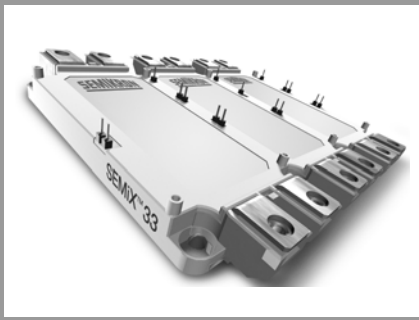


SEMiX703GD126HDc



SEMiX[®]33c

Trench IGBT Modules

SEMiX703GD126HDc

Preliminary Data

Features

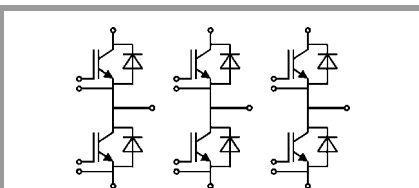
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability
- UL recognised file no. E63532

Typical Applications

- AC inverter drives
- UPS
- Electronic Welding

Remarks

- Case temperatur limited to $T_C=125^\circ\text{C}$ max.
- Not for new design

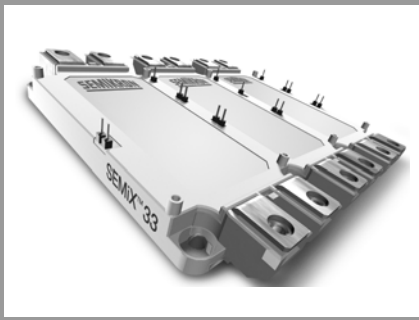


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Absolute Maximum Ratings				
Symbol	Conditions		Values	Unit
IGBT				
V _{CES}			1200	V
I _C	T _j = 150°C	T _c = 25°C	642	A
		T _c = 80°C	449	A
I _{CRM}	I _{CRM} = 2xI _{Cnom}		900	A
V _{GES}			-20 ... 20	V
t _{psc}	V _{CC} = 600V V _{GE} ≤ 20V T _j = 125°C V _{CES} ≤ 1200V		10	μs
T _j			-40 ... 150	°C
Inverse diode				
I _F	T _j = 150°C	T _c = 25°C	561	A
		T _c = 80°C	384	A
I _{FRM}	I _{FRM} = 2xI _{Fnom}		900	A
I _{FSM}	t _p = 10ms, half sine wave, T _j = 25°C		2900	A
T _j			-40 ... 150	°C
Module				
I _{t(RMS)}			600	A
T _{stg}			-40 ... 125	°C
V _{isol}	AC sinus 50Hz, t = 60s		4000	V

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
IGBT						
V _{CE(sat)}	I _{Cnom} = 450A V _{GE} = 15V chipelevel	T _J = 25°C		1.7	2.1	V
		T _J = 125°C		2.00	2.45	V
V _{CE0}	V _{GE} = 15V	T _J = 25°C		1	1.2	V
		T _J = 125°C		0.9	1.1	V
r _{CE}		T _J = 25°C		1.6	2.0	mΩ
		T _J = 125°C		2.4	3.0	mΩ
V _{GE(th)}	V _{GE} =V _{CE} , I _C = 18mA		5	5.8	6.5	V
I _{CES}	V _{GE} = 0V	T _J = 25°C		0.1	0.3	mA
	V _{CE} = 1200V	T _J = 125°C				mA
C _{ies}	V _{CE} = 25V V _{GE} = 0V	f = 1MHz		32.3		nF
C _{oes}		f = 1MHz		1.69		nF
C _{res}		f = 1MHz		1.46		nF
Q _G	V _{GE} = - 8 V...+ 15 V			3600		nC
R _{Gint}	T _J = 25°C			1.67		Ω
t _{d(on)}	V _{CC} = 600V I _{Cnom} = 450A T _J = 125°C R _{G on} = 1.6Ω R _{G off} = 1.6Ω			310		ns
t _r				60		ns
E _{on}				32		mJ
t _{d(off)}				680		ns
t _f				135		ns
E _{off}				68		mJ
R _{th(j-c)}		per IGBT				0.061

SEMiX703GD126HDc



SEMiX®33c

Trench IGBT Modules

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Preliminary Data

Features

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- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability
- UL recognised file no. E63532

