



Li-ion Button Battery Specification

MODEL: LIR2032

Prepared By/Date	Checked By/Date	Approved By/Date

Note: 1. Kindly please sign on the underneath and send it back to us if the sample is approved.
 2. Kindly please contact us as soon as possible if the sample isn't approved. Thanks!

Customer confirmation	
Date	

History of revisions				
Edition	Description	Prepared by	Approved by	Date
A	First Edition			

1. 0 Product Specification

No.	ITEM	RATED PERFORMANCE		REMARK
1	Rated Capacity	Typical	40mAh	Standard discharge (0.2 C ₅ A) after Standard charge
		Minimum	35mAh	
2	Nominal Voltage	3.7V		Mean Operation Voltage During Standard Discharge After Standard Charge
3	Voltage at end of Discharge	2.75V		
4	Charging Voltage	4.2±0.03V		
5	Standard charge	Constant Current 0.2C ₅ A Constant Voltage 4.2V 0.01 C ₅ A cut-off		Charge time : Approx 8h
6	Standard discharge	Constant current 0.2C ₅ A end voltage 2.75V		
5	Maximum Continuous Charge Current	1 C ₅ A		
6	Maximum Continuous Operation Current	1.5 C ₅ A		
7	Impulse Current(≤0. 1S)	3 C ₅ A		
8	Operation Temperature Range	Charge: 0~45°C		60±25%R.H.
		Discharge: -20~70°C		
9	Storable Temperature Range	1YEAR -20~25°C		60±25%R.H.
		3MONTH -20~40°C		
		1WEEK -20~60°C		
10	Weight	Approx:2.5 g		Bare Cell
11	Cell Dimension	Φ 20. 0 (±0. 5) × 4. 0 (±0. 3) mm		Initial dimension

2. Performance And Test Conditions

3.1 Standard Test Conditions

Test should be conducted with new batteries within one week after shipment from our factory and the cells shall not be cycled more than five times before the test. Unless otherwise defined, test and measurement shall be done under temperature of 20±5°C and relative humidity of 45~85%. If it is judged that the test results are not affected by such conditions, the tests may be conducted at temperature 15~30°C and humidity 25~85%RH.

3.2 Measuring Instrument or Apparatus

3.2.1 Dimension Measuring Instrument

The dimension measurement shall be implemented by instruments with equal or more Precision scale of 0.01mm.

3.2.2 Voltmeter

Standard class specified in the national standard or more sensitive class having inner impedance more than 10k Ω/V

3.2.3 Ammeter

Standard class specified in the national standard or more sensitive class. Total external

Resistance including ammeter and wire is less than 0.01 Ω .

3.2.4 Impedance Meter

Impedance shall be measured by a sinusoidal alternating current method (1kHz LCR meter).

3.3 Standard Charge\Discharge

3.3.1 Standard Charge : Test procedure and its criteria are referred as follows:

$0.2C_{5A} = 8mA$

Charging shall consist of charging at a $0.2C_{5A}$ constant current rate until the cell reaches 4.2V. The cell shall then be charged at constant voltage of 4.2 volts while tapering the charge current. Charging shall be terminated when the charging current has tapered to 0.01 C_{5A} . Charge time: Approx 8.0h, The cell shall demonstrate no permanent degradation when charged between 0 °C and 45 °C.

3.3.2 Standard Discharge

$0.2C_{5A} = 8mA$

Cells shall be discharged at a constant current of $0.2C_{5A}$ to 2.75 volts @ $20^{\circ} \pm 5C$

3.4 Appearance

There shall be no such defect as flaw, crack, rust, leakage, which may adversely affect commercial value of battery.

3.5 Initial Performance Test

Table 2

Item	Measuring Procedure	Requirements
(1) Open-Circuit Voltage	The open-circuit voltage shall be measured within 24 hours after standard charge.	$\geq 4.08V$
(2) AC Impedance Resistance	The Impedance shall be measured in an alternating current method (1kHz LCR meter) after standard charge at $20 \pm 5^{\circ}C$.	$\leq 700m\Omega$
(3) Nominal Capacity	The capacity on $0.2C_{5A}$ discharge shall be measured after standard charge at $20 \pm 5^{\circ}C$.	Discharge Capacity $\geq 35mAh$

3.6 Temperature Dependence of Capacity (Discharge)

Cells shall be charged per 3.3.1. and discharged @ $0.2C_{5A}$ to 2.75 volts. except to be discharged at temperatures per Table 3. Cells shall be stored for 3 hours at the test temperature prior to discharging and then shall be discharged at the test temperature. The capacity of a cell at each temperature shall be compared to the capacity achieved at 23 °C and the percentage shall be calculated. Each cell shall meet or exceed the requirements of Table 3.

