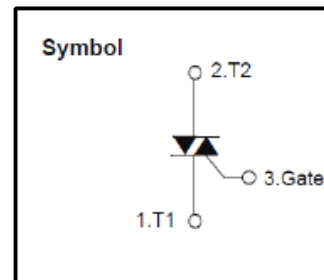


***Bi-Directional Triode Thyristor***

**Features**

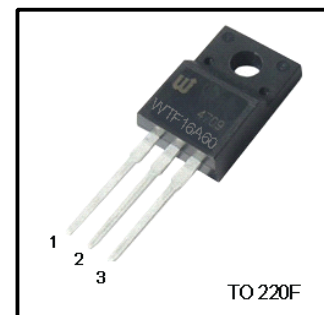
- Repetitive Peak off -State Voltage:600V
- R.M.S On-State Current( $I_{T(RMS)}$ )=16A)
- Isolation voltage( $V_{ISO}$ )=1500V AC)
- High Commutation  $dv/dt$



**General Description**

This device is fully isolated package suitable for AC switching application, phase control application such as fan speed and temperature modulation control, lighting control and static switching relay. This device is approved to comply with applicable requirements by Underwriters Laboratories Inc.

By using an internal ceramic pad, the TO220F series provides voltage insulated tab (rated at 2500V RMS) complying with UL standards (file ref.:E347423)



**Absolute Maximum Ratings** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

symbol	Parameter	Ratings	Units
$V_{DRM}$	Peak Repetitive Forward Blocking Voltage(gate open) (Note1)	600	V
$I_{T(RMS)}$	Forward Current RMS(All Conduction Angles, $T_J=68^\circ\text{C}$ )	16	A
$I_{TSM}$	Peak Forward Surge Current, (1/2 Cycle, Sine Wave, 50/60Hz)	155/170	A
$I^2t$	Circuit Fusing Considerations ( $t_p=10\text{ms}$ )	120	$\text{A}^2\text{s}$
$P_{GM}$	Peak Gate Power —Forward, ( $T_c=68^\circ\text{C}$ , Pulse Width $\leq 1.0\mu\text{s}$ )	5.0	W
$P_{G(AV)}$	Average Gate Power —Forward, (Over any 20ms period)	0.5	W
$I_{FGM}$	Peak Gate Current—Forward, $T_J=125^\circ\text{C}$ (20 $\mu\text{s}$ , 120PPS)	2.0	A
$V_{RGM}$	Peak Gate Voltage—Reverse, $T_J=125^\circ\text{C}$ (20 $\mu\text{s}$ , 120PPS)	10	V
$T_J$	Junction Temperature	-40~125	$^\circ\text{C}$
$T_{stg}$	Storage Temperature	-40~150	$^\circ\text{C}$
	Mass	2.0	g

Note1. Although not recommended off -state voltages up to 800v, may be applied with out damage, but the TRIAC may switch, to the on-state. the rate of rise of current should not exceed 3A/ $\mu\text{s}$ .

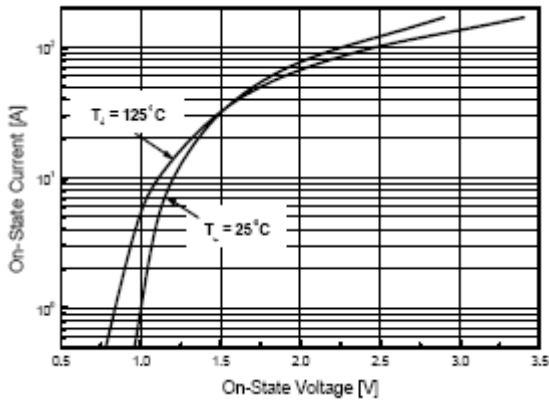
**Thermal Characteristics**

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance Junction to case	3.0	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal resistance Junction to Ambient	120	$^\circ\text{C}/\text{W}$

