maxell
Within, the Future

Maxell Within the Future: The Next Generation

Global energy consumption, increased population, economic growth along with sustainable energy resources have driven Maxell forward in advanced development, achieving excellence with new battery technology. Maxell has succeeded once again in developing the next generation with their new CR17500AU Lithium Manganese Dioxide Battery (CR Battery).

Maxell History of CR Cylindrical Battery Design

With ever changing markets and higher energy demand, Maxell engineers were driven to optimize their CR Cylindrical battery lineup. Cylindrical shape offered engineers the flexibility of design, and with CR technology Maxell was able to optimize a reliable, durable product with proven chemistry to support new market requirements. Increased battery capacity, durability and performance over extreme environmental temperatures are key to supporting markets such as Smart Metering, Security, Tracking & Monitoring Devices as well as other IoT devices.

Maxell New Battery Development (CR17500AU)

Maxell has succeeded in achieving the highest capacity cell in the industry for Cylindrical CR type battery [*1]. Maxell's new CR17500AU, utilizing proprietary advanced electrode technology, was developed based on existing model CR17450AH technology with balanced properties of high energy density and long-term reliability. CR17500AU has 500mAh (approx. 17%) higher capacity while nominal discharge current is five times higher in comparison to CR17450AH.

[*1] highest capacity: According to research in 17500 cylindrical type $LiMnO_2$ battery by Maxell as of Feb 17, 2021

Maxell CR17500AU Specifications

Model		CR17500AU
Nominal voltage (V)		3
Nominal capacity (mAh)*		3500
Nominal discharge current (mA)		5
Operating temperature range (℃)		-40 to +85
Dimensions (mm)	Diameter	17
	Height	50
Materials	Negative electrode	Li-Al alloy
	Positive electrode	MnO_2
	Gasket	Special resin
	Collector (Negative electrode)	Copper foil

* Nominal capacity (mAh): Nominal capacity indicates duration until the voltage drops down to 2.0V when discharged at a nominal discharge current at 20 ℃

Maxell Product Lineup

Model		*New* CR17500AU [*1]	CR17450AH	CR17450A	CR17335A
Nominal Voltage (V)		3	3	3	3
Nominal Capacity (mAh) [*2]		3500	3000	2500	1650
Energy Density (Wh/L) [*3]		926	882	735	651
Nominal Discharge Current (mA)		5	1	5	5
Operating Temperature Range (deg. C)		-40 ~ +85			
Dimension [*4]	Diameter (mm)	17	17	17	17
	Height (mm)	50	45	45	35
Weight (g) [*4]		25	24	22	17

[*1] CR17500AU is under development for the commercial production.
[*2] Nominal capacity indicates duration until the voltage drops down to 2.0 V when discharged at a nominal discharge current at 20 deg. C.
[*3] (Energy density) = (Nominal capacity) x (Nominal voltage) / (Cell volume)
[*4] Dimensions and weigh are for the battery itself, and it may vary depending on terminal specification and other factors.

Advancing Technology for Smart Meters

Energy resources such as oil, coal and natural gas are limited, with supply-demand relationship expected to become restricted on a global scale. Smart metering continues to emerge as advanced technology to reduce energy consumption. CR Technology offers significant advantages over Thionyl Chloride for Smart Metering applications, with high load capability, lower voltage and gradual capacity reduction. See below Advantages.

Chemistry	Lithium Manganese Dioxide	Lithium Thionyl Chloride
Cell Designation	CR	ER
Nominal Voltage	3 V	3.6 V
Positive Material	Manganese dioxide	Thionyl Chloride
Negative Material	Lithium	Lithium
Discharge Property		
Energy Density *	900 Wh/L	900 Wh/L
General Features	• High energy density • High load current capability • Voltage slope in life end • Low self-discharge • Long use reliability	• High energy density • High & flat discharge voltage • Low self-discharge • Long use reliability
Application	Camera flash Meters Home security (Fire alarm) Asset tags	Meters Memory back-up

* The energy density is general value when it is considered A size cell (H; 17 mm x D; 50 mm).

Features of CR Technology

- Long life and reliability over 10 years
  - Reduces battery & infrastructure replacement costs
- Provides High load current required for transmitting
- Accepts high pulse discharge
- Wide Operating Temperature Range (-40C to +85C)
- Competitive Price

Maxell Design Features: 10-year Life and High Current Load Battery

- **Sealing property** – Maxell proprietary Laser sealing between the negative can & upper lid; insulates the cell & avoids electrolyte vaporization, eliminating moisture penetration.
- **Electrolyte solution** – Electrolyte solution is the medium where ion diffusion is made between positive and negative.
- **Positive electrode** – Highly reactive Manganese dioxide is controlled by Maxell unique process during discharge, and reducing impedance.
- **Negative electrode (Lithium metal)**–Maxell has adopted the unique surface treatment which prevents passivation layer after depletion of lithium.

Maxell Designs for the Future

Maxell's advancement in cylindrical battery technology offers unique advantage to evolving markets such as IoT, Smart Metering, Security, and Tracking & Monitoring applications. Our new CR17500AU ($LiMnO_2$) battery which provides 3500mAh capacity, high discharge capability, extended temperature & long-life performance has achieved Maxell excellence. Please contact us at OEMBatterySupport@maxell.com for more information or visit us at https://www.maxell.com.