

SK10GD12T4ET



SEMITOP® 3

IGBT Module

SK10GD12T4ET

Target Data

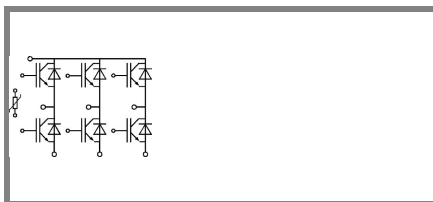
Features

- One screw mounting module
- Trench4 IGBT technology
- CAL4 technology FWD
- Integrated NTC temperature sensor

Typical Applications*

Remarks

- $V_{CE,sat}$, V_F = chip level value



GD-ET

Absolute Maximum Ratings		$T_s = 25\text{ °C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25\text{ °C}$	1200		V
I_C	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	17	A
		$T_s = 70\text{ °C}$	15	A
I_{CRM}	$I_{CRM} = 3 \times I_{Cnom}$	24		A
V_{GES}		± 20		V
t_{psc}	$V_{CC} = 800\text{ V}$; $V_{GE} \leq 15\text{ V}$; $T_j = 150\text{ °C}$ $V_{CES} < 1200\text{ V}$	10		µs
Inverse Diode				
I_F	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	15	A
		$T_s = 70\text{ °C}$	12	A
I_{FRM}	$I_{FRM} = 3 \times I_{Fnom}$	24		A
Module				
$I_{t(RMS)}$				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
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 0,3\text{ mA}$	5	5,8	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}$, $V_{CE} = V_{CES}$	$T_j = 25\text{ °C}$	0,001		mA
		$T_j = 125\text{ °C}$			mA
I_{GES}	$V_{CE} = 0\text{ V}$, $V_{GE} = 20\text{ V}$	$T_j = 25\text{ °C}$	120		nA
		$T_j = 125\text{ °C}$			nA
V_{CE0}		$T_j = 25\text{ °C}$	1,1	1,3	V
		$T_j = 150\text{ °C}$	1	1,2	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}$	93,8		mΩ
		$T_j = 150\text{ °C}$	156		mΩ
$V_{CE(sat)}$	$I_{Cnom} = 8\text{ A}$, $V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}_{chiplev.}$	1,85	2,05	V
		$T_j = 150\text{ °C}_{chiplev.}$	2,25	2,45	V
C_{ies}	$V_{CE} = 25$, $V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	0,49		nF
C_{oes}			0,05		nF
C_{res}			0,03		nF
Q_G	$V_{GE} = -7V \dots +15V$	37,5		nC	
$t_{d(on)}$	$R_{Gon} = 32\ \Omega$ $di/dt = 1375\text{ A}/\mu\text{s}$	$V_{CC} = 600V$ $I_C = 8A$	16		ns
t_r			14		ns
E_{on}			0,41		mJ
$t_{d(off)}$	$R_{Goff} = 32\ \Omega$ $di/dt = 1375\text{ A}/\mu\text{s}$	$T_j = 150\text{ °C}$ $V_{GE} = \pm 15\text{ V}$	273		ns
t_f			85		ns
E_{off}			0,76		mJ
$R_{th(j-s)}$	per IGBT	2,2		K/W	

