



SKiM[®] 4

IGBT Modules

SKiM 200GD126D

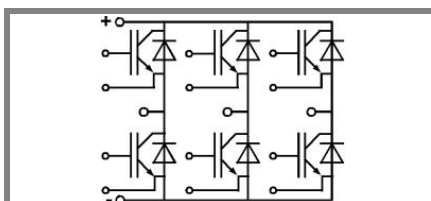
Data

Features

- Trench gate IGBT with field stop layer
- Low inductance case
- Fast & soft inverse CAL diode
- Isolated by Al₂O₃ 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*

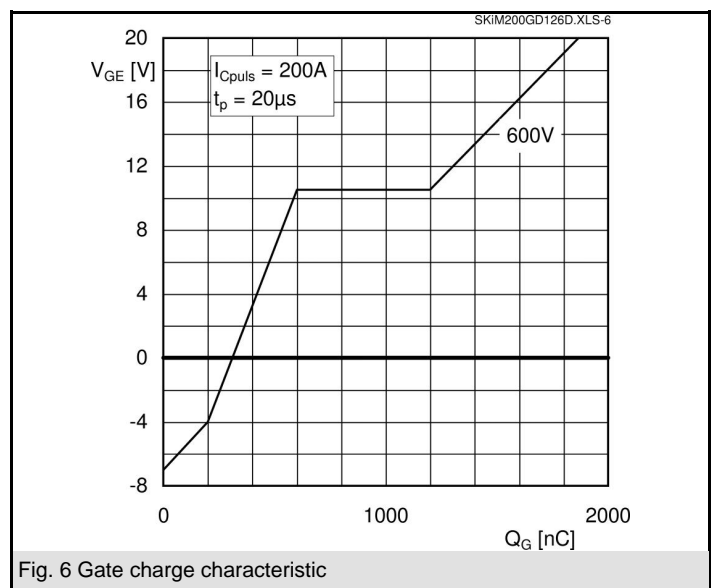
