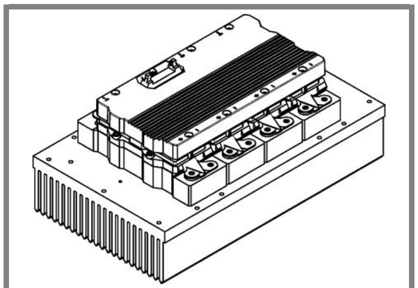


SKiiP® 3

2-pack-integrated intelligent Power System

Power section

SKiiP 2413GB123-4DL

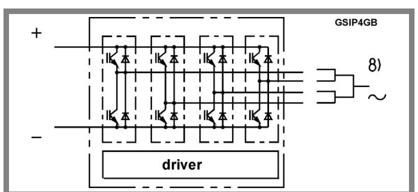
Data

Power section features

- SKiiP technology inside
- Trench IGBTs
- CAL HD diode technology
- Integrated current sensor
- Integrated temperature sensor
- Integrated heat sink
- IEC 60721-3-3 (humidity) class 3K3/IE32 (SKiiP® 3 System)
- IEC 60068-1 (climate) 40/125/56
- UL recognized File no. E63532

1) with assembly of suitable MKP capacitor per terminal

8) AC connection busbars must be connected by the user; copper busbars available on request



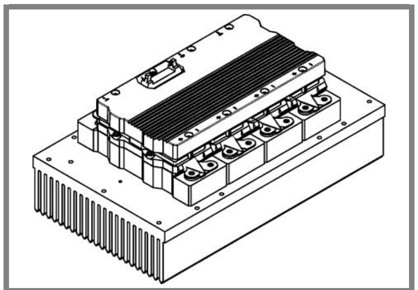
Case S43

Absolute Maximum Ratings		T_s = 25°C unless otherwise specified	
Symbol	**Conditions**	**Values**	**Units**
IGBT			
V_{CES}		1200	V
V_{CC} 1)	Operating DC link voltage	900	V
V_{GES}		± 20	V
I_C	T_s = 25 (70) °C	2400 (1800)	A
Inverse diode			
$I_F = - I_C$	T_s = 25 (70) °C	1860 (1400)	A
I_{FSM}	T_j = 150 °C, t_p = 10 ms; sin.	13500	A
I²t (Diode)	Diode, T_j = 150 °C, 10 ms	911	kA²s
T_j, (T_{stg})		- 40 ... + 150 (125)	°C
V_{isol}	rms, AC, 1 min, main terminals to heat sink	3000	V
$I_{AC\text{-}terminal}$	per AC terminal, rms, T_s = 70 °C, $T_{terminal}$ <115 °C	400	A

Characteristics				T_s = 25°C unless otherwise specified	
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Units**
IGBT					
V_{CEsat}	I_C = 1200 A, T_j = 25 (125) °C; measured at terminal		1,7 (1,9)	2,1	V
V_{CEO}	T_j = 25 (125) °C; at terminal		0,9 (0,8)	1,1 (1)	V
r_{CE}	T_j = 25 (125) °C; at terminal		0,7 (0,9)	0,9 (1,2)	mΩ
I_{CES}	V_{GE} = 0 V, V_{CE} = V_{CES}, T_j = 25 (125) °C		4,8 (144)		mA
$E_{on} + E_{off}$	I_C = 1200 A, V_{CC} = 600 V		442		mJ
	T_j = 125 °C, V_{CC} = 900 V		780		mJ
$R_{CC'+EE'}$	terminal chip, T_j = 25 °C		0,13		mΩ
L_{CE}	top, bottom		3		nH
C_{CHC}	per phase, AC-side		6,8		nF
Inverse diode					
$V_F = V_{EC}$	I_F = 1200 A, T_j = 25 (125) °C measured at terminal		1,5 (1,5)	1,8	V
V_{TO}	T_j = 25 (125) °C		0,9 (0,7)	1,1 (0,9)	V
r_T	T_j = 25 (125) °C		0,5 (0,7)	0,6 (0,8)	mΩ
E_{rr}	I_C = 1200 A, V_{CC} = 600 V		84		mJ
	T_j = 125 °C, V_{CC} = 900 V		112		mJ
Mechanical data					
M_{dc}	DC terminals, SI Units	6		8	Nm
M_{ac}	AC terminals, SI Units	13		15	Nm
w	SKiiP® 3 System w/o heat sink		3,1		kg
w	heat sink		9,7		kg
Thermal characteristics (PX 16 heat sink with fan SKF 16B-230-1); "s" reference to heat sink; "r" reference to built-in temperature sensor					
$R_{th(j-s)I}$	per IGBT			0,015	K/W
$R_{th(j-s)D}$	per diode			0,029	K/W

