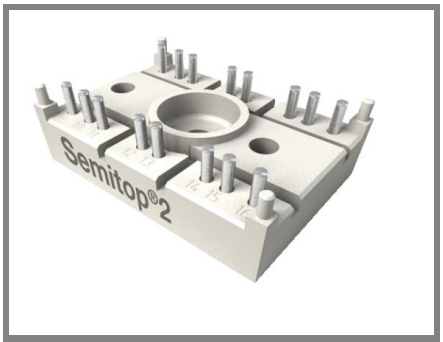
# SK10GH123




**SEMITOP® 2**

## IGBT Module

**SK10GH123**

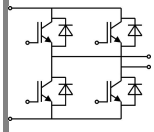
Preliminary Data

### 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 punch-through 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



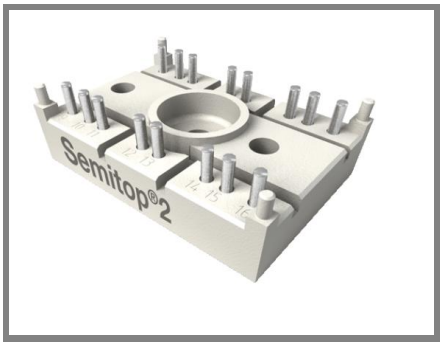
**GH**

| **Absolute Maximum Ratings** | | | $T_s$ = 25 °C, unless otherwise specified | |
|---|---|---|---|---|
| **Symbol** | **Conditions** | | **Values** | **Units** |
| **IGBT** | | | | |
| $V_{CES}$ | $T_j$ = 25 °C | | 1200 | V |
| $I_C$ | $T_j$ = 125 °C | $T_s$ = 25 °C | 16 | A |
| | | $T_s$ = 80 °C | 11 | A |
| $I_{CRM}$ | $I_{CRM}$= 2 x $I_{Cnom}$ | | 16 | A |
| $V_{GES}$ | | | ± 20 | V |
| $t_{psc}$ | $V_{CC}$ = 600 V; $V_{GE} \leq$ 20 V; $V_{CES}$ < 1200 V | $T_j$ = 125 °C | 10 | µs |
| **Inverse Diode** | | | | |
| $I_F$ | $T_j$ = 150 °C | $T_s$ = 25 °C | 18 | A |
| | | $T_s$ = 80 °C | 12 | A |
| $I_{FRM}$ | $I_{FRM}$= 2 x $I_{Fnom}$ | | | A |
| $I_{FSM}$ | $t_p$ = 10 ms; half sine wave | $T_j$ = 150 °C | 125 | 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** | | | | | | |
| $V_{GE(th)}$ | $V_{GE}$ = $V_{CE}$, $I_C$ = 0,35 mA | | 4,5 | 5,5 | 6,5 | V |
| $I_{CES}$ | $V_{GE}$ = 0 V, $V_{CE}$ = $V_{CES}$ | $T_j$ = 25 °C | | | 0,05 | mA |
| | | $T_j$ = 125 °C | | | | mA |
| $I_{GES}$ | $V_{CE}$ = 0 V, $V_{GE}$ = 30 V | $T_j$ = 25 °C | | | 120 | nA |
| | | $T_j$ = 125 °C | | | | nA |
| $V_{CE0}$ | | $T_j$ = 25 °C | | 1,2 | | V |
| | | $T_j$ = 125 °C | | 1,2 | | V |
| $r_{CE}$ | $V_{GE}$ = 15 V | $T_j$ = 25°C | | 150 | | mΩ |
| | | $T_j$ = 125°C | | 210 | | mΩ |
| $V_{CE(sat)}$ | $I_{Cnom}$ = 10 A, $V_{GE}$ = 15 V | $T_j$ = 25°C$_{chiplev.}$ | | 2,7 | 3,2 | V |
| | | $T_j$ = 125°C$_{chiplev.}$ | | 3,3 | 3,9 | V |
| $C_{ies}$ | $V_{CE}$ = 25, $V_{GE}$ = 0 V | f = 1 MHz | | 0,6 | | nF |
| $C_{oes}$ | | | | 0,06 | | nF |
| $C_{res}$ | | | | 0,038 | | nF |
| $t_{d(on)}$ | $R_{Gon}$ = 50 Ω | $V_{CC}$ = 600V | | 30 | | ns |
| $t_r$ | | $I_{Cnom}$= 10A | | 45 | | ns |
| $E_{on}$ | | $T_j$ = 125 °C | | 1,3 | | mJ |
| $t_{d(off)}$ | $R_{Goff}$ = 50 Ω | $V_{GE}$=±15V | | 200 | | ns |
| $t_f$ | | | | 35 | | ns |
| $E_{off}$ | | | | 1 | | mJ |
| $R_{th(j-s)}$ | per IGBT | | | | 1,8 | K/W |

