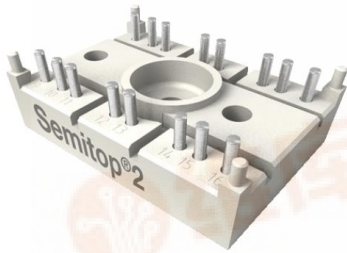


## SK 9GD065

SEMITOP<sup>®</sup> 2

## IGBT Module

SK 9GD065

Preliminary Data

## Features

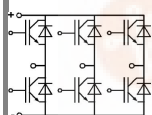
- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- Ultrafast NPT technology IGBT
- CAL technology FWD

## Typical Applications

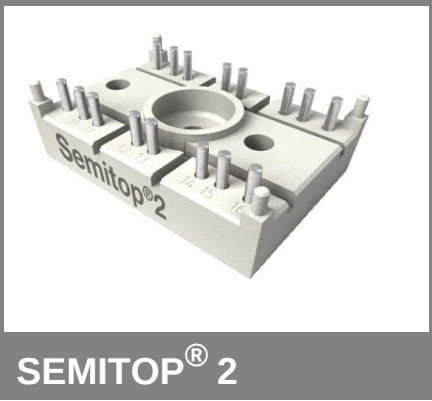
- Switching (not for linear use)
- Inverter
- Switched mode power supplies
- UPS

| Absolute Maximum Ratings |                                                                                                                 | $T_s = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified          |                    |
|--------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------|
| Symbol                   | Conditions                                                                                                      | Values                                                                   | Units              |
| IGBT                     |                                                                                                                 |                                                                          |                    |
| $V_{CES}$                | $T_j = 25\text{ }^{\circ}\text{C}$                                                                              | 600                                                                      | V                  |
| $I_C$                    | $T_j = 125\text{ }^{\circ}\text{C}$                                                                             | $T_s = 25\text{ }^{\circ}\text{C}$<br>$T_s = 80\text{ }^{\circ}\text{C}$ | 11<br>8            |
|                          |                                                                                                                 |                                                                          | A<br>A             |
| $I_{CRM}$                | $I_{CRM} = 2 \times I_{Cnom}$                                                                                   | 12                                                                       | A                  |
| $V_{GES}$                |                                                                                                                 | $\pm 20$                                                                 | V                  |
| $t_{psc}$                | $V_{CC} = 300\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ }^{\circ}\text{C}$<br>$V_{CES} < 600\text{ V}$ | 10                                                                       | $\mu\text{s}$      |
| Inverse Diode            |                                                                                                                 |                                                                          |                    |
| $I_F$                    | $T_j = 125\text{ }^{\circ}\text{C}$                                                                             | $T_s = 25\text{ }^{\circ}\text{C}$<br>$T_s = 80\text{ }^{\circ}\text{C}$ | 22<br>15           |
|                          |                                                                                                                 |                                                                          | A<br>A             |
| $I_{FRM}$                | $I_{FRM} = 2 \times I_{Fnom}$                                                                                   | 30                                                                       | A                  |
| Module                   |                                                                                                                 |                                                                          |                    |
| $I_{t(RMS)}$             |                                                                                                                 |                                                                          | A                  |
| $T_{vj}$                 |                                                                                                                 | -40 ... +150                                                             | $^{\circ}\text{C}$ |
| $T_{stg}$                |                                                                                                                 | -40 ... +125                                                             | $^{\circ}\text{C}$ |
| $V_{isol}$               | AC, 1 min.                                                                                                      | 2500                                                                     | V                  |

