



SKIM® 4

IGBT Modules

SKiM 250GD128D

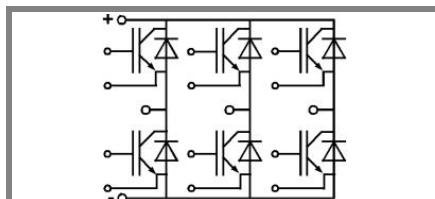
Preliminary Data

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 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

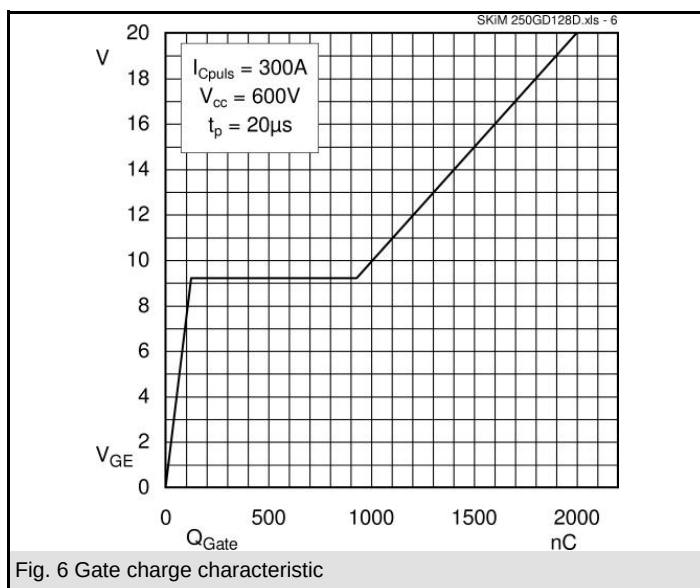
