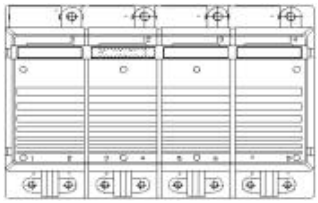
# SKiiP 832GB120-406CTV ...



**SKiiP® 2**

## 2-pack - integrated intelligent Power System

**Power section**

**SKiiP 832GB120-406CTV**

### Features

- SKiiP technology inside
- Low loss IGBTs
- CAL diode technology
- Integrated current sensor
- Integrated temperature sensor
- Integrated heat sink
- IEC 60721-3-3 (humidity) class 3k3/IE32 (SKiiP® 2 System)
- IEC 68T.1 (climate) 40/125/56 (SKiiP® 2 power section)

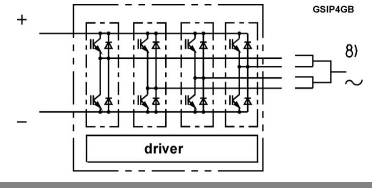
1) with assembly of suitable MKP capacitor per terminal (SEMIKRON type is recommended)

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

| **Absolute Maximum Ratings** | $T_s$ = 25 °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 | 800 (600) | A |
| **Inverse diode** | | | |
| $I_F$ = - $I_C$ | $T_s$ = 25 (70) °C | 800 (600) | A |
| $I_{FSM}$ | $T_j$ = 150 °C, $t_p$ = 10 ms; sin. | 5760 | A |
| I²t (Diode) | Diode, $T_j$ = 150 °C, 10 ms | 166 | kA²s |
| $T_j$, ($T_{stg}$) | | - 40 (- 25) ... + 150 (125) | °C |
| $V_{isol}$ | AC, 1 min. (mainterminals to heat sink) | 3000 | V |

| **Characteristics** | $T_s$ = 25 °C unless otherwise specified | | | | |
|---|---|---|---|---|---|
| **Symbol** | **Conditions** | **min.** | **typ.** | **max.** | **Units** |
| **IGBT** | | | | | |
| $V_{CEsat}$ | $I_C$ = 700 A, $T_j$ = 25 (125) °C | | 2,6 (3,1) | 3,1 | V |
| $V_{CEO}$ | $T_j$ = 25 (125) °C | | 1,2 (1,3) | 1,5 (1,6) | V |
| $r_{CE}$ | $T_j$ = 25 (125) °C | | 1,9 (2,5) | 2,3 (2,9) | mΩ |
| $I_{CES}$ | $V_{GE}$ = 0 V, $V_{CE}$ = $V_{CES}$, $T_j$ = 25 (125) °C | | (40) | 1,6 | mA |
| $E_{on}$ + $E_{off}$ | $I_C$ = 700 A, $V_{CC}$ = 600 V | | | 210 | mJ |
| | $T_j$ = 125 °C, $V_{CC}$ = 900 V | | | 370 | mJ |
| $R_{CC'+EE'}$ | terminal chip, $T_j$ = 125 °C | | 0,13 | | mΩ |
| $L_{CE}$ | top, bottom | | 3,8 | | nH |
| $C_{CHC}$ | per phase, AC-side | | 5,6 | | nF |
| **Inverse diode** | | | | | |
| $V_F$ = $V_{EC}$ | $I_F$ = 600 A, $T_j$ = 25 (125) °C | | 2,1 (1,9) | 2,6 | V |
| $V_{TO}$ | $T_j$ = 25 (125) °C | | 1,3 (1) | 1,4 (1,1) | V |
| $r_T$ | $T_j$ = 25 (125) °C | | 1,3 (1,5) | 1,7 (2) | mΩ |
| $E_{rr}$ | $I_C$ = 700 A, $V_{CC}$ = 600 V | | | 24 | mJ |
| | $T_j$ = 125 °C, $V_{CC}$ = 900 V | | | 31 | mJ |
| **Mechanical data** | | | | | |
| $M_{dc}$ | DC terminals, SI Units | 6 | | 8 | Nm |
| $M_{ac}$ | AC terminals, SI Units | 13 | | 15 | Nm |
| w | SKiiP® 2 System w/o heat sink | | 3,5 | | kg |
| w | heat sink | | 8,5 | | kg |
| **Thermal characteristics (P16 heat sink; 275m³/h); "$_r$ " reference to temperature sensor** | | | | | |
| $R_{th(j-s)I}$ | per IGBT | | | 0,032 | K/W |
| $R_{th(j-s)D}$ | per diode | | | 0,094 | K/W |
| $R_{th(s-a)}$ | per module | | | 0,033 | K/W |