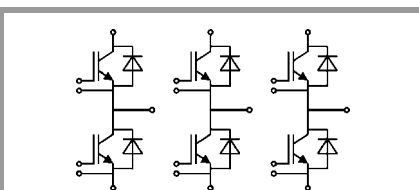
Typical Applications

- AC inverter drives
- UPS
- Electronic Welding

Remarks

- Case temperatur limited to $T_C=125^\circ\text{C}$ max.
- Not for new design

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Inverse diode						
V _F = V _{EC}	I _{Fnom} = 450A V _{GE} = 0V chipelevel	T _j = 25°C		1.6	1.8	V
		T _j = 125°C		1.6	1.8	V
V _{F0}		T _j = 25°C	0.9	1	1.1	V
		T _j = 125°C	0.7	0.8	0.9	V
r _F		T _j = 25°C	1.1	1.3	1.6	mΩ
		T _j = 125°C	1.6	1.8	2.0	mΩ
I _{RRM}	I _{Fnom} = 450A di/dt _{off} = 8500A/μs V _{GE} = -15V V _{CC} = 600V	T _j = 125°C	580			A
Q _{rr}		T _j = 125°C	130			μC
E _{rr}		T _j = 125°C	60			mJ
R _{th(j-c)D}	per diode		0.11			K/W
Module						
L _{CE}			20			nH
R _{CC'+EE'}	res., terminal-chip	T _C = 25°C	0.7			mΩ
		T _C = 125°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°C (R ₂₅ =5 kΩ)		0,493 ±5%			kΩ
B _{100/125}	R _(T) =R ₁₀₀ exp[B _{100/125} (1/T-1/T ₁₀₀)]; T[K];		3550 ±2%			K



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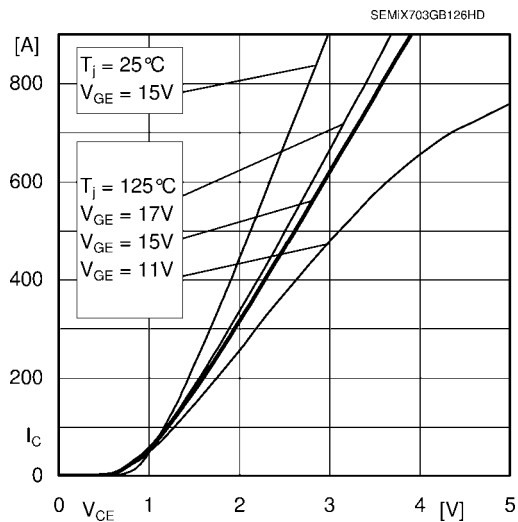


