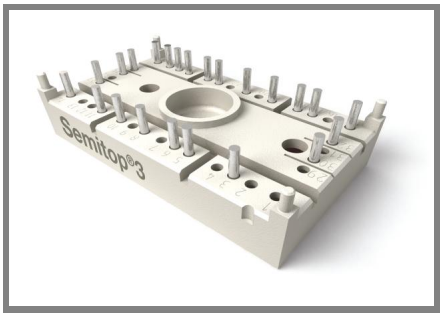
# SK71GB065TF




**SEMITOP® 3**

## IGBT Module

**SK71GB065TF**

Target Data

### Features

- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonding aluminium oxide ceramic (DBC)
- High short circuit capability
- Low tail current with low temperature dependence
- Hyperfast diodes
- Integrated NTC temperature sensor

### Typical Applications

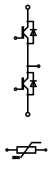
- Switching (not for linear use)
- Inverter
- Switched mode power supplies
- UPS

### Remarks

- $V_F$ = chip level value

| Absolute Maximum Ratings | | | $T_s$ = 25 °C, unless otherwise specified | |
|---|---|---|---|---|
| **Symbol** | **Conditions** | | **Values** | **Units** |
| **IGBT** | | | | |
| $V_{CES}$ | $T_j$ = 25 °C | | 600 | V |
| $I_C$ | $T_j$ = 125 °C | $T_s$ = 25 °C | 100 | A |
| | | $T_s$ = 80 °C | 70 | A |
| $I_{CRM}$ | $I_{CRM}$= 2 x $I_{Cnom}$ | | 200 | A |
| $V_{GES}$ | | | ± 20 | V |
| $t_{psc}$ | $V_{CC}$ = 300 V; $V_{GE} \leq$ 20 V; $V_{CES}$ < 600 V | $T_j$ = 125 °C | 10 | µs |
| **Inverse Diode** | | | | |
| $I_F$ | $T_j$ = 150 °C | $T_s$ = 25 °C | 45 | A |
| | | $T_s$ = 80 °C | 30 | A |
| $I_{FRM}$ | $I_{FRM}$= 2 x $I_{Fnom}$ | | 60 | A |
| **Module** | | | | |
| $I_{t(RMS)}$ | | | | A |
| $T_{vj}$ | | | -40 ... +150 | °C |
| $T_{stg}$ | | | -40 ... +125 | °C |
| $V_{isol}$ | AC, 1 min. | | 2500 | V |

| Characteristics | | | $T_s$ = 25 °C, unless otherwise specified | | | |
|---|---|---|---|---|---|---|
| **Symbol** | **Conditions** | | **min.** | **typ.** | **max.** | **Units** |
| **IGBT** | | | | | | |
| $V_{GE(th)}$ | $V_{GE}$ = $V_{CE}$, $I_C$ = 2 mA | | 3 | 4 | 5 | V |
| $I_{CES}$ | $V_{GE}$ = 600 V, $V_{CE}$ = $V_{CES}$ | $T_j$ = 25 °C | | | 0,3 | mA |
| $I_{GES}$ | $V_{CE}$ = 0 V, $V_{GE}$ = 20 V | $T_j$ = 25 °C | | | 240 | nA |
| $V_{CE0}$ | | $T_j$ = 25 °C | | 1,2 | 1,3 | V |
| | | $T_j$ = 125 °C | | 1,1 | 1,2 | V |
| $r_{CE}$ | $V_{GE}$ = 15 V | $T_j$ = 25°C | | | 12 | mΩ |
| | | $T_j$ = 125°C | | | 15 | mΩ |
| $V_{CE(sat)}$ | $I_{Cnom}$ = 100 A, $V_{GE}$ = 15 V | $T_j$ = 25°C$_{chiplev.}$ | | 2 | 2,5 | V |
| | | $T_j$ = 125°C$_{chiplev.}$ | | 2,2 | 2,7 | V |
| $C_{ies}$ | $V_{CE}$ = 25, $V_{GE}$ = 0 V | f = 1 MHz | | 5,2 | | nF |
| $C_{oes}$ | | | | 0,5 | | nF |
| $C_{res}$ | | | | 0,3 | | nF |
| $Q_G$ | $V_{GE}$=0 ... 20 V | | | 1000 | | nC |
| $t_{d(on)}$ | $R_{Gon}$ = 6,2 Ω | $V_{CC}$ = 400V | | 71 | | ns |
| $t_r$ | | $I_{Cnom}$= 60A | | 22 | | ns |
| $E_{on}$ | | $T_j$ = 125 °C | | 1,26 | | mJ |
| $t_{d(off)}$ | $R_{Goff}$ = 6,2 Ω | $V_{GE}$=±15V | | 338 | | ns |
| $t_f$ | | | | 40 | | ns |
| $E_{off}$ | | | | 2,08 | | mJ |
| $R_{th(j-s)}$ | per IGBT | | | | 0,5 | K/W |



