

## SEMI<sup>®</sup>PACK 1 Thyristor/ Diode Modules

**SKKT 91**      **SKKH 91**  
**SKKT 92**      **SKKH 92**  
**SKKT 92B**     **SKMT 91<sup>2)</sup>**  
**SKKL 92<sup>2)</sup>**



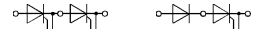
| V <sub>RSM</sub> | V <sub>RRM</sub> | (dv/dt) <sub>cr</sub> | I <sub>TRMS</sub> (maximum value for continuous operation) |                            |              |              |
|------------------|------------------|-----------------------|--|----------------------------|--------------|--------------|
|                  |                  |                       | 150 A  |                            |              |              |
| V                | V                | V/μs                  | I <sub>TAV</sub> (sin. 180; T <sub>case</sub> = 85 °C)     |                            |              |              |
|                  |                  |                       | 95 A   |                            |              |              |
| 500              | 400              | 500                   | –  | –                          | SKKH 91/04 D | –            |
| 700              | 600              | 500                   | SKKT 91/06 D   | SKKT 92/06 D               | SKKH 91/06 D | SKKH 92/06 D |
| 900              | 800              | 500                   | SKKT 91/08 D   | SKKT 92/08 D <sup>1)</sup> | SKKH 91/08 D | SKKH 92/08 D |
| 1300             | 1200             | 500                   | SKKT 91/12 D   | –                          | SKKH 91/12 D | –            |
| 1300             | 1200             | 1000                  | SKKT 91/12 E   | SKKT 92/12 E <sup>1)</sup> | –            | SKKH 92/12 E |
| 1500             | 1400             | 1000                  | SKKT 91/14 E   | SKKT 92/14 E <sup>1)</sup> | SKKH 91/14 E | SKKH 92/14 E |
| 1700             | 1600             | 1000                  | SKKT 91/16 E   | SKKT 92/16 E <sup>1)</sup> | SKKH 91/16 E | SKKH 92/16 E |
| 1900             | 1800             | 1000                  | SKKT 91/18 E   | SKKT 92/18 E <sup>1)</sup> | SKKH 91/18 E | SKKH 92/18 E |