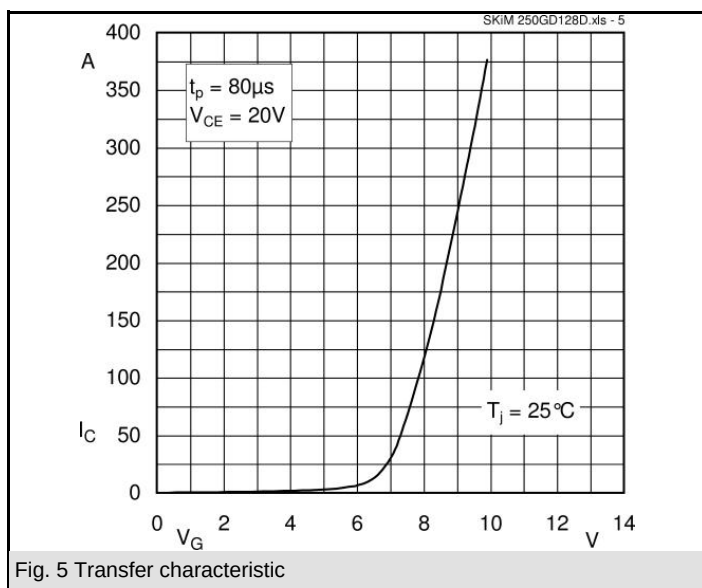
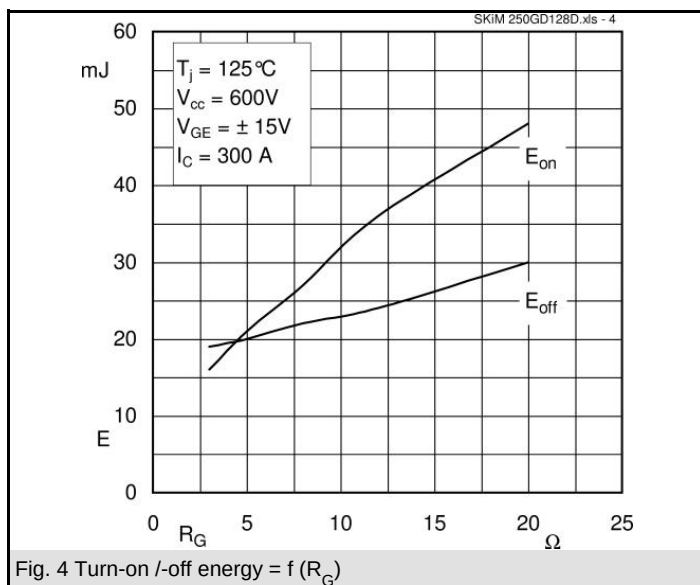
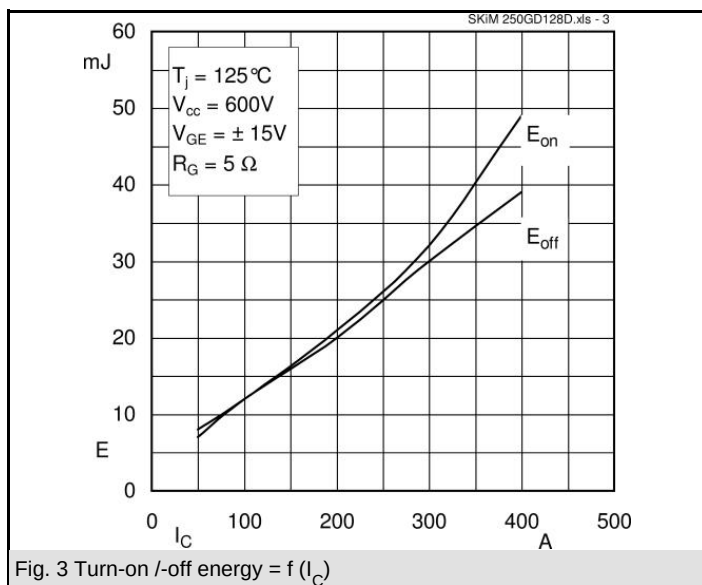
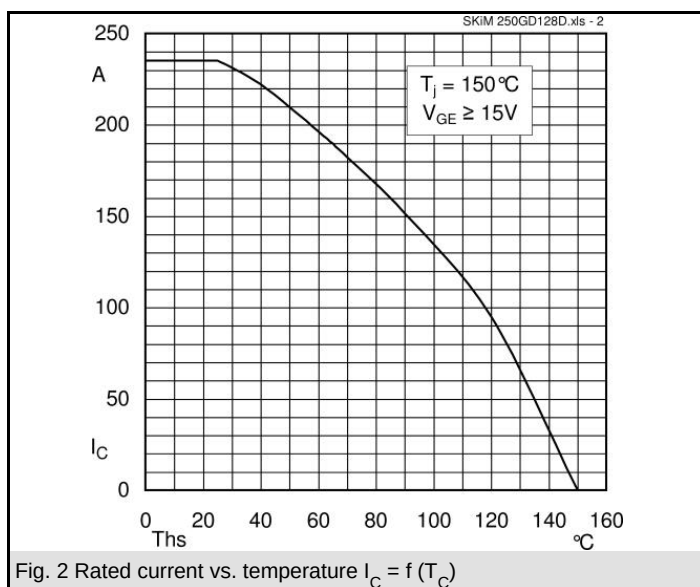
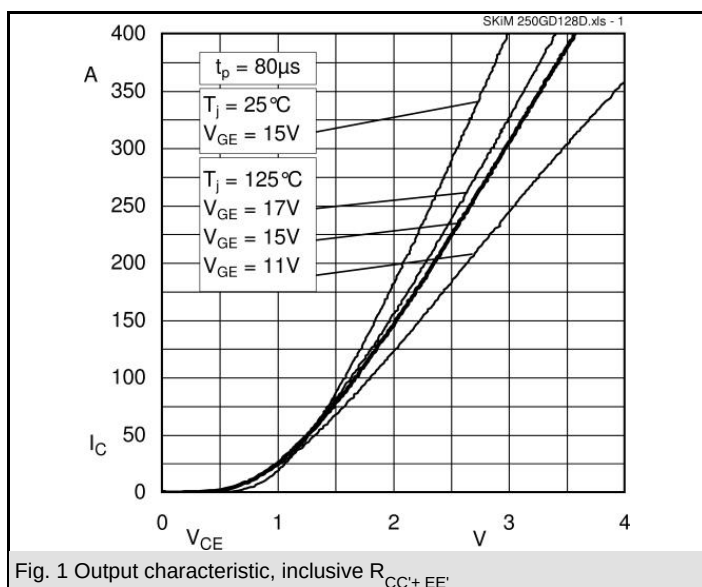
- Switched mode power supplies
- Three phase inverters for AC motor speed control



