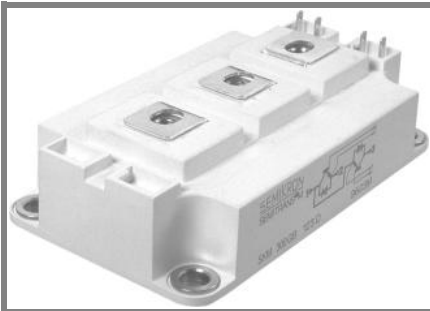


SKM 150GB123D



SEMITRANS® 3

IGBT Modules

SKM 150GB123D

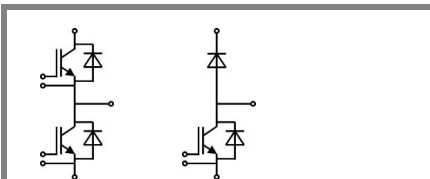
SKM 150GAL123D

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
- Large clearance (12 mm) and creepage distances (20 mm)

Typical Applications*

- AC inverter drives
- UPS



GB

GAL

| Absolute Maximum Ratings | | $T_c = 25^\circ\text{C}$, unless otherwise specified | | |
|---------------------------|--|---|------|------------------|
| Symbol | Conditions | Values | | Units |
| IGBT | | | | |
| V_{CES} | $T_j = 25^\circ\text{C}$ | 1200 | | V |
| I_C | $T_j = 150^\circ\text{C}$ | $T_{case} = 25^\circ\text{C}$ | 150 | A |
| | | $T_{case} = 80^\circ\text{C}$ | 110 | A |
| I_{CRM} | $I_{CRM} = 2 \times I_{Cnom}$ | 200 | | A |
| V_{GES} | | ± 20 | | V |
| t_{psc} | $V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125^\circ\text{C}$ $V_{CES} < 1200\text{ V}$ | 10 | | μs |
| Inverse Diode | | | | |
| I_F | $T_j = 150^\circ\text{C}$ | $T_{case} = 25^\circ\text{C}$ | 150 | A |
| | | $T_{case} = 80^\circ\text{C}$ | 100 | A |
| I_{FRM} | $I_{FRM} = 2 \times I_{Fnom}$ | 200 | | A |
| I_{FSM} | $t_p = 10\text{ ms}; \text{sin.}$ | $T_j = 150^\circ\text{C}$ | 1100 | A |
| Freewheeling Diode | | | | |
| I_F | $T_j = 150^\circ\text{C}$ | $T_{case} = 25^\circ\text{C}$ | 200 | A |
| | | $T_{case} = 80^\circ\text{C}$ | 135 | A |
| I_{FRM} | | 300 | | A |
| I_{FSM} | $t_p = 10\text{ ms}; \text{sin.}$ | $T_j = 150^\circ\text{C}$ | 1440 | A |
| Module | | | | |
| $I_{t(RMS)}$ | | 500 | | A |
| T_{vj} | | - 40 ... + 150 | | $^\circ\text{C}$ |
| T_{stg} | | -40 ... + 125 | | $^\circ\text{C}$ |
| V_{isol} | AC, 1 min. | 2500 | | V |

| Characteristics | | $T_c = 25^\circ\text{C}$, unless otherwise specified | | | |
|-----------------|---|---|------|------|------------------|
| Symbol | Conditions | min. | typ. | max. | Units |
| IGBT | | | | | |
| $V_{GE(th)}$ | $V_{GE} = V_{CE}, I_C = 4\text{ mA}$ | 4,5 | 5,5 | 6,5 | V |
| I_{CES} | $V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$ | $T_j = 25^\circ\text{C}$ | 0,1 | 0,3 | mA |
| | | $T_j = 125^\circ\text{C}$ | | | mA |
| V_{CE0} | | $T_j = 25^\circ\text{C}$ | 1,4 | 1,6 | V |
| | | $T_j = 125^\circ\text{C}$ | 1,6 | 1,8 | V |
| r_{CE} | $V_{GE} = 15\text{ V}$ | $T_j = 25^\circ\text{C}$ | 11 | 14 | $\text{m}\Omega$ |
| | | $T_j = 125^\circ\text{C}$ | 15 | 19 | $\text{m}\Omega$ |
| $V_{CE(sat)}$ | $I_{Cnom} = 100\text{ A}, V_{GE} = 15\text{ V}$ | $T_j = ^\circ\text{C}_{chiplev.}$ | 2,5 | 3 | V |
| C_{ies} | $V_{CE} = 25, V_{GE} = 0\text{ V}$ | $f = 1\text{ MHz}$ | 6,5 | 8,5 | nF |
| C_{oes} | | | 1 | 1,5 | nF |
| C_{res} | | | 0,5 | 0,6 | nF |
| Q_G | $V_{GE} = -8\text{ V} - +20\text{ V}$ | | 1000 | | nC |
| R_{Gint} | $T_j = ^\circ\text{C}$ | | 2,5 | | Ω |
| $t_{d(on)}$ | $R_{Gon} = 6,8\ \Omega$ | $V_{CC} = 600\text{ V}$ $I_C = 100\text{ A}$ | 160 | 320 | ns |
| | | | 80 | 160 | ns |
| E_{on} | $R_{Goff} = 6,8\ \Omega$ | $T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$ | 13 | | mJ |
| $t_{d(off)}$ | | | 400 | 520 | ns |
| t_f | | | 70 | 100 | ns |
| E_{off} | | | 11 | | mJ |
| $R_{th(j-c)}$ | per IGBT | | | 0,15 | K/W |