| Symbol                            | Conditions  | SKKT 91<br>SKKH 91   | SKKT 92<br>SKKT 92B<br>SKKH 92                   |
|-----------------------------------|---|--|--|
| I <sub>TAV</sub>                  | sin. 180; T <sub>case</sub> = 85 °C   | 95 A   |  |
| I <sub>D</sub>                    | B2/B6   | T <sub>amb</sub> = 45 °C; P 3/180  | 70 A/85 A  |
|                                   |   | T <sub>amb</sub> = 35 °C; P 3/180 F  | 140 A/175 A                                      |
| I <sub>RMS</sub>                  | W1/W3   | T <sub>amb</sub> = 35 °C; P 3/180 F  | 190 A/3 x 135 A                                  |
| I <sub>TSM</sub>                  | T <sub>vj</sub> = 25 °C; 10 ms  | 2 000 A  |  |
|                                   | T <sub>vj</sub> = 125 °C; 10 ms   | 1 750 A  |  |
| i <sup>2</sup> t                  | T <sub>vj</sub> = 25 °C; 8,3 ... 10 ms  | 20 000 A <sup>2</sup> s  |  |
|                                   | T <sub>vj</sub> = 125 °C; 8,3 ... 10 ms   | 15 000 A <sup>2</sup> s  |  |
| t <sub>gd</sub>                   | T <sub>vj</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   |  |
| (di/dt) <sub>cr</sub>             | T <sub>vj</sub> = 125 °C  | 150 A/μs   |  |
| t <sub>q</sub>                    | T <sub>vj</sub> = 125 °C  | typ. 100 μs  |  |
| I <sub>H</sub>                    | T <sub>vj</sub> = 25 °C;  | max. 250 mA  |  |
| I <sub>L</sub>                    | T <sub>vj</sub> = 25 °C; R <sub>G</sub> = 33 Ω  | max. 600 mA  |  |
| V <sub>T</sub>                    | T <sub>vj</sub> = 25 °C; I <sub>T</sub> = 300 A   | max. 1,65 V  |  |
| V <sub>T(TO)</sub>                | T <sub>vj</sub> = 125 °C  | 0,9 V  |  |
| r <sub>T</sub>                    | T <sub>vj</sub> = 125 °C  | 2 mΩ   |  |
| I <sub>DD</sub> ; I <sub>RD</sub> | T <sub>vj</sub> = 125 °C; V <sub>DD</sub> = V <sub>DRM</sub> ; V <sub>RD</sub> = V <sub>RRM</sub> | max. 20 mA   |  |
| V <sub>GT</sub>                   | T <sub>vj</sub> = 25 °C; d. c.  | 3 V  |  |
| I <sub>GT</sub>                   | T <sub>vj</sub> = 25 °C; d. c.  | 150 mA   |  |
| V <sub>GD</sub>                   | T <sub>vj</sub> = 125 °C; d. c.   | 0,25 V   |  |
| I <sub>GD</sub>                   | T <sub>vj</sub> = 125 °C; d. c.   | 6 mA   |  |
| R <sub>thjc</sub>                 | cont. }<br>sin. 180 }<br>rec.120 } per thyristor/per module                                       | 0,28 °C/W / 0,14 °C/W<br>0,30 °C/W / 0,15 °C/W<br>0,32 °C/W / 0,16 °C/W<br>0,2 °C/W / 0,1 °C/W |  |
| R <sub>thch</sub>                 |   | – 40 ... +125 °C   |  |
| T <sub>vj</sub>                   |   | – 40 ... +125 °C   |  |
| T <sub>stg</sub>                  |   |  |  |
| V <sub>isol</sub>                 | a. c. 50 Hz; r.m.s.; 1 s/1 min  | 3600 V~ / 3000 V~  |  |
| M <sub>1</sub>                    | to heatsink } SI units/   | 5 Nm/44 lb. in. ± 15 % <sup>3)</sup>   |  |
| M <sub>2</sub>                    | to terminals } US units   | 3 Nm/26 lb.in. ± 15 %  |  |
| a                                 |   | 5 · 9,81 m/s <sup>2</sup>  |  |
| w                                 | approx.   | 120 g  |  |
| Case                              | → page B 1 – 93   | SKKT 91: A 5<br>SKKH 91: A 6<br>SKMT 91: A 65  | SKKL 92: A 59<br>SKKT 92: A 46<br>SKKT 92B: A 48 |



**SKKT 91**

**SKKH 91**



**SKKT 92**

**SKKH 92**



**SKMT 91**

**SKKL 92**

### Features

- Heat transfer through aluminium oxide ceramic isolated metal baseplate
- Hard soldered joints for high reliability
- UL recognized, file no. E 63 532

### Typical Applications

- DC motor control (e. g. for machine tools)
- AC motor soft starters
- Temperature control (e. g. for ovens, chemical processes)
- Professional light dimming (studios, theaters)

- 1) Also available in SKKT 92 B configuration (case A 48)
- 2) SKKL 92, SKMT 91 available on request
- 3) See the assembly instructions

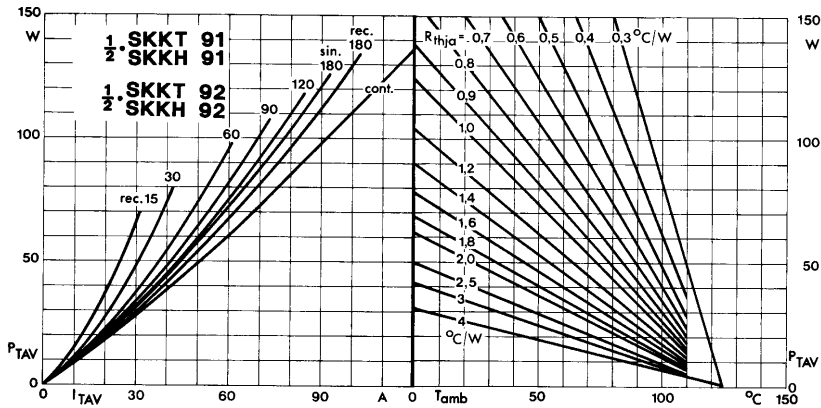


Fig. 1 Power dissipation per thyristor vs. on-state current and ambient temperature

