FEATURE

● The operating voltage is approximately 3.0V

The operating voltage is approximately twice that of nickel-cadmium rechargeable batteries. Charging is done at voltages ranging from 3.0 to 3.3 volts, and during discharge, when at 10% of the nominal capacity (discharge depth of 10% or less), it exhibits a discharge voltage of up to 2.8 volts.

● A broad operating range from minus 20 degrees Celsius to 60 degrees Celsius

It maintains a stable operating voltage within the temperature range of minus 20 degrees Celsius to 60 degrees Celsius.

APPLICATION

● Mobile phone ● PHS ● Laptop ● PC ● PDA
● Calculator ● Digital camera ● CD/MD player ● Watch
●Medical and cash register equipment ● OA equipment(fax machine, photocopier, printer) ● FA equipment(Measuring instruments, onboard microcomputers, sensors)
● Electronic meters (water, gas, electricity)

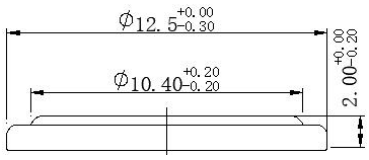
GENERAL SPECIFICATION

Item		ML1220	ML1225	ML2016	ML2020	ML2032	ML2430
Nominal Voltage(V)		3	3	3	3	3	3
Nominal Capacity(mAh)①		18	25	30	40	65	100
Nominal Discharge current(uA)		100	100	200	200	200	300
Charge/discharge cycle lifespan	Discharge depth：10%	300	300	400	400	600	1000
	Discharge depth：20%	120	120	180	180	300	500
Operating temperature range(℃)		-20~+60	-20~+60	-20~+60	-20~+60	-20~+60	-20~+60
Size②	Diameter(mm)	12.5	12.5	20.0	20.0	20.0	24.5
	Height(mm)	2.0	2.5	1.6	2.0	3.2	3.0
Weight②		0.8	0.9	1.8	2.2	3.1	4.2

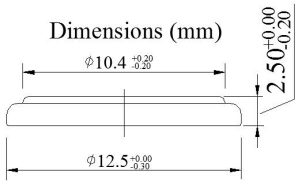
①Nominal capacity refers to the discharge capacity achieved by discharging the battery at a standard discharge current in a 20°C environment until the battery voltage drops to 2.0V.
②The dimensions and weight pertain solely to the battery itself but may vary due to factors such as the shape of terminal pins and other considerations.

DEMENSIONS

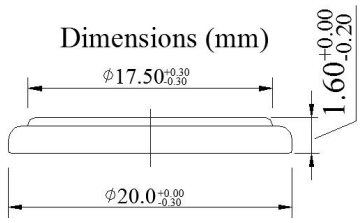
ML1220



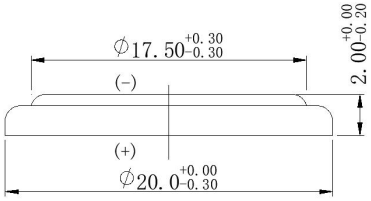
ML1225



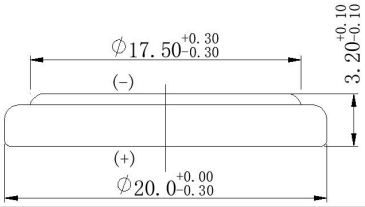
ML2016



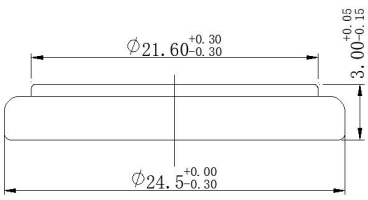
ML2020



ML2032



ML2430



TEL: +86-852-51245795 Web: www.cda-cap.com Email: zfw@cda-cap.tw

Spec. Date:2024-01-06

PRODUCT MATERIAL CODE EXPLANATION

Model Code:

ML 12 20 / DN **

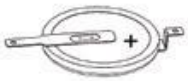
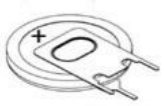
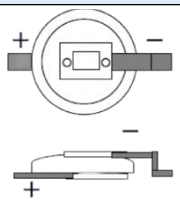
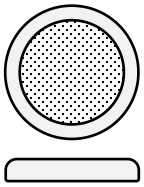
- **: Customization Code
- DN:Battery Terminal Code
- 20:Product Height Code
- 12:Product Diameter Ø Code
- ML:Series Name

