

**REFERENCE**ALPHA-PLUS CO., LTD. / OFFICE IV BLD.1

Specification	
Lithium Primary Battery	
Ordering code	CR-123APA/BE
Model code	CR123A

This is the PROVISIONAL SPECIFICATION just only for the engineering review on our product herein. Also, this is a reference documents for reviewing characteristics of our product, which is for prevention any trouble or misuse. Since this is just for customer's reference, the description for warranty herein shall be handled with the formal specification, which shall be agreed upon between the customer and IS Company of Panasonic Corporation. Please note that all descriptions specify this product maybe possibly changed without notification if we decide it is required.

Approved by

Division/Department

Name

Signature/date

Date of Issue : Nov.27,2020  
Industrial Solutions Company  
Panasonic Corporation

Drafted

Y.Kashimura

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## 1. Application Range

This specification is applied to Manganese dioxide Lithium batteries, CR-123APA/BE (the products) which are manufactured by Industrial Solutions (IS) Company, Panasonic Corporation.

## 2. Nominal Specification

2-1 Ordering code(Model code)	CR-123APA/BE (CR123A)
2-2 Nominal Voltage	3V
2-3 Nominal Capacity	1,550mAh (Nominal capacity is based on the standard discharge current and cut-off voltage 1.8V at 20°C.)
2-4 Standard Discharge Load	100Ω
2-5 Maximum Continuous Discharge Current	1A at 20°C
2-6 Dimensions	Refer to attached drawing
2-7 Mass (bare cell)	Approx. 16g
2-8 Appearance	No noticeable deformation
2-9 Temperature	Operating; -40°C to 70°C (Non condensing) (Note: Contact Panasonic in case of using the battery out of the specified temperature range above.)
2-10 Recommendable Storage Condition	Temperature: 5°C to 35°C Humidity: Less than 70% R.H.
2-11 Battery Composition	Lithium primary battery is composed of cathode from Manganese dioxide, anode from Lithium, and electrolyte from organic solvent and lithium salt.

## 3. Characteristics

3-1 Open Circuit Voltage	
3-1-1 Initial	Between 3.0V and 3.5V (The measuring method is described in item 5-3-1.)
3-1-2 After 1 year storage at 25±5°C (humidity : less than 70%R.H.)	Between 3.0V and 3.5V (The measuring method is described in item 5-3-1.)
3-2 Impedance	
3-2-1 Initial	Between 0.1Ω and 1.0Ω (The measuring method is described in item 5-3-2.)
3-2-2 After 1 year storage at 25±5°C (humidity : less than 70%R.H.)	Between 0.1Ω and 1.0Ω (The measuring method is described in item 5-3-2.)
3-3 Duration(Pulse cycles)	
3-3-1 Initial	Min. 1500cycles (20±3°C) Min. 700cycles (-20±3°C) (The measuring method is described in item 5-3-3.)
3-3-2 After 1 year storage at 25±5°C (humidity : less than 70%R.H.)	Min. 1500cycles (20±3°C) Min. 700cycles (-20±3°C) (The measuring method is described in item 5-3-3.)
3-4 Vibration Resistance	Deterioration of performance (3-1) shall not occur after the test described in item 5-3-4.
3-5 High Temperature Storage	The battery shall not show leakage after the high temperature storage described in item 5-3-5.

#### 4. Test Condition

4-1 Test Condition	Unless otherwise specified the test shall be carried out at, Temperature : $20\pm 2^{\circ}\text{C}$ Humidity : $65\pm 20\%$ R.H.
4-2 Test Timing	The test shall be started within a month from delivered day.
4-3 Measurement Instrument	
4-3-1 Voltage Meter	Input impedance : $\geq 10\text{M}\Omega$ Measurement error : $\leq 0.5\%$
4-3-2 Battery Impedance Meter	Sine-wave AC method (1kHz, 0.1mA) (As a general, Hioki LCR Meter IM3523 with DC BIAS VOLTAGE UNIT 9268-10 is recommended.)
4-3-3 Caliper	Those with an accuracy higher than the current JIS B 7507

