SKM 100GB12T4G

SEMITRANS® 3

IGBT4 Modules

SKM 100GB12T4G

Target Data

Features

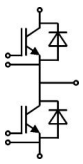
- IGBT4 = 4. Generation (Trench) IGBT
- V_{CEsat} with positive temperature coefficient
- High short circuit capaility, self limiting to 6 x I_{CNOM}
- Soft switching 4. Generation CAL diode (CAL4)

Typical Applications

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

Remarks

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



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Absolute Maximum Ratings T_c = 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_{case} = 25 °C	150	A
		T_{case} = 80 °C	115	A
I_{CRM}	I_{CRM} = 3 x I_{CNOM}		300	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 600 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_{case} = 25 °C	120	A
		T_{case} = 80 °C	90	A
I_{FRM}	I_{FRM} = 3 x I_{FNOM}		300	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 175 °C	860	A
Module				
$I_{t(RMS)}$			500	A
T_{vj}			-40 ... +175	°C
T_{stg}			-40 ... +125	°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} = 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		10,5	11,5	mΩ
		T_j = 150°C		15,5	16,5	mΩ
$V_{CE(sat)}$	I_{Cnom} = 100 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		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			2		Ω
$t_{d(on)}$	R_{Gon} = Ω	V_{CC} = 600V				ns
t_r						ns
E_{on}		I_{Cnom}= 100A		11		mJ
$t_{d(off)}$	R_{Goff} = Ω	T_j = 150 °C				ns
t_f		$V_{GE} \leq$ -8V				ns
E_{off}				11		mJ
$R_{th(j-c)}$	per IGBT				0,29	K/W

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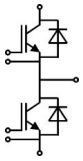

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Characteristics

Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 100 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		2,25	2,55	V
		T_j = 150 °$C_{chiplev.}$		2,2	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		9,5	10,5	mΩ
		T_j = 150 °C		13	14	mΩ
I_{RRM}	I_{Fnom} = 100 A	T_j = 150 °C				A
Q_{rr}						µC
E_{rr}	$V_{GE} \leq$ -8V			7,5		mJ
$R_{th(j-c)}$	per diode				0,49	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.

