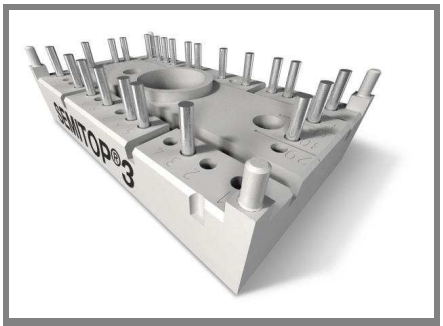
SK50GB12T4T



SEMITOP® 3

IGBT Module

SK50GB12T4T

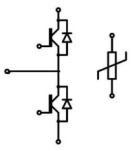
Features

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

Typical Applications*

Remarks

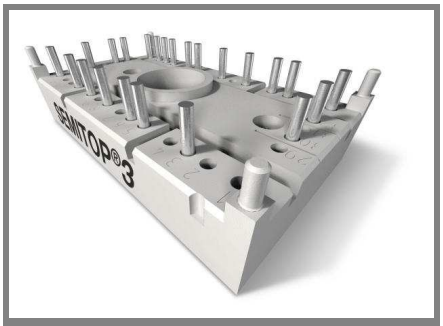
- $V_{CE,sat}$, V_F = chip level value



GB-T

Absolute Maximum Ratings			T_s = 25 °C, unless otherwise specified	
Symbol	**Conditions**		**Values**	**Units**
IGBT				
V_{CES}	T_j = 25 °C		1200	V
I_C	T_j = 175 °C	T_s = 25 °C	71	A
		T_s = 70 °C	56	A
I_{CRM}	I_{CRM}= 3 x I_{Cnom}		150	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 800 V; $V_{GE} \leq$ 15 V; V_{CES} < 1200 V	T_j = 150 °C	10	µs
Inverse Diode				
I_F	T_j = 175 °C	T_s = 25 °C	50	A
		T_s = 70 °C	40	A
I_{FRM}	I_{FRM}= 3 x I_{Fnom}		150	A
I_{FSM}	t_p = 10 ms; half sine wave	T_j = 150 °C	265	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 °C, unless otherwise specified			
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
IGBT						
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 1,7 mA		5	5,8	6,5	V
I_{CES}	V_{GE} = 0 V, V_{CE} = V_{CES}	T_j = 25 °C			1,0	mA
		T_j = 125 °C				mA
I_{GES}	V_{CE} = 0 V, V_{GE} = 20 V	T_j = 25 °C			600	nA
		T_j = 125 °C				nA
V_{CE0}		T_j = 25 °C		1,1	1,3	V
		T_j = 150 °C		1	1,2	V
r_{CE}	V_{GE} = 15 V	T_j = 25°C		15		mΩ
		T_j = 150°C		25		mΩ
$V_{CE(sat)}$	I_{Cnom} = 50 A, V_{GE} = 15 V	T_j = 25°C$_{chiplev.}$		1,85	2,05	V
		T_j = 150°C$_{chiplev.}$		2,25	2,45	V
C_{ies}				2,77		nF
C_{oes}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		0,2		nF
C_{res}				0,16		nF
Q_G	V_{GE}=-7V...+15V			375		nC
R_{Gint}	T_j = 25 °C			4		Ω
$t_{d(on)}$				63		ns
t_r	R_{Gon} = 32 Ω	V_{CC} = 600V		65		ns
E_{on}	di/dt = 920 A/µs	I_C= 50A		8,3		mJ
$t_{d(off)}$	R_{Goff} = 32 Ω	T_j = 150 °C		521		ns
t_f	di/dt = 920 A/µs	V_{GE}= ±15 V		80		ns
E_{off}				5		mJ
$R_{th(j-s)}$	per IGBT			0,9		K/W



SEMITOP® 3

IGBT Module

SK50GB12T4T

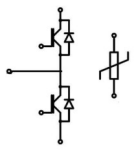
Features

- 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



GB-T

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 50 A; V_{GE} = 0 V	T_j = 25 °C$_{chiplev.}$		2,2	2,55	V
		T_j = 150 °C$_{chiplev.}$		2,18	2,5	V
V_{F0}		T_j = 25 °C		1,3	1,5	V
		T_j = 150 °C		0,9	1,1	V
r_F		T_j = 25 °C		19	21	mΩ
		T_j = 150 °C		26	28	mΩ
I_{RRM}	I_F = 50 A	T_j = 150 °C		30		A
Q_{rr}	di/dt = 920 A/µs			7,2		µC
E_{rr}	V_{CC}= 600V			2,15		mJ
$R_{th(j-s)D}$	per diode			1,24		K/W
M_s	to heat sink				2,5	Nm
w				30		g
Temperature sensor						
R_{100}	T_s=100°C (R_{25}=5kΩ)			493±5%		Ω