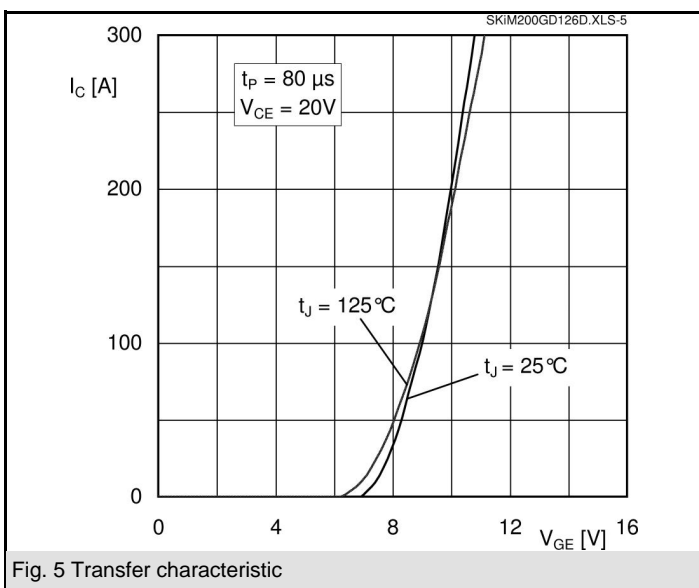
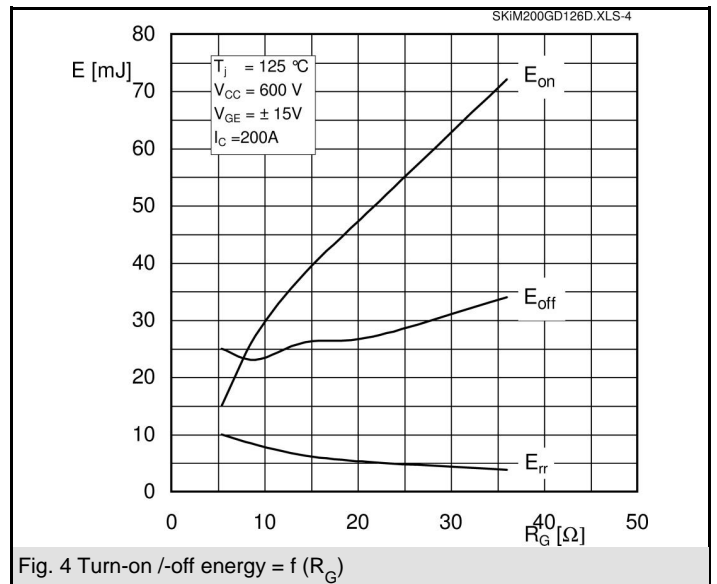
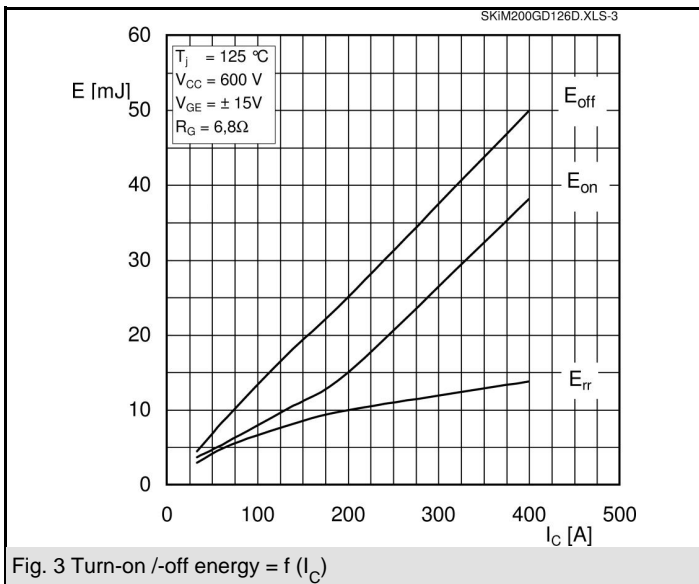
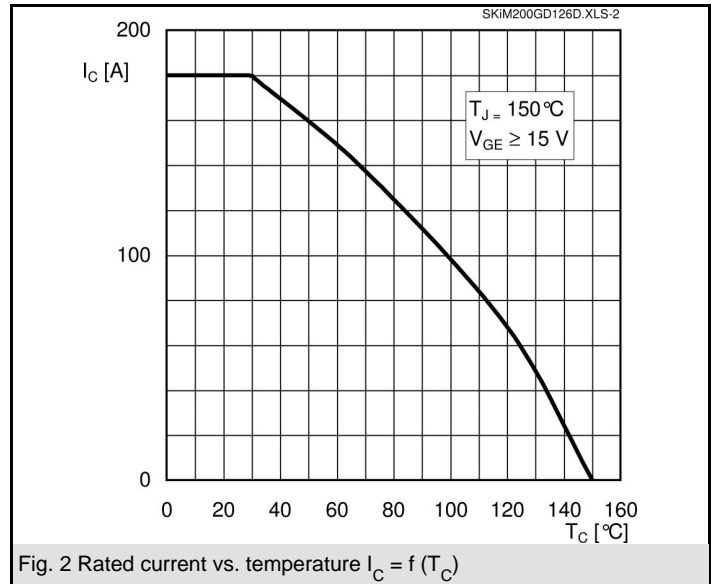
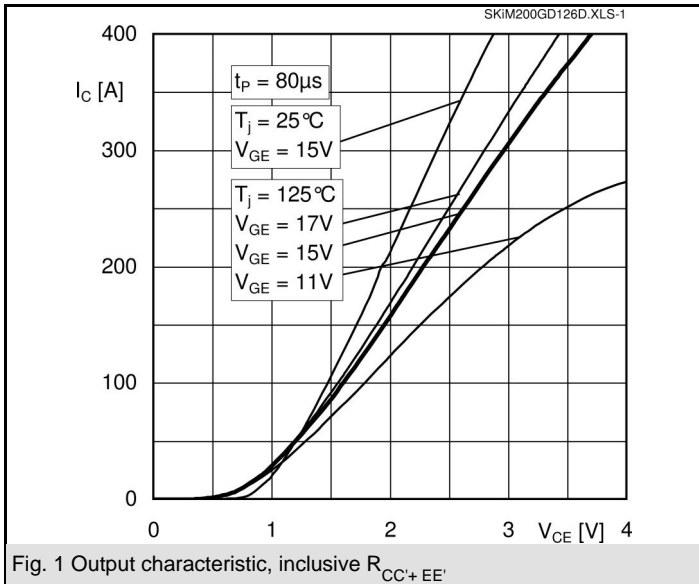
- Switched mode power supplies
- Uninterruptable Power Supplies (UPS)
- Three phase inverters for AC motor speed control



