

# SKUT 115/12T V2



**SEMIPONT® 5**

**Three phase antiparallel  
thyristor module**

**SKUT 115/12T V2**

## Features

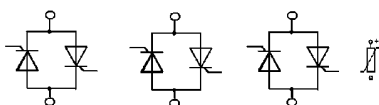
- Compact design
- Two screws mounting
- Heat transfer and isolation through direct copper board (Low  $R_{th}$ )
- Low resistance in steady-state and high reliability
- High surge currents
- Glass passivated thyristor chips
- UL recognized, file no. E 63 532
- Integrated temperature sensor

## Typical Applications\*

- Soft starter
- Light control (e.g. studios, theaters)
- Temperature control (e.g. oven, chemical processes)

## Remarks

- $I_{RMS}=105A$ , for W3C application,  $\sin.180^\circ$  and  $T_S=85^\circ C$



**UT-T**

| Absolute Maximum Ratings |                         |                         |             |                  |
|--------------------------|-------------------------|-------------------------|-------------|------------------|
| Symbol                   | Conditions              |                         | Values      | Unit             |
| Chip                     |                         |                         |             |                  |
| I <sub>T(AV)</sub>       | sinus 180°              | T <sub>s</sub> = 25 °C  | 127         | A                |
|                          |                         | T <sub>s</sub> = 85 °C  | 71          | A                |
| I <sub>TSM</sub>         | 10 ms                   | T <sub>j</sub> = 25 °C  | 1500        | A                |
|                          |                         | T <sub>j</sub> = 130 °C | 1250        | A                |
| i <sup>2</sup> t         | 10 ms                   | T <sub>j</sub> = 25 °C  | 11250       | A <sup>2</sup> s |
|                          |                         | T <sub>j</sub> = 130 °C | 7813        | A <sup>2</sup> s |
| V <sub>RSM</sub>         |                         |                         | 1300        | V                |
| V <sub>RRM</sub>         |                         |                         | 1200        | V                |
| V <sub>DRM</sub>         |                         |                         | 1200        | V                |
| (di/dt) <sub>cr</sub>    | T <sub>j</sub> = 130 °C |                         | 50          | A/μs             |
| (dv/dt) <sub>cr</sub>    | T <sub>j</sub> = 130 °C |                         | 500         | V/μs             |
| T <sub>j</sub>           |                         |                         | -40 ... 125 | °C               |
| Module                   |                         |                         |             |                  |
| T <sub>stg</sub>         |                         |                         | -40 ... 125 | °C               |
| V <sub>isol</sub>        | ac; 50Hz; 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> = 25 °C, I <sub>T</sub> = 150 A                                                                                                |               |           |      | 1.6  | V                |
| V <sub>T(TO)</sub>               | T <sub>j</sub> = 130 °C                                                                                                                       |               |           |      | 0.9  | V                |
| r <sub>T</sub>                   | T <sub>j</sub> = 130 °C                                                                                                                       |               |           |      | 5    | mΩ               |
| I <sub>DD</sub> ;I <sub>RD</sub> | T <sub>j</sub> = 130 °C, V <sub>RD</sub> =V <sub>RRM</sub>                                                                                    |               |           |      | 20   | 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                                                                    |               |           | 1    |      | μs               |
| t <sub>gr</sub>                  | V <sub>D</sub> = 0.67 * V <sub>DRM</sub>                                                                                                      |               |           | 2    |      | μs               |
| t <sub>q</sub>                   | T <sub>j</sub> = 130 °C                                                                                                                       |               |           | 150  |      | μs               |
| I <sub>H</sub>                   | T <sub>j</sub> = 25 °C                                                                                                                        |               |           |      | 200  | mA               |
| I <sub>L</sub>                   | T <sub>j</sub> = 25 °C, R <sub>G</sub> = 33 Ω                                                                                                 |               |           |      | 600  | mA               |
| V <sub>GT</sub>                  | T <sub>j</sub> = 25 °C, d.c.                                                                                                                  |               | 3         |      |      | V                |
| I <sub>GT</sub>                  | T <sub>j</sub> = 25 °C, d.c.                                                                                                                  |               | 150       |      |      | mA               |
| V <sub>GD</sub>                  | T <sub>j</sub> = 130 °C, d.c.                                                                                                                 |               |           |      | 0.25 | V                |
| I <sub>GD</sub>                  | T <sub>j</sub> = 115 °C, d.c.                                                                                                                 |               | 6         |      |      | mA               |
| R <sub>th(j-s)</sub>             | continuous DC                                                                                                                                 | per thyristor |           |      |      | K/W              |
| R <sub>th(j-s)</sub>             |                                                                                                                                               | per module    |           |      |      | K/W              |
| R <sub>th(j-s)</sub>             | sin. 180°                                                                                                                                     | per thyristor |           |      |      | K/W              |
| R <sub>th(j-s)</sub>             |                                                                                                                                               | per module    | 0.32      |      |      | K/W              |
| R <sub>th(j-s)</sub>             | rec. 120°                                                                                                                                     | per thyristor |           |      |      | K/W              |
| R <sub>th(j-s)</sub>             |                                                                                                                                               | per module    |           |      |      | K/W              |
| Module                           |                                                                                                                                               |               |           |      |      |                  |
| R <sub>th(c-s)</sub>             |                                                                                                                                               |               |           |      |      | K/W              |
|                                  |                                                                                                                                               |               |           |      |      | K/W              |
| M <sub>s</sub>                   | to heatsink                                                                                                                                   |               | 2.25      |      | 2.5  | Nm               |
| M <sub>t</sub>                   |                                                                                                                                               |               |           |      |      | Nm               |
| a                                |                                                                                                                                               |               |           |      |      | m/s <sup>2</sup> |
| w                                |                                                                                                                                               |               | 75        |      |      | g                |
| Temperature Sensor               |                                                                                                                                               |               |           |      |      |                  |
| R <sub>100</sub>                 | T <sub>r</sub> = 100 °C, tolerance = 3 %                                                                                                      |               | 1670      |      |      | Ω                |
| B <sub>100/125</sub>             | R(T)=1000Ω[1+A(T-25°C)+B(T-25°C) <sup>2</sup> ], A = 7.635*10 <sup>-3</sup> °C <sup>-1</sup> ,<br>B = 1.731*10 <sup>-5</sup> °C <sup>-2</sup> |               | 3550 ± 2% |      |      | K                |

