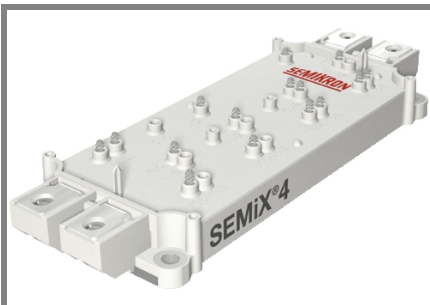


# SEMiX 404GB12T4s



**SEMiX® 4s**

## Trench IGBT Modules

### SEMiX 404GB12T4s

#### Target Data

#### Features

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

#### Typical Applications

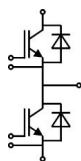
- AC inverter drives
- UPS
- Electronic Welding

#### Remarks

- Case temperature limited to  $T_C=125^\circ\text{C}$  max.
- Product reliability results are valid for  $T_j=150^\circ\text{C}$

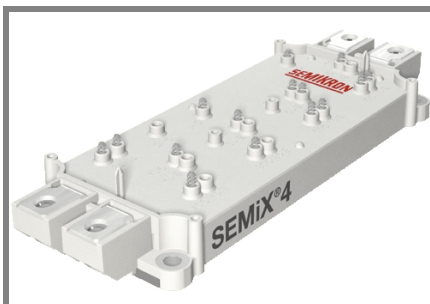
Absolute Maximum Ratings		$T_{case} = 25^\circ\text{C}$ , unless otherwise specified		
Symbol	Conditions	Values	Units	
<b>IGBT</b>				
$V_{CES}$	$T_j = 25^\circ\text{C}$	1200	V	
$I_C$	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	615	A
		$T_c = 80^\circ\text{C}$	475	A
$I_{CRM}$	$I_{CRM}=3 \times I_{Cnom}$	1200	A	
$V_{GES}$		$\pm 20$	V	
$t_{psc}$	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 150^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10	$\mu\text{s}$	
<b>Inverse Diode</b>				
$I_F$	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	440	A
		$T_c = 80^\circ\text{C}$	330	A
$I_{FRM}$	$I_{FRM}=3 \times I_{Fnom}$	1200	A	
<b>Module</b>				
$I_{t(RMS)}$		600	A	
$T_{vj}$		- 40 ... + 175	$^\circ\text{C}$	
$T_{stg}$		- 40 ... + 125	$^\circ\text{C}$	
$V_{isol}$	AC, 1 min.	4000	V	

Characteristics		$T_{case} = 25^\circ\text{C}$ , 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	5,8	6,5	V
$I_{CES}$	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$				$T_j = 25^\circ\text{C}$ mA
$V_{CE0}$					$T_j = 25^\circ\text{C}$
					$T_j = 150^\circ\text{C}$
$r_{CE}$	$V_{GE} = 15\text{ V}$				$T_j = 25^\circ\text{C}$
					$T_j = 150^\circ\text{C}$
$V_{CE(sat)}$	$I_{Cnom} = 400\text{ A}, V_{GE} = 15\text{ V}$				$T_j = 25^\circ\text{C}_{chiplev.}$
					$T_j = 150^\circ\text{C}_{chiplev.}$
$C_{ies}$	$V_{CE} = 25, V_{GE} = 0\text{ V}$				24,8
$C_{oes}$					1,7
$C_{res}$					1,4
$Q_G$	$V_{GE} = -8 \dots +15\text{ V}$				2300
$R_{Gint}$	$T_j = 25^\circ\text{C}$				1,9
$t_{d(on)}$	$R_{Gon} = \Omega$				45
$t_r$					
$E_{on}$					
$t_{d(off)}$	$R_{Goff} = \Omega$				45
$t_f$					
$E_{off}$					
$R_{th(j-c)}$	per IGBT				0,072



**GB**

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#### Typical Applications

- AC inverter drives
- UPS
- Electronic Welding

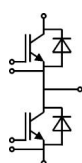
#### Remarks

- Case temperature limited to  $T_C=125^\circ\text{C}$  max.
- Product reliability results are valid for  $T_j=150^\circ\text{C}$

