

SEMiX 252GB126HDs

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SEMiX® 2s

Trench IGBT Modules

SEMiX 252GB126HDs

Preliminary Data

Features

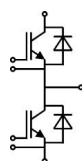
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability

Typical Applications

- AC inverter drives
- UPS
- Electronic Welding

Remarks

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



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Absolute Maximum Ratings		T _{case} = 25°C, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V _{CES}	T _j = 25 °C	1200	V
I _C	T _j = 150 °C T _c = 25 °C T _c = 80 °C	240 170	A A
I _{CRM}	I _{CRM} = 2xI _{Cnom}	300	A
V _{GES}		± 20	V
t _{psc}	V _{CC} = 600 V; V _{GE} ≤ 20 V; T _j = 125 °C V _{CES} < 1200 V	10	μs
Inverse Diode			
I _F	T _j = 150 °C T _c = 25 °C T _c = 80 °C	225 155	A A
I _{FRM}	I _{FRM} = 2xI _{Fnom}	300	A
I _{FSM}	t _p = 10 ms; sin. T _j = 25 °C	1000	A
Freewheeling Diode			
I _F	T _j = °C T _c = °C	10	A
I _{FRM}			A
Module			
I _{t(RMS)}		600	A
T _{vj}		- 40 ... + 150	°C
T _{stg}		- 40 ... + 125	°C
V _{isol}	AC, 1 min.	4000	V

Characteristics			T _{case} = 25°C, unless otherwise specified			
Symbol	Conditions		min.	typ.	max.	Units
IGBT						
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 6 mA		5	5,8	6,5	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES} T _J = 25 °C				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		4,7	6,3	mΩ
		T _J = 125°C		7,3	9	mΩ
V _{CE(sat)}	I _{Cnom} = 150 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		10,7		nF
C _{oes}				0,6		nF
C _{res}				0,5		nF
Q _G	V _{GE} = -8 ... +15V			1200		nC
t _{d(on)}	R _{Gon} = 3 Ω	V _{CC} = 600V I _{Cnom} = 150A		300		ns
t _r				45		ns
E _{on}				20		mJ
t _{d(off)}	R _{Goff} = 3 Ω	T _J = 125 °C		570		ns
t _f				110		ns
E _{off}				21		mJ
R _{th(j-c)}	per IGBT				0,15	K/W

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- AC inverter drives
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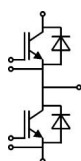
Remarks

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

Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 150\text{ A}$; $V_{GE} = 0\text{ V}$				
	$T_j = 25^\circ\text{C}_{chiplev.}$		1,6	1,8	V
	$T_j = 125^\circ\text{C}_{chiplev.}$		1,6	1,8	V
V_{F0}	$T_j = 25^\circ\text{C}$		1	1,1	V
	$T_j = 125^\circ\text{C}$		0,8	0,9	V
r_F	$T_j = 25^\circ\text{C}$		4	4,7	mΩ
	$T_j = 125^\circ\text{C}$		5,3	6	mΩ
I_{RRM}	$I_{Fnom} = 150\text{ A}$		260		A
Q_{rr}	$di/dt = 4600\text{ A}/\mu\text{s}$		43		μC
E_{rr}	$V_{GE} = -15\text{ V}$; $V_{CC} = 600\text{ V}$		18		mJ
$R_{th(j-c)D}$	per diode			0,24	K/W
Freewheeling Diode					
$V_F = V_{EC}$	$I_{Fnom} = A$; $V_{GE} = V$				V
V_{F0}	$T_j = ^\circ\text{C}$				V
r_F	$T_j = ^\circ\text{C}$				V
I_{RRM}	$I_{Fnom} = A$				A
Q_{rr}					μC
E_{rr}	$V_{GE} = 0\text{ V}$; $V_{CC} = 300\text{ V}$				mJ
	per diode				K/W
Module					
L_{CE}			18		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		0,045		K/W
M_s	to heat sink (M5)		3	5	Nm
M_t	to terminals (M6)		2,5	5	Nm
w				250	g
Temperature sensor					
R_{100}	$T_C = 100^\circ\text{C}$ ($R_{25} = 5\text{ k}\Omega$)		0,493±5%		kΩ
$B_{100/125}$	$R(T) = R_{100} \exp[B_{100/125}(1/T - 1/T_{100})]$; $T[K]$; B		3550±2%		K

