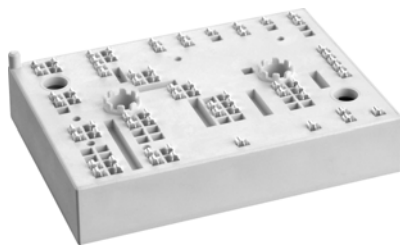


# SKiiP 35ACC12T4V10



MiniSKiiP® 3

Twin 6-pack

## SKiiP 35ACC12T4V10

Target Data

### Features

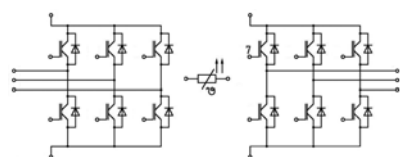
- Trench 4 IGBTs
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised: File no. E63532

### Typical Applications\*

- 4Q inverters
- Double axis inverters

### Remarks

- Max. case temperature limited to  $T_C = 125^\circ\text{C}$
- Product reliability results valid for  $T_j \leq 150^\circ\text{C}$  (recommended  $T_{j,op} = -40 \dots +150^\circ\text{C}$ )

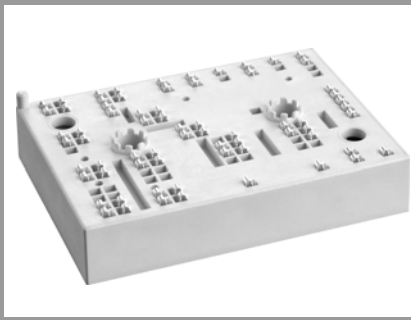


ACC

### Absolute Maximum Ratings

| Symbol              | Conditions                                                                     |                         | Values      | Unit |
|---------------------|--------------------------------------------------------------------------------|-------------------------|-------------|------|
| IGBT 1 - 6          |                                                                                |                         |             |      |
| V <sub>CES</sub>    | T <sub>j</sub> = 25 °C                                                         |                         | 1200        | V    |
| I <sub>C</sub>      | T <sub>j</sub> = 150 °C                                                        | T <sub>s</sub> = 25 °C  | 62          | A    |
|                     |                                                                                | T <sub>s</sub> = 70 °C  | 47          | A    |
| I <sub>C</sub>      | T <sub>j</sub> = 175 °C                                                        | T <sub>s</sub> = 25 °C  | 69          | A    |
|                     |                                                                                | T <sub>s</sub> = 70 °C  | 56          | A    |
| I <sub>Cnom</sub>   |                                                                                |                         | 50          | A    |
| I <sub>CRM</sub>    | I <sub>CRM</sub> = 3 x I <sub>Cnom</sub>                                       |                         | 150         | A    |
| V <sub>GES</sub>    |                                                                                |                         | -20 ... 20  | V    |
| t <sub>psc</sub>    | V <sub>CC</sub> = 800 V<br>V <sub>GE</sub> ≤ 15 V<br>V <sub>CES</sub> ≤ 1200 V | T <sub>j</sub> = 150 °C | 10          | µs   |
| T <sub>j</sub>      |                                                                                |                         | -40 ... 175 | °C   |
| IGBT 7 - 12         |                                                                                |                         |             |      |
| V <sub>CES</sub>    | T <sub>j</sub> = 25 °C                                                         |                         | 1200        | V    |
| I <sub>C</sub>      | T <sub>j</sub> = 150 °C                                                        | T <sub>s</sub> = 25 °C  | 62          | A    |
|                     |                                                                                | T <sub>s</sub> = 70 °C  | 47          | A    |
| I <sub>C</sub>      | T <sub>j</sub> = 175 °C                                                        | T <sub>s</sub> = 25 °C  | 69          | A    |
|                     |                                                                                | T <sub>s</sub> = 70 °C  | 56          | A    |
| I <sub>Cnom</sub>   |                                                                                |                         | 50          | A    |
| I <sub>CRM</sub>    | I <sub>CRM</sub> = 3 x I <sub>Cnom</sub>                                       |                         | 150         | A    |
| V <sub>GES</sub>    |                                                                                |                         | -20 ... 20  | V    |
| t <sub>psc</sub>    | V <sub>CC</sub> = 800 V<br>V <sub>GE</sub> ≤ 15 V<br>V <sub>CES</sub> ≤ 1200 V | T <sub>j</sub> = 150 °C | 10          | µs   |
| T <sub>j</sub>      |                                                                                |                         | -40 ... 175 | °C   |
