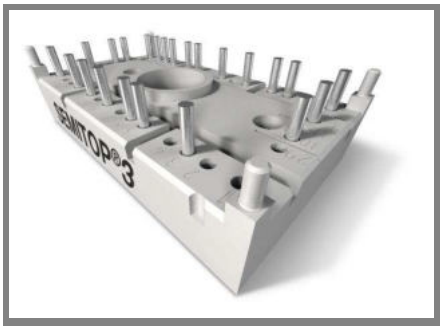


**SEMITOP® 3**

# IGBT Module

**SK75GB12T4 T**

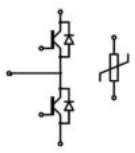
## Features

- One screw mounting module
- Trench4 IGBT technology
- CAL4 technology FWD
- Integrated NTC temperature sensor

## Typical Applications*

## Remarks

- $V_{CE,sat}$ , $V_F$ = chip level value



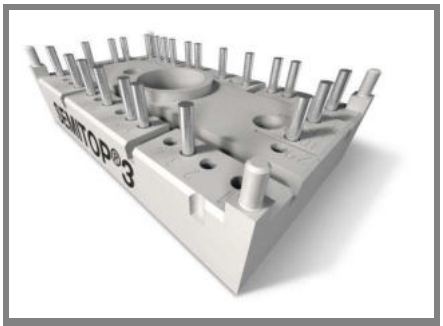
**GB-T**

| **Absolute Maximum Ratings** | | | $T_s$ = 25 °C, unless otherwise specified | |
|---|---|---|---|---|
| **Symbol** | **Conditions** | | **Values** | **Units** |
| **IGBT** | | | | |
| $V_{CES}$ | $T_j$ = 25 °C | | 1200 | V |
| $I_C$ | $T_j$ = 175 °C | $T_s$ = 25 °C | 80 | A |
| | | $T_s$ = 70 °C | 65 | A |
| $I_{CRM}$ | $I_{CRM}$= 3 x $I_{Cnom}$ | | 225 | A |
| $V_{GES}$ | | | ± 20 | V |
| $t_{psc}$ | $V_{CC}$ = 800 V; $V_{GE} \leq$ 15 V; $V_{CES}$ < 1200 V | $T_j$ = 150 °C | 10 | µs |
| **Inverse Diode** | | | | |
| $I_F$ | $T_j$ = 175 °C | $T_s$ = 25 °C | 70 | A |
| | | $T_s$ = 70 °C | 55 | A |
| $I_{FRM}$ | $I_{FRM}$= 3 x $I_{Fnom}$ | | 225 | A |
| $I_{FSM}$ | $t_p$ = 10 ms; half sine wave | $T_j$ = 150 °C | 425 | A |
| **Module** | | | | |
| $I_{t(RMS)}$ | | | | A |
| $T_{vj}$ | | | -40 ... +175 | °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** | | | | | | |
| $V_{GE(th)}$ | $V_{GE}$ = $V_{CE}$, $I_C$ = 3 mA | | 5 | 5,8 | 6,5 | V |
| $I_{CES}$ | $V_{GE}$ = 0 V, $V_{CE}$ = $V_{CES}$ | $T_j$ = 25 °C | | | **1** | mA |
| | | $T_j$ = 125 °C | | | | mA |
| $I_{GES}$ | $V_{CE}$ = 0 V, $V_{GE}$ = 20 V | $T_j$ = 25 °C | | | 600 | nA |
| | | $T_j$ = 125 °C | | | | nA |
| $V_{CE0}$ | | $T_j$ = 25 °C | | 1,1 | 1,3 | V |
| | | $T_j$ = 150 °C | | 1 | 1,2 | V |
| $r_{CE}$ | $V_{GE}$ = 15 V | $T_j$ = 25°C | | 10 | | mΩ |
| | | $T_j$ = 150°C | | 16 | | mΩ |
| $V_{CE(sat)}$ | $I_{Cnom}$ = 75 A, $V_{GE}$ = 15 V | $T_j$ = 25°C$_{chiplev.}$ | | 1,85 | 2,05 | V |
| | | $T_j$ = 150°C$_{chiplev.}$ | | 2,25 | 2,45 | V |
| $C_{ies}$ | $V_{CE}$ = 25, $V_{GE}$ = 0 V | f = 1 MHz | | 4,4 | | nF |
| $C_{oes}$ | | | | 0,29 | | nF |
| $C_{res}$ | | | | 0,235 | | nF |
| $Q_G$ | $V_{GE}$=-7V...+15V | | | 570 | | nC |
| $R_{Gint}$ | $T_j$ = 25 °C | | | 10 | | Ω |
| $t_{d(on)}$ | $R_{Gon}$ = 24 Ω<br>di/dt = 1360 A/µs | $V_{CC}$ = 600V<br>$I_C$= 75A<br>$T_j$ = 150 °C<br>$V_{GE}$= -7/+15V | | 63 | | ns |
| $t_r$ | | | | 65 | | ns |
| $E_{on}$ | | | | 13,6 | | mJ |
| $t_{d(off)}$ | $R_{Goff}$ = 24 Ω | | | 521 | | ns |
| $t_f$ | | | | 80 | | ns |
| $E_{off}$ | | | | 8,2 | | mJ |
| $R_{th(j-s)}$ | per IGBT | | | 0,74 | | K/W |

