Lithium-ion Rechargeable Battery Pack

Specification

Product Name: LiCoxNiyMnzO2 Battery Pack

Product Specification: 48V12Ah（18650）

Designed	Checked	Approved
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Directory

1. Preface

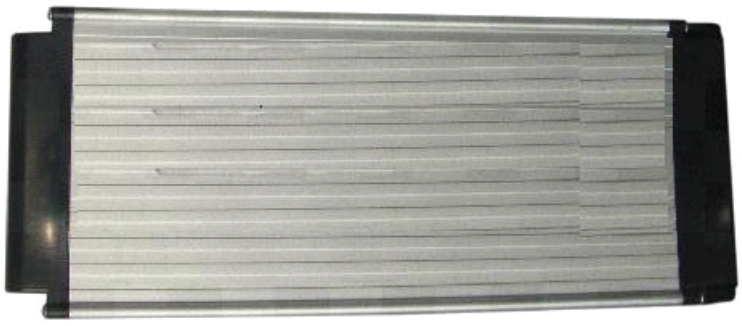
This specification describes the type and size, performance, technical characteristics, warning and caution of the HETER-48V/12Ah LiCoxNiyMnzO2 rechargeable pack.The specification only applies to HETER-48V/12Ah LiCoxNiyMnzO2 pack supplied by HETER ELECTRONICS GROUP CO.,LTD.

2. Product and Model

2.1 Product: Lithium-ion Battery Pack

2.2 Model: HT-48V12Ah-13S6P-18650

2.3 Picture And Output Wire



Charging input	Lotus plug	
Discharge output	3Poles connector	

3. Battery PackSpecifications

Items	Standard	Comments
Nominal voltage	48V	
Typical capacity	12.6Ah	At 0.2C discharge rate
Minimum capacity	12.0Ah	
Size（L*W*H）	149*70*370mm	
Weight	4.3±0.2kg	
Most continuous discharge current	20A	
Over current protection	80±10A	5-20ms
Discharge cut-off voltage	39V	
Charge voltage	54.6V	Charge mode: CC/CV
Charge current	3A	Use a constant current, constant voltage(CC/CV) lithium-ion (Li+) battery charge controller.
Inner resistance	≤150mΩ	Between positive and negative polar of discharge port
Operation temperature range	Charge:	0℃～+45℃
	Discharge:	-20℃～+65℃
Storage temperature range	0℃～40℃ at half charged state	Recommended long-term storage temperature is 15~25℃

Storage environment humidity	RH: 65±20%	
Environment humidity	≤85%RH	
Shell material	Aluminum alloy	

4. PCM Electrical Characteristics（Ta=25℃）

NO.	Item		Standard
1	Voltage	Charge mode	CC/CV
		Single cell Charge balance Voltage	4.20±0.025V
2	Current	Single cell balance current	84±5mA
		Self-discharge current	≤20uA
		Max continuous charge current/discharge current	5A/20A
3	Over charge protection	Over charge protection voltage	4.25±0.025V
		Over charge protection delay time	0.5S—2S
		Over charge release voltage	4.05±0.05V
4	Over discharge protection	Over discharge protection voltage	2.50±0.062V
		Over discharge protection delay	10-300mS
		Over discharge release voltage	2.50±0.062V
5	Over current protection	Over current protection current	80±10A

		Over current protection delay	5ms—20ms
		Over current release	Cut off load
6	Short circuit protection	Condition	Outside short circuit
		Short circuit protection delay time	200-500us
		Release condition	Cut off Loading, release automatically
7	Inner resistance	（MOSFET）Protection circuit（MOSFET）	≤20mΩ
8	Temperature	Working temperature range	-20℃~+60℃
		Storage temperature range	-40℃~+85℃

5.Appearance And Delivery Condition

There shall be no such defects as scratch, discoloration, leakage which may adversely affect commercial value of the cell. About 80%~90% charged (after discharged, use the charger to charge about 4~5 hours).

