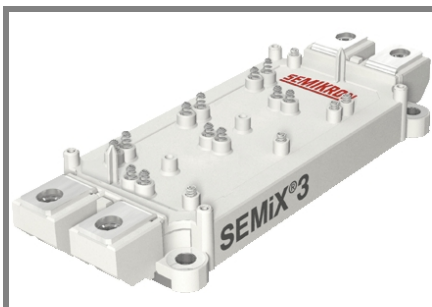


SEMiX 303GB12T4s



SEMiX® 3s

Trench IGBT Modules

SEMiX 303GB12T4s

Target Data

Features

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

Typical Applications

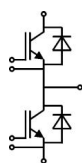
- AC inverter drives
- UPS
- Electronic Welding

Remarks

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

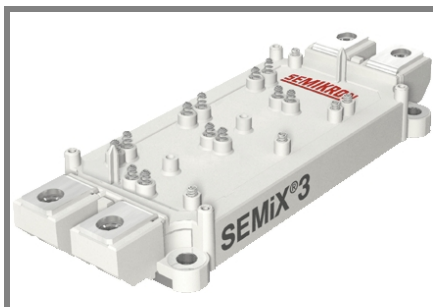
Absolute Maximum Ratings		$T_{case} = 25^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}	$T_j = 25^\circ\text{C}$	1200	V
I_C	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	465 A
		$T_c = 80^\circ\text{C}$	355 A
I_{CRM}	$I_{CRM}=3 \times I_{Cnom}$	900	A
V_{GES}		± 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	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	340 A
		$T_c = 80^\circ\text{C}$	255 A
I_{FRM}	$I_{FRM}=3 \times I_{Fnom}$	900	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					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 12\text{ mA}$	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}	$V_{GE} = 15\text{ V}$				$T_j = 25^\circ\text{C}$
					$T_j = 150^\circ\text{C}$
$V_{CE(sat)}$	$I_{Cnom} = 300\text{ A}, V_{GE} = 15\text{ V}$				$T_j = 25^\circ\text{C}_{chiplev.}$
					$T_j = 150^\circ\text{C}_{chiplev.}$
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$			18,6
C_{oes}					1,3
C_{res}					1,1
Q_G	$V_{GE} = -8 \dots +15\text{ V}$				1700
R_{Gint}	$T_j = 25^\circ\text{C}$				2,5
$t_{d(on)}$	$R_{Gon} = \Omega$	$V_{CC} = V$	$I_{Cnom} = A$	$T_j = 150^\circ\text{C}$	33
t_r					
E_{on}	$R_{Goff} = \Omega$				33
$t_{d(off)}$					
t_f					
E_{off}					
$R_{th(j-c)}$	per IGBT				0,095



