

Lithium-ion Rechargeable Coin Battery

TECHNICAL SPECIFICATION

Model No.: LIR2032

1 Scope

This specs approval is applied only for the Coin lithium-ion rechargeable cell battery produced by WECODO.

2 Type and model

2.1 **Type:** Coin type lithium-ion rechargeable cell battery

2.2 **Model:** LIR2032

3 Main technical parameters

Item		额定值 Rated value	Remarks
Rated capacity		45mAh	0.2CmA(9mA) discharge
Rated voltage		3.6V	0.2CmA(9mA) Average discharge voltage
Interior Resistance		$\leq 300\text{m}\Omega$	
Discharge end voltage		2.75V	
Charge current		22.5mA	Standard charge
Charge voltage		4.2V	
Max. charge voltage		4.23V	
Charge duration		2.5-3 hours	22.5mA Charge
Max. charge current		67.5mA	1.5CmA
Max. discharge current		90mA	2.0CmA
Weight		About 2.8g	
Operation temp. Humidity range	Charge	0~+45℃	
	Discharge	-20~+60℃	
Storage temp.	<1 Month	-20~+45℃	20℃ recommended when transportation
	>6 Months	-20~+35℃	

4 Size and Appearance

4.1 Size

See **10 LIR2032 size Chart**

Thickness: $3.2 \pm 0.2\text{mm}$ (The pressure from tester acting on the battery when measuring is 300gf, Temperature $25 \pm 2^\circ\text{C}$)

Diameter: $20.0 \pm 0.3\text{mm}$ (The pressure from tester acting on the battery when measuring is 300gf, Temperature $25 \pm 2^\circ\text{C}$)

Remark: Storing or using in high temperature environment, the height of the battery will

increase.

4.2 Appearance

The battery should be clean, no electrolyte leakage or obvious scratch or technical damages, light spot welding allowed, no deformation, no other appearance defects to affect battery function.

5 Performance

5.1 Standard test conditions

The batteries to be tested should be new ones not exceeding one month out of factory, and the time for cycling of charge and discharge is no more than 5. All the tests should be done based on below test conditions unless special specified. Temperature $25\pm 2^{\circ}\text{C}$, Relative humidity $45\%\sim 85\%$. If test results that are proved not affected by these test conditions, test may be done at $15\sim 30^{\circ}\text{C}$ and relative humidity $25\%\sim 85\%$.

5.2 Tester

- (1) Accuracy of size tester should not less than 0.01mm.
- (2) Multimeter's accuracy should not be lower than 0.5 grade when measuring voltage and current, the interior resistance not lower than $10\text{K}\Omega$.
- (3) Interior resistance tester applies to alternative current impedance method(1KHZ LCR).
- (4) The current accuracy of battery test system is over $\pm 0.1\%$, constant voltage accuracy $\pm 0.5\%$ and timing accuracy not less than $\pm 0.1\%$.
- (5) The accuracy of temperature tester is not lower than $\pm 0.5^{\circ}\text{C}$.

5.3 Standard charge

$$0.5\text{CmA}=22.5\text{mA}$$

4.2V(CC-CV) end voltage is 2mA, total charge duration is no less than 3.5 hrs.

To shorten time when doing cycle test, stop charging when current value lowers than 5mA at constant voltage charging.

5.4 Put-aside time

If no special requirement, the interval between charging and discharging is 10min.

5.5 Initial test

Item	Test method	Standard
Open circuit voltage	Measure the open circuit voltage within 24 hrs after standard charge	$\geq 4.15\text{V}$
AC interior resistance	Measure the AC interior resistance at $25\pm 2^{\circ}\text{C}$ after standard charge	$\leq 550\text{m}\Omega$
Rated capacity	Putting aside 10min after standard charge, discharge at 0.2CmA(9mA) till to 2.75V, then measure the capacity(Defined as C_5)	$C_5 \geq 45\text{mAh}$
1.0CmA	Putting aside 10min after standard charge,	discharge

Discharge capacity	discharge till to 2.75V, then measure discharge capacity	capacity \geq 40mAh
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5.6 Electrical performance test

5.6.1 Discharge temperature characteristics

After standard charge at $25\pm 2^{\circ}\text{C}$, then make it cold or heat it in 30min till to test temperature. Before discharge keep the battery at the same temperature for 1hr, then discharge at 0.2CmA(9mA). After this temperature test, keep the battery at room temperature ($25\pm 2^{\circ}\text{C}$) for 2hr, then charge it based on below requirement.

Discharge temperature	-20 $^{\circ}\text{C}$	25 $^{\circ}\text{C}$	60 $^{\circ}\text{C}$
Discharge capacity	60%	100%	90%

5.6.2 Cycle performance

After standard charge, put it aside for 10min, discharge at 0.5CmA to 3.0V, put it aside for 10min, repeat above steps for times till discharge capacity in 3 running times $\leq 75\%C_5$, test temperature is $25\pm 2^{\circ}\text{C}$ which is very important parameter affecting cycle performance. Requirement is as below,

