



**SEMITOP<sup>®</sup> 2**

## IGBT Module

**SK25GH063**

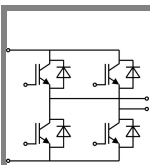
Preliminary Data

### Features

- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- N channel, homogeneous Silicon structure (NPT-Non punchthrough IGBT)
- High short circuit capability
- Low tail current with low temperature dependence
- UL recognized, file no. E63532

### Typical Applications

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



**GH**

| Absolute Maximum Ratings |                                                                                                         |                      |  | $T_s = 25\text{ °C}$ , unless otherwise specified |                    |
|--------------------------|---------------------------------------------------------------------------------------------------------|----------------------|--|---------------------------------------------------|--------------------|
| Symbol                   | Conditions                                                                                              |                      |  | Values                                            | Units              |
| <b>IGBT</b>              |                                                                                                         |                      |  |                                                   |                    |
| $V_{CES}$                | $T_j = 25\text{ °C}$                                                                                    |                      |  | 600                                               | V                  |
| $I_C$                    | $T_j = 125\text{ °C}$                                                                                   | $T_s = 25\text{ °C}$ |  | 30                                                | A                  |
|                          |                                                                                                         | $T_s = 80\text{ °C}$ |  | 21                                                | A                  |
| $I_{CRM}$                | $I_{CRM} = 2 \times I_{Cnom}$                                                                           |                      |  | 60                                                | A                  |
| $V_{GES}$                |                                                                                                         |                      |  | $\pm 20$                                          | V                  |
| $t_{psc}$                | $V_{CC} = 300\text{ V}$ ; $V_{GE} \leq 20\text{ V}$ ; $T_j = 125\text{ °C}$<br>$V_{CES} < 600\text{ V}$ |                      |  | 10                                                | $\mu\text{s}$      |
| <b>Inverse Diode</b>     |                                                                                                         |                      |  |                                                   |                    |
| $I_F$                    | $T_j = 150\text{ °C}$                                                                                   | $T_s = 25\text{ °C}$ |  | 36                                                | A                  |
|                          |                                                                                                         | $T_s = 80\text{ °C}$ |  | 24                                                | A                  |
| $I_{FRM}$                | $I_{FRM} = 2 \times I_{Fnom}$                                                                           |                      |  |                                                   | A                  |
| $I_{FSM}$                | $t_p = 10\text{ ms}$ ; half sine wave $T_j = 150\text{ °C}$                                             |                      |  | 200                                               | A                  |
| <b>Module</b>            |                                                                                                         |                      |  |                                                   |                    |
| $I_{t(RMS)}$             |                                                                                                         |                      |  |                                                   | A                  |
| $T_{vj}$                 |                                                                                                         |                      |  | -40 ... +150                                      | $^{\circ}\text{C}$ |
| $T_{stg}$                |                                                                                                         |                      |  | -40 ... +125                                      | $^{\circ}\text{C}$ |
| $V_{isol}$               | AC, 1 min.                                                                                              |                      |  | 2500                                              | V                  |

