

SKiIP 312 GD 120 - 302 WT

Absolute Maximum Ratings		Values	Units
Symbol	Conditions ¹⁾		
IGBT & Inverse Diode			
V_{CES}		1200	V
V_{CC} ¹⁰⁾	Operating DC link voltage	900	V
I_C	$T_{heatsink} = 25\text{ °C}$	300	A
I_{CM}	$T_{heatsink} = 25\text{ °C}; t_p < 1\text{ ms}$	600	A
T_j ³⁾	IGBT & Diode	-55 ... +150	°C
V_{isol} ⁴⁾	AC, 1 min.	3000 ⁵⁾	V
I_F	$T_{heatsink} = 25\text{ °C}$	240	A
I_{FM}	$T_{heatsink} = 25\text{ °C}; t_p < 1\text{ ms}$	600	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.; T_j = 150\text{ °C}$	2160	A
I^2t (Diode)	$t_p = 10\text{ ms}; T_j = 150\text{ °C}$	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

Characteristics					
Symbol	Conditions ¹⁾	min.	typ.	max.	Units
$V_{(BR)CES}$	Driver without power supply	$\geq V_{CES}$	-	-	V
I_{CES}	$V_{GE} = 0$ } $T_j = 25\text{ °C}$ $V_{CE} = V_{CES}$ } $T_j = 125\text{ °C}$	-	0,3	-	mA
V_{CESat} ⁸⁾	$I_C = 225\text{ A}$ } $T_j = 25\text{ (125) °C}$	-	2,75 (3,6)	-	V
V_{CESat} ⁸⁾	$I_C = 300\text{ A}$ } $T_j = 25\text{ (125) °C}$	-	3,15 (4,2)	-	V
I_{CETrip}	$T_j = 125\text{ °C}; V_s = 15\text{ V} \pm 0,6\text{V}$	≥ 375	-	-	A
C_{CHC}	per SKiIPPACK AC side	-	0,8	-	nF
L_{CE}	Top (Bottom)	-	15	-	nH
$t_{d(on)}$	$V_{CC} = 600\text{ V}$ $I_C = 300\text{ A}$ $T_j = 125\text{ °C}$ 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⁾					
$V_F^8) = V_{EC}$	$I_F = 225\text{ A}$ } $T_j = 25\text{ (125) °C}$ $I_F = 300\text{ A}$ } $T_j = 25\text{ (125) °C}$	-	2,0(1,8)	-	V
		-	2,25(2,05)	-	V
V_{TO}	$T_j = 125\text{ °C}$	-	1,0	-	V
r_T	$T_j = 125\text{ °C}$	-	4,0	-	mΩ
$E_{on} + E_{off}$	$I_F = 300\text{ A}; T_j = 125\text{ °C}$	-	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, $v_{air} = 285\text{ m}^3/\text{h}$	-	0,036	-	K/W
Mechanical Data					
Mdc	for DC terminals, SI Units	4	-	6	Nm
Mac	for AC terminals, SI Units	8	-	10	Nm
Case			S3		

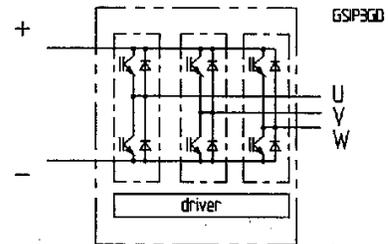
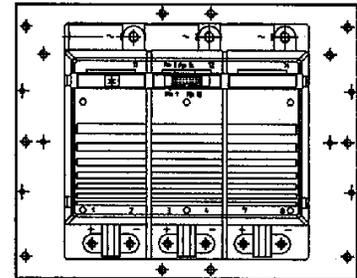
SKiIPPACK®

SK integrated intelligent Power PACK

3-phase bridge

SKiIP 312 GD 120 + Driver 302 WT ⁷⁾

Case S3

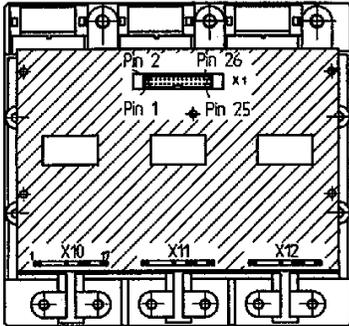


Features

- 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⁾ $T_{heatsink} = 25\text{ °C}$, 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}

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



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
 T - Temperature protection
 4) 4 kV_{AC} (on request)

