

SPECIFICATION OF PRODUCT

Lithium-ion Rechargeable Cell Product Name: Trydan Tech HPE Prime Series

December 2025

1. Scope:

This document outlines the specifications for the rechargeable lithium-ion high-power cell (referred to as the “cell”) to be supplied by Trydan Tech to our valued customer.

2. Description and model:

- Description lithium-ion rechargeable cell
- Product name HPE Prime Series
- Framework TT2025-HPESeries314
- Site Manufactured in India

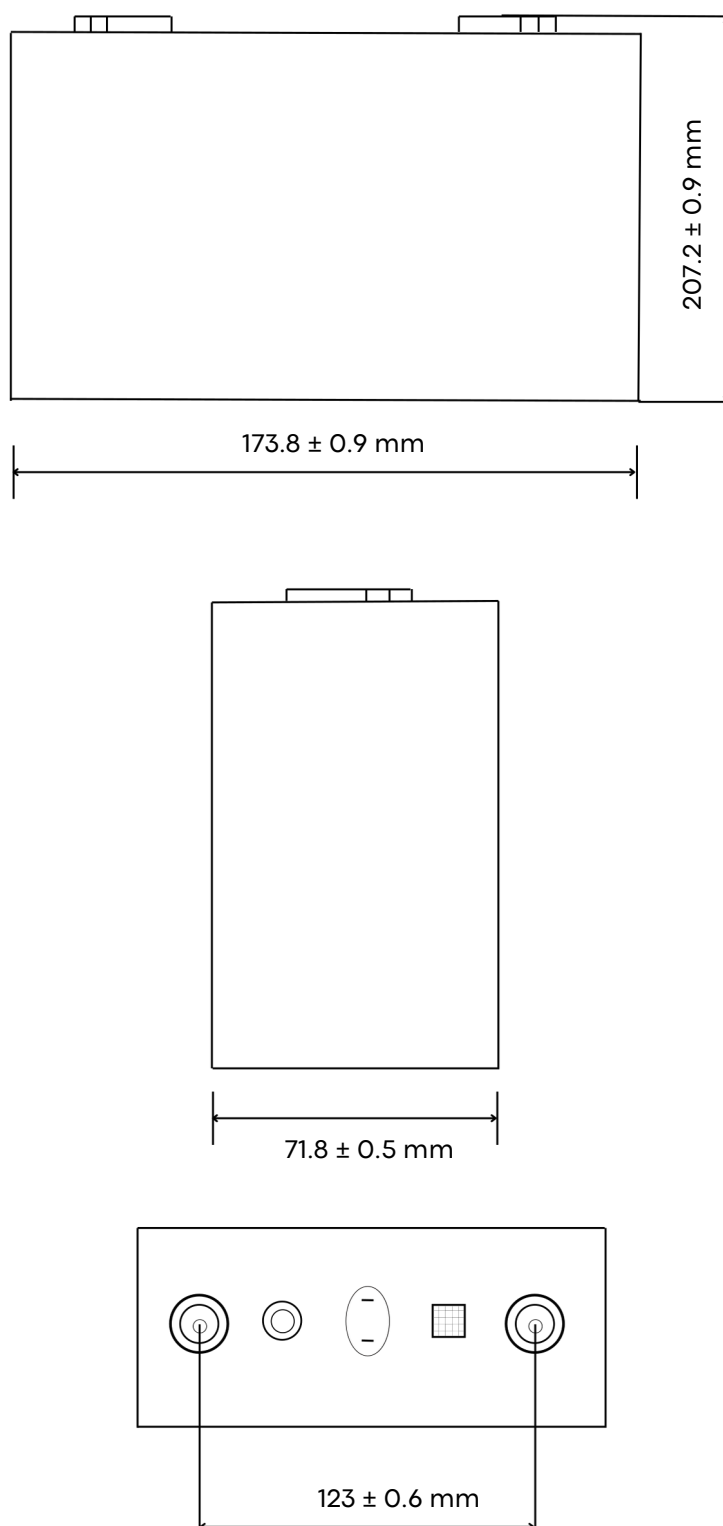
3. Nominal Specifications:

