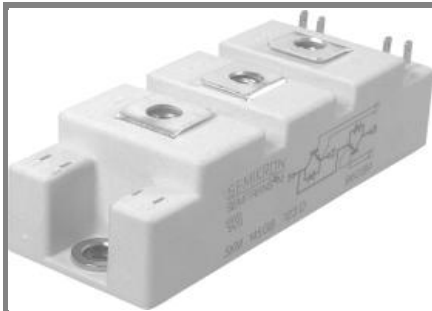


SKM 100GB123D



SEMITRANS™ 2

IGBT Modules

SKM 100GB123D

SKM 100GAL123D

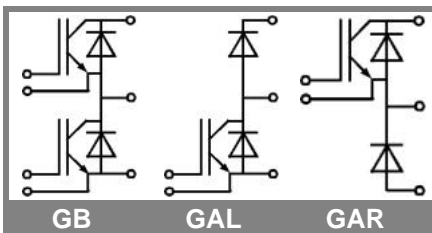
SKM 100GAR123D

Features

- MOS input (voltage controlled)
- N channel, Homogeneous Si
- Low inductance case
- Very low tail current with low temperature dependence
- High short circuit capability, self limiting to $6 \times I_{Cnom}$
- Latch-up free
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DCB Direct Copper Bonding Technology
- Large clearance (10 mm) and creepage distances (20 mm)

