

SKM 300GB12T4



SEMITRANS® 3

IGBT4 Modules

SKM 300GB12T4

Target Data

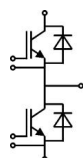
Features

- IGBT4 = 4. Generation (Trench) IGBT
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_{CNOM}$
- Soft switching 4. Generation CAL diode (CAL4)

Typical Applications

Remarks

- Case temperature limited to $T_c = 125^\circ\text{C}$ max, recomm. $T_{op} = -40 \dots +150^\circ\text{C}$, product rel. results valid for $T_j \leq 150^\circ$

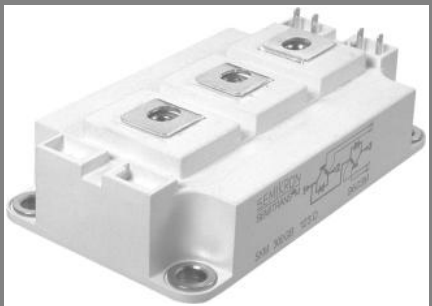


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Absolute Maximum Ratings			$T_c = 25\text{ }^{\circ}\text{C}$, unless otherwise specified	
Symbol	Conditions		Values	Units
IGBT				
V_{CES}	$T_j = 25\text{ }^{\circ}\text{C}$		1200	V
I_C	$T_j = 175\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	420	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	325	A
I_{CRM}	$I_{CRM} = 3 \times I_{CNOM}$		900	A
V_{GES}			± 20	V
t_{psc}	$V_{CC} = 600\text{ V}; V_{GE} \leq 15\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$ $V_{CES} < 1200\text{ V}$		10	μs
Inverse Diode				
I_F	$T_j = 175\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	350	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	260	A
I_{FRM}	$I_{FRM} = 3 \times I_{FNOM}$		900	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 175\text{ }^{\circ}\text{C}$	1720	A
Module				
$I_{t(RMS)}$			500	A
T_{vj}			-40 ... +175	$^{\circ}\text{C}$
T_{stg}			-40 ... +125	$^{\circ}\text{C}$
V_{isol}	AC, 1 min.		4000	V

Characteristics			T _c = 25 °C, unless otherwise specified			
Symbol	Conditions		min.	typ.	max.	Units
IGBT						
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 12 mA		5	5,8	6,5	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES} T _j = 25 °C					mA
V _{CE0}	T _j = 25 °C			0,8	0,9	V
	T _j = 150 °C			0,7	0,8	V
r _{CE}	V _{GE} = 15 V T _j = 25°C			3,5	3,8	mΩ
	T _j = 150°C			5,2	5,5	mΩ
V _{CE(sat)}	I _{Cnom} = 300 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} = , V _{GE} = V f = MHz		18,6			nF
C _{oes}			1,2			nF
C _{res}			1			nF
Q _G	V _{GE} = -8V / +15V		1700			nC
R _{Gint}	T _j = 25 °C		2,5			Ω
t _{d(on)}	R _{Gon} = Ω	V _{CC} = 600V I _{Cnom} = 300A T _j = 150 °C V _{GE} = -±15V	33			ns
t _r						ns
E _{on}	33			mJ		
t _{d(off)}				ns		
t _f	33			ns		
E _{off}				mJ		
R _{th(j-c)}	per IGBT		0,11			K/W

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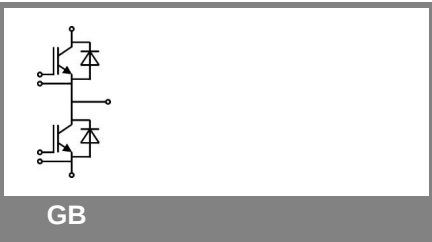
Remarks

- Case temperature limited to $T_c = 125^\circ\text{C}$ max, recomm. $T_{op} = -40 \dots +150^\circ\text{C}$, product rel. results valid for $T_j \leq 150^\circ$

