

SKiIP 312 GD 120 - 302 WT

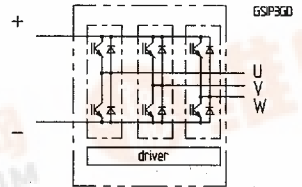
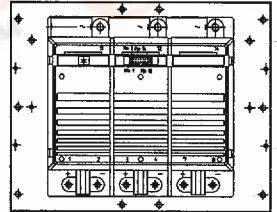
SKiIPPACK®

SK integrated intelligent Power PACK

3-phase bridge

SKiIP 312 GD 120 + Driver 302 WT ⁷⁾

Case S3



Symbol	Conditions ¹⁾	Values	Units
Absolute Maximum Ratings			
IGBT & Inverse Diode			
V _{CEs}		1200	V
V _{CC} ¹⁰⁾	Operating DC link voltage	900	V
I _C	T _{heatsink} = 25 °C	300	A
I _{CM}	T _{heatsink} = 25 °C; t _p < 1 ms	600	A
T _J ³⁾	IGBT & Diode	- 55 ... + 150	°C
V _{isol} ⁴⁾	AC, 1 min.	3000 ⁵⁾	V
I _F	T _{heatsink} = 25 °C	240	A
I _{FM}	T _{heatsink} = 25 °C; t _p < 1 ms	600	A
I _{FSM}	t _p = 10 ms; sin.; T _J = 150 °C	2160	A
I ² t (Diode)	t _p = 10 ms; T _J = 150 °C	23,4	kA ² s
Driver			
V _{S1}	Stabilized power supply	18	V
V _{S2} ⁹⁾	Nonstabilized power supply	30	V
dv/dt	Primary to second. side	75	kV/μs
T _{Op} , T _{stg}	Operating / stor. temperature	- 25 ... + 85	°C

Symbol	Conditions ¹⁾	min.	typ.	max.	Units
Characteristics					
V _{(BR)CES}	Driver without power supply	≥ V _{CEs}	-	-	V
I _{CES}	V _{GE} = 0 } T _J = 25 °C	-	0,3	-	mA
	V _{CE} = V _{CEs} } T _J = 125 °C	-	1%	-	mA
V _{CEsat} ⁸⁾	I _C = 225 A T _J = 25 (125) °C	-	2,75 (3,6)	-	V
V _{CEsat} ⁸⁾	I _C = 300 A T _J = 25 (125) °C	-	3,15 (4,2)	-	V
I _{CETRIP}	T _J = 125 °C; V _S = 15 V ± 0,6V	≥ 375	-	-	A
C _{CHC}	per SKiIPPACK AC side	-	0,8	-	nF
L _{CE}	Top (Bottom)	-	15	-	nH
t _{d(on)}	V _{CC} = 600 V I _C = 300 A T _J = 125 °C inductive load	-	150	-	ns
t _{d(on)Driver}		-	1,2	-	μs
t _r		-	100	-	ns
t _{d(off)}		-	0,7	-	μs
t _{d(off)Driver}		-	1,2	-	μs
t _f		-	80	-	ns
E _{on} + E _{off}		-	90	-	mJ
Inverse Diode ²⁾					
V _F ⁸⁾ = V _{EC}	I _F = 225 A T _J = 25 (125) °C	-	2,0(1,8)	-	V
	I _F = 300 A T _J = 25 (125) °C	-	2,25(2,05)	-	V
V _{TO}	T _J = 125 °C	-	1,0	-	V
r _T	T _J = 125 °C	-	4,0	-	mΩ
E _{on} + E _{off}	I _F = 300 A; T _J = 125 °C	-	12	-	mJ
Thermal Characteristics					
R _{thjh}	per IGBT	-	0,08	-	K/W
R _{thjd}	per diode	-	0,27	-	K/W
T _{tp} ¹¹⁾	Over temperature protection	109	115	121	°C
R _{thha} ⁶⁾	P16/280 F; V _{air} = 285 m ³ / h	-	0,036	-	K/W
Mechanical Data					
M _{dc}	for DC terminals, SI Units	4	-	6	Nm
M _{ac}	for AC terminals, SI Units	8	-	10	Nm
Case			S3		

