

SKiM 270GD128D



SKiM[®] 4

SPT IGBT Modules

SKiM 270GD128D

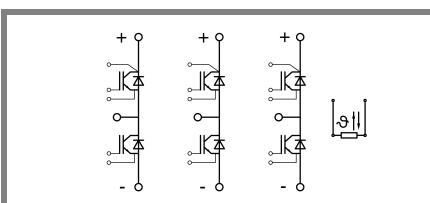
Target Data

Features

- N channel, homogenous planar IGBT with n+ buffer layer in SPT (soft punch through) technology
- Isolated by Al₂O₃ DCB (direct copper bonded) ceramic substrate plate
- Pressure contact technology for thermal contacts
- Spring contact system to attach driver PCB to the auxiliary terminals
- Integrated temperature sensor

Typical Applications

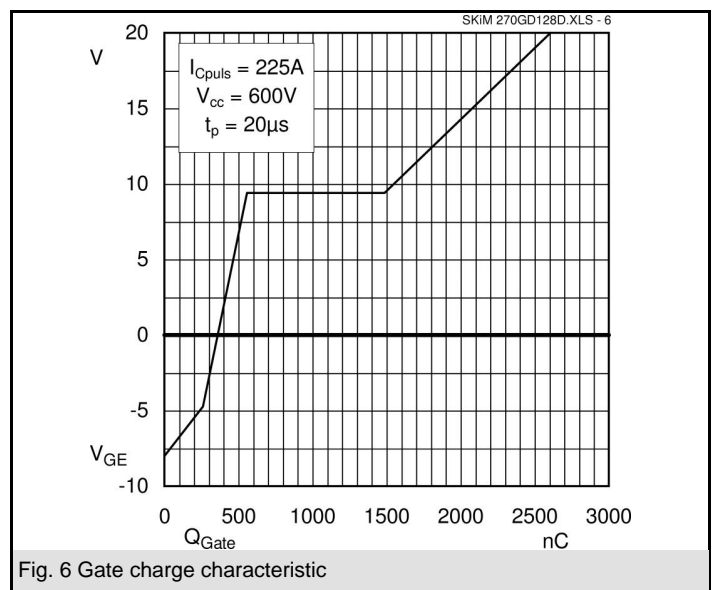
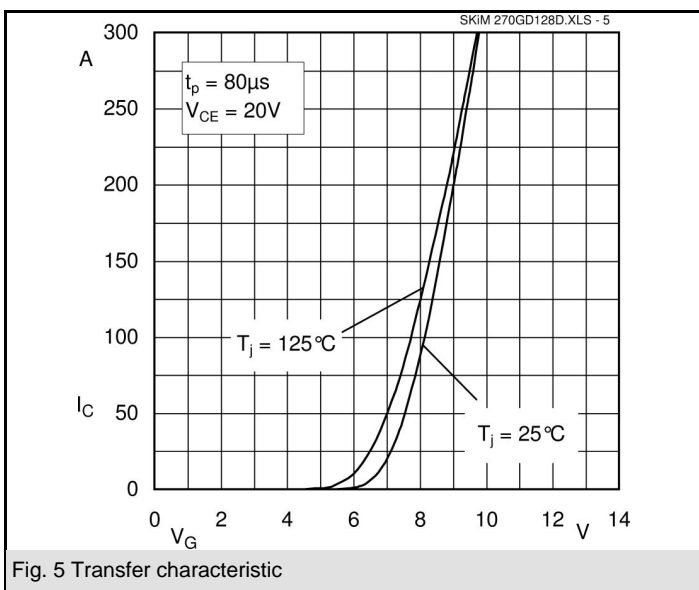
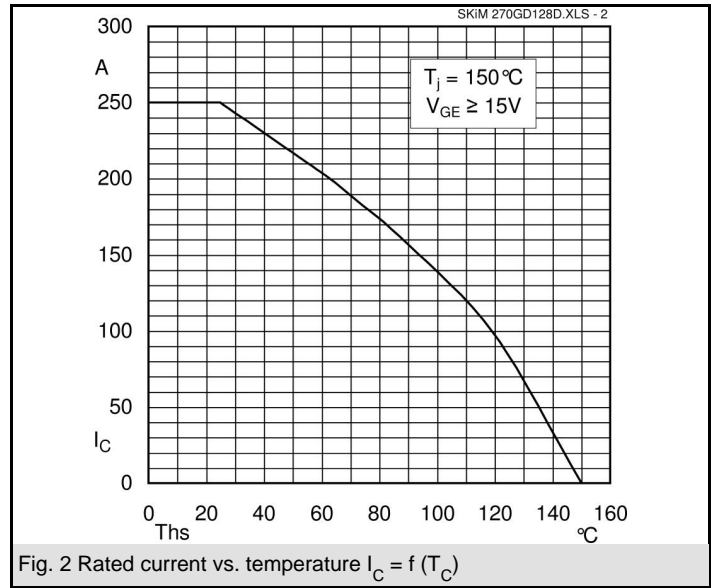
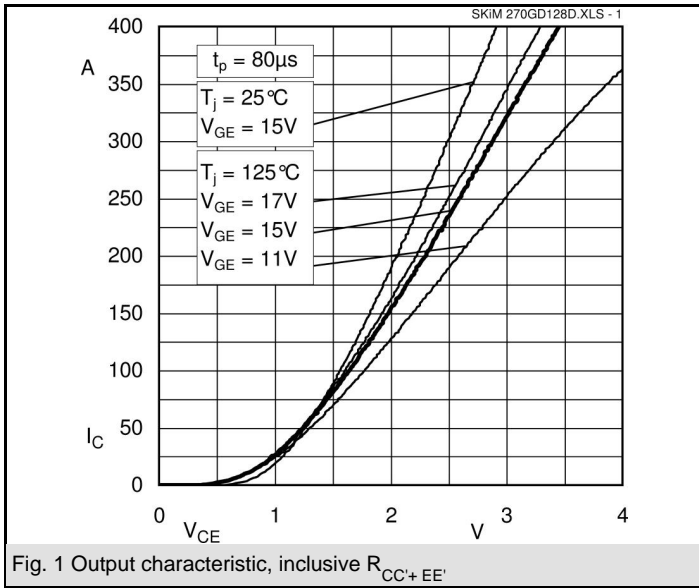
- Switched mode power supplies
- Three phase inverter for AC motor drives



