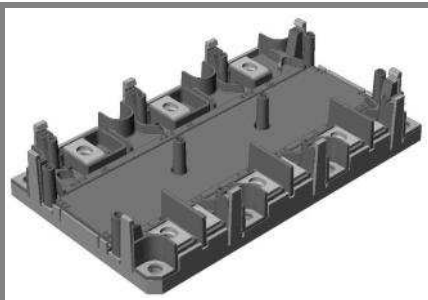


# SKiM455GD12T4D1



SKiM<sup>®</sup> 5

## Trench IGBT modules

SKiM455GD12T4D1

Preliminary Data

### Features

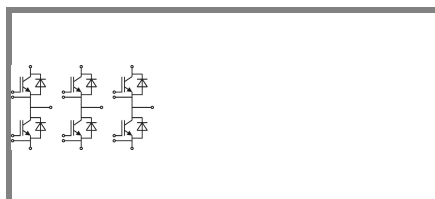
- IGBT 4 = Trenchgate technology
- $V_{CE(sat)}$  with positive temperature coefficient
- High short circuit capability

### 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  $150^\circ\text{C}$

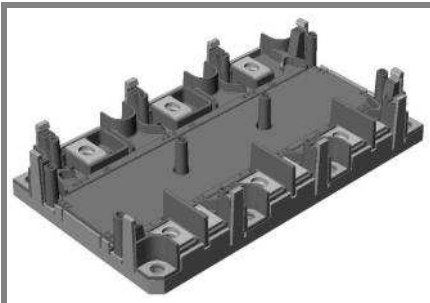


GD

Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$ , unless otherwise specified			
Symbol	Conditions	Values		Units	
<b>IGBT</b>					
$V_{CES}$	$T_j = ^\circ\text{C}$	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	
$V_{GES}$		$\pm 20$		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		$\mu\text{s}$	
<b>Inverse Diode</b>					
$I_F$	$T_j = 150^\circ\text{C}$	$T_{heatsink} = 25^\circ\text{C}$	295		A
		$T_{heatsink} = 70^\circ\text{C}$	215		A
$I_{FRM}$	$I_{FRM} = 2 \times I_{FNOM}$	600		A	
<b>Module</b>					
$I_{t(RMS)}$				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	
<b>IGBT</b>						
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 18\text{ mA}$	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		V	
		$T_j = 125^\circ\text{C}$	0,7		V	
$r_{CE}$	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	2,2		$\text{m}\Omega$	
		$T_j = 125^\circ\text{C}$	3,1		$\text{m}\Omega$	
$V_{CE(sat)}$	$I_{Cnom} = 450\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	1,8		V	
		$T_j = 125^\circ\text{C}_{chiplev.}$	2,1		V	
$C_{ies}$	$V_{CE} = 25, V_{GE} = 0\text{ V}$			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	$\Omega$	
$t_{d(on)}$	$R_{Gon} = 1\ \Omega$ $di/dt = 8200\text{ A}/\mu\text{s}$	$V_{CC} = 600\text{V}$ $I_C = 450\text{A}$			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



SKiM<sup>®</sup> 5

## Trench IGBT modules

SKiM455GD12T4D1

Preliminary Data

### Features

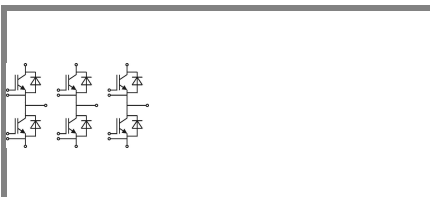
- IGBT 4 = Trenchgate technology
- $V_{CE(sat)}$  with positive temperature coefficient
- High short circuit capability