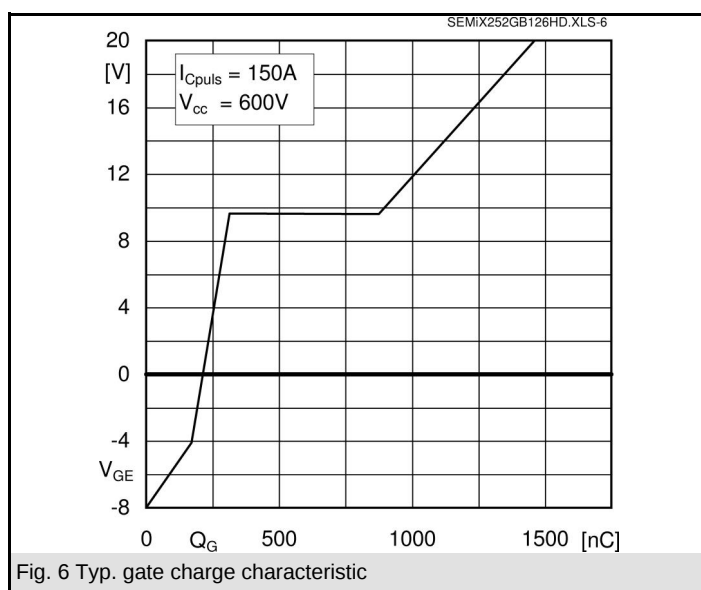
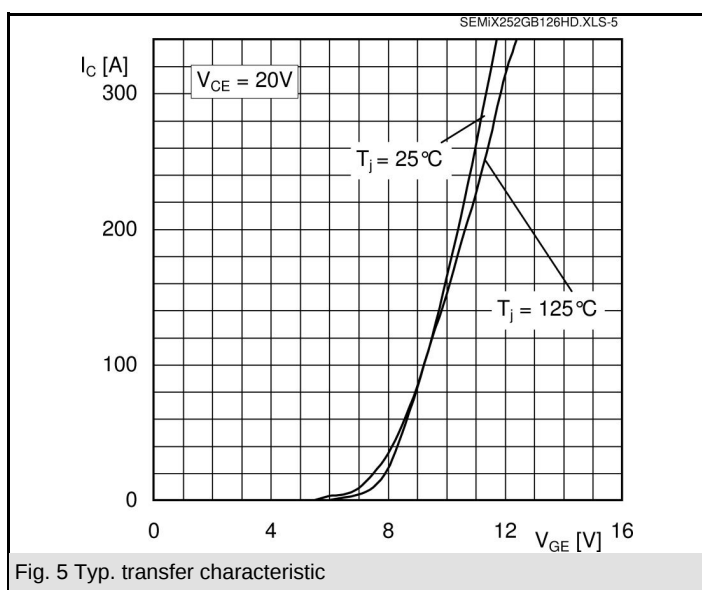
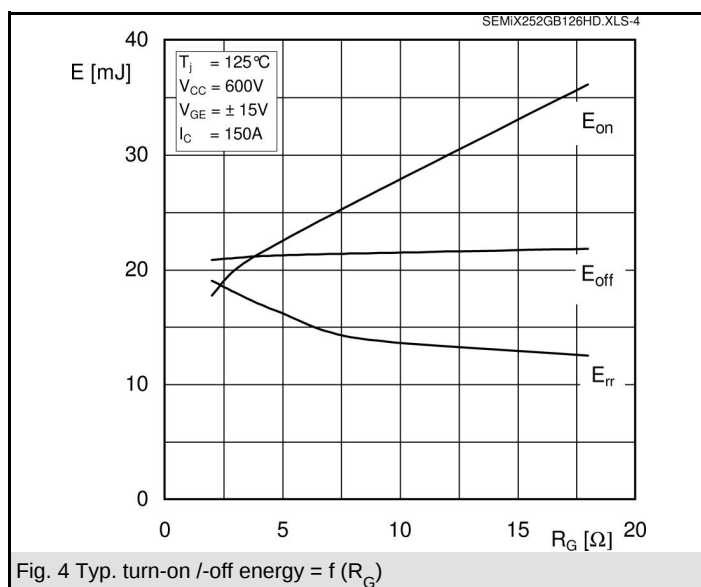
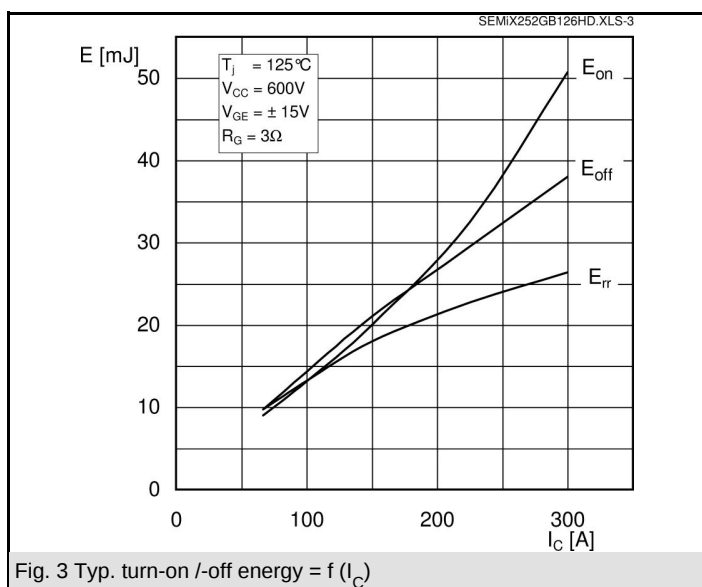
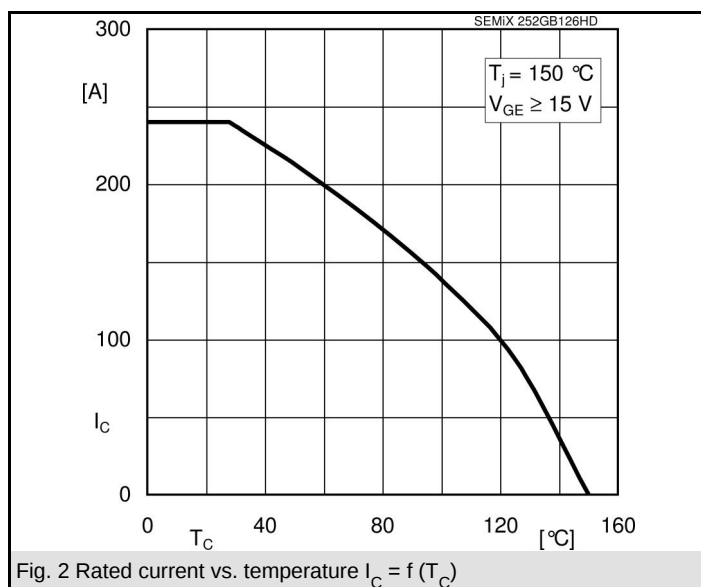