BUTTON CELL PACKING CONFIGURATION

Item	Packaging type		Final configuration
	Insulating sleeve with PET	Insulating sleeve without PET	Type
ML1220	T1	ML1220/DN	T1
ML1225	H1	ML1225/DN	H1
ML2016	FA	ML2016/DN	T2
ML2020	H2	ML2020/DN	F90
ML2032	H2	ML2032/DN	H2
ML2430	G	ML2430/DN	G

*All the above models can be supplied with bare cells or without sleeves and with pins.

CONFIGURATION TYPE

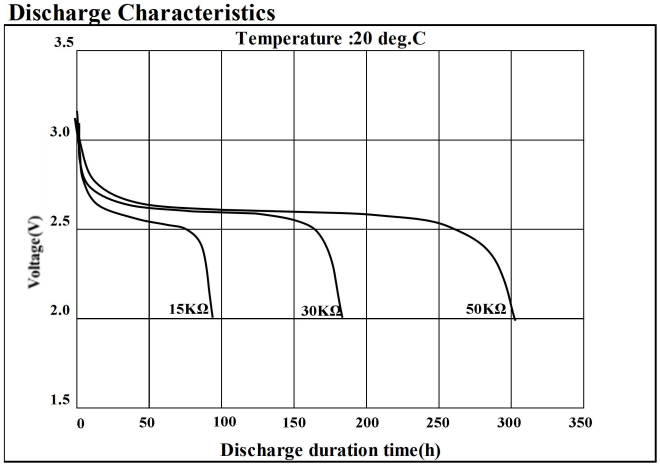
G -TYPE	H -TYPE	H1 -TYPE	H2-TYPE	R -TYPE
				
T1 -TYPE	**T2 -TYPE**	**V -TYPE**	**V1-TYPE**	**W -TYPE**
				
F90 -TYPE	**FA -TYPE**	**DN -TYPE**	**1ST-TYPE**	**1S-TYPE**
				

*The above configuration types can be customized according to customer requirements for corresponding pin type/pitch and different terminal types.

