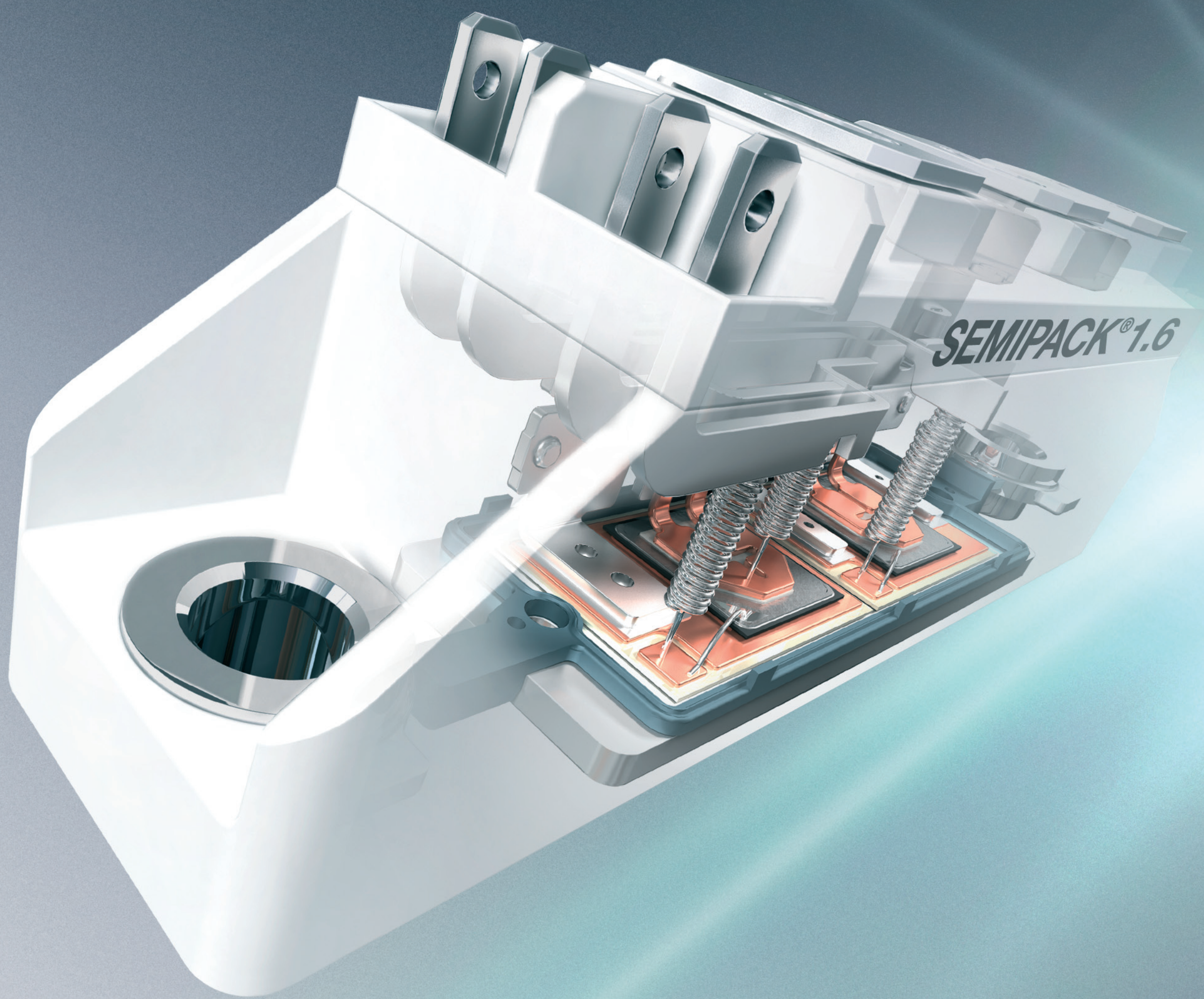
SEMIKRON
innovation+service

# Catalogue 2013 / 2014



More than 60 years of experience in the field of power electronics, a comprehensive portfolio of chips, solutions and inverter systems, a global network of production plants and sales offices as well as our highly qualified staff – these are our success factors. SEMIKRON's power electronics components and systems primarily address the medium and high performance segment (approx. 1 kW up to 10 MW). Applications include speed-controlled industrial drive units, automation technology, welding equipment and elevators. Other applications include uninterrupted power supply (UPS), renewable energies (wind, solar) as well as electrification of commercial vehicles, conveyances, sports cars and material handling.

## Note:

All data and information referred to in this data book are based on the best of our knowledge and state-of-the-art technology available at the time of printing and are intended to be used for information purposes only. Component specifications are not to be considered a guarantee of component characteristics. The use of SEMIKRON products in life-support appliances and systems is subject to prior specification and written approval by SEMIKRON.

All product specifications and terms of delivery are subject to change. For updates of our datasheets as well as information on our latest products, please refer to www.semikron.com. Sales and delivery of SEMIKRON products are subject to our "General Terms and Conditions of Sale". Please refer to www.semikron.com for applicable power semiconductor standards.


All product specifications and promotion statements apply to SEMIKRON International GmbH and all SEMIKRON companies within the SEMIKRON group.

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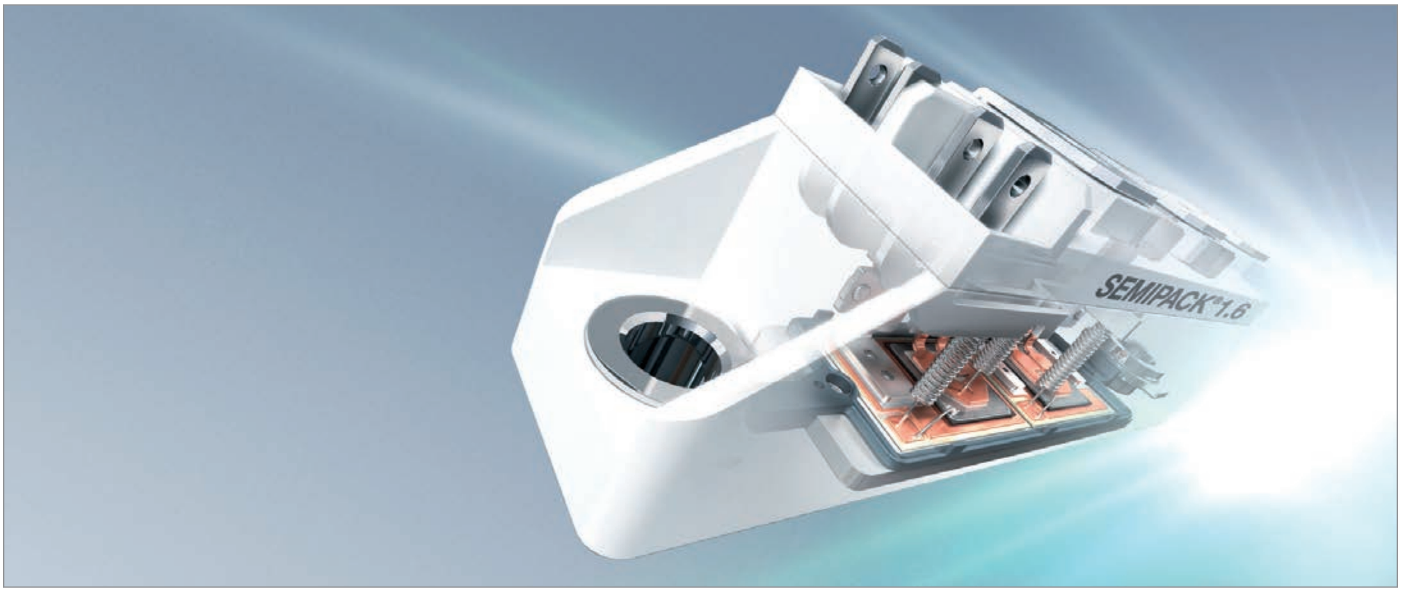



Title: SEMIPACK 6th generation

# Comprehensive product range – industrial standard

**Applications**

The target applications for the thyristor, thyristor/diode or diode modules include input rectifiers (single-phase, three-phase, un-controlled, half-controlled or controlled) for frequency inverters or UPS systems, soft start applications, lighting control systems in theatres and temperature control systems in furnaces.

**Product range**

The SEMIPACK product line offers a comprehensive product range with seven module lines: with voltages from 800 V to 2200 V, insulation voltages of 3.6kV, 4.8 kV@1s and a current range from 15 to 1200 A. Uncontrolled, half-controlled and controlled rectifier modules are available as well as single thyristor or diode modules. Also, fast diodes come in SEMIPACK modules. Furthermore, different contact technologies - soldered contact, bonded contact or pressure contact modules - are available.

**Benefits**

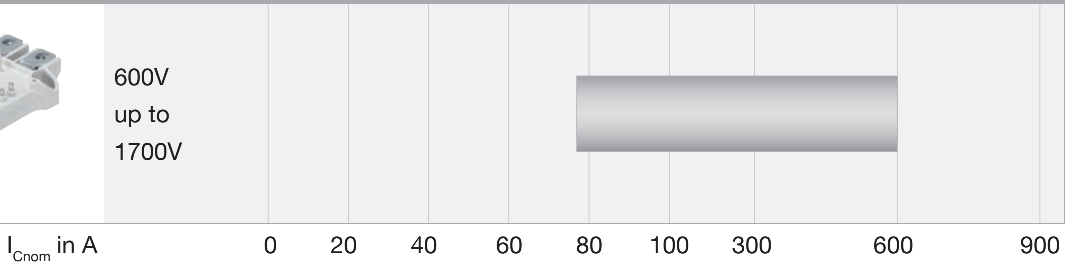
SEMIPACK was the first insulated module on the market, and almost 40 years later, it is still state-of-the-art. It is a well-established industrial standard with regard to footprint and module outlines. Due to the comprehensive product range, the optimal solution for each application can be found. With SemiSel, the free online calculation and simulation tool for losses and temperature, the power electronic system developer is able to make the perfect power module choice.

**www.semikron.com/thyristor-diode-semipack**

# IGBT Modules

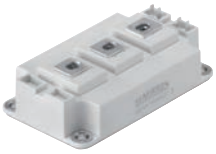
## SEMiX®

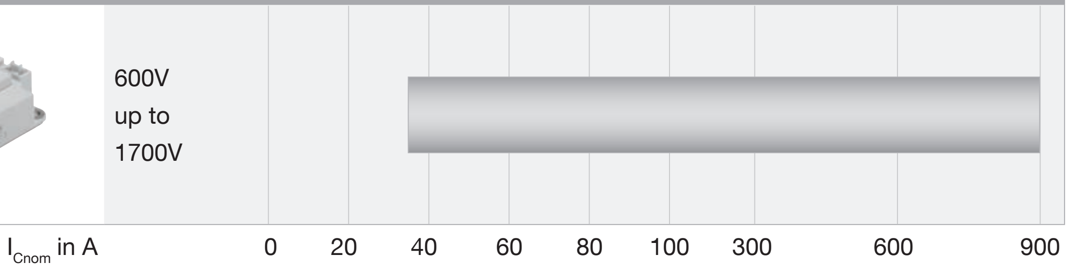
half bridge
6-pack
chopper




## SEMITRANS®

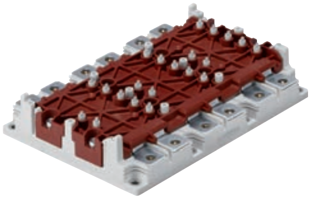
half bridge
6-pack
chopper
single switch

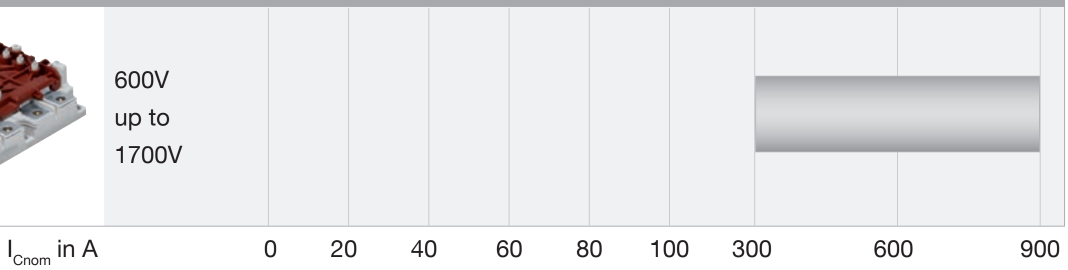





## SKiM®63/93

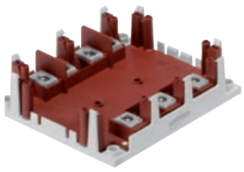
6-pack

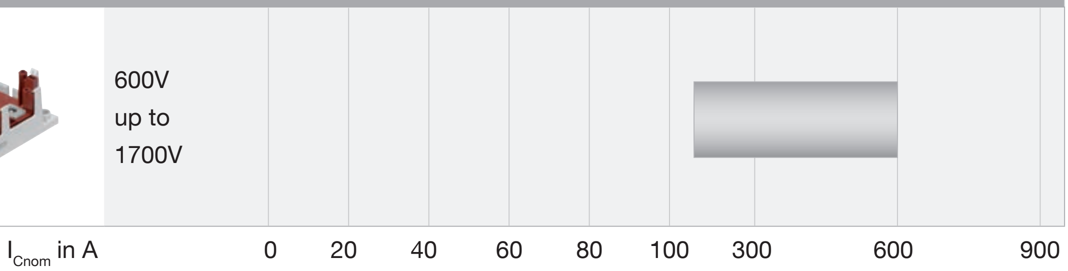





## SKiM®4/5

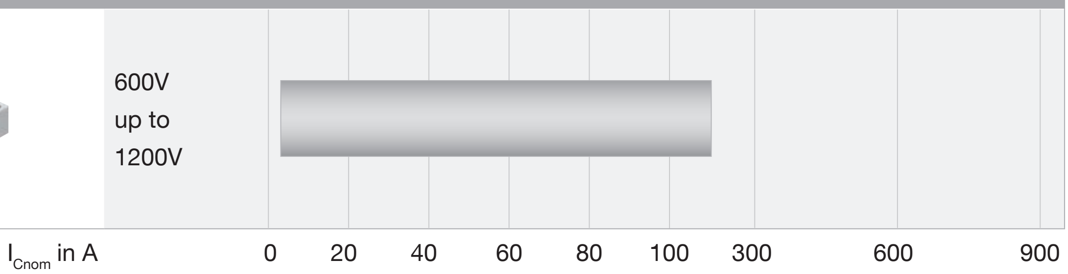
6-pack
3-level





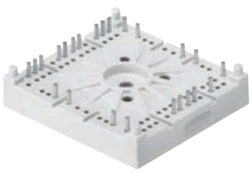

## MiniSKiiP®

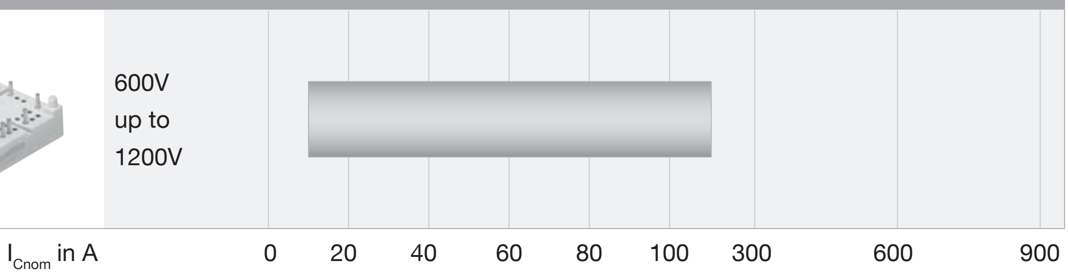
6-pack
3-level
H-bridge
CIB

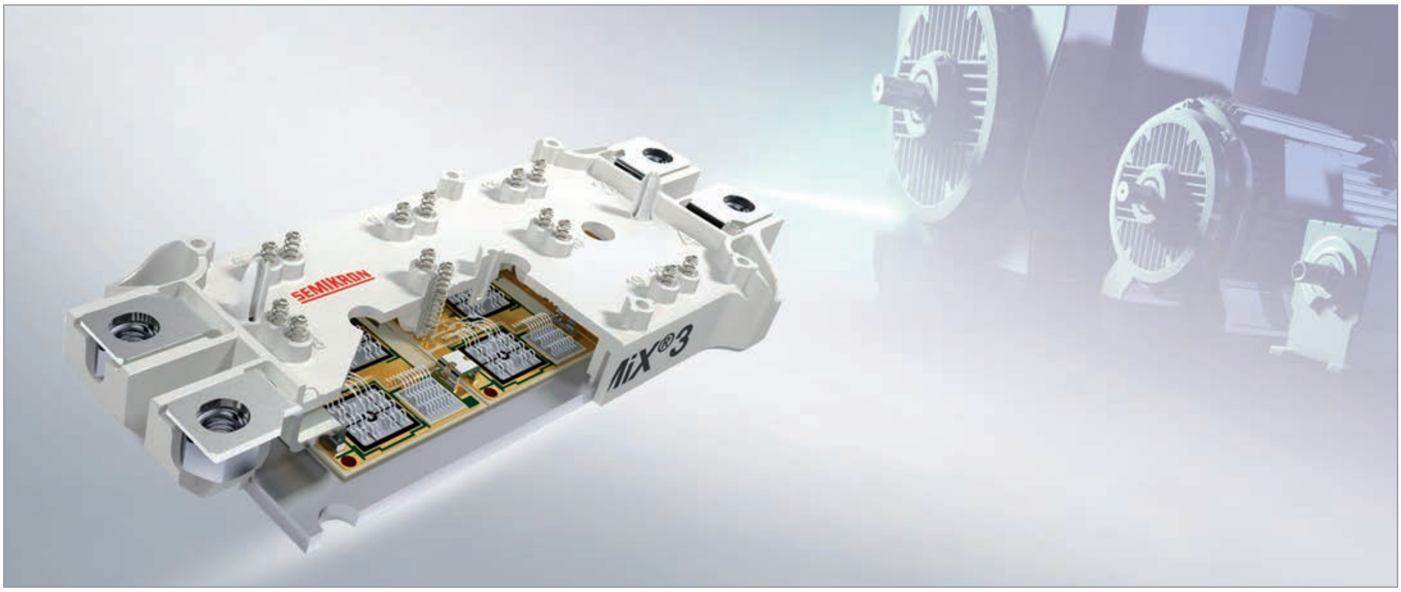



## SEMITOP®

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








# IGBT and rectifier module family for solder-free assemblies

**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 matrix converters, uninterruptible power supplies and electronic welding devices.

**Product range**

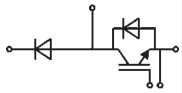
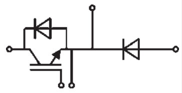
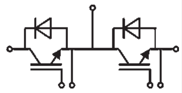
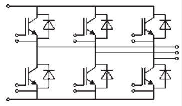
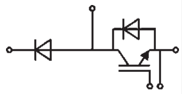
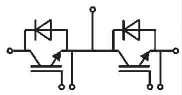
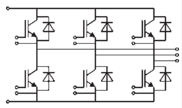
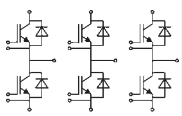
Six different housing sizes are available in voltage classes 600 V, 1200 V and 1700 V for the IGBT modules. Half-bridge, six-pack and chopper topologies are available for a current range from 75 A to 600 A. Besides IGBT3 and IGBT4 chips, the 1200 V range also includes a series with V-IGBT devices. Controlled, semi-controlled and uncontrolled rectifier modules with an identical footprint and 17 mm module height are also available.

**Benefits**

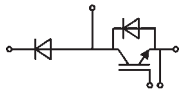
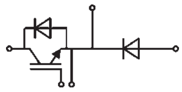
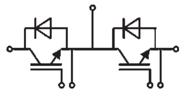
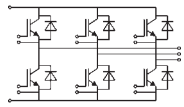
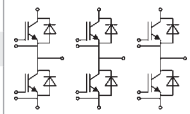
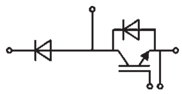
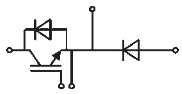
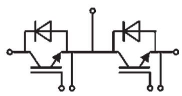
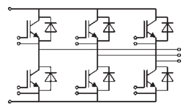
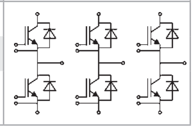
- Fast, one-directional assembly from above
- Solder-free connection to control unit using reliable spring contacts
- Separation of control unit, AC and DC terminals
- Direct driver assembly
- Same-height (17 mm) of IGBT and rectifier modules
- Flat and compact inverter design
- Optimised production at customer site
- Easy service

**www.semikron.com/igbt-semix**

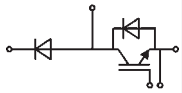
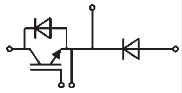
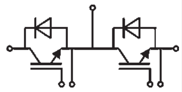
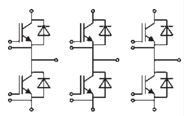
# Modules - IGBT - SEMiX

| Type | IGBT | | | | | | Diode | | | | Case | | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @$T_C$= 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 | $R_{th(c-s)}$ | |
| | A | A | V | mJ | mJ | K/W | A | V | mJ | K/W | | K/W | |
| **600 V - IGBT 3 (Trench)** | | | | | | | | | | | | | |
| **SEMiX402GAL066HDs** | 502 | 400 | 1.45 | 22 | 24 | 0.12 | 543 | 1.4 | 10 | 0.15 | 2s | 0.045 |  |
| **SEMiX603GAL066HDs** | 720 | 600 | 1.45 | 12 | 43 | 0.087 | 771 | 1.4 | 13 | 0.11 | 3s | 0.04 | |
| **SEMiX402GAR066HDs** | 502 | 400 | 1.45 | 22 | 24 | 0.12 | 543 | 1.4 | 10 | 0.15 | 2s | 0.045 |  |
| **SEMiX603GAR066HDs** | 720 | 600 | 1.45 | 12 | 43 | 0.087 | 771 | 1.4 | 13 | 0.11 | 3s | 0.04 | |
| **SEMiX202GB066HDs** | 274 | 200 | 1.45 | 6 | 8 | 0.21 | 291 | 1.4 | 6.5 | 0.27 | 2s | 0.045 |  |
| **SEMiX302GB066HDs** | 379 | 300 | 1.45 | 11.5 | 15 | 0.16 | 419 | 1.4 | 7.5 | 0.19 | 2s | 0.045 | |
| **SEMiX402GB066HDs** | 502 | 400 | 1.45 | 22 | 24 | 0.12 | 543 | 1.4 | 10 | 0.15 | 2s | 0.045 | |
| **SEMiX603GB066HDs** | 720 | 600 | 1.45 | 12 | 43 | 0.087 | 771 | 1.4 | 13 | 0.11 | 3s | 0.04 | |
| **SEMiX101GD066HDs** | 139 | 100 | 1.45 | 3 | 4 | 0.41 | 151 | 1.4 | 4.5 | 0.51 | 13 | 0.04 |  |
| **SEMiX151GD066HDs** | 200 | 150 | 1.45 | 3.8 | 6.1 | 0.29 | 219 | 1.4 | 5.8 | 0.36 | 13 | 0.04 | |
| **SEMiX201GD066HDs** | 259 | 200 | 1.45 | 5 | 8 | 0.23 | 284 | 1.4 | 7.5 | 0.28 | 13 | 0.04 | |
| **1200 V - V-IGBT** | | | | | | | | | | | | | |
| **SEMiX151GAL12Vs** [1] | 231 | 150 | 1.75 | 19.4 | 17.1 | 0.19 | 189 | 2.1 | 11.5 | 0.31 | 1s | 0.075 |  |
| **SEMiX151GB12Vs** | 231 | 150 | 1.75 | 19.4 | 17.1 | 0.19 | 189 | 2.14 | 11.5 | 0.31 | 1s | 0.075 |  |
| **SEMiX202GB12Vs** | 310 | 200 | 1.75 | 24.9 | 24.1 | 0.14 | 229 | 2.2 | 14.5 | 0.26 | 2s | 0.045 | |
| **SEMiX223GB12Vs** | 323 | 225 | 1.85 | 19.9 | 27.2 | 0.14 | 263 | 2.2 | 16.4 | 0.23 | 3s | 0.04 | |
| **SEMiX302GB12Vs** | 448 | 300 | 1.75 | 37.3 | 36.1 | 0.1 | 356 | 2.1 | 21.8 | 0.17 | 2s | 0.045 | |
| **SEMiX303GB12Vs** | 448 | 300 | 1.75 | 26.5 | 36.3 | 0.1 | 327 | 2.2 | 21.4 | 0.19 | 3s | 0.04 | |
| **SEMiX404GB12Vs** | 596 | 400 | 1.75 | 39.1 | 52.3 | 0.075 | 440 | 2.2 | 34.3 | 0.14 | 4s | 0.03 | |
| **SEMiX453GB12Vs** | 673 | 450 | 1.75 | 39.8 | 54.4 | 0.067 | 516 | 2.1 | 32.7 | 0.12 | 3s | 0.04 | |
| **SEMiX603GB12Vs** [1] | 800 | 600 | 1.85 | 50 | 83 | 0.057 | 516 | 2.4 | 40 | 0.12 | 3s | 0.04 | |
| **SEMiX604GB12Vs** | 880 | 600 | 1.75 | 58.7 | 78.5 | 0.051 | 707 | 2.1 | 49.5 | 0.086 | 4s | 0.03 | |
| **SEMiX101GD12Vs** | 159 | 100 | 1.75 | 12.9 | 11.4 | 0.27 | 121 | 2.2 | 7.7 | 0.48 | 13 | 0.04 |  |
| **SEMiX151GD12Vs** | 231 | 150 | 1.75 | 19.4 | 17.1 | 0.19 | 189 | 2.1 | 11.5 | 0.31 | 13 | 0.04 | |
| **SEMiX223GD12Vc** | 323 | 225 | 1.85 | 19.9 | 27.2 | 0.14 | 263 | 2.2 | 16.4 | 0.23 | 33c | 0.014 |  |
| **SEMiX303GD12Vc** | 448 | 300 | 1.75 | 26.5 | 36.3 | 0.1 | 327 | 2.2 | 21.4 | 0.19 | 33c | 0.014 | |
| **SEMiX453GD12Vc** | 673 | 450 | 1.75 | 39.8 | 54.4 | 0.067 | 516 | 2.1 | 32.7 | 0.12 | 33c | 0.014 | |

# Modules - IGBT - SEMiX

| Type | IGBT | | | | | | Diode | | | | Case | | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @$T_c$= 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 | $R_{th(c-s)}$ | |
| | A | A | V | mJ | mJ | K/W | A | V | mJ | K/W | | K/W | |
| **1200 V - IGBT 4 (Trench)** | | | | | | | | | | | | | |
| **SEMiX151GAL12E4HDs** | 232 | 150 | 1.8 | 18 | 18 | 0.19 | 207 | 1.7 | 12 | 0.31 | 1s | 0.075 |  |
| **SEMiX302GAL12E4HDs** | 463 | 300 | 1.8 | 33 | 44 | 0.096 | 387 | 1.7 | 25 | 0.17 | 2s | 0.045 | |
| **SEMiX453GAL12E4HDs** | 683 | 450 | 1.8 | 50 | 67 | 0.065 | 592 | 1.7 | 36 | 0.11 | 3s | 0.04 | |
| **SEMiX604GAL12E4HDs** | 916 | 600 | 1.8 | 38 | 110 | 0.049 | 777 | 1.7 | 57 | 0.086 | 4s | 0.03 | |
| **SEMiX151GAR12E4HDs** | 232 | 150 | 1.8 | 18 | 18 | 0.19 | 207 | 1.7 | 12 | 0.31 | 1s | 0.075 |  |
| **SEMiX302GAR12E4HDs** | 463 | 300 | 1.8 | 33 | 44 | 0.096 | 387 | 1.7 | 25 | 0.17 | 2s | 0.045 | |
| **SEMiX453GAR12E4HDs** | 683 | 450 | 1.8 | 50 | 67 | 0.065 | 592 | 1.7 | 36 | 0.11 | 3s | 0.04 | |
| **SEMiX604GAR12E4HDs** | 916 | 600 | 1.8 | 38 | 110 | 0.049 | 777 | 1.7 | 57 | 0.086 | 4s | 0.03 | |
| **SEMiX151GB12E4HDs** | 232 | 150 | 1.8 | 18 | 18 | 0.19 | 207 | 1.7 | 12 | 0.31 | 1s | 0.075 |  |
| **SEMiX202GB12E4HDs** | 314 | 200 | 1.8 | 24 | 28 | 0.14 | 249 | 1.8 | 16 | 0.26 | 2s | 0.045 | |
| **SEMiX302GB12E4HDs** | 463 | 300 | 1.8 | 33 | 44 | 0.096 | 387 | 1.7 | 25 | 0.17 | 2s | 0.045 | |
| **SEMiX303GB12E4HDs** | 466 | 300 | 1.8 | 33 | 41 | 0.095 | 362 | 1.8 | 23 | 0.18 | 3s | 0.04 | |
| **SEMiX404GB12E4HDs** | 618 | 400 | 1.8 | 30 | 60 | 0.072 | 471 | 1.8 | 34 | 0.14 | 4s | 0.03 | |
| **SEMiX453GB12E4HDs** | 683 | 450 | 1.8 | 50 | 67 | 0.065 | 592 | 1.7 | 36 | 0.11 | 3s | 0.04 | |
| **SEMiX604GB12E4HDs** | 916 | 600 | 1.8 | 38 | 110 | 0.049 | 777 | 1.7 | 57 | 0.086 | 4s | 0.03 | |
| **SEMiX71GD12E4HDs** | 115 | 75 | 1.85 | 8.5 | 9 | 0.38 | 107 | 1.7 | 7 | 0.58 | 13 | 0.04 |  |
| **SEMiX101GD12E4HDs** | 160 | 100 | 1.8 | 12 | 13 | 0.27 | 130 | 1.8 | 8 | 0.48 | 13 | 0.04 | |
| **SEMiX151GD12E4HDs** | 232 | 150 | 1.8 | 16 | 19 | 0.19 | 207 | 1.7 | 16 | 0.31 | 13 | 0.04 | |
| **SEMiX223GD12E4HDc** | 333 | 225 | 1.85 | 24 | 31 | 0.135 | 296 | 1.7 | 22 | 0.22 | 33c | 0.014 |  |
| **SEMiX303GD12E4HDc** | 466 | 300 | 1.8 | 33 | 42 | 0.095 | 362 | 1.8 | 30 | 0.18 | 33c | 0.014 | |
| **SEMiX453GD12E4HDc** | 683 | 450 | 1.8 | 57 | 68 | 0.065 | 592 | 1.7 | 36 | 0.11 | 33c | 0.014 | |
| **1200 V - IGBT 3 (Trench)** | | | | | | | | | | | | | |
| **SEMiX452GAL126HDs** | 455 | 300 | 1.7 | 35 | 45 | 0.083 | 394 | 1.6 | 33 | 0.15 | 2s | 0.045 |  |
| **SEMiX703GAL126HDs** | 642 | 450 | 1.7 | 32 | 68 | 0.061 | 561 | 1.6 | 60 | 0.11 | 3s | 0.04 | |
| **SEMiX703GAR126HDs** | 642 | 450 | 1.7 | 32 | 68 | 0.061 | 561 | 1.6 | 60 | 0.11 | 3s | 0.04 |  |
| **SEMiX252GB126HDs** | 242 | 150 | 1.7 | 20 | 21 | 0.15 | 228 | 1.6 | 18 | 0.24 | 2s | 0.045 |  |
| **SEMiX302GB126HDs** | 311 | 200 | 1.7 | 30 | 26 | 0.12 | 292 | 1.6 | 22.5 | 0.19 | 2s | 0.045 | |
| **SEMiX353GB126HDs** | 364 | 225 | 1.7 | 26.5 | 32.5 | 0.1 | 329 | 1.6 | 29 | 0.17 | 3s | 0.04 | |
| **SEMiX452GB126HDs** | 455 | 300 | 1.7 | 35 | 45 | 0.083 | 394 | 1.6 | 33 | 0.15 | 2s | 0.045 | |
| **SEMiX503GB126HDs** | 466 | 300 | 1.7 | 28 | 44 | 0.08 | 431 | 1.6 | 32.5 | 0.13 | 3s | 0.04 | |
| **SEMiX604GB126HDs** | 590 | 400 | 1.7 | 36 | 60 | 0.065 | 533 | 1.6 | 46 | 0.11 | 4s | 0.03 | |
| **SEMiX703GB126HDs** | 642 | 450 | 1.7 | 32 | 68 | 0.061 | 561 | 1.6 | 60 | 0.11 | 3s | 0.04 | |
| **SEMiX904GB126HDs** | 821 | 600 | 1.7 | 60 | 88 | 0.05 | 752 | 1.6 | 75 | 0.081 | 4s | 0.03 | |
| **SEMiX101GD126HDs** | 129 | 75 | 1.7 | 10 | 11 | 0.27 | 117 | 1.6 | 9 | 0.46 | 13 | 0.04 |  |
| **SEMiX151GD126HDs** | 168 | 100 | 1.7 | 12 | 14 | 0.21 | 152 | 1.6 | 11.5 | 0.36 | 13 | 0.04 | |
| **SEMiX251GD126HDs** | 242 | 150 | 1.7 | 19 | 22 | 0.15 | 207 | 1.6 | 14.5 | 0.28 | 13 | 0.04 | |
| **SEMiX353GD126HDc** | 364 | 225 | 1.7 | 26.5 | 32.5 | 0.1 | 329 | 1.6 | 29 | 0.17 | 33c | 0.014 |  |
| **SEMiX503GD126HDc** | 466 | 300 | 1.7 | 28 | 44 | 0.08 | 412 | 1.6 | 32.5 | 0.14 | 33c | 0.014 | |
| **SEMiX703GD126HDc** | 642 | 450 | 1.7 | 32 | 68 | 0.061 | 561 | 1.6 | 60 | 0.11 | 33c | 0.014 | |

# Modules - IGBT - SEMiX

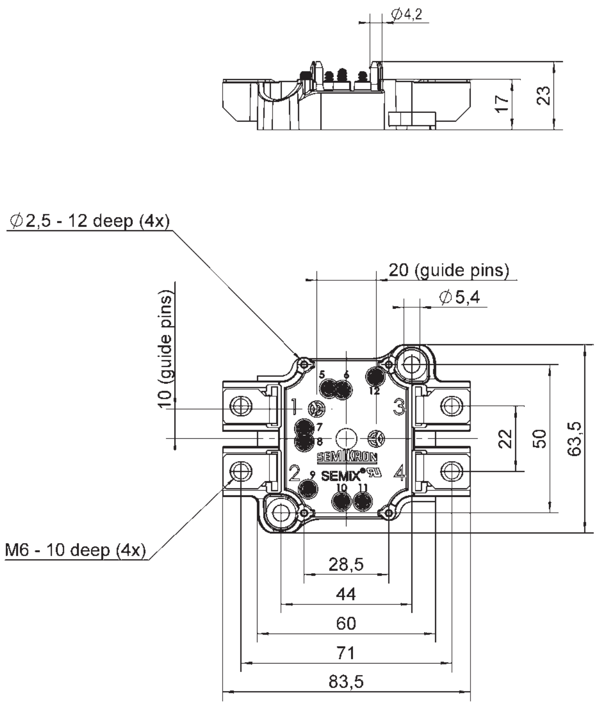
| Type | IGBT | | | | | | Diode | | | | Case | | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @$T_c$= 25°C | $I_{Cnom}$ | $V_{CE(sat)}$ @$T_j$= 25°C typ. | $E_{on}$ | $E_{off}$ | $R_{th(j-c)}$ | $I_F$ @$T_c$= 25°C | $V_F$ @$T_j$= 25°C typ. | $E_{rr}$ | $R_{th(j-c)}$ | Case | $R_{th(c-s)}$ | |
| | A | A | V | mJ | mJ | K/W | A | V | mJ | K/W | | K/W | |
| **1700 V - IGBT 3 (Trench)** | | | | | | | | | | | | | |
| **SEMiX653GAL176HDs** | 619 | 450 | 2 | 300 | 180 | 0.054 | 545 | 1.7 | 73 | 0.11 | 3s | 0.04 |  |
| **SEMiX653GAR176HDs** | 619 | 450 | 2 | 300 | 180 | 0.054 | 545 | 1.7 | 73 | 0.11 | 3s | 0.04 |  |
| **SEMiX252GB176HDs** | 246 | 150 | 2 | 90 | 55 | 0.12 | 288 | 1.6 | 32 | 0.19 | 2s | 0.045 | |
| **SEMiX302GB176HDs** | 308 | 200 | 2 | 130 | 77 | 0.1 | 389 | 1.5 | 43 | 0.15 | 2s | 0.045 | |
| **SEMiX353GB176HDs** | 353 | 225 | 2 | 155 | 85 | 0.086 | 428 | 1.6 | 45 | 0.13 | 3s | 0.04 | |
| **SEMiX452GB176HDs** | 437 | 300 | 2 | 180 | 110 | 0.073 | 389 | 1.7 | 46 | 0.15 | 2s | 0.045 |  |
| **SEMiX453GB176HDs** | 444 | 300 | 2 | 215 | 125 | 0.071 | 545 | 1.5 | 65 | 0.11 | 3s | 0.04 | |
| **SEMiX604GB176HDs** | 567 | 400 | 2 | 215 | 165 | 0.058 | 740 | 1.5 | 95 | 0.081 | 4s | 0.03 | |
| **SEMiX653GB176HDs** | 619 | 450 | 2 | 300 | 180 | 0.054 | 545 | 1.7 | 73 | 0.11 | 3s | 0.04 | |
| **SEMiX854GB176HDs** | 779 | 600 | 2 | 300 | 250 | 0.045 | 740 | 1.7 | 170 | 0.081 | 4s | 0.03 | |
| **SEMiX353GD176HDc** | 353 | 225 | 2 | 155 | 85 | 0.086 | 428 | 1.6 | 45 | 0.13 | 33c | 0.014 | |
| **SEMiX453GD176HDc** | 444 | 300 | 2 | 215 | 125 | 0.071 | 545 | 1.5 | 65 | 0.11 | 33c | 0.014 |  |
| **SEMiX653GD176HDc** | 619 | 450 | 2 | 300 | 180 | 0.054 | 545 | 1.7 | 73 | 0.11 | 33c | 0.014 | |

### Footnotes

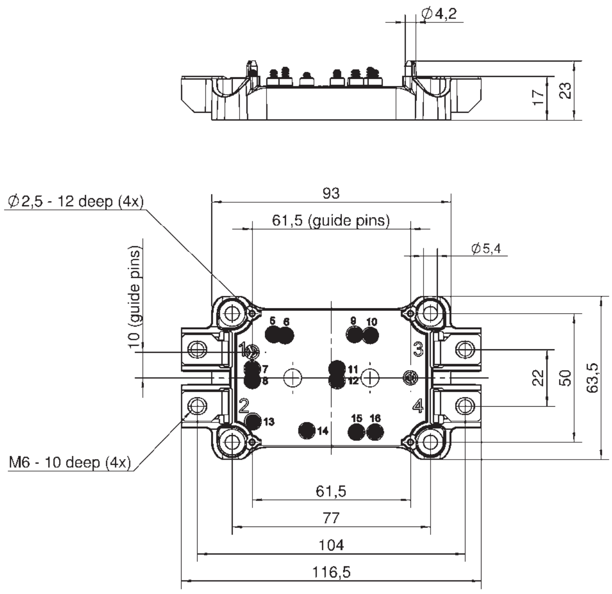
1) New

## Cases

### SEMiX 1s




### SEMiX 2s

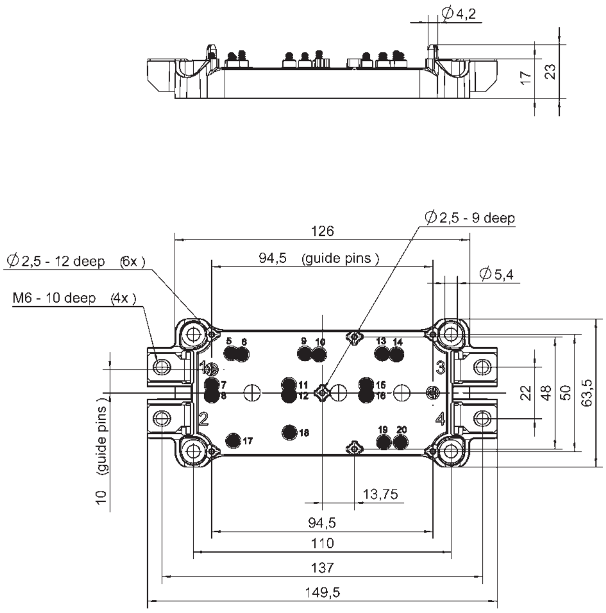



**Dimensions in mm**

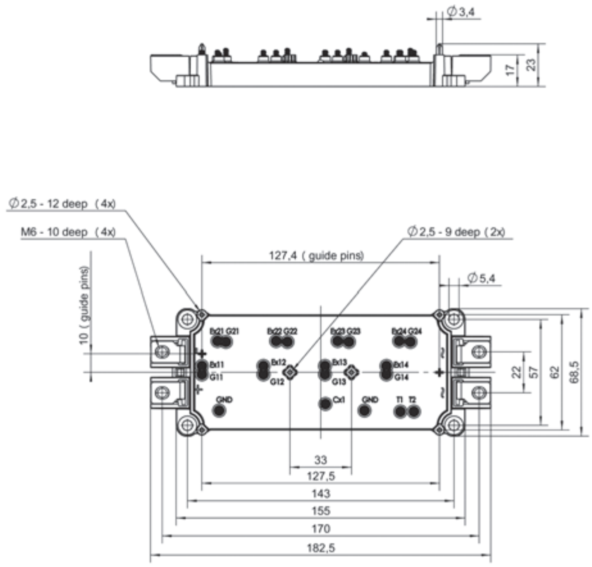
# Modules - IGBT - SEMiX

## Cases

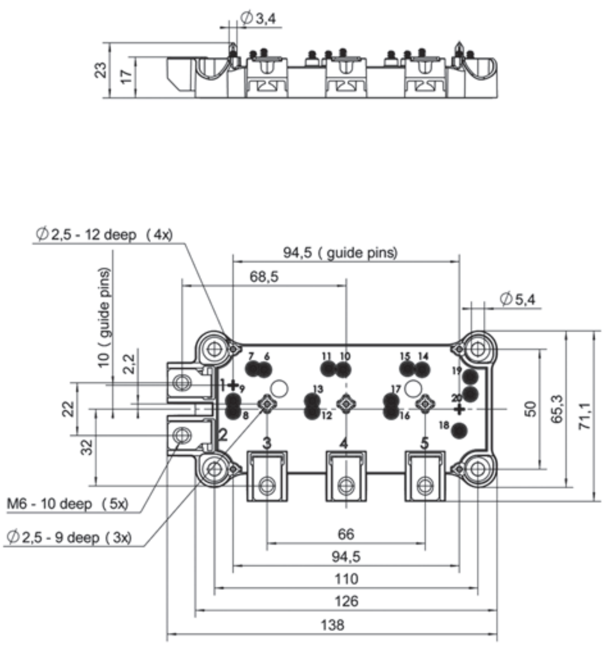
### SEMiX 3s



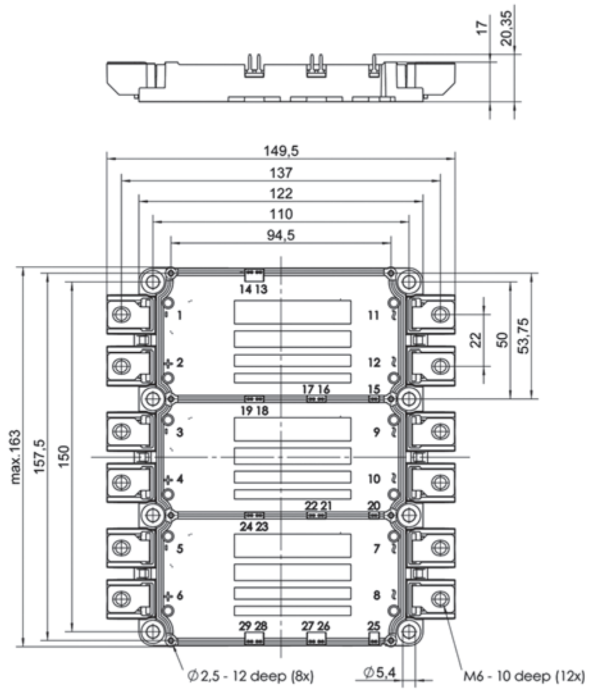

### SEMiX 4s




### SEMiX 13

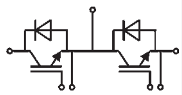
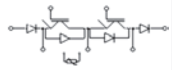
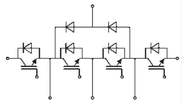
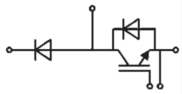
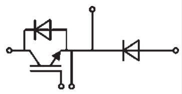
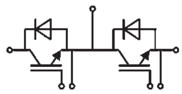
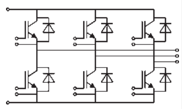
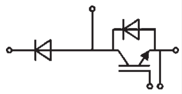
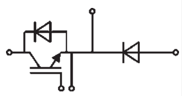
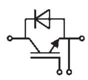
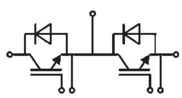



### SEMiX 33c

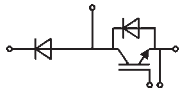
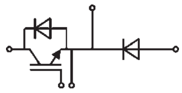
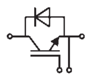
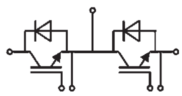
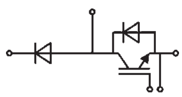
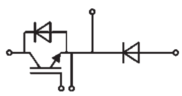
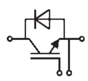
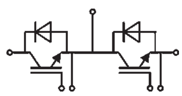
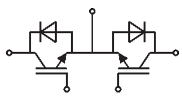
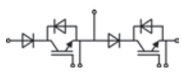



