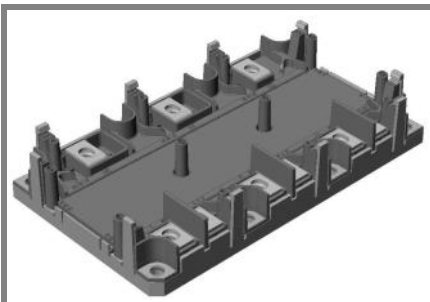


SKiM455GD12T4D1



SKiM[®] 5

Trench IGBT modules

SKiM455GD12T4D1

Preliminary Data

Features

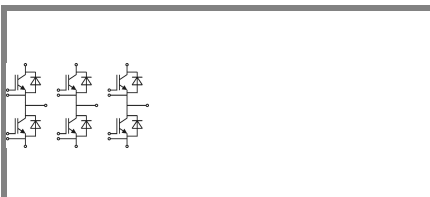
- IGBT 4 = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability

Typical Applications*

- High Reliability AC inverter drives
- UPS

Remarks

- Case temperature limited to $T_c = 125^\circ\text{C}$ max
- $T_{j,max}$ of the diode is limited to 150°C

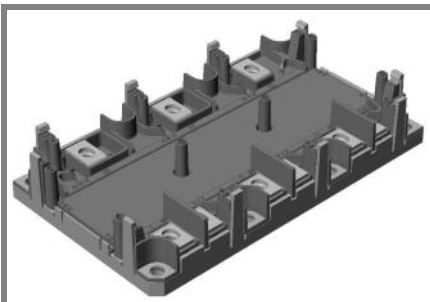


GD

Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = ^\circ\text{C}$	1200		V
I_C	$T_j = 150^\circ\text{C}$	$T_{heatsink} = 25^\circ\text{C}$	400	A
		$T_{heatsink} = 70^\circ\text{C}$	305	A
I_{CRM}	$I_{CRM} = 3 \times I_{CNOM}$	1350		A
V_{GES}		± 20		V
t_{psc}	$V_{CC} = 800\text{ V}; V_{GE} \leq 15\text{ V}; T_j = 150^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10		μs
Inverse Diode				
I_F	$T_j = 150^\circ\text{C}$	$T_{heatsink} = 25^\circ\text{C}$	295	A
		$T_{heatsink} = 70^\circ\text{C}$	215	A
I_{FRM}	$I_{FRM} = 2 \times I_{FNOM}$	600		A
Module				
$I_{t(RMS)}$				A
T_{vj}		-40 ... +150		$^\circ\text{C}$
T_{stg}		-40 ... +125		$^\circ\text{C}$
V_{isol}	AC, 1 min.	2500		V

Characteristics		$T_c = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 18\text{ mA}$	5	5,8	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$			0,3	mA
V_{CE0}		$T_j = 25^\circ\text{C}$	0,8	0,9	V
		$T_j = 125^\circ\text{C}$	0,7	0,8	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	2,2	2,4	$\text{m}\Omega$
		$T_j = 125^\circ\text{C}$	3,1	3,3	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 450\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	1,8	2	V
		$T_j = 125^\circ\text{C}_{chiplev.}$	2,1	2,3	V
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	27,9		nF
C_{oes}			1,7		nF
C_{res}			1,5		nF
Q_G	$V_{GE} = -8\text{V}/+15\text{V}$	2600		nC	
R_{Gint}	$T_j = 25^\circ\text{C}$	1,7		Ω	
$t_{d(on)}$	$R_{Gon} = 1\ \Omega$ $di/dt = 8200\text{ A}/\mu\text{s}$	$V_{CC} = 600\text{V}$ $I_C = 450\text{A}$	265		ns
t_r			60		ns
E_{on}			34		mJ
$t_{d(off)}$	$R_{Goff} = 1\ \Omega$ $di/dt = 5300\text{ A}/\mu\text{s}$	$T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15\text{V}$	470		ns
t_f			65		ns
E_{off}			40		mJ
$R_{th(j-s)}$	per IGBT	0,14		K/W	

