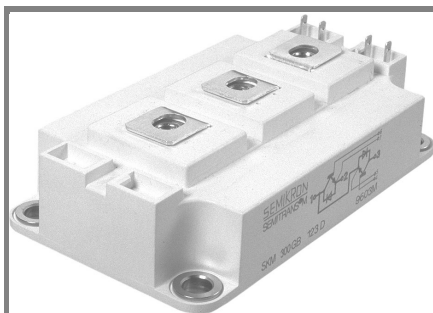


SKM 200GB173D



SEMITRANS™ 3

IGBT Modules

SKM 200GB173D

SKM 200GB173D1

SKM 200GAL173D

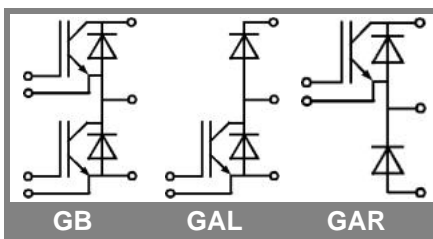
SKM 200GAR173D

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 (13 mm) and creepage distance (20 mm)

Typical Applications

- AC inverter drives on mains 575 - 750 V_{AC}
- DC bus voltage 750 - 1200 V_{DC}
- Public transport (auxiliary syst.)
- Switching (not for linear use)



| Absolute Maximum Ratings | | $T_c = 25\text{ °C}$, unless otherwise specified | |
|--------------------------|------------------------------|---|-------|
| Symbol | Conditions | Values | Units |
| IGBT | | | |
| V_{CES} | | 1700 | V |
| I_C | $T_c = 25\text{ (80) °C}$ | 220 (150) | A |
| I_{CRM} | $t_p = 1\text{ ms}$ | 300 | A |
| V_{GES} | | ± 20 | V |
| T_{vj} (T_{stg}) | $T_{OPERATION} \leq T_{stg}$ | - 40 ... + 150 (125) | °C |
| V_{isol} | AC, 1 min. | 4000 | V |

| Inverse diode | | | |
|---------------|--|-----------|-------|
| Symbol | Conditions | Values | Units |
| I_F | $T_c = 25\text{ (80) °C}$ | 150 (100) | A |
| I_{FRM} | $t_p = 1\text{ ms}$ | 300 | A |
| I_{FSM} | $t_p = 10\text{ ms; sin.; } T_j = 150\text{ °C}$ | 1450 | A |

| Freewheeling diode | | | |
|--------------------|--|-----------|-------|
| Symbol | Conditions | Values | Units |
| I_F | $T_c = 25\text{ (80) °C}$ | 230 (150) | A |
| I_{FRM} | $t_p = 1\text{ ms}$ | 400 | A |
| I_{FSM} | $t_p = 10\text{ ms; sin.; } T_j = 150\text{ °C}$ | 2200 | A |