**Dimensions in mm**

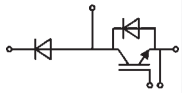
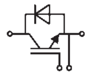
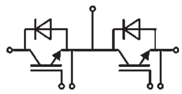
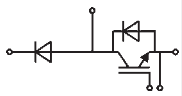
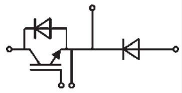
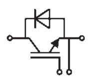
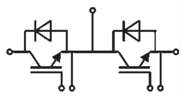
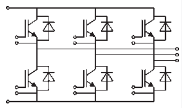
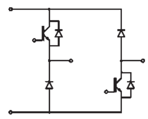
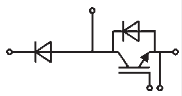
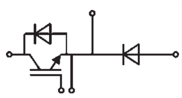
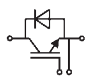
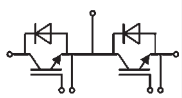
# Modules - IGBT - SEMITRANS

| Type | IGBT | | | | | | Diode | | | | Case | | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @$T_C$= 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 | $R_{th(c-s)}$ | |
| | A | A | V | mJ | mJ | K/W | A | V | mJ | K/W | | K/W | |
| **600 V - IGBT 3 (Trench)** | | | | | | | | | | | | | |
| **SKM145GB066D** | 195 | 150 | 1.45 | 8.5 | 5.5 | 0.3 | 150 | 1.38 | 3.5 | 0.5 | 2 | 0.05 |  |
| **SKM195GB066D** | 265 | 200 | 1.45 | 14 | 8 | 0.22 | 200 | 1.35 | 5.6 | 0.4 | 2 | 0.05 | |
| **SKM300GB066D** | 390 | 300 | 1.45 | 7.5 | 11.5 | 0.15 | 350 | 1.38 | 10.5 | 0.25 | 3 | 0.038 | |
| **SKM400GB066D** | 500 | 400 | 1.45 | 8 | 16 | 0.12 | 450 | 1.35 | 14 | 0.2 | 3 | 0.038 | |
| **SKM600GB066D** | 760 | 600 | 1.45 | 7.5 | 29.5 | 0.08 | 700 | 1.38 | 25 | 0.125 | 3 | 0.038 | |
| **SKM200GARL066T [1]** | 280 | 200 | 1.45 | 2.24 | 7.89 | 0.21 | 270 | 1.45 | 4 | 0.39 | 5 | 0.038 |  |
| **SKM300GARL066T [1]** | 400 | 300 | 1.45 | 3.5 | 10.1 | 0.15 | 400 | 1.45 | 4 | 0.26 | 5 | 0.038 | |
| **SKM400GARL066T [1]** | 504 | 400 | 1.45 | 4.48 | 15.78 | 0.12 | 421 | 1.54 | 8 | 0.28 | 5 | 0.038 | |
| **SKM150MLI066TAT** | 200 | 150 | 1.45 | 1.7 | 5.1 | 0.29 | 200 | 1.35 | 2 | 0.52 | 5 | 0.038 |  |
| **SKM200MLI066TAT [1]** | 280 | 200 | 1.45 | 2.53 | 6.82 | 0.21 | 270 | 1.4 | 4 | 0.39 | 5 | 0.038 | |
| **SKM300MLI066TAT [1]** | 400 | 300 | 1.45 | 3.5 | 10.1 | 0.15 | 324 | 1.35 | 4 | 0.25 | 5 | 0.038 | |
| **600 V - NPT IGBT (Standard)** | | | | | | | | | | | | | |
| **SKM75GAL063D [2]** | 100 | 75 | 2.1 | 3 | 2.5 | 0.35 | 75 | 1.55 | 0.53 | 0.72 | 2 | 0.05 |  |
| **SKM300GAL063D [2]** | 400 | 300 | 2.1 | 14 | 13 | 0.09 | 250 | 1.65 | 4 | 0.25 | 3 | 0.038 | |
| **SKM75GAR063D [2]** | 100 | 75 | 2.1 | 3 | 2.5 | 0.35 | 75 | 1.55 | 0.53 | 0.72 | 2 | 0.05 |  |
| **SKM300GAR063D** | 400 | 300 | 2.1 | 14 | 13 | 0.09 | 250 | 1.65 | 4 | 0.25 | 3 | 0.038 | |
| **SKM50GB063D [2]** | 70 | 50 | 2.1 | 2.5 | 1.8 | 0.5 | 75 | 1.35 | 0.48 | 1 | 2 | 0.05 |  |
| **SKM75GB063D [2]** | 100 | 75 | 2.1 | 3 | 2.5 | 0.35 | 75 | 1.55 | 0.53 | 0.72 | 2 | 0.05 | |
| **SKM100GB063D [2]** | 130 | 100 | 2.1 | 4 | 3 | 0.27 | 100 | 1.55 | 1.5 | 0.6 | 2 | 0.05 | |
| **SKM200GB063D [2]** | 260 | 200 | 2.1 | 11 | 7.5 | 0.14 | 200 | 1.55 | 2.1 | 0.3 | 3 | 0.038 | |
| **SKM300GB063D [2]** | 400 | 300 | 2.1 | 14 | 13 | 0.09 | 250 | 1.65 | 4 | 0.25 | 3 | 0.038 | |
| **SKM100GD063DL [2]** | 130 | 100 | 2.1 | 4 | 3 | 0.27 | 100 | 1.55 | 1.5 | 0.6 | 6 | 0.05 |  |
| **1200 V - V-IGBT** | | | | | | | | | | | | | |
| **SKM150GAL12V [1]** | 231 | 150 | 1.75 | 13.5 | 14.2 | 0.19 | 189 | 2.14 | 8.9 | 0.31 | 2 | 0.05 |  |
| **SKM400GAL12V [1]** | 612 | 400 | 1.75 | 39 | 42 | 0.072 | 440 | 2.20 | 26 | 0.14 | 3 | 0.038 | |
| **SKM400GAR12V [1]** | 612 | 400 | 1.75 | 39 | 42 | 0.072 | 440 | 2.20 | 26 | 0.14 | 3 | 0.038 |  |
| **SKM300GA12V [1]** | 420 | 300 | 1.85 | 23 | 33 | 0.11 | 353 | 2.17 | 21 | 0.17 | 4 | 0.038 |  |
| **SKM400GA12V [1]** | 612 | 400 | 1.75 | 39 | 42 | 0.072 | 440 | 2.20 | 26 | 0.14 | 4 | 0.038 | |
| **SKM600GA12V [1]** | 908 | 600 | 1.75 | 76 | 76 | 0.049 | 707 | 2.14 | 43 | 0.086 | 4 | 0.038 | |
| **SKM50GB12V [1]** | 77 | 50 | 1.85 | 5 | 4 | 0.53 | 65 | 2.22 | 3.6 | 0.84 | 2 | 0.05 |  |
| **SKM75GB12V [1]** | 114 | 75 | 1.85 | 6.7 | 7.1 | 0.38 | 97 | 2.17 | 4.2 | 0.58 | 2 | 0.05 | |
| **SKM100GB12V [1]** | 159 | 100 | 1.75 | 10.7 | 8.7 | 0.27 | 121 | 2.20 | 5.7 | 0.48 | 2 | 0.05 | |
| **SKM150GB12V [1]** | 231 | 150 | 1.75 | 13.5 | 14.2 | 0.19 | 189 | 2.14 | 8.9 | 0.31 | 2 | 0.05 | |
| **SKM150GB12VG [1]** | 222 | 150 | 1.85 | 10 | 16.5 | 0.2 | 187 | 2.17 | 11 | 0.31 | 3 | 0.038 | |
| **SKM200GB12V [1]** | 311 | 200 | 1.75 | 14 | 22 | 0.14 | 229 | 2.20 | 13 | 0.26 | 3 | 0.038 | |
| **SKM300GB12V [1]** | 420 | 300 | 1.85 | 23 | 33 | 0.11 | 353 | 2.17 | 21 | 0.17 | 3 | 0.038 | |
| **SKM400GB12V [1]** | 612 | 400 | 1.75 | 39 | 42 | 0.072 | 440 | 2.20 | 26 | 0.14 | 3 | 0.038 | |

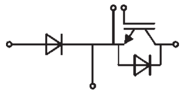
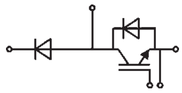
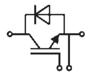
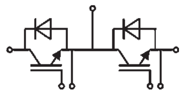
# Modules - IGBT - SEMITRANS

| Type | IGBT | | | | | | Diode | | | | Case | | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @$T_C$= 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 | $R_{th(c-s)}$ | |
| | A | A | V | mJ | mJ | K/W | A | V | mJ | K/W | | K/W | |
| **1200 V - IGBT 4 (Trench)** | | | | | | | | | | | | | |
| SKM200GAL12E4HD | 313 | 200 | 1.8 | 23 | 27 | 0.14 | 249 | 1.77 | 17 | 0.26 | 3 | 0.038 |  |
| SKM300GAL12E4HD | 422 | 300 | 1.85 | 30 | 39 | 0.11 | 387 | 1.72 | 30 | 0.17 | 3 | 0.038 | |
| SKM400GAL12E4HD | 616 | 400 | 1.8 | 36 | 56 | 0.072 | 471 | 1.77 | 40 | 0.14 | 3 | 0.038 | |
| SKM200GAR12E4HD | 313 | 200 | 1.8 | 21 | 27 | 0.14 | 249 | 1.77 | 13 | 0.26 | 3 | 0.038 |  |
| SKM300GAR12E4HD | 422 | 300 | 1.85 | 27 | 39 | 0.11 | 387 | 1.72 | 23 | 0.17 | 3 | 0.038 | |
| SKM400GAR12E4HD | 616 | 400 | 1.8 | 36 | 56 | 0.072 | 471 | 1.77 | 40 | 0.14 | 3 | 0.038 | |
| SKM300GA12E4HD | 422 | 300 | 1.85 | 29 | 35 | 0.11 | 387 | 1.72 | 29 | 0.17 | 4 | 0.038 |  |
| SKM400GA12E4HD | 616 | 400 | 1.8 | 31 | 59 | 0.072 | 471 | 1.77 | 48 | 0.14 | 4 | 0.038 | |
| SKM600GA12E4HD | 913 | 600 | 1.8 | 81 | 84 | 0.049 | 777 | 1.72 | 49 | 0.086 | 4 | 0.038 | |
| SKM900GA12E4HD 1) | 1305 | 900 | 1.83 | 100 | 137 | 0.035 | 956 | 1.84 | 85 | 0.07 | 4 | 0.038 | |
| SKM200GB12E4HD | 313 | 200 | 1.8 | 23 | 27 | 0.14 | 249 | 1.77 | 17 | 0.26 | 3 | 0.038 |  |
| SKM300GB12E4HD | 422 | 300 | 1.85 | 30 | 39 | 0.11 | 387 | 1.72 | 30 | 0.17 | 3 | 0.038 | |
| SKM400GB12E4HD | 616 | 400 | 1.8 | 36 | 56 | 0.072 | 471 | 1.77 | 40 | 0.14 | 3 | 0.038 | |
| SKM450GB12E4HD 1) | 699 | 450 | 1.82 | 39 | 61 | 0.062 | 471 | 1.84 | 43 | 0.14 | 3 | 0.038 | |
| **1200 V - IGBT 4 Fast (Trench)** | | | | | | | | | | | | | |
| SKM50GAL12T4 1) | 81 | 50 | 1.85 | 5.5 | 4.5 | 0.53 | 65 | 2.22 | 3.6 | 0.84 | 2 | 0.05 |  |
| SKM100GAL12T4 1) | 160 | 100 | 1.8 | 15 | 10.2 | 0.27 | 121 | 2.20 | 5.9 | 0.48 | 2 | 0.05 | |
| SKM150GAL12T4 | 232 | 150 | 1.8 | 19.2 | 15.8 | 0.19 | 189 | 2.14 | 13 | 0.31 | 2 | 0.05 | |
| SKM200GAL12T4 | 313 | 200 | 1.8 | 21 | 20 | 0.14 | 229 | 2.20 | 13 | 0.26 | 3 | 0.038 | |
| SKM300GAL12T4 | 422 | 300 | 1.85 | 27 | 29 | 0.11 | 353 | 2.17 | 23 | 0.17 | 3 | 0.038 | |
| SKM400GAL12T4 | 616 | 400 | 1.8 | 33 | 42 | 0.072 | 440 | 2.20 | 30.5 | 0.14 | 3 | 0.038 | |
| SKM150GAR12T4 | 232 | 150 | 1.8 | 19.2 | 15.8 | 0.19 | 189 | 2.14 | 13 | 0.31 | 2 | 0.05 |  |
| SKM400GAR12T4 | 616 | 400 | 1.8 | 33 | 42 | 0.072 | 440 | 2.20 | 30.5 | 0.14 | 3 | 0.038 | |
| SKM300GA12T4 | 422 | 300 | 1.85 | 23.4 | 26 | 0.11 | 353 | 2.17 | 22.2 | 0.17 | 4 | 0.038 |  |
| SKM400GA12T4 | 616 | 400 | 1.8 | 28 | 44 | 0.072 | 440 | 2.20 | 37 | 0.14 | 4 | 0.038 | |
| SKM600GA12T4 | 913 | 600 | 1.8 | 74 | 63 | 0.049 | 707 | 2.14 | 38 | 0.086 | 4 | 0.038 | |
| SKM50GB12T4 | 81 | 50 | 1.85 | 5.5 | 4.5 | 0.53 | 65 | 2.22 | 3.8 | 0.84 | 2 | 0.05 |  |
| SKM75GB12T4 | 115 | 75 | 1.85 | 11 | 6.9 | 0.38 | 97 | 2.17 | 4.7 | 0.58 | 2 | 0.05 | |
| SKM100GB12T4 | 160 | 100 | 1.8 | 15 | 10.2 | 0.27 | 121 | 2.20 | 5.9 | 0.48 | 2 | 0.05 | |
| SKM100GB12T4G | 154 | 100 | 1.85 | 16.1 | 8.6 | 0.29 | 118 | 2.22 | 6 | 0.49 | 3 | 0.038 | |
| SKM150GB12T4 | 232 | 150 | 1.8 | 19.2 | 15.8 | 0.19 | 189 | 2.14 | 13 | 0.31 | 2 | 0.05 | |
| SKM150GB12T4G | 223 | 150 | 1.85 | 18.7 | 14.1 | 0.2 | 183 | 2.17 | 9 | 0.32 | 3 | 0.038 | |
| SKM200GB12T4 | 313 | 200 | 1.8 | 21 | 20 | 0.14 | 229 | 2.20 | 13 | 0.26 | 3 | 0.038 | |
| SKM300GB12T4 | 422 | 300 | 1.85 | 27 | 29 | 0.11 | 353 | 2.17 | 23 | 0.17 | 3 | 0.038 | |
| SKM400GB12T4 | 616 | 400 | 1.8 | 33 | 42 | 0.072 | 440 | 2.20 | 30.5 | 0.14 | 3 | 0.038 | |
| SKM150GM12T4G 1) | 229 | 150 | 1.85 | 19.2 | 15.8 | 0.19 | 187 | 2.17 | 13 | 0.31 | 3 | 0.038 |  |
| SKM200GM12T4 1) | 313 | 200 | 1.8 | 21 | 20 | 0.14 | 229 | 2.20 | 13 | 0.26 | 3 | 0.038 | |
| SKM300GM12T4 1) | 422 | 300 | 1.85 | 27 | 29 | 0.11 | 353 | 2.17 | 23 | 0.17 | 3 | 0.038 | |
| SKM400GM12T4 1) | 616 | 400 | 1.8 | 33 | 42 | 0.072 | 440 | 2.20 | 30.5 | 0.14 | 3 | 0.038 | |
| SKM300GBD12T4 1) | 422 | 300 | 1.85 | 27 | 29 | 0.11 | 56 | 2.41 | 30.5 | 0.94 | 3 | 0.038 |  |

# Modules - IGBT - SEMITRANS

| Type | IGBT | | | | | | Diode | | | | Case | | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @$T_c$= 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 | $R_{th(c-s)}$ | |
| | A | A | V | mJ | mJ | K/W | A | V | mJ | K/W | | K/W | |
| **1200 V - IGBT 3 (Trench)** | | | | | | | | | | | | | |
| **SKM195GAL126D** | 220 | 150 | 1.7 | 16 | 24.5 | 0.16 | 170 | 2.45 | 5.8 | 0.32 | 2 | 0.05 |  |
| **SKM200GAL126D** | 260 | 150 | 1.7 | 18 | 24 | 0.13 | 200 | 1.64 | 18 | 0.3 | 3 | 0.038 | |
| **SKM400GAL126D** | 470 | 300 | 1.7 | 29 | 48 | 0.08 | 400 | 1.64 | 27 | 0.18 | 3 | 0.038 | |
| **SKM600GAL126D** | 660 | 400 | 1.7 | 39 | 64 | 0.055 | 490 | 1.67 | 41 | 0.125 | 3 | 0.038 | |
| **SKM600GA126D** | 660 | 400 | 1.7 | 39 | 64 | 0.055 | 490 | 1.67 | 41 | 0.125 | 4 | 0.038 |  |
| **SKM800GA126D** | 960 | 600 | 1.7 | 65 | 95 | 0.042 | 680 | 1.69 | 59 | 0.09 | 4 | 0.038 | |
| **SKM195GB126D** | 220 | 150 | 1.7 | 16 | 24.5 | 0.16 | 170 | 2.45 | 5.8 | 0.32 | 2 | 0.05 |  |
| **SKM200GB126D** | 260 | 150 | 1.7 | 18 | 24 | 0.13 | 200 | 1.64 | 18 | 0.3 | 3 | 0.038 | |
| **SKM300GB126D** | 310 | 200 | 1.7 | 21 | 33 | 0.12 | 250 | 1.67 | 18 | 0.25 | 3 | 0.038 | |
| **SKM400GB126D** | 470 | 300 | 1.7 | 29 | 48 | 0.08 | 400 | 1.64 | 27 | 0.18 | 3 | 0.038 | |
| **SKM600GB126D** | 660 | 400 | 1.7 | 39 | 64 | 0.055 | 490 | 1.67 | 41 | 0.125 | 3 | 0.038 | |
| **1200 V - NPT IGBT (Ultrafast)** | | | | | | | | | | | | | |
| **SKM200GAL125D** | 200 | 150 | 3.3 | 14 | 8 | 0.09 | 200 | 2.06 | 8 | 0.25 | 3 | 0.038 |  |
| **SKM400GAL125D** | 400 | 300 | 3.3 | 17 | 18 | 0.05 | 390 | 2.06 | 16 | 0.125 | 3 | 0.038 | |
| **SKM200GAR125D** | 200 | 150 | 3.3 | 14 | 8 | 0.09 | 200 | 2.06 | 8 | 0.25 | 3 | 0.038 |  |
| **SKM400GAR125D** | 400 | 300 | 3.3 | 17 | 18 | 0.05 | 390 | 2.06 | 16 | 0.125 | 3 | 0.038 | |
| **SKM600GA125D** | 580 | 400 | 3.3 | 30 | 22 | 0.041 | 500 | 2.00 | 24 | 0.09 | 4 | 0.038 |  |
| **SKM800GA125D** | 760 | 600 | 3.2 | 88 | 48 | 0.03 | 720 | 2.3 | 28 | 0.07 | 4 | 0.038 | |
| **SKM100GB125DN** | 100 | 75 | 3.3 | 9 | 3.5 | 0.18 | 95 | 2.06 | 4 | 0.5 | 2N | 0.05 |  |
| **SKM200GB125D** | 200 | 150 | 3.3 | 14 | 8 | 0.09 | 200 | 2.06 | 8 | 0.25 | 3 | 0.038 | |
| **SKM300GB125D** | 300 | 200 | 3.3 | 16 | 11 | 0.075 | 260 | 2.00 | 13 | 0.18 | 3 | 0.038 | |
| **SKM400GB125D** | 400 | 300 | 3.3 | 17 | 18 | 0.05 | 390 | 2.06 | 16 | 0.125 | 3 | 0.038 | |
| **SKM25GD125D** [1] | 39 | 25 | 3.2 | 3.9 | 1.6 | 0.56 | 47 | 2.13 | 1.1 | 1 | 6 | 0.05 |  |
| **SKM50GD125D** [1] | 73 | 50 | 3.2 | 8 | 3.2 | 0.32 | 77 | 2.00 | 2.1 | 0.6 | 6 | 0.05 | |
| **SKM25GAH125D** [1] | 39 | 25 | 3.2 | 3.9 | 1.6 | 0.56 | 47 | 2.13 | 1.1 | 1 | 6 | 0.05 |  |
| **1700 V - IGBT 3 (Trench)** | | | | | | | | | | | | | |
| **SKM145GAL176D** | 160 | 100 | 2 | 60 | 38 | 0.19 | 140 | 1.6 | 27.5 | 0.36 | 2 | 0.05 |  |
| **SKM200GAL176D** | 260 | 150 | 2 | 93 | 58 | 0.12 | 210 | 1.55 | 31 | 0.25 | 3 | 0.038 | |
| **SKM400GAL176D** | 432 | 300 | 2 | 170 | 118 | 0.075 | 440 | 1.55 | 78 | 0.125 | 3 | 0.038 | |
| **SKM400GAR176D** | 432 | 300 | 2 | 170 | 118 | 0.075 | 440 | 1.55 | 78 | 0.125 | 3 | 0.038 |  |
| **SKM600GA176D** | 660 | 400 | 2 | 255 | 155 | 0.044 | 600 | 1.6 | 102 | 0.09 | 4 | 0.038 |  |
| **SKM800GA176D** | 830 | 600 | 2 | 335 | 245 | 0.04 | 630 | 1.6 | 155 | 0.07 | 4 | 0.038 | |
| **SKM75GB176D** | 80 | 50 | 2 | 25 | 18 | 0.38 | 80 | 1.50 | 14.5 | 0.55 | 2 | 0.05 |  |
| **SKM100GB176D** | 125 | 75 | 2 | 44 | 28.5 | 0.24 | 100 | 1.6 | 21.4 | 0.45 | 2 | 0.05 | |
| **SKM145GB176D** | 160 | 100 | 2 | 60 | 38 | 0.19 | 140 | 1.6 | 27.5 | 0.36 | 2 | 0.05 | |
| **SKM200GB176D** | 260 | 150 | 2 | 93 | 58 | 0.12 | 210 | 1.55 | 31 | 0.25 | 3 | 0.038 | |
| **SKM400GB176D** | 432 | 300 | 2 | 170 | 118 | 0.075 | 440 | 1.55 | 78 | 0.125 | 3 | 0.038 | |

# Modules - IGBT - SEMITRANS

| Type | IGBT | | | | | | Diode | | | | Case | | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @$T_C$= 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 | $R_{th(c-s)}$ | |
| | A | A | V | mJ | mJ | K/W | A | V | mJ | K/W | | K/W | |
| **1700 V - NPT IGBT (Standard)** | | | | | | | | | | | | | |
| **SKM200GAR173D** 2) | 220 | 150 | 3.4 | 95 | 45 | 0.1 | 150 | 2.2 | 21 | 0.32 | 3 | 0.038 |  |
| **SKM200GAL173D** 2) | 220 | 150 | 3.4 | 95 | 45 | 0.1 | 150 | 2.2 | 21 | 0.32 | 3 | 0.038 |  |
| **SKM400GA173D** 2) | 440 | 300 | 3 | 180 | 10 | 0.05 | 300 | 2.2 | 46 | 0.17 | 4 | 0.038 |  |
| **SKM75GB173D** 2) | 75 | 50 | 3.4 | 18 | 13 | 0.25 | 60 | 2.2 | 10.5 | 0.75 | 2 | 0.05 |  |
| **SKM100GB173D** 2) | 110 | 75 | 3.4 | 35 | 21 | 0.2 | 80 | 2.2 | 11.5 | 0.63 | 2 | 0.05 | |
| **SKM150GB173D** 2) | 150 | 100 | 3.4 | 60 | 32 | 0.125 | 125 | 2.2 | 14 | 0.4 | 3 | 0.038 | |
| **SKM200GB173D** 2) | 220 | 150 | 3.4 | 95 | 45 | 0.1 | 150 | 2.2 | 21 | 0.32 | 3 | 0.038 | |

**Footnotes**

1) New

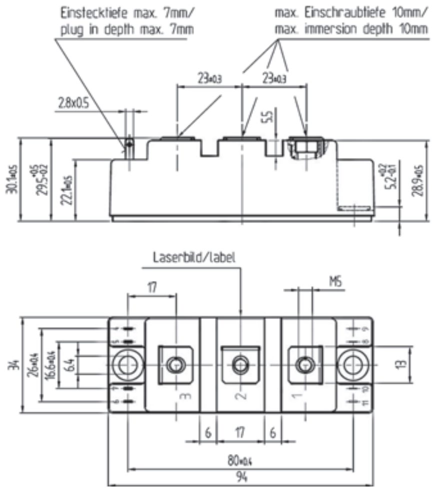
2) Not for New Design

# Modules - IGBT - SEMITRANS

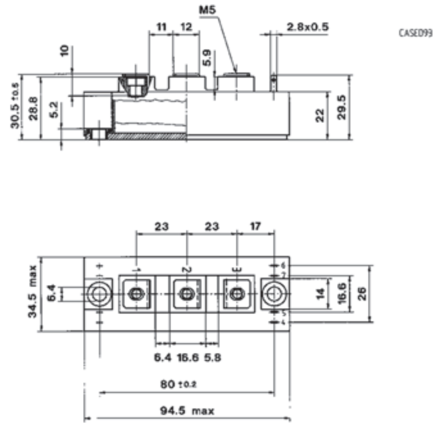


## Cases

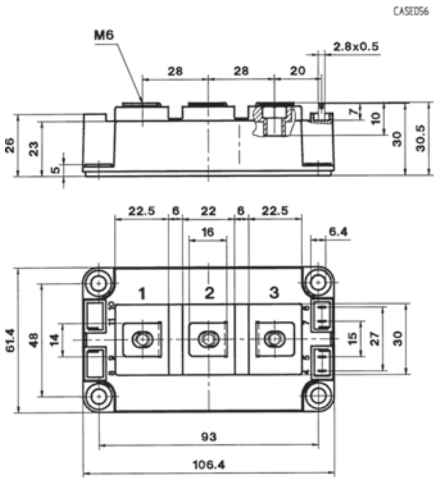
### SEMITRANS 2



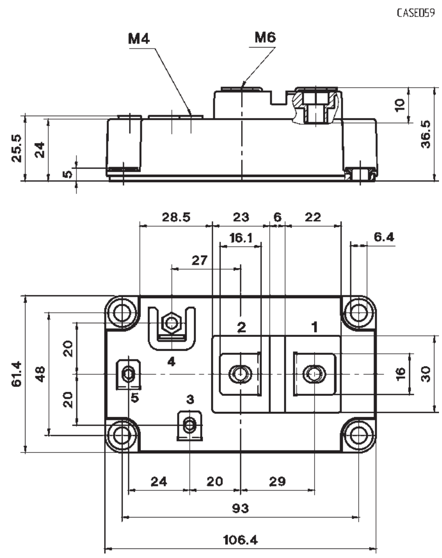

### SEMITRANS 2N



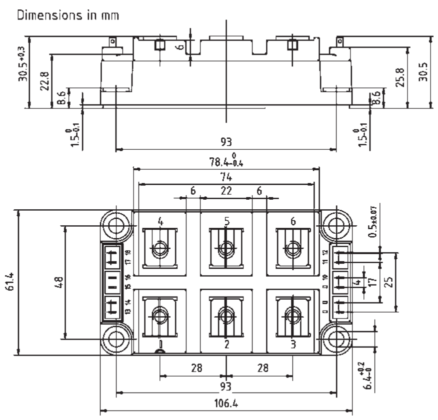

### SEMITRANS 3



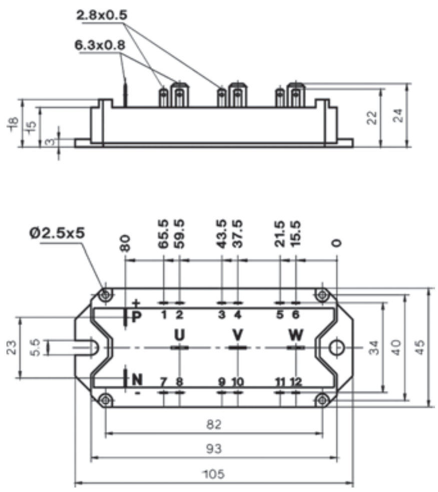

### SEMITRANS 4




### SEMITRANS 5

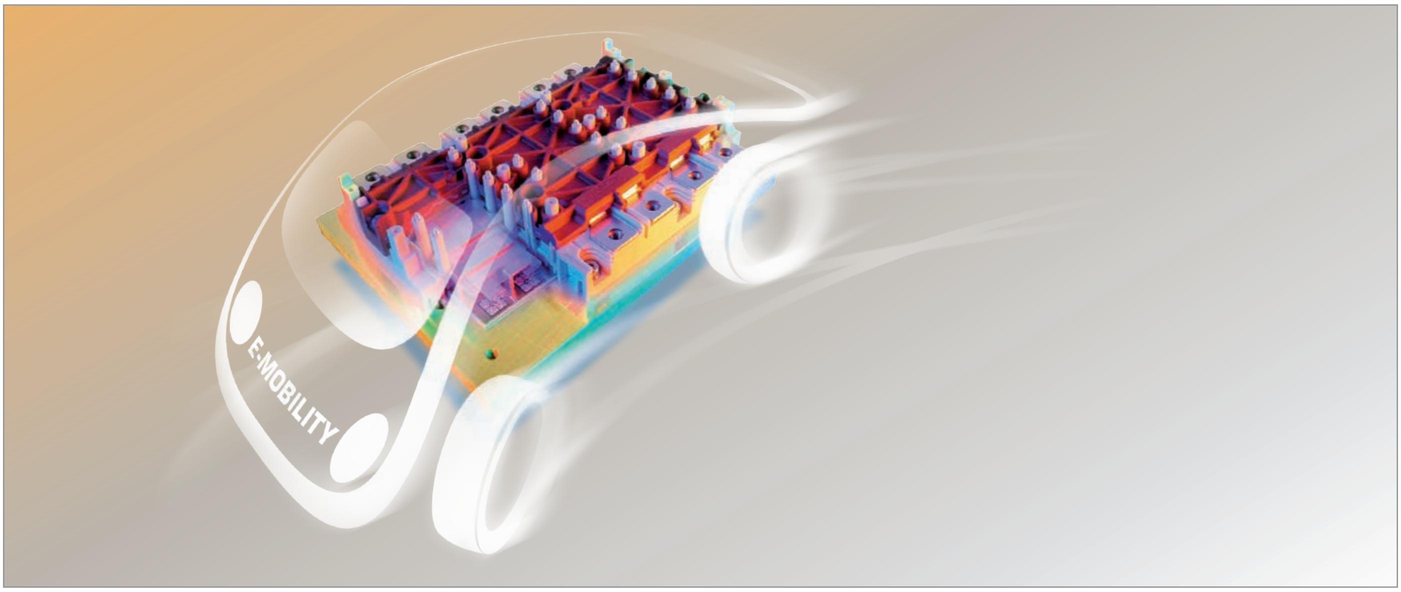



### SEMITRANS 6




**Dimensions in mm**

# SKiM® 63/93




## 100 % solder-free ensures durability

### Applications

SKiM 63/93 sintered modules with no base plate offer a number of possibilities for boosting the reliability of inverters. The SKiM 63/93 is used in many different applications, such as electric powertrains in electric vehicles, hybrid cars and utility vehicles, heavy-duty construction machinery, or even to provide leading-edge performance in race cars.

### Product range

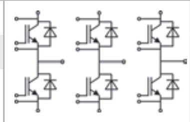
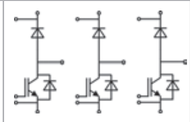
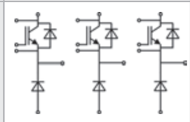
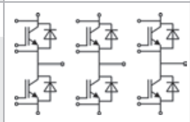
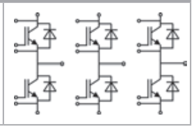
The SKiM 63/93 modules combine 3-phase inverter topology with temperature control for all 3 phases at 600 V, 1200 V and 1700 V voltage. Power ranges from 20 kW - 180 kW, nominal currents range from 300 A - 900 A. Driver solutions for all voltage classes are available as well as an optimised water cooler for fast and customer-friendly evaluation. In addition, paralleling boards for a simple and powerful half-bridge configuration are also available.

### Benefits

SKiM solderfree technology completely eliminates solder connections that can be detrimental to service life. The reliability of the inverter, even under substantial active and passive temperature swings, can be increased by several factors. This is proven by best-in-class results in power cycle and temperature cycle tests. Thanks to the baseplate-free design, the thickness of the thermal paste layer could be reduced by a factor of 4 as compared to conventional modules. Hand in hand with the optimised thermal layout, operating temperatures are reduced significantly. Temperatures are largely homogenous throughout the 3 phases of the inverter. All SKiM modules come with pre-applied thermal paste. No soldering is required for SKiM driver board and heat sink mounting, making the assembly easy and cost-efficient.

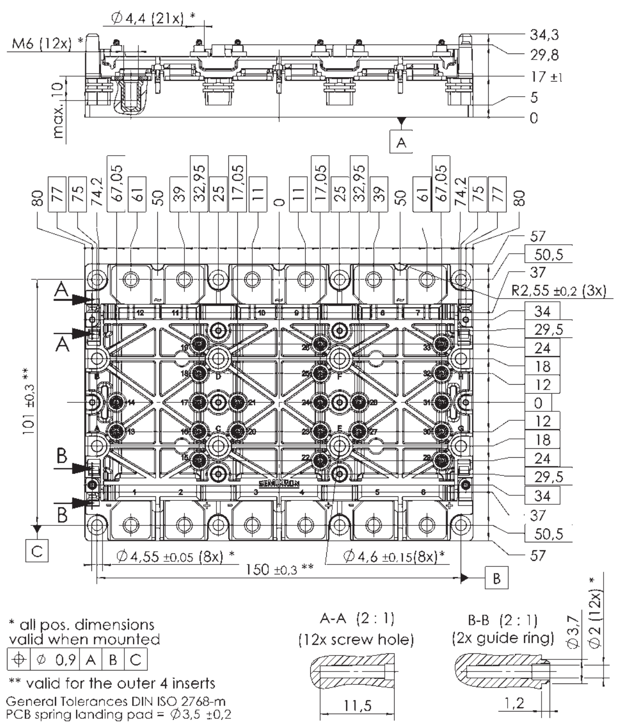
**www.semikron.com/igbt-skim6393**

# Modules - IGBT - SKiM 63/93

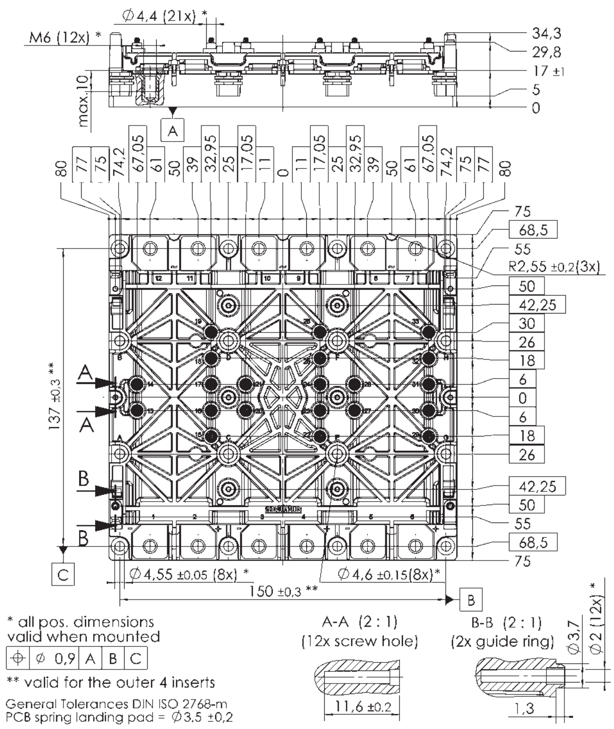
| Type | IGBT | | | | | | Diode | | | | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @$T_S$= 25°C | $I_{Cnom}$ | $V_{CE(sat)}$ @$T_j$= 25°C typ. | $E_{on}$ | $E_{off}$ | $R_{th(j-s)}$ | $I_F$ @$T_S$= 25°C | $V_F$ @$T_j$= 25°C typ. | $E_{rr}$ | $R_{th(j-s)}$ | | |
| | A | A | V | mJ | mJ | K/W | A | V | mJ | K/W | | |
| **600 V - IGBT 3 (Trench)** | | | | | | | | | | | | |
| **SKiM406GD066HD** | 468 | 400 | 1.45 | 8 | 25 | 0.135 | 360 | 1.5 | 12 | 0.243 | 63 |  |
| **SKiM606GD066HD** | 641 | 600 | 1.45 | 16 | 53 | 0.105 | 453 | 1.6 | 21 | 0.201 | 63 | |
| **SKiM909GD066HD** | 899 | 900 | 1.45 | 36 | 88 | 0.078 | 712 | 1.5 | 29 | 0.135 | 93 | |
| **1200 V - IGBT 4 (Trench)** | | | | | | | | | | | | |
| **SKiM609GAL12E4** | 748 | 600 | 1.85 | 136 | 83 | 0.068 | 1397 | 1.7 | 39 | 0.048 | 93 |  |
| **SKiM609GAR12E4** | 748 | 600 | 1.85 | 136 | 83 | 0.068 | 1397 | 1.7 | 39 | 0.048 | 93 |  |
| **SKiM306GD12E4** | 410 | 300 | 1.85 | 19 | 39 | 0.116 | 302 | 2.1 | 21 | 0.218 | 63 |  |
| **SKiM459GD12E4** | 554 | 450 | 1.85 | 22 | 57 | 0.092 | 438 | 2.1 | 40 | 0.155 | 93 | |
| **1700 V - IGBT 4 (Trench)** | | | | | | | | | | | | |
| **SKiM429GD17E4HD** | 595 | 420 | 1.9 | 245 | 180 | 0.079 | 413 | 1.7 | 99 | 0.169 | 93 |  |

## Cases

### SKiM 63

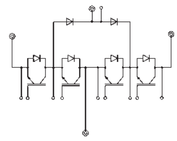
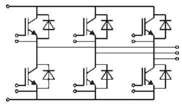
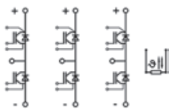
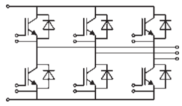
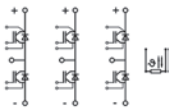
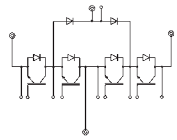
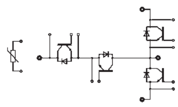
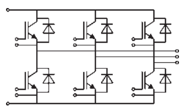
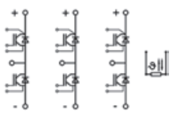



### SKiM 93

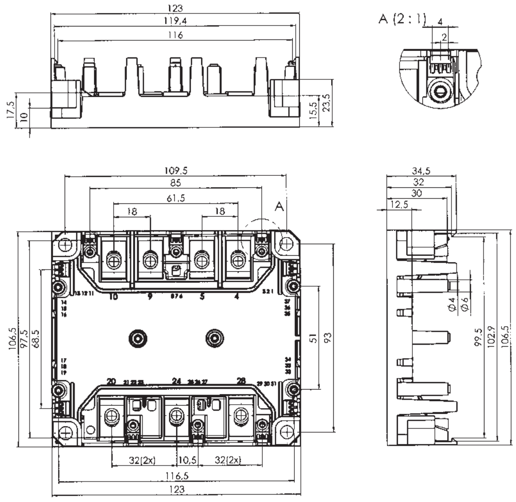
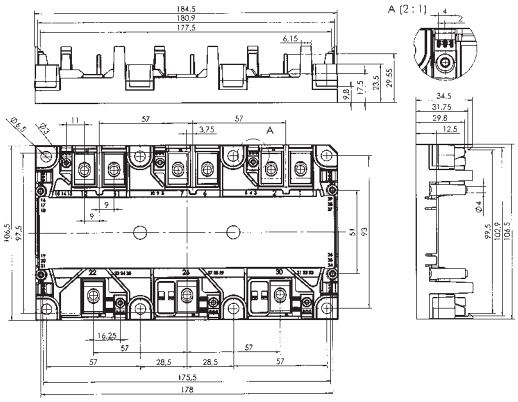



**Dimensions in mm**

# Modules - IGBT - SKiM 4/5

| Type | IGBT | | | | | | Diode | | | | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @$T_S$= 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. | $E_{rr}$ | $R_{th(j-s)}$ | | |
| | A | A | V | mJ | mJ | K/W | A | V | mJ | K/W | | |
| **650 V - IGBT 3 (Trench)** | | | | | | | | | | | | |
| **SKiM201MLI07E4** | 190 | 200 | 1.45 | - | - | - | - | - | - | - | 4 |  |
| **SKiM301MLI07E4** | 256 | 300 | 1.45 | - | - | - | - | - | - | - | 4 | |
| **SKiM401MLI07E4** | 317 | 400 | 1.45 | 3.32 | | - | - | - | 1.8 | - | 4 | |
| **SKiM601MLI07E4** | 438 | 600 | 1.45 | 5.49 | | - | - | - | 2.4 | - | 4 | |
| **1200 V - IGBT 3 (Trench)** | | | | | | | | | | | | |
| **SKiM200GD126D** | - | 200 | 1.65 | 15 | 25 | - | 152 | 2.4 | - | 0.35 | 4 |  |
| **SKiM300GD126D** | 265 | 300 | 1.7 | 28 | 47 | 0.2 | 260 | 1.9 | - | 0.285 | 4 | |
| **SKiM300GD126DL** | 265 | 300 | 1.65 | 28 | 47 | 0.2 | 260 | 1.9 | - | 0.285 | 4 | |
| **SKiM400GD126DLM** | 330 | 300 | 1.65 | 29 | 46 | 0.134 | 300 | 1.9 | - | 0.19 | 4 | |
| **SKiM400GD126DM** | 330 | 300 | 1.7 | 29 | 46 | 0.134 | 300 | 1.9 | - | 0.19 | 4 | |
| **SKiM450GD126D** | 390 | 450 | 1.7 | 42 | 70 | 0.13 | 345 | 1.9 | - | 0.19 | 5 |  |
| **SKiM450GD126DL** | 390 | 450 | 1.65 | 42 | 70 | 0.13 | 345 | 1.9 | - | 0.19 | 5 | |
| **SKiM600GD126DLM** | 480 | 450 | 1.65 | 42 | 70 | 0.09 | 450 | 1.9 | - | 0.125 | 5 | |
| **SKiM601GD126DM** | 480 | 450 | 1.7 | 42 | 70 | 0.09 | 450 | 1.9 | - | 0.125 | 5 | |
| **1200 V - IGBT 4 (Trench)** | | | | | | | | | | | | |
| **SKiM304GD12T4D** | 312 | 300 | 1.8 | - | - | 0.19 | 221 | 2.3 | - | 0.25 | 4 |  |
| **SKiM455GD12T4D1** | 400 | 450 | 1.8 | 34 | 40 | 0.14 | 295 | 2.3 | 28 | 0.19 | 5 |  |
| **SKiM455GD12T4DM1** | 460 | 450 | 1.8 | 34 | 40 | 0.11 | 390 | 2.3 | 28 | 0.12 | 5 | |
| **SKiM201MLI12E4** | 225 | 200 | 1.8 | 23.7 | | - | 180 | 2.2 | | - | 4 |  |
| **SKiM301MLI12E4** | 312 | 300 | 1.8 | 23.7 | | - | 253 | 2.1 | | - | 4 | |
| **SKiM301TMLI12E4B** | 311 | 300 | 1.8 | 23.7 | | 0.19 | 249 | 2.20 | - | 0.29 | 4 |  |
| **SKiM301TMLI12E4C** | 311 | 300 | 1.8 | 23.7 | | 0.19 | 249 | 2.20 | - | 0.29 | 4 | |
| **SKiM401TMLI12E4B** | 388 | 400 | 1.8 | 8.83 | | 0.16 | 311 | 2.20 | 2.26 | 0.24 | 4 | |
| **SKiM601TMLI12E4B** | 542 | 600 | 1.8 | | | 0.12 | 438 | 2.14 | 3.45 | 0.18 | 4 | |
| **1700 V - IGBT 3 (Trench)** | | | | | | | | | | | | |
| **SKiM120GD176D** | 110 | 125 | 2 | 72 | 46 | 0.4 | 105 | 1.6 | 22 | 0.56 | 4 |  |
| **SKiM220GD176DH4** | 220 | 250 | 2 | 145 | 100 | 0.21 | 220 | 1.7 | 65 | 0.26 | 4 | |
| **SKiM270GD176D** | 260 | 300 | 2 | 170 | 120 | 0.175 | 215 | 1.7 | - | 0.29 | 5 |  |

# Modules - IGBT - SKiM 4/5

| Cases | |
|---|---|
| SKiM 4 | SKiM 5 |
|  |  |

**Dimensions in mm**

Modules

Discretes

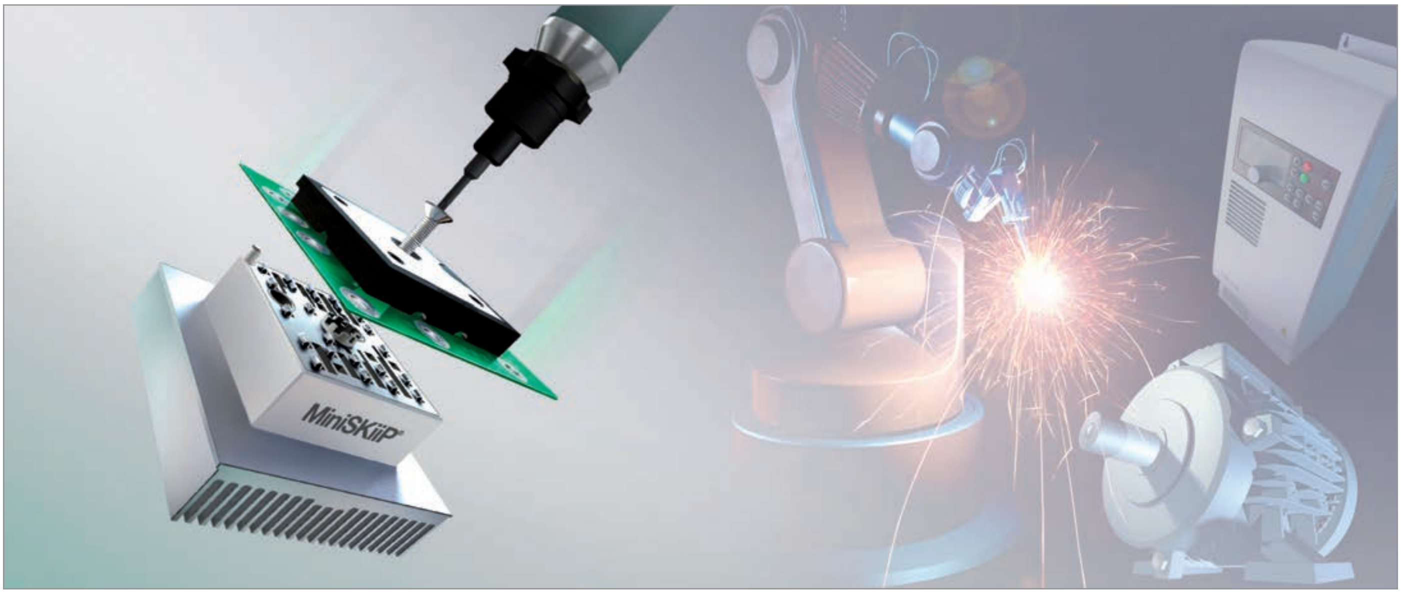
Driver Electronics

Systems for vehicle applications

Solutions

Accessories

# MiniSKiiP®




## Fast, cost efficient and reliable one screw mounting

### Applications

Thanks to the use of spring contact technology, MiniSKiiP modules enable fast single-screw or double-screw assembly, facilitating quick and reliable inverter manufacture. With more than 15 years of field experience and more than 21 million modules in the field, this module platform has proven successful in all standard applications. Key applications include all kinds of frequency inverters, such as standard drives, stand-alone drives, servo drives, system drives, solar inverters, UPS systems and welding machines. Thanks to the reliability of spring contacts, applications such as agricultural vehicles or pitch motors of windmills benefit from the MiniSKiiP technology.

### Product range

MiniSKiiP modules are designed for 600 V and 1200 V chip with 4-200 A nominal chip currents, and feature Trench IGBT technology in combination with the SEMIKRON CAL diode. In the 1200 V range, the latest Trench IGBT4 technology is used in combination with the CAL 4 diode. These chips are designed for a junction temperature of up to 175°C. In addition to the CIB configuration and 6-pack modules, non-controlled rectifiers with brake chopper, as well as half-controlled rectifiers with brake chopper, are also available. Modules for 3-level inverters with output powers of 30-80 kVA and an IGBT blocking voltage of 650 V, as well as SiC devices, are also available.

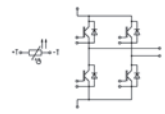
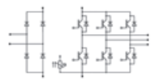
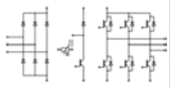
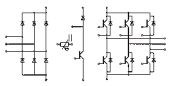
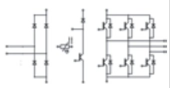
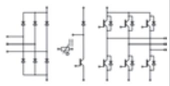
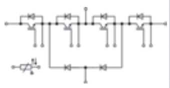
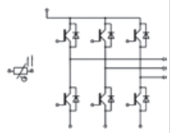
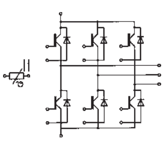
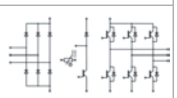
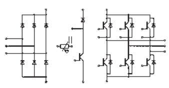
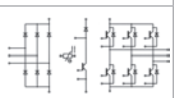
### Benefits

An important mechanical feature in this module is the easy-assembly and service-friendly spring-contact for load and gate terminals. Compared to conventionally soldered modules, where expensive automatic soldering equipment is required for time-consuming soldering processes, no special tools are needed to assemble MiniSKiiP modules - instead, a single-screw connection is used. The printed circuit board (PCB), power module and heat sink are firmly joined via the pressure lid.

