Single Coil Inductors

**Core material**

- **Ferrite**
  - NiZn: Robust WE-PD, WE-PD2, WE-LQS, WE-T1
  - MnZn: Performance WE-PD, WE-HCF, WE-TPC

- **Iron**
  - Powder: Power density WE-LHMI
  - Alloy: Efficient WE-MAPI, WE-XHMI, WE-HCl and WE-PMCI

**Wire types**

- **Round Wire**: Up to 4 wires in parallel for ultra low losses, e.g. WE-PD, WE-TPC, WE-MAPI, WE-LHMI
- **Flat Wire**: Best filling grade for highest power density possible, e.g. WE-HCl, WE-XHMI and extremely low RDC, e.g. WE-HCM
- **Litz Wire**: Up to 115 wires twisted for highest ripple current application, e.g. WE-HCF

**Shielding types**

- Unshielded (cost efficient)
- Semi shielded (allrounder)
- Shielded (best performance)
- Molded (highest power)

**Suitable for all kind of applications**

- SMT (Surface Mount)
- THT (Through Hole)

**AEC-Q200 qualified**
- Certain series
- Temperature range: -40 °C up to +125 °C / +150 °C / +155 °C
- Outstanding saturation behavior
- Extreme low $R_{DC}$

- Highest power density based in package volume
- Robust design for advanced applications
- Best filter characteristics
- Operating voltage rating up to 400 V

- Size from 1.6 mm up to 41 mm
- Current rating up to >125 A
- Inductance value from 25 nH up to 22 mH
- Switching frequency from 10 kHz up to 10 MHz

**Usage of Single Coil Inductors:**

- Often used in DC/DC converter, e.g. buck converter
- One of the most important factors of an inductor is its current capability

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Inductor in a DC/DC Converter

Inductor in a DC/DC Converter

Ripple Current over Inductor

Digital Audio Inductors: WE-HIDA and WE-LHMD

Thick lines are showing the current load of the inductor with the duty cycle shown in the right graph.

The current load is depending on the switching frequency and the inductance value.

In this example the duty cycle is 50%.

Soft saturation leads to overall higher ripple.

Hard saturation may lead to ripple peaks when inductor is close to saturation.

Applications / Characteristics

- Class D Audio amplifiers
- Digital amplifiers
- PWM switching frequency from 150 kHz up to 2 MHz
- 2-in-1 inductor design uses less space on PCBs with full-bridge topology
- Very low $R_{dc}$

Measurement Characteristics

- Low THD+N possible with new MnZn or Iron powder core materials
- Red area is mostly influenced by inductor selection
- THD+N tested with 1 kHz input audio signal (according AES-17 standard)

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