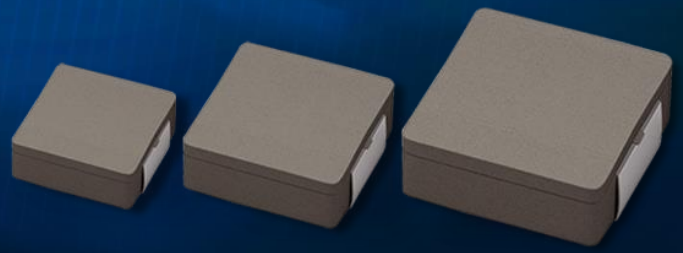
METCOM

KEMET POWER INDUCTORS

MPX and MPXV Inductors



METCOM Power Inductors

METCOM MPX Power Inductors are metal composite inductors ideal for use in DC to DC switching power supplies, as power inductors as well as EMI filter inductors. MPXV Series is automotive qualified.

METCOM's metal composite core has high saturation characteristics ideal for designs requiring stable inductance across temperature and current

AEC-Q200

PPAP Capable

Part Number System

MPX(V) 1 D0630 L 3R3

- 3R3 — Inductance in µH (3R3 = 3.3 µH)
- L — Power Inductor
- D0630 — Size: D0630 | 06 = 6x6 mm | 30 = 3.0 mm height
- 1 — Product Version 1
- MPX(V) — MPX: Standard Product Series; MPXV: Automotive Qualified

For more detailed information: **www.kemet.com/METCOM**

Construction

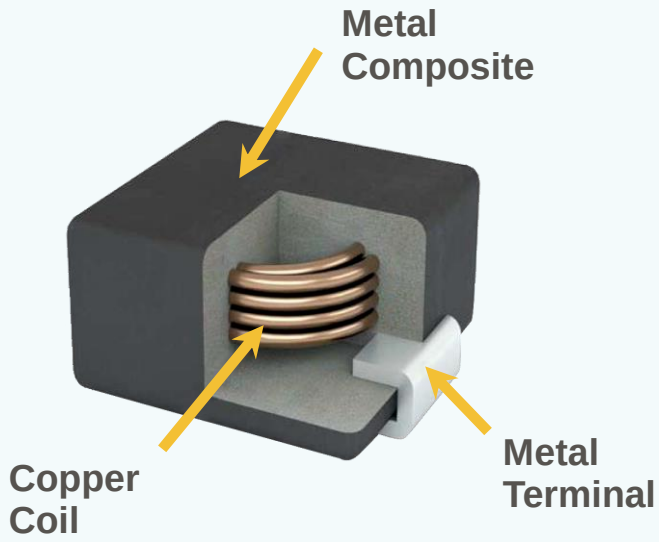
Simple reliable configuration.

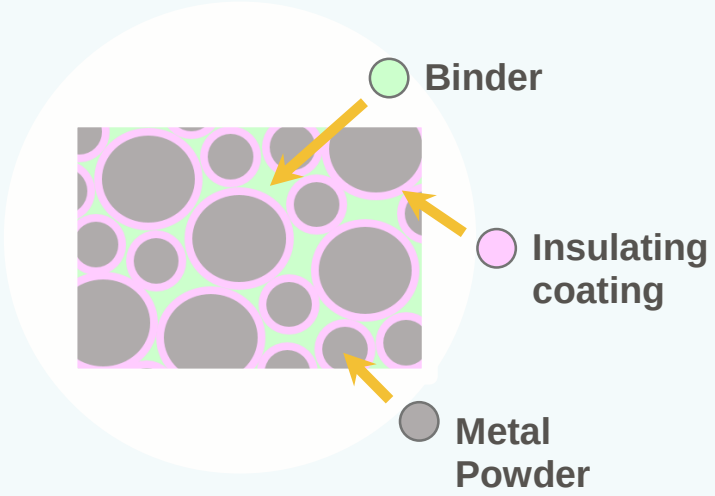
METCOM's footprint form, fit, and function was developed to facilitate its use with prior designs or in new ones.

The construction consists of a wire-wound copper coil embedded into a metal composite core.

The wound copper wire is attached to the SMD metal terminals before the core is formed around the coil.

The core consists of metal powder with an isolating coating and binding agent that holds it together.



