



**SKiM<sup>®</sup> 5**

## Trench IGBT modules

### SKiM 600GD126DLM

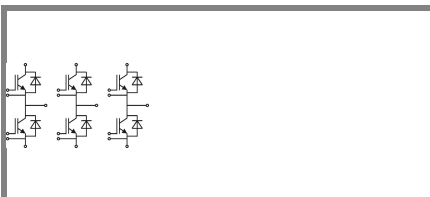
#### Target Data

#### Features

- Trench gate IGBT with field stop layer
- Low inductance case
- Fast & soft inverse CAL diodes
- Isolated by AlN 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 sensor

#### Typical Applications\*

- Uninterruptable power supplies (UPS)
- Three phase inverters for AC motor speed control



GD

Absolute Maximum Ratings		$T_c = 25\text{ }^\circ\text{C}$ , unless otherwise specified		
Symbol	Conditions	Values	Units	
<b>IGBT</b>				
$V_{CES}$	$T_j = \text{ }^\circ\text{C}$	1200	V	
$I_C$	$T_j = 150\text{ }^\circ\text{C}$	$T_{\text{heatsink}} = 25\text{ }^\circ\text{C}$	524	A
		$T_{\text{heatsink}} = 70\text{ }^\circ\text{C}$	361	A
$I_{CRM}$	$I_{CRM} = 2 \times I_{CNOM}; V_{CC} = 800\text{V}$	900	A	
$V_{GES}$		$\pm 20$	V	
$t_{psc}$	$V_{CC} = 800\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 150\text{ }^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10	$\mu\text{s}$	
<b>Inverse Diode</b>				
$I_F$	$T_j = 150\text{ }^\circ\text{C}$	$T_{\text{heatsink}} = 25\text{ }^\circ\text{C}$	388	A
		$T_{\text{heatsink}} = 70\text{ }^\circ\text{C}$	289	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{FNOM}$	600	A	
$I_{FSM}$	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 150\text{ }^\circ\text{C}$	3300	A
<b>Module</b>				
$I_t(\text{RMS})$			A	
$T_{vj}$		-40 ... +150	$^\circ\text{C}$	
$T_{stg}$		-40 ... +125	$^\circ\text{C}$	
$V_{isol}$	AC, 1 min.	2500	V	

Characteristics		$T_c = 25\text{ }^\circ\text{C}$ , unless otherwise specified				
Symbol	Conditions	min.	typ.	max.	Units	
<b>IGBT</b>						
$V_{GE(th)}$	$V_{GE} = V_{CE}; I_C = 18\text{ mA}$	5	5,8	6,5	V	
$I_{CES}$	$V_{GE} = 0\text{ V}; V_{CE} = V_{CES}$	$T_j = 25\text{ }^\circ\text{C}$			5,0	mA
			$T_j = 125\text{ }^\circ\text{C}$	1	1,2	V
$V_{CE0}$		$T_j = 25\text{ }^\circ\text{C}$	0,9	1,1	V	
		$T_j = 125\text{ }^\circ\text{C}$	1,44	1,89	$\text{m}\Omega$	
$r_{CE}$	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ }^\circ\text{C}$	2,33	2,78	$\text{m}\Omega$	
		$T_j = 125\text{ }^\circ\text{C}$	1,65	2,05	V	
$V_{CE(sat)}$	$I_{Cnom} = 450\text{ A}; V_{GE} = 15\text{ V}$	$T_j = 25\text{ }^\circ\text{C}_{\text{chiplev.}}$	1,95	2,35	V	
		$T_j = 125\text{ }^\circ\text{C}_{\text{chiplev.}}$			V	
$C_{res}$	$V_{CE} = 25; V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$			35	nF
$C_{oes}$					2,5	nF
$C_{res}$					2,4	nF
$Q_G$	$V_{GE} = -8\text{V}/+15\text{V}$				3000	nC
$R_{Gint}$	$T_j = 25\text{ }^\circ\text{C}$				1,7	$\Omega$
$t_{d(on)}$	$R_{Gon} = 2\text{ }\Omega$	$V_{CC} = 600\text{V}$			315	ns
			$di/dt = 6800\text{ A}/\mu\text{s}$	$I_C = 450\text{A}$	70	ns
$E_{on}$					37	mJ
$t_{d(off)}$	$R_{Goff} = 2\text{ }\Omega$	$T_j = 125\text{ }^\circ\text{C}$			680	ns
			$di/dt = 3200\text{ A}/\mu\text{s}$	$V_{GE} = \pm 15\text{V}$	90	ns
$E_{off}$					60	mJ
$R_{th(j-s)}$	per IGBT				0,09	K/W



