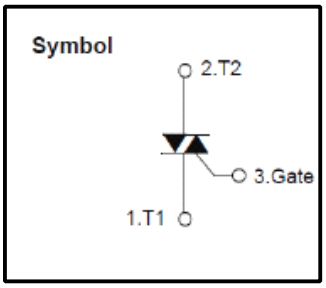
WINSEMI MICROELECTRONICS

WTPA12A60SW

Sensitive Gate Bi-Directional Triode Thyristor

Features

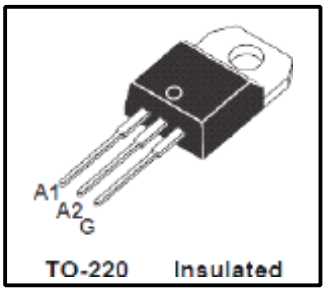
- Repetitive Peak off -State Voltage:600V
- R.M.S On-State Current(IT(RMS)=12A)
- Low On-State Voltage (1.55V(Max.)@I_{TM}
- High Commutation dv/dt
- Halogen free(WTPA12A60SW-HF)



General Description

General purpose switching and phase control applications .These devices are intented 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_J=25℃ unless otherwise specified)

symbol	Parameter		Ratings	Units
V_{DRM}/V_{PRM}	Peak Repetitive Forward Blocking Voltage(gate open) (Note1)		600	V
$I_{T(RMS)}$	Forward Current RMS(All Conduction Angles, T_J=58℃)		12	A
I_{TSM}	Peak Forward Surge Current, (full Cycle, Sine Wave,50/60Hz)		120/126	A
I^2t	Circuit Fusing Considerations (tp=10ms)		100	A^2s
P_{GM}	Peak Gate Power —Forward,(T_J=58℃,Pulse With≤1.0us)		5	W
$P_{G(AV)}$	Average Gate Power —Forward,(Over any 20ms period)		1.0	W
dI/dt	Critical rate of rise of on-state current I_{TM}=20A;I_G=200mA;dI_G/dt=200mA/μs	T_J=125℃	50	A/μs
I_{FGM}	Peak Gate Current—Forward,T_J=125℃(20μs,120PPS)		4	A
V_{RGM}	Peak Gate Voltage—Reverse,TJ=125℃(20μs,120PPS)		10	V
T_J	Junction Temperature		-40~125	℃
T_{stg}	Storage Temperature		-40~150	℃

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
$R_{\Theta JC}$	Thermal Resistance Junction to case	2.3	℃/W
$R_{\Theta JA}$	Thermal resistance Junction to Ambient	60	℃/W

Electrical Characteristics(Tc=25℃ unless otherwise noted)

Symbol	Characteristics		Min.	Typ.	Max.	Unit
I_{DRM}/I_{RRM}	Peak Forward or Reverse Blocking Current	T_J=25℃	-	-	5	μA
	($V_{DRM}=V_{RRM}$)	TJ=125℃	-	-	1	mA
V_{TM}	Forward "On" Voltage (Note2) (I_{TM}=17A tp=380μs)		-	-	1.55	V
I_{GT}	Gate Trigger Current (Continuous dc)	T2+G+	-	-	10	mA
	(V_D=12 Vdc,R_L=30Ω)	T2+G-	-	-	10	
		T2-G-	-	-	10	
V_{GT}	Gate Trigger Voltage (Continuous dc)	T2+G+	-	-	1.2	V
	(V_D=12 Vdc,R_L=30Ω)	T2+G-	-	-	1.2	
		T2-G-	-	-	1.2	
V_{GD}	Gate threshold voltage ($V_D=V_{DRM}$,R_L=3.3KΩ,T_J=125℃)		0.2	-	-	V
dV/dt	Critical rate of rise of commutation Voltage(V_D=0.67V_{DRM})		40	-	-	V/μs
I_H	Holding Current (I_T=100mA)		-	-	15	mA
I_L	Latching current	T2+G+	-	-	25	mA
	(V_D=12Vdc,I_{GT}=1.2 I_{GT})	T2+G-	-	-	30	
		T2-G-	-	-	25	
R_d	Dynamic resistance		-	-	35	mΩ

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

Note3.For both polarities of A2 to A1

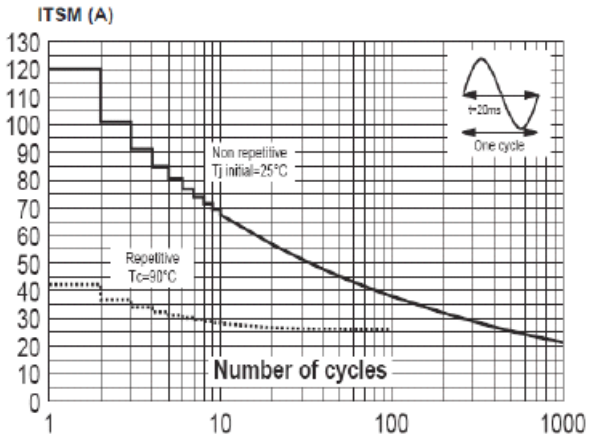


Fig . 1 Maximum permissible non-repetitive peak on-state current I_{TSM}, versus number of cycles, for Sinusoidal currents, f=50Hz.

