



Optimum power handling  
Low on-state and switching losses  
Designed for traction and industrial applications

## Avalanche Stud Thyristor Type TA271-250-12

Mean on-state current	$I_{TAV}$		250 A				
Repetitive peak off-state voltage	$V_{DRM}$		600÷1200 V				
Repetitive peak reverse voltage	$V_{RRM}$						
Turn-off time	$t_q$		160 $\mu$ s				
$V_{DRM}, V_{RRM}, V$	600	700	800	900	1000	1100	1200
Voltage code	6	7	8	9	10	11	12
$T_j, ^\circ\text{C}$	-60÷140						

### MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions	
<b>ON-STATE</b>					
$I_{TAV}$	Mean on-state current	A	250 305	$T_c = 100\text{ }^\circ\text{C};$ $T_c = 85\text{ }^\circ\text{C};$ 180° half-sine wave; 50 Hz	
$I_{TRMS}$	RMS on-state current	A	393	$T_c = 100\text{ }^\circ\text{C};$ 180° half-sine wave; 50 Hz	
$I_{TSM}$	Surge on-state current	kA	8.00 9.20	$T_j = T_{j\max}$ $T_j = 25\text{ }^\circ\text{C}$	180° half-sine wave; 50 Hz ( $t_p = 10\text{ ms}$ ); single pulse; $V_D = V_R = 0\text{ V};$ Gate pulse: $I_G = 2\text{ A};$ $t_{GP} = 50\text{ }\mu\text{s}; di_G/dt \geq 1\text{ A}/\mu\text{s}$
			9.00 10.4	$T_j = T_{j\max}$ $T_j = 25\text{ }^\circ\text{C}$	180° half-sine wave; 60 Hz ( $t_p = 8.3\text{ ms}$ ); single pulse; $V_D = V_R = 0\text{ V};$ Gate pulse: $I_G = 2\text{ A};$ $t_{GP} = 50\text{ }\mu\text{s}; di_G/dt \geq 1\text{ A}/\mu\text{s}$
$I^2t$	Safety factor	$\text{A}^2\text{s} \cdot 10^3$	320 420	$T_j = T_{j\max}$ $T_j = 25\text{ }^\circ\text{C}$	180° half-sine wave; 50 Hz ( $t_p = 10\text{ ms}$ ); single pulse; $V_D = V_R = 0\text{ V};$ Gate pulse: $I_G = 2\text{ A};$ $t_{GP} = 50\text{ }\mu\text{s}; di_G/dt \geq 1\text{ A}/\mu\text{s}$
			335 445	$T_j = T_{j\max}$ $T_j = 25\text{ }^\circ\text{C}$	180° half-sine wave; 60 Hz ( $t_p = 8.3\text{ ms}$ ); single pulse; $V_D = V_R = 0\text{ V};$ Gate pulse: $I_G = 2\text{ A};$ $t_{GP} = 50\text{ }\mu\text{s}; di_G/dt \geq 1\text{ A}/\mu\text{s}$
<b>BLOCKING</b>					
$V_{DRM}, V_{RRM}$	Repetitive peak off-state and Repetitive peak reverse voltages	V	600÷1200	$T_{j\min} < T_j < T_{j\max};$ 180° half-sine wave; 50 Hz; Gate open	
$V_{DSM}, V_{RSM}$	Non-repetitive peak off-state and Non-repetitive peak reverse voltages	V	700÷1300	$T_{j\min} < T_j < T_{j\max};$ 180° half-sine wave; 50 Hz; single pulse; Gate open	
$V_{(BR)}$	Breakdown voltage	V	850÷1700	$T_{j\min} < T_j < T_{j\max}; I_{RRM} = 100\text{ mA};$ 180° half-sine wave; single pulse; Gate open	

$V_{D_r}, V_R$	Direct off-state and Direct reverse voltages	V	$0.75 \cdot V_{DRM}$ $0.75 \cdot V_{RRM}$	$T_j = T_{j\max}$ ; Gate open
$P_{RSM}$	Surge reverse power dissipation	kW	16	$T_j = T_{j\max}$ ; $t_p = 100 \mu s$ ; 180° half-sine wave; single pulse
<b>TRIGGERING</b>				
$I_{FGM}$	Peak forward gate current	A	6	$T_j = T_{j\max}$
$V_{RGM}$	Peak reverse gate voltage	V	5	
$P_G$	Gate power dissipation	W	3	$T_j = T_{j\max}$ for DC gate current
<b>SWITCHING</b>				
$(di_T/dt)_{crit}$	Critical rate of rise of on-state current non-repetitive (f=1 Hz)	A/ $\mu s$	125	$T_j = T_{j\max}$ ; $V_D = 0.67 \cdot V_{DRM}$ ; $I_{TM} = 2 I_{TAV}$ ; Gate pulse: $I_G = 2 A$ ; $t_{GP} = 50 \mu s$ ; $di_G/dt \geq 1 A/\mu s$
<b>THERMAL</b>				
$T_{stg}$	Storage temperature	°C	-60÷50	
$T_j$	Operating junction temperature	°C	-60÷140	
<b>MECHANICAL</b>				
M	Tightening torque	Nm	25÷35	
a	Acceleration	m/s <sup>2</sup>	100	

