

TECHNICAL SPECIFICATION

FOR

MANGANESE DIOXIDE LITHIUM BATTERY

TYPE:CR2025

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1. Scope

This specification is applicable to the Manganese Dioxide Lithium Battery CR2025 supplied by Guangdong TIANQIU Electronics Technology Co. Ltd.

2. Designations

2.1 Defining

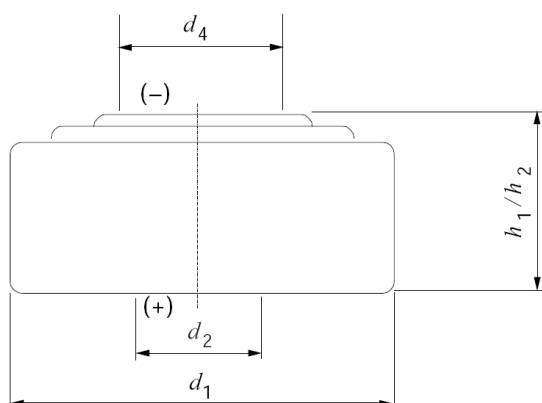
At the temperature of $20\pm 2^{\circ}\text{C}$, loading at $15\text{k}\Omega$ continuous discharge, till the voltage down to 2.0V

3. Designations and Dimensions

3.1 Designations:

Manganese Dioxide Lithium Battery CR2025

3.2 Dimensions



SPEC code	specification standard(mm)	
	MAX	MIN
h1/h2	2.5	2.2
d1	20.0	19.7
d2	-	-
d4	-	8.0

Note: h1 battery maximum total height
 h2 battery positive and negative minimum distance between contacting surfaces
 d1 Maximum and minimum diameter of the battery
 d2 minimum diameter of the anode contact area
 d4 minimum diameter of the cathode surface

4. Product characteristic

Item	Characteristic
Nominal capacity	150mAh /0.45Wh
Nominal voltage	3.0V
Discharge Voltage	2.0 V
Suggested continuously discharge	0.2mA
Suggested maximum pulse curren	15mA
Service temperature	$-20\sim 60^{\circ}\text{C}$
Storage Temperature	$0^{\circ}\text{C}\sim 35^{\circ}\text{C}$
Storage humidity	45% ~ 75 % RH (no condensate)
Dimensions	maximum height:2.5mm Maximum diameter: $\Phi 20\text{mm}$
Average weight	2.3g

5. Technical requirements

5.1 Test conditions

Unless otherwise specified, the test conditions shall be, as a general rule, at the temperature of $20\pm 2^{\circ}\text{C}$ and the relative humidity of $60\pm 15\%$.

5.2 Electrical characteristics

NO.	Item	Test condition	Requirement
5.2.1	storage characteristics	Sampling plan: MIL-STD-105E, General Inspection Lever II, Single Sampling, AQL=0.4 Remark: Load voltage test method: $15\text{K}\Omega/1\text{S}$, The initial samples shall be tested within 30 days after delivery	Open Circuit Voltage(V) load voltage(V) Initial: 3.10-3.50 3.0-3.40 12 months @ RT: 3.0-3.40 3.0-3.40
5.2.2	Service output	Load resistance: $15\text{k}\Omega$; Discharge method: 24h/d continuously discharge; End point voltage 2.0V Remark: The initial samples shall be tested within 30 days after delivery.	Initial $\geq 750\text{hrs}$ 12 months @ RT $\geq 720\text{hrs}$
5.2.3	Temperature characteristics	Load resistance: $15\text{k}\Omega$; Discharge method: 24 hrs/d continuously discharge; End point voltage 2.0V	$0\pm 2^{\circ}\text{C} \geq 650\text{hrs}$ $60\pm 2^{\circ}\text{C} \geq 735\text{hrs}$
5.2.4	Over-discharge	Continuously discharge: $15\text{K}\Omega$, End point voltage 1.2V	No leakage, No deformation; N=9, Ac=0, Re=1
5.2.5	High temp. storage	60°C , RH below 70% for 30days	No leakage; N=40, Ac=0, Re=1
5.2.6	Short circuit test	The battery short circuit in 55°C environment, When the battery shell after the temperature dropped to 55°C continue to short circuit at least 1 hrs	No explosion、No fire ; N=5, Ac=0, Re=1.

