



CHANGZHOU JINTAN CHAOCHUANG BATTERY CO., LTD

Customer acceptance

Lithium Manganese Dioxide Battery

CR2025

Typed : _____ Date : _____

Checked : _____ Date : _____

Approved: _____ Date : _____

Customer admit signature:

Approved :

Date :

1. Scope

These specifications are applicable to the manganese dioxide lithium batteries supplied by CHANGZHOU JINTAN Chaochuang Battery Co., Ltd.

- | | |
|---|---|
| 2. Applicable Battery Type | Manganese dioxide Lithium Battery |
| 3. Battery Type and Performance | |
| 3.1 Type | CR2025 |
| 3.2 Nominal voltage | 3.0 volts |
| 3.3 Nominal discharge capacity | 160mAh (Load: 15K ohm, End voltage 2.0V) |
| 3.4 Outside dimensions | As per drawing attached |
| 3.5 Standard weight | 2.40g |
| 3.6 Guarantee | 1 year (at the temperature of less than 25 deg. C and the relative humidity of less than 75%.) |
| 3.7 Appearance | Will be free from flaw, stain, deformation, uneven tone, electrolyte leakage and other defects which impair the value of the commodity. |
| 3.8 Brand | Neutral. |
| 3.9 Symbol of manufactured month and year | <p>Manufactured month and year will be shown on the surface of the battery.</p> <p>Example:</p> <p>21 (Manufactured in Jan, 2012)</p> <p>22 (Manufactured in Feb, 2012)</p> <p>20 (Manufactured in Oct, 2012)</p> <p>2Y (Manufactured in Nov, 2012)</p> <p>2Z (Manufactured in Dec, 2012)</p> <p>shown on the surface of the battery.</p> |



4. Main reference

Item	Unit	Figures	Condition	
Nominal Voltage	V	3.0	Only appropriated for CR Battery	
Nominal Volume	mAh	160	15kΩ continuously discharge load	
Instantaneous short-cut circuit	mA	≥300	time≤0.5'	
Open circuit Voltage	V	3.20-3.45	All CR Battery series	
Storage temperature	°C	0-30	All CR Battery series	
Appropriated temperature	°C	-20-60	All CR Battery series	
Standard weight	g	Appro2.40	Only appropriated for this item	
Discharge of life	%/yr	≤2	Only appropriated for this item	
Quick Test Use of life	Initial	h	≥106.7	Discharge load 2kΩ, Temperature 20±2°C, under the condition of related humidity≤75%
	After 12 months	h	≥104.5	

Remark1: The electrochemistry of this product, dimension are under IEC 60086-1: 2015 standard (GB/T8897.1-2021, Battery , Related to 1st part)

5.Specification of product and Test method

Exception for specified explanation, all tests should process under below conditions:

(1) Environment Temperature : Temperature $20\pm 2^{\circ}\text{C}$ (2) related humidity: under $55\pm 20\%$

Test items	Test Methods	Standard
1. Dimension	Use of caliper under precision is 0.02mm or more precise, to avoid short-circuit, insulated materials should be put on the vernier caliper during test.	diameter (mm): 20.0 (-0.20) height (mm): 2.50 (-0.20)
2. Open circuit voltage	Precision is 0.25% or more precise、resistance of internal circuit is bigger than 1 MΩ DDM。	3.20-3.45
3. Instantaneous short-circuit	Using pointer multimeter for test, the time is not more than 0.5' , avoid duplicated test, the time for next test should be after half an hours.	$\geq 300\text{mA}$
4. Appearance	Visual test	Will be free from flaw, stain, deformation, uneven tone, electrolyte leakage and other defects. Installed to utensils, both terminal of battery should be under good connections.
5. Quick Discharged Volume	Standard Temperature $20\pm 2^{\circ}\text{C}$, related humidity $\leq 75\%$, discharge load 2kΩ, terminated voltage be 2.0V	≥ 106.7 hours
6. Vibrate test	Vibrate frequency 100-150 times per min under continuously vibration for 1 hour	Stability
7. High temperature-resistant of weeping performance	Storage 30 days Under 45 ± 2 conditions	leakage % ≤ 0.0001
8. Circuit load of weeping performance	When terminated voltage is 2.0V, continuously discharge load for 5hrs	No leakage

Remark2: The bearing boundary dimension of this product, dimension are under IEC 60086-2: 2015 standard (GB/T8897.2-2021, Battery, Related to 2nd part)

Remark3:

1.Above tests were approved under plenty of experiments.

2.The company completely more stringent than the national standard issued by the GB/T8897 《primary batteries》 standards.

3.If necessary or under customer's specified requested, our company can adopt any test methods provided by customers.

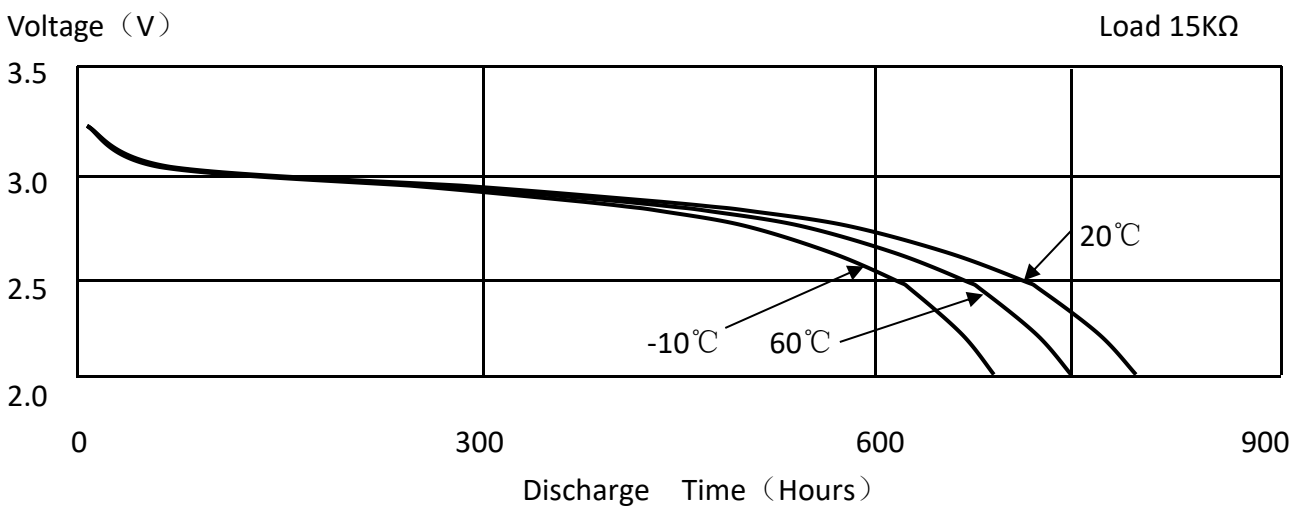
6. Service life

Load resistance	15,000 ohms
Discharge method	24 hours/day
End voltage	2.0V
Minimum duration (Initial)	8 0 0 hours
Minimum duration (After 12 months storage)	7 8 4 hours

Initial test : A test commencing within one month after delivery.

