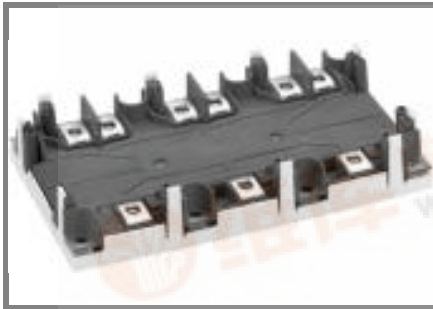


# SKiM 500GD063DM



SKiM 5<sup>®</sup>

## IGBT Modules

### SKiM 500GD063DM

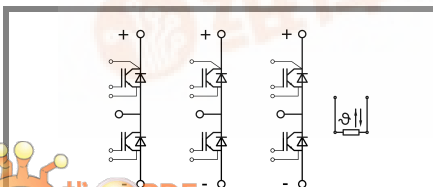
Preliminary Data

#### Features

- NPT-IGBT with positive temperature coefficient of  $V_{CEsat}$
- Short circuit, self limiting to  $6 \times I_C$
- DBC substrate : AIN
- Corresponds to standards IEC 60721-3-3 (humidity) class 3K7IE32 and IEC 68T.1 (climate) 40/125/56

#### Typical Applications

- Resonant inverters up to 100 kHz
- Inductive heating
- Electronic welders at  $f_{SW}$  up to 20 kHz



Absolute Maximum Ratings		$T_{case} = 25^\circ C$ , unless otherwise specified	
Symbol	Conditions	Values	Units
<b>IGBT</b>			
$V_{CES}$		600	V
$I_C$	$T_s = 25 (70)^\circ C$	530 (400)	A
$I_{CRM}$	$t_p = 1 \text{ ms}$	600	A
$V_{GES}$		$\pm 20$	V
$T_j (T_{stg})$		- 40 ... + 125 $^\circ C$ (125)	$^\circ C$
$T_{cop}$	max. case operating temperature		$^\circ C$
$V_{isol}$	AC, 1 min.	2500	V

Inverse diode			
Symbol	Conditions	Values	Units
$I_F$	$T_s = 25 (70)^\circ C$	490 (370)	A
$I_{FRM}$	$t_p = 1 \text{ ms}$	600	A
$I_{FSM}$	$t_p = 10 \text{ ms; sin.; } T_j = 150^\circ C$	4300	A

Characteristics		$T_{case} = 25^\circ C$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}; I_C = 12 \text{ mA}$	4,5	5,5	6,5	V
$I_{CES}$	$V_{GE} = 0; V_{CE} = V_{CES}; T_j = 25^\circ C$			0,3	mA
$V_{CEO}$	$T_j = 25 (125)^\circ C$		0,9 (0,8)	1	V
$r_{CE}$	$T_j = 25 (125)^\circ C$		2 (2,9)	2,7	m $\Omega$
$V_{CEsat}$	$I_{Cnom} = 300 \text{ A; } V_{GE} = 15 \text{ V; } T_j = 25 (125)^\circ C \text{ on chip level}$		1,5 (1,7)	1,8	V
$C_{ies}$	$V_{GE} = 0; V_{CE} = 25 \text{ V; } f = 1 \text{ MHz}$		26,2		nF
$C_{oes}$	$V_{GE} = 0; V_{CE} = 25 \text{ V; } f = 1 \text{ MHz}$		3,7		nF
$C_{res}$	$V_{GE} = 0; V_{CE} = 25 \text{ V; } f = 1 \text{ MHz}$		3,6		nF
$L_{CE}$				20	nH
$R_{CC'+EE'}$	resistance, terminal-chip $T_c = 25 (125)^\circ C$		0,9 (1,1)		m $\Omega$
$t_{d(on)}$	$V_{CC} = 300 \text{ V}$		160		ns
$t_r$	$I_{Cnom} = 300 \text{ A}$		120		ns
$t_{d(off)}$	$R_{Gon} = R_{Goff} = 6,2 \Omega$		730		ns
$t_f$	$T_j = 125^\circ C$		60		ns
$E_{on} (E_{off})$	$V_{GE} \pm 15 \text{ V}$		16 (16)		mJ
$E_{on} (E_{off})$	with SKHI 6; $T_j = 25^\circ C$ $V_{CC} = V; I_C = A$				mJ

