

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

Fast Thyristor Type **FDT56-700-30**

Low switching losses / Low reverse recovery charge
Distributed amplified gate for high di_T/dt

Mean on-state current	I_{TAV}	700 A
Repetitive peak off-state voltage	V_{DRM}	3000 V
Repetitive peak reverse voltage	V_{RRM}	
Turn-off time	t_q	40.0, 50.0, 63.0 μ s
V_{DRM}, V_{RRM}, V		3000
Voltage code		30
$T_j, ^\circ$ C		- 60 ÷ 120

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions
ON-STATE				
I_{TAV}	Mean on-state current	A	700 1125	$T_c=87^\circ$ 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	1100	$T_c=87^\circ$ C; Double side cooled; 180° half-sine wave; 50 Hz
I_{TSM}	Surge on-state current	kA	14.0 16.0	$T_j=T_{jmax}$ $T_j=25^\circ$ 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; $t_{GP}=50$ μ s; $di_G/dt=1$ A/ μ s
			15.0 17.0	$T_j=T_{jmax}$ $T_j=25^\circ$ 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; $t_{GP}=50$ μ s; $di_G/dt=1$ A/ μ s
I^2t	Safety factor	$A^2s \cdot 10^3$	980 1280	$T_j=T_{jmax}$ $T_j=25^\circ$ 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; $t_{GP}=50$ μ s; $di_G/dt=1$ A/ μ s
			930 1190	$T_j=T_{jmax}$ $T_j=25^\circ$ 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; $t_{GP}=50$ μ s; $di_G/dt=1$ A/ μ s
BLOCKING				
V_{DRM}, V_{RRM}	Repetitive peak off-state and Repetitive peak reverse voltages	V	3000	$T_{jmin} < T_j < T_{jmax}$; 180° half-sine wave; 50 Hz; Gate open
V_{DSM}, V_{RSM}	Non-repetitive peak off-state and Non-repetitive peak reverse voltages	V	3100	$T_{jmin} < T_j < T_{jmax}$; 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	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	$T_j = T_{j\max}$; $V_D = 0.67 \cdot V_{DRM}$; $I_{TM} = 2 I_{TAV}$; 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 ÷ 120	
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	3.20 2.85	$T_j = T_{j\max}$; $I_{TM} = 3200$ A $T_j = 25$ $^{\circ}$ C; $I_{TM} = 2512$ A	
$V_{T(TO)}$	On-state threshold voltage, max	V	1.50	$T_j = T_{j\max}$;	
r_T	On-state slope resistance, max	m Ω	0.500	$0.5 \pi I_{TAV} < I_T < 1.5 \pi I_{TAV}$	
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	$T_j = T_{j\max}$; $V_D = 0.67 \cdot V_{DRM}$; Gate open	
TRIGGERING					
V_{GT}	Gate trigger direct voltage, max	V	4.00 2.50 2.00	$T_j = T_{j\min}$ $T_j = 25$ $^{\circ}$ 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	500 300 200	$T_j = T_{j\min}$ $T_j = 25$ $^{\circ}$ C $T_j = T_{j\max}$	
V_{GD}	Gate non-trigger direct voltage, min	V	0.25	$T_j = T_{j\max}$; $V_D = 0.67 \cdot V_{DRM}$;	
I_{GD}	Gate non-trigger direct current, min	mA	10.00	Direct gate current	
SWITCHING					
t_{gd}	Delay time, max	μ s	0.88	$T_j = 25$ $^{\circ}$ C; $V_D = 1500$ V; $I_{TM} = I_{TAV}$; $di/dt = 200$ A/ μ s;	
t_{gt}	Turn-on time ²⁾	μ s	2.50, 3.20, 4.00, 6.30	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 ³⁾ , max	μ s	40.0, 50.0, 63.0	$dv_D/dt = 50$ V/ μ s;	
			50.0, 63.0, 80.0	$dv_D/dt = 200$ V/ μ s;	
Q_{rr}	Total recovered charge, max	μ C	770	$T_j = T_{j\max}$; $I_{TM} = I_{TAV}$;	
t_{rr}	Reverse recovery time, typ	μ s	7.0	$di_R/dt = -50$ A/ μ s;	
I_{rRM}	Peak reverse recovery current, max	A	220	$V_R = 100$ V	