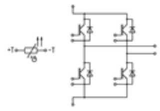
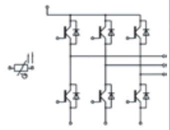
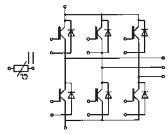
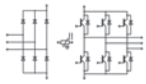
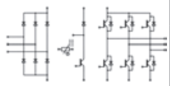
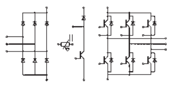
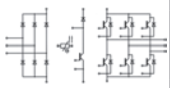
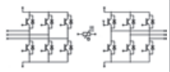
This connection technology features a number of additional advantages: the customer's PCB can be more flexible in design, as the power circuit board does not need to include holes for solder pins. The springs provide a flexible connection between the PCB and the power circuitry which is far superior to a soldered joint, particularly under thermal or mechanical load conditions which can affect lifetime. Thanks to the good contact force provided by the springs, an air-tight, reliable electrical connection can be sustained.

**www.semikron.com/igbt-miniskiip**

# Modules - IGBT - MiniSKiiP

| Type | IGBT | | | | | | Diode | | | | Rectifier | | | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @$T_S$= 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. | $E_{rr}$ | $R_{th(j-s)}$ | $I_{FSM}$ @$T_S$= 25°C | $R_{th(j-s)}$ | | |
| | A | A | V | mJ | mJ | K/W | A | V | mJ | K/W | A | K/W | | |
| **600 V - IGBT 3 (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 01NEC066V3 | 12 | 6 | 1.45 | 0.3 | 0.2 | 2.4 | 12 | 1.30 | 0.2 | 3 | 220 | 1.5 | II 0 |  |
| SKiiP 02NEC066V3 | 20 | 10 | 1.45 | 0.5 | 0.3 | 2 | 20 | 1.30 | 0.5 | 2.5 | 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 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 25NEB066V1 | 43 | 30 | 1.45 | 0.9 | 1.2 | 1.35 | 39 | 1.50 | 1.1 | 2.1 | 370 | 1.5 | II 2 |  |
| **600 V - NPT IGBT (Ultrafast)** | | | | | | | | | | | | | | |
| SKiiP 11NAB065V1 [2] | 12 | 6 | 2 | 0.3 | 0.2 | 1.9 | 12 | 1.30 | 0.2 | 2.5 | 220 | 1.5 | II 1 |  |
| SKiiP 12NAB065V1 [2] | 20 | 10 | 2 | 0.3 | 0.3 | 1.5 | 20 | 1.40 | 0.2 | 2.5 | 220 | 1.5 | II 1 | |
| SKiiP 13NAB065V1 [2] | 24 | 15 | 2 | 0.6 | 0.3 | 1.4 | 26 | 1.40 | 0.4 | 2.2 | 220 | 1.5 | II 1 | |
| SKiiP 14NAB065V1 [2] | 29 | 20 | 2 | 0.7 | 0.4 | 1.25 | 26 | 1.60 | 0.4 | 2.2 | 370 | 1.25 | II 1 | |
| **650 V - IGBT 3 (Trench)** | | | | | | | | | | | | | | |
| SKiiP 26MLI07E3V1 [1] | - | 75 | 1.45 | - | - | - | - | 1.5 | - | - | - | - | II 2 |  |
| SKiiP 27MLI07E3V1 [1] | - | 100 | 1.45 | - | - | - | - | 1.4 | - | - | - | - | II 2 | |
| SKiiP 28MLI07E3V1 [1] | - | 150 | 1.45 | - | - | - | - | 1.4 | - | - | - | - | II 2 | |
| SKiiP 39MLI07E3V1 [1] | - | 200 | 1.45 | - | - | - | - | 1.4 | - | - | - | - | II 3 | |
| **1200 V - IGBT 3 (Trench)** | | | | | | | | | | | | | | |
| SKiiP 11AC126V1 [2] | 16 | 8 | 1.7 | 0.9 | 1 | 1.5 | 14 | 1.90 | 0.9 | 2.5 | - | - | II 1 |  |
| SKiiP 12AC126V1 [2] | 28 | 15 | 1.7 | 1.7 | 1.9 | 1.15 | 26 | 1.60 | 1.2 | 1.95 | - | - | II 1 | |
| SKiiP 13AC126V1 [2] | 41 | 25 | 1.7 | 4.1 | 3.1 | 0.9 | 30 | 1.80 | 2.2 | 1.7 | - | - | II 1 | |
| SKiiP 23AC126V1 [2] | 41 | 25 | 1.7 | 3.7 | 3.1 | 0.9 | 30 | 1.80 | 2.6 | 1.7 | - | - | II 2 |  |
| SKiiP 24AC126V1 [2] | 52 | 35 | 1.7 | 4.2 | 4.4 | 0.75 | 38 | 1.80 | 3.5 | 1.5 | - | - | II 2 | |
| SKiiP 25AC126V1 [2] | 73 | 50 | 1.7 | 5.8 | 6.5 | 0.55 | 62 | 1.60 | 5.1 | 1 | - | - | II 2 | |
| SKiiP 26AC126V1 [2] | 88 | 70 | 1.7 | 9 | 7.7 | 0.5 | 91 | 1.50 | 7.5 | 0.7 | - | - | II 2 | |
| SKiiP 37AC126V2 [2] | 97 | 75 | 1.7 | 9.6 | 8.7 | 0.45 | 90 | 1.60 | 9.6 | 0.7 | - | - | II 3 | |
| SKiiP 38AC126V2 [2] | 118 | 105 | 1.7 | 13.1 | 13 | 0.4 | 118 | 1.60 | 11.2 | 0.55 | - | - | II 3 | |
| SKiiP 39AC126V2 [2] | 157 | 140 | 1.7 | 19.9 | 17.2 | 0.3 | 167 | 1.50 | 16.2 | 0.4 | - | - | II 3 | |
| SKiiP 11NAB126V1 [2] | 16 | 8 | 1.7 | 0.8 | 1 | 1.5 | 14 | 1.90 | 0.9 | 2.5 | 220 | 1.5 | II 1 |  |
| SKiiP 12NAB126V1 [2] | 28 | 15 | 1.7 | 2 | 1.9 | 1.15 | 26 | 1.60 | 1.3 | 1.95 | 220 | 1.5 | II 1 | |
| SKiiP 23NAB126V1 [2] | 41 | 25 | 1.7 | 3.5 | 3 | 0.9 | 30 | 1.80 | 2.5 | 1.7 | 370 | 1.25 | II 2 |  |
| SKiiP 23NAB126V10 [2] | 41 | 25 | 1.7 | 3.5 | 3 | 0.9 | 30 | 1.80 | 2.5 | 1.7 | 635 | 0.9 | II 2 | |
| SKiiP 24NAB126V1 [2] | 52 | 35 | 1.7 | 4.6 | 4 | 0.75 | 38 | 1.80 | 3.3 | 1.5 | 370 | 1.25 | II 2 | |
| SKiiP 24NAB126V10 [2] | 52 | 35 | 1.7 | 4.6 | 4 | 0.75 | 38 | 1.80 | 3.3 | 1.5 | 635 | 0.9 | II 2 | |
| SKiiP 35NAB126V1 [2] | 73 | 50 | 1.7 | 6.5 | 6.1 | 0.55 | 62 | 1.60 | 4.7 | 1 | 700 | 0.9 | II 3 |  |
| SKiiP 36NAB126V1 [2] | 88 | 70 | 1.7 | 9 | 7.7 | 0.5 | 91 | 1.50 | 7.5 | 0.7 | 700 | 0.9 | II 3 | |

# Modules - IGBT - MiniSKiiP

| Type | IGBT | | | | | | Diode | | | | Rectifier | | | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @$T_S$= 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. | $E_{rr}$ | $R_{th(j-s)}$ | $I_{FSM}$ @$T_S$= 25°C | $R_{th(j-s)}$ | | |
| | A | A | V | mJ | mJ | K/W | A | V | mJ | K/W | A | K/W | | |
| **1200 V - IGBT 4 (Trench)** | | | | | | | | | | | | | | |
| **SKiiP 26GH12T4V11** | 90 | 70 | 1.85 | 9.5 | 7.1 | 0.55 | 83 | 2.1 | 5.6 | 0.75 | - | - | II 2 |  |
| **SKiiP 11AC12T4V1** | 12 | 8 | 1.85 | 0.87 | 0.75 | 1.84 | 15 | 2.3 | 0.53 | 2.53 | - | - | II 1 |  |
| **SKiiP 12AC12T4V1** | 18 | 15 | 1.85 | 1.65 | 1.5 | 1.3 | 23 | 2.4 | 0.79 | 1.92 | - | - | II 1 | |
| **SKiiP 13AC12T4V1** | 41 | 25 | 1.85 | 3.7 | 2.4 | 1 | 32 | 2.4 | 1.64 | 1.52 | - | - | II 1 | |
| **SKiiP 23AC12T4V1** | 41 | 25 | 1.85 | 3.7 | 2.4 | 1 | 32 | 2.4 | 1.64 | 1.52 | - | - | II 2 |  |
| **SKiiP 24AC12T4V1** | 52 | 35 | 1.85 | 3.7 | 3 | 0.85 | 44 | 2.3 | 2.3 | 1.2 | - | - | II 2 | |
| **SKiiP 25AC12T4V1** | 69 | 50 | 1.85 | 6 | 4.5 | 0.71 | 60 | 2.2 | 3.2 | 0.95 | - | - | II 2 | |
| **SKiiP 26AC12T4V1** | 90 | 70 | 1.85 | 9.5 | 7.1 | 0.55 | 83 | 2.2 | 5.6 | 0.75 | - | - | II 2 | |
| **SKiiP 37AC12T4V1** | 90 | 75 | 1.85 | 11.5 | 6.8 | 0.58 | 83 | 2.2 | 5.5 | 0.75 | - | - | II 3 | |
| **SKiiP 38AC12T4V1** | 115 | 100 | 1.8 | 13.7 | 9.7 | 0.48 | 100 | 2.2 | 6.5 | 0.66 | - | - | II 3 | |
| **SKiiP 39AC12T4V1** | 167 | 150 | 1.85 | 22.5 | 14 | 0.33 | 136 | 2.1 | 11.4 | 0.52 | - | - | II 3 | |
| **SKiiP 02NAC12T4V1** | 6 | 4 | 1.85 | 0.66 | 0.37 | 2.49 | 7.5 | 1.8 | 0.34 | 2.53 | 220 | 1.5 | II 0 |  |
| **SKiiP 03NAC12T4V1** | 7.5 | 8 | 1.85 | 0.9 | 0.7 | 1.84 | 9 | 2.3 | 0.5 | 2.53 | 220 | 1.5 | II 0 | |
| **SKiiP 10NAB12T4V1** | 6 | 4 | 1.85 | 0.66 | 0.37 | 2.49 | 7.5 | 1.8 | 0.34 | 2.53 | 220 | 1.5 | II 1 |  |
| **SKiiP 11NAB12T4V1** | 12 | 8 | 1.85 | 0.87 | 0.74 | 1.84 | 15 | 2.3 | 0.57 | 2.53 | 220 | 1.5 | II 1 | |
| **SKiiP 12NAB12T4V1** | 18 | 15 | 1.85 | 1.4 | 1.3 | 1.3 | 23 | 2.40 | 1.1 | 1.92 | 220 | 1.5 | II 1 | |
| **SKiiP 23NAB12T4V1** | 37 | 25 | 1.85 | 2.65 | 2.3 | 1.2 | 32 | 2.40 | 1.6 | 1.52 | 370 | 1.25 | II 2 |  |
| **SKiiP 24NAB12T4V1** | 48 | 35 | 1.85 | 4.3 | 3.25 | 1 | 44 | 2.3 | 2.4 | 1.2 | 370 | 1.25 | II 2 | |
| **SKiiP 34NAB12T4V1** | 52 | 35 | 1.85 | 4.3 | 3.3 | 0.85 | 44 | 2.3 | 2.4 | 1.2 | 370 | 1.25 | II 3 |  |
| **SKiiP 35NAB12T4V1** | 69 | 50 | 1.85 | 6 | 4.7 | 0.71 | 60 | 2.25 | 3.4 | 0.95 | 700 | 0.9 | II 3 | |
| **SKiiP 37NAB12T4V1** | 90 | 75 | 1.85 | 9.7 | 6.8 | 0.58 | 83 | 2.2 | 4.9 | 0.75 | 700 | 0.9 | II 3 | |
| **SKiiP 38NAB12T4V1** | 115 | 100 | 1.8 | 11.2 | 10 | 0.48 | 99 | 2.2 | 6.5 | 0.66 | 1000 | 0.7 | II 3 | |
| **SKiiP 11ACC12T4V10** 1) | 12 | 8 | 1.85 | 0.87 | 0.74 | 1.84 | 15 | 2.3 | 0.57 | 2.53 | - | - | II 1 |  |
| **SKiiP 12ACC12T4V10** 1) | 18 | 15 | 1.85 | 1.73 | 1.42 | 1.3 | 23 | 2.4 | 1.1 | 1.92 | - | - | II 1 | |
| **SKiiP 23ACC12T4V10** 1) | 41 | 25 | 1.85 | 2.8 | 2.3 | 1 | 32 | 2.4 | 1.7 | 1.52 | - | - | II 2 | |
| **SKiiP 24ACC12T4V10** 1) | 52 | 35 | 1.85 | 4.2 | 3.1 | 0.85 | 44 | 2.3 | 2.2 | 1.2 | - | - | II 2 | |

**Footnotes**

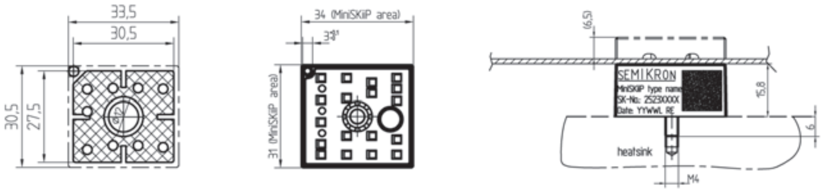
1) New

2) Not for New Design

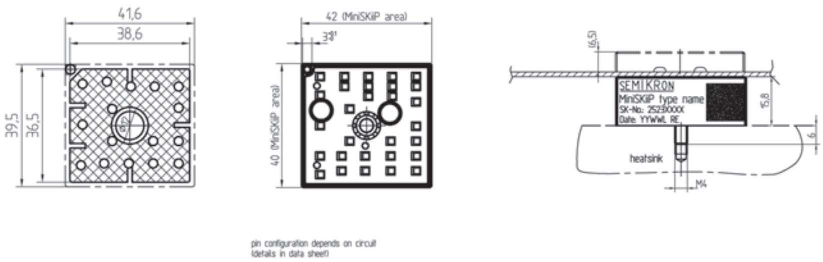
# Modules - IGBT - MiniSKiiP

## Cases

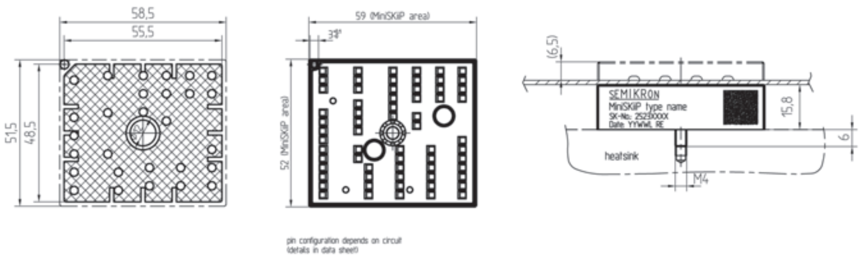
### MiniSKiiP II 0



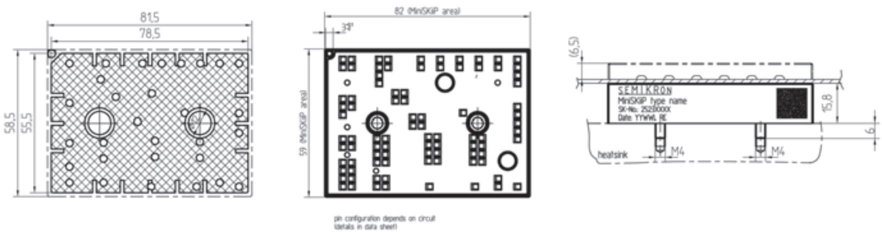

### MiniSKiiP II 1




### MiniSKiiP II 2

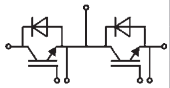
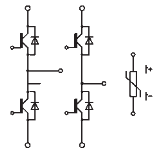
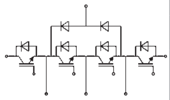
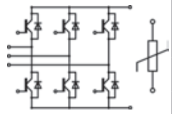
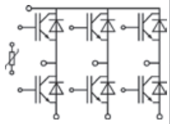
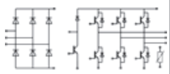
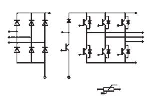



### MiniSKiiP II 3

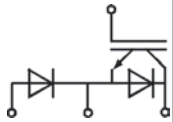
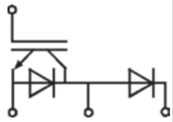
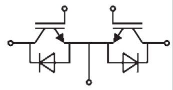
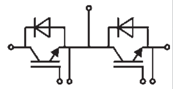
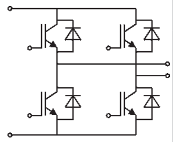
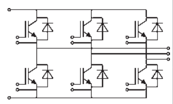
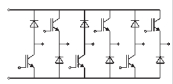



**Dimensions in mm**

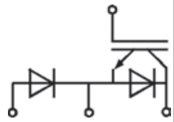
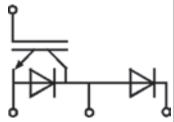
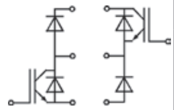
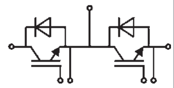
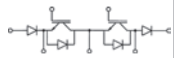
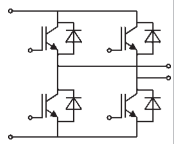
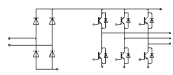
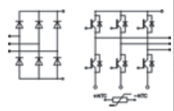
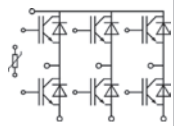
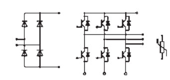
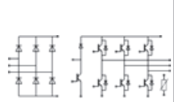
# Modules - IGBT - SEMITOP

| 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 $I_{FSM}$ @$T_s$= 25°C (A) | Rectifier $R_{th(j-s)}$ (K/W) | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **600 V - IGBT 3 (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 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 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 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 20 DGDL 066 ET** | 30 | 20 | 1.45 | 0.3 | 0.6 | 1.95 | 27 | 1.40 | 0.2 | 2.46 | 220 | 2.15 | 3 |  |
| **SK 30 DGDL 066 ET** | 40 | 30 | 1.45 | 0.55 | 1.15 | 1.65 | 36 | 1.50 | 0.53 | 2.3 | 370 | 1.7 | 3 | |
| **SK 50 DGDL 066 T** | 69 | 50 | 1.45 | 2.2 | 1.74 | 0.95 | 54 | 1.35 | 0.73 | 1.6 | 370 | 1.5 | 4 |  |
| **SK 75 DGDL 066 T** | 81 | 75 | 1.45 | 3.1 | 2.8 | 0.75 | 64 | 1.35 | 0.9 | 1.2 | 700 | 0.9 | 4 | |
| **SK 100 DGDL 066 T** | 106 | 100 | 1.45 | 4.4 | 3.5 | 0.65 | 99 | 1.10 | 1.45 | 0.8 | 700 | 0.9 | 4 | |

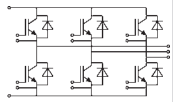
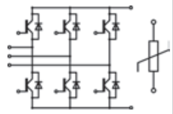
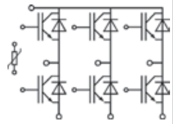
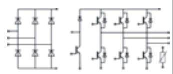
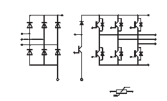
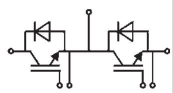
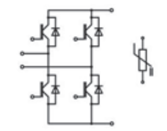
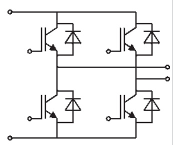
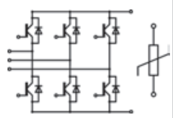
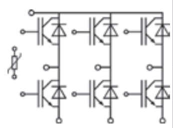
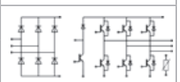
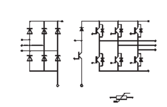
# Modules - IGBT - SEMITOP

| Type | IGBT | | | | | | Diode | | | | Rectifier | | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @$T_S$= 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. | $E_{rr}$ | $R_{th(j-s)}$ | $I_{FSM}$ @$T_S$= 25°C | $R_{th(j-s)}$ | | |
| | A | A | V | mJ | mJ | K/W | A | V | mJ | K/W | A | K/W | | |
| **600 V - NPT IGBT (Standard)** | | | | | | | | | | | | | | |
| **SK 45 GAR 063 2)** | 45 | 50 | 2.1 | 1.4 | 1.2 | 1 | 57 | 1.45 | 0.25 | 1.2 | - | - | 2 |  |
| **SK 45 GAL 063 2)** | 45 | 50 | 2.1 | 1.4 | 1.2 | 1 | 57 | 1.45 | 0.25 | 1.2 | - | - | 2 |  |
| **SK 80 GM 063 2)** | 81 | 100 | 2 | 3 | 2.3 | 0.6 | 105 | 1.30 | 0.2 | 1.2 | - | - | 2 |  |
| **SK 45 GB 063 2)** | 45 | 50 | 2.1 | 1.4 | 1.2 | 1 | 57 | 1.45 | 0.25 | 1.2 | - | - | 2 |  |
| **SK 80 GB 063 2)** | 81 | 100 | 2.1 | 4 | 3 | 0.6 | 79 | 1.40 | 1.2 | 0.9 | - | - | 3 | |
| **SK 15 GH 063 2)** | 20 | 15 | 2 | 0.71 | 0.4 | 1.9 | 20 | 1.45 | 0.45 | 1.2 | - | - | 2 |  |
| **SK 25 GH 063 2)** | 30 | 30 | 2.1 | 1.1 | 0.8 | 1.4 | 36 | 1.45 | 0.25 | 1.7 | - | - | 2 | |
| **SK 45 GH 063 2)** | 45 | 50 | 2.1 | 1.4 | 1.2 | 1 | 57 | 1.30 | 0.9 | 1.2 | - | - | 3 | |
| **SK 13 GD 063 2)** | 18 | 10 | 2.1 | 0.6 | 0.4 | 2 | 22 | 1.45 | 0.1 | 2.3 | - | - | 3 |  |
| **SK 25 GD 063 2)** | 30 | 30 | 2.1 | 1.3 | 0.9 | 1.4 | 36 | 1.45 | 0.25 | 1.7 | - | - | 3 | |
| **SK 45 GD 063 2)** | 45 | 50 | 2.1 | 1.4 | 1.2 | 1 | 36 | 1.45 | 0.25 | 1.7 | - | - | 3 | |
| **SK 25 GAD 063 T 2)** | 30 | 30 | 2.1 | 1.3 | 0.9 | 1.4 | 36 | 1.45 | 0.25 | 1.7 | - | - | 3 |  |

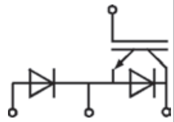
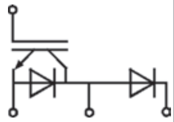
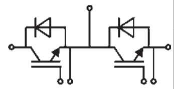
# Modules - IGBT - SEMITOP

| Type | IGBT | | | | | | Diode | | | | Rectifier | | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @$T_s$= 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. | $E_{rr}$ | $R_{th(j-s)}$ | $I_{FSM}$ @$T_s$= 25°C | $R_{th(j-s)}$ | | |
| | A | A | V | mJ | mJ | K/W | A | V | mJ | K/W | A | K/W | | |
| **600 V - NPT IGBT (Ultrafast)** | | | | | | | | | | | | | | |
| **SK 50 GAR 065** | 54 | 60 | 2 | 1.1 | 0.7 | 0.85 | 57 | 1.30 | 0.2 | 1.2 | - | - | 2 |  |
| **SK 50 GAL 065** | 54 | 60 | 2 | 1.1 | 0.7 | 0.85 | 57 | 1.30 | 0.2 | 1.2 | - | - | 2 |  |
| **SK 55 GARL 065 E** | 54 | 60 | 1.7 | 1.1 | 0.76 | 0.85 | 36 | 1.45 | 0.9 | 1.7 | - | - | 3 |  |
| **SK 75 GARL 065 E** | 80 | 90 | 1.7 | 2.71 | 2.75 | 0.6 | 57 | 1.30 | 0.2 | 1.2 | - | - | 3 | |
| **SK 50 GB 065** | 54 | 60 | 2 | 1.1 | 0.7 | 0.85 | 64 | 1.45 | 0.55 | 1.1 | - | - | 2 |  |
| **SK 50 GARL 065 F** | 54 | 60 | 1.7 | 1.03 | 0.8 | 0.85 | 82 | 1.70 | - | 2.3 | - | - | 2 |  |
| **SK 50 GARL 065 USA** | 54 | 60 | 1.7 | 1.07 | 0.76 | 0.85 | 64 | 1.40 | - | 2.3 | - | - | 2 | |
| **SK 50 GH 065 F** | 54 | 60 | 2 | 1.07 | 1.76 | 0.85 | 82 | 1.10 | 0.42 | 1.1 | - | - | 3 |  |
| **SK 8 BGD 065 E** 2) | 12 | 6 | 2 | 0.22 | 0.12 | 2.6 | 13 | 1.35 | - | 2.7 | 220 | 2.15 | 2 |  |
| **SK 9 DGD 065 ET** | 12 | 6 | 2 | 0.22 | 0.12 | 2.6 | 20 | 1.35 | 0.31 | 2.7 | 220 | 2.15 | 3 |  |
| **SK 20 DGD 065 ET** | 26 | 20 | 2 | 0.66 | 0.4 | 1.7 | 25 | 1.60 | - | 1.7 | 370 | 1.7 | 3 | |
| **SK 25 DGD 065 ET** 2) | 30 | 20 | 1.8 | 0.8 | 0.55 | 1.4 | 36 | 1.45 | - | 1.7 | 370 | 1.7 | 3 | |
| **SK 35 GD 065 ET** | 45 | 50 | 2 | 1.3 | 0.6 | 1 | 36 | 1.90 | 0.9 | 1.7 | - | - | 3 |  |
| **SK 10 BGD 065 ET** | 17 | 6 | 2 | 0.18 | 0.13 | 2 | 22 | 1.30 | 0.18 | 2.3 | 220 | 2.7 | 3 |  |
| **SK 9 BGD 065 ET** | 12 | 6 | 2 | 0.22 | 0.12 | 2.6 | 20 | 1.35 | 0.31 | 2.7 | 220 | 2.15 | 3 | |
| **SK 10 DGDL 065 ET** | 17 | 6 | 2 | 0.18 | 0.13 | 2 | 22 | 1.30 | 0.18 | 2.3 | 220 | 2.7 | 3 |  |
| **SK 8 DGDL 065 ET** 2) | 12 | 6 | 2 | 0.22 | 0.12 | 2.6 | 13 | 1.35 | - | 2.7 | - | 2.8 | 3 | |
| **SK 15 DGDL 065 ET** 2) | 19 | 10 | 2 | 0.3 | 0.22 | 1.9 | 22 | 1.40 | 0.24 | 2.3 | 220 | 2.7 | 3 | |
| **SK 20 DGDL 065 ET** | 24 | 20 | 2 | 0.69 | 0.39 | 1.7 | 25 | 1.60 | - | 1.7 | 220 | 2 | 3 | |

# Modules - IGBT - SEMITOP

| Type | IGBT | | | | | | Diode | | | | Rectifier | | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @$T_s$= 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. | $E_{rr}$ | $R_{th(j-s)}$ | $I_{FSM}$ @$T_s$= 25°C | $R_{th(j-s)}$ | | |
| | A | A | V | mJ | mJ | K/W | A | V | mJ | K/W | A | K/W | | |
| **1200 V - IGBT 3 (Trench)** | | | | | | | | | | | | | | |
| **SK 8 GD 126 [2)]** | 15 | 8 | 1.7 | 0.78 | 0.96 | 2 | 13 | 1.90 | 20.6 | 2.8 | - | - | 2 |  |
| **SK 50 GD 126 T** | 68 | 50 | 1.7 | 4.6 | 6.3 | 0.6 | 62 | 1.35 | 3.6 | 1 | - | - | 4 |  |
| **SK 75 GD 126 T** | 88 | 75 | 1.7 | 11.3 | 10 | 0.5 | 91 | 1.46 | 6 | 0.7 | - | - | 4 | |
| **SK 100 GD 126 T** | 114 | 100 | 1.7 | 9.8 | 11.7 | 0.4 | 118 | 1.50 | 7.3 | 0.55 | - | - | 4 | |
| **SK 10 GD 126 ET** | 15 | 8 | 1.7 | 1 | 1 | 2 | 25 | 1.90 | 1.4 | 2.1 | - | - | 3 |  |
| **SK 15 GD 126 ET** | 22 | 15 | 1.7 | 2 | 1.8 | 1.6 | 25 | 1.60 | 1.4 | 2.1 | - | - | 3 | |
| **SK 25 GD 126 ET** | 32 | 25 | 1.7 | 3.3 | 3.1 | 1.2 | 28 | 1.80 | 2.1 | 1.9 | - | - | 3 | |
| **SK 35 GD 126 ET** | 40 | 35 | 1.7 | 4.6 | 4.3 | 1.05 | 34 | 1.80 | 2.9 | 1.7 | - | - | 3 | |
| **SK 10 DGDL 126 ET** | 15 | 8 | 1.7 | 1 | 1 | 2 | 25 | 1.90 | 1.4 | 2.1 | 220 | 2.7 | 3 |  |
| **SK 15 DGDL 126 ET** | 22 | 15 | 1.7 | 2 | 1.8 | 1.6 | 25 | 1.60 | 1.1 | 2.1 | 220 | 2 | 3 | |
| **SK 25 DGDL 126 T** | 41 | 25 | 1.7 | 2.8 | 3.1 | 0.9 | 30 | 1.50 | 2 | 1.7 | 370 | 1.5 | 4 |  |
| **SK 35 DGDL 126 T** | 52 | 35 | 1.7 | 3.7 | 4.8 | 0.75 | 38 | 1.50 | 3 | 1.5 | 370 | 1.25 | 4 | |
| **SK 50 DGDL 126 T** | 68 | 50 | 1.7 | 4.6 | 6.3 | 0.6 | 62 | 1.35 | 3.6 | 1 | 700 | 0.9 | 4 | |
| **1200 V - IGBT 4 (Trench)** | | | | | | | | | | | | | | |
| **SK 25 GB 12T4** | 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 | 40 | 2.30 | 1.46 | 1.55 | 225 | - | 2 | |
| **SK 50 GB 12T4 T** | 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** | 100 | 100 | 1.85 | 16.6 | 10 | 0.6 | 85 | 2.25 | 5.2 | 0.87 | - | - | 3 | |
| **SK 50 GH 12T4 T** | 75 | 50 | 1.8 | 8.3 | 5 | 0.65 | 56 | 2.20 | 2.15 | 1.05 | - | - | 4 |  |
| **SK 100 GH 12T4 T** | 126 | 100 | 1.8 | 16.6 | 10 | 0.43 | 102 | 2.20 | 5.2 | 0.62 | - | - | 4 | |
| **SK 25 GH 12T4 [1)]** | - | 25 | 1.85 | 2.27 | 2.7 | 1.11 | 26 | 2.41 | 1.28 | 2.15 | - | - | 3 |  |
| **SK 50 GD 12T4 T** | 75 | 50 | 1.85 | 8.3 | 5 | 0.65 | 60 | 2.20 | 2.15 | 0.97 | - | - | 4 |  |
| **SK 75 GD 12T4 T** | 102 | 75 | 1.85 | 13.6 | 8.2 | 0.51 | 83 | 2.20 | 3.38 | 0.75 | - | - | 4 | |
| **SK 100 GD 12T4 T** | 126 | 100 | 1.85 | 16.6 | 10 | 0.43 | 102 | 2.25 | 5.2 | 0.62 | - | - | 4 | |
| **SK 10 GD 12T4 ET** | 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 35 GD 12T4 ET** | 44 | 35 | 1.85 | 3.27 | 3.3 | 1.21 | 40 | 2.30 | 1.46 | 1.55 | - | - | 3 | |
| **SK 10 DGDL 12T4 ET** | 17 | 8 | 1.85 | 0.41 | 0.75 | 2.2 | 15 | 2.38 | 0.41 | 2.7 | 220 | 2 | 3 |  |
| **SK 15 DGDL 12T4 ET** | 27 | 15 | 1.85 | 0.82 | 1.52 | 1.65 | 21 | 2.38 | 0.82 | 2.34 | 220 | 2 | 3 | |
| **SK 25 DGDL 12T4 T** | 45 | 25 | 1.85 | 2.27 | 2.7 | 0.96 | 30 | 2.40 | - | 1.7 | 370 | 1.25 | 4 |  |
| **SK 35 DGDL 12T4 T** | 58 | 35 | 1.85 | 3.27 | 3.3 | 0.8 | 46 | 2.30 | 1.46 | 1.37 | 370 | 1.25 | 4 | |
| **SK 50 DGDL 12T4 T** | 75 | 50 | 1.85 | 8.3 | 5 | 0.65 | 60 | 2.22 | 2.15 | 0.97 | 700 | 0.9 | 4 | |

# Modules - IGBT - SEMITOP

| Type | IGBT | | | | | | Diode | | | | Rectifier | | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @$T_s$= 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. | $E_{rr}$ | $R_{th(j-s)}$ | $I_{FSM}$ @$T_s$= 25°C | $R_{th(j-s)}$ | | |
| | A | A | V | mJ | mJ | K/W | A | V | mJ | K/W | A | K/W | | |
| **1200 V - NPT IGBT (Ultrafast)** | | | | | | | | | | | | | | |
| **SK 60 GAR 125** | 51 | 50 | 3.2 | 8.36 | 3.32 | 0.6 | 43 | 2.00 | 2 | 1.16 | - | - | 2 |  |
| **SK 60 GAL 125** | 51 | 50 | 3.2 | 8.36 | 3.32 | 0.6 | 43 | 2.00 | 2 | 1.16 | - | - | 2 |  |
| **SK 60 GB 125** | 51 | 50 | 3.2 | 8.36 | 3.32 | 0.6 | 57 | - | 2 | 0.9 | - | - | 3 |  |
| **SK 80 GB 125 T** | 85 | 75 | 3.2 | 9.9 | 5 | 0.32 | 90 | 2.00 | 1 | 0.65 | - | - | 3 | |

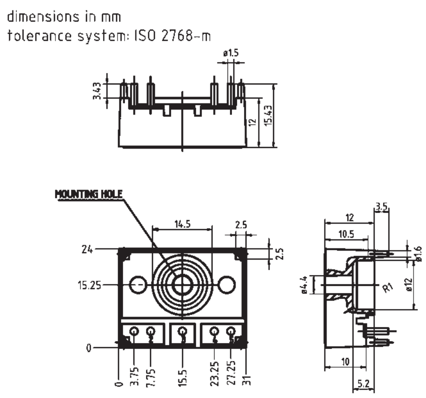
## Footnotes

1) New

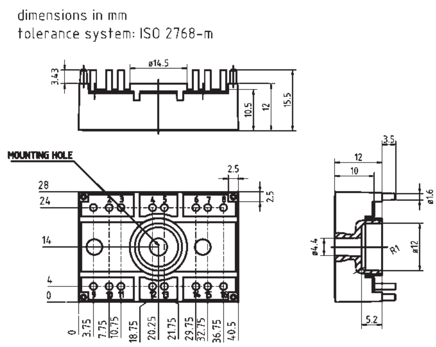
2) Not for New Design

## Cases

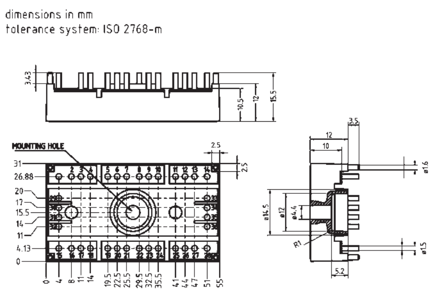
### SEMITOP 1



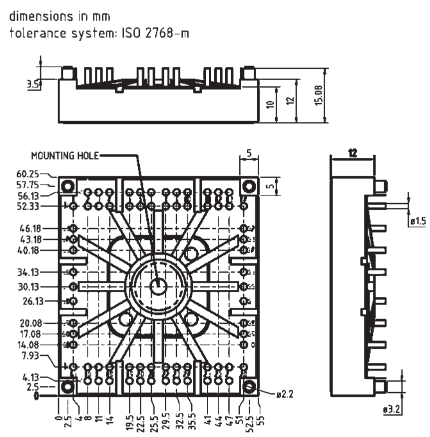

### SEMITOP 2




### SEMITOP 3




### SEMITOP 4

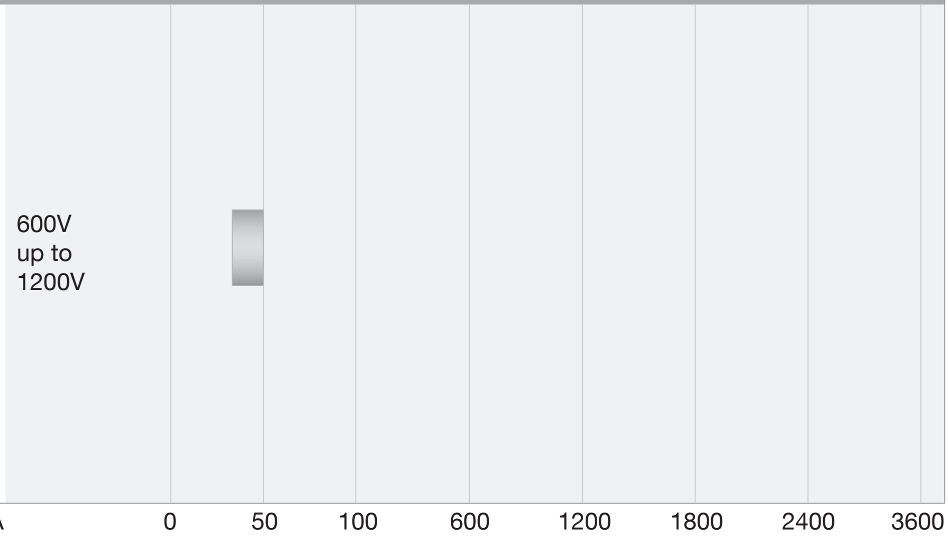



**Dimensions in mm**

# IPM Intelligent Power Module

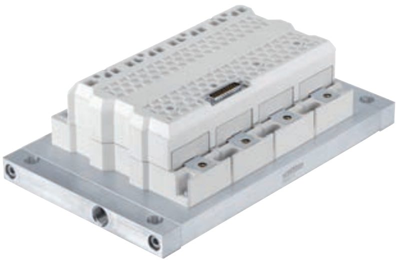
## MiniSKiiP® IPM

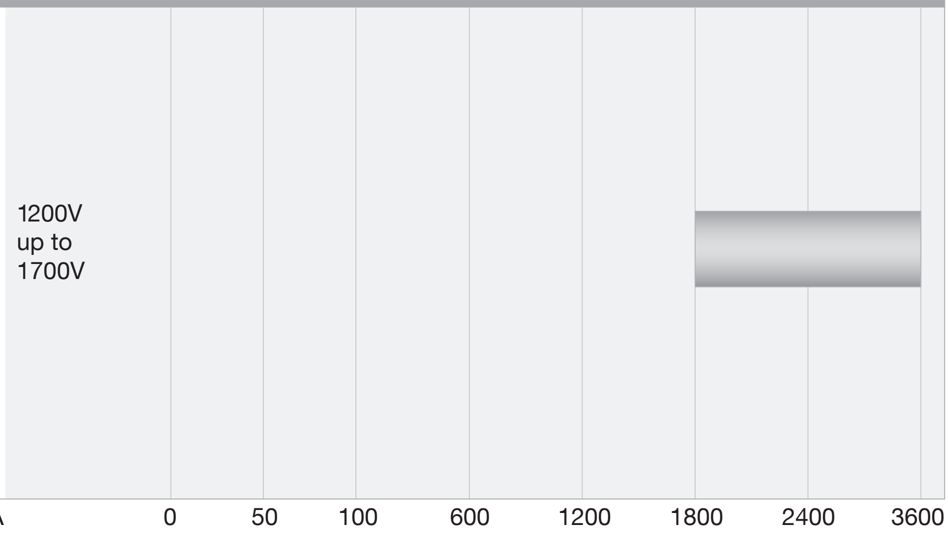
CIB
6-pack




## SKiiP® 4

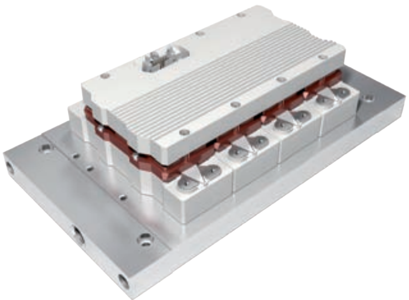
half bridge

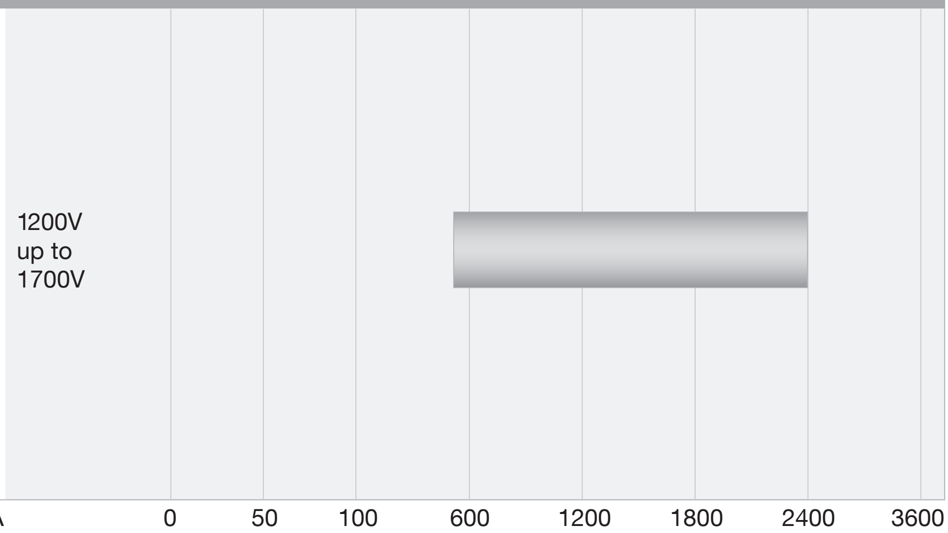




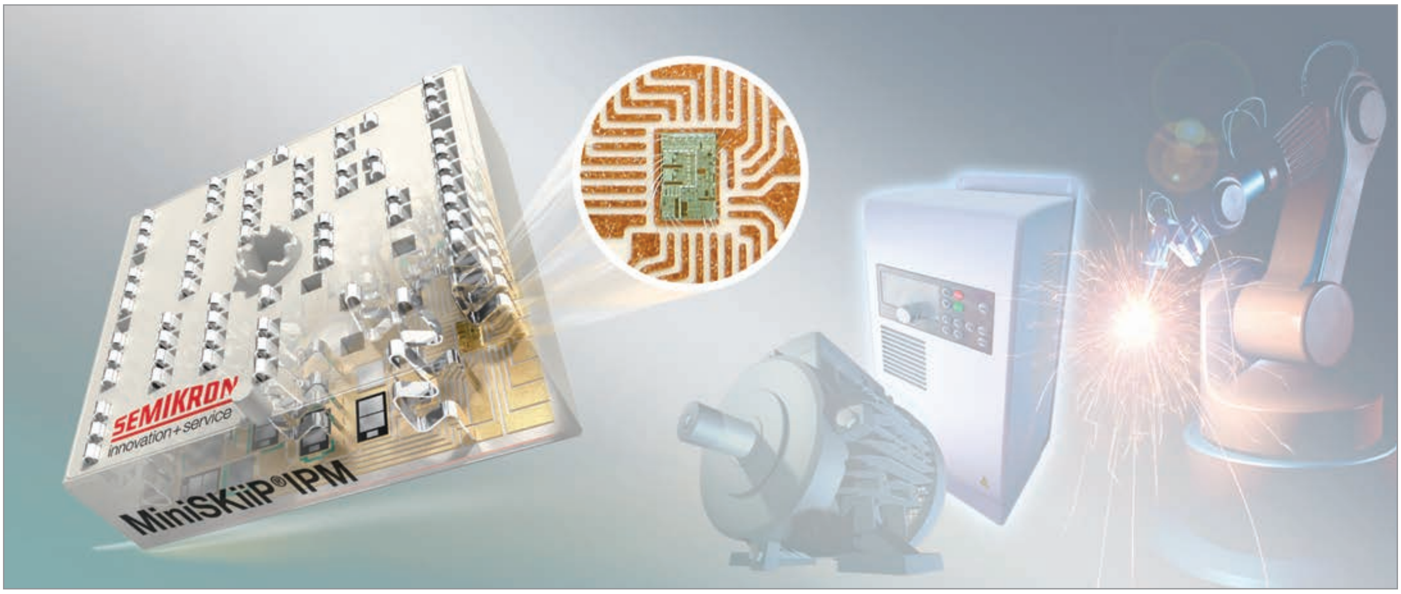

## SKiiP® 3

6-pack
half bridge





# MiniSKiiP® IPM




## Compact 3-phase inverter design through high power density

### Applications

MiniSKiiP IPM is SEMIKRON's new intelligent power module family for medium power applications. Each IPM incorporates a latch-up free HVIC SOI gate driver with the advanced level shifter concept. The gate driver features a 3.3 V/ 5 V/ 15 V compatible input signal interface and provides short-circuit current detection using an external shunt resistor, integrated under-voltage lockout for all channels and interlock logic with dead time setting for cross- conduction protection. A built-in temperature sensor with NTC characteristics allows for the permanent monitoring of the intelligent power module temperature by using the external µC.

### Product range

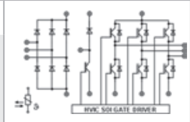
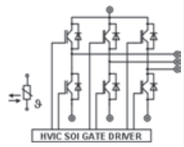
MiniSKiiP IPM is suitable for industrial and consumer drives up to 15 kW, as well as for process control and solar applications. Using state-of the-art Trench-Field-Stop IGBTs, the IPMs are available in 600 V as CIB and 1200 V as a 6-pack. The modules are RoHS compliant.

### Benefits

The IPM combines a base plate-free package with the proven pressure contact technology for quick and easy solder-free assembly. All power, control and auxiliary contacts are connected directly to the printed circuit board via springs, resulting in more reliable electrical connections under more severe vibration and shock conditions. The simple one-step mounting of module, printed circuit board and heat sink with a single standard screw reduces assembly steps and costs.