Stored test : A test conducted after 12 months storage under the specified conditions after delivery.

7. Discharge characteristics on load



8. Battery Testing

8.1 Temperature and Humidity

8.1.1 Conditions of Measurement

The battery will be measured under the conditions of temperature of 20+/-5 deg. C and relative humidity of 55+/-20% unless otherwise stated.

8.1.2 Conditions of Storage

The sample batteries for testing will be stocked under the conditions of temperature of less

than 25 deg. C and relative humidity of less than 75%.

The test will be carried out within 1 month after storage unless otherwise stated.

8.2 Instruments and Devices for Measurement

8.2.1 The DC voltmeter will be used to carry out voltage measurement that can measure from 0V to 4V. The accuracy of the voltmeter will be +/-1mV or it will be more accurate. The input impedance will be more than 10M ohm.

8.2.2 All the resistance of the external circuit load resistance will be comprised and the tolerance will be within 0.5%.

8.2.3 The caliper will be used to conduct dimension measurement and the range for measurement is from 0mm to 150mm. The accuracy is 5/100mm or more.

8.3 Testing systems

8.3.1 Dimensions

The caliper is used as the instrument for measurement.

8.3.2 Appearance

The visual inspection is applied.

8.3.3 Open circuit voltage

The DC voltmeter is used to measure the voltage between both terminals

8.3.4 Service Life

The battery samples are kept under the condition of temperature of 20+/-5 deg. C for over 12 hours. The battery samples will be discharged persistently through the discharge load mentioned in Table 1. The discharge test will be conducted till the discharge voltage falls down to not less than the final voltage specified in Table 1. The discharge time is the service life while the discharge voltage remains above the final voltage as stated.

8.3.5 Resistance of electrolyte leakage

The visual inspection is used for checking the state of the leakage. The battery will be put 30cm away under 40 watt fluorescent lamp at one meter above.

9. Limited warranty

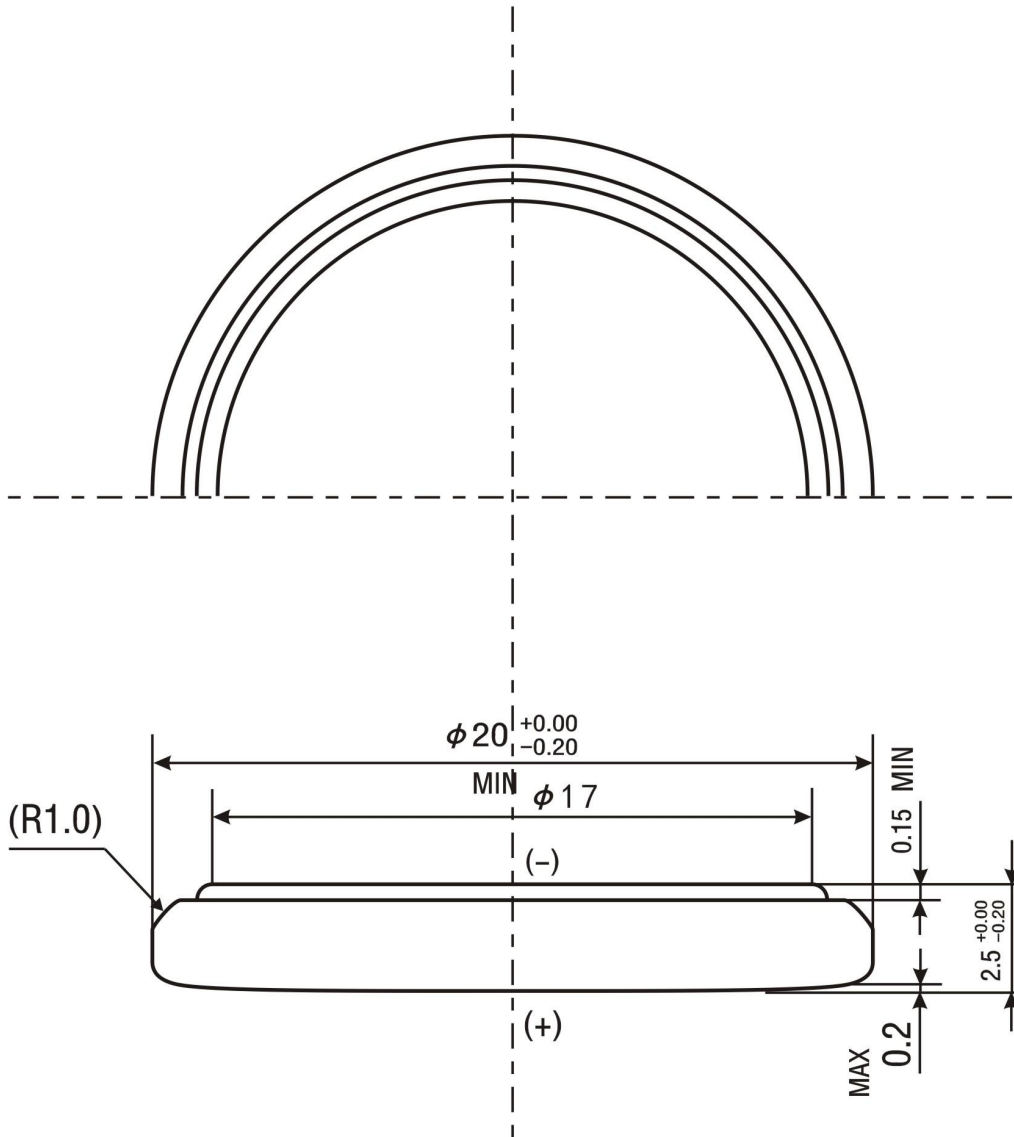
- (1) If defective in materials or workmanship is identified, please return the product to CHANGZHOU JINTAN Chaochuang Battery Co., Ltd. and the replacement will be delivered

without charge. Please note that the only obligation under this warranty is the replacement of the battery. Other loss, damage, destruction, any legal liabilities, cost or expense including consequential loss of whatsoever nature, directly or indirectly caused by, resulting from or in connection with use of or inability to use the product are expressly excluded.

