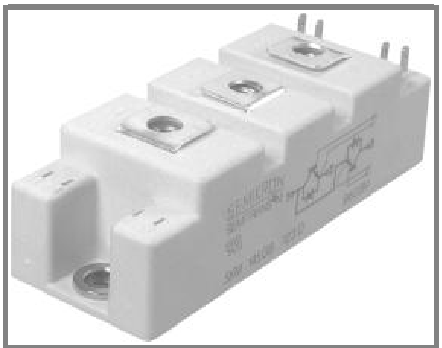
SKM 100GB12T4



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 x I_{CNOM}
- Soft switching 4. generation CAL diode (CAL4)

Typical Applications

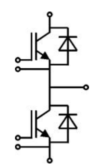
- AC inverter drives
- UPS
- Electronic welders at f_{sw} up to 20 kHz

Remarks

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

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	160	A
		T_{case} = 80 °C	125	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; VCES < 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	550	A
Module				
$I_{t(RMS)}$			200	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} = V, $V_{CE} = V_{CES}$	T_j = °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	11	mΩ
		T_j = 150°C		15	16	mΩ
$V_{CE(sat)}$	I_{Cnom} = 100 A, V_{GE} = 15 V	T_j = 25°C$_{chiplev.}$		1,8	2	V
		T_j = 150°C$_{chiplev.}$		2,2	2,4	V
C_{ies}				6,2		nF
C_{oes}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		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
$t_{d(on)}$						ns
t_r	R_{Gon} =	V_{CC} = 600V				ns
E_{on}		I_{Cnom}= 100A		11		mJ
$t_{d(off)}$	R_{Goff} =	T_j = 150 °C				ns
t_f						ns
E_{off}				11		mJ
$R_{th(j-c)}$	per IGBT				0,27	K/W



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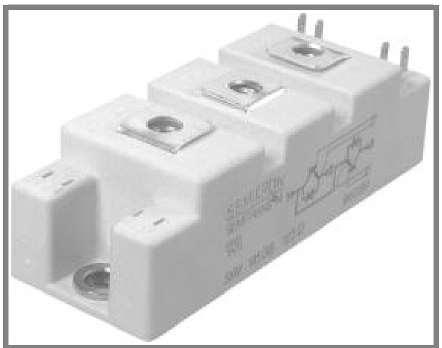

SEMITRANS® 2

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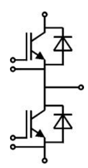

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Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 100 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		2,2	2,5	V
		T_j = 150 °$C_{chiplev.}$		2,1	2,45	V
V_{F0}		T_j = 25 °C		1,3	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}	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				0,48	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}	I_{Fnom} = A	T_j = °C				A
Q_{rr}						µC
E_{rr}						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.