**GB-T**

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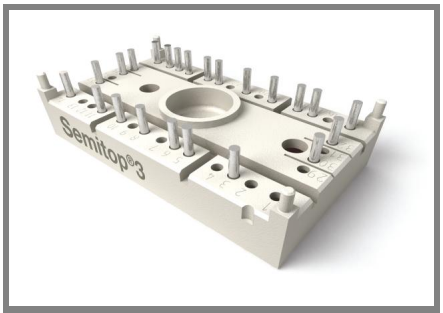


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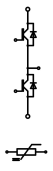


**GB-T**

**Characteristics**

| Symbol | Conditions | | min. | typ. | max. | Units |
|---|---|---|---|---|---|---|
| **Inverse Diode** | | | | | | |
| $V_F = V_{EC}$ | $I_{Fnom}$ = 30 A; $V_{GE}$ = 0 V | $T_j$ = 25 °$C_{chiplev.}$ | | 1,1 | 1,6 | V |
| | | $T_j$ = 125 °$C_{chiplev.}$ | | | 1,2 | V |
| $V_{F0}$ | | $T_j$ = 150 °C | | 0,85 | | V |
| $r_F$ | | $T_j$ = 150 °C | | 12 | | mΩ |
| $I_{RRM}$ | $I_{Fnom}$ = 30 A | $T_j$ = 125 °C | | 25 | | A |
| $Q_{rr}$ | di/dt = 500 A/µs | | | 1 | | µC |
| $E_{rr}$ | $V_{CC}$=400V | | | 1 | | mJ |
| $R_{th(j-s)D}$ | per diode | | | | 1,8 | K/W |
| $M_s$ | to heat sink | | 2,25 | | 2,5 | Nm |
| w | | | | 30 | | g |
| **Temperature sensor** | | | | | | |
| $R_{100}$ | $T_s$=100°C ($R_{25}$=5kΩ) | | | 493±5% | | Ω |

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.

