

# 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 $\mu$ 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
<b>ON-STATE</b>				
$I_{TAV}$	Mean on-state current	A	2500 3600	$T_c = 94^\circ C$ , 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	$T_c = 94^\circ C$ , 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; $t_{GP} = 50 \mu$ s; $di_G/dt \geq 1$ A/ $\mu$ 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; $t_{GP} = 50 \mu$ s; $di_G/dt \geq 1$ A/ $\mu$ 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; $t_{GP} = 50 \mu$ s; $di_G/dt \geq 1$ A/ $\mu$ 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; $t_{GP} = 50 \mu$ s; $di_G/dt \geq 1$ A/ $\mu$ s
<b>BLOCKING</b>				
$V_{DRM}, V_{RRM}$	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	$0.6 \cdot V_{DRM}$ $0.6 \cdot V_{RRM}$	$T_j = T_{jmax}$ ; 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/ $\mu$ 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/ $\mu$ 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 <sup>2</sup>	50	Device clamped

## CHARACTERISTICS

Symbols and parameters		Units	Values	Conditions		
ON-STATE						
$V_{TM}$	Peak on-state voltage, max	V	2.10	$T_j = 25$ $^{\circ}$ 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 $\Omega$	0.190	$0.5 \pi I_{TAV} < I_T < 1.5 \pi I_{TAV}$		
$I_L$	Latching current, max	mA	1500	$T_j = 25$ $^{\circ}$ 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	$T_j = 25$ $^{\circ}$ 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 <sup>1)</sup> , min	V/ $\mu$ 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	$T_j = T_{j\min}$ $T_j = 25$ $^{\circ}$ C	$V_D = 12$ V; $I_D = 3$ A; Direct gate current	
			3.00			
$I_{GT}$	Gate trigger direct current, max	mA	2.00	$T_j = T_{j\max}$		
			500			$T_j = T_{j\min}$ $T_j = 25$ $^{\circ}$ C
			300			
200	$T_j = T_{j\max}$					
$V_{GD}$	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	$\mu$ s	4.00	$T_j = 25$ $^{\circ}$ C; $V_D = 1500$ V; $I_{TM} = I_{TAV}$ ; $di/dt = 200$ A/ $\mu$ s; Gate pulse: $I_G = 2$ A; $V_G = 20$ V; $t_{GP} = 50$ $\mu$ s; $di_G/dt = 2$ A/ $\mu$ s		
$t_q$	Turn-off time <sup>2)</sup> , max	$\mu$ s	800	$dv_D/dt = 50$ V/ $\mu$ s; $T_j = T_{j\max}$ ; $I_{TM} = 1000$ A; $di_R/dt = -5$ A/ $\mu$ s; $V_R = 100$ V; $V_D = 1600$ V;		
$Q_{rr}$	Total recovered charge, max	$\mu$ C	12500	$T_j = T_{j\max}$ ; $I_{TM} = 1000$ A;		
$t_{rr}$	Reverse recovery time, typ	$\mu$ s	157	$di_R/dt = -5$ A/ $\mu$ s;		
$I_{rrM}$	Peak reverse recovery current, max	A	159	$V_R = 100$ V		

