

POWER ELECTRONICS FOR MOTOR DRIVES



# Motor Drives



# Performance Range

Since the first appearance of motor drives, Semikron Danfoss has been committed to supplying solutions for every power range. 50 years ago, Semikron Danfoss introduced the first isolated power module: the SEMIPACK rectifier. Since then, other innovations for motor drives have been introduced, with the MiniSKiiP in particular revolutionizing the design of low and medium power systems.

Today, Semikron Danfoss offers the complete industry standard power module portfolio that serves a power range of 0.2kW to several megawatts.

With the latest generation of IGBTs and SiC MOSFETs from multiple suppliers, our power modules boost performance, power density, and efficiency in motor drive applications.

The portfolio is completed with high power IPMs, power electronic stacks, and a comprehensive product line of driver electronics that help to reduce development effort and time-to-market.

## GENERAL PURPOSE DRIVES

### 0.1kW - 300kW

- Pumps, fans, compressors
- Material handling, conveyors
- Marine drives
- Factory automation
- Heat Pumps, motor-embedded drives

CI, CIB, sixpacks, half-bridges
Easy and cost effective assembly
High power density for compact drive designs
Wide power range packages for scalable platform design

#### Products

SEMITOP E
MiniSKiiP
SEMiX 1
SEMiX 2
SEMiX 3 Press-Fit
SEMiX 5
SEMiX 6
SEMITRANS Classic
SEMIPACK
Drivers
Power Electronics Stacks





PERFORMANCE DRIVES

0.1kW - 300kW

- Lifts, hoists
- Spindle, turbo applications
- Single/multi-axis servo and motion control
- Robotics controller
- Extruders, compressors

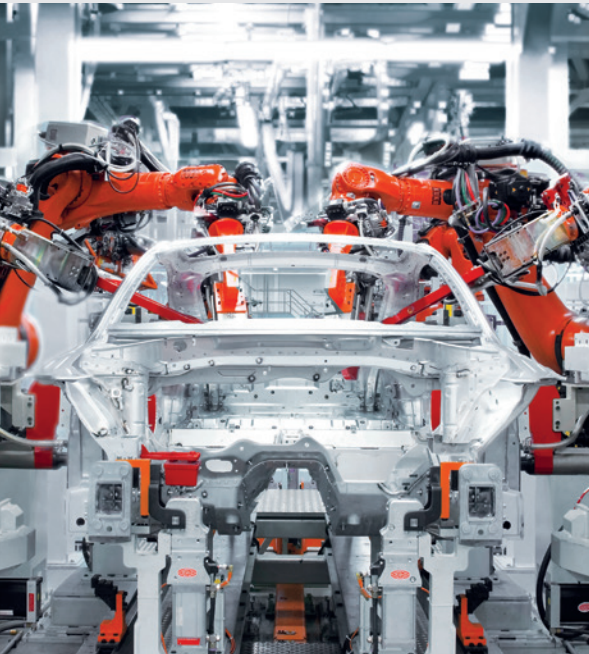
CI, CIB, sixpacks, twelvpacks, half-bridges, IPMs, Single-PCB, multi-axis, drives and modular drive concepts

High carrier frequency

High overload/peak-load capability tolerance

Products

- SEMITOP E
- MiniSKiiP
- SEMiX 1
- SEMiX 2
- SEMiX 3 Press-Fit
- SEMiX 5
- SEMiX 6
- SEMIPACK
- SKiiP 4/7 IPM
- Drivers
- Power Electronic Stacks



HIGH POWER/MEDIUM VOLTAGE DRIVES

300kW - 20MW

- Pumps, fans, centrifuges
- Mining, marine drives
- Pulp and paper

Half-bridges, single switches, IPMs

Compact designs with high power density

High reliability in harsh environments

Products

- SEMiX 3 Press-Fit
- SEMISTRANS Classic
- SEMISTRANS 10
- SEMISTRANS 20
- SEMIPACK
- SKiiP 4/7 IPM
- Drivers
- Power Electronic Stacks







# Silicon Carbide MOSFETs: New Degrees of Freedom in Design

Compared to the latest generation of silicon IGBTs, SiC MOSFETs exhibit much lower switching losses. In partial load conditions, also the conduction losses of MOSFETs are lower, thus offering designers new options for efficient drive platforms.

Increased power density allows for more compact drives or more power from given thermal designs. Faster switching with lower losses enables silent motor operation and smaller magnetics. Additionally, with SiC, users can exploit new energy saving potentials. On a system level, this leads to a fast return on investment and reduced total cost of ownership. It also represents an important step towards more efficient energy utilization and decarbonization of the industry. Power modules with silicon carbide MOSFETs allow designers to push boundaries and re-think drives design.

With decades of experience in packaging power modules and supply chain reliability secured by strong, long-term partnerships with top chip manufacturers, Semikron Danfoss is your ultimate partner for silicon carbide.

