



SEMIPACK® 6

## Thyristor Modules

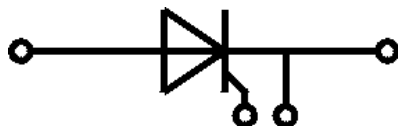
### SKET 741/22 E

#### Features

- Precious metal pressure contacts for high reliability
- Thyristor with amplifying gate
- UL recognized, file no. E 63 532

#### Typical Applications\*

- DC motor control (e. g. for machine tools)
- Temperature control (e. g. for ovens, chemical processes)
- Softstart application



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| Absolute Maximum Ratings |                      |                         |             |                  |
|--------------------------|----------------------|-------------------------|-------------|------------------|
| Symbol                   | Conditions           |                         | Values      | Unit             |
| Chip                     |                      |                         |             |                  |
| I <sub>T(AV)</sub>       | sinus 180°           | T <sub>c</sub> = 85 °C  | 819         | A                |
|                          |                      | T <sub>c</sub> = 100 °C | 564         | A                |
| I <sub>TRMS</sub>        | continuous operation |                         | 1500        | A                |
| I <sub>TSM</sub>         | 10 ms                | T <sub>j</sub> = 25 °C  | 30000       | A                |
|                          |                      | T <sub>j</sub> = 125 °C | 26500       | A                |
| i <sup>2</sup> t         | 10 ms                | T <sub>j</sub> = 25 °C  | 4500000     | A <sup>2</sup> s |
|                          |                      | T <sub>j</sub> = 125 °C | 3500000     | A <sup>2</sup> s |
| V <sub>RSM</sub>         |                      |                         | 2300        | V                |
| V <sub>RRM</sub>         |                      |                         | 2200        | V                |
| V <sub>DRM</sub>         |                      |                         | 2200        | V                |
| (di/dt) <sub>cr</sub>    |                      |                         | 200         | A/μs             |
| (dv/dt) <sub>cr</sub>    |                      |                         | 1000        | V/μs             |
| T <sub>j</sub>           |                      |                         | -40 ... 125 | °C               |
| Module                   |                      |                         |             |                  |
| T <sub>stg</sub>         |                      |                         | -40 ... 130 | °C               |
| V <sub>isol</sub>        | a.c.; 50 Hz; r.m.s.  | 1 min                   | 3000        | V                |
|                          |                      | 1 s                     | 3600        | V                |

