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

Phase Control Disc Thyristor Type DT56-1600-8

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

Mean on-state current				I_{TAV}		1600 A		
Repetitive peak off-state voltage				V_{DRM}		100 ÷ 800 V		
Repetitive peak reverse voltage				V_{RRM}				
Turn-off time				t_q		160, 200, 250, 320, 400, 500 µs		
V_{DRM}, V_{RRM}, V	100	200	300	400	500	600	700	800
Voltage code	1	2	3	4	5	6	7	8
T_j, °C	-60 ÷ 140							

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions	
ON-STATE					
I_{TAV}	Mean on-state current	A	1600 2106	T_c=102 °C, Double side cooled T_c=85 °C, Double side cooled 180° half-sine wave; 50 Hz	
I_{TRMS}	RMS on-state current	A	2512	T_c=102 °C, Double side cooled 180° half-sine wave; 50 Hz	
I_{TSM}	Surge on-state current	kA	39.0 45.0	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
			41.0 47.0	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	$A^2s \cdot 10^3$	7600 10100	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
			6900 9100	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	100÷800	$T_{j\,min}$< 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	200÷900	$T_{j\,min}$< T_j <$T_{j\,max}$; 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=$T_{j\,max}$; Gate open	

TRIGGERING				
I_{FGM}	Peak forward gate current	A	8	$T_j=T_{j\,max}$
V_{RGM}	Peak reverse gate voltage	V	5	
P_G	Gate power dissipation	W	4	$T_j=T_{j\,max}$ for DC gate current
SWITCHING				
$(di_T/dt)_{crit}$	Critical rate of rise of on-state current non-repetitive (f=1 Hz)	A/μs	1000	$T_j=T_{j\,max}$; $V_D=0.67\cdot V_{DRM}$; I_{TM}=3200 A; Gate pulse: I_G=2 A; t_{GP}=50 μs; $di_G/dt\geq$2 A/μs
THERMAL				
T_{stg}	Storage temperature	°C	-60÷50	
T_j	Operating junction temperature	°C	-60÷140	
MECHANICAL				
F	Mounting force	kN	24.0÷28.0	
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	1.50	T_j=25 °C; I_{TM}=5024 A	
$V_{T(TO)}$	On-state threshold voltage, max	V	0.857	$T_j=T_{j\,max}$; 0.5 π I_{TAV} < I_T < 1.5 π I_{TAV}	
r_T	On-state slope resistance, max	mΩ	0.115		
I_L	Latching current, max	mA	1500	T_j=25 °C; V_D=12 V; Gate pulse: I_G=2 A; t_{GP}=50 μs; $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	150	$T_j=T_{j\,max}$; $V_D=V_{DRM}$; $V_R=V_{RRM}$	
$(dv_D/dt)_{crit}$	Critical rate of rise of off-state voltage[1)], min	V/μs	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 °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	0.50	$T_j=T_{j\,max}$; $V_D=0.67\cdot V_{DRM}$; Direct gate current	
I_{GD}	Gate non-trigger direct current, min	mA	55.00		
SWITCHING					
t_{gd}	Delay time, max	μs	0.85	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 μs; di_G/dt=2 A/μs	
t_{gt}	Turn-on time, max	μs	5.00		
t_q	Turn-off time[2)], max	μs	160, 200, 250, 320, 400, 500	dv_D/dt=50 V/μs; $T_j=T_{j\,max}$; $I_{TM}=I_{TAV}$; di_R/dt=-10 A/μs; V_R=100V; $V_D=0.67\cdot V_{DRM}$	
Q_{rr}	Total recovered charge, max	μC	1250	$T_j=T_{j\,max}$; $I_{TM}=I_{TAV}$; di_R/dt=-10 A/μs; V_R=100 V;	
t_{rr}	Reverse recovery time, typ	μs	18		
I_{rrM}	Peak reverse recovery current, max	A	140		

THERMAL					
R_{thjc}	Thermal resistance, junction to case, max	°C/W	0.0180	Direct current	Double side cooled
R_{thjc-A}			0.0396		Anode side cooled
R_{thjc-K}			0.0324		Cathode side cooled
R_{thck}	Thermal resistance, case to heatsink, max	°C/W	0.0040	Direct current	
MECHANICAL					
w	Weight, max	g	330		
D_s	Surface creepage distance	mm (inch)	7.51 (0.295)		
D_a	Air strike distance	mm (inch)	5.60 (0.220)		

