



## Fast Diode Modules

### SKKE 600F

#### Features

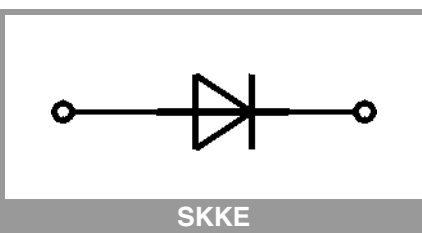
- CAL (controlled axial lifetime) technology, patent No. 43 10 44
- Heat transfer through aluminium oxide DCB ceramic isolated metal baseplate
- Small recovered charge
- Fast & soft recovery CAL diodes
- UL recognized, file no. E 63 532

#### Typical Applications\*

- Freewheeling diodes for IGBT
- Freewheeling diode for inductive loads
- Brake choppers
- Inverters and DC choppers
- AC motor control
- Boost choppers
- up to 20 kHz

| Absolute Maximum Ratings |                         |                         |             |                  |
|--------------------------|-------------------------|-------------------------|-------------|------------------|
| Symbol                   | Conditions              |                         | Values      | Unit             |
| Diode                    |                         |                         |             |                  |
| I <sub>FAV</sub>         | sin. 180                | T <sub>c</sub> = 85 °C  | 360         | A                |
|                          | T <sub>j</sub> = 150 °C | T <sub>c</sub> = 100 °C | 305         | A                |
| I <sub>FSM</sub>         | 10 ms                   | T <sub>j</sub> = 25 °C  | 7000        | A                |
|                          |                         | T <sub>j</sub> = 150 °C | 5800        | A                |
| i <sup>2</sup> t         | 10 ms                   | T <sub>j</sub> = 25 °C  | 245000      | A <sup>2</sup> s |
|                          |                         | T <sub>j</sub> = 150 °C | 168200      | A <sup>2</sup> s |
| V <sub>RSM</sub>         |                         |                         | 1200        | V                |
| V <sub>RRM</sub>         |                         |                         | 1200        | V                |
| T <sub>j</sub>           |                         |                         | -40 ... 150 | °C               |
| Module                   |                         |                         |             |                  |
| T <sub>stg</sub>         |                         |                         | -40 ... 125 | °C               |
| V <sub>isol</sub>        | a.c.; 50 Hz; r.m.s.     | 1 min                   | 4000        | V                |
|                          |                         | 1 s                     | 4800        | V                |

| Characteristics      |                                                                                      |                         |          |       |          |                  |
|----------------------|--------------------------------------------------------------------------------------|-------------------------|----------|-------|----------|------------------|
| Symbol               | Conditions                                                                           |                         | min.     | typ.  | max.     | Unit             |
| Diode                |                                                                                      |                         |          |       |          |                  |
| V <sub>F</sub>       | T <sub>j</sub> = 25 °C, I <sub>F</sub> = 600 A,                                      |                         |          |       | 2.5      | V                |
| V <sub>(TO)</sub>    | T <sub>j</sub> = 150 °C,                                                             |                         |          |       | 1.2      | V                |
| r <sub>T</sub>       | T <sub>j</sub> = 150 °C,                                                             |                         |          |       | 1.9      | mΩ               |
| I <sub>R</sub>       | V <sub>R</sub> = V <sub>RRM</sub>                                                    | T <sub>j</sub> = 25 °C  |          |       | 4        | mA               |
|                      |                                                                                      | T <sub>j</sub> = 150 °C |          |       | 30       | mA               |
| Q <sub>rr</sub>      | I <sub>F</sub> = 600 A<br>di/dt <sub>off</sub> = 4000 A/μs<br>V <sub>R</sub> = 600 V | T <sub>j</sub> = 150 °C |          | 80    |          | μC               |
| I <sub>RRM</sub>     |                                                                                      | T <sub>j</sub> = 150 °C |          | 280   |          | A                |
| t <sub>rr</sub>      |                                                                                      | T <sub>j</sub> = 150 °C |          | 0.78  |          | μs               |
| E <sub>rr</sub>      |                                                                                      | T <sub>j</sub> = 150 °C |          | 21    |          | mJ               |
| R <sub>th(j-c)</sub> |                                                                                      | cont.                   | per chip |       | 0.062    |                  |
|                      | per module                                                                           |                         |          |       |          | K/W              |
| Module               |                                                                                      |                         |          |       |          |                  |
| R <sub>th(c-s)</sub> | chip                                                                                 |                         |          | 0.038 |          | K/W              |
|                      | module                                                                               |                         |          |       |          | K/W              |
| M <sub>s</sub>       |                                                                                      |                         | 3        |       | 5        | Nm               |
| M <sub>t</sub>       |                                                                                      |                         | 2.5      |       | 5        | Nm               |
| a                    |                                                                                      |                         |          |       | 5 * 9,81 | m/s <sup>2</sup> |
| w                    |                                                                                      |                         |          | 330   |          | g                |