5.2.2&5.2.3 acceptance standard:

- 1) 9 pieces of battery will be tested for each discharging method.
- 2) The average discharging time from each discharging method shall be equal to or greater than the specified figure, and no more than one battery has a service output less than 80% of the specified figure.
- 3) One retest is allowed to confirm the results if the first test didn't meet the requirements.

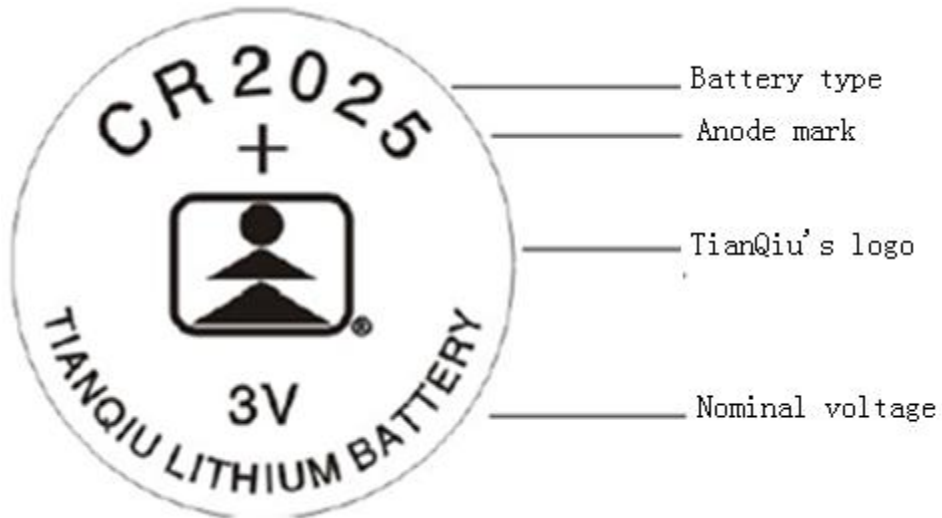
5.3 Expiration date

1 year storage in the conditions of GB/T 8897.1-2013, appendix E part

6. Packing and marking

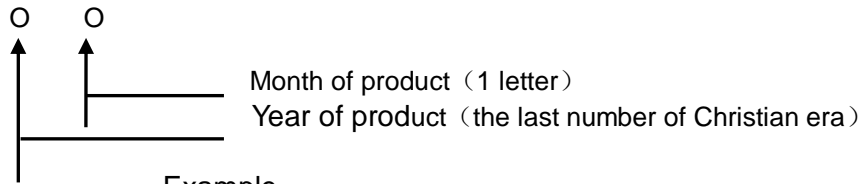
6.1 Marking Design

Any specific design and packing requirements will be accommodated as required. But as a general, the following markings will be printed, stamped or impressed on the body of the battery:



6.2 date code

Manufacturing marks: the year and month of product shall be marked on the negative (-) terminal side.



Example:

69 (manufactured in September,2016)

6X (manufactured in October,2016)

6Y (manufactured in November,2016)

