



SEMUTOP® 2

Thyristor and Diode  
separated in the same  
housing

### SK 100 TAE 12

#### Features\*

- Compact design
- One screw mounting
- High current density due to double mesa technology
- Heat transfer and insulation through direct copper bonded aluminum oxide ceramic (DBC)
- Glass passivated thyristor chips
- High surge currents
- UL recognized, file no. E 63 532

#### Typical Applications

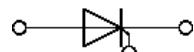
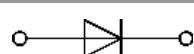
- Controlled rectifier circuit
- Solid state relays

Absolute Maximum Ratings		Values	Unit
Symbol	Conditions		
<b>Diode 1</b>			
$V_{RRM}$	$T_j = 25^\circ\text{C}$	1200	V
$I_F$	$T_j = 150^\circ\text{C}$	253	A
	$T_s = 25^\circ\text{C}$	180	A
$I_{FSM}$	$T_s = 70^\circ\text{C}$	2300	A
$i^2t$	10 ms, $T_j = 150^\circ\text{C}$	26450	$\text{A}^2\text{s}$
$T_j$		-40 ... 150	$^\circ\text{C}$

Absolute Maximum Ratings		Values	Unit
Symbol	Conditions		
<b>Thyristor 1</b>			
$V_{RRM}$		1200	V
$V_{DRM}$		1200	V
$I_{T(AV)}$	$T_j = 130^\circ\text{C}, T_s = 70^\circ\text{C}$	96	A
$I_{TSM}$	$t_p = 10 \text{ ms, sin } 180^\circ, T_j = 25^\circ\text{C}$	2000	A
$i^2t$	$t_p = 10 \text{ ms, sin } 180^\circ, T_j = 25^\circ\text{C}$	20000	$\text{A}^2\text{s}$
$T_j$		-40 ... 130	$^\circ\text{C}$

Absolute Maximum Ratings		Values	Unit
Symbol	Conditions		
<b>Module</b>			
$I_{t(\text{RMS})}$	$\Delta T_{\text{terminal}} \text{ at PCB joint} = 30 \text{ K, per pin}$	60	A
$T_{\text{stg}}$	module without TIM	-40 ... 125	$^\circ\text{C}$
$V_{\text{isol}}$	AC, sinusoidal, $t = 1 \text{ min}$	2500	V

Characteristics		min.	typ.	max.	Unit
Symbol	Conditions				
<b>Diode 1</b>					
$V_F$	$I_F = 160 \text{ A}$	1.00	1.21		V
	chiplevel	0.90	1.10		V
$V_{FO}$	$I_F = 160 \text{ A}$	0.88	0.98		V
	chiplevel	0.73	0.83		V
$r_F$	$I_F = 160 \text{ A}$	0.75	1.44		$\text{m}\Omega$
	chiplevel	1.06	1.69		$\text{m}\Omega$
$I_R$	$T_j = 120^\circ\text{C}, V_{RRM}$		4		$\text{mA}$
$R_{\text{th(j-s)}}$	per diode, $\lambda_{\text{paste}} = 0.8 \text{ W/(mK)}$		0.4		K/W



TAE



Thyristor and Diode separated in the same housing

SK 100 TAE 12

## Features\*

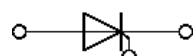
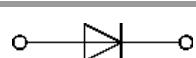
- Compact design
- One screw mounting
- High current density due to double mesa technology
- Heat transfer and insulation through direct copper bonded aluminum oxide ceramic (DBC)
- Glass passivated thyristor chips
- High surge currents
- UL recognized, file no. E 63 532

