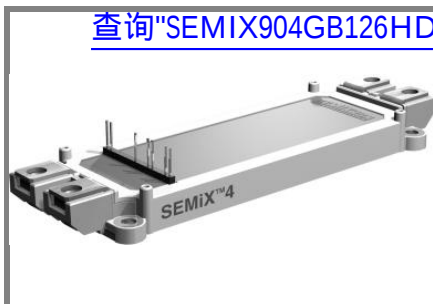


SEMiX 904GB126HD ...

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SEMiX® 4

Trench IGBT Modules

SEMiX 904GB126HD

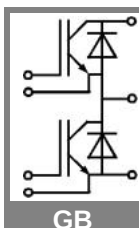
Target Data

Features

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

Typical Applications

- AC inverter drives
- UPS
- Electronic welders



Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_C	$T_c = 25\ (80)^\circ\text{C}$	910 (640)	A
I_{CRM}	$t_p = 1\ \text{ms}$	1200	A
V_{GES}		± 20	V
T_{vj} , (T_{stg})	$T_{OPERATION} \leq T_{stg}$	- 40 ... + 150 (125)	$^\circ\text{C}$
V_{isol}	AC, 1 min.	4000	V
Inverse diode			
I_F	$T_c = 25\ (80)^\circ\text{C}$	710 (480)	A
I_{FRM}	$t_p = 1\ \text{ms}$	1200	A
I_{FSM}	$t_p = 10\ \text{ms}$; sin.; $T_j = 25^\circ\text{C}$	3600	A

Characteristics		$T_c = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 24\ \text{mA}$	5	5,8	6,5	V
I_{CES}	$V_{GE} = 0$, $V_{CE} = V_{CES}$, $T_j = 25\ ()^\circ\text{C}$			3	mA
$V_{CE(TO)}$	$T_j = 25\ (125)^\circ\text{C}$		1 (0,9)	1,2 (1,1)	V
r_{CE}	$V_{GE} = 15\ \text{V}$, $T_j = 25\ (125)^\circ\text{C}$		1,17 (1,83)	1,6 (2,3)	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 600\ \text{A}$, $V_{GE} = 15\ \text{V}$, $T_j = 25\ (125)^\circ\text{C}$, chip level		1,7 (2)	2,15 (2,45)	V
C_{ies}	under following conditions		43		nF
C_{oes}	$V_{GE} = 0$, $V_{CE} = 25\ \text{V}$, $f = 1\ \text{MHz}$		2,3		nF
C_{res}			2		nF
L_{CE}			22		nH
$R_{CC'+EE'}$	terminal-chip, $T_c = 25\ (125)^\circ\text{C}$		0,7 (1,05)		$\text{m}\Omega$
$t_{d(on)}/t_r$	$V_{CC} = 600\ \text{V}$, $I_{Cnom} = 600\ \text{A}$		440 / 85		ns
$t_{d(off)}/t_f$	$V_{GE} = \pm 15\ \text{V}$		710 / 130		ns
$E_{on}\ (E_{off})$	$R_{Gon} = R_{Goff} = 1,6\ \Omega$, $T_j = 125^\circ\text{C}$		60 (88)		mJ
Inverse diode					
$V_F = V_{EC}$	$I_{Fnom} = 600\ \text{A}$; $V_{GE} = 0\ \text{V}$; $T_j = 25\ (125)^\circ\text{C}$, chip level		1,6 (1,6)	1,8 (1,8)	V
$V_{(TO)}$	$T_j = 25\ (125)^\circ\text{C}$		1 (0,8)	1,1 (0,9)	V
r_T	$T_j = 25\ (125)^\circ\text{C}$		1 (1,3)	1,2 (1,5)	$\text{m}\Omega$
I_{RRM}	$I_{Fnom} = 600\ \text{A}$; $T_j = 25\ (125)^\circ\text{C}$		(625)		A
Q_{rr}	$di/dt = 8400\ \text{A}/\mu\text{s}$		(165)		μC
E_{rr}	$V_{GE} = -15\ \text{V}$		(75)		mJ
Thermal characteristics					
$R_{th(j-c)}$	per IGBT			0,042	K/W
$R_{th(j-c)D}$	per Inverse Diode			0,09	K/W
$R_{th(j-c)FD}$	per FWD				K/W
$R_{th(c-s)}$	per module		0,03		K/W
Temperature sensor					
R_{25}	$T_c = 25^\circ\text{C}$		5 $\pm 5\%$		k Ω
$B_{25/85}$	$R_2 = R_1 \exp[B(1/T_2 - 1/T_1)]$; $T[K]$; B		3420		K
Mechanical data					
M_s/M_t	to heatsink (M5) / for terminals (M6)	3/2,5		5 / 5	Nm
w			390		g

