EVLYS LTD. - POWER SEMICONDUCTORS DEVICES - Wholesale and Retail.

Avalanche Stud Thyristor Type STA32-320-12

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

Mean on-state current	I_{TAV}	320 A				
Repetitive peak off-state voltage	V_{DRM}	600÷1200 V				
Repetitive peak reverse voltage	V_{RRM}					
Turn-off time	t_q	160 μs				
V_{DRM}, V_{RRM}, V	600	700	800	900	1000	1100	1200
Voltage code	6	7	8	9	10	11	12
T_j, °C	-60÷140					

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions	
ON-STATE					
I_{TAV}	Mean on-state current	A	320	T_c= 97 °C; 180° half-sine wave; 50 Hz	
I_{TRMS}	RMS on-state current	A	502	T_c= 97 °C; 180° half-sine wave; 50 Hz	
I_{TSM}	Surge on-state current	kA	9.0 10.5	$T_j=T_{j\,max}$ T_j=25 °C	180° half-sine wave; t_p=10 ms; single pulse; $V_D=V_R$=0 V; Gate pulse: I_G=2 A; t_{GP}=50 μs; di_G/dt≥1 A/μs
			9.5 11.0	$T_j=T_{j\,max}$ T_j=25 °C	180° half-sine wave; t_p=8.3 ms; single pulse; $V_D=V_R$=0 V; Gate pulse: I_G=2 A; t_{GP}=50 μs; di_G/dt≥1 A/μs
I^2t	Safety factor	$A^2s·10^3$	400 550	$T_j=T_{j\,max}$ T_j=25 °C	180° half-sine wave; t_p=10 ms; single pulse; $V_D=V_R$=0 V; Gate pulse: I_G=2 A; t_{GP}=50 μs; di_G/dt≥1 A/μs
			370 500	$T_j=T_{j\,max}$ T_j=25 °C	180° half-sine wave; t_p=8.3 ms; single pulse; $V_D=V_R$=0 V; Gate pulse: I_G=2 A; t_{GP}=50 μs; di_G/dt≥1 A/μs
BLOCKING					
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; single pulse; Gate open	
$V_{(BR)}$	Breakdown voltage	V	850÷1700	$T_{j\,min}$< T_j <$T_{j\,max}$; I_{RRM} = 100 mA; 180° half-sine wave; single pulse; Gate open	

V_D, V_R	Direct off-state and Direct reverse voltages	V	$0.6 \cdot V_{DRM}$ $0.6 \cdot V_{RRM}$	$T_j = T_{j\,max}$; 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
TRIGGERING				
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
SWITCHING				
$(di_T/dt)_{crit}$	Critical rate of rise of on-state current non-repetitive (f=1 Hz)	A/μs	800	$T_j = T_{j\,max}$; $V_D = 0.67 \cdot V_{DRM}$; $I_{TM} = 3000$ A; Gate pulse: $I_G = 2$ A; $t_{GP} = 50\ \mu s$; $di_G/dt \geq 2$ A/μs
THERMAL				
T_{stg}	Storage temperature	°C	-60÷50	
T_j	Operating junction temperature	°C	-60÷140	
MECHANICAL				
M	Tightening torque	Nm	25÷35	
a	Acceleration	m/s^2	100	

CHARACTERISTICS

Symbols and parameters		Units	Values	Conditions	
ON-STATE					
V_{TM}	Peak on-state voltage, max	V	1.65	$T_j = 25$ °C; $I_{TM} = 1005$ A	
$V_{T(TO)}$	On-state threshold voltage, max	V	1.012	$T_j = T_{j\,max}$;	
r_T	On-state slope resistance, max	mΩ	0.717	$0.5\ \pi\ I_{TAV} < I_T < 1.5\ \pi\ I_{TAV}$	
I_L	Latching current, max	mA	700	$T_j = 25$ °C; $V_D = 12$ V; Gate pulse: $I_G = 2$ A; $t_{GP} = 50\ \mu s$; $di_G/dt \geq 1$ A/μs	
I_H	Holding current, max	mA	300	$T_j = 25$ °C; $V_D = 12$ V; Gate open	
BLOCKING					
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[1], min	V/μs	320 500 1000	$T_j = T_{j\,max}$; $V_D = 0.67 \cdot V_{DRM}$; Gate open	
TRIGGERING					
V_{GT}	Gate trigger direct voltage, max	V	3.00 2.50 1.50	$T_j = T_{j\,min}$ $T_j = 25$ °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	400 250 150	$T_j = T_{j\,min}$ $T_j = 25$ °C $T_j = T_{j\,max}$	
V_{GD}	Gate non-trigger direct voltage, min	V	0.60	$T_j = T_{j\,max}$; $V_D = 0.67 \cdot V_{DRM}$; Direct gate current	
I_{GD}	Gate non-trigger direct current, min	mA	30.00		
SWITCHING					
t_{gd}	Delay time, max	μs	1.25	$T_j = 25$ °C; $V_D = 600$ V; $I_{TM} = I_{TAV}$; di/dt=200 A/μs; Gate pulse: $I_G = 2$ A; $V_G = 20$ V; $t_{GP} = 50\ \mu s$; $di_G/dt = 2$ A/μs	
t_{gt}	Turn-on time, max	μs	4.00		
t_q	Turn-off time[2], max	μs	160	$dv_D/dt = 50$ V/μs; $T_j = T_{j\,max}$; $I_{TM} = I_{TAV}$; $di_R/dt = -10$ A/μs; $V_R = 100$V; $V_D = 0.67 \cdot V_{DRM}$;	
Q_{rr}	Total recovered charge, max	μC	490	$T_j = T_{j\,max}$; $I_{TM} = 320$ A;	
t_{rr}	Reverse recovery time, max	μs	13.0		