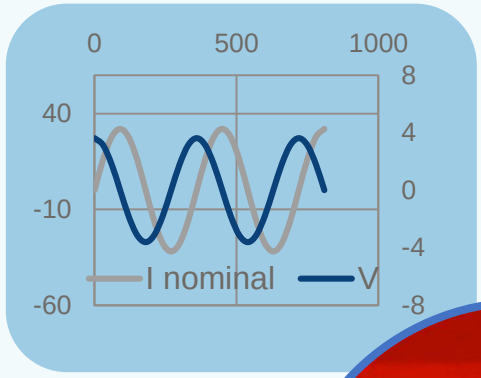


Typical Inductor Losses

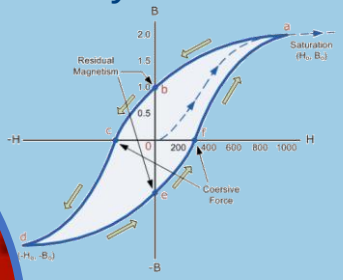
DC Copper Loss
Commonly referred to as DCR, it is the loss in the form of heat due to the resistance of the windings of the inductor.

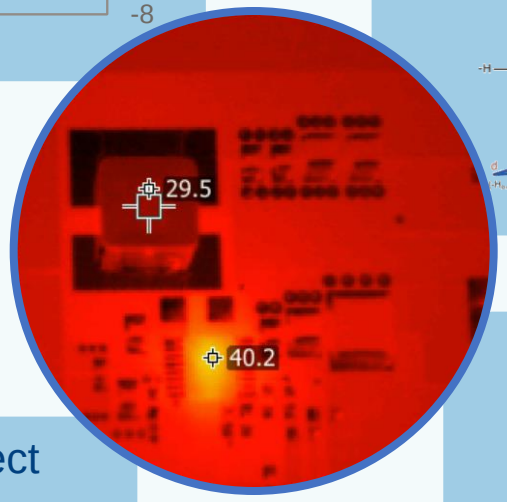
AC Copper Loss
Power loss based on the inductor core material, which translates into heat due to eddy currents. (Most relevant at higher frequencies.)

Core Loss
Energy loss due to the changing magnetic energy in the core during a switching cycle and equals the difference between magnetic energy put into the core during the on time, and the magnetic energy extracted from the core during the off time.

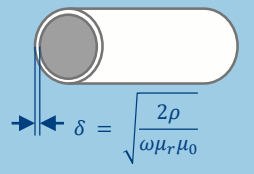


B-H Hysteresis

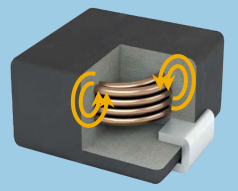




Skin Effect

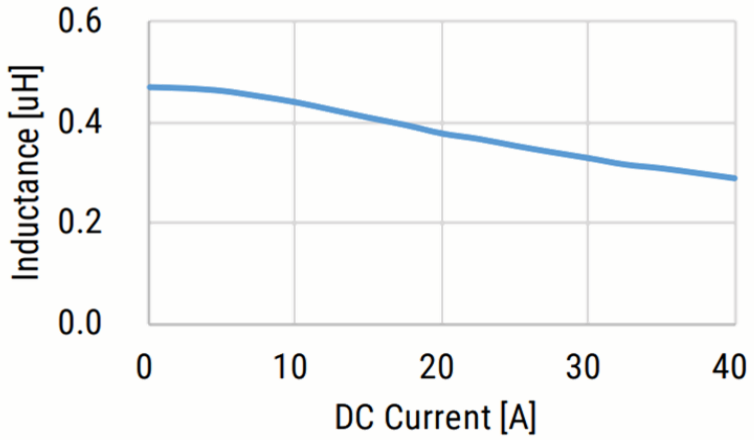


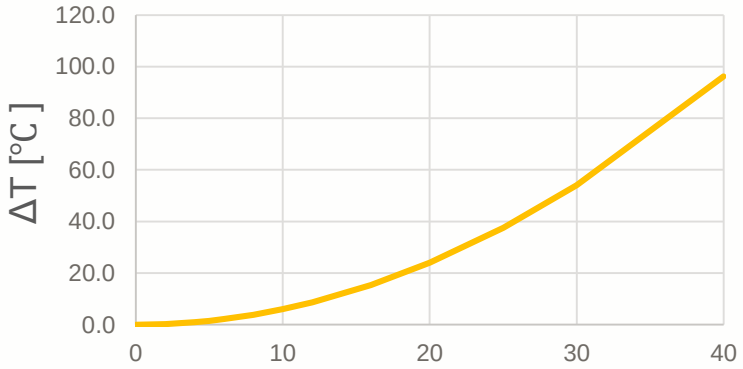
Eddy Current



Typical Characteristics

MPX1D0840LR47





Performance Characteristics

- Operating Temperature −55°C to +155°C
- Rated Inductance 0.10 – 47 µH at 100 kHz (±20% tol.)
- Rated DCR 1.5 – 341.2 mΩ maximum
- Rated Current 2.0 – 35.4 A

