/A
	The power bank shall not exhibit a risk of fire, electric shock or mechanical hazard when subjected to foreseeable misuse conditions. Compliance is checked by the test of 7.3.		P
	Electronic circuits shall be designed and applied so that a fault condition will not render the power bank unsafe with regard to electric shock, fire hazard, or mechanical hazard.		P
	If a thermal cutout functions to interrupt charging or discharging, or if its functioning is necessary for the power bank to comply with the requirements of 7.3, the thermal cutout shall comply with UL 60730-1.		N/A

UL 2056: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
	Electronic circuits are checked by evaluation of the fault conditions that are likely to occur and result in electric shock, fire hazard, or mechanical hazard, such as short circuit or open circuit of MOSFET (metal oxide semiconductor field-effect transistor), fuse, thermostat or positive temperature coefficient (PTC) thermistor.		P
7	Performance		P
7.1	General		P
	Some lithium batteries are capable of exploding when the tests described in this outline of investigation are conducted. It is important that personnel be protected from the flying fragments, explosive force, sudden release of heat, and noise that results from such explosions. The test area shall be well ventilated to protect personnel from possible harmful fumes or gases.		P
	Unless otherwise specified, tests are carried out under the most unfavorable conditions of intended use in an ambient temperature of 20 °C. [REDACTED] charging at temperatures outside the range of 10 – 40°C, the ambient temperature for testing is as follows:	Charging temperature 10~40°C declared by [REDACTED]	P
	-If the battery is recommended to be charged at a minimum ambient temperature lower than 10°C, the test is also conducted at that minimum temperature +0/-5°C;		N/A
	-If the battery is recommended to be charged at a maximum ambient temperature greater than 40°C, the test is also conducted at that maximum temperature +0/-5°C.		N/A
	Unless otherwise specified, samples of power banks shall be fully discharged and then charged [REDACTED] instructions prior to any testing. The sequence shall be repeated at least two hours after the battery was charged.		P
	[REDACTED]		P

UL 2056: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
	The discharging procedure is to discharge the power bank at a steady rate of current to attain the end of discharge condition specified by the [REDACTED]		P
7.2	Operating conditions		
7.2.1	Rated capacity		P
	The capacity of power bank shall not be less than 90% or exceed 110% of the marked capacity rating. Compliance is checked by the following test:	See appended table 7.2.1	P
	A sample of a fully charged power bank is stored for not less than 1 h and not more than 4 h.		P
	The power bank is then discharged, at a constant current equal to the rated current of the output port, until its voltage reaches to the end-of-discharge voltage of the output port specified by [REDACTED]		P
	The test may be repeated up to 4 additional times, as necessary to satisfy this requirement.		P
7.2.2	Specified operating region and temperature tests		P
	Power banks shall operate within the specified operating region of the batteries / cells. For each [REDACTED]	See appended table 7.2.2 a	P
	-The upper limit of charging voltage: [REDACTED]		P
	-The maximum charging current: [REDACTED]		P
	-The surface temperature:		--
	[REDACTED] Compliance is checked by tests consisting of two full discharge – charge cycles under the following conditions (as applicable):		P
	-Charging and discharging while placed in the most unfavorable stable position on a softwood surface and covered by two plies of loosely draped cheesecloth that overlap the supporting surface by minimum 25 mm in each direction.		P

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Clause	Requirement + Test	Result - Remark	Verdict
	-Charging while placed in associated luggage, carrying case, etc. according to the luggage		N/A
	•with no electrical load; and		N/A
	•with all electrical loads of the associated luggage connected, or a portion of the electrical loads if such a condition represents a worse case.		N/A
	During charging and discharging, the voltage, the temperature and the charging current are monitored for all individual cells. Currents measured during battery charging shall be the average current over a period of between one and five seconds.		P
	temperature measurements shall be on the outer		P
	For batteries where the cells are configured in series, the test shall be repeated with the charge in one battery deliberately imbalanced. The imbalance is introduced by having all cells with from fully charged condition to the specified fully discharged to approximately 50% of its specified state of charge (SOC).		N/A
	The measured temperatures shall not exceed the values in Table 7.1.	See appended table 7.2.2 a	P
	External touchable surfaces of power banks shall not present a risk of thermal burn injury. Compliance is checked by determining the temperature rise of touchable surfaces during two full discharge – charge cycles under the following conditions:		P
	-Charging and discharging while placed on a softwood surface.		P
	During charging and discharging, the measured temperatures shall not exceed the values in Table 7.2.	See appended table 7.2.2 a	P
7.2.3	Limited power source		P