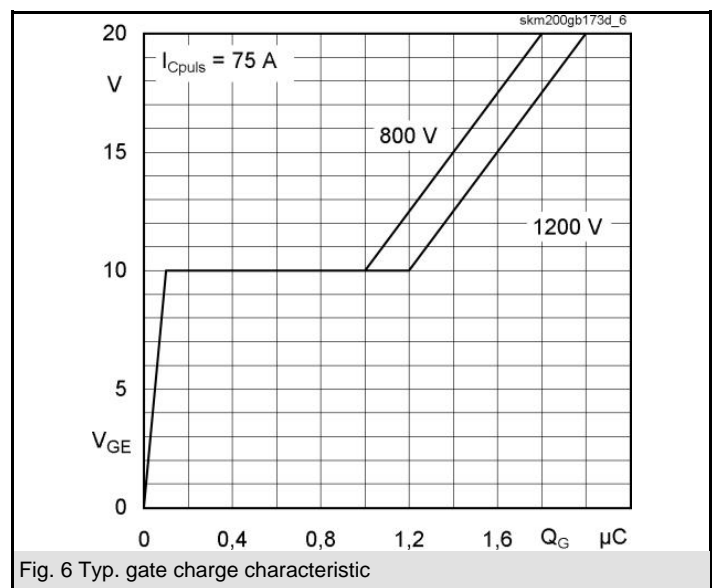
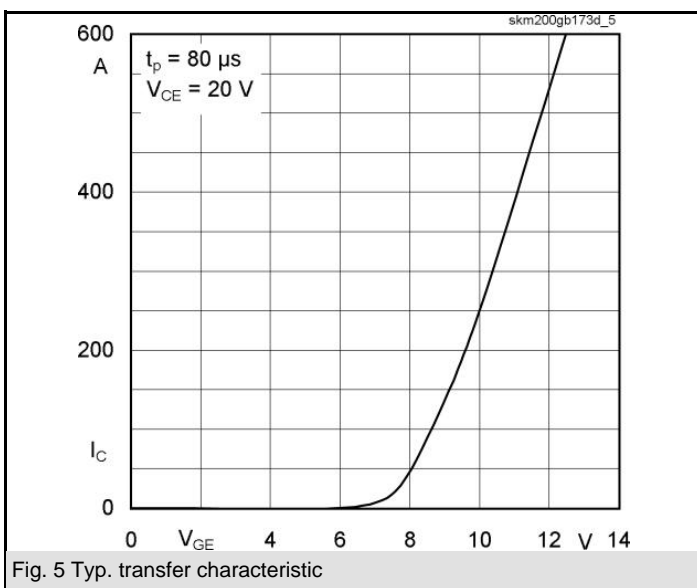
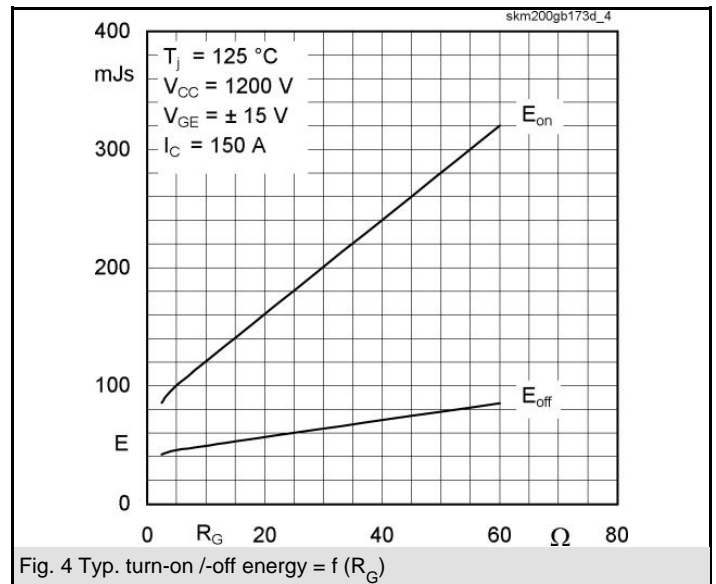
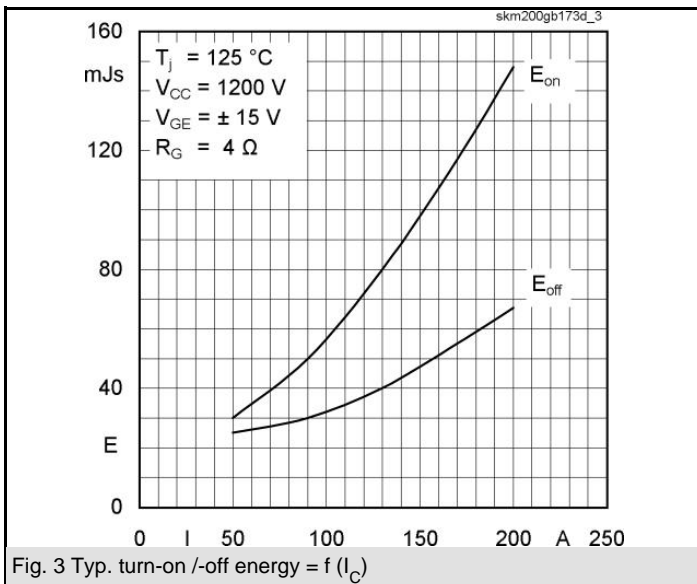
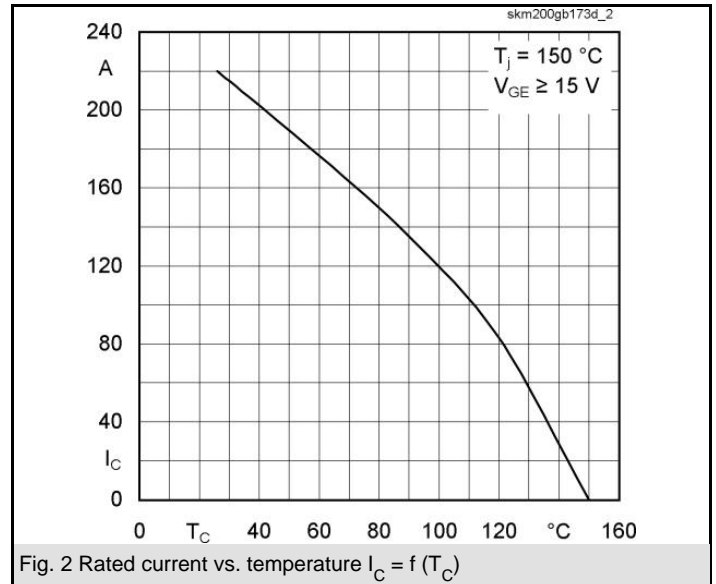
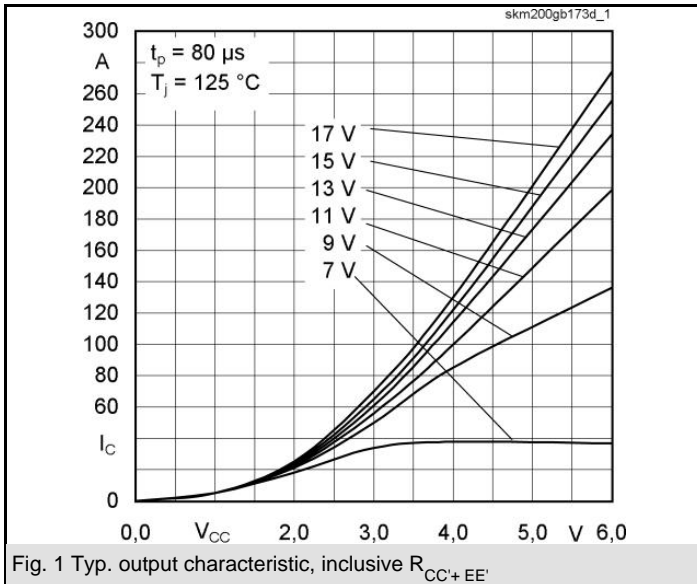
| Characteristics | | $T_c = 25\text{ °C}$, unless otherwise specified | | | Units |
|--------------------|--|---|-------------|------------|-------|
| Symbol | Conditions | min. | typ. | max. | Units |
| IGBT | | | | | |
| $V_{GE(th)}$ | $V_{GE} = V_{CE}, I_C = 10\text{ mA}$ | 4,8 | 5,5 | 6,2 | V |
| I_{CES} | $V_{GE} = 0, V_{CE} = V_{CES}, T_j = 25\text{ (125) °C}$ | | 0,1 | 0,3 | mA |
| $V_{CE(TO)}$ | $T_j = 25\text{ (125) °C}$ | | 1,65 (1,9) | 1,9 (2,15) | V |
