

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	$T_s = 25 (70)^\circ\text{C}$	250 (188)	A
Inverse diode			
$I_F = -I_C$	$T_s = 25 (70)^\circ\text{C}$	250 (188)	A
I_{FSM}	$T_j = 150^\circ\text{C}$, $t_p = 10\text{ms}$; sin	2160	A
I^2t (Diode)	Diode, $T_j = 150^\circ\text{C}$, 10ms	23	kA^2s
$T_j, (T_{stg})$	AC, 1min.	-40 (-25) ... +150 (125)	$^\circ\text{C}$
V_{isol}		4000	V

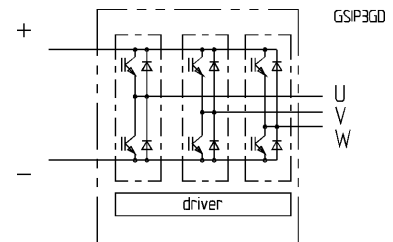
Characteristics $T_s = 25^\circ\text{C}$ unless otherwise specified					
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
V_{CESat}	$I_C = 200\text{A}$, $T_j = 25 (125)^\circ\text{C}$	–	3,3 (4,3)	3,9	V
V_{CEO}	$T_j = 25 (125)^\circ\text{C}$	–	1,7 (2,0)	2,0 (2,3)	V
r_{CE}	$T_j = 25 (125)^\circ\text{C}$	–	8,1 (11,7)	9,6 (13,2)	$\text{m}\Omega$
I_{CES}	$V_{GE}=0, V_{CE}=V_{CES}, T_j=25(125)^\circ\text{C}$	–	(15)	1,0	mA
$E_{on} + E_{off}$	$I_C=200\text{A}$, $V_{CC}=900\text{V}$	–	–	173	mJ
	$T_j=125^\circ\text{C}$, $V_{CC}=1200\text{V}$	–	–	254	mJ
$R_{CC'-EE'}$	terminal chip, $T_j = 125^\circ\text{C}$	–	0,50	–	$\text{m}\Omega$
L_{CE}	top, bottom	–	15,0	–	nH
C_{CHC}	per phase, AC-side	–	0,8	–	nF
Inverse diode					
$V_F = V_{EC}$	$I_F = 200\text{A}$; $T_j = 25(125)^\circ\text{C}$	–	2,3 (2,1)	2,9	V
V_{TO}	$T_j = 25 (125)^\circ\text{C}$	–	1,3 (1,0)	1,6 (1,3)	V
r_T	$T_j = 25 (125)^\circ\text{C}$	–	5,0 (5,6)	6,3 (7,0)	$\text{m}\Omega$
E_{RR}	$I_C=200\text{A}$, $V_{CC}=900\text{V}$	–	–	21	mJ
	$T_j=125^\circ\text{C}$, $V_{CC}=1200\text{V}$	–	–	25	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; $295 \text{ m}^3/\text{h}$); " r " reference to temperature sensor					
$R_{thjriGBT}$	per IGBT	–	–	0,080	K/W
$R_{thjrdiode}$	per diode	–	–	0,267	K/W
R_{thra}	per module	–	–	0,036	K/W
Z_{th}	R_i (mK/W) (max.)	$\tau_{ui}(\text{s})$			
	1 2 3 4	1	2	3	4
$IGBT_{jr}$	9 62 10 –	1	0,13	0,001	–
$diode_{jr}$	29 205 32 –	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 292GD170-375CTV

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 292GD170-375CTV

SKiiP 2®

SK integrated intelligent Power

SKiiP 292GD170-375CTV

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

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)

Electrical characteristics (T _a = 25 °C)			Values			Units
Symbol	Term		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	$340 + 550 \cdot f / f_{\max} + 3,5 \cdot (I_{AC}/A)$				mA
I _{S2}	V _{S2} = 24V	$250 + 400 \cdot f / f_{\max} + 2,6 \cdot (I_{AC}/A)$				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		–	250	–	A
I _{Vs1outmax}	max. current of 15 V supply voltage (available when supplied with 24V)		–	–	50	mA
I _{AOmax}	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)		–	313	–	A
I _{TRIPLG}	ground fault protection		–	72	–	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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