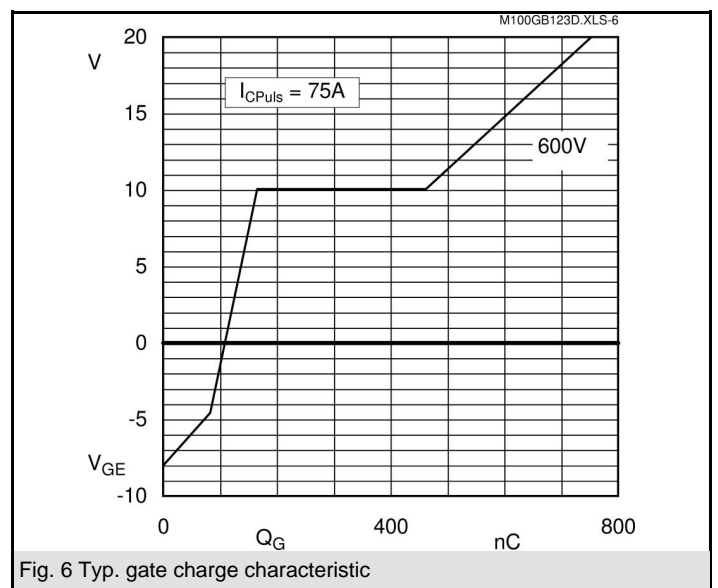
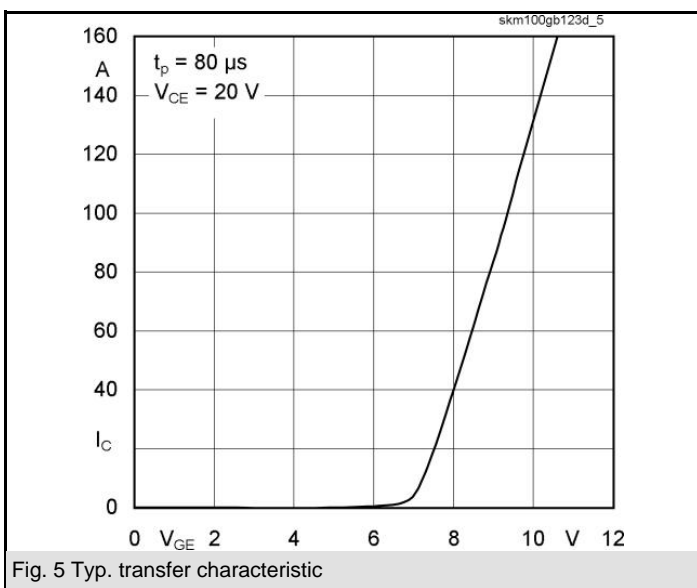
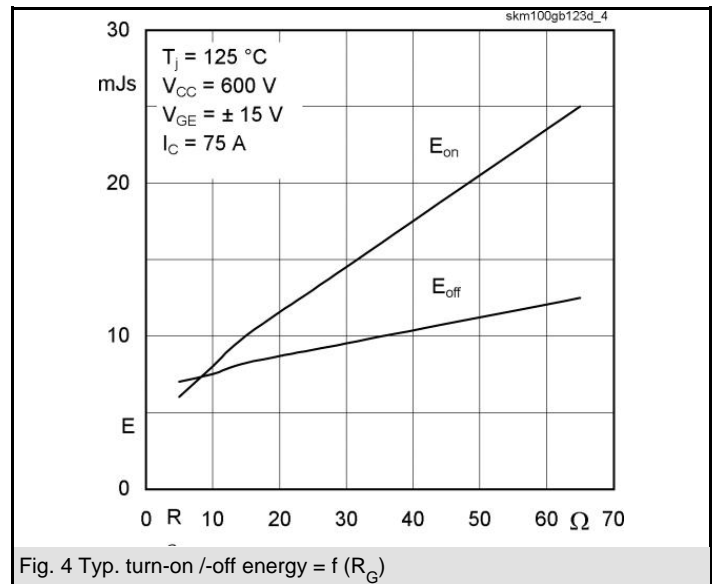
