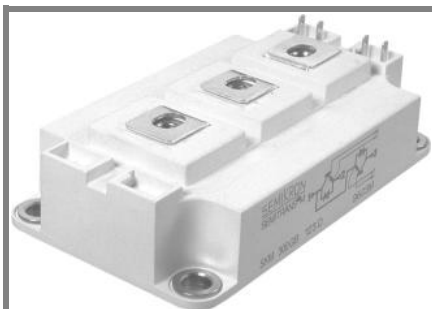


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SEMITRANS® 3

SPT IGBT Modules

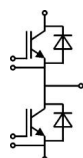
SKM 150GB128D

Features

- SPT = Soft punch-through technology
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications

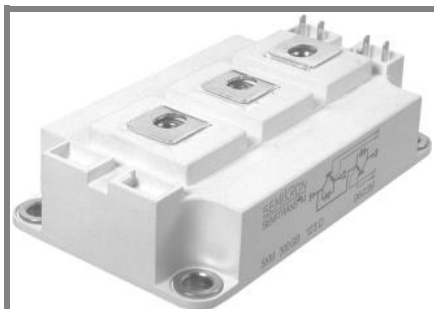
- AC inverter drives
- UPS
- Electronic welders at f_{sw} up to 20 kHz



GB

| Absolute Maximum Ratings | | $T_c = 25\text{ °C}$, unless otherwise specified | |
|--------------------------|--|---|--------------------|
| Symbol | Conditions | Values | Units |
| IGBT | | | |
| V_{CES} | $T_j = 25\text{ °C}$ | 1200 | V |
| I_C | $T_j = 150\text{ °C}$ | $T_c = 25\text{ °C}$ | 200 |
| | | $T_c = 80\text{ °C}$ | 140 |
| I_{CRM} | $I_{CRM} = 2 \times I_{Cnom}$ | 200 | A |
| V_{GES} | | ± 20 | V |
| t_{psc} | $V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ °C}$ $V_{CES} < 1200\text{ V}$ | 10 | μs |
| Inverse Diode | | | |
| I_F | $T_j = 150\text{ °C}$ | $T_{case} = 25\text{ °C}$ | 150 |
| | | $T_{case} = 80\text{ °C}$ | 100 |
| I_{FRM} | $I_{FRM} = 2 \times I_{Fnom}$ | 200 | A |
| I_{FSM} | $t_p = 10\text{ ms}; \text{sin.}$ | $T_j = 150\text{ °C}$ | 1100 |
| 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. | 4000 | V |

| Characteristics | | $T_c = 25\text{ °C}$, 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} | $V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$ | $T_j = 25\text{ °C}$ | 0,2 | 0,6 | mA |
| | | $T_j = 125\text{ °C}$ | 0,9 | 1,05 | V |
| V_{CE0} | | | 1 | 1,15 | V |
| r_{CE} | $V_{GE} = 15\text{ V}$ | $T_j = 25\text{ °C}$ | 9 | 12 | $\text{m}\Omega$ |
| | | $T_j = 125\text{ °C}$ | 12 | 15 | $\text{m}\Omega$ |
| $V_{CE(sat)}$ | $I_{Cnom} = 100\text{ A}, V_{GE} = 15\text{ V}$ | $T_j = 25\text{ °C}_{chiplev.}$ | 1,9 | 2,35 | V |
| | | $T_j = 125\text{ °C}_{chiplev.}$ | 2,1 | 2,55 | V |
| C_{ies} | $V_{CE} = 25, V_{GE} = 0\text{ V}$ | $f = 1\text{ MHz}$ | 8,1 | | nF |
| C_{oes} | | | 1,2 | | nF |
| C_{res} | | | 1,1 | | nF |
| Q_G | $V_{GE} = -8\text{ V} - +20\text{ V}$ | | 1200 | | nC |
| R_{Gint} | $T_j = 25\text{ °C}$ | | 2,5 | | Ω |
| $t_{d(on)}$ | $R_{Gon} = 8\text{ }\Omega$ | $V_{CC} = 600\text{ V}$ $I_{Cnom} = 100\text{ A}$ | 80 | | ns |
| t_r | | | 40 | | ns |
| E_{on} | | | 10 | | mJ |
| $t_{d(off)}$ | $R_{Goff} = 8\text{ }\Omega$ | $T_j = 125\text{ °C}$ $V_{GE} = \pm 15\text{ V}$ | 460 | | ns |
| t_f | | | 65 | | ns |
| E_{off} | | | 9 | | mJ |
| $R_{th(j-c)}$ | per IGBT | | | 0,15 | K/W |