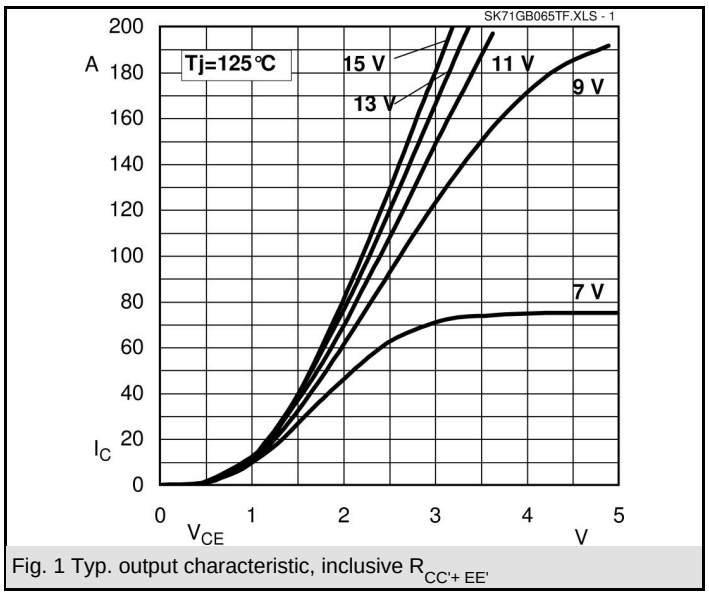



Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

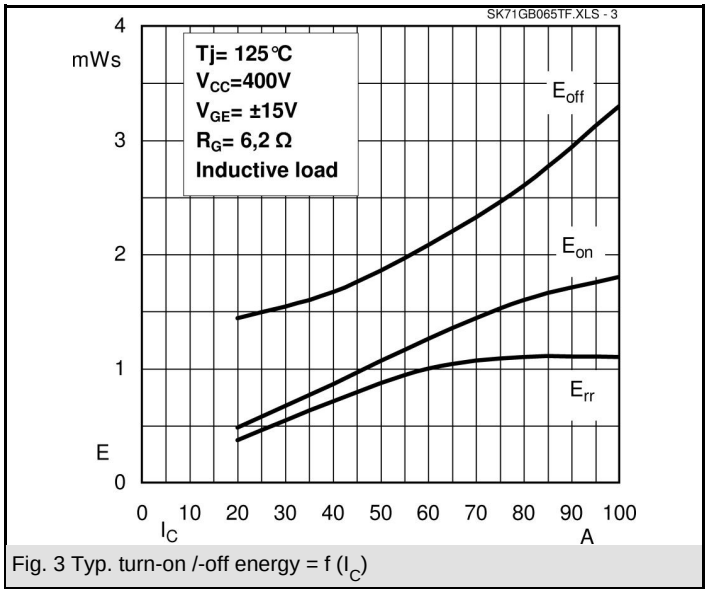



Fig. 3 Typ. turn-on /-off energy = f ($I_C$)

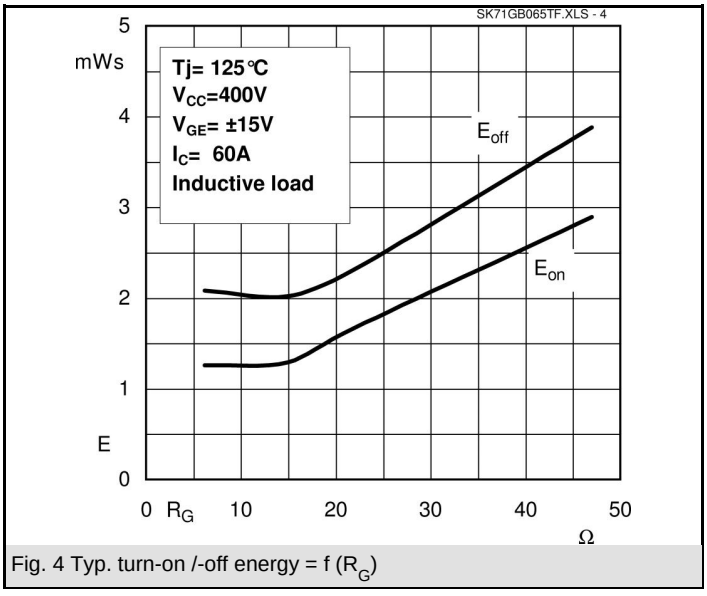



Fig. 4 Typ. turn-on /-off energy = f ($R_G$)