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Clause	Requirement + Test	Result - Remark	Verdict
	The output available from any port shall comply in Table 7.3 or Table 7.4. Compliance is checked by the following test:	See appended table 7.2.3	P
	The open circuit output voltage and short-circuit output current from a fully charged power bank shall be measured. If more than one port is provided, the output from each port shall be measured one at a time with the others unloaded.		P
	source if complying with one of the following:		P
	with Table 7.3;		N/A
	-A linear or non-linear impedance limits the output in compliance with Table 7.3. If a positive temperature coefficient (PTC) device is relied upon, it shall:		N/A
	•be tested in accordance with UL 60730-1, 15, Endurance tests of Clause 17, additional J.15, and additional Endurance tests of Clause J.17; or		N/A
	•meet the requirements in UL 60730-1 for a device for Type 2.AL action;		N/A
	-A regulating network or an integrated circuit (IC) current limiter, limits the output in compliance with Table 7.3, both with and without a simulated single fault in the regulating network or the IC current limiter (open circuit or short circuit). A single fault between the input and output is not conducted if the IC current limiter meets a suitable test program as given in the Annex for Integrated Circuit (IC) Current Limiters of UL 60950-1 or the Clause for Integrated Circuit (IC) Current Limiters of UL 62368-1;		P
	-An overcurrent protective device is used and the		N/A
	Where an overcurrent protective device is used, it shall be a fuse or a non-adjustable, non-auto-reset, electromechanical device.		N/A

UL 2056: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.4	Vibration and mechanical shock		P
	Vibration and mechanical shock encountered during transportation and use shall not cause fire, explosion, rupture, leakage or venting. Compliance is checked by the following tests:	See appended table 7.2.4	P
	Three fully charged power bank samples are firmly secured to the platform of a vibration machine without distorting them in such a manner as to faithfully transmit the vibration. Each sample is then subjected to sinusoidal vibration sweep cycle according to the conditions of Table 7.5. The sweep cycle shall be repeated 11 additional times for each of three mutually perpendicular mounting positions. One of the directions shall be perpendicular to the power bank face with the most ports or where an adjustable control is located.		P
	Three additional fully charged power banks are firmly secured to a shock testing machine by means of a rigid mount of sufficient size and sample is subjected to 3 shocks in each direction of three mutually perpendicular mounting positions of the sample for a total of 18 shocks. For each shock, the parameters given in Table 7.6 shall be applied.		P
	After the aforementioned tests, if the power bank is still operational, one charge and discharge cycle is conducted on each operational sample		P
7.3	Abnormal operation		P
7.3.1	External short-circuit and overload		P
	Short-circuiting of positive and negative terminals of the power bank shall not cause fire or explosion from the power bank or ignite the external fire indicators. Compliance is checked by the following tests:		P

