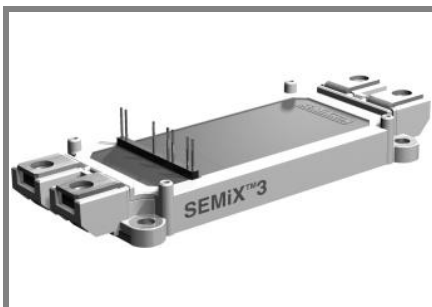


# SEMIX 403GB128D



SEMIX® 3

## SPT IGBT Modules

### SEMIX 403GB128D

Preliminary Data

#### Features

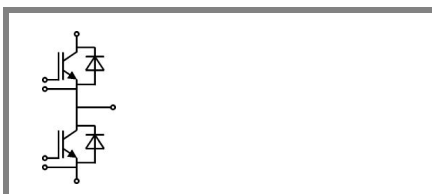
- Homogeneous Si
- SPT = Soft-Punch-Through technology
- $V_{CE(sat)}$  with positive temperature coefficient
- High short circuit capability

#### Typical Applications

- AC inverter drives
- UPS
- Electronic welders up to 20 kHz

#### Remarks

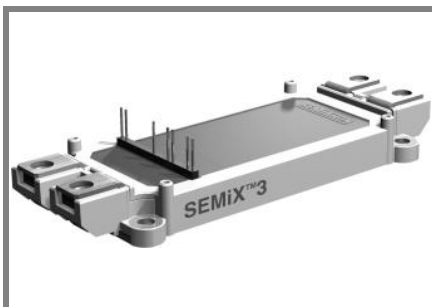
- Not for new design



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Absolute Maximum Ratings		$T_{case} = 25^{\circ}C$ , unless otherwise specified		
Symbol	Conditions	Values		Units
<b>IGBT</b>				
$V_{CES}$	$T_j = 25^{\circ}C$	1200		V
$I_C$	$T_j = 150^{\circ}C$	$T_{case} = 25^{\circ}C$	420	A
		$T_{case} = 80^{\circ}C$	300	A
$I_{CRM}$	$I_{CRM} = 2 \times I_{Cnom}$	450		A
$V_{GES}$		$\pm 20$		V
$t_{psc}$	$V_{CC} = 600 V$ ; $V_{GE} \leq 20 V$ ; $T_j = 125^{\circ}C$ $V_{CES} < 1200 V$	10		$\mu s$
<b>Inverse Diode</b>				
$I_F$	$T_j = 150^{\circ}C$	$T_{case} = 25^{\circ}C$	340	A
		$T_{case} = 80^{\circ}C$	235	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$	450		A
$I_{FSM}$	$t_p = 10 ms$ ; sin.	$T_j = 25^{\circ}C$	2000	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>						
$V_{GE(th)}$	$V_{GE} = V_{CE}$ , $I_C = 9 mA$	4,5	5	6,5	V	
$I_{CES}$	$V_{GE} = 0 V$ , $V_{CE} = V_{CES}$			0,3	mA	
$V_{CE0}$		$T_j = 25^{\circ}C$	1	1,15	V	
		$T_j = 125^{\circ}C$	0,9	1,05	V	
$r_{CE}$	$V_{GE} = 15 V$	$T_j = 25^{\circ}C$	4	5,3	m $\Omega$	
		$T_j = 125^{\circ}C$	5,3	6,7	m $\Omega$	
$V_{CE(sat)}$	$I_{Cnom} = 225 A$ , $V_{GE} = 15 V$	$T_j = 25^{\circ}C_{chiplev.}$	1,9	2,35	V	
		$T_j = 125^{\circ}C_{chiplev.}$	2,1	2,55	V	
$C_{ies}$	$V_{CE} = 25$ , $V_{GE} = 0 V$			20,8	nF	
$C_{oes}$				1,4	nF	
$C_{res}$				0,9	nF	
$Q_G$	$V_{GE} = -8 V \dots +15 V$			2150	nC	
$t_{d(on)}$	$R_{Gon} = 4 \Omega$	$V_{CC} = 600V$ $I_{Cnom} = 225A$			145	ns
$t_r$					60	ns
$E_{on}$	$R_{Goff} = 4 \Omega$	$T_j = 125^{\circ}C$			20	mJ
$t_{d(off)}$					575	ns
$t_f$					70	ns
$E_{off}$					23	mJ
$R_{th(j-c)}$	per IGBT			0,075	K/W	



