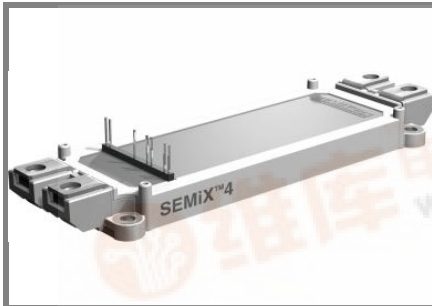


# SEMIX 854GB176HD



SEMIX<sup>®</sup> 4

## Trench IGBT Modules

### SEMIX 854GB176HD

#### Target Data

#### Features

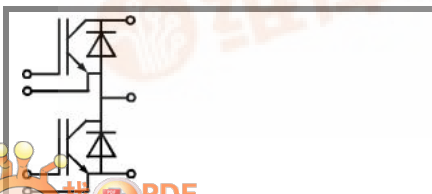
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$  with positive temperature coefficient
- High short circuit capability

#### Typical Applications

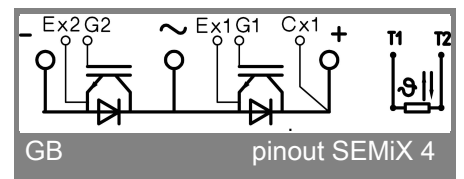
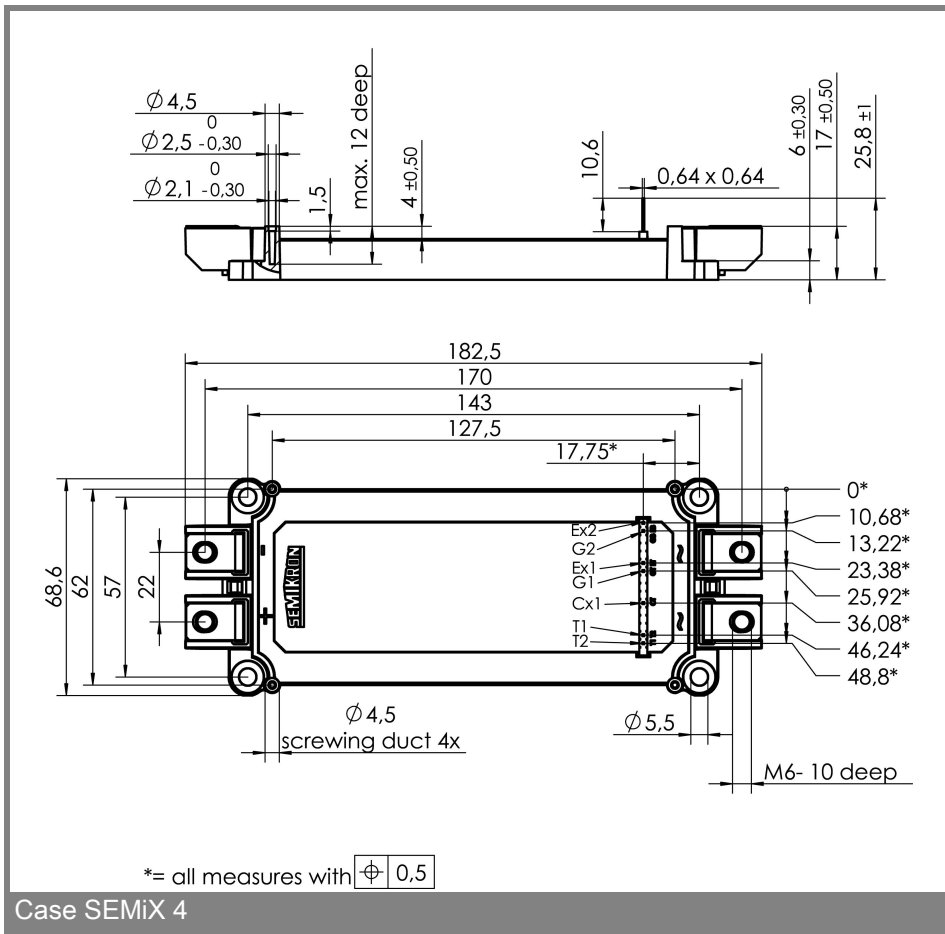
- AC inverter drives
- UPS
- Electronic welders

