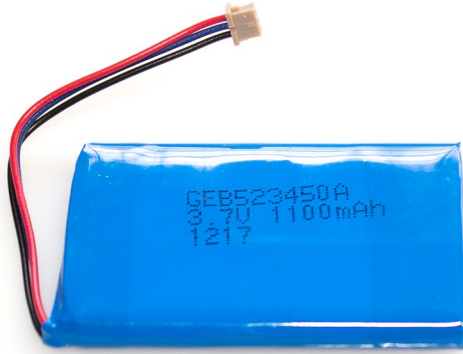


## GEB523450A\_DF13

Lithium Ion Polymer rechargeable battery 1050mAh 3.7V



## Basic Information

### Cell

Type: Rechargeable Lithium-Ion

Size:  $50.0 \pm 0.3\text{mm} \times 34.0 \pm 0.3\text{mm} \times 5.2 \pm 0.3\text{mm}$

Model: 523450A

Quantity: 1pc

Capacity: 1050mAh

Voltage: 3.7V

Internal Resistance:  $<60\Omega$

### PCB

• Model: MD-JC01

- Over charge prohibition: Shut down the circuiting and stop the charge if one of the cell's voltage exceeds more than  $4.325 \pm 0.05\text{V}$  momentarily or continuously. (Meanwhile it is able to discharge)
- Over charge release: In case of the cell voltage which has detected charge prohibition mode. If all of the cells are less than  $4.15\text{V} \pm 15\text{V}$  prohibition mode would be best
- Over discharge prohibition: Shut down circuiting and stop discharge if one of the cell's voltage becomes less than  $2.5\text{V} \pm 0.1\text{V}$  momentarily or continuously. (Meanwhile, it is able to discharge)
- Over discharge release: Recover when the voltage of cells reach above  $2.9 \pm 0.1\text{V}$ . If the battery pack has no voltage, please connect the power supply and the voltage will recover.
- Excess current protection: When the protection IC detects the current exceeds the specified current ( $2.1\text{A} < I < 3.9\text{A}$ ,  $\text{typ}=3.0\text{A}$ ), it shall shut the circuit and stop discharge.  $4.48\text{ms}(\text{Typ})$ ,  $13.5\text{ms}(\text{max})$
- Short circuit protection: When protection IC detects the voltage drop in MOS it exceeds the specified voltage ( $1.2\text{V Min.}$ ),  $1.25\text{V}(\text{Typ})$ ,  $1,3(\text{MXA})$ , it shall shut the circuit and stop discharge.  $600\mu\text{s}(\text{Max.})$ ; Delay time:  $600\mu\text{s}(\text{Max})$
- Normal operation current consumption:  $1.0\mu\text{A}(\text{Typ})$ ,  $6.0\mu\text{A}(\text{Max})$   
Power-down current consumption:  $0,1\mu\text{A}(\text{Max})$



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### • Spec and compatible function:

work Voltage: 3.7V

IC Master IC: 5DC6073

Apply Area: one piece Li-Ion/Li-Po battery protect

### Pack Information

Description: Rechargeable Lithium Ion Battery pack

Cell Configuration: 1P-1S

Model Name: 523450A

Normal Voltage: 3.7V

Normal Capacity: 1050mAh

Size: 53.5 x 34.2 x 5.4 ± 0.5mm

Output Style: out lead 5.m 26#Awg

## Product Specifications

### Electrical:

(1) Voltage Normal 3.7V

(2) Capacity: Normal - 1050mAh (by standard charge and discharge)

(3) Charge: Voltage - 4.2±/± 0.05V

- Current 1050mA (1C Quick Charge)
- 210mA (0.2C Continuous Charge)
- Method CC/CV
- Finish < 10mA

(4) Discharge: Current - 1050mA (Continuous)

525mA (Standard)

Empty 3.0V

### Physical:

Size: Refer to attached drawing - LxWxH 53.5\*34.2\*5.4±0.5 mm (L\*W\*H)

### Using conditions:

(1) Temperature: Charge 0 ~ 50°C ; Discharge -10 ~ 60°C

Storage -20 ~ 25°C (< 1 year)

-20 ~ 40°C (< 3 months)

-20 ~ 50°C (< 1 month)

(2) Humidity: Operation 20 ~ 85%RH (not condensed)

Storage 40 ~ 85%RH (not condensed)

## Safety Specifications

(1)  $4.325 \pm 0.05V$

Over Charge Prohibition: Shut down the circuitry and stop charge if one of cell's voltage exceeds more than  $4.325 \pm 0.05V$  momentarily or continuously. (Meanwhile, it is able to discharge)

: 1.5s(Typ.), 1.7s(Max.)

