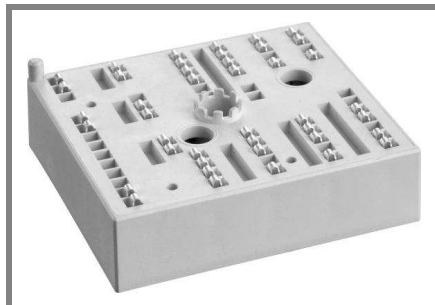


# SKiiP 24NAB126V10



MiniSKiiP® 2

3-phase bridge rectifier +  
brake chopper + 3-phase  
bridge inverter  
SKiiP 24NAB126V10

## Features

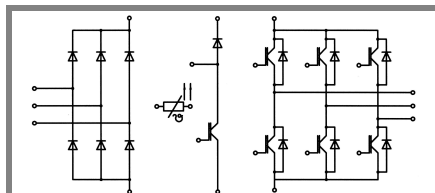
- Fast Trench IGBTs
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532

## Typical Applications\*

- Inverter up to 19 kVA
- Typical motor power 11 kW

## Remarks

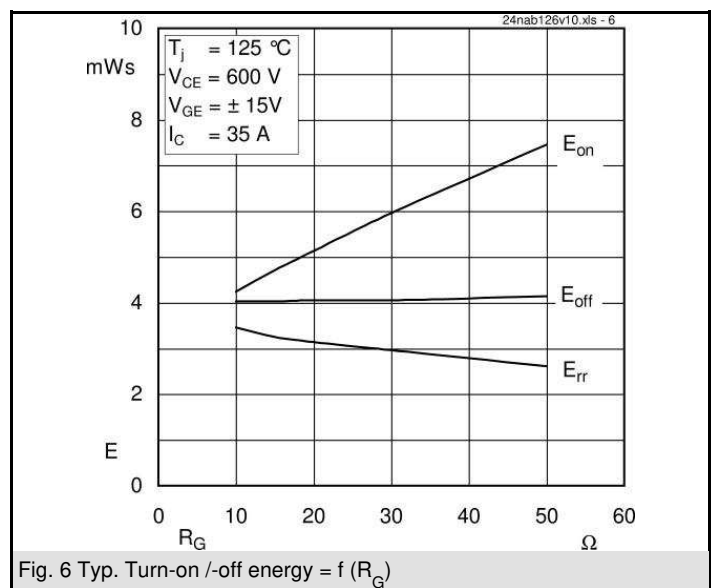
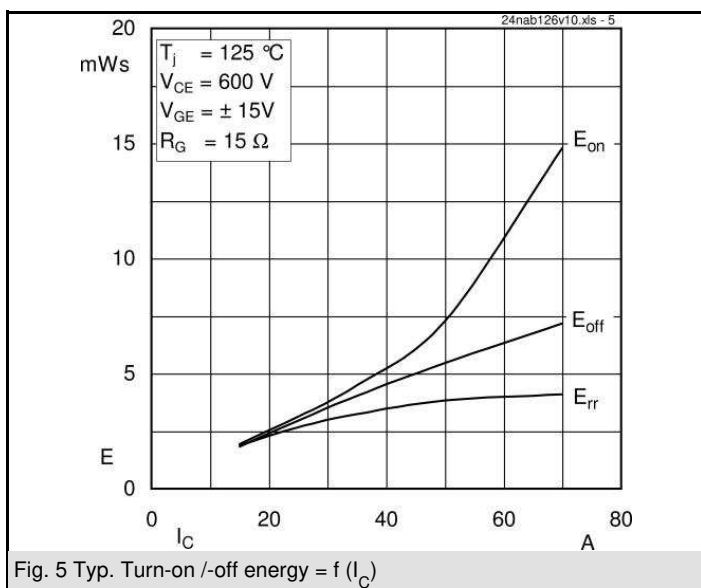
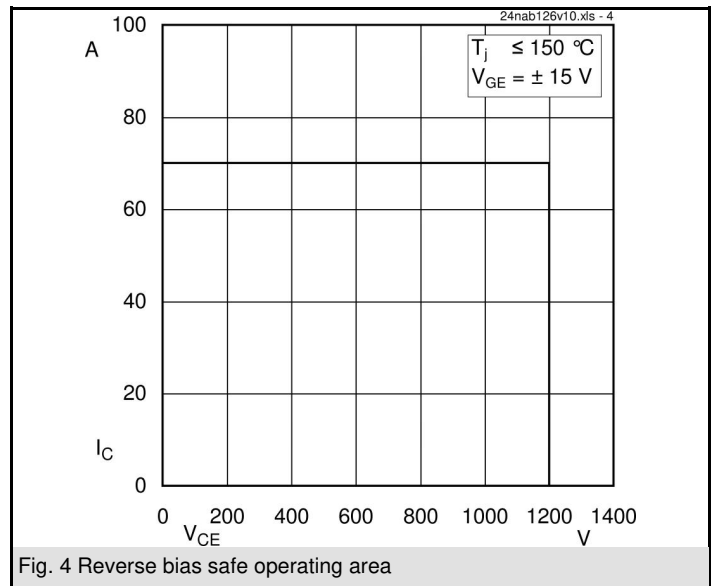
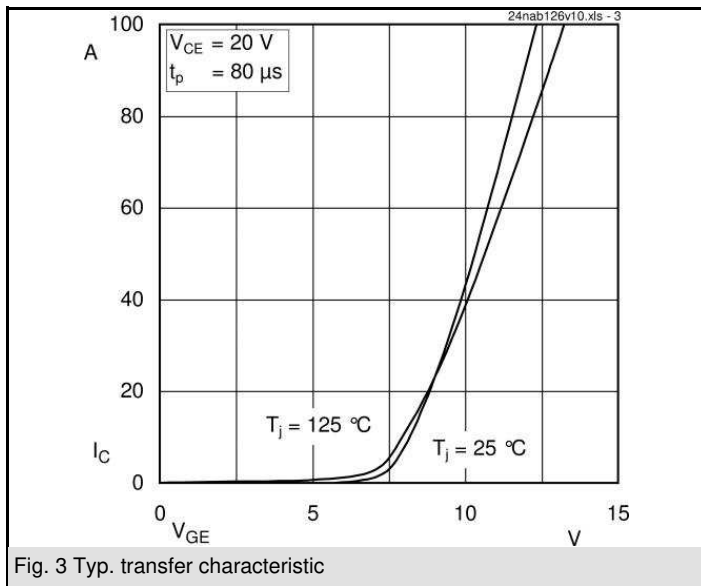
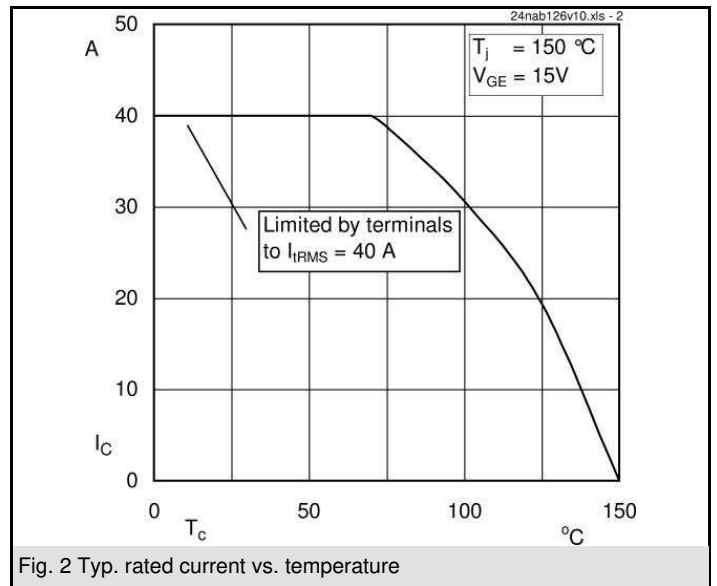
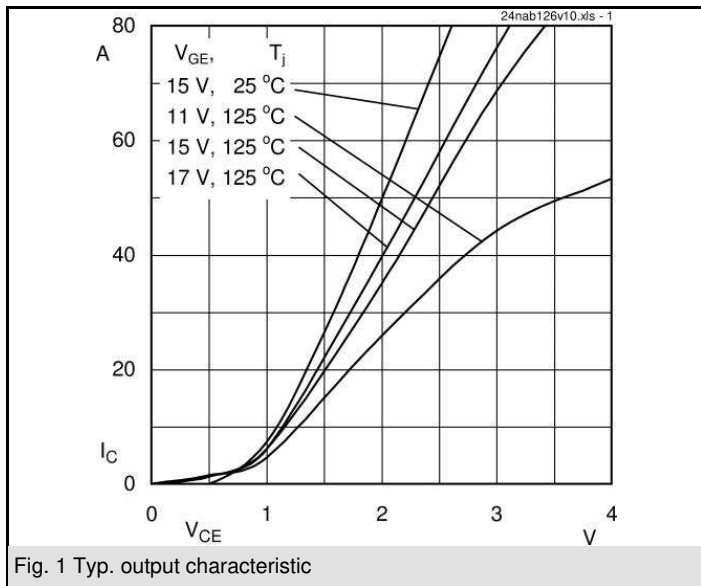
- $V_{CEsat}$ ,  $V_F$  = chip level value