| Characteristics      |                                                             |  | T <sub>s</sub> = 25 °C, unless otherwise specified |      |      |       |     |
|----------------------|-------------------------------------------------------------|--|----------------------------------------------------|------|------|-------|-----|
| Symbol               | Conditions                                                  |  | min.                                               | typ. | max. | Units |     |
| IGBT                 |                                                             |  |                                                    |      |      |       |     |
| V <sub>GE(th)</sub>  | V <sub>GE</sub> = V <sub>CE</sub> , I <sub>C</sub> = 0,7 mA |  | 4,5                                                | 5,5  | 6,5  | V     |     |
| I <sub>CES</sub>     | V <sub>GE</sub> = 0 V, V <sub>CE</sub> = V <sub>CES</sub>   |  |                                                    |      | 0,1  | mA    |     |
|                      |                                                             |  |                                                    |      |      | mA    |     |
| I <sub>GES</sub>     | V <sub>CE</sub> = 0 V, V <sub>GE</sub> = 30 V               |  |                                                    |      | 120  | nA    |     |
|                      |                                                             |  |                                                    |      |      | nA    |     |
| V <sub>CE0</sub>     |                                                             |  | T <sub>j</sub> = 25 °C                             |      |      | V     |     |
|                      |                                                             |  | T <sub>j</sub> = 125 °C                            |      |      | V     |     |
| r <sub>CE</sub>      | V <sub>GE</sub> = 15 V                                      |  | T <sub>j</sub> = 25°C                              |      |      | mΩ    |     |
|                      |                                                             |  | T <sub>j</sub> = 125°C                             |      |      | mΩ    |     |
| V <sub>CE(sat)</sub> | I <sub>Cnom</sub> = 30 A, V <sub>GE</sub> = 15 V            |  | T <sub>j</sub> = 25°C <sub>chiplev.</sub>          |      | 2,1  | 2,5   | V   |
|                      |                                                             |  | T <sub>j</sub> = 125°C <sub>chiplev.</sub>         |      | 2    | 2,3   | V   |
| C <sub>ies</sub>     | V <sub>CE</sub> = 25, V <sub>GE</sub> = 0 V                 |  | f = 1 MHz                                          |      | 1,3  |       | nF  |
| C <sub>oes</sub>     |                                                             |  |                                                    |      | 0,15 |       | nF  |
| C <sub>res</sub>     |                                                             |  |                                                    |      | 0,1  |       | nF  |
| t <sub>d(on)</sub>   | R <sub>Gon</sub> = 33 Ω                                     |  | V <sub>CC</sub> = 300V<br>I <sub>C</sub> = 25A     |      | 37   |       | ns  |
| t <sub>r</sub>       |                                                             |  |                                                    |      | 40   |       | ns  |
| E <sub>on</sub>      | R <sub>Goff</sub> = 33 Ω                                    |  | T <sub>j</sub> = 125 °C<br>V <sub>GE</sub> =±15V   |      | 1,1  |       | mJ  |
| t <sub>d(off)</sub>  |                                                             |  |                                                    |      | 200  |       | ns  |
| t <sub>f</sub>       |                                                             |  |                                                    |      | 30   |       | ns  |
| E <sub>off</sub>     |                                                             |  |                                                    |      | 0,8  |       | mJ  |
| R <sub>th(j-s)</sub> | per IGBT                                                    |  |                                                    |      |      | 1,4   | K/W |



IGBT Module

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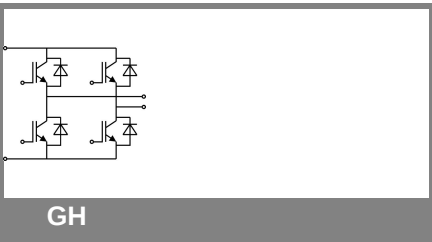
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Typical Applications