SEMITRANS® 3

IGBT Modules

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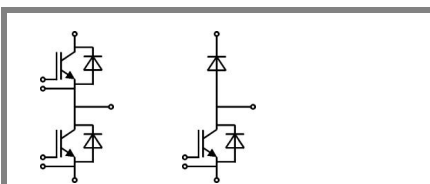
SKM 150GAL123D

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
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Typical Applications*

- AC inverter drives
- UPS



GB

GAL

Characteristics

| Symbol | Conditions | min. | typ. | max. | Units |
|---------------------------|--|---|------|-------|-------|
| Inverse Diode | | | | | |
| $V_F = V_{EC}$ | $I_{Fnom} = 100 \text{ A}; V_{GE} = 0 \text{ V}$ | $T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$ | 2 | 2,5 | V |
| | | $T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$ | 1,8 | | V |
| V_{F0} | | $T_j = 25 \text{ }^\circ\text{C}$ | 1,1 | 1,2 | V |
| | | $T_j = 125 \text{ }^\circ\text{C}$ | | | V |
| r_F | | $T_j = 25 \text{ }^\circ\text{C}$ | 9 | 13 | mΩ |
| | | $T_j = 125 \text{ }^\circ\text{C}$ | | | mΩ |
| I_{RRM} | $I_F = 100 \text{ A}$ | $T_j = 125 \text{ }^\circ\text{C}$ | 50 | | A |
| Q_{rr} | $di/dt = 1000 \text{ A}/\mu\text{s}$ | | 5 | | μC |
| E_{rr} | $V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$ | | | | mJ |
| $R_{th(j-c)D}$ | per diode | | | 0,3 | K/W |
| Freewheeling Diode | | | | | |
| $V_F = V_{EC}$ | $I_{Fnom} = 150 \text{ A}; V_{GE} = 0 \text{ V}$ | $T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$ | 2 | 2,5 | V |
| | | $T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$ | 1,8 | | V |
| V_{F0} | | $T_j = 25 \text{ }^\circ\text{C}$ | 1,1 | 1,2 | V |
| | | $T_j = 125 \text{ }^\circ\text{C}$ | | | V |
| r_F | | $T_j = 25 \text{ }^\circ\text{C}$ | 6 | 8,7 | V |
| | | $T_j = 125 \text{ }^\circ\text{C}$ | | | V |
| I_{RRM} | $I_F = 100 \text{ A}$ | $T_j = 25 \text{ }^\circ\text{C}$ | 40 | | A |
| Q_{rr} | | | 5 | | μC |
| E_{rr} | $V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$ | | | | mJ |
| $R_{th(j-c)FD}$ | per diode | | | 0,25 | K/W |
| Module | | | | | |
| L_{CE} | | | 15 | 20 | nH |
| $R_{CC'+EE'}$ | res., terminal-chip | $T_{case} = 25 \text{ }^\circ\text{C}$ | 0,35 | | mΩ |
| | | $T_{case} = 125 \text{ }^\circ\text{C}$ | 0,5 | | mΩ |
| $R_{th(c-s)}$ | per module | | | 0,038 | K/W |
| M_s | to heat sink M6 | | 3 | 5 | Nm |
| M_t | to terminals M6 | | 2,5 | 5 | Nm |
| w | | | | 325 | g |

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.