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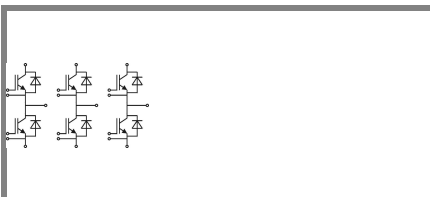
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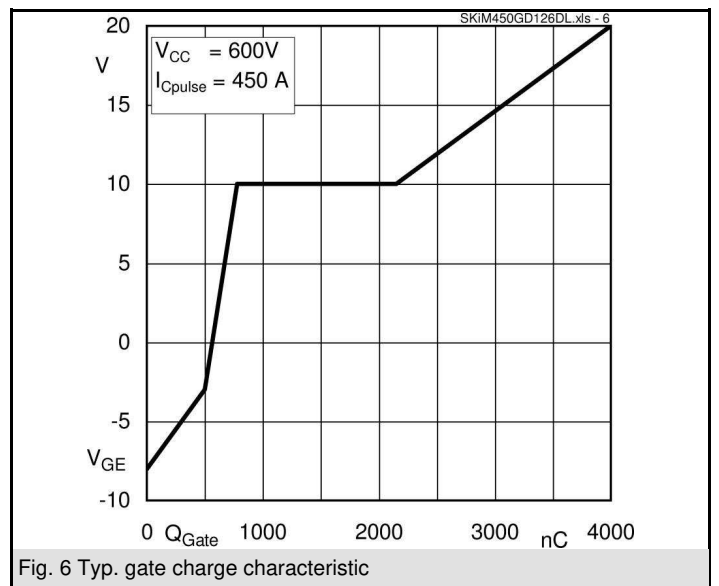
