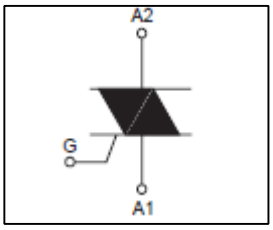
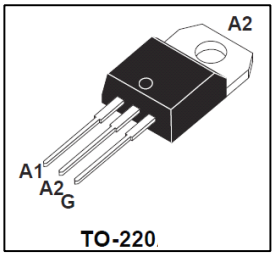
WTPB16A60SW

Sensitive Gate
Bi-Directional Triode Thyristor





Features

- Repetitive Peak off-State Voltage: 600V
- R.M.S On-State Current($I_{T(RMS)}$=16A
- Low on-state voltage: V_{TM}=1.55V(Max.)@ I_T=22.5A
- High Commutation dV/dt.

General Description

General purpose swiTJhing 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}/V_{PRM}	Peak Repetitive Forward Blocking Voltage(gate open) (Note 1)		600	V
$I_{T(RMS)}$	Forward Current RMS (All Conduction Angles, TJ=58℃)		16	A
I_{TSM}	Peak Forward Surge Current, (full Cycle, Sine Wave, 50/60 Hz)		160/168	A
I^2t	Circuit Fusing Considerations (tp= 10 ms)		144	A^2s
P_{GM}	Peak Gate Power — Forward, (TJ = 58°C,Pulse with≤1.0us)		5	W
$P_{G(AV)}$	Average Gate Power — Forward, (Over any 20ms period)		1	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°C (20 μs, 120 PPS)		4	A
V_{RGM}	Peak Gate Voltage — Reverse, T_J= 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 swiTJh to the on-state. The rate of rise of current should not exceed 15A/us.

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
R_{QJC}	Thermal Resistance, Junction-to-Case	-	-	1.6	℃/W
R_{QJA}	Thermal Resistance, Junction-to-Ambient	-	-	60	℃/W

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

Symbol	Characteristics		Min	Typ.	Max	Unit
I_{DRM}/I_{RRM}	Peak Forward or Reverse Blocking Current ($V_{DRM}=V_{RRM,}$)	T_J=25℃	-	-	5	μA
		T_J=125℃	-	-	1	mA
V_{TM}	Forward “On” Voltage (Note2) (I_{TM} = 22.5A tp=380μs)		-	-	1.55	V
I_{GT}	Gate Trigger Current (Continuous dc) (V_D = 12 Vdc, R_L = 33 Ω)	T2+G+	-	-	10	mA
		T2+G-	-	-	10	
		T2-G-	-	-	10	
V_{GT}	Gate Trigger Voltage (Continuous dc) (V_D =12 Vdc, R_L = 33 Ω)	T2+G+	-	-	1.2	V
		T2+G-	-	-	1.2	
		T2-G-	-	-	1.2	
V_{GD}	Gate threshold voltage(V_D= $V_{DRM,}$RL = 3.3 KΩ,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= 100 mA)		-	-	15	mA
I_L	Latching current (V_D =12 Vdc,I_{GT}=0.1A)	T2+G+	-	-	25	mA
		T2+G-	-	-	30	
		T2-G-	-	-	25	
R_d	Dynamic resistance		-	-	25	mΩ

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

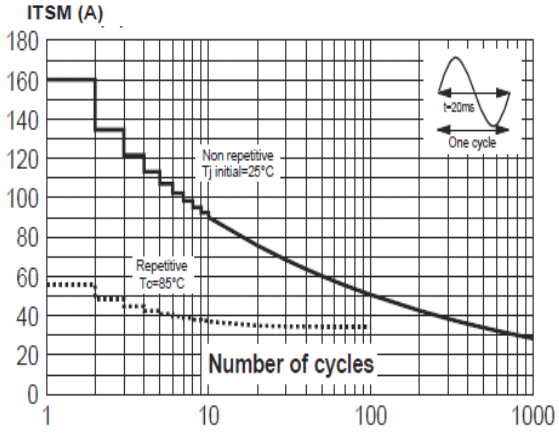


Fig.1 Maximum permissible non-repetitive peak on-state current I_{TSM}, versus number of cycles, for sinusoidal currents, f = 50 Hz.

