

MiniSKiiP® 3

3-phase bridge rectifier +  
brake chopper + 3-phase  
bridge inverter  
SKiiP 35NAB126V1

### Features

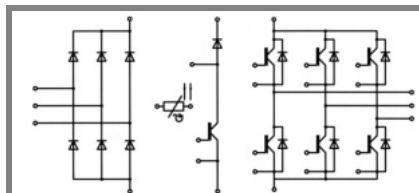
- Fast Trench IGBTs
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532

### Typical Applications\*

- Inverter up to 28 kVA
- Typical motor power 15 kW

### Remarks

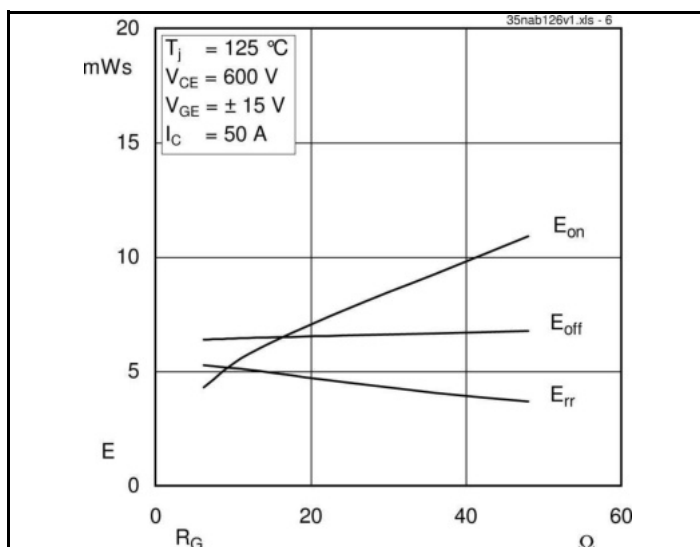
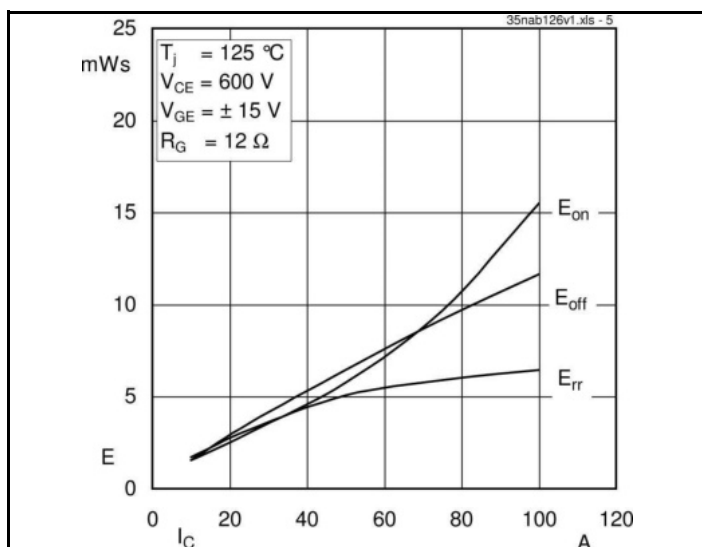
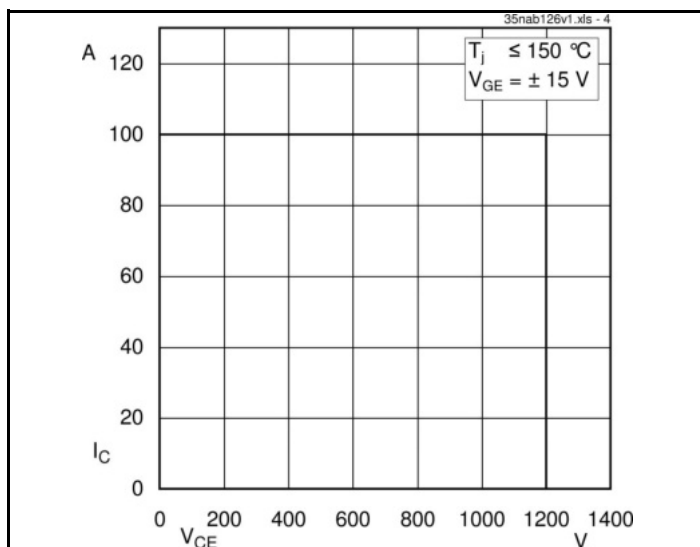
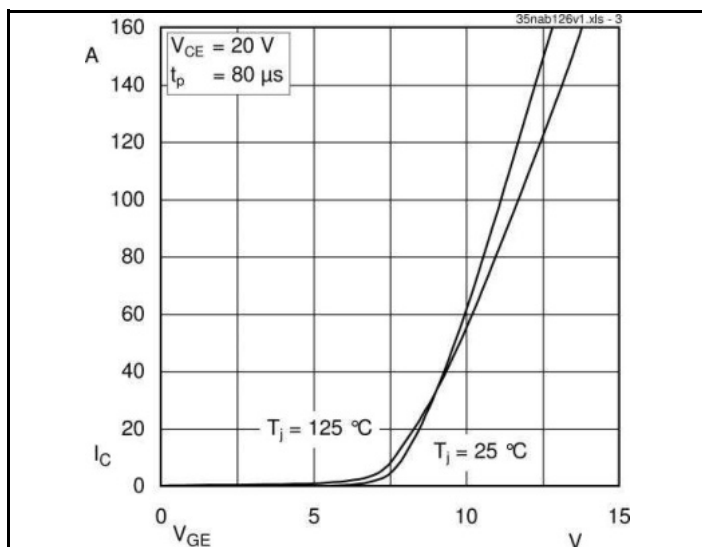
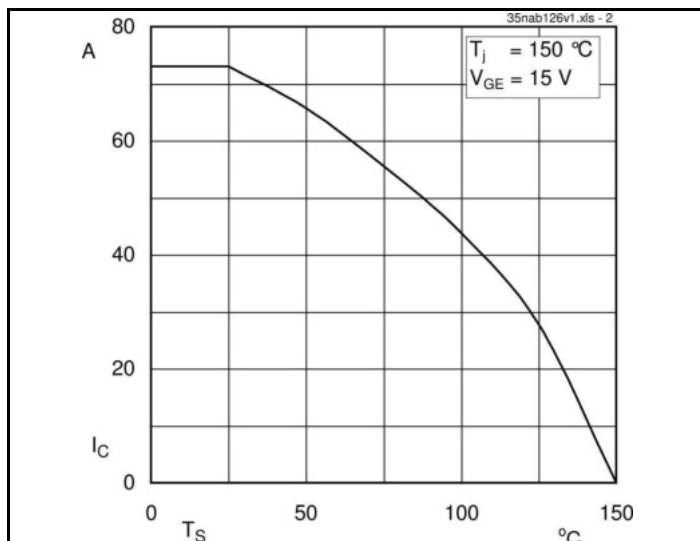
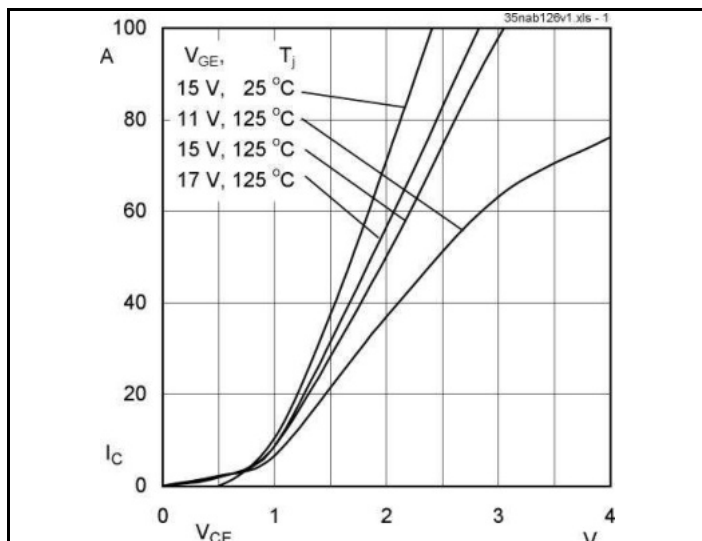
- $V_{CEsat}$ ,  $V_F$  = chip level value

