SKiiP 642 GB 120 - 208 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	600	A
T_j [3]	IGBT + Diode	-40...+150	°C
I_F	Diode	600	A
I_{FM}	Diode, t_p < 1 ms	1200	A
I_{FSM}	Diode, T_j = 150 °C, 10ms; sin	4320	A
I^2t (Diode)	Diode, T_j = 150 °C, 10ms	93	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

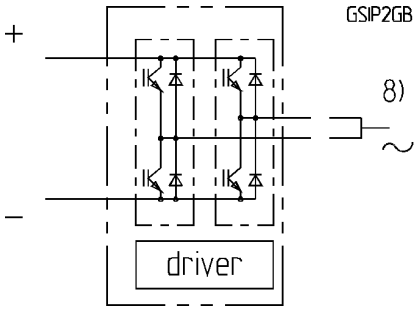
Characteristics						
Symbol	**Conditions** [1]		**min.**	**typ.**	**max.**	**Units**
IGBT[11]						
$V_{(BR)CES}$	Driver without supply		≥V_{CES}	–	–	V
I_{CES}	V_{GE} = 0,	T_j = 25 °C	–	–	0,8	mA
	V_{CE} = V_{CES}	T_j = 125 °C	–	30	–	mA
V_{TO}	T_j = 125 °C		–	–	1,38	V
r_T	T_j = 125 °C		–	–	3,7	mΩ
V_{Cesat}	I_C = 500A,	T_j = 125 °C	–	–	3,2	V
V_{Cesat}	I_C = 500A,	T_j = 25 °C	–	–	3,05	V
E_{on} + E_{off}	V_{CC}=600/900V,I_C=600A T_j = 125 °C		–	–	180/293	mJ
C_{CHC}	per Phase, AC side		–	2,8	–	nF
L_{CE}	Top, Bottom		–	7,5	–	nH
Inverse Diode [2]						
V_F = V_{EC}	I_F= 500A;	T_j = 125 °C	–	–	2,43	V
V_F= V_{EC}	I_F= 500A;	T_j = 25 °C	–	–	2,55	V
E_{on} + E_{off}	I_F= 600A;	T_j = 125 °C	–	–	24	mJ
V_{TO}	T_j = 125 °C		–	–	0,91	V
r_T	T_j = 125 °C		–	–	1,9	mΩ
Thermal Characteristics						
R_{thjs} [10]	per IGBT		–	–	0,045	K/W
R_{thjs} [10]	per Diode		–	–	0,125	K/W
R_{thsa} [6,10]	P16 heatsink; see case S2		–	–	44	K/KW
Driver						
I_{S1}	Supply current 15V-supply		210+430*f_s /f_{smax}+1,3*I_{AC}/A			mA
I_{S2}	Supply current 24V-supply		160+290*f_s /f_{smax}+1,0*I_{AC}/A			mA
$t_{interlock-driver}$	Interlock-time			3,3		µs
SKiiPPACK protection						
I_{TRIPSC}	Short circuit protection			750		A
I_{TRIPLG}	Ground fault protection			-		A
T_{TRIP}	Over-temp. protection			115		°C
U_{DCTRIP} [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 642 GB 120 - 208 CTV [7,9)]

Preliminary Data

Case S2



Features

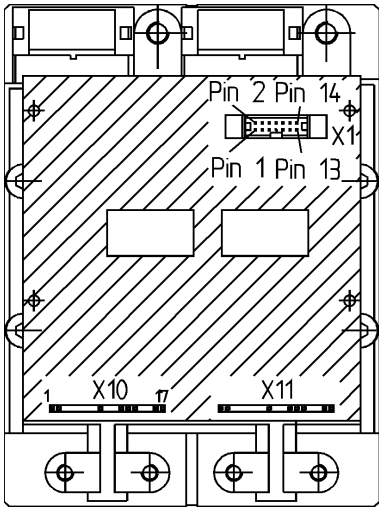
- Short circuit protection, due to evaluation of current sensor signals
- Isolated power supply
- Low thermal impedance
- Optimal thermal management with integrated heatsink
- Pressure contact technology with increased power cycling capability, compact design
- Low stray inductance
- High power, small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

PIN-array - halfbridge driver SKiiPPACK 2-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 = ϑ_{DCB} < 115 ± 5°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