| Characteristics                   |                                                                                                  |            |      |      |          |                  |
|-----------------------------------|--------------------------------------------------------------------------------------------------|------------|------|------|----------|------------------|
| Symbol                            | Conditions                                                                                       |            | min. | typ. | max.     | Unit             |
| Chip                              |                                                                                                  |            |      |      |          |                  |
| V <sub>T</sub>                    | T <sub>j</sub> = 125 °C, I <sub>T</sub> = 3000 A                                                 |            |      |      | 1.51     | V                |
| V <sub>T(TO)</sub>                | T <sub>j</sub> = 125 °C                                                                          |            |      |      | 0.82     | V                |
| r <sub>T</sub>                    | T <sub>j</sub> = 125 °C                                                                          |            |      |      | 0.17     | mΩ               |
| I <sub>DD</sub> ; I <sub>RD</sub> | T <sub>j</sub> = 125 °C, V <sub>DD</sub> = V <sub>DRM</sub> ; V <sub>RD</sub> = V <sub>RRM</sub> |            |      |      | 150      | mA               |
| t <sub>gd</sub>                   | T <sub>j</sub> = 25 °C, I <sub>G</sub> = 1 A, di <sub>G</sub> /dt = 1 A/μs                       |            |      |      | 4        | μs               |
| t <sub>q</sub>                    |                                                                                                  |            |      | 350  |          | μs               |
| I <sub>H</sub>                    | T <sub>j</sub> = 25 °C                                                                           |            |      |      | 500      | mA               |
| I <sub>L</sub>                    | T <sub>j</sub> = 25 °C, R <sub>G</sub> = 33 Ω                                                    |            |      |      | 2500     | mA               |
| V <sub>GT</sub>                   | T <sub>j</sub> = 25 °C, d.c.                                                                     |            | 2.2  |      |          | V                |
| I <sub>GT</sub>                   | T <sub>j</sub> = 25 °C, d.c.                                                                     |            | 250  |      |          | mA               |
| V <sub>GD</sub>                   | T <sub>j</sub> = 125 °C, d.c.                                                                    |            |      |      | 0.25     | V                |
| I <sub>GD</sub>                   | T <sub>j</sub> = 125 °C, d.c.                                                                    |            |      |      | 10       | mA               |
| R <sub>th(j-c)</sub>              | cont.                                                                                            | per chip   |      |      | 0.0405   | K/W              |
|                                   |                                                                                                  | per module |      |      | 0.0405   | K/W              |
| R <sub>th(j-c)</sub>              | sin. 180°                                                                                        | per chip   |      |      | 0.042    | K/W              |
|                                   |                                                                                                  | per module |      |      | 0.042    | K/W              |
| R <sub>th(j-c)</sub>              | rec. 120°                                                                                        | per chip   |      |      | 0.043    | K/W              |
|                                   |                                                                                                  | per module |      |      | 0.043    | K/W              |
| Module                            |                                                                                                  |            |      |      |          |                  |
| R <sub>th(c-s)</sub>              | chip                                                                                             |            |      |      | 0.015    | K/W              |
|                                   | module                                                                                           |            |      |      | 0.015    | K/W              |
| M <sub>s</sub>                    | to heatsink M6                                                                                   |            | 5.1  |      | 6.9      | Nm               |
| M <sub>t</sub>                    | to terminal M12                                                                                  |            | 16.2 |      | 19.8     | Nm               |
| a                                 |                                                                                                  |            |      |      | 5 * 9,81 | m/s <sup>2</sup> |
| w                                 |                                                                                                  |            |      | 1950 |          | g                |