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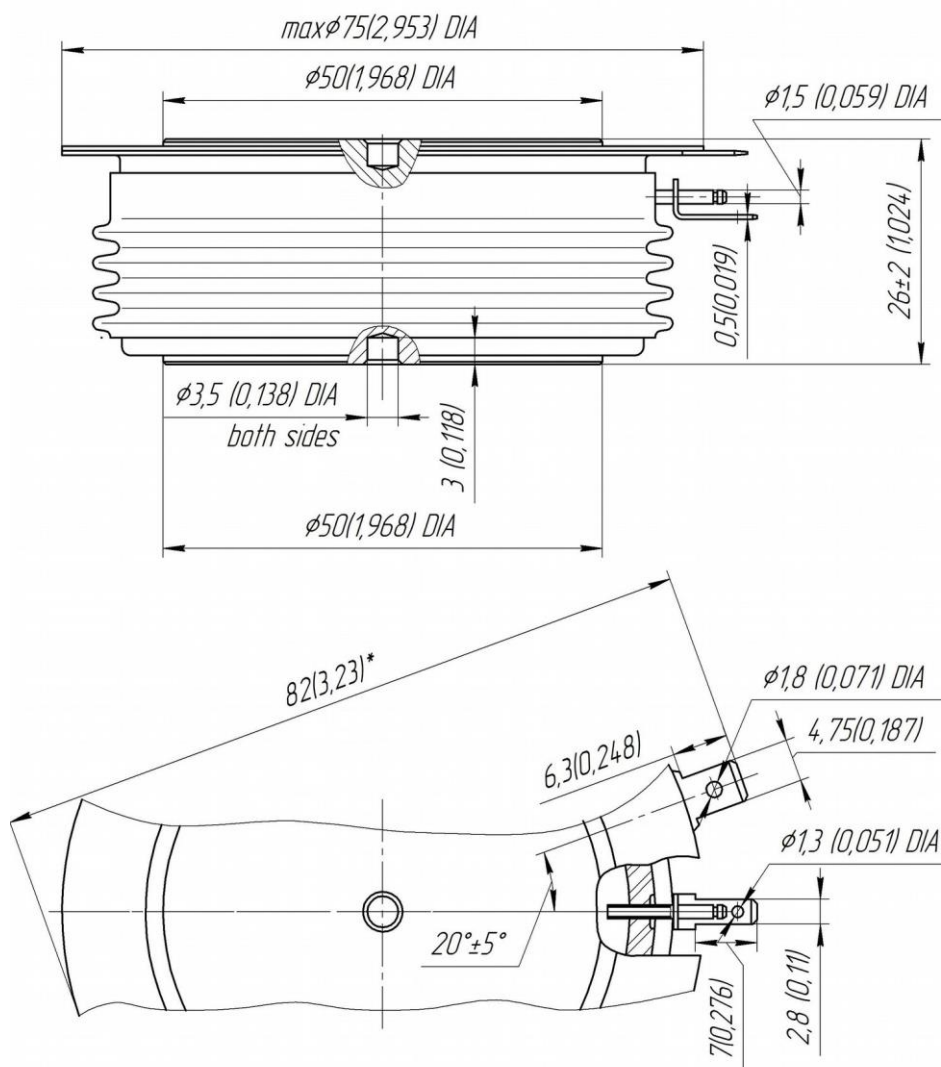
THERMAL					
R_{thjc}	Thermal resistance, junction to case, max	°C/W	0.0200	Direct current	Double side cooled
R_{thjc-A}			0.0440		Anode side cooled
R_{thjc-K}			0.0360		Cathode side cooled
R_{thck}	Thermal resistance, case to heatsink, max	°C/W	0.0040	Direct current	
MECHANICAL					
w	Weight, max	g	510		
D_s	Surface creepage distance	mm (inch)	30.38 (1.196)		
D_a	Air strike distance	mm (inch)	18.05 (0.710)		

PART NUMBERING GUIDE								NOTES																																
FDT	56	700	30	7	2	4		¹⁾ Critical rate of rise of off-state voltage <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Symbol of group</th> <th style="text-align: center;">4</th> <th style="text-align: center;">5</th> <th style="text-align: center;">6</th> <th style="text-align: center;">7</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">$(dv_D/dt)_{crit}, V/\mu s$</td> <td style="text-align: center;">200</td> <td style="text-align: center;">320</td> <td style="text-align: center;">500</td> <td style="text-align: center;">1000</td> </tr> </tbody> </table> ²⁾ Turn-on time <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Symbol of group</th> <th style="text-align: center;">4</th> <th style="text-align: center;">3</th> <th style="text-align: center;">2</th> <th style="text-align: center;">1</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">$t_{gt}, \mu s$</td> <td style="text-align: center;">2.50</td> <td style="text-align: center;">3.20</td> <td style="text-align: center;">4.00</td> <td style="text-align: center;">6.30</td> </tr> </tbody> </table> ³⁾ Turn-off time ($dv_D/dt=50 V/\mu s$) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Symbol of group</th> <th style="text-align: center;">3</th> <th style="text-align: center;">2</th> <th style="text-align: center;">1</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">$t_{dr}, \mu s$</td> <td style="text-align: center;">40.0</td> <td style="text-align: center;">50.0</td> <td style="text-align: center;">63.0</td> </tr> </tbody> </table>					Symbol of group	4	5	6	7	$(dv_D/dt)_{crit}, V/\mu s$	200	320	500	1000	Symbol of group	4	3	2	1	$t_{gt}, \mu s$	2.50	3.20	4.00	6.30	Symbol of group	3	2	1	$t_{dr}, \mu s$	40.0	50.0	63.0
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1. FDT — Fast Inverter Disc Thyristor 2. Design version 3. Mean on-state current, A 4. Voltage code 5. Critical rate of rise of off-state voltage 6. Group of turn-off time ($dv_D/dt=50 V/\mu s$) 7. Group of turn-on time																																								

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OVERALL DIMENSIONS

Package type: T.D5



All dimensions in millimeters (inches)