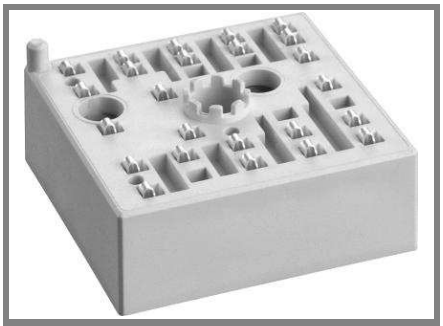


MiniSKiiP® 1

3-phase bridge inverter

**SKiiP 11AC126V10**

Preliminary Data

## Features

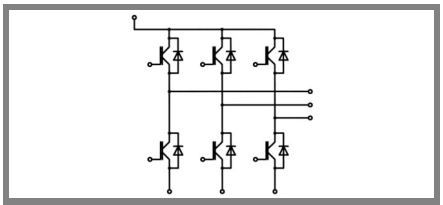
- Fast Trench IGBT
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532

## Typical Applications*

- Inverter up to 8 kVA
- Typical motor power 4 kW

## Remarks

- $V_{CEsat}$ , $V_F$= chip level value
- Module with rectifier diodes



AC

| Absolute Maximum Ratings | | $T_s$ = 25 °C, unless otherwise specified | |
|---|---|---|---|
| **Symbol** | **Conditions** | **Values** | **Units** |
| **IGBT - Inverter** | | | |
| $V_{CES}$ | | 1200 | V |
| $I_C$ | $T_s$ = 25 (70) °C | 16 (15) | A |
| $I_{CRM}$ | $t_p \leq$ 1 ms | 16 | A |
| $V_{GES}$ | | ± 20 | V |
| $T_j$ | | - 40 ... + 150 | °C |
| **Diode - Inverter** | | | |
| $I_F$ | $T_s$ = 25 (70) °C | 48 (35) | A |
| $I_{FRM}$ | $t_p \leq$ 1 ms | 220 | A |
| $T_j$ | | - 40 ... + 150 | °C |
| $I_{tRMS}$ | per power terminal (20 A / spring) | 40 | A |
| $T_{stg}$ | $T_{op} \leq T_{stg}$ | - 40 ... + 125 | °C |
| $V_{isol}$ | AC, 1 min. | 2500 | V |

| Characteristics | | $T_s$ = 25 °C, unless otherwise specified | | | |
|---|---|---|---|---|---|
| **Symbol** | **Conditions** | **min.** | **typ.** | **max.** | **Units** |
| **IGBT - Inverter** | | | | | |
| $V_{CEsat}$ | $I_{Cnom}$ = 8 A, $T_j$ = 25 (125) °C | | 1,7 (2) | 2,1 (2,4) | V |
| $V_{GE(th)}$ | $V_{GE} = V_{CE}$, $I_C$ = 0,3 mA | 5 | 5,8 | 6,5 | V |
| $V_{CE(TO)}$ | $T_j$ = 25 (125) °C | | 1 (0,9) | 1,2 (1,1) | V |
| $r_T$ | $T_j$ = 25 (125) °C | | 87 (138) | 113 (162) | mΩ |
| $C_{ies}$ | $V_{CE}$ = 25 V, $V_{GE}$ = 0 V, f = 1 MHz | | 0,7 | | nF |
| $C_{oes}$ | $V_{CE}$ = 25 V, $V_{GE}$ = 0 V, f = 1 MHz | | 0,1 | | nF |
| $C_{res}$ | $V_{CE}$ = 25 V, $V_{GE}$ = 0 V, f = 1 MHz | | 0,1 | | nF |
| $R_{th(j-s)}$ | per IGBT | | 1,5 | | K/W |
| $t_{d(on)}$ | under following conditions | | 30 | | ns |
| $t_r$ | $V_{CC}$ = 600 V, $V_{GE}$ = ± 15 V | | 20 | | ns |
| $t_{d(off)}$ | $I_{Cnom}$ = 8 A, $T_j$ = 125 °C | | 380 | | ns |
| $t_f$ | $R_{Gon} = R_{Goff}$ = 56 Ω | | 120 | | ns |
| $E_{on}$ | inductive load | | 17,8 | | mJ |
| $E_{off}$ | | | 1 | | mJ |
| **Diode - Inverter** | | | | | |
| $V_F = V_{EC}$ | $I_{Fnom}$ = 15 A, $T_j$ = 25 (125) °C | | 1,1 | | V |
| $V_{(TO)}$ | $T_j$ = 25 (150) °C | | (0,8) | | V |
| $r_T$ | $T_j$ = 25 (150) °C | | (20) | | mΩ |
| $R_{th(j-s)}$ | per diode | | 1,5 | | K/W |
| $I_{RRM}$ | under following conditions | | 28 | | A |
| $Q_{rr}$ | $I_{Fnom}$ = 15 A, $V_R$ = 600 V | | 59 | | µC |
| $E_{rr}$ | $V_{GE}$ = 0 V, $T_j$ = 125 °C | | 16,4 | | mJ |
| | $di_F/dt$ = 520 A/µs | | | | |
| **Temperature Sensor** | | | | | |
| $R_{ts}$ | %, $T_r$ = () °C | | () | | Ω |
| **Mechanical Data** | | | | | |
| m | | | 35 | | g |
| $M_s$ | Mounting torque | 2 | | 2,5 | Nm |