GD

Absolute Maximum Ratings		T _c = 25 °C, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V _{CES}		1200	V
I _C	T _s = 25 (70) °C	240 (180)	A
I _{CM}	T _s = 25 (70) °C, t _p = 1 ms	480 (360)	A
V _{GES}		± 20	V
T _j (T _{stg})		- 40 ... + 150 (125)	°C
T _{cop}	max. case operating temperature	125	°C
V _{isol}	AC, 1 min.	2500	V
Inverse diode			
I _F	T _s = 25 (70) °C	240 (180)	A
I _{FM} = - I _{CM}	T _s = 25 (70) °C, t _p = 1 ms	480 (360)	A
I _{FSM}	t _p = 10 ms; sin.; T _j = 150 °C	2200	A

Characteristics		T _c = 25 °C, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
V _{GE(th)}	V _{GE} = V _{CE} ; I _C = 8 mA	4,45	5,5	6,55	V
I _{CES}	V _{GE} = 0; V _{CE} = V _{CES} ; T _j = 25 °C			0,3	mA
V _{CEO}	T _j = 25 °C		1 (0,9)	1,15 (1,05)	V
r _{CE}	T _j = 25 () °C		5 (7)	6 (7,5)	mΩ
V _{CEsat}	I _C = 200 A; V _{GE} = 15 V, T _j = 25 (125) °C on chip level		2 (2,3)	2,35 (2,55)	V
C _{ies}	V _{GE} = 0; V _{CE} = 25 V; f = 1 MHz		18		nF
C _{oes}	V _{GE} = 0; V _{CE} = 25 V; f = 1 MHz		4,3		nF
C _{res}	V _{GE} = 0; V _{CE} = 25 V; f = 1 MHz		3,6		nF
L _{CE}				20	nH
R _{CC'+EE'}	resistance, terminal-chip T _c = 25 °C		1,15		mΩ
t _{d(on)}	V _{CC} = 600 V		150		ns
t _r	I _C = 200 A		45		ns
t _{d(off)}	R _{Gon} = R _{Goff} = 5 Ω		700		ns
t _f	T _j = 125 °C		50		ns
E _{on} (E _{off})	V _{GE} ± 15 V		21 (20)		mJ
E _{on} (E _{off})	with SKHI 64; T _j = 125 °C V _{CC} = 600 V; I _C = 200 A				mJ
Inverse diode					
V _F = V _{EC}	I _F = 200 A; V _{GE} = 0 V; T _j = 25 (125) °C		2,3 (2,1)	2,65	V
V _{TO}	T _j = 125 °C		1,1		V
r _T	T _j = 125 °C		5		mΩ
I _{RRM}	I _F = 200 A; T _j = 125 °C				A
Q _{rr}	V _{GE} = V di/dt = A/μs				μC
E _{rr}	R _{Gon} = R _{Goff} =				mJ
Thermal characteristics					
R _{th(j-s)}	per IGBT			0,2	K/W
R _{th(j-s)}	per FWD			0,285	K/W
Temperature Sensor					
R _{TS}	T = 25 (100) °C		1 (1,67)		kΩ
tolerance	T = 25 (100) °C		3 (2)		%
Mechanical data					
M ₁	to heatsink (M5)	2		3	Nm
M ₂	for terminals (M6)	4		5	Nm
w				310	g