Absolute Maximum Ratings		$T_c = 25\text{ }^\circ\text{C}$ , unless otherwise specified		
Symbol	Conditions	Values		Units
<b>IGBT</b>				
$V_{CES}$		1700		V
$I_C$	$T_c = 25\text{ (80) }^\circ\text{C}$	830 (590)		A
$I_{CRM}$	$t_p = 1\text{ ms}$	1200		A
$V_{GES}$		$\pm 20$		V
$T_{vj}$ , ( $T_{stg}$ )	$T_{OPERATION} \leq T_{stg}$	- 40 ... + 150 (125)		$^\circ\text{C}$
$V_{isol}$	AC, 1 min.	4000		V
<b>Inverse diode</b>				
$I_F$	$T_c = 25\text{ (80) }^\circ\text{C}$	590 (370)		A
$I_{FRM}$	$t_p = 1\text{ ms}$	1200		A
$I_{FSM}$	$t_p = 10\text{ ms; sin.; } T_j = 25\text{ }^\circ\text{C}$	3800		A

Characteristics		$T_c = 25\text{ }^\circ\text{C}$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}$ , $I_C = 24\text{ mA}$	5,2	5,8	6,4	V
$I_{CES}$	$V_{GE} = 0$ , $V_{CE} = V_{CES}$ , $T_j = 25\text{ (125) }^\circ\text{C}$			3,6	mA
$V_{CE(TO)}$	$T_j = 25\text{ (125) }^\circ\text{C}$		1 (0,9)	1,2 (1,1)	V
$r_{CE}$	$V_{GE} = 0\text{ V}$ , $T_j = 25\text{ (125) }^\circ\text{C}$		1,7 (2,6)	2,1 (3)	m $\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 600\text{ A}$ , $V_{GE} = 15\text{ V}$ , $T_j = 25\text{ (125) }^\circ\text{C}$ , chip level		2 (2,45)	2,45 (2,9)	V
$C_{ies}$	under following conditions		39,6		nF
$C_{oes}$	$V_{GE} = 0$ , $V_{CE} = 25\text{ V}$ , $f = 1\text{ MHz}$		2,2		nF
$C_{res}$			1,8		nF
$L_{CE}$			22		nH
$R_{CC+EE}$	terminal-chip, $T_c = 25\text{ (125) }^\circ\text{C}$				m $\Omega$
$t_{d(on)}/t_r$	$V_{CC} = 1200\text{ V}$ , $I_{Cnom} = 600\text{ A}$		410 / 70		ns
$t_{d(off)}/t_f$	$V_{GE} = \pm 15\text{ V}$		775 / 145		ns
$E_{on} (E_{off})$	$R_{Gon} = R_{Goff} = 1\text{ }^\circ\Omega$ , $T_j = 125\text{ }^\circ\text{C}$		298 (202)		mJ
<b>Inverse diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 600\text{ A}$ ; $V_{GE} = 0\text{ V}$ ; $T_j = 25\text{ (125) }^\circ\text{C}$ , chip level		2 (2,1)	2,2 (2,3)	V
$V_{(TO)}$	$T_j = 25\text{ (125) }^\circ\text{C}$		1,1 (0,9)	1,3 (1,1)	V
$r_T$	$T_j = 25\text{ (125) }^\circ\text{C}$		1,5 (2)	1,5 (2)	m $\Omega$
$I_{RRM}$	$I_{Fnom} = 600\text{ A}$ ; $T_j = 25\text{ (125) }^\circ\text{C}$		(830)		A
$Q_{rr}$	$di/dt = 10000\text{ A}/\mu\text{s}$		(230)		$\mu\text{C}$
$E_{rr}$	$V_{GE} = -15\text{ V}$		(172)		mJ
<b>Thermal characteristics</b>					
$R_{th(j-c)}$	per IGBT			0,039	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
<b>Temperature sensor</b>					
$R_{25}$	$T_c = 25\text{ }^\circ\text{C}$		5 $\pm$ 5%		k $\Omega$
$B_{25/85}$	$R_2 = R_1 \exp[B(1/T_2 - 1/T_1)]$ ; $T[K]; B$		3420		K
<b>Mechanical data</b>					
$M_s/M_t$	to heatsink (M5) / for terminals (M6)	3/2,5		5 / 5	Nm
w			390		g



# SEMiX 854GB176HD



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.