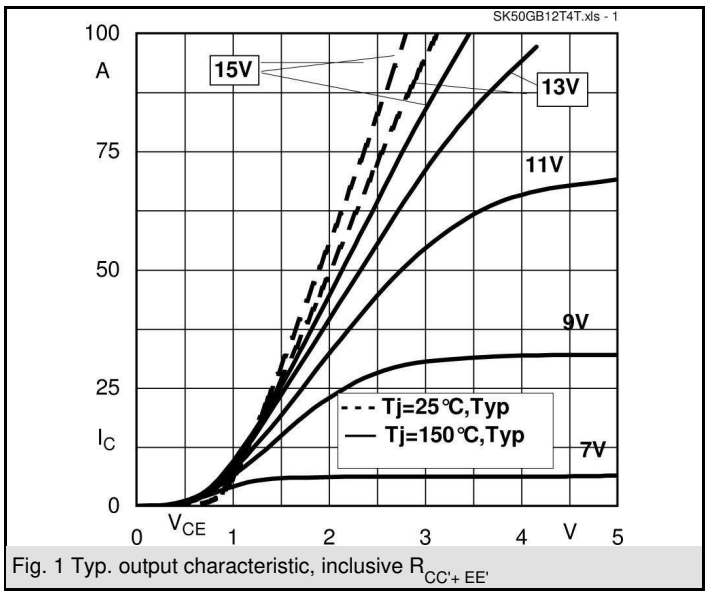


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

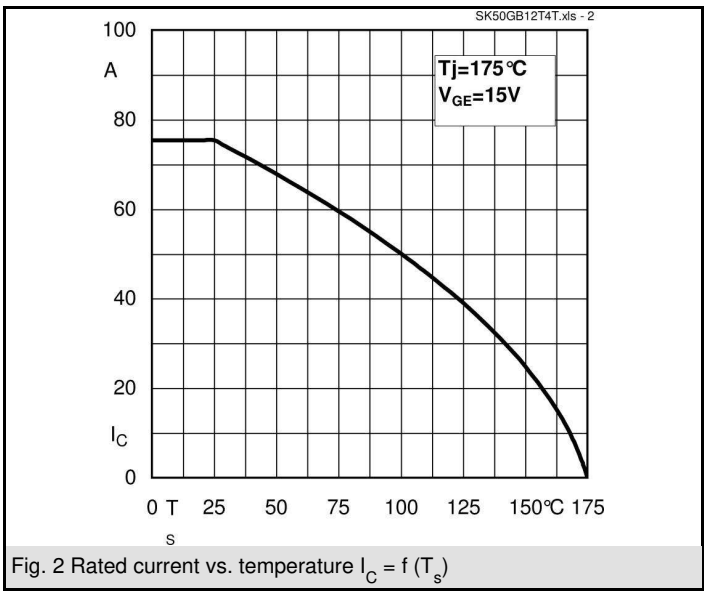


Fig. 2 Rated current vs. temperature $I_C = f(T_s)$

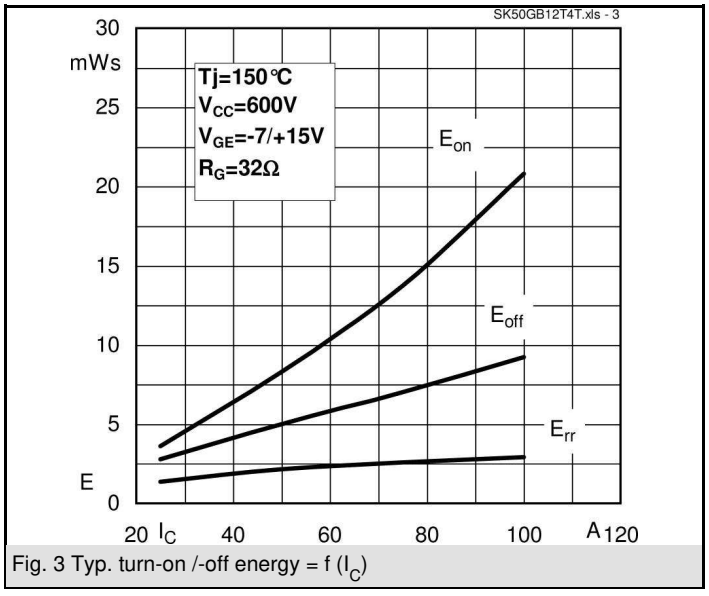


Fig. 3 Typ. turn-on /-off energy = f (I_C)

