Lithium Battery

Feb, 2020
Panasonic Corporation
Features

1. Wide product range
Panasonic offers a wide range of Lithium Batteries which meet your requests such as main battery for small devices, backup battery for emergency, etc.

2. High quality based on many years of production
Over 40 years of technical development and manufacturing experiences

3. Excellent durability under severe conditions
Superior characteristics in a wide temperature range, and long term reliability suitable for outdoor devices (e.g. meters) which are difficult to maintain for a long time
Market Sectors

Lithium Batteries are used in various industries such as automotive, infrastructure, and IoT.

Automotive
- RKE
- TPMS
- eCall

Infrastructure
- Gas/Water meters
- Fire alarms
- AED
- Manufacturing Machine

IoT
- Construction machinery
- Agricultural machinery
- Water level sensor
## Lineup

<table>
<thead>
<tr>
<th>Primary Lithium Batteries (Non-chargeable)</th>
<th>Coin-type Lithium Batteries</th>
<th>CR Series (Manganese Dioxide Lithium Batteries)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cylindrical-type Lithium Batteries</td>
<td>BR Series (Poly-carbonmonofluoride Lithium Batteries)</td>
</tr>
<tr>
<td></td>
<td>Pin-type Lithium-ion Batteries</td>
<td>BR Series (Poly-carbonmonofluoride Lithium Batteries)</td>
</tr>
</tbody>
</table>

**Example Lithium Battery Model-Number Composition [Coin Type]**

Example: **CR2032**

- **Height**: 3.2 mm
- **Diameter**: 20 mm
- **R**: Round

Battery Type C: Manganese dioxide lithium battery

**Size**

- **Diameter**: 20 mm
- **Height**: 3.2 mm

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**Panasonic INDUSTRY**
CR series Manganese Dioxide Lithium Batteries

Features

- High rate pulse discharge
- Wide lineup from thin-type to high-drain models
- Excellent low-temperature performance enhanced by manganese-dioxide positive pole

Applications

- RKE, memory backup, security price tag, etc

Discharge temperature characteristics (e.g. CR2032)

*1. Nominal capacity shown above is based on standard drain and cutoff voltage down to 2.0V at 20°C
CR series Manganese Dioxide Lithium Batteries for High Temperature

**Features**
- Superior discharge characteristics
- Enables to use in high temperature (Max. 125°C)

**Applications**
- TPMS, ETC, meters (hot water, electricity), etc

### Table: Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Nominal voltage (V)</th>
<th>Nominal capacity (mAh)*</th>
<th>Continuous drain (mA)</th>
<th>Dimensions (mm)</th>
<th>Mass (g)</th>
<th>Operating temperature range</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR2032A</td>
<td>3</td>
<td>210</td>
<td>0.2</td>
<td>20.0</td>
<td>3.2</td>
<td>-40°C to 125°C</td>
</tr>
<tr>
<td>CR2032B</td>
<td></td>
<td>345</td>
<td></td>
<td>20.5</td>
<td>3.4</td>
<td>-40°C to 125°C</td>
</tr>
<tr>
<td>CR2032A</td>
<td></td>
<td>580</td>
<td></td>
<td>24.5</td>
<td>6.2</td>
<td>-40°C to 105°C</td>
</tr>
</tbody>
</table>

*1. Tabbed type batteries only
*2. Nominal capacity shown above is based on standard drain and cutoff voltage down to 2.0V at 20°C

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**Deliver excellent discharge characteristics in a wide range of temperature**

Enables to use from low to high temperature
-40 to 125°C

*Test condition is as following

- For high-temperature (CR2032A @+125°C)
- For high-temperature (CR2032A @+40°C)
- General-purpose product (CR2032 @-40°C)

Test condition
- Pulse load: 10mA
- 3 times pulse at least, every 5 minutes
- Acceleration load: 194G
BR series Poly-carbonmonofluoride Lithium Batteries

**Features**
- BR series developed with exclusive Panasonic technology
- Exhibits stable performance after long periods in storage due to low self discharge characteristics
- Suitable for backup power in low drain applications

**Applications**
Commercial equipment (communication/measurement devices), electricity meters, memory backup, ETC, etc

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### Discharge temperature characteristics (e.g. BR2032)

