



Trench IGBT Modules

SKiM 304GD12T4D

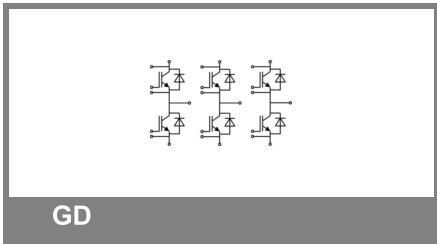
Preliminary Data

Features

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

Typical Applications*

- Automotive inverter
- AC inverter drives



Absolute Maximum Ratings			T _{case} = 25°C, unless otherwise specified	
Symbol	Conditions		Values	Units
IGBT				
V _{CES}	T _j = 25 °C		1200	V
I _C	T _j = 150 °C	T _s = 25 °C	285	A
		T _s = 70 °C	215	A
I _{CRM}	I _{CRM} =3xI _{Cnom}		900	A
V _{GES}			±20	V
t _{psc}	V _{CC} = 800 V; V _{GE} ≤ 15 V; T _j = 150 °C V _{CES} < 1200 V		10	μs
Inverse Diode				
I _F	T _j = 150 °C	T _s = 25 °C	220	A
		T _s = 70 °C	160	A
I _{FRM}			400	A
Module				
I _{t(RMS)}			400	A
T _{vj}			- 40 + 150	°C
T _{stg}			- 40 + 125	°C
V _{isol}	AC, 1 min.		2500	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	3,8			mA
V _{CE0}	T _J = 25 °C		0,8			V
	T _J = 125 °C		0,72			V
r _{CE}	V _{GE} = 15 V	T _J = 25°C	3,3			mΩ
		T _J = 125°C	4,7			mΩ
V _{CE(sat)}	I _{Cnom} = 300 A, V _{GE} = 15 V	T _J = 25°C _{chiplev.}	1,8			V
		T _J = 125°C _{chiplev.}	2,1			V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V	f = 1 MHz	19			nF
C _{oes}			1,2			nF
C _{res}			1			nF
Q _G	V _{GE} = -15V...+15V		1700			nC
t _{d(on)}	R _{Gon} = 1 Ω di/dt = 9250 A/μs	V _{CC} = 600V I _C = 300A	225			ns
t _r			40			ns
E _{on}			21			mJ
t _{d(off)}	R _{Goff} = 1 Ω di/dt = 4060 A/μs	T _J = 125 °C V _{GE} = -15V/+15V	435			ns
t _f			60			ns
E _{off}			23			mJ
R _{th(j-s)}	per IGBT		0,19			K/W



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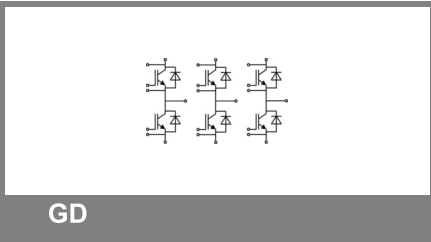
Preliminary Data

