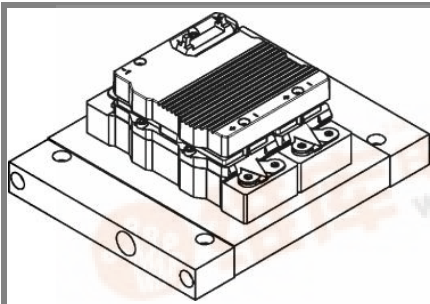


SKiiP 1203GB172-2DW



SKiiP[®] 3

2-pack-integrated intelligent Power System

Power section

SKiiP 1203GB172-2DW

Preliminary Data

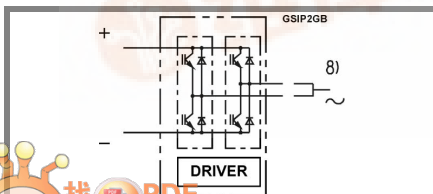
Features

- SKiiP technology inside
- Trench IGBTs
- CAL diode technology
- Integrated current sensor
- Integrated temperature sensor
- Integrated heat sink
- IEC 60721-3-3 (humidity) class 3K3/IE32 (SKiiP[®] 3 System)
- IEC 60068-1 (climate) 40/125/56
- UL recognized file no. E63532

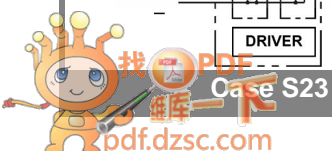
- 1) with assembly of suitable MKP capacitor per terminal (SEMIKRON type is recommended)
- 8) AC connection busbars must be connected by the user; copper busbars available on request

Absolute Maximum Ratings		$T_s = 25^\circ\text{C}$ unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}	Operating DC link voltage	1700	V
$V_{CC}^{1)}$		1200	V
V_{GES}		± 20	V
I_C	$T_s = 25 (70)^\circ\text{C}$	1200 (900)	A
Inverse diode			
$I_F = -I_C$	$T_s = 25 (70)^\circ\text{C}$	900 (700)	A
I_{FSM}	$T_j = 150^\circ\text{C}$, $t_p = 10$ ms; sin.	6900	A
I^2t (Diode)	Diode, $T_j = 150^\circ\text{C}$, 10 ms	238	kA ² s
T_j , (T_{stg})		- 40 ... + 150 (125)	$^\circ\text{C}$
V_{isol}	rms, AC, 1 min, main terminals to heat sink	4000	V
$I_{AC-terminal}$	per AC terminal, rms, $T_s = 70^\circ\text{C}$,	400	A
	$T_{terminal} < 115^\circ\text{C}$		

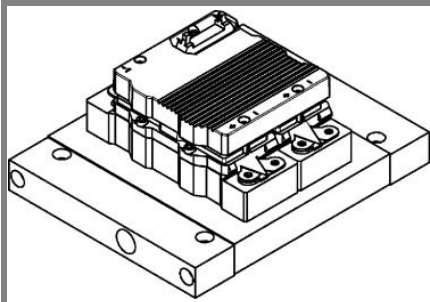
Characteristics		$T_s = 25^\circ\text{C}$ unless otherwise specified							
Symbol	Conditions	min.	typ.	max.	Units				
IGBT									
V_{CEsat}	$I_C = 600$ A, $T_j = 25 (125)^\circ\text{C}$; measured at terminal		1,9 (2,2)	2,4	V				
V_{CEO}	$T_j = 25 (125)^\circ\text{C}$; at terminal		1 (0,9)	1,2 (1,1)	V				
r_{CE}	$T_j = 25 (125)^\circ\text{C}$; at terminal		1,5 (2,1)	1,9 (2,5)	m Ω				
I_{CES}	$V_{GE} = 0$ V, $V_{CE} = V_{CES}$, $T_j = 25 (125)^\circ\text{C}$		2,4 (144)		mA				
$E_{on} + E_{off}$	$I_C = 600$ A, $V_{CC} = 900$ V		390		mJ				
	$T_j = 125^\circ\text{C}$, $V_{CC} = 1200$ V		575		mJ				
R_{CC+EE}	terminal chip, $T_j = 25^\circ\text{C}$		0,25		m Ω				
L_{CE}	top, bottom		6		nH				
C_{CHC}	per phase, AC-side		2		nF				
Inverse diode									
$V_F = V_{EC}$	$I_F = 600$ A, $T_j = 25 (125)^\circ\text{C}$ measured at terminal		2 (1,8)	2,15	V				
V_{TO}	$T_j = 25 (125)^\circ\text{C}$		1,1 (0,8)	1,2 (0,9)	V				
r_T	$T_j = 25 (125)^\circ\text{C}$		1,5 (1,7)	1,6 (1,8)	m Ω				
E_{rr}	$I_C = 600$ A, $V_{CC} = 900$ V		72		mJ				
	$T_j = 125^\circ\text{C}$, $V_{CC} = 1200$ V		86		mJ				
Mechanical data									
M_{dc}	DC terminals, SI Units		6	8	Nm				
M_{ac}	AC terminals, SI Units		13	15	Nm				
w	SKiiP [®] 3 System w/o heat sink			1,7	kg				
w	heat sink			4,3	kg				
Thermal characteristics (NWK 40; 8l/min; 50%glyc.); "s" reference to heat sink; "r" reference to built-in temperature sensor (acc. IEC 60747-15)									
$R_{th(j-s)I}$	per IGBT			0,026	K/W				
$R_{th(j-s)D}$	per diode			0,05	K/W				
Z_{th}	R_i (mK/W) (max. values)	tau _i (s)							
		1	2	3	4				
$Z_{th(j-r)I}$		2,8	11,6	13,6	0	69	0,35	0,02	1
$Z_{th(j-r)D}$		4	6	26	26	50	5	0,25	0,04
$Z_{th(r-a)}$		5,5	4,8	1,1	0,6	48	15	2,8	0,4