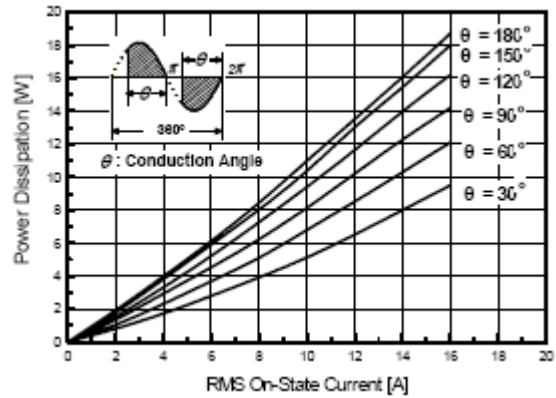
## Electrical Characteristics (T<sub>C</sub>=25°C unless otherwise specified)

Symbol	Characteristics	Min.	Typ.	Max.	Unit	
I <sub>DRM</sub>	Peak Forward or Reverse Blocking Current (V <sub>D</sub> =V <sub>DRM</sub> /V <sub>RRM</sub> )	T <sub>C</sub> =25°C	-	-	10	μA
		T <sub>C</sub> =125°C	-	-	2	mA
V <sub>TM</sub>	Forward "On" Voltage (Note2) (I <sub>TM</sub> =25A Peak @ TA =25°C)	-	-	1.4	V	
I <sub>GT</sub>	Gate Trigger Current (Continuous dc) (V <sub>D</sub> =6 Vdc, R <sub>L</sub> =10 Ω)	T2+G+	-	-	30	mA
		T2+G-	-	-	30	
		T2-G-	-	-	30	
V <sub>GT</sub>	Gate Trigger Voltage (Continuous dc) (V <sub>D</sub> =6 Vdc, R <sub>L</sub> =10 Ω)	T2+G+	-	-	1.5	V
		T2+G-	-	-	1.5	
		T2-G-	-	-	1.5	
V <sub>GD</sub>	Gate threshold voltage (T <sub>J</sub> =125°C, V <sub>D</sub> =0.5V <sub>DRM</sub> )	0.2	-	-	V	
dV/dt	Critical rate of rise of commutation Voltage (V <sub>D</sub> =0.67V <sub>DRM</sub> )	-	500	-	V/μs	
(dv/dt) c	Critical rate of rise On-State voltage at Commutation (V <sub>D</sub> =400V, T <sub>J</sub> =125°C, di <sub>com</sub> /dt=0.5A/μs)	10	-	-	A/μs	
I <sub>H</sub>	Holding Current (V <sub>D</sub> =12Vdc, initiating current=20mA)	-	30	-	mA	

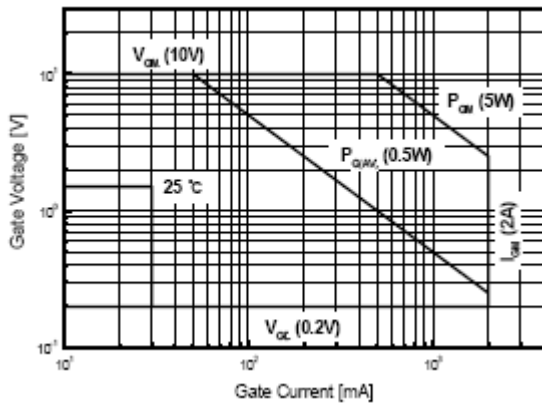
Note2. Forward current applied for 1 ms maximum duration ,duty cycle



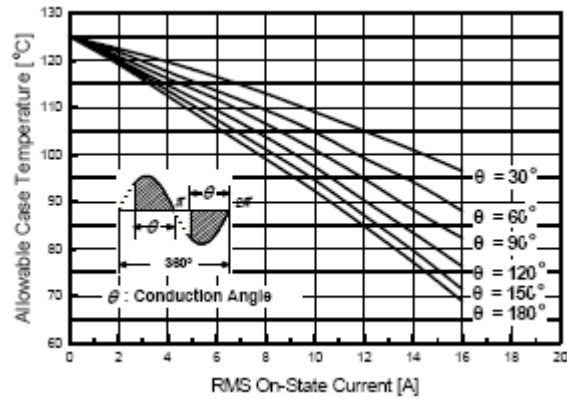
**Fig.1 On-State Voltage**



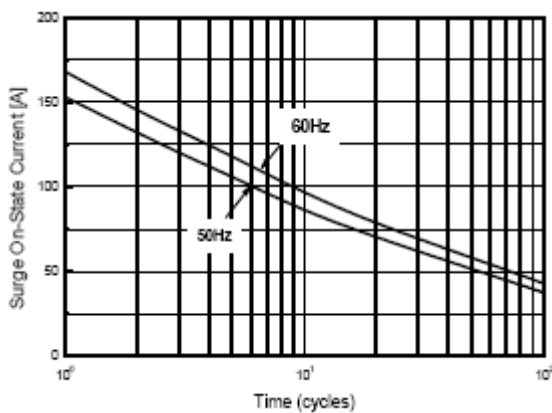
**Fig.2 On-State current vs maximum Power Dissipation**



