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Shenzhen chenmu Industrial Co., Ltd

Lithium thionyl chloride cylindrical battery

Product specification

Battery model:ER10280

Implementation date：2016.08.11

Prepared by：_____Date：_____

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1 Scope

This product specification is applicable to er10280 lithium / thionyl chloride battery produced by Hangzhou Yiyang Electronic Technology Co., Ltd. it specifies the performance index, testing method and safety precautions of the product.

2. Basic characteristics of products

2.1 nominal voltage: 3.60v

2.2 standard capacity: 0.45ah (discharge from 0.5mA to 2.0V at 23 ℃± 2 ℃)

2.3 service temperature: - 55 ℃ to + 85 ℃

2.4 maximum weight: 6g

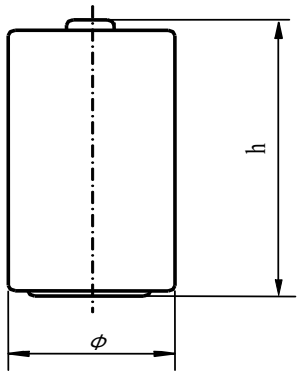
2.5 maximum continuous working current: 10mA (within 30 days after offline, when there is no voltage lag at 20 ℃± 10 ℃, continuous discharge can be carried out under this current. With the change of storage time, environment and working discharge conditions, continuous discharge capacity will decrease. If you have any questions, you can consult by telephone.)

2.6 maximum pulse working current: 15mA (within 30 days after offline, when there is no voltage lag at 20 ℃± 10 ℃, pulse discharge can be carried out under this current. With the change of storage time, environment and pulse working discharge conditions, the pulse discharge capacity will decrease. If you have any questions, you can call.)

2.7 maximum dimension: diameter Φ: 10.4mm, height H: 28.0mm

2.8 annual average volume drop rate: ≤ 2%

3 Outline drawing



4 appearance

Check the battery with eyes, the appearance is clean, the mark is clear,noscratch deformation, no rust, leakage and other phenomena.

5 performance and test method

5.1 electrical performance

1

Test items	test method	Test standard	
Open circuit voltage	Measurement with three and a half digit voltmeter	3.65～3.70V（23℃±2℃）	The test data are typical voltage values
		3.65～3.74V（-40℃±2℃）	
		3.63～3.70V（85℃±2℃）	
Load voltage	The resistance is 1.2k Ω and the time is less than 10s	≥3.30V（23℃±2℃）	
working voltage	3.6kΩ load discharge	≥3.40V（23℃±2℃）	
		≥3.0V（-40℃±2℃）	
		≥3.40V（85℃±2℃）	
Standard discharge	7.2KΩ, continuous discharge to 2.0V at 23 ℃± 2 ℃	≥0.45Ah	
Fast discharge	1.1 K Ω, continuous discharge to 2.0 V at 23 ℃± 2 ℃	≥0.30Ah	
Conventional discharge	3K Ω, continuous discharge to 2.0V at 23 ℃± 2 ℃	≥0.38Ah	
High temperature discharge	3K Ω, continuous discharge to 2.0V at 55 ℃ ± 2 ℃ Discharge after 16 hours at 55 ± 2 ℃	≥0.34Ah	
Low temperature discharge	3K Ω, discharge continuously to 1.8V at - 40 ℃ ± 2 ℃ for 16 hours at - 40 ± 2 ℃	≥0.12Ah	

5.2 Environmental adaptability

2

Test items	Test method	Criteria for determination

temperature To attack	A) The battery is placed in the test box, and the air temperature in the box is adjusted to -40 (+) 3 (+) C, and kept for at least 4 hours; B) The batteries are transferred to a test box with a temperature of 70 (+) 3 (+) within 5 minutes; C) Batteries are kept at least 4 hours at 70 (+) 3 (+) C; D) The batteries are transferred to a test box with a temperature of -40 (+) 3 (+) within 5 minutes; E) Batteries are kept at least 4 hours at -40 (+) 3 (+) C; F) Repeat steps 2 to 5 three times; G) The batteries are transferred to a test box with a temperature of 70 (+) 3 (+) within 5 minutes; H) Batteries are kept at least 4 hours at 70 (+) 3 (+) C; I) Keep the battery for at least 4 hours under 6.2 conditions to check appearance and open-circuit voltage;	The open circuit voltage conforms to Table 1, the battery does not explode, No fire, no leakage