- (2) The work on the battery needs to comply with the instructions in this specification; otherwise, CHANGZHOU JINTAN Chaochuang Battery Co., Ltd. cannot warrant any battery performance included but not limited to safety and the customer shall be responsible for all claims, demands, loss, damage, actions or proceedings, and costs (legal or otherwise) caused by this battery.
- (3) It is the customer's responsibility for the matching and reliability of batteries on actual set or unit application.
- (4) CHANGZHOU JINTAN Chaochuang Battery Co., Ltd. will not be responsible for the following situations:
 - (i) Inappropriate handling, use, installation, or examination of the battery.
 - (ii) Do not comply with the instructions, attentions or warnings mentioned in this specification.
 - (iii) Do not comply with the instructions or advice of CHANGZHOU JINTAN Chaochuang Battery Co., Ltd. Limited.

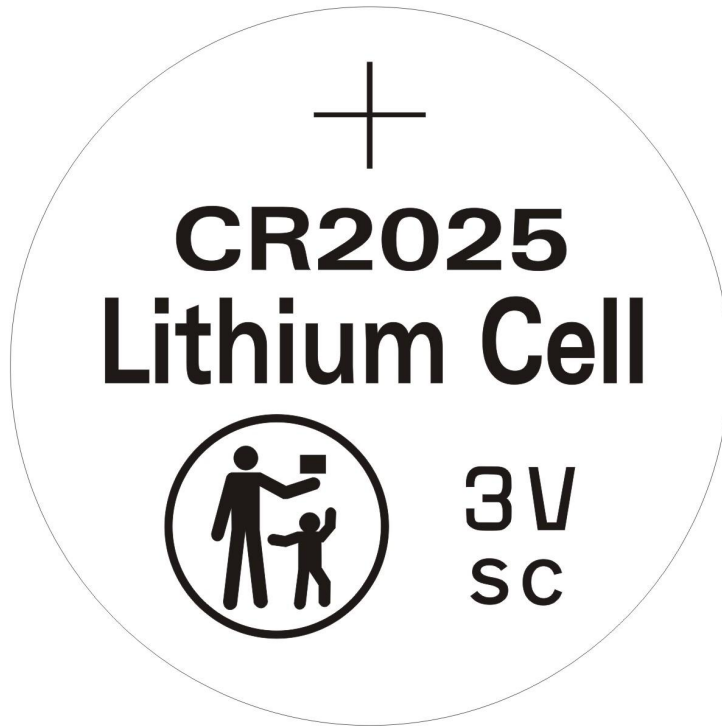
10. Others

Subject the RoHS directive, this battery does not contain the following chemical substance: lead, mercury, cadmium, hexavalent chromium, boric, fire retardants (polybrominated biphenyl (PBB), polybrominated diphenyl (PBDE))



Unit : mm

			PROJECTION	SCALE	TITLE
				5/1	CR2025
Dwn. BY	HuShaoXiang	2022. 11. 02	CHANGZHOU JINTAN CHAOCHUANG BATTERY CO. , LTD.		CHAOCHUANG WORKS DWG. NO. CCY20.2025.25-A
CHK. BY	TangQingFeng	2022. 11. 02			
APP. BY	XieYuXin	2022. 11. 02			



			PROJECTION	SCALE	TITLE
				5/1	CR2025
Dwn. BY	HuShaoXiang	2022. 11. 02	CHANGZHOU JINTAN CHAOCHUANG BATTERY CO. , LTD.		CHAOCHUANG WORKS DWG. NO. CCY20.2025.25-B
CHK. BY	TangQingFeng	2022. 11. 02			
APP. BY	XieYuXin	2022. 11. 02			

Instructions for Usage and Safety

The battery consists of lithium, organic, solvent, and other combustible materials. Proper handling of the battery is of utmost importance; otherwise, the battery could lead to distortion, leakage (accidental seepage of liquid), overheating, explosion, or fire and cause bodily injury or damage to equipment. Please strictly comply with the following instructions to avoid the occurrence of accident.

WARNING for Handling

- **Do Not Ingest**
The battery should be properly stored and keep away from children in order to avoid them to put it into their mouths and ingest it. However, if it happens, you should immediately take them to the hospital.
- **Do Not Recharge**
The battery is not a rechargeable battery. You should never charge it as it could generate gas and internal short-circuiting, leading to distortion, leakage, overheating, explosion, or fire.
- **Do Not Make Hot**
If the battery is being heated to more than 100 degree centigrade, it would increase the internal pressure resulting distortion, leakage, overheating, explosion, or fire.
- **Do Not Burn**
If the battery is burnt or put to flame, the lithium metal will melt and cause explosion or fire.
- **Do Not Dismantle**
The battery should not be dismantled as it will cause damage to separator or gasket resulting distortion, leakage, overheating, explosion, or fire
- **Do Not Make Improper Setting**
The improper setting of the battery could lead to short-circuiting, charging or forced-discharging and distortion, leakage, overheating, explosion, or fire could be occasioned as a result. When setting, the positive and negative terminals should not be reversed.
- **Do Not Short-circuit The Battery**
The short-circuit should be avoided for positive and negative terminals. Do you carry or keep battery with metal goods; otherwise, battery could occasion distortion, leakage, overheating, explosion, or fire.
- **Do Not Directly Weld The Terminal or Wire to The Body of The Battery**
The welding will cause heat and occasion lithium melted or insulating material damaged in the battery. As a result, the distorting, leakage, overheating, explosion, or fire would be caused. The

battery should not be soldered directly to equipment which it must be done only on tabs or leads. The temperature of soldering iron must not be over 50 degree C and the soldering time must not be more than 5 seconds; it is important to keep the temperature low and the time short. The soldering bath should not be used as the board with battery could stop on the bath or the battery could drop into the bath. It should avoid taking excessive solder because it could go to unintended portion on the board resulting short or charge of the battery.

