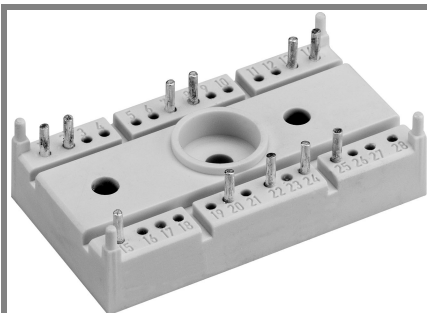




**SEMITOP® 3**

## Mosfet Module

**SK 300MB075**

Preliminary Data

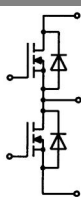
## Features

- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- Trench technology
- Short internal connections and low inductance case

## Typical Applications

- Low switched mode power supplies
- DC servo drives
- UPS

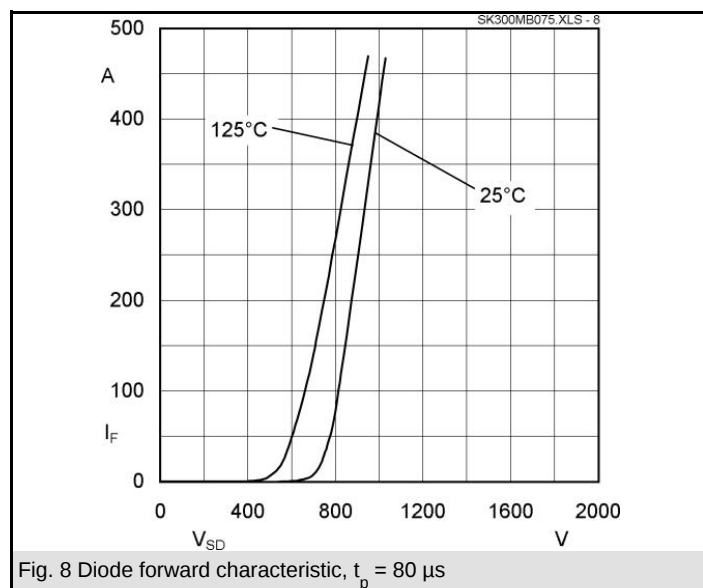
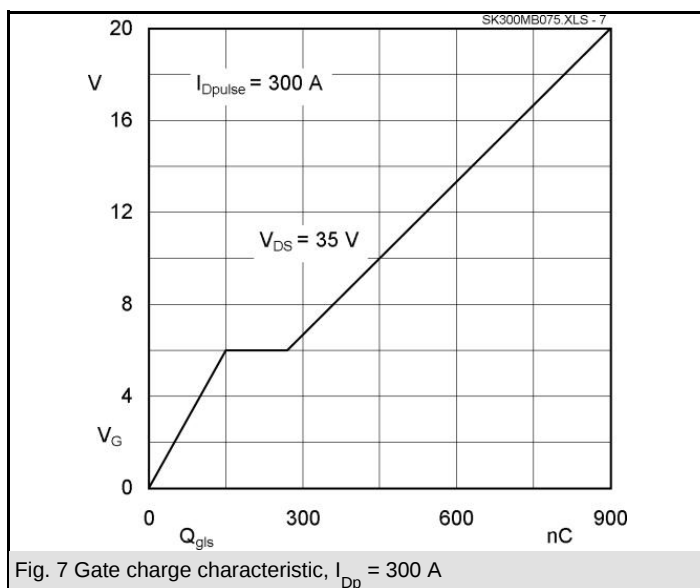
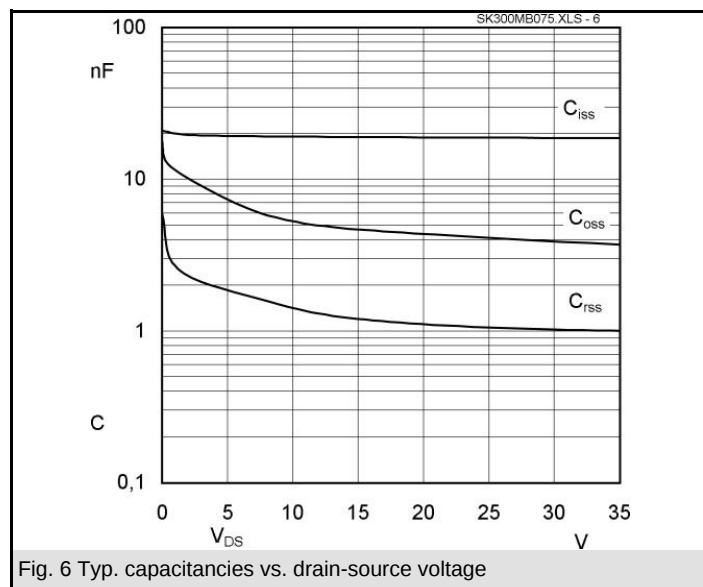
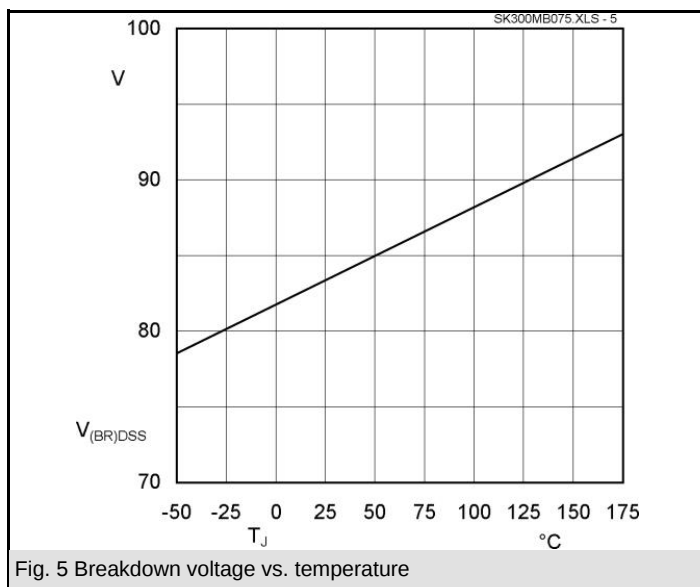
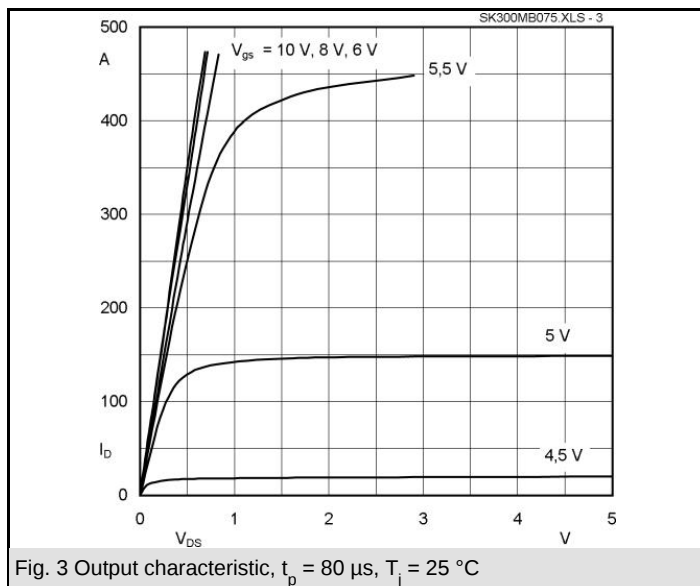
<sup>1)</sup> Maximum PCB temperature, at pins/PCB contact, = 85°C

