

# SK 100 TAE 12



SEMITOP® 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

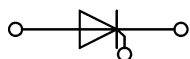
- Controlled rectifier circuit
- Solid state relays

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

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

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

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
<b>Diode 1</b>					
$V_F$	$I_F = 160\text{ A}$	$T_j = 25\text{ °C}$	1.00	1.21	V
		chipelevel	0.90	1.10	V
$V_{F0}$	chipelevel	$T_j = 25\text{ °C}$	0.88	0.98	V
		$T_j = 125\text{ °C}$	0.73	0.83	V
$r_F$	chipelevel	$T_j = 25\text{ °C}$	0.75	1.44	mΩ
		$T_j = 125\text{ °C}$	1.06	1.69	mΩ
$I_R$	$T_j = 120\text{ °C}$ , $V_{RRM}$			4	mA
$R_{th(j-s)}$	per diode, $\lambda_{\text{paste}} = 0.8\text{ W/(mK)}$		0.4		K/W



TAE



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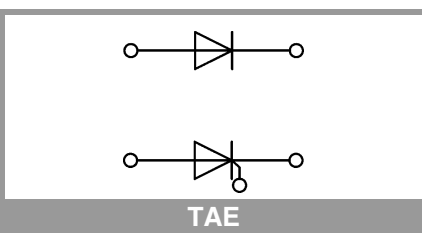
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### Typical Applications

- Controlled rectifier circuit
- Solid state relays

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
<b>Thyristor 1</b>					
$V_T$	$T_j = 25\text{ °C}$ , $I_T = 150\text{ A}$			1.26	V
$V_{T(TO)}$	$T_j = 130\text{ °C}$			0.85	V
$r_T$	$T_j = 130\text{ °C}$			2.20	mΩ
$I_{DD}; I_{RD}$	$T_j = 130\text{ °C}$ , $V_{DD} = V_{DRM}$ ; $V_{RD} = V_{RRM}$			21	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
$t_q$	$T_j = 130\text{ °C}$		150		μs
$I_H$	$T_j = 25\text{ °C}$	220			mA
$I_L$	$T_j = 25\text{ °C}$ , $R_G = 33\text{ Ω}$	550			mA
$V_{GT}$	$T_j = 25\text{ °C}$ , d.c.	2			V
$I_{GT}$	$T_j = 25\text{ °C}$ , d.c.	100			mA
$V_{GD}$	$T_j = 130\text{ °C}$ , d.c.			0.25	V
$I_{GD}$	$T_j = 130\text{ °C}$ , d.c.			6	mA
$R_{th(j-s)}$	per thyristor, $\lambda_{paste}=0.8\text{ W}/(\text{mK})$ , sin. $180^\circ$		0.45		K/W

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
<b>Module</b>					
$M_s$	to heatsink	1.8		2	Nm
w	weight		19		g



