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EEMB CO., LTD

Polymer Li-ion Battery

Specification

聚合物锂离子电池

产品规格书

Model 型号:	LP532030HB
Capacity 容量:	200mAh

Prepared 编制	Checked 审核	Approved 批准

Customer 客户名称:

Customer Approval (Customer confirmation) 客户确认:

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1. Scope 适用范围

This product specification defines the requirements of the rechargeable polymer lithium-ion battery supplied to the customer by EEMB Co., Ltd.

本产品规格书适用于 EEMB 提供的聚合物锂离子电池

2. Battery Cell Basic Characteristics 电芯产品基本特性

No.	Item 项目		Characteristics 性能指标		Remark 备注
2.1	Model 型号		LP532030HB		
2.2	Capacity 容量	Nominal 标称容量	200	mAh	0.5C ₅ A discharge
		Minimum 最小容量	190	mAh	0.5C ₅ A discharge
2.3	Nominal Voltage 额定电压		3.7	V	
2.4	Weight 重量		Approx. 7	g	With PCM
2.5	Internal Impedance 内阻		≤ 200	mΩ	AC 1KHz(50% charge)
2.6	Dimension 外形尺寸	Length 长	≤ 32.5	mm	With PCM
		Width 宽	≤ 20.5	mm	
		Thickness 主体厚	≤ 5.8	mm	
2.7	Charge 充电	Standard Charge 标准充电	100	mA	0.5C ₅ A
			3.0	hrs	
		Rapid Charge 快速充电	400	mA	2.0C ₅ A
			1.0	hrs	
		Maximum Current 最大充电电流	400	mA	2C ₅ A (CC&CV)
		Limited Voltage 充电上限电压	4.20±0.02	V	
2.8	Discharge 放电	End-of Current 充电截止电流	4	mA	0.02C ₅ A
		Standard Current 标准放电电流	100	mA	0.5C ₅ A
		Maximum Current 最大放电电流	4000	mA	20C ₅ A
2.9	Operation Temperature 工作温度	Cut-off Voltage 放电终止电压	2.75	V	
		Charge 充电温度	0 ~ 40	℃	
2.10	Storage Temperature 贮存温度	Discharge 放电温度	-20 ~ +40	℃	
		Less than 1 month 短期少于 1 个月	-20 ~ +45	℃	
		More than 1 month 长期超过 1 个月	-10 ~ +30	℃	

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3. Appearance 外观

It shall be free from any defects such as remarkable scratches, breaks, cracks, discoloration, leakage, or middle deformation.

电池表面无划伤、裂纹、脏点、锈蚀、变形、变色、漏液等缺陷，中间无翘起

4. Battery Cell Specification 电池性能测试规范

4.1 Electrical Characteristics 电学性能

No.	Item 项目	Criteria 标准	Test Instructions 测试方法
4.1.1	Standard discharge capacity 标准放电容量	Discharge Capacity $\geq$ 160mAh 放电容量 $\geq$ 160mAh	Within 1 hour after standard charge, discharge at 4000mA to 2.75V at 25 $\pm$ 5 $^{\circ}$ C. 电池在标准充电完成 1 小时内用 4000mA 放电至电池截止电压 2.75V 时记录放电容量，25 $\pm$ 5 $^{\circ}$ C。
4.1.2	Cycle life 循环寿命	Capacity $\geq$ 152mAh (80% of initial capacity) 容量 $\geq$ 152mAh (初始容量的 80%)	Each cycle is an interval between the charge at CC-CV (100mA-4.2V) for 3h and the discharge with 4000mA to 2.75V. After 150 cycles, measure capacity. 电池恒流恒压充电至 4.2V，充电电流 100mA。3 小时后，4000mA 恒流放电至 2.75V。150 个循环后对电池进行容量测试。
4.1.3	Capacity Retention 荷电保持能力	Capacity retention $\geq$ 170mAh (85% of initial capacity) 剩余容量 $\geq$ 170mAh (初始容量的 85%)	After full charge, store at 25 $\pm$ 5 $^{\circ}$ C for 28 days. Then discharge with 40mA to 2.75V 电池完全充电后在温度为 25 $\pm$ 5 $^{\circ}$ C 条件下将电池开路搁置 28 天后，以 40mA 电流放电至 2.75V 记录放电时间。