#### 5. Measuring Method

5-1 Dimensions	This shall be measured with the caliper described in item 4-3-3.
5-2 Appearance	Deformation or tarnish shall be checked by visual observation method.
5-3 Characteristics	
5-3-1 Open Circuit Voltage	This shall be measured with the voltage meter described in item 4-3-1.
5-3-2 Impedance	This shall be measured with the impedance meter described in item 4-3-2.
5-3-3 Duration(Pulse cycles)	This shall be measured by constant resistance discharge method. Test temperature : $20\pm 3^{\circ}\text{C}$ $-20\pm 3^{\circ}\text{C}$ Pulse pattern : 0.9A 3secON $\Leftrightarrow$ 27secOFF End voltage : 1.55V ( $20\pm 3^{\circ}\text{C}$ ) 1.20V ( $-20\pm 3^{\circ}\text{C}$ )
5-3-4 Vibration Test	This test shall be carried out by the following condition according to UN Manual of Test and Criteria, Part III, sub-section 38.3.4.3 Amplitude: 0.8mm Frequency: 7 $\Leftrightarrow$ 200Hz Directions: X, Y, Z Duration: 15 minutes, 12 times (each direction)
5-3-5 High Temperature Storage	The battery shall be stored at $60^{\circ}\text{C}$ for 30 days. After the storage, the battery shall be kept in dry place at $25\pm 5^{\circ}\text{C}$ during 4hours, then leakage and appearance shall be checked by visual observation method.

## 6. Indication

### 6.1 Below items are indicated on the side surface of the battery.

(Design of indication is possibly modified without prior announcement.)

Model code	CR123A
Nominal voltage	3V
Manufacture or its brand	Panasonic
Production	U.S.A.

### 6.2 Date Code System

Expiry date (10years)

MM – YYYY  
(Month) (Year)

Ex.) In case of production in May 2019.

05-2029

### 6.3 UL

This battery is UL1642 recognized component. The UL file number is MH12210.

### 6.4 Production Site

Panasonic Energy Corporation of America (PECA)  
One Panasonic DR Columbus 31907/GA U.S.A.

## 7. Operations and Modification of This Specification

Revision and modification must be carried out after the prior mutual agreement. All accidents or issues caused by any events that are neither defined nor described in this specification, mutual discussion shall take place for the resolution. If the customer fails to sign and return this specification, this specification will be automatically deemed to be accepted by the customer upon the earlier of (a) six (6) months from the issue date of this specification or (b) the issue date of the first P/O for the Products from the customer.

