



## SEMiSTART

### Antiparallel thyristors for softstart

#### SKKQ 1500/14E

##### Features

- Compact design
- Thyristor with amplifying gate
- Pressure contact technology

##### Typical Applications\*

- Soft starters

##### Remarks

- Please note: This module has no soft mold protection around the chip. It is therefore susceptible to environmental influences (dust, humidity, etc.). The humidity test according to IEC60068-2-67 is not passed by this product.
- Recommendation: The devices should be installed in control cabinets of IP54 degree of protection.

##### Footnotes

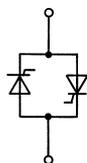
<sup>1)</sup>  $T_{jmax}$  up to 150°C is allowable for overload conditions, max. time period for the overload condition is 20s.

#### Absolute Maximum Ratings

Symbol	Conditions	Values	Unit	
<b>Module</b>				
$I_{overload}$	W1C, sin. 180°, 20 s, $T_{jmax} = 150\text{ °C}$ , $T_{jstart} = 40\text{ °C}$	1500	A	
$I_{TSM}$	10 ms	$T_j = 25\text{ °C}$	17000	A
		$T_j = 125\text{ °C}$	15000	A
$i^2t$	10 ms	$T_j = 25\text{ °C}$	1445000	A <sup>2</sup> s
		$T_j = 125\text{ °C}$	1125000	A <sup>2</sup> s
$V_{RSM}$		1500	V	
$V_{RRM}$ $V_{DRM}$		1400	V	
$T_j$	<sup>1)</sup>	-40 ... + 125	°C	
$T_{stg}$		-40 ... + 125	°C	

#### Characteristics

Symbol	Conditions	min.	typ.	max.	Unit
$V_T$	$T_j = 25\text{ °C}$ , $I_T = 1700\text{ A}$			1.5	V
$V_{T(TO)}$	$T_j = 125\text{ °C}$			0.85	V
$r_T$	$T_j = 125\text{ °C}$			0.3	mΩ
$I_{DD}; I_{RD}$	$T_j = 125\text{ °C}$ , $V_{RD} = V_{RRM}$ , per module			190	mA
$t_{gd}$	$T_j = 25\text{ °C}$ , $I_G = 1\text{ A}$ , $di_G/dt = 1\text{ A}/\mu\text{s}$		1		μs
$t_{gr}$	$V_D = 0.67 \cdot V_{DRM}$		2		μs
$(dv/dt)_{cr}$	$T_j = 125\text{ °C}$		1000		V/μs
$(di/dt)_{cr}$	$T_j = 125\text{ °C}$ , $f = 50 \dots 60\text{ Hz}$		200		A/μs
$t_q$	$T_j = 125\text{ °C}$		200		μs
$I_H$	$T_j = 25\text{ °C}$		150	500	mA
$I_L$	$T_j = 25\text{ °C}$ , $R_G = 33\text{ Ω}$		300	2000	mA
$V_{GT}$	$T_j = 25\text{ °C}$ , d.c.	3			V
$I_{GT}$	$T_j = 25\text{ °C}$ , d.c.	200			mA
$V_{GD}$	$T_j = 125\text{ °C}$ , d.c.			0.25	V
$I_{GD}$	$T_j = 125\text{ °C}$ , d.c.			10	mA
$R_{th(j-r)}$	continuous DC, per thyristor			0.037	K/W
$M_t$	to terminals	4.25		5.75	Nm
$m$	approx.		1200		g
Case			2		



