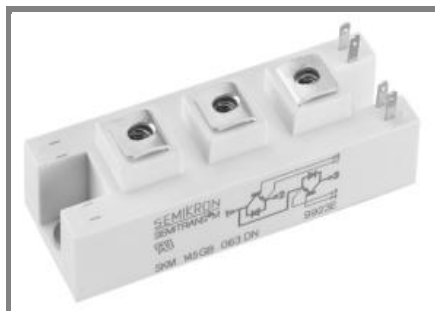


# SKM 100GB176DN



**SEMITRANS™ 2N**

## Trench IGBT Modules

**SKM 100GB176DN**

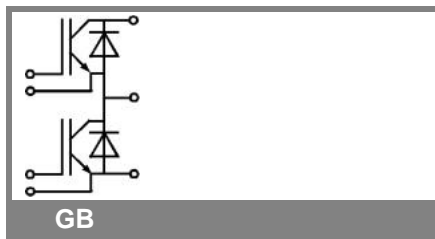
Preliminary Data

### Features

- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CEsat}$  with positive temperature coefficient
- High short circuit capability, self limiting to  $6 \times I_C$

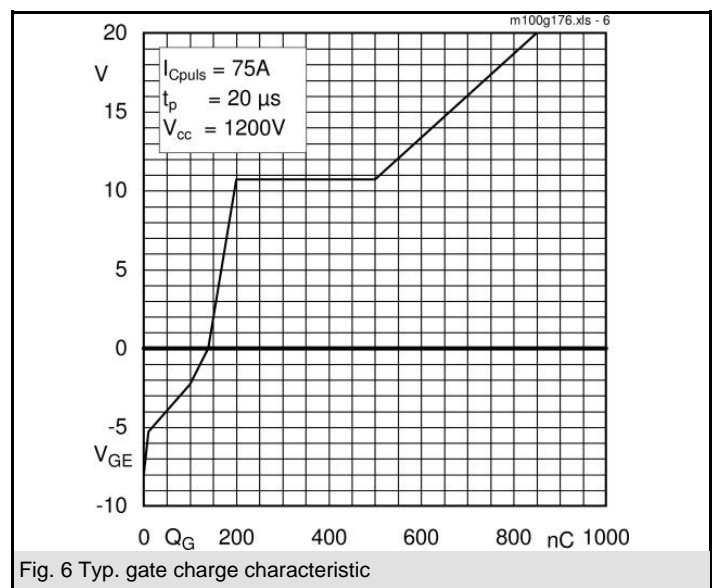
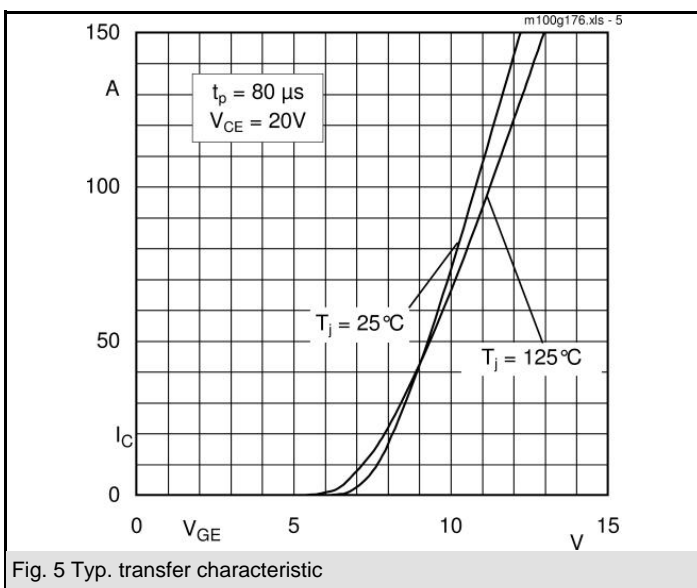
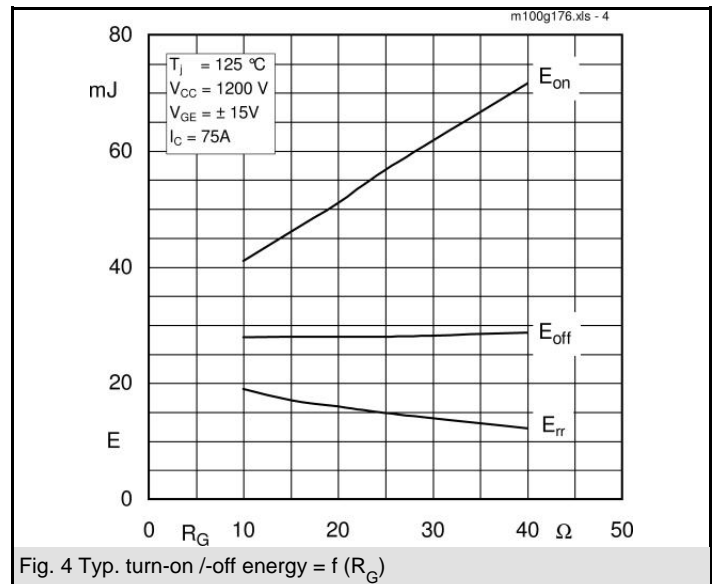
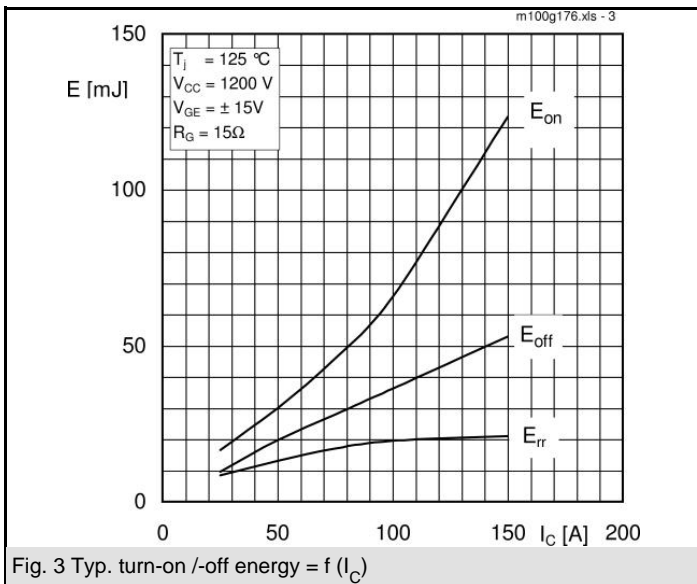
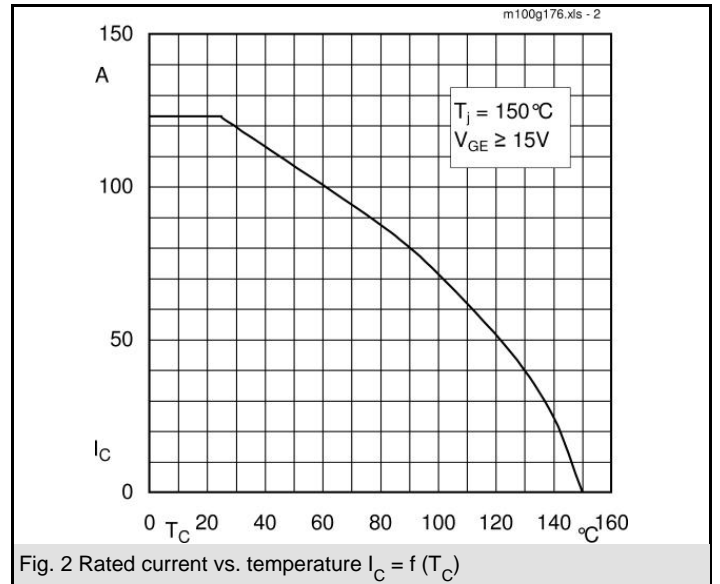
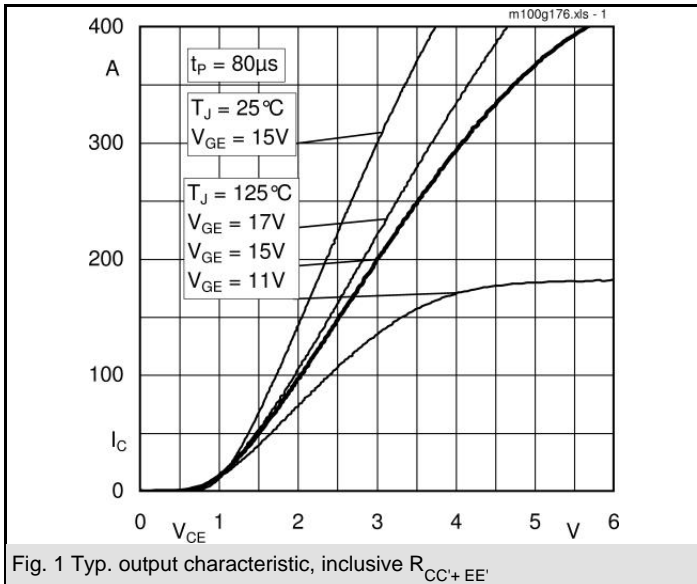
### Typical Applications