NAB

| Absolute Maximum Ratings         |                                    | $T_s = 25\text{ °C}$ , unless otherwise specified            |       |                  |
|----------------------------------|------------------------------------|--|-------|------------------|
| Symbol                           | Conditions                         | Values   | Units |                  |
| <b>IGBT - Inverter, Chopper</b>  |                                    |  |       |                  |
| $V_{CES}$                        | $T_s = 25\text{ (70) °C}$          | 1200   | V     |                  |
| $I_C$                            |                                    | 52 (40)  | A     |                  |
| $I_{CRM}$                        |                                    | 70   | A     |                  |
| $V_{GES}$                        |                                    | $\pm 20$   | V     |                  |
| $T_j$                            |                                    | - 40 ... + 150   | °C    |                  |
| <b>Diode - Inverter, Chopper</b> |                                    |  |       |                  |
| $I_F$                            | $T_s = 25\text{ (70) °C}$          | 38 (29)  | A     |                  |
| $I_{FRM}$                        |                                    | 70   | A     |                  |
| $T_j$                            |                                    | - 40 ... + 150   | °C    |                  |
| <b>Diode - Rectifier</b>         |                                    |  |       |                  |
| $V_{RRM}$                        | $T_s = 70\text{ °C}$               | 1600   | V     |                  |
| $I_F$                            |                                    | 61   | A     |                  |
| $I_{FSM}$                        |                                    | $t_p = 10\text{ ms, sin } 180\text{ °, } T_j = 25\text{ °C}$ | 700   | A                |
| $i^2t$                           |                                    | $t_p = 10\text{ ms, sin } 180\text{ °, } T_j = 25\text{ °C}$ | 2400  | A <sup>2</sup> s |
| $T_j$                            |                                    | - 40 ... + 150   | °C    |                  |
| <b>Module</b>                    |                                    |  |       |                  |
| $I_{RMS}$                        | per power terminal (20 A / spring) | 40   | A     |                  |
| $T_{stg}$                        |                                    | - 40 ... + 125   | °C    |                  |
| $V_{isol}$                       | AC, 1 min.                         | 2500   | V     |                  |

