Panasonic

Lithium Battery Catalog

Please see the latest information on our web site
http://industrial.panasonic.com/

General description

Capable of meeting a wide range of needs from security equipment to vehicle-mounted electric equipment.

Lithium batteries feature a high voltage, a wide working temperature range, very small self-discharge, and high reliability displayed over an extended period of time. Panasonic provides a wide battery lineup from cylindrical types used as power supplies for cameras and various meters, to coin types used as main power supplies of miniature devices and memory backup purposes, as well as pin types developed for use in electric floats.

Panasonic lithium batteries have been certified by the UL (Underwriters Laboratory Inc.) in the United States (file No.: MH12210). For decals.

Applications

Usage		Coin type			Cylindrical type			Pin type
		CR series	BR series	High temperature resistance BR series	BR series	CR series	CR series For Industry	
Primary type	Light				○	◎		
	Shaver					◎		
	Business use (Wireless equipments, Test equipments, Fire alarm)		○	○	◎		◎	
	Meters (electric, gas, water etc)	○	○	○	◎		○	
	Car equipment			○	○		○	
	Keyless entry	◎						
	Card remote control	◎						
	IC cards	○						
	Memory back up (Low load)	○	◎	◎	◎		◎	
	Floats for fishing							◎

Usage		Coin type			
		VL series	ML series	MS series	MT series
Rechargeable type	Memory back up (Low load)	◎	◎	◎	
	Keyless entry	○			
	Watch				◎

◎Recommended applications
○Potential applications

Composition of model numbers. (Example)

Coin type

BR2325

- Height (2.5mm)
- Diameter (23mm)
- (R:) Round type
- Battery type

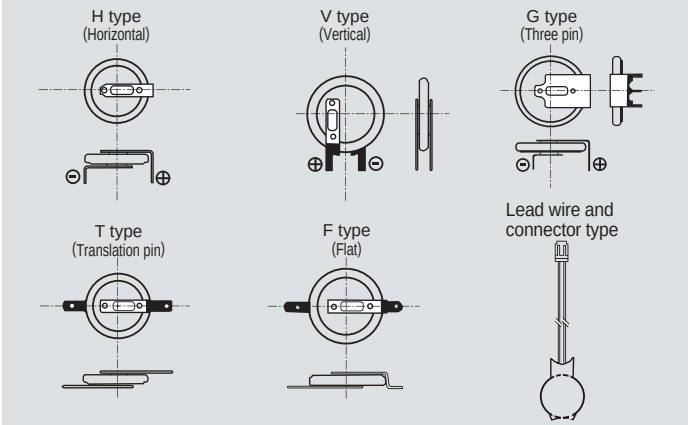
Types of Lithium batteries

- **Lithium Batteries**
  - **Rechargeable Lithium Batteries**
    - **Coin Type**
      - Vanadium Rechargeable Lithium Batteries (VL series)
      - Manganese Rechargeable Lithium Batteries (ML series)
      - Manganese Silicon Rechargeable Lithium Battery (MS series)
      - Titanium Lithium Rechargeable Batteries (MT series)
  - **Primary Lithium Batteries (non-rechargeable)**
    - **Coin Type**
      - Manganese Dioxide Lithium Batteries (CR series)
      - Poly-carbonmonofluoride Lithium Batteries (BR series)
    - **Cylindrical Type**
      - Poly-carbonmonofluoride Lithium Batteries (BR series)
      - Manganese Dioxide Lithium Batteries (CR series)
    - **Pin Type**
      - Poly-carbonmonofluoride Lithium Batteries (BR series)

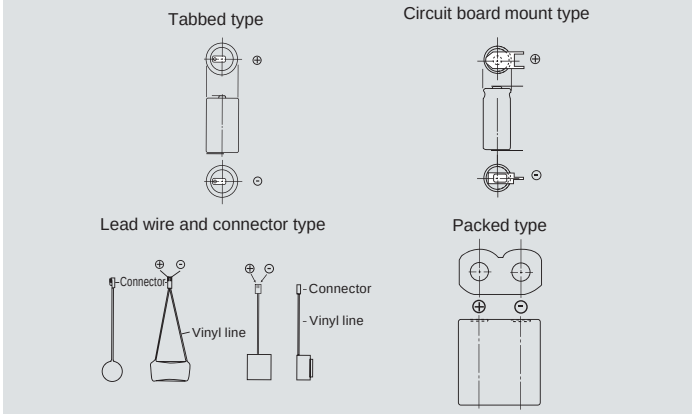
Terminal shape

Coin type Lithium batteries are available in a variety of terminal shapes according to needs. Typical types are shown below.
Please see latest information on our web site. **http://industrial.panasonic.com/**

Coin type (Example)



Cylindrical type (Example)



Lithium battery holders

Battery holders are offered for applications that require battery replacement.
Our battery holders are easy for battery installing and ensure proper fit. In addition, our holders are designed to prevent reverse polarity insertion for safety.


