



# Maxwell ultracapacitors. Changing how the world stores and uses energy.

Maxwell's industry-leading ultracapacitors are breakthrough energy storage and delivery devices that offer millions of times more capacitance than traditional capacitors. They deliver rapid, reliable bursts of power for hundreds of thousands of duty cycles – even in demanding conditions.\*

## A New Standard

Ultracapacitors create a new standard of energy-use optimization. They are ideal for applications ranging from wind turbines and mass transit, to hybrid cars, consumer electronics and industrial equipment. Available in a wide range of sizes, capacitance and modular configurations, ultracapacitors can cost-effectively supplement and extend battery life, or in some cases, replace batteries altogether.

## Lowering Costs, Increasing Value

Proprietary advances in material science, coupled with process optimization and global manufacturing enable Maxwell to keep costs down and quality high. This agility enables our product teams to tailor device design and performance to a wide spectrum of industry-specific uses.

Specifications	HC Series	BC Series	K2 Series	Modules
<b>Capacitance (F)</b>	1 - 150	310 - 350	650 - 3,400	5.8 - 500
<b>Voltage (V DC)</b>	2.3 - 2.7	2.7	2.7 - 2.85	16 - 160
<b>ESR<sub>DC</sub> (mohm)</b>	14 - 700	2.2 - 3.2	0.28 - 0.8	2.1 - 240
<b>Leakage current (mA)</b>	0.006 - 0.500	0.3 - 0.45	1.5 - 18	3.0 - 170
<b>E<sub>max</sub> (Wh/kg)</b>	0.7 - 4.7	5.2 - 5.9	4.1 - 7.4	2.3 - 4.0
<b>P<sub>max</sub> (W/kg)</b>	2,400 - 7,000	9,500 - 14,000	12,000 - 14,000	3,600 - 6,800

## Efficient, Economical and Environmentally Friendly

Traditional lead-acid batteries rely on aging technology and toxic chemicals for energy storage. While adequate for some uses, chemical energy can create insurmountable limitations for emerging applications that require safe, dependable, quick-burst power, over long periods of time.

Seeking an alternative, many industries have embraced Maxwell Technologies' ultracapacitors – one of today's most efficient, economical and environmentally friendly energy storage alternatives.

## Regenerative Braking and Peak Power

Ultracapacitors' unique performance characteristics make them ideal for capturing and storing braking energy generated in trains, trams, trucks and automobiles – and then releasing it on demand. They can deliver peak power for drive systems and actuators in a variety of vehicles.

## Ideal for UPS Backup and Pulse Power

In UPS applications, ultracapacitors ensure that critical information and functions are available when supply voltage dips, sags, drops out or surges, or during a battery changeover. Working in tandem with a complementary power source, ultracapacitors reliably supply energy in peak power demand conditions, reducing strain on the primary source and extending its usable life.

## Modular Storage Solutions

By linking multiple cells in a single module, Maxwell Technologies' ultracapacitors can meet or exceed the storage and power needs of today's most demanding applications. Based on either our K2 or BC series, modules provide a dependable, cost-effective solution for UPS, telecom, automotive, transportation, and other applications, reliably performing through hundreds of thousands of recharge cycles.

\*\*\*Additional terms and conditions, including the limited warranty, apply at the time of purchase. See the datasheet and warranty details for applicable operating and use requirements.



**Maxwell Technologies, Inc.**  
**Global Headquarters**  
3888 Calle Fortunada  
San Diego, CA 92123  
USA  
Tel: +1 858 503 3300  
Fax: +1 858 503 3301



**Maxwell Technologies SA**  
Route de Montena 65  
CH-1728 Rossens  
Switzerland  
Tel: +41 (0)26 411 85 00  
Fax: +41 (0)26 411 85 05



**Maxwell Technologies, GmbH**  
Leopoldstrasse 244  
80807 Munchen  
Germany  
Tel: +49 (0)89 4161403 0  
Fax: +49 (0)89 4161403 99



**Maxwell Technologies  
Shanghai Trading Co. Ltd.**  
Unit A2,C 12th Floor  
Huarun Times Square  
500 Zhangyang Road,  
Pudong New Area  
Shanghai 200122,  
P.R. China  
Phone: +86 21 3852 4000  
Fax: +86 21 3852 4099



**Maxwell Technologies Korea Co., Ltd.**  
Room 1524, D-Cube City  
Office Tower, 15F #662  
Gyeongin-Ro, Guro-Gu,  
Seoul, 152-706  
South Korea  
Phone: +82 10 4518 9829

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## Specialty Modules

Maxwell also offers several dependable specialty modules that are tailored to the critical requirements of specific industries and applications. Our Heavy-duty Transportation Modules (HTM), for example, deliver the performance, reliability, and serviceability that satisfies transportation industry demands.

Our Engine Start Modules (ESM) for the trucking industry work in tandem with batteries, extending their life by providing reliable burst power at ignition. When the key turns, the engine cranks – even after a night of hotel loading in harsh conditions – in temperatures to forty below. The ESM also reduces or eliminates jump starts, improves driver safety and on-time deliveries; lowers total cost of ownership; and greater compliance with anti-idling laws. The ESM features a Group 31 form factor that can replace a battery in Class 3 to 8 trucks.

## Numerous Benefits

- Environmentally safe
- No toxic chemicals
- Virtually maintenance free
- Long life\*\*\*
- Operating temperature range -40°C to +65°C
- Higher energy vs. electrolytic capacitors
- Higher power vs. batteries
- Resists shock and vibration
- Multiple mounting options

## Countless Applications

- Automated Meter Reading (AMR)
- Automotive
- Consumer electronics
- Industrial
- Telecommunications
- Transportation
- Renewable Energies
- Uninterruptible Power Supplies (UPS)
- Solid State Disk Drives
- Grid Storage
- Heavy Equipment

**Maxwell**  
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