Cycle times \geq 350

5.6.3 Capacity holding

Item		Test method	Standard
Common temp storage	1	After standard charge, store the battery at $25\pm 2^{\circ}\text{C}$ for 30 days, then measure discharge capacity (capacity holding) at 0.2CmA	Capacity holding $\geq 85\%C_5$
	2	Cycle (charge and discharge)3 times under 0.2CmA, then measure capacity recovery(the max. discharge capacity among 3 cycles)	Capacity recovery $\geq 85\%C_5$
High temp storage	1	After standard charge, store the battery at $60\pm 2^{\circ}\text{C}$ for 7 days, then measure discharge capacity (capacity holding) at 0.2CmA	Capacity holding $\geq 60\%C_5$
	2	Cycle (charge and discharge)3 times under 0.2CmA, then measure capacity recovery(the max. discharge capacity among 3 cycles)	Capacity recovery $\geq 80\%C_5$

5.6.4 Long term storage performance

The battery for this test should be not more than 3 months from manufacturing date to test date. Before storage, charge and discharge 50% capacity, lay the battery aside in open circuit status for 365 days。 At $25\pm 2^{\circ}\text{C}$,cycle 3 times under 0.2CmA, then measure capacity recovery(the max. discharge capacity among 3 cycles), requirement is as below,

Capacity recovery $\geq 85\%C_5$

5.7 Technical performance

Item	Test method	Standard
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Constant Temperature and Humidity	After standard charge, the battery is stored in an incubator of $40\pm 2^{\circ}\text{C}$ ($90\sim 95\%\text{RH}$) for 48h, then placed at $25\pm 2^{\circ}\text{C}$ for 2hr. After that, check its appearance, if no obvious change, discharge to 2.75V	Discharge capacity $\geq 80\%C_5$
Vibration	After standard charge, the battery is fixed on the vibration platform, perform test on X,Y,Z axis, vibration frequency: 10Hz \sim 55Hz, speed change: HZ/min; Displacement vibration amplitude: 0.8mm. Reciprocating vibration: 90min	4.0V No scratch, no leakage, no fume, no explosion; the voltage is min 4.0V.
Drop test	After vibration test, drop test begins according to below conditions. Height of drop: 1.0mm; Bearer: a thick and hard wooden board; Direction of drop: drop one time of both sides for the axial direction.	no scratch, no leakage, no fume, no explosion; the voltage is min 4.0V.

5.8 Safety performance

Item	Test method	Standard
Impact Test	Place a battery on the impact flat and drop a 10 kg weight from a height of 1m onto the battery fixed by a clamp. The surface of max square measure of the battery should be vertical with the surface of the impact flat.	no fire, no explosion
Heating Test	Place battery into hot container, the temperature of the container is to be raised at a rate of $5\pm 2^{\circ}\text{C}/\text{min}$ to $130\pm 2^{\circ}\text{C}$ and keep for 30min at this temperature	no fire, no explosion
High Temperature Test	After standard charge, the battery is placed in a oven of 90°C for 4hr, then, discharge at 0.2CmA constant current till to 2.75V, cycle 3 times	Capacity recovery $\geq 75\%$ C_5
overcharge test	After standard charge, the battery connecting its polarities with copper wire is placed in ventilating cabinet, battery and slide rheostat are connected in series mode with a constant voltage source, then set the voltage as 4.8V, adjust through slide rheostat the current as 3.0CmA, then monitor the temperature of battery case when it is charged at 3.0CmA. when the temperature of battery case lowers down to 10°C less than peak temperature, finish the test. During test, no need keeping current at 3.0CmA all the time.	no fire, no explosion
Short-circuit test	A battery is to be short-circuited by connecting the positive and negative terminals of the battery with copper wire having a maximum resistance load of $100\text{m}\Omega$. Monitor its temperature while testing, the cell is to be discharged until the cell case temperature has returned to be 10°C less than peak temperature	no fire, no explosion

6 Usage guideline

Danger alarm

The usage rulers should be strictly complied.

- No placing battery in the fire or heat it.
- Observe the correct polarity (+/-).
- No connecting the polarities of the battery with mental material.
- No mixing the battery with mental necklace or other mental materials.
- No acupuncture, hammering, stamping or strong bumping the battery with other objections. No placing the battery in the rain or salt water.
- No disassembling or charging the interior structure of the battery.
- No placing the battery close to the fire, high temperature burner or other high temperature sites.
- Battery should be placed out of reach of children to avoid swallowing the battery.
- When using, charging or storage, battery releases unpleasant smell, generates heat, change the color or shape, and shows abnormal, you should stop using the battery immediately.
- No placing battery in the micro-oven or high pressure container.
- When leakage happens and electrolyte enters into eyes, do not wipe eyes, use large quantity of water to wash eyes immediately and see a doctor.

Attention

Do not place the battery in extreme hot environment, such as inside the car in very hot climate or under strong sunlight. Or the battery will over-heat, even fire. This will damage battery's performance, shorten its lifespan.

Only conditions as below are suitable for battery. Beyond these, the battery will over-heat, or explode or fire.

Working conditions

Charge: 0°C ~ 45°C

Discharge: -20°C ~ 60°C

Storing 30 days: -20°C ~ 45°C

Storing 90 days: 0°C ~ 45°C

7 Warranty

The guarantee period of the battery is one year out of factory. If any quality problem occurs, our company will be responsible to replace. We will not burden any responsibility due to client's misuse.

8 Status when leaving factory

When leaving factory, the battery has be charged around 60% capacity, voltage is 3.90-4.10V.

9 Specification revision

Our company has the right to revise the specification. Any doubts about technology, please contact our engineers.

10 LIR2032 size Chart

Item	Specification
Thickness	$3.2 \pm 0.2\text{mm}$
Diameter	$20 \pm 0.3\text{mm}$

