

SKM 50GB12T4



SEMITRANS® 2

IGBT4 Modules

SKM 50GB12T4

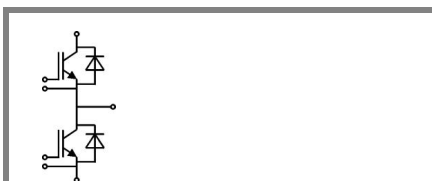
Target Data

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 (CALI4)

Typical Applications

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



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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	80	A
		T _{case} = 80 °C	60	A
I _{CRM}	I _{CRM} = 3 x I _{CNOM}		150	A
V _{GES}			± 20	V
t _{psc}	V _{CC} = 600 V; V _{GE} ≤ 15 V; T _j = 125 °C V _{CES} < 1200 V		10	µs
Inverse Diode				
I _F	T _j = 175 °C	T _{case} = 25 °C	65	A
		T _{case} = 80 °C	50	A
I _{FRM}	I _{FRM} = 3 x I _{FNOM}		150	A
I _{FSM}	t _p = 10 ms; sin.	T _j = 175 °C	265	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 = 2 mA		5	5,8	6,5	V		
I _{CES}	V _{GE} = V, V _{CE} = V _{CES} T _j = °C					mA		
V _{CE0}				0,8	0,9	V		
				0,7	0,8	V		
r _{CE}	V _{GE} = 15 V T _j = 25°C T _j = 150°C			21	23	mΩ		
				31	33	mΩ		
V _{CE(sat)}	I _{Cnom} = 50 A, V _{GE} = 15 V T _j = 25°C _{chiplev.} T _j = 150°C _{chiplev.}			1,85	2,05	V		
				2,25	2,45	V		
C _{ies}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz			3,6		nF		
C _{oes}				0,2		nF		
C _{res}				0,18		nF		
Q _G	-8V / +15V			280		nC		
R _{Gint}	T _j = 25 °C			4		Ω		
t _{d(on)}	R _{Gon} =	V _{CC} = 600V I _{Cnom} = 50A T _j = °C		5,5		ns		
t _r						ns		
E _{on}	R _{Goff} =						5,5	mJ
t _{d(off)}								ns
t _f								ns
E _{off}								mJ
R _{th(j-c)}	per IGBT				0,53	K/W		