**www.semikron.com/ipm-miniskiip**

# Modules - IPM - MiniSKiiP

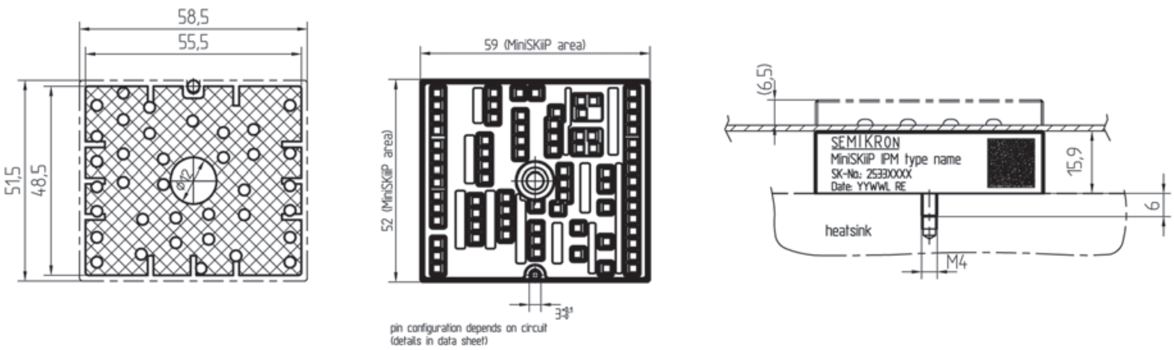
| Type | IGBT | | | | | | Diode | | | | Rectifier | | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @ $T_S$= 25°C | $I_{Cnom}$ | $V_{CE(sat)}$ @$T_j$= 25°C typ. | $E_{on}$ | $E_{off}$ | $R_{th(j-s)}$ | $I_F$ @ $T_S$= 25°C | $V_F$ @$T_j$= | $E_{rr}$ | $R_{th(j-s)}$ | $I_{FSM}$ @ $T_S$= 25°C | $R_{th(j-s)}$ | | |
| | A | A | V | mJ | mJ | K/W | A | V | mJ | K/W | A | K/W | | |
| **600 V - IGBT 3 (Trench)** | | | | | | | | | | | | | | |
| **SKiiP 25NABI066V3** [1)] | 41 | 30 | 1.5 | 1.1 | 1 | 1.4 | 37 | 1.6 | 0.7 | 1.8 | 370 | 1.7 | IPM 2 |  |
| **SKiiP 26NABI066V3** [1)] | 59 | 50 | 1.45 | 2.4 | 2.1 | 1.1 | 51 | 1.5 | 1 | 1.6 | 370 | 1.7 | IPM 2 | |
| **1200 V - IGBT 4 (Trench)** | | | | | | | | | | | | | | |
| **SKiiP 25ACI12T4V2** [1)] | 62 | 50 | 1.85 | 6.6 | 5.7 | 0.84 | 59 | 2.25 | 3 | 0.99 | - | - | IPM 2 |  |

### Footnotes

[1)] New

## Cases

### MiniSKiiP IPM 2




**Dimensions in mm**

# SKiiP® 4


## Sintered chips – for high operating temperatures

### Applications

The success story of the SKiiP family has progressed hand in hand with the advancement of the wind power market. The 4th generation SKiiP modules are a further improvement of the powerful SKiiP series. The mainstay of SKiiP4 modules is the wind power sector, with approximately 57 GW out of the 122 GW of wind power installed worldwide (at the end of 2009) featuring SEMIKRON solutions, in many cases SKiiP technology. 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.

### Product range

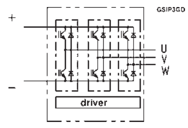
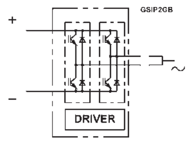
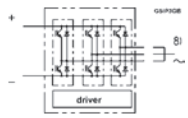
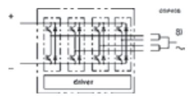
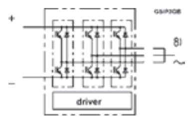
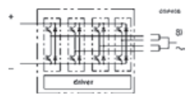
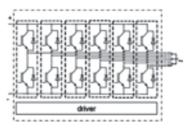
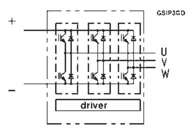
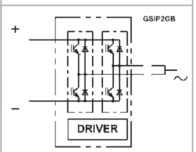
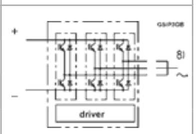
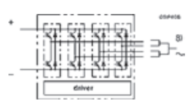
SKiiP4 is available for 1200 V and 1700 V. In both of these voltage classes, SKiiP4 modules come in the topologies 3GB 1800 A, 4GB 2400 A and - new to the SKiiP family - 6GB 3600 A. The wide range of accessories is now available for both SKiiP3 and SKiiP4. Among them the fiberoptic boards, the boards for paralleling of SKiiP systems and the adapter board for connection SKiiP4 to SKiiP3 controller.

### Benefits

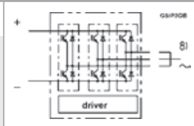
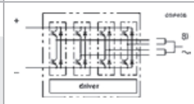
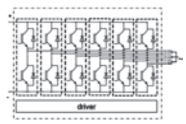
SKiiP4 is the most powerful IPM on the market. SKiiP4 modules enable the production of converter units with outputs of up to 2.1 MW. The power semiconductors used in SKiiP4 modules can be operated at a junction temperature of up to 175°C. To make sure these components can be reliably used at these temperatures, the power circuitry is 100% solder-free. Instead, 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. A further benefit is the better load cycling capability as compared to solder-based modules. The integrated gate driver in the SKiiP4 sets new standards in terms of reliability and functionality. The digital driver guarantees safe isolation between the primary and secondary side, both for switching signals and all measurement parameters, such as temperature and DC link voltage. This means the user no longer has to introduce complex and costly circuit components to provide safe isolation. For the first time, the SKiiP drive features a CANopen diagnosis channel for the integration of additional functions.

**www.semikron.com/ipm-skiip4**

# Modules - IPM - SKiiP 3 / 4

| Type | IGBT | | | | Diode | | | Case | | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @$T_s$= 25°C A | $I_{nom}$ A | $V_{CE(sat)}$ @$T_j$= 25°C typ. V | $E_{on} + E_{off}$ mJ | $I_F$ @$T_s$= 25°C A | $V_F$ @$T_j$= 25°C typ. V | $E_{rr}$ mJ | Case | Options F=F-Option U=U-Option S=SKiFace Adapter | |
| **1200 V - IGBT 3 (Trench) - SKiiP 3** | | | | | | | | | | |
| **SKiiP 603 GD123-3DUL V3** | 627 | 600 | 1.7 | 195 | 508 | 1.50 | 28 | S33 | - |  |
| **SKiiP 603 GD123-3DUW V3** | 627 | 600 | 1.7 | 195 | 508 | 1.50 | 28 | S33 | - | |
| **SKiiP 613 GD123-3DUL V3** | 577 | 600 | 1.7 | 195 | 466 | 1.50 | 28 | S33 | - | |
| **SKiiP 613 GD123-3DUW V3** | 577 | 600 | 1.7 | 195 | 466 | 1.50 | 28 | S33 | - | |
| **SKiiP 1213 GB123-2DL V3** | 1145 | 1200 | 1.7 | 390 | 925 | 1.50 | 56 | S23 | F,U |  |
| **SKiiP 1213 GB123-2DW V3** | 1145 | 1200 | 1.7 | 390 | 925 | 1.50 | 56 | S23 | F,U | |
| **SKiiP 1813 GB123-3DL V3** | 1695 | 1800 | 1.7 | 585 | 1411 | 1.50 | 84 | S33 | F,U |  |
| **SKiiP 1813 GB123-3DW V3** | 1695 | 1800 | 1.7 | 585 | 1411 | 1.50 | 84 | S33 | F,U | |
| **SKiiP 2413 GB123-4DL V3** | 2280 | 2400 | 1.7 | 780 | 1807 | 1.50 | 112 | S43 | F,U |  |
| **SKiiP 2413 GB123-4DW V3** | 2280 | 2400 | 1.7 | 780 | 1807 | 1.50 | 112 | S43 | F,U | |
| **1200 V - IGBT 4 (Trench) - SKiiP 4** | | | | | | | | | | |
| **SKiiP 1814 GB12E4-3DUL** | 2345 | 1800 | 2.01 | 1260 | 1776 | 2.33 | 150 | S34 | F,S |  |
| **SKiiP 1814 GB12E4-3DUW** | 2345 | 1800 | 2.01 | 1260 | 1776 | 2.33 | 150 | S34 | F,S | |
| **SKiiP 2414 GB12E4-4DUL** | 3109 | 2400 | 2.01 | 1680 | 2369 | 2.33 | 200 | S44 | F,S |  |
| **SKiiP 2414 GB12E4-4DUW** | 3109 | 2400 | 2.01 | 1680 | 2369 | 2.33 | 200 | S44 | F,S | |
| **SKiiP 3614 GB12E4-6DUL** | 4664 | 3600 | 2.01 | 2520 | 3558 | 2.33 | 300 | S64 | F,S |  |
| **SKiiP 3614 GB12E4-6DUW** | 4664 | 3600 | 2.01 | 2520 | 3558 | 2.33 | 300 | S64 | F,S | |
| **1700 V - IGBT 3 (Trench) - SKiiP 3** | | | | | | | | | | |
| **SKiiP 513 GD172-3DUL V3** | 540 | 500 | 1.9 | 288 | 438 | 2.00 | 43 | S33 | - |  |
| **SKiiP 513 GD172-3DUW V3** | 540 | 500 | 1.9 | 288 | 438 | 2.00 | 43 | S33 | - | |
| **SKiiP 603 GD172-3DUL V3** | 587 | 570 | 1.9 | 288 | 476 | 2.00 | 43 | S33 | - | |
| **SKiiP 603 GD172-3DUW V3** | 570 | 570 | 1.9 | 288 | 476 | 2.00 | 43 | S33 | - | |
| **SKiiP 1013 GB172-2DL V3** | 1072 | 1000 | 1.9 | 575 | 879 | 2.00 | 86 | S23 | F,U |  |
| **SKiiP 1013 GB172-2DW V3** | 1072 | 1000 | 1.9 | 575 | 879 | 2.00 | 86 | S23 | F,U | |
| **SKiiP 1203 GB172-2DL V3** | 1159 | 1200 | 1.9 | 575 | 961 | 2.00 | 86 | S23 | F,U | |
| **SKiiP 1203 GB172-2DW V3** | 1159 | 1200 | 1.9 | 575 | 961 | 2.00 | 86 | S23 | F,U | |
| **SKiiP 1513 GB172-3DL V3** | 1589 | 1500 | 1.9 | 863 | 1336 | 2.00 | 128 | S33 | F,U |  |
| **SKiiP 1513 GB172-3DW V3** | 1589 | 1500 | 1.9 | 863 | 1336 | 2.00 | 128 | S33 | F,U | |
| **SKiiP 1803 GB172-3DL V3** | 1744 | 1800 | 1.9 | 863 | 1454 | 2.00 | 128 | S33 | F,U | |
| **SKiiP 1803 GB172-3DW V3** | 1744 | 1800 | 1.9 | 863 | 1454 | 2.00 | 128 | S33 | F,U | |
| **SKiiP 2013 GB172-4DL V3** | 2102 | 2000 | 1.9 | 1150 | 1758 | 2.00 | 171 | S43 | F,U |  |
| **SKiiP 2013 GB172-4DW V3** | 2102 | 2000 | 1.9 | 1150 | 1758 | 2.00 | 171 | S43 | F,U | |
| **SKiiP 2403 GB172-4DL V3** | 2282 | 2400 | 1.9 | 1150 | 1921 | 2.00 | 171 | S43 | F,U | |
| **SKiiP 2403 GB172-4DW V3** | 2282 | 2400 | 1.9 | 1150 | 1921 | 2.00 | 171 | S43 | F,U | |

# Modules - IPM - SKiiP 3 / 4

| Type | IGBT $I_C$ @$T_s$= 25°C (A) | IGBT $I_{nom}$ (A) | IGBT $V_{CE(sat)}$ @$T_j$= 25°C typ. (V) | IGBT $E_{on}$ + $E_{off}$ (mJ) | Diode $I_F$ @$T_s$= 25°C (A) | Diode $V_F$ @$T_j$= 25°C typ. (V) | Diode $E_{rr}$ (mJ) | Case | Case Options F=F-Option U=U-Option S=SKiFace Adapter | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|
| **1700 V - IGBT 4 (Trench) - SKiiP 4** | | | | | | | | | | |
| **SKiiP 1814 GB17E4-3DUL** | 2547 | 1800 | 2.12 | 2130 | 1771 | 2.02 | 498 | S34 | F,S |  |
| **SKiiP 1814 GB17E4-3DUW** | 2547 | 1800 | 2.12 | 2130 | 1771 | 2.02 | 498 | S34 | F,S | |
| **SKiiP 2414 GB17E4-4DUL** | 3385 | 2400 | 2.12 | 2840 | 2362 | 2.02 | 664 | S44 | F,S |  |
| **SKiiP 2414 GB17E4-4DUW** | 3385 | 2400 | 2.12 | 2840 | 2362 | 2.02 | 664 | S44 | F,S | |
| **SKiiP 3614 GB17E4-6DUL** | 5078 | 3600 | 2.12 | 6840 | 3547 | 2.02 | 996 | S64 | F,S |  |
| **SKiiP 3614 GB17E4-6DUW** | 5078 | 3600 | 2.12 | 6840 | 3547 | 2.02 | 996 | S64 | F,S | |

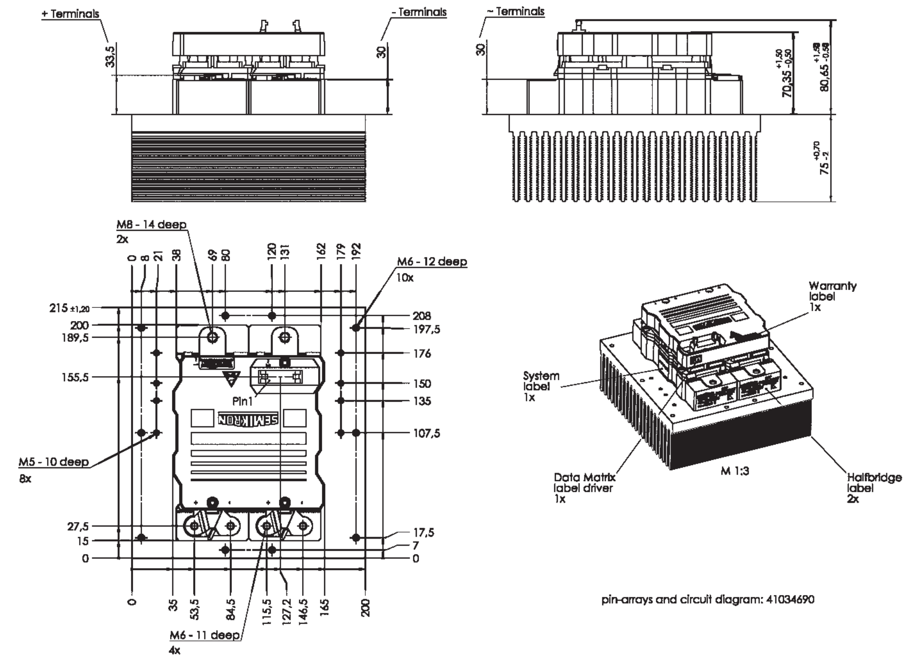
| Type | Description |
|---|---|
| **F-Option SKiiP4** | |
| **SKiiP4 F-Option** | Fiber optic control board for SKiiP4 |
| **SKiiP3 Parallel Board** | |
| **SKiiP3 Parallel Board 4-fold** | Board for paralleling of 4 SKiiP3, F-Option usage possible |
| **SKiiP3 Parallel Board 3-fold** | Board for paralleling of 3 SKiiP3, F-Option usage possible |
| **SKiiP3 Parallel Board 2-fold** | Board for paralleling of 2 SKiiP3, F-Option usage possible |
| **SKiiP4 Parallel Board** | |
| **SKiiP4 Parallel Board 4-fold without F-Option** | Board for paralleling of 4 SKiiP4, F-Option usage not possible |
| **SKiiP4 Parallel Board 4-fold F-Option** | Board for paralleling of 4 SKiiP4, F-Option usage possible |
| **SKiiP4 Parallel Board 3-fold without F-Option** | Board for paralleling of 3 SKiiP4, F-Option usage not possible |
| **SKiiP4 Parallel Board 3-fold F-Option** | Board for paralleling of 3 SKiiP4, F-Option usage possible |
| **SKiiP4 Parallel Board 2-fold without F-Option** | Board for paralleling of 2 SKiiP4, F-Option usage not possible |
| **SKiiP4 Parallel Board 2-fold F-Option** | Board for paralleling of 2 SKiiP4, F-Option usage possible |
| **SKiFace Adapter Board** | |
| **SKiiP4 SKiFace Adapter UZK** | Adapter board to connect SKiiP4 to SKiiP3 controller with DC-Link voltage measurement function |
| **SKiiP4 SKiFace Adapter Temp** | Adapter board to connect SKiiP4 to SKiiP3 controller with temperatur measurement function |

# Modules - IPM - SKiiP 3 / 4



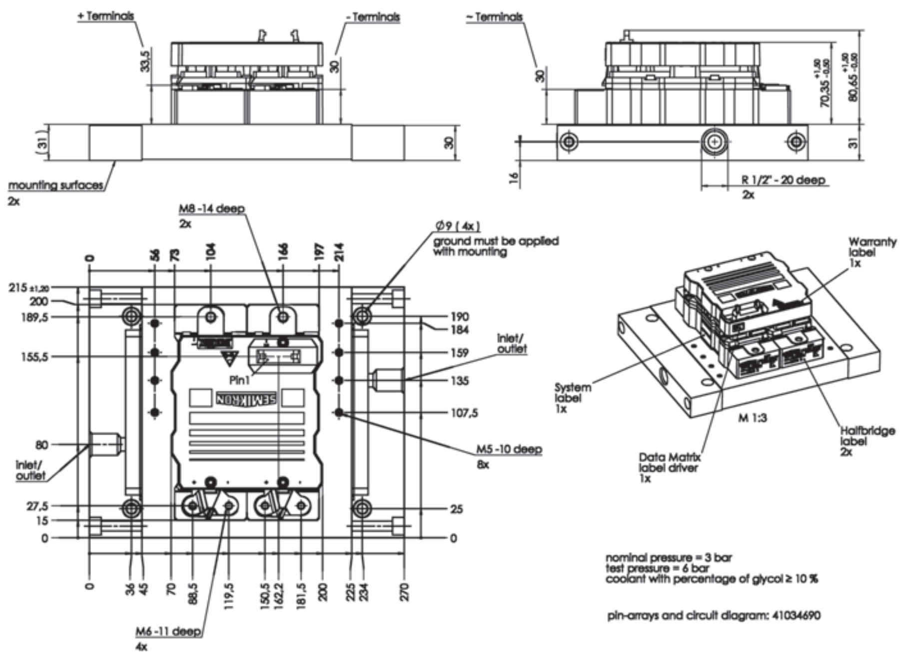
## Cases SKiiP 3

### Case S 23 mounted on P3016 heat sink




| | |
|---|---|
| **weight without heat sink:** | **1,7 kg** |
| **P3016:** | **4,4 kg** |

### Case S 23 mounted on liquid cooled heat sink NWK 40



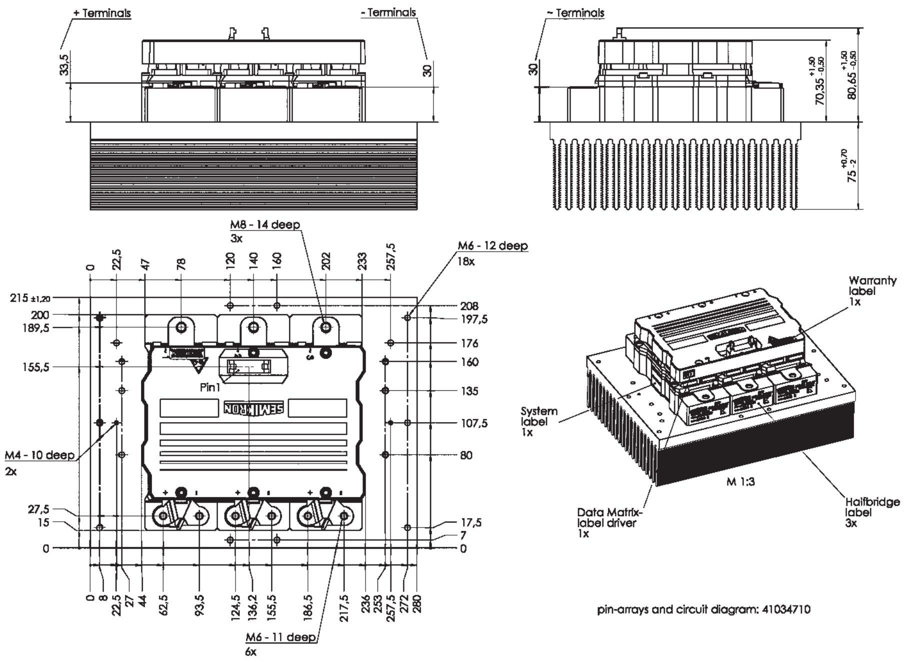

| | |
|---|---|
| **NWK 40:** | **2,8 kg** |

**Dimensions in mm**

# Modules - IPM - SKiiP 3 / 4

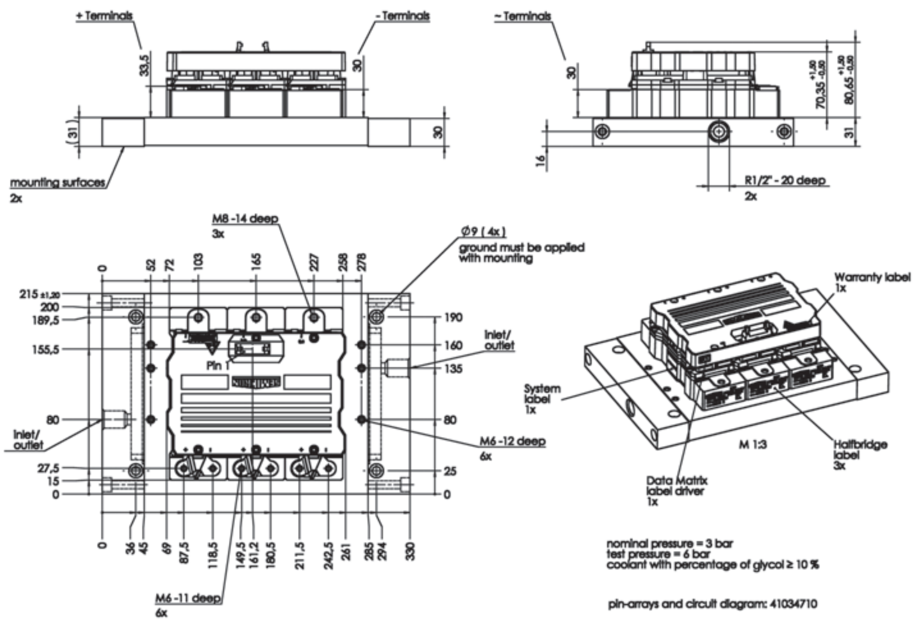
## Cases SKiiP 3

### Case S 33 mounted on P3016 heat sink




| | |
|---|---|
| **weight without heat sink:** | **2,4 kg** |
| **P3016:** | **6,2 kg** |

### Case S 33 mounted on liquid cooled heat sink NWK 40

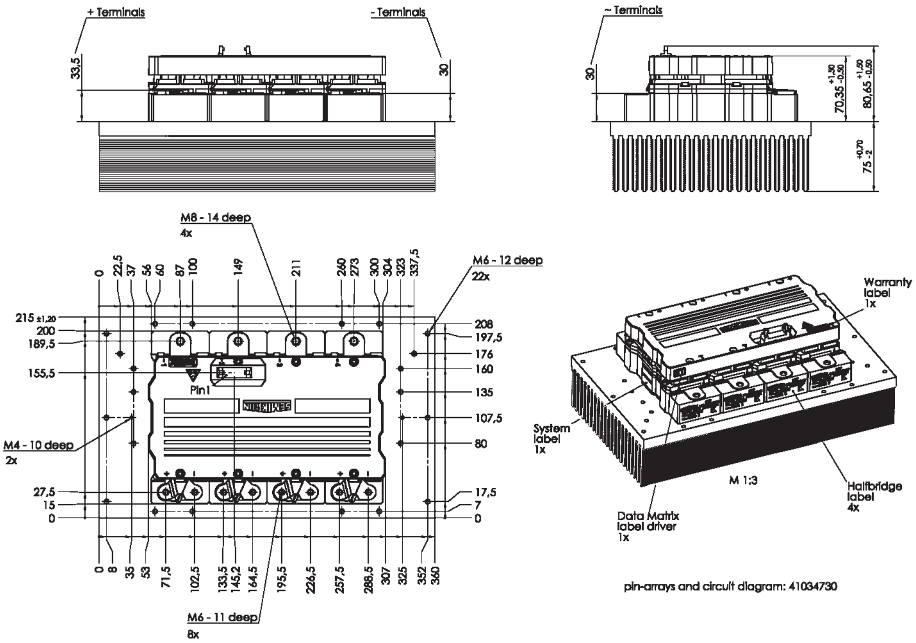



| | |
|---|---|
| **NWK 40:** | **5,2 kg** |

**Dimensions in mm**

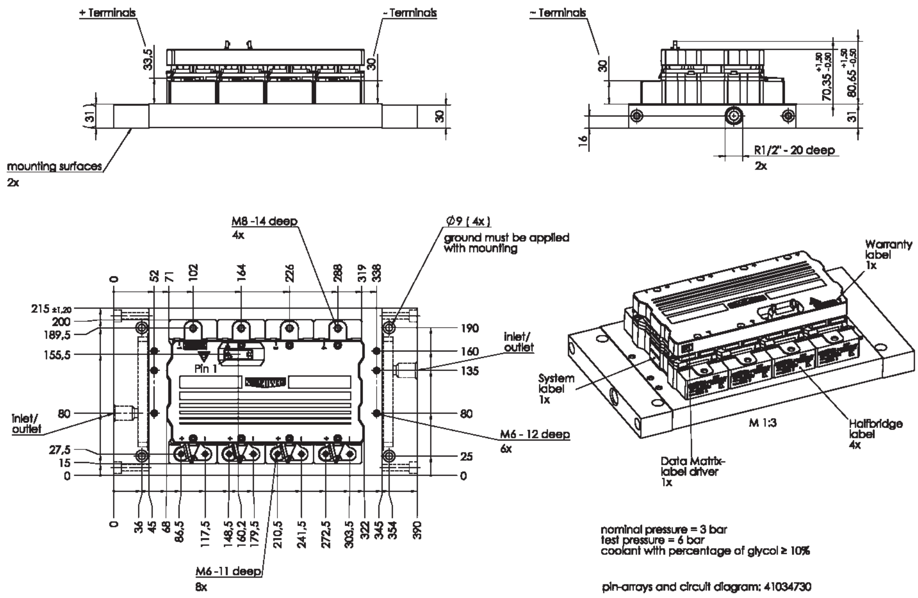
## Cases SKiiP 3

### Case S 43 mounted on P3016 heat sink




| | |
|---|---|
| **weight without heat sink:** | **3,1 kg** |
| **P3016:** | **8,0 kg** |

### Case S 43 mounted on liquid cooled heat sink NWK 40



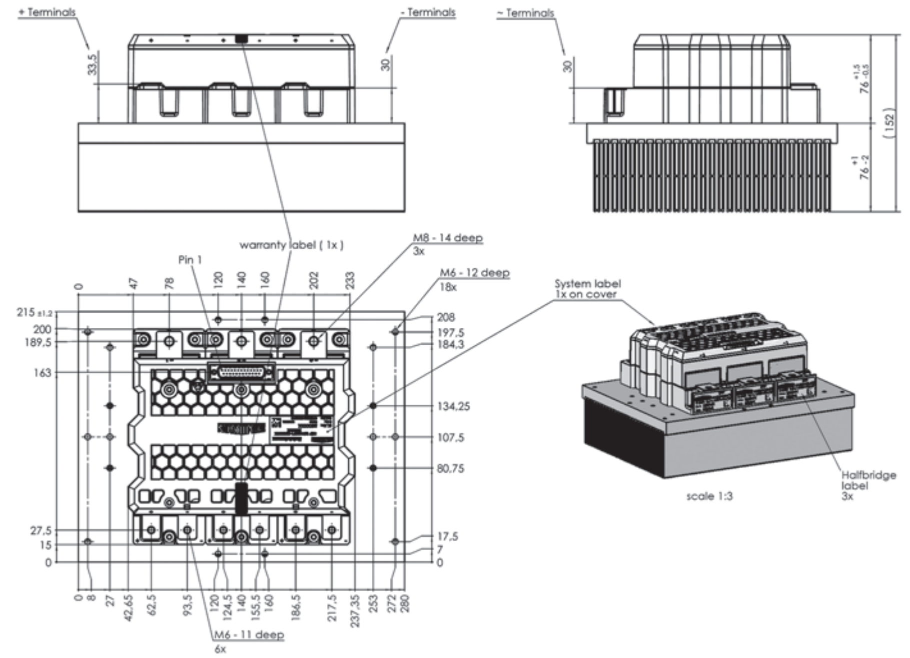

| | |
|---|---|
| **NWK 40:** | **6,2 kg** |

**Dimensions in mm**

# Modules - IPM - SKiiP 3 / 4

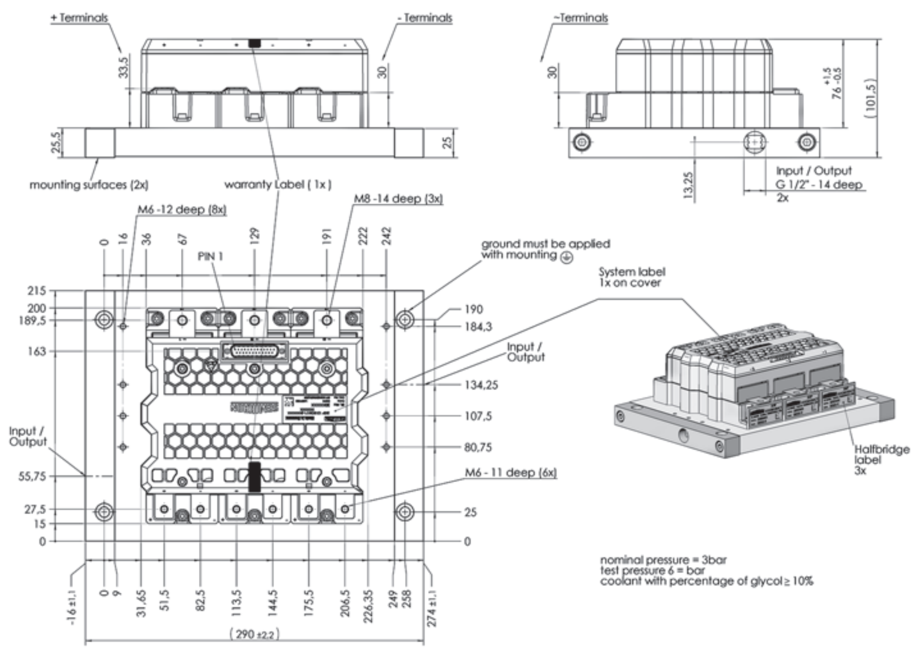
## Cases SKiiP 4

### Case S 34 mounted on P4016 heat sink




| | |
|---|---|
| **weight without heat sink:** | **2,48 kg** |
| **P4016:** | **5,9 kg** |

### Case S 34 mounted on liquid cooled heat sink NHC

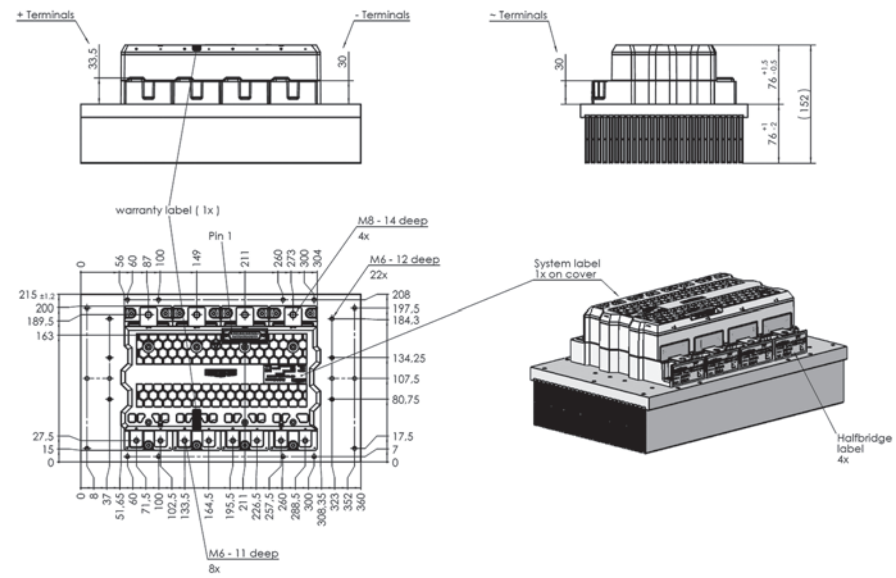



| | |
|---|---|
| **NHC:** | **3,49 kg** |

**Dimensions in mm**

## Cases SKiiP 4

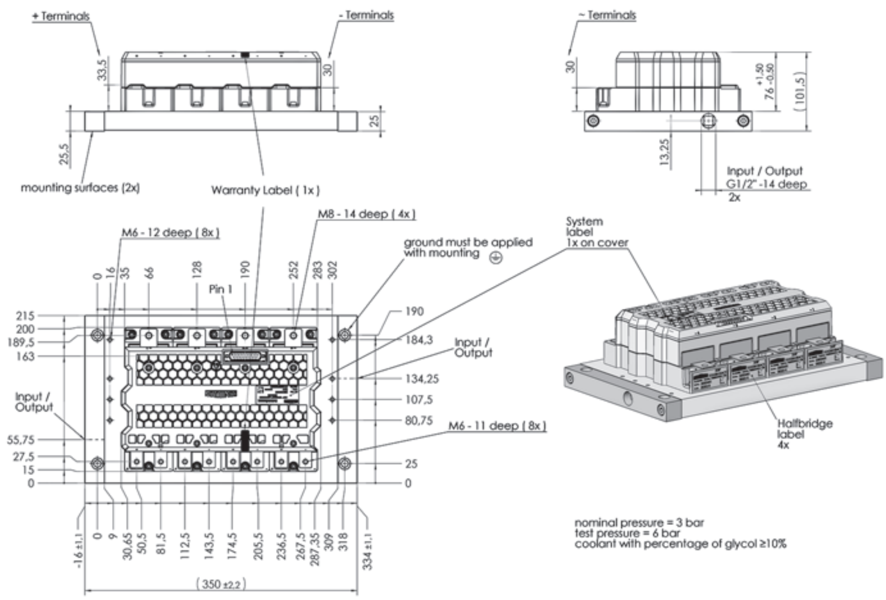
### Case S 44 mounted on P4016 heat sink




**weight without heat sink:** 3,22 kg

**P4016:** 7,55 kg

### Case S 44 mounted on liquid cooled heat sink NHC



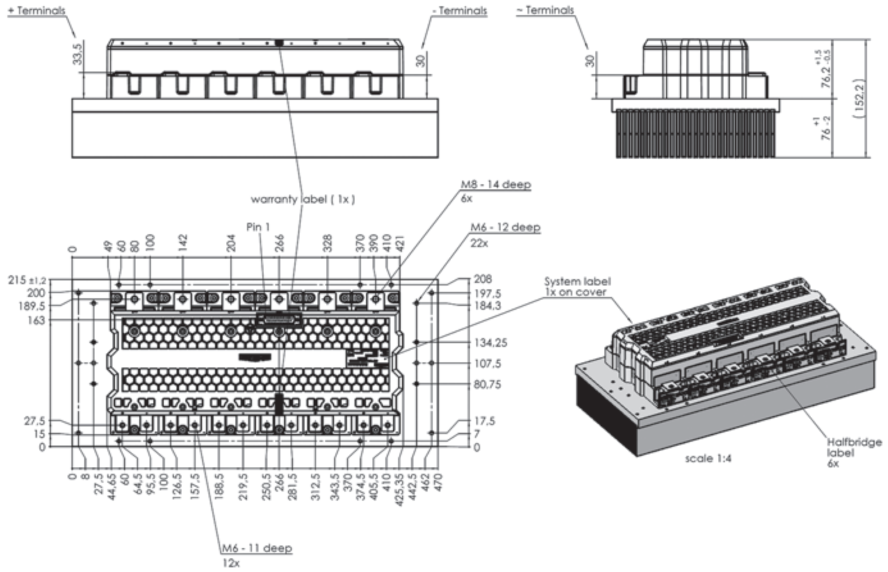

**NHC:** 4,25 kg

**Dimensions in mm**

# Modules - IPM - SKiiP 3 / 4

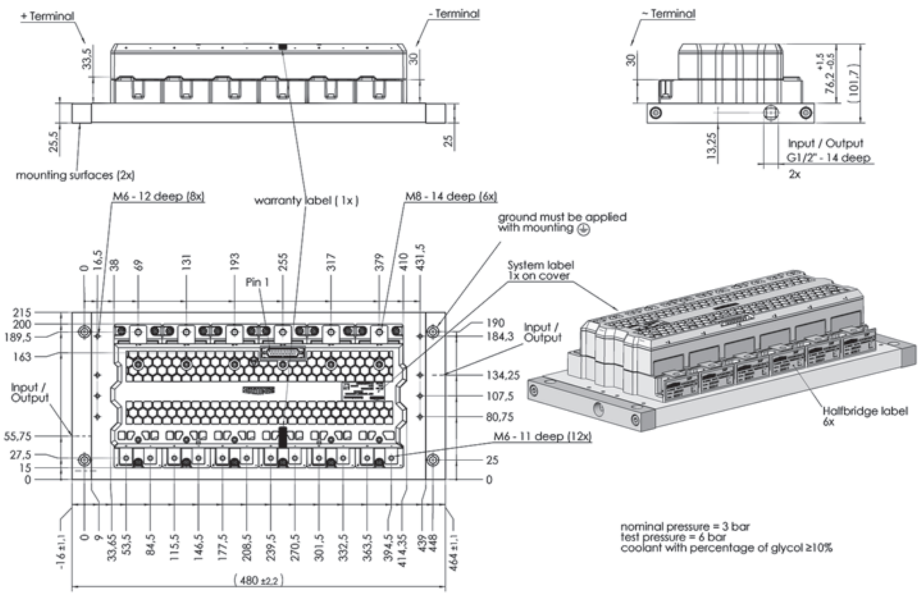
## Cases SKiiP 4

### Case S 64 mounted on P4016 heat sink




| | |
|---|---|
| **weight without heat sink:** | **4,84 kg** |
| **P4016:** | **9,9 kg** |

### Case S 64 mounted on liquid cooled heat sink NHC



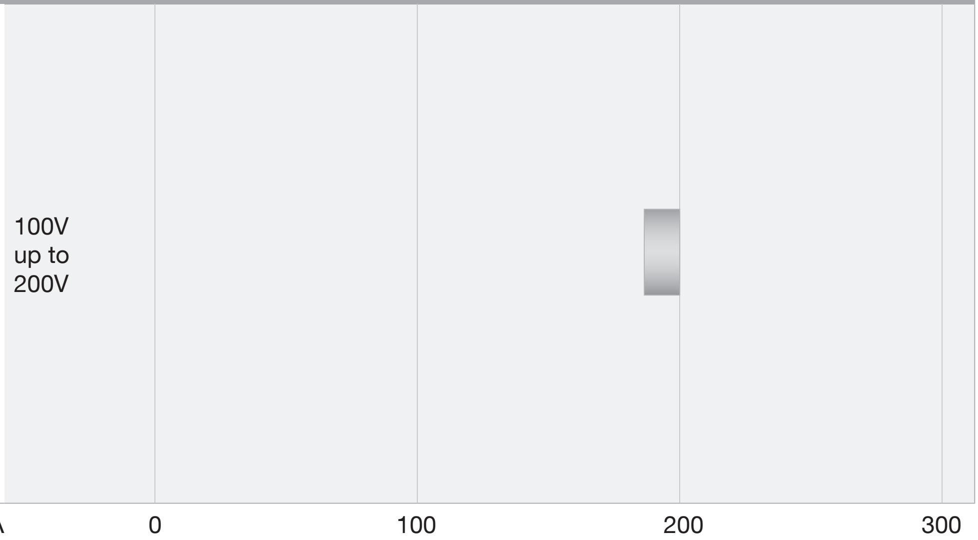

| | |
|---|---|
| **NHC:** | **5,77 kg** |

**Dimensions in mm**

# MOSFET Modules

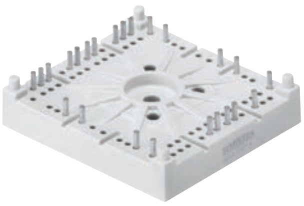
## SEMITRANS®

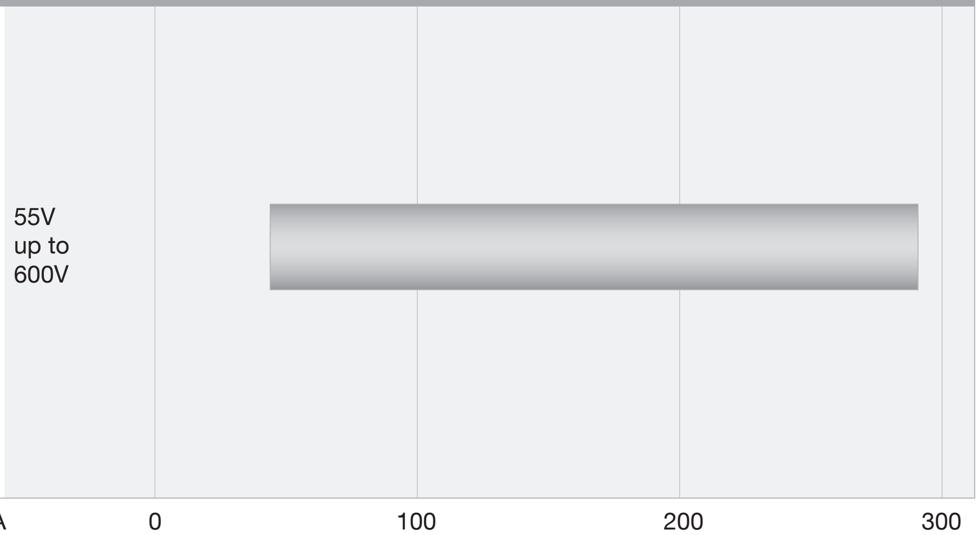
single switch

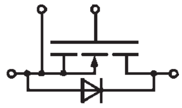
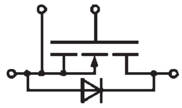

## SEMITOP®

6-pack
H-bridge
half bridge



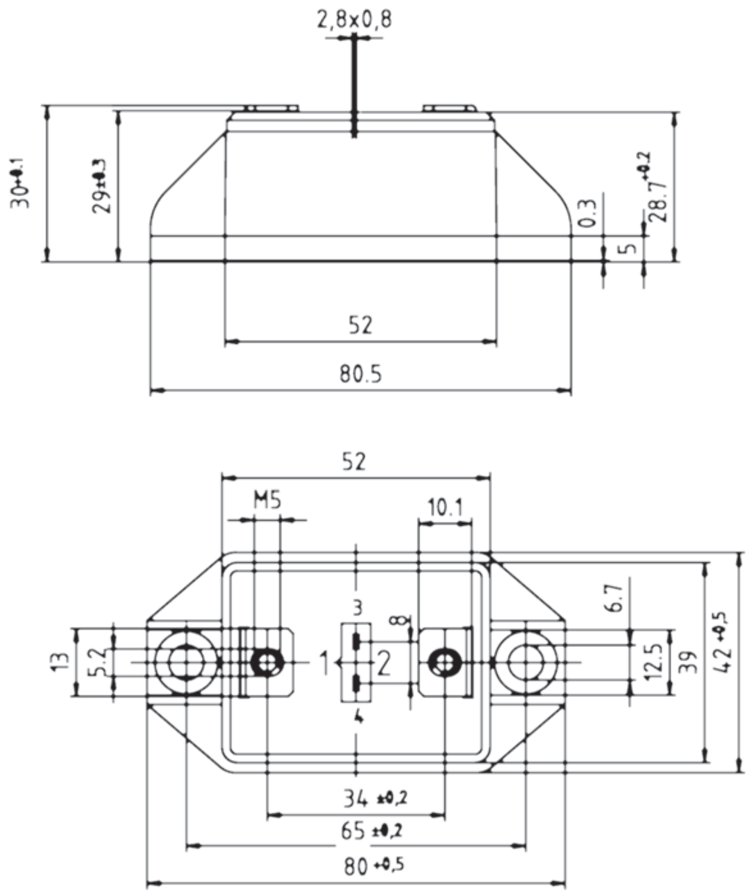


# Modules - MOSFET - SEMITRANS

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

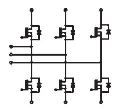
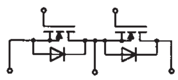
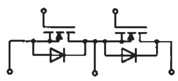
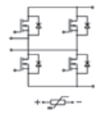
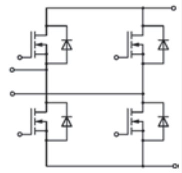
**Cases**

**SEMITRANS M1**




**Dimensions in mm**

# Modules - MOSFET - SEMITOP

| Type | $V_{DS}$<br>V | $I_D$ @$T_C$= 25°C<br>A | $R_{DS(on)}$ @$T_j$= 25°C typ.<br>mΩ | $R_{th(j-s)}$<br>K/W | Case | Circuit |
|---|---|---|---|---|---|---|
| **55 V** | | | | | | |
| **SK 80 MBBB 055** | 55 | 117 | 2.2 | 1.1 | 3 |  |
| **75 V** | | | | | | |
| **SK 300 MB 075** | 75 | 290 | - | 0.45 | 3 |  |
| **100 V** | | | | | | |
| **SK 260 MB 10** | 100 | 230 | - | 0.45 | 3 |  |
| **SK 85 MH 10 T** | 100 | 80 | - | 1.1 | 2 |  |
| **600 V** | | | | | | |
| **SK 60 MH 60** [1] | 600 | 60 | 33 | 0.54 | 4 |  |

For detailed case drawings please see page 26

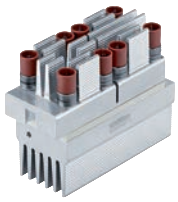
### Footnotes

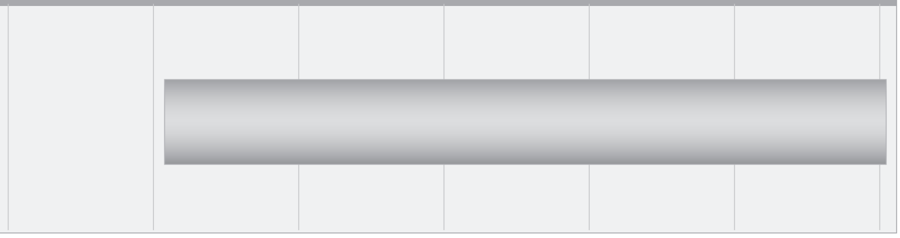
[1] New

# Thyristor / Diode Modules

## SEMiSTART®

W1C



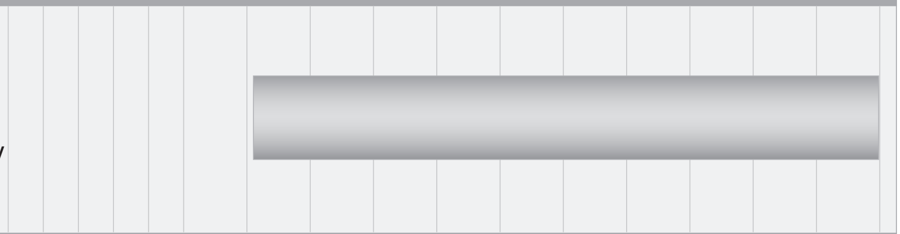


$I_{overload}$ in A   0   500   1000   1500   2000   2500   3000

## SEMIPACK® 3 / 4 / 5 / 6

single switch
half bridge

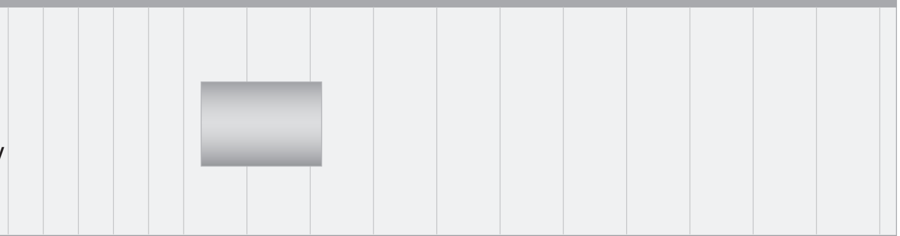
800V
up to
2200V



## SEMIPACK® 2 / 3

single switch
half bridge

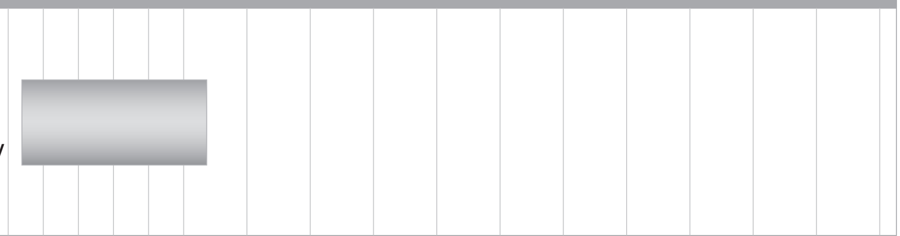
200V
up to
2200V



## SEMIPACK® 0 / 1

single switch
half bridge

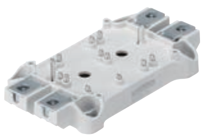
400V
up to
2200V



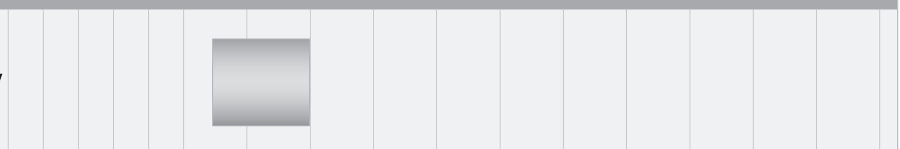
$I_{TAV / FAV}$ in A   0  20  40  60  80  100   200   300   400   500   600   700   800   900   1000   1100   1200

