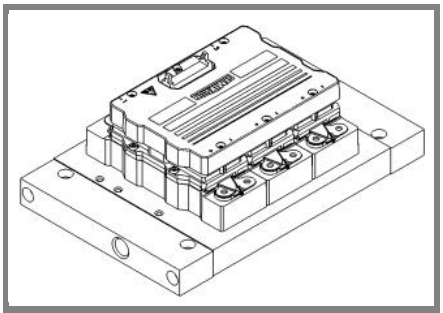
SKiiP 603GD172-3DUW V3



SKiiP® 3

6-pack-integrated intelligent Power System

Power section

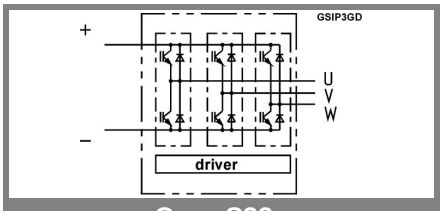
SKiiP 603GD172-3DUW V3

Target Data

Power section features

- SKiiP technology inside
- Trench 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



Case S33

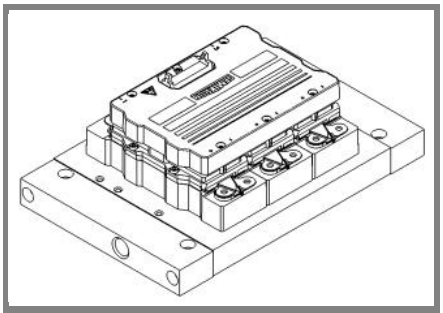
Absolute Maximum Ratings	T_s = 25°C unless otherwise specified		
Symbol	**Conditions**	**Values**	**Units**
IGBT			
V_{CES}		1700	V
V_{CC} 1)	Operating DC link voltage	1200	V
V_{GES}		± 20	V
I_C	T_s = 25 (70) °C	570 (440)	A
Inverse diode			
I_F = - I_C	T_s = 25 (70) °C	450 (340)	A
I_{FSM}	T_j = 150 °C, t_p = 10 ms; sin	3500	A
I^2t (Diode)	Diode, T_j = 150 °C, 10 ms	61	kA²s
T_j, (T_{stg})		- 40 ... + 150 (125)	°C
V_{isol}	rms, AC, 1 min, main terminals to heat sink	4000	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 = 300 A, T_j = 25 (125) °C; measured at terminal		1,9 (2,2)	2,4	V
V_{CEO}	T_j = 25 (125) °C; at terminal		1 (0,9)	1,2 (1,1)	V
r_{CE}	T_j = 25 (125) °C; at terminal		3 (4,1)	3,9 (5)	mΩ
I_{CES}	V_{GE} = 0 V, V_{CE} = V_{CES}, T_j = 25 (125) °C		1,2 (72)		mA
E_{on} + E_{off}	I_C = 300 A, V_{CC} = 900 V		195		mJ
	T_j = 125 °C, V_{CC} = 1200 V		288		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 = 300 A, T_j = 25 (125) °C measured at terminal		1,9 (1,7)	2,4	V
V_{TO}	T_j = 25 (125) °C		1,1 (0,8)	1,4 (1,1)	V
r_T	T_j = 25 (125) °C		2,6 (2,9)	3,4 (3,7)	mΩ
E_{rr}	I_C = 300 A, V_{CC} = 900 V		36		mJ
	T_j = 125 °C, V_{CC} = 1200 V		43		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 (NWK40; 8l/min; 50%glyc.); "s" reference to heat sink; "r" reference to built-in temperature sensor

$R_{th(j\text{-}s)I}$	per IGBT						0,051	K/W
$R_{th(j\text{-}s)D}$	per diode						0,1	K/W
Z_{th}	R_i (mK/W) (max. values)				tau_i(s)			
	1	2	3	4	1	2	3	4
$Z_{th(j\text{-}r)I}$	4,2	20,4	23,4	0	69	0,35	0,02	1
$Z_{th(j\text{-}r)D}$	7,8	12	53,1	53,1	50	5	0,25	0,04
$Z_{th(r\text{-}a)}$	4,6	4,7	1,1	0,6	48	15	2,8	0,35

* 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

6-pack-integrated intelligent Power System

6-pack
integrated gate driver
SKiiP 603GD172-3DUW V3

Target 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 transformer
- IEC 60068-1 (climate) 40/85/56

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)	4000	V
V_{isolPD}	partial discharge extinction voltage, rms, $Q_{PD} \leq 10$ pC;	1500	V
V_{isol12}	output 1 / output 2 (AC, rms, 2s)	1500	V
f_{sw}	switching frequency	14	kHz
f_{out}	output frequency for $I_{peak(1)}=I_C$	14	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} = 13V - 30V		417+42*f/kHz+0,00014*$(I_{AC}/A)^2$		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		1,4		µs
$t_{d(off)IO}$	input-output turn-off propagation time		1,4		µs
$t_{pERRRESET}$	error memory reset time		12,2		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		500		A
I_{s1out}	max. load current			50	mA
I_{TRIPSC}	over current trip level (I_{analog} OUT = 10 V)		625		A
T_{tp}	over temperature protection	110		120	°C
U_{DCTRIP}	U_{DC}-protection ($U_{analog\ OUT}$ = 9 V); ()		1200		V

For electrical and thermal design support please use SEMISEL.
Access to SEMISEL is via SEMIKRON website http://www.semikron.com.

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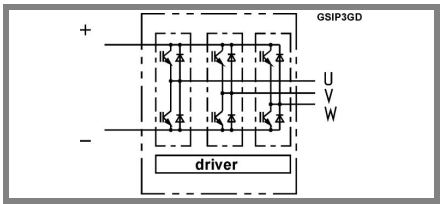

Case S33