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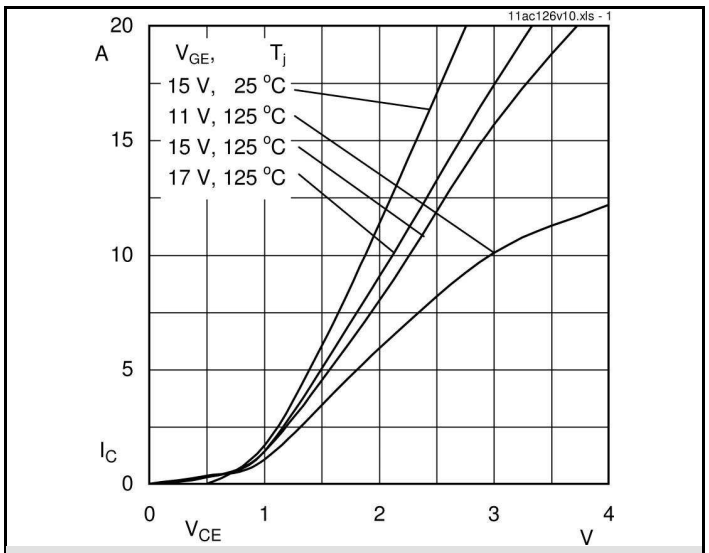