## CHARACTERISTICS

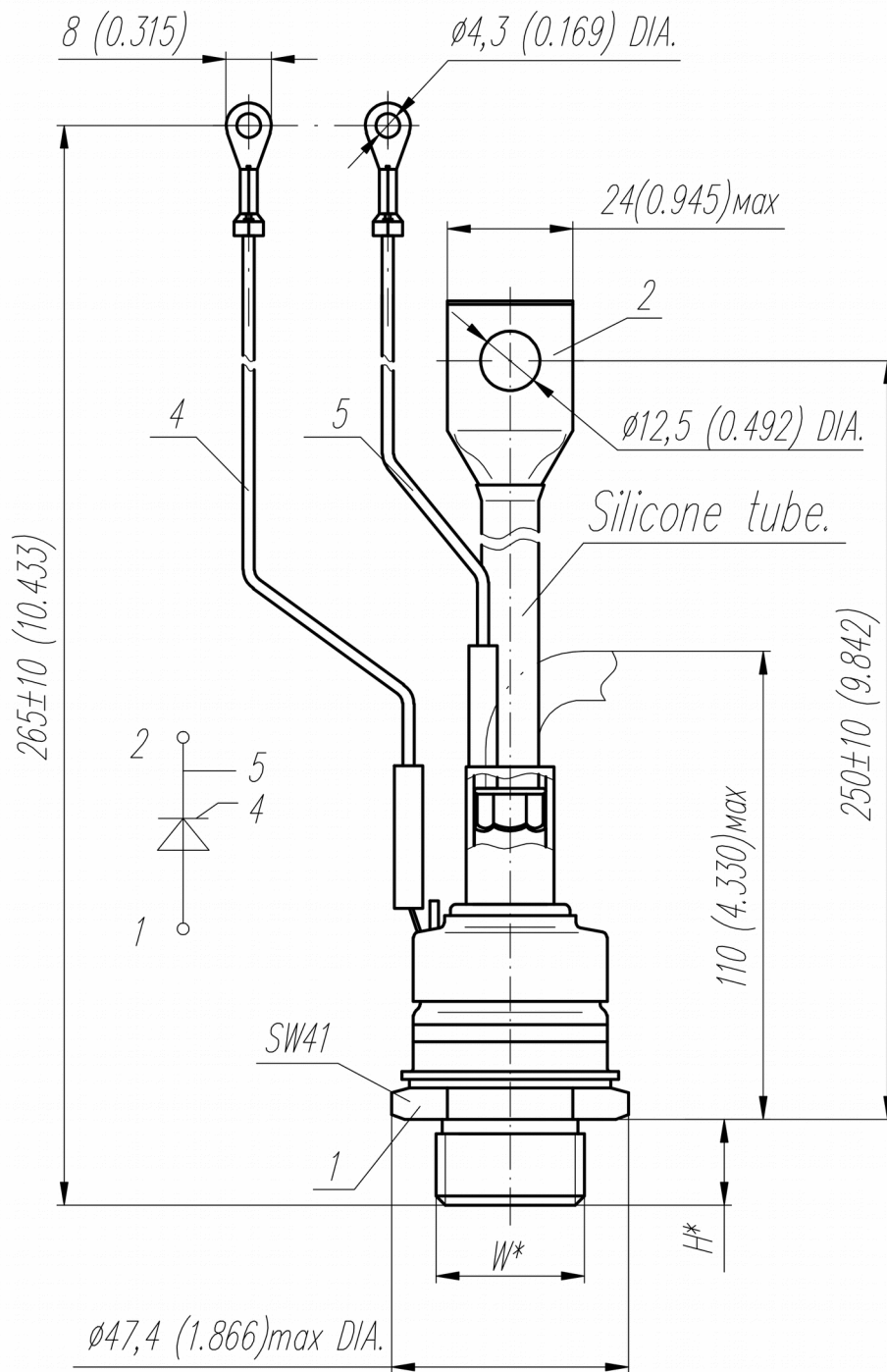
Symbols and parameters		Units	Values	Conditions	
<b>ON-STATE</b>					
$V_{TM}$	Peak on-state voltage, max	V	1.90	$T_j = 25 \text{ °C}$ ; $I_{TM} = 785 A$	
$V_{T(TO)}$	On-state threshold voltage, max	V	0.95	$T_j = T_{j\max}$ ;	
$r_T$	On-state slope resistance, max	m $\Omega$	1.700	$0.5 \pi I_{TAV} < I_T < 1.5 \pi I_{TAV}$	
$I_L$	Latching current, max	mA	700	$T_j = 25 \text{ °C}$ ; $V_D = 12 V$ ; Gate pulse: $I_G = 2 A$ ; $t_{GP} = 50 \mu s$ ; $di_G/dt \geq 1 A/\mu s$	
$I_H$	Holding current, max	mA	300	$T_j = 25 \text{ °C}$ ; $V_D = 12 V$ ; Gate open	
<b>BLOCKING</b>					
$I_{DRM}, I_{RRM}$	Repetitive peak off-state and Repetitive peak reverse currents, max	mA	35	$T_j = T_{j\max}$ ; $V_D = V_{DRM}$ ; $V_R = V_{RRM}$	
$(dv_D/dt)_{crit}$	Critical rate of rise of off-state voltage <sup>1)</sup> , min	V/ $\mu s$	320 500 1000	$T_j = T_{j\max}$ ; $V_D = 0.67 \cdot V_{DRM}$ ; Gate open	
<b>TRIGGERING</b>					
$V_{GT}$	Gate trigger direct voltage, max	V	5.50 2.50 2.00	$T_j = T_{j\min}$ $T_j = 25 \text{ °C}$ $T_j = T_{j\max}$	$V_D = 12 V$ ; $I_D = 3 A$ ; Direct gate current
$I_{GT}$	Gate trigger direct current, max	mA	600 250 200	$T_j = T_{j\min}$ $T_j = 25 \text{ °C}$ $T_j = T_{j\max}$	
$V_{GD}$	Gate non-trigger direct voltage, min	V	0.4	$T_j = T_{j\max}$ ;	
$I_{GD}$	Gate non-trigger direct current, min	mA	10.00	$V_D = 0.67 \cdot V_{DRM}$ ; Direct gate current	
<b>SWITCHING</b>					
$t_{gd}$	Delay time	$\mu s$	2.00	$T_j = 25 \text{ °C}$ ; $V_D = 0.4 \cdot V_{DRM}$ ; $I_{TM} = I_{TAV}$ ; Gate pulse: $I_G = 2 A$ ; $t_{GP} = 50 \mu s$ ; $di_G/dt \geq 1 A/\mu s$	
<b>THERMAL</b>					
$t_q$	Turn-off time, max	$\mu s$	160	$dv_D/dt = 50 V/\mu s$ ; $T_j = T_{j\max}$ ; $I_{TM} = I_{TAV}$ ; $di_R/dt = -10 A/\mu s$ ; $V_R = 100V$ ; $V_D = 0.67 \cdot V_{DRM}$ ;	