Inverse diode				
Symbol	Conditions	min.	max.	Units
$V_F = V_{EC}$	$I_{Fnom} = 300 \text{ A; } V_{GE} = 0 \text{ V; } T_j = 25 (125)^\circ C$	1,25 (1,2)	1,5	V
$V_{TO}$	$T_j = 25 (125)^\circ C$	0,85	0,9	V
$r_T$	$T_j = 25 (125)^\circ C$	1,3	2	m $\Omega$
$I_{RRM}$	$I_F = 300 \text{ A; } T_j = 125^\circ C$	220		A
$Q_{rr}$	$V_{GE} = 0 \text{ V } di/dt = 3000 \text{ A}/\mu\text{s}$	36,5		$\mu\text{C}$
$E_{rr}$	$R_{Gon} = R_{Goff} = 6,2 \Omega$	7,3		mJ

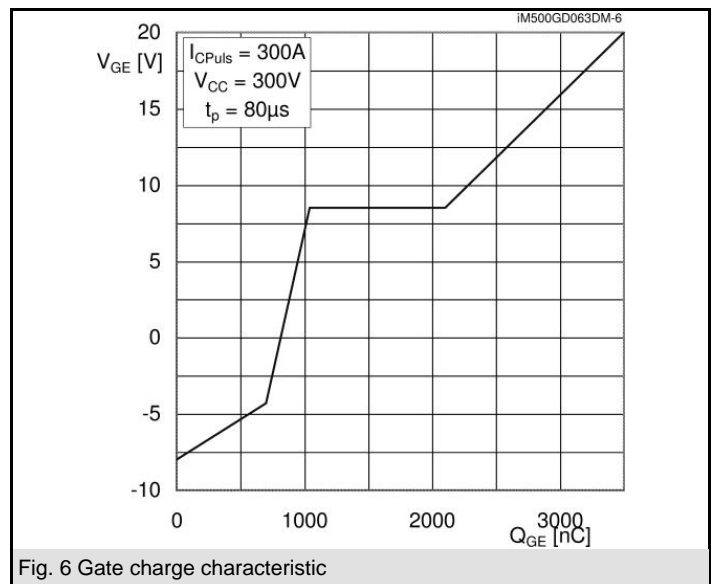
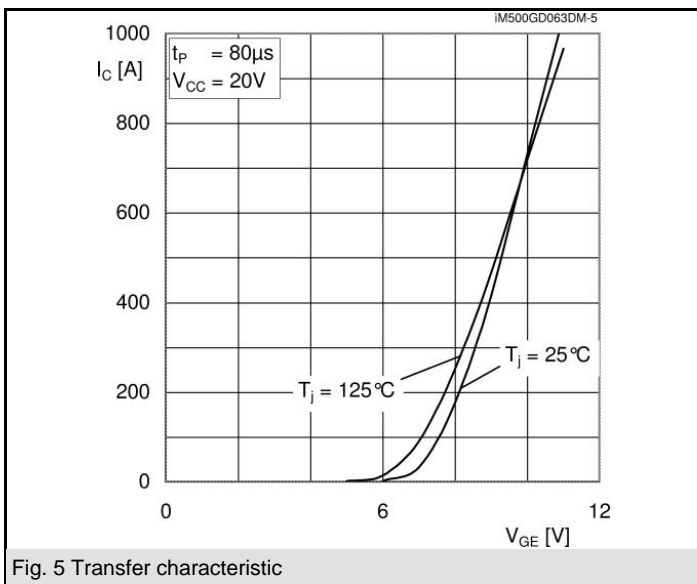
