

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

Fast Thyristor Type **FDT56-630-22**

Low switching losses
Distributed amplified gate for high di_T/dt

Mean on-state current				I_{TAV}	630 A		
Repetitive peak off-state voltage				V_{DRM}	1400...2200 V		
Repetitive peak reverse voltage				V_{RRM}			
Turn-off time				t_q	20.0, 25.0, 32.0, 40.0 μs		
V_{DRM}, V_{RRM}, V	1400	1500	1600	1800	2000	2200	
Voltage code	14	15	16	18	20	22	
$T_j, ^\circ C$	-60...+125						

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions
ON-STATE				
I_{TAV}	Mean on-state current	A	630 783 1187	$T_c = 94^\circ C$; Double side cooled; $T_c = 85^\circ C$; Double side cooled; $T_c = 55^\circ C$; Double side cooled; 180° half-sine wave; 50 Hz
I_{TRMS}	RMS on-state current	A	989	$T_c = 94^\circ C$; Double side cooled; 180° half-sine wave; 50 Hz
I_{TSM}	Surge on-state current	kA	20.0 23.0	$T_j = T_{jmax}$ $T_j = 25^\circ C$ 180° half-sine wave; $t_p = 10$ ms; single pulse; $V_D = V_R = 0$ V; Gate pulse: $I_G = I_{FGM}$; $V_G = 20$ V; $t_{GP} = 50 \mu s$; $di_G/dt = 1$ A/ μs
			21.0 24.0	$T_j = T_{jmax}$ $T_j = 25^\circ C$ 180° half-sine wave; $t_p = 8.3$ ms; single pulse; $V_D = V_R = 0$ V; Gate pulse: $I_G = I_{FGM}$; $V_G = 20$ V; $t_{GP} = 50 \mu s$; $di_G/dt = 1$ A/ μs
I^2t	Safety factor	$A^2s \cdot 10^3$	2000 2600	$T_j = T_{jmax}$ $T_j = 25^\circ C$ 180° half-sine wave; $t_p = 10$ ms; single pulse; $V_D = V_R = 0$ V; Gate pulse: $I_G = I_{FGM}$; $V_G = 20$ V; $t_{GP} = 50 \mu s$; $di_G/dt = 1$ A/ μs
			1800 2300	$T_j = T_{jmax}$ $T_j = 25^\circ C$ 180° half-sine wave; $t_p = 8.3$ ms; single pulse; $V_D = V_R = 0$ V; Gate pulse: $I_G = I_{FGM}$; $V_G = 20$ V; $t_{GP} = 50 \mu s$; $di_G/dt = 1$ A/ μs
BLOCKING				
V_{DRM}, V_{RRM}	Repetitive peak off-state and Repetitive peak reverse voltages	V	1400...2200	$T_{jmin} < T_j < T_{jmax}$; 180° half-sine wave; 50 Hz; Gate open
V_{DSM}, V_{RSM}	Non-repetitive peak off-state and Non-repetitive peak reverse voltages	V	1500...2300	$T_{jmin} < T_j < T_{jmax}$; 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				

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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	8	$T_j = T_{j\max}$ 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	2000	$T_j = T_{j\max}$; $V_D = 0.67 \cdot V_{DRM}$; $I_{TM} = 2800$ A; Gate pulse: $I_G = 2$ A; $V_G = 20$ V; $t_{GP} = 50$ μ s; $di_G/dt = 2$ 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	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	2.50	$T_j = 25$ $^{\circ}$ C; $I_{TM} = 1978$ A	
$V_{T(TO)}$	On-state threshold voltage, max	V	1.699	$T_j = T_{j\max}$;	
r_T	On-state slope resistance, max	m Ω	0.381	$0.5 \pi I_{TAV} < I_T < 1.5 \pi I_{TAV}$	
I_H	Holding current, max	mA	500	$T_j = 25$ $^{\circ}$ C; $V_D = 12$ V; Gate open	
BLOCKING					
I_{DRM}, I_{RRM}	Repetitive peak off-state and Repetitive peak reverse currents, max	mA	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/ 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	500 300 150	$T_j = T_{j\min}$ $T_j = 25$ $^{\circ}$ C $T_j = T_{j\max}$	
V_{GD}	Gate non-trigger direct voltage, min	V	0.40	$T_j = T_{j\max}$; $V_D = 0.67 \cdot V_{DRM}$;	
I_{GD}	Gate non-trigger direct current, min	mA	75.00	Direct gate current	
SWITCHING					
t_{gd}	Delay time, max	μ s	0.90	$T_j = 25$ $^{\circ}$ C; $V_D = 1000$ V; $I_{TM} = I_{TAV}$; $di/dt = 200$ A/ μ s;	
t_{gt}	Turn-on time ²⁾ , max	μ s	2.00, 2.50, 3.20, 4.00	Gate pulse: $I_G = 2$ A; $V_G = 20$ V; $t_{GP} = 50$ μ s; $di_G/dt = 2$ A/ μ s	
			20.0, 25.0, 32.0, 40.0	$dv_D/dt = 50$ V/ μ s	$T_j = T_{j\max}$; $I_{TM} = I_{TAV}$;

