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

Fast Thyristor Type FDT80-2000-12

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

Mean on-state current	I_{TAV}	2000 A	
Repetitive peak off-state voltage	V_{DRM}	1000 ÷ 1200 V	
Repetitive peak reverse voltage	V_{RRM}		
Turn-off time	t_q	10.0, 12.5, 16.0, 20.0 μs	
V_{DRM}, V_{RRM}, V	1000	1100	1200
Voltage code	10	11	12
T_j, °C	– 60 ÷ 125		

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions	
ON-STATE					
I_{TAV}	Mean on-state current	A	2000 3390	T_c=89 °C; Double side cooled; T_c=55 °C; Double side cooled; 180° half-sine wave; 50 Hz	
I_{TRMS}	RMS on-state current	A	3140	T_c=89 °C; Double side cooled; 180° half-sine wave; 50 Hz	
I_{TSM}	Surge on-state current	kA	48.5 56.0	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=I_{FGM}; V_G=20 V; t_{GP}=50 μs; di_G/dt=2 A/μs
			51.0 59.0	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=2 A/μs
I^2t	Safety factor	$A^2s \cdot 10^3$	11700 15600	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=2 A/μs
			10700 14400	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=2 A/μs
BLOCKING					
V_{DRM}, V_{RRM}	Repetitive peak off-state and Repetitive peak reverse voltages	V	1000÷1200	$T_{j\,min}$< 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	1100÷1300	$T_{j\,min}$< 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	10	$T_j=T_{j\,max}$
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/μs	2500	$T_j=T_{j\,max}$; $V_D=0.67\cdot V_{DRM}$; $I_{TM}=2\ I_{TAV}$; Gate pulse: $I_G=I_{FGM}$; $V_G=20$ 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	40.0 ÷ 50.0	
a	Acceleration	m/s^2	50 100	Device unclamped Device clamped

CHARACTERISTICS

Symbols and parameters		Units	Values	Conditions	
ON-STATE					
V_{TM}	Peak on-state voltage, max	V	1.55 2.15	$T_j=T_{j\,max}$; $I_{TM}=4000$ A $T_j=25$ °C; $I_{TM}=6280$ A	
$V_{T(TO)}$	On-state threshold voltage, max	V	1.40	$T_j=T_{j\,max}$; $0.5\ \pi\ I_{TAV} < I_T < 1.5\ \pi\ I_{TAV}$	
r_T	On-state slope resistance, max	mΩ	0.080		
I_H	Holding current, max	mA	1000	$T_j=25$ °C; $V_D=12$ V; Gate open	
BLOCKING					
I_{DRM}, I_{RRM}	Repetitive peak off-state and Repetitive peak reverse currents, max	mA	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[1)]	V/μs	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	5.00 3.00 2.00	$T_j=T_{j\,min}$ $T_j=25$ °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	500 300 200	$T_j=T_{j\,min}$ $T_j=25$ °C $T_j=T_{j\,max}$	
V_{GD}	Gate non-trigger direct voltage, min	V	0.35	$T_j=T_{j\,max}$; $V_D=0.67\cdot V_{DRM}$; Direct gate current	
I_{GD}	Gate non-trigger direct current, min	mA	15.00		
SWITCHING					
t_{gd}	Delay time, max	μs	0.78	$T_j=25$ °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[2)]	μs	1.60, 2.00, 2.50, 3.20		
t_q	Turn-off time[3)]	μs	10.0, 12.5, 16.0, 20.0	$dv_D/dt=50$ V/μs;	$T_j=T_{j\,max}$; $I_{TM}=I_{TAV}$; $di_R/dt=-10$ A/μs; $V_R=100$V; $V_D=0.67\ V_{DRM}$
			12.5, 16.0, 20.0, 25.0	$dv_D/dt=200$ V/μs;	
Q_{rr}	Total recovered charge(linear), max	μC	220	$T_j=T_{j\,max}$; $I_{TM}=2000$ A; $di_R/dt=-50$ A/μs; $V_R=100$ V	
t_{rr}	Reverse recovery time, max	μs	3.8		
I_{rrM}	Peak reverse recovery current, max	A	115		

THERMAL					
R_{thjc}	Thermal resistance, junction to case, max	°C/W	0.0100	Direct current	Double side cooled
R_{thjc-A}			0.0220		Anode side cooled
R_{thjc-K}			0.0180		Cathode side cooled
R_{thck}	Thermal resistance, case to heatsink, max	°C/W	0.0020	Direct current	
MECHANICAL					
w	Weight, typ	g	1600		
D_s	Surface creepage distance	mm (inch)	55.13 (2.170)		
D_a	Air strike distance	mm (inch)	25.10 (0.988)		