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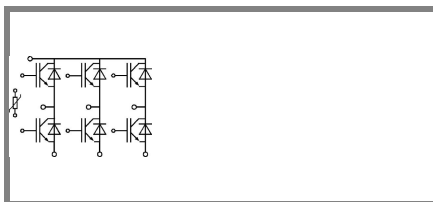
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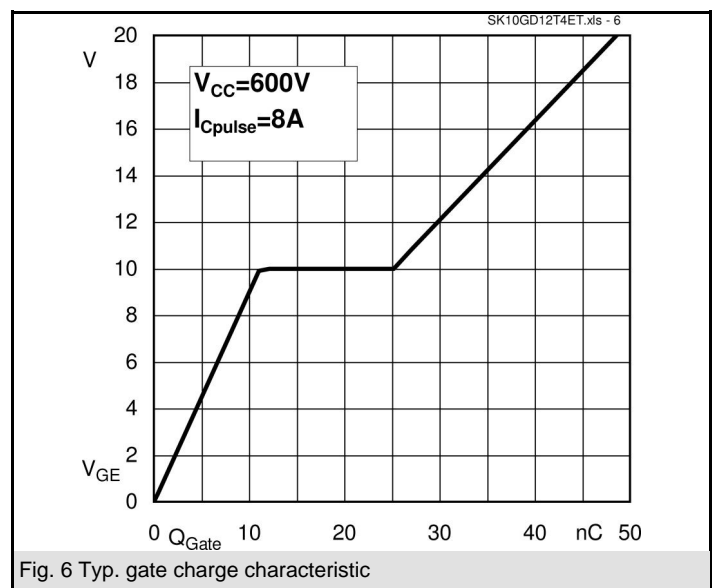
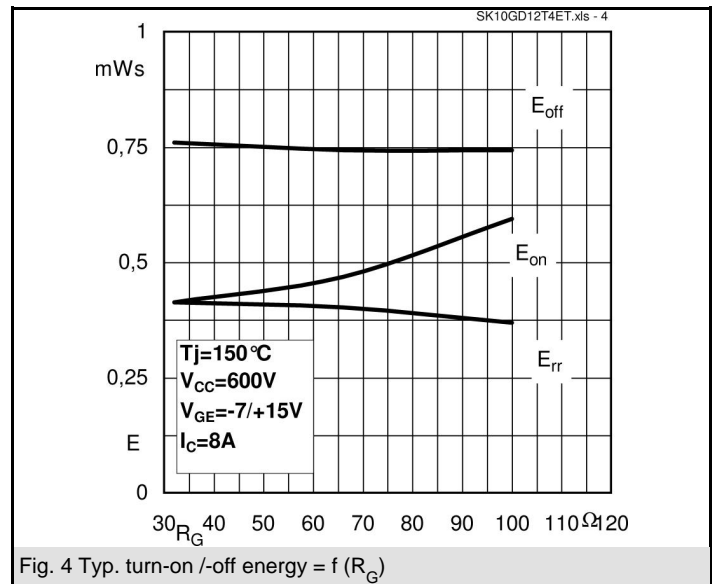
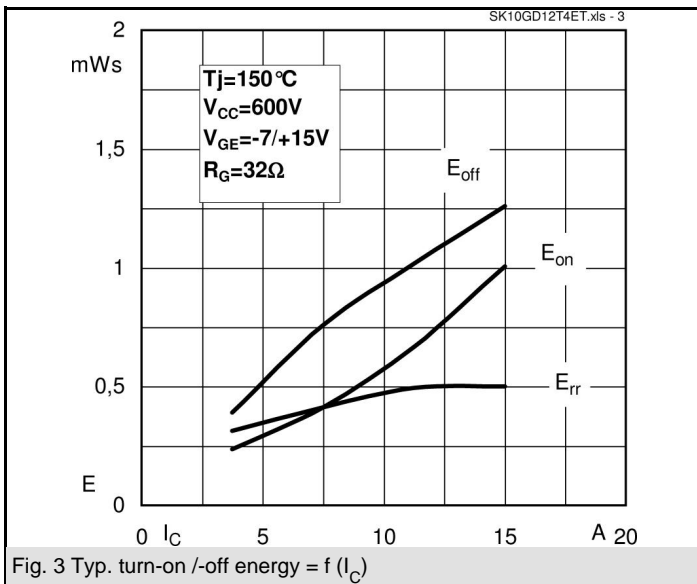
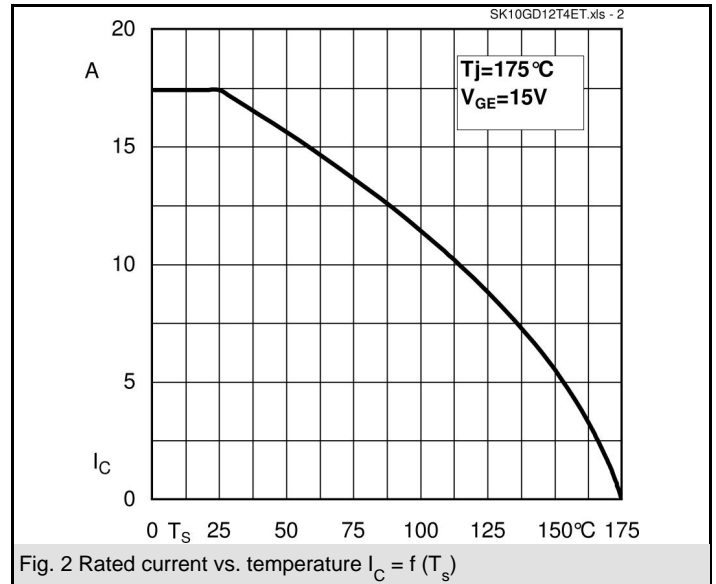
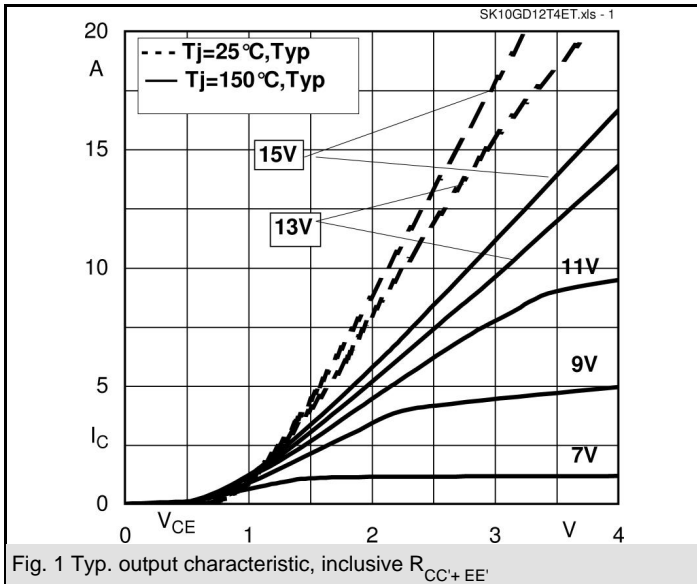
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Characteristics