Features

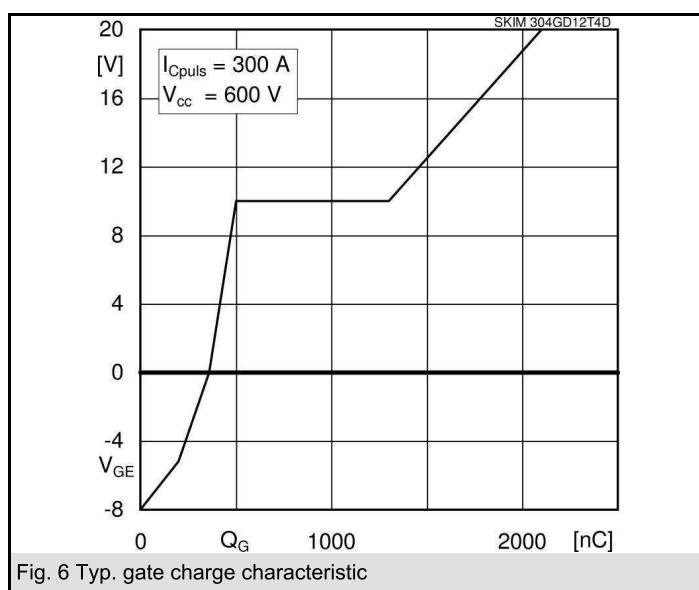
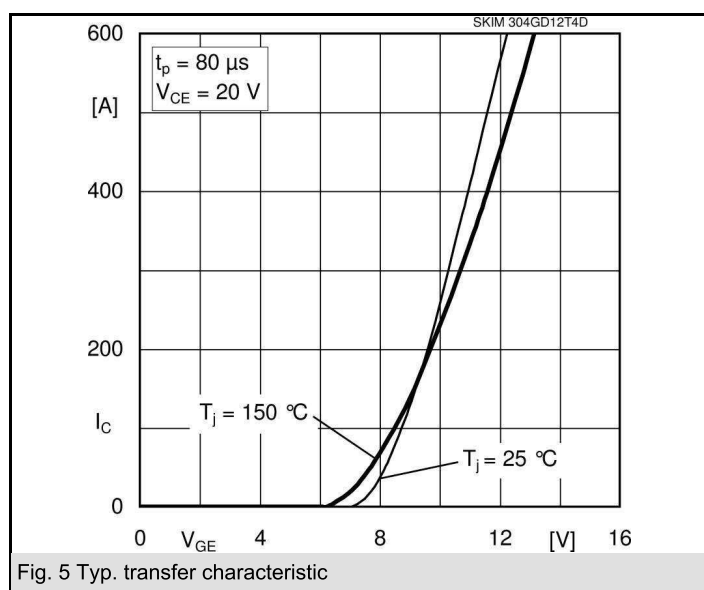
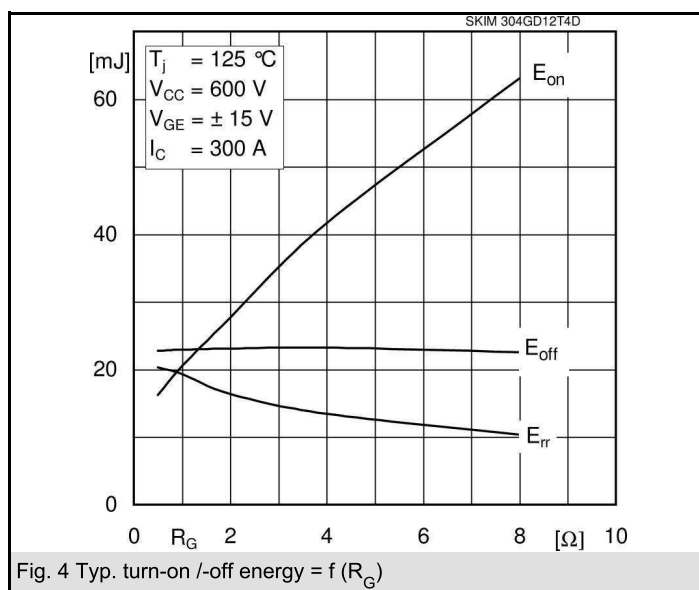
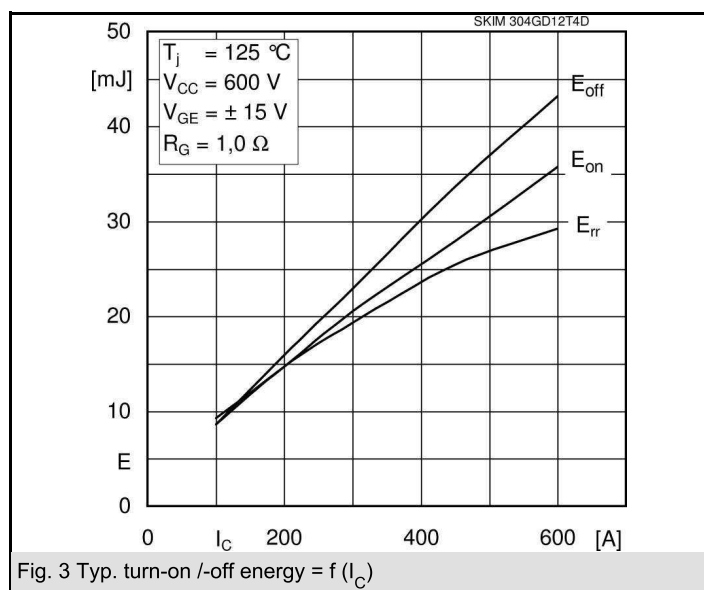