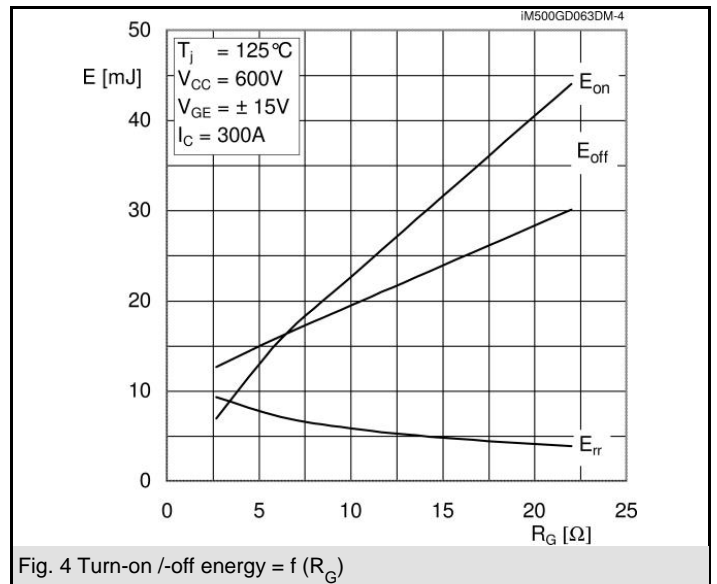
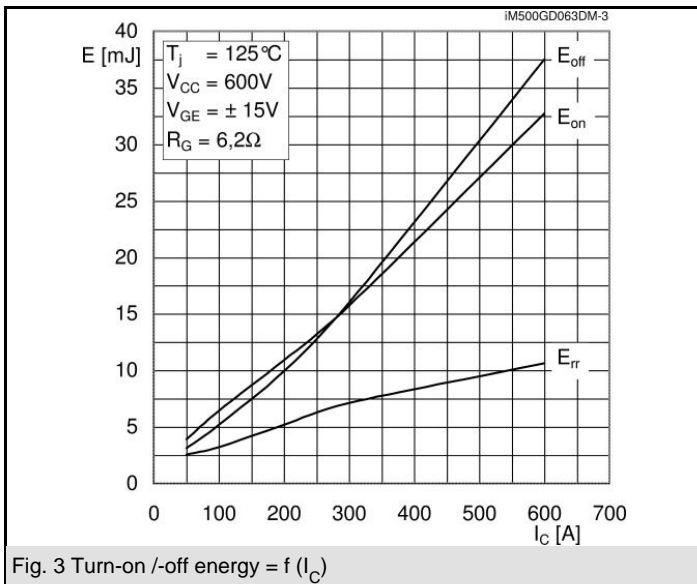
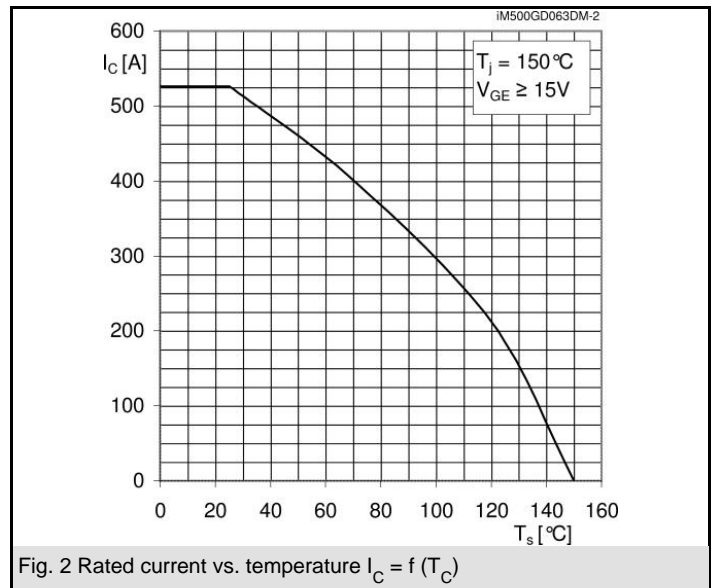
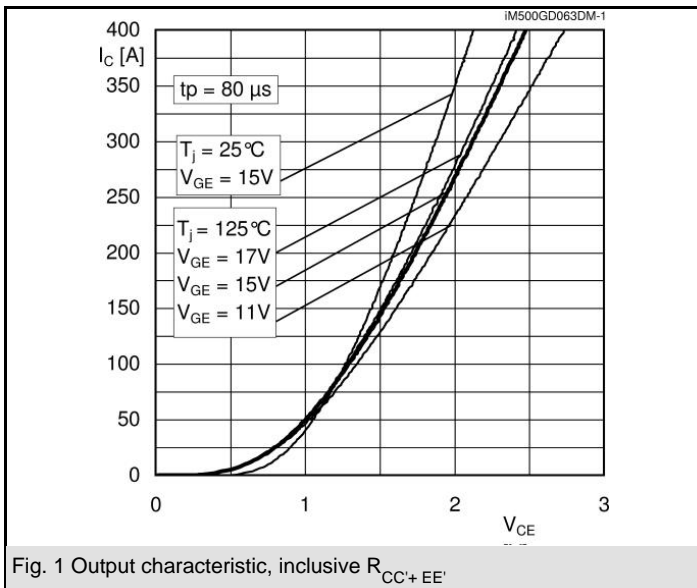
Thermal characteristics			
Symbol	Conditions	Values	Units
$R_{th(j-s)}$	per IGBT	0,09	K/W
$R_{th(j-s)}$	per FWD	0,125	K/W

