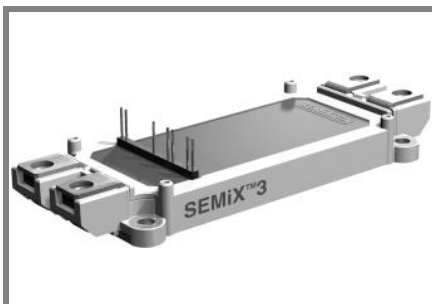


SEMiX 453GB176HD



SEMiX® 3

Trench IGBT Modules

SEMiX 453GB176HD

Preliminary Data

Features

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

Typical Applications

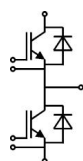
- AC inverter drives
- UPS
- Electronic welders

Remarks

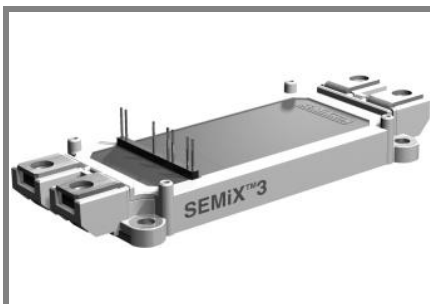
- short circuit capability is tested @ $V_{CC}=1000V$ (all other static parameters are tested @ $V_{CC}=1200V$)
- Not for new design

Absolute Maximum Ratings		T _c = 25 °C, unless otherwise specified		
Symbol	Conditions		Values	Units
IGBT				
V _{CES}	T _j = 25 °C		1700	V
I _C	T _j = 150 °C	T _c = 25 °C	445	A
		T _c = 80 °C	315	A
I _{CRM}	I _{CRM} =2xI _{Cnom}		600	A
V _{GES}			± 20	V
t _{psc}	V _{CC} = 1200 V; V _{GE} ≤ 20 V; T _j = 125 °C V _{CES} < 1700 V		10	µs
Inverse Diode				
I _F	T _j = 150 °C	T _c = 25 °C	545	A
		T _c = 80 °C	365	A
I _{FRM}	I _{FRM} =2xI _{Fnom}		600	A
I _{FSM}	t _p = 10 ms; sin.	T _j = 25 °C	2900	A
Module				
I _{t(RMS)}			600	A
T _{vj}			- 40 ... + 150	°C
T _{stg}			- 40 ... + 125	°C
V _{isol}	AC, 1 min.		4000	V

Characteristics			T _c = 25 °C, unless otherwise specified			
Symbol	Conditions		min.	typ.	max.	Units
IGBT						
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 12 mA		5,2	5,8	6,4	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES} T _j = 25 °C		0,45			mA
V _{CE0}	T _j = 25 °C T _j = 125 °C		1			V
			0,9			V
r _{CE}	V _{GE} = 0 V T _j = 25°C T _j = 125°C		3,3			mΩ
			5,2			mΩ
V _{CE(sat)}	I _{Cnom} = 300 A, V _{GE} = 15 V T _j = 25°C _{chiplev.} T _j = 125°C _{chiplev.}		2			V
			2,45			V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz		26,4			nF
1,1			nF			
C _{oes}			0,88			nF
C _{res}						
Q _G	V _{GE} = -8 V ... +15 V		2800			nC
t _{d(on)}	R _{Gon} = 4,3 Ω		335			ns
t _r			70			ns
E _{on}	R _{Goff} = 4,3 Ω T _j = 125 °C		215			mJ
t _{d(off)}			990			ns
t _f			150			ns
E _{off}			125			mJ
R _{th(j-c)}	per IGBT		0,071			K/W



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Typical Applications

- AC inverter drives
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- Electronic welders

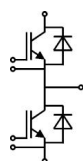
Remarks

- short circuit capability is tested @ $V_{CC}=1000V$ (all other static parameters are tested @ $V_{CC}=1200V$)
- Not for new design

