

TECHNICAL SPECIFICATION

FOR

MANGANESE DIOXIDE LITHIUM BATTERY

TYPE:CR2032

Document No.	TMMQ/GPTD-BPS214	Effective date	2020-6-12
Edition	A01	Pages	Total 5 pages
Compiled		Revision	
Auditing		Approved	

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1. Scope

This specification is applicable to the Manganese Dioxide Lithium Battery CR2032 supplied by Guangdong TIANQIU electronic s Technology Co., LTD.

2. Designations

2.1 Defining

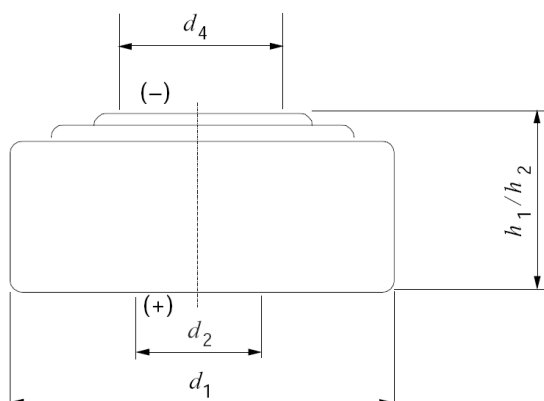
At the temperature of $20 \pm 2^\circ\text{C}$, loading at $15\text{k}\Omega$ continuous discharge, till the voltage down to 2.0V

3. Designations and Dimensions

3.1 Designations:

Manganese Dioxide Lithium Battery CR2032

3.2 Dimensions



SPEC code	specification standard(mm)	
	MAX	MIN
h1/h2	3.2	3.0
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	210mAh /0.63Wh
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: 3.2mm Maximum diameter: $\Phi 20\text{mm}$
Average weight	2.9g

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 Level 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 $\geq 1050\text{hrs}$ 12 months @ RT $\geq 980\text{hrs}$
5.2.3	Temperature characteristics	Load resistance: $15\text{k}\Omega$; Discharge method: 24 hrs/d continuously discharge; End point voltage 2.0V	$0\pm 2^{\circ}\text{C} \geq 850\text{hrs}$ $60\pm 2^{\circ}\text{C} \geq 980\text{hrs}$
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

