

SPECIFICATIONS
FOR ALKALINE MANGANESE BUTTON CELL
(Safety Structure)

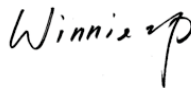
L1028F
(Mercury Free)

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Date : FEB 2021

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Alkaline Manganese Button Cell L1028F (Safety Structure)

1 · Scope

The specification is applicable to the “Vinnic” brand Alkaline Manganese Button Cell L1028F (Mercury free) supplied by CHUNG PAK BATTERY WORKS LTD.

2 · Kind of Products Specified

Vinnic	IEC	ANSI	JIS	Others
L1028F	/	1811A	/	A23, MN21, V23GA, GP23A

3 · Normative references

GB/T 8897.1-2013 Primary batteries –Part 1: General (IEC 60086-1:2015, MOD);

GB/T 8897.2-2013 Primary batteries –Part 2: Physical and electrical specifications (IEC 60086-2:2015, MOD);

GB/T 8897.3-2013 Primary batteries –Part 3: Watch batteries (IEC 60086-3:2016, MOD);

GB/T 8897.5-2013 Primary batteries –Part 5: Safety of batteries with aqueous electrolyte (IEC 60086-5:2011, IDT);

Conform to Directive 2006/66/EC.

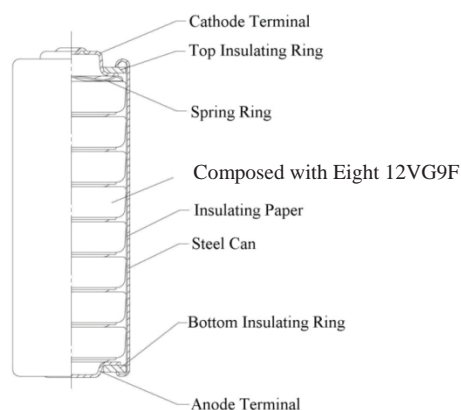
4 · Chemical System

Zinc-Manganese Dioxide (Potassium Hydroxide Electrolyte)

5 · Technical Specification

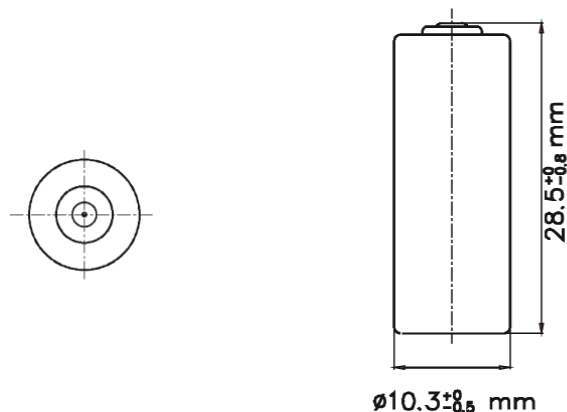
No.	Item	Characteristics		Remark
5.1	Model No.	L1028F		
5.2	Nominal Voltage	12.0V		
5.3	Nominal capacity (20±2℃)	54 mAh		Discharge at 20KΩ to 6.0V. The average discharging time of 9pcs batteries.
5.4	Typical Discharge Duration (20±2℃)	100 hrs		Discharge at 20KΩ to 6.0V. The average discharging time of 9pcs batteries.
		60 min		Discharge at 470Ω to 6.0V. The average discharging time of 9pcs batteries.
5.5	Dimension	Height (H)	28.5 ⁺⁰ _{-0.8} mm	
		Diameter (Φ)	10.3 ⁺⁰ _{-0.5} mm	
5.6	Average weight	8.10g		
5.7	Usage Temperature	0℃~40℃		
5.8	Storage Temperature	20±5℃		

5.9 The Drawing of Finished Battery :



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5.10 Outside Shape Dimensions and Terminals :



6 · Performance

6.1 Open-circuit Voltage :

Initial	$\cong 12.40$ V
After 12 Months Storage	$\cong 12.08$ V

6.2 Service Out-put :

Load Resistance	470 Ω	20K Ω
Discharge Method	Continuously	Continuously
End-point Voltage	6.0V	6.0V
Minimum Duration (Initial)	50 Min	95 Hrs
Minimum Duration (After 12 Months Storage)	40 Min	87 Hrs

Remark : The word " initial " is applicable to the products elapsed three months or less after production.