## Silicon Carbide Features

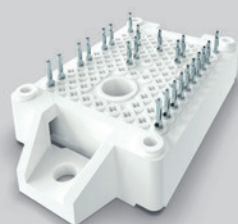
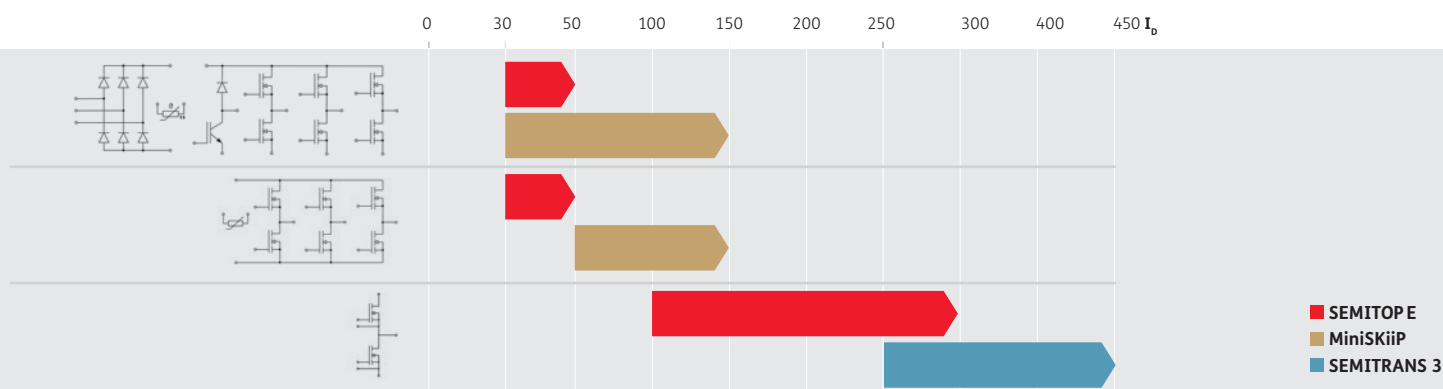
- Greatly reduced conduction losses under partial load
- Lower switching losses by using the body diode as FWD
- Short circuit withstand capability of  $2\mu\text{s}$  in the latest generation of SiC MOSFET chips
- Highest power density and efficiency
- Robustness against ambient conditions
- Unipolar gate control

## Applications

- Pumps, fans, heat pumps, air conditioners and other variable torque applications requiring maximum efficiency
- Space-saving active frontends for low-harmonics and regenerative operation
- Servo drives

## Reliable Supply

- Multiple SiC chip sources
- Long-term partnerships with top SiC chip manufacturers
- More than 15 years of experience in packaging SiC



**SEMISTOP® E**  
up to 90kW



**MiniSKiiP®**  
up to 45kW



**SEMISTRANS® 3**  
up to 160kW

# RGA IGBT for True Multiple Sourcing

With the ROHM RGA IGBT, a newly designed 1200V, trench gate, light punch through IGBT, we offer a powerful alternative to current Generation 7 IGBTs.

The RGA IGBT, which was developed with motor drives in mind, is widely compatible to latest Generation 7 IGBTs. Likewise, it can be continuously operated at  $T_{j,max}=150^{\circ}\text{C}$  and intermittently at  $T_{j,max}=175^{\circ}\text{C}$ . Gate voltages are identical and the gate charge is even lower, thus it can easily be driven by existing driver circuits.

The RGA also offers advantages when comparing it to market available Generation 7 IGBTs. The chip size is optimized so that the thermal resistance is lower and a power module with RGA IGBT runs cooler. This allows for an increase of power or a reduction in cooling. Additionally, while typical Generation 7 IGBTs desaturate at twofold nominal current, the RGA IGBT can handle threefold nominal current, thus offering higher peak current tolerance.

With the ROHM RGA IGBT packed into our MiniSKiiP and SEMITOP E industry standard housings, there is now a true alternative to Generation 7 IGBT power modules.

### Optimized for Motor Drives

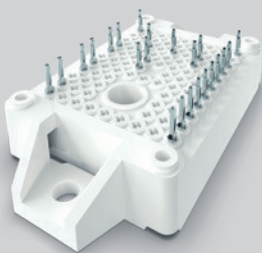
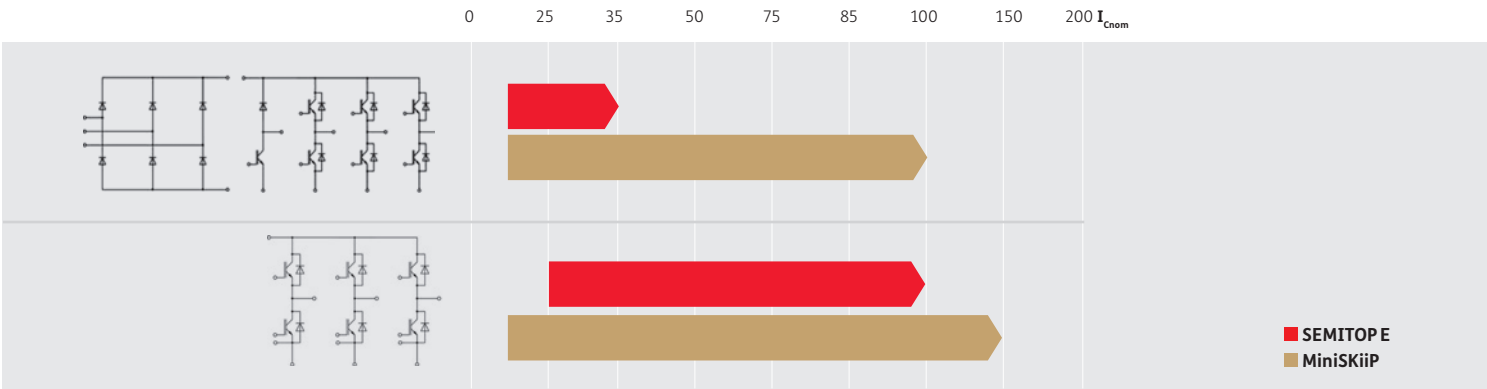
Low thermal resistance
High peak current capability
1200V, 10 to 150A in CIB and sixpack topologies

### Compatible with Market Standards

$T_{j,max}=175^{\circ}\text{C}$
Robust against humidity
Typical gate voltage -8 to +15V <sub>DC</sub>
Industry standard packages

### Reliable Supply

Long-term partnership
True multiple sourcing option from package down to chip



**SEMISTOP® E**  
0.4kW to 30kW



**MiniSKiiP®**  
0.4kW to 45kW

# Flexibility for Compact Drives

The SEMITOP E product line design offers a range of alternative packages for compact PCB-based motor drives. With multiple sourcing down to the chip level, it provides the best supply chain safety.

The baseplate-less design offers superior thermal performance. This, combined with a low-inductance design, also makes SEMITOP E the perfect package for the latest Si and SiC chip technologies.

SEMITOP E modules are available with pre-applied High Performance Thermal Paste (HPTP). Alternatively, for ease of handling during assembly, it can also be supplied with pre-applied HP-PCM, the new Semikron Danfoss-exclusive High Performance Phase Change Material.

