

# SKiM 380GD176DM



SKiM<sup>®</sup> 5

## Trench IGBT Modules

### SKiM 380GD176DM

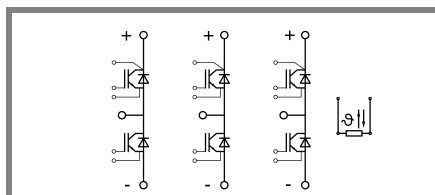
Target Data

#### Features

- Homogeneous Si
- Trench = Trenchgate Technology
- Low inductance case
- Isolated by AlN DCB (Direct Copper Bonded) ceramic plate
- Pressure contact technology for thermal contacts
- $V_{CEsat}$  with positive temperature coefficient
- High short circuit capability, limiting to  $6 \times I_C$
- Integrated temperature sensor
- Spring contact system to attach driver PCB to the auxiliary terminals

#### Typical Applications

- AC inverter drives mains 575 - 750 V AC
- public transport (auxiliary syst.)

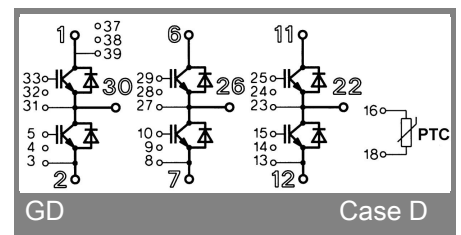
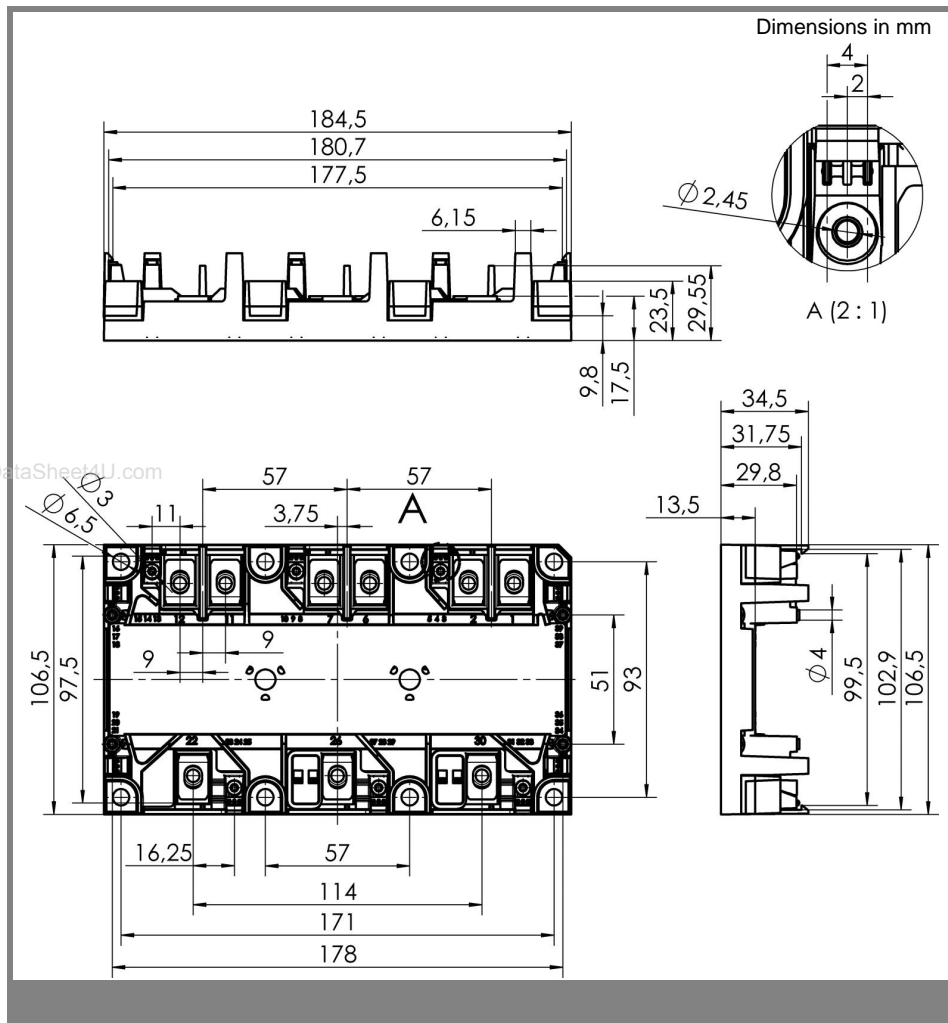