# SK75GB12T4T



**SEMITOP® 3**

## IGBT Module

**SK75GB12T4 T**

### Features

- One screw mounting module
- Trench4 IGBT technology
- CAL4 technology FWD
- Integrated NTC temperature sensor

### Typical Applications*

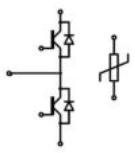
### Remarks

- $V_{CE,sat}$ , $V_F$ = chip level value

| Characteristics | | | | | | |
|---|---|---|---|---|---|---|
| **Symbol** | **Conditions** | | **min.** | **typ.** | **max.** | **Units** |
| **Inverse Diode** | | | | | | |
| $V_F = V_{EC}$ | $I_{Fnom}$ = 75 A; $V_{GE}$ = 0 V | $T_j$ = 25 °C$_{chiplev.}$ | | 2,1 | 2,5 | V |
| | | $T_j$ = 150 °C$_{chiplev.}$ | | 2,4 | 2,5 | V |
| $V_{F0}$ | | $T_j$ = 25 °C | | 1,3 | 1,5 | V |
| | | $T_j$ = 150 °C | | 0,9 | 1,1 | V |
| $r_F$ | | $T_j$ = 25 °C | | 12 | 13,3 | mΩ |
| | | $T_j$ = 150 °C | | 16 | 17,3 | mΩ |
| $I_{RRM}$ | $I_F$ = 75 A | $T_j$ = 150 °C | | 41 | | A |
| $Q_{rr}$ | di/dt = 1360 A/µs | | | 10,6 | | µC |
| $E_{rr}$ | $V_{CC}$= 600V | | | 3,39 | | mJ |
| $R_{th(j-s)D}$ | per diode | | | 0,97 | | K/W |
| $M_s$ | to heat sink | | | | 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.

* 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 personal.