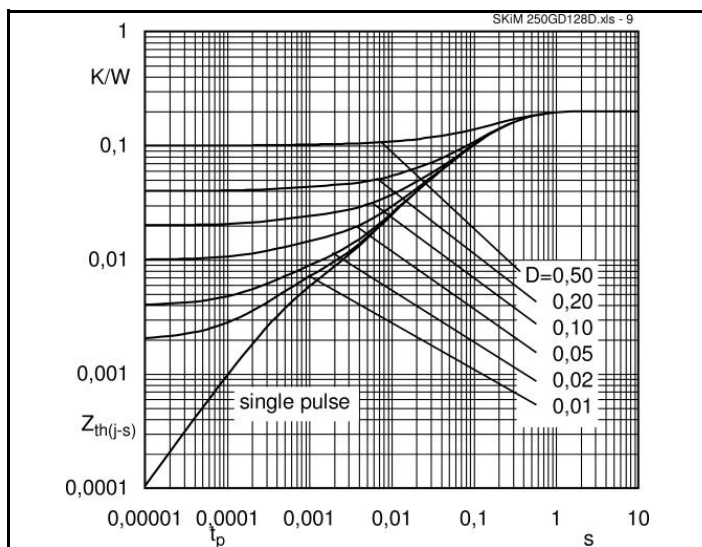
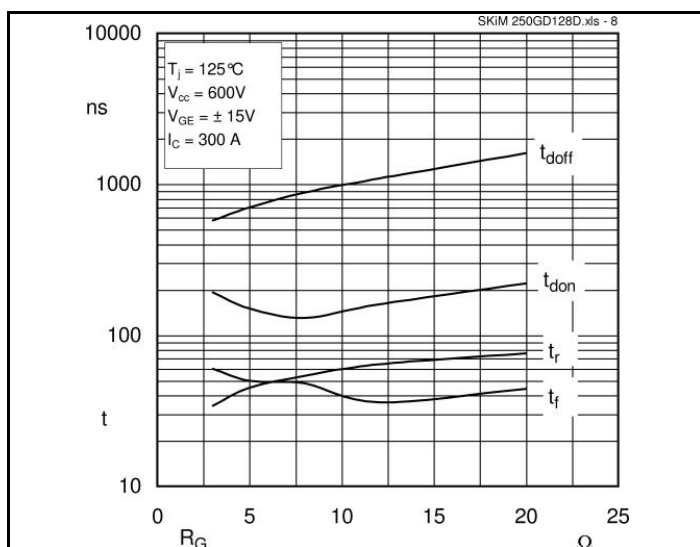
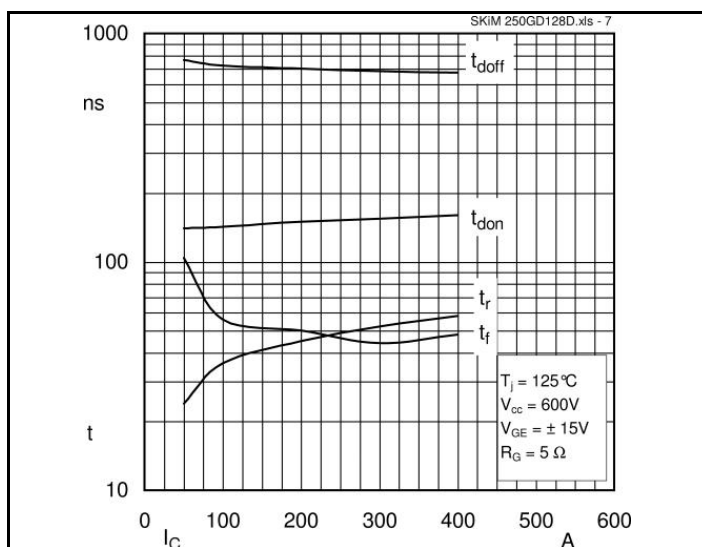