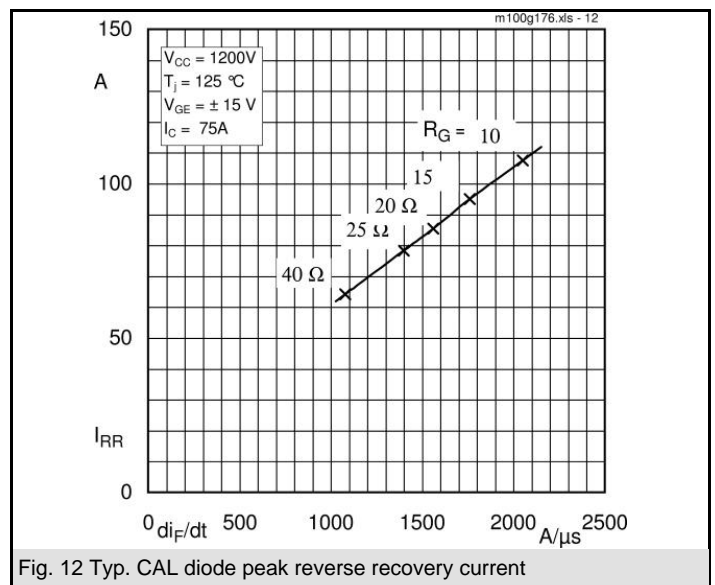
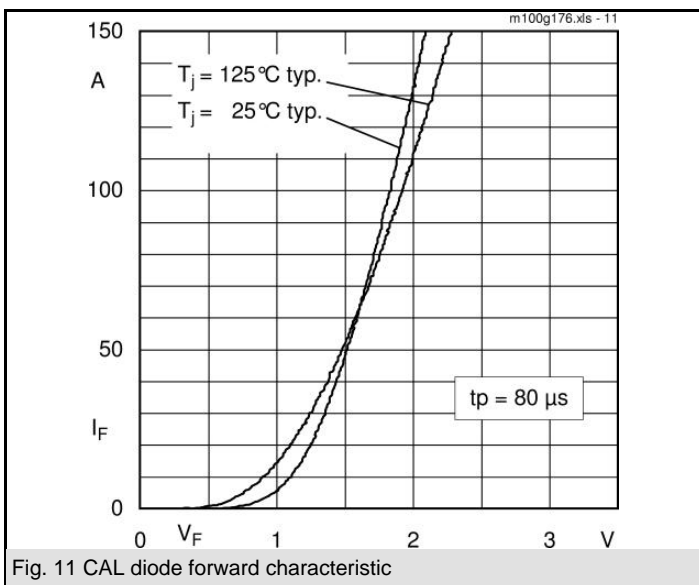
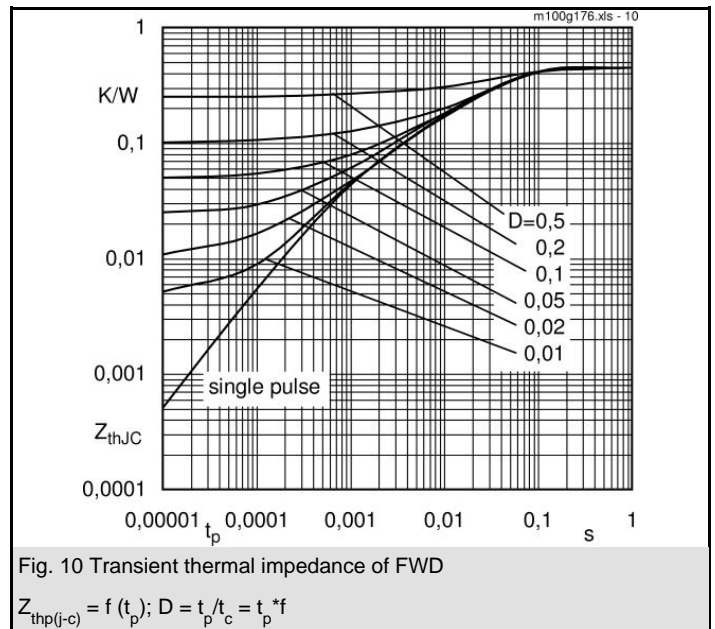
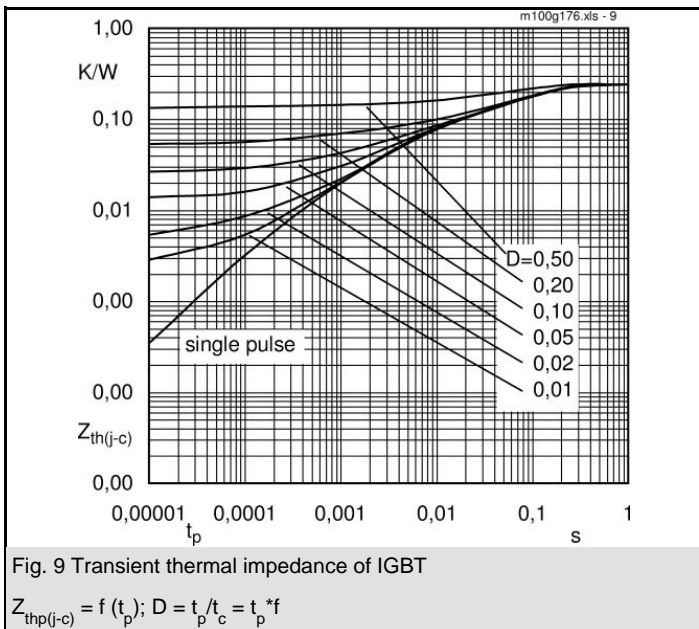