| Diode 1 - 6         |                                                                                |                         |             |      |
| V <sub>RRM</sub>    | T <sub>j</sub> = 25 °C                                                         |                         | 1200        | V    |
| I <sub>F</sub>      | T <sub>j</sub> = 150 °C                                                        | T <sub>s</sub> = 25 °C  | 52          | A    |
|                     |                                                                                | T <sub>s</sub> = 70 °C  | 39          | A    |
| I <sub>F</sub>      | T <sub>j</sub> = 175 °C                                                        | T <sub>s</sub> = 25 °C  | 60          | A    |
|                     |                                                                                | T <sub>s</sub> = 70 °C  | 48          | A    |
| I <sub>Fnom</sub>   |                                                                                |                         | 50          | A    |
| I <sub>FRM</sub>    | I <sub>FRM</sub> = 3xI <sub>Fnom</sub>                                         |                         | 150         | A    |
| I <sub>FSM</sub>    | 10 ms, sin 180°, T <sub>j</sub> = 150 °C                                       |                         | 270         | A    |
| T <sub>j</sub>      |                                                                                |                         | -40 ... 175 | °C   |
| Diode 7 - 12        |                                                                                |                         |             |      |
| V <sub>RRM</sub>    | T <sub>j</sub> = 25 °C                                                         |                         | 1200        | V    |
| I <sub>F</sub>      | T <sub>j</sub> = 150 °C                                                        | T <sub>s</sub> = 25 °C  | 54          | A    |
|                     |                                                                                | T <sub>s</sub> = 70 °C  | 41          | A    |
| I <sub>F</sub>      | T <sub>j</sub> = 175 °C                                                        | T <sub>s</sub> = 25 °C  | 60          | A    |
|                     |                                                                                | T <sub>s</sub> = 70 °C  | 48          | A    |
| I <sub>Fnom</sub>   |                                                                                |                         | 50          | A    |
| I <sub>FRM</sub>    | I <sub>FRM</sub> = 3 x I <sub>Fnom</sub>                                       |                         | 150         | A    |
| I <sub>FSM</sub>    | 10 ms, sin 180°, T <sub>j</sub> = 150 °C                                       |                         | 270         | A    |
| T <sub>j</sub>      |                                                                                |                         | -40 ... 175 | °C   |
| Module              |                                                                                |                         |             |      |
| I <sub>t(RMS)</sub> | 20 A per spring                                                                |                         | 60          | A    |
| T <sub>stg</sub>    |                                                                                |                         | -40 ... 125 | °C   |
| V <sub>isol</sub>   | AC sinus 50 Hz, 1 min                                                          |                         | 2500        | V    |

# SKiiP 35ACC12T4V10



MiniSKiiP® 3

## Twin 6-pack

### SKiiP 35ACC12T4V10

#### Target Data

#### Features

- Trench 4 IGBTs
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised: File no. E63532

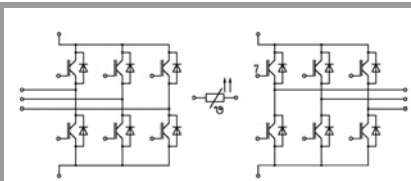
#### Typical Applications\*

- 4Q inverters
- Double axis inverters

#### Remarks

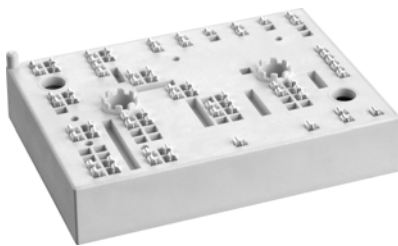
- Max. case temperature limited to  $T_C = 125^\circ\text{C}$
- Product reliability results valid for  $T_j \leq 150^\circ\text{C}$  (recommended  $T_{j,op} = -40 \dots +150^\circ\text{C}$ )

