

What is a multifunctional capacitor?

Cite this: ACS Appl. Mater. Interfaces 2019, 11, 37, 34117-34127 Multifunctional capacitors can efficiently integrate multiple functionalities into a single material to further down-scale state-of-the-art integrated circuits, which are urgently needed in new electronic devices.

Why do we need multilayer ceramic capacitors?

Next-generation electrical and electronic systems elaborate further requirements of multilayer ceramic capacitors in terms of higher energy storage capabilities, better stabilities, environmental-friendly lead-free, etc., where these major obstacles may restrict each other.

Do structural capacitors provide mass and volume savings?

At these high-fiber volume fractions, the overall multifunctional performance of the structural capacitors is predicted to provide mass and volume savings over conventional designs. View all access and purchase options for this article.

What is all-inorganic flexible capacitor?

Here, an all-inorganic flexible capacitor based on $\text{Pb} 0.91 \text{ La} 0.09 (\text{Zr} 0.65 \text{ Ti} 0.35) 0.9775 \text{ O} 3$ (PLZT 9/65/35) relaxor ferroelectric thick film (1 μm) was successfully fabricated on LaNiO_3 /F-Mica substrate for application in electrostatic energy storage and electrocaloric refrigeration simultaneously.

What is the energy density of lead-free multilayer ceramic capacitors?

A large energy density of 20.0 J cm^{-3} along with a high efficiency of 86.5%, and remarkable high-temperature stability, are achieved in lead-free multilayer ceramic capacitors.

Are lead-free multilayer ceramic capacitors ultra-high energy storage performance?

Zhao, P. et al. Ultra-high energy storage performance in lead-free multilayer ceramic capacitors via a multiscale optimization strategy. Energy Environ. Sci. 13, 4882-4890 (2020). Lu, Z. et al. Superior energy density through tailored dopant strategies in multilayer ceramic capacitors. Energy Environ. Sci. 13, 2938-2948 (2020).

Abstract: This study describes a duty-cycle-controlled resonant dual-half-bridge converter with multifunctional capacitors for enhancing the voltage level of fuel cell and photovoltaic sources to ...

Multifunctional structural supercapacitor based on the structural electrolyte of cement/PVA-KOH composite and the structural electrode of highly electrically graphene was ...

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1D carbon materials, such as high-modulus CNTs and carbon fibers, are invaluable for multifunctional energy storage nanocomposite electrodes and current collectors, ...

Dielectric capacitors with mechanical load-bearing capability have been constructed by laminating glass-epoxy prepregs with metalized film ...

This study describes a duty-cycle-controlled resonant dual-half-bridge converter with multifunctional capacitors for enhancing the voltage level of fuel cell and photovoltaic sources to 380 V. Owing to the incorporation of dc ...

The rapid development of portable electronics requires miniaturized and flexible electrochemical capacitors (ECs) with ultrafast frequency response and/or integrated high capacitive ...

1 A Critical Review on Multifunctional Composites as Structural Capacitors for Energy Storage Kit-Ying. Chan1,*, Baohua Jia 1, Han Lin, Nishar Hameed1, Joong-Hee Lee2 and Kin-Tak Lau1, 3 ...

Mechanical Properties of Highly Deformable Elastomeric Gyroids for Multifunctional Capacitors Advanced Engineering Materials (IF 3.6) Pub Date : 2023-07-04, DOI: ...

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Multifunctional structural composite capacitors for U.S. army applications. In: 38th ISTC, Army Research Laboratory, Dallas, Texas, 6-9 November 2006, p. 11.

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Multifunctional structural composite capacitors for US Army application. In: Proceedings of society for the advancement of material and processing engineering (SAMPE) ...

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