



SKiM® 4

IGBT Modules

SKiM 220GD176D H4

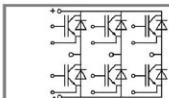
Preliminary Data

Features

- Homogenous Si
- Trench = Trenchgate Technology
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to $6x I_C$

Typical Applications*

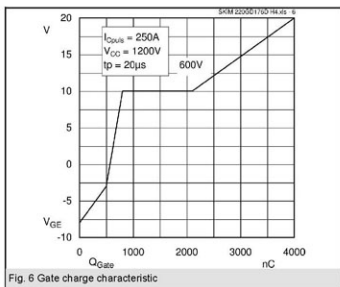
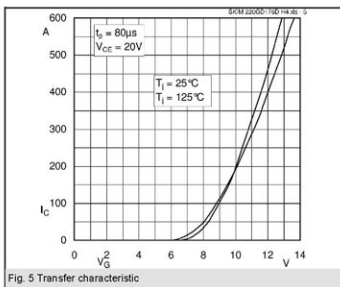
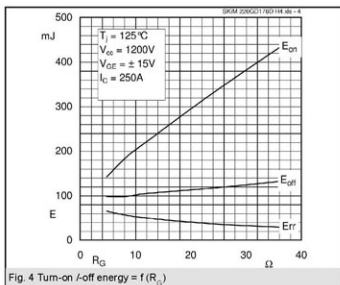
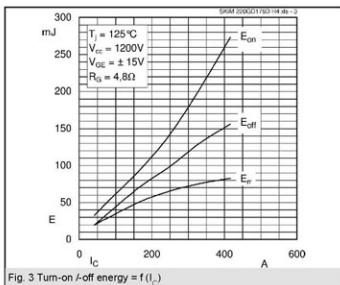
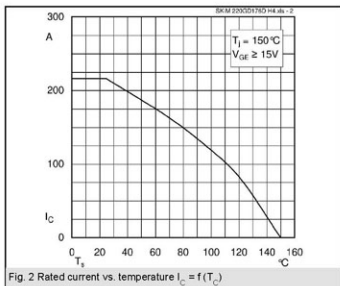
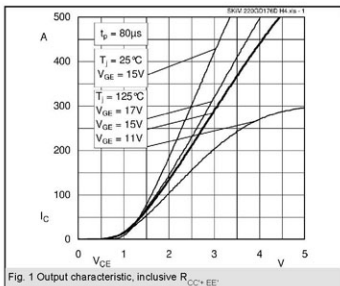
- AC inverter drives mains 575 - 750 V AC
- public transport (auxiliary syst.)

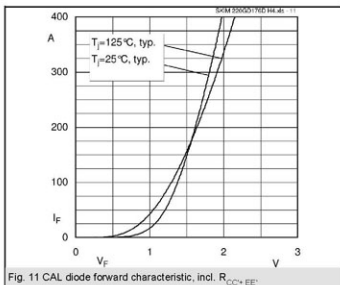
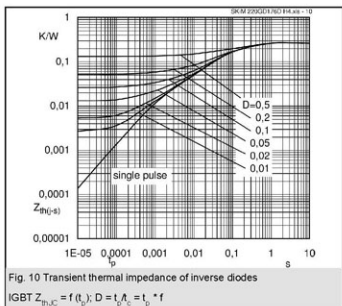
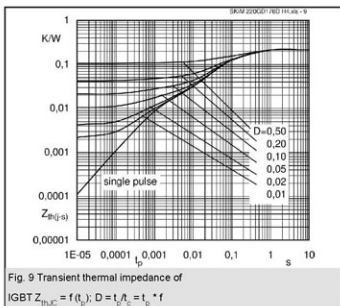
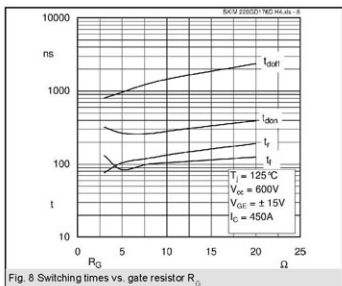
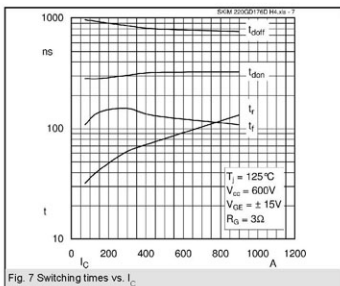