UL 2056: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
	Two samples of a fully charged power bank are short-circuited for a period of 24 h by connecting the positive and negative terminals of a port with a total external resistance of $80 \pm 20 \text{ m}\Omega$. If the enclosure temperature of power bank declines by 20% of the maximum temperature rise [REDACTED] recommended charging period or 3 h if no charging period is specified, the test may terminated sooner. However, in case of a rapid decline in the short-circuit current, the power bank shall remain on test for an additional one hour after the current reaches a low-end steady state condition.	See appended table 7.3.1 a	P
	The test is repeated on two additional samples after a fault is introduced in the discharge protection circuit. The faults of 6.8 shall be applied, one at a time and as appropriate.		P
	Two additional samples are placed on a softwood surface covered by a single layer of white tissue paper. Each power output port is then simultaneously loaded to continuously draw a maximum attainable current for at least 1 h. If a protective circuit operates to limit the current from one or more simultaneously loaded ports, the test is repeated on two additional samples after a fault is introduced in the protection circuit. The faults of 6.8 shall be applied, one at a time and as appropriate.	See appended table 7.3.1 b	P
	After the aforementioned tests, if the power bank is still operational, one charge and discharge cycle shall be conducted for each operational sample using the method declared by [REDACTED]		P
	For a power bank integrated in luggage, a nominal 1 m length of USB cable, having 0.3211 mm diameter conductors and mating connector, shall be attached to one sample of the power bank port providing the maximum output current. The cable shall have a short circuit made by any convenient means at approximately its mid-point and shall then be placed on a softwood surface that is covered by a single layer of white tissue paper and the cable draped with a single layer of cheesecloth. The test is conducted until ultimate results are observed.		N/A

UL 2056: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
7.3.2	Overcharge		P
	A power bank shall tolerate without fire or explosion an overcharging condition outside the [REDACTED] Compliance is checked by the following test:	See appended table 7.3.2	P
	Two power bank samples are discharged to fully discharged state. They are then charged at a constant current of 2.0 It A, using a steady supply voltage which is:		P
	-1.4 times the upper limit charging voltage of the [REDACTED] block construction; or		P
	-1.2 times the upper limit charging voltage per [REDACTED]		N/A
	NOTE The DC-DC converter circuitry of power bank will need to be bypassed in order to make it possible to apply the specified overcharge.		P
	The test shall continue until the temperature of the housing reaches steady state or peaks and returns to ambient.		P
	The test is repeated on two additional samples after a fault is introduced in the charge protection circuit. The faults of 6.8 shall be applied, one at a time and as appropriate.		P
	For a power bank with a series configuration battery, an additional sample shall be prepared such that all cells are at approximately 50% charge, except for one which is shorted. The battery is then charged.		N/A
	After the aforementioned tests, if the power bank is still operational, one charge and discharge cycle is conducted on each operational sample [REDACTED]		P
8	Markings		P
8.1	Electrical rating marking		P
	The following electrical rating shall be permanently and legibly marked on the power bank:	See marking plate.	P
	-Input rating in Vdc or Vac and A for each port;		P

UL 2056: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
	-Output rating in Vdc and A for each port and a combined ampere rating (if not equal to the summation of all ports);		P
	-Electrical capacity in Ah or mAh of the power bank. A capacity rating shall additionally be specified for each port if it is not equal to the rating of the power bank.		P
8.2	Identification marking		P
	The following marking shall be permanently and legibly marked on the power bank:	See marking plate.	P
			P
			P
	-Date of manufacture (which may be in code).		P
8.3	Cautionary marking		P
	The following or equivalent wording shall be permanently and legibly marked on the power bank:	See marking plate.	P
	This wording or equivalent shall also be included in the instructions supplied with the power bank.	User manual provided.	P
	For removeable power banks integrated into luggage, carrying cases, bags, packs, etc., the following or equivalent shall be permanently and legibly marked on the power bank and the luggage, carrying cases, bags, packs, etc.: "For use only with ____"		N/A
			N/A
8.4	Other information		P
			P
9	Instructions		P

UL 2056: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
9.1	General		P
	The following instructions shall be supplied with the power bank in the form of a manual, stuffer sheet or on packaging. The instructions may additionally be repeated via marking provided directly on the power bank. See also Annex A.	User manual provided.	
	-Storage and disposal instructions; and	User manual provided.	P
	-Recommended charging instructions.	User manual provided.	P
	For removeable power banks integrated into luggage, carrying cases, bags, packs, etc., the following instructions shall also be supplied in the form of a manual, stuffer sheet. These instructions may additionally be repeated via marking provided directly on the power bank and/or the luggage, carrying case, bag, pack etc.:		N/A
	-Installation and removal instructions, including when storing the luggage, carrying case, bag, pack, etc. in a cargo area of an airplane;		N/A

