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SEMITRANS® 2

IGBT4 Modules

SKM 100GB12T4

Target Data

Features

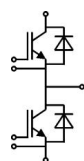
- IGBT4 = 4. Generation (Trench) IGBT
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_{CNOM}$
- Soft switching 4. generation CAL diode (CAL4)

Typical Applications

- AC inverter drives
- UPS
- Electronic welders at f_{sw} up to 20 kHz

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 $T_j \leq 150^\circ$



GB

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	$T_j = 175\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	160	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	125	A
I_{CRM}	$I_{CRM} = 3 \times I_{CNOM}$		300	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	$T_j = 175\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	120	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	90	A
I_{FRM}	$I_{FRM} = 3 \times I_{FNOM}$		300	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 175\text{ }^{\circ}\text{C}$	550	A
Module				
$I_{t(RMS)}$			200	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 = 4 mA		5	5,8	6,5	V
I _{CES}	V _{GE} = V, V _{CE} = V _{CES} T _j = °C					mA
V _{CE0}	T _j = 25 °C		0,8			V
	T _j = 150 °C		0,7			V
r _{CE}	V _{GE} = 15 V T _j = 25°C		10			mΩ
	T _j = 150°C		15			mΩ
V _{CE(sat)}	I _{Cnom} = 100 A, V _{GE} = 15 V T _j = 25°C _{chiplev.}		1,8			V
	T _j = 150°C _{chiplev.}		2,2			V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz		6,2			nF
C _{oes}			0,41			nF
C _{res}			0,35			nF
Q _G	V _{GE} = -8V/+15V		570			nC
R _{Gint}	T _j = 25 °C		7,5			Ω
t _{d(on)}	R _{Gon} =	V _{CC} = 600V I _{Cnom} = 100A T _j = 150 °C	11			ns
t _r						ns
E _{on}	11			mJ		
t _{d(off)}				ns		
t _f				ns		
E _{off}				mJ		
R _{th(j-c)}	per IGBT		0,27			K/W

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Characteristics						
Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
V _F = V _{EC}	I _{Fnom} = 100 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		9	11	mΩ
		T _j = 150 °C		12	13,5	mΩ
I _{RRM} Q _{rr} E _{rr}	I _{Fnom} = 100 A V _{GE} ≤-8V	T _j = 150 °C				A μC mJ
R _{th(j-c)}	per diode				0,48	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} Q _{rr} E _{rr}	I _{Fnom} = A	T _j = °C				A μC mJ
	per diode					K/W
Module						
L _{CE}				20	30	nH
R _{CC'+EE'}	res., terminal-chip	T _{case} = 25 °C			0,75	mΩ
		T _{case} = 125 °C			1	mΩ
R _{th(c-s)}	per module				0,05	K/W
M _s	to heat sink M6		3		5	Nm
M _t	to terminals M5		2,5		5	Nm
w					160	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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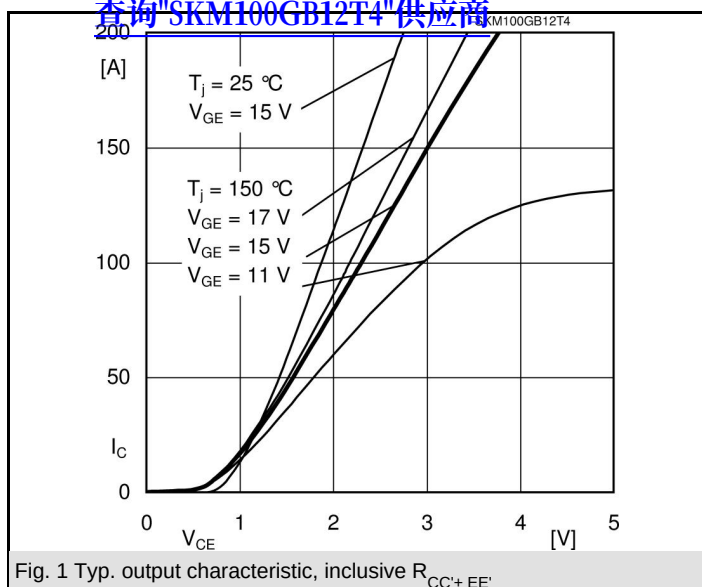