W1C

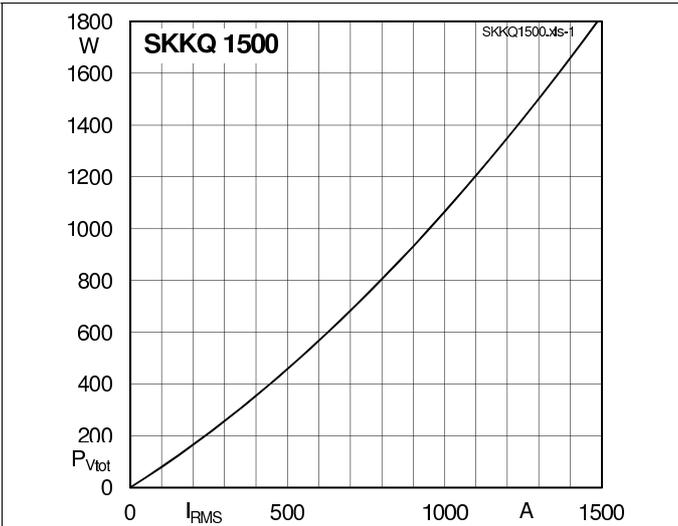


Fig. 1: Power dissipation per module vs. rms current

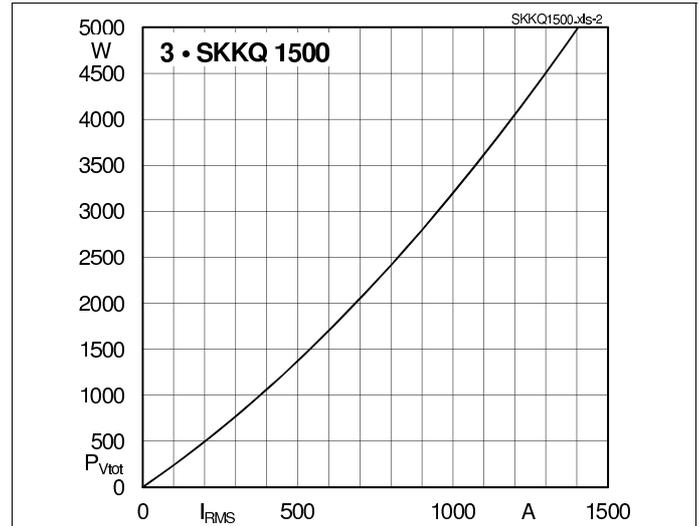


Fig. 2: Power dissipation of three modules vs. rms current

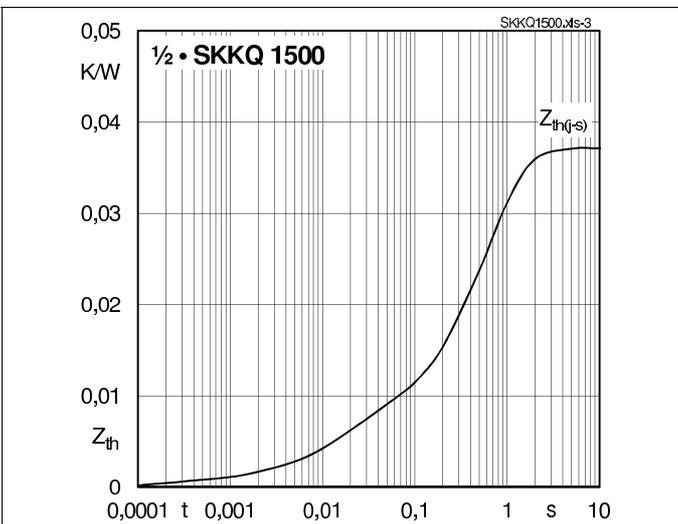


Fig. 3: Transient thermal impedance  $Z_{th(j-r)}$  vs. time

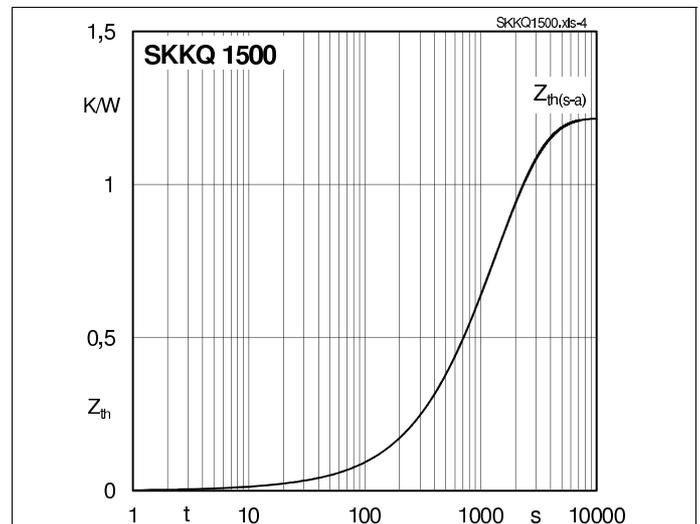


Fig. 4: Typ. transient thermal impedance  $Z_{th(s-a)}$  vs. time (natural cooling)