Critical Components					
Material: e.g. external enclosure, PCB, closed-end connector, sleeves, cord anchorage etc					
Components with winding: e.g. motor, transformer, magnetic coil etc.					
Other components: e.g. switch, thermostat, heater, plug, internal wire, capacitor, relay, varistor etc.					
Object/part No.		Type/ model	Technical data	Standard	Mark(s) of conformity
Plastic enclosure	SABIC INNOVATIVE PLASTICS B V	CX7240 (GG)	V-0, 90°C, Min. thickness: 1.5mm	UL 94 UL 746C	UL E45329
PCB	Precision Circuit Scien-Tech Co.,		V-0, 130°C	UL 796	UL E248037
PCB (Alternative)	Interchangeable	Interchangeable	V-0, 130°C	UL 796	UL approved
IC (U1)	INJOINIC TECHNOLOGY	IP5310	V _{IN} : -0.3V~6V T _J : -40~150°C	--	Tested with appliance
IC (U2)	XYSEMI	XB7608A	Over charge protection voltage: 4.30±0.05V, Over discharge protection voltage: 2.4±0.1V	--	Tested with appliance
	GanZhou Novel Battery Technology	1376074	3.85V, 10000mAh	--	Test with compliance
-Positive electrode	--	--	LiCoO ₂	--	--
-Negative electrode	--	--	Graphite	--	--
-Separator	--	--	Shutdown temperature: 130°C	--	--
-Electrolyte	--	--	LiPF ₆ +EMC+EC+DMC	--	--
Supplementary information:					
¹⁾ Provided evidence ensures the agreed level of compliance.					

Table 7.2.1	Rated capacity					P
Rated capacity		6000mAh		90%~110% capacity		5400mAh ~6600mAh
Sample No.	Cycle No./ Measured Capacity					Results
	1	2	3	4	5	
B1#	6261mAh	--	--	--	--	P
Supplementary information:						
The capacity of power bank not be less than 90% or exceed 110% of the marked capacity rating;						

Table 7.2.2 a	Specified operating region and temperature tests (Normal test)					P
POWER BANK Component Temperature Test						
Sample No.	B2# (1 st cycle)		B2# (2 nd cycle)		Limited T	
Testing Process	Charging	Discharging (USB)	Charging	Discharging (DC)	Charging	Discharging
PCB near U1	57.3	70.5	54.5	68.3	130+23.2-40=113.2	130+23.3-60=93.3
PCB near U2/U3	54.2	67.3	52.6	65.4	130+23.2-40=113.2	130+23.3-60=93.3
PCB near L1	56.1	69.5	53.4	67.0	130+23.2-40=113.2	130+23.3-60=93.3
DC	25.1	31.0	23.9	61.9	Ref.	Ref.
USB	24.7	65.2	23.8	29.7	Ref.	Ref.
Type-C	53.4	30.9	50.6	28.9	Ref.	Ref.
Inner Wire	48.2	57.1	44.8	57.6	200+23.2-40=183.2	200+23.3-60=163.3
	39.7	47.9	36.4	45.8	Ref.	Ref.
Enclosure Inside	33.6	43.6	31.2	42.5	120+23.2-40=103.2	120+23.3-45=98.5
Ambient	23.2	23.3	23.2	23.3	--	--
Accessible parts:						
Power bank surface	31.9	41.8	30.7	39.7	48	48
Ambient	23.2	23.3	23.2	23.3	--	--

