



**THE DATASHEET OF  
TFI443-400-32\_26MM**





**TET ESTEL AS**  
ESTONIA

**January**  
**2015**

**Series**  
**TFI443-400**

**High Frequency Inverter grade**  
**Capsule Thyristor**  
**Type TFI443-400**

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

Maximum mean on-state current	$I_{TAV}$			<b>400 A</b>
Maximum repetitive peak off-state and reverse voltage	$U_{DRM}$			<b>2600 ÷ 3200 V</b>
Turn-off time	$U_{RRM}$			<b>50; 63 μs</b>
$U_{DRM}, U_{RRM}, V$	2600	2800	3000	3200
Voltage code	26	28	30	32
$T_{vj}, °C$	- 60 ÷ 125			

**MAXIMUM ALLOWABLE RATINGS**

Symbols and parameters		Units	TFI443-400	Conditions
$I_{TAV}$	Mean on-state current	A	400 572	$T_c=85 °C$ , $T_c=55 °C$ , 180° half-sine wave, 50 Hz
$I_{TRMS}$	RMS on-state current	A	628	$T_c=88 °C$
$I_{TSM}$	Surge on-state current	kA	7,0 8,0	$T_{vj}=125 °C$ $T_{vj}=25 °C$ tp=10 ms $U_R=0$
$I^2t$	Limiting load integral	kA <sup>2</sup> s	245 320	$T_{vj}=125 °C$ $T_{vj}=25 °C$
$U_{DRM}, U_{RRM}$	Repetitive peak off-state and reverse voltage	V	2600 ÷ 3200	$T_j \min \leq T_{vj} \leq T_{jM}$ 180° half-sine wave, 50 Hz Gate open
$U_{DSM}, U_{RSM}$	Non-repetitive peak off-state and reverse voltage	V	2700 ÷ 3300	$T_j \min \leq T_{vj} \leq T_{jM}$ 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/μs	2000 1250	$T_{vj}=125 °C$ ; $U_D=0,67 U_{DRM}$ , Gate pulse : 10V, 5 Ω, 1 μs rise time, 10 μs
$U_{RGM}$	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	2,8	$T_{vj}=25 °C$ , $I_{TM}=3,14 I_{TAV}$
$U_{T(TO)}$	Threshold voltage	V	1,45	$T_{vj}=125 °C$
$R_T$	On-state slope resistance	mΩ	0,95	1,57 $I_{TAV} < I_T < 4,71 I_{TAV}$
$I_{DRM}$ $I_{RRM}$	Repetitive peak off-state and reverse current	mA	100 100	$T_{vj}=125 °C$ , $U_D = U_{DRM}$ $U_R = U_{RRM}$

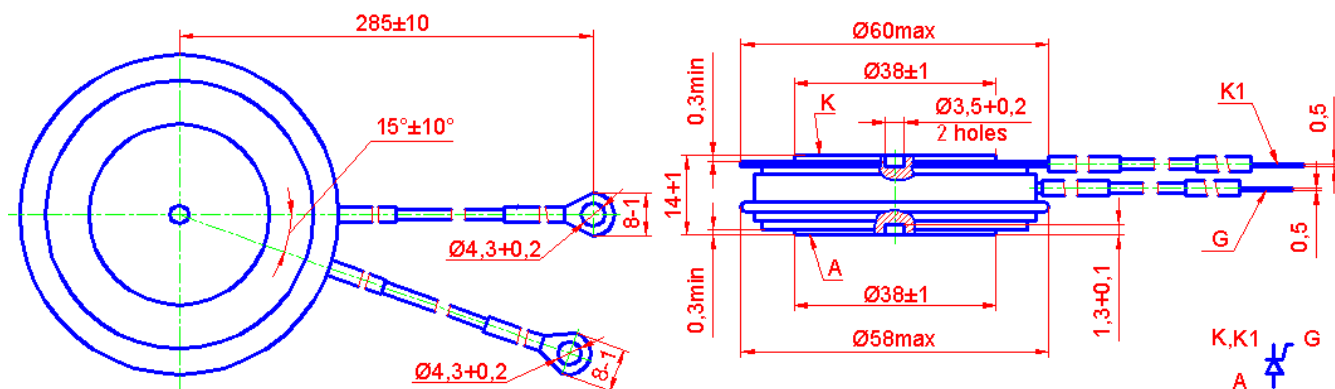
## CHARACTERISTICS

Symbols and parameters		Units	TFI443-400	Conditions
$I_L$	Latching current	A	8	$T_{vj}=25^{\circ}\text{C}, U_D=12\text{V}$ Gate pulse : 10V, 5 $\mu\text{s}$ , 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	$\mu\text{s}$	2,5	$T_{vj}=25^{\circ}\text{C}, U_D=500\text{V}$ $I_{TM} = 400 \text{ A}$
$t_{gt}$	Turn-on time	$\mu\text{s}$	4,0	Gate pulse : 10V, 5 $\mu\text{s}$ , 1 $\mu\text{s}$ rise time, 10 $\mu\text{s}$
$t_q$	Turn-off time	$\mu\text{s}$	50÷63 63÷80	$T_{vj}=125^{\circ}\text{C}$ , $I_{TM}=400 \text{ A}$ $di_R/dt = 10 \text{ A}/\mu\text{s}$ , $U_R=100\text{V}$ $U_D = 0,67 U_{DRM}$ $du_D/dt=50 \text{ V}/\mu\text{s}$ $du_D/dt=200 \text{ V}/\mu\text{s}$
$Q_{rr}$	Recovered charge	$\mu\text{C}$	700	$T_{vj}=125^{\circ}\text{C}$ , $I_{TM}=400 \text{ A}$ $di_R/dt=50 \text{ A}/\mu\text{s}$ , $U_R=100\text{V}$
$t_{rr}$	Reverse recovery time	$\mu\text{s}$	7,0	
$I_{rrM}$	Peak reverse recovery current	A	200	$T_{vj}=125^{\circ}\text{C}$ , $U_D = 0,67 U_{DRM}$ Gate open
$(du_D/dt)_{crit}$	Critical rate of rise of off-state voltage	$\text{V}/\mu\text{s}$	500 1000	
$R_{thjc}$	Thermal resistance junction to case	$^{\circ}\text{C}/\text{W}$	0,034	Direct current, double side cooled

## ORDERING

	TFI	443	400	30	7	2	1	
	1	2	3	4	5	6	7	



- Fast thyristor with interdigitated gate structure.
- Design version.
- Mean on-state current, A.
- Voltage code (30=3000 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 ( $du_D/dt=50 \text{ V}/\mu\text{s}$ ,  $1 \leq 63\mu\text{s}$ ,  $2 \leq 50 \mu\text{s}$ ).
- Group of turn-on time ( $1 \leq 4 \mu\text{s}$ ).



Mounting force : 13÷19 kN  
Weight : 210 grams

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