Module properties

Module-integrated AlN ceramic heatsink with chip-on heatsink technology

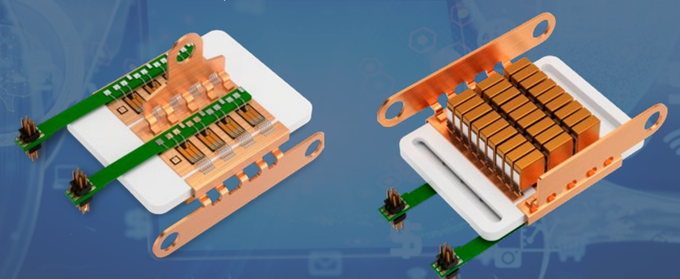
- Maximum power density with minimum weight
  » No additional metal heatsink required
- Ceramic heatsink can be used on both sides
- Internal structure optimized for the sintering process of SiC semiconductors
- Scalable for different performance classes

Very good thermal properties for maximum current per SiC semiconductor area

- Rth ‘= 0.15 K*cm²/W
- Integrated pin style structure
- Integrated capacitors thermally connected to the heatsink

Low-inductance module structure for high switching performance

- Metallization around the edges
- Module-integrated ceramic capacitor
- Optimized for the use of 1200V SiC semiconductors



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E L E C T R O N I C S

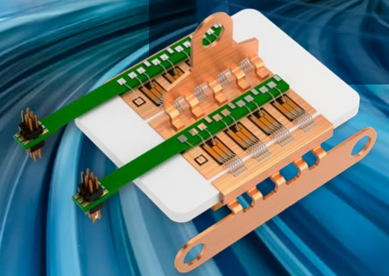
Advanced ceramic
for e-mobility

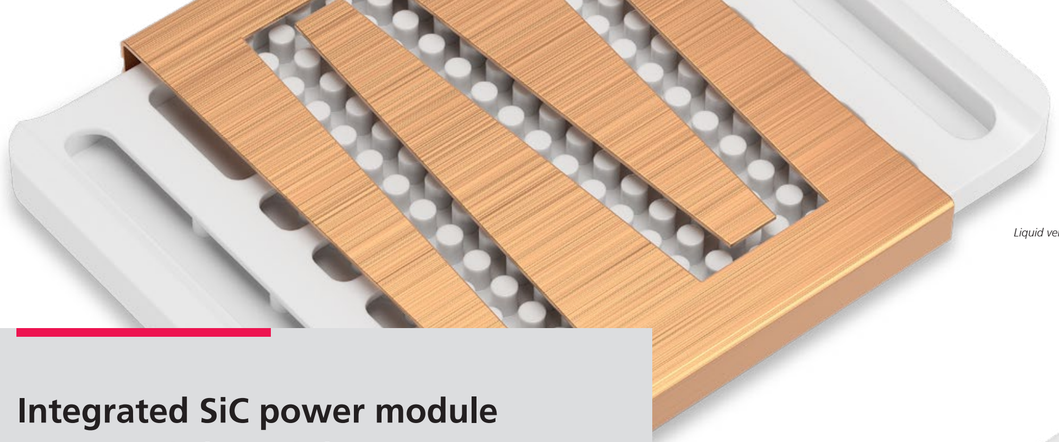
Thermal management with ceramic heatsink

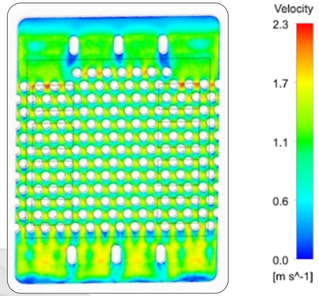
C E R A M I C E X P E R T S

Ceramic heatsink in e-mobility

The use of ceramic heatsink in power electronics, as used in various applications in e-mobility, offers significant advantages in terms of thermal and electrical performance as well as their power density compared to conventional heatsinks. For this purpose, CeramTec provides ceramic heatsinks with applied metallization, which make it possible to apply the electrical components directly to the ceramic heatsink (chip-on-heatsink) and thus make the best possible use of the chip surface.
High-performance ceramics offer several advantages over conventional materials such as metals and plastics. They are resistant to temperature changes, corrosion, and chemical resistance. In addition, they are characterized by a particular thermal conductivity and electrical insulation as well as strength and good tribological properties. High-performance ceramic solutions can therefore be used in a variety of ways in e-mobility.



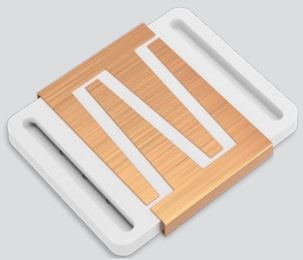




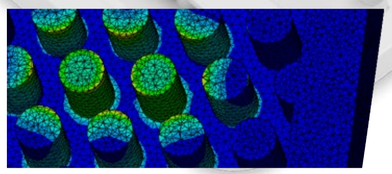
Liquid velocity distribution through the ceramic heatsink

Integrated SiC power module on ceramic heatsink

The integrated SiC power module is based on CeramTec chip-on-heatsink technology. The ceramic heatsink is a cooling structure and circuit carrier in one component, which leads to a significant increase in power density. The design of the ceramic heatsink enables optimized cooling of the SiC semiconductors on the top of the heatsink. On the underside of the heatsink, the DC link capacitor is integrated with low inductance in the power module via metallization around the edges of the heatsink.



Ceramic heatsinks metallized on both sides for low-inductance electronic assemblies



Mechanical stress on the internal structure during the sintering process