SEMIKRON
innovation+service

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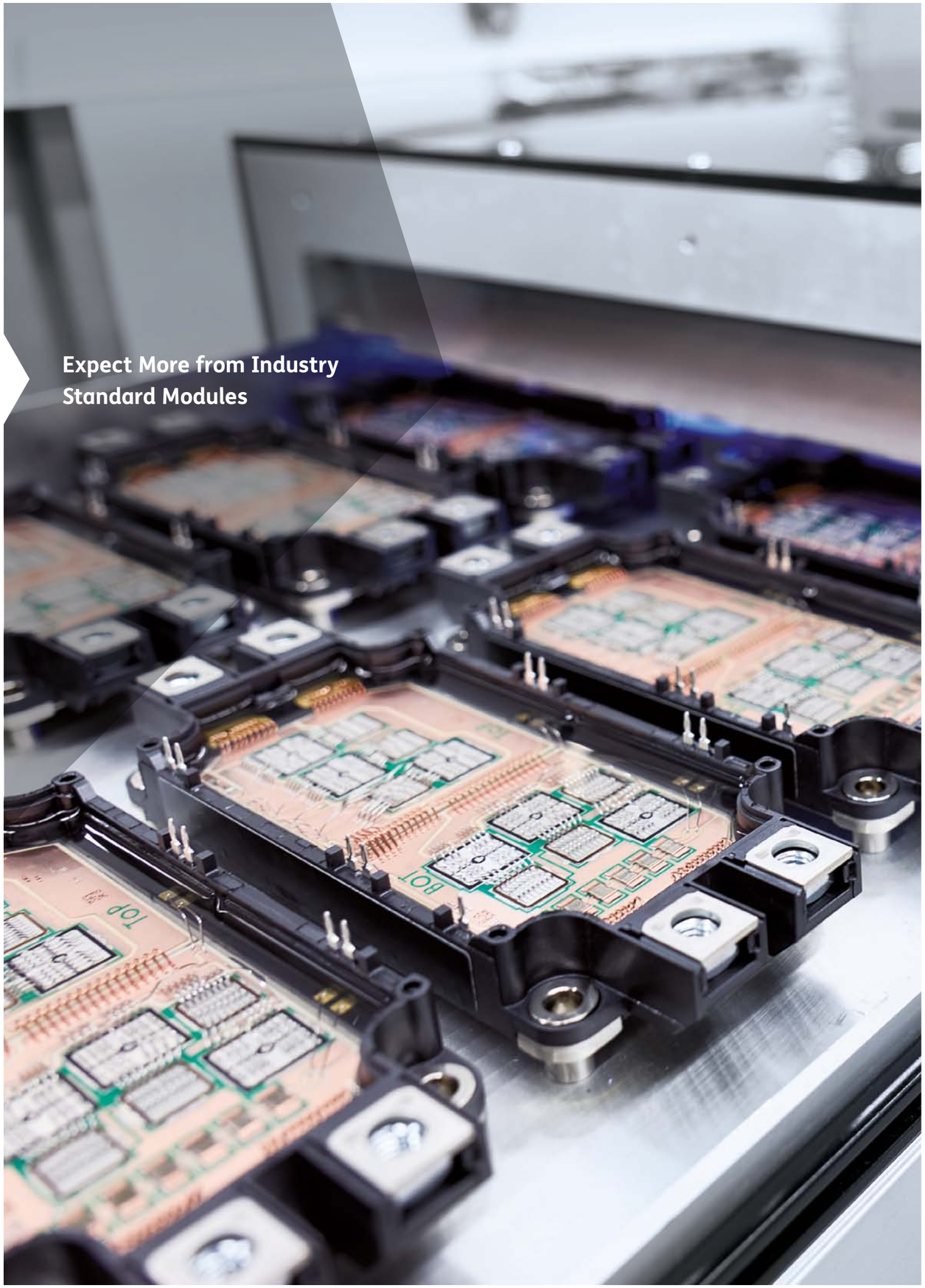
2015/16

Power Electronics

CATALOGUE



Expect More from Industry Standard Modules

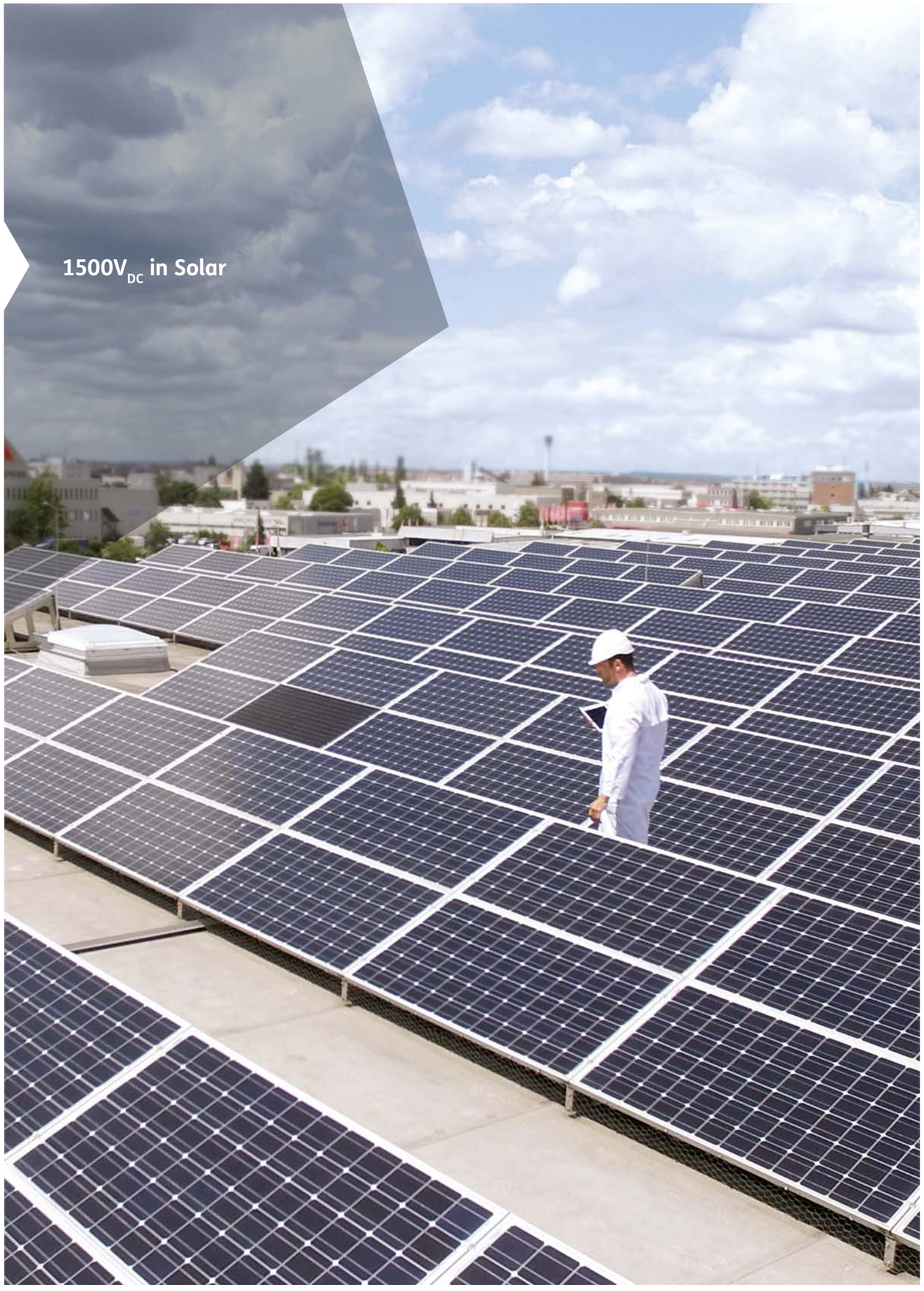
Increased production capacity

Industry standard power modules are the key to supply chain safety. With increased production capacities, SEMIKRON can ensure it's on track to meet present and future demands. Being compatible on the one hand, SEMIKRON standard modules even exceed these requirements on the other hand.

At the same time power densities and reliability requirements are constantly increasing. The SEMIKRON technology portfolio of sintering and wire-bonding technologies takes output power capability and reliability to new levels. Module-integrated current measurement shunts, plug & play drivers and pre-applied thermal interface materials with superior performance reduce the system parts count and development times, cutting system costs and time-to-market.

Demand for industry standard modules has risen sharply in recent years owing to their wide range of applications. For this reason, we have already begun to expand our production lines for SEMIX5 and SEMIX3p by doubling the production capacity. An additional fully automated production line is also in the pipeline for MiniSKiiP, increasing volume output by 50%. SEMIKRON is and remains your reliable partner, supplying everything you need from a one-stop shop.

www.semikron.com/video/miniskiip



1500V$_{DC}$ in Solar ?

We Cover all Your Needs

SEMIKRON' s portfolio includes a wide range of products for efficient solar inverters across every power range. Especially for increased DC voltage up to 1500VDC, this enables a significant reduction in system costs. SEMIKRON offers a broad portfolio of power modules, IPMs and ready-to-use power electronic stacks.

Power Modules
- Broad portfolio of 2-level, 3-level and booster modules
- Up to 750kW (air-cooled) without paralleling with SEMITRANS 10
- Up to 400A for direct PCB mounting with MiniSKiiP
- Latest Si and SiC chip technologies
- All connection technologies available: solder pins, press-fit pins, screw connectors and spring contacts
- Plug & Play drivers

IPMs
- Dedicated SKiiP 4 version for 1500V PV applications
- Water- and air-cooled versions
- Maximum reliability thanks to sinter technology and SEMIKRON ASIC driver chipset

Stacks
- Fast time-to-market with ready-to-use power stacks
- Customised designs for individual customer applications
- Includes SEMIKRON drivers with ASIC chipset

Further information: www.semikron.com/1500v-solar

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MiniSKiiP® with IGBT 7

AC | DC

New Standard in Power Density

In 2017, the MiniSKiiP celebrated its 20th birthday. In 2018, SEMIKRON is demonstrating its innovation potential once again. With the introduction of the latest IGBT chip generation, the MiniSKiiP is once more setting a new standard in power density and performance for low and medium power motor drives. Combined with the well-known advantages of MiniSKiiP SPRiNG technology and its easy assembly process, a new performance benchmark is being set.

Key features

- Latest chip technology in a proven package
- Optimised production processes thanks to fast and easy assembly
- Highly reliable SPRiNG technology
- Optimised layouts and topologies for motor drive applications

MiniSKiiP® Dual Split MLI

AC | DC

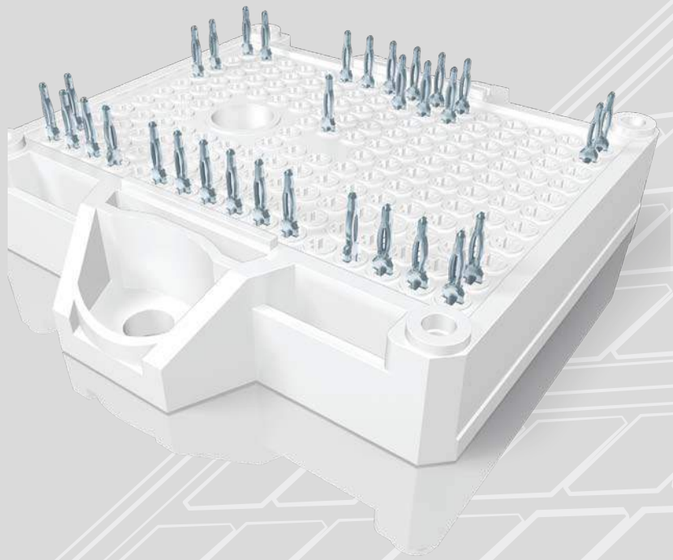
Maximum Power Density for Compact String Inverter Designs

The MiniSKiiP is entering new markets: the MiniSKiiP Dual Split MLI takes the superior reliability of MiniSKiiP technology to 1500VDC solar applications up to 180kW. The use of SiC Schottky diodes in the neutral path delivers supreme efficiency and maximum power density for compact string inverter designs.

Key features

- Up to 180kW non-baseplate design for direct PCB mounting
- Maximum efficiency using SiC Schottky diodes in the neutral path
- Low inductance DC-link connection
- Spring contacts for easy PCB routing
- Well-established and highly reliable MiniSKiiP package

SEMITOP® E1/E2



AC | DC

Exceeding the Standard for Superior Performance and Supply Chain Safety

SEMITOP E1/E2 is a module platform with a height of 12mm, two lateral mounting screws, press-fit pins, and no baseplate.
The platform is designed for the low and medium power range up to 70kW by offering a compact and low inductance design. These features, combined with the latest chip technologies and a pin grid philosophy for flexible design layouts, make SEMITOP E1 and E2 suitable for different markets such as UPS, solar (incl. up to 1500VDC bus for string inverter solutions), motor drives, power supplies and the new emerging EV battery charger market.

Key features

- Industry standard package
- Low stray inductance design
- Optimised footprint for excellent thermal performance
- High design flexibility
- Latest Si and SiC technologies
- Optionally available with snubber capacitor

Silicon Carbide

AC | DC

Hybrid SiC Power Modules

Portfolio: MiniSKiiP, SEMiX 3 Press-Fit, SEMITRANS, SKiM 63/93

Full SiC Power Modules

Portfolio: MiniSKiiP, SEMITOP, SEMITOP E1/E2, SEMITRANS, SEMIPACK

Leading Chip and Packaging Technology for Maximum Energy Efficiency

SEMIKRON's silicon carbide power modules combine industry standard package outlines with sophisticated packaging technologies. The multiple chip sourcing strategy allows SEMIKRON to propose the best supplier for every application. Optimised power module designs and technologies will help you to get the most out of silicon carbide.

Key features

- Hybrid silicon carbide modules achieve up to 50% lower power losses, convertible into triple the switching frequency
- Full silicon carbide modules achieve 99% at the highest of switching frequencies
- Optimised power module designs allow you to get the most out of silicon carbide
- Optimised chip sets thanks to multiple SiC chip sources

Product Lines

Product Lines

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AC | DC

Fast, Cost Efficient and Reliable One Screw Mounting

MiniSKiiP®

Short facts

- Low cost assembly, high production run rate, high yield
- Small and compact inverter design
- High reliability and long product life time

Key features

- Solder-free SPRiNG technology for fast and easy assembly
- Without copper baseplate for cost efficient concept
- Easy and flexible PCB routing without pin holes
- Current range 4A to 400A for inverter range up to 90kW with one product platform
- Comprehensive setup of topologies: CIB, 6-pack, twin 6-pack, H-bridge, half-bridge, 3-level, bridge rectifiers with brake chopper

Applications

With 2 decades of field experience and 40 million modules in the field, this module platform has proven successful in all standard applications. Key applications include all kinds of inverters, such as standard drives, stand-alone drives, servo drives, system drives, solar inverters, UPS systems and welding machines. Thanks to the high reliability of spring contacts, applications such as agricultural vehicles or pitch motors of windmills benefit from the MiniSKiiP technology as well.

Benefits

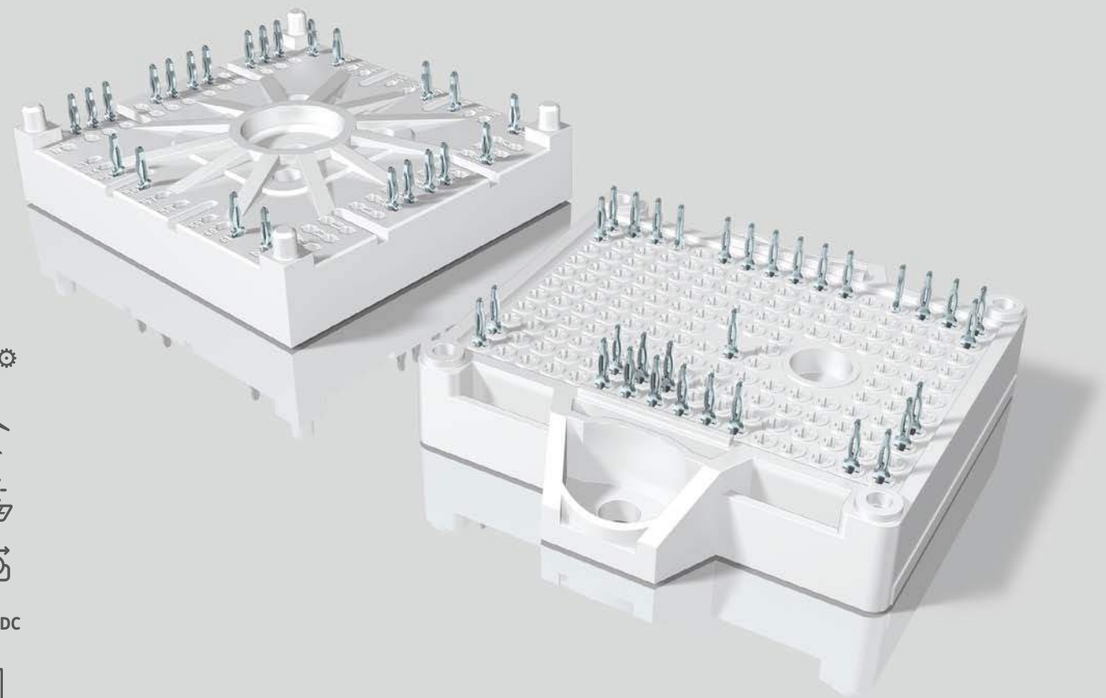
An important mechanical feature of MiniSKiiP modules is the outstandingly easy assembly and service friendly spring contact for load and gate terminals. Compared to conventionally soldered modules, where expensive soldering equipment is required for time-consuming solder processes, no special tools are needed for MiniSKiiP assembly. Instead, a single screw connection is used. The printed circuit board (PCB), the power module and the heat sink are assembled in one mounting step. This connection technology features a number of addit-ional advantages: the PCB can be more flexible in design, as the power circuit board does not need to include holes for solder pins. The springs provide a flexible connection between the PCB and the power circuitry which is far superior to a sol-dered joint, particularly under thermal or mechanical stress conditions which can affect lifetime. Thanks to the high mechanical pressure provided by the springs, an air-tight, reliable electrical connection is achieved.

Product range

MiniSKiiP modules are designed for 600V/650V, 1200V and 1700V with 4A - 400A nominal chip currents, and feature Trench IGBT technology in combination with the SEMIKRON CAL diodes. 1200V Trench IGBT4 and CAL 4 diodes are designed for maximum junction temperatures of 175°C. In addition to CIB, 6-pack, twin 6-pack, H-bridge, half-bridge, 3-level and uncontrolled/half-controlled rectifiers plus brake chopper, customer-specific modules are also available. In addition, the latest chip technology such as full and hybrid Silicon Carbide power modules meet the highest of power density and efficiency demands. For fast evaluation, lab test boards can be ordered for each module type.

Further information: www.semikron.com/miniskiip

SEMITOP® 1-4
SEMITOP® E1/E2



Flexible and High Performing Product for a Comprehensive Portfolio

SEMITOP®

Portfolio

SEMITOP 1, 2, 3, 4	up to 55kW
SEMITOP E1/E2	up to 70kW

Short facts

- 12mm module height
- Reliable solder or press-fit connection
- Low stray inductance case

Key features

- No baseplate
- Complex configurations possible
- Different chip technologies and manufacturer available
- Optmised system costs

Applications

The SEMITOP family features a cost effective design. This product generation is designed for the low and medium-power range of up to 70kW following the latest introduction of the SEMITOP E family. The ability to offer a compact and low inductance design, coupled with the latest chip technologies and different topologies, makes the two platforms suitable for different markets like UPS, solar, motor drives, power supplies and the new, emerging EV battery charger market.

Benefits

The SEMITOP platform centers around 12-mm-high modules, covering the low and medium-power range, with one or two mounting screws and no baseplate, featuring PCB interface via solder or press-fit pins. Low commutation inductance design and the availability of latest Si and SiC chip technologies make this product suitable for UPS and solar applications, motor drives, power supplies, welding and the new EV battery charger market. A large variety of configurations is possible within the SEMITOP family, including 3-level (NPC/TNPC) and CIB (converter-inverter-brake) topologies.

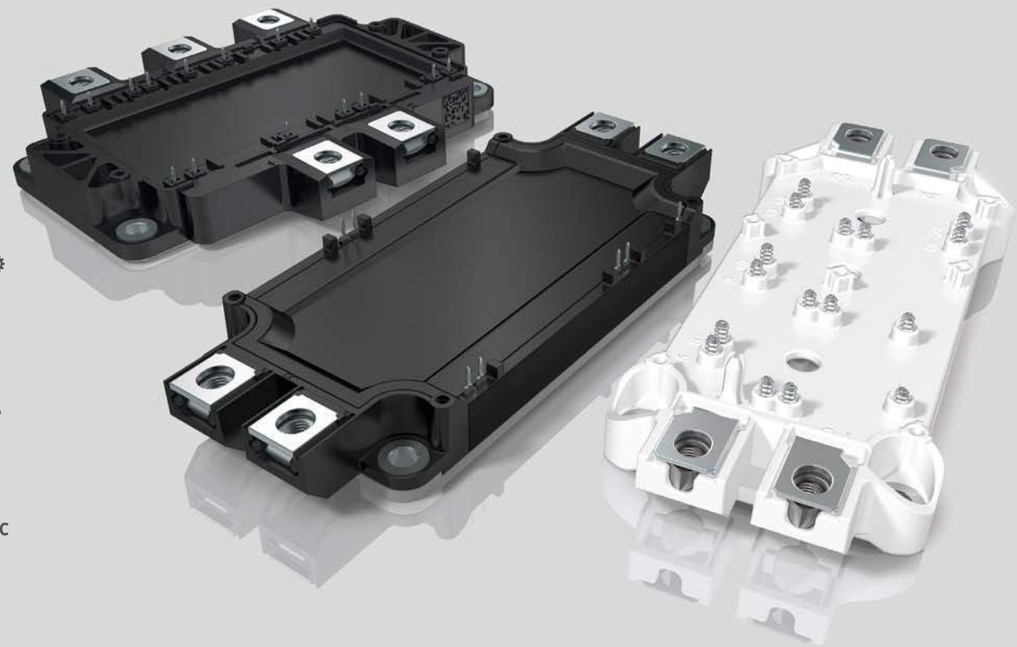
Product range

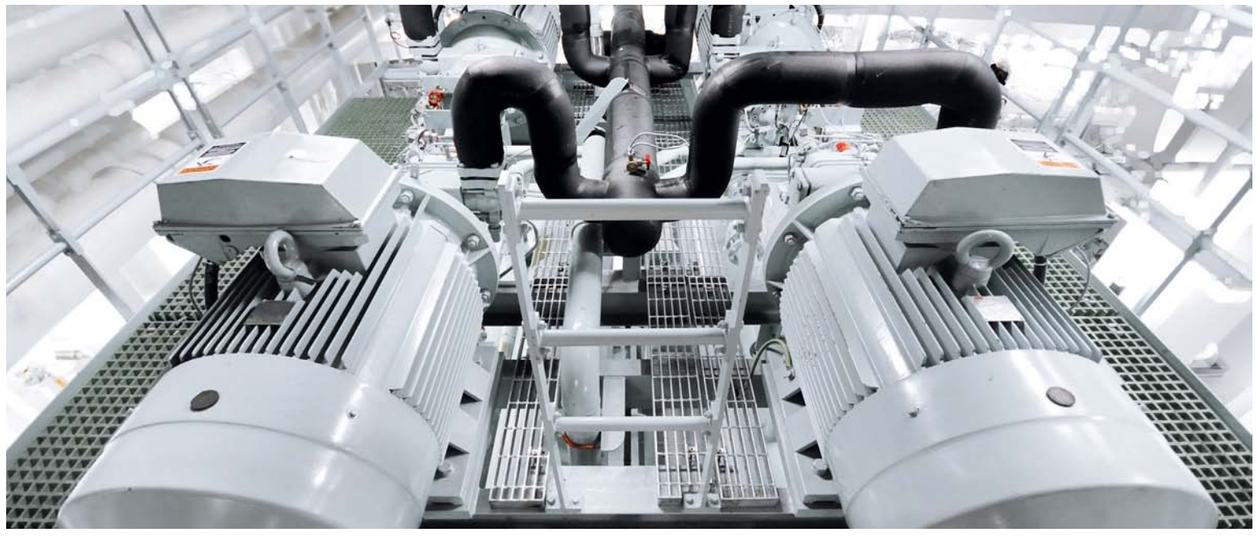
SEMITOP can include fast-Si diodes, fast IGBTs 650V/1200V versions and MOSFETs even for high voltage. Even the latest SiC chip technologies for diodes and MOSFETs can be evaluated in the platform, making a lot of different configurations with different chip combinations:

- Neutral point clamp 3-level configuration (NPC)
- T-type NPC 3-level configuration (TNPC)
- 3-phase inverter
- CIB configurations (converter-inverter-brake)
- 3-phase bridge rectifier
- Full SiC and hybrid configurations
- Custom electrical configurations also possible

Further information: www.semikron.com/semitop

SEMiX® Spring
SEMiX® 3 Press-Fit
SEMiX® 5





IGBT and Rectifier Module Family for Solder-Free Mounting

SEMiX®

Portfolio

SEMiX Spring	75A up to 600A
SEMiX Press-Fit	225A up to 600A
SEMiX 5	up to 350kVA

Short facts

- Low stray inductance case
- Reliable spring or press-fit connection
- Flat and compact inverter design

Key features

- Half-bridge, chopper and 6-pack topologies
- Isolated copper baseplate using DBC technology
- Also available with integrated shunt resistor (SEMiX 3 press-fit)
- Multiple IGBT sources

Applications

SEMiX is a flexible and application-oriented module. On the basis of a scalable platform concept, modern chip technology is integrated into IGBT and rectifier modules which are used in a wide variety of applications, such as AC motor drives, switching power supplies and current source inverters. Other typical applications include uninterruptible power supplies, photovoltaic systems and the field of wind energy.

Benefits

The family concept of SEMiX includes a unification of IGBT and rectifier housings. All have the same height (17mm) and can be connected by one principle DC-link design. This saves development time and makes a simple and low-inductance DC-link profile possible. SPRiNG or press-fit contacts allow a gate driver to be mounted directly on top of the module eliminating the risk of noise on wires or loose connectors. Thanks to the flat package and separated AC and DC terminals, a highly compact, state-of-the-art inverter construction is possible. The auxiliary contacts avoid solder joints and offer highly reliable pressure contacts. This leads to an increased product reliability and lifetime. The solder-free contacts offer a fast and easy assembly process. Production at the customer site can be optimised by a uniform direction of assembly (everything top down). This simplifies logistics and reduces manufacturing costs.
The half-bridge topologies come with a selection of choices for connection technologies such as press-fit and spring contact as well as for the integration level: current measurement shunts can be included in the power module, plug & play driver solutions and pre-printed Phase Change Material can be supplied to shorten the time-to-market and development times.

Product range

For the IGBT modules different housing sizes are available in 600V, 1200V and 1700V. Half-bridge, 6-pack and chopper topologies are available with a current range from 75A to 600A. Besides IGBT3 and IGBT4 chips, the 1200V range also includes a series with V-IGBT devices. Controlled, half-controlled and uncontrolled rectifier modules with identical footprint and 17mm height are also available. For the newest housing versions, we offer optional integrated shunt resistors, 3-level topologies (NPC, T-NPC or Buck-Boost-Converters).

Further information: www.semikron.com/semix

SEMITRANS® 2-9
SEMITRANS® 10
SEMITRANS® 20

AC | DC

Low Inductance Package Design down to 10nH

SEMITRANS®

Portfolio

SEMITRANS 2 - 9	45kW up to 500kW
SEMITRANS 10	500kW up to 2MW
SEMITRANS 20	3.3 kV, 450A / Half-bridge

Short facts

- Safe operation with high DC-link voltages
- Maximum power output
- Multiple IGBT sources

Key features

- Half-bridge, chopper, single switch, MLI, common emitter
- Isolated copper baseplate using DBC technology
- With integrated gate resitor
- High isolation voltage

Applications

SEMITRANS power modules are designed for a broad range of applications such as motor drives, regenerative inverters, power supplies or traction applications. The long service life is perfectly suited to ambitious applications such as AC drives, switched reluctance and DC motors.

Benefits

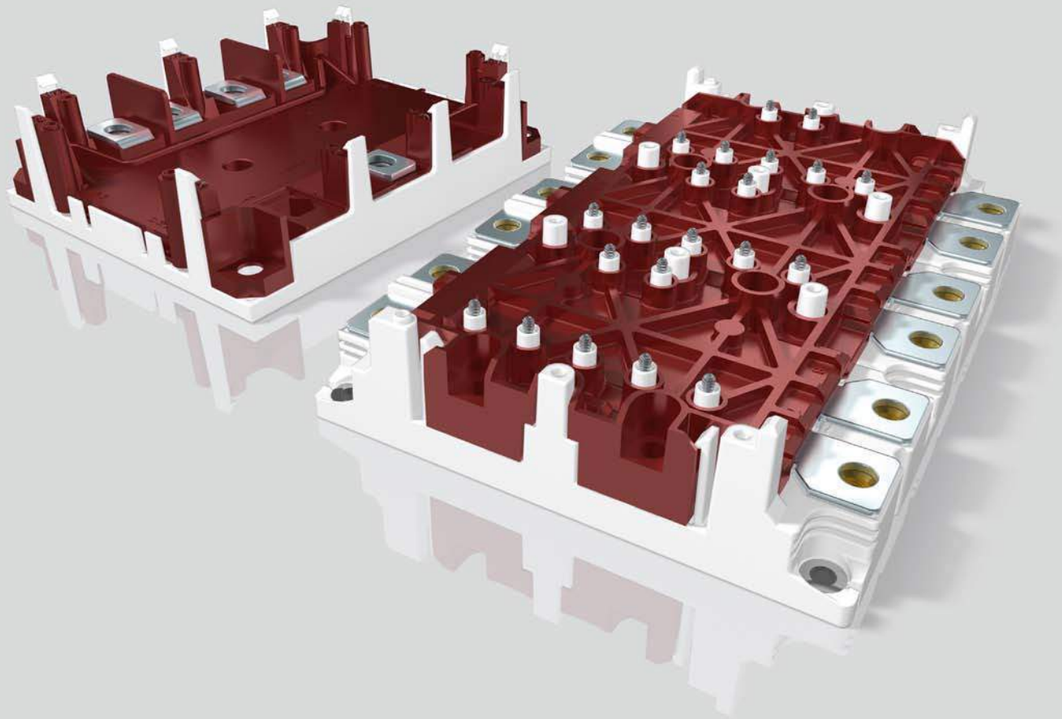
SEMITRANS 2-9 feature well-proven designs that come from over 25 years of market experience, but are still suitable for the latest generation of chips, including Silicon Carbide, thanks to its low-inductance design. SEMITRANS 10 takes the power range into the realm of mega-watt applications, utilizing the latest SEMIKRON packaging technologies including Direct Pressed Die technology for maximum reliability and minimum thermal resistance. SEMITRANS 20 serves medium-voltage applications with a low-inductance and easy-to-parallel power module design.

