

Specification

Product Name: Li-MnO₂ Thin cells

Model: <u>CP603742</u>



1. Scope:

The document applies to Li-MnO₂ Battery CP603742 supplied by Akyga Battery.

2. Description

2.1 Model: CP603742

2.2 Assembly Way

Single cell 1S1P

3. Specifications

3.1 Assembled cell parameters

No.	Item	Spec	Note
1	Model	CP603742/2400mAh	1S1P
2	Nominal Voltage	3.0V	OCV: 3.05V~3.25V.
3	Tab	Ni	
4	Nominal Capacity	2400mAh @1mA	At 1mA load, until 1.8V voltage at 23°C (The actual measured capacity value will be changed by discharge current, temperature and cut-off voltage)
5	Max. Continuous Discharge Current	200mA	To get 50% of the nominal capacity at +23±2°C with 1.8V cut off. Higher currents possible, consult Akyga Battery



6	Max. Pulse Discharge Current	400mA	To get 50% of the nominal capacity is up to 400 mA, at +23±2°C, discharge 3s and stand 27s. Varies according to pulse characteristics, temperature, cell history and the application. Consult Akyga Battery.
7	Discharge Cut-off Voltage	1.8V	
8	Operating Temperature	-20°C∼ +60°C	Operation under higher or lower ambient temperature may lead to reduced capacity and function lost.
9	storage temperature	-5 °C~+35°C	
10	Storage life	8 years	Relative humidity: 45~75%RH Temperature: -5 °C~+35°C
11	Cell Weight	Approx.: 17.5g	
12	Self-Discharge Rate	≤2%	Less than 2% after 1 year of storage at 25°C
13	Assemblage Dimension	Length: 43.0mm Max Width: 37.0 mm Max Thickness: 6.2mm Max	

4. Battery Cell Performance

4.1 Standard Testing Environment

Test conditions:

The test must be done within one month after received unless there is otherwise noted.

Ambient Temperature: $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$; Ambient Humidity: $45\sim75\%\text{RH}$.

4.2 The Requirement of Measure Instrument

- (1) The measurement instrument has been qualified by the inspection institution.
- (2) The accuracy of the measuring instrument is less than 0.01mm.
- (3) The accuracy of multimeter is not less than 0.5%.
- (4) The current accuracy of the battery test system is above $\pm 0.1\%$, constant voltage is $\pm 0.5\%$, and timer accuracy is not less than $\pm 0.1\%$.
- (5) The accuracy of the thermometer is not lower than ± 0.5 °C.

4.3 Appearance

Not allowing any visual defects which will affect the electronic characteristics, such as leakage and damage.

4.4 Mechanical Characteristics

No.	Item	Testing Conditions and Method	Standard
1	Vibration Test	According to the UL1642 test requirement, a battery vibration frequency is to be varied at the rate of 1 hertz per minute between 10 and 55 hertz, amplitude is 0.38 mm. The battery is to be tested in three mutually perpendicular directions; each is not less than 30mins.	III 1642: No explosion no
2	Drop Test	According to the UL1642 test requirement, each cell should be dropped 2 times from 1.2m height onto cement ground.	UL1642 No explosion, no fire

4.5 Safety Test

No.	Item	Testing Conditions and Method	Standard
1	UN38.3/MSDS	Follows UN38.3/MSDS.	UN38.3
2	UL-1642 (Cell Level)	Follows UL1642.	UL-1642

4.6 High and Low Temperature Test

No.	Item	Testing Conditions and Method	Standard
1	High Temperature	A battery is placed in a high-temperature cabinet for 2 hours at 55°C±2°C, then discharged at 10 mA current until the voltage cut off. 在	Discharge 90% of the nominal capacity.
2	Low Temperature	A battery is placed in a high-temperature cabinet for 2 hours at -20°C±2°C, then discharged at 1mA current until the voltage cut off.	Discharge more than 45% of the nominal capacity.

5. Storage and Others

5.1 Long-term Storage

Lithium batteries should be stored in a cool, clean, dry environment. The recommended temperature and relative humidity should be the same as 3.3.1.9, avoid contact with corrosive materials, away from fire and heat.

