

Specification Approval Sheet

Product : Lithium Polymer Battery pack

Model : 12210215

Spec : GMBG1002230001

Agree	Check	Make

confirmation	Sign	Date
	Company :	
	Stamp :	

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1. Scope

This document describes the Product Specification of chargeable Lithium Polymer Battery produced by Yoku Energy (Zhang zhou) Co., Ltd.

2. Battery pack configuration and function

1. 12210215 battery pack is composed by four parts:

1.1 the plastic part of the battery pack (color, print, label content according to customer requirement).

1.2 Cell:

Type:	LI-Polymer
Model:	12210215
Spec:	80Ah(2P)
Cell's assemble:	Pile up in series, voltage:37V.

1.3 Module: Important part of the battery pack. It has much function that over-charge protection, over-discharge protection, over-current protection and so on.

1.4 Other parts: the accessories for packing, such as the sponge which is used for fix up, avoiding to drop.

2. Battery (PACK) basic performance

Item		Parameter	Remark
Normal characteristic	Nominal capacity	80Ah(2P)	0.2C discharge 25±5°C
	Nominal voltage	37V	
Charging Characteristics	Charging method	CC/CV	
	DC input voltage	41~42V	
	Solely DC input charge current	10A±0.1A	Charge the battery only
	Voltage after full charge	41~42V	PACK+;PACK-
	Individual charging time	约 9h	
	Temperature during charging	0°C~+45°C	
Discharge characteristics	Discharge current(standard)	30~31A	
	Cut-off voltage	28~32V	
	Temperature during discharging	-10°C~+60°C	
Impedance		≤150mΩ	After standard charging, measure the resistance of AC1KHz under the

			temperature of 25 ±5°C.PACK+and PACK-port
Protection function	It has the function that is overcharge protection, over-discharge protection, over-current protection and short circuit protection.		
Indicator function	The red is on when charging, the green is on when full charged, there's no light on means no charging.		
Self-discharge	When the battery pack has no load, because of the cell's protect circuit, there's operation current's consume, it causes the battery pack's voltage decreased. Please take care to charge the battery when the storage time is longer, please see the 7item for detailed information.		
Storage temperature	within 1 month	-5 °C~+45°C	Relative humidity 65 ± 20%RH
	within 3 month	-5 °C~+35°C	
	within 6 month	0 °C~+35°C	
Cycle life	Under 25°C, ≥300times		
Battery pack status when shipping	It has been charged 25~35% of capacity when shipping, voltage is 36~39V.		

3. PCM Performance

3.1 Environment

- 3.1.1 Operation temp. -10°C~+45°C relative humidity<80%
- 3.1.2 Storage temp. -20°C~+65°C relative humidity<80%

3.2 Electronic performance parameter

Item	Min.	Typical	Max.	Remark
Overcharge protect voltage(V)	4.225	4.25	4.275	Single cell
Overcharge protect retard time(S)		2		
Overcharge protect resume voltage(V)	4.075	4.1	4.125	Single cell
Over-discharge protect voltage(V)	2.475	2.5	2.525	Single cell
Over-discharge protect retard time (S)		2		
Overdischarge protect resume voltage (V)	2.975	3.0	3.025	
Over-current protect retard time(ms)		10		
◇ The above protect function is for single cell only, when the cells in assembled, as long as any one of the cells reaches to the protect key, all the cells is protected.				

3.3 PCM function

Charging function : The function has only cell circuit protection.

3.3.1 cell protection circuit

3.3.1.1 over-charge: During charging, when the cell's voltage over the overcharge voltage, the overcharge protect circuit worked, and it will be cut when reach to retard time.

Overcharge protection	Protect voltage	4.25V /cell
	Protect retard time	2S
	Protect unchain voltage	4.1V/cell

3.3.1.2 Over-discharge: When battery is over discharged than the over-discharge protect voltage, the over-discharge circuit worked, it will cut the circuit to protect the cell when reach to the retard time.

Over-discharge protection	Protect voltage(single cell, connect to load)	2.5V/cell
	Protect retard time	2S
	Protect unchain condition	charging

3.3.1.3 over-current protection: when the current is over than the over-current, the over-current circuit will work, it will cut the discharge circuit when reach to the retard time.

