



Lithium-ion Battery

DATA SHEET

Battery Model : [LIR17500-PCM-LD](#)

Prepared	Authorized	Approved
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Manufacturer: EEMB Co., Ltd.

Website: <http://eemb.com>

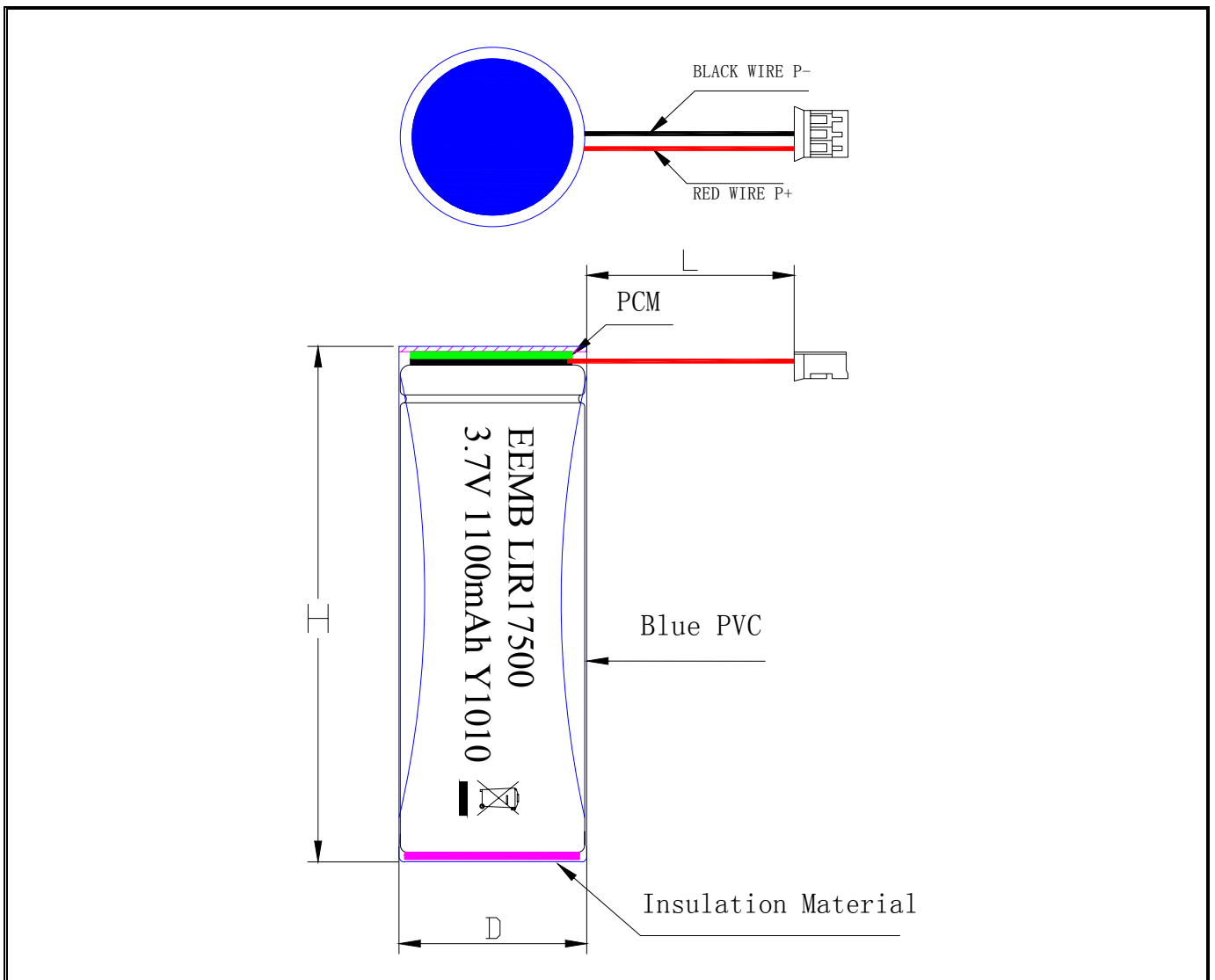
Catalog

1. MODIFIED LIST	3
2 .Scope	4
3. Initial Dimension	4
4.Specification	5
5 General Performance	6
6 Environment Performance	6
7 Safe Characteristic	7
8.Protection circuit	7
9.Warnings	8
10. Cautions	9
11. Battery operation instruction.....	9
12. Period of Warranty	10
13. Others	10

2. Scope

This specification describes the basic performance, technical requirement, testing method, warning and caution of the Li-ion Cylindrical rechargeable battery pack, the pack defined in this documentation is an assembly which include battery, PCM and wire, the specification only applies to Shenzhen SpringPower battery Co Ltd.

