

SKiiP 3-phase bridge

Absolute Maximum Ratings		Values	Units
Symbol	Conditions ¹⁾		
V_{isol} ⁴⁾	AC, 1min	3000	V
T_{op}, T_{stg}	Operating / stor. temperature	-25...+85	°C
IGBT and Inverse Diode			
V_{CES}		1200	V
V_{CC} ⁵⁾	Operating DC link voltage	900	V
I_C	IGBT	200	A
T_j ³⁾	IGBT + Diode	-40...+150	°C
I_F	Diode	200	A
I_{FM}	Diode, $t_p < 1$ ms	400	A
I_{FSM}	Diode, $T_j = 150$ °C, 10ms; sin	1440	A
I^2t (Diode)	Diode, $T_j = 150$ °C, 10ms	10	kAs ²
Driver			
V_{S1}	Stabilized Power Supply	18	V
V_{S2}	Non-stabilized Power Supply	30	V
f_{smax}	Switching frequency	20	kHz
dV/dt	Primary to secondary side	75	kV/μs

Characteristics		min.	typ.	max.	Units
Symbol	Conditions ¹⁾				
IGBT ¹¹⁾					
$V_{(BR)CES}$	Driver without supply	$\geq V_{CES}$	–	–	V
I_{CES}	$V_{GE} = 0, T_j = 25$ °C	–	–	0,4	mA
	$V_{CE} = V_{CES}, T_j = 125$ °C	–	10	–	mA
V_{TO}	$T_j = 125$ °C	–	–	1,38	V
r_T	$T_j = 125$ °C	–	–	10,5	mΩ
V_{Cesat}	$I_C = 175A, T_j = 125$ °C	–	–	3,2	V
V_{Cesat}	$I_C = 175A, T_j = 25$ °C	–	–	3,05	V
$E_{on} + E_{off}$	$V_{CC}=600/900V, I_C=200A, T_j = 125$ °C	–	–	60/98	mJ
C_{CHC}	per SKiiP, AC side	–	1,4	–	nF
L_{CE}	Top, Bottom	–	15	–	nH
Inverse Diode ²⁾					
$V_F = V_{EC}$	$I_F = 175A; T_j = 125$ °C	–	–	2,45	V
$V_F = V_{EC}$	$I_F = 175A; T_j = 25$ °C	–	–	2,55	V
$E_{on} + E_{off}$	$I_F = 200A; T_j = 125$ °C	–	–	8	mJ
V_{TO}	$T_j = 125$ °C	–	0,91	–	V
r_T	$T_j = 125$ °C	–	5,7	–	mΩ
Thermal Characteristics ¹⁰⁾					
R_{thjs}	per IGBT	–	–	0,129	°C/W
R_{thjs}	per Diode	–	–	0,375	°C/W
R_{thsa} ^{6,10)}	P16 heatsink; see case	–	–	0,033	°C/W
Driver					
I_{S1}	Supply current 15V-supply	$340+360 \cdot f_s / f_{smax} + 3,5 \cdot I_{AC}/A$			mA
I_{S2}	Supply current 24V-supply	$250+240 \cdot f_s / f_{smax} + 2,6 \cdot I_{AC}/A$			mA
$t_{interlock-driver}$	Interlock-time	2,3			μs
SKiiPPACK protection					
I_{TRIPSC}	Short circuit protection	$250 \pm 2\%$			A
I_{TRIPLG}	Ground fault protection	$58 \pm 2\%$			A
T_{TRIP}	Over-temp. protection	$115 \pm 5\%$			°C
U_{DCTRIP} ⁹⁾	U_{DC} -protection	$920 \pm 2\%$			V
Mechanical Data					
M1	DC terminals, SI Units	4	–	6	Nm
M2	AC terminals, SI Units	8	–	10	Nm

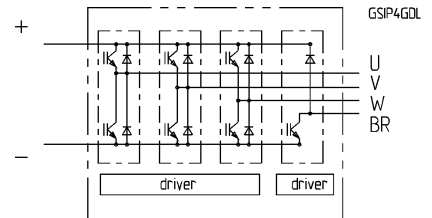
SKiiPPACK®

SK integrated intelligent Power PACK

3-phase bridge with brake chopper (E/A) SKiiP

232 GDL 120 - 410 CTV ^{7,9)}

Preliminary Data
Case S5GDL



Features

- Short circuit protection, due to evaluation of current sensor signals
- Isolated power supply
- Low thermal impedance
- Optimal thermal management with integrated heatsink
- Pressure contact technology with increased power cycling capability, compact design
- Low stray inductance
- High power, small losses
- Over-temperature protection

- ¹⁾ $T_{heatsink} = 25$ °C, unless otherwise specified
- ²⁾ CAL = Controlled Axial Lifetime Technology (soft and fast)
- ³⁾ without driver
- ⁴⁾ Driver input to DC link/ AC output to heatsink
- ⁵⁾ with Semikron-DC link (low inductance)
- ⁶⁾ other heatsinks on request
- ⁷⁾ C - Integrated current sensors
T - Temperature protection
V - 15 V or 24 V power supply
- ⁹⁾ options available for driver:
U - DC link voltage sense
F – Fiber optic connector
- ¹⁰⁾ “s” referenced to temperature sensor
- ¹¹⁾ NPT-technology with homogenous current-distribution

SKiiP Brake-chopper

Absolute Maximum Ratings			
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I ² t (Diode)	Diode, T _j = 150 °C, 10ms	10	kAs ²
Driver			
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V _{S2}	Non-stabilized Power Supply	30	V
f _{smax}	Switching frequency	5	kHz
dV/dt	Primary to secondary side	50	kV/μs

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V _{TO}	T _j = 125 °C	–	–	1,38	V
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Driver					
I _{S1}	Supply current 15V-supply	67+10*f _s /f _{smax} +0*I _{AC} /A			mA
I _{S2}	Supply current 24V-supply	67+10*f _s /f _{smax} +0,0*I _{AC} /A			mA
t _{interlock-driver}	Interlock-time	2,3			μs
SKiiPPACK protection					
I _{TRIPSC}	Short circuit protection	250 ± 2%			A
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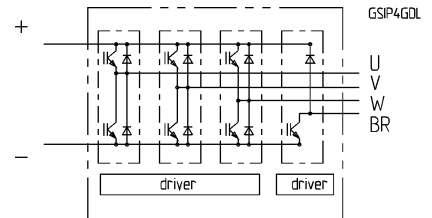
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- 4) Driver input to DC link/ AC output to heatsink
- 5) with Semikron-DC link (low inductance)
- 6) other heatsinks on request
- 7) C - Integrated current sensors
T - Temperature protection
V - 15 V or 24 V power supply
- 8) E - adapted to 400 Vrms; U - adapted to 460 Vrms
- 9) options available for driver:
U - DC link voltage sense
F – Fiber optic connector
- 10) "s" referenced to temperature sensor
- 11) NPT-technology with homogenous current-distribution