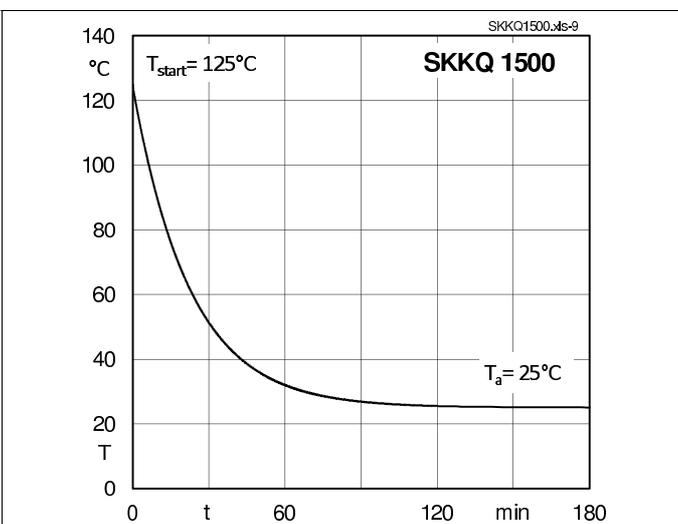


Fig. 5: Typ. cooling down vs. time (natural cooling)

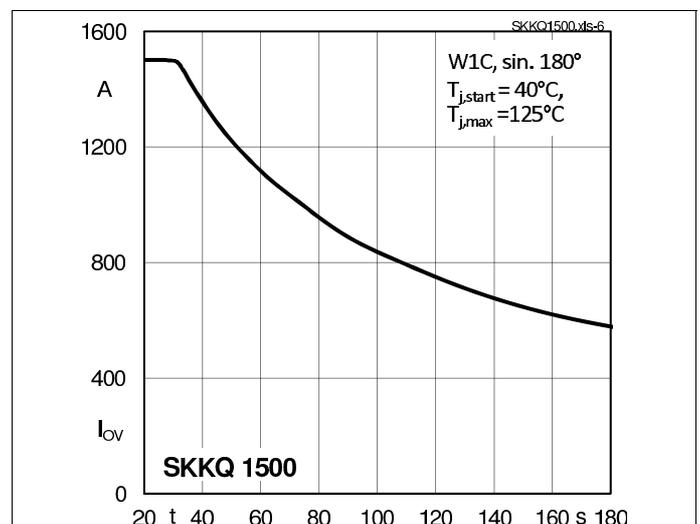


Fig. 6: Typ. overload current vs. time (natural cooling)