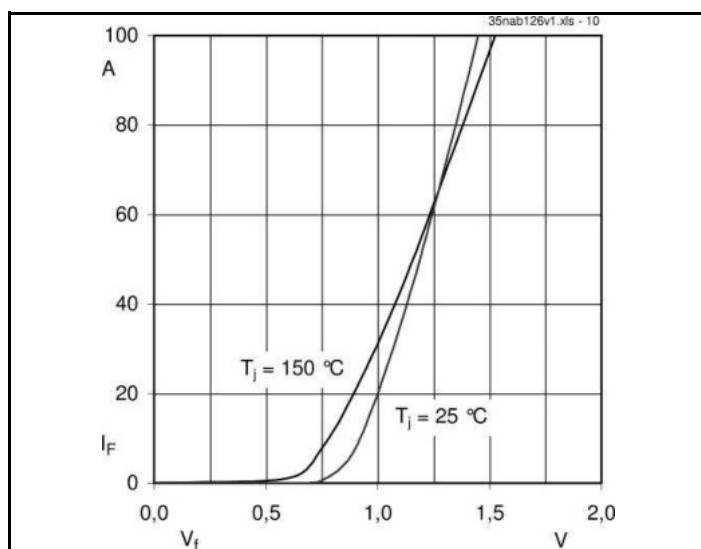
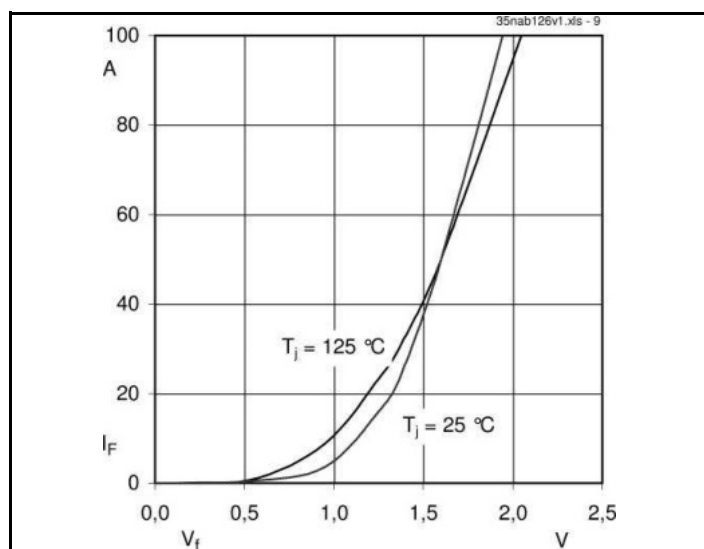
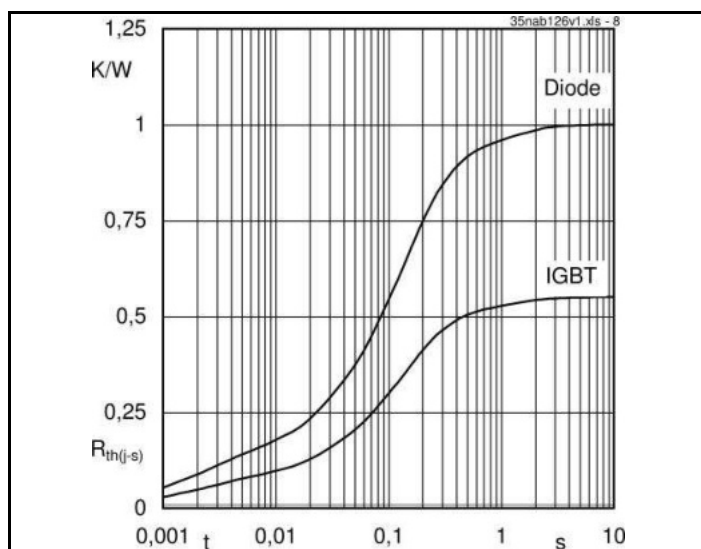
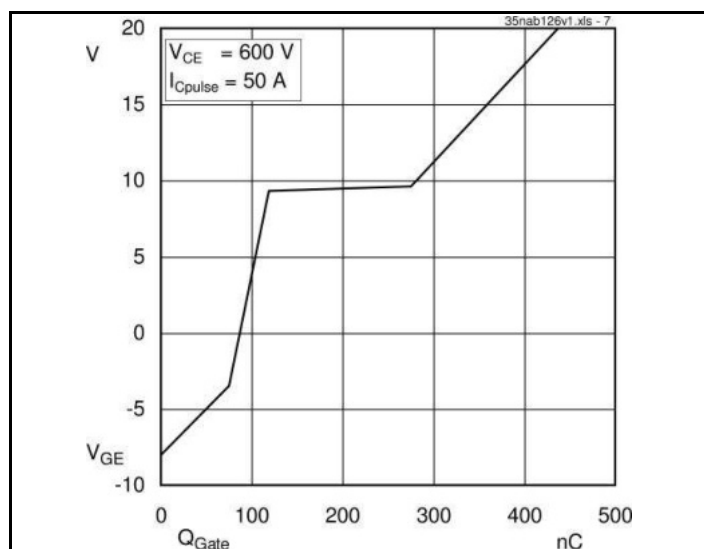