SKM 150GB123D



SEMITRANS® 3

IGBT Modules

SKM 150GB123D

SKM 150GAL123D

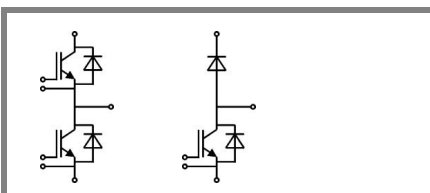
Features

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Typical Applications*

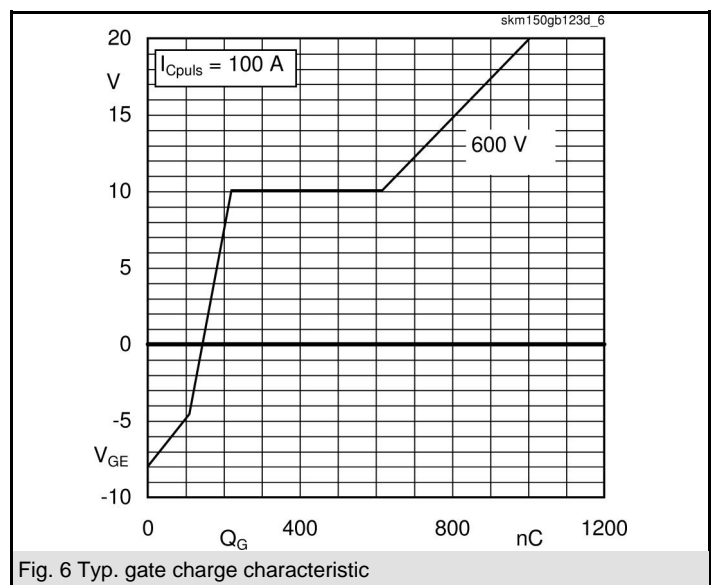
