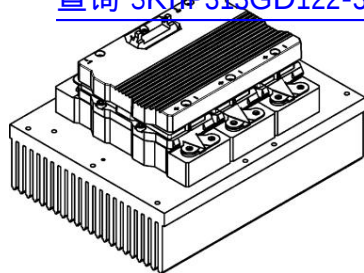


SKiiP 313GD122-3DUL

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SKiiP® 3

6-pack-integrated intelligent Power System

Power Section

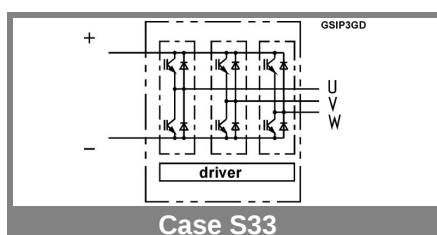
SKiiP 313GD122-3DUL

Data

Power section features

- SKiiP technology inside
- SPT (Soft Punch Through) 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



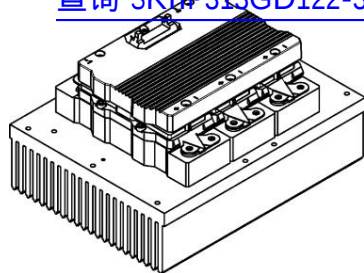
Absolute Maximum Ratings		$T_s = 25\text{ °C}$ unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}	Operating DC link voltage	1200	V
$V_{CC}^{1)}$		900	V
V_{GES}		± 20	V
I_C	$T_s = 25\text{ (70) °C}$	300 (225)	A
Inverse diode			
$I_F = -I_C$	$T_s = 25\text{ (70) °C}$	230 (180)	A
I_{FSM}	$T_j = 150\text{ °C}$, $t_p = 10\text{ ms}$; sin	2500	A
I^2t (Diode)	Diode, $T_j = 150\text{ °C}$, 10 ms	31	kA²s
$T_j, (T_{stg})$	rms, AC, 1 min, main terminals to heat sink per AC terminal, rms, $T_s = 70\text{ °C}$, $T_{terminal} < 115\text{ °C}$	- 40 ... + 150 (125)	°C
V_{isol}		3000	V
$I_{AC-terminal}$		400	A

Characteristics		T _s = 25 °C unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
V _{CEsat}	I _C = 193 A, T _j = 25 (125) °C; measured at terminal		2,3 (2,5)	2,6	V
V _{CEO}	T _j = 25 (125) °C; at terminal		1,1 (1)	1,3 (1,2)	V
r _{CE}	T _j = 25 (125) °C; at terminal		6 (7,8)	7 (8,8)	mΩ
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES} , T _j = 25 (125) °C		0,6 (18)		mA
E _{on} + E _{off}	I _C = 193 A, V _{CC} = 600 V		58		mJ
	T _j = 125 °C, V _{CC} = 900 V		102		mJ
R _{CC+EE}	terminal chip, T _j = 25 °C		0,5		mΩ
L _{CE}	top, bottom		12		nH
C _{CHC}	per phase, AC-side		1,7		nF
Inverse diode					
V _F = V _{EC}	I _F = 193 A, T _j = 25 (125) °C measured at terminal		2 (1,8)	2,3	V
V _{TO}	T _j = 25 (125) °C		1 (0,7)	1,2 (0,9)	V
r _T	T _j = 25 (125) °C		5,3 (5,6)	7 (7,4)	mΩ
E _{rr}	I _C = 193 A, V _{CC} = 600 V		15		mJ
	T _j = 125 °C, V _{CC} = 900 V		20		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		2,4		kg
w	heat sink		7,5		kg
Thermal characteristics (PX16 heat sink with fan SKF 16B-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			0,092	K/W
R _{th(j-s)D}	per diode			0,23	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}					
Z _{th(j-r)D}					
Z _{th(r-a)}	2,1 20 5,5 1,4	210	85	11	0,4

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SKiiP® 3

6-pack-integrated intelligent Power System

6-pack
integrated gate driver
SKiiP 313GD122-3DUL

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 protection against under voltage
- Interlock of top/bottom switch
- Isolation by transformer
- 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, 2)	3000	V
V_{isolPD}	partial discharge extinction voltage, rms, $Q_{PD} \leq 10 \text{ pC}$	1170	V
V_{isol12}	output 1 / output 2 (AC, rms, 2 s)	1500	V
f_{sw}	switching frequency	20	kHz
f_{out}	output frequency for $I_{peak(1)} = I_C$	20	kHz
$T_{op} (T_{stg})$	operating / storage temperature	$-40 \dots +85$	$^\circ\text{C}$

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}	$V_{S2} = 24 \text{ V}$	$365 + 20 \cdot f / \text{kHz} + 0,00111 \cdot (I_{AC}/A)^2$			mA
V_{iT+}	input threshold voltage (High)			12,3	V
V_{iT-}	input threshold voltage (Low)	4,6			V
R_{IN}	input resistance		10		k Ω
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		μs
$I_{analogOUT}$	max. 5mA; 8 V corresponds to 15 V supply voltage for external components		300		A
I_{s1out}	max. load current			50	mA
I_{TRIPSC}	over current trip level ($I_{analogOUT} = 10 \text{ V}$)		375		A
T_{tp}	over temperature protection	110		120	$^\circ\text{C}$
U_{DCTRIP}	U_{DC} -protection ($U_{analogOUT} = 9 \text{ V}$); (option for GB types)		900		V

For electrical and thermal design support please use SEMISEL.

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