6.3 Resistance to leakage proof of High Temperature

Test Item	Condition	Period	Requirements
Resistance to leakage proof of High Temperature	Temp.: 45 \pm 2 $^{\circ}$ C RH: Below 70%RH	30 days	No deformation and no external electrolyte leakage shall be observed.

6.4 Safety Characteristics

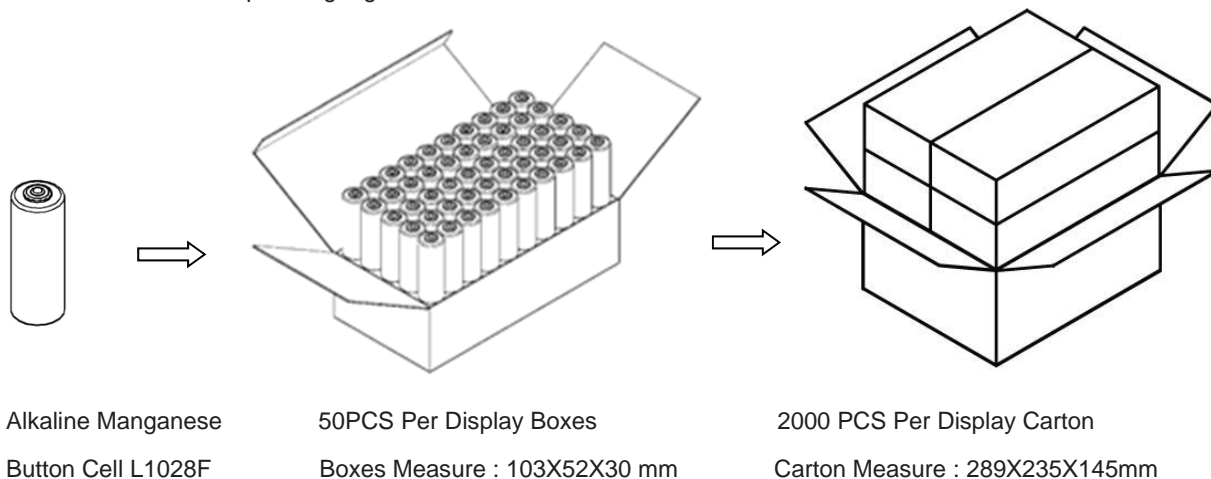
Test Item	Condition	Period	Requirements	Acceptance Standard
External Short Circuit	Temp.: 20 \pm 5 $^{\circ}$ C	24 hrs	No explosion	N=10 Ac=0, Re=1