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Nominal voltage (V)</th>
<th>Nominal capacity (mAh)</th>
<th>Continuous drain (mA)</th>
<th>Dimensions (mm)</th>
<th>Mass (g)</th>
<th>Operating temperature range</th>
</tr>
</thead>
<tbody>
<tr>
<td>BR1220</td>
<td>3</td>
<td>35</td>
<td>0.03</td>
<td>Diameter</td>
<td>Height</td>
<td>0.7</td>
</tr>
<tr>
<td>BR1225</td>
<td>3</td>
<td>48</td>
<td></td>
<td>12.5</td>
<td>2.0</td>
<td>0.8</td>
</tr>
<tr>
<td>BR1632</td>
<td>3</td>
<td>120</td>
<td></td>
<td>16.0</td>
<td>2.5</td>
<td>1.5</td>
</tr>
<tr>
<td>BR2032</td>
<td>3</td>
<td>200</td>
<td></td>
<td>20.0</td>
<td>3.2</td>
<td>2.6</td>
</tr>
<tr>
<td>BR2325</td>
<td>3</td>
<td>165</td>
<td></td>
<td>23.0</td>
<td>2.5</td>
<td>3.0</td>
</tr>
<tr>
<td>BR2330</td>
<td>3</td>
<td>255</td>
<td></td>
<td>30.0</td>
<td>3.0</td>
<td>3.2</td>
</tr>
<tr>
<td>BR3032</td>
<td>3</td>
<td>500</td>
<td></td>
<td>30.0</td>
<td>3.2</td>
<td>5.7</td>
</tr>
</tbody>
</table>

*1. Nominal capacity shown above is based on standard drain and cutoff voltage down to 2.0V at 20°C*
BR series Poly-carbonmonofluoride Lithium Batteries for High Temperature

**Features**
- In addition to the appeal of normal BR series, this batteries can operate in temperature up to 125°C

**Applications**
- TPMS, ETC, meters (gas, water), memory backup, etc

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### Discharge temperature characteristics (e.g. BR1225A)

- **Discharge temperature characteristics (e.g. BR1225A)**

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<table>
<thead>
<tr>
<th>Model No.**</th>
<th>Nominal voltage (V)</th>
<th>Nominal capacity (mAh)**</th>
<th>Continuous drain (mAh)</th>
<th>Dimensions (mm)</th>
<th>Mass (g)</th>
<th>Operating temperature range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Diameter</td>
<td>Height</td>
<td></td>
</tr>
<tr>
<td>BR1225A</td>
<td>1.2</td>
<td>3</td>
<td>40</td>
<td>12.5</td>
<td>2.5</td>
<td>0.8</td>
</tr>
<tr>
<td>BR1632A</td>
<td>2.0</td>
<td>120</td>
<td>255</td>
<td>16.0</td>
<td>3.2</td>
<td>1.5</td>
</tr>
<tr>
<td>BR2330A</td>
<td>2.5</td>
<td>550</td>
<td>550</td>
<td>23.0</td>
<td>3.0</td>
<td>3.2</td>
</tr>
<tr>
<td>BR2450A</td>
<td>3.0</td>
<td>1,000</td>
<td>1,000</td>
<td>24.5</td>
<td>5.0</td>
<td>4.9</td>
</tr>
</tbody>
</table>

*1. Tabbed type batteries only
*2. Nominal capacity shown above is based on standard drain and cutoff voltage down to 2.0V at 20°C
CR series Manganese Dioxide Lithium Batteries (Standard Type)

Features
- Offer super high rate discharge, and suitable for cameras, lights, etc.
- Also available in the consumer market

Applications
Lights, Security devices (door lock, fire alarms), eCall, AED etc

Discharge temperature characteristics (e.g. CR123A)

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Nominal voltage (V)</th>
<th>Nominal capacity (mAh)*1</th>
<th>Continuous drain (mA)</th>
<th>Dimensions (mm)</th>
<th>Mass (g)</th>
<th>Operating temperature range**</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR2</td>
<td>3</td>
<td>850</td>
<td>20</td>
<td>Diameter</td>
<td>Height</td>
<td>15.6</td>
</tr>
<tr>
<td>CR123A</td>
<td>3.0</td>
<td>1,500</td>
<td>20</td>
<td>17.0</td>
<td>34.5</td>
<td>16</td>
</tr>
</tbody>
</table>

*1 Nominal capacity shown above is based on standard drain and cutoff voltage down to 2.0V at 20°C
*2 Nominal capacity shown above is based on standard drain and cutoff voltage down to 4.0V at 20°C
*3 Please consult Panasonic when anticipating usage in operating temperature -40 to -20°C, or 60 to 70°C.
CR series Manganese Dioxide Lithium Batteries (Long-life Type)

Features
- Superior discharge characteristics and long-life
- Suitable for power of automotive devices due to superior low temperature discharge characteristics and compact design

