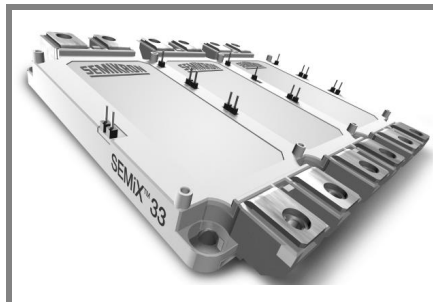


SEMiX 303GD12T4c



SEMiX® 33c

Trench IGBT Modules

SEMiX 303GD12T4c

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Target Data

Features

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

Typical Applications

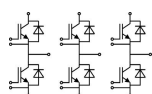
- AC inverter drives
- UPS
- Electronic Welding

Remarks

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

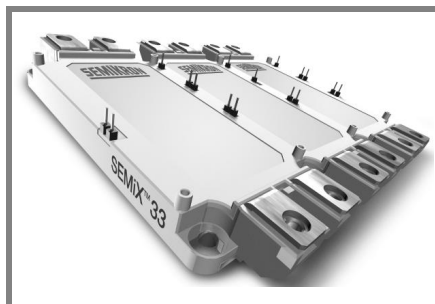
Absolute Maximum Ratings				$T_{case} = 25^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions			Values	Units
IGBT					
V_{CES}	$T_j = 25^\circ\text{C}$			1200	V
I_C	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$		465	A
		$T_c = 80^\circ\text{C}$		360	A
I_{CRM}	$I_{CRM}=3 \times I_{Cnom}$			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°C, unless otherwise specified			
Symbol	Conditions		min.	typ.	max.	Units
IGBT						
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 12 mA		5	5,8	6,5	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES} T _j = 25 °C					mA
V _{CE0}	T _j = 25 °C			0,8	0,9	V
	T _j = 150 °C			0,7	0,8	V
r _{CE}	V _{GE} = 15 V T _j = 25°C			3,3	3,7	mΩ
	T _j = 150°C			5	5,3	mΩ
V _{CE(sat)}	I _{Cnom} = 300 A, V _{GE} = 15 V T _j = 25°C _{chiplev.}			1,8	2	V
	T _j = 150°C _{chiplev.}			2,2	2,4	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz		18,6			nF
C _{oes}			1,2			nF
C _{res}			1,1			nF
Q _G	V _{GE} = -8 ... +15V		1700			nC
R _{Gint}	T _j = 25 °C		2,5			Ω
t _{d(on)}	R _{Gon} = Ω	V _{CC} = V I _{Cnom} = A T _j = 150 °C	33			ns
t _r						ns
E _{on}	mJ					
t _{d(off)}	ns					
t _f	ns					
E _{off}	mJ					
R _{th(j-c)}	per IGBT		0,095			K/W



GD

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Typical Applications

- AC inverter drives
- UPS
- Electronic Welding

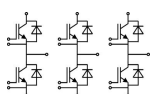
Remarks

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- Product reliability results are valid for $T_j=150^{\circ}\text{C}$