Temperature Sensor			
Symbol	Conditions	Values	Units
$R_{TS}$	$T = 25 (100)^\circ C$	1 (1,67)	k $\Omega$
tolerance	$T = 25 (100)^\circ C$	3 (2)	%

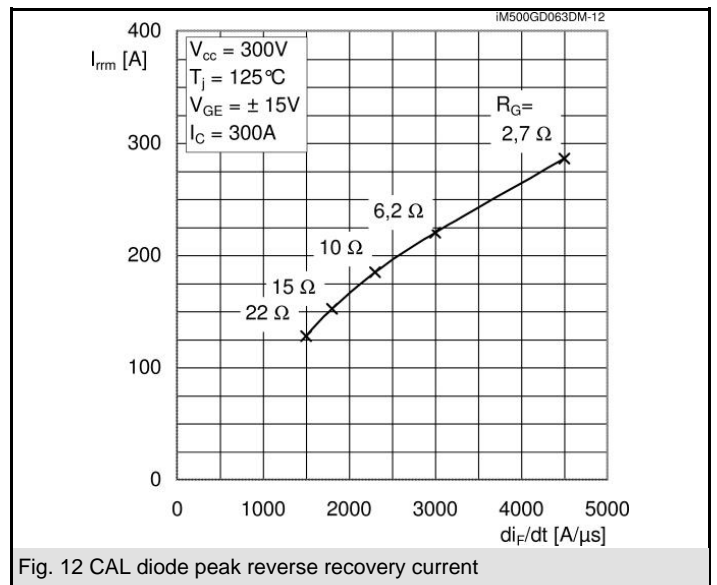
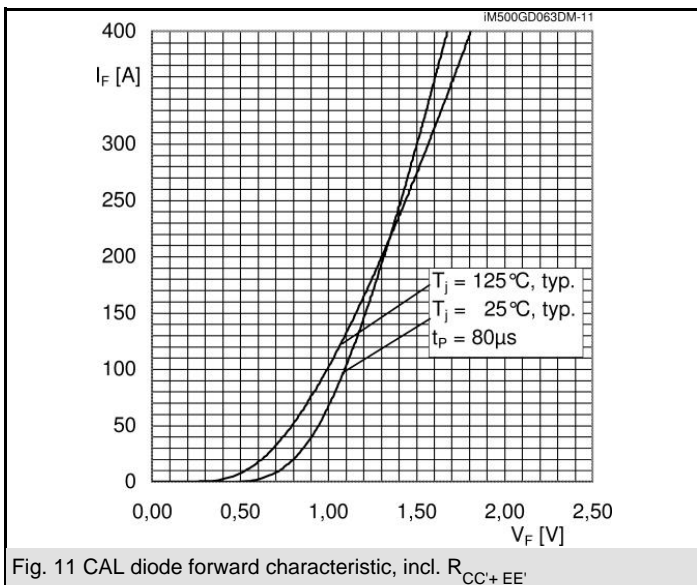
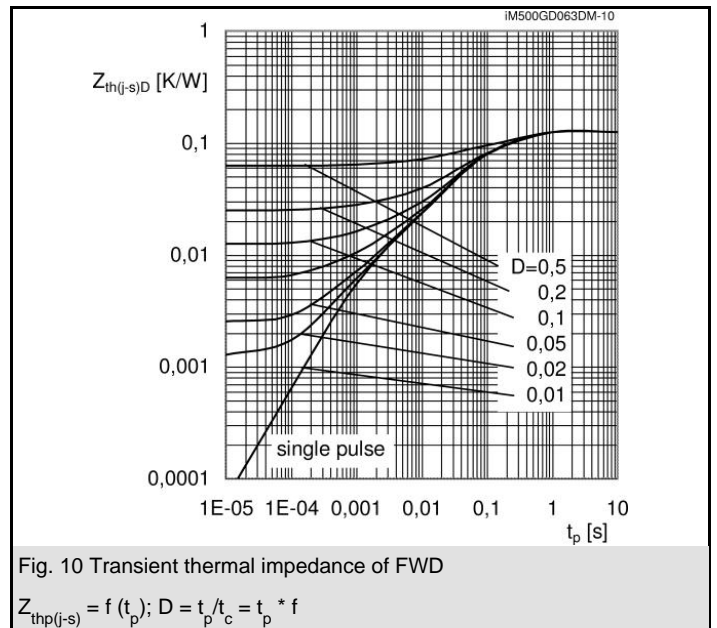