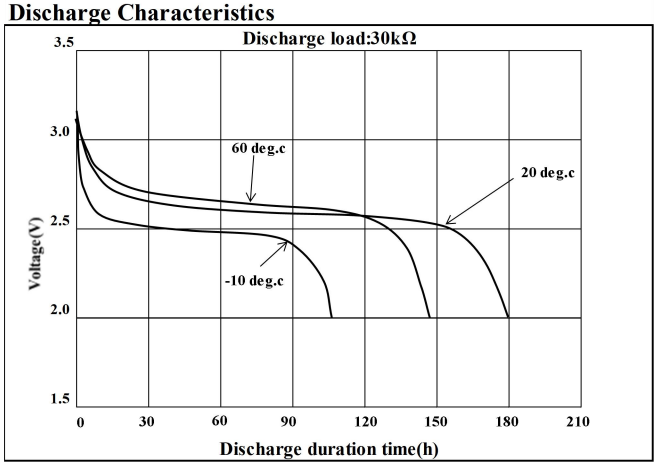
DISCHARGE CHARACTERISTIC

ML1220

Discharge Characteristics

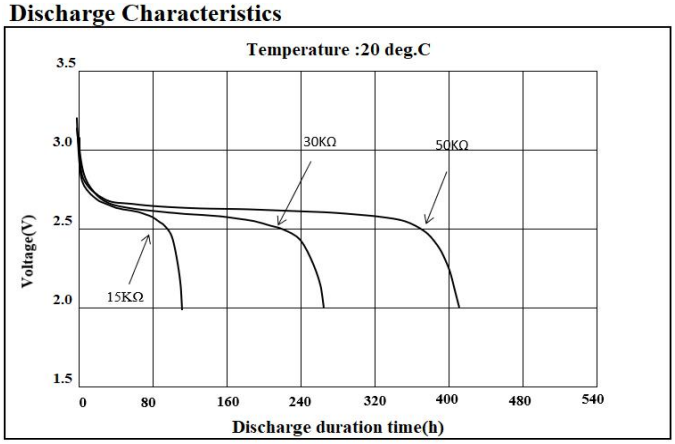


Discharge Characteristics

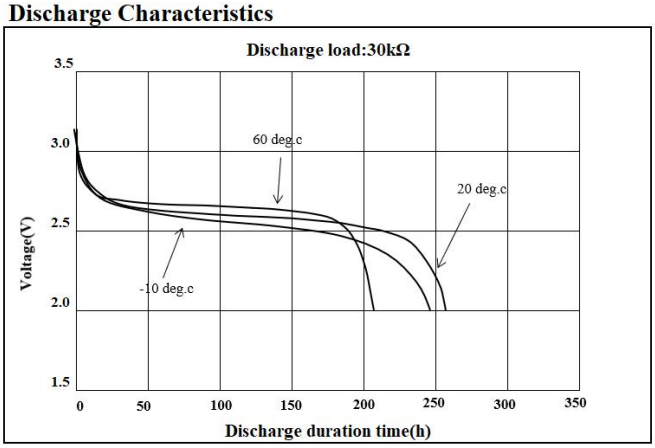


ML1225

Discharge Characteristics

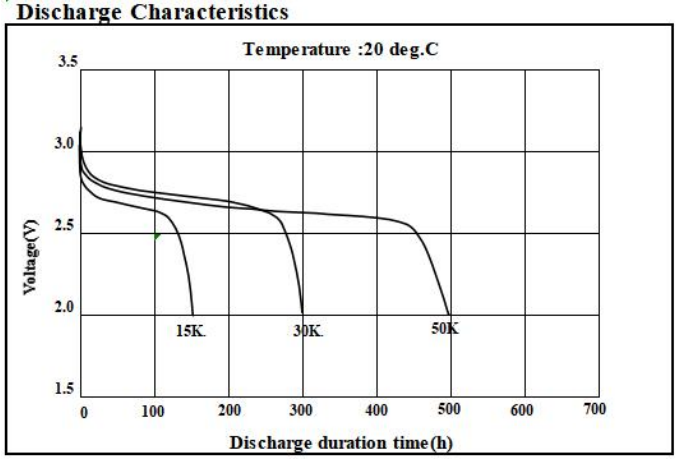


Discharge Characteristics

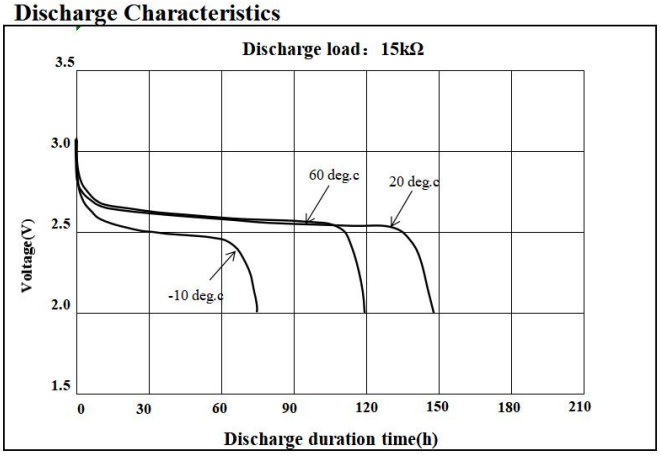


ML2016

Discharge Characteristics

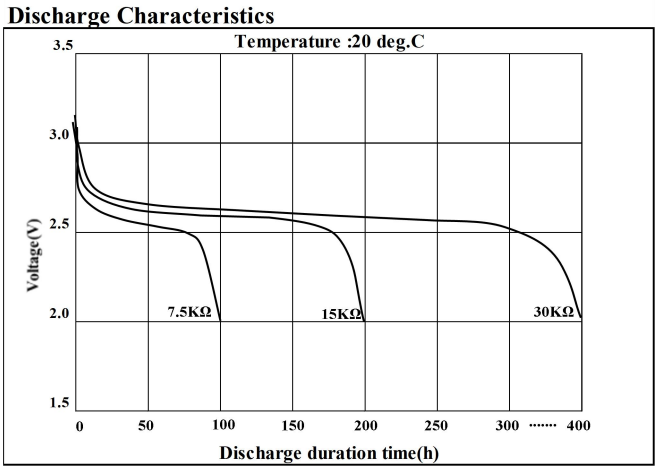


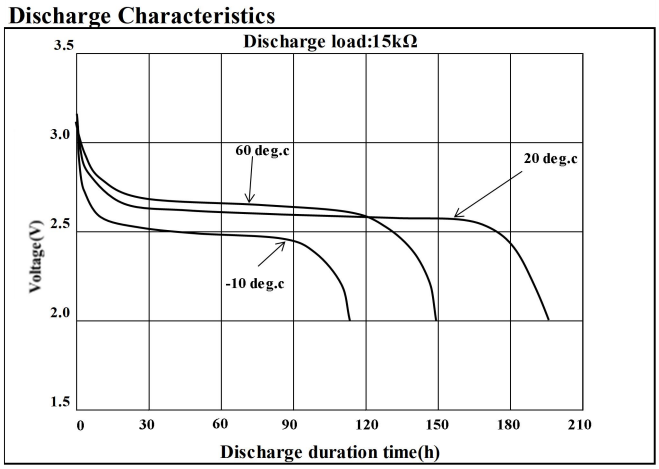
Discharge Characteristics



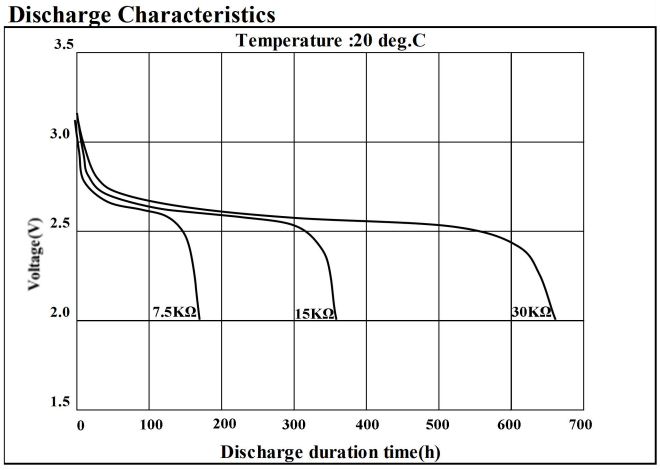
DISCHARGE CHARACTERISTIC

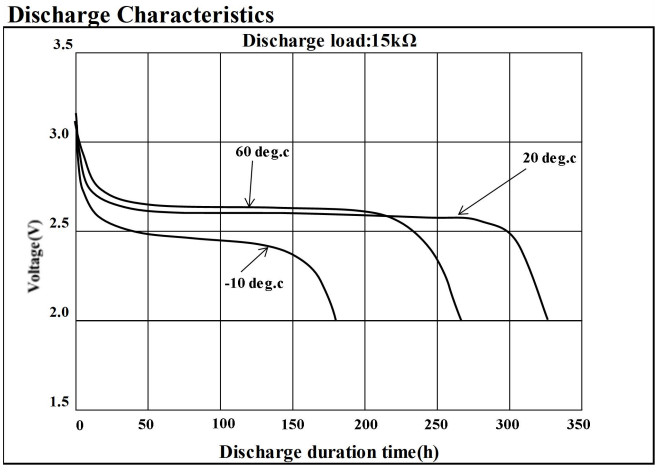
ML2020



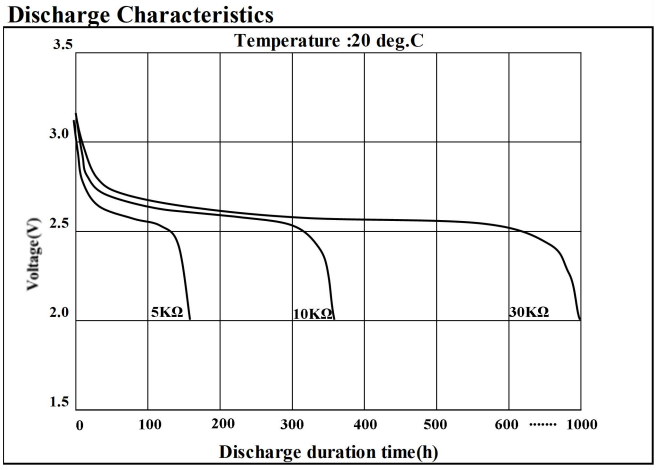


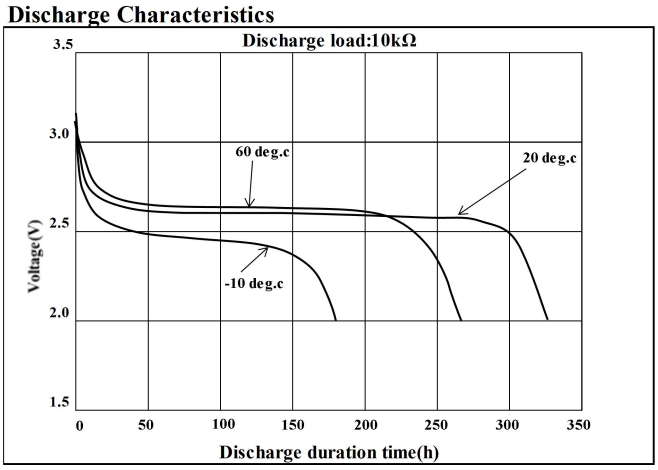
ML2032





ML2430





⚠Warning – Circuit Design

● Do not set the charging voltage above 3.3V

Charging above 3.3 volts may cause issues like gas generation, internal shorts, leading to battery deformation, leakage, overheating, explosion, or fire. Refer to the diagram for details.

● Charge the battery according to the specified current in the table below.

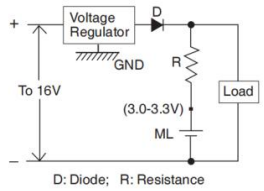
High currents can damage the battery's characteristics, leading to deformation, leakage, overheating, explosion, or fire. To prevent overcurrent at the beginning of charging, ensure the installation of a protective resistor to control the current. Refer to the recommended circuit in the diagram below.

