

SEMiX 553GB128D

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SEMiX® 3

SPT IGBT Modules

SEMiX 553GB128D

Preliminary Data

Features

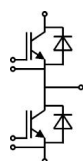
- Homogeneous Si
- SPT = Soft-Punch-Through technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability

Typical Applications

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

Remarks

- Not for new design

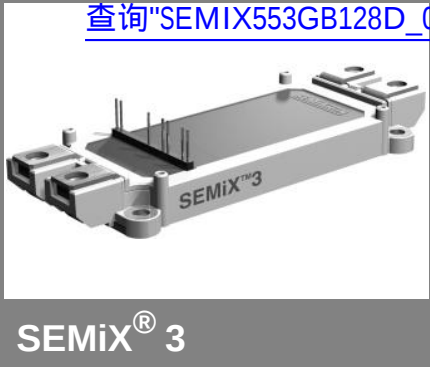


GB

Absolute Maximum Ratings		$T_{case} = 25^{\circ}C$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25^{\circ}C$	1200		V
I_C	$T_j = 150^{\circ}C$	$T_{case} = 25^{\circ}C$	535	A
		$T_{case} = 80^{\circ}C$	380	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	600		A
V_{GES}		± 20		V
t_{psc}	$V_{CC} = 600 V$; $V_{GE} \leq 20 V$; $T_j = 125^{\circ}C$ $V_{CES} < 1200 V$	10		μs
Inverse Diode				
I_F	$T_j = 150^{\circ}C$	$T_{case} = 25^{\circ}C$	420	A
		$T_{case} = 80^{\circ}C$	285	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	600		A
I_{FSM}	$t_p = 10 ms$; sin. $T_j = 25^{\circ}C$	2300		A
Module				
$I_{t(RMS)}$		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°C, unless otherwise specified			
Symbol	Conditions		min.	typ.	max.	Units
IGBT						
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 12 mA		4,5	5	6,5	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES} T _J = 25 °C				0,3	mA
V _{CE0}	T _J = 25 °C			1	1,15	V
	T _J = 125 °C			0,9	1,05	V
r _{CE}	V _{GE} = 15 V	T _J = 25°C		3	4	mΩ
		T _J = 125°C		4	5	mΩ
V _{CE(sat)}	I _{Cnom} = 300 A, V _{GE} = 15 V	T _J = 25°C _{chiplev.}		1,9	2,35	V
		T _J = 125°C _{chiplev.}		2,1	2,55	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V	f = 1 MHz		28,3		nF
C _{oes}				1,9		nF
C _{res}				1,2		nF
Q _G	V _{GE} = -8 V ... +15 V			2900		nC
t _{d(on)}	R _{Gon} = 3 Ω	V _{CC} = 600V I _{Cnom} = 300A		185		ns
t _r				65		ns
E _{on}	R _{Goff} = 3 Ω	T _J = 125 °C		27		mJ
t _{d(off)}				635		ns
t _f				80		ns
E _{off}				33		mJ
R _{th(j-c)}	per IGBT				0,061	K/W

