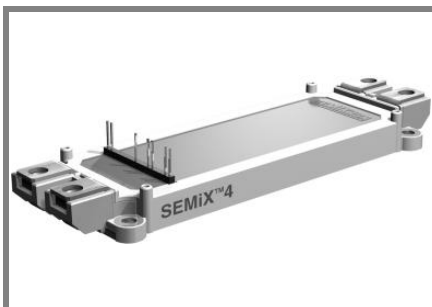


# SEMiX 604GB176HD



**SEMiX® 4**

## Trench IGBT Modules

### SEMiX 604GB176HD

Preliminary Data

#### Features

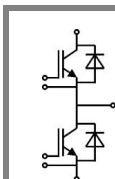
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$  with positive temperature coefficient
- High short circuit capability

#### Typical Applications

- AC inverter drives
- UPS
- Electronic welders

#### Remarks

- short circuit capability is tested @  $V_{CC}=1000V$  (all other static parameters are tested @  $V_{CC}=1200V$ )
- Not for new design

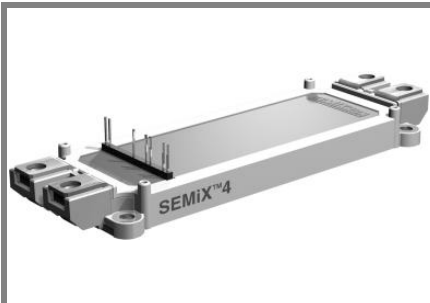


**GB**

Absolute Maximum Ratings		$T_c = 25\text{ °C}$ , unless otherwise specified		
Symbol	Conditions	Values		Units
<b>IGBT</b>				
$V_{CES}$	$T_j = 25\text{ °C}$	1700		V
$I_C$	$T_j = 150\text{ °C}$	$T_c = 25\text{ °C}$	565	A
		$T_c = 80\text{ °C}$	400	A
$I_{CRM}$	$I_{CRM}=2 \times I_{Cnom}$	800		A
$V_{GES}$		± 20		V
$t_{psc}$	$V_{CC} = 1200\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ °C}$ $V_{CES} < 1700\text{ V}$	10		µs
<b>Inverse Diode</b>				
$I_F$	$T_j = 150\text{ °C}$	$T_c = 25\text{ °C}$	735	A
		$T_c = 80\text{ °C}$	495	A
$I_{FRM}$	$I_{FRM}=2 \times I_{Fnom}$	800		A
$I_{FSM}$	$t_p = 10\text{ ms}; \sin.$	$T_j = 25\text{ °C}$	2700	A
<b>Module</b>				
$I_{t(RMS)}$		600		A
$T_{vj}$		- 40 ... + 150		°C
$T_{stg}$		- 40 ... + 125		°C
$V_{isol}$	AC, 1 min.	4000		V

Characteristics		$T_c = 25\text{ °C}$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 16\text{ mA}$	5,2	5,8	6,4	V
$I_{CES}$	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$	$T_j = 25\text{ °C}$	0,45		mA
		$T_j = 125\text{ °C}$			mA
$V_{CE0}$		$T_j = 25\text{ °C}$	1	1,2	V
		$T_j = 125\text{ °C}$	0,9	1,1	V
$r_{CE}$	$V_{GE} = 0\text{ V}$	$T_j = 25\text{ °C}$	2,5	3,1	mΩ
		$T_j = 125\text{ °C}$	3,9	4,5	mΩ
$V_{CE(sat)}$	$I_{Cnom} = 400\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}_{chiplev.}$	2	2,45	V
		$T_j = 125\text{ °C}_{chiplev.}$	2,45	2,9	V
$C_{ies}$		35,3		nF	
$C_{oes}$	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	1,5		nF
$C_{res}$		1,2		nF	
$Q_G$	$V_{GE} = -8\text{ V} \dots +15\text{ V}$	3750		nC	
$t_{d(on)}$	$R_{Gon} = 3\text{ }\Omega$	$V_{CC} = 1200V$ $I_{Cnom} = 400A$ $T_j = 125\text{ °C}$	360		ns
$t_r$			65		ns
$E_{on}$			215		mJ
$t_{d(off)}$	$R_{Goff} = 3\text{ }\Omega$	$T_j = 125\text{ °C}$	900		ns
$t_f$			165		ns
$E_{off}$			165		mJ
$R_{th(j-c)}$	per IGBT	0,058		K/W	