# SK10GH123




**SEMITOP® 2**

## IGBT Module

**SK10GH123**

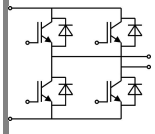
Preliminary Data

### 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 punch-through 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**

| Characteristics | | | | | | |
|---|---|---|---|---|---|---|
| **Symbol** | **Conditions** | | **min.** | **typ.** | **max.** | **Units** |
| **Inverse Diode** | | | | | | |
| $V_F = V_{EC}$ | $I_{Fnom}$ = 10 A; $V_{GE}$ = 0 V | $T_j$ = 25 °$C_{chiplev.}$ | | 2 | 2,5 | V |
| | | $T_j$ = 125 °$C_{chiplev.}$ | | 1,8 | 2,3 | V |
| $V_{F0}$ | | $T_j$ = 125 °C | | 1 | 1,2 | V |
| $r_F$ | | $T_j$ = 125 °C | | 80 | 110 | mΩ |
| $I_{RRM}$ | $I_{Fnom}$ = 10 A | $T_j$ = 125 °C | | 12 | | A |
| $Q_{rr}$ | di/dt = -300 A/µs | | | 1,8 | | µC |
| $E_{rr}$ | $V_{CC}$= 600V | | | 0,4 | | mJ |
| $R_{th(j-s)D}$ | per diode | | | | 2,1 | K/W |
| $M_s$ | 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.