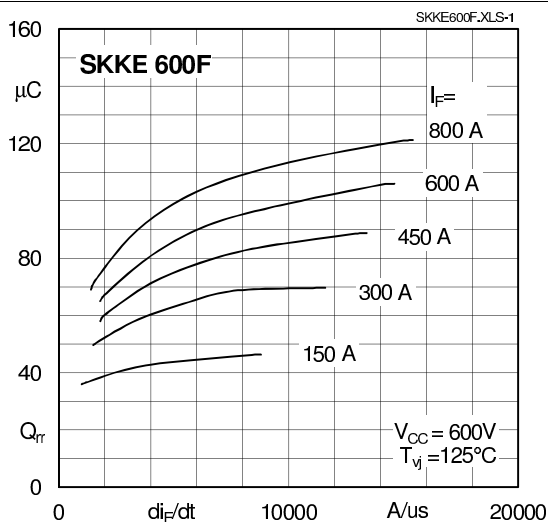


Fig. 1: Typ. recovery charge vs. current decrease

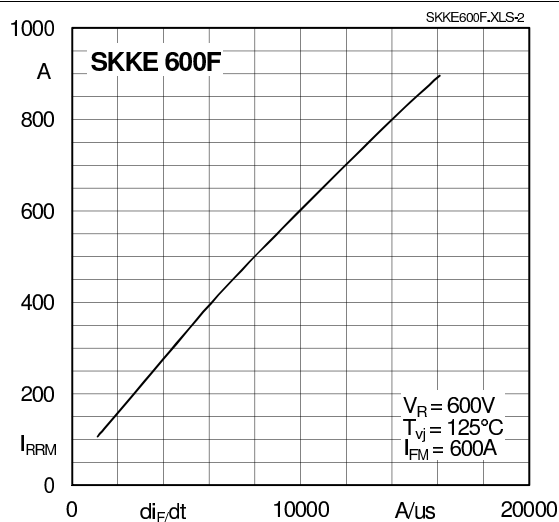


Fig. 2: Peak recovery current vs. current decrease

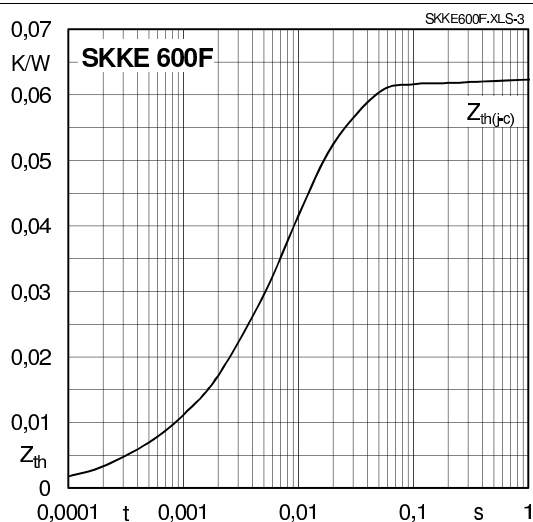


Fig. 3: Transient thermal impedance vs. time

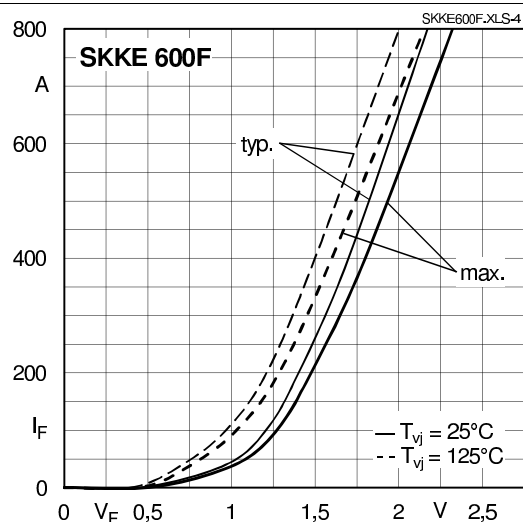


Fig. 4: Forward characteristics