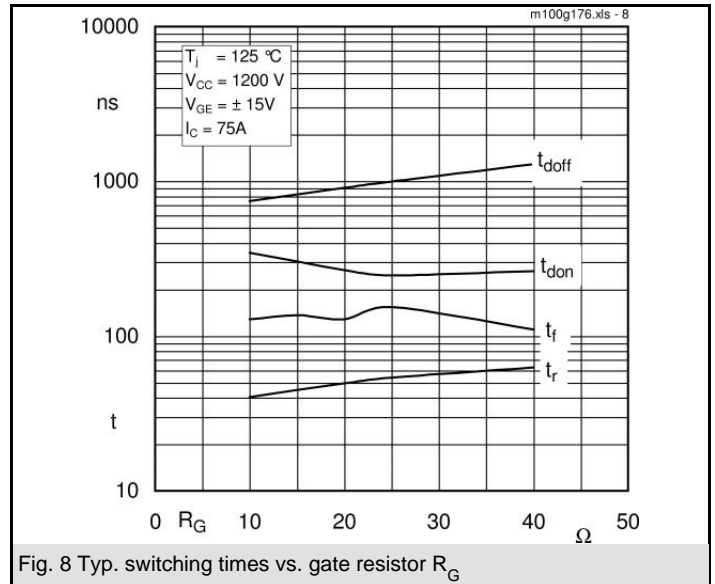
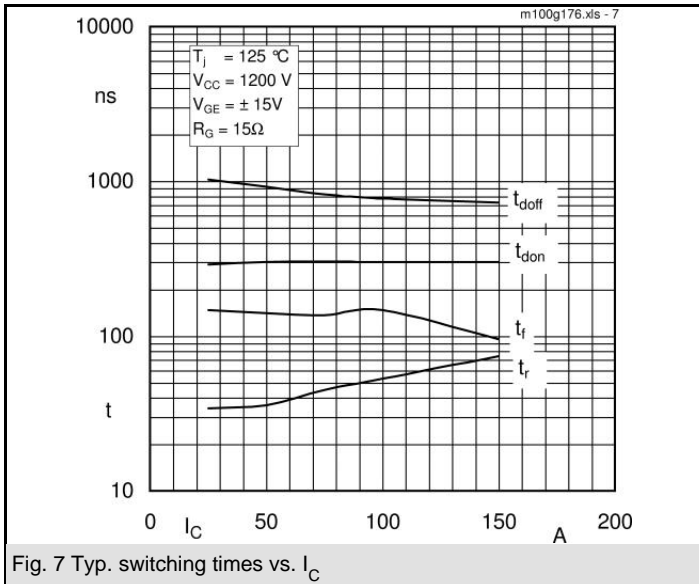
- AC inverter drives mains 575 - 750 V AC
- Public transport (auxiliary syst.)