# SEMiX 604GB176HD



**SEMiX® 4**

## Trench IGBT Modules

### SEMiX 604GB176HD

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 welders

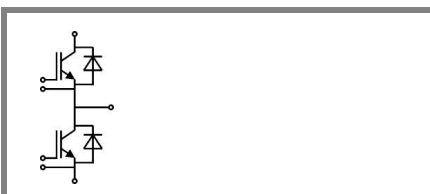
#### Remarks

- short circuit capability is tested @  $V_{CC}=1000V$  (all other static parameters are tested @  $V_{CC}=1200V$ )
- Not for new design

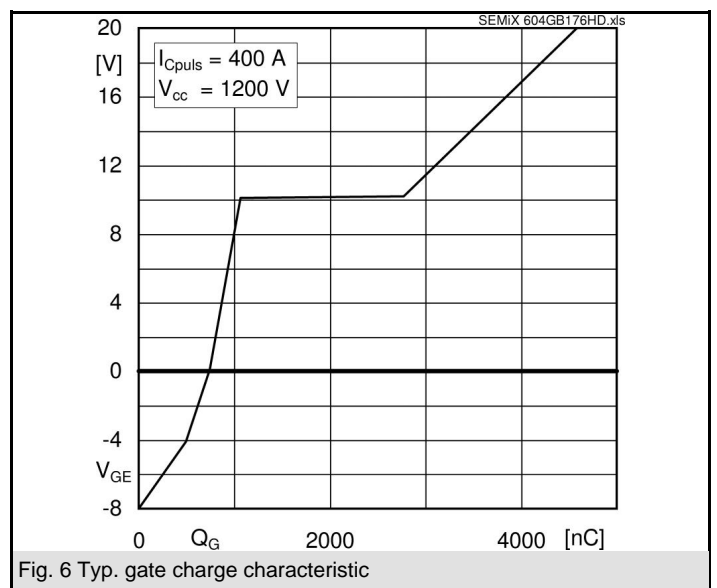
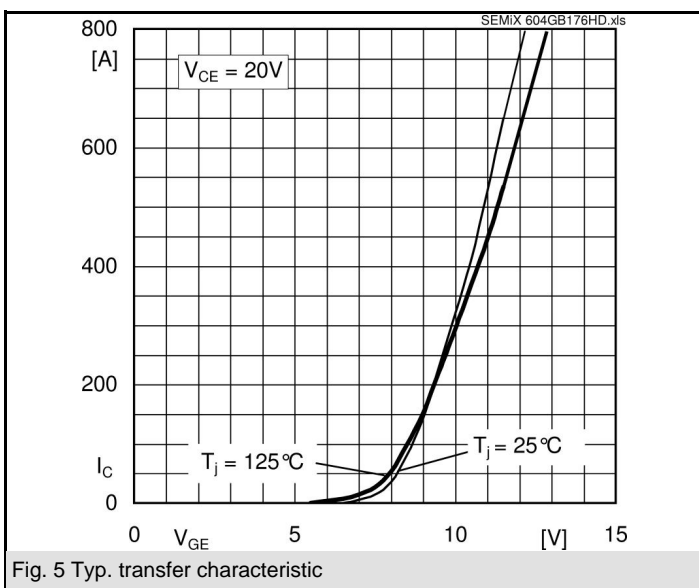
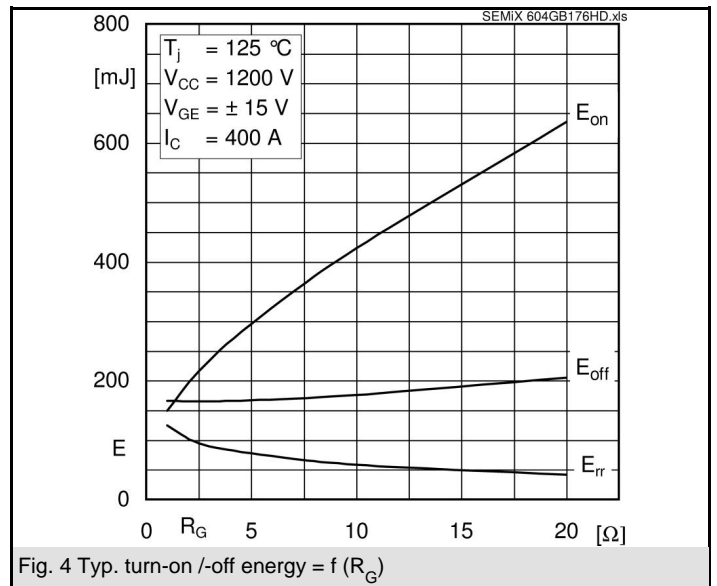
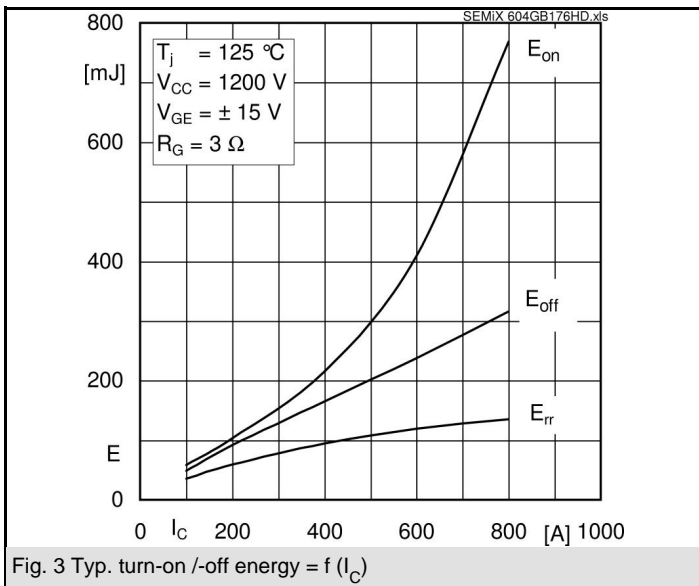
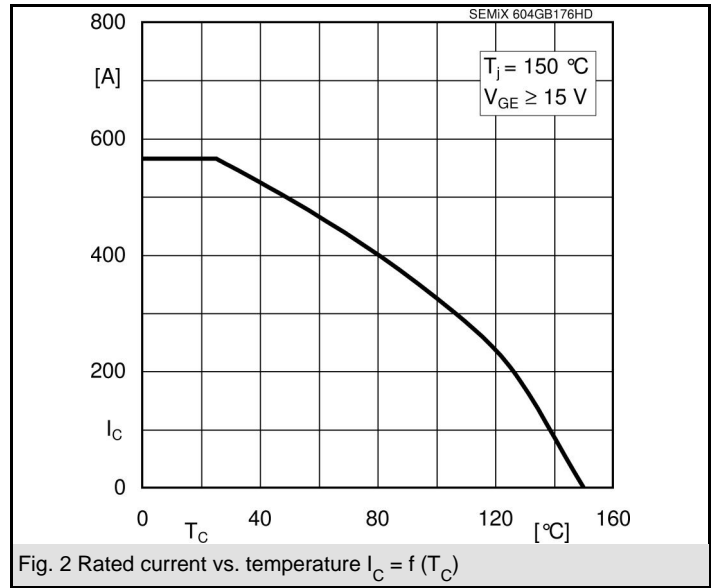
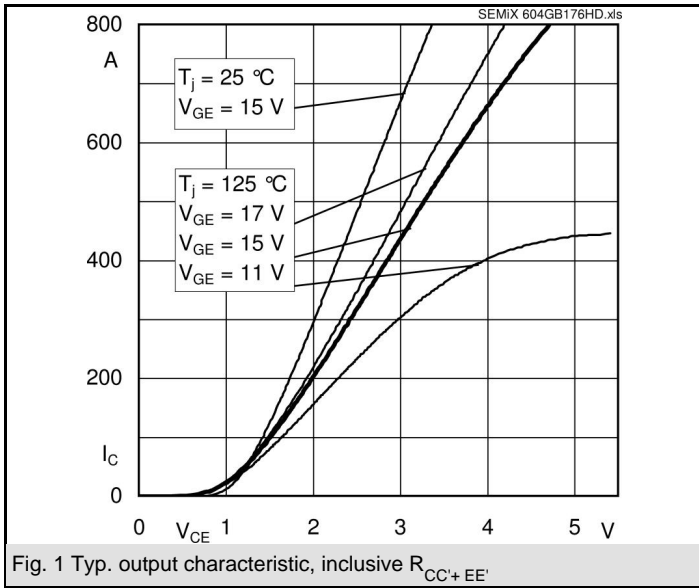
Characteristics		min.	typ.	max.	Units
<b>Inverse Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 400 A; V_{GE} = 0 V$		1,5	1,7	V
	$T_j = 25 ^\circ C_{chiplev.}$				
	$T_j = 125 ^\circ C_{chiplev.}$		1,45	1,65	V
$V_{F0}$			1,1	1,3	V
	$T_j = 25 ^\circ C$				
	$T_j = 125 ^\circ C$		0,9	1,1	V
$r_F$			1		mΩ
	$T_j = 25 ^\circ C$				
	$T_j = 125 ^\circ C$		1,3		mΩ
$I_{RRM}$	$I_{Fnom} = 400 A$		560		A
$Q_{rr}$	$di/dt = 6600 A/\mu s$		131		μC
$E_{rr}$	$V_{GE} = -15 V; V_{CC} = 1200 V$		95		mJ
$R_{th(j-c)D}$	per diode			0,081	K/W
<b>Module</b>					
$L_{CE}$			22		nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25 ^\circ C$	0,7		mΩ
		$T_{case} = 125 ^\circ C$	1		mΩ
$R_{th(c-s)}$	per module		0,03		K/W
$M_s$	to heat sink M5		3	5	Nm
$M_t$	to terminals M6		2,5	5	Nm
w				400	g
<b>Temperature sensor</b>					
$R_{100}$	$T_c = 100^\circ C (R_{25} = 5 k\Omega)$		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