## Full Flexibility for Compact Drives

CI, CIB, rectifiers with/without chopper, sixpacks

650V / 1200V IGBT: 10A to 100A

1200V SiC: 30A to 300A

1600V Rectifiers: up to 150A

Low inductance design ready for SiC

Flexible pin-grid for additional topologies

Press-fit or solder pins

Multiple chip sources for Si and SiC

## Optimized Package

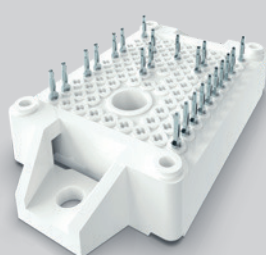
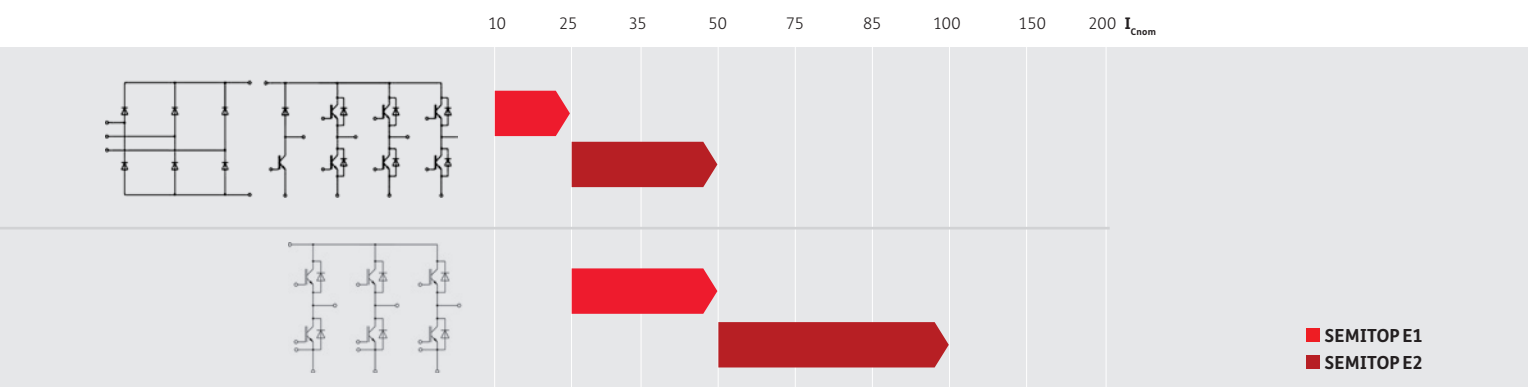
12mm high baseplate-less design

Optimized press-fit pins with strain relief for mounting robustness and reliability in operation

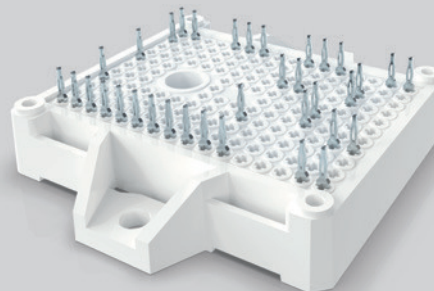
## Superior Thermal Performance

Optimized DBC and pressure system for up to 20% lower  $R_{th,j-s}$  than market standard

Available with pre-applied High Performance Thermal Paste (HPTP) or High Performance Phase Change Material (HP-PCM)



**SEMITOP® E1**  
0.4kW up to 15kW



**SEMITOP® E2**  
4kW to 22kW

# Full Scalability for PCB-Based Designs

With two decades of field experience and more than 75 million modules in the field, the MiniSKiiP platform has proven successful in all standard applications.

The unique mechanical design offers the simplest possible assembly. Heatsink, module and PCB connected with one or two screws in a single step, making solder or press-in processes and tools obsolete. In terms of sensitivity to mechanical or thermal stress, the springs doing the electrical connection between PCB and power module have proven to be far superior to solder or press-fit joints.

With its wide power range, the MiniSKiiP product family provides a unique base for scalable PCB-based drive designs from 0.4kW up to 110kW. With a variety of topologies, it is the perfect match from single-axis drives to single PCB assemblies with multiple axes.

## One Consistent Mounting Concept for Drives up to 110kW

Available as CIB, sixpack, half-bridge, rectifier, brake chopper, twelvepack

Covering 600/650V, 1200V, 1700V

## Easy One-Step Mounting

Easy PCB-based assembly with only one or two mounting screws

High-productivity mounting thanks to automatable production lines

No additional tools, no soldering, no press-in process required

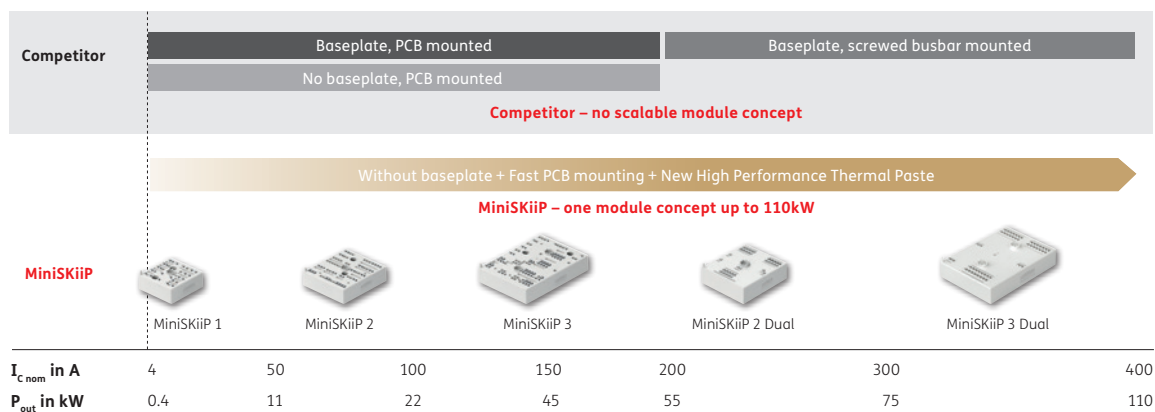
Easy manufacturing of single-PCB multi-axis designs

## Benchmark Performance

Sintered SiC versions provide best reliability while offering highest efficiency and power density

Lowest thermal resistance with High Performance Thermal Paste (HPTP)

Spring contacts for superior vibration resistance



**MiniSKiiP®**  
0.4kW up to 110kW



# IGBT and Rectifier Module Family for Complete Motor Drive Solutions

SEMiX 3 Press-Fit is an industry-standard package that provides the ideal platform for complete medium- and high-power drive solutions.