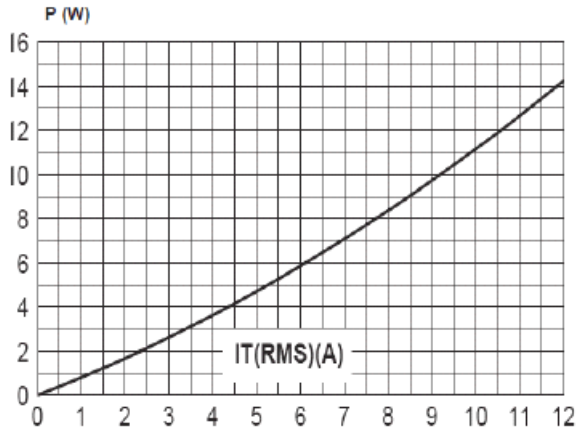


Fig.2Maximum on-state dissipation, P_{tot}, versus rms on-state current, $I_{T(RMS)}$, where α=conduction angle.

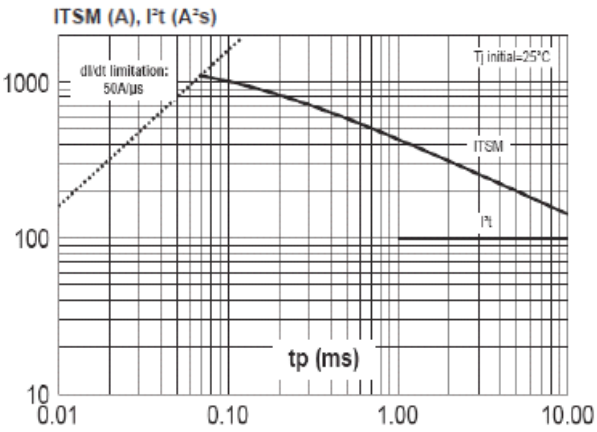


Fig . 3 Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp<10ms, and corresponding value of I^2t

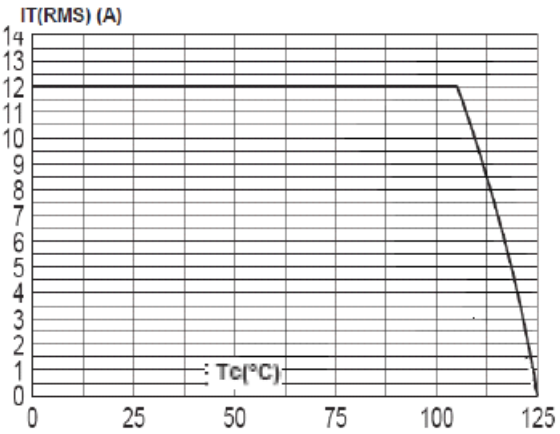


Fig.4 Maximum permissible rms current $I_{T(RMS)}$, Versus lead temperature T_{lead}.

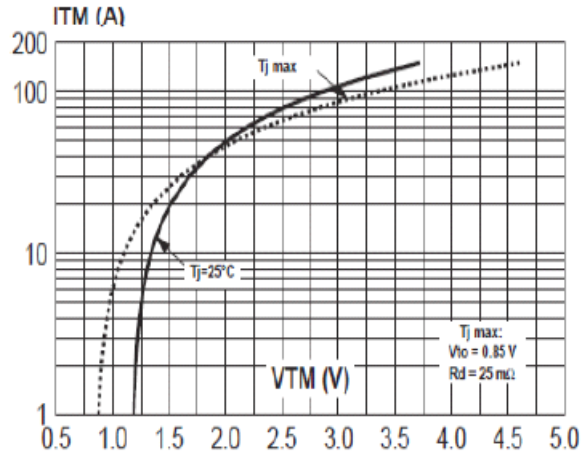
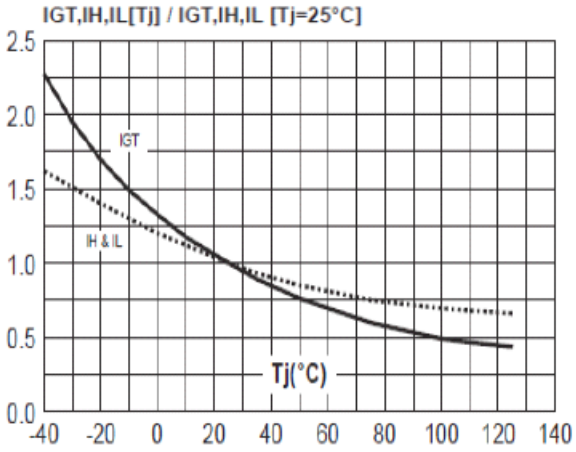