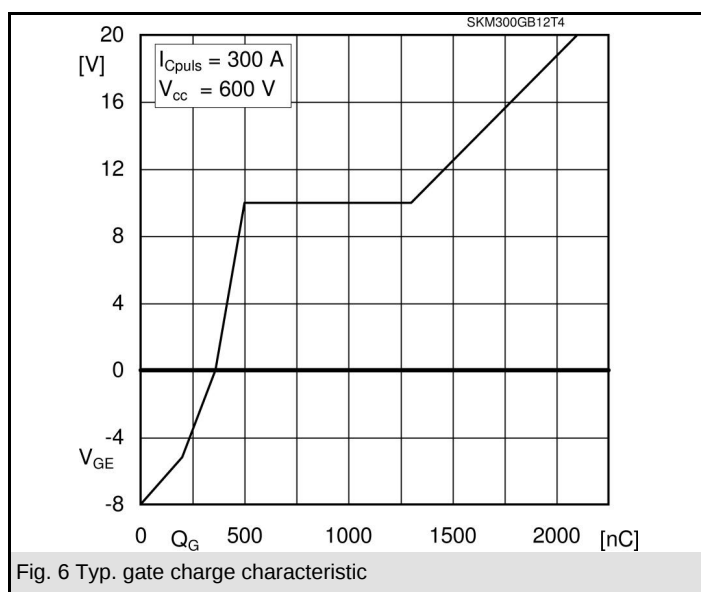
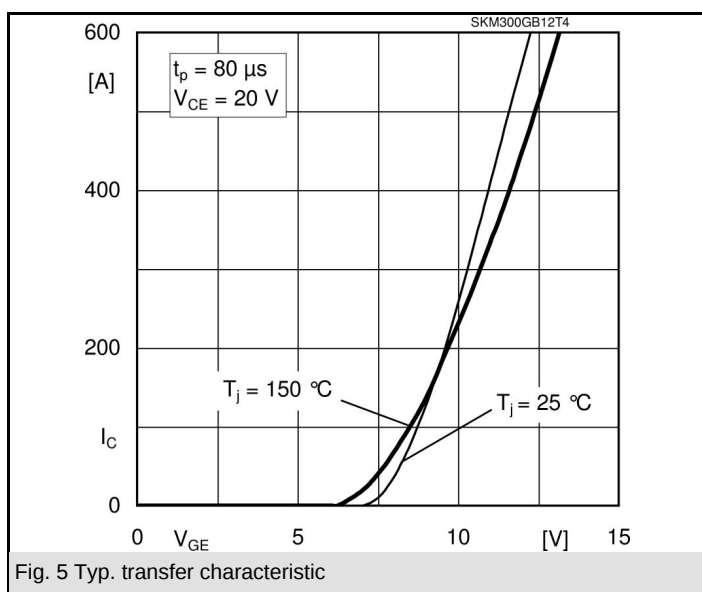
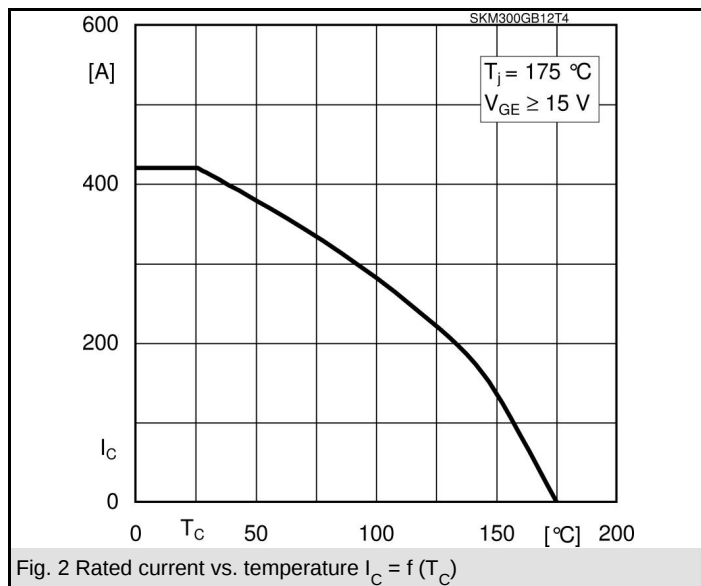
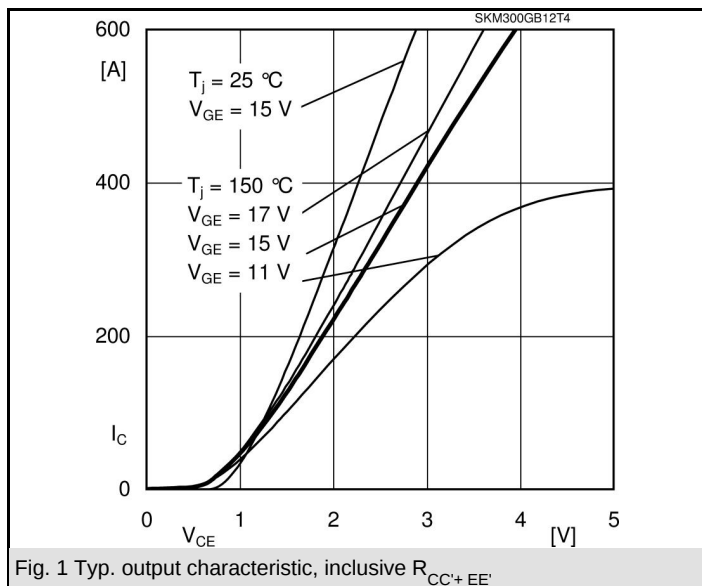
Characteristics						
Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
V _F = V _{EC}	I _{Fnom} = 300 A; V _{GE} = 0 V	T _j = 25 °C _{chiplev.}		2,2	2,5	V
		T _j = 150 °C _{chiplev.}		2,1	2,45	V
V _{F0}		T _j = 25 °C		1,3	1,5	V
		T _j = 150 °C		0,9	1,1	V
r _F		T _j = 25 °C		3	3,33	mΩ
		T _j = 150 °C		4	4,5	mΩ
I _{RRM}	I _{Fnom} = 300 A	T _j = 150 °C		22,5		A
Q _{rr}						μC
E _{rr}						mJ
R _{th(j)-c})	per diode				0,17	K/W
Freewheeling Diode						
V _F = V _{EC}	I _{Fnom} = A; V _{GE} = V	T _j = °C _{chiplev.}				V
V _{F0}		T _j = °C				V
r _F		T _j = °C				V
I _{RRM}	I _{Fnom} = A	T _j = °C				A
Q _{rr}						μC
E _{rr}						mJ
	per diode					K/W
Module						
L _{CE}				15	20	nH
R _{CC'+EE'}	res., terminal-chip	T _{case} = 25 °C			0,35	mΩ
		T _{case} = 125 °C			0,5	mΩ
R _{th(c-s)}	per module			0,02	0,038	K/W
M _s	to heat sink M6			3	5	Nm
M _t	to terminals M6			2,5	5	Nm
w					325	g