PART NUMBERING GUIDE

FDT	80	2000	12	7	7	5
1	2	3	4	5	6	7

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/μs)
7. Group of turn-on time

NOTES

[1] Critical rate of rise of off-state voltage

Symbol of group	4	5	6	7
$(dv_D/dt)_{crit}$, V/μs	200	320	500	1000

[2] Turn-on time

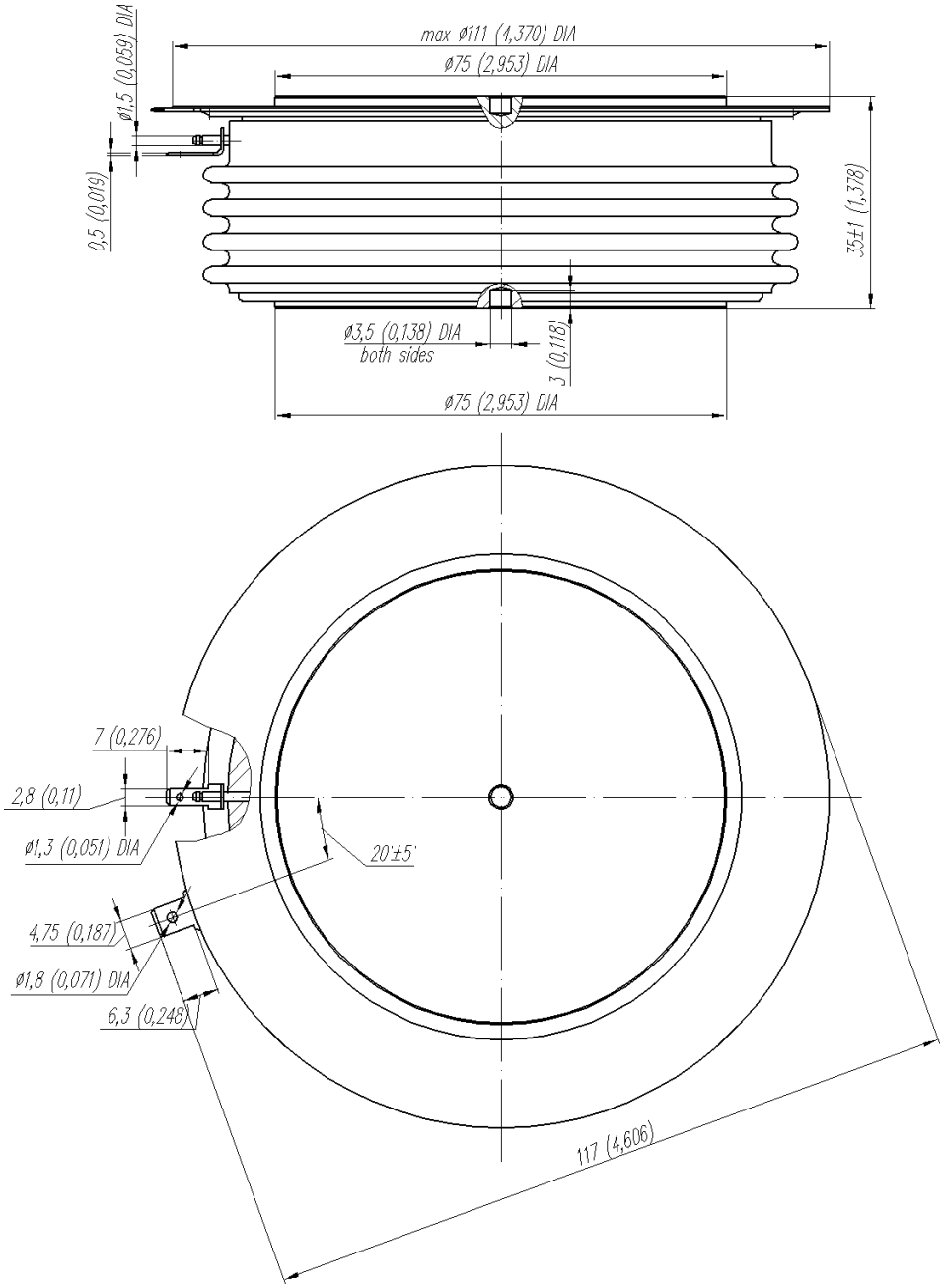
Symbol of group	6	5	4	3
t_{gt}, μs	1.60	2.00	2.50	3.20

[3] Turn-off time (dv_D/dt=50 V/μs)

Symbol of group	8.5	8	7	6
t_q, μs	10.0	12.5	16.0	20.0

OVERALL DIMENSIONS

Package type: T.F5



All dimensions in millimeters (inches)