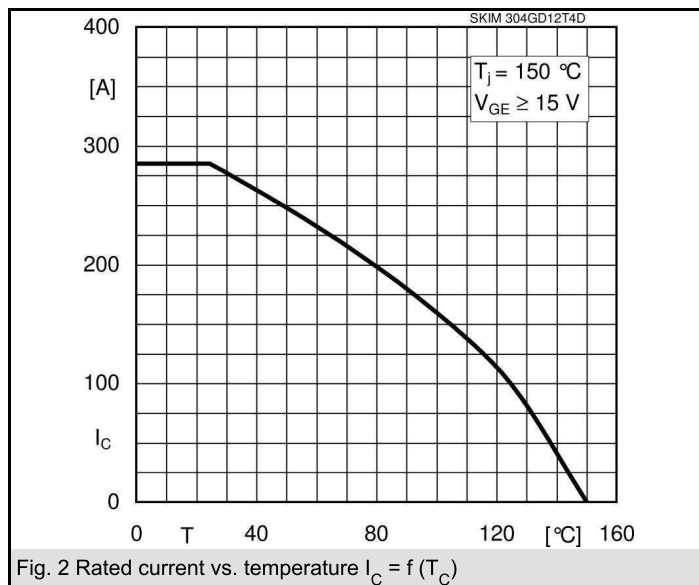
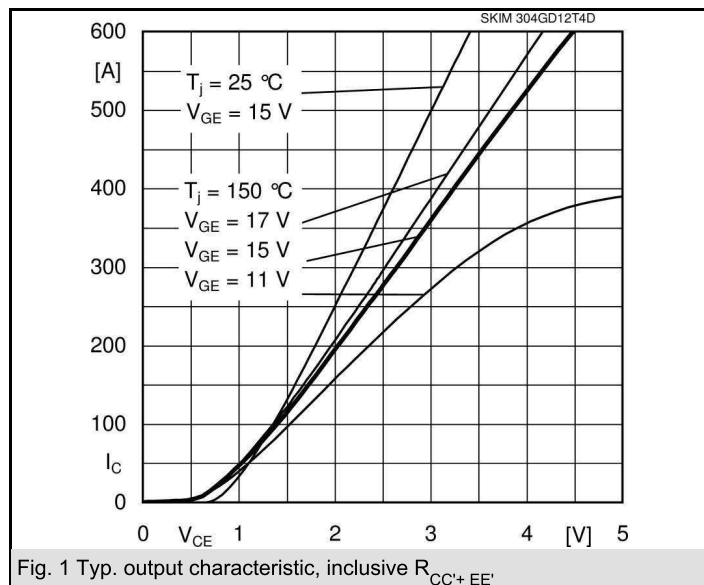
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- High short circuit capability

