

Li-Polymer Battery Specification

Model: PLCT603455

Voltage: 3.7V

Nominal Capacity: 1200mAh

Assembled: 3.7V battery

Revision: A-0

Date: 2015-12-17

File code:G2015121705

Product Code:

Customer:

PACK Registered/Date PACK	PACK Checked/Date	Proj. Checked /Date
CELL Confirmation/Date	CELL Checked/Date	Approved/Date

Customer Confirmation	Date

Revisal record

REV.	Date	Contents	Revised	Remarks
A0	2015.12.17	First issue		

1. Scope

The specification shall be applied to Li-Polymer Battery, which is manufactured by Patron.

2. Specification

No.	Items	Criteria	Remark
2.1	Typical capacity	1200mAh	With a discharge current of 0.2C ₅ to the cut-off v (Temperature : 23°C±2°C)
	Minimum Capacity	1140mAh	
2.2	Energy	4,44Wh	
2.3	Nominal Voltage	3.7V	
2.4	Outgoing Voltage	≥3.80V	
2.5	Battery internal resistance	≤50mΩ	AC 1.0±0.1kHz test after standard charge 1.0±0.1kHz (Temperature: 23°C±2°C)
2.6	Limited charge voltage	4.20V	
2.7	Standard charge current	600mA	
2.8	Maximum charge current	1200mA	
2.9	Standard discharge current	600mA	
2.10	Max continuous discharge current	1200mA	
2.12	Cut-off voltage	2.75V	
2.13	Operating Temperature	Charging : 0~50°C	
		Discharging : -20~60°C	
		Recommended operating temperature: 15°C~35°C	
2.14	Storage Environment	Less than 1 month : -10°C~40°C, 75%RH Max	
		Less than 3 months : -5°C~35°C, 75%RH Max	
		Recommended storage environment: 15°C~35°C, 75%RH Max	

Long time storage :

If the battery need be stored for a long time, the voltage should be 3.8~4.0V, and stored in the condition as storage proposal. It need at least one charge & discharge cycle every three months.

3. Test Conditions

3.1 Standard Test Conditions

3.1.1 Unless otherwise specified, all performance tests is required conducted at temperature $23\text{ }^{\circ}\text{C}\pm 2\text{ }^{\circ}\text{C}$, Humidity less than 75% and atmospheric pressure 86~106 kPa.

3.1.2 Refer to the national standard of the People's Republic of China: GB/T 18287-2013

3.1.3 Unless otherwise specified, the tested product is required unused within one month after outgoing.

3.2 Standard Charge Mode

"Standard Charge" means at $23\pm 2\text{ }^{\circ}\text{C}$ charge to limit voltage with $0.2I_t\text{A}$ constant current, then charge with constant voltage until current less than $0.02I_t\text{A}$.

3.3 Quick Charge Mode

" Quick Charge" means charge to limit voltage with $0.5I_t\text{A}$ constant current, then charge with constant voltage until current less than $0.02I_t\text{A}$.

3.4 Standard Discharge Mode

"Standard Discharge" means at $23\pm 2\text{ }^{\circ}\text{C}$ discharge to the cut-off voltage with $0.2I_t\text{A}$ current.

3.5 Quick Discharge Mode

"Quick Discharge" means discharge to the cut-off voltage with $0.5I_t\text{A}$ current.

3.6 Initial Capacity

The standard charge mode for charging, then the standard discharge mode to discharge, measured for the first time the battery capacity is the initial capacity.

