

SKiiP 3-phase bridge

Absolute Maximum Ratings		Values	Units
Symbol	Conditions ¹⁾		
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	400	A
T _j ³⁾	IGBT + Diode	-40...+150	°C
I _F	Diode	400	A
I _{FM}	Diode, t _p < 1 ms	800	A
I _{FSM}	Diode, T _j = 150 °C, 10ms; sin	4000	A
I ² t (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	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	≥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 = 400A, T _j = 125 °C	–	–	2,6	V
V _{Cesat}	I _C = 400A, T _j = 25 °C	–	–	2,60	V
E _{on} + E _{off}	V _{CC} =300/400V, I _C =400A T _j = 125 °C	–	–	36/51	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 = 400A; T _j = 125 °C	–	–	1,72	V
V _F = V _{EC}	I _F = 400A T _j = 25 °C	–	–	1,75	V
E _{on} + E _{off}	I _F = 400A; T _j = 125 °C	–	–	12	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	340+490*f _s /f _{smax} +3,5*I _{AC} /A			mA
I _{S2}	Supply current 24V-supply	250+360*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	413			A
I _{TRIPLG}	Ground fault protection	96			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

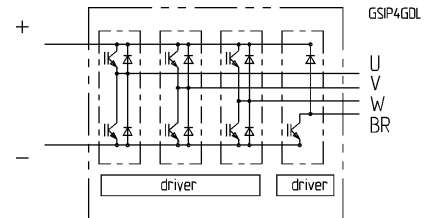
3-phase bridge with brake chopper

SKiiP

402 GDL 061 - 460 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) without driver
- 3) Driver input to DC link / AC output to DC link / AC output to heatsink
- 4) with Semikron-DC link (low inductance)
- 5) other heatsinks on request
- 6) C - Integrated current sensors
T - Temperature protection
V - 15 V or 24 V power supply
- 7) options available for driver:
U - DC link voltage sense
F – Fiber optic connector
- 8) “_s” referenced to temperature sensor
- 9) NPT-technology with homogeneous current-distribution

SKiiP Brake-chopper

Absolute Maximum Ratings		Values	Units
Symbol	Conditions ¹⁾		
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	600	A
T _j ³⁾	IGBT + Diode	-40...+150	°C
I _F	Diode	600	A
I _{FM}	Diode, t _p < 1 ms	1200	A
I _{FSM}	Diode, T _j = 150 °C, 10ms; sin	7000	A
I ² t (Diode)	Diode, T _j = 150 °C, 10ms	245	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		min.	typ.	max.	Units
Symbol	Conditions ¹⁾				
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	–	10,5	–	mA
V _{TO}	T _j = 125 °C	–	–	0,94	V
r _T	T _j = 125 °C	–	–	3,2	mΩ
V _{Cesat}	I _C = 600A, T _j = 125 °C	–	–	2,9	V
V _{Cesat}	I _C = 600A, T _j = 25 °C	–	–	2,60	V
E _{on} + E _{off}	V _{CC} =300/400V, I _C =600A T _j = 125 °C	–	–	54/76	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 = 600A; T _j = 125 °C	–	–	1,70	V
V _F = V _{EC}	I _F = 600A T _j = 25 °C	–	–	1,75	V
E _{on} + E _{off}	I _F = 600A; T _j = 125 °C	–	–	18	mJ
V _{TO}	T _j = 125 °C	–	–	0,78	V
r _T	T _j = 125 °C	–	–	1,4	mΩ
Thermal Characteristics					
R _{thjs} ¹⁰⁾	per IGBT	–	–	0,075	K/W
R _{thjs} ¹⁰⁾	per Diode	–	–	0,107	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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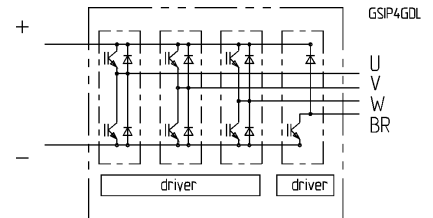
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