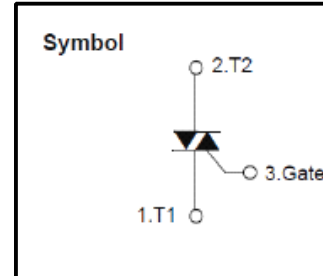


***Sensitive Gate  
Bi-Directional Triode Thyristor***

**Features**

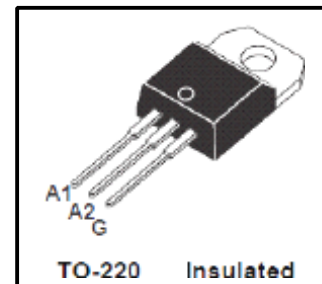
- Repetitive Peak off -State Voltage:600V
- R.M.S On-State Current(IT(RMS))=12A
- Low On-State Voltage (1.55V(Max.)@ITM)
- High Commutation dv/dt
- Halogen free(WTPA12A60SW-HF)



**General Description**

General purpose switching and phase control applications .These devices are intended to be interfaced directly to miro-Controllers,logic integrated circuits and other low power gatetrigger circuits such as fan speed and temperature modulation control,lighting control and static switching relay.

By using an internal ceramic pad, the WTPA 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	Ratings	Units
V <sub>DRM</sub> /V <sub>PRM</sub>	Peak Repetitive Forward Blocking Voltage(gate open) (Note1)	600	V
I <sub>T(RMS)</sub>	Forward Current RMS(All Conduction Angles, T <sub>J</sub> =58°C)	12	A
I <sub>TSM</sub>	Peak Forward Surge Current, (full Cycle, Sine Wave,50/60Hz)	120/126	A
I <sup>2</sup> t	Circuit Fusing Considerations (tp=10ms)	100	A <sup>2</sup> s
P <sub>GM</sub>	Peak Gate Power —Forward,(T <sub>J</sub> =58°C,Pulse With≤1.0us)	5	W
P <sub>G(AV)</sub>	Average Gate Power —Forward,(Over any 20ms period)	1.0	W
di/dt	Critical rate of rise of on-state current I <sub>TM</sub> =20A;I <sub>G</sub> =200mA;di <sub>G</sub> /dt=200mA/μs	T <sub>J</sub> =125°C 50	A/μs
I <sub>FGM</sub>	Peak Gate Current—Forward,T <sub>J</sub> =125°C (20μs,120PPS)	4	A
V <sub>RGM</sub>	Peak Gate Voltage—Reverse,T <sub>J</sub> =125°C(20μs,120PPS)	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 with out damage, but the TRIAC may swiTJh to the on-state .the rate of rise of current should not exceed 15A/us.

**Thermal Characteristics**

Symbol	Parameter	Value	Units
R <sub>θJC</sub>	Thermal Resistance Junction to case	2.3	°C/W
R <sub>θJA</sub>	Thermal resistance Junction to Ambient	60	°C/W

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

Symbol	Characteristics	Min.	Typ.	Max.	Unit	
I <sub>DRM</sub> /I <sub>RRM</sub>	Peak Forward or Reverse Blocking Current (V <sub>DRM</sub> =V <sub>RRM</sub> )	T <sub>J</sub> =25°C	-	-	5	μA
		T <sub>J</sub> =125°C	-	-	1	mA
V <sub>TM</sub>	Forward "On" Voltage (Note2) (I <sub>TM</sub> =17A tp=380μs)	-	-	1.55	V	
I <sub>GT</sub>	Gate Trigger Current (Continuous dc) (V <sub>D</sub> =12 Vdc, R <sub>L</sub> =30Ω)	T2+G+	-	-	10	mA
		T2+G-	-	-	10	
		T2-G-	-	-	10	
V <sub>GT</sub>	Gate Trigger Voltage (Continuous dc) (V <sub>D</sub> =12 Vdc, R <sub>L</sub> =30Ω)	T2+G+	-	-	1.2	V
		T2+G-	-	-	1.2	
		T2-G-	-	-	1.2	
V <sub>GD</sub>	Gate threshold voltage (V <sub>D</sub> =V <sub>DRM</sub> , R <sub>L</sub> =3.3KΩ, T <sub>J</sub> =125°C)	0.2	-	-	V	
dV/dt	Critical rate of rise of commutation Voltage (V <sub>D</sub> =0.67V <sub>DRM</sub> )	40	-	-	V/μs	
I <sub>H</sub>	Holding Current (I <sub>T</sub> =100mA)	-	-	15	mA	
I <sub>L</sub>	Latching current (V <sub>D</sub> =12Vdc, I <sub>GT</sub> =1.2 I <sub>GT</sub> )	T2+G+	-	-	25	mA
		T2+G-	-	-	30	
		T2-G-	-	-	25	
R <sub>d</sub>	Dynamic resistance	-	-	35	mΩ	

