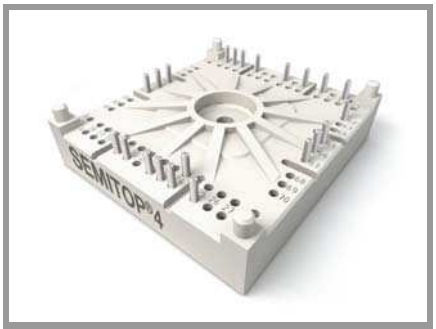
SK100GD07F3TD1



SEMITOP® 4

IGBT module

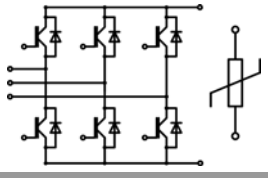
SK100GD07F3TD1

Features

- Compact design
- One screw mounting module
- Improved thermal performances by aluminium oxide substrate
- 650V Fast Trench3 IGBT technology
- Rapid switching 650V diode technology
- Integrated NTC temperature sensor
- UL recognized, file no. E63 532

Typical Applications*

- Switching (not for linear use)
- Inverter
- Switched mode power supplies
- UPS



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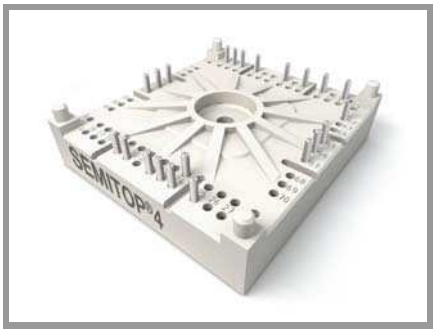
Absolute Maximum Ratings				
Symbol	**Conditions**		**Values**	**Unit**
IGBT 1				
V_{CES}	T_j = 25 °C		650	V
I_C	T_j = 150 °C	T_s = 25 °C	93	A
		T_s = 70 °C	69	A
I_C	T_j = 175 °C	T_s = 25 °C	104	A
		T_s = 70 °C	83	A
I_{Cnom}			100	A
I_{CRM}	I_{CRM} = 3 x I_{Cnom}		300	A
V_{GES}			-20 ... 20	V
t_{psc}	V_{CC} = 400 V $V_{GE} \leq$ 15 V $V_{CES} \leq$ 650 V	T_j = 150 °C	5	µs
T_j			-40 ... 175	°C

Absolute Maximum Ratings				
Symbol	**Conditions**		**Values**	**Unit**
Diode 1				
V_{RRM}	T_j = 25 °C		650	V
I_F	T_j = 150 °C	T_s = 25 °C	84	A
		T_s = 70 °C	62	A
I_F	T_j = 175 °C	T_s = 25 °C	95	A
		T_s = 70 °C	75	A
I_{Fnom}			80	A
I_{FRM}	I_{FRM} = 2 x I_{Fnom}		160	A
I_{FSM}	10 ms, sin 180°,			A
T_j			-40 ... 175	°C

Absolute Maximum Ratings			
Symbol	**Conditions**	**Values**	**Unit**
Module			
$I_{t(RMS)}$	,		A
T_{stg}		-40 ... 125	°C
V_{isol}	AC, sinusoidal, t = 1 min	2500	V

SK100GD07F3TD1



SEMITOP® 4

IGBT module

SK100GD07F3TD1

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- One screw mounting module
- Improved thermal performances by aluminium oxide substrate
- 650V Fast Trench3 IGBT technology
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Typical Applications*

- Switching (not for linear use)
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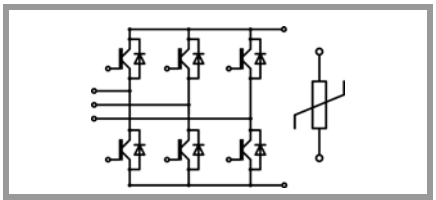

