

SKiM 601GD126DM



SKiM[®] 5

IGBT Modules

SKiM 601GD126DM

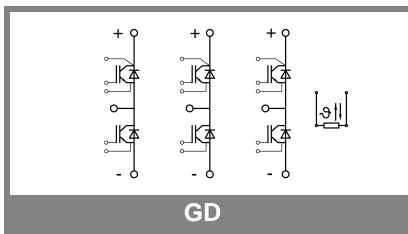
Preliminary Data

Features

- Trench gate IGBT with field stop layer
- 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

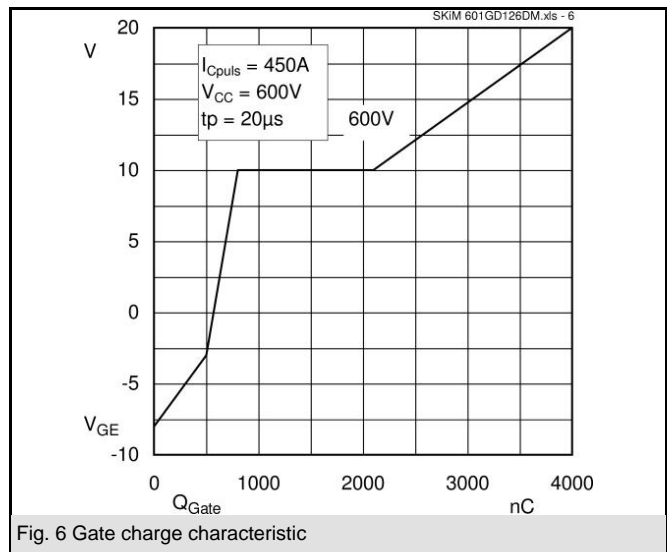
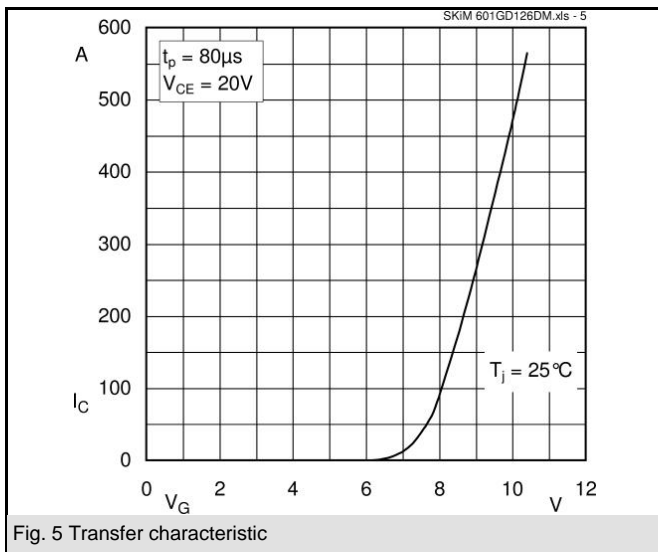
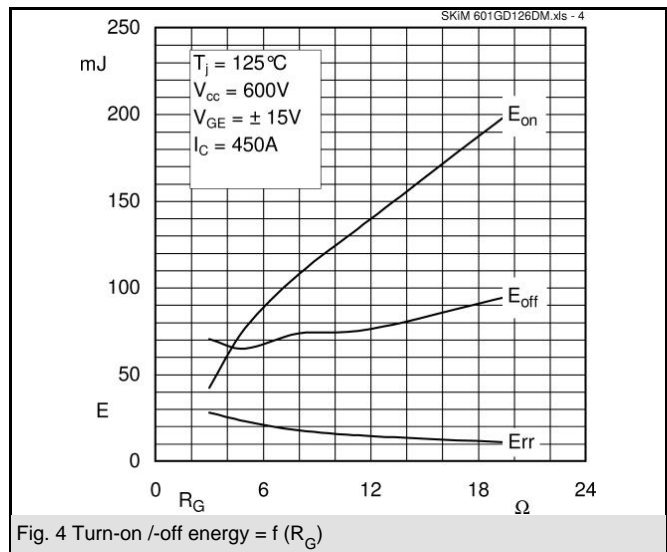
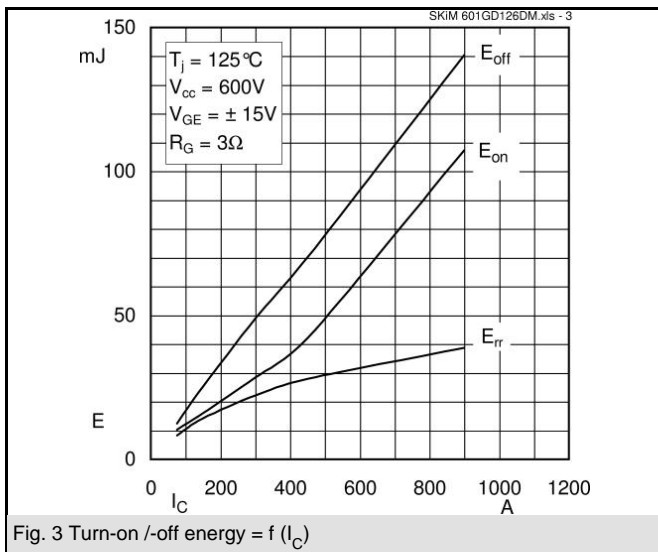
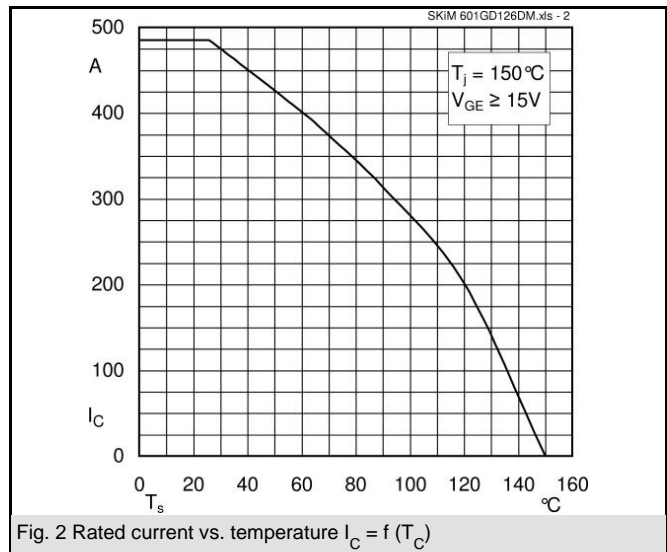
