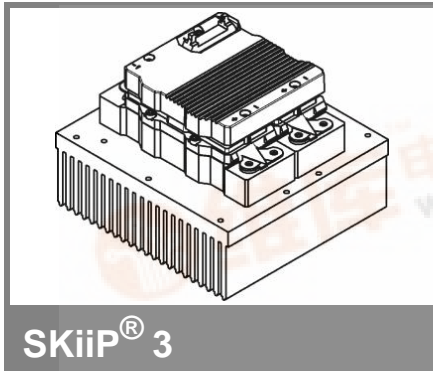


SKiiP 1013GB122-2DL



2-pack-integrated intelligent Power System

Power section

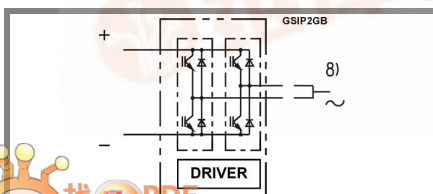
SKiiP 1013GB122-2DL

Preliminary Data

Features

- SKiiP technology inside
- SPT (Soft Punch Trough) IGBTs
- CAL 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 (SEMIKRON type is recommended)
- 8) AC connection busbars must be connected by the user; copper busbars available on request



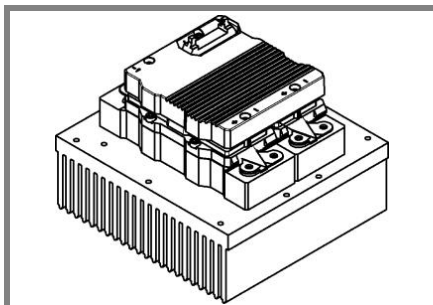
Absolute Maximum Ratings		$T_s = 25^\circ\text{C}$ unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}	Operating DC link voltage	1200	V
$V_{CC}^{(1)}$		900	V
V_{GES}		± 20	V
I_C	$T_s = 25 (70)^\circ\text{C}$	1000 (750)	A
Inverse diode			
$I_F = -I_C$	$T_s = 25 (70)^\circ\text{C}$	880 (670)	A
I_{FSM}	$T_j = 150^\circ\text{C}$, $t_p = 10$ ms; sin.	6900	A
I^2t (Diode)	Diode, $T_j = 150^\circ\text{C}$, 10 ms	238	kA^2s
T_j ; (T_{stg})		- 40 ... + 150 (125)	$^\circ\text{C}$
V_{isol}	rms, AC, 1 min, main terminals to heat sink	3000	V
$I_{AC-terminal}$	per AC terminal, rms, $T_s = 70^\circ\text{C}$,	400	A
	$T_{terminal} < 115^\circ\text{C}$		