| Characteristics      |                                                              |                         |      |      |      |      |
|----------------------|--------------------------------------------------------------|-------------------------|------|------|------|------|
| Symbol               | Conditions                                                   |                         | min. | typ. | max. | Unit |
| IGBT 1 - 6           |                                                              |                         |      |      |      |      |
| V <sub>CE(sat)</sub> | I <sub>C</sub> = 50 A                                        | T <sub>j</sub> = 25 °C  |      | 1.85 | 2.10 | V    |
|                      | V <sub>GE</sub> = 15 V<br>chiplevel                          | T <sub>j</sub> = 150 °C |      | 2.25 | 2.40 | V    |
| V <sub>CE0</sub>     | chiplevel                                                    | T <sub>j</sub> = 25 °C  |      | 0.8  | 0.9  | V    |
|                      |                                                              | T <sub>j</sub> = 150 °C |      | 0.7  | 0.8  | V    |
| r <sub>CE</sub>      | V <sub>GE</sub> = 15 V                                       | T <sub>j</sub> = 25 °C  |      | 21   | 24   | mΩ   |
|                      | chiplevel                                                    | T <sub>j</sub> = 150 °C |      | 31   | 32   | mΩ   |
| V <sub>GE(th)</sub>  | V <sub>GE</sub> = V <sub>CE</sub> V, I <sub>C</sub> = 1.7 mA |                         | 5    | 5.8  | 6.5  | V    |
| I <sub>CES</sub>     | V <sub>GE</sub> = 0 V                                        | T <sub>j</sub> = 25 °C  |      | 0.1  | 0.3  | mA   |
|                      | V <sub>CE</sub> = 1200 V                                     |                         |      |      |      | mA   |
| C <sub>ies</sub>     | V <sub>CE</sub> = 25 V<br>V <sub>GE</sub> = 0 V              | f = 1 MHz               |      | 2.77 |      | nF   |
| C <sub>oes</sub>     |                                                              | f = 1 MHz               |      | 0.21 |      | nF   |
| C <sub>res</sub>     |                                                              | f = 1 MHz               |      | 0.16 |      | nF   |
| Q <sub>G</sub>       | V <sub>GE</sub> = - 8 V...+ 15 V                             |                         |      | 280  |      | nC   |
| R <sub>Gint</sub>    | T <sub>j</sub> = 25 °C                                       |                         |      | 4    |      | Ω    |
| t <sub>d(on)</sub>   | V <sub>CC</sub> = 600 V                                      | T <sub>j</sub> = 150 °C |      |      |      | ns   |
| t <sub>r</sub>       | I <sub>C</sub> = 50 A                                        | T <sub>j</sub> = 150 °C |      |      |      | ns   |
| E <sub>on</sub>      |                                                              | T <sub>j</sub> = 150 °C |      |      |      | mJ   |
| t <sub>d(off)</sub>  |                                                              | T <sub>j</sub> = 150 °C |      |      |      | ns   |
| t <sub>f</sub>       |                                                              | T <sub>j</sub> = 150 °C |      |      |      | ns   |
| E <sub>off</sub>     | V <sub>GE</sub> = +15/-15 V                                  | T <sub>j</sub> = 150 °C |      |      |      | mJ   |