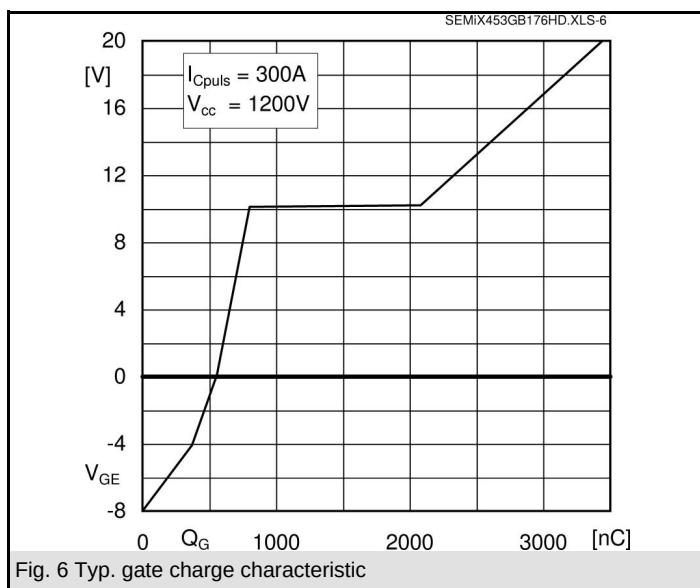
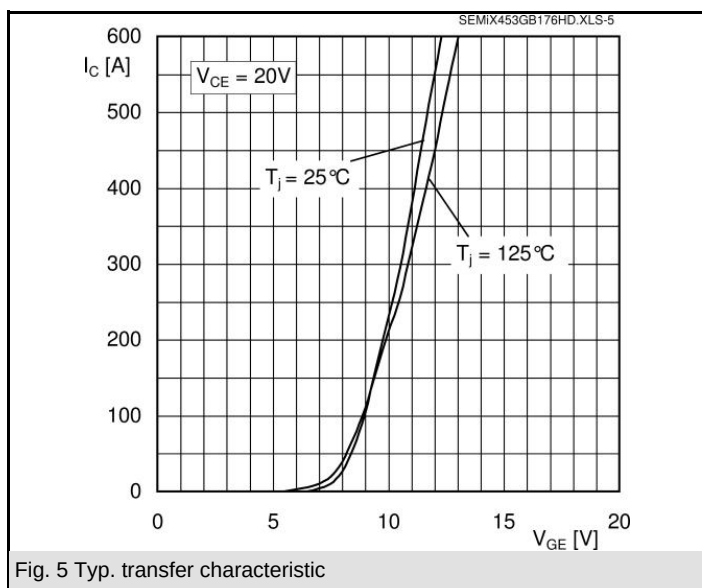
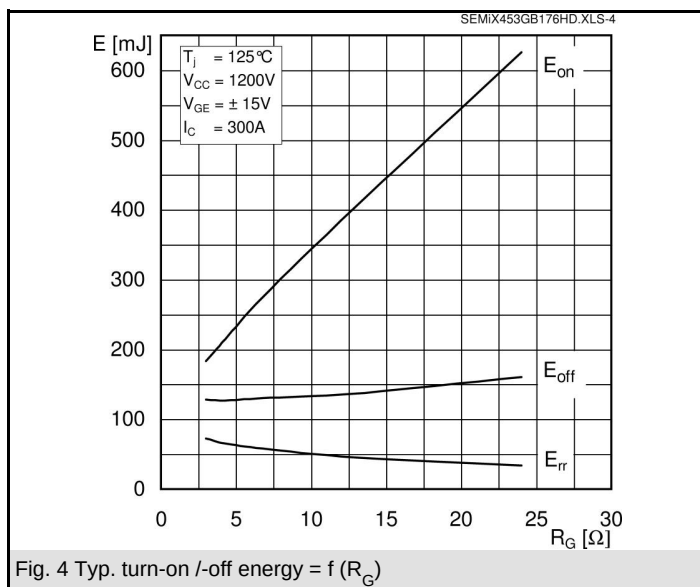
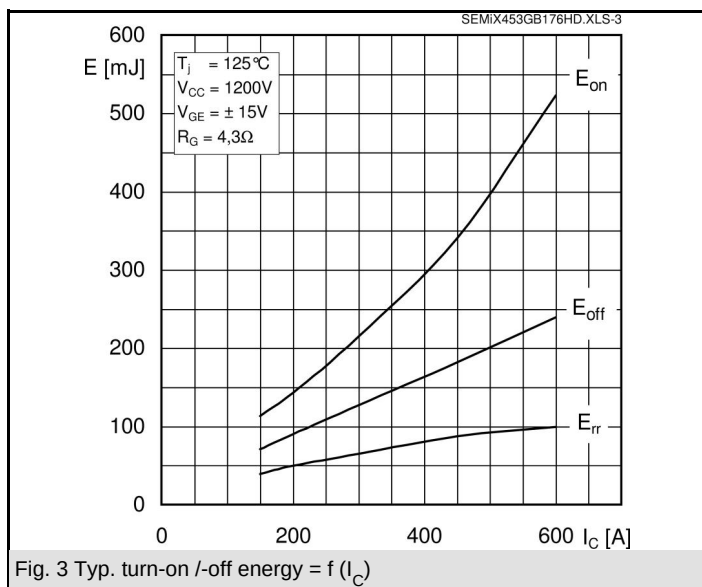
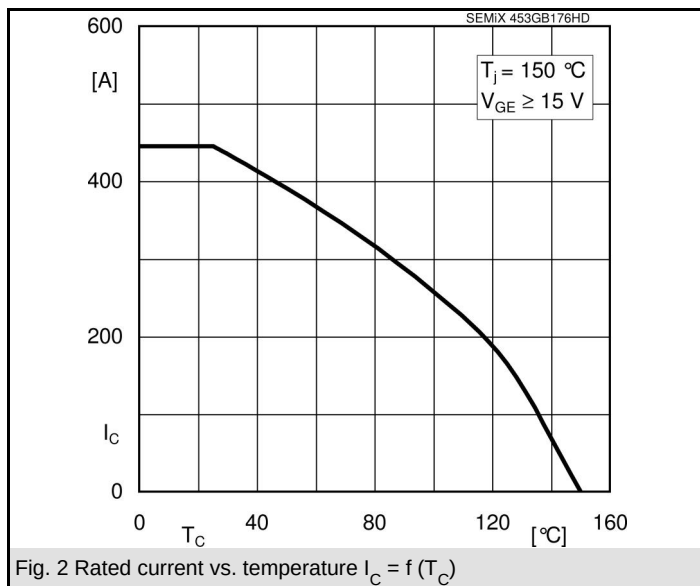
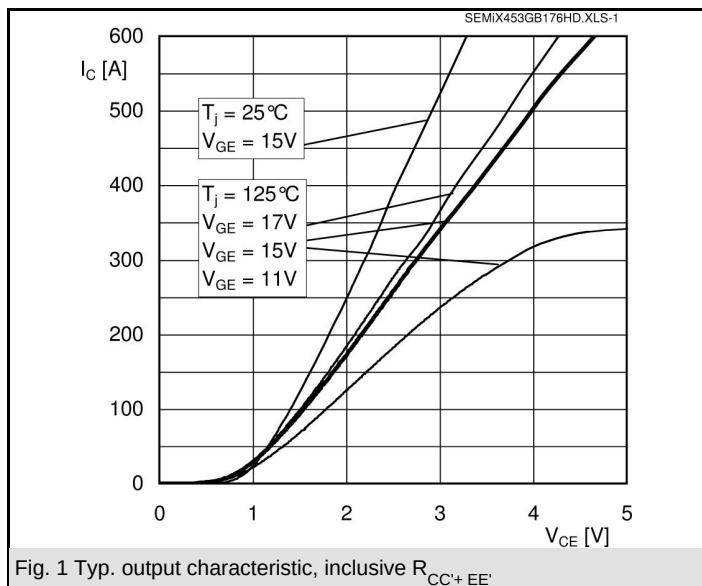
Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 300 A$; $V_{GE} = 0 V$				
	$T_j = 25 ^\circ C_{chiplev.}$		1,5	1,7	V
	$T_j = 125 ^\circ C_{chiplev.}$		1,45	1,65	V
V_{F0}	$T_j = 25 ^\circ C$		1,1	1,3	V
	$T_j = 125 ^\circ C$		0,9	1,1	V
r_F	$T_j = 25 ^\circ C$		1,3		mΩ
	$T_j = 125 ^\circ C$		1,8		mΩ
I_{RRM}	$I_{Fnom} = 300 A$		350		A
Q_{rr}	$di/dt = 4700 A/\mu s$		115		μC
E_{rr}	$V_{GE} = -15 V$; $V_{CC} = 1200 V$		65		mJ
$R_{th(j-c)D}$	per diode			0,11	K/W
Module					
L_{CE}			20		nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25 ^\circ C$	0,7		mΩ
		$T_{case} = 125 ^\circ C$	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}	$T_c = 100 ^\circ C$ ($R_{25} = 5 k\Omega$)		0,493±5%		kΩ
$B_{100/125}$	$R(T) = R_{100} \exp[B_{100/125} (1/T - 1/T_{100})]$; $T[K]$; B		3550±2%		K

