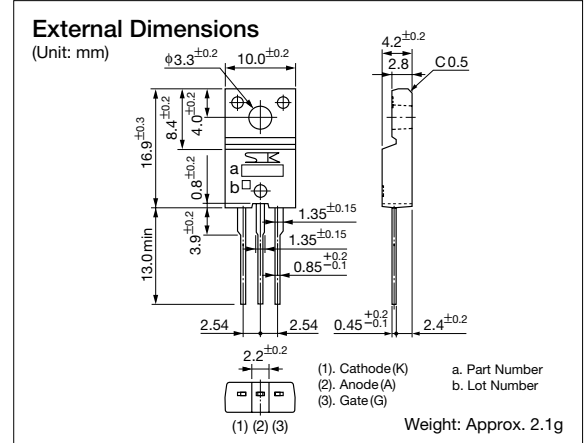


# TO-220F 5A Thyristor

## TF521S, TF541S, TF561S

### ■ Features

- Repetitive peak off-state voltage:  $V_{DRM}=200, 400, 600V$
- Average on-state current:  $I_{T(AV)}=5A$
- Gate trigger current:  $I_{GT}=15mA$  max
- Isolation voltage:  $V_{ISO}=1500V$  (50Hz Sine wave, RMS)
- UL approved type available



### ■ Absolute Maximum Ratings

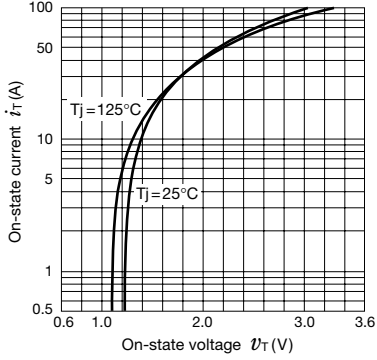
Parameter	Symbol	Ratings			Unit	Conditions
		TF521S	TF541S	TF561S		
Repetitive peak off-state voltage	$V_{DRM}$	200	400	600	V	$T_j = -40$ to $+125^\circ C$ , $R_{GK} = 1k\Omega$
Repetitive peak reverse voltage	$V_{RRM}$	200	400	600	V	
Non-repetitive peak off-state voltage	$V_{DSM}$	300	500	700	V	
Non-repetitive peak reverse voltage	$V_{RSM}$	300	500	700	V	
Average on-state current	$I_{T(AV)}$	5.0			A	50Hz Half-cycle sinewave, Continuous current, $T_c = 87^\circ C$
RMS on-state current	$I_{T(RMS)}$	7.8			A	
Surge on-state current	$I_{TSM}$	80			A	50Hz Half-cycle sinewave, Single shot, Non-repetitive, $T_j = 125^\circ C$
Peak forward gate current	$I_{FGM}$	2.0			A	$f \geq 50Hz$ , duty $\leq 10\%$
Peak forward gate voltage	$V_{FGM}$	10			V	
Peak reverse gate voltage	$V_{RGM}$	5.0			V	$f \geq 50Hz$
Peak gate power loss	$P_{GM}$	5.0			W	$f \geq 50Hz$ , duty $\leq 10\%$
Average gate power loss	$P_{G(AV)}$	0.5			W	
Junction temperature	$T_j$	$-40$ to $+125$			$^\circ C$	
Storage temperature	$T_{stg}$	$-40$ to $+125$			$^\circ C$	
Isolation voltage	$V_{ISO}$	1500			V	50Hz Sine wave, RMS, Terminal to Case, 1 min.

### ■ Electrical Characteristics

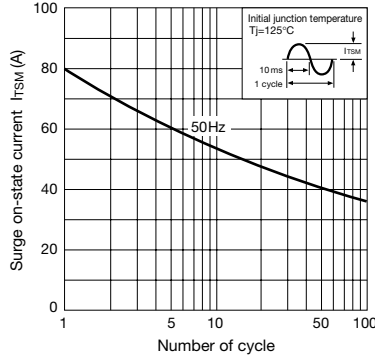
Parameter	Symbol	Ratings			Unit	Conditions
		min	typ	max		
Off-state current	$I_{DRM}$			2.0	mA	$T_j = 125^\circ C$ , $V_D = V_{DRM}(V_{RRM})$ , $R_{GK} = 1k\Omega$
Reverse current	$I_{RRM}$			2.0	mA	
On-state voltage	$V_{TM}$			1.4	V	$T_c = 25^\circ C$ , $I_{TM} = 10A$
Gate trigger voltage	$V_{GT}$			1.5	V	$V_D = 6V$ , $R_L = 10\Omega$ , $T_c = 25^\circ C$
Gate trigger current	$I_{GT}$		3.0	15	mA	
Gate non-trigger voltage	$V_{GD}$	0.1			V	$V_D = 1/2 \times V_{DRM}$ , $T_j = 125^\circ C$ , $R_{GK} = 1k\Omega$
Holding current	$I_H$		4.0		mA	$R_{GK} = 1k\Omega$ , $T_j = 25^\circ C$
Critical rate-of-rise of off-state voltage	$dv/dt$		50		V/ $\mu S$	$V_D = 1/2 \times V_{DRM}$ , $T_j = 125^\circ C$ , $R_{GK} = 1k\Omega$ , $C_{GK} = 0.033\mu F$
Turn-off time	$t_q$		30		$\mu S$	$T_c = 25^\circ C$
Thermal resistance	$R_{th}$			4.0	$^\circ C/W$	Junction to case