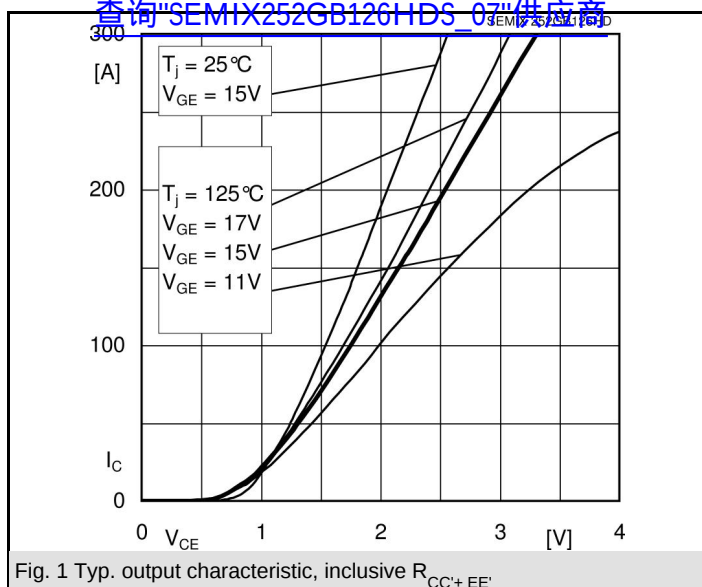
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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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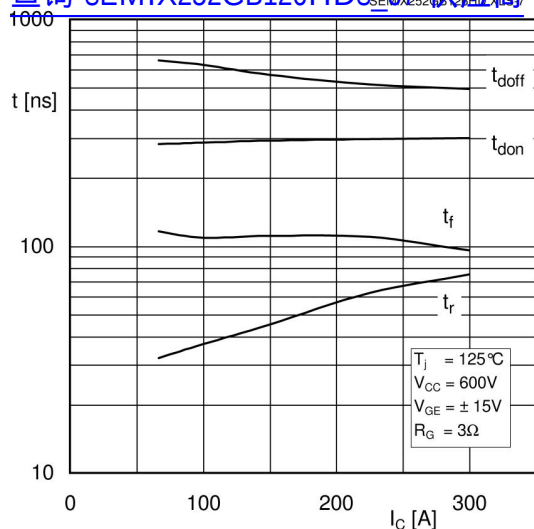