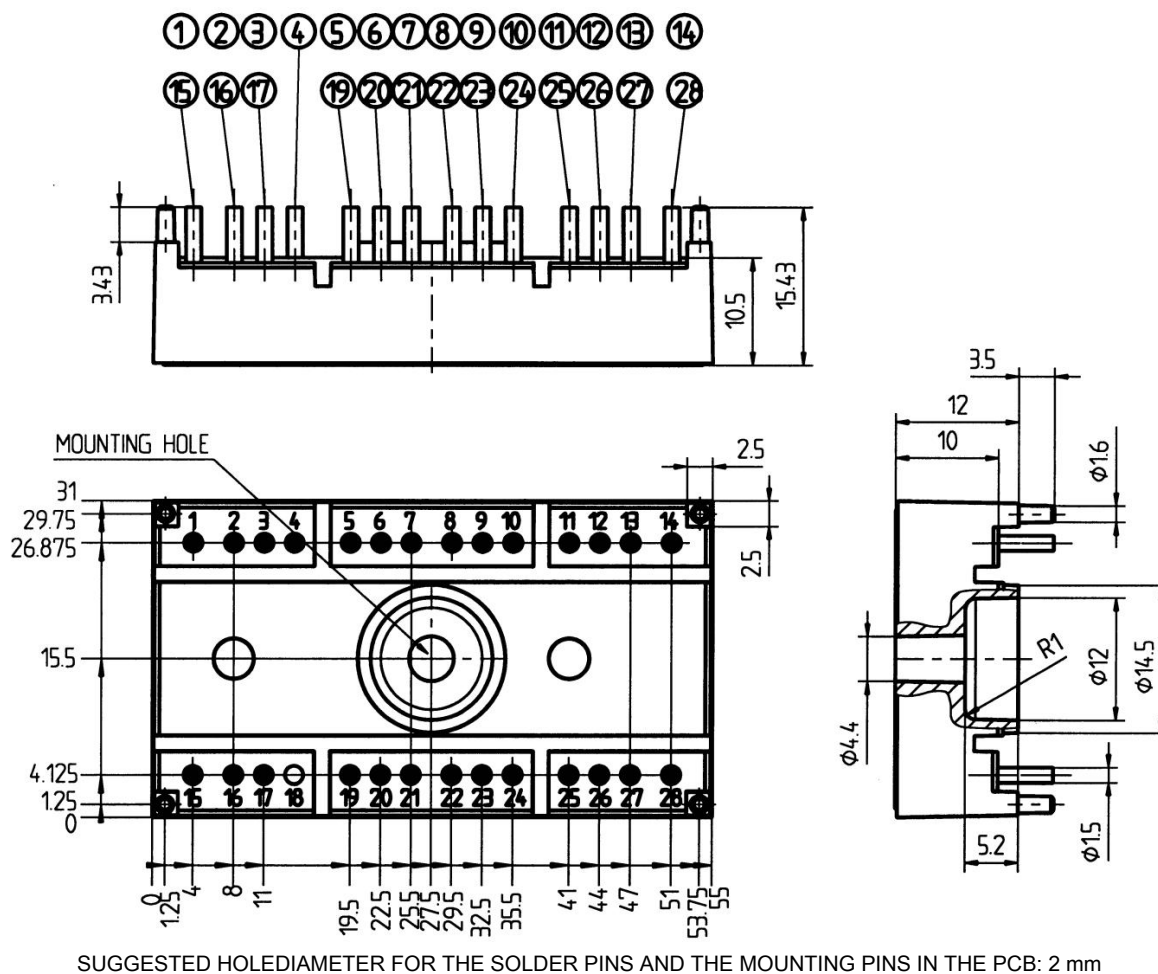


**MB**

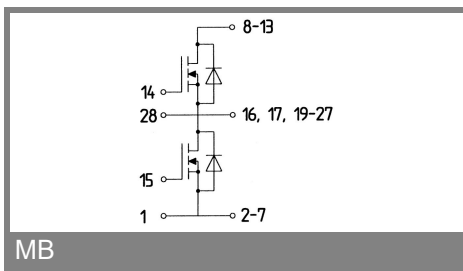
| Absolute Maximum Ratings      |                                                  | $T_s = 25\text{ °C}$ , unless otherwise specified |       |
|-------------------------------|--------------------------------------------------|---------------------------------------------------|-------|
| Symbol                        | Conditions                                       | Values                                            | Units |
| <b>MOSFET</b>                 |                                                  |                                                   |       |
| $V_{DSS}$                     |                                                  | 75                                                | V     |
| $V_{GSS}$                     |                                                  | $\pm 20$                                          | V     |
| $I_D$                         | $T_s = 25\text{ (80) °C}; ^1$                    | 290 (210)                                         | A     |
| $I_{DM}$                      | $t_p < 1\text{ ms}; T_s = 25\text{ (80) °C}; ^1$ | 580 (420)                                         | A     |
| $T_j$                         |                                                  | -40...+150                                        | °C    |
| <b>Inverse diode</b>          |                                                  |                                                   |       |
| $I_F = -I_D$                  | $T_s = 25\text{ (80) °C};$                       | 290 (210)                                         | A     |
| $I_{FM} = -I_{DM}$            | $t_p < 1\text{ ms}; T_s = 25\text{ (80) °C};$    | 580 (210)                                         | A     |
| $T_j$                         |                                                  | -40...+150                                        | °C    |
| <b>Freewheeling CAL diode</b> |                                                  |                                                   |       |
| $I_F = -I_D$                  | $T_s = \text{°C}$                                |                                                   | A     |
| $T_j$                         |                                                  |                                                   | °C    |
| $T_{stg}$                     |                                                  | - 40 ... + 125                                    | °C    |
| $T_{sol}$                     | Terminals, 10 s                                  | 260                                               | °C    |
| $V_{isol}$                    | a. c. 50 Hz; r.m.s.; 1 min (1s)                  | 2500 / 3000                                       | V     |

