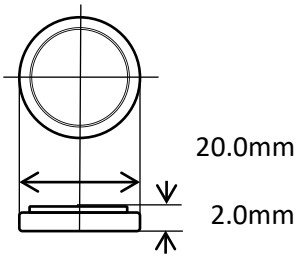
Panasonic ENERGY

ML2020

Coin-type Manganese Rechargeable Lithium Batteries



Specifications

Charging Voltage		2.8V～3.2V
Nominal Voltage		3.0V
Nominal Capacity*1		45.0mAh
Continuous drain		0.12mA
Dimensions*2	Diameter (Max.)	20.0mm
	Height (Max.)	2.0mm
Weight*2		Approx. 2.20g
Operating Temperature		-20°C to +60°C

*1 Based on standard drain and cut-off voltage down to 2.0V at 20°C.
*2 Without tabs.

Features & Benefits

- Ideal for long-term memory backup with extra-high capacity.

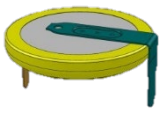
Applications

Memory backup, RTC backup (drive recorders, PCs,communication/radio, medical equipment, FA equipment etc.)

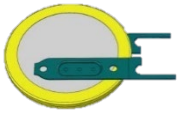
Terminal types

Please see the documents for the terminal and lead wire settings.
- Line up of tab terminal types by product number

H type



V type



Charging circuits

Please ask Panasonic about constant- current charging system.
The charging circuit is crucial in terms of ensuring that full justice will be done to the battery characteristics.
Please study it carefully as the wrong charging circuit can cause trouble.

Charging/discharging cycle	Approx. 1,000times at 10% discharge depth to nominal capacity.
Charging system	Constant-voltage system
Operating temperature	-20°C to +60°C

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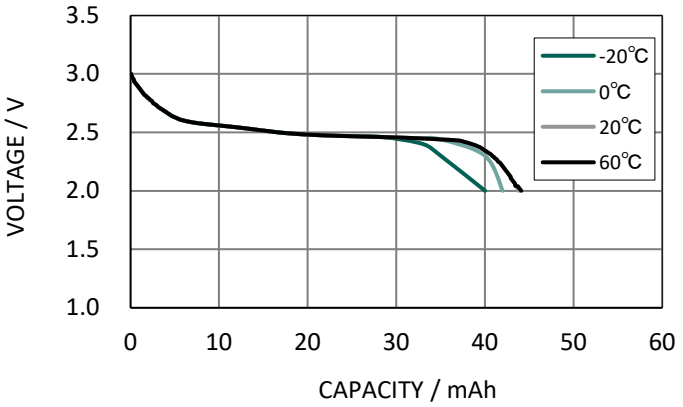
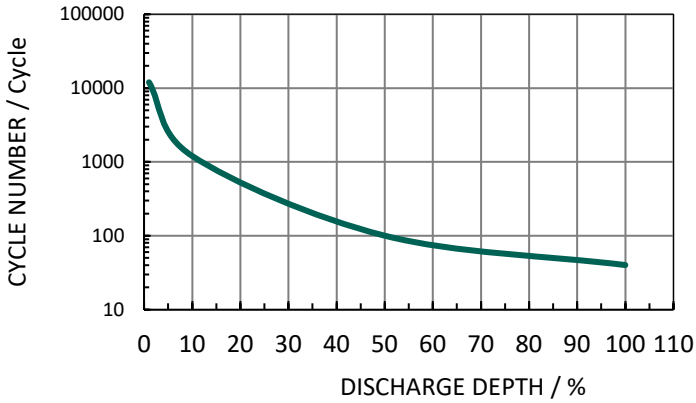
Characteristics

Discharging Characteristics

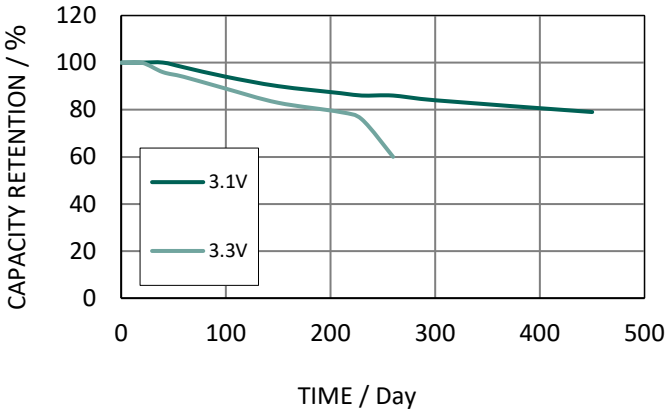


Charging Condition : CV(3.1V,160Ω,60H)
Discharging Condition : CR(20kΩ, 2.0V Cut-off)

Cycle Life Characteristics



Continuous Charging Characteristics (60℃)



Charging Condition : CV(3.1V or 3.3V,60°C)
Discharging Condition : CR(1.5kΩ, 2.0V Cut-off, 60°C)

Handling Guidelines

1. **<u>If a fixed-charging method is applied, please adhere to the specified charging voltage. Guaranteed voltage is 2.8V to 3.2V at the temperature of -20°C to 60°C.</u>**
   If the charging voltage exceeds the specifications, the internal resistance of the battery will rise and may cause battery deterioration.
   Also with a charge voltage around 4V, corrosion of the positive(+) terminal (case) may occur causing leakage.
   It is not possible for the battery to recover completely when the charging voltage is below the specification.

2. **<u>Under no circumstances trickle charging should be used.</u>**
   Ignoring this precaution will cause the battery voltage to rise to about 5V, resulting in a deterioration of performance.