Single Coil Inductors

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

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

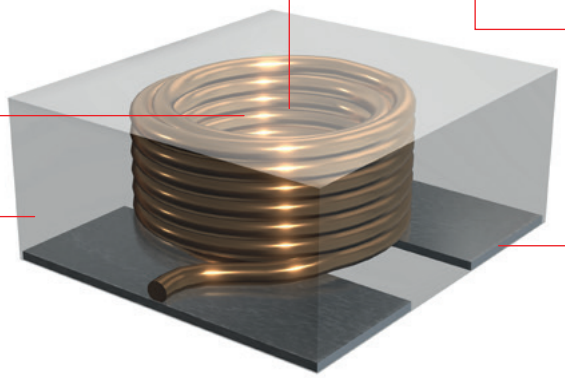
Core material

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-HCI, WE-XHMI and extremly low R_{DC} e.g. WE-HCM

Litz Wire: Up to 115 wires twisted for highest ripple current application, e.g. WE-HCF

Wire types



Shielding types

Unshielded (cost efficient)

Semi shielded (allrounder)

Shielded (best performance)

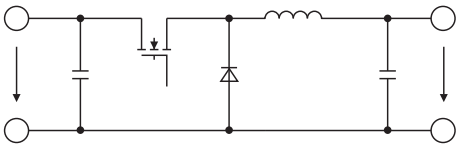
Molded (highest power)

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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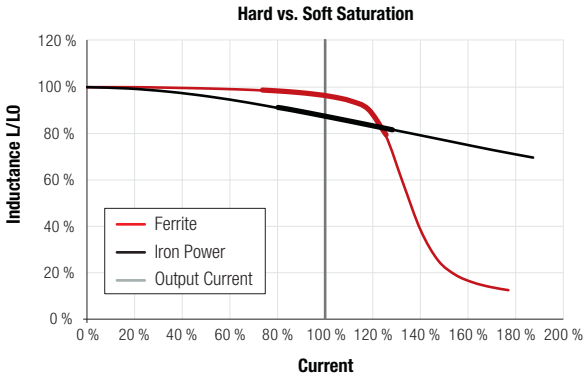
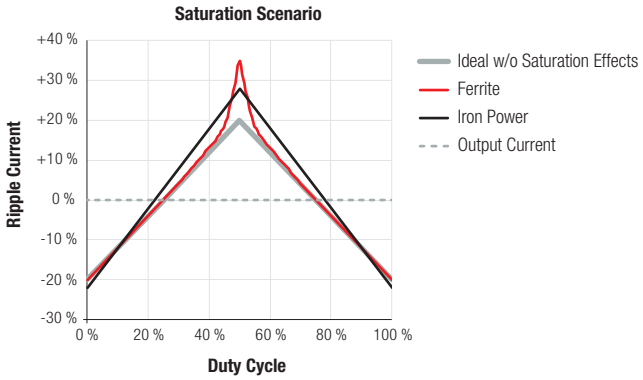
Inductor in a DC/DC Converter



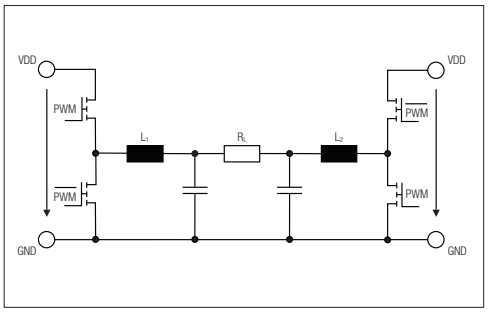
- Thick lines are showing the current load of the inductor with the duty cyle shown in the right graph
- The current load is depending on the switching frequency and the inductance value

Ripple Current over Inductor

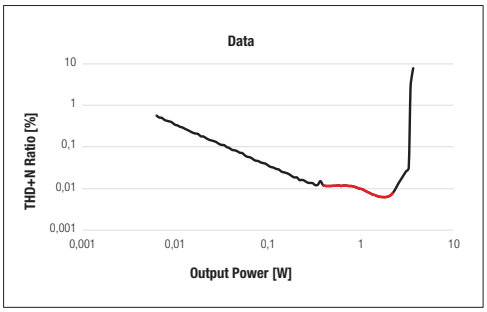


- In this example the duty cycle is 50%
- Soft saturation leads to overall higher ripple
- Hard saturation may lead to ripple peaks when inductor is close to saturation

Digital Audio Inductors: WE-HIDA and WE-LHMD



Full-bridge topology



THD+N ratio vs. output power measurement

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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