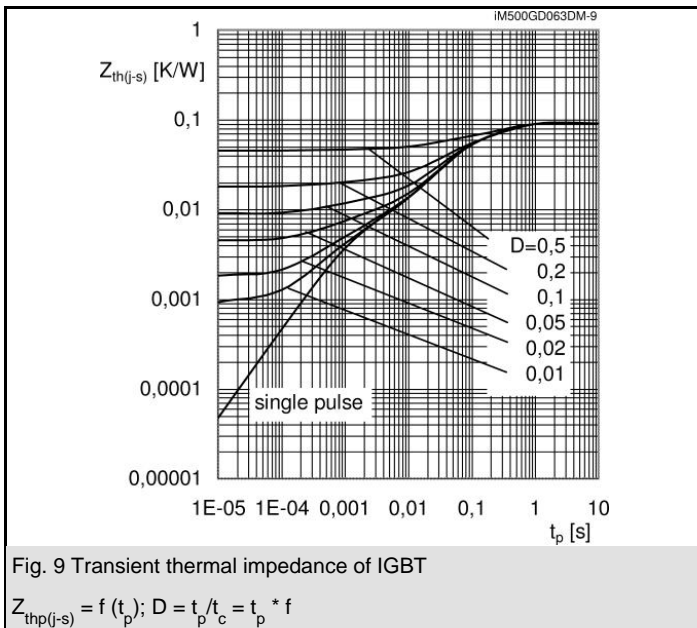
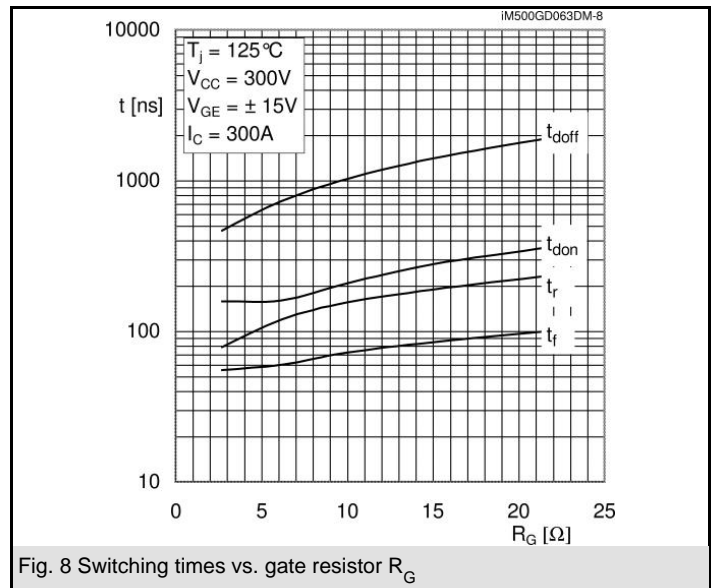
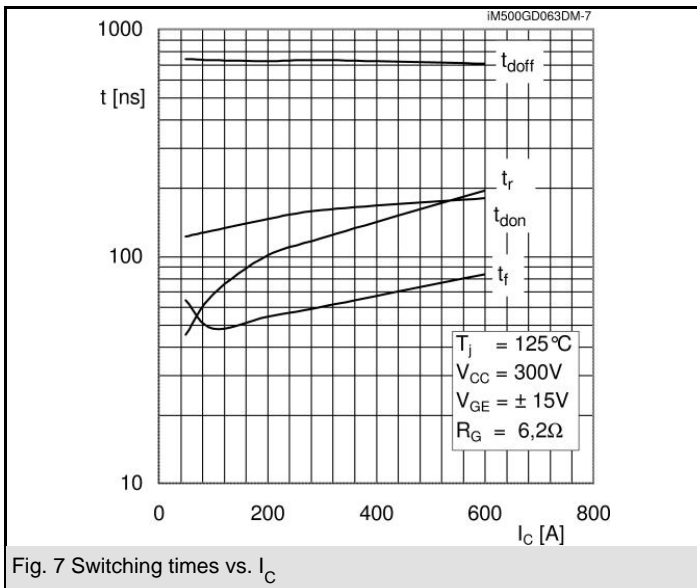
Mechanical data			
Symbol	Conditions	Values	Units
$M_1$	to heatsink (M5)	2	3 Nm
$M_2$	for terminals (M6)	4	5 Nm
w			325 g