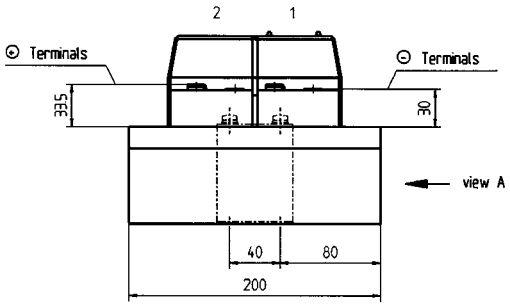
Pin	Signal
1	Temp.-Sensor (HB2)1
2	Temp.-Sensor (HB2)2
8	Collector TOP (HB2)
11	Gate TOP (HB2)
12	Emitter TOP (HB2)
13	Collector BOT (HB2)
16	Gate BOT (HB2)
17	Emitter BOT (HB2)

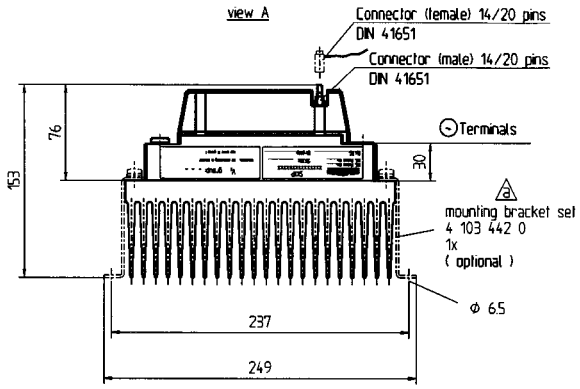
type “GAL”
as type “GB” except
- PIN X1-4: connect this pin to GND
- TOP switch does not exist

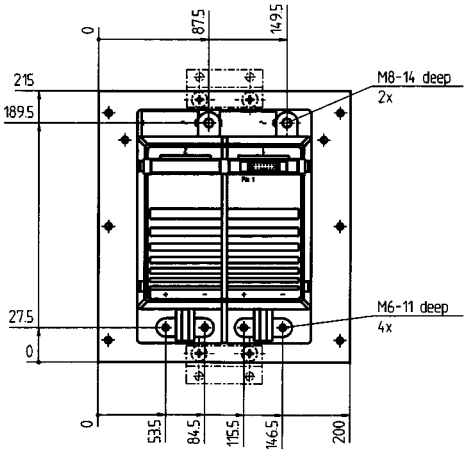
type “GAR”
as type “GB” except
- PIN X1-2: connect this pin to GND
- BOTTOM switch does not exist

[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 S2 **SKiiPPACK 2 - GB; GH**

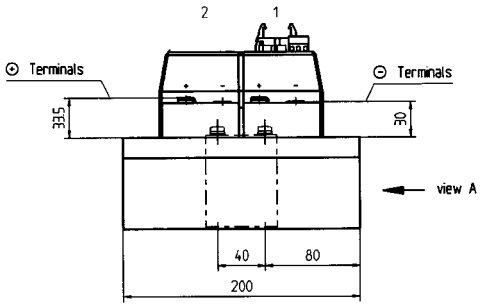


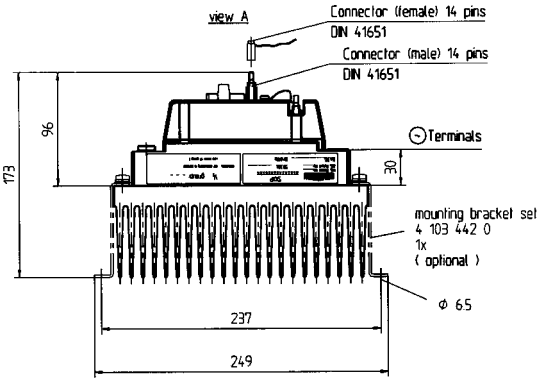


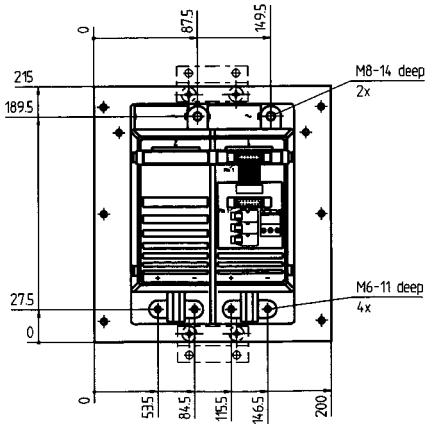


Weight without heatsink: 1,85 kg
P16: 4,7 kg

SKiiPPACK 2 - GB with F-option







F-Option