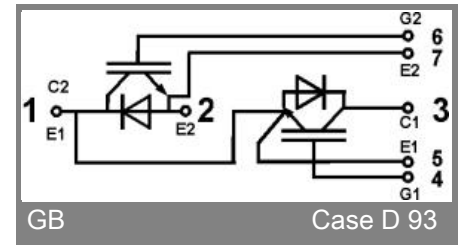
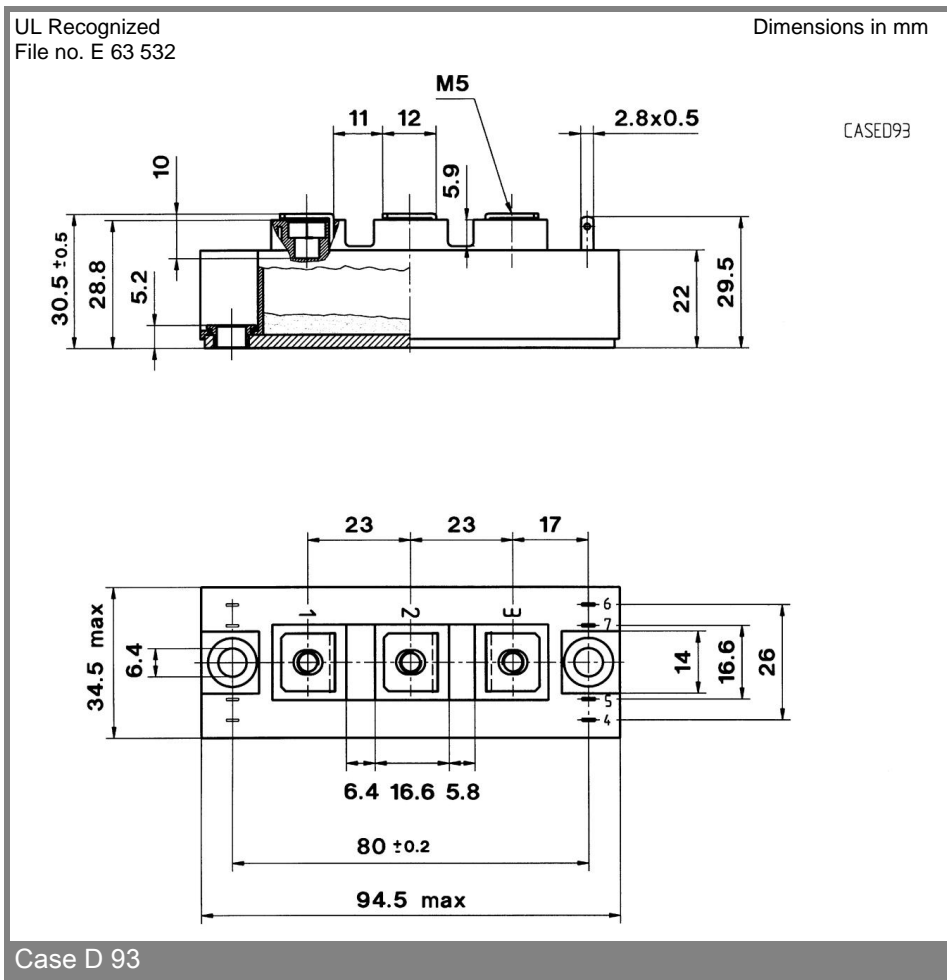
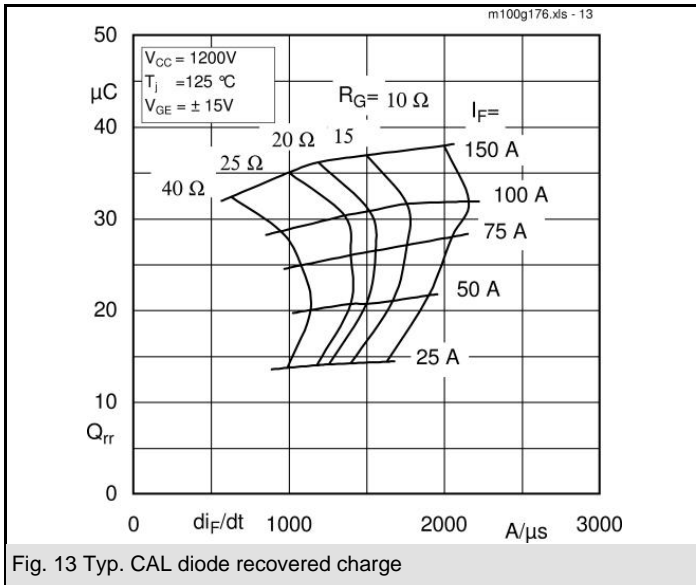
| Absolute Maximum Ratings |  | $T_c = 25\text{ °C}$ , unless otherwise specified |       |
|--------------------------|--|---|-------|
| Symbol                   | Conditions                                       | Values  | Units |
| <b>IGBT</b>              |  |   |       |
| $V_{CES}$                |  | 1700  | V     |
| $I_C$                    | $T_c = 25\text{ (80) °C}$                        | 125 (90)  | A     |
| $I_{CRM}$                | $t_p = 1\text{ ms}$                              | 150   | A     |
| $V_{GES}$                |  | $\pm 20$  | V     |
| $T_{vj}$ ( $T_{stg}$ )   | $T_{OPERATION} \leq T_{stg}$                     | - 40...+ 150 (125)                                | °C    |
| $V_{isol}$               | AC, 1 min.                                       | 4000  | V     |
| <b>Inverse diode</b>     |  |   |       |
| $I_F$                    | $T_c = 25\text{ (80) °C}$                        | 100 (70)  | A     |
| $I_{FRM}$                | $t_p = 1\text{ ms}$                              | 150   | A     |
| $I_{FSM}$                | $t_p = 10\text{ ms; sin.; } T_j = 150\text{ °C}$ | 720   | A     |