| r_{CE} | $V_{GE} = 15\text{ V}, T_j = 25\text{ (125) °C}$ | | 11,7 (17,3) | 13,3 (19) | mΩ |
| $V_{CE(sat)}$ | $I_{Cnom} = 150\text{ A}, V_{GE} = 15\text{ V}$, chip level | | 3,4 (4,5) | 3,9 (5) | V |
| C_{res} | under following conditions | | 20 | | nF |
| C_{oes} | $V_{GE} = 0, V_{CE} = 25\text{ V}, f = 1\text{ MHz}$ | | 2 | | nF |
| C_{res} | | | 0,55 | | nF |
| L_{CE} | | | | 20 | nH |
| $R_{CC'+EE'}$ | res., terminal-chip $T_c = 25\text{ (125) °C}$ | | 0,35 (0,5) | | mΩ |
| $t_{d(on)}$ | $V_{CC} = 1200\text{ V}, I_{Cnom} = 150\text{ A}$ | | 580 | | ns |
| t_r | $R_{Gon} = R_{Goff} = 4\text{ Ω}, T_j = 125\text{ °C}$ | | 100 | | ns |
| $t_{d(off)}$ | $V_{GE} = \pm 15\text{ V}$ | | 750 | | ns |
| t_f | | | 40 | | ns |
| $E_{on} (E_{off})$ | | | 95 (45) | | mJ |