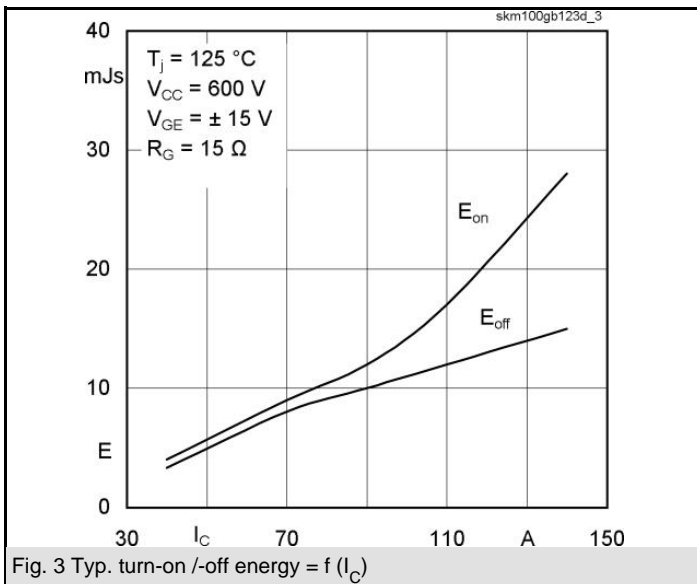
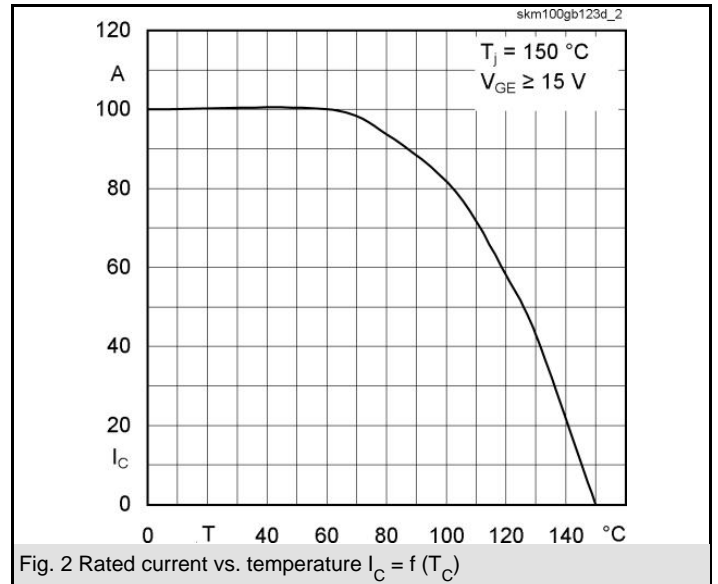
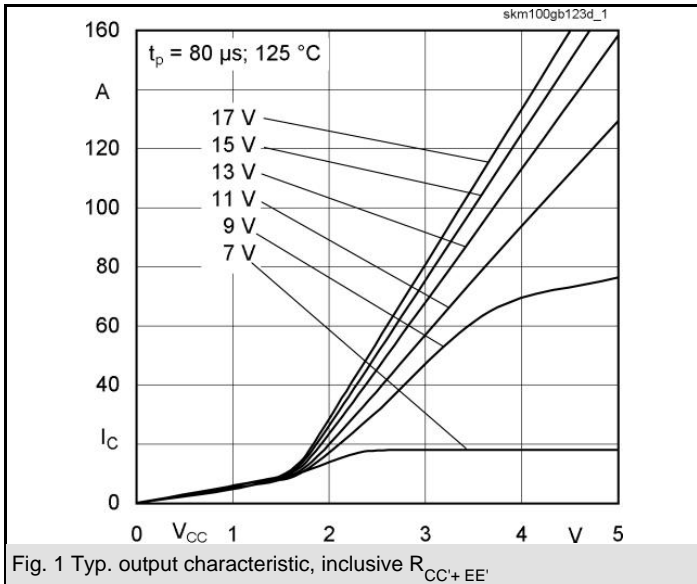
Typical Applications

