



**TET ESTEL AS**  
ESTONIA

**October**  
**2014**

**Series**  
**TFI243-500**

**High Frequency Inverter grade**  
**Capsule Thyristor**  
**Type TFI243-500**

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

Maximum mean on-state current					$I_{TAV}$	<b>500 A</b>		
Maximum repetitive peak off-state and reverse voltage					$U_{DRM}$	<b>800 ÷ 1500 V</b>		
Turn-off time					$U_{RRM}$			
					$t_q$	<b>12,5; 16; 20; 25 <math>\mu</math>s</b>		
$U_{DRM}, U_{RRM}, V$	800	900	1000	1100	1200	1300	1400	1500
Voltage code	8	9	10	11	12	13	14	15
$T_{vj}, ^\circ C$	- 60 ÷ 125							

**MAXIMUM ALLOWABLE RATINGS**

Symbols and parameters		Units	TFI243-500	Conditions
$I_{TAV}$	Mean on-state current	A	500 830	$T_c=90^\circ C,$ $T_c=55^\circ C,$ 180° half-sine wave, 50 Hz
$I_{TRMS}$	RMS on-state current	A	785	$T_c=90^\circ C$
$I_{TSM}$	Surge on-state current	kA	10,0 11,0	$T_{vj}=125^\circ C$ $T_{vj}=25^\circ C$ tp=10 ms
$I^2t$	Limiting load integral	$kA^2s$	500 605	$T_{vj}=125^\circ C$ $T_{vj}=25^\circ C$ $U_R=0$
$U_{DRM}, U_{RRM}$	Repetitive peak off-state and reverse voltage	V	800÷1500	$T_{j\ min} \leq T_{vj} \leq T_{jM}$ 180° half-sine wave, 50 Hz Gate open
$U_{DSM}, U_{RSM}$	Non-repetitive peak off-state and reverse voltage	V	880÷1600	$T_{j\ min} \leq T_{vj} \leq T_{jM}$ 180° half-sine wave tp=10 ms, Single pulse Gate open
(diT/dt) crit	Critical rate of rise of on-state current : non - repetitive repetitive	$A/\mu s$	2000 1250	$T_{vj}=125^\circ C ; U_D=0,67 U_{DRM},$ Gate pulse : 10V, 5 $\Omega,$ 1 $\mu s$ rise time, 10 $\mu s$
$U_{RGM}$	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	2,4	$T_{vj}=25^\circ C, I_{TM}=3,14 I_{TAV}$
$U_{T(TO)}$	Threshold voltage	V	1,4	$T_{vj}=125^\circ C$
$R_T$	On-state slope resistance	$m\Omega$	0,6	$1,57 I_{TAV} < I_T < 4,71 I_{TAV}$
$I_{DRM}$ $I_{RRM}$	Repetitive peak off-state and reverse current	mA	50 50	$T_{vj}=125^\circ C,$ $U_D = U_{DRM}$ $U_R = U_{RRM}$