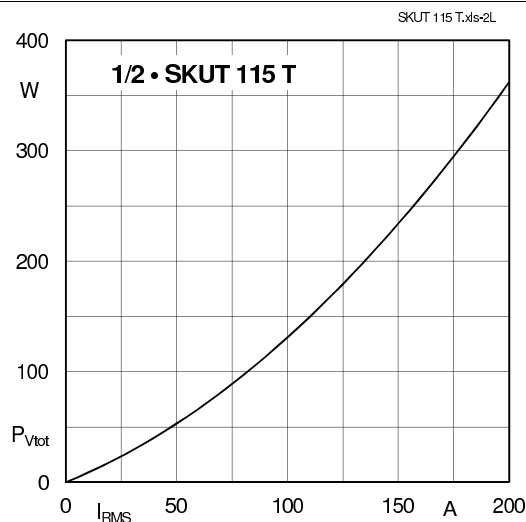


Fig. 2: Power dissipation per thyristor vs r.m.s. current

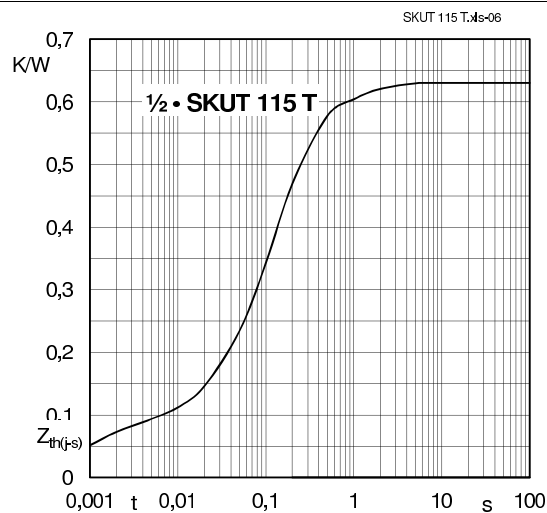


Fig. 6: Transient thermal impedance  $Z_{th(j-s)}$

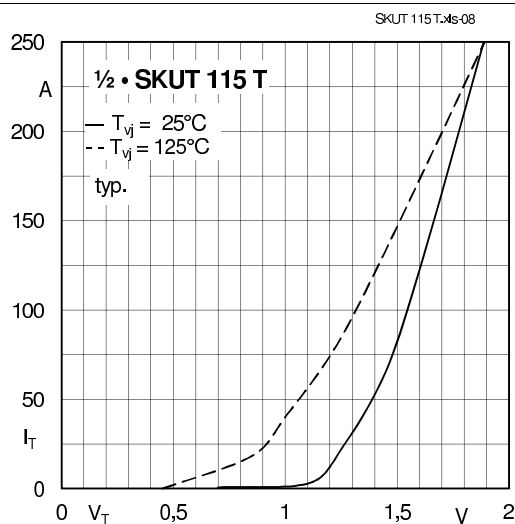


Fig. 8: On state characteristics

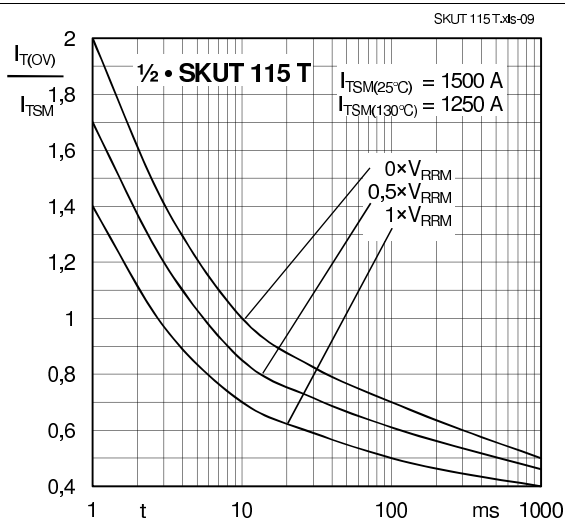


Fig. 9: Surge overload current vs. time

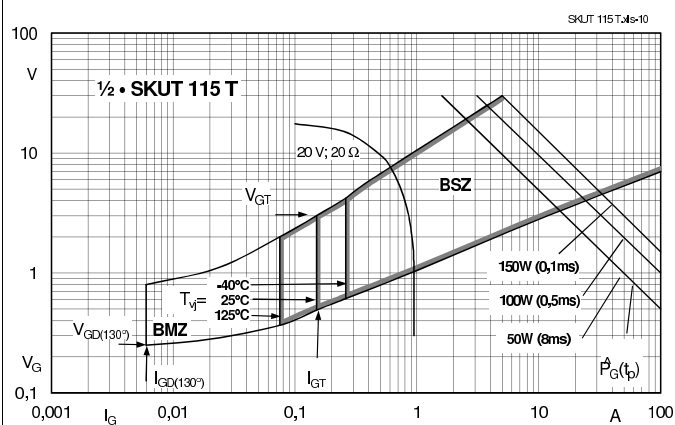