### Typical Applications\*

- High Reliability AC inverter drives
- UPS

### Remarks

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

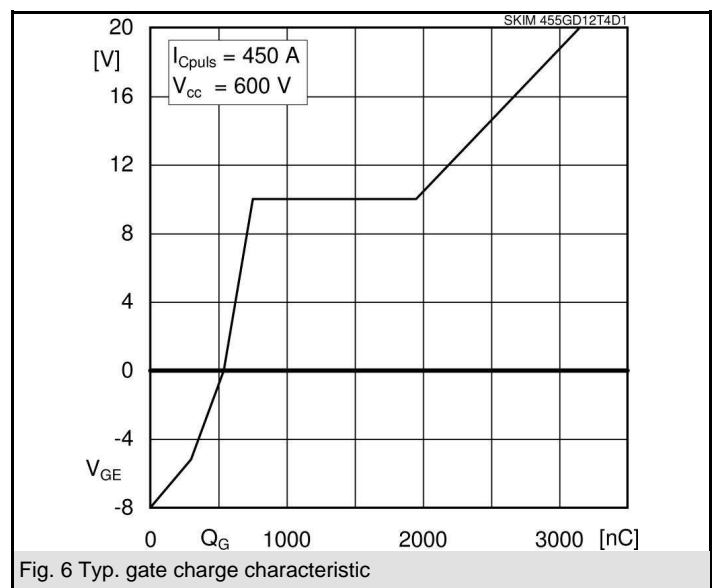