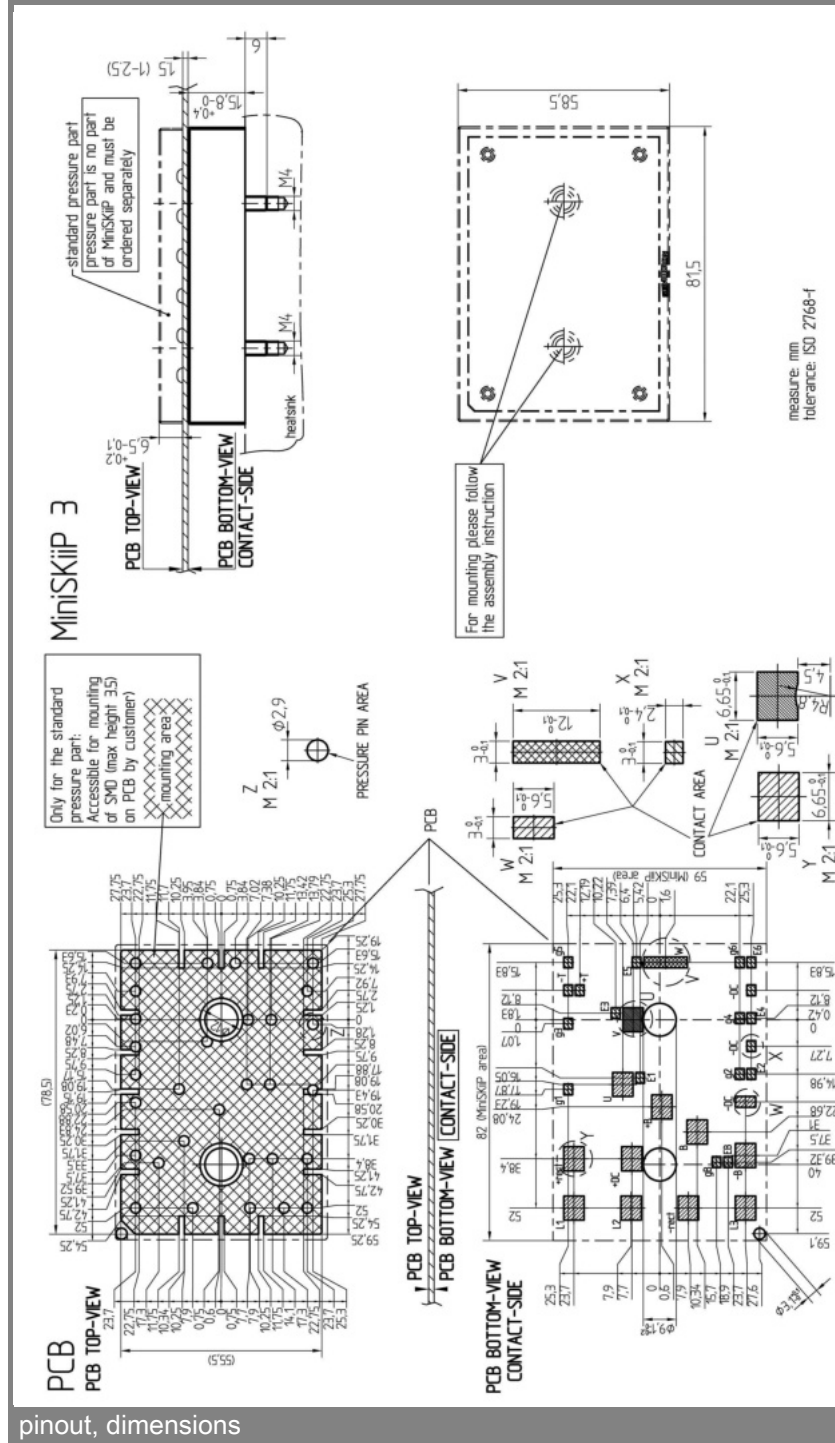
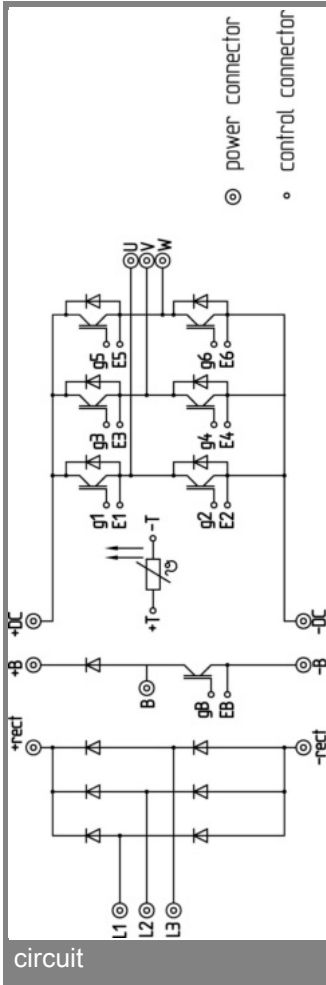
NAB