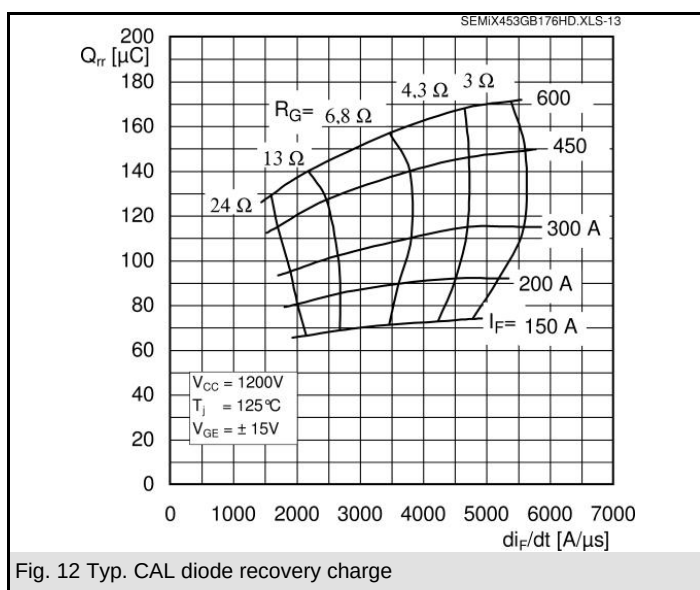
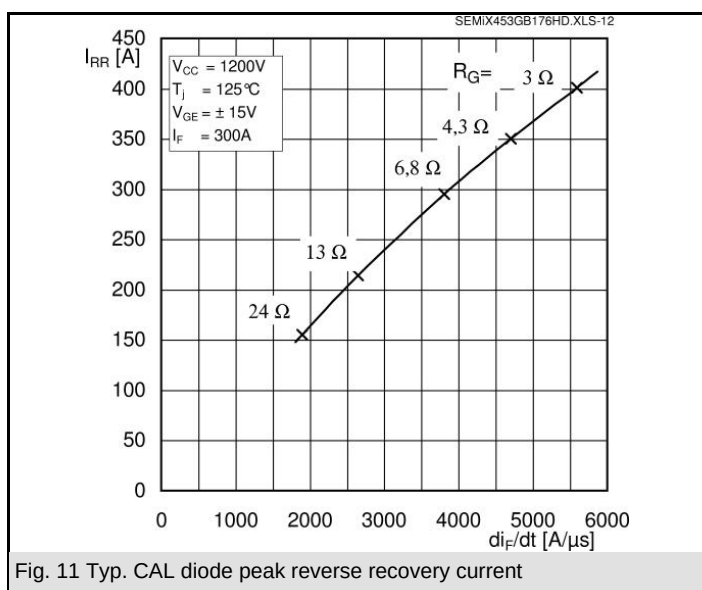
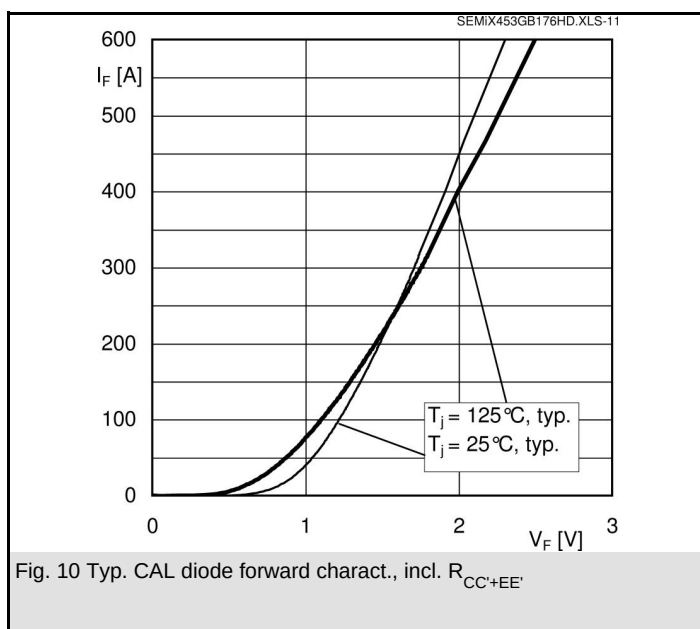
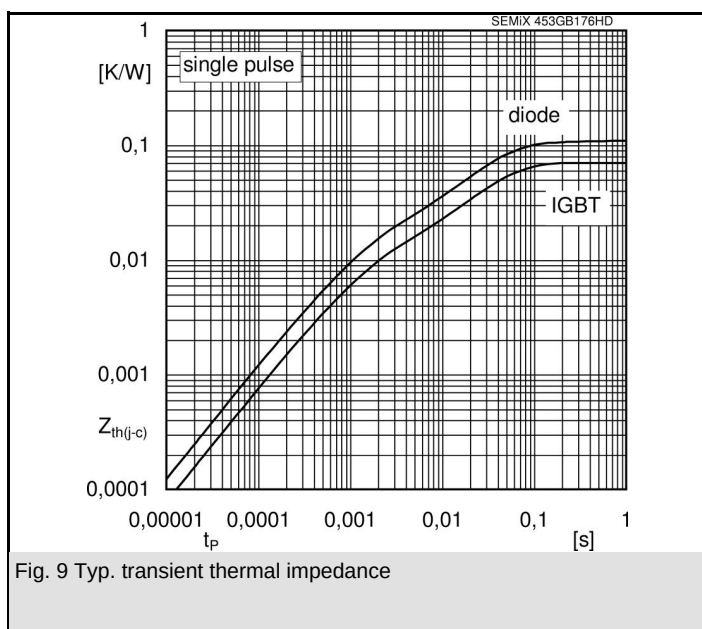