SKiM455GD12T4D1



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Trench IGBT modules

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Preliminary Data

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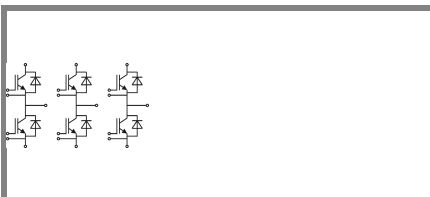
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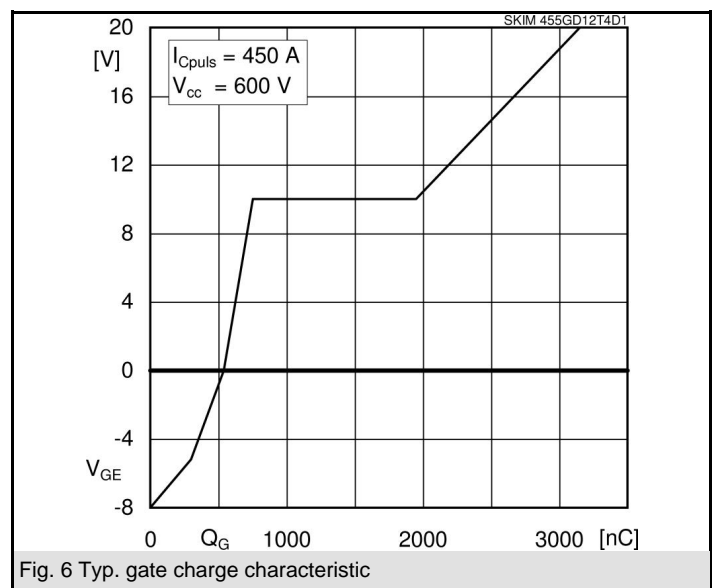
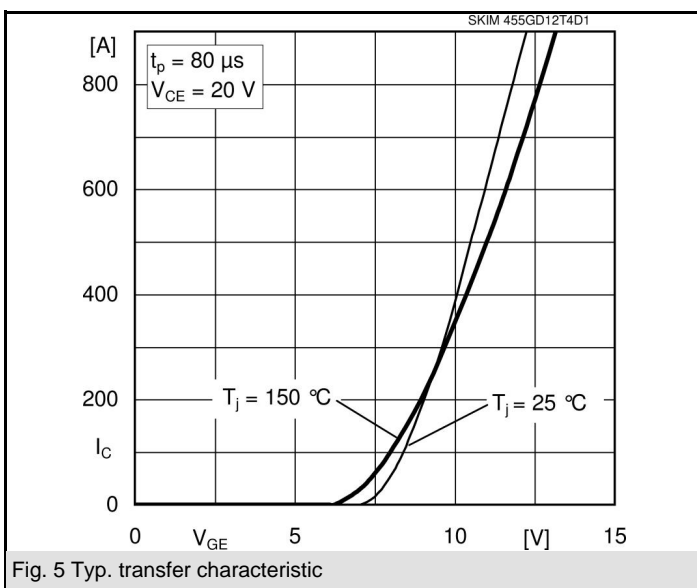
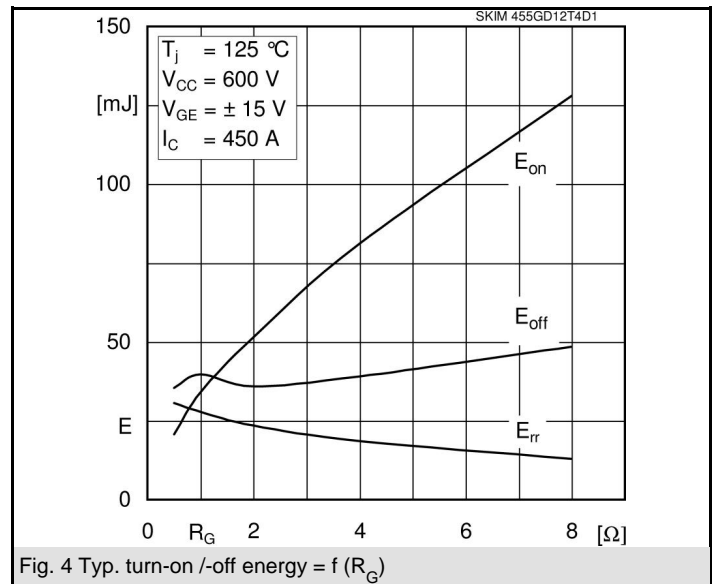
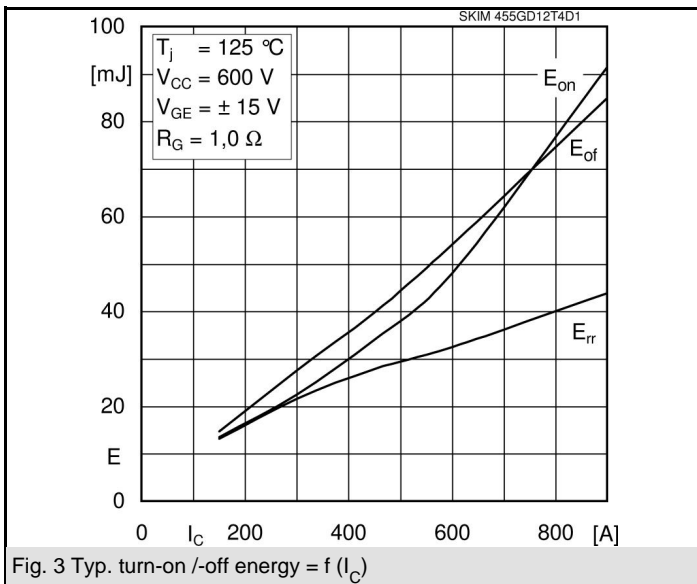
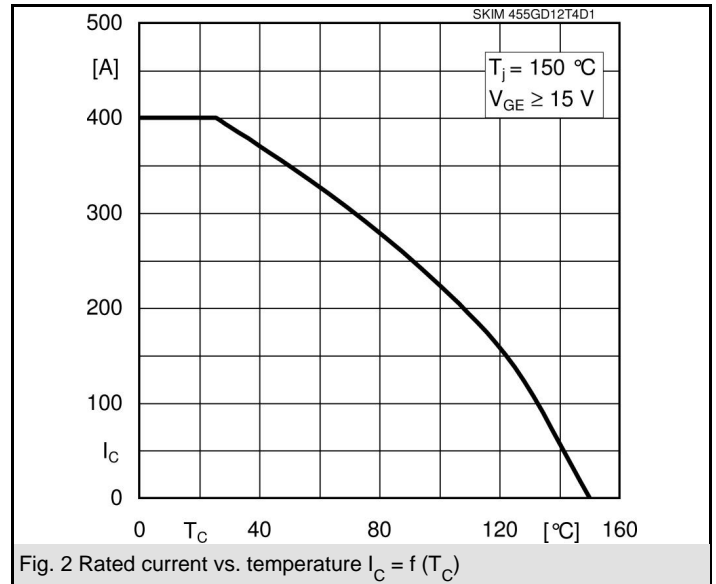
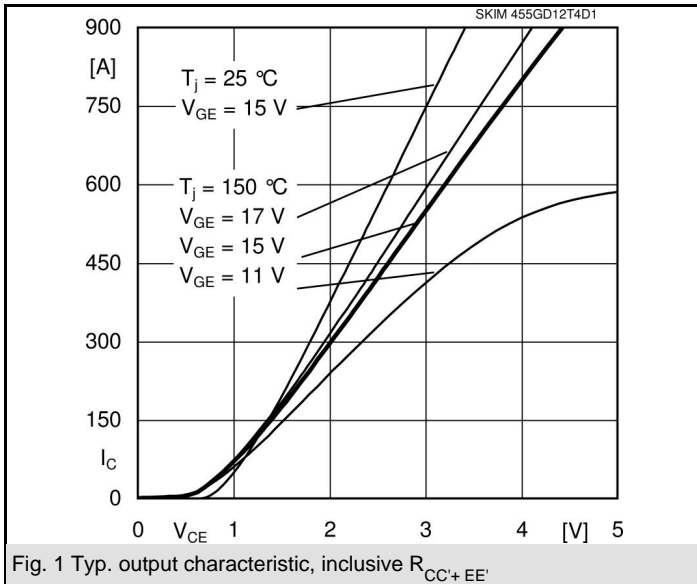