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Typical Applications

- AC inverter drives
- UPS
- Electronic Welding

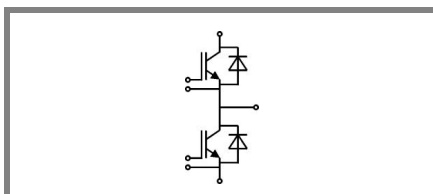
Remarks

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

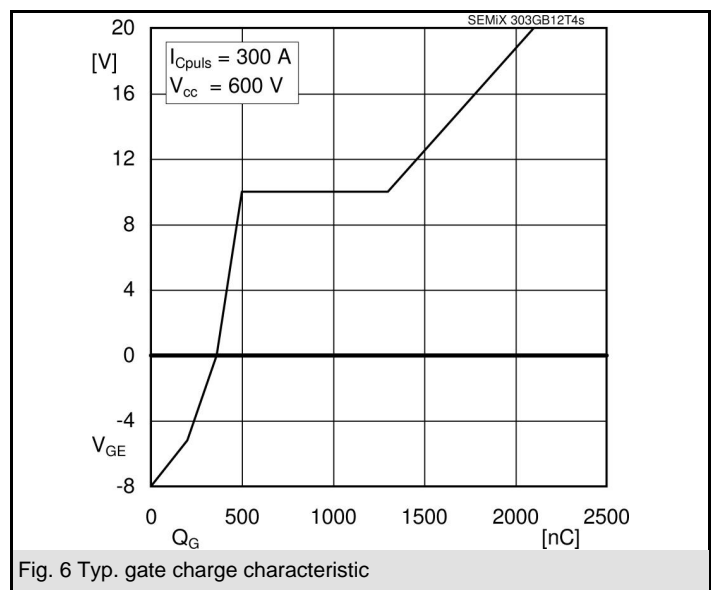
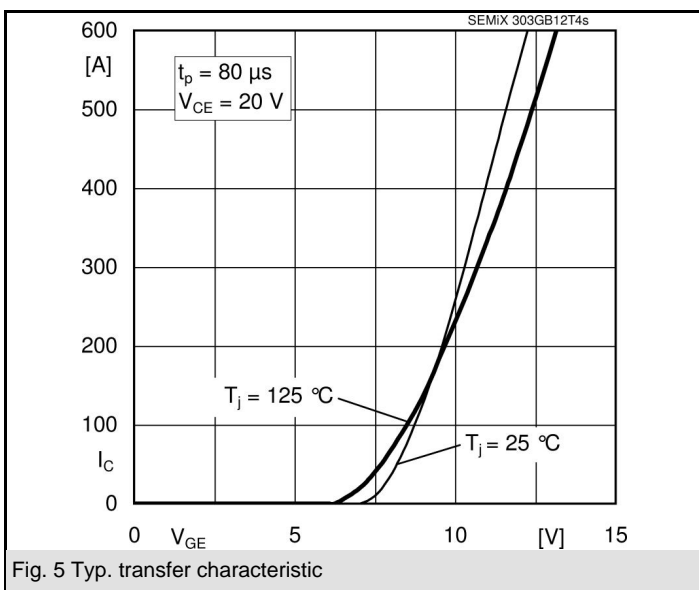
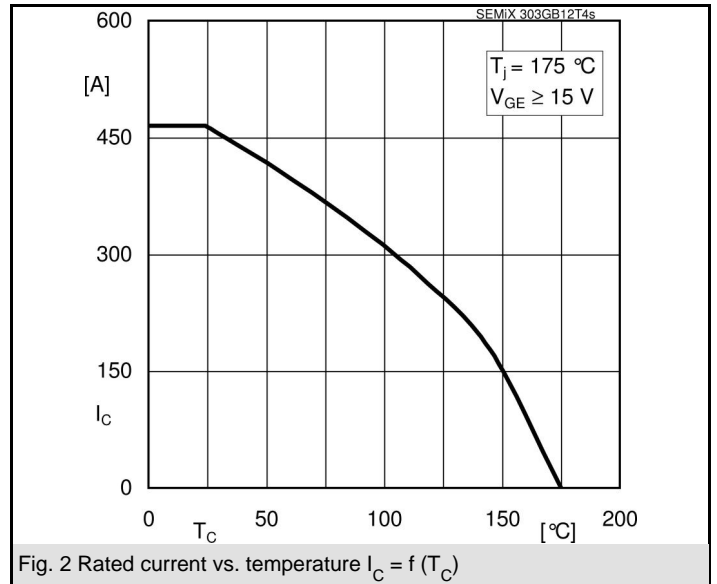
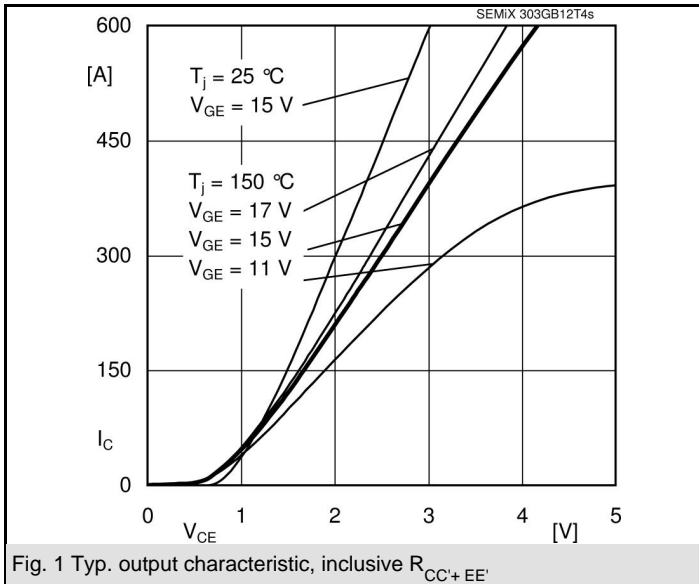
Characteristics		min.	typ.	max.	Units
Symbol	Conditions				
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 300\text{ A}; V_{GE} = 0\text{ V}$		2,2	2,5	V
					$T_j = 25^\circ\text{C}_{chiplev.}$
			2,1	2,45	V
					$T_j = 150^\circ\text{C}_{chiplev.}$
V_{F0}			1,3	1,5	V
					$T_j = 25^\circ\text{C}$
			0,9	1,1	V
					$T_j = 150^\circ\text{C}$
r_F			3	3,3	mΩ
					$T_j = 25^\circ\text{C}$
			4	4,5	mΩ
					$T_j = 150^\circ\text{C}$
I_{RRM}	$I_{Fnom} = 300\text{ A}$				A
Q_{rr}					μC
E_{rr}	$V_{GE} = -15\text{ V}; V_{CC} = 600\text{ V}$		22,5		mJ
$R_{th(j-c)D}$	per diode			0,18	K/W
Module					
L_{CE}			20		nH
$R_{CC'+EE'}$	res., terminal-chip		0,7		mΩ
		$T_{case} = 25^\circ\text{C}$			
		$T_{case} = 125^\circ\text{C}$	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}	$T_c = 100^\circ\text{C}$ ($R_{25} = 5\text{ k}\Omega$)		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.