Product range

The SEMITRANS family offers a broad range of topologies and power ranges. All the standard voltage classes from 600V to 3300V are available. The current rating extends from 25A to 1800A. The SEMITRANS package is available as half-bridge, chopper, single switch, MLI and common emitter.

Further information: www.semikron.com/semitrans

SKiM® 4-5
SKiM® 63/93



100% Solder-Free Ensures Durability

SKiM®

Portfolio

SKiM 4, 5	200A up to 600A
SKiM 63/93	22kW up to 180kW

Short facts

- No solder delamination thanks to sintered chips – SKiM 63/93
- 1500 temperature cycles without failure – SKiM 63/93
- Up to 23% more performance with AlCu-bonded diodes and high performance thermal grease

Key features

- IGBT power module in 6-pack configuration with 3 separated half-bridges - SKiM 63/93
- Available in 600V, 1200V and 1700V and from 200A to 900A
- MLI and TMLI configuration - SKiM4/5
- In 1200V, 600A also available in buck/boost configuration - SKiM 63/93
- Solder-free design for highest durability - SKiM 63/93
- Design without baseplate
- Solder-free mounting of the module and the driver PCB
- Low inductance design thanks to symmetrical layout

Applications

The SKiM 63/93 is designed for applications that require high inverter reliability. This applies first and foremost to automotive applications such as electric powertrains in electric utility vehicles, heavy-duty construction machinery and tractors. It can also provide leading-edge performance in super sports and race cars. The SKiM 4/5 with its proven 3-level topologies can be found in ambitious applications such as solar and UPS.

Benefits

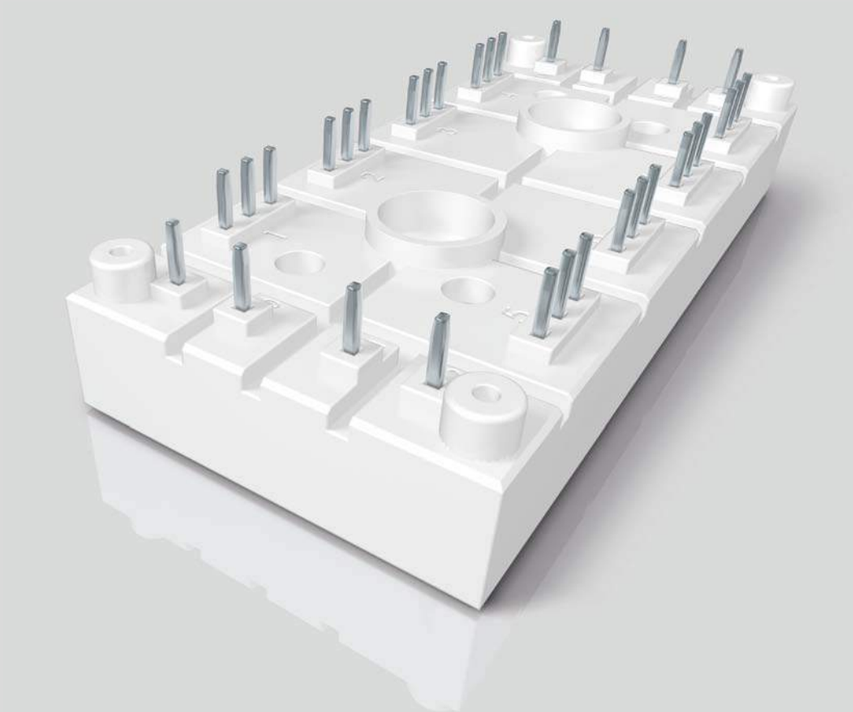
The SKiM module can increase the reliability of inverters by several factors, even under substantial active and passive temperature swings. In addition to sintered chips, pressure contacts and spring technology, the SKiM63/93 featuring AlCu-bonded diodes and high performance thermal grease delivers as much as 23.3% better performance with the same chip set and same lifetime or twice the power cycling capability than standard sinter modules.

Product range

The SKiM 4/5 modules are available as 6-pack, MLI and TMLI configurations with nominal currents from 200A to 600A. The SKiM 63/93 offers 3-phase inverter topologies at 600V, 1200V and 1700V. The power ranges from 20kW to 180kW with nominal currents of 300A to 900A. Modules in buck and boost configuration for 1200V/600A complete the portfolio. Driver solutions are available as does an optimised water cooler for fast and customer-friendly evaluation. In addition, paralleling boards for a simple and powerful half-bridge configuration are also available.

Further information: www.semikron.com/skim

SEMIPONT®



Compact Package with Various Configurations

SEMIPONT®

Short facts

- Compact packages with screw, fast on or lead terminals
- High insulation voltages
- Diode, thyristor rectifier, rectifier/brake chopper and AC controller

Key features

- Diode, thyristor rectifier, rectifier/brake chopper and AC controller
- From 400V up to 1.8kV blocking voltages
- From 28A up to 207A
- Compact packages with screw, fast on or lead terminals

Applications

Typical application areas for the broad field of SEMIPONT power bridge rectifiers include AC and DC drives, servo drives, (controlled) field rectifiers for DC motors, (controllable) rectifiers for power supplies, input rectifiers for variable frequency drives, soft motor starters, temperature control, (controlled) battery charger rectifiers, DC motor field controllers, DC motor controllers and DC power supplies.

Benefits

With blocking voltages up to 1.8kV the SEMIPONT family offers high ruggedness for harsh industrial applications. The different housings with soldered PCB connection allow for compact inverter designs.

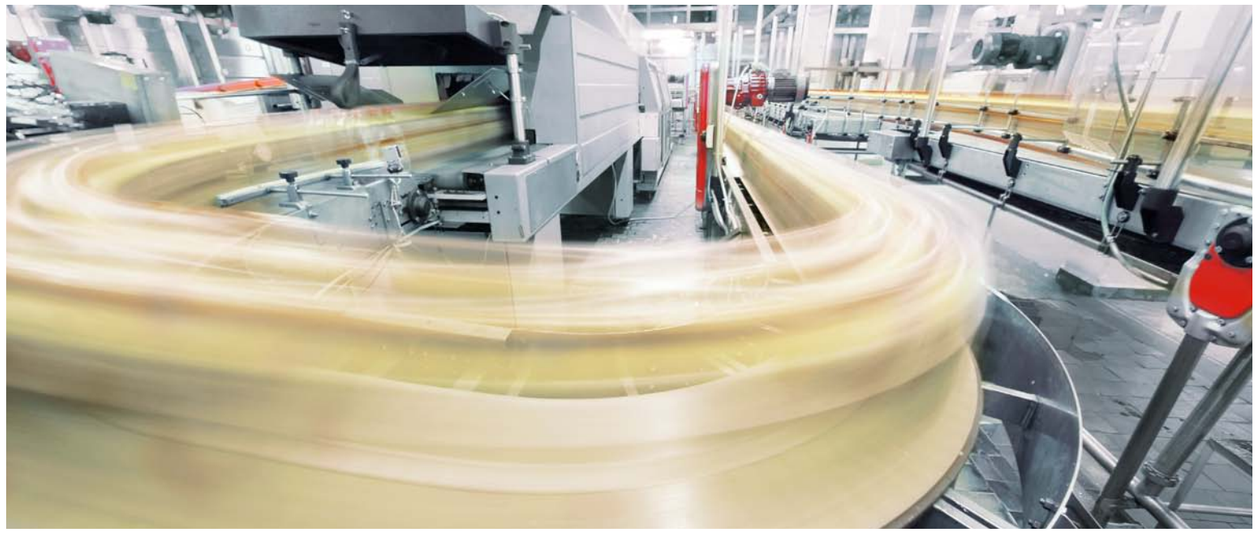
Product range

The SEMIPONT bridge rectifier family is available in various configurations with diode and thyristor rectifiers, rectifier/brake chopper or AC controller. The compact screw-mounted packages enable fast PCB assembly. High blocking voltages of up to 1800V, high ruggedness for harsh industrial applications and high insulation voltages are also available.

Further information: www.semikron.com/semipont

SEMIPACK®

AC | DC



Bipolar Modules from the Market Leader

SEMIPACK®

Short facts

- Well established thyristor diode package
- Market experience over 40 years
- Broad power and topology range

Key features

- Industrial standard thyristor/diode modules
- Over 40 years of market experience
- Wide power and topology range
- 800V up to 2200V
- 15A up to 1360A
- Uncontrolled, half-controlled and controlled rectifiers
- Single thyristors and diodes

Applications

The target applications for the thyristor, thyristor/diode or diode modules include input rectifiers (single-phase, three-phase, uncontrolled, half-controlled or controlled) for inverters or UPS systems, soft start applications and control systems.

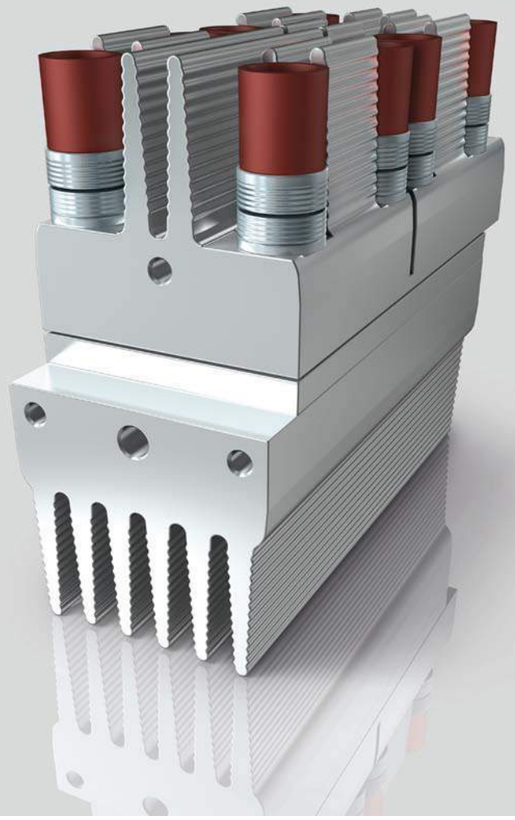
Benefits

SEMIPACK delivers a well-established industrial standard with regard to footprint and module outline. Thanks to the comprehensive product range, the ideal solution can be found for any application. With SemiSel, the free online calculation and simulation tool for losses and temperature, the power electronic system developer can make the right power module choice.

Product range

The SEMIPACK product line includes a comprehensive range The SEMIPACK product line is a comprehensive product range with seven module lines covering voltage classes from 800V to 2200V, insulation voltages of 3.6kV, 4.8kV@1s and a current range from 15A to 1360A. The SEMIPACK product line includes uncontrolled, half-controlled and controlled rectifier modules. Also available are, custom topologies, single thyristor or diode modules and SEMIPACK modules featuring fast switching diodes for dedicated applications. The SEMIPACK FAST product line covers a current range from 40A to 600A with voltage classes from 600V to 1700V. The portfolio of the SEMIPACK product line is extended continuously to meet market requirements.

Further information: www.semikron.com/semipack



Compact Soft-Starter Module

SEMiSTART®

Short facts

- Double-sided cooling for high load cycle capability
- Robust pressure contact technology
- Low thermal resistance

Key features

- Up to 3080A
- Qualified plug & play subsystem
- Robust pressure contact technology
- Double-sided cooling for high load cycle capability
- Excellent thermal performance
- From 560A to 3080A overload current

Applications

SEMiSTART, the anti-parallel thyristor module, is designed for soft-start applications.

Benefits

SEMiSTART – a power module with integrated heat sink – provides an ultra-compact design for soft-start applications. Double-sided cooling along with pressure contact technology allow for a high current capability with overload currents of up to 3080A for 20s overload duration. SEMiSTART is a robust plug & play subsystem that helps cut development time and system costs.

Product range

SEMiSTART power modules are available in three housing sizes for overload currents ranging from 560A to 3080A. All overload current classes are available for voltages of 1400V and 1800V.

Further information www.semikron.com/semistart

SKiiP® 3-4

Intelligent Power Module (IPM) for Maximum Reliability

SKiiP®

Portfolio

SKiiP 3, 4	500A up to 3600A

Short facts

- 3-in-1: Driver, semiconductors and cooling
- 2-3 times higher power cycling capability thanks to sinter technology
- Completely assembled and 100% tested

Key features

- Integrated driver, semiconductor and cooling
- Integrated temperature measurement
- Integrated current sensors (SKiiP 3, SKiiP 4)
- Integrated DC-Link monitoring (SKiiP 3, SKiiP 4)
- 100% solder-free (SKiiP 4)

Applications

SKiiP meets the requirements specifically for wind turbines in a power range of 0.5 to 6MW in an outstanding way. Besides wind power applications, SKiiP modules can also be found in elevators, solar power and railway applications – in fact, in any area where powerful, safe and reliable IGBT IPMs are a must.

Benefits

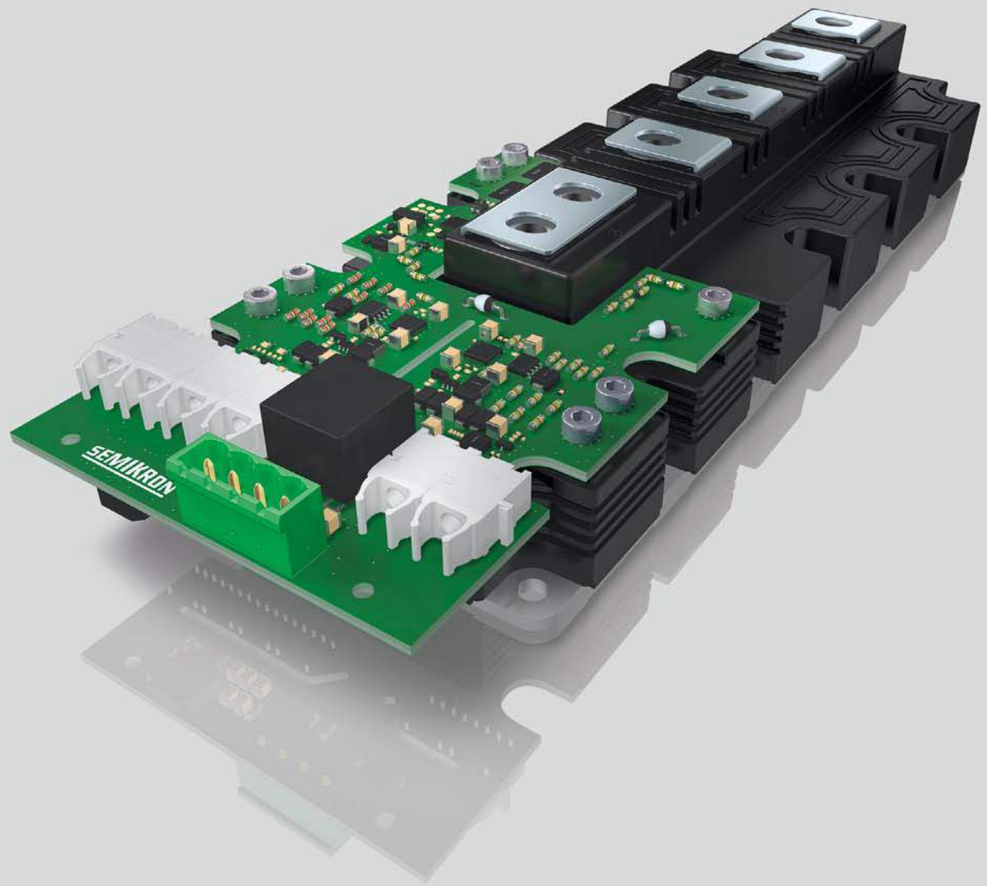
SKiiP is the most powerful IPM on the market. The power semiconductors used in SKiiP 4 modules can be operated up to a junction temperature of 175°C. To make sure these components can be reliably used at these temperatures, the power circuitry is 100% solder-free. Sinter technology is used to create a sintered silver layer instead of the solder layer which could limit the service life of power modules. Reliability during active and passive thermal cycling is greatly improved.
The integrated gate driver in the SKiiP 4 sets new standards in terms of reliability and functionality. The digital driver guarantees safe isolation between the primary and secondary side for both switching signals and parameter measurement. This means the user no longer has to introduce complex and costly circuit components to provide safe isolation.

Product range

SKiiP IPMs are available in half-bridge and 6-pack topologies in power ratings up to 6MW. The cooling varies from water to air-cooled systems and customized cooling in SKiiP 3/4.
A wide range of accessories is now available for both SKiiP 3 and SKiiP 4. These include fiber optic boards, paralleling boards for SKiiP systems and adapter boards to connect SKiiP 4 to SKiiP 3 controller.

Further information: www.semikron.com/skiip

Plug & Play Driver
Driver Cores
Adapter Boards



Drives 3 Times Longer

SKYPER®

Short facts

- MTBF rate of 5 x 10^6 hours (29500) with new SEMIKRON ASIC chipset
- Safe gate control with separate signal transmission
- 7kV burst durability thanks to interlayer connection and metal pad ASICs

Key features

- Two driver channels for IGBT single and half-bridges
- For 600V, 1200V and 1700V IGBT modules
- Driving up to 2500A
- Short pulse suppression and EMC cage
- SoftOff and separate error channels
- Adjustable filter and failure management
- Customized adapter boards on request

Applications

SKYPER 12R is the latest driver core which delivers 20A output but is smaller than a matchbox. Thanks to its feature set and robustness the driver is suitable for simple drives as well as ambitious interleaved applications. The SKYPER 12PF is a plug & play driver solution based on the same platform, allowing a solution without adapterboard for 17mm modules. SKYPER 42LJ offers the benefits of digital signal consistency while maintaining full performance. Ambitious applications such as medical or large drives up to 500kW are securely powered. SKYPER 32 is the perfect solution for industrial drives and process control applications. SKYPER 42 meets the requirements of induction heating / welding applications that call for high currents, durable solar inverters and motor drives between 500kW and 1.5MW. The new plug & play driver SKYPER Prime and Prime O is the best match for high power with SEMITRANS 10 modules up to 1700V and 1800A.

Benefits

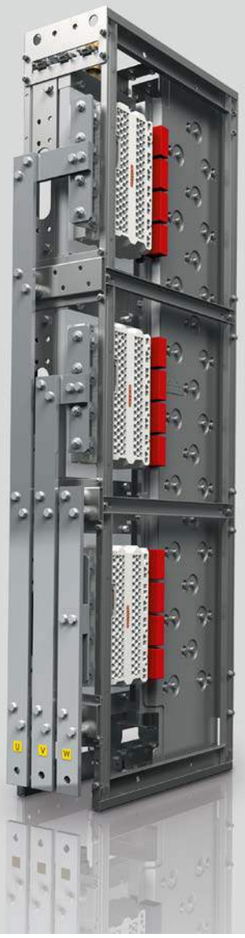
The high integration of SEMIKRON's new ASIC chipset provides for safe IGBT gate control over the whole lifecycle. Short circuits are managed very fast by separate error channels. SoftOff and over voltage feedback avoid dangerous overvoltages. The mixed signal ASICs guarantee minimum tolerances over the full temperature range. MLI or paralleled IGBT topologies are managed by adjustable error handling.
With an optimized interface and the adjustable filter setting the SKYPER IGBT driver family survives external interferences over 100% of IEC standards.

Product range

The SKYPER drivers are available as IGBT driver cores and plug & play drivers. The SKYPER platform can drive 600V, 1200V and 1700V IGBT modules. SKYPER 32 drives with a standard and a PRO version 1W per channel. The PRO version has additional protection features such as external failure inputs and SoftOff. The SKYPER 42 has 4W per channel and can drive up to 2500A IGBTs. The SKYPER 42LJ has 3W per channel, closing the gap between SKYPER 32 and 42. The driver core SKYPER 12 R and the two qualified plug & play drivers, SKYPER 12 press-fit and SKYPER Prime, offer maximum performance when using SEMiX press-fit or SEMITRANS 10 modules.

Further information: www.semikron.com/skyper

SEMISTACK® RE
SKiiPRACK®



IGBT Platforms up to 6MVA
Standards for Water-Cooled Inverter

Water-Cooled IGBT
STACKS

Short facts

- Off-the-shelf product range
- 2- and 4-quadrant 3-phase converter
- IGBT inverter power density of up to 10.4kVA/L
- Long life expectancy

Key features

- Maximum continuous output current from 600A to 1400A_{RMS}
- DC bus voltage of up to 1250V_{DC}
- Inverter output voltage of up to 690V_{AC}
- DC bus polypropylene capacitor bank lifetime rates at 100,000 hours at 40°C
- Analogue measurements for $T_{heatsink}$, V_{bus}, I_{out}
- CAN Interface (configuration & monitoring)

Applications

The SEMISTACK platforms comply with wind turbine requirements, making it possible to build 4-quadrant converters that are suitable for use with synchronous generators and double fed induction generators, with an optional brake chopper design. The platform flexibility allows for the requirements of solar central inverters to be met with a continuous DC bus voltage of up to 900V_{DC}. Alternatively, SEMISTACK platforms can be used in low-voltage applications requiring high power and a high degree of reliability, such as 3-phase inverters in a shipyard or in a battery energy storage unit installed close to renewable energy power plants.

Benefits

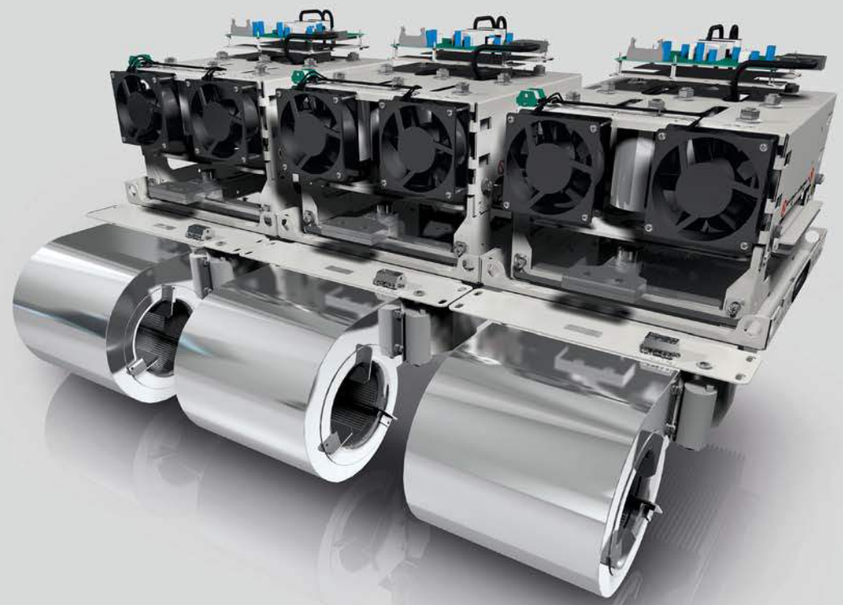
The SEMISTACK water-cooled platforms offer a pre-qualified power assembly ready for integration following rigorous SEMIKRON qualification tests and the latest environmental standards (IEC 60721-3). The platform design has been optimized to achieve an optimum balance between costs and performance for a water-cooled power inverter in the megawatt power range. They are designed for applications requiring a high degree of reliability and long lifetimes of up to 20 years. The design and footprint enables compact integration in standard industrial cabinets, making high power of up to 6MVA low-voltage possible. Specified for wind turbine applications, the SEMISTACK family boasts excellent IGBT cycling capability and a high capacitor bank lifetime, reducing maintenance.

Product range

The SEMISTACK water-cooled platform offers various inverter sizes to fit two power sub-assemblies into a 600 x 600 x 2000mm cabinet. The standard size has a current range between 1000A and 1400A_{RMS}. For applications with lower current ratings or with tighter cabinet size constraints, a smaller inverter size is available with a continuous output current rated for up to 900A_{RMS}. The SEMISTACKs embed the SKiiP IPM product family, which in turn integrates IGBT gate driver and monitoring analogue outputs (temperature, output current and DC bus voltage). As an option, a CAN interface is also available to monitor the SKiiP. To increase power capacity up to 6MVA, SEMISTACKs can be put in parallel, connected together through the DC bus and controlled all-in-one using a SEMIKRON paralleling board. Optionally, SEMISTACK platforms are also available integrated into an industrial cabinet with suitable AC and/or DC power filters, electrical and hydraulic distribution systems.

Further information: www.semikron.com/water-cooled-igbt-stacks

SEMIKUBE®
SEMIKUBE® SlimLine
SEMIKUBE® 1500V



IGBT Converter Family up to 1MVA
Standards for Air-Cooled Inverter

Air-Cooled IGBT
STACKS

Short facts

- Off-the shelf product range
- Air-cooled power assemblies
- Maximum output current from 150A to 1500A
- Customizable

Key features

- Frame sizes ranging from 75kVA up to 1500kVA
- AC output voltage of up to 690V_{AC}
- Current measurement accuracy <1%
- Analogue measurements or CAN monitoring for $T_{heatsink}$, V_{bus}, I_{out}
- Forced-air cooled platform
- Fits into 300mm cabinet
- UL1741 1500V ready

Applications

The SEMIKUBE platform is optimized for general-purpose inverters and central solar inverters. Designed for the most commonly used PV central inverter ratings on the market, i.e. 500kW, 670kW up to as much as 1200kW, the SEMIKUBE 3-phase inverter operates at up to 1500V_{DC} bus voltage. Designed in accordance with IEC 62109, the platform is set to obtain UL recognition. The SEMIKUBE family complies with most AC drives application requirements. The current measurement precision of 1% (at 25°C) allows for premium motor control as required in highly dynamic applications and motion control systems.

Benefits

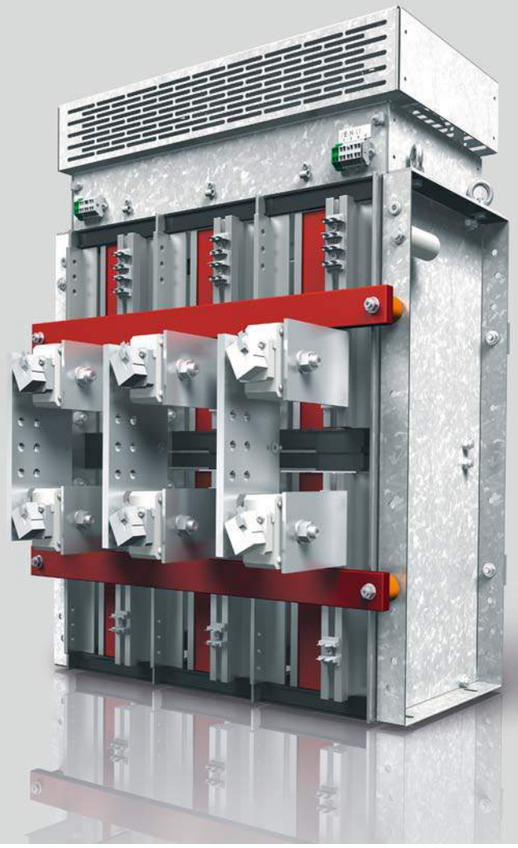
The SEMIKUBE platform is a family of pre-qualified power assemblies which are in line with the rigorous SEMIKRON qualification tests and certifications. The platform integrates advanced technologies which maximize performance and power density. SEMIKUBE, thanks to its modular design and patented DC connections, enables designs in various converter power ranges.

Product range

The SEMIKUBE platform comes in four frame sizes for continuous rated currents ranging from 150A to 1500A and features SEMITRANS 1200V and 1700V IGBT Trench E4 modules. The SEMIKUBE design is optimized for 3-phase inverter topologies. A dedicated rectifier with 3-phase inverter and optional brake chopper can be added. The IGBTs are controlled by a SEMIKRON embedded driver for error management, and analogue outputs for current, DC voltage and heatsink temperature.
For the SEMIKUBE SlimLine a CAN interface is available for parameter configuration and diagnostics monitoring. Air cooling is provided by highly efficient long-life axial and radial fans, achieving maximum power within a compact package.
SEMIKUBE is a versatile product, allowing for converter designs around a common DC link, including four quadrant converters, multiphase converters and a 1500V inverter for central solar power systems. Thanks to its optimized layout , the platform integrates state of the art hybrid SiC and full SiC modules, extending the SEMIKUBE Slimline portfolio.

Further information: www.semikron.com/air-cooled-igbt-stacks

SEMISTACK® CLASSIC B6U
SEMISTACK® CLASSIC B6C
SEMISTACK® CLASSIC W3C



Rectifier Stacks
Standards for LV Diode/Thyristor Rectifiers

Diode/Thyristor

STACKS

Short facts

- Off-the shelf product range
- Air-cooled power assemblies
- Ready for integration
- Customizable

Key features

- Various topologies (B6U, B6C, B2C, B2U, W3C, W1C)
- Maximum continuous DC Current from 60A to 4015A
- Rectifier AC voltage of up to $500V_{AC}$
- DC bus voltage of up to $670V_{DC}$
- RC, fuses, cooling fans and thermal switches

Applications

The SEMISTACK CLASSIC product range is designed for fast integration of industrial rectifiers. Each power bridge has been sized to embed semiconductors with a suitable RC commutation circuit, proper AC fuses and cooling devices. The high power range of rectifiers has been improved using a new heatsink profile, resulting in modularity, various fan options, low maintenance and weight reductions.