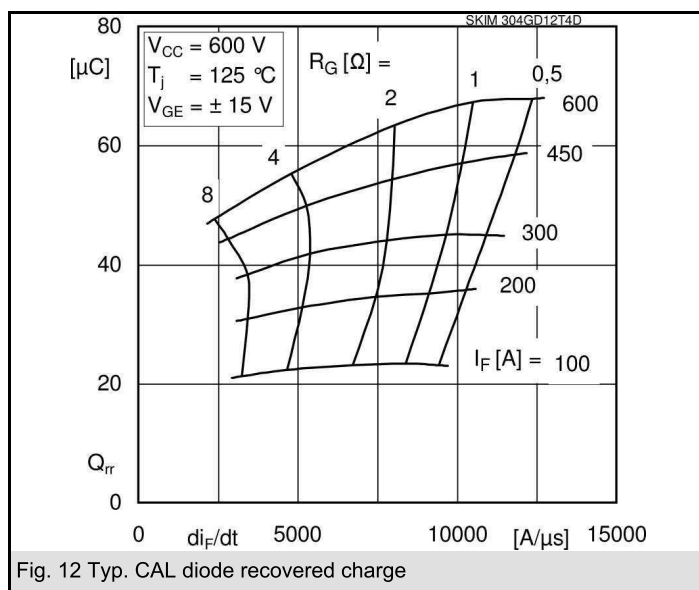
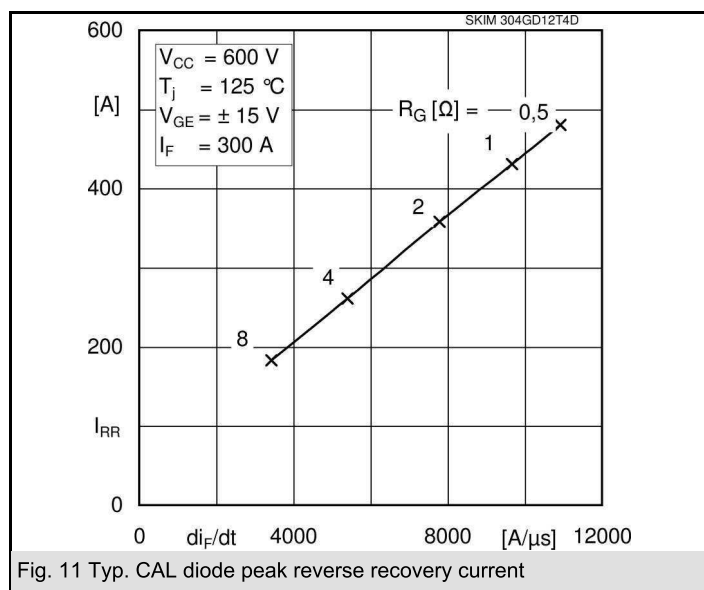
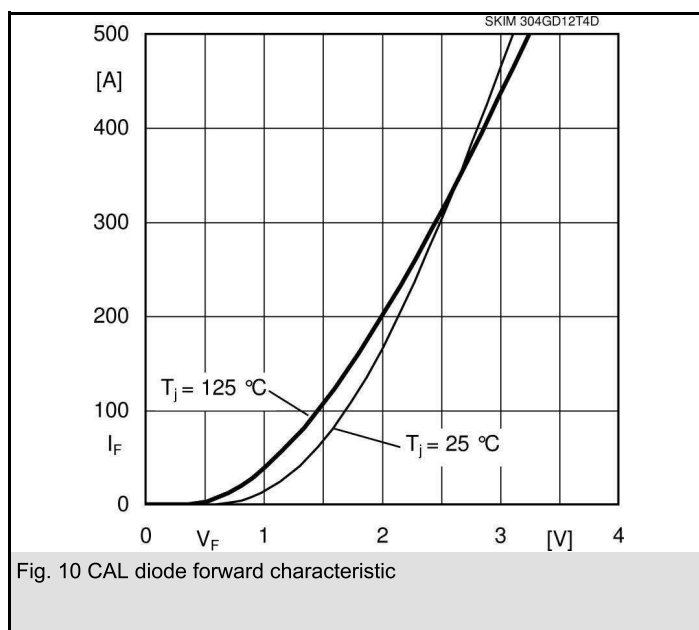