## Typical Applications

- Controlled rectifier circuit
- Solid state relays

Characteristics		min.	typ.	max.	Unit
<b>Thyristor 1</b>					
V <sub>T</sub>	T <sub>j</sub> = 25 °C, I <sub>T</sub> = 150 A			1.26	V
V <sub>T(TO)</sub>	T <sub>j</sub> = 130 °C			0.85	V
r <sub>T</sub>	T <sub>j</sub> = 130 °C			2.20	mΩ
I <sub>DD</sub> :I <sub>RD</sub>	T <sub>j</sub> = 130 °C, V <sub>DD</sub> = V <sub>DRM</sub> ; V <sub>RD</sub> = V <sub>RRM</sub>			21	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	220			mA
I <sub>L</sub>	T <sub>j</sub> = 25 °C, R <sub>G</sub> = 33 Ω	550			mA
V <sub>GT</sub>	T <sub>j</sub> = 25 °C, d.c.	2			V
I <sub>GT</sub>	T <sub>j</sub> = 25 °C, d.c.	100			mA
V <sub>GD</sub>	T <sub>j</sub> = 130 °C, d.c.			0.25	V
I <sub>GD</sub>	T <sub>j</sub> = 130 °C, d.c.		6		mA
R <sub>th(j-s)</sub>	per thyristor, λ <sub>paste</sub> =0.8 W/(mK), sin. 180°		0.45		K/W

Characteristics		min.	typ.	max.	Unit
<b>Module</b>					
M <sub>s</sub>	to heatsink	1.8		2	Nm
w	weight		19		g



