

SEMITOP®4

## IGBT module

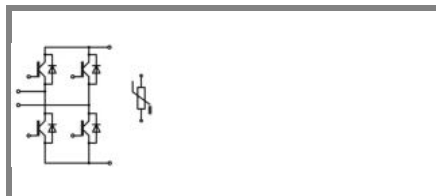
SK50GH12T4T

## Features

- One screw mounting module
- Fully compatible with SEMITOP®1,2,3
- Improved thermal performances by aluminium oxide substrate
- New IGBT4 Technology
- CAL 4 technology FWD
- Integrated NTC Temperature sensor

## Typical Applications\*

- Voltage regulator

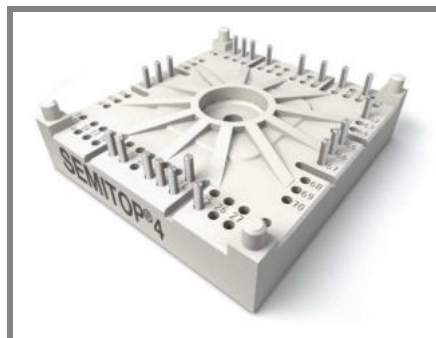


GH-T

Absolute Maximum Ratings		T <sub>s</sub> = 25 °C, unless otherwise specified		
Symbol	Conditions	Values	Units	
IGBT				
V <sub>CES</sub>	T <sub>j</sub> = 25 °C	1200	V	
I <sub>C</sub>	T <sub>j</sub> = 175 °C	T <sub>s</sub> = 25 °C	75	A
		T <sub>s</sub> = 70 °C	60	A
I <sub>CRM</sub>	I <sub>CRM</sub> = 3 x I <sub>Cnom</sub> , t <sub>p</sub> ≤ 1ms	150	A	
V <sub>GES</sub>		±20	V	
t <sub>psc</sub>	V <sub>CC</sub> = 800 V; V <sub>GE</sub> ≤ 15 V; T <sub>j</sub> = 150 °C V <sub>CES</sub> < 1200 V	10	µs	
Inverse Diode				
I <sub>F</sub>	T <sub>j</sub> = 175 °C	T <sub>s</sub> = 25 °C	56	A
		T <sub>s</sub> = 70 °C	45	A
I <sub>FRM</sub>	I <sub>FRM</sub> = 3 x I <sub>Fnom</sub> , t <sub>p</sub> ≤ 1ms	150	A	
I <sub>FSM</sub>	t <sub>p</sub> = 10 ms; half sine wave T <sub>j</sub> = 150 °C	335	A	
Module				
I <sub>t(RMS)</sub>			A	
T <sub>vj</sub>		-40 ... +175	°C	
T <sub>stg</sub>		-40 ... +125	°C	
V <sub>isol</sub>	AC, 1 min.	2500	V	

Characteristics		$T_c = 25\text{ °C}$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}$ , $I_C = 1,7\text{ mA}$	5	5,8	6,5	V
$I_{CES}$	$V_{GE} = 0\text{ V}$ , $V_{CE} = V_{CES}$		$T_j = 25\text{ °C}$	1,0	mA
			$T_j = 125\text{ °C}$	0,4	mA
$I_{GES}$	$V_{CE} = 0\text{ V}$ , $V_{GE} = 20\text{ V}$		$T_j = 125\text{ °C}$	600	nA
$V_{CE0}$			$T_j = 25\text{ °C}$	0,8	V
			$T_j = 150\text{ °C}$	0,7	V
$r_{CE}$	$V_{GE} = 15\text{ V}$		$T_j = 25\text{ °C}$	20	m $\Omega$
			$T_j = 150\text{ °C}$	30	m $\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 50\text{ A}$ , $V_{GE} = 15\text{ V}$		$T_j = 25\text{ °C}_{chiplev.}$	1,8	V
			$T_j = 150\text{ °C}_{chiplev.}$	2,2	V
$C_{ies}$	$V_{CE} = 25$ , $V_{GE} = 0\text{ V}$		$f = 1\text{ MHz}$	5,54	nF
$C_{oes}$				0,41	nF
$C_{res}$				0,32	nF
$Q_G$	$V_{GE} = -7V...+15V$		375		nC
$R_{Gint}$	$T_j = 25\text{ °C}$		4		$\Omega$
$t_{d(on)}$	$R_{Gon} = 32\text{ }\Omega$ $di/dt = 920\text{ A}/\mu\text{s}$	$V_{CC} = 600V$ $I_C = 50A$	63		ns
$t_r$			65		ns
$E_{on}$	$R_{Goff} = 32\text{ }\Omega$	$T_j = 150\text{ °C}$	8,3		mJ
$t_{d(off)}$			521		ns
$t_f$			80		ns
$E_{off}$			5		mJ
$R_{th(j-s)}$	per IGBT		0,65		K/W