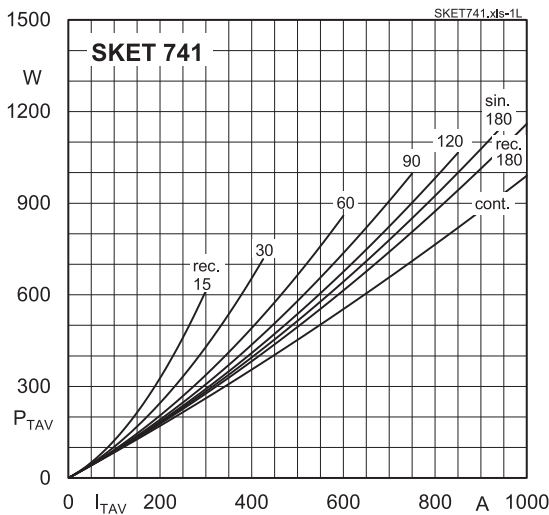


Fig. 1L: Power dissipation per thyristor vs. on-state current

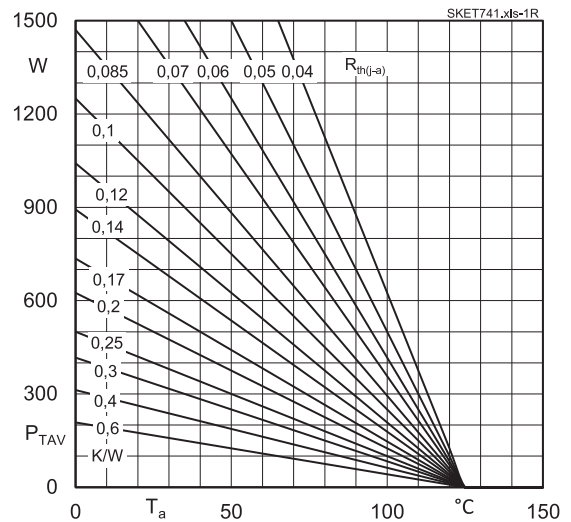


Fig. 1R: Power dissipation per thyristor vs. ambient temperature

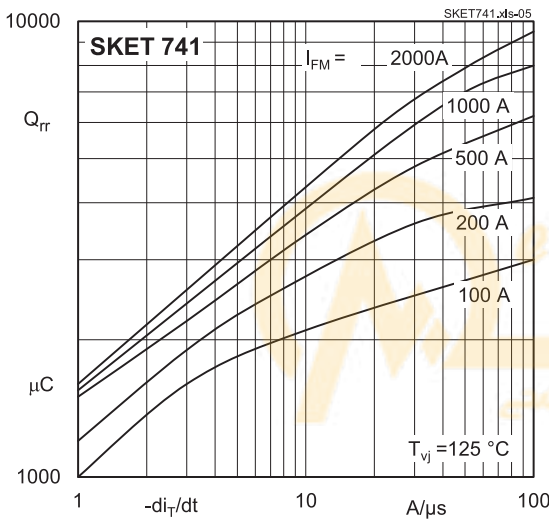


Fig. 5: Recovered charge vs. current decrease

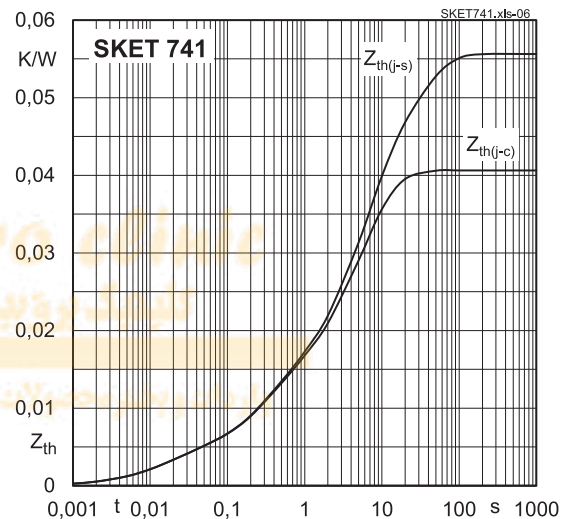


Fig. 6: Transient thermal impedance vs. time

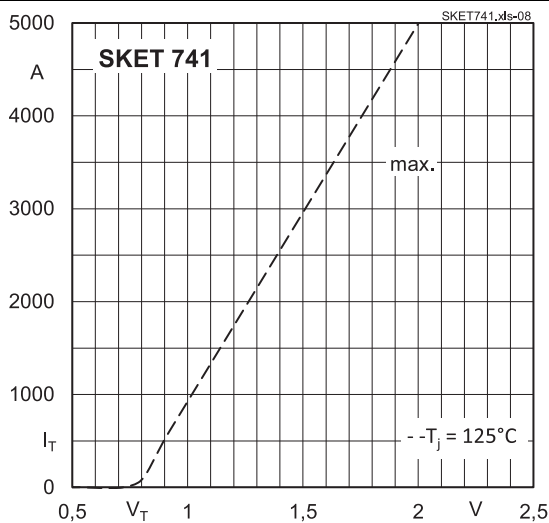


