

SKiM 601GD126DM



SKiM[®] 5

IGBT Modules

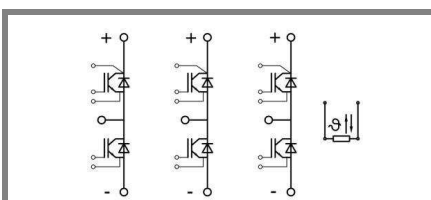
SKiM 601GD126DM

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*

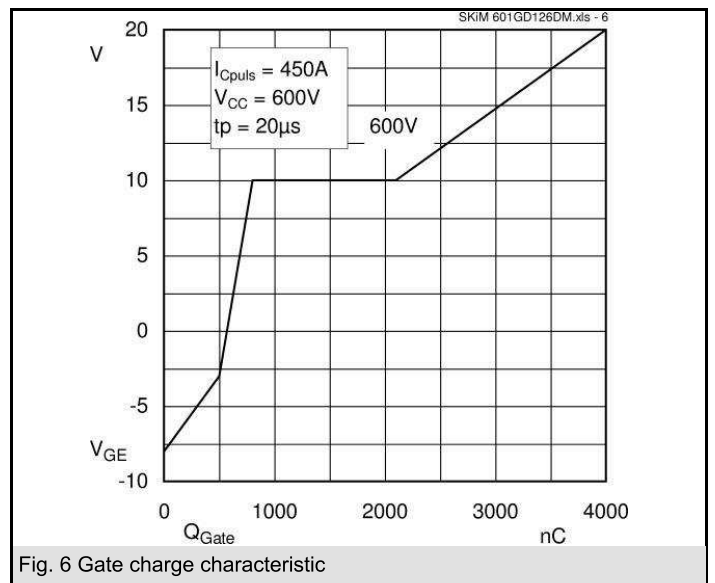
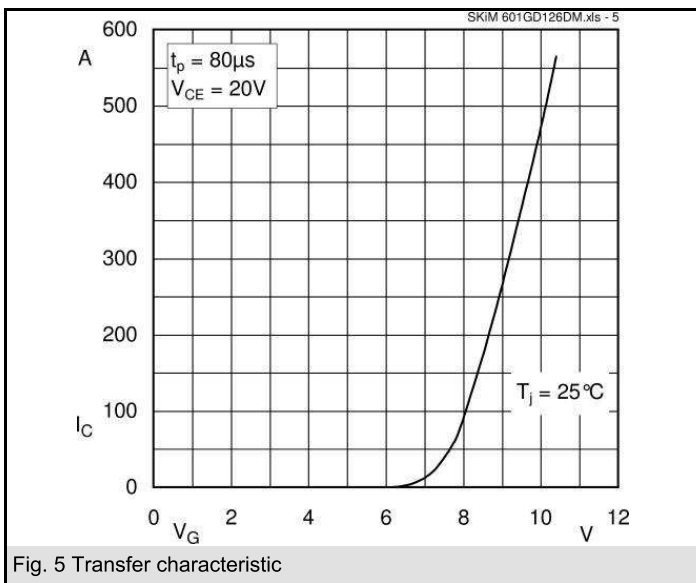