Fig. 1 Typ. output characteristic

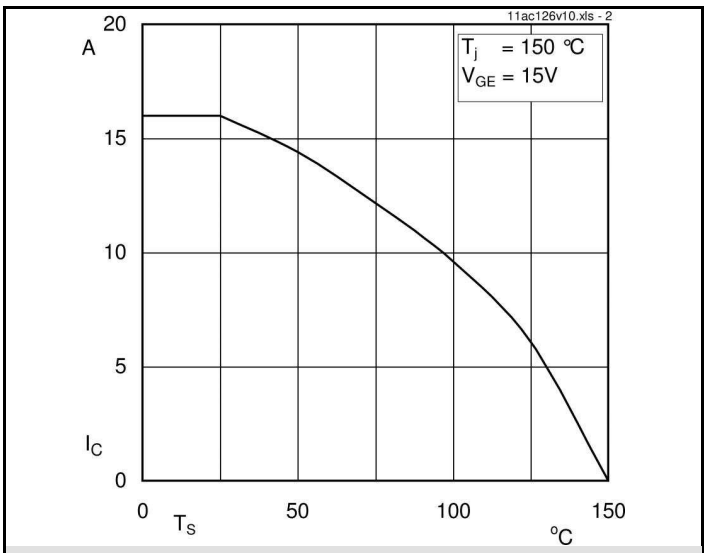


Fig. 2 Typ. rated current vs. temperature

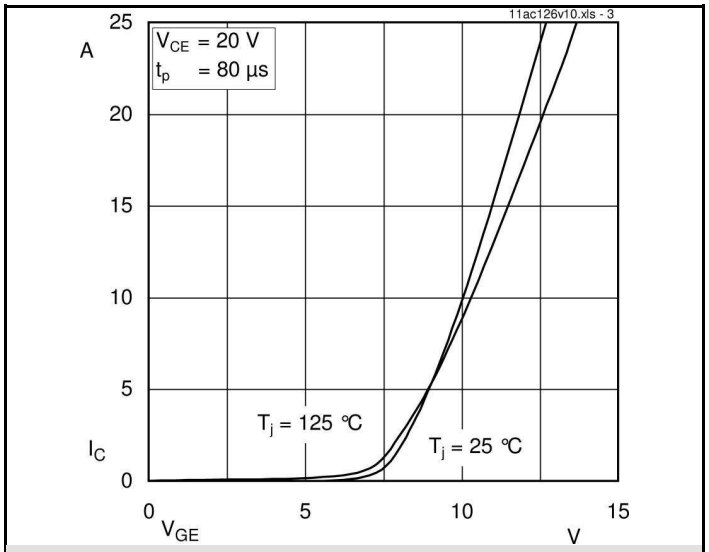


Fig. 3 Typ. transfer characteristic

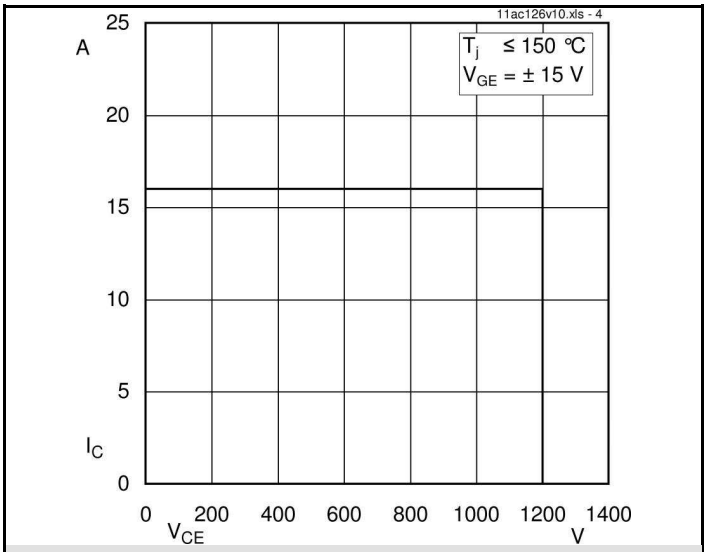


Fig. 4 Reverse bias safe operating area

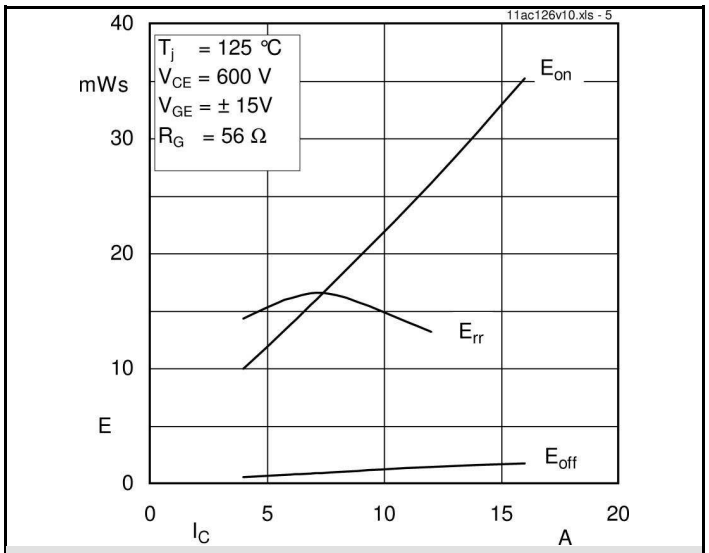


Fig. 5 Typ. Turn-on /-off energy = f ($I_C$)