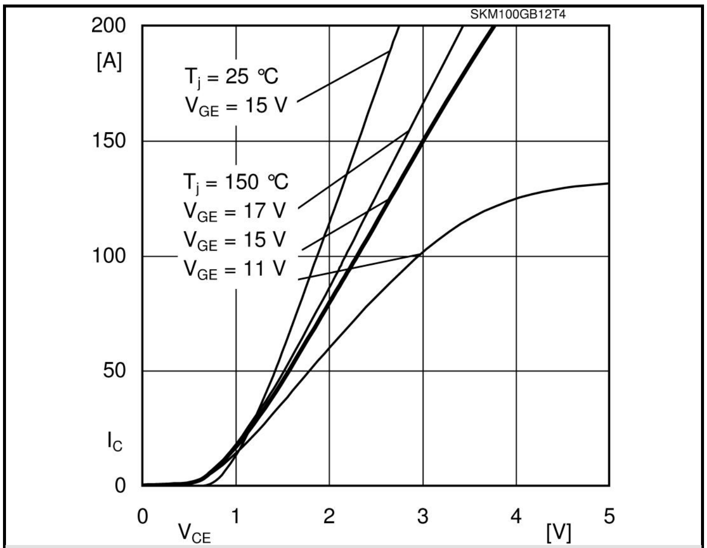

Fig. 1 Typ. output characteristic, inclusive $R_{CC'+ EE'}$

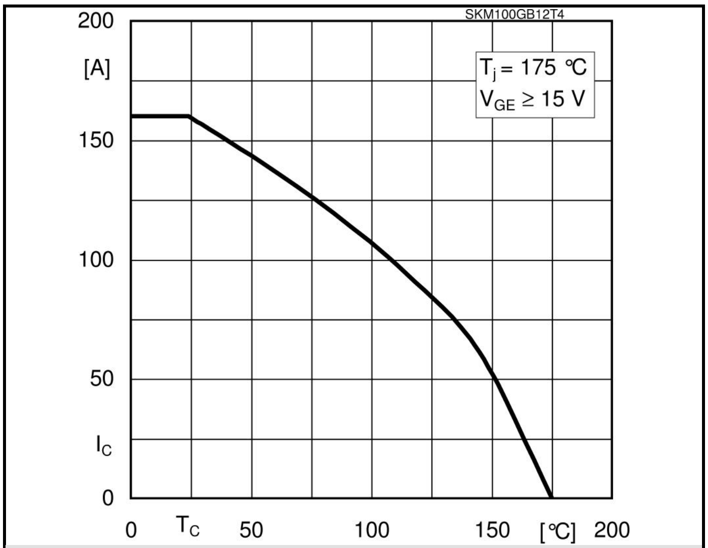

Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

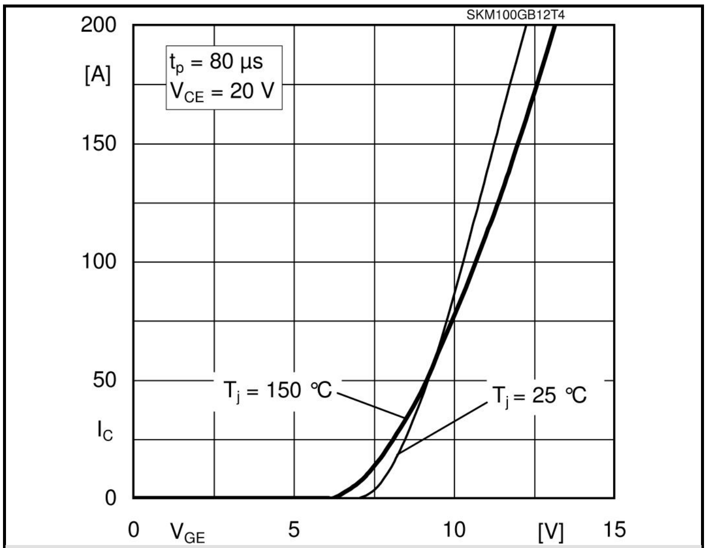

Fig. 5 Typ. transfer characteristic

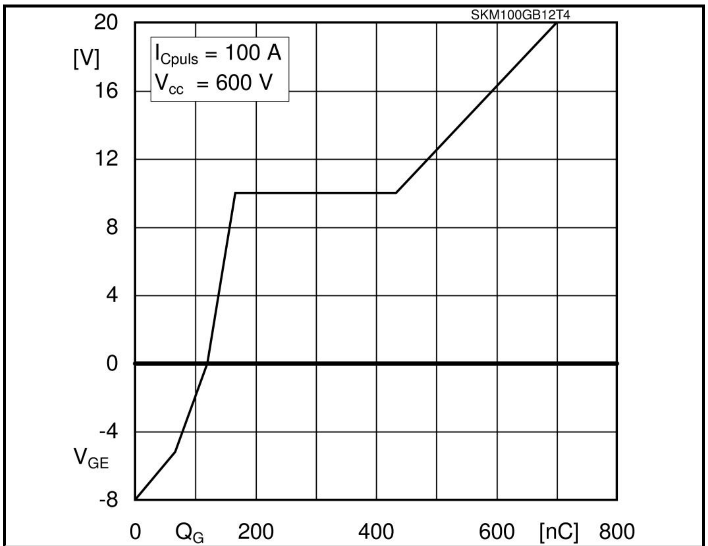

Fig. 6 Typ. gate charge characteristic

