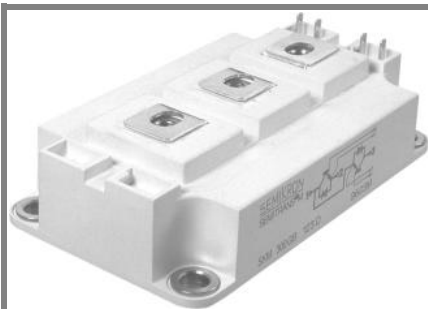


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Trench IGBT Module

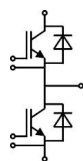
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Features

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

Typical Applications*

- Electronic welders
- AC inverter drives
- UPS

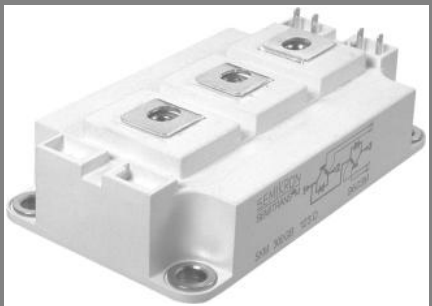


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Absolute Maximum Ratings				$T_c = 25^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions			Values	Units
IGBT					
V_{CES}	$T_j = 25^\circ\text{C}$			1200	V
I_C	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$		310	A
		$T_{case} = 80^\circ\text{C}$		200	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$			400	A
V_{GES}				± 20	V
t_{psc}	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125^\circ\text{C}$ $V_{CES} < 1200\text{ V}$			10	μs
Inverse Diode					
I_F	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$		250	A
		$T_{case} = 80^\circ\text{C}$		170	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$			400	A
Module					
$I_{t(RMS)}$				500	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 °C, unless otherwise specified			
Symbol	Conditions		min.	typ.	max.	Units
IGBT						
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 8 mA		5	5,8	6,5	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES}	T _j = 25 °C		0,1	0,3	mA
V _{CE0}		T _j = 25 °C		1	1,2	V
		T _j = 125 °C		0,9	1,1	V
r _{CE}	V _{GE} = 15 V	T _j = 25°C		3,5	4,7	mΩ
		T _j = 125°C		5,5	6,8	mΩ
V _{CE(sat)}	I _{Cnom} = 200 A, V _{GE} = 15 V	T _j = 25°C _{chiplev.}		1,7	2,15	V
		T _j = 125°C _{chiplev.}		2	2,45	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V	f = 1 MHz		15		nF
C _{oes}				1,2		nF
C _{res}				1,1		nF
Q _G	V _{GE} = -8V - +20V			1800		nC
R _{Gint}	T _j = 25 °C			3,8		Ω
t _{d(on)}	R _{Gon} = 1,5 Ω	V _{CC} = 600V I _C = 200A T _j = 125 °C V _{GE} = ± 15V		280		ns
t _r				37		ns
E _{on}				21		mJ
t _{d(off)}	R _{Goff} = 1,5 Ω			560		ns
t _f				100		ns
E _{off}			33		mJ	
R _{th(j-c)}	per IGBT				0,12	K/W

SKM 300GB126D



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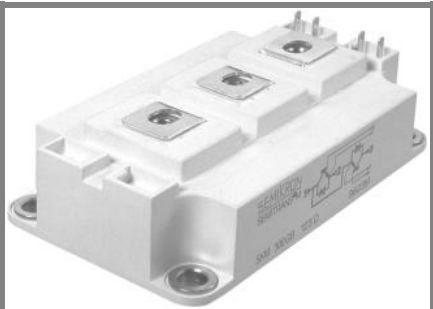
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Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse diode					
$V_F = V_{EC}$	$I_{Fnom} = 200\text{ A}; V_{GE} = 0\text{ V}$				
	$T_j = 25\text{ }^{\circ}\text{C}_{chiplev.}$		1,6	1,8	V
	$T_j = 125\text{ }^{\circ}\text{C}_{chiplev.}$		1,6	1,8	V
V_{F0}					
	$T_j = 25\text{ }^{\circ}\text{C}$		1	1,1	V
	$T_j = 125\text{ }^{\circ}\text{C}$		0,8	0,9	V
r_F					
	$T_j = 25\text{ }^{\circ}\text{C}$		3	3,5	mΩ
	$T_j = 125\text{ }^{\circ}\text{C}$		4	4,5	mΩ
I_{RRM}	$I_F = 200\text{ A}$		290		A
Q_{rr}	$di/dt = 6200\text{ A}/\mu\text{s}$		44		μC
E_{rr}	$V_{GE} = -15\text{ V}; V_{CC} = 600\text{ V}$		18		mJ
$R_{th(j-c)D}$	per diode			0,25	K/W
Module					
L_{CE}			15	20	nH
$R_{CC'+EE'}$	res., terminal-chip		0,35		mΩ
	$T_{case} = 25\text{ }^{\circ}\text{C}$				
	$T_{case} = 125\text{ }^{\circ}\text{C}$		0,5		mΩ
$R_{th(c-s)}$	per module			0,038	K/W
M_s	to heat sink M6	3		5	Nm
M_t	to terminals M6	2,5		5	Nm
w				325	g

This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.

SKM 300GB126D



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Z_{th}	Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$				
R_i		$i = 1$	80	mk/W
R_i		$i = 2$	30	mk/W
R_i		$i = 3$	8,5	mk/W
R_i		$i = 4$	1,5	mk/W
τ_{ui}		$i = 1$	0,0576	s
τ_{ui}		$i = 2$	0,01	s
τ_{ui}		$i = 3$	0,002	s
τ_{ui}		$i = 4$	0,0002	s
$Z_{th(j-c)D}$				
R_i		$i = 1$	150	mk/W
R_i		$i = 2$	75	mk/W
R_i		$i = 3$	22	mk/W
R_i		$i = 4$	3	mk/W
τ_{ui}		$i = 1$	0,0331	s
τ_{ui}		$i = 2$	0,0113	s
τ_{ui}		$i = 3$	0,0012	s
τ_{ui}		$i = 4$	0,001	s



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