

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

Phase Control Disc Thyristor Type DT99-2500-52

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

Mean on-state current		I_{TAV}	2500 A	
Repetitive peak off-state voltage		V_{DRM}	4600 ÷ 5200 V	
Repetitive peak reverse voltage		V_{RRM}		
Turn-off time		t_q	800 μ s	
V_{DRM}, V_{RRM}, V	4600	4800	5000	5200
Voltage code	46	48	50	52
$T_j, ^\circ C$	- 60 ÷ 125			

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions
ON-STATE				
I_{TAV}	Mean on-state current	A	2500 3900	$T_c = 98^\circ C$, Double side cooled $T_c = 70^\circ C$, Double side cooled 180° half-sine wave; 50 Hz
I_{TRMS}	RMS on-state current	A	3925	$T_c = 98^\circ C$, Double side cooled 180° half-sine wave; 50 Hz
I_{TSM}	Surge on-state current	kA	55.0 63.0	$T_j = T_{jmax}$ $T_j = 25^\circ C$ 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
			58.0 67.0	$T_j = T_{jmax}$ $T_j = 25^\circ C$ 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	$A^2s \cdot 10^3$	15100 19800	$T_j = T_{jmax}$ $T_j = 25^\circ C$ 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
			13900 18600	$T_j = T_{jmax}$ $T_j = 25^\circ C$ 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	4600 ÷ 5200	$T_{jmin} < T_j < T_{jmax}$; 180° half-sine wave; 50 Hz; Gate open
V_{DSM}, V_{RSM}	Non-repetitive peak off-state and Non-repetitive peak reverse voltages	V	4700 ÷ 5300	$T_{jmin} < T_j < T_{jmax}$; 180° half-sine wave; single pulse; Gate open
V_D, V_R	Direct off-state and Direct reverse voltages	V	0.6· V_{DRM} 0.6· V_{RRM}	$T_j = T_{jmax}$; Gate open

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TRIGGERING				
I_{FGM}	Peak forward gate current	A	12	$T_j = T_{j\max}$
V_{RGM}	Peak reverse gate voltage	V	5	
P_G	Gate power dissipation	W	5	$T_j = T_{j\max}$ 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	1000	$T_j = T_{j\max}$; $V_D = 0.67 \cdot V_{DRM}$; $I_{TM} = 2 I_{TAV}$; Gate pulse: $I_G = 2$ A; $t_{GP} = 50 \mu$ S; $di_G/dt \geq 2$ 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	70.0 ÷ 90.0	
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	2.10	$T_j = 25 \text{ }^{\circ}$ C; $I_{TM} = 6300$ A	
$V_{T(TO)}$	On-state threshold voltage, max	V	1.00	$T_j = T_{j\max}$;	
r_T	On-state slope resistance, max	m Ω	0.190	$0.5 \pi I_{TAV} < I_T < 1.5 \pi I_{TAV}$	
I_L	Latching current, max	mA	1500	$T_j = 25 \text{ }^{\circ}$ C; $V_D = 12$ V; Gate pulse: $I_G = 2$ A; $t_{GP} = 50 \mu$ S; $di_G/dt \geq 1$ A/ μ S	
I_H	Holding current, max	mA	300	$T_j = 25 \text{ }^{\circ}$ C; $V_D = 12$ V; Gate open	
BLOCKING					
I_{DRM}, I_{RRM}	Repetitive peak off-state and Repetitive peak reverse currents, max	mA	300	$T_j = T_{j\max}$; $V_D = V_{DRM}$; $V_R = V_{RRM}$	
$(dv_D/dt)_{crit}$	Critical rate of rise of off-state voltage ¹⁾ , min	V/ μ S	500, 1000, 1600	$T_j = T_{j\max}$; $V_D = 0.67 \cdot V_{DRM}$; Gate open	
TRIGGERING					
V_{GT}	Gate trigger direct voltage, max	V	5.00 3.00 2.00	$T_j = T_{j\min}$ $T_j = 25 \text{ }^{\circ}$ 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	500 300 200	$T_j = T_{j\min}$ $T_j = 25 \text{ }^{\circ}$ C $T_j = T_{j\max}$	
V_{GD}	Gate non-trigger direct voltage, min	V	0.35	$T_j = T_{j\max}$; $V_D = 0.67 \cdot V_{DRM}$;	
I_{GD}	Gate non-trigger direct current, min	mA	15.00	Direct gate current	
SWITCHING					
t_{gd}	Delay time	μ S	4.00	$T_j = 25 \text{ }^{\circ}$ C; $V_D = 1500$ V; $I_{TM} = I_{TAV}$; $di/dt = 200$ A/ μ S; Gate pulse: $I_G = 2$ A; $V_G = 20$ V; $t_{GP} = 50 \mu$ S; $di_G/dt = 2$ A/ μ S	
t_q	Turn-off time ²⁾ , max	μ S	800	$dv_D/dt = 50$ V/ μ S; $T_j = T_{j\max}$; $I_{TM} = 1000$ A; $di_R/dt = -5$ A/ μ S; $V_R = 100$ V; $V_D = 1600$ V;	
Q_{rr}	Total recovered charge, max	μ C	12500	$T_j = T_{j\max}$; $I_{TM} = 1000$ A;	
t_{rr}	Reverse recovery time, typ	μ S	157	$di_R/dt = -5$ A/ μ S;	
I_{rrM}	Peak reverse recovery current, max	A	159	$V_R = 100$ V	