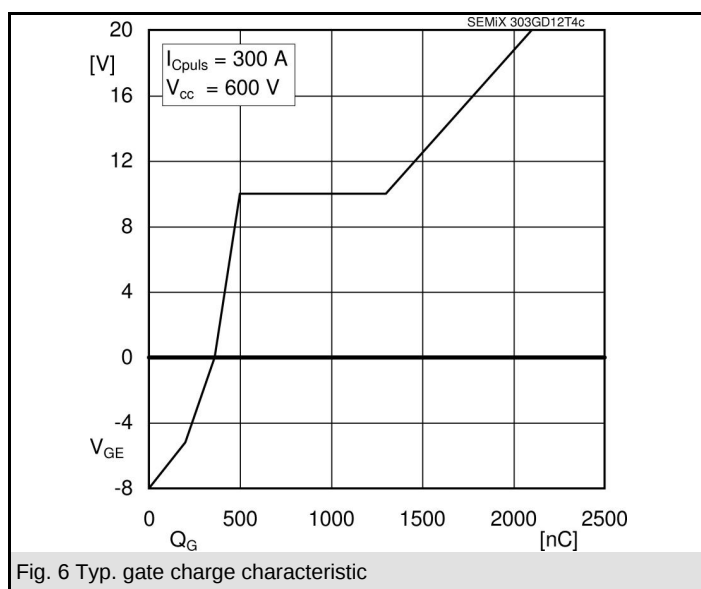
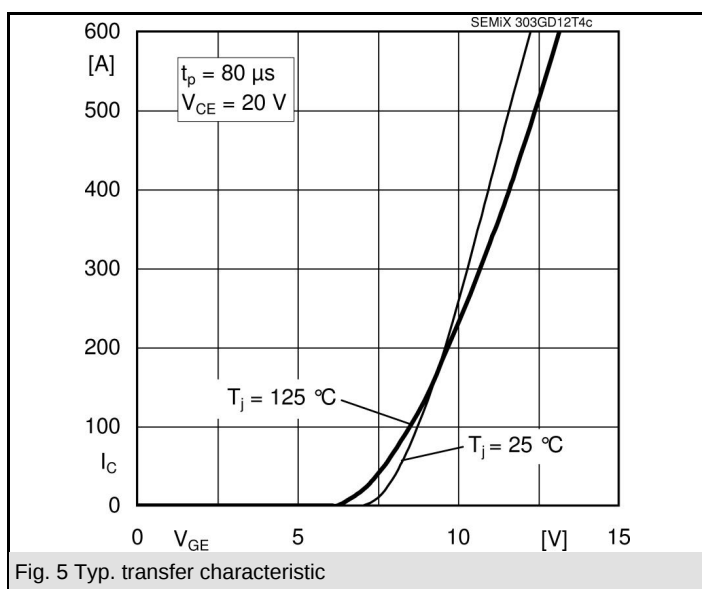
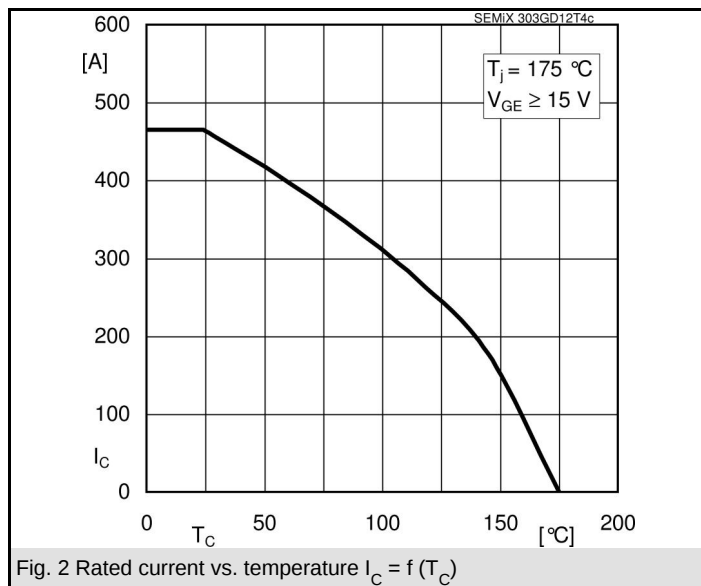
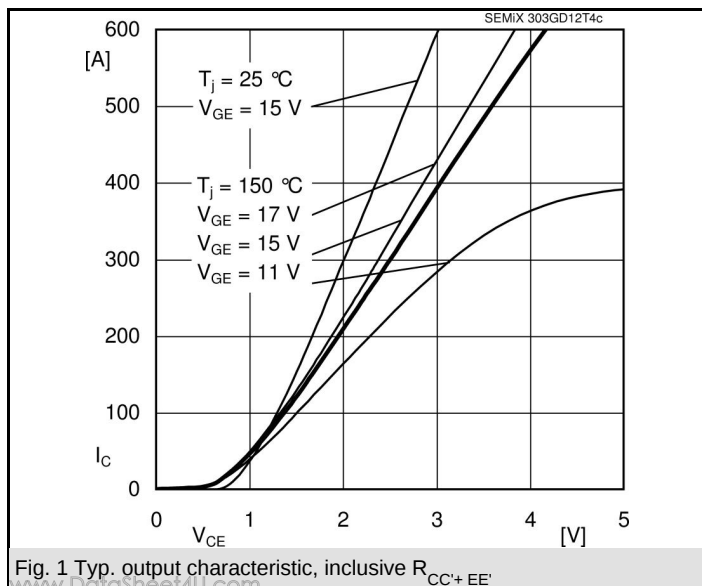
Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 300 \text{ A}; V_{GE} = 0 \text{ V}$				
	$T_j = 25^{\circ}\text{C}_{chiplev.}$		2,2	2,5	V
	$T_j = 150^{\circ}\text{C}_{chiplev.}$		2,1	2,45	V
V_{F0}	$T_j = 25^{\circ}\text{C}$		1,3	1,5	V
	$T_j = 150^{\circ}\text{C}$		0,9	1,1	V
r_F	$T_j = 25^{\circ}\text{C}$		3	3,3	mΩ
	$T_j = 150^{\circ}\text{C}$		4	4,5	mΩ
I_{RRM}	$I_{Fnom} = 300 \text{ A}$				A
Q_{rr}	$T_j = 150^{\circ}\text{C}$				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	$T_{case} = 25^{\circ}\text{C}$	0,7		mΩ
		$T_{case} = 125^{\circ}\text{C}$	1		mΩ
$R_{th(c-s)}$	per module		0,014		K/W
M_s	to heat sink (M5)		3	5	Nm
M_t	to terminals (M6)		2,5	5	Nm
w				900	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