Fig. 1 Typ. output characteristic, inclusive $R_{CC'} + EE'$

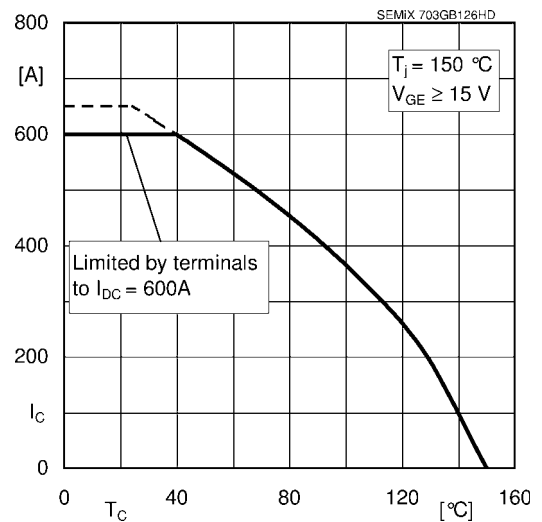


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

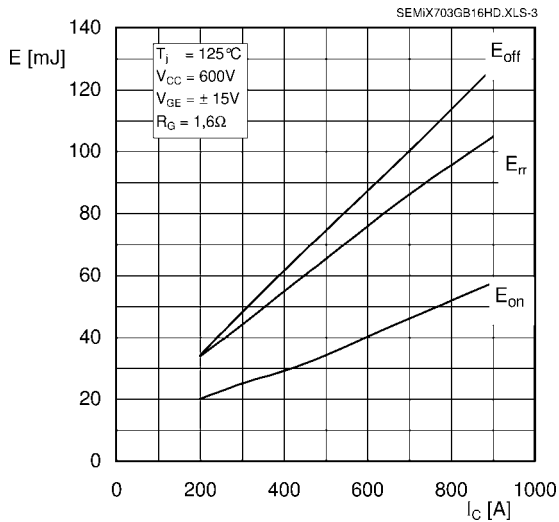


Fig. 3 Typ. turn-on /-off energy = $f(I_C)$

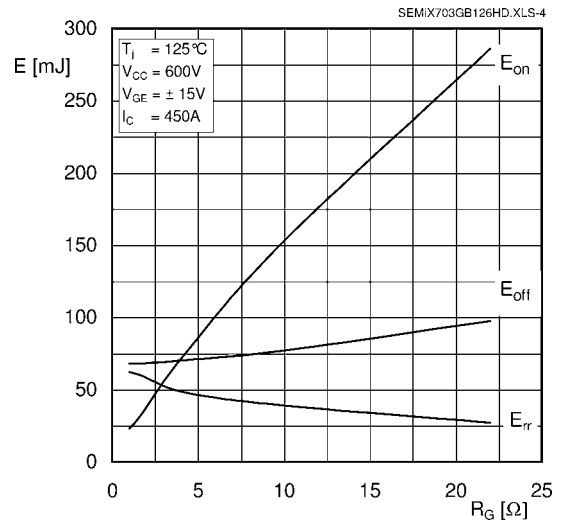


Fig. 4 Typ. turn-on /-off energy = $f(R_G)$

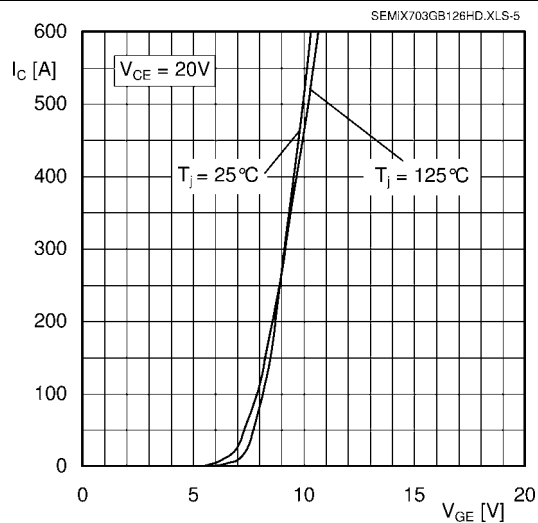


Fig. 5 Typ. transfer characteristic

