

# SKiM 400GD128D



SKiM<sup>®</sup> 5

## IGBT Modules

### SKiM 400GD128D

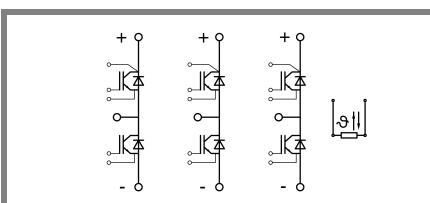
Preliminary Data

#### Features

- Homogeneous Si
- SPT = Soft Punch Through Technology
- $V_{CEsat}$  with positive temperature coefficient
- High Short circuit capability, self limiting to  $6 \times I_C$
- Isolated by  $Al_2O_3$  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 sensore

#### Typical Applications

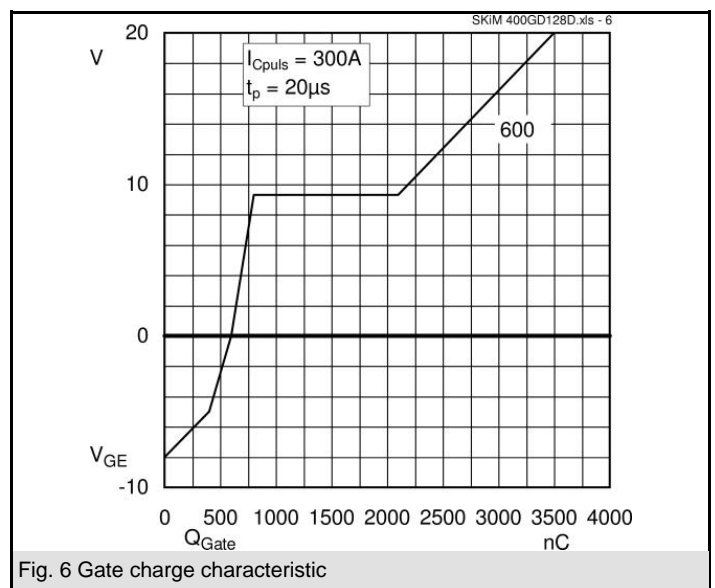
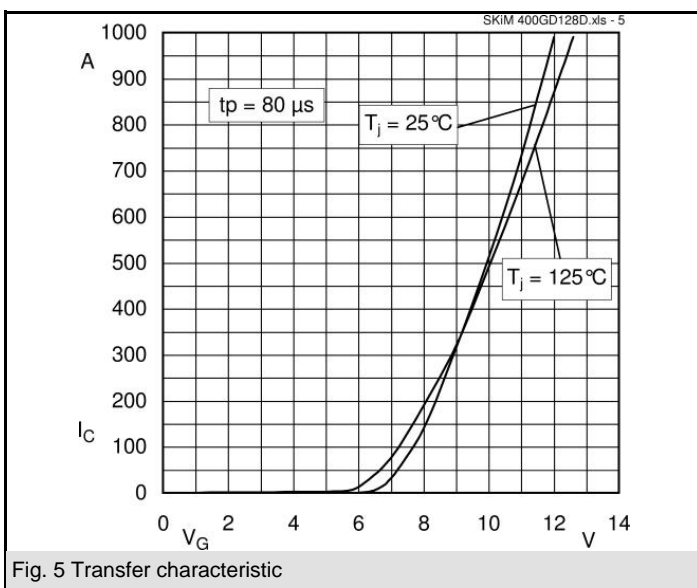
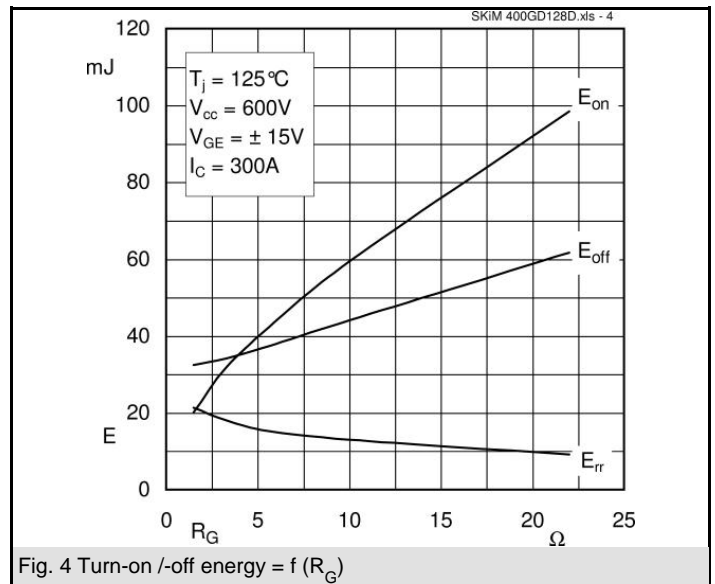
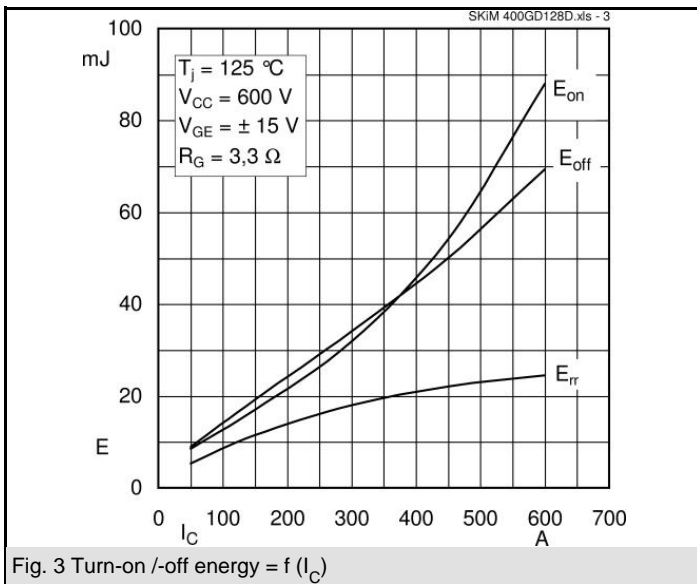
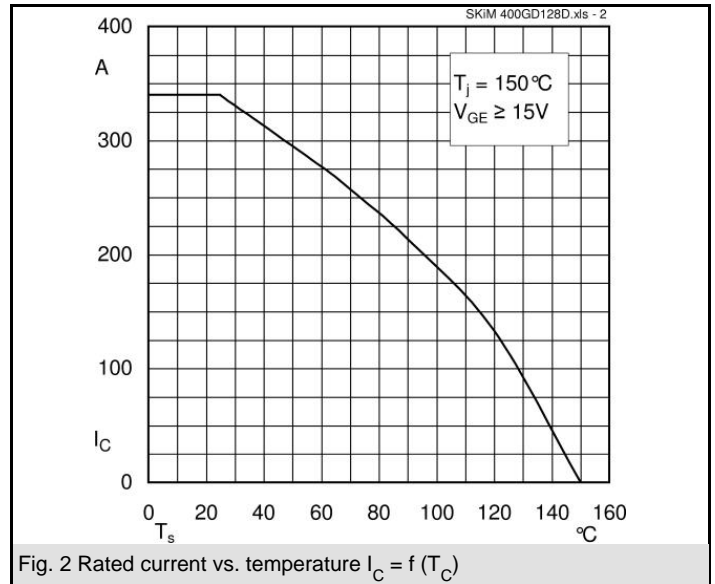
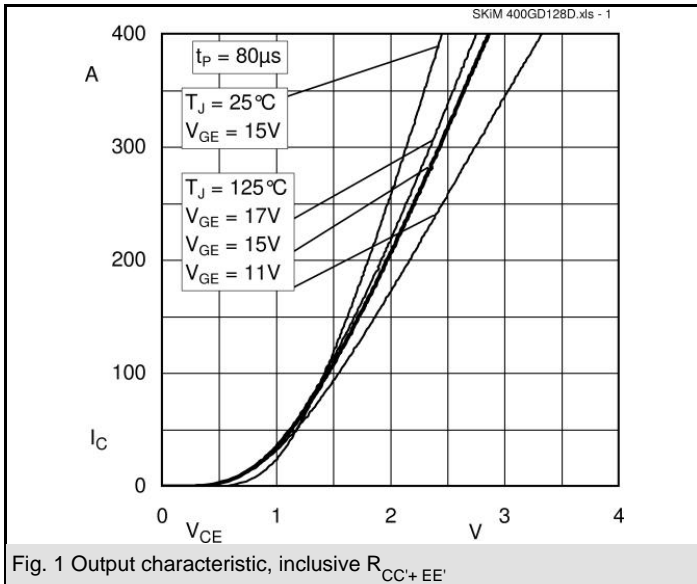
- AC inverter drives
- Uninterruptable Power supplies