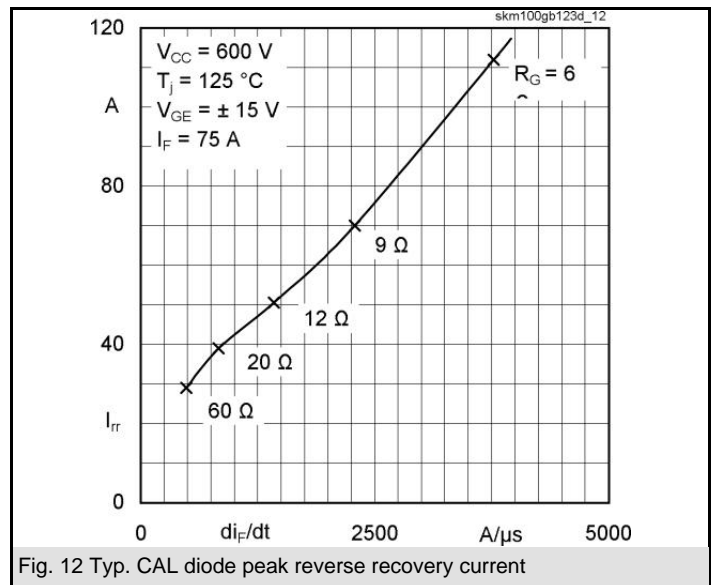
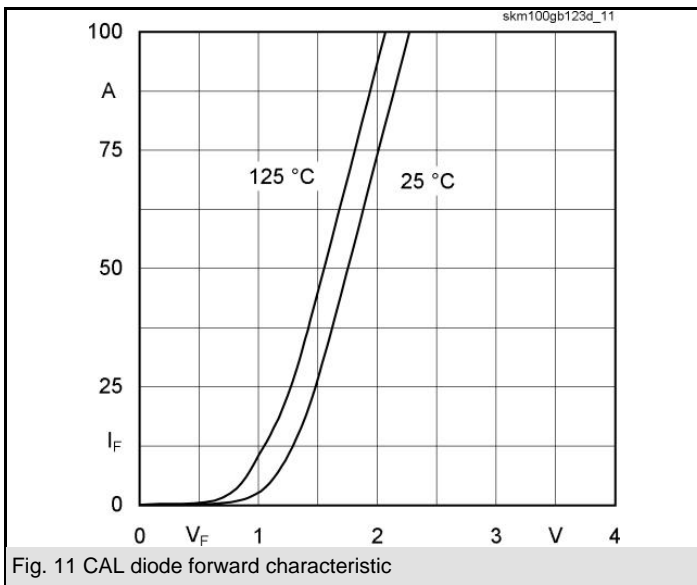
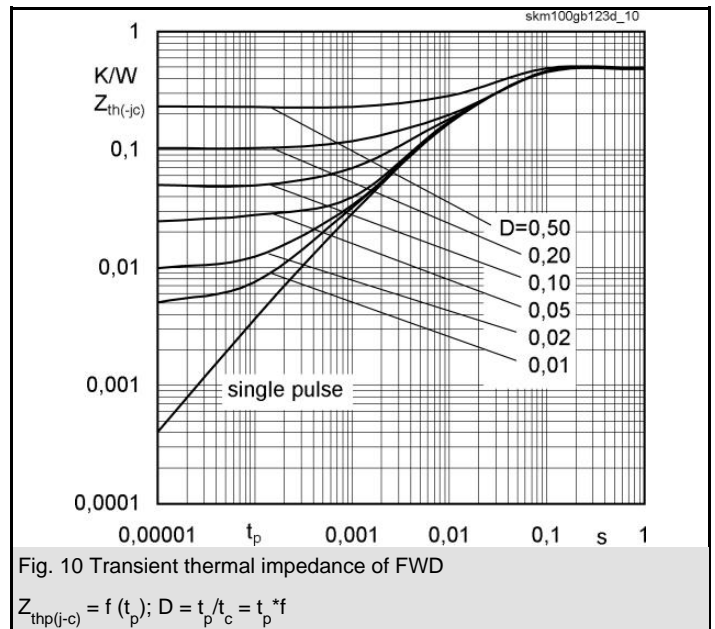