Delay Time: 1.5s(Typ.), 1.7s(Max.)

(2)  $4.15V \pm 0.5V$

Over Charge Release: In case of the cell voltage which has detected charge prohibition mode. If all of cells are less than:  $4.15V \pm 0.05V$  prohibition mode would be reset.

(3)  $2.5V \pm 0.1V$

Over Discharge Prohibition: Shut down circuitry and stop discharge if one of cell's voltage becomes less than  $2.5V \pm 0.1V$  momentary or continuously. (Meanwhile, it is able to discharge)

: 180ms(Typ.), 210ms(Max.)

Delay Time: 180ms(Typ.), 210ms(Max.)

(4)  $2.9V \pm 0.1V$

Over Discharge Release: Recover when the voltage of cells reach above:  $2.9V \pm 0.1V$ . If battery pack is no voltage, please connect the power supply, and the voltage will recover.

(5) IC ( $2.1A < I < 3.9A, 3.0A$ )

Excess current protection: When the protection IC detects the current exceeds the specified current ( $2.1A < I < 3.9A$ , typ=3.0A, ), it shall shut the circuit and stop discharge.

: 4.48ms(Typ.), 13.5ms(Max.)

Delay time: 4.48ms(Typ.), 13.5ms(Max.)

(6) IC MOS ( $1.2V(\text{Min.}), 1.25V(\text{Typ.}), 1.3V(\text{Max.})$ ),

Short circuit protection: When protection IC detects the voltage drop on MOS exceeds the specified voltage ( $1.2V(\text{Min.}), 1.25V(\text{Typ.}), 1.3V(\text{Max.})$ ), it shall shut the circuit and stop discharge.

: 600us(Max.)

Delay time: 600us(Max.)

## Performance & Tests

### 4-1. Test sampling and environmental conditions

#### (1) Test sample condition

The battery used for the test shall be manufactured and delivered no later than one month before.

#### (2) Environmental condition

23±2°C and 65± 20%RH

The test shall be performed at 23±2°C and 65± 20%RH.

#### (3) Test equipment condition

The grade of Voltmeter and Ammeter used in the test shall be higher than class 0.5, a high impedance type.

### 4-2. Standard test conditions

#### (1) Standard Charge: 0.01C.

"Standard Charge" means charging the pack with a Charge Current 0.5C with constant Voltage of 4.2V

at 23±2°C for 2.5 hours until the current <0.01c.

#### (2) Standard Discharge: 1050 mA 3.0V.

"Standard discharge" means charging the pack with a Discharge Current 1050mA with constant

Voltage down to 3.0V at 23±2°C.

### 4-3. General performance

#### (1) Initial capacity

Perform the Standard Charge and Discharge cycling for 3 times, and measure the last Discharge Capacity.

\* The initial capacity shall be higher than minimum capacity

#### (2) Cycle life

After 300 cycles of Standard Charge and Discharge under conditions mentioned below, the pack is measured for Discharge Capacity.

\* Each charge and discharge process includes 10 minutes rest time.

\* Last Discharge Capacity after 300th cycle shall be higher than 80% of minimum capacity.

#### (3) Discharge Capacity with temperature

100%, this means the relative value of Discharge Capacity at various temperatures compared with the Standard Discharge Capacity as 100%.

\* Pack is charged under Standard Charge conditions.

\* Pack is discharged under Standard Discharge conditions at various temperatures.

Relative Capacity	70%	80%	100%	95%
Temp.	-10°C	0°C	23°C	60°C

Storage: 23±2°C

A fully charged pack under Standard Charge condition is stored at 23±2°C for 30 days and the capacity is measured for the standard discharge condition.

90%。

\* Remaining capacity shall be higher than 90% of the minimum capacity.

#### 4-4. Mechanical performance

(1) Drop test

Test method :1000mm

18mm~20mm

Test method :Dropping the battery pack freely on the hard board 18mm~20mm thickness at 1000mm height on 6 bearings of X、Y、Z freely each time.

(2) Vibration test

Test method:

This is to test the endurance of the pack against vibration.

Frequency and Amplitude: 10Hz → 55Hz → 10Hz / 0.8mm

Sweep speed: 1 ±0.055Hz/min

No damage such as leakage, flame, or fire is allowed.