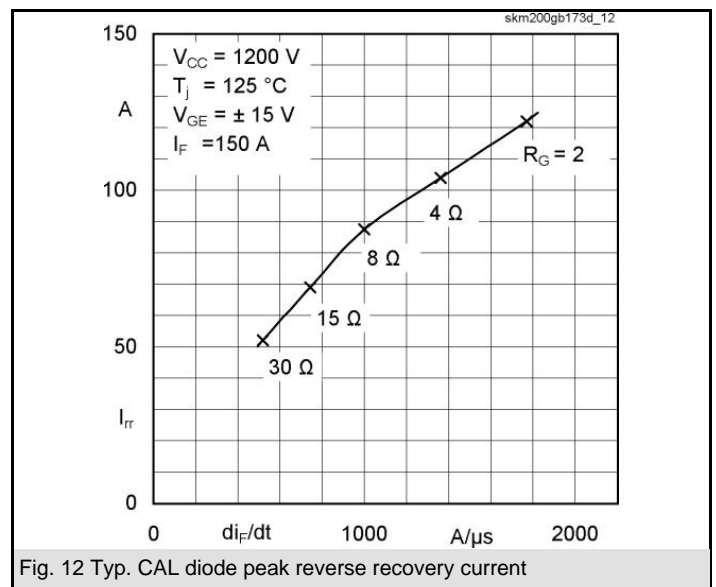
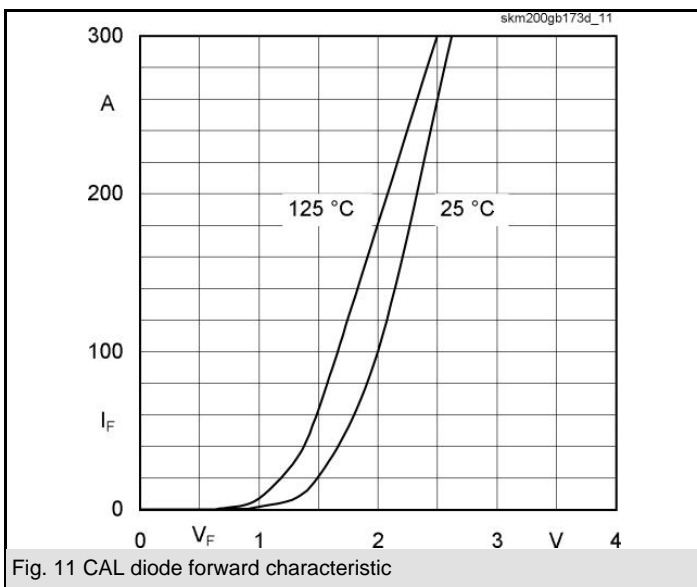
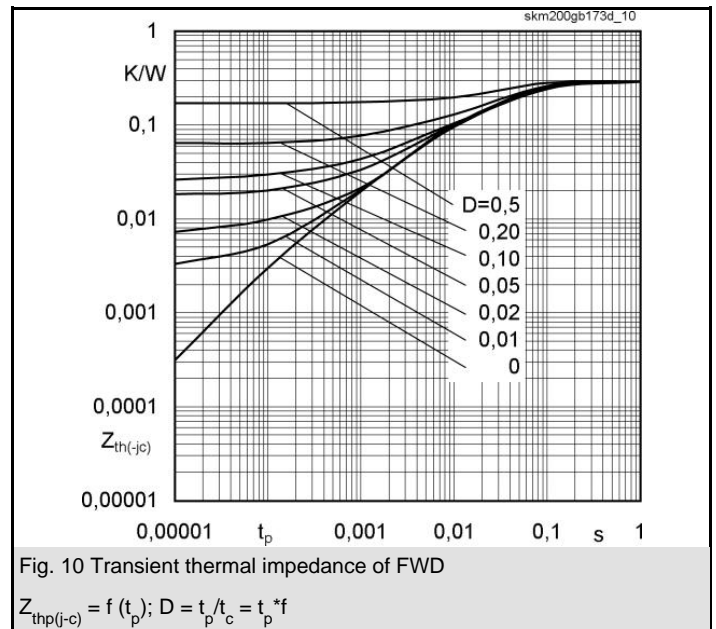
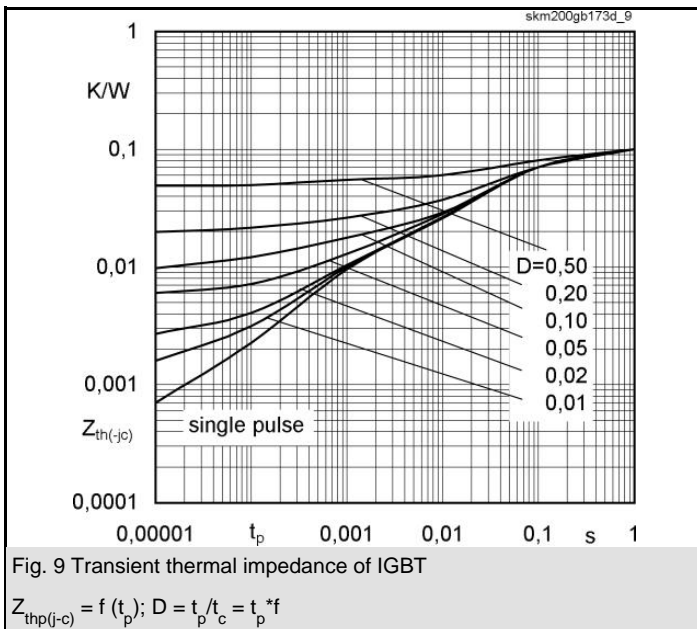
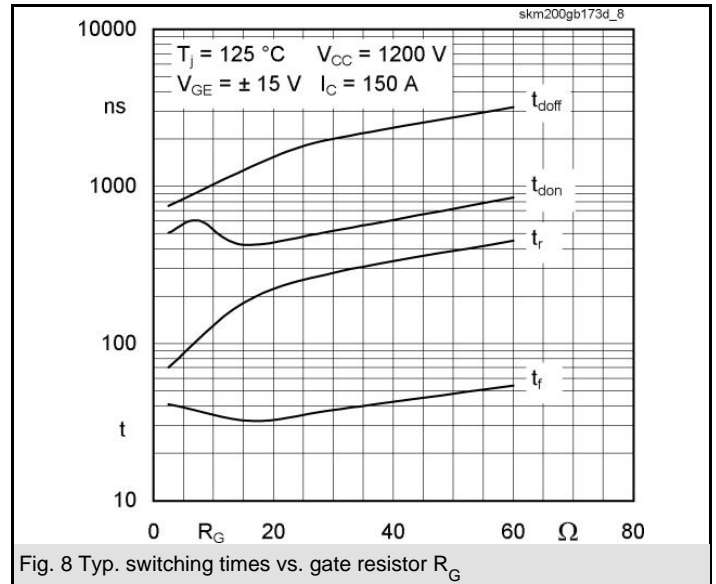
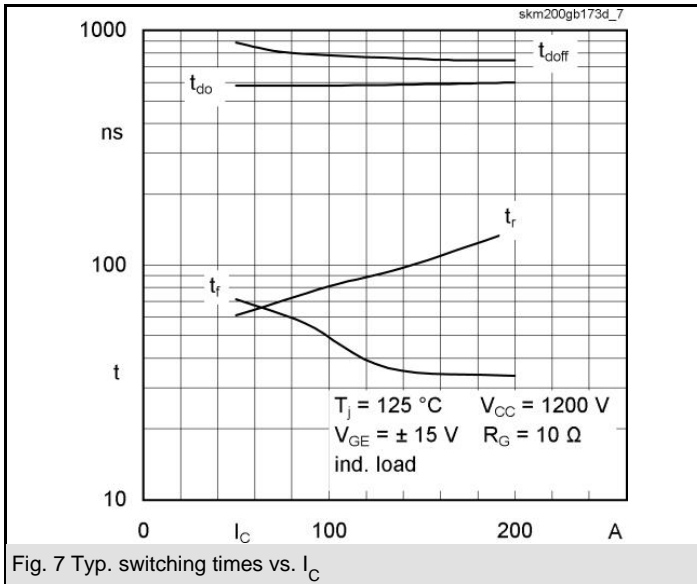
| Inverse diode | | | | |
|----------------|--|-----------|------|-------|
| Symbol | Conditions | min. | max. | Units |
| $V_F = V_{EC}$ | $I_{Fnom} = 150\text{ A}; V_{GE} = 0\text{ V}; T_j = 25\text{ (125) °C}$ | 2,2 (1,9) | 2,7 | V |
| $V_{(TO)}$ | $T_j = 125\text{ () °C}$ | 1,3 | 1,5 | V |
| r_T | $T_j = 125\text{ () °C}$ | 4,5 | 6,2 | mΩ |
| I_{RRM} | $I_{Fnom} = 150\text{ A}; T_j = 25\text{ (125) °C}$ | 60 (85) | | A |
| Q_{rr} | $di/dt = 1000\text{ A/μs}$ | 15 (38) | | μC |
| E_{rr} | $V_{GE} = 0\text{ V}$ | | | mJ |