**GB-T**

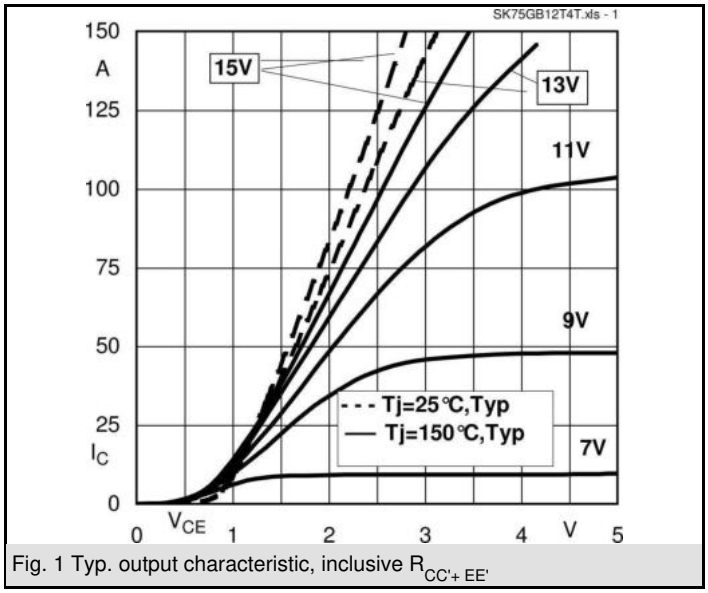



Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

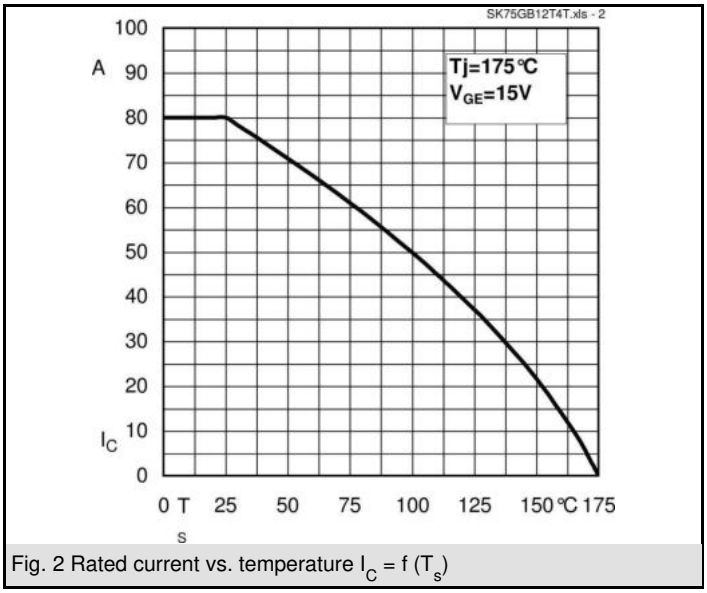



Fig. 2 Rated current vs. temperature $I_C = f(T_s)$

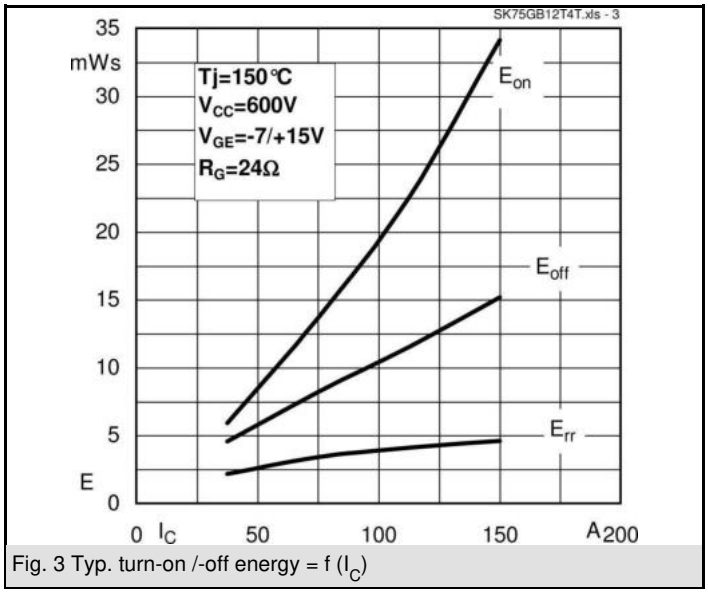



Fig. 3 Typ. turn-on /-off energy = f ($I_C$)

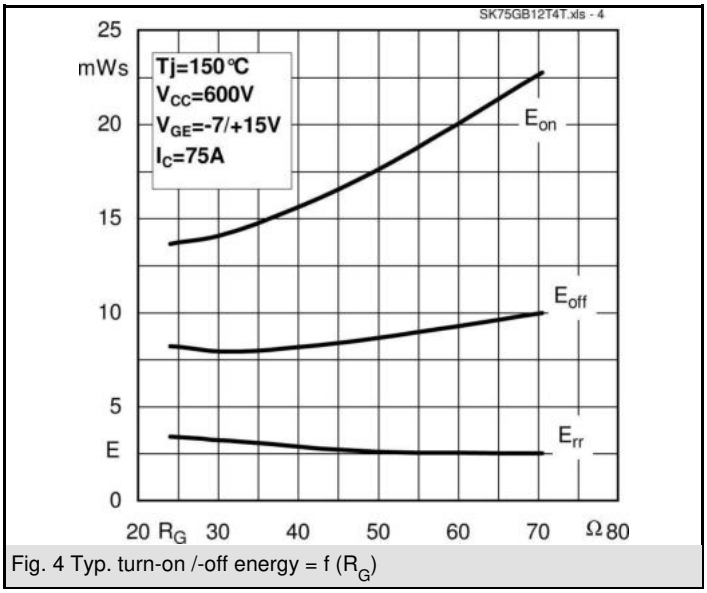



Fig. 4 Typ. turn-on /-off energy = f ($R_G$)