6. Standard Test Conditions

6.1 Environmental Conditions

Unless otherwise specified, all tests stated in this specification are conducted at temperature 25±2℃and humidity 65±20%, air pressure 86kPa～106kPa .

6.2 Measuring Equipment

a)Voltage is measured by D.C. voltmeter which precision is higher than 0.5 grade and self resistance is higher than 1kΩ/V;

b) Current is measured by D.C. meter which precision is higher than 0.5 grade;

c) Temperature is measured by thermometer which has proper measuring range and division value is lower than 0.5℃；

d）The timer used in measuring should be degreed in hour, minute and second, and should have degree of accuracy no more than ±1%.

6.3 Test conditions

The cells to be tested should be new cells and within one month after shipment from our factory and the cells shall not be cycled over five times before the testing. All the tests in this specification shall be conducted in an ambient temperature of 25ºC ±2ºC under a humidity of 65±20%, unless otherwise specified .

7. Characteristics

7.1 Standard charge

Charge the battery with DC stabilized power supply54.6 V, constant-current 0.2C(A) current until current reach to 0.02C（A）.

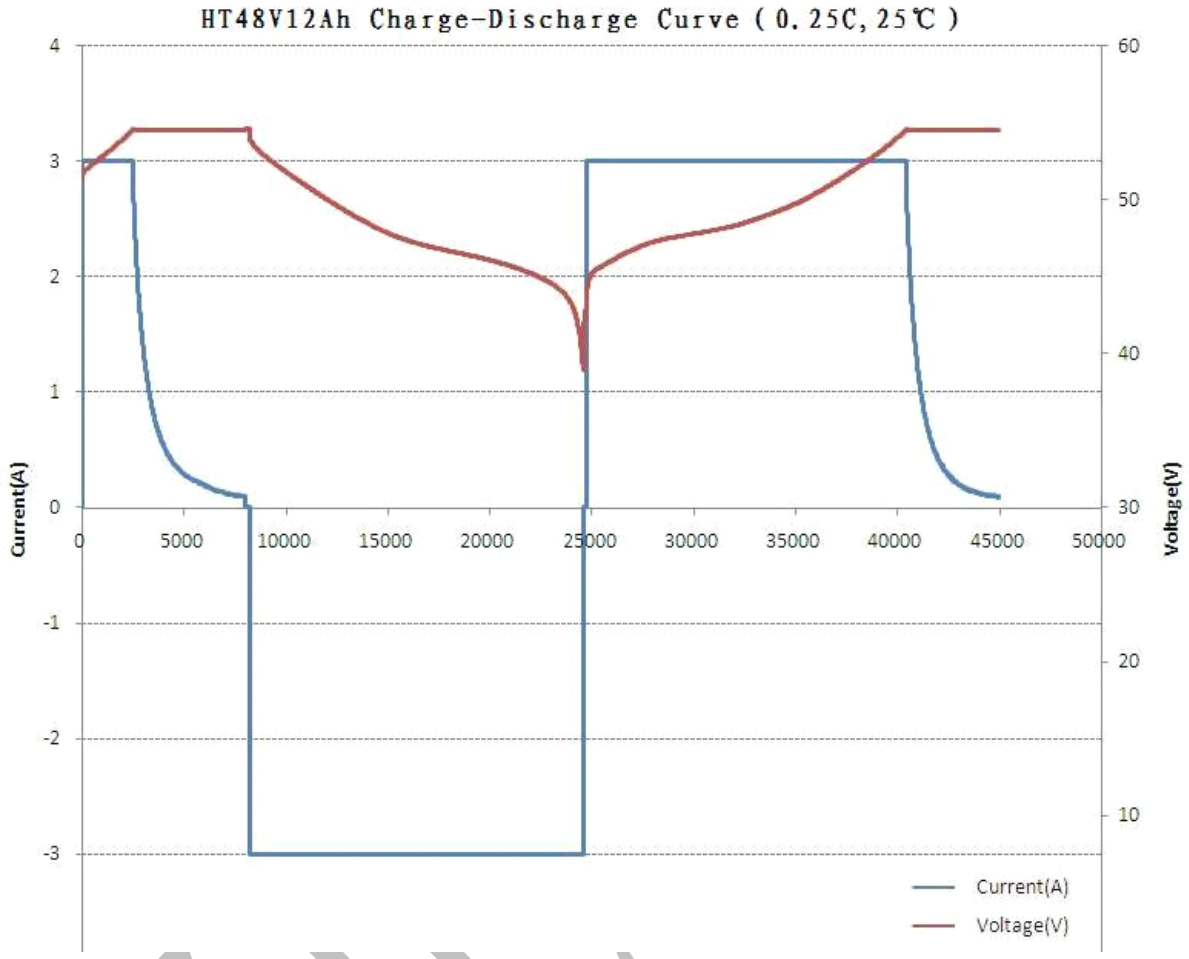
7.2 standard discharge

Discharge the battery at 0.2C to 39.0V or the protection circuit come to protection, stop.

7.3 Electrical Performance

Test Items	Test Methods	Test Standards
7.3.1 0.2C Discharging Performance	After standard charge, store the battery for 0.5 ～ 1hr under 6.1 specified conditions, then discharge at 0.2C to cut-off voltage.	≥100% Nominal capacity
7.3.2 High Temperature Performance	After standard charge, put the cells into 55℃±2℃ high temperature box with constant temperature for 2hrs, then discharging at 0.2C to cut-off voltage. Then take the cell out, stored for 2hrs under 6.1 specified conditions, check the exterior appearance.	≥90% Nominal capacity The battery no explosion,no fire
7.3.3 Charge Retention	After standard charge, store the cells for 28 days under 6.1 specified conditions, then discharge at 0.2C5mA to cut-off voltage.	capacity retention rate≥90% of minimum capacity