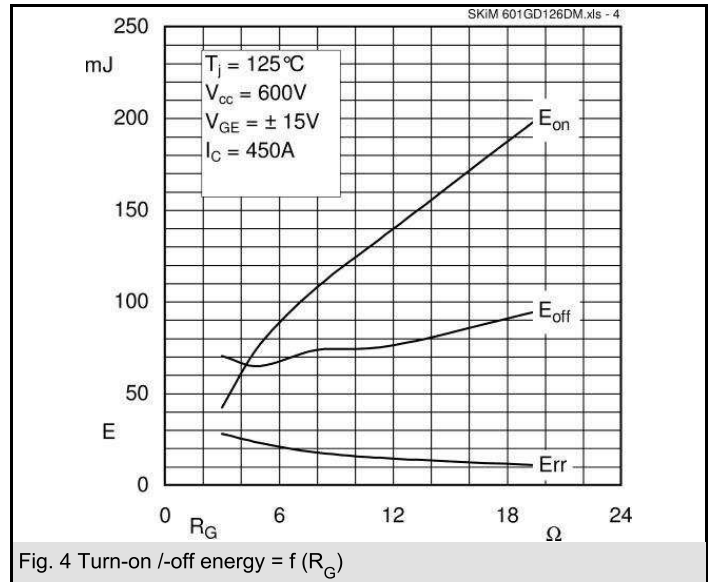
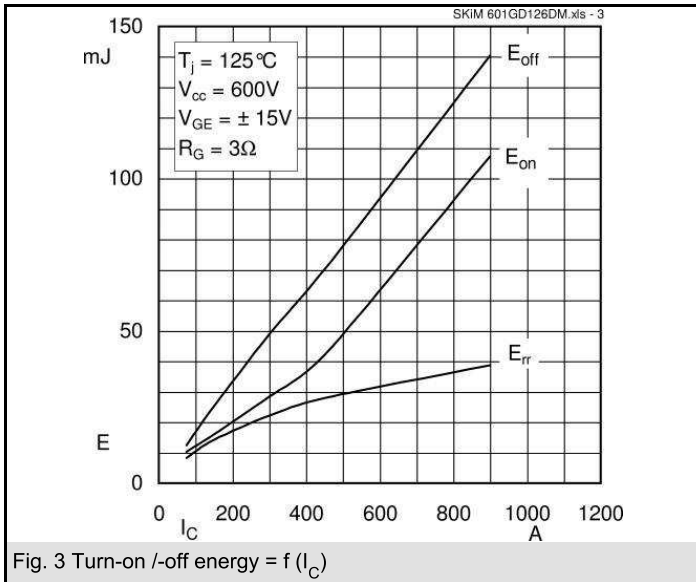
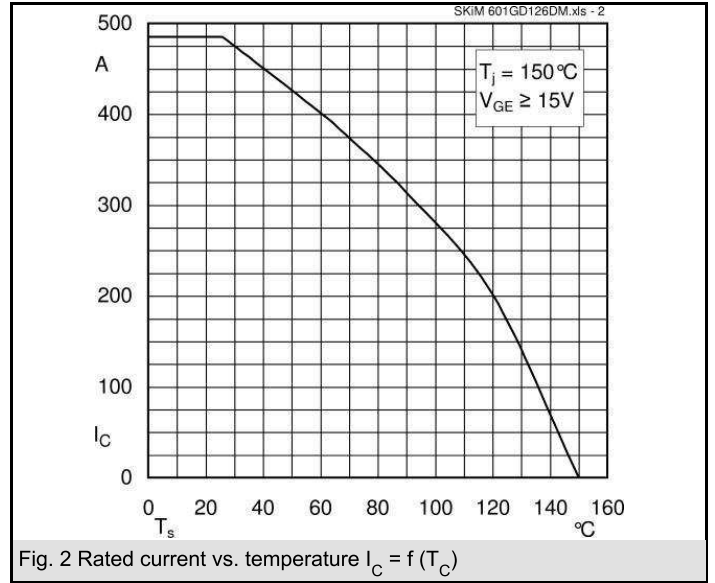
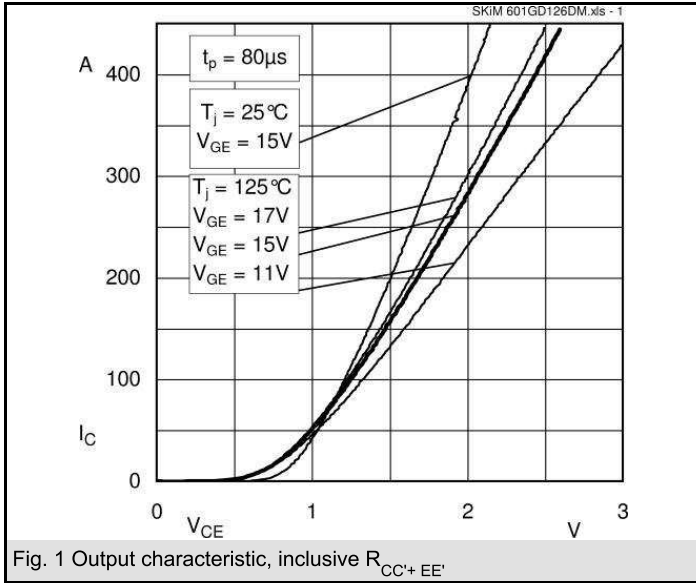
- Switched mode power supplies
- Three phase inverters for AC motor speed control