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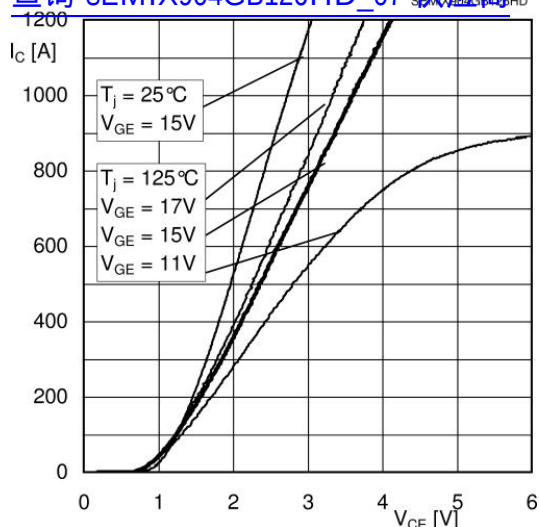


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

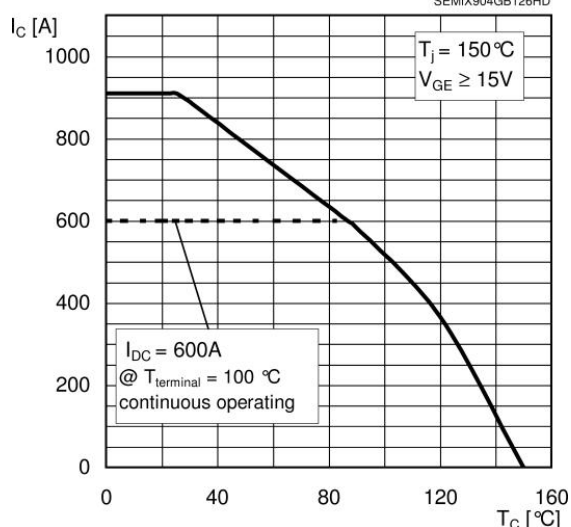


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

