

# SKM 75GB176D



**SEMITRANS® 2**

## Trench IGBT Modules

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### Features

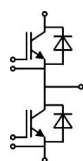
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$  with positive temperature coefficient
- High short circuit capability, self limiting to  $6 \times I_C$

### Typical Applications\*

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

| Absolute Maximum Ratings |                                                                                                        | T <sub>case</sub> = 25°C, unless otherwise specified |               |       |
|--------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------|---------------|-------|
| Symbol                   | Conditions                                                                                             |                                                      | Values        | Units |
| IGBT                     |                                                                                                        |                                                      |               |       |
| V <sub>CES</sub>         | T <sub>j</sub> = 25 °C                                                                                 |                                                      | 1700          | V     |
| I <sub>C</sub>           | T <sub>j</sub> = 150 °C                                                                                | T <sub>c</sub> = 25 °C                               | 80            | A     |
|                          |                                                                                                        | T <sub>c</sub> = 80 °C                               | 55            | A     |
| I <sub>CRM</sub>         | I <sub>CRM</sub> =2xI <sub>Cnom</sub>                                                                  |                                                      | 100           | A     |
| V <sub>GES</sub>         |                                                                                                        |                                                      | ± 20          | V     |
| t <sub>psc</sub>         | V <sub>CC</sub> = 1200 V; V <sub>GE</sub> ≤ 20 V; T <sub>j</sub> = 125 °C<br>V <sub>CES</sub> < 1700 V |                                                      | 10            | µs    |
| Inverse Diode            |                                                                                                        |                                                      |               |       |
| I <sub>F</sub>           | T <sub>j</sub> = 150 °C                                                                                | T <sub>c</sub> = 25 °C                               | 80            | A     |
|                          |                                                                                                        | T <sub>c</sub> = 80 °C                               | 55            | A     |
| I <sub>FRM</sub>         | I <sub>FRM</sub> =2xI <sub>Fnom</sub>                                                                  |                                                      | 100           | A     |
| I <sub>FSM</sub>         | t <sub>p</sub> = 10 ms; sin.                                                                           | T <sub>j</sub> = 150 °C                              | 550           | A     |
| Module                   |                                                                                                        |                                                      |               |       |
| I <sub>t(RMS)</sub>      |                                                                                                        |                                                      | 200           | A     |
| T <sub>vj</sub>          |                                                                                                        |                                                      | -40 ... + 150 | °C    |
| T <sub>stg</sub>         |                                                                                                        |                                                      | -40 ... + 125 | °C    |
| V <sub>isol</sub>        | AC, 1 min.                                                                                             |                                                      | 4000          | V     |

| Characteristics |                                                                | $T_{case} = 25^\circ\text{C}$ , unless otherwise specified |                                      |      |                  |
|-----------------|----------------------------------------------------------------|------------------------------------------------------------|--------------------------------------|------|------------------|
| Symbol          | Conditions                                                     | min.                                                       | typ.                                 | max. | Units            |
| <b>IGBT</b>     |                                                                |                                                            |                                      |      |                  |
| $V_{GE(th)}$    | $V_{GE} = V_{CE}, I_C = 2\text{ mA}$                           | 5,2                                                        | 5,8                                  | 6,4  | V                |
| $I_{CES}$       | $V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$                        |                                                            |                                      | 3    | mA               |
| $V_{CE0}$       |                                                                |                                                            | $T_j = 25^\circ\text{C}$             | 1    | V                |
|                 |                                                                |                                                            | $T_j = 125^\circ\text{C}$            | 0,9  | V                |
| $r_{CE}$        | $V_{GE} = 15\text{ V}$                                         |                                                            | $T_j = 25^\circ\text{C}$             | 20   | $\text{m}\Omega$ |
|                 |                                                                |                                                            | $T_j = 125^\circ\text{C}$            | 31   | $\text{m}\Omega$ |
| $V_{CE(sat)}$   | $I_{Cnom} = 50\text{ A}, V_{GE} = 15\text{ V}$                 |                                                            | $T_j = 25^\circ\text{C}_{chiplev.}$  | 2    | V                |
|                 |                                                                |                                                            | $T_j = 125^\circ\text{C}_{chiplev.}$ | 2,45 | V                |
| $C_{ies}$       | $V_{CE} = 25, V_{GE} = 0\text{ V}$                             | $f = 1\text{ MHz}$                                         |                                      | 4,3  | nF               |
| $C_{oes}$       |                                                                |                                                            |                                      | 0,18 | nF               |
| $C_{res}$       |                                                                |                                                            |                                      | 0,15 | nF               |
| $Q_G$           | $V_{GE} = -8\text{V}...+15\text{V}$                            |                                                            |                                      | 410  | nC               |
| $R_{Gint}$      | $T_j = 25^\circ\text{C}$                                       |                                                            |                                      | 9,5  | $\Omega$         |
| $t_{d(on)}$     | $R_{Gon} = 6,2\ \Omega$<br>$di/dt = 1680\text{ A}/\mu\text{s}$ | $V_{CC} = 1200\text{V}$<br>$I_C = 50\text{A}$              |                                      | 210  | ns               |
| $t_r$           |                                                                |                                                            |                                      | 30   | ns               |
| $E_{on}$        |                                                                |                                                            |                                      | 25   | mJ               |
| $t_{d(off)}$    | $R_{Goff} = 6,2\ \Omega$<br>$di/dt = 320\text{ A}/\mu\text{s}$ | $T_j = 125^\circ\text{C}$<br>$V_{GE} = \pm 15\text{V}$     |                                      | 590  | ns               |
| $t_f$           |                                                                |                                                            |                                      | 135  | ns               |
| $E_{off}$       |                                                                |                                                            |                                      | 18   | mJ               |
| $R_{th(j-c)}$   | per IGBT                                                       |                                                            |                                      | 0,38 | K/W              |