Supplementary information: Charging: 5V, 2A; Discharge: 5 V, 3A						
Sample No.	B2# (1 st cycle)		B2# (2 nd cycle)		Limited T	
Testing Process	Charging	Discharging	Charging	Discharging	Charging	Discharging
(extreme value) (V)	4.37	3.31	4.38	3.33	4.40	3.00
max (A)	2.10	3.55	2.08	3.53	5.00	10.00
Supplementary information: Charging: 5V, 2A; Discharge: 5 V, 3A						

Table 7.2.2 b	Specified operating region and temperature tests (Imbalanced test)						N/A
POWER BANK Component Temperature Test							
Sample No.	(1 st cycle)		(2 nd cycle)		Limited T		
Testing Process	Charging	Discharging	Charging	Discharging	Charging	Discharging	
Supplementary information: Charging: V, A; Discharge: V, A							
Sample No.	(1 st cycle)		(2 nd cycle)		Limited T		
Testing Process	Charging	Discharging	Charging	Discharging	Charging	Discharging	
(extreme value) (V)							
max (A)							
Supplementary information: Charging: V, A; Discharge: V, A							

						P
Circuit output tested:						
Note: Measured Uoc (V) with all load circuits disconnected:						
Components	Sample No.	Uoc (V)	Isc (A)		VA	
			Meas.	Limit	Meas.	Limit
Normal condition	B3#	5.18	3.60	8	12.81	100
Single fault: (U2)	B4#	5.19	3.70	8	13.24	100
Single fault: (U1)	B5#	4.31	7.50	8	23.25	100
Supplementary information: S-C=Short circuit						

Table 7.2.4	Vibration and mechanical shock			P
Vibration test				
Sample no.	B6#	B7#	B8#	
Mass (before test) (g)	163.308	163.035	162.834	
Mass (after test) (g)	163.305	163.034	162.831	
Mass loss ratio	0.002%	0.001%	0.002%	
Shock test				
Sample no.	B9#	B10#	B11#	
Mass (before test) (g)	162.918	163.431	162.864	
Mass (after test) (g)	162.916	163.428	162.863	
Mass loss ratio	0.001%	0.002 %	0.001 %	
Supplementary information: No fire, explosion, rupture, leakage or venting.				

Table 7.3.1 a	External short-circuit					P
Sample No.	Test output	OCV before test (Vdc)	Resistance of circuit (mΩ)	Maximum case temperature (°C)	Component single fault condition	Results
B12#	USB	5.18	81.9	23.6	Normal	P
B12#	USB	5.19	83.1	23.9	Normal	P
B13#	USB	5.19	78.5	23.5	(U2) S-C	P
B13#	USB	4.30	86.2	23.7	(U1) S-C	P
B14#	DC	5.18	83.7	23.8	Normal	P
B14#	DC	5.17	85.7	23.7	Normal	P
B15#	DC	5.18	78.6	23.6	(U2) S-C	P

B15#	DC	4.31	80.3	23.5	(U1) S-C	P
Supplementary information: No fire or explosion from the power bank or ignite the external fire indicators.						

Table 7.3.1 b	Overload test					P
Sample No.	OCV before test (Vdc)	Test time	Current drawn (A)	Maximum case temperature (°C)	Component single fault condition	Results
B16#	5.19	1.7h	3.55	34.2	Normal	P
B17#	5.21	1.6h	3.57	36.1	Normal	P
B18#	5.13	1.7h	3.65	33.7	U2 (S-C)	P
B19#	4.30	1.4h	7.41	54.1	U1 (S-C)	P

Supplementary information: No fire or explosion from the power bank or ignite the external fire indicators.						
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Table 7.3.2	Overcharge				P
Constant charging current (A)		20.0			—
Supply voltage (Vdc)		6.00			—
Sample no.	OCV before charging (Vdc)	Component single fault condition	Maximum outer case temperature (°C)	Results	
B20#	3.37	Normal	31.1	P	
B21#	3.35	Normal	29.9	P	
B22#	3.37	(U2) S-C	36.9	P	
B23#	3.36	(U2) S-C	38.1	P	

