



**SEMITOP<sup>®</sup> 3**

## IGBT Module

**SK50GD066ET**

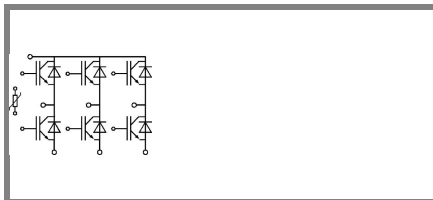
### Target Data

### 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
<b>IGBT</b>				
$V_{CES}$	$T_j = 25\text{ °C}$	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
<b>Inverse Diode</b>				
$I_F$	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	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
<b>Module</b>				
$I_{t(RMS)}$				A
$T_{vj}$		-40 ... +175		°C
$T_{stg}$		-40 ... +125		°C
$V_{isol}$	AC, 1 min.	2500		V

Characteristics		$T_s = 25\text{ °C}$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}$ , $I_C = 0,8\text{ mA}$	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	mΩ
		$T_j = 150\text{ °C}$	17	21	mΩ
$V_{CE(sat)}$	$I_{Cnom} = 50\text{ A}$ , $V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}_{chiplev.}$	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
$Q_G$	$V_{GE} = -7V...+15V$	250		nC	
$t_{d(on)}$	$R_{Gon} = 16\text{ }\Omega$ $di/dt = 2438\text{ A}/\mu\text{s}$	$V_{CC} = 300V$ $I_C = 50A$	28		ns
$t_r$			32		ns
$E_{on}$			2,2		mJ
$t_{d(off)}$	$R_{Goff} = 16\text{ }\Omega$ $di/dt = 2438\text{ A}/\mu\text{s}$	$T_j = 150\text{ °C}$ $V_{GE} = -7/+15V$	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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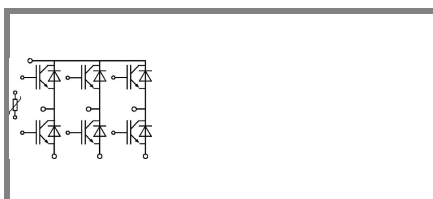
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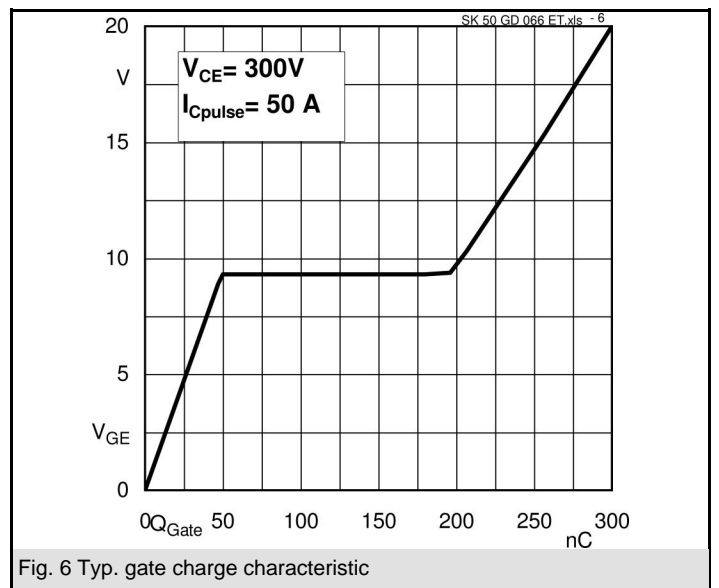
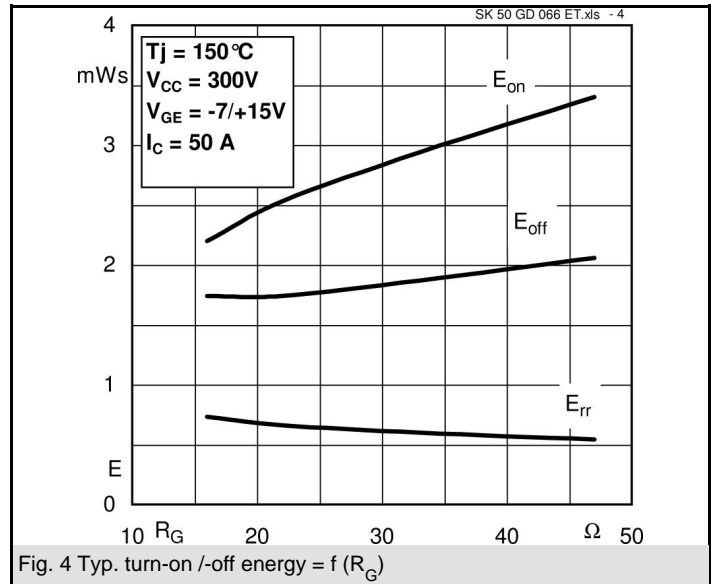
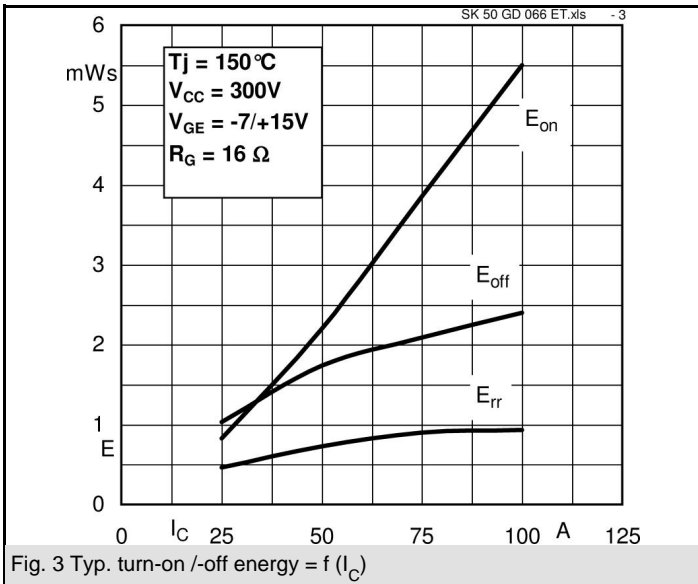
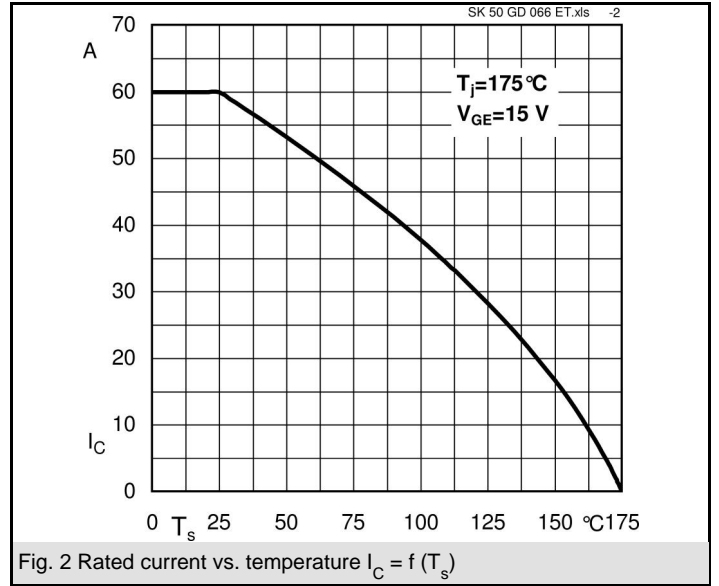
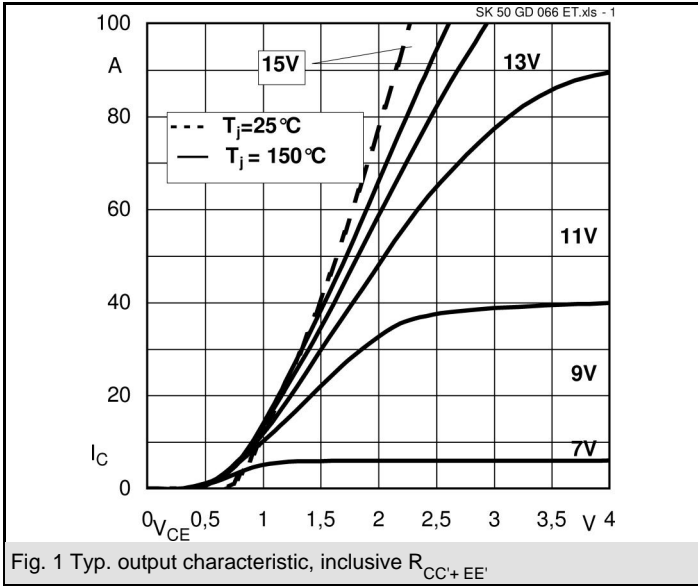