BCR20H4


BCR20H5


BCR20V4

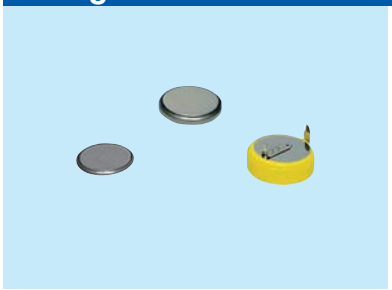
Precaution for washing battery holders

The battery holders can be adversely affected by some detergents use in the circuit board washing process and may result in cracks forming in the holder. Please test the holders in your washing process before use.

Coin Type Lithium Batteries

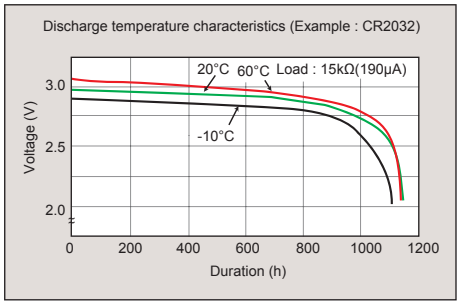
Coin type Lithium batteries are well known as not only for power sources for remote control devices or RFID tags, but also widely used as back-up power source for various memories in many kinds of equipment. In order to be used for various applications, two choice of chemistries (CR/BR), various sizes and wide temperature range up to 125 degree C are available.

Manganese Dioxide Lithium Batteries (CR series) 3V



Features

1. Suitable for small electronic appliances requiring relatively high currents, such as digital watches and card remote control, digital watches, and remote controls and so on.
2. Operating temperature : -30°C to 60°C

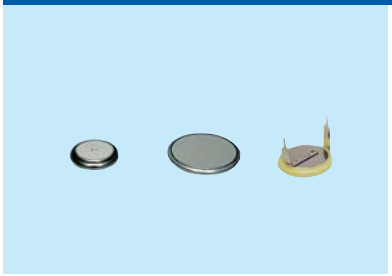


General Specifications

Model No.	Electrical characteristics (20°C)			Dimensions(mm)		Mass(g) (Except terminal)	JIS	IEC
	Nominal voltage (V)	Nominal capacity (mAh)*1	Continuous drain (mA)	Diameter	Height			
CR1025	3	30	0.1	10.0	2.5	0.7	CR1025	CR1025
CR1216		25		12.5	1.6		CR1216	CR1216
CR1220		35			2.0	1.0	CR1220	CR1220
CR1612		40		16.0	1.2	0.8	–	–
CR1616		55			1.6	1.2	CR1616	CR1616
CR1620		75			2.0	1.3	CR1620	CR1620
CR1632		140			3.2	1.8	–	–
CR2012		55		20.0	1.2	1.4	CR2012	CR2012
CR2016		90			1.6	1.6	CR2016	CR2016
CR2025		165	0.2		2.5	2.3	CR2025	CR2025
CR2032		225			3.2	2.9	CR2032	CR2032
CR2330		265		23.0	3.0	3.8	CR2330	CR2330
CR2354		560			5.4	5.8	CR2354	CR2354
CR2412		100		24.5	1.2	2.0	–	–
CR2450		620			5.0	6.3	CR2450	CR2450
CR2477		1,000			7.7	10.5	–	–
CR3032		500		30.0	3.2	6.8	CR3020	–

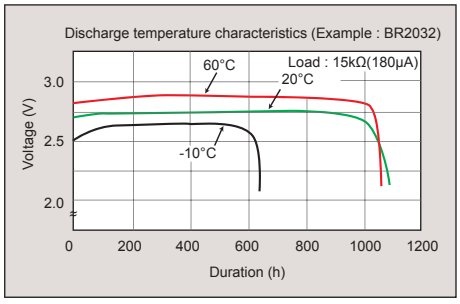
*1 : Nominal capacity shown above is based on standard drain and cut off voltage down to 2.0V at 20°C