**SEMiX® 3**

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- High short circuit capability

#### Typical Applications

- AC inverter drives
- UPS
- Electronic welders up to 20 kHz

#### Remarks

- Not for new design

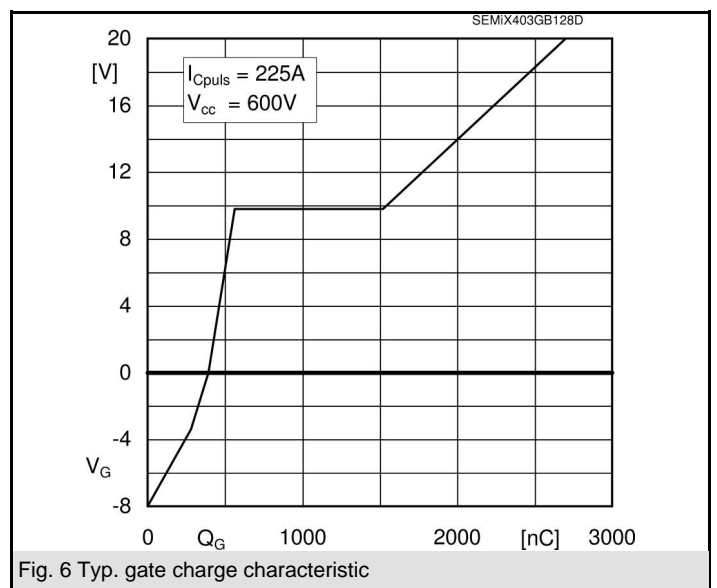
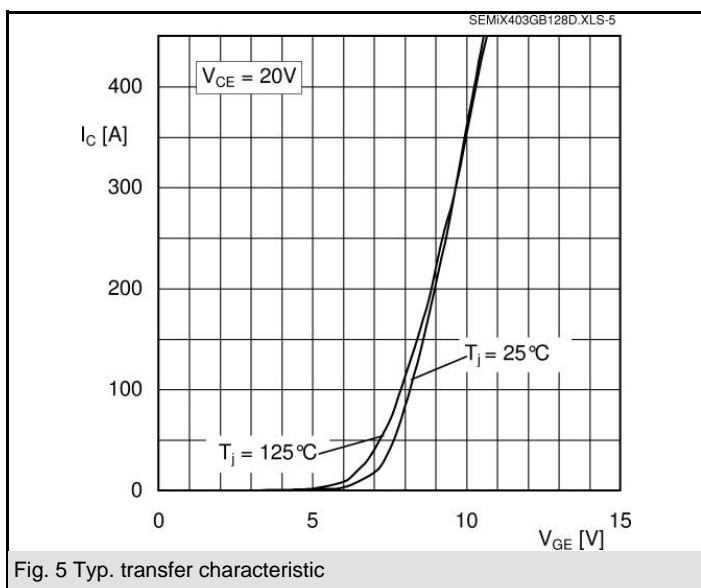
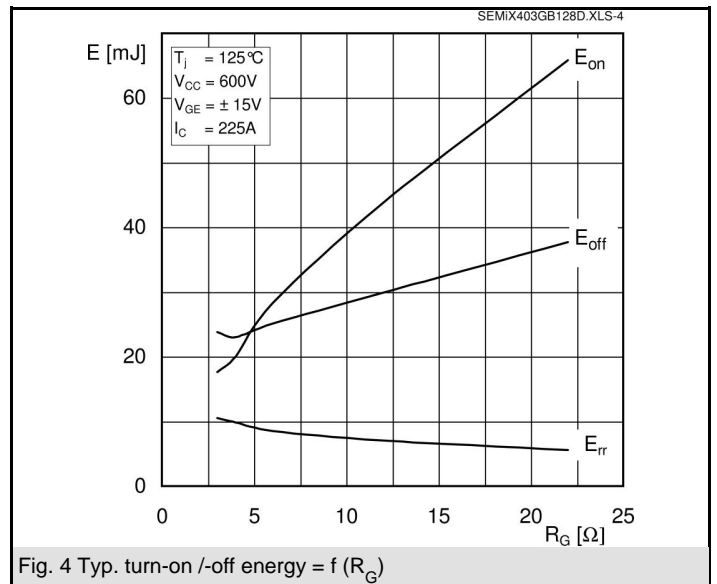
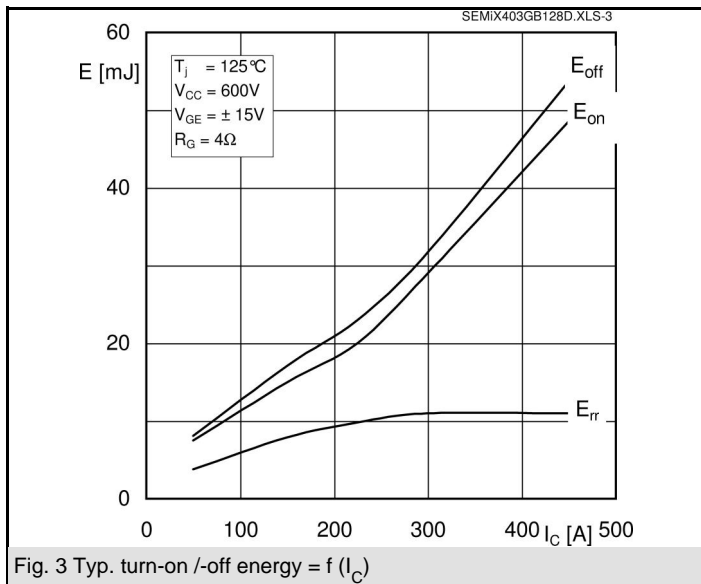
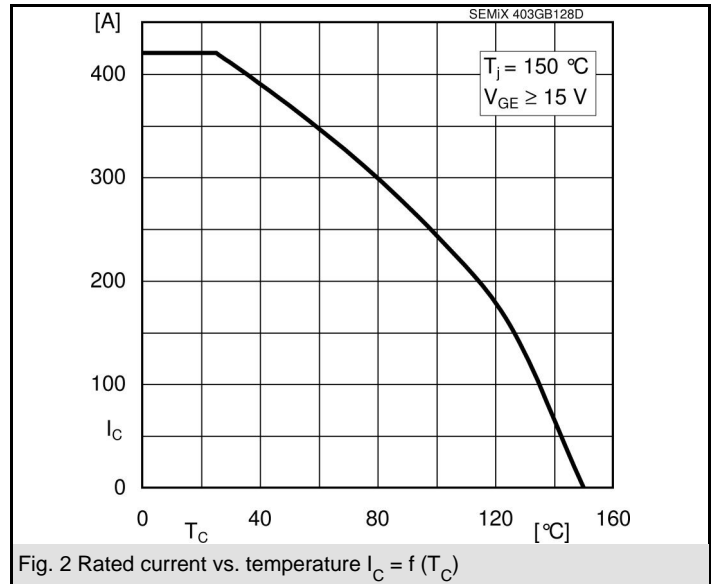
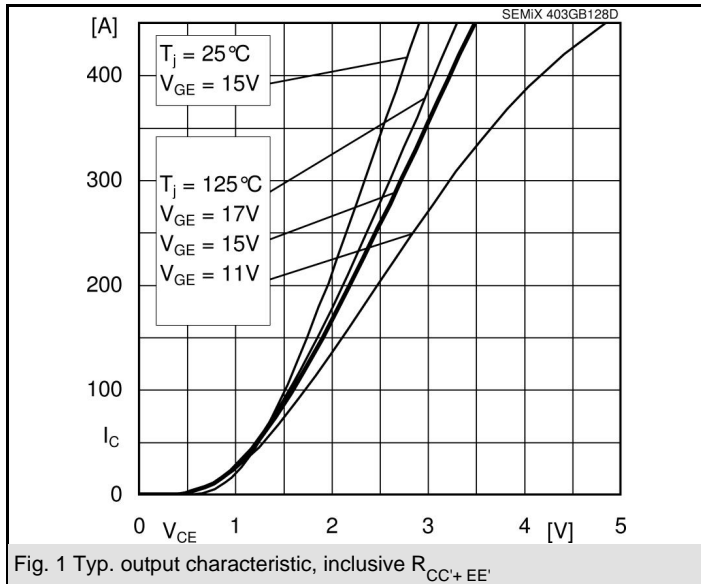