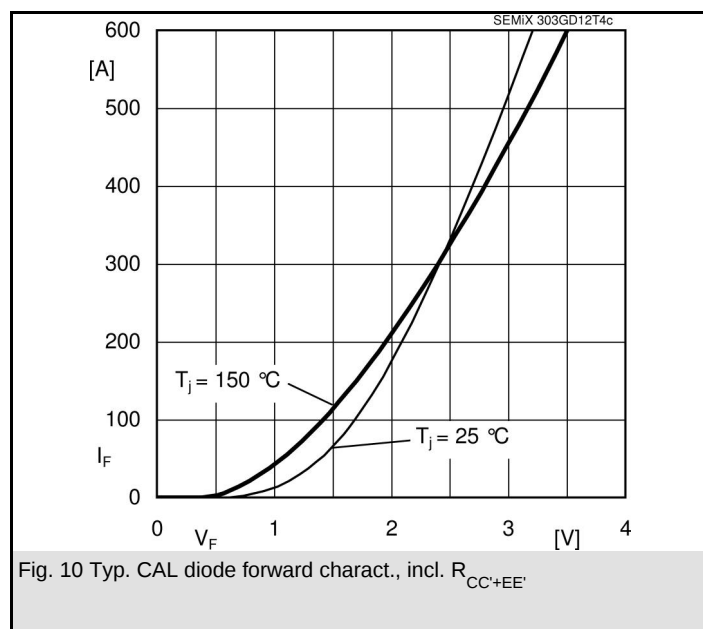
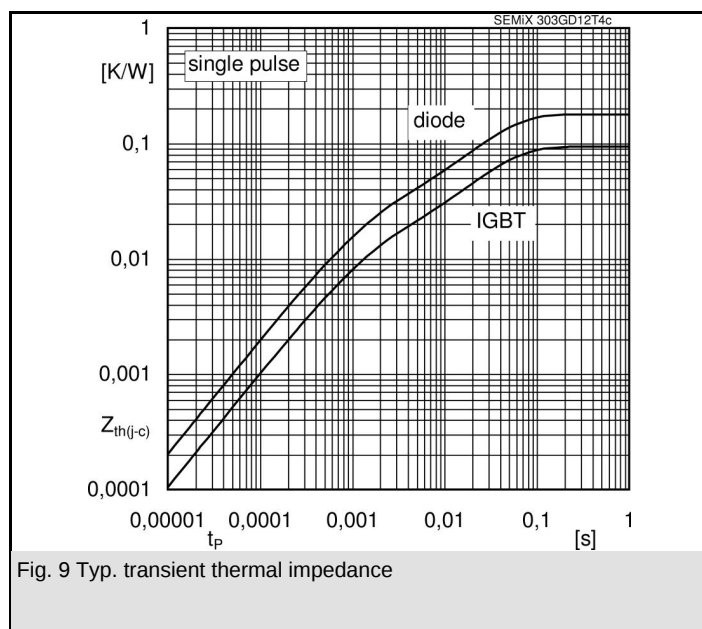
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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

