Li-ion Polymer Rechargeable Battery Specifications

Model: VTC-LP502030-200mAh 3.7V

Revision:1.0

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Data Sheet Modified List

Revision	Modified content	Mark	Date	Approved by
1.0	The first release		2026.9.4	Youman Zhao

1. Scope

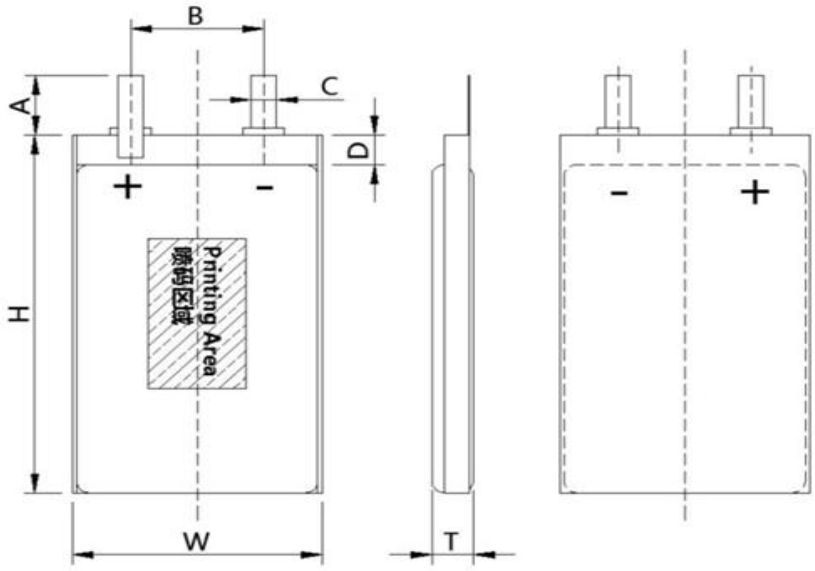
This specification describes the technological parameters and testing standards for the lithium-ion polymer rechargeable battery, VTC-LP502030, manufactured and supplied by VTC Power Co., Ltd.

2. Products Specified

2.1 Type: Li-ion Polymer Rechargeable battery

2.2 Name：VTC-LP502030

3. Drawing of Cell



Item	Description		Dimension
A	Cell Tab Length		4~8 mm
B	Cell Tab Pitch		8.5±1.5mm
C	Cell Tab Width		3±0.2 mm
D	Cell Top Sealent Length		4±1mm
T	Cell Thickness max.	Initial	5.0mm
		After 600 cycle life	5.4mm
W	Cell Width max.		20.0mm
H	Cell Height max.		30.0mm

4. Basic Performance

NO.	Item	Specifications	Note
1	Rated Capacity	210mAh	0.2C discharge
2	Nominal Capacity	200mAh	0.2C discharge
3	Min. Capacity	190mAh	0.2C discharge
4	Pack Weight	≈4g	
5	Pack Initial Impedance	≤220mΩ	3.7V AC 1KHz measured
6	Normal Voltage	3.7V	
7	Initial Voltage	≥3.8V	
8	Limited Charge Voltage	4.2 V	Voltage of CC charge to CV charge
9	Standard Charging Method	0.2C CC current charge to 4.2V, then CV charge till current declines to 0.01C	
10	Cut-off Voltage	3.0 V	Load Voltage when discharge ended
11	Standard Charging Current	40mA	CC charge to 4.2 V, then CV charge till current declines to less than 0.01C
12	Standard Charging Time	6~7 hours	
13	Rapid Charging Current	200mA	
14	Rapid Charging Time	1.0hours	
15	Standard Discharging Current	40mA	CC discharge to 3.0 V
16	Max. Discharging Current	200mA	
17	Peak Discharging Current	400mA	
18	Operating Temperature Range	Charging:0~45℃ Discharging:-20～60℃	
19	Operating Humidity Range	≤ 90%RH	

5. Electrical Characteristics of the Cell

5.1 Normal Test Conditions

Temperature	Relative Humidity	Atmospheric Pressure
15 ~ 35 ℃	45 ~ 85 % RH	86 ~ 106KPa

5.2 Electrochemical Characteristics

No	Item	Criterion	Test Method
1	0.2C discharging capacity	Discharging capacity is not less than normal capacity	After Standard Charging, rest 5 minutes, then 0.2C discharge to cut-off voltage
2	1.0C discharging Capacity	Discharging capacity is not less than 90% of normal capacity	After Standard Charging, rest 5 minutes, then 1.0C discharge to cut-off voltage
3	Cycle life	The cycle times is not less than 600	Charge： 0.2C CC-CV charge to 4.2 V, then current declines to 0.02C Discharge： 0.2C CC discharge to 3.0 V When the discharge capacity reduced to 80% of rated capacity, stop testing, and record the cycle times.
4	Self-discharge	Discharging capacity is not less than 85% of initial capacity	After Standard Charging, rest the cell for 28 days in the condition of 20± 5℃, then 0.2C discharge to cutoff voltage, and record the capacity.