GD

Absolute Maximum Ratings		$T_{case} = 25^{\circ}\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_C	$T_s = 25 (70) ^{\circ}\text{C}$	180 (140)	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_{cop}	max. case operating temperature	125	$^{\circ}\text{C}$
V_{isol}	AC, 1 min.	2500	V
Inverse diode			
I_F	$T_s = 25 (70) ^{\circ}\text{C}$	200 (130)	A
I_{FRM}	$t_p = 1 \text{ ms}$	400	A
I_{FSM}	$t_p = 10 \text{ ms}; \text{sin.}; T_j = 150 ^{\circ}\text{C}$	1400	A

Characteristics		$T_{case} = 25^{\circ}\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}; I_C = 8 \text{ mA}$	5	5,8	6,5	V
I_{CES}	$V_{GE} = 0; V_{CE} = V_{CES}; T_j = 25 ^{\circ}\text{C}$		0,1	0,3	mA
V_{CEO}	$T_j = 25 (125) ^{\circ}\text{C}$		1 (0,9)	1,2 (1,1)	V
r_{CE}	$T_j = 25 (125) ^{\circ}\text{C}$		3,3 (5,3)	4,5 (6,5)	m Ω
V_{CEsat}	$I_{Cnom} = 200 \text{ A}; V_{GE} = 15 \text{ V}; T_j = 25 (125) ^{\circ}\text{C}$ on chip level		1,65 (1,95)	2,1 (2,4)	V
C_{ies}	$V_{GE} = 0; V_{CE} = 25 \text{ V}; f = 1 \text{ MHz}$		15		nF
C_{oes}	$V_{GE} = 0; V_{CE} = 25 \text{ V}; f = 1 \text{ MHz}$		1,2		nF
C_{res}	$V_{GE} = 0; V_{CE} = 25 \text{ V}; f = 1 \text{ MHz}$		1,1		nF
L_{CE}				15	nH
$R_{CC'+EE'}$	resistance, terminal-chip $T_c = 25 (125) ^{\circ}\text{C}$		1,35 (1,75)		m Ω
$t_{d(on)}$	$V_{CC} = 600 \text{ V}$				ns
t_r	$I_{Cnom} = 200 \text{ A}$				ns
$t_{d(off)}$	$R_{Gon} = R_{Goff} = 6,8 \Omega$				ns
t_f	$T_j = 125 ^{\circ}\text{C}$				ns
$E_{on} (E_{off})$	$V_{GE} \pm 15 \text{ V}$		15 (25)		mJ
$E_{on} (E_{off})$	with SKHI 64; $T_j = 125 ^{\circ}\text{C}$ $V_{CC} = 600 \text{ V}; I_C = 200 \text{ A}$				mJ
Inverse diode					
$V_F = V_{EC}$	$I_{Fnom} = 150 \text{ A}; V_{GE} = 0 \text{ V}; T_j = 25 (125) ^{\circ}\text{C}$		2 (1,8)	2,5 (2,3)	V
V_{TO}	$T_j = 25 (125) ^{\circ}\text{C}$		1,1	1,45 (1,25)	V
r_T	$T_j = 25 (125) ^{\circ}\text{C}$		6	7 (7)	m Ω
I_{RRM}	$I_F = 150 \text{ A}; T_j = 125 ^{\circ}\text{C}$				A
Q_{rr}	$V_{GE} = 0 \text{ V}; di/dt = \text{A}/\mu\text{s}$				μC
E_{rr}	$R_{Gon} = R_{Goff} = 6,8 \Omega$				mJ
Thermal characteristics					
$R_{th(j-s)}$	per IGBT			0,28	K/W
$R_{th(j-s)}$	per FWD			0,35	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