The specified charging current for different battery models.

Item	ML1220	ML1225	ML2016	ML2020	ML2032	ML2430
Charging current	≤1mA	≤1mA	≤2mA	≤2mA	≤2mA	≤2mA

● Recommended circuit

Please refer to the typical basic circuit diagram shown below. If you have any questions, consult CDA for clarification.



Item		ML1220	ML1225	ML2016	ML2020	ML2032	ML2430
Output voltage	3.1V	>1100Ω	>1100Ω	>550Ω	>550Ω	>550Ω	>550Ω
	3.2V	>1200Ω	>1200Ω	>600Ω	>600Ω	>600Ω	>600Ω

(How to choose the current-limiting resistor for controlling electric current?)

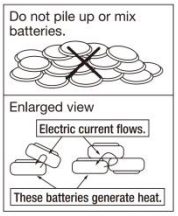
When charging to a termination voltage of 2V, the maximum charging current will flow through the battery. Therefore, we calculate the resistance value using the following formula: (Resistance) >= ((Regulator Output Voltage) - 2) / (Specified Charging Current). For example, the S-812C series with a maximum input voltage of 18V or the S-817 series with a maximum input voltage of 10V (Seiko Instruments Inc.) can be used as a regulator in this circuit.

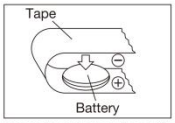
Note 1: If the main power supply voltage is stable, the charging voltage can be obtained by combining resistors with the main power supply.

Note 2: Due to battery height changes during charge and discharge, leave at least 1mm space between device/board and battery.

⚠Warning – Disposal

Batteries are subject to national or local regulations; comply accordingly. Due to residual energy, cover (+) and (-) terminals with insulating material like tape before disposal to prevent deformation, leakage, overheating, or explosion upon contact with other metals.





Example of battery insulation

⚠Caution – Operation, Use, and Storage

● Use the battery within the temperature range of -20 to 60 degrees Celsius.

Otherwise, it may adversely affect the charge-discharge characteristics of the battery.

● Strictly prohibit placing the battery in ultrasonic environments.

Exposure to ultrasonic environments may cause internal metal fragmentation, leading to short circuits and potential battery issues such as deformation, leakage, overheating, explosion, or fire.

● Strictly avoid subjecting the battery to severe vibrations.

Dropping, throwing, or stepping on the battery may result in battery deformation, leakage, overheating, explosion, or fire.

● Do not use the battery in extremely hot conditions.

And avoid leaving it in hot places such as direct sunlight or inside a hot car during warm weather. Doing so may result in battery deformation, leakage, overheating, explosion, or fire.