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

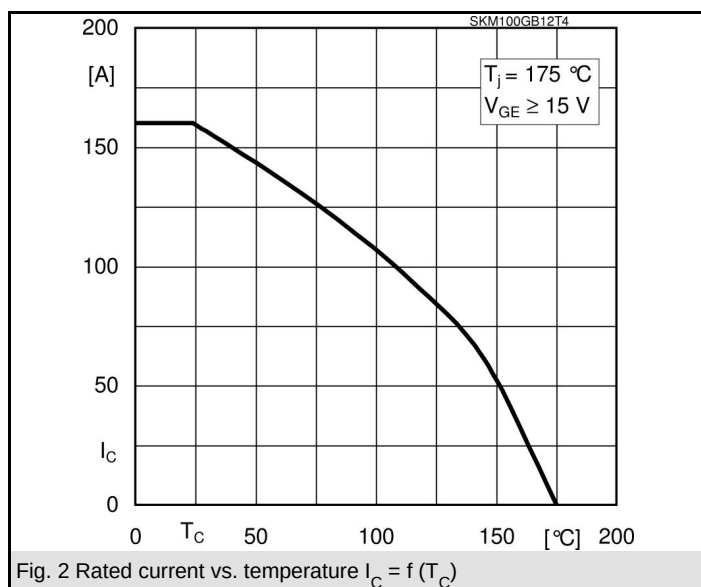


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

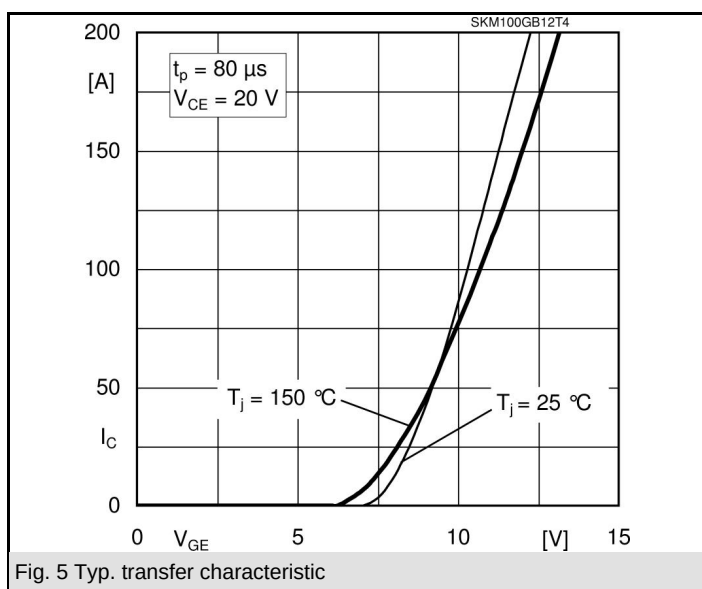


Fig. 5 Typ. transfer characteristic

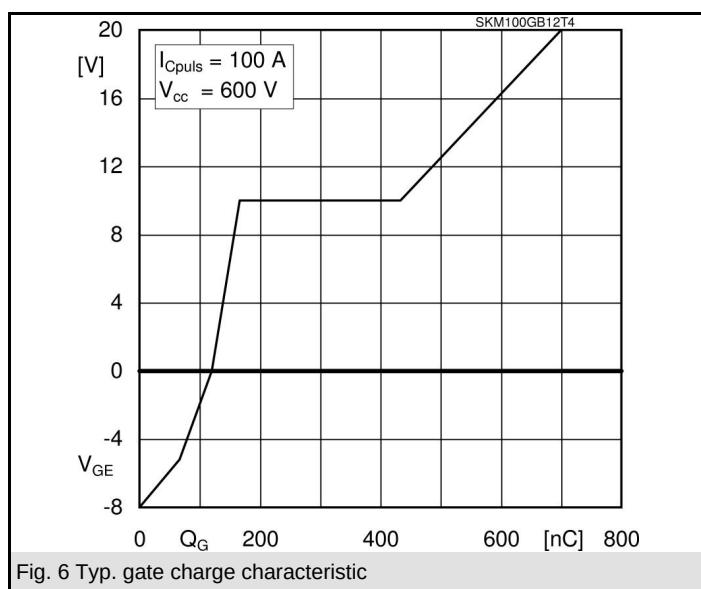