GD

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

Characteristics		$T_c = 25\text{ }^\circ\text{C}$, 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}	$V_{GE} = 0$; $V_{CE} = V_{CES}$; $T_j = 125\text{ }^\circ\text{C}$			0,6	mA
V_{CEO}	$T_j = 25\text{ (125) }^\circ\text{C}$		1 (0,9)	1,2 (1,1)	V
r_{CE}	$T_j = 25\text{ (125) }^\circ\text{C}$		1,6 (2,4)	2,1 (3)	m Ω
V_{CESat}	$I_{Cnom} = 450\text{ A}$; $V_{GE} = 15\text{ V}$; $T_j = 25\text{ (125) }^\circ\text{C}$ 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 $T_c = 25\text{ (125) }^\circ\text{C}$		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
$t_{d(off)}$	$R_{Gon} = R_{Goff} = 3\text{ }^\circ\Omega$		800		ns
t_f	$T_j = 125\text{ }^\circ\text{C}$		120		ns
$E_{on} (E_{off})$	$V_{GE} \pm 15\text{ V}$		42 (70)		mJ
$E_{on} (E_{off})$	with SKHI 65; $T_j = 125\text{ }^\circ\text{C}$ $V_{CC} = 600\text{ V}$; $I_C = 450\text{ A}$				mJ
Inverse diode					
$V_F = V_{EC}$	$I_{Fnom} = 300\text{ A}$; $V_{GE} = 0\text{ V}$; $T_j = 25\text{ (125) }^\circ\text{C}$		2 (1,8)	2,55 (2,3)	V
V_{TO}	$T_j = 25\text{ (125) }^\circ\text{C}$		1,1	1,45 (1,25)	V
r_T	$T_j = 25\text{ (125) }^\circ\text{C}$		3,3	3,5 (3,5)	m Ω
I_{RRM}	$I_F = 450\text{ A}$; $T_j = 125\text{ }^\circ\text{C}$				A
Q_{rr}	$V_{GE} = V\text{ di/dt} = A/\mu\text{s}$				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}	$T = 25\text{ (100) }^\circ\text{C}$		1 (1,67)		k Ω
tolerance	$T = 25\text{ (100) }^\circ\text{C}$		3 (2)		%
Mechanical data					
M_1	to heatsink (M5)	2		3	Nm
M_2	for terminals (M6)	4		5	Nm
w				460	g