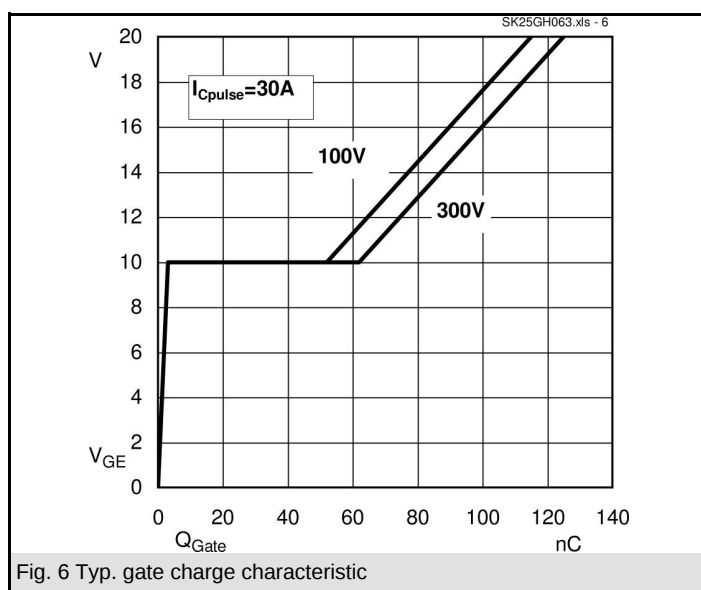
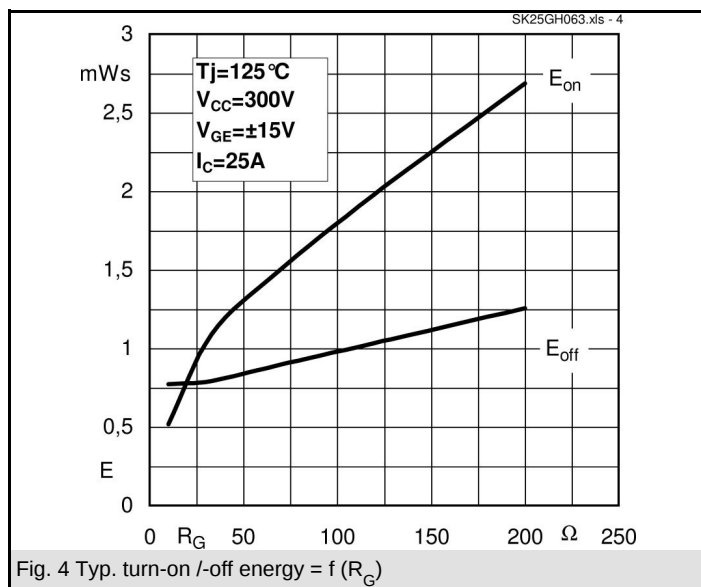
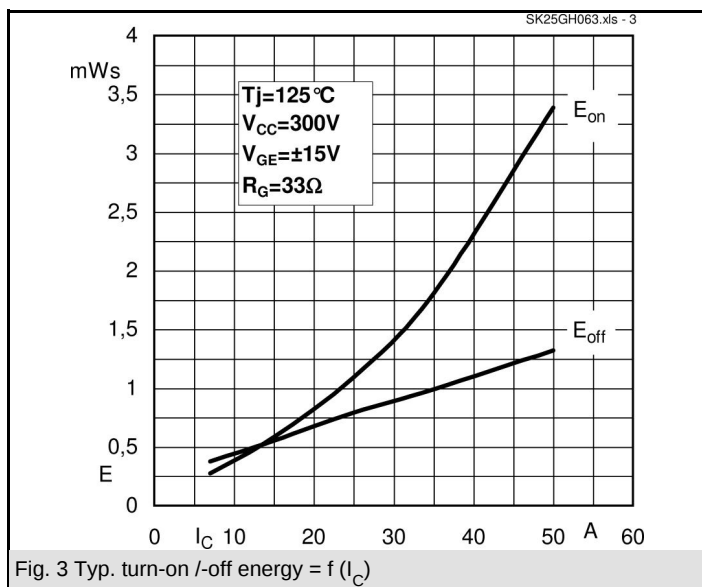
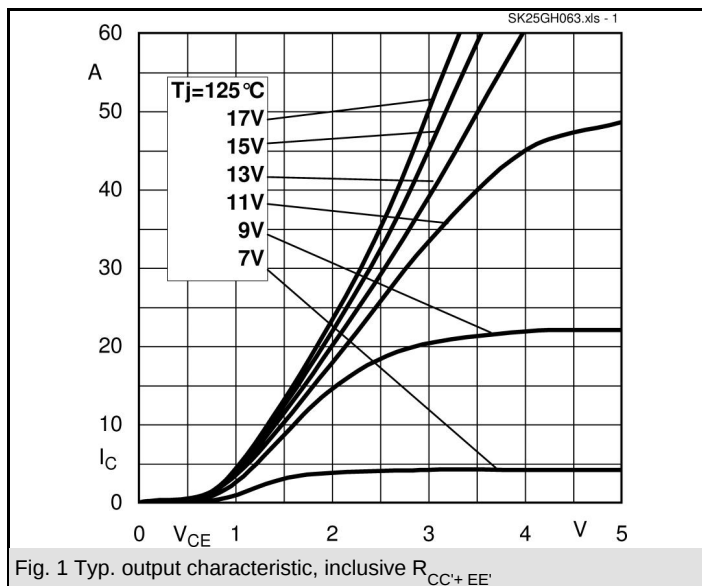