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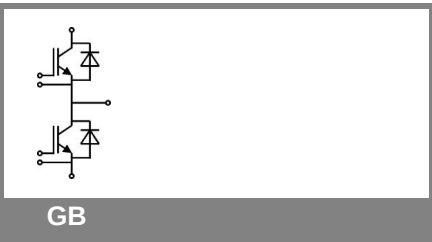
Typical Applications\*

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

| Characteristics                  |                                                   |                                             |      |      |      |       |
|----------------------------------|---------------------------------------------------|---------------------------------------------|------|------|------|-------|
| Symbol                           | Conditions                                        |                                             | min. | typ. | max. | Units |
| Inverse Diode                    |                                                   |                                             |      |      |      |       |
| V <sub>F</sub> = V <sub>EC</sub> | I <sub>Fnom</sub> = 50 A; V <sub>GE</sub> = 0 V   | T <sub>j</sub> = 25 °C <sub>chiplev.</sub>  | 1,7  | 1,9  | V    |       |
|                                  |                                                   | T <sub>j</sub> = 125 °C <sub>chiplev.</sub> | 1,8  | 2    | V    |       |
| V <sub>F0</sub>                  |                                                   | T <sub>j</sub> = 25 °C                      | 1,1  | 1,3  | V    |       |
|                                  |                                                   | T <sub>j</sub> = 125 °C                     | 0,9  | 1,1  | V    |       |
| r <sub>F</sub>                   |                                                   | T <sub>j</sub> = 25 °C                      | 12   | 12   | mΩ   |       |
|                                  |                                                   | T <sub>j</sub> = 125 °C                     | 18   | 18   | mΩ   |       |
| I <sub>RRM</sub>                 | I <sub>F</sub> = 50 A                             | T <sub>j</sub> = 125 °C                     | 52   |      | A    |       |
| Q <sub>rr</sub>                  | di/dt = 1320 A/μs                                 |                                             | 20   |      | μC   |       |
| E <sub>rr</sub>                  | V <sub>GE</sub> = -15 V; V <sub>CC</sub> = 1200 V |                                             | 14,5 |      | mJ   |       |
| R <sub>th(j-c)D</sub>            | per diode                                         |                                             |      | 0,55 | K/W  |       |
| Module                           |                                                   |                                             |      |      |      |       |
| L <sub>CE</sub>                  |                                                   |                                             |      | 30   | nH   |       |
| R <sub>CC'+EE'</sub>             | res., terminal-chip                               | T <sub>case</sub> = 25 °C                   | 0,75 |      | mΩ   |       |
|                                  |                                                   | T <sub>case</sub> = 125 °C                  | 1    |      | mΩ   |       |
| R <sub>th(c-s)</sub>             | per module                                        |                                             |      | 0,05 | K/W  |       |
| M <sub>s</sub>                   | to heat sink M6                                   |                                             | 3    | 5    | Nm   |       |
| M <sub>t</sub>                   | to terminals M5                                   |                                             | 2,5  | 5    | Nm   |       |
| w                                |                                                   |                                             |      | 160  | 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.