I_{rrM}	Peak reverse recovery current, max	A	75.0	di_R/dt=-10 A/μs; V_R=100 V

THERMAL				
R_{thjc}	Thermal resistance, junction to case, max	°C/W	0.0850	Direct current
MECHANICAL				
w	Weight, max	g	440	
D_s	Surface creepage distance	mm (inch)	12.4 (4.882)	
D_a	Air strike distance	mm (inch)	12.4 (4.882)	

PART NUMBERING GUIDE

STA	32	320	12	7	3
1	2	3	4	5	6

1. STA - Avalanche Stud Thyristor
2. Element Diameter
3. Mean on-state current, A
4. Voltage code
5. Critical rate of rise of on-state current non-repetitive, V/μs
6. Turn-off time (dv_D/dt=50 V/μs)

NOTES

1) Critical rate of rise of on-state current non-repetitive

Symbol of Group	5	6	7
$(dv_D/dt)_{crit}$, V/μs	320	500	1000

2) Turn-off time (dv_D/dt=50 V/μs)

Symbol of Group	3
t_q, μs	160

OVERALL DIMENSIONS

8 (0.315)

Ø4,3 (0.169) DIA.

24(0.945)мах

Ø13 (0.512) DIA

Silicone tube.

265±10 (10.433)

250±10 (9.842)

110 (4.330)мах

SW41

Ø47,4 (1.866)max DIA.

W*

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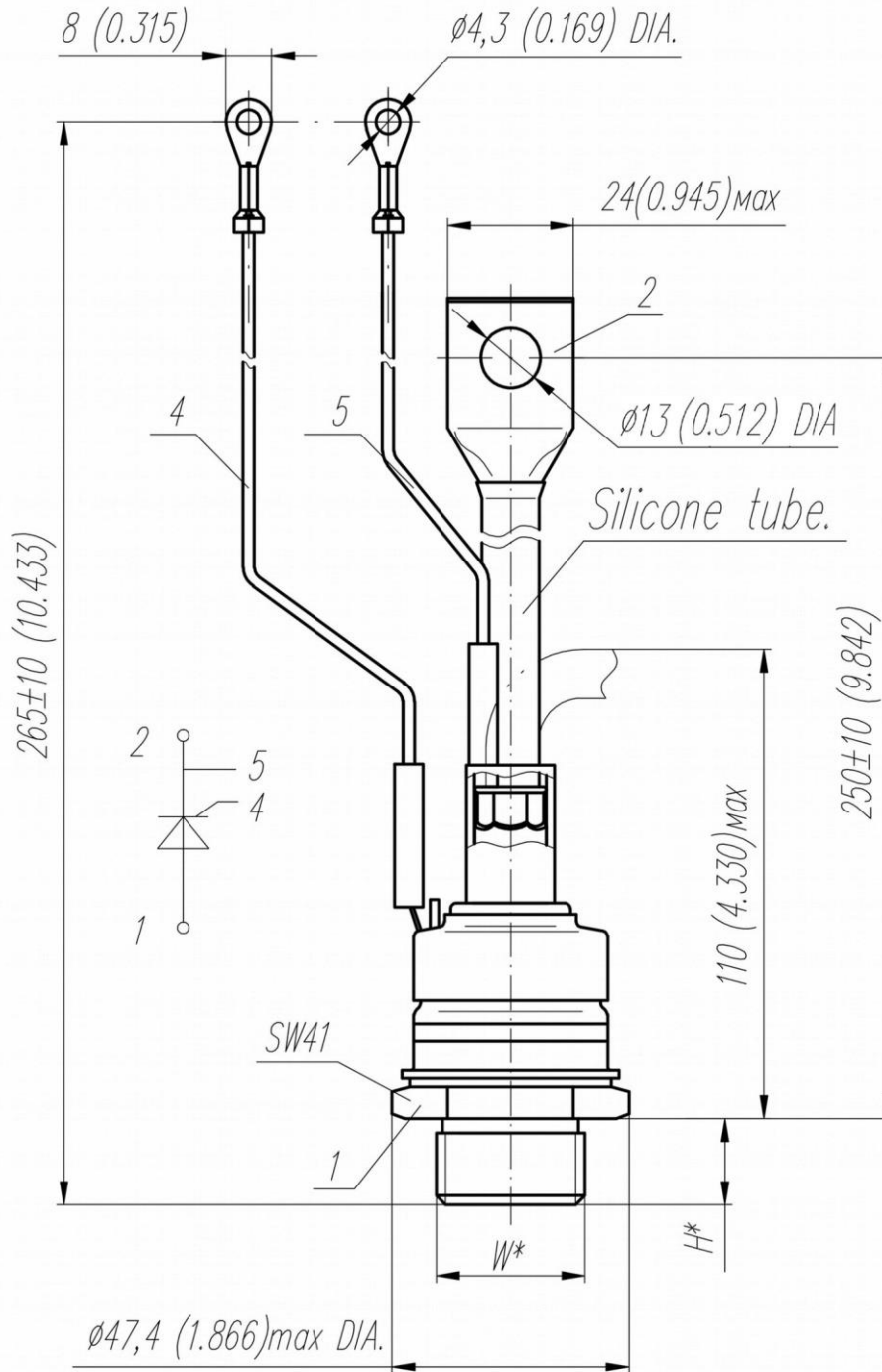
Type of screw	W	H
Metric Screw Type C	M24x1,5 – 8g	19
Metric Screw Type B(upon request)	M20x1,5 – 8g	15

Polarity	Example of code designation	Reference designation	Colors		
			Anode	Cathode	Gate
Anode to stud	STA32_27		-	Red tube	White

All dimensions in millimeters (inches)