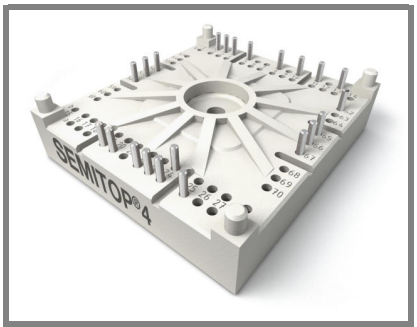
SK50GD12T4T



SEMITOP® 4

IGBT Module

SK50GD12T4T

Target Data

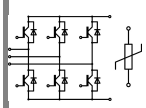
Features

- One screw mounting module
- Fully compatible with SEMITOP®1,2,3
- Improved thermal performances by aluminium oxide substrate
- Trench4 IGBT technology
- CAL4 technology FWD
- Integrated NTC temperature sensor

Typical Applications*

Remarks

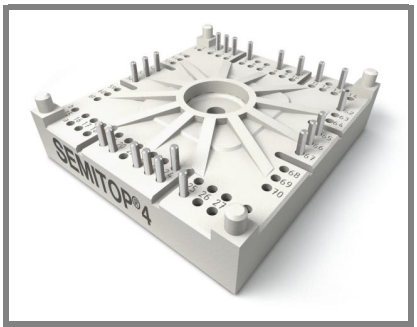
- $V_{CE,sat}$, V_F = chip level value



GD-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	75	A
		T_s = 70 °C	60	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	60	A
		T_s = 70 °C	45	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			0,01	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			0,65		K/W



SEMITOP® 4

IGBT Module

SK50GD12T4T

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Typical Applications*

Remarks

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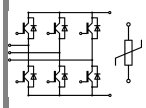


GD-T

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			0,97		K/W
M_s	to heat sink		2,5		2,75	Nm
w				60		g
Temperature sensor						
R_{100}	T_s =100°C (R_{25}=5kΩ)			493±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.