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Characteristics

Symbol	Conditions		min.	typ.	max.	Unit
IGBT 1						
$V_{CE(sat)}$	I_C = 100 A V_{GE} = 15 V chiplevel	T_j = 25 °C		1.85	2.22	V
		T_j = 150 °C		2.18	2.55	V
V_{CE0}	chiplevel	T_j = 25 °C		1.10	1.20	V
		T_j = 150 °C		1.00	1.10	V
r_{CE}	V_{GE} = 15 V chiplevel	T_j = 25 °C		7.5	10	mΩ
		T_j = 150 °C		12	15	mΩ
$V_{GE(th)}$	V_{GE} = V_{CE} V, I_C = 1.6 mA		4.2	5.1	5.6	V
I_{CES}	V_{GE} = 0 V V_{CE} = 650 V	T_j = 25 °C			1.5	mA
						mA
C_{ies}	V_{CE} = 25 V V_{GE} = 0 V	f = 1 MHz		6.2		nF
C_{oes}		f = 1 MHz		0.232		nF
C_{res}		f = 1 MHz		0.18		nF
Q_G	- 8 V...+ 15 V			367		nC
R_{Gint}	T_j = 25 °C			2.4		Ω
$t_{d(on)}$	V_{CC} = 300 V I_C = 100 A $R_{G\ on}$ = 6.2 Ω $R_{G\ off}$ = 6.2 Ω di/dt_{on} = 1050 A/µs di/dt_{off} = 2570 A/µs $V_{GE\ neg}$ = -7 V $V_{GE\ pos}$ = 15 V	T_j = 150 °C		137		ns
t_r		T_j = 150 °C		79		ns
E_{on}		T_j = 150 °C		3.92		mJ
$t_{d(off)}$		T_j = 150 °C		480		ns
t_f		T_j = 150 °C		32		ns
E_{off}		T_j = 150 °C		2.1		mJ
$R_{th(j-s)}$	per IGBT			0.54		K/W

Characteristics

Symbol	Conditions		min.	typ.	max.	Unit
Diode 1						
$V_F = V_{EC}$	I_F = 80 A	T_j = 25 °C		1.35	1.77	V
	chiplevel	T_j = 150 °C		1.30	1.72	V
V_{F0}	chiplevel	T_j = 25 °C		0.95	1.15	V
		T_j = 150 °C		0.75	0.95	V
r_F	chiplevel	T_j = 25 °C		5.0	7.8	mΩ
		T_j = 150 °C		6.9	9.6	mΩ
I_{RRM}	I_F = 100 A di/dt_{off} = 1050 A/µs V_{GE} = -7 V V_{CC} = 300 V	T_j = 150 °C		38.9		A
Q_{rr}		T_j = 150 °C		4.47		µC
E_{rr}		T_j = 150 °C		0.92		mJ
$R_{th(j-s)}$	per Diode			0.85		K/W

Characteristics

Symbol	Conditions	min.	typ.	max.	Unit
Module					
M_s	to heatsink	2.5		2.75	Nm
w	weight		60		g

Characteristics

Symbol	Conditions	min.	typ.	max.	Unit
Temperature Sensor					
R_{100}	T_r = 100 °C,		493 ± 5%		Ω
$B_{100/125}$	$R_2=R_1*\exp[B(1/T_1-1/T_2)]$, T(K), ,		3550 ±2%		K

