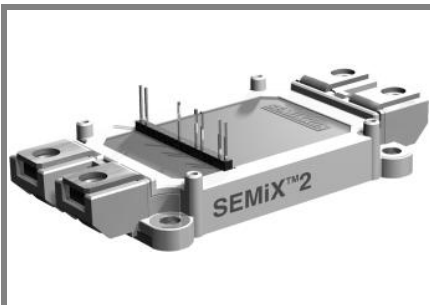


# SEMiX 452GB176HD



**SEMiX<sup>®</sup> 2**

## Trench IGBT Modules

### SEMiX 452GB176HD

Preliminary Data

#### Features

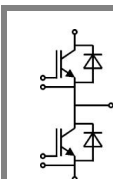
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$  with positive temperature coefficient
- High short circuit capability

#### 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

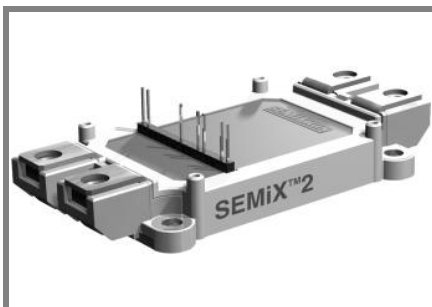


**GB**

Absolute Maximum Ratings		$T_{case} = 25^{\circ}C$ , unless otherwise specified		
Symbol	Conditions	Values		Units
<b>IGBT</b>				
$V_{CES}$	$T_j = 25^{\circ}C$	1700		V
$I_C$	$T_j = 150^{\circ}C$	$T_c = 25^{\circ}C$	435	A
		$T_c = 80^{\circ}C$	310	A
$I_{CRM}$	$I_{CRM} = 2 \times I_{Cnom}$	600		A
$V_{GES}$		$\pm 20$		V
$t_{psc}$	$V_{CC} = 1200V$ ; $V_{GE} \leq 20V$ ; $T_j = 125^{\circ}C$ $V_{CES} < 1700V$	10		$\mu s$
<b>Inverse Diode</b>				
$I_F$	$T_j = 150^{\circ}C$	$T_c = 25^{\circ}C$	385	A
		$T_c = 80^{\circ}C$	260	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$	600		A
$I_{FSM}$	$t_p = 10ms$ ; sin.	$T_j = 25^{\circ}C$	2200	A
<b>Module</b>				
$I_{t(RMS)}$		600		A
$T_{vj}$		- 40 ... + 150		$^{\circ}C$
$T_{stg}$		- 40 ... + 125		$^{\circ}C$
$V_{isol}$	AC, 1 min.	4000		V

Characteristics		$T_{case} = 25^{\circ}C$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}$ ; $I_C = 12mA$	5,2	5,8	6,4	V
$I_{CES}$	$V_{GE} = 0V$ ; $V_{CE} = V_{CES}$	$T_j = 25^{\circ}C$	0,45		mA
		$T_j = 125^{\circ}C$			mA
$V_{CE0}$		$T_j = 25^{\circ}C$	1	1,2	V
		$T_j = 125^{\circ}C$	0,9	1,1	V
$r_{CE}$	$V_{GE} = 15V$	$T_j = 25^{\circ}C$	3,3	4,2	m $\Omega$
		$T_j = 125^{\circ}C$	5,2	6	m $\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 300A$ ; $V_{GE} = 15V$	$T_j = 25^{\circ}C_{chiplev.}$	2	2,45	V
		$T_j = 125^{\circ}C_{chiplev.}$	2,45	2,9	V
$C_{ies}$	$V_{CE} = 25$ ; $V_{GE} = 0V$	26,4		nF	
$C_{oes}$		1,1		nF	
$C_{res}$		0,88		nF	
$Q_G$	$V_{GE} = -8V \dots +15V$	2800		nC	
$t_{d(on)}$	$R_{Gon} = 4\Omega$	$V_{CC} = 1200V$ $I_{Cnom} = 300A$	340		ns
$t_r$			75		ns
$E_{on}$	$R_{Goff} = 4\Omega$	$T_j = 125^{\circ}C$	180		mJ
$t_{d(off)}$			900		ns
$t_f$			105		ns
$E_{off}$			110		mJ
$R_{th(j-c)}$	per IGBT	0,073		K/W	

