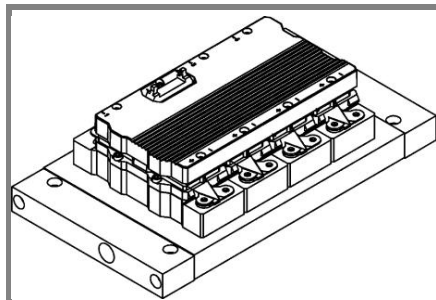


SKiiP 2403GB172-4DW



SKiiP® 3

2-pack-integrated intelligent Power System

Power section

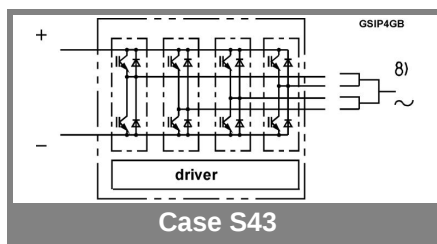
SKiiP 2403GB172-4DW

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

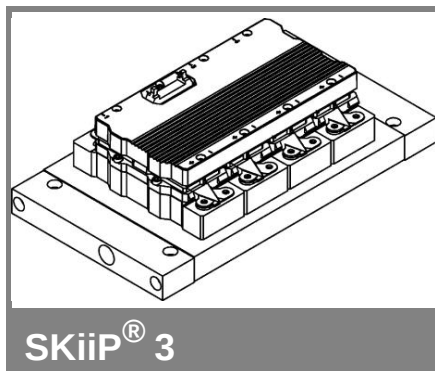


Absolute Maximum Ratings		T _s = 25°C unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V _{CES}	Operating DC link voltage	1700	V
V _{CC} ¹⁾		1200	V
V _{GES}		±20	V
I _C	T _s = 25 (70) °C	2400 (1800)	A
Inverse diode			
I _F = - I _C	T _s = 25 (70) °C	1800 (1400)	A
I _{FSM}	T _j = 150 °C, t _p = 10 ms; sin.	13500	A
I²t (Diode)	Diode, T _j = 150 °C, 10 ms	911	kA²s
T _j , (T _{stg})	rms, AC, 1 min, main terminals to heat sink per AC terminal, rms, T _s = 70 °C, T _{terminal} <115 °C	- 40 ... + 150 (125)	°C
V _{isol}		4000	V
I _{AC-terminal}		400	A

Characteristics		$T_s = 25^\circ\text{C}$ unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
V_{CEsat}	$I_C = 1200\text{ A}$, $T_j = 25 (125)^\circ\text{C}$; 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}	$V_{GE} = 0\text{ V}$, $V_{CE} = V_{CES}$, $T_j = 25 (125)^\circ\text{C}$		4,8 (288)		mA
$E_{on} + E_{off}$	$I_C = 1200\text{ A}$, $V_{CC} = 900\text{ V}$		780		mJ
	$T_j = 125^\circ\text{C}$, $V_{CC} = 1200\text{ V}$		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					
$V_F = V_{EC}$	$I_F = 1200\text{ A}$, $T_j = 25 (125)^\circ\text{C}$ 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}	$I_C = 1200\text{ A}$, $V_{CC} = 900\text{ V}$		144		mJ
	$T_j = 125^\circ\text{C}$, $V_{CC} = 1200\text{ V}$		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)			$\tau_{th}(s)$	
	1 2 3 4	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



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, $Q_{PD} \leq 10 \text{ pC}$;	1500	V
V_{isol12}	output 1 / output 2 (AC, rms, 2s)	1500	V
f_{sw}	switching frequency	7	kHz
f_{out}	output frequency for $I = I_C$; sin.	1	kHz
$T_{op} (T_{stg})$	operating / storage temperature	$-40 \dots +85$	$^\circ\text{C}$

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}	$V_{S2} = 24 \text{ V}$	$430 + 45 \cdot f / \text{kHz} + 0,00011 \cdot (I_{AC} / \text{A})^2$			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		2000		A
I_{s1out}	max. load current			50	mA
I_{TRIPSC}	over current trip level ($I_{analog OUT} = 10 \text{ V}$)		2500		A
T_{tp}	over temperature protection	110		120	$^\circ\text{C}$
U_{DCTRIP}	U_{DC} -protection ($U_{analog OUT} = 9 \text{ V}$); (option for GB types)		not implemented		V

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