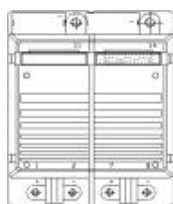


# SKiiP 592GB170-2D



SKiiP® 2

## 2-pack - integrated intelligent Power System

### Power section

#### SKiiP 592GB170-2D

### Features

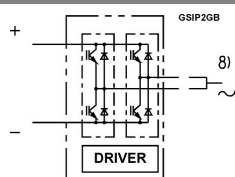
- SKiiP technology inside
- CAL diode technology
- Integrated current sensor
- Integrated temperature sensor
- Integrated heat sink
- IEC 60721-3-3 (humidity) class 3K3/IE32 (SKiiP® 2 System)
- IEC 60068-1 (climate) 40/125/56
- UL recognized file no. E63532

- 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		$T_s = 25\text{ °C}$ 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
$I_C$	$T_s = 25\text{ (70) °C}$	500 (375)	A
<b>Inverse diode</b>			
$I_F = -I_C$	$T_s = 25\text{ (70) °C}$	500 (375)	A
$I_{FSM}$	$T_j = 150\text{ °C}$ , $t_p = 10\text{ ms}$ ; sin.	4320	A
$I^2t$ (Diode)	Diode, $T_j = 150\text{ °C}$ , 10 ms	93	kA²s
$T_j, (T_{stg})$	AC, 1 min. (mainterminals to heat sink)	- 40 (- 25) ... + 150 (125)	°C
$V_{isol}$		4000	V

Characteristics		$T_s = 25\text{ °C}$ unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{CESat}$	$I_C = 400\text{ A}$ , $T_j = 25\text{ (125) °C}$	3,3 (4,3)	3,9		V
$V_{CEO}$	$T_j = 25\text{ (125) °C}$	1,7 (2)	2 (2,3)		V
$r_{CE}$	$T_j = 25\text{ (125) °C}$	4 (5,9)	4,8 (6,6)		mΩ
$I_{CES}$	$V_{GE} = 0\text{ V}$ , $V_{CE} = V_{CES}$ , $T_j = 25\text{ (125) °C}$	(30)	2		mA
$E_{on} + E_{off}$	$I_C = 400\text{ A}$ , $V_{CC} = 900\text{ V}$			345	mJ
	$T_j = 125\text{ °C}$ , $V_{CC} = 1200\text{ V}$			509	mJ
$R_{CC'} + EE'$	terminal chip, $T_j = 125\text{ °C}$	0,25			mΩ
$L_{CE}$	top, bottom	7,5			nH
$C_{CHC}$	per phase, AC-side	1,6			nF
<b>Inverse diode</b>					
$V_F = V_{EC}$	$I_F = 400\text{ A}$ , $T_j = 25\text{ (125) °C}$	2,3 (2,1)	2,9		V
$V_{TO}$	$T_j = 25\text{ (125) °C}$	1,3 (1)	1,6 (1,3)		V
$r_T$	$T_j = 25\text{ (125) °C}$	2,5 (2,8)	3,2 (3,5)		mΩ
$E_{rr}$	$I_C = 400\text{ A}$ , $V_{CC} = 900\text{ V}$			42	mJ
	$T_j = 125\text{ °C}$ , $V_{CC} = 1200\text{ V}$			50	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® 2 System w/o heat sink		1,9		kg
w	heat sink		4,7		kg

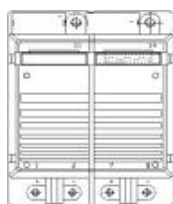
Thermal characteristics (P16 heat sink; 310 m³/h); "r" reference to temperature sensor							
$R_{th(j-s)I}$	per IGBT				0,04		K/W
$R_{th(j-s)D}$	per diode				0,133		K/W
$R_{th(s-a)}$	per module				0,043		K/W
$Z_{th}$	$R_i$ (mK/W) (max. values)					$\tau_{th}(s)$	
	1	2	3	4	1	2	3
$Z_{th(j-r)I}$	4	31	5	0	1	0,13	0,001
$Z_{th(j-r)D}$	15	103	16	0	1	0,13	0,001
$Z_{th(r-a)}$	13,9	18,9	6,6	3,6	262	50	5
							0,02



Case S 2

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# SKiiP 592GB170-2D



SKiiP® 2

## 2-pack - integrated intelligent Power System

### 2-pack integrated gate driver

#### SKiiP 592GB170-2D

#### Gate driver features

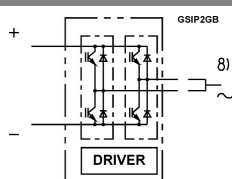
- CMOS compatible inputs
- Wide range power supply
- Integrated circuitry to sense phase current, heat sink temperature and DC-bus voltage (option)
- Short circuit protection
- Over current protection
- Over voltage protection (option)
- Power supply protected against under voltage
- Interlock of top/bottom switch
- Isolation by transformers
- Fibre optic interface (option for GB-types only)
- IEC 60068-1 (climate) 25/85/56

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	10	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 <sub>a</sub> = 25 °C)			
Symbol	Conditions	min.	typ.	max.	Units
V <sub>S1</sub>	supply voltage stabilized	14,4	15	15,6	V
V <sub>S2</sub>	supply voltage non stabilized	20	24	30	V
I <sub>S1</sub>	V <sub>S1</sub> = 15 V	210+440*f/f <sub>max</sub> +1,2*(I <sub>AC</sub> /A)			mA
I <sub>S2</sub>	V <sub>S2</sub> = 24 V	160+310*f/f <sub>max</sub> +0,85*(I <sub>AC</sub> /A)			mA
V <sub>IT+</sub>	input threshold voltage (High)	12,3			V
V <sub>IT-</sub>	input threshold voltage (Low)	4,6			V
R <sub>IN</sub>	input resistance	10			kΩ
t <sub>d(on)IO</sub>	input-output turn-on propagation time	1,5			μs
t <sub>d(off)IO</sub>	input-output turn-off propagation time	1,4			μs
t <sub>pERRRESET</sub>	error memory reset time	9	μs		
t <sub>TD</sub>	top / bottom switch : interlock time	3,3			μs
I <sub>analogOUT</sub>	8 V corresponds to max. current of 15 V supply voltage (available when supplied with 24 V)	500			A
I <sub>Vs1outmax</sub>	output current at pin 12/14	50			mA
I <sub>A0max</sub>	output current at pin 12/14	5			mA
V <sub>0l</sub>	logic low output voltage	0,6			V
V <sub>0H</sub>	logic high output voltage	30			V
I <sub>TRIPSC</sub>	over current trip level (I <sub>analog OUT</sub> = 10 V)	625			A
I <sub>TRIPLG</sub>	ground fault protection				A
T <sub>tp</sub>	over temperature protection	110	120		°C
U <sub>DCTRIP</sub>	trip level of U <sub>DC</sub> -protection ( U <sub>analog OUT</sub> = 9 V); (option)	1200			V

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