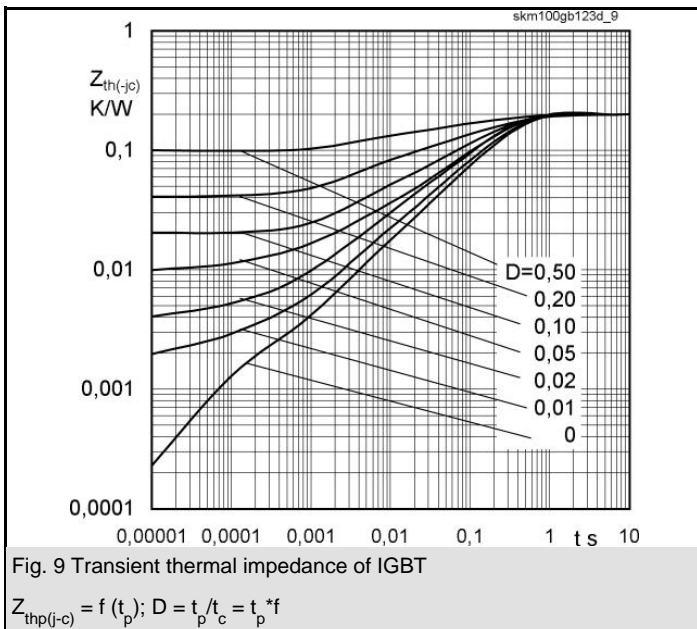
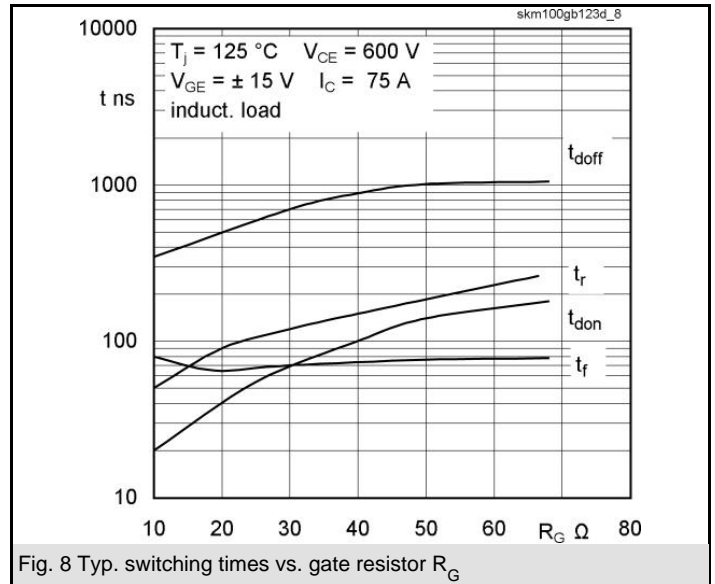
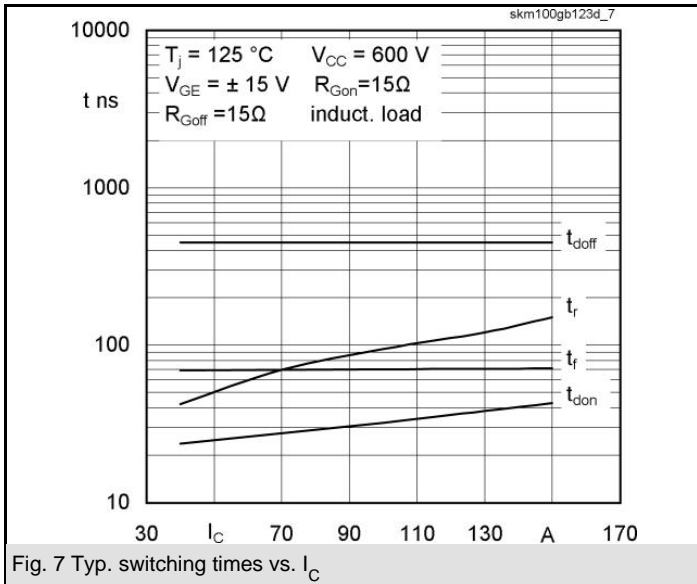
- Switching (not for linear use)