| Characteristics      |                                                                                          | T <sub>s</sub> = 25 °C, unless otherwise specified |      |           |       |
|----------------------|------------------------------------------------------------------------------------------|----------------------------------------------------|------|-----------|-------|
| Symbol               | Conditions                                                                               | min.                                               | typ. | max.      | Units |
| MOSFET               |                                                                                          |                                                    |      |           |       |
| V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0 V, I <sub>D</sub> = 5,6 mA                                           | ≥ V <sub>DSS</sub>                                 |      |           | V     |
| V <sub>GS(th)</sub>  | V <sub>GS</sub> = V <sub>DS</sub> ; I <sub>D</sub> = 5,6 mA                              | 2,5                                                | 3,3  |           | V     |
| I <sub>DSS</sub>     | V <sub>GS</sub> = 0 V; V <sub>DS</sub> = V <sub>DSS</sub> ; T <sub>j</sub> = 25 (125) °C |                                                    |      | 100 (500) | µA    |
| I <sub>GSS</sub>     | V <sub>GS</sub> = 20V ;V <sub>DS</sub> = 0 V                                             |                                                    |      | 100       | nA    |
| R <sub>DS(on)</sub>  | I <sub>D</sub> = 200 A; V <sub>GS</sub> = 10 V; T <sub>j</sub> = 25 °C                   |                                                    |      | 1,6       | mΩ    |
| R <sub>DS(on)</sub>  | I <sub>D</sub> = 200 A; V <sub>GS</sub> = 10 V; T <sub>j</sub> = 125 °C                  |                                                    | 2,3  | 3         | mΩ    |
| C <sub>CHC</sub>     | per MOSFET                                                                               |                                                    |      |           | pF    |
| C <sub>iss</sub>     | under following conditions:                                                              |                                                    | 18,9 |           | nF    |
| C <sub>oss</sub>     | V <sub>GS</sub> = 0 V; V <sub>DS</sub> = 25 V; f = 1 MHz                                 |                                                    | 3,6  |           | nF    |
| C <sub>rss</sub>     |                                                                                          |                                                    | 1,1  |           | nF    |
| L <sub>DS</sub>      |                                                                                          |                                                    | 2,2  |           | nH    |
| t <sub>d(on)</sub>   | under following conditions:                                                              |                                                    | 350  |           | ns    |
| t <sub>r</sub>       | V <sub>DD</sub> = 40 V; V <sub>GS</sub> = 10 V;<br>I <sub>D</sub> = 300 A                |                                                    | 620  |           | ns    |
| t <sub>d(off)</sub>  | R <sub>G</sub> = 25 Ω                                                                    |                                                    | 1250 |           | ns    |
| t <sub>f</sub>       |                                                                                          |                                                    | 400  |           | ns    |
| R <sub>th(j-s)</sub> | per MOSFET (per module)                                                                  |                                                    |      | 0,45      | K/W   |
| Inverse diode        |                                                                                          |                                                    |      |           |       |
| V <sub>SD</sub>      | I <sub>F</sub> = 300 A; V <sub>GS</sub> = 0 V; T <sub>j</sub> = 25 °C                    |                                                    | 0,8  |           | V     |
| I <sub>RRM</sub>     | under following conditions:                                                              |                                                    |      |           | A     |
| Q <sub>rr</sub>      | I <sub>F</sub> = A; T <sub>vj</sub> = °C; R <sub>G</sub> = Ω                             |                                                    |      |           | µC    |
| t <sub>rr</sub>      | V <sub>R</sub> = A; di/dt = A/µs                                                         |                                                    |      |           | ns    |
| Free-wheeling diode  |                                                                                          |                                                    |      |           |       |
| V <sub>F</sub>       | I <sub>F</sub> = A; V <sub>GS</sub> = V                                                  |                                                    |      |           | V     |
| I <sub>RRM</sub>     | under following conditions:                                                              |                                                    |      |           | A     |
| Q <sub>rr</sub>      | I <sub>F</sub> = A; T <sub>vj</sub> = °C                                                 |                                                    |      |           | µC    |
| t <sub>rr</sub>      | V <sub>r</sub> = A; di/dt = A/µs                                                         |                                                    |      |           | ns    |
| Mechanical data      |                                                                                          |                                                    |      |           |       |
| M1                   | mounting torque                                                                          |                                                    |      | 2,5       | Nm    |
| w                    |                                                                                          |                                                    | 30   |           | g     |
| Case                 | SEMITOP® 3                                                                               |                                                    | T 24 |           |       |





Case T24



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.