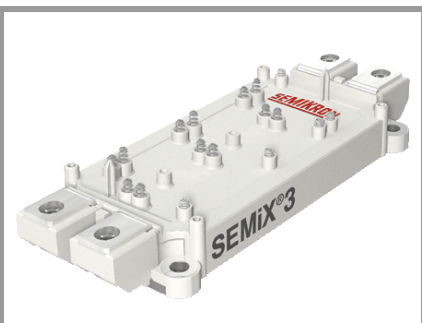


SEMiX503GB126HDs



SEMiX[®]3s

Trench IGBT Modules

SEMiX503GB126HDs

Preliminary Data

Features

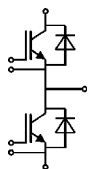
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability
- UL recognised file no. E63532

Typical Applications

- AC inverter drives
- UPS
- Electronic Welding

Remarks

- Case temperature limited to $T_C=125^\circ\text{C}$ max.
- Not for new design

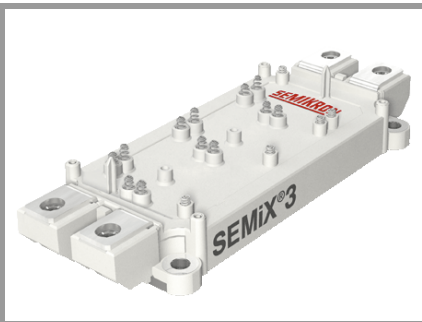


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Absolute Maximum Ratings				
Symbol	Conditions		Values	Unit
IGBT				
V_{CES}			1200	V
I_C	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	466	A
		$T_c = 80^\circ\text{C}$	327	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$		600	A
V_{GES}			-20 ... 20	V
t_{psc}	$V_{CC} = 600\text{V}$ $V_{GE} \leq 20\text{V}$ $T_j = 125^\circ\text{C}$ $V_{CES} \leq 1200\text{V}$		10	μs
T_j			-40 ... 150	$^\circ\text{C}$
Inverse diode				
I_F	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	431	A
		$T_c = 80^\circ\text{C}$	298	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$		600	A
I_{FSM}	$t_p = 10\text{ms}$, half sine wave, $T_j = 25^\circ\text{C}$		2000	A
T_j			-40 ... 150	$^\circ\text{C}$
Module				
$I_{t(RMS)}$			600	A
T_{stg}			-40 ... 125	$^\circ\text{C}$
V_{isol}	AC sinus 50Hz, $t = 60\text{s}$		4000	V

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
IGBT						
$V_{CE(sat)}$	$I_{Cnom} = 300\text{A}$ $V_{GE} = 15\text{V}$ chiplevel	$T_j = 25^\circ\text{C}$		1.7	2.1	V
		$T_j = 125^\circ\text{C}$		2.00	2.45	V
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}	$V_{GE} = 15\text{V}$	$T_j = 25^\circ\text{C}$		2.3	3.0	$\text{m}\Omega$
		$T_j = 125^\circ\text{C}$		3.7	4.5	$\text{m}\Omega$
$V_{GE(th)}$	$V_{GE}=V_{CE}$, $I_C = 12\text{mA}$		5	5.8	6.5	V
I_{CES}	$V_{GE} = 0\text{V}$ $V_{CE} = 1200\text{V}$	$T_j = 25^\circ\text{C}$		0.1	0.3	mA
		$T_j = 125^\circ\text{C}$				mA
C_{ies}	$V_{CE} = 25\text{V}$ $V_{GE} = 0\text{V}$	$f = 1\text{MHz}$		21.6		nF
C_{oes}		$f = 1\text{MHz}$		1.13		nF
C_{res}		$f = 1\text{MHz}$		0.98		nF
Q_G	$V_{GE} = -8\text{V} \dots +15\text{V}$			2400		nC
R_{Gint}	$T_j = 25^\circ\text{C}$			2.50		Ω
$t_{d(on)}$	$V_{CC} = 600\text{V}$			275		ns
t_r	$I_{Cnom} = 300\text{A}$			55		ns
E_{on}	$T_j = 125^\circ\text{C}$			28		mJ
$t_{d(off)}$	$R_{G on} = 2.2\Omega$			625		ns
	$R_{G off} = 2.2\Omega$					ns
t_f				125		ns
E_{off}				44		mJ
$R_{th(j-c)}$	per IGBT				0.08	K/W

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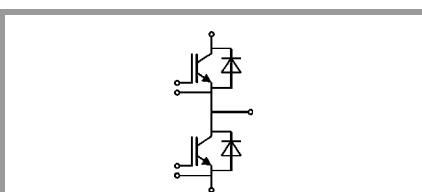
Typical Applications

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- UPS
- Electronic Welding

Remarks

- Case temperatur limited to $T_C=125^\circ\text{C}$ max.
- Not for new design

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Inverse diode						
$V_F = V_{EC}$	$I_{Fnom} = 300\text{A}$ $V_{GE} = 0\text{V}$ chipllevel	$T_j = 25^\circ\text{C}$		1.6	1.8	V
		$T_j = 125^\circ\text{C}$		1.6	1.8	V
V_{F0}		$T_j = 25^\circ\text{C}$	0.9	1	1.1	V
		$T_j = 125^\circ\text{C}$	0.7	0.8	0.9	V
r_F		$T_j = 25^\circ\text{C}$	1.7	2.0	2.3	m Ω
		$T_j = 125^\circ\text{C}$	2.3	2.7	3.0	m Ω
I_{RRM}	$I_{Fnom} = 300\text{A}$	$T_j = 125^\circ\text{C}$		400		A
Q_{rr}	$di/dt_{off} = 6900\text{A}/\mu\text{s}$	$T_j = 125^\circ\text{C}$		77		μC
E_{rr}	$V_{GE} = -15\text{V}$ $V_{CC} = 600\text{V}$	$T_j = 125^\circ\text{C}$		32.5		mJ
$R_{th(j-c)D}$	per diode				0.13	K/W
Module						
L_{CE}				20		nH
$R_{CC'+EE'}$	res., terminal-chip	$T_C = 25^\circ\text{C}$		0.7		m Ω
		$T_C = 125^\circ\text{C}$		1		m Ω
$R_{th(c-s)}$	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					300	g
Temperature sensor						
R_{100}	$T_c=100^\circ\text{C}$ ($R_{25}=5\text{ k}\Omega$)			0,493 $\pm 5\%$		k Ω
$B_{100/125}$	$R_{(T)}=R_{100}\exp[B_{100/125}(1/T-1/T_{100})]$; $T[\text{K}]$;			3550 $\pm 2\%$		K



GB

