

SKiiP 3-phase bridge

Absolute Maximum Ratings			
Symbol	Conditions ¹⁾	Values	Units
V_{isol} ⁴⁾	AC, 1min	2500	V
T_{op}, T_{stg}	Operating / stor. temperature	-25...+85	°C
IGBT and Inverse Diode			
V_{CES}		600	V
V_{CC} ⁵⁾	Operating DC link voltage	400	V
I_C	IGBT	300	A
T_j ³⁾	IGBT + Diode	-40...+150	°C
I_F	Diode	300	A
I_{FM}	Diode, $t_p < 1$ ms	600	A
I_{FSM}	Diode, $T_j = 150$ °C, 10ms; sin	3000	A
I^2t (Diode)	Diode, $T_j = 150$ °C, 10ms	45	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					
Symbol	Conditions ¹⁾	min.	typ.	max.	Units
IGBT ¹¹⁾					
V _{(BR)CES}	Driver without supply	≥V _{CES}	—	—	V
I _{CES}	V _{GE} = 0, T _j = 25 °C	—	—	0,4	mA
	V _{CE} = V _{CES} T _j = 125 °C	—	4,5	—	mA
V _{TO}	T _j = 125 °C	—	—	0,94	V
r _T	T _j = 125 °C	—	—	6,4	mΩ
V _{Cesat}	I _C = 300A, T _j = 125 °C	—	—	2,9	V
V _{Cesat}	I _C = 300A, T _j = 25 °C	—	—	2,65	V
E _{on} + E _{off}	V _{CC} =300/400V, I _C =300A T _j = 125 °C	—	—	27/38	mJ
C _{CHC}	per SkiiP, AC side	—	0,8	—	nF
L _{CE}	Top, Bottom	—	15	—	nH
Inverse Diode ²⁾					
V _F = V _{EC}	I _F = 300A; T _j = 125 °C	—	—	1,72	V
V _F = V _{EC}	I _F = 300A T _j = 25 °C	—	—	1,75	V
E _{on} + E _{off}	I _F = 300A; T _j = 125 °C	—	—	9	mJ
V _{TO}	T _j = 125 °C	—	—	0,78	V
r _T	T _j = 125 °C	—	—	3,3	mΩ
Thermal Characteristics					
R _{thjs} ¹⁰⁾	per IGBT	—	—	0,150	K/W
R _{thjs} ¹⁰⁾	per Diode	—	—	0,250	K/W
R _{thsa} ^{6,10)}	P16 heatsink; see case S5	—	—	36	K/KW
Driver					
I _{S1}	Supply current 15V-supply	340+360*f _s /f _{smax} +3,5*I _{AC} /A			mA
I _{S2}	Supply current 24V-supply	250+240*f _s /f _{smax} +2,6*I _{AC} /A			mA
t _{interlock-driver}	Interlock-time	2,3			µs
SKiiPPACK protection					
I _{TRIPSC}	Short circuit protection	375			A
I _{TRIPLG}	Ground fault protection	87			A
T _{TRIP}	Over-temp. protection	115			°C
U _{DCTRIP} ⁹⁾	U _{DC} -protection	410			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

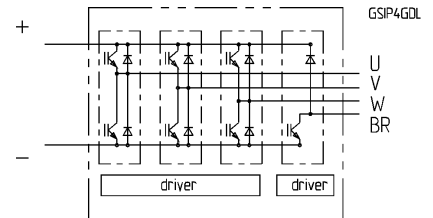
3-phase bridge with brake chopper

SKiiP

302 GDL 061 - 458 CTV ^{7,9)}

Preliminary Data

Case S5



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 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 homogeneous current-distribution

SKiiP Brake-chopper

Absolute Maximum Ratings			
Symbol	Conditions ¹⁾	Values	Units
V_{isol} ⁴⁾	AC, 1min	2500	V
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I_F	Diode	300	A
I_{FM}	Diode, $t_p < 1$ ms	600	A
I_{FSM}	Diode, $T_j = 150$ °C, 10ms; sin	4000	A
I^2t (Diode)	Diode, $T_j = 150$ °C, 10ms	80	kAs ²
Driver			
V_{S1}	Stabilized Power Supply	18	V
V_{S2}	Non-stabilized Power Supply	30	V
f_{smax}	Switching frequency	5	kHz
dV/dt	Primary to secondary side	50	kV/μs

Characteristics					
Symbol	Conditions ¹⁾	min.	typ.	max.	Units
IGBT ¹¹⁾					
V _{(BR)CES}	Driver without supply	≥V _{CES}	—	—	V
I _{CES}	V _{GE} = 0, T _j = 25 °C	—	—	0,4	mA
	V _{CE} = V _{CES} T _j = 125 °C	—	6	—	mA
V _{TO}	T _j = 125 °C	—	—	0,94	V
r _T	T _j = 125 °C	—	—	4,2	mΩ
V _{Cesat}	I _C = 300A, T _j = 125 °C	—	—	2,2	V
V _{Cesat}	I _C = 300A, T _j = 25 °C	—	—	2,60	V
E _{on} + E _{off}	V _{CC} =300/400V, I _C =300A T _j = 125 °C	—	—	27/38	mJ
C _{CHC}	per SkiiP, AC side	—	0,8	—	nF
L _{CE}	Top, Bottom	—	15	—	nH
Inverse Diode ²⁾					
V _F = V _{EC}	I _F = 300A; T _j = 125 °C	—	—	1,68	V
V _F = V _{EC}	I _F = 300A T _j = 25 °C	—	—	1,75	V
E _{on} + E _{off}	I _F = 300A; T _j = 125 °C	—	—	9	mJ
V _{TO}	T _j = 125 °C	—	—	0,78	V
r _T	T _j = 125 °C	—	—	2,5	mΩ
Thermal Characteristics					
R _{thjs} ¹⁰⁾	per IGBT	—	—	0,100	K/W
R _{thjs} ¹⁰⁾	per Diode	—	—	0,188	K/W
R _{thsa} ^{6,10)}	P16 heatsink; see case S5	—	—	36	K/KW
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*I _{AC} /A			mA
t _{interlock-driver}	Interlock-time	-			µs
SKiiPPACK protection					
I _{TRIPSC}	Short circuit protection	Vcesat-protection			A
I _{TRIPLG}	Ground fault protection	-			A
T _{TRIP}	Over-temp. protection	115			°C
U _{DCTRIP} ⁹⁾	U _{DC} -protection	410			V
Mechanical Data					
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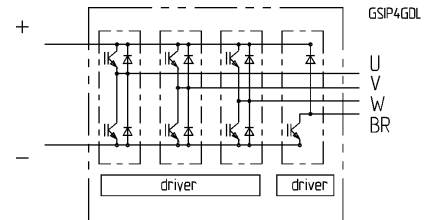
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