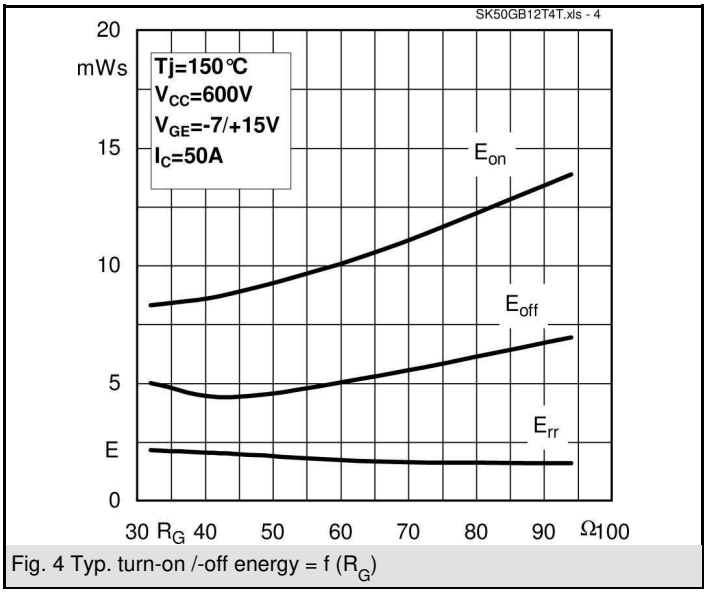


Fig. 4 Typ. turn-on /-off energy = f (R_G)