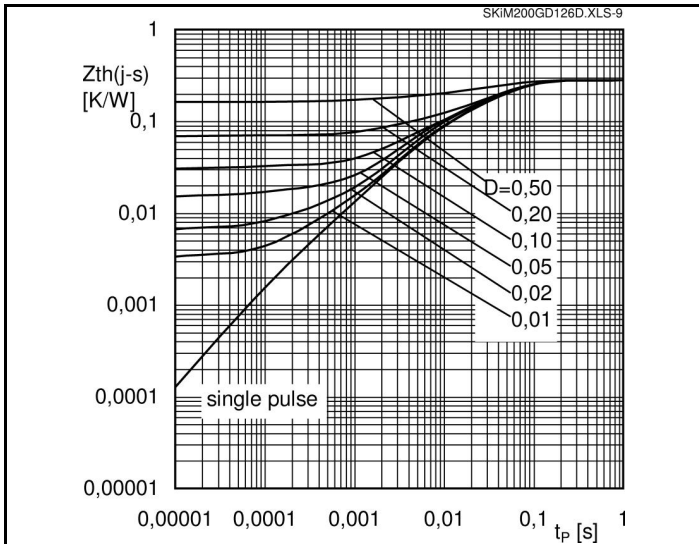


Fig. 9 Transient thermal impedance of

IGBT $Z_{thJC} = f(t_p)$; $D = t_p/t_c = t_p * f$

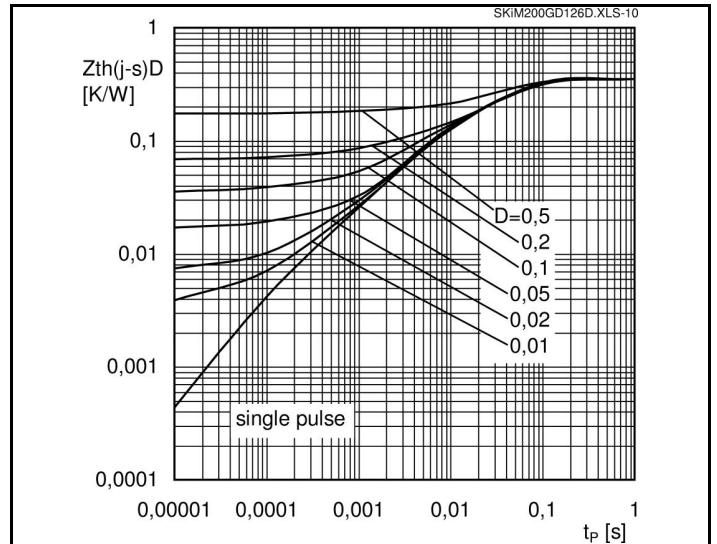


Fig. 10 Transient thermal impedance of inverse diodes

IGBT $Z_{thJC} = f(t_p)$; $D = t_p/t_c = t_p * f$