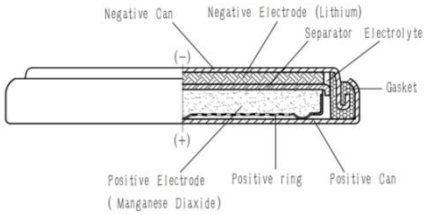
● Strictly prohibit the battery from coming into contact with water.

Contact with water may cause the battery to rust or lead to deformation, leakage, overheating, explosion, or fire.

● Strictly prohibit storing the battery in hot and high-humidity environments.

This can lead to deterioration in battery performance. Moreover, in such environments, the battery may deform, leak, overheat, explode, or catch fire.

Structure



⚠Warning – Handling

● Strictly prohibited to swallow

Keep batteries away from infants and children to prevent swallowing. If a battery is swallowed, seek medical attention immediately.

● Strictly prohibited to replace

Due to potential performance differences among batteries from different manufacturers, even of the same model or type, it is crucial to use new batteries of the identical type and model when replacing batteries in electronic devices. Rechargeable batteries differ significantly from regular ones, and substituting them with non-rechargeable batteries may lead to smoke, short circuits, and various hazards, including deformation, leakage, overheating, explosion, or fire. Design your equipment to prevent end-users from accidentally replacing batteries.

● Do not connect two or more batteries in series or parallel.

Connecting batteries in this manner makes it challenging to adhere to the voltage and current conditions specified in the 'Warning - Circuit Design.

⚠Warning - Handling

●Strictly prohibited to install batteries with reversed polarity.

Inappropriate installation of batteries may lead to short circuits, charging, or forced discharge, resulting in battery deformation, leakage, overheating, explosion, or fire.

●Strictly prohibited to short-circuit the battery.

Do not short-circuit the positive and negative terminals. Avoid carrying or storing batteries with metal items such as necklaces and hairpins. During installation, prevent contact with metal objects that could cause a short circuit, as it may result in battery deformation, leakage, overheating, explosion, or fire.

● Strictly prohibited to heat

Heating the battery to over 100 degrees Celsius increases internal pressure, leading to battery deformation, leakage, overheating, explosion, or fire.

●Strictly prohibited to place in an open flame

Placing the battery in an open flame can cause the lithium metal to melt, leading to battery ignition or explosion.

●Strictly prohibited to disassemble the battery

Do not disassemble the battery, as it may damage insulation layers or seals, resulting in battery deformation, leakage, overheating, explosion, or fire.

●Strictly prohibited to touch the battery electrodes

Do not allow the battery electrodes to come into contact with your skin or fingers. Moisture from your skin may cause the battery to discharge, leading to exposure to chemicals that can cause chemical burns.

● Place leaking batteries away from open flames

If there is suspicion of leakage or a strong odor is detected, place the battery away from open flames, as the leaked liquid may be flammable.

● Strictly prohibited to directly solder wires or terminals onto the battery body

Heating during soldering can cause lithium to melt or damage the insulation material inside the battery. This can result in battery deformation, leakage, overheating, explosion, or fire. If you need to solder the battery directly to the device, only solder on the terminal pins or wires. Even in this case, the temperature of the soldering iron must be below 350 degrees Celsius, and the soldering time should be less than 5 seconds. Do not use a solder bath, as the circuit board containing the battery may stop moving or fall into the solder bath. Additionally, avoid using excessive solder, as it may flow into areas of the board where it should not, causing short circuits or affecting battery charging.

● Strictly prohibited to allow leaked battery liquid to come into contact with eyes or mouth.

As this liquid can cause serious harm, if it comes into contact with your eyes, immediately rinse with plenty of water and consult a doctor. Similarly, if the liquid enters your mouth, rinse immediately with plenty of water and seek medical advice.

● Place leaking batteries away from open flames

If there is suspicion of leakage or a strong odor is detected, place the battery away from open flames, as the leaked liquid may be flammable.

● Safety Instructions

The battery contains lithium, organic solvents, and other flammable materials. Improper handling of the battery may lead to battery deformation, leakage*, overheating, explosion, or fire, resulting in bodily harm or equipment issues. Please read the following instructions carefully to prevent accidents. *Leakage is defined as the unintentional release of liquid from the battery.