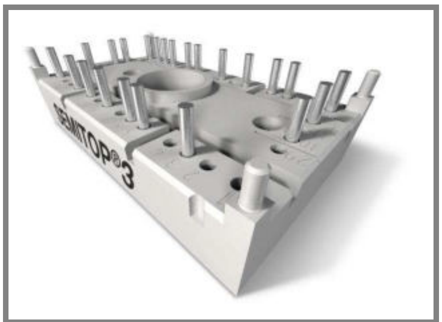


SEMITOP® 3

IGBT Module

SK50GB12T4T

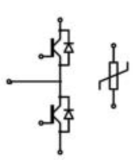
Features

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

Typical Applications*

Remarks

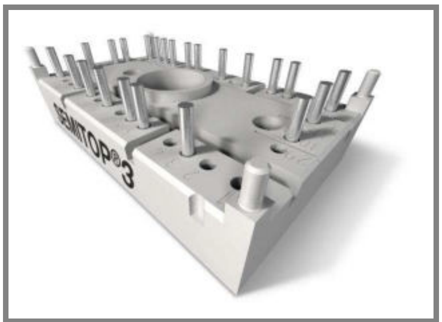
- $V_{CE,sat}$, V_F = chip level value



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; VCES < 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}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		2,77		nF
C_{oes}				0,2		nF
C_{res}				0,16		nF
Q_G	V_{GE}=-7V...+15V			375		nC
R_{Gint}	T_j = 25 °C			4		Ω
$t_{d(on)}$	R_{Gon} = 32 Ω di/dt = 920 A/µs	V_{CC} = 600V I_C= 50A T_j = 150 °C V_{GE}= ±15 V		63		ns
t_r				65		ns
E_{on}				8,3		mJ
$t_{d(off)}$	R_{Goff} = 32 Ω di/dt = 920 A/µs			521		ns
t_f				80		ns
E_{off}				5		mJ
$R_{th(j-s)}$	per IGBT			0,9		K/W