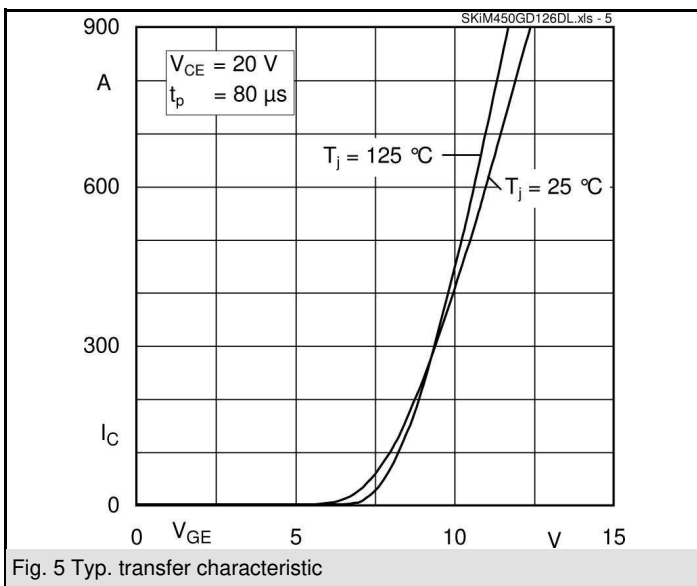
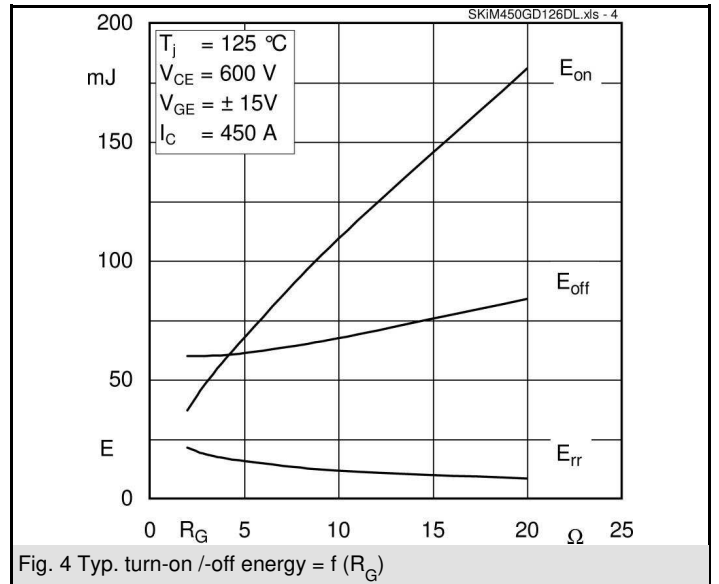
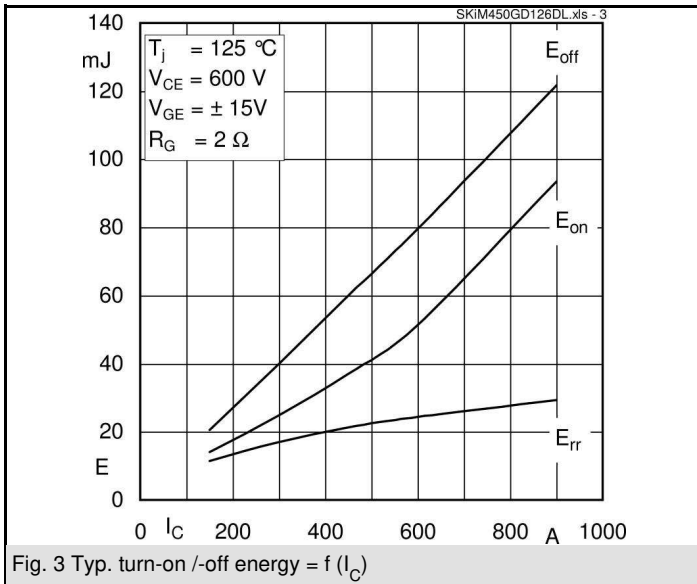
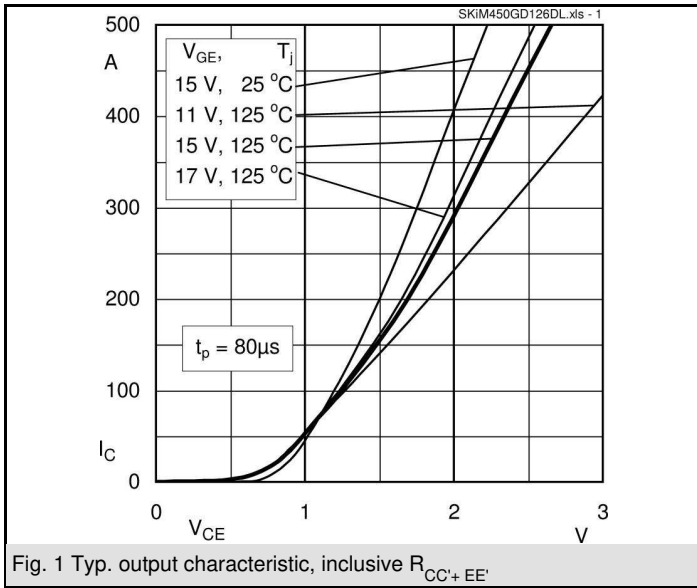
#### Typical Applications\*

