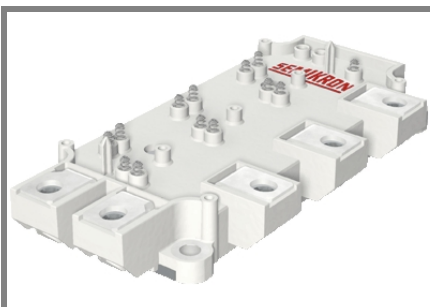


SEMiX 151GD126HDs



SEMiX® 13s

Trench IGBT Modules

SEMiX 151GD126HDs

Preliminary Data

Features

- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability

Typical Applications

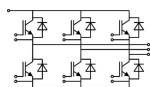
- AC inverter drives
- UPS
- Electronic Welding

Remarks

- Case temperatur limited to $T_C=125^\circ\text{C}$ max.

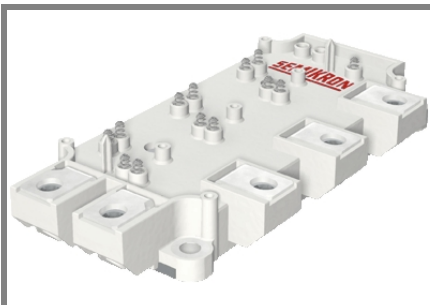
Absolute Maximum Ratings		$T_{case} = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	Values			Units
IGBT					
V_{CES}	$T_j = 25^\circ\text{C}$	1200			V
I_C	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	170		A
		$T_c = 80^\circ\text{C}$	120		A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	200			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	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	150		A
		$T_c = 80^\circ\text{C}$	105		A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	200			A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 25^\circ\text{C}$	700		A
Module					
$I_{t(RMS)}$		600			A
T_{vj}		- 40 ... + 150			$^\circ\text{C}$
T_{stg}		- 40 ... + 125			$^\circ\text{C}$
V_{isol}	AC, 1 min.	4000			V

Characteristics		$T_{case} = 25^\circ\text{C}$, unless otherwise specified				
Symbol	Conditions	min.	typ.	max.	Units	
IGBT						
$V_{GE(th)}$	$V_{GE} = V_{CE}; I_C = 4\text{ mA}$	5	5,8	6,5	V	
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$			0,3	mA	
V_{CE0}		$T_j = 25^\circ\text{C}$	1		1,2	V
		$T_j = 125^\circ\text{C}$	0,9		1,1	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	7		9,5	$\text{m}\Omega$
		$T_j = 125^\circ\text{C}$	11		13,5	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 100\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	1,7		2,15	V
		$T_j = 125^\circ\text{C}_{chiplev.}$	2		2,45	V
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	7,2		nF	
C_{oes}			0,38		nF	
C_{res}			0,33		nF	
Q_G	$V_{GE} = -8 \dots +15\text{V}$		800		nC	
$t_{d(on)}$	$R_{Gon} = 1,7\ \Omega$	$V_{CC} = 600\text{V}$ $I_{Cnom} = 100\text{A}$	290		ns	
t_r			50		ns	
E_{on}	$R_{Goff} = 1,7\ \Omega$	$T_j = 125^\circ\text{C}$	12		mJ	
$t_{d(off)}$			605		ns	
t_f			110		ns	
E_{off}			14		mJ	
$R_{th(j-c)}$	per IGBT		0,21		K/W	



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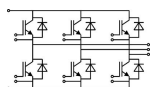
Remarks

- Case temperatur limited to $T_C=125^{\circ}\text{C}$ max.

Characteristics		min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 100\text{ A}; V_{GE} = 0\text{ V}$		1,6	1,8	V
	$T_j = 25^{\circ}\text{C}_{chiplev.}$				
	$T_j = 125^{\circ}\text{C}_{chiplev.}$		1,6	1,8	V
V_{F0}			1	1,1	V
	$T_j = 25^{\circ}\text{C}$				
	$T_j = 125^{\circ}\text{C}$		0,8	0,9	V
r_F			6	7	mΩ
	$T_j = 25^{\circ}\text{C}$				
	$T_j = 125^{\circ}\text{C}$		8	9	mΩ
I_{RRM}	$I_{Fnom} = 100\text{ A}$		125		A
Q_{rr}	$di/dt = 2900\text{ A}/\mu\text{s}$		26		μC
E_{rr}	$V_{GE} = -15\text{ V}; V_{CC} = 600\text{ V}$		11,5		mJ
$R_{th(j-c)D}$	per diode			0,36	K/W
Module					
L_{CE}			20		nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25^{\circ}\text{C}$	0,7		mΩ
		$T_{case} = 125^{\circ}\text{C}$	1		mΩ
$R_{th(c-s)}$	per module		0,04		K/W
M_s	to heat sink (M5)		3	5	Nm
M_t	to terminals (M6)		2,5	5	Nm
w				350	g
Temperature sensor					
R_{100}	$T_c = 100^{\circ}\text{C}$ ($R_{25} = 5\text{ k}\Omega$)		0,493±5%		kΩ
$B_{100/125}$	$R(T) = R_{100} \exp[B_{100/125} (1/T - 1/T_{100})]$; $T[\text{K}]$		3550±2%		K

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

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