SEMITRANS® 3

SPT IGBT Modules

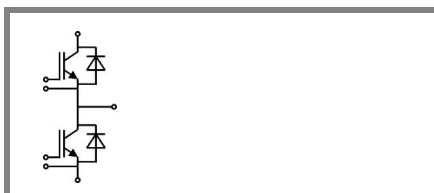
SKM 150GB128D

Features

- SPT = Soft punch-through technology
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_c$

Typical Applications

- AC inverter drives
- UPS
- Electronic welders at f_{sw} up to 20 kHz



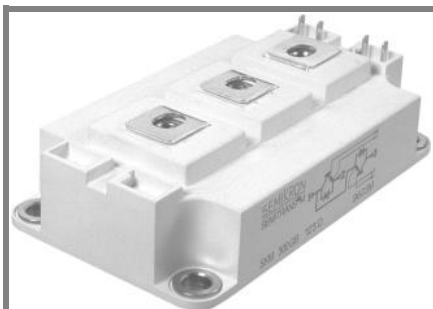
GB

| Characteristics | | | | min. | typ. | max. | Units |
|----------------------|--------------------------------------|--------------------------|---|------|------|-------|-------|
| Symbol | Conditions | | | | | | |
| 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 | 2,3 | V |
| V_{F0} | | | $T_j = 25 \text{ }^\circ\text{C}$ | | 1,1 | 1,45 | V |
| | | | $T_j = 125 \text{ }^\circ\text{C}$ | | | 1,25 | V |
| r_F | | | $T_j = 25 \text{ }^\circ\text{C}$ | | 9 | 13 | mΩ |
| | | | $T_j = 125 \text{ }^\circ\text{C}$ | | | 11 | mΩ |
| I_{RRM} | $I_{Fnom} = 100 \text{ A}$ | | $T_j = 125 \text{ }^\circ\text{C}$ | | 145 | | A |
| Q_{rr} | $di/dt = 3600 \text{ A}/\mu\text{s}$ | | | | 16,5 | | μC |
| E_{rr} | $V_{GE} = -15 \text{ V}$ | $V_{CC} = 600 \text{ V}$ | | | 5,5 | | mJ |
| $R_{th(j-c)D}$ | per diode | | | | | 0,3 | 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.

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

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SEMITRANS® 3

SPT IGBT Modules

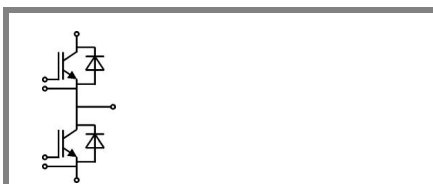
SKM 150GB128D

Features

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- High short circuit capability, self limiting to $6 \times I_c$