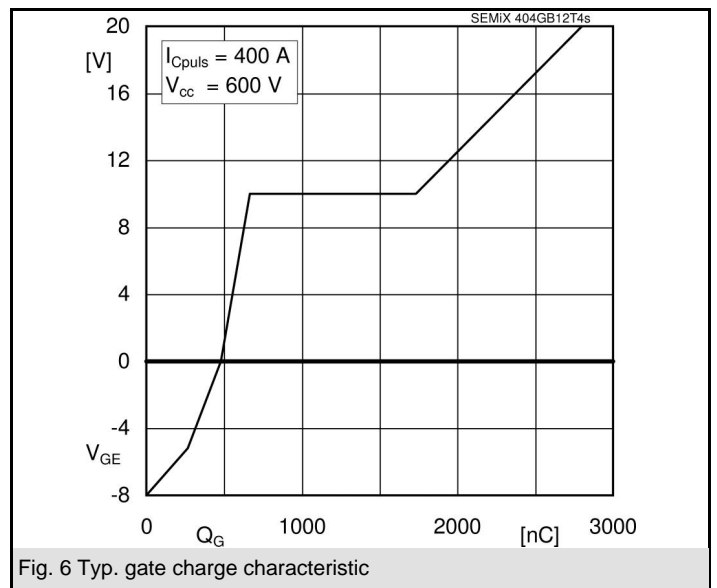
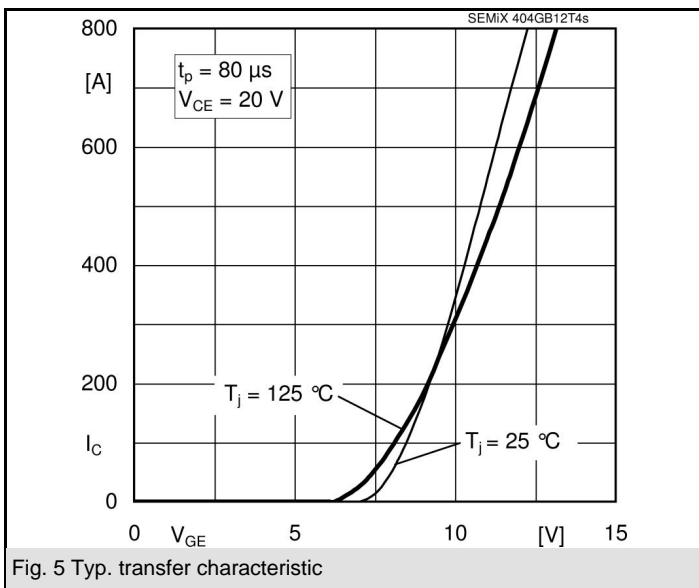
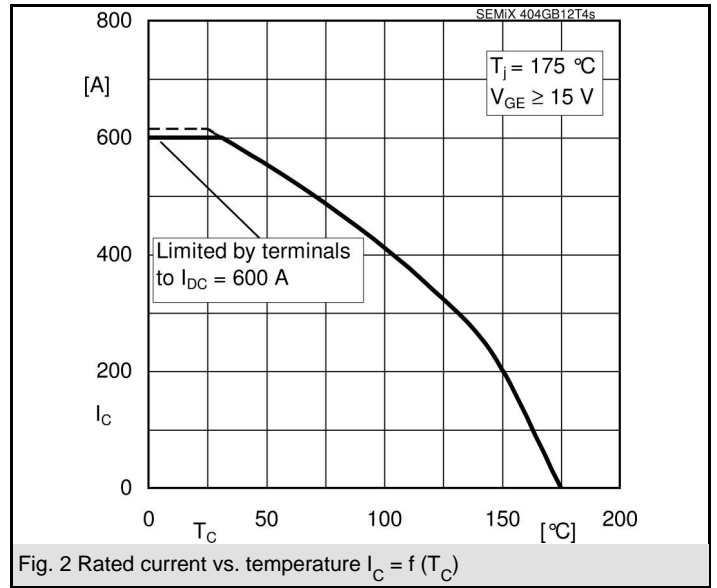
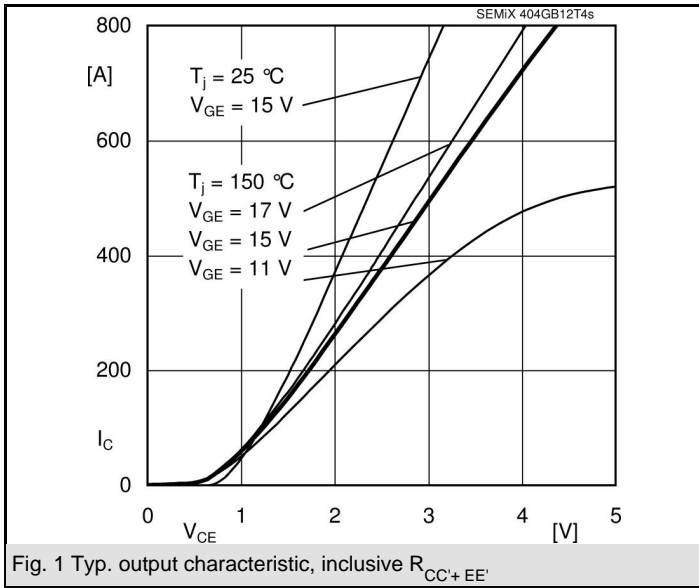
Characteristics		min.	typ.	max.	Units
<b>Inverse Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 400\text{ A}; V_{GE} = 0\text{ V}$		2,2	2,5	V
	$T_j = 25^\circ\text{C}_{chiplev.}$				
	$T_j = 150^\circ\text{C}_{chiplev.}$		2,1	2,45	V
$V_{F0}$			1,3	1,5	V
	$T_j = 25^\circ\text{C}$				
	$T_j = 150^\circ\text{C}$		0,9	1,1	V
$r_F$			2,3	2,5	mΩ
	$T_j = 25^\circ\text{C}$				
	$T_j = 150^\circ\text{C}$		3	3,4	mΩ
$I_{RRM}$	$I_{Fnom} = 400\text{ A}$				A
$Q_{rr}$					μC
$E_{rr}$	$V_{GE} = -15\text{ V}; V_{CC} = 600\text{ V}$		30		mJ
$R_{th(j-c)D}$	per diode			0,14	K/W
<b>Module</b>					
$L_{CE}$			22		nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25^\circ\text{C}$	0,7		mΩ
		$T_{case} = 125^\circ\text{C}$	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>					
$R_{100}$	$T_c = 100^\circ\text{C}$ ( $R_{25} = 5\text{ k}\Omega$ )		0,493±5%		kΩ
$B_{100/125}$	$R(T) = R_{100} \exp[B_{100/125} (1/T - 1/T_{100})]$ ; $T[\text{K}]$		3550±2%		K