| R <sub>th(j-s)</sub> | per IGBT, λ <sub>paste</sub> =0.8 W/K*m                      |                         |      | 0.71 |      | K/W  |
| IGBT 7 - 12          |                                                              |                         |      |      |      |      |
| V <sub>CE(sat)</sub> | I <sub>C</sub> = 50 A                                        | T <sub>j</sub> = 25 °C  |      | 1.85 | 2.10 | V    |
|                      | V <sub>GE</sub> = 15 V<br>chiplevel                          | T <sub>j</sub> = 150 °C |      | 2.20 | 2.40 | V    |
| V <sub>CE0</sub>     | chiplevel                                                    | T <sub>j</sub> = 25 °C  |      | 0.80 | 0.90 | V    |
|                      |                                                              | T <sub>j</sub> = 150 °C |      | 0.70 | 0.80 | V    |
| r <sub>CE</sub>      | V <sub>GE</sub> = 15 V                                       | T <sub>j</sub> = 25 °C  |      | 21   | 24   | mΩ   |
|                      | chiplevel                                                    | T <sub>j</sub> = 150 °C |      | 30   | 32   | mΩ   |
| V <sub>GE(th)</sub>  | V <sub>GE</sub> = V <sub>CE</sub> V, I <sub>C</sub> = 1.7 mA |                         | 5    | 5.8  | 6.5  | V    |
| I <sub>CES</sub>     | V <sub>GE</sub> = 0 V                                        | T <sub>j</sub> = 25 °C  |      |      |      | mA   |
|                      | V <sub>CE</sub> = 1200 V                                     |                         |      |      |      | mA   |
| C <sub>ies</sub>     | V <sub>CE</sub> = 25 V<br>V <sub>GE</sub> = 0 V              | f = 1 MHz               |      | 2.77 |      | nF   |
| C <sub>oes</sub>     |                                                              | f = 1 MHz               |      | 0.21 |      | nF   |
| C <sub>res</sub>     |                                                              | f = 1 MHz               |      | 0.16 |      | nF   |
| Q <sub>G</sub>       | V <sub>GE</sub> = - 8 V...+ 15 V                             |                         |      | 280  |      | nC   |
| R <sub>Gint</sub>    | T <sub>j</sub> = 25 °C                                       |                         |      | 4    |      | Ω    |
| t <sub>d(on)</sub>   | V <sub>CC</sub> = 600 V                                      | T <sub>j</sub> = 150 °C |      |      |      | ns   |
| t <sub>r</sub>       | I <sub>C</sub> = 50 A                                        | T <sub>j</sub> = 150 °C |      |      |      | ns   |
| E <sub>on</sub>      |                                                              | T <sub>j</sub> = 150 °C |      |      |      | mJ   |
| t <sub>d(off)</sub>  |                                                              | T <sub>j</sub> = 150 °C |      |      |      | ns   |
| t <sub>f</sub>       |                                                              | T <sub>j</sub> = 150 °C |      |      |      | ns   |
| E <sub>off</sub>     | V <sub>GE</sub> = +15/-15 V                                  | T <sub>j</sub> = 150 °C |      |      |      | mJ   |
| R <sub>th(j-s)</sub> | per IGBT, λ <sub>paste</sub> =0.8 W/K*m                      |                         |      | 0.71 |      | K/W  |