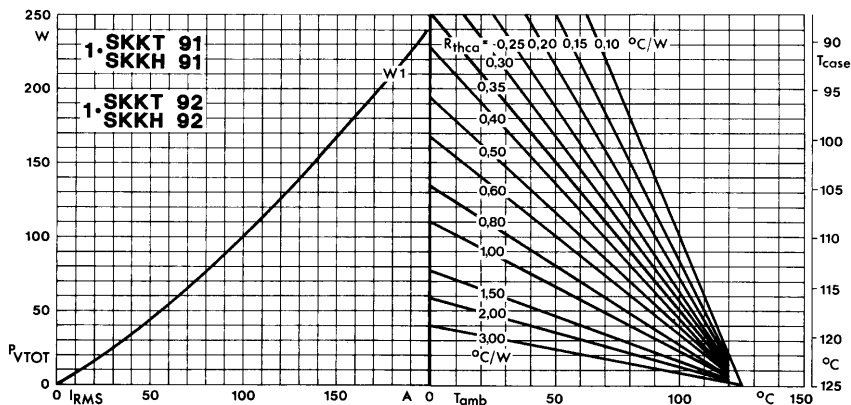


Fig. 2 Power dissipation per module vs. rms current and case temperature

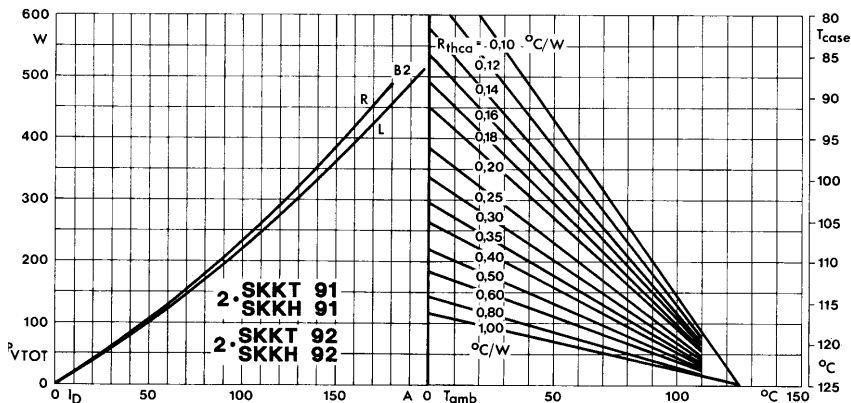


Fig. 3 Power dissipation of two modules vs. direct current and case temperature

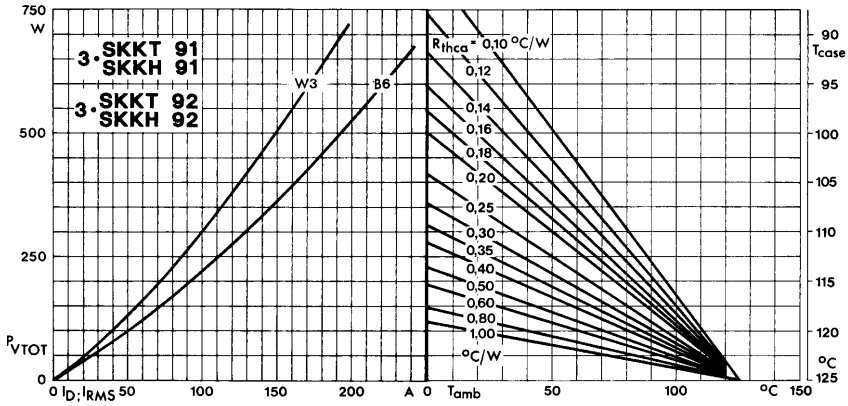


Fig. 4 Power dissipation of three modules vs. direct and rms current and case temperature

