

LITHIUM COIN CELL SPECIFICATION / MODEL : CR2032

1 Scope

This technology specification covers lithium/manganese dioxide coin cells of Model CR2032

2 Technology parameters

- 2.1 Model: CR2032
- 2.2 Nominal voltage: 3.0V
- 2.3 Nominal capacity: 210mAh (Continuously discharged under 15k Ω load till 2.0V end-voltage at the temperature of $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$)
- 2.4 Operating temperature range: -20°C to 60°C
- 2.5 Storage temperature range: $<30^{\circ}\text{C}$
- 2.6 Outer dimensions: Diameter: $\Phi 20.0^{+0.0}_{-0.3}\text{mm}$, Height: $3.20^{+0.0}_{-0.2}\text{mm}$
- 2.7 Nominal weight: 3.0g.
- 2.8 Structures: Manganese dioxide cathode, lithium anode, organic electrolyte, polypropylene separator and stainless steel cell can and anode cap.

3 Characteristics and test

- 3.1 Dimensions:

Dimensions shall be measured with instruments specified in subparagraph 4.3. The result must conform to 2.6.
- 3.2 Off-load voltage:

The samples shall be kept standing open for 24h or longer at a temperature of 25°C , and the voltage between both terminals at the same temperature shall be measured with a voltmeter specified in subparagraph 4.3. The result must conform to table 1.
- 3.3 On-load voltage:

The samples shall be kept standing open for 24h or longer at a temperature of 25°C , and the voltage between both terminals at the same temperature shall be measured with a voltmeter specified in subparagraph 4.3 while a exactitude resistance value 15k Ω (including resistance throughout external circuits) is connected between both terminals at the same temperature as specified. The result must conform to table 1.

3.4 Duration:

The samples shall be kept for 24h or longer at a temperature of 25℃, and shall then be continuously discharged at 25℃ under 15kΩ load to 2.0V end-voltage. The result must conform to table 1.

3.5 Appearance: The appearance of batteries shall be inspected by visual means. The superficies of the cells are clean and slippery. The mark is clear. The batteries shall have no deformation, dent, stain or camber.

3.6 Terminals:

The terminals have a nicer electroconductibility. There is no rust or leakage within the term of recommend use.

3.7 Leakage characteristics:

The samples shall be stored for 48hours at a temperature of 60℃ and a relative humidity of 90%, then take a view of them at a temperature of 25℃, a relative humidity of 65%±20%, there must be no leakage cells.

3.8 Storage characteristics:

The samples shall be stored for 12 month at a temperature of 25℃, a relative humidity of 65%±20%. Then the samples shall be continuously discharged at 25℃ under 15kΩ load to 2.0V end-voltage.

Self-discharging rate is to be calculated using the formula:

$$\text{Self-discharging rate (\%)} = \frac{A1-A2}{A1} \times 100$$

A1——Average initial discharge life.

A2——Average discharge life after storage.

The result must conform to table 2.

3.9 Vibration durability:

The sample is to be subjected to simple harmonic motion with an amplitude of 0.8mm (1.6mm total maximum excursion). The frequency is to be varied at the rate of 1 hertz per minute between 10 and 55 hertz, and return in not less than 90 nor more than 100 minutes. The sample is to be tested in three mutually perpendicular directions. After the

test, the sample must conform to table 1.

3.10 Drop durability:

The samples are dropped ten times from a height of 1.9m onto a concrete floor. The samples are to be randomly oriented when released to obtain impacts in several positions. There is no distortion, no leakage, no explosion, no fire. The sample must conform to table 1.

3.11 Short-circuit durability :

Each test sample cell is to be short-circuited by connecting the positive and negative terminals of the battery with a minimum length of $\phi 1.3\text{mm}^2$ copper wire. The battery is to discharge until it is completely discharged and the battery case temperature returned to near $55^\circ\text{C} \pm 2^\circ\text{C}$. There is no explosion, no fire.

4 Condition of testing

4.1 Initial Test:

Means the test begin in three months after the cell produced.

4.2 Temperature, humidity:

As for as there is no special requirement, testing should be placed under normal temperature 25°C and Relative humidity of $60\% \pm 20\%$.

4.3 Test facility: 4.3.1 Outer micrometers: Instruments which tolerance shall be $\pm 0.02\text{mm}$ or below and those having equal or better accuracy shall be used.

4.3.2 DC voltmeters: Precision is 0.25 rate or better and the input resistor shall be $10\text{M}\Omega$ or more.

4.3.3 Exactitude resistance: Relative error is 0.5% or below.

4.3.4 Resistance box: Relative error is 0.5% or below.

4.3.5 Electrical drying box : Tolerances shall be $\pm 2^\circ\text{C}$ or below.

5 Mark

5.1 Battery type: CR2032

5.2 Nominal voltage: 3.0V

5.3 Polarity: +

5.4 Manufacturing marks: The year and month of production shall be marked on negative terminal when needed.

6 Others

6.1. Caution: Please read the caution carefully before used.

Fire and burn hazard. Do not recharge, disassemble, heat or incinerate. Keep battery out of reach of children and in original package until ready to use. Installed the cell correctly. Dispose of used batteries promptly. If swallowed contact physician immediately.