4.2 Acclimatization Characteristics 环境适应性能

No.	Item 项目	Criteria 标准	Test Instructions 测试方法
45.2.1	Vibration 振动	No damnification, leakage, no fire or explosion 电池外观应无明显损伤、漏液、冒烟或爆炸	Batteries are vibrated 30 min in three mutually perpendicular directions with amplitude of 0.38mm (10~30Hz) or 0.19mm (30~55Hz) and the scanning rate of 1oct per min 在三个相互垂直的方向按单振幅 0.38mm（振动频率 10~30Hz）、0.19mm（振动频率 30~55Hz）循环扫描振动 30min，扫频速度为 1oct/min。
4.2.2	Drop 自由跌落	No leakage, no fire or explosion; 电池应不漏液、不冒烟、不爆炸	Batteries are dropped onto a hard board with the thickness of 18~20mm from 1meter from X, Y, Z direction of the positive and negative (six directions) 电池由高度（最低点高度）为 1000mm 的位置自由跌落到置于水泥地面上的 18mm~20mm 厚的硬木板上，从 X、Y、Z 正负方向（六个方向）每个方向自由跌落 1 次。

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4.3 Safety Characteristics 安全性能

No.	Item 项目	Criteria 标准	Test Instructions 测试方法
4.3.1	Overcharge 过充电	No fire or explosion 电池应不爆炸、不起火。	After standard charge, charging the battery with 200mA at constant voltage of 4.6V while tapering the charge current at 25°C for 2.5hrs. 标准充电后, 2.5 小时内以 200mA 恒流恒压将电池充电至 4.6V
4.3.2	Short-Circuit 短路	No fire or explosion; The maximum Temperature: 150°C. 电池不起火、不爆炸。电池外表面温度不超过 150°C。	Place the battery with thermocouple into a fume hood, and short-circuit by connecting the positive and negative terminals (resistance load of 50mΩ), monitoring the battery temperature changes in the course of test. End the test when the battery temperature drops to about 10°C lower than peak value. 将接有热电偶的电池置于通风橱中, 短路其正负极(线路总电阻 50mΩ), 试验过程中监视电池温度变化。当电池温度下降到比峰值低约 10°C 时, 结束试验。

Note: Unless otherwise specified, all tests stated in this specification are conducted at the following conditions: Temp. :20±5°C; Relative Humidity: 25%~85%.

备注: 除特别说明外, 本产品规格书规定的测试条件为: 温度 20±5°C, 相对湿度 25%~85%。

5. Specification of PCM 保护板参数

The specification shall be applied to Lithium polymer battery protection circuit module manufactured by EEMB CO., LTD.