2

Pilot projects	Test method	Criteria for determination
Low Frequency Vibration	The battery is firmly fixed to the shaking table, and a simple resonance with an amplitude of 0.8 mm (double amplitude of 1.6 mm), a frequency change rate of 1 Hz/min and a frequency range of 10-55 Hz is applied. The round-trip vibration was 95 min +5 min. The battery vibrates in both axial and radial directions. Remove the battery after each vibration and measure the battery open voltage within 3 minutes.	The open circuit voltage conforms to Table 1, the battery does not explode, No fire, no leakage
Drop	At ambient temperature, drop the battery from 76cm height to the cement floor in any direction, and drop it 6 times repeatedly to observe the test results.	The open circuit voltage conforms to Table 1, the battery does not explode, No fire, no leakage
Low Pressure	Put the battery in the vacuum test box with a pressure of 11.6 kPa and a temperature of 25 (+) 2 (+) C for 6 hours. Observe the test results.	The open circuit voltage conforms to Table 1, the battery does not explode, No fire, no leakage
To attack	The batteries should be firmly fixed on the test bench and the batteries should be tested with equal amplitude impact in both axial and radial directions.The minimum average acceleration of the battery is 735 m/s2 in the first 3 ms, and the peak acceleration is 125m/s2-1715 m/s2.Measure the open-circuit voltage of the battery after the test and observe the test results.	The open circuit voltage conforms to Table 1, the battery does not explode, No fire, no leakage、

5.3 Security

表 3

Pilot projects	Security	Criteria for determination
short circuit test	At room temperature, short-circuit the positive and negative poles of the batteries with copper wires with resistance less than 0.1_until the batteries fire or explode or the rising temperature of the battery housing drops to the ambient temperature. Observe the test results.	Allow release without explosion or fire

Charge test	Charge the battery with a 12V DC power supply and connect a suitable resistance in series so that the charging current is initially 0.02A (not required to be maintained all the time), and the charging time is at least 12h. Observe the test results.	Allow release without explosion or fire
Heating test	Place the battery in the high temperature box and heat it up at 5 C/min for 10 min at 130 C. Observe the test results.	Allow release without explosion or fire
Force discharge	Connect the exhausted test batteries in series with three new batteries of the same type. Short-circuit the positive and negative poles of the batteries with copper wires with resistance less than 0.1_. Stop the test by lowering the temperature of the battery to ambient temperature for ignition, explosion, leakage or enclosure.	Allow release without explosion or fire

6. experimental condition

6.1 Initial Test:

Unless otherwise specified, routine performance testing must be completed within 45 days of receiving the battery.

6.2 Temperature, Humidity:

In the absence of special regulations, the tests should be carried out at 20 (+) 5 (+) C with relative humidity ranging from 45% to 75%.

6.3 Test Equipment:

6.3.1 Dimension Measuring Instrument: A cursor caliper with a measurement error not greater than +0.02mm or a measure with the same precision.

6.3.2 Voltmeter: A DC voltmeter with an accuracy of not less than 0.25% and an internal resistance of not less than 10M.

6.3.3 Precision resistance: Relative error is less than 0.5%.

6.3.4 Resistance Box: Relative error is less than 0.5%.

6.3.5 Electrothermal Thermostatic Drying Tank: Absolute error is less than (+) 2 C.

7 Shipment Inspection

Shipping inspection is divided into four groups: A, B, C and D. When the customer requests an inspection report, the report is sent to the customer along with the product.

7.1 Shipping lot

A shipment lot shall consist of all products produced under essentially the same conditions, with the same structure, physical dimensions and extreme forms, and all products shall be produced in the same production cycle using the same materials and processes.

Group 7.2 A Test

According to a batch battery delivered under a contract or order, Group A inspection carries out 100% shipment inspection according to the inspection items and order specified in Table 4. Only batteries that pass Group A inspection can carry out Group B and Group C inspection. Group A Batteries that fail to meet any of the requirements in Table 4 shall be classified as defective and removed from the batch. When the number of defective batteries exceeds 4% of the batch, the batch is rejected.

表 4Group A Test

Number	Inspection items	Test methods and criteria
1	Appearance	4, 5.1
2	Open circuit voltage	
3	Load Voltage	

7.3 Group B Test

Group B inspections are carried out according to the items and order specified in Table 5, and sampling plans and decision rules are carried out according to Table 5.

表 5 Group B Test

Number	Inspection	Test methods and criteria	Sampling scheme

			Inspection	AQL
1	Shape size	2, 3	S-3	0.65
2	Weight			

7.4 Group C Test

Group C inspections are carried out by taking samples from the shipment batches, and the number of samples is carried out according to Table 6. The test results meet the requirements of Table 1.

表 6 Group C Test

Batch Products	Number of Samples	Sample Assignment
1～100	6	Quick Discharge and Conventional Discharge Detection Half Battery
100～2000	10	
2000～10000	14	
More than 10000	18	

7.4.1 Group C Test Decision Rules

7.4.1.1When the average discharge capacity is not less than the standard value specified in Table 1, and the number of batteries less than 90% of the standard value is 0, the battery capacity is determined to be qualified.