3. Initial Dimension



Unit (mm)

D Max	18.0	H Max	56.0		/	/
L	50±3	Connector	JST-PHR-03	Wire	UL1007 AWG24#	
PCM.	SP-PCM			PVC	Blue	

4.Specification

NO.	Item	Specifications
4.1	Min capacity	1100mAh 0.2C Discharge
4.2	Initial Impedance	$\leq 200\text{m}\Omega$
4.3	Weight	Approx: 26g
4.4	Nominal voltage	3.7 V
	Fully charge voltage(FC) FC	4.2 V Defined in this DOC: FC = 4.2 V
	Fully discharge voltage(FD) FD	3.0 V Defined in this DOC: FD = 3.0 V
4.5	Standard charge current 0.5 C	
4.6	Standard charging method	0.5C CC (constant current) charge to FC, then CV(constant voltage FC)charge till charge current decline to $\leq 0.01\text{C}$
		0.5C CC to FC, CV charge to current $\leq 0.01\text{C}$
4.7	Charging time	Standard Charging Approx 3 hours
4.8	Max. charge current	Constant Current 1C Constant Voltage FC 0.01 C cut-off
4.9	Max. discharge current	Constant current 1C. end voltage FD
4.10	Standard Discharge Current	Constant current 0.2 C end voltage FD
4.11	Charge cut-off voltage	Ref. 8.1 VDET1
4.12	Discharge cut-off Voltage	Ref. 8.1 VDET2
4.13	Storage temperature	-20°C~60°C ≤ 1 month
		-20°C~45°C ≤ 3 month
		-20°C~28°C ≤ 1 year
4.13	Storage temperature	Percentage of recoverable capacity no less than 80% of the initial capacities
4.14	Recoverable capacity	Constant current 0.5C charge to FC, then constant voltage FC charge to current declines to 0.01C, rest for 10min, constant current 0.5C discharge to FD, rest for 10min.Repeat above steps 3 times, recording the maximum capacity
4.15	Storage Humidity	$\leq 75\%$ RH
4.16	Appearance	Without distortion and leakage
4.17	Standard testing condition	Temperature : $23 \pm 5^\circ\text{C}$
		Humidity : $\leq 75\%$ RH
		Atmospheric Pressure : 86-106 Kpa

Remark: 1.From 4.1 to 4.12, the testing condition is following 4.17 (standard testing condition)

2.Operating temperature: charging $0^\circ\text{C}\sim 45^\circ\text{C}$; Discharging: $-10^\circ\text{C}\sim 60^\circ\text{C}$

If the working condition is out of 4.17 , the performance will be some shift.

5 General Performance

No.	Item	Test Methods and Condition	Criteria
5.1	0.2C Capacity	At standard testing condition, after standard charging, rest battery for 10min, then discharging at 0.2C to voltage FD, recording the discharging time.	$\geq 300\text{min}$
5.2	1C Capacity	At standard testing condition, after standard charging, rest battery for 10min, then discharging at 1C to voltage FD, recording the discharging Capacity	$\geq 54\text{min}$
5.3	Cycle Life	At standard testing condition, constant current 0.5C charge to FC, then constant voltage charge to current declines to 0.01C, rest 10min, constant current 0.5C discharge to FD, rest 10min. Repeat above steps till continuously discharging capacity Higher than 80% of the Initial Capacities of the Cells	≥ 300 times
5.4	Capability of keeping electricity	At standard testing condition, After standard charging, no outer loading circuit, rest the pack 28days, discharging at 0.2C to voltage FD, recording the discharging time.	$\geq 240\text{min}$

6 Environment Performance

No.	Item	Test Methods and Condition	Criteria
6.1	Discharge at high temperature	At standard testing condition, after standard charging, rest the Cells 4h at $60 \pm 2^\circ\text{C}$, then discharging at 1C to voltage FD, recording the discharging time.	$\geq 54\text{min}$
6.2	Discharge at low temperature	At standard testing condition, after standard charging, rest the Cells 16h at $-20 \pm 2^\circ\text{C}$, then discharging at 0.2C to voltage FD, recording the discharging time.	$\geq 210\text{min}$
6.3	Thermal shock	After standard charging, put the pack in the oven. The temperature of the oven is to be raised at $5 \pm 2^\circ\text{C}$ per minute to a temperature of $130 \pm 2^\circ\text{C}$ and remains 30 minutes.	No fire, no smoke

