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

Fast Thyristor Type FDT32-400-24

Low switching losses
Distributed amplified gate for high di_T/dt

Mean on-state current	I_{TAV}	400 A		
Repetitive peak off-state voltage	V_{DRM}	1600...2400 V		
Repetitive peak reverse voltage	V_{RRM}			
Turn-off time	t_q	50.0, 63.0 µs		
V_{DRM}, V_{RRM}, V	1600	1800	2000	2200	2400
Voltage code	16	18	20	22	24
T_j, °C	−60...+125				

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions
ON-STATE				
I_{TAV}	Mean on-state current	A	371 400 544	T_c= 85 °C; Double side cooled; T_c= 80 °C; Double side cooled; T_c= 55 °C; Double side cooled; 180° half-sine wave; 50 Hz
I_{TRMS}	RMS on-state current	A	628	T_c= 80 °C; Double side cooled; 180° half-sine wave; 50 Hz
I_{TSM}	Surge on-state current	kA	6.6 7.5	$T_j=T_{j\,max}$ $T_j=25$ °C	180° half-sine wave; t_P=10 ms; single pulse; $V_D=V_R$=0 V; Gate pulse:$I_G=I_{FGM}$; V_G=20 V; t_{GP}=50 µs; di_G/dt=1 A/µs
			7.0 8.0	$T_j=T_{j\,max}$ $T_j=25$ °C	180° half-sine wave; t_P=8.3 ms; single pulse; $V_D=V_R$=0 V; Gate pulse:$I_G=I_{FGM}$; V_G=20 V; t_{GP}=50 µs; di_G/dt=1 A/µs
I^2t	Safety factor	$A^2s·10^3$	210 280	$T_j=T_{j\,max}$ $T_j=25$ °C	180° half-sine wave; t_P=10 ms; single pulse; $V_D=V_R$=0 V; Gate pulse:$I_G=I_{FGM}$; V_G=20 V; t_{GP}=50 µs; di_G/dt=1 A/µs
			200 260	$T_j=T_{j\,max}$ $T_j=25$ °C	180° half-sine wave; t_P=8.3 ms; single pulse; $V_D=V_R$=0 V; Gate pulse:$I_G=I_{FGM}$; V_G=20 V; 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	1600...2400	$T_{j\,min}< T_j <T_{j\,max}$; 180° half-sine wave; 50 Hz; Gate open
V_{DSM}, V_{RSM}	Non-repetitive peak off-state and Non-repetitive peak reverse voltages	V	1700...2500	$T_{j\,min}< T_j <T_{j\,max}$; 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	6	$T_j=T_{j\,max}$
V_{RGM}	Peak reverse gate voltage	V	5	
P_G	Gate power dissipation	W	3	$T_j=T_{j\,max}$ for DC gate current
SWITCHING				
$(di_T/dt)_{crit}$	Critical rate of rise of on-state current non-repetitive (f=1 Hz)	A/μs	1600	$T_j=T_{j\,max}$; $V_D=0.67 \cdot V_{DRM}$; $I_{TM}=1700$ A; Gate pulse: $I_G=2$ A; $V_G=20$ V; $t_{GP}=50$ μs; $di_G/dt=2$ A/μs
THERMAL				
T_{stg}	Storage temperature	°C	−60...+50	
T_j	Operating junction temperature	°C	−60...+125	
MECHANICAL				
F	Mounting force	kN	9.0...11.0	
a	Acceleration	m/s^2	50	Device clamped