Applications
Security devices (door lock, fire alarms), automotive electric components (tracking system, security alarms), meters (gas, water), AED, etc.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Nominal voltage (V)</th>
<th>Nominal capacity (mAh)**</th>
<th>Continuous drain (mAh)</th>
<th>Dimensions (mm)</th>
<th>Mass (g)</th>
<th>Operating temperature range**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Diameter</td>
<td>Height</td>
<td></td>
</tr>
<tr>
<td>NEW</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CR-AGZ</td>
<td>3</td>
<td>2,700</td>
<td>2.5</td>
<td>17.0</td>
<td>45.5</td>
<td>23</td>
</tr>
<tr>
<td>CR-AG</td>
<td></td>
<td>2,400</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>CR-2/3AZ</td>
<td></td>
<td>1,600</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CR12Z</td>
<td></td>
<td>1,000</td>
<td>2.5</td>
<td>15.8</td>
<td>33.5</td>
<td>16</td>
</tr>
<tr>
<td>CR12U</td>
<td></td>
<td>1,000</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CR-AAU</td>
<td></td>
<td>1,800</td>
<td>2.5</td>
<td>14.5</td>
<td>59.5</td>
<td>18</td>
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<td>CR-AAK</td>
<td></td>
<td>1,600</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1. provided with terminals or lead wire and connectors
*2. Nominal capacity shown above is based on standard drain and cutoff voltage down to 2.0V at 20°C
*3. Please consult Panasonic when anticipating usage in operating temperature of 70°C or above

Achieve long time reliability and superior discharge characteristics

Conventional model: less than 5 years
Improved model: More than 10 years

Achieve long time reliability and superior discharge characteristics

* Test condition is as followings

Transition of internal resistance due to continuous use

* Test condition
  - Storage Temperature: 20°C
  - Base load: 300Ω x 0.1mA

*2020/2 | 10 / 14
BR series Poly-carbonmonofluoride Lithium Batteries

Features
- Suitable for backup battery of metering devices due to superior long-storage life

Applications
- Commercial equipment (communication/measurement devices), meters (gas, water), memory backup (manufacturing machine), automotive electric components (security alarms), etc

<table>
<thead>
<tr>
<th>Model No.*1</th>
<th>Nominal voltage (V)</th>
<th>Nominal capacity (mAh)*2</th>
<th>Continuous drain (mA)</th>
<th>Dimensions (mm)</th>
<th>Mass (g)</th>
<th>Operating temperature range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Diameter</td>
<td>Height</td>
<td></td>
</tr>
<tr>
<td>BR-1/2AA</td>
<td>3</td>
<td>1,000</td>
<td>2.5</td>
<td>14.5</td>
<td>25.5</td>
<td>8</td>
</tr>
<tr>
<td>BR-2/3A</td>
<td></td>
<td>1,200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BR-2/3AG</td>
<td></td>
<td>1,450</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BR-A</td>
<td></td>
<td>1,800</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BR-AG</td>
<td></td>
<td>2,200</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>BR-C</td>
<td></td>
<td>5,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1. provided with terminals or lead wire and connectors
*2. Nominal capacity shown above is based on standard drain and cutoff voltage down to 2.0V at 20°C
Pin-type Lithium Batteries

**Features**
- Panasonic original design
- Enable to generate power for LED lights

**Applications**
Electric fishing-float light, small transmitters, etc

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Nominal voltage (V)</th>
<th>Nominal capacity (mAh)**</th>
<th>Continuous drain (mA)</th>
<th>Dimensions (mm)</th>
<th>Mass (g)</th>
<th>Operating temperature range</th>
</tr>
</thead>
<tbody>
<tr>
<td>BR425</td>
<td>3</td>
<td>25</td>
<td>0.5</td>
<td>4.2</td>
<td>25.9</td>
<td>0.5</td>
</tr>
<tr>
<td>BR435</td>
<td></td>
<td>50</td>
<td>1.0</td>
<td>4.2</td>
<td>35.9</td>
<td>0.8</td>
</tr>
</tbody>
</table>

*1. Nominal capacity shown above is based on standard drain and cutoff voltage down to 2.0V at 20℃
About Terminals

- Panasonic offers a variety of tab terminals to meet your requests.
- Please note that it will be a customized solution if you need another tab terminal which is not shown on the web site.

Lithium Batteries Product List:
https://industrial.panasonic.com/ww/products/batteries/primary-batteries/lithium-batteries?list=1
Please feel free to ask a Panasonic sales person

Panasonic Lithium Batteries HP
https://industrial.panasonic.com/ww/products/batteries/primary-batteries/lithium-batteries