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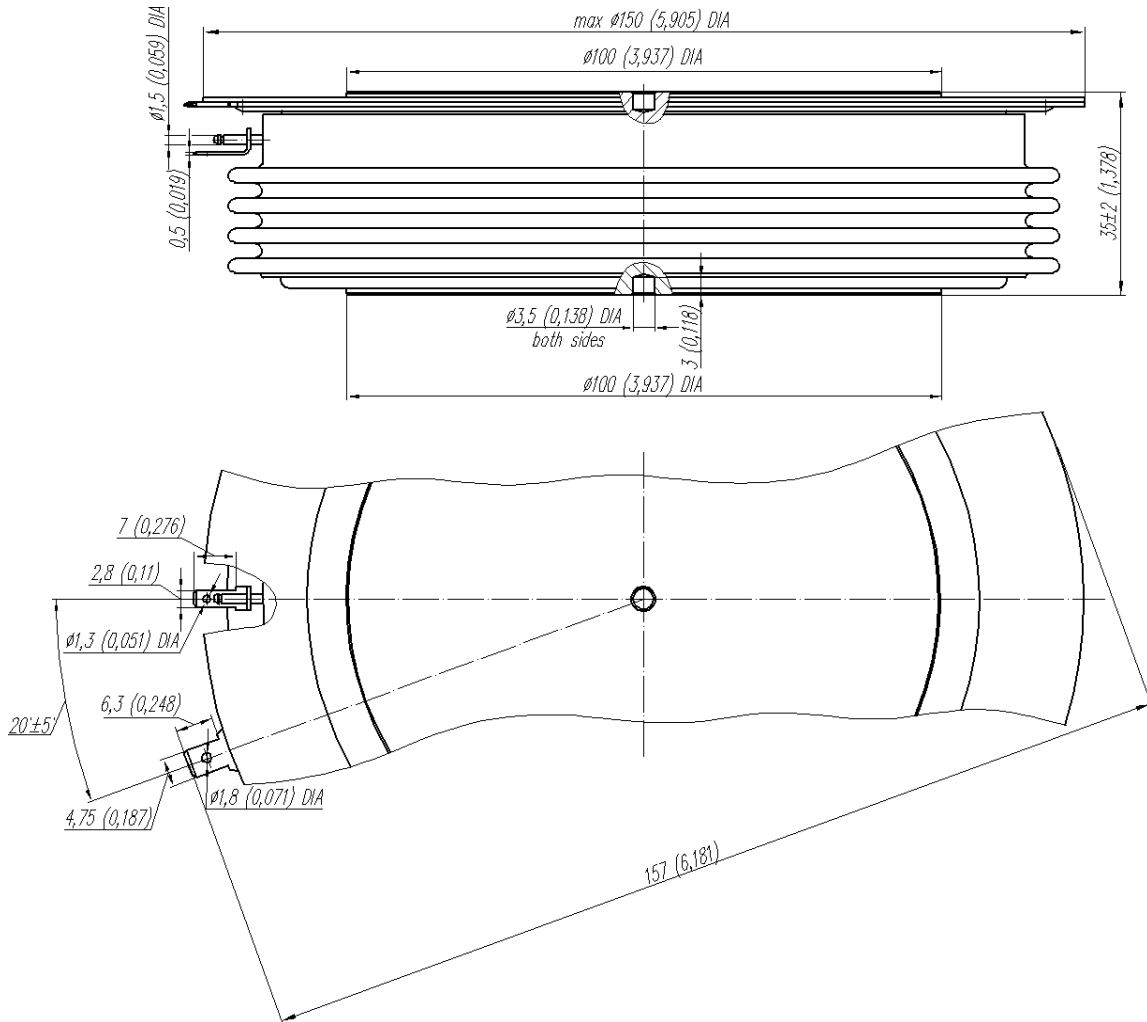
<b>THERMAL</b>					
$R_{thjc}$	Thermal resistance, junction to case, max	°C/W	0.0057	Direct current	Double side cooled
$R_{thjc-A}$			0.0125		Anode side cooled
$R_{thjc-K}$			0.0103		Cathode side cooled
$R_{thck}$	Thermal resistance, case to heatsink, max	°C/W	0.0010	Direct current	
<b>MECHANICAL</b>					
w	Weight, max	g	2700		
$D_s$	Surface creepage distance	mm (inch)	62.09 (2.444)		
$D_a$	Air strike distance	mm (inch)	23.40 (0.921)		

<b>PART NUMBERING GUIDE</b>							<b>NOTES</b>				
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							$(dv_b/dt)_{crit}, V/\mu s$	500	1000	1600	
2. Element Diameter							2) Turn-off time ( $dv_b/dt=50 V/\mu s$ )				
3. Mean on-state current, A							Symbol of Group	0			
4. Voltage code							$t_{tr}, \mu s$	800			
5. Critical rate of rise of on-state current non-repetitive, V/ $\mu s$											
6. Turn-off time ( $dv_b/dt=50 V/\mu s$ )											

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## OVERALL DIMENSIONS

Package type: T.G6



All dimensions in millimeters (inches)