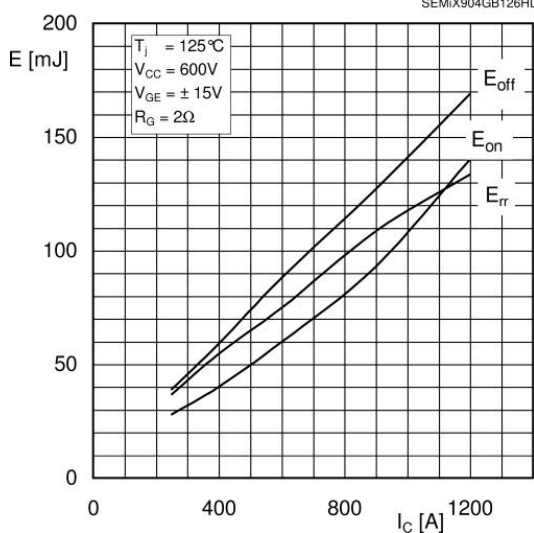


Fig. 3 Typ. turn-on /-off energy = $f(I_C)$

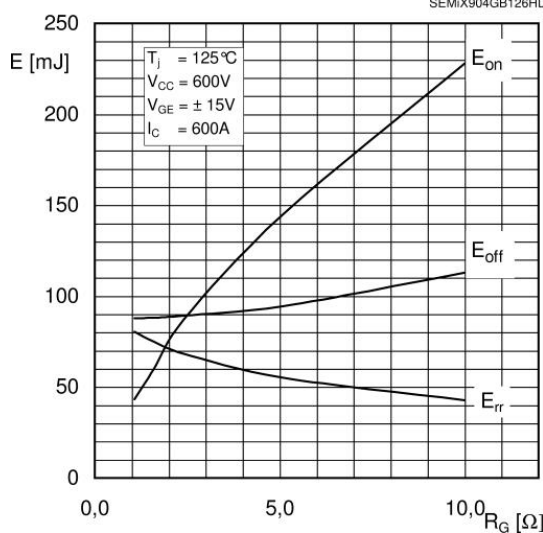


Fig. 4 Typ. turn-on /-off energy = $f(R_G)$

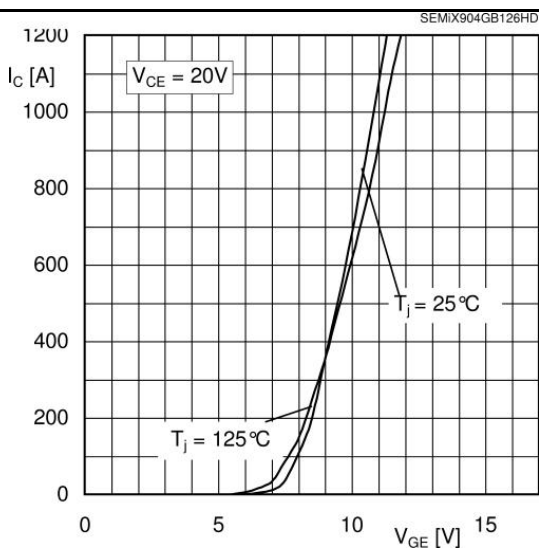


Fig. 5 Typ. transfer characteristic

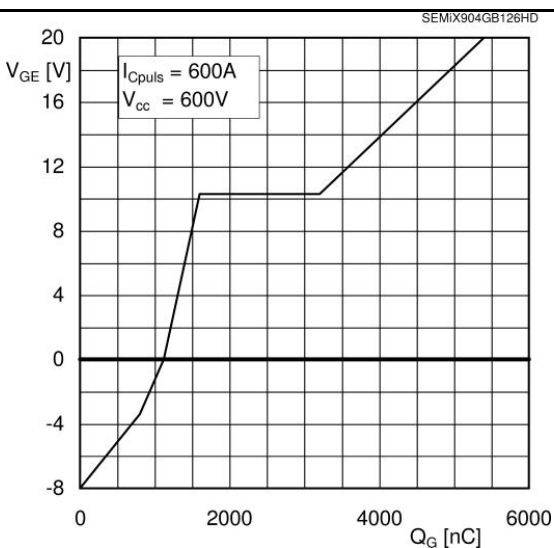