- Do Not Use Different Batteries Together

It must be avoided for using different batteries collectively because batteries of different types or used and new or different manufacturers could occasion distortion, leakage, overheating, explosion, or fire. Please obtain advice from CHANGZHOU JINTAN Chaochuang Battery Co., Ltd. if it is necessary for using two or more batteries connected in series or in parallel.

- Do Not Touch The Liquid Leaked Out of Battery

In case the liquid leaked and get into the mouth, you should immediately rinse your mouth. In case the liquid gets into your eyes, you should immediately flush eyes with water. In any event, you should go to the hospital and have proper treatment from a medical practitioner.

- Do Not Bring Fire Close to Battery Liquid

If the leakage or strange smell is found, immediately put the battery away from fire as the leaked liquid is combustible.

- Do Not Keep in Touch with Battery

Try to avoid keeping the battery in touch with the skin as it will get hurt.

WARNING for Disposal

There are different regulations in different countries or regions and please comply with those regulations. In general, the insulating tape or friction tape should be used to cover the (+) and (-) terminals before disposal. It is because the discarded battery still has electric capacity and when it is in touch with other metals or materials, it could occasion distortion, leakage, overheating, or explosion.

WARNING for Circuit Design for Back-up Use

The battery is not rechargeable. It is important that the diodes are applied for prevention of charging from the main power or other batteries when the battery is used for the device having memory or RTC back-up applications. In addition, the application of protective resistance is necessary as it can regulate the current as shown in the figure below. The following points have to be paid attention when choosing diodes and protective resistance.

- Supplied voltage to load

Due to the application of a diode and a resistance, the voltage generated will drop during operation, you are reminded to pay attention to these drops of voltage for supplied voltage to load.

- Prevent charging by applying diodes

It is recommended to use the least leak current diodes. The charged capacity owing to leak current should be maintained within 1% of nominal capacity.

- Using and setting protective resistance

In order to refrain from changing the battery by large surges of current when the diode is failed, the protective resistance should be applied. It is recommended to adjust the protective resistance to make the maximum current not over the figures as stated in the table.

CAUTION (Handling / Storage)

- Do Not place the battery in ultrasonic

The short-circuit may be caused if the battery is placed in ultrasonic as the materials inside may be powdered occasioning distortion, leakage, overheating, explosion, or fire.

- Do Not roughly handle the battery

Distortion, leakage, overheating, explosion, or fire might be caused if the battery is received heavy impact or strong shock.

- Do Not short-circuit the battery while putting into equipment

It is advised to put the battery to the equipment in a prudent way. It is because the short-circuit may occurs to the battery through metal parts of the equipment.

- Do Not maintain contact pressure less than 2N

Due to the poor contact condition, the intended value may be higher than the battery voltage. For appropriate contact resistance, the contact pressure must be maintained not less than 2N.

- Do Not wrongly match the battery and equipment

Please use the proper battery conforming to the handling manual of the equipment. It is because the specifications or types of equipments are different and the battery may not fit all kinds of equipments.

- Do Not put the battery in hot place such as under the sun or in the car in the daytime

If the battery is put in hot place, it may cause distortion, leakage, overheating, explosion, or fire of the battery.

- Do Not allow the battery touch water

If the battery touches water may occasion distortion, leakage, overheating, explosion, or fire. It may also generate rust.

- Do Not stock the battery in the condition of high humidity and heat

In the high humid and hot condition, the battery may deteriorate. It may cause the battery distorted, leaked, overheated, or exploded.

SPECIFICATION FOR INSPECTIONS

It is guaranteed that this specification of the inspections will be fulfilled by our products. CHANGZHOU JINTAN Chaochuang Battery Co., Ltd. shall identify the cause of the problem and proceed to take remedial actions if the products do not fulfill this specification of inspections.

1. Quality Standard

The product specification will be conformed.

2. Unit of Inspections

One battery will be taken as one unit of inspection.

3. Definition of Lot

A batch of products that are manufactured by the same production lines with the same lot code mark.

4. Test Method

The product specification will be conformed.

5. Sampling Plan

The following table is referred and is only used for the initial test.

	Inspection Item	Inspection Plan	Sampling Level	A.Q.L
1	Dimensions	GB/T8897.2-2021	China National Standard	1.0
2	Open Circuit Voltage	GB/T8897.2-2021	China National Standard	1.0
3	Appearances	GB/T8897.2-2021	China National Standard	1.5

Major Defect: If there is failure on the functions of the products, it will be construed as major defect.

Others: Defect that is distinguished from Major Defect.

The operating features by attributes are used as a base for sampling inspections.



APPROVAL SHEET

MESSRS	
BRAND	LIDEV
PRODUCT	3.0V LITHIUM-MANGANESE BUTTON CELL
MODEL	CR2025
PREPARED BY	
APPROVED BY	
DATE	2019-7-1



1. 【SCOPE】

This specification applies to the following 3.0v lithium button cell CR2025 made by **SHENZHEN LIDEA BATTERY CO., LTD.**

2. 【RATINGS】

TABLE I :

ITEM		UNIT	SPECIFICATIONS	CONDITIONS
Nominal voltage		V	3.0	
Nominal capacity		mAh	150	Standard discharge with load 15kΩ
Instantaneous short-circuit current		mA	≥250	Time≤0.5 second
Off-load voltage		V	≥3.20	
Operating temperature		℃	-20~60	
Standard weight		g	2.5	Unit cell
Service output	Initial	Standard	840 h	Continuous discharge with load 15kΩ, till 2.0v end-voltage at 20~25℃
	After 12 months storage	Standard	790 h	

TABLE II :

ITEM	CONDITIONS	CHARACTERISTICS	
Thermal durability	Kept for 20 days at 60℃±3℃, then continuously discharge with 15kΩ load till 2.0v end-voltage	Standard	790 h
Self-discharge rate	Stored for 12 months at normal temperature and humidity	≤5%	

3. 【PERFORMANCE AND TEST METHODS】

Unless otherwise stated, all the testing is carried out under the condition: environmental temperature, 20℃~25℃; environmental humidity, 65±20%. Please refer to Table III

4. 【SUGGESTIONS AND CAUTIONS】

- 4.1 Install batteries correctly.
- 4.2 Ensure the contact points to be clean and conductive.
- 4.3 Do not mix different types, different brands batteries to serve together.
- 4.4 Do not heat, recharge the batteries.
- 4.5 Do not dispose of the batteries in fire.
- 4.6 Keep away from the small children, if swallowed promptly see doctor.
- 4.7 Pay attention to the producing date.

