



IGBT Modules

SKiM 400GD128D

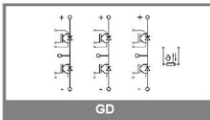
Preliminary Data

Features

- Homogeneous Si
- SPT = Soft Punch Through Technology
- V_{CEsat} with positive temperature coefficient
- High Short circuit capability, self limiting to $6 \times I_C$
- Isolated by Al_2O_3 DCB (Direct Copper Bonded) ceramic plate
- Pressure contact technology for thermal contacts
- Spring contact system to attach driver PCB to the control terminals
- Integrated temperature sensore

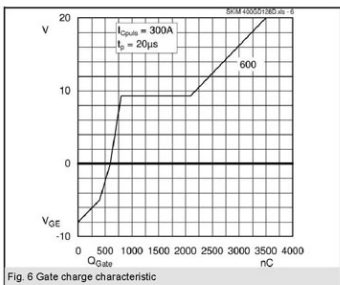
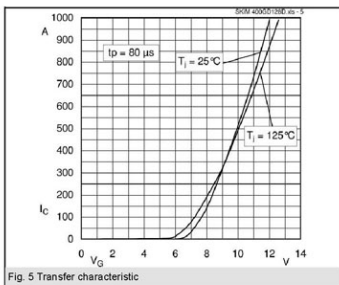
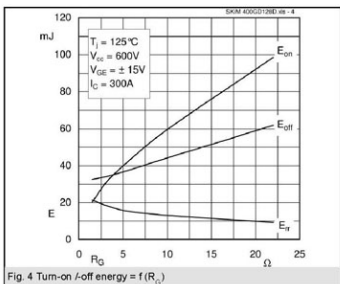
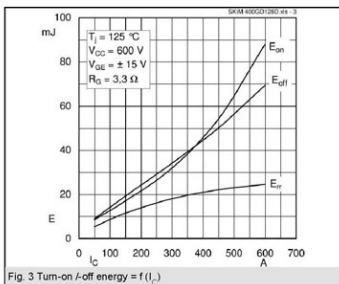
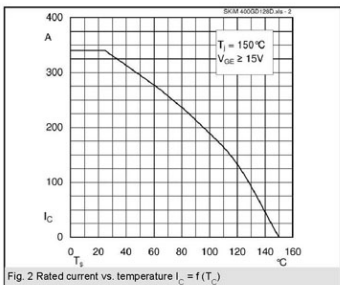
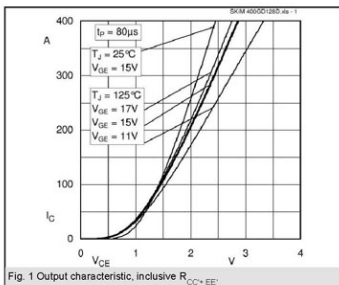
Typical Applications