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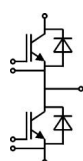
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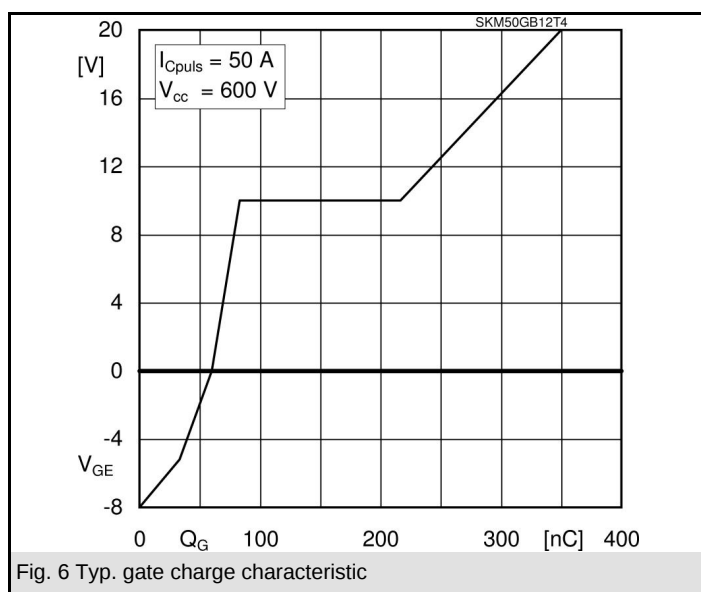
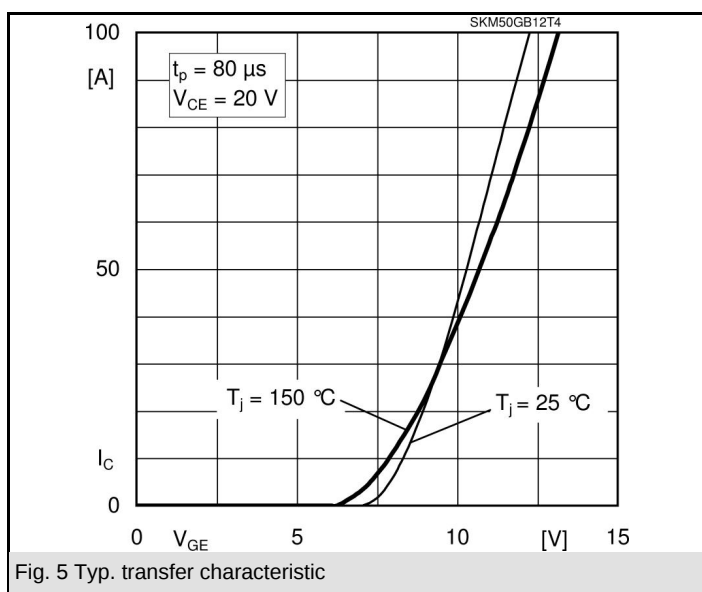
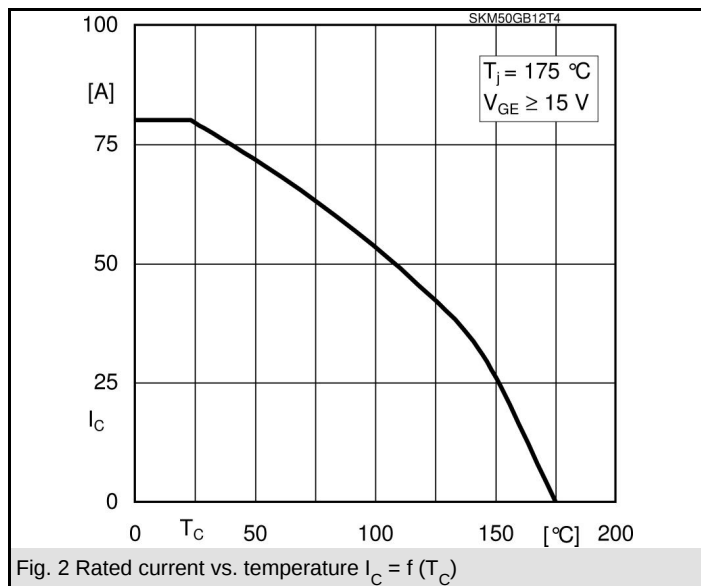
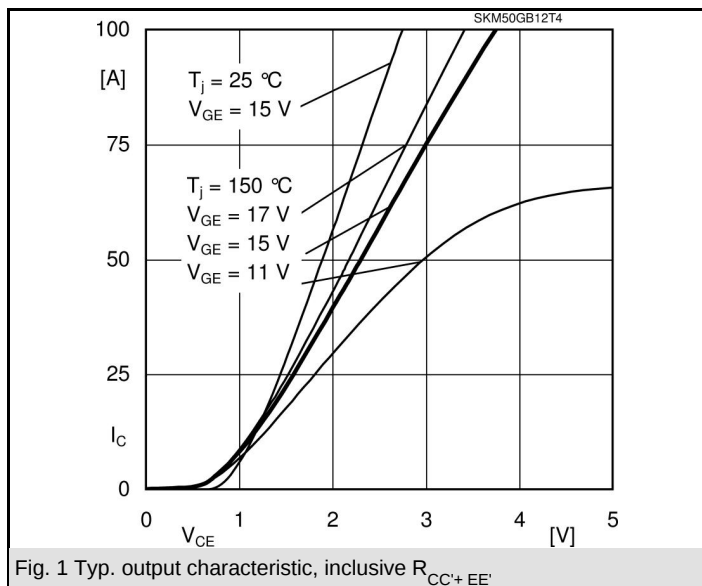
Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 50 \text{ A}; V_{GE} = 0 \text{ V}$				
	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		2,25	2,55	V
	$T_j = 150 \text{ }^\circ\text{C}_{chiplev.}$		2,2	2,5	V
V_{F0}	$T_j = 25 \text{ }^\circ\text{C}$		1,3	1,5	V
	$T_j = 150 \text{ }^\circ\text{C}$		0,9	1,1	V
r_F	$T_j = 25 \text{ }^\circ\text{C}$		19	21	mΩ
	$T_j = 150 \text{ }^\circ\text{C}$		26	28	mΩ
I_{RRM}	$I_{Fnom} = 50 \text{ A}$				A
Q_{rr}					μC
E_{rr}			3,8		mJ
$R_{th(j-c)}$	per diode			0,84	K/W
Freewheeling Diode					
$V_F = V_{EC}$	$I_{Fnom} = \text{A}; V_{GE} = \text{V}$				V
V_{F0}	$T_j = \text{ }^\circ\text{C}$				V
r_F	$T_j = \text{ }^\circ\text{C}$				V
I_{RRM}	$I_{Fnom} = \text{A}$				A
Q_{rr}					μC
E_{rr}					mJ
	per diode				K/W
Module					
L_{CE}			20	30	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25 \text{ }^\circ\text{C}$		0,75	mΩ
		$T_{case} = 125 \text{ }^\circ\text{C}$		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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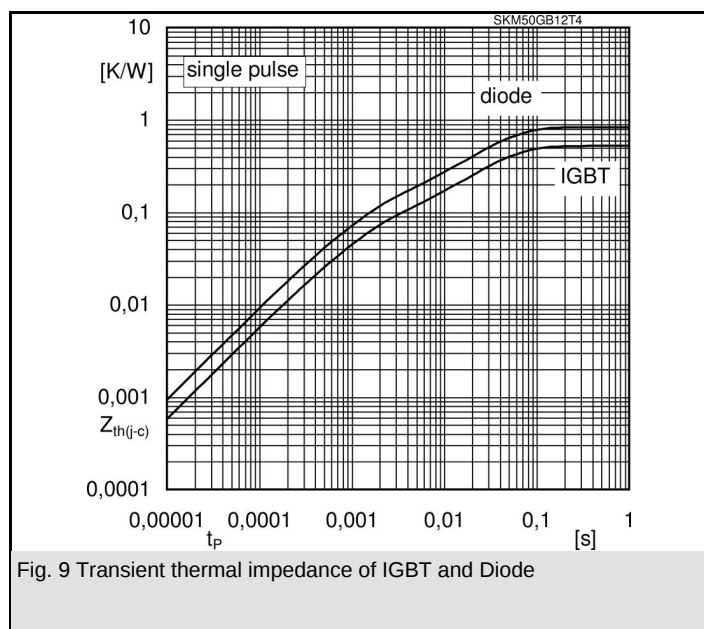


