

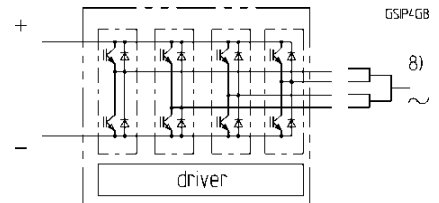
SKiiP 1242 GB 120 - 407 CTV

Absolute Maximum Ratings			
Symbol	Conditions ¹⁾	Values	Units
V_{isol} ⁴⁾	AC, 1min	3000	V
T_{op}, T_{stg}	Operating / stor. temperature	-25...+85	°C
IGBT and Inverse Diode			
V_{CES}		1200	V
V_{CC} ⁵⁾	Operating DC link voltage	900	V
I_C	IGBT	1200	A
T_j ³⁾	IGBT + Diode	-40...+150	°C
I_F	Diode	1200	A
I_{FM}	Diode, $t_p < 1$ ms	2400	A
I_{FSM}	Diode, $T_j = 150$ °C, 10ms; sin	8640	A
I^2t (Diode)	Diode, $T_j = 150$ °C, 10ms	373	kAs ²
Driver			
V_{S1}	Stabilized Power Supply	18	V
V_{S2}	Non-stabilized Power Supply	30	V
f_{smax}	Switching frequency	14	kHz
dV/dt	Primary to secondary side	75	kV/ μ s

Characteristics		min.	typ.	max.	Units
Symbol	Conditions ¹⁾				
IGBT ¹¹⁾					
$V_{(BR)CES}$	Driver without supply	$\geq V_{CES}$	-	-	V
I_{CES}	$V_{GE} = 0, T_j = 25$ °C $V_{CE} = V_{CES}, T_j = 125$ °C	-	-	1,8	mA
V_{TO}	$T_j = 125$ °C	-	-	1,38	V
r_T	$T_j = 125$ °C	-	-	1,8	m Ω
V_{Cesat}	$I_C = 1000A, T_j = 125$ °C	-	-	3,2	V
V_{Cesat}	$I_C = 1000A, T_j = 25$ °C	-	-	3,05	V
$E_{on} + E_{off}$	$V_{CC}=600/900V, I_C=1200A$ $T_j = 125$ °C	-	-	360/586	mJ
C_{CHC}	per Phase, AC side	-	5,6	-	nF
L_{CE}	Top, Bottom	-	4	-	nH
Inverse Diode ²⁾					
$V_F = V_{EC}$	$I_F = 1000A; T_j = 125$ °C	-	-	2,43	V
$V_F = V_{EC}$	$I_F = 1000A; T_j = 25$ °C	-	-	2,55	V
$E_{on} + E_{off}$	$I_F = 1200A; T_j = 125$ °C	-	-	48	mJ
V_{TO}	$T_j = 125$ °C	-	-	0,91	V
r_T	$T_j = 125$ °C	-	-	1,0	m Ω
Thermal Characteristics					
R_{thjs} ¹⁰⁾	per IGBT	-	-	0,023	K/W
R_{thjs} ¹⁰⁾	per Diode	-	-	0,063	K/W
R_{thsa} ^{6,10)}	P16 heatsink; see case S4	-	-	33	K/KW
Driver					
I_{S1}	Supply current 15V-supply	$290+580 \cdot f_s / f_{smax} + 1,3 \cdot I_{AC} / A$		mA	
I_{S2}	Supply current 24V-supply	$220+420 \cdot f_s / f_{smax} + 1,0 \cdot I_{AC} / A$		mA	
$t_{interlock-driver}$	Interlock-time	3,3		μ s	
SKiiPPACK protection					
I_{TRIPSC}	Short circuit protection	1500		A	
I_{TRIPLG}	Ground fault protection	-		A	
T_{TRIP}	Over-temp. protection	115		°C	
$U_{DCT RIP}$ ⁹⁾	U_{DC} -protection	920		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 halfbridge SKiiP 1242 GB 120 - 407 CTV ^{7,9)}
 Preliminary Data
 Case S4