4. Product Performance

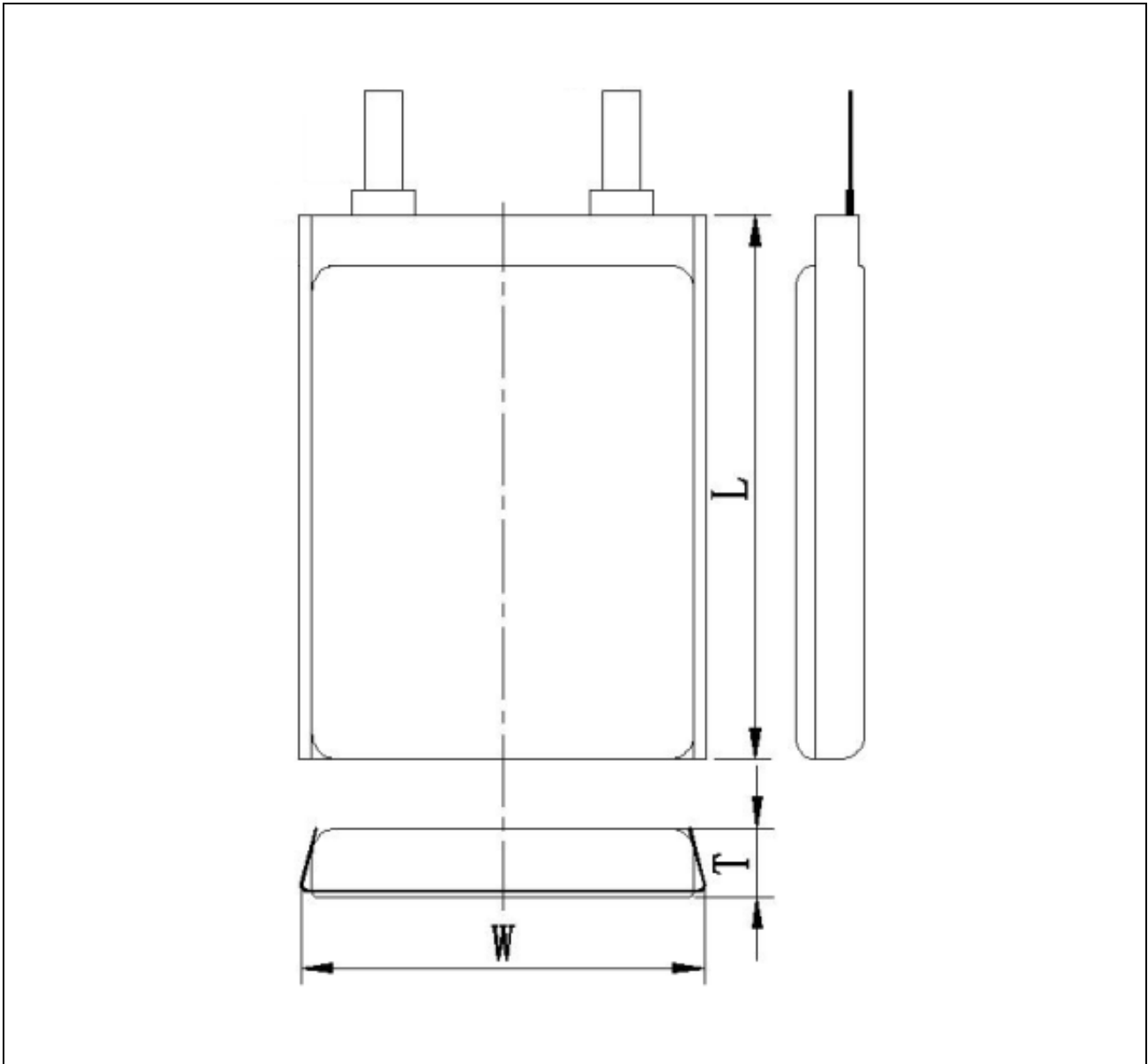
4.1 Product General Performance

No.	Items	Testing method and criterion
1	0.2I _t A discharging Performance 0.2I _t A	The cell or battery charged with standard charge mode, deposit 0.5~1h, then discharged with standard discharge mode. The discharge time is required ≥ 5 h. The above test cycle can be repeated five times, Once is qualified to meet the requirements.
2	Quick discharging Performance	The cell or battery charged with quick charge mode, deposit 0.5~1h, then discharged with quick discharge mode. The discharge capacity is no less than 90% of initial capacity.
3	Cycle life	At $23 \pm 2^\circ\text{C}$, during the test, every 50 cycles for a capacity check. the cell or battery life is expressed in multiples of 50. For every 50 times the process of test as follows: A: 1~49 cycles: charge to limit voltage with 0.5I _t A constant current, then charge with constant voltage until current less than 0.1I _t A, deposit 0.5~1h, then discharged with quick discharge mode; B: 50 cycles: charged with standard charge mode, deposit 0.5~1h, then discharged with standard discharge mode; Any one of the 50 cycles, if the discharge time of less than 3h, then repeat B one time accordance with the provisions of the 50th once again, if the discharge time is still less than 3h, the life is over. The cycle is required ≥ 500 times.
4	Charged Storage Characteristics	The cell or battery charged with standard charge mode, Open circuit stored in $20 \pm 5^\circ\text{C}$ for 28 days. Discharged with standard discharge mode. Discharge time should not be less than 4.25h. Then charged with Standard Charge mode, Discharged with standard discharge mode again. Discharge time should not be less than 4.5h.

