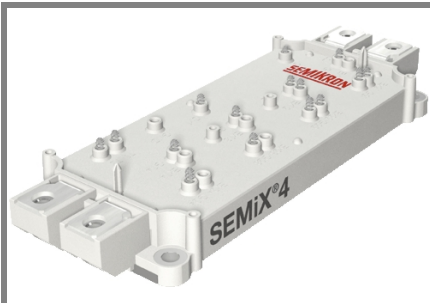


SEMiX 604GB12T4s



SEMiX® 4s

Trench IGBT Modules

SEMiX 604GB12T4s

Target Data

Features

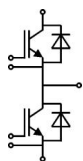
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability

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 $T_j=150^\circ\text{C}$
- Dynamic values apply to the following combination of resistors:
 $R_{Gon,main}=1,0\Omega$,
 $R_{Goff,main}=1,0\Omega$,
 $R_{G,x}=2,2\Omega$ each,
 $R_{E,x}=0,5\Omega$ each

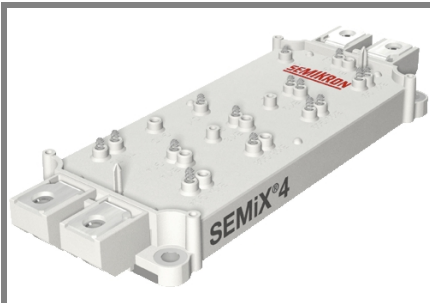


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Absolute Maximum Ratings		$T_{case} = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$	1200		V
I_C	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	910	A
		$T_c = 80^\circ\text{C}$	700	A
I_{CRM}	$I_{CRM}=3 \times I_{Cnom}$	1800		A
V_{GES}		± 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		μs
Inverse Diode				
I_F	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	705	A
		$T_c = 80^\circ\text{C}$	525	A
I_{FRM}	$I_{FRM}=3 \times I_{Fnom}$	1800		A
Module				
$I_{t(RMS)}$		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	
IGBT						
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 24\text{ mA}$	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}		$T_j = 25^\circ\text{C}$		0,8	0,9	V
		$T_j = 150^\circ\text{C}$		0,7	0,8	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$		1,7	1,8	$\text{m}\Omega$
		$T_j = 150^\circ\text{C}$		2,5	2,7	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 600\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$		1,8	2	V
		$T_j = 150^\circ\text{C}_{chiplev.}$		2,2	2,4	V
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$		37,2	nF	
C_{oes}				2,3	nF	
C_{res}				2,1	nF	
Q_G	$V_{GE} = -8 \dots +15\text{ V}$			3400	nC	
R_{Gint}	$T_j = 25^\circ\text{C}$			1,25	Ω	
$t_{d(on)}$	$R_{Gon} = 1,7\ \Omega$ $di/dt = 5200\text{ A}/\mu\text{s}$ $R_{Goff} = 1,7\ \Omega$	$V_{CC} = 600\text{ V}$ $I_{Cnom} = 600\text{ A}$ $T_j = 150^\circ\text{C}$			355	ns
t_r					90	ns
E_{on}					62	mJ
$t_{d(off)}$					590	ns
t_f					112	ns
E_{off}			62	mJ		
$R_{th(j-c)}$	per IGBT			0,049	K/W	