| Characteristics |                                               | $T_s = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified   |      |       |            |
|-----------------|-----------------------------------------------|-------------------------------------------------------------------|------|-------|------------|
| Symbol          | Conditions                                    | min.                                                              | typ. | max.  | Units      |
| <b>IGBT</b>     |                                               |                                                                   |      |       |            |
| $V_{GE(th)}$    | $V_{GE} = V_{CE}, I_C = 0,2\text{ mA}$        | 3                                                                 | 4    | 5     | V          |
| $I_{CES}$       | $V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$       |                                                                   |      | 0,03  | mA         |
|                 |                                               |                                                                   |      |       | mA         |
| $I_{GES}$       | $V_{CE} = 0\text{ V}, V_{GE} = 20\text{ V}$   |                                                                   |      | 120   | nA         |
|                 |                                               |                                                                   |      |       | nA         |
| $V_{CE0}$       |                                               |                                                                   |      | 1,2   | V          |
|                 |                                               |                                                                   |      | 1,1   | V          |
| $r_{CE}$        | $V_{GE} = 15\text{ V}$                        |                                                                   |      | 133   | m $\Omega$ |
|                 |                                               |                                                                   |      | 183   | m $\Omega$ |
| $V_{CE(sat)}$   | $I_{Cnom} = 6\text{ A}, V_{GE} = 15\text{ V}$ |                                                                   |      | 2     | V          |
|                 |                                               |                                                                   |      | 2,5   | V          |
| $C_{ies}$       | $V_{CE} = 25, V_{GE} = 0\text{ V}$            | $f = 1\text{ MHz}$                                                |      | 0,35  | nF         |
|                 |                                               |                                                                   |      | 0,038 | nF         |
| $C_{oes}$       |                                               |                                                                   |      | 0,023 | nF         |
| $C_{res}$       |                                               |                                                                   |      |       | nF         |
| $t_{d(on)}$     | $R_{Gon} = 120\text{ }\Omega$                 | $V_{CC} = 300\text{ V}$<br>$I_{Cnom} = 6\text{ A}$                |      | 20    | ns         |
| $t_r$           |                                               |                                                                   |      | 25    | ns         |
| $E_{on}$        | $R_{Goff} = 120\text{ }\Omega$                | $T_j = 125\text{ }^{\circ}\text{C}$<br>$V_{GE} = \pm 15\text{ V}$ |      | 0,22  | mJ         |
| $t_{d(off)}$    |                                               |                                                                   |      | 145   | ns         |
| $t_f$           |                                               |                                                                   |      | 25    | ns         |
| $E_{off}$       |                                               |                                                                   |      | 0,12  | mJ         |
| $R_{th(j-s)}$   | per IGBT                                      |                                                                   |      | 2,6   | K/W        |



SK 9GD065



IGBT Module

SK 9GD065

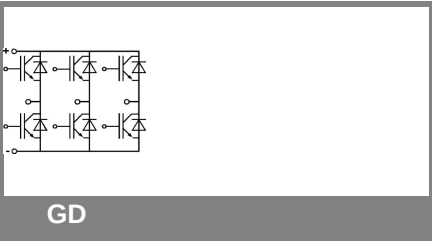
Preliminary Data

Features

- Compact design
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Typical Applications

- Switching (not for linear use)
- Inverter
- Switched mode power supplies
- UPS



| Characteristics                  |                                                 |                                             |      |      |      |       |
|----------------------------------|-------------------------------------------------|---------------------------------------------|------|------|------|-------|
| Symbol                           | Conditions                                      |                                             | min. | typ. | max. | Units |
| Inverse Diode                    |                                                 |                                             |      |      |      |       |
| V <sub>F</sub> = V <sub>EC</sub> | I <sub>Fnom</sub> = 15 A; V <sub>GE</sub> = 0 V | T <sub>j</sub> = 25 °C <sub>chiplev.</sub>  |      | 1,4  | 1,7  | V     |
|                                  |                                                 | T <sub>j</sub> = 125 °C <sub>chiplev.</sub> |      | 1,4  | 1,7  | V     |
| V <sub>F0</sub>                  |                                                 | T <sub>j</sub> = 25 °C                      |      | 1    | 1,1  | V     |
|                                  |                                                 | T <sub>j</sub> = 125 °C                     |      | 0,9  | 1    | V     |
| r <sub>F</sub>                   |                                                 | T <sub>j</sub> = 25 °C                      |      | 30   | 40   | mΩ    |
|                                  |                                                 | T <sub>j</sub> = 125 °C                     |      | 33   | 47   | mΩ    |
| I <sub>RRM</sub>                 | I <sub>Fnom</sub> = 15 A                        | T <sub>j</sub> = 125 °C                     |      | 22   |      | A     |
| Q <sub>rr</sub>                  | di/dt = 1100 A/μs                               |                                             |      | 1,5  |      | μC    |
| E <sub>rr</sub>                  | V <sub>CC</sub> = 300V                          |                                             |      | 0,31 |      | mJ    |
| R <sub>th(j-s)D</sub>            | per diode                                       |                                             |      |      | 2,3  | K/W   |
| M <sub>s</sub>                   | to heat sink                                    |                                             |      |      | 2    | Nm    |
| w                                |                                                 |                                             |      | 21   |      | g     |