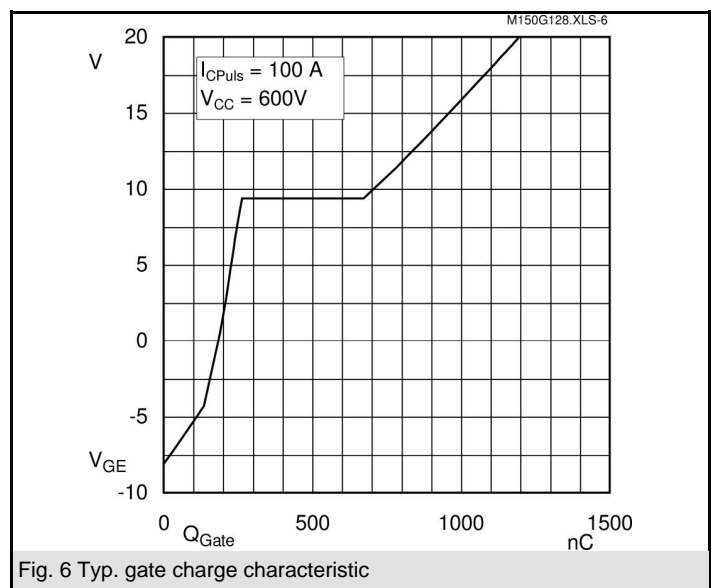
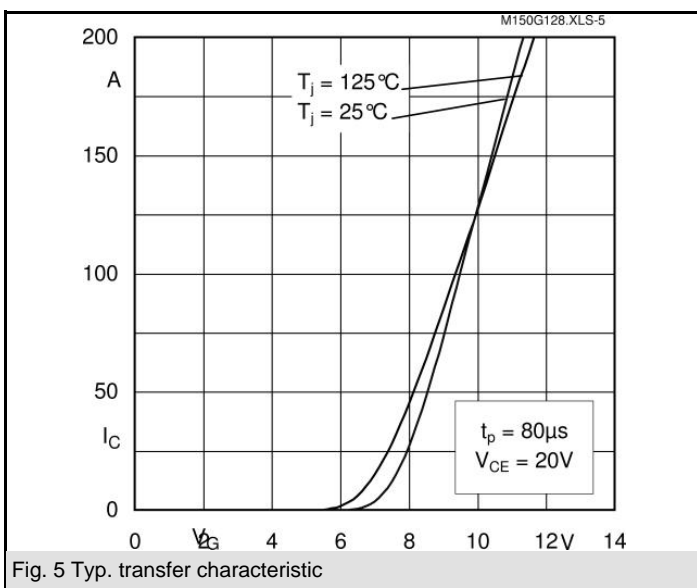
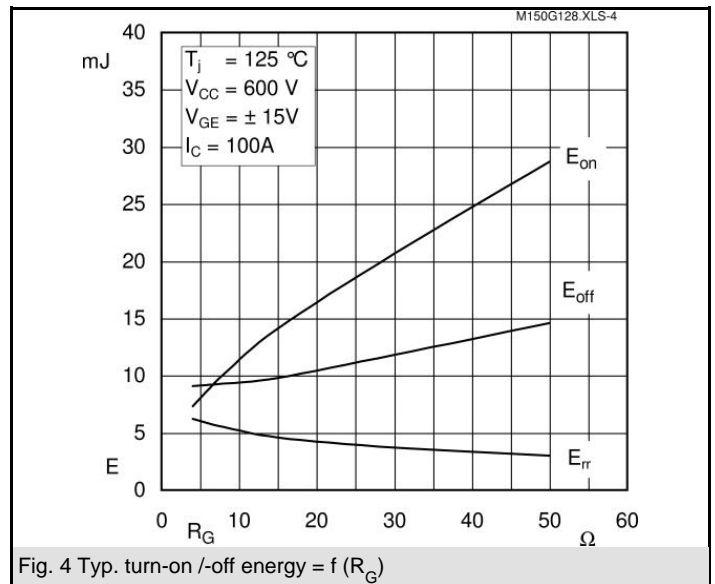