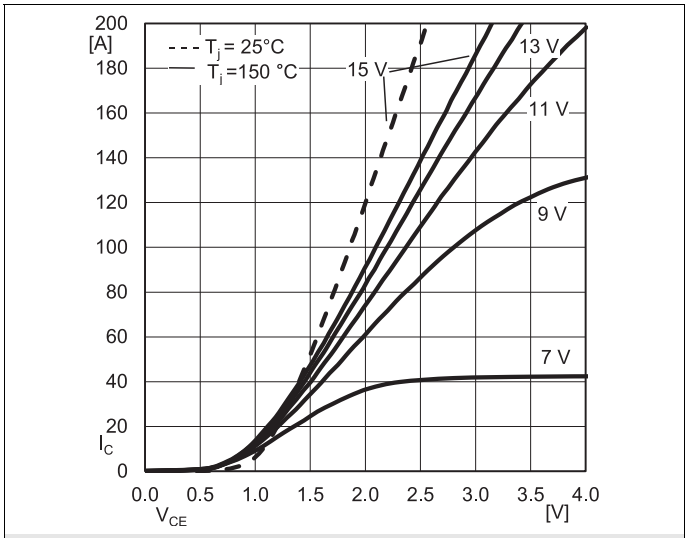


Fig. 1: Typ. output characteristic, inclusive $R_{CC'+EE'}$

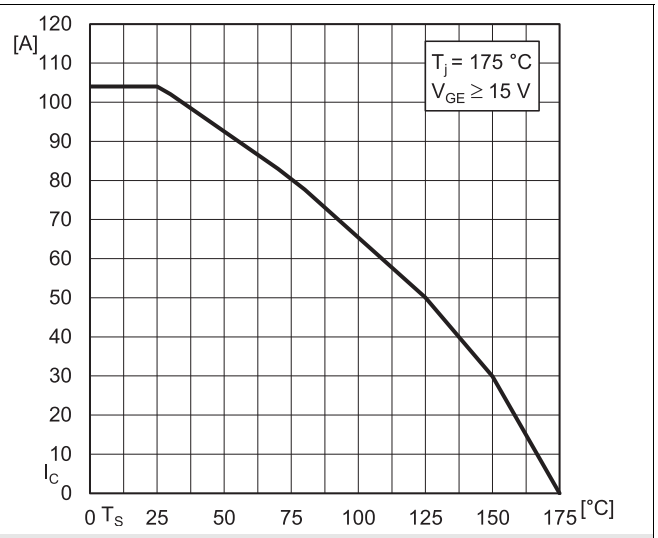


Fig. 2: Rated current vs. temperature IC = f (T_S)

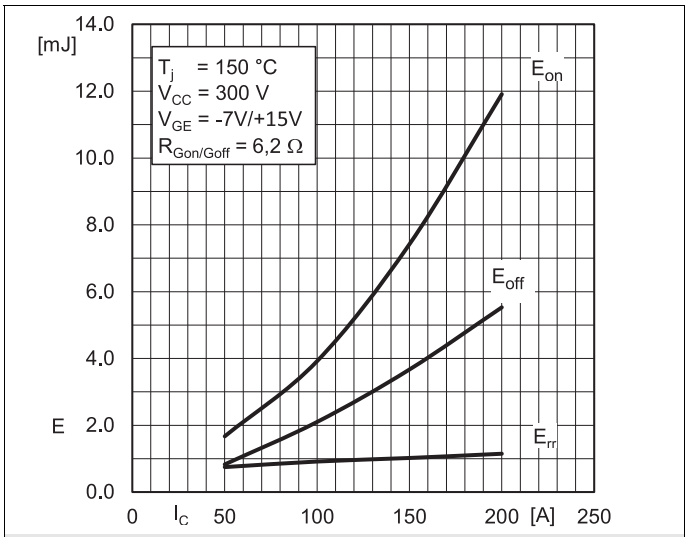


Fig. 3: Typ. turn-on /-off energy = f (I_C)

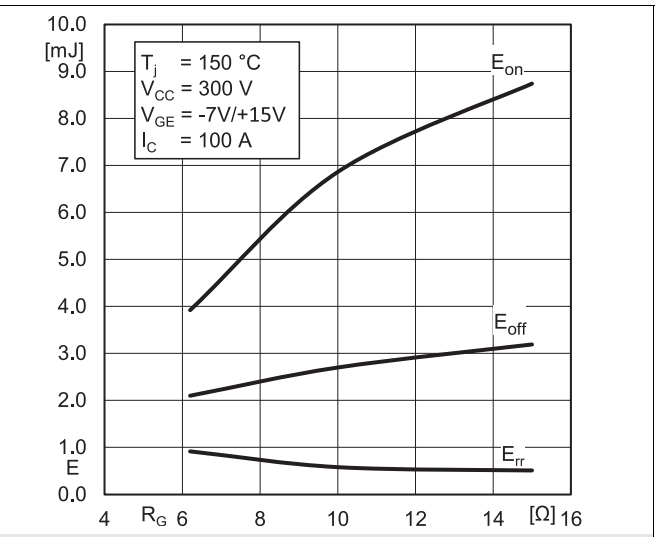


Fig. 4: Typ. turn-on /-off energy = f (R_G)