7.4.1.2When the average discharge capacity is lower than the standard value specified in Table 1, or when the number of batteries 90% below the standard value is greater than 0, the samples are re-sampled for testing. If the average discharge capacity is not lower than the standard value specified in Table 1 and the number of batteries 90% below the standard value is not greater than 0, the battery capacity is determined to be qualified.

7.4.1.3If the average discharge capacity in the second test is lower than the standard value specified in Table 1, or if the number of batteries less than 90% of the standard value is greater than 0, the battery capacity is determined to be unqualified.

7.5 Group D Test

Group D test samples were collected from shipment batches that passed Group C test and stored under 12 specified environmental conditions. Battery appearance and open circuit voltage were tested every 12 months, and 9 samples were sampled for 3 K capacity discharge. The test results met the requirements of Items 2.8, 2.9, 4,5.1.

8 Packing

Specifications for battery case, weight see Table 7

表 7

Outline dimensions of cartons	Net weight of packing box	Gross weight of box	Number of Batteries
545×305×470mm	14kg	15kg	2000 pcs/box

9 Plates and Signs

The plate and marking of the battery should be kept clear, without peeling off and obvious color difference.

9.1 nameplate

The plate (trademark) of batteries includes battery type, rated voltage, production date code, warning mark, etc.

9.2 Coding

The battery production date code is represented by six digits. The first two digits represent the year, and the middle two represent the month. The last two digits represent the date.

For example, the code "140220" indicates that the battery was manufactured on February 20, 2014.

9.3 Extreme Marker

Labeled on the side of the battery, '+' '-' denotes the positive and negative extremes respectively.

10 Transport

- Batteries should be protected from sunlight, fire, rain, water immersion and corrosive substances during transportation.- Shock and vibration during transportation and handling should be limited to a minimum.

- For paper boxes, the stacking height must not exceed 1.5 meters.

- Keep batteries away from engines when transporting batteries for long distances; do not stay in an unventilated environment for long periods in summer.

11 Security precautions

Because there are some dangers in the transportation, storage and use of this product, leakage may occur if the operation is incorrect, or even

Explosion, please read this product specification carefully before you use this product, and save it for reference.

- Batteries must not be discharged, extruded or burned.

- Short circuit and charging of batteries is strictly prohibited.

- Disassembly of batteries by users is strictly prohibited

- It is strictly forbidden to use or heat up outside the allowable temperature range.

- It is strictly forbidden to weld directly on the battery surface.

- Batteries with severe wounds or deformation are strictly prohibited.

- It is strictly forbidden to use batteries with dry batteries or other primary batteries, nor to use batteries in different packages, models or brands

Batteries are used together.

- It is strictly forbidden to mix old and new batteries.

- Pay attention to the positive and negative poles of the batteries when loading the device.

- When the battery is in use to the end voltage, it should be removed from the instrument in time.

- When not in use for a long time, remove the battery from the device and store it in a low temperature and humidity environment.

- Series and parallel connection of batteries should contact our company.

- Used batteries should be treated according to local environmental regulations.

- Stop using the battery if you notice heat, odor, discoloration, distortion or other abnormalities during use or storage.

12 Storage

- Batteries should be used and stored away from static electricity.

- Batteries should be stored at temperatures not exceeding 30 C and relative humidity between 45% and 75%.

- Keep batteries away from heat sources and from direct sunlight when storing them. Keep them clean, cool, dry and ventilated, free from climate.

- The stacking height of batteries depends on the packaging strength. Generally speaking, the stacking height of paper boxes should not exceed 1.5 meters and wooden boxes should not exceed 3 meters.

- Batteries are stored and displayed in the original package. Batteries cannot be stacked in disorder after unpacking, which may cause short circuit and damage to batteries.

13 Recommendations for use

- Batteries have the highest energy utilization when used with the positive pole facing up extremely. It is recommended that the battery be placed upright when designing the battery compartment.

- Batteries are used in relatively shady locations at ambient temperatures to avoid long-term use in high temperature and humidity environments.

14 Declaration

If you have any questions about the specifications of this product, please contact Hangzhou Yiyang Electronic Technology Co., Ltd.Hangzhou Yiyang Electronic Technology Co., Ltd. reserves the right to change the specification of this product.