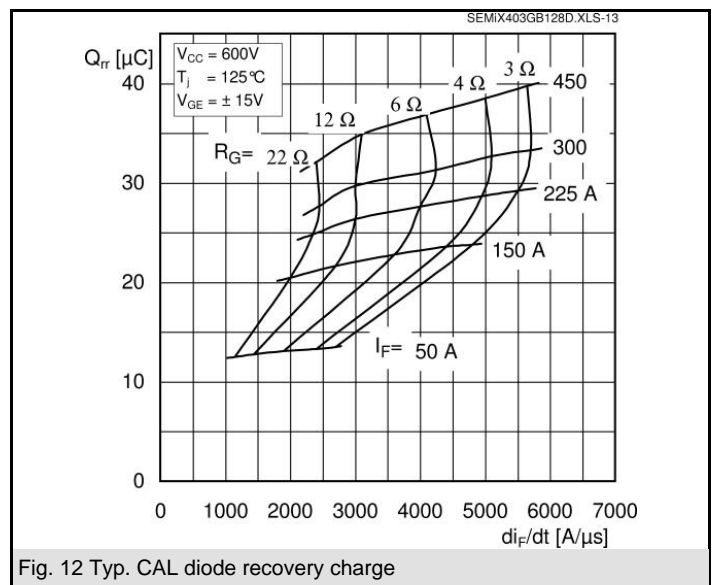
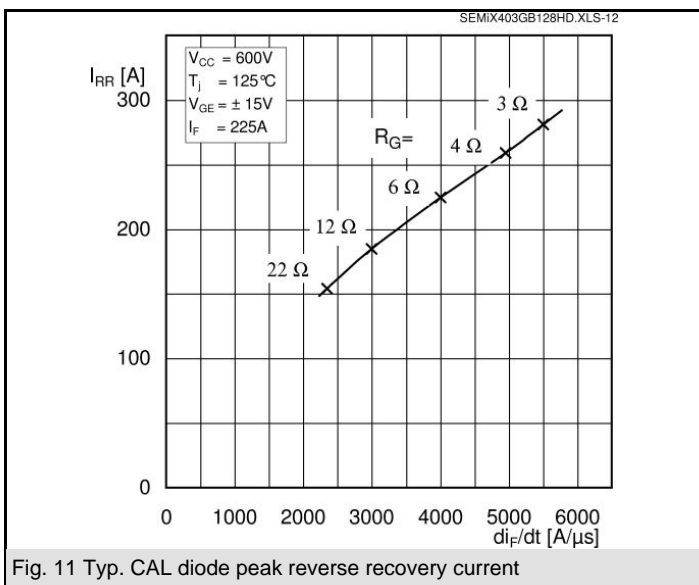
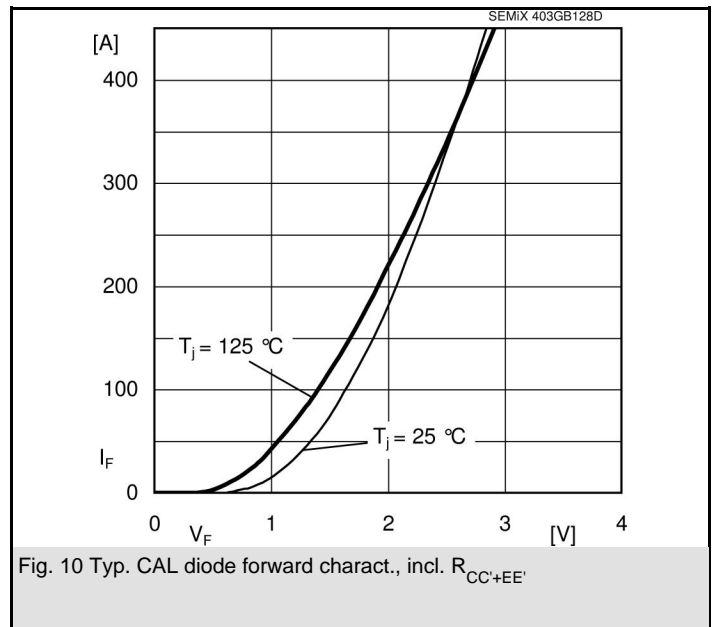
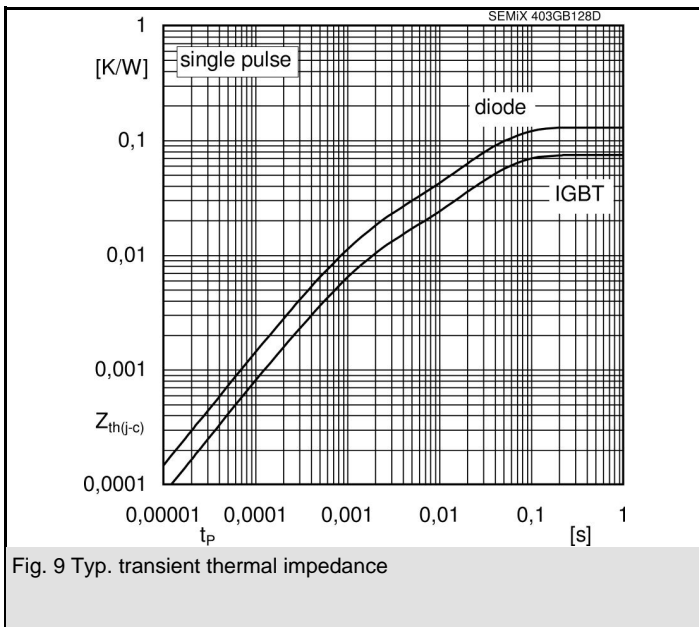
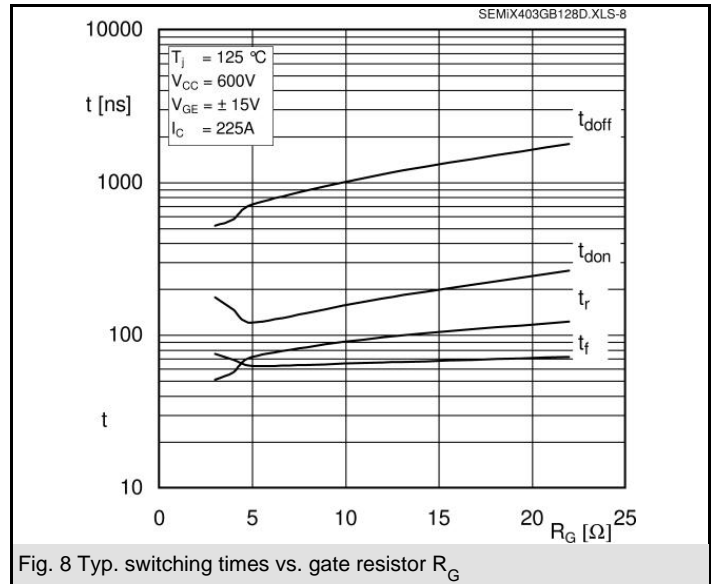
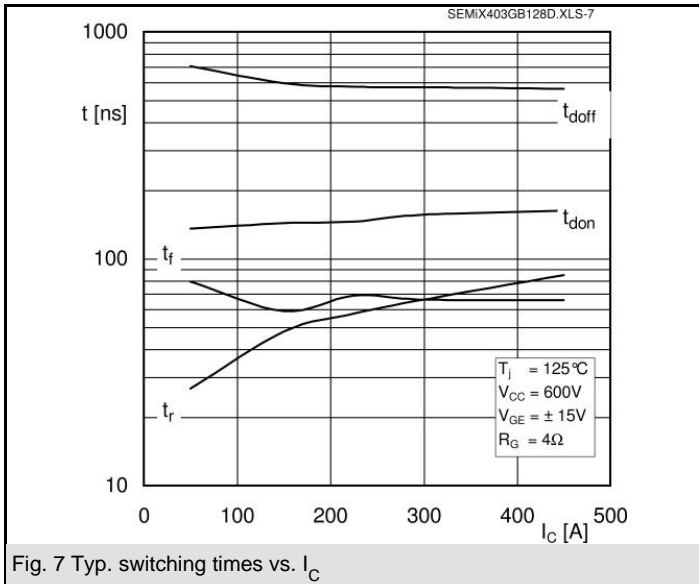
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Characteristics		min.	typ.	max.	Units
<b>Inverse Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 225 \text{ A}; V_{GE} = 0 \text{ V}$		2	2,5	V
	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$				
	$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$		1,8	2,3	V
$V_{F0}$			1,1	1,45	V
	$T_j = 25 \text{ }^\circ\text{C}$				
	$T_j = 125 \text{ }^\circ\text{C}$		0,85	1,2	V
$r_F$			4	4,7	mΩ
	$T_j = 25 \text{ }^\circ\text{C}$				
	$T_j = 125 \text{ }^\circ\text{C}$		4,2	4,9	mΩ
$I_{RRM}$	$I_{Fnom} = 225 \text{ A}$		260		A
$Q_{rr}$	$di/dt = 4950 \text{ A}/\mu\text{s}$		29		μC
$E_{rr}$	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$		10		mJ
$R_{th(j-c)D}$	per diode			0,13	K/W
<b>Module</b>					
$L_{CE}$			20		nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25 \text{ }^\circ\text{C}$	0,7		mΩ
		$T_{case} = 125 \text{ }^\circ\text{C}$	1		mΩ
$R_{th(c-s)}$	per module		0,04		K/W
$M_s$	to heat sink (M5)		3	5	Nm
$M_t$	to terminals (M6)		2,5	5	Nm
w				300	g
<b>Temperature sensor</b>					
$R_{100}$	$T_c = 100 \text{ }^\circ\text{C}$ ( $R_{25} = 5 \text{ k}\Omega$ )		0,493±5%		kΩ
$B_{100/125}$	$R(T) = R_{100} \exp[B_{100/125} (1/T - 1/T_{100})]$ ; $T[\text{K}]; B$		3550±2%		K

