



Product Specification Sheet

Name: Li-ion Polymer Battery

Model: 34593-0

SPEC: 20.4V 23.68Ah-Connector

436 Kato Terrace, Fremont, CA 94539 U.S.A.

Tel: 510.687.0388 Fax: 510.687.0328

www.Tenergybattery.com

Amendment Records

[illegible]

1 Scope

This document describes the performance characteristics and testing methods for Li-ion Polymer battery supplied by Tenergy Corporation.

2 Product type and model number

2.1 Product type

Li-ion Polymer Battery

2.2 Model number

34593-0

3 Rated performance

Form 1: Battery rated performance

No	Item	Rated performance	Remark
1	Rated capacity	Nominal 23.68Ah	Standard discharge after standard charge
2	Nominal voltage	20.4V	
3	Discharge cut-off voltage	15.6V	
4	Charge cut-off voltage	25.2V	
5	Standard charge	Constant current 0.2C ₅ A Constant voltage 25.2V Cut-off current ≤0.02C ₅ A	
6	Standard discharge	Constant current 0.2 C ₅ A End voltage 15.6V	
7	Maximum Charge Current	0.2C ₅ A	Constant voltage 25.2V Cut-off current ≤0.02C ₅ A
8	Maximum discharge current	1C continuous, 3C <30second	
9	Operating temperature	charge: 10 ~55°C discharge: -20 ~ 55°C	
10	Storage temperature	-20 ~ 45°C	
11	Weight	Approx: 1.277Kg	
12	Dimension(mm)	Thickness*Width*Height (max)	147*84*54.5
13	output wire length (mm)	Excluding the connector	Discharge wire: 150mm Balancing charge wire: 70mm

4 Standard test conditions

Test should be conducted with new batteries within 30days after manufacture. Unless otherwise defined, test and measurement shall be done under temperature of $25\pm3^{\circ}\text{C}$ and relative humidity of $60\pm20\%\text{R.H}$

5 BOM (Main components)

No.	Name	Model	QTY	Note
1	Cell	Amprius SA03	12	
2	Connector	XT90	1	
3	Connector	JST XHP-7	1	
4	Crimps	JST SPH-002T-P0.5S	7	
5	Wire	Silicon 10# Red	1	
6	Wire	Silicon 10# Black1	1	
7	Wire	Silicon 22# Red	1	
8	Wire	Silicon 22# Black	6	

6 Technical and Safety Requirements

- 1) Customers are required to apply the batteries under the conditions described in this specification. Otherwise, customers are required to consult us to evaluate the risk to use the batteries in other application conditions.
- 2) We will take no responsibility for any accident when the batteries are used under other conditions than those described in this specification.

6.1 Handling

- Do not expose to, dispose of the battery in 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 make, type, or model batteries.
- Keep out of the reach of children. **Do not allow children to replace batteries without adult supervision.**

6.2 Charge and discharge

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

6.3 Storage

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

6.4 Disposal

Regulations vary for different countries, Dispose of in accordance with local regulations.

7 Battery operation instruction

7.1 Charging

Charging current: Cannot exceed the max charging current that specified in this specification.
Charging voltage: Cannot exceed the max charging voltage that specified in this specification.
Charging temperature: The battery must be charged in the temperature conditions that specified in this specification. Use the constant electric current and constant voltage to charge. will damage the
Prohibition of Reverse charge: Do not reverse charge. Reverse charge will damage the batteries chemical system, and may lead gassing, overheat, fast capacity degradation, and even catching fire.
Prohibition of charge to 1.5V batteries
Battery is prohibited to be charged when its voltage is 9V (1.5V/cell)

7.2 Discharging

Discharging current: The discharging current Cannot exceed the max discharging current that specified in this specification. the higher discharging current May cause battery over-heat and fast capacity degradation.
Discharging temperature: battery shall be discharged according to the temperature condition specified in this specification.

7.3 Over-discharges

Short time of excessively discharge will not affect the usage. But the long time excess discharge can damage the battery performance and cause the degradation. When the battery is not used for a long time, because of its self-discharging characteristic, it may be over-discharged. To prevent over-discharging, the battery should be charged periodically to keep certain voltage

7.4 Storing the batteries



8 Protection

Below protection functions are required for battery packs and host devices to keep the cells under safe usage conditions: over charge protection, over discharge protection, over current protection, over heat protection, and short circuit protection.

8.3.1 Over Charge Protection

Overcharge protection shall be triggered and stop charging if the cell voltage reaches Charge Cut-off Voltage. The host devices and battery pack shall be designed to indefinitely withstand the maximum voltage from the adapter, under a single fault condition, to prevent a cascading failure through the system to the battery pack and/or Cell.

8.3.2 Over Discharge Protection

Over-discharge protection shall be triggered and stop discharging if the cell voltage is lower than the threshold of over-discharge cut-off voltage.

8.3.3 Over Current Protection

Over current protection shall be triggered and stop discharging when the charge current is higher than the specified current limitation. The battery pack shall have at least one over current protection circuit or device designed to prevent the cell to be charged with higher current than the specified charge current.

8.3.4 Over Heat Protection

At least one thermal protection device or mechanism is required for the battery pack or host device. For a thermistor type temperature protection circuit, all packs of the same model shall have the same voltage to temperature translation (acceptable tolerance no more than $\pm 10\%$), with consideration for any temperature lag over time.

During charge and discharge, the temperature of the cell shall be monitored. When temperature limitations are exceeded, action shall be taken to mitigate hazards. Action should include shutdown, or disabling of charging, or other protective action. The action may be taken by the battery pack and/or host.