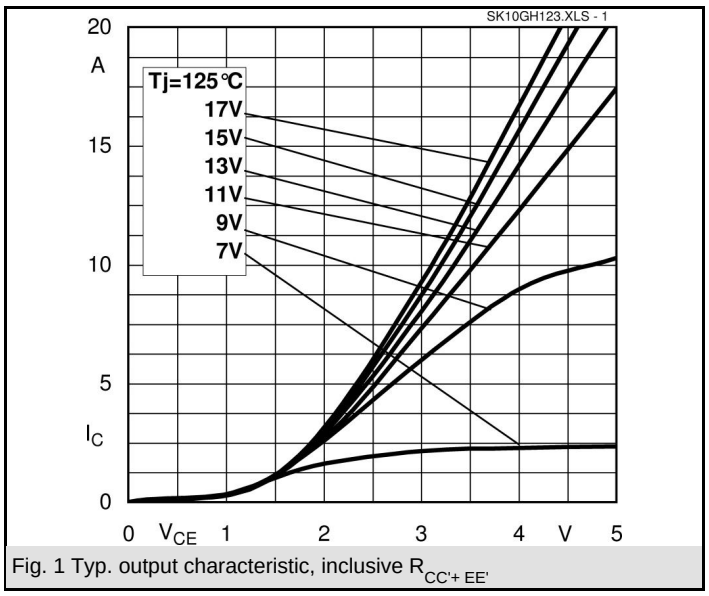



Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

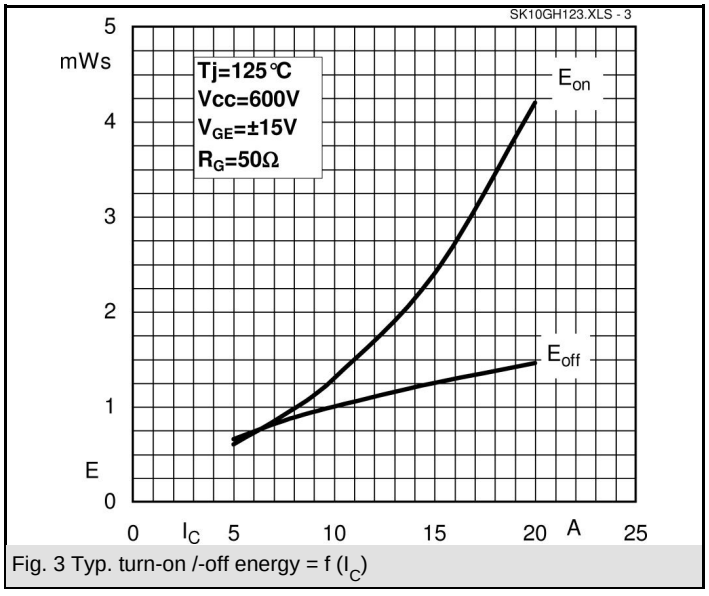



Fig. 3 Typ. turn-on /-off energy = f ($I_C$)

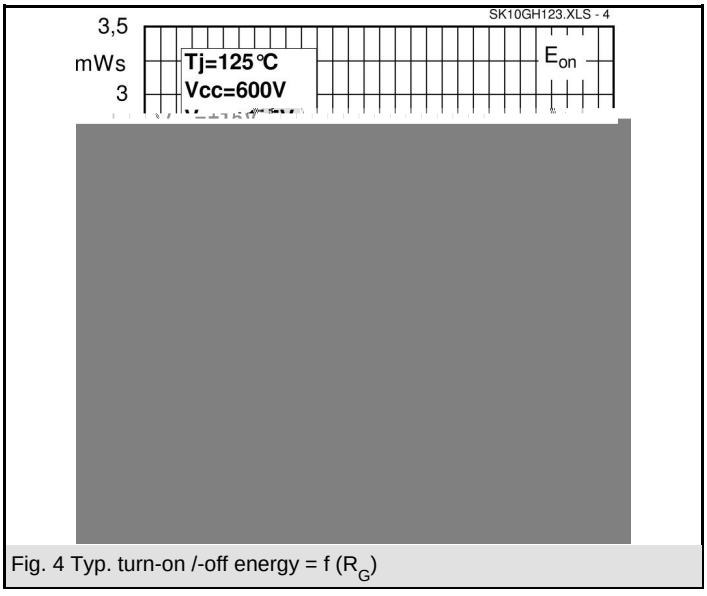



Fig. 4 Typ. turn-on /-off energy = f ($R_G$)