Poly-carbonmonofluoride Lithium Batteries (BR series) 3V



Features

1. Offers excellent long-term service life and can be the most suitable power sources for memory back-up operated at small current drain.
2. Operating temperature : -30°C to 80°C

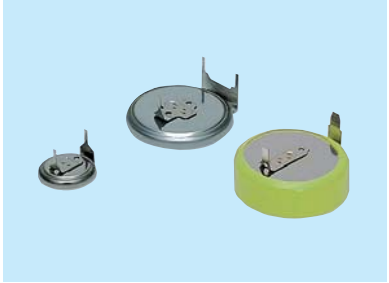


General Specifications

Model No.	Electrical characteristics (20°C)			Dimensions(mm)		Mass(g) (Except terminal)	JIS	IEC
	Nominal voltage (V)	Nominal capacity (mAh)*1	Continuous drain (mA)	Diameter	Height			
BR1220	3	35	0.03	12.5	2.0	0.7	–	–
BR1225		48			2.5	0.8	–	BR1225
BR1632		120		16.0	3.2	1.5	–	–
BR2032		200		20.0		2.5	–	–
BR2325		165		23.0	2.5	3.0	–	BR2325
BR2330		255			3.0	3.2	–	–
BR3032		500		30.0	3.2	5.5	–	–

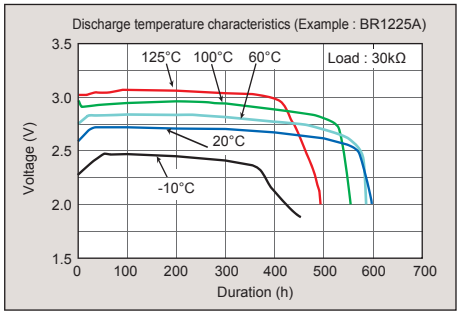
*1 : Nominal capacity shown above is based on standard drain and cut off voltage down to 2.0V at 20°C

Poly-carbonmonofluoride Lithium Batteries for High Temperature (BR "A" series) 3V



Features

1. Applicable for equipment operating at a high temperature range.
2. Operating temperature : -40°C to 125°C



General Specifications

Model No.	Electrical characteristics (20°C)			Dimensions(mm)		Mass(g) (Except terminal)	JIS	IEC
	Nominal voltage (V)	Nominal capacity (mAh)*1	Continuous drain (mA)	Diameter	Height			
BR1225A	3	48	0.03	12.5	2.5	0.8	–	–
BR1632A		120		16.0	3.2	1.5	–	–
BR2330A		255		23.0	3.0	3.2	–	–
BR2450A		550		24.5	5.0	5.0	–	–
BR2477A		1,000			7.7	8.0	–	–

*1 : Nominal capacity shown above is based on standard drain and cut off voltage down to 2.0V at 20°C
*2 : Provide with terminals or lead wire and connectors except for BR1225A

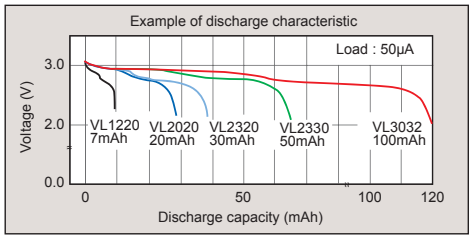
Coin Type Rechargeable Lithium Batteries

Coin type Rechargeable Lithium batteries can be charged for repeated use, and are intended for customers who do not want to replace batteries or have equipment which are not available for battery replacement due to their constructions. Optimal for memory backup.

Vanadium Rechargeable Lithium Batteries (VL series) 3V

Features

1. High Electric discharge sustaining voltage.
2. Operating temperature : -20°C to 60°C
3. Constant-voltage charge : Charging voltage 3.25V to 3.55V



General Specifications

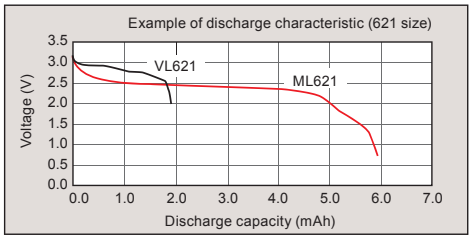
Model No.*2	Electrical characteristics (20°C)			Dimensions(mm)		Mass(g) (except terminal)	JIS	IEC
	Nominal voltage (V)	Nominal capacity (mAh)*1	Continuous drain (mA)	Diameter	Height			
VL621	3	1.5	0.01	6.8	2.1	0.27	–	–
VL1220		7.0	0.02	12.5	2.0	0.8	–	–
VL2020		20.0	0.07	20.0		2.2	–	–
VL2320		30.0	0.10	23.0		2.7	–	–
VL2330		50.0			3.0	3.5	–	–
VL3032		100.0	0.20	30.0	3.2	6.2	–	–