Fig. 7 Typ. switching times vs. I_C

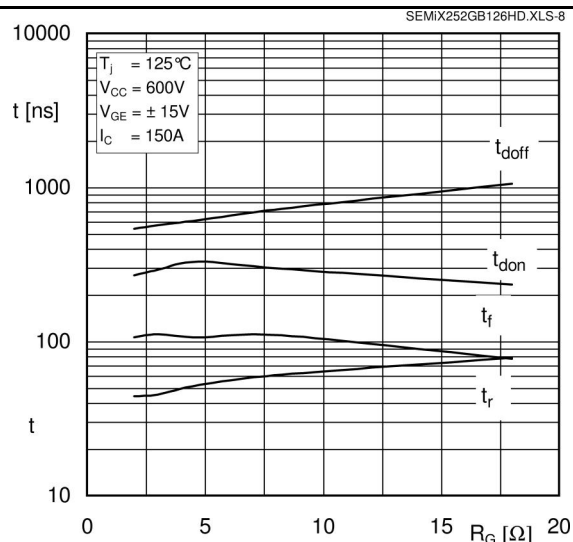


Fig. 8 Typ. switching times vs. gate resistor R_G

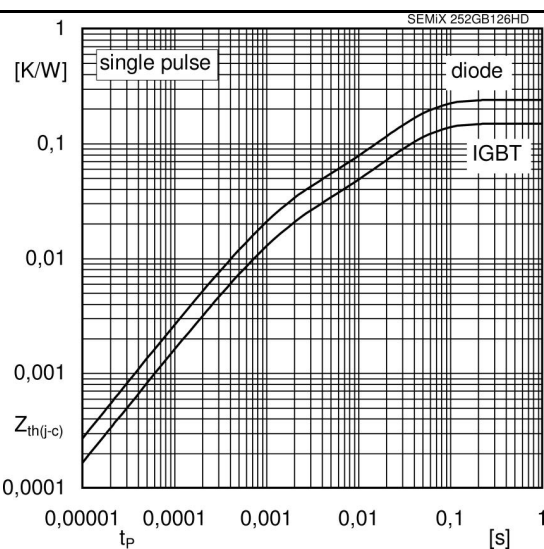


Fig. 9 Typ. transient thermal impedance

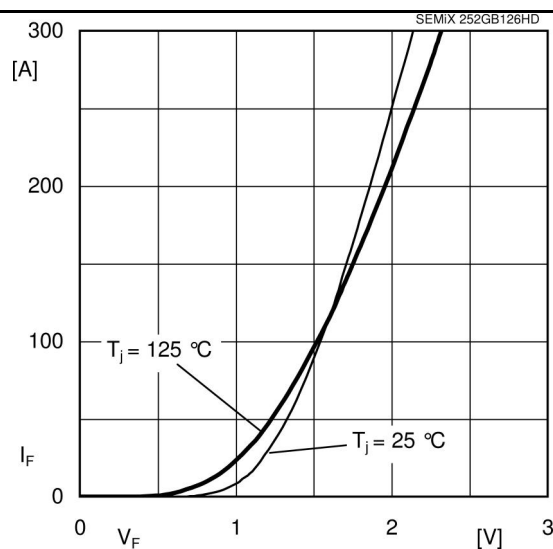


Fig. 10 Typ. CAL diode forward charact., incl. $R_{CC+EE'}$

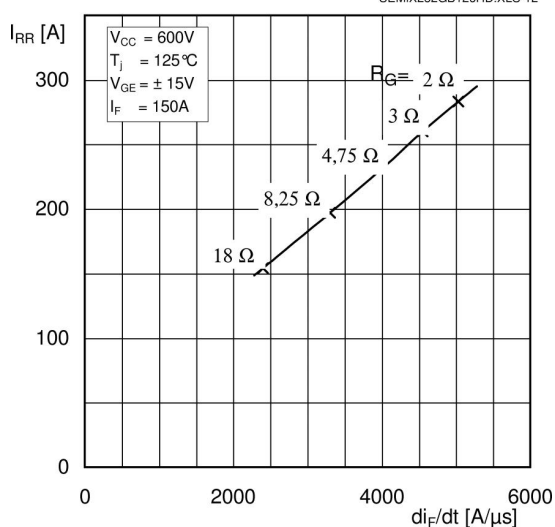