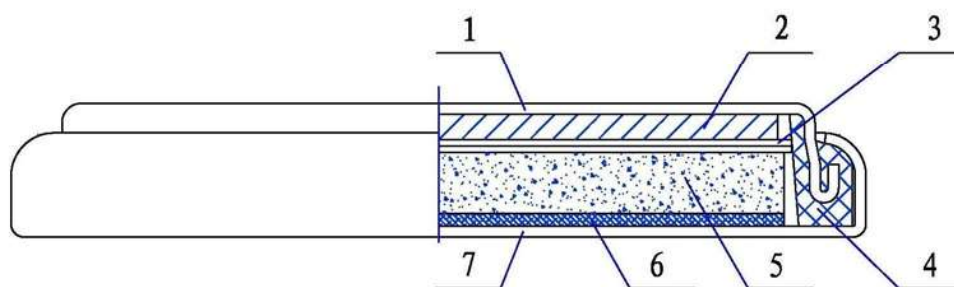
TABLE III:

No	ITEM	TEST METHODS	STANDARD	
			Parameter	Value
1	Dimensions	Using vernier caliper (accuracy \geq 0.02) while avoiding short-circuit	Diameter	20.0 (-0.20) mm
			Height	2.5(-0.20) mm
2	Off-load voltage	Using multimeter (accuracy \geq 0.25%) internal resistance \geq 1M Ω	\geq 3.20v	
3	Instantaneous short-circuit current	Time of short-circuit should be less than 0.5 second and avoid repeated test within half an hour	\geq 250 mA	
4	Appearance	Eyeballing	Bright, clean, no rust, no leakage, And no flaw	
5	Capacity	Continuously discharge for 8 hours with load 15k Ω , temperature at 20~25 $^{\circ}$ C, humidity at 65 \pm 20% till 2.0v end-voltage (for fresh battery only: within 3 months)	\geq 840 h	
6	Vibration test	Put battery on the platform of the vibrations machine, start the machine and adjust the frequency form 10 times per minute to 15 times per minute. keep it running for an hour	Characteristics keep stability	
7	Leakage at high temperature test	Stored under temperature (60 $^{\circ}$ C) for 7 days	No leakage allowed	
8	Over discharge Test	After 2.0v end-voltage, continuously discharged for 5 hours	No leakage allowed	

5. 【CUTAWAY DIAGRAM OF 3.0V LITHIUM MANGANESE DIOXIDE BUTTON CELL】

3.0V 锂—二氧化锰扣式电池剖面图

Cutaway Diagram of 3.0V Lithium Manganese Dioxide Button Cell



- | | | | |
|-----------------------------|------------------------------|---------------|----------|
| 1、负极壳 | 2、负极锂片 | 3、隔膜 | 4、密封胶圈 |
| 5、正极片 | 6、正极集流网 | 7、正极壳 | |
| 1、Cathode Shell | 2、Cathode (slice of lithium) | 3、Septum | 4、Gasket |
| 5、Anode (MnO ₂) | 6、Anode collector net | 7、Anode shell | |



6. 【DISCHARGE CHARACTERISTICS】

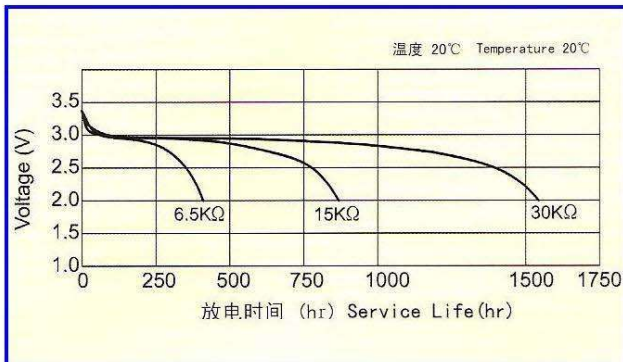
规格参数 SPECIFICATIONS



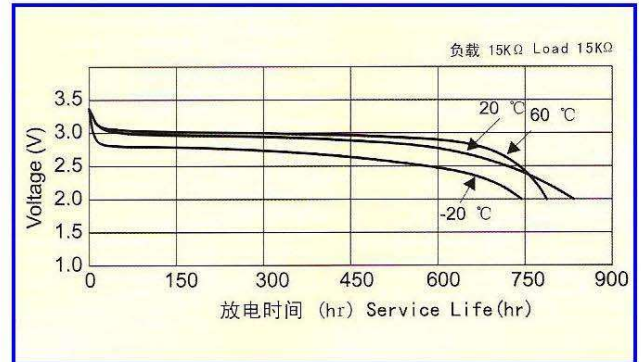
型号 Model No.	CR2025	结构图 Dimensions (mm)
标称电压 Nominal Voltage	3 (V)	
标称容量 Nominal Capacity	150 (mAh)	
标准电阻 Load Resistance	15 (kΩ)	
重量 Weight	2.5 (g)	
使用温度 Using Temperature	-20℃~60℃	

