



**TET ESTEL AS**  
ESTONIA

**November**  
**2016**

**Series**  
**TFI143S-400**

**High Frequency Inverter grade**  
**Capsule Thyristor**  
**Type TFI143S-400**

Strong distributed amplified gate  
and low turn-off time thyristor for  
high frequency applications to 20 kHz

Maximum mean on-state current	$I_{TAV}$	<b>400 A</b>			
Maximum repetitive peak off-state and reverse voltage	$U_{DRM}$ $U_{RRM}$	<b>800 ÷ 1200 V</b>			
Turn-off time	$t_q$	<b>6,3; 8 <math>\mu</math>s</b>			
$U_{DRM}, U_{RRM}, V$	800	900	1000	1100	1200
Voltage code	8	9	10	11	12
$T_{vj}, ^\circ C$	- 60 ÷ 125				

**MAXIMUM ALLOWABLE RATINGS**

Symbols and parameters		Units	TFI143S-400	Conditions
$I_{TAV}$	Mean on-state current	A	400 785	$T_c=92^\circ C$ , $T_c=55^\circ C$ , 180° half-sine wave, 50 Hz
$I_{TRMS}$	RMS on-state current	A	628	$T_c=92^\circ C$
$I_{TSM}$	Surge on-state current	kA	9,0 10,0	$T_{vj}=125^\circ C$ $T_{vj}=25^\circ C$ tp=10 ms
$I^2t$	Limiting load integral	kA <sup>2</sup> s	405 500	$T_{vj}=125^\circ C$ $T_{vj}=25^\circ C$ $U_R=0$
$U_{DRM}, U_{RRM}$	Repetitive peak off-state and reverse voltage	V	800÷1200	$T_j \min \leq T_{vj} \leq T_{jM}$ 180° half-sine wave, 50 Hz Gate open
$U_{DSM}, U_{RSM}$	Non-repetitive peak off-state and reverse voltage	V	880÷1300	$T_j \min \leq T_{vj} \leq T_{jM}$ 180° half-sine wave tp=10 ms, Single pulse Gate open
(di <sub>T</sub> /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	°C	-60÷80	
$T_{vj}$	Junction temperature	°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 $\Omega$	0,48	1,57 $I_{TAV} < I_T < 4,71 I_{TAV}$
$I_{DRM}$ $I_{RRM}$	Repetitive peak off-state and reverse current	mA	50 50	$T_{vj}=125^\circ C$ , $U_D = U_{DRM}$ $U_R = U_{RRM}$

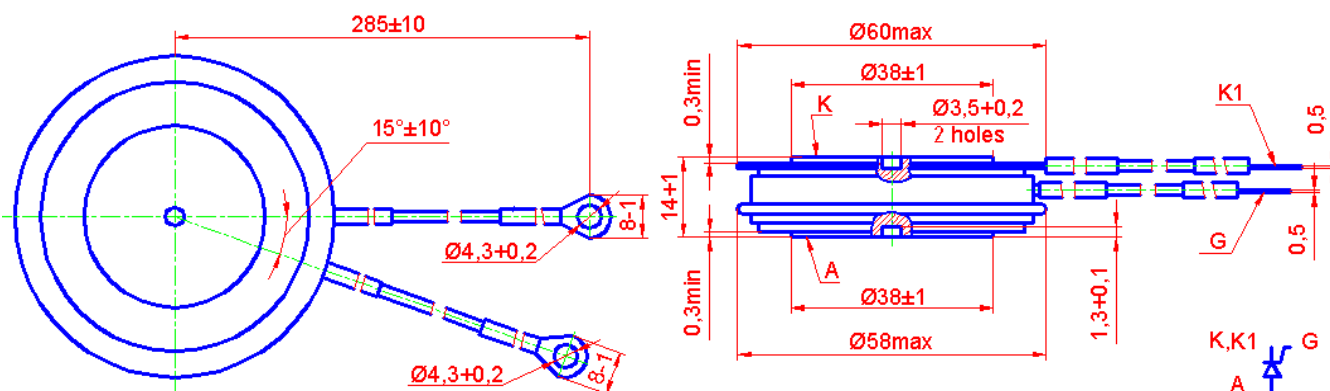
## CHARACTERISTICS

Symbols and parameters		Units	TFI143S-400	Conditions
$I_L$	Latching current	A	16	$T_{vj}=25^{\circ}\text{C}$ , $U_D=12\text{V}$ 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	0,35 0,85	$T_{vj}=25^{\circ}\text{C}$ , $T_{vj}=-60^{\circ}\text{C}$
$U_{GD}$	Gate non-trigger direct voltage	V	0,25	$T_{vj}=125^{\circ}\text{C}$ , $U_D = 0,67 U_{DRM}$ Direct gate current
$I_{GD}$	Gate non-trigger direct current	mA	10	
$t_{gd}$	Delay time	$\mu\text{s}$	1,6	$T_{vj}=25^{\circ}\text{C}$ , $U_D=500\text{V}$ $I_{TM} = 400 \text{ A}$
$t_{gt}$	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	$\mu\text{s}$	6,3; 8,0 8,0; 10,0	$T_{vj}=125^{\circ}\text{C}$ , $I_{TM}=400 \text{ A}$ $di_R/dt = 10 \text{ A}/\mu\text{s}$ , $U_R=100\text{V}$ $U_D = 0,67 U_{DRM}$ $du_D/dt=50 \text{ V}/\mu\text{s}$ $du_D/dt=200 \text{ V}/\mu\text{s}$
$Q_{rr}$	Recovered charge	$\mu\text{C}$	100	
$t_{rr}$	Reverse recovery time	$\mu\text{s}$	2,5	$T_{vj}=125^{\circ}\text{C}$ , $I_{TM}=400 \text{ A}$
$I_{rrm}$	Peak reverse recovery current	A	80	$di_R/dt = 50 \text{ A}/\mu\text{s}$ , $U_R=100\text{V}$
$(du_D/dt)_{crit}$	Critical rate of rise of off-state voltage	$\text{V}/\mu\text{s}$	500 1000	$T_{vj}=125^{\circ}\text{C}$ , $U_D = 0,67 U_{DRM}$ Gate open
$R_{thjc}$	Thermal resistance junction to case	$^{\circ}\text{C}/\text{W}$	0,038	Direct current, double side cooled

## ORDERING

TFI	143	S	400	10	7	C4	3	
1	2	3	4	5	6	7	8	

- Fast thyristor with interdigitated gate structure.
- Design version.
- Strong distributed amplified gate.
- Mean on-state current, A.
- Voltage code (10=1000 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 ( $du_D/dt=50 \text{ V}/\mu\text{s}$ ,  $9 \leq 8 \mu\text{s}$ , C4 $\leq 6,3 \mu\text{s}$ ).
- Group of turn-on time ( $3 \leq 2,5 \mu\text{s}$ ).



Mounting force : 13÷19 kN  
Weight : 210 grams