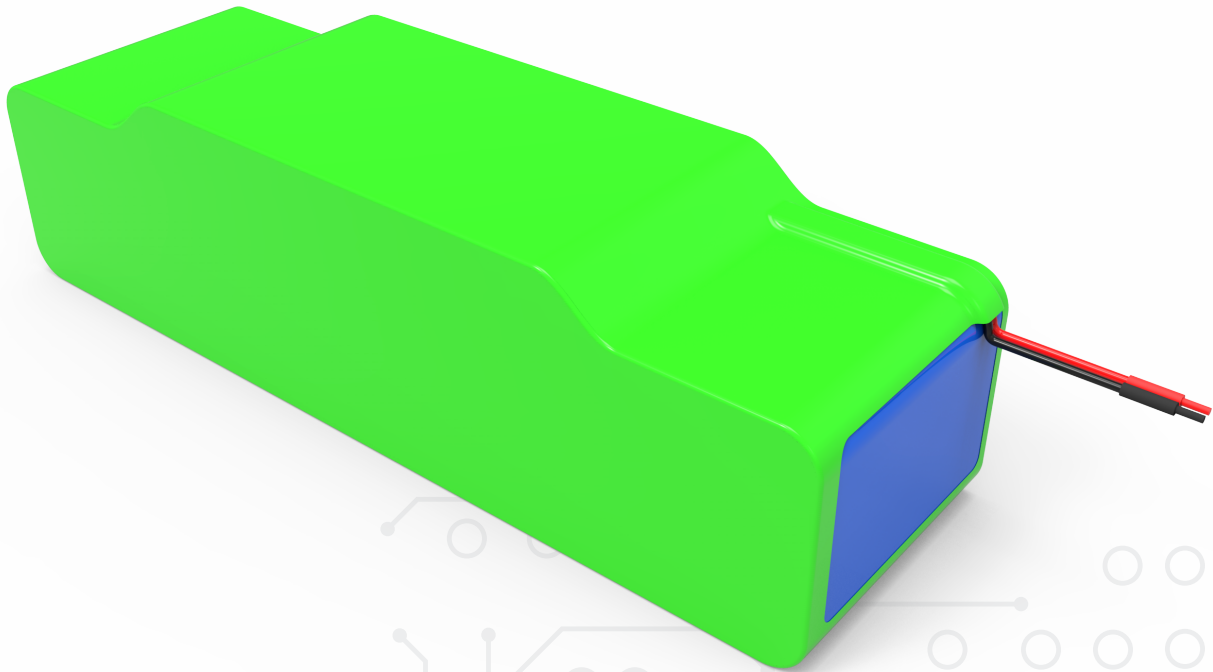


Specification of LiTech Power Li-ion 13S1P 48.1V 2.2Ah Battery Pack

Model No.: LP-30249



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1. General

LP-30249 is an 13S1P Lithium-Ion rechargeable Battery Pack with Battery Protection Circuit Board integrated, normal voltage at 48.1V, rated capacity at 2.2Ah, with open wires (it comes with bare leads in default but connector can be customized accordingly).

2. Battery Pack basic characteristics

2.1 Capacity	Nominal Capacity : 2200mAh (0.5C _A Discharge)	
	Minimum Capacity: 2150mAh (0.2C _A Discharge)	
2.2 Nominal Voltage	48.1V	
2.3 Internal impedance	≤ 240mΩ	
2.4 Discharge Cut-off Voltage	5.60V	
2.5 Max Charge Voltage	8.56V	
2.6 Max. Continuous Charge Current	5.0A	
2.7 Max. Continuous Discharge Current	80A	
2.8 Max. Discharge Peak Current	85A for 10mS	
2.9 Cycle Life	≥ 300 cycles After 300 cycles in 100% DOD charge and discharge at rated current, the residual discharge capacity is above 60% of nominal capacity	
2.10 Protections	All protections adopted, please check Specs. of the PCM as below	
2.11 Weight	1910g ± 4g	
2.12 Max. Dimension	235 x 66 mm (L*D)	
2.13 Operating Temperature	Charge	0°C ~ 45°C
	Discharge	-20°C ~ 60°C
2.14 Storage Temperature	Within 1 month	-5°C ~ 35°C
	Within 6 months	0°C ~ 35°C

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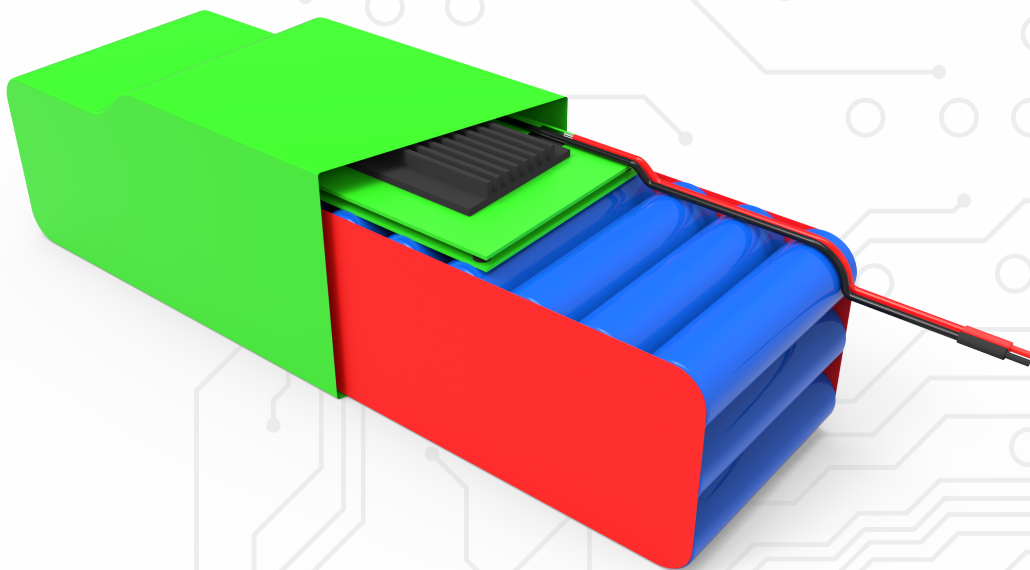
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3. PCM Parameters