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

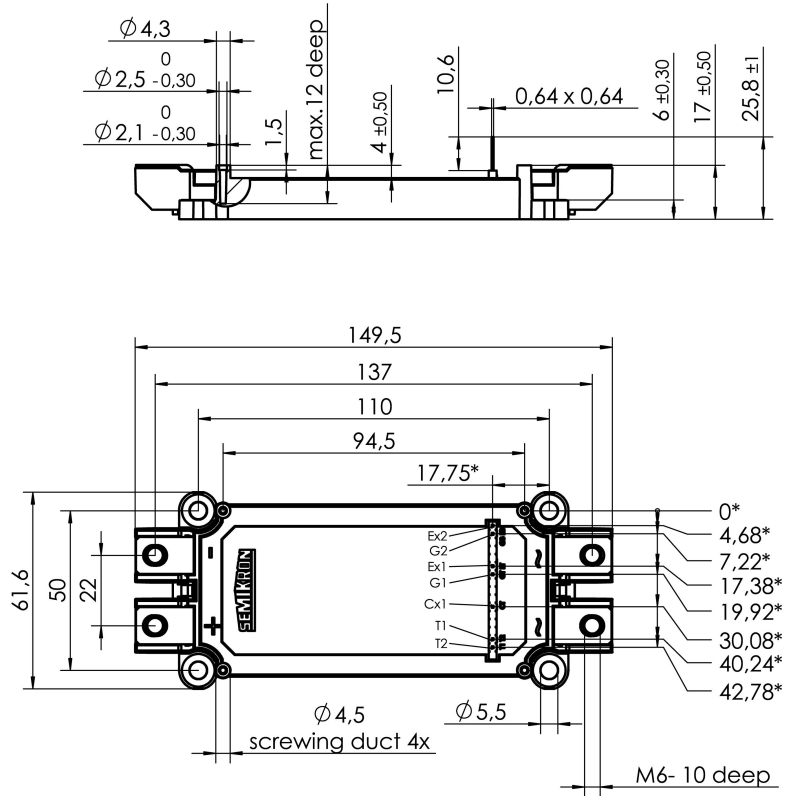
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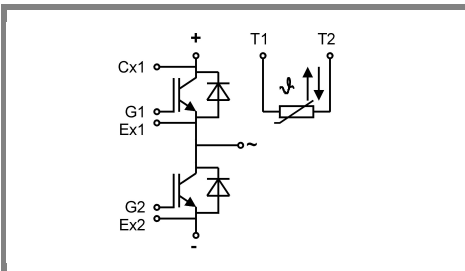
# SEMiX 403GB128D

case: SEMiX 3



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

Case SEMiX 3



Pinout

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