| Absolute Maximum Ratings  |                                    | T <sub>s</sub> = 25 °C, unless otherwise specified |       |
|---------------------------|------------------------------------|----------------------------------------------------|-------|
| Symbol                    | Conditions                         | Values                                             | Units |
| IGBT - Inverter, Chopper  |                                    |                                                    |       |
| V <sub>CES</sub>          | T <sub>s</sub> = 25 (70) °C        | 1200                                               | V     |
| I <sub>C</sub>            |                                    | 73 (55)                                            | A     |
| I <sub>CRM</sub>          |                                    | 100                                                | A     |
| V <sub>GES</sub>          |                                    | ± 20                                               | V     |
| T <sub>j</sub>            |                                    | - 40 ... + 150                                     | °C    |
| Diode - Inverter, Chopper |                                    |                                                    |       |
| I <sub>F</sub>            | T <sub>s</sub> = 25 (70) °C        | 62 (46)                                            | A     |
| I <sub>FRM</sub>          |                                    | 100                                                | A     |
| T <sub>j</sub>            |                                    | - 40 ... + 150                                     | °C    |
| Diode - Rectifier         |                                    |                                                    |       |
| V <sub>RRM</sub>          | T <sub>s</sub> = 70 °C             | 1600                                               | V     |
| I <sub>F</sub>            |                                    | 61                                                 | A     |
| I <sub>FSM</sub>          |                                    | 700                                                | A     |
| i <sup>2</sup> t          |                                    | 2400                                               | A²s   |
| T <sub>j</sub>            |                                    | - 40 ... + 150                                     | °C    |
| Module                    |                                    |                                                    |       |
| I <sub>tRMS</sub>         | per power terminal (20 A / spring) | 80                                                 | A     |
| T <sub>stg</sub>          |                                    | - 40 ... + 125                                     | °C    |
| V <sub>isol</sub>         | 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>  |                                                                               |                                                   |            |           |       |
| $V_{CEsat}$                      | $I_{Cnom} = 50\text{ A}$ , $T_j = 25\text{ (125) °C}$                         |                                                   | 1,7 (2)    | 2,1 (2,4) | V     |
| $V_{GE(th)}$                     | $V_{GE} = V_{CE}$ , $I_C = 2\text{ mA}$                                       | 5                                                 | 5,8        | 6,5       | V     |
| $V_{CE(TO)}$                     | $T_j = 25\text{ (125) °C}$                                                    |                                                   | 1 (0,9)    | 1,2 (1,1) | V     |
| $r_T$                            | $T_j = 25\text{ (125) °C}$                                                    |                                                   | 14 (22)    | 18 (26)   | mΩ    |
| $C_{ies}$                        | $V_{CE} = 25\text{ V}$ , $V_{GE} = 0\text{ V}$ , $f = 1\text{ MHz}$           |                                                   | 3,7        |           | nF    |