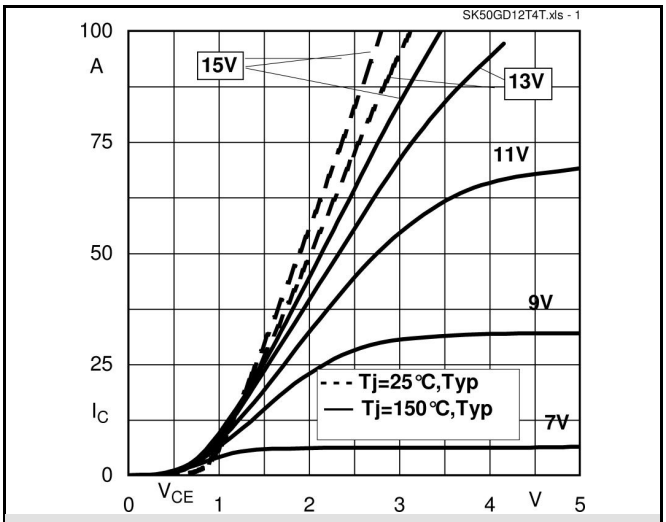


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

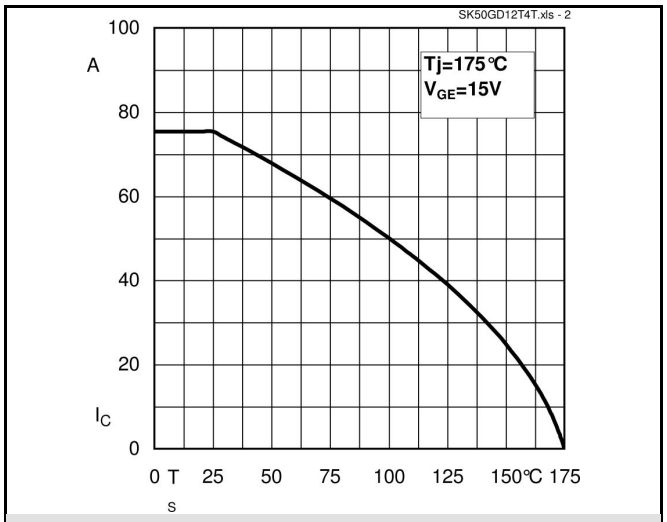


Fig. 2 Rated current vs. temperature $I_C = f(T_s)$

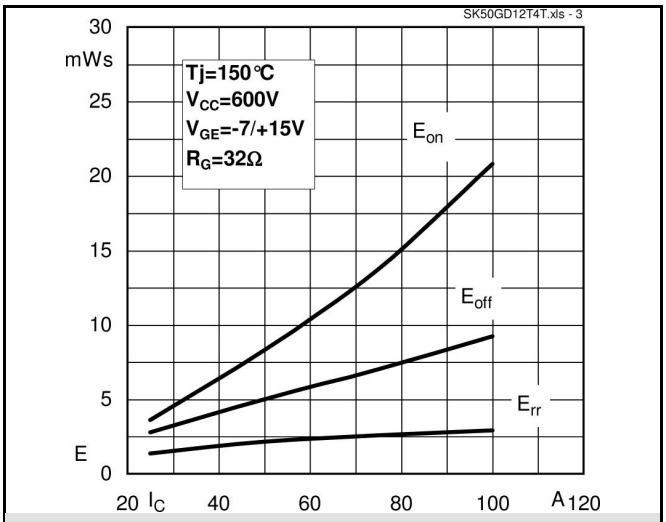


Fig. 3 Typ. turn-on /-off energy = f (I_C)

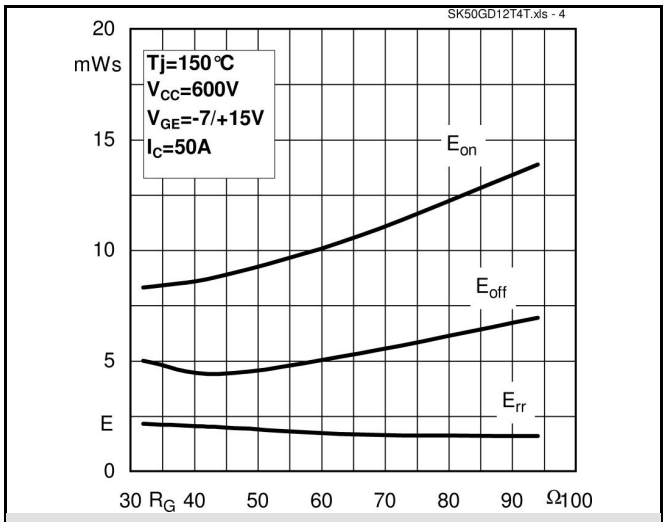


Fig. 4 Typ. turn-on /-off energy = f (R_G)

