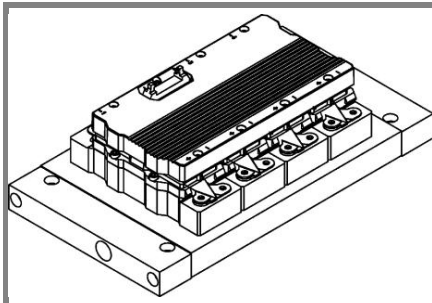


SKiiP 2403GB172-4DW



SKiiP® 3

2-pack-integrated intelligent Power System

Power section

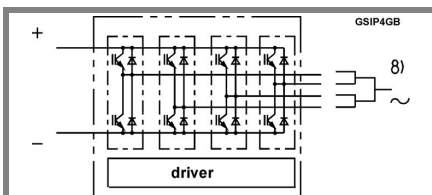
SKiiP 2403GB172-4DW

Preliminary Data

Power section 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
- 8) AC connection busbars must be connected by the user; copper busbars available on request



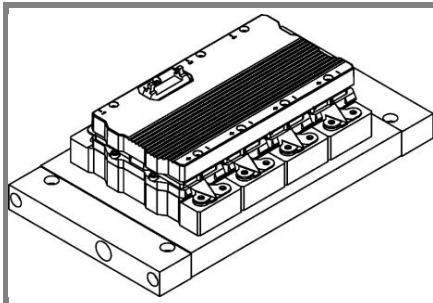
Case S43

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	$T_s = 25 (70)^\circ\text{C}$	2400 (1800)	A
Inverse diode			
$I_F = -I_C$	$T_s = 25 (70)^\circ\text{C}$	1800 (1400)	A
I_{FSM}	$T_j = 150^\circ\text{C}$, $t_p = 10$ ms; sin.	13500	A
I^2t (Diode)	Diode, $T_j = 150^\circ\text{C}$, 10 ms	911	kA^2s
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}	$I_C = 1200$ 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		0,8 (1)	1 (1,3)	$\text{m}\Omega$			
I_{CES}	$V_{GE} = 0$ V, $V_{CE} = V_{CES}$; $T_j = 25 (125)^\circ\text{C}$		4,8 (288)		mA			
$E_{on} + E_{off}$	$I_C = 1200$ A, $V_{CC} = 900$ V		780		mJ			
	$T_j = 125^\circ\text{C}$, $V_{CC} = 1200$ V		1150		mJ			
R_{CC+EE}	terminal chip, $T_j = 25^\circ\text{C}$		0,13		$\text{m}\Omega$			
L_{CE}	top, bottom		3		nH			
C_{CHC}	per phase, AC-side		4		nF			
Inverse diode								
$V_F = V_{EC}$	$I_F = 1200$ 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	$T_j = 25 (125)^\circ\text{C}$		0,8 (0,8)	0,8 (0,9)	$\text{m}\Omega$			
E_{rr}	$I_C = 1200$ A, $V_{CC} = 900$ V		144		mJ			
	$T_j = 125^\circ\text{C}$, $V_{CC} = 1200$ V		171		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		3,1		kg			
w	heat sink		6,2		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			0,013	K/W			
$R_{th(j-s)D}$	per diode			0,025	K/W			
Z_{th}	R_i (mK/W) (max. values)	tau,(s)						
		1	2	3	4			
$Z_{th(j-r)I}$	1,2	5	5,8	0	69	0,35	0,02	1
$Z_{th(j-r)D}$	2	3	13,5	13,5	50	5	0,25	0,04
$Z_{th(r-a)}$	2,7	4,6	1,1	0,6	48	15	2,8	0,4

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SKiiP 2403GB172-4DW



SKiiP® 3

2-pack-integrated intelligent Power System

2-pack
integrated gate driver
SKiiP 2403GB172-4DW

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	7	kHz
f_{out}	output frequency for $I_{peak(1)} = I_C$	7	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	$430 + 45 \cdot f / \text{kHz} + 0,00011 \cdot (I_{AC}/A)^2$			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		2000		A
I_{S1out}	max. load current			50	mA
I_{TRIPSC}	over current trip level ($I_{analog OUT} = 10$ V)		2500		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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