Lithium Polymer Cell - 1100mAh Specifications Report

1、Scope:

This product specification describes model # 803048 1100mAh polymer lithium-ion battery. Please read the precautions recommended in the specifications before using the battery cell.

2、Product Type, Model and Dimension:

2.1 Type：Polymer lithium-ion battery

2.2 Model： #803048 with PCB and lead wire

2.3 Nominal Dimension (Pack): 8.1 x 31.0 x 51.5 mm

3、Specification:

Item		Specifications	Remark
Nominal Capacity		1100mAh	0.2C_5A discharge
Nominal Voltage		3.7V	Average Voltage at 0.2C_5A discharge
Charge Current		Standard：0.2 C_5A；Max：1C_5A	Working temperature：0~40℃
Charge cut-off Voltage		4.20±0.03V	
Discharge Current		Continuously: 0.2C_5A；Max：2C_5A	Working temperature：0~60℃
Discharge cut-off Voltage		2.75V	
Cell Voltage		3.8~3.9V	When leave factory
Impedance		≤130mΩ	AC 1KHz after 50% charge
Weight		Approx: 24 g	
Storage temperature	≤1month	-20～45℃	Best 20±5℃ for long-term storage
	≤3month	0～30℃	
	≤6month	20±5℃	
Storage humidity		65±20% RH	

4、General Performance:

Definition of Standard charging method: At 20±5℃, charging the cell initially with constant current 0.2C_5A till voltage 4.2V, then with constant voltage 4.2V till current declines to 0.05C_5A.

Item		Test Methods	Performance
4.1	0.2C Capacity	After standard charging, laying the battery 0.5h, then discharging at 0.2C_5A to voltage 2.75V, recording the discharging time.	≥300min
4.2	1C Discharge	After standard charging, laying the battery 0.5h, then discharging at 1C_5A to voltage 2.75V, recording the discharging time.	≥51min
4.3	Cycle Life	Constant current 1C_5A charge to 4.2V, then constant voltage charge to current declines to 0.05C_5A, stay 5min, constant current 1C_5A discharge to 2.75V, stay 5min. Repeat above steps till continuously discharging time less than 36min.	≥300times
4.4	Storage	20±5℃, After standard charging, laying the battery 28days, discharging at 0.2C_5A to voltage 2.75V, recording the discharging time.	≥240min

5、Environment Performance:

Item		Test Methods	Performance
5.1	High temperature	After standard charging, laying the battery 4h at 60℃, then discharging at 0.2C_5A to voltage 2.75V, recording the discharging time.	≥270min
5.2	Low temperature	After standard charging, laying the battery 4h at 0.2C_5A, then discharging at 0.2C_5A to voltage 2.75V, recording the discharging time.	≥210min
5.3	Constant humidity and temperature	After standard charging, laying the battery 48h at 40±2℃, RH 93±2%. Recording 0.2C_5A discharging time	No distortion No electrolytes leakage ≥270 min
5.4	Temperature shock	After standard charging, battery stored at -20℃ for 2 hours, then stored at 50℃ for 2 hours. Repeat 10 times.	No electrolytes leakage

6、Mechanical Performance:

Item		Test Methods	Performance
6.1	Vibration	After standard charging, put battery on the vibration table. 30 min experiment from X,Y,Z axis. Scan rate: 1 oct/min; Frequency 10-30Hz, Swing 0.38mm; Frequency 30-55Hz, Swing 0.19mm.	No influence to batteries' electrical performance and appearance.
6.2	Collision	After vibration test, batteries were laying on the vibration table about X, Y, Z axis. Max frequency acceleration: 100m/s^2; collision times per minutes: 40~80; frequency keeping time 16ms; all collision times 1000±10.	No influence to batteries' electrical performance and appearance.
6.3	Drop	Random drop the battery from 10m height onto concrete one times.	No explosion or fire

7、Safety Test:

Test conditions: The following tests must be measured at flowing air and safety protection conditions. All batteries must standard charge and lay 24h.