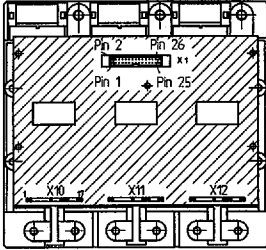
Features

- 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
- Overtemp. protection
- Short circuit protection
- Isolated power supply

- 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 or DC link/AC output to heatsink
- 5) 4 kV (AC; on request)
- 6) other heatsink on request
- 7) W - Driver wire input
T - Temperature protection
- 8) Chip voltage drop
- 9) 24 V supply voltage selective
- 10) with SK-DC link (low inductance)
- 11) thermal reference for R_{thjh}; R_{thha}



SKiIPACK®
SK integrated
intelligent Power PACK
3-phase bridge
SKiIP 312 GD 120
+ Driver 302 WT ³⁾



SKiIP 312 GD 120 - 302 WT
Driver for 3-phase bridge

Absolute Maximum Ratings				
Symbol	Conditions	Values	Units	remark
V _{S1}	supply voltage primary	18	V	pin 16 / 17
V _{S2} ¹⁾	supply voltage primary	30	V	pin 14 / 15
I _{outmax}	output peak current max.	± 10	A	
I _{outAV}	output average current	± 50	mA	
f _{swmax}	switching frequency max.	12	kHz	
V _{CE}	collector emitter voltage sense across IGBT	1200	V	
dv/dt	rate of rise and fall of voltage (secondary to primary side)	75	kV/μs	
V _{isol IO} ⁴⁾	Isol. test volt. IN/OUT (RMS; 1 min)	2,5	kV-	
V _{isol I2}	Isol. test volt. output 1 - output 2	1,5	kV=	
T _{op} , T _{stg}	operating / stor. temperature	-25...+85	°C	

Characteristics				
Symbol	Conditions	Values	Units	remark
V _{S1}	supply voltage primary	15,0 ± 4%	V	pin 16 / 17
V _{S2} ¹⁾	supply voltage primary	24,0	V	pin 14 / 15
V _{uvs}	supply undervolt. monitoring	+25%/-15%	V	15 V / 24 V
I _{S01}	sup. current pr.side (standby)	380	mA	15 V supply
I _{S02} ¹⁾	sup. current pr.side (standby)	300	mA	24 V supply
I _{S1}	sup. current pr.side (max)	900	mA	15 V supply
I _{S2} ¹⁾	sup. current pr.side (max)	700	mA	24 V supply
V _{IT+}	input thresh. volt. (high) min	12,9	V	
V _{IT-}	input thresh. volt. (low) max.	2,1	V	
V _{GE(on)}	turn-on output gate voltage	15	V	
V _{GE(off)}	turn-off output gate voltage	- 8	V	
t _{d(on)}	propagation delay time on	1,2	μs	typ.
t _{d(off)}	propagation delay time off	1,2	μs	typ.
t _{TD}	dead time of interlock	3	μs	typ.
V _{CEstat}	V _{CE} -thresh. st. monitoring	5,1	V	typ.
V _{CEdyn}	V _{CE} -thresh. dyn. monitoring	9,5	V	typ.
V _{ol} ²⁾	logic low output voltage	< 500	mV	15 mA
V _{oh} ²⁾	logic high output voltage	max. 30	V	
t _{pdon-error}	propag. delay time-on error	6	μs	typ.
t _{p RESET}	min. pulse width error memory RESET	5	μs	
T _{err}	max. temperature	115 ± 6	°C	
I _{A0max}	max. output current	± 5	mA	pin 20

