

Are soft magnetic powder cores sustainable?

Conclusion In a society that promotes energy saving, magnetic core materials, which are the nucleus of electromagnetic conversion parts, need to deliver sustainable performance. The soft magnetic powder cores we developed by using powder metallurgy technology, exhibited both low core loss and high flux density.

What is soft magnetic powder core (SMPC)?

While laminated steel and ferrite core are conventional materials for the cores, for downsizing these systems and devices and improving their power efficiency, we have developed a soft magnetic powder core (SMPC), which exhibits superior magnetic properties in a high frequency region and a high degree of forming freedom.

What is a soft magnetic powder core?

To be used for these applications, magnetic cores need to have a high flux density at high operating frequencies and can be formed into various shapes, thereby allowing three-dimensional magnetic circuit design. Soft magnetic powder cores are produced from insulated magnetic powder by means of powder metallurgy.

What is a soft magnetic composite?

Composites are the newest class of soft magnetic materials, and in the field of soft magnetics, they are referred to as powder cores or soft magnetic composites. These materials are composed of micrometer-sized particles coated with an insulating binder and consolidated at high pressures.

What is a soft magnetic composite (SMC)?

In the early 1990s, powder cores (also known as soft magnetic composites or SMCs) gained acceptance in some soft magnetic applications (1,36).

What is a soft magnetic material?

Soft magnetic materials play important roles in both power generation and conversion devices. One of their important applications is power inductor, which acts as an energy transfer station, transferring the direct current energy and blocking the high-frequency alternating current.

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The DC bias characteristics and power loss characteristics of the second-generation FeSi cores are equivalent to those of amorphous magnetic powder cores, and they are mainly used in ...

Photovoltaic power generation has a fluctuating relationship between its power output and its working voltage.

Metallic soft magnetic powder and photovoltaic inverter

That is, in the actual power conversion, control of the maximum power output needs to be realized first. ...

A novel soft switching flyback inverter for PV AC module applications is introduced in this study. The presented inverter is simple and a small auxiliary circuit is added ...

Photovoltaic (PV) power systems have gained a significant interest, thanks to the evolution of highly reliable power conversion and mass production of PV panels. Among ...

In the early 1990s, powder cores (also known as soft magnetic composites or SMCs) gained acceptance in some soft magnetic applications (1, 36). These materials combine magnetic particles, anywhere between ~1 to ...

such as the photovoltaic inverter, charger for the electric vehicle, smartphone, and tablet. SMC is based on insulated metallic magnetic particles and additives such as binder and lubricant by ...

Bioinspired Soft Magnetic Composites (SMCs) with nacre-like structure were fabricated using highly planar arranged flaky-Sendust. These SMCs show particularly high permeability and low loss, thus ...

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