Benefits

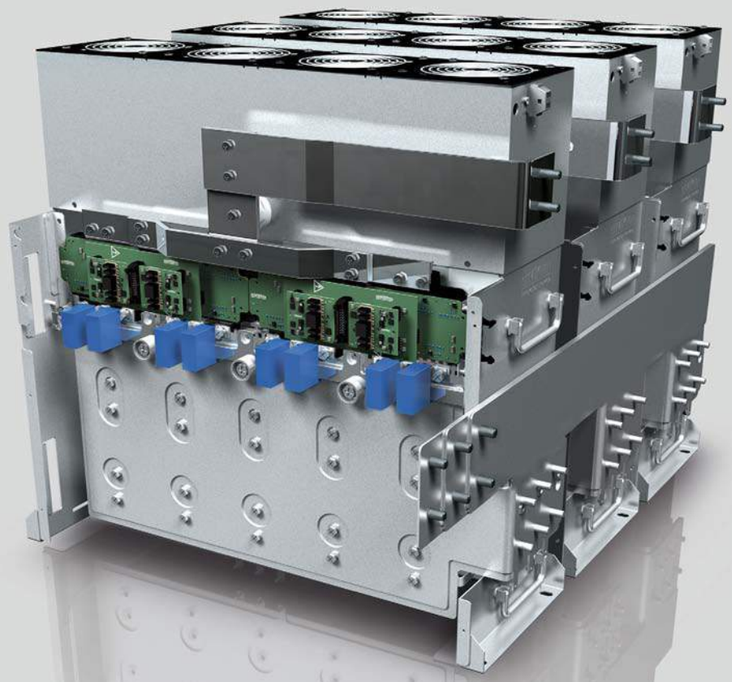
The SEMISTACK CLASSIC family offers a pre-qualified power assembly ready for integration following rigorous SEMIKRON qualification tests and current environmental standards. The platform design has been optimized to achieve the best balance between costs and performance for power inverters and rectifiers as far up as the megawatt range.

Product range

The SEMISTACK family consists of a broad portfolio of over 200 stacks with different topologies of uncontrolled, half-controlled and fully controlled rectifiers. These products are available with natural or forced cooling, with or without fuses. All SEMISTACK Classics include RC protection circuitry and are optimized for fast cabinet integration.

Further information: www.semikron.com/diode-thyristor-stacks

SEMISTACK® Application



Customized Power Electronic Stacks Create the Standard for Your Inverter

Customized

STACKS

Short facts

- 45 years of experience in stack design, manufacture and service
- Global market leader in power electronic stacks
- 7 local engineering & production locations for direct and fast communication
- More than 200,000 stacks already in the field
- 1,500 different assemblies available
- Air and water-cooled power assemblies

Outsource design and manufacturing to:

- Focus on your core competencies
- Reduce production fluctuations
- Benefit from economy of scale
- Cut design, assembly and production costs
- Reduce your risks

Applications

SEMIKRON provides custom stacks to the world´s leading electric industries, ranging from simple press-fit diode plates for battery chargers or welding equipment, to thyristor and IGBT industrial drives, complex high-power four quadrant inverters for wind energy generation, and IGBT converters for main traction drives in railway applications. SEMIKRON has experience in many different applications each with their specific constraints. This extensive knowledge ensures a robust and reliable design.

Benefits

If our platforms and/or standard stacks do not suit the customer requirements, our stack center can always offer a 100% customized turn-key solution. Our unparalleled experience in the stack business coupled with direct access to our core semiconductor and driver technology enables us to provide highly efficient, cost effective designs to meet every customer need. We encourage exchange and transfers between the stack centers and transform local success into global competence. Thanks to this internal information exchange, you get an optimized, pre-qualified and field-tested stack in the shortest possible time.

Product range

SEMIKRON designs, builds and tests customized stacks based on your needs. With our long-term experience and successful track record, we are the global market leader in stack design and production. With our vast portfolio of standard stacks we deliver short lead times while adapting them to your requirements. SEMIKRON continously develops new stack assemblies with the latest materials, topologies and technologies in order to guarantee our customers up-to-date products for a short time-to-market. Semikron offers full cycle cooperation from the product concept stage to mass delivery and beyond for repairs & aftermarket services. Costs and delivery times are kept to the minimum. Our R&D departments continuously focus on designing re-useable standard sub-assemblies in our SEMISTACKs. As an example, the SEMIKUBE platform is the result of 45 years of experience in the stacks business and with more than 75,000 SEMIKUBEs in the field, the most successful stack to date.

SKAI®2 HV
SKAI®2 LV

Most Compact Power Electronic System "Off-the-shelf" for Electro-Mobility

SKAI®

Short facts

- Suitable for battery voltages 24V up to 800V
- Sintered power semiconductors
- EMI compliant
- "off-the-shelf" variants with gate driver interface, vector control software, automotive power connections

Key features

- Compact integration in IP 67 enclosure
- Voltage, current and temperature sensors
- Gate driver with protection
- IGBT/ MOSFET power semiconductors
- Fully programmable digital signal processor
- EMI filters
- Versatile cooling system (liquid cooled, forced air cooled, base plate)
- DC link capacitors
- Motor control software

Applications

The SKAI 2 "off-the-shelf" power electronic building block family has been introduced to cover a broad range of vehicle electrification applications. Examples are electric drivetrains with standardized motor/generator flanges to fit or retrofit the drives easily into existing vehicle designs. These types of drivetrains have been developed for many vehicle types, i.e. buses, light trucks, agriculture and construction machinery as well as marine applications or cars.

Benefits

The SKAI power electronic platform – now in its 2nd generation – comprises highly integrated motor controllers which provide the ideal powertrain solution for mobile electric and hybrid applications. Power densities of up to 20 kVA / liter provide a notable size reduction compared with other available standard motor controller products. The systems are designed to operate with supply voltages of 24V up to 800V and with output power ratings of up to 250 kVA. The IGBT-based SKAI 2 HV motor controller operates on sintered 100% solder-free 600V or 1200V power semiconductors and it features polypropylene film DC-link capacitors. The MOS-based SKAI 2 LV motor controller uses the established SkiiP technology with a very low-inductance connection to the DC-link capacitors, driver electronics, latest generation DSP controller, current, voltage and temperature sensors. It is integrated in a waterproof IP67 enclosure. The compact motor controllers withstand high vibration amplitudes up to 10g rms. QUASAR motor control software functionally complements the system and completes this tried-and-tested package. SEMIKRON provides engineering services to support customers in the integration of the SKAI 2 motor controller systems. Available services include, for instance, lifetime estimation, field application support, individual parameterization of motor control software etc.

Product range

There are versatile SKAI 2 HV "off-the-shelf" variants available. The SKAI 2 LV is available as single or dual motor controller for supply voltages between 24V and 115V. Cooling methods are liquid, forced air cooling or base plate. There are different optional services available like end-of-line flashing of customer specific software, lifetime estimation based on application profile analysis, field application support, individual parameterization of motor control software and further services on request.

Further information: www.semikron.com/skai

Discrete Diodes
Discrete Thyristors
Rectifier Bridges

Discrete Devices – Robust and Easy to Use

Discretes

Short facts

- Discrete diodes and thyristors for low to high power applications
- Rectifier bridges for low to medium power applications
- Available in voltage classes from 200V to 8000V
- Current ratings from 1A to 6000A
- Wide range of case designs

Key features

- Recommended for natural convection, forced air and water cooling
- Compact case with high current capability
- Stud and disc types: forward drop selections available for easy paralleling
- Axial diodes for PCB mounting
- Standard, avalanche and fast types

Discrete benefits

Discrete components are used in a wide variety of applications. Particular benefits are achieved whenever high current, uncommon topologies, natural cooling or resistance to harsh conditions are required.
The SEMIKRON portfolio includes axial leaded diodes up to 6A, diodes and thyristors in screw fit (stud) and capsule housings which range from 6000A and 8000V for diodes to 1200A and 1800V for thyristors.

- Easy assembly
- Hermetic sealing
- Rugged construction

Rectifier bridge benefits

SEMIKRON rectifier bridges are the best solution in many applications where performance, space and fast production are paramount. Single or 3-phase topologies using diodes, thyristors and IGBTs in isolated compact cases are possible. Whether your preference is connection by solder, solderless spring or press-fit contacts, mechanical screw connections, fast-on or busbars, SEMIKRON has a product to meet your needs.

Discrete applications

Key applications include welding machines, battery chargers, electroplating, soft starters, DC motor control, AC controllers (e.g. for temperature control), alternators and others. With sealed cases, discrete devices are convenient for both natural convection and forced cooling, allowing for use in wider fields of application. With over 50 years of field experience and millions of units produced every year, the SEMIKRON portfolio provides options that are competitive, flexible and highly reliable

Avalanche diodes

- No over-voltage suppressors needed
- Insensitive to short term reverse overloads
- High blocking voltages possible without static or dynamic voltage sharing circuits

Rectifier bridge applications

Key applications include battery chargers, motor drive input rectifiers, power supplies, DC motor control, rectifiers with PFC, AC controllers, static switches (SKWT types) for natural convection or forced cooling.

Further information: www.semikron.com/discrete-diodes-thyristors
www.semikron.com/rectifier-bridges

Product Classes

01	**IGBT Modules**	56
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11	**Accessories**, Thermal Interface Materials / Heatsinks, Fans	216

IGBT Modules
For Maximum Performance

SEMIKRON offers IGBT (insulated-gate bipolar transistor) modules in SEMITRANS, SEMiX, SKiM, MiniSKiiP and SEMITOP packages in different topologies, current and voltage ratings. Starting from 4A to 1400A in voltage classes from 600V to 1800V, the IGBT modules are used in a variety of applications and feature key technologies such as sintering, spring or press-fit contacts for quick and easy assembly.

Different topologies such as CIB (converter inverter brake), half-bridge, H-bridge, 6-pack and 3-level are available, covering almost every application field. The latest IGBT chip and diode technologies offer optimized switching performance up to Tj max= 175°C.

MiniSKiiP	60
SEMITOP	66
SEMiX	75
SEMITRANS	82
SKiM 4/5	90
SKiM 63/93	92

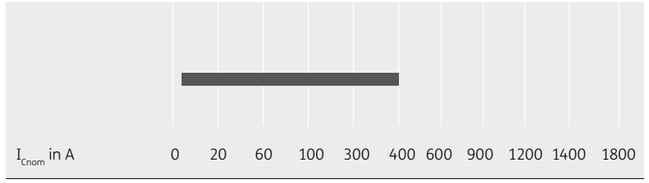
For detailed information please refer to data sheets.

Further information: www.semikron.com/igbt-modules

MiniSKiiP®

6-pack
3-level
H-bridge
CIB
half-bridge
twin 6-pack

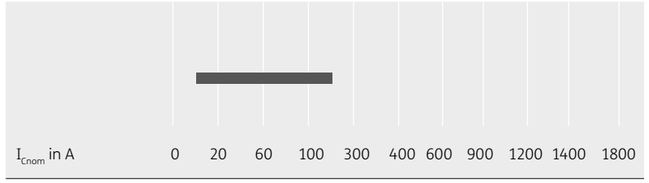
600V up to 1700V



SEMITOP®

half-bridge
6-pack
3-level
chopper
H-bridge
CIB

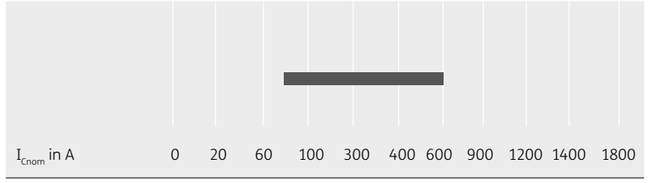
600V up to 1200V



SEMiX®

half-bridge
6-pack
3-level
chopper
buck-boost converter

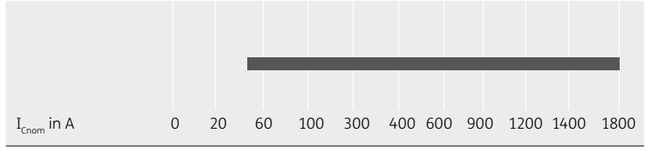
600V up to 1700V



SEMITRANS®

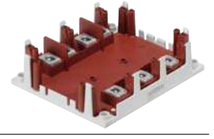
half-bridge
6-pack
chopper
single switch
multi level

600V up to 3300V

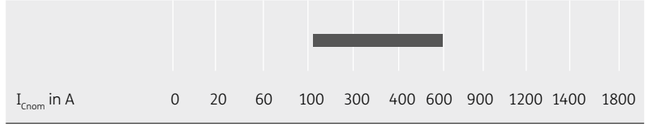


SKiM®4/5

6-pack
3-level



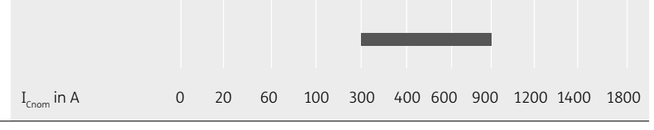
600V up to 1700V



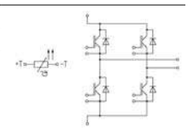
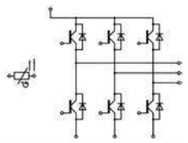
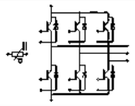
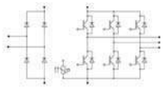
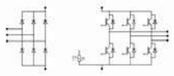
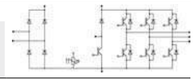
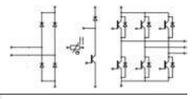
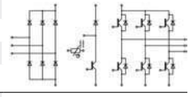
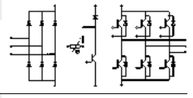
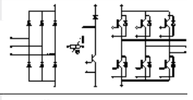
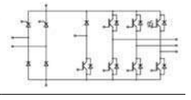
SKiM®63/93

6-pack
chopper

600V up to 1700V

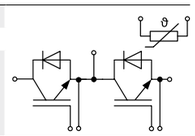
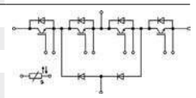
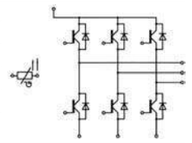
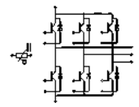
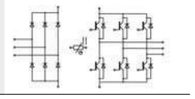
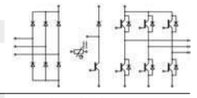
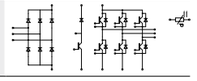
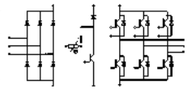
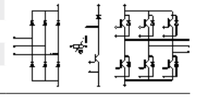


IGBT Modules / MiniSKiiP

Type	IGBT I_C @ T_S = 25°C A	IGBT I_{Cnom} A	IGBT $V_{CE(sat)}$ @ T_j = 25°C typ. V	IGBT E_{on} mJ	IGBT E_{off} mJ	IGBT $R_{th(j-s)}$ K/W	Diode I_F @ T_S = 25°C A	Diode V_F @ T_j = 25°C typ. V	Diode E_{rr} mJ	Diode $R_{th(j-s)}$ K/W	Rectifier I_{FSM} @ T_j = 25°C A	Rectifier $R_{th(j-s)}$ K/W	Module Case	Circuit
600V - IGBT3 (Trench)														
SKiiP 16GH066V1	65	50	1.45	1.7	1.7	0.95	56	1.50	1.3	1.6	-	-	II 1	
SKiiP 27GH066V1	88	75	1.45	2.7	3	0.75	77	1.50	1.8	1.2	-	-	II 2	
SKiiP 28GH066V1	112	100	1.45	3.4	3.5	0.6	112	1.30	3.3	0.8	-	-	II 2	
SKiiP 02AC066V1	20	10	1.45	0.45	0.3	2	20	1.30	0.3	2.5	-	-	II 0	
SKiiP 04AC066V1	33	20	1.45	0.8	0.7	1.6	31	1.60	0.55	2.5	-	-	II 0	
SKiiP 15AC066V1	40	30	1.45	1	1.1	1.35	39	1.50	1.1	2.1	-	-	II 1	
SKiiP 26AC066V1	65	50	1.45	1.6	1.6	0.95	56	1.50	1.3	1.6	-	-	II 2	
SKiiP 27AC066V1	88	75	1.45	2.7	3	0.75	77	1.50	1.8	1.2	-	-	II 2	
SKiiP 28AC066V1	112	100	1.45	3.4	3.5	0.6	112	1.30	3.3	0.8	-	-	II 2	
SKiiP 39AC066V4	146	150	1.45	7.9	5.6	0.5	164	1.30	3.5	0.55	-	-	II 3	
SKiiP 01NEC066V3	12	6	1.45	0.3	0.2	2.4	12	1.30	0.2	3	220	1.5	II 0	
SKiiP 03NEC066V3	27	15	1.45	0.6	0.5	1.8	28	1.40	0.5	2.5	220	1.5	II 0	
SKiiP 01NAC066V3	12	6	1.45	0.3	0.2	2.4	12	1.30	0.2	3	220	1.5	II 0	
SKiiP 02NAC066V3	20	10	1.45	0.5	0.3	2	20	1.30	0.5	2.5	220	1.5	II 0	
SKiiP 02NEB066V3	20	10	1.45	0.5	0.3	2	20	1.30	0.5	2.46	220	1.5	II 0	
SKiiP 03NEB066V3	27	15	1.45	0.6	0.5	1.8	28	1.40	0.5	2.5	220	1.5	II 0	
SKiiP 25NEB066V1	43	30	1.45	0.9	1.2	1.35	39	1.50	1.1	2.1	370	1.5	II 2	
SKiiP 11NAB066V1	12	6	1.45	0.3	0.2	2.4	12	1.30	0.2	3	220	1.5	II 1	
SKiiP 12NAB066V1	20	10	1.45	0.5	0.3	2	20	1.30	0.5	2.5	220	1.5	II 1	
SKiiP 13NAB066V1	27	15	1.45	0.6	0.5	1.8	28	1.40	0.5	2.5	220	1.5	II 1	
SKiiP 14NAB066V1	33	20	1.45	0.75	0.7	1.6	31	1.60	0.55	2.5	220	1.5	II 1	
SKiiP 25NAB066V1	43	30	1.45	0.9	1.2	1.35	39	1.50	1.1	2.1	370	1.5	II 2	
SKiiP 26NAB066V1	65	50	1.45	1.6	1.6	0.95	56	1.50	1.3	1.6	370	1.5	II 2	
SKiiP 37NAB066V1	88	75	1.45	2.7	3	0.75	77	1.50	1.8	1.2	700	0.9	II 3	
SKiiP 38NAB066V1	112	100	1.45	3.4	3.5	0.6	112	1.30	3.3	0.8	700	0.9	II 3	
SKiiP 11HEB066V1	27	15	1.50	0.6	0.5	1.8	28	1.40	0.5	2.46	370	1.25	II 1	
SKiiP 12HEB066V1	33	15	1.50	0.8	0.7	1.6	29	1.40	0.6	2.1	370	1.25	II 1	

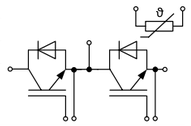
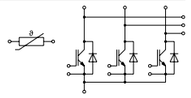
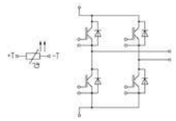
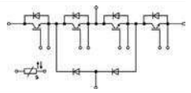
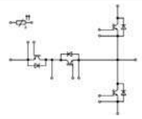
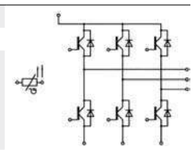
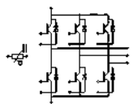
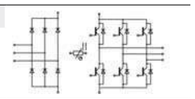
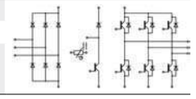
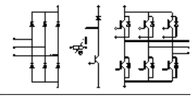
Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs

IGBT Modules / MiniSKiiP

Type	IGBT I_C @ T_S = 25°C A	IGBT I_{Cnom} A	IGBT $V_{CE(sat)}$ @ T_j = 25°C typ. V	IGBT E_{on} mJ	IGBT E_{off} mJ	IGBT $R_{th(j-s)}$ K/W	Diode I_F @ T_S = 25°C A	Diode V_F @ T_j = 25°C typ. V	Diode E_{rr} mJ	Diode $R_{th(j-s)}$ K/W	Rectifier I_{FSM} @ T_j = 25°C A	Rectifier $R_{th(j-s)}$ K/W	Module Case	Circuit
650V - IGBT3 (Trench)														
SKiiP 24GB07E3V1 [2)]	185	150	1.45	2.2	5.1	0.33	161	1.54	3.7	0.45	-	-	II 2	
SKiiP 26GB07E3V1 [2)]	229	200	1.45	4.4	7.4	0.28	235	1.40	4.5	0.35	-	-	II 2	
SKiiP 38GB07E3V1 [2)]	287	300	1.45	5.5	10.6	0.25	310	1.40	5.1	0.28	-	-	II 3	
SKiiP 26MLI07E3V1 [2)]	98	75	1.45	2.8	2.8	0.6	75	1.54	1.4	1	-	-	II 2	
SKiiP 27MLI07E3V1 [2)]	110	100	1.45	4.2	4.2	0.6	107	1.40	3.5	0.8	-	-	II 2	
SKiiP 28MLI07E3V1 [2)]	135	150	1.45	5.5	5.6	0.55	126	1.40	5.5	0.75	-	-	II 2	
SKiiP 39MLI07E3V1 [2)]	159	200	1.45	3.6	8.9	0.5	163	1.39	8.3	0.6	-	-	II 3	
1200V - IGBT3 (Trench)														
SKiiP 03AC126V1 [3)]	16	8	1.70	0.9	0.9	1	8	1.90	0.7	2.5	-	-	II 0	
SKiiP 11AC126V1 [3)]	16	8	1.70	0.9	1	1.5	14	1.90	0.9	2.5	-	-	II 1	
SKiiP 11AC126V10 [3)]	16	6	1.65	18	1	1.5	48	1.10	16.4	2.5	-	-	II 1	
SKiiP 12AC126V1 [3)]	28	15	1.70	1.7	1.9	1.15	26	1.60	1.2	1.95	-	-	II 1	
SKiiP 13AC126V1 [3)]	41	25	1.70	4.1	3.1	0.9	30	1.80	2.2	1.7	-	-	II 1	
SKiiP 13AC126V20 [3)]	41	25	1.65	2.9	3	0.9	27	2.00	1.2	1.5	-	-	II 1	
SKiiP 23AC126V1 [3)]	41	25	1.70	3.7	3.1	0.9	30	1.80	2.6	1.7	-	-	II 2	
SKiiP 24AC126V1 [3)]	52	35	1.70	4.2	4.4	0.75	38	1.80	3.5	1.5	-	-	II 2	
SKiiP 25AC126V1 [3)]	73	50	1.70	5.8	6.5	0.55	62	1.60	5.1	1	-	-	II 2	
SKiiP 26AC126V1 [3)]	88	70	1.70	9	7.7	0.5	91	1.50	7.5	0.7	-	-	II 2	
SKiiP 37AC126V2 [3)]	97	75	1.70	9.6	8.7	0.45	90	1.60	9.6	0.7	-	-	II 3	
SKiiP 38AC126V2 [3)]	118	105	1.70	13.1	13	0.4	118	1.60	11.2	0.55	-	-	II 3	
SKiiP 39AC126V2 [3)]	157	140	1.70	19.9	17.2	0.3	167	1.50	16.2	0.4	-	-	II 3	
SKiiP 39AC126V20 [3)]	157	140	1.65	13	17	0.3	-	2.00	8.1	0.4	-	-	II 3	
SKiiP 03NAC126V1 [3)]	16	8	1.70	0.9	0.9	1.5	14	1.60	0.7	2.5	220	1.5	II 0	
SKiiP 11NAB126V1 [3)]	16	8	1.70	0.8	1	1.5	14	1.90	0.9	2.5	220	1.5	II 1	
SKiiP 12NAB126V1 [3)]	28	15	1.70	2	1.9	1.15	26	1.60	1.3	1.95	220	1.5	II 1	
SKiiP 12NAB126V20 [3)]	28	15	1.65	1.5	1.8	1.15	28	2.45	0.9	1.95	220	1.5	II 1	
SKiiP 22NAB126V10 [3)]	28	15	1.65	2	1.9	1.15	28	1.60	1.1	1.95	700	0.9	II 2	
SKiiP 23NAB126V1 [3)]	41	25	1.70	3.5	3	0.9	30	1.80	2.5	1.7	370	1.25	II 2	
SKiiP 23NAB126V10 [3)]	41	25	1.70	3.5	3	0.9	30	1.80	2.5	1.7	635	0.9	II 2	
SKiiP 23NAB126V20 [3)]	-	25	1.65	2.7	2.9	0.9	41	2.00	1.2	1.5	370	1.25	II 2	
SKiiP 24NAB126V1 [3)]	52	35	1.70	4.6	4	0.75	38	1.80	3.3	1.5	370	1.25	II 2	
SKiiP 24NAB126V10 [3)]	52	35	1.70	4.6	4	0.75	38	1.80	3.3	1.5	635	0.9	II 2	
SKiiP 35NAB126V1 [3)]	73	50	1.70	6.5	6.1	0.55	62	1.60	4.7	1	700	0.9	II 3	
SKiiP 35NAB126V10 [3)]	72	50	1.70	6.5	6.1	0.55	60	1.67	4.7	1	850	0.85	II 3	
SKiiP 36NAB126V1 [3)]	88	70	1.70	9	7.7	0.5	91	1.50	7.5	0.7	700	0.9	II 3	
SKiiP 36NAB126V10 [3)]	91	80	1.70	9	7.7	0.5	87	1.64	7.5	0.7	850	0.85	II 3	

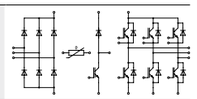
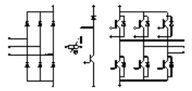
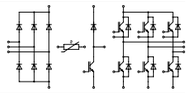
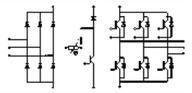
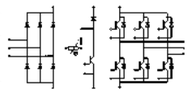
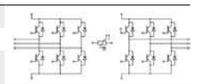
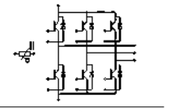
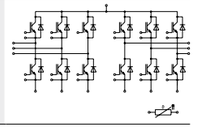
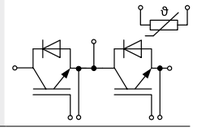
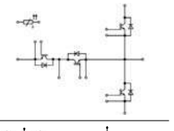
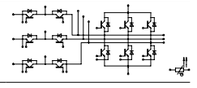
Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs

IGBT Modules / MiniSKiiP

Type	IGBT						Diode				Rectifier		Module	
	I_C @ T_S = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @ T_S = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-s)}$	I_{FSM} @ T_j = 25°C	$R_{th(j-s)}$	Case	Circuit
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W	A	K/W		
1200V - IGBT4 (Trench)														
SKiiP 24GB12T4V1 [2]	170	150	1.85	10.8	15.6	0.32	157	2.17	10.3	0.41	-	-	II 2	
SKiiP 26GB12T4V1 [2]	224	200	1.80	13.6	22.1	0.25	194	2.20	13.4	0.34	-	-	II 2	
SKiiP 38GB12E4V1 [2]	329	300	1.85	19.1	34.6	0.17	267	2.20	21.5	0.26	-	-	II 3	
SKiiP 39GB12E4V1 [2]	388	400	1.80	20.8	49.7	0.16	363	2.20	30.2	0.19	-	-	II 3	
SKiiP 39GA12T4V1 [2]	167	150	1.85	22.5	14	0.33	136	2.14	11.4	0.52	-	-	II 3	
SKiiP 26GH12T4V11	90	70	1.85	9.5	7.1	0.55	83	2.17	5.6	0.75	-	-	II 2	
SKiiP 39MLI12T4V1 [1]	167	150	1.85	11.1	16.9	0.33	134	2.14	10.9	0.53	-	-	II 3	
SKiiP 39TMLI12T4V2 [2]	235	200	1.80	7.5	12.8	0.23	194	2.20	9.7	0.34	-	-	II 3	
SKiiP 11AC12T4V1	12	8	1.85	0.87	0.75	1.84	15	2.33	0.53	2.53	-	-	II 1	
SKiiP 12AC12T4V1	18	15	1.85	1.65	1.5	1.3	23	2.38	0.79	1.92	-	-	II 1	
SKiiP 13AC12T4V1	41	25	1.85	3.7	2.4	1	32	2.41	1.64	1.52	-	-	II 1	
SKiiP 23AC12T4V1	41	25	1.85	3.7	2.4	1	32	2.41	1.64	1.52	-	-	II 2	
SKiiP 24AC12T4V1	52	35	1.85	3.7	3	0.85	44	2.30	2.3	1.2	-	-	II 2	
SKiiP 25AC12T4V1	69	50	1.85	6	4.5	0.71	60	2.22	3.2	0.95	-	-	II 2	
SKiiP 26AC12T4V1	90	70	1.85	9.5	7.1	0.55	83	2.17	5.6	0.75	-	-	II 2	
SKiiP 37AC12T4V1	90	75	1.85	11.5	6.8	0.58	83	2.17	5.5	0.75	-	-	II 3	
SKiiP 38AC12T4V1	115	100	1.80	13.7	9.7	0.48	100	2.20	6.5	0.66	-	-	II 3	
SKiiP 39AC12T4V1	167	150	1.85	22.5	14	0.33	136	2.14	11.4	0.52	-	-	II 3	
SKiiP 02NAC12T4V1	6	4	1.85	0.66	0.37	2.49	7.5	1.82	0.34	2.53	220	1.5	II 0	
SKiiP 03NAC12T4V1	7.5	8	1.85	0.9	0.7	1.84	9	2.33	0.5	2.53	220	1.5	II 0	
SKiiP 10NAB12T4V1	6	4	1.85	0.66	0.37	2.49	7.5	1.82	0.34	2.53	220	1.5	II 1	
SKiiP 11NAB12T4V1	18	8	1.85	0.87	0.74	1.84	15	2.33	0.57	2.53	220	1.5	II 1	
SKiiP 12NAB12T4V1	28	15	1.85	1.4	1.3	1.3	23	2.38	1.1	1.92	220	1.5	II 1	
SKiiP 23NAB12T4V1	37	25	1.85	2.65	2.3	1.2	32	2.41	1.6	1.52	370	1.25	II 2	

