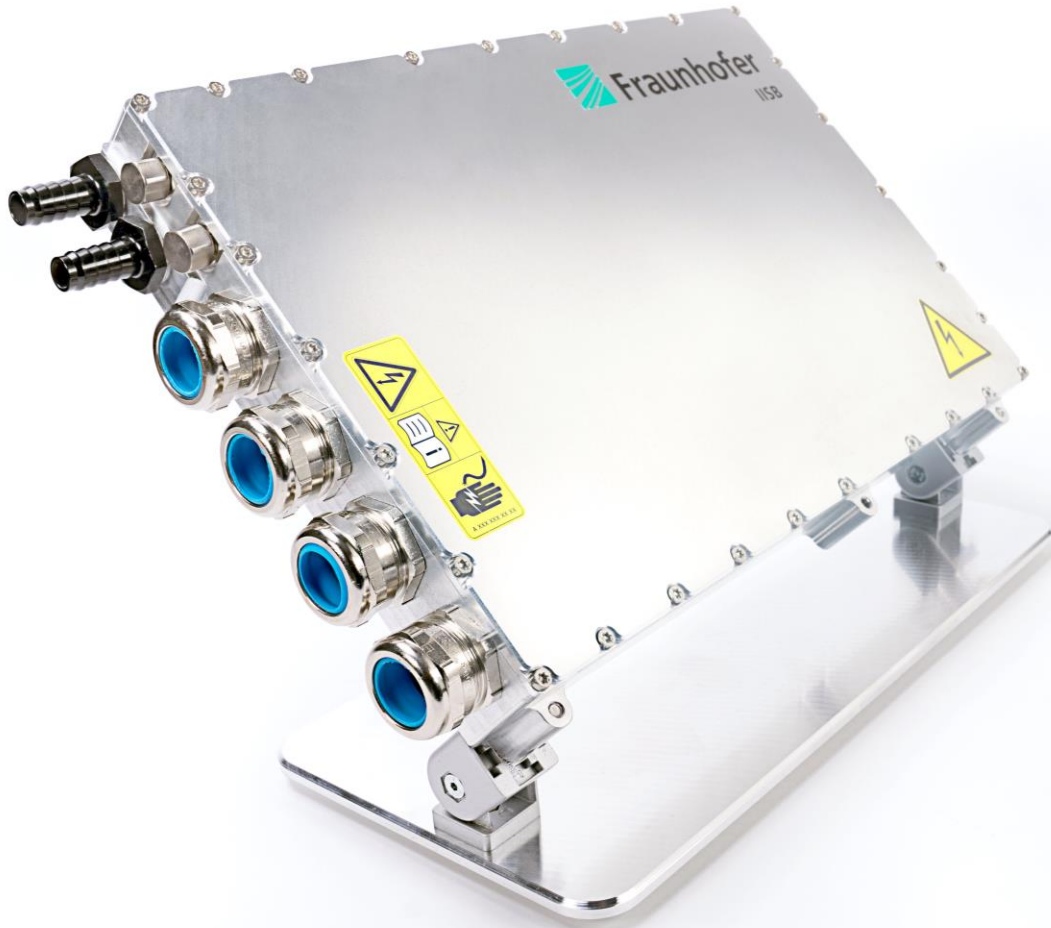


# Full SiC Traction 600 A DC-DC Converter

for Electric, Hybrid, and Fuel Cell Vehicles





## Description

This Full SiC 6 Phase Half Bridge converter is suitable for electrical power train application. Its topology can provide bidirectional power transfer connecting a super cap or a fuel cell to a drive inverter.

By its SiC technology, it can deliver currents of 400 A continuous at high voltages of at least 850 V. It is capable of a high overdrive for several minutes, providing extra power for braking or acceleration.

Its high performance FPGA based digital control can handle very high dynamic distortion and reference values and is fully configurable by the Fraunhofer IISB team based on system theory approaches as well as by the customer for tuning real time on the testbench or in the electric vehicle.

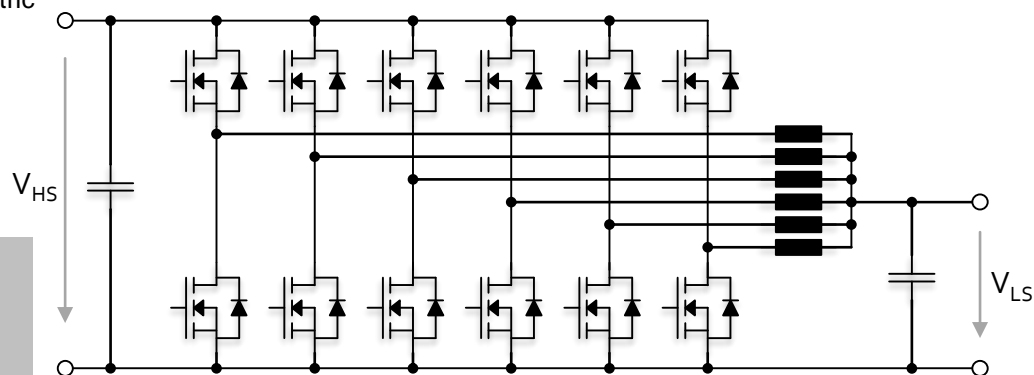
## Technical Data

Highside Voltage Range $V_{HS}$	20 to 850 V
Lowside Voltage Range $V_{LS}$	10 V to $V_{HS}$
Lowside Current peak	600 A (5 min)
Lowside Current	400 A
Maximum Output Power	360 kW (@ 600 V Input Voltage)
Coolant Temperature	-25°C to 85 °C
Switching Frequency	100 kHz
Dimension	~40 x 25 x 5 cm <sup>3</sup> (~5 dm <sup>3</sup> )
Weight	~12 kg
Power Density	> 50 kW/dm <sup>3</sup>
Efficiency	98 - 99 %
Isolation	2,4 kV

## Features

- High power density
- Wide input and output voltage range
- High efficiency
- Overload features and temperature derating
- Over current protection
- Phase switch-off function for high light load efficiency
- Wide coolant temperature range
- Fully digital controlled via CAN-Bus
- Programmable control loop parameters
- Active discharge of capacitors
- EMI filtered auxiliary voltage input (12 or 24 V systems)
- High isolation voltage between HV-net and housing

## Topology and Technology



The converter is designed for fixed-frequency hard switching. To minimize hard-switching loss, low inductive cells and module integrated gate drivers are used. Oscillations are minimized by optimized parasitic element constellation as well as distributed RC-Snubbers.

The benefit of this hard-switched technology is zero blind loads compared to resonant converters. It also allows a wide range of voltages, currents and conversation ratio.

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