## SEMiX® 1 / 2

half bridge



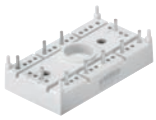
1600V



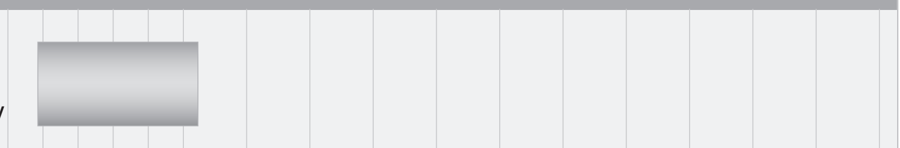
$I_{TAV / FAV}$ in A   0  20  40  60  80  100   200   300   400   500   600   700   800   900   1000   1100   1200

## SEMITOP® 1 / 2 / 3

W1C, WT, W3C
single switch



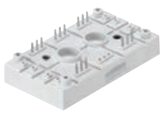
800V
up to
1600V



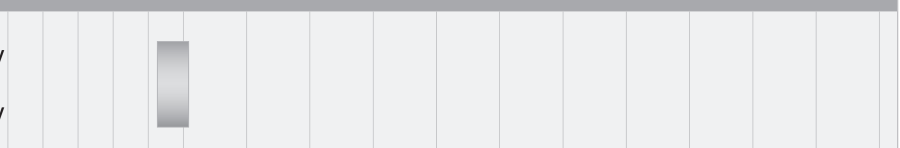
$I_{TAV / FAV}$ in A   0  20  40  60  80  100   200   300   400   500   600   700   800   900   1000   1100   1200

## SEMIPONT® 5

W3C

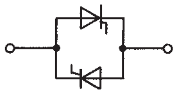


1200V
up to
1600V



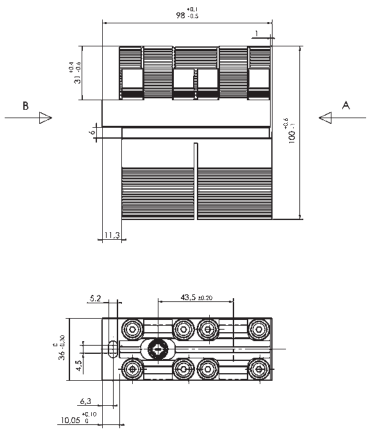
$I_{RMS}$ in A   0  20  40  60  80  100   200   300   400   500   600   700   800   900   1000   1100   1200

# Modules - Thyristors - SEMiSTART

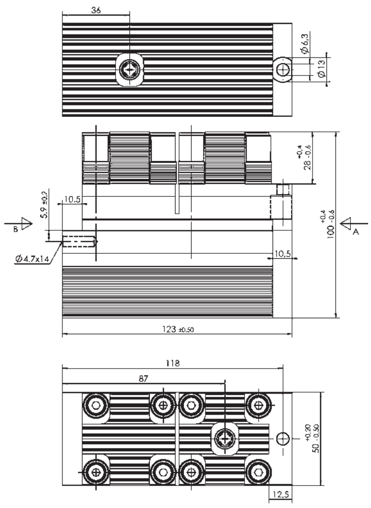
| Type | $V_{RRM}$ $V_{DRM}$ V | $I_{overload}$ W1C (for 20s) A | $T_c$ °C | $I_{TSM}$ @$T_j$= 125°C A | $V_{T(TO)}$ @$T_j$= 125°C V | $r_T$ @$T_j$= 125°C mΩ | $R_{th(j-s)}$ cont. per chip K/W | $T_j$ (for 20s) °C | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|
| **SKKQ 560** | 1400-1800 | 560 | 150 | 5200 | 0.9 | 0.9 | 0.106 | 150 | 1 |  |
| **SKKQ 800** | 1400-1800 | 800 | 150 | 5200 | 0.9 | 0.8 | 0.106 | 150 | 2 | |
| **SKKQ 1200** | 1400-1800 | 1225 | 150 | 8000 | 0.9 | 0.5 | 0.066 | 150 | 2 | |
| **SKKQ 1201** | 1400-1800 | 1225 | 150 | 8000 | 0.9 | 0.5 | 0.066 | 150 | 2a | |
| **SKKQ 1500** | 1400-1800 | 1500 | 150 | 15000 | 0.85 | 0.3 | 0.037 | 150 | 2 | |
| **SKKQ 1501** | 1400-1800 | 1500 | 150 | 15000 | 0.85 | 0.3 | 0.037 | 150 | 2a | |
| **SKKQ 2001** | 1400-1800 | 1950 | 150 | 15000 | 0.85 | 0.3 | 0.051 | 150 | 3a | |
| **SKKQ 3000** | 1400-1800 | 3080 | 150 | 25500 | 0.95 | 0.18 | 0.026 | 150 | 3 | |
| **SKKQ 3001** | 1400-1800 | 3080 | 150 | 25500 | 0.95 | 0.18 | 0.026 | 150 | 3a | |

## Cases

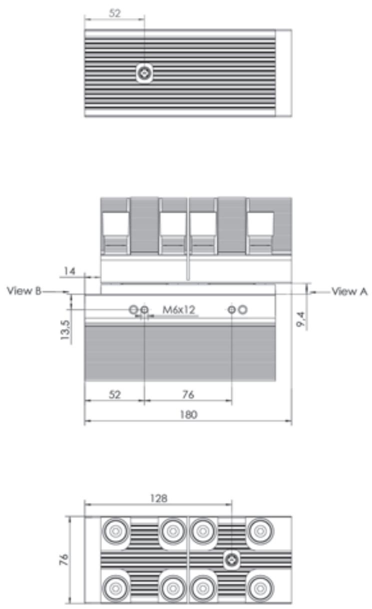
### SEMiSTART 1



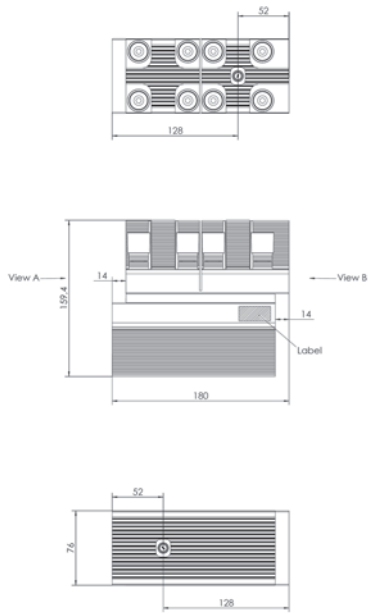
### SEMiSTART 2 / 2a



### SEMiSTART 3

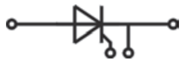
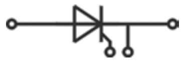
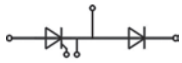
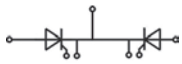
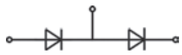
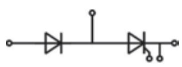



### SEMiSTART 3a



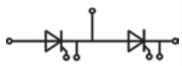

**Dimensions in mm**

# Modules - Thyristor / Diode - SEMIPACK

| Type | $V_{RRM}$ $V_{DRM}$ V | $I_{TAV}$ $I_{FAV}$ @$T_C$ A | $T_C$ °C | $I_{TSM}$ $I_{FSM}$ @$T_{jmax}$ A | $V_{T(TO)}$ @$T_{jmax}$ V | $r_T$ @$T_{jmax}$ mΩ | $R_{th(j-c)}$ cont. per chip K/W | $R_{th(c-s)}$ per chip K/W | $T_j$ °C | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SKET 330 | 800-2200 | 295 | 85 | 8000 | 1.2 | 0.55 | 0.09 | 0.02 | -40 ... +130 | 4 |  |
| SKET 400 | 800-1800 | 392 | 85 | 12000 | 0.92 | 0.3 | 0.09 | 0.02 | -40 ... +130 | 4 | |
| SKKE 15 | 600-1600 | 14 | 85 | 280 | 0.85 | 15 | 2 | 0.2 | -40 ... +125 | 0 |  |
| SKKE 162 | 800-1800 | 195 | 85 | 5000 | 0.85 | 1.2 | 0.18 | 0.1 | -40 ... +135 | 2 | |
| SKKE 380 | 1200-1600 | 380 | 100 | 10000 | 0.8 | 0.35 | 0.11 | 0.04 | -40 ... +150 | 3 | |
| SKKE 600 | 1200-2200 | 600 | 100 | 18000 | 0.75 | 0.25 | 0.07 | 0.02 | -40 ... +150 | 4 | |
| SKKE 1200 | 1800-2200 | 1180 | 85 | 40000 | 0.72 | 0.19 | 0.0385 | 0.01 | -40 ... +160 | 6 | |
| SKET 740 | 1800-2200 | 699 | 85 | 31000 | 0.88 | 0.28 | 0.0405 | 0.01 | -40 ... +125 | 6 |  |
| SKET 800 | 1400-1800 | 808 | 85 | 32000 | 0.83 | 0.25 | 0.0405 | 0.01 | -40 ... +130 | 6 | |
| SKKL 92 | 800-1800 | 95 | 85 | 1750 | 0.9 | 2 | 0.28 | 0.2 | -40 ... +125 | 1 |  |
| SKMT 92 | 800-1800 | 95 | 85 | 1750 | 0.9 | 2 | 0.28 | 0.2 | -40 ... +125 | 1 |  |
| SKKD 15 | 600-1600 | 14 | 85 | 280 | 0.85 | 15 | 2 | 0.2 | -40 ... +125 | 0 |  |
| SKKD 26 | 1200-1600 | 31 | 85 | 480 | 0.85 | 6 | 1 | 0.2 | -40 ... +125 | 1 | |
| SKKD 46 | 400-1800 | 47 | 85 | 600 | 0.85 | 5 | 0.6 | 0.2 | -40 ... +125 | 1 | |
| SKKD 81 | 400-1800 | 82 | 85 | 1750 | 0.85 | 1.8 | 0.4 | 0.2 | -40 ... +125 | 1 | |
| SKKD 100 | 400-1800 | 100 | 85 | 2000 | 0.85 | 1.3 | 0.35 | 0.2 | -40 ... +125 | 1 | |
| SKKD 101/16 [1] | 1600 | 134 | 85 | 2000 | 0.87 | 2.45 | 0.19 | 0.22 | -40 ... +130 | 1 | |
| SKKD 162 | 800-2200 | 195 | 85 | 5000 | 0.85 | 1.2 | 0.18 | 0.1 | -40 ... +135 | 2 | |
| SKKD 212 | 1200-1800 | 212 | 85 | 5500 | 0.75 | 1.05 | 0.18 | 0.1 | -40 ... +135 | 2 | |
| SKKD 260 | 800-2200 | 260 | 85 | 10000 | 0.9 | 0.37 | 0.14 | 0.04 | -40 ... +130 | 3 | |
| SKKD 380 | 800-2200 | 380 | 100 | 10000 | 0.8 | 0.35 | 0.11 | 0.04 | -40 ... +150 | 3 | |
| SKKD 701 | 1200-2200 | 701 | 100 | 22500 | 0.7 | 0.28 | 0.069 | 0.02 | -40 ... +160 | 5 | |
| SKKD 82/22 H4 [5] | 2200 | - | - | - | - | - | - | - | - | 1 | |
| SKKH 15 | 600-1600 | 13.5 | 85 | 280 | 1.1 | 20 | 1.6 | 0.2 | -40 ... +125 | 0 |  |
| SKKH 27 | 800-1800 | 25 | 85 | 480 | 0.9 | 12 | 0.9 | 0.2 | -40 ... +125 | 1 | |
| SKKH 42 | 800-1800 | 40 | 85 | 850 | 1 | 4.5 | 0.65 | 0.2 | -40 ... +125 | 1 | |
| SKKH 58/16 E [1] | 1600 | 55 | 85 | 1200 | 1 | 4.8 | 0.47 | 0.22 | -40 ... +130 | 1 | |
| SKKH 57 | 800-1800 | 50 | 85 | 1250 | 0.9 | 3.5 | 0.57 | 0.2 | -40 ... +125 | 1 | |
| SKKH 72 | 800-1800 | 70 | 85 | 1450 | 0.9 | 3.5 | 0.35 | 0.2 | -40 ... +125 | 1 | |
| SKKH 92 | 800-1800 | 95 | 85 | 1750 | 0.9 | 2 | 0.28 | 0.2 | -40 ... +125 | 1 | |
| SKKH 106 | 800-1800 | 106 | 85 | 1900 | 0.9 | 2 | 0.28 | 0.2 | -40 ... +130 | 1 | |
| SKKH 107/16 E [1] | 1600 | 119 | 85 | 1900 | 0.9 | 3.35 | 0.19 | 0.22 | -40 ... +130 | 1 | |
| SKKH 122 | 800-1800 | 129 | 85 | 3200 | 0.85 | 2 | 0.2 | 0.13 | -40 ... +125 | 2 | |
| SKKH 132 H4 | 2000-2200 | 128 | 85 | 3800 | 1.1 | 2 | 0.17 | 0.1 | -40 ... +125 | 2 | |
| SKKH 132 | 800-1800 | 137 | 85 | 4000 | 1 | 1.6 | 0.18 | 0.1 | -40 ... +125 | 2 | |
| SKKH 162 H4 | 2000-2200 | 143 | 85 | 4800 | 0.95 | 2 | 0.16 | 0.1 | -40 ... +125 | 2 | |
| SKKH 162 | 800-1800 | 156 | 85 | 5000 | 0.85 | 1.5 | 0.17 | 0.1 | -40 ... +125 | 2 | |
| SKKH 172 | 1600 | 175 | 85 | 5000 | 0.83 | 1.3 | 0.155 | 0.1 | -40 ... +125 | 2 | |
| SKKH 280 H4 | 2000-2200 | 252 | 85 | 7500 | 0.9 | 0.75 | 0.11 | 0.04 | -40 ... +125 | 3 | |
| SKKH 250 | 1200-1800 | 250 | 85 | 8000 | 0.925 | 0.45 | 0.14 | 0.04 | -40 ... +130 | 3 | |
| SKKH 273 | 1200-1800 | 273 | 85 | 8000 | 0.9 | 0.92 | 0.104 | 0.08 | -40 ... +130 | 3 | |
| SKKH 330 | 800-1800 | 305 | 85 | 8000 | 0.8 | 0.6 | 0.11 | 0.04 | -40 ... +130 | 3 | |
| SKKH 323 | 1200-1600 | 320 | 85 | 8200 | 0.81 | 0.85 | 0.091 | 0.08 | -40 ... +130 | 3 | |
| SKKH 460 | 1600 | 460 | 85 | 15500 | 0.88 | 0.45 | 0.072 | 0.02 | -40 ... +130 | 5 | |
| SKKH 460 H4 | 2200 | 460 | 85 | 15500 | 0.88 | 0.45 | 0.072 | 0.02 | -40 ... +130 | 5 | |
| SKKH 570 | 1600-1800 | 570 | 85 | 15500 | 0.78 | 0.32 | 0.069 | 0.02 | -40 ... +135 | 5 | |
| SKKH 73/22 H4 | 2200 | - | - | - | - | - | - | - | - | 1 | |

# Modules - Thyristor / Diode - SEMIPACK



| Type | $V_{RRM}$ $V_{DRM}$ (V) | $I_{TAV}$ $I_{FAV}$ @$T_C$ (A) | $T_C$ (°C) | $I_{TSM}$ $I_{FSM}$ @$T_{jmax}$ (A) | $V_{T(TO)}$ @$T_{jmax}$ (V) | $r_T$ @$T_{jmax}$ (mΩ) | $R_{th(j-c)}$ cont. per chip (K/W) | $R_{th(c-s)}$ per chip (K/W) | $T_j$ (°C) | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **SKKT 15** | 600-1600 | 13.5 | 85 | 280 | 1.1 | 20 | 1.6 | 0.2 | -40 ... +125 | 0 | |
| **SKKT 20** | 800-1600 | 18 | 85 | 280 | 1 | 16 | 1.2 | 0.2 | -40 ... +125 | 1 | |
| **SKKT 20B** | 800-1600 | 18 | 85 | 280 | 1 | 16 | 1.2 | 0.2 | -40 ... +125 | 1 | |
| **SKKT 27** | 800-1600 | 25 | 85 | 480 | 0.9 | 12 | 0.9 | 0.2 | -40 ... +125 | 1 | |
| **SKKT 27B** | 800-1600 | 25 | 85 | 480 | 0.9 | 12 | 0.9 | 0.2 | -40 ... +125 | 1 | |
| **SKKT 42** | 800-1800 | 40 | 85 | 850 | 1 | 4.5 | 0.65 | 0.2 | -40 ... +125 | 1 | |
| **SKKT 42B** | 800-1800 | 40 | 85 | 850 | 1 | 4.5 | 0.65 | 0.2 | -40 ... +125 | 1 | |
| **SKKT 58/16 E [1]** | 1600 | 55 | 85 | 1200 | 1 | 4.8 | 0.47 | 0.22 | -40 ... +130 | 1 | |
| **SKKT 58B16 E [1]** | 1600 | 55 | 85 | 1200 | 1 | 4.8 | 0.47 | 0.22 | -40 ... +130 | 1 | |
| **SKKT 57** | 800-1800 | 50 | 85 | 1250 | 0.9 | 3.5 | 0.57 | 0.2 | -40 ... +125 | 1 | |
| **SKKT 57 H4** | 2000-2200 | 50 | 85 | 1250 | 0.9 | 3.5 | 0.57 | 0.2 | -40 ... +125 | 1 | |
| **SKKT 57B** | 800-1800 | 50 | 85 | 1250 | 0.9 | 3.5 | 0.57 | 0.2 | -40 ... +125 | 1 | |
| **SKKT 72** | 800-1800 | 70 | 85 | 1450 | 0.9 | 3.5 | 0.35 | 0.2 | -40 ... +125 | 1 | |
| **SKKT 72 H4** | 2000-2200 | 70 | 85 | 1450 | 0.9 | 3.5 | 0.35 | 0.2 | -40 ... +125 | 1 | |
| **SKKT 72B** | 800-1800 | 70 | 85 | 1450 | 0.9 | 3.5 | 0.35 | 0.2 | -40 ... +125 | 1 | |
| **SKKT 92** | 800-1800 | 95 | 85 | 1750 | 0.9 | 2 | 0.28 | 0.2 | -40 ... +125 | 1 | |
| **SKKT 92B** | 800-1800 | 95 | 85 | 1750 | 0.9 | 2 | 0.28 | 0.2 | -40 ... +125 | 1 | |
| **SKKT 106** | 800-1800 | 106 | 85 | 1900 | 0.9 | 2 | 0.28 | 0.2 | -40 ... +130 | 1 |  |
| **SKKT 106B** | 800-1800 | 106 | 85 | 1900 | 0.9 | 2 | 0.28 | 0.2 | -40 ... +130 | 1 | |
| **SKKT 107/16 E [1]** | 1600 | 119 | 85 | 1900 | 0.9 | 3.35 | 0.19 | 0.22 | -40 ... +130 | 1 | |
| **SKKT 107B16 E [1]** | 1600 | 119 | 85 | 1900 | 0.9 | 3.35 | 0.19 | 0.22 | -40 ... +130 | 1 | |
| **SKKT 122** | 800-1800 | 129 | 85 | 3200 | 0.85 | 2 | 0.2 | 0.13 | -40 ... +125 | 2 | |
| **SKKT 132 H4** | 2000-2200 | 128 | 85 | 3800 | 1.1 | 2 | 0.17 | 0.1 | -40 ... +125 | 2 | |
| **SKKT 132** | 800-1800 | 137 | 85 | 4000 | 1 | 1.6 | 0.18 | 0.1 | -40 ... +125 | 2 | |
| **SKKT 162 H4** | 2000-2200 | 143 | 85 | 4800 | 0.95 | 2 | 0.16 | 0.1 | -40 ... +125 | 2 | |
| **SKKT 162** | 800-1800 | 156 | 85 | 5000 | 0.85 | 1.5 | 0.17 | 0.1 | -40 ... +125 | 2 | |
| **SKKT 172** | 1400-1800 | 175 | 85 | 5000 | 0.83 | 1.3 | 0.155 | 0.1 | -40 ... +125 | 2 | |
| **SKKT 280 H4** | 2000-2200 | 252 | 85 | 7500 | 0.9 | 0.75 | 0.11 | 0.04 | -40 ... +125 | 3 | |
| **SKKT 250** | 800-1800 | 250 | 85 | 8000 | 0.925 | 0.45 | 0.14 | 0.04 | -40 ... +130 | 3 | |
| **SKKT 273** | 1200-1800 | 273 | 85 | 8000 | 0.9 | 0.92 | 0.104 | 0.08 | -40 ... +130 | 3 | |
| **SKKT 330** | 800-1800 | 305 | 85 | 8000 | 0.8 | 0.6 | 0.11 | 0.04 | -40 ... +130 | 3 | |
| **SKKT 323** | 1200-1600 | 320 | 85 | 8200 | 0.81 | 0.85 | 0.091 | 0.08 | -40 ... +130 | 3 | |
| **SKKT 460** | 1600 | 460 | 85 | 15500 | 0.88 | 0.45 | 0.072 | 0.02 | -40 ... +130 | 5 | |
| **SKKT 460 H4** | 2200 | 460 | 85 | 15500 | 0.88 | 0.45 | 0.072 | 0.02 | -40 ... +130 | 5 | |
| **SKKT 570** | 1200-1800 | 570 | 85 | 15500 | 0.78 | 0.32 | 0.069 | 0.02 | -40 ... +135 | 5 | |

**Footnotes**

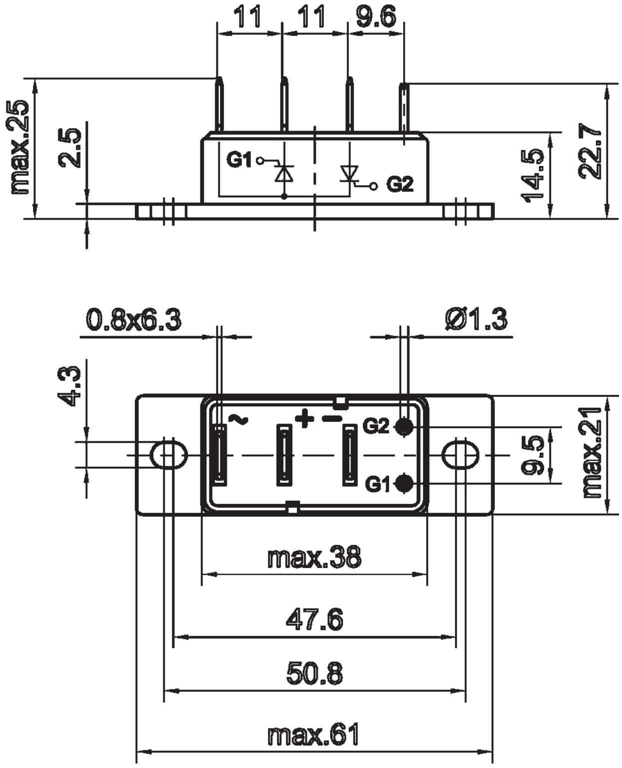
1) New

5) UNDER DEVELOPMENT

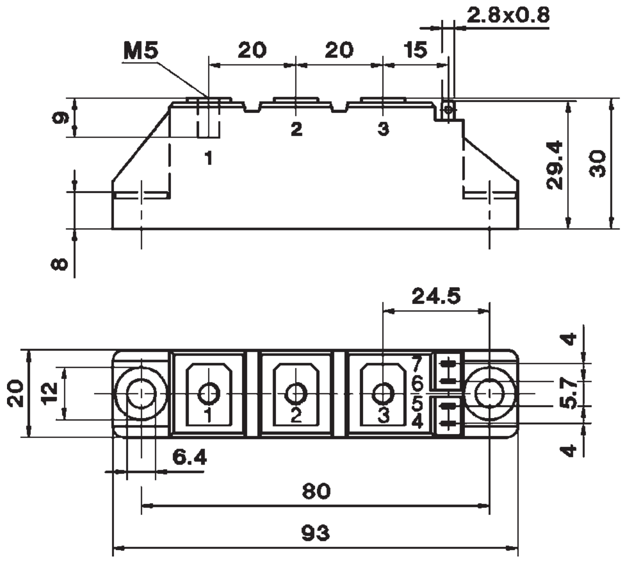
# Modules - Thyristor / Diode - SEMIPACK

## Cases

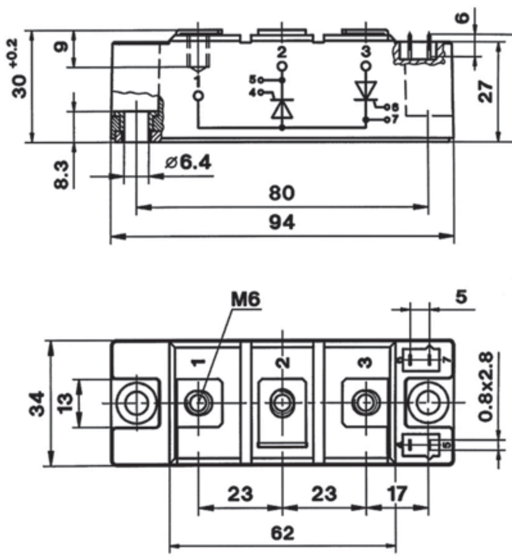
### SEMIPACK 0



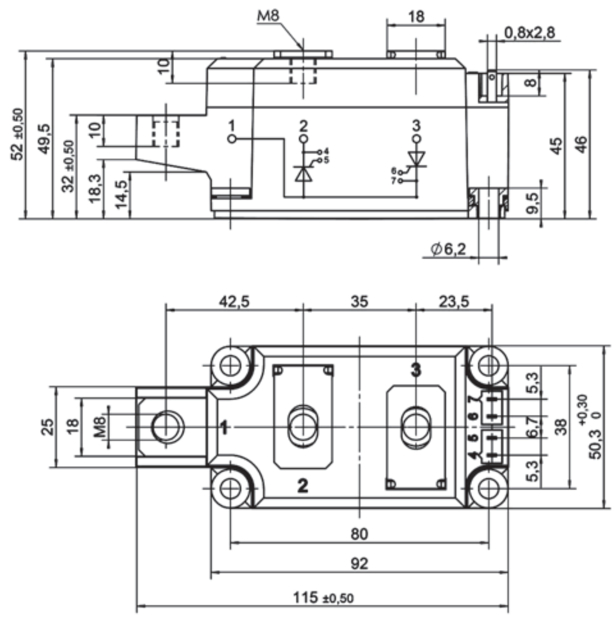

### SEMIPACK 1




### SEMIPACK 2



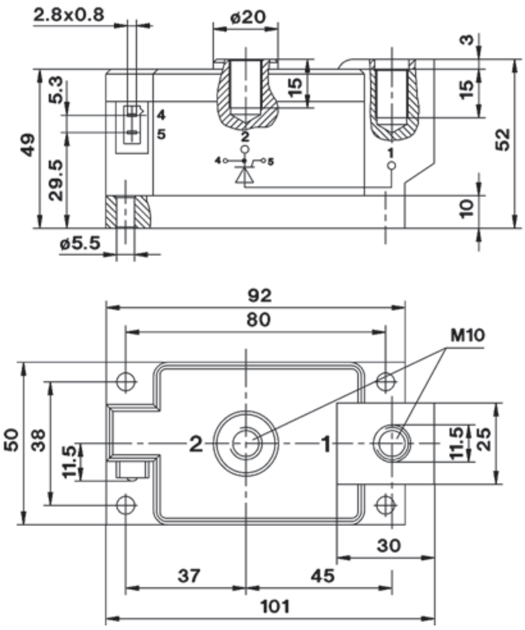

### SEMIPACK 3



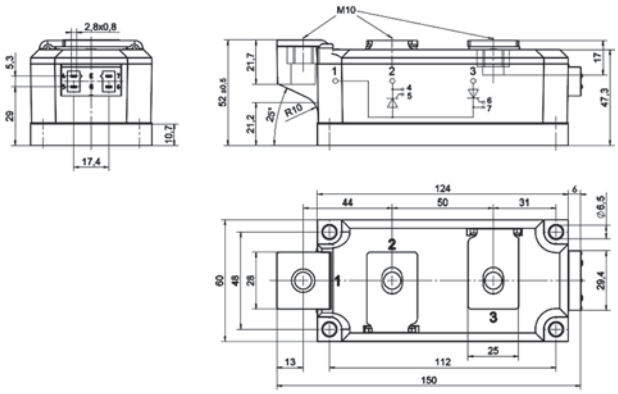

Dimensions in mm

## Cases

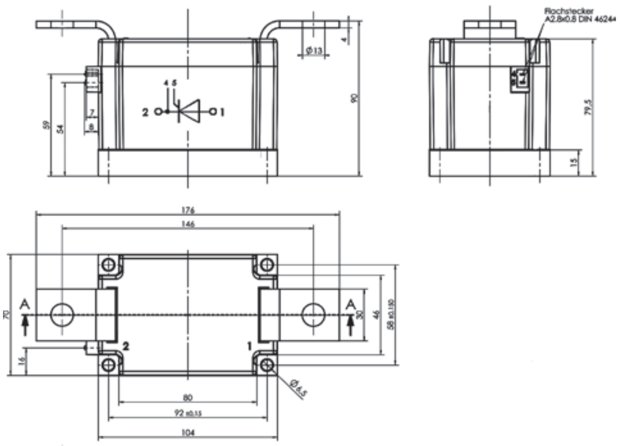
### SEMIPACK 4




### SEMIPACK 5

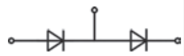
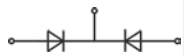
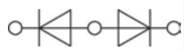



### SEMIPACK 6




Dimensions in mm

# Modules - Thyristor / Diode - SEMIPACK Fast

| Type | $V_{RRM}$ $V_{DRM}$ V | $I_{TAV}$ $I_{FAV}$ @$T_C$ A | $T_C$ °C | $I_{FSM}$ @$T_{jmax}$ A | $V_{T(TO)}$ @$T_{jmax}$ V | $r_T$ @$T_{jmax}$ mΩ | $R_{th(j-c)}$ per chip K/W | $R_{th(c-s)}$ per chip K/W | $T_j$ °C | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SKKE 120F | 1700 | 120 | 82 | 1800 | 1.5 | 4.5 | 0.2 | 0.05 | -40 ... +150 | 2 |  |
| SKKE 290F | 600 | 290 | 109 | 6000 | 0.9 | 1.2 | 0.08 | 0.05 | -40 ... +150 | 2 | |
| SKKE 301F | 1200 | 300 | 43 | 3600 | 1.2 | 2.75 | 0.11 | 0.05 | -40 ... +150 | 2 | |
| SKKE 310F | 1200 | 310 | 84 | 5500 | 1.2 | 1.9 | 0.08 | 0.05 | -40 ... +150 | 2 | |
| SKKE 330F [5] | 1700 | 330 | 70 | 5200 | 1.5 | 1.9 | 0.079 | 0.038 | -40 ... +150 | 4 | |
| SKKE 600F [5] | 1200 | 600 | 85 | 5800 | 1.2 | 1.9 | 0.062 | 0.038 | -40 ... +150 | 4 | |
| SKKD 60F | 1700 | 60 | 83 | 900 | 1.5 | 9 | 0.4 | 0.1 | -40 ... +150 | 2 |  |
| SKKD 75F12 | 1200 | 75 | 55 | 900 | 1.2 | 11 | 0.4 | 0.1 | -40 ... +150 | 2 | |
| SKKD 150F | 1200 | 150 | 54 | 1800 | 1.2 | 5.5 | 0.2 | 0.1 | -40 ... +150 | 2 | |
| SKKD 170F | 1200 | 170 | 85 | 2300 | 1.2 | 3.5 | 0.14 | 0.1 | -40 ... +150 | 2 | |
| SKKD 205F | 600 | 205 | 87 | 3000 | 0.9 | 2 | 0.16 | 0.1 | -40 ... +150 | 2 | |
| SKKD 116F [6] | - | - | - | - | - | - | - | - | - | 1 | |
| SKMD 150F12 | 1200 | 150 | 54 | 1800 | 1.2 | 5.5 | 0.2 | 0.1 | -40 ... +150 | 2 |  |
| SKMD 202E | 200-300 | 202 | 87 | 2800 | 0.8 | 1.5 | 0.2 | 0.1 | -40 ... +150 | 2 | |
| SKND 150F | 1200 | 150 | 54 | 1800 | 1.2 | 5.5 | 0.2 | 0.1 | -40 ... +150 | 2 |  |
| SKND 202E | 200-300 | 202 | 87 | 2800 | 0.8 | 1.5 | 0.2 | 0.1 | -40 ... +150 | 2 | |
| SKND 205F | 600 | 205 | 87 | 3000 | 0.9 | 2 | 0.16 | 0.1 | -40 ... +150 | 2 | |

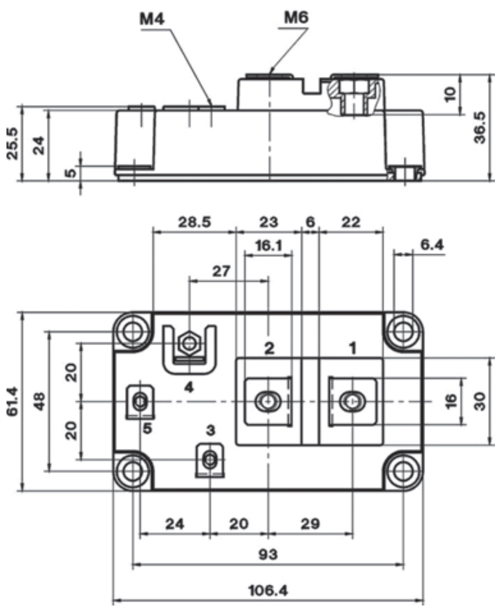
### Footnotes

5) SEMIPACK Fast in SEMITRANS 4 case

6) UNDER DEVELOPMENT

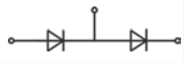
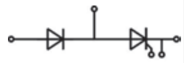
## Cases

### SEMIPACK Fast in SEMITRANS 4



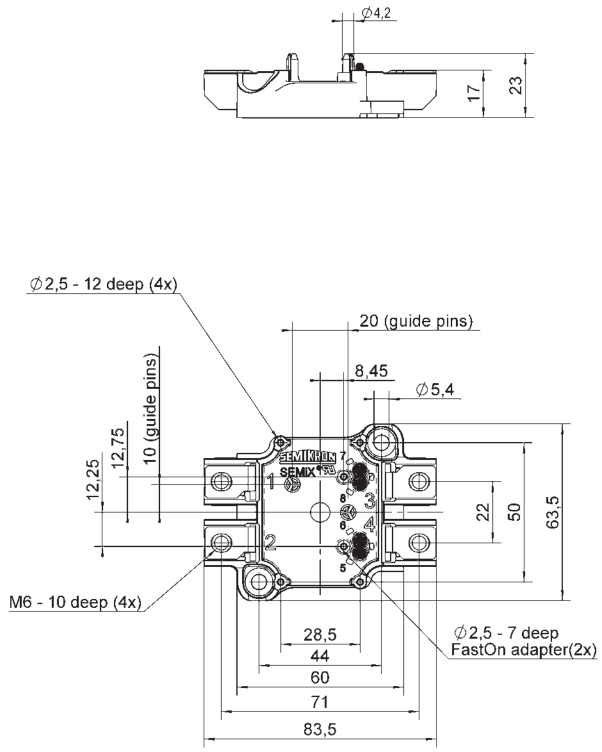

Dimensions in mm

# Modules - Thyristor / Diode - SEMiX

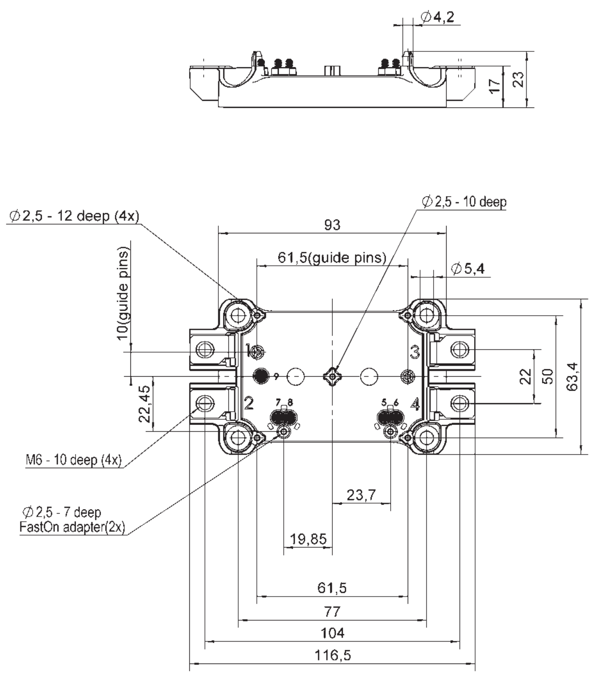
| Type | $V_{RRM}$ $V_{DRM}$ | $I_{TAV}$ $I_{FAV}$ @$T_C$ | $T_C$ | $I_{TSM}$ $I_{FSM}$ @$T_{jmax}$ | $V_{T(TO)}$ @$T_{jmax}$ | $r_T$ @$T_{jmax}$ | $R_{th(j-c)}$ per chip | $R_{th(c-s)}$ per module | $T_j$ | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | V | A | °C | A | V | mΩ | K/W | K/W | °C | | |
| **SEMiX191KD16s** | 1600 | 190 | 85 | 5000 | 0.85 | 0.95 | 0.18 | 0.075 | -40 ... +130 | 1s |  |
| **SEMiX302KD16s** | 1600 | 300 | 85 | 7500 | 0.85 | 1.1 | 0.091 | 0.045 | -40 ... +130 | 2s | |
| **SEMiX171KH16s** | 1600 | 170 | 85 | 4800 | 0.85 | 1.5 | 0.18 | 0.075 | -40 ... +130 | 1s |  |
| **SEMiX302KH16s** | 1600 | 300 | 85 | 8000 | 0.85 | 1.1 | 0.091 | 0.045 | -40 ... +130 | 2s | |
| **SEMiX141KT16s** | 1600 | 140 | 85 | 3000 | 0.85 | 2.1 | 0.21 | 0.075 | -40 ... +130 | 1s |  |
| **SEMiX302KT16s** | 1600 | 300 | 85 | 8000 | 0.85 | 1.7 | 0.091 | 0.045 | -40 ... +130 | 2s | |

## Cases

### SEMiX 1s

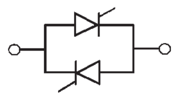
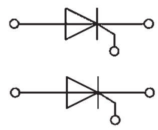
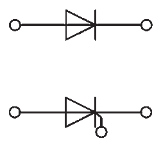
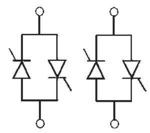
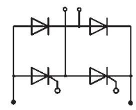
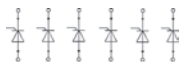
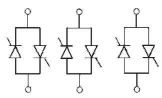
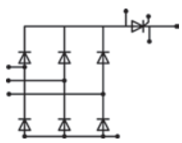



### SEMiX 2s



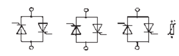
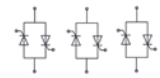

**Dimensions in mm**

# Modules - Thyristor / Diode - SEMITOP

| Type | $V_{RRM}$ $V_{DRM}$ V | $I_{TAV}$ $I_{FAV}$ @$T_C$ A | $T_C$ °C | $I_{TSM}$ $I_{FSM}$ @$T_{jmax}$ A | $V_{T(TO)}$ @$T_{jmax}$ V | $r_T$ @$T_{jmax}$ mΩ | $R_{th(j-s)}$ cont. per chip K/W | $T_j$ °C | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|
| **SK 25 KQ** | 800-1600 | 29 | 85 | 280 | 1.1 | 20 | 1.7 | -40 ... +125 | 1 |  |
| **SK 45 KQ** | 800-1600 | 47 | 85 | 380 | 1 | 10 | 1.2 | -40 ... +125 | 1 | |
| **SK 70 KQ** | 800-1600 | 72 | 85 | 900 | 1 | 6 | 0.8 | -40 ... +125 | 1 | |
| **SK 100 KQ** | 800-1600 | 101 | 85 | 1350 | 0.9 | 4.5 | 0.6 | -40 ... +125 | 2 | |
| **SK 120 KQ** | 800-1600 | 134 | 85 | 1800 | 0.9 | 3.5 | 0.45 | -40 ... +125 | 2 | |
| **SK 35 TAA** | 800-1600 | 35 | 80 | 380 | 0.85 | 9.1 | 1.2 | -40 ... +130 | 2 |  |
| **SK 55 TAA** | 800-1600 | 55 | 80 | 900 | 0.85 | 5.7 | 0.8 | -40 ... +130 | 2 | |
| **SK 75 TAA** | 800-1600 | 75 | 80 | 1500 | 0.9 | 4.5 | 0.6 | -40 ... +130 | 2 | |
| **SK 100 TAA** | 800-1600 | 100 | 80 | 2000 | 0.9 | 3.5 | 0.45 | -40 ... +130 | 2 | |
| **SK 75 TAE 12** | 1200 | 75 | 80 | 1250 | 0.85 | 4.4 | 0.6 | -40 ... +130 | 2 |  |
| **SK 25 WT** | 800-1600 | 29 | 85 | 280 | 1.1 | 20 | 1.7 | -40 ... +125 | 2 |  |
| **SK 45 WT** | 800-1600 | 47 | 85 | 380 | 1 | 10 | 1.2 | -40 ... +125 | 2 | |
| **SK 70 WT** | 800-1600 | 72 | 85 | 900 | 1 | 6 | 0.8 | -40 ... +125 | 3 | |
| **SK 100 WT** | 800-1600 | 101 | 85 | 1350 | 0.9 | 4.5 | 0.6 | -40 ... +125 | 3 | |
| **SK 35 BZ** | 800-1600 | 35 | 80 | 270 | 0.85 | 14 | 1.7 | -40 ... +125 | 2 |  |
| **SK 45 STA** | 800-1600 | 47 | 75 | 380 | 1 | 10 | 1.2 | -40 ... +125 | 3 |  |
| **SK 25 UT** | 800-1600 | 29 | 85 | 280 | 1.1 | 20 | 1.7 | -40 ... +125 | 3 |  |
| **SK 45 UT** | 800-1600 | 47 | 85 | 380 | 1 | 10 | 1.2 | -40 ... +125 | 2 | |
| **SK 30 DTA** | 800-1600 | 25 | 80 | 900 | 1 | 6 | 1.7 | -40 ... +150 | 3 |  |
| **SK 60 DTA** | 800-1600 | 61 | 80 | 1350 | 0.9 | 0.6 | 0.6 | -40 ... +125 | 3 | |
| **SK 80 DTA** | 800-1600 | 65 | 80 | 1800 | 0.9 | 3.5 | 1 | -40 ... +150 | 3 | |

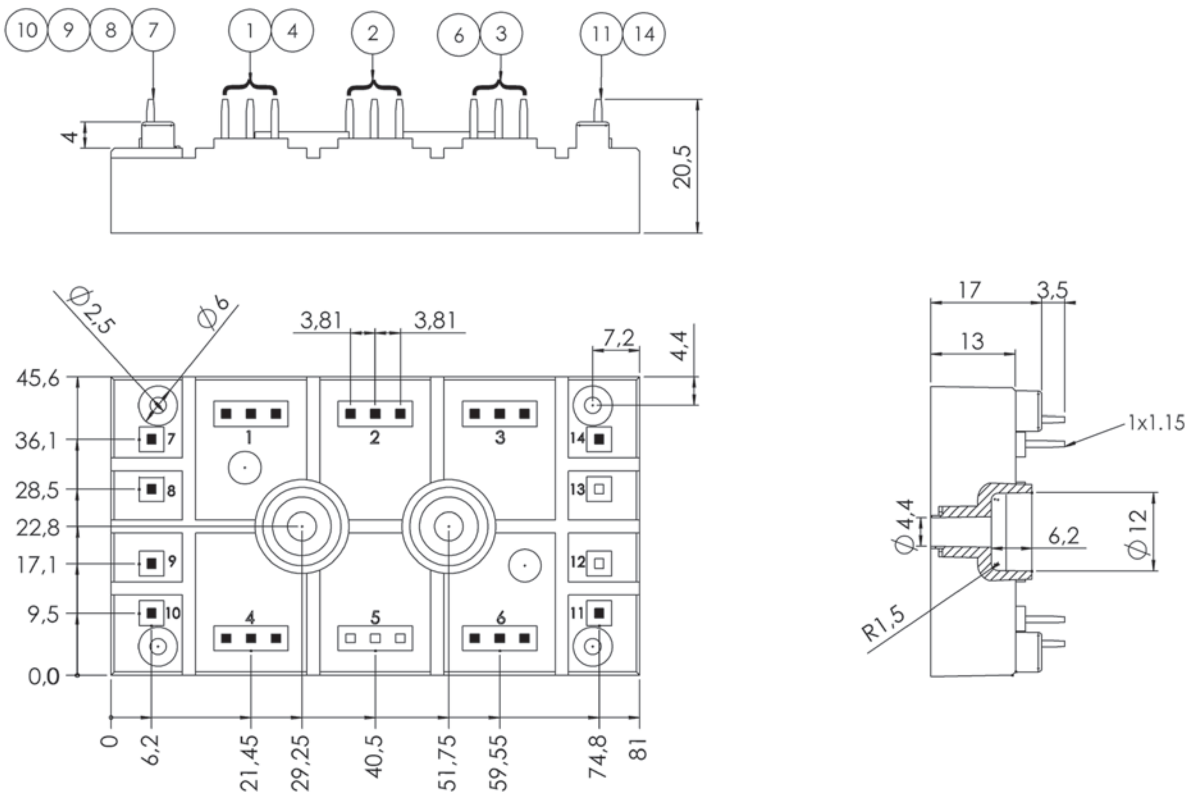
**For detailed case drawings please see page 26**