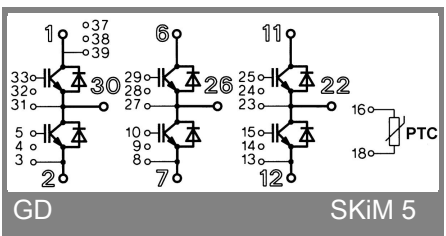
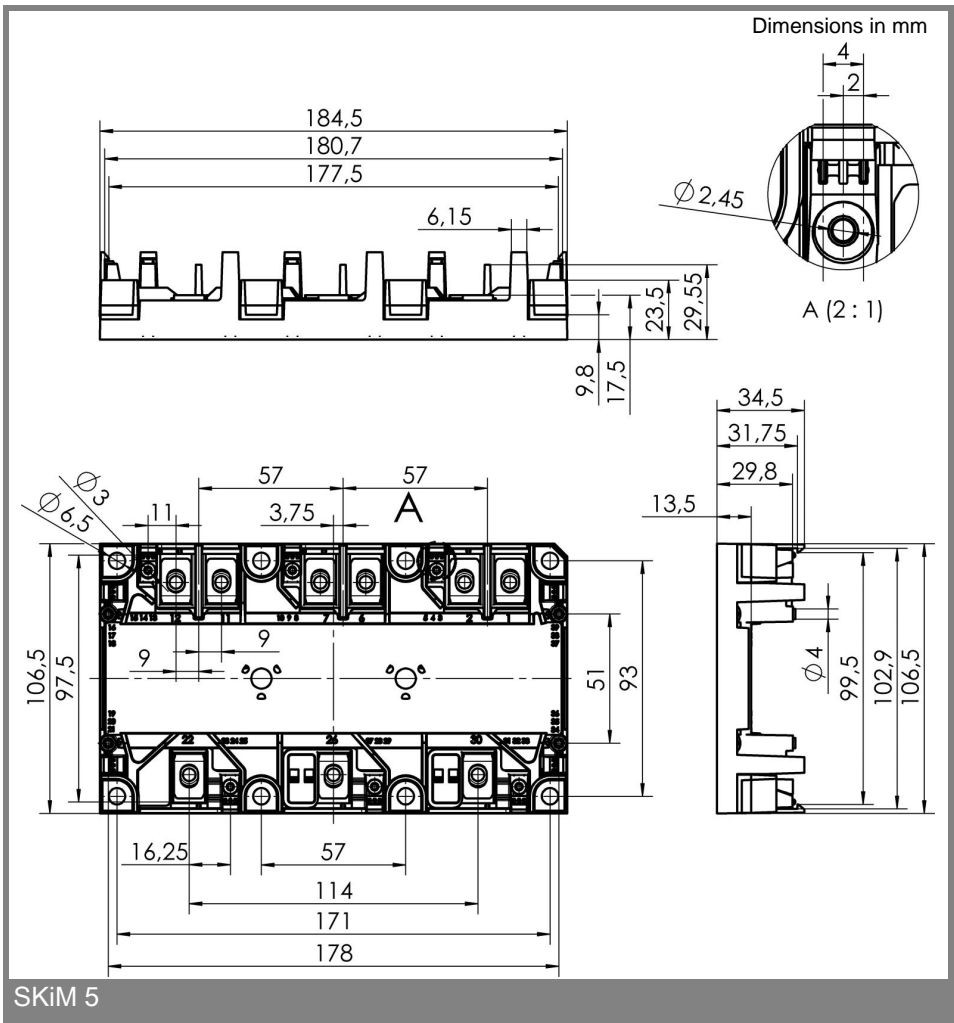
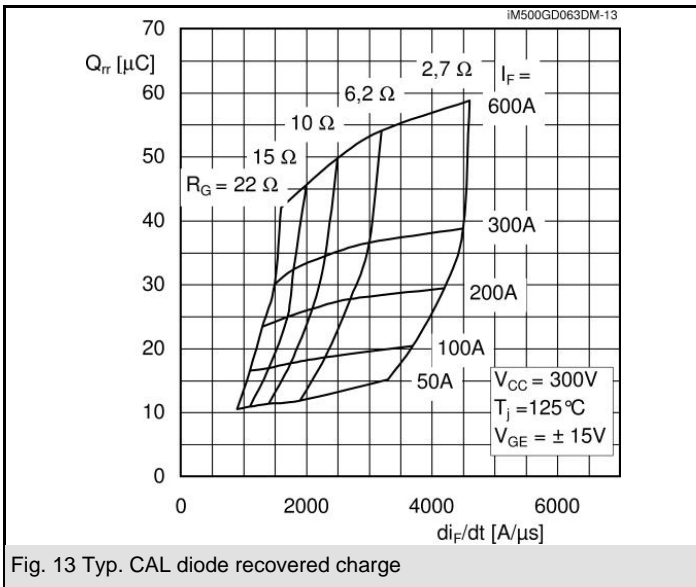
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This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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