## 8. Important Notes (Warranty)

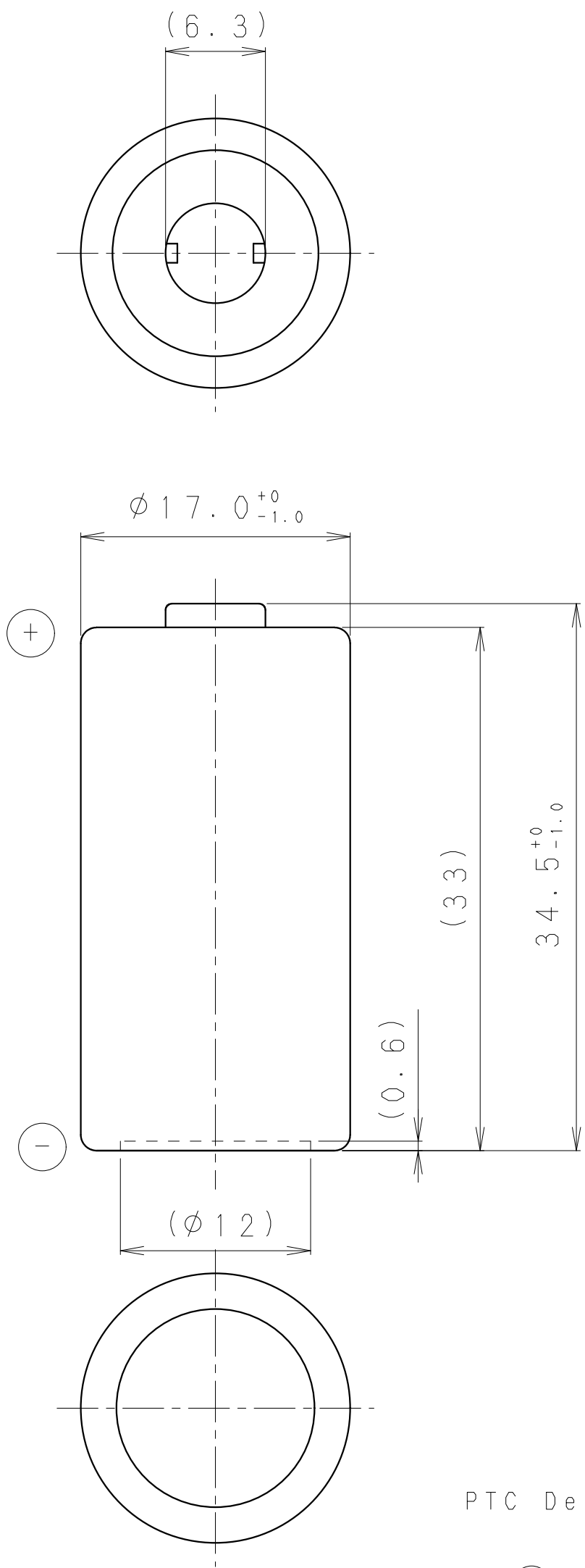
- 1) The Products are warranted to conform to the description contained in this specification for a period of twelve 【12】 months from the ex-factory date the Products are shipped and any claim by the customer (apparatus manufacturer or distributor) must be made within such period. During that warranty period, if the customer finds a non-conformity of the Products and presents sufficient evidence that (i) such defect was caused by Panasonic's negligence, and (ii) the usage and handling of the Products were appropriate, Panasonic will independently analyze the cause of such non-conformity in the Products. If Panasonic's analysis confirms the non-conformity is solely attributable to the negligence of Panasonic, Panasonic agrees to supply conforming Products as a replacement at its sole expense. THE CUSTOMER AGREES THAT THE RIGHTS AND REMEDIES OF THE CUSTOMER WILL BE STRICTLY LIMITED TO THOSE CONTAINED IN THIS WARRANTY WITH RESPECT TO ANY MATTER RELATING TO OR IN CONNECTION WITH THE PRODUCTS AND THIS SPECIFICATION. TO THE MAXIMUM EXTENT PERMITTED BY LAW, THE CUSTOMER WAIVES ALL OTHER RIGHTS AND REMEDIES WITH RESPECT TO ANY MATTER IN ANY WAY RELATING TO THE USE OF THE PRODUCTS AND THIS SPECIFICATION.
- 2) Confirmation and assurance of the matching, compatibility and reliability of the Products on an actual set or unit application shall be the customer's responsibility.
- 3) Panasonic shall not warrant or be responsible in any case where the customer fails to carry out proper handling, operation, installation, testing, service and inspection of the Products and/or to follow the instruction, cautions, warnings, notes provided in this specification, or Panasonic's other instructions or advice.
- 4) Panasonic will not be held responsible for any issues caused by modifications to the Products made after the Products are delivered to the customer.
- 5) If the customer intends to use or incorporate the Products for or into devices for which failure or malfunction of the Products may directly jeopardize life or cause threat of personal injury, including but not limited to medical equipment, vehicle equipment, aircraft and aerospace equipment, aircraft electronics equipment, explosion-proof equipment or any other similar equipment ("Specific Application Devices"), the customer must obtain prior written approval from Panasonic. Unless otherwise approved by Panasonic in advance, Panasonic shall not take any responsibility for the use or incorporation of the Products for or into any Specific Application Devices.
- 6) If customer resells or otherwise transfers the Products (whether alone or incorporated into other devices) to any third parties, the customer shall cause such third parties and any other downstream third parties (collectively, "Third Parties") to comply with all restrictions, obligations, and recommendations described in Section 10 below in order to prevent unsafe use, damage, or injury (including but not limited to expansion, electrolyte leakage, explosion or ignition by over-discharging, recharging or over-heating). Panasonic shall not be held responsible for any incidents or liability in connection with the use of the Products by Third Parties which do not comply with Section 10.
- 7) To the maximum extent permitted by applicable law (notwithstanding prior written approval from Panasonic pursuant to Section 5 above), the customer shall defend, indemnify and hold harmless Panasonic, its affiliates, shareholders, officers, directors, agents, representatives, and employees from and against all claims, damages, demands, suits, actions, liabilities, judgements, losses, expenses, attorneys' fees, and costs, including but not limited to lost profits, direct, indirect, special, consequential and incidental damages, arising from or in connection with the use of the Products by the customer and Third Parties.
- 8) EXCEPT AS EXPRESSLY SET FORTH IN THIS SPECIFICATION, PANASONIC MAKES NO WARRANTIES OR REPRESENTATIONS OF ANY KIND, EXPRESS OR IMPLIED, WITH RESPECT TO THE PRODUCTS, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