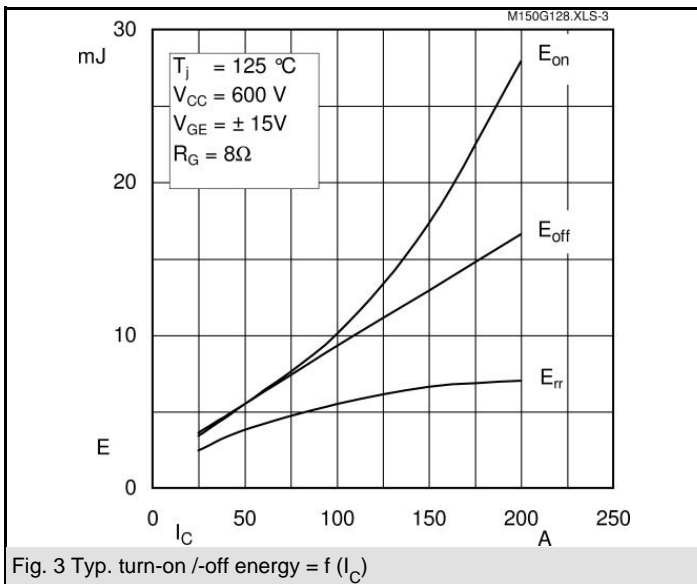
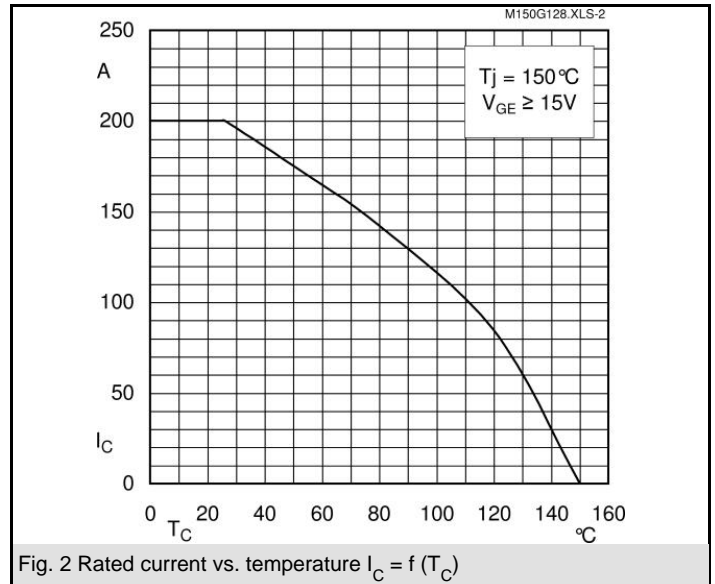
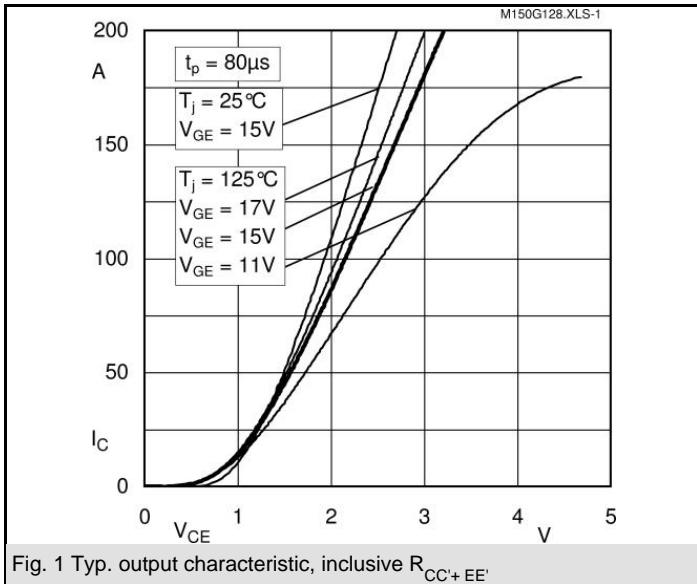
Typical Applications