| Characteristics                  |   | $T_s = 25\text{ °C}$ , unless otherwise specified |            |           |       |
|----------------------------------|---|---|------------|-----------|-------|
| Symbol                           | Conditions  | min.  | typ.       | max.      | Units |
| <b>IGBT - Inverter, Chopper</b>  |   |   |            |           |       |
| $V_{CEsat}$                      | $I_{Cnom} = 35\text{ A, } T_j = 25\text{ (125) °C}$             |   | 1,7 (2)    | 2,1 (2,4) | V     |
| $V_{GE(th)}$                     | $V_{GE} = V_{CE}, I_C = 1,5\text{ mA}$                          | 5   | 5,8        | 6,5       | V     |
| $V_{CE(TO)}$                     | $T_j = 25\text{ (125) °C}$                                      |   | 1 (0,9)    | 1,2 (1,1) | V     |
| $r_T$                            | $T_j = 25\text{ (125) °C}$                                      |   | 20 (31)    | 26 (37)   | mΩ    |
| $C_{ies}$                        | $V_{CE} = 25\text{ V, } V_{GE} = 0\text{ V, } f = 1\text{ MHz}$ |   | 2,4        |           | nF    |
| $C_{oes}$                        | $V_{CE} = 25\text{ V, } V_{GE} = 0\text{ V, } f = 1\text{ MHz}$ |   | 0,5        |           | nF    |
| $C_{res}$                        | $V_{CE} = 25\text{ V, } V_{GE} = 0\text{ V, } f = 1\text{ MHz}$ |   | 0,3        |           | nF    |
| $R_{th(j-s)}$                    | per IGBT  |   | 0,75       |           | K/W   |
| $t_{d(on)}$                      | under following conditions                                      |   | 80         |           | ns    |
| $t_r$                            | $V_{CC} = 600\text{ V, } V_{GE} = \pm 15\text{ V}$              |   | 30         |           | ns    |
| $t_{d(off)}$                     | $I_{Cnom} = 35\text{ A, } T_j = 125\text{ °C}$                  |   | 410        |           | ns    |
| $t_f$                            | $R_{Gon} = R_{Goff} = 15\text{ Ω}$                              |   | 120        |           | ns    |
| $E_{on}$                         | inductive load  |   | 4,6        |           | mJ    |
| $E_{off}$                        |   |   | 4          |           | mJ    |
| <b>Diode - Inverter, Chopper</b> |   |   |            |           |       |
| $V_F = V_{EC}$                   | $I_{Fnom} = 35\text{ A, } T_j = 25\text{ (125) °C}$             |   | 1,8 (1,8)  | 2,1 (2,2) | V     |
| $V_{(TO)}$                       | $T_j = 25\text{ (125) °C}$                                      |   | 1 (0,8)    | 1,1 (0,9) | V     |
| $r_T$                            | $T_j = 25\text{ (125) °C}$                                      |   | 23 (31)    | 29 (37)   | mΩ    |
| $R_{th(j-s)}$                    | per diode   |   | 1,5        |           | K/W   |
| $I_{RRM}$                        | under following conditions                                      |   | 43         |           | A     |
| $Q_{rr}$                         | $I_{Fnom} = 35\text{ A, } V_R = 600\text{ V}$                   |   | 7          |           | μC    |
| $E_{rr}$                         | $V_{GE} = 0\text{ V, } T_j = 125\text{ °C}$                     |   | 3,3        |           | mJ    |
|                                  | $di_F/dt = 1450\text{ A/μs}$                                    |   |            |           |       |
| <b>Diode - Rectifier</b>         |   |   |            |           |       |
| $V_F$                            | $I_{Fnom} = 35\text{ A, } T_j = 25\text{ °C}$                   |   | 1,1        |           | V     |
| $V_{(TO)}$                       | $T_j = 150\text{ °C}$   |   | 0,8        |           | V     |
| $r_T$                            | $T_j = 150\text{ °C}$   |   | 11         |           | mΩ    |
| $R_{th(j-s)}$                    | per diode   |   | 0,9        |           | K/W   |
| <b>Temperature Sensor</b>        |   |   |            |           |       |
| $R_{ts}$                         | 3 %, $T_r = 25\text{ (100) °C}$                                 |   | 1000(1670) |           | Ω     |
| <b>Mechanical Data</b>           |   |   |            |           |       |
| w                                |   |   | 65         |           | g     |
| $M_s$                            | Mounting torque   | 2   |            | 2,5       | Nm    |