# Modules - Thyristor / Diode - SEMIPONT

| Type | $V_{RRM}$ $V_{DRM}$ | $I_{RMS}$ @$T_C$ | $T_C$ | $I_{TSM}$ $I_{FSM}$ @$T_{jmax}$ | $V_{T(TO)}$ @$T_{jmax}$ | $r_T$ @$T_{jmax}$ | $R_{th(j-s)}$ cont. per chip | $T_j$ | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|
| | V | A | °C | A | V | mΩ | K/W | °C | | |
| **SKUT 85 T** | 1200-1600 | 85 | 85 | 1050 | 1.1 | 6 | 0.85 | -40 ... +125 | 5 |  |
| **SKUT 115 T** | 1200-1600 | 105 | 85 | 1250 | 0.9 | 5 | 0.63 | -40 ... +125 | 5 | |
| **SKUT 85** | 1200-1600 | 85 | 85 | 1050 | 1.1 | 6 | 0.85 | -40 ... +125 | 5 |  |
| **SKUT 115** | 1200-1600 | 105 | 85 | 1250 | 0.9 | 5 | 0.63 | -40 ... +125 | 5 | |

## Cases

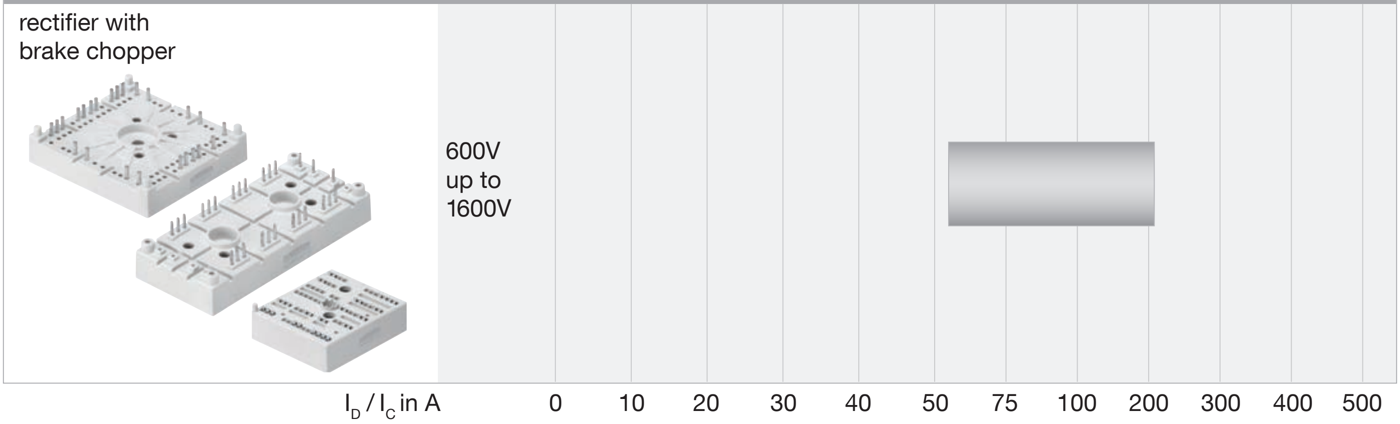
### SEMIPONT 5



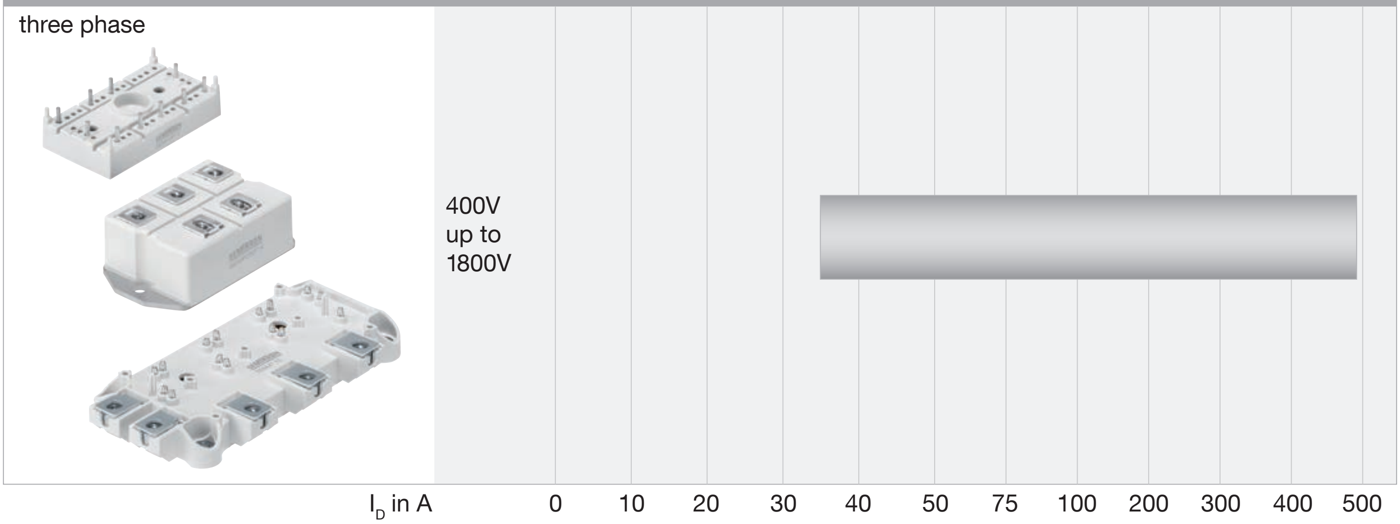

**Dimensions in mm**

# Bridge Rectifier

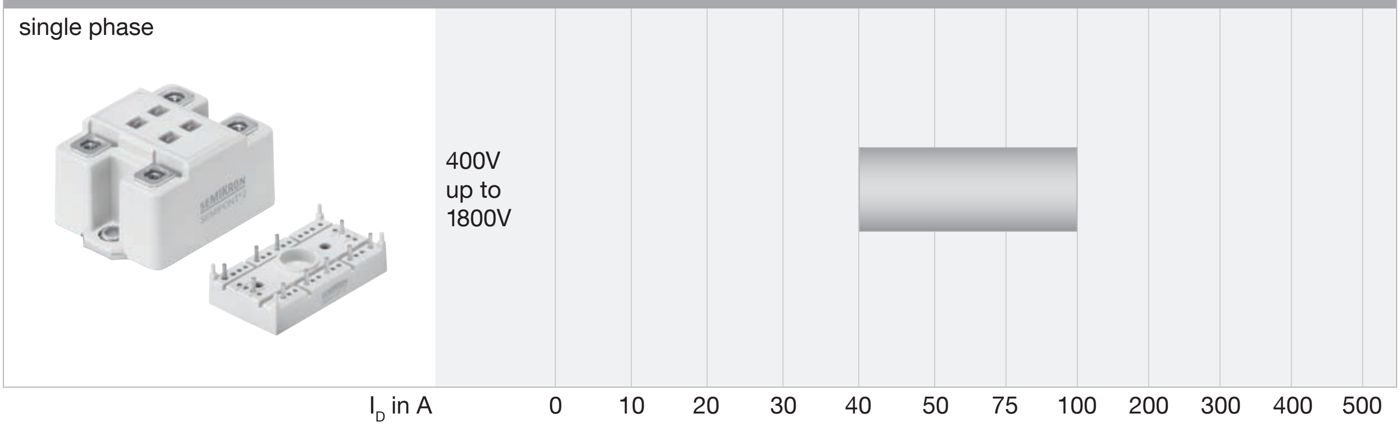
## SEMITOP® / SEMIPONT® /MiniSKiiP®



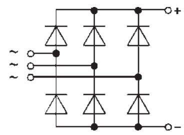
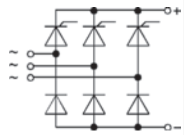

## SEMITOP® / SEMIPONT® / SEMiX®




## SEMIPONT® / SEMITOP®



# Modules - Bridge - SEMiX

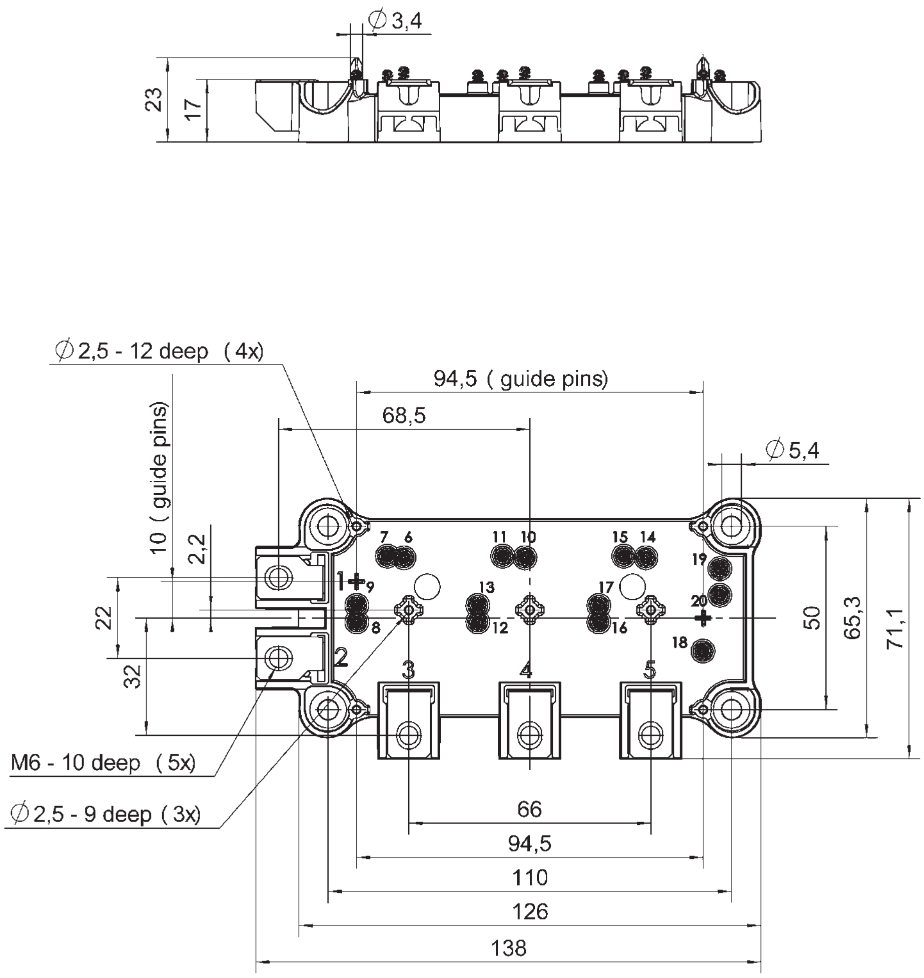
| Type | $V_{RRM}$ $V_{DRM}$ V | $I_D$ @$T_C$ A | $T_C$ °C | $I_{TSM}$ $I_{FSM}$ @$T_{jmax}$ A | $V_{T(TO)}$ @$T_{jmax}$ V | $r_T$ @$T_{jmax}$ mΩ | $R_{th(j-c)}$ per chip K/W | $R_{th(c-s)}$ per mo-dule K/W | $T_j$ °C | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **SEMiX251D12Fs** | 1200 | 250 | 85 | 1330 | 1.2 | 7 | 0.26 | 0.04 | -40 ... +150 | 13 |  |
| **SEMiX291D16s [1)]** | 1600 | 290 | 85 | 1380 | 0.83 | 4.6 | 0.45 | 0.04 | -40 ... +150 | 13 | |
| **SEMiX341D16s** | 1600 | 340 | 85 | 2000 | 0.9 | 2.7 | 0.22 | 0.04 | -40 ... +130 | 13 | |
| **SEMiX501D17Fs [1)]** | 1700 | 489 | 85 | 2140 | 1.1 | 2.7 | 0.165 | 0.04 | -40 ... +150 | 13 | |
| **SEMiX241DH16s** | 1600 | 240 | 85 | 1900 | 0.85 | 4 | 0.32 | 0.04 | -40 ... +130 | 13 |  |

**Footnotes**

1) New

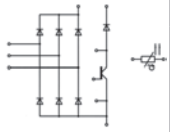
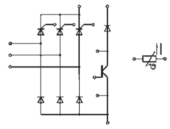
**Cases**

**SEMiX 13**



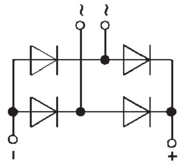
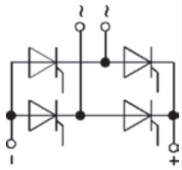
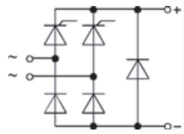
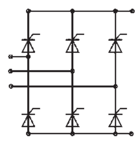
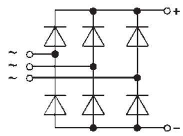
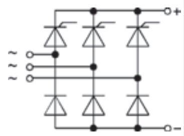
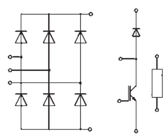
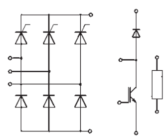

**Dimensions in mm**

# Modules - Bridge - MiniSKiiP

| Type | IGBT | | | | | | Diode | | | | Rectifier | | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_C$ @$T_s$= 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. | $E_{rr}$ | $R_{th(j-s)}$ | $I_{FSM}$ @$T_s$= 25°C | $R_{th(j-s)}$ | | |
| | A | A | V | mJ | mJ | K/W | A | V | mJ | K/W | A | K/W | | |
| **1200 V - IGBT 3 (Trench)** | | | | | | | | | | | | | | |
| **SKiiP 28ANB16V1** | 118 | 105 | 1.7 | 13.1 | 13 | 0.4 | 118 | 1.60 | 11.2 | 0.55 | 1000 | 0.7 | II 2 |  |
| **SKiiP 39ANB16V1** | 157 | 140 | 1.7 | 19.9 | 17.2 | 0.3 | 167 | 1.50 | 16.2 | 0.4 | 1600 | 0.5 | II 3 | |
| **SKiiP 28AHB16V1** | 118 | 105 | 1.7 | 14.4 | 13.3 | 0.4 | 118 | 1.60 | 10.8 | 0.55 | 1000 | 0.7 | II 2 |  |
| **SKiiP 39AHB16V1** | 157 | 140 | 1.7 | 19.9 | 17.3 | 0.3 | 167 | 1.50 | 16.2 | 0.4 | 1250 | 0.5 | II 3 | |

**For detailed case drawings please see page 21**

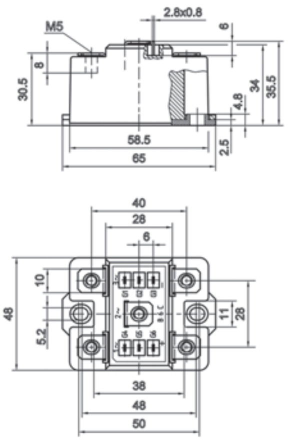
# Modules - Bridge - SEMIPONT

| Type | $V_{RRM}$ $V_{DRM}$ V | $I_D$ @$T_C$ A | $T_C$ °C | $I_{TSM}$ $I_{FSM}$ @$T_{jmax}$ A | $V_{T(TO)}$ @$T_{jmax}$ V | $r_T$ @$T_{jmax}$ mΩ | $R_{th(j-c)}$ cont. per chip K/W | $T_j$ °C | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|
| **1 and 3 phase** | | | | | | | | | | |
| SKB 52 | 400-1800 | 50 | 99 | 425 | 0.85 | 8 | 1.5 | -40 ... +150 | 3 |  |
| SKB 60 | 400-1600 | 60 | 88 | 850 | 0.85 | 5 | 1 | -40 ... +125 | 2 | |
| SKB 72 | 400-1800 | 70 | 101 | 640 | 0.85 | 5 | 1.1 | -40 ... +150 | 3 | |
| SKBT 40 | 800-1400 | 46 | 92 | 400 | 1 | 16 | 1 | -40 ... +125 | 2 |  |
| SKCH 40 | 400-1600 | 40 | 92 | 400 | 1 | 16 | 1 | -40 ... +125 | 2 |  |
| SKDT 60 | 400-1400 | 60 | 86 | 400 | 1 | 16 | 1 | -40 ... +125 | 2 |  |
| SKDT 115 | 1200-1600 | 110 | 80 | 950 | 1.1 | 6 | 0.84 | -40 ... +125 | 5 | |
| SKDT 145 | 1200-1600 | 140 | 80 | 1250 | 0.9 | 5 | 0.6 | -40 ... +125 | 5 | |
| SKD 60 | 400-1600 | 60 | 102 | 850 | 0.85 | 5 | 1 | -40 ... +125 | 2 |  |
| SKD 62 | 400-1800 | 60 | 110 | 425 | 0.85 | 8 | 1.5 | -40 ... +150 | 3 | |
| SKD 82 | 400-1800 | 80 | 110 | 640 | 0.85 | 5 | 1.1 | -40 ... +150 | 3 | |
| SKD 100 | 400-1600 | 100 | 93 | 1000 | 0.85 | 5 | 0.85 | -40 ... +125 | 2 | |
| SKD 110 | 800-1800 | 110 | 100 | 1000 | 0.85 | 4 | 0.9 | -40 ... +150 | 4 | |
| SKD 115 | 1200-1800 | 110 | 85 | 1150 | 0.8 | 7 | 1 | -40 ... +150 | 5 | |
| SKD 145 | 1200-1800 | 140 | 85 | 1700 | 0.8 | 4 | 0.8 | -40 ... +150 | 5 | |
| SKD 160 | 800-1800 | 205 | 100 | 1500 | 0.85 | 3 | 0.65 | -40 ... +150 | 4 | |
| SKD 210 | 900-1800 | 207 | 99 | 1600 | 0.85 | 3 | 0.5 | -40 ... +150 | 4 | |
| SKDH 100 | 800-1400 | 100 | 84 | 850 | 1 | 4.5 | 0.85 | -40 ... +125 | 2 |  |
| SKDH 115 | 1200-1600 | 110 | 80 | 950 | 1.1 | 6 | 0.84 | -40 ... +125 | 5 | |
| SKDH 145 | 1200-1600 | 110 | 80 | 1250 | 0.9 | 5 | 0.63 | -40 ... +125 | 5 | |
| **3 phase with brake chopper** | | | | | | | | | | |
| SKD 116/..-L105 | 1200-1600 | 110 | 85 | 1050 | 0.8 | 7 | 1 | -40 ... +125 | 6 |  |
| SKD 116/..-L140 | 1200-1600 | 110 | 85 | 1050 | 0.8 | 7 | 1 | -40 ... +125 | 6 | |
| SKD 146/..-L105 | 1200-1600 | 140 | 85 | 1250 | 0.8 | 4 | 0.8 | -40 ... +125 | 6 | |
| SKD146/..-L140T4 | 1200-1600 | 140 | 85 | 1250 | 0.8 | 4 | 0.8 | -40 ... +125 | 6 | |
| SKDH116/..L105 | 1200-1600 | 110 | 85 | 1050 | 0.8 | 7 | 1 | -40 ... +125 | 6 |  |
| SKDH116/..L140 | 1200-1600 | 110 | 85 | 1050 | 0.8 | 7 | 1 | -40 ... +125 | 6 | |
| SKDH146/..-L105 | 1200-1600 | 110 | 85 | 1250 | 0.8 | 4 | 0.8 | -40 ... +125 | 6 | |
| SKDH146/..-L140 | 1200-1600 | 110 | 85 | 1250 | 0.8 | 4 | 0.8 | -40 ... +125 | 6 | |
| SKDH 146/08-L200 | 800 | 140 | 80 | 1250 | 0.85 | 3 | 0.6 | -40 ... +125 | 6 | |

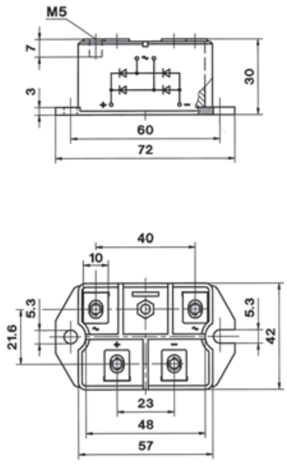
# Modules - Bridge - SEMIPONT

## Cases

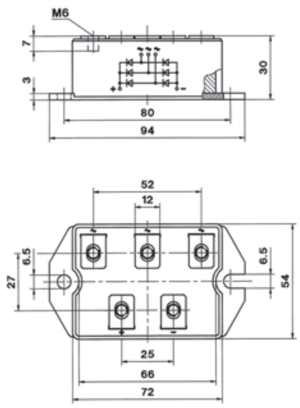
### SEMIPONT 2



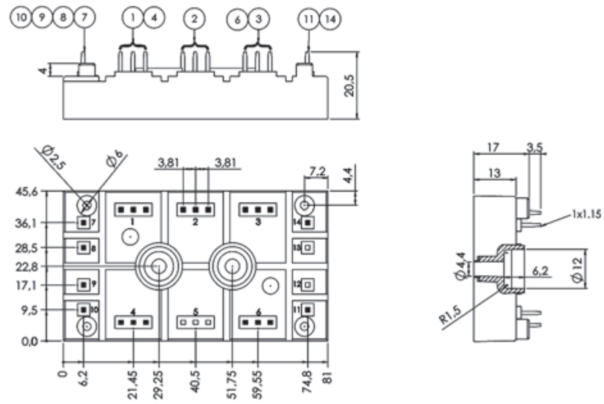

### SEMIPONT 3



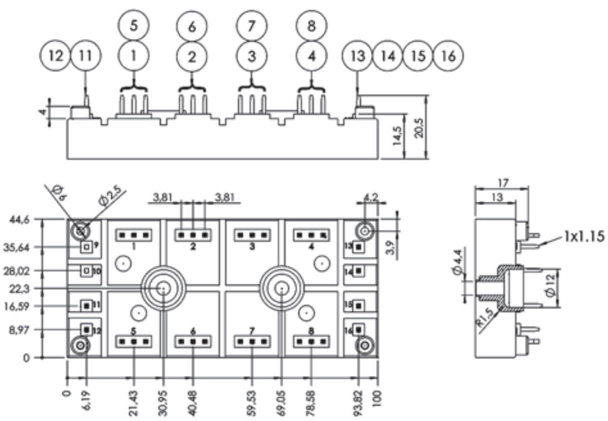

### SEMIPONT 4




### SEMIPONT 5

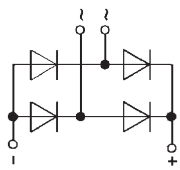
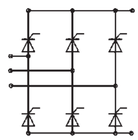
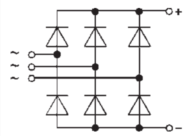
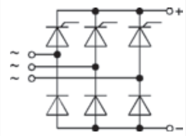
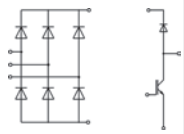
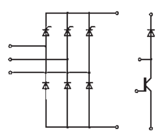



### SEMIPONT 6



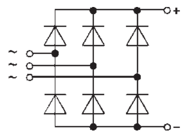

**Dimensions in mm**

# Modules - Bridge - SEMITOP

| Type | $V_{RRM}$ $V_{DRM}$ | $I_D$ @$T_s$ | $T_s$ | $I_{TSM}$ $I_{FSM}$ @$T_{jmax}$ | $V_{T(TO)}$ @$T_{jmax}$ | $r_T$ @$T_{jmax}$ | $R_{th(j-s)}$ per chip | $T_j$ | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|
| | V | A | °C | A | V | mΩ | K/W | °C | | |
| **1 and 3 phase** | | | | | | | | | | |
| **SK 50 B 06 UF** | 600 | 46 | 80 | 400 | 0.8 | 11 | 0.45 | -40 ... +150 | 2 |  |
| **SK 50 B** | 800-1600 | 51 | 80 | 270 | 0.8 | 13 | 1.7 | -40 ... +150 | 2 | |
| **SK 55 B 06 F** | 600 | 54 | 80 | 440 | 0.9 | 16 | 1.2 | -40 ... +150 | 2 | |
| **SK 55 B 12 F** | 1200 | 57 | 80 | 550 | 1.2 | 22 | 0.9 | -40 ... +150 | 2 | |
| **SK 70 B** | 800-1600 | 68 | 80 | 560 | 0.8 | 11 | 1.2 | -40 ... +150 | 2 | |
| **SK 100 B** | 800-1600 | 100 | 80 | 890 | 0.83 | 3.9 | 1 | -40 ... +150 | 2 | |
| **SK 40 DT** | 800-1600 | 42 | 80 | 280 | 1.1 | 20 | 1.7 | -40 ... +125 | 3 |  |
| **SK 70 DT** | 800-1600 | 68 | 80 | 380 | 1 | 10 | 1.2 | -40 ... +125 | 3 | |
| **SK 55 D** | 800-1600 | 55 | 80 | 200 | 0.8 | 13 | 2.15 | -40 ... +150 | 2 |  |
| **SK 70 D** | 800-1600 | 70 | 80 | 270 | 0.8 | 13 | 1.7 | -40 ... +150 | 2 | |
| **SK 80 D 12F** | 1200 | 80 | 80 | 550 | 1.2 | 22 | 0.9 | -40 ... +150 | 3 | |
| **SK 95 D** | 800-1600 | 95 | 80 | 560 | 0.8 | 11 | 1.2 | -40 ... +150 | 2 | |
| **SK 40 DH** | 800-1600 | 42 | 80 | 270 | 1.1 | 20 | 1.7 | -40 ... +150 | 3 |  |
| **SK 70 DH** | 800-1600 | 68 | 80 | 270 | 1 | 10 | 1.2 | -40 ... +125 | 3 | |
| **SK 55 DGL 126** | 1200 | 55 | 80 | 370 | 0.8 | 13 | 2 | -40 ... +150 | 3 |  |
| **SK 95 DGL 126** | 1600 | 96 | 80 | 700 | 0.8 | 11 | 1.2 | -40 ... +150 | 3 | |
| **SK 170 DHL 126** | 1200 | 170 | 70 | 1000 | 0.8 | 7 | 0.51 | -40 ... +150 | 4 |  |
| **SK 200 DHL 066** | 600 | 210 | 70 | 1250 | 0.8 | 4 | 0.52 | -40 ... +150 | 4 | |

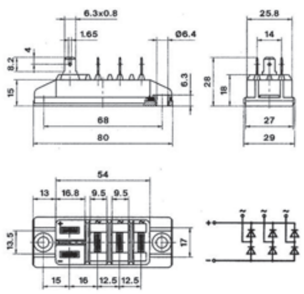
**For detailed case drawings please see page 26**

# Modules - Bridge - Power Bridge

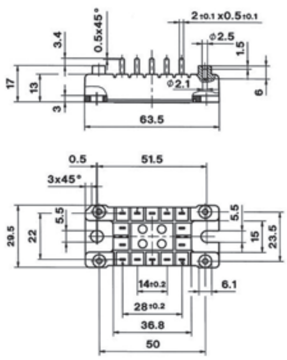
| Type | $V_{RRM}$ $V_{DRM}$ V | $I_D$ @$T_C$ A | $T_C$ °C | $I_{FSM}$ @$T_{jmax}$ A | $V_{T(TO)}$ @$T_{jmax}$ V | $r_T$ @$T_{jmax}$ mΩ | $R_{th(j-s)}$ cont. per chip K/W | $T_j$ °C | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|
| **3 phase** | | | | | | | | | | |
| **SKD 33** | 400-1800 | 33 | 110 | 240 | 0.8 | 18 | 2.5 | -40 ... +150 | G55 |  |
| **SKD 51** | 400-1800 | 50 | 127 | 700 | 0.8 | 8.5 | 1.1 | -40 ... +150 | G51 | |
| **SKD 53** | 400-1800 | 53 | 100 | 270 | 0.8 | 13 | 1.9 | -40 ... +150 | G55 | |
| **SKD 83** | 400-1800 | 83 | 95 | 560 | 0.8 | 7.5 | 1.4 | -40 ... +150 | G55 | |

## Cases

**G 51**



**G 55**

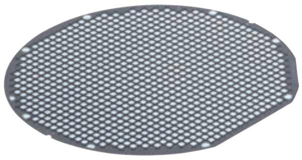


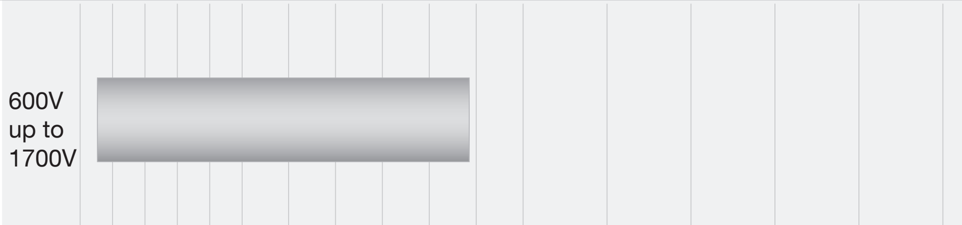
**Dimensions in mm**

# Discretes

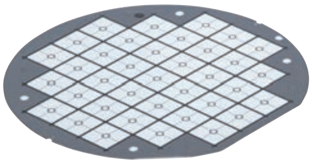
## Chips SEMICELL

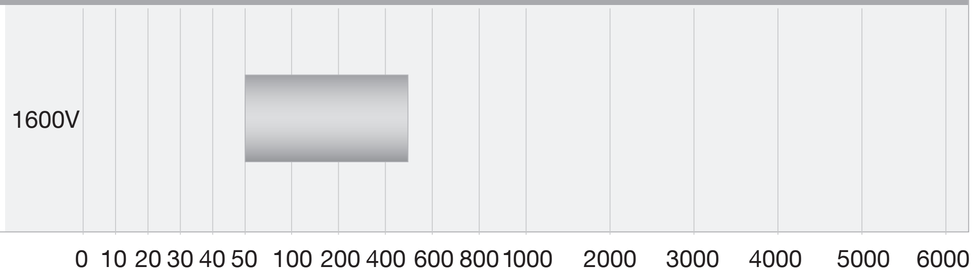
### Freewheeling Diode CAL / Rectifier






### Thyristor

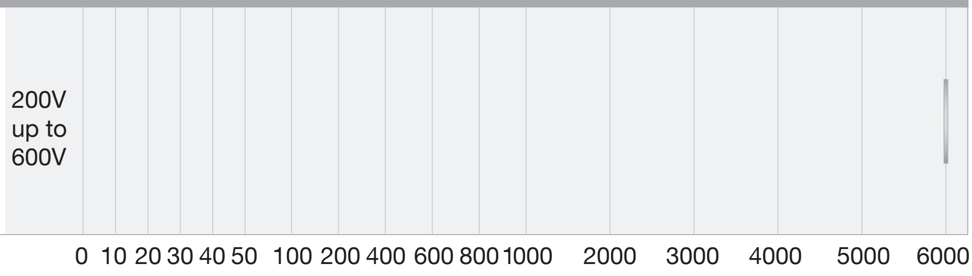





$I_{T/F}$ in A

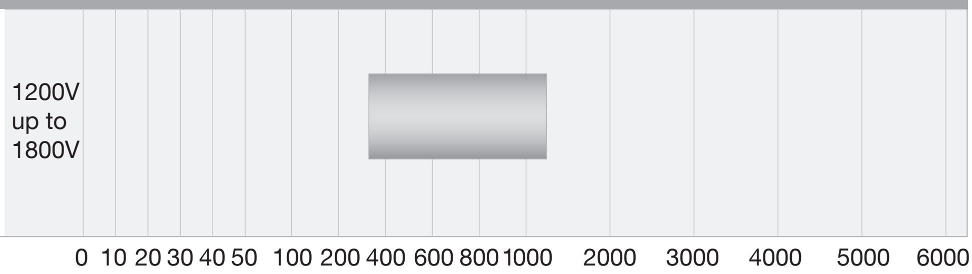
## Capsule

### Diode




$I_{FAV}$ in A

### Thyristor




$I_{TAV}$ in A

# Discretes - Chips - SEMICELL

| Type | $V_{RRM}$ V | $I_F$ @$T_j$= 150°C A | $I_{FSM}$ @$T_j$= 150°C 10ms A | $V_F$ @$T_j$= 25°C V | $I_F$ @ $V_F$ $T_j$= 25°C A | $Q_{rr}$ @$T_j$= 125°C µC |
|---|---|---|---|---|---|---|
| **600 V - Freewheeling Diodes CAL I3 Fast** | | | | | | |
| **SKCD 06 C 060 I3** | 600 | 15 | - | 1.35 | 10 | 0.7 |
| **SKCD 09 C 060 I3** | 600 | 20 | 100 | 1.35 | 15 | 1.2 |
| **SKCD 18 C 060 I3** | 600 | 30 | 200 | 1.35 | 25 | 2.5 |
| **SKCD 31 C 060 I3** | 600 | 50 | 440 | 1.35 | 50 | 3.3 |
| **SKCD 47 C 060 I3** | 600 | 80 | 720 | 1.35 | 85 | 5.5 |
| **SKCD 61 C 060 I3** | 600 | 100 | 1000 | 1.35 | 110 | 7 |
| **SKCD 81 C 060 I3** | 600 | 150 | 1260 | 1.35 | 155 | 8.5 |
| **SKCD 121 C 060 I3** | 600 | 210 | 2100 | 1.35 | 245 | 10.7 |

| Type | $V_{RRM}$ V | $I_F$ @$T_j$= 175°C A | $I_{FSM}$ @$T_j$= 150°C 10ms A | $V_F$ @$T_j$= 25°C V | $I_F$ @ $V_F$ $T_j$= 25°C A | $Q_{rr}$ @$T_j$= 150°C µC |
|---|---|---|---|---|---|---|
| **600 V - Freewheeling Diodes CAL High Density** | | | | | | |
| **SKCD 04 C 060 I HD** | 600 | 10 | 65 | 1.35 | 7 | 0.89 |
| **SKCD 06 C 060 I HD** | 600 | 20 | 95 | 1.35 | 12 | 0.93 |
| **SKCD 09 C 060 I HD** | 600 | 30 | 160 | 1.35 | 19 | 1.6 |
| **SKCD 16 C 060 I HD** | 600 | 50 | 320 | 1.35 | 37 | 5.64 |
| **SKCD 24 C 060 I HD** | 600 | 75 | 395 | 1.35 | 60 | 7.8 |
| **SKCD 42 C 060 I HD** | 600 | 100 | 810 | 1.35 | 110 | 14 |
| **SKCD 61 C 060 I HD** | 600 | 150 | 1080 | 1.35 | 160 | 22 |
| **SKCD 81 C 060 I HD** | 600 | 200 | 1310 | 1.35 | 230 | 32 |

| Type | $V_{RRM}$ V | $I_F$ @$T_j$= 175°C A | $I_{FSM}$ @$T_j$= 150°C 10ms A | $V_F$ @$T_j$= 25°C V | $I_F$ @ $V_F$ $T_j$= 25°C A | $E_{off}$ @$T_j$= 150°C mJ |
|---|---|---|---|---|---|---|
| **650 V - Freewheeling Diodes CAL I4 Fast** | | | | | | |
| **SKCD 24 C 065 I4F** | 650 | 50 | 460 | 1.30 | 39 | 1.1 |
| **SKCD 42 C 065 I4F** | 650 | 100 | 680 | 1.30 | 73 | 2.2 |
| **SKCD 61 C 065 I4F** | 650 | 150 | 1100 | 1.30 | 109 | 3.8 |
| **SKCD 81 C 065 I4F** | 650 | 200 | 1290 | 1.30 | 148 | 5.8 |

# Discretes - Chips - SEMICELL

| Type | $V_{RRM}$ V | $I_F$ @$T_j$= 150°C A | $I_{FSM}$ @$T_j$= 150°C 10ms A | $V_F$ @$T_j$= 25°C V | $I_F$ @ $V_F$ $T_j$= 25°C A | $Q_{rr}$ @$T_j$= 125°C µC |
|---|---|---|---|---|---|---|
| **1200 V - Freewheeling Diodes CAL I3 Fast** | | | | | | |
| **SKCD 11 C 120 I3** | 1200 | 15 | 130 | 2.00 | 10 | 1.6 |
| **SKCD 18 C 120 I3** | 1200 | 25 | 200 | 2.00 | 15 | 3 |
| **SKCD 23 C 120 I3R** | 1200 | 30 | 270 | 2.00 | 25 | 3.8 |
| **SKCD 31 C 120 I3** | 1200 | 40 | 370 | 2.00 | 35 | 5.3 |
| **SKCD 47 C 120 I3** | 1200 | 55 | 600 | 2.00 | 55 | 7.5 |
| **SKCD 61 C 120 I3** | 1200 | 75 | 800 | 2.00 | 70 | 11 |
| **SKCD 81 C 120 I3** | 1200 | 100 | 1100 | 2.00 | 100 | 16.5 |
| **SKCD 121 C 120 I3** | 1200 | 150 | 1600 | 2.00 | 155 | 24 |

| Type | $V_{RRM}$ V | $I_F$ @$T_j$= 150°C A | $I_{FSM}$ @$T_j$= 150°C 10ms A | $V_F$ @$T_j$= 25°C V | $I_F$ @ $V_F$ $T_j$= 25°C A | $Q_{rr}$ @$T_j$= 125°C µC |
|---|---|---|---|---|---|---|
| **1200 V - Freewheeling Diodes CAL High Density** | | | | | | |
| **SKCD 06 C 120 I HD** | 1200 | 6 | 60 | 1.50 | 5 | 1.24 |
| **SKCD 11 C 120 I HD** | 1200 | 15 | 140 | 1.50 | 12 | 2.9 |
| **SKCD 14 C 120 I HD** | 1200 | 20 | 170 | 1.50 | 15 | 4 |
| **SKCD 18 C 120 I HD** | 1200 | 25 | 200 | 1.50 | 20 | 5 |
| **SKCD 31 C 120 I HD** | 1200 | 55 | 480 | 1.50 | 45 | 11 |
| **SKCD 47 C 120 I HD** | 1200 | 85 | 700 | 1.50 | 70 | 17.4 |
| **SKCD 61 C 120 I HD** | 1200 | 115 | 900 | 1.50 | 90 | 24.5 |
| **SKCD 81 C 120 I HD** | 1200 | 160 | 1150 | 1.50 | 130 | 34.4 |

| Type | $V_{RRM}$ V | $I_F$ @$T_j$= 175°C A | $I_{FSM}$ @$T_j$= 150°C 10ms A | $V_F$ @$T_j$= 25°C V | $I_F$ @ $V_F$ $T_j$= 25°C A | $E_{off}$ @$T_j$= 150°C mJ |
|---|---|---|---|---|---|---|
| **1200 V - Freewheeling Diodes CAL I4 Fast** | | | | | | |
| **SKCD 08 C 120 I4F** | 1200 | 8 | 36 | 2.33 | 8 | 0.4 |
| **SKCD 11 C 120 I4F** | 1200 | 15 | 65 | 2.38 | 15 | 0.6 |
| **SKCD 16 C 120 I4F** | 1200 | 25 | 100 | 2.41 | 25 | 1 |
| **SKCD 22 C 120 I4F** | 1200 | 35 | 170 | 2.30 | 35 | 1.6 |
| **SKCD 31 C 120 I4F** | 1200 | 50 | 270 | 2.22 | 50 | 2.6 |
| **SKCD 46 C 120 I4F** | 1200 | 75 | 430 | 2.17 | 75 | 4.2 |
| **SKCD 46 C 120 I4F R** | 1200 | 75 | 430 | 2.17 | 75 | 4.2 |
| **SKCD 53 C 120 I4F** | 1200 | 100 | 550 | 2.20 | 100 | 5.4 |
| **SKCD 81 C 120 I4F** | 1200 | 150 | 900 | 2.14 | 150 | 8.7 |

| Type | $V_{RRM}$ V | $I_F$ @$T_j$= 175°C A | $I_{FSM}$ @$T_j$= 150°C 10ms A | $V_F$ @$T_j$= 25°C V | $I_F$ @ $V_F$ $T_j$= 25°C A | $E_{off}$ @$T_j$= 150°C mJ |
|---|---|---|---|---|---|---|
| **1200 V - Freewheeling Diodes CAL I4 High Density** | | | | | | |
| **SKCD 46 C 120 I4 HD** | 1200 | 75 | 430 | 1.72 | 75 | 6.2 |
| **SKCD 53 C 120 I4 HD** | 1200 | 100 | 550 | 1.77 | 100 | 8 |
| **SKCD 81 C 120 I4 HD** | 1200 | 150 | 900 | 1.72 | 150 | 13.4 |

# Discretes - Chips - SEMICELL

| Type | $V_{RRM}$ | $I_F$ @$T_j$= 150°C | $I_{FSM}$ @$T_j$= 150°C 10ms | $V_F$ @$T_j$= 25°C | $I_F$ @ $V_F$ $T_j$= 25°C | $Q_{rr}$ @$T_j$= 125°C |
|---|---|---|---|---|---|---|
| | V | A | A | V | A | µC |
| **1700 V - Freewheeling Diodes CAL Fast** | | | | | | |
| **SKCD 47 C 170 I** | 1700 | 55 | 550 | 2.05 | 55 | 15 |
| **SKCD 61 C 170 I** | 1700 | 75 | 720 | 2.05 | 75 | 19 |

| Type | $V_{RRM}$ | $I_F$ @$T_j$= 150°C | $I_{FSM}$ @$T_j$= 150°C 10ms | $V_F$ @$T_j$= 25°C | $I_F$ @ $V_F$ $T_j$= 25°C | $Q_{rr}$ @$T_j$= 125°C |
|---|---|---|---|---|---|---|
| | V | A | A | V | A | µC |
| **1700 V - Freewheeling Diodes CAL High Density** | | | | | | |
| **SKCD 47 C 170 I HD** | 1700 | 75 | 650 | 1.73 | 75 | 19 |
| **SKCD 61 C 170 I HD** | 1700 | 100 | 710 | 1.73 | 100 | 26 |
| **SKCD 81 C 170 I HD** | 1700 | 150 | 1070 | 1.73 | 150 | 44 |

| Type | $V_{RRM}$ | $I_F$ @$T_j$= 175°C | $I_{FSM}$ @$T_j$= 150°C 10ms | $V_F$ @$T_j$= 25°C | $I_F$ @ $V_F$ $T_j$= 25°C | $E_{off}$ @$T_j$= 150°C |
|---|---|---|---|---|---|---|
| | V | A | A | V | A | mJ |
| **1700 V - Freewheeling Diodes CAL I4 Fast** | | | | | | |
| **SKCD 28 C 170 I4F** [1)] | 1700 | 40 | 280 | 1.71 | 23 | 12 |
| **SKCD 46 C 170 I4F** [1)] | 1700 | 75 | 450 | 1.71 | 43 | 17 |
| **SKCD 56 C 170 I4F** [1)] | 1700 | 100 | 580 | 1.71 | 57 | 22.2 |
| **SKCD 81 C 170 I4F** [1)] | 1700 | 150 | 860 | 1.71 | 89 | 31.5 |

# Discretes - Chips - SEMICELL

| Type | $V_{RRM}$ V | $I_{F(DC)}$ @$T_j$= 150°C A | $I_{FSM}$ @$T_j$= 150°C 10ms A | $V_F$ @$T_j$= 25°C V | $I_F$ @ $V_F$ $T_j$= 25°C A | $t_{rr}$ @$T_j$= 25°C µs |
|---|---|---|---|---|---|---|
| **1600 V - Rectifier** | | | | | | |
| SKR 3,5 Qu bond [5] | 1600 | 25 | 200 | 1 | 8 | 20 |
| SKR 4,2 Qu bond [5] | 1600 | 35 | 270 | 1 | 13 | 20 |
| SKR 4,8 Qu bond [5] | 1600 | 45 | 350 | 1 | 18 | 21 |
| SKR 5,6 Qu bond [5] | 1600 | 50 | 490 | 1 | 25 | 22 |
| SKR 6,2 Qu bond [5] | 1600 | 65 | 600 | 1 | 33 | 22 |
| SKR 7,0 Qu bond [5] | 1600 | 75 | 890 | 1 | 45 | 23 |
| SKR 8,9 Qu bond [5] | 1600 | 140 | 1380 | 1 | 77 | 26 |
| SKR 10,3 Qu bond [5] | 1600 | 170 | 1650 | 1 | 106 | 29 |
| SKR 12,4 Qu bond [5] | 1600 | 235 | 2300 | 1 | 160 | 34 |
| SKR 15,2 Qu bond [5] | 1600 | 330 | 3800 | 1 | 245 | 42 |
| SKR 16,3 x 18,2 Qu bond [5] | 1600 | 365 | 5100 | 1 | 320 | 49 |
| SKR 18,2 Qu bond [5] | 1600 | 380 | 5500 | 1 | 360 | 53 |
| SKR 22,4 Qu bond [5] | 1600 | 770 | 9450 | 1 | 550 | 72 |

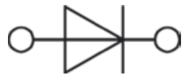
| Type | $V_{RRM}$ $V_{DRM}$ V | $I_{T(DC)}$ @$T_C$=80°C, $T_j$=130°C A | $I_{TSM}$ @$T_j$= 130°C 10ms A | $V_{GT}$ @$T_j$= 25°C V | $I_{GT}$ @$T_j$= 25°C mA | $t_q$ @$T_j$= 130°C µs |
|---|---|---|---|---|---|---|
| **1600 V - Thyristor Central Gate** | | | | | | |
| SKT 8,9 Qu ZG bond. [5] | 1600 | 105 | 1000 | 1.98 | 100 | 150 |
| SKT 10,3 Qu ZG bond. [5] | 1600 | 125 | 1250 | 1.98 | 100 | 150 |
| SKT 12,4 Qu ZG bond. [5] | 1600 | 165 | 1800 | 1.98 | 100 | 150 |
| SKT 13,5 Qu ZG bond. [5] | 1600 | 185 | 2300 | 1.98 | 100 | 135 |
| SKT 15,2 Qu ZG bond. [5] | 1600 | 215 | 3200 | 1.98 | 100 | 150 |
| SKT 18,2 Qu ZG bond. [5] | 1600 | 250 | 5000 | 1.98 | 100 | 150 |
| SKT 24,3 Qu ZG bond. [5] | 1600 | 480 | 8200 | 1.98 | 150 | 150 |
| **1600 V - Thyristor Corner Gate** | | | | | | |
| SKT 5,6 Qu RG bond. [5] | 1600 | 60 | 280 | 1.98 | 100 | 150 |
| SKT 7,0 Qu RG bond. [5] | 1600 | 75 | 450 | 1.98 | 100 | 150 |
| SKT 8,9 Qu RG bond. [5] | 1600 | 105 | 1000 | 1.98 | 100 | 150 |
| SKT 10,3 Qu RG bond. [5] | 1600 | 125 | 1250 | 1.98 | 100 | 150 |
| SKT 12,4 Qu RG bond. [5] | 1600 | 165 | 1800 | 1.98 | 100 | 150 |

**Footnotes**

1) New

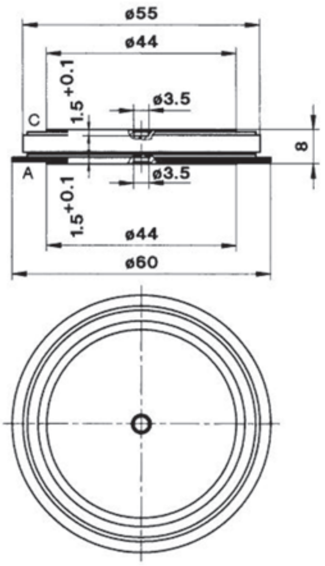
5) solderable top metallization on request

# Discretes - Diodes - Capsule

| Type | $V_{RRM}$ (V) | $I_{FAV}$ @$T_C$ (A) | $T_C$ (°C) | $I_{FSM}$ @$T_j$= 25°C (A) | $V_F$ @ $I_F$ $T_j$= 25°C (V) | $I_F$ – $V_F$ (A) | $R_{th(j-c)}$ per chip (K/W) | $T_j$ (°C) | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|
| **SKN 6000** | 200-600 | 6000 | 85 | 60000 | 1.30 | 14000 | 0.012 | -40 ... +180 | E35 |  |

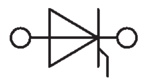
## Cases

**E35**



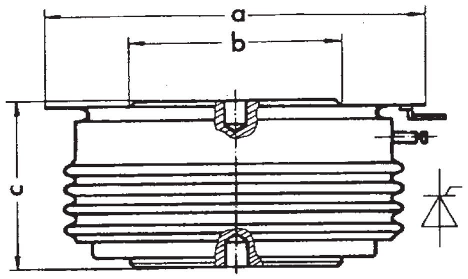

**Dimensions in mm**

# Discretes - Thyristor - Capsule

| Type | $V_{RRM}$ $V_{DRM}$ V | $I_{TAV}$ @$T_C$ A | $T_C$ °C | $I_{TSM}$ @$T_j$= 25°C A | $V_T$ @ $I_T$ $T_j$= 25°C V | $I_T$_$V_T$ A | $R_{th(j-c)}$ @sin. 180° K/W | $T_j$ °C | Case | Circuit |
|---|---|---|---|---|---|---|---|---|---|---|
| **SKT 340** | 1200-1800 | 340 | 82 | 5700 | 1.9 | 1000 | 0.072 | -40 ... +125 | B8 |  |
| **SKT 551** | 1200-1800 | 550 | 85 | 9000 | 1.65 | 1500 | 0.047 | -40 ... +125 | B11 | |
| **SKT 760** | 1200-1800 | 760 | 80 | 15000 | 1.65 | 2400 | 0.04 | -40 ... +125 | B10 | |
| **SKT 1200** | 1200-1800 | 1200 | 85 | 30000 | 1.65 | 3600 | 0.022 | -40 ... +125 | B14 | |

## Cases

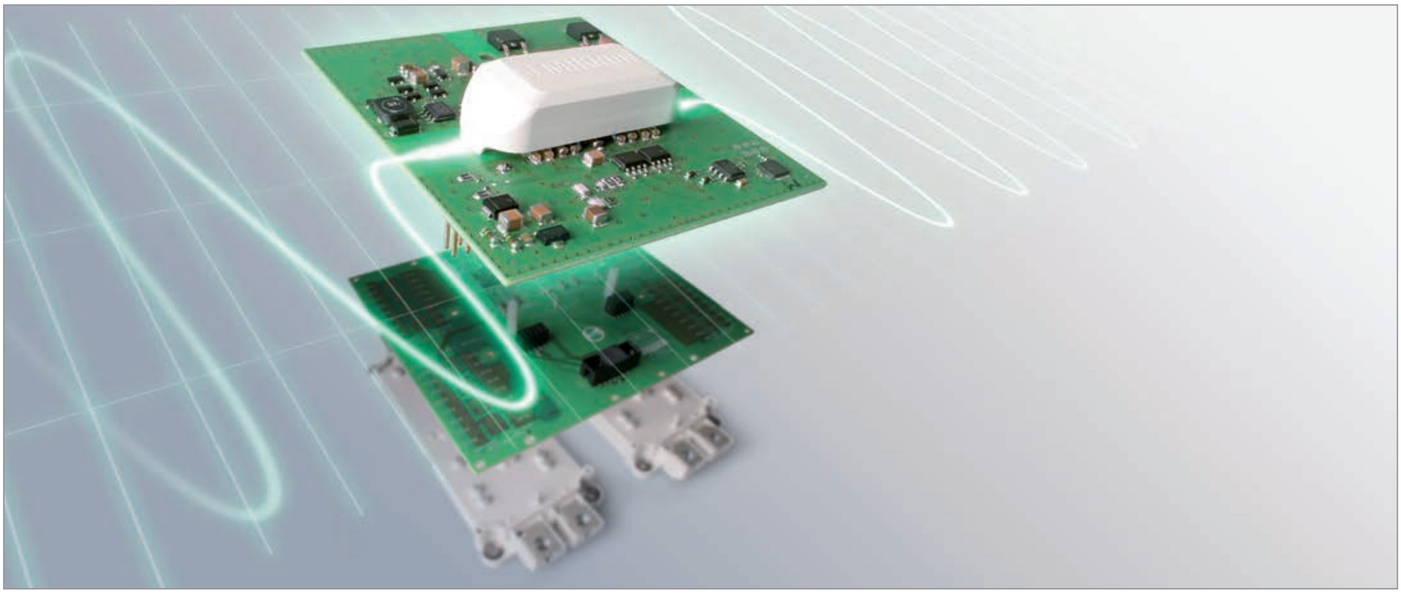
**B8 ... B14**




| Cases | a | b | c |
|---|---|---|---|
| B 8 | 41 | 19 | 14 |
| B 10 | 57,3 | 34 | 26 |
| B 11 | 41 | 25 | 14 |
| B 14 | 73 | 47 | 26 |

**Dimensions in mm**

# SKYPER®



## Robust IGBT Driver

### Applications
The new SKYPER 42 LJ offers the benefits of digital signal consistency while maintaining full performance. Ambitious applications such as medical or large drives are securely powered. SKYPER 32 is the perfect solution for industrial drives and process control applications. Boasting a mean time between failures of more over five million hours, the service life of this driver is triple that of standard IGBT drivers. The SKYPER platform can drive 600 V, 1200 V and 1700 V IGBT modules.