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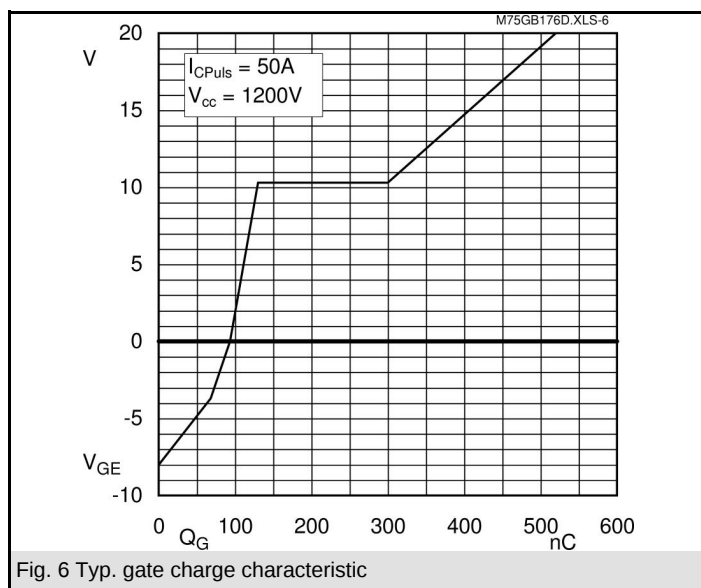
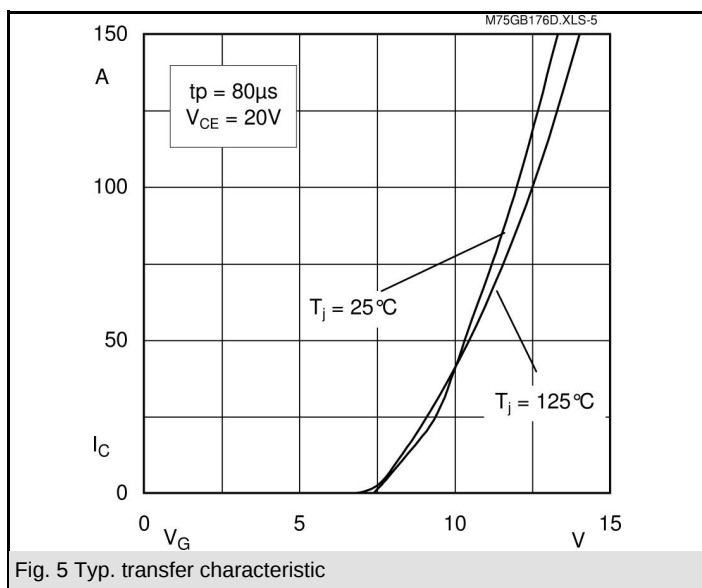
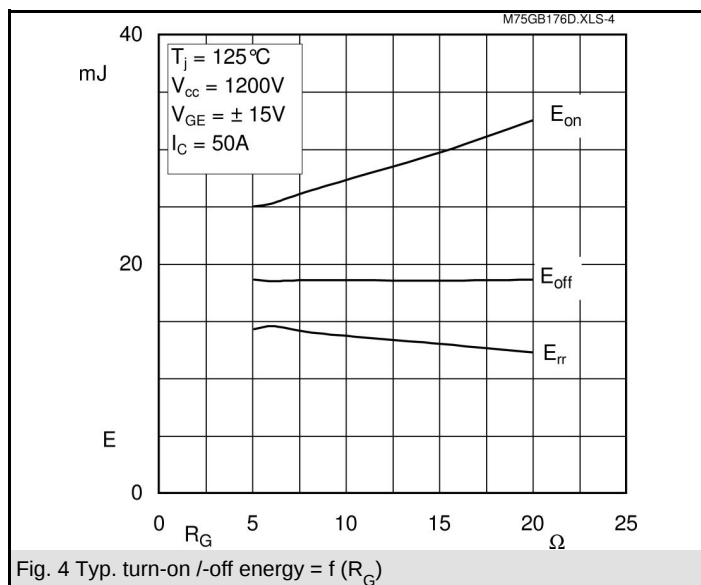