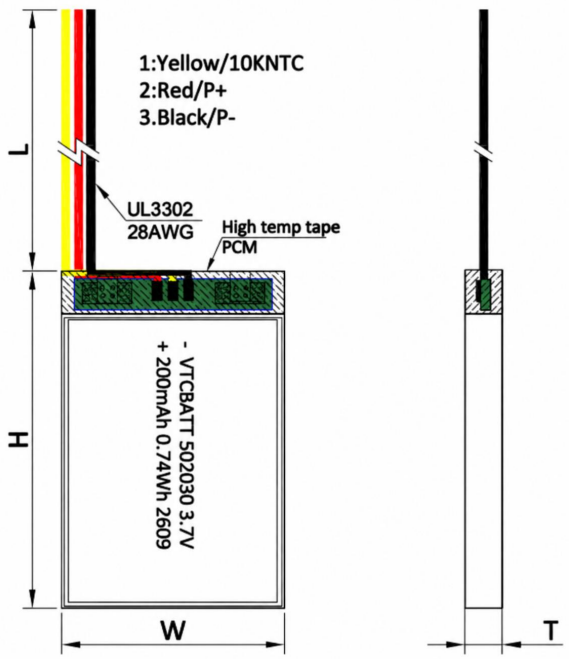
5.3 Environment Characteristics

No	Item	Criterion	Test Method
1	Constant temperature and constant humidity test	No explosion, no fire, no leakage, Discharging capacity is not less than 60% of initial capacity	After Standard Charging, rest the cell for 48 hours in the conditions of 40 ± 5 ℃ and 90~95%RH, then 1.0Cdischarge to cut-off voltage, and record the capacity.
2	Vibration test	No explosion, no fire, no leakage	After Standard Charging, fixed the cell to vibration table, then subjected to vibration test for 30 minutes per axis of XYZ axes. Frequency rate: 1oct/min Vibration frequency: 10Hz~30Hz Excursion(single amplitude): 0.38mm Vibration frequency: 30Hz~55Hz Excursion(single amplitude): 0.19mm
3	Shock test	No explosion, no fire, no leakage	After Standard Charging, test condition: Acceleration: 100m/s2 Pulse lasting time: <16ms Shock times: 2100±10 times

5.4 Safety Characteristics(cell)

No	Item	Criterion	Test Method
1	Overcharge test	No explosion, no fire	Discharge：1.0C to 3.0V Charge：1.0C last for 2.5H
2	Short-circuit test	No explosion, no fire	After Standard Charging, Short circuit the positive and negative tabs with the copper wire, and the resistance of it is not more than 80mΩ, When the temperature falls 10℃ lower than the peak, Stop testing.
3	Thermal test	No explosion, no fire	After Standard Charging, put cell into an hot box, test condition: Temperature Rate：5±2℃/min Ending temperature：130±2℃ Keep temperature for 30 minutes, Then stop testing
Note: Above testing of sage characteristics must be with protective equipment.			

6. Drawing of battery pack



Item	Description	Dimension
T	Battery pack Thickness max.	5.2mm
W	Battery pack Width max.	20.5mm
H	Battery pack Height max.	32.0mm
L	Wire Length	100±3mm

7. Pack List

No.	Item	Quantity	Material	Specification
1	Li-ion polymer cell	1	VTC-LP502030	200mAh
2	PCB	1	Fiber glass polymer compound circuit board	Pass RoHS
3	Wire	3	Polythene and copper	UL3302 28AWG