GD

Absolute Maximum Ratings		$T_{case} = 25^{\circ}\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_C	$T_s = 25 (70) ^{\circ}\text{C}$	250 (190)	A
I_{CM}	$T_s = 25 (70) ^{\circ}\text{C}$, $t_p = 1 \text{ ms}$	500 (380)	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	$T_s = 25 (70) ^{\circ}\text{C}$	220 (150)	A
$I_{FM} = -I_{CM}$	$T_s = 25 (70) ^{\circ}\text{C}$, $t_p = 1 \text{ ms}$	500 (380)	A
I_{FSM}	$t_p = 10 \text{ ms}$; sin.; $T_j = 150 ^{\circ}\text{C}$		A

Characteristics		$T_{case} = 25^{\circ}\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$; $I_C = 12 \text{ mA}$	4,45	5,5	6,55	V
I_{CES}	$V_{GE} = 15$; $V_{CE} = V_{CES}$; $T_j = 25 ^{\circ}\text{C}$		0,2	0,6	mA
V_{CEO}	$T_j = 25 ^{\circ}\text{C}$		1 (0,9)	1,15 (1,05)	V
r_{CE}	$T_j = 25 () ^{\circ}\text{C}$		4 (5,3)	5,3 (6,7)	m Ω
V_{CEsat}	$I_C = 225 \text{ A}$; $V_{GE} = 15 \text{ V}$; $T_j = 25 (125) ^{\circ}\text{C}$ on chip level		1,9 (2,1)	2,35 (2,55)	V
C_{ies}	$V_{GE} = 0$; $V_{CE} = 25 \text{ V}$; $f = 1 \text{ MHz}$		18,6		nF
C_{oes}	$V_{GE} = 0$; $V_{CE} = 25 \text{ V}$; $f = 1 \text{ MHz}$		2,2		nF
C_{res}	$V_{GE} = 0$; $V_{CE} = 25 \text{ V}$; $f = 1 \text{ MHz}$		2,1		nF
L_{CE}				20	nH
$R_{CC'+EE'}$	resistance, terminal-chip $T_c = 25 (125) ^{\circ}\text{C}$		0,9 (1,1)		m Ω
$t_{d(on)}$	$V_{CC} = 600 \text{ V}$		160		ns
t_r	$I_C = 225 \text{ A}$		60		ns
$t_{d(off)}$	$R_{Gon} = R_{Goff} = 4,4 \Omega$		660		ns
t_f	$T_j = 125 ^{\circ}\text{C}$		80		ns
$E_{on} (E_{off})$	$V_{GE} \pm 15 \text{ V}$		20,9 (24,1)		mJ
$E_{on} (E_{off})$	with SKHI 65; $T_j = 125 ^{\circ}\text{C}$ $V_{CC} = 600 \text{ V}$; $I_C = 225 \text{ A}$				mJ
Inverse diode					
$V_F = V_{EC}$	$I_F = 225 \text{ A}$; $V_{GE} = 0 \text{ V}$; $T_j = 25 (125) ^{\circ}\text{C}$				V
V_{TO}	$T_j = 25 (125) ^{\circ}\text{C}$				V
r_T	$T_j = 25 (125) ^{\circ}\text{C}$				m Ω
I_{RRM}	$I_F = 225 \text{ A}$; $T_j = 125 ^{\circ}\text{C}$				A
Q_{rr}	$V_{GE} = 0 \text{ V}$ $di/dt = \text{A}/\mu\text{s}$				μC
E_{rr}	$R_{Gon} = R_{Goff} = 4,4 \Omega$		14,5		mJ
Thermal characteristics					
$R_{th(j-s)}$	per IGBT			0,18	K/W
$R_{th(j-s)}$	per FWD			0,25	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)				Nm
M_2	for terminals (M6)	4		5	Nm
w				460	g



