



TET ESTEL AS
ESTONIA

May
2013

Series
TF353-1000

High Frequency Inverter grade
Capsule Thyristor
Type TF353-1000

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					
Tum-off time	U_{RRM}	40; 50; 63 μs					
U_{DRM}, U_{RRM}, V	1200	1300	1400	1500	1600	1800	2000
Voltage code	12	13	14	15	16	18	20
$T_{vj}, °C$	- 60 ÷ 125						

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	TF353-1000	Conditions
I_{TAV}	Mean on-state current	A	1000 1395	$T_c=82 °C$, $T_c=55 °C$, 180° half-sine wave, 50 Hz
I_{TRMS}	RMS on-state current	A	1570	$T_c=82 °C$
I_{TSM}	Surge on-state current	kA	18 19	$T_{vj}=125 °C$ $T_{vj}=25 °C$ tp=10 ms $U_R=0$
I^2t	Limiting load integral	kA ² s	1620 1805	$T_{vj}=125 °C$ $T_{vj}=25 °C$
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 _T /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 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	2,35	$T_{vj}=25 °C, I_{TM}=3,14 I_{TAV}$
$U_{T(TO)}$	Threshold voltage	V	1,18	$T_{vj}=125 °C$
R_T	On-state slope resistance	mΩ	0,35	1,57 $I_{TAV} < I_T < 4,71 I_{TAV}$
I_{DRM} I_{RRM}	Repetitive peak off-state and reverse current	mA	150 150	$T_{vj}=125 °C$, $U_D = U_{DRM}$ $U_R = U_{RRM}$

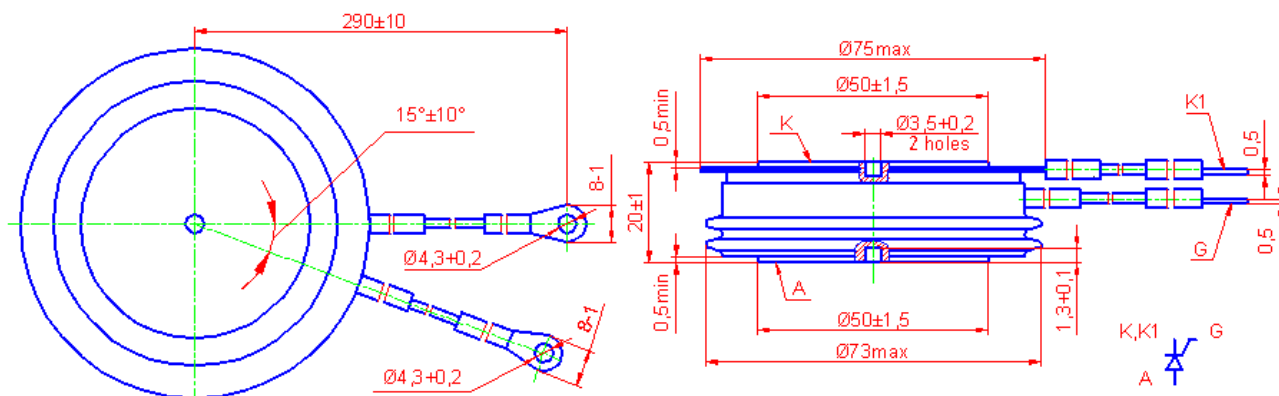
CHARACTERISTICS

Symbols and parameters		Units	TF353-1000	Conditions
I_L	Latching current	A	15	$T_{vj}=25^{\circ}\text{C}, U_D=12\text{V}$ Gate pulse : 10V, 5 Ω , 1 μs rise time, 10 μs
I_H	Holding current	A	1,5	$T_{vj}=25^{\circ}\text{C}, U_D=12\text{V}$, 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 0,85	$T_{vj}=25^{\circ}\text{C}$, $T_{vj}=-60^{\circ}\text{C}$
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
t_{gd}	Delay time	μs	2,5	$T_{vj}=25^{\circ}\text{C}, U_D=500\text{V}$ $I_{TM} = 1000 \text{ A}$
t_{gt}	Turn-on time	μs	4,0	Gate pulse : 10V, 5 Ω , 1 μs rise time, 10 μs
t_q	Turn-off time	μs	40÷63 50÷70	$T_{vj}=125^{\circ}\text{C}$, $I_{TM}=1000 \text{ A}$ $di_R/dt = 10 \text{ A}/\mu\text{s}$, $U_R=100\text{V}$ $U_D = 0,67 U_{DRM}$ $du_D/dt=50 \text{ V}/\mu\text{s}$ $du_D/dt=200 \text{ V}/\mu\text{s}$
Q_{rr}	Recovered charge	μC	1800	$T_{vj}=125^{\circ}\text{C}$, $I_{TM}=1000 \text{ A}$ $di_R/dt=50 \text{ A}/\mu\text{s}$, $U_R=100\text{V}$
t_{rr}	Reverse recovery time	μs	9	
I_{rrM}	Peak reverse recovery current	A	400	
$(du_D/dt)_{crit}$	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

	TF	353	1000	16	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 (16=1600 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 ($du_D/dt=50 \text{ V}/\mu\text{s}$, $1 \leq 63 \mu\text{s}$, $2 \leq 50 \mu\text{s}$, $3 \leq 40 \mu\text{s}$).
- Group of turn-on time ($1 \leq 4,0 \mu\text{s}$).



Mounting force : 19 ÷ 28 kN
Weight : 480 grams