

ENGINEERING  
TOMORROW



Danfoss Silicon Power | North America

**Engineering tomorrow**  
with world-class power modules  
build in the US



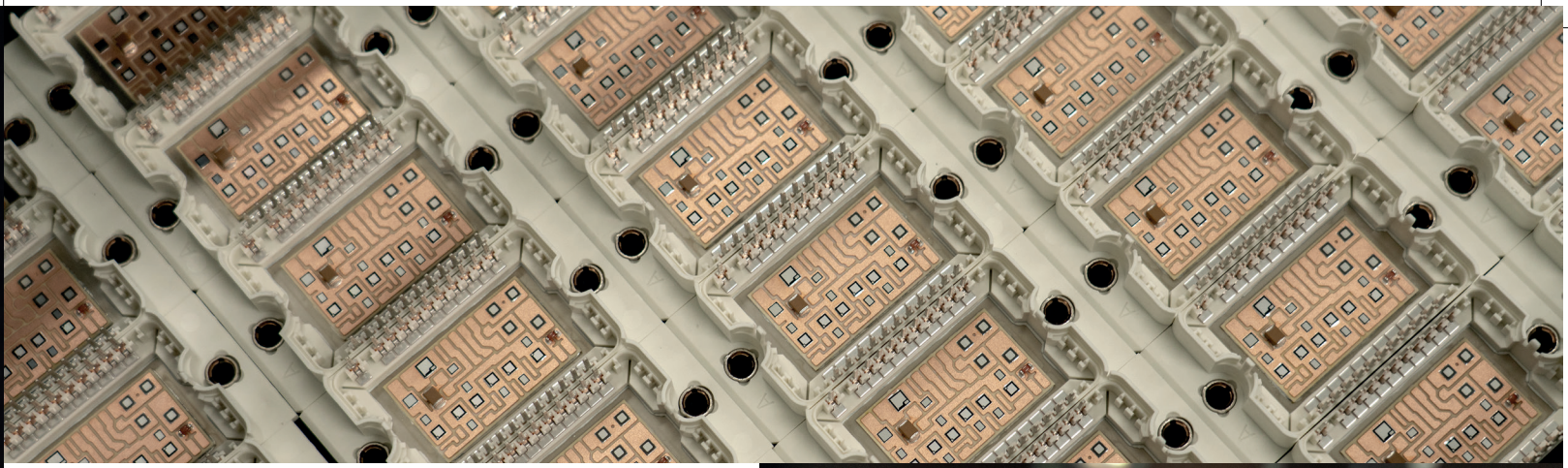
[siliconpower.danfoss.com](http://siliconpower.danfoss.com)



## The power **to trust**

Danfoss has specialized in customized power modules for industrial, automotive and renewable applications for over three decades. Our power module capabilities are the result of years of research, development and testing.

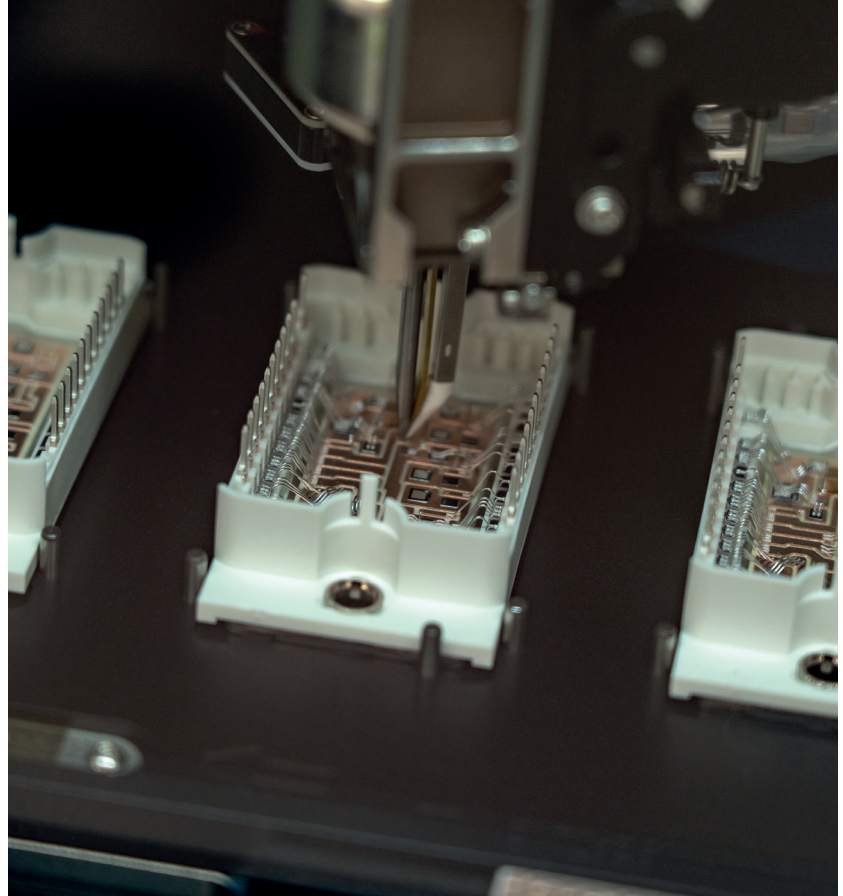
Partnering with Danfoss, we help you optimize your power solution. Our highly skilled and specialized engineers work closely together with you to design power modules fitted specifically to your application. Keeping development time and overall costs down, we set you up with a solution making the most out of silicon (Si) or silicon carbide (SiC) and is scaled correctly to meet your performance targets.