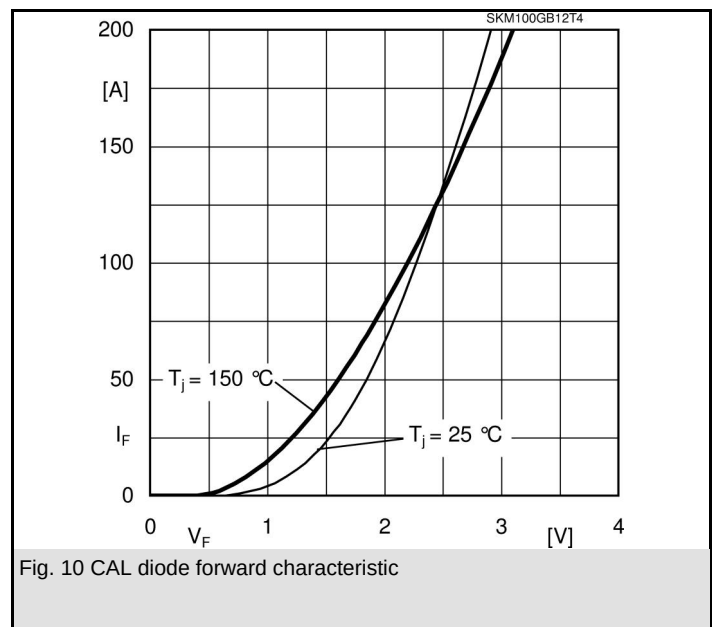
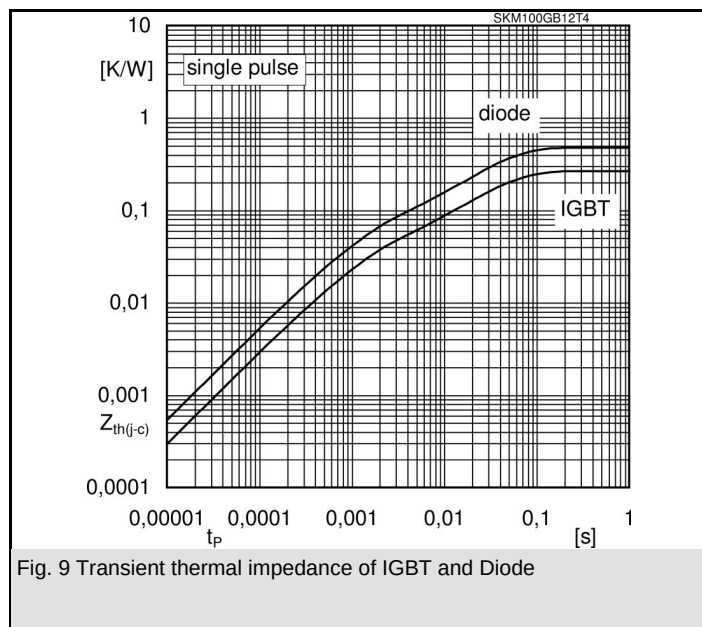


Fig. 6 Typ. gate charge characteristic



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UL recognized file

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