# SK50GH12T4T



**SEMITOP®4**

**IGBT module**

**SK50GH12T4T**

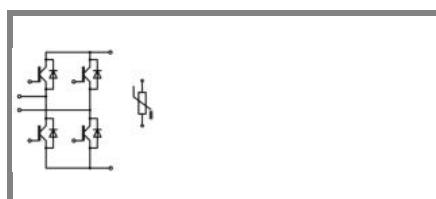
## Features

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- Improved thermal performances by aluminium oxide substrate
- New IGBT4 Technology
- CAL 4 technology FWD
- Integrated NTC Temperature sensor

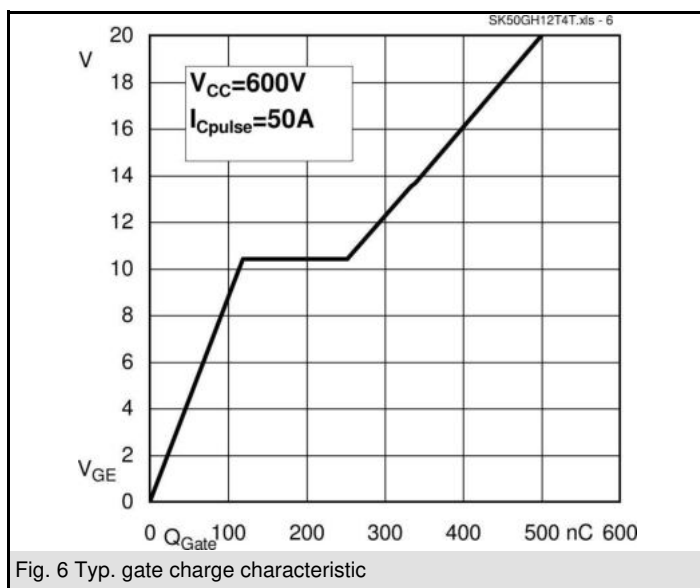
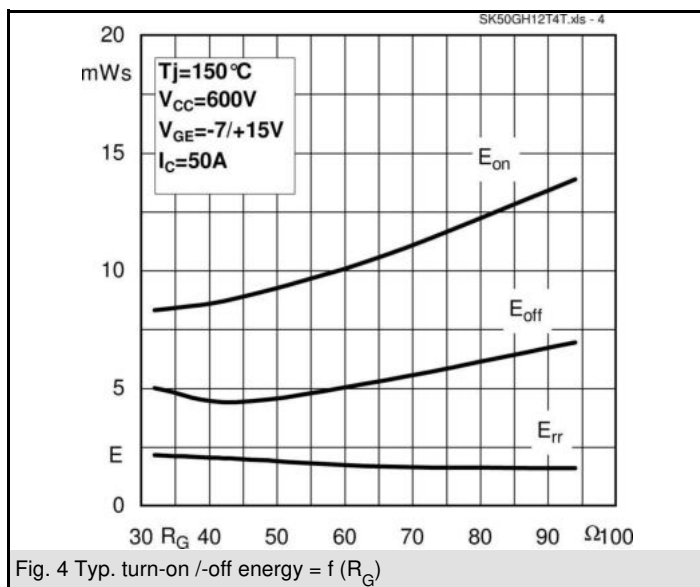
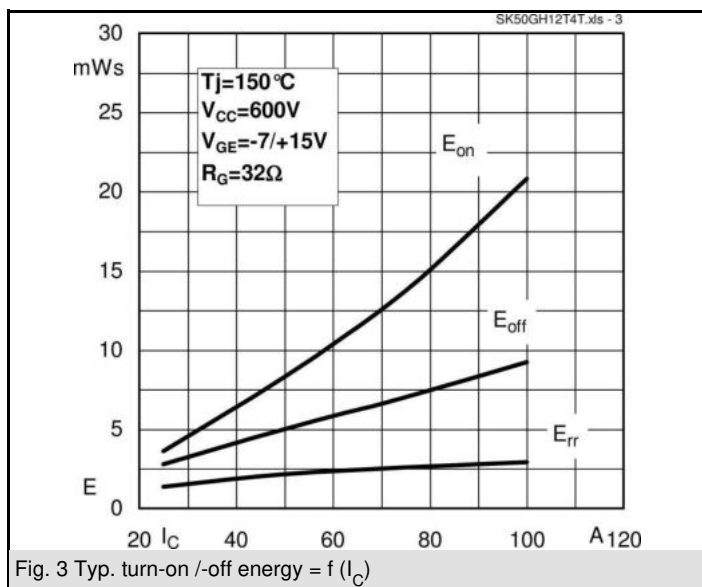
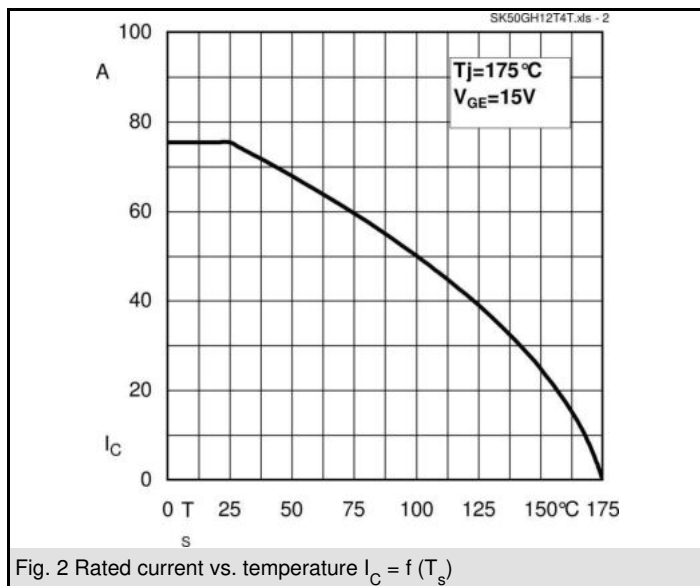
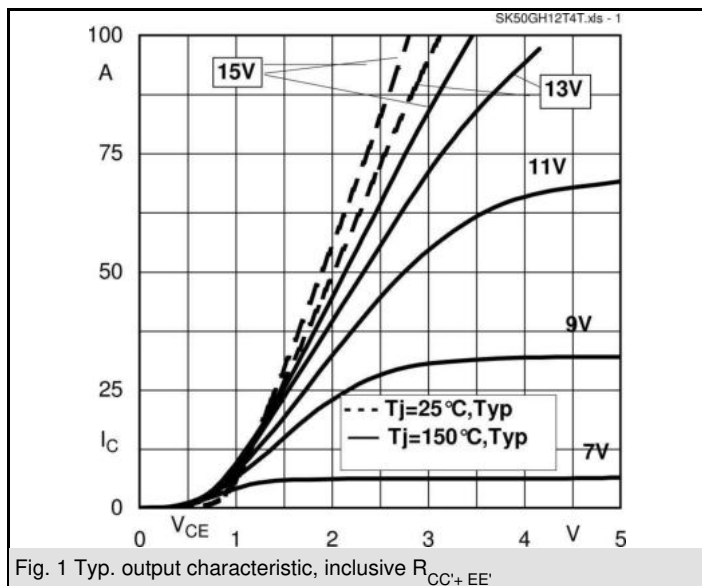
## Typical Applications\*