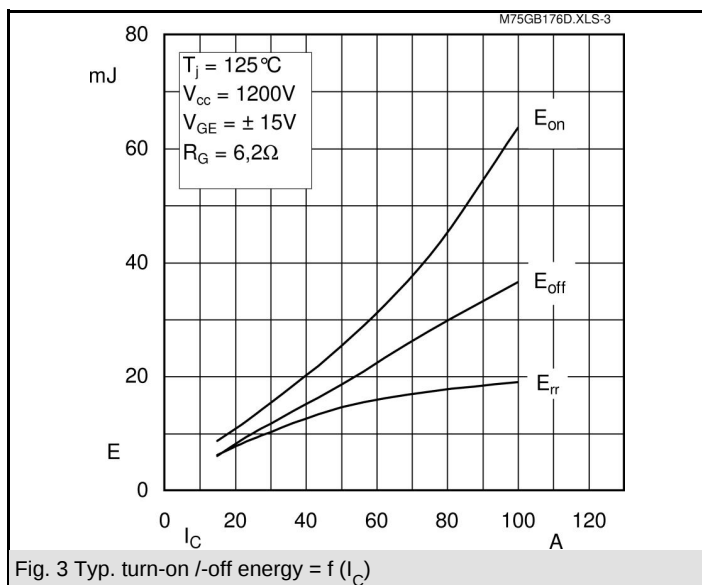
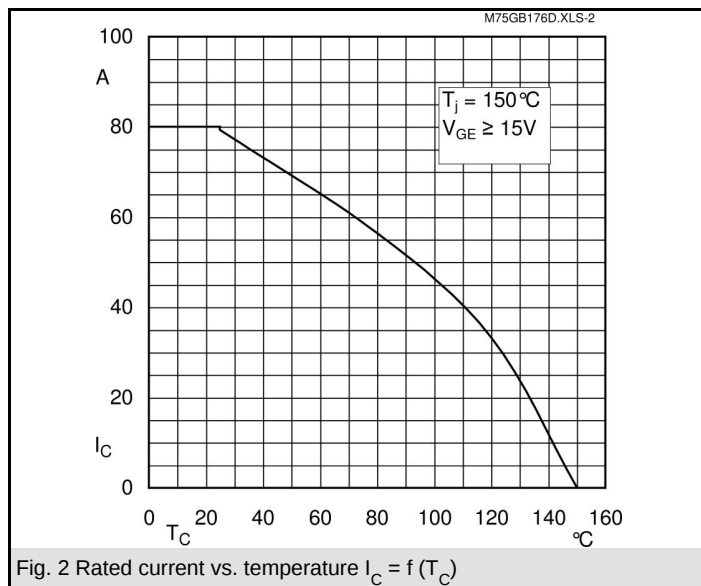
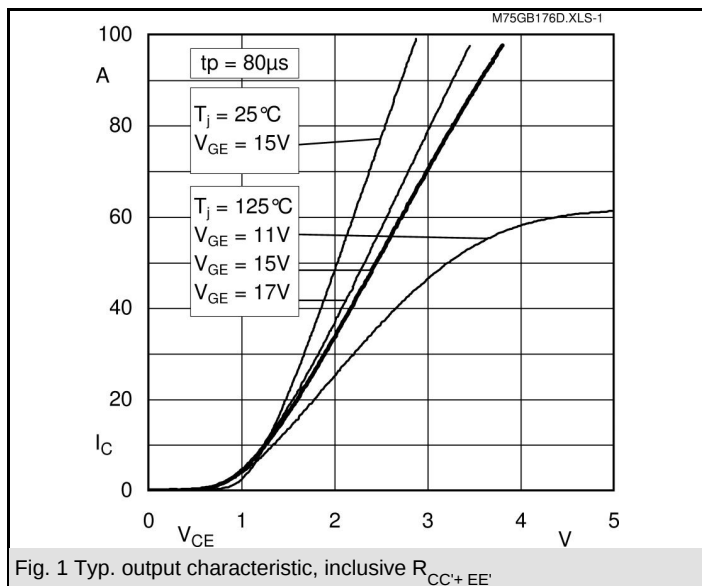
### Typical Applications\*