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

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.



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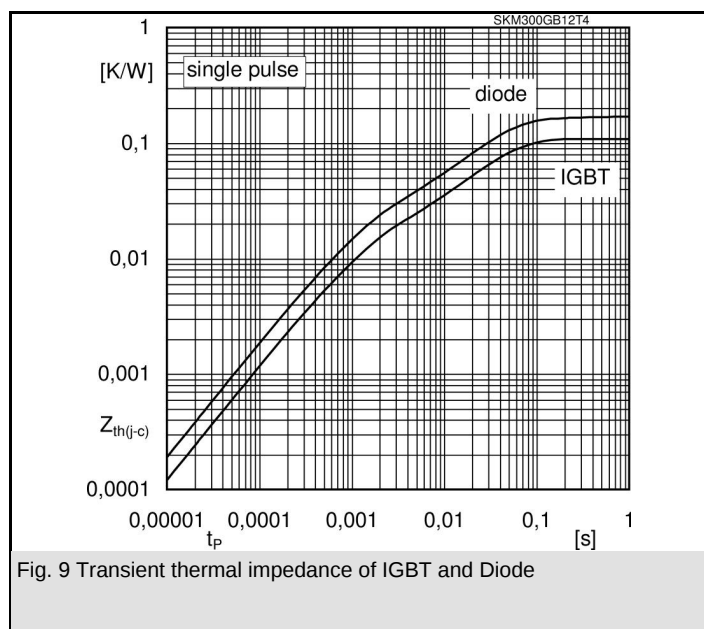