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

Note3. For both polarities of A2 to A1

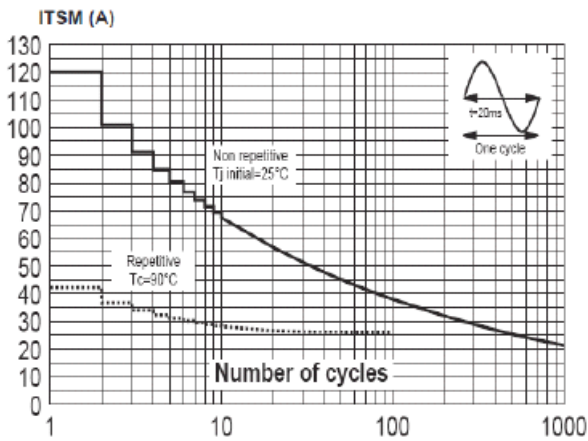


Fig. 1 Maximum permissible non-repetitive peak on-state current  $I_{TSM}$ , versus number of cycles, for sinusoidal currents,  $f=50\text{Hz}$ .

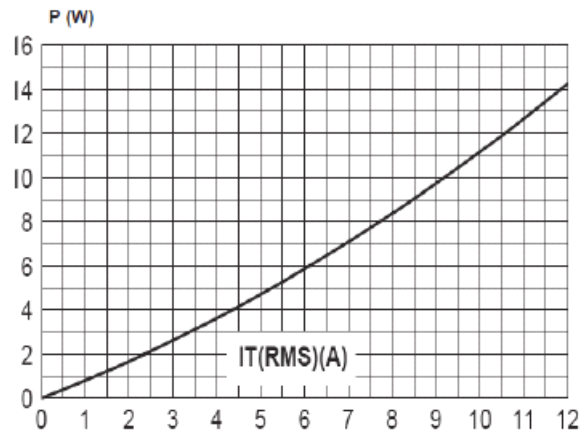


Fig. 2 Maximum on-state dissipation,  $P_{tot}$ , versus rms on-state current,  $I_{T(RMS)}$ , where  $\alpha$ =conduction angle.

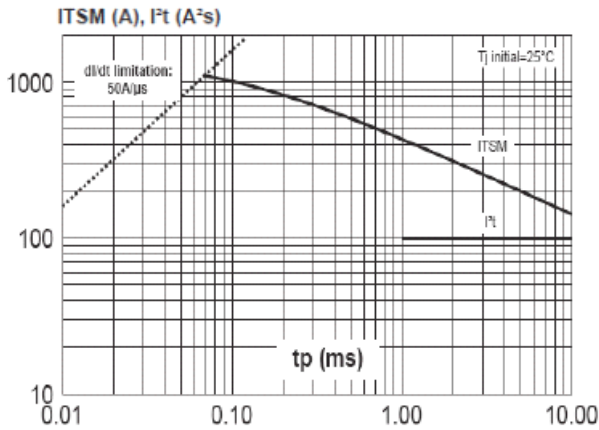


Fig. 3 Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$ , and corresponding value of  $ft$

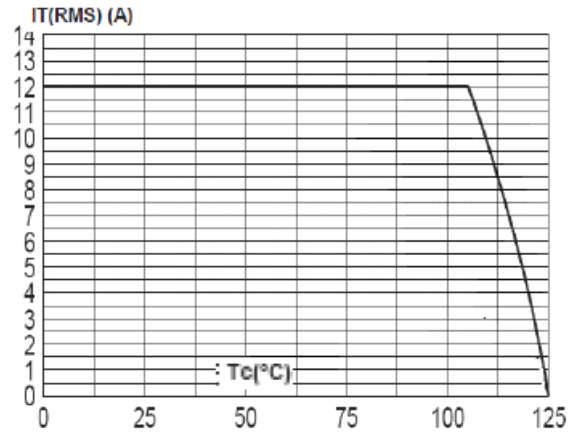


Fig. 4 Maximum permissible rms current  $I_{T(RMS)}$ , Versus lead temperature  $T_{lead}$ .

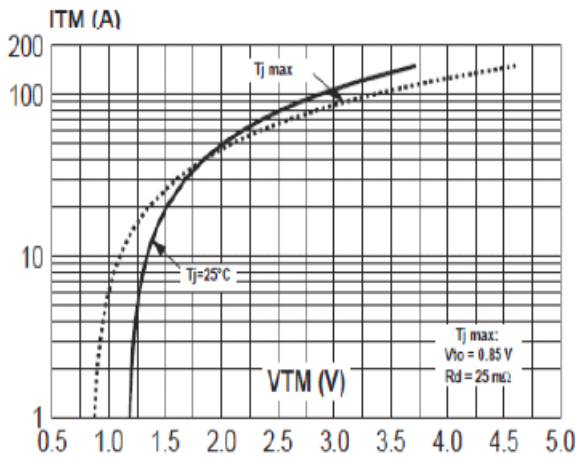


Fig. 5 Typical and maximum on-state characteristic.