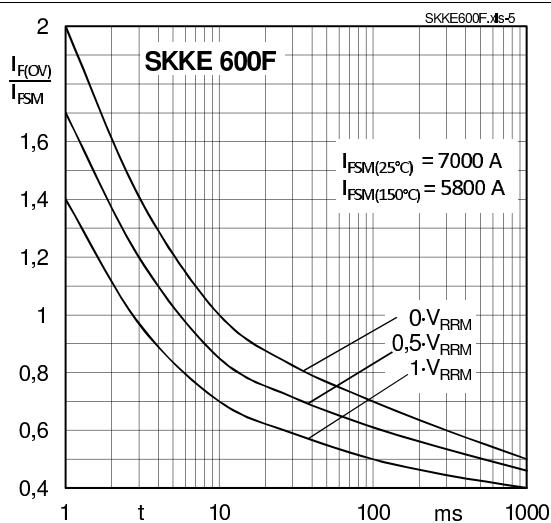


Fig. 5: Surge overload current vs. time

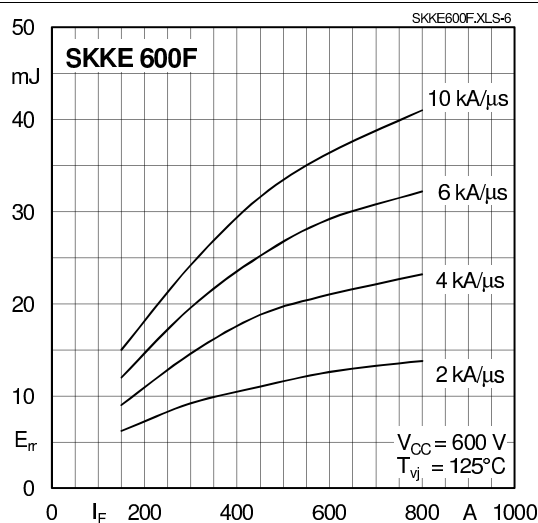
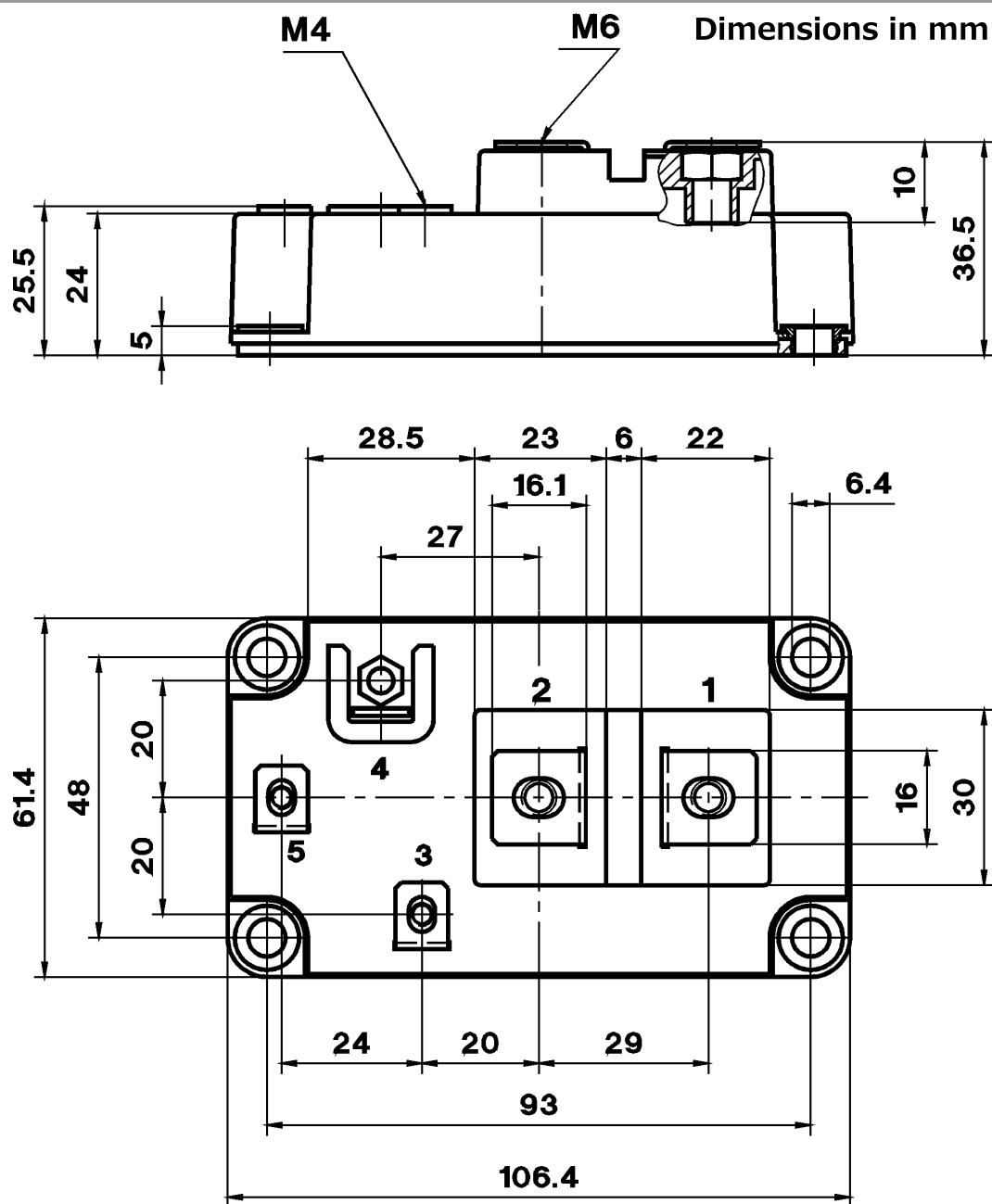


Fig. 6: Typ. turn-off energy dissipation per pulse



General tolerance  $\pm 0.5$  mm

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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 staff.