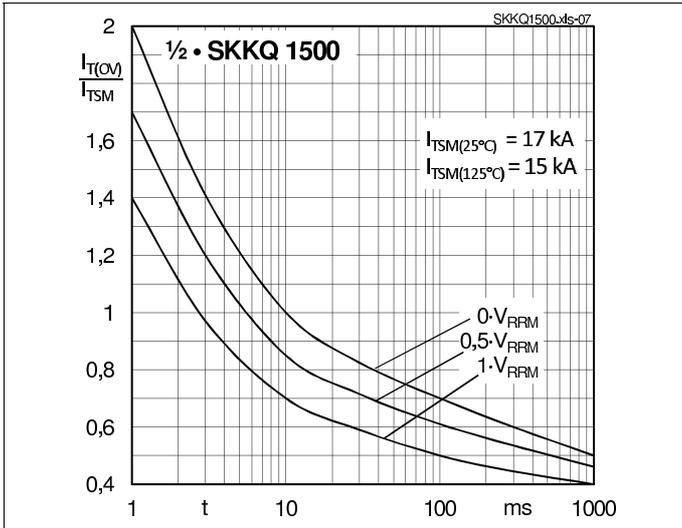


Fig. 7: Surge overload current vs. time

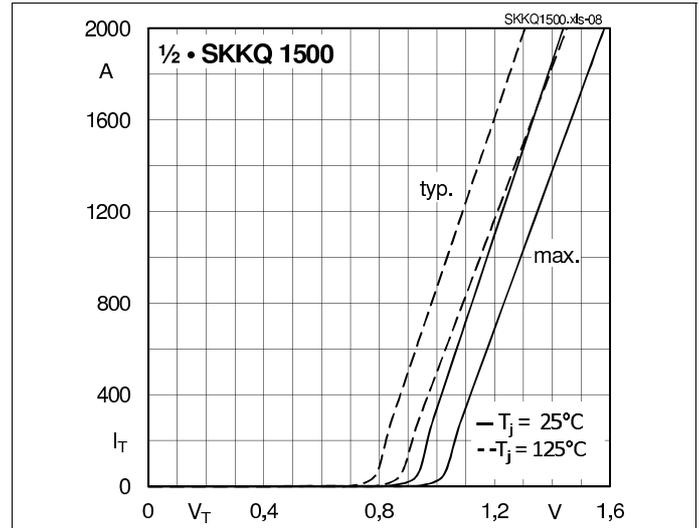


Fig. 8: On state characteristics

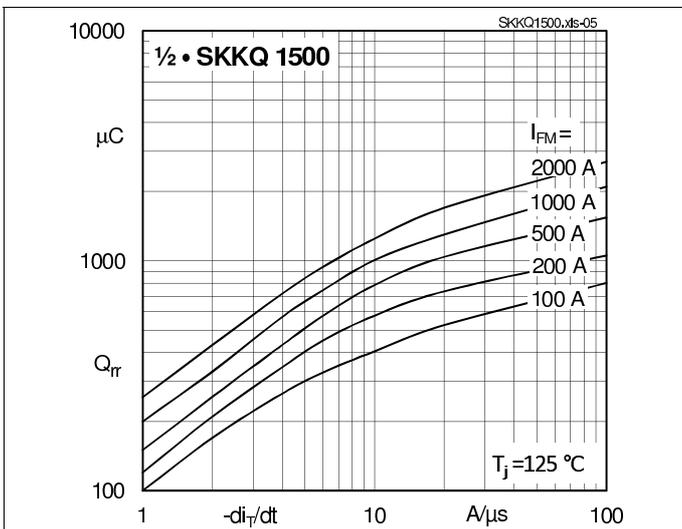


Fig. 9: Recovery charge vs. current decrease

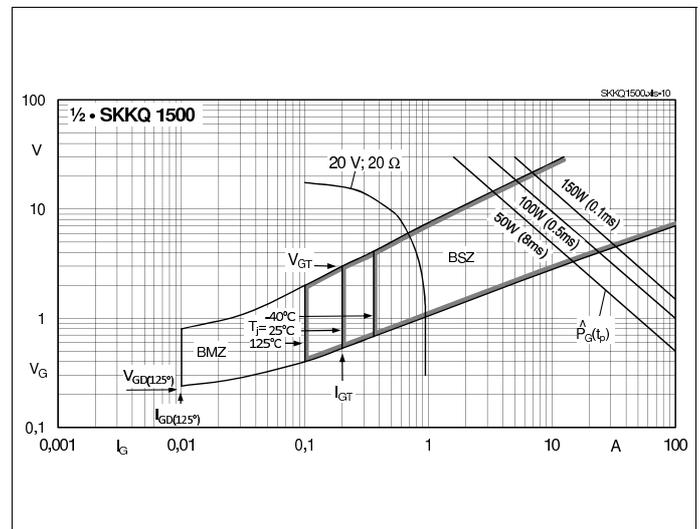