7 Safe Characteristic

No.	Item	Test Methods and Condition	Criteria
7.1	Overcharge testing (NO PCM)	At standard testing condition, charging pack with constant current 3C to voltage 4.6V, then with constant voltage 4.6V till current decline to 0. Stop test till cells temperature 10°C lower than max temperature.	No smoke or fire
7.2	Over-discharge testing/ (NO PCM)	At standard testing condition, the pack be discharge to cut-off voltage, then connect with external load of 30 ohm for 24 hours.	No fire, no smoke, no leakage.
7.3	Short-circuit testing (NO PCM)	At standard testing condition, after standard charging, connect pack anode and cathode by wire which impedance less than 50mΩ, keep 6h.	No smoke or fire

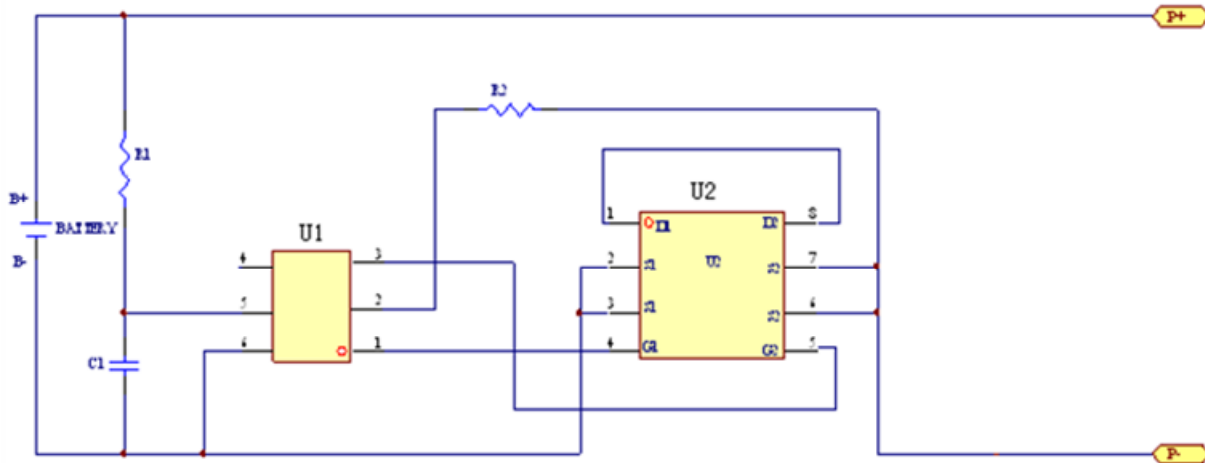
※ Above testing of safe characteristic must be with protective equipment.

8. Protection circuit

1 PCM Standard

Symbol	Name	MIN.	Typical.	MAX.	Unit
VDET1	Over-Charge detect voltage	4.23	4.28	4.33	V
VDET2	Over-discharge detect voltage	2.9	3.0	3.1	V
IEC	Excess Current threshold	2		6.0	A
IDD	Supply current	--	--	7	μA
RD	Internal resistance in normal operation	--	--	70	mΩ
RWV	Reverse withstand voltage: reverse voltage adding to pack caused by load circuit :Max.12				V
RWI	Reverse current adding to pack caused by load circuit : Max.5				A

2 Schematic diagram


8.2 Hazard Warning
1 Forbid Disassemble Batteries

The battery has protective component and circuit internally to avoid danger. Mishandling such as improper disassembly will destroy its protective function and make it heat, smoke, distort or burning.

2 Forbid Short-circuit Batteries

Do not touch the plus and minus contacts with metals. Do not put the battery with metal element together in either storage or movement. If the battery is short-circuit, it carries magnified current, which will cause damage and make the battery heat, smoke, distort or burning.

3 Forbid heat and burn the battery

If heating or burning the battery, it will caused the isolated element in the battery dissolved, protection function stopped or the electrode burning, over heated, which will make the battery heat, smoke, distort or burning.

4 To avoid use the battery near the heat

Do not use the battery near the fire and stove, or over 80°C, and over heating will cause the battery internal short-circuit and make it heat, smoke, distort or burning.

5 Forbid bathing the battery

Do not dampen the battery, or even immerse it in the water, which will cause internal protection circuit and its function lost or abnormal chemical reactions, which will lead to heating, smoking, distortion or burning.