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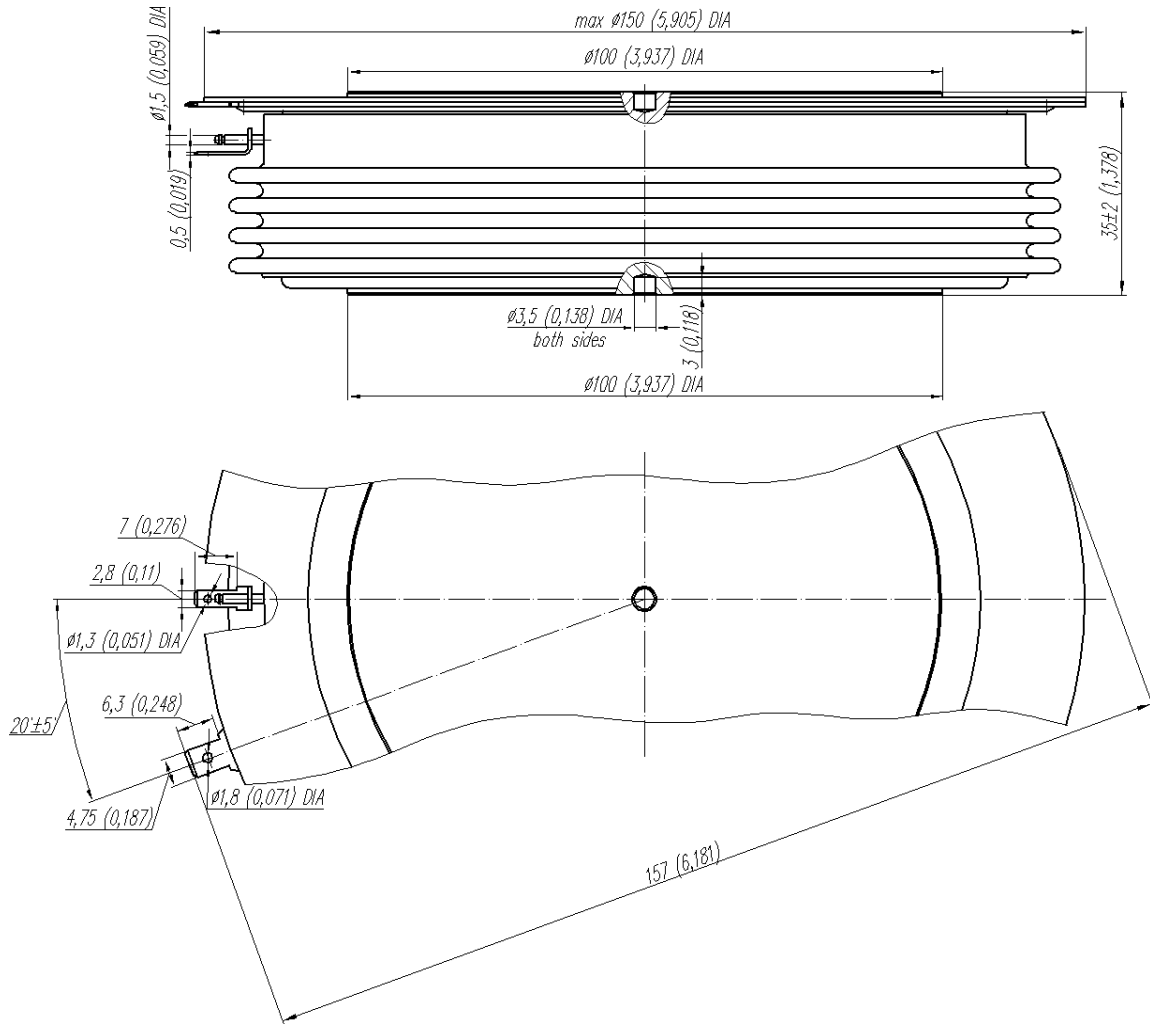
THERMAL					
R_{thjc}	Thermal resistance, junction to case, max	°C/W	0.0050	Direct current	Double side cooled
R_{thjc-A}			0.0110		Anode side cooled
R_{thjc-K}			0.0090		Cathode side cooled
R_{thck}	Thermal resistance, case to heatsink, max	°C/W	0.0010	Direct current	
MECHANICAL					
w	Weight, max	g	2200		
D_s	Surface creepage distance	mm (inch)	44.60 (1.756)		
D_a	Air strike distance	mm (inch)	15.70 (0.618)		

PART NUMBERING GUIDE							NOTES				
DT	99	2500	52	7	3		1) Critical rate of rise of off-state voltage				
1	2	3	4	5	6		Symbol of Group	6	7	8	
1. DT - Phase Control Disc Thyristor							$(dv_D/dt)_{crit}$, V/ μ s	500	1000	1600	
2. Element Diameter							2) Turn-off time ($dv_D/dt=50$ V/ μ s)				
3. Mean on-state current, A							Symbol of Group	0			
4. Voltage code							t_q , μ s	800			
5. Critical rate of rise of on-state current non-repetitive, V/ μ s											
6. Turn-off time ($dv_D/dt=50$ V/ μ s)											

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OVERALL DIMENSIONS

Package type: T.G6



All dimensions in millimeters (inches)