

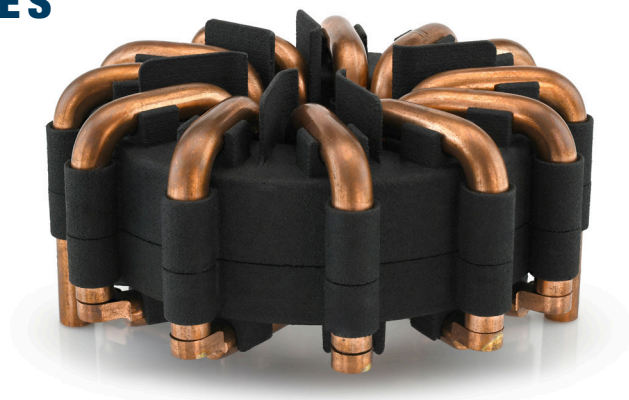
VACOCOIL COMMON MODE CHOKE

COST OPTIMIZED HIGH POWER CMC WITH SUPERIOR HF-PROPERTIES

Common mode chokes (CMCs) using our new VACOCOIL® design offer improved attenuation at high frequencies ($f > 1$ MHz) in comparison to conventional windings made of several parallel wound strands or litz wire. By using VACOCOIL instead of conventional windings, costs are significantly reduced, winding capacitance is minimized and impedance at 10 MHz is improved by one order of magnitude. Furthermore, our new VACOCOIL technology reduces mechanical stress which is commonly applied on the core during winding. This new design is most suitable for high current/high power applications with load currents above 50 A. VACOCOIL are made of shaped copper bars, possible diameters are 4.5 mm, 6 mm and even more. VACOCOIL-CMCs feature nanocrystalline VITROPERM® cores providing highest permeability and lowest losses combined with excellent thermal properties.

ADVANTAGES

- most compact design (compared to other high-current solutions such as flat wires)
- without glue (technical cleanliness)
- highest clearance and creepage distances



THE ADVANTAGES OF OUR VACOCOIL-CMC DESIGNS ARE MOST USEFUL IN FILTER DESIGNS FOR:

- electrified powertrains in road & rail vehicles, ships & aerospace
- battery charging (wall boxes, on-board chargers, charging piles) for electric vehicles
- wind and high power solar inverters
- large industrial frequency inverters
- welding machines

LIST OF STANDARD VACOCOIL COMMON MODE CHOKES

Product	I_N @ T_{amb} 75 °C [A]	Number of Windings	U_N OVCat III [V]	U_N OVCat II [V]	L_N 10 kHz [mH]	L_N 100 kHz [mH]	$ Z $ 100 kHz [Ω]	I_{CM} 10 kHz [mA]	Length [mm]	Height [mm]	Width [mm]
6109-X004	120	2	1000	1500	1.52	1.26	870	700	91.6	42.5	91.6
6109-X005	120	3	1000	1500	1.21	0.77	598	700	91.6	42.5	91.6
6109-X006	120 240	4 2	1000	1500	0.85	0.46	383	500	91.6	42.5	91.6

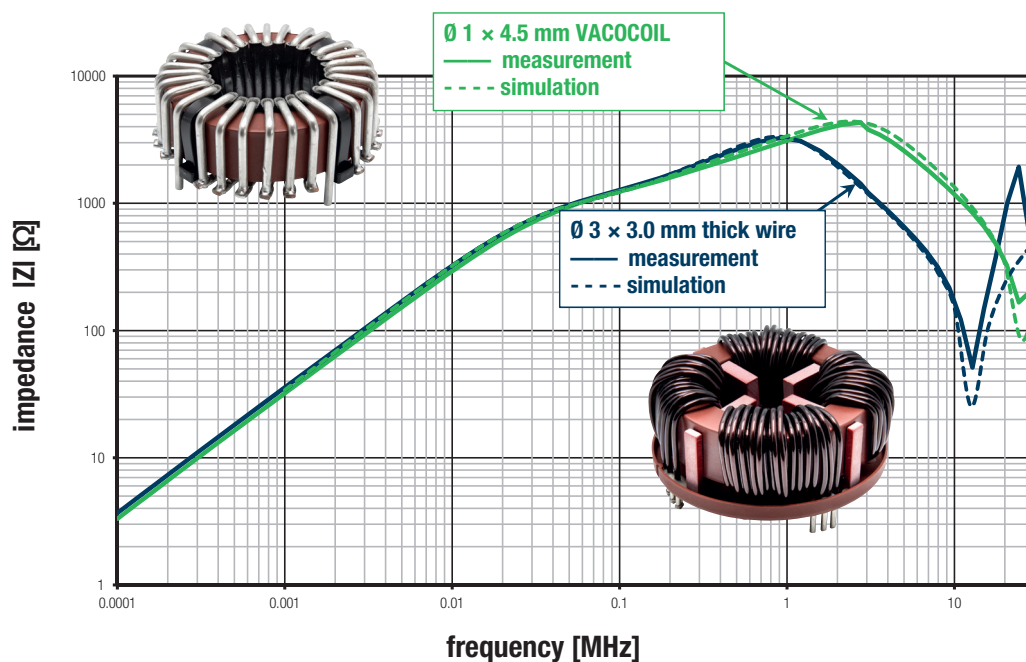
Customized types, especially those with different magnetic properties, can be easily adopted without any mechanical design changes and can be requested directly from VAC. Further standard types for higher current ratings are in preparation. The pin ends can be supplied either bare for laser welding or tin-plated for soldering. We look forward to receiving your enquiry.

CASE STUDY: POSSIBLE DESIGNS OF HIGH CURRENT CMCs

Characteristic value	Massive wire (\varnothing 3 x 3 mm)	VACOCOIL (\varnothing 1 x 4.5 mm)
Max. load current I_{load} (< 130 °C)		80 A
Size		102 x 76 x 25 mm (core) 122 x 122 x 48 mm (component)
Winding capacitance C_w	43 pF	13.5 pF
Resonance frequency f_{res}	0.73 MHz	1.9 MHz
Insertion loss aE* @ 1 MHz	30 dB	30 dB
Insertion loss aE* @ 10 MHz	7 dB	21 dB
Impedance Z @ 10 MHz	176 Ω	1.2 kΩ

*50 Ω impedance system

IMPROVED IMPEDANCE AT HIGH FREQUENCIES



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