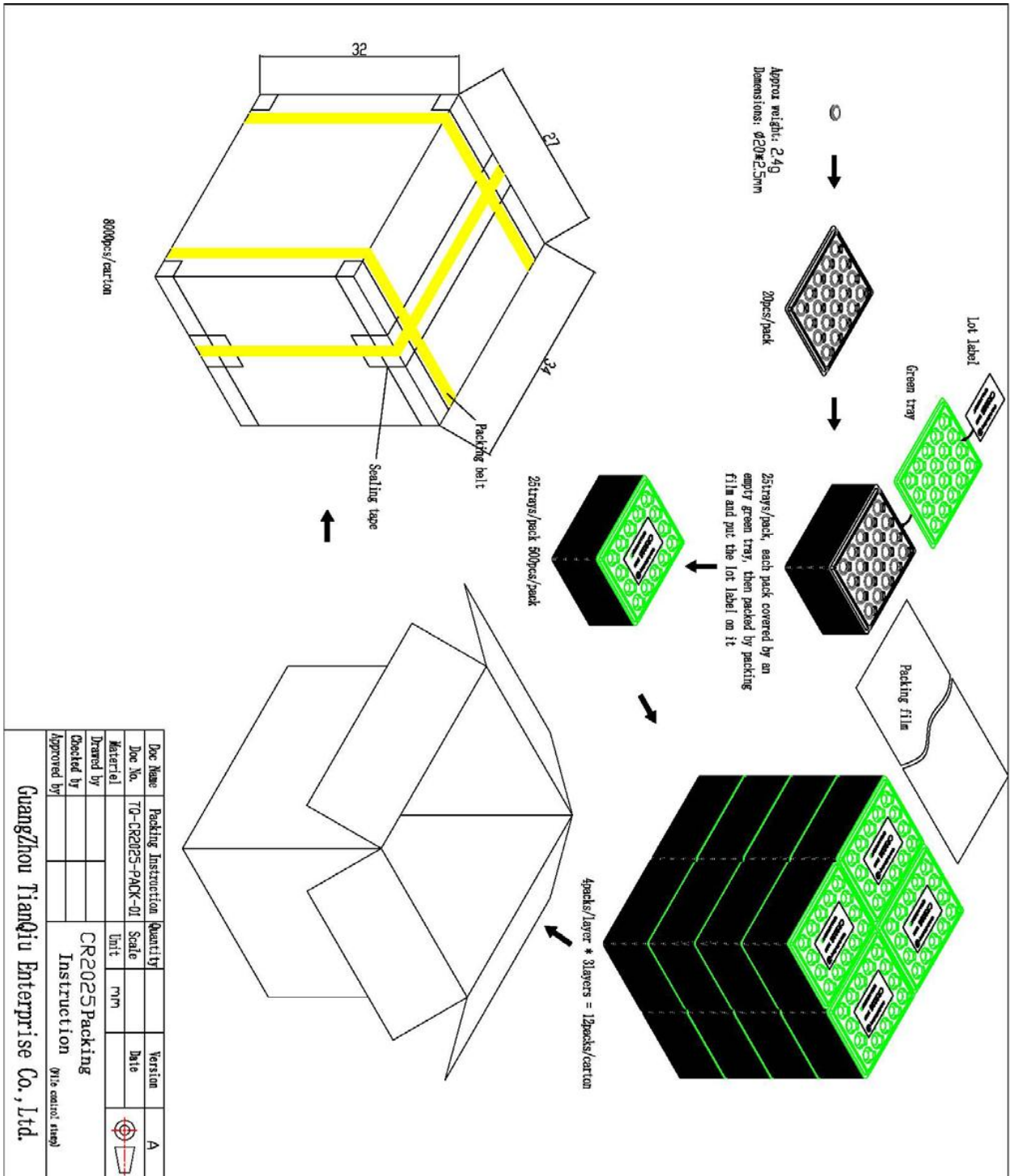
6Z (manufactured in December,2016)

Month of product:

January to September..... (1-9)

Oct, Nov, Dec..... (X,Y,Z)

6.3 Packing Picture



7. Caution for Use

- 1) Since the battery is not designed to be charged, there are risks of electrolyte leakage or causing damage to the device if the battery is charged.
- 2) The battery shall be installed with its “+” and “-” polarity in correct position, otherwise may cause the battery to be charged or over-discharged.
- 3) Short-circuiting, heating, disposing of in fire and disassembling the battery are prohibited.
- 4) Battery cannot be forced discharge, which lead to excess internal gas generation and, may result in bulging, leakage and explosion.
- 5) New and used batteries cannot be mix used at the same time, when replaced batteries, it is recommend to replace all and with the same brand type.
- 6) Exhausted batteries should be removed from compartment to prevent over-discharge, which cause leakage and damage to the device.
- 7) Direct soldering is not allowed, which will damage the battery.
- 8) Keep the battery out of the reach of children to prevent swallow, in case of accident should contact physician at once.
- 9) The battery should not be dismantled and deformed.

caution:

- » If a battery is leakage and materials contact eyes, flush immediately with running water for at least 15 minutes. Consult an ophthalmologist at once.
- » If battery emits an odor, fever, discoloration, deformation or any abnormal phenomena appeared in the process of use/storage, removed the battery immediately from the device and dispose of the battery.