6.5 Storage life: 18 months. (Temperature: 20 \pm 2 $^{\circ}$ C , Relative Humidity 55 \pm 20%)

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7 · Brand and packaging

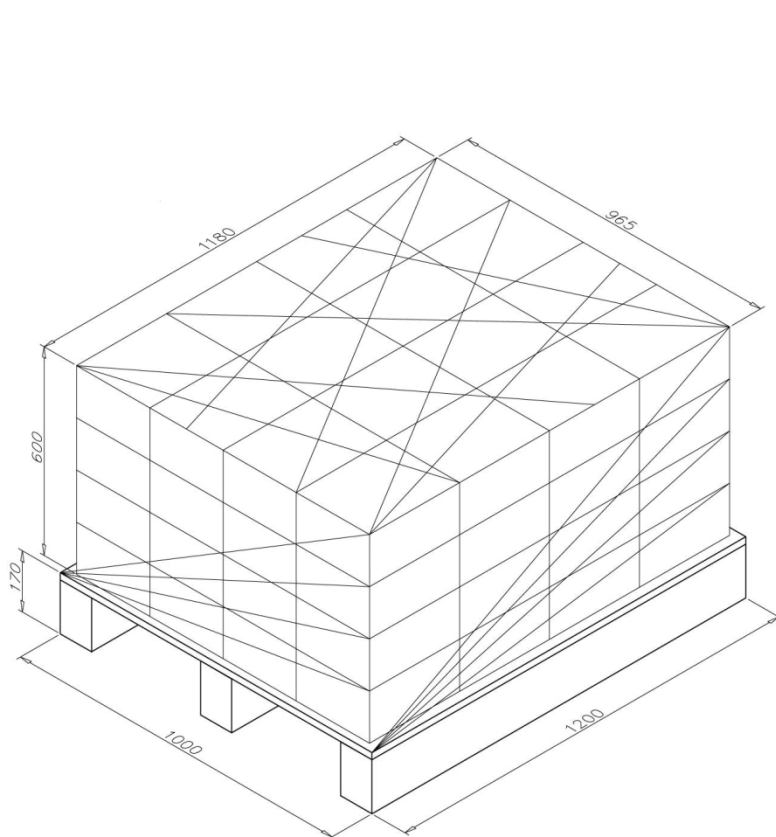
7.1 Standard and packaging



Alkaline Manganese
Button Cell L1028F

50PCS Per Display Boxes
Boxes Measure : 103X52X30 mm

2000 PCS Per Display Carton
Carton Measure : 289X235X145mm



Goods Dimension:

Height : 600mm

Length : 1180mm

Width : 965mm

Wooden Pallet:

Pallet Height : 170mm

Pallet Measure : 1200X1000mm

Weight :

Pallet Weight : 21 kgs

Net Weight : 1010.0 kgs

Gross Weight With Pallet : 1074.0 kgs

Quantity :

1 Layer = 16 Cartons

4 Layers X 16 Cartons =

64 Cartons / Pallet

7.2 Any specific design and packing requirements will be accommodated as required.

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8 · Safety instructions

! Caution

- Always insert batteries correctly with regard to the polarities (+ and -) marked on the battery and the equipment.



- Use Nickel-plated iron or Nickel-plated stainless steel for the terminals that contact the battery.
- Make sure that terminal contact pressure is 50g minimum, for a stable contact.
- Keep the battery and contact terminal surfaces clean and free from moisture and foreign matter.
- Before inserting the battery, check the battery contact terminals to make sure they are normal, not bent or damaged. (Bent terminals may not make good contact with the battery or may cause short circuit.)
- When the positive (+) and negative (-) terminals of a battery are in electrical contact with each other, the battery becomes short-circuited. This may result in venting, leakage, explosion and personal injury.



- Do not mix batteries of different types and brands, or new and used batteries. We are well informed that battery pack should be assembled with single batteries of similar voltage, capacity and inner resistance.



- Use a high impedance (1M or higher) voltmeter to measure battery voltage.
- Do not contact terminals with conductive i.e. metal, goods. Keep batteries in non-conductive, i.e. plastic, trays.
- Reduce impact to insulation layer from vibration, but the dimension will enlarge.
- Battery characteristics vary with type and grade, even when batteries are the same size and shape. When replacing batteries with new ones, be sure to carefully check the symbols and numbers on them.

! Danger

- Keep batteries out of the reach of children. Swallowing coin cells or batteries can cause chemical burns, perforation of soft tissue, and in severe cases can cause death. They need to be removed immediately if swallowed.



- Do NOT allow children to replace batteries without adult supervision.

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- Do NOT charge batteries. Attempting to charge a non-rechargeable (primary) battery may cause internal gas and/or heat generation resulting in venting, leakage, explosion and personal injury.



- Do NOT dismantle batteries. When a battery is dismantled or taken apart, contact with the components can be harmful and may cause personal injury or possibly fire.



- Do NOT deform batteries. Batteries should not be crushed, punctured, or otherwise mutilated. Such abuse may result in venting, leakage and explosion and cause personal injury.



- Do NOT dispose of batteries in fire. When batteries are disposed of in fire, the heat build-up may cause explosion personal injury. Do Not incinerate batteries except for approved disposal in a controlled incinerator.