# SEMiX 452GB176HD



SEMiX<sup>®</sup> 2

## Trench IGBT Modules

### SEMiX 452GB176HD

Preliminary Data

#### Features

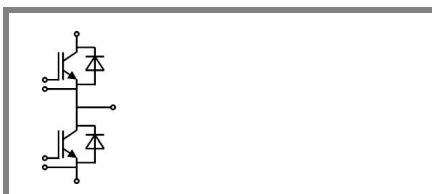
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$  with positive temperature coefficient
- High short circuit capability

#### 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

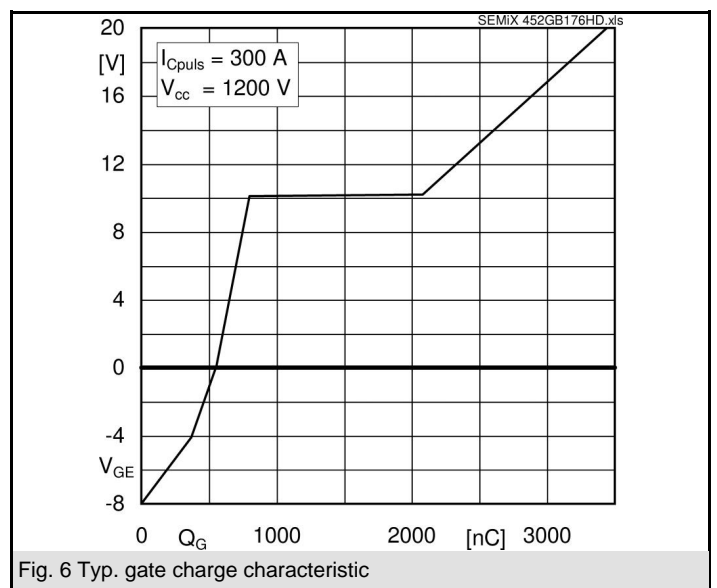
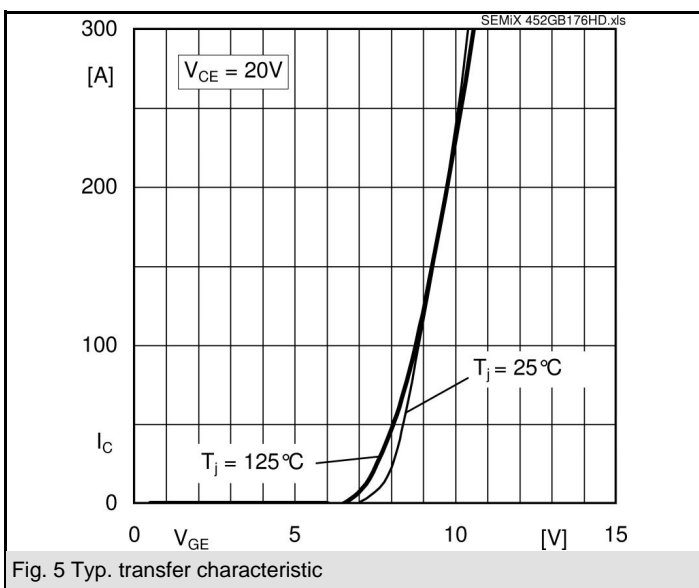
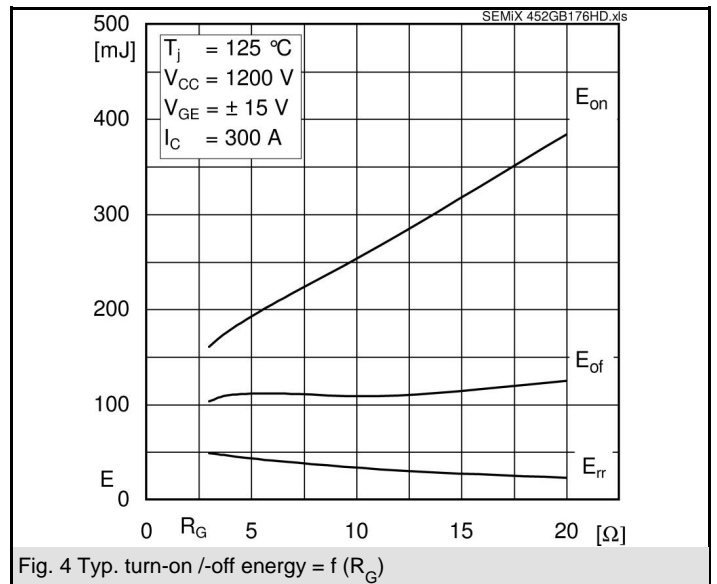
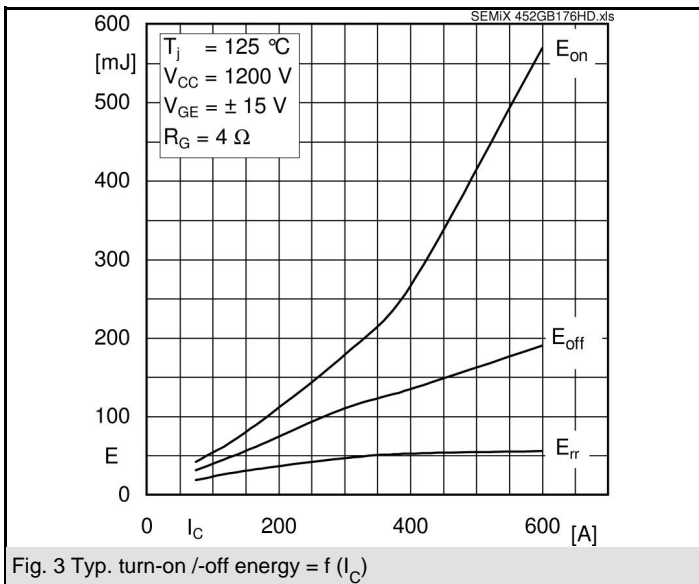
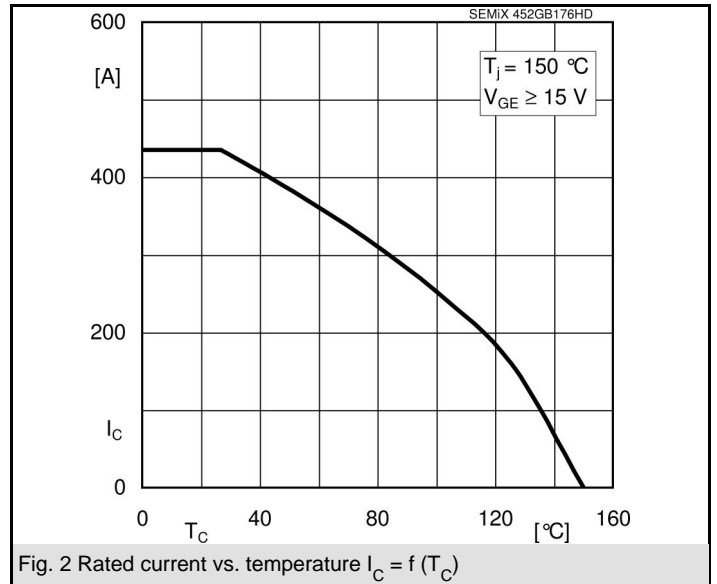
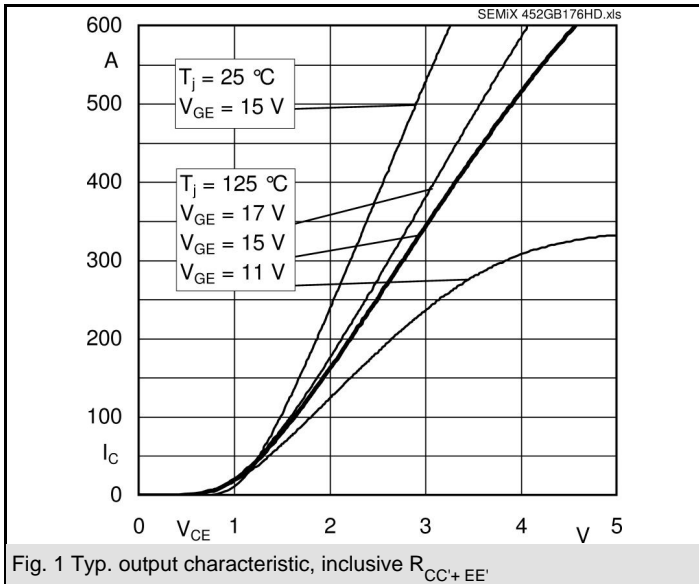