Features

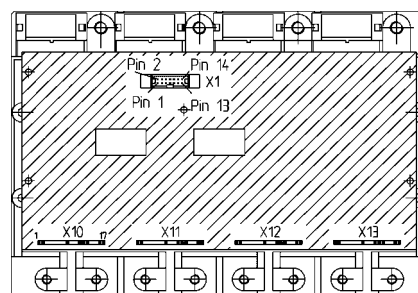
- Short circuit protection, due to evaluation of current sensor signals
- Isolated power supply
- Low thermal impedance
- Optimal thermal management with integrated heatsink
- Pressure contact technology with increased power cycling capability, compact design
- Low stray inductance
- High power, small 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
- ⁸⁾ AC connection busbars must be connected by the user; copper busbars available on request
- 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

PIN-array - halfbridge driver SKiiPACK 4-fold type "GB"

X1:

Pin	signal	remark
1	shield	connected to GND, when shielded cable is used
2	BOT IN ⁴⁾	positive 15V CMOS logic; 10 kΩ impedance, don't connect when using fiber optic
3	ERROR OUT ¹⁾	LOW = NO ERROR; open Collector Output; max. 30 V / 15 mA don't connect when using fiber optic, propagation delay 1 μs min. pulsewidth error-memory-reset 8 μs
4	TOP IN ⁴⁾	positive 15V CMOS logic; 10 kΩ impedance don't connect when using fiber optic
5	Overtemp. OUT ¹⁾	LOW = NO ERROR = $\vartheta_{DCB} < 115 \pm 5^\circ\text{C}$ open collector Output; max. 30 V / 15 mA „low“ output voltage < 0,6 V „high“ output voltage max. 30 V
6	+ 24 V _{DC} IN	24 V _{DC} (20 - 30 V)
7	+ 24 V _{DC} IN	don't supply with 24 V, when using + 15 V _{DCIN} supply voltage monitoring threshold 19,5 V
8	+ 15 V _{DC} IN	15 V _{DC} ± 4 %
9	+ 15 V _{DC} IN	don't supply with 15 V, when using + 24 V _{DCIN} supply voltage monitoring threshold 13 V
10	GND	GND for power supply and
11	GND	GND for digital signals
12	Temp. analog OUT or U _{DC} analog OUT ²⁾	U _{DC} when using option "U" actual DC-link voltage, 9 V refer to U _{DCmax} max. output current 5 mA; overvoltage trip level 9 V
13	GND aux ³⁾	GND for analog signals
14	I analog OUT	current actual value, 8,0 V refer to I _C @ 25 °C overcurrent trip level 10 V ⇔ 125 % I _C @ 25 °C current value > 0 ⇔ SKiiP is source current value < 0 ⇔ SKiiP is sink



X10: halfbridge 1 (HB1) OUT

Pin	Signal
1	
2	
8	Collector TOP (HB1)
11	Gate TOP (HB1)
12	Emitter TOP (HB1)
13	Collector BOT (HB1)
16	Gate BOT (HB1)
17	Emitter BOT (HB1)

X11: halfbridge 2 (HB2) OUT

Pin	Signal
1	Temp.-Sensor (HB2)1
2	Temp.-Sensor (HB2)2
8	Collector TOP (HB2)
11	Gate TOP (HB2)
12	Emitter TOP (HB2)
13	Collector BOT (HB2)
16	Gate BOT (HB2)
17	Emitter BOT (HB2)

X12: halfbridge 3 (HB3) OUT

Pin	Signal
1	
2	
8	Collector TOP (HB3)
11	Gate TOP (HB3)
12	Emitter TOP (HB3)
13	Collector BOT (HB3)
16	Gate BOT (HB3)
17	Emitter BOT (HB3)

X13: halfbridge 4 (HB4) OUT

Pin	Signal
1	
2	
8	Collector TOP (HB4)
11	Gate TOP (HB4)
12	Emitter TOP (HB4)
13	Collector BOT (HB4)
16	Gate BOT (HB4)
17	Emitter BOT (HB4)

type "GAL"

as type "GB" except
- PIN X1-4: connect this pin to GND
- TOP switch does not exist

