

**SKiiP 942 GB 120 - 317 CTV**

Absolute Maximum Ratings		Values	Units
Symbol	Conditions <sup>1)</sup>		
$V_{isol}$ <sup>4)</sup>	AC, 1min	3000	V
$T_{op}, T_{stg}$	Operating / stor. temperature	-25...+85	°C
<b>IGBT and Inverse Diode</b>			
$V_{CES}$		1200	V
$V_{CC}$ <sup>5)</sup>	Operating DC link voltage	900	V
$I_C$	IGBT	900	A
$T_j$ <sup>3)</sup>	IGBT + Diode	-40...+150	°C
$I_F$	Diode	900	A
$I_{FM}$	Diode, $t_p < 1$ ms	1800	A
$I_{FSM}$	Diode, $T_j = 150$ °C, 10ms; sin	6480	A
$I^2t$ (Diode)	Diode, $T_j = 150$ °C, 10ms	210	kAs <sup>2</sup>
<b>Driver</b>			
$V_{S1}$	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/ $\mu$ s

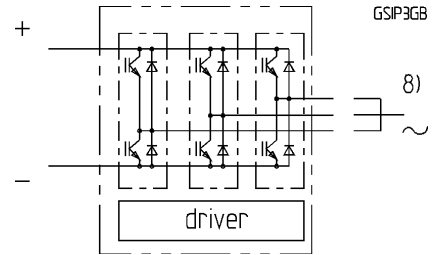
Characteristics		min.	typ.	max.	Units
Symbol	Conditions <sup>1)</sup>				
<b>IGBT <sup>11)</sup></b>					
$V_{(BR)CES}$	Driver without supply	$\geq V_{CES}$	-	-	V
$I_{CES}$	$V_{GE} = 0, T_j = 25$ °C $V_{CE} = V_{CES}, T_j = 125$ °C	-	-	1,2	mA
$V_{TO}$	$T_j = 125$ °C	-	-	1,38	V
$r_T$	$T_j = 125$ °C	-	-	2,5	m $\Omega$
$V_{Cesat}$	$I_C = 750A, T_j = 125$ °C	-	-	3,2	V
$V_{Cesat}$	$I_C = 750A, T_j = 25$ °C	-	-	3,05	V
$E_{on} + E_{off}$	$V_{CC}=600/900V, I_C=900A$ $T_j = 125$ °C	-	-	270/439	mJ
$C_{CHC}$	per Phase, AC side	-	4,2	-	nF
$L_{CE}$	Top, Bottom	-	5	-	nH
<b>Inverse Diode <sup>2)</sup></b>					
$V_F = V_{EC}$	$I_F = 750A; T_j = 125$ °C	-	-	2,43	V
$V_F = V_{EC}$	$I_F = 750A; T_j = 25$ °C	-	-	2,55	V
$E_{on} + E_{off}$	$I_F = 900A; T_j = 125$ °C	-	-	36	mJ
$V_{TO}$	$T_j = 125$ °C	-	-	0,91	V
$r_T$	$T_j = 125$ °C	-	-	1,3	m $\Omega$
<b>Thermal Characteristics</b>					
$R_{thjs}$ <sup>10)</sup>	per IGBT	-	-	0,030	K/W
$R_{thjs}$ <sup>10)</sup>	per Diode	-	-	0,083	K/W
$R_{thsa}$ <sup>6,10)</sup>	P16 heatsink; see case S3	-	-	36	K/KW
<b>Driver</b>					
$I_{S1}$	Supply current 15V-supply	$260+320 \cdot f_s / f_{smax} + 1,3 \cdot I_{AC} / A$		mA	
$I_{S2}$	Supply current 24V-supply	$200+210 \cdot f_s / f_{smax} + 1,0 \cdot I_{AC} / A$		mA	
$t_{interlock-driver}$	Interlock-time	2,3		$\mu$ s	
<b>SKiiPPACK protection</b>					
$I_{TRIPSC}$	Short circuit protection	1125		A	
$I_{TRIPLG}$	Ground fault protection	-		A	
$T_{TRIP}$	Over-temp. protection	115		°C	
$U_{DCTRIP}$ <sup>9)</sup>	$U_{DC}$ -protection	920		V	
<b>Mechanical Data</b>					
M1	DC terminals, SI Units	4	-	6	Nm
M2	AC terminals, SI Units	8	-	10	Nm