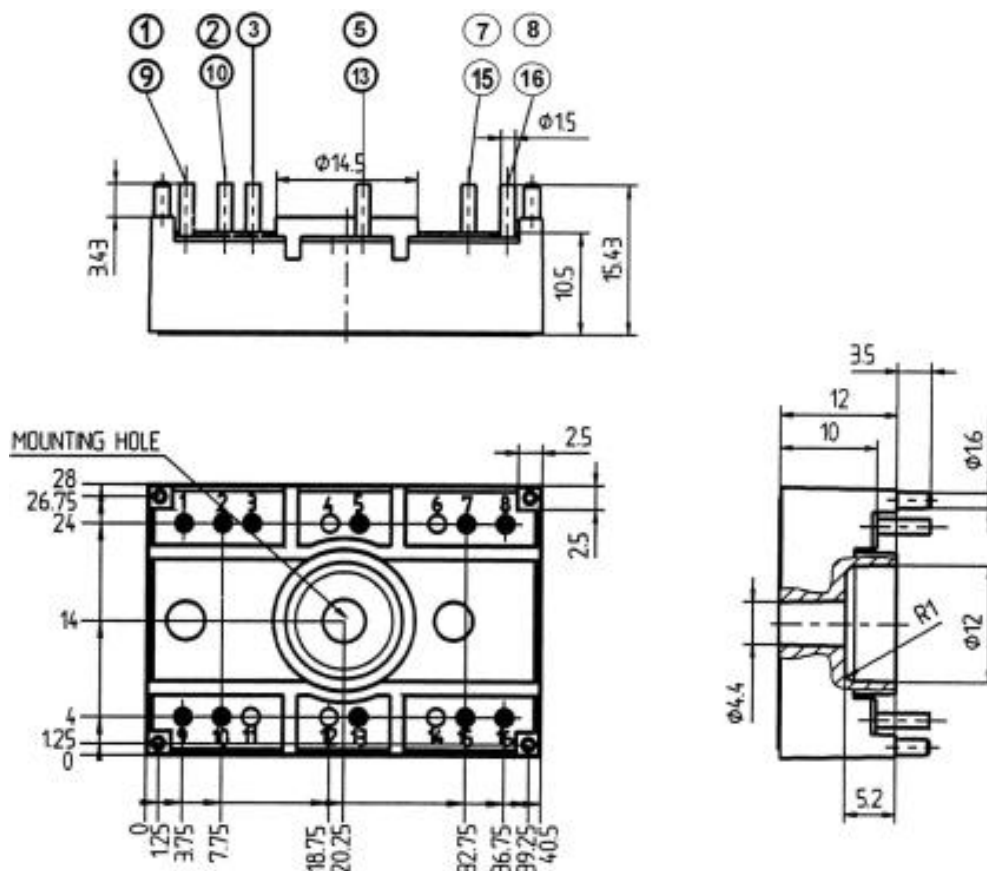
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.

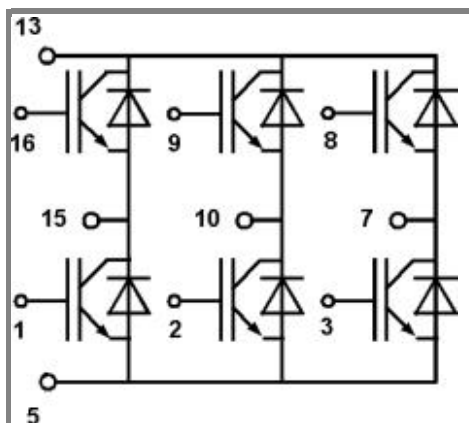
# SK 9GD065

UL recognized file

no. E 63 532



Case T47 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)



Case T 47

GD