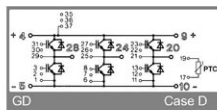
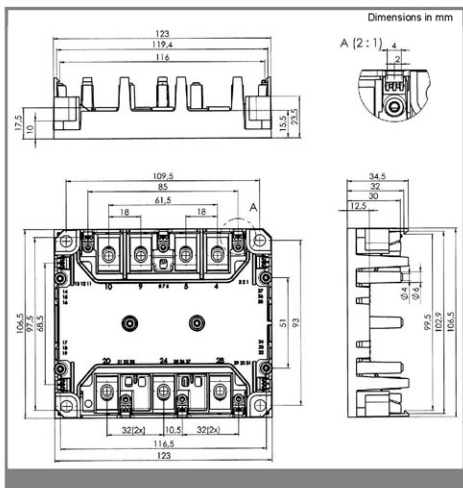
GD

Absolute Maximum Ratings		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}		1700		V
I_C	$T_s = 25\text{ (70) }^\circ\text{C}$	220 (165)		A
I_{CRM}	$t_p = 1\text{ ms}$	440		A
V_{GES}		± 20		V
T_j (T_{stp})		-40 ... +150 (125)		$^\circ\text{C}$
T_{cop}	max. case operating temperature	125		$^\circ\text{C}$
V_{bcf}	AC, 1 min.	4000		V
Inverse diode				
I_F	$T_s = 25\text{ (70) }^\circ\text{C}$	220 (165)		A
I_{FRM}	$t_p = 1\text{ ms}$	440		A
I_{FSM}	$t_p = 10\text{ ms}$; \sin ; $T_j = 150\text{ }^\circ\text{C}$	2200		A

Characteristics		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{CE(oh)}$	$V_{GE} = V_{CE}$; $I_C = 10\text{ mA}$	5,15	5,8	6,45	V
I_{CES}	$V_{GE} = 0$; $V_{CE} = V_{CES}$; $T_j = 25\text{ }^\circ\text{C}$			0,3	mA
V_{CE0}	$T_j = 0\text{ }^\circ\text{C}$		1 (0,9)	1,2 (1,1)	V
r_{CE}	$T_j = \text{ }^\circ\text{C}$		4 (6)	5	m Ω
V_{CEsat}	$I_{Cnom} = 250\text{ A}$; $V_{GE} = 15\text{ V}$; $T_j = 25\text{ (125) }^\circ\text{C}$ on chip level		2 (2,4)	2,45	V
C_{ies}	$V_{GE} = 0$; $V_{CE} = 25\text{ V}$; $f = 1\text{ MHz}$		22		nF
C_{oss}	$V_{GE} = 0$; $V_{CE} = 25\text{ V}$; $f = 1\text{ MHz}$		0,9		nF
C_{res}	$V_{GE} = 0$; $V_{CE} = 25\text{ V}$; $f = 1\text{ MHz}$		0,7		nF
L_{CE}				15	nH
$R_{DC+EE'}$	resistance, terminal-chip $T_c = 25\text{ (125) }^\circ\text{C}$		1,35 (1,75)		m Ω
$t_{(on)}$	$V_{CC} = 1200\text{ V}$; $I_{Cnom} = 250\text{ A}$		330		ns
t_r	$R_{Con} = R_{Coff} = 4,8\text{ }\Omega$; $T_j = 125\text{ }^\circ\text{C}$		55		ns
$t_{(off)}$			880		ns
t_f			145		ns
$E_{on} (E_{off})$	$V_{GE} = 15\text{ V}$		145 (100)		mJ
$E_{on} (E_{off})$	with SKHI 64; $T_j = 125\text{ }^\circ\text{C}$; $V_{CC} = 1200\text{ V}$; $I_C = 250\text{ A}$				mJ
Inverse diode					
$V_F = V_{EC}$	$I_{Fnom} = 250\text{ A}$; $V_{GE} = 15\text{ V}$; $T_j = 25\text{ (125) }^\circ\text{C}$		1,7 (1,8)	1,9 (2)	V
V_{TO}	$T_j = 25\text{ (125) }^\circ\text{C}$		1,1 (0,9)	1,3 (1,1)	V
r_T	$T_j = 25\text{ (125) }^\circ\text{C}$		3 (4,5)	3 (4,5)	m Ω
I_{RRM}	$I_F = 200\text{ A}$; $T_j = 125\text{ }^\circ\text{C}$				A
Q_{rr}	$V_{GE} = 0\text{ V}$; $di/dt = A/\mu\text{s}$				μC
E_{rr}	$R_{Con} = R_{Coff} = 4,8\text{ }\Omega$		(65)		mJ
Thermal characteristics					
$R_{th(j-s)}$	per IGBT			0,21	K/W
$R_{th(j-a)}$	per FWD			0,26	K/W
Temperature Sensor					
R_{TS}	$T = 25\text{ (100) }^\circ\text{C}$		1 (1,67)		k Ω
tolerance	$T = 25\text{ (100) }^\circ\text{C}$		3 (2)		%
Mechanical data					
M_1	to heatsink (M5)	2		3	Nm
M_2	for terminals (M6)	4		5	Nm
w				310	g







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.