Characteristics		$T_s = 25^\circ\text{C}$ unless otherwise specified							
Symbol	Conditions	min.	typ.	max.	Units				
IGBT									
V_{CEsat}	$I_C = 600$ A, $T_j = 25 (125)^\circ\text{C}$; measured at terminal		2,3 (2,5)	2,6	V				
V_{CEO}	$T_j = 25 (125)^\circ\text{C}$; at terminal		1,1 (1)	1,3 (1,2)	V				
r_{CE}	$T_j = 25 (125)^\circ\text{C}$; at terminal		1,9 (2,5)	2,3 (2,8)	$\text{m}\Omega$				
I_{CES}	$V_{GE} = 0$ V, $V_{CE} = V_{CES}$, $T_j = 25 (125)^\circ\text{C}$		2,4 (72)		mA				
$E_{on} + E_{off}$	$I_C = 600$ A, $V_{CC} = 600$ V		180		mJ				
	$T_j = 125^\circ\text{C}$, $V_{CC} = 900$ V		318		mJ				
R_{CC+EE}	terminal chip, $T_j = 25^\circ\text{C}$		0,25		$\text{m}\Omega$				
L_{CE}	top, bottom		6		nH				
C_{CHC}	per phase, AC-side		3,4		nF				
Inverse diode									
$V_F = V_{EC}$	$I_F = 600$ A, $T_j = 25 (125)^\circ\text{C}$ measured at terminal		1,95 (1,7)	2,1	V				
V_{TO}	$T_j = 25 (125)^\circ\text{C}$		1,1 (0,8)	1,2 (0,9)	V				
r_T	$T_j = 25 (125)^\circ\text{C}$		1,4 (1,5)	1,5 (1,8)	$\text{m}\Omega$				
E_{rr}	$I_C = 600$ A, $V_{CC} = 600$ V		48		mJ				
	$T_j = 125^\circ\text{C}$, $V_{CC} = 900$ V		61		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			1,7	kg				
w	heat sink			5,4	kg				
Thermal characteristics (PX16 heat sink with fan SKF16B-230-1); "s" reference to heat sink; "r" reference to built-in temperature sensor (acc. IEC 60747-15)									
$R_{th(j-s)I}$	per IGBT			0,03	K/W				
$R_{th(j-s)D}$	per diode			0,058	K/W				
Z_{th}	R_i (mK/W) (max. values)	$\tau_{th}(s)$							
		1	2	3	4				
$Z_{th(j-r)I}$		9,8	16,4	3,8	0	0,37	0,06	0,01	1
$Z_{th(j-r)D}$		10	24	24	36	50	5	0,25	0,04
$Z_{th(r-a)}$		4,3	20,3	7,1	2,3	160	53	9	0,4

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SKiiP 1013GB122-2DL



SKiiP® 3

2-pack-integrated intelligent Power System

2-pack integrated gate driver SKiiP 1013GB122-2DL

Preliminary 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

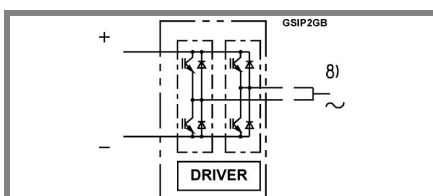
Absolute Maximum Ratings		$T_a = 25^\circ\text{C}$ unless otherwise specified	
Symbol	Conditions	Values	Units
V_{S2}	unstabilized 24 V power supply	30	V
V_i	input signal voltage (high)	15 + 0,3	V
dv/dt	secondary to primary side	75	kV/ μs
V_{isolIO}	input / output (AC, rms, 2s)	3000	V
V_{isolPD}	partial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

Characteristics		$(T_a = 25^\circ\text{C})$			
Symbol	Conditions	min.	typ.	max.	Units
V_{S2}	supply voltage non stabilized	13	24	30	V
I_{S2}	$V_{S2} = 24$ V	$278 + 20 \cdot f / \text{kHz} + 0,00022 \cdot (I_{\text{AC}} / \text{A})^2$			mA
$V_{\text{IT+}}$	input threshold voltage (High)			12,3	V
$V_{\text{IT-}}$	input threshold voltage (Low)	4,6			V
R_{IN}	input resistance		10		k Ω
C_{IN}	input capacitance		1		nF
$t_{\text{d(on)IO}}$	input-output turn-on propagation time		1,3		μs
$t_{\text{d(off)IO}}$	input-output turn-off propagation time		1,3		μs
$t_{\text{pERRRESET}}$	error memory reset time		9		μs
t_{TD}	top / bottom switch interlock time		3,3		μs
$I_{\text{analogOUT}}$	max. 5mA; 8 V corresponds to 15 V supply voltage for external components		1000		A
I_{s1out}	max. load current			50	mA
I_{TRIPSC}	over current trip level ($I_{\text{analog OUT}} = 10$ V)		1250		A
T_{tp}	over temperature protection	110		120	$^\circ\text{C}$
U_{DCTRIP}	U_{DC} -protection ($U_{\text{analog OUT}} = 9$ V); (option for GB types)		not implemented		V

For electrical and thermal design support please use SEMISEL.

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Case S23