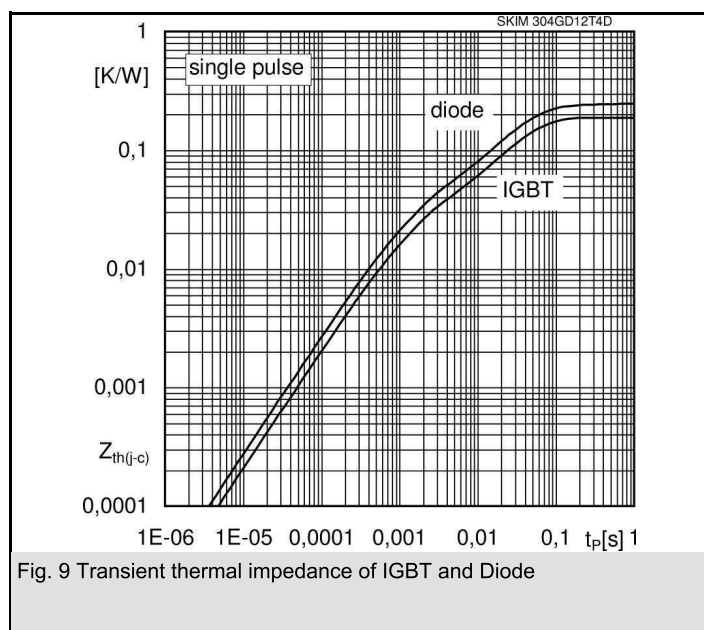
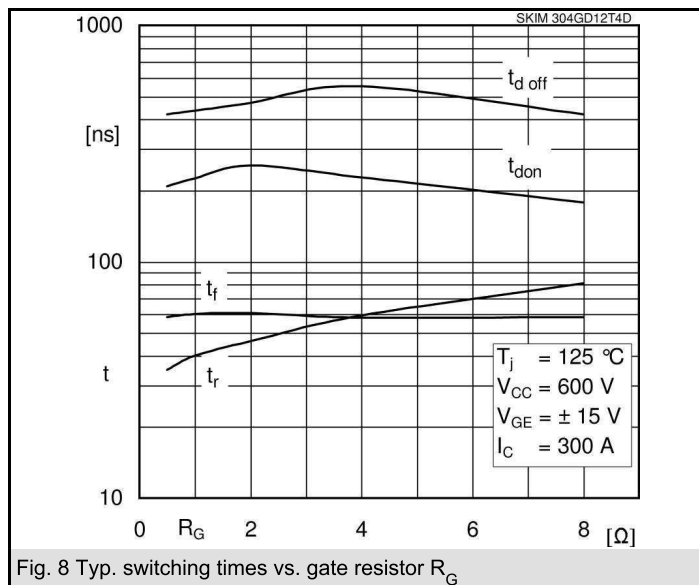
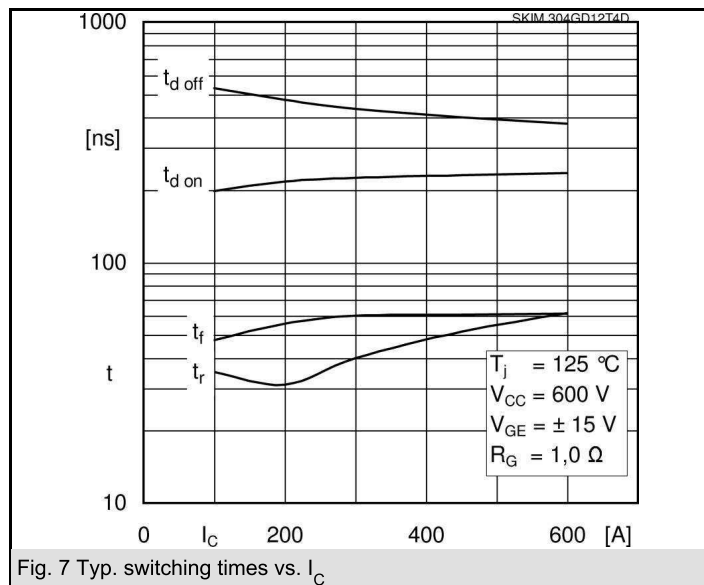
Typical Applications*