| FWD | | | | |
|----------------|---|----------|------|-------|
| Symbol | Conditions | min. | max. | Units |
| $V_F = V_{EC}$ | $I_F = 150\text{ A}; V_{GE} = 0\text{ V}, T_j = 25\text{ (125) °C}$ | 2 (1,8) | 2,4 | V |
| $V_{(TO)}$ | $T_j = 125\text{ () °C}$ | 1,3 | 1,5 | V |
| r_T | $T_j = 125\text{ () °C}$ | 3,5 | 4,5 | mΩ |
| I_{RRM} | $I_F = 150\text{ A}; T_j = 25\text{ (125) °C}$ | 75 (110) | | A |
| Q_{rr} | $di/dt = \text{A/μs}$ | 20 (50) | | μC |
| E_{rr} | $V_{GE} = \text{V}$ | | | mJ |

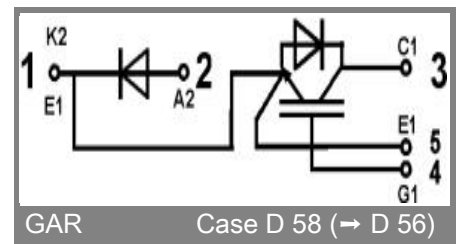
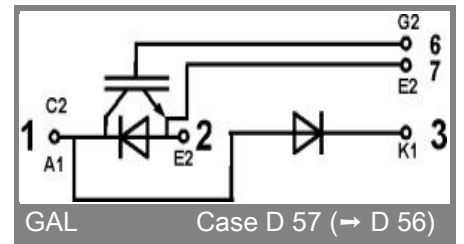
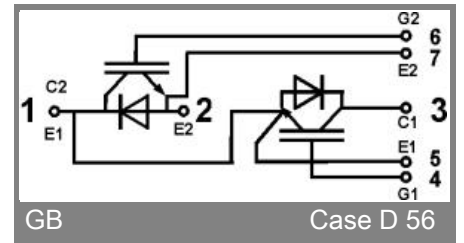
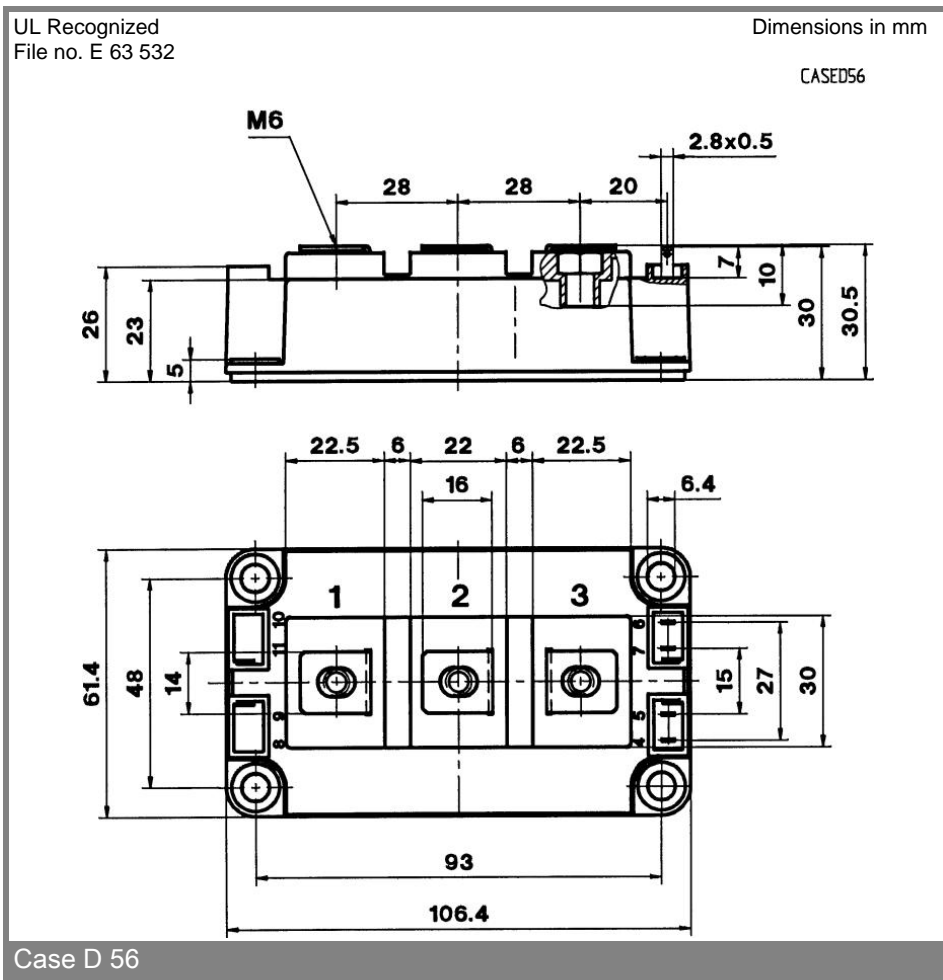