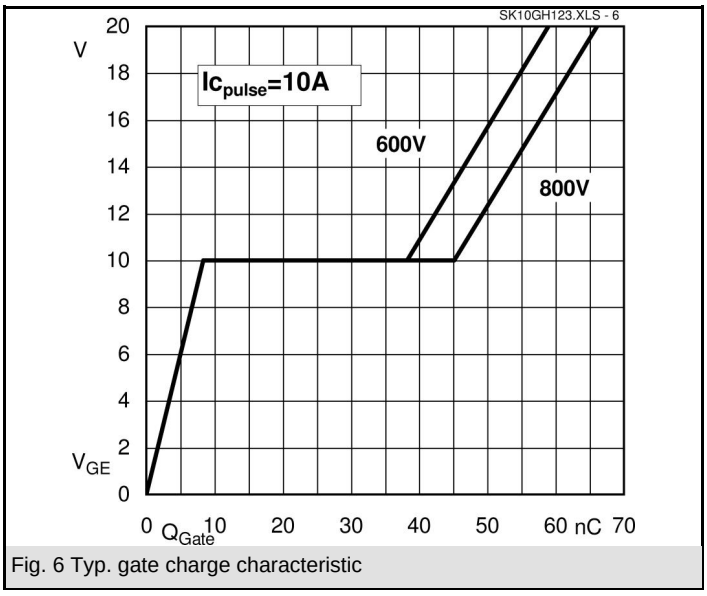



Fig. 6 Typ. gate charge characteristic

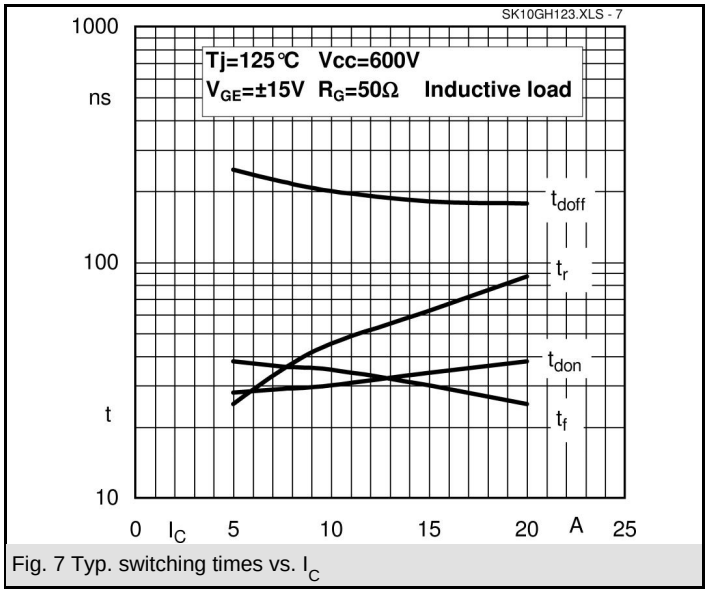



Fig. 7 Typ. switching times vs. $I_C$

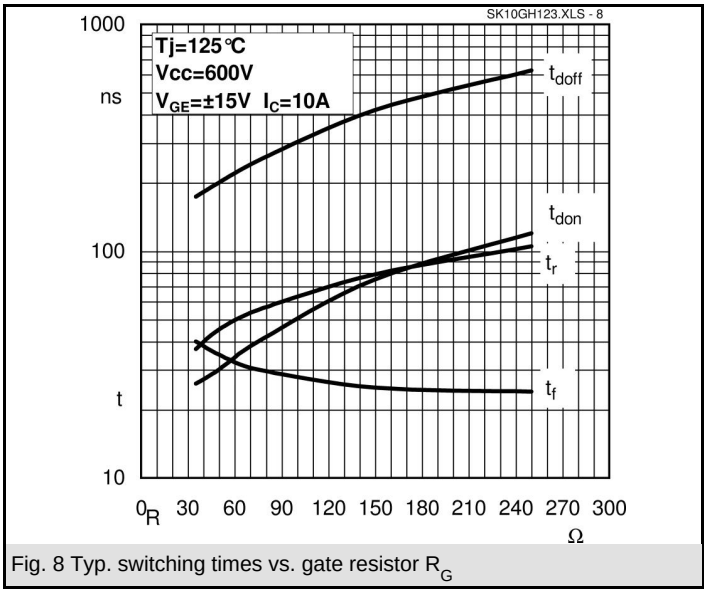



Fig. 8 Typ. switching times vs. gate resistor $R_G$