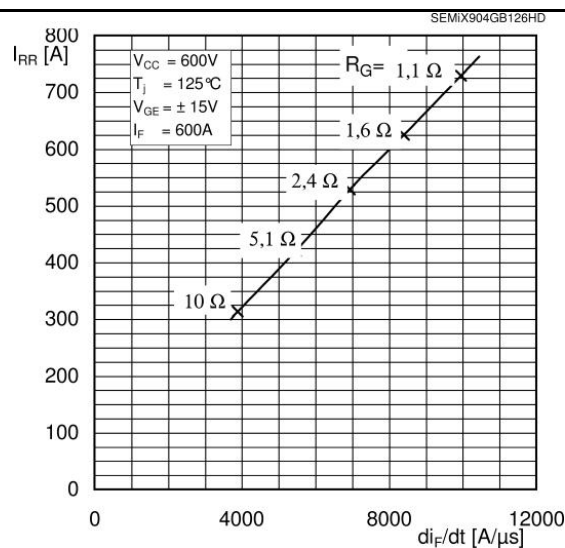
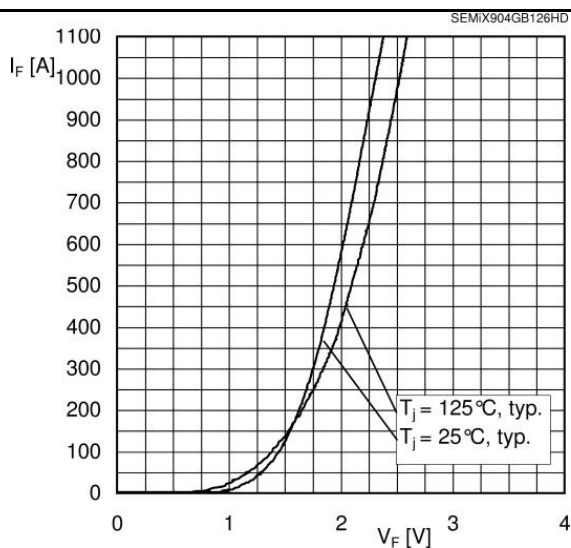
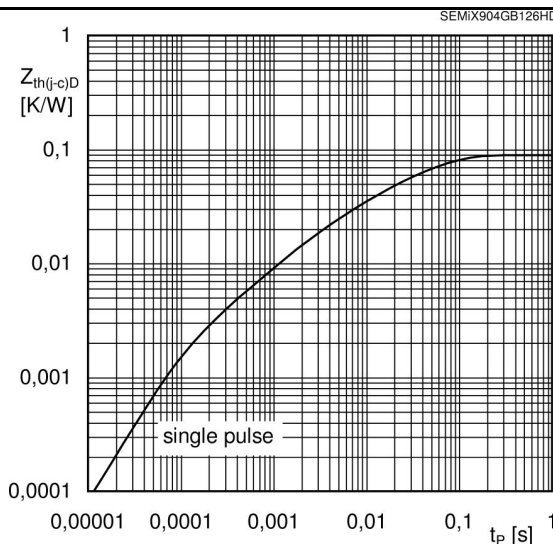
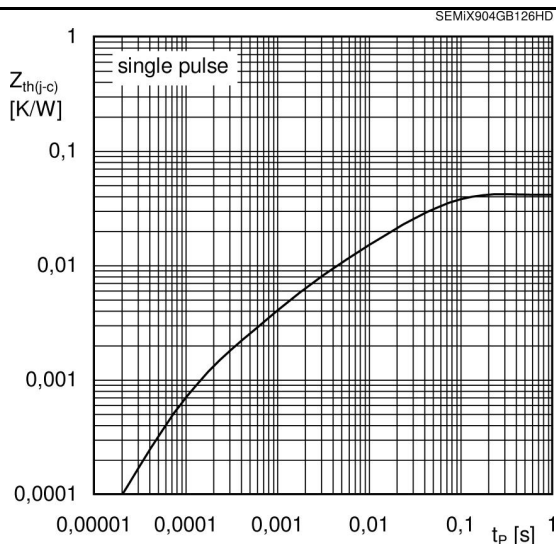
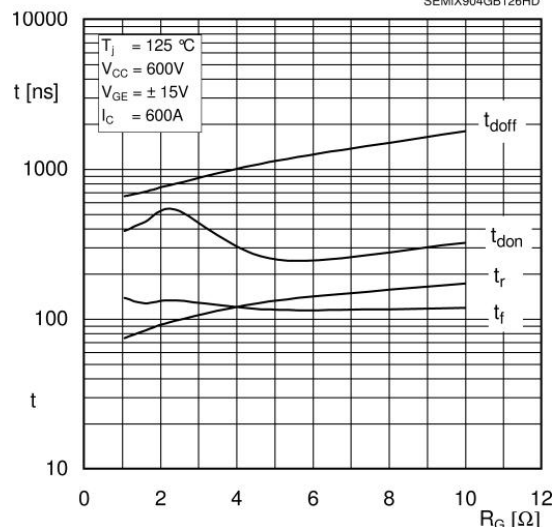
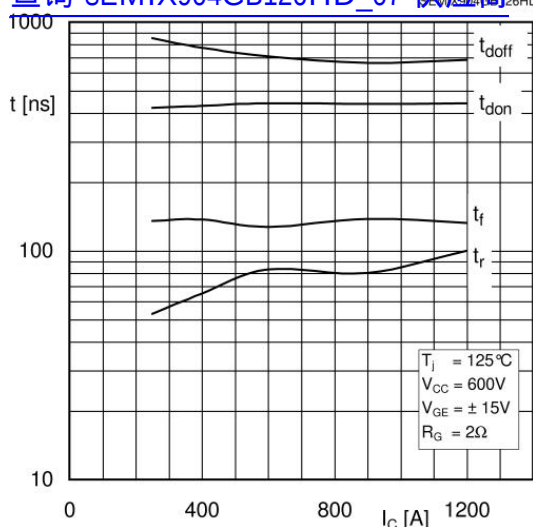