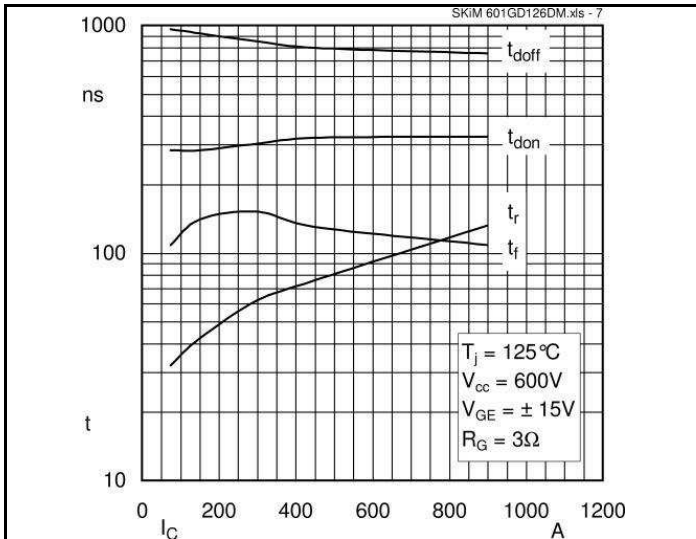


Fig. 7 Switching times vs. I_C

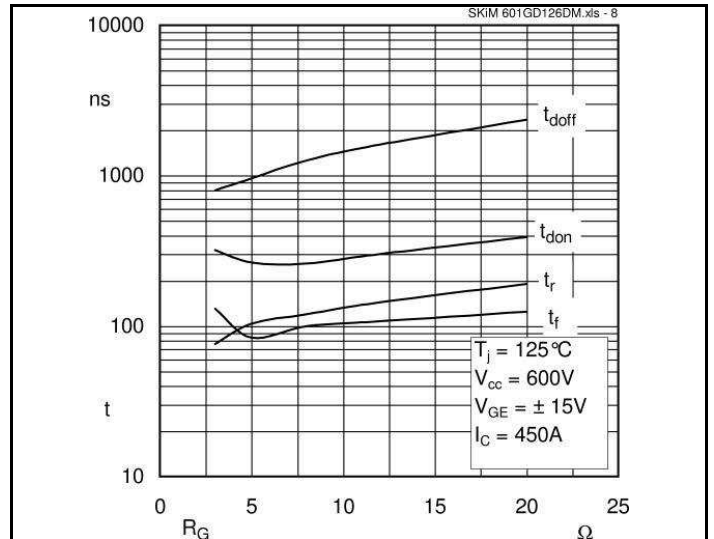


Fig. 8 Switching times vs. gate resistor R_G

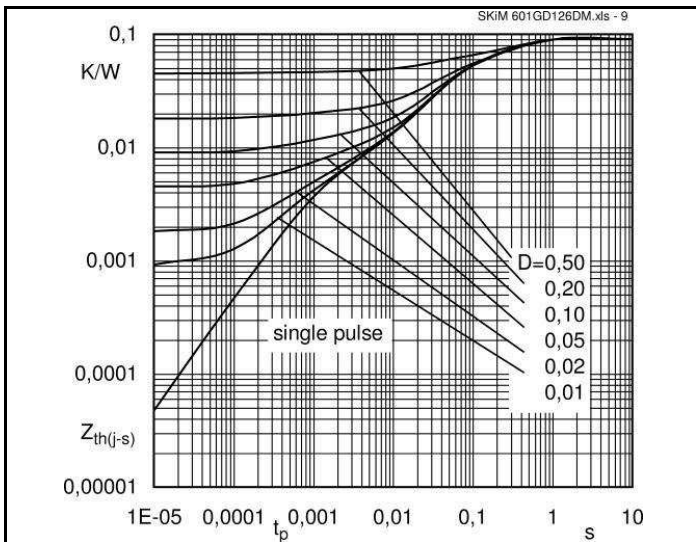


Fig. 9 Transient thermal impedance of IGBT

$$Z_{thp(j-s)} = f(t_p); D = t_p/t_c = t_p * f$$

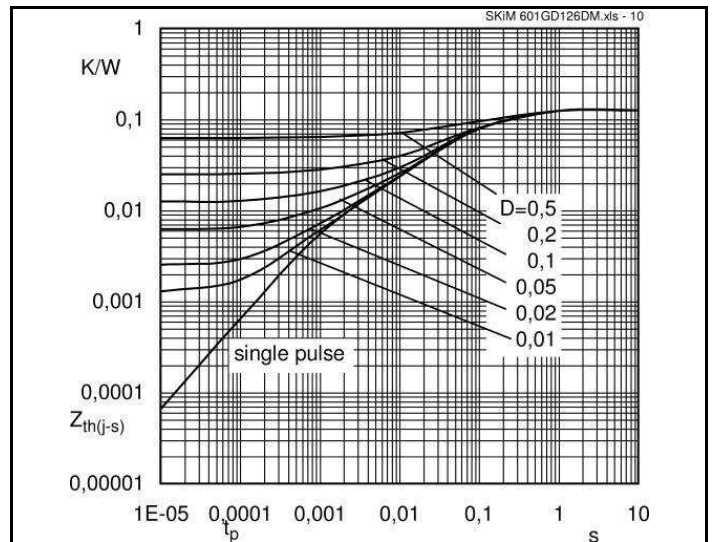