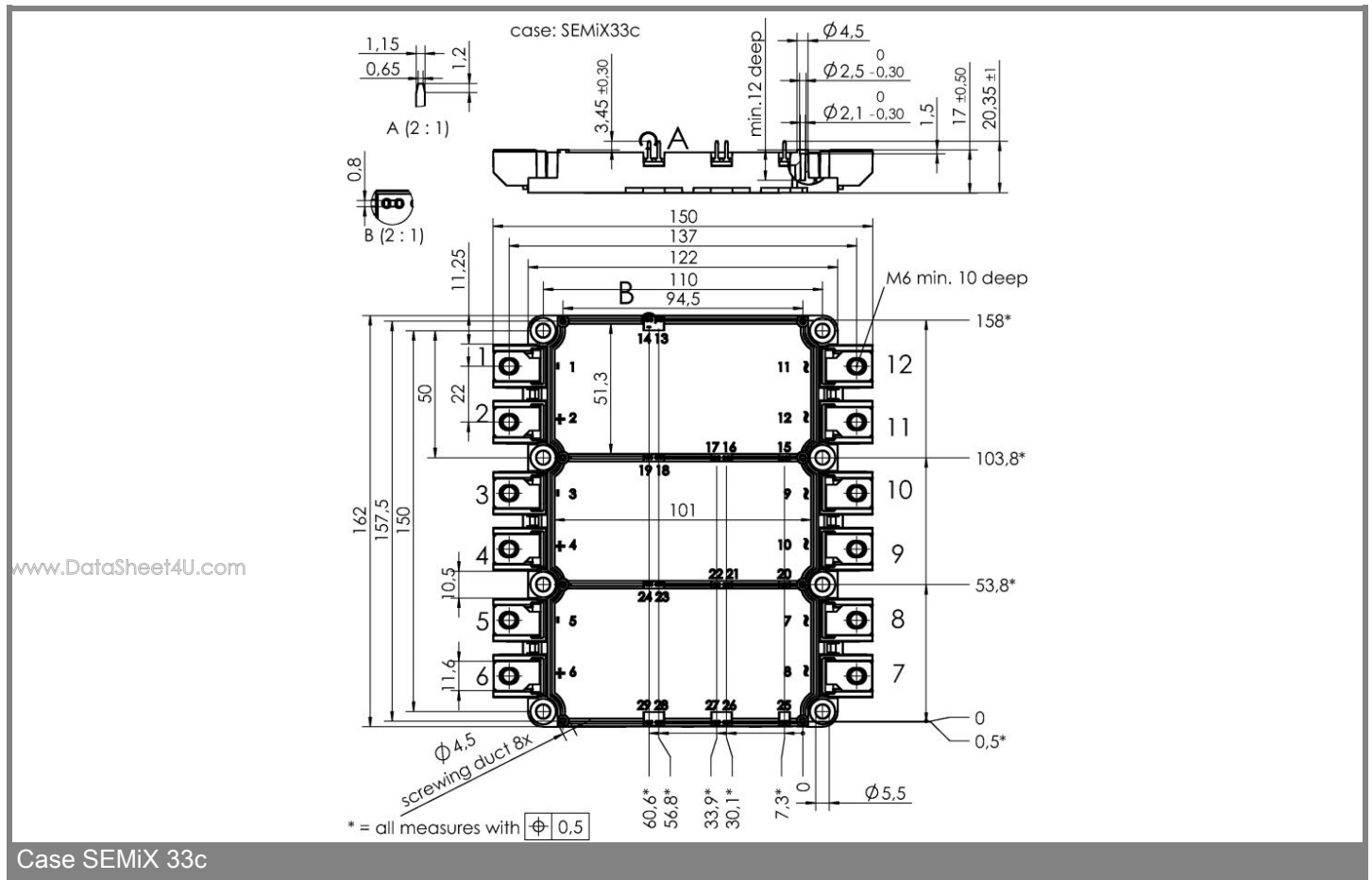


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SEMiX 303GD12T4c



Case SEMiX 33c