4.2 Product environmental adaptability

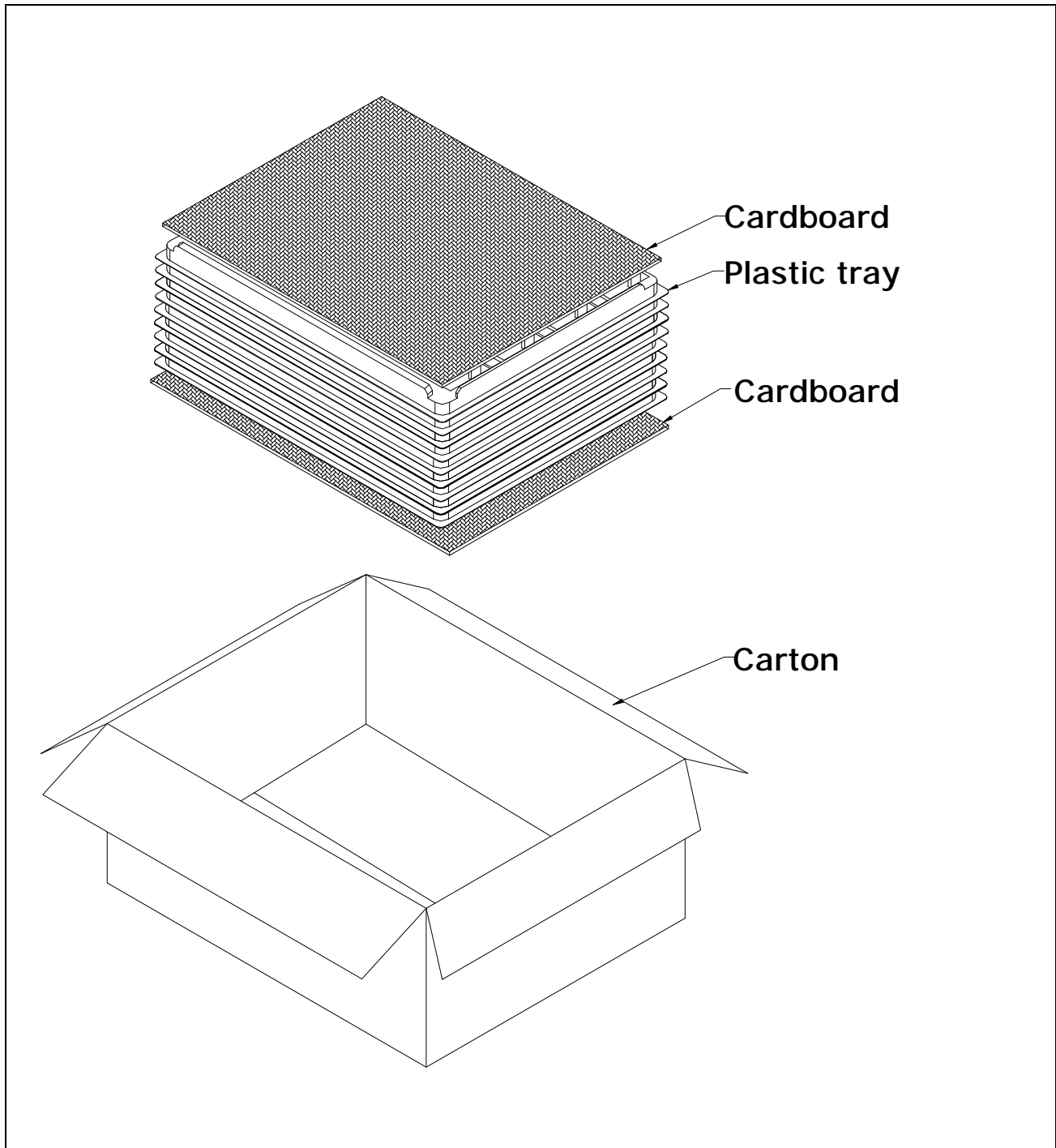
No.	Items	Testing method and criterion
1	High-temperature discharge	The cell or battery charged with standard charge mode, deposit at $55\pm 2^{\circ}\text{C}$ hi-temp box for 2h, then discharge with $0.2I_t\text{A}$ current to cut-off voltage. Discharge time should not be less than 5h.
2	Low-Temperature discharge	The cell or battery charged with standard charge mode, store at $-10\pm 2^{\circ}\text{C}$ low-temp box for 4h, then discharge with $0.2I_t\text{A}$ current to cut-off voltage. Discharge time should not be less than 3h.
3	Constant Humidity and Temperature	The battery charged with standard charge mode, placed in a temperature of $40\pm 2^{\circ}\text{C}$, relative humidity 90~95% of the constant temperature and humidity box 48h, After test, remove the battery pack at $23\pm 2^{\circ}\text{C}$ ambient temperature shelved 2h, then discharge with $0.2I_t\text{A}$ current to cut-off voltage. Discharge time should not be less than 3h.

