

Technology Comparisons

Characteristic	Lead Acid Battery	Ultracapacitor	Conventional Capacitor
Charge Time	1 to 5 hrs	0.3 to 30 s	10 ⁻³ to 10 ⁻⁶ s
Discharge Time	0.3 to 3 hrs	0.3 to 30 s	10 ⁻³ to 10 ⁻⁶ s
Energy (Wh/kg)	10 to 100	1 to 10	< 0.1
Cycle Life	1,000	>500,000	>500,000
Specific Power (W/kg)	~1000	~10,000	~100,000
Charge/discharge	0.7 to 0.85	0.85 to 0.98	>0.95
efficiency	Discarge UltraCap	Charge rge Charge $Q = \frac{U * I}{dU/dt}$	
Iltracapacitors ● Microelectronics ● High-Voltage Capacitors			



Ultracapacitor vs. Battery Technologies



axwell