*1 : Nominal capacity shown above is based on standard drain and cut off voltage down to 2.5V at 20°C
*2 :Only battery with terminal are handled

Manganese Rechargeable Lithium Batteries (ML series) 3V

Features

1. Long-term backup with high capacity.
2. Operating temperature : -20°C to 60°C
3. Constant-voltage charge : Charging voltage 2.8V to 3.2V



General Specifications

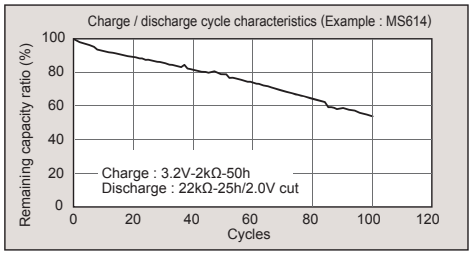
Model No.	Electrical characteristics (20°C)			Dimensions(mm)		Mass(g) (except terminal)	JIS	IEC
	Nominal voltage (V)	Nominal capacity (mAh)*1	Continuous drain (mA)	Diameter	Height			
ML421	3	2.3	0.005	4.8	2.1	0.11	–	–
ML614		3.4	0.01	6.8	1.4	0.16	–	–
ML621		5.0			2.1	0.23	–	–
ML920		11.0	0.03	9.5	2.0	0.4	–	–
ML1220		17.0		12.5		0.8	–	–
ML2020		45.0	0.12	20.0		2.2	–	–

*1 : Nominal capacity shown above is based on standard drain and cut off voltage down to 2.0V at 20°C

Manganese Silicon Rechargeable Lithium Battery (MS series) 3V

Features

1. Available 100 cycles at Full Charge-Discharge.
2. Operating temperature : -20°C to 60°C
3. Constant-voltage charge : Charging voltage 2.8V to 3.3V

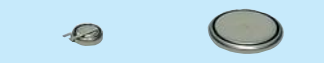


General Specifications

Model No.	Electrical characteristics (20°C)			Dimensions(mm)		Mass(g) (except terminal)	JIS	IEC
	Nominal voltage (V)	Nominal capacity (mAh)*1	Continuous drain (mA)	Diameter	Height			
MS614	3.0	2.7	0.01	6.8	1.4	0.20	–	–

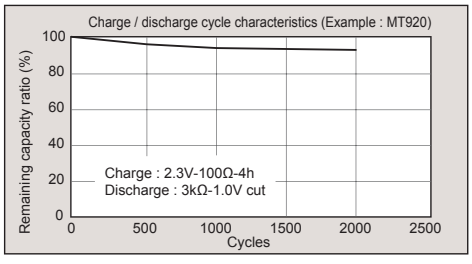
*1 : Nominal capacity shown above is based on standard drain and cut off voltage down to 2.0V at 20°C

Titanium Lithium Rechargeable Batteries (MT series) 1.5V



Features

1. Lithium rechargeable battery of 1.5V that endures at deep electrical discharge cycle.
2. Operating temperature : -10°C to 60°C
3. Constant-voltage charge : Charging voltage 1.8V to 2.6V



General Specifications

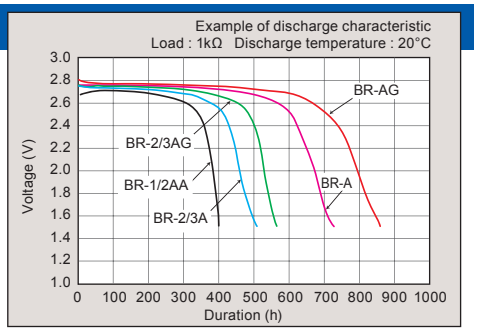
Model No.	Electrical characteristics (20°C)			Dimensions(mm)		Mass(g) (except terminal)	JIS	IEC
	Nominal voltage (V)	Nominal capacity (mAh)*1	Continuous drain (mA)	Diameter	Height			
MT416F	1.5	0.60	0.013	4.8	1.6	0.10	–	–
MT516F		1.8	0.025	5.8	1.6	0.15	–	–
MT621		2.5	0.05	6.8	2.1	0.25	–	–
MT920		5.0	0.05	9.5	2.0	0.50	–	–

*1 : Nominal capacity shown above is based on standard drain and cut off voltage down to 1.0V at 20°C

Cylindrical Type Lithium Batteries

BR-series Cylindrical type Lithium batteries are suitable as a power supply of various meters used for a long period of time or a memory backup use.
CR-series Cylindrical type Lithium batteries are widely used as power supplies for applications which require high drain discharge such as Flash lights, fire or smoke alarms and other security devices, and RFIDs.

