

SKM 75GB128D



SEMITRANS® 2

SPT IGBT Module

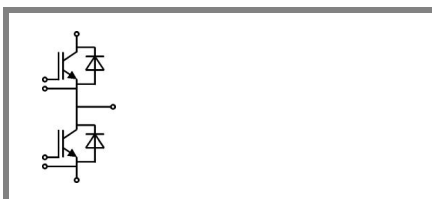
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Features

- SPT = Soft-Punch-Through technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

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	$T_j = 150\text{ }^\circ\text{C}$	$T_c = 25\text{ }^\circ\text{C}$	100		A	
		$T_c = 80\text{ }^\circ\text{C}$	70		A	
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	100			A	
V_{GES}		± 20			V	
t_{psc}	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ }^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10			μs	
Inverse Diode						
I_F	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	75		A	
		$T_{case} = 80\text{ }^\circ\text{C}$	50		A	
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	100			A	
I_{FSM}	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 150\text{ }^\circ\text{C}$	550			A
Module						
$I_{t(RMS)}$		200			A	
T_{vj}		- 40...+ 150			$^\circ\text{C}$	
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					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 2\text{ mA}$	4,5	5,5	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$	$T_j = 25\text{ }^\circ\text{C}$	0,1	0,3	mA
		$T_j = 125\text{ }^\circ\text{C}$	0,9	1,05	V
V_{CE0}			1	1,15	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ }^\circ\text{C}$	18	24	$\text{m}\Omega$
		$T_j = 125\text{ }^\circ\text{C}$	24	30	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 50\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25\text{ }^\circ\text{C}_{chiplev.}$	1,9	2,35	V
		$T_j = 125\text{ }^\circ\text{C}_{chiplev.}$	2,1	2,55	V
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	4,5		nF
C_{oes}			0,6		nF
C_{res}			0,55		nF
Q_G	$V_{GE} = -8\text{ V} - +20\text{ V}$	600			nC
R_{Gint}	$T_j = 25\text{ }^\circ\text{C}$	5			Ω
$t_{d(on)}$	$R_{Gon} = 6\text{ }\Omega$	$V_{CC} = 600\text{ V}$ $I_{Cnom} = 50\text{ A}$	160		ns
t_r			35		ns
E_{on}			6		mJ
$t_{d(off)}$	$R_{Goff} = 6\text{ }\Omega$	$T_j = 125\text{ }^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$	310		ns
t_f			65		ns
E_{off}			8		mJ
$R_{th(j-c)}$	per IGBT	0,3			K/W



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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	2,5	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$	1,8		V
V_{F0}			1,1	1,2	V
r_F			18	26	mΩ
I_{RRM}	$I_{Fnom} = 50 \text{ A}$		55		A
Q_{rr}	$di/dt = 2100 \text{ A}/\mu\text{s}$		7,3		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$		2,6		mJ
$R_{th(j-c)D}$	per diode			0,6	K/W
Module					
L_{CE}				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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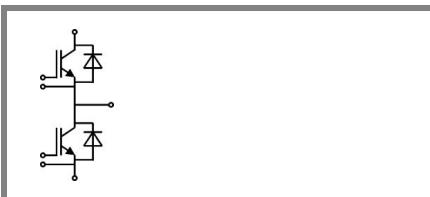
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Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
$R_{\theta j-c1}$	$i = 1$	210	mk/W
$R_{\theta j-c2}$	$i = 2$	70	mk/W
$R_{\theta j-c3}$	$i = 3$	17	mk/W
$R_{\theta j-c4}$	$i = 4$	3	mk/W
τ_{th1}	$i = 1$	0,0382	s
τ_{th2}	$i = 2$	0,0242	s
τ_{th3}	$i = 3$	0,0013	s
τ_{th4}	$i = 4$	0,0002	s
$Z_{th(j-c)D}$			
$R_{\theta j-cD1}$	$i = 1$	400	mk/W
$R_{\theta j-cD2}$	$i = 2$	160	mk/W
$R_{\theta j-cD3}$	$i = 3$	35,5	mk/W
$R_{\theta j-cD4}$	$i = 4$	4,5	mk/W
τ_{thD1}	$i = 1$	0,0831	s
τ_{thD2}	$i = 2$	0,0063	s
τ_{thD3}	$i = 3$	0,0022	s
τ_{thD4}	$i = 4$	0,08	s