此参数适用于 EEMB 生产的聚合物锂离子电池保护板。

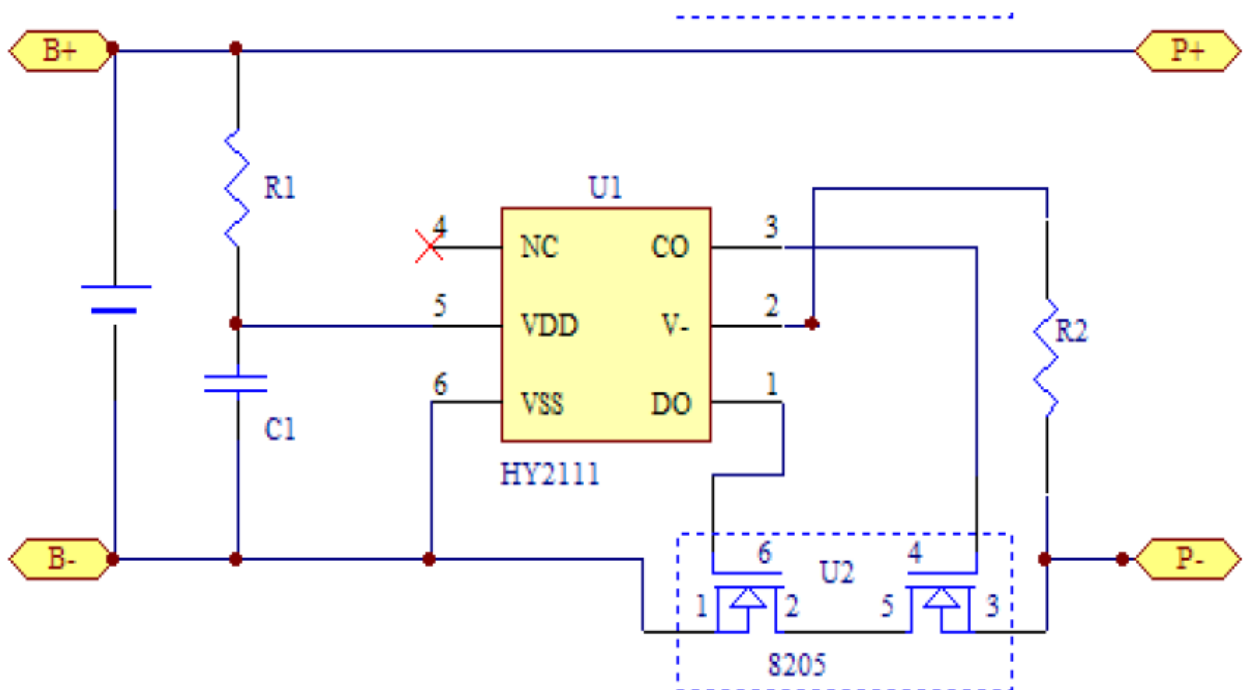
5.1 Basic Specification(T=25°C) 基本参数

Item 项目	Min. 最小值	Type Value 典型值	Max. 最大值	Unit 单位
Over charge protection voltage 过充保护电压	4.245	4.28	4.315	V
Over charge protection release voltage 过充保护恢复电压	4.03	4.08	4.13	V
Over discharge protection voltage 过放保护电压	2.82	2.9	2.98	V
Over discharge protection release voltage 过放保护恢复电压	2.92	3.0	3.08	V
Over discharge current detection voltage 放电过流检测电压	0.175	0.2	0.225	V
Over discharge current protection current 放电过流保护电流	4.5	5.5	6.5	A
Over charge protection delay time 过充保护延迟时间	50	100	150	ms
Over discharge protection delay time 过放保护延迟时间	10	25	40	ms
Over discharge current protection delay time 放电过流保护延迟时间		10	15	ms

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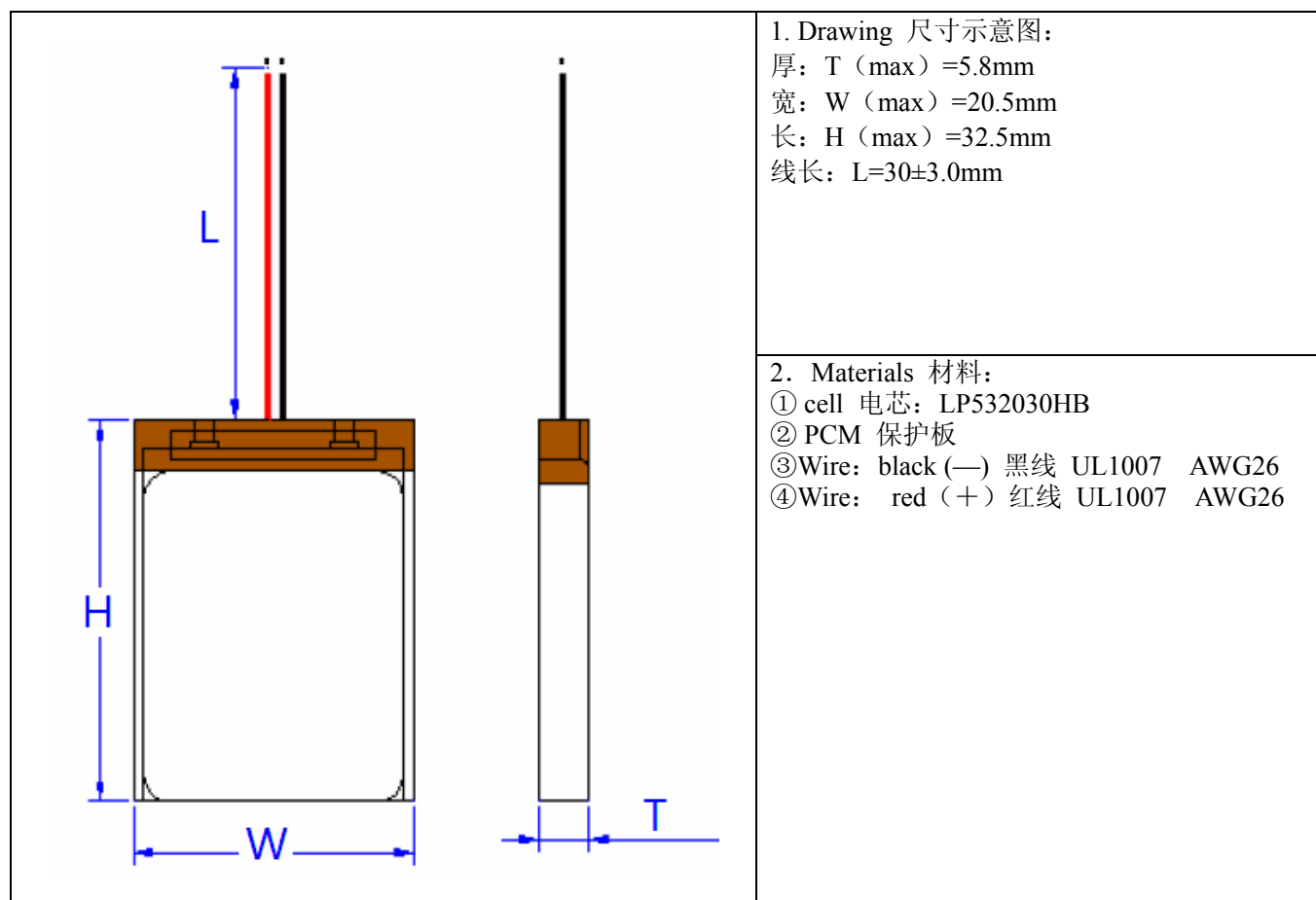
Short protection delay time 短路保护延迟时间	5	500	700	μs
Normal current consumption 正常状态下静态电流		3.0	6.0	μA
Over charge current consumption 过放状态下静态电流			0.1	μA
Interior resistance 内阻		35	50	$\text{m}\Omega$
Input voltage B+ to B- B+/B-间输入电压	-0.3		12	V
Max. continuous charge current 最大持续充电电流		1	2	A
Max. continuous discharge current 最大持续放电电流		2	2.5	A

