

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	1700	V
$V_{CC}^{1)}$		1200	V
V_{GES}		± 20	V
I_C	$T_s = 25 (70)^\circ\text{C}$	175 (131)	A
Inverse diode			
$I_F = -I_C$	$T_s = 25 (70)^\circ\text{C}$	175 (131)	A
I_{FSM}	$T_j = 150^\circ\text{C}$, $t_p = 10\text{ms}$; sin	1440	A
I^2t (Diode)	Diode, $T_j = 150^\circ\text{C}$, 10ms	10	kA^2s
$T_j, (T_{stg})$	AC, 1min.	-40 (-25) ... +150 (125)	$^\circ\text{C}$
V_{isol}		4000	V

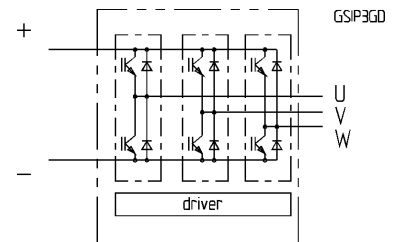
Characteristics								
T _s = 25°C unless otherwise specified								
Symbol		Conditions			min.	typ.	max.	Units
IGBT								
V _{CESat}	I _C = 140A, T _j = 25 (125)°C			–	3,3 (4,3)	3,9		V
V _{CEO}	T _j = 25 (125) °C			–	1,7 (2,0)	2,0 (2,3)		V
r _{CE}	T _j = 25 (125) °C			–	11,5 (16,7)	13,7 (18,8)		mΩ
I _{CES}	V _{GE} =0, V _{CE} =V _{CES} , T _j =25(125) °C			–	(10)	1,0		mA
E _{on} + E _{off}	I _C =140A, V _{CC} =900V			–	–	121		mJ
	T _j =125°C V _{CC} =1200V			–	–	178		mJ
R _{CC-EE}	terminal chip, T _j = 125 °C			–	0,50	–		mΩ
L _{CE}	top, bottom			–	15,0	–		nH
C _{CHC}	per phase, AC-side			–	0,8	–		nF
Inverse diode								
V _F = V _{EC}	I _F = 140A; T _j = 25(125) °C			–	2,4 (2,2)	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			–	7,5 (8,5)	9,5 (10,5)		mΩ
E _{RR}	I _C =140A V _{CC} =900V			–	–	15		mJ
	T _j =125°C V _{CC} =1200V			–	–	17		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			–	2,7	–		kg
w	heat sink			–	6,6	–		kg
Thermal characteristics (P16 heat sink; 295 m^3/ h); "r" reference to temperature sensor								
R _{thjrlGBT}	per IGBT			–	–	0,114		K/W
R _{thjrdiode}	per diode			–	–	0,400		K/W
R _{thra}	per module			–	–	0,036		K/W
Z _{th}	R _i (mK/W) (max.)				tau _i (s)			
	1	2	3	4	1	2	3	4
IGBT _{jr}	13	88	14	–	1	0,13	0,001	–
diode _{jr}	44	308	48	–	1	0,13	0,001	–
heatsink _{ra}	11,1	18,3	3,5	3,1	204	60	6	0,02

SKiiP[®] 2

SK integrated intelligent Power 6-pack

SKiiP 192GD170-374CTV

Case S3



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 (SEMİKRON type is recommended)

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SKiiP 192GD170-374CTV

SKiiP 2®

SK integrated intelligent Power

SKiiP 192GD170-374CTV

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)

II. Integrated gate 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 _{isollO}	input / output (AC)	4000	Vac
V _{isol12}	output 1 / output 2 (AC)	1500	Vac
f _{max}	switching frequency	20	kHz
T _{op} (T _{stg})	operating / storage temperature	- 25 ... + 85	°C

Electrical characteristics (T_a = 25 °C)

Symbol	Term	Values			Units
		min	typ	max.	
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	340 + 380*f / f _{max} + 3,5* (I _{AC} /A)			mA
I _{S2}	V _{S2} = 24V	250 + 260*f / f _{max} + 2,6 * (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	–	2,3	–	μs
I _{analogOUT}	8 V corresponds to	–	150	–	A
I _{Vs1outmax}	max. current of 15 V supply voltage (available when supplied with 24V)	–	–	50	mA
I _{A0max}	output current at pin 13/20/22/24/26	–	–	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)	–	188	–	A
I _{TRIPLG}	ground fault protection	–	43	–	A
T _{tp}	over temperature protection	110	–	120	°C
U _{DCTRIIP}	trip level of U _{DC} -protection (U _{analog OUT} = 9V); (option)	1200	–	–	V

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