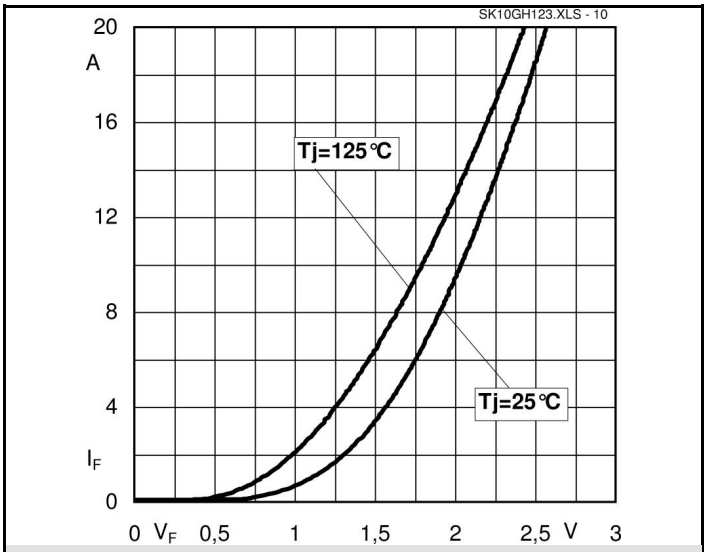
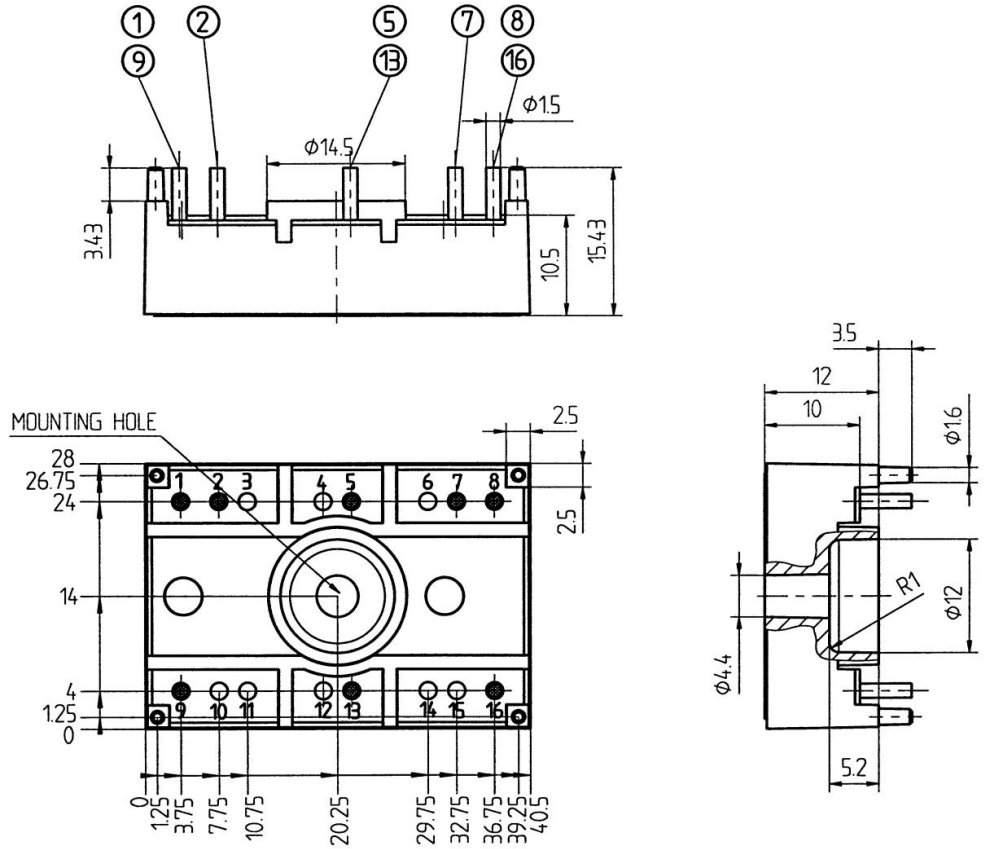


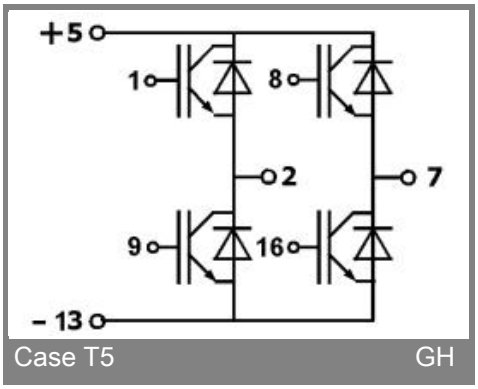

Fig. 10 CAL diode forward characteristic

UL recognized file no. E 63 532




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




Case T5 GH