Features

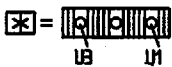
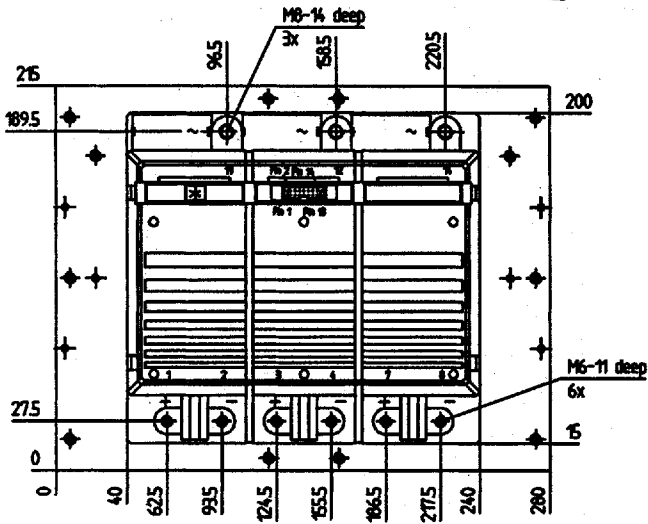
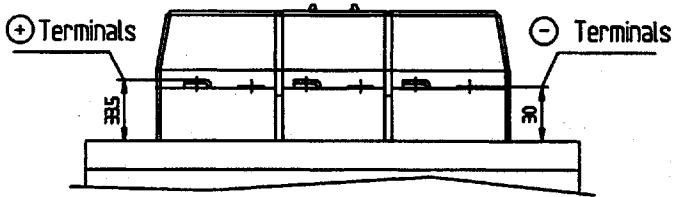
- CMOS compatible inputs
- Short circuit protection by V_{CE} monitoring and soft switch off
- Drive interlock top/bottom
- Isolation by transformers
- Supply undervoltage protection
- Overtemperature protection

- 1) 24 V - supply voltage selective
 - 2) Open collector output, external pull-up resistor necessary
 - 3) W - Driver wire input
 - 4) T - Temperature protection
- 4) 4 kV_{AC} (on request)

Case S3

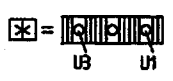
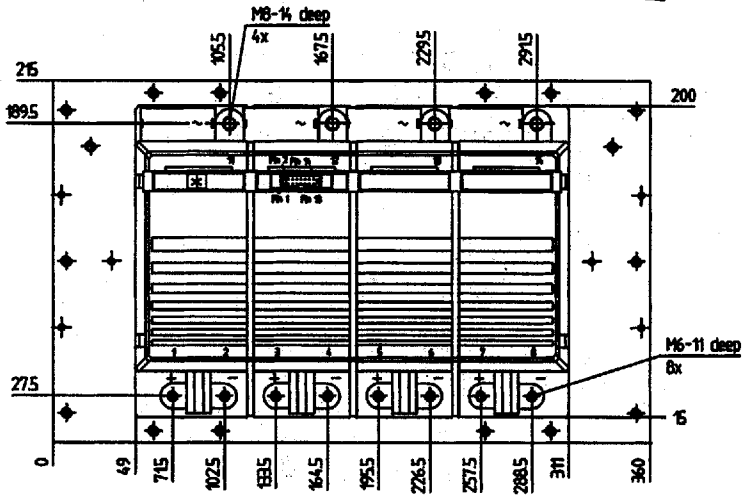
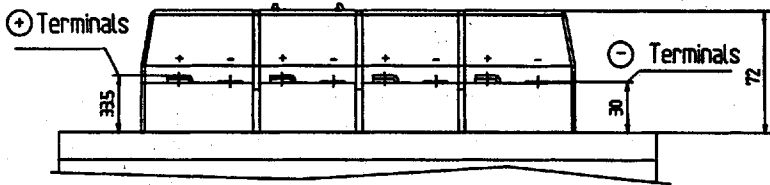
SKIIPACK 3 - GB, GD

CASES3



Version SkiiP ... GB ... FT (Fibre optic input)

CASES4



Version SKiIP ... GB ... FT (Fibreoptic input)

SKIIPACK view from right