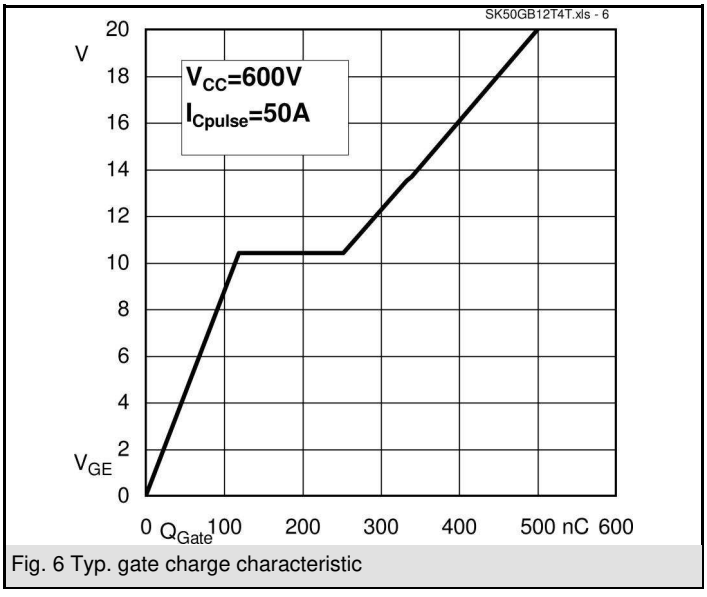


Fig. 6 Typ. gate charge characteristic

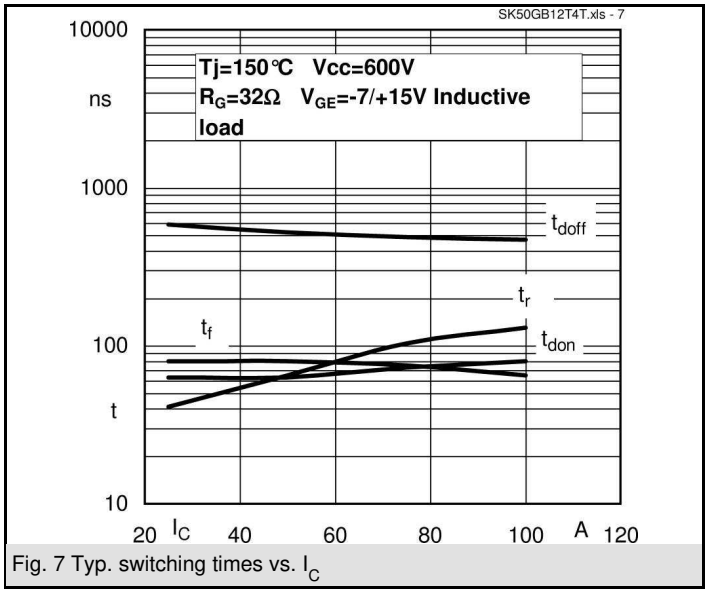


Fig. 7 Typ. switching times vs. I_C

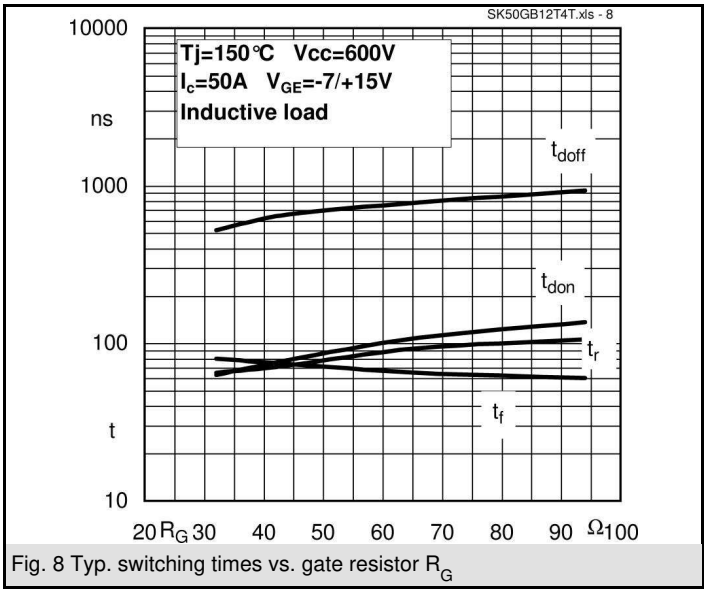


Fig. 8 Typ. switching times vs. gate resistor R_G

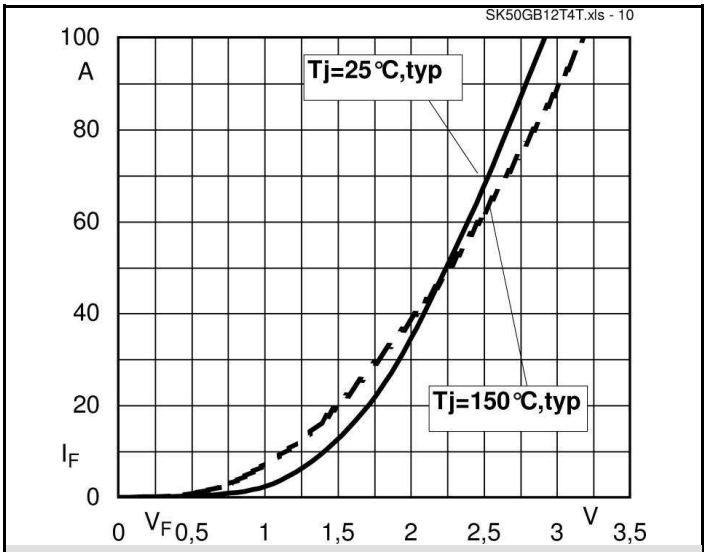
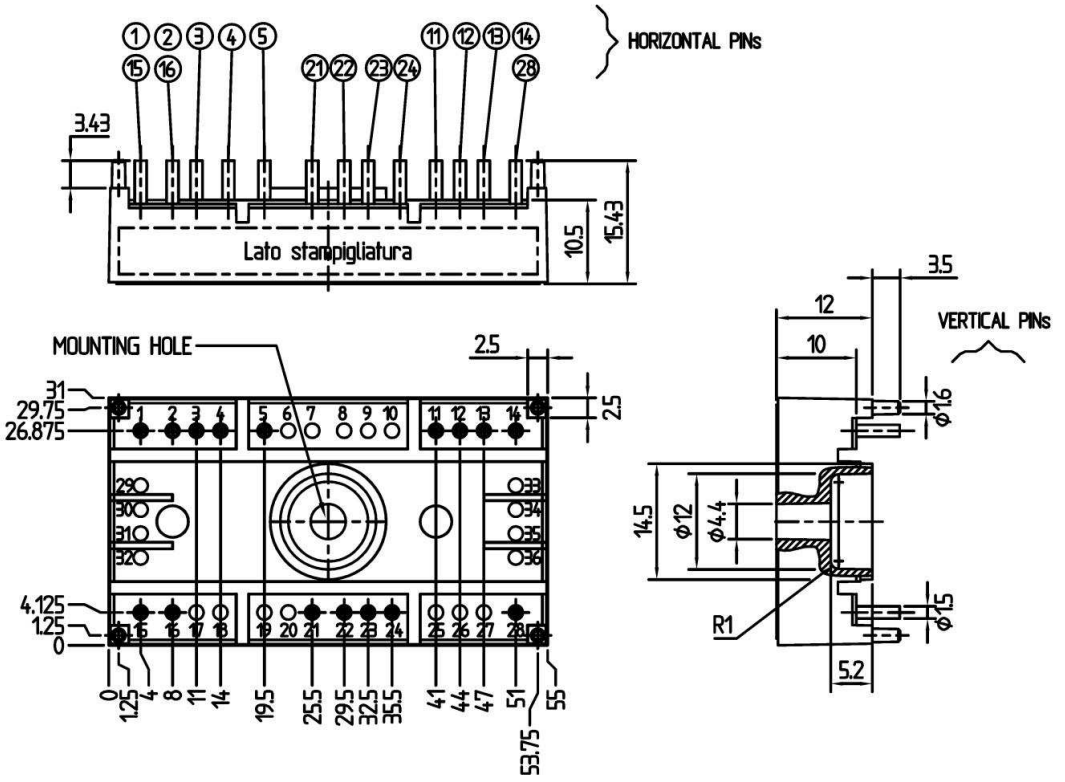
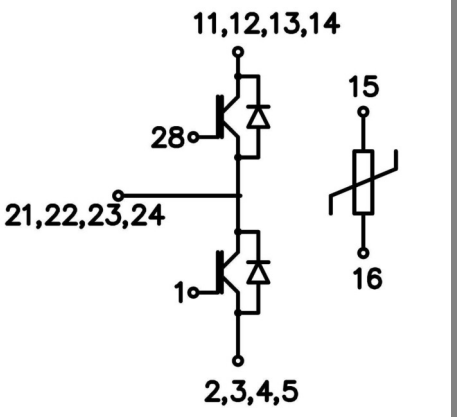


Fig. 10 CAL diode forward characteristic



Case T73 (Suggested hole diameter for the solder pins and mounting plastic pins: 2mm)



Case T73 GB-T

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

***IMPORTANT INFORMATION AND WARNINGS**

The specifications of SEMIKRON products may not be considered as guarantee or assurance of product characteristics ("Beschaffenheitsgarantie"). The specifications of SEMIKRON products describe only the usual characteristics of products to be expected in typical applications, which may still vary depending on the specific application. Therefore, products must be tested for the respective application in advance. Application adjustments may be necessary. The user of SEMIKRON products is responsible for the safety of their applications embedding SEMIKRON products and must take adequate safety measures to prevent the applications from causing a physical injury, fire or other problem if any of SEMIKRON products become faulty. The user is responsible to make sure that the application design is compliant with all applicable laws, regulations, norms and standards. Except as otherwise explicitly approved by SEMIKRON in a written document signed by authorized representatives of SEMIKRON, SEMIKRON products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury. No representation or warranty is given and no liability is assumed with respect to the accuracy, completeness and/or use of any information herein, including without limitation, warranties of non-infringement of intellectual property rights of any third party. SEMIKRON does not assume any liability arising out of the applications or use of any product; neither does it convey any license under its patent rights, copyrights, trade secrets or other intellectual property rights, nor the rights of others. SEMIKRON makes no representation or warranty of non-infringement or alleged non-infringement of intellectual property rights of any third party which may arise from applications. Due to technical requirements our products may contain dangerous substances. For information on the types in question please contact the nearest SEMIKRON sales office. This document supersedes and replaces all information previously supplied and may be superseded by updates. SEMIKRON reserves the right to make changes.