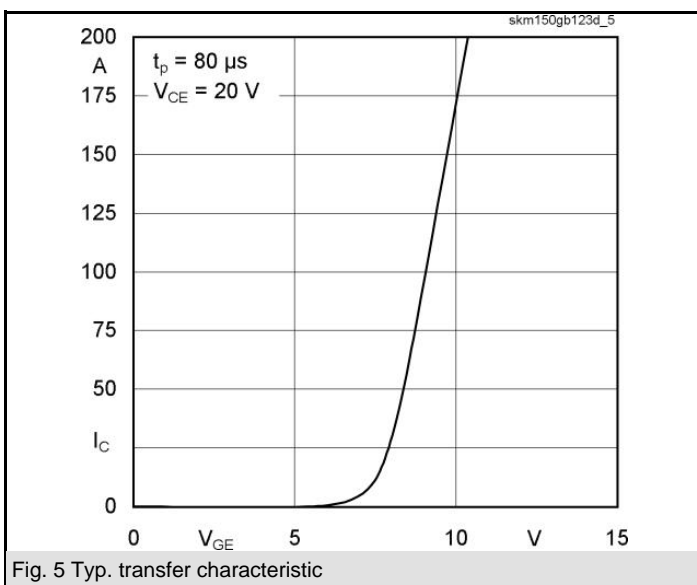
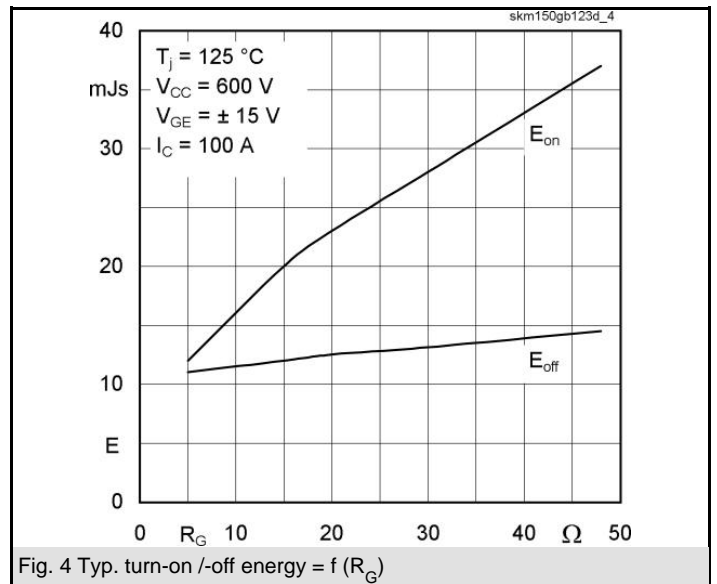
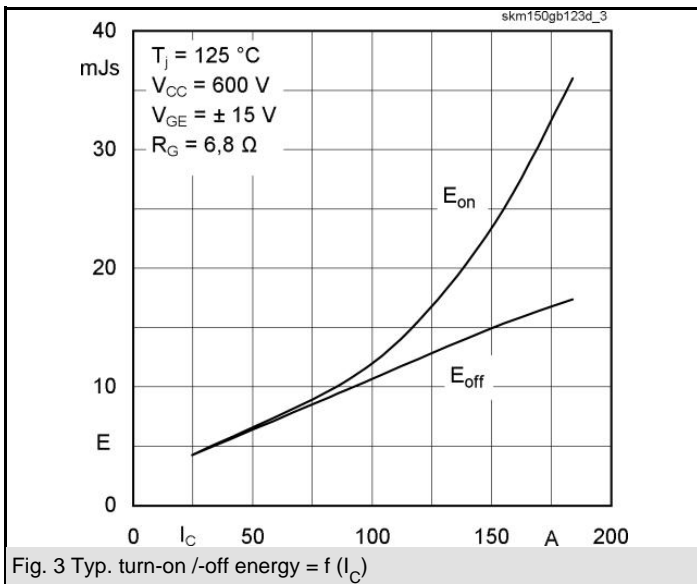
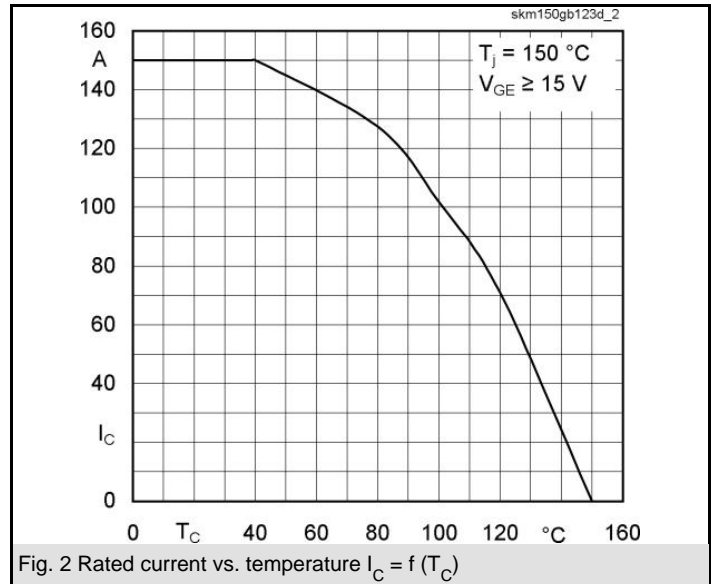
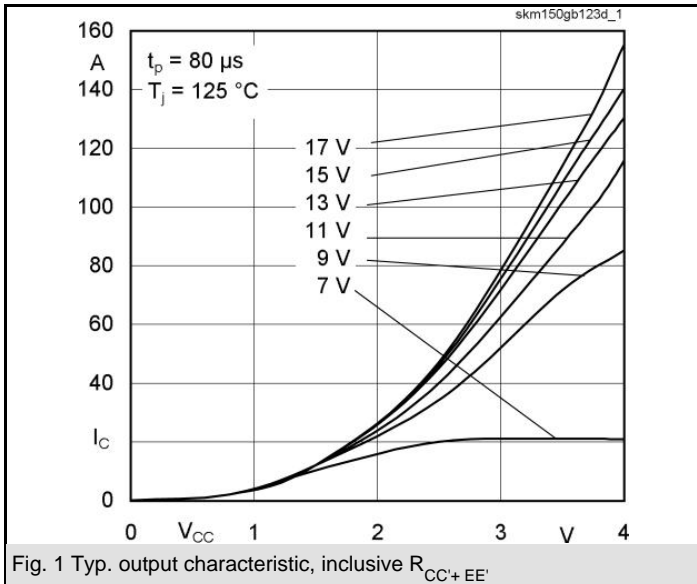
- AC inverter drives
- UPS