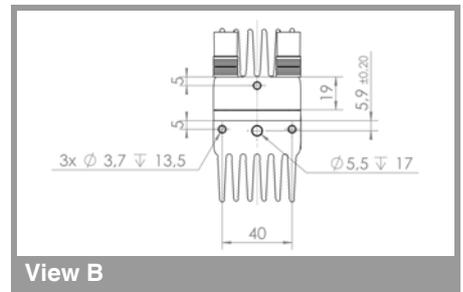
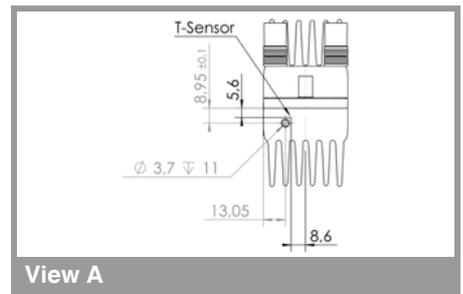
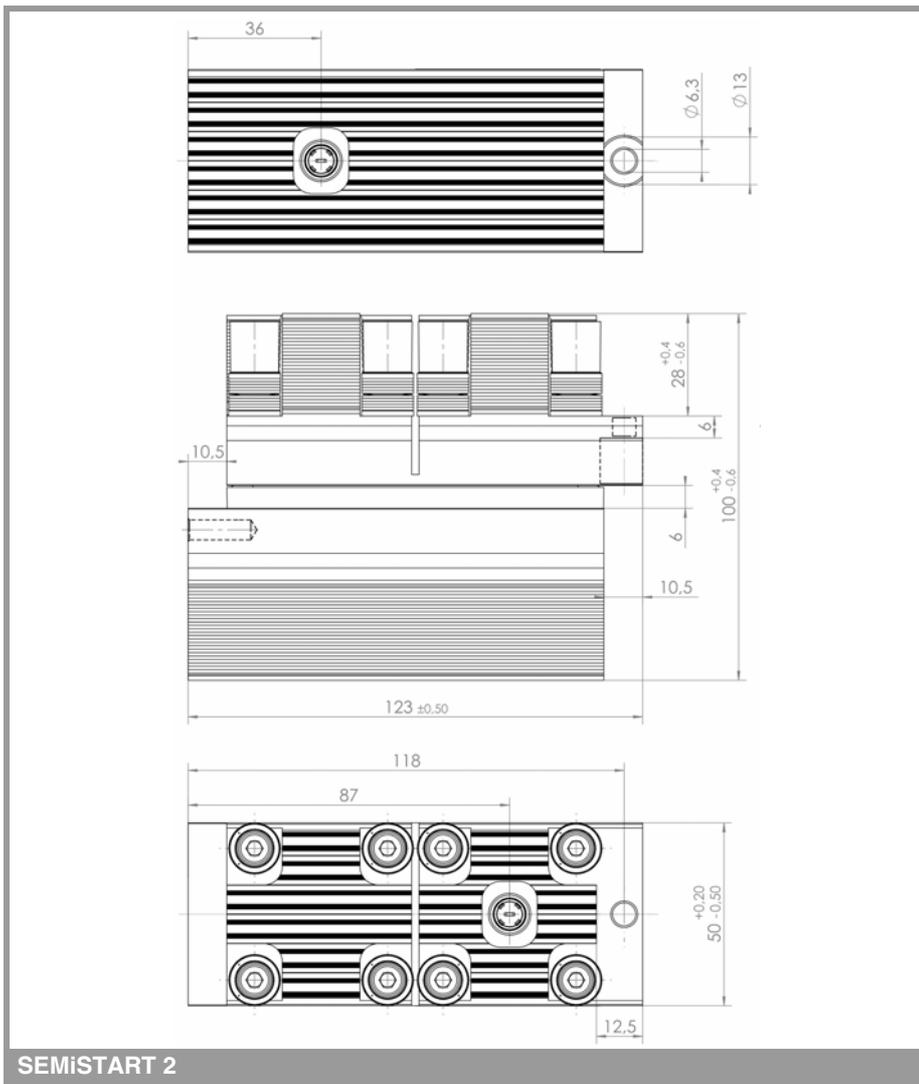


Fig. 10: Gate trigger characteristic

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\* 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.