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Typical Applications

- AC inverter drives
- UPS
- Electronic Welding

Remarks

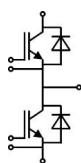
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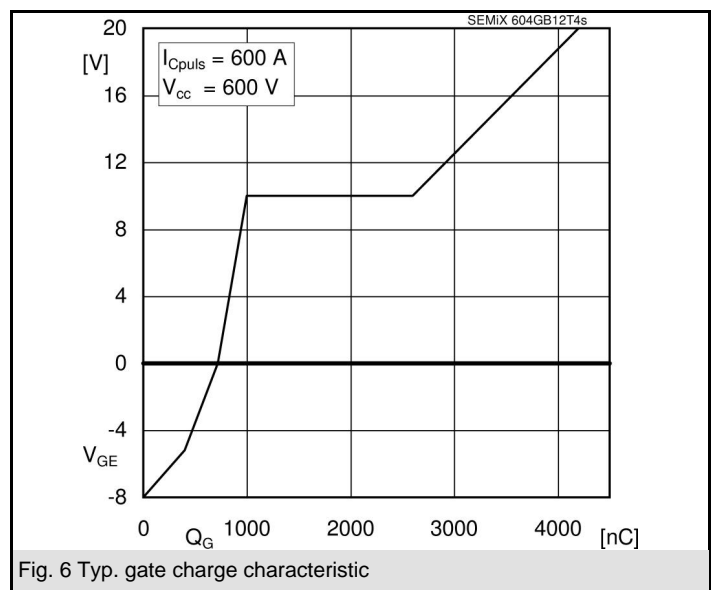
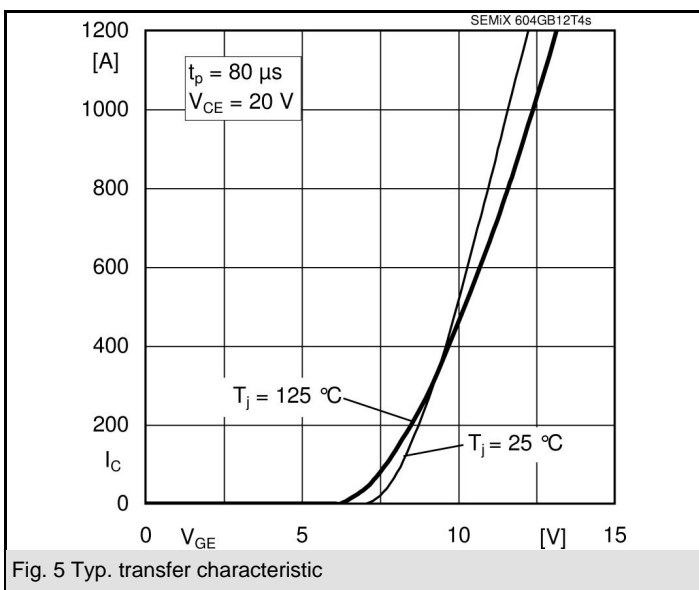
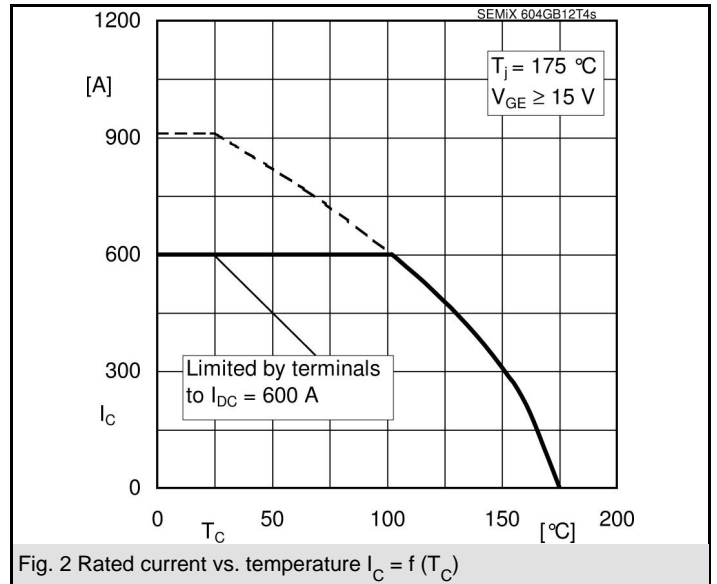
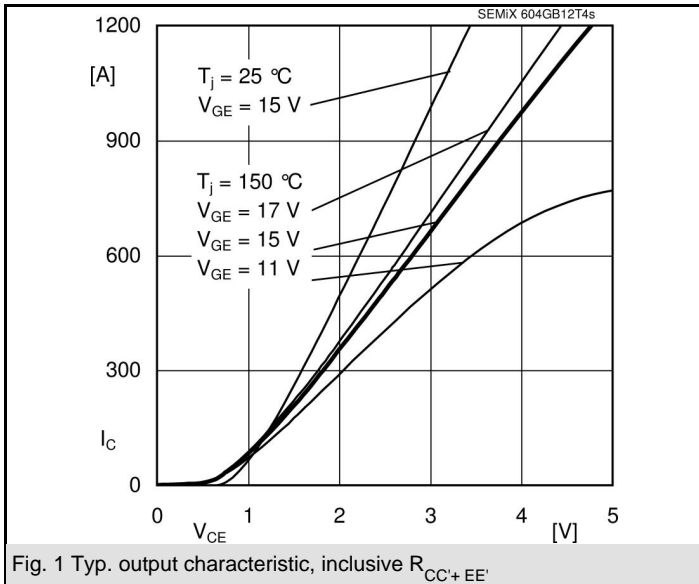


