

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

Phase Control Disc Thyristor Type DT24-250-16

High power cycling capability / Low on-state and switching losses
Designed for traction and industrial applications

Mean on-state current							I_{TAV}			250 A					
Repetitive peak off-state voltage							V_{DRM}			400 ÷ 1600 V					
Repetitive peak reverse voltage							V_{RRM}								
Turn-off time							t_q			125, 160, 200, 250, 320, 400, 500 μ s					
V_{DRM}, V_{RRM}, V	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600		
Voltage code	4	5	6	7	8	9	10	11	12	13	14	15	16		
$T_j, ^\circ C$	-60 ÷ 125														

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions	
ON-STATE					
I_{TAV}	Mean on-state current	A	250 322	$T_c=96^\circ C$, Double side cooled $T_c=85^\circ C$, Double side cooled 180° half-sine wave; 50 Hz	
I_{TRMS}	RMS on-state current	A	392	$T_c=96^\circ C$, Double side cooled 180° half-sine wave; 50 Hz	
I_{TSM}	Surge on-state current	kA	4.5 5.0	$T_j=T_{jmax}$ $T_j=25^\circ C$	180° half-sine wave; $t_p=10$ ms; single pulse; $V_D=V_R=0$ V; Gate pulse: $I_G=2$ A; $t_{GP}=50$ μ s; $di_G/dt \geq 1$ A/ μ s
			4.5 5.0	$T_j=T_{jmax}$ $T_j=25^\circ C$	180° half-sine wave; $t_p=8.3$ ms; single pulse; $V_D=V_R=0$ V; Gate pulse: $I_G=2$ A; $t_{GP}=50$ μ s; $di_G/dt \geq 1$ A/ μ s
I^2t	Safety factor	$A^2s \cdot 10^3$	100 120	$T_j=T_{jmax}$ $T_j=25^\circ C$	180° half-sine wave; $t_p=10$ ms; single pulse; $V_D=V_R=0$ V; Gate pulse: $I_G=2$ A; $t_{GP}=50$ μ s; $di_G/dt \geq 1$ A/ μ s
			80 100	$T_j=T_{jmax}$ $T_j=25^\circ C$	180° half-sine wave; $t_p=8.3$ ms; single pulse; $V_D=V_R=0$ V; Gate pulse: $I_G=2$ A; $t_{GP}=50$ μ s; $di_G/dt \geq 1$ A/ μ s
BLOCKING					
V_{DRM}, V_{RRM}	Repetitive peak off-state and Repetitive peak reverse voltages	V	400 ÷ 1600	$T_{jmin} < T_j < T_{jmax}$; 180° half-sine wave; 50 Hz; Gate open	
V_{DSM}, V_{RSM}	Non-repetitive peak off-state and Non-repetitive peak reverse voltages	V	500 ÷ 1700	$T_{jmin} < T_j < T_{jmax}$; 180° half-sine wave; single pulse; Gate open	
V_D, V_R	Direct off-state and Direct reverse voltages	V	$0.6 \cdot V_{DRM}$ $0.6 \cdot V_{RRM}$	$T_j=T_{jmax}$; Gate open	
TRIGGERING					
I_{FGM}	Peak forward gate current	A	5	$T_j=T_{jmax}$	
V_{RGM}	Peak reverse gate voltage	V	5		

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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/ μ s	800	$T_j = T_{j \max}$; $V_D = 0.67 \cdot V_{DRM}$; $I_{TM} = 640$ A; Gate pulse: $I_G = 2$ A; $t_{GP} = 50$ μ s; $di_G/dt \geq 2$ A/ μ s
THERMAL				
T_{stg}	Storage temperature	$^{\circ}$ C	-60÷50	
T_j	Operating junction temperature	$^{\circ}$ C	-60÷125	
MECHANICAL				
F	Mounting force	kN	5.0÷7.0	
a	Acceleration	m/s ²	50	Device clamped

