Lithium Polymer Battery Pack

Specification

Model: PCLP602038-1S

191 Covington Drive, Bloomingdale, IL 60108
Phone: 630-295-6800 Fax: 630-295-6801
Toll Free: 877-469-4255

Amendment History

Rev	Description	Date	Name
Pre	Initial Release	8-8-2017	Kevin Oh
Pre 1.0	Added Molex connector	8-15-17	Kevin Oh
Pre 1.1	Added PCM Parameters	8-16-17	Kevin Oh

Customer Approval

Company/Customer Name	Department	Date	Signature

- **For Air Shipments:** A 30% state of charge (SOC) limit on secondary lithium-ion cells and batteries, including Section II cells and batteries, will now apply. This does not apply to batteries packed with or contained in equipment (Effective April1, 2016).
- Lithium cells/battery packs must be charged within 45 days of receipt to avoid over discharge.
- Shipping lithium materials must be done through a licensed shipper with appropriate packaging & labeling to meet current regulations.

These amendments are detailed in a lithium battery update document found on the International Air Transport Association (IATA) website:http://www.iata.org/whatwedo/cargo/dgr/Documents/lithium-battery-update.pdf

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1. Scope

This product specification applies to rechargeable Lithium polymer battery supplied by Zeus Battery Products.

2. Description and Model

Model: PCLP503038-1S

Description: 3.7V 450mAh (1S1P configuration)

3. Nominal Specifications

No.	Item	Specification	Remark
1	Nominal Capacity	450mAh	@ 0.2C discharge, room temperature
2	Nominal Voltage	3.70V	
3	Charge Voltage	4.20+/-0.05V	
4	Standard Charge current	90mA	0.2C
5	Max. continuous charge current	450mA	
6	Max. continuous discharge current	450mA	
7	Discharge cut-off Voltage	3.0V	
8	Internal resistance	≤200mΩ	
9	Weight	Approx. 22.0g	
10	Operating temperature	Charge: 0 ~ 45°C Discharge: -20 ~ 60°C	
11	Storage temperature	1 yr: -10 ~ 25°C 6 months: 25 ~ 45°C 1 month: 45 ~ 55°C	Recommended 25+/-5°C at 50% SOC
12	Cycle Life	≥500 cycles	@ 0.2C discharge, room temperature

***Note on Air transport: Lithium ion cells and batteries must be offered for transport at a state of charge (SOC) not exceeding 30% of their rated design capacity**

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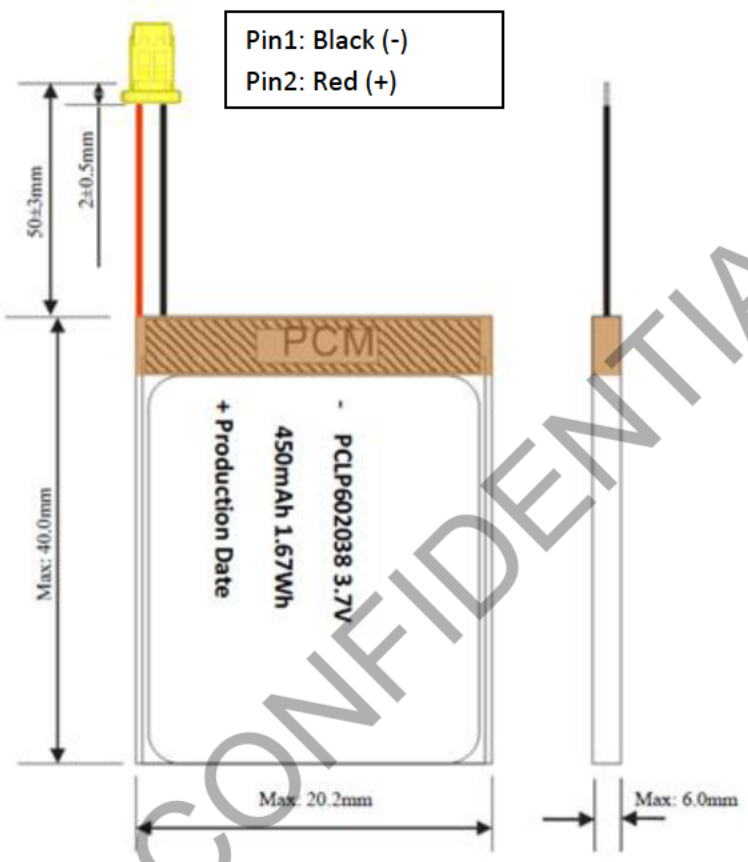
3. Dimension



Item	Description	Specification	Qty
1	Cell	PCLP602038 (450mAh)	1
2	PCB	PCB1640-11	1
3	Wi es	Red (UL 3302 #28) Black (UL 3302 #28)	1 1
4	Connector	Molex 5013300200	1
5	Crimp terminals	Molex 5013340100	2

3.1 Protection Parameters

Item	Content	Criterion
Overcharge Protection	Detection voltage	4.28+/-0.05V
	Detection delay time	1.4s Max.