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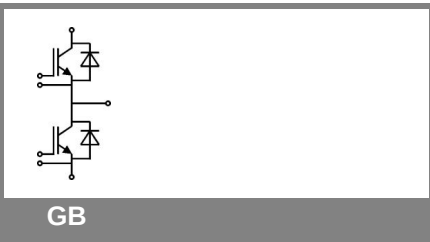
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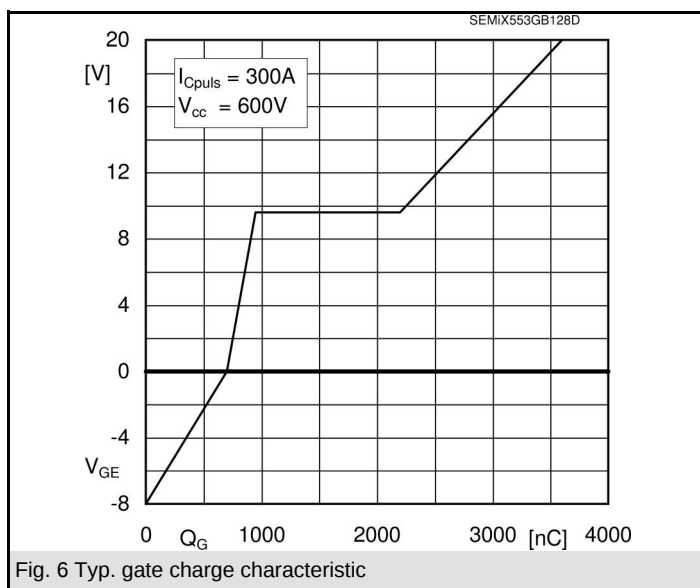
