

SEMITOP[®] 3

IGBT Module

SK10GD065ET

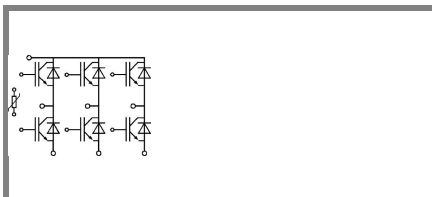
Preliminary Data

Features

- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- Ultrafast NPT technology IGBT
- CAL technology FWD
- Integrated NTC temperature sensor

Typical Applications

- Inverter

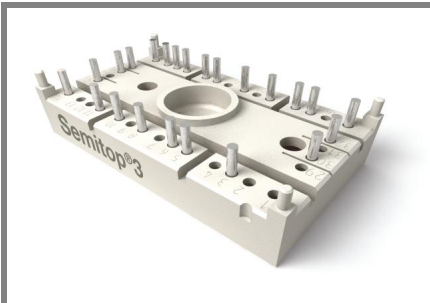


GD-ET

| Absolute Maximum Ratings | | $T_s = 25\text{ °C}$, unless otherwise specified | | | |
|--------------------------|---|---|----|--|--------------------|
| Symbol | Conditions | Values | | | Units |
| IGBT | | | | | |
| V_{CES} | $T_j = 25\text{ °C}$ | 600 | | | V |
| I_C | $T_j = 125\text{ °C}$ | $T_s = 25\text{ °C}$ | 17 | | A |
| | | $T_s = 80\text{ °C}$ | 11 | | A |
| I_{CRM} | $I_{CRM} = 2 \times I_{Cnom}$ | 20 | | | A |
| V_{GES} | | ± 20 | | | V |
| t_{psc} | $V_{CC} = 300\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ °C}$ $V_{CES} < 600\text{ V}$ | 10 | | | μs |
| Inverse Diode | | | | | |
| I_F | $T_j = 150\text{ °C}$ | $T_s = 25\text{ °C}$ | 22 | | A |
| | | $T_s = 80\text{ °C}$ | 15 | | A |
| I_{FRM} | $I_{FRM} = 2 \times I_{Fnom}$ | 30 | | | A |
| Module | | | | | |
| $I_{t(RMS)}$ | | | | | A |
| T_{vj} | | -40 ... +150 | | | $^{\circ}\text{C}$ |
| T_{stg} | | -40 ... +125 | | | $^{\circ}\text{C}$ |
| V_{isol} | AC, 1 min. | 2500 | | | V |

| Characteristics | | $T_s = 25\text{ °C}$, unless otherwise specified | | | |
|-----------------|--|---|--------|------|------------------|
| Symbol | Conditions | min. | typ. | max. | Units |
| IGBT | | | | | |
| $V_{GE(th)}$ | $V_{GE} = V_{CE}, I_C = 0,3\text{ mA}$ | 3 | 4 | 5 | V |
| I_{CES} | $V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$ | $T_j = 25\text{ °C}$ | 0,0008 | | mA |
| | | $T_j = 125\text{ °C}$ | | | mA |
| I_{GES} | $V_{CE} = 0\text{ V}, V_{GE} = 20\text{ V}$ | $T_j = 25\text{ °C}$ | 100 | | nA |
| | | $T_j = 125\text{ °C}$ | | | nA |
| V_{CE0} | | $T_j = 25\text{ °C}$ | 1,2 | 1,3 | V |
| | | $T_j = 125\text{ °C}$ | 1,1 | 0,9 | V |
| r_{CE} | $V_{GE} = 15\text{ V}$ | $T_j = 25\text{ °C}$ | 133 | 200 | $\text{m}\Omega$ |
| | | $T_j = 125\text{ °C}$ | 183 | | $\text{m}\Omega$ |
| $V_{CE(sat)}$ | $I_{Cnom} = 10\text{ A}, V_{GE} = 15\text{ V}$ | $T_j = 25\text{ °C}_{chiplev.}$ | 2 | 2,5 | V |
| | | $T_j = 125\text{ °C}_{chiplev.}$ | 2,2 | | V |
| C_{ies} | $V_{CE} = 25, V_{GE} = 0\text{ V}$ | $f = 1\text{ MHz}$ | 0,58 | | nF |
| C_{oes} | | | 0,07 | | nF |
| C_{res} | | | 0,05 | | nF |
| $t_{d(on)}$ | $R_{Gon} = 210\ \Omega$ | $V_{CC} = 300\text{ V}$ $I_{Cnom} = 6\text{ A}$ | 45 | | ns |
| t_r | | | 30 | | ns |
| E_{on} | $R_{Goff} = 210\ \Omega$ | $T_j = 125\text{ °C}$ $V_{GE} = \pm 15\text{ V}$ | 0,18 | | mJ |
| $t_{d(off)}$ | | | 340 | | ns |
| t_f | | | 25 | | ns |
| E_{off} | | | 0,13 | | mJ |
| $R_{th(j-s)}$ | per IGBT | 2 | | | K/W |

