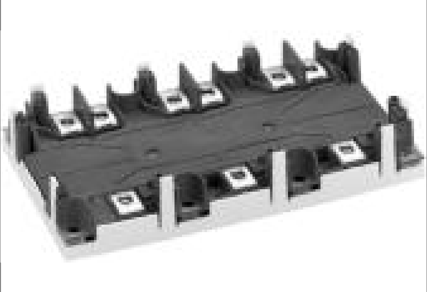
SKiM 270GD128D



SKiM® 4

SPT IGBT Modules

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SKiM 270GD128D

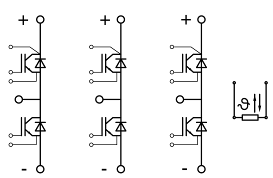
Target Data

Features

- N channel, homogenous planar IGBT with n+ buffer layer in SPT (soft punch through) technology
- Isolated by Al_2O_3 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



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

Characteristics	T_{case} = 25°C, unless otherwise specified				
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Units**
IGBT					
$V_{GE(th)}$	V_{GE} = V_{CE}; I_C = 12 mA	4,45	5,5	6,55	V
I_{CES}	V_{GE} = 15; V_{CE} = V_{CES}; T_j = 25 °C		0,2	0,6	mA
V_{CEO}	T_j = 25 °C		1 (0,9)	1,15 (1,05)	V
r_{CE}	T_j = 25 () °C		4 (5,3)	5,3 (6,7)	mΩ
V_{CEsat}	I_C = 225 A; V_{GE} = 15 V, T_j = 25 (125) °C on chip level		1,9 (2,1)	2,35 (2,55)	V
C_{ies}	V_{GE} = 0; V_{CE} = 25 V; f = 1 MHz		18,6		nF
C_{oes}	V_{GE} = 0; V_{CE} = 25 V; f = 1 MHz		2,2		nF
C_{res}	V_{GE} = 0; V_{CE} = 25 V; f = 1 MHz		2,1		nF
L_{CE}				20	nH
$R_{CC'+EE'}$	resistance, terminal-chip T_c= 25 (125) °C		0,9 (1,1)		mΩ
$t_{d(on)}$	V_{CC} = 600 V		160		ns
t_r	I_C = 225 A		60		ns
$t_{d(off)}$	R_{Gon} = R_{Goff} = 4,4 Ω		660		ns
t_f	T_j = 125 °C		80		ns
E_{on} (E_{off})	V_{GE} ± 15 V		20,9 (24,1)		mJ
E_{on} (E_{off})	with SKHI 65; T_j = 125 °C V_{CC} = 600 V; I_C = 225 A				mJ
Inverse diode					
V_F = V_{EC}	I_F = 225 A; V_{GE} = 0 V; T_j = 25 (125) °C				V
V_{TO}	T_j = 25 (125) °C				V
r_T	T_j = 25 (125) °C				mΩ
I_{RRM}	I_F = 225 A; T_j = 125 °C				A
Q_{rr}	V_{GE} = 0 V di/dt = A/µs				µC
E_{rr}	R_{Gon} = R_{Goff} = 4,4 Ω		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) °C		1 (1,67)		kΩ
tolerance	T = 25 (100) °C		3 (2)		%
Mechanical data					
M_1	to heatsink (M5)				Nm
M_2	for terminals (M6)	4		5	Nm
w				460	g

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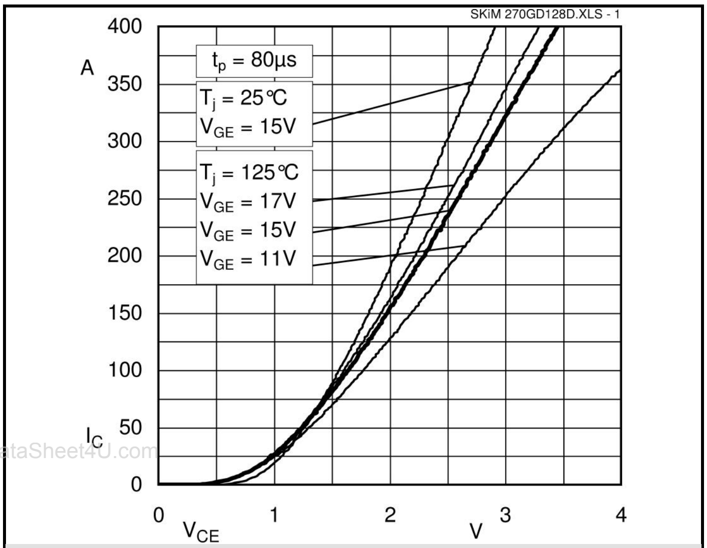

Fig. 1 Output characteristic, inclusive $R_{CC'+EE'}$

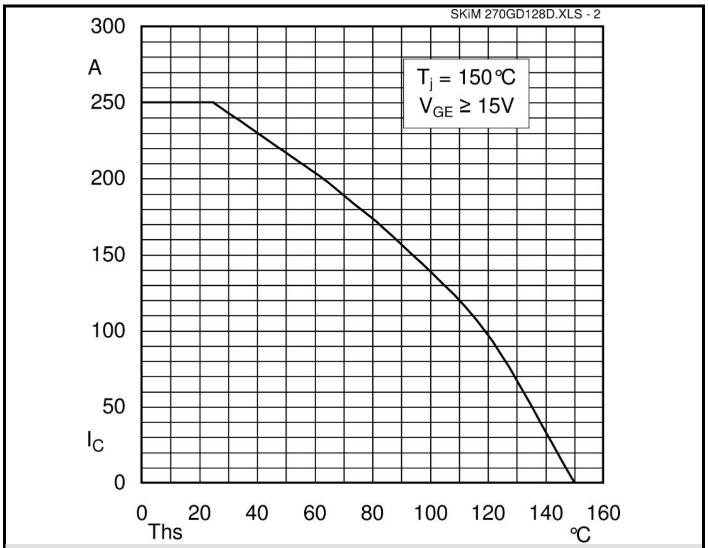

Fig. 2 Rated current vs. temperature I_C = f (T_C)

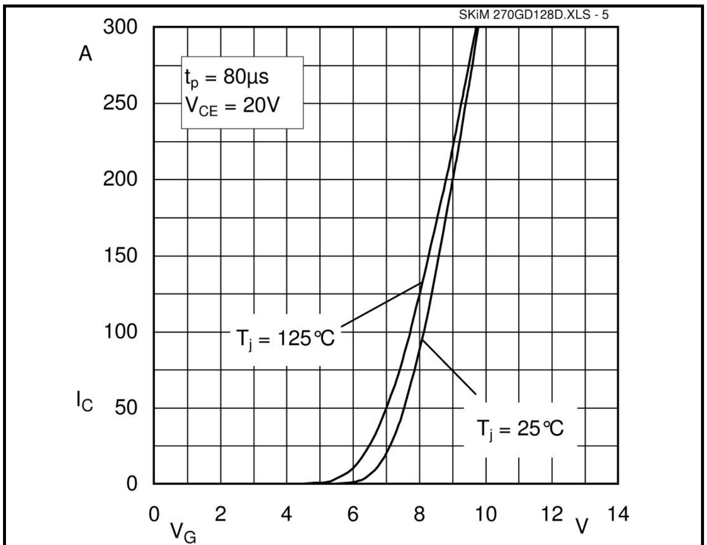

Fig. 5 Transfer characteristic

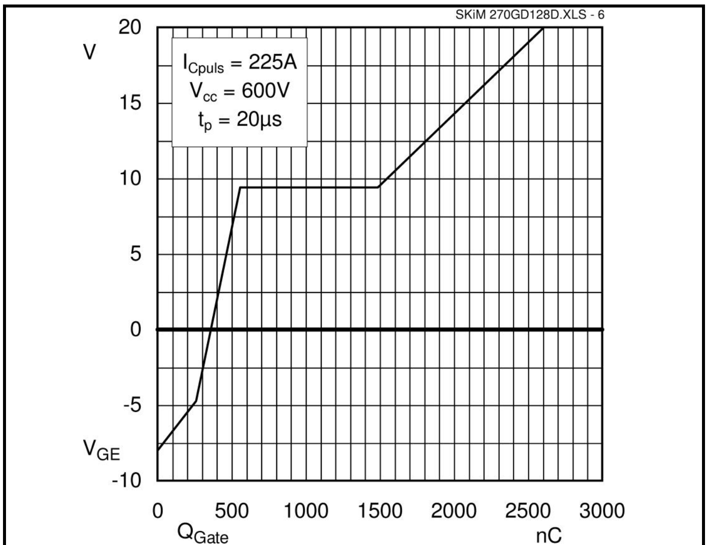

Fig. 6 Gate charge characteristic

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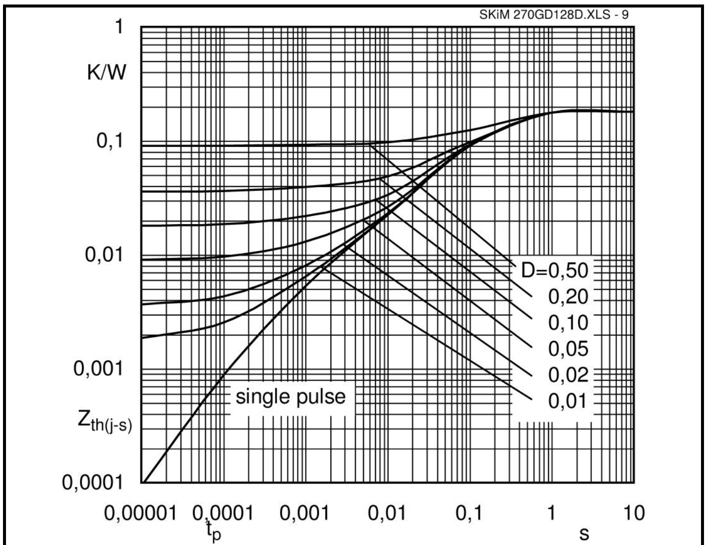

Fig. 9 Transient thermal impedance of

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

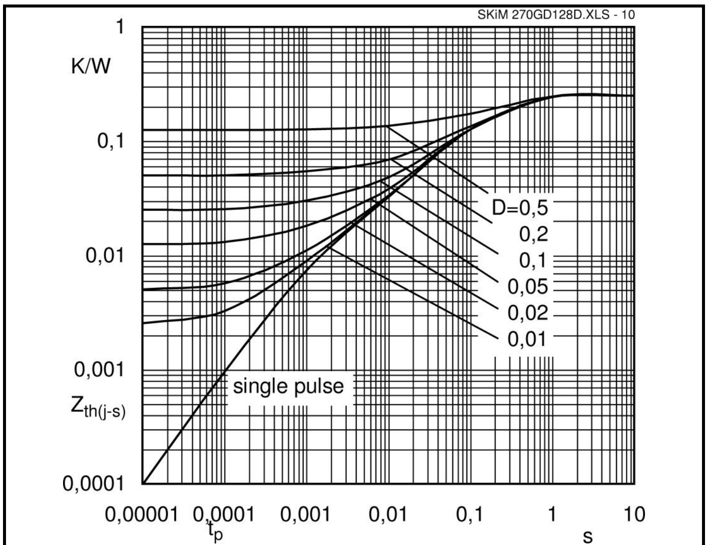

Fig. 10 Transient thermal impedance of inverse diodes

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

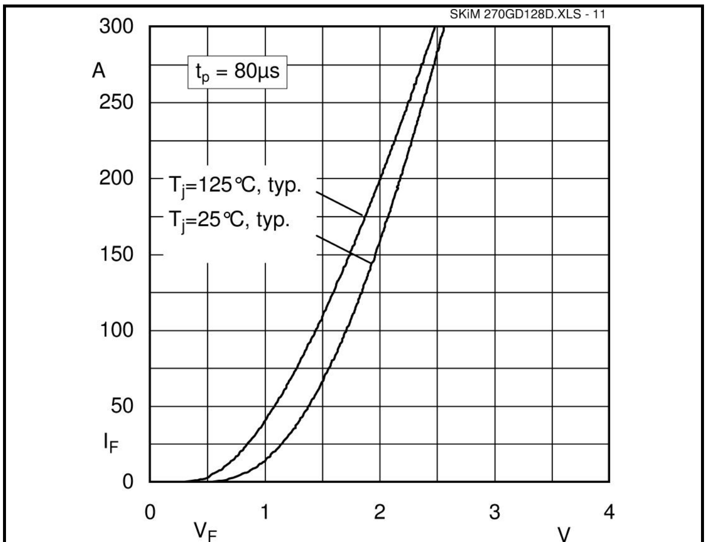

Fig. 11 CAL diode forward characteristic, incl. $R_{CC'+EE'}$

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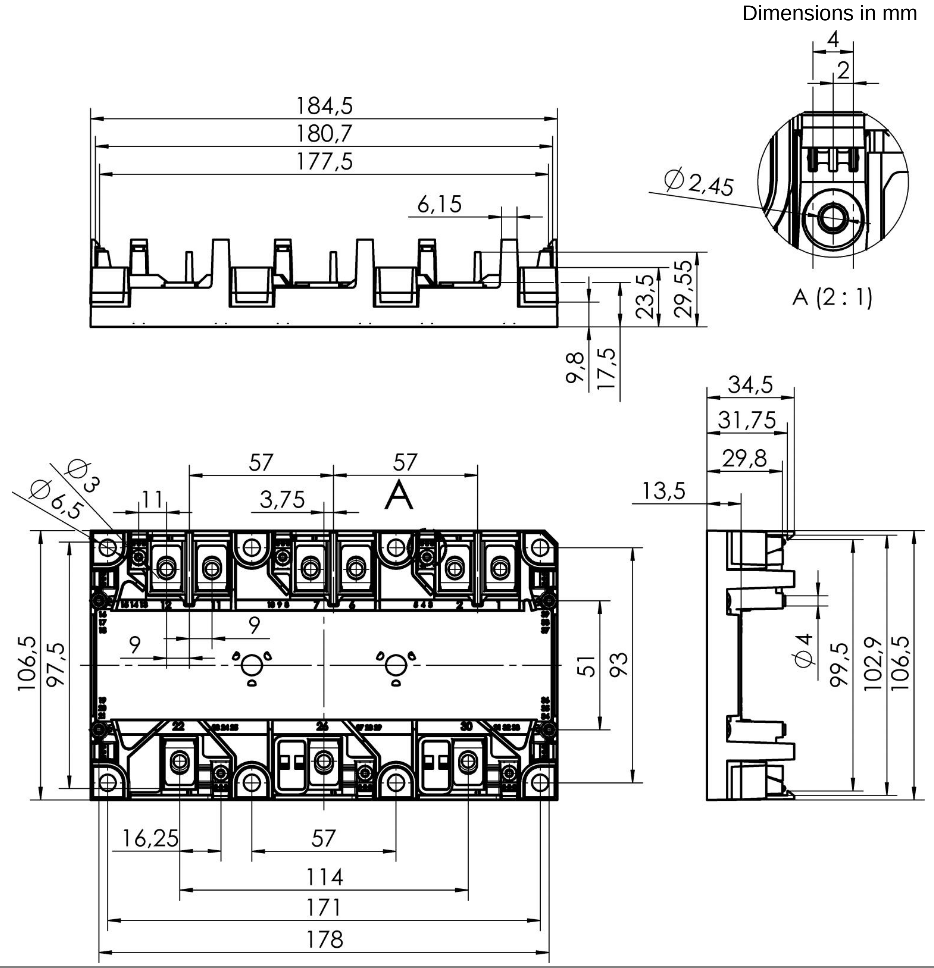

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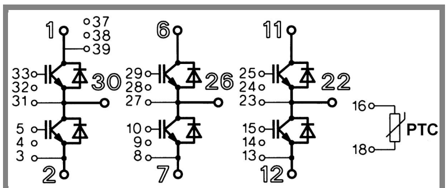

GD Case SKiM 5

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

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