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Technical Application Notes of RF Inductors

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► Technical Application Notes

Technical Application Notes for Inductors and Chokes

Selecting the Optimum Inductor Choke to Best Match the Right Performance

Inductive components store energy intermittently in switch-mode power supplies and DC/DC converters, form parts of RF circuits or RFID systems, transform current/voltage, match impedances, are filter elements and last but not least interference suppression components to ensure EMC.

The requirements on inductors depend on how and where they are used. RF circuits need coils with high quality factors and resonant frequencies. EMC applications require high inductance to achieve good interference suppression characteristics, low Q factors being more desirable here due to the need to avoid resonance.

Token Electronics provides suitable inductive components for all applications. This guide contains a wide selection of standard components, from SMT types through high current inductors for power electronics applications to transformers.

Comparison of Inductor Factors for Applications					
Applications	Inductance	Current Rating	Resonance frequency	Q factor	DC Resistance
RF Circuits, Resonant Circuits	low	low	very high	very high	low
EMC	high	high	high	low	very low
RFID	depends on the specific application	low	high	high	low
DC/DC Converters	depends on the specific application	high	medium	high	low
Transformers in DC/DC	depends on the specific application	depends on the specific application	medium	depends on the specific application	low
Signal Processing	depends on the specific application	low	high	-	medium

RF Circuits

The Token RF product range of SMT and leaded RF chokes are especially suitable for RF and other high frequency circuits. Typical applications are resonant circuits and frequency-selective filters of the type increasingly used in telecommunications engineering and automotive electronics.

Filter Circuits

When inductive components are used for filters in power supplies for electronics, high inductance, the lowest possible DC resistance and a low Q factor are required. The impedance should have a wideband frequency characteristic. In addition to the current rating, the maximum permissible pulse current (switching transient currents) and adequately high core material saturation are important.

RFID Systems

RFID systems allow contactless identification without direct line-of-sight contact. They are used for wireless data transmission in a range of a few meters. Examples of their application include the automobile industry, logistics, agriculture, medical engineering and security systems. The range of Token transponder coils is especially designed for high mechanical stability and high sensitivity as required in the automobile industry for immobilizers, car access systems and tire pressure monitoring systems (TPMS).

DC/DC Converters, Switch-Mode Power Supplies

Inductive components are used for magnetic energy storage in all kinds of DC/DC converters and switch-mode power supplies. Depending on application, a broad range of different components starting from high-current RF and SMT power inductors up to toroid chokes and transformers can be used.

Signal Processing

Among other things, signal transformers are notable for being able to transform signals in a large frequency range. They are consequently used in particular in high-speed data transmission (e.g. xDSL) for matching and electrical isolation. Innovative materials and a special winding and coil former design result in low losses, good total harmonic distortion, and fulfilling the requirements on creep age and clearance distances.

EMC Application

For broadband interference suppression, current-compensated chokes with different core shapes are especially suitable, e.g. ring or D cores and powder core chokes.

Apart from use as filters in mains and other power supply lines, such chokes are important for data lines as used in telecommunications engineering, in line cards, in telephone exchanges (digital and analog), in automotive electronics, and CAN bus applications.

Almost all component families are approved in accordance with the main international standards. All chokes for low-frequency mains networks are dimensioned and tested in compliance with applicable EN and IEC standards.