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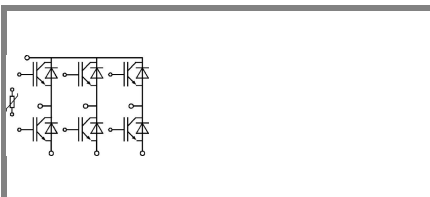
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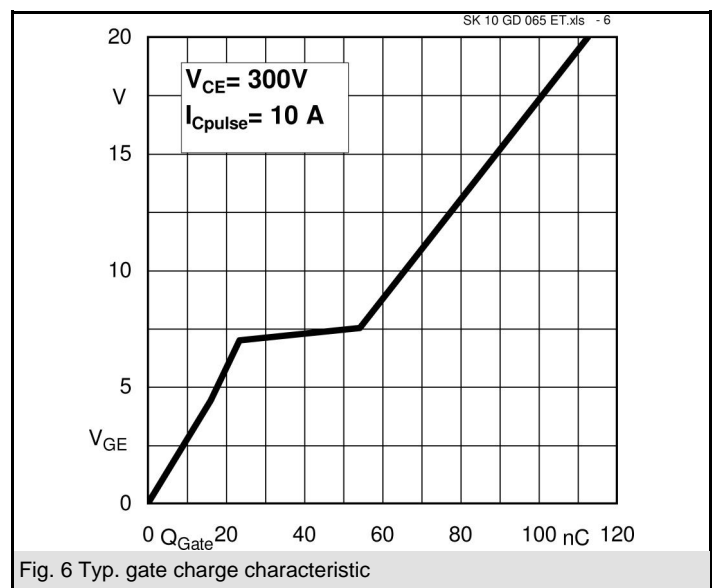
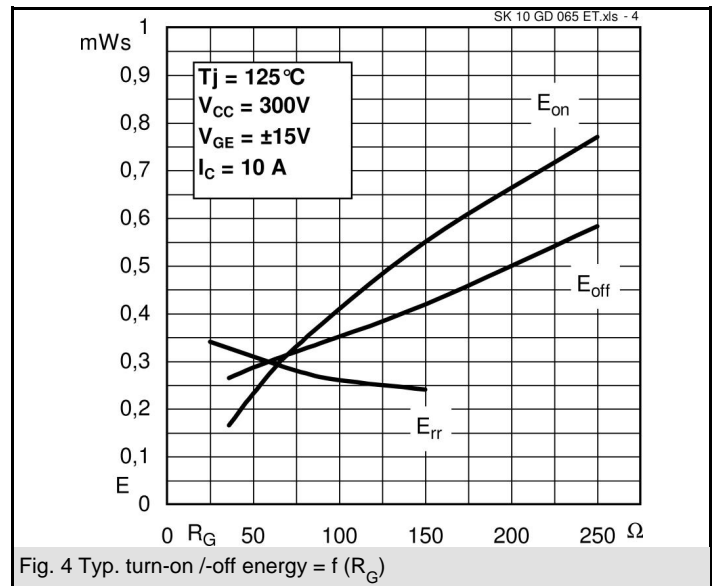
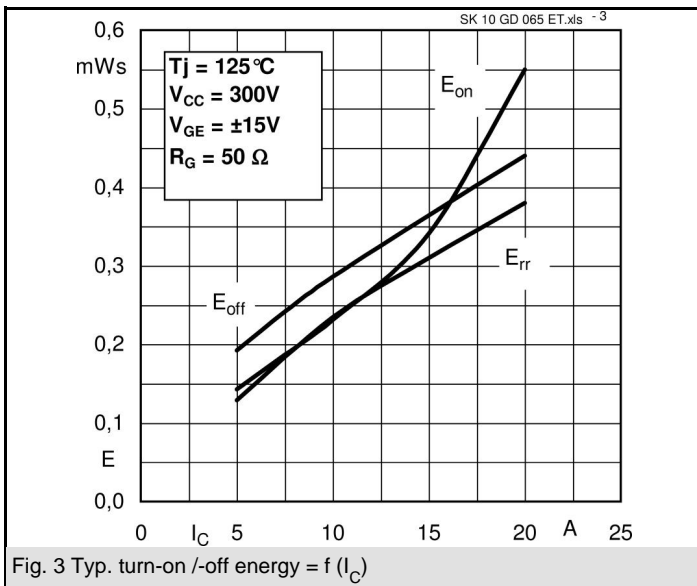
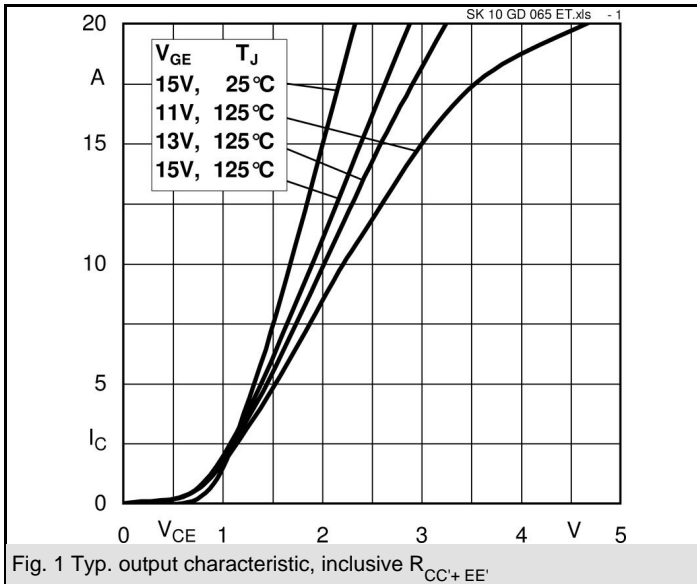