Item	Content	Criterion
1	over charge protection voltage	4.28V ± 25mV
2	over charge recovery voltage	4.08V ± 50mV
3	over charge protection delay time	80ms - 120ms
4	over discharge protection voltage	2.8V ± 50mV
5	over discharge recovery voltage	2.8V ± 100mV
6	over discharge protection delay time	40ms-100ms
7	over current protection current	6-12A
8	short protection delay time	10ms - 20ms
9	static self-consumption current	I < 6.0uA
10	PCB internal resistance	R < 65mΩ

4. Battery Pack Construction



* Cable: 18AWG, 10-15cm;

* Connector: It comes with open bare lead in default but connector can be customized accordingly.

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5. Standard test conditions

Any tests are to be conducted with new batteries that have not been cycled more than five times in one month before the test. Unless otherwise defined, test and measurements done under a temperature of $20 \pm 5^{\circ}\text{C}$ and relative humidity of 45~85%. If it is judged that the test results are not affected by such conditions, the tests may be conducted at Ambient Temperature: $25 \pm 5^{\circ}\text{C}$; Relative Humidity: $65 \pm 20\%$.

5.1 Standard Charge:	Constant Current and Constant Voltage (CC/CV) Current = 500mA End-up Voltage = 4.28V End Current = 20mA
5.2 Standard Discharge:	Constant Current (CC) Current = 4000mA End Voltage = 2.8V

6. Transportation

The rated energy of the accumulator is less than 100Wh, therefore you could transport them by air, by road, by railway and by sea. BUT Violent shaking, bumping, rain and flaring sun shall be forbidden during the transportation. Keep the battery less than 30% charged according to IATA shipping regulations.

Transport classification:

UN Class: 9 Class | UN number: UN3480



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7. Storage

Please keep the pack in the cool and dry environment: Within 1 month $-5^{\circ}\text{C}\sim 35^{\circ}\text{C}$ or Within 6 months $0^{\circ}\text{C}\sim 35^{\circ}\text{C}$, Relative humidity $\leq 75\%$, don't keep the packs fully charged.

8. Warranty

All LiTech Power products are covered by a one year limited warranty. The warranty covers premature failure due to defects in materials and / or workmanship. Any breakage caused by accidental damage or as a result of abuse or misuse is not covered. The warranty is limited to the original purchaser and is not transferable.

The warranty is void if the serial number is removed from the product or if the battery has been modified in any way. Please charge your battery directly after each use. Leaving your battery in discharged state will seriously and permanently damage its performance. Please note we cannot uphold warranty claims in these circumstances. Your battery will degrade over time and with use, such degradation is not covered by warranty.

9. The information in this specification subject to change without prior notice. The information contained in this document is for reference only and should not be used as a basis for product guarantee or warranty. For applications other than those described here, please consult LiTech Power directly.

10. Caution

- * Please read the specification carefully before testing or using the battery, as improper handling of Lithium-ion battery may result in loss of efficiency, heating ignition, electrolyte leakage or even explosion.
- * While testing the battery of charging and discharging, please use the testing equipment special for Li-ion battery. Do NOT use the ordinary source of constant current and constant voltage, which fails to restrict charge and discharge to battery in order to prevent the battery from being overcharged and over-discharged, triggering battery malfunction or explosion.
- * When charging and discharging to the battery or packing it into the equipment, do NOT reverse the terminals of cathode and anode or it will make the battery overcharging and over-discharging, causing the battery to lose efficiency seriously and even explode.
- * Do NOT weld the battery directly, do not disassembly the battery.
- * Do NOT put the battery together with such metal products as necklace, hairpin, coin or screw in the pocket or in the bag; neither store them together. Do NOT connect the positive and negative electrode directly with such conductive materials as metal, or it may make the battery short-circuit.
- * Do NOT beat, throw or trample the battery. Do NOT put the battery into the washing machine or the high-pressure container.
- * Do NOT put the battery close to heat source, for instance, fire, heater etc. Do NOT use the battery under the circumstance of burning sun or the temperature exceeding 60°C , or it may cause the battery to generate heat, heating ignition and loss of efficiency.
- * Do NOT get the battery wet or throw the battery into water. When not use, it should be placed in the dry and low temperature environment.
- * While using, testing or preserving the battery, if you find the battery become hot, distribute smell, change color, deform or any other abnormality, please stop using or testing immediately, and attempt to isolate and keep away from the battery.
- * If the battery leaks, the electrolyte gets into the eyes, do not rub eyes, instead, rinse the eyes with plenty of water, and seek medical service. If the electrolyte gets onto the skin or clothe, wash it with plenty of water immediately.

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