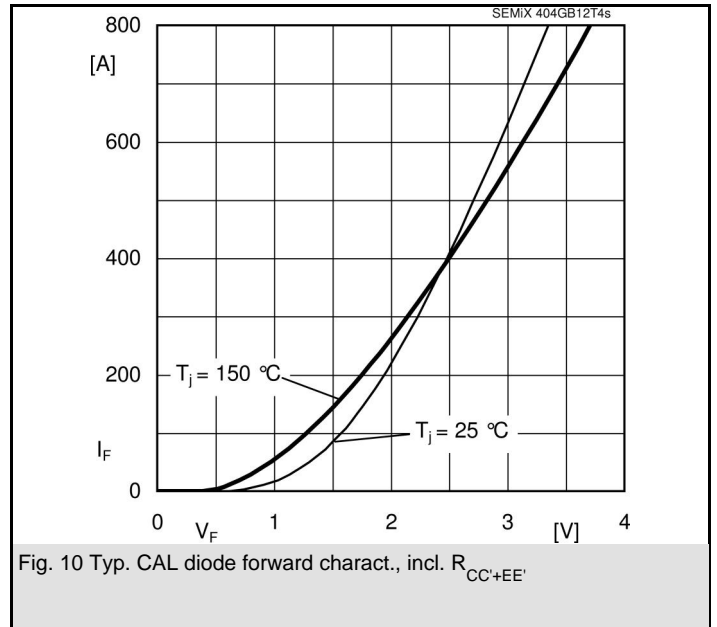
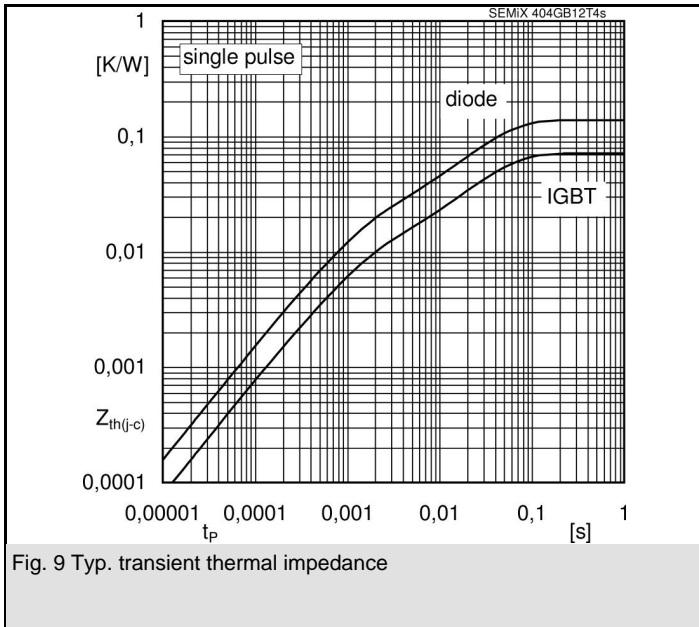
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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