SEMITOP® 3

IGBT Module

SK50GB12T4T

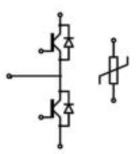
Features

- 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

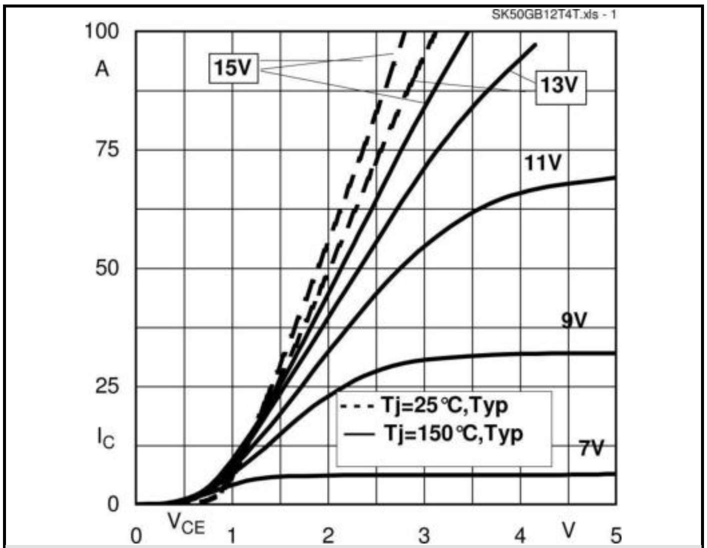


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+ EE'}$

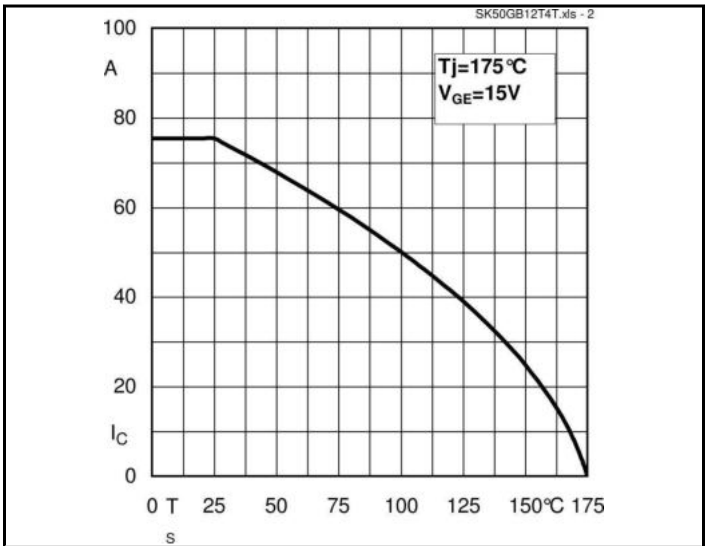


Fig. 2 Rated current vs. temperature $I_C = f (T_s)$

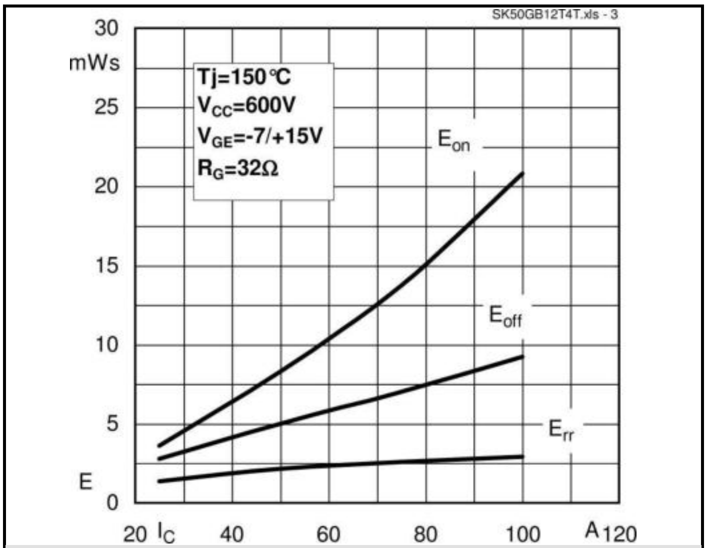


Fig. 3 Typ. turn-on /-off energy = f (I_C)

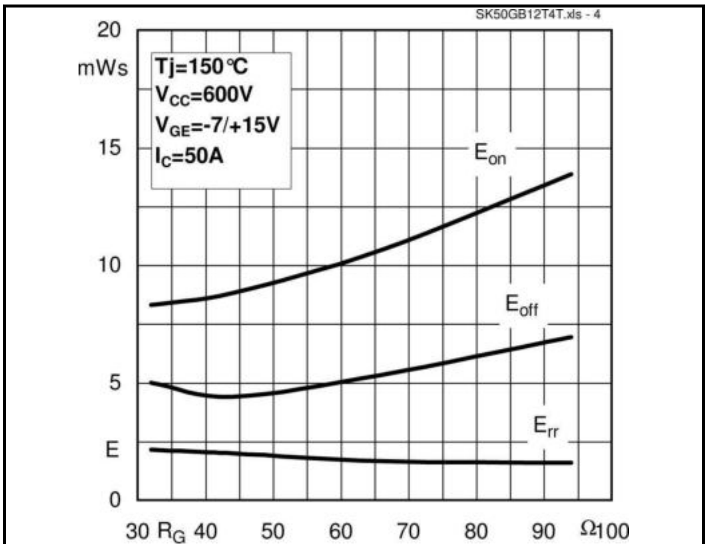


Fig. 4 Typ. turn-on /-off energy = f (R_G)