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SKiiP 1203GB172-2DW



SKiiP® 3

2-pack-integrated intelligent Power System

2-pack integrated gate driver SKiiP 1203GB172-2DW

Preliminary Data

Gate driver features

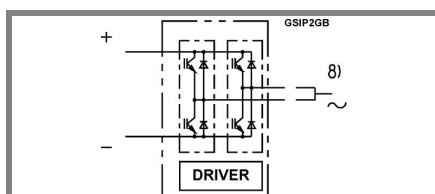
- CMOS compatible inputs
- Wide range power supply
- Integrated circuitry to sense phase current, heat sink temperature and DC-bus voltage (option)
- Short circuit protection
- Over current protection
- Over voltage protection (option)
- Power supply protected against under voltage
- Interlock of top/bottom switch
- Isolation by transformers
- Fibre optic interface (option for GB-types only)
- IEC 60068-1 (climate) 40/85/56)
- UL recognized file no. 242581

Absolute Maximum Ratings		$T_a = 25^\circ\text{C}$ unless otherwise specified	
Symbol	Conditions	Values	Units
V_{S2}	unstabilized 24 V power supply	30	V
V_i	input signal voltage (high)	15 + 0,3	V
dv/dt	secondary to primary side	75	kV/ μs
V_{isolIO}	input / output (AC, rms, 2s)	4000	V
V_{isolPD}	partial discharge extinction voltage, rms, $Q_{PD} \leq 10$ pC;	1500	V
V_{isol12}	output 1 / output 2 (AC, rms, 2s)	1500	V
f_{sw}	switching frequency	14	kHz
f_{out}	output frequency for $I = I_C$; sin.	1	kHz
T_{op} (T_{stg})	operating / storage temperature	- 40 ... + 85	$^\circ\text{C}$

Characteristics		$(T_a = 25^\circ\text{C})$			
Symbol	Conditions	min.	typ.	max.	Units
V_{S2}	supply voltage non stabilized	13	24	30	V
I_{S2}	$V_{S2} = 24$ V	$320 + 23 \cdot f / \text{kHz} + 0,00022 \cdot (I_{AC} / \text{A})^2$			mA
V_{iT+}	input threshold voltage (High)	12,3			V
V_{iT-}	input threshold voltage (Low)	4,6			V
R_{IN}	input resistance	10			k Ω
C_{IN}	input capacitance	1			nF
$t_{d(on)IO}$	input-output turn-on propagation time	1,3			μs
$t_{d(off)IO}$	input-output turn-off propagation time	1,3			μs
$t_{pERRRESET}$	error memory reset time	9			μs
t_{TD}	top / bottom switch interlock time	3,3			μs
$I_{analogOUT}$	max. 5mA; 8 V corresponds to 15 V supply voltage for external components	1000			A
I_{s1out}	max. load current	50			mA
I_{TRIPSC}	over current trip level ($I_{analog OUT} = 10$ V)	1250			A
T_{tp}	over temperature protection	110	120		$^\circ\text{C}$
U_{DCTRIP}	U_{DC} -protection ($U_{analog OUT} = 9$ V); (option for GB types)	not implemented			V

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Case S23