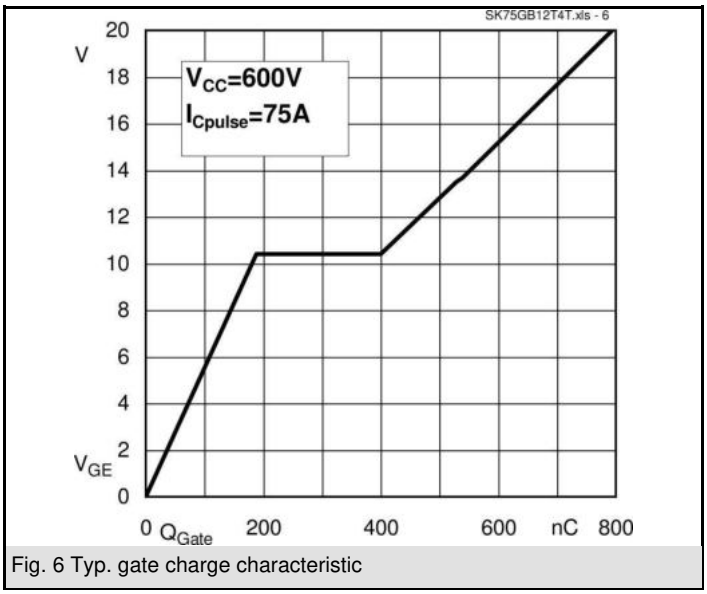



Fig. 6 Typ. gate charge characteristic

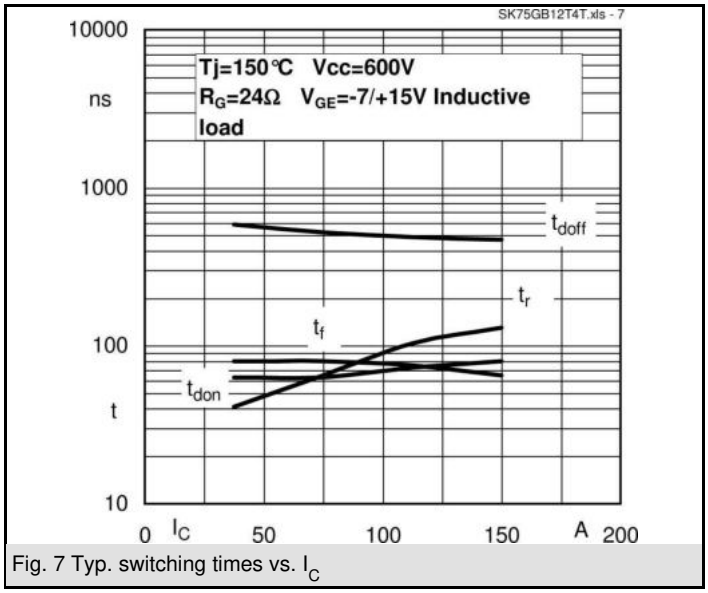



Fig. 7 Typ. switching times vs. $I_C$

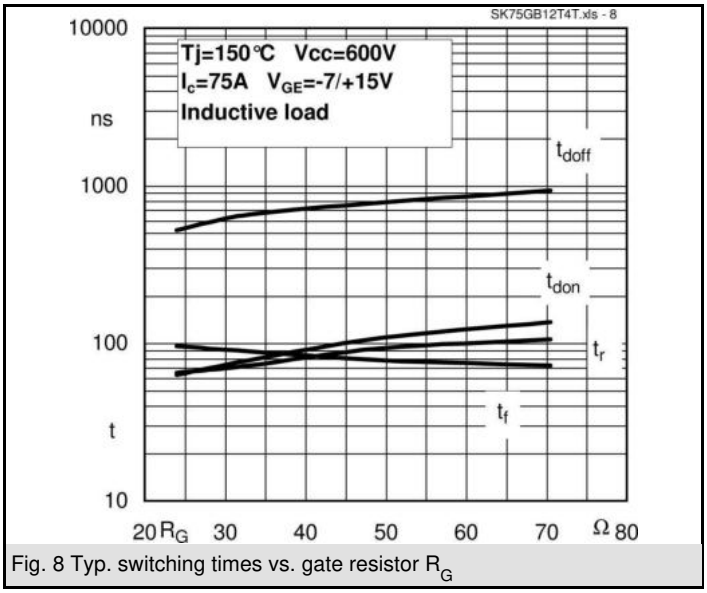



Fig. 8 Typ. switching times vs. gate resistor $R_G$

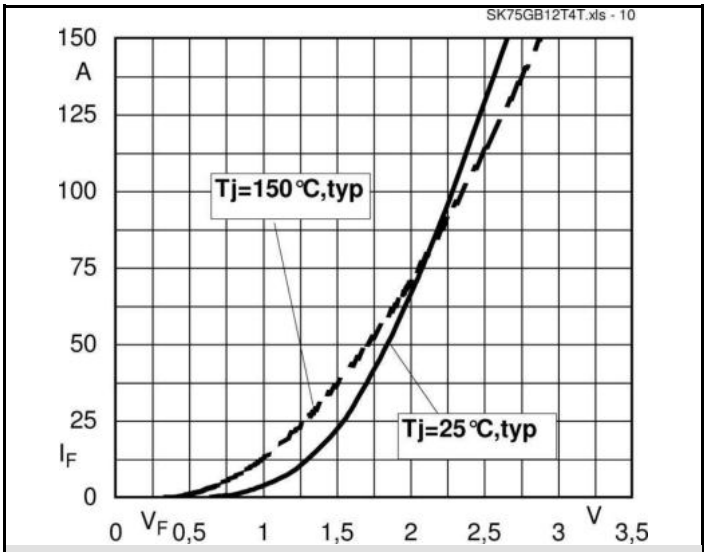