## Standard housings **with flexibility**

Danfoss works with a customized business model based on a philosophy of dialogue and freedom. It allows us to give you a flexibility never before seen in the world of power modules.

Accommodating an increased industry focus on system optimization, we offer custom solutions in standard industry packages. This allows for flexible configurations, including free choice of chip in standard housings that fit your specific application profile.



## Chip **independence**

All power modules from Danfoss are compatible with any type of semiconductor from any manufacturer of IGBTs and MOSFETs. We offer both Si and SiC configurations and we can support your specific technology and performance targets.

Danfoss is not tied to a particular manufacturer, which means we can accommodate both your first choice and your back-up provider in case of supply shortage.

Drawing on years of industry knowledge and expertise, we also help you identify the best possible chip for your application to ensure top performance and security of supply.

# What we offer specifically within each industry



## Automotive traction

DCM™1000  
technology platform

- High power density and design flexibility
- Scalable across voltage class and power levels
- Extended lifetime
- Compatible with Si and WBG devices
- Improved shock and vibration capability



## EV charging

SiC for efficient  
DC fast charging

- Support OBC to DC fast charging
- Wide-bandgap semiconductors for higher power and system density
- Standard and customized package solutions



## Active Power

Reliability and  
efficiency in focus

- Alternate topologies in standard package
- Customized semiconductor content
- Advanced cooling technologies



### **Battery energy storage**

## Maximizing battery performance

- High power density and power conversion efficiency
- Single or multilevel topologies available
- Semiconductor selection for loss optimization
- SiC custom made solutions for higher system efficiency



### **PV Inverters**

## Targeting high efficiency

- 3-level modules to support 1500VDC
- Low module stray inductance
- Higher system efficiency with SiC
- Longer lifetime and reliability



### **Elevators**

## Maximizing elevator uptime

- Increased power cycling lifetime with advanced bonding and joining technology (DBB®)
- Reduced package size
- Increased power output



# Leading technology portfolio

Danfoss is a front-runner in the packaging of power semiconductors. We have developed a market-leading portfolio of innovative packaging technologies that address the most challenging aspects of power electronics. These technologies equip us to develop the most reliable and cost-efficient solution for your individual application.



## ShowerPower®

### Enabling the highest power density

Smart and efficient thermal management is an essential element to achieve higher system performance. Our patented ShowerPower® concept for direct liquid cooling of power modules offers superior thermal performance at a very low cost. This cooling design almost doubles the effective heat transfer coefficient enabling much higher current carrying capability.

#### Benefits

- Enables higher power density
- Increases system lifetime
- Eliminates the need for thermal interface material
- Reduces the semiconductor area needed to achieve the desired output
- More efficient than standard cooling
- Low differential pressure-drop
- Homogeneous cooling





