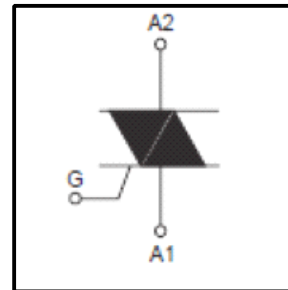


*Bi-Directional Triode Thyristor*

**Features**

- Repetitive Peak off-State Voltage:600
- R.M.S On-State Current( $I_{T(RMS)}$ )=12A
- Isolation Voltage (  $V_{ISO}$  = 1500V AC )
- High Commutation dV/dt.

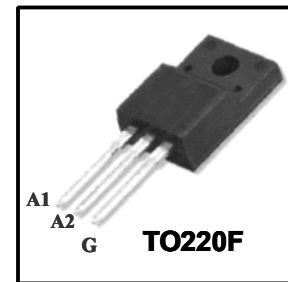


**General Description**

General purpose switching and phase control applications.

These devices are intended to be interfaced directly to micro-controllers, logic integrated circuits and other low power gate trigger circuits such as fan speed and temperature modulation control, lighting control and static switching relay.

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<sub>J</sub>=25°C unless otherwise specified)

Symbol	Parameter	Value	Units
V <sub>DRM</sub>	Peak Repetitive Forward Blocking Voltage(gate open) (Note 1)	600	V
I <sub>T(RMS)</sub>	Forward Current RMS (All Conduction Angles, T <sub>c</sub> =58°C)	12	A
I <sub>TSM</sub>	Peak Forward Surge Current, (1/2 Cycle, Sine Wave, 50/60 Hz)	119/130	A
I <sup>2</sup> t	Circuit Fusing Considerations (t p= 10 ms)	71	A <sup>2</sup> s
P <sub>GM</sub>	Peak Gate Power — Forward, (T <sub>c</sub> = 58°C,Pulse with ≤1.0us)	5	W
P <sub>G(AV)</sub>	Average Gate Power — Forward, (Over any 20ms period)	0.5	W
I <sub>FGM</sub>	Peak Gate Current — Forward, T <sub>j</sub> = 125°C (20 μs, 120 PPS)	2	A
V <sub>RGM</sub>	Peak Gate Voltage — Reverse, T <sub>j</sub> = 125°C (20 μs, 120 PPS)	10	V
T <sub>J</sub>	Junction Temperature	-40~125	°C
T <sub>stg</sub>	Storage Temperature	-40~150	°C

**Note1:** Although not recommended, off-state voltages up to 800V may be applied without damage, but the TRIAC may switch to the on-state. The rate of rise of current should not exceed 3A/us.

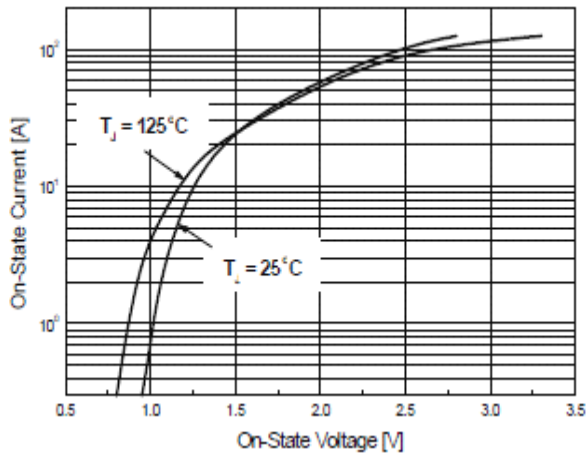
**Thermal Characteristics**

Symbol	Parameter	Value			Units
		Min	Typ	Max	
R <sub>QJC</sub>	Thermal Resistance, Junction-to-Case	-	-	3.3	°C/W
R <sub>QJA</sub>	Thermal Resistance, Junction-to-Ambient	-	-	120	°C/W