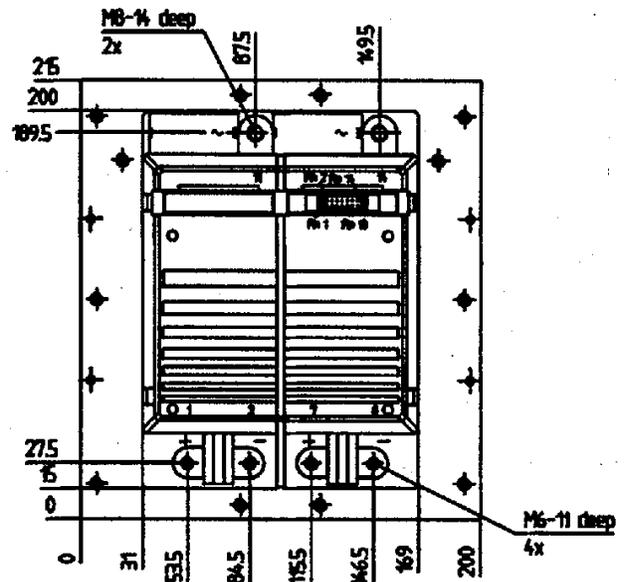
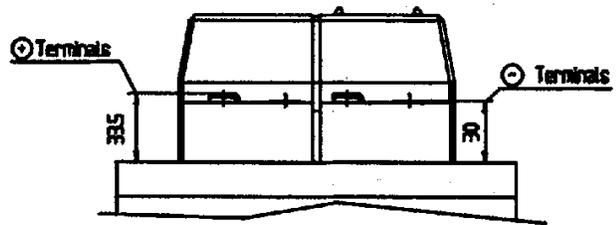
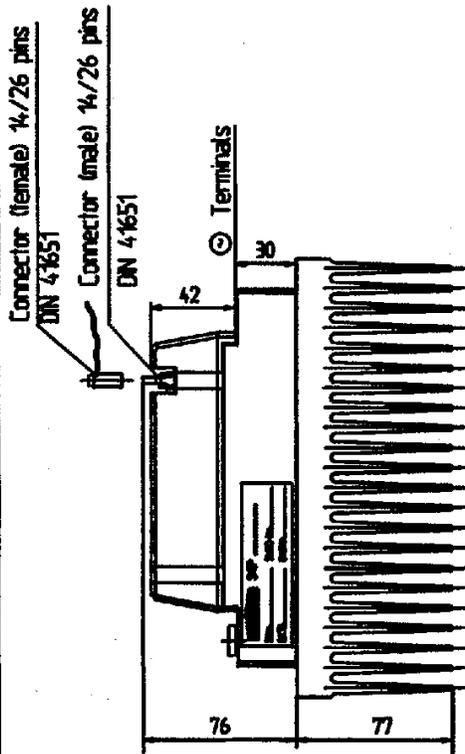
SKiP 312 GD 120 - 302 WT
Driver for 3-phase bridge

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-	
$V_{isol 12}$	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 +25%/-15%	V	pin 14 / 15
V_{UVS}	supply undervolt. monitoring	13 / 19,5	V	15 V / 24 V
I_{SO1}	sup. current pr.side (standby)	380	mA	15 V supply
I_{SO2} 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_{AOmax}	max. output current	± 5	mA	pin 20