ACC

# SKiiP 35ACC12T4V10



MiniSKiiP® 3

## Twin 6-pack

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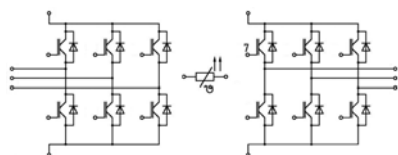
#### Typical Applications\*

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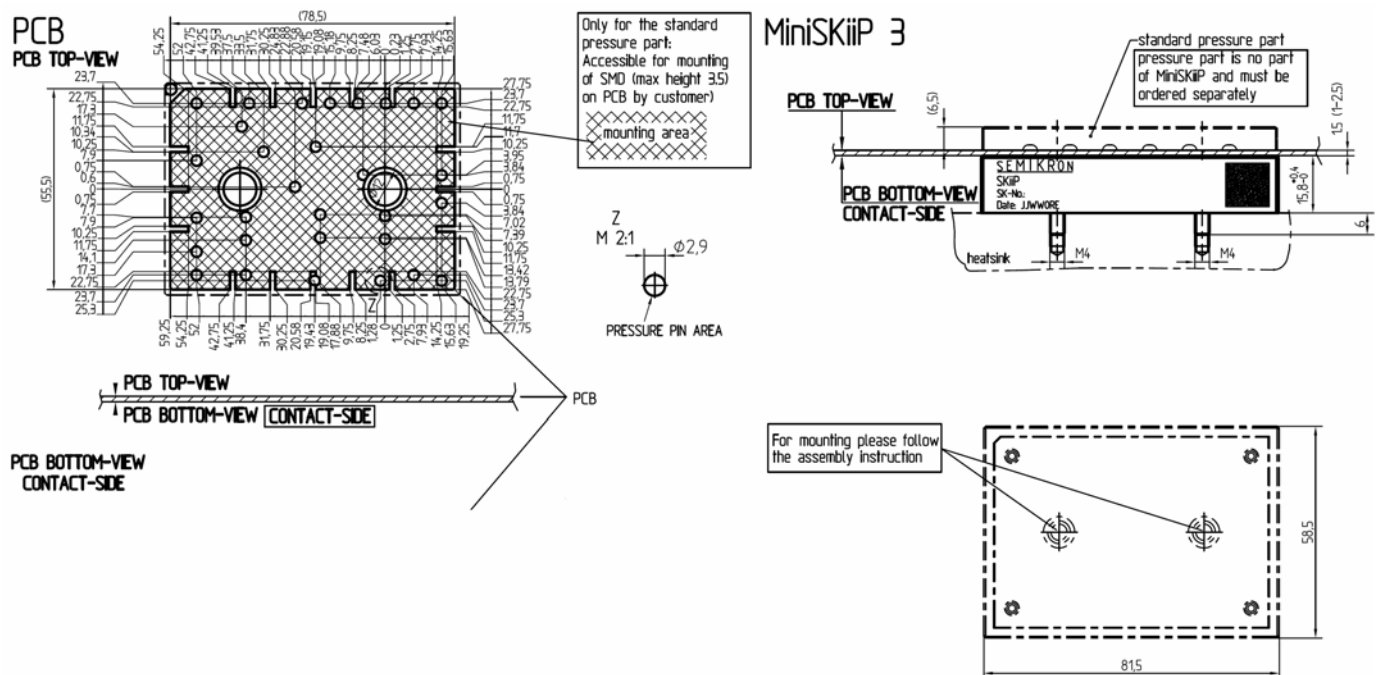
#### Remarks