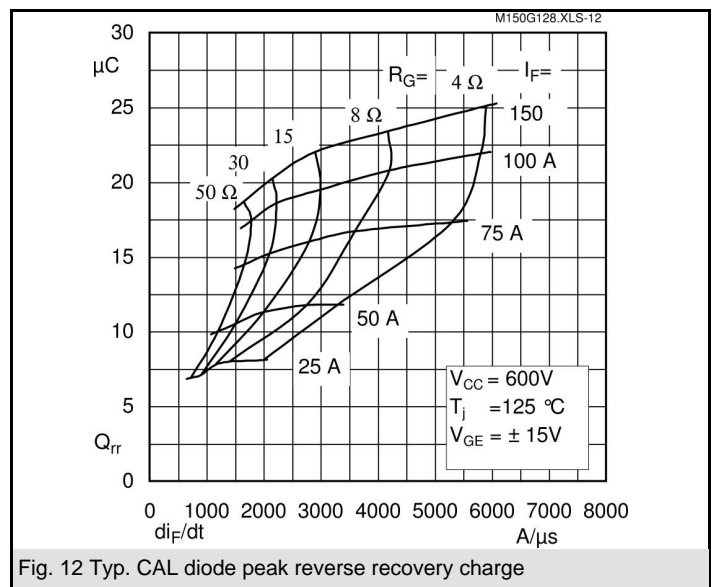
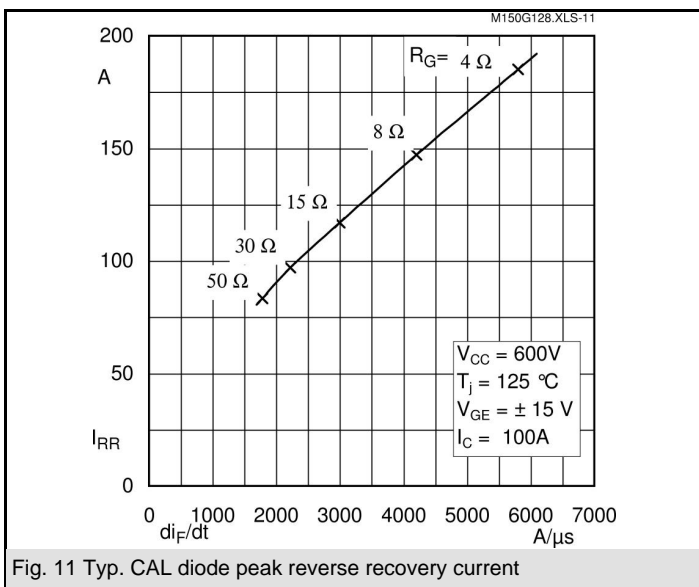
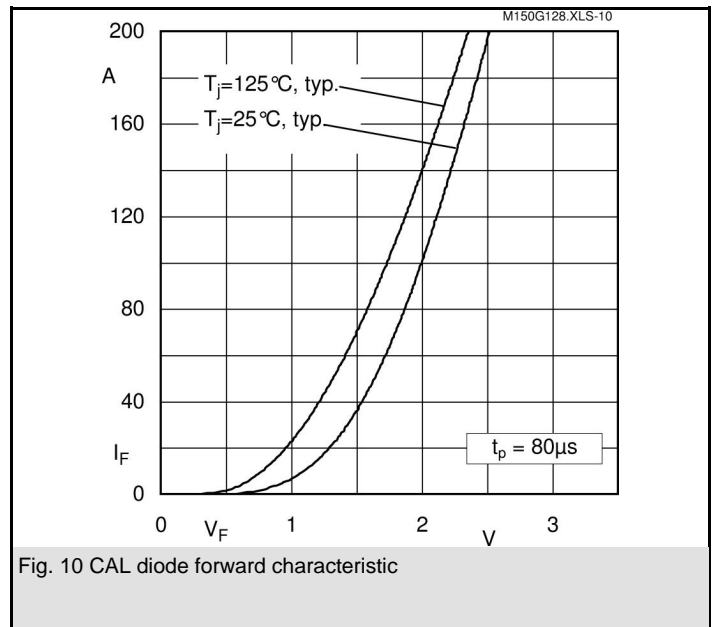
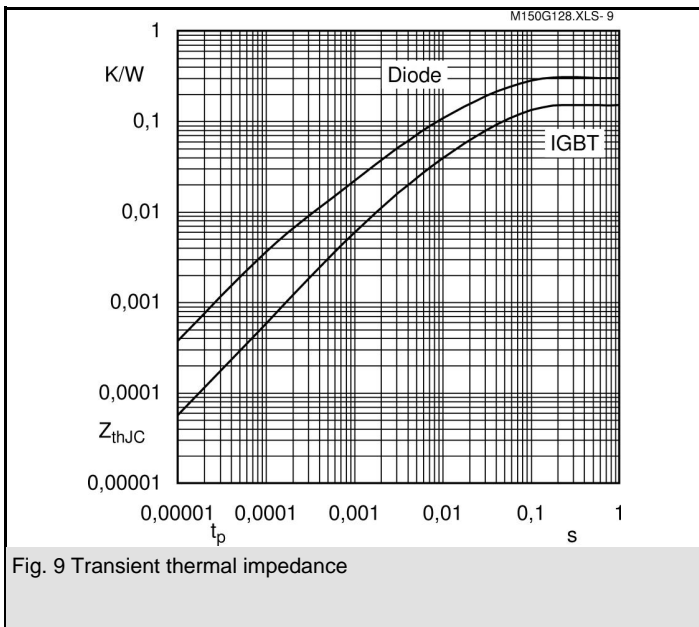