Saturation Current

Inductance drops 20% of its nominal value at the rated current

Rated Current

Current where the inductor’s self-heating temperature does not rise by more than 40 degrees Kelvin

METCOM Design Advantages

METCOM
KEMET POWER INDUCTORS

Using METCOM over traditional ferrite inductors provides:

- Smaller Footprint
- High permeability
- High saturation flux density

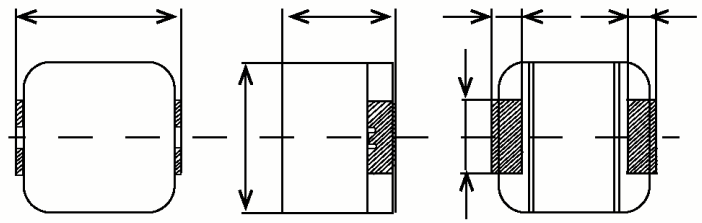
The core's high saturation flux density enables a stronger magnetic field

Perfect for DC-DC converters with switching frequencies from 30 KHz to 1 MHz

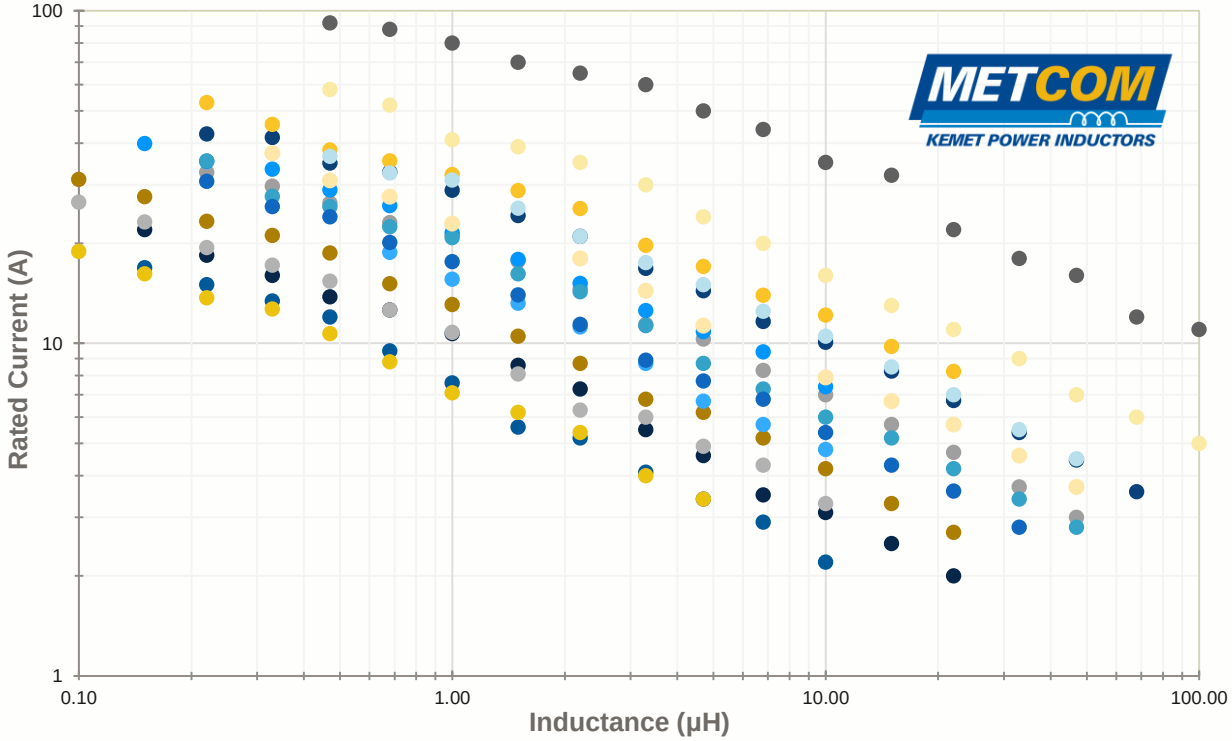
Power filtering, using KEMET's capacitor, to create LC filters on high current paths