5.2 PCM Circuit Diagram (FYI) 保护板原理图(参考图)



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6. Battery Pack's Dimension 电池组合尺寸示意图(参考图)



7. Battery Pack's Shipping Standard 电池组合出货标准

Voltage: 3.83V~3.9V

Internal Resistance: $\leq 200\text{m}\Omega$

电池出货电压: 3.83V~3.9V

电池内阻: $\leq 200\text{m}\Omega$

8. Warranty 保质期

6 months warranty for sample battery after date of production. One year warranty for finished battery after the date of production

样品电池保质期为（出厂之日起）半年；产品电池保质期为（出厂之日起）1 年。

9. Matters Needing Attention 注意事项

Strictly observes the following needing attention. EEMB will not be responsible for any accident occurred by handling outside of the precautions in this specification.

您必须严格遵守下述电池使用注意事项。对于没有按照以下注意事项所造成的任何意外事故，EEMB 不负担任何责任。

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! Danger 危险

- Strictly prohibits heat or throw cell into fire. 严禁把将电池投进火中或进行加热
- Strictly prohibits throw and wet cell in liquid such as water、gasoline or drink etc.
严禁把电池投入液体中，如水、汽油、饮料等，也不要把电池弄湿。
- Strictly prohibits use leave cell close to fire or inside of a car where temperature may be above 60℃.
Also do not charge / discharge in such conditions.
禁止在火源附近或温度超过 60℃的轿车中使用或遗留电池，也不要这些环境中进行充放电。
- Strictly prohibits put batteries in your pockets or a bag together with metal objects such as necklaces.
Hairpins, coins, or screws. Do not store or transportation batteries with such objects.
禁止把电池同项链、发夹、硬币或螺钉等金属品一起放在兜中或包中，也不要把电池同上述物品一起储存或运输。
- Strictly prohibits short circuit the (+) and (-) terminals with other metals.
禁止使用金属导体短路电池的正负极。
- Do not place Cell in a device with the (+) and (-) in the wrong way around.
在装入设备时注意电池的正负极不要反装。
- Strictly prohibits pierce Cell with a sharp object such as a needle.
禁止使用锐利的物品刺穿电池。
- Strictly prohibits disassemble or modify the cell.
禁止对电池进行分解。
- Strictly prohibits welding a cell directly.
禁止直接对电池进行焊接。
- Do not use a Cell with serious scar or deformation.
禁止使用已经损坏的电池。
- Thoroughly read the user's manual before use, inaccurate handling of lithium ion rechargeable cell may cause leakage, heat, smoke, an explosion, or fire, capacity decreasing.
在使用之前请详细阅读操作说明书，不适当的操作可能引起电池变热、着火、爆炸、毁坏或电池容量的衰减。