Item	Specification
3.1 Standard Discharge Capacity	Capacity: 314,000 mAh Discharge: • Current: 157 A (0.5C) • Cut-off: 2.5V Note: 1C corresponds to 314 A
3.2 Nominal voltage	3.2 V
3.3 Standard charge	• Charging Method: CCCV (Constant Current Constant Voltage) • Charge Current: 157A (0.5C) • Charge Voltage: 3.65V • Cut-off Current: 15.7 A (C/20)
3.4 Rated charge	• Charging Method: CCCV (Constant Current Constant Voltage) • Charge Current: 157A (0.5C) • Charge Voltage: 3.65V • Cut-off Current: 15.7 A (C/20)

3.5 Max. continuous discharge Max Pulse discharge	157A (0.5C) 314A (1C), 10s
3.6 Discharge cut-off voltage (End of Discharge)	2.5V
3.7 Cell weight	~5.65 kg $\pm$ 0.16 kg
3.8 Cell dimensions	• Height: Max. 207.2 $\pm$ 0.9 mm • Width: Max. 173.8 $\pm$ 0.9 mm • Thickness: Max. 71.8 $\pm$ 0.5 mm
3.9 Operating temperature (surface temperature)	Charge Temperature: • Operating Range: 0 to 60°C • Recommended Recharge Release: Below 45°C Discharge Temperature: • Operating Range: -20 to 60°C • Recommended Re-discharge Release: Below 60°C
3.10 Storage temperature (Recovery 90% after storage)	1.5 years: • Storage Temperature: -10 to 25°C 3 months: • Storage Temperature: -20 to 35°C 1 month: • Storage Temperature: -20 to 45°C

4. Product Dimensions:

Fig.1. Outline dimensions of Trydan Tech HPE Prime Series



5. Aesthetics:

The cells shall be free from defects such as scratches, rust, discoloration, or leakage that can adversely impact its commercial value.

6. Standard test conditions:

1) Environmental Conditions: All tests are conducted at temperature $25 \pm 5^\circ\text{C}$ and humidity under 65%. (Unless stated)

2) Measuring equipments:

- Amp-meter and Voltmeter - Current: 0.5 mA | Voltage: 1 mV or better
- Impedance meter - The impedance meter with AC 1 kHz should be used.

7.0. Characteristics:

1. Standard charge:

- Mode: CCCV
- Current: 157 A (0.5C)
- Cutoff Voltage: 3.65 V
- Cutoff Current: 15.7 A (C/20)

2. Rated charge:

- Mode: CCCV
- Current: 157 A (0.5C)
- Cutoff Voltage: 3.65 V
- Cutoff Current: 15.7 A (C/20)

3. Standard discharge:

- Mode: CC
- Current: 157 A (0.5C)
- Cutoff Voltage: 2.5 V
- Capacity to Check: After 15 mins

The standard discharge capacity is the initial discharge capacity of the cell, which is measured with discharge current of 157A (0.5C) with 2.5V cut-off at 25°C within 15 mins after 1 hour of full standard charge. Standard discharge capacity $\geq$ 314,000mAh.

4. Internal impedance: Internal impedance measured at AC 1kHz:
 $\leq 0.25 \text{ m}\Omega$

5. Temperature dependence of charge capacity: Capacity comparison at each temperature, measured with discharge constant current 157A and 2.5V cut-off after the rated charge is as follows.

	Charge temperature				
Temperature	-20°C	-10°C	0 °C	25°C	55°C
Capacity	$\geq 60\%$	70%	$\geq 85\%$	100%	$\geq 100\%$

Note: Capacity values in the table are expressed as a percentage of the standard discharge capacity measured at 25°C using a discharge current of 157 A (0.5C) and a cut-off voltage of 2.5V, which is defined as 100%. At -20°C, the capacity is measured with a lower cut-off voltage of 2.0V. If the charge and discharge temperatures are different, a stabilization interval of at least 3 hours should be maintained between temperature transitions.

6. Charge rate capabilities: Discharge capacity is measured with constant current 157A and 2.5V cut-off after the cell is charged with 3.65V as follows.

