

SKM 50GB12T4



SEMITRANS® 2

IGBT4 Modules

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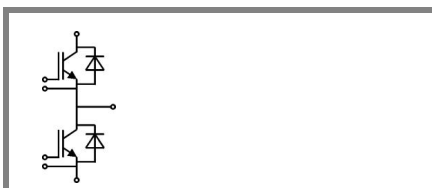
Target Data

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		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values	Units	
IGBT				
V_{CES}	$T_j = 25\text{ }^\circ\text{C}$	1200	V	
I_C	$T_j = 175\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	80	A
		$T_{case} = 80\text{ }^\circ\text{C}$	60	A
I_{CRM}	$I_{CRM} = 3 \times I_{CNOM}$	150	A	
V_{GES}		± 20	V	
t_{psc}	$V_{CC} = 600\text{ V}; V_{GE} \leq 15\text{ V}; T_j = 125\text{ }^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10	μs	
Inverse Diode				
I_F	$T_j = 175\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	65	A
		$T_{case} = 80\text{ }^\circ\text{C}$	50	A
I_{FRM}	$I_{FRM} = 3 \times I_{FNOM}$	150	A	
I_{FSM}	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 175\text{ }^\circ\text{C}$	265	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		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified				
Symbol	Conditions	min.	typ.	max.	Units	
IGBT						
$V_{GE(th)}$	$V_{GE} = V_{CE}; I_C = 2\text{ mA}$	5	5,8	6,5	V	
I_{CES}	$V_{GE} = V; V_{CE} = V_{CES}$				$T_j = \text{ }^\circ\text{C}$ mA	
V_{CE0}			$T_j = 25\text{ }^\circ\text{C}$	0,8	0,9	V
			$T_j = 150\text{ }^\circ\text{C}$	0,7	0,8	V
r_{CE}	$V_{GE} = 15\text{ V}$		$T_j = 25\text{ }^\circ\text{C}$	21	23	$\text{m}\Omega$
			$T_j = 150\text{ }^\circ\text{C}$	31	33	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 50\text{ A}; V_{GE} = 15\text{ V}$		$T_j = 25\text{ }^\circ\text{C}_{chiplev.}$	1,85	2,05	V
			$T_j = 150\text{ }^\circ\text{C}_{chiplev.}$	2,25	2,45	V
C_{res}	$V_{CE} = 25; V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$		3,6		nF
C_{oes}				0,2		nF
C_{res}				0,18		nF
Q_G	-8V / +15V		280		nC	
R_{Gint}	$T_j = 25\text{ }^\circ\text{C}$		4		Ω	
$t_{d(on)}$	$R_{Gon} =$	$V_{CC} = 600\text{ V}$ $I_{Cnom} = 50\text{ A}$ $T_j = \text{ }^\circ\text{C}$	5,5		ns	
t_r						
E_{on}						mJ
$t_{d(off)}$	$R_{Goff} =$		5,5		ns	
t_f						
E_{off}						mJ
$R_{th(j-c)}$	per IGBT			0,53	K/W	

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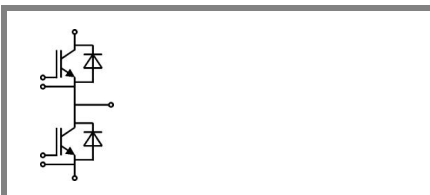
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Characteristics			min.	typ.	max.	Units
Symbol	Conditions					
Inverse Diode						
$V_F = V_{EC}$	$I_{Fnom} = 50 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		2,25	2,55	V
		$T_j = 150 \text{ }^\circ\text{C}_{chiplev.}$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

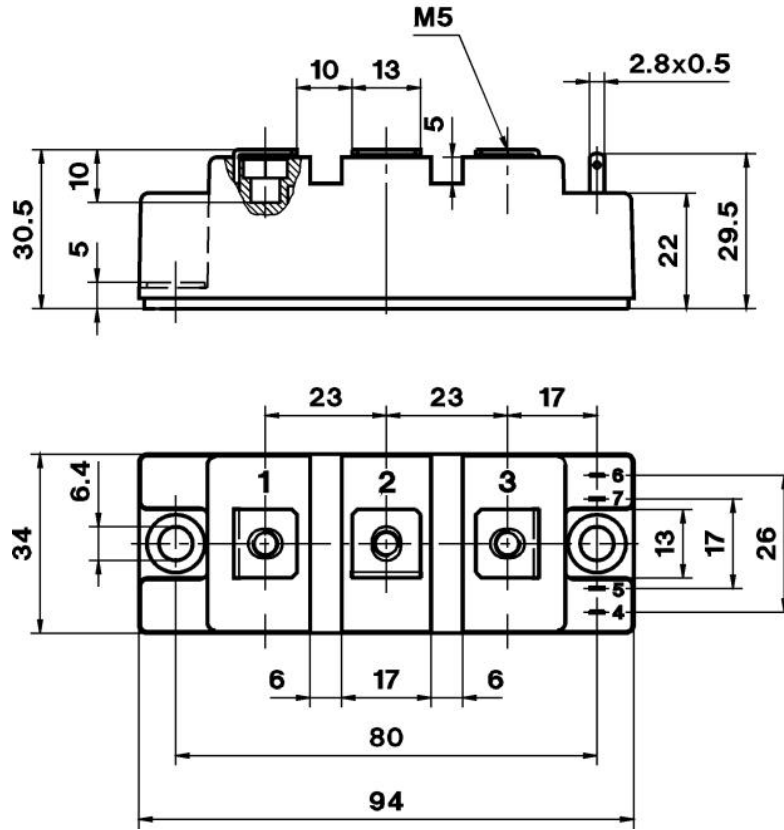
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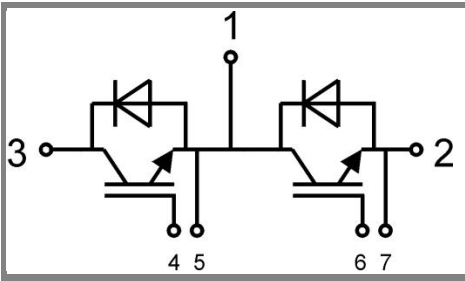
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CASED61

no. E 63 532



Case D61



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