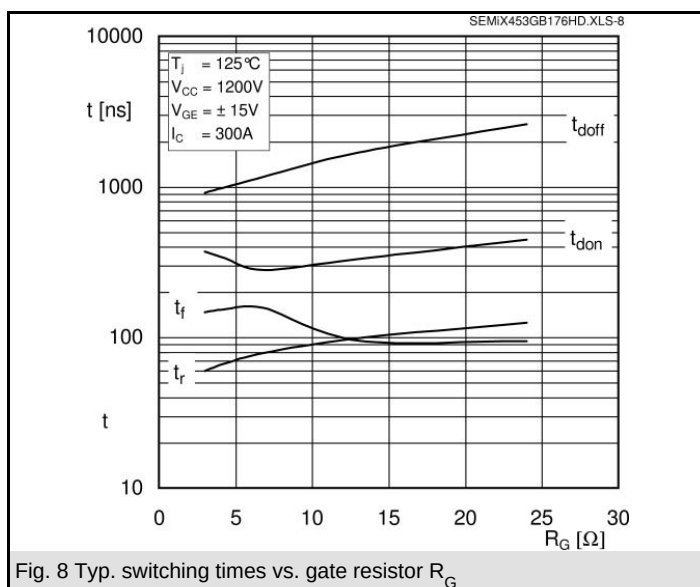
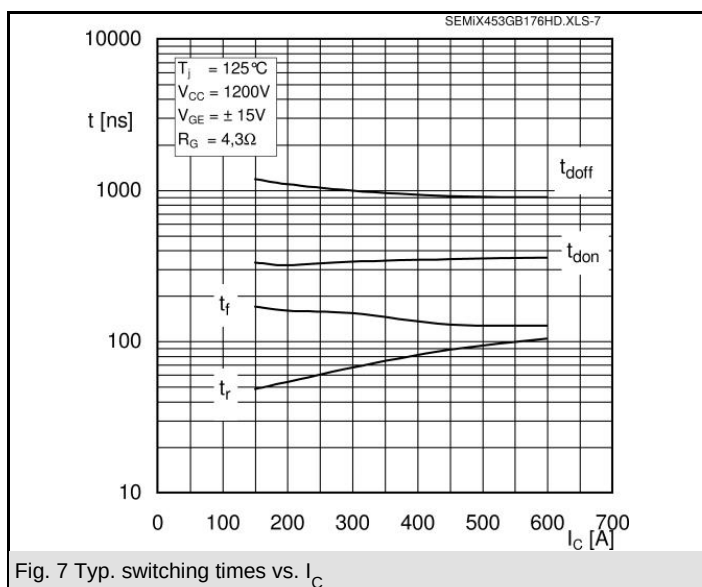
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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