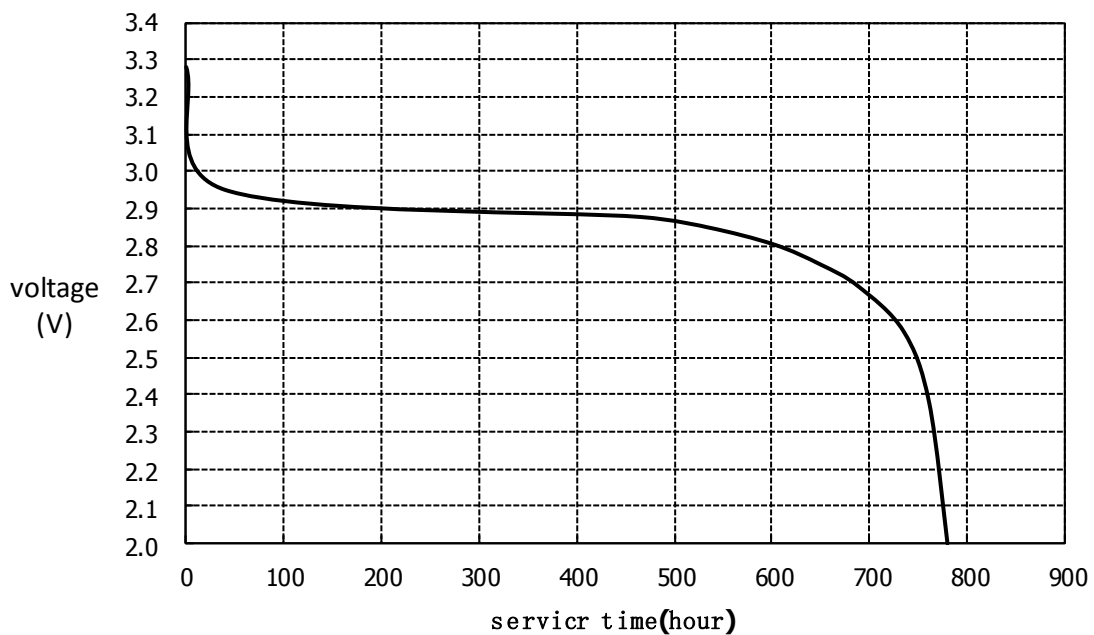
8. Referenced Standards

IEC 60086-1:2015 –Primary Batteries –Part 1: General

IEC 60086-2:2015–Primary Batteries –Part 2: Physical and electrical specifications

IEC 60086-4:2019 –Primary Batteries –Part 4: Safety of lithium batteries

9. Discharge Curves



Discharge method: 15KΩ, 24 hours/day EV 2.0V
 temperature of 20±2℃

TECHNICAL SPECIFICATION
FOR
MANGANESE DIOXIDE LITHIUM BATTERY
TYPE:CR2032

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1. Scope

This specification is applicable to the Manganese Dioxide Lithium Battery CR2032 supplied by GUANGZHOU TIANQIU ENTERPRISE CO.,LTD.

2. Definition

2.1 Nominal capacity:

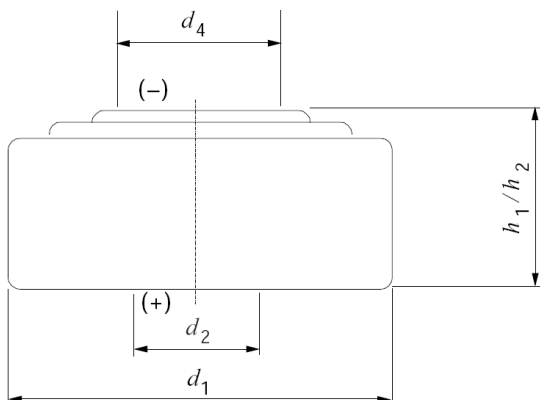
Continuously discharge at $20\pm 2^{\circ}\text{C}$ under $15\text{K}\Omega$ to 2.0V .

3. Product model and dimensions

3.1 Product model

CR2032 Manganese Dioxide Lithium Battery

3.2 Dimensions



Symbols	Specification (mm)	
	Maximum	Maximum
h1/h2	3.2	3.0
d1	20.0	19.7
d2		-
d4		8.0

Note: h1 maximum overall height of the battery

h2 minimum distance between the flats of the positive and negative contacts

d1 maximum and minimum diameters of the battery

d2 minimum diameter of the flat positive contact

d4 minimum diameter of the flat negative contact

4. Technical Specifications

Item	Specification
Nominal Capacity	210mAh /0.63Wh
Nominal Voltage	3.0V
End point voltage	2.0 V
Recommended continuous drain	0.2mA
Recommended pulse drain	15mA
Working temperature range	-20~60°C
Storage conditons	0°C~35°C
Humidity range	45% ~75 % RH (No condensate)
Product dimensions	maximum over height: : 3.2mm maximum diameter: Φ20mm
Average weight	2.9g

5. Technical characteristic

5.1 Testing environment

Unless otherwise stated, the test conditions shall be, as a general rule, at the temperature of $20 \pm 2^{\circ}\text{C}$ and the relative humidity of $60 \pm 15\%$.