Item		Test Methods	Performance
7.1	Over charge	At 20±5℃, charging batteries with constant current 3C_5A to voltage 5V, then with constant voltage 5V till current decline to 0. Stop test till batteries' temperature 10℃ lower than max temperature.	No explosion or fire
7.2	Over discharge	At 20±5℃, discharge battery with 0.2C_5A continuously 12.5h.	No explosion or fire
7.3	short-circuit	At 20±5℃, connect batteries' anode and cathode by wire which impedance less than 50mΩ, keep 6h.	No explosion or fire
7.4	Extrusion	At 20±5℃, put the battery in two parallel steal broad, add pressure 13kN.	No explosion or fire
7.5	Thermal shock	Put the battery in the oven. The temperature of the oven is to be raised at 5±1℃ per minute to a temperature of 130±2℃ and remains 60 minutes.	No explosion or fire

8、Precautions:

8.1 Care of batteries during operation

The batteries must be handled with extreme care as it has a soft exterior.

8.1.1 Aluminium packing materials

The aluminium packing material can be easily damaged by the sharp edge objects, such as nickel-tabs.

(1) Never use sharp object touching or in contact with the battery;

(2) When surface cleaning is required, avoid the rubbing/scrubbing sharp edge parts of cells;

(3) Strictly prohibited to pierce the battery with nail and other sharp items;

(4) Contact forbidden with metal, such as necklace, hairpin etc in transportation and storage.

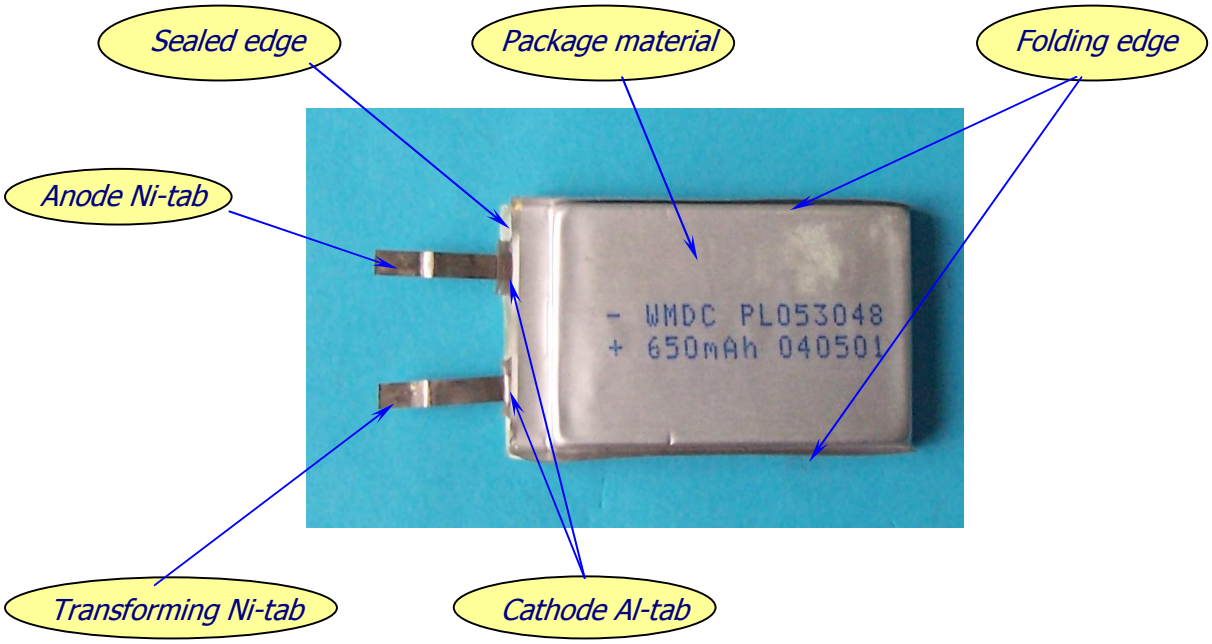


Fig.1 Exterior schematic of polymer lithium-ion cells

8.1.2 Sealed edge

Sealing edge is very vulnerable to damage and cannot be bent

The Al interlayer of package has good electric performance. It is forbidden to connect interlayer with any exterior component in order to prevent possible short-circuits.