| $Z_{th}$ | $R_i$ (mK/W) (max. values) | | | | $tau_i$(s) | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| $Z_{th(j-r)I}$ | 4 | 25 | 4 | | 1 | 0,13 | 0,001 | |
| $Z_{th(j-r)D}$ | 10 | 72 | 11 | | 1 | 0,13 | 0,001 | |
| $Z_{th(r-a)}$ | 1,6 | 22 | 7 | 2,4 | 494 | 165 | 20 | 0,03 |




**Case S 4**

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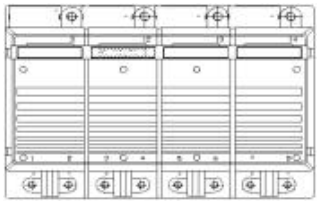


**SKiiP® 2**

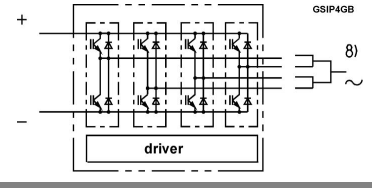
## 2-pack - integrated intelligent Power System

**2-pack**
**integrated gate driver**

**SKiiP 832GB120-406CTV**

### 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 68T.1 (climate) 25/85/56 (SKiiP® 2 gate driver)




**Case S 4**

**Absolute Maximum Ratings**

| Symbol | Conditions | Values | Units |
|---|---|---|---|
| $V_{S1}$ | stabilized 15 V power supply | 18 | V |
| $V_{S2}$ | unstabilized 24 V power supply | 30 | V |
| $V_{iH}$ | input signal voltage (high) | 15 + 0,3 | V |
| dv/dt | secondary to primary side | 75 | kV/µs |
| $V_{isolIO}$ | input / output (AC, r.m.s., 2s ) | 3000 | Vac |
| $V_{isol12}$ | output 1 / output 2 (AC, r.m.s., 2s ) | 1500 | Vac |
| $f_{max}$ | switching frequency | 19 | kHz |
| $T_{op}$ ($T_{stg}$) | operating / storage temperature | - 25 ... + 85 | °C |

**Characteristics** ($T_a$= 25 °C)

| Symbol | Conditions | min. | typ. | max. | Units |
|---|---|---|---|---|---|
| $V_{S1}$ | supply voltage stabilized | 14,4 | 15 | 15,6 | V |
| $V_{S2}$ | supply voltage non stabilized | 20 | 24 | 30 | V |
| $I_{S1}$ | $V_{S1}$ = 15 V | | 290+550*f/$f_{max}$+1,3*($I_{AC}$/A) | | mA |
| $I_{S2}$ | $V_{S2}$ = 24 V | | 220+400*f/$f_{max}$+1,0*($I_{AC}$/A) | | mA |
| $V_{iT+}$ | input threshold voltage (High) | 11,2 | | | V |
| $V_{iT-}$ | input threshold voltage (Low) | | | 5,4 | V |
| $R_{IN}$ | input resistance | | 10 | | kΩ |
| $t_{d(on)IO}$ | input-output turn-on propagation time | | 1,2 | | µs |
| $t_{d(off)IO}$ | input-output turn-off propagation time | | 1,6 | | µs |
| $t_{pERRRESET}$ | error memory reset time | 9 | | | µs |
| $t_{TD}$ | top / bottom switch : interlock time | | 3,3 | | µs |
| $I_{analogOUT}$ | 8 V corresponds to max. current of 15 V supply voltage | | 800 | | A |
| $I_{Vs1outmax}$ | (available when supplied with 24 V) | | | 50 | mA |
| $I_{A0max}$ | output current at pin 12/14 | | | 5 | mA |
| $V_{0l}$ | logic low output voltage | | | 0,6 | V |
| $V_{0H}$ | logic high output voltage | | | 30 | V |
| $I_{TRIPSC}$ | over current trip level ($I_{analog\ OUT}$ = 10 V) | | 1000 | | A |
| $I_{TRIPLG}$ | ground fault protection | | | | A |
| $T_{tp}$ | over temperature protection | 110 | | 120 | °C |
| $U_{DCTRIP}$ | trip level of $U_{DC}$-protection ( $U_{analog\ OUT}$ = 9 V); (option) | 900 | | | V |

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