5.2 Typical performance

No.	Item	Test condition	Criterion
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5.2.1	Electrical characteristics	<p>Sampling plan MIL-STD-105E, general level II , single sampling AQL=0.4</p> <p>Remark: On-load voltage:15KΩ/1 seconds</p> <p>The initial samples shall be tested within 30 days after delivery</p>	<table border="1"> <thead> <tr> <th></th> <th>OCV(V)</th> <th>CCV(V)</th> </tr> </thead> <tbody> <tr> <td>Initial</td> <td>3.0-3.4</td> <td>3.0-3.4</td> </tr> <tr> <td>12 months at RT</td> <td>3.0-3.4</td> <td>3.0-3.4</td> </tr> </tbody> </table>		OCV(V)	CCV(V)	Initial	3.0-3.4	3.0-3.4	12 months at RT	3.0-3.4	3.0-3.4
	OCV(V)	CCV(V)										
Initial	3.0-3.4	3.0-3.4										
12 months at RT	3.0-3.4	3.0-3.4										
5.2.2	Service output	<p>Discharge load:15kΩ; discharge time:24 hours/day continuous discharge; end-point voltage:2.0V</p> <p>Remark: The initial samples shall be tested within 30 days after delivery</p>	<p>The initial samples ≥ 1050 hours</p> <p>After 12 months at room temperature ≥ 980 hours</p>									
5.2.3	Temperature characteristics	<p>Discharge load:15kΩ discharge time:24 hours/day continuous discharge; final voltage:2.0V</p> <p>The method of testing the load voltage: 15kΩ/1sec The initial samples shall be tested within 30 days after delivery</p>	<p>$0 \pm 2^{\circ}\text{C} \geq 850$ hours</p> <p>$60 \pm 2^{\circ}\text{C} \geq 980$ hours</p>									

5. 2. 4	Over-discharge	Continuously discharge at 15KΩ to 1. 2V	No leakage,no deformation; N=9, Ac=0, Re=1
5. 2. 5	High Temp.storage	Storage the samples at 60°C,RH below 70% for 30 days	No leakage; N=40, Ac=1, Re=2
5. 2. 6	Short circuit test	Short circuit at 55°C.Continued the test at least 1 hour after the cell external case temperature has returned to 55°C.	No explosion, no fire; N=5, Ac=0, Re=1.

5.2.2 Acceptance test:

- 1) 9 pieces of battery will be tested for each discharging method.
- 2) The average discharging time from each discharging method shall be equal to or greater than the specified figure, and no more than one battery has a service output less than 80% of the specified figure.
- 3) One retest is allowed to confirm the results if the first test did not meet the requirements.

5.3 Shelf life

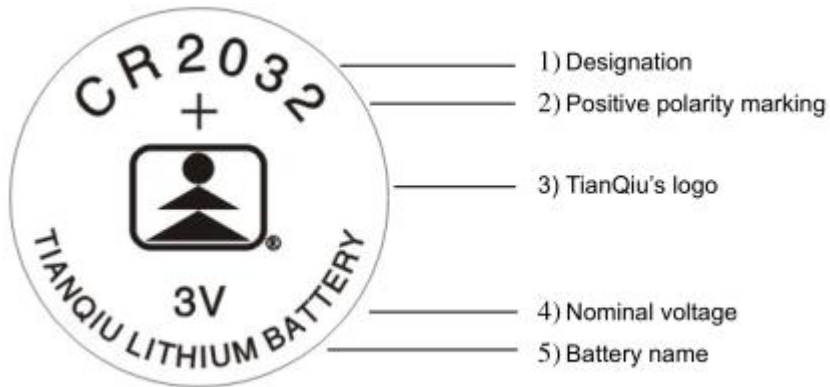
One year after delivery under normal storage conditions according to appendix E of GB/T 8897.1-2013.

