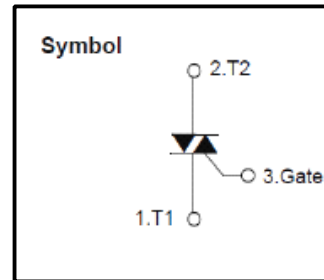


Bi-Directional Triode Thyristor

Features

- Repetitive Peak off -State Voltage:600V
- R.M.S On-State Current($I_{T(RMS)}$)=12A)
- Isolation voltage(V_{ISO} =1500V AC)
- High Commutation dv/dt
- Halogen free(WTF12A60-HF)



General Description

General purpose switching and phase control applications .These devices are intended to be interfaced directly to microcontrollers,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 ($T_J=25^\circ\text{C}$ unless otherwise specified)

| symbol | Parameter | Ratings | Units |
|--------------|---|---------|----------------------|
| V_{DRM} | Peak Repetitive Forward Blocking Voltage(gate open) (Note1) | 600 | V |
| $I_{T(RMS)}$ | Forward Current RMS(All Conduction Angles, $T_J=58^\circ\text{C}$) | 12 | A |
| I_{TSM} | Peak Forward Surge Current, (1/2 Cycle, Sine Wave,50/60Hz) | 119/130 | A |
| I^2t | Circuit Fusing Considerations ($t_p=10\text{ms}$) | 71 | A^2s |
| P_{GM} | Peak Gate Power —Forward,($T_c=58^\circ\text{C}$,Pulse With $\leq 1.0\mu\text{s}$) | 5 | W |
| $P_{G(AV)}$ | Average Gate Power —Forward,(Over any 20ms period) | 0.5 | W |
| I_{FGM} | Peak Gate Current—Forward, $T_J=125^\circ\text{C}$ (20 μs ,120PPS) | 2 | A |
| V_{RGM} | Peak Gate Voltage—Reverse, $T_J=125^\circ\text{C}$ (20 μs ,120PPS) | 10 | V |
| T_J | Junction Temperature | -40~125 | $^\circ\text{C}$ |
| T_{stg} | Storage Temperature | -40~150 | $^\circ\text{C}$ |

Note1.Although not recommended off -state voltages up to 800v ,may be applied with out 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 |
|-----------------|--|-------|---------------------------|
| $R_{\theta JC}$ | Thermal Resistance Junction to case | 3.3 | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JA}$ | Thermal resistance Junction to Ambient | 120 | $^\circ\text{C}/\text{W}$ |

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

| Symbol | Characteristics | Min. | Typ. | Max. | Unit | |
|-----------------------|--|-----------------------|------|------|------|----|
| I _{DRM} | Peak Forward or Reverse Blocking Current (V _D =V _{DRM} /V _{RRM}) | T _C =25°C | - | - | 10 | μA |
| | | T _C =125°C | - | - | 2 | mA |
| V _{TM} | Forward "On" Voltage (Note2) (I _{TM} =20A Peak @ TA =25°C) | - | - | 1.4 | V | |
| I _{GT} | Gate Trigger Current (Continuous dc) (V _D =6 Vdc, R _L =10 Ohms) | T2+G+ | - | - | 30 | mA |
| | | T2+G- | - | - | 30 | |
| | | T2-G- | - | - | 30 | |
| V _{GT} | Gate Trigger Voltage (Continuous dc) (V _D =6 Vdc, R _L =10 Ohms) | T2+G+ | - | - | 1.2 | V |
| | | T2+G- | - | - | 1.2 | |
| | | T2-G- | - | - | 1.2 | |
| V _{GD} | Gate threshold voltage (T _J =125°C, V _D =0.5V _{DRM}) | 0.2 | - | - | V | |
| dV/dt | Critical rate of rise of commutation Voltage (V _D =0.67V _{DRM}) | 10 | - | - | V/μs | |
| dV _{com} /dt | Critical rate of rise On-State voltage (V _D =400V, T _J =125°C, dI _{com} /dt=0.5A/μs) | 50 | - | - | A/μs | |
| I _H | Holding Current (V _D =12Vdc, initiating current=20mA) | - | 20 | - | mA | |

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

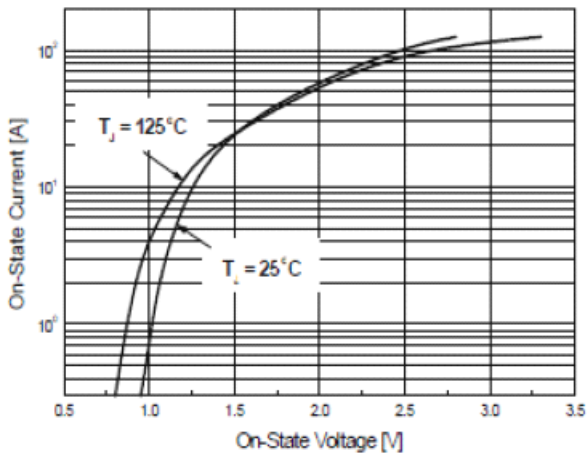


Fig .1 On-State Voltage vs on-State Current

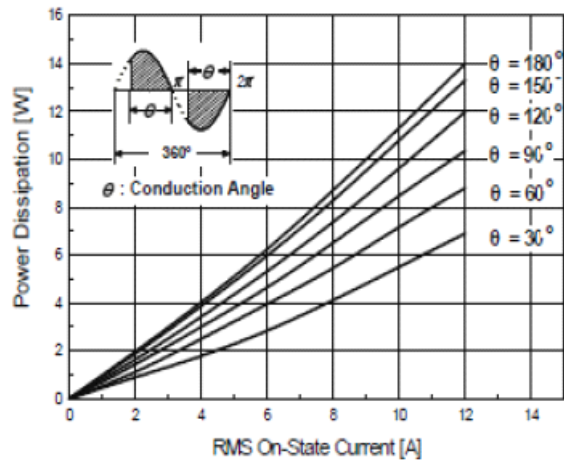


Fig.2 On-State current vs maximum Power Dissipation

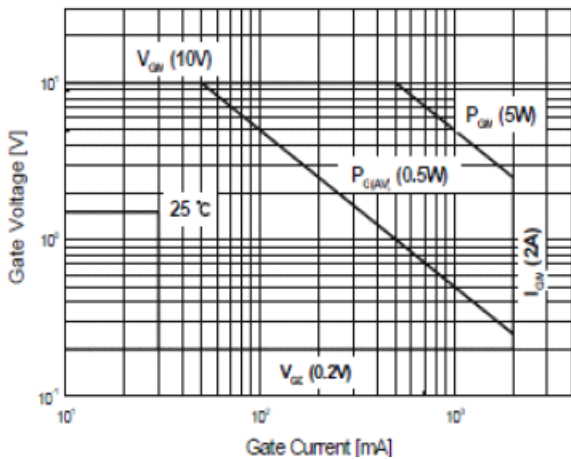


Fig . 3 Gate Characteristics

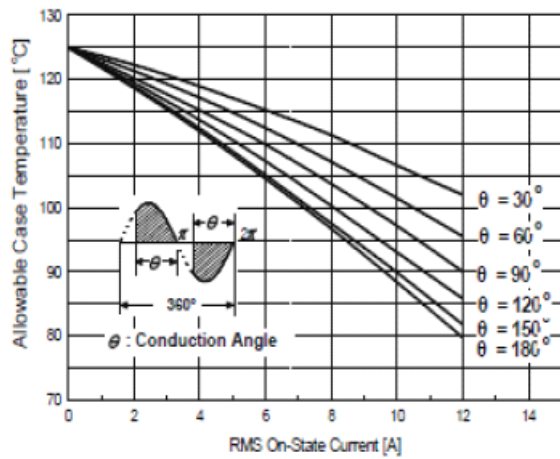


Fig.4 On-State Current vs Allowable case Temperature

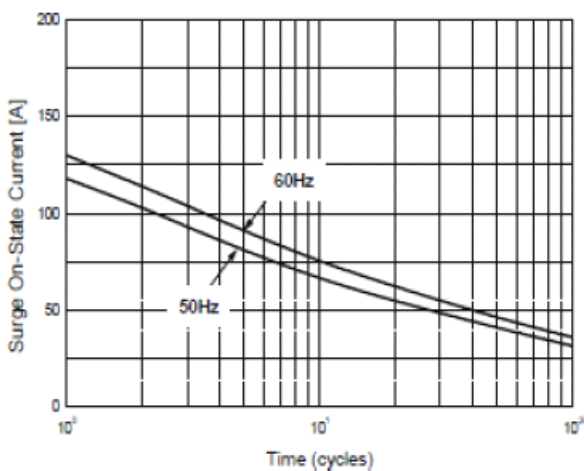


Fig.5 Surge On-State Current Ration (Non-Repetitive)

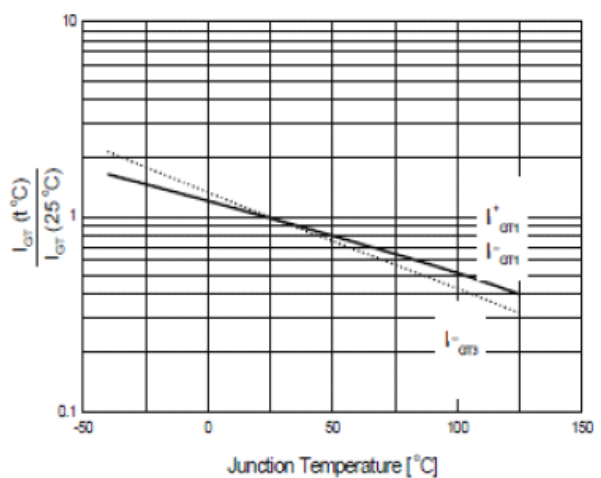


Fig.6 Gate Trigger Current vs Junction Temperature

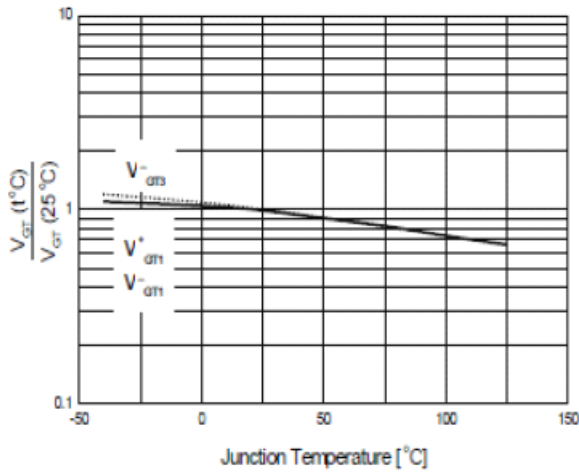


Fig.7 Gate Trigger Current vs Junction.

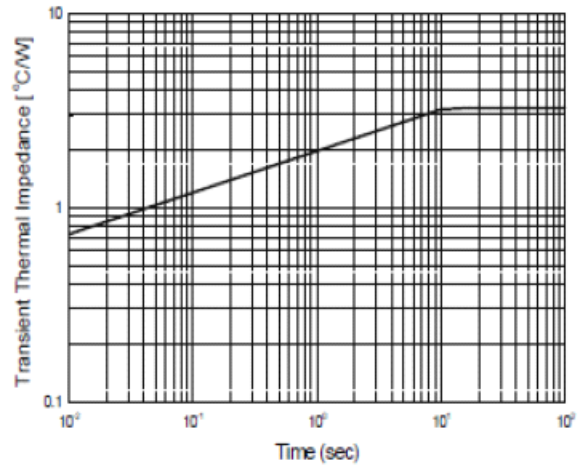


Fig.8 Transient Thermal Impedance

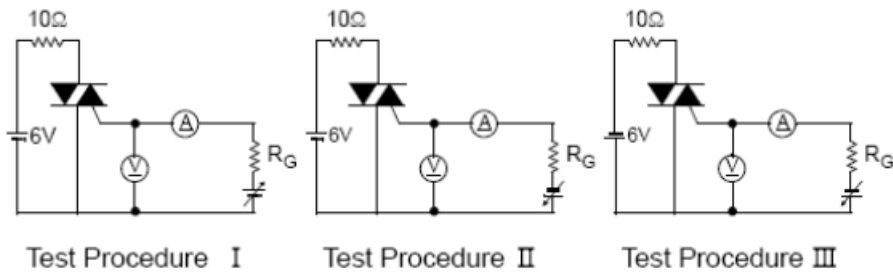
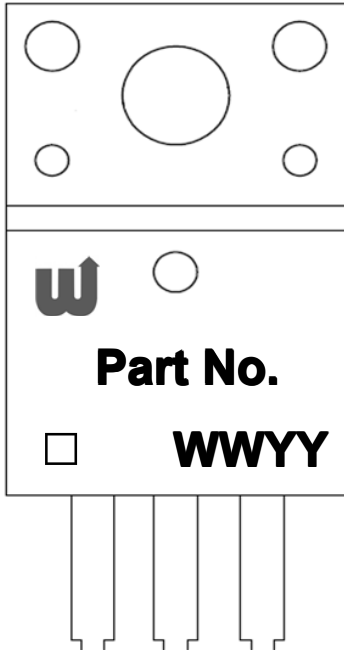


Fig.9 Gate Trigger Characteristics Test Circuit

Marking layout



: Winsemi Semiconductor Logo

WW : Weekly code(01-52)

YY : Last two digit of calendar year
(10:2010;11:2011)

: HF Halogen free

Null Halogen

TO-220F Package Dimension

