

SEMITOP® 3

IGBT Module

SK50GD066ET

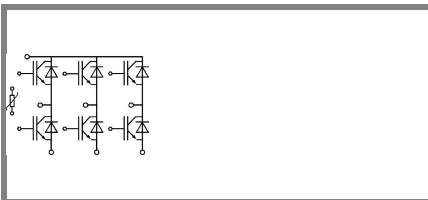
Target Data

Features

- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- Trench IGBT technology
- CAL technology FWD
- Integrated NTC temperature sensor

Typical Applications*

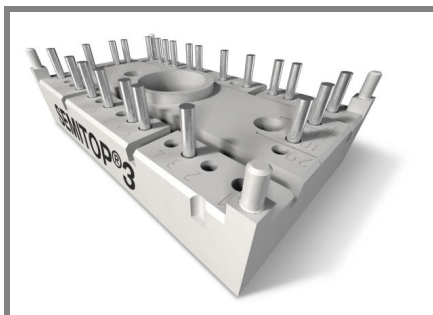
- Inverter up to 12,5 kVA
- Typ. motor power 5,5 kW



GD-ET

Absolute Maximum Ratings		$T_s = 25\text{ °C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}	$T_j = 25\text{ °C}$	600	V
I_C	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	60 A
		$T_s = 70\text{ °C}$	50 A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	100	A
V_{GES}		± 20	V
t_{psc}	$V_{CC} = 360\text{ V}$; $V_{GE} \leq 20\text{ V}$; $T_j = 150\text{ °C}$ $V_{CES} < 600\text{ V}$	6	μs
Inverse Diode			
I_F	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	56 A
		$T_s = 70\text{ °C}$	44 A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	60	A
I_{FSM}	$t_p = 10\text{ ms}$; half sine wave $T_j = 150\text{ °C}$	320	A
Module			
$I_{t(RMS)}$			A
T_{vj}		-40 ... +175	$^{\circ}\text{C}$
T_{stg}		-40 ... +125	$^{\circ}\text{C}$
V_{isol}	AC, 1 min.	2500	V

Characteristics		$T_s = 25\text{ °C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 0,8\text{ mA}$	5	5,8	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}$, $V_{CE} = V_{CES}$	$T_j = 25\text{ °C}$			mA
		$T_j = 150\text{ °C}$			mA
I_{GES}	$V_{CE} = 0\text{ V}$, $V_{GE} = 20\text{ V}$	$T_j = 25\text{ °C}$		600	nA
		$T_j = 150\text{ °C}$			nA
V_{CE0}		$T_j = 25\text{ °C}$	0,9	1,1	V
		$T_j = 150\text{ °C}$	0,8	1	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}$	11	15	$\text{m}\Omega$
		$T_j = 150\text{ °C}$	17	21	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 50\text{ A}$, $V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}_{chiplev.}$	1,45	1,85	V
		$T_j = 150\text{ °C}_{chiplev.}$	1,65	2,05	V
C_{ies}	$V_{CE} = 25$, $V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	3,1		nF
C_{oes}			0,2		nF
C_{res}			0,093		nF
Q_G	$V_{GE} = -7\text{V}...+15\text{V}$		250		nC
$t_{d(on)}$	$R_{Gon} = 16\ \Omega$ $di/dt = 2438\text{ A}/\mu\text{s}$	$V_{CC} = 300\text{V}$ $I_C = 50\text{A}$	28		ns
t_r			32		ns
E_{on}			2,2		mJ
$t_{d(off)}$	$R_{Goff} = 16\ \Omega$ $di/dt = 2438\text{ A}/\mu\text{s}$	$T_j = 150\text{ °C}$ $V_{GE} = -7/+15\text{V}$	301		ns
t_f			45		ns
E_{off}			1,73		mJ
$R_{th(j-s)}$	per IGBT		1,11		K/W



