



SKiM[®] 4

IGBT Modules

SKiM 350GD128DM

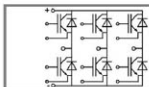
Preliminary Data

Features

- N channel, homogenous planar IGBT Silicon structure with n+ buffer layer in SPT (soft punch through) technology
- Low inductance case
- Fast & soft inverse CAL diodes
- Isolated by AlN 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 sensor

Typical Applications

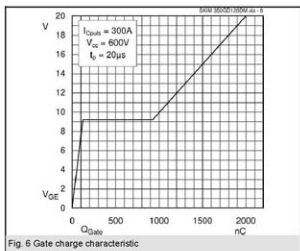
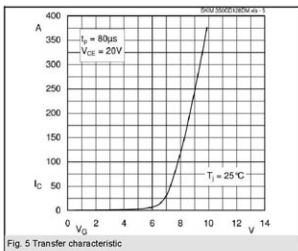
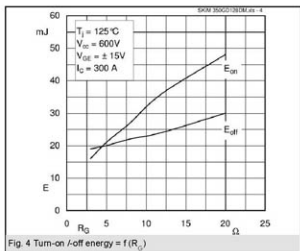
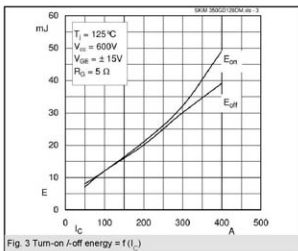
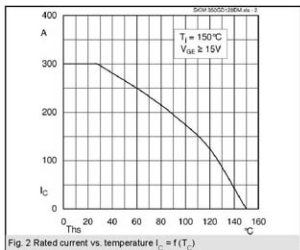
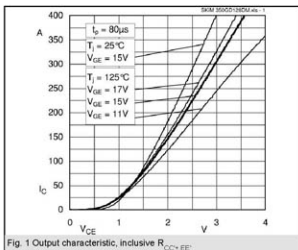
- Switched mode power supplies
- Three phase inverters for AC motor speed control
- Switching (not for linear use)

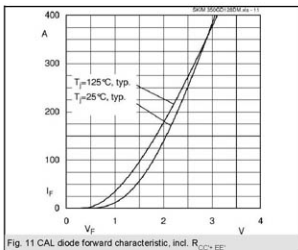
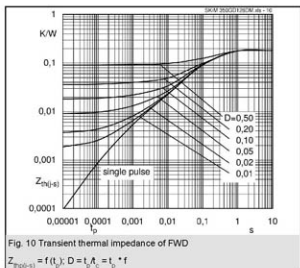
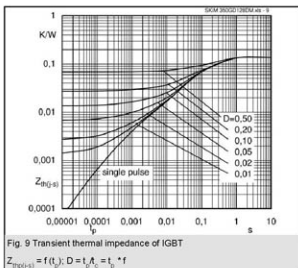
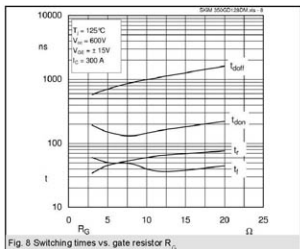
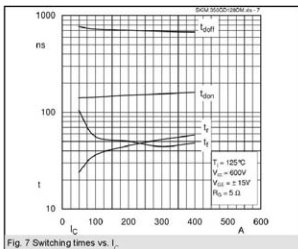


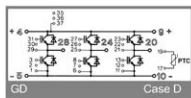
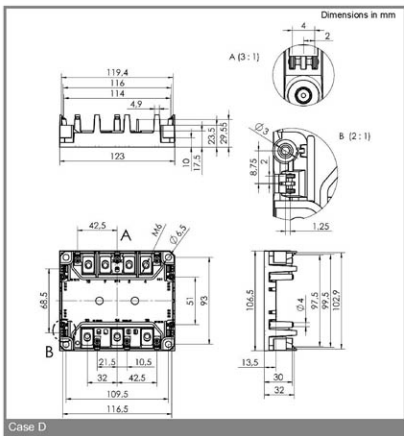
GD