Fig. 11 Typ. CAL diode peak reverse recovery current

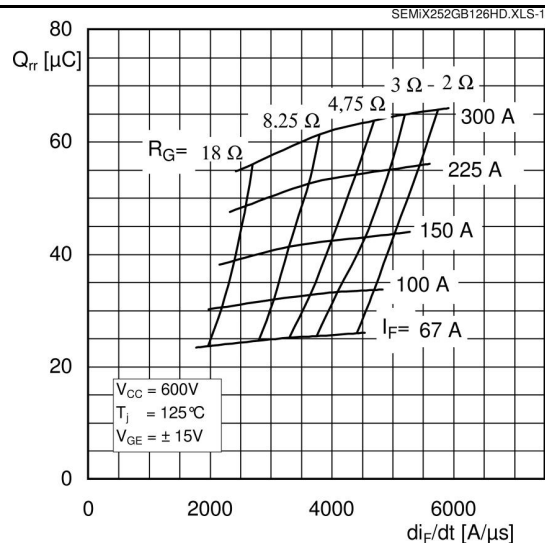
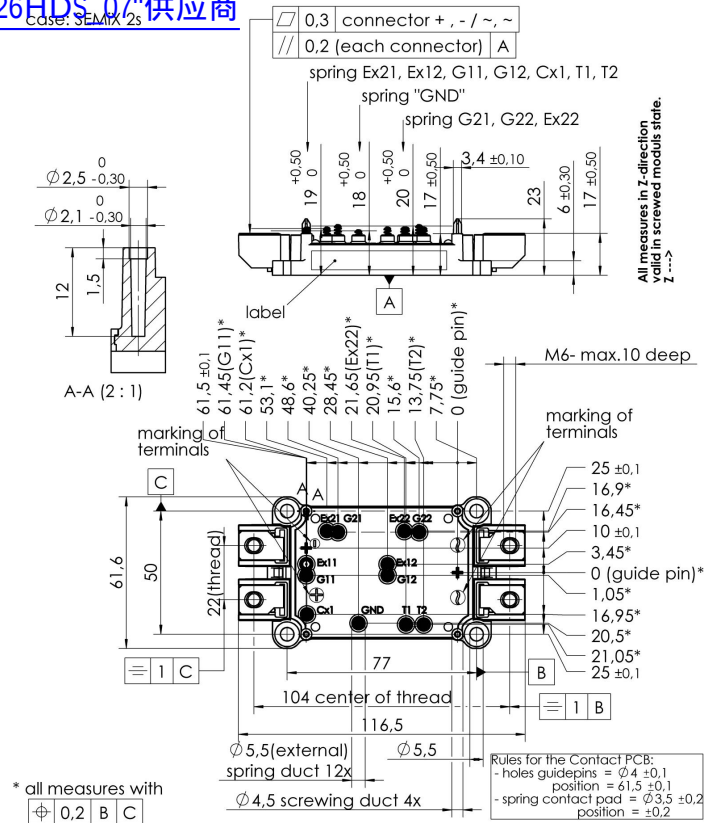


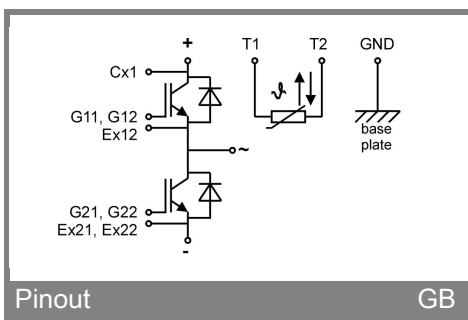
Fig. 12 Typ. CAL diode recovery charge

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Case: SEMiX 2s



Case SEMiX 2s



Pinout

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