



Maintenance free reliability. Maxwell's durable, maintenance-free ultracapacitors are currently in thousands of wind turbines worldwide. Our ultracapacitors perform reliably for years in all weather conditions with zero or minimal maintenance. Maxwell ultracapacitors have demonstrated their durability and reliability at temperatures ranging from -40 to $+65^{\circ}\text{C}$, which enables pitch control systems to meet the grueling wind energy expectations under virtually any conditions.

Implementing a Maxwell ultracapacitor solution provides versatile, green and maintenance-free energy that delivers power bursts safely and reliably for more than a million cycles and virtually eliminates site visits to change out batteries. For wind, ultracapacitors can:



Maxwell's 16 V Small Cell Module and 75 V Module are ideal for use in wind applications.

- Significantly reduce lifetime maintenance costs
- 50,000 pitch systems installed worldwide
- Deliver high performance in all weather conditions
- Virtually eliminates site visits to change out batteries
- Provides the most cost effective, maintenance free Power Quality solution
- Up to 15 year lifetime

Ultracapacitors

Also known as Electric Double Layer Capacitors, or Supercapacitors - are alternative energy storage devices which store energy by electrostatically (physically) separating positive and negative charges. This is in contrast to batteries which store energy via orbital electron exchange (chemically). The lack of chemical reaction within permits ultracapacitors to be charged and discharged up to 1,000,000 times (compared to 100s or 1000s of charge/discharge cycles in batteries) - and at a faster rate than batteries.

All Maxwell Technologies ultracapacitors can be rapidly charged and discharged over, and over, and over again, at the same rate, making them one of the most energy efficient, environmentally friendly, and cost effective ways to store energy.



16 V Small Cell Module

Background

Maxwell Technologies is the global leader in ultracapacitor technology and is helping to change the way energy is used and stored. Our ultracapacitor products provide energy storage and power delivery solutions for applications in an array of industries, including automotive, heavy transportation, renewable energy, backup power, wireless communications and consumer and industrial electronics.

Available in a range of component cells, modules and system configurations, our ultracapacitor products bring new levels of efficiency and power to everything from consumer electronics to hybrid vehicles and renewable energy sources, ensuring an ideal solution for virtually any application up to 1 million recharge cycles or 15 years life.

Our proprietary electrode technology and global manufacturing facilities allow us to deliver unsurpassed value to our customers, while tailoring performance to specific applications.



75 V Module

Specifications

	16 V Small Cell Module	75 V Module
Rated Capacitance (F)	58	94
Rated Voltage (V)	16	75
DC Life (°C)	25	65



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