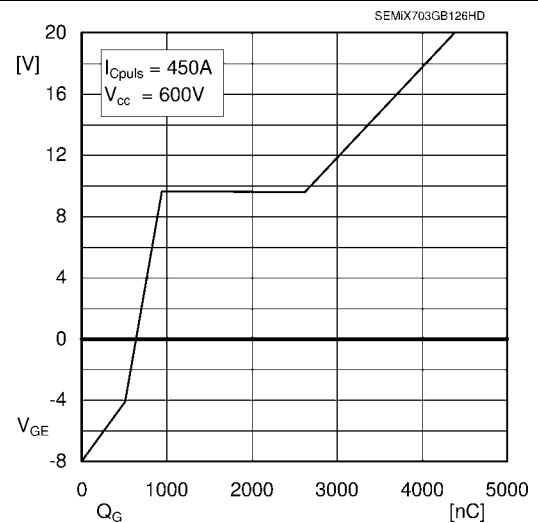


Fig. 6 Typ. gate charge characteristic

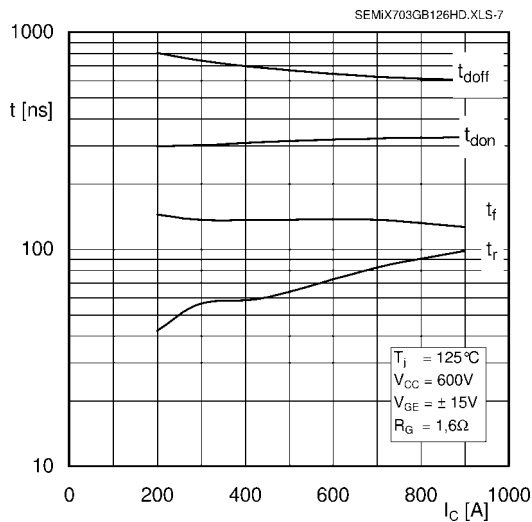


Fig. 7 Typ. switching times vs. I_C

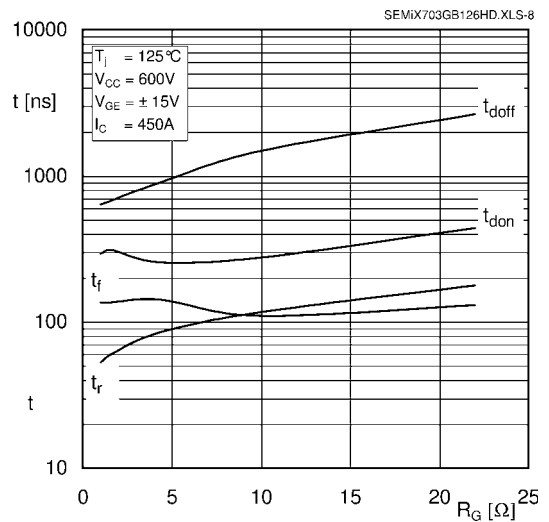


Fig. 8 Typ. switching times vs. gate resistor R_G

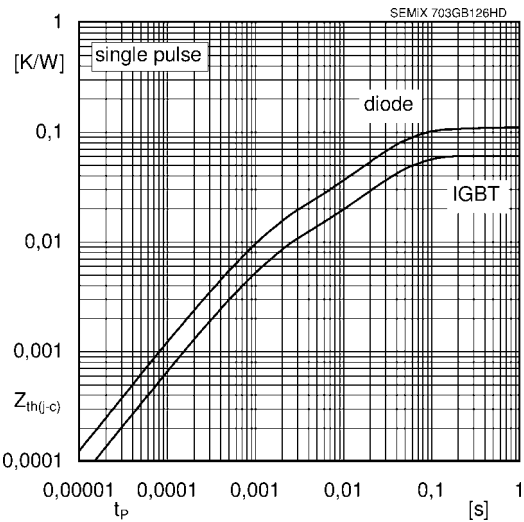


Fig. 9 Typ. transient thermal impedance

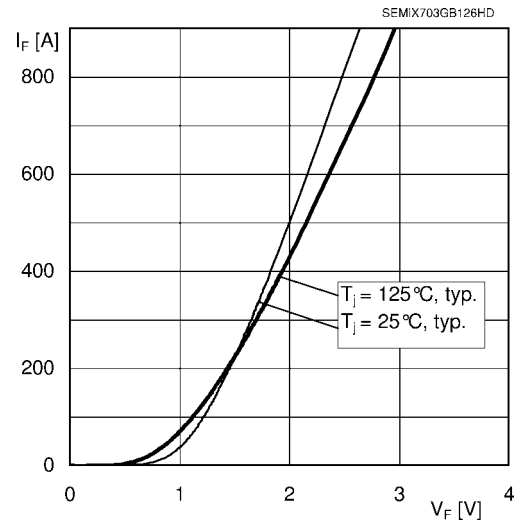