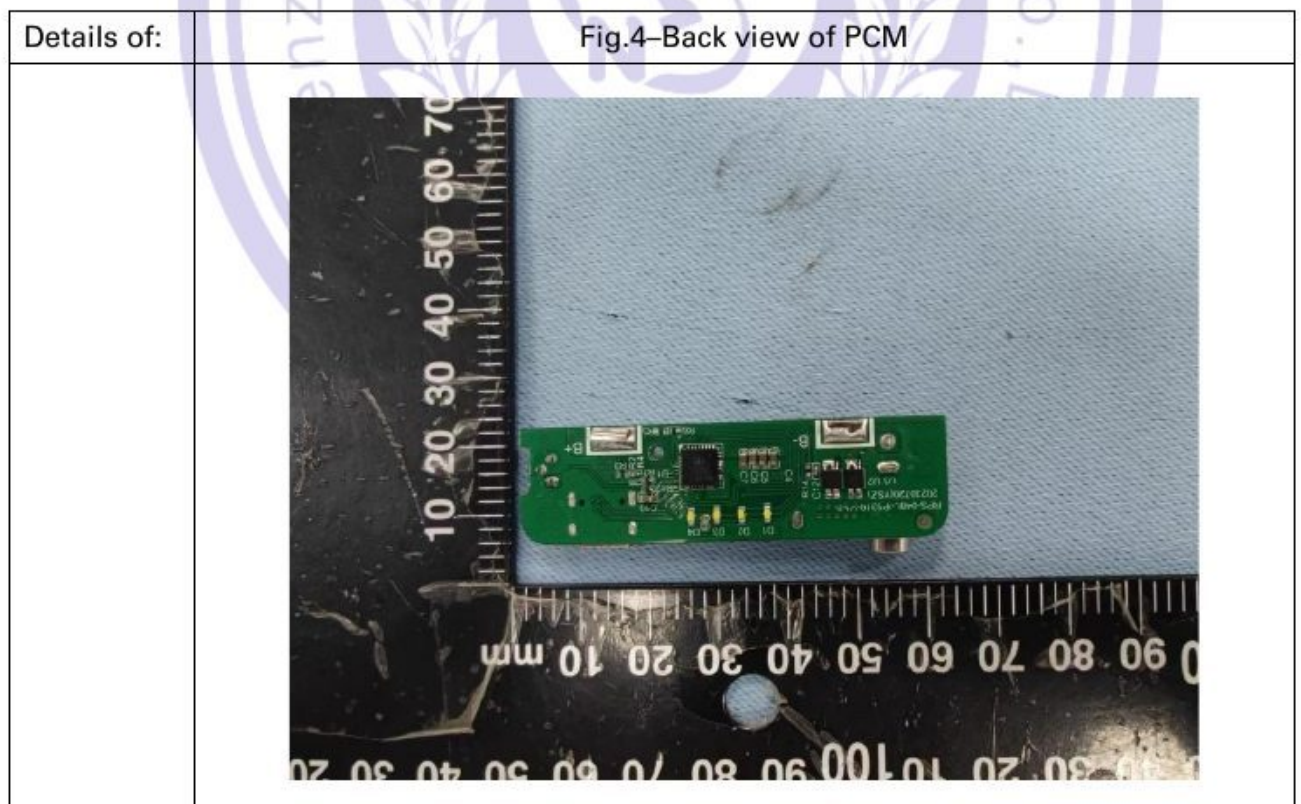
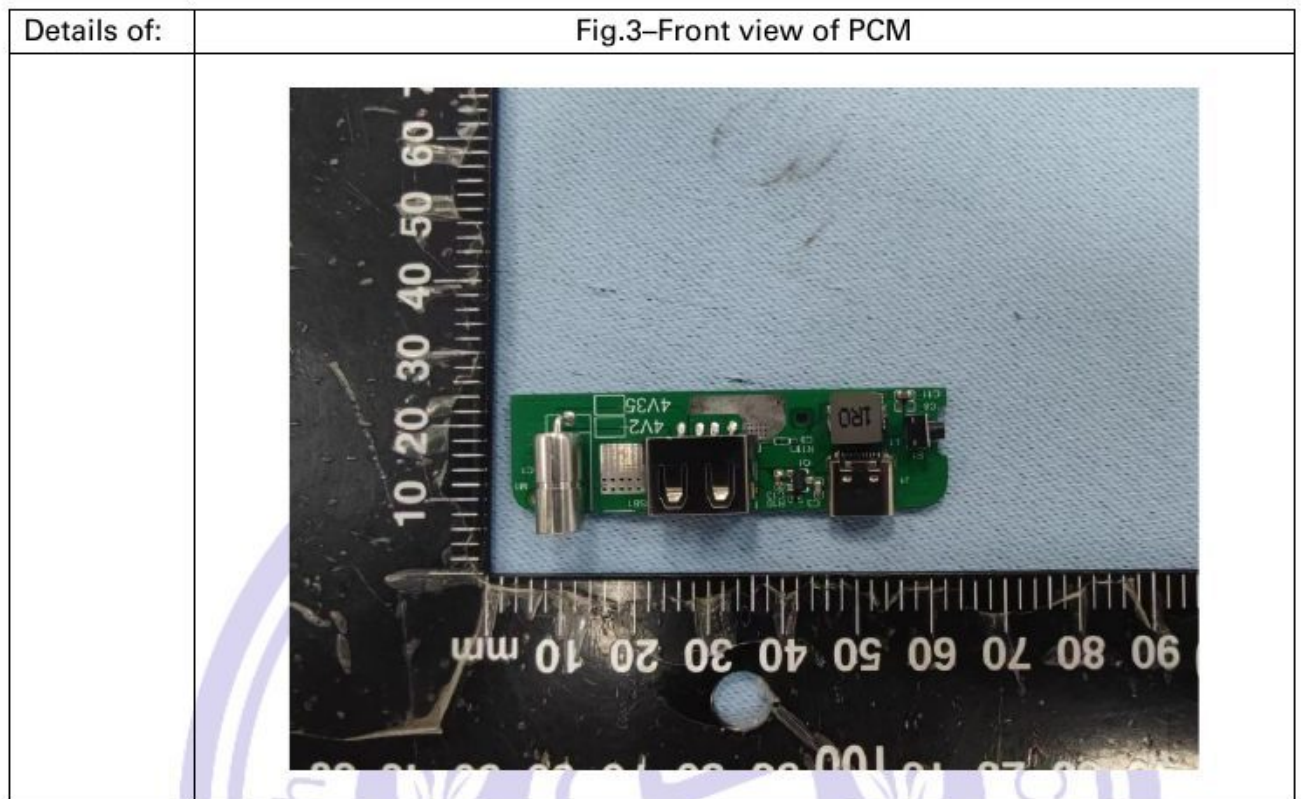
Supplementary information: The DC-DC converter circuit S-C