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*ECS Transactions, Volume 50, Issue 43*  
Electrochemical Capacitors  

#### Preface  

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Having power and energy characteristics between batteries and conventional capacitors, electrochemical capacitors offer new
opportunities in electrical engineering and a fertile ground for the development and refinement of new electrode materials. This chapter
will begin by introducing the fundamentals of electrochemical double-layer capacitors and pseudocapacitors (Sect. 17.1). It will go on to
describe the most commonly used methods (Sect. Testing Electrochemical Capacitors-Electrochemical Impedance Spectroscopy. This
note describes electrochemical techniques for energy-storage devices. Electrochemical Impedance Spectroscopy. EIS is a widely
used technique to investigate electrochemical systems. The advantage of EIS is that it is generally non-destructive to the investigated
system. This enables the possibility for further electrochemical measurements and post-mortem investigations.
Electrochemical double layer capacitors, also known as supercapacitors or ultracapacitors, are energy storage elements with high energy density compared to conventional capacitors and high power density compared to batteries. Unlike conventional capacitors, where no chemical reactions is used and small amount of energy is stored by physically storing electric charges between two conductive