WIMA Plastic Film Capacitors for Electric and Hybrid Vehicles

In modern cars, a lot of assistance systems require more and more electrical power. The conventional 12 VDC on-board power supply is therefore increasingly supported by an additional 48 VDC power supply, which reliably supplies high-current consumers e. g. power steering, ESP and roll stabilisers with power.

The additional 48 V power supply can, for example, draw its energy from a storage device connected parallel to the battery (lithium-ion battery or WIMA SuperCap module), which supports the battery at high power requirements.
In this case, the storage device is supplied by a DC/DC converter from the 12 V mains.

A more complex solution is the coupling of the voltage levels by a bi-directional DC/DC converter in which the 12 V mains is supplied from the 48 V mains. This is done by means of a controlled starter-generator combination, which is also advantageous for the recovery of braking energy.

Advantages of the 48 V on-board network

- Support of the start, stop and floating function
- Drive support
- Support of typical power consumers such as power steering, ESP, air conditioning or roll stabilization
- More efficient recuperation of braking energy
- Fuel and CO_2 reduction.

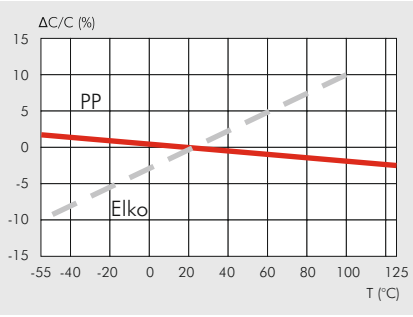
Capacitor Applications in the 48 V On-board System

Capacitors perform key functions in the intermediate circuits by:

- Storing electricity
- Smoothing currents
- Suppress interferences.

Compared to electrolytic capacitors, film capacitors have decisive advantages:

- Very high volume/capacitance ratio
- High rated voltage per component
- Suitable for both DC and AC voltage
- Very low dissipation factor
- Very high insulation resistance
- Excellent self-healing properties
- High life expectancy/reliability
- Non-polar construction
- High vibration and shock resistance
- Excellent mechanical stability
- Uncritical failure mode (high-impedance)
- Solvent-resistant, flame-retardant plastic case according to UL 94 V-0



Capacitance change with temperature (f=1 kHz) (general guide)

WIMA Series for Applications in Electric and Hybrid Vehicles

DC-LINK capacitors with very low self-inductance are particularly suitable for converter applications in

- on-board chargers
- DC-DC converter in external charging stations
- electronic power steering
- drive inverters
- DC engine filtering.

The components are characterized by

- THB-test at 85°C/85% HR/500 hours
- dry construction without electrolyte
- long life expectancy
- AEC-Q200 compliance.

Versions with metal plate connections and custom-made products are available on request.

Pulse capacitors are used in inverters. They are available with double-sided metallized electrodes or with metal foil electrodes and metallized internal series connection and show

- highest pulse load capacity
- excellent self-healing ability.

Snubber capacitors have been developed to meet the needs of high-performance converters. Their internal

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construction in combination with directly contacted metal plates is designed for high currents. They are used e. g. in

- compressors in air conditioners
- on-board power chargers
- induction charging systems.

The electrical performance of the components as well as the various optional connection configurations make the WIMA Snubber technology unique in the world.

RFI Capacitors are used to comply with EMC regulations and are therefore safety-relevant components. In the automotive sector, they are used in the suppression of switching processes in

- EMC filter
- on-board chargers
- external charging stations.

WIMA interference suppression capacitors are produced and certified according to IEC 60384-14.

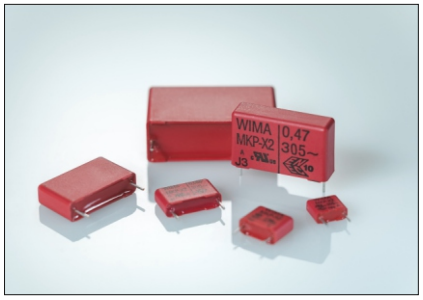
SuperCap PowerBlocks based on double-layer capacitors serve as energy storage devices to support the vehicle battery e. g.

- during the start process
- in the recovery of braking energy
- for peak load coverage.

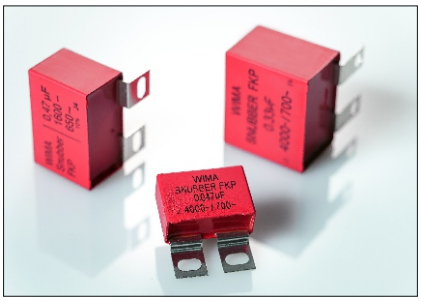
PowerBlocks are modular designed, cascaded and actively balanced. They are maintenance-free and environmentally friendly according to RoHS.

WIMA DC-LINK Capacitors
Dielectric: Polypropylene film
Capacitance values: 1 µF to 400 µF
Voltage ranges: 400 VDC to 1300 VDC
Customized versions on request.

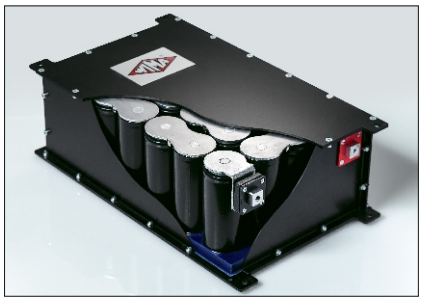
WIMA Pulse Capacitors
Dielectric: Polypropylene film
Capacitance values: 100 pF to 47 µF
Voltage ranges: 100 VDC to 6000 VDC
Pulse duty, self-healing construction.



WIMA RFI Capacitors
Dielectric: Polypropylene
Capacitance values: 1000 pF to 10 µF
Voltage ranges: 300 VAC to 440 VAC
Class X2, X1, Y2.



WIMA Snubber Capacitors
Dielectric: Polypropylene film
Capacitance values: 0.01 µF to 8 µF
Voltage ranges: 630 VDC to 4000 VDC
Various contact configurations.



WIMA SuperCap PowerBlocks
Dielectric: electric double layers
Capacitance values: 62 F to 500 F
Voltage ranges: 16 VDC to 125 VDC
Customized versions on request.

Made in Germany !

All components supplied by WIMA are manufactured exclusively in Germany. Organization, technical equipment and quality control in our plants comply with internationally recognized standards. In addition, the production is subject to the company's own WPCS (WIMA Process Control System).

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