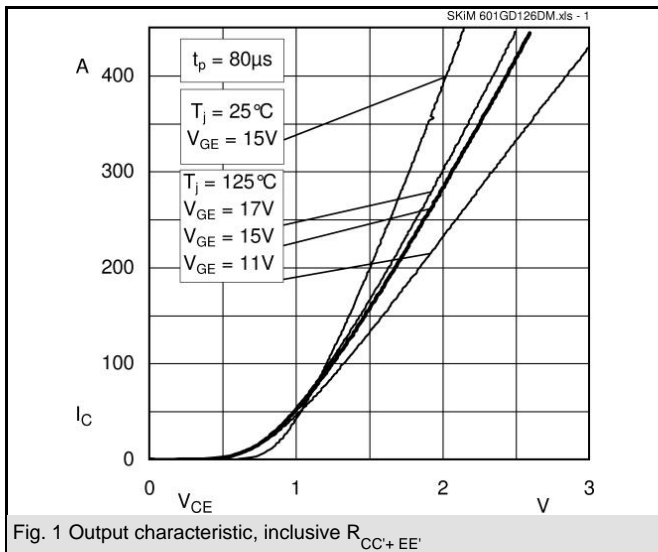
- Switched mode power supplies
- Three phase inverters for AC motor speed control



GD

Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_C	$T_s = 25 (70)^\circ\text{C}$	480 (370)	A
I_{CRM}	$t_p = 1 \text{ ms}$	900	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	$T_s = 25 (70)^\circ\text{C}$	450 (340)	A
I_{FRM}	$t_p = 1 \text{ ms}$	900	A
I_{FSM}	$t_p = 10 \text{ ms}$; sin.; $T_j = 150^\circ\text{C}$	3300	A