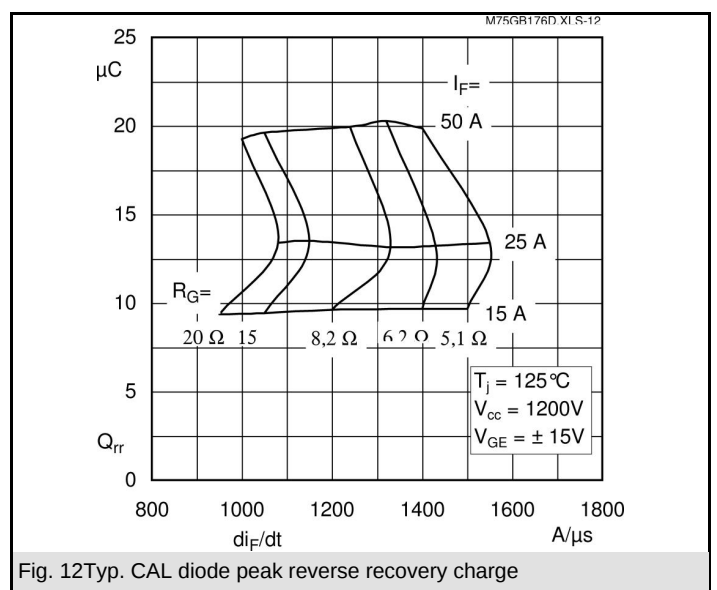
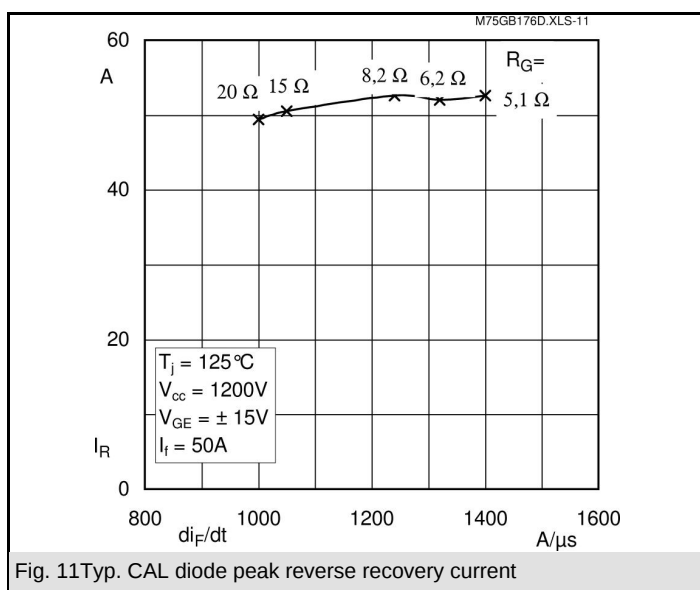
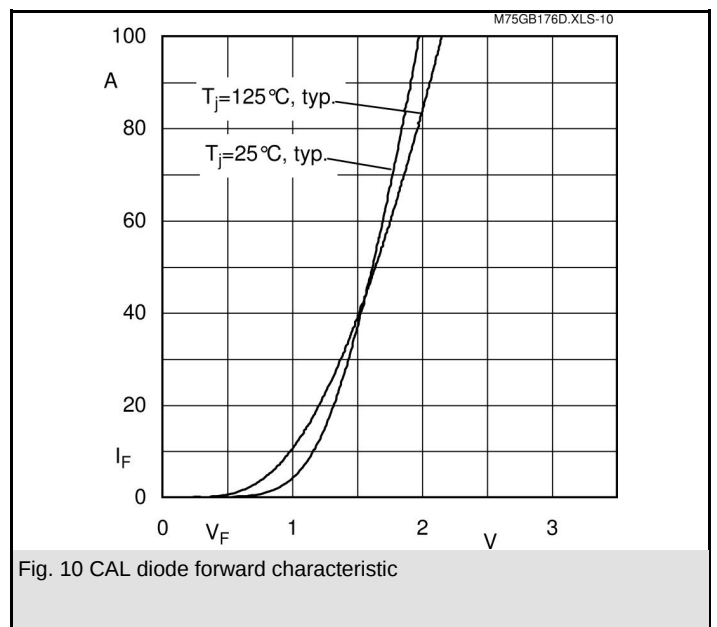
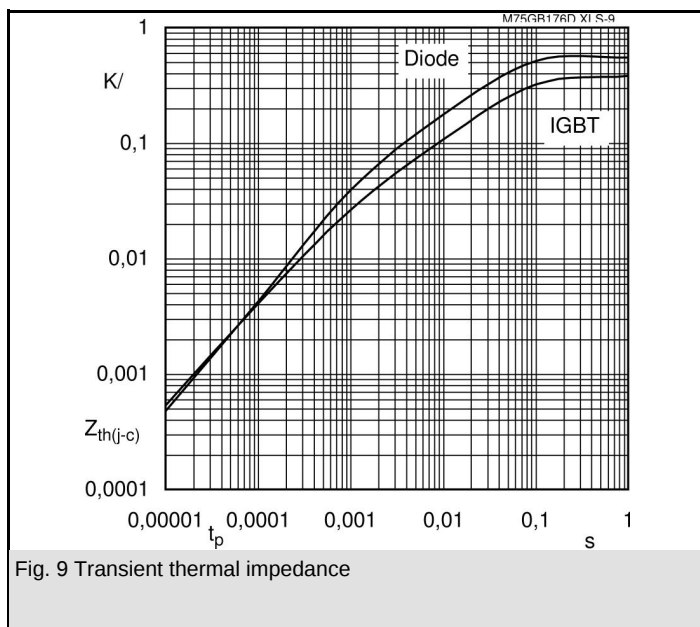
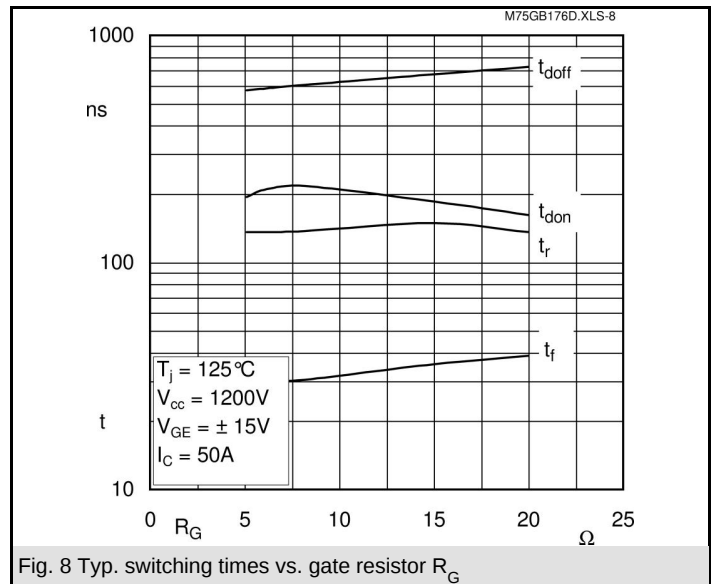
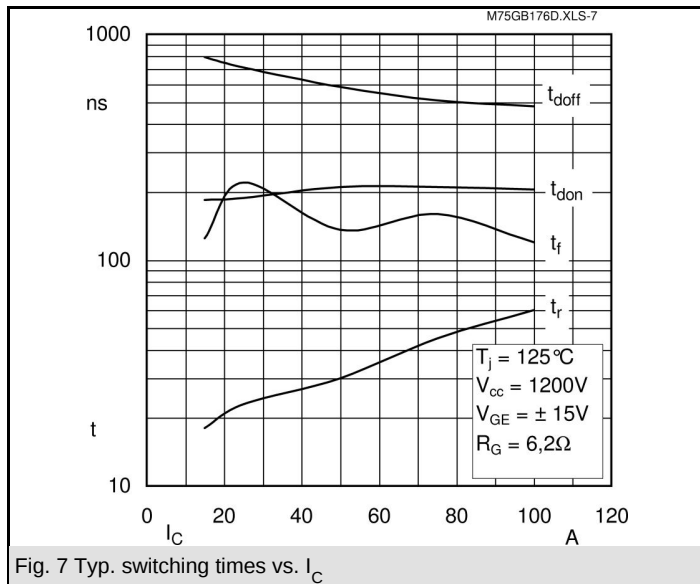
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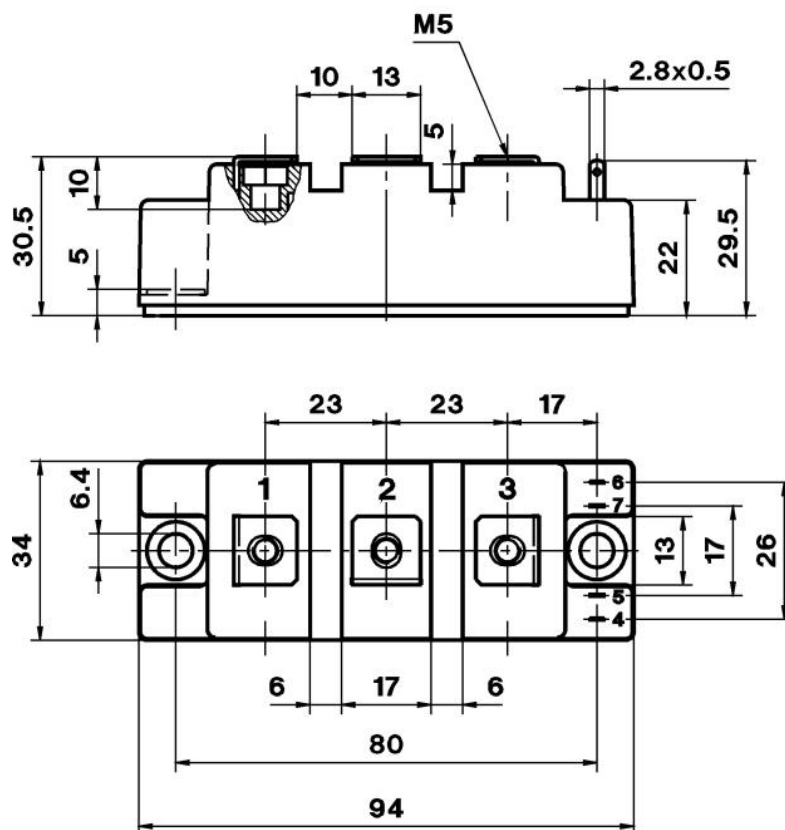
| $Z_{th}$       |            |        |       |
|----------------|------------|--------|-------|
| Symbol         | Conditions | Values | Units |
| $Z_{th(j-c)I}$ |            |        |       |
| $R_i$          | $i = 1$    | 270    | mk/W  |