Fig.1 Lithium-thionyl chloride battery (energy type) configuration

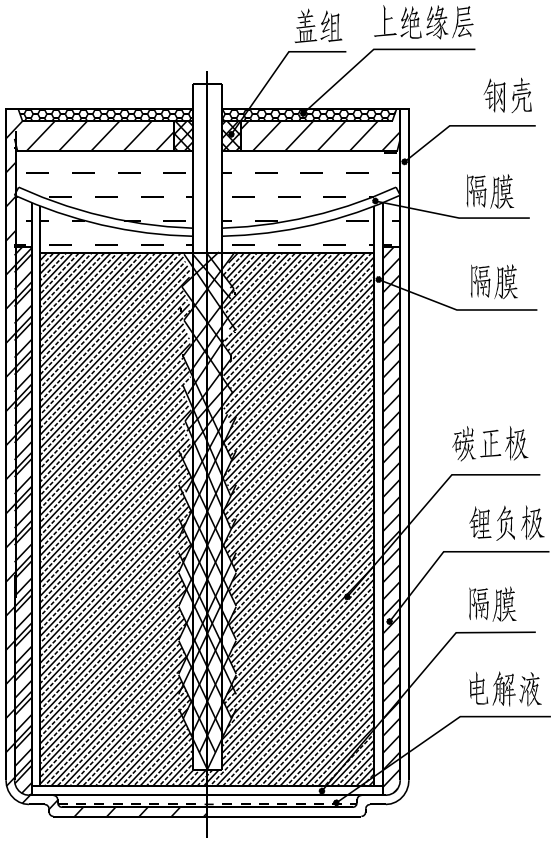


Fig.2 Typical curves of battery performance

Chart of discharge characteristics under different loads at normal temperature

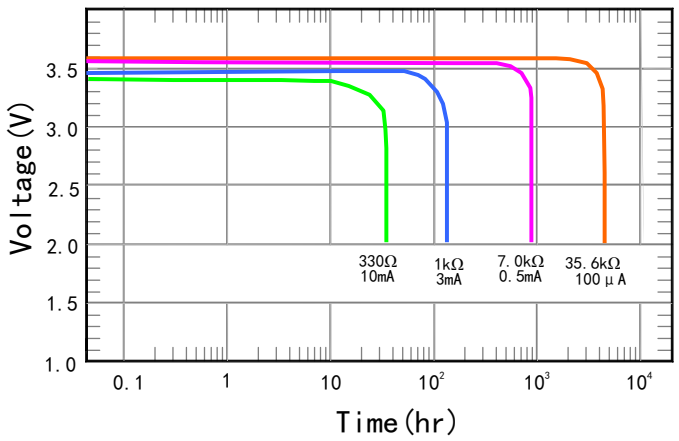


Chart of different discharge current and discharge capacity

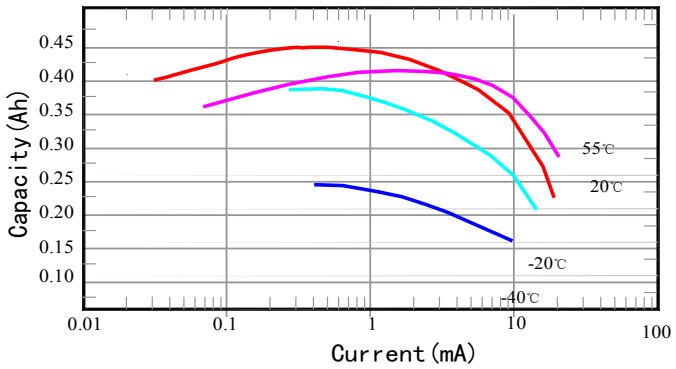
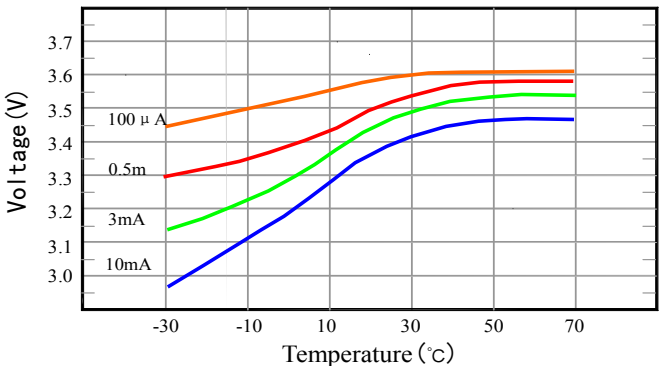
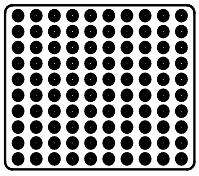


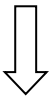
Chart of Voltage Platform at Different Temperatures



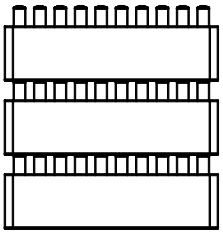
附图 3 Product packing

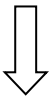
1. 100 batteries per disk





2. 20 batteries per box





3. 2000 batteries per box, net weight 14kg, gross weight 15kg