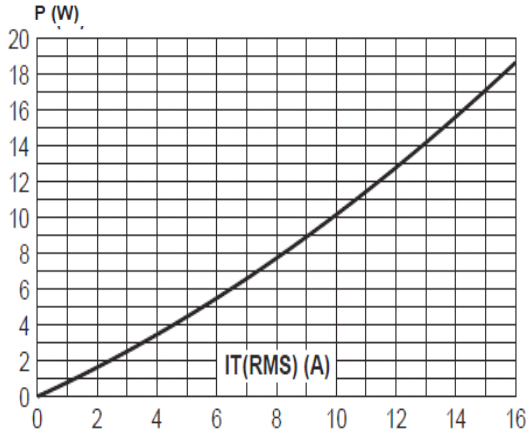


Fig.2 Maximum on-state dissipation, P_{tot}, versus rms on-state current, $I_{T(RMS)}$, where α = conduction angle.

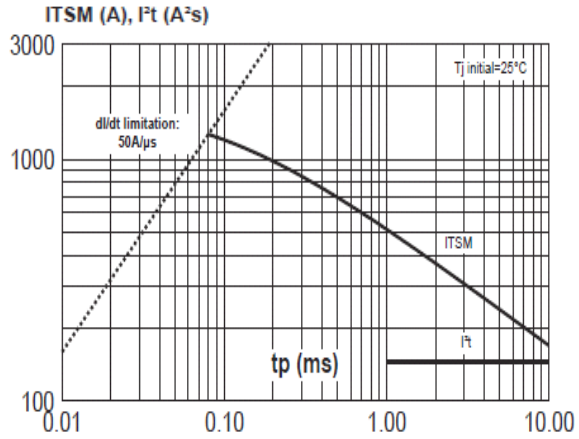


Fig.3 Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp < 10ms, and corresponding value of I²t.

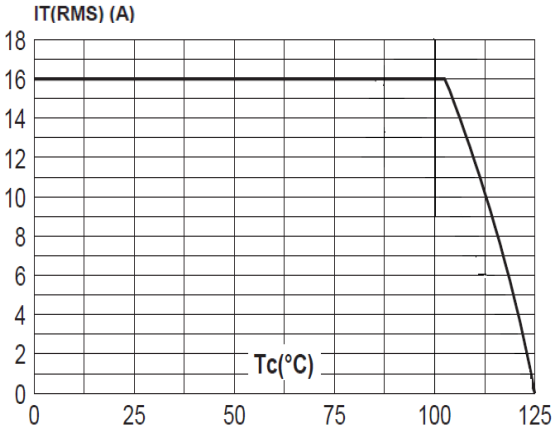


Fig.4 Maximum permissible rms current $I_{T(RMS)}$, versus lead temperature T_{lead}.

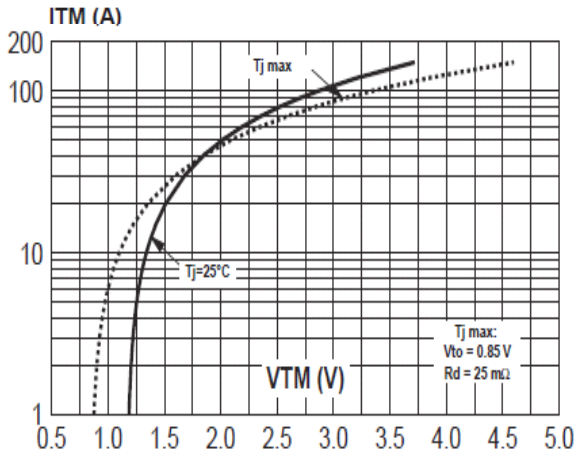


Fig.5 Typical and maximum on-state characteristic.