PART NUMBERING GUIDE

DT	56	1600	8	7	3
1	2	3	4	5	6

1. DT - Phase Control Disc 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 off-state voltage

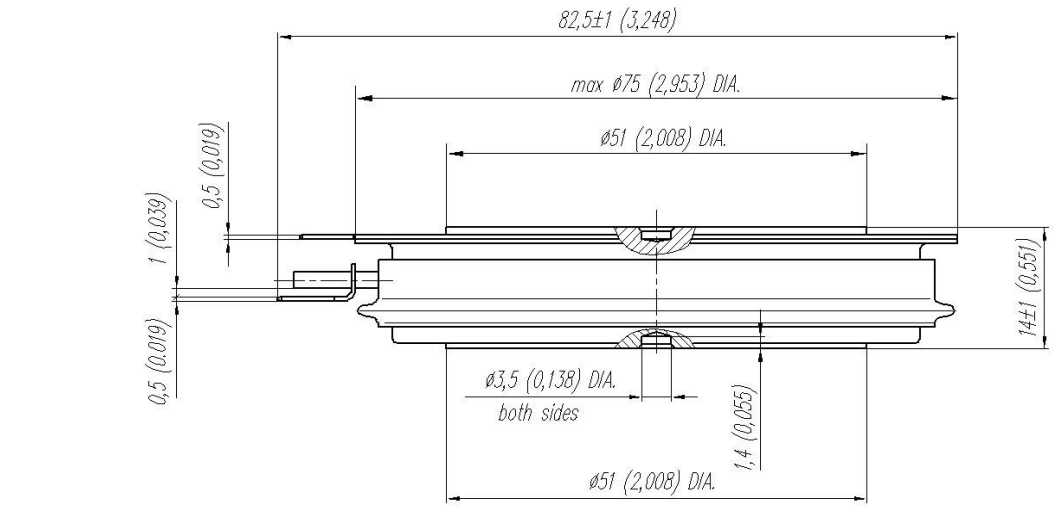
Symbol of Group	4	5	6	7	8	8.5	9
$(dv_D/dt)_{crit}$, V/µs	200	320	500	1000	1600	2000	2500

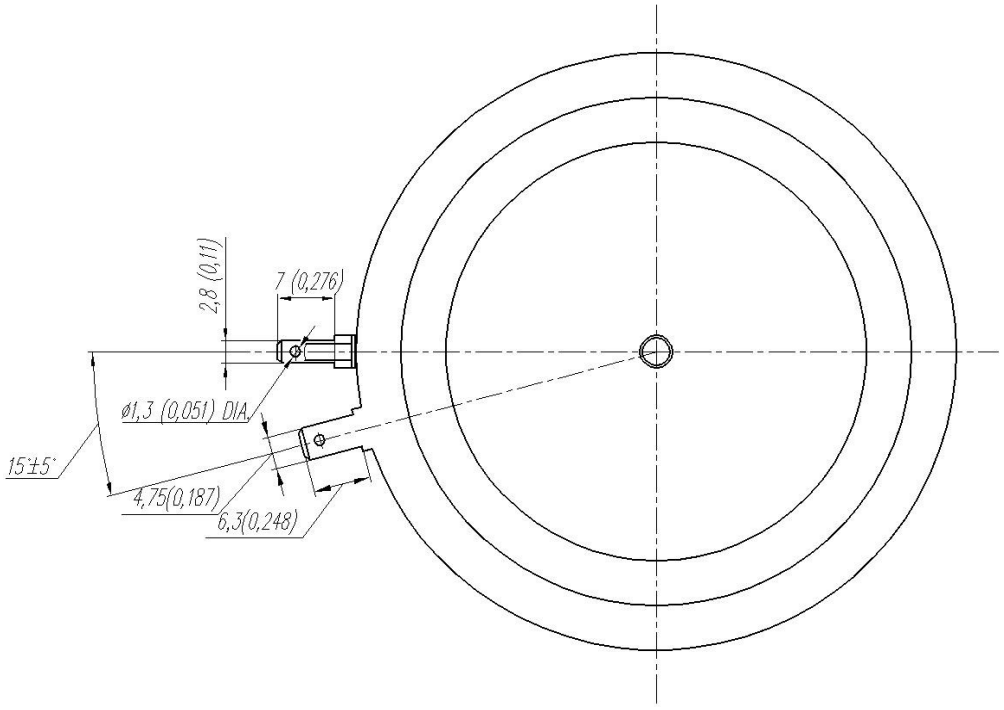
[2] Turn-off time (dv_D/dt=50 V/µs)

Symbol of Group	3	0	0	0	0	0
t_q, µs	160	200	250	320	400	500

OVERALL DIMENSIONS

Package type: T.D1





All dimensions in millimeters (inches)