

Lithium-ion Polymer Cell Specification

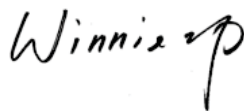
PL1454/85mAh

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Lithium-ion Polymer Cell PL1454/85mAh

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Lithium-ion Polymer Cell PL1454/85mAh

1. Scope:

This document describes the product specification and using condition of the Lithium-ion Polymer rechargeable cell supplied by CHUNG PAK (GUANGDONG) BATTERY INDUSTRIAL CO.,LTD.

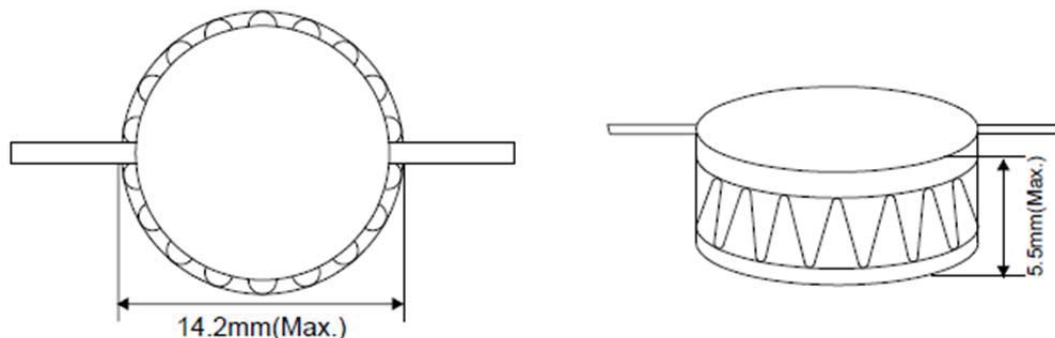
2. Specification

2.1 Product Basic Information

No.	Items	Specifications	
1	Model	PL1454/85mAh	
2	Charge voltage	4.2 V	
3	Nominal voltage	3.7V	
4	Discharge cut-off voltage	3.0 V	
5	Typical capacity	90mAh @0.2C Discharge	
6	Minimal capacity	85mAh @0.2C Discharge	
7	Standard charge	0.2C constant current charge to 4.2V, then constant voltage 4.2V charge till charged current declines to $\leq 0.02C$	
8	Charging time	Standard Charging: 6.0 hours (0.2C) Rapid charge: 1.5-2.5 hours (1.0C)	
9	Max. charge/discharge current	Charging: 0~15℃: 0.2C/4.2V (Max.) 15~45℃: 1.0C/4.2V (Max.) 45~60℃: 1.0C/4.1V (Max.)	
		Discharging : -20~+10℃: 0.2C/3.0V (Max.) 10~+60℃: 1.0C/3.0V (Max.)	
10	Temperature range for storage	less than 1 month	-20~+45℃
		less than 3 month	-20~+40℃
		less than 1 year	-20~+35℃

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2.2 Mechanical Drawing (not in scale)



Description/	Dimension and SPEC
Thickness (max)	$\leq 5.5\text{mm}$
Width (max)	$\leq 14.2\text{mm}$
Weight	Approx.:1.9g
Initial impedance	$\leq 600\text{m}\Omega$
Shipment voltage	$\geq 3.85\text{V}$

3. Cell Performance Criteria

3.1 Visual Inspecting

There shall be no defects such as scratch, flaw, crack, and leakage, which may adversely affect commercial value of the cell.

3.2 Standard Environmental Test Condition

- Unless otherwise specified, all tests stated in this product specification are conducted at below condition:

Temperature: $23 \pm 2^\circ\text{C}$

Humidity : $65 \pm 20\%\text{RH}$

- Above testing of safe characteristic must be with protective equipment.

3.3 Electrical Characteristics

No.	Items	Test Method and Condition	Criteria
1	Initial capacity	The capacity means the first discharge capacity of the cell, which is measured with discharge current of 0.2 C with 3.0V cut-off after standard charge.	2.1.6
2	Initial impedance	Internal resistance measured at AC 1KHz ,50% SOC.	2.2 ①
3	Cycle Life	Test condition: Charge: 0.2C to 4.2V ,CV to 0.02C; Rest :10min; Discharge: 0.2C to3.0V; Repeat above steps till discharge capacity higher than 80% of the initial capacity.	≥ 500 cycles

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3.4 Environment Characteristics