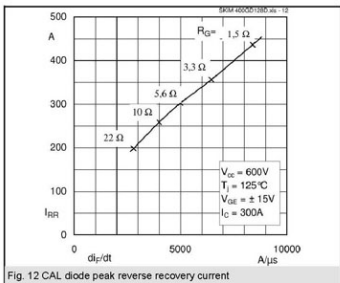
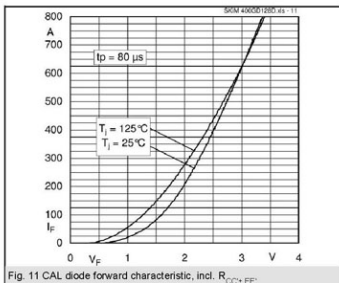
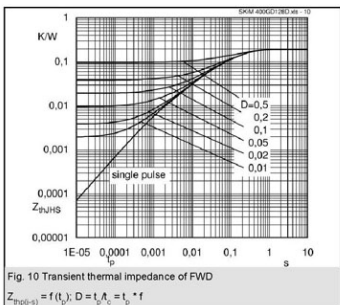
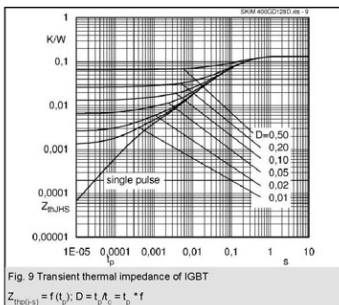
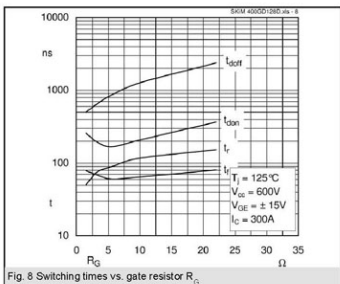
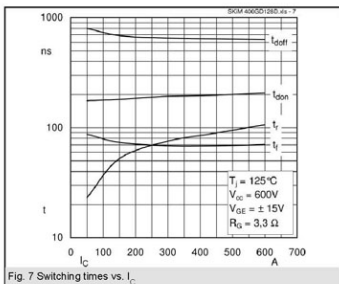
- AC inverter drives
- Uninterruptable Power supplies

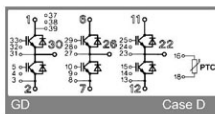
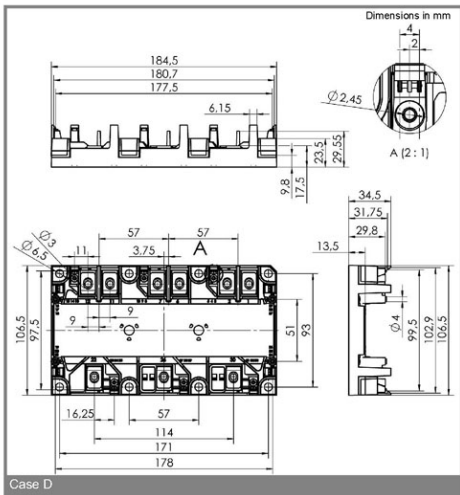
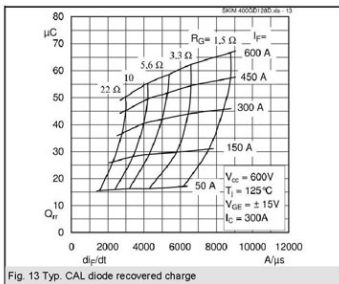


| Absolute Maximum Ratings | | $T_c = 25^\circ\text{C}$, unless otherwise specified | |
|--------------------------|--|---|------------------|
| Symbol | Conditions | Values | Units |
| IGBT | | | |
| V_{CES} | | 1200 | V |
| I_C | $T_s = 25 (70)^\circ\text{C}$ | 340 (260) | A |
| I_{CRM} | $t_p = 1 \text{ ms}$ | 600 | A |
| V_{GES} | | ± 20 | V |
| $T_j (T_{stb})$ | | -40 ... +150 (125) | $^\circ\text{C}$ |
| T_{cop} | max. case operating temperature | 125 | $^\circ\text{C}$ |
| V_{bol} | AC, 1 min. | 2500 | V |
| Inverse diode | | | |
| I_F | $T_s = 25 (70)^\circ\text{C}$ | 350 (300) | A |
| I_{FRM} | $t_p = 1 \text{ ms}$ | 600 | A |
| I_{FSM} | $t_p = 10 \text{ ms}$; \sin ; $T_j = 150^\circ\text{C}$ | 3300 | A |