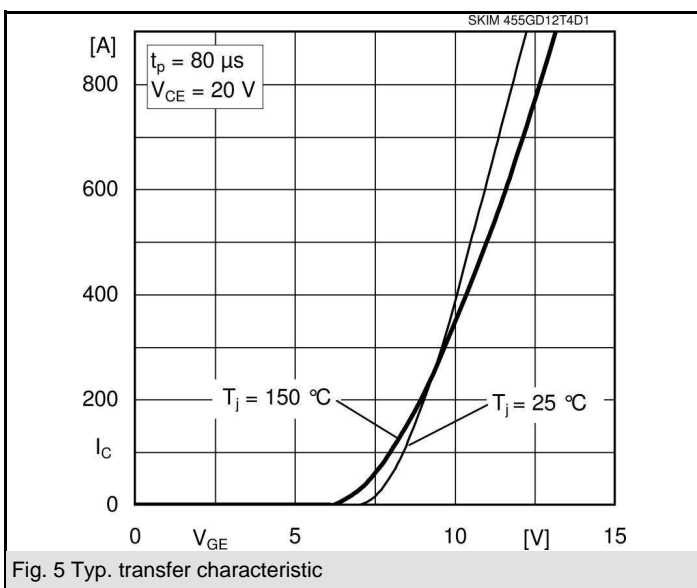
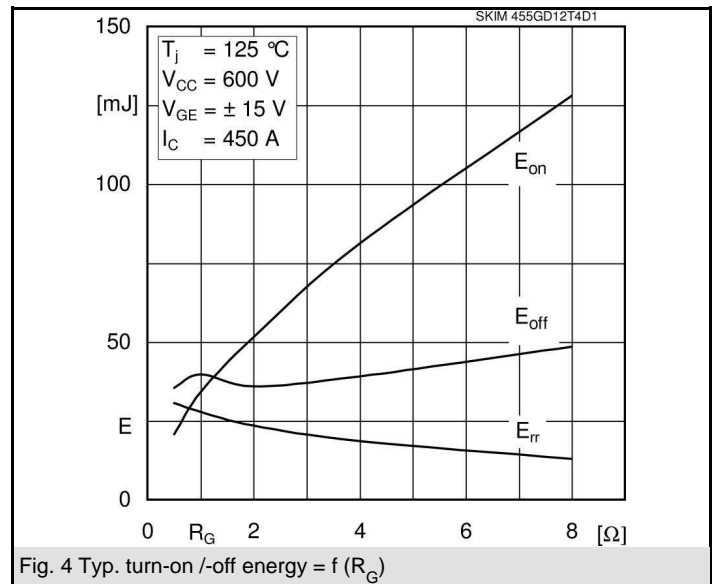
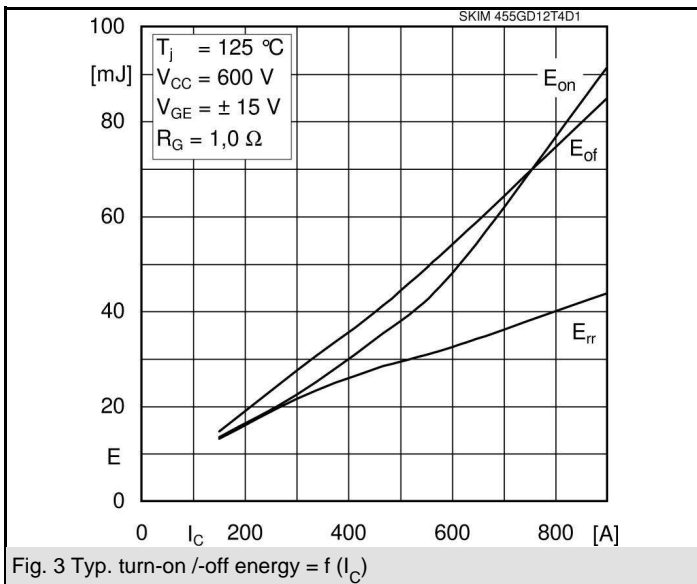
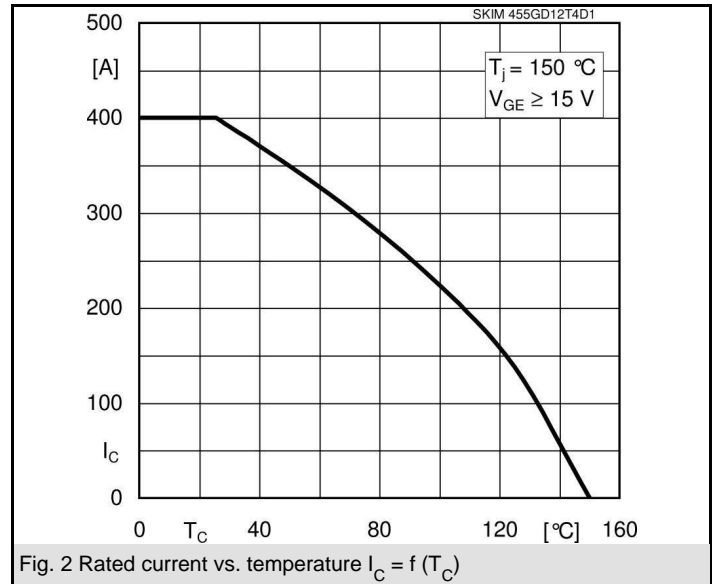
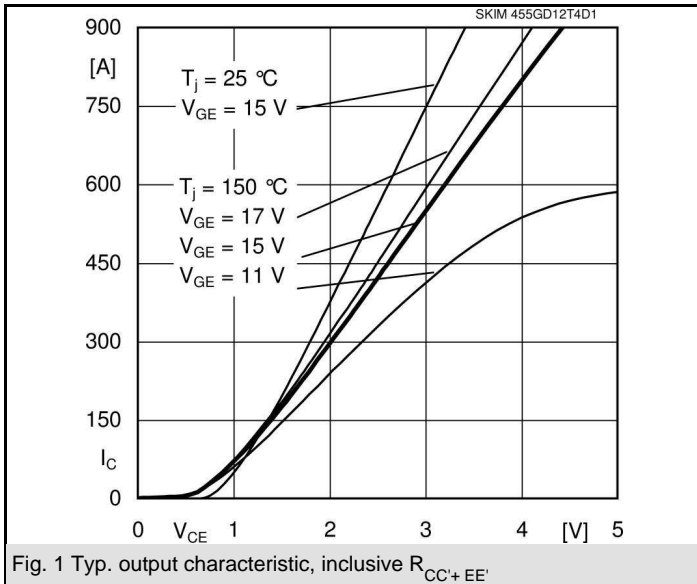


