



TET ESTEL AS
ESTONIA

May
2013

Series
TF233-500

High Frequency Inverter grade
Capsule Thyristor
Type TF233-500

Low switching losses
Low reverse recovery charge
Center amplifying gate

Maximum mean on-state current						I_{TAV}	500 A			
Maximum repetitive peak off-state and reverse voltage						U_{DRM}	600 ÷ 1400 V			
Tum-off time						U_{RRM}				
						t_q	25; 32; 40; 50 μs			
U_{DRM}, U_{RRM}, V	600	700	800	900	1000	1100	1200	1300	1400	
Voltage code	6	7	8	9	10	11	12	13	14	
$T_{vj}, ^\circ C$	- 60 ÷ 125									

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	TF233-500	Conditions
I_{TAV}	Mean on-state current	A	500	$T_c=88^\circ C$, 180° half-sine wave, 50 Hz
I_{TRMS}	RMS on-state current	A	785	$T_c=88^\circ C$
I_{TSM}	Surge on-state current	kA	7,5 8,2	$T_{vj}=125^\circ C$ $T_{vj}=25^\circ C$ tp=10 ms $U_R=0$
I^2t	Limiting load integral	kA ² s	281 336	$T_{vj}=125^\circ C$ $T_{vj}=25^\circ C$
U_{DRM}, U_{RRM}	Repetitive peak off-state and reverse voltage	V	500÷1400	$T_j \min \leq T_{vj} \leq T_{jM}$ 180° half-sine wave, 50 Hz Gate open
U_{DSM}, U_{RSM}	Non-repetitive peak off-state and reverse voltage	V	660÷1500	$T_j \min \leq T_{vj} \leq T_{jM}$ 180° half-sine wave tp=10 ms, Single pulse Gate open
(di _T /dt) crit	Critical rate of rise of on-state current : non - repetitive repetitive	A/ μ s	1000 400	$T_{vj}=125^\circ C$; $U_D=0,67 U_{DRM}$, Gate pulse : 10V, 5 Ω , 1 μ s rise time, 10 μ s
U_{RGM}	Peak reverse gate voltage	V	5	$T_j \min \leq T_{vj} \leq T_{jM}$
T_{stg}	Storage temperature	$^\circ C$	-60÷80	
T_{vj}	Junction temperature	$^\circ C$	-60÷125	

CHARACTERISTICS

U_{TM}	Peak on-state voltage	V	2,25	$T_{vj}=25^\circ C$, $I_{TM}=3,14 I_{TAV}$
$U_{T(TO)}$	Threshold voltage	V	1,0	$T_{vj}=125^\circ C$
R_T	On-state slope resistance	m Ω	0,5	1,57 $I_{TAV} < I_T < 4,71 I_{TAV}$
I_{DRM} I_{RRM}	Repetitive peak off-state and reverse current	mA	40 40	$T_{vj}=125^\circ C$, $U_D = U_{DRM}$ $U_R = U_{RRM}$

