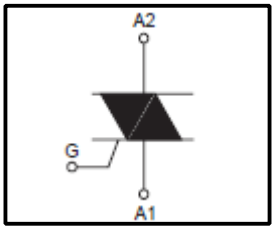
WTPB8A60TW

Bi-Directional Triode Thyristor

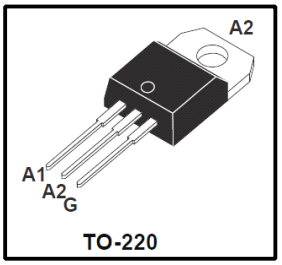
Features

- Repetitive Peak off-State Voltage:600V
- R.M.S On-State Current($I_{T(RMS)}$=8A
- Low on-state voltage: V_{TM}=1.55V(Max.)@ I_T=11A
- 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.



Absolute Maximum Ratings (TJ=25℃ unless otherwise specified)

Symbol	Parameter	Value	Units
V_{DRM}	Peak Repetitive Forward Blocking Voltage(gate open) (Note 1)	600	V
$I_{T(RMS)}$	Forward Current RMS (All Conduction Angles, Tc=58℃)	8	A
I_{TSM}	Peak Forward Surge Current, (1/2 Cycle, Sine Wave, 50/60 Hz)	80/84	A
I^2t	Circuit Fusing Considerations (t p= 10 ms)	36	A^2s
P_{GM}	Peak Gate Power — Forward, (Tc = 58°C,Pulse with≤1.0us)	5	W
$P_{G(AV)}$	Average Gate Power — Forward, (Over any 20ms period)	1	W
I_{FGM}	Peak Gate Current — Forward, Tj = 125°C (20 μs, 120 PPS)	2	A
V_{RGM}	Peak Gate Voltage — Reverse, Tj = 125°C (20 μs, 120 PPS)	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 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	
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	-	-	1.6	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	-	-	60	℃/W

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

Symbol	Characteristics		Min	Typ.	Max	Unit
I_{DRM}/I_{RRM}	Peak Forward or Reverse Blocking Current ($V_{DRM}=V_{RRM}$)	Tc=25℃	-	-	5	μA
		Tc=125℃	-	-	1	mA
V_{TM}	Forward "On" Voltage(Note2) (I_{TM} = 11A Peak @ TA = 25°C)		-	-	1.55	V
I_{GT}	Gate Trigger Current (Continuous dc) (V_D = 6 Vdc, RL = 10 Ohms)	T2+G+	-	-	5	mA
		T2+G-	-	-	5	
		T2-G-	-	-	5	
V_{GT}	Gate Trigger Voltage (Continuous dc) (V_D =6 Vdc, RL = 10 Ohms)	T2+G+	-	-	1.2	V
		T2+G-	-	-	1.2	
		T2-G-	-	-	1.2	
V_{GD}	Gate threshold voltage(Tj=125℃, V_D= V_{DRM})		0.2	-	-	V
dV/dt	Critical rate of rise of commutation Voltage (V_D=0.67V_{DRM})		400	-	-	V/μs
dI_{com}/dt	Critical rate of rise On-State voltage(V_D=400V,Tj=125℃)		4.5	-	-	A/μs
I_H	Holding Current (I_T= 100 mA)		-	4	10	mA
I_L	I_G=1.2I_{GT}		-	-	60	mA
R_d	Dynamic resistance		-	-	50	mΩ

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

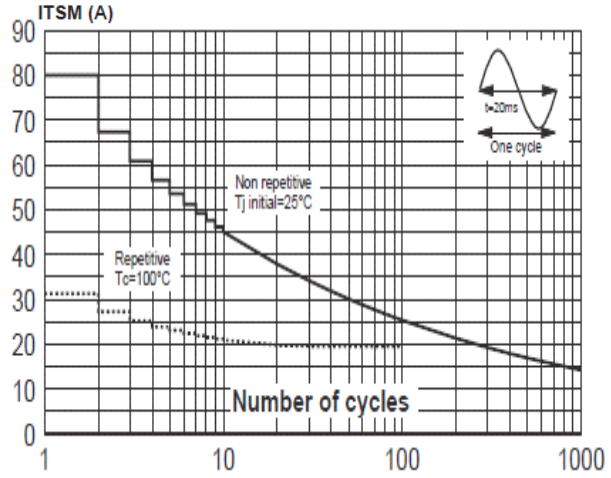


Fig.1 Maximum permissible non-repetitive peak on-state current I_{TSM}, versus number of cycles, for sinusoidal currents, f = 50 Hz.