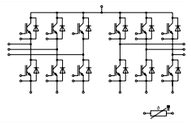
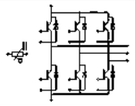
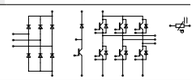
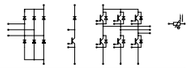
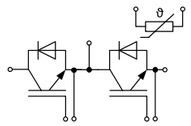
Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs

IGBT Modules / MiniSKiiP

Type	IGBT						Diode				Rectifier		Module	
	I_C @ T_S = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @ T_S = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-s)}$	I_{FSM} @ T_j = 25°C	$R_{th(j-s)}$	Case	Circuit
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W	A	K/W		
1200V - IGBT4 (Trench)														
SKiiP 23NAB12T4V2 [2]	37	25	1.85	3.1	2.56	1.2	32	2.41	1.4	1.52	370	1.25	II 2	
SKiiP 23NAB12T4V10	37	25	1.85	2.65	2.3	1.2	30	2.41	1.6	1.52	700	0.9	II 2	
SKiiP 24NAB12T4V1	48	35	1.85	4.3	3.25	1	44	2.30	2.4	1.2	370	1.25	II 2	
SKiiP 24NAB12T4V4 [2]	48	35	1.85	4.3	3.25	1	40	2.30	2.4	1.4	370	1.25	II 2	
SKiiP 24NAB12T4V10	48	35	1.85	4.3	3.25	1	44	2.30	2.4	1.2	700	0.9	II 2	
SKiiP 34NAB12T4V1	52	35	1.85	4.3	3.3	0.85	44	2.30	2.4	1.2	370	1.25	II 3	
SKiiP 35NAB12T4V1	69	50	1.85	6	4.7	0.71	60	2.22	3.4	0.95	700	0.9	II 3	
SKiiP 37NAB12T4V1	90	75	1.85	9.7	6.8	0.58	83	2.17	4.9	0.75	700	0.9	II 3	
SKiiP 37NAB12T4V10	90	75	1.85	9.7	6.8	0.58	83	2.17	4.9	0.75	850	0.85	II 3	
SKiiP 38NAB12T4V1	115	100	1.80	11.2	10	0.48	99	2.20	6.5	0.66	1000	0.7	II 3	
SKiiP 12ACC12T4V10 [2]	28	15	1.85	2.1	1.6	1.3	23	2.38	0.8	1.92	60	2.5	II 1	
SKiiP 23ACC12T4V10 [2]	41	25	1.85	3.5	2.7	1	32	2.41	1.15	1.52	65	1.92	II 2	
SKiiP 24ACC12T4V10 [2]	52	35	1.85	3.9	3.5	0.85	44	2.30	2.3	1.2	100	1.52	II 2	
SKiiP 39AC12T4V21 [2]	192	150	1.85	22.5	14	0.26	149	2.14	11.4	0.45	-	-	II 3	
SKiiP 35ACC12F4V1 [2]	54	50	2.05	4.8	3.4	0.87	58	2.22	3	1.02	270	0.97	II 3	
1200V - IGBT4 (Fast Trench)														
SKiiP 26GB12F4V1 [2]	197	200	2.05	16.8	16.3	0.25	194	2.20	11.7	0.34	-	-	II 2	
SKiiP 28TMLI12F4V1 [2]	93	80	2.05	3.4	2.2	0.49	76	2.17	1.7	0.86	-	-	II 2	
SKiiP 29TMLI12F4V1 [2]	144	150	2.05	5.2	6.1	0.35	148	2.17	6.5	0.45	-	-	II 2	
SKiiP 35TMLI12F4V2 [1]	49	40	2.05	1.2	1.7	0.88	46	2.30	1	1.13	-	-	II 3	

Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs

IGBT Modules / MiniSKiiP

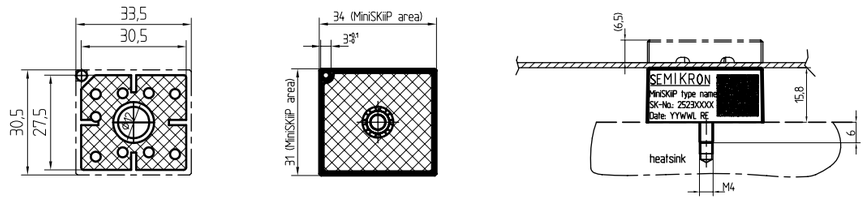
Type	IGBT						Diode				Rectifier		Module	
	I_C @ T_s = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @ T_s = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-s)}$	I_{FSM} @ T_j = 25°C	$R_{th(j-s)}$	Case	Circuit
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W	A	K/W		
1200V - IGBT4 (Fast Trench)														
SKiiP 35ACC12F4V1 [2]	54	50	2.05	4.8	3.4	0.87	58	2.22	3	1.02	270	0.97	II 3	
1700V - IGBT3 (Trench)														
SKiiP 38AC176V2 [2]	118	100	2.00	23.8	32.2	0.38	115	1.76	26.2	0.61	-	-	II 3	
SKiiP 24NAB176V1 [2]	38	29	2.00	5.1	6.3	0.91	48	2.00	4.9	1.14	370	1.32	II 2	
SKiiP 34NAB176V3 [2]	67	58	2.00	11.2	12.8	0.57	66	2.06	6.6	0.84	635	0.86	II 3	
1700V - IGBT4 (Trench)														
SKiiP 22GB17E4V1 [2]	117	100	1.90	22.2	30.7	0.43	91	2.00	20.9	0.7	-	-	II 2	
SKiiP 24GB17E4V1 [2]	177	150	1.90	26	46	0.28	149	2.00	32.4	0.41	-	-	II 2	
SKiiP 36GB17E4V1 [2]	224	200	1.90	37	66	0.23	193	2.00	47	0.32	-	-	II 3	
SKiiP 38GB17E4V1 [2]	341	300	1.90	47	102	0.15	267	2.00	69	0.24	-	-	II 3	

Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs

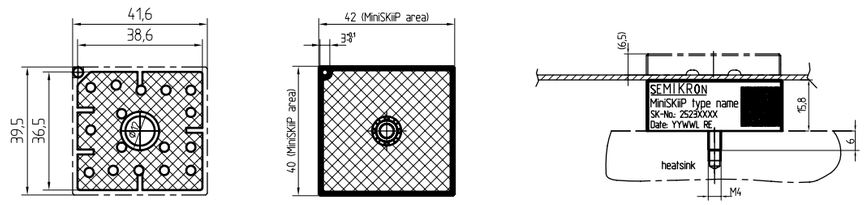
IGBT Modules / MiniSKiiP

Cases

MiniSKiiP II 0

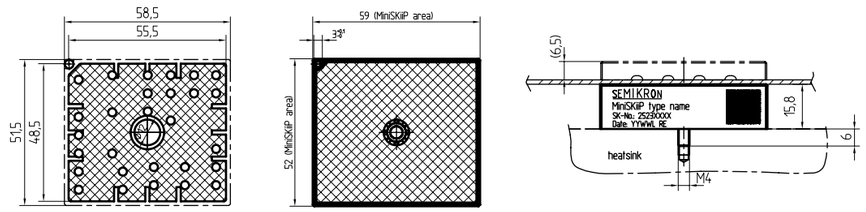


MiniSKiiP II 1



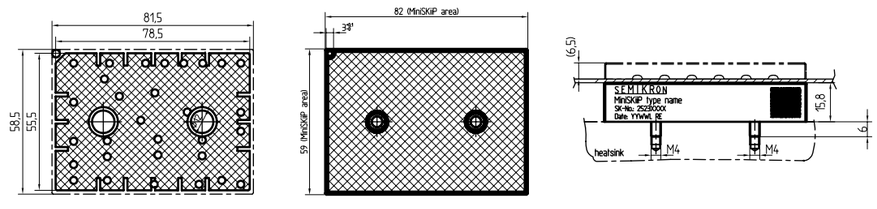
pin configuration depends on circuit
(details in data sheet)

MiniSKiiP II 2



pin configuration depends on circuit
(details in data sheet)

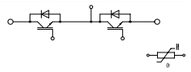
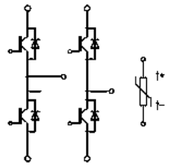
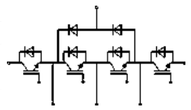
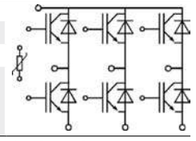
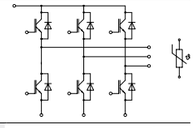
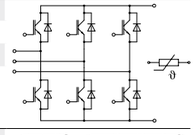
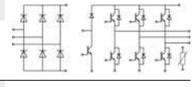
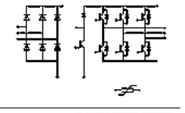
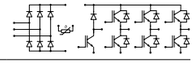
MiniSKiiP II 3



pin configuration depends on circuit
(details in data sheet)

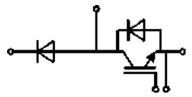
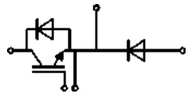
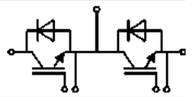
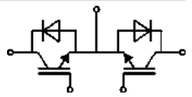
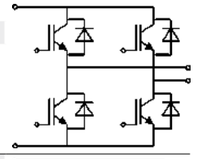
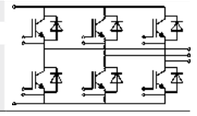
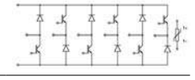
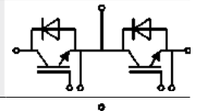
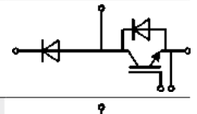
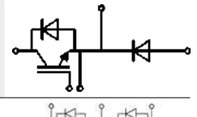
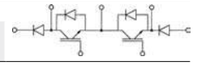
Dimensions in mm

IGBT Modules / SEMITOP

Type	IGBT						Diode				Rectifier		Module	
	I_C @ T_S = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @ T_S = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-s)}$	$R_{th(j-s)}$	I_{FSM} @ T_j = 25°C	Case	Circuit
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W	K/W	A		
600V - IGBT3 (Trench)														
SK 75 GB 066 T	77	75	1.45	3.1	2.8	0.94	62	1.35	0.85	1.55	-	-	3	
SK 100 GB 066 T	96	100	1.45	7	6	0.78	108	1.35	1.7	0.91	-	-	3	
SK 150 GB 066 T	124	150	1.45	6.25	5.7	0.55	135	1.35	1.7	0.73	-	-	3	
SK 30 GBB 066 T	40	30	1.45	0.97	1.77	1.65	36	1.45	0.26	2.1	-	-	3	
SK 50 GBB 066 T	60	50	1.45	2.2	1.73	1.11	56	1.50	0.72	1.7	-	-	3	
SK 75 GBB 066 T	77	75	1.45	3.1	2.8	0.94	77	1.35	0.85	1.55	-	-	3	
SK 20 MLI 066	30	20	1.45	0.4	1.07	1.95	30	1.60	0.2	2.46	-	-	3	
SK 30 MLI 066	40	30	1.45	0.97	1.77	1.65	37	1.50	0.26	2.3	-	-	3	
SK 30 MLI 066p [1]	37	30	1.45	0.97	1.77	1.65	34	1.50	0.26	2.3	-	-	3p	
SK 50 MLI 066	60	50	1.45	1.46	2.02	1.11	56	1.50	1.07	1.7	-	-	3	
SK 75 MLI 066 T	83	75	1.45	1.7	2.8	0.75	92	1.50	1.1	1.2	-	-	4	
SK 100 MLI 066 T	105	100	1.45	2.5	4.2	0.65	110	1.35	1.9	0.9	-	-	4	
SK 150 MLI 066 T	151	150	1.45	2.7	5.9	0.55	115	1.50	2.6	0.72	-	-	4	
SK 20 GD 066 ET	30	20	1.45	0.34	0.63	1.95	31	1.45	0.2	2.46	-	-	3	
SK 30 GD 066 ET	40	30	1.45	0.97	1.77	1.65	36	1.45	0.26	2.1	-	-	3	
SK 50 GD 066 ET	60	50	1.45	2.2	1.73	1.11	56	1.50	0.72	1.7	-	-	3	
SK 50 GD 066 ETp [1]	59	50	1.45	2.2	1.73	1.11	51	1.47	0.72	1.7	-	-	3p	
SK 30 GD 066 ETp [1]	40	30	1.45	0.97	1.77	1.65	36	1.45	0.26	2.1	-	-	3p	
SK 75 GD 066 T	83	75	1.45	3.1	2.8	0.75	92	1.35	0.85	1.2	-	-	4	
SK 100 GD 066 T	105	100	1.45	7	6	0.65	99	1.30	1.7	0.8	-	-	4	
SK 150 GD 066 T	151	150	1.45	6.25	5.7	0.55	198	1.30	1.7	0.54	-	-	4	
SK 200 GD 066 T	174	200	1.45	13.9	12	0.45	99	1.30	3.4	0.8	-	-	4	
SK 20 DGDL 066 ET	30	20	1.45	0.3	0.6	1.95	27	1.40	0.2	2.46	2.15	220	3	
SK 30 DGDL 066 ET	40	30	1.45	0.55	1.15	1.65	36	1.50	0.53	2.3	1.7	370	3	
SK 50 DGDL 066 T	69	50	1.45	2.2	1.74	0.95	54	1.35	0.73	1.6	1.5	370	4	
SK 75 DGDL 066 T [3]	81	75	1.45	3.1	2.8	0.75	64	1.35	0.9	1.2	0.9	700	4	
SK 100 DGDL 066 T	106	100	1.45	4.4	3.5	0.65	99	1.10	1.45	0.8	0.9	700	4	
SK 50 DGDL 066 ETE2 [1]	53	50	1.45	0.85	1.6	1.31	51	1.00	0.9	1.46	1.8	520	E2	

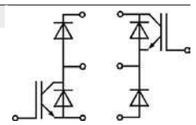
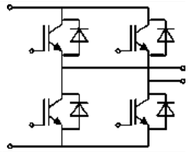
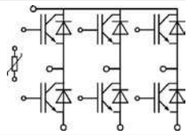
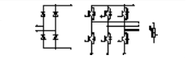
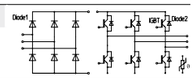
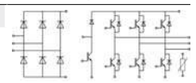
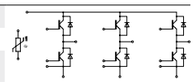
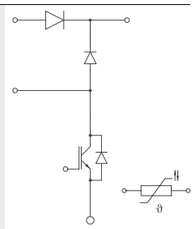
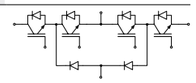
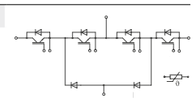
Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs

IGBT Modules / SEMITOP

Type	IGBT						Diode				Rectifier		Module	
	I_C @ T_S = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @ T_S = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-s)}$	$R_{th(j-s)}$	I_{FSM} @ T_j = 25°C	Case	Circuit
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W	K/W	A		
600V - NPT IGBT (Standard)														
SK 45 GAL 063 [3]	45	50	2.10	1.4	1.2	1	57	1.45	0.25	1.2	-	-	2	
SK 45 GAR 063 [3]	45	50	2.10	1.4	1.2	1	57	1.45	0.25	1.2	-	-	2	
SK 45 GB 063 [3]	45	50	2.10	1.4	1.2	1	57	1.45	0.25	1.2	-	-	2	
SK 80 GB 063 [3]	81	100	2.10	4	3	0.6	79	1.40	1.2	0.9	-	-	3	
SK 80 GM 063 [3]	81	100	2.00	3	2.3	0.6	105	1.30	0.2	1.2	-	-	2	
SK 15 GH 063 [3]	20	15	2.00	0.71	0.4	1.9	20	1.45	0.45	1.2	-	-	2	
SK 25 GH 063 [3]	30	30	2.10	1.1	0.8	1.4	36	1.45	0.25	1.7	-	-	2	
SK 45 GH 063 [3]	45	50	2.10	1.4	1.2	1	57	1.30	0.9	1.2	-	-	3	
SK 13 GD 063 [3]	18	10	2.10	0.6	0.4	2	22	1.45	0.1	2.3	-	-	3	
SK 25 GD 063 [3]	30	30	2.10	1.3	0.9	1.4	36	1.45	0.25	1.7	-	-	3	
SK 45 GD 063 [3]	45	50	2.10	1.4	1.2	1	36	1.45	0.25	1.7	-	-	3	
SK 25 GAD 063 T [3]	30	30	2.10	1.3	0.9	1.4	36	1.45	0.25	1.7	-	-	3	
600V - NPT IGBT (Ultrafast)														
SK 50 GB 065 [3]	54	60	2.00	1.1	0.7	0.85	64	1.45	0.55	1.1	-	-	2	
SK 50 GAL 065 [3]	54	60	2.00	1.1	0.7	0.85	57	1.30	0.2	1.2	-	-	2	
SK 50 GAR 065 [3]	54	60	2.00	1.1	0.7	0.85	57	1.30	0.2	1.2	-	-	2	
SK 50 GARL 065 F	54	60	1.70	1.03	0.8	0.85	82	1.70	0.45	2.3	-	-	2	
SK 50 GARL 065 USA [3]	54	60	1.70	1.07	0.76	0.85	64	1.40	0.55	2.3	-	-	2	

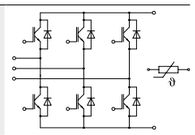
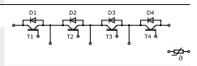
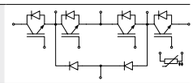
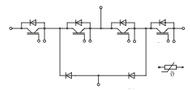
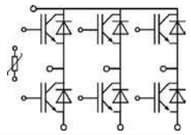
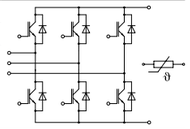
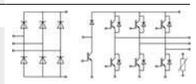
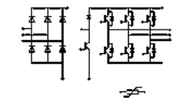
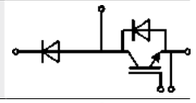
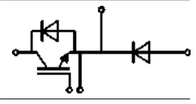
Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs

IGBT Modules / SEMITOP

Type	IGBT						Diode				Rectifier		Module	
	I_C @ T_S = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @ T_S = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-s)}$	$R_{th(j-s)}$	I_{FSM} @ T_j = 25°C	Case	
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W	K/W	A		Circuit
600V - NPT IGBT (Ultrafast)														
SK 55 GARL 065 E [3]	54	60	1.70	1.1	0.76	0.85	36	1.45	0.9	1.7	-	-	3	
SK 75 GARL 065 E [3]	80	90	1.70	2.71	2.75	0.6	57	1.30	0.2	1.2	-	-	3	
SK 50 GH 065 F [3]	54	60	2.00	1.07	1.76	0.85	82	1.10	0.42	1.1	-	-	3	
SK 35 GD 065 ET [3]	45	50	2.00	1.3	0.6	1	36	1.90	0.9	1.7	-	-	3	
SK 10 BGD 065 ET [3]	17	6	2.00	0.18	0.13	2	22	1.30	0.18	2.3	2.7	220	3	
SK 9 BGD 065 ET [3]	12	6	2.00	0.22	0.12	2.6	20	1.35	0.31	2.7	2.15	220	3	
SK 9 DGD 065 ET [3]	12	6	2.00	0.22	0.12	2.6	20	1.35	0.31	2.7	2.15	220	3	
SK 20 DGD 065 ET [3]	26	20	2.00	0.66	0.4	1.7	25	1.60	-	1.7	1.7	370	3	
SK 10 DGDL 065 ET [3]	17	6	2.00	0.18	0.13	2	22	1.30	0.18	2.3	2.7	220	3	
SK 20 DGDL 065 ET [3]	24	20	2.00	0.69	0.39	1.7	25	1.60	-	1.7	2	220	3	
650V - IGBT3 (Trench)														
SK 75 GD 07E3 ETE2 [1]	66	75	1.45	1.1	2.55	1.1	70	1.43	1.85	1.35	-	-	E2	
SK 50 GD 07E3 ETE1 [1]	49	50	1.45	0.64	1.7	1.45	57	1.37	0.85	1.5	-	-	E1	
SK30GD07E3ETE1V1 [1]	38	30	1.45	0.8	1.45	1.6	37	1.55	0.65	2.2	-	-	E1	
650V - IGBT3 (Fast Trench)														
SK 151 GALE 07F3 TUF [1]	-	150	1.85	8.8	4	0.41	116	1.59	0.55	2.34	1.2	635	3	
SK 50 MLI 07F3 D1p [1]	51	50	1.85	1	1.18	1.11	56	1.37	0.95	1.55	-	-	3p	
SK 100 MLI 07F3 TD1p [1]	92	100	1.85	2	3.36	0.65	118	1.37	1.9	0.72	-	-	4p	
SK 150 MLI 07F3 TD1p [1]	119	150	1.85	9.07	1.3	0.55	118	1.37	1.76	0.72	-	-	4p	

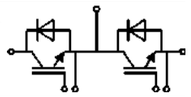
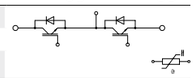
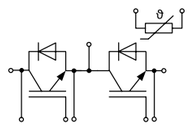
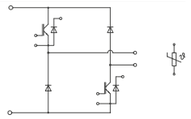
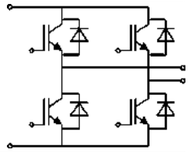
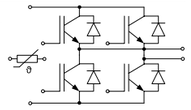
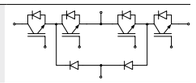
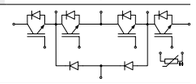
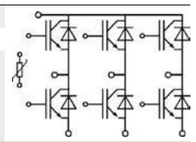
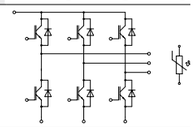
Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs

IGBT Modules / SEMITOP

Type	IGBT						Diode				Rectifier		Module	
	I_C @ T_S = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @ T_S = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-s)}$	$R_{th(j-s)}$	I_{FSM} @ T_j = 25°C	Case	
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W	K/W	A		Circuit
650V - IGBT3 (Fast Trench)														
SK 100 GD 07F3 TD1 [2]	104	100	1.85	3.92	2.1	0.54	95	1.35	0.92	0.85	-	-	4	
SK150DBB07F3TD1p [1]	68	75	1.85	2.4	1.6	0.9	81	1.35	1.2	1.1	-	-	4p	
SK100DBB07F3TD1p [1]	57	50	1.85	3.6	1.8	0.94	95	1.35	1.2	0.9	-	-	4p	
650V - IGBT L5 (Low saturation voltage Trench5 technology)														
SK 150 MLI 07L5 TD1p [1]	103	150	1.65	2.66	2.5	0.7	118	1.35	2.6	0.83	-	-	4p	
SK 150 MLI 07L5 TD1E2 [1]	103	150	1.65	2.66	2.5	0.7	118	1.35	2.6	0.83	-	-	E2	
1200V - IGBT3 (Trench)														
SK 10 GD 126 ET [3]	15	8	1.70	1	1	2	25	1.90	1.4	2.1	-	-	3	
SK 15 GD 126 ET [3]	22	15	1.70	2	1.8	1.6	25	1.60	1.4	2.1	-	-	3	
SK 25 GD 126 ET	32	25	1.70	3.3	3.1	1.2	28	1.80	2.1	1.9	-	-	3	
SK 35 GD 126 ET	40	35	1.70	4.6	4.3	1.05	34	1.80	2.9	1.7	-	-	3	
SK 50 GD 126 T	68	50	1.70	4.6	6.3	0.6	62	1.35	3.6	1	-	-	4	
SK 75 GD 126 T	88	75	1.70	11.3	10	0.5	91	1.46	6	0.7	-	-	4	
SK 100 GD 126 T [3]	114	100	1.70	9.8	11.7	0.4	118	1.50	7.3	0.55	-	-	4	
SK 10 DGDL 126 ET [3]	15	8	1.70	1	1	2	25	1.90	1.4	2.1	2.7	220	3	
SK 15 DGDL 126 ET	22	15	1.70	2	1.8	1.6	25	1.60	1.1	2.1	2	220	3	
SK 25 DGDL 126 T [3]	41	25	1.70	2.8	3.1	0.9	30	1.50	2	1.7	1.5	370	4	
SK 35 DGDL 126 T	52	35	1.70	3.7	4.8	0.75	38	1.50	3	1.5	1.25	370	4	
SK 50 DGDL 126 T [3]	68	50	1.70	4.6	6.3	0.6	62	1.35	3.6	1	0.9	700	4	
1200V - IGBT4 (Trench)														
SK 35 GAL 12T4	44	35	1.85	3.27	3.3	1.21	38	2.30	1.46	1.55	-	-	2	
SK 35 GAR 12T4 [1]	44	35	1.85	3.27	3.3	1.21	38	2.30	1.46	1.55	-	-	2	

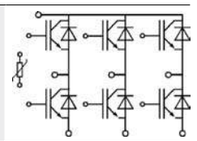
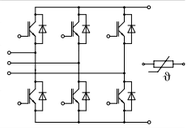
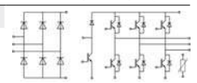
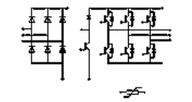
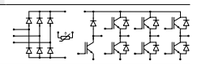
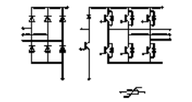
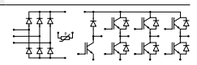
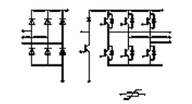
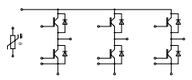
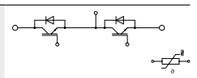
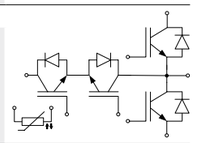
Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs

IGBT Modules / SEMITOP

Type	IGBT						Diode				Rectifier		Module	
	I_C @ T_S = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @ T_S = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-s)}$	$R_{th(j-s)}$	I_{FSM} @ T_j = 25°C	Case	Circuit
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W	K/W	A		
1200V - IGBT4 (Trench)														
SK 25 GB 12T4 [2]	37	25	1.85	2.27	2.7	1.31	30	2.40	1.28	1.91	-	-	2	
SK 35 GB 12T4	44	35	1.85	3.27	3.3	1.21	38	2.30	1.46	1.55	-	-	2	
SK 50 GB 12T4 T [2]	71	50	1.85	8.3	5	0.9	50	2.20	2.15	1.24	-	-	3	
SK 75 GB 12T4 T	80	75	1.85	13.6	8.2	0.74	70	2.10	3.39	0.97	-	-	3	
SK 100 GB 12T4 T [2]	100	100	1.85	16.6	10	0.6	85	2.25	5.2	0.87	-	-	3	
SK 200 GB 12T4 Tp [1]	210	200	1.80	13.6	22.1	0.28	190	2.20	13.4	0.35	-	-	4p	
SK 150 GAH 12T4 Tp [1]	167	150	1.85	10.8	15.6	0.33	33	2.33	0.82	1.1	-	-	4p	
SK 25 GH 12T4 [2]	35	25	1.85	2.27	2.7	1.31	28	2.41	1.28	1.91	-	-	3	
SK 50 GH 12T4 T [2]	75	50	1.80	8.3	5	0.65	56	2.20	2.15	1.05	-	-	4	
SK 100 GH 12T4 T	126	100	1.80	16.6	10	0.43	102	2.20	5.2	0.62	-	-	4	
SK 35 MLI 12T4 p [1]	43	35	1.85	1.6	3.27	1.21	38	2.30	1.73	1.55	-	-	3p	
SK 70 MLI 12T4 Tp [1]	90	70	1.85	13.5	8.5	0.55	78	2.30	2.73	0.73	-	-	4p	
SK 10 GD 12T4 ET [2]	17	8	1.85	0.41	0.76	2.2	15	2.38	0.41	2.7	-	-	3	
SK 15 GD 12T4 ET	27	15	1.85	0.83	1.52	1.65	21	2.38	0.82	2.34	-	-	3	
SK 25 GD 12T4 ET	37	25	1.85	2.27	2.7	1.31	30	2.40	1.28	1.91	-	-	3	
SK 25 GD 12T4 ETp [1]	35	25	1.85	2.27	2.7	1.31	28	2.41	1.28	1.91	-	-	3p	

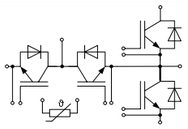
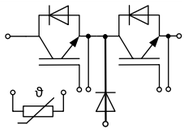
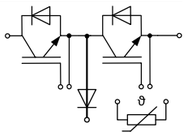
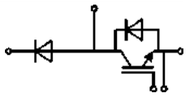
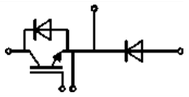
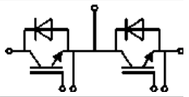
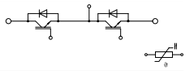
Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs

IGBT Modules / SEMITOP

Type	IGBT						Diode				Rectifier		Module	
	I_C @ T_S = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @ T_S = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-s)}$	$R_{th(j-s)}$	I_{FSM} @ T_j = 25°C	Case	Circuit
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W	K/W	A		
1200V - IGBT4 (Trench)														
SK 35 GD 12T4 ET [2]	44	35	1.85	3.27	3.3	1.21	40	2.30	1.46	1.55	-	-	3	
SK 50 GD 12T4 T	75	50	1.85	8.3	5	0.65	60	2.20	2.15	0.97	-	-	4	
SK 50 GD 12T4 Tp [2]	72	50	1.85	8.3	5	0.65	60	2.22	2.15	0.97	-	-	4p	
SK 75 GD 12T4 T	102	75	1.85	13.6	8.2	0.51	83	2.20	3.38	0.75	-	-	4	
SK 75 GD 12T4 Tp [1]	97	75	1.85	13.6	8.2	0.51	83	2.17	3.38	0.75	-	-	4p	
SK 100 GD 12T4 T	126	100	1.85	16.6	10	0.43	102	2.25	5.2	0.62	-	-	4	
SK 10 DGDL 12T4 ET	17	8	1.85	0.41	0.75	2.2	15	2.38	0.41	2.7	2	220	3	
SK 15 DGDL 12T4 ET	27	15	1.85	0.82	1.52	1.65	21	2.38	0.82	2.34	2	220	3	
SK 25 DGDL 12T4 T	45	25	1.85	2.27	2.7	0.96	30	2.40	-	1.7	1.25	370	4	
SK 25 DGDL 12T4 ETE2 [1]	33	25	1.85	2.6	2.35	1.45	53	1.00	2.05	1.46	1.8	520	E2	
SK 35 DGDL 12T4 T	58	35	1.85	3.27	3.3	0.8	46	2.30	1.46	1.37	1.25	370	4	
SK 35 DGDL 12T4 ETE2 [1]	43	35	1.85	3.15	3.2	1.2	53	1.00	2.6	1.46	1.55	520	E2	
SK 50 DGDL 12T4 T	75	50	1.85	8.3	5	0.65	60	2.22	2.15	0.97	0.9	700	4	
SK25GD12T4ETE1 [1]	33	25	1.85	2.6	2.35	1.45	29	2.41	2.05	1.8	-	-	E1	
SK35GD12T4ETE1 [1]	43	35	1.85	3.15	3.2	1.2	38	2.30	2.6	1.55	-	-	E1	
SK50GD12T4ETE2 [1]	66	50	1.85	5.8	4.5	0.75	59	2.22	3.6	0.98	-	-	E2	
SK75GD12T4ETE2 [1]	84	75	1.85	8	6.4	0.65	82	2.17	5.5	0.77	-	-	E2	
1200V - IGBT4 (Fast Trench)														
SK 120 GB 12F4 T [1]	174	120	2.05	8.8	7.47	0.22	29	2.38	2.04	1.25	-	-	3	
SK80TMLI12F4Tp [1]	88	80	2.05	1.9	2.04	0.54	83	2.17	1.6	0.75	-	-	3p	
SK 150 TMLI 12F4 Tp [2]	180	150	2.05	3.13	5.29	0.24	100	2.20	4.8	0.65	-	-	4p	

Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs

IGBT Modules / SEMITOP

Type	IGBT						Diode				Rectifier		Module	
	I_C @ T_s = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @ T_s = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-s)}$	$R_{th(j-s)}$	I_{FSM} @ T_j = 25°C	Case	Circuit
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W	K/W	A		
1200V - IGBT4 (Fast Trench)														
SK 200 TMLI 12F4 TE2 1)	147	200	2.05	7.2	4.5	0.4	67	2.17	4	1.05	-	-	E2	
SK 150 MLIT 12F4 TE2 1)	149	150	2.05	12.6	11	0.33	80	2.20	8.3	0.91	-	-	E2	
SK 150 MLIB 12F4 TE2 1)	149	150	2.05	12.6	11	0.33	80	2.20	8.3	0.91	-	-	E2	
1200V - NPT IGBT (Ultrafast)														
SK 60 GAL 125 3)	51	50	3.20	8.36	3.32	0.6	43	2.00	2	1.16	-	-	2	
SK 60 GAR 125 3)	51	50	3.20	8.36	3.32	0.6	43	2.00	2	1.16	-	-	2	
SK 60 GB 125	51	50	3.20	8.36	3.32	0.6	57	2.00	2	0.9	-	-	3	
SK 80 GB 125 T	85	75	3.20	9.9	5	0.32	90	2.00	1	0.65	-	-	3	

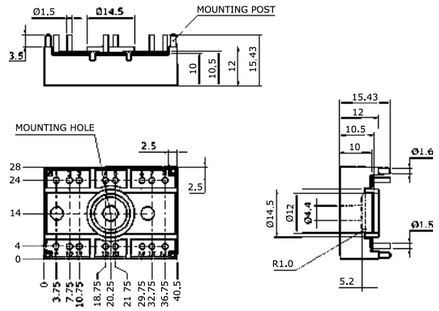
Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs

IGBT Modules / SEMITOP

Cases

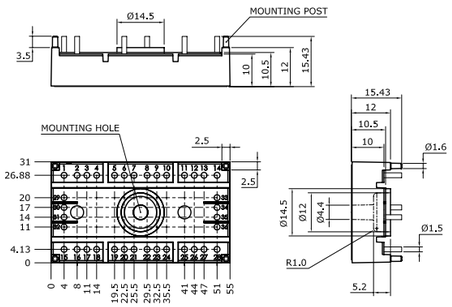
SEMITOP 2

Dimensions: mm
Tolerance system: ISO 2768-m



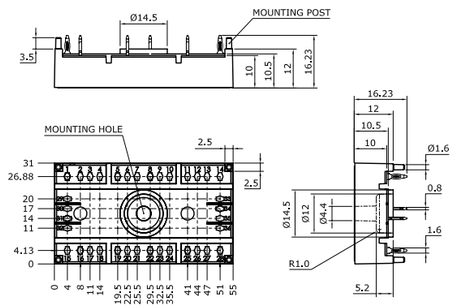
SEMITOP 3

Dimensions: mm
Tolerance system: ISO 2768-m



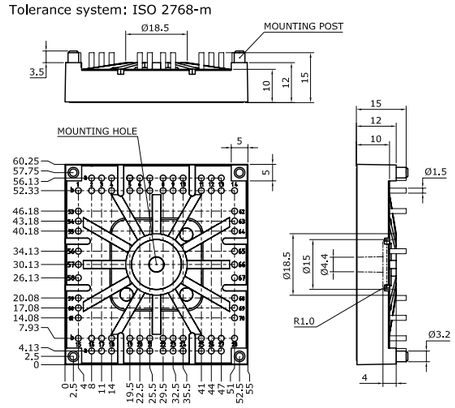
SEMITOP 3 Press-Fit

Dimensions: mm
Tolerance system: ISO 2768-m



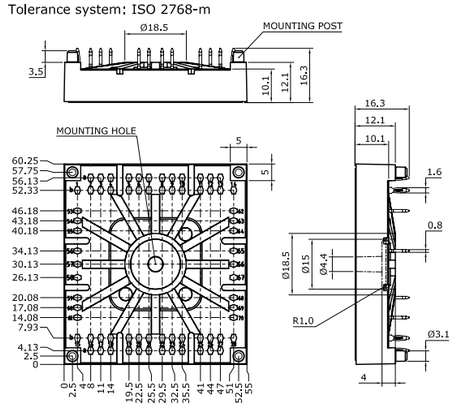
SEMITOP 4

Dimensions: mm
Tolerance system: ISO 2768-m



SEMITOP 4 Press-Fit

Dimensions: mm
Tolerance system: ISO 2768-m

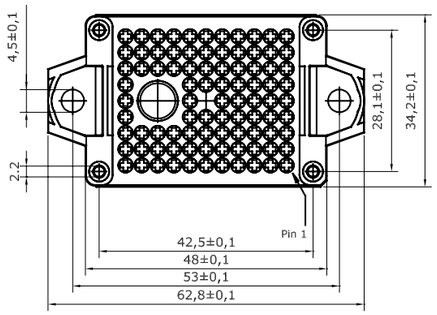


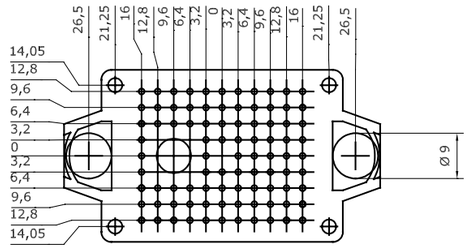
Dimensions in mm

IGBT Modules / SEMITOP

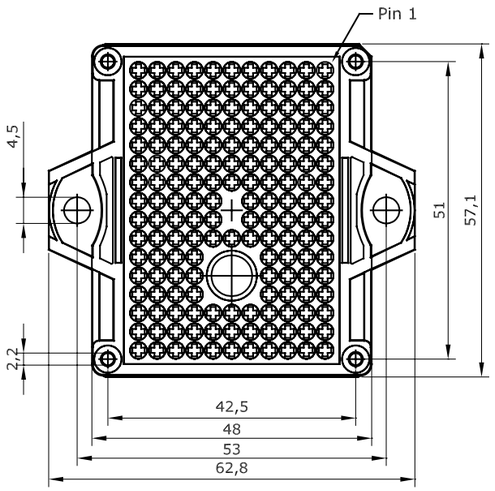
Cases

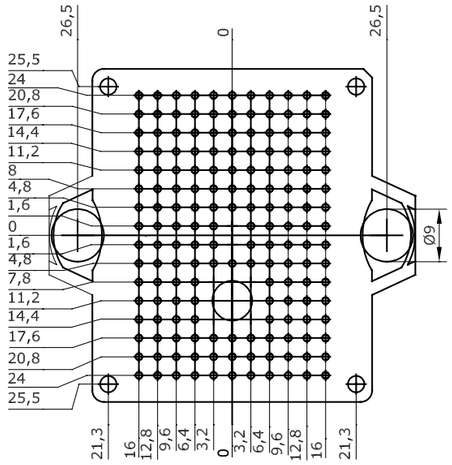
SEMITOP E1





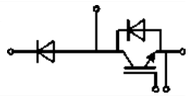
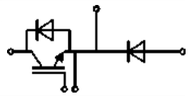
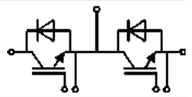
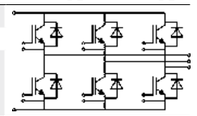
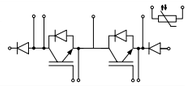
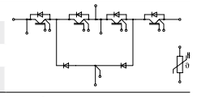
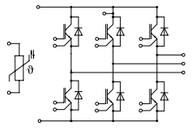
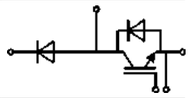
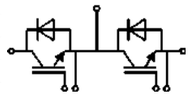
SEMITOP E2





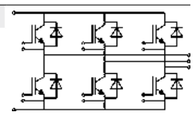
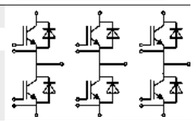
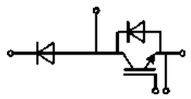
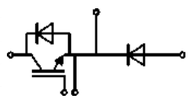
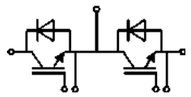
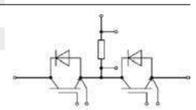
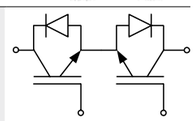
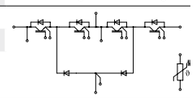
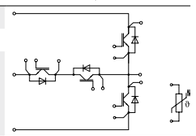
Dimensions in mm

IGBT Modules / SEMiX

Type	IGBT I_C @ T_C = 25°C A	IGBT I_{Cnom} A	IGBT $V_{CE(sat)}$ @ T_j = 25°C typ. V	IGBT E_{on} mJ	IGBT E_{off} mJ	IGBT $R_{th(j-c)}$ K/W	Diode I_F @ T_C = 25°C A	Diode V_F @ T_j = 25°C typ. V	Diode E_{rr} mJ	Diode $R_{th(j-c)}$ K/W	Module Case	Module $R_{th(c-s)}$ K/W	Circuit
600V - IGBT3 (Trench)													
SEMiX402GAL066HDs	502	400	1.45	22	24	0.12	543	1.40	10	0.15	2s	0.045	
SEMiX603GAL066HDs	720	600	1.45	12	43	0.087	771	1.40	13	0.11	3s	0.04	
SEMiX402GAR066HDs	502	400	1.45	22	24	0.12	543	1.40	10	0.15	2s	0.045	
SEMiX603GAR066HDs	720	600	1.45	12	43	0.087	771	1.40	13	0.11	3s	0.04	
SEMiX202GB066HDs	272	200	1.45	6	8	0.21	291	1.40	6.5	0.27	2s	0.045	
SEMiX302GB066HDs	379	300	1.45	12	15	0.16	419	1.40	7.5	0.19	2s	0.045	
SEMiX402GB066HDs	502	400	1.45	22	24	0.12	543	1.40	10	0.15	2s	0.045	
SEMiX603GB066HDs	720	600	1.45	12	43	0.087	771	1.40	13	0.11	3s	0.04	
SEMiX101GD066HDs	139	100	1.45	3	4	0.41	151	1.40	4.5	0.51	13	0.04	
SEMiX151GD066HDs	200	150	1.45	3.8	6.1	0.29	219	1.40	5.8	0.36	13	0.04	
SEMiX201GD066HDs	258	200	1.45	5	8	0.23	284	1.40	7.5	0.28	13	0.04	
650V - IGBT4 (Trench)													
SEMiX205GARL07E3 [1]	258	200	1.45	16	16	0.23	86	1.37	-	0.81	5p	0.019	
SEMiX305GARL07E3 [1]	353	300	1.45	21	21	0.18	86	1.37	-	0.81	5p	0.018	
SEMiX405GARL07E3 [1]	457	400	1.45	28	28	0.14	86	1.37	-	0.81	5p	0.017	
SEMiX155MLI07E4 [2]	187	150	1.55	1.5	8.6	0.32	145	1.40	2.3	0.51	5p	0.009	
SEMiX205MLI07E4 [2]	262	200	1.55	2	10	0.22	294	1.40	4.5	0.25	5p	0.005	
SEMiX305MLI07E4 [2]	388	300	1.55	2.5	16	0.15	294	1.40	7.7	0.25	5p	0.005	
SEMiX405MLI07E4 [2]	474	400	1.55	5.3	20	0.13	377	1.40	11	0.21	5p	0.004	
SEMiX305GD07E4 [1]	372	300	1.55	5.5	16	0.16	335	1.40	5.2	0.25	5p	0.004	
1200V - V-IGBT													
SEMiX151GAL12Vs	231	150	1.75	19	17	0.19	189	2.14	12	0.31	1s	0.075	
SEMiX151GB12Vs	231	150	1.75	19	17	0.19	189	2.14	12	0.31	1s	0.075	
SEMiX202GB12Vs	310	200	1.75	25	24	0.14	229	2.20	15	0.26	2s	0.045	
SEMiX223GB12Vs	323	225	1.85	20	27	0.14	263	2.17	16	0.23	3s	0.04	
SEMiX302GB12Vs	448	300	1.75	37	36	0.1	356	2.14	22	0.17	2s	0.045	
SEMiX303GB12Vs	448	300	1.75	27	36	0.1	327	2.20	21	0.19	3s	0.04	
SEMiX404GB12Vs	596	400	1.75	39	52	0.075	440	2.20	34	0.14	4s	0.03	
SEMiX453GB12Vs	673	450	1.75	40	54	0.067	516	2.14	33	0.12	3s	0.04	
SEMiX603GB12Vs	800	600	1.85	50	83	0.057	516	2.42	40	0.12	3s	0.04	
SEMiX604GB12Vs	880	600	1.75	59	79	0.051	707	2.14	50	0.086	4s	0.03	

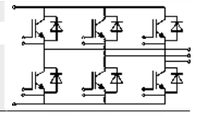
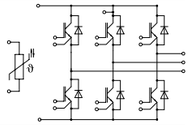
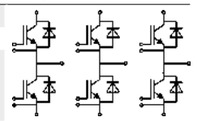
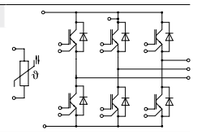
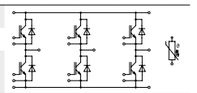
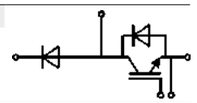
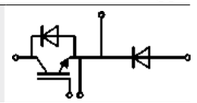
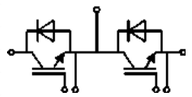
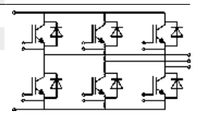
Footnotes: 1) Sample status / 2) In production new

IGBT Modules / SEMiX

Type	IGBT						Diode				Module		
	I_C @ T_C = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-c)}$	I_F @ T_C = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-c)}$	Case	$R_{th(c-s)}$	Circuit
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		K/W	
1200V - V-IGBT													
SEMiX101GD12Vs	159	100	1.75	13	11	0.27	121	2.20	7.7	0.48	13	0.04	
SEMiX151GD12Vs	231	150	1.75	19	17	0.19	189	2.14	12	0.31	13	0.04	
SEMiX223GD12Vc	323	225	1.85	20	27	0.14	263	2.17	16	0.23	33c	0.014	
SEMiX303GD12Vc	448	300	1.75	27	36	0.1	327	2.20	21	0.19	33c	0.014	
SEMiX453GD12Vc	673	450	1.75	40	54	0.067	516	2.14	33	0.12	33c	0.014	
1200V - IGBT4 (Trench)													
SEMiX151GAL12E4s	232	150	1.80	17	18	0.19	189	2.14	8.9	0.31	1s	0.075	
SEMiX302GAL12E4s	463	300	1.80	30	44	0.096	356	2.14	19	0.17	2s	0.045	
SEMiX453GAL12E4s	683	450	1.80	45	67	0.065	544	2.14	28	0.11	3s	0.04	
SEMiX603GAL12E4p [2]	1110	600	1.80	59	76	0.037	856	2.08	33	0.065	3p	0.009	
SEMiX604GAL12E4s	916	600	1.80	35	110	0.049	707	2.14	44	0.086	4s	0.03	
SEMiX151GAR12E4s	232	150	1.80	17	18	0.19	189	2.14	8.9	0.31	1s	0.075	
SEMiX302GAR12E4s	463	300	1.80	30	44	0.096	356	2.14	19	0.17	2s	0.045	
SEMiX453GAR12E4s	683	450	1.80	45	67	0.065	544	2.14	28	0.11	3s	0.04	
SEMiX603GAR12E4p [2]	1110	600	1.80	64	76	0.037	856	2.08	32	0.065	3p	0.009	
SEMiX604GAR12E4s	916	600	1.80	35	110	0.049	707	2.14	44	0.086	4s	0.03	
SEMiX151GB12E4s	232	150	1.80	17	18	0.19	189	2.14	8.9	0.31	1s	0.075	
SEMiX202GB12E4s	312	200	1.80	22	28	0.14	229	2.20	12	0.26	2s	0.045	
SEMiX223GB12E4p	326	225	1.85	14	26	0.14	287	2.17	17	0.2	3p	0.009	
SEMiX302GB12E4s	463	300	1.80	30	44	0.096	356	2.14	19	0.17	2s	0.045	
SEMiX303GB12E4p	469	300	1.80	23	38	0.094	378	2.20	23	0.15	3p	0.009	
SEMiX303GB12E4s	466	300	1.80	30	41	0.095	338	2.20	18	0.18	3s	0.04	
SEMiX404GB12E4s	618	400	1.80	27	60	0.072	440	2.20	26	0.14	4s	0.03	
SEMiX453GB12E4p	678	450	1.80	25	57	0.066	578	2.14	37	0.1	3p	0.009	
SEMiX453GB12E4s	683	450	1.80	45	67	0.065	544	2.14	28	0.11	3s	0.009	
SEMiX603GB12E4p	1110	600	1.80	69	80	0.037	856	2.08	40	0.065	3p	0.009	
SEMiX604GB12E4s	916	600	1.80	35	110	0.049	707	2.14	44	0.086	4s	0.03	
SEMiX303GB12E4I50p [1]	469	300	1.80	23	38	0.094	378	2.20	23	0.15	3Ip	0.009	
SEMiX453GB12E4Ip	678	450	1.80	33	57	0.066	578	2.14	39	0.1	3Ip	0.009	
SEMiX603GB12E4Ip	1110	600	1.80	63	80	0.037	856	2.08	40	0.065	3Ip	0.009	
SEMiX453GM12E4p [1]	678	450	1.80	11	66	0.066	544	2.14	32	0.11	3Ip	0.009	
SEMiX155MLI12E4 [1]	237	150	1.85	12	17	0.18	191	2.17	5.5	0.3	5p	0.007	
SEMiX205MLI12E4 [1]	313	200	1.80	13	25	0.14	229	2.20	5.8	0.26	5p	0.006	
SEMiX305MLI12E4 [2]	451	300	1.80	17	39	0.1	344	2.14	22	0.18	5p	0.009	
SEMiX205TMLI12E4B [2]	318	200	1.80	5	4	0.136	229	2.20	5.9	0.26	5p	0.008	
SEMiX305TMLI12E4B [2]	479	300	1.80	4.5	21	0.09	363	2.20	8.8	0.16	5p	0.006	
SEMiX405TMLI12E4B [2]	636	400	1.80	6	28	0.068	461	2.20	12	0.13	5p	0.005	

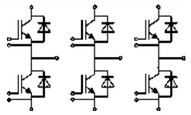
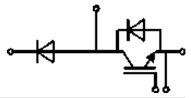
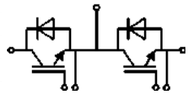
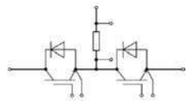
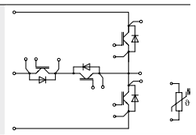
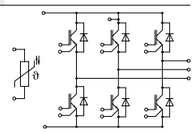
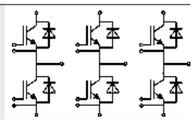
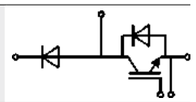
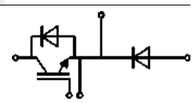
Footnotes: 1) Sample status / 2) In production new

IGBT Modules / SEMiX

Type	IGBT						Diode				Module		
	I_C @ T_C = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-c)}$	I_F @ T_C = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-c)}$	Case	$R_{th(c-s)}$	Circuit
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		K/W	
1200V - IGBT4 (Trench)													
SEMiX71GD12E4s	115	75	1.85	7.5	9	0.38	97	2.17	5.3	0.58	13	0.04	
SEMiX101GD12E4s	160	100	1.80	11	13	0.27	121	2.20	6.5	0.48	13	0.04	
SEMiX151GD12E4s	232	150	1.80	14	19	0.19	189	2.14	8.9	0.31	13	0.04	
SEMiX205GD12E4 [2]	313	200	1.80	14	23	0.15	224	2.20	16	0.27	5p	0.005	
SEMiX223GD12E4c	333	225	1.85	22	31	0.135	270	2.17	17	0.22	33c	0.014	
SEMiX303GD12E4c	466	300	1.80	29	42	0.095	338	2.20	23	0.18	33c	0.014	
SEMiX453GD12E4c	683	450	1.80	52	68	0.065	544	2.14	28	0.11	33c	0.014	
1200V - IGBT4 (Fast Trench)													
SEMiX105GD12T4 [1]	163	100	1.80	12	19	0.26	129	2.20	12	0.43	5p	t.b.d.	
SEMiX155GD12T4 [1]	219	150	1.80	13	21	0.21	175	2.14	14	0.35	5p	t.b.d.	
SEMiX106GD12T4p [1]	153	100	1.80	7.5	9.5	0.29	128	1.70	8	0.5	6p	t.b.d.	
SEMiX156GD12T4p [1]	225	150	1.80	10	16	0.2	177	1.70	13.5	0.375	6p	t.b.d.	
SEMiX206GD12T4p [1]	302	200	1.80	29.4	31.4	0.15	249	1.70	22.9	0.26	6p	t.b.d.	
1200V - IGBT3 (Trench)													
SEMiX452GAL126HDs	455	300	1.70	35	45	0.083	394	1.60	33	0.15	2s	0.045	
SEMiX703GAL126HDs	642	450	1.70	32	68	0.061	561	1.60	60	0.11	3s	0.04	
SEMiX703GAR126HDs	642	450	1.70	32	68	0.061	561	1.60	60	0.11	3s	0.04	
SEMiX252GB126HDs	242	150	1.70	20	21	0.15	228	1.60	18	0.24	2s	0.045	
SEMiX302GB126HDs	311	200	1.70	30	26	0.12	292	1.60	23	0.19	2s	0.045	
SEMiX353GB126HDs	364	225	1.70	27	33	0.1	329	1.60	29	0.17	3s	0.04	
SEMiX452GB126HDs	455	300	1.70	35	45	0.083	394	1.60	33	0.15	2s	0.045	
SEMiX503GB126HDs	466	300	1.70	28	44	0.08	431	1.60	33	0.13	3s	0.04	
SEMiX604GB126HDs	590	400	1.70	36	60	0.065	533	1.60	46	0.11	4s	0.03	
SEMiX703GB126HDs	642	450	1.70	32	68	0.061	561	1.60	60	0.11	3s	0.04	
SEMiX904GB126HDs	821	600	1.70	60	88	0.05	752	1.60	75	0.081	4s	0.03	
SEMiX101GD126HDs	129	75	1.70	10	11	0.27	117	1.60	9	0.46	13	0.04	
SEMiX151GD126HDs	168	100	1.70	12	14	0.21	152	1.60	12	0.36	13	0.04	
SEMiX251GD126HDs	242	150	1.70	19	22	0.15	207	1.60	15	0.28	13	0.04	

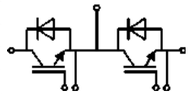
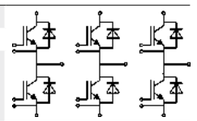
Footnotes: 1) Sample status / 2) In production new

IGBT Modules / SEMiX

Type	IGBT						Diode				Module		
	I_C @ T_C = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-c)}$	I_F @ T_C = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-c)}$	Case	$R_{th(c-s)}$	Circuit
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		K/W	
1200V - IGBT3 (Trench)													
SEMiX353GD126HDc	364	225	1.70	27	33	0.1	329	1.60	29	0.17	33c	0.014	
SEMiX503GD126HDc	466	300	1.70	28	44	0.08	412	1.60	33	0.14	33c	0.014	
SEMiX703GD126HDc	642	450	1.70	32	68	0.061	561	1.59	60	0.11	33c	0.014	
1700V - IGBT4 (Trench)													
SEMiX302GAL17E4s	516	300	1.90	140	122	0.083	324	1.98	70	0.184	2s	0.045	
SEMiX453GAL17E4s	762	450	1.90	250	190	0.056	482	1.98	100	0.125	3s	0.04	
SEMiX151GB17E4s	260	150	1.90	52	60	0.162	169	1.98	41	0.345	1s	0.075	
SEMiX202GB17E4s	321	200	1.90	75	82	0.122	213	2.00	55	0.276	2s	0.045	
SEMiX302GB17E4s	516	300	1.90	140	122	0.083	324	1.98	70	0.184	2s	0.045	
SEMiX303GB17E4s	477	300	1.90	140	125	0.083	311	2.00	85	0.191	3s	0.04	
SEMiX404GB17E4s	633	400	1.90	190	165	0.062	412	2.00	97	0.145	4s	0.03	
SEMiX453GB17E4p	731	450	1.90	131	146	0.06	557	1.98	72	0.1	3p	0.009	
SEMiX453GB17E4s	762	450	1.90	250	190	0.056	482	1.98	100	0.125	3s	0.04	
SEMiX603GB17E4p [2]	981	600	1.95	125	200	0.037	794	1.88	120	0.073	3p	0.009	
SEMiX604GB17E4s	1015	600	1.90	255	255	0.042	629	1.98	150	0.095	4s	0.03	
SEMiX453GB17E4Ip	731	450	1.90	153	150	0.06	557	1.98	73	0.1	3Ip	0.009	
SEMiX305TMLI17E4C [1]	486	300	1.90	38	60	0.08	338	2.00	38	0.17	5p	0.005	
SEMiX155GD17E4 [1]	245	150	1.90	-	-	0.18	175	2.00	-	0.32	5p	t.b.d.	
SEMiX453GD17E4c	762	450	1.90	186	183	0.056	482	1.98	122	0.125	33c	0.014	
1700V - IGBT3 (Trench)													
SEMiX653GAL176HDs	619	450	2.00	300	180	0.054	545	1.70	73	0.11	3s	0.04	
SEMiX653GAR176HDs	619	450	2.00	300	180	0.054	545	1.70	73	0.11	3s	0.04	

Footnotes: 1) Sample status / 2) In production new

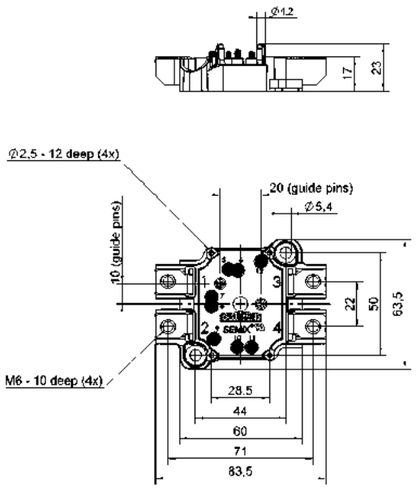
IGBT Modules / SEMiX

Type	IGBT						Diode				Module		
	I_C @ T_C = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-c)}$	I_F @ T_C = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-c)}$	Case	$R_{th(c-s)}$	Circuit
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		K/W	
1700V - IGBT3 (Trench)													
SEMiX252GB176HDs	246	150	2.00	90	55	0.12	288	1.55	32	0.19	2s	0.045	
SEMiX302GB176HDs	308	200	2.00	130	77	0.1	389	1.50	43	0.15	2s	0.045	
SEMiX353GB176HDs	353	225	2.00	155	85	0.086	428	1.55	45	0.13	3s	0.04	
SEMiX452GB176HDs	437	300	2.00	180	110	0.073	389	1.70	46	0.15	2s	0.045	
SEMiX453GB176HDs	444	300	2.00	215	125	0.071	545	1.50	65	0.11	3s	0.04	
SEMiX604GB176HDs	567	400	2.00	215	165	0.058	740	1.50	95	0.081	4s	0.03	
SEMiX653GB176HDs	619	450	2.00	300	180	0.054	545	1.70	73	0.11	3s	0.04	
SEMiX854GB176HDs	779	600	2.00	300	250	0.045	740	1.70	170	0.081	4s	0.03	
SEMiX353GD176HDc	353	225	2.00	155	85	0.086	428	1.55	45	0.13	33c	0.014	
SEMiX453GD176HDc	444	300	2.00	215	125	0.071	545	1.50	65	0.11	33c	0.014	
SEMiX653GD176HDc	619	450	2.00	300	180	0.054	545	1.70	73	0.11	33c	0.014	

