



**TET ESTEL AS**  
ESTONIA

**June**  
**2013**

**Series**  
**TFI343L-500**

**High Frequency Inverter grade**  
**Capsule Thyristor**  
**Type TFI343L-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	$U_{DRM}$ $U_{RRM}$	<b>2000 ÷ 2400 V</b>	
Turn-off time	$t_q$	<b>32; 40 <math>\mu</math>s</b>	
$U_{DRM}, U_{RRM}, V$	2000	2200	2400
Voltage code	20	22	24
$T_{vj}, ^\circ C$	- 60 ÷ 125		

**MAXIMUM ALLOWABLE RATINGS**

Symbols and parameters		Units	TFI343L-500	Conditions
$I_{TAV}$	Mean on-state current	A	500 727	$T_c=83^\circ C,$ $T_c=55^\circ C,$ 180° half-sine wave, 50 Hz
$I_{TRMS}$	RMS on-state current	A	785	$T_c=85^\circ C$
$I_{TSM}$	Surge on-state current	kA	10,0 11,0	$T_{vj}=125^\circ C$ $T_{vj}=25^\circ C$ $t_p=10\text{ ms}$ $U_R=0$
$I^2t$	Limiting load integral	$kA^2s$	500 605	$T_{vj}=125^\circ C$ $T_{vj}=25^\circ C$
$U_{DRM}, U_{RRM}$	Repetitive peak off-state and reverse voltage	V	1200÷2200	$T_j \min \leq T_{vj} \leq T_{jM}$ 180° half-sine wave, 50 Hz Gate open
$U_{DSM}, U_{RSM}$	Non-repetitive peak off-state and reverse voltage	V	1300÷2300	$T_j \min \leq T_{vj} \leq T_{jM}$ 180° half-sine wave $t_p=10\text{ ms}$ , Single pulse Gate open
$(di_T/dt)_{crit}$	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	2,6	$T_{vj}=25^\circ C, I_{TM}=3,14 I_{TAV}$
$U_{T(To)}$	Threshold voltage	V	1,6	$T_{vj}=125^\circ C$
$R_T$	On-state slope resistance	$m\Omega$	0,69	1,57 $I_{TAV} < I_T < 4,71 I_{TAV}$
$I_{DRM}$ $I_{RRM}$	Repetitive peak off-state and reverse current	mA	70; 70 0,7; 0,7	$T_{vj}=125^\circ C,$ $U_D = U_{DRM}; U_R = U_{RRM}$ $T_{vj}=25^\circ C,$ $U_D = U_{DRM}; U_R = U_{RRM}$

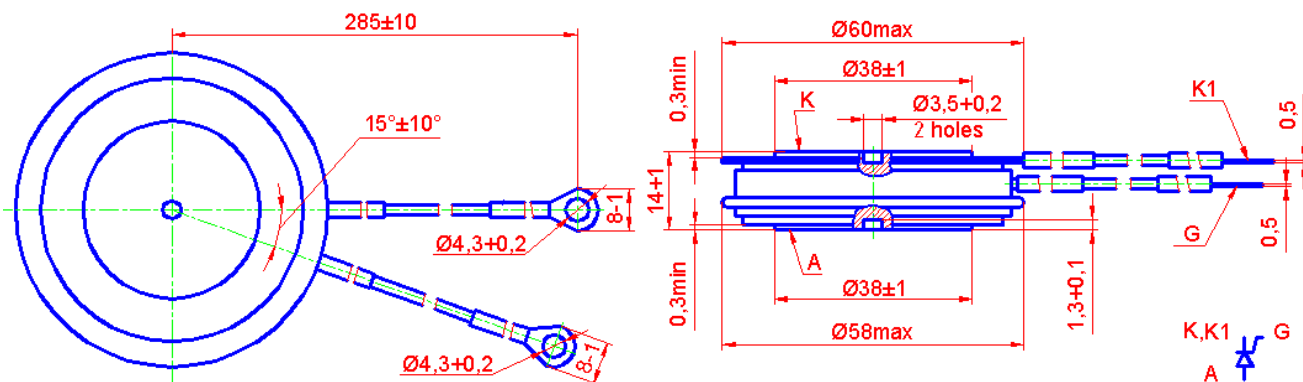
## CHARACTERISTICS

Symbols and parameters		Units	TFI343L-500	Conditions
$I_L$	Latching current	A	8	$T_{vj}=25^{\circ}\text{C}, U_D=12\text{V}$ 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 0,8	$T_{vj}=25^{\circ}\text{C}$ , $T_{vj}=-60^{\circ}\text{C}$
$U_{GD}$	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
$t_{gd}$	Delay time	$\mu\text{s}$	1,6	$T_{vj}=25^{\circ}\text{C}, U_D=500\text{V}$ $I_{TM} = 500 \text{ A}$
$t_{gt}$	Turn-on time	$\mu\text{s}$	2,5	Gate pulse : 10V, 5 $\Omega$ , 1 $\mu\text{s}$ rise time, 10 $\mu\text{s}$
$t_q$	Turn-off time	$\mu\text{s}$	32÷40 40÷50	$T_{vj}=125^{\circ}\text{C}, I_{TM}=500 \text{ A}$ $di_R/dt = 10 \text{ A}/\mu\text{s}, U_R=100\text{V}$ $U_D = 0,67 U_{DRM}$ $du_D/dt=50 \text{ V}/\mu\text{s}$ $du_D/dt=200 \text{ V}/\mu\text{s}$
$Q_{rr}$	Recovered charge	$\mu\text{C}$	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	$\mu\text{s}$	5,5	
$I_{rrM}$	Peak reverse recovery current	A	145	
$(du_D/dt)_{crit}$	Critical rate of rise of off-state voltage	V/ $\mu\text{s}$	500 1000	$T_{vj}=125^{\circ}\text{C}, U_D = 0,67 U_{DRM}$ Gate open
$R_{thjc}$	Thermal resistance junction to case	$^{\circ}\text{C}/\text{W}$	0,034	Direct current, double side cooled

## ORDERING

	TFI	343L	500	20	7	4	3	
	1	2	3	4	5	6	7	

- Fast thyristor with interdigitated gate structure.
- Design version.
- Mean on-state current, A.
- Voltage code (20=2000 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 ( $du_D/dt=50 \text{ V}/\mu\text{s}$ ,  $3 \leq 40 \mu\text{s}$ ,  $4 \leq 32 \mu\text{s}$ ).
- Group of turn-on time ( $3 \leq 2,5 \mu\text{s}$ ).



Mounting force : 13÷19 kN  
Weight : 210 grams