标准曲线 STANDARD CHARACTERISTICS

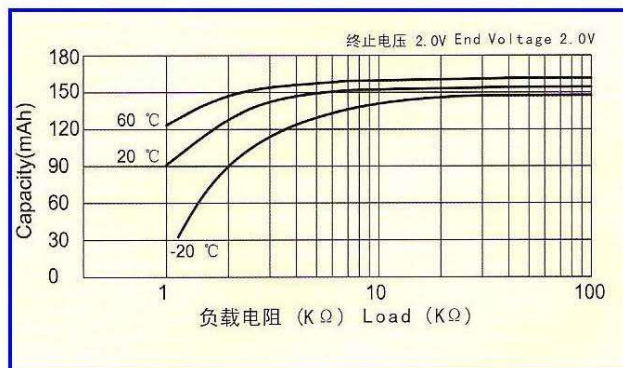
定电阻放电曲线
Discharge Characteristics



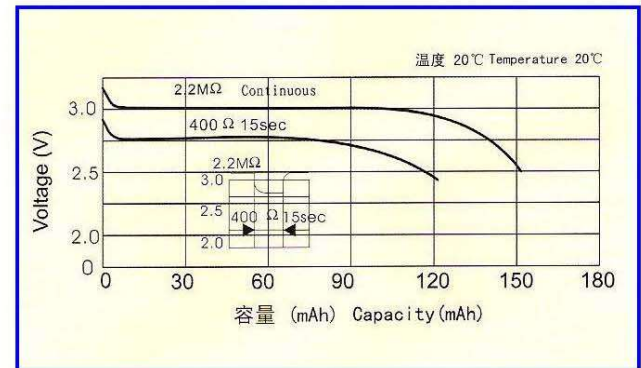
温度放电曲线
Temperature Characteristics



电阻容量曲线
Load-capacity



脉冲放电曲线
Pulse Discharge Characteristics



NANFU GROUP	Shenzhen Jingfu Technology Co., Ltd. Product Specification	Spec No.	SPEC-LMB-CR2025
		Version	A/2

Coin Manganese Dioxide Lithium Battery

Product Specification

Model: CR2025

Drafted by/Date	Checked by/Date	Approved by/Date
2021-08-02	2021-08-02	2021-08-02
Lyn Deng	Liangxi Yi	Qingfu Xie

NANFU GROUP	Shenzhen Jingfu Technology Co., Ltd. Product Specification	Spec No.	SPEC-LMB-CR2025
		Version	A/2

Revision History

Version	Revision	Date	Prepared by
A/0	Initial issue	2020.04.01	Changfu Jiang
A/1	Add discharge content	2021.02.28	Jiqin Shi
A/1	Modify product dimension drawing and add package specification	2021.02.28	Jiqin Shi
A/1	Modify the basic battery performance, Add Thermal shock weight loss assessment.	2021.02.28	Jiqin Shi
A/1	Add electrical safety performance test items	2021.02.28	Jiqin Shi
A/1	Add environmental safety performance test items	2021.02.28	Jiqin Shi
A/2	Add precautions for safe use	2021.08.02	Lyn Deng

NANFU GROUP	Shenzhen Jingfu Technology Co., Ltd. Product Specification	Spec No.	SPEC-LMB-CR2025
		Version	A/2

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NANFU GROUP	Shenzhen Jingfu Technology Co., Ltd. Product Specification	Spec No.	SPEC-LMB-CR2025
		Version	A/2

1. Scope

This specification is applicable to Coin Manganese Dioxide Lithium Battery CR2025, produced or supervised by Nanfu Corp.

2. Product specification parameter table

Item	Unit	Technical Index	Condition
Dimensions	mm	Diameter: 20.00(-0.10)	Test with vernier caliper with accuracy not less than 0.02mm.
		Height: 2.50(-0.20)	
Nominal Voltage	V	3.0	
Open-Circuit Voltage	V	3.05~3.40	No-loaded.
Nominal Capacity	mAh	165	Load: 15K Ω , cut-off Voltage: 2.0V, Temperature: 20 \pm 2 $^{\circ}$ C
Standard Discharge Current	mA	0.2	
Recommended Storage Temperature	$^{\circ}$ C	18~22	60% \pm 15%
Applicable Temperature	$^{\circ}$ C	-20~70	See note 3.
Nominal Weight	g	About 2.6	Bare cell.
Self-Discharge Rate	/Year	\leq 2%	Store at 20 \pm 5 $^{\circ}$ C & 55% \pm 20%RH for 1year

Note:

- The electrochemical system, dimensions and safety requirements of this product shall comply with the following standards:
 - GB/T8897.1-2013 --- Primary Batteries - Part 1: General
 - GB/T8897.2-2013 --- Primary Batteries - Part 2: Physical and electrical specifications
 - GB/T8897.4-2008 --- Primary Batteries - Part 4: Safety of lithium batteries
 - IEC 60086-2: 2015 Primary batteries Part 2: Physical and electrical specifications
- The appearance of the battery should be free from deformation, dent, stain, leakage, arch or burr of the sealing parts, and the terminal of the battery should be free of cover or foreign matter, so as not to affect the actual use or battery performance.
- For long-term use in extreme environment such as low temperature (< 0 $^{\circ}$ C) or high temperature (> 60 $^{\circ}$ C), please consult Nanfu Corp firstly.

3. Standard test conditions

Add: No.109 Industrial Road, Yanping District, Nanping, Fujian
Tel: +86-0599-8733999 Fax: +86-0599-8735117 Postcode:3 53000

NANFU GROUP	Shenzhen Jingfu Technology Co., Ltd. Product Specification	Spec No.	SPEC-LMB-CR2025
		Version	A/2

Unless otherwise specified, the test is generally conducted at the temperature of 20°C ±2°C and the relative humidity of 60%±15%. The test battery must be fresh, for no more than three months after delivery.

4. Test instruments and methods

1) The voltage is measured with a voltmeter with the range of 0V to 4 V and the accuracy of ± 1mV, or with a more accurate multimeter with the input impedance more than 10 M Ω.

2) The resistance of the battery is tested with an internal resistance tester, the error is no more than 0.5%, and the AC signal is 1KHz.

3) Dimensions should be measured with electronic calipers (with a range of 0 to 150 mm and the accuracy is 5/100mm), or other measuring tools with higher detection accuracy

4) Appearance: Visual inspection.

5) Anti-Leakage inspection: To check the cell appearance, it is necessary to observe the cell 1meter away from the 40Watt fluorescent lamp, 30cm away from the eyes without light source sheltered, and the cell appearance must be clean, no dirt.

5. Electrical performance test

Item	Unit	Technical Standard	Conditions
Internal Resistance	Ω	<15(AC,1KHZ)	Fresh battery
Discharge duration	h	≥870 (see Appendix I)	Load: 15K Ω , cut-off Voltage: 2.0V.
	h	≥850	After 20days in 60±2°C, discharge with 15K Ω , cut-off Voltage: 2.0V.

