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

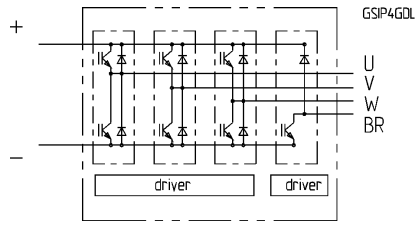
Characteristics						
Symbol	**Conditions** [1]		**min.**	**typ.**	**max.**	**Units**
IGBT[11]						
$V_{(BR)CES}$	Driver without supply		≥V_{CES}	–	–	V
I_{CES}	V_{GE} = 0,	T_j = 25 °C	–	–	0,4	mA
	V_{CE} = V_{CES}	T_j = 125 °C	–	4,5	–	mA
V_{TO}	T_j = 125 °C		–	–	0,94	V
r_T	T_j = 125 °C		–	–	6,4	mΩ
V_{Cesat}	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 homogenous current-distribution

SKiiP Brake-chopper

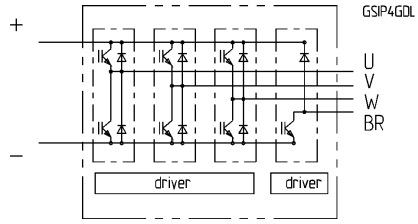
Absolute Maximum Ratings			
Symbol	**Conditions** [1]	**Values**	**Units**
V_{isol} [4]	AC, 1min	2500	V
T_{op} , T_{stg}	Operating / stor. temperature	-25...+85	°C
IGBT and Inverse Diode			
V_{CES}		600	V
V_{CC} [5]	Operating DC link voltage	400	V
I_C	IGBT	300	A
T_j [3]	IGBT + Diode	-40...+150	°C
I_F	Diode	300	A
I_{FM}	Diode, t_p < 1 ms	600	A
I_{FSM}	Diode, T_j = 150 °C, 10ms; sin	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						
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



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