5.2 Any issues not mentioned in the specification should be discussed with Akyga Battery.

6. Warranty Period

The warranty period is 6 months from the date on the cells.

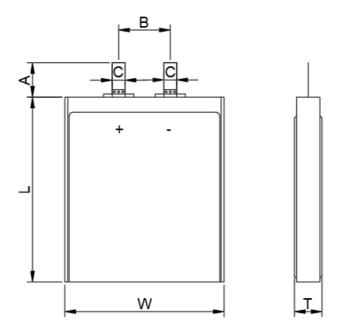


7.Drawing

7.1 Assembly Diagram (not drawn to scale)

Model: CP603742

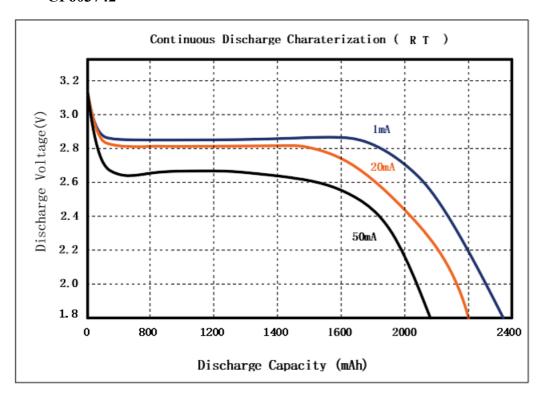
Unit: mm



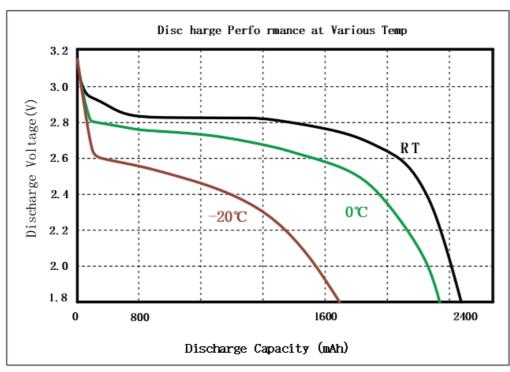
Items	Description	Dimension and Spec
A	Tab length	8 mm±1.0mm
В		12.0mm±1.0mm
С	Tab width	3.0mm±0.2mm
Т	Cell thickness	6.2mm(Max)
W	Cell width	37.0mm(Max)
L	Cell length	43.0mm(Max)

8. Discharge Curve

8.1 Different Current Discharge Curve at 23°C CP603742



8.2 Different Temp. Discharge Curve at 1mA CP603742



Handling Precaution and Guideline

For CP batteries

The document of 'Handling Precautions and Guidelines for CP Batteries' is only applied to the battery cells manufactured by Akyga Battery.

Note (1): Customer should contact Akyga Battery in advance if needs to change the working conditions stipulated in the document. Additional tests are required to verify the performance and safety of the cell with these conditions.

Note (2): Akyga Battery will take no responsibility for any accident when the cell is used on conditions which is not mentioned in specification.

Note (3): Akyga Battery will inform the customer in writing of the improvement measures to use and operation of the cell correctly if necessary. Akyga Battery can revise the specification before signature and will confirm with customer.

1. Discharging Current:

Discharge current shall not exceed the maximum discharge current specified in the specification. Excessive discharge current will cause reduced capacity and cells will be overheating.

2. Discharging Temperature

The discharge temperature of the cell must be within the ambient temperature range specified in the specification.

3. Over-Discharge

Over-discharging will cause cell degradation and functional losses and should be avoided.

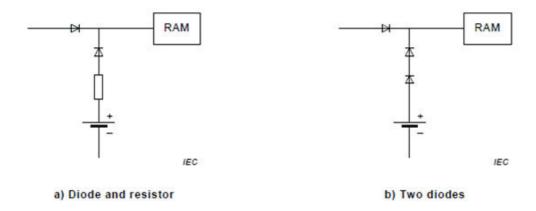
4. Charge Protection

When incorporating a lithium primary battery into a circuit powered by an independent main power source, protective devices shall be used in order to prevent charging the primary battery from the main power source, for example:

- a) a blocking diode and a current limiting resistor (see Figure a);
- b) two series blocking diodes (see Figure b);
- c) circuits with a similar blocking function based on two or more independent protective;

devices:

provided the first protective device is capable to limiting the charging current through the lithium battery to the normal reverse current specified by the manufacturer which can be applied to the battery during its operating life, while the second protective device is capable to limit the charging current to the abnormal charging current specified by the battery manufacturer. The circuit shall be so desist ered that at least one of these protective devices remains operational when any one component of the circuit fails.



