

Model	ICR18650	Spec. No.	ICR18650	Version No.	A
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1.0. Scope

This product specification has been prepared to specify the rechargeable lithium-ion cell to be supplied to customer

2.0. Description and Model

2.1 Description Lithium-ion rechargeable cell

2.2 Model name 18650 gge2600 4C

3.0. Nominal Specifications

1,000cycles

Item	Specification
3.1 Typical Discharge Capacity	2550mAh Charge: 0.5A, 4.20V, CCCV 50mA cut-off Discharge: 0.5A, 2.50V DC cut-off
3.2 Min. Discharge Capacity	2500mAh Charge: 0.5A, 4.20V, CCCV 50mA cut-off Discharge: 0.5A, 2.50V DC cut-off
	2400mAh Charge: 0.5A, 4.20V, CCCV 50mA cut-off Discharge: 2.5A, 2.50V DC cut-off
3.3 Typical Voltage	3.60V
3.4 Standard Charge	CCCV, 0.5A, 4.20±0.05V, 50mA cut-off
3.5 Rapid Charge	CCCV, 1.25A, 4.20±0.05V, 50mA cut-off
3.6 Standard Discharge	DC, 0.5A, 2.50V cut-off
3.7 Max. Instantaneous Discharge	DC, 7.5A, 2.50V cut-off
3.8 Charge/Discharge Voltage Range	4.20~2.50V
3.9 Cell Weight	47.0g Max
3.10 Cell Dimension	Height: 65.00±0.15mm Diameter: 18.35±0.10mm
3.11 Operation Temperature (Surface Temperature)	Charge: 0 to 15 °C ≤0.2C
	Charge: 15 to 45 °C ≤0.5C

	Discharge: -20 to 60°C(Pack cut-off temperature 70°C)	
3.12 Storage Temperature (At Shipping SOC)	1 year 3 months 1 month	0~25°C 0~45°C 0~60°C

4.0. Outline Dimensions

See the attachment (Fig. 1).

5.0. Appearance

There shall be no such defects as rust, discoloration, leakage which may adversely affect commercial value of the cell.

6.0. Standard Test Condition

6.1 Environment Condition

Unless otherwise specified, all tests stated in this specification are conducted at temperature $25 \pm 2^\circ\text{C}$ and humidity under 65% RH.

6.2 Measuring Equipment

(1) Amp-meter and volt-meter

The amp-meter and volt-meter should have an accuracy of the grade 0.5mA and 0.5mV or higher.

(2) Slide caliper

The slide caliper should have 0.01mm scale.

(3) Impedance meter

The impedance meter with AC 1 kHz should be used.

7.0. Characteristics

7.1 Standard Charge

Standard Charge means charging the cell CCCV with charge current 0.5A (0.2C), constant voltage 4.20V and 50mA cut-off in CV mode at 25°C for capacity.

7.2 Rapid Charge

Rapid Charge means charging the cell CCCV with charge current 1.25A (0.5C), constant voltage 4.20V and 50mA cut-off in CV mode at 25°C.

7.3 Standard Discharge Capacity

The Standard Discharge Capacity is the initial discharge capacity of the cell, which is measured with discharge current of 0.5A (0.2C) with 2.50V cut-off at 25°C within 1 hour after the standard charge.

Discharge Capacity $\geq 2500\text{mAh}$
(Referring IEC61960 standard)

7.4 Initial Internal Impedance

Initial Internal Impedance is measured at AC 1kHz at shipping SOC.

Initial Internal Impedance $\leq 20\text{m}\Omega$

7.5 Discharge Rate Capabilities

Discharge capacity is measured with the various currents in the following table and 2.50V cut-off after the standard charge.

Item	Discharge Condition	
Current	0.5A (0.2C)	7.5A (3C)
Relative Capacity	100%	$\geq 90\%$

Note: Relative capacity is divided by the discharge capacity of 0.5A.

7.6 Temperature dependence of discharge capacity

Capacity comparison at each temperature, measured after 3 hours storage at the test environment with discharge constant current 0.5A (0.2C) and 2.50V cut-off after the standard charge at 25°C.

Item	Discharge temperature		
Temperature	-20°C	25°C	55°C
Relative Capacity	$\geq 70\%$	100%	$\geq 90\%$

Note: Relative capacity is divided by the 0.5A discharge capacity at 25°C.

7.7 Cycle Life

Charge: standard charge (0.5A, 4.18V, 125mA cut-off).

Discharge: standard discharge (0.5A, 3.00V cut-off).

Rest time: 10min after charge and 30min after discharge.

Capacity after 1000cycles.

Capacity \geq 2000mAh (80% of the min. capacity at $25 \pm 2^\circ\text{C}$)

7.8 Storage Characteristics

Initial Capacity: Standard discharge capacity.

Retention Capacity: The standard discharge capacity after fully standard charged storage at condition in the following table.

Recovery Capacity: The standard discharge capacity of three times cycles after fully standard charged storage at condition in the following table.

Retention Ratio= Retention Capacity/ Initial Capacity*100%

Recovery Ratio= Recovery Capacity/ Initial Capacity*100%

Item	Retention Ratio	Recovery Ratio
25°C 28Days	$\geq 85\%$	$\geq 90\%$
55°C 7Days	$\geq 85\%$	$\geq 90\%$
45°C 28Days	/	$\geq 90\%$

7.9 Status of the cell as of ex-factory

The cell should be shipped in 3.600V to 3.650V charging voltage range (35~45% SOC).

8.0. Mechanical Characteristics

8.1 Drop test

Test method: Each fully charged cell is dropped three times from a height of 1.0m onto a concrete floor at $20 \pm 5^\circ\text{C}$. The cells are dropped so as to obtain impacts in random orientations. After the test, the cells shall be put on rest for a minimum one hour and then a visual inspection shall be performed.

Criteria: No fire, no explosion.

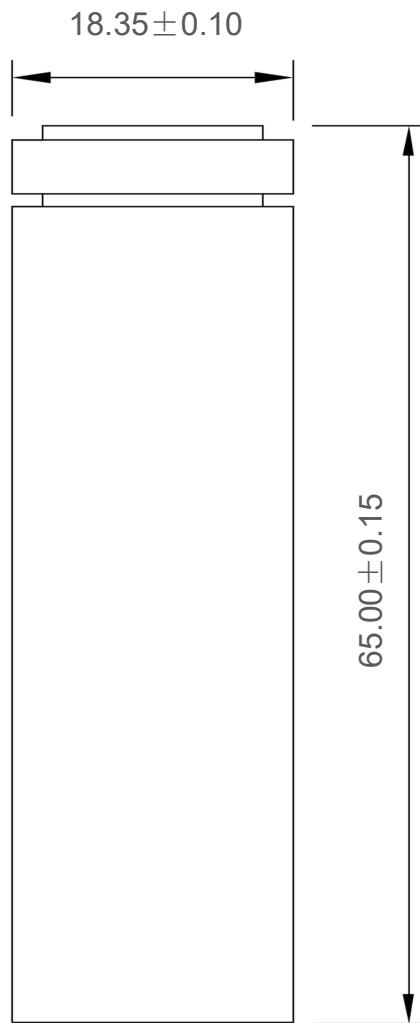
Drop test shall be performed with the IEC62133 standard.

8.2 Vibration test

Test method: For X and Y axis with cylindrical cell 7Hz \rightarrow 200Hz \rightarrow 7Hz for 15min, repetition 12 times totally 3 hours, the acceleration 1g during 7 to 18Hz, then amplitude 1.6mm and maximum 8g up to 200Hz. Tests are to be conducted

Attachment:

Fig 1:



Unit: mm
with tube