| Characteristics | | $T_{case} = 25^\circ\text{C}$, unless otherwise specified | | | |
|--------------------------------|---|--|-----------|-------------|---------------|
| Symbol | Conditions | min. | typ. | max. | Units |
| IGBT | | | | | |
| $V_{GE(β)}$ | $V_{GE} = V_{CE}$; $I_C = 9 \text{ mA}$ | 4,45 | 5,5 | 6,55 | V |
| I_{CES} | $V_{GE} = 0$; $V_{CE} = V_{CES}$; $T_j = 25^\circ\text{C}$ | | | 0,3 | mA |
| V_{CE0} | $T_j = 25 (125)^\circ\text{C}$ | | 1 (0,9) | 1,15 (1,05) | V |
| r_{CE} | $T_j = 25 (125)^\circ\text{C}$ | | 3,3 (4,7) | 4 (5) | m Ω |
| V_{CEsat} | $I_{Cnom} = 300 \text{ A}$; $V_{GE} = 15 \text{ V}$; $T_j = 25 (125)^\circ\text{C}$ on chip level | | 2 (2,3) | 2,35 (2,55) | V |
| C_{los} | $V_{GE} = 0$; $V_{CE} = 25 \text{ V}$; $f = 1 \text{ MHz}$ | | 27 | | nF |
| C_{oss} | $V_{GE} = 0$; $V_{CE} = 25 \text{ V}$; $f = 1 \text{ MHz}$ | | 6,5 | | nF |
| C_{res} | $V_{GE} = 0$; $V_{CE} = 25 \text{ V}$; $f = 1 \text{ MHz}$ | | 5,4 | | nF |
| L_{CE} | | | | 20 | nH |
| $R_{CCE'}$ | resistance, terminal-chip $T_c = 25 (125)^\circ\text{C}$ | | 0,9 (1,1) | | m Ω |
| $t_{(on)}$ | $V_{CC} = 600 \text{ V}$ | | 190 | | ns |
| t_r | $I_{Cnom} = 300 \text{ A}$ | | 75 | | ns |
| $t_{(off)}$ | $R_{Con} = R_{Coff} = 3,3 \Omega$ | | 650 | | ns |
| t_t | $T_j = 125^\circ\text{C}$ | | 70 | | ns |
| $E_{on} (E_{off})$ | $V_{GE} = 15 \text{ V}$ | | 32 (34) | | mJ |
| $E_{on} (E_{off})$ | with SKHI 65; $T_j = 125^\circ\text{C}$; $V_{CC} = 600 \text{ V}$; $I_C = 300 \text{ A}$ | | 35 (44) | | mJ |
| Inverse diode | | | | | |
| $V_F = V_{EC}$ | $I_{Fnom} = 300 \text{ A}$; $V_{GE} = 0 \text{ V}$; $T_j = 25 (125)^\circ\text{C}$ | | 2,3 (2,1) | 2,65 | V |
| V_{TO} | $T_j = 125^\circ\text{C}$ | | 1,1 | | V |
| r_T | $T_j = 125^\circ\text{C}$ | | 3,3 | | m Ω |
| I_{FRM} | $I_F = 300 \text{ A}$; $T_j = 125^\circ\text{C}$ | | 360 | | A |
| C_{rr} | $V_{GE} = 0 \text{ V}$ $di/dt = 6450 \text{ A}/\mu\text{s}$ | | 44 | | μC |
| E_{rr} | $R_{Con} = R_{Coff} = 3,3 \Omega$ | | 18 | | mJ |
| Thermal characteristics | | | | | |
| $R_{th(j-s)}$ | per IGBT | | | 0,13 | K/W |
| $R_{th(j-s)}$ | per FWD | | | 0,19 | K/W |
| Temperature Sensor | | | | | |
| R_{TS} | $T = 25 (100)^\circ\text{C}$ | | 1 (1,67) | | k Ω |
| tolerance | $T = 25 (100)^\circ\text{C}$ | | 3 (2) | | % |
| Mechanical data | | | | | |
| M_1 | to heatsink (M5) | 2 | | 3 | Nm |
| M_2 | for terminals (M6) | 4 | | 5 | Nm |
| w | | | | 460 | g |







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

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