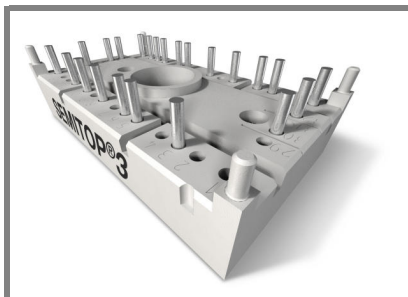


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SEMITOP® 3

IGBT Module

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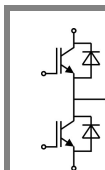
Preliminary Data

Features

- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- High short circuit capability
- Low tail current with low temperature dependence
- Integrated PTC temperature sensor

Typical Applications*

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

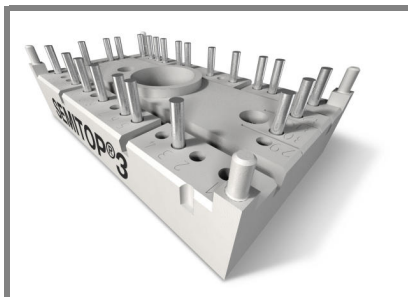


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| Absolute Maximum Ratings | | T _s = 25 °C, unless otherwise specified | |
|--------------------------|--|--|-------|
| Symbol | Conditions | Values | Units |
| IGBT | | | |
| V _{CES} | T _j = 25 °C | 600 | V |
| I _C | T _j = 125 °C | T _s = 25 °C | 81 A |
| | | T _s = 80 °C | 57 A |
| I _{CRM} | I _{CRM} = 2 × I _{Cnom} | 200 | A |
| V _{GES} | | ± 20 | V |
| t _{psc} | V _{CC} = 300 V; V _{GE} ≤ 20 V; T _j = 125 °C V _{CES} < 600 V | 10 | μs |
| Inverse Diode | | | |
| I _F | T _j = 150 °C | T _s = 25 °C | 79 A |
| | | T _s = 80 °C | 53 A |
| I _{FRM} | I _{FRM} = 2 × I _{Fnom} | 150 | A |
| I _{FSM} | t _p = 10 ms; half sine wave T _j = 150 °C | 720 | 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 = 1,5 mA | 4,5 | 5,5 | 6,5 | V |
| I _{CES} | V _{GE} = 0 V, V _{CE} = V _{CES} | T _j = 25 °C | | 0,3 | mA |
| | | T _j = 125 °C | | | mA |
| I _{GES} | V _{CE} = 0 V, V _{GE} = 30 V | T _j = 25 °C | | 300 | nA |
| | | T _j = 125 °C | | | nA |
| V _{CE0} | | T _j = 25 °C | 1 | | V |
| | | T _j = 125 °C | 1,1 | | V |
| r _{CE} | V _{GE} = 15 V | T _j = 25 °C | 11 | | mΩ |
| | | T _j = 125 °C | 9 | | mΩ |
| V _{CE(sat)} | I _{Cnom} = 100 A, V _{GE} = 15 V | T _j = 25 °C _{chiplev.} | 2,1 | 2,5 | V |
| | | T _j = 125 °C _{chiplev.} | 2 | 2,3 | V |
| C _{ies} | V _{CE} = 25, V _{GE} = 0 V f = 1 MHz | | 4,3 | | nF |
| C _{oes} | | | | | nF |
| C _{res} | | | 0,4 | | nF |
| Q _G | V _{GE} = 0 ... 20 V | | 310 | | nC |
| t _{d(on)} | R _{Gon} = 10 Ω | V _{CC} = 300V I _C = 100A | 50 | | ns |
| t _r | | | 40 | | ns |
| E _{on} | | | 4 | | mJ |
| t _{d(off)} | R _{Goff} = 10 Ω | T _j = 125 °C V _{GE} = ±15V | 300 | | ns |
| t _f | | | 35 | | ns |
| E _{off} | | | 3 | | mJ |
| R _{th(j-s)} | per IGBT | | | 0,6 | K/W |

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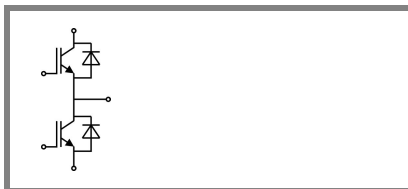
Preliminary Data

Features

- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- High short circuit capability
- Low tail current with low temperature dependence
- Integrated PTC temperature sensor