**SKiiPPACK®**

**SK integrated intelligent Power PACK halfbridge SKiiP**

**942 GB 120 - 317 CTV <sup>7,9)</sup>**

Preliminary Data  
Case S3



**Features**

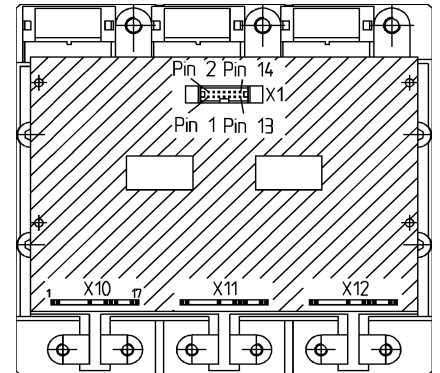
- Short circuit protection, due to evaluation of current sensor signals
- Isolated power supply
- Low thermal impedance
- Optimal thermal management with integrated heatsink
- Pressure contact technology with increased power cycling capability, compact design
- Low stray inductance
- High power, small losses
- Over-temperature protection

- <sup>1)</sup>  $T_{heatsink} = 25$  °C, unless otherwise specified
- <sup>2)</sup> CAL = Controlled Axial Lifetime Technology (soft and fast)
- <sup>3)</sup> without driver
- <sup>4)</sup> Driver input to DC link / AC output to DC link / AC output to heatsink
- <sup>5)</sup> with Semikron-DC link (low inductance)
- <sup>6)</sup> other heatsinks on request
- <sup>7)</sup> C - Integrated current sensors  
T - Temperature protection  
V - 15 V or 24 V power supply
- <sup>8)</sup> AC connection busbars must be connected by the user; copper busbars available on request
- <sup>9)</sup> options available for driver:  
U - DC link voltage sense  
F – Fiber optic connector
- <sup>10)</sup> “<sub>s</sub>” referenced to temperature sensor
- <sup>11)</sup> NPT-technology with homogeneous current-distribution

## PIN-array - halfbridge driver SKiiPPACK 3-fold type "GB"

X1:

Pin	signal	remark
1	shield	connected to GND, when shielded cable is used
2	BOT IN <sup>4)</sup>	positive 15V CMOS logic; 10 kΩ impedance, don't connect when using fiber optic
3	ERROR OUT <sup>1)</sup>	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 <sup>4)</sup>	positive 15V CMOS logic; 10 kΩ impedance don't connect when using fiber optic
5	Overtemp. OUT <sup>1)</sup>	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 <sub>DC</sub> IN	24 V <sub>DC</sub> (20 - 30 V)
7	+ 24 V <sub>DC</sub> IN	don't supply with 24 V, when using + 15 V <sub>DCIN</sub> supply voltage monitoring threshold 19,5 V
8	+ 15 V <sub>DC</sub> IN	15 V <sub>DC</sub> ± 4 %
9	+ 15 V <sub>DC</sub> IN	don't supply with 15 V, when using + 24 V <sub>DCIN</sub> 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 <sub>DC</sub> analog OUT <sup>2)</sup>	U <sub>DC</sub> when using option "U" actual DC-link voltage, 9 V refer to U <sub>DCmax</sub> max. output current 5 mA; overvoltage trip level 9 V
13	GND aux <sup>3)</sup>	GND for analog signals
14	I analog OUT	current actual value; 8,0 V refer to I <sub>C</sub> @ 25 °C overcurrent trip level 10 V ⇔ 125 % I <sub>C</sub> @ 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)