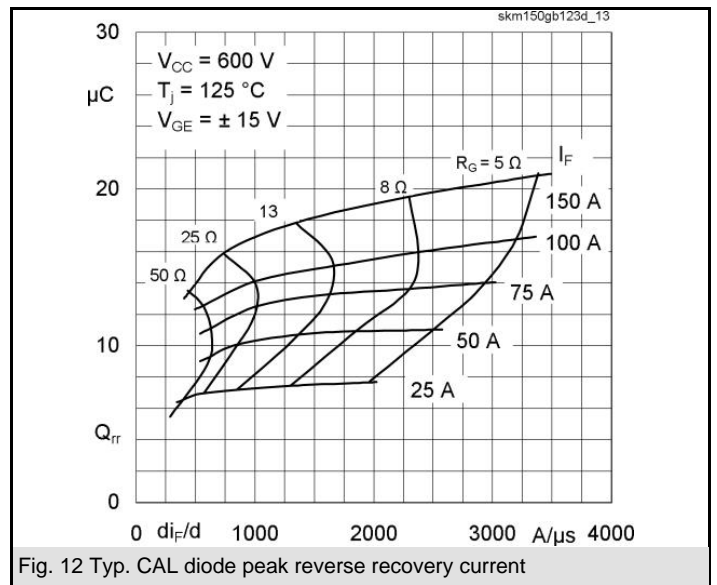
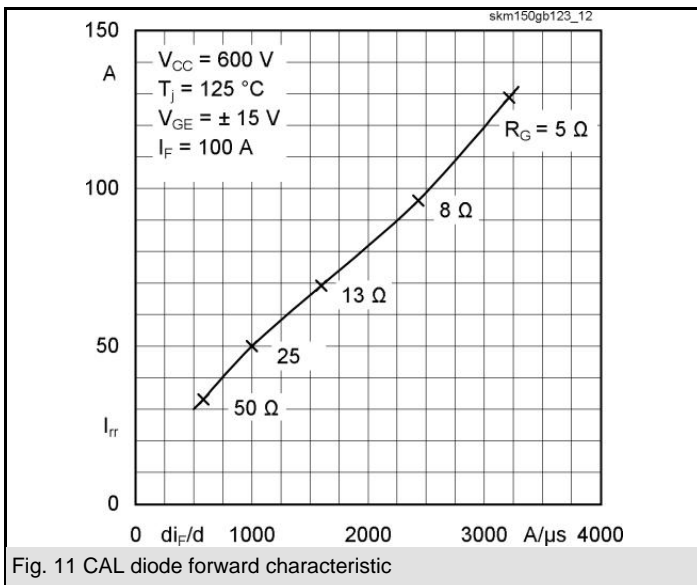
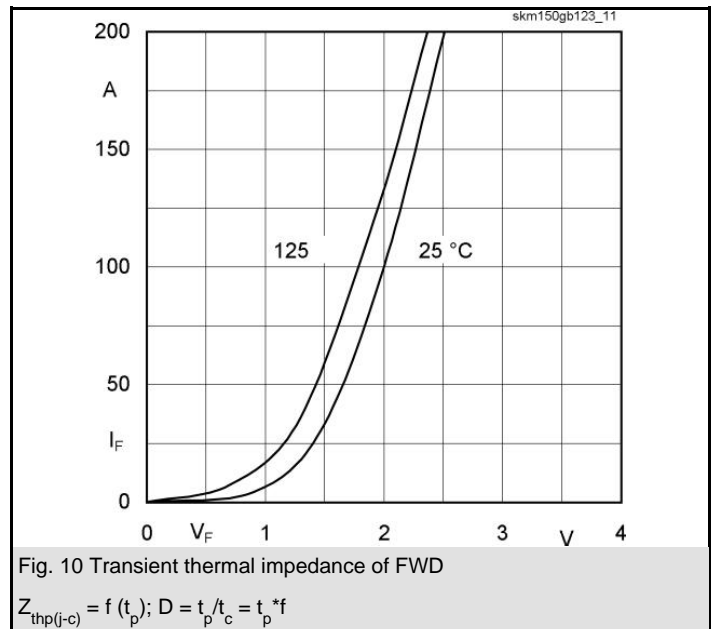
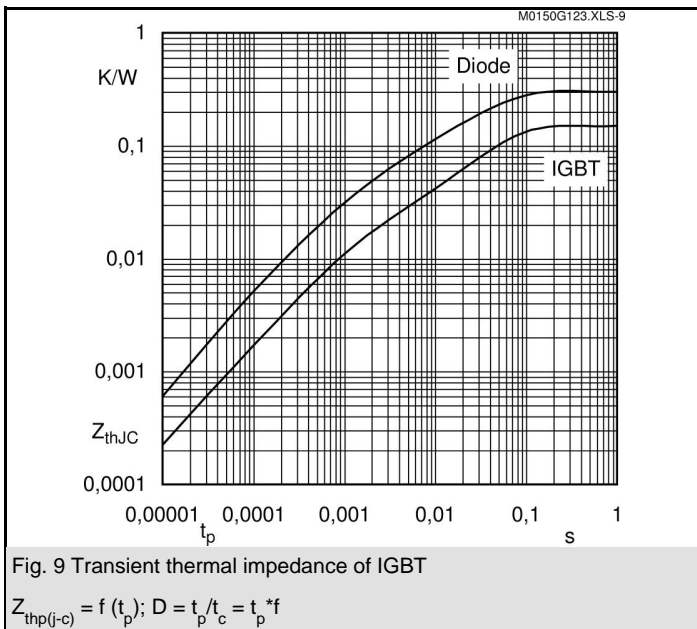
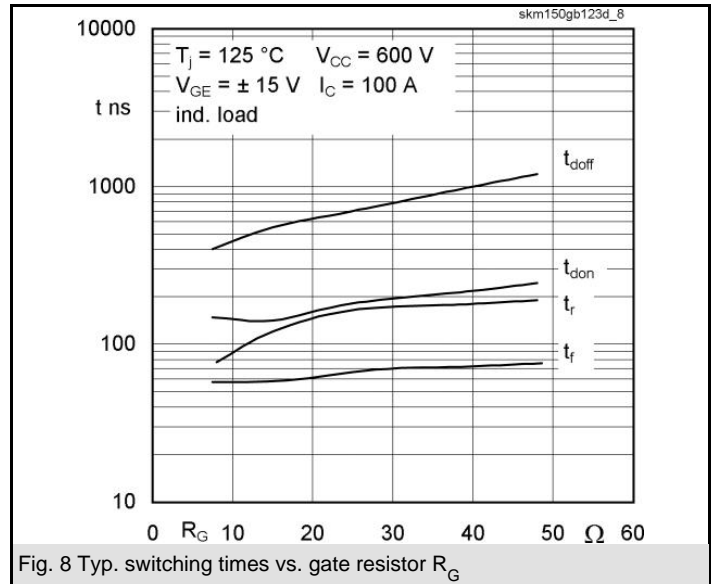
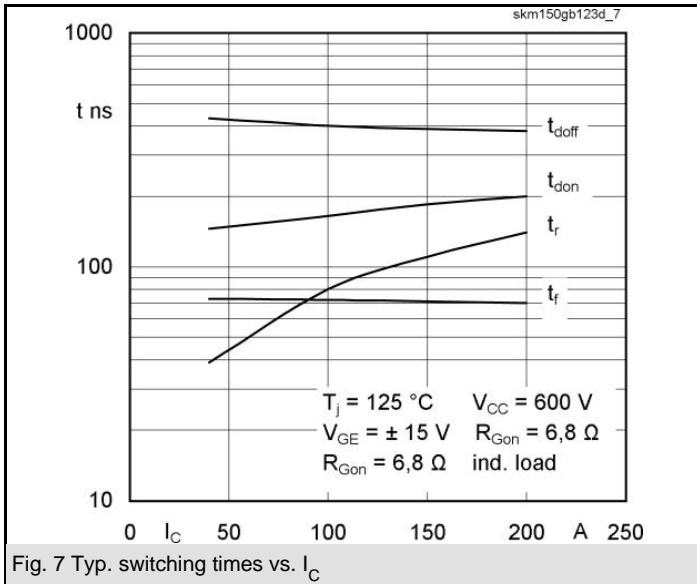
| Z_{th} | | Conditions | Values | Units |
|----------------------------------|--|------------|--------|-------|
| $Z_{th(j-c)I}$ | | | | |
| $R_{\theta j-c}$ | | $i = 1$ | 105 | mk/W |
| $R_{\theta j-c}$ | | $i = 2$ | 35 | mk/W |
| $R_{\theta j-c}$ | | $i = 3$ | 8 | mk/W |
| $R_{\theta j-c}$ | | $i = 4$ | 2 | mk/W |
| $\tau_{th j-c}$ | | $i = 1$ | 0,03 | s |
| $\tau_{th j-c}$ | | $i = 2$ | 0,03 | s |
| $\tau_{th j-c}$ | | $i = 3$ | 0,0014 | s |
| $\tau_{th j-c}$ | | $i = 4$ | 0,0001 | s |
| $Z_{th(j-c)D}$ | | | | |
| $R_{\theta j-cD}$ | | $i = 1$ | 210 | mk/W |
| $R_{\theta j-cD}$ | | $i = 2$ | 70 | mk/W |
| $R_{\theta j-cD}$ | | $i = 3$ | 16 | mk/W |
| $R_{\theta j-cD}$ | | $i = 4$ | 4 | mk/W |
| $\tau_{th j-cD}$ | | $i = 1$ | 0,0623 | s |
| $\tau_{th j-cD}$ | | $i = 2$ | 0,0083 | s |
| $\tau_{th j-cD}$ | | $i = 3$ | 0,003 | s |
| $\tau_{th j-cD}$ | | $i = 4$ | 0,0002 | s |