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Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$ , unless otherwise specified	
Symbol	Conditions	Values	Units
<b>IGBT</b>			
$V_{CES}$		1700	V
$I_C$	$T_s = 25 (70)^\circ\text{C}$	425 (325)	A
$I_{CRM}$	$t_p = 1 \text{ ms}$	750	A
$V_{GES}$		$\pm 20$	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.	3300	V
<b>Inverse diode</b>			
$I_F$	$T_s = 25 (70)^\circ\text{C}$	380 (285)	A
$I_{FRM}$	$t_p = \text{ms}$	750	A
$I_{FSM}$	$t_p = 10 \text{ ms}$ ; sin.; $T_j = 150^\circ\text{C}$	3300	A

Characteristics		$T_c = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$ ; $I_C = 18\text{ mA}$	5,15	5,8	6,45	V
$I_{CES}$	$V_{GE} = 0$ ; $V_{CE} = V_{CES}$ ; $T_j = 25\text{ }^{\circ}\text{C}$			0,3	mA
$V_{CEO}$	$T_j = 25\text{ (125)}\text{ }^{\circ}\text{C}$			1,2 (1,1)	V
$r_{CE}$	$T_j = 25\text{ (125)}\text{ }^{\circ}\text{C}$			3,3 (4,8)	m $\Omega$
$V_{CEsat}$	$I_{Cnom} = 375\text{ A}$ ; $V_{GE} = 15\text{ V}$ , $T_j = 25\text{ (125)}\text{ }^{\circ}\text{C}$ on chip level	1,6	2 (2,4)	2,45	V
$C_{ies}$	$V_{GE} = 0$ ; $V_{CE} = 25\text{ V}$ ; $f = 1\text{ MHz}$		33		nF
$C_{oes}$	$V_{GE} = 0$ ; $V_{CE} = 25\text{ V}$ ; $f = 1\text{ MHz}$		1,4		nF
$C_{res}$	$V_{GE} = 0$ ; $V_{CE} = 25\text{ V}$ ; $f = 1\text{ MHz}$		1,1		nF
$L_{CE}$				20	nH
$R_{CC'+EE'}$	resistance, terminal-chip $T_c = 25\text{ (125)}\text{ }^{\circ}\text{C}$		0,9 (1,1)		m $\Omega$
$t_{d(on)}$	$V_{CC} = 1200\text{ V}$				ns
$t_r$	$I_{Cnom} = 375\text{ A}$				ns
$t_{d(off)}$	$R_{Gon} = R_{Goff} = \Omega$				ns
$t_f$	$T_j = 125\text{ }^{\circ}\text{C}$				ns
$E_{on} (E_{off})$	$V_{GE} \pm 15\text{ V}$		225 (150)		mJ
$E_{on} (E_{off})$	with SKHI 65; $T_j = 125\text{ }^{\circ}\text{C}$ $V_{CC} = 1200\text{ V}$ ; $I_C = 375\text{ A}$				mJ
Inverse diode					
$V_F = V_{EC}$	$I_{Fnom} = 375\text{ A}$ ; $V_{GE} = 0\text{ V}$ ; $T_j = 25\text{ (125)}\text{ }^{\circ}\text{C}$				V
$V_{TO}$	$T_j = 25\text{ (125)}\text{ }^{\circ}\text{C}$				V
$r_T$	$T_j = 25\text{ (125)}\text{ }^{\circ}\text{C}$				m $\Omega$
$I_{RRM}$	$I_F = 375\text{ A}$ ; $T_j = 25\text{ }^{\circ}\text{C}$				A
$Q_{rr}$	$V_{GE} = 0\text{ V}$ di/dt = A/ $\mu\text{s}$				$\mu\text{C}$
$E_{rr}$	$R_{Gon} = R_{Goff} =$				mJ
Thermal characteristics					
$R_{th(j-s)}$	per IGBT			0,09	K/W
$R_{th(j-s)}$	per FWD			0,14	K/W
Temperature Sensor					
$R_{TS}$	$T = 25\text{ (125)}\text{ }^{\circ}\text{C}$		1 (1,67)		k $\Omega$
tolerance	$T = 25\text{ (125)}\text{ }^{\circ}\text{C}$		3 (2)		%
Mechanical data					
$M_1$	to heatsink (M5)	2		3	Nm
$M_2$	for terminals (M6)	4		5	Nm
w				460	g

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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.