$R_{thjc}$	Thermal resistance, junction to case, max	$^{\circ}\text{C}/\text{W}$	0.0800	Direct current
<b>MECHANICAL</b>				
w	Weight, typ	g	440	
$D_s$	Surface creepage distance	mm (inch)	12.4 (4.882)	
$D_a$	Air strike distance	mm (inch)	12.4 (4.882)	

<b>PART NUMBERING GUIDE</b>							<b>NOTES</b>				
TA	271	320	12	A2	T2	N	1) Critical rate of rise of on-state current non-repetitive				
1	2	3	4	5	6	7	Symbol of Group		K2	E2	A2
1. Phase Control Thyristor							$(dv_D/dt)_{crit}, \text{V}/\mu\text{s}$		320	500	1000
2. Design version							2) Turn-off time ( $dv_D/dt=50 \text{ V}/\mu\text{s}$ )				
3. Mean on-state current, A							Symbol of Group		T2		
4. Voltage code							$t_q, \mu\text{s}$		160		
5. Critical rate of rise of on-state current non-repetitive, $\text{V}/\mu\text{s}$											
6. Turn-off time ( $dv_D/dt=50 \text{ V}/\mu\text{s}$ )											
7. Ambient conditions: N – normal; T – tropical											

**OVERALL DIMENSIONS**

**Package type: T.SB1**



Type of screw	W	H
Metric Screw Type C	M24x1,5 – 8g	19
Metric Screw Type B (upon request)	M20x1,5 – 8g	15

Polarity	Example of code designation	Reference designation	Colors		
			Anode	Cathode	Gate
Anode to stud	TA271-250-12		-	Red tube	White

All dimensions in millimeters (inches)

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