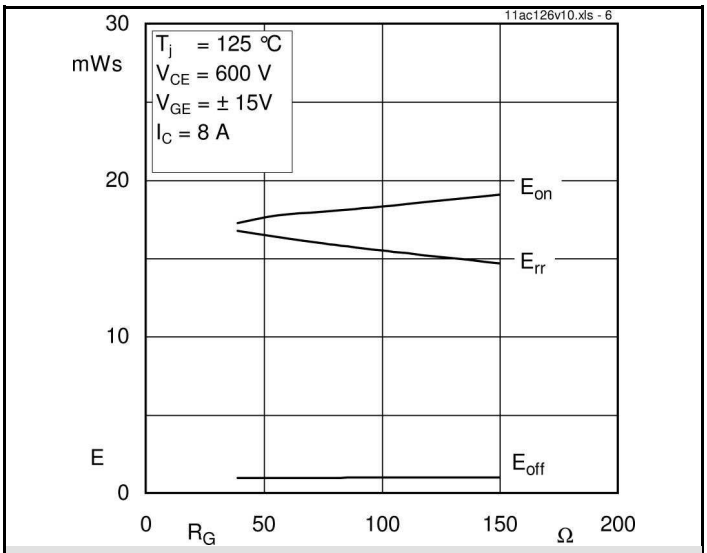


Fig. 6 Typ. Turn-on /-off energy = f ($R_G$)

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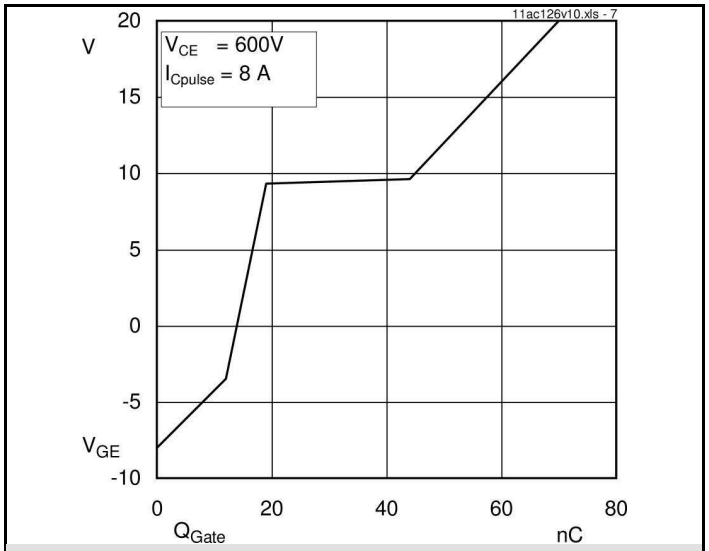