# TF521S, TF541S, TF561S

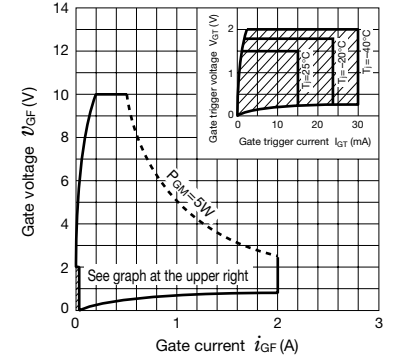
$V_T - I_T$  Characteristics (max)



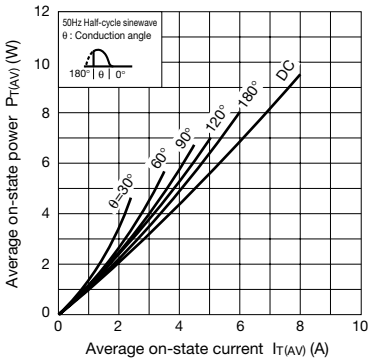
$I_{TSM}$  Ratings



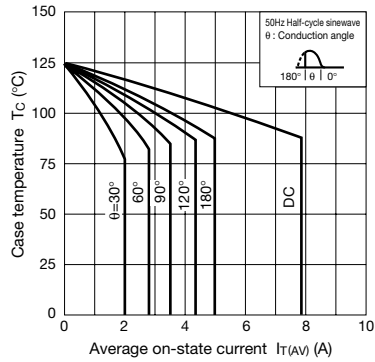
Gate Characteristics



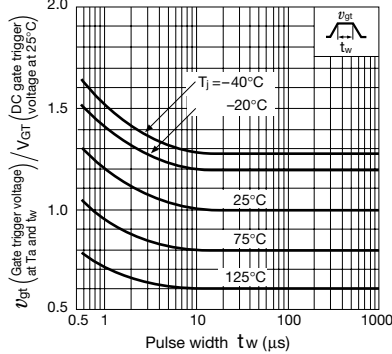
$I_T(AV) - P_T(AV)$  Characteristics



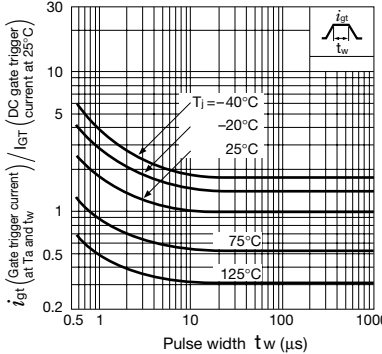
$I_T(AV) - T_c$  Ratings



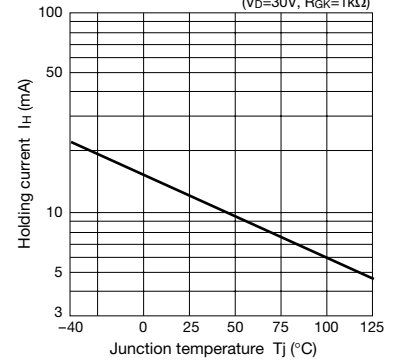
Pulse trigger temperature Characteristics  $V_{gt}$  (Typical)



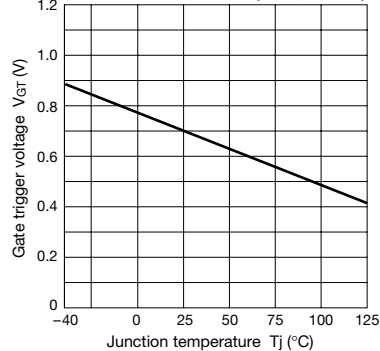
Pulse trigger temperature Characteristics  $I_{gt}$  (Typical)



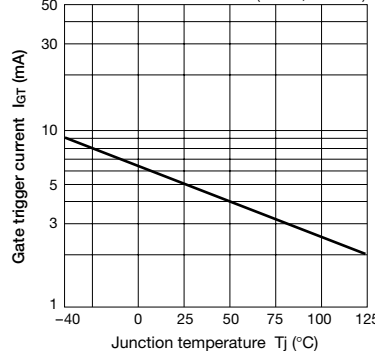
$I_H$  temperature Characteristics (Typical)



$V_{GT}$  temperature Characteristics (Typical)



$I_{GT}$  temperature Characteristics (Typical)



Transient thermal resistance Characteristics (Junction to case)