Poly-carbonmonofluoride Lithium Batteries (BR series) 3V



Features

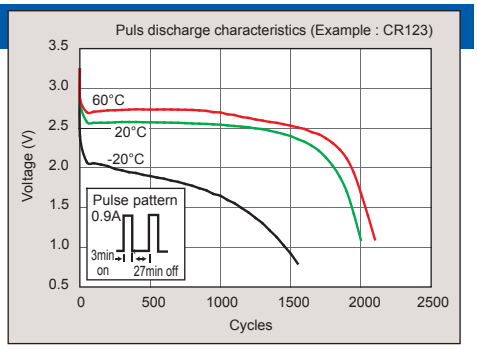
1. Offers excellent long-term storage characteristics and most suitable for power supplies of various meters.
2. Operating temperature : -40°C to 85°C (BR-1/2AA -40°C to 100°C)

General Specifications

Model No.	Electrical characteristics (20°C)			Dimensions(mm)		Mass(g) (Except terminal)	JIS	IEC
	Nominal voltage (V)	Nominal capacity (mAh)*1	Continuous drain (mA)	Diameter	Height			
BR-1/2AA	3	1,000	2.5	14.5	25.5	8.0	–	–
BR-2/3A		1,200		17.0	33.5	13.5	–	BR17335
BR-2/3AG		1,450					–	BR17335
BR-A		1,800			45.5	18.0	–	–
BR-AG		2,200					–	–
BR-C		5,000	5.0	26.0	50.5	42.0	–	–

*1 : Nominal capacity shown above is based on standard drain and cut off voltage down to 1.8V at 20°C
*2 : All batteries are provided with terminals or lead wire and connectors attached, basically.

Manganese Dioxide Lithium Batteries (CR series) 3V/6V



Features

1. Offer excellent high-rate discharge characteristics and most suitable for use as main power supplies of security equipment, lights, etc.
2. Operating temperature : -40°C to 70°C
   (Please consult panasonic for use below and above -20°C to 60°C)
3. Available at consumer market

General Specifications

Model No.	Electrical characteristics (20°C)			Dimensions(mm)		Mass(g) (Except terminal)	JIS	IEC
	Nominal voltage (V)	Nominal capacity (mAh)*1	Continuous drain (mA)	Diameter	Height			
CR-2	3	850	20	15.6	27.0	11.0	CR15H270,CR2	CR15H270
CR123A		1,400		17.0	34.5	17.0	CR17345,CR123A	CR17345

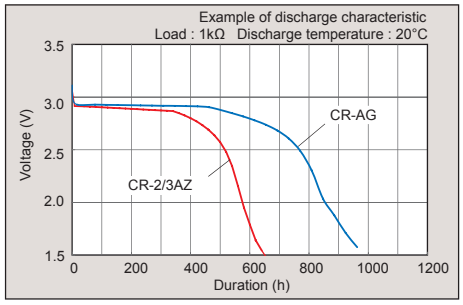
Model No.	Electrical characteristics (20°C)			Dimensions(mm)			Mass(g) (Except terminal)	JIS	IEC
	Nominal voltage (V)	Nominal capacity (mAh)*1	Continuous drain (mA)	Length	Width	Height			
2CR5	6	1,400*2	20	34.0	17.0	45.0	38.0	2CR5	2CR5
CR-P2				35.0	19.5	36.0	37.0	CR-P2	CR-P2
CR-V3	3	3,300*1	200	28.4	14.4	52.0	39.0	–	–

*1 : Nominal capacity shown above is based on standard drain and cut off voltage down to 2.0V at 20°C
*2 : Nominal capacity shown above is based on standard drain and cut off voltage down to 4.0V at 20°C

【For Industry】

Features

1. Industrial equipment-targeted series offering both excellent high-rate discharge performance and long-term use
2. Operating temperature : -40°C to 70°C