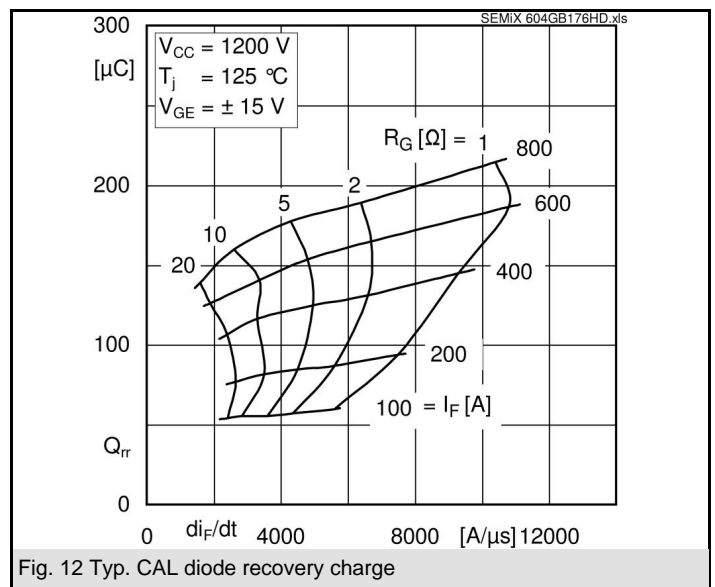
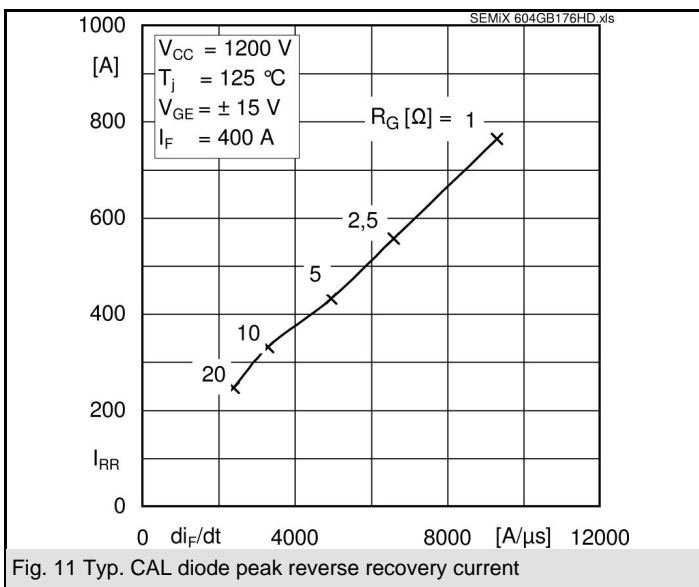
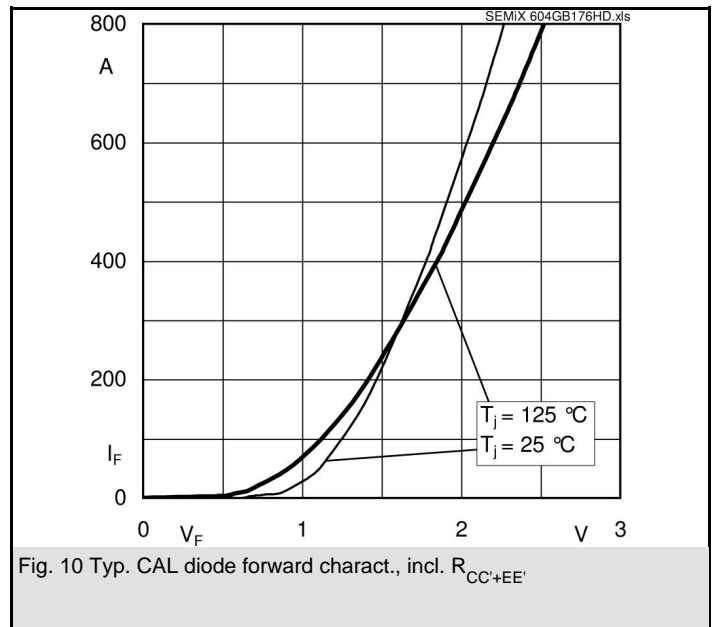
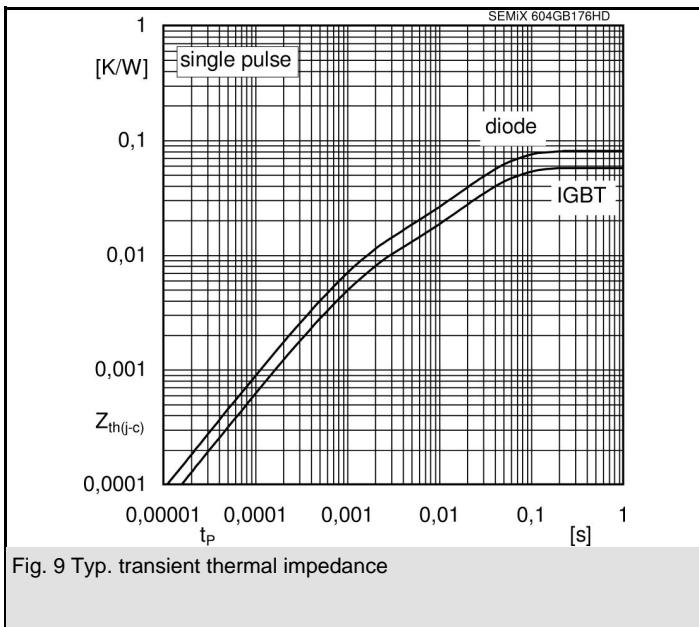