Typical Applications*

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



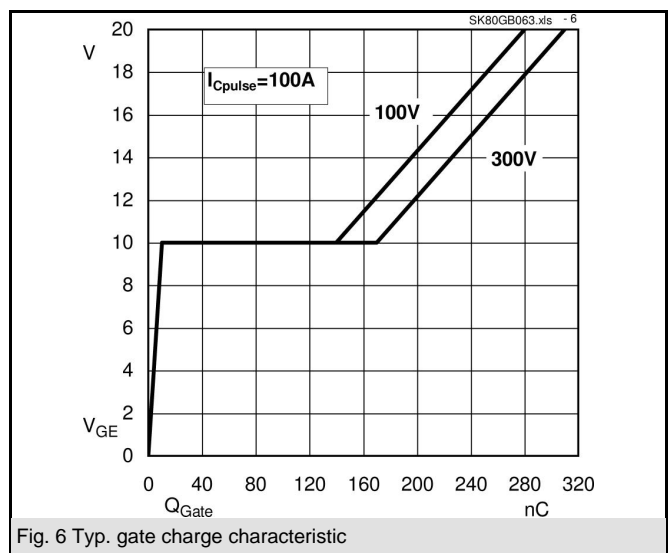
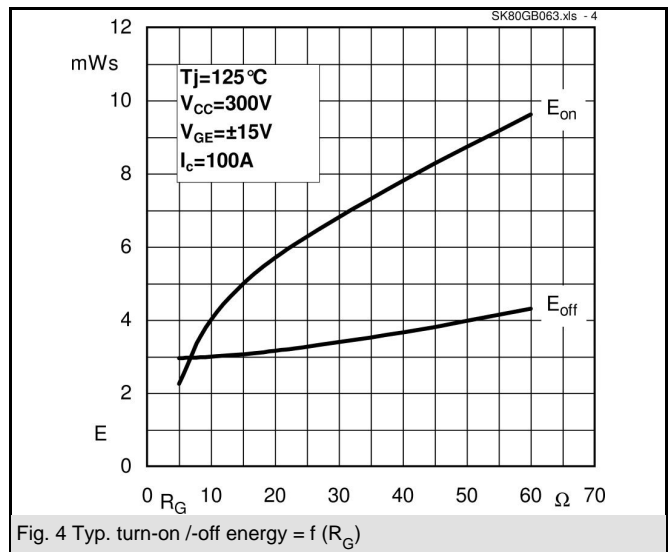
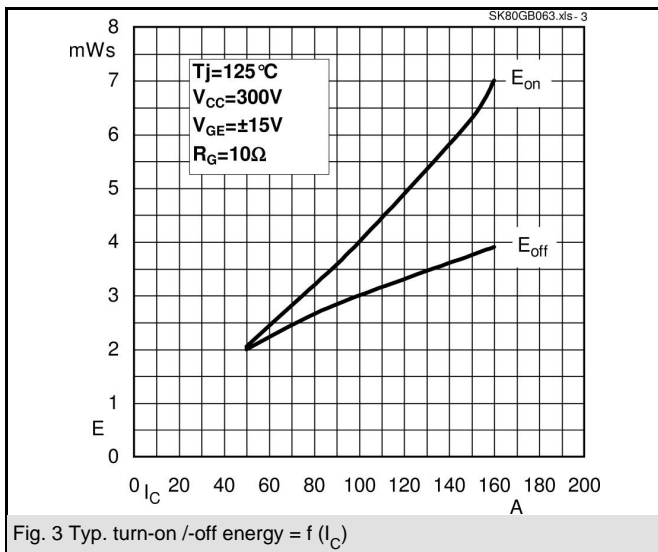
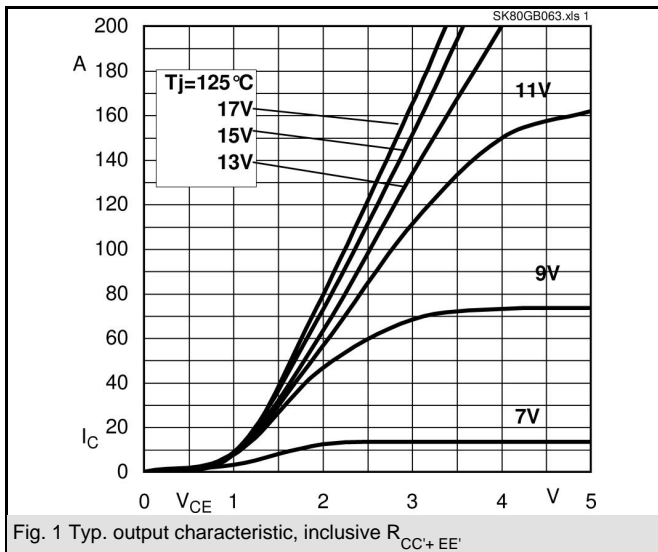
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Characteristics