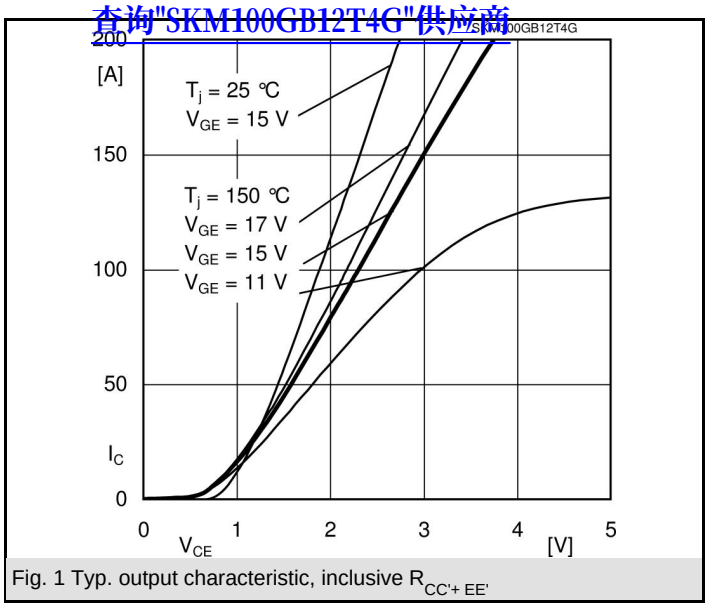

Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

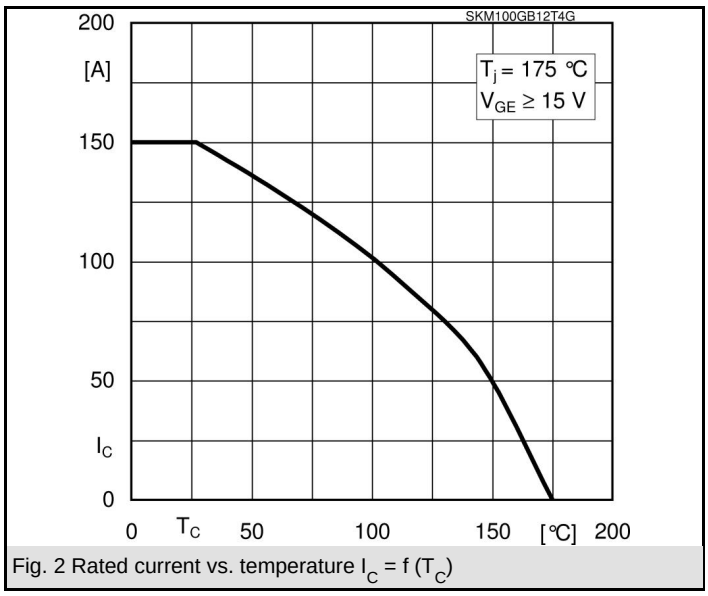

Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

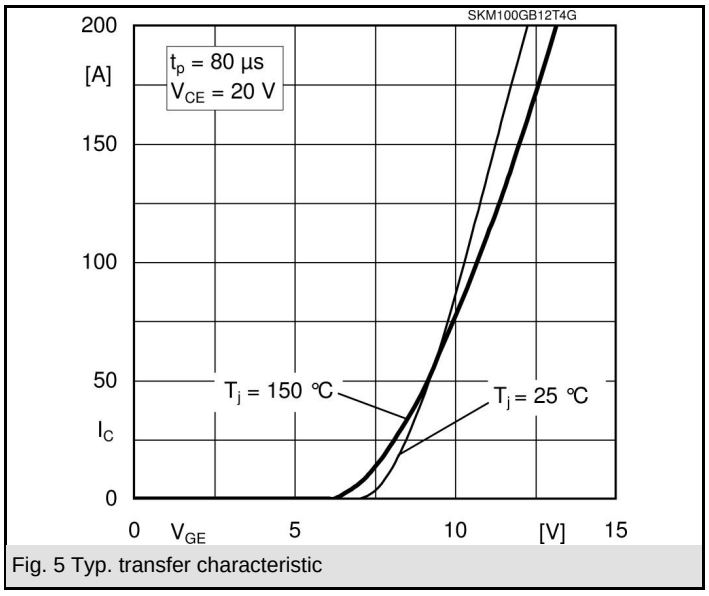

Fig. 5 Typ. transfer characteristic

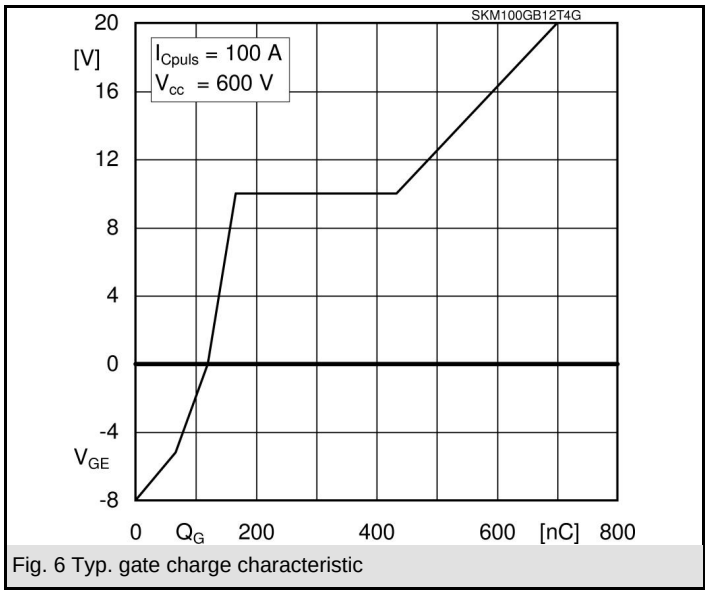

Fig. 6 Typ. gate charge characteristic

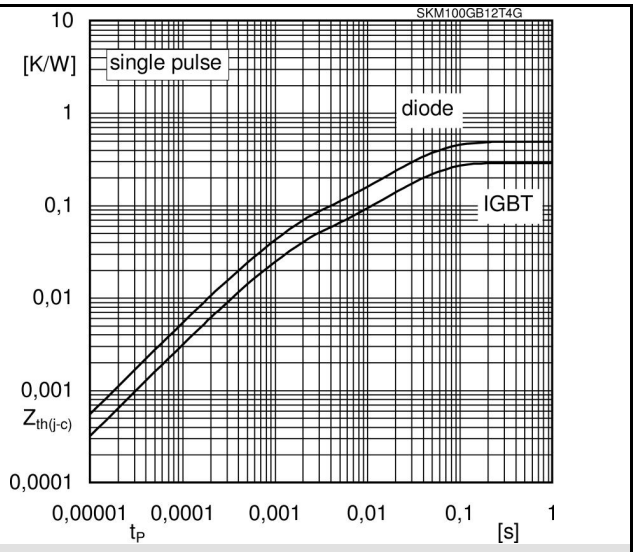

Fig. 9 Transient thermal impedance of IGBT and Diode

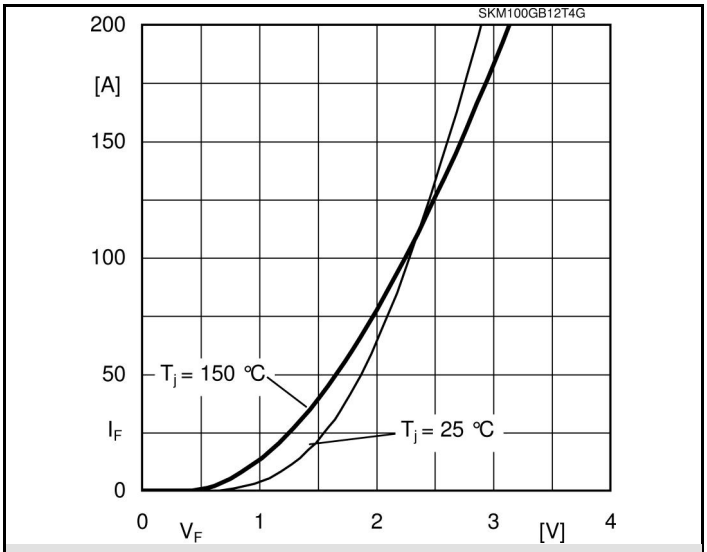

Fig. 10 CAL diode forward characteristic