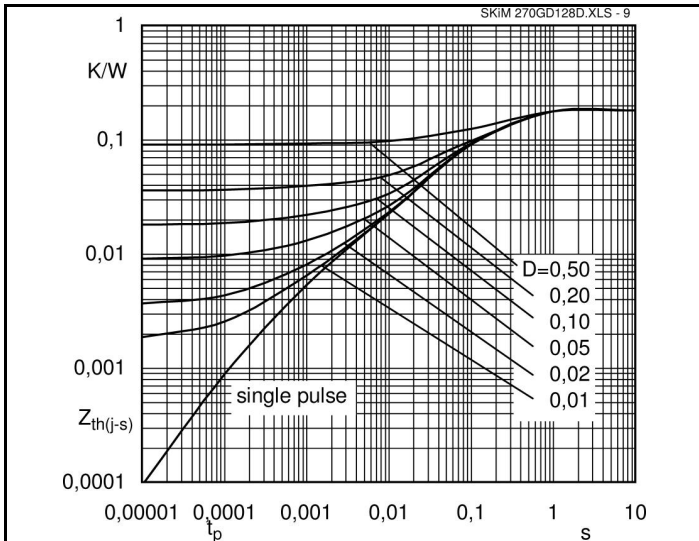


Fig. 9 Transient thermal impedance of

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

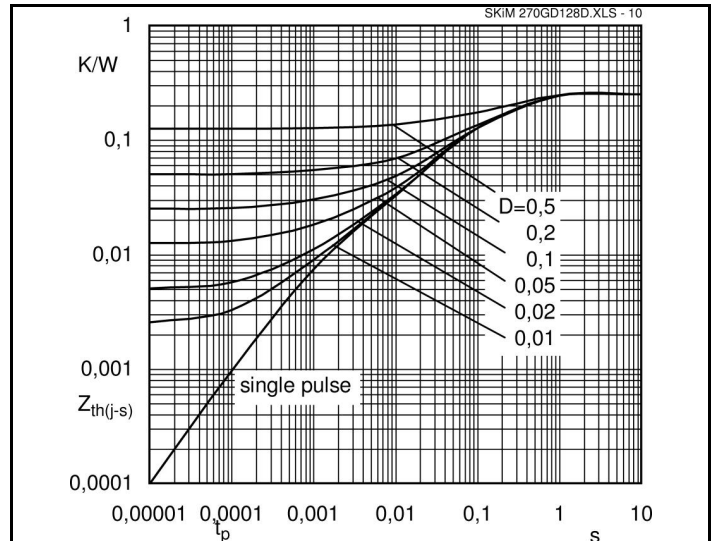


Fig. 10 Transient thermal impedance of inverse diodes

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

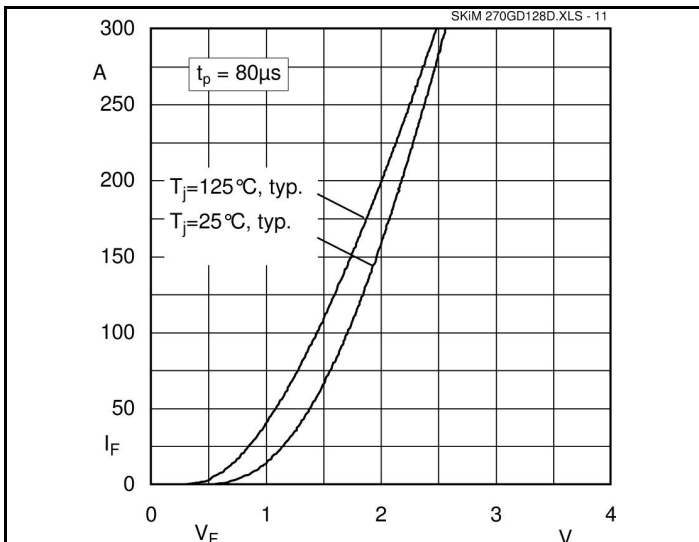
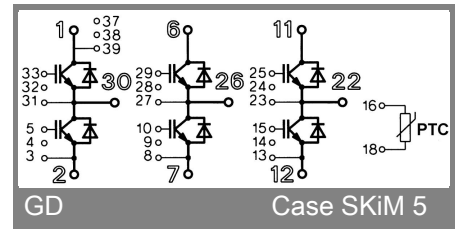
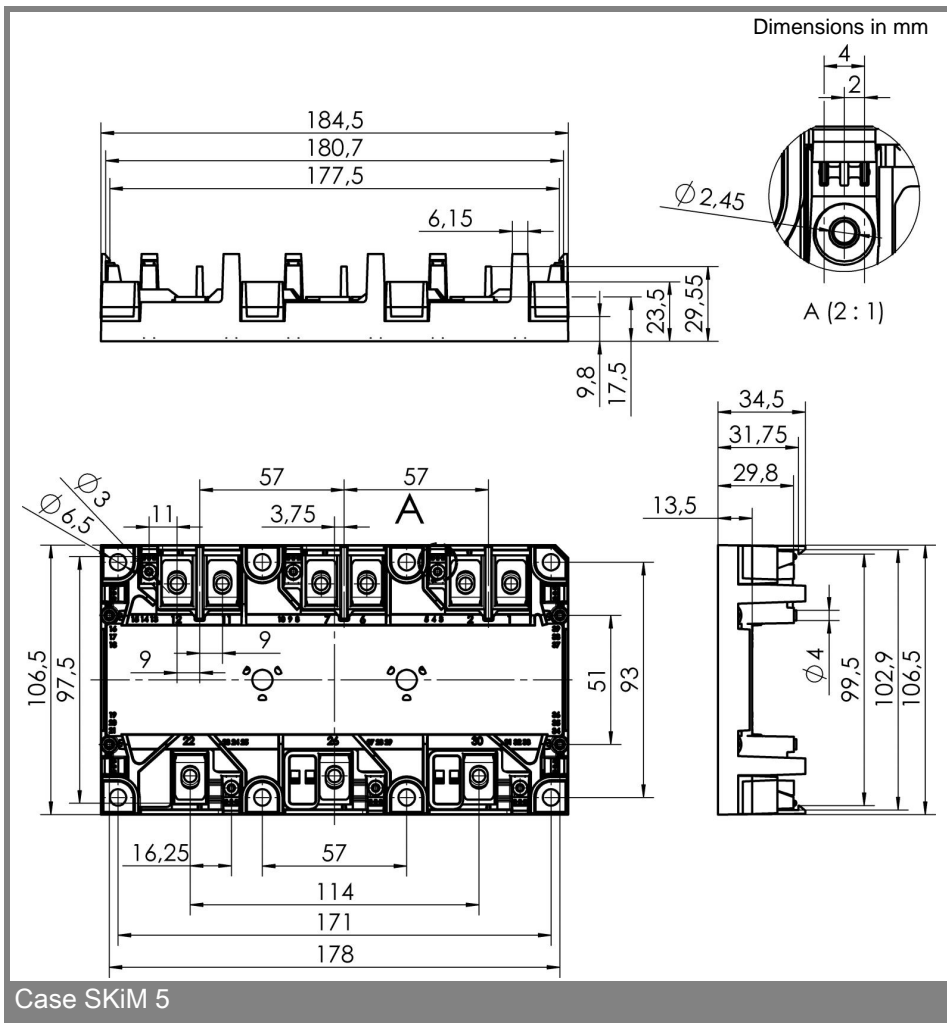


Fig. 11 CAL diode forward characteristic, incl. R_{CC+EE}



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

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