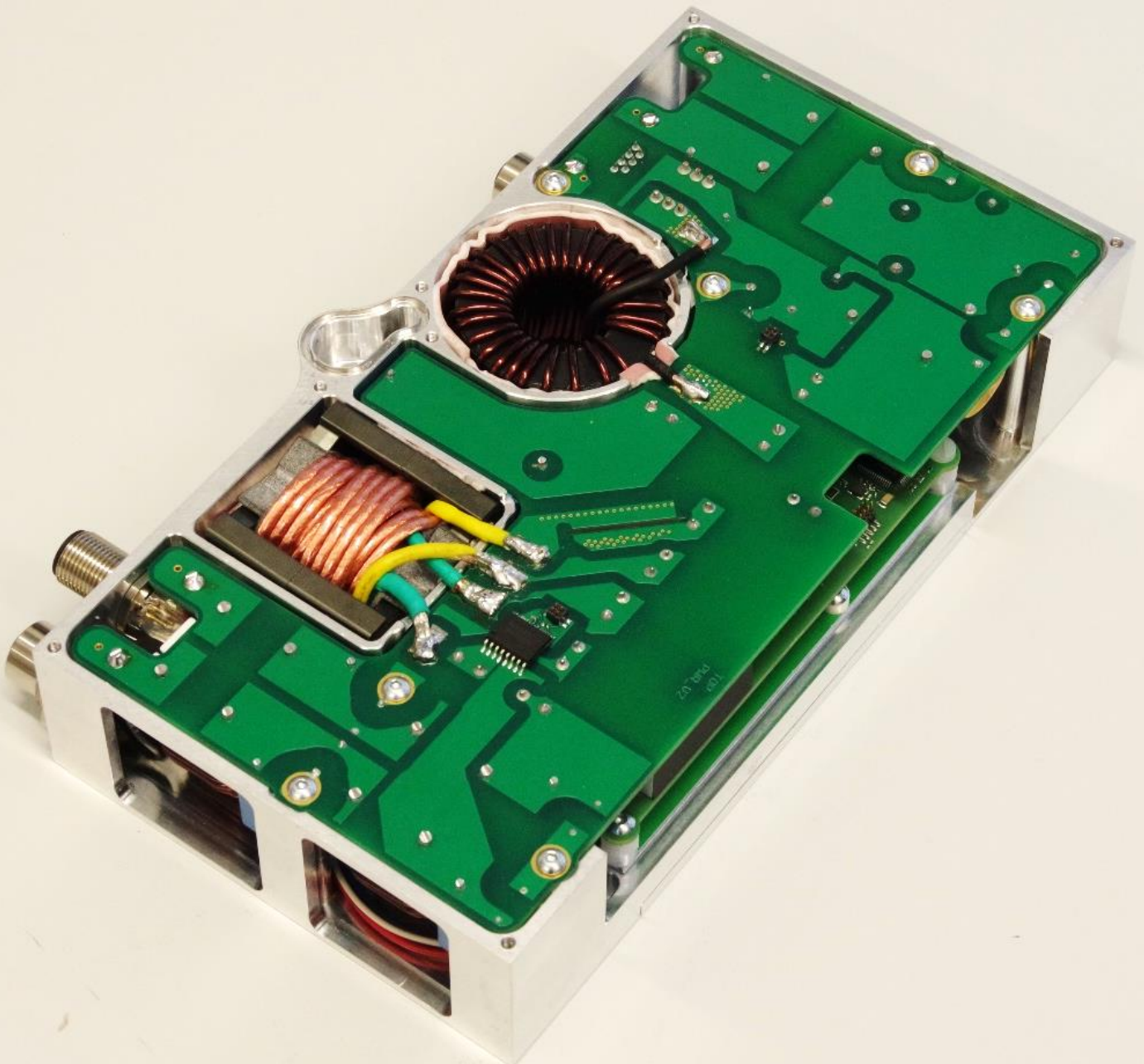
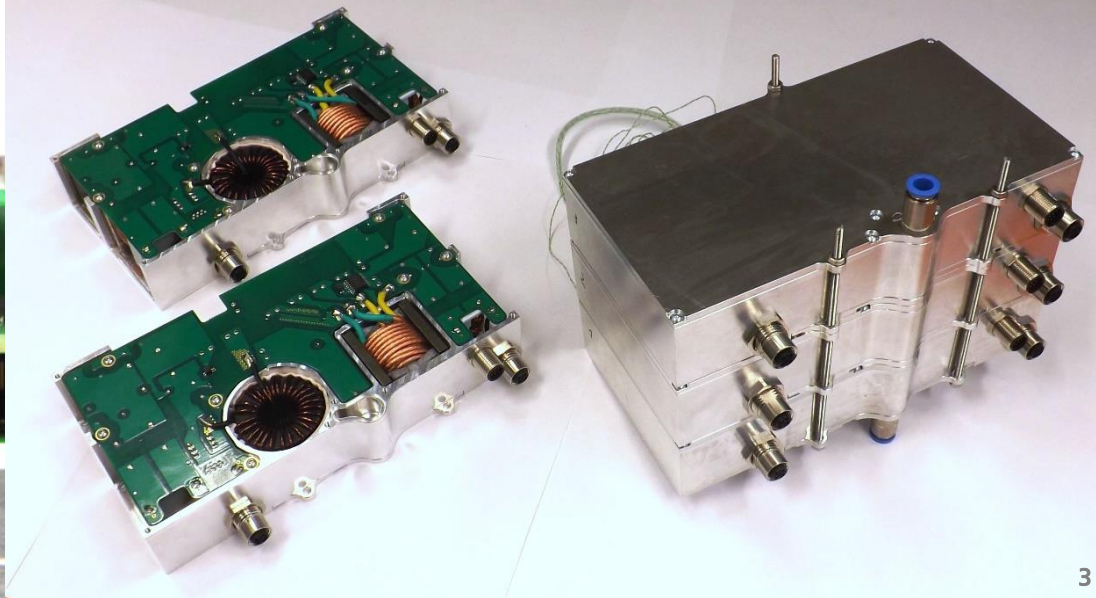
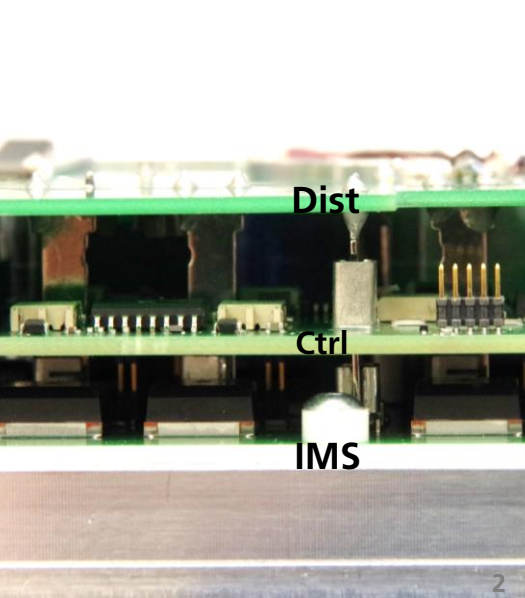