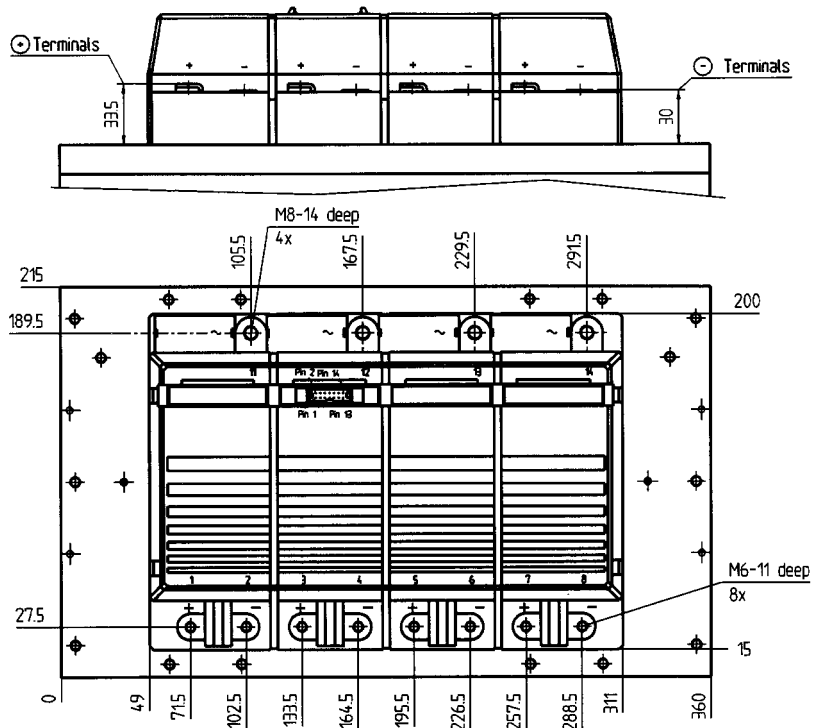
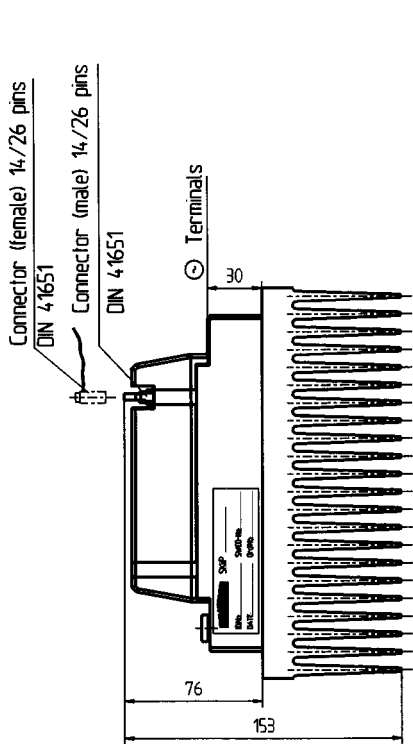
type "GAR"

as type "GB" except
- PIN X1-2: connect this pin to GND
- BOTTOM switch does not exist

- 1) Open collector output, external pull up resistor necessary
- 2) When using option "U" the analog temperature signal is not available
- 3) GND aux = reference for analog output signals
- 4) „high“ (min) 11,2 V
„low“ (max) 5,4 V

Case S4

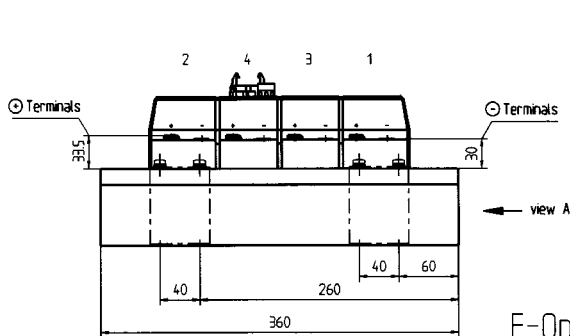
SKiiPPACK 4 - GB



Weight without heatsink: 3,54 kg

P16: 8,46 kg

SKiiPPACK 4 - GB with F-option



F-Option

