



**TET ESTEL AS**  
ESTONIA

**October**  
**2014**

**Series**  
**TFI153S-1000**

**High Frequency Inverter grade**  
**Capsule Thyristor**  
**Type TFI153S-1000**

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>1000 A</b>
Maximum repetitive peak off-state and reverse voltage	$U_{DRM}$					<b>800 ÷ 1300 V</b>
Turn-off time	$U_{RRM}$					<b>8, 10; 12,5 μs</b>
$U_{DRM}, U_{RRM}, V$	800	900	1000	1100	1200	1300
Voltage code	8	9	10	11	12	13
$T_{vj}, °C$	- 60 ÷ 125					

**MAXIMUM ALLOWABLE RATINGS**

Symbols and parameters		Units	TFI153S-1000	Conditions	
$I_{TAV}$	Mean on-state current	A	1000 1370	$T_c=78 °C$ , $T_c=55 °C$ , 180° half-sine wave, 50 Hz	
$I_{TRMS}$	RMS on-state current	A	1570	$T_c=78 °C$	
$I_{TSM}$	Surge on-state current	kA	20,0 22,0	$T_{vj}=125°C$ $T_{vj}=25°C$	tp=10 ms $U_R=0$
$I^2t$	Limiting load integral	kA <sup>2</sup> s	2000 2420	$T_{vj}=125°C$ $T_{vj}=25°C$	
$U_{DRM}, U_{RRM}$	Repetitive peak off-state and reverse voltage	V	800÷1300	$T_j \min \leq T_{vj} \leq T_{jM}$ 180° half-sine wave, 50 Hz Gate open	
$U_{DSM}, U_{RSM}$	Non-repetitive peak off-state and reverse voltage	V	880÷1400	$T_j \min \leq T_{vj} \leq T_{jM}$ 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	1600 1000	$T_{vj}=125°C$ ; $U_D=0,67 U_{DRM}$ , Gate pulse : 10V, 5 μs, 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	2,6	$T_{vj}=25°C, I_{TM}=3,14 I_{TAV}$
$U_{T(To)}$	Threshold voltage	V	1,55	$T_{vj}=125°C$
$R_T$	On-state slope resistance	mΩ	0,265	1,57 $I_{TAV} < I_T < 4,71 I_{TAV}$
$I_{DRM}$ $I_{RRM}$	Repetitive peak off-state and reverse current	mA	100 100	$T_{vj}=125°C$ , $U_D = U_{DRM}$ $U_R = U_{RRM}$

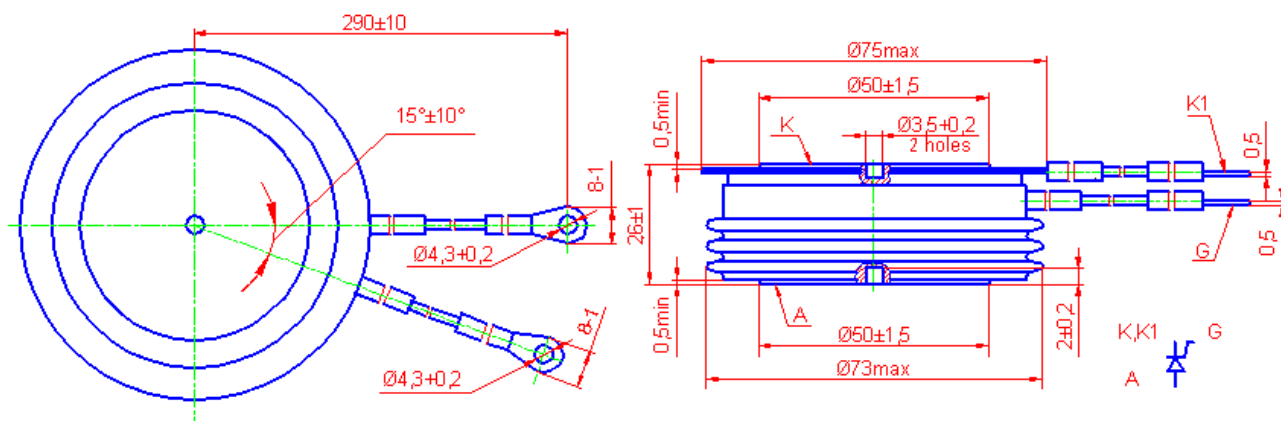
## CHARACTERISTICS

Symbols and parameters		Units	TFI153S-1000	Conditions
$I_L$	Latching current	A	20	$T_{vj}=25^{\circ}\text{C}, U_D=12\text{V}$ 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	0,35 0,90	$T_{vj}=25^{\circ}\text{C}$ , $T_{vj}=-60^{\circ}\text{C}$
$U_{GD}$	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	$T_{vj}=25^{\circ}\text{C}, U_D=500\text{V}$ $I_{TM} = 1000 \text{ A}$
$t_{gt}$	Turn-on time	$\mu\text{s}$	2,5	Gate pulse : 10V, 5 $\mu\text{s}$ , 1 $\mu\text{s}$ rise time, 10 $\mu\text{s}$
$t_q$	Turn-off time	$\mu\text{s}$	8; 10; 12,5 10; 12,5; 16	$T_{vj}=125^{\circ}\text{C}, I_{TM}=1000 \text{ A}$ $di_R/dt = 10 \text{ A}/\mu\text{s}, U_R=100\text{V}$ $U_D = 0,67 U_{DRM}$ $du_D/dt=50 \text{ V}/\mu\text{s}$ $du_D/dt=200 \text{ V}/\mu\text{s}$
$Q_{rr}$	Recovered charge	$\mu\text{C}$	190	$T_{vj}=125^{\circ}\text{C}, I_{TM}=1000 \text{ A}$ $di_R/dt=50 \text{ A}/\mu\text{s}, U_R=100\text{V}$
$t_{rr}$	Reverse recovery time	$\mu\text{s}$	3,0	
$I_{rrM}$	Peak reverse recovery current	A	125	
$(du_D/dt)_{crit}$	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	$^{\circ}\text{C}/\text{W}$	0,021	Direct current, double side cooled

## ORDERING

	TFI	153	S	1000	12	7	8	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 (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 ( $du_D/dt=50 \text{ V}/\mu\text{s}$ ,  $8 \leq 12,5 \mu\text{s}$ ,  $A4 \leq 10 \mu\text{s}$ ,  $9 \leq 8 \mu\text{s}$ ).
- Group of turn-on time ( $3 \leq 2,5 \mu\text{s}$ ).



Mounting force : 19 ÷ 28 kN  
Weight : 580 grams