Over-current protection	Protect current	12A
	Protect retard time	10mS
	Protect unchain condition	Charging

			temperature of 25 ±5°C.PACK+and PACK-port
Protection function	It has the function that is overcharge protection, over-discharge protection, over-current protection and short circuit protection.		
Indicator function	The red is on when charging, the green is on when full charged, there's no light on means no charging.		
Self-discharge	When the battery pack has no load, because of the cell's protect circuit, there's operation current's consume, it causes the battery pack's voltage decreased. Please take care to charge the battery when the storage time is longer, please see the 7item for detailed information.		
Storage temperature	within 1 month	-5 °C~+45°C	Relative humidity 65 ± 20%RH
	within 3 month	-5 °C~+35°C	
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5. Cell parameter index:
1. Single cell parameter

No.	Item	Spec.	Note
1	Model	12210215/40Ah	14PCS
2	Charging voltage	4.20V	
3	Nominal voltage	3.7V	The cell voltage is 3.6V~3.9V when shipping.
4	Rated capacity	≥40Ah @0.2C Discharge	Nominal Capacity refers to the capacity of 0.2C discharge with 2.75V cut-off voltage, after charging by standard method.
5	Cycle Life	≥ 300 Times	One cycle refer to one charge period and then one discharge period. Test condition: Charge current: 0.2C Cut-off voltage: 2.75V The cycle life is the cycle times when the discharge capacity is about 80% of the rated capacity.
6	Self-discharge	Remain capacity> 90%	After standard charging, storied at 5°C±2°C for 30 days, then measure the capacity as Item 4.
7	Impedance	≤8mΩ	After Standard charging, measure the internal resistance with AC1KHz.
8	Max. Charge Current	1CmA (40Ah)	
9	Max. Discharge Current	1CmA (40Ah)	
10	Discharge Cut-off Voltage	2.75V	
11	Operating Temperature	Discharge : -10°C~ +60°C Charge : 0°C~+45°C	Cells must be storied at 3.6V-3.9V. During long period storage, cells should be maintained every 90 days.
12	Storage Temperature	within 1 month: -5 °C~+45°C within 3 month: -5 °C~+35°C within 6 month: 0 °C~+35°C	Relative humidity 65 ± 20%RH
13	Cell Weight	Approx 0.85g	
14	Cell Dimension	L : 215mm Max W : 210mm Max T : 12mm Max	Without tabs.

2.Paremeter of battery pair

No.	Item	Spec	Remark
1	Rated capacity	≥80Ah(2P)	@0.2CmA Discharge.
2	Nominal voltage	37V	After standard charging, and then discharge according to standard. The average voltage when discharge is the nominal voltage.
3	Assemblage Dimension	Length: 270mm Max Width: 250mm Max Thickness : 260mm Max	Measured with weighting 300gf at 25°C± 5°C Not including battery drawing line.

*Except the special explain, all the tests of this product in the spec is made according to the following condition:

Temperature: 25°C±5°C

Humidity: 65 ± 20%

			temperature of 25 ±5°C.PACK+and PACK-port
Protection function	It has the function that is overcharge protection, over-discharge protection, over-current protection and short circuit protection.		
Indicator function	The red is on when charging, the green is on when full charged, there's no light on means no charging.		
Self-discharge	When the battery pack has no load, because of the cell's protect circuit, there's operation current's consume, it causes the battery pack's voltage decreased. Please take care to charge the battery when the storage time is longer, please see the 7item for detailed information.		
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Overcharge protection	Protect voltage	4.25V /cell
	Protect retard time	2S
	Protect unchain voltage	4.1V/cell

3.3.1.2 Over-discharge: When battery is over discharged than the over-discharge protect voltage, the over-discharge circuit worked, it will cut the circuit to protect the cell when reach to the retard time.

Over-discharge protection	Protect voltage(single cell, connect to load)	2.5V/cell
	Protect retard time	2S
	Protect unchain condition	charging

3.3.1.3 over-current protection: when the current is over than the over-current, the over-current circuit will work, it will cut the discharge circuit when reach to the retard time.

Over-current protection	Protect current	12A
	Protect retard time	10mS
	Protect unchain condition	Charging