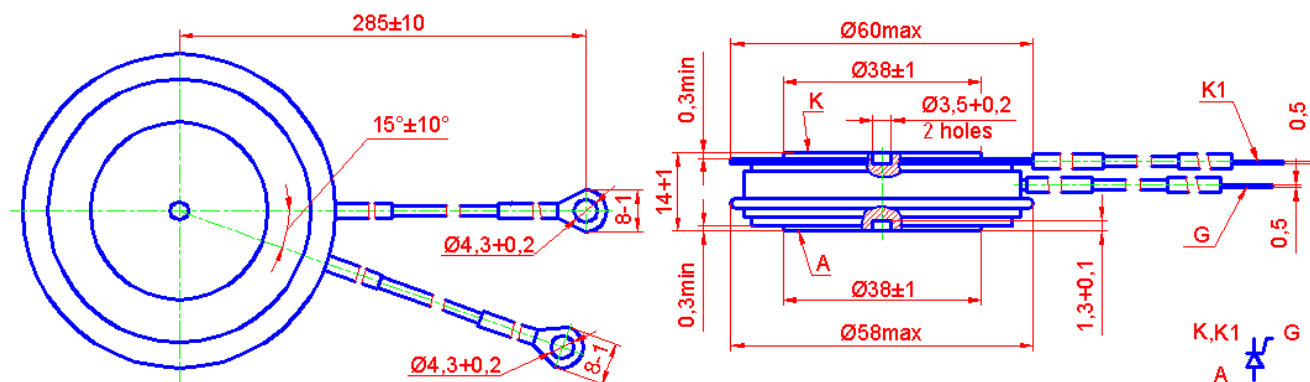
## CHARACTERISTICS

Symbols and parameters		Units	TFI243-500	Conditions
$I_L$	Latching current	A	7	$T_{vj}=25^{\circ}\text{C}$ , $U_D=12\text{V}$ Gate pulse : 10V, 5 $\Omega$ , 1 $\mu\text{s}$ rise time, 10 $\mu\text{s}$
$I_H$	Holding current	A	0,5	$T_{vj}=25^{\circ}\text{C}$ , $U_D=12\text{V}$ , 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	$T_{vj}=25^{\circ}\text{C}$ , $T_{vj}=-60^{\circ}\text{C}$
$U_{GD}$	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
tgd	Delay time	$\mu\text{s}$	1,6	$T_{vj}=25^{\circ}\text{C}$ , $U_D=500\text{V}$ $I_{TM} = 500 \text{ A}$
tgt	Turn-on time	$\mu\text{s}$	2,5	Gate pulse : 10V, 5 $\Omega$ , 1 $\mu\text{s}$ rise time, 10 $\mu\text{s}$
tq	Turn-off time	$\mu\text{s}$	12,5÷25 16÷32	$T_{vj}=125^{\circ}\text{C}$ , $I_{TM}=500 \text{ A}$ $di_R/dt = 10 \text{ A}/\mu\text{s}$ , $U_R=100\text{V}$ $U_D = 0,67 U_{DRM}$ $du_D/dt=50 \text{ V}/\mu\text{s}$ $du_D/dt=200 \text{ V}/\mu\text{s}$
Qrr	Recovered charge	$\mu\text{C}$	230	$T_{vj}=125^{\circ}\text{C}$ , $I_{TM}=500 \text{ A}$ $di_R/dt=50 \text{ A}/\mu\text{s}$ , $U_R=100\text{V}$
trr	Reverse recovery time	$\mu\text{s}$	4,0	
Irrm	Peak reverse recovery current	A	115	$T_{vj}=125^{\circ}\text{C}$ , $U_D = 0,67 U_{DRM}$ Gate open
( $du_D/dt$ )crit	Critical rate of rise of off-state voltage	V/ $\mu\text{s}$	500 1000	
Rthjc	Thermal resistance junction to case	$^{\circ}\text{C}/\text{W}$	0,032	Direct current, double side cooled

## ORDERING

	TFI	243	500	14	7	7	3	
	1	2	3	4	5	6	7	

- Fast thyristor with interdigitated gate structure.
- Design version.
- Mean on-state current, A.
- Voltage code (14=1400 V).
- Critical rate of rise of off-state voltage (6  $\geq$  500 V/ $\mu\text{s}$ , 7  $\geq$  1000 V/ $\mu\text{s}$ ).
- Group of turn-off time ( $du_D/dt=50 \text{ V}/\mu\text{s}$ , 5  $\leq$  25 $\mu\text{s}$ , 6  $\leq$  20 $\mu\text{s}$ , 7  $\leq$  16 $\mu\text{s}$ , 8  $\leq$  12,5 $\mu\text{s}$ ).
- Group of turn-on time ( 3  $\leq$  2,5 $\mu\text{s}$ ).



Mounting force : 13÷19 kN

Weight : 210 grams