5. Storage

The cells should be stored at the temperature range specified in the specification.

6. Attentions

6.1 Attention When Using Cells:

★ Avoid short-circuit. Short circuit may cause the tap got heated which will make battery function invalid.

★ Keep cells away from the sharp object.

★ Don't bend or fold the top sealing edge.

★ Don't open the folded the sealing edge on sides.

Li-MnO2 Flat Battery

★ Don't bend the tabs.
★ Avoid mechanical shock on the cells.
★ Don't put the cells into heater, washing machine or any high pressure vessel.
★ Any heat, smelly, discolored, deformation or otherwise abnormal during storage, stop immediately.
★ Keep cells away from children.
★ Please read carefully and understand the handling guidelines before using batteries.
★ Away from static electricity when using, and storing cells.
★ Don't use or leave, discharge batteries near to fire or in cars with temperatures over 60°C.
★ Keep the cells away from the metal items.
★ Don't connect the positive and negative together with metal conductors.
★ Avoid Don't assemble the positive and negative in the opposition direction when using.
★ The deformed battery can't be used.
6.2 Attention for Desisering Battery Pack
6.2.1 Package Desiser

The battery pack should be with mechanical strength to avoid the mechanical damage.

2 No sharp edges in the housing where Install the battery.

6.3 Attention for Assembling Battery Pack

6.3.1 Tab Connection

- ① Ultrasonic welding or spot welding is recommended to connect the battery with the PCM or other parts.
- 2 If using manual soldering, please pay attention to the below to ensure battery performance:
 - a) The solder iron should be temperature controlled and anti-static.
 - b) Soldering temperature should not exceed 350±10°C.
 - c) Soldering time should not be longer than 3 seconds.
 - d) Soldering times should not more than 5 times.
 - e) The battery tab should be cooled down before soldering again.
 - f) Direct heat to the cell body is strictly prohibited. The battery will be damaged by heat above approx. 60°C. Direct heating of the cell is forbidden. The battery will be damaged if temperature higher than 60°C.

6.3.2 Cell Fixing

- 1 The cell should be fixed to the battery pack by its large surface area.
- No burrs or sharp edges are allowed in the position of the cell.
- (3) The cell should be fixed to the shell, no movement.
- The thickness of the pack, including the cell and auxiliary materials (such as: sponge pat, insulation sheet, tape, etc.) should not exceed the shell inner space, to prevent the cell from the damage and safe issue.

7. Others



- 7.1 Disassembly may cause an internal short circuit to the cell, which may cause out-gassing, fire, or other problems.
- **7.2** No flowing liquid inside the battery, but if leakage is happened and touched on the skin, eyes or other parts on the body, please take the below preventive measures:
 - a. Touch eyes: immediately rinse with water for at least 15 minutes. If still discomfort, medical treatment will be sought.
 - b. Touch skin: immediately rinse with plenty of water.
 - c. Breath the released gas: Go outside to breath flash air.
 - d. Accidental ingestion: medical treatment is required immediately.
- **7.3** Prohibit dumping cells into fire

Never incinerate or dispose the cells into fire, for these may cause firing of the cells.

- **7.4** The cells should never be soaked with liquids such as water, drinks or oil.
- **7.5** Prohibit using the cells mixed with different manufactories and mixed with old ones.
- **7.6** Prohibit using damaged cells.

8. Recommended Notice:

- **8.1** Using cells on specified facilities only.
- **8.2** Using cells in normal ambition temperature.

Temperature: $-10 \sim 35$ °C, Relative Humidity: $45 \sim 75$ %.

- **8.3** Using the cells, away from heat source, not allow children playing with cells.
- **8.4** Avoid short circuit on battery and avoid affected with damp.
- **8.5** Useless cells should be deal with in a safety way. Don't drop them into the water or fire.