CHARACTERISTICS

Symbols and parameters		Units	Values	Conditions	
ON-STATE					
V_{TM}	Peak on-state voltage, max	V	1.70	$T_j = 25$ $^{\circ}$ C; $I_{TM} = 785$ A	
$V_{T(TO)}$	On-state threshold voltage, max	V	1.034	$T_j = T_{j \max}$;	
r_T	On-state slope resistance, max	m Ω	0.937	$0.5 \pi I_{TAV} < I_T < 1.5 \pi I_{TAV}$	
I_L	Latching current, max	mA	500	$T_j = 25$ $^{\circ}$ C; $V_D = 12$ V; Gate pulse: $I_G = 2$ A; $t_{GP} = 50$ μ s; $di_G/dt \geq 1$ A/ μ s	
I_H	Holding current, max	mA	250	$T_j = 25$ $^{\circ}$ C; $V_D = 12$ V; Gate open	
BLOCKING					
I_{DRM}, I_{RRM}	Repetitive peak off-state and Repetitive peak reverse currents, max	mA	50	$T_j = T_{j \max}$; $V_D = V_{DRM}$; $V_R = V_{RRM}$	
$(dv_D/dt)_{crit}$	Critical rate of rise of off-state voltage ¹⁾ , min	V/ μ s	200, 320, 500, 1000, 1600, 2000, 2500	$T_j = T_{j \max}$; $V_D = 0.67 \cdot V_{DRM}$; Gate open	
TRIGGERING					
V_{GT}	Gate trigger direct voltage, max	V	3.00 2.50 1.50	$T_j = T_{j \min}$ $T_j = 25$ $^{\circ}$ 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	$T_j = T_{j \min}$ $T_j = 25$ $^{\circ}$ C $T_j = T_{j \max}$	
V_{GD}	Gate non-trigger direct voltage, min	V	0.70	$T_j = T_{j \max}$;	
I_{GD}	Gate non-trigger direct current, min	mA	65.00	$V_D = 0.67 \cdot V_{DRM}$; Direct gate current	
SWITCHING					
t_{gd}	Delay time, max	μ s	1.10	$T_j = 25$ $^{\circ}$ C; $V_D = 600$ V; $I_{TM} = I_{TAV}$; $di/dt = 200$ A/ μ s;	
t_{gt}	Turn-on time, max	μ s	3.00	Gate pulse: $I_G = 2$ A; $V_G = 20$ V; $t_{GP} = 50$ μ s; $di_G/dt = 2$ A/ μ s	
t_q	Turn-off time ²⁾ , max	μ s	125, 160, 200, 250, 320, 400, 500	$dv_D/dt = 50$ V/ μ s; $T_j = T_{j \max}$; $I_{TM} = I_{TAV}$; $di_R/dt = -10$ A/ μ s; $V_R = 100$ V; $V_D = 0.67 \cdot V_{DRM}$	
Q_{rr}	Total recovered charge, max	μ C	700	$T_j = T_{j \max}$; $I_{TM} = 250$ A;	
t_{rr}	Reverse recovery time, max	μ s	16	$di_R/dt = -10$ A/ μ s;	
I_{rrM}	Peak reverse recovery current, max	A	88	$V_R = 100$ V	
THERMAL					

