Content

1.Scope Application

This product specification describes the performances and indicators of Solid-State Lithium- ion Batteries produced by Dazzle Robotics Private Limited. Note: The solid-state lithium-ion batteries described in this specification refers to a lithium- ion battery with solid-state technology (based on mixed solid liquid electrolyte).

2.Product Model

GenX Pro+ 7.4V 2S1P 2250mAh

3.Product Details

Item	Specs
Length	70mm
Width	35mm
Height	17mm
Connector Cable	UL3135 12AWG
Balance Connector Cable	UL3239 22AWG
Balance Connector	22AWG XHR-3P
Discharge Connector	XT60
Cell Specs	3.7V 2.25Ah Solid State Li-Ion
Cell Configuration	2S1P
External Metal Protection	Optional Not standard
Packing	Heat Shrink Sleeve

4. Product Specification

NO.	Items		Specifications
1	Nominal Capacity		2.25Ah (0.5C)
2	Nominal Voltage		7.4V
3	Charging Voltage		8.4V
4	Cut-Off Voltage		5.5V
5	Charging Method	Ultrafast	2C(4.5A) constant current (CC) charge to 8.4V,then constant voltage (CV) charge till charge current decline to ≤ 0.02C(0.045A).
		Fast	1C(2.25A) constant current (CC) charge To 8.4V, then constant voltage (CV) charge till charge current decline to ≤ 0.02C(0.045A).
		Standard	0.5C(1.125A) constant current (CC) charge to 8.4 V, then constant voltage (CV) charge till charge current decline to ≤ 0.02C(0.045A).
6	Dis-Charging Method	Pulse	30C (67.5A, duration ≤10s)
		High Rate	15C-17C (33.75A-38.25A)
		Fast	9C (20.25A)
		Standard	0.5C (1.125A)
7	Cycle Life		600 Cycles (0.5C/0.5C; 100%DOD)
			500 Cycles (0.5C/3C; 100%DOD)
			300 Cycles (0.5C/5C; 80%DOD)
8	Operating Temperature		Charge: 0℃~45℃ Discharge: -20℃~55℃
9	Storage Temperature		Short-term(one month): -20℃~45℃ Long-term(six months): -10℃~35℃
10	Store Humidity		＜75%RH
11	Energy Density		Weight Specific Energy:>262.5Wh/Kg(0.5C/0.5C) Volume Specific Energy:>528.0Wh/L (0.5C/0.5C)
12	Internal Resistance		5±0.5mΩ
13	Weight		80g±5g

5. Battery Performance

5.1 Electrochemical Characteristics of cell level

NO.	Items	Criteria	Test Methods
1	Discharge Performance at Room Temperature	Discharge Capacity/ Nominal Capacity ×100% 0.5C≥100% 3C≥95% 5C≥90%	Standard charge (0.5C) under the condition of 1 atm, 20±5 ℃ and ≤ 75 % RH, discharge at 0.5C/3C /5C to 2.75V; Charge/discharge can be cycled for 3 times before meeting the standards.
2	Capacity Retention	Residual Capacity ≥ Nominal Capacity ×90% Restore Capacity ≥ Nominal Capacity ×95%	Standard charge (0.5C, CC-CV) and store for 28 days, then discharge to 2.75V at 0.5C, then measure residual capacity. 0.5C/0.5C measure restore capacity. Charge /discharge cycle can be conducted for 3 times before meeting the standards.
3	Cycle Life	Capacity ≥ Initial Capacity ×80%	Conduct 0.5C/0.5C cycle for 800 times. The discharge capacity shall be measured after 800 cycles.
			Conduct 0.5C/3C cycle for 500 times. The discharge capacity shall be measured after 500 cycles.
			Conduct 0.5C/5C cycle for 300 times. The discharge capacity shall be measured after 300 cycles.
4	Discharge Performance at Low Temperature	Capacity ≥ Nominal Capacity ×80%	Standard charge (0.5C, CC-CV) and rest for 8h at -20℃ , then discharge to 2.75V at 0.5C , measure the final capacity.
5	Discharge Performance at High Temperature	Capacity ≥ Nominal Capacity ×98%	Standard charge (0.5C, CC-CV) and rest for 4h at 55℃ , then discharge to 2.75V at 0.5C , measure the final capacity.
6	Storage Performance	Capacity ≥ Nominal Capacity ×100%; 3 months ≥90%; 6 months ≥85%; 12 months ≥80%	Measure initial status and initial capacity. Standard charge and store for 3 months, 6 months and 1 year respectively. Measure the final capacity, then charge and discharge at capacity.