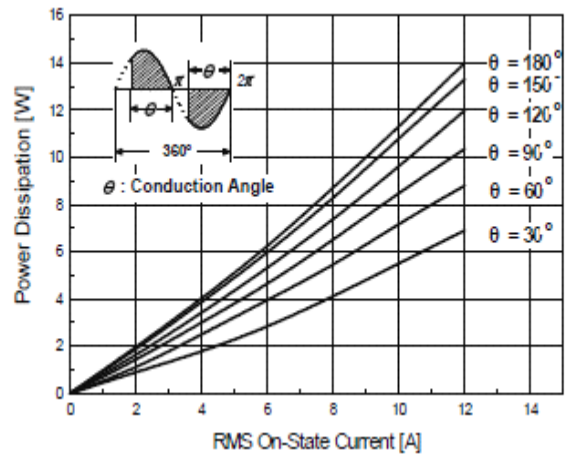
**Electrical Characteristics** (Tc = 25°C unless otherwise specified)

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> .)					
	Tc=25°C Tc=125°C	- -	- -	10 2	μA mA	
V <sub>TM</sub>	Forward "On" Voltage(Note2) (I <sub>TM</sub> = 20A Peak @ TA = 25°C)	-	-	1.4	V	
I <sub>GT</sub>	Gate Trigger Current (Continuous dc) (V <sub>D</sub> = 6 Vdc, RL = 10 Ohms)	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, RL = 10 Ohms)	T2+G+	-	-	1.2	V
		T2+G-	-	-	1.2	
		T2-G-	-	-	1.2	
V <sub>GD</sub>	Gate threshold voltage(Tj=125°C, V <sub>D</sub> =0.5 V <sub>DRM</sub> )	0.2	-	-	V	
dV/dt	Critical rate of rise of commutation Voltage (V <sub>D</sub> =0.67V <sub>DRM</sub> )	10	-	-	V/μs	
dV <sub>com</sub> /dt	Critical rate of rise On-State voltage (V <sub>D</sub> =400V, Tj=125°C, di <sub>com</sub> /dt=0.5A/μs)	50	-	-	A/μs	
I <sub>H</sub>	Holding Current (V <sub>D</sub> = 12 Vdc, initiating current = 20 mA)	-	20	-	mA	

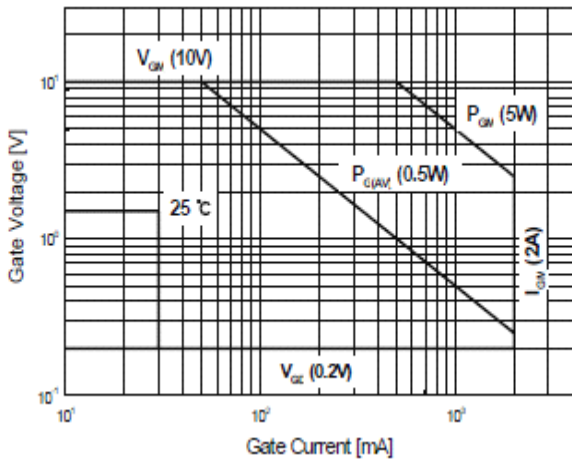
Note 2. Forward current applied for 1 ms maximum duration, duty cycle



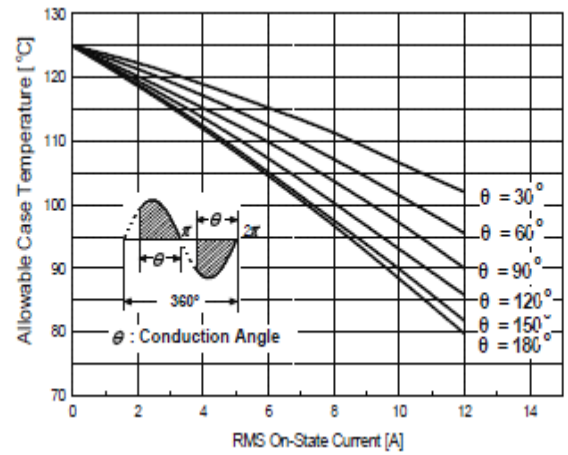
**Fig.1 ON-state Voltage vs On-state Current**



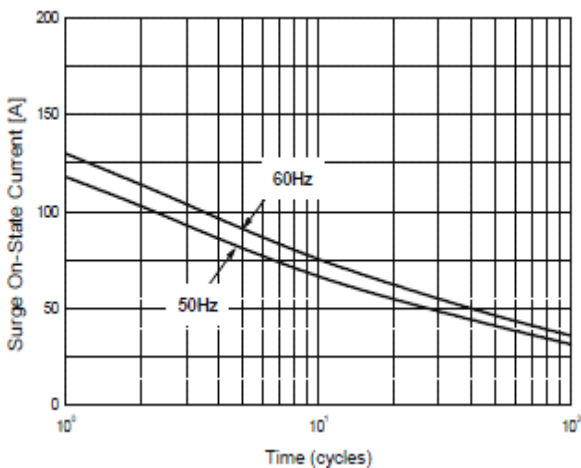
**Fig.2 On-state Current vs Maximum Power Dissipation**