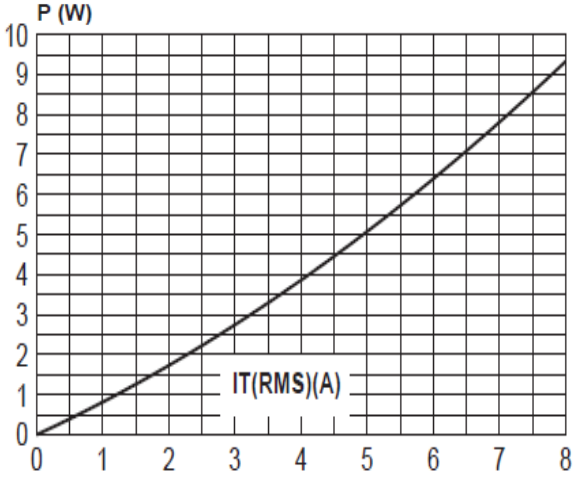


Fig.2 Maximum on-state dissipation, P_{tot}, versus rms on-state current, $I_{T(RMS)}$, where α = conduction angle.

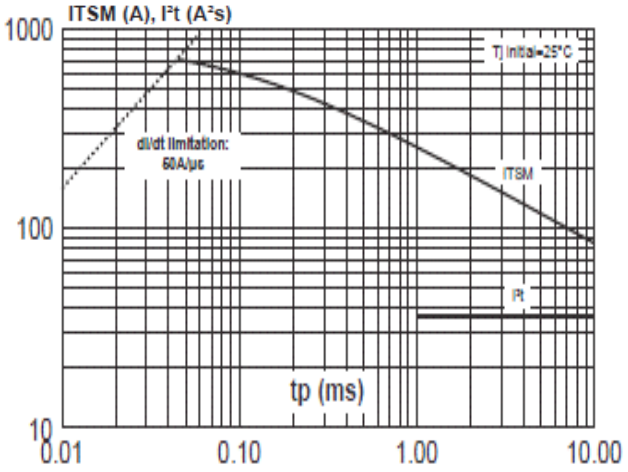


Fig.3 Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp < 10ms, and corresponding value of I²t.

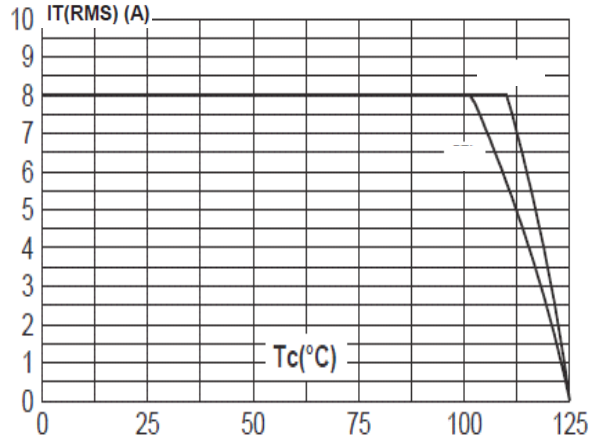


Fig.4 Maximum permissible rms current $I_{T(RMS)}$, versus lead temperature T_{lead}.

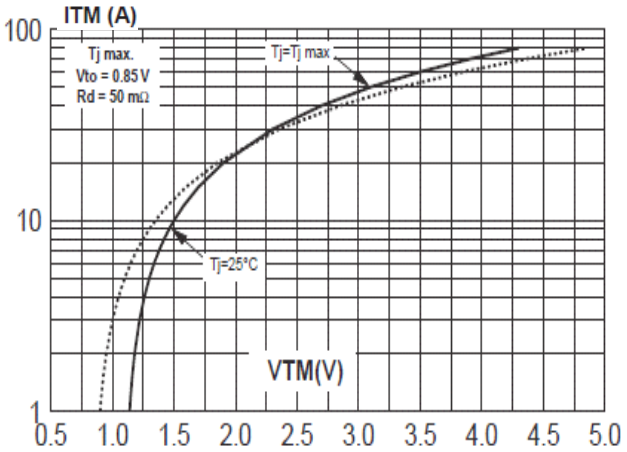


Fig.5 Typical and maximum on-state characteristic.