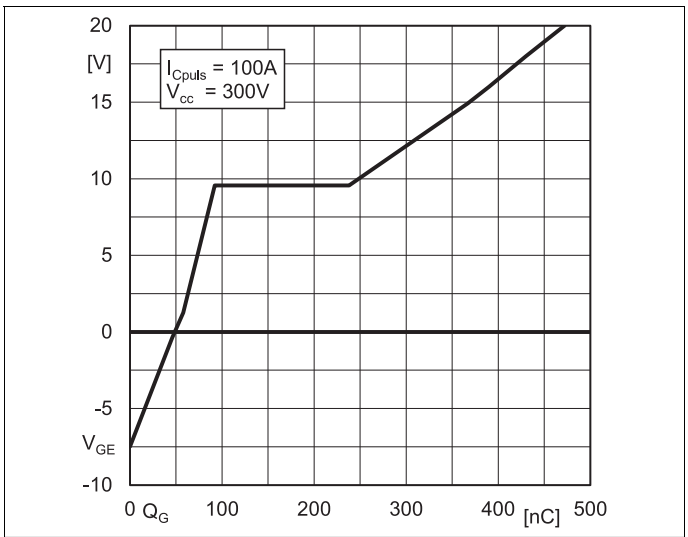


Fig. 6: Typ. gate charge characteristic

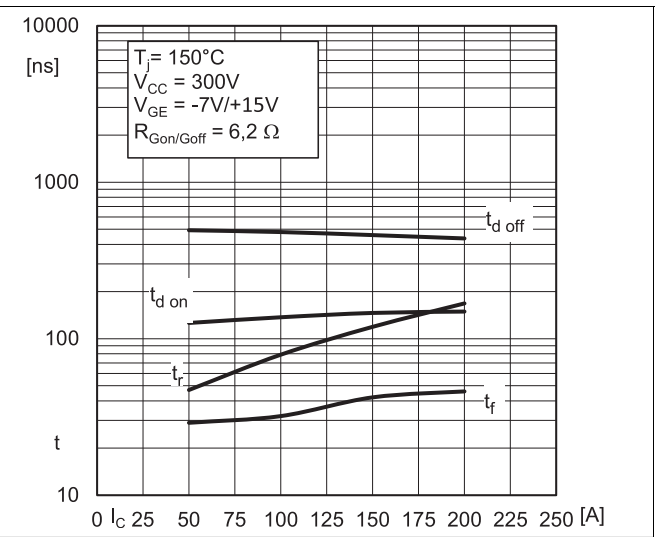


Fig. 7: Typ. switching times vs. I_C

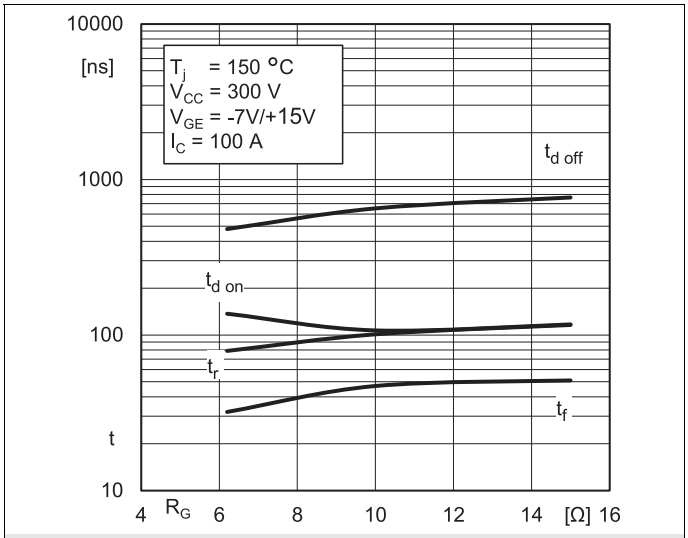


Fig. 8: Typ. switching times vs. gate resistor R_G

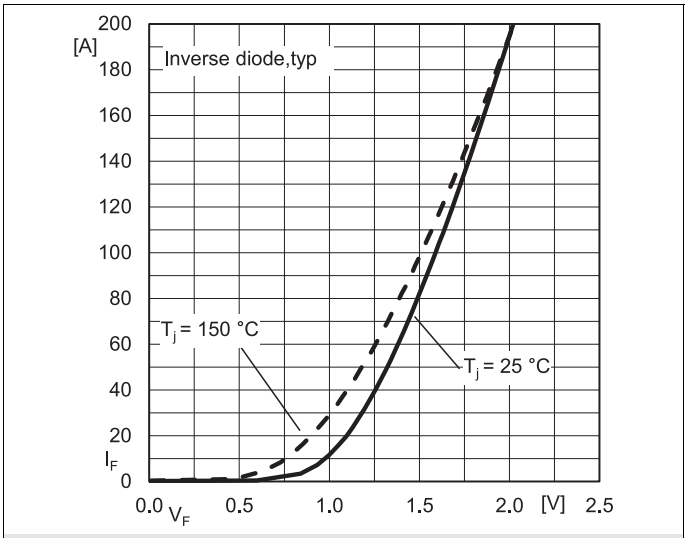


Fig. 10: Typ. CAL diode forward charact., incl. $R_{CC'+EE'}$

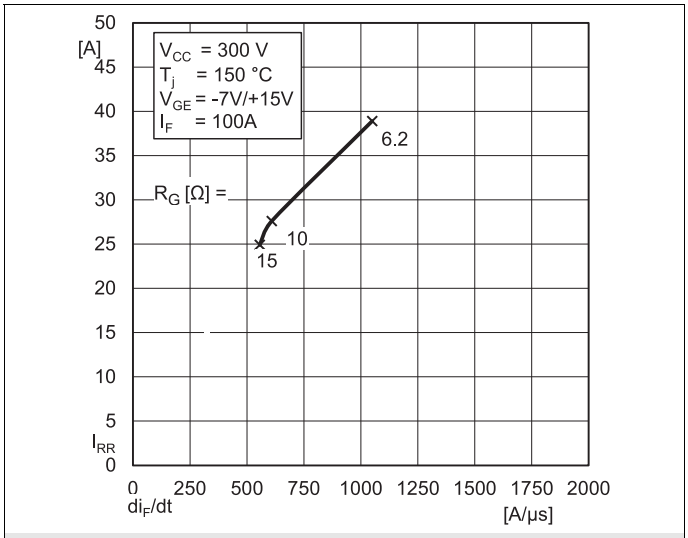


Fig. 11: Typ. CAL diode peak reverse recovery current