Fig. 10 Typ. CAL diode forward charact., incl. $R_{CC'+EE'}$

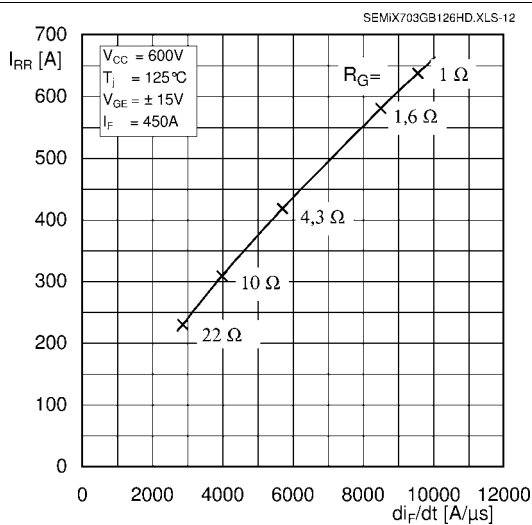


Fig. 11 Typ. CAL diode peak reverse recovery current

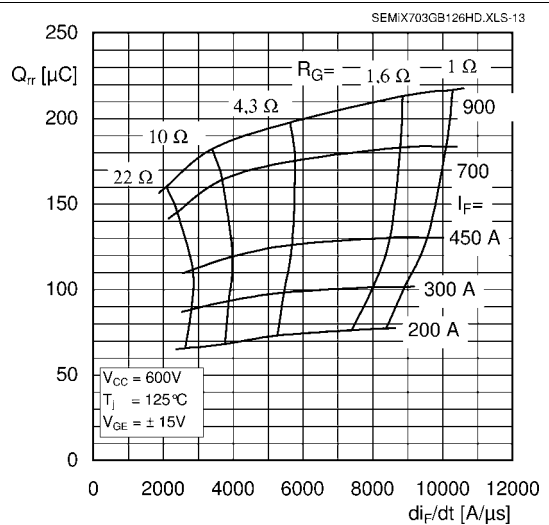
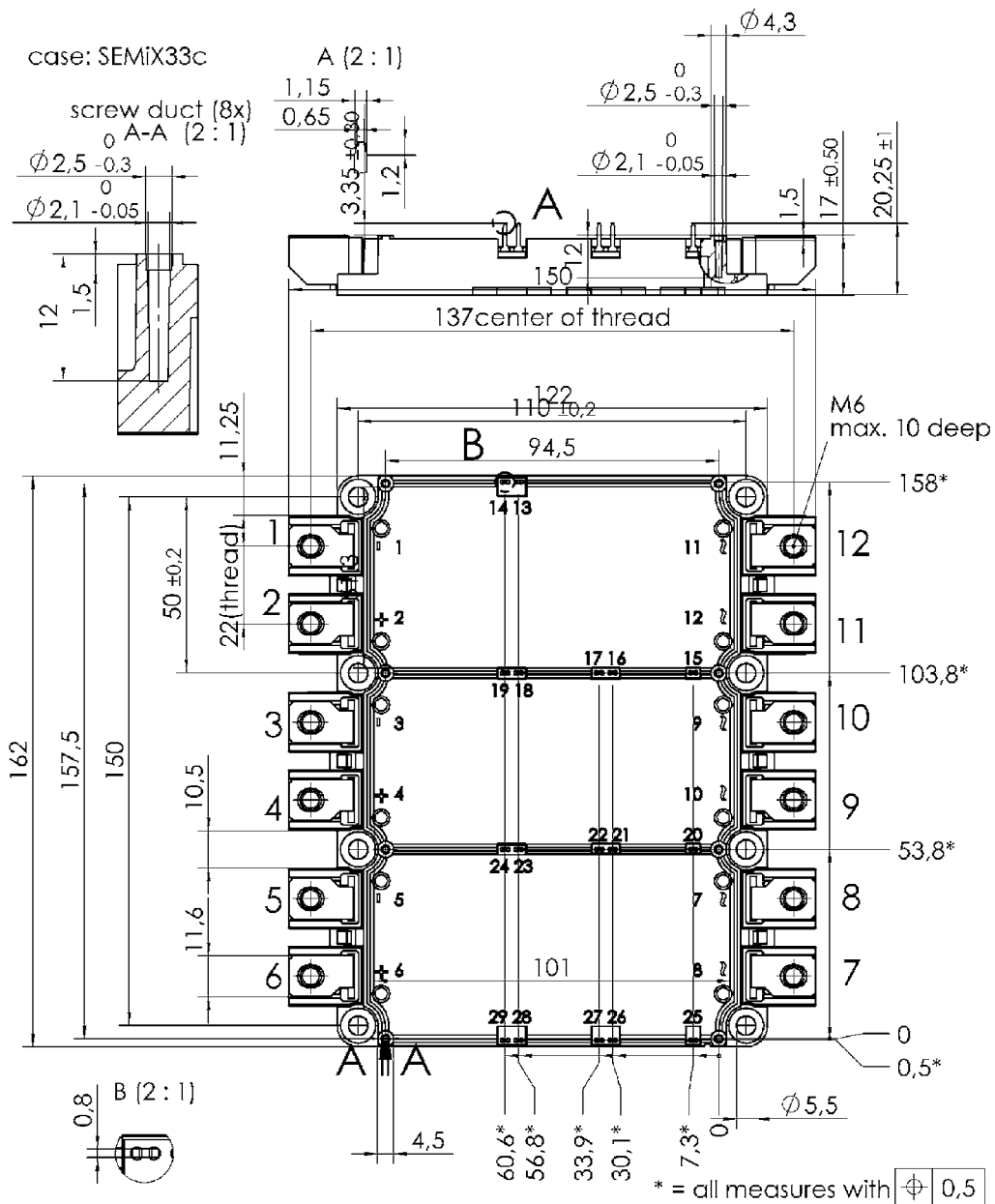
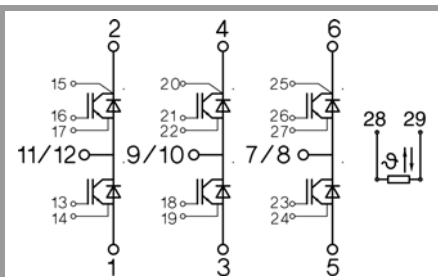


Fig. 12 Typ. CAL diode recovery charge



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

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