6. Packing and Marking

Any specific design and packing requirements will be accommodated as enquired.

But as a general, the following markings will be printed, stamped or impressed on the body of the battery:

6.1 Marking design:



7. Caution for use

- 1) Since the battery is not designed to be charged, there are risks of electrolyte leakage or causing damage to the device if the battery is charged.
- 2) The battery shall be installed with its “+” and “-” polarity in correct position, otherwise may cause the battery to be charged or over-discharged.
- 3) Short-circuiting, heating, disposing of in fire and disassembling the battery are prohibited.
- 4) Battery cannot be forced discharge, which lead to excess internal gas generation and, may result in bulging, leakage and explosion.
- 5) New and used batteries cannot be mix used at the same time, when replaced batteries, it is recommend to replace all and with the same brand type.
- 6) Exhausted batteries should be removed from compartment to prevent over-discharge, which cause leakage and damage to the device.
- 7) Direct soldering is not allowed, which will damage the battery.
- 8) Keep the battery out of the reach of children to prevent swallow, in case of accident should contact physician at once
- 9) The battery should not be dismantled and deformed.

Caution:

If the product leaked, the electrolyte get into the eyes, do not rub, wash eyes with clean water, please immediately go to the hospital for treatment when necessary, otherwise the eyes will be damaged.

If the product emits an odor, fever, discoloration, deformation or any abnormal phenomena appeared in the process of use, storage, please remove the product immediately from the device.

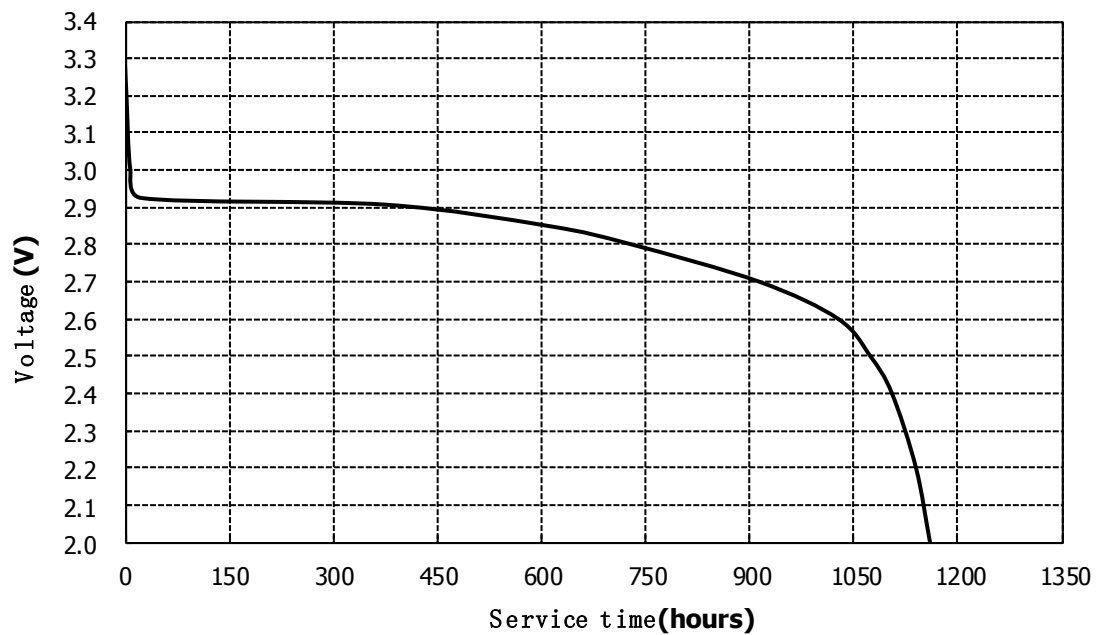
8. Referenced Standards

GB/T 8897.1-2013 Primary Batteries –Part 1: General

GB/T 8897.2-2013 Primary Batteries –Part 2: Physical and electrical specifications

GB/T 8897.4-2008 Primary Batteries –Part 4: Safety of Lithium batteries

9. Discharge curves



Discharge method: 15K Ω , 24hours/day, E.V.2.0V

Temperature: 20 \pm 2 $^{\circ}$ C