| Absolute Maximum Ratings | | $T_c = 25^\circ\text{C}$, unless otherwise specified | | |
|--------------------------|---------------------------------------------------------|-------------------------------------------------------|--|------------------|
| Symbol | Conditions | Values | | Units |
| IGBT | | | | |
| V_{CES} | | 1200 | | V |
| I_C | $T_s = 25 (70)^\circ\text{C}$ | 300 (230) | | A |
| I_{CRM} | $t_p = 1 \text{ ms}$ | 400 | | A |
| V_{GES} | | ± 20 | | V |
| $T_J (T_{stg})$ | | -40 ... +150 (125) | | $^\circ\text{C}$ |
| T_{top} | max. case operating temperature | 125 | | $^\circ\text{C}$ |
| V_{test} | AC, 1 min. | 2500 | | V |
| Inverse diode | | | | |
| I_F | $T_s = 25 (70)^\circ\text{C}$ | 300 (230) | | A |
| I_{FRM} | $t_p = 1 \text{ ms}$ | 400 | | A |
| I_{FSM} | $t_p = 10 \text{ ms}$; air.; $T_J = 150^\circ\text{C}$ | 2200 | | A |

| Characteristics | | $T_c = 25^\circ\text{C}$, unless otherwise specified | | | |
|--------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------|-------------|---------------|
| Symbol | Conditions | min. | typ. | max. | Units |
| IGBT | | | | | |
| $V_{CE(Br)}$ | $V_{GE} = V_{CE}$; $I_C = 8 \text{ mA}$ | 4,45 | 5,5 | 6,55 | V |
| I_{CES} | $V_{GE} = 0$; $V_{CE} = V_{CES}$; $T_s = 25^\circ\text{C}$ | | | 0,3 | mA |
| V_{CEC} | $T_J = 25 (125)^\circ\text{C}$ | | 1 (0,9) | 1,15 (1,05) | V |
| r_{CE} | $T_J = 25 (125)^\circ\text{C}$ | | 5 (7) | 6 (7,5) | m Ω |
| V_{CEsat} | $I_{Cnom} = 200 \text{ A}$; $V_{GE} = 15 \text{ V}$; $T_J = 25 (125)^\circ\text{C}$ on chip level | | 2 (2,3) | 2,35 (2,55) | V |
| C_{oss} | $V_{GE} = 0$; $V_{CE} = 25 \text{ V}$; $f = 1 \text{ MHz}$ | | 18 | | nF |
| C_{res} | $V_{GE} = 0$; $V_{CE} = 25 \text{ V}$; $f = 1 \text{ MHz}$ | | 4,3 | | nF |
| C_{LCE} | $V_{GE} = 0$; $V_{CE} = 25 \text{ V}$; $f = 1 \text{ MHz}$ | | 3,6 | | nF |
| R_{CC+EE} | resistance, terminal-chip $T_c = 25 (125)^\circ\text{C}$ | | 1,35 (1,75) | | m Ω |
| $t_{(on)}$ | $V_{CC} = 600 \text{ V}$ | | 150 | | ns |
| t_f | $I_{Cnom} = 200 \text{ A}$ | | 45 | | ns |
| $t_{(off)}$ | $R_{Coff} = R_{Coff} = 5 \Omega$ | | 700 | | ns |
| E_{on} | $T_J = 125^\circ\text{C}$ | | 50 | | ns |
| $E_{on} (E_{off})$ | $V_{GE} = 15 \text{ V}$ | | 21 (20) | | mJ |
| $E_{on} (E_{off})$ | with SKHI 64; $T_J = 125^\circ\text{C}$ | | | | mJ |
| | $V_{CC} = 600 \text{ V}$; $I_C = 200 \text{ A}$ | | | | |
| Inverse diode | | | | | |
| $V_F = V_{EC}$ | $I_{FRM} = 200 \text{ A}$; $V_{GE} = 0 \text{ V}$; $T_J = 25 (125)^\circ\text{C}$ | | 2,3 (2,1) | 2,65 | V |
| r_{TD} | $T_J = 125^\circ\text{C}$ | | 1,1 | | V |
| r_T | $T_J = 125^\circ\text{C}$ | | 5 | | m Ω |
| I_{FRM} | $I_F = 200 \text{ A}$; $T_J = 125^\circ\text{C}$ | | | | A |
| C_{TF} | $V_{GE} = V \text{ di/dt} = A/\mu\text{s}$ | | | | μC |
| E_{off} | $R_{Coff} = R_{Coff} =$ | | | | mJ |
| Thermal characteristics | | | | | |
| $R_{th(j-s)}$ | per IGBT | | | 0,135 | K/W |
| $R_{th(j-c)}$ | per FWD | | | 0,185 | 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 | | | | 310 | g |







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

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