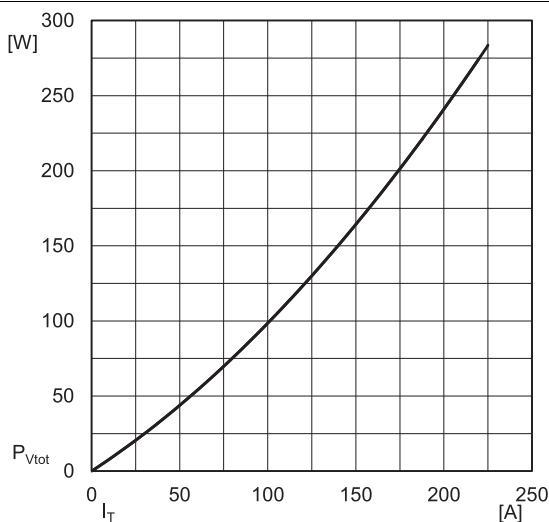


Fig. 1: Power dissipation per module vs r.m.s current

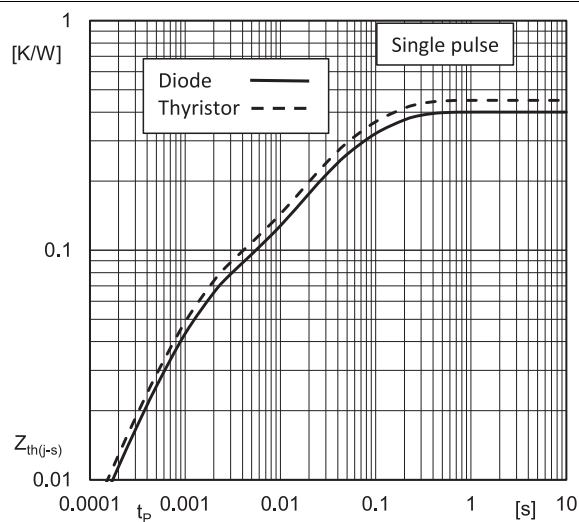


Fig. 2: Typ. transient thermal impedance vs. time

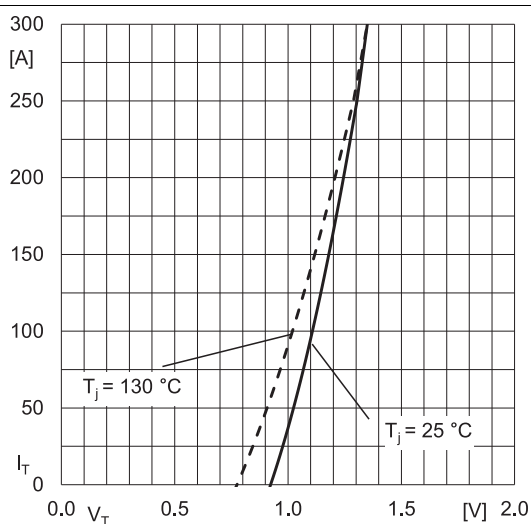


Fig. 3: Typ. forward characteristic of single thyristor

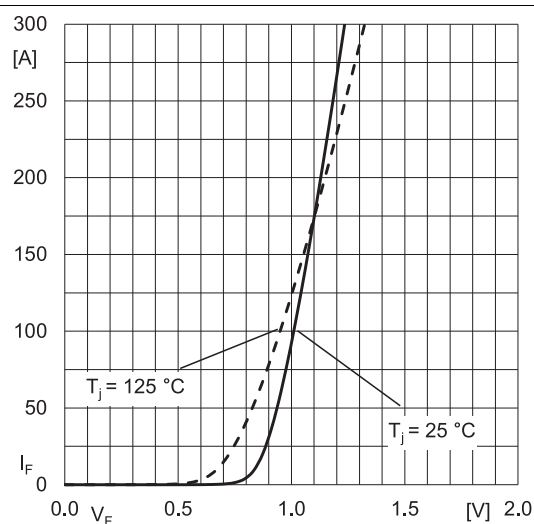


Fig. 4: Typ. Rect. characteristic of Diode, incl.  $R_{CC'} + EE'$

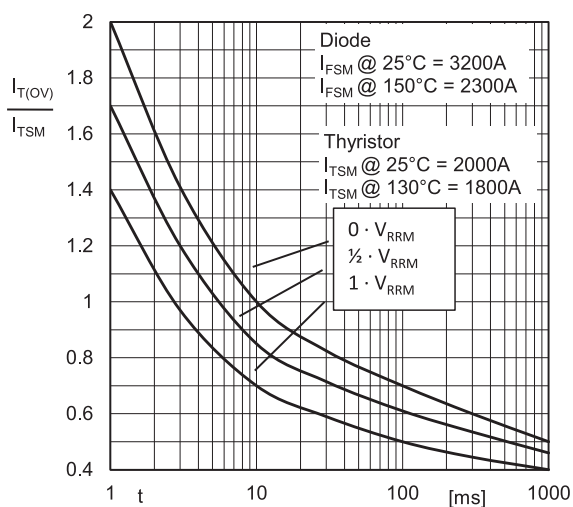


Fig. 5: Surge overload current vs. time

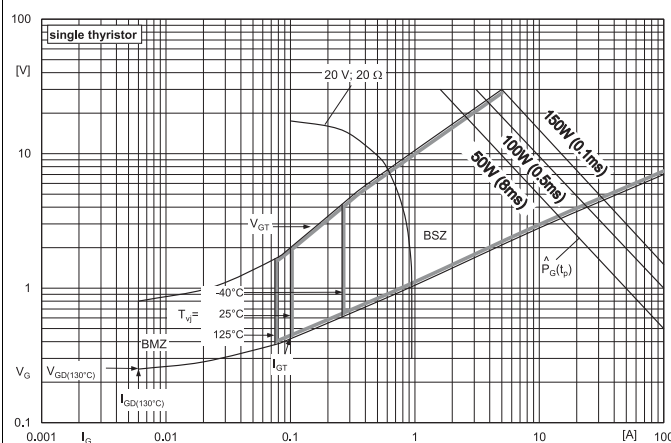