7.3.4 Cycle Life	1) standard charge at 0.2C, 2) rest 0.5~1 hr 3) discharge at 0.2C to cut off voltage 4) rest 0.5~1hr repeat the above steps until 500 cycles.	Capacity retention rate≥70%

8. Characteristic curve



9. Cautions

9.1 Charging current should be less than maximum charge current specified in the Product Specification. Charging with higher current than recommended value may cause damage to cell electrical, mechanical and safety performance and could lead to heat generation or leakage.

9.2 The cell shall be discharged at less than the maximum discharge current specified in the Product Specification. High discharging current may reduce the discharging capacity significantly or cause over-heat.

9.3 It should be noted that the cell would be possible to be at a over-discharged state by its self-discharge characteristics in case the cell is not used for long time. In order to prevent over-discharging, the cell shall be charged periodically to maintain between 50.7V and 52.0V.Over-discharging may causes loss of cell performance, characteristics, or battery functions.

9.4 The storage temperature and humidity of the battery are as below: -10℃~40℃ within one month ，0℃~35℃ within 2 months，15℃~25℃ for 3 months and above 3 months .Humidity: 65±20%RH .

9.5 Prohibition of disassembly.

9.6 Do not expose the battery to extreme heat or flame.

9.7 Do not reverse the polarity of the battery pack for any reason.

9.8 Do not immerse the battery pack in water or sea water, or get it wet.

9.9 Use a constant current, constant voltage (CC/CV) lithium-ion (Li+) battery charge controller.

10.Warranty & Product Liability

Warranty period begins from the delivery date, and is exclusively continued 6 months.HETER is not responsible for the incident caused by not obeying the specifications.Before using the battery, you should read the specifications,usage instruction and some attentions carefully to learn its application method and areas. If the phenominon such as error using method or wrong circuit connection,or input power data,working index are inconsistent with the specifications happen and cause damage to production,circuit and its accesories, we are not responsible for it.

If you have any questions, please contact the following address:

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