Characteristics		$T_c = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$; $I_C = 18 \text{ mA}$	4,95	5,8	6,55	V
I_{CES}	$V_{GE} = 0$; $V_{CE} = V_{CES}$; $T_j = 125^\circ\text{C}$			0,6	mA
V_{CEO}	$T_j = 25 (125)^\circ\text{C}$		1 (0,9)	1,2 (1,1)	V
r_{CE}	$T_j = 25 (125)^\circ\text{C}$		1,6 (2,4)	2,1 (3)	m Ω
V_{CEsat}	$I_{Cnom} = 450 \text{ A}$; $V_{GE} = 15 \text{ V}$; $T_j = 25 (125)^\circ\text{C}$ on chip level		1,7 (2)	2,15 (2,45)	V
C_{ies}	$V_{GE} = 0$; $V_{CE} = 25 \text{ V}$; $f = 1 \text{ MHz}$		35		nF
C_{oes}	$V_{GE} = 0$; $V_{CE} = 25 \text{ V}$; $f = 1 \text{ MHz}$		2,5		nF
C_{res}	$V_{GE} = 0$; $V_{CE} = 25 \text{ V}$; $f = 1 \text{ MHz}$		2,4		nF
L_{CE}				20	nH
$R_{CC'+EE'}$	resistance, terminal-chip $T_c = 25 (125)^\circ\text{C}$		0,9 (1,1)		m Ω
$t_{d(on)}$	$V_{CC} = 600 \text{ V}$		250		ns
t_r	$I_{Cnom} = 450 \text{ A}$		55		ns
$t_{d(off)}$	$R_{Gon} = R_{Goff} = 3 \Omega$		800		ns
t_f	$T_j = 125^\circ\text{C}$		120		ns
$E_{on} (E_{off})$	$V_{GE} \pm 15 \text{ V}$		42 (70)		mJ
$E_{on} (E_{off})$	with SKHI 65; $T_j = 125^\circ\text{C}$ $V_{CC} = 600 \text{ V}$; $I_C = 450 \text{ A}$				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 (1,8)	2,55 (2,3)	V
V_{TO}	$T_j = 25 (125)^\circ\text{C}$		1,1	1,45 (1,25)	V
r_T	$T_j = 25 (125)^\circ\text{C}$		3,3	3,5 (3,5)	m Ω
I_{RRM}	$I_F = 450 \text{ A}$; $T_j = 125^\circ\text{C}$				A
Q_{rr}	$V_{GE} = V \text{ di/dt} = \text{A}/\mu\text{s}$				μC
E_{rr}	$R_{Gon} = R_{Goff} =$				mJ
Thermal characteristics					
$R_{th(j-s)}$	per IGBT			0,09	K/W
$R_{th(j-s)}$	per FWD			0,125	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



