

SKM 50GB12T4



SEMITRANS® 2

IGBT4 Modules

SKM 50GB12T4

Features

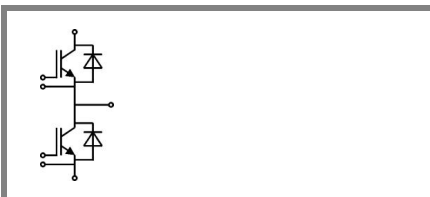
- IGBT4 = 4. Generation (Trench) IGBT
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_{CNOM}$
- Soft switching 4. Generation CAL diode (CALI4)

Typical Applications

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

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 $T_j \leq 150^\circ$



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Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$	1200		V
I_C	$T_j = 175^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	80	A
		$T_{case} = 80^\circ\text{C}$	60	A
I_{CRM}	$I_{CRM} = 3 \times I_{CNOM}$	150		A
V_{GES}		± 20		V
t_{psc}	$V_{CC} = 800\text{ V}; V_{GE} \leq 15\text{ V}; T_j = 150^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10		μs
Inverse Diode				
I_F	$T_j = 175^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	65	A
		$T_{case} = 80^\circ\text{C}$	50	A
I_{FRM}	$I_{FRM} = 3 \times I_{FNOM}$	150		A
I_{FSM}	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 175^\circ\text{C}$	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		$T_c = 25^\circ\text{C}$, 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}	$V_{GE} = V, V_{CE} = V_{CES}$				$T_j = 25^\circ\text{C}$ $T_j = 150^\circ\text{C}$ mA
V_{CE0}		$T_j = 25^\circ\text{C}$	0,8	0,9	V
		$T_j = 150^\circ\text{C}$	0,7	0,8	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	21	23	$\text{m}\Omega$
		$T_j = 150^\circ\text{C}$	31	33	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 50\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	1,85	2,05	V
		$T_j = 150^\circ\text{C}_{chiplev.}$	2,25	2,45	V
C_{res}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	2,8		nF
C_{oes}			0,21		nF
C_{res}			0,16		nF
Q_G	-8V / +15V		280		nC
R_{Gint}	$T_j = 25^\circ\text{C}$		4		Ω
$t_{d(on)}$	$R_{Gon} = 8,2\ \Omega$ $di/dt = 1700\text{ A}/\mu\text{s}$	$V_{CC} = 600\text{V}$ $I_C = 50\text{A}$ $T_j = 150^\circ\text{C}$	98		ns
t_r			29		ns
E_{on}	$R_{Goff} = 8,2\ \Omega$ $di/dt = 670\text{ A}/\mu\text{s}$	$V_{CC} = 600\text{V}$ $I_C = 50\text{A}$ $T_j = 150^\circ\text{C}$	5,5		mJ
$t_{d(off)}$			325		ns
t_f			75		ns
E_{off}			4,5		mJ
$R_{th(j-c)}$	per IGBT			0,53	K/W



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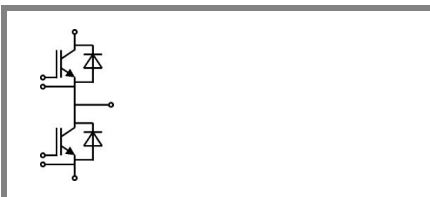
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Characteristics			min.	typ.	max.	Units
Symbol	Conditions					
Inverse Diode						
$V_F = V_{EC}$	$I_{Fnom} = 50 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$		2,25	2,55	V
		$T_j = 150^\circ\text{C}_{chiplev.}$		2,2	2,5	V
V_{F0}		$T_j = 25^\circ\text{C}$		1,3	1,5	V
		$T_j = 150^\circ\text{C}$		0,9	1,1	V
r_F		$T_j = 25^\circ\text{C}$		19	21	mΩ
		$T_j = 150^\circ\text{C}$		26	28	mΩ
I_{RRM}	$I_F = 50 \text{ A}$	$T_j = 150^\circ\text{C}$		35		A
Q_{rr}	$di/dt = 1380 \text{ A}/\mu\text{s}$			8,7		μC
E_{rr}				3,6		mJ
$R_{th(j-c)}$	per diode				0,84	K/W
Freewheeling Diode						
$V_F = V_{EC}$	$I_{Fnom} = \text{A}; V_{GE} = \text{V}$	$T_j = ^\circ\text{C}_{chiplev.}$				V
V_{F0}		$T_j = ^\circ\text{C}$				V
r_F		$T_j = ^\circ\text{C}$				V
I_{RRM}	$I_F = \text{A}$	$T_j = ^\circ\text{C}$				A
Q_{rr}						μC
E_{rr}						mJ
	per diode					K/W
Module						
L_{CE}				20	30	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25^\circ\text{C}$			0,75	mΩ
		$T_{case} = 125^\circ\text{C}$			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.

