

Noise Suppressing / Magnetic Sheets

TDK introduces new IFQ06 ultra-thin magnetic sheets with high permeability for NFC Applications

- High permeability and low magnetic loss material for 13.56 MHz NFC applications
- High flexibility which allows sheets to easily be formed to desired shape
- High quality (Q) factor
- Protects system from metal objects located directly behind coils
- Available in roll or in sheet form

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TDK Corporation (TSE:6762) extends its Flexield family of magnetic shielding materials with the introduction of the IFQ06, offering high permeability (μ') and low magnetic loss (μ'') designed for near-field communications (NFC) applications. The IFQ06 material provides highly effective protection against performance-reducing design features that can complicate NFC designs, such as metal objects directly behind the antenna.

With the evolution of ever smaller and more multifunctional electronic devices, it is increasingly difficult to keep advanced functionalities from interfering with each other. NFC communication uses electromagnetic induction where the antenna receiving a carrier wave from a reader/writer allows the on-board IC chip to perform signal processing.

Metal objects, in particular, can absorb or disturb the magnetic flux lines of the generated H field, creating eddy currents which reduce effective range. These disturbances can also shift the inductance value and self-resonance frequency, reducing performance because of tuning issues between the two antennas. In some cases, metal close to the antenna will carry an induced current that produces a countering magnetic field, shortening the communication distance and making communication impossible.

By placing the newly released IFQ06 series material between the antenna coil and any metal surface, the magnetic flux is confined within the magnetic shield that is generated by the reader/writer. As a result, the generation of an induced current on the metal surface is eliminated and optimum 13.56 MHz communication conditions can be maintained.

Other benefits of the IFQ06 series include:

- Shaping/directing the magnetic H field
- Influencing the quality factor (Q) of the inductive antenna
- Increasing the coupling factor (K) between the two antennas
- Helping set the inductance value (Ls) for resonant tuning
- Completing the magnetic field path
- Improving security by encapsulating the magnetic field and its respective information

TDK's IFQ06 flexible magnetic sheet materials are offered in a choice of three formats: roll or sheet materials ideal for prototyping, lower volumes or where large areas need to be covered; and custom cut parts to exactly match design requirements for higher volume or automated assembly options.

Main features and benefits

- Highly flexible magnetic material that facilitates easy forming to desired sizes and shapes
- Available in multiple standard thicknesses: 0.050 mm, 0.100 mm, and 0.200 mm
- Additional thicknesses of 0.065 mm and 0.075 mm available upon request
- High permeability for thin film (μ' : 55), low magnetic loss (μ'' : ~ 2) and good Q [μ'/μ'' : 28] at 13.56 MHz
- High surface resistivity of $>10\text{ M}\Omega$ allowing for direct contact to metal antennas
- Available with an optional high temperature resin [IFQ06S] that supports applications up to $+125\text{ }^\circ\text{C}$
- Available on a roll, in sheet format, or customized to customer's specific needs

About TDK Corporation

TDK Corporation is a world leader in electronic solutions for the smart society based in Tokyo, Japan. Built on a foundation of material sciences mastery, TDK welcomes societal transformation by resolutely remaining at the forefront of technological evolution and deliberately “Attracting Tomorrow.” It was established in 1935 to commercialize ferrite, a key material in electronic and magnetic products. TDK's comprehensive, innovation-driven portfolio features passive components such as ceramic, aluminum electrolytic and film capacitors, as well as magnetics, high-frequency, and piezo and protection devices. The product spectrum also includes sensors and sensor systems such as temperature and pressure, magnetic, and MEMS sensors. In addition, TDK provides power supplies and energy devices, magnetic heads and more. These products are marketed under the product brands TDK, EPCOS, InvenSense, Micronas, Tronics and TDK-Lambda. TDK focuses on demanding markets in automotive, industrial and consumer electronics, and information and communication technology. The company has a network of design and manufacturing locations and sales offices in Asia, Europe, and in North and South America. In fiscal 2023, TDK posted total sales of USD 16.3 billion and employed about 103,000 people worldwide.

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