Fig. 9 Transient thermal impedance of IGBT and Diode

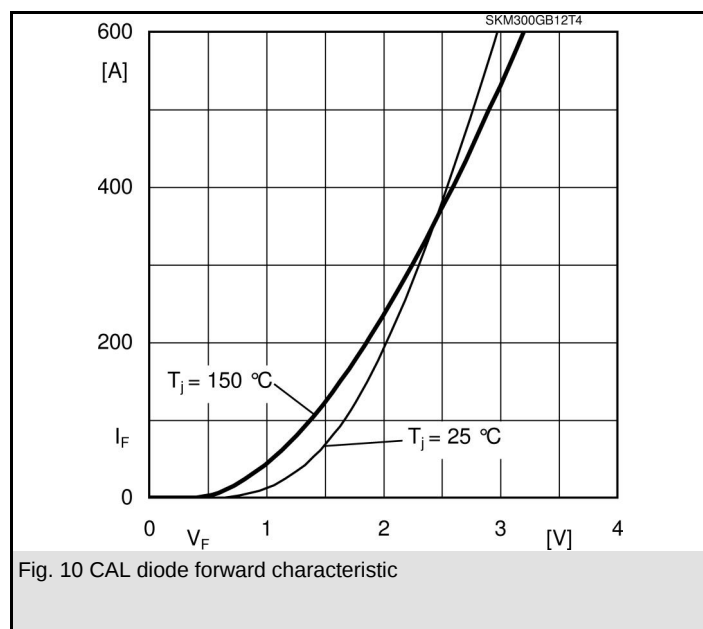


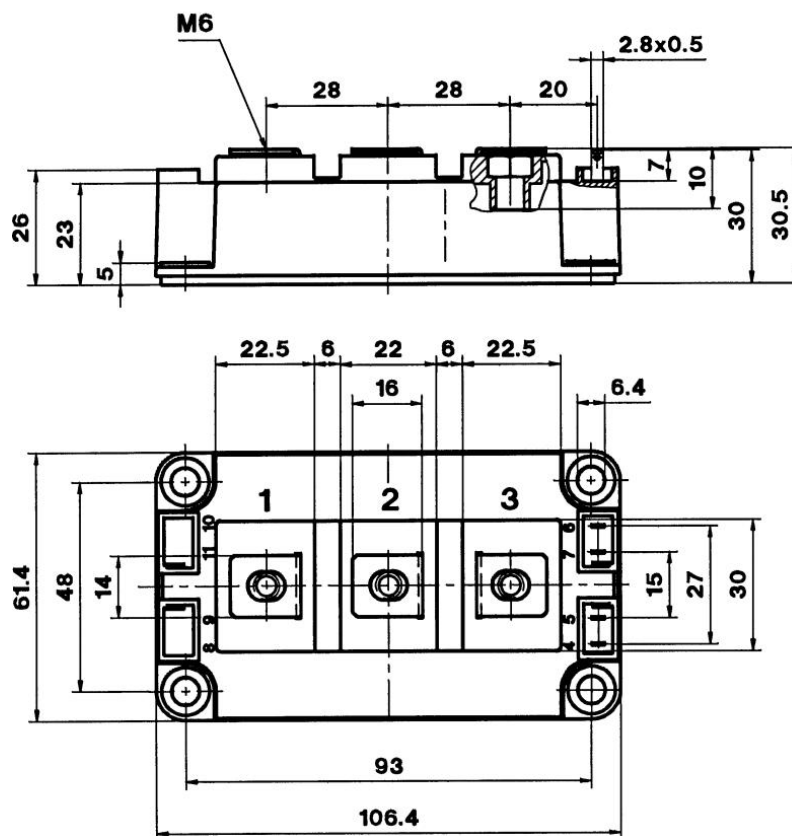
Fig. 10 CAL diode forward characteristic

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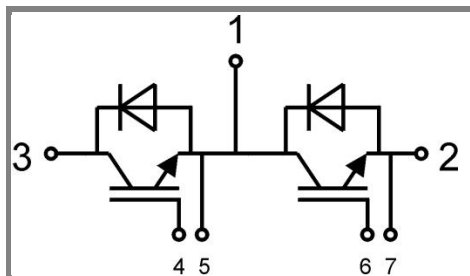
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CASED56

no. E 63 532



Case D56



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Case D56