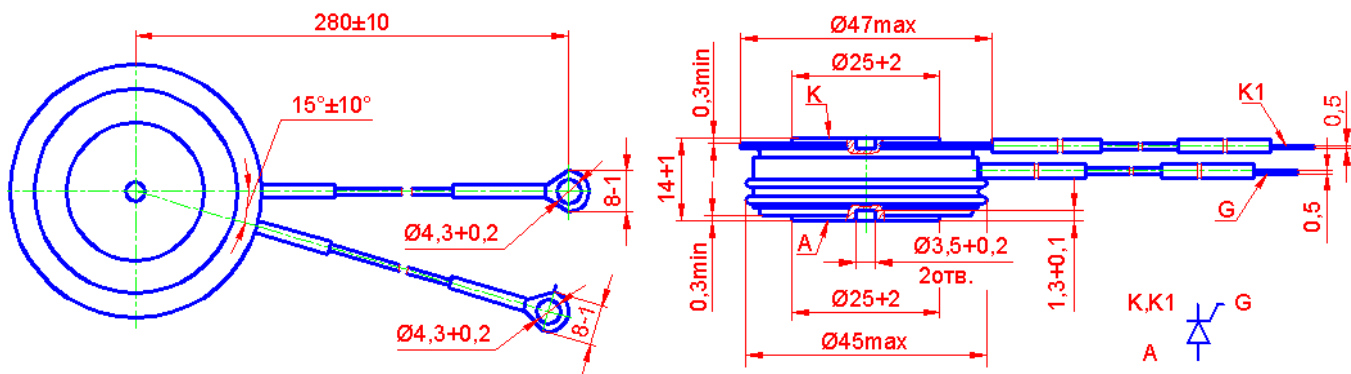
CHARACTERISTICS

Symbols and parameters		Units	TF233-500	Conditions
I_L	Latching current	A	1	$T_{vj}=25^{\circ}\text{C}, U_D=12\text{V}$ Gate pulse : 10V, 5 μs , 1 μs rise time, 10 μs
I_H	Holding current	A	0,3	$T_{vj}=25^{\circ}\text{C}, U_D=12\text{V}$, Gate open
U_{GT}	Gate trigger direct voltage	V	2,5 5,0	$T_{vj}=25^{\circ}\text{C}$, $T_{vj}=-60^{\circ}\text{C}$ $U_D=12\text{V}$
I_{GT}	Gate trigger direct current	A	0,3 0,85	
U_{GD}	Gate non-trigger direct voltage	V	0,25	$T_{vj}=125^{\circ}\text{C}, U_D = 0,67 U_{DRM}$
I_{GD}	Gate non-trigger direct current	mA	10	Direct gate current
t_{gd}	Delay time	μs	1,9	$T_{vj}=25^{\circ}\text{C}, U_D=500\text{V}$ $I_{TM} = 500 \text{ A}$
t_{gt}	Turn-on time	μs	3,2	Gate pulse : 10V, 5 μs , 1 μs rise time, 10 μs
t_q	Turn-off time	μs	25 \div 50 32 \div 63	$T_{vj}=125^{\circ}\text{C}, I_{TM}=500 \text{ A}$ $di_R/dt = 10 \text{ A}/\mu\text{s}, U_R=100\text{V}$ $U_D = 0,67 U_{DRM}$ $du_D/dt=50 \text{ V}/\mu\text{s}$ $du_D/dt=200 \text{ V}/\mu\text{s}$
Q_{rr}	Recovered charge	μC	400	$T_{vj}=125^{\circ}\text{C}, I_{TM}=500 \text{ A}$ $di_R/dt = 50 \text{ A}/\mu\text{s}, U_R=100\text{V}$
t_{rr}	Reverse recovery time	μs	4,0	
I_{rrM}	Peak reverse recovery current	A	200	
$(du_D/dt)_{crit}$	Critical rate of rise of off-state voltage	V/ μs	500 1000	$T_{vj}=125^{\circ}\text{C}, U_D = 0,67 U_{DRM}$ Gate open
R_{thjc}	Thermal resistance junction to case	$^{\circ}\text{C}/\text{W}$	0,045	Direct current, double side cooled

ORDERING

	TF	233	500	12	7	4	2	
	1	2	3	4	5	6	7	

- Fast thyristor.
- Design version.
- Mean on-state current, A.
- Voltage code (12=1200 V).
- Critical rate of rise of off-state voltage ($6 \geq 500 \text{ V}/\mu\text{s}$, $7 \geq 1000 \text{ V}/\mu\text{s}$).
- Group of turn-off time ($du_D/dt=50 \text{ V}/\mu\text{s}$, $2 \leq 50\mu\text{s}$, $3 \leq 40\mu\text{s}$, $4 \leq 32\mu\text{s}$, $5 \leq 25\mu\text{s}$).
- Group of turn-on time ($2 \leq 3,2 \mu\text{s}$).



Mounting force : 9 \div 12 kN

Weight : 120 grams