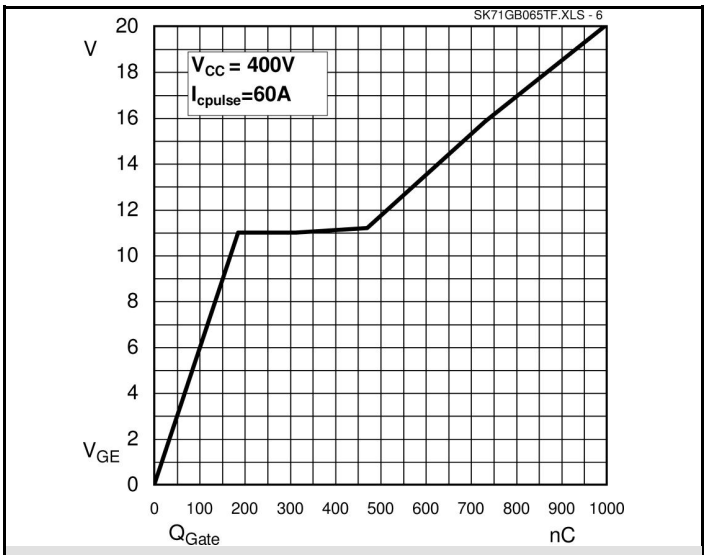



Fig. 6 Typ. gate charge characteristic

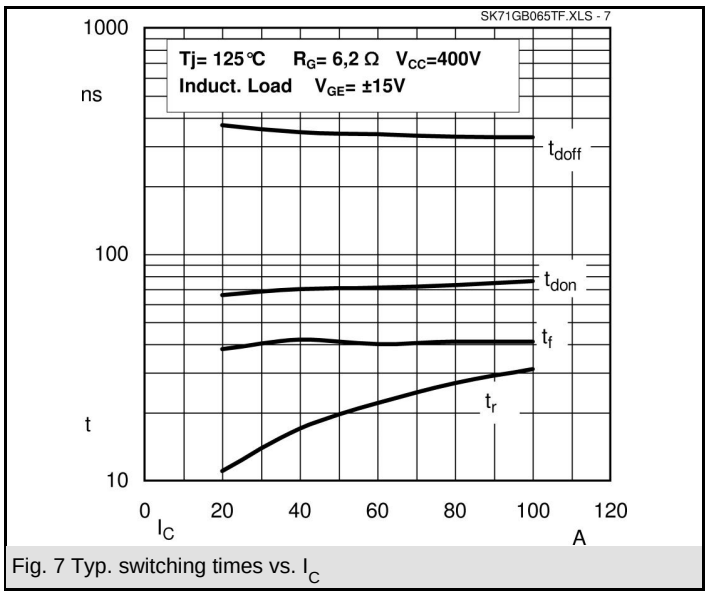



Fig. 7 Typ. switching times vs. $I_C$

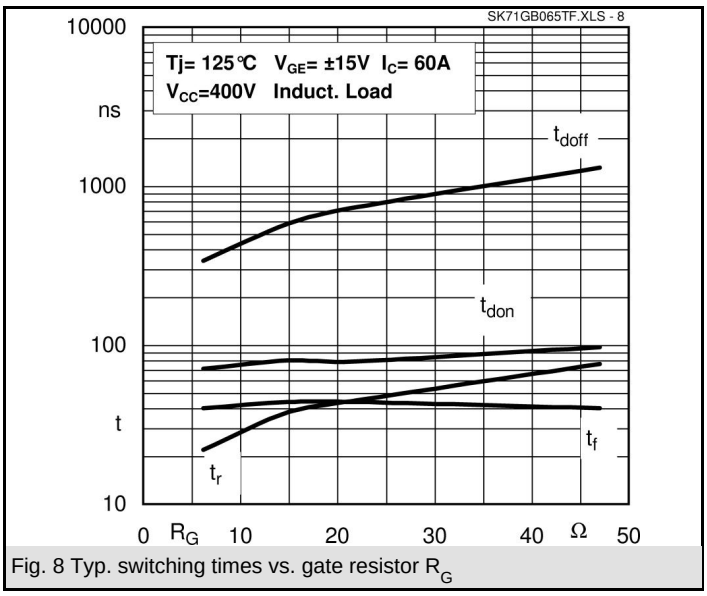



Fig. 8 Typ. switching times vs. gate resistor $R_G$

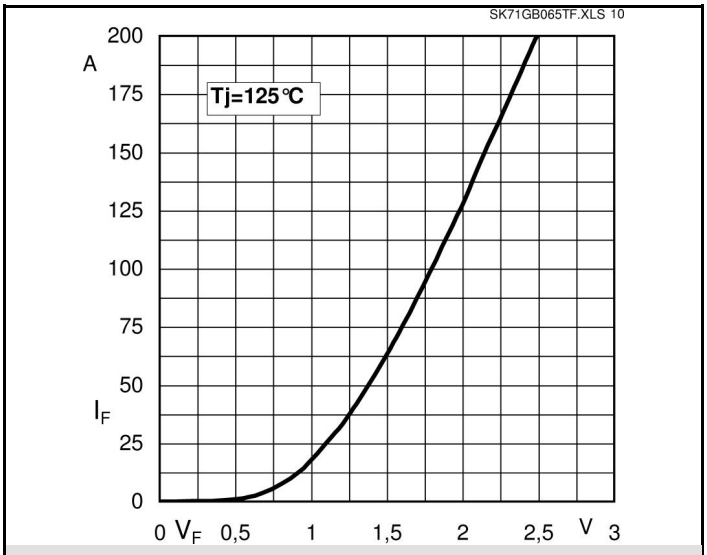