With IGBTs ranging from 650V to 1700V and up to 900A, SEMiX 3p enables flexible and scalable drive architectures. Supply chain security is ensured through the latest generation of IGBT chips from multiple suppliers.

SEMiX 3p also provides phase legs for uncontrolled, half-controlled, or fully controlled rectifiers. These allow the grid-side connection to be perfectly adapted to application needs. AC-switch topologies with anti-parallel thyristors enable compact and efficient soft-starter designs, minimizing system footprint.

## Features for Enhanced Functionality and Ease of Integration:

- SEMiX 3 Press-Fit is optionally available with integrated current measurement shunts, eliminating the need for bulky current sensors. This reduces both the size and cost of the motor drive system.
- Significantly shorten your time-to-market with SKYPER 12 Press-Fit drivers. They can simply be pressed onto the module's press-fit pins providing a ready-to-use solution.
- For best thermal performance, pre-applied High Performance Phase Change Material (HP-PCM) is available. It combines phase change technology with the thermal efficiency of high-end thermal paste, ensuring optimal heat dissipation, reliability, and hassle-free handling.

## Industry Standard Package with Optional:

---

Integrated current shunts

---

Plug-and-play gate driver

---

Pre-applied High Performance Phase Change Material

---

H<sub>2</sub>S protection

---

## Available as a Complete 17mm - High Solution

---

Uncontrolled, half-controlled, full-controlled rectifier, brake chopper and half-bridge

---

1600V / 2200V Rectifier: up to 500A

---

1600V AC-switch: 500A

---

650V / 1200V / 1700V IGBT: 225A to 900A

---

1200V Hybrid SiC: 600A

---

Full multiple source thanks to several IGBT suppliers

---

Hybrid silicon carbide version offers highest efficiency and power density

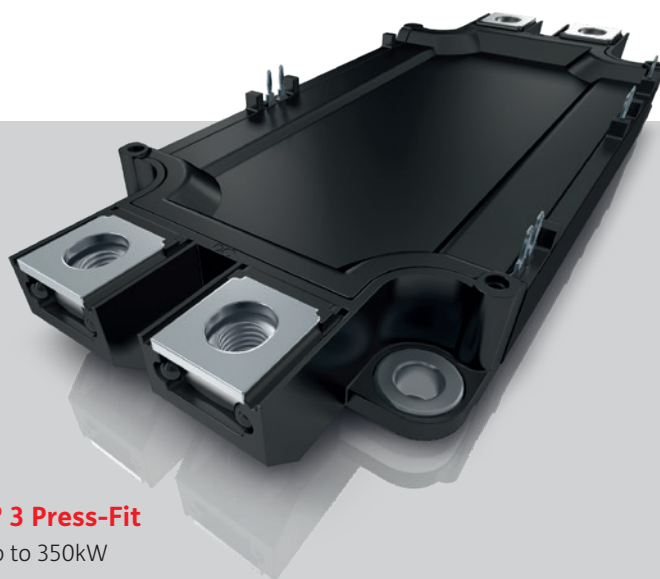
---

## The Latest Generation 7 IGBT

---

25% higher output power thanks to the latest Generation 7 IGBT

---



**SEMiX® 3 Press-Fit**  
55kW up to 350kW

# Best in Class Rectifiers



When first released, the SEMIPACK set a new industry standard for power semiconductor modules. It was the first fully isolated power module available on the market and it was the basis for many innovations to come.

Today SEMIPACK is still setting benchmarks. With a mean on-state current of up to 145A and a super low thermal resistance, the 6th generation of the SEMIPACK 1 is the most powerful 20mm module available on the market.

The SEMIPACK 2 Performance, which incorporates the latest generation of diode and thyristor chips, allows operation temperatures of up to 150°C and provides an unrivaled power density in the class of 34mm modules.

The complete SEMIPACK product line consists of uncontrolled, half-controlled and full-controlled rectifier modules in six module lines covering voltage classes from 1200V to 2200V, isolation voltages of 3.6kV and 4.8kV, and rated currents from 20A to 1360A.

With all of this, the SEMIPACK is the ideal rectifier solution for any motor drive application.

## Scalable Product Range

Six industry standard housings
20A...1360A and 1200V...2200V
Uncontrolled, half-controlled, fully-controlled rectifier legs and switches

## Setting Benchmarks - 6<sup>th</sup> Generation of SEMIPACK 1

$I_{TAV}/I_{FAV}$ up to 145A and $I_{TSM}/I_{FSM}$ up to 2210A
New, lighter baseplate for optimal heat spread
Up to 50% lower $R_{th}$ compared to the market standard
Full lineup for motor drives up to 75kW



**SEMIPACK® 1**  
6<sup>th</sup> Generation



**SEMIPACK® 2 Performance**







# Product Portfolio

## Power Modules



### MiniSKiiP®

0.4kW to 110kW

#### Solder-Free Spring Technology for Minimum Assembly Time

Full family of power modules up to 110kW

650V / 1200V / 1700V IGBT: 4A to 400A

1200V hybrid and full SiC: 30 to 150A

1600V / 2200V Rectifiers: up to 229A

Comprehensive set of topologies: CIB, sixpack, twelvepacks, H-bridge, half-bridge, 3-level, bridge rectifiers with brake chopper

Easy and flexible PCB routing without pin holes

Easy manufacturing of single-PCB multi-axis designs

RGA IGBT and Generation 7 IGBT for true multiple sourcing



### SEMITOP® E

0.4kW to 75kW

#### Exceeding the Standard for Superior Performance

PCB-based and press-fit connected baseplate-less industry standard power module in two housing sizes

650V / 1200V IGBT: 10A to 100A

1200V SiC: 30A to 300A

1600V Rectifiers: up to 150A

Rectifier, CI, CIB, sixpack, and half-bridge topologies

Optimized mounting concept and pre-applied High Performance Thermal Interface Material provide lowest thermal resistance in class

RGA IGBT and Generation 7 IGBT for true multiple sourcing



### SEMIPACK®

800V to 2200V



#### Bipolar Modules from the Market Leader

6 housing sizes SEMIPACK 1 to 6

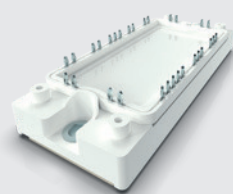
1200V to 2200V: 20A to 1360A

Semikron Danfoss diode and thyristor chips

Diode and thyristor in un-, half-, full-controlled and AC switch topologies

Different technologies for certain packages: high reliability pressure contact or cost-effective wire bonded modules

Enhanced isolation voltage of 4.8kV/1s available on request



### SEMiX® 1/2

1.5kW to 18.5kW

#### Reliable Standard for Low-Power Drives

Baseplate design for mounting robustness and optimized heat spreading

Solder or press-fit pins

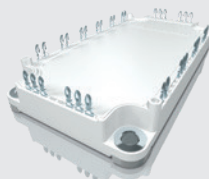
1600V Rectifiers: 100A

650/1200V IGBT: 15 to 75A

Bridge rectifier (B6U), CI, CIB

Fully compatible industry standard package for multiple sourcing

Latest Generation 7 IGBTs



### SEMiX® 6

15 to 75kW

#### The Baseplate Standard for Mid-Power PCB-based Designs

Baseplate design for mounting robustness and optimized heat spreading

Improved thermal management by design for minimized  $R_{th}$

Solder or press-fit pins

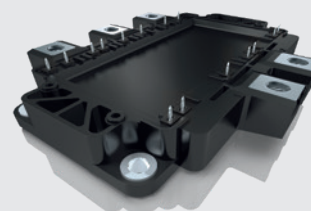
1600V / 2200V Rectifiers: 120A to 630A

650 / 1200V IGBT: 75A to 250A

Bridge rectifier (B6U), CIB, sixpack, and H-bridge topologies

Latest press-fit pin technology for optimal assembly and connection reliability

IGBT 4 and IGBT M7 ensure high supply chain safety



### SEMiX® 5

55 to 90 kW

#### For Compact 2- and 3-Level Medium Power Drives

Five-terminal baseplate standard package with 17mm height

Improved thermal management by design for minimized  $R_{th}$

1600V Rectifier: 336A to 484A

650V / 1200V IGBT: 200A to 300A (sixpack), 150A to 400A (NPC), 200A to 400A (TMLI)

Bridge rectifier (B6U), sixpack, 3-Level phase legs with optimized DCB layout for low stray inductance

Direct driver assembly

IGBT 4 and IGBT M7 ensure high supply chain safety



### SEMIX® 3 Press-Fit

55kW to 350kW

#### For Scalable Large-Power Designs

Industry standard press-fit design  
with 17mm height

Optimized design for maximum power density

1600V / 2200V Rectifier: up to 500A

1600V AC-switch: 500A

650V / 1200V / 1700V IGBT: 225A to 900A

1200V Hybrid SiC: 600A

Complete motor drive topologies available:  
half-bridge, rectifier, and brake chopper

Direct driver assembly

Available with integrated shunt resistor for  
current measurement

Optional H<sub>2</sub>S protection



### SEMITRANS® Classic

25kW to 500kW

#### The Proven Power Electronics Package

Robust industry standard package for  
multiple sourcing in four housing sizes

600V / 650V / 1200V / 1700V IGBT: 50A to 900A

1200V / 2000V Full SiC: 250A to 650A

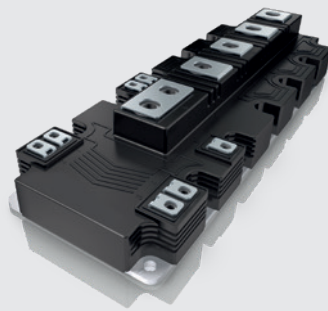
Half-bridge, single switch and brake  
chopper topology

Multiple IGBT sources including  
Generation 7 IGBTs

Extended 62mm portfolio

1200V IGBT: 800A

1700V IGBT: 500A



### SEMITRANS® 10

110kW to 1MW

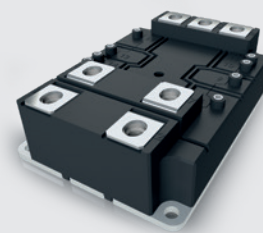
#### Robust High Power Module

Established high power module package  
scaled in three different housings

1200V / 1700V / 2300V IGBT: 450A to 1800A

Half-bridge, chopper, TNPC, NPC,  
and split NPC topologies

Full multiple source thanks to  
Generation 7 IGBT M7



### SEMITRANS® 20

from 500kW

#### The New Standard in High Power

The latest industry standard power module  
for high power applications

1200V / 1700V IGBT: 1200A to 1800A

2000V SiC: 1700A, 1mOhm

Half-bridge topology

Low stray inductance,  
high power density package

Excellent reliability thanks to sintered chips  
and latest packaging technology







# Intelligent Power Modules – IPMs

## For Maximum Reliability

The SKiiP IPM product line set the benchmark for high performance and robust inverter designs. Both SKiiP 4 and SKiiP 7 feature high power densities combined with flexible cooling options such as air or water cooling, as well as with customized heatsinks. Reliable driver technology, integrated current sensors and comprehensive protection functions complete the IPM design.

SKiiP 7 has become increasingly popular through the industrial applications. With its sixpack or half-bridge topologies, it covers a current range of 500A to 2400A.

The SKiiP 4, available in half-bridge topology, has been optimized for ultra-high power cycling requirements and covers a higher power range up to 3600A.

To ensure maximum reliability and service life, the power circuitry is 100% solder-free. Sinter die attach technology replaces the solder layer, the common cause of module lifetime limitations, thus improving power and thermal cycling capability.

High Performance Cooling (HPC) technology has been introduced, to provide 25% more output power capability compared to standard water cooling. A double-sided mounting HPC is also available, enabling ever higher power density.

The integrated gate driver in the SKiiP 4 has set new standards in terms of reliability and enhanced functionality through its CAN interface. The digital driver guarantees safe isolation between the primary and secondary side for both switching signals and parameter measurements. The CAN interface allows setting the SKiiP 4 configuration parameter and reading application parameter.

### Key Features

---

Half-bridges and sixpacks

---

1200V / 1700V IGBT: 500A to 3600A

2000V SiC: 1200A to 2400A

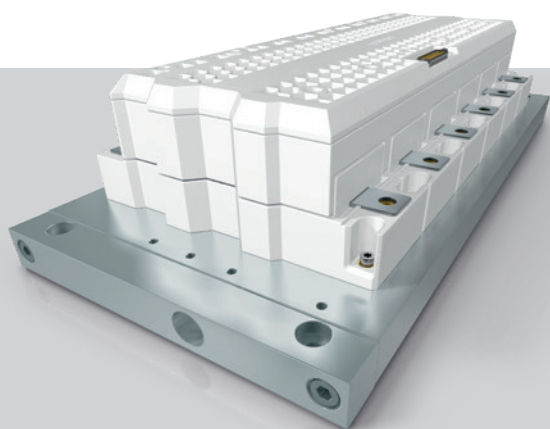
---

Flexible cooling options: air, water or customized cooling options

---

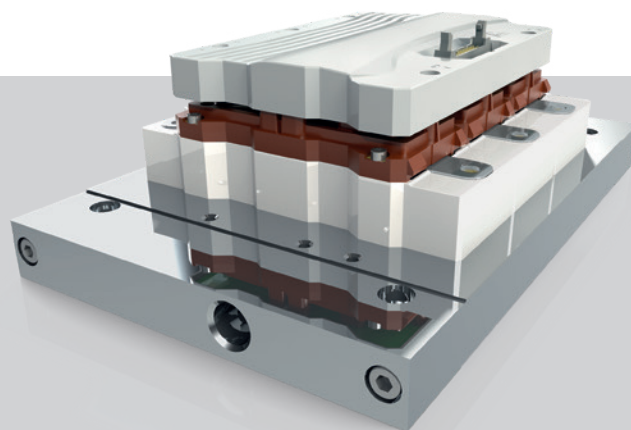
Parallel operation for even higher output power possible

---



#### SKiiP®4

Up to 2MW  
available with SiC MOSFET



#### SKiiP®7

150kW up to 2.4MW







# Power Electronic **Stack Platforms** for **Fully Qualified** Inverter Assemblies Tailored to Your **Specific Needs**

## Standard Stacks

Our Power Electronic Stacks enable our customers to succeed in dynamic markets and meet any global challenge. We deliver Rectifier-, IGBT- and SiC-based stacks for AC voltages from 380V to 690V. Our standard stacks cover an output current range from 70A to 4000A.

## Water-Cooled IGBT Stacks

SKiiPRACK  
SEMISTACK RE

## Air-Cooled IGBT Stacks

SEMIKUBE  
SEMIKUBE SlimLine

## Diode/Thyristor Stacks

SEMISTACK CLASSIC B6U/B6C/W3C

## Customized Stacks

In addition to standard stacks, Semikron Danfoss has vast experience in developing customer-specific solutions. Engineers are available in our stack centers around the globe to offer specific solutions by adapting existing platforms or designing customized converters.

## Four Key Factors to Your Success

---

Shortest time to market

---

Cost savings in R&D, production and qualification

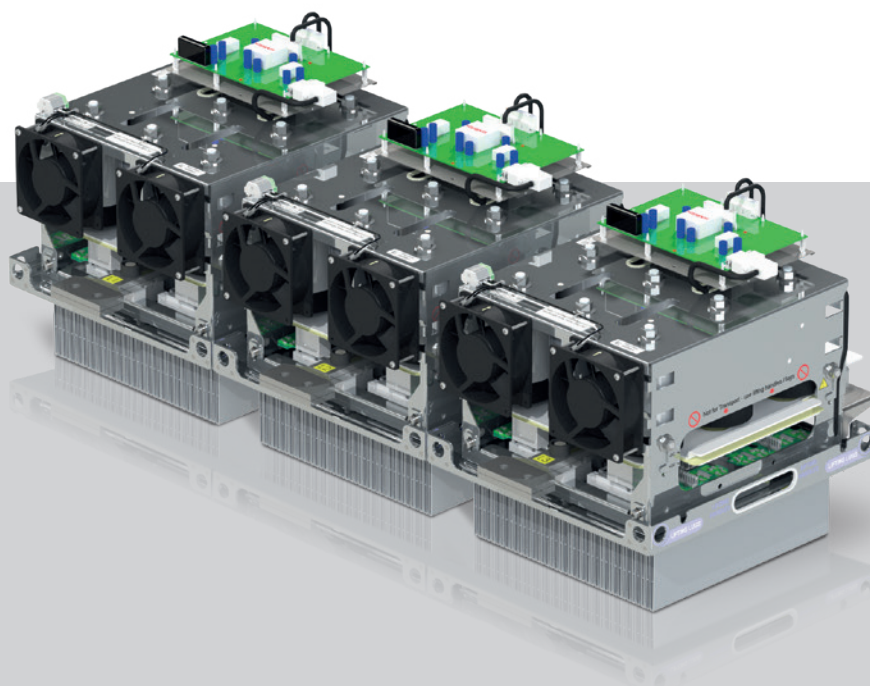
---

Global Semikron Danfoss stack production footprint

---

Highly experienced engineering team

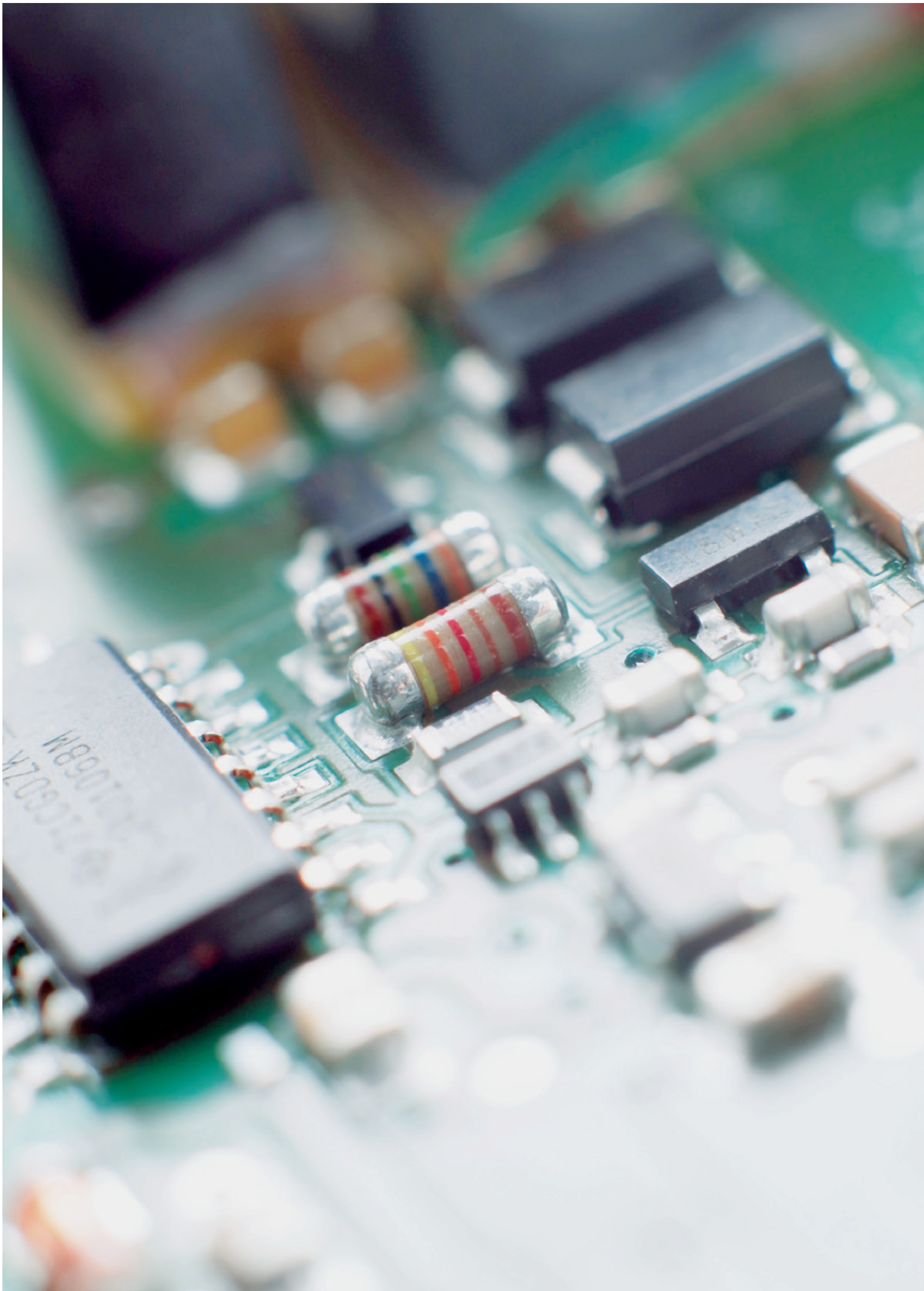
---



## SEMIKUBE®

Air-cooled IGBT Power Stack





# Product Portfolio

## IGBT Driver

The unique product portfolio enables access to all established industries with a one-stop solution that combines state-of-the-art power modules and driver electronics.

Our IGBT drivers are available as two-channel driver cores suitable for any standard semiconductor power module or as Plug-and-Play solutions, which perfectly fit the SEMiX 3 Press-Fit, SEMITRANS 10 and compatible modules.

### Cost Efficient

Achieve outstanding system compactness and create space- and cost-effective inverter designs with our drivers, utilizing highly integrated ASIC technology. Isolated DC-link voltage and temperature sensor signals at the driver's interface along with over-voltage and over-temperature lockout also help to reduce system costs significantly.

### Time Efficient

More than 25 years of experience in developing innovative IGBT driver electronics enables Semikron Danfoss to have a short-term solution for almost every challenge related to driver electronics. Our Plug-and-Play drivers connect directly to most common standard IGBT modules. The IGBT driver cores fit with the adapter boards or application sample PCBs. For the latter, Semikron Danfoss shares the entire manufacturing data to decrease development time, speeding up the time-to-market.

### Reliable

Our SKYPER are well-known, highly robust and reliable IGBT driver solutions under demanding environmental conditions. Over many years of field operation experience the proprietary IGBT driver technology has been relentlessly developed further. This technology sets new standards for the essential features of safe gate control, reliable gate protection and reinforced insulation.

### Compact Design

Our SKIC ASIC technology enables very compact system design with minimal peripheral components. With highly integrated signal processing and multi-channel failure management, our ASICs offer robust gate control.



### Key Factors

---

Reinforced insulation for signal and power transmission

---

Two-channel driver

---

Up to 1700V transients

---

Up to 1500V continuous DC bus voltage

---

8Apk to 35Apk per channel

---

1W to 4.2W peak per channel

---

Suitable for multi-level topologies and Generation 7 IGBT

---

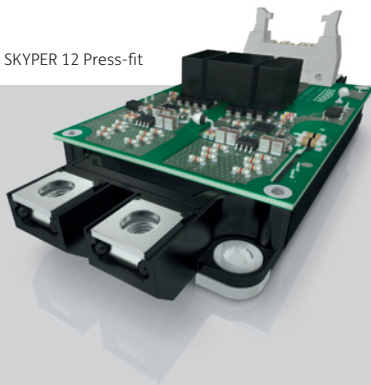
SKYPER 12 PV



### Driver Cores

Two-channel driver cores for PCB integration with Semikron Danfoss ASIC technology and integrated safety functions

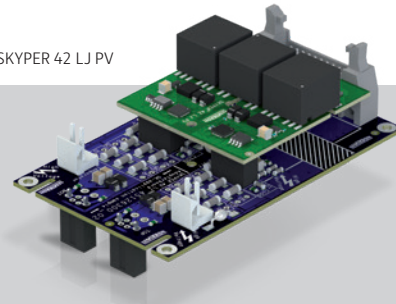
SKYPER 12 Press-fit



### Plug-and-Play Driver

Two-channel drivers for direct module mounting with electrical or optical interface

SKYPER 42 LJ PV



### Adapter Board and Application Samples

Adapter boards for driver core mounting to Semikron Danfoss IGBT and SiC modules







# Thermal Interface Materials

## Stay Cool: Heat Dissipation is Our Job

Semikron Danfoss was the first power module manufacturer to offer modules with pre-applied thermal interface material (TIM). We now have over two decades of experience and more than 33 million pre-printed modules in the field. We design print patterns for each module type for the best TIM distribution and thickness when the module is mounted to a heatsink. These patterns are printed in a clean environment using automated silkscreen and stencil machines. Statistical process control (SPC) is used to ensure consistency. Special packaging ensures the TIM arrives in pristine condition.

We offer either thermal grease or phase change material (PCM) based on customer needs (e.g., performance or reduced handling effort) and module type. Baseplate-less modules benefit from low-viscosity materials like thermal paste. Our High Performance Thermal Paste (HPTP) provides top-tier thermal performance with optimized filler content.

For easier assembly, most power modules are also available with pre-applied PCM. PCM is solid at room temperature but becomes fluid during operation, filling gaps for thermal contact. HP-PCM, our exclusive High Performance Phase Change Material, combines the benefits of PCM with the performance of the best thermal paste.

For field serviceability, compressible graphite sheets are an innovative option. Panasonic Industry has overcome the shortcomings of traditional graphite sheets with a new compressible pyrolytic graphite sheet called G-TIM (GraphiteTIM).

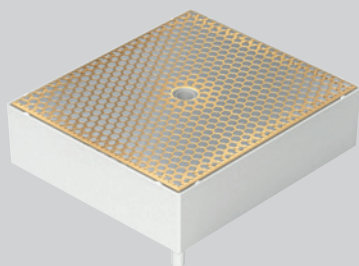
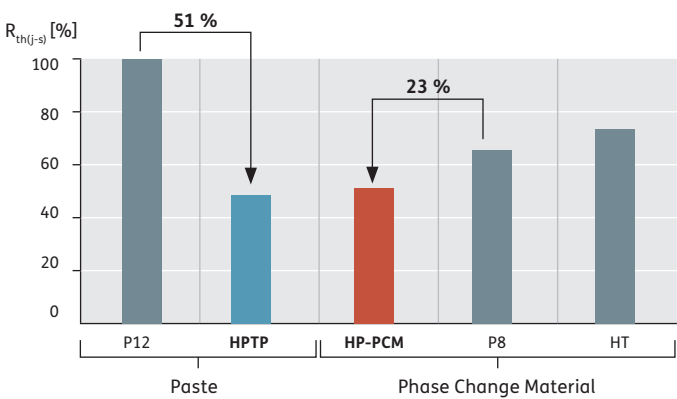
This compressible sheet conforms to the underside of the module during mounting. The crystalline structure of the graphite outstanding long-term stability. Panasonic offers pre-cut graphite sheets for Semikron Danfoss modules.

### Key Features

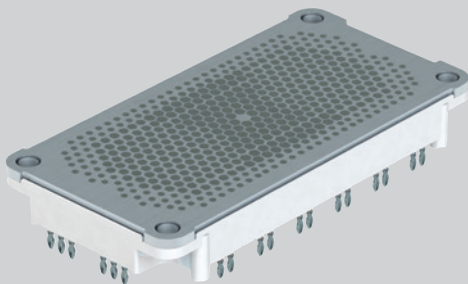
- Best possible thermal performance
- Simplified logistics and reduced production costs
- Improved assembly robustness
- Increased lifetime and reliability

### Portfolio

- HPTP:** High Performance Thermal Paste
- HP-PCM:** High Performance Phase Change Material



Baseplate-less module with pre-applied thermal paste



Baseplate module with pre-applied phase change material

## THE ULTIMATE PARTNER IN POWER ELECTRONICS

Semikron Danfoss is a global technology leader in power electronics. Our product offerings include semiconductor devices, power modules, stacks and systems. In a world that is going electric, Semikron Danfoss technologies are more relevant than ever. With our innovative solutions for automotive, industrial and renewable applications we help the world utilize energy more efficiently and sustainably and thus to significantly reduce overall CO<sub>2</sub> emissions – facing one of the biggest challenges today. We take care of our employees and create value for our customers by investing significantly in innovation, technology, capacity, and service to deliver best-in-industry performance and for a sustainable future.



05/2025



### **Semikron Danfoss GmbH**

Husumer Strasse 251  
24941 Flensburg, Germany

### **Semikron Danfoss International GmbH**

Sigmundstrasse 200  
90431 Nuremberg, Germany

[www.semikron-danfoss.com](http://www.semikron-danfoss.com)

Note: All information is based on our present knowledge and is to be used for information purposes only. The specifications of our products may not be considered as an assurance of component characteristics.