#### 5. Caution and prohibition

Before using and handling the pack, see attached "Handling instructions for Rechargeable Lithium Ion Battery Pack".

For safety reasons Rechargeable Batteries are shipped in a low capacity state.

Charge battery pack before using.

New pack is the initialized. But if used over a period of time without fully charging and discharging, a loss in capacity accuracy may occur. Recover such packs to original performance through repeating several cycles of full charging and discharging.

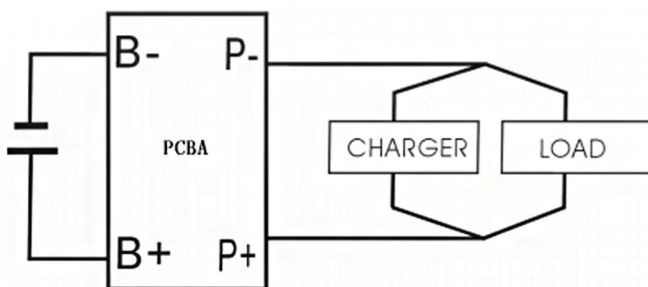
#### 6. Storage for a long term

If the pack is kept in storage for a long term (3 months or more), it is strongly recommended that the pack be preserved in a dry and low temperature atmosphere.

#### 7. Warranty

Manufacturer will be responsible for replacing the pack against defects or poor workmanship for 6 months from the date of shipping. Any other problem caused by malfunction of the equipment or misuse of the battery is not covered under this Warranty.

Circuit connection



端子名称	描述
B+	连接电芯正极端 connect to the battery +
B-	连接电芯正极端 connect to the battery +
P-	电池负极输出端 battery pack - output
P+	电池正极输出端 battery pack + output

### **8-3 Handling instructions guide for Rechargeable Li-ion Battery Pack**

#### **1. General**

Battery packs have to be handled carefully according to the specifications. Here are some more to be followed.

#### **2. Storage of pack**

- a. The packs are requested to be stored under the following conditions:
- b. Indoor storage in cool conditions without direct sun light on the packs or cartons.
- c.  $-20^{\circ}\text{C} \sim +30^{\circ}\text{C}$

Store batteries in a dry location with low humidity, and a temperature range of  $-20^{\circ}\text{C}$  to  $+30^{\circ}\text{C}$

#### **Instructions for 'long term storage:**

- d.  $+10^{\circ}\text{C} \sim +30^{\circ}\text{C}$ .

Long-term storage can accelerate battery self-discharge and lead to the deactivation of the batteries. To minimize the deactivation effect, store battery packs in a temperature range of  $+10^{\circ}\text{C}$  to  $+30^{\circ}\text{C}$ .

e. When charging for the first time after long-term storage, deactivation of the packs may have led to decreased capacity. Recover such packs to original performance through repeating several cycles of fully charging and discharging.

f. When storing packs for more than 6 month, charge at least once every 6 months to prevent leakage and deterioration in performance due to self-discharging.

#### **3. Charging the pack**

- a. Use suitable Charger with the specified Voltage and Current.
- b. Never attempt Reverse Charging. Charging with polarity reversed can cause a reversal in battery polarity, causing gas pressure inside of the battery to rise, which can lead to leakage of the batteries in the pack.
- c. Avoid overcharging. Repeated overcharging can lead to deterioration in pack performance and the battery pack may get over heated.
- d. Charging efficiency drops at temperatures above  $40^{\circ}\text{C}$

#### **Protection from unexpected damaged to pack**

- a. (+) and/or (-) terminals must not be connected in metal wire, necklace, chasing.
- b. Do not drop packs from height in order to prevent them from possible malfunction or damage.
- c. Do not twist or bend packs in order to prevent possible damage.

#### **5. For Safety**

- a. Do not disassemble packs.
- b. Do not use the pack if an abnormality is detected such as foul odor, deformation, discoloration, and so on.
- c. Do not re-use Li-ion Polymer cells or other parts after removing from the packs.
- d. Do not touch the liquid if there is an electrolyte leakage.
- e. Once watered, packs may have potential malfunctions. Do not use those packs.
- f. Do not keep packs in hot temperature ( $60^{\circ}\text{C}$  or more) conditions.
- g. Do not put packs into fire.
- h. Do not crush/nail packs.
- i. Do not apply solder directly to packs.