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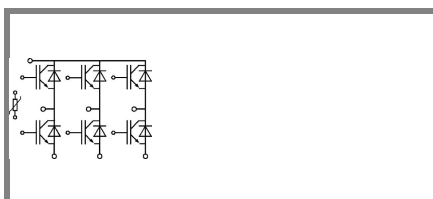
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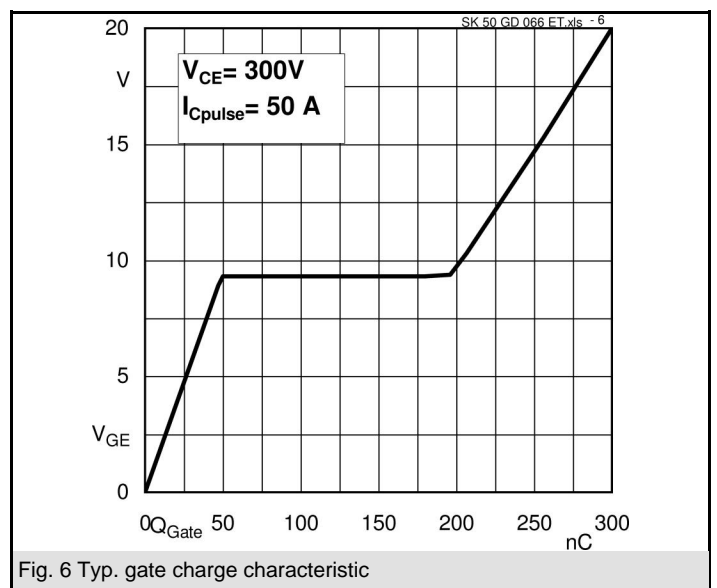
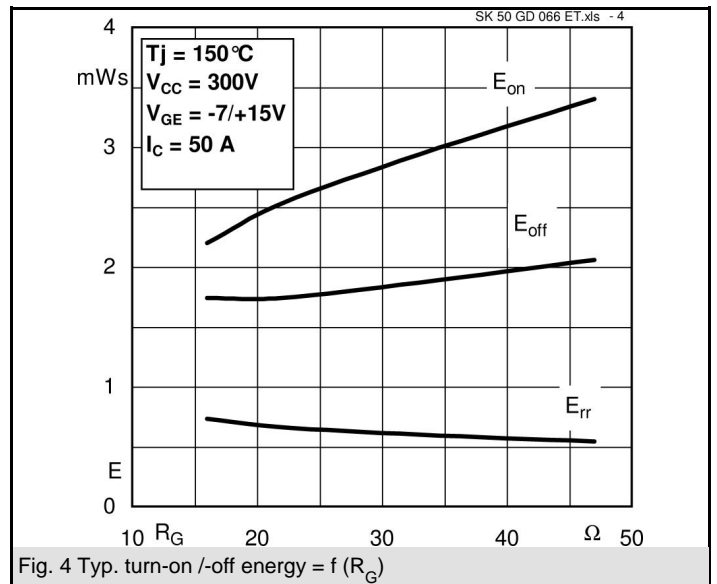
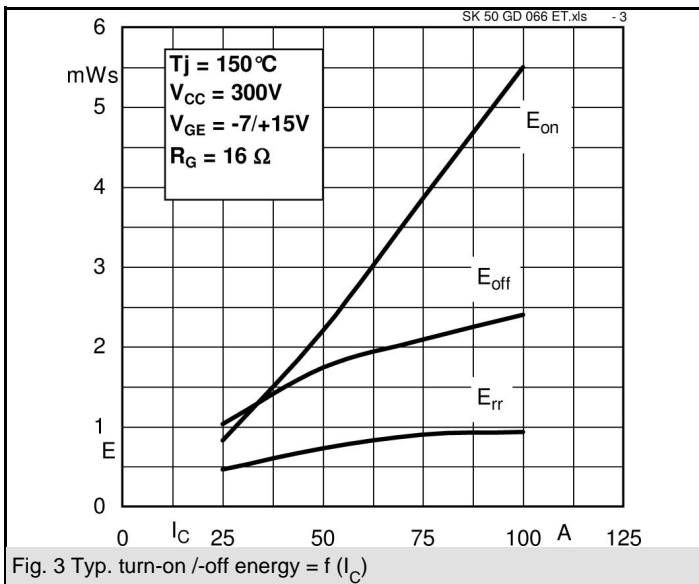