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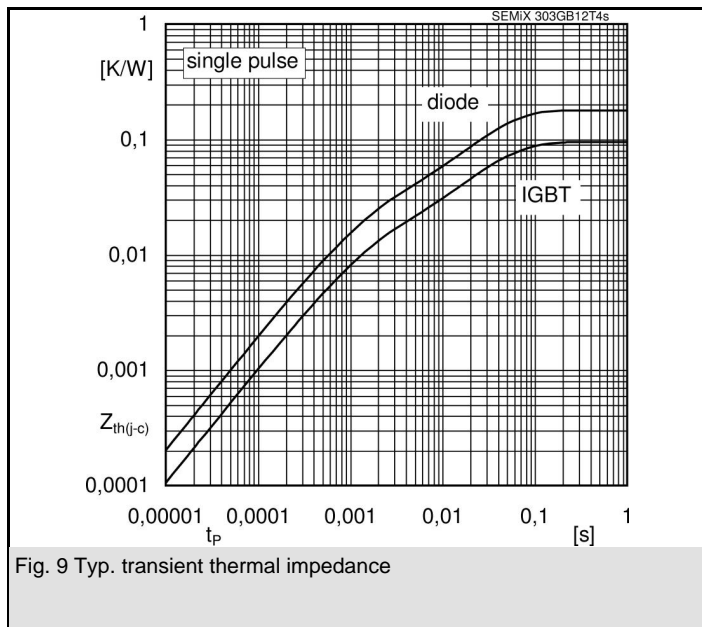


Fig. 9 Typ. transient thermal impedance

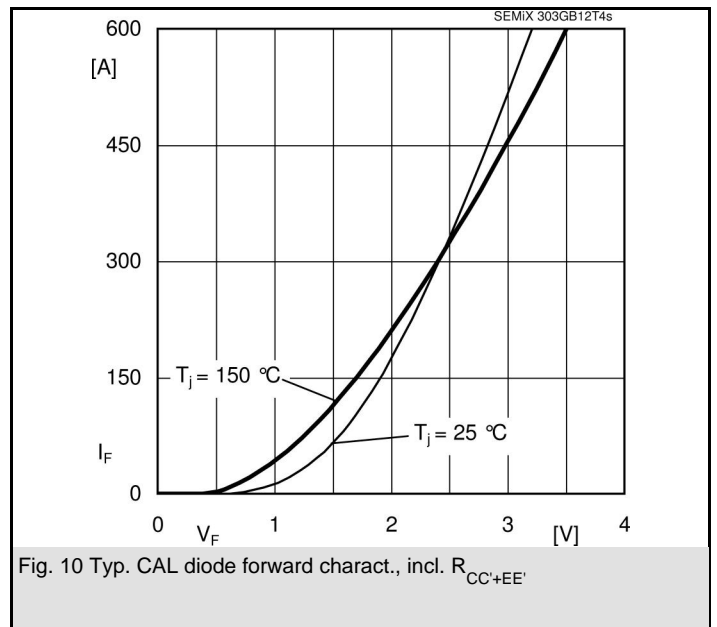


Fig. 10 Typ. CAL diode forward charact., incl. R_{CC+EE}