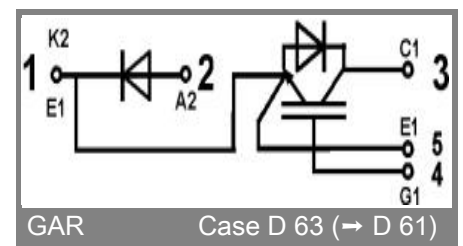
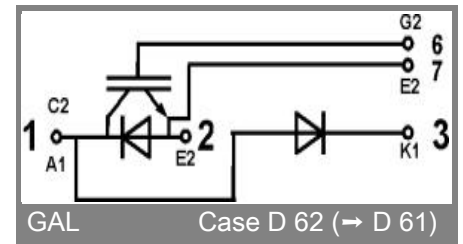
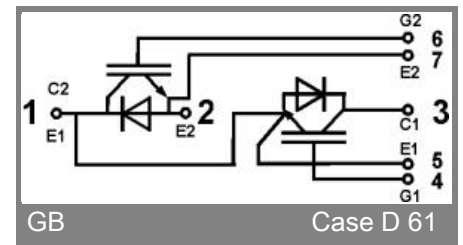
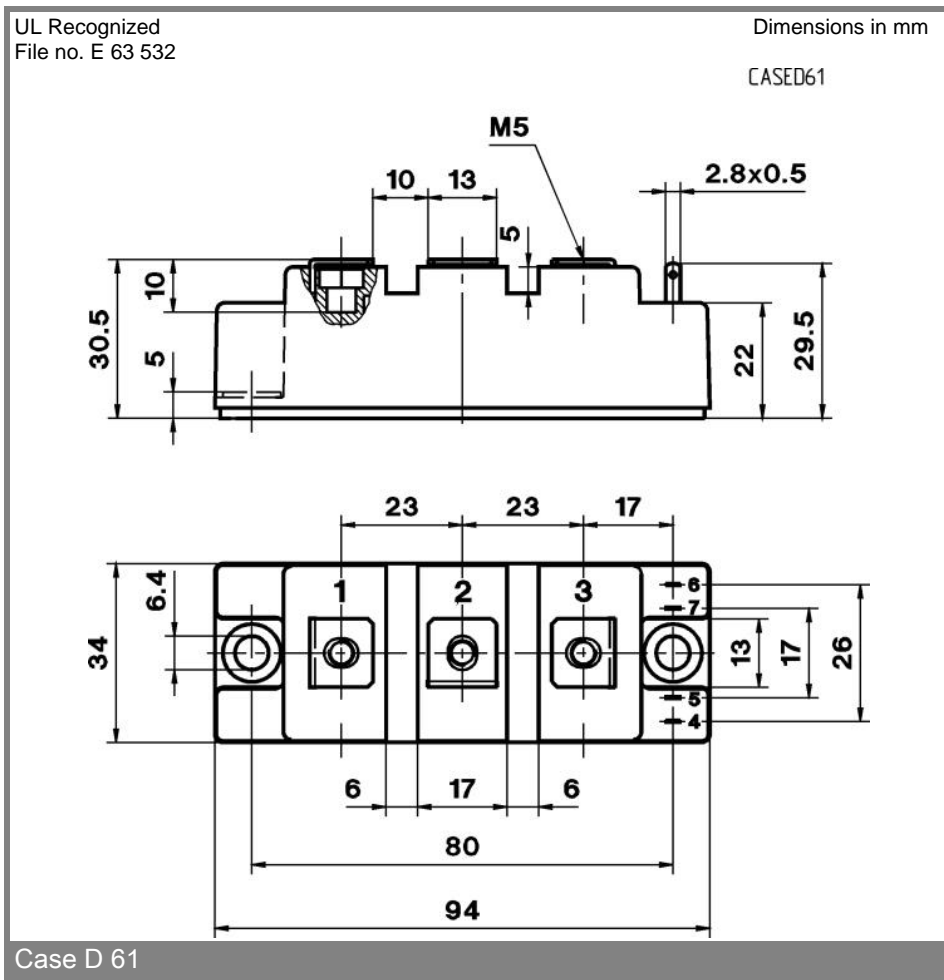
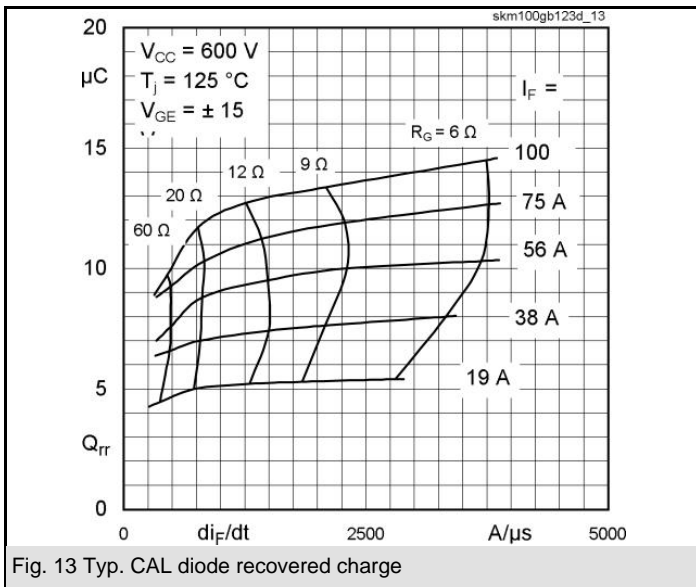
| Absolute Maximum Ratings | | $T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified | |
|---------------------------|--|---|------------------|
| Symbol | Conditions | Values | Units |
| IGBT | | | |
| V_{CES} | | 1200 | V |
| I_C | $T_c = 25\text{ (80) }^\circ\text{C}$ | 100 (90) | A |
| I_{CRM} | $t_p = 1\text{ ms}$ | 150 | A |
| V_{GES} | | ± 20 | V |
| T_{vj} (T_{stg}) | $T_{OPERATION} \leq T_{stg}$ | - 40 ... + 150 (125) | $^\circ\text{C}$ |
| V_{isol} | AC, 1 min. | 2500 | V |
| Inverse diode | | | |
| I_F | $T_c = 25\text{ (80) }^\circ\text{C}$ | 95 (65) | A |
| I_{FRM} | $t_p = 1\text{ ms}$ | 150 | A |
| I_{FSM} | $t_p = 10\text{ ms}$; sin.; $T_j = 150\text{ }^\circ\text{C}$ | 720 | A |
| Freewheeling diode | | | |
| I_F | $T_c = 25\text{ (80) }^\circ\text{C}$ | 130 (90) | A |
| I_{FRM} | $t_p = 1\text{ ms}$ | 200 | A |
| I_{FSM} | $t_p = 10\text{ ms}$; sin.; $T_j = 150\text{ }^\circ\text{C}$ | 1100 | A |

