

SKM 100GB128D



SEMITRANS® 2

SPT IGBT Module

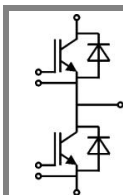
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Features

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

Typical Applications

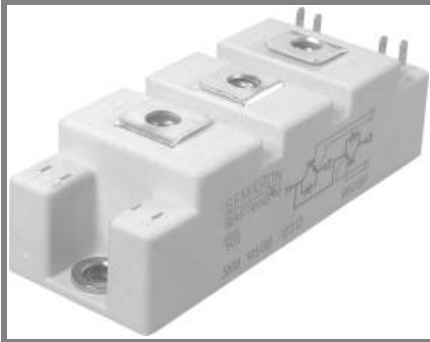
- AC inverter drives
- UPS
- Electronic welders at f_{sw} up to 20 kHz



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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	$T_J = 150\text{ }^\circ\text{C}$	$T_C = 25\text{ }^\circ\text{C}$	145		A
		$T_C = 80\text{ }^\circ\text{C}$	105		A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	150			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	$T_J = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	95		A
		$T_{case} = 80\text{ }^\circ\text{C}$	65		A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	150			A
I_{FSM}	$t_p = 10\text{ ms}; \text{sin.}$	$T_J = 150\text{ }^\circ\text{C}$	720		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						
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 3\text{ mA}$	4,5	5,5	6,45	V	
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$		0,1	0,3	mA	
V_{CE0}		$T_J = 25\text{ }^\circ\text{C}$	1		1,15	V
		$T_J = 125\text{ }^\circ\text{C}$	0,9		1,05	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_J = 25\text{ }^\circ\text{C}$	13		16	m Ω
		$T_J = 125\text{ }^\circ\text{C}$	16		20	m Ω
$V_{CE(sat)}$	$I_{Cnom} = 75\text{ A}, V_{GE} = 15\text{ V}$	$T_J = 25\text{ }^\circ\text{C}_{chiplev.}$	1,9		2,35	V
		$T_J = 125\text{ }^\circ\text{C}_{chiplev.}$	2,1		2,55	V
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	6,2		nF	
C_{oes}			0,74		nF	
C_{res}			0,71		nF	
Q_G	$V_{GE} = -8\text{ V} - +20\text{ V}$		860		nC	
R_{Gint}	$T_J = 25\text{ }^\circ\text{C}$		5		Ω	
$t_{d(on)}$	$R_{Gon} = 4,7\text{ }^\circ\Omega$	$V_{CC} = 600\text{ V}$ $I_{Cnom} = 75\text{ A}$	175		ns	
t_r			38		ns	
E_{on}			9		mJ	
$t_{d(off)}$	$R_{Goff} = 4,7\text{ }^\circ\Omega$	$T_J = 125\text{ }^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$	370		ns	
t_f			65		ns	
E_{off}			7,5		mJ	
$R_{th(j-c)}$	per IGBT		0,21		K/W	



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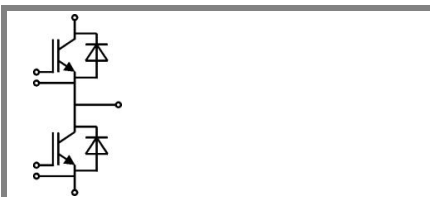
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Characteristics				min.	typ.	max.	Units
Symbol	Conditions						
Inverse Diode							
$V_F = V_{EC}$	$I_{Fnom} = 75 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		2	2,5		V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$		1,8			V
V_{F0}		$T_j = 25 \text{ }^\circ\text{C}$		1,1	1,2		V
r_F		$T_j = 25 \text{ }^\circ\text{C}$		12	17,3		mΩ
I_{RRM}	$I_{Fnom} = 75 \text{ A}$ $di/dt = 2800 \text{ A}/\mu\text{s}$	$T_j = 125 \text{ }^\circ\text{C}$		88			A
Q_{rr}				13			μC
E_{off}	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$			3,9			mJ
$R_{th(j-c)D}$	per diode				0,5		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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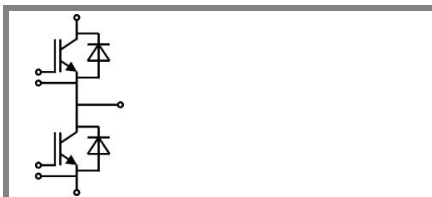
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Z_{th}				
Symbol	Conditions	Values	Units	
$Z_{th(j-c)I}$				
$R_{\theta j-c}$	$i = 1$	114	mk/W	
$R_{\theta j-c}$	$i = 2$	71	mk/W	
$R_{\theta j-c}$	$i = 3$	22	mk/W	
$R_{\theta j-c}$	$i = 4$	3	mk/W	
$\tau_{\theta j-c}$	$i = 1$	0,054	s	
$\tau_{\theta j-c}$	$i = 2$	0,0115	s	
$\tau_{\theta j-c}$	$i = 3$	0,0012	s	
$\tau_{\theta j-c}$	$i = 4$	0,001	s	
$Z_{th(j-c)D}$				
$R_{\theta j-c}$	$i = 1$	300	mk/W	
$R_{\theta j-c}$	$i = 2$	160	mk/W	
$R_{\theta j-c}$	$i = 3$	35,5	mk/W	
$R_{\theta j-c}$	$i = 4$	4,5	mk/W	
$\tau_{\theta j-c}$	$i = 1$	0,054	s	
$\tau_{\theta j-c}$	$i = 2$	0,0071	s	
$\tau_{\theta j-c}$	$i = 3$	0,0017	s	
$\tau_{\theta j-c}$	$i = 4$	0,005	s	