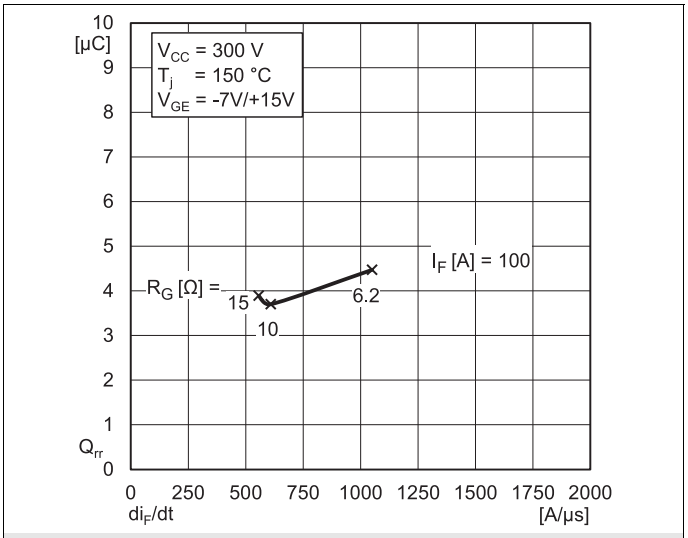
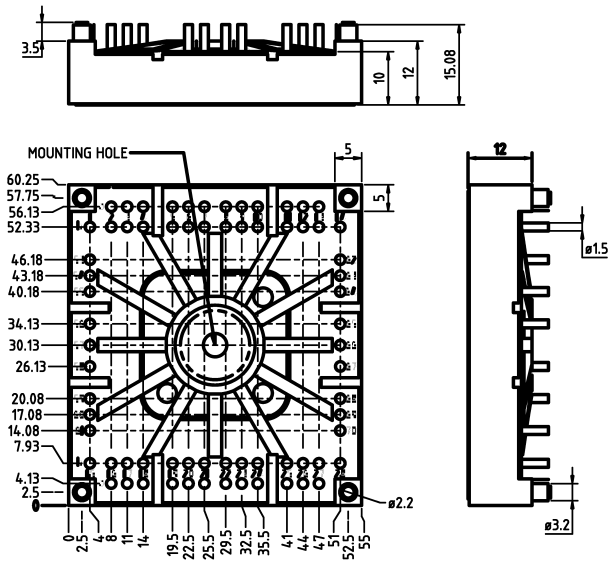


Fig. 12: Typ. CAL diode recovery charge

dimensions in mm
tolerance system: ISO 2768-m



Suggested hole diameter for solder pins in the circuit board: 2mm
Suggested hole diameter for the mounting pins in the circuit board: 3,6mm

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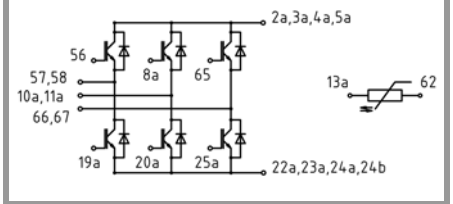

GD-T

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 staff.