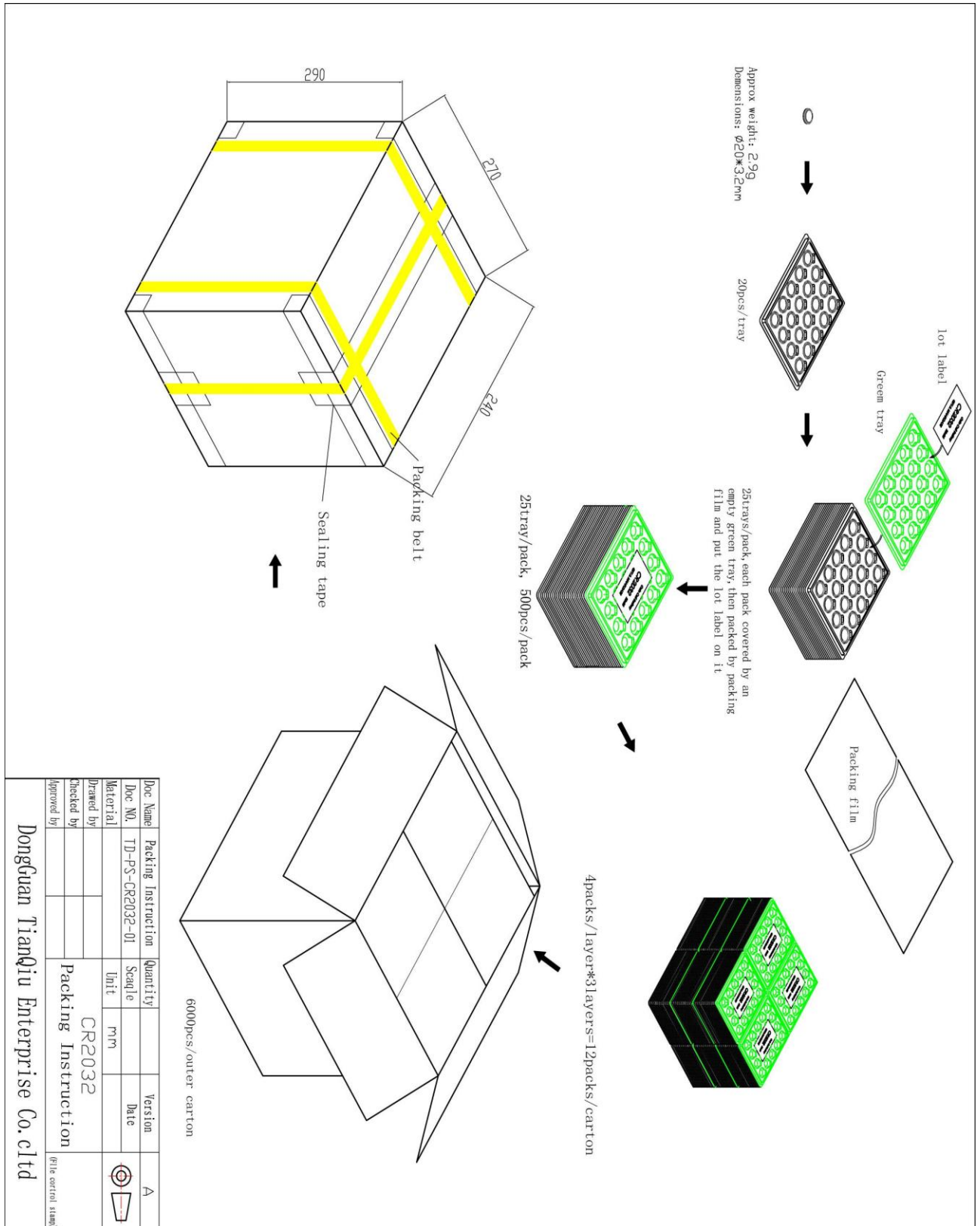
6. Packing and marking

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:

- 1) Designation: CR2032
- 2) Polarity Marking: " + " on the cathode can.

6.2 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.

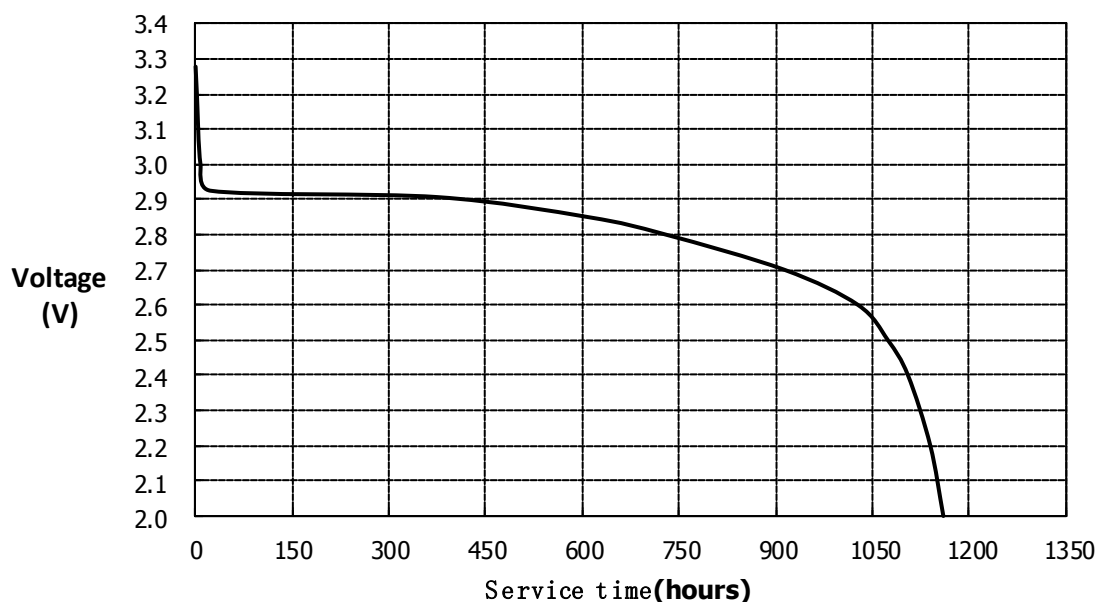
8. Referenced Standards

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: 15K Ω , 24 hours/day EV 2.0V
temperature of 20 $\pm$ 2 $^{\circ}$ C