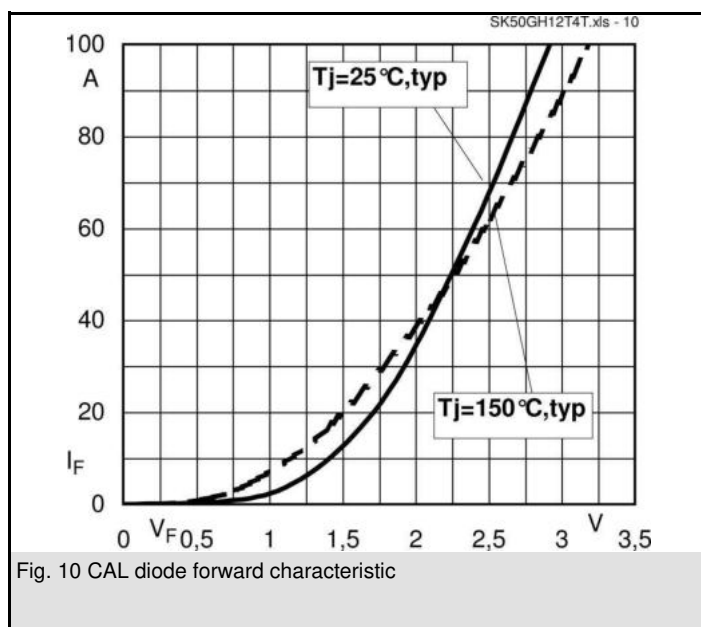
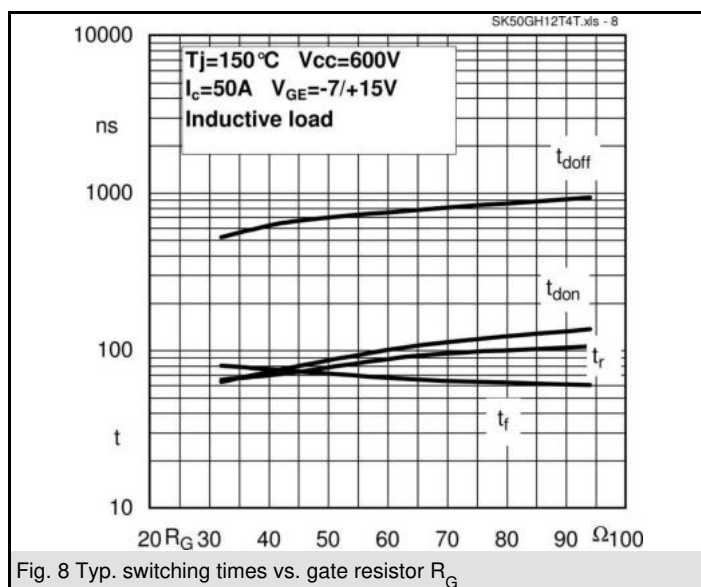
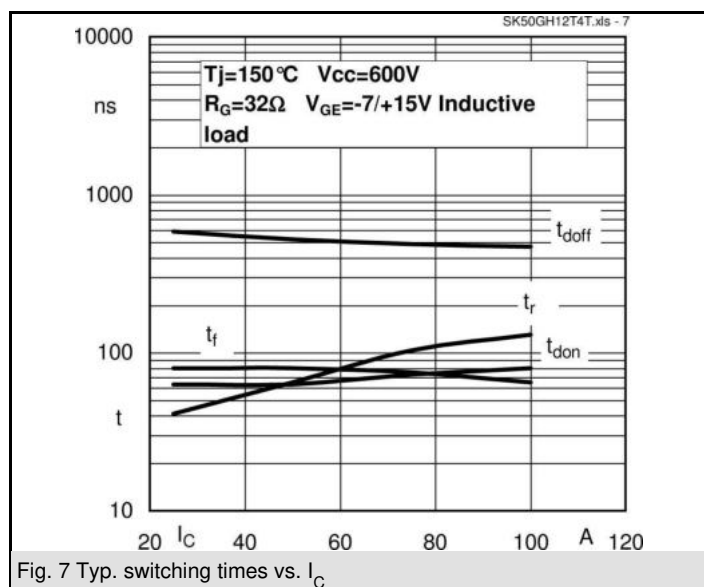
- Voltage regulator

