

I. Power section

Absolute maximum ratings		$T_s = 25^\circ\text{C}$ unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}	Operating DC link voltage	1200	V
$V_{CC}^{1)}$		900	V
V_{GES}		± 20	V
I_C	$T_s = 25 (70)^\circ\text{C}$	600 (450)	A
Inverse diode			
$I_F = -I_C$	$T_s = 25 (70)^\circ\text{C}$	600 (450)	A
I_{FSM}	$T_j = 150^\circ\text{C}$, $t_p = 10\text{ms}$; sin	4320	A
I^2t (Diode)	Diode, $T_j = 150^\circ\text{C}$, 10ms	93	kA^2s
$T_j, (T_{stg})$	rms, AC, 1min per AC terminal, rms, $T_s = 70^\circ\text{C}$, $T_{terminal} < 115^\circ\text{C}$	-40...+150 (125)	$^\circ\text{C}$
V_{isol}		3000	V
$I_{AC-terminal}$		400	A

Characteristics								
T _s = 25°C unless otherwise specified								
Symbol	Conditions	min.	typ.	max.	Units			
IGBT								
V _{CEsat}	I _C = 300A, T _j = 25 (125)°C; measured at terminal	–	2,3 (2,5)	2,6	V			
V _{CEO}	T _j = 25 (125) °C; at terminal	–	1,1 (1,0)	1,3 (1,2)	V			
r _{CE}	T _j = 25 (125) °C; at terminal	–	3,8 (5,0)	4,5 (5,6)	mΩ			
I _{CES}	V _{GE} =0, V _{CE} =V _{CES} , T _j =25(125) °C	–	1,2 (36)	–	mA			
E _{on} + E _{off}	I _C =300A, V _{CC} =600V	–	90	–	mJ			
	T _j =125°C V _{CC} =900V	–	159	–	mJ			
L _{CE}	top, bottom	–	12	–	nH			
C _{CHC}	per phase , AC side	–	1,0	–	nF			
R _{CC'-EE'}	terminal-chip, T _j =25 °C	–	0,50	–	mΩ			
Inverse diode								
V _F = V _{EC}	I _F = 300A; T _j = 25(125) °C measured at terminal	–	1,8 (1,5)	2,3	V			
V _{TO}	T _j = 25 (125) °C	–	1,0 (0,7)	1,2 (0,9)	V			
r _T	T _j = 25 (125) °C	–	2,6 (2,8)	3,5 (3,7)	mΩ			
E _{RR}	I _C =300A V _{CC} =600V	–	24	–	mJ			
	T _j =125°C V _{CC} =900V	–	31	–	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	–	2,4	–	kg			
w	heat sink	–	7,5	–	kg			
Thermal characteristics (PX16 heat sink with fan SKF16B-230-1); "s" reference to heat sink; "r" reference to built-in temperature sensor (acc. IEC 60747-15)								
R _{thjsIGBT}	per IGBT	–	–	0,051	°C/W			
R _{thjsdiode}	per diode	–	–	0,100	°C/W			
Z _{th}	R _i (mK/W) (max. values)				tau _i (s)			
	1	2	3	4	1	2	3	4
IGBT _{jr}	4,2	20,4	23,4	0,0	69,0	0,35	0,02	1,0
diode _{jr}	7,8	12,0	53,1	53,1	50,0	5,0	0,25	0,04
heatsink _{ra}	2,1	20,0	5,5	1,4	210	85	11,0	0,4

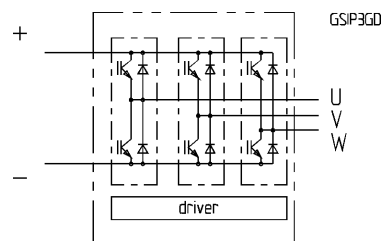
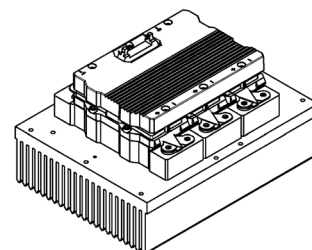
SKiiP® 3

SK integrated intelligent Power 6-pack

SKiiP 603GD122-3DUL

Preliminary data

Case S33



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® 3 System)
- IEC 68T.1 (climate) 40/125/56 (SKiiP® 3 power section)
- UL recognized File no. E63532 (SKiiP® 3 power section)

- 1) with assembly of suitable MKP capacitor per terminal (SEMİKRON type is recommended)

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SKiiP 603GD122-3DUL

SKiiP 3®

SK integrated intelligent Power

SKiiP 603GD122-3DUL

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 68T.1 (climate) 40/85/56 (SKiiP® 3 gate driver)

II. Integrated gate driver

Absolute maximum ratings

Symbol	Term	Value	Unit
V _{S2}	unstabilized 24V power supply	35	V
V _{iH}	input signal voltage (high)	15 + 0,3	V
dv/dt	secondary to primary side	75	kV/μs
V _{isollO}	input / output (AC, rms, 2 s)	3000	V
V _{isolPD}	partial discharge extinction voltage, rms, Q _{PD} ≤ 10 pC;	1170	V
V _{isol12}	output 1 / output 2 (AC, rms, 2s)	1500	V
f	switching frequency	15	kHz
T _{op} (T _{stg})	operating / storage temperature	- 40 ... + 85	°C

Electrical characteristics (T_a = 25 °C)

Symbol	Term	Values			Units
		min	typ	max.	
V _{S2}	supply voltage non stabilized	13	24	30	V
I _{S2}	V _{S2} = 24V	365 + 30*f / kHz + 0,00111 * (I _{AC} /A) ²			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
C _{in}	input capacitance	–	1	–	nF
t _{d(on)IO}	input-output turn-on propagation time	–	1,1	–	μs
t _{d(off)IO}	input-output turn-off propagation time	–	1,1	–	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; max load current	–	500	–	A
I _{S1out}		–	–	50	mA
I _{TRIPSC}	over current trip level (I _{analog OUT} = 10V)	–	625	–	A
T _{tp}	over temperature protection	110	–	120	°C
U _{DCTRIIP}	U _{DC} -protection (U _{analog OUT} = 9V) (option for GB types)	900	–	–	V

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