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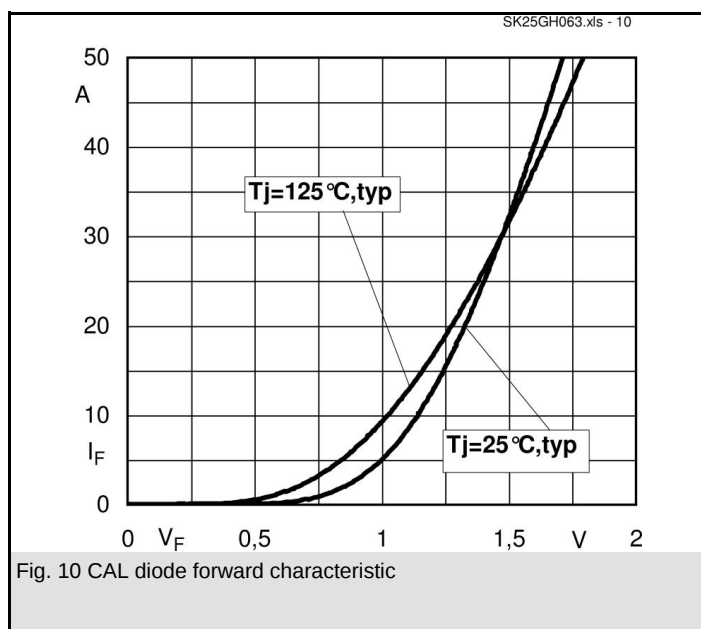
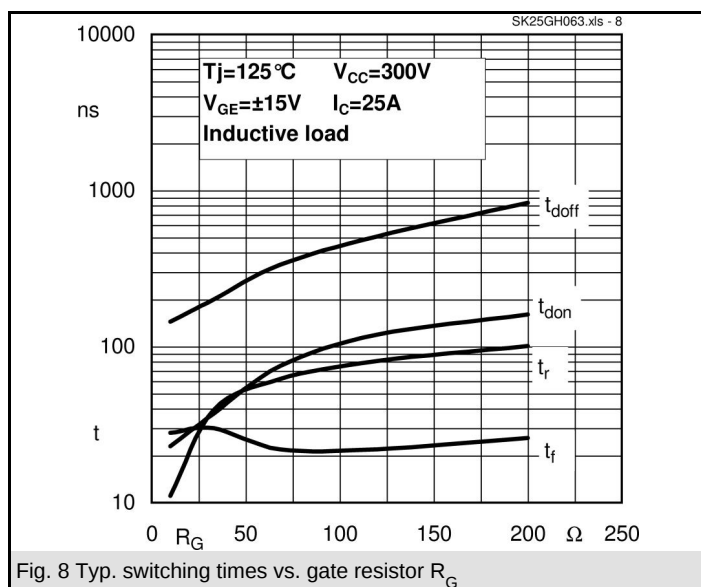
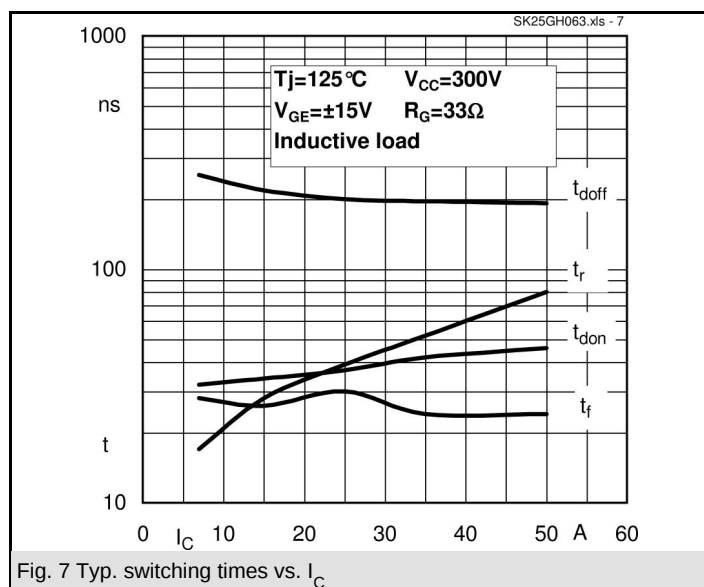