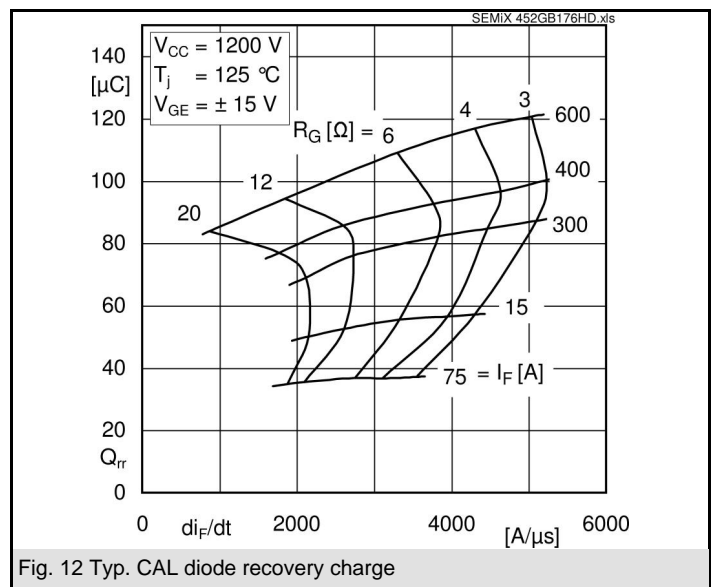
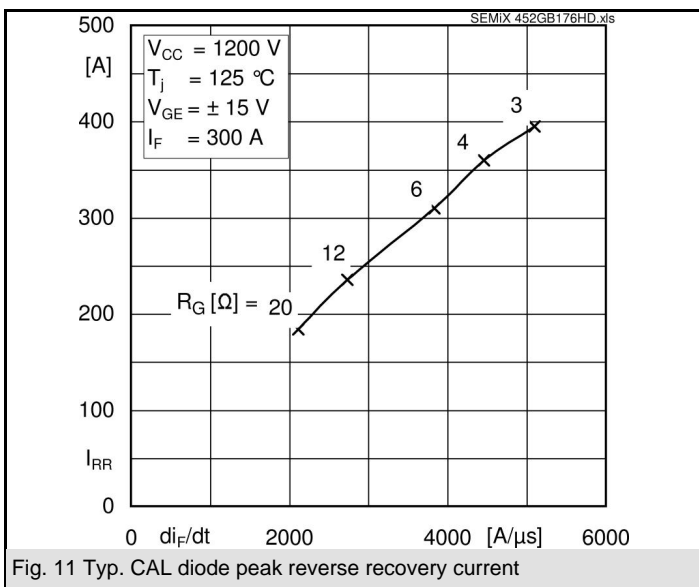
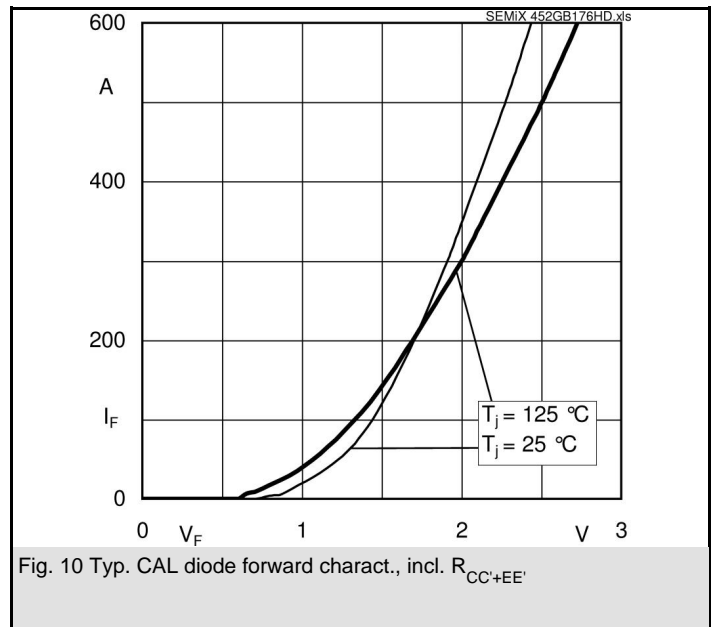