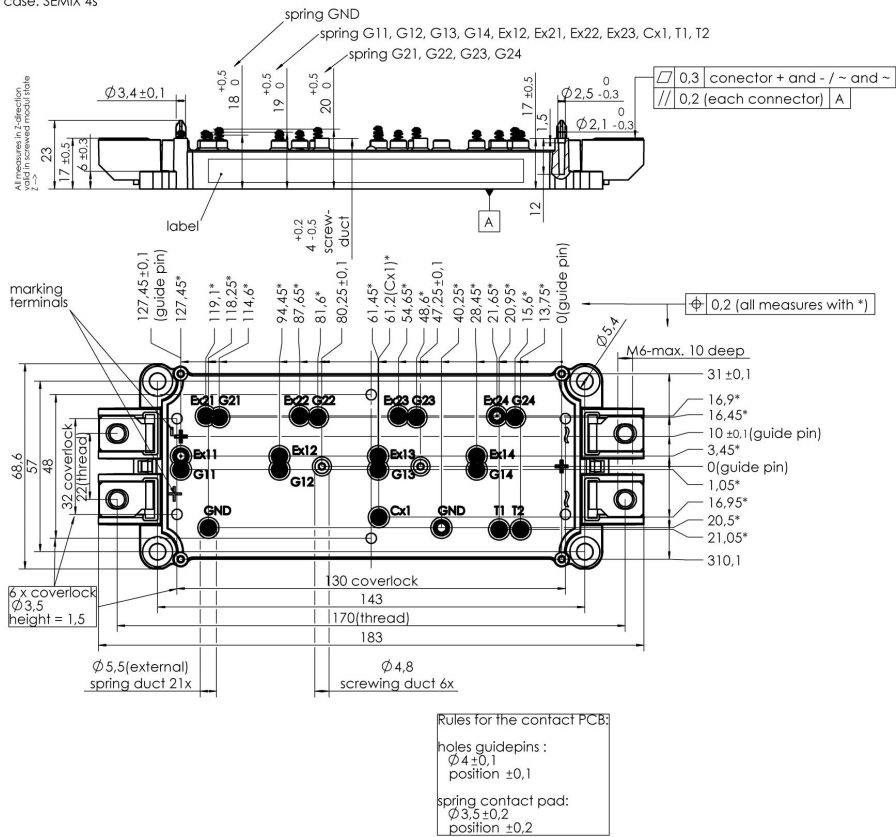
**GB**



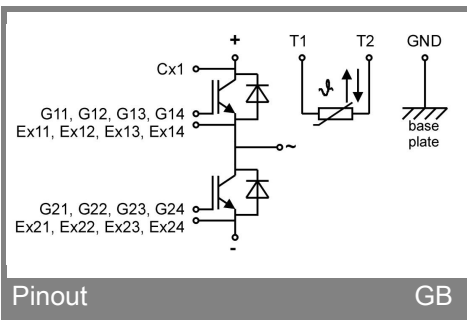


# SEMiX 404GB12T4s

case: SEMiX 4s



## Case SEMiX 4s



Pinout

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