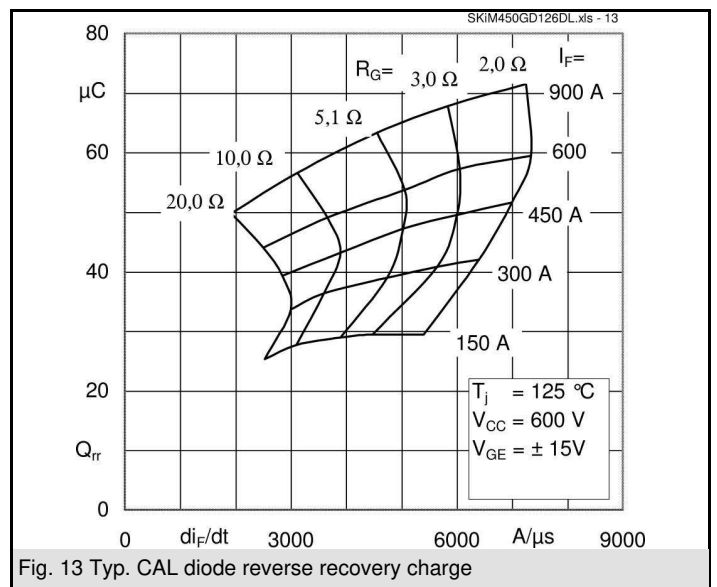
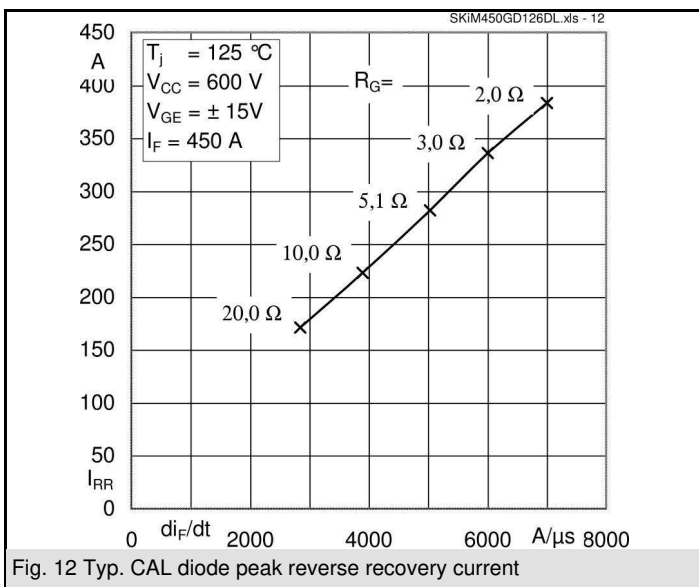
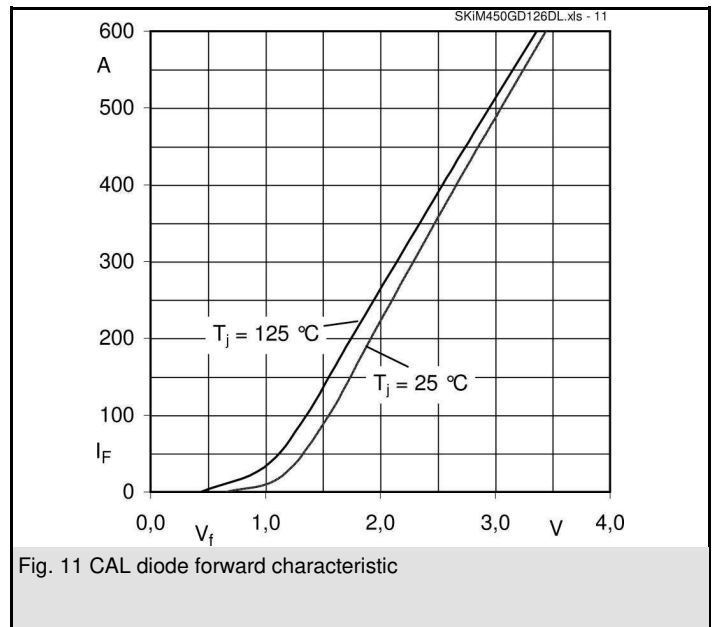
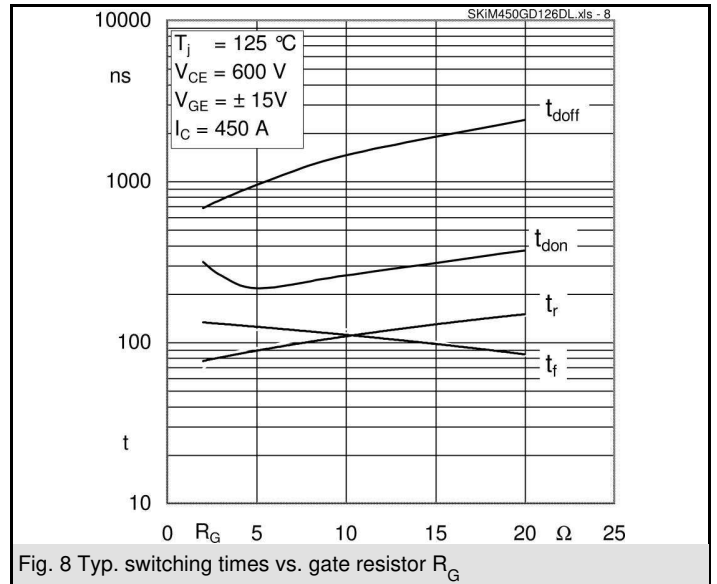
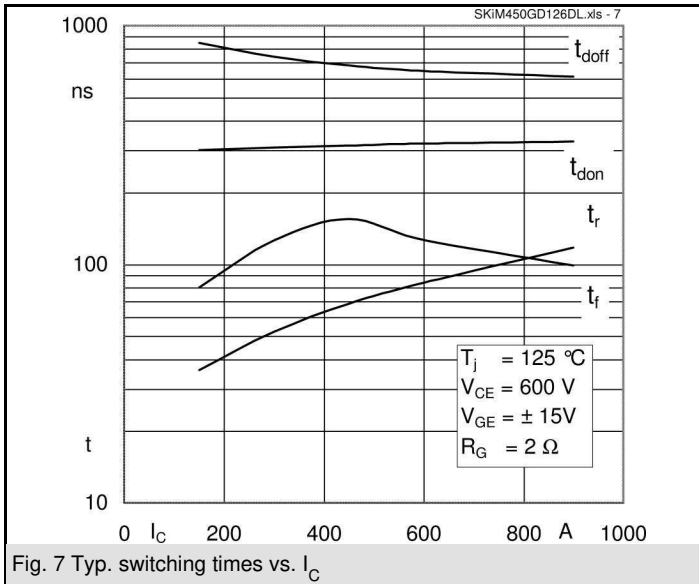
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- Three phase inverters for AC motor speed control