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	Release voltage	4.08+/-0.05V
Over discharge Protection	Detection voltage	3.0+/-0.10V
	Detection delay time	115 ~ 175ms
	Release voltage	3.0+/-.010V
Over current Protection	Detection voltage	80+/-30mV
	Detection current	1.5 ~ 3.5A
	Detection delay time	11.0ms Max.
	Release condition	Cut load
Short circuit Protection	Detection condition	External short circuit
	Delay time	220 ~ 380us
	Release condition	Cu short circuit
Internal resistance	Main loop resistance	Vc: 4.2V; Rds≤70mΩ
Current consumption	In normal operation	3 0uA typical, 7.0uA Max.
0V Prohibition	Available	

4. Standard Test Conditions

4.1 Environmental Conditions

Unless otherwise specified, all tests stated in this specification are conducted at 25±5°C and 60±20% humidity.

4.2 Measuring Equipment

1) Ammeter and Voltmete

Standard class specified in the national standard or more sensitive class

2) Slide caliper

The slide calipe should have 0.01mm accuracy.

3) Impedance meter

An impedance meter with 1kHz AC should be used.

5. Electrical Characteristics

No	Items	Test Method	Criteria
1	Standard charge	Charge the cell initially with constant current at 0.2C and then with constant voltage at 4.20V untill charge current	N.A

		declines to 0.02C.	
2	Minimal capacity	The capacity means the discharge capacity of the cell, which is measured with discharge current of 0.2C with 3.0V cut-off voltage after the standard charge.	≥430mAh
3	Cycle life	The capacity on 0.2C discharge shall be measured after 500 cycles Of 0.2C charge and discharge at 23±2℃.	Capacity ≥80% stated capacity
4	Charge retention	After full charging, store the battery for 28 days in 20 ± 5°C conditions, and then rest for 1 hour with discharge current of 0.2C till 3.0V cut-off voltage.	Capacity ≥85%

6 Cell Safety Performances

No	Items	Test Method	Criteria
1	Over charge	After discharge to limi voltage, charge at constant current of 3C and constant voltage of 4.6V. Once he voltage reaches to the max, if charging continued over 7 hours or temperature is 0% less than the peak, terminate the test.	No explosion and no fire.
2	External short-circuit	Cel terminals are short-circuited to discharged state less than 0.1V or longer time with a resistance of 50mΩ or less.	No explosion and no fire.
3	Over discharge	Cell is discharged at a current of 1C rate for 2.5 hours. (If current stops by safety or passive circuit on the battery, test is finished.).	No explosion and no fire.
4	Crush test	Crush between two flat plates. Applied force is about 13kN.	No explosion and no fire.
5	Impact test	Impact between bar (15.8mm diameter) and 9.1Kg falling material (at a height of 6.1cm). Bar is laid across the center of the test sample.	No explosion and no fire.
6	Drop test	After standard charge, the cell is to be dropped from a height of 1.2meter onto a thickness of 20mm board, dropped once in the positive and negative directions of three mutually perpendicular X, Y, Z axes.	No leakage, no smoke, no fire, no explosion.

7	Vibration test	Affix the fully charged cell to vibration table and subject to vibration cycling that the frequency is to be varied at the rate of 1Hz per minute between 10Hz and 55Hz, the excursion of the vibration is 0.8mm. The cell shall be tested for 90 ~100 minutes per axis of XYZ axes.	No explosion, no fire, no leakage.
8	Thermal abuse	After standard charge, place the cell in a baking oven. The temperature of the oven is to be raised at a rate of 5±2℃ per minute to a temperature of 130±2℃, remain for 30minutes at that temperature.	No explosion and no fire.

7. Battery Handling Precautions

- The battery should be stored at half charged state in a dry, clean area with good ventilation. If the battery has to be stored for extended period of tim (ove 3 months), the environmental condition should be 20+/-5°C with 65+/-20% Relat ve Humidity.
- Charging current and voltage should be less than max mum charge current specified in the Product Specification. Charging with higher current or voltage than recommended value may damage the battery and lead to poor performance increased safety risk.
- Do not reverse the polarity of battery pack leads. Reverse charging may cause damage to the battery and lead to degradation of performance and increased safety risk.
- Please use a charger appropriat for charging lithium batteries.
- The battery shall be discharged at l ss than the maximum discharge current specified in the Product Specification. Higher cur ent than allowed may reduce performance and lead the battery to over-heat
- Always adhere to operating temperature as listed in the Product Specification. Using batteries outside of its operating temperature will lead to reduced performance and increased safety risk.
- Never short-circuit the battery pack.
- Do not disassemble the battery pack as it may generate internal short circuit in the battery and lead to gassing, fire, or other safety problems.
- If electrolyt s leak and come into contact with the skin or eyes, flush with fresh water and seek medical attention immediately.
- Never incinerate or dispose the battery in fire.
- Never allow the battery to come into contact with liquids such as water, soft drinks, juices and etc.
- Batteries might be damaged during shipping. If abnormal features are present such as damage in a plastic envelop, visible deformation of packaging, or electrolyte odor, the battery shall not be used and placed in a safe well ventilated area away from heat source.

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8. Warranty

Products supplied by Zeus Battery Products contain 12 months warranty against manufacturing defects from date of manufacture. Zeus Battery Products shall not be responsible for any accident or damage resulting from user abuse or misuse.

Note: This product specification is subject to change without prior notice.

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