### Product range driver cores

| | |
|---|---|
| SKYPER 32/ PRO/ UL | 1W |
| SKYPER 42 LJ | 2W |
| SKYPER 42 | 4W |
| SKYPER 52 | 9W |

### Benefits
Robust driving technology
- Adjustable filter time for optimised performance
- High signal accuracy with +/- 1.25 ns jitter
- Safe signal transmission with rectangle pulses and seperated channels
- Low coupling capacitance with 100 kV/dt ruggedness
- Steady stabilised gate voltage for safe switching characteristics
- Safe gate control with SoftOff and adjustable failure management
- EMC with unique interlayer connection and short-pulse suppression
- Adapter boards for easy paralleling of SEMIKRON modules
- Assembly service for gate resistors and $V_{CE}$ components for adaptor boards on request
- Adapter boards with integrated DC link measurement and excess temperature control

**www.semikron.com/skyper**

# Driver Electronics - SEMIDRIVER

| Type | Channels | $V_{CE}$ V | $V_{G(on)}$ V | $V_{G(off)}$ V | $I_{outPEAK}$ A | $Q_{out/pulse}$ µC | $f_{max}$ kHZ | $V_{isolIO}$ kV | dv/dt kV/µs |
|---|---|---|---|---|---|---|---|---|---|
| **Driver** | | | | | | | | | |
| SKHI 10/12 R | 1 | 1200 | 15 | -8 | 8 | 9.6 | 100 | 2500 | 75 |
| SKHI 10/17 R | 1 | 1700 | 15 | -8 | 8 | 9.6 | 100 | 4000 | 75 |
| SKHI 23/12 R | 2 | 1200 | 15 | -8 | 8 | 4.8 | 100 | 2500 | 75 |
| SKHI 23/17 R | 2 | 1700 | 15 | -8 | 8 | 4.8 | 100 | 4000 | 75 |
| SKHIT 01 R [5] | 3 | 528 | - | - | - | - | 10 | 2500 | - |
| **Driver Core** | | | | | | | | | |
| SKHI 21A R [6] | 2 | 1200 | 15 | 0 | 8 | 4 | 50 | 2500 | 50 |
| SKHI 22 A/B H4 R | 2 | 1700 | 15 | -7 | 8 | 4 | 50 | 4000 | 50 |
| SKHI 22 A/B R | 2 | 1200 | 15 | -7 | 8 | 4 | 50 | 2500 | 50 |
| SKHI 24 R | 2 | 1700 | 15 | -8 | 15 | 5 | 50 | 4000 | 50 |
| SKYPER 32 PRO R | 2 | 1700 | 15 | -7 | 15 | 6.3 | 50 | 4000 | 50 |
| SKYPER 32 PRO R UL | 2 | 1700 | 15 | -7 | 15 | 6.3 | 50 | 4000 | 50 |
| SKYPER 32 R | 2 | 1700 | 15 | -7 | 15 | 2.5 | 50 | 4000 | 50 |
| SKYPER 32 R UL | 2 | 1700 | 15 | -7 | 15 | 2.5 | 50 | 4000 | 50 |
| SKYPER 42 R | 2 | 1700 | 15 | -8 | 30 | 50 | 100 | 4000 | 100 |
| SKYPER 52 R | 2 | 1700 | 15 | -15 | 50 | 100 | 100 | 4000 | 100 |
| SKHI 61 R | 6 | 900 | 14.9 | -6.5 | 2 | 1 | 50 | 2500 | 15 |
| SKHI 71 R | 7 | 900 | 14.9 | -6.5 | 2 | 1 | 50 | 2500 | 15 |
| **Adaptor Board** | | | | | | | | | |
| Board 1 SKYPER 32 R | 2 | 1700 | 15 | -7 | 15 | 2.5 | 50 | 4000 | 50 |
| Board 1 SKYPER 32PRO R | 2 | 1700 | 15 | -7 | 15 | 6.3 | 50 | 4000 | 50 |
| Board 2 // 4S SKYPER 42 R | 2 | 1200 | 15 | -8 | 30 | 50 | 100 | 4000 | 100 |
| Board 2 generic SKYPER 42 R | 2 | 1700 | 15 | -8 | 30 | 50 | 100 | 4000 | 100 |
| Board 2//3S SKYPER 42 R | 2 | 1700 | 15 | -8 | 30 | 50 | 100 | 4000 | 100 |
| Board 2S SKYPER 32 PRO R Gold | 2 | 1700 | 15 | -7 | 15 | 6.3 | 50 | 4000 | 50 |
| Board 2S SKYPER 32 R Gold | 2 | 1700 | 15 | -7 | 15 | 2.5 | 50 | 4000 | 50 |
| Board 3S SKYPER 32 PRO R Gold | 2 | 1700 | 15 | -7 | 15 | 6.3 | 50 | 4000 | 50 |
| Board 3S SKYPER 32 R Gold | 2 | 1700 | 15 | -7 | 15 | 2.5 | 50 | 4000 | 50 |
| Board 4S SKYPER 32 PRO R Gold | 2 | 1700 | 15 | -7 | 15 | 6.3 | 50 | 4000 | 50 |
| Board 4S SKYPER 32 R Gold | 2 | 1700 | 15 | -7 | 15 | 2.5 | 50 | 4000 | 50 |
| Board 63 GB SKYPER 42 R | 2 | 1700 | 15 | -8 | 30 | 50 | 100 | 4000 | 100 |
| Board 93 GB SKYPER 42 R | 2 | 1700 | 15 | -8 | 30 | 50 | 100 | 4000 | 100 |

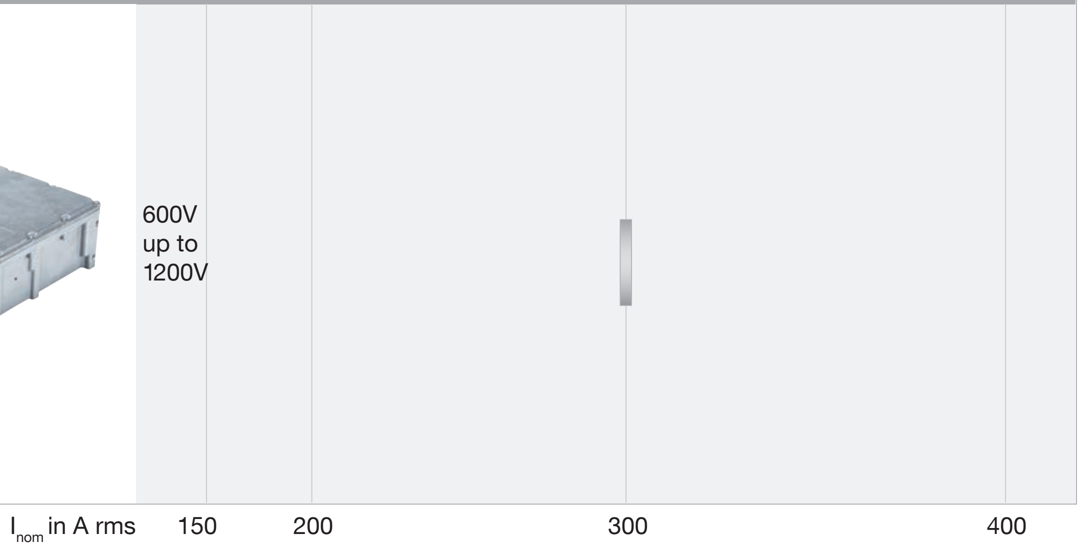
### Footnotes

5) Thyristor Driver

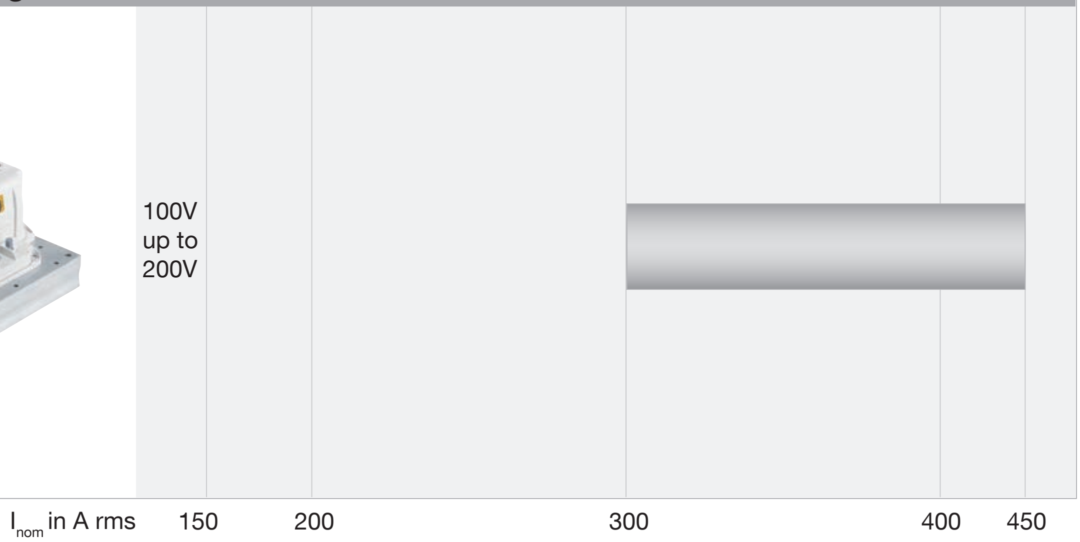
6) MOSFET Driver

# Systems for vehicle applications

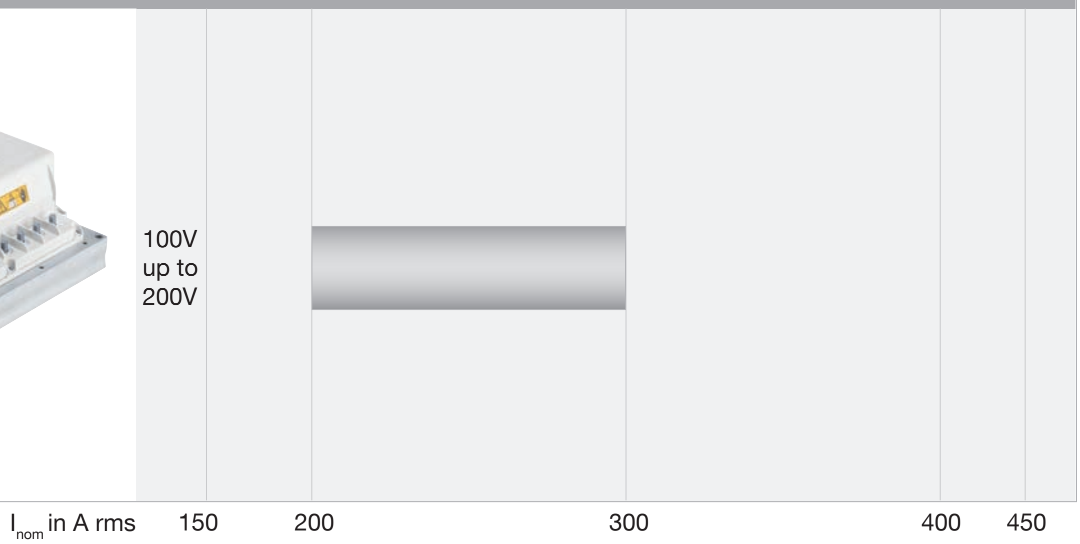
## SKAI®2 IGBT Inverter




## SKAI®2 MOSFET Single Inverter




## SKAI®2 MOSFET Dual Inverter




# 3-phase inverter systems up to 250 kVA for vehicle applications

## Applications

SEMIKRON's SKAI2 product platform is predestined for use in vehicle applications. The systems are designed to operate with battery voltages of 24 - 800 V and output power ratings of 10 - 250 kVA. The standard systems are supplied with low-voltage MOSFETs or high-voltage IGBTs in single or dual configuration.

## Product range

The IGBT-based SKAI2 is available as a liquid-cooled 3-phase inverter in voltage classes 600 V or 1200 V, with or without DSP and a power output of up to 250 kVA. The MOSFET-based SKAI2 is available as forced-air cooled, liquid-cooled or baseplate type, for nominal battery voltages of 48V, 80V and 120V, in single or dual 3-phase inverter topology with a power output of up to 55 kVA.

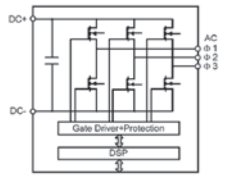
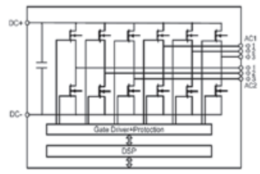
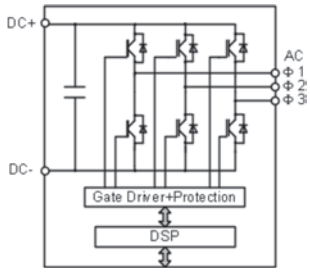
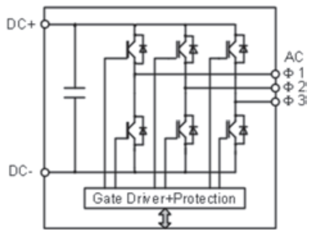
## Benefits

The high-voltage SKAI2 is available as a liquid-cooled 600 V or 1200 V IGBT-based 3-phase inverter system. It has been optimised for electrification of commercial vehicles and mobile working machine drive trains. This system is based on the proven, sintered, and 100 % solder-free power semiconductor technology for a power output of up to 250 kVA. It features a polypropylene film DC-link capacitor, driver electronics, a state of the art DSP controller, EMC filters and sensors for current, voltage and temperature monitoring. All system components are protected against environmental impacts by a waterproof IP67 metal case. The system can communicate with the vehicle master controller via CANbus.

The low-voltage SKAI2 MOSFET 3-phase inverter systems are available in different configurations regarding cooling, battery voltage and topology. They are mainly deployed in medium-power electric vehicle applications with a motor power of up to 55 kVA. The extremely low inductive internal power routing between DC-link capacitance and MOSFET switches results in low switching losses and a very low voltage overshoot. This allows an optimised utilisation of the maximum MOSFET drain-source voltage and hence, operation and high switching frequencies and maximum power densities. The inverter is integrated in a waterproof IP67 enclosure, except for the open power terminals. Thermal and electrical contact of SKAI2 systems are based on the proven and mature SKiiP pressure-contact technology. This results in extended service life and high load cycling capability. The SKAI2 family is fitted with a CAN bus and a large number of digital and analog I/Os for communication and control purposes. In addition, 3 PWM-controllable power outputs are installed to directly control auxiliary systems, such as cooling fans, valves or lights.

**www.semikron.com/mosfet-skai2**
**www.semikron.com/igbt-skai2**

# Systems - SKAI2

| Type | $V_{battery\ (max)}$ V | $I_{nom}$ A rms | Topology | Cooling | DSP | Case | Circuit |
|---|---|---|---|---|---|---|---|
| **MOSFET - Three-phase inverter** | | | | | | | |
| **SKAI 60 A2 MD10-P** [1] | 72 | 365 | 3-Phase | Baseplate | Yes | 3 |  |
| **SKAI 70 A2 MD15-W** [1] | 115 | 450 | 3-Phase | Liquid | Yes | 2 | |
| **SKAI 50 A2 MD20-L** [1] | 160 | 300 | 3-Phase | Forced Air | Yes | 1 | |
| **SKAI 50 A2 MD20-W** [1] | 160 | 350 | 3-Phase | Liquid | Yes | 2 | |
| **SKAI 70 A2 MM15-L** [1] | 115 | 250 | Dual 3-Phase | Forced Air | Yes | 4 |  |
| **SKAI 70 A2 MM15-P** [1] | 115 | 250 | Dual 3-Phase | Baseplate | Yes | 6 | |
| **SKAI 70 A2 MM15-W** [1] | 115 | 300 | Dual 3-Phase | Liquid | Yes | 5 | |
| **SKAI 50 A2 MM20-L** [1] | 160 | 200 | Dual 3-Phase | Forced Air | Yes | 4 | |
| **SKAI 50 A2 MM20-W** [1] | 160 | 250 | Dual 3-Phase | Liquid | Yes | 5 | |
| **IGBT - Three-phase inverter** | | | | | | | |
| **SKAI 90 A2 GD06-WCI** [1] | 450 | 300 | 3-Phase | Liquid | Yes | 7 |  |
| **SKAI 45 A2 GD12-WCI** [1] | 800 | 300 | 3-Phase | Liquid | Yes | 7 | |
| **SKAI 90 A2 GD06-WDI** [1] | 450 | 300 | 3-Phase | Liquid | No | 7 |  |
| **SKAI 45 A2 GD12-WDI** [1] | 800 | 300 | 3-Phase | Liquid | No | 7 | |

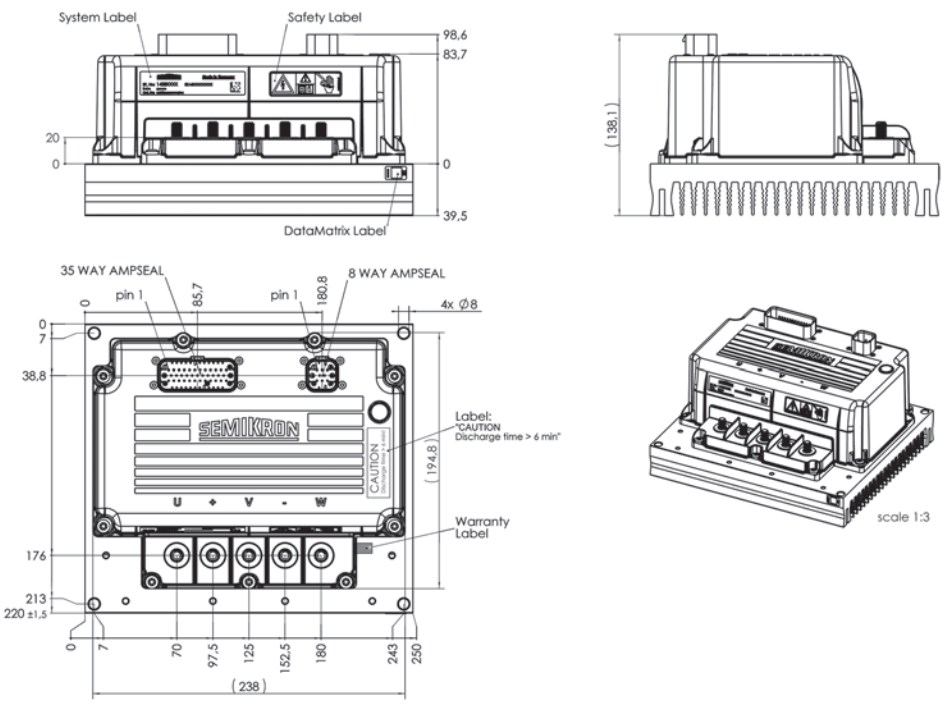
**footnotes**

1) New

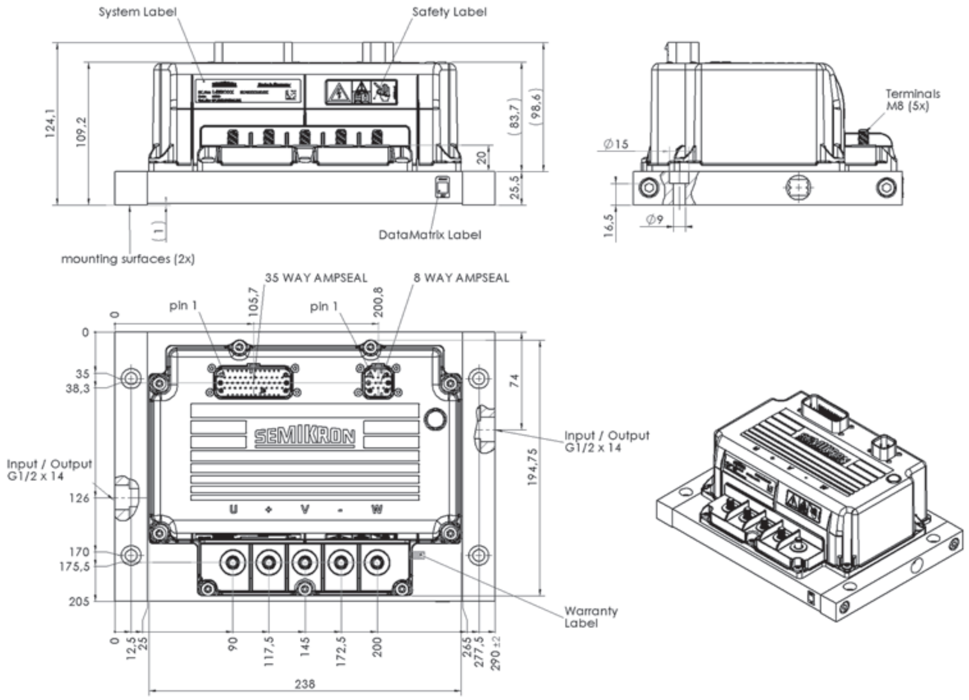
# Systems - SKAI2

## Cases

### Case 1




### Case 2

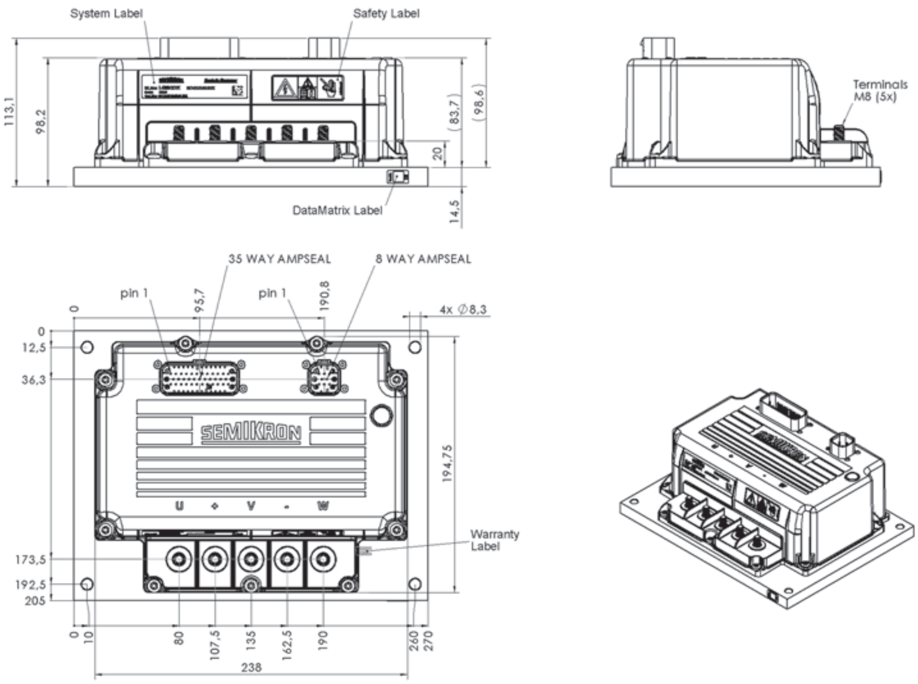



Dimensions in mm

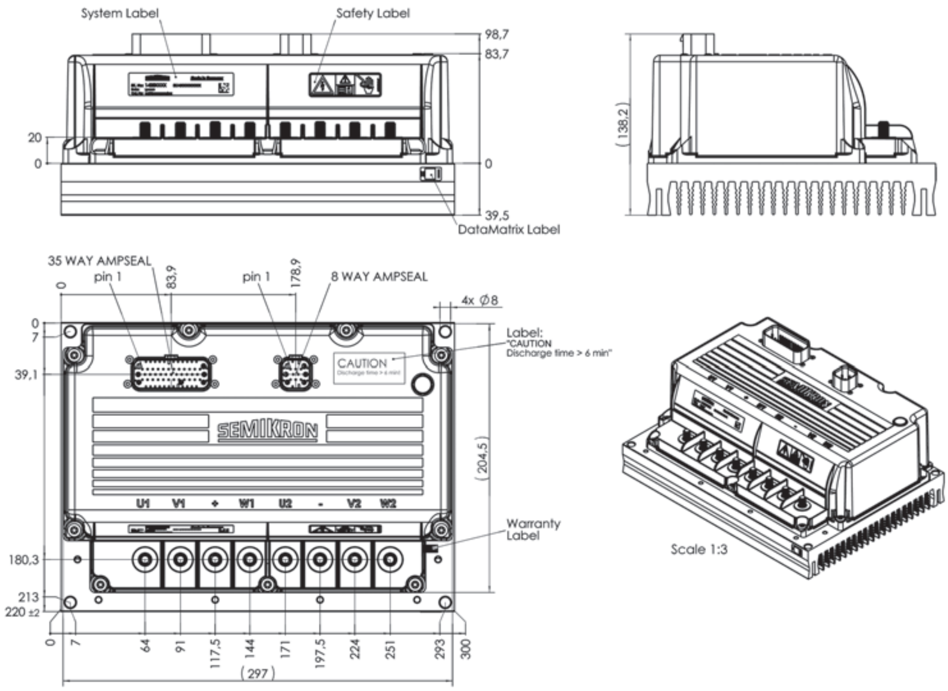
# Systems - SKAI2

## Cases

### Case 3




### Case 4

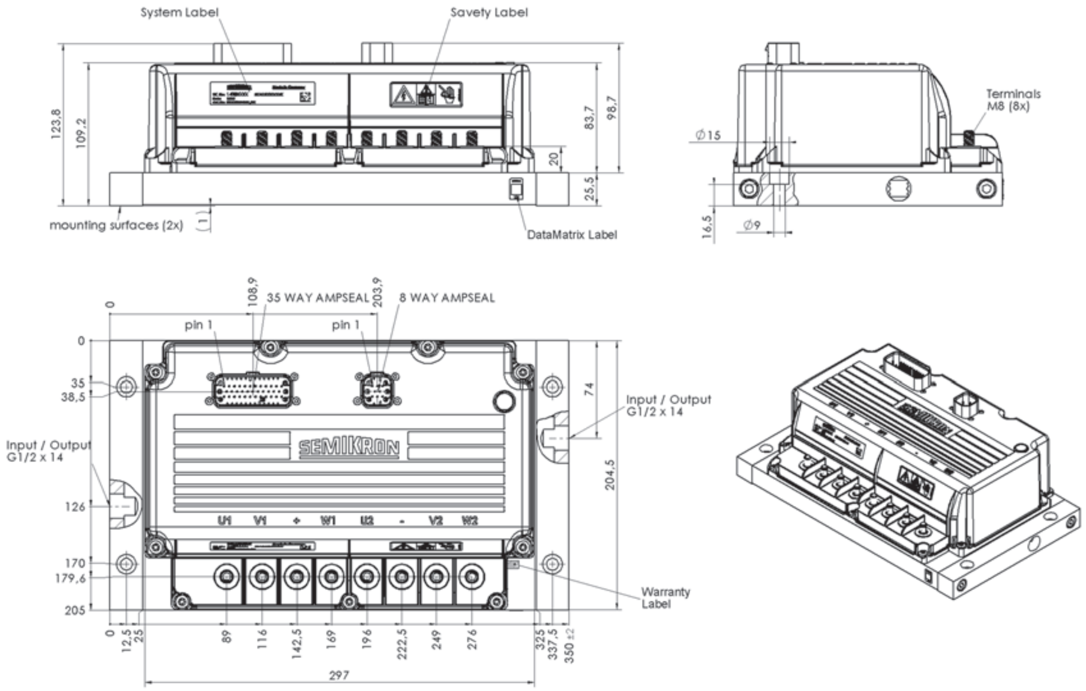



**Dimensions in mm**

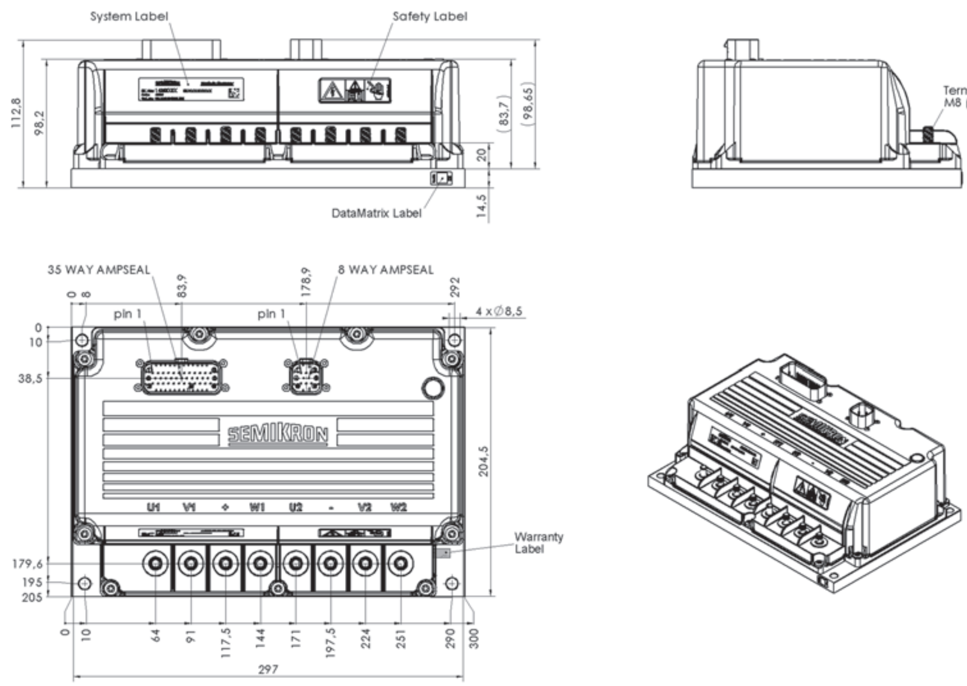
# Systems - SKAI2

## Cases

### Case 5




### Case 6

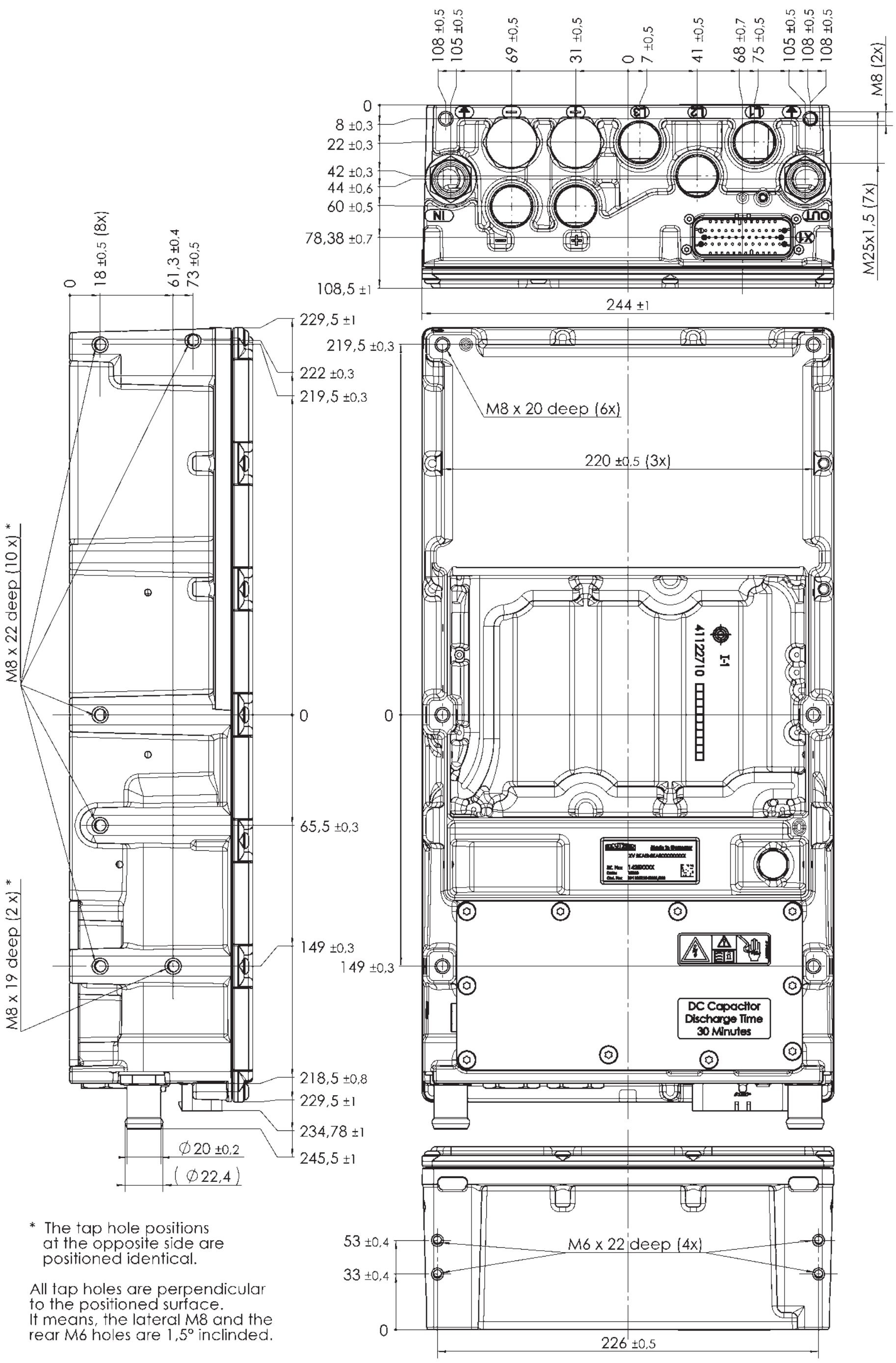



**Dimensions in mm**

# Systems - SKAI2

## Cases

### Case 7

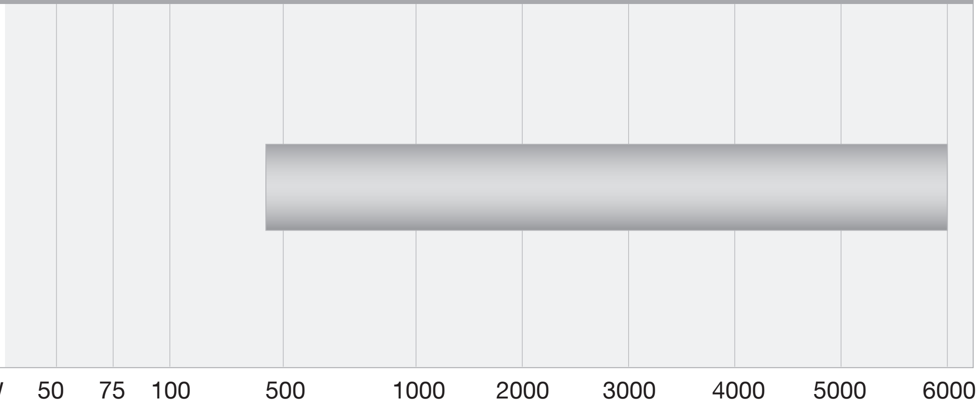



**Dimensions in mm**

# Solutions - IGBT Platforms

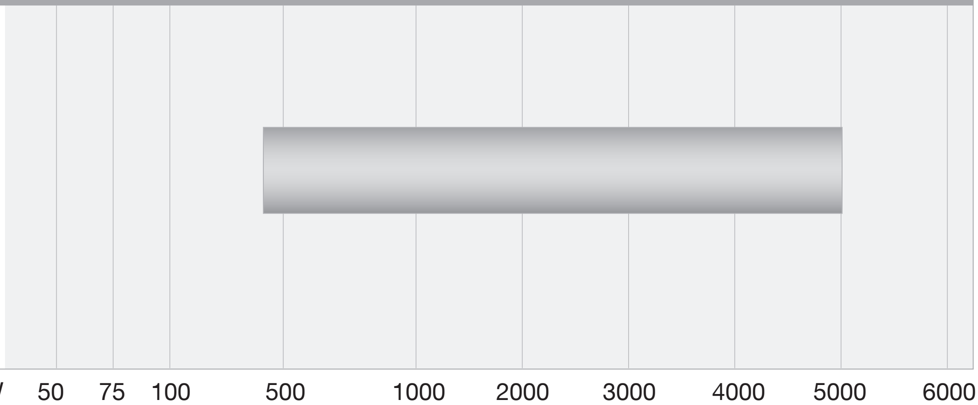
## SEMISTACK Renewable Energy

Synchronus wind generators
Double-fed wind generators
Solar inverters



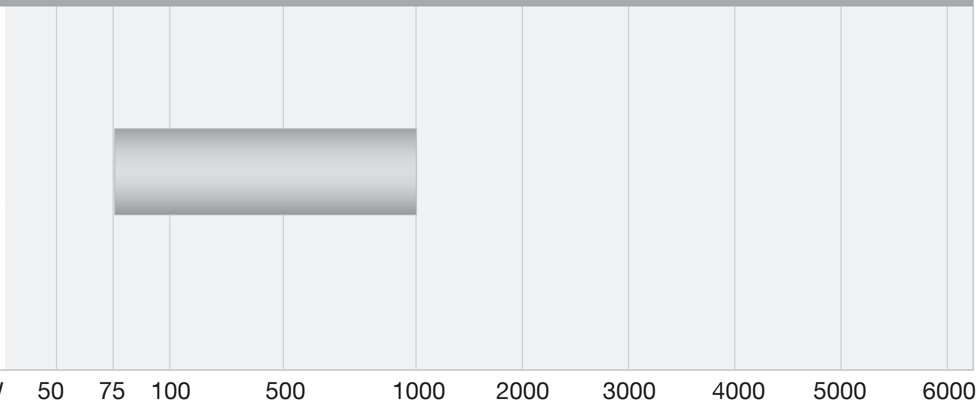

## SKiiPRACK

Synchronus wind generators
Double-fed wind generators
High power AC drives




## SEMIKUBE

Solar inverters
Pump & compressor drives



# SEMISTACK® RE

## Optimized converter for solar and wind

### Applications

The new SEMISTACK RE is a new high-power converter for use in renewable energy applications, such as wind and solar power installations. The SEMISTACK RE will typically be deployed in synchronous and double-fed induction generators (DFIG) in wind turbines, as well as in central solar PV inverters. Up to four SEMISTACK RE converters can be connected in parallel and support applications of up to 6 MVA.

### Benefits

The SEMISTACK RE family features the SKiiP 4, the latest generation of SEMIKRON's SKiiP intelligent power module family that integrates power components, driver and heat sink in a single case. SKiiP 4 modules allows for increased power over the predecessor generation from 1.4 to 1.7 MVA. While the current carrying capacity of the smaller SEMISTACK RE solution featuring 3-bay SKiiP modules is 900 A, the bigger 4-bay SKiiP version has a current rating of between 1000 A and 1400 A, resulting in a power density increase of 17% greater than in the predecessor version with combined SKiiP 3 modules.

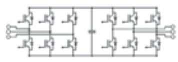
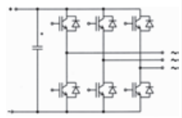
Owing to the very low inductance planar DC bus bar of the SEMISTACK RE, and the internal design of the SKiiP 4, nominal DC voltage can now be extended up to 1250 Vdc with the 1700 Vdc modules, even when short circuit conditions are considered.

Signal processing on the SKiiP 4 is handled by a newly designed digital driver incorporating the standard control, monitoring and protection functions of the SKiiP 3 plus new additional functions of parameter configuration and diagnostic/fault memory. Further advantages include improved isolation, noise immunity inherent in digital control and the functionality and flexibility of the CANopen interface.

Owing to its 100% solder-free sintering process and innovative pressure contact system, the thermal cycling capability of the SKiiP 4 is increased by a factor of 5 and the maximum junction temperature is raised to 175° C. These enhancements to the SKiiP 4 are combined with long lifetime polypropylene capacitors to ensure that the SEMISTACK RE meets the severe requirements in today's grid-connected power generation applications.