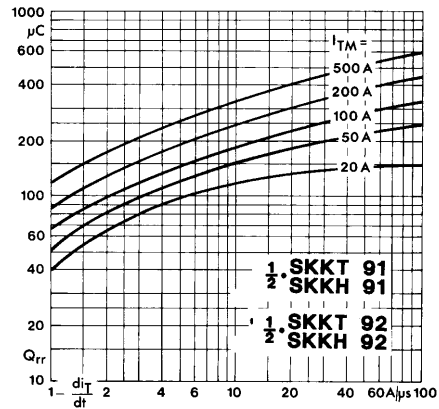


Fig. 5 Recovered charge vs. current decrease

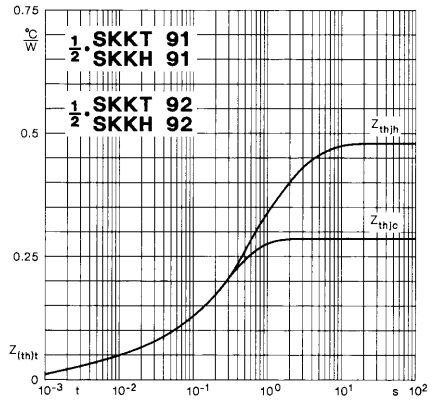


Fig. 6 Transient thermal impedance vs. time

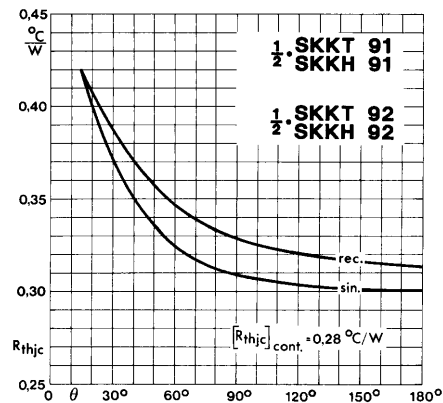


Fig. 7 Thermal resistance vs. conduction angle

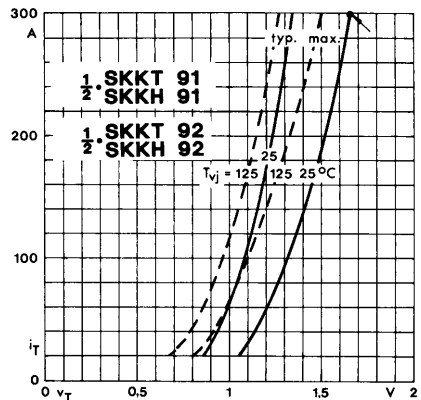


Fig. 8 On-state characteristics

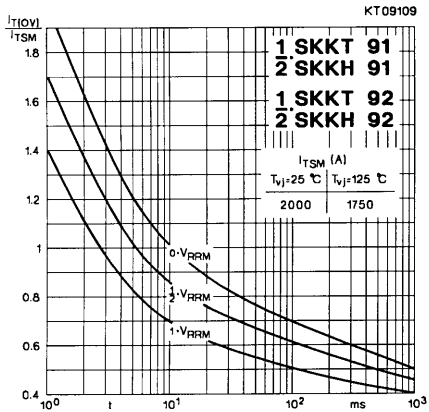


Fig. 9 Surge overload current vs. time

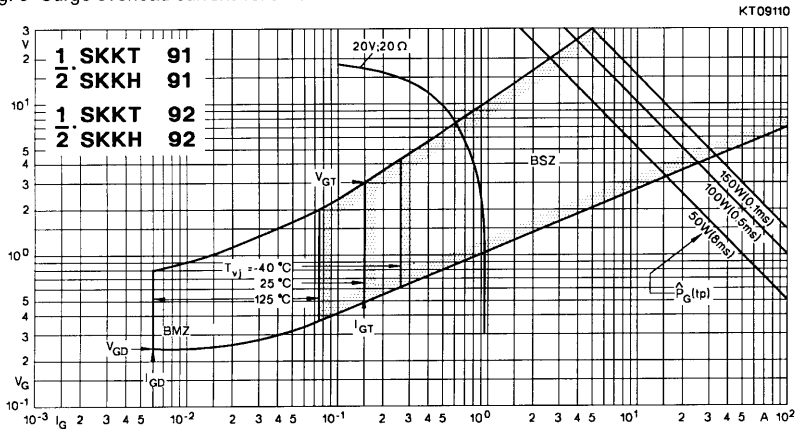


Fig. 10 Gate trigger characteristics