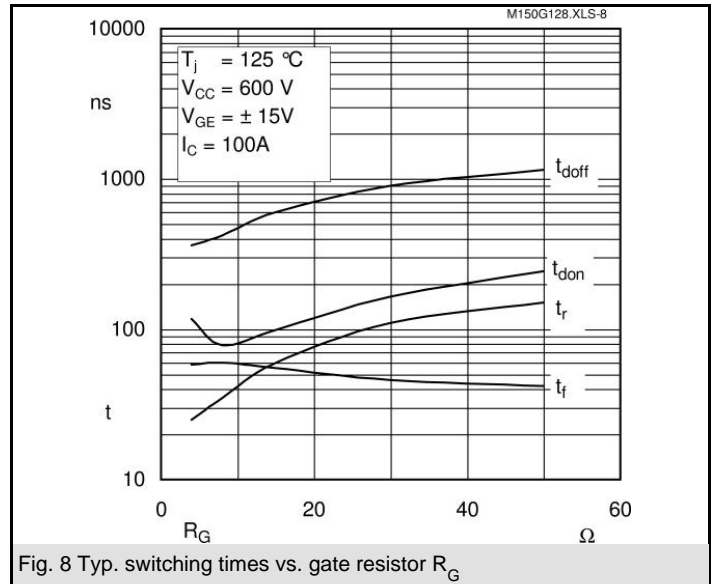
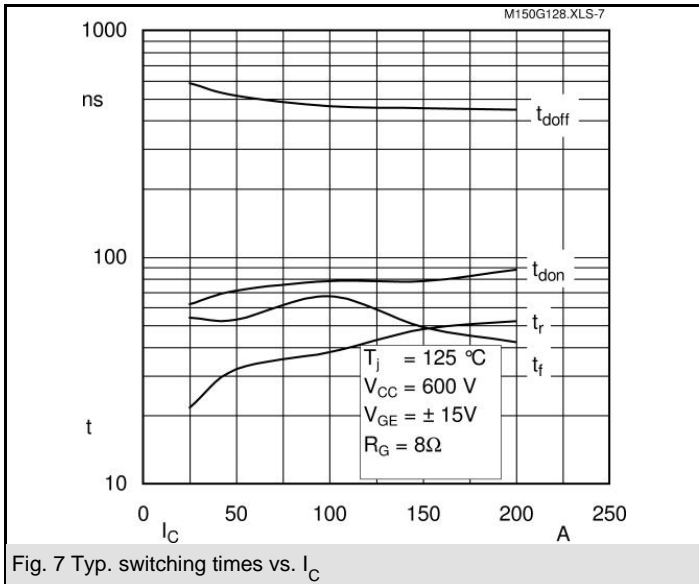
- AC inverter drives
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- Electronic welders at f_{sw} up to 20 kHz