Symbol	Conditions	min.	typ.	max.	Units	
Inverse Diode						
$V_F = V_{EC}$	$I_{Fnom} = 8 \text{ A}; V_{GE} = 0 \text{ V}$		$T_j = 25 \text{ }^\circ\text{C}_{\text{chiplev.}}$	2,38	2,71	V
			$T_j = 150 \text{ }^\circ\text{C}_{\text{chiplev.}}$	2,44	2,77	V
V_{F0}			$T_j = 25 \text{ }^\circ\text{C}$	1,3	1,5	V
			$T_j = 150 \text{ }^\circ\text{C}$	0,9	1,1	V
r_F			$T_j = 25 \text{ }^\circ\text{C}$	135	151,3	m Ω
			$T_j = 150 \text{ }^\circ\text{C}$	192	208,8	m Ω
I_{RRM}	$I_F = 8 \text{ A}$	$T_j = 150 \text{ }^\circ\text{C}$		15	A	
Q_{rr}	$di/dt = 1375 \text{ A}/\mu\text{s}$			0,2	μC	
E_{rr}	$V_{CC} = 600\text{V}$			0,41	mJ	
$R_{th(j-s)D}$	per diode		2,7		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.



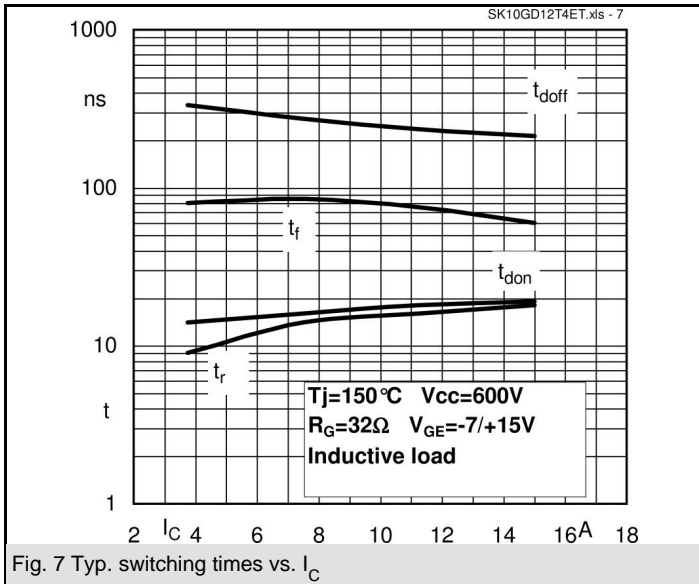


Fig. 7 Typ. switching times vs. I_C

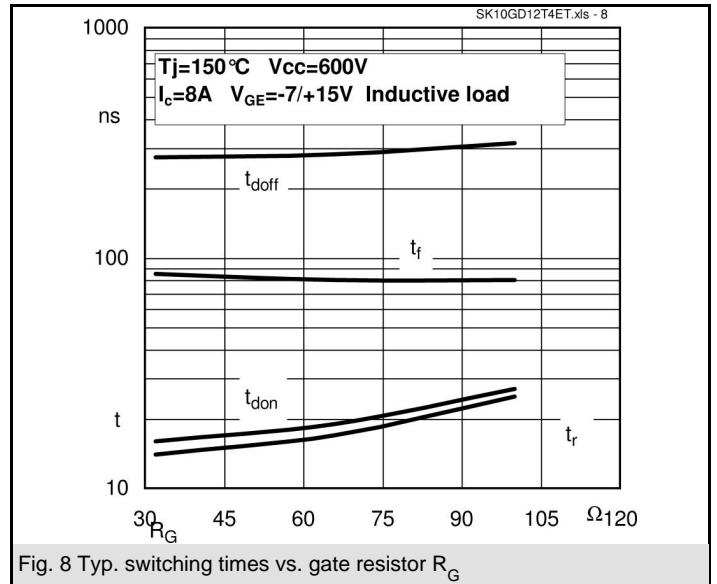


Fig. 8 Typ. switching times vs. gate resistor R_G

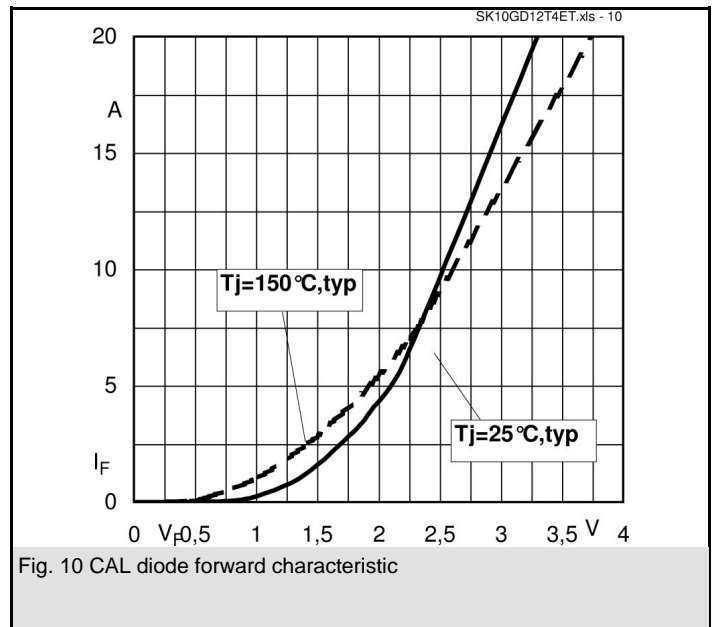
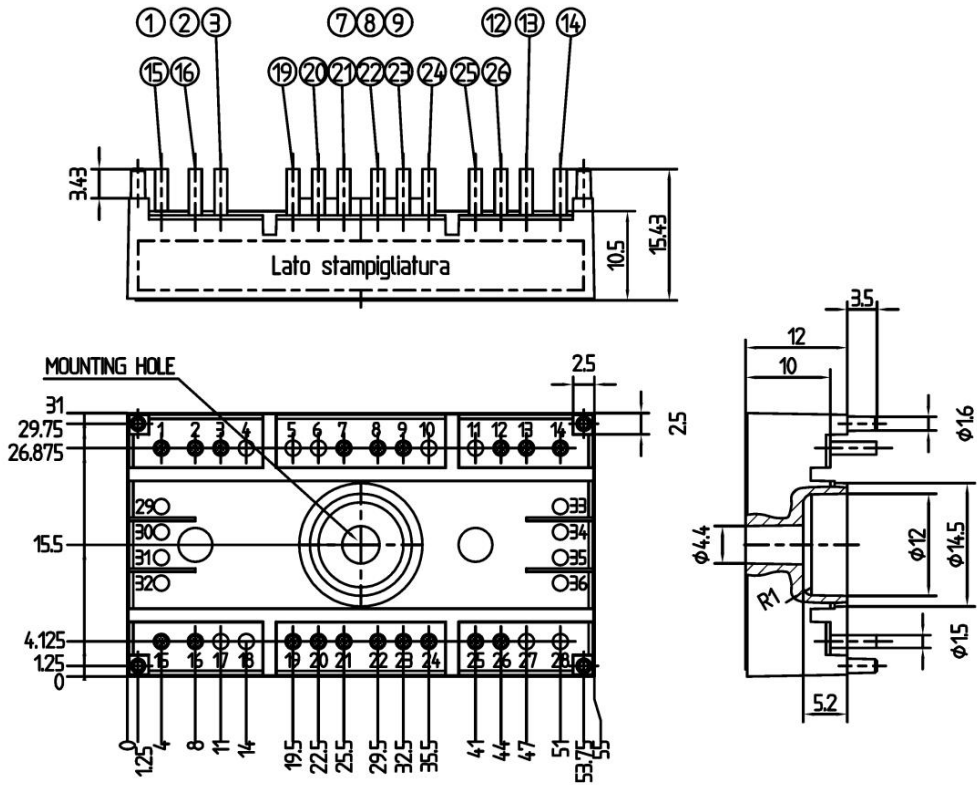
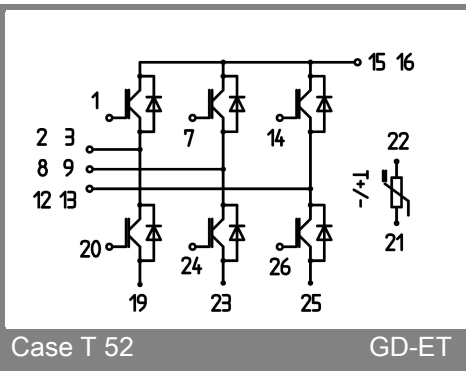


Fig. 10 CAL diode forward characteristic

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



Case T 52

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