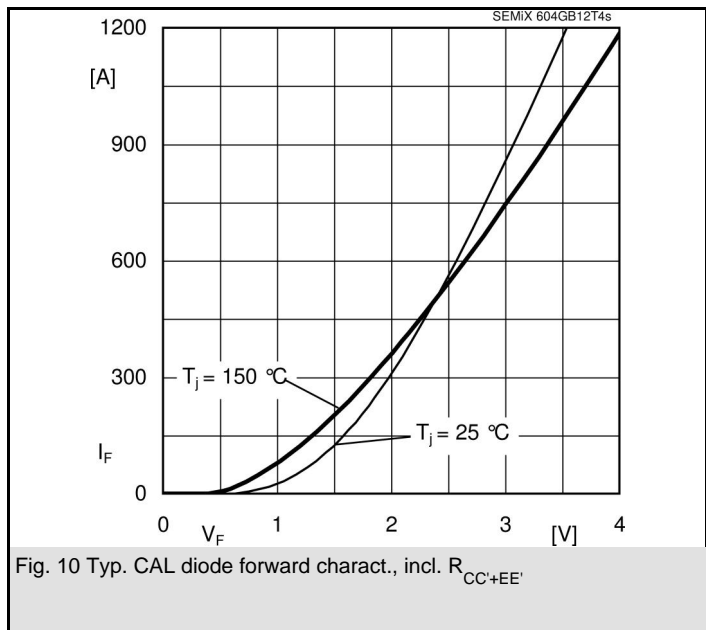
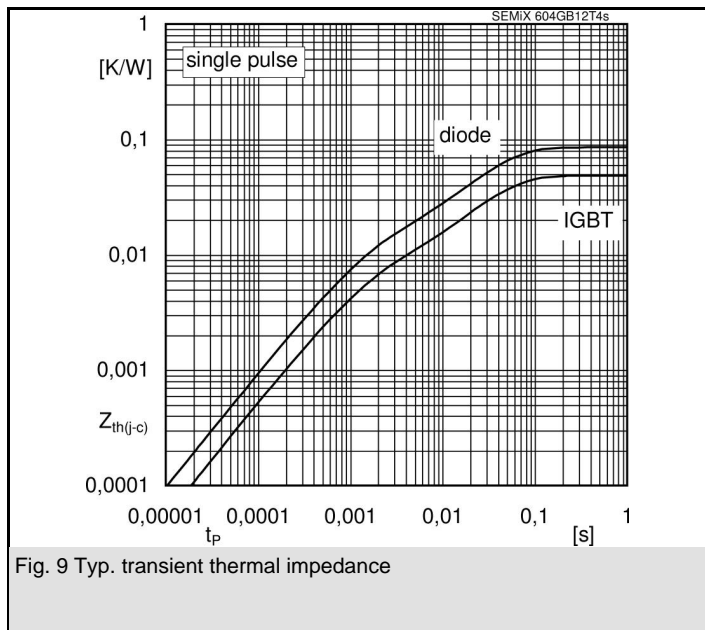
GB

Characteristics		min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 600 \text{ A}; V_{GE} = 0 \text{ V}$		2,15	2,45	V
			2,05	2,4	V
V_{F0}			1,3	1,5	V
			0,9	1,1	V
r_F			1,4	1,6	mΩ
			1,9	2,2	mΩ
I_{RRM}	$I_{Fnom} = 600 \text{ A}$		390		A
Q_{rr}	$di/dt = 5200 \text{ A}/\mu\text{s}$		94		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$		35		mJ
$R_{th(j-c)D}$	per diode			0,086	K/W
Module					
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
Temperature sensor					
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

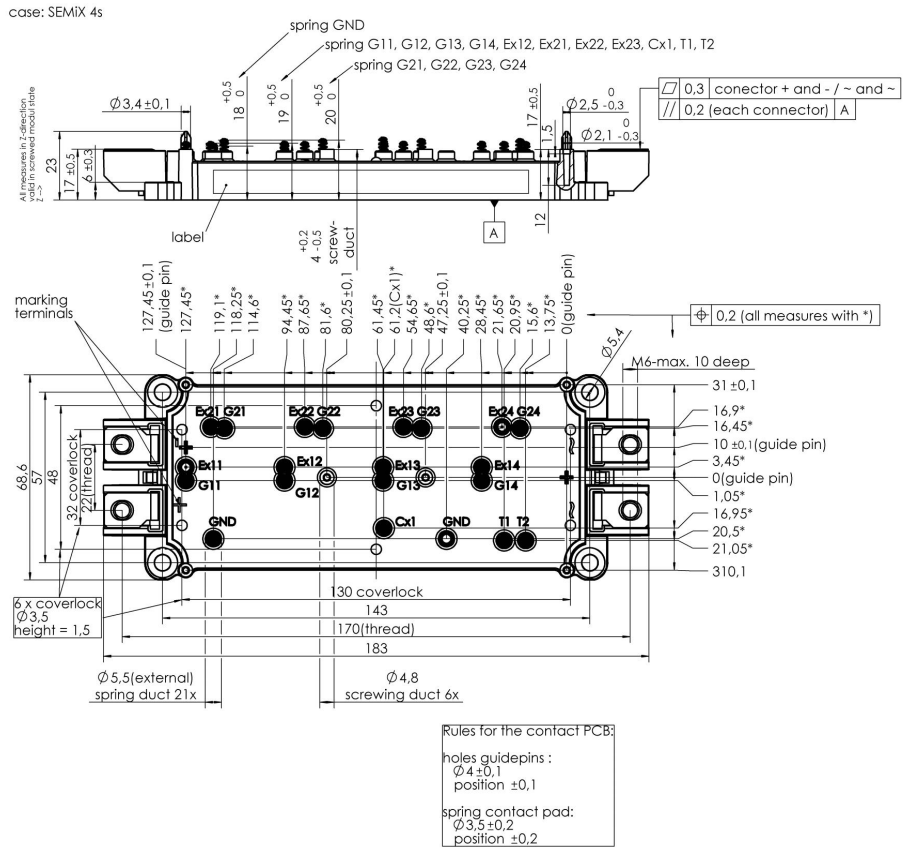
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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





SEMiX 604GB12T4s



Case SEMiX 4s