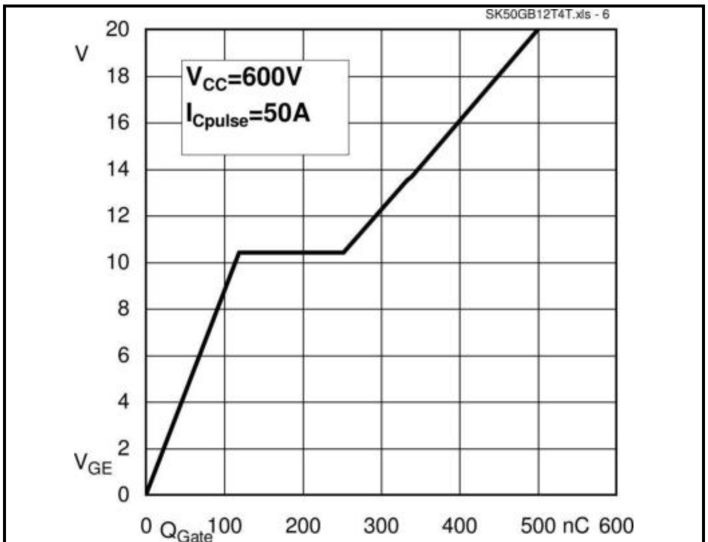


Fig. 6 Typ. gate charge characteristic

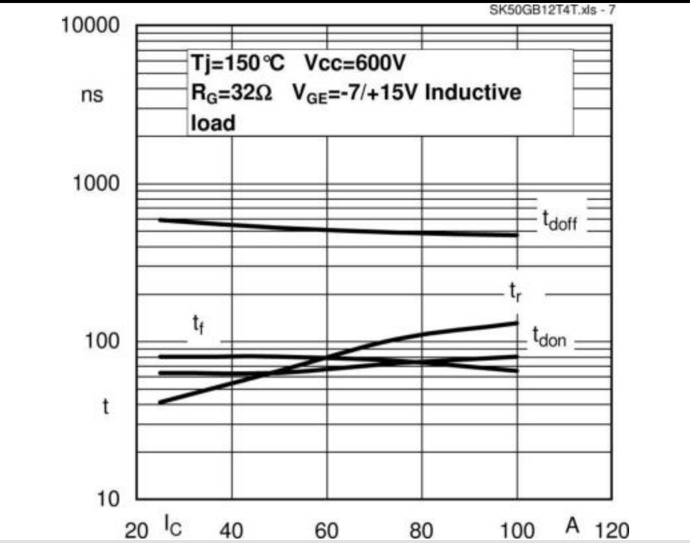


Fig. 7 Typ. switching times vs. I_C

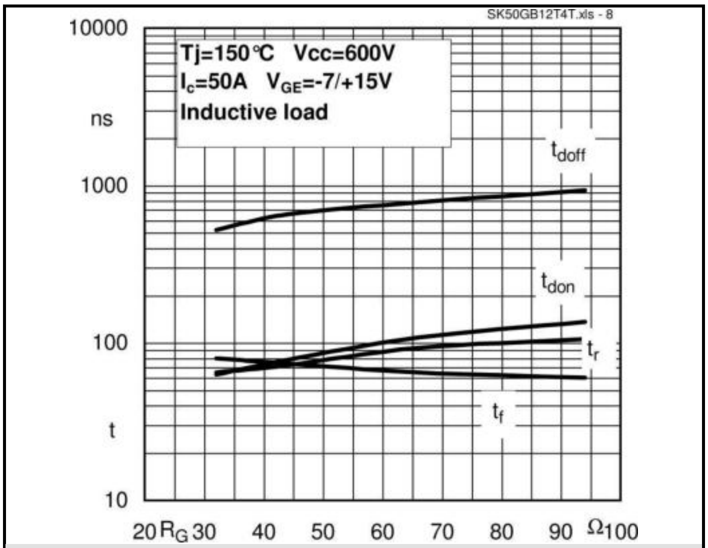


Fig. 8 Typ. switching times vs. gate resistor R_G