8. PCB Specification

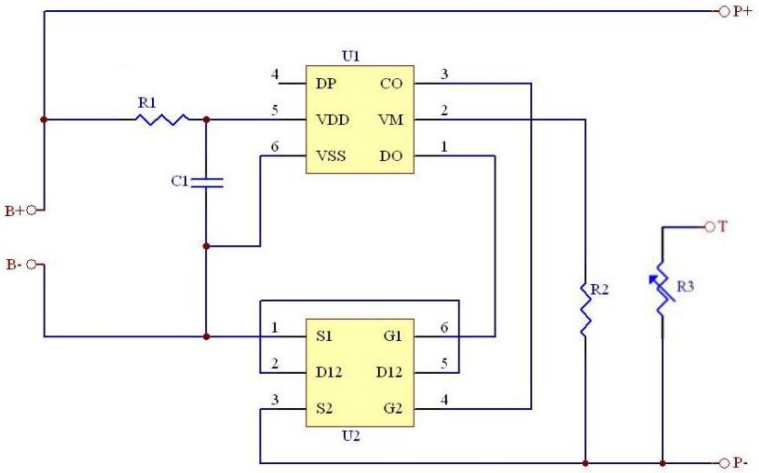
8.1 Electrical Characteristics

No.	Item	Min	Typ	Max	Unit
1	Over-charge Protection Voltage	4.260	4.280	4.300	V
2	Over-charge Release Voltage	4.030	4.080	4.130	V
3	Over-charge Protection Delay Time	0.7	1	1.3	s
4	Over-discharge Protection Voltage	2.950	3.000	3.050	V
5	Over-discharge Release Voltage	2.900	3.000	3.100	V
6	Over-discharge Protection Delay Time	179	256	333	ms
7	Over-current Protection for Discharge	1	1.8	2.5	A
8	Internal Resistance	/	50	70	mΩ
9	Operation Static Current	3	5	7	μA
10	Current consumption(Power down)	/	/	0.5	μA
11	Short Circuit Protection	Available			
12	Short Circuit Protection Delay Time	196	280	364	μs

8.2 Pin Explanation

Symbol	Explanation	Symbol	Explanation
P+	Battery output/charging positive pole	B+	Cell positive pole
P-	Battery output/charging negative pole	B-	Cell negative pole

8.3 Circuit Diagram



8.4 PCBA Parts List

No.	Location	Part Name	Specification	Pack Type	Quantity	Maker/Remark
1	U1	protection IC	S8261DAA-M6T1U	SOT23-6	1	Seiko
2	U2	MOSFET	dp8205	SOT23-6	1	DP
3	R1	Resistor	330Ω±5%	0603	1	
4	R2	Resistor	470Ω±5%	0603	1	
5	R3	NTC	10K±1%,B3435±1%	0603	1	
6	C1	Capacitor	0.1μF/25V ±5%	0603	1	
7	PCB	Print circuit board	/	/	1	/

9. Storage and Shipment Requirement

Item	Storage environment	Requirement
	Short period less than 1 month	-20℃ ~ +45℃, 90% RH Max.
	Long period more than 3 months	-10℃ ~ +45℃, 90% RH Max.
	Recommend storage	15℃ ~ 35℃, 85% RH Max.
Long time storage: If the cell is stored for a long time, the cell's storage voltage should be 3.6~3.9V and the cell is to be stored in a condition as No.5.1. Also, it is recommended to charge the cell every six months.		

10.Warning and Cautions

10.1 Warning

Danger warning(it should be described in manual or instruction for users, indicated especially) to prevent the possibility of the battery from leaking, heating, explosion. Please observe the following precautions:

- Don't immerse the battery in water and seawater. Please put it in cool and dry environment if no using.
- Do not discard or leave the battery near a heat source as fire or heater.
- Being charged, using the battery charger specifically for that purpose.
- Don't reverse the positive and negative terminals.
- Don't connect the battery to an electrical outlet directly.
- Don't connect the positive and negative terminal directly with metal objects such as wire. Short. terminals of battery is strictly prohibited, it may damage battery.
- Do not transport and store the battery together with metal objects such as necklaces, hairpins.
- Do not strike, throw or trample the battery.
- Do not directly solder the battery and pierce the battery with a nail or other sharp object.
- Do not use it with other different battery, or other different lithium polymer battery model in mixture.
- Prohibition of use of damaged cells.
- Don't bend or fold sealing edge. Don't open or deform folding edge. Don't fillet the end of the folding edge.
- Don't fall, hit, bend battery body.
- Battery pack designing and packing Prohibition injury batteries.
- Never disassemble the cells.
- The battery replacement shall be done only by either cells supplier or device supplier and never be done by the user.
- Keep the battery away from babies.
- Any components contacting these two edges, they must be insulated.

10.2 Cautions

- Do not use or leave the battery at very high temperature conditions (for example, strong direct sun light or a vehicle in extremely hot conditions). Otherwise, it can overheat or fire or its performance will be degenerated and its service life will be decreased.
- Do not use it in a location where is electrostatic and magnetic greatly, otherwise, the safety devices maybe damaged, causing hidden trouble of safety.
- If the battery leaks, and the electrolyte get into the eyes. Do not wipe eyes, instead, rinse the eyes with clean water, and immediately seek medical attention. Otherwise, eyes injury can result.
- If the battery gives off an odor, generates heat, becomes discolored or deformed, or in any way appearab normal during use, recharging or storage, immediately remove it from the device or battery charge rand stop using it.
- In case the battery terminals are dirt, clean the terminals with a dry cloth before use. Otherwise power failure or charge failure may occur due to the poor connection with the instrument.
- Be aware discharged batteries may cause fire, tape the terminals to insulate them.