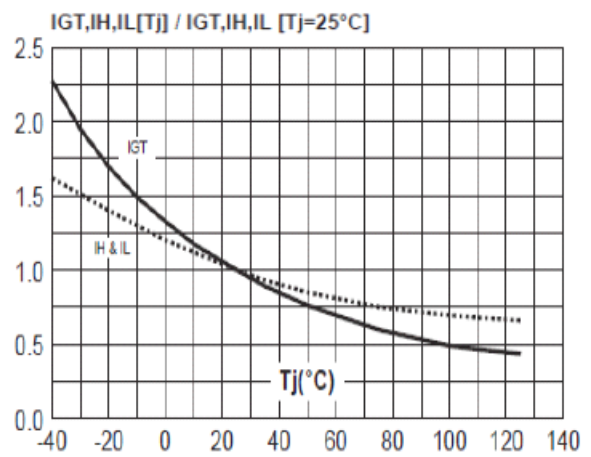


Fig. 6 Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

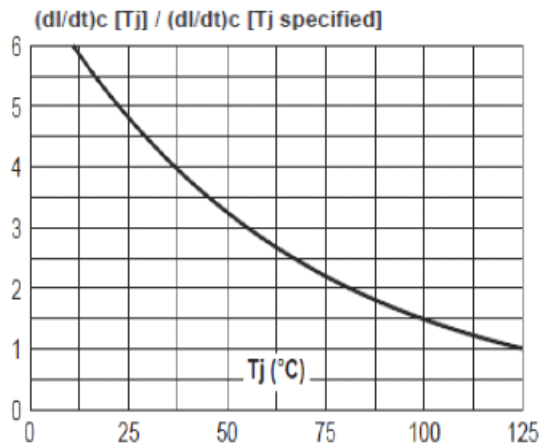


Fig.7 Relative variation of critical rate of decrease of main current versus junction temperature.

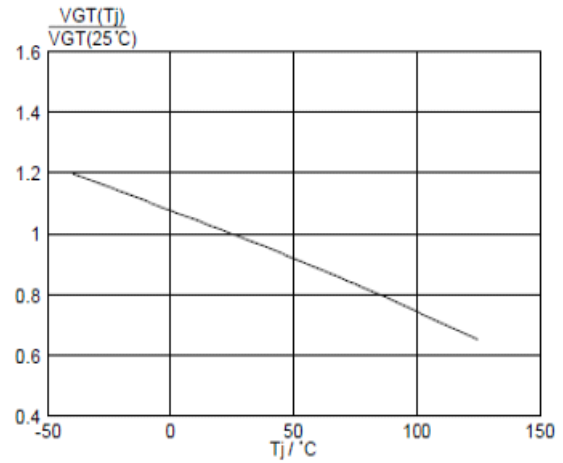


Fig.8 Normalised gate trigger voltage V<sub>GT</sub>(T<sub>j</sub>)/V<sub>GT</sub>(25°C) Versus junction temperature T<sub>j</sub>

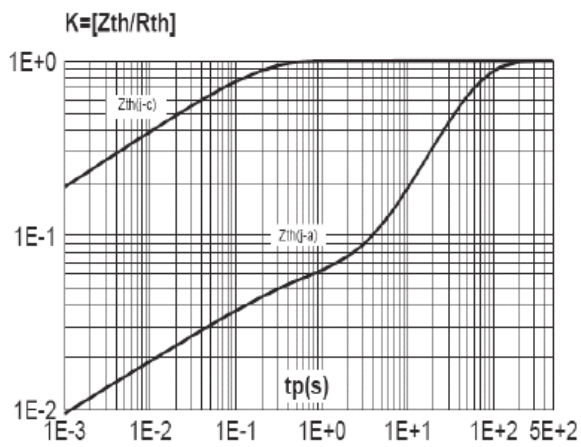
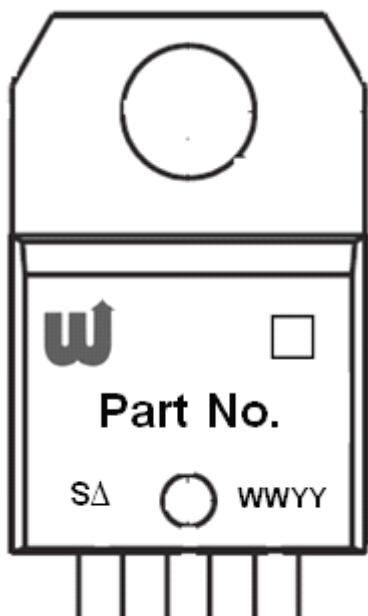


Fig.9 Transient thermal impedance Z<sub>th j-mb</sub>, versus pulse width t<sub>p</sub>

**Marking layout**



- : Winsemi Semiconductor Logo
- S : IGT
- Δ : W:The third quadrant
- Null : The fourth quadrant
- WW : Weekly code(01-52)
- YY : Last two digit of calendar year  
(11:2011;12:2012)
- : HF Halogen free
- Null Halogen

## TO-220 Package Dimension

