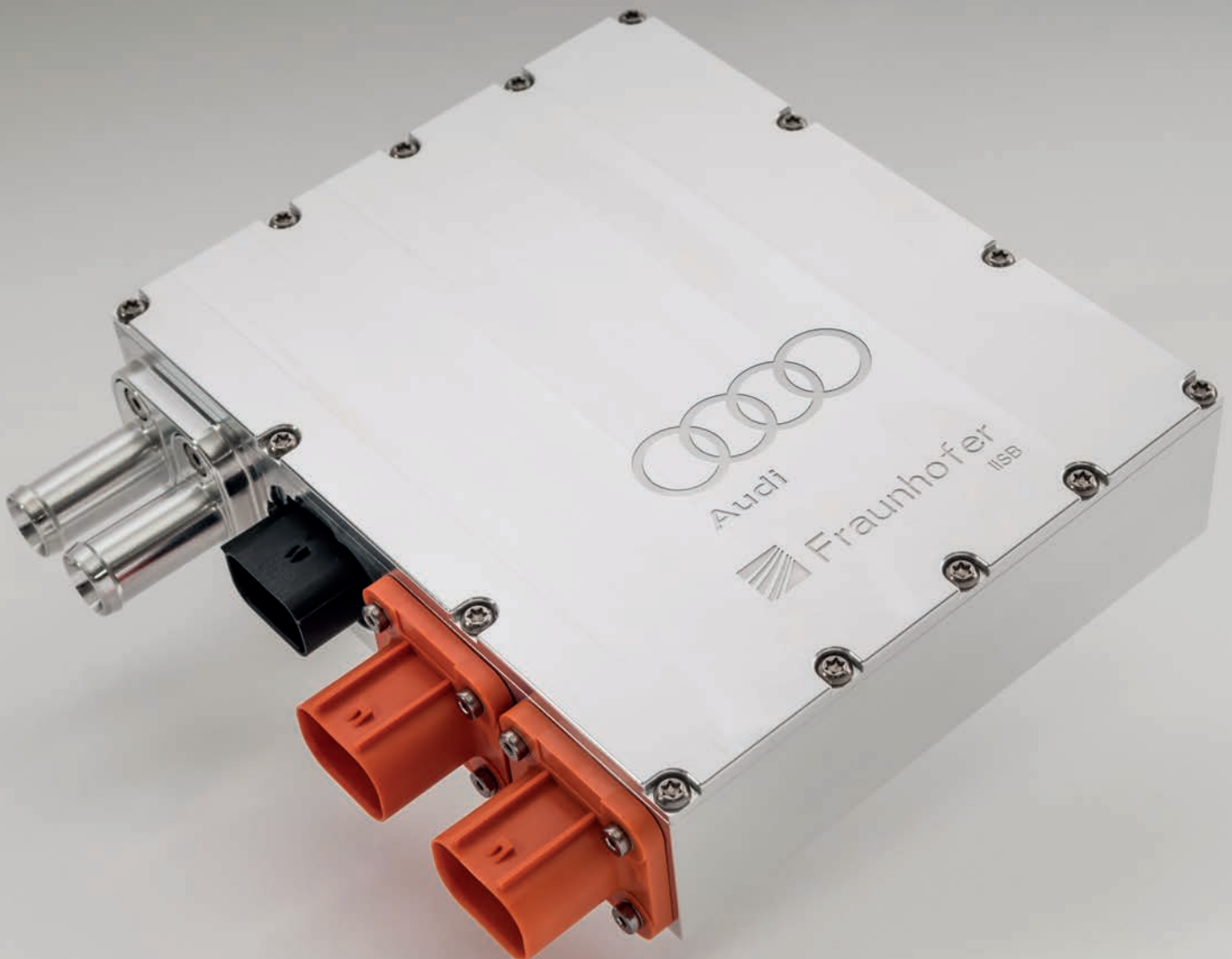


22 kW 900 V Bidirectional DC-DC Converter



22 kW 900 V Bidirectional DC-DC Converter



Description

The Fraunhofer IISB developed in cooperation with the AUDI AG this high efficient and compact DC-DC converter for automotive and industrial applications with harsh environmental conditions. It is designed with focus on industrial feasibility and cost reduction.

The converter has a bidirectional topology enabling power flow in buck and boost direction. With an output power of 22 kW, lowside voltage range of 100 – 450 V and highside voltages up to 900 V, it is suitable for many applications like DC charging or coupling several batteries.

The design is modular and easy to assemble in order to reduce production time and costs. To provide a safe and reliable operation, the converter comes with overcurrent/-voltage protection, active discharge, keep alive CAN messages and temperature derating. This leads to an extremely robust design and stable operation, even in extreme situations during evaluation in test bench areas or prototype cars.

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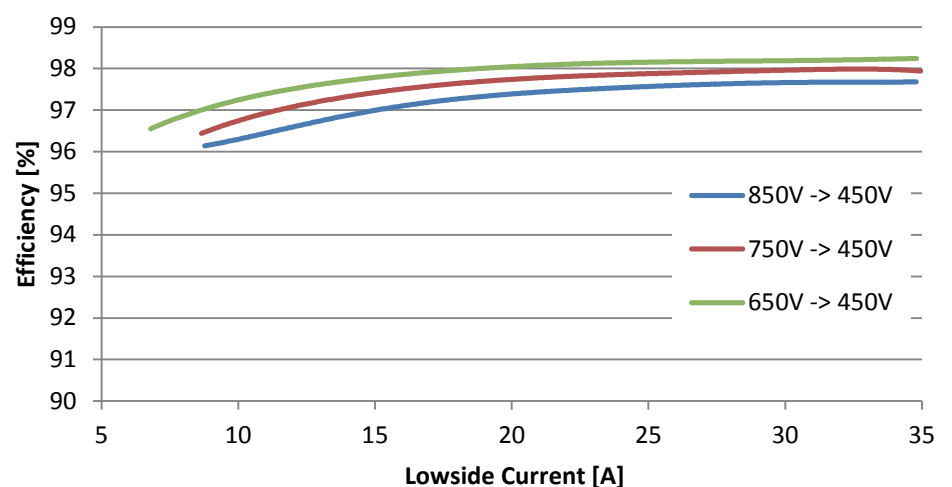
Technical Data

Lowside Voltage Range V_{LV}	100 - 450 V
Highside Voltage Range V_{HV}	V_{LV} - 900 V
Maximum Lowside Current	50 A
Power @ 450 V Lowside	22 kW
Coolant Temperature	-40°C to 60 / 85 °C (derating)
Switching Frequency	~ 100 kHz
Dimension	20 x 17 x 4,7 cm ³
Weight	2,8 kg
Power Density	Up to 13,8 kW/dm ³
Efficiency	Average > 97 %

Features

- SiC MOSFET chips technology and SiC diodes
- High power density
- Alternative version including resonant switching possible
- Focus on industrial design
- Fully digital controlled via CAN
- Programmable control loop parameters
- Temperature derating
- Over current protection
- Active discharge of capacitors
- Wide input and output voltage range
- Wide coolant temperature range
- EMV filter for CAN and auxiliary supply
- Protection for auxiliary supply according to LV124

Efficiency Data



Test Setup: DC-DC Converter is connected between two DC sources/loads. Lowside voltage is constant 450 V while highside voltage is set to 650, 750 and 850 V. Efficiency is average between both conversation directions. For every voltage level, current is variated, resulting in electrical DC conversation power between 2700 and 16000 W.