

SKiiP[®] 2

2-pack - integrated intelligent Power System

Power section

SKiiP 592GB170-271CTV

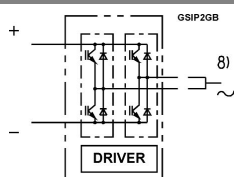
Features

- SKiiP technology inside
- Low loss IGBTs
- CAL diode technology
- Integrated current sensor
- Integrated temperature sensor
- Integrated heat sink
- IEC 60721-3-3 (humidity) class 3K3/IE32 (SKiiP[®] 2 System)
- IEC 68T.1 (climate) 40/125/56 (SKiiP[®] 2 power section)

- 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

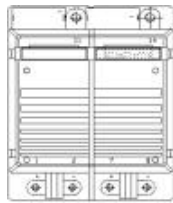
Absolute Maximum Ratings		$T_s = 25\text{ °C}$ unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}	Operating DC link voltage	1700	V
$V_{CC}^{1)}$		1200	V
V_{GES}		± 20	V
I_C	$T_s = 25\text{ (70) °C}$	500 (375)	A
Inverse diode			
$I_F = -I_C$	$T_s = 25\text{ (70) °C}$	500 (375)	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	kA ² s
$T_j, (T_{stg})$	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
IGBT					
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
$E_{on} + E_{off}$	$I_C = 400\text{ A}$, $V_{CC} = 900\text{ V}$ $T_j = 125\text{ °C}$, $V_{CC} = 1200\text{ V}$			345	mJ
					509
$R_{CC'} + EE'$	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
Inverse diode					
$V_F = V_{EC}$	$I_F = 400\text{ A}$, $T_j = 25\text{ (125) °C}$	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}	$I_C = 400\text{ A}$, $V_{CC} = 900\text{ V}$ $T_j = 125\text{ °C}$, $V_{CC} = 1200\text{ V}$			42	mJ
					50
Mechanical data					
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 _i (s)			
		1	2	3	4
$Z_{th(j-r)I}$		4	31	5	1
$Z_{th(j-r)D}$		15	103	16	0,13
$Z_{th(r-a)}$		13,9	18,9	6,6	3,6
					262
					50
					5
					0,02



Case S 2

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2-pack
integrated gate driver

SKiiP 592GB170-271CTV

Gate driver features

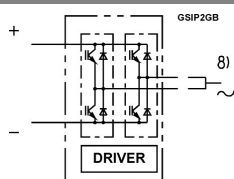
- CMOS compatible inputs
- Wide range power supply
- Integrated circuitry to sense phase current, heat sink temperature and DC-bus voltage (option)
- Short circuit protection
- Over current protection
- Over voltage protection (option)
- Power supply protected against under voltage
- Interlock of top/bottom switch
- Isolation by transformers
- Fibre optic interface (option for GB-types only)
- IEC 68T.1 (climate) 25/85/56 (SKiiP[®] 2 gate driver)

Absolute Maximum Ratings			
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/μs
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 _{max}	switching frequency	10	kHz
T _{op} (T _{stg})	operating / storage temperature	- 25 ... + 85	°C

Characteristics				(T _a = 25 °C)	
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 V	210+440*f/f _{max} +1,3*(I _{AC} /A)			mA
I _{S2}	V _{S2} = 24 V	160+310*f/f _{max} +1,0*(I _{AC} /A)			mA
V _{IT+}	input threshold voltage (High)	11,2			V
V _{IT-}	input threshold voltage (Low)	5,4			V
R _{IN}	input resistance	10			kΩ
t _{d(on)IO}	input-output turn-on propagation time	1,2			μs
t _{d(off)IO}	input-output turn-off propagation time	3			μs
t _{pERRRESET}	error memory reset time	9			μs
t _{TD}	top / bottom switch : interlock time	3,3			μs
I _{analogOUT}	8 V corresponds to max. current of 15 V supply voltage (available when supplied with 24 V)	500			A
I _{Vs1outmax}	output current at pin 12/14	5			mA
I _{A0max}	logic low output voltage	0,6			V
V _{0l}	logic high output voltage	30			V
I _{TRIPSC}	over current trip level (I _{analog OUT} = 10 V)	625			A
I _{TRIPLG}	ground fault protection				A
T _{tp}	over temperature protection	110	120		°C
U _{DCTRIP}	trip level of U _{DC} -protection (U _{analog OUT} = 9 V); (option)	1200			V

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