| Characteristics                |  | $T_c = 25\text{ °C}$ , unless otherwise specified |           |           |       |
|--------------------------------|--|---|-----------|-----------|-------|
| Symbol                         | Conditions   | min.  | typ.      | max.      | Units |
| <b>IGBT</b>                    |  |   |           |           |       |
| $V_{GE(th)}$                   | $V_{GE} = V_{CE}; I_C = 3\text{ mA}$                               | 5,2   | 5,8       | 6,4       | V     |
| $I_{CES}$                      | $V_{GE} = 0; V_{CE} = V_{CES}; T_j = 25\text{ (125) °C}$           |   | 0,1       | 0,3       | mA    |
| $V_{CE(TO)}$                   | $T_j = 25\text{ (125) °C}$   |   | 1 (0,9)   | 1,2 (1,1) | V     |
| $r_{CE}$                       | $V_{GE} = 15\text{ V}; T_j = 25\text{ (125) °C}$                   |   | 13 (20)   | 17        | mΩ    |
| $V_{CE(sat)}$                  | $I_C = 75\text{ A}; V_{GE} = 15\text{ V}$ , chip level             |   | 2 (2,4)   | 2,45      | V     |
| $C_{ies}$                      | under following conditions   |   | 6         |           | nF    |
| $C_{oes}$                      | $V_{GE} = 0; V_{CE} = 25\text{ V}; f = 1\text{ MHz}$               |   | 0,6       |           | nF    |
| $C_{res}$                      |  |   | 0,4       |           | nF    |
| $L_{CE}$                       |  |   |           | 25        | nH    |
| $R_{CC'+EE'}$                  | res., terminal-chip $T_c = 25\text{ (125) °C}$                     |   | 0,75 (1)  |           | mΩ    |
| $t_{d(on)}$                    | $V_{CC} = 1200\text{ V}; I_C = 75\text{ A}$                        |   | 300       |           | ns    |
| $t_r$                          | $R_{Gon} = R_{Goff} = 15\text{ Ω}; T_j = 125\text{ °C}$            |   | 45        |           | ns    |
| $t_{d(off)}$                   | $V_{GE} \pm 15\text{ V}$   |   | 830       |           | ns    |
| $t_f$                          |  |   | 140       |           | ns    |
| $E_{on} (E_{off})$             |  |   | 46 (28)   |           | mJ    |
| <b>Inverse diode</b>           |  |   |           |           |       |
| $V_F = V_{EC}$                 | $I_F = 75\text{ A}; V_{GE} = 0\text{ V}; T_j = 25\text{ (125) °C}$ |   | 1,6 (1,6) | 1,9 (1,9) | V     |
| $V_{(TO)}$                     | $T_j = 25\text{ (125) °C}$   |   | 1,1 (0,9) | 1,3 (1,1) | V     |
| $r_T$                          | $T_j = 25\text{ (125) °C}$   |   | 6,7 (9,3) | 8 (11)    | mΩ    |
| $I_{RRM}$                      | $I_F = 75\text{ A}; T_j = 125\text{ ( ) °C}$                       |   | 95        |           | A     |
| $Q_{rr}$                       | $di/dt = 1760\text{ A/μs}$   |   | 27        |           | μC    |
| $E_{rr}$                       | $V_{GE} = 0\text{ V}$  |   | 17        |           | mJ    |
| <b>Thermal characteristics</b> |  |   |           |           |       |
| $R_{th(j-c)}$                  | per IGBT   |   |           | 0,24      | K/W   |
| $R_{th(j-c)D}$                 | per Inverse Diode  |   |           | 0,45      | K/W   |
| $R_{th(c-s)}$                  | per module   |   |           | 0,05      | K/W   |
| <b>Mechanical data</b>         |  |   |           |           |       |
| $M_s$                          | to heatsink M6   | 3   |           | 5         | Nm    |
| $M_t$                          | to terminals M5  | 2,5   |           | 5         | Nm    |
| w                              |  |   |           | 160       | g     |





# SKM 100GB176DN



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

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.