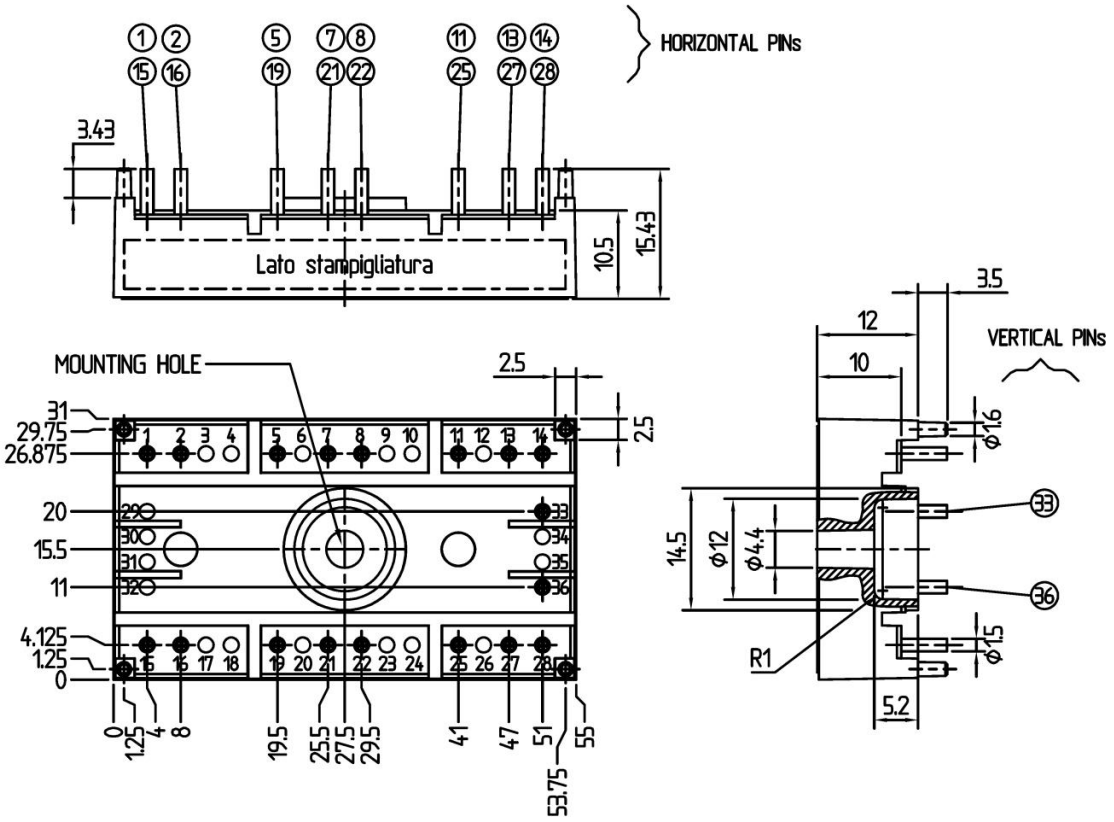



Fig. 10 CAL diode forward characteristic

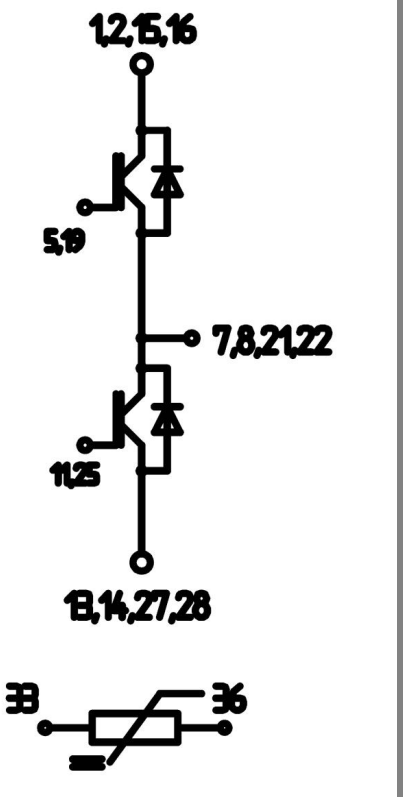
 

UL Recognized
File no. E 63 532

Dimensions in mm




Case T78 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)




Case T78 GB-TF