5. Cell drawing (all unit in mm, not in scale)



Items	Description	Dimension and Spec
T	Thickness	6.3 mm max
W	Width	34.5mm max
L	Length	52mm max
/	Side sealing edge mode	
/	Tab processing mode	

6.Package Drawing(all unit in mm, not in scale)



No.	Item	Description	Remark
1	Packing style	Carton& Cardboard& Plastic tray	
2	Outside size of the box		
3	Weight	≤10Kg	
4	Carton Sealing method	Transparent adhesive tape& Packing belt	

7. Warning

To ensure proper use of the battery please read the manual carefully before using it.

- § Keep away from insolate and fire.
- § Do not put the battery in a charger or equipment with wrong terminals connected.
- § Avoid shorting the battery
- § Avoid excessive physical shock or vibration.
- § Do not disassemble or deform the battery.
- § Do not immerse in water.
- § Do not use the battery mixed with other different manufacturer, type, or model batteries.
- § Keep out of the reach of children.

. charge and discharge

- § Battery must be charged in appropriate condition only.
- § Never use a modified or damaged charger.
- § Do not leave battery in charger over 24 hours.
- §

. storage

- § Store the battery in a cool, dry and well-ventilated area.

.disposal

- § Regulations vary for different countries. Disposed in accordance with local regulations.

8 .Battery operation instruction

8 .1 Charging

Charging current: Do not surpass the largest charging current that specification stipulated.

Charging voltage: Do not surpass the highest limited voltage that specification stipulated.

Charging temperature: within temperature scope that specification stipulated.

Charge with constant current, then with the constant voltage, no reverse charge, which is dangerous

8.2 Discharging current

The discharging current cannot surpass the largest discharging current that specification stipulated, the overlarge discharge current can cause the battery heat and capacity reduction.

8.3 discharge temperature

The battery discharge must within temperature scope which specification stipulated

8.4 Over-discharges

Short time over discharge does not affect the battery function, but long time over discharges can damage battery performance, and can't use any more. due to its own self-discharge characteristics also lead to over-discharge, to prevent over-discharge occurs, the battery should maintain the certain electric quantity, the cell shall be charged periodically to maintain between 3.8V and 4.0V. Over-discharging may causes loss of cell performance, characteristics, or battery functions. The electrical products shall be equipped with a device to prevent further discharging exceeding a cut-off

voyage specified in the Product Specification. Also the charger shall be equipped with a device to control the recharging procedures as follows:

The cell battery pack shall start with a low current (0.02C) for 30 - 45minutes, i.e. pre-charging, before rapid charging starts. The rapid charging shall be started after the (individual) cell voltage has been reached above 3V within 30 - 45 minutes that can be determined with the use of an appropriate timer for pre-charging. In case the (individual) cell voltage does not rise to 3V within the pre-charging time, then the charger shall have functions to stop further charging and display the cell/pack is at abnormal state.

8.5 Storage

The battery is required stored within the temperature range that specification stipulated.

9 . Handling of Cells

Since cells are packed in soft material, for protecting it better performance, careful handling is very important.



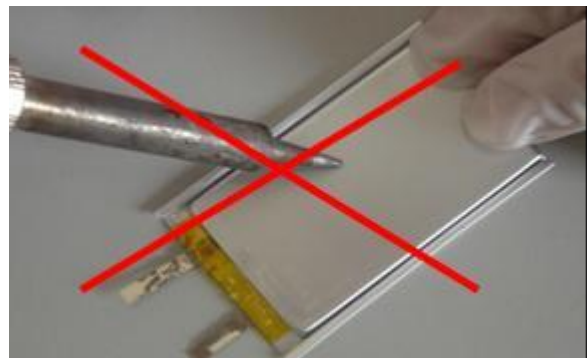
a) Soft Aluminium Foil

The soft aluminum packing foil may be damaged by sharp matter such as Ni-tabs, pins and needles or other jig and tool. Not strike cell with any sharp matter.

Trim your nail or wear gloves before taking cell.