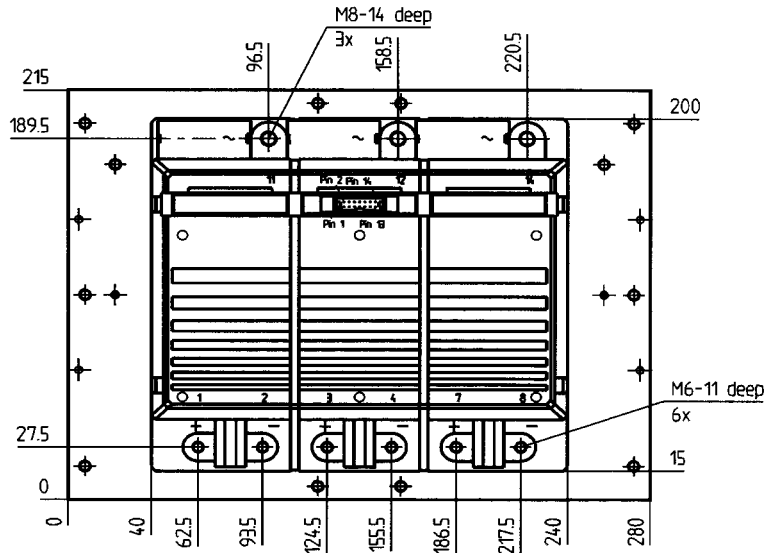
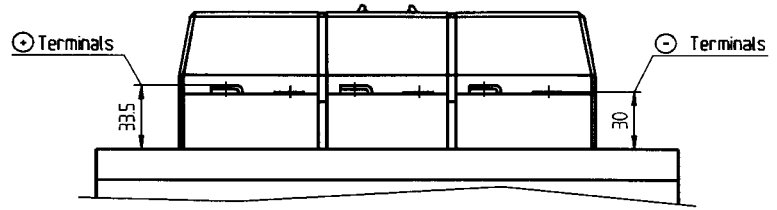
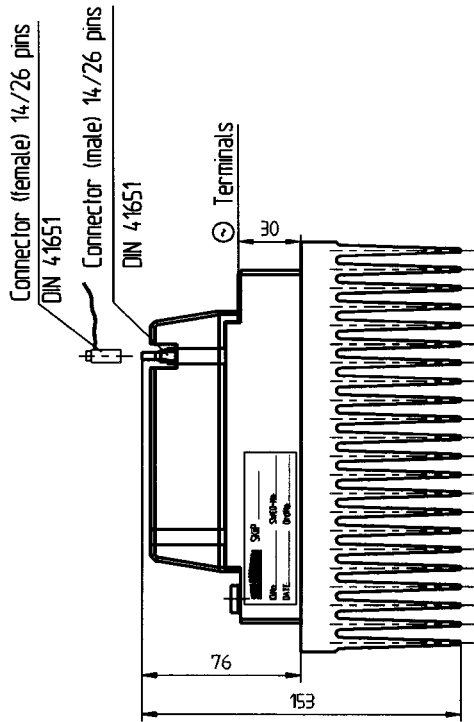
### type "GAL"

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

### type "GAR"

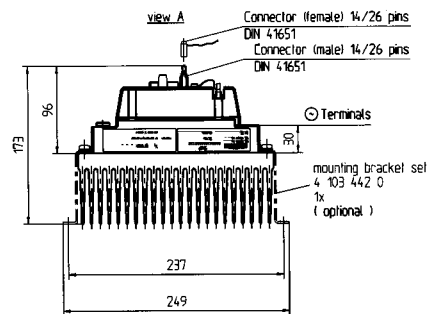
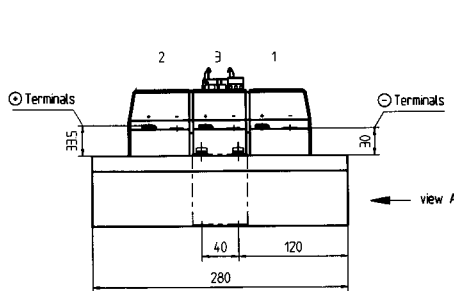
as type "GB" except  
- PIN X1-2: connect this pin to GND  
- BOTTOM switch does not exist

- 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



Weight without heatsink: 2,72 kg  
P16: 6,6 kg

SKiiPPACK 3 - GB with F-option



F-Option

