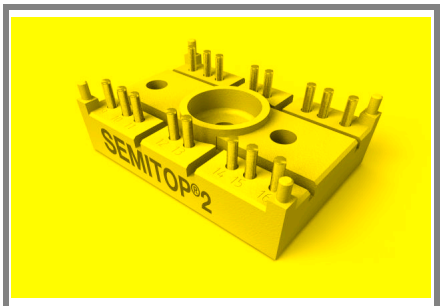
# SK50GB065




**SEMITOP® 2**

## IGBT Module

**SK50GB065**

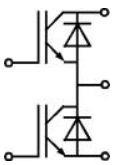
Preliminary Data

### 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)
- Low tail current with low temperature dependence
- Low treshold voltage

### Typical Applications

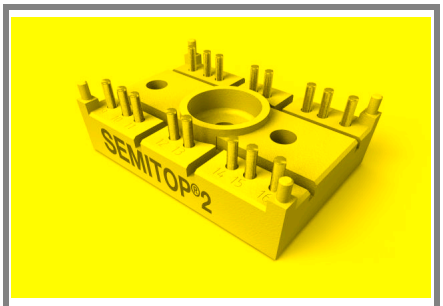
- Switching (not for linear use)
- Inverter
- Switched mode power supplies
- UPS



GB

| 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 | 54 | A |
| | | $T_s$ = 80 °C | 40 | A |
| $I_{CRM}$ | $I_{CRM}$= 2 x $I_{Cnom}$ | | 60 | 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 | 64 | A |
| | | $T_s$ = 80 °C | 48 | A |
| $I_{FRM}$ | $I_{FRM}$= 2 x $I_{Fnom}$ | | | A |
| $I_{FSM}$ | $t_p$ = 10 ms; half sine wave | $T_j$ = 150 °C | 200 | 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** | | | | | | |
| $V_{GE(th)}$ | $V_{GE}$ = $V_{CE}$, $I_C$ = 1,4 mA | | 3 | 4 | 5 | V |
| $I_{CES}$ | $V_{GE}$ = 0 V, $V_{CE}$ = $V_{CES}$ | $T_j$ = 25 °C | | | 0,0044 | mA |
| $I_{GES}$ | $V_{CE}$ = 0 V, $V_{GE}$ = 20 V | $T_j$ = 25 °C | | | 240 | nA |
| $V_{CE0}$ | | $T_j$ = 25 °C | | 1,1 | | V |
| | | $T_j$ = 125 °C | | 1,1 | | V |
| $r_{CE}$ | $V_{GE}$ = 15 V | $T_j$ = 25°C | | 15 | | mΩ |
| | | $T_j$ = 125°C | | 19 | | mΩ |
| $V_{CE(sat)}$ | $I_{Cnom}$ = 60 A, $V_{GE}$ = 15 V | $T_j$ = 25°C$_{chiplev.}$ | | 2 | 2,5 | V |
| | | $T_j$ = 125°C$_{chiplev.}$ | | 2,2 | | V |
| $C_{ies}$ | $V_{CE}$ = 25, $V_{GE}$ = 0 V | f = 1 MHz | | 3,2 | | nF |
| $C_{oes}$ | | | | 0,3 | | nF |
| $C_{res}$ | | | | 0,18 | | nF |
| $t_{d(on)}$ | $R_{Gon}$ = 16 Ω | $V_{CC}$ = 300V, $I_C$= 40A, $T_j$ = 125 °C, $V_{GE}$=±15V | | 60 | 80 | ns |
| $t_r$ | | | | 30 | 40 | ns |
| $E_{on}$ | | | | 1,1 | 1,4 | mJ |
| $t_{d(off)}$ | $R_{Goff}$ = 16 Ω | | | 220 | 280 | ns |
| $t_f$ | | | | 20 | 26 | ns |
| $E_{off}$ | | | | 0,7 | 0,9 | mJ |
| $R_{th(j-s)}$ | per IGBT | | | | 0,85 | K/W |

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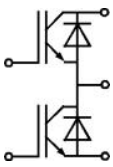