6. Electrical safety performance test

No.	Test Item	Test Procedure	Requirement
1	External Short-Circuit	The test cell or battery shall be stabilized at an external case temperature of 55 °C and then subjected to a short-circuit condition with a total external resistance of less than 0.1 Ω at 55°C. This short-circuit condition is continued for at least 1h after the cell or battery external case temperature has returned to 55°C. The test sample shall be observed for a further 6h.	No overheating, no rupture, no explosion, no fire
2	Forced Discharge	Each cell shall be force discharged at ambient temperature by connecting it in series with a 12V direct current power supply at an initial current equal to the maximum continuous discharge current specified. There shall be no explosion and no fire during this test and within 7 days after the test.	No explosion, no fire
3*	Abnormal Charge	Each test battery shall be subjected to a charging current of 3 times than the abnormal charging current specified by connecting it in opposition to a DC power supply.	No explosion, no fire

* The allowed maximum charge current of CR2025 is 10mA, suggest to launch abnormal charge test with this parameter.

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7. Environmental safety performance test

No.	Test Item	Test Procedure	Requirement
1	Anti-Leakage	Test cells shall be stored at $45 \pm 2^{\circ}\text{C}$ & 75%RH for 30 days, then take out of and stored at $20 \pm 2^{\circ}\text{C}$ & $60\% \pm 15\text{RH}$ for 24 at least, check the appearance finally.	No leakage, no rust, no dirt
2	Thermal cycling	Test cells shall be stored for at least 5h at a test temperature of 75°C , followed by storage for at least 6h at a test temperature of -40°C . The maximum time for transfer to each temperatures shall be 30 min. Each test cell shall undergo this procedure 10 times. This is then followed by storage for 24h at ambient temperature.	No fire, no explosion, no leakage, no rust, no venting
3	Altitude simulation	Test cells shall be stored at a pressure of 11.6KPa or less for at least 6 hours at ambient temperature of $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$.	No weight loss, no leakage, no venting, no short circuit, no rupture, no explosion, no fire
4	Vibration	Test cells and batteries shall be firmly secured to the platform of the vibration machine without distorting them and in such a manner as to faithfully transmit the vibration. Test cells and batteries shall be subjected to sinusoidal vibration by the battery manufacturer. This cycle shall be repeated 12 times for a total of 3 h for each of three mutually perpendicular mounting positions. One of the directions shall be perpendicular to the terminal face. The test shall be conducted using the test cells and batteries previously subjected to the thermal cycling test.	No weight loss, no leakage, no venting, no short circuit, no rupture, no explosion, no fire
5	Shock	Test cells and batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test cell or battery. Each test cell or battery shall be subjected to 3 shocks in each direction of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks. For each shock, the parameters given in by the battery manufacturer.	No weight loss, no leakage, no venting, no short circuit, no rupture, no explosion, no fire

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No.	Test Item	Test Procedure	Requirement
6	Crush	The cell or component cell shall be crushed between two flat surfaces. The force shall be applied by a vice or by a hydraulic ram with a round piston. The crushing shall be gradual with a speed of approximately 1,5 cm / s at the first point of contact. The crushing shall be continued until the applied force reaches approximately 13 kN.	No overheating no explosion, no fire
7	Thermal abuse	A test battery shall be placed in an oven and the temperature raised at a rate of 5 °C/min to a temperature of 130 °C at which the battery shall remain for 10 min.	No overheating, no explosion, no fire

8. Transportation and storage

8.1 Transportation specification

- 1) Proper packaging (seeing Appendix II) should be adopted to avoid strong shock and vibration during transportation, loading, unloading or stacking.
- 2) Appropriate stacking height should be adopted (generally, paper packaging should not exceed 1.5m and wooden case should not exceed 3m).
- 3) The battery should not be placed too close to the engine of the vehicle or ship during transportation.
- 4) Do not leave the battery in a metal boxcar or airtight container for a long time during warm seasons.

8.2 Storage specification

- 1) Batteries should be stored in a cool, dry place with good ventilation. The normal short-term storage environment is between 20°C±5°C and 60%±15%RH.
- 2) Avoid storing the batteries in an environment exposed to direct sunlight or nearby heat sources (such as radiators, engines, boilers, etc.).
- 3) Put the unused batteries in the original package, away from the metal objects which are easy to cause short circuit. If the packaging has been removed, do not mix the batteries together, so as to avoid short circuit caused by direct accumulation of batteries.

9. Revision

The changes brought about by the product upgrade will be reflected in the new version of the specification, and the revision will be notified separately.

10. Others

10.1 Six restricted substances in battery

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The contents of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE) meet the requirements of the RoHS directive.

10.2 Quality Standard

The quality standard is consistent with the "Product Specification", the contents not described in the specification shall not be lower than the national standard.

10.3 Inspection unit

A single battery will be regarded as an inspection unit.

10.4 Sampling plan

Inspection Items	Reference Standard	Sampling Standard	Inspection Level	AQL
External Dimension	GB/T8897.2-2013	GB/T2828.1-2012	II	AQL=1.0
Open-Circuit Voltage	GB/T8897.2-2013	GB/T2828.1-2012	I	AQL=0.65
Appearance	GB/T8897.2-2013	GB/T2828.1-2012	II	AQL=1.0

10.5 Precaution

The battery consists of lithium, organic solvents, and other flammable materials. Please use the battery properly to avoid possible deformation, leakage (accidental leakage), overheating, explosion, fire, and other personal injury or equipment damage, etc. Please strictly comply with the following requirements to avoid accidents.

- 1) Do not swallow the battery and keep them away from children to avoid accidental ingestion.
- 2) Do not charge the battery.
- 3) Do not heat or dispose of battery in fire.
- 4) Do not disassemble the battery.
- 5) Do not short circuit the battery.
- 6) Do not reverse the positive and negative terminals of the battery when installing.
- 7) Direct welding of battery is forbidden. If welding is required, please consult Nanfu group for specific technical requirements.
- 8) Mixed use of different types of battery is prohibited.
- 9) Do not touch the leaking battery. If you accidentally touch the battery liquid, rinse thoroughly and consult a doctor immediately.
- 10) Keep battery away from flammable liquids.
- 11) Do not allow batteries to overlap or cross stack (as shown below).