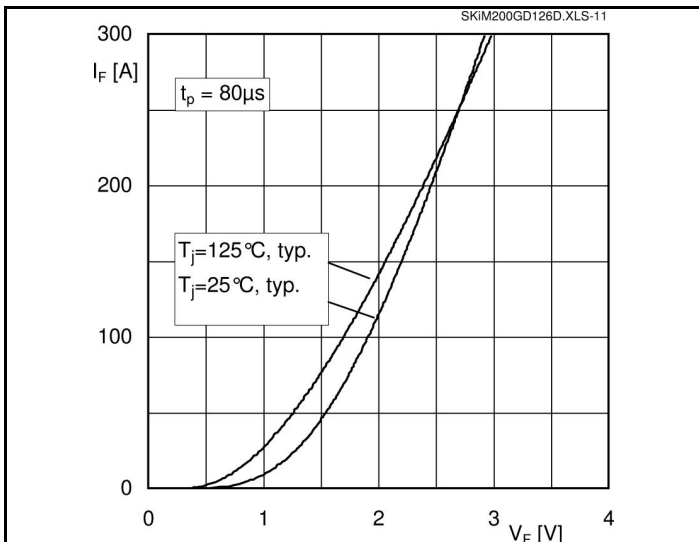
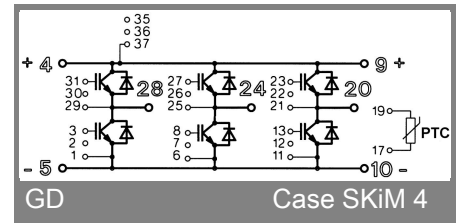
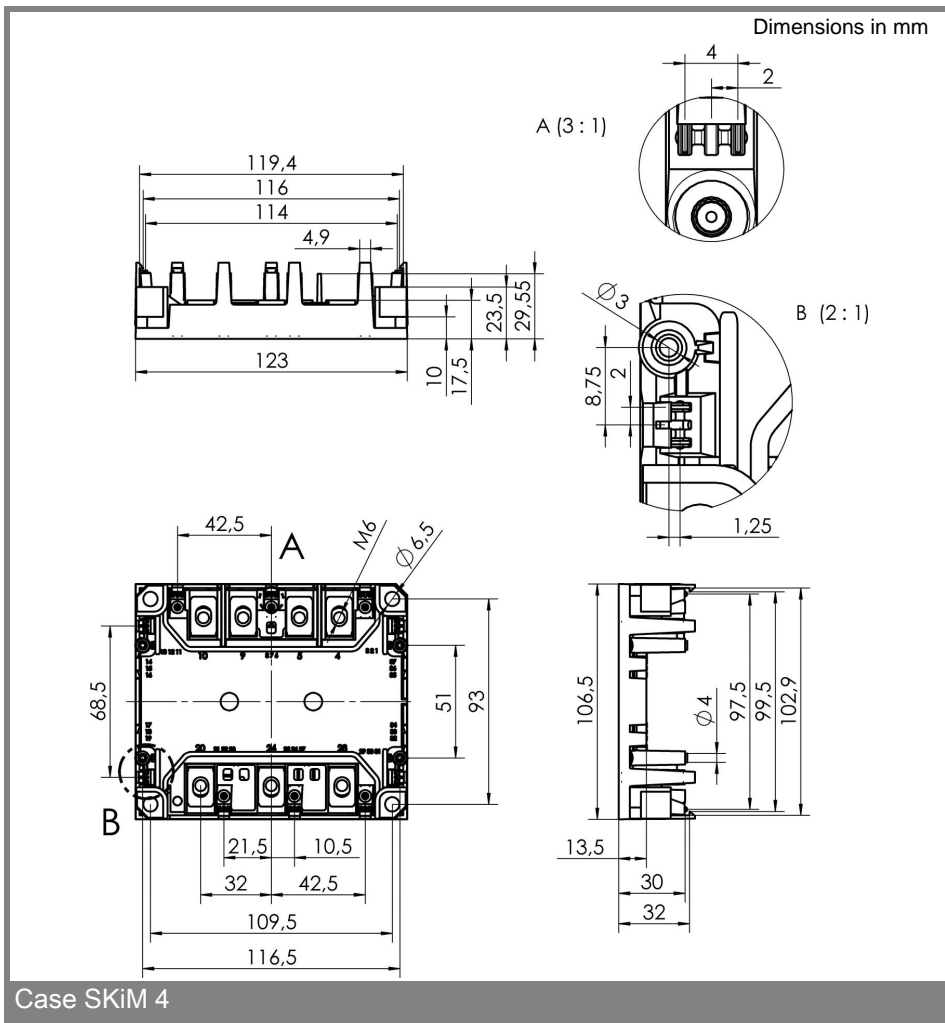


Fig. 11 CAL diode forward characteristic, incl. R_{CC+EE}



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.