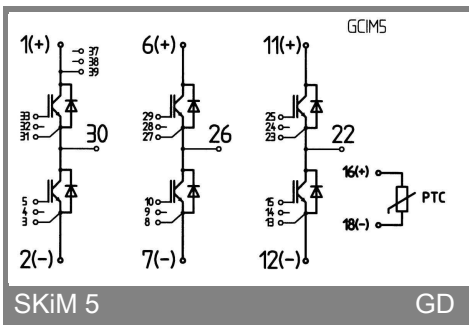
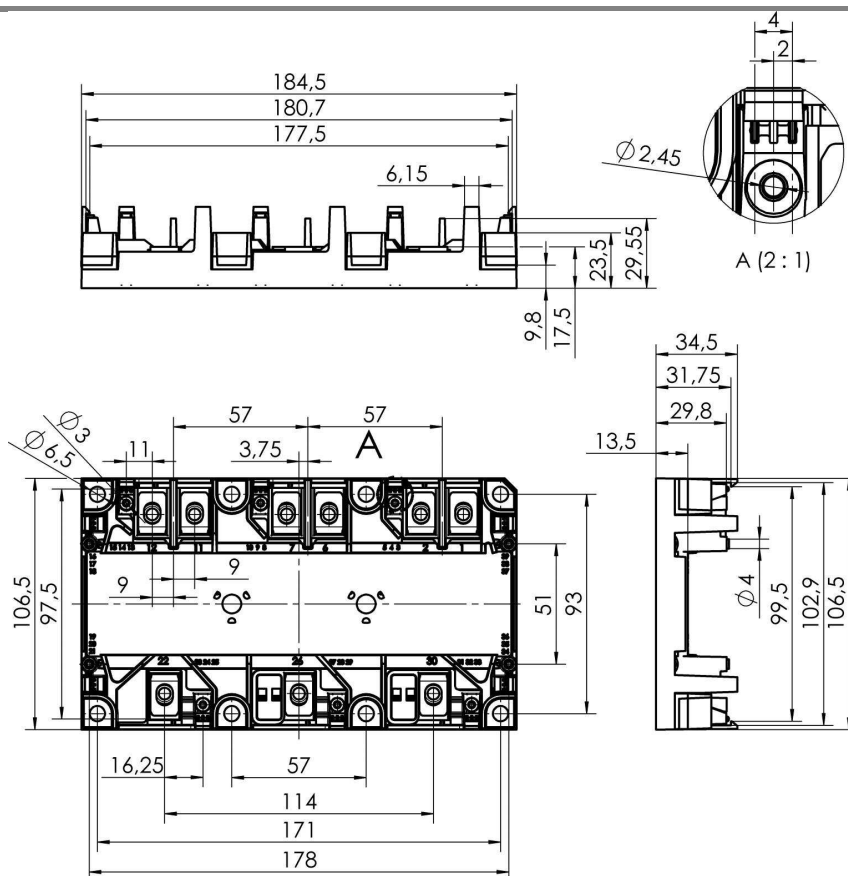