1	Self-discharge	After the standard charging, stored the cells under the condition as item 3.2 for 28 days, then tested the capacity with 0.2C till 3.0V.	Residual capacity >90%
2	Temperature characteristics	1. Charge the battery according to item 2.1.7; 2. Discharge the battery with 0.2 C till 3.0V cut-off at test temperature; 3. The capacity of the battery at each temperature shall be compared to the capacity tested at 25 °C.	-10℃: ≥60% 25℃: 100% 55℃: ≥85%
3	Constant humidity and temperature	After standard charging, storage the battery at 40±2℃ RH 90~95% for 48h. Recording 0.2C discharging time.	No distortion no leakage Discharge time≥3h

3.5 Mechanical Characteristics

1	Vibration Test	Cell is vibrated per axis in each of three mutually orthogonal axes with total excursion of 1.6mm and with vibration cycling that consists of 10Hz to 55Hz to 10Hz at sweep rate 1Hz/min.	No fire, no leakage
2	Drop Test	The cell is to be dropped from a height of 1m twice onto concrete ground.	No fire, no leakage

3.6 Safety Characteristics

No.	Item	Test Methods and Condition	Criteria
1	Over charge testing	At 20±5℃, charging batteries with constant current 3C to voltage 4.6V, then with constant voltage 4.6V till current decline to 0A. Stop test till temperature 10℃ lower than max temperature.	No fire, no explosion
2	Short-circuit testing	At 20±5℃, After standard charging, connect batteries' anode and cathode by wire which impedance less than 80±20mΩ, Stop test till batteries' temperature 10℃ lower than max temperature.	No fire, no explosion
3	Heating	Put the Cell in a circulating air oven, at a rate of (5 ±2 °C) per minute to 130℃,and then placed for 30 minutes at 130℃.	No fire, no explosion
4	Crush test	The pressure on the surface of the fully charged cell do not stop being raised until 13kN when the cell is crushed by two flat surfaces.	No fire, no explosion

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4. Storage and Transportation

4.1 Storage

- The Li-ion battery pack should be stored in a cool, dry and well-ventilated area, and should be far from the fire and the high temperature.
- The battery should store in the product specification book stipulation temperature range, the best storage temp. is $25\pm 5^{\circ}\text{C}$. The best humidity is $60\pm 15\%$.
- The battery should be stored within room temperature, and charged to 40%~60% electric quantity (3.85V) . In order to avoid over-discharge, we suggest charge and discharge the batteries every three months. Then charge to 40%~60%electric quantity(3.85V).

4.2 Transportation

- Do not mix the battery products with other cargoes.
- Do not immerse the battery products in water or allow it to get wet.
- Do not over 7 layers staking and upside-down.
- The highest temperature in transportation is lower than 60°C .

5. Use Attentions

To ensure proper use of the battery please read the manual carefully before using it.

5.1 Warnings

- Do not expose to, dispose of the battery in fire.
- Do not put the battery in a charger or equipment with wrong terminals connected.
- Avoid shorting the battery.
- Avoid excessive physical shock or vibration.
- Do not disassemble or deform the battery.
- Do not immerse in water.
- Do not use the battery mixed with other different type or model batteries.

5.2 Charge

- Battery must be charged in appropriate charger only.
- Do not charge battery over 24 hours.
- Charging current: Can not surpass the biggest charging current which in this specification book stipulated.
- Charging voltage: Does not have to surpass the highest amount which in this specification book stipulated to decide the voltage.
- Charge temperature: The battery must carry on the charge in the ambient temperature scope which this specification book stipulated.
- Uses constant current and constant voltage way charge. PLS connect the positive and negative terminals in right way, or the battery may be damaged.

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5.3 Discharge

- The discharging current should not surpass the biggest discharging current this specification book stipulation. The large discharge current can cause heat and lower capacity.
- Discharge temperature: The battery discharge must carry on in the ambient temperature scope which this specification book stipulated.
- Over-discharge: After short time over discharge, then charge immediately won't damage the battery. But the battery will be damaged for being long time over discharged. During long-term storage, the battery may be within over-discharging condition for self-discharge. To prevent the occurrence of over discharging, the battery should maintain the certain capacity when storage.

5.4 Handling of Cell

- Soft Aluminium foil

Don't strike battery with any sharp edge parts

Trim your nail or wear glove before taking battery

Clean worktable to make sure no any sharp particle

- Sealed edge may be damaged by heat above 100°C, bend or fold sealed edge.
- Avoid some components to contact the edge of packing foil of batteries

5.5 Disposal

Regulations vary for different countries. Dispose of in accordance with local regulations.

6. Period of Warranty

The period of warranty is 12 month from the date of shipment. Guarantees to give a replacement in case of cells with defects proven due to manufacturing process instead of the customers abuse and misuse.

Note

Any other items which are not covered in this specification shall be agreed by both parties.