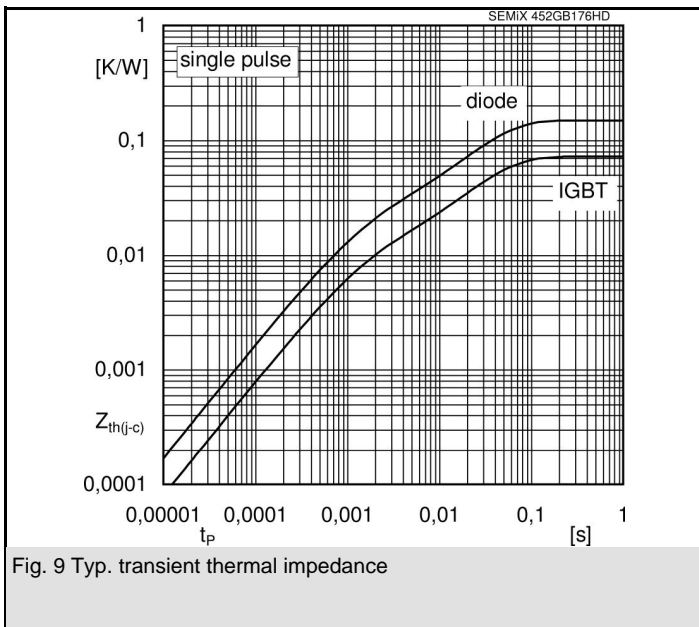
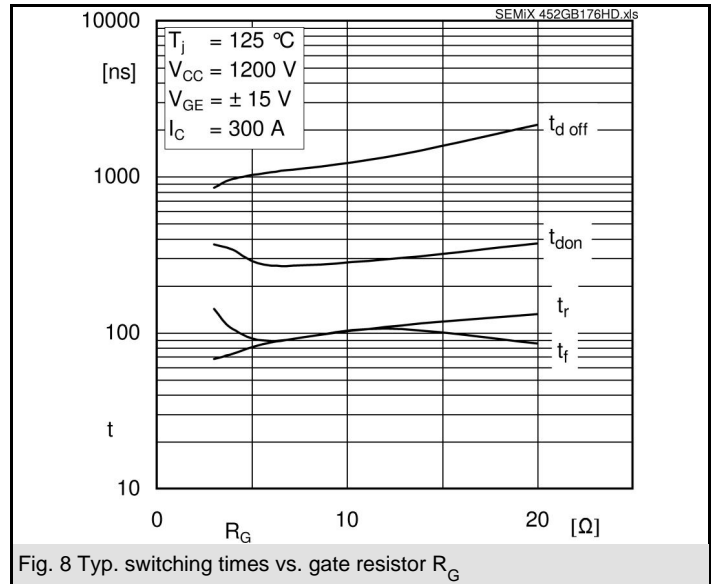
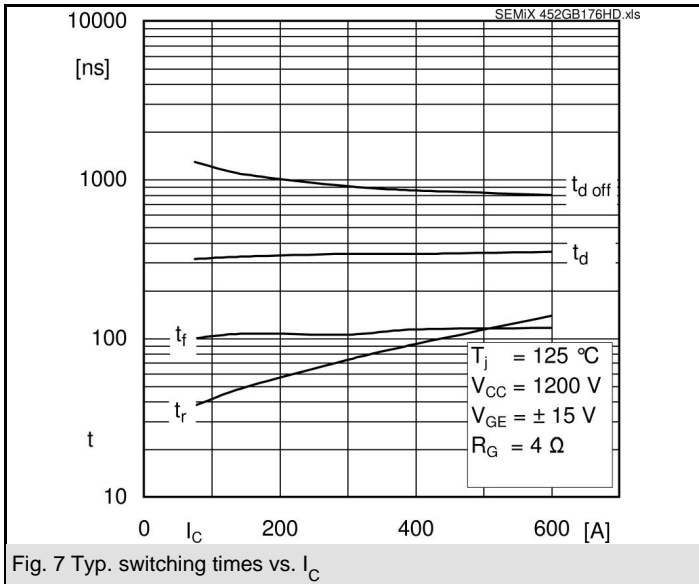
GB

Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
<b>Inverse Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 300 A; V_{GE} = 0 V$	$T_j = 25 ^\circ C_{chiplev.}$	1,7	1,9	V
		$T_j = 125 ^\circ C_{chiplev.}$	1,7	1,9	V
$V_{F0}$		$T_j = 25 ^\circ C$	1,1	1,3	V
		$T_j = 125 ^\circ C$	0,9	1,1	V
$r_F$		$T_j = 25 ^\circ C$	2		mΩ
		$T_j = 125 ^\circ C$	2,7		mΩ
$I_{RRM}$	$I_{Fnom} = 300 A$		360		A
$Q_{rr}$	$di/dt = 4500 A/\mu s$		85		μC
$E_{rr}$	$V_{GE} = -15 V; V_{CC} = 1200 V$		46		mJ
$R_{th(j-c)D}$	per diode			0,15	K/W
<b>Module</b>					
$L_{CE}$			18		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		0,045		K/W
$M_s$	to heat sink M5		3	5	Nm
$M_t$	to terminals M6		2,5	5	Nm
w				250	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.

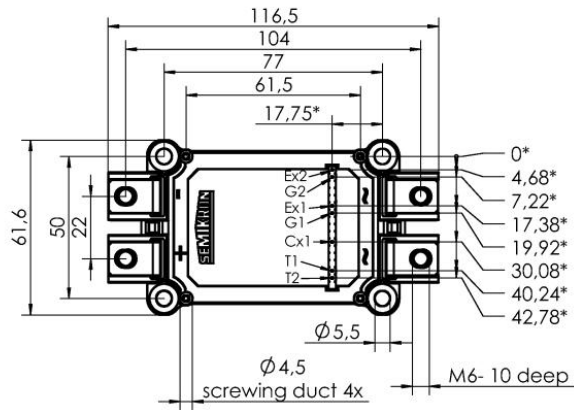
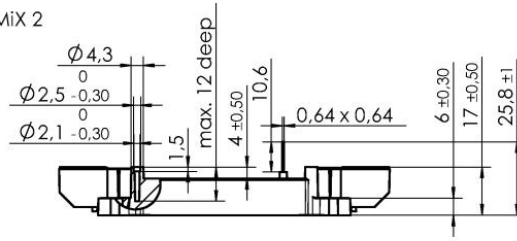
This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.





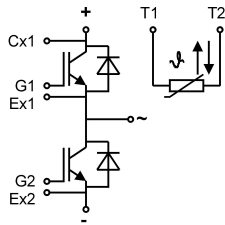
# SEMiX 452GB176HD

case: SEMiX 2



\*= all measures with  $\phi 0.5$

Case SEMiX 2



Pinout

GD