TAE

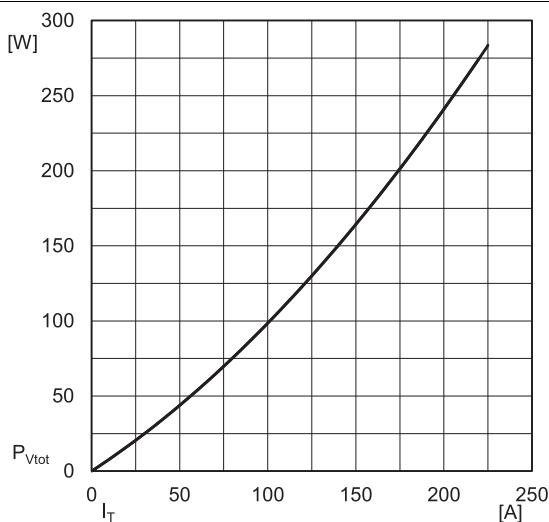


Fig. 1: Power dissipation per module vs r.m.s current

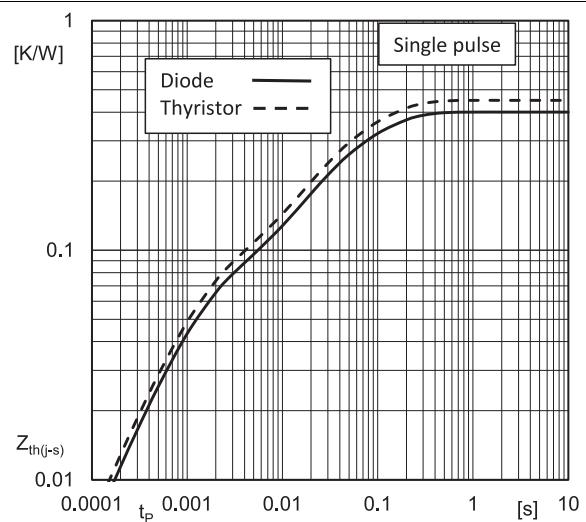


Fig. 2: Typ. transient thermal impedance vs. time

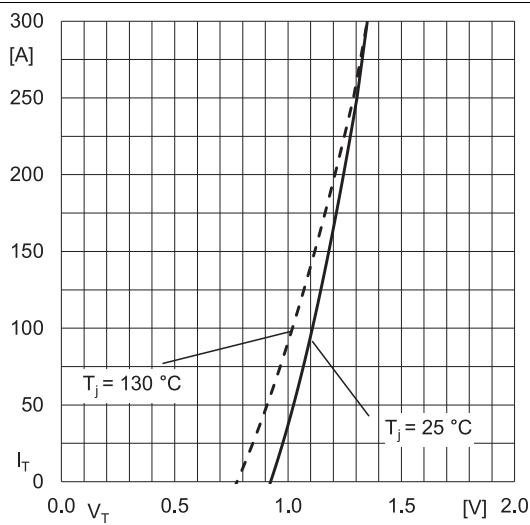


Fig. 3: Typ. forward characteristic of single thyristor

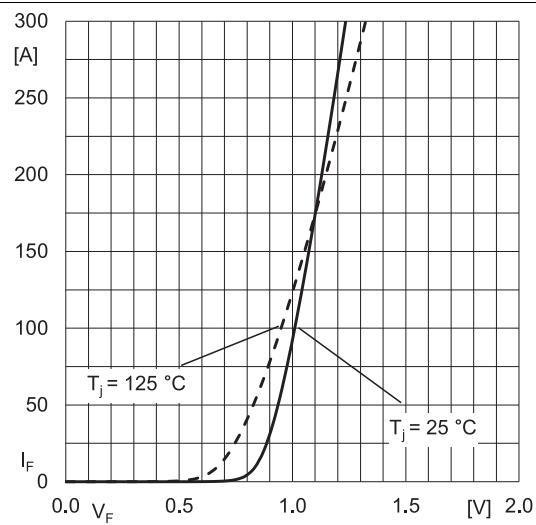


Fig. 4: Typ. Rect. characteristic of Diode, incl.  $R_{CC+EE'}$

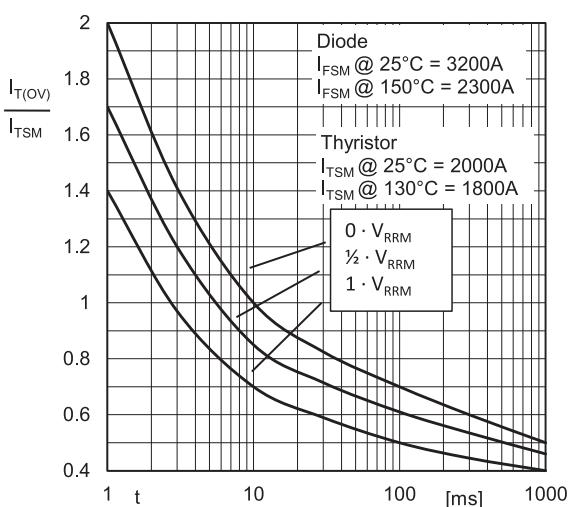


Fig. 5: Surge overload current vs. time

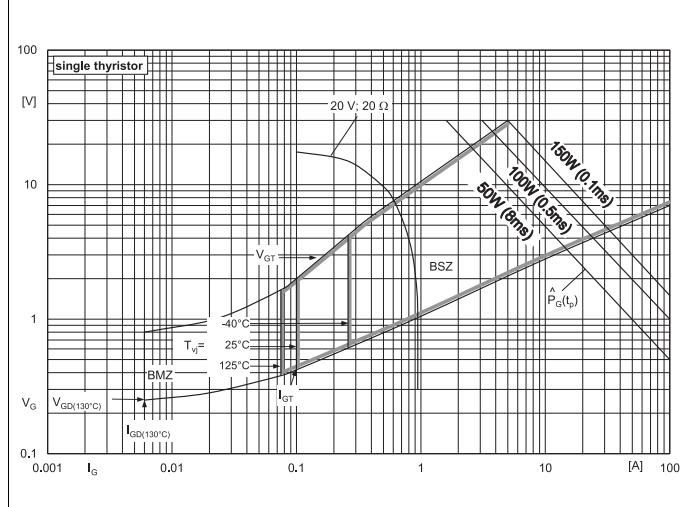
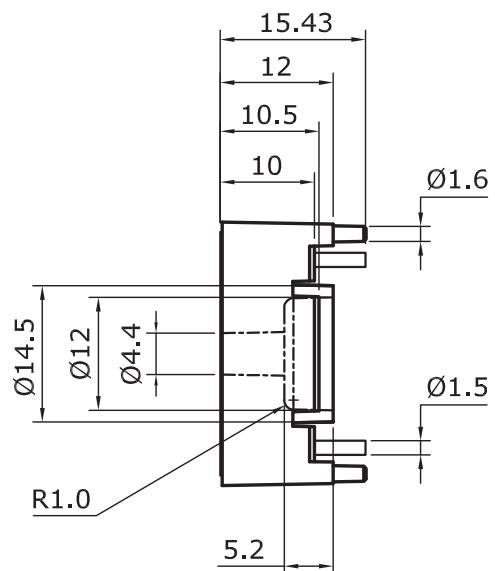
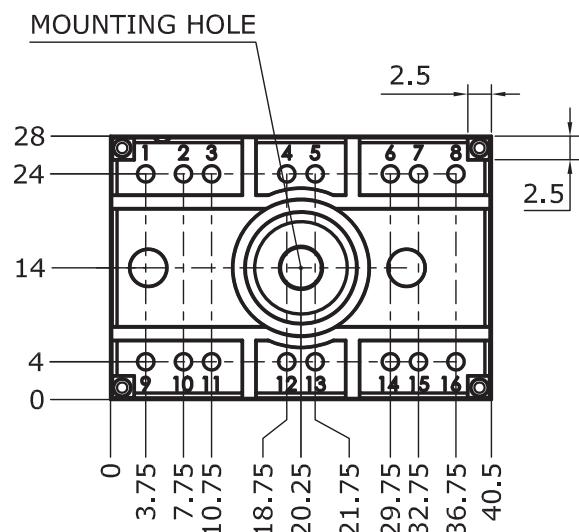
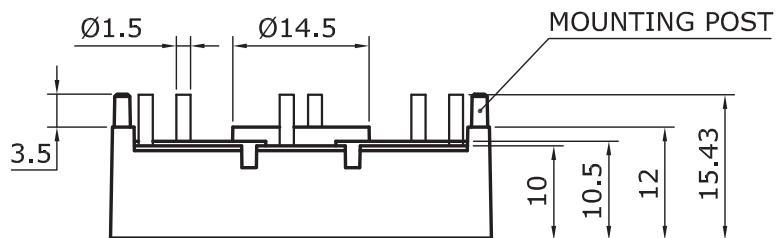