| Characteristics | | $T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified | | | |
|--------------------------------|---|---|-----------|-------------|---------------|
| Symbol | Conditions | min. | typ. | max. | Units |
| IGBT | | | | | |
| $V_{GE(th)}$ | $V_{GE} = V_{CE}$, $I_C = 2\text{ mA}$ | 4,5 | 5,5 | 6,5 | V |
| I_{CES} | $V_{GE} = 0$, $V_{CE} = V_{CES}$, $T_j = 25\text{ (125) }^\circ\text{C}$ | | 0,1 | 0,3 | mA |
| $V_{CE(TO)}$ | $T_j = 25\text{ (125) }^\circ\text{C}$ | | 1,4 (1,6) | 1,6 (1,8) | V |
| r_{CE} | $V_{GE} = 15\text{ V}$, $T_j = 25\text{ (125) }^\circ\text{C}$ | | 14,6 (20) | 18,6 (25,3) | m Ω |
| $V_{CE(sat)}$ | $I_{Cnom} = 75\text{ A}$, $V_{GE} = 15\text{ V}$, chip level | | 2,5 (3,1) | 3 (3,7) | V |
| C_{res} | under following conditions | | 5 | 6,6 | nF |
| C_{oes} | $V_{GE} = 0$, $V_{CE} = 25\text{ V}$, $f = 1\text{ MHz}$ | | 0,72 | 0,9 | nF |
| C_{res} | | | 0,38 | 0,5 | nF |
| L_{CE} | | | | 30 | nH |
| $R_{CC'+EE'}$ | res., terminal-chip $T_c = 25\text{ (125) }^\circ\text{C}$ | | 0,75 (1) | | m Ω |
| $t_{d(on)}$ | $V_{CC} = 600\text{ V}$, $I_{Cnom} = 75\text{ A}$ | | 30 | 60 | ns |
| t_r | $R_{Gon} = R_{Goff} = 15\text{ }^\circ\Omega$, $T_j = 125\text{ }^\circ\text{C}$ | | 70 | 140 | ns |
| $t_{d(off)}$ | $V_{GE} = \pm 15\text{ V}$ | | 450 | 600 | ns |
| t_f | | | 70 | 90 | ns |
| E_{on} (E_{off}) | | | 10 (8) | | mJ |
| Inverse diode | | | | | |
| $V_F = V_{EC}$ | $I_{Fnom} = 75\text{ A}$; $V_{GE} = 0\text{ V}$; $T_j = 25\text{ (125) }^\circ\text{C}$ | | 2 (1,8) | 2,5 | V |
| $V_{(TO)}$ | $T_j = 125\text{ () }^\circ\text{C}$ | | | 1,2 | V |
| r_T | $T_j = 125\text{ () }^\circ\text{C}$ | | 12 | 15 | m Ω |
| I_{RRM} | $I_{Fnom} = 75\text{ A}$; $T_j = 125\text{ () }^\circ\text{C}$ | | 27 (40) | | A |
| Q_{rr} | $di/dt = 800\text{ A}/\mu\text{s}$ | | 3 (10) | | μC |
| E_{rr} | $V_{GE} = 0\text{ V}$ | | 3 | | mJ |
| FWD | | | | | |
| $V_F = V_{EC}$ | $I_F = 100\text{ A}$; $V_{GE} = 0\text{ V}$, $T_j = 25\text{ (125) }^\circ\text{C}$ | | 2 (1,8) | 2,2 | V |
| $V_{(TO)}$ | $T_j = 125\text{ () }^\circ\text{C}$ | | | 1,2 | V |
| r_T | $T_j = 125\text{ () }^\circ\text{C}$ | | 8 | 11 | m Ω |
| I_{RRM} | $I_F = 100\text{ A}$; $T_j = 25\text{ (125) }^\circ\text{C}$ | | 35 (50) | | A |
| Q_{rr} | $di/dt = 1000\text{ A}/\mu\text{s}$ | | 5 (14) | | μC |
| E_{rr} | $V_{GE} = 0\text{ V}$ | | | | mJ |
| Thermal characteristics | | | | | |
| $R_{th(j-c)}$ | per IGBT | | | 0,18 | K/W |
| $R_{th(j-c)D}$ | per Inverse Diode | | | 0,5 | K/W |
| $R_{th(j-c)FD}$ | per FWD | | | 0,36 | K/W |
| $R_{th(c-s)}$ | per module | | | 0,05 | K/W |
| Mechanical data | | | | | |
| M_s | to heatsink M6 | 3 | | 5 | Nm |
| M_t | to terminals M5 | 2,5 | | 5 | Nm |
| w | | | | 160 | g |





SKM 100GB123D



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

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