Product Offering

- The chart shows possible inductance to rated-current selection (based on physical size)
- The current sizes available are 5x5, 6x6, and 8x8
  - Q4 2019: 10x10 mm, 12x12 mm ,17x17 mm, and 22x22 mm
  - 2020: AEC-Q200



METCOM MPX Series Selection Guide



5x5 mm | (Height)
D0520 | 2.0 mm
D0530 | 3.0 mm

6x6 mm | (Height)
D0618 | 1.8 mm
D0624 | 2.4 mm
D0630 | 3.0 mm
D0650 | 5.0 mm

8x8 mm | (Height)
D0830 | 3.0 mm
D0840 | 4.0 mm

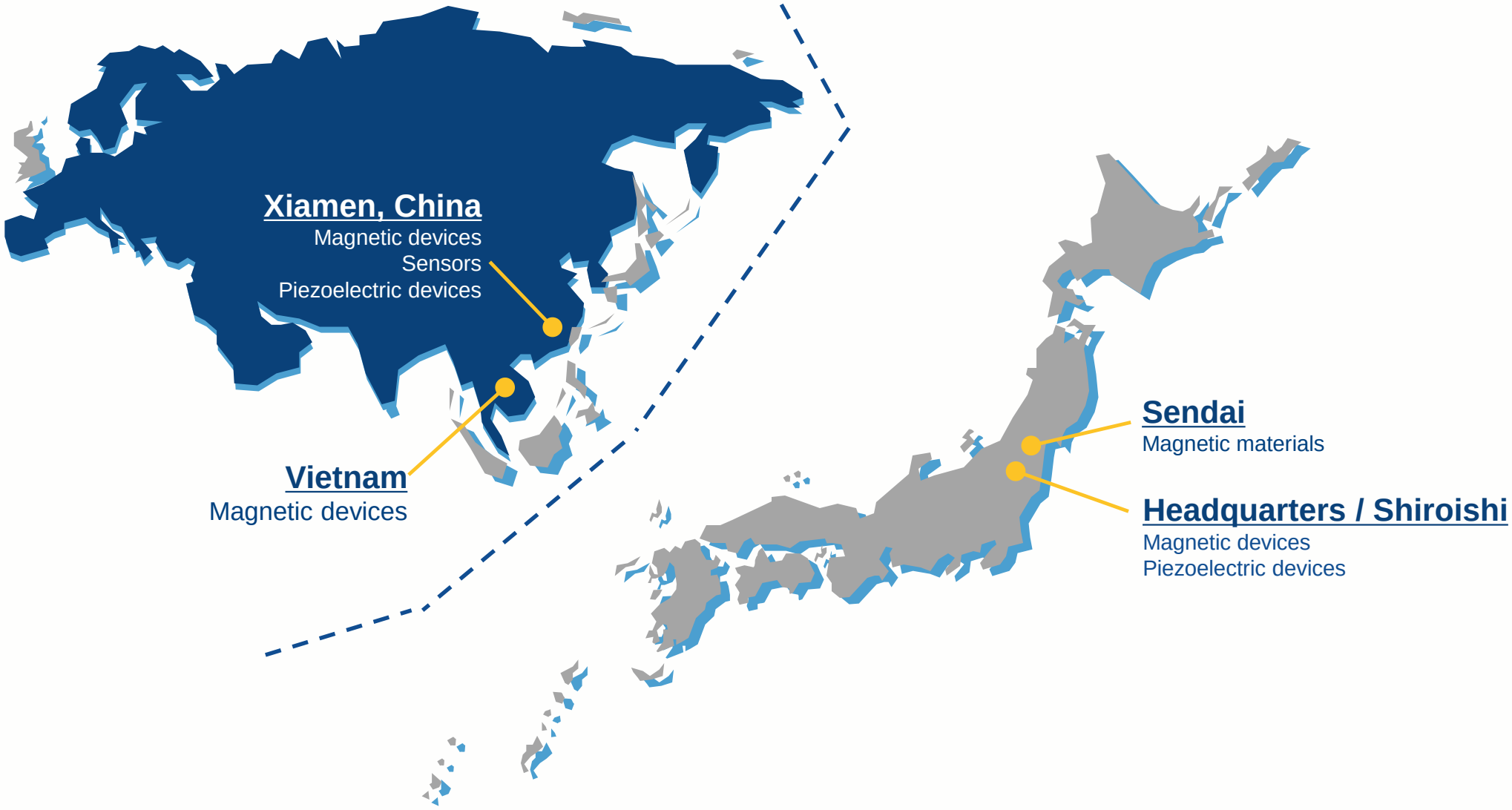
10x10 mm | (Height)
D1040 | 4.0 mm
D1054 | 5.4 mm