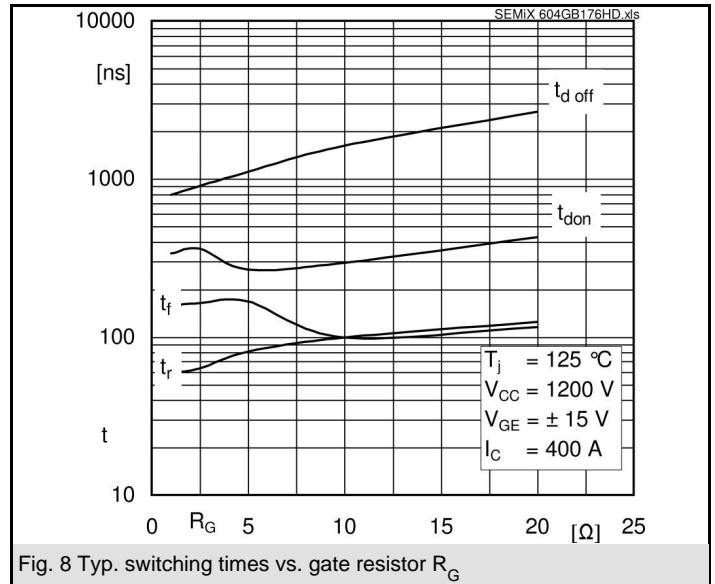
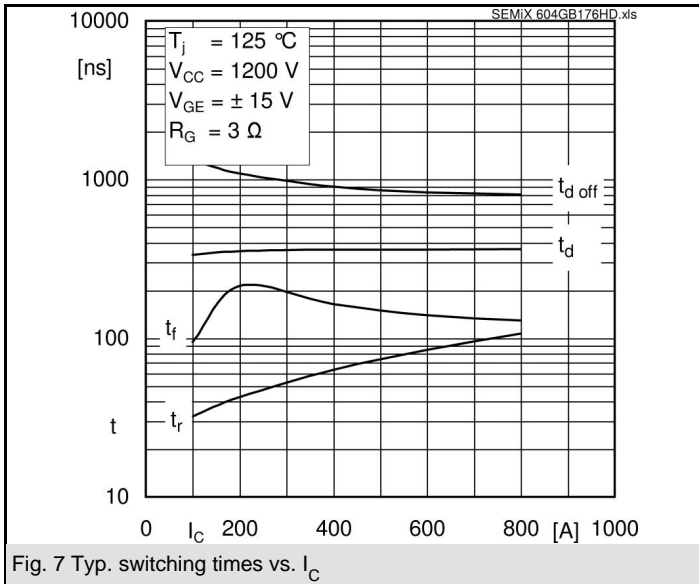
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.