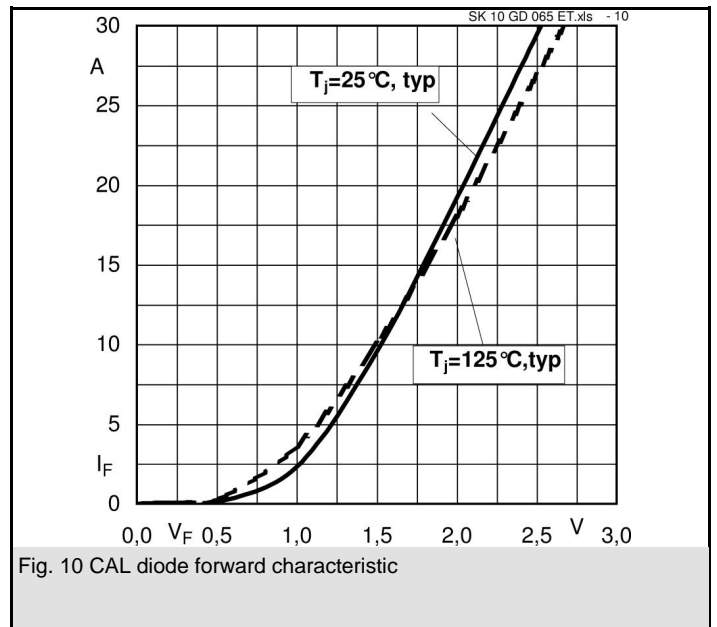
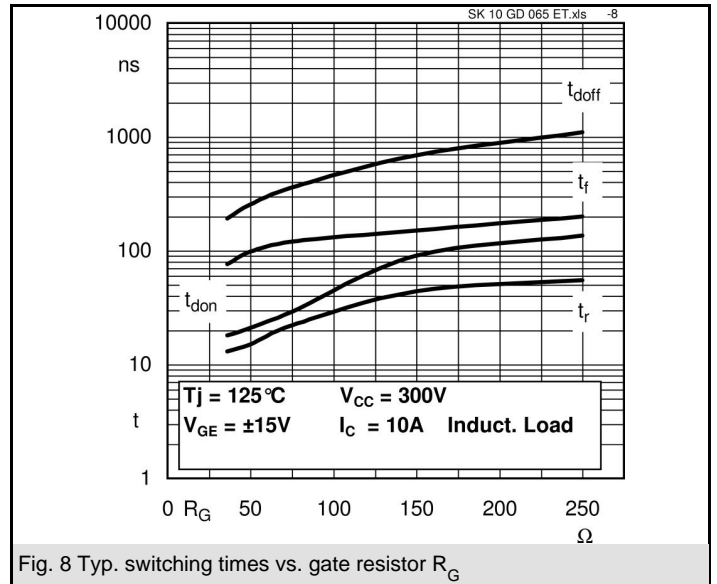
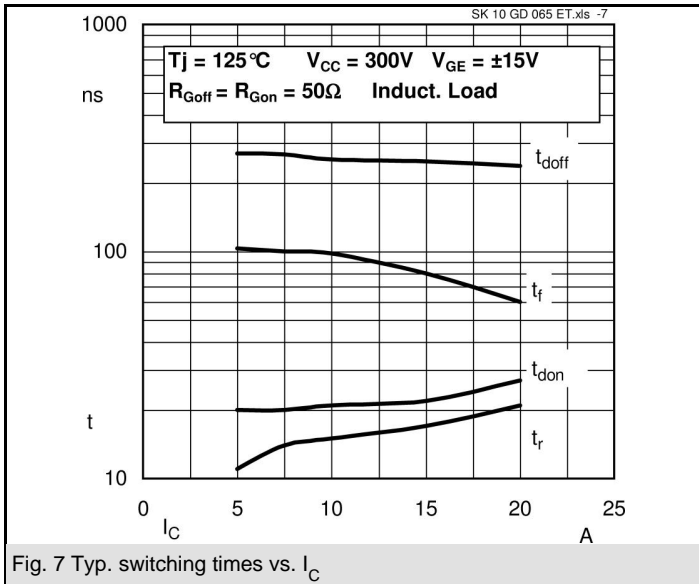
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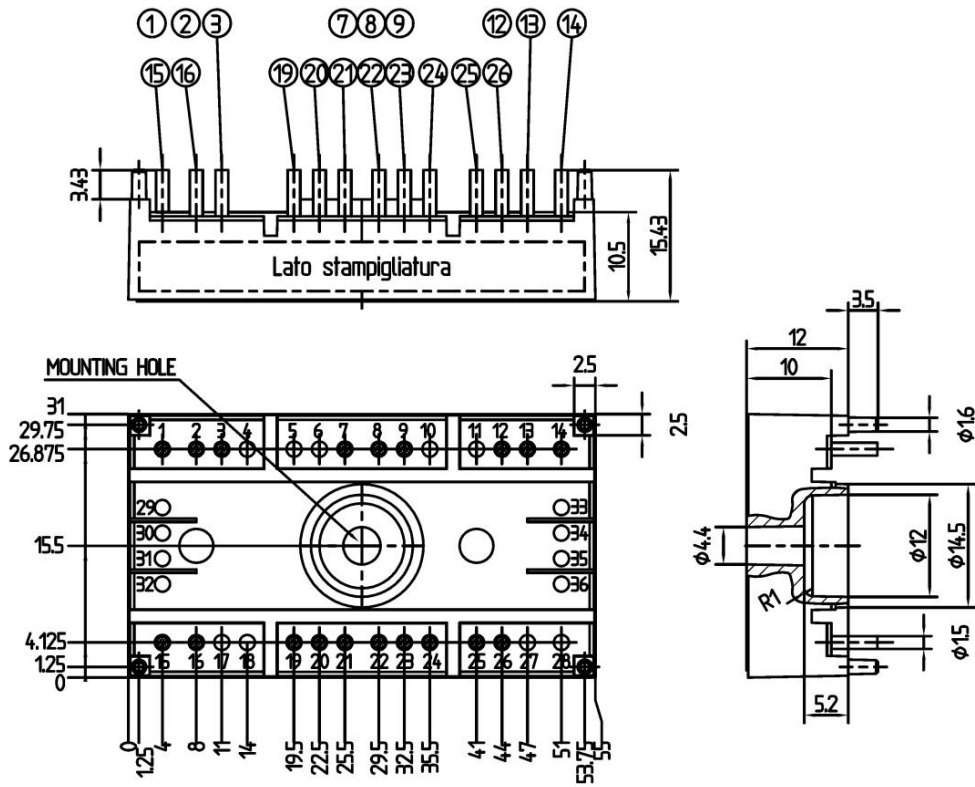
| Characteristics | | min. | typ. | max. | Units |
|---------------------------|--|------|--------|------|-------|
| Inverse Diode | | | | | |
| $V_F = V_{EC}$ | $I_{Fnom} = 6 \text{ A}; V_{GE} = 0 \text{ V}$ | | 1,3 | 1,5 | V |
| | $T_j = 25 \text{ }^\circ\text{C}_{\text{chiplev.}}$ | | | | |
| | $T_j = 125 \text{ }^\circ\text{C}_{\text{chiplev.}}$ | | 1,2 | | V |
| V_{F0} | | | 1 | 1,1 | V |
| | $T_j = 25 \text{ }^\circ\text{C}$ | | | | |
| | $T_j = 125 \text{ }^\circ\text{C}$ | | 0,9 | | V |
| r_F | | | 45 | 60 | mΩ |