! Warning 警告

- Strictly prohibits put cell into a microware oven, dryer, or high-pressure container.
禁止把电池放加热器皿、洗衣机或高压容器中。
- Strictly prohibits use cell with dry cells and other primary batteries, or new and old battery or batteries of a different package, type, or brand.
禁止把电池同干电池或其它原电池或者新旧电池一起使用，也不要同不同包装、不同型号或不同品牌的电池一起使用。
- Stop charging the Cell if charging is not completed within the specified time.
如果在规定的充电时间内充电没有结束，停止充电。
- Stop using the Cell if abnormal heat, odor, discoloration, deformation or abnormal condition is detected during use, charge, or storage.
在使用、充电或储存期间如发现电池有变热、散发气味、变色、变形或其它反常之处停止使用。
- Keep away from fire immediately when leakage or foul odor is detected.
当发现电池漏液或散发出难闻的气味时立即远离。
- If liquid leaks onto your skin or clothes, wash well with fresh water immediately.
如果电解液渗漏到您的皮肤或衣服上，立刻用大量清水冲洗。

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- If liquid leaking from the Cell gets into your eyes, do not rub your eyes. Wash them well with clean edible oil and go to see a doctor immediately.

如果电解液渗出并进入您的眼睛里，不要揉擦您的眼睛，立刻用食用油清洗眼睛并就医。

! Caution 注 意

- Before using the Cell, be sure to read the user's manual and cautions on handling thoroughly.
在使用电池之前，应详细阅读操作指南并对使用中的注意事项有足够深刻的理解。
- Charging with specific charger according to product specification. Charge with CC/CV method. Strictly prohibits reversed charging. Connect cell reverse will not charge the cell. At the same time, it will reduce the charge-discharge characteristics and safety characteristics; this will lead to product heat and leakage.
充电时请使用指定的充电器并按照本规格书的要求进行充电。采用恒流恒压方式充电，禁止反向充电。若电池正负极接反，将无法对电芯进行充电；同时，反向充电会降低电芯的充放电性能和安全性，并会导致发热和泄漏。
- Store batteries out of reach of children so that they are not accidentally swallowed.
把电池放到小孩够不到的地方以免吞服。
- If younger children use the Cell, their guardians should explain the proper handling.
小孩使用电池时，监护人应详细解释操作方法。
- Before using the Cell, be sure to read the user's manual and cautions on handling thoroughly.
在将电池装入设备或从设备中取出之前详细阅读设备操作手册。
- Batteries have life cycles. If the time that the Cell powers equipment becomes much shorter than usual, the Cell life is at an end. Replace the Cell with a new same one.
电池具有使用寿命，如果使用电池的设备的工作时间比平常少的多，请更换新电池。
- When not using Cell for an extended period, remove it from the equipment and store in a place with low humidity and low temperature.
当长期不用时，要将电池从设备中取出并放在低温低湿的环境中保存。
- While the Cell pack is charged, used and stored, keep it away from objects or materials with static electric charges.
电池应在远离静电的场所进行充电、使用和储存。
- If the terminals of the Cell become dirty, wipe with a dry cloth before using the Cell.
如果电池的接线端变脏，在使用之前用干布擦净。
- Storage the cells in storage temperature range as the specifications. After full discharged, we suggest that charging to 3.7~4.0V. with no using for a long time.
电芯应贮存在产品规格书规定的温度范围内，电芯放电放完后，如果长期不使用，建议充电至 3.7~4.0V 贮存。
- Battery should be charged and discharged every 3 months at 0.2 C during long term storage, and then charge to 50-70% of the capacity for storage.
- 电池在长期贮存过程中，必须每 3 个月 0.2C 进行充放电一次，然后充电至 50~70% 的容量进行贮存。
- Do not exceed these ranges of the following temperature ranges:
电池在使用和贮存时的温度不能超出下面的要求：

Charge temperature range 充电 : 0℃ to 40℃;

Discharge temperature range 放电 : -20℃ to 40℃.

Store less than 1 month 贮存少于 1 个月 : -20℃ - +45℃



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Store more than 1 months 贮存超过 1 个月 : -10℃ - +30℃

! Special Notice 特别注意

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 3.7~4.0V. And store the battery in cool and dry place.

电池在长时间储存的过程中保持带电量为 50%。我们建议每 3 个月充电至 50 以上容量，保持电压在 3.7~4.0V。将电池存储在阴凉干燥的地方。

EEMB reserves the final explanation. Please use battery strictly according to specification. EEMB will not be responsible for any inappropriate operation. EEMB keeps the right to change product specifications without previous notice. If any question, please consult with the manufacturer

EEMB 保留最终解释权。请严格按照规范使用电池。EEMB 对任何不当操作将不负责。EEMB 保留修改产品规格书不另行通知的权利。如有任何问题, 请咨询制造商。