

Selecting the Right Lithium Battery

BR -vs- CR Chemistries

Manganese Dioxide [MnO₂] Lithium Batteries (CR type)

Available in 6 different cylindrical configurations and 23 different coin cell sizes, this 3V chemistry is popular because of its slightly lower cost and broad availability on the retail market so it is typically found in applications where replacement of the battery is performed by end users. The CR chemistry is preferred for higher current drain, intermittent pulse mode applications such as alarm actuation in watches or remote keyless entry systems.

Because of the MnO₂ content in the cell, CR type batteries have a tapered discharge profile and perform well in comparatively large current applications. Characteristically, CR type batteries begin with a slightly higher voltage than BR during discharge. However, as a CR cell discharges, the operating voltage drops over time because of the rise in internal impedance. CR type batteries are slightly less robust than the BR type when exposed to temperatures at the high end of the operating temperature range and can experience a rapid increase in self-discharge at the high end of its temperature rating.

Poly-carbon Monofluoride [(CF)_n] Lithium Batteries (BR type)

Available in 3 different cylindrical sizes, 2 types of pin cells and 12 coin cell sizes in the standard version plus 5 coin cell sizes in our special high operating temperature series. This 3V chemistry is ideal for real-time clock and memory backup applications.

BR series batteries exhibit stable voltage over the entire life of the cell and stable performance at comparatively high environmental temperatures. The self-discharge of the BR chemistry at elevated temperatures is also superior to other lithium coin cell chemistries.

Superior Storability

Because lithium batteries employ substances that are very chemically stable as the active material (BR series: Poly-carbon Monofluoride; CR series: Manganese Dioxide) it is possible to have more than 90% residual capacity after 10 years of storage*, more than five times greater than that of conventional batteries. The estimates rate of annual deterioration is around 0.5% for the cylindrical type BR series and around 1% for the cylindrical type CR series and the coin type BR and CR series* (at room temperature)

BR –vs- CR: Comparison Table

Item		BR	CR
Negative Material		Lithium (Li)	Lithium (Li)
Positive Material		Poly-Carbonmonofluoride (CF) _n	Manganese Dioxide (MnO ₂)
Storage Temperature over 60°C		Good (up to +85°C)	Not recommended
Operating Temperature:	Cylindrical Type	-40°C~+85°C	-40°C~+70°C
	Coin Type	-30°C~+80°C	-30°C~+60°C
	High Temperature Coin Type	-40°C~+125°C	-
	Pin Type	-30°C~+80°C	-
Current Handling Capability		Good	Excellent
Discharge Voltage Characteristics		Stable to end of battery life	Gradually decreases
Discharge Current Characteristics		Better for Low Drain	Better for High Drain
Typical applications		Real Time Clock, Memory B/U	Pulse Discharge, RFID, Keyless Entry, Flashes

**Discharge Characteristics
BR2032 –v- CR2032 Coin Cells**

