



Specification For Polymer Lithium-ion Power Battery

Battery Type: 48V 20Ah

Drafted: _____

Checked: _____

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1 Scope

This specification is applied to 48V 20Ah type polymer lithium-ion rechargeable power battery produced by GUANG ZHOU MARKYN BATTERY Co., LTD.

2 Battery Type

48V20Ah

3 Battery Dimension

275±5mm×160±5mm×160±10mm

4 Battery specification

No.	Item	Rated Performance
1	Rated Capacity ^①	20Ah(13S)
2	Minimum Capacity ^①	19Ah
3	Nominal Voltage	48.1V (3.7V×13)
4	Maximum Charge Current	10A
5	Nominal Discharge Current	20A
6	Maximum Discharge Current	40A
7	Standard Charge Method	CC/CV
8	Weight	10.8±1kg
9	Internal Resistance	-----
10	Operating Temperature	Charge Temperature: 0~45℃
		Discharge Temperature: -20~45℃
11	Storage Temperature	-20~45℃

① Standard Charge/Discharge Method:

(1) Charging the battery initially with constant current at 0.25C and then with constant voltage at 4.2V till charge current declines to 0.025C at ambient temperature 20±5℃.

(2) Discharging the battery with constant current 0.25C with 3.0V cut-off voltage at ambient temperature 20±5℃.

5 Electrical Characteristics

No.	Item	Test Method and Condition	Criteria	Remark
1	Rated Capacity	Standard Charge/Discharge ^①	20Ah	
2	Minimum Capacity	Standard Charge/Discharge ^①	$\geq 19\text{Ah}$	
3	Cycle Life	Measure the capacity after 300 cycles with standard charge/discharge method at 0.25C to 3.0V cut-off voltage.	$\geq 70\%$	

6 Safety Characteristics

No.	Item	Test Method and Condition	Criteria	Remark
1	Overcharge Test	After standard charge, the battery shall be charged at 0.5C with voltage limit of 5.0V.	No explosion, no fire.	
2	Short-Circuit Test	After Standard Charge, the battery is to be short-circuited by connecting the positive and negative of the battery with copper wire having a maximum resistance load of 10m Ω .	No explosion, no fire.	
3	Nail Test	After standard charge, a nail (diameter: 3~8mm) is penetrated vertically through the center of battery (a nail kept inside)	No explosion, no fire.	

7 Handling Precautions

- Do not pierce the battery with a nail or other sharp objects.
- Do not strike or throw the battery, or step on it.
- Do not directly solder the battery.
- Do not connect the positive (+) and negative (-) terminals with a metal object such as wire
- Do not reverse the positive (+) and negative (-) terminals.
- Do not discard the battery into fire or heat it.
- Do not immerse the battery in water or seawater.
- Do not use or leave the battery near a heat source such as a fire or a heater (60°C or higher)

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8 Storage and Shipment

- Storage and shipment approx. 50% ~ 70% charged
- Leave in cool and dry places
- Prevent the battery from severe mechanical impact, shock, press, intense sunlight or getting wet during shipment
- Handle carefully, prevent the battery from throw, welter or heavy press when loading or unloading
- Do not carry or store the batteries together with necklaces, hairpins or other metal objects

9 Others

Mistreatment of a battery may cause the battery to get heat, ignite, or explode and cause serious injury. Be sure to abide by the safety rules as following :

Warning!

- Do not immerse the battery in water or seawater; store in cool and dry places if not using.
- Do not place the battery in microwave ovens, high-pressure containers, or on induction cookware.
- Do not place the battery on or near fires, stoves, or other high-temperature locations.
- Use a specified charger.
- Do not directly attach the battery to a power supply plug.
- Do not discard the battery into fire or heat it.
- Do not disassemble the battery.

Caution!

- Do not place the battery on or near fires, stoves, or other high-temperature locations.
- Do not place the battery in direct sunshine and use or store the battery inside cars in hot atmosphere. Otherwise, it may cause the battery to generate heat, ignite or explode. Using the battery in this way may also result in loss of performance and its life expectancy will be shortened.
- In case the battery electrolyte leaks and the electrolyte enters the eyes, please do not rub them. Instead, please rinse the eyes with clean running water and immediately seek medical attention. Otherwise, eye disease will be caused.

<p style="text-align: center;">GUANG ZHOU MARKYN BATTERY Co., LTD</p>	<p>File No:</p>
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<ul style="list-style-type: none"> ● In case the battery electrolyte leaks and the electrolyte enters the eyes, please do not rub them. Instead, please rinse the eyes with clean running water and immediately seek medical attention. Otherwise, eye disease will be caused. ● If the battery gives out odor, generates heat, becomes discolored or deformed, or appears other abnormal phenomena during using, recharging or storage, please immediately remove it from the main device or battery charger. In this case, the battery should be stopped using. ● Store the battery in place where children can not reach, make sure that children can not take out the battery from the battery charger or electrical devices. ● If acid leaks from the battery and contacts your skin or clothing, please immediately wash it away with running water. ● Do not mix-use our battery with other manufacturers' products, different types and/or models of batteries such as dry batteries, nickel-metal hydride batteries, or nickel-cadmium batteries, or new and old lithium batteries together. ● When the battery is worn out, please insulate the terminals with adhesive tape or similar materials before disposal. 	
<p>10 Product Liability</p>	
<p>An accident or fire may occur because of improper usage of the battery.). GUANG ZHOU MARKYN BATTERY Co., LTD will not bear any product liability in case those accidents occur under circumstances not included in this specification.</p>	