Fig. 10: Gate trigger characteristic

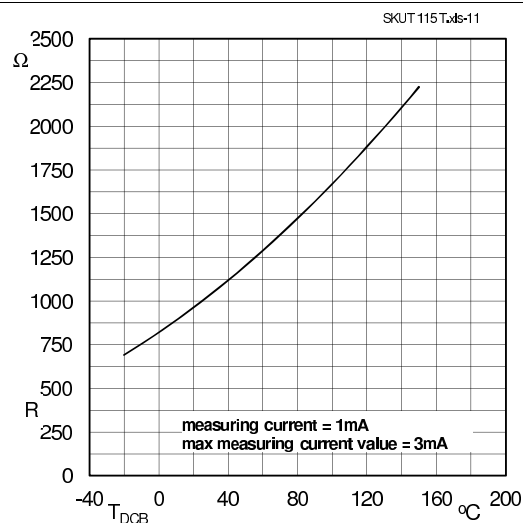
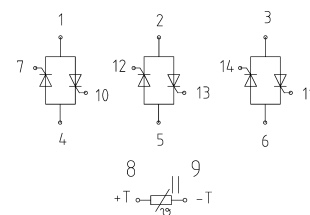
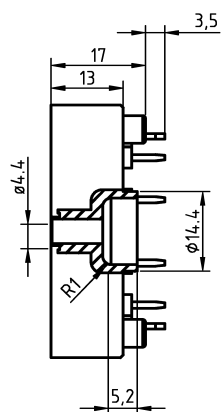
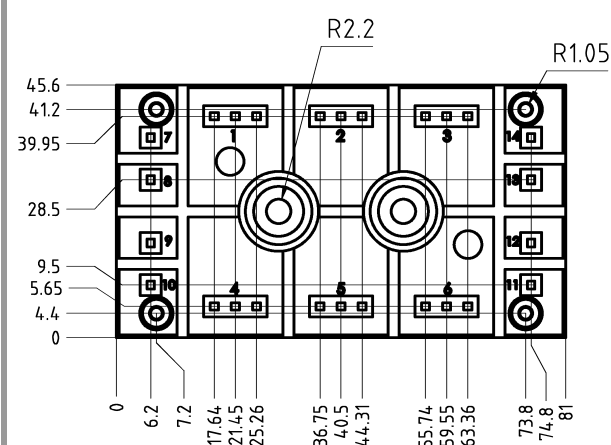
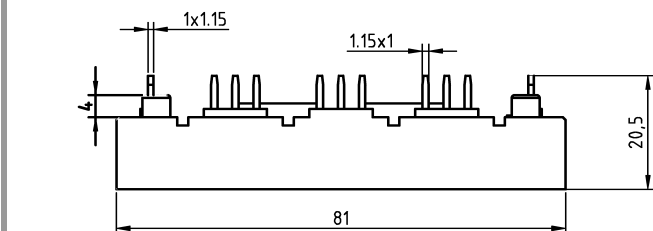


Fig. 11: Temperature sensor characteristic

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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.