Fig. 6: Gate trigger characteristic

Dimensions: mm

## Tolerance system: ISO 2768-m

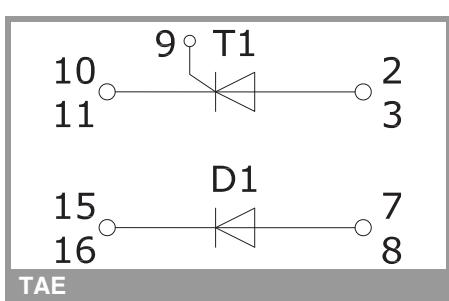


Suggested hole diameter for solder pins in the circuit board:

- refer Mounting Instruction SEMITOP® Classic

These documents are SEMIKRON properties. SEMIKRON reserves all copyrights.  
All copying and transmitting of this information requires written permission.  
For the case of industrial property rights, SEMIKRON reserves all rights.

SEMITOP®2



This is an electrostatic discharge sensitive device (ESDS) due to international standard IEC 61340.

## \*IMPORTANT INFORMATION AND WARNINGS

The specifications of SEMIKRON products may not be considered as guarantee or assurance of product characteristics ("Beschaffenheitsgarantie"). The specifications of SEMIKRON products describe only the usual characteristics of products to be expected in typical applications, which may still vary depending on the specific application. Therefore, products must be tested for the respective application in advance. Application adjustments may be necessary. The user of SEMIKRON products is responsible for the safety of their applications embedding SEMIKRON products and must take adequate safety measures to prevent the applications from causing a physical injury, fire or other problem if any of SEMIKRON products become faulty. The user is responsible to make sure that the application design is compliant with all applicable laws, regulations, norms and standards. Except as otherwise explicitly approved by SEMIKRON in a written document signed by authorized representatives of SEMIKRON, SEMIKRON products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury. No representation or warranty is given and no liability is assumed with respect to the accuracy, completeness and/or use of any information herein, including without limitation, warranties of non-infringement of intellectual property rights of any third party. SEMIKRON does not assume any liability arising out of the applications or use of any product; neither does it convey any license under its patent rights, copyrights, trade secrets or other intellectual property rights, nor the rights of others. SEMIKRON makes no representation or warranty of non-infringement or alleged non-infringement of intellectual property rights of any third party which may arise from applications. Due to technical requirements our products may contain dangerous substances. For information on the types in question please contact the nearest SEMIKRON sales office. This document supersedes and replaces all information previously supplied and may be superseded by updates. SEMIKRON reserves the right to make changes.