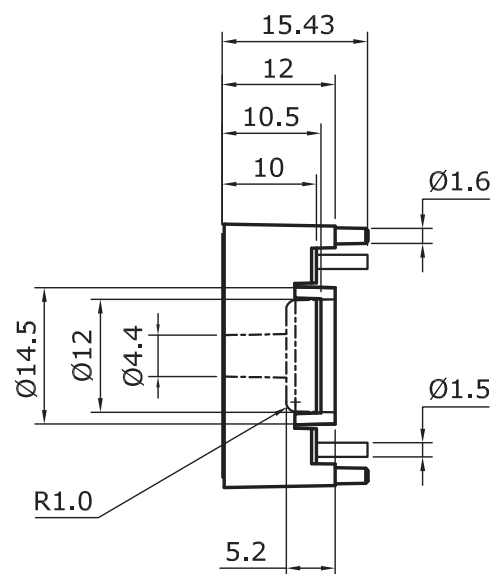
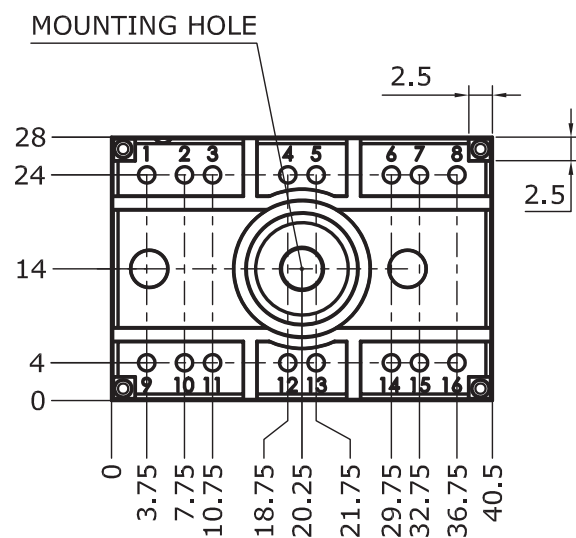
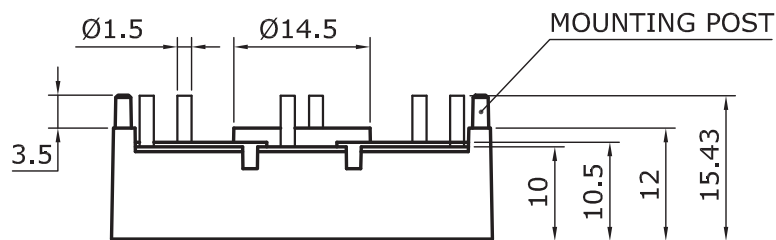


Fig. 6: Gate trigger characteristic

Dimensions: mm

Tolerance system: ISO 2768-m

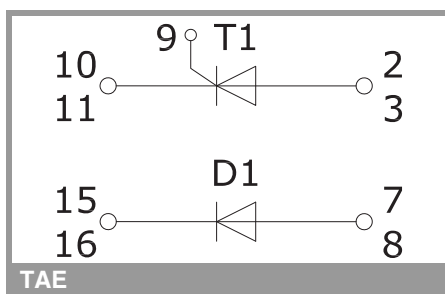


Suggested hole diameter for solder pins in the circuit board:

- refer Mounting Instruction SEMITOP® Classic

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SEMITOP®2



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

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