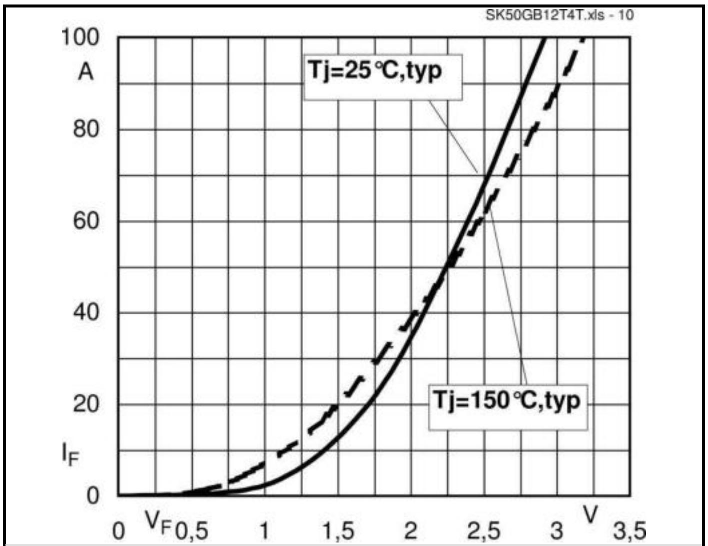
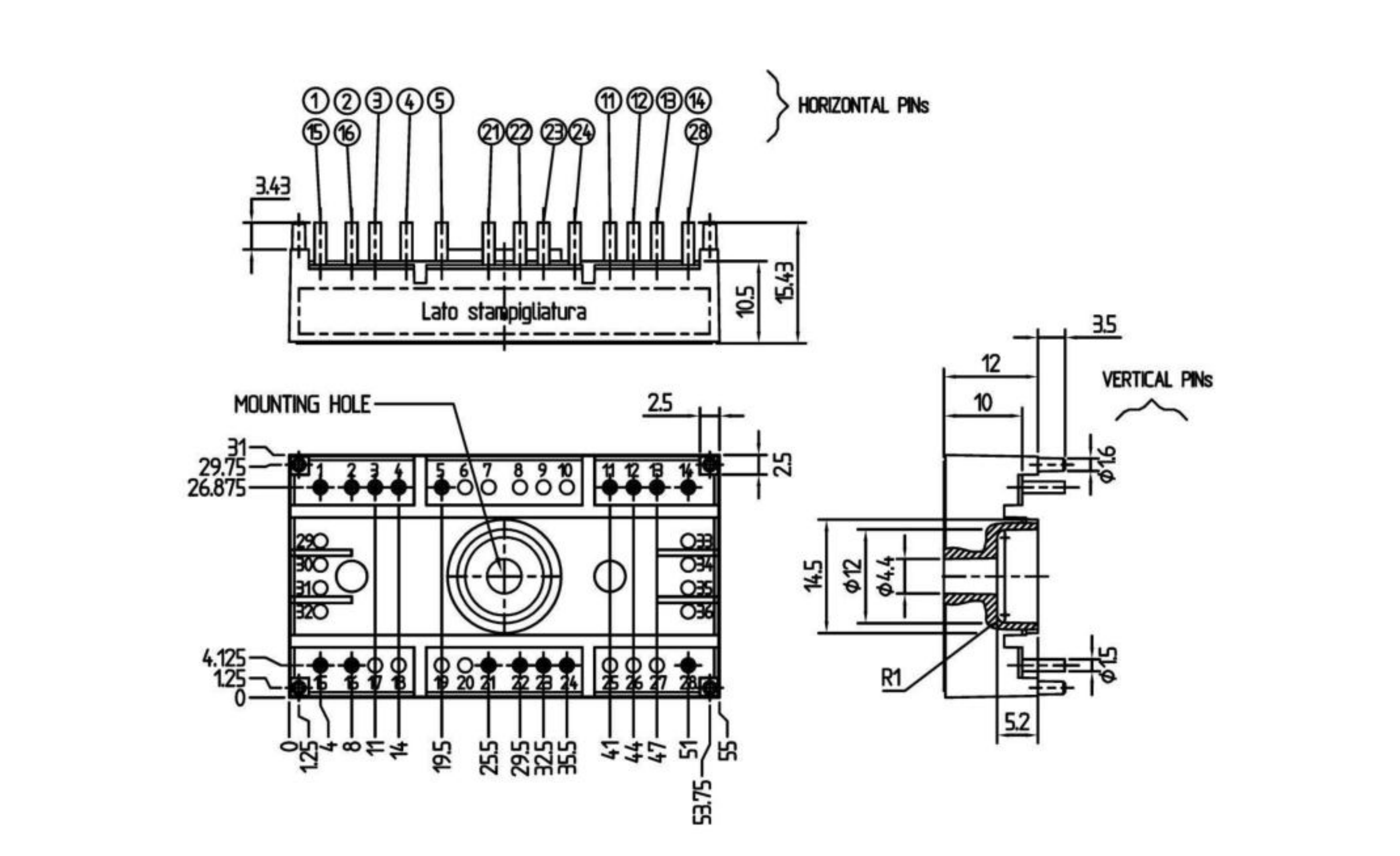
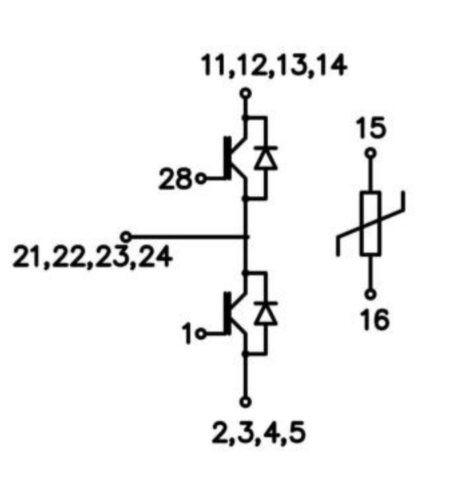


Fig. 10 CAL diode forward characteristic



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.

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