8.1.3 Folding edge

The folding edge is formed in batteries' processes and passed all hermetic tests, please do not open or deform it. The Al interlayer of package has good electric performance. It is prohibited to connect with exterior component to preventing short-circuits.

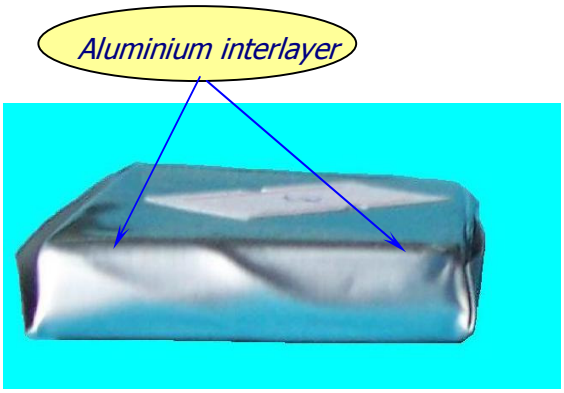


Fig.2. Single folding edge of PL cells

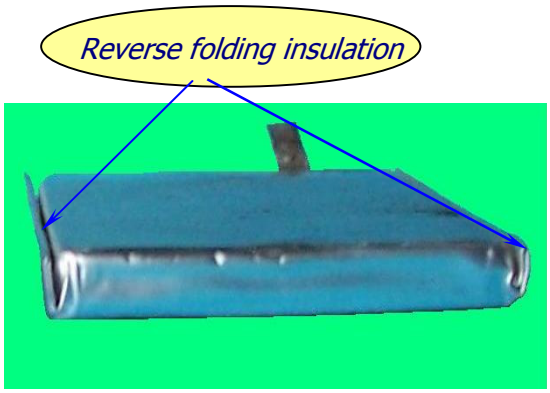


Fig.3. Reverse folding edge of PL cells

8.1.4 Tabs

The batteries' tabs are not so hardy or durable especially for aluminium tabs. Don't bend tabs.

8.1.5 Mechanical shock

Don't fall, hit, bent the batteries' body.

8.1.6 Short-circuit

Short-circuit is strictly prohibited. It can cause irreparable damage to batteries.

8.2 Standard Test Environment for polymer lithium-ion batteries

Environment temperature: 20±5℃,

Humidity: 45-85%

8.3 Cautions of charge & discharge

8.3.1 charge

Charging current should be lower than values that recommend below. Higher current and voltage charging may cause damage to cell electrical, mechanical, safety performance and could lead to high heat generation or chemical leakage.

(1) Batteries charger should charging with constant current and constant voltage mode;

(2) Charging current should be lower than (or equal to)1C_5A;

(3) Temperature 0～40℃ is preferred when charging;

(4) Charging voltage must be lower than 4.25V.

8.3.2 discharge

(1) Discharging current must be lower than (or equal to) $5C_5A$;

(2) Temperature 0～60℃ is preferred when discharging;

(3) Discharging voltage must not be lower than 2.75V.

8.3.3 over-discharge

It should be noted that the cell would be at an over-discharge state by prolonged self-discharge. In order to prevent over-discharge, the cell shall be charged periodically to maintain voltage between 3.6-3.9V. Over-discharge may cause permanent loss of cell performance. It should be noted that the cell would continue to discharge till voltage is below 2.5V.

8.4 Storage of polymer lithium-ion batteries

The ideal environmental condition for long-term storage:

- Temperature: 20±5℃;
- Humidity: 45-85%;
- Batteries charged state at 40～60%.

8.5 Transportation of polymer lithium-ion batteries

The batteries should be transported in not exceeding 10～50% charged states.

8.6 Others

Please note precautions below to prevent cells' leakage, heat generation and explosion.