Charge Condition	
Current	Standard 157A
Cut-off	15.7 A
Capacity	100%

Note: Capacity retention is measured by discharging at 0.5C (157 A) after charging at different rates to 3.65 V.

7. Temperature dependence of discharge capacity: Capacity comparison at each temperature, measured with discharge constant current 157A and 2.5V cut-off after the rated charge is as follows:

	Discharge temperature				
Temperature	-20°C	-10 °C	0°C	25°C	55°C
Capacity	≥60%	70%	≥85%	100%	≥100%

Note: Capacity percentages are indexed to the standard discharge test conducted at 25°C with a current of 157 A and a cut-off of 2.5V. At -20°C, capacity is measured with a cut-off voltage of 2.0V. If the charge/discharge temperatures differ, a minimum stabilization period of 3 hours is recommended before testing.

8. Discharge rate capabilities: Discharge capacity is measured with the various currents in the under table [2.5V cut-off]:

	Discharge condition				
Current	20A	33A	100A	120A	157A
Capacity	102%	100%	100%	>97%	>95%

Note: All capacity values in the table are indexed to the standard discharge test performed at 25°C with a current of 157A and a cut-off of 2.5V, which is defined as 100%.

8. Cycle life:

With rated charge and maximum continuous discharge. Capacity after ≥ 8000 cycles,

Capacity ≥ 219,800 mAh (70% of the standard capacity at 25°C).

9. Storage characteristics:

After storage for 1 month at 60°C, the cell is tested at 25°C.

The charge retention (before recharge) is ≥92% of the original capacity.

10. Status of the cell as of ex-factory:

The cell should be shipped in 3.275V ~ 3.305V charging voltage range.

11. Retention characteristics:

Capacity after storage for 30 days at 60°C from the standard charge.

Following recharging after 30 days of storage at 60°C, the cell is discharged at 157 A with a 2.5V cut-off at 25°C. The recovered capacity is $\geq 93\%$ of the initial capacity ($\geq 292,000$ mAh).

12. Mechanical Characteristics:

1) Drop test:

Method: Fully charged cells are dropped from a height of 1.5 m onto a concrete surface in the terminal-down orientation, repeated once.

Post-test: Cells rest for 1 hour before visual inspection.

Acceptance Criteria:

- No fire, explosion, or electrolyte leakage.

Reference: In accordance with IEC 62133.

2) Vibration test:

Method:

- Vibration direction: vertical only Discharge:
- Constant current of 103 A (1/3C) to 2.5 V
- Acceleration: 30 m/s²
- Frequency: 10–55 Hz
- Sweep cycle: 10 times
- Total vibration time: 3 hours

Acceptance Criteria: No leakage should occur, and the open-circuit voltage (OCV) drop should be less than 10%.

The vibration test shall be performed in accordance with the UN38.3 standard.

13. Safety:

1) Overcharge test:

Procedure:

- Charge method: Standard CCCV charge Overcharge condition: Cell
- charged to 3.80V at 1C (314 A) or held for 1 hour
- Observation for 1 hour post charge

Acceptance Criteria:

No fire or explosion should occur during the test.

The overcharge test shall be conducted in accordance with the UL1642 standard.

2) External short-circuit test:

Test Method:

- Connect the positive and negative terminals of the fully rated charged cell with a circuit load having a resistance of $80 \pm 20 \text{ m}\Omega$.
- The cell is to discharge until either a fire or explosion occurs, or until it reaches a completely discharged state of less than 0.2 V.
- Monitor the battery case temperature during the test. Once it returns to within $\pm 10^\circ\text{C}$ of ambient temperature, the test is complete.

Acceptance Criteria: No fire or explosion should occur during the test.

The external short-circuit test shall be performed in accordance with the UL1642 standard.

3) Forced discharge test:

Test method:

A discharged cell is subjected to a reverse charge at 0.5C (157A) for 90 min.

Acceptance Criteria: No fire and no explosion. Forced discharge test shall be performed with the IEC62133 standard

4) Heating test:

Test method: To heat up the rated charged cell at heating rate 5°C per minute up to 130°C and keep the cell in oven for 30 minutes.

Acceptance Criteria: No fire and no explosion.

14. Warranty:

To be worked during the later stages.