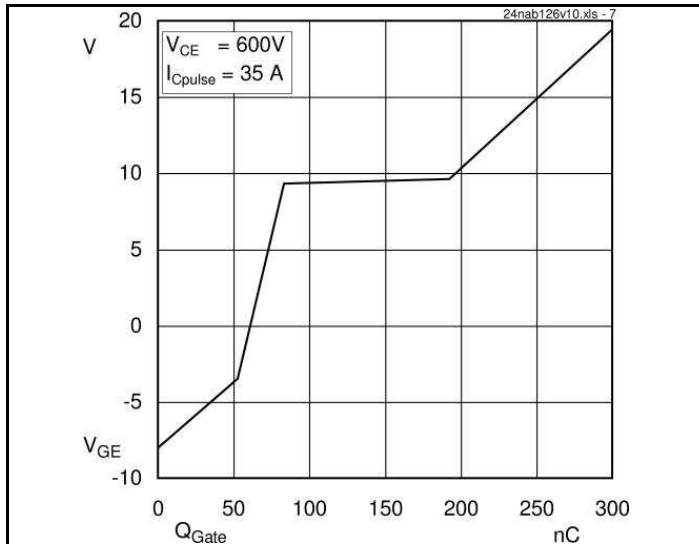


Fig. 7 Typ. gate charge characteristic

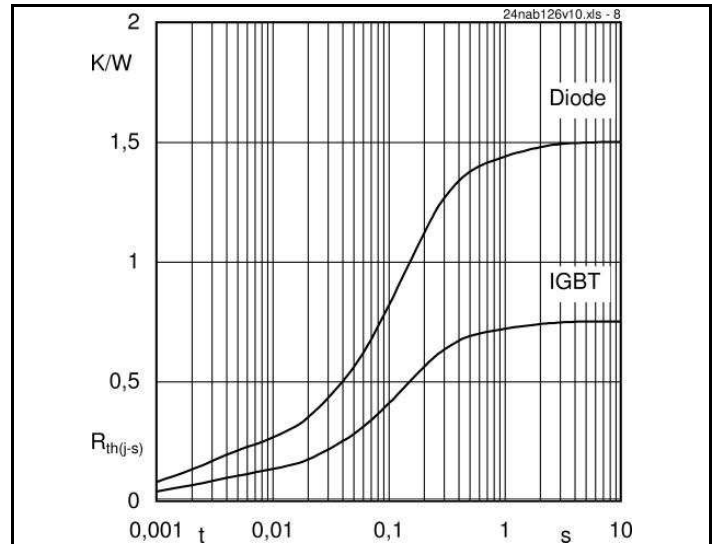


Fig. 8 Typ. thermal impedance

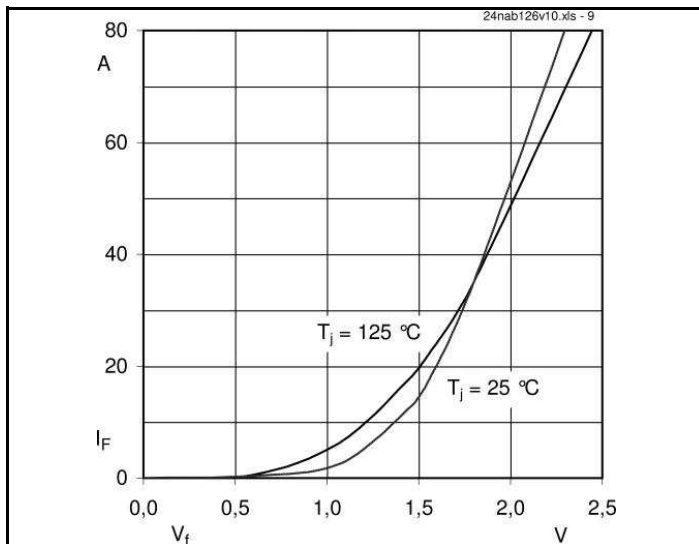


Fig. 9 Typ. freewheeling diode forward characteristic