- Prohibition of disassembly or dismantling of cells;
- Prohibition of cells immersion into liquid such as water or seawater;
- Prohibition of dumping cells into naked fire or incinerator, explosion may occur;
- Prohibition of using damaged or bloated cells. The cells with a smell of electrolyte or leakage must be placed away from fire to avoid catching fire;
- In case of electrolyte leakage contact with skin, eye, or any body parts; immediately flush the electrolyte with fresh water and medical advice is to be sought.

9、Notice on Assembling of Battery Pack:

9.1 Pack design

Battery pack should have sufficient strength and battery should be protected from mechanical shock. No sharp edge components should be inside the pack containing the battery.

9.2 PCM design

The overcharge threshold voltage should not exceed 4.25V.

The over discharge threshold voltage should not be lower than 2.75V.

The PCM should have short protection function built-in.

9.3 Tab connection

Ultrasonic welding or spot welding is recommended to connect battery with PCM or other parts.

If apply manual solder method to connect tab with PCM, the notice below is very important to ensure battery performance.

(1) The electric iron should be temperature controlled and ESD safe;

(2) Soldering temperature should not exceed 350℃;

(3) Soldering time should not be longer than 3s, allow battery tab to cold down before next soldering;

(4) Soldering times should not exceed 5 times on same spot; and

(5) Apply direct heat to cell body is strictly prohibited, battery may be damaged by heat above 100℃.

9.4 Cell fixing

The battery should be fixed to the battery pack by its large surface area. No cell movement in the battery pack should be allowed.

9.5 Cells replacement

The cell replacement should be performed by professionals. Avoid short-circuit between cells, Aluminium package and exterior component.

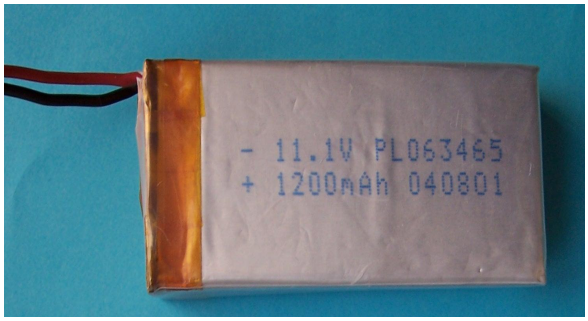
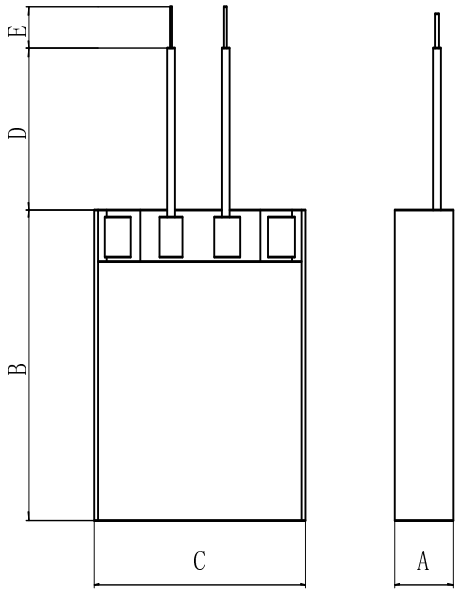


Fig.4. Protect schematic of transforming component connecting with cell

10. Drawing: (mm)



Sign	Item	Max (mm)
A	Battery Thickness	8.1
B	Battery Length	51.5
C	Battery Width	31.0
	Wire Standard	AWG28#×30

10. PCB Parameter

Item	Specifications	Remark
Over charged Protect Voltage	4.275 ± 0.050 V	H313A PCB
Over charged Protect Delay time	≤ 1400 mS	
Over charged Protect Relieve Voltage	4.175 ± 0.025 V	
Over Discharged Protect Voltage	2.30 ± 0.10 V	
Over Discharged Protect Delay time	≤ 173 mS	
Over Discharged Protect Relieve	Charge	
Over Current Protect	3.0 ± 0.5 A	
Over Current Protect Delay time	≤ 11 mS	
Protect Component Static State Power	< 7 μA	