Fig. 10 Transient thermal impedance of FWD

$$Z_{thp(j-s)} = f(t_p); D = t_p/t_c = t_p * f$$

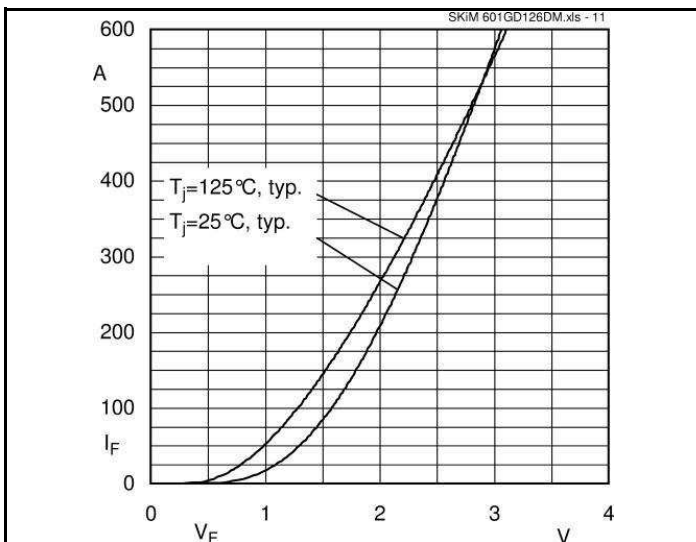
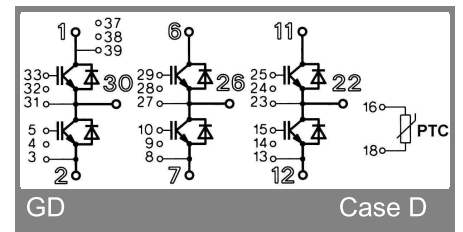
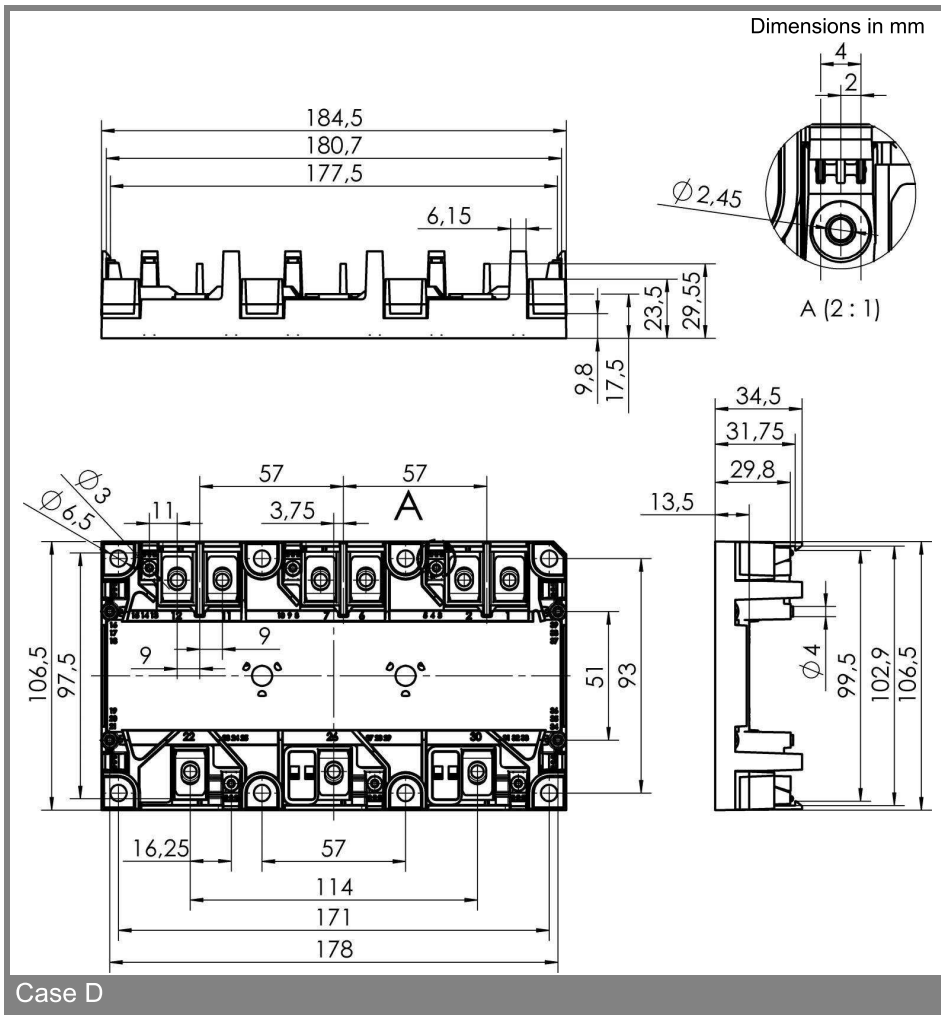


Fig. 11 CAL diode forward characteristic, incl. $R_{CC+EE'}$



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.