Fig. 7: On-state characteristics

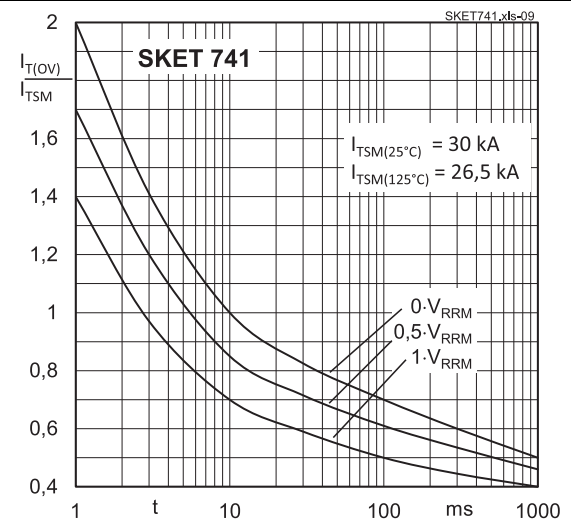


Fig. 8: Surge overload current vs. time

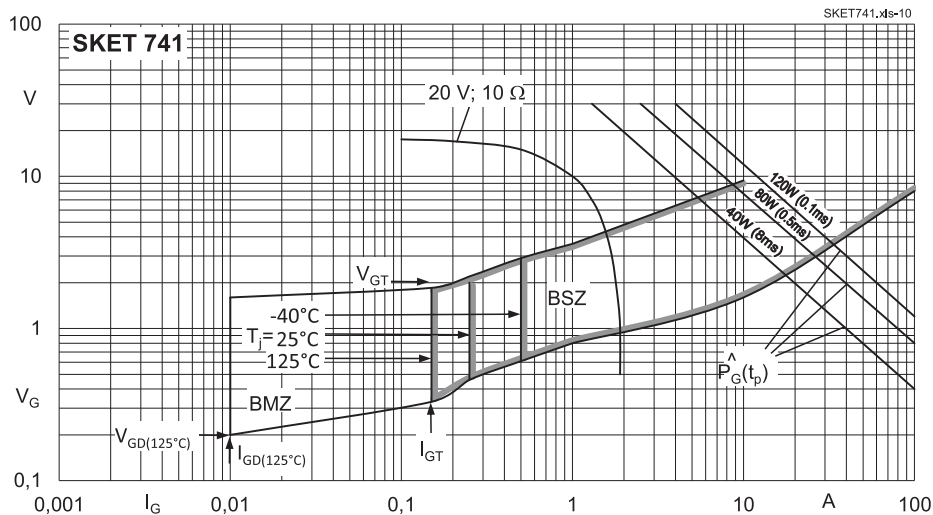
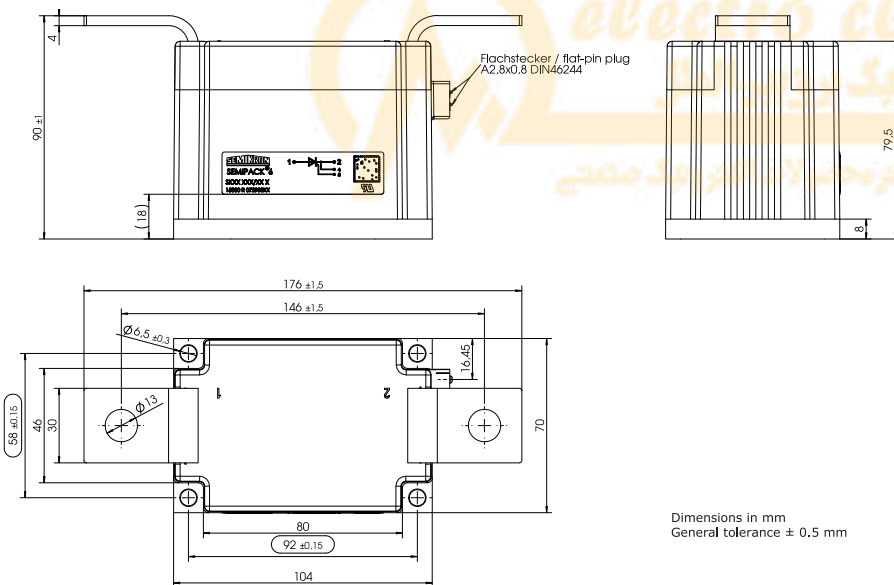
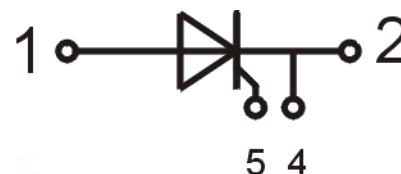


Fig. 9: Gate trigger characteristics



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

## \*IMPORTANT INFORMATION AND WARNINGS

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