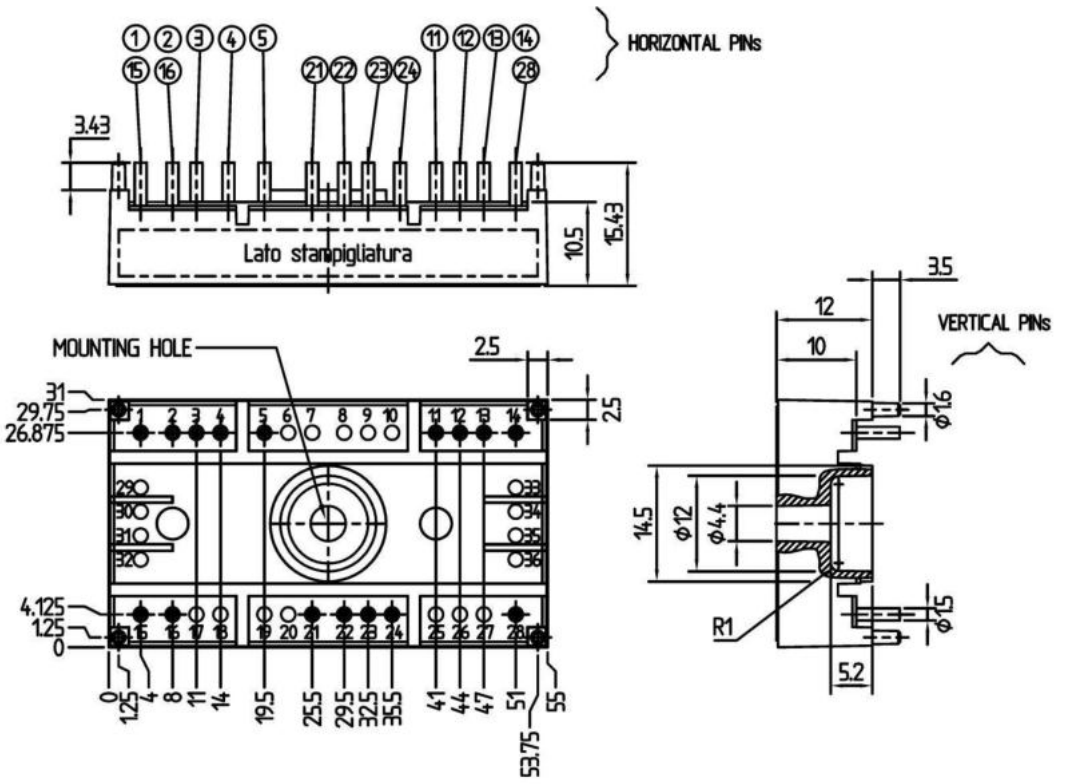
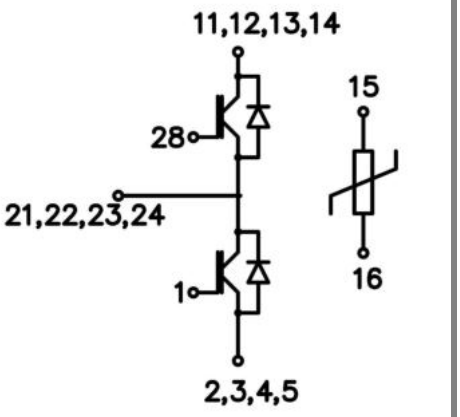



Fig. 10 CAL diode forward characteristic




Case T73 (Suggested hole diameter for the solder pins and mounting plastic pins: 2mm)




Case T73 GB-T

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