CHARACTERISTICS

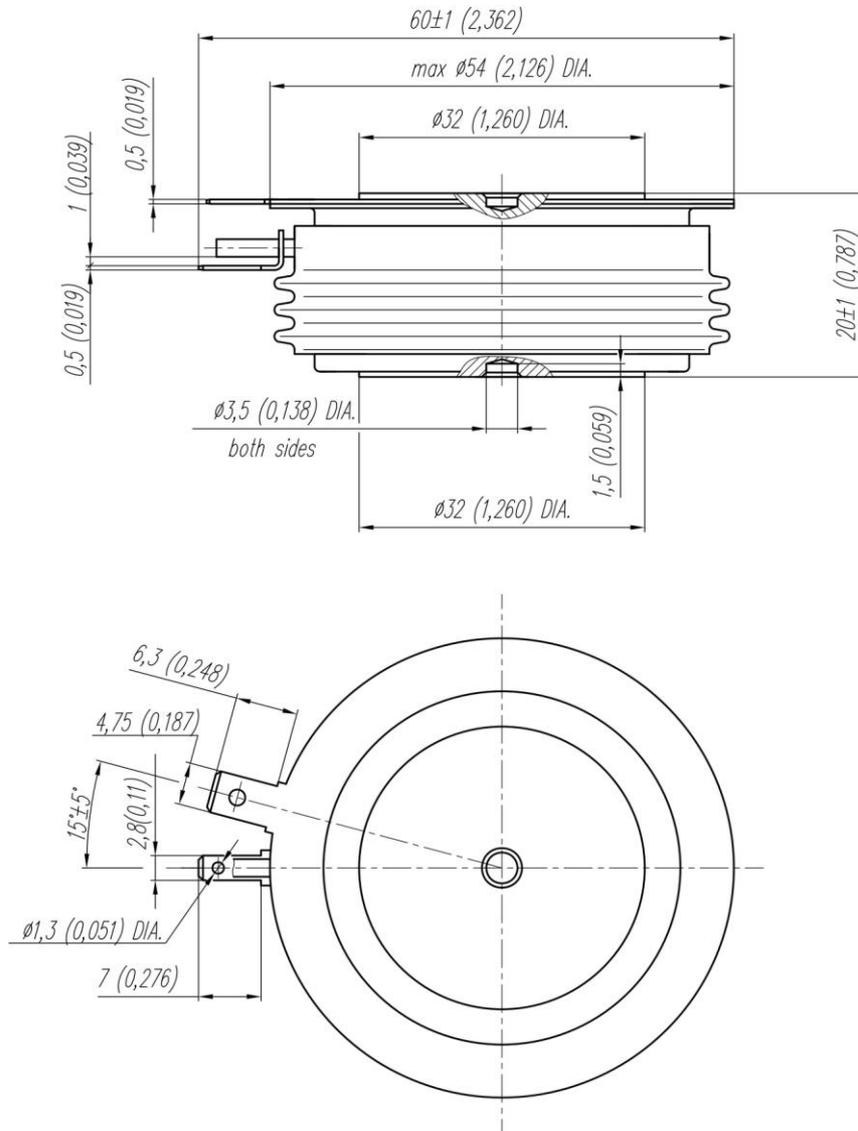| Symbols and parameters		Units	Values	Conditions	
ON-STATE					
V_{TM}	Peak on-state voltage, max	V	2.20	$T_j=25$ °C; $I_{TM}=1256$ A	
$V_{T(TO)}$	On-state threshold voltage, max	V	1.248	$T_j=T_{j\,max}$;	
r_T	On-state slope resistance, max	mΩ	0.992	$0.5\,\pi\,I_{TAV} < I_T < 1.5\,\pi\,I_{TAV}$	
I_H	Holding current, max	mA	500	$T_j=25$ °C; $V_D=12$ V; Gate open	
BLOCKING					
I_{DRM}, I_{RRM}	Repetitive peak off-state and Repetitive peak reverse currents, max	mA	50	$T_j=T_{j\,max}$; $V_D=V_{DRM}$; $V_R=V_{RRM}$	
$(dv_D/dt)_{crit}$	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	500 300 150	$T_j= T_{j\,min}$ $T_j= 25$ °C $T_j= T_{j\,max}$	
V_{GD}	Gate non-trigger direct voltage, min	V	0.35	$T_j=T_{j\,max}$; $V_D=0.67 \cdot V_{DRM}$;	
I_{GD}	Gate non-trigger direct current, min	mA	35.00	Direct gate current	
SWITCHING					
t_{gd}	Delay time, max	μs	0.85	$T_j=25$ °C; $V_D=1000$ 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[2], max	μs	2.00, 2.50, 3.20, 4.00		
t_q	Turn-off time[3] max	μs	50.0, 63.0	$dv_D/dt=50$ V/μs	$T_j=T_{j\,max}$; $I_{TM}= I_{TAV}$; $di_R/dt=-10$ A/μs; $V_R=100$V; $V_D=0.67$ V_{DRM}
			63.0, 80.0	$dv_D/dt=200$ V/μs	

THERMAL

R_{thjc}	Thermal resistance, junction to case, max	°C/W	0.0500	Direct current	Double side cooled
R_{thjc-A}			0.1100		Anode side cooled
R_{thjc-K}			0.0900		Cathode side cooled
R_{thck}	Thermal resistance, case to heatsink, max	°C/W	0.0060	Direct current	

MECHANICAL

w	Weight, max	g	176
D_s	Surface creepage distance	mm (inch)	19.44 (0.765)
D_a	Air strike distance	mm (inch)	12.10 (0.476)

PART NUMBERING GUIDE

FDT	32	400	24	7	2	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 ($dv_D/dt=50$ V/μs)
7. Group of turn-on time

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-on time

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

[3] Turn-off time ($dv_D/dt=50$ V/μs)

Symbol of group	2	1
t_q, μs	50.0	63.0

OVERALL DIMENSIONS

Package type: T.B3

All dimensions in millimeters (inches)