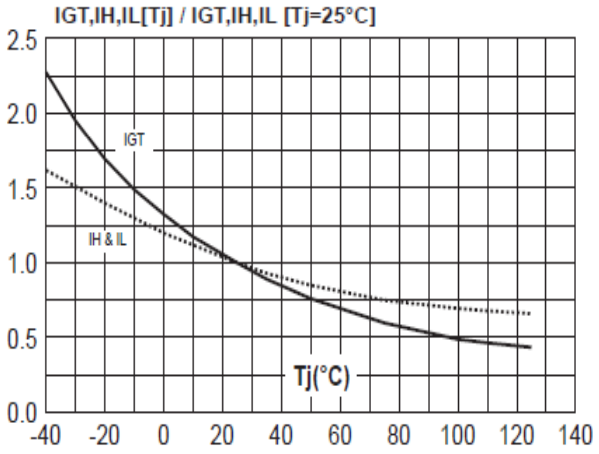


Fig.6 Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

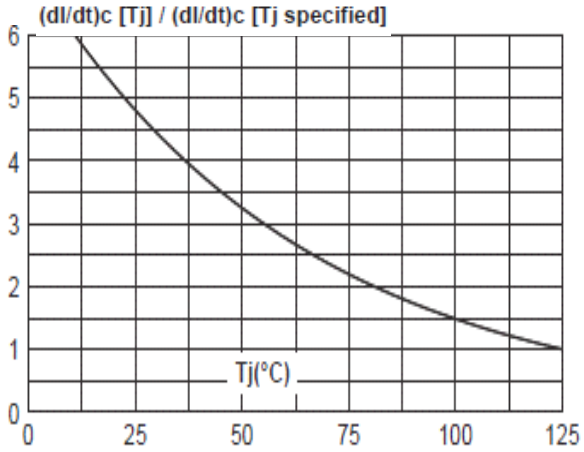


Fig.7 : Relative variation of critical rate of decrease of main current versus junction temperature.

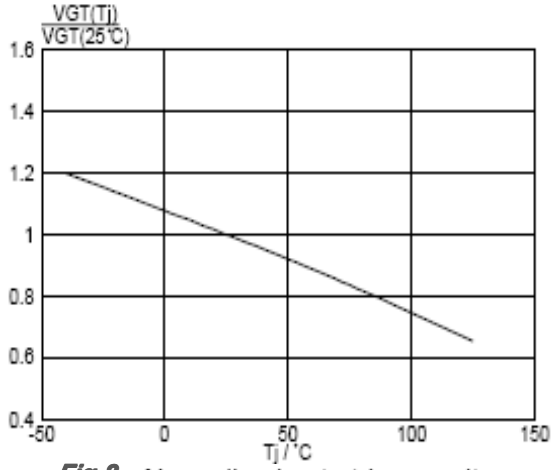


Fig.8. *Normalised gate trigger voltage $V_{GT}(T_j)/V_{GT}(25°C)$, versus junction temperature T_j.*

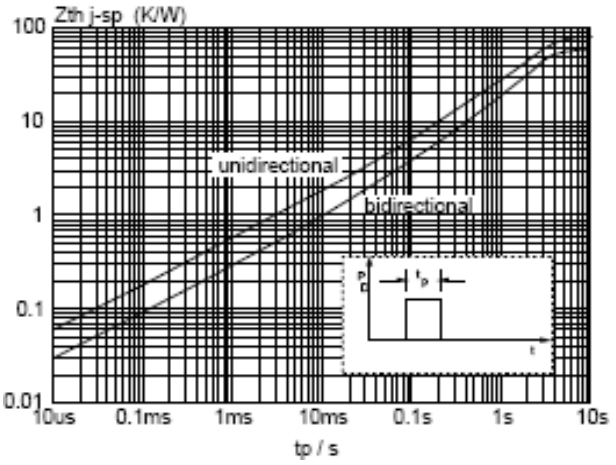


Fig.9 *Transient thermal impedance $Z_{th\ j\text{-}lead}$, versus pulse width t_p.*

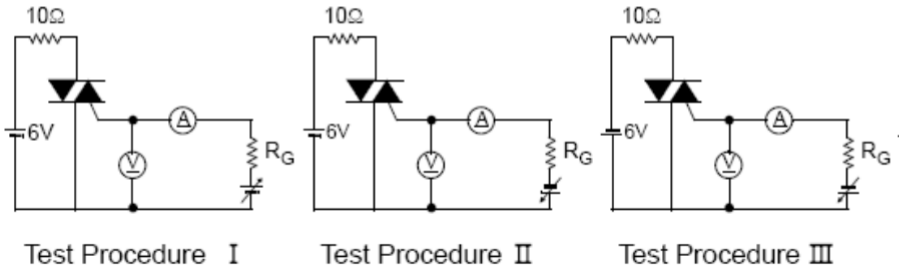


Fig.10 Gate Trigger Characteristics Test Circuit

TO-220 Package Dimension