| $C_{oes}$                        | $V_{CE} = 25\text{ V}$ , $V_{GE} = 0\text{ V}$ , $f = 1\text{ MHz}$           |                                                   | 0,8        |           | nF    |
| $C_{res}$                        | $V_{CE} = 25\text{ V}$ , $V_{GE} = 0\text{ V}$ , $f = 1\text{ MHz}$           |                                                   | 0,7        |           | nF    |
| $R_{th(j-s)}$                    | per IGBT                                                                      |                                                   | 0,55       |           | K/W   |
| $t_{d(on)}$                      | under following conditions                                                    |                                                   | 85         |           | ns    |
| $t_r$                            | $V_{CC} = 600\text{ V}$ , $V_{GE} = \pm 15\text{ V}$                          |                                                   | 30         |           | ns    |
| $t_{d(off)}$                     | $I_{Cnom} = 50\text{ A}$ , $T_j = 125\text{ °C}$                              |                                                   | 430        |           | ns    |
| $t_f$                            | $R_{Gon} = R_{Goff} = 12\text{ Ω}$                                            |                                                   | 90         |           | ns    |
| $E_{on}$                         | inductive load                                                                |                                                   | 6,5        |           | mJ    |
| $E_{off}$                        |                                                                               |                                                   | 6,1        |           | mJ    |
| <b>Diode - Inverter, Chopper</b> |                                                                               |                                                   |            |           |       |
| $V_F = V_{EC}$                   | $I_{Fnom} = 50\text{ A}$ , $T_j = 25\text{ (125) °C}$                         |                                                   | 1,6 (1,6)  | 1,8 (1,8) | V     |
| $V_{(TO)}$                       | $T_j = 25\text{ (125) °C}$                                                    |                                                   | 1 (0,8)    | 1,1 (0,9) | V     |
| $r_T$                            | $T_j = 25\text{ (125) °C}$                                                    |                                                   | 12 (16)    | 14 (18)   | mΩ    |
| $R_{th(j-s)}$                    | per diode                                                                     |                                                   | 1          |           | K/W   |
| $I_{RRM}$                        | under following conditions                                                    |                                                   | 71         |           | A     |
| $Q_{rr}$                         | $I_{Fnom} = 50\text{ A}$ , $V_R = 600\text{ V}$                               |                                                   | 11,5       |           | μC    |
| $E_{rr}$                         | $V_{GE} = 0\text{ V}$ , $T_j = 125\text{ °C}$<br>$di_F/dt = 1900\text{ A/μs}$ |                                                   | 4,7        |           | mJ    |
| <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                                |                                                                               |                                                   | 95         |           | g     |
| $M_s$                            | Mounting torque                                                               | 2                                                 |            | 2,5       | Nm    |







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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.