## 9. Others

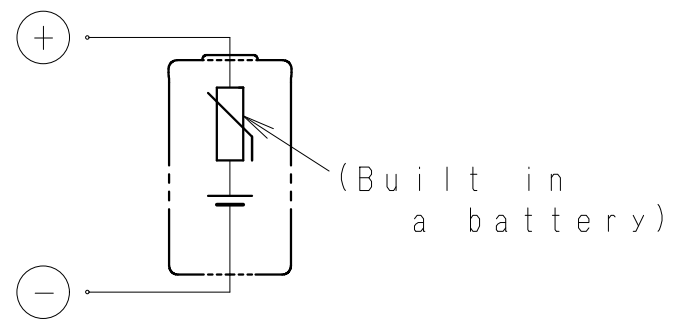
- 1) CR123A was developed as a battery for cameras and is not suitable for long-term discharge applications. Please replace the batteries within 2 years.
- 2) This battery is of the type proven to meet the requirements of each test in the Manual of UN Tests and Criteria, Part III, sub-section 38.3. This battery is manufactured in ISO9001 certified factory.
- 3) The battery herein complies with EU battery directive (2006/66/EC and 2013/56/EU).  
Since the batteries shall comply with EU battery directive, RoHS directive does not cover batteries. However, this battery does not use the 10 substances restricted by RoHS directive.  
Each content of 10 restricted substances is less than the maximum amount regulated by RoHS.

## 10. Precautions for use

- 1) Store the battery at a constant temperature of 5°C to 35°C (Avoid storage above 45°C.) in order to prevent deteriorations from heat. Keep the battery away from high humidity such as 70% R.H. or higher in order to prevent dew condensations on the battery that may cause to electrical leakage. Keep the battery away from heat sources (i.e., boiler, radiator and etc.), and from direct sunlight.
- 2) The battery has an explosion resistant construction. But the following cautions should be taken, because combustible materials such as Lithium metal and organic electrolyte are contained in the battery.
  - \* Do not use except in applicable model or equipment.
  - \* Do not connect three or more series.
  - \* Do not mix different types (chemistries) of batteries.
  - \* Do not mix new (fresh) and old (end of life) batteries.
  - \* Do not force-discharge.
  - \* Do not short circuit.
  - \* Do not dispose in fire.
  - \* Do not charge.
  - \* Do not disassemble.
  - \* Do not heat up more than 100°C.
  - \* Do not solder directly onto batteries.
  - \* Do not soak in water.
  - \* Do not deform.
  - \* Do not inadequately modify and remodel for installation.
  - \* Insert the batteries in correct polarity position.
- 3) Keep away from heat source or flame.
- 4) Do not wash by ultrasonic wave washer.
- 5) Keep away from children and infants to prevent the possibility of swallowing by mistake.

