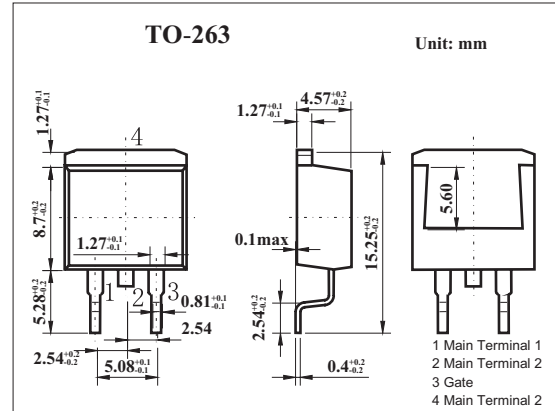
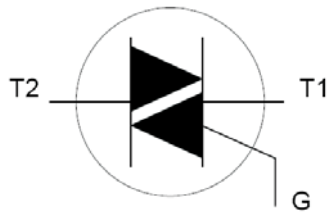


Triacs

BT139B series

■ Features

- RMS on-state current : $I_{T(RMS)}=16A$
- Non-repetitive peak on-state current: $I_{TSM}=140A$



■ Absolute Maximum Ratings $T_a = 25^\circ C$

| Parameter | Symbol | BT139B series | | | Unit |
|---|-----------------------|---------------|------|------|------------|
| | | -500 | -600 | -800 | |
| Peak Repetitive Off-State Voltage | V_{DRM}, V_{RRM} | 500 | 600 | 800 | V |
| On-State RMS Current | $I_{T(RMS)}$ | 16 | | | A |
| Peak Non-Repetitive Surge Current | I_{TSM} | 140 | | | A |
| $t = 20 \text{ ms}$ | | | | | |
| | $t = 16.7 \text{ ms}$ | 150 | | | A |
| Circuit Fusing Consideration | I^2t | 98 | | | A^2s |
| Repetitive rate of rise of on-state current after triggering *1 | di_T/dt | 50 | | | $A/\mu s$ |
| T2+ G+ | | | | | |
| T2+ G- | | | | | |
| T2- G- | | | | | |
| | T2- G+ | 10 | | | $A/\mu s$ |
| Peak Gate Current | I_{GM} | 2 | | | A |
| Peak Gate Voltage | V_{GM} | 5 