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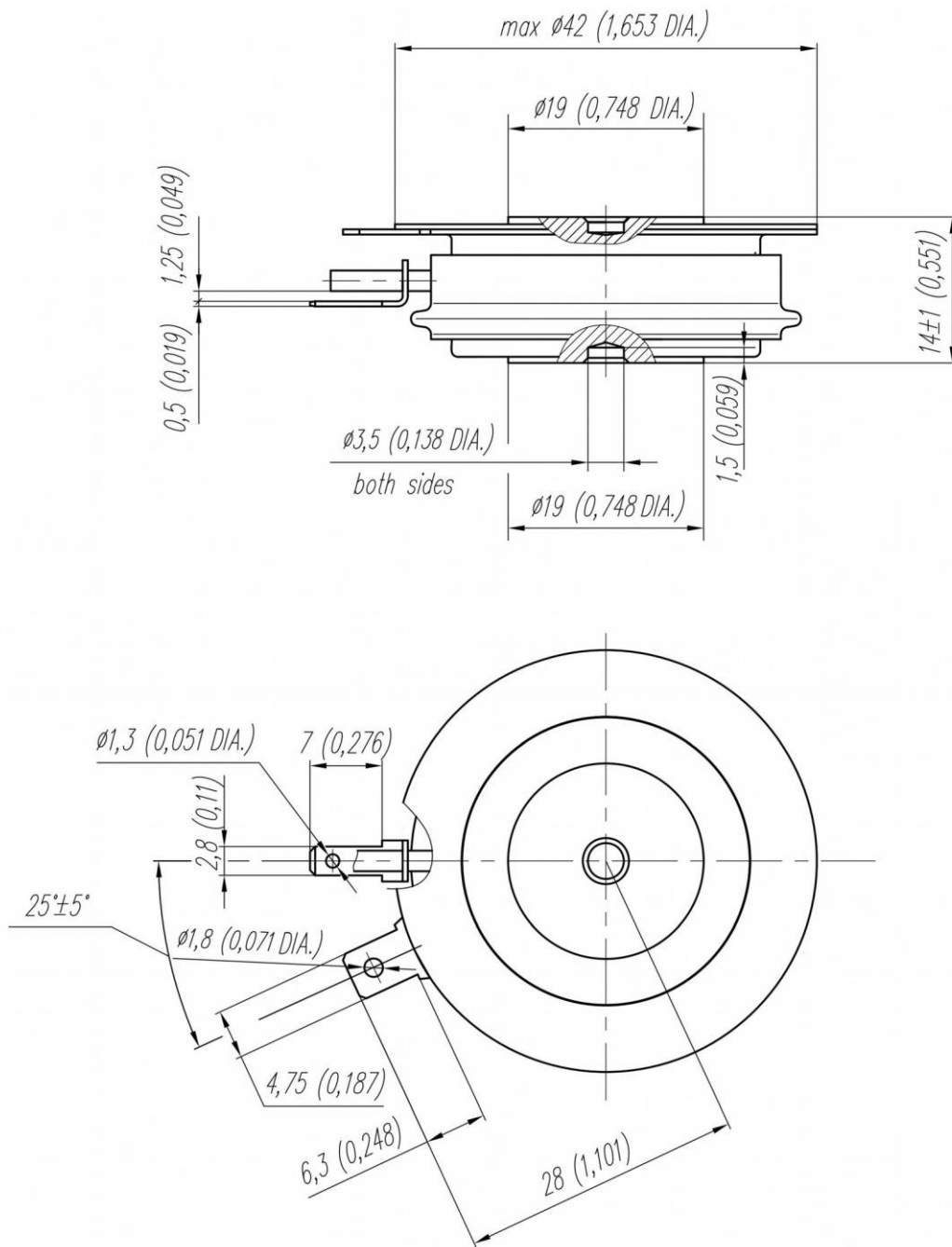
R_{thjc}	Thermal resistance, junction to case, max	°C/W	0.070	Direct current	Double side cooled
R_{thjc-A}			0.154		Anode side cooled
R_{thjc-K}			0.126		Cathode side cooled
R_{thck}	Thermal resistance, case to heatsink, max	°C/W	0.010	Direct current	
MECHANICAL					
w	Weight, max	g	70		
D_s	Surface creepage distance	mm (inch)	7.94 (0.313)		
D_a	Air strike distance	mm (inch)	5.00 (0.197)		

PART NUMBERING GUIDE							NOTES																							
DT	24	250	16	7	2		1) Critical rate of rise of off-state voltage																							
1	2	3	4	5	6		<table border="1"> <thead> <tr> <th>Symbol of Group</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>8.5</th> <th>9</th> </tr> </thead> <tbody> <tr> <td>$(dv_D/dt)_{crit}, V/\mu s$</td> <td>200</td> <td>320</td> <td>500</td> <td>1000</td> <td>1600</td> <td>2000</td> <td>2500</td> </tr> </tbody> </table>								Symbol of Group	4	5	6	7	8	8.5	9	$(dv_D/dt)_{crit}, V/\mu s$	200	320	500	1000	1600	2000	2500
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2. Element Diameter							<table border="1"> <thead> <tr> <th>Symbol of Group</th> <th>2.5</th> <th>3</th> <th>4</th> <th>4.5</th> <th>5</th> <th>5.5</th> <th>6</th> </tr> </thead> <tbody> <tr> <td>$t_q, \mu s$</td> <td>125</td> <td>160</td> <td>200</td> <td>250</td> <td>320</td> <td>400</td> <td>500</td> </tr> </tbody> </table>								Symbol of Group	2.5	3	4	4.5	5	5.5	6	$t_q, \mu s$	125	160	200	250	320	400	500
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OVERALL DIMENSIONS

Package type: T.A1



All dimensions in millimeters (inches)