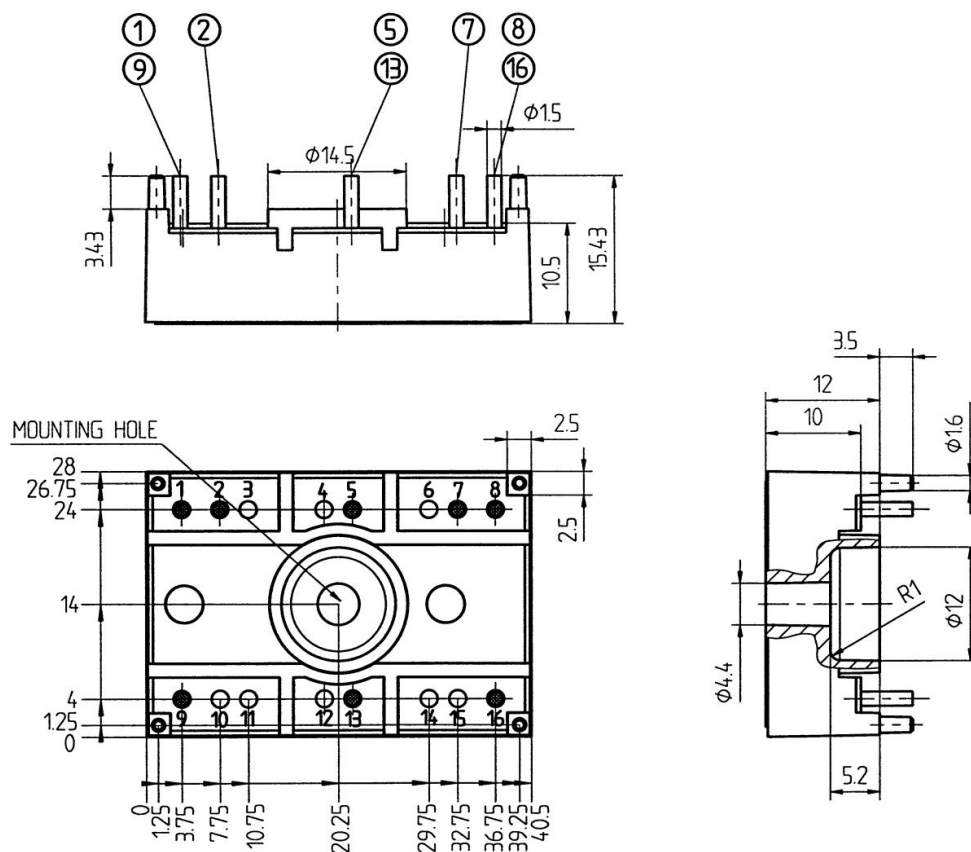
| Characteristics                  |                                                                      |                                             |      |      |      |       |
|----------------------------------|----------------------------------------------------------------------|---------------------------------------------|------|------|------|-------|
| Symbol                           | Conditions                                                           |                                             | min. | typ. | max. | Units |
| Inverse Diode                    |                                                                      |                                             |      |      |      |       |
| V <sub>F</sub> = V <sub>EC</sub> | I <sub>Fnom</sub> = 25 A; V <sub>GE</sub> = 0 V                      | T <sub>j</sub> = 25 °C <sub>chiplev.</sub>  |      | 1,45 | 1,7  | V     |
|                                  |                                                                      | T <sub>j</sub> = 125 °C <sub>chiplev.</sub> |      | 1,4  | 1,75 | V     |
| V <sub>F0</sub>                  |                                                                      | T <sub>j</sub> = 125 °C                     |      | 0,85 | 0,9  | V     |
| r <sub>F</sub>                   |                                                                      | T <sub>j</sub> = 125 °C                     |      | 22   | 32   | mΩ    |
| I <sub>RRM</sub>                 | I <sub>F</sub> = 25 A<br>di/dt = -500 A/μs<br>V <sub>CC</sub> = 300V | T <sub>j</sub> = 125 °C                     |      | 16   |      | A     |
| Q <sub>rr</sub>                  |                                                                      |                                             |      | 2    |      | μC    |
| E <sub>rr</sub>                  |                                                                      |                                             |      | 0,25 |      | mJ    |
| R <sub>th(j-s)D</sub>            | per diode                                                            |                                             |      |      | 1,7  | K/W   |
| M <sub>s</sub>                   | to heat sink M1                                                      |                                             |      |      | 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.







Case T5 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)