GB

| Z_{th} | | Conditions | Values | Units |
|----------------------------------|--|------------|--------|-------|
| $Z_{th(j-c)I}$ | | | | |
| $R_{\theta j-c}$ | | $i = 1$ | 116 | mk/W |
| $R_{\theta j-c}$ | | $i = 2$ | 28 | mk/W |
| $R_{\theta j-c}$ | | $i = 3$ | 5,4 | mk/W |
| $R_{\theta j-c}$ | | $i = 4$ | 0,6 | mk/W |
| $\tau_{th(j-c)}$ | | $i = 1$ | 0,0576 | s |
| $\tau_{th(j-c)}$ | | $i = 2$ | 0,0073 | s |
| $\tau_{th(j-c)}$ | | $i = 3$ | 0,023 | s |
| $\tau_{th(j-c)}$ | | $i = 4$ | 0,02 | s |
| $Z_{th(j-c)D}$ | | | | |
| $R_{\theta j-c}$ | | $i = 1$ | 190 | mk/W |
| $R_{\theta j-c}$ | | $i = 2$ | 85 | mk/W |
| $R_{\theta j-c}$ | | $i = 3$ | 21,5 | mk/W |
| $R_{\theta j-c}$ | | $i = 4$ | 3,5 | mk/W |
| $\tau_{th(j-c)}$ | | $i = 1$ | 0,0331 | s |
| $\tau_{th(j-c)}$ | | $i = 2$ | 0,0113 | s |
| $\tau_{th(j-c)}$ | | $i = 3$ | 0,0012 | s |
| $\tau_{th(j-c)}$ | | $i = 4$ | 0,001 | s |



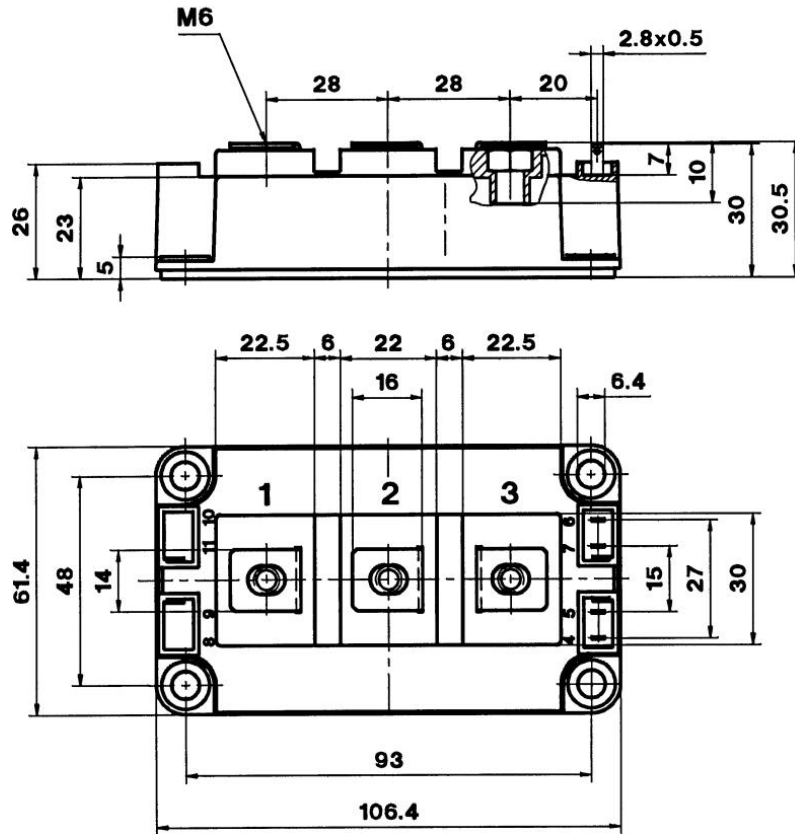


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CASED56

File no. 63 532



Case D 56



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Case D 56