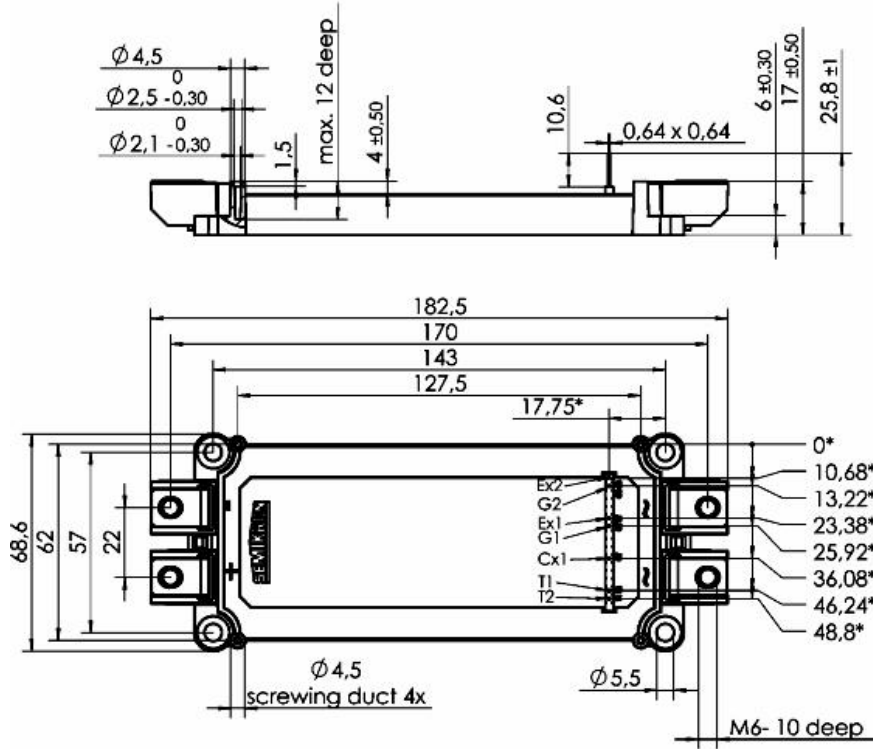


**GB**



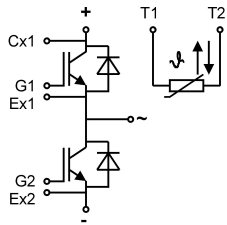


# SEMiX 604GB176HD



\*= all measures with  $\pm 0,5$

Case SEMiX 4



Pinout

GB