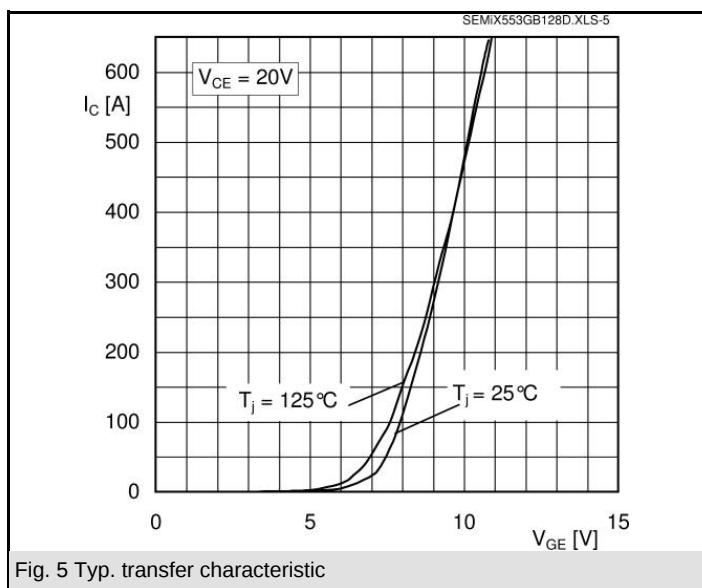
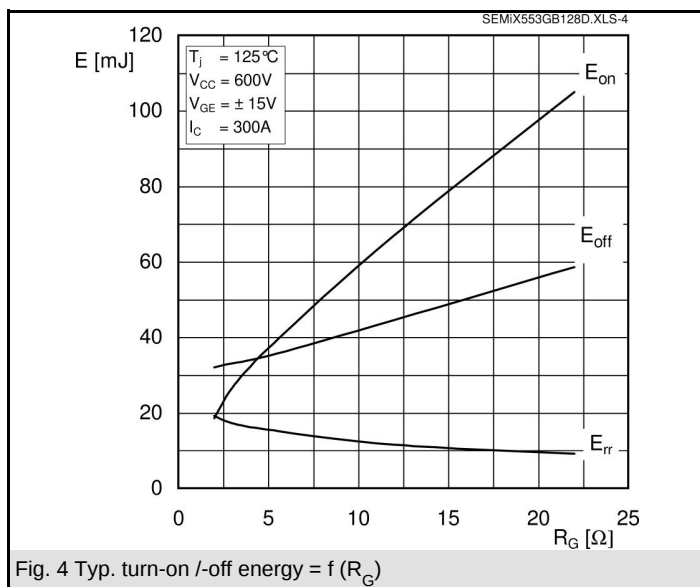
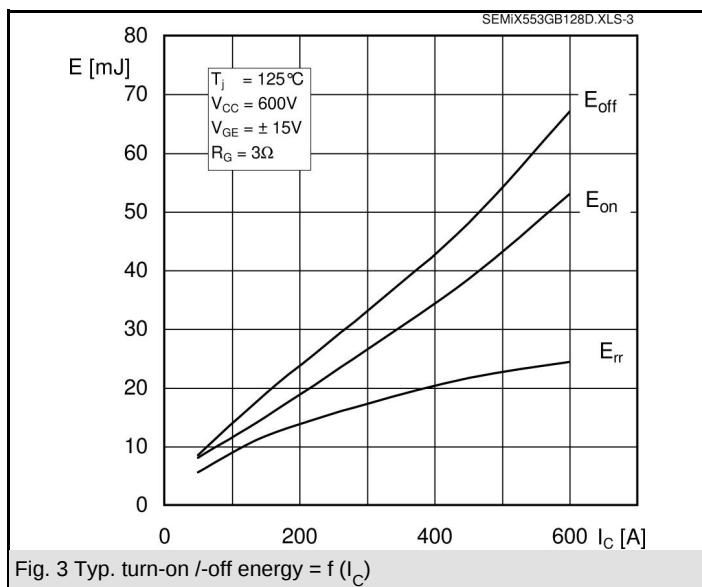
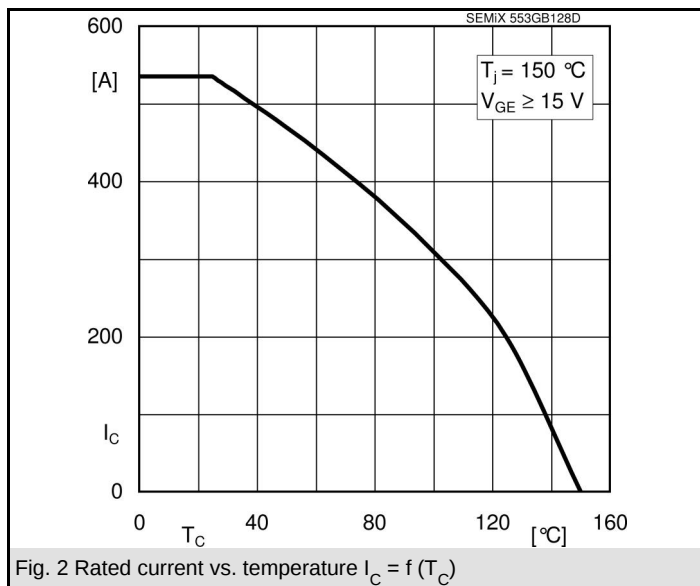
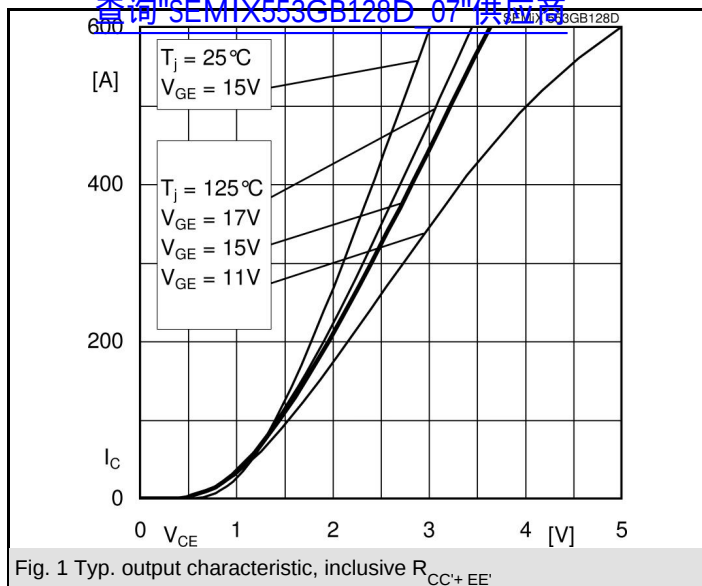