Clean worktable to sweep away dust.

Avoid component contacting with the edge of foil of cells. Otherwise, there will be corrosion, flatulence and other hidden dangers.



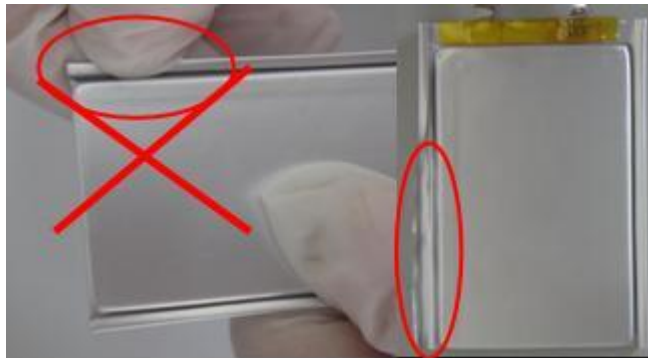
b) Top Sealing Edge

Sealing edge on the top of cells is very flimsy and easy to be delaminated. Don't bend or fold this area



c) Fold Edge

The side sealing edge has been folded and fixed in cell forming processes and passed hermetic test. The Aluminum foil may break by re-folding time after time. Don't open and refold this edge.



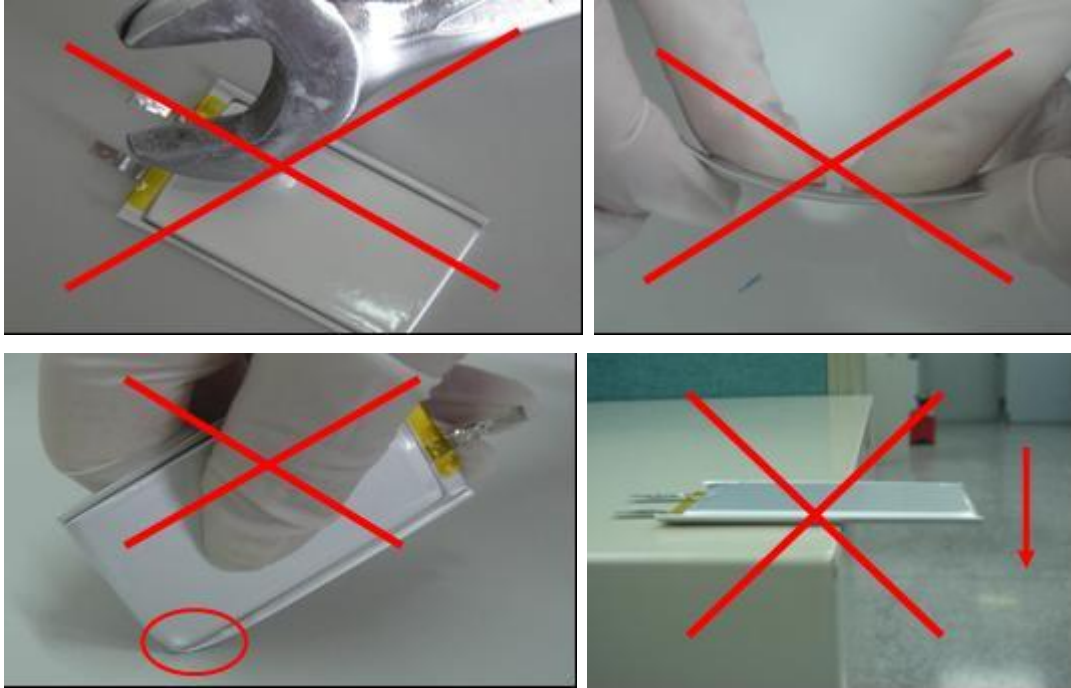
d) Tabs

The cell tabs are easy to be broken especially for Aluminum tab. doesn't bend the tabs.



f) Mechanical Shock

Don't fall, shock, and bend cell .



g) Short

Short of cells is strictly prohibited; it may damage cells, even result in safety accident.



10. Period of Warranty

The period of warranty is six months from the date of shipment. Replacement is guaranteed within warranty if battery with defects proven due to manufacturing process instead of the customer's abuse and misuse.

11. Other Chemical Reaction

Because batteries utilize a chemical reaction, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, if the various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges, the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage. If the discharge time is much shorter than the normal after full charged, even battery is charged correctly, and this may indicate it is time to change the battery.

12. Note:

Any other items which are not covered in this specification shall be agreed by both parties.