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t_q	Turn-off time ³⁾ max	μs	25.0, 32.0, 40.0, 50.0	$dv_D/dt=200 \text{ V}/\mu\text{s}$	$di_R/dt=-10 \text{ A}/\mu\text{s};$ $V_R=100\text{V};$ $V_D=0.67 V_{\text{DRM}}$
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THERMAL

R_{thjc}	Thermal resistance, junction to case, max	$^{\circ}\text{C}/\text{W}$	0.0210	Direct current	Double side cooled
$R_{\text{thjc-A}}$			0.0462		Anode side cooled
$R_{\text{thjc-K}}$			0.0378		Cathode side cooled
R_{thck}	Thermal resistance, case to heatsink, max	$^{\circ}\text{C}/\text{W}$	0.0040	Direct current	

MECHANICAL

w	Weight, max	g	550	
D_s	Surface creepage distance	mm (inch)	29.47 (1.160)	
D_a	Air strike distance	mm (inch)	17.50 (0.689)	

PART NUMBERING GUIDE

FDT	56	630	22	7	5	3	
1	2	3	4	5	6	7	

1. FDT — Fast Disc Thyristor
2. Element Diameter
3. Mean on-state current, A
4. Voltage code
5. Critical rate of rise of off-state voltage
6. Group of turn-off time ($dv_D/dt=50 \text{ V}/\mu\text{s}$)
7. Group of turn-on time

NOTES

1) Critical rate of rise of off-state voltage

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

2) Turn-on time

Symbol of group	5	4	3	2
t_{gt} , μs	2.00	2.50	3.20	4.00

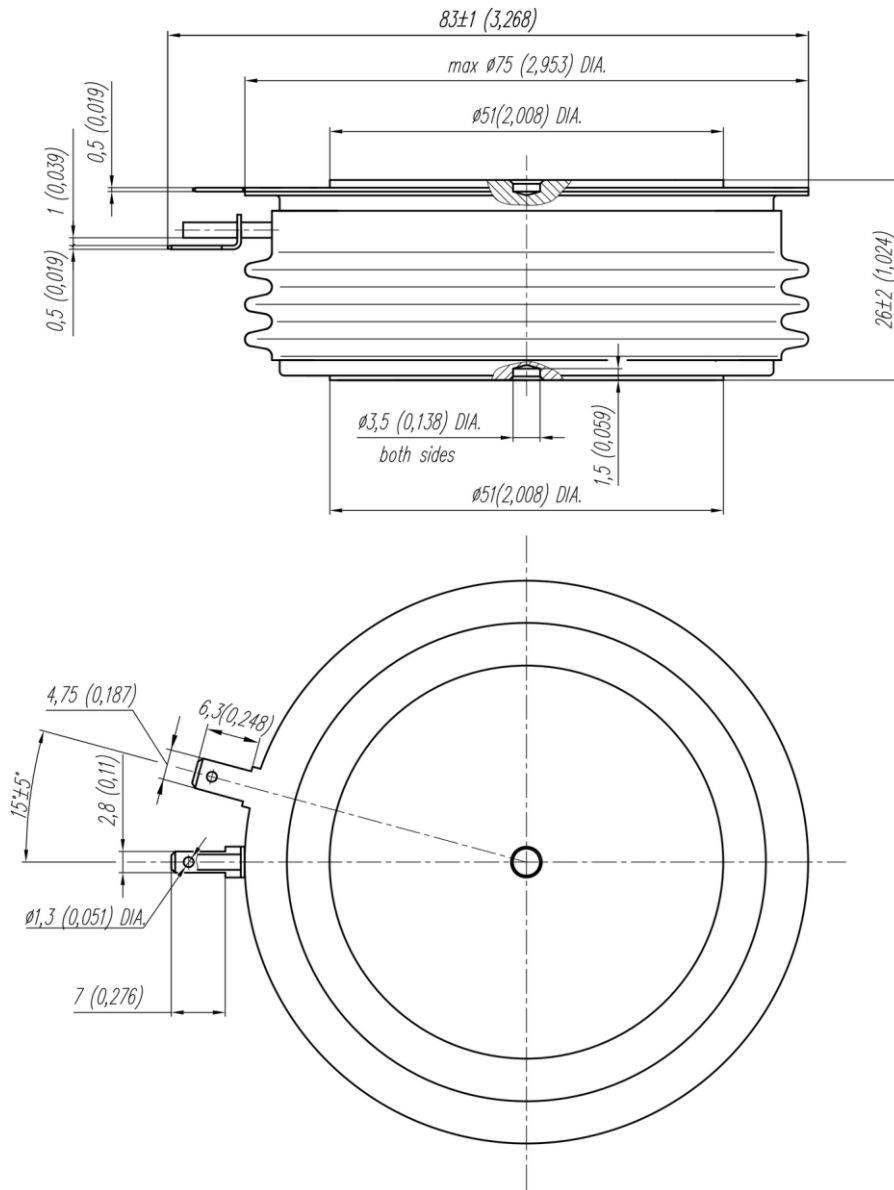
3) Turn-off time ($dv_D/dt=50 \text{ V}/\mu\text{s}$)

Symbol of group	6	5	4	3
t_q , μs	20.0	25.0	32.0	40.0

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OVERALL DIMENSIONS

Package type: T.D2



All dimensions in millimeters (inches)