Case S2
 SKIIPACK
 View from right

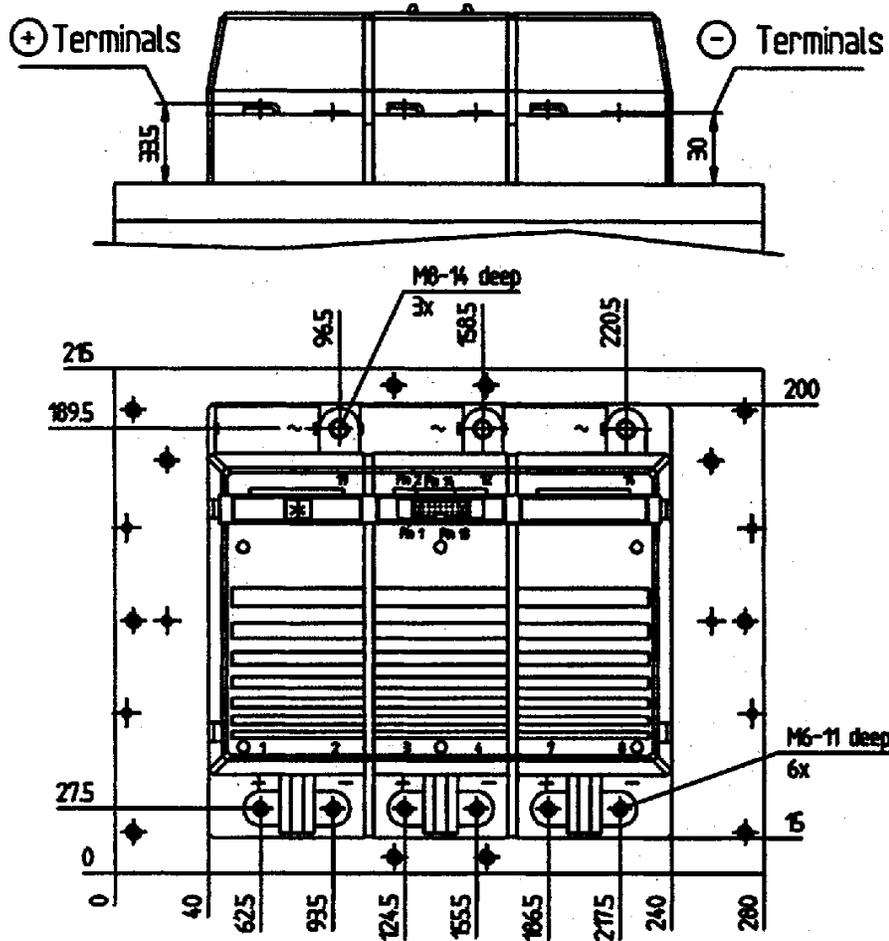
SKIIPACK 2 - GB



Case S3

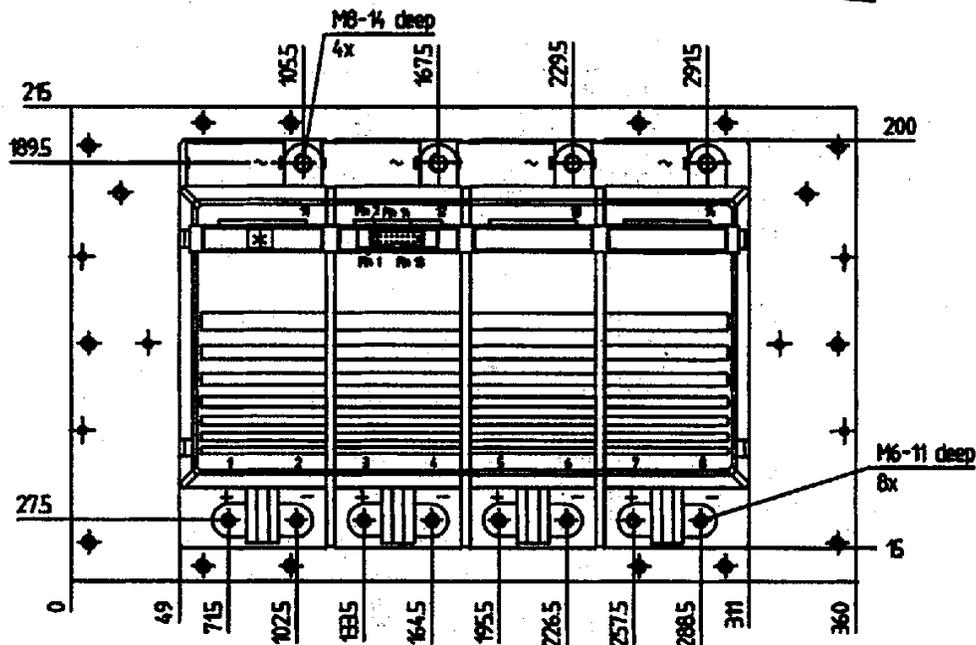
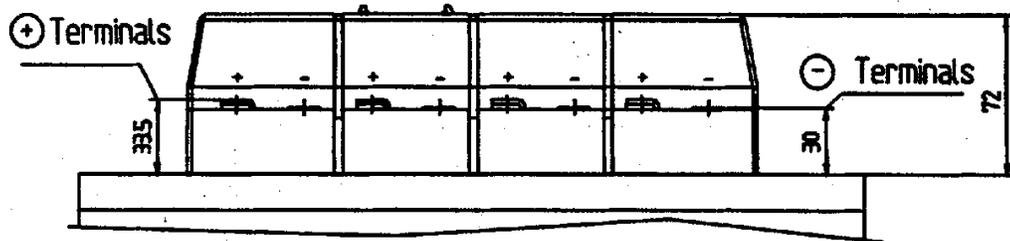
SKIIPACK 3 - GB, GD

CASES3



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

CASES4



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

SKIIPACK view from right

