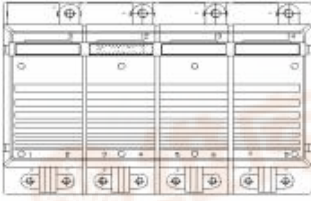


# SKiiP 1092GB170-4D



SKiiP<sup>®</sup> 2

## 2-pack - integrated intelligent Power System

### Power section

#### SKiiP 1092GB170-4D

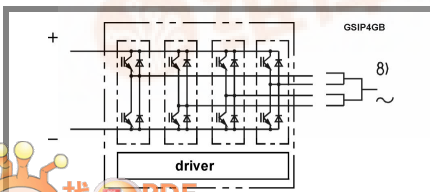
### Features

- SKiiP technology inside
- CAL diode technology
- Integrated current sensor
- Integrated temperature sensor
- Integrated heat sink
- IEC 60721-3-3 (humidity) class 3K3/IE32 (SKiiP<sup>®</sup> 2 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 user, copper busbars available on request

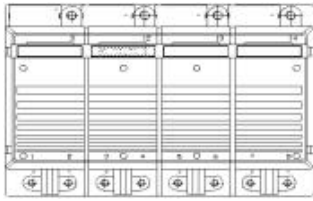
Absolute Maximum Ratings		$T_s = 25\text{ }^\circ\text{C}$ unless otherwise specified	
Symbol	Conditions	Values	Units
<b>IGBT</b>			
$V_{CES}$	Operating DC link voltage	1700	V
$V_{CC}^{(1)}$		1200	V
$V_{GES}$		$\pm 20$	V
$I_C$	$T_s = 25\text{ (70) }^\circ\text{C}$	1000 (750)	A
<b>Inverse diode</b>			
$I_F = -I_C$	$T_s = 25\text{ (70) }^\circ\text{C}$	1000 (750)	A
$I_{FSM}$	$T_j = 150\text{ }^\circ\text{C}$ , $t_p = 10\text{ ms}$ ; sin.	8640	A
$I^2t$ (Diode)	Diode, $T_j = 150\text{ }^\circ\text{C}$ , 10 ms	373	kA <sup>2</sup> s
$T_j, (T_{stg})$		- 40 (- 25) ... + 150 (125)	$^\circ\text{C}$
$V_{isol}$	AC, 1 min. (mainterminals to heat sink)	4000	V

Characteristics		$T_s = 25\text{ }^\circ\text{C}$ unless otherwise specified						
Symbol	Conditions	min.	typ.	max.	Units			
<b>IGBT</b>								
$V_{CEsat}$	$I_C = 800\text{ A}$ , $T_j = 25\text{ (125) }^\circ\text{C}$		3,3 (4,3)	3,9	V			
$V_{CEO}$	$T_j = 25\text{ (125) }^\circ\text{C}$		1,7 (2)	2 (2,3)	V			
$r_{CE}$	$T_j = 25\text{ (125) }^\circ\text{C}$		2 (2,9)	2,4 (3,3)	m $\Omega$			
$I_{CES}$	$V_{GE} = 0\text{ V}$ , $V_{CE} = V_{CES}$ , $T_j = 25\text{ (125) }^\circ\text{C}$		(60)	4	mA			
$E_{on} + E_{off}$	$I_C = 800\text{ A}$ , $V_{CC} = 900\text{ V}$ $T_j = 125\text{ }^\circ\text{C}$ , $V_{CC} = 1200\text{ V}$			690 1017	mJ mJ			
$R_{CC'} + EE'$	terminal chip, $T_j = 125\text{ }^\circ\text{C}$		0,13		m $\Omega$			
$L_{CE}$	top, bottom		3,8		nH			
$C_{CHC}$	per phase, AC-side		3,2		nF			
<b>Inverse diode</b>								
$V_F = V_{EC}$	$I_F = 800\text{ A}$ , $T_j = 25\text{ (125) }^\circ\text{C}$		2,3 (2,1)	2,9	V			
$V_{TO}$	$T_j = 25\text{ (125) }^\circ\text{C}$		1,3 (1)	1,6 (1,3)	V			
$r_T$	$T_j = 25\text{ (125) }^\circ\text{C}$		1,3 (1,4)	1,6 (1,7)	m $\Omega$			
$E_{rr}$	$I_C = 800\text{ A}$ , $V_{CC} = 900\text{ V}$ $T_j = 125\text{ }^\circ\text{C}$ , $V_{CC} = 1200\text{ V}$			85 101	mJ mJ			
<b>Mechanical data</b>								
$M_{dc}$	DC terminals, SI Units	6		8	Nm			
$M_{ac}$	AC terminals, SI Units	13		15	Nm			
w	SKiiP <sup>®</sup> 2 System w/o heat sink		3,5		kg			
w	heat sink		8,5		kg			
<b>Thermal characteristics (P16 heat sink; 275m<sup>3</sup>/h); "r" reference to temperature sensor</b>								
$R_{th(j-s)I}$	per IGBT			0,02	K/W			
$R_{th(j-s)D}$	per diode			0,067	K/W			
$R_{th(s-a)}$	per module			0,033	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	0,13	0,001	1
$Z_{th(j-r)D}$					1	0,13	0,001	1
$Z_{th(r-a)}$					494	165	20	0,03