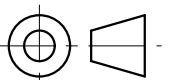


PTC Device



CIRCUIT DIAGRAM  
(回路図)

NOTE  
THE FOLLOWING ITEMS ARE INDICATED  
ON BATTERIES. [電池に下記の表記を行う]  
BATTERY NAME, BATTERY PN, NOMINAL  
VOLTAGE, CAUTIONS AND etc.  
[電池名称・素電池品番・公称電圧及び注意事項等]

PRODUCT NO.	CR123A		SCALE
			2 : 1
DRAWING NO.	P_CR123A	REV.	 UNIT: mm
		0	

# Battery Safety Practices

## Avoiding hazards in lithium battery handling



**Warning** Mishandling batteries can cause battery leakage, heat generation, rupture, ignition etc., that can lead to possible fire or injury.

Both of coin type and cylinder type of lithium batteries contain flammable materials such as lithium, organic solvent and other chemical ingredients. Improper handling of lithium batteries may result in heat generation, fire or explosion, with a risk of personal injury or damage. To prevent these accidents in battery handling, be sure to observe the following precautions.

### 1. Do not Short circuit

Direct connection of plus(+) and minus(-) poles may result in leakage, heat generation, explosion and/or fire. Do not store and/or carry batteries with metallic product such as necklace. (Refer fig.1)

### 2. Do not stack and/or jumble batteries

Stacked and/or jumbled batteries may cause short circuit and/or forced discharge by the contact of other batteries. This may result in leakage, heat generation, explosion and/or fire. Especially, a connection with the 006P(9V) type batteries may have a high risk of leakage, heat generation, explosion and/or fire. (Refer fig.2 & 3)

### 3. Do not make forced discharge batteries

Forced discharge by external power source, the battery voltage goes to negative and this cause gas generation in inside of the battery. This may result in leakage, heat generation, explosion and/or fire. (Refer fig.3)

- \* In your disposal and/or storage of the batteries, please isolate plus and minus poles by adhesive tape.
- A connection with other metals and/or batteries may result in leakage, heat generation, explosion and/or fire. (Refer fig.4)
- \* When using the stored battery, please remove the tape perfectly to avoid high contact resistance problem.

### 4. Do not dispose of batteries in fire

Disposal of batteries in fire is extremely dangerous with a risk of explosion and violent flaring.

### 5. Do not heat batteries

Heating batteries above 100°C (212°F) may damage the resin in crimping, separator and other parts, causing electrolyte leak, internal short circuit, fire and explosion.

### 6. Do not solder directly onto batteries

Direct soldering onto batteries may damage the resin in crimping, separator and other parts, causing electrolyte leak, internal short circuit, fire and explosion.

### 7. Do not charge batteries

Charging of primary batteries may result internal gas generation, causing electrolyte leak, battery swelling, fire and explosion.

### 8. Do not disassemble batteries

Disassembly batteries may cause gas generation that may irritate your throat. Lithium may also react with moisture to generate heat and fire.

### 9. Do not deform batteries

Applying extreme pressure to batteries may cause deformation of the crimping and internal short circuit, causing electrolyte leak, battery swelling, fire and explosion.

### 10. Do not mix different type batteries

For some applications, mixing of different type batteries, or new and old batteries, can cause over discharge due to differences in voltage and discharge capacities. This may lead to the risk of swelling and/or explosion.

### 11. Do not insert batteries with opposite polarity

For some applications, battery insertion with opposite polarity (reverse insertion of plus and minus) may result in leakage, heat generation, explosion

Please ensure the above precautions are strictly observed by related divisions including production departments, sales departments and external subcontractors.

For additional details and information, please contact our sales representatives.

Fig. 1 Short circuit

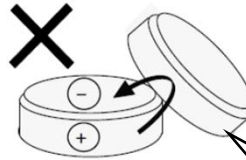


Fig. 2 stacked & jumble batteries



DANGER!

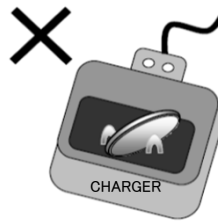


Fig. 3  
Examples of forced  
discharge

Connection with battery charger

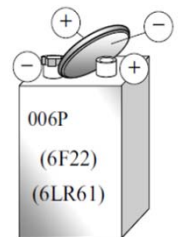


Fig. 4  
Examples of  
isolation in  
disposal and/or  
storage