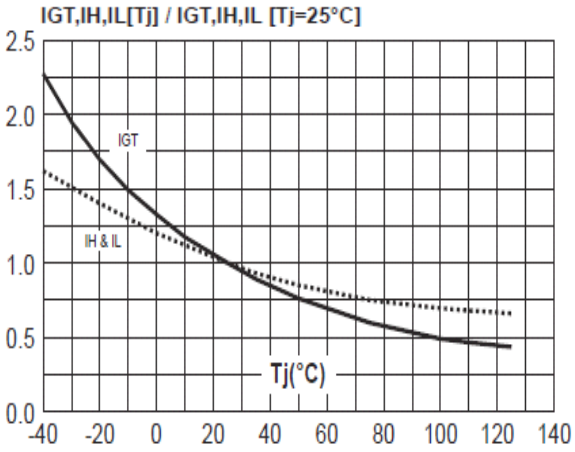


Fig.6 Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

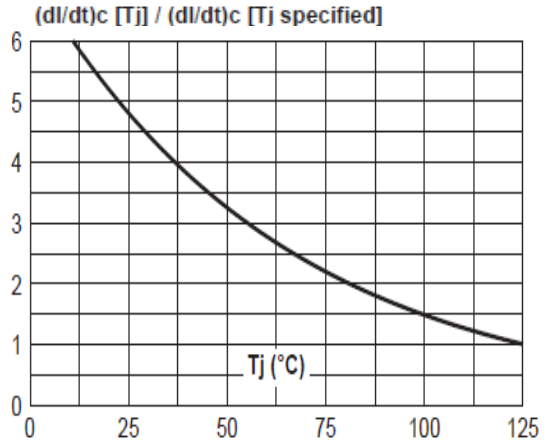


Fig.7 Relative variation of critical rate of decrease of main current versus junction temperature.

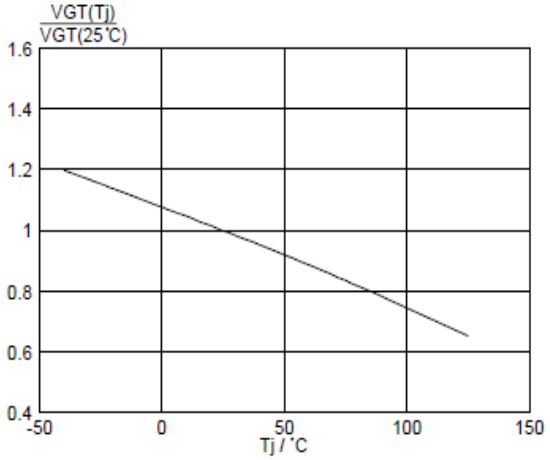


Fig.8 *Normalised gate trigger voltage $V_{GT}(T_j)/ V_{GT}(25°C)$, versus junction temperature T_j.*

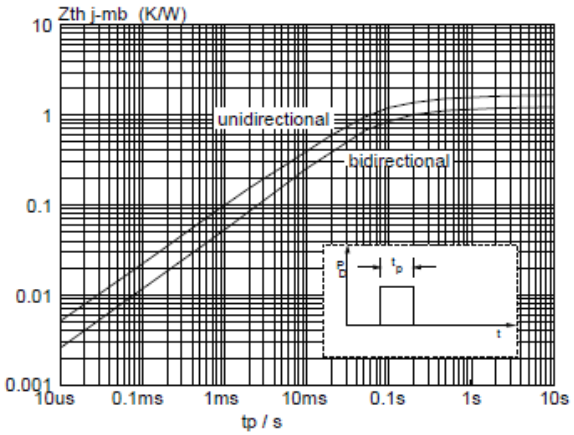


Fig.9 *Transient thermal impedance $Z_{th\ j\text{-}mb}$, versus pulse width t_p.*

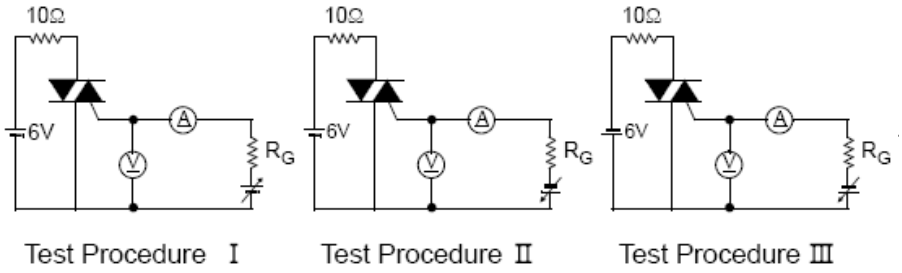


Fig.10 Gate Trigger Characteristics Test Circuit

TO-220 Package Dimension

Unit: mm