6 Avoid charging near fire or in the sunlight

Otherwise, it will cause internal protection circuit and its function lost or abnormal chemical reactions, which will lead to heating, smoking, distortion or burning.

7 Danger in using non-indicated chargers in

Charging in abnormal condition, the battery will cause internal protection circuit and its function lost or abnormal chemical reactions, which will lead to heating, smoking, distortion or burning.

8 Forbid Damage Battery

Do not allow damage the battery with the metals gouged, forged or dropped etc., otherwise, it will cause over-heated, distort, smoke or burning, even in danger.

9 Forbid directly welding on the battery

Over-heated will cause the isolated element dissolved in the battery and losing protective function its cycle life, even will cause over-heated, distort, smoke or burning.

10 Forbid directly charging on the power socket or car kit cigarette

High voltage and amplified current will damage the battery and reduce its cycle life, even will cause over-heated, distort, smoke or burning.

11 Do not use this battery for other equipment

Improprate usage will damage the battery and reduce its cycle life, even will cause over-heated, distort, smoke or burning.

12 Do not touch the leak-out battery

The leak-out electrolyte will cause the skin uncomfortable. If it drops into eyes, do not rob the eyes but wash in time, and go to hospital for treatment.

8.3 Warning

- 1** This battery cannot mix with deposal or twice- recycled batteries in use. Otherwise, for its abnormal charge and discharge, it will cause over-heated, distort, smoke or burning.
- 2** Keep the battery out of children's reach and prevent them biting or swallowing the battery.
- 3** Do not insert the battery onto the charger for a long time If charging beyond the normal time, the battery is still in the charger, please stop charging. The abnormal charging will cause battery over-heated, distort, smoke or burning.
- 4** Do not put into microwave stove or any other pressure apparatus. Take the battery away from the cellular phone or the charger if it is instant heated or leak-out (or odors) and depose it. The bad battery will causes over-heated, smoke or burning.

8.4 Cautions

1 Notice

The battery shall be prevented to be exposed in effulgence so as not to cause over-heated, distort, smoke and weaken its performance and cycle life.

2 Electro Static-free

There is a protective circuit inside the battery to prevent contingency. Do not use the battery in the Electro static circumstances, (above 1000V), for it is easily destroyed the circuit board so that the battery doses not work and causes over-heated, distort, smoke or burning.

3 Discharging Temperature Range

Recommended discharging temperature range is 0-40°C, beyond which it will result in decadence of the battery performance and shortness of its life.

4 Read carefully the manual before use or whenever in need.

5 Charging Method

Use the special chargers in the recommended charging method to charge the battery.

6 First Usage

When you use the battery for its first time, do not put it into the cellular phone or any other equipment once you find it in unusual conditions such as unclearness or odors. The battery should be returned to the vendor.

7 Children Use

When Children use the battery, they should be under their parents' instructions and superintend in use.

8 Avoid Children's Touch

Battery should keep out of the place where children in reach. Prevent children taking the battery out of the charger or the cellular phone to play.

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- 9** To avoid the leak-out liquid be exposed to the skin or clothes. If touched, please wash by clean water so as not to cause the skin uncomfortable

10 Consultation

When you buy the battery, please note how to contact with the vendors, so that you may get in touch with vendors for consultation whenever in need.

11 Guarantee period

Guarantee is one year since it is out of the factory. Life time:300 cycles. Any damage by incorrect use and not quality problem, even in its guarantee period, free service won't be provided by the manufacture.

12 Safety Usage Guarantee

If the battery is used on other instruments, please contact with your manufacturer for how to get the best performance, at least consult its maximum current, fast charge and special application.

9. Quality Evaluation Programme

Quality evaluation composes of authoritative check and quality consistence check. Authoritative check is carried out on design decision, emended design and production decision. It should be confirmed by both Purchaser and Vendor on sampling proposal, check project, sequence and judgment etc., which in principle, should be all included. Quality consistence check should be divided into lot by lot check-up and periodical check-up, as to test the quality steadiness during the products in production (refer to GB2828—1987 standard). The detailed check-ups compose of appearance, internal resistance, rating capacity or 1C₅A discharging capacity etc.

10. Environment Protection

This product accord with ROHS requirement.

11. Others

All the above are the agreed the battery descriptions and test regulation between Purchaser and Vendor.

! Special Notice

Keep the cells in **50% charged state** during long period storage. We recommend to charge the battery up to 50% of the total capacity every 3 months after receipt of the battery and maintain the voltage 3.7~4.1V. And store the battery in cool and dry place.