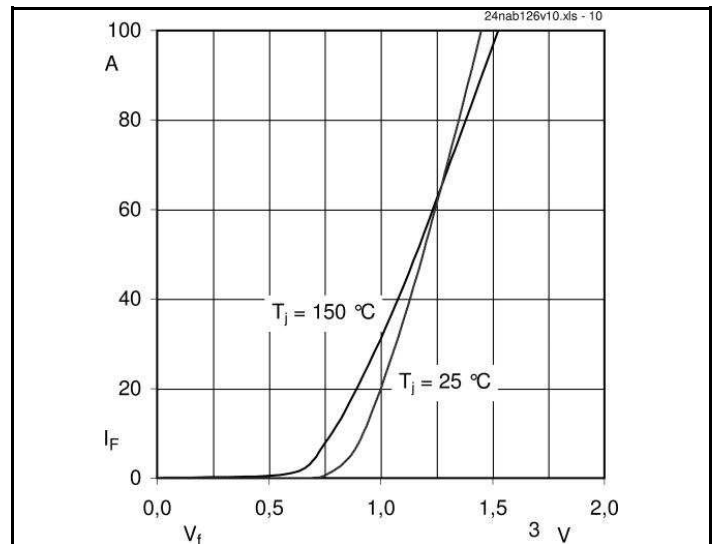
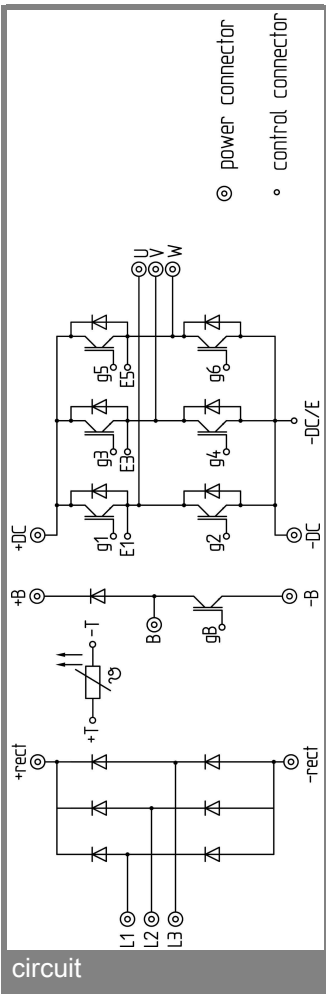
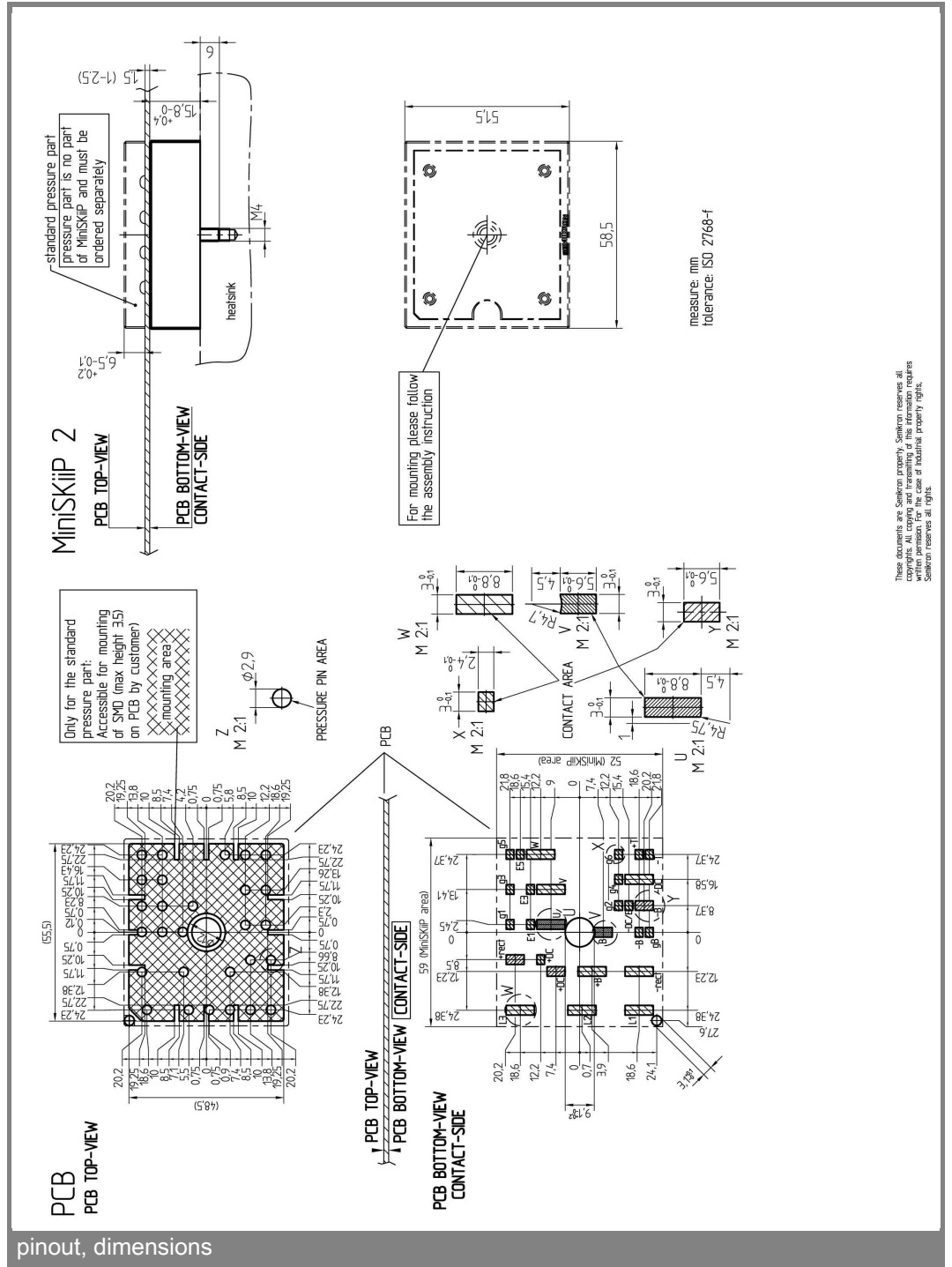


Fig. 10 Typ. input bridge forward characteristic



circuit



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

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