I. Power section

Absolute maximum ratings		T_s = 25°C unless otherwise specified	
Symbol	**Conditions**	**Values**	**Units**
IGBT			
V_{CES}		1700	V
V_{CC} 1)	Operating DC link voltage	1200	V
V_{GES}		± 20	V
I_C	T_s = 25 (70) °C	500 (375)	A
Inverse diode			
$I_F = -I_C$	T_s = 25 (70) °C	500 (375)	A
I_{FSM}	T_j = 150 °C, t_p = 10ms; sin	4320	A
I^2t (Diode)	Diode, T_j = 150 °C, 10ms	93	kA^2s
T_j , (T_{stg})		-40 (-25) ...+150 (125)	°C
V_{isol}	AC, 1min.	4000	V

Characteristics		T_s = 25°C unless otherwise specified			
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Units**
IGBT					
V_{CEsat}	I_C = 400A, T_j = 25 (125)°C	–	3,3 (4,3)	3,9	V
V_{CEO}	T_j = 25 (125) °C	–	1,7 (2,0)	2,0 (2,3)	V
r_{CE}	T_j = 25 (125) °C	–	4,0 (5,9)	4,8 (6,6)	mΩ
I_{CES}	V_{GE}=0,V_{CE}=V_{CES},T_j=25(125) °C	–	(30)	2,0	mA
$E_{on} + E_{off}$	I_C=400A, Vcc=900V	–	–	345	mJ
	T_j=125°C Vcc=1200V	–	–	509	mJ
$R_{CC'-EE'}$	terminal chip, T_j = 125 °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= 400A; T_j = 25(125) °C	–	2,3 (2,1)	2,9	V
V_{TO}	T_j = 25 (125) °C	–	1,3 (1,0)	1,6 (1,3)	V
r_T	T_j = 25 (125) °C	–	2,5 (2,8)	3,2 (3,5)	mΩ
E_{RR}	I_C=400A Vcc=900V	–	–	42	mJ
	T_j=125°C Vcc=1200V	–	–	50	mJ
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	–	3,5	–	kg
w	heat sink	–	8,5	–	kg

Thermal characteristics (P16 heat sink; 275 m^3/ h); "$_r$" reference to temperature sensor

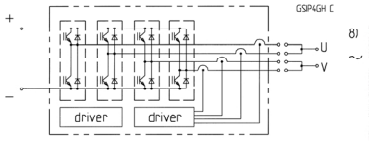
$R_{thjrIGBT}$	per IGBT				–	–	0,040	K/W
$R_{thjrdiode}$	per diode				–	–	0,133	K/W
R_{thra}	per module				–	–	0,033	K/W
Z_{th}	R_i (mK/W) (max.)				tau$_i$(s)			
	1	2	3	4	1	2	3	4
$IGBT_{jr}$	4	31	5	–	1	0,13	0,001	–
$diode_{jr}$	15	103	16	–	1	0,13	0,001	–
$heatsink_{ra}$	1,6	22,0	7,0	2,4	494	165	20	0,03

SKiiP® 2

SK integrated intelligent Power 4-pack

SKiiP 592GH170-2*271CTV

Case S5



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 the user; copper busbars available on request

SKiiP 2®

SK integrated intelligent Power

SKiiP 592GH170-2*271CTV

II. Integrated gate driver (per driver)

Absolute maximum ratings

Symbol	Term	Value	Unit
V_{S1}	stabilized 15V power supply	18	V
V_{S2}	unstabilized 24V 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)	4000	Vac
V_{isol12}	output 1 / output 2 (AC)	1500	Vac
f_{max}	switching frequency	10	kHz
T_{op} (T_{stg})	operating / storage temperature	- 25 ... + 85	°C

Gate driver features

- CMOS compatible inputs
- wide range power supply
- integrated circuitry to sense phase current, heat sink temperature and DC-bus voltage (option)
- U-option is integrated on left driver, (DC terminals at bottom; refer to case drawing)
- 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)

Electrical characteristics (T_a = 25 °C)

Symbol	Term		Values 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} = 15V	210 + 440*f / f_{max} + 1,3* (I_{AC}/A)				mA
I_{S2}	V_{S2} = 24V	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
$t_{d(on)IO}$	turn-on propagation time (system)		–	1,2	–	µs
$t_{d(off)IO}$	turn-off propagation time (system)		–	3,0	–	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		–	500	–	A
$I_{Vs1outmax}$	max. current of 15 V supply voltage (available when supplied with 24V)		–	–	50	mA
I_{AOmax}	output current at pin 12/14		–	–	5	mA
V_{ol}	logic low output voltage		–	–	0,6	V
V_{oH}	logic high output voltage		–	–	30	V
I_{TRIPSC}	over current trip level ($I_{analog\ OUT}$ = 10V)		–	625	–	A
I_{TRIPLG}	ground fault protection		–	-	–	A
T_{tp}	over temperature protection		110	–	120	°C
U_{DCTRIP}	trip level of U_{DC}-protection ($U_{analog\ OUT}$ = 9V); (option)		1200	–	–	V

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