Table 3

Discharge Temperature	-10°C	0°C	23°C	60°C
Discharge Capacity ($0.2 C_{5A}$)	50%	80%	100%	95%

3.7 Cycle Life and Leakage-Proof Table 4

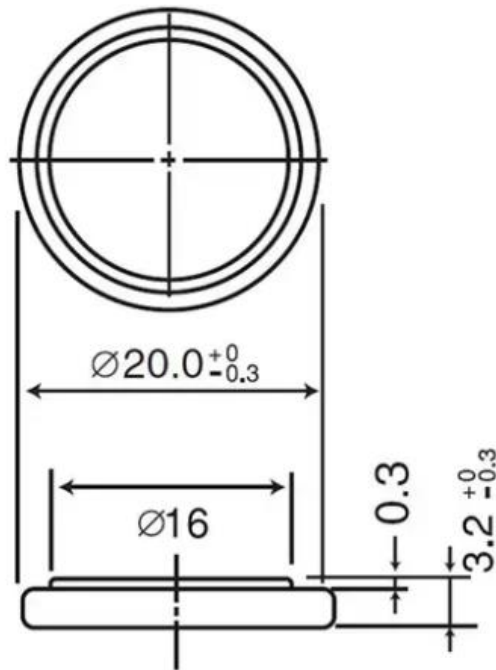
No.	Item	Criteria	Test Conditions
1	Cycle Life ($0.5C_{5A}$)	Higher than 70% of the Initial Capacities of the Cells	Carry out 500cycle charging/ Discharging in the below condition. ◆Charge:CC/CV, $0.5C_{5A}$, 4.2V, $1/100 C_{5A}$ -End ◆Discharge: $0.5C_{5A}$ up to 2.75V ◆Rest Time between charge/discharge:30min.

			◆Temperature: $20 \pm 5^{\circ}\text{C}$
2	Leakage-Proof	No leakage (visual inspection)	After full charge, store at $60 \pm 3^{\circ}\text{C}$ $60 \pm 10\% \text{RH}$ for 1month.

3. SAFETY TEST

Item	Battery Condition	Test Method	Requirements
Crush	Fresh, Fully charged	Crush between two flat plates. Applied force is about 13kN(1.72Mpa) for 30min.	No explosion, No fire
Short Circuit	Fresh, Fully charged	Each test sample battery, in turn, is to be short-circuited by connecting the (+) and (-) terminals of the battery with a Cu wire having a maximum resistance load of 0.1Ω . Tests are to be conducted at room temperature ($20 \pm 2^{\circ}\text{C}$).	No explosion, No fire The Temperature of the surface of the Cells are lower than 150°C
Short Circuit	Fresh, Fully charged	Each test sample battery, in turn, is to be short-circuited by connecting the (+) and (-) terminals of the battery with a Cu wire having a maximum resistance load of 0.1Ω . Tests are to be conducted at temperature ($60 \pm 2^{\circ}\text{C}$).	No explosion, No fire The Temperature of the surface of the Cells are lower than 150°C
Impact	Fresh, Fully charged	A 56mm diameter bar is inlaid into the bottom of a 10kg weight. And the weight is to be dropped from a height of 1m onto a sample battery and then the bar will be across the center of the sample.	No explosion, No fire
Forced Discharge	Fresh, Fully charged	Discharge at a current of $1 C_5A$ for 2.5h.	No explosion, No fire
Nail Pricking (3mm)	Fresh, Fully charged	Prick through the sample battery with a nail having a diameter of 3mm and remain 2h.	No explosion, No fire

Drawing



5. CAUTIONS IN USE

To ensure proper use of the battery please read the manual carefully before using it.

. 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.

. charge and discharge

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

. storage

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

. disposal

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

6.Note:

Any other items which are not covered in this specification shall be agreed by both parties.

7. Period of Warranty

The period of warranty is one year from the date of shipment. Great Power guarantees to give a

replacement in case of cells with defects proven due to manufacturing process instead of the customer abuse and misuse.

8. Storing the Batteries

The batteries should be stored at room temperature, charged to about 30% to 50% of capacity. We recommend that batteries be charged about once per year to prevent over discharge.

9. Other The Chemical Reaction

Because batteries utilize a chemical reaction, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, if the various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage. If the batteries cannot maintain a charge for long periods of time, even when they are charged correctly, this may indicate it is time to change the battery.