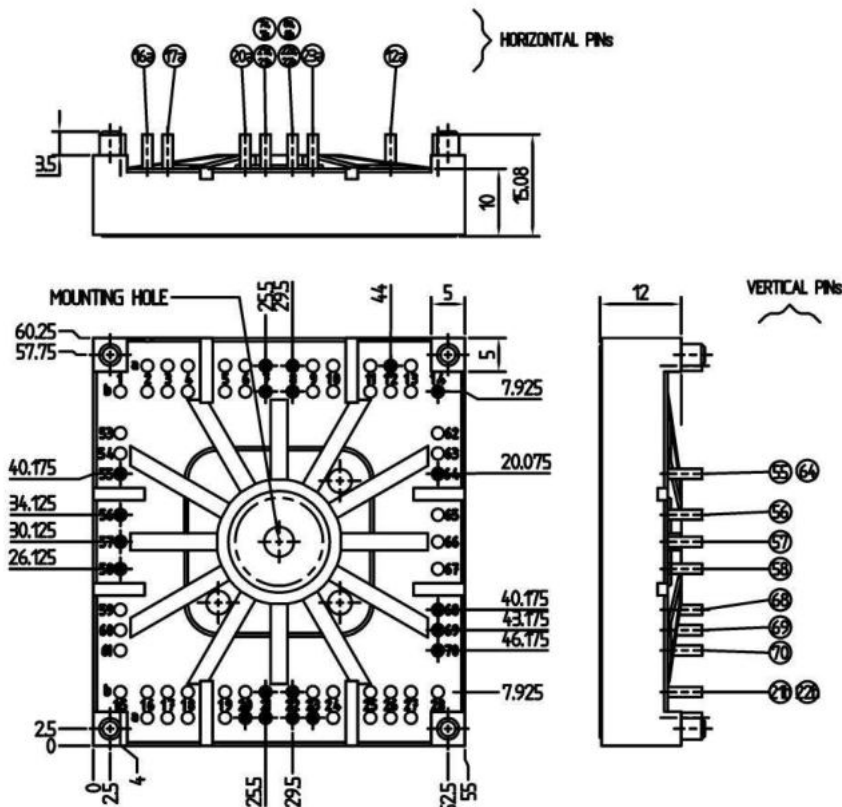
Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
<b>Inverse Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 50 \text{ A}; V_{GE} = 0 \text{ V}$				
	$T_j = 25 \text{ }^{\circ}\text{C}_{chiplev.}$		2,2	2,5	V
	$T_j = 150 \text{ }^{\circ}\text{C}_{chiplev.}$		2,1	2,45	V
$V_{F0}$	$T_j = 25 \text{ }^{\circ}\text{C}$		1,3	1,5	V
	$T_j = 150 \text{ }^{\circ}\text{C}$		0,9	1,1	V
$r_F$	$T_j = 25 \text{ }^{\circ}\text{C}$		18		mΩ
	$T_j = 150 \text{ }^{\circ}\text{C}$		24		mΩ
$I_{RRM}$	$I_F = 50 \text{ A}$		30		A
$Q_{rr}$	$di/dt = 920 \text{ A}/\mu\text{s}$		7,2		μC
$E_{rr}$	$V_{CC}=600\text{V}$		2,15		mJ
$R_{th(j-s)D}$	per diode		1,05		K/W
<b>Freewheeling Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = \text{A}; V_{GE} = \text{V}$				V
$V_{F0}$	$T_j = \text{ }^{\circ}\text{C}$				V
$r_F$	$T_j = \text{ }^{\circ}\text{C}$				V
$I_{RRM}$	$I_F = \text{A}$				A
$Q_{rr}$					μC
$E_{rr}$					mJ
	per diode				K/W
$M_s$	to heat sink	2,5		2,75	Nm
w			60		g
<b>Temperature sensor</b>					
$R_{100}$	$T_s = 100^{\circ}\text{C} (R_{25}=5\text{k}\Omega)$		493±5%		Ω



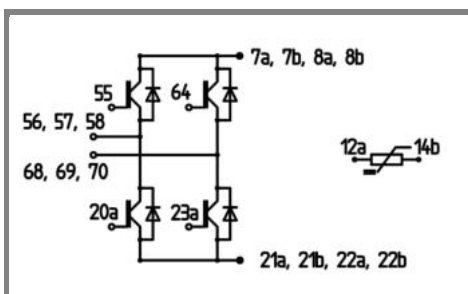
**GH-T**







Case T84 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)



Case T 84

GH-T

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

#### \*IMPORTANT INFORMATION AND WARNINGS

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