General Specifications

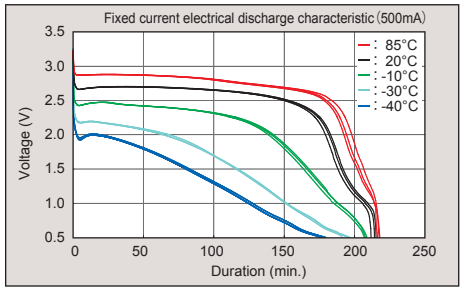
Model No.	Electrical characteristics (20°C)			Dimensions(mm)		Mass(g) (Except terminal)	JIS	IEC
	Nominal voltage (V)	Nominal capacity (mAh)*1	Continuous drain (mA)	Diameter	Height			
CR-2/3AZ	3	1,600	2.5	17.0	33.5	17	–	CR17335
CR-AG		2,400			45.5	22	–	–

*1 : Nominal capacity shown above is based on standard drain and cut off voltage down to 2.0V at 20°C
*2 : All batteries are provided with terminals or lead wire and connectors attached, basically.

【For Industry】
Under development

Features

1. Superior electric discharge properties and long-term reliability
   Most suitable for the power supplies such as in-vehicle apparatuses requiring space saving
2. Operating temperature : -40°C to 85°C



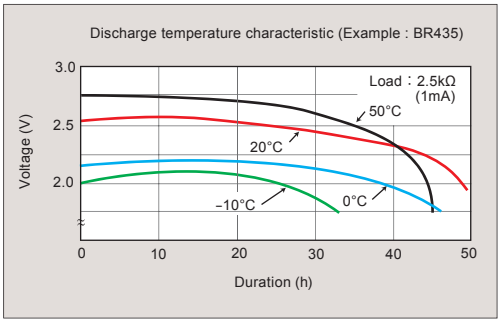
General Specifications

Model No.	Electrical characteristics (20°C)			Dimensions(mm)		Mass(g) (Except terminal)	JIS	IEC
	Nominal voltage (V)	Nominal capacity (mAh)*1	Continuous drain (mA)	Diameter	Height			
CR-AAK	3	1,650	100	14.5	50.5	18	–	–

*1 : Nominal capacity shown above is based on standard drain and cut off voltage down to 1.8V at 20°C

Pin Type Lithium Batteries

Poly-carbonmonofluoride Lithium Batteries (BR series) 3V



Features

1. Panasonic's original battery. Single cell can support LED light.
2. Operating temperature : -30°C to 80°C

General Specifications

Model No.	Electrical characteristics (20°C)			Dimensions(mm)		Mass(g) (Except terminal)	JIS	IEC
	Nominal voltage (V)	Nominal capacity (mAh)*1	Continuous drain (mA)	Diameter	Height			
BR425	3	25	0.5	4.2	25.9	0.6	–	–
BR435		50	1.0		35.9	0.9	–	–

*1 : Nominal capacity shown above is based on standard drain and a cut off voltage down to 2.0V at 20°C

⚠ Safety precautions

Since Lithium batteries contain flammable substances such as Lithium or other organic solvents, they may generate heat, liquid leakage or strain or rupture or catch fire if mishandled. Please ensure to observe the following safety precautions.

WARNING

● Charging
-Never charge any battery other than rechargeable batteries.
-Design circuits so that no current will flow into the battery from other power supplies.

● Heating
-Do not throw batteries into a fire or heat them up to a high temperature.
-Avoid directly soldering batteries.
-Do not drop batteries into the solder bath.

● Disassembly
-Do not disassemble or deform batteries.

● Accidental ingestion
-Keep out of reach of children. If swallowed go straight to a hospital emergency room.

● Short-circuit
-Do not short-circuit the positive and negative electrodes of the battery.
-Do not place many batteries in jumbled condition or store batteries together with metallic objects, etc

● Reverse connection
-Do not install the battery backward.

● Mixed use
-Avoid using fresh and used batteries together.
-Avoid the mixed use of different types of batteries.
-Avoid using batteries of other types or brands together.

Secure appropriate safety engineering on design of equipment for the sake of prevent accident of swallowing when user replace battery.

Automotive & Industrial Systems Company
Panasonic Corporation

1-1, Matsushita-cho,
Moriguchi, Osaka, 570-8511, Japan
http://industrial.panasonic.com/

The contents of this catalog are valid as of March, 2015