**GD**

Characteristics		min.	typ.	max.	Units
<b>Inverse Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 300 \text{ A}; V_{GE} = 0 \text{ V}$		2	2,5	V
	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$				
	$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$		1,8	2,3	V
$V_{F0}$			1,1	1,45	V
	$T_j = 25 \text{ }^\circ\text{C}$				
	$T_j = 125 \text{ }^\circ\text{C}$		0,85	1,2	V
$r_F$			3	3,5	m $\Omega$
	$T_j = 25 \text{ }^\circ\text{C}$				
	$T_j = 125 \text{ }^\circ\text{C}$		3,17	3,67	m $\Omega$
$I_{RRM}$	$I_F = 450 \text{ A}$		380		A
$Q_{rr}$	$di/dt = 7000 \text{ A}/\mu\text{s}$		52		$\mu\text{C}$
$E_{rr}$	$V_{GE} = -15\text{V};$ $R_{Gon} = R_{Goff} = 2\Omega$		21,3		mJ
$R_{th(j-s)}$	per diode		0,125		K/W
<b>Module</b>					
$L_{CE}$				20	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25 \text{ }^\circ\text{C}$	0,9		m $\Omega$
		$T_{case} = 125 \text{ }^\circ\text{C}$	1,1		m $\Omega$
$M_s$	to heat sink M5		2	3	Nm
$M_t$	to terminals M6		4	5	Nm
w				460	g
<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)		%







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

### \*IMPORTANT INFORMATION AND WARNINGS

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