



**THE DATASHEET OF
TFI253-1000-20_26MM**





TET ESTEL AS
ESTONIA

May
2016

Series
TFI253-1000

High Frequency Inverter grade Capsule Thyristor Type TFI253-1000

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

| | | | | | | | |
|---|------------|------|------|------|-----------|-------------------------------------|------|
| Maximum mean on-state current | | | | | I_{TAV} | 1000 A | |
| Maximum repetitive peak off-state and reverse voltage | | | | | U_{DRM} | 1200 ÷ 2000 V | |
| Turn-off time | | | | | U_{RRM} | | |
| | | | | | t_q | 20; 25; 32 μs | |
| U_{DRM}, U_{RRM}, V | 1200 | 1300 | 1400 | 1500 | 1600 | 1800 | 2000 |
| Voltage code | 12 | 13 | 14 | 15 | 16 | 18 | 20 |
| $T_{vj}, ^\circ C$ | - 60 ÷ 125 | | | | | | |

MAXIMUM ALLOWABLE RATINGS

| Symbols and parameters | | Units | TFI253-1000 | Conditions |
|------------------------|---|------------|--------------|--|
| I_{TAV} | Mean on-state current | A | 1000 1425 | $T_c=80^\circ C$, $T_c=55^\circ C$, 180° half-sine wave, 50 Hz |
| I_{TRMS} | RMS on-state current | A | 1570 | $T_c=80^\circ C$ |
| I_{TSM} | Surge on-state current | kA | 20,0 22,0 | $T_{vj}=125^\circ C$ $T_{vj}=25^\circ C$ tp=10 ms $U_R=0$ |
| I^2t | Limiting load integral | kA^2s | 2000 2420 | $T_{vj}=125^\circ C$ $T_{vj}=25^\circ C$ |
| U_{DRM}, U_{RRM} | Repetitive peak off-state and reverse voltage | V | 1200÷2000 | $T_j \min \leq T_{vj} \leq T_{jM}$ 180° half-sine wave, 50 Hz Gate open |
| U_{DSM}, U_{RSM} | Non-repetitive peak off-state and reverse voltage | V | 1300÷2100 | $T_j \min \leq T_{vj} \leq T_{jM}$ 180° half-sine wave tp=10 ms, Single pulse Gate open |
| (di/dt) crit | Critical rate of rise of on-state current : non - repetitive repetitive | A/ μ s | 2000 1250 | $T_{vj}=125^\circ C$; $U_D=0,67 U_{DRM}$, Gate pulse : 10V, 5 Ω , 1 μ s rise time, 10 μ 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 | 2,3 | $T_{vj}=25^\circ C$, $I_{TM}=3,14 I_{TAV}$ |
| $U_{T(To)}$ | Threshold voltage | V | 1,35 | $T_{vj}=125^\circ C$ |
| R_T | On-state slope resistance | m Ω | 0,28 | $1,57 I_{TAV} < I_T < 4,71 I_{TAV}$ |
| I_{DRM} I_{RRM} | Repetitive peak off-state and reverse current | mA | 100 100 | $T_{vj}=125^\circ C$, $U_D = U_{DRM}$ $U_R = U_{RRM}$ |

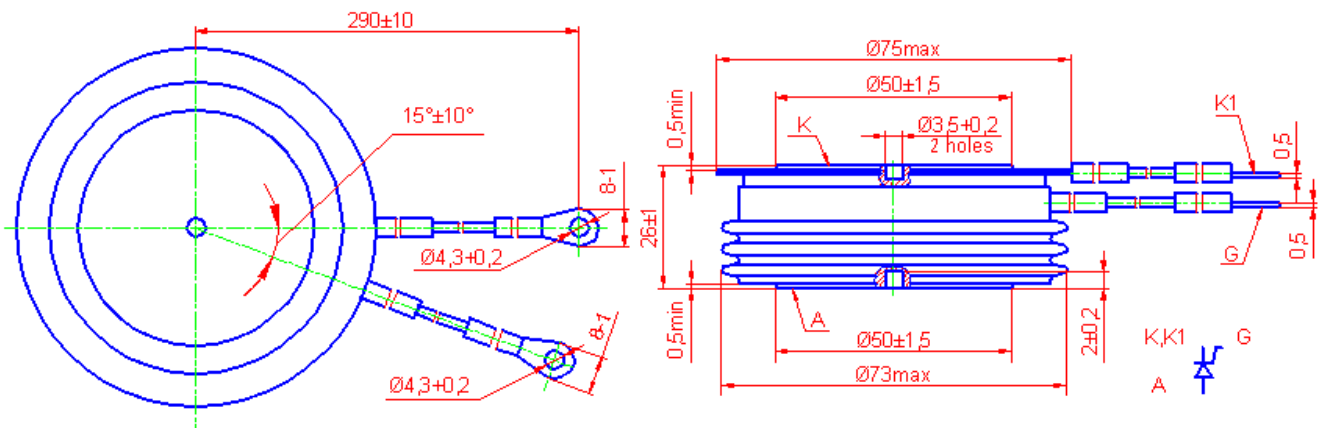
CHARACTERISTICS

| Symbols and parameters | | Units | TFI253-1000 | Conditions |
|-------------------------------|--|-----------------------------|------------------------------|---|
| I_L | Latching current | A | 10 | $T_{vj}=25^{\circ}\text{C}, U_D=12\text{V}$ Gate pulse : 10V, 5 Ω , 1 μs rise time, 10 μs |
| 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 | $T_{vj}=25^{\circ}\text{C}$, $T_{vj}=-60^{\circ}\text{C}$ |
| 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 |
| tg _d | Delay time | μs | 2,0 | $T_{vj}=25^{\circ}\text{C}, U_D=500\text{V}$ $I_{TM} = 1000 \text{ A}$ |
| tg _t | Turn-on time | μs | 3,2 | Gate pulse : 10V, 5 Ω , 1 μs rise time, 10 μs |
| tq | Turn-off time | μs | 20 \div 32 25 \div 40 | $T_{vj}=125^{\circ}\text{C}$, $I_{TM}=1000 \text{ A}$ $di_R/dt = 10 \text{ A}/\mu\text{s}$, $U_R=100\text{V}$ $U_D = 0,67 U_{DRM}$ $du_D/dt=50 \text{ V}/\mu\text{s}$ $du_D/dt=200 \text{ V}/\mu\text{s}$ |
| Q _{rr} | Recovered charge | μC | 450 | $T_{vj}=125^{\circ}\text{C}$, $I_{TM}=1000 \text{ A}$ $di_R/dt = 50 \text{ A}/\mu\text{s}$, $U_R=100\text{V}$ |
| trr | Reverse recovery time | μs | 5,6 | |
| I _{rrm} | Peak reverse recovery current | A | 160 | |
| (du_D/dt) _{crit} | Critical rate of rise of off-state voltage | V/ μs | 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 | 253 | 1000 | 20 | 7 | 5 | 2 | |
|--|-----|-----|------|----|---|---|---|--|
| | 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 V/ μs , 7 \geq 1000 V/ μs).
- Group of turn-off time ($du_D/dt=50 \text{ V}/\mu\text{s}$, 4 \leq 32 μs , 5 \leq 25 μs , 6 \leq 20 μs).
- Group of turn-on time (2 \leq 3,2 μs).



Mounting force : 19 \div 28 kN
Weight : 580 grams

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