12x12 mm | (Height)
D1235 | 3.5 mm
D1250 | 5.0 mm
D1264 | 6.4 mm

17x17 mm | (Height)
D1740 | 4.5 mm
D1770 | 7.0 mm

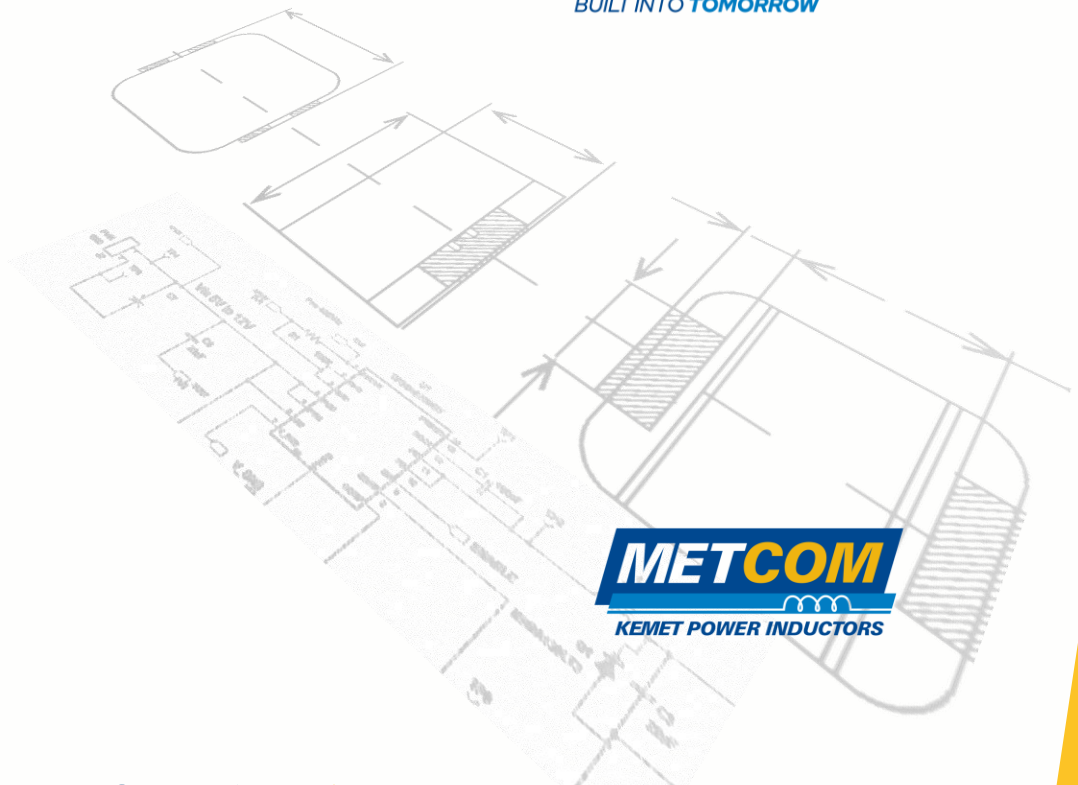
22x22 mm | (Height)
D2240 | 13 mm

Manufacturing Locations



Applications

- DC-DC converters are not a new technology but a new challenge to each design
- METCOM Power inductors are used in:
  - High frequency DC-DC converters, including WBG GaN applications
  - PCs and servers
  - Points of loads (POL)
  - Field-programmable gate arrays (FPGA)
  - Battery powered regulators



Other products used along with METCOM

Polymer Capacitor

T598 and T599
- DC-DC bulk capacitance
- High temperature
- Long life-time

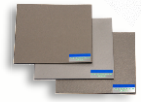
ESD Protection

VE Series SMD varistor
- Transient overvoltage
- High temperature
- Load dump protection

High Ripple Current

U2J KONNEKT
- High power density
- Temperature stable
- Low loss, low ESR, and ESL

EMI Isolation



Flex Suppressor
- Radiation noise suppression
- Wide range frequencies
- Isolate sub-circuits