- Do NOT heat batteries. When a battery is exposed to heat, venting, leakage and explosion may occur and cause personal injury.
- DO NOT over-discharge the battery. In case the battery is over-discharged when connected with exterior power source or connected with other batteries in series, explosion may occur.
- When storing a battery or throwing it away, be sure to cover it with tape. If the battery is contacted with other metal objects, it could cause fire or become damaged.

! Warning

- Thoroughly read the user's manual before use, inaccurate handling may cause leakage, heat, smoke, explosion, or fire, causing device trouble or injury.
- Insert the battery with the "+" and "-" ends correctly oriented.
- If the battery is used together with new batteries, do not use it with a different type battery.
- Do not solder the battery directly. Protect the welding point and connector.
- The battery should be preferably stored in dry and cool conditions. Avoid storing the battery in direct sunlight, or in excessively hot and humid place. Storage at high temperature must be avoided to preserve the battery life time.

! Storage

- The cell should be preferably stored in dry and cool conditions.

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Appendix 1 : Test

1. Storage and Test Conditions for Samples

Unless otherwise specified, the storage conditions for samples shall be, as a general rule, at the temperature of $20\pm 2^{\circ}\text{C}$ and the humidity of $55\pm 20\%$.

2. Measuring Instruments

2.1 Voltmeter : The accuracy of the measuring equipment shall be $\leq 0.25\%$ and the precision shall be $\leq 50\%$ of the value of the last significant digit. The internal resistance of the measuring instrument shall be $\geq 1\text{M}\Omega$.

2.2 Load Resistance : The load resistance shall include all of the external circuit, and its allowance shall be within $\pm 0.5\%$.

2.3 Caliper : The caliper shall be the one having precision of 0.02 millimeters or the one having the same or superior precision to this.

3. Test Method

3.1 Dimensions : Measurements shall be made by use of the calipers.

3.2 Appearance : Examination shall be carried out by visual inspection .

3.3 Open-circuit Voltage : Measurements shall be carried out before the start of discharge of the sample by use of the voltmeter .

3.4 Service Out-put

Discharge Start time : After leaving in an atmosphere at a temperature of $20\pm 2^{\circ}\text{C}$ for at least 8 hours or more .