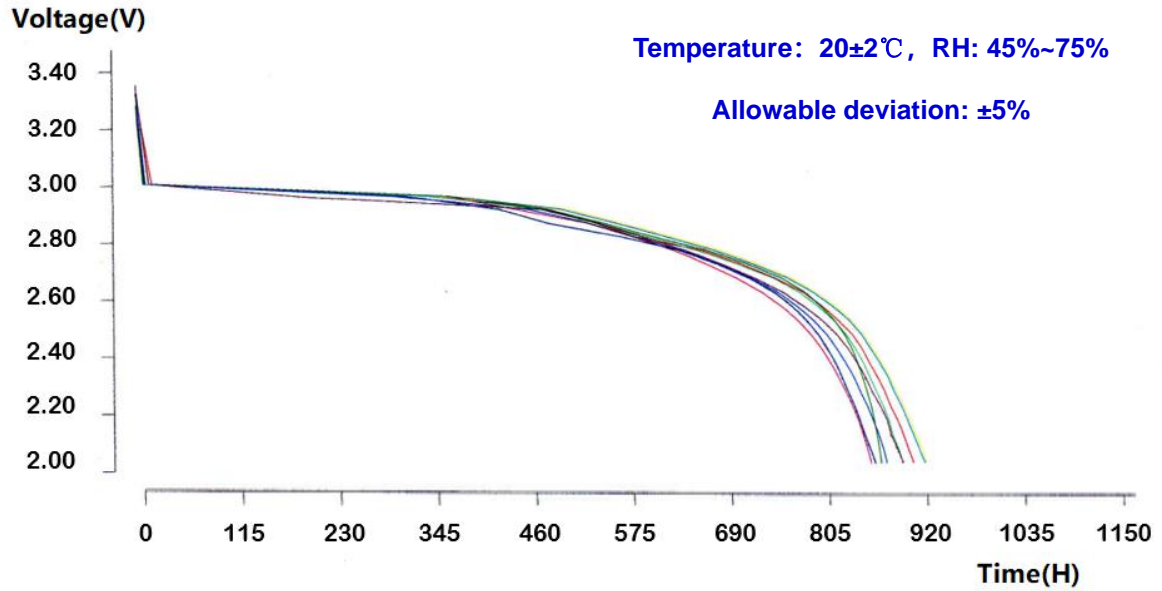


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- 12) There are different regulations for handling batteries in different countries or regions. Please comply with these regulations. It is recommended to cover the (+) and (-) ends of the battery with insulating tape before handling the battery.

Appendix I

CR2025 discharge cure (typical value)

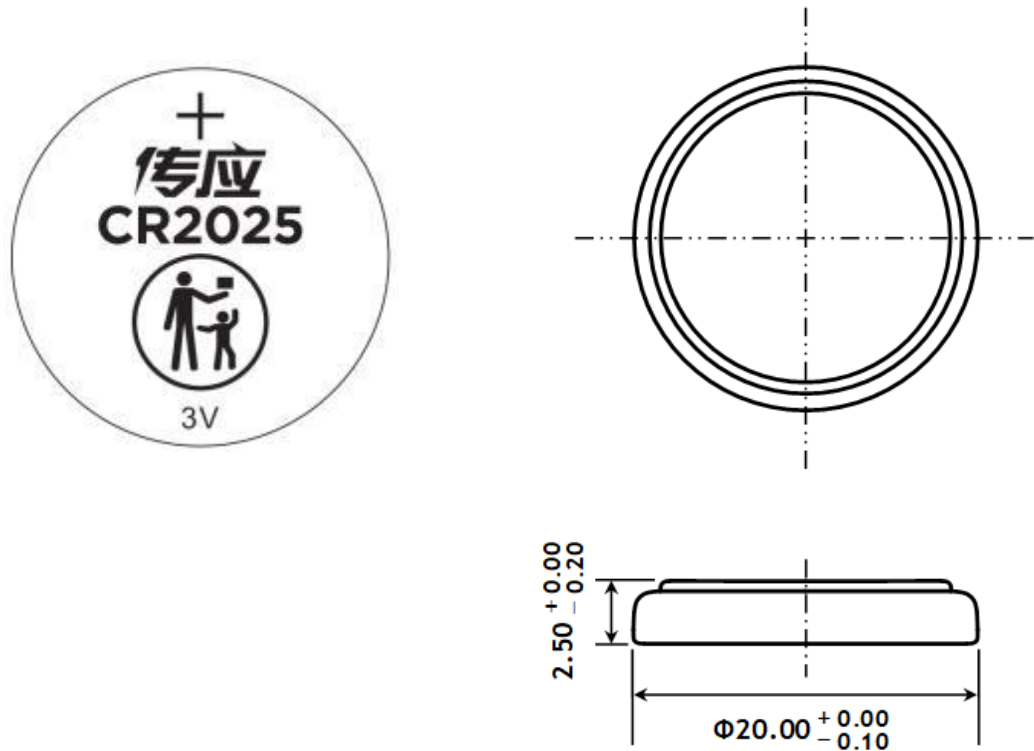


Note: 15KΩ discharge continuously, cut off volatage:2.0V.

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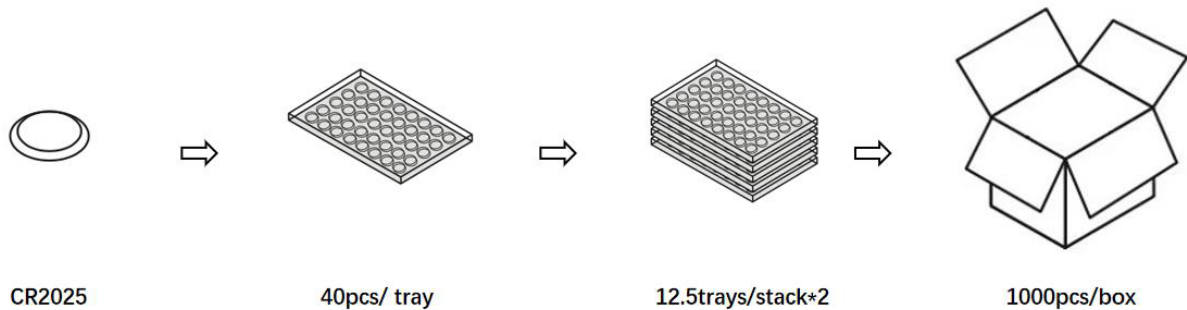
Appendix II

Dimensions and package specification



Unit: mm

Model	Qty(pcs)	Carton Size(mm)	Weight(kg)
CR2025	1000	225×152×118	3.0



Note: the packing quantity is subject to the actual quantity; the packing method is as above, if there is any adjustment, it shall be subject to the agreement of both sides at the time of delivery.

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