**GB**

| Characteristics | | | | | | |
|---|---|---|---|---|---|---|
| **Symbol** | **Conditions** | | **min.** | **typ.** | **max.** | **Units** |
| **Inverse Diode** | | | | | | |
| $V_F = V_{EC}$ | $I_{Fnom}$ = 50 A; $V_{GE}$ = 0 V | $T_j$ = 25 °$C_{chiplev.}$ | | 1,45 | 1,7 | V |
| | | $T_j$ = 150 °$C_{chiplev.}$ | | 1,4 | 1,75 | V |
| $V_{F0}$ | | $T_j$ = 25 °C | | | | V |
| | | $T_j$ = 125 °C | | 0,85 | 0,9 | V |
| $r_F$ | | $T_j$ = 25 °C | | | | mΩ |
| | | $T_j$ = 125 °C | | 11 | 16 | mΩ |
| $I_{RRM}$ | $I_F$ = 50 A | $T_j$ = 125 °C | | 40 | | A |
| $Q_{rr}$ | di/dt = -1000 A/µs | | | 3,6 | | µC |
| $E_{rr}$ | $V_{CC}$= 300V | | | 0,55 | | mJ |
| $R_{th(j-s)D}$ | per diode | | | | 1,1 | K/W |
| $M_s$ | to heat sink | | | | 2 | Nm |
| w | | | | 19 | | g |

This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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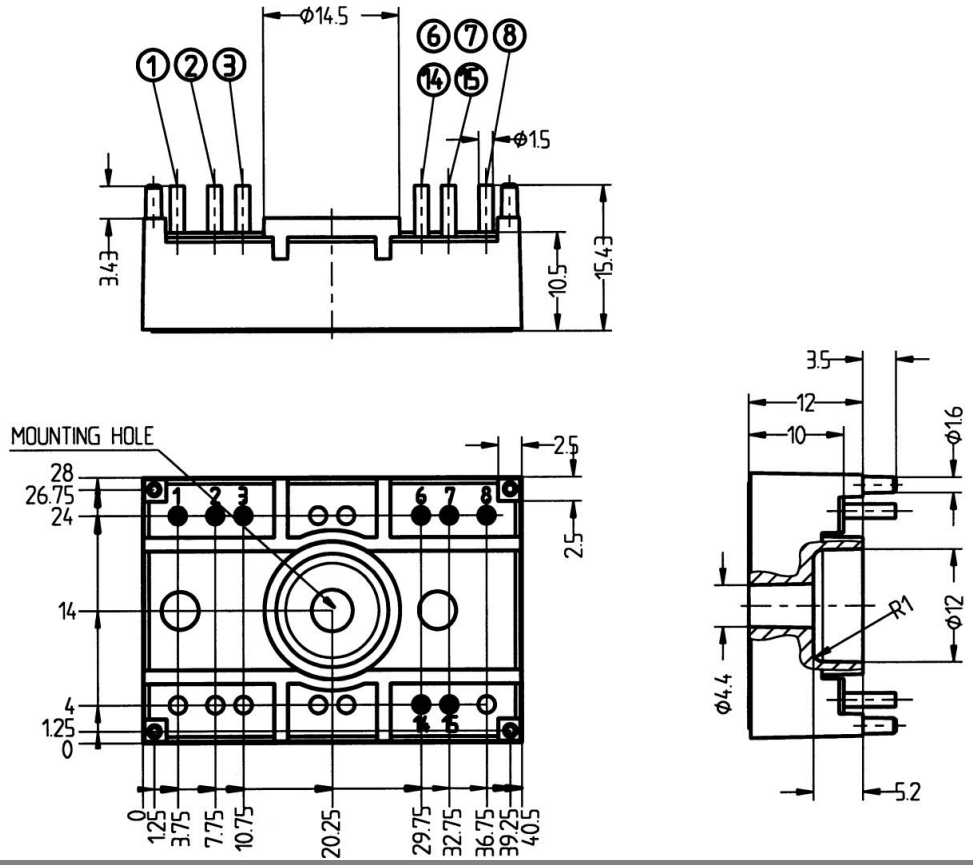
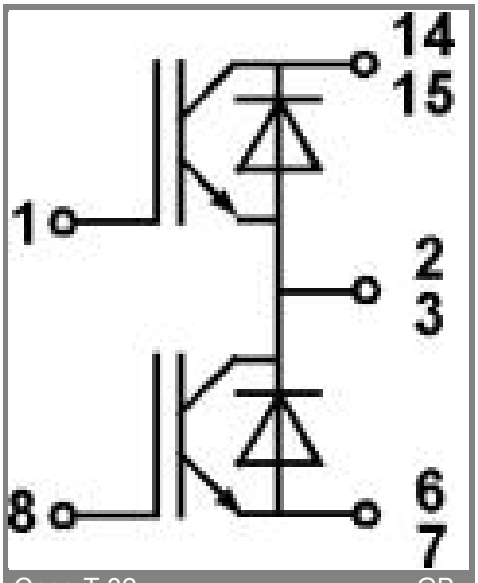
UL recognized file no. E 63 532




Case T32 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)




Case T 32 GB