Characteristics					
Symbol	Conditions		min.	typ.	max. Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 300\text{ A}$; $V_{GE} = 0\text{ V}$	$T_j = 25\text{ }^{\circ}\text{C}_{chiplev.}$		2	2,5 V
		$T_j = 125\text{ }^{\circ}\text{C}_{chiplev.}$		1,8	2,3 V
V_{F0}		$T_j = 25\text{ }^{\circ}\text{C}$		1,1	1,45 V
		$T_j = 125\text{ }^{\circ}\text{C}$		0,85	1,2 V
r_F		$T_j = 25\text{ }^{\circ}\text{C}$		3	3,5 mΩ
		$T_j = 125\text{ }^{\circ}\text{C}$		3,2	3,7 mΩ
I_{RRM}	$I_{Fnom} = 300\text{ A}$	$T_j = 125\text{ }^{\circ}\text{C}$		325	A
Q_{rr}	$di/dt = 5400\text{ A}/\mu\text{s}$			46	μC
E_{rr}	$V_{GE} = -15\text{ V}$; $V_{CC} = 600\text{ V}$			17	mJ
$R_{th(j-c)D}$	per diode			0,11	K/W
Module					
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
Temperature sensor					
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

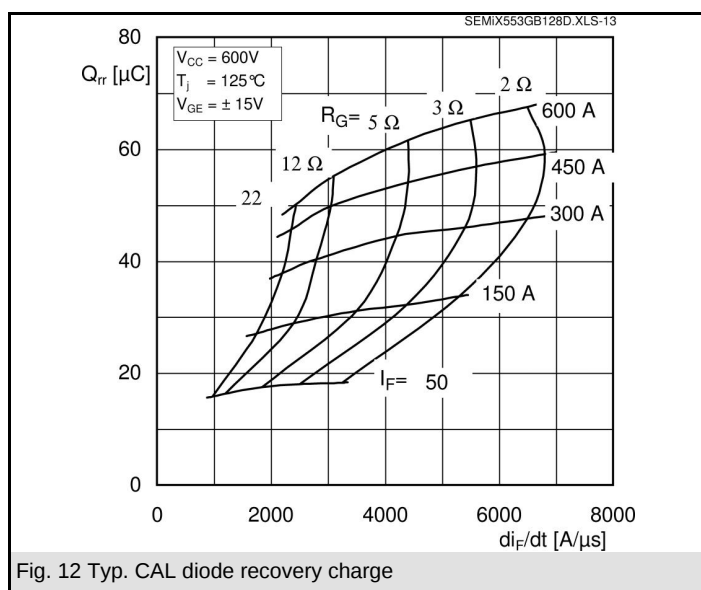
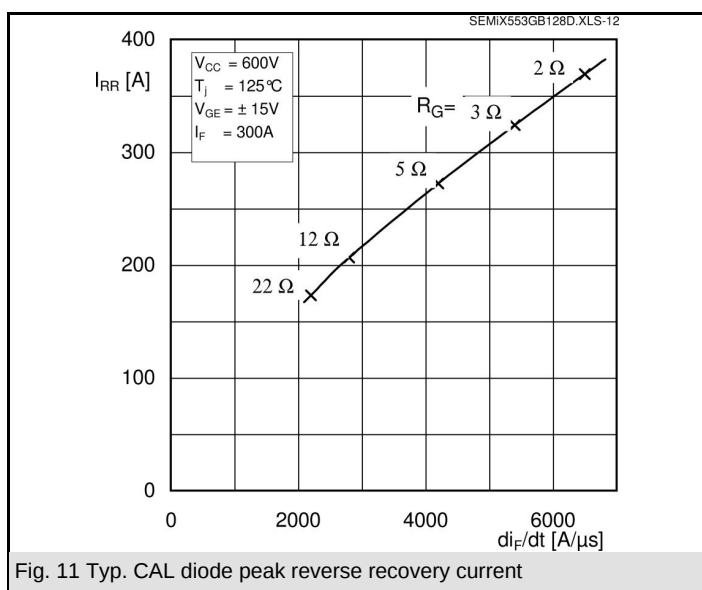
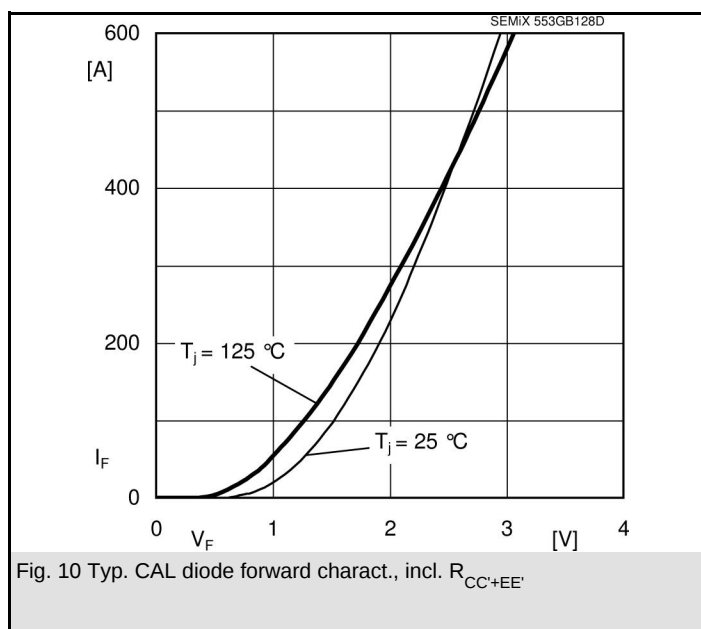
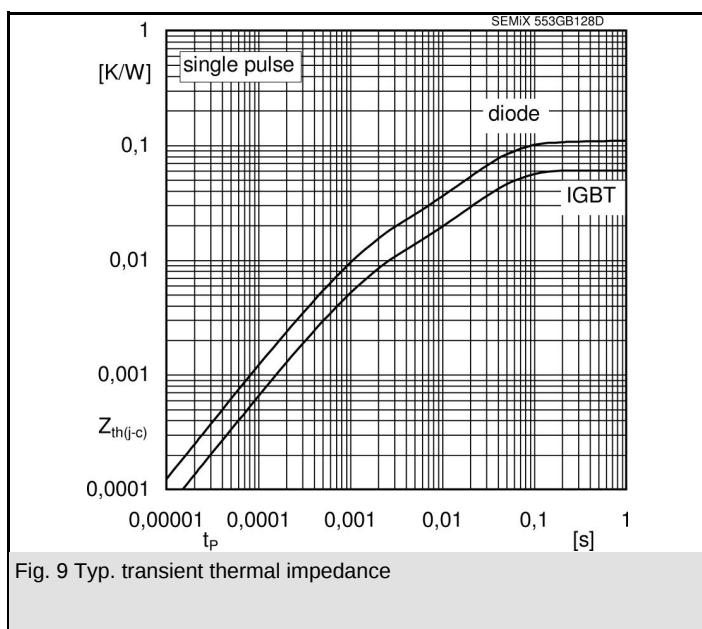
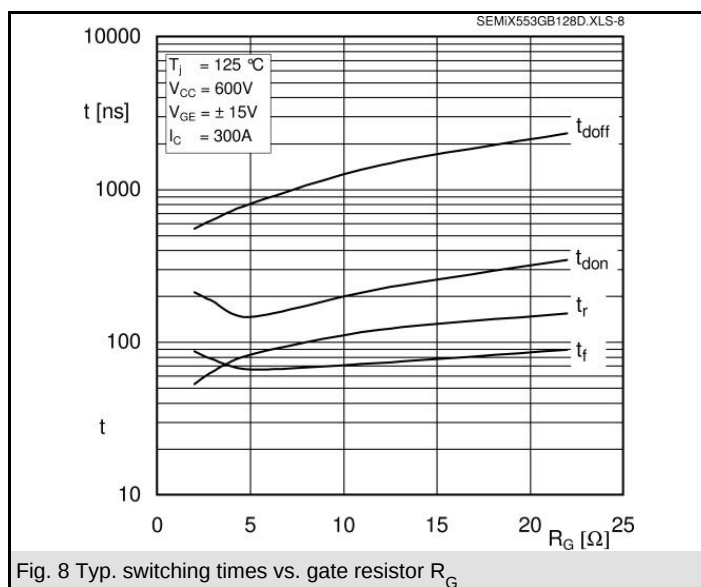
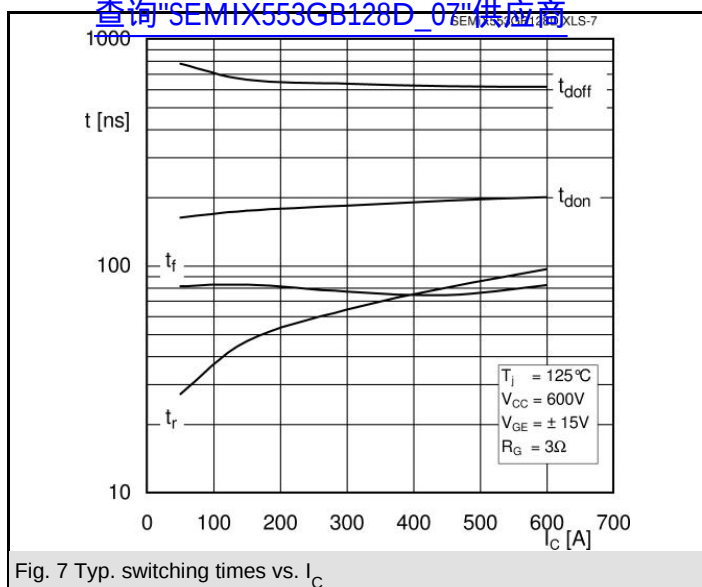
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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