Fig. 9 Transient thermal impedance of IGBT and Diode

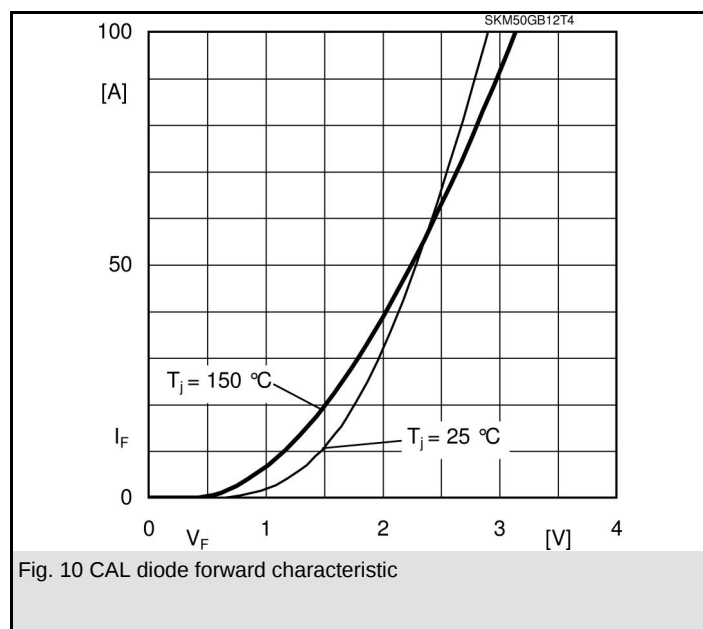


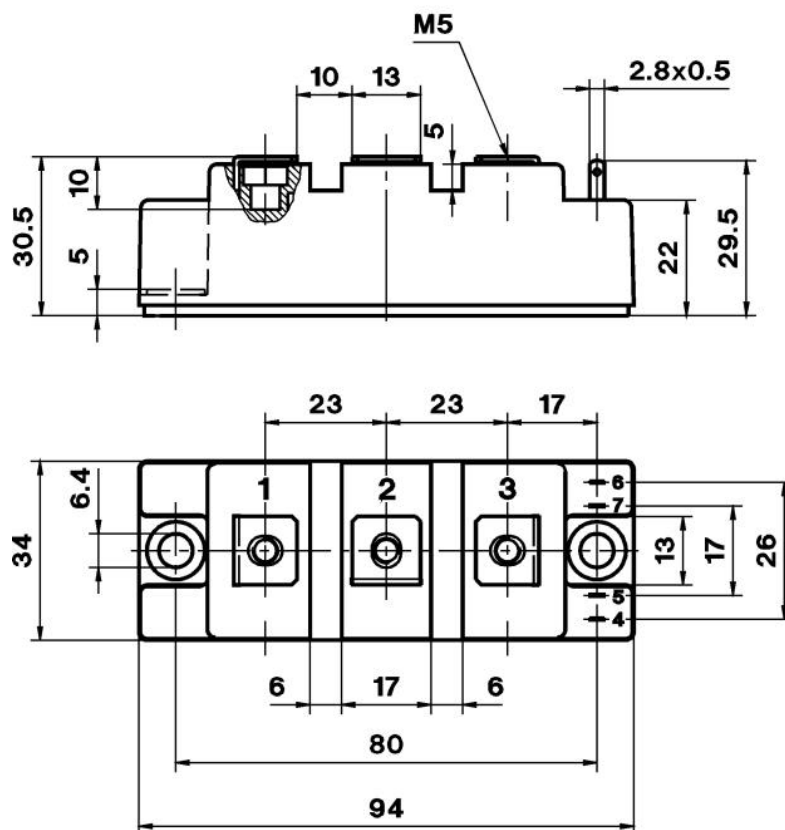
Fig. 10 CAL diode forward characteristic

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UL recognized file

CASED61

no. E 63 532



Case D61