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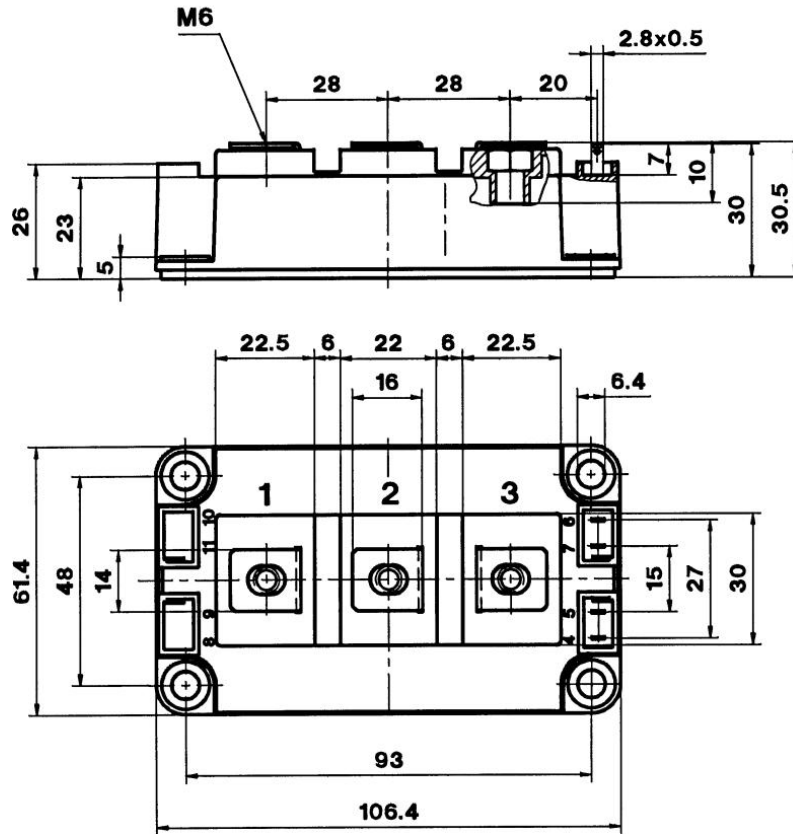


SKM 150GB123D

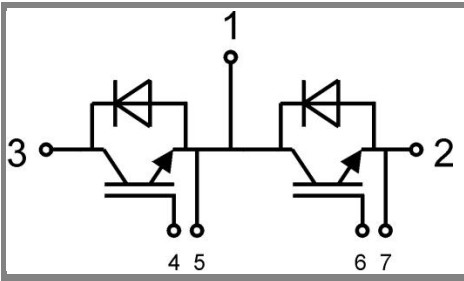
UL Recognized

CASED56

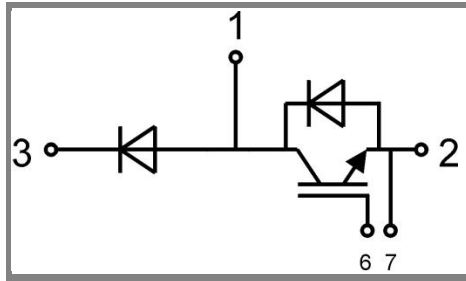
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Case D 56



GB Case D 56



GAL Case D 57 (→ D 56)