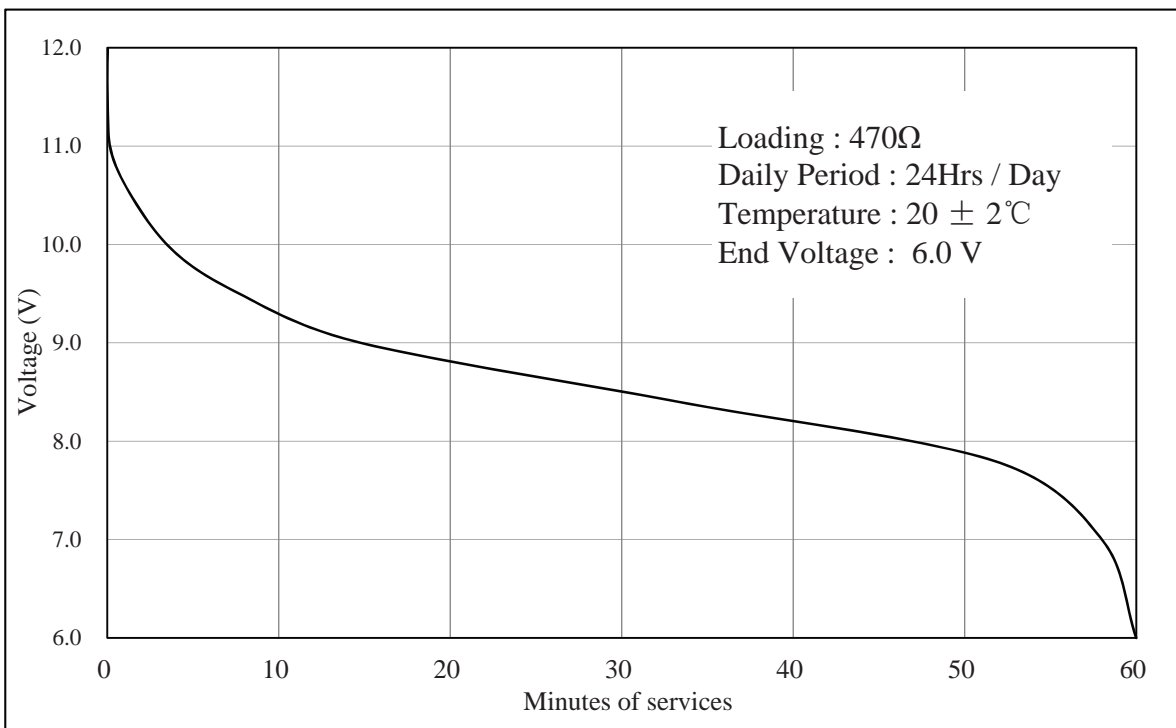
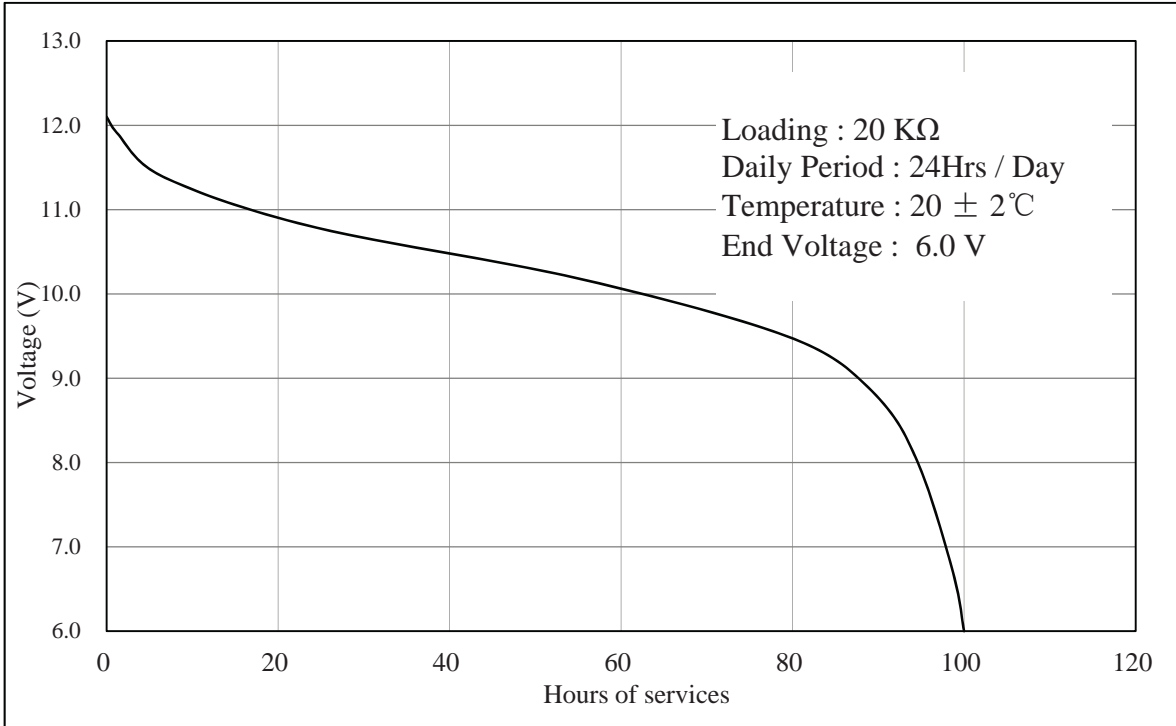
Discharge Method : As defined in 6.2 , page 2 .

Discharge End-point : The instant when the closed-circuit voltage has reached below the end-point voltage(as defined in 6.2, page 2).

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Appendix 2 : Discharge Characteristics

Standard Discharge Curve :



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Temperature Characteristic :