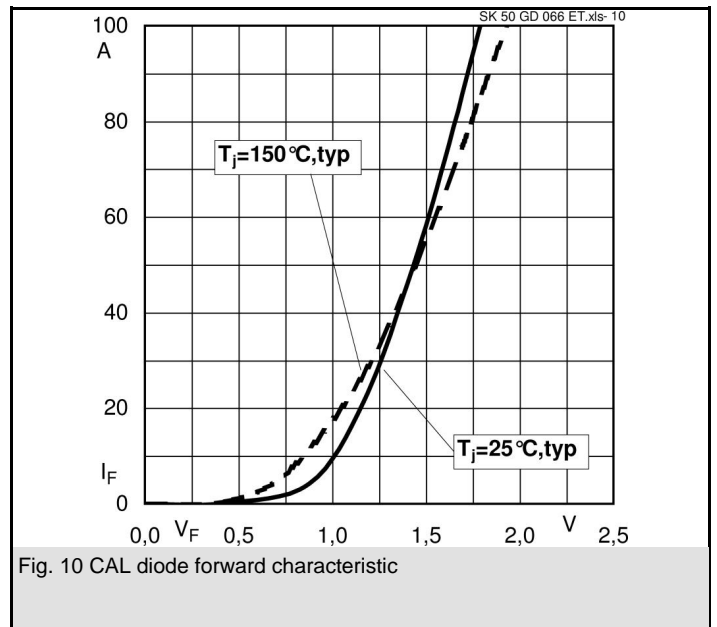
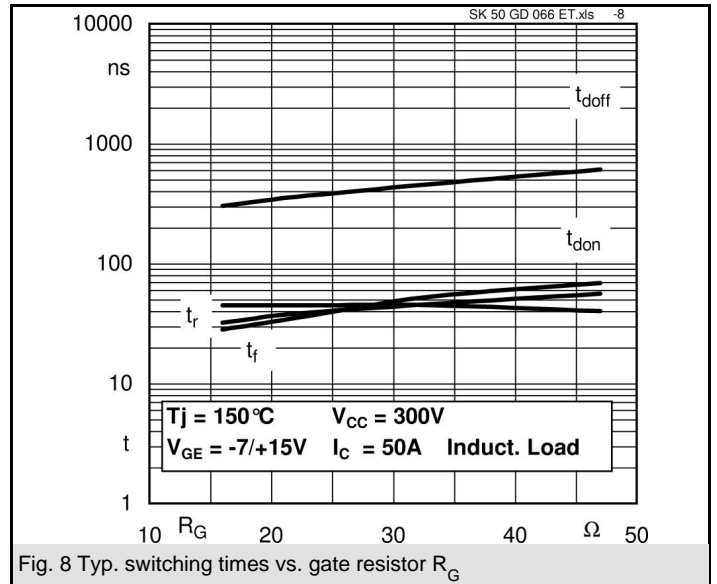
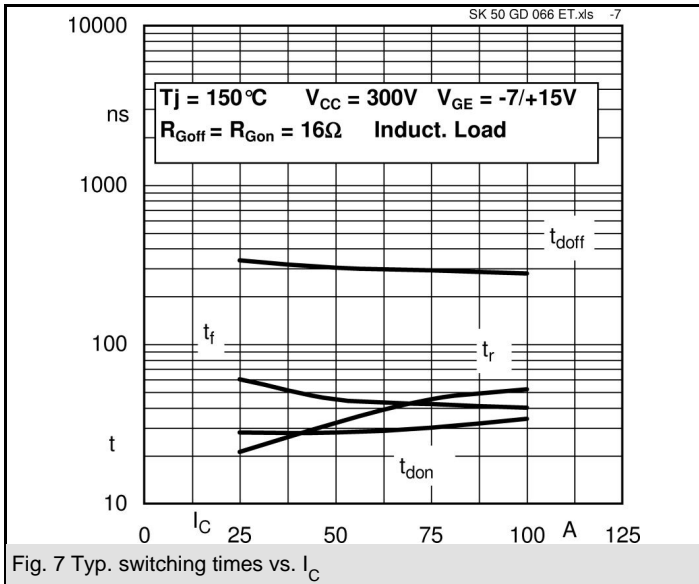
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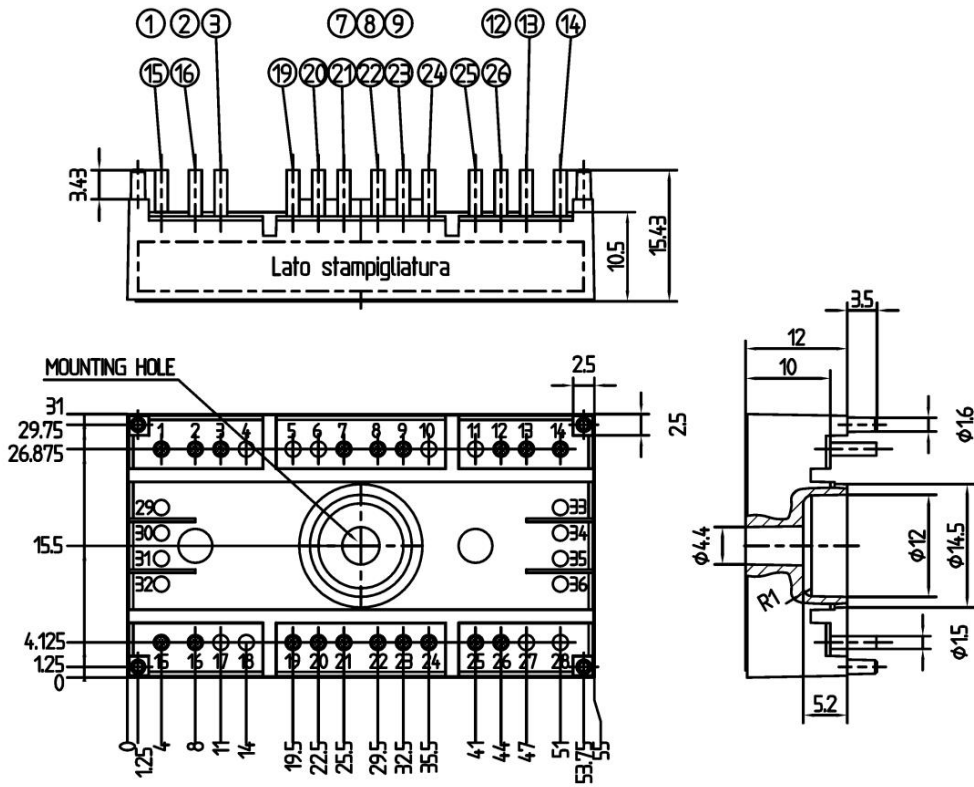
Characteristics			min.	typ.	max.	Units
<b>Inverse Diode</b>						
$V_F = V_{EC}$	$I_{Fnom} = 50 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		1,5		V
		$T_j = 150 \text{ }^\circ\text{C}_{chiplev.}$		1,5		V
$V_{F0}$		$T_j = 25 \text{ }^\circ\text{C}$		1	1,1	V
		$T_j = 150 \text{ }^\circ\text{C}$		0,9	1	V
$r_F$		$T_j = 25 \text{ }^\circ\text{C}$		10	12	m $\Omega$
		$T_j = 150 \text{ }^\circ\text{C}$		12	14	m $\Omega$
$I_{RRM}$	$I_F = 50 \text{ A}$	$T_j = 150 \text{ }^\circ\text{C}$		44		A
$Q_{rr}$	$di/dt = 2438 \text{ A}/\mu\text{s}$			4,8		$\mu\text{C}$
$E_{rr}$	$V_{CC} = 300\text{V}$			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
<b>Temperature sensor</b>						
$R_{100}$	$T_s = 100^\circ\text{C} (R_{25} = 5\text{k}\Omega)$			493 $\pm$ 5%		$\Omega$

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.







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