before test. No Fire or explosion.					
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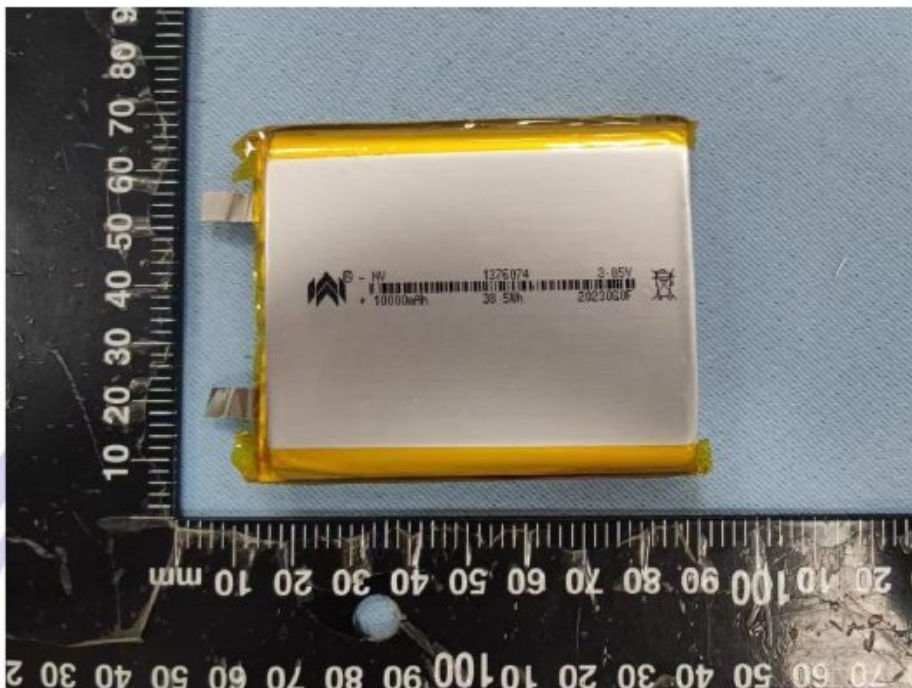
Appendix 1