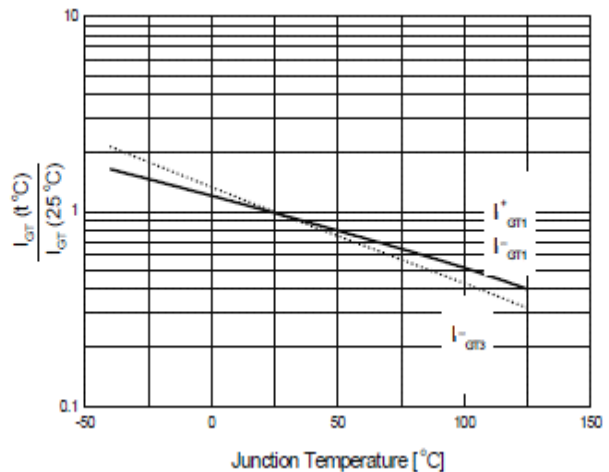
**Fig.3 Gate Characteristics**



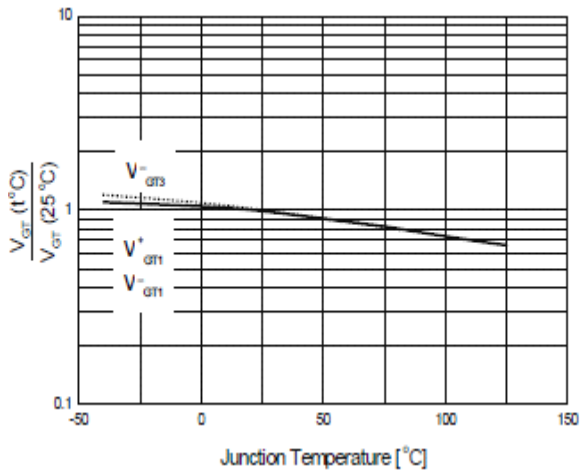
**Fig.4 On-state Current vs Allowable Case Temperature**



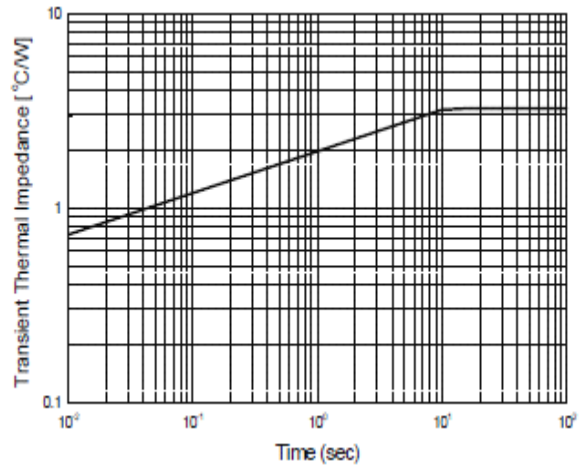
**Fig.5 Surge On-state Current Rating(Non-Repetitive)**



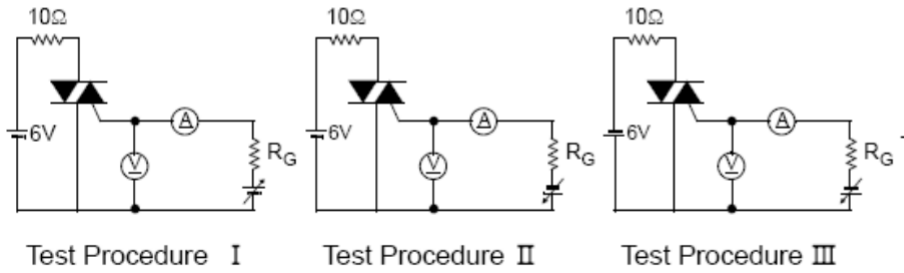
**Fig.6 Gate Trigger Current vs Junction Temperature**



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



**Fig.8 Transient Thermal Impedance**



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

**TO220F Package Dimension**