Fig. 7 Typ. gate charge characteristic

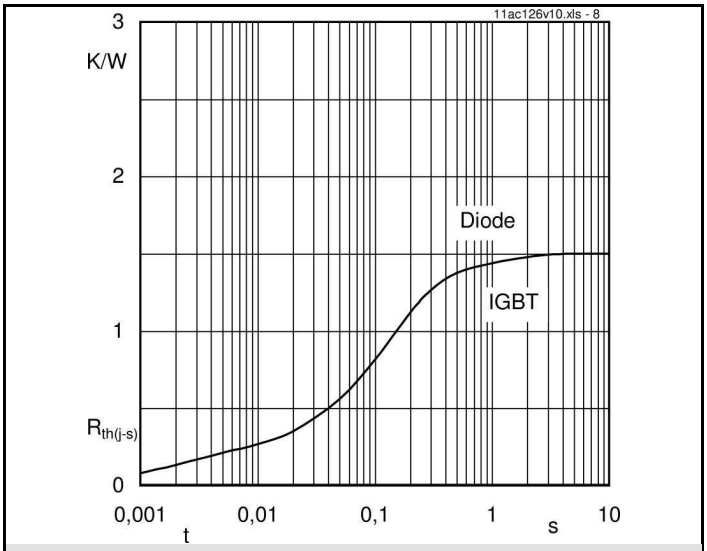



Fig. 8 Typ. thermal impedance

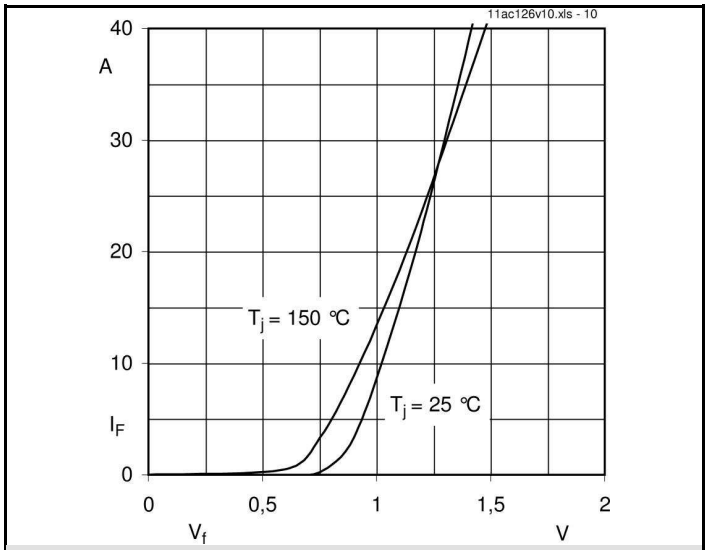
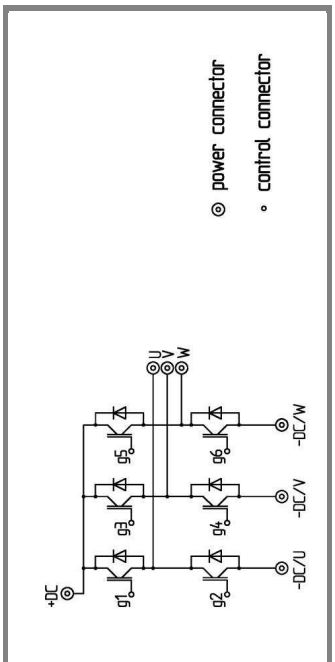



Fig. 9 Typ. freewheeling diode forward characteristic




circuit

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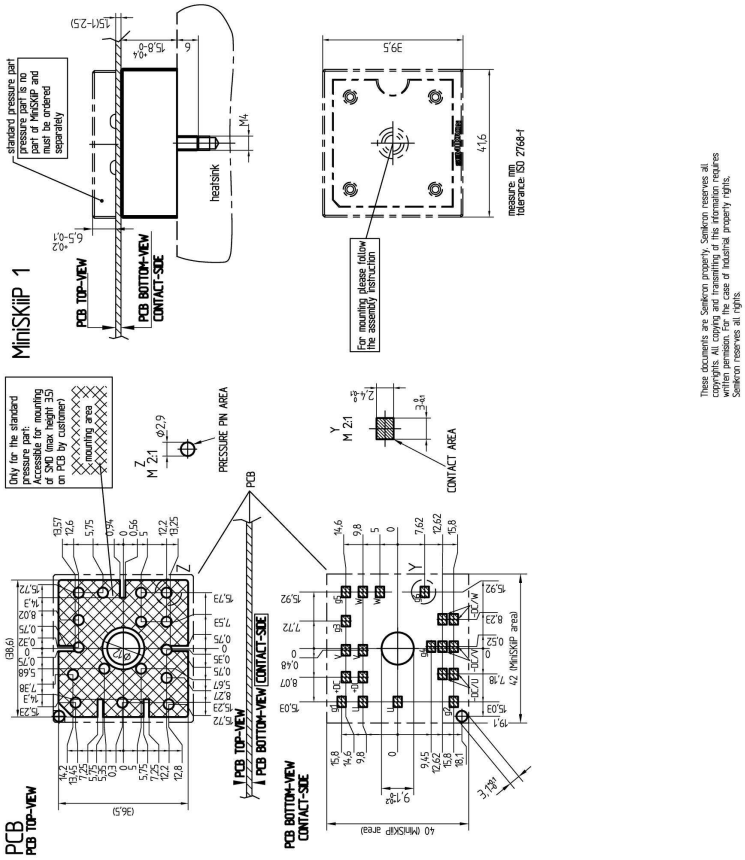


pinout, dimensions

This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

* 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.