| Symbol | Conditions | min. | typ. | max. | Units |
|----------------------|---|---|------|------|---------------|
| Inverse Diode | | | | | |
| $V_F = V_{EC}$ | $I_{Fnom} = 60 \text{ A}; V_{GE} = 0 \text{ V}$ | $T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$ | 1,4 | | V |
| | | $T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$ | 1,3 | | V |
| V_{F0} | | | 0,85 | 0,9 | V |
| r_F | | | 6,5 | 11 | m Ω |
| I_{RRM} | $I_F = 60 \text{ A}$ | | 90 | | A |
| Q_{rr} | $di/dt = -3000 \text{ A}/\mu\text{s}$ | | 7 | | μC |
| E_{rr} | $V_{CC} = 300\text{V}$ | | 1,2 | | mJ |
| $R_{th(j-s)D}$ | per diode | | | 0,9 | K/W |
| M_s | to heat sink M1 | 2,25 | | 2,5 | Nm |
| w | | | 30 | | g |

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.



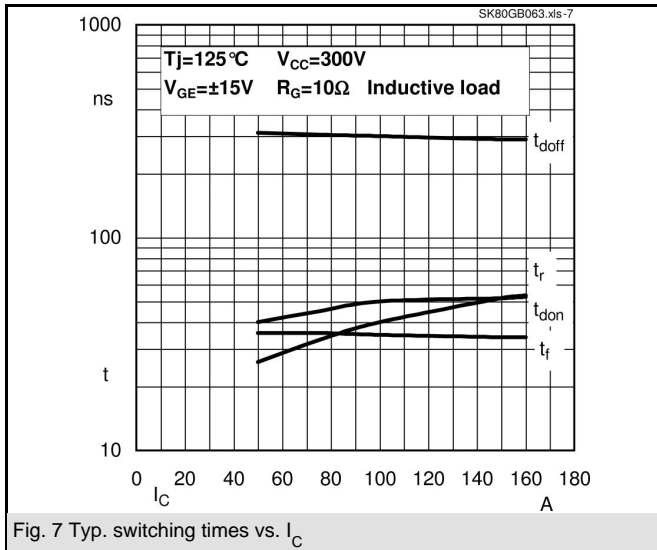


Fig. 7 Typ. switching times vs. I_C

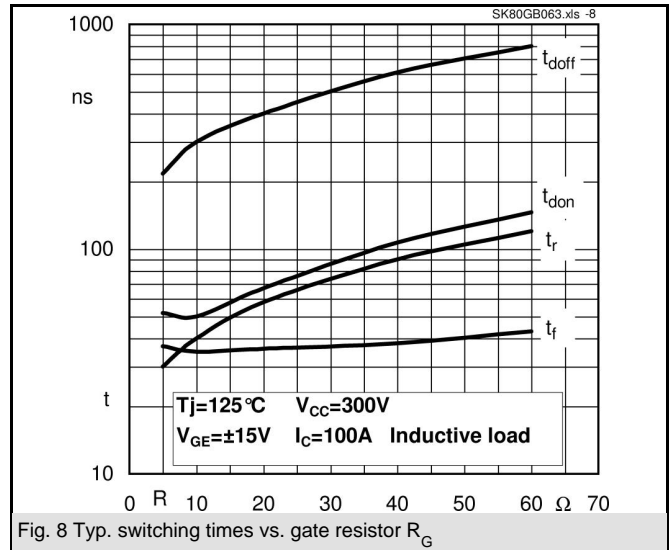


Fig. 8 Typ. switching times vs. gate resistor R_G

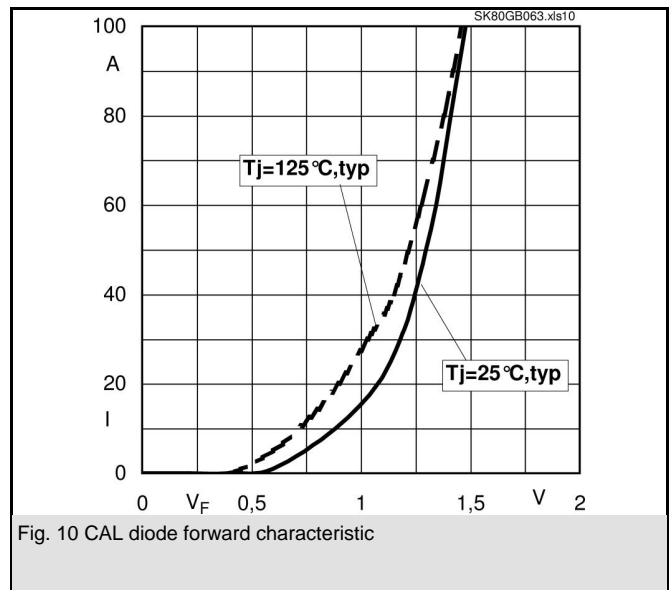
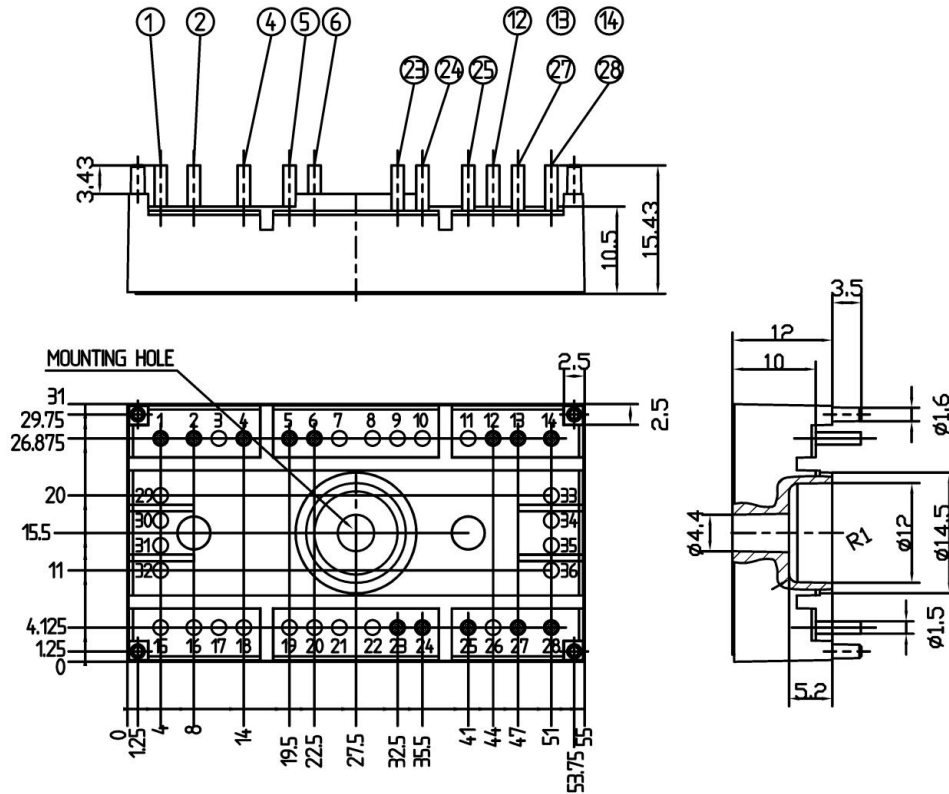
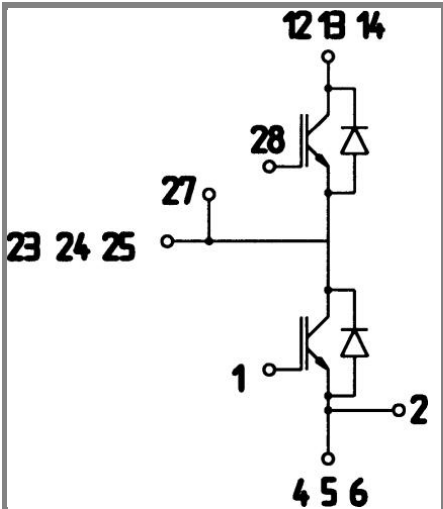


Fig. 10 CAL diode forward characteristic



Case T26 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)



Case T 26

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