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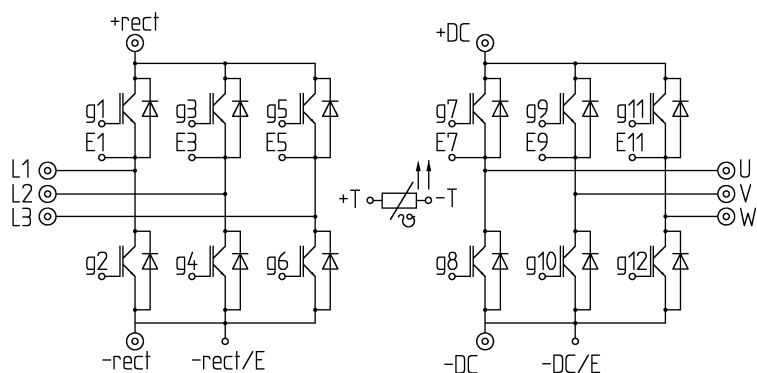
| Characteristics    |                                                                                                                                                                                              |                                     |      |                |      |      |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------|----------------|------|------|
| Symbol             | Conditions                                                                                                                                                                                   |                                     | min. | typ.           | max. | Unit |
| Diode 1 - 6        |                                                                                                                                                                                              |                                     |      |                |      |      |
| $V_F = V_{EC}$     | $I_F = 50\text{ A}$                                                                                                                                                                          | $T_j = 25\text{ }^{\circ}\text{C}$  |      | 2.2            | 2.7  | V    |
|                    | $V_{GE} = 0\text{ V}$<br>chipelevel                                                                                                                                                          | $T_j = 150\text{ }^{\circ}\text{C}$ |      | 2.2            | 2.5  | V    |
| $V_{F0}$           | chipelevel                                                                                                                                                                                   | $T_j = 25\text{ }^{\circ}\text{C}$  |      | 1.3            | 1.5  | V    |
|                    |                                                                                                                                                                                              | $T_j = 150\text{ }^{\circ}\text{C}$ |      | 0.9            | 1.1  | V    |
| $r_F$              | chipelevel                                                                                                                                                                                   | $T_j = 25\text{ }^{\circ}\text{C}$  |      | 18             | 25   | mΩ   |
|                    |                                                                                                                                                                                              | $T_j = 150\text{ }^{\circ}\text{C}$ |      | 26             | 28   | mΩ   |
| $I_{RRM}$          | $I_F = 50\text{ A}$                                                                                                                                                                          | $T_j = 150\text{ }^{\circ}\text{C}$ |      |                |      | A    |
| $Q_{rr}$           | $V_{GE} = -15\text{ V}$<br>$V_R = 600\text{ V}$                                                                                                                                              | $T_j = 150\text{ }^{\circ}\text{C}$ |      |                |      | μC   |
| $E_{rr}$           |                                                                                                                                                                                              | $T_j = 150\text{ }^{\circ}\text{C}$ |      |                |      | mJ   |
| $R_{th(j-s)}$      | per Diode, $\lambda_{paste}=0.8\text{ W/K}\cdot\text{m}$                                                                                                                                     |                                     |      | 0.95           |      | K/W  |
| Diode 7 - 12       |                                                                                                                                                                                              |                                     |      |                |      |      |
| $V_F = V_{EC}$     | $I_F = 50\text{ A}$                                                                                                                                                                          | $T_j = 25\text{ }^{\circ}\text{C}$  |      | 2.2            | 2.5  | V    |
|                    | $V_{GE} = 0\text{ V}$<br>chipelevel                                                                                                                                                          | $T_j = 150\text{ }^{\circ}\text{C}$ |      | 2.2            | 2.5  | V    |
| $V_{F0}$           | chipelevel                                                                                                                                                                                   | $T_j = 25\text{ }^{\circ}\text{C}$  |      | 1.3            | 1.5  | V    |
|                    |                                                                                                                                                                                              | $T_j = 150\text{ }^{\circ}\text{C}$ |      | 0.9            | 1.1  | V    |
| $r_F$              | chipelevel                                                                                                                                                                                   | $T_j = 25\text{ }^{\circ}\text{C}$  |      | 18             | 21   | mΩ   |
|                    |                                                                                                                                                                                              | $T_j = 150\text{ }^{\circ}\text{C}$ |      | 26             | 28   | mΩ   |
| $I_{RRM}$          | $I_F = 50\text{ A}$                                                                                                                                                                          | $T_j = 150\text{ }^{\circ}\text{C}$ |      |                |      | A    |
| $Q_{rr}$           | $V_{GE} = -15\text{ V}$<br>$V_{CC} = 600\text{ V}$                                                                                                                                           | $T_j = 150\text{ }^{\circ}\text{C}$ |      |                |      | μC   |
| $E_{rr}$           |                                                                                                                                                                                              | $T_j = 150\text{ }^{\circ}\text{C}$ |      |                |      | mJ   |
| $R_{th(j-s)}$      | per Diode, $\lambda_{paste}=0.8\text{ W/K}\cdot\text{m}$                                                                                                                                     |                                     |      | 0.95           |      | K/W  |
| Module             |                                                                                                                                                                                              |                                     |      |                |      |      |
| $M_s$              | to heat sink                                                                                                                                                                                 |                                     | 2    |                | 2.5  | Nm   |
| w                  |                                                                                                                                                                                              |                                     |      | 82             |      | g    |
| Temperature Sensor |                                                                                                                                                                                              |                                     |      |                |      |      |
| $R_{100}$          | $T_r=100^{\circ}\text{C}$ ( $R_{25}=1000\Omega$ )                                                                                                                                            |                                     |      | $1670 \pm 3\%$ |      | Ω    |
| $R(T)$             | $R(T)=1000\Omega[1+A(T-25^{\circ}\text{C})+B(T-25^{\circ}\text{C})^2]$ ,<br>$A = 7.635\cdot 10^{-3}\text{ }^{\circ}\text{C}^{-1}$ ,<br>$B = 1.731\cdot 10^{-5}\text{ }^{\circ}\text{C}^{-2}$ |                                     |      |                |      |      |



ACC



pinout, dimensions



pinout

This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX

\* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our staff.