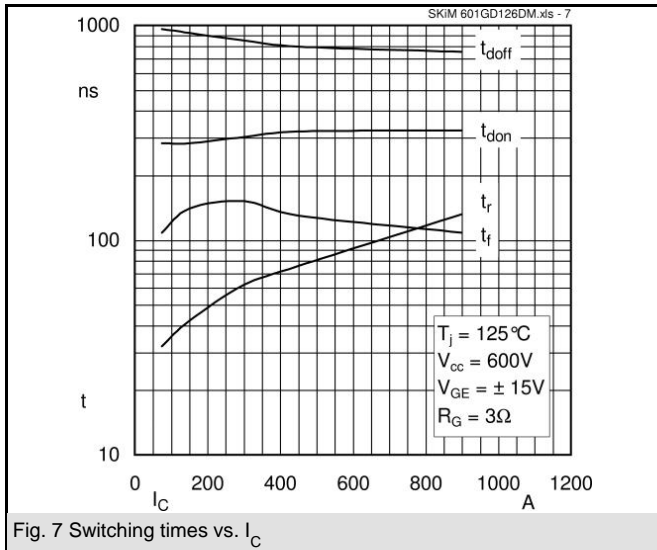


Fig. 7 Switching times vs. I_C

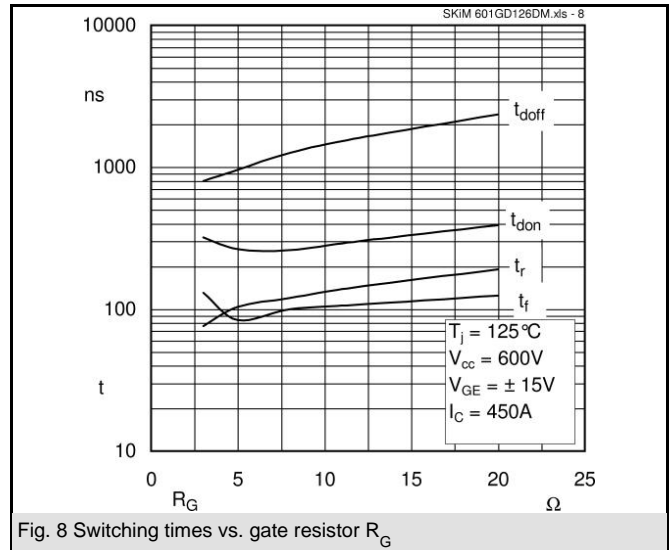


Fig. 8 Switching times vs. gate resistor R_G

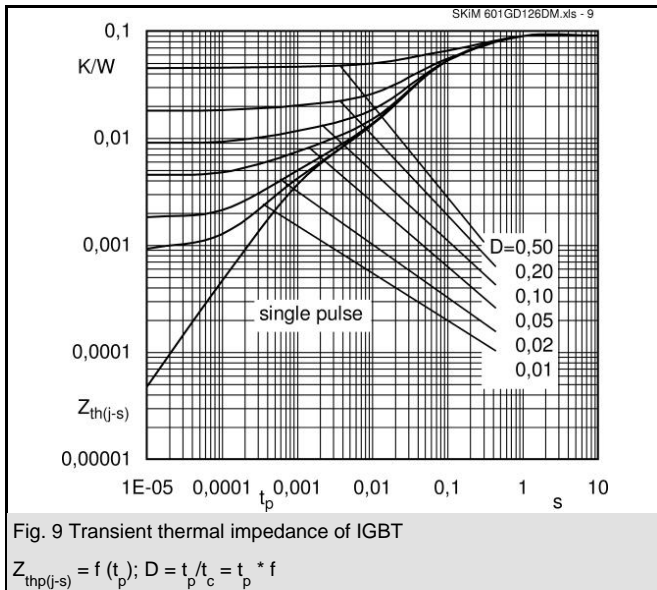


Fig. 9 Transient thermal impedance of IGBT

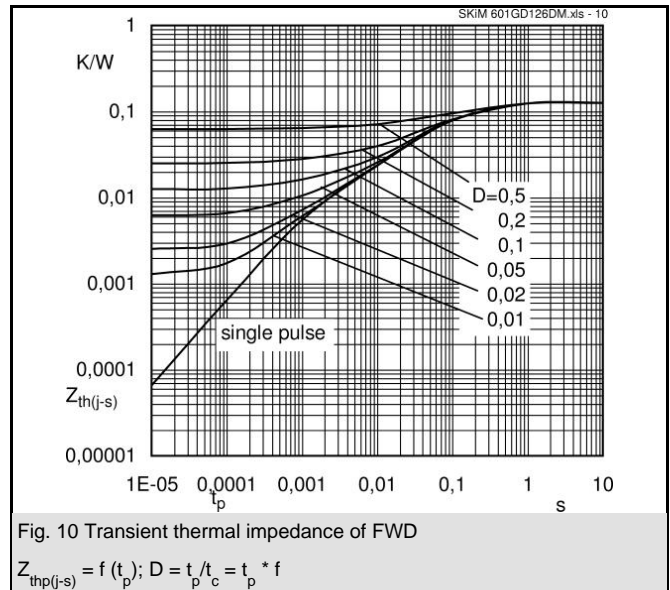


Fig. 10 Transient thermal impedance of FWD