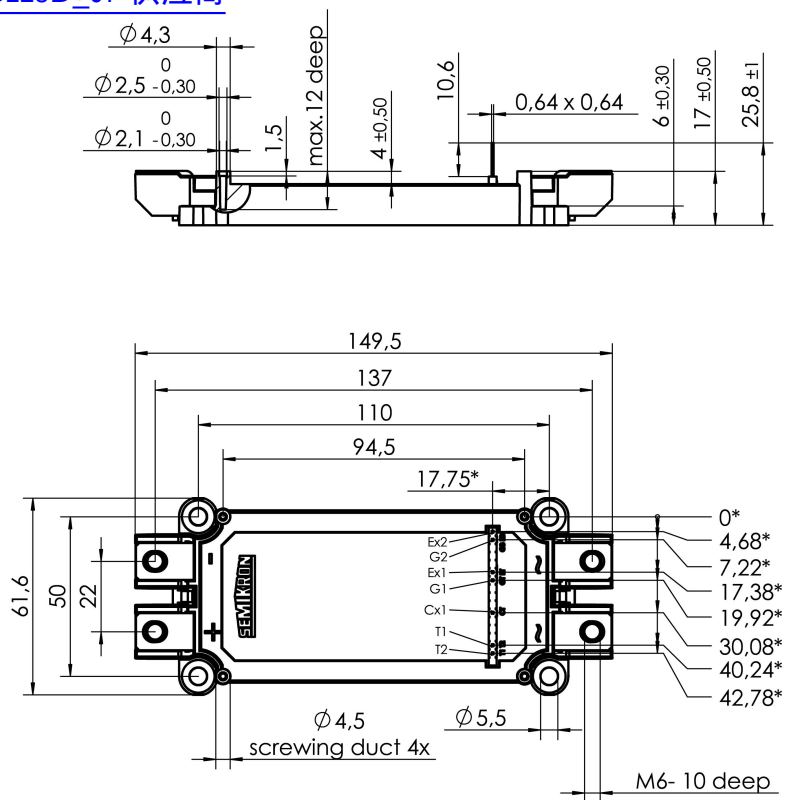
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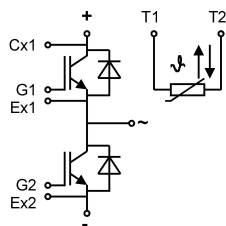


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* = all measures with $\pm 0,5$

Case SEMiX 3



Pinout

GB