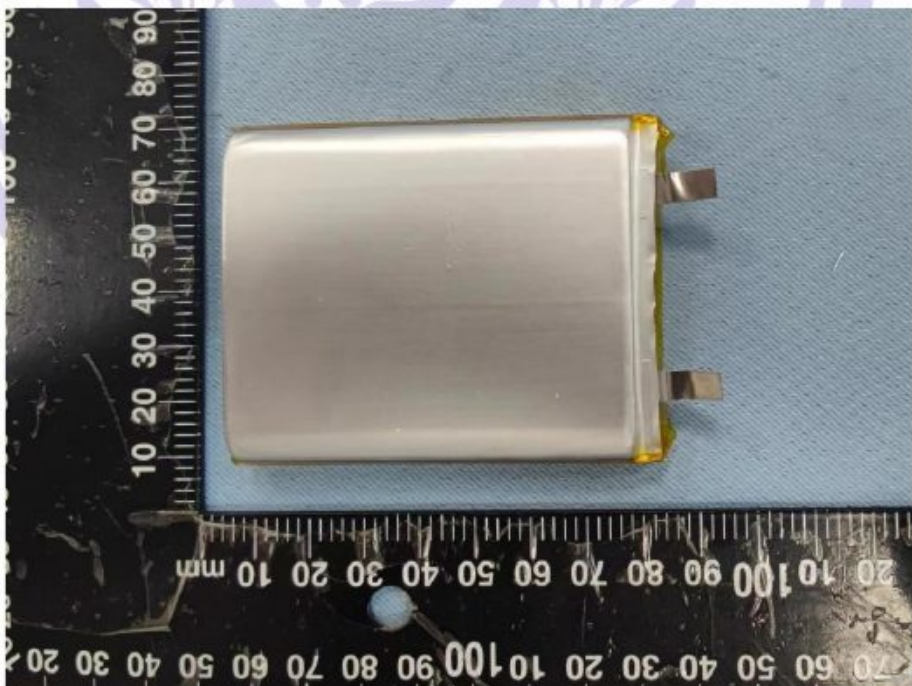
Photo Documentation

Details of:	Fig.1–Front view of battery RPS-048L
	 A black rectangular battery, model RPS-048L, is shown next to a black ruler. The battery has a label with the following text: "10000mAh", "Model: RPS-048L", "Capacity: 10000mAh/36Wh", "Input: 5V-1A", "Output: USB 5V-2A", "DC 5V-3A", "Made in China", and "制造商: 广东普源智能科技股份有限公司". The ruler shows measurements in centimeters and millimeters.

Details of:	Fig. 2–Side view of battery RPS-048L
	 A side view of the black rectangular battery, model RPS-048L, is shown next to a black ruler. The battery has a USB port and a DC port on the side. The ruler shows measurements in centimeters and millimeters.



Details of:	
	

Details of:	
	

---End of Test Report---