5.2 Electrochemical Characteristics

NO.	Items	Criteria	Test Methods
1	Overcharge	No fire No explosion	Charge to 4.6V at 1.5C after standard discharge at 0.5C: stop charging if charging duration ≥7h or the surface temperature of battery is 20% lower than of the peak value.
2	Forced-Discharge	No fire No explosion No leakage	Reverse charge at 1C for 90min after standard discharge at 0.5C, then observe for at least 1h.
3	Short Circuit	No fire No explosion Temperature ≤ 150℃	After standard charge (0.5C, CC-CV), put the battery into a ventilation cabinet and connect the positive and negative terminals directly by a 80 ±20mΩ wire for 1h at 20±5℃, stop testing when the battery temperature is 20% lower than the peak value, or the short-circuit duration ≥ 24h.
4	Low Pressure	No fire No explosion No leakage	After 0.5C standard constant current and constant voltage charging, put the battery in a 20±5°C empty chamber. Vacuum until the internal pressure drops to 11.6kPa, then keep for 6h.
5	Temperature Cycling	No fire No explosion No leakage	1.The battery is charged according to the standard charging method: 2. Put the battery in a room temperature box, and do the following steps: >The temperature box was heated up to 75℃ within 30 min and kept for 6h; >Temperature box temperature was cooled down to -40℃ within 30min and kept for 6h. >Repeat the above steps for 10 times.
6	Droping	No fire No explosion No leakage	After the battery is charged at 0.5C with standard constant current and constant voltage, the battery is dropped onto a concrete slab form 1m height. The battery is dropped for 6 times so as to obtain impatcs from every surface/side.

	7	Crushing	No fire No explosion	1.The battery shall be charged according to 0.5C standard charging method 2.The crushing method is as follows: The crushing direction is vertical to the plate direction; The size of the plane pressing plate is larger than the battery surface; 3.The crushing pressure is 13±0.78kN; Stop crushing when the pressure reaches the specific value.
	8	Vibration	No fire No explosion	After standard charging at 0.5C, the battery is set on the vibrating table under the condition of 20±5℃ for 1h.The test equipment is adjusted according to the following vibration frequency and corresponding amplitude.The frequency of vibration in each direction of X. Y and Z is cyclically swept from 10Hz to 55Hz for 30min, and the frequency sweeping rate of 1oct/min: A) Vibration frequency: 10Hz~ 30Hz; Displacement amplitude (single amplitude): 0.38mm; B) Vibration frequency: 30Hz~55Hz; Displacement amplitude (single amplitude): 0.19mm; After frequency scanning, test the final state of the battery and observe the changes of the battery appearance.
	9	Thermal Abuse	No fire No explosion	Rest for 1h at 20±5°C after standard charge (0.5C, CC-CV) of the battery.Then ,Put the battery into an oven and heating from room temperature to 130±2°C at the rate of 5±2°C/min.After keeping the temperature for 30 min, the heating was stopped and then observe for 1h.

6. Visual Inspection

There shall be no such defects as scratch, flaw, crack, and leakage, which may adversely affect the commercial value of the battery.

7. Standard Environmental Test Condition

Unless otherwise specified, all tests stated in this Product Specification are conducted at below condition: Temperature：20±5℃, Humidity：≤75%RH
Atmosphere：86KPa～106KPa

8. Storage

8.1 Long Time Storage： If the battery is to be stored for a long time (over 3 months), the battery should be stored in dry and cool place.
The battery should be charged and discharged every six month. The battery's storage voltage should be 3.6~3.75V and the battery is to be stored at the condition as NO.7.
8.2 Others： Any matters which have not been covered in this specification should be conferred between the customer and Others

9. Warranty Period and Product Liability

(1) Warranty period of this product is 3 months from the production date.
(2) Dazzle Robotics Private Limited is not responsible for the troubles caused by Mishandling of the battery which is clearly against the instructions in this specification.