# Modular 3.6 kW On Board Charger

Up to 22 kW in three phase configuration





## Highlights

- Galvanically isolated OBC Module
- Ultra Low Volume of 1dm<sup>3</sup>
- High Power Density of 3,6 kW/dm<sup>3</sup>
- Directly stackable up to 6 modules and 22 kW
- Digitally Controlled

Core materials are made by Hitachi

- Amorphous PFC Core (HLM50)
- Ferrite Transformer Core (ML29D)
- Finemet® CM-chokes

## Description

This isolated AC/DC converter combines a good efficiency with a very small volume and therefore a high power density. It was developed using the newest high performance Materials provided by Hitachi Metals.

It contains a totem pole PFC stage and a full bridge resonant converter both using 900 V SiC Mosfets by Cree.

All semiconductors are mounted on an Insulated Metal Substrate (IMS). This provides a good thermal connection to the coolant underneath and also an easy way for assembly.

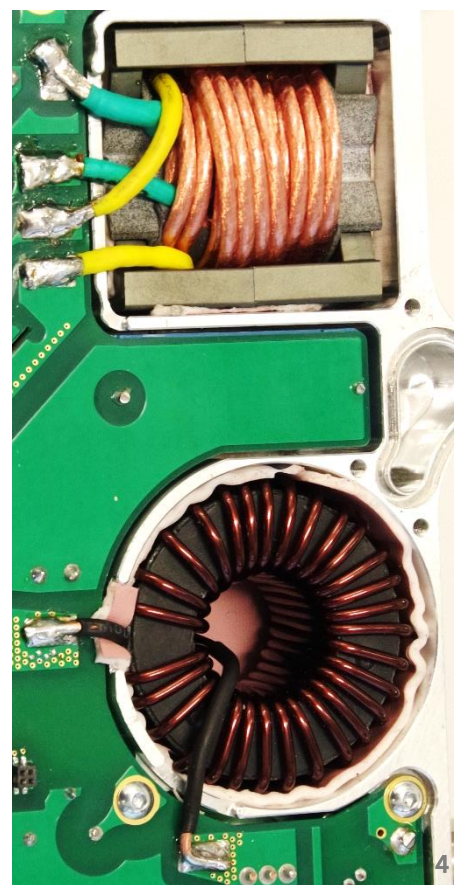
The total system consist of only three boards. They are labeled in picture 2. PFC stage is digital controlled and runs at a switching frequency of 120 kHz. The coil consist of a gapless amorphous ring core with a solid copper winding.

The resonant converter is working at a fixed switching frequency of 250 kHz. Its transformer is built of ferrite material with a small air gap, litz wire. and has a significant leakage inductance. Together with ceramic capacitors it forms up the resonant tank of the LLC converter.

Both, AC and DC EMI filters are buildup out of Finemet® material.

## Technical Data

	Min	Max
<b>Vin</b>	<b>80 Vrms</b>	<b>265 Vrms</b>
Vout	300 V	450 V
<b>P (p.Module)</b>	<b>0 kW</b>	<b>3.66 kW</b>
Efficiency		95.4 %
<b>Dimensions</b>	<b>11,2 x 21,1 x 4,2 cm</b>	



- 1 3.6 kW OBC with open case
- 2 Side view with naming of the tree boards
- 3 An 11 kW OBC consisting of 3 three 3,6 kW modules next to the open 3,6 kW OBCs
- 4 Detail of the inductive components of the OBC

## Fraunhofer IISB

Schottkystraße 10  
91058 Erlangen

### Contact:

Stefan Endres  
Phone +49 9131 761 435  
stefan.endres@iisb.fraunhofer.de

[www.iisb.fraunhofer.de](http://www.iisb.fraunhofer.de)