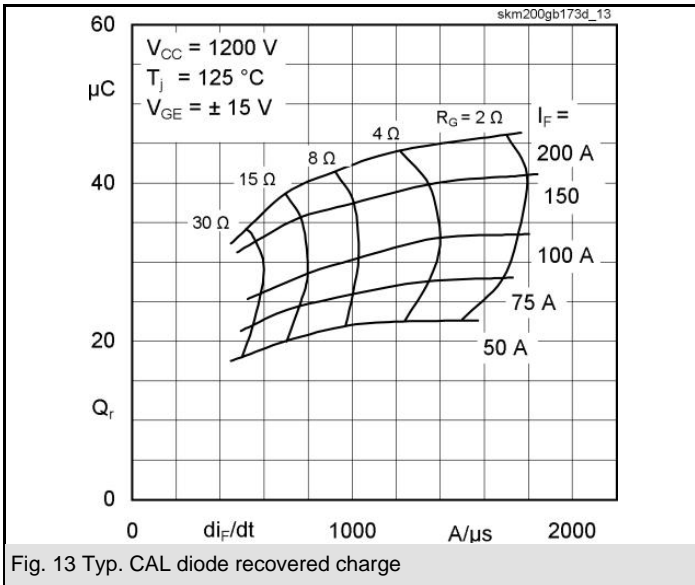
| Thermal characteristics | | | |
|-------------------------|-------------------|--------|-------|
| Symbol | Conditions | Values | Units |
| $R_{th(j-c)}$ | per IGBT | 0,1 | K/W |
| $R_{th(j-c)D}$ | per Inverse Diode | 0,32 | K/W |
| $R_{th(j-c)FD}$ | per FWD | 0,21 | K/W |
| $R_{th(c-s)}$ | per module | 0,038 | K/W |

| Mechanical data | | | |
|-----------------|-----------------|--------|-------|
| Symbol | Conditions | Values | Units |
| M_s | to heatsink M6 | 3 | Nm |
| M_t | to terminals M6 | | Nm |
| w | | | 325 g |





SKM 200GB173D



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

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