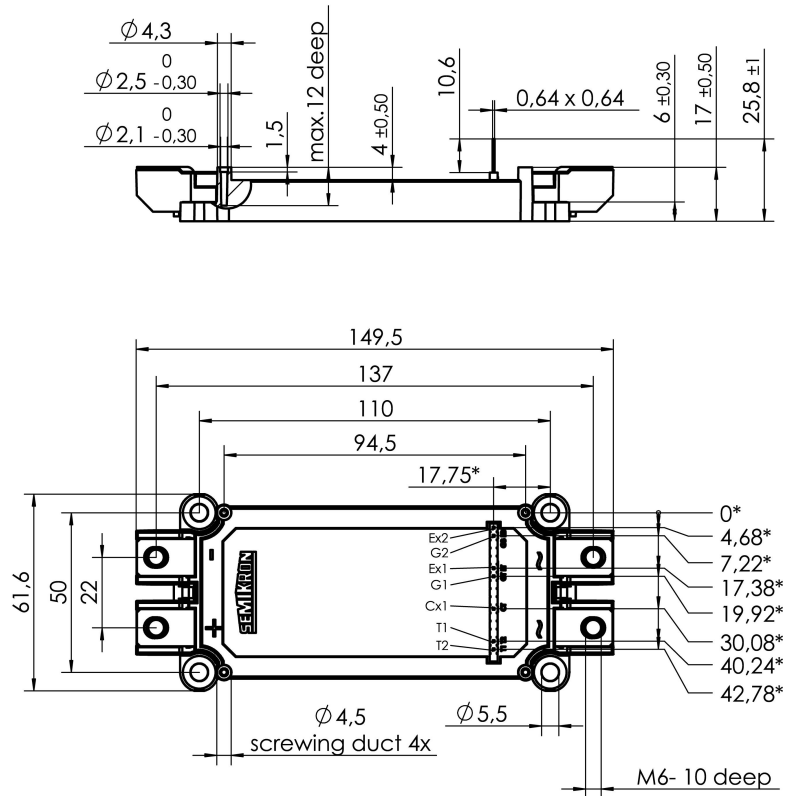


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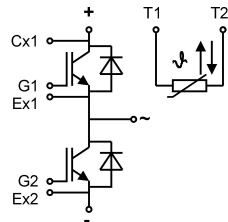


case: SEMiX 3



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

Case SEMiX 3



Pinout

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