Fig. 6 Typ. gate charge characteristic

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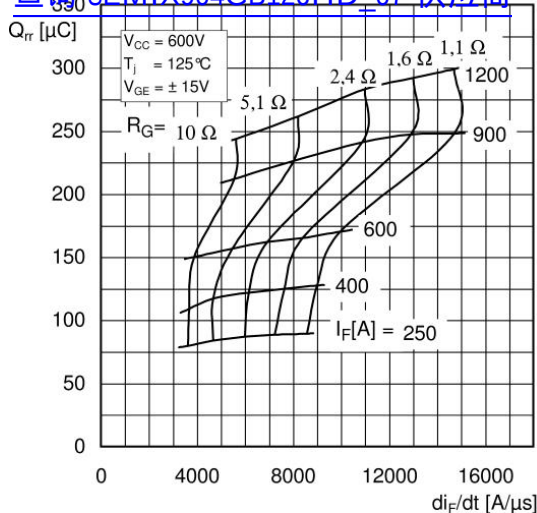
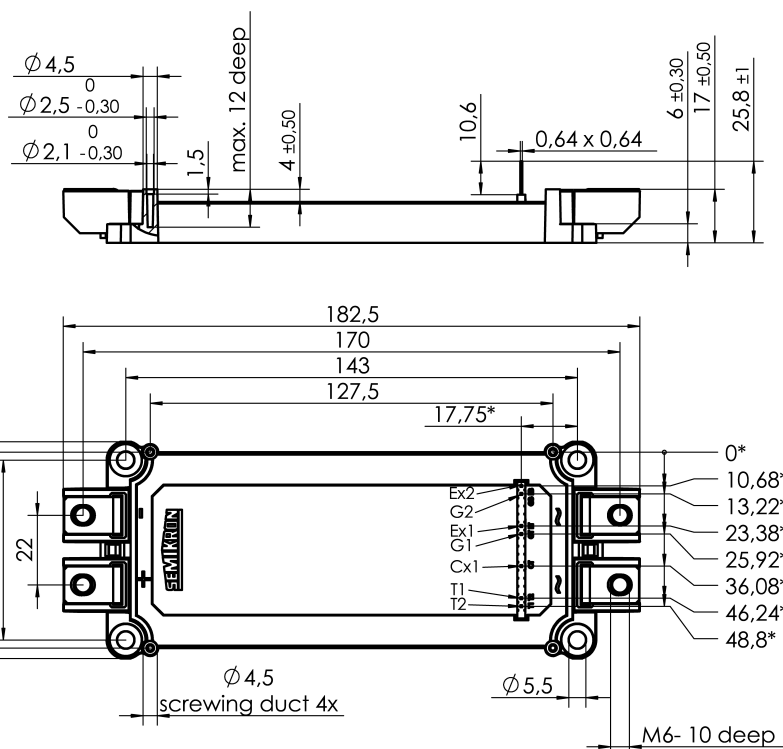
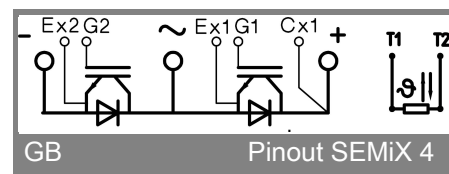


Fig. 13 Typ. CAL diode recovered charge



*= all measures with ± 0.5

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

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