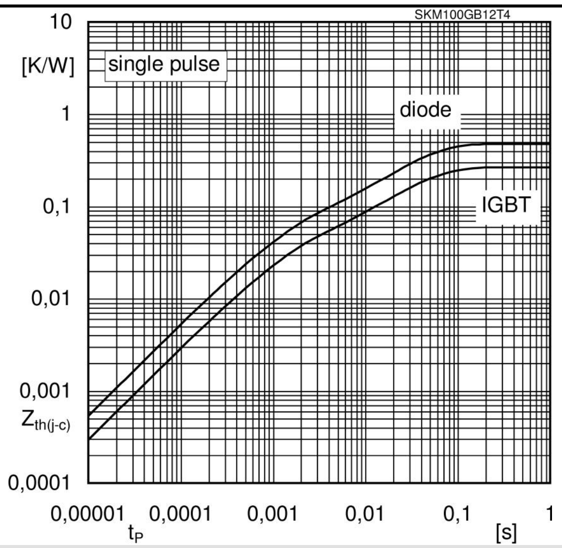

Fig. 9 Transient thermal impedance of IGBT and Diode

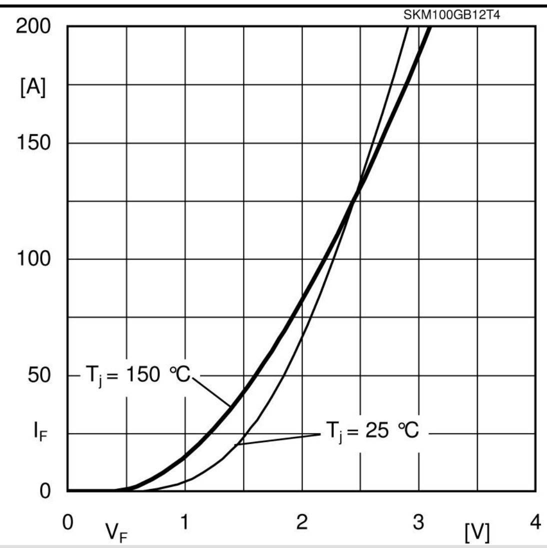

Fig. 10 CAL diode forward characteristic

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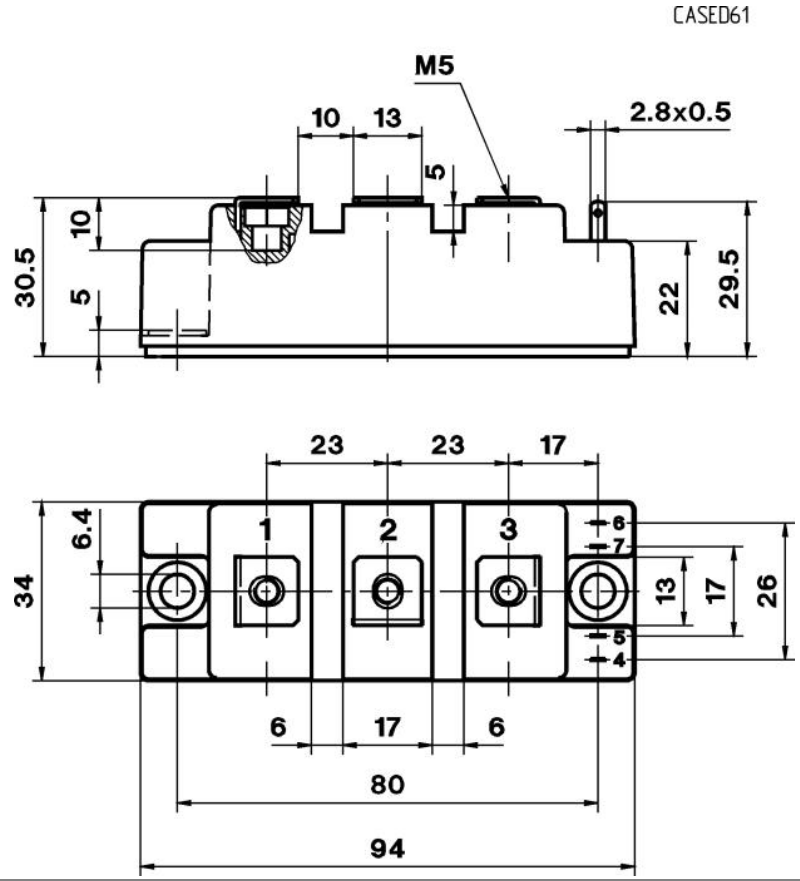
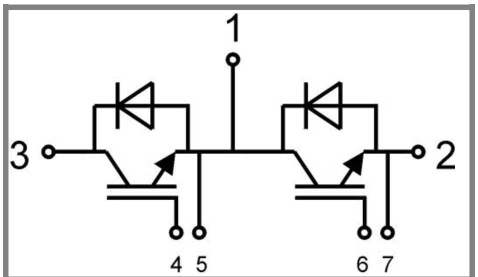
UL recognized file no. E 63 532





GB Case D61