Fig. 9 Transient thermal impedance of IGBT

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

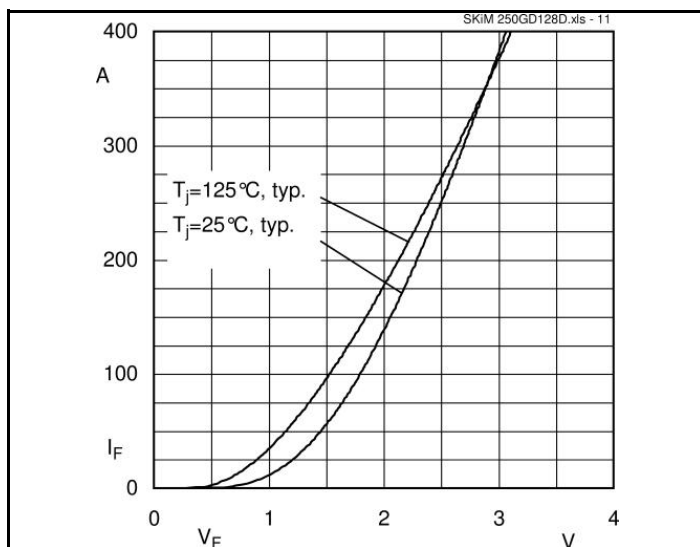
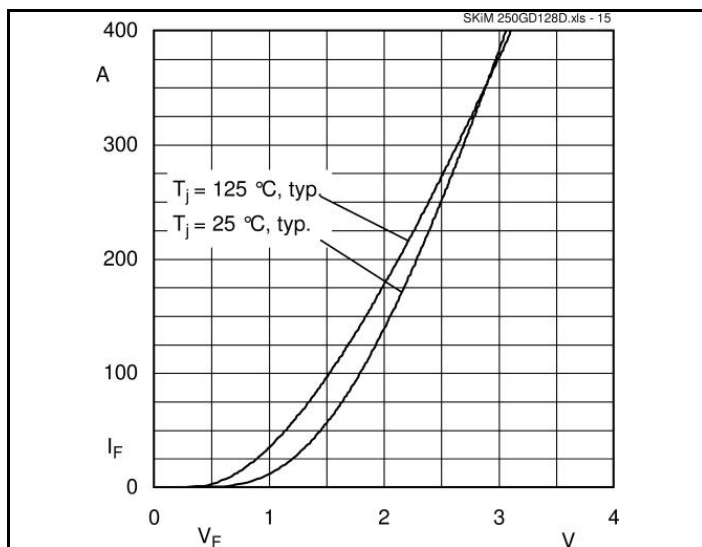
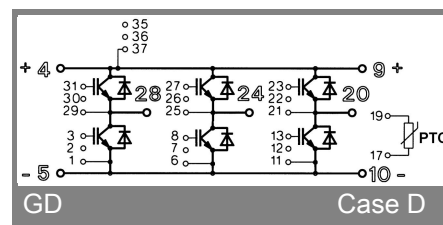
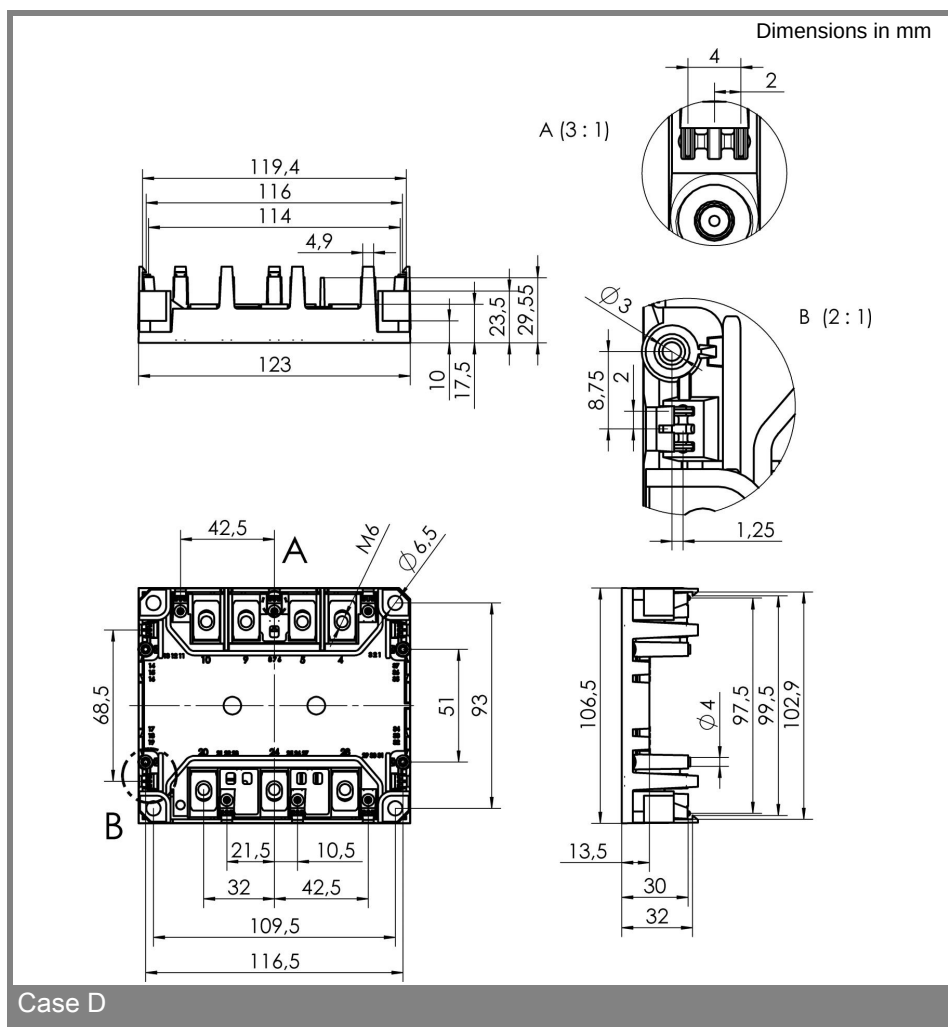


Fig. 10 Transient thermal impedance of FWD

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


 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.

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.