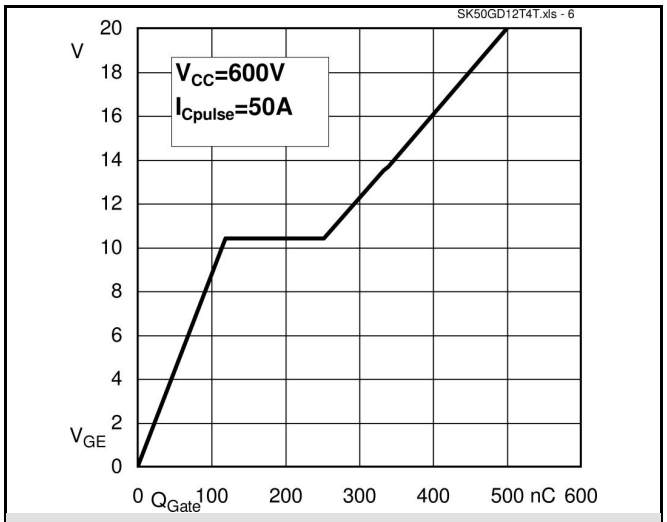


Fig. 6 Typ. gate charge characteristic

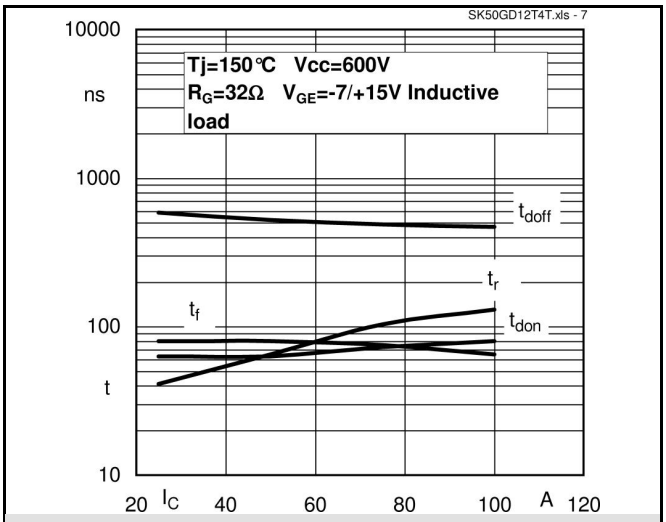


Fig. 7 Typ. switching times vs. I_C

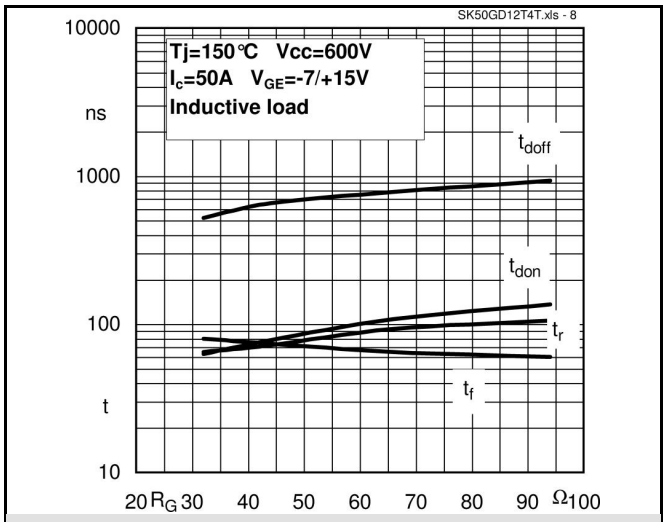


Fig. 8 Typ. switching times vs. gate resistor R_G

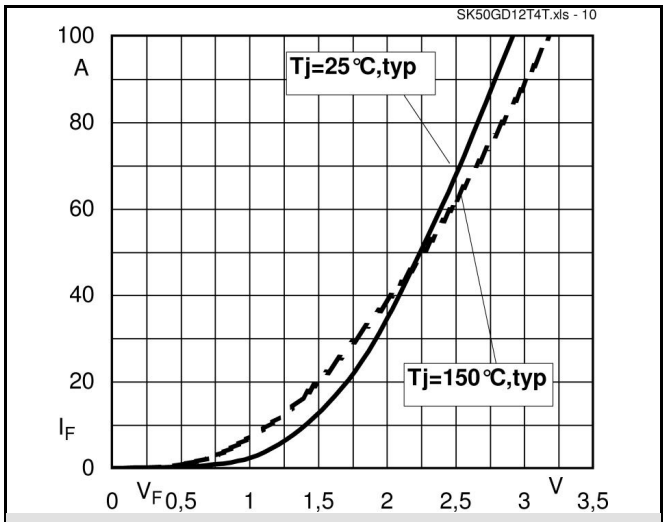
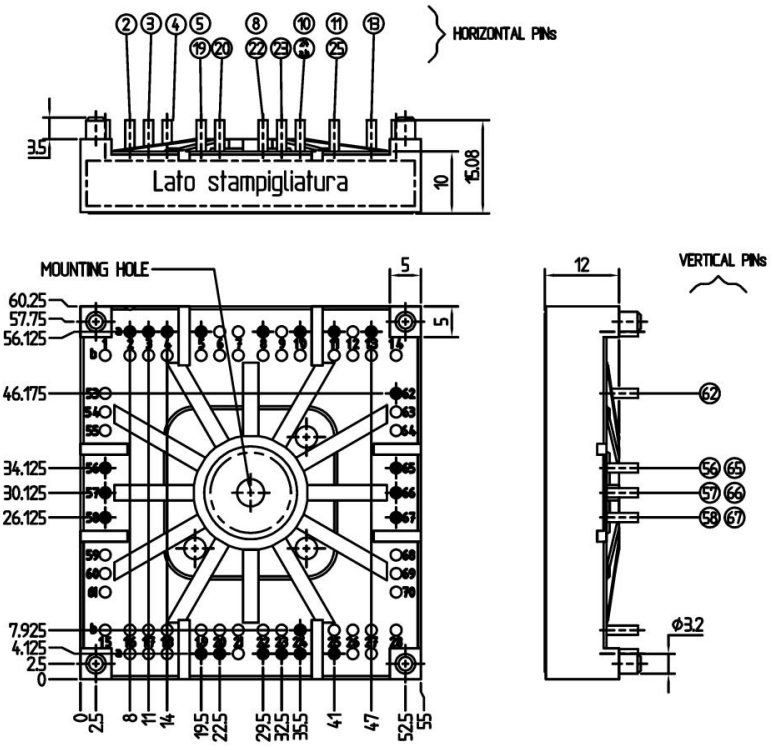
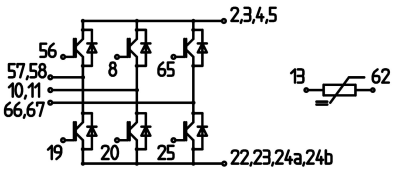


Fig. 10 CAL diode forward characteristic



Case T74 (Suggested hole diameter for the solder pins in the circuit board: 2mm. Suggested hole diameter for the mounting pins in the circuit board: 3,6mm)



Case T 74 GD-T

