

# Thyristor with built-in reverse diode for HID lamp ignition TFC562D

## Features

- Repetitive peak off-state voltage:  $V_{DRM}=600V$
- Repetitive peak surge on-state current:  $I_{TRM}=600A$
- Critical rate-of-rise of on-state current:  $di/dt=1600A/\mu s$
- Gate trigger current:  $I_{GT}=20mA$  max
- With built-in reverse diode

## Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit	Conditions
Repetitive peak off-state voltage	$V_{DRM}$	600	V	$T_J = -40$ to $+125^\circ C$ , $R_{GK} = 1k\Omega$
Repetitive surge peak on-state current	$I_{TRM}$	600	A	$T_a = 100^\circ C$ , $V_D \leq 430V$ , $W_p = 1.05\mu s$ , $I_G = 70mA$ , $di/dt = 0.5A/\mu s$ , 100cycle*, See the examples of current waveforms
Critical rate-of-rise of on-state current	$di/dt$	1600	A/ $\mu s$	
Peak forward gate current	$I_{FGM}$	2	A	$f \geq 50Hz$ , duty $\leq 10\%$
Peak gate power loss	$P_{GM}$	5	W	$f \geq 50Hz$ , duty $\leq 10\%$
Average gate power loss	$P_{G(AV)}$	0.5	W	
Peak reverse gate voltage	$V_{RGM}$	5	V	$f \geq 50Hz$
Diode repetitive peak surge forward current	$I_{FRM}$	460	A	$T_a = 100^\circ C$ , $V_D \leq 430V$ , $W_p = 1.05\mu s$ , 100cycle*, See the examples of current waveforms
Junction temperature	$T_J$	$-40$ to $+125$	$^\circ C$	
Storage temperature	$T_{stg}$	$-40$ to $+125$	$^\circ C$	

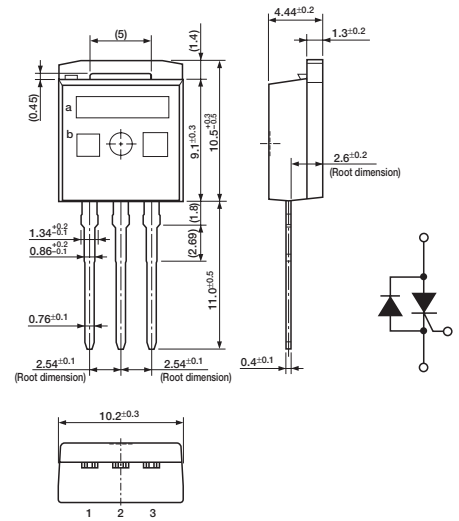
\* The surge current for  $T=10ms$  /cycle shall be applied 50 cycles successively, and an interval time shall follow to cool down the junction temperature of the device to  $125^\circ C$ . This process shall be repeated up to 100K cycles.

## Electrical Characteristics

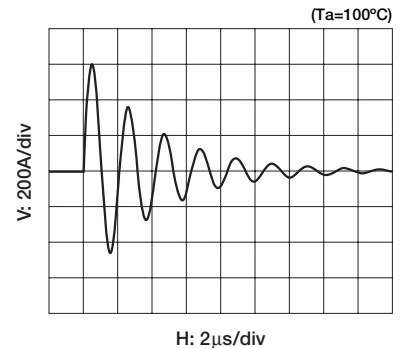
( $T_J=25^\circ C$ )

Parameter	Symbol	Ratings			Unit	Conditions
		min	typ	max		
On-state voltage	$V_{TM}$			1.4	V	$I_T = 10A$
Gate trigger voltage	$V_{GT}$			1.5	V	$V_D = 6V$ , $R_L = 10\Omega$
Gate trigger current	$I_{GT}(1)$			20	mA	$V_D = 6V$ , $R_L = 10\Omega$
Gate non-trigger voltage	$V_{GD}$	0.1			V	$V_D = 480V$ , $T_J = 125^\circ C$
Holding current	$I_H$	2	5		mA	$R_{G-K} = 1k\Omega$ , $T_J = 25^\circ C$
Off-state current (1)	$I_{DRM}(1)$			10	$\mu A$	$V_D = V_{DRM}$ , $R_{G-K} = 1k\Omega$ , $T_J = 25^\circ C$
Off-state current (2)	$I_{DRM}(2)$			1	mA	$V_D = V_{DRM}$ , $R_{G-K} = 1k\Omega$ , $T_J = 125^\circ C$
Thermal resistance	$R_{th}$			4.0	$^\circ C/W$	Junction to case, With infinite heatsink
Diode forward voltage	$V_F$			1.4	V	$I_F = 10A$

## External Dimensions (unit: mm)



## Current waveform (1cycle)



\* A single cycle operation consists of a continuous impression of 50 rounds with period  $T = 10ms$  followed by a rest time for the junction temperature of the element to cool down to  $100^\circ C$  ( $= T_a$ ). Repeat this cycle operation.