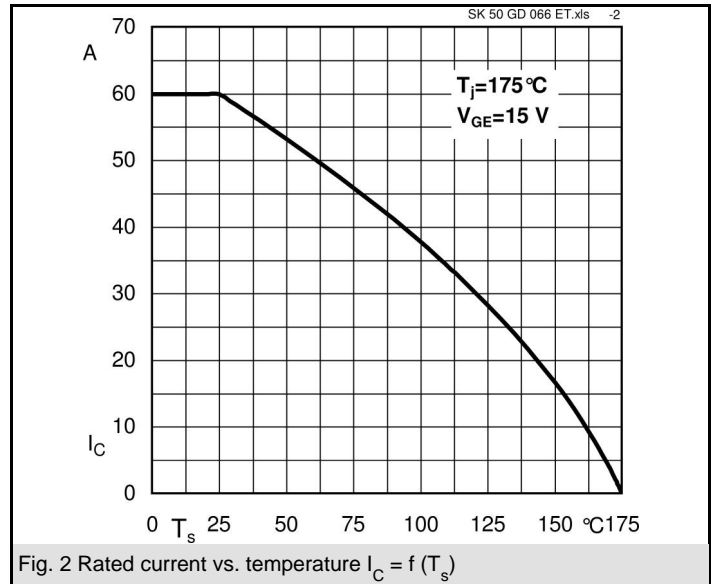
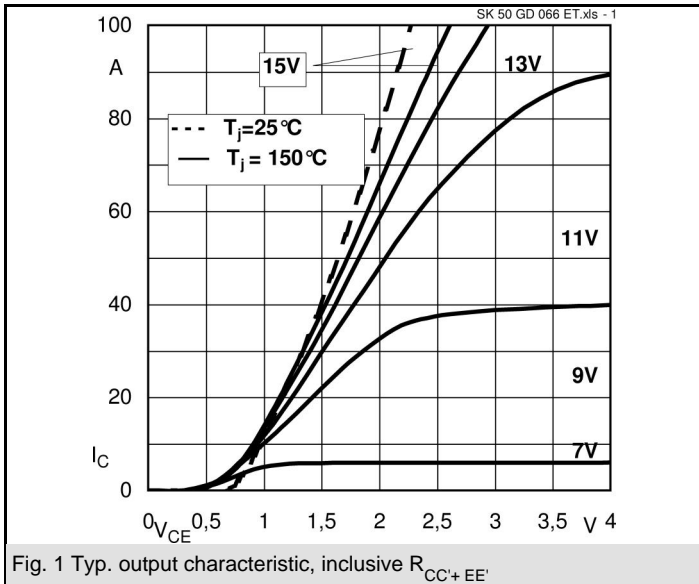
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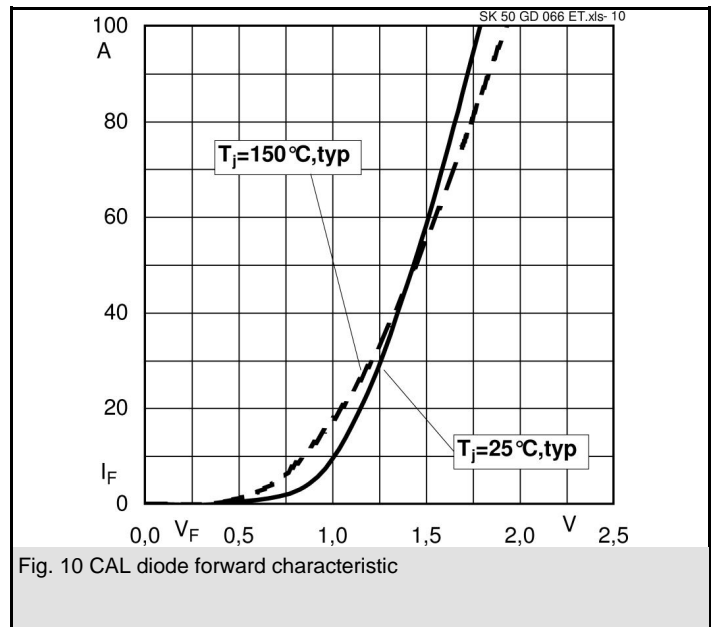
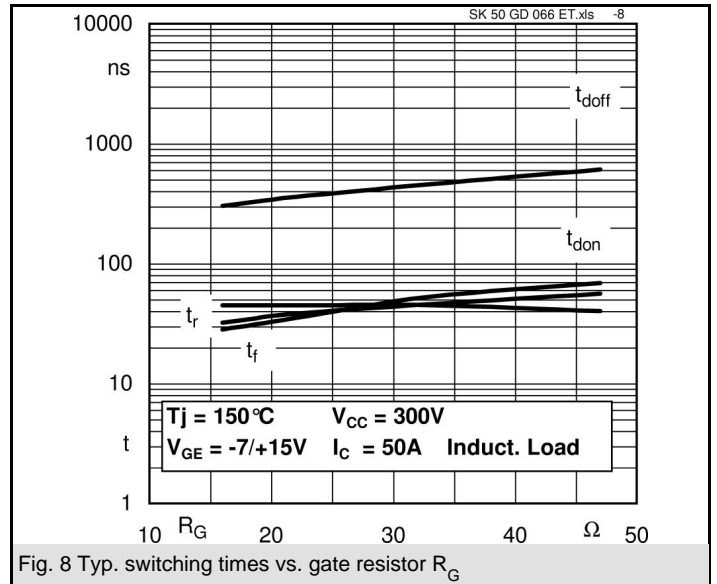
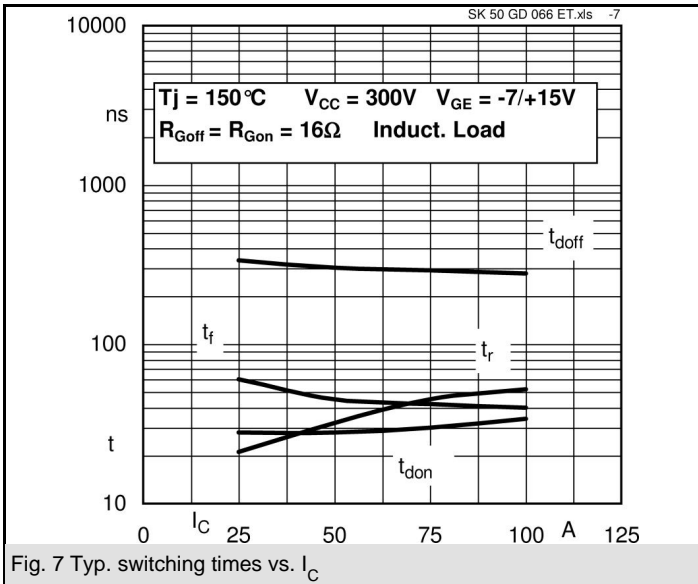
Characteristics

Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 50 \text{ A}; V_{GE} = 0 \text{ V}$		$T_j = 25 \text{ }^\circ\text{C}_{\text{chiplev.}}$	1,5	V
			$T_j = 150 \text{ }^\circ\text{C}_{\text{chiplev.}}$	1,5	V
V_{F0}			$T_j = 25 \text{ }^\circ\text{C}$	1	1,1
			$T_j = 150 \text{ }^\circ\text{C}$	0,9	1
r_F			$T_j = 25 \text{ }^\circ\text{C}$	10	12
			$T_j = 150 \text{ }^\circ\text{C}$	12	14
I_{RRM}	$I_F = 50 \text{ A}$	$T_j = 150 \text{ }^\circ\text{C}$	44		A
Q_{rr}	$di/dt = 2438 \text{ A}/\mu\text{s}$		4,8		μC
E_{rr}	$V_{CC} = 300\text{V}$		0,72		mJ
$R_{th(j-s)D}$	per diode		1,7		K/W
M_s	to heat sink	2,25		2,5	Nm
w			30		g
Temperature sensor					
R_{100}	$T_s = 100^\circ\text{C} (R_{25} = 5\text{k}\Omega)$		493 \pm 5%		Ω

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

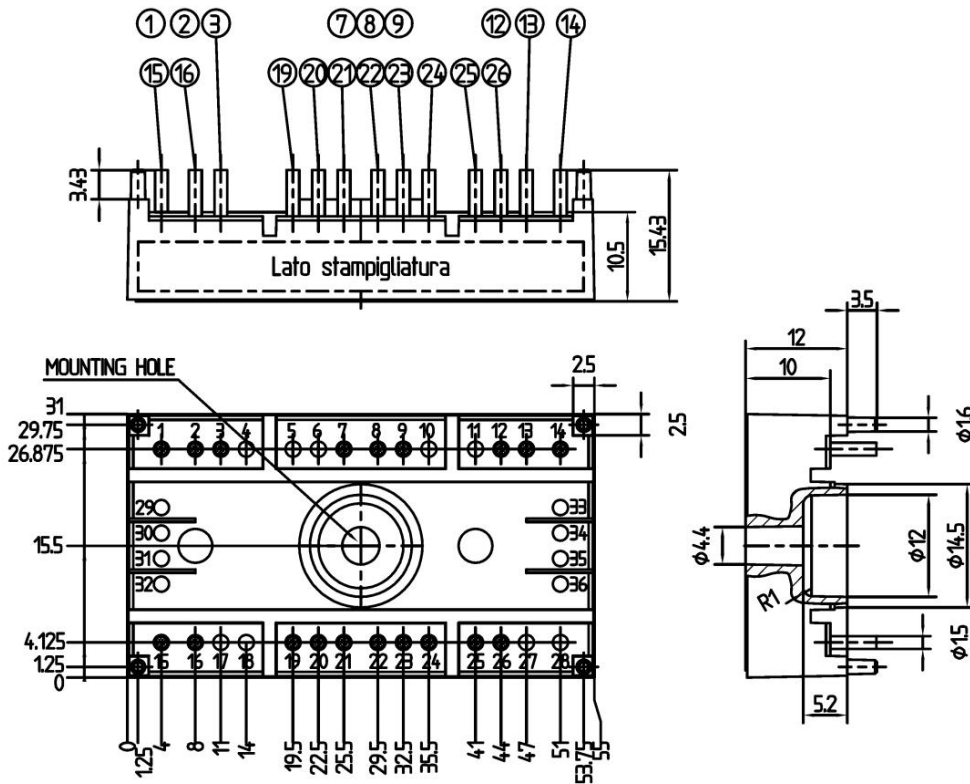
* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.





UL recognized

file no. E63 532



Case T52 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)