6.2. About the technology specification modified : This technology specification may be modified when needed.

6.3. Forestall notify: We will notify our customers when the plant or materials or technology is modified.

CR2032 Characteristics table

Table 1

Project	Condition	Test temperature	Characteristics	
Off-load voltage	Off-load	25℃	>3.05v	
		0℃	>3.05v	
On-load voltage	15k Ω load after 0.8S	25℃	>3.05v	
		0℃	>3.05v	
service output	Continuously discharged under 15k Ω load till 2.0V end-voltage	25℃	Standard	1000h
			Min value	800h
		0℃	Standard	850h
			Min value	680h

Table 2

Project	Condition	Characteristics	
Thermal durability	Kept for 48 hours at 60℃, then continuously discharged under 15k Ω load till 2.0V end-voltage	Standard	935h
		Min value	748h
Self-charging rate	Stored for 12 month at normal temperature, then continuously discharged under 15k Ω load till 2.0V end-voltage	Less than 10%	
	Stored for 24 month at normal temperature, then continuously discharged under 15k Ω load till 2.0V end-voltage	Less than 30%	

7 Inspection rules

7.1 Deliver inspection: Depending on GB2828

Table 3

Number	Test	Item	IL	AQL
1	Dimensions	3.1	S-2	0.4
2	Appearance	3.5	II	1.0
3	Terminals	3.6	II	0.4
4	On-load voltage	3.3	II	0.4

7.2 Routine inspection: Depending on GB2829 and QB/T2389

7.3 Inspection for service output

7.3.1 9 samples shall be tested for service output

7.3.2 If the average value is equal to or more than the value of table 1, and if the number of batteries showing a value less than 80% of the value of table 1 is 1 or less. The batteries are considered to conform to the requirement.

7.3.3 If the average value is less than the value of table 1, or if the number of batteries showing a value less than 80% is 2 or more, the test shall be repeated with other 9 pieces. At the second test, if the average value is equal to or more than the value of table 1, and if the number of batteries showing a value less than 80% of the value of table 1 is 1 or less, these batteries are considered to conform to the requirement.

7.3.4 At above second test, if the average value is less than the value of table 1, or if the number of batteries showing a value less than 80% of the value of table 1 is 2 or more, the batteries are considered not to conform to the requirement. A third test shall not be performed.

Fig.1

CR2032 Cross section view

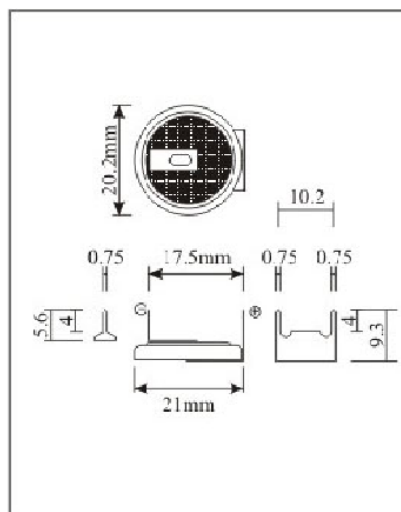
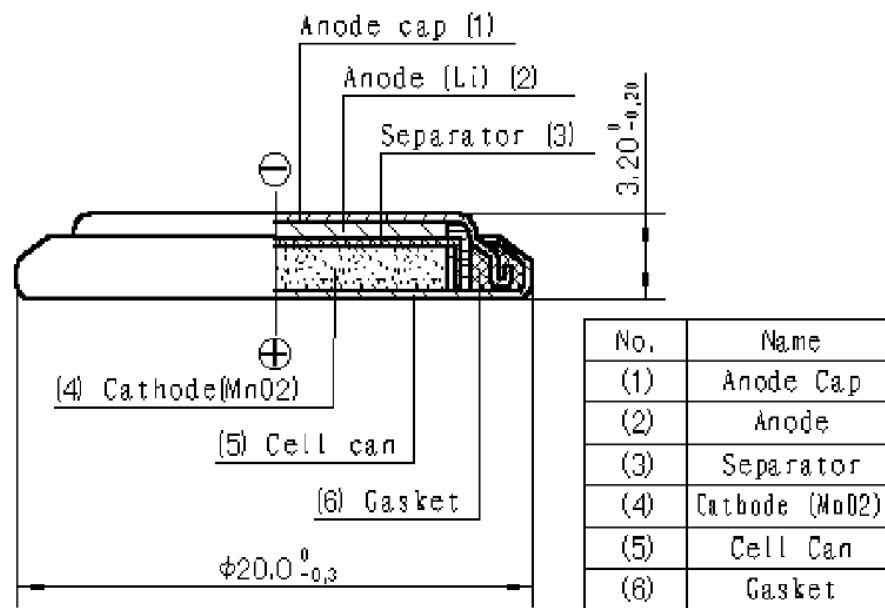
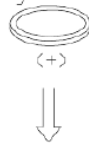


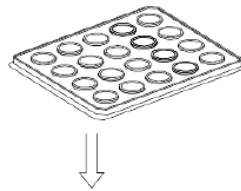
Fig.2

Structure Figure of Package
CR2032 4000 Pcs Per Box

1. Battery(-)

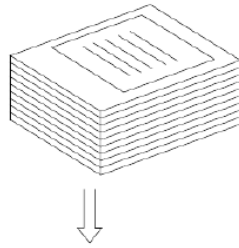


2. 20 Pcs Per Plate

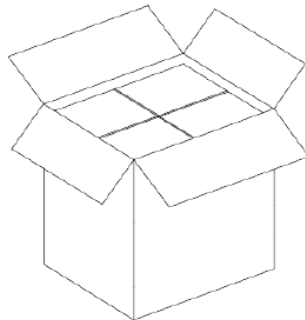


Outline Dimensions of
Plate: 136x168x7

3. 10 Plates Per Min Package



4. 20 Min Package Per Box



Outline Dimensions of
Box: 355x285x275
Net: 11kg
Gross: 15kg