| | $T_j = 25 \text{ }^\circ\text{C}$ | | | | |
| | $T_j = 125 \text{ }^\circ\text{C}$ | | 50 | | mΩ |
| I_{RRM} | $I_{Fnom} = 6 \text{ A}$ | | 8,4 | | A |
| Q_{rr} | $di/dt = -170 \text{ A}/\mu\text{s}$ | | 0,8 | | μC |
| E_{rr} | $V_{CC} = 300\text{V}$ | | 0,18 | | mJ |
| $R_{th(j-s)D}$ | per diode | | | 2,3 | K/W |
| M_s | to heat sink | 2,25 | | 2,5 | Nm |
| w | | | 30 | | g |
| Temperature sensor | | | | | |
| R_{100} | $T_s = 100^\circ\text{C} (R_{25} = 5\text{k}\Omega)$ | | 493±5% | | Ω |

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

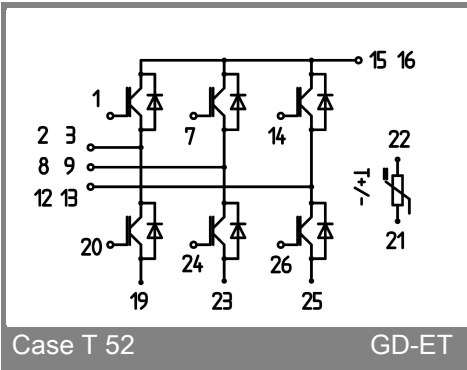
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Case T52 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)



Case T 52

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