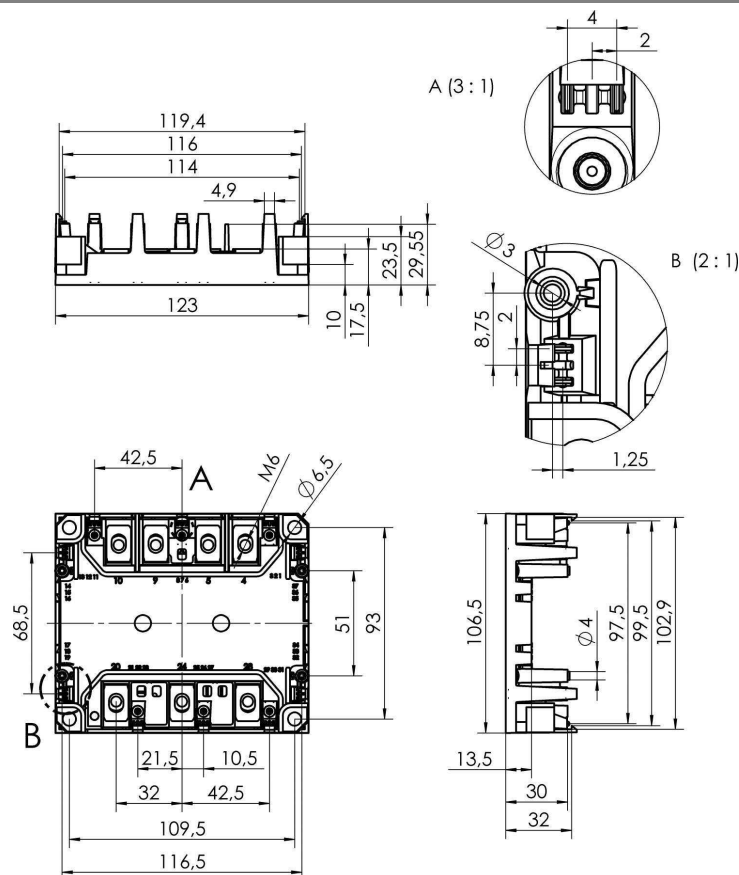
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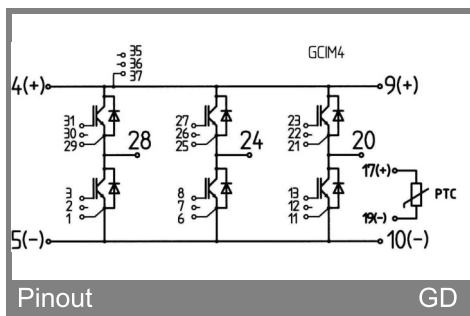
Characteristics						
Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
V _F = V _{EC}	I _{Fnom} = 300 A; V _{GE} = 0 V	T _j = 25 °C _{chiplev.}		2,3	2,8	V
		T _j = 125 °C _{chiplev.}		2,2	2,7	V
V _{F0}		T _j = 25 °C		1,2	1,6	V
		T _j = 125 °C		0,9	1,3	V
r _F		T _j = 25 °C		3,5	4	mΩ
		T _j = 125 °C		4,2	4,7	mΩ
I _{RRM}	I _F = 300 A	T _j = 125 °C		430		A
Q _{rr}				45		μC
E _{rr}	V _{GE} = -15 V; V _{CC} = 600 V			19,3		mJ
R _{th(j-s)D}	per diode				0,25	K/W
Module						
L _{CE}					20	nH
R _{CC'+EE'}	res., terminal-chip	T _{case} = 25 °C		1,35		mΩ
		T _{case} = 125 °C		1,75		mΩ
M _s	to heat sink M4					Nm
M _t	to terminals M6		4		5	Nm
w					310	g
Temperature sensor						
R ₁₀₀	T _c =100°C (R ₂₅ =1,0kΩ)			1,67		kΩ
B _{100/125}	R(T)=R ₁₀₀ *exp[B _{100/125} *(1/T-1/373)]; T[K]					K







Case SKiM 4



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

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