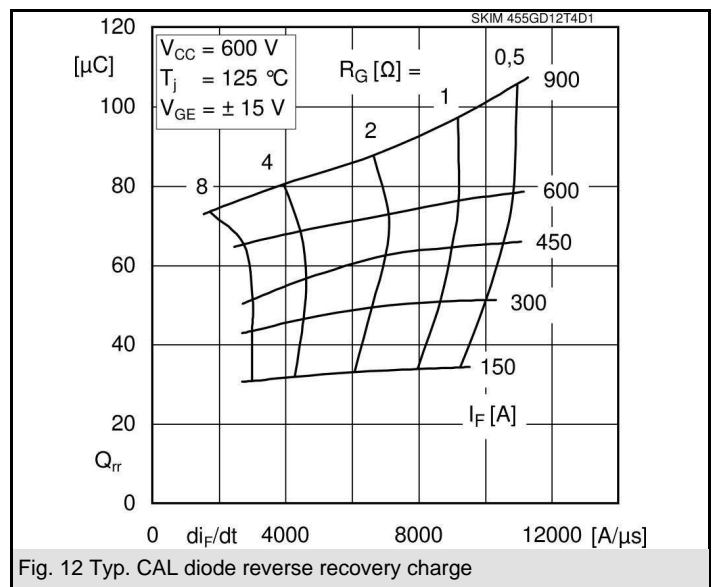
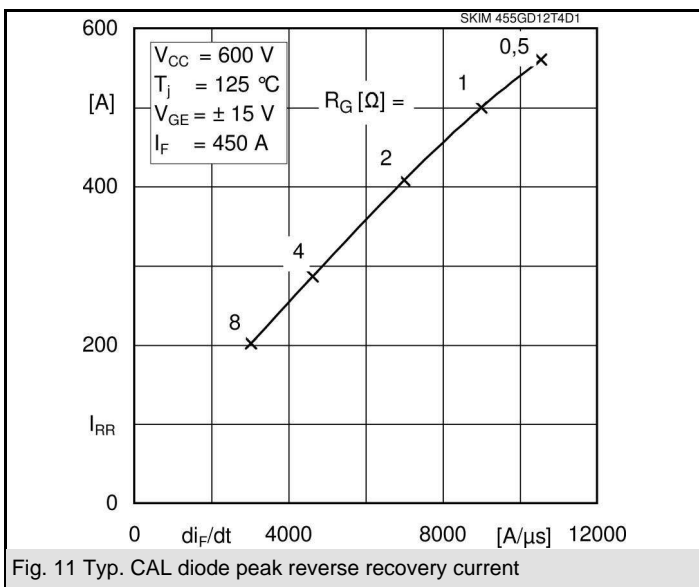
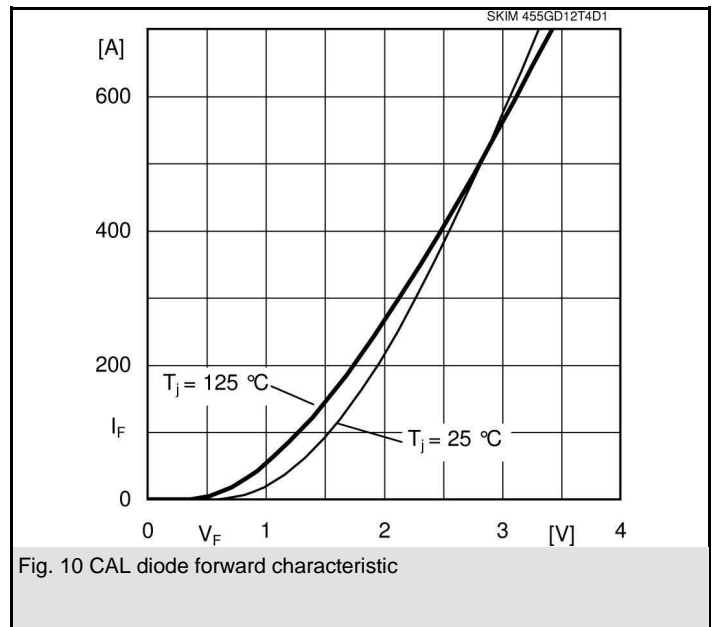
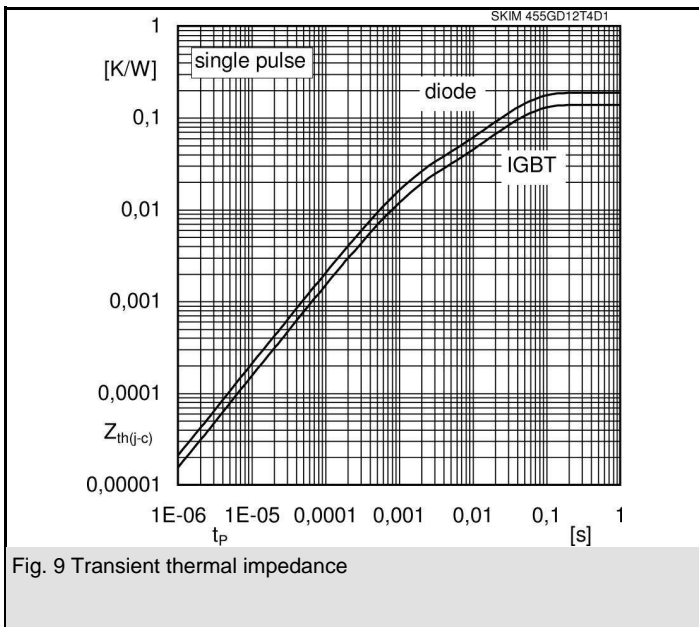
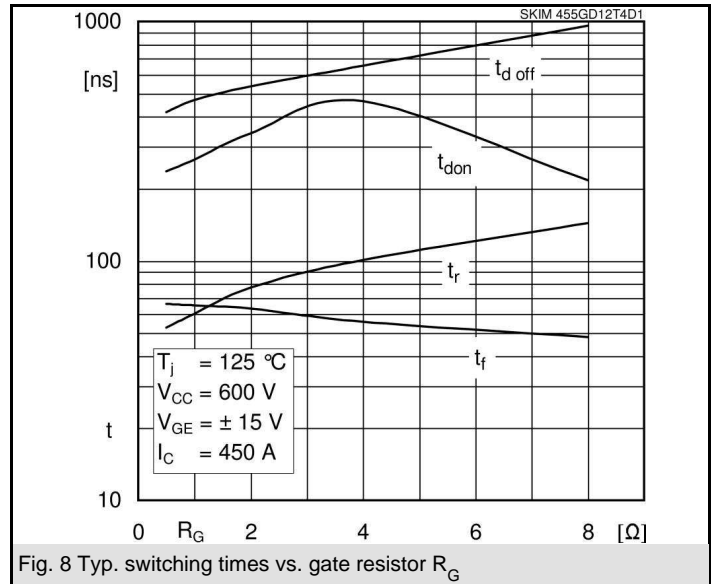
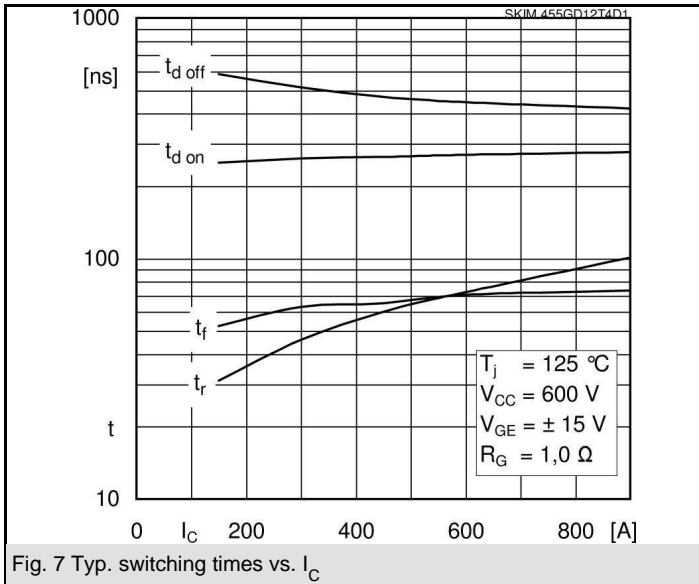
GD

Characteristics		min.	typ.	max.	Units
<b>Symbol</b>	<b>Conditions</b>				
<b>Inverse Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 450\text{ A}; V_{GE} = 0\text{ V}$		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
<b>Module</b>					
$L_{CE}$				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
<b>Temperature sensor</b>					
$R_{TS}$	$T = 25 (100)^\circ\text{C}$		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