Fig.5 Typical and maximum on-state characteristic.



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

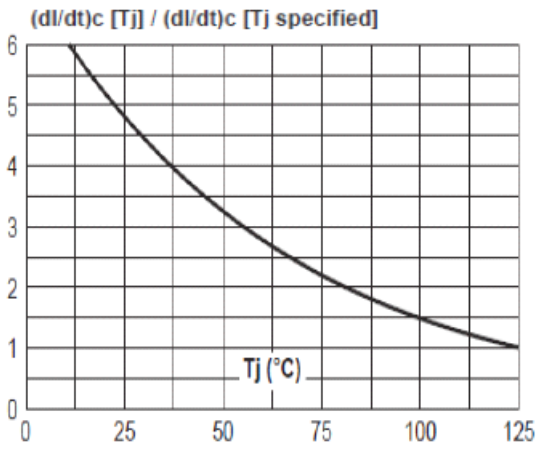


Fig.7 Relative variation of critical rate of decrease of main current versus junction temperature.

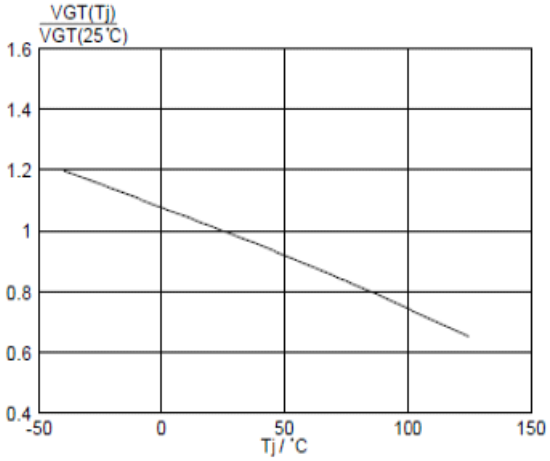


Fig.8 Normalised gate trigger voltage $V_{GT}(T_j)/V_{GT}(25℃)$ Versus junction temperature T_j

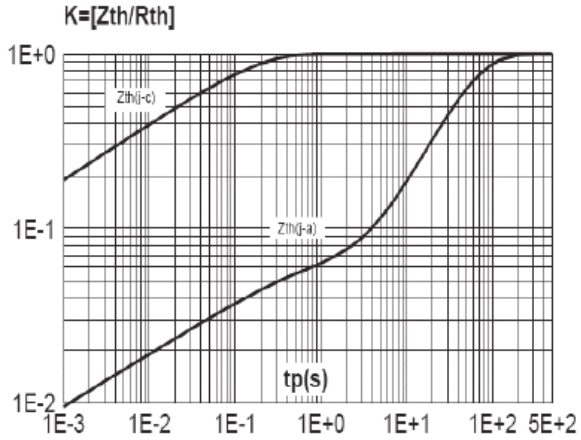
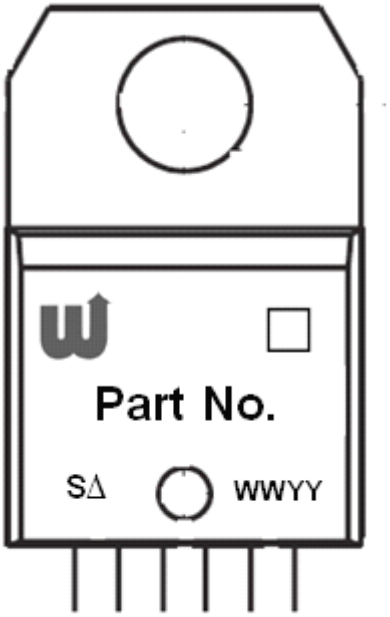


Fig.9 Transient thermal impedance $Z_{th\ j\text{-}mb}$, versus pulse width t_p

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

Unit:mm