

Energy storage film power capacitor





Overview

What are energy storage capacitors?

Capacitors exhibit exceptional power density, a vast operational temperature range, remarkable reliability, lightweight construction, and high efficiency, making them extensively utilized in the realm of energy storage. There exist two primary categories of energy storage capacitors: dielectric capacitors and supercapacitors.

Can lead-free dielectric film capacitors be used for high-energy storage?

Lead-free dielectric film capacitors are widely used in electronic devices and power systems. However, the relatively low energy density and poor stability have become the bottlenecks restricting their further application. In this work, we demonstrate that the high-energy storage density (114.49 J cm^{-3}) can.

What are metallized film capacitors?

Metallized film capacitors towards capacitive energy storage at elevated temperatures and electric field extremes call for high-temperature polymer dielectrics with high glass transition temperature (T_g), large bandgap (E_g), and concurrently excellent self-healing ability.

What is the thermal stability of film capacitors?

In addition, the film capacitors exhibit good thermal stability over the temperature range of -100 to $225 \text{ }^\circ\text{C}$ and fatigue properties (10^6 cycles). Importantly, the energy storage density reaches 62.3 J cm^{-3} at $225 \text{ }^\circ\text{C}$, and the energy storage efficiency is as high as $\sim 81\%$.



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