

ENGINEERING
TOMORROW

Danfoss

Harness the wind.
Lower the **cost** of energy with
customised power electronics

40 years'
experience

within energy
optimisation, power
conversion and thermal
management.



siliconpower.danfoss.com

MAXIMISE OUTPUT

Wind turbines often operate 24/7 and are exposed to extreme weather conditions. This calls for rugged equipment designed for heavy loads and high performance. With over four decades of experience in power electronics, Danfoss offers customised power stack solutions for power conversion systems.

At Danfoss you instantly benefit from years of expertise in power modules, thermal management, manufacturing and testing of power conversion equipment. Our goal is simple: to help you to get the most out of your wind turbine generator and reduce the cost of power conversion.

Reduce the cost of energy

Customised power modules and power stacks from Danfoss Silicon Power are designed to meet your application's actual mission profile. Each component in the power module is selected to suit the specific requirements, right from the density and type of semiconductors to the material of the base plate. This is all fitted in a standard housing. As a result, it is not necessary to modify the turbines' power conversion system.

POWER STACKS

The Danfoss power stack is a high quality power conversion assembly, which is a main building block in any power conversion system. Based on modular design and custom tailoring to the mission profile, customers benefit from having their own, individually designed product.

- 20-30% more effective heat removal compared to pin fin designs and more than 50% compared to indirect cooling.
- No detectable temperature gradients across the baseplate of the IGBT module
- Compatibility with a broad range of equipment
- Cost efficient and more reliable power section
- Built to last in harsh environments

POWER STACK FEATURES

Each stack is designed to meet your exact requirements for converter topology, mission profile, input/ outputs sizes etc. The Danfoss power stack features:

- 380 – 690 VAC
- 500 – 1400A rms
- Liquid cooling using ShowerPower®
- Analogue voltage, current and temperature measurements
- Full protection built-in
- Easy paralleling
- Scalable upto 8 MW
- Easy to integrate





POWER MODULES

The building blocks of power conversion

Different power converter topologies, application requirements and design philosophies each lead to different load profiles of the power modules. This means that the design and cooling of these modules must be based on calculations that consider the load cycles, which result from the power converter configuration.

With a broad range of semiconductor suppliers to choose from, Danfoss power modules are available in standard as well as customised housings.

Customised Danfoss power modules, tailored to the specific application demands, enable owners to achieve a level of efficiency and durability that far exceeds standard solutions.

- Reliable
- Fully customisable
- Cost effective



COOLED BY ShowerPower®

Developed and patented by Danfoss, ShowerPower® is a superior, direct liquid cooling technology that uses simple and robust plastic parts to provide homogenous cooling across large power modules.

- Eliminates the need for thermal interface material
- Allows direct cooling with standard power modules
- Achieve very low differential pressure drop



Danfoss Silicon Power

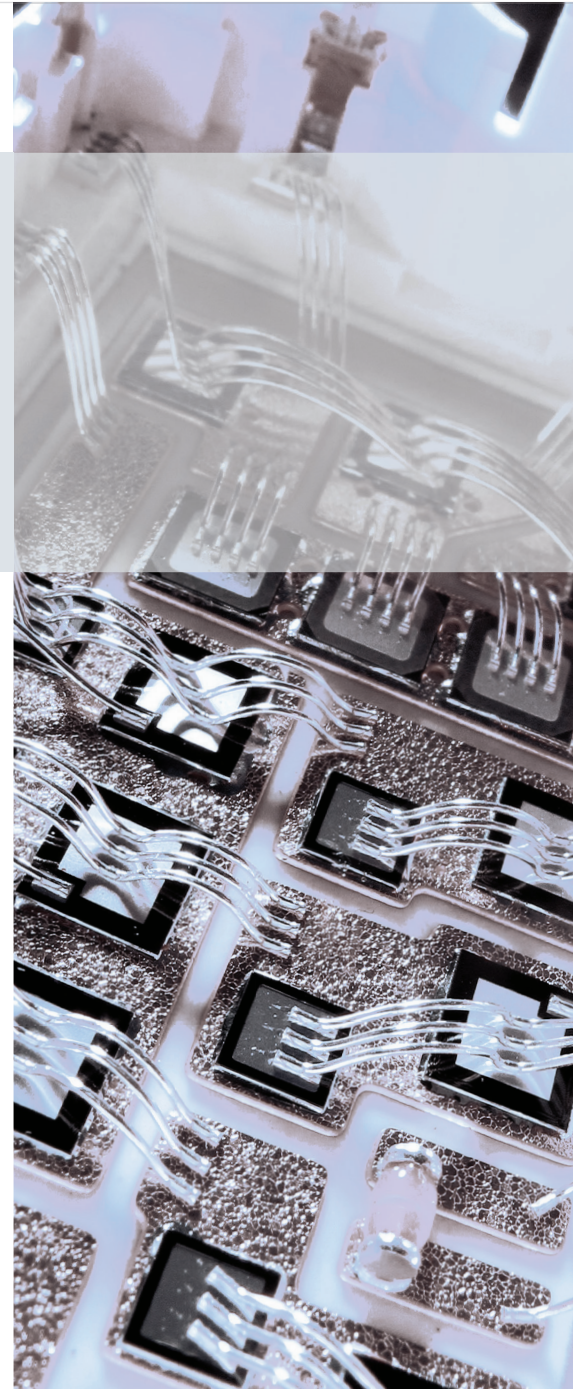
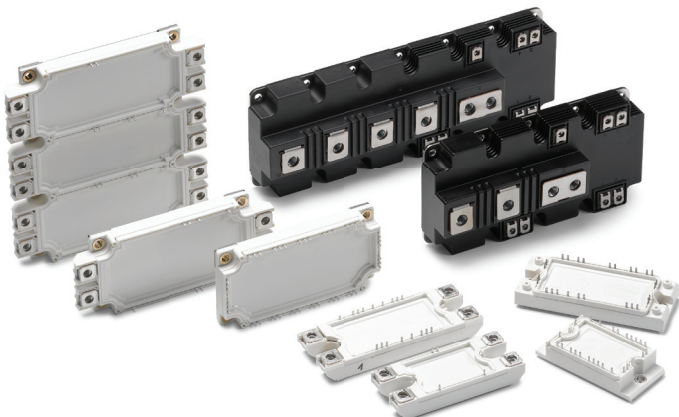
Based in Flensburg, Germany, Danfoss Silicon Power is a leading developer and supplier of customer specific IGBT and MOSFET modules and power stacks for power intensive applications.

Our power modules and power stacks are a preferred choice in demanding automotive and wind power applications and a wide variety of industrial applications.

Our 35,000 m² research, development and production facility is certified according ISO 9001, ISO/TS 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 full focus on quality.

Danfoss Silicon Power is a subsidiary of the Danfoss Group, the largest industrial company in Denmark. Danfoss employs more than 24,000 people in 100 countries within development, production, sales and support.



Danfoss Silicon Power GmbH, Husumer Strasse 251, 24941 Flensburg, Germany, Tel. +49 461 4301-40, Fax +49 461 4301-4310
www.siliconpower.danfoss.com, E-mail: dsp-sales@danfoss.com

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequent changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.