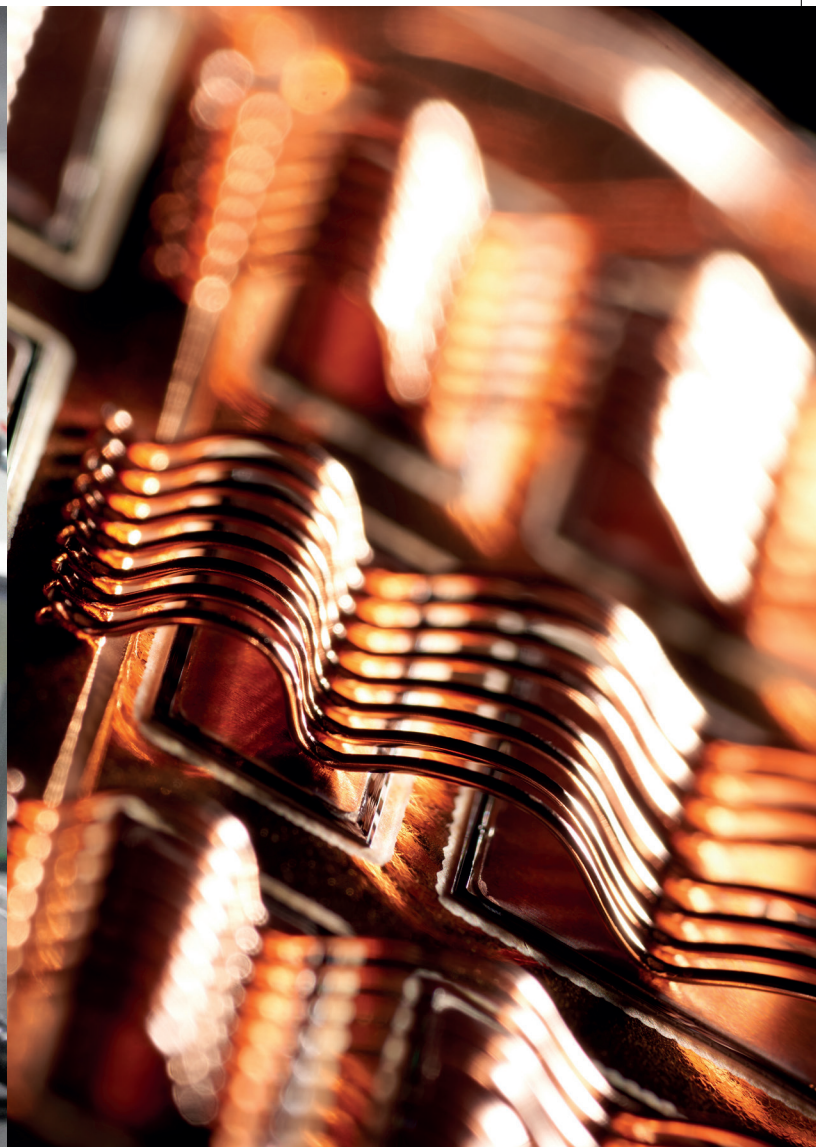
### **Transfer molding**

## For extremely robust packages

Hybrid electric, battery electric drivetrains and many applications subjected to demanding and harsh conditions benefit from our unique transfer molded packaging design. Transfer molding in combination with our bond buffer technology allows for more extreme temperature cycling and higher junction temperatures. Sealed and protected against vibrations and humidity, the power module provides stable and reliable performance even when subjected to mechanical shocks and damp environments.

### **Benefits**

- Superior mechanical robustness
- Stable at higher operation temperatures and temperature cycles
- Protected against humidity
- Longer lifetime



### **Danfoss Bond Buffer®**

## Making the most out of semiconductors

Increase power density without derating the current, while actually improving reliability and prolonging the lifetime of the module. Danfoss Bond Buffer® is a breakthrough in bonding and joining technology that helps you raise the bar for system performance. Our patented DBB® concept is an innovative combination of copper wire bonding and sintered die attach that replaces traditional solder joints. The result is a power module with high thermal robustness that significantly enhances the system performance on all essential parameters.

### **Benefits**

- Reduces the semiconductor area for a more cost-effective solution
- Increased power density and thermal robustness
- Improved lifetime and reliability



## About **Danfoss Silicon Power**

Danfoss Silicon Power is a subsidiary of the Danfoss Group, the largest industrial company in Denmark. Danfoss employs more than 26,000 people in over 100 countries within development, production, sales and support.

For over three decades, Danfoss Silicon Power has been helping top tier manufacturers and system suppliers meet stringent reliability, design and cost targets by designing, developing and manufacturing customized power modules for industrial, automotive and renewable applications.

Our state-of-the-art development and production plants in Utica, New York and in Flensburg, Germany boast 9,000 m<sup>2</sup> of cleanroom manufacturing area. It is here we design, prototype and manufacture today's and tomorrow's power solutions. Our ability to deliver large series production allows to meet the high demands of major industries.

Our research, development and production facilities in Flensburg and Utica are certified according to ISO 9001, IATF 16949, ISO 14001, ISO 50001 and OHSAS 18001. This enables us to quickly transfer development projects to high volume production that can be integrated seamlessly into our customers' supply chain with a consistent focus on quality.

### **Unique security of supply**

Danfoss Silicon Power's global manufacturing footprint means we can offer unique supply chain support and risk mitigation, as you effectively achieve double sourcing when procuring from us.

Visit [siliconpower.danfoss.com](https://siliconpower.danfoss.com) for further product information.

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