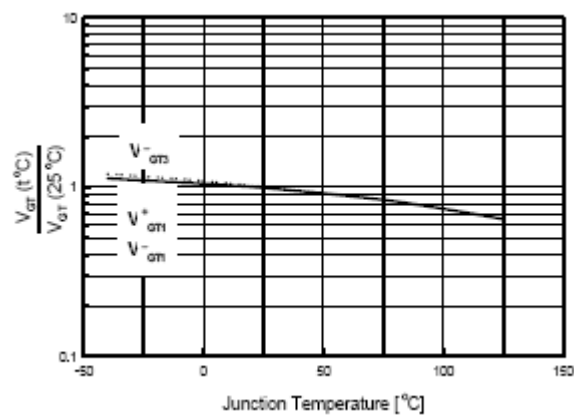
**Fig. 3 Gate Characteristics**



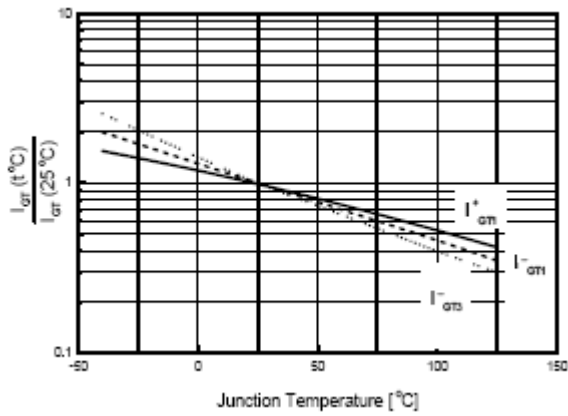
**Fig.4 On-State Current vs Allowable case Temperature**



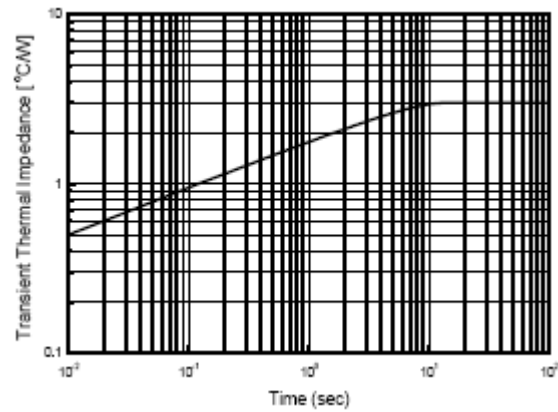
**Fig.5 Surge On-State Current Ration (Non-Repetitive)**



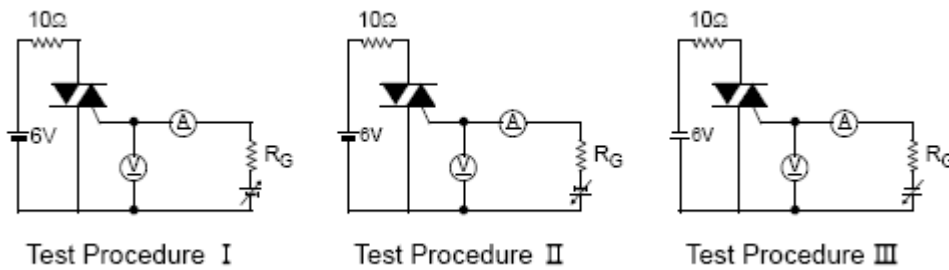
**Fig.6 Gate Trigger Voltage vs Junction Temperature**



**Fig.7**Gate Trigger Current vs Junction.



**Fig.8**Transient Thermal Impedance



**Fig.9** Gate Trigger Characteristics Test Circuit

**TO-220F Package Dimension**