| $R_i$          | $i = 2$    | 85     | mk/W  |
| $R_i$          | $i = 3$    | 21     | mk/W  |
| $R_i$          | $i = 4$    | 4      | mk/W  |
| $\tau_{u_i}$   | $i = 1$    | 0,0393 | s     |
| $\tau_{u_i}$   | $i = 2$    | 0,0786 | s     |
| $\tau_{u_i}$   | $i = 3$    | 0,0014 | s     |
| $\tau_{u_i}$   | $i = 4$    | 0,0002 | s     |
| $Z_{th(j-c)D}$ |            |        |       |
| $R_i$          | $i = 1$    | 360    | mk/W  |
| $R_i$          | $i = 2$    | 150    | mk/W  |
| $R_i$          | $i = 3$    | 36     | mk/W  |
| $R_i$          | $i = 4$    | 4      | mk/W  |
| $\tau_{u_i}$   | $i = 1$    | 0,0262 | s     |
| $\tau_{u_i}$   | $i = 2$    | 0,0417 | s     |
| $\tau_{u_i}$   | $i = 3$    | 0,0012 | s     |
| $\tau_{u_i}$   | $i = 4$    | 0,001  | s     |



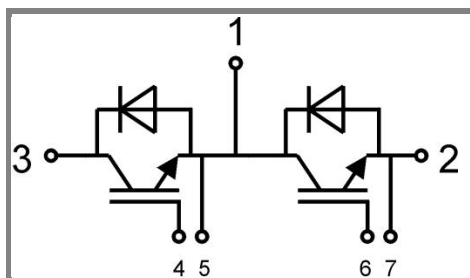
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Case D 61



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Case D 61



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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**Факс:** 8 (812) 320-02-42

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**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.