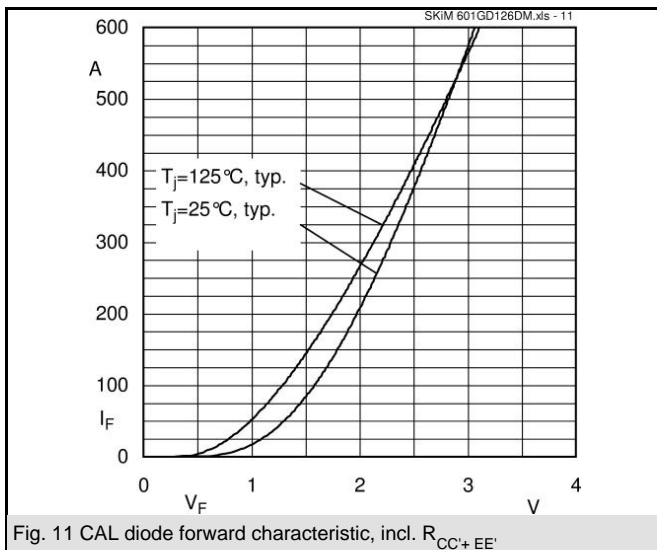
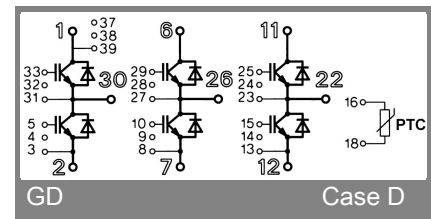
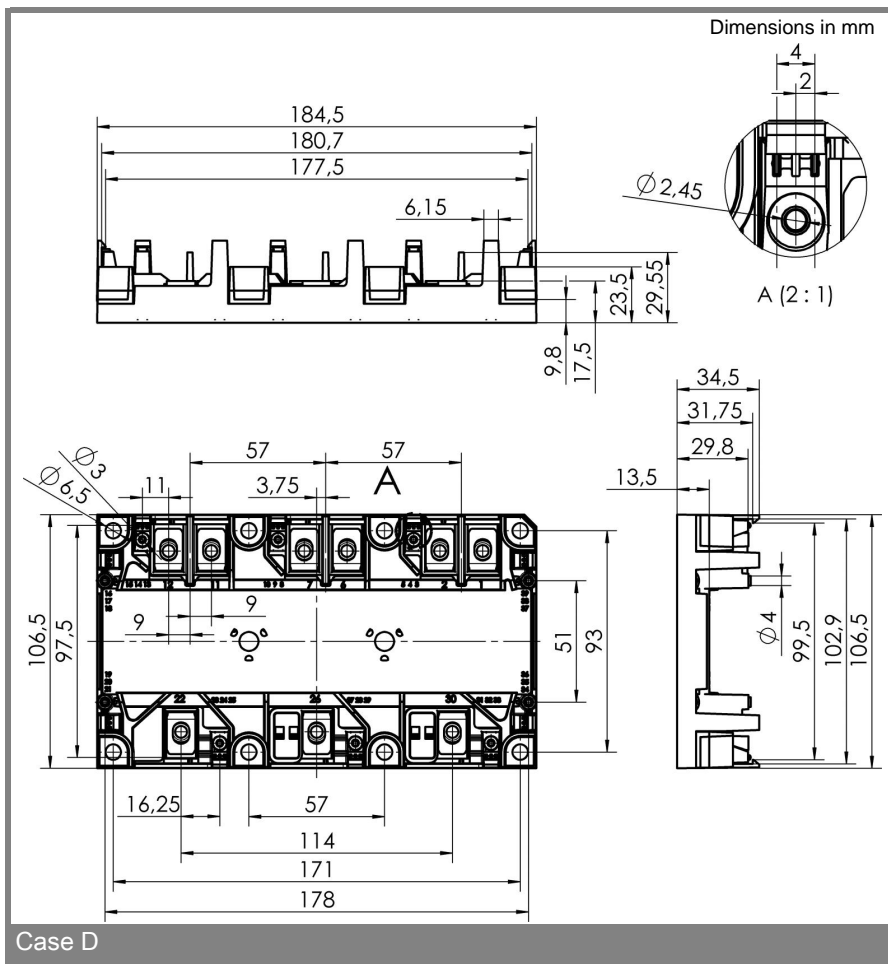


Fig. 11 CAL diode forward characteristic, incl. $R_{CC+EE'}$



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

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