Z_{th}	R_i (mK/W) (max. values)				tau_i(s)			
	1	2	3	4	1	2	3	4
$Z_{th(j-r)I}$	5,6	6	6,4	0	363	0,18	0,04	1
$Z_{th(j-r)D}$	10	8,4	14,8	14,8	50	5	0,25	0,04
$Z_{th(r-a)}$	3,1	17,3	3,7	0,9	230	78	13	0,4

* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.



SKiiP® 3

2-pack-integrated intelligent Power System

2-pack

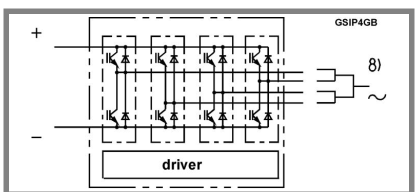
integrated gate driver

SKiiP 2413GB123-4DL

Data

Gate driver features

- CMOS compatible inputs
- Wide range power supply
- Integrated circuitry to sense phase current, heat sink temperature and DC-bus voltage (option)
- Short circuit protection
- Over current protection
- Over voltage protection (option)
- Power supply protected against under voltage
- Interlock of top/bottom switch
- Isolation by transformers
- Fibre optic interface (option for GB-types only)
- IEC 60068-1 (climate) 40/85/56
- UL recognized file no. 242581



Case S43

Absolute Maximum Ratings		T_a = 25°C unless otherwise specified	
Symbol	**Conditions**	**Values**	**Units**
V_{S2}	unstabilized 24 V power supply	30	V
V_i	input signal voltage (high)	15 + 0,3	V
dv/dt	secondary to primary side	75	kV/µs
V_{isolIO}	input / output (AC, rms, 2s)	3000	V
V_{isolPD}	partial discharge extinction voltage, rms, $Q_{PD} \leq 10$ pC;	1170	V
V_{isol12}	output 1 / output 2 (AC, rms, 2s)	1500	V
f_{sw}	switching frequency	8	kHz
f_{out}	output frequency for $I_{peak(1)}=I_C$	8	kHz
T_{op} (T_{stg})	operating / storage temperature	- 40 ... + 85	°C

Characteristics				(T_a = 25°C)	
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Units**
V_{S2}	supply voltage non stabilized	13	24	30	V
I_{S2}	V_{S2} = 24 V		324+50*f/kHz+0,00011*(I_{AC}/A)^2		mA
V_{iT+}	input threshold voltage (High)			12,3	V
V_{iT-}	input threshold voltage (Low)	4,6			V
R_{IN}	input resistance		10		kΩ
C_{IN}	input capacitance		1		nF
$t_{d(on)IO}$	input-output turn-on propagation time		1,3		µs
$t_{d(off)IO}$	input-output turn-off propagation time		1,3		µs
$t_{pERRRESET}$	error memory reset time		9		µs
t_{TD}	top / bottom switch interlock time		3,3		µs
$I_{analogOUT}$	max. 5mA; 8 V corresponds to 15 V supply voltage for external components		2400		A
I_{s1out}	max. load current			50	mA
I_{TRIPSC}	over current trip level (I_{analog} OUT = 10 V)		3000		A
T_{tp}	over temperature protection	110		120	°C
U_{DCTRIP}	U_{DC}-protection ($U_{analog\ OUT}$ = 9 V); (option for GB types)		not implemented		V

For electrical and thermal design support please use SEMISEL.
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