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# SKiiP 1092GB170-4D



SKiiP® 2

Absolute Maximum Ratings		$T_a = 25\text{ °C}$ unless otherwise specified	
Symbol	Conditions	Values	Units
$V_{S1}$	stabilized 15 V power supply	18	V
$V_{S2}$	unstabilized 24 V power supply	30	V
$V_{iH}$	input signal voltage (high)	15 + 0,3	V
dv/dt	secondary to primary side	75	kV/ $\mu$ s
$V_{isolIO}$	input / output (AC, r.m.s., 2s )	4000	Vac
$V_{isol12}$	output 1 / output 2 (AC, r.m.s., 2s )	1500	Vac
$f_{sw}$	switching frequency	7	kHz
$f_{out}$	output frequency for $I=I_C$ ; sin.	1	kHz
$T_{op}$ ( $T_{stg}$ )	operating / storage temperature	- 40 ... + 85	°C

## 2-pack - integrated intelligent Power System

### 2-pack integrated gate driver

#### SKiiP 1092GB170-4D

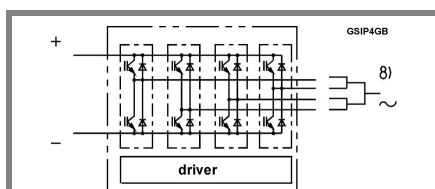
#### Gate driver features

- 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) 25/85/56

Characteristics		$(T_a = 25\text{ °C})$			Units
Symbol	Conditions	min.	typ.	max.	Units
$V_{S1}$	supply voltage stabilized	14,4	15	15,6	V
$V_{S2}$	supply voltage non stabilized	20	24	30	V
$I_{S1}$	$V_{S1} = 15\text{ V}$	$290+590*f/f_{max}+1,2*(I_{AC}/A)$			mA
$I_{S2}$	$V_{S2} = 24\text{ V}$	$220+430*f/f_{max}+0,85*(I_{AC}/A)$			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 $\Omega$
$t_{d(on)IO}$	input-output turn-on propagation time	1,5			$\mu$ s
$t_{d(off)IO}$	input-output turn-off propagation time	1,4			$\mu$ s
$t_{pERRRESET}$	error memory reset time	9			$\mu$ s
$t_{TD}$	top / bottom switch : interlock time	3,3			$\mu$ s
$I_{analogOUT}$	8 V corresponds to max. current of 15 V supply voltage (available when supplied with 24 V)	1000			A
$I_{Vs1outmax}$	output current at pin 12/14	50			mA
$I_{A0max}$	output current at pin 12/14	5			mA
$V_{OI}$	logic low output voltage	0,6			V
$V_{OH}$	logic high output voltage	30			V
$I_{TRIPSC}$	over current trip level ( $I_{analog OUT} = 10\text{ V}$ )	1250			A
$I_{TRIPLG}$	ground fault protection	120			A
$T_{tp}$	over temperature protection	110			°C
$U_{DCTRIP}$	trip level of $U_{DC}$ -protection ( $U_{analog OUT} = 9\text{ V}$ ); (option)	1200			V

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Case S 4