**www.semikron.com/semistackre**

# Solutions - SEMISTACK Renewable Energy

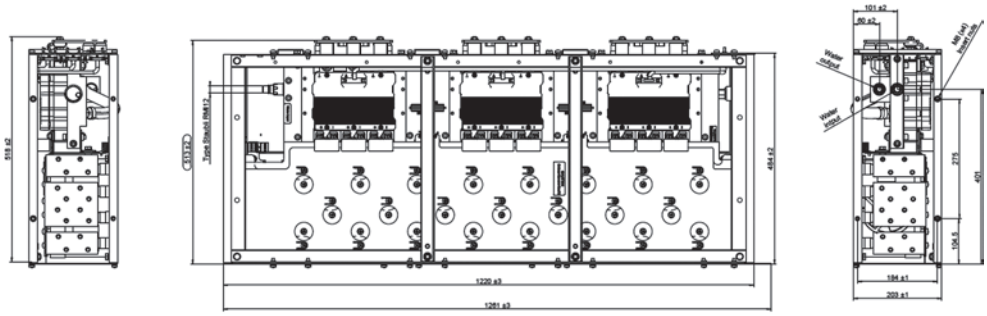
| Type | $V_{AC}$ V | $V_{DC}$ V | Current A | Component Family | Cooling | Heatsink profile | Iso-lated | Circuit |
|---|---|---|---|---|---|---|---|---|
| **4-Quadrant converter** | | | | | | | | |
| **SKS B2 120 GDD 69/11 - A11 MA PB [1]** | 690 | 1100 | 1200 | SKiiP 3 | Water/ Glycol | - | yes |  |
| **SKS B2 140 GDD 69/12 U - A11 MA PB [1]** | 690 | 1250 | 1400 | SKiiP 4 | Water/ Glycol | - | yes | |
| **Three-phase inverter** | | | | | | | | |
| **SKS B1 090 GD 69/11 - MA PB** | 690 | 1100 | 900 | SKiiP 3 | Water/ Glycol | - | yes |  |
| **SKS B2 100 GD 69/11 - MA PB** | 690 | 1100 | 1000 | SKiiP 3 | Water/ Glycol | - | yes | |
| **SKS B2 120 GD 69/11 - MA PB** | 690 | 1100 | 1200 | SKiiP 3 | Water/ Glycol | - | yes | |
| **SKS B2 140 GD 69/12 U - MA PB [1]** | 690 | 1250 | 1400 | SKiiP 4 | Water/ Glycol | - | yes | |

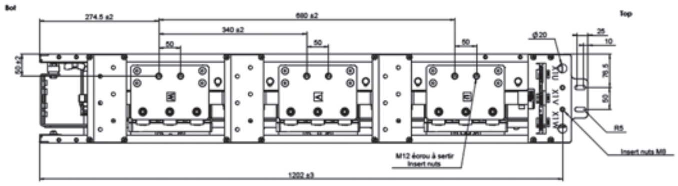
### Footnotes

[1] New

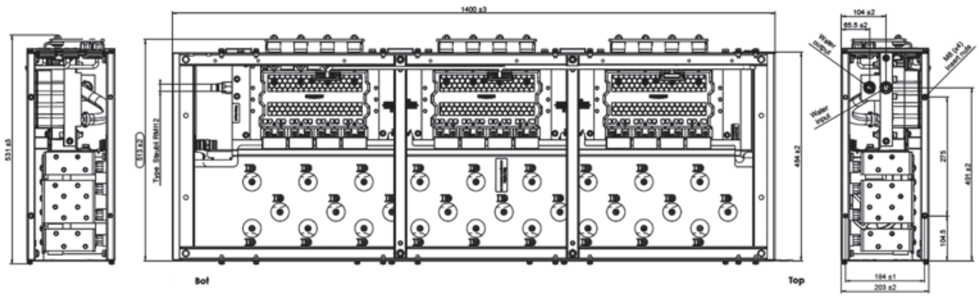
## Cases

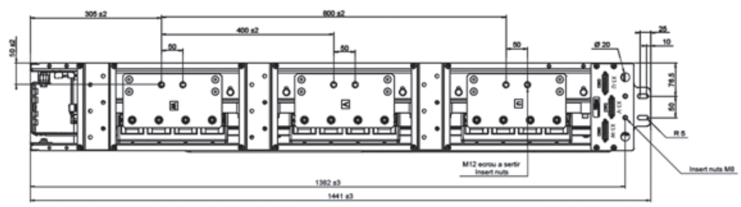
### SKS 090 GD 69/11 - MA PB





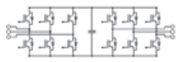
### SKS B2 100 GD 69/11 - MA PB, SKS B2 120 GD 69/11 - MA PB, and SKS B2 140 GD 69/12 - MA PB





**Dimensions in mm**

# Solutions - SKiiPRACK

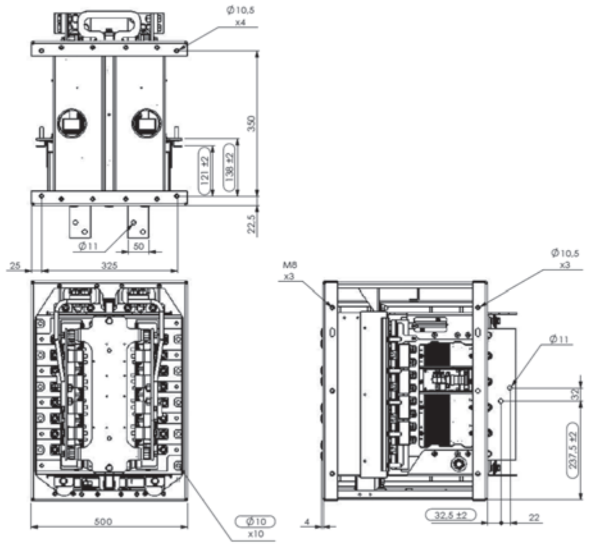
| Type | $V_{AC}$<br>V | $V_{DC}$<br>V | Current<br>A | Component Family | Cooling | Heatsink profile | Iso-lated | Circuit |
|---|---|---|---|---|---|---|---|---|
| **4-Quadrant converter** | | | | | | | | |
| **SKS C 120 GDD 69/11 - A3A WA B1B** | 690 | 1100 | 1200 | SKiiP 3 | Water/ Glycol | - | yes |  |
| **SKS C 240 GDD 69/11 - A6A MA B1C [1]** | 690 | 1100 | 2400 | SKiiP 3 | Water/ Glycol | - | yes | |

**Footnotes**

1) New

## Cases

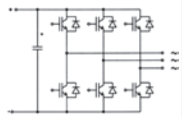
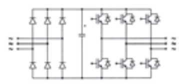
**SKiiPRACK basic stack element, the CELL**




**3-Cell vertical integration**

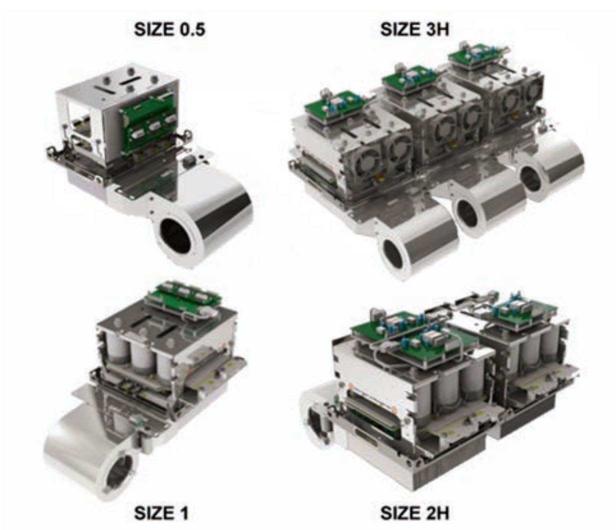
**Dimensions in mm**

# Solutions - SEMIKUBE

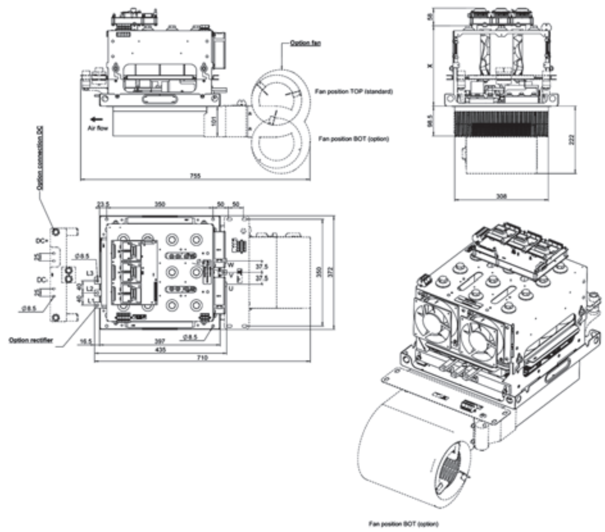
| Type | $V_{AC}$ V | $V_{DC}$ V | Current A | Component Family | Cooling | Heatsink profile | Iso-lated | Circuit |
|---|---|---|---|---|---|---|---|---|
| **Three-phase inverter** | | | | | | | | |
| **IGD-1-424-P1N4-DL-FA** | 460 | 750 | 200 | SEMITRANS | Forced-air cooled | PX 308 | yes |  |
| **IGD-2-424-P1N6-DH-FA** | 460 | 750 | 350 | SEMITRANS | Forced-air cooled | PX 308 | yes | |
| **IGD-4-424-P1F7-BL-FA** | 460 | 750 | 750 | SEMITRANS | Forced-air cooled | PX 308 | yes | |
| **IGD-8-326-E1F12-BH-FA** | 460 | 750 | 1230 | SEMITRANS | Forced-air cooled | PX 308 | yes | |
| **IGD-8-424-P1F9-BH-FA** | 460 | 750 | 1470 | SEMITRANS | Forced-air cooled | PX 308 | yes | |
| **IGD-8-426-E1F12-BH-FA** | 460 | 750 | 1470 | SEMITRANS | Forced-air cooled | PX 308 | yes | |
| **Three-phase rectifier and inverter** | | | | | | | | |
| **IGDD6-1-326-D1616-E1N6-DL-FA** | 460 | 750 | 150 | SEMITRANS/ SEMIPACK | Forced-air cooled | PX 308 | yes |  |
| **IGDD6-1-426-D1616-E1N6-DL-FA** | 460 | 750 | 180 | SEMITRANS/ SEMIPACK | Forced-air cooled | PX 308 | yes | |
| **IGDD6-2-326-D1616-E1F12-DH-FA** | 460 | 750 | 280 | SEMITRANS/ SEMIPACK | Forced-air cooled | PX 308 | yes | |
| **IGDD6-2-426-D1616-E1F12-DH-FA** | 460 | 750 | 330 | SEMITRANS/ SEMIPACK | Forced-air cooled | PX 308 | yes | |
| **IGDD6-4-326-D3816-E1F12-BL-FA** | 460 | 750 | 570 | SEMITRANS/ SEMIPACK | Forced-air cooled | PX 308 | yes | |
| **IGDD6-4-426-D3816-E1F12-BL-FA** | 460 | 750 | 680 | SEMITRANS/ SEMIPACK | Forced-air cooled | PX 308 | yes | |

**Cases**

**SEMIKUBE size range**




**Size 1**

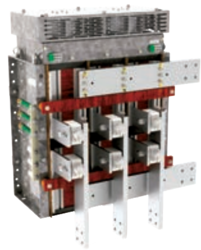


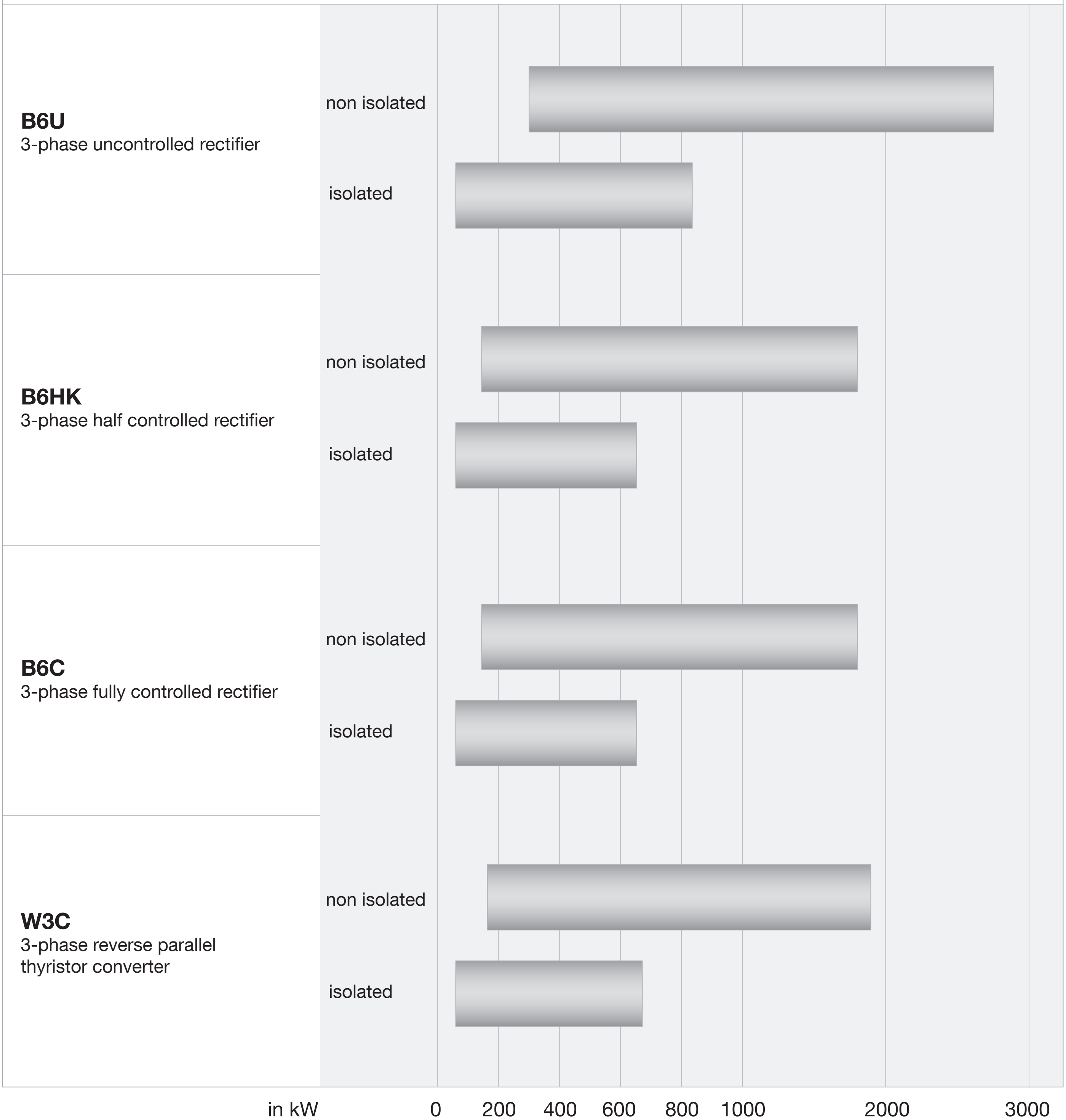
**Dimensions in mm**

# Solutions - Diode / Thyristor Standards

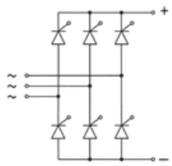
## SEMISTACK CLASSICS



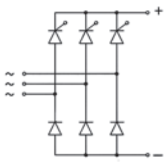




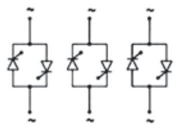
# Solutions - CLASSICS

| Type | $V_{AC}$ V | $V_{DC}$ V | Current A | Component Family | Cooling | Heatsink profile | Iso-lated | Circuit |
|---|---|---|---|---|---|---|---|---|
| **Three-phase fully-controlled thyristor bridge rectifier** | | | | | | | | |
| **SKS 88N B6C 60 V16** | 500 | 670 | 88 | SEMIPACK 1 | Natural cooled | P3/180 | yes | |
| **SKS 88N B6C 60 V16 SU** | 500 | 670 | 88 | SEMIPACK 1 | Natural cooled | P3/180 | yes | |
| **SKS 180F B6C 120 V16** | 500 | 670 | 180 | SEMIPACK 1 | Forced-air cooled | P3/180 | yes | |
| **SKS 180F B6C 120 V16 SU** | 500 | 670 | 180 | SEMIPACK 1 | Forced-air cooled | P3/180 | yes | |
| **SKS 215N B6C 145 V16** | 500 | 670 | 215 | Stud devices | Natural cooled | P1/150 | no | |
| **SKS 215N B6C 145 V16 SU** | 500 | 670 | 215 | Stud devices | Natural cooled | P1/150 | no | |
| **SKS 250F B6C 170 V16** | 500 | 670 | 250 | SEMIPACK 2 | Forced-air cooled | P3/265 | yes | |
| **SKS 250F B6C 170 V16 SU** | 500 | 670 | 250 | SEMIPACK 2 | Forced-air cooled | P3/265 | yes | |
| **SKS 355N B6C 240 V16** | 500 | 670 | 355 | Stud devices | Natural cooled | P1/200 | no | |
| **SKS 355N B6C 240 V16 SU** | 500 | 670 | 355 | Stud devices | Natural cooled | P1/200 | no | |
| **SKS 365F B6C 245 V16** | 500 | 670 | 365 | SEMIPACK 2 | Forced-air cooled | P16/200 | yes | |
| **SKS 365F B6C 245 V16 SU** | 500 | 670 | 365 | SEMIPACK 2 | Forced-air cooled | P16/200 | yes | |
| **SKS 570F B6C 380 V16** | 500 | 670 | 570 | SEMIPACK 3 | Forced-air cooled | P16/200 | yes | |
| **SKS 570F B6C 380 V16 SU** | 500 | 670 | 570 | SEMIPACK 3 | Forced-air cooled | P16/200 | yes | |
| **SKS 640F B6C 430 V16** | 500 | 670 | 640 | SEMIPACK 3 | Forced-air cooled | P16/200 | yes | |
| **SKS 640F B6C 430 V16 SU** | 500 | 670 | 640 | SEMIPACK 3 | Forced-air cooled | P16/200 | yes |  |
| **SKS 700N B6C 470 V16** | 500 | 670 | 700 | Capsules | Natural cooled | P11/415 | no | |
| **SKS 700N B6C 470 V16 SU** | 500 | 670 | 700 | Capsules | Natural cooled | P11/415 | no | |
| **SKS 845N B6C 570 V16** | 500 | 670 | 845 | Capsules | Natural cooled | U3/515 | no | |
| **SKS 845N B6C 570 V16 SU** | 500 | 670 | 845 | Capsules | Natural cooled | U3/515 | no | |
| **SKS 970F B6C 650 V16** | 500 | 670 | 970 | SEMIPACK 5 | Forced-air cooled | P16/300 | yes | |
| **SKS 970F B6C 650 V16 SU** | 500 | 670 | 970 | SEMIPACK 5 | Forced-air cooled | P16/300 | yes | |
| **SKS 1000N B6C 670 V16** | 500 | 670 | 1000 | Capsules | Natural cooled | U3/515 | no | |
| **SKS 1000N B6C 670 V16 SU** | 500 | 670 | 1000 | Capsules | Natural cooled | U3/515 | no | |
| **SKS 1200F B6C 800 V16** | 500 | 670 | 1200 | Capsules | Forced-air cooled | P17/130 | no | |
| **SKS 1200F B6C 800 V16 SU** | 500 | 670 | 1200 | Capsules | Forced-air cooled | P17/130 | no | |
| **SKS 1500F B6C 1010 V16** | 500 | 670 | 1500 | Capsules | Forced-air cooled | P17/130 | no | |
| **SKS 1500F B6C 1010 V16 SU** | 500 | 670 | 1500 | Capsules | Forced-air cooled | P17/130 | no | |
| **SKS 1890F B6C 1270 V16** | 500 | 670 | 1890 | Capsules | Forced-air cooled | P18/180 | no | |
| **SKS 1890F B6C 1270 V16 ZU** | 500 | 670 | 1890 | Capsules | Forced-air cooled | P18/180 | no | |
| **SKS 2580F B6C 1730 V16** | 500 | 670 | 2580 | Capsules | Forced-air cooled | N4/250 | no | |
| **SKS 2580F B6C 1730 V16 ZU** | 500 | 670 | 2580 | Capsules | Forced-air cooled | N4/250 | no | |

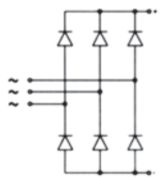
# Solutions - CLASSICS

| Type | $V_{AC}$ V | $V_{DC}$ V | Current A | Component Family | Cooling | Heatsink profile | Iso-lated | Circuit |
|---|---|---|---|---|---|---|---|---|
| **Three-phase half-controlled bridge rectifier** | | | | | | | | |
| **SKS 88N B6HK 60 V16** | 500 | 670 | 88 | SEMIPACK 1 | Natural cooled | P3/180 | yes | |
| **SKS 88N B6HK 60 V16 SU** | 500 | 670 | 88 | SEMIPACK 1 | Natural cooled | P3/180 | yes | |
| **SKS 180F B6HK 120 V16** | 500 | 670 | 180 | SEMIPACK 1 | Forced-air cooled | P3/180 | yes | |
| **SKS 180F B6HK 120 V16 SU** | 500 | 670 | 180 | SEMIPACK 1 | Forced-air cooled | P3/180 | yes | |
| **SKS 215N B6HK 145 V16** | 500 | 670 | 215 | Stud devices | Natural cooled | P1/150 | no | |
| **SKS 215N B6HK 145 V16 SU** | 500 | 670 | 215 | Stud devices | Natural cooled | P1/150 | no | |
| **SKS 250F B6HK 170 V16** | 500 | 670 | 250 | SEMIPACK 2 | Forced-air cooled | P3/265 | yes | |
| **SKS 250F B6HK 170 V16 SU** | 500 | 670 | 250 | SEMIPACK 2 | Forced-air cooled | P3/265 | yes | |
| **SKS 355N B6HK 240 V16** | 500 | 670 | 355 | Stud devices | Natural cooled | P1/200 | no | |
| **SKS 355N B6HK 240 V16 SU** | 500 | 670 | 355 | Stud devices | Natural cooled | P1/200 | no | |
| **SKS 365F B6HK 245 V16** | 500 | 670 | 365 | SEMIPACK 2 | Forced-air cooled | P16/200 | yes | |
| **SKS 365F B6HK 245 V16 SU** | 500 | 670 | 365 | SEMIPACK 2 | Forced-air cooled | P16/200 | yes | |
| **SKS 570F B6HK 380 V16** | 500 | 670 | 570 | SEMIPACK 3 | Forced-air cooled | P16/200 | yes | |
| **SKS 570F B6HK 380 V16 SU** | 500 | 670 | 570 | SEMIPACK 3 | Forced-air cooled | P16/200 | yes | |
| **SKS 640F B6HK 430 V16** | 500 | 670 | 640 | SEMIPACK 3 | Forced-air cooled | P16/200 | yes | |
| **SKS 640F B6HK 430 V16 SU** | 500 | 670 | 640 | SEMIPACK 3 | Forced-air cooled | P16/200 | yes |  |
| **SKS 700N B6HK 470 V16** | 500 | 670 | 700 | Capsules | Natural cooled | P11/415 | no | |
| **SKS 700N B6HK 470 V16 SU** | 500 | 670 | 700 | Capsules | Natural cooled | P11/415 | no | |
| **SKS 845N B6HK 570 V16** | 500 | 670 | 845 | Capsules | Natural cooled | U3/515 | no | |
| **SKS 845N B6HK 570 V16 SU** | 500 | 670 | 845 | Capsules | Natural cooled | U3/515 | no | |
| **SKS 970F B6HK 650 V16** | 500 | 670 | 970 | SEMIPACK 5 | Forced-air cooled | P16/300 | yes | |
| **SKS 970F B6HK 650 V16 SU** | 500 | 670 | 970 | SEMIPACK 5 | Forced-air cooled | P16/300 | yes | |
| **SKS 1000N B6HK 670 V16** | 500 | 670 | 1000 | Capsules | Natural cooled | U3/515 | no | |
| **SKS 1000N B6HK 670 V16 SU** | 500 | 670 | 1000 | Capsules | Natural cooled | U3/515 | no | |
| **SKS 1200F B6HK 800 V16** | 500 | 670 | 1200 | Capsules | Forced-air cooled | P17/130 | no | |
| **SKS 1200F B6HK 800 V16 SU** | 500 | 670 | 1200 | Capsules | Forced-air cooled | P17/130 | no | |
| **SKS 1500F B6HK 1010 V16** | 500 | 670 | 1500 | Capsules | Forced-air cooled | P17/130 | no | |
| **SKS 1500F B6HK 1010 V16 SU** | 500 | 670 | 1500 | Capsules | Forced-air cooled | P17/130 | no | |
| **SKS 1890F B6HK 1270 V16** | 500 | 670 | 1890 | Capsules | Forced-air cooled | P18/180 | no | |
| **SKS 1890F B6HK 1270 V16 ZU** | 500 | 670 | 1890 | Capsules | Forced-air cooled | P18/180 | no | |
| **SKS 2580F B6HK 1730 V16** | 500 | 670 | 2580 | Capsules | Forced-air cooled | N4/250 | no | |
| **SKS 2580F B6HK 1730 V16 ZU** | 500 | 670 | 2580 | Capsules | Forced-air cooled | N4/250 | no | |

# Solutions - CLASSICS

| Type | $V_{AC}$ V | $V_{DC}$ V | Current A | Component Family | Cooling | Heatsink profile | Iso-lated | Circuit |
|---|---|---|---|---|---|---|---|---|
| **Three-phase reverse parallel thyristor converter** | | | | | | | | |
| **SKS 67N W3C 60 V16 [1)]** | 500 | - | 67 | SEMIPACK 1 | Natural cooled | P3/180 | yes | |
| **SKS 67N W3C 60 V16 SU [1)]** | 500 | - | 67 | SEMIPACK 1 | Natural cooled | P3/180 | yes | |
| **SKS 140F W3C 120 V16** | 500 | - | 140 | SEMIPACK 1 | Forced-air cooled | P3/180 | yes | |
| **SKS 140F W3C 120 V16 SU [1)]** | 500 | - | 140 | SEMIPACK 1 | Forced-air cooled | P3/180 | yes | |
| **SKS 170N W3C 150 V16 [1)]** | 500 | - | 170 | Stud devices | Natural cooled | P1/150 | no | |
| **SKS 170N W3C 150 V16 SU [1)]** | 500 | - | 170 | Stud devices | Natural cooled | P1/150 | no | |
| **SKS 195F W3C 170 V16 [1)]** | 500 | - | 195 | SEMIPACK 2 | Forced-air cooled | P3/265 | yes | |
| **SKS 195F W3C 170 V16 SU [1)]** | 500 | - | 195 | SEMIPACK 2 | Forced-air cooled | P3/265 | yes | |
| **SKS 275N W3C 240 V16 [1)]** | 500 | - | 275 | Stud devices | Natural cooled | P1/200 | no | |
| **SKS 275N W3C 240 V16 SU [1)]** | 500 | - | 275 | Stud devices | Natural cooled | P1/200 | no | |
| **SKS 290F W3C 250 V16 [1)]** | 500 | - | 290 | SEMIPACK 2 | Forced-air cooled | P16/200 | yes | |
| **SKS 290F W3C 250 V16 SU [1)]** | 500 | - | 290 | SEMIPACK 2 | Forced-air cooled | P16/200 | yes | |
| **SKS 450F W3C 390 V16 [1)]** | 500 | - | 450 | SEMIPACK 3 | Forced-air cooled | P16/200 | yes | |
| **SKS 450F W3C 390 V16 SU [1)]** | 500 | - | 450 | SEMIPACK 3 | Forced-air cooled | P16/200 | yes | |
| **SKS 520F W3C 450 V16 [1)]** | 500 | - | 520 | SEMIPACK 3 | Forced-air cooled | P16/200 | yes | |
| **SKS 520F W3C 450 V16 SU [1)]** | 500 | - | 520 | SEMIPACK 3 | Forced-air cooled | P16/200 | yes |  |
| **SKS 545N W3C 470 V16 [1)]** | 500 | - | 545 | Capsules | Natural cooled | P11/415 | no | |
| **SKS 545N W3C 470 V16 SU [1)]** | 500 | - | 545 | Capsules | Natural cooled | P11/415 | no | |
| **SKS 650N W3C 560 V16 [1)]** | 500 | - | 650 | Capsules | Natural cooled | U3/515 | no | |
| **SKS 650N W3C 560 V16 SU [1)]** | 500 | - | 650 | Capsules | Natural cooled | U3/515 | no | |
| **SKS 760F W3C 660 V16 [1)]** | 500 | - | 760 | SEMIPACK 5 | Forced-air cooled | P16/300 | yes | |
| **SKS 760F W3C 660 V16 SU [1)]** | 500 | - | 760 | SEMIPACK 5 | Forced-air cooled | P16/300 | yes | |
| **SKS 780N W3C 675 V16 [1)]** | 500 | - | 780 | Capsules | Natural cooled | U3/515 | no | |
| **SKS 780N W3C 675 V16 SU [1)]** | 500 | - | 780 | Capsules | Natural cooled | U3/515 | no | |
| **SKS 950F W3C 825 V16 [1)]** | 500 | - | 950 | Capsules | Forced-air cooled | P17/130 | no | |
| **SKS 950F W3C 825 V16 SU [1)]** | 500 | - | 950 | Capsules | Forced-air cooled | P17/130 | no | |
| **SKS 1180F W3C 1020 V16 [1)]** | 500 | - | 1180 | Capsules | Forced-air cooled | P17/130 | no | |
| **SKS 1180F W3C 1020 V16 SU [1)]** | 500 | - | 1180 | Capsules | Forced-air cooled | P17/130 | no | |
| **SKS 1540F W3C 1335 V16 [1)]** | 500 | - | 1540 | Capsules | Forced-air cooled | P18/180 | no | |
| **SKS 1540F W3C 1335 V16 SU [1)]** | 500 | - | 1540 | Capsules | Forced-air cooled | P18/180 | no | |
| **SKS 2150F W3C 1860 V16 [1)]** | 500 | - | 2150 | Capsules | Forced-air cooled | N4/250 | no | |
| **SKS 2150F W3C 1860 V16 ZU [1)]** | 500 | - | 2150 | Capsules | Forced-air cooled | N4/250 | no | |

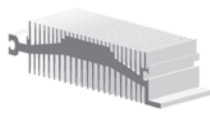
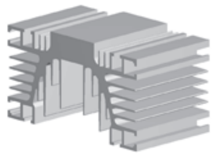
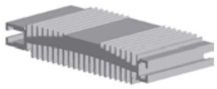
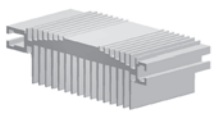
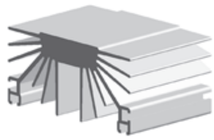
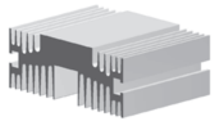
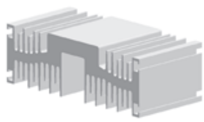
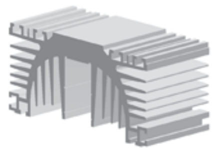
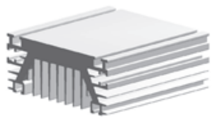
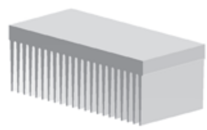
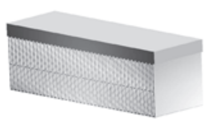
# Solutions - CLASSICS

| Type | $V_{AC}$ | $V_{DC}$ | Current | Component Family | Cooling | Heatsink profile | Iso-lated | Circuit |
|---|---|---|---|---|---|---|---|---|
| | V | V | A | | | | | |
| **Three-phase uncontrolled diode bridge rectifier** | | | | | | | | |
| **SKS 91N B6U 60 V16** | 500 | 670 | 91 | SEMIPACK 1 | Natural cooled | P3/180 | yes | |
| **SKS 91N B6U 60 V16 SU** | 500 | 670 | 91 | SEMIPACK 1 | Natural cooled | P3/180 | yes | |
| **SKS 185F B6U 125 V16** | 500 | 670 | 185 | SEMIPACK 1 | Forced-air cooled | P3/180 | yes | |
| **SKS 185F B6U 125 V16 SU** | 500 | 670 | 185 | SEMIPACK 1 | Forced-air cooled | P3/180 | yes | |
| **SKS 290F B6U 195 V16** | 500 | 670 | 290 | SEMIPACK 2 | Forced-air cooled | P3/265 | yes | |
| **SKS 290F B6U 195 V16 SU** | 500 | 670 | 290 | SEMIPACK 2 | Forced-air cooled | P3/265 | yes | |
| **SKS 425N B6U 285 V16** | 500 | 670 | 425 | Stud devices | Natural cooled | P1/150 | no | |
| **SKS 425N B6U 285 V16 SU** | 500 | 670 | 425 | Stud devices | Natural cooled | P1/150 | no | |
| **SKS 430F B6U 290 V16** | 500 | 670 | 430 | SEMIPACK 2 | Forced-air cooled | P16/200 | yes | |
| **SKS 430F B6U 290 V16 SU** | 500 | 670 | 430 | SEMIPACK 2 | Forced-air cooled | P16/200 | yes | |
| **SKS 535N B6U 360 V16** | 500 | 670 | 535 | Stud devices | Natural cooled | P1/200 | no | |
| **SKS 535N B6U 360 V16 SU** | 500 | 670 | 535 | Stud devices | Natural cooled | P1/200 | no | |
| **SKS 660F B6U 440 V16** | 500 | 670 | 660 | SEMIPACK 3 | Forced-air cooled | P16/200 | yes | |
| **SKS 660F B6U 440 V16 SU** | 500 | 670 | 660 | SEMIPACK 3 | Forced-air cooled | P16/200 | yes | |
| **SKS 850F B6U 570 V16** | 500 | 670 | 850 | SEMIPACK 3 | Forced-air cooled | P16/200 | yes |  |
| **SKS 850F B6U 570 V16 SU** | 500 | 670 | 850 | SEMIPACK 3 | Forced-air cooled | P16/200 | yes | |
| **SKS 1185N B6U 795 V16** | 500 | 670 | 1185 | Capsules | Natural cooled | P11/415 | no | |
| **SKS 1185N B6U 795 V16 SU** | 500 | 670 | 1185 | Capsules | Natural cooled | P11/415 | no | |
| **SKS 1220F B6U 820 V16** | 500 | 670 | 1220 | SEMIPACK 5 | Forced-air cooled | P16/300 | yes | |
| **SKS 1220F B6U 820 V16 SU** | 500 | 670 | 1220 | SEMIPACK 5 | Forced-air cooled | P16/300 | yes | |
| **SKS 1630N B6U 1090 V16** | 500 | 670 | 1630 | Capsules | Natural cooled | U3/515 | no | |
| **SKS 1630N B6U 1090 V16 ZU** | 500 | 670 | 1630 | Capsules | Natural cooled | U3/515 | no | |
| **SKS 1910N B6U 1280 V16** | 500 | 670 | 1910 | Capsules | Natural cooled | U3/515 | no | |
| **SKS 1910N B6U 1280 V16 ZU** | 500 | 670 | 1910 | Capsules | Natural cooled | U3/515 | no | |
| **SKS 1950F B6U 1305 V16** | 500 | 670 | 1950 | Capsules | Forced-air cooled | P17/130 | no | |
| **SKS 1950F B6U 1305 V16 ZU** | 500 | 670 | 1950 | Capsules | Forced-air cooled | P17/130 | no | |
| **SKS 2300F B6U 1540 V16** | 500 | 670 | 2300 | Capsules | Forced-air cooled | P18/180 | no | |
| **SKS 2300F B6U 1540 V16 ZU** | 500 | 670 | 2300 | Capsules | Forced-air cooled | P18/180 | no | |
| **SKS 4015F B6U 2690 V16** | 500 | 670 | 4015 | Capsules | Forced-air cooled | N4/250 | no | |

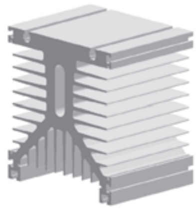
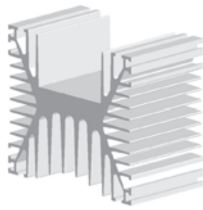
**Footnotes**

1) New

# Accessories - Heatsinks

| Type | Suitable for | $R_{thsa}$ natural cooling K/W | $R_{thsa}$ forced air or water cooling K/W | w kg | w kg/m | Picture |
|---|---|---|---|---|---|---|
| **Forced-air cooled** | | | | | | |
| **N 4** | Capsules | - | 0.04 | - | 25.1 |  |
| **P 11** | Capsules | 0.2 | 0.05 | - | 15 |  |
| **P 17** | Capsules | 0.45 | 0.12 | - | 10.6 |  |
| **P 18** | Capsules | 0.37 | 0.08 | - | 12.2 |  |
| **P 8** [5] | Capsules | 0.35 | 0.07 | - | 9.6 |  |
| **P 8,5** [5] | Capsules | 0.3 | 0.08 | - | 9.5 |  |
| **P 9** [5] | Capsules | 0.21 | 0.06 | - | 17.8 |  |
| **U 3** | Capsules | 0.14 | 0.06 | - | 23.7 |  |
| **P 21** [5] | Isolated base modules | - | 0.02 | - | 40.8 |  |
| **R 4A** | Isolated base modules | 1.4 | 0.38 | 0.6 | - |  |
| **P 16** | SKiiP or modules | - | 0.06 | - | 23.5 |  |
| **Px 308** [5] | SKiiP or modules | - | 0.013 | - | 12.2 |  |

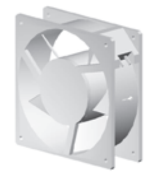
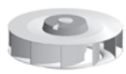
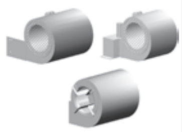
# Accessories - Heatsinks

| Type | Suitable for | $R_{thsa}$ natural cooling K/W | $R_{thsa}$ forced air or water cooling K/W | w kg | w kg/m | Picture |
|---|---|---|---|---|---|---|
| **Forced-air cooled** | | | | | | |
| **P 1** | Studs or modules | 0.7 | 0.4 | - | 11.3 |  |
| **P 3** | Isolated base modules | 0.45 | 0.14 | - | 17.6 |  |
| **Natural cooled** | | | | | | |
| **P 4** [5] | Stud device | 0.27 | - | - | 20.6 |  |

**footnotes**

[5] Non standard item, available on request only, typical minimum batch quantities of 60 pieces will apply

# Accessories - Fans

| Type | $V_{in}$ V | f Hz | $V_{air}$ / t m³/h | $P_{max}$ V | $T_{Amax}$ °C | w kg | Noise dB | Picture |
|---|---|---|---|---|---|---|---|---|
| **Axial Fans** | | | | | | | | |
| **SKF 3-230-01** | 230 | 50 | 159 / 190 | 15 / 14 | 70 | 0.55 | 37 / 41 |  |
| **Centrifugal Fans** | | | | | | | | |
| **SKF 17A-230-11** | 230 | 50 | 850 / 930 | 110 / 120 | 70 | 2 | 74 |  |
| **SKF N4-230-01** | 230 | 50 | 1500 / 1700 | 210 / 280 | 80 / 70 | 3.1 | 76 / 78 |  |
| **Radial Fans** | | | | | | | | |
| **SKF 16A-230-11** | 230 | 50 | 615 / 575 | 135 / 154 | 50 / 40 | 3.6 | 55 / 57 |  |
| **SKF 16O-230-02** | 230 | 50 | 1150 | 260 | 40 | 4.2 | - | |
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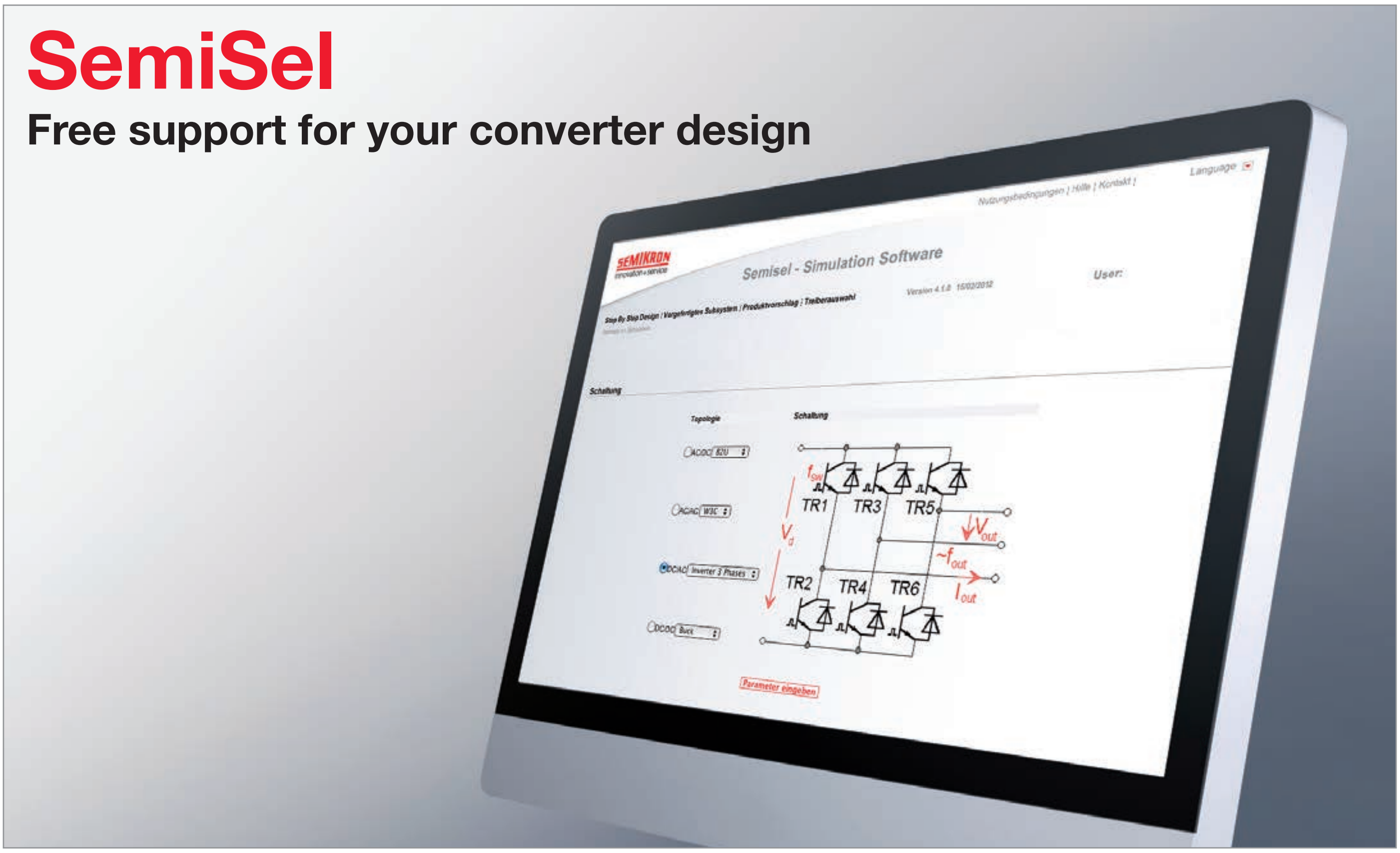
# SemiSel

## Free support for your converter design




### Applications

SemiSel is the SEMIKRON online calculation and simulation tool for losses, temperatures and optimal choice of power electronic components (www.semikron.com). Due to the ever-present cost pressure, the optimal choice of power conductor components is a must-have. The days when a module was purchased solely on the basis of its nominal current are over. Today, increased product diversity in the field of power semiconductors calls for comparisons beyond the information contained in data sheets. Only a comparison under application-oriented conditions, such as voltage level, switching frequency or cooling conditions, can demonstrate differences in the performance of the devices available. Miniaturisation combined with higher power densities makes it essential to have the right thermal design for heat dissipation.

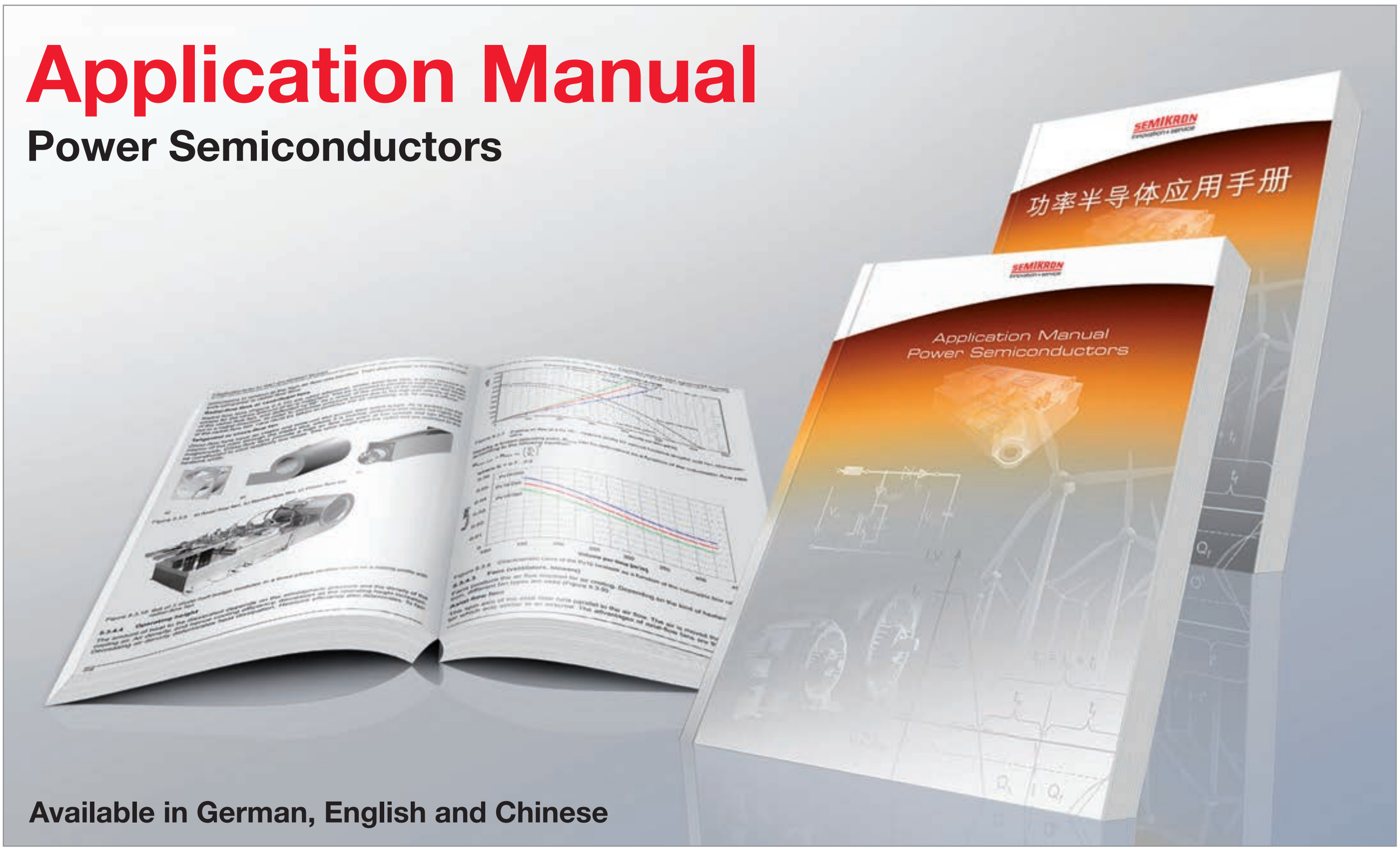
### Benefits

The risk arising from variations in both component and electrical circuit parameters should be considered in proper circuit design. These facts are only a few of the many points that need to be considered when developing a power electronics system. And this is where efficient support is provided by SemiSel to enable developers to make the right decision. Many manufacturers of power semiconductors offer tools for device selection, yet, SemiSel is still the most comprehensive free tool of its kind that can be used to investigate different power electronic circuits under different operating conditions. This programme has been available online since 2001, and it has been continually improved and expanded since its introduction. It provides a good compromise of user-friendliness, applications and speed. The calculation functions range from product proposal for nominal operating conditions to drivers and heat sink specifications and product selections for specific overload conditions and complex calculations, such as complete load cycles that take into account temperature cycling problems.

**semisel.semikron.com**

# Abbreviations

| Acronym | English |
|---|---|
| $E_{off}$ | Energy dissipation during turn-off |
| $E_{on}$ | Energy dissipation during turn-on |
| $E_{rr}$ | Energy dissipation during reverse recovery (diode) |
| f | Operating frequency |
| $f_{max}$ | Maximum frequency |
| $I_C$ | Continuous collector current |
| $I_{Cnom}$ | Nominal collector current |
| $I_D$ | Direct output current (of a rectifier connection) |
| $I_D$ | Continuous drain current (MOSFET) |
| $I_F$ | Forward current (actual value) |
| $I_{FAV}$ | Mean forward current |
| $I_{FSM}$ | Surge forward current |
| $I_{GT}$ | Minimum guaranteed gate trigger current |
| $I_{outPEAK}$ | Output peak current (driver) |
| $I_{overload}$ | Overload current for a specified time |
| $i_T$ | On-State current (instantaneous value) |
| $I_{TAV}$ | Mean on-state current |
| $I_{TSM}$ | Surge on-state curren |
| Qout/pulse | Output charge per pulse (Driver) |
| $Q_{rr}$ | Reverse recovery charge |
| $R_{DS(on)}$ | Drain-source on-resistance (MOSFET) |
| $r_T$ | On-state slope resistance, forward slope resistance (Thyristor) |
| $R_{th(c-s)}$ | thermal resistance case to heat sink |
| $R_{th(j-a)}$ | Thermal resistance junction to ambient |
| $R_{th(j-c)}$ | Thermal resistance junction to case |
| $R_{th(j-s)}$ | Thermal resistance junction to sink |
| $R_{th(s-a)}$ | Thermal resistance heat sink to ambient |
| $T_c$ | Case temperature |
| $T_j$ | Junction temperature |
| $t_q$ | Circuit commutated turn-off time (thyristor) |
| $T_s$ | Heatsink temperature |
| $V_{air}/t$ | Air flow |
| $V_{CE}$ | Collector-emitter voltage |
| $V_{CEsat}$ | Collector-emitter saturation voltage |
| $V_{DRM}$ | Repetitive peak off-state voltage |
| $V_{DS}$ | Drain-source voltage |
| $V_F$ | Forward voltage |
| $V_{G(off)}$ | Turn-off gate voltage level (driver) |
| $V_{G(on)}$ | Turn-on gate voltage level (driver) |
| $V_{GT}$ | Gate trigger voltage |
| $V_{in}$ | Input voltage |
| $V_{isol(IO)}$ | Isolation test voltage (r.m.s. /1 min.) input-output (driver) |
| $V_{RRM}$ | Repetitive peak reverse voltage |
| $V_T$ | On-state voltage (Thyristor) |
| w | Weight |




## 465 pages of acquired knowledge

IGBT´s and MOSFET´s integrated in power modules are the key components of power electronic circuits today and are continuously finding their way into new fields of application. This goes hand in hand with the ever increasing call for line rectifier diodes and thyristors as a cost-effective way of connecting the circuits to the power grid. The aim of the application manual is to provide users with support in selecting and using such devices. The manual contains basic background knowledge on semiconductors in order to enable a better understanding of application possibilities and limits. More in-depth explanations are given on packaging and assembly technologies, because of the major influence they have on module properties and limitations in field applications. Statements on reliability data, life cycle analyses and key test processes round off the chapter. The Application Manual also explains the structure of datasheets and provides notes to help users better understand datasheet parameters.

The Application Manual contains detailed application-related information on electrical configuration under important operating conditions, driver and protection elements for semiconductors; thermal dimensioning and cooling, tips on parallel and series connection, assembly tips for optimized power layouts with regard to parasitic elements and the requirements arising from specific ambient conditions.

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