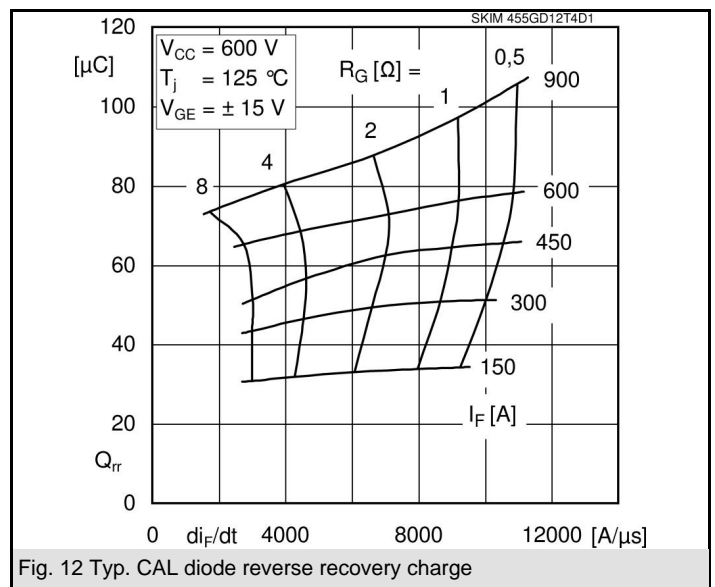
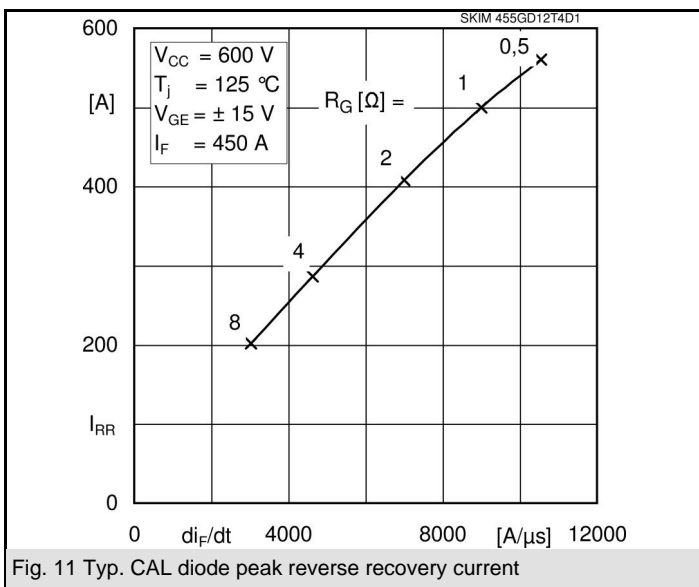
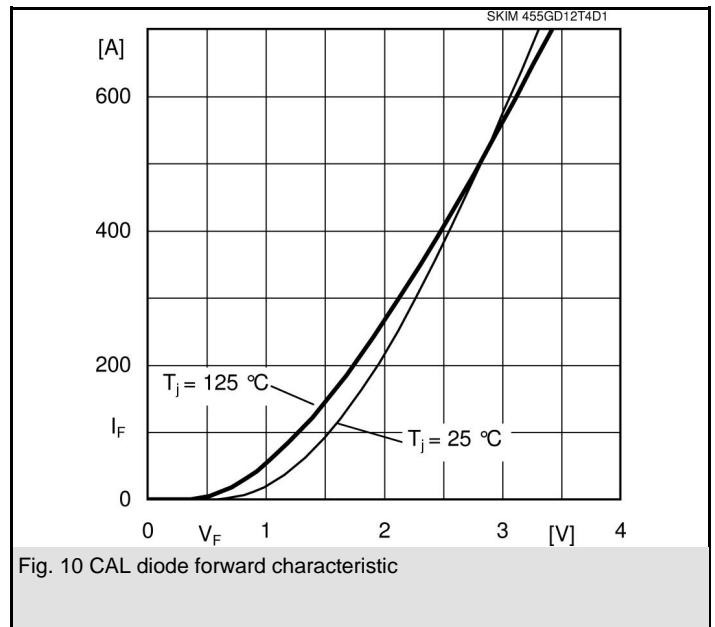
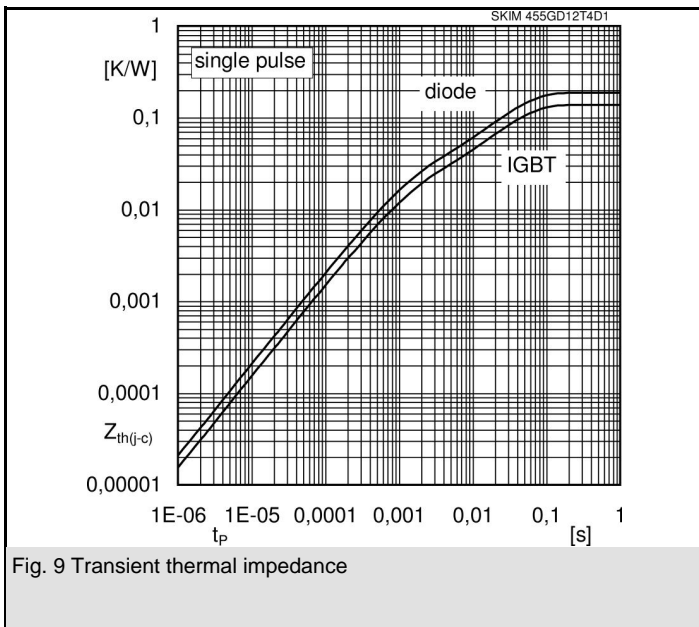
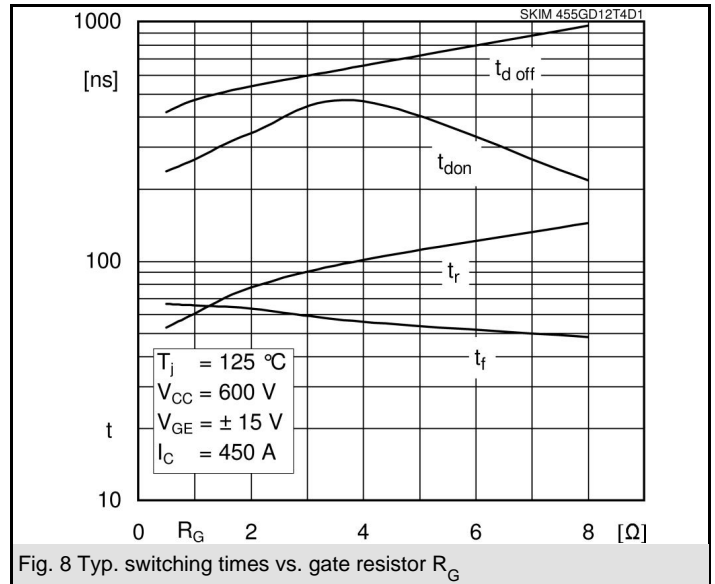
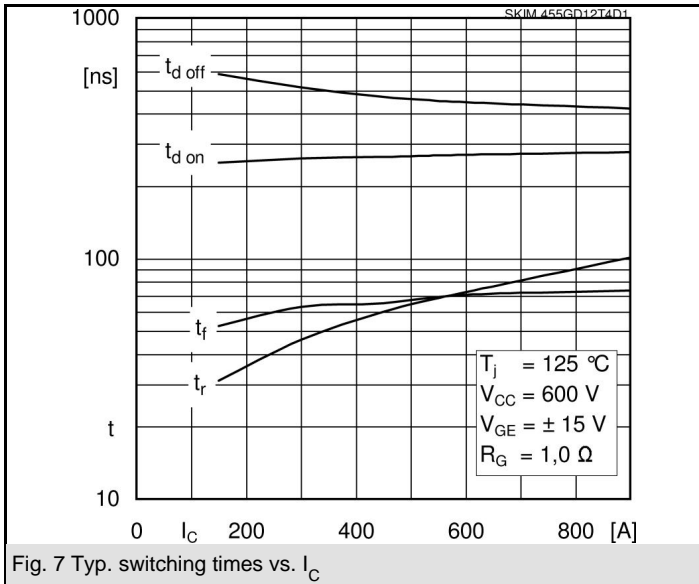
GD

Characteristics		min.	typ.	max.	Units
Symbol	Conditions				
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 450\text{ A}; V_{GE} = 0\text{ V}$		2,3	2,8	V
			2,2	2,7	V
					V
V_{F0}			1,2	1,6	V
			0,9	1,3	V
r_F			2,3	2,7	mΩ
			2,8	3,1	mΩ
I_{RRM}	$I_F = 450\text{ A}$		500		A
Q_{rr}	$di/dt = 9000\text{ A}/\mu\text{s}$		64,5		μC
E_{rr}	$V_{GE} = -15\text{ V}$		27,8		mJ
$R_{th(j-s)}$	per diode		0,19		K/W
Module					
L_{CE}				20	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25^\circ\text{C}$	0,9		mΩ
		$T_{case} = 125^\circ\text{C}$	1,1		mΩ
M_s	to heat sink M5				Nm
M_t	to terminals M6		4	5	Nm
w				460	g
Temperature sensor					
R_{TS}	$T = 25 (100)^\circ\text{C}$		1 (1,67)		kΩ
Tolerance	$T = 25 (100)^\circ\text{C}$		3 (2)		%

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

* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.





SKiM455GD12T4D1

UL recognized file

no. E 63 532