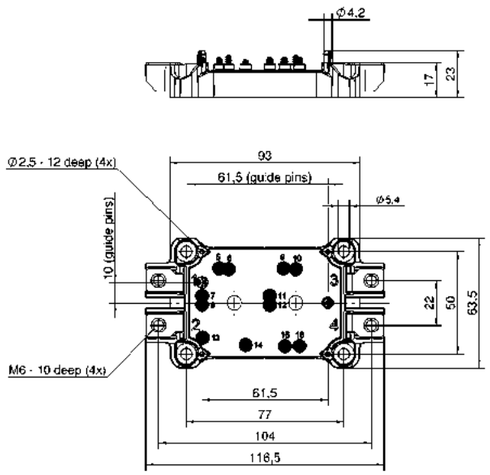
Footnotes: 1) Sample status / 2) In production new

Cases

SEMiX 1s



SEMiX 2s

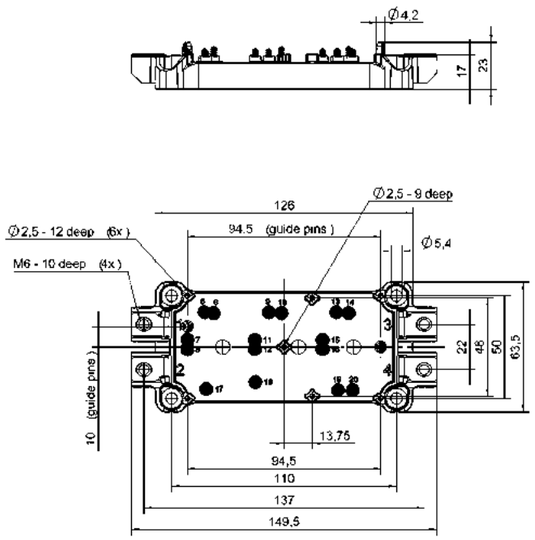


Dimensions in mm

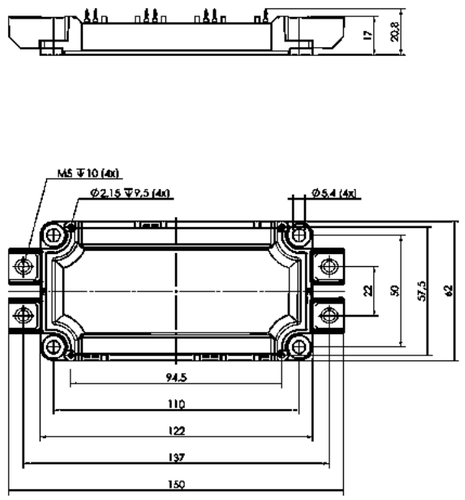
IGBT Modules / SEMiX

Cases

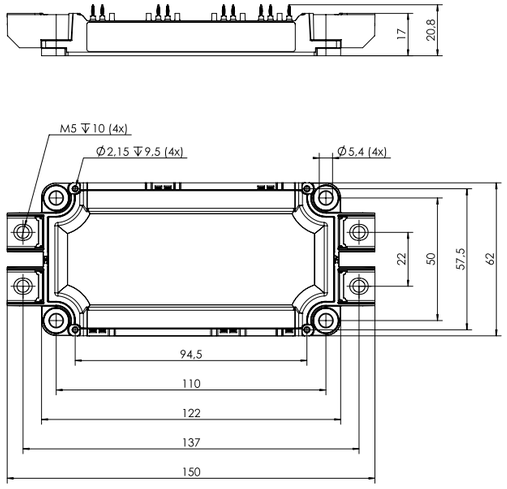
SEMiX 3s



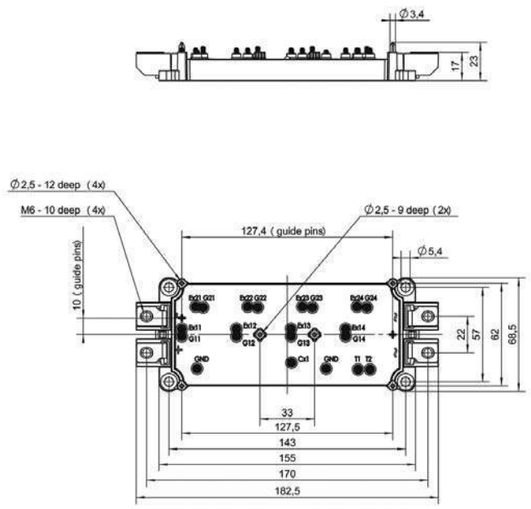
SEMiX 3p



SEMiX 3Ip



SEMiX 4s

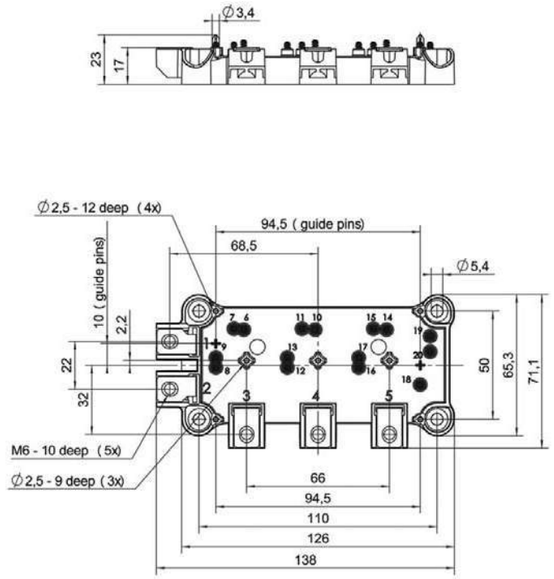


Dimensions in mm

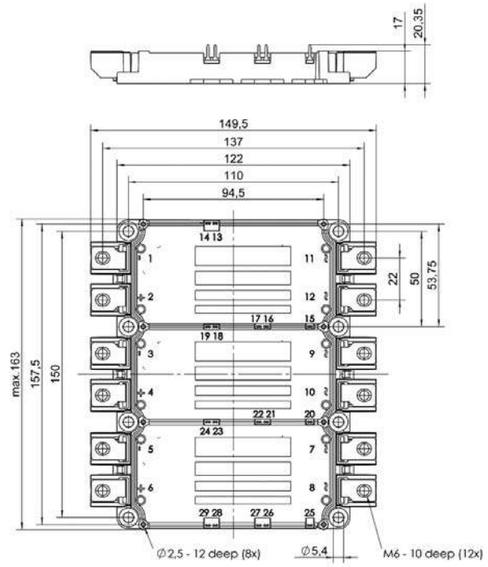
IGBT Modules / SEMiX

Cases

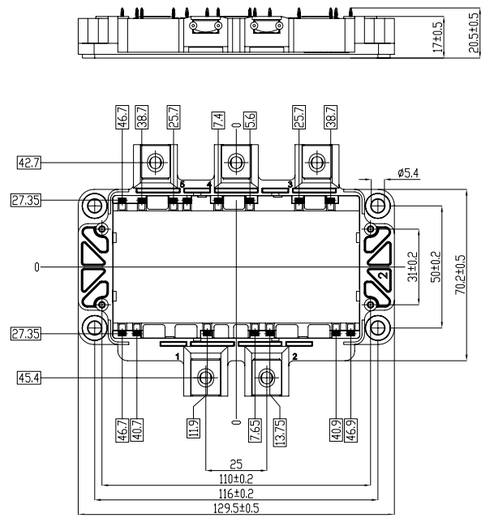
SEMiX 13



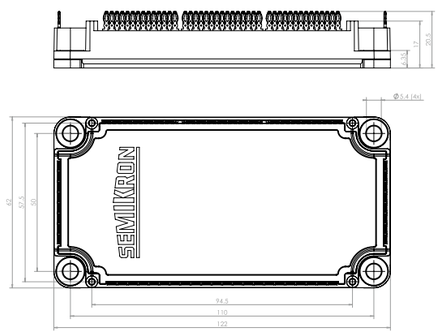
SEMiX 33c



SEMiX 5p

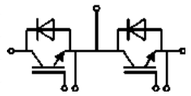
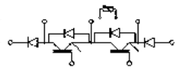
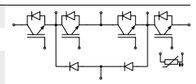
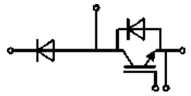
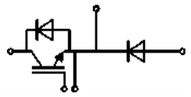
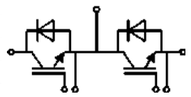
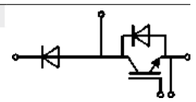
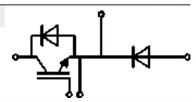
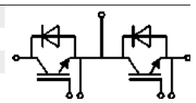
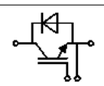
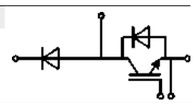


SEMiX 6p



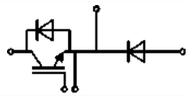
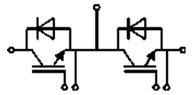
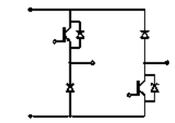
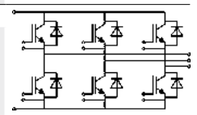
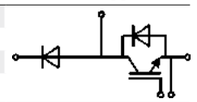
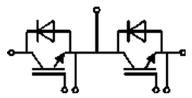
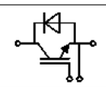
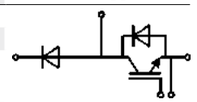
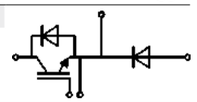
Dimensions in mm

IGBT Modules / SEMITRANS

Type	IGBT						Diode				Module	
	I_C @ T_C = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-c)}$	I_F @ T_C = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-c)}$	Case	Circuit
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		
600V - IGBT3 (Trench)												
SKM145GB066D	195	150	1.46	8.5	5.5	0.3	150	1.40	3.5	0.5	2	
SKM195GB066D	265	200	1.46	14	8	0.22	200	1.40	5.6	0.4	2	
SKM300GB066D	390	300	1.45	7.5	11.5	0.15	350	1.38	10.5	0.25	3	
SKM400GB066D	500	400	1.45	8	16	0.12	450	1.40	14	0.2	3	
SKM600GB066D	760	600	1.45	7.5	29.5	0.08	700	1.40	25	0.125	3	
SKM200GARL066T [2]	280	200	1.45	2.24	7.89	0.21	270	1.45	4	0.39	5	
SKM300GARL066T [2]	393	300	1.45	3.5	10.1	0.15	421	1.54	4	0.28	5	
SKM400GARL066T [1]	504	400	1.45	4.48	15.78	0.12	421	1.54	8	0.28	5	
SKM150MLI066TAT [1]	200	150	1.45	1.7	5.1	0.29	200	1.35	2	0.52	5	
SKM200MLI066TAT [2]	280	200	1.45	2.53	6.82	0.21	270	1.4	4	0.39	5	
SKM300MLI066TAT [2]	400	300	1.45	3.5	10.1	0.15	324	1.35	4	0.25	5	
600V - NPT IGBT (Standard)												
SKM75GAL063D[3]	100	75	2.1	3	2.5	0.35	75	1.55	0.53	0.72	2	
SKM300GAL063D[3]	400	300	2.1	14	13	0.09	250	1.65	4	0.25	3	
SKM75GAR063D[3]	100	75	2.1	3	2.5	0.35	75	1.55	0.53	0.72	2	
SKM300GAR063D[3]	400	300	2.1	14	13	0.09	250	1.65	4	0.25	3	
SKM50GB063D[3]	70	50	2.10	2.5	1.8	0.5	75	1.35	0.48	1	2	
SKM75GB063D[3]	100	75	2.1	3	2.5	0.35	75	1.55	0.53	0.72	2	
SKM100GB063D[3]	130	100	2.1	4	3	0.27	100	1.55	1.5	0.6	2	
SKM200GB063D[3]	260	200	2.1	11	7.5	0.14	200	1.55	2.1	0.3	3	
SKM300GB063D[3]	400	300	2.1	14	13	0.09	250	1.65	4	0.25	3	
650V - IGBT3 (Trench)												
SKM195GAL07E3 [2]	266	200	1.46	6.3	8.3	0.22	217	1.39	4.2	0.4	2	
SKM300GAL07E3 [2]	382	300	1.45	3	14	0.15	335	1.40	6.4	0.25	3	
SKM195GAR07E3 [2]	266	200	1.46	6.3	8.3	0.22	217	1.39	4.2	0.4	2	
SKM300GAR07E3 [2]	382	300	1.45	3	14	0.15	335	1.40	6.4	0.25	3	
SKM195GB07E3 [2]	266	200	1.46	6.3	8.3	0.22	217	1.39	4.2	0.4	2	
SKM300GB07E3 [2]	382	300	1.45	3	14	0.15	335	1.40	6.4	0.25	3	
SKM400GB07E3 [2]	506	400	1.45	4	17	0.12	449	1.39	12	0.19	3	
SKM600GB07E3 [2]	758	600	1.45	4.7	37	0.08	770	1.40	9.3	0.104	3	
1200V - NPT IGBT (Ultrafast)												
SKM600GA125D	580	400	3.3	30	22	0.041	500	2.00	24	0.09	4	
SKM800GA125D	760	600	3.20	88	48	0.03	720	2.3	28	0.07	4	
SKM200GAL125D	200	150	3.3	14	8	0.09	200	2.06	8	0.25	3	
SKM400GAL125D	400	300	3.3	17	18	0.05	390	2.06	16	0.125	3	

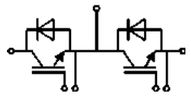
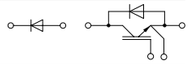
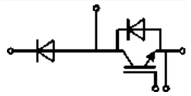
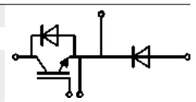
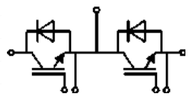
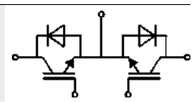
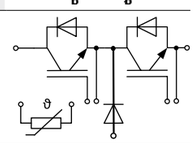
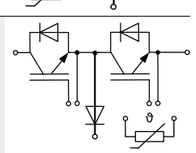
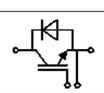
Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs / 11) Values at T_j=150°C

IGBT Modules / SEMITRANS

Type	IGBT						Diode				Module	
	I_C @ T_C = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-c)}$	I_F @ T_C = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-c)}$	Case	Circuit
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		
1200V - NPT IGBT (Ultrafast)												
SKM200GAR125D	200	150	3.3	14	8	0.09	200	2.06	8	0.25	3	
SKM400GAR125D	400	300	3.3	17	18	0.05	390	2.06	16	0.125	3	
SKM100GB125DN	100	75	3.3	9	3.5	0.18	95	2.06	4	0.5	2N	
SKM200GB125D	200	150	3.3	14	8	0.09	200	2.06	8	0.25	3	
SKM300GB125D	300	200	3.3	16	11	0.075	260	2.00	13	0.18	3	
SKM400GB125D	400	300	3.3	17	18	0.05	390	2.06	16	0.125	3	
SKM25GAH125D [2]	39	25	3.20	3.9	1.6	0.56	47	2.13	1.1	1	6	
SKM25GD125D [2]	39	25	3.20	3.9	1.6	0.56	47	2.13	1.1	1	6	
SKM50GD125D [2]	73	50	3.20	8	3.2	0.32	77	2.00	2.1	0.6	6	
1200V - IGBT3 (Trench)												
SKM600GA126D	660	400	1.70	39	64	0.055	490	1.60	41	0.125	4	
SKM800GA126D	910	600	1.70	65	95	0.042	703	1.60	59	0.09	4	
SKM195GAL126D	220	150	1.71	16	24.5	0.16	143	2.00	5.8	0.32	2	
SKM200GAL126D	260	150	1.71	18	24	0.13	200	1.60	18	0.3	3	
SKM400GAL126D	470	300	1.69	29	48	0.08	352	1.60	27	0.18	3	
SKM600GAL126D	660	400	1.70	39	64	0.055	490	1.60	41	0.125	3	
SKM195GB126D	220	150	1.71	16	24.5	0.16	143	2.00	5.8	0.32	2	
SKM200GB126D	260	150	1.71	18	24	0.13	200	1.60	18	0.3	3	
SKM300GB126D	310	200	1.70	21	33	0.12	250	1.60	18	0.25	3	
SKM400GB126D	470	300	1.69	29	48	0.08	352	1.60	27	0.18	3	
SKM600GB126D	660	400	1.70	39	64	0.055	490	1.60	41	0.125	3	
1200V - V-IGBT												
SKM300GA12V	420	300	1.84	23	33	0.11	353	2.17	21	0.17	4	
SKM400GA12V	612	400	1.74	39	42	0.072	440	2.20	26	0.14	4	
SKM600GA12V	908	600	1.75	76	76	0.049	707	2.14	43	0.086	4	
SKM150GAL12V	231	150	1.75	13.5	14.2	0.19	189	2.14	8.9	0.31	2	
SKM200GAL12VL2 [2]	299	200	1.86	24	22	0.14	189	2.14	8.5	0.31	2	
SKM400GAL12V	612	400	1.74	39	42	0.072	440	2.20	26	0.14	3	
SKM150GAR12V [1]	231	150	1.75	13.5	14.2	0.19	189	2.14	8.9	0.31	2	
SKM400GAR12V	612	400	1.74	39	42	0.072	440	2.20	26	0.14	3	

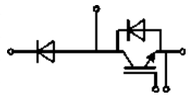
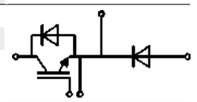
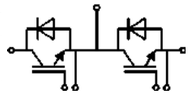
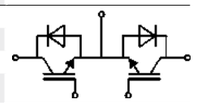
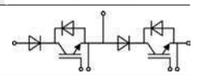
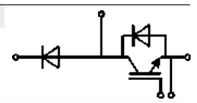
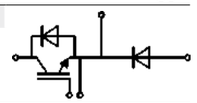
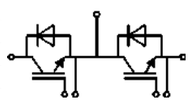
Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs / 11) Values at T_j=150°C

IGBT Modules / SEMITRANS

Type	IGBT						Diode				Module	
	I_C @ T_C = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-c)}$	I_F @ T_C = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-c)}$	Case	Circuit
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		
1200V - V-IGBT												
SKM50GB12V	77	50	1.84	4.9	4.5	0.53	65	2.22	2.8	0.84	2	
SKM75GB12V	114	75	1.84	6.7	7.1	0.38	97	2.17	4.2	0.58	2	
SKM100GB12V	159	100	1.75	10.7	8.7	0.27	121	2.20	5.7	0.48	2	
SKM150GB12V	231	150	1.75	13.5	14.2	0.19	189	2.14	8.9	0.31	2	
SKM150GB12VG	222	150	1.86	10	16.5	0.2	187	2.17	11	0.31	3	
SKM200GB12V	311	200	1.76	14	22	0.14	229	2.20	13	0.26	3	
SKM300GB12V	420	300	1.84	23	33	0.11	353	2.17	21	0.17	3	
SKM400GB12V	612	400	1.74	39	42	0.072	440	2.20	26	0.14	3	
1200V - IGBT4 (Trench)												
SKM300GA12E4	422	300	1.85	23.4	35	0.11	353	2.17	22.2	0.17	4	
SKM400GA12E4	616	400	1.80	28	59	0.072	461	2.20	37	0.13	4	
SKM600GA12E4	913	600	1.80	74	84	0.049	707	2.14	38	0.086	4	
SKM900GA12E4	1305	900	1.83	130	121	0.035	871	2.31	53	0.07	4	
SKM600GAE12E4 [1)]	913	600	1.80	81	83	0.049	54	2.41	47	1	5	
SKM200GAL12E4	313	200	1.80	21	27	0.14	229	2.20	13	0.26	3	
SKM300GAL12E4	422	300	1.85	27	39	0.11	353	2.17	23	0.17	3	
SKM400GAL12E4	616	400	1.80	33	56	0.072	461	2.20	30.5	0.13	3	
SKM200GAR12E4	313	200	1.80	21	27	0.14	229	2.20	13	0.26	3	
SKM300GAR12E4	422	300	1.85	27	39	0.11	353	2.17	23	0.17	3	
SKM400GAR12E4	616	400	1.80	33	56	0.072	461	2.20	30.5	0.13	3	
SKM200GB12E4	313	200	1.80	21	27	0.14	229	2.20	13	0.26	3	
SKM300GB12E4	422	300	1.85	27	39	0.11	353	2.17	23	0.17	3	
SKM400GB12E4	616	400	1.80	33	56	0.072	461	2.20	30.5	0.13	3	
SKM450GB12E4	700	450	1.84	32	60	0.062	461	2.31	28	0.13	3	
SKM600GB12E4 [1)]	860	600	1.80	75	84	0.049	623	2.12	38	0.095	3	
SKM450GM12E4 [1)]	700	450	1.84	32	60	0.062	461	2.31	28	0.13	3	
SKM1200MLI12TE4 [2)]	2082	1200	1.80	108	189	0.021	1065	2.46	76	0.057	10	
SKM1200MLI12BE4 [2)]	2082	1200	1.80	108	189	0.021	1065	2.46	76	0.057	10	
1200V - IGBT4 Fast (Trench)												
SKM300GA12T4	422	300	1.85	23.4	26	0.11	353	2.17	22.2	0.17	4	
SKM400GA12T4	616	400	1.80	28	44	0.072	461	2.20	37	0.13	4	
SKM600GA12T4	913	600	1.80	74	63	0.049	707	2.14	38	0.086	4	

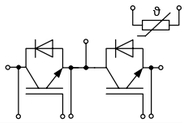
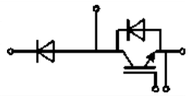
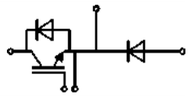
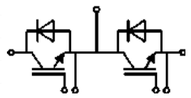
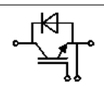
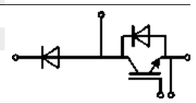
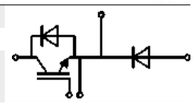
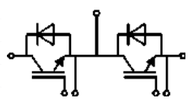
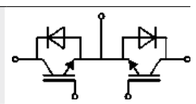
Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs / 11) Values at T_j=150°C

IGBT Modules / SEMITRANS

Type	IGBT						Diode				Module	
	I_C @ T_C = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-c)}$	I_F @ T_C = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-c)}$	Case	Circuit
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		
1200V - IGBT4 Fast (Trench)												
SKM50GAL12T4	81	50	1.85	5.5	4.5	0.53	65	2.22	3.6	0.84	2	
SKM100GAL12T4	160	100	1.80	15	10.2	0.27	121	2.20	5.9	0.48	2	
SKM150GAL12T4	232	150	1.81	19.2	15.8	0.19	189	2.14	13	0.31	2	
SKM200GAL12T4	313	200	1.80	21	20	0.14	229	2.20	13	0.26	3	
SKM300GAL12T4	422	300	1.85	27	29	0.11	353	2.17	23	0.17	3	
SKM400GAL12T4	616	400	1.80	33	42	0.072	461	2.20	30.5	0.13	3	
SKM600GAL12T4 [1)]	913	600	1.80	74	63	0.049	662	2.12	38	0.086	3	
SKM150GAR12T4	232	150	1.81	19.2	15.8	0.19	189	2.14	13	0.31	2	
SKM400GAR12T4	616	400	1.80	33	42	0.072	461	2.20	30.5	0.13	3	
SKM600GAR12T4 [1)]	913	600	1.80	74	63	0.049	662	2.12	38	0.086	3	
SKM50GB12T4	81	50	1.85	5.5	4.5	0.53	65	2.22	3.8	0.84	2	
SKM75GB12T4	115	75	1.85	11	6.9	0.38	97	2.17	4.7	0.58	2	
SKM100GB12T4	160	100	1.80	15	10.2	0.27	121	2.20	5.9	0.48	2	
SKM100GB12T4G	154	100	1.90	16.1	8.6	0.29	118	2.22	6	0.49	3	
SKM150GB12T4	232	150	1.81	19.2	15.8	0.19	189	2.14	13	0.31	2	
SKM150GB12T4G	223	150	1.85	18.7	14.1	0.2	183	2.17	9	0.32	3	
SKM200GB12T4	313	200	1.80	21	20	0.14	229	2.20	13	0.26	3	
SKM300GB12T4	422	300	1.85	27	29	0.11	353	2.17	23	0.17	3	
SKM400GB12T4	616	400	1.80	33	42	0.072	461	2.20	30.5	0.13	3	
SKM450GB12T4 [2)]	699	450	1.84	32	49	0.062	461	2.31	28	0.13	3	
SKM600GB12T4 [1)]	860	600	1.80	75	60	0.049	623	2.12	38	0.095	3	
SKM150GM12T4G	229	150	1.85	19.2	15.8	0.19	187	2.17	13	0.31	3	
SKM200GM12T4	313	200	1.80	21	20	0.14	229	2.20	13	0.26	3	
SKM300GM12T4	422	300	1.85	27	29	0.11	353	2.17	23	0.17	3	
SKM400GM12T4	616	400	1.80	33	42	0.072	461	2.20	30.5	0.13	3	
SKM300GBD12T4	422	300	1.85	27	29	0.11	56	2.41	30.5	0.94	3	
1200V - IGBT4 High Speed (Trench) (new product series, target data)												
SKM100GAL12F4 [1)]	142	100	2.05	10	7	0.27	113	2.53	3.8	0.48	2	
SKM400GAL12F4 [1)]	548	400	2.06	26	28	0.072	408	2.53	20	0.14	3	
SKM100GAR12F4 [1)]	142	100	2.05	10	7	0.27	113	2.53	3.8	0.48	2	
SKM400GAR12F4 [1)]	548	400	2.06	26	28	0.072	408	2.53	20	0.14	3	
SKM75GB12F4 [1)]	103	75	2.08	7	5	0.38	94	2.42	3	0.58	2	
SKM100GB12F4 [1)]	142	100	2.05	10	7	0.27	113	2.53	3.8	0.48	2	
SKM150GB12F4 [1)]	201	150	2.05	14	10	0.2	176	2.42	5.8	0.32	2	
SKM150GB12F4G [1)]	201	150	2.05	14	10	0.2	176	2.42	5.8	0.32	3	
SKM200GB12F4 [1)]	279	200	2.06	15	14	0.14	214	2.53	8.5	0.26	3	
SKM300GB12F4 [1)]	380	300	2.06	21	21	0.11	337	2.42	15	0.17	3	
SKM400GB12F4 [1)]	548	400	2.06	26	28	0.072	408	2.53	20	0.14	3	

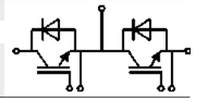
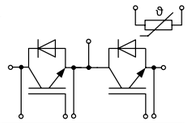
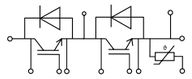
Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs / 11) Values at T_j=150°C

IGBT Modules / SEMITRANS

Type	IGBT I_C @ T_C = 25°C A	IGBT I_{Cnom} A	IGBT $V_{CE(sat)}$ @ T_j = 25°C typ. V	IGBT E_{on} mJ	IGBT E_{off} mJ	IGBT $R_{th(j-c)}$ K/W	Diode I_F @ T_C = 25°C A	Diode V_F @ T_j = 25°C typ. V	Diode E_{rr} mJ	Diode $R_{th(j-c)}$ K/W	Module Case	Circuit
1200V - IGBT4 High Power (Trench)												
SKM1400GB12P4 2)	2165	1400	1.75	150	277	0.02	1768	2.06	85	0.033	10	
1700V - IGBT3 (Trench)												
SKM600GA176D	660	400	2.00	255	155	0.044	600	1.6	102	0.09	4	
SKM800GA176D	830	600	2.00	335	245	0.04	630	1.6	155	0.07	4	
SKM145GAL176D	160	100	2.00	60	38	0.19	140	1.6	27.5	0.36	2	
SKM200GAL176D	260	150	2.01	93	58	0.12	210	1.70	31	0.25	3	
SKM400GAL176D	432	300	1.99	170	118	0.075	440	1.70	78	0.125	3	
SKM400GAR176D	432	300	1.99	170	118	0.075	440	1.70	78	0.125	3	
SKM75GB176D	80	50	2.00	25	18	0.38	80	1.70	14.5	0.55	2	
SKM100GB176D	125	75	1.98	44	28.5	0.24	100	1.6	21.4	0.45	2	
SKM145GB176D	160	100	2.00	60	38	0.19	140	1.6	27.5	0.36	2	
SKM200GB176D	260	150	2.01	93	58	0.12	210	1.70	31	0.25	3	
SKM400GB176D	432	300	1.99	170	118	0.075	440	1.70	78	0.125	3	
1700V - IGBT4 (Trench)												
SKM600GA17E4	1021	600	1.90	258	246	0.042	629	1.98	132	0.095	4	
SKM100GAL17E4	164	100	1.90	43	39	0.234	113	2.00	26	0.504	2	
SKM200GAL17E4	321	200	1.90	69	79	0.122	213	2.00	45	0.276	3	
SKM400GAL17E4	614	400	1.92	156.5	180	0.066	443	2.00	130	0.13	3	
SKM100GAR17E4	164	100	1.90	43	39	0.234	113	2.00	26	0.504	2	
SKM200GAR17E4	321	200	1.90	69	79	0.122	213	2.00	45	0.276	3	
SKM400GAR17E4	614	400	1.92	156.5	180	0.066	443	2.00	130	0.13	3	
SKM75GB17E4	125	75	1.93	30	29	0.304	88	2.00	21	0.632	2	
SKM100GB17E4	164	100	1.90	43	39	0.234	113	2.00	26	0.504	2	
SKM150GB17E4	261	150	1.90	67	59	0.162	169	1.98	32	0.345	2	
SKM150GB17E4G	242	150	1.90	39	59	0.161	163	2.00	33	0.356	3	
SKM200GB17E4	321	200	1.90	69	79	0.122	213	2.00	45	0.276	3	
SKM300GB17E4	476	300	1.91	88	121	0.083	314	2.00	77	0.19	3	
SKM400GB17E4	614	400	1.92	156.5	180	0.066	443	2.00	130	0.13	3	
SKM400GM17E4	614	400	1.92	156.5	180	0.066	443	2.00	130	0.13	3	

Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs / 11) Values at T_j=150°C

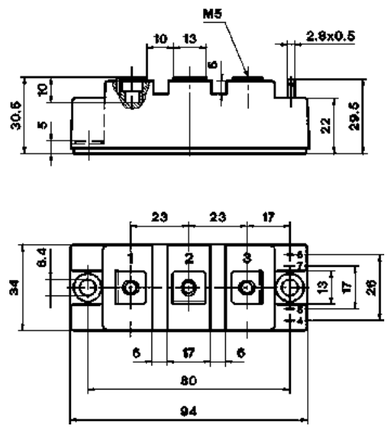
IGBT Modules / SEMITRANS

Type	IGBT I_C @ T_C = 25°C A	IGBT I_{Cnom} A	IGBT $V_{CE(sat)}$ @ T_j = 25°C typ. V	IGBT E_{on} mJ	IGBT E_{off} mJ	IGBT $R_{th(j-c)}$ K/W	Diode I_F @ T_C = 25°C A	Diode V_F @ T_j = 25°C typ. V	Diode E_{rr} mJ	Diode $R_{th(j-c)}$ K/W	Module Case	Circuit
1700V - IGBT4 (Trench) chip - dedicated for humid environment (target data)												
SKM75GB17E4H16 2)	132	75	1.93	37	29	0.304	88	2.00	18	0.632	2	
SKM150GB17E4GH16 2)	255	150	1.96	69	59	0.161	163	2.00	36	0.356	3	
SKM300GB17E4H16 2)	500	300	1.97	106	122	0.083	314	2.00	71	0.19	3	
1700V - Renesas Gen 8												
SKM1000GB17R8 2)	1574	1000	1.66	465	332	0.03	1449	1.78	159	0.042	10	
SKM1400GB17R8 2)	2337	1400	1.63	866	495	0.02	1874	1.84	253	0.032	10	
3300V - N-Channel F-IGBT (new product series, target data)												
SKM450GB33F 2) 11)	760	450	2.07	601	601	0.035	674	2.05	542	0.055	20	

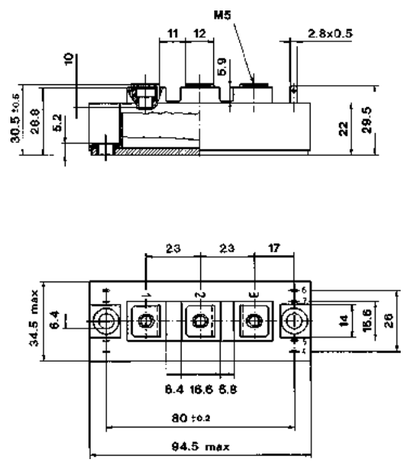
Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs / 11) Values at T_j=150°C

Cases

SEMITRANS 2



SEMITRANS 2N

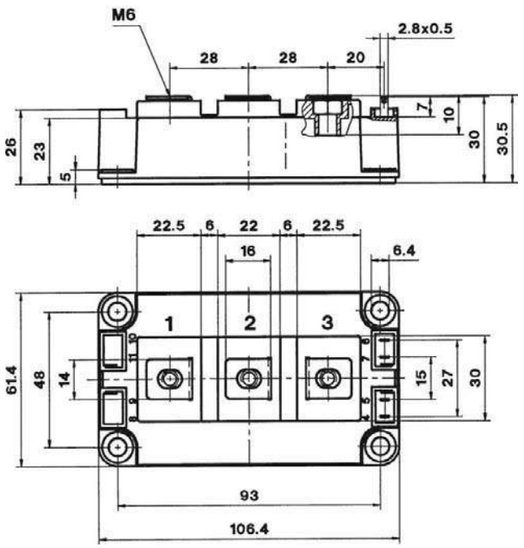


Dimensions in mm

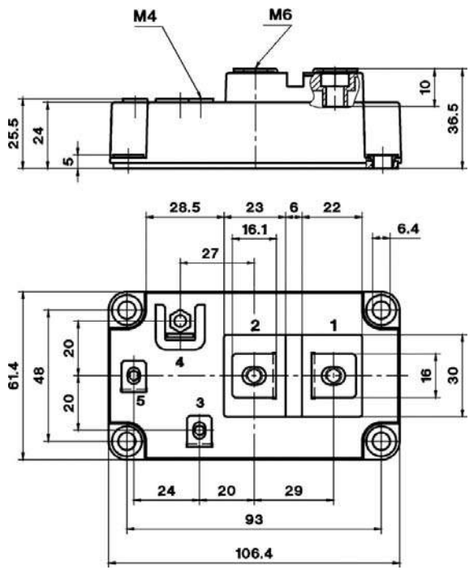
IGBT Modules / SEMITRANS

Cases

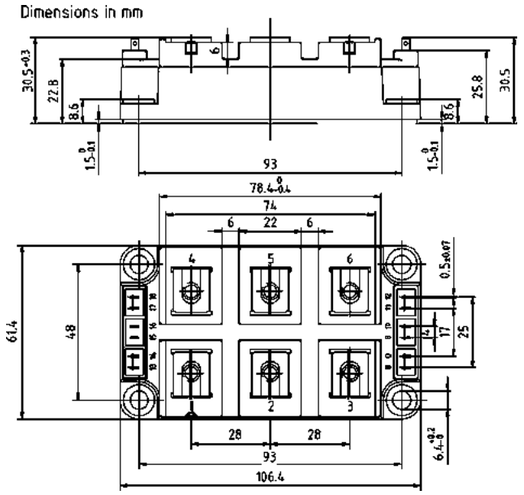
SEMITRANS 3



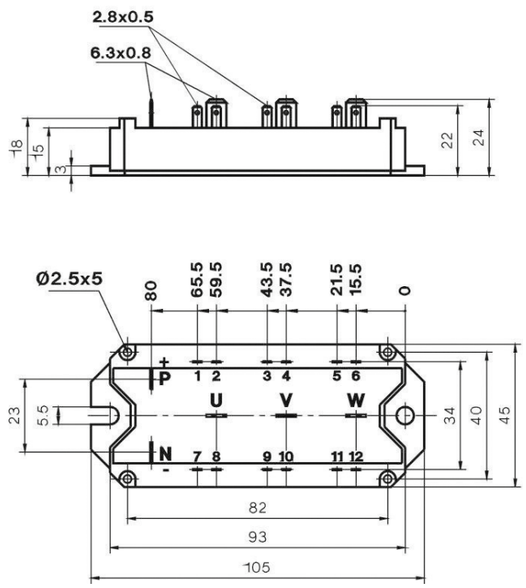
SEMITRANS 4



SEMITRANS 5



SEMITRANS 6

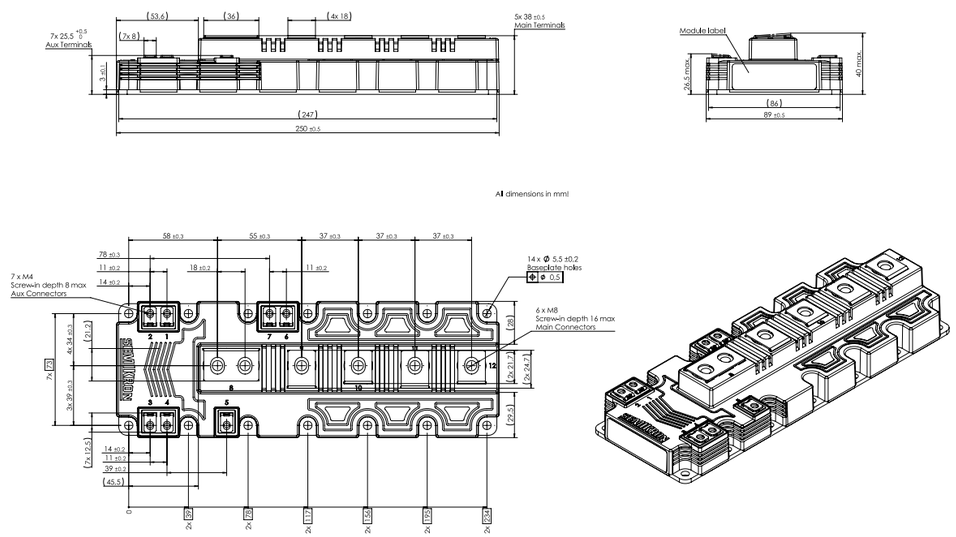


Dimensions in mm

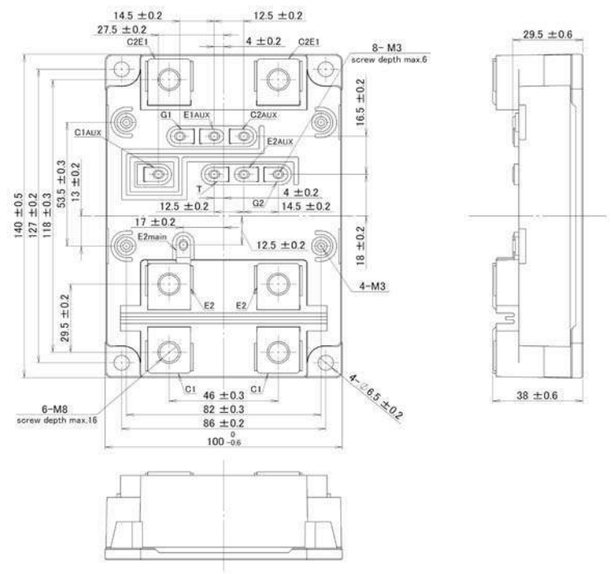
IGBT Modules / SEMITRANS

Cases

SEMITRANS 10

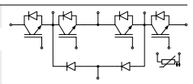
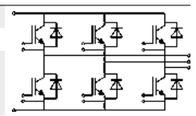
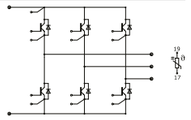
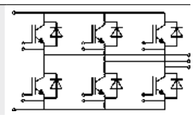
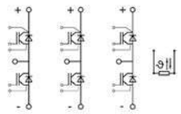
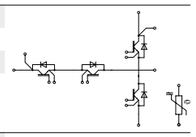
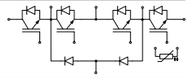
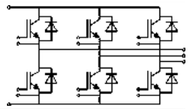
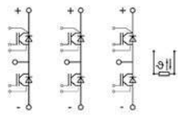


SEMITRANS 20



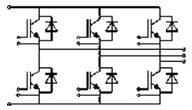
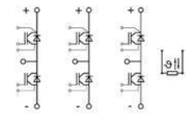
Dimensions in mm

IGBT Modules / SKiM 4/5

Type	IGBT						Diode				Module	
	I_C @ T_S = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @ T_S = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-s)}$	Case	
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		Circuit
600V - IGBT3 (Trench)												
SKiM301MLI07E4 [2]	252	300	1.55	2.8	17	0.3	177	1.40	-	0.53	4	
SKiM401MLI07E4 [2]	314	400	1.55	3.3	21	0.25	289	1.40	1.8	0.31	4	
SKiM601MLI07E4 [2]	433	600	1.55	6.1	44	0.19	318	1.39	2.4	0.31	4	
1200V - IGBT3 (Trench)												
SKiM200GD126D [3]	-	200	1.65	15	25	-	152	2.39	-	0.35	4	
SKiM300GD126D	265	300	1.70	28	47	0.2	260	1.92	-	0.285	4	
SKiM300GD126DL	265	300	1.65	28	47	0.2	260	1.92	-	0.285	4	
SKiM400GD126DM	330	300	1.70	29	46	0.134	300	1.92	-	0.19	4	
SKiM400GD126DLM	330	300	1.65	29	46	0.134	300	1.92	-	0.19	4	
SKiM450GD126D	390	450	1.70	42	70	0.13	345	1.92	-	0.19	5	
SKiM450GD126DL [3]	390	450	1.65	42	70	0.13	345	1.92	-	0.19	5	
SKiM600GD126DLM	480	450	1.65	42	70	0.09	450	1.92	-	0.125	5	
SKiM601GD126DM	480	450	1.70	42	70	0.09	450	1.92	-	0.125	5	
1200V - IGBT4 (Trench)												
SKiM301TMLI12E4B [2]	311	300	1.80	6.6	19	0.19	249	2.20	1.8	0.29	4	
SKiM301TMLI12E4C [1]	294	300	1.80	6.6	19	0.21	274	2.20	1.8	0.25	4	
SKiM401TMLI12E4B	388	400	1.80	8.8	26	0.16	311	2.20	2.4	0.24	4	
SKiM601TMLI12E4B	529	600	1.80	11	45	0.125	495	2.14	4.4	0.15	4	
SKiM201MLI12E4 [2]	206	200	1.80	15	23	0.29	187	2.20	15	0.36	4	
SKiM301MLI12E4	311	300	1.80	22	34	0.19	282	2.20	15	0.24	4	
SKiM304GD12T4D [3]	312	300	1.80	-	-	0.19	221	2.33	-	0.25	4	
SKiM455GD12T4D1 [3]	400	450	1.80	34	40	0.14	295	2.33	28	0.19	5	

Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs

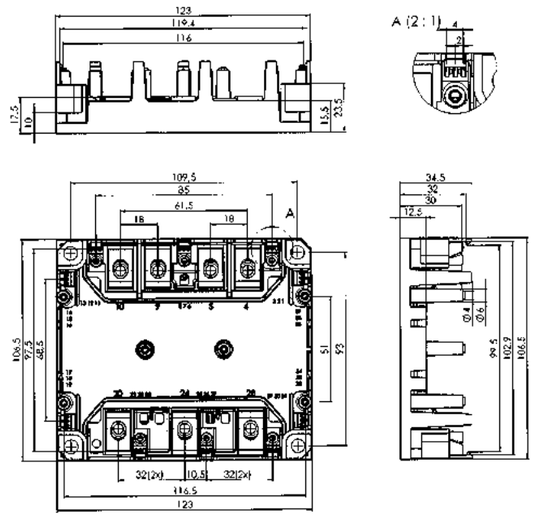
IGBT Modules / SKiM 4/5

Type	IGBT						Diode				Module	
	I_C @ T_S = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @ T_S = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-s)}$	Case	
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		Circuit
1700V - IGBT3 (Trench)												
SKiM120GD176D	110	125	2.00	72	46	0.4	105	1.6	22	0.56	4	
SKiM220GD176DH4	220	250	2.00	145	100	0.21	220	1.7	65	0.26	4	
SKiM270GD176D	260	300	2.00	170	120	0.175	215	1.7	-	0.29	5	

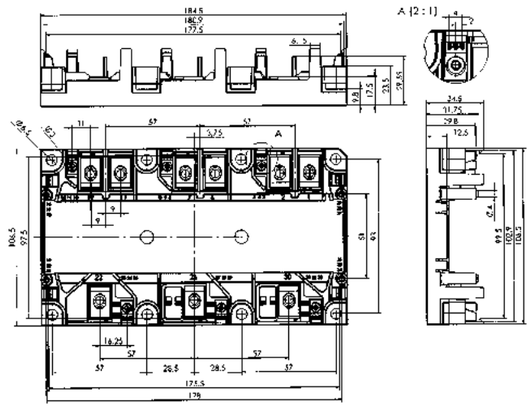
Footnotes: 1) Sample status / 2) In production new / 3) Not for new designs

Cases

SKiM 4

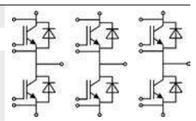
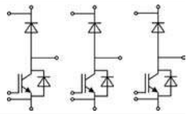
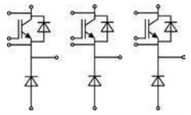
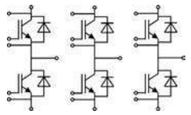
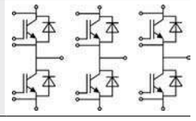


SKiM 5



Dimensions in mm

IGBT Modules / SKiM 63/93

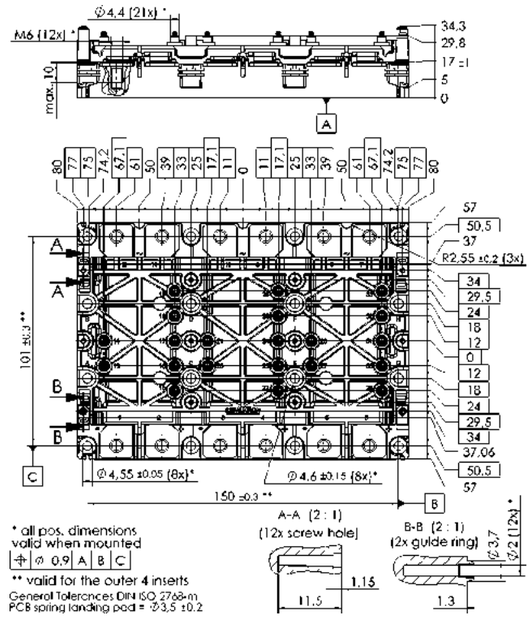
Type	IGBT						Diode				Module	
	I_C @ T_S = 25°C	I_{Cnom}	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @ T_S = 25°C	V_F @ T_j = 25°C typ.	E_{rr}	$R_{th(j-s)}$	Case	
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		Circuit
600V - IGBT3 (Trench)												
SKiM406GD066HD[10)]	468	400	1.45	8	25	0.135	360	1.53	12	0.243	63	
SKiM606GD066HD[10)]	640	600	1.45	16	53	0.105	462	1.52	21	0.201	63	
SKiM909GD066HD[10)]	897	900	1.45	36	88	0.078	690	1.52	29	0.135	93	
1200V - IGBT4 (Trench)												
SKiM609GAL12E4[2)]	748	600	1.85	136	83	0.068	1397	1.7	39	0.048	93	
SKiM609GAR12E4[2)]	748	600	1.85	136	83	0.068	1397	1.7	39	0.048	93	
SKiM306GD12E4[10)]	410	300	1.85	19	39	0.116	305	2.14	21	0.218	63	
SKiM459GD12E4[10)]	554	450	1.85	22	57	0.092	438	2.14	40	0.155	93	
1700V - IGBT4 (Trench)												
SKiM429GD17E4HD[2) 10)]	595	420	1.90	245	180	0.079	411	1.66	99	0.169	93	

Footnotes: 2) In production new / 10) Also available with new HpTp, see Accessories/Thermal Interface Materials

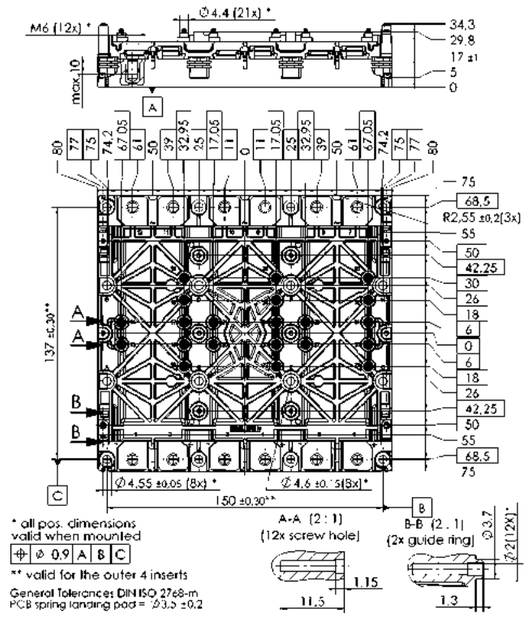
IGBT Modules / SKiM 63/93

Cases

SKiM 63

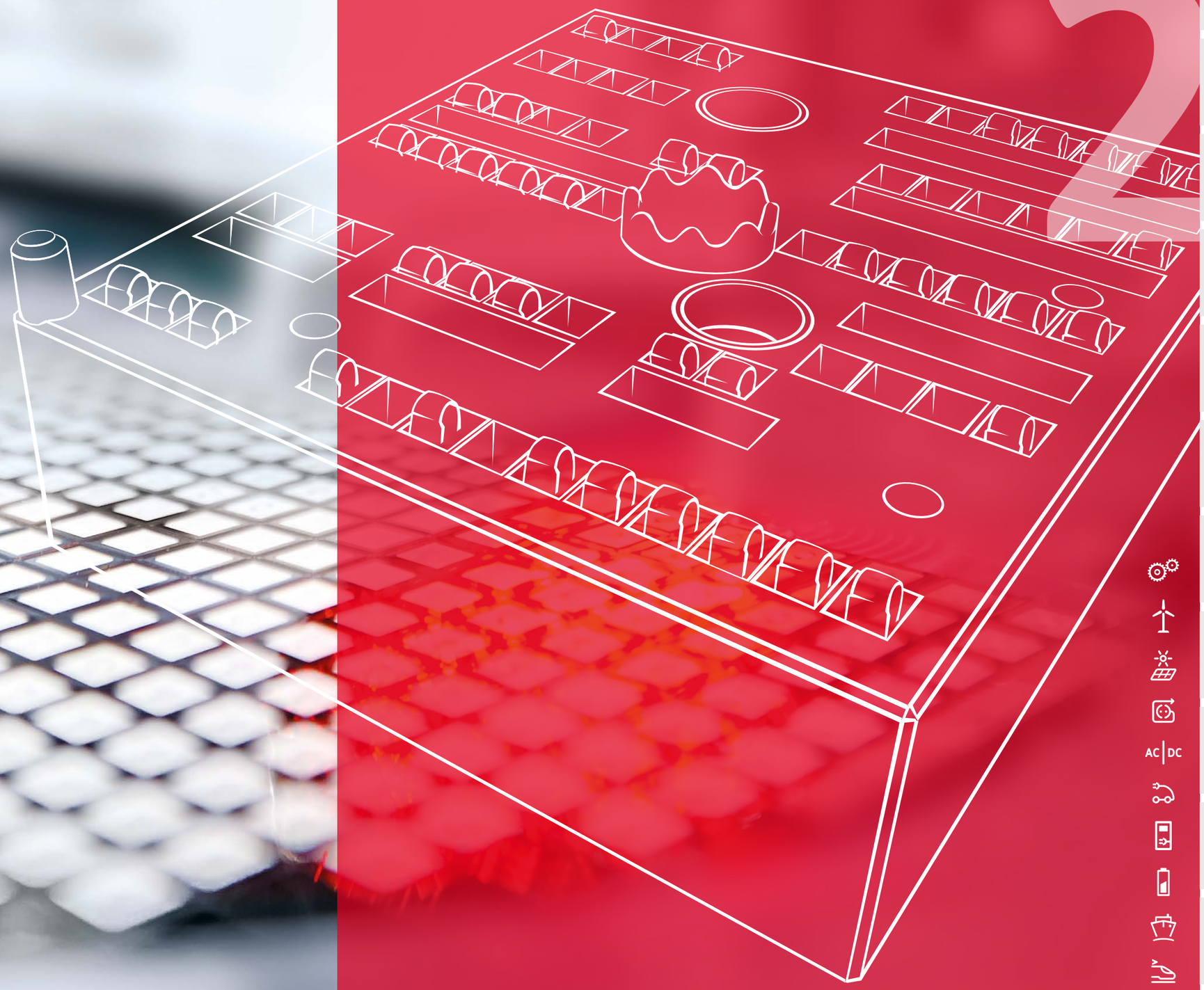


SKiM 93



Dimensions in mm

Silicon Carbide Modules



Product Classes

Full Silicon Carbide Modules
Highest Power Output and Efficiency

SEMIKRON offers full silicon carbide power modules in MiniSKiiP, SEMITOP and SEMITRANS housings. By using SiC MOSFETs of the leading suppliers highest output power and power densities are reached in combination with high switching frequencies, lowest losses and maximum efficiency.

Through the increase of switching frequency the passive filter components can be reduced drastically. Power losses are reduced at the same time which lead to smaller heat sinks and less cooling effort in general. Both benefits result in a major decrease of system cost.

The Full Silicon Carbide Power Modules are available from 20A to 540A in 1200V, with and without anti-parallel free-wheeling Schottky diode.

Covered topologies are 6-packs in classic configuration but also with split output to enable a flexible adaption to your application. Further half bridges and boost converters including a bypass diode are available.

Full SiC	
MiniSKiiP	98
SEMITOP	100
SEMITOP E1/E2	102
SEMITRANS	103
SEMIPACK	104

Hybrid SiC	
MiniSKiiP	108
SEMITOP	109
SEMiX Press-Fit	110
SEMITRANS	111
SKiM 63/93	112

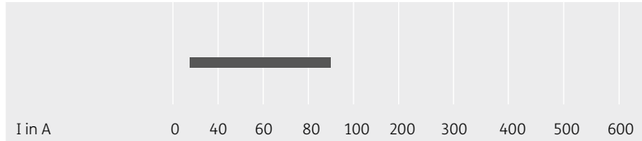
For detailed information please refer to data sheets.

Further information
http://www.semikron.com/full-sic
http://www.semikron.com/hybrid-sic

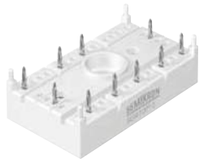
Full SiC

MiniSKiiP®
6-pack

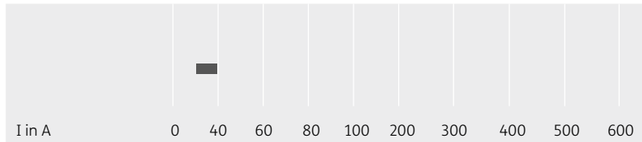
1200V



SEMITOP®
6-pack
chopper
H-bridge
half-bridge

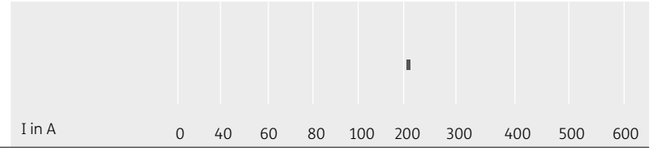


1200V



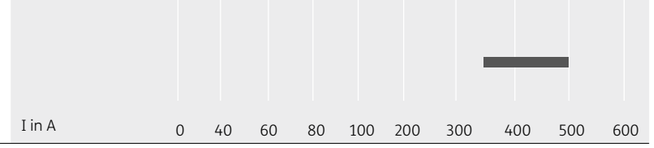
SEMITOP®E1/E2
half-bridge

1200V



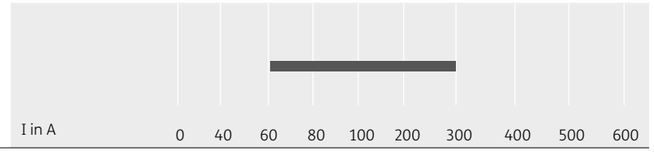
SEMITRANS®
half-bridge

1200V

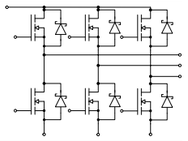
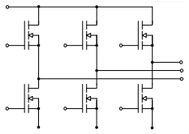
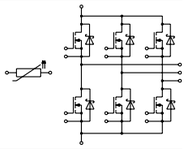


SEMIPACK®2
rectifier single-switch

1200V



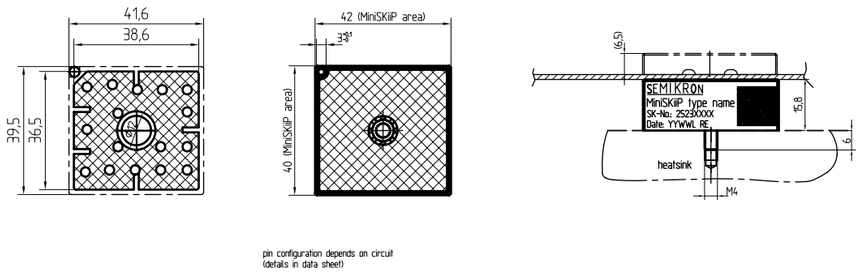
SiC Modules / Full SiC / MiniSKiiP

Type	V_{DS} V	I_D @ T_C = 25°C A	$R_{DS(on)}$ @ T_j = 25°C typ. mΩ	$R_{th(j-s)}$ K/W	Case	Circuit
1200V - SiC MOSFET						
SKiiP 13ACM12V17 1)	1200	25	80	1.5	II 1	
SKiiP 13ACM12V18 1)	1200	25	80	1.5	II 1	
SKiiP 26ACM12V17 1)	1200	72	23	0.6	II 2	

Footnotes: 1) Sample status

Cases

MiniSKiiP II 1

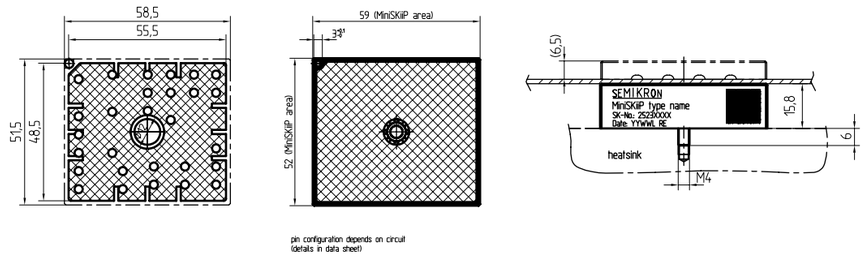


Dimensions in mm

SiC Modules / Full SiC / MiniSKiiP

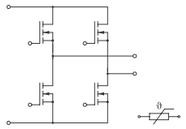
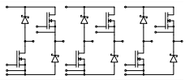
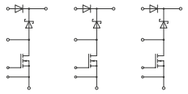
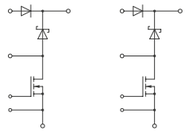
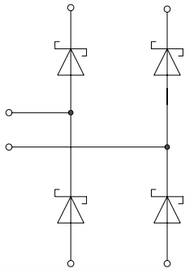
Cases

MiniSKiiP II 2



Dimensions in mm

SiC Modules / Full SiC / SEMITOP

Type	V_{DS} V	I_D @ T_C = 25°C A	$R_{DS(on)}$ @ T_j = 25°C typ. mΩ	$R_{th(j-s)}$ K/W	Case	Circuit
1200V - SiC MOSFET						
SK45MH120TSCp [1]	1200	40	45	1	2p	
SK25MH120TSCp [1]	1200	26	80	1.4	2p	
SK45MAHT12SCp [2]	1200	39	45	1.04	3p	
SK45MLET12SCp [1]	1200	39	45	1.04	3p	
SK35MLLE120SCp [1]	1200	36	40	1.4	2p	
SEMITOP rectifier module						
SK20KDD12SCp [1]	1200	18	-	2.65	2p	

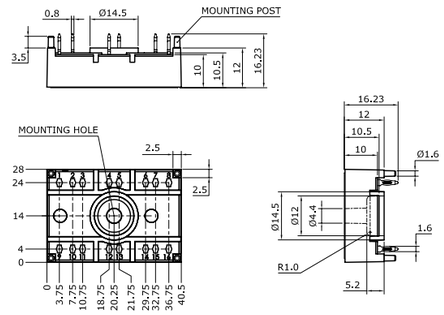
Footnotes: 1) Sample status / 2) In production new

SiC Modules / Full SiC / SEMITOP

Cases

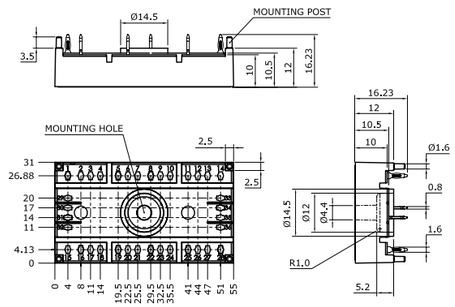
SEMITOP 2 Press-Fit

Dimensions: mm
Tolerance system: ISO 2768-m



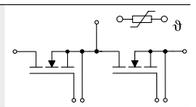
SEMITOP 3 Press-Fit

Dimensions: mm
Tolerance system: ISO 2768-m



Dimensions in mm

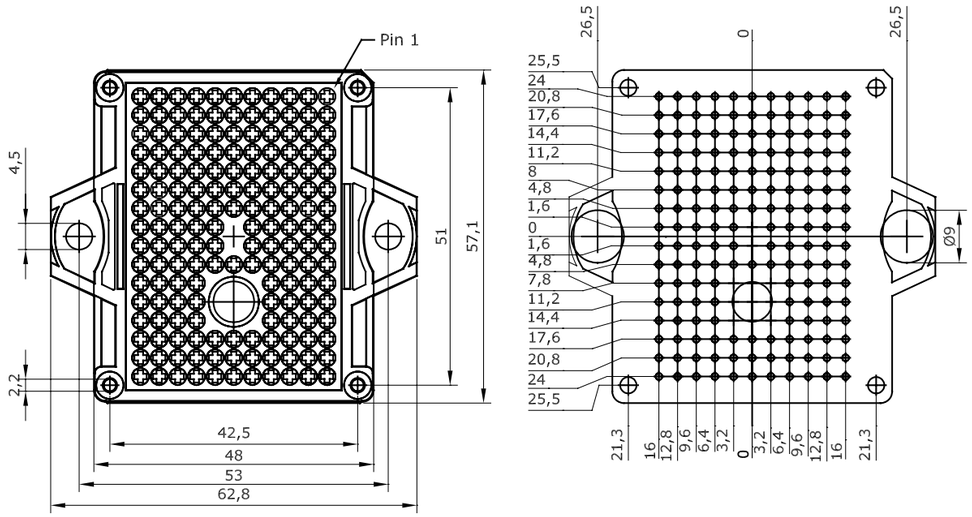
SiC Modules / Full SiC / Semitop E1/E2

Type	V_{DS} V	I_D @ T_C = 25°C A	$R_{DS(on)}$ @ T_j = 25°C typ. mΩ	$R_{th(j-s)}$ K/W	Case	Circuit
1200V - SiC MOSFET						
SK200MB120TSCE2 1)	1200	400	3.7	0.4	E2	

Footnotes: 1) Sample status

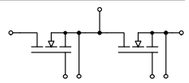
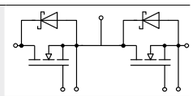
Cases

SEMITOP E2



Dimensions in mm

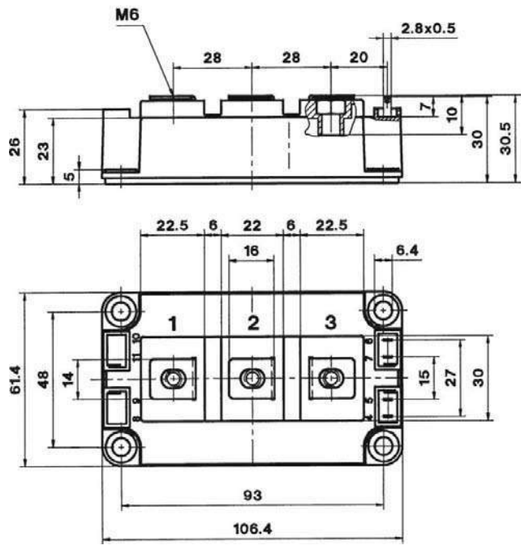
SiC Modules / Full SiC / SEMITRANS

Type	V_{DS} V	I_D @ T_C = 25°C A	$R_{DS(on)}$ @ T_j = 25°C typ. mΩ	$R_{th(j-c)}$ K/W	Case	Circuit
1200V - SiC MOSFET						
SKM350MB120SCH15 1)	1200	523	5.6	0.05	3	
SKM500MB120SC 1)	1200	541	3.8	0.07	3	
SKM350MB120SCH17 1)	1200	523	5.6	0.045	3	

Footnotes: 1) Sample status

Cases

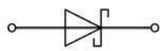
SEMITRANS 3



Dimensions in mm

SiC Modules / Full SiC / SEMIPACK

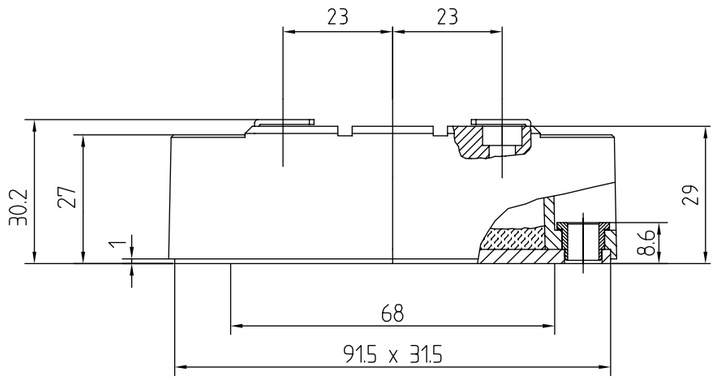
Type

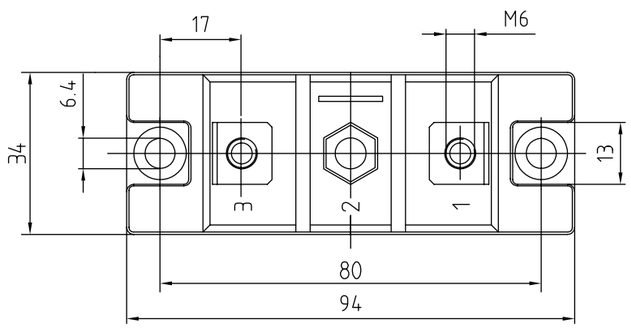
	V_{RRM} V_{DRM}	I_{FAV} @ T_C	T_C	V_{F0} @ T_j = 150°C max.	r_F @ T_j = 150°C max.	$R_{th(j-c)}$	T_j	Case	Circuit
	V	A	°C	V	mΩ	K/W	°C		
SKKE60S12 [1)]	1200	64	85	0.90	15	0.4	-40 ... +175	2	

Footnotes: 1) Sample status

Cases

SEMIPACK 2





Dimensions in mm

Hybrid Silicon Carbide Modules For Maximum Energy Efficiency

SEMIKRON offers hybrid silicon carbide power modules in MiniSKiiP, SEMITRANS, SEMiX 3 Press-Fit and SKiM63/93. Latest IGBT technology is combined with SiC Schottky diodes of the leading suppliers to increase the switching frequency and reduce power losses at the same time.

The hybrid silicon carbide power modules are available from 50A to 600A in 1200V. Covered topologies are 6-packs and half bridges.

SiC Schottky free-wheeling diodes have virtually no switching losses and reduce the turn-on losses of the IGBT drastically. With these effects higher switching frequencies can be reached in the same module package which efficiently lowers the filter efforts on the output side of e.g. solar inverters, UPS systems or high frequency power supplies. Additionally higher output powers compared to standard silicon power modules can be realized.

Full SiC

MiniSKiiP	98
SEMITOP	100
SEMITOP E1/E2	102
SEMITRANS	103
SEMIPACK	104

Hybrid SiC

MiniSKiiP	108
SEMITOP	109
SEMiX Press-Fit	110
SEMITRANS	111
SKiM 63/93	112

For detailed information please refer to data sheets.

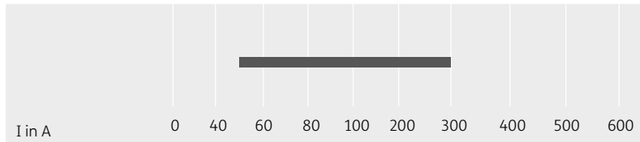
Further information
http://www.semikron.com/full-sic
http://www.semikron.com/hybrid-sic

Hybrid SiC

MiniSkiiP®

half-bridge
6-packs

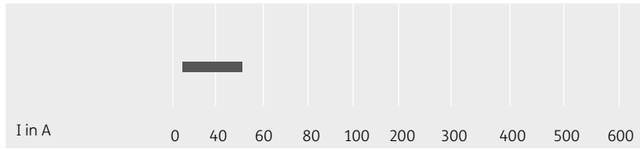
1200V



SEMITOP®

chopper

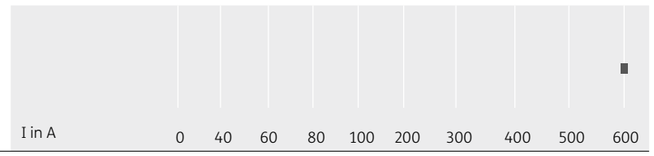
1200V



SEMiX Press-Fit®

half-bridge

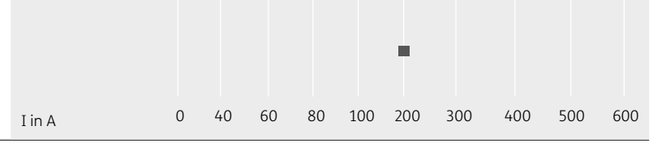
1200V



SEMITRANS®

half-bridge

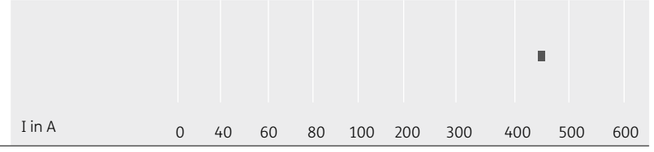
1200V



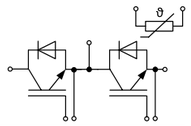
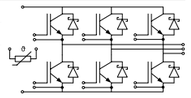
SKiM®63/93

6-pack

1200V



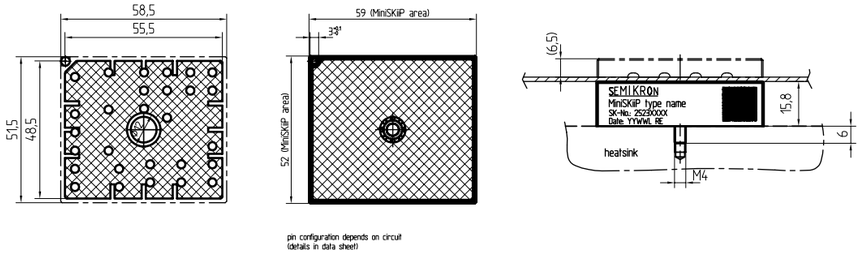
SiC Modules / Hybrid SiC / MiniSKiiP

Type	IGBT						Diode			Module	
	I_C @ T_S= 25°C	Current (A)	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @ T_S = 25°C	V_F	$R_{th(j-s)}$	Case	
	A	A	V	mJ	mJ	K/W	A	V	K/W		Circuit
1200V - IGBT4 (Fast Trench)											
SKiiP 38GB12F4V19 1)	303	300	2.05	10	22	0.16	133	1.40	0.36	II 3	
SKiiP25AC12F4V19 1)	61	50	2.05	2.2	2.8	0.7	45	1.40	1.15	II 2	
SKiiP38AC12F4V19 1)	102	100	2.05	6.4	6.3	0.47	64	1.40	0.9	II 3	
SKiiP39AC12F4V19 1)	144	150	2.05	9.6	9.4	0.35	118	1.40	0.44	II 3	

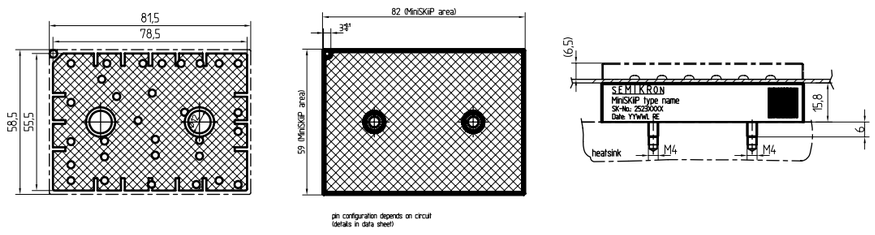
Footnotes: 1) Sample status

Cases

MiniSKiiP II 2

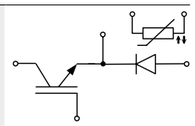
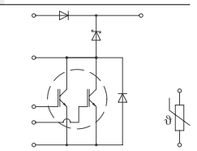


MiniSKiiP II 3



Dimensions in mm

SiC Modules / Hybrid SiC / SEMITOP

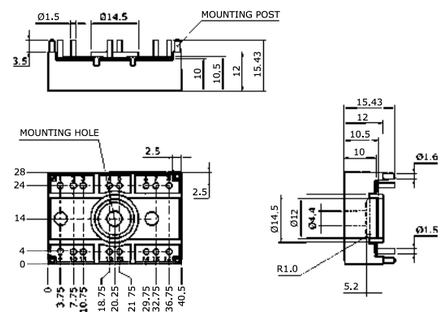
Type	IGBT						Diode			Module	
	I_C @ T_S= 25°C	Current (A)	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}		I_F @ T_S = 25°C	V_F	$R_{th(j-s)}$	Case	
	A	A	V	mJ	mJ	K/W	A	V	K/W		Circuit
1200V - IGBT4 Fast (Trench)											
SK 25 GAR 12F4 TSC 1)	33	25	2.05	2.27	2.7	1.2	21	1.40	2.7	2	
SK 50 GLLE 12F4 TSC 1)	56	50	2.05	4.5	5.4	0.8	67	1.00	1.2	2	

Footnotes: 1) Sample status

Cases

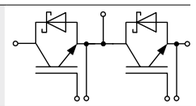
SEMITOP 2

Dimensions: mm
Tolerance system: ISO 2768-m



Dimensions in mm

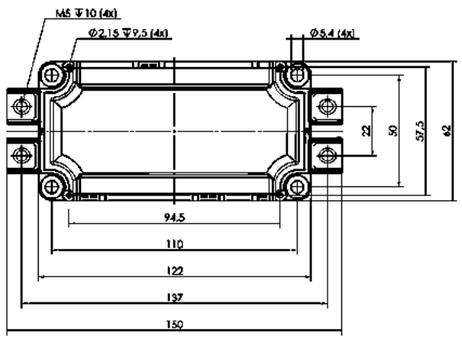
SiC Modules / Hybrid SiC / SEMiX

Type	IGBT						Diode			Module		
	I_C @ T_C = 25°C	Current (A)	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-c)}$	I_F @ T_C = 25°C	V_F	$R_{th(j-c)}$	Case	$R_{th(c-s)}$	
	A	A	V	mJ	mJ	K/W	A	V	K/W		K/W	Circuit
1200V - IGBT4 (Trench)												
SEMiX603GB12E4SiCp	1110	600	1.80	17	72	0.037	404	1.40	0.14	3p	0.012	

Footnotes: 1) Sample status

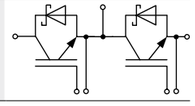
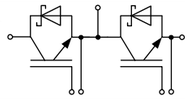
Cases

SEMiX 3p



Dimensions in mm

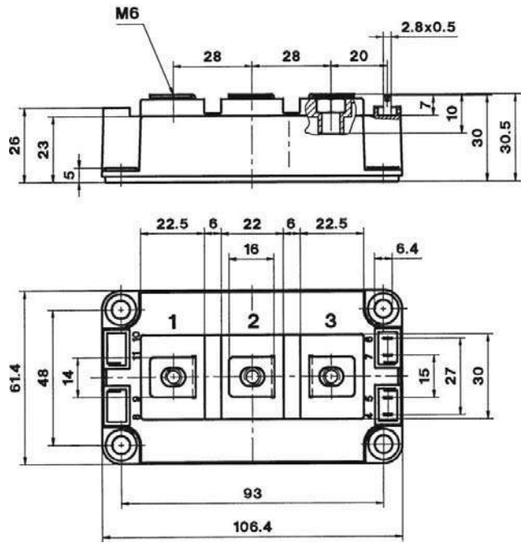
SiC Modules / Hybrid SiC / SEMITRANS

Type	IGBT						Diode			Module		
	I_C @ T_C = 25°C	Current (A)	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-c)}$	I_F @ T_C = 25°C	V_F	$R_{th(j-c)}$	Case	$R_{th(c-s)}$	
	A	A	V	mJ	mJ	K/W	A	V	K/W		K/W	Circuit
1200V - IGBT4 (Trench)												
SKM200GB12T4SiC2 1)	313	200	1.80	7	20	0.14	246	1.40	0.21	3	0.038	
1200V - IGBT4 (Fast Trench)												
SKM200GB12F4SiC2 1)	279	200	2.06	7	17	0.14	246	1.40	0.21	3	0.038	
SKM200GB12F4SiC3 1)	279	200	2.06	7	17	0.14	123	1.40	0.42	3	0.038	

Footnotes: 1) Sample status

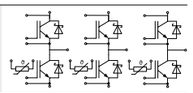
Cases

SEMITRANS 3



Dimensions in mm

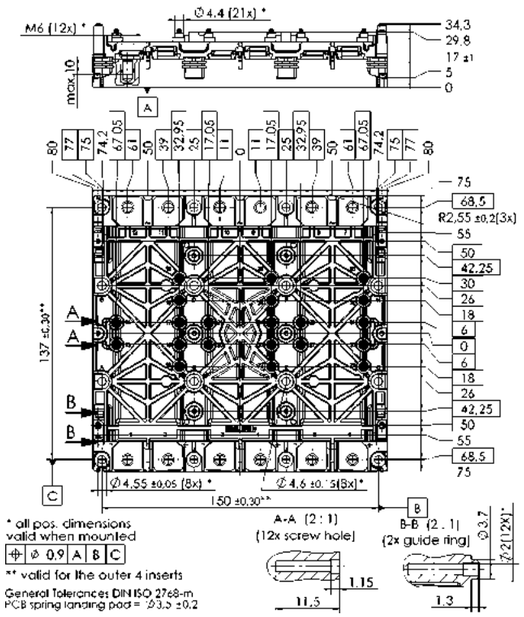
SiC Modules / Hybrid SiC / SKiM 63/93

Type	IGBT						Diode			Module	
	I_C @ T_S = 25°C	Current (A)	$V_{CE(sat)}$ @ T_j = 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @ T_S = 25°C	V_F	$R_{th(j-s)}$	Case	
	A	A	V	mJ	mJ	K/W	A	V	K/W		Circuit
1200V - IGBT4 (Fast Trench)											
SKiM459GD12F4V4 [1)]	435	450	2.05	2	11	0.099	320	1.40	0.172	93	

Footnotes: 1) Sample status

Cases

SKiM 93



Dimensions in mm

MOSFET Modules
Best in Class Switching Performance

SEMIKRON produces MOSFET (Metal Oxide Semiconductor Field Effect Transistor) modules in single switch, halfbridge, H-bridge and 6-pack configuration in SEMITOP and SEMITRANS packages.

The available MOSFET modules in the voltage range from 55V up to 600V and current ratings of 40A up to 290A are especially designed for high-speed switching applications and boast low switching losses.

SEMITOP	118
SEMITRANS	119

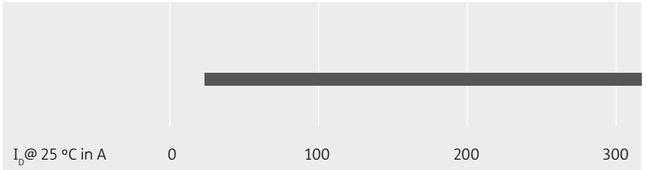
For detailed information please refer to data sheets.

Further information: http://www.semikron.com/mosfet-modules

SEMITOP®

6-pack
H-bridge
half-bridge

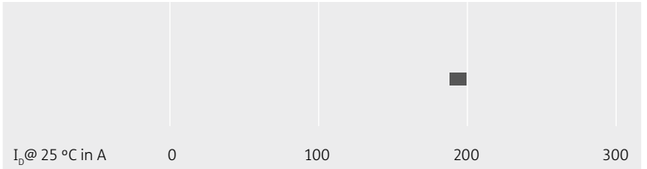
60V up to 100V



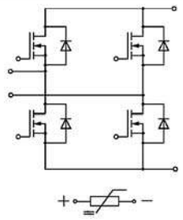
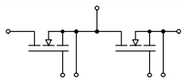
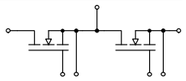
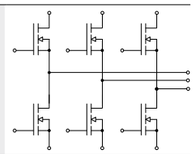
SEMITRANS®

single switch

100V up to 200V



MOSFET Modules / SEMITOP

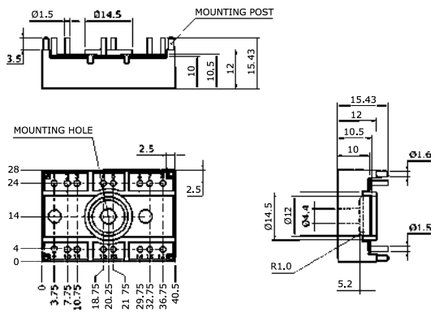
Type	V_{DS} V	I_D @ T_C = 25°C A	$R_{DS(on)}$ @ T_j = 25°C typ. mΩ	$R_{th(j-s)}$ K/W	Case	Circuit
100V						
SK 85 MH 10 T [3]	100	80	-	1.1	2	
SK280MB10 [1]	100	278	1.15	0.68	3	
80V						
SK300MB080 [1]	80	317	0.90	0.68	3	
60V						
SK165MBBB060 [1]	60	190	1.10	1.4	3	

Footnotes: 1) Sample status / 3) Not for new designs

Cases

SEMITOP 2

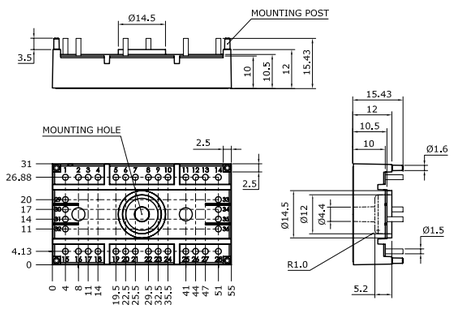
Dimensions: mm
Tolerance system: ISO 2768-m



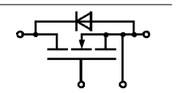
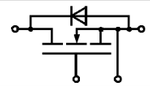
Dimensions in mm

SEMITOP 3

Dimensions: mm
Tolerance system: ISO 2768-m

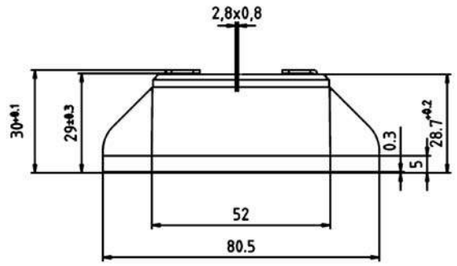


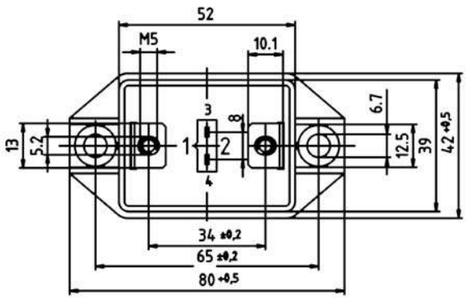
MOSFET Modules / SEMITRANS

Type	V_{DS} V	I_D @ T_C = 25°C A	$R_{DS(on)}$ @ T_j = 25°C typ. mΩ	$R_{th(j-c)}$ K/W	Case	Circuit
100V						
SKM 111 AR	100	200	7	0.18	M1	
SKM 111 RZR	100	200	7	0.18	M1	
200V						
SKM 180 A020	200	180	9	0.18	M1	

Cases

SEMITRANS M1





Dimensions in mm

Thyristor / Diode Modules
With Proven Packages

The SEMIKRON thyristor/diode modules are available in different packages like SEMIPACK, SEMiSTART, SEMIPONT, SEMiX and SEMITOP. Different contact technologies – soldered contact, bonded contact or pressure contact modules – are available.

The thyristor/diode modules are offered in a variety of dual and single topologies for almost all phase control or rectifier applications.

The product class offers a product range with voltages up to 2200V. Thanks to the comprehensive product range, the optimal solution for each application can be found.

SEMITOP	124
SEMiX	126
SEMIPONT	128
SEMIPACK	129
SEMIPACK Fast	133
SEMiSTART	135

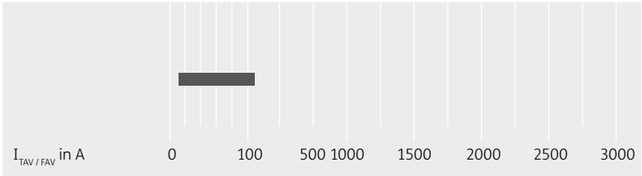
For detailed information please refer to data sheets.

Further information: www.semikron.com/thyristor-diode-modules

SEMITOP®

W1C, WT, W3C
single switch

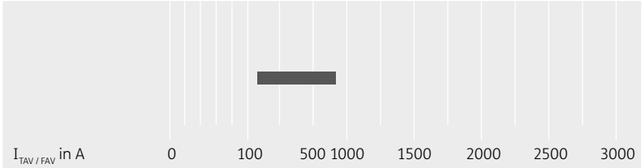
800V up to 1600V



SEMiX®

half-bridge

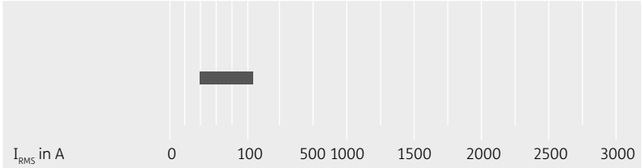
1600V up to 2200V



SEMIPONT®

WT, W3C

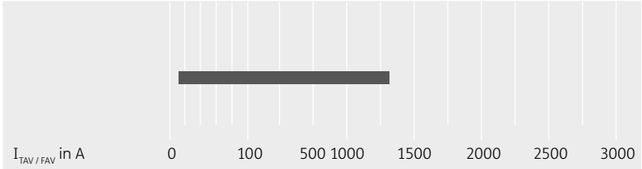
800V up to 2200V



SEMIPACK®

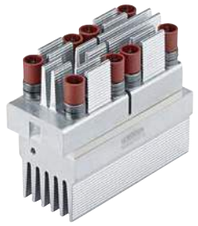
single switch
half-bridge

400V up to 2200V

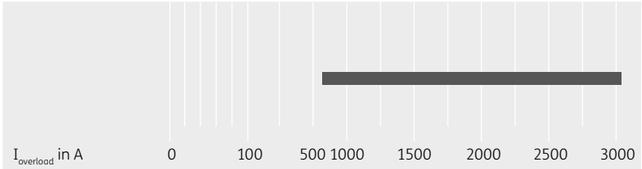


SEMiSTART®

W1C



1400V up to 1800V



модуль semikron, igbt, мост диодный Минск +375447584780
www.fotorele.net www.tiristor.by радиодетали, электронные компоненты
email minsk17@tut.by tel.+375 29 758 47 80 мтс

Мы не работаем с частными (физическими) лицами.
Мы работаем только с юридическими лицами(организациями) и ИП и только по безналичному расчёту.
каталог, описание, технические, характеристики, datasheet, параметры, маркировка,габариты, фото

КАТАЛОГ SEMIKRON 2017/2018 МИНСК

модуль semikron, igbt, мост диодный

купить, продажа

Mini SKiiP

SEMITOP

SEMITRANS

SEMIX

SKiM

Full SiC

Hybrid SiC

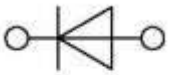
SKiiP

SEMIPACK

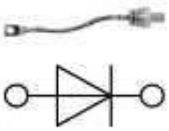
SEMITOP

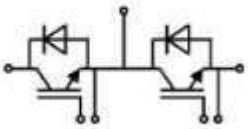
SEMIX

SEMISTART



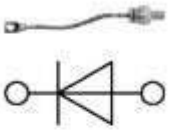
Power Bridge Rectifiers



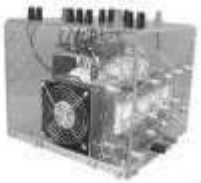


SEMISTACK Classics

SEMIPONT



SEMITEACH



SEMIX

PT 22b3 RoHS

Pulse Transformer

Part Number: 97492890
Manufacturer: SEMIKRON
datasheet

Product Details >>

Current delivery time approx. 10 weeks

Axial fan 230V 119x38m 150m3/h

Fan

V 230 V

Part Number: 30031061
Manufacturer: SEMIKRON
datasheet

Thermal paste P12

Thermal paste

Part Number: 31867700
Manufacturer: SEMIKRON
datasheet