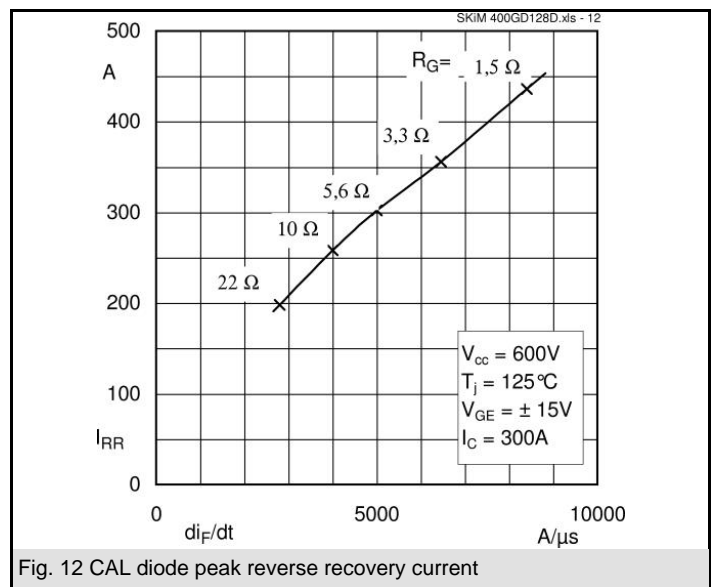
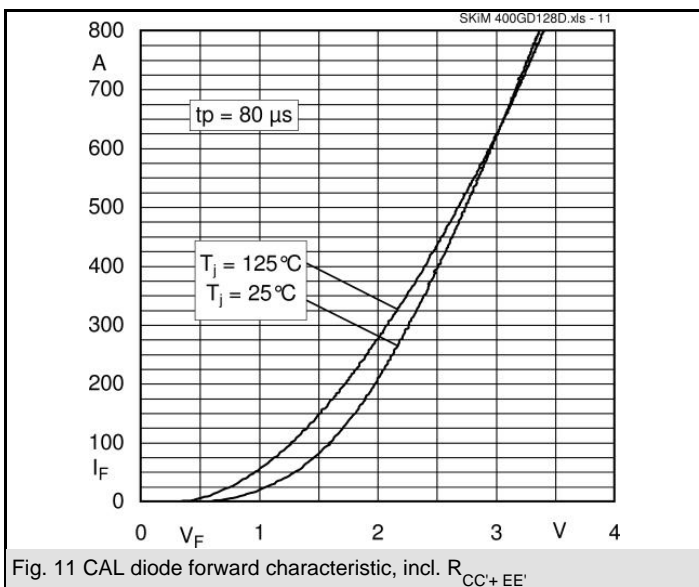
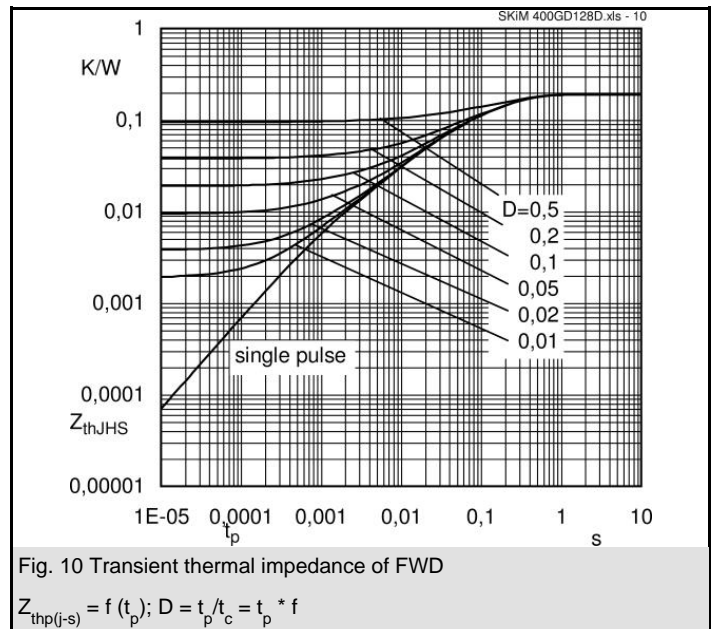
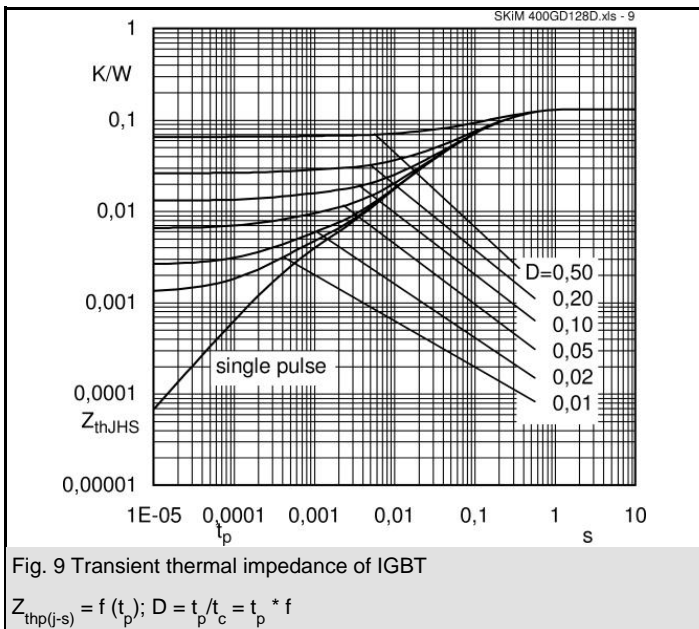
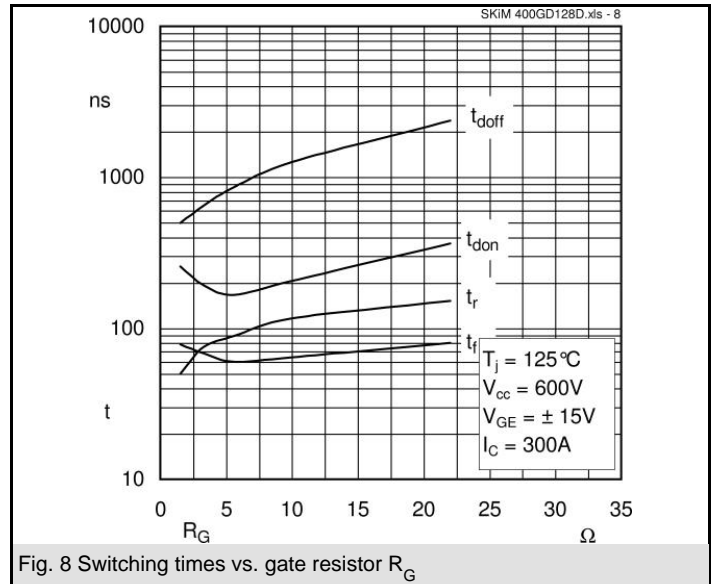
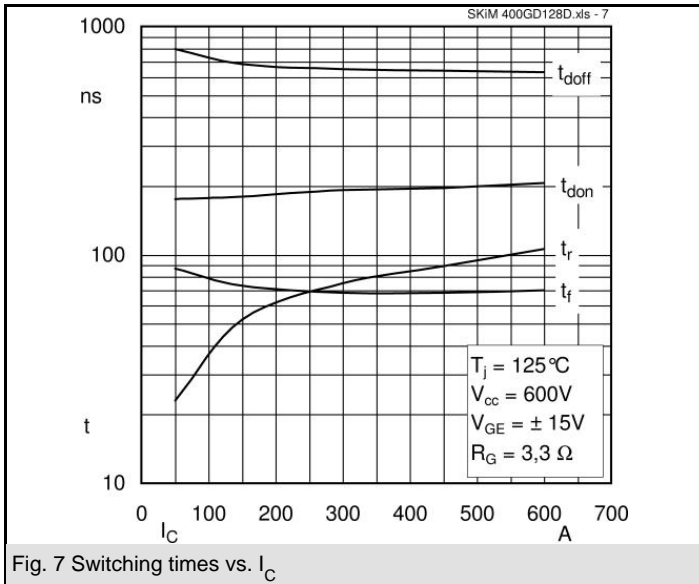


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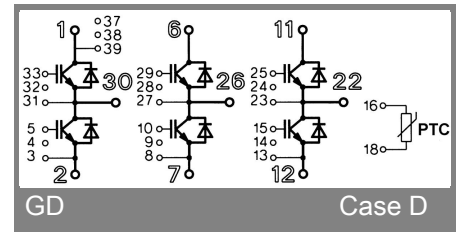
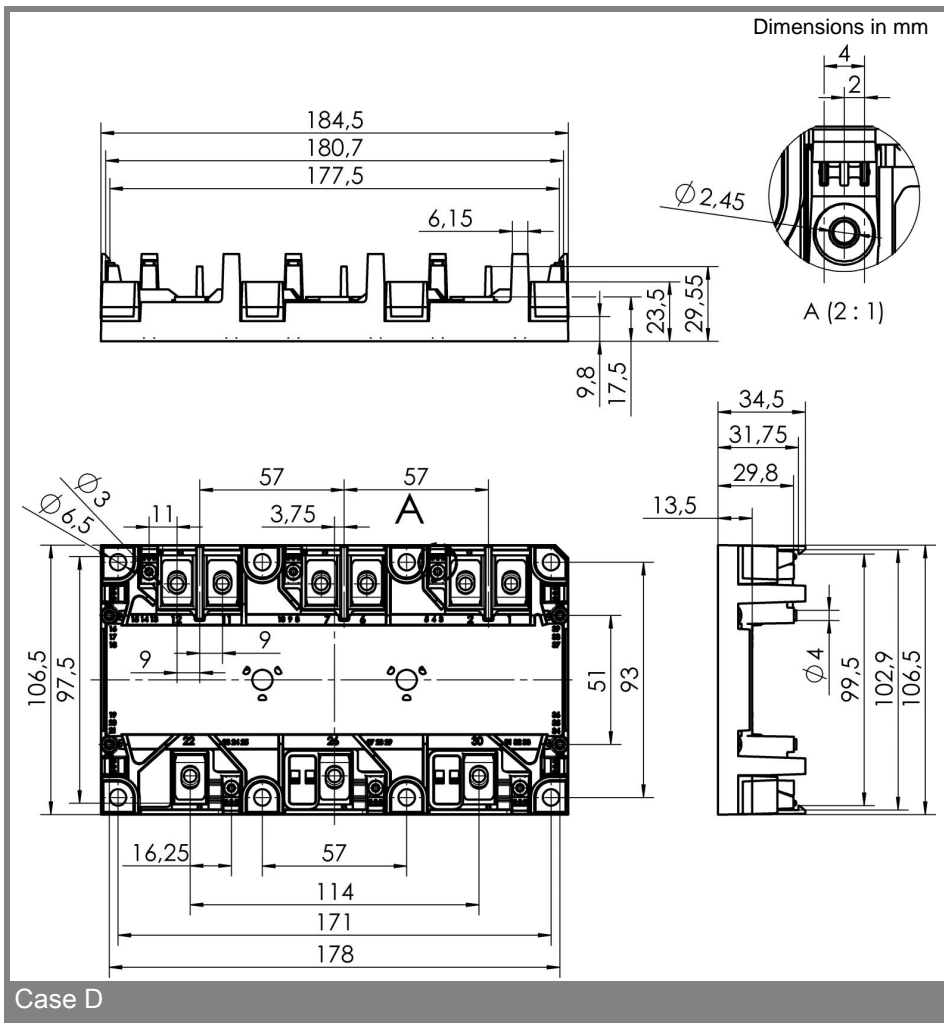
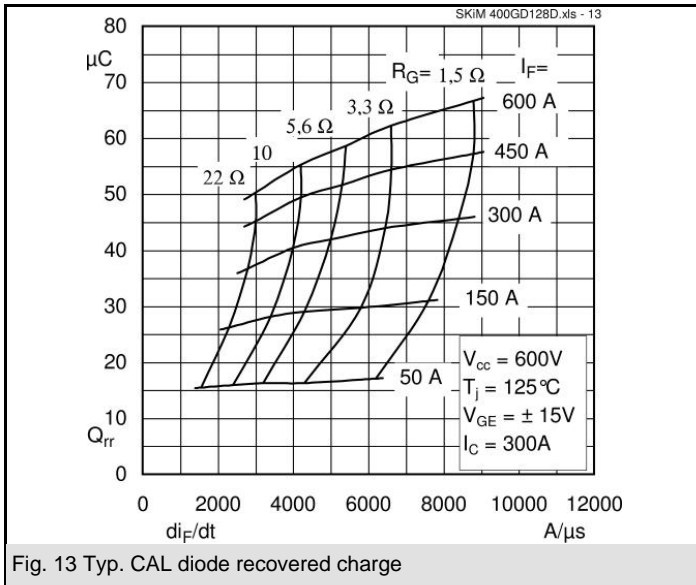
Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$ , unless otherwise specified	
Symbol	Conditions	Values	Units
<b>IGBT</b>			
$V_{CES}$		1200	V
$I_C$	$T_s = 25 (70)^\circ\text{C}$	340 (260)	A
$I_{CRM}$	$t_p = 1 \text{ ms}$	600	A
$V_{GES}$		$\pm 20$	V
$T_j (T_{stg})$		- 40 ... + 150 (125)	$^\circ\text{C}$
$T_{cop}$	max. case operating temperature	125	$^\circ\text{C}$
$V_{isol}$	AC, 1 min.	2500	V
<b>Inverse diode</b>			
$I_F$	$T_s = 25 (70)^\circ\text{C}$	350 (300)	A
$I_{FRM}$	$t_p = 1 \text{ ms}$	600	A
$I_{FSM}$	$t_p = 10 \text{ ms}; \text{sin.}; T_j = 150^\circ\text{C}$	3300	A

Characteristics		$T_{case} = 25^\circ\text{C}$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}; I_C = 9 \text{ mA}$	4,45	5,5	6,55	V
$I_{CES}$	$V_{GE} = 0; V_{CE} = V_{CES}; T_j = 25^\circ\text{C}$			0,3	mA
$V_{CEO}$	$T_j = 25 (125)^\circ\text{C}$		1 (0,9)	1,15 (1,05)	V
$r_{CE}$	$T_j = 25 (125)^\circ\text{C}$		3,3 (4,7)	4 (5)	m $\Omega$
$V_{CEsat}$	$I_{Cnom} = 300 \text{ A}; V_{GE} = 15 \text{ V}; T_j = 25 (125)^\circ\text{C}$ on chip level		2 (2,3)	2,35 (2,55)	V
$C_{ies}$	$V_{GE} = 0; V_{CE} = 25 \text{ V}; f = 1 \text{ MHz}$		27		nF
$C_{oes}$	$V_{GE} = 0; V_{CE} = 25 \text{ V}; f = 1 \text{ MHz}$		6,5		nF
$C_{res}$	$V_{GE} = 0; V_{CE} = 25 \text{ V}; f = 1 \text{ MHz}$		5,4		nF
$L_{CE}$				20	nH
$R_{CC'+EE'}$	resistance, terminal-chip $T_c = 25 (125)^\circ\text{C}$		0,9 (1,1)		m $\Omega$
$t_{d(on)}$	$V_{CC} = 600 \text{ V}$		190		ns
$t_r$	$I_{Cnom} = 300 \text{ A}$		75		ns
$t_{d(off)}$	$R_{Gon} = R_{Goff} = 3,3 \Omega$		650		ns
$t_f$	$T_j = 125^\circ\text{C}$		70		ns
$E_{on} (E_{off})$	$V_{GE} \pm 15 \text{ V}$		32 (34)		mJ
$E_{on} (E_{off})$	with SKHI 65; $T_j = 125^\circ\text{C}$ $V_{CC} = 600 \text{ V}; I_C = 300 \text{ A}$		35 (44)		mJ
<b>Inverse diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 300 \text{ A}; V_{GE} = 0 \text{ V}; T_j = 25 (125)^\circ\text{C}$		2,3 (2,1)	2,65	V
$V_{TO}$	$T_j = 125^\circ\text{C}$		1,1		V
$r_T$	$T_j = 125^\circ\text{C}$		3,3		m $\Omega$
$I_{RRM}$	$I_F = 300 \text{ A}; T_j = 125^\circ\text{C}$		360		A
$Q_{rr}$	$V_{GE} = 0 \text{ V}; di/dt = 6450 \text{ A}/\mu\text{s}$		44		$\mu\text{C}$
$E_{rr}$	$R_{Gon} = R_{Goff} = 3,3 \Omega$		18		mJ
<b>Thermal characteristics</b>					
$R_{th(j-s)}$	per IGBT			0,13	K/W
$R_{th(j-s)}$	per FWD			0,19	K/W
<b>Temperature Sensor</b>					
$R_{TS}$	$T = 25 (100)^\circ\text{C}$		1 (1,67)		k $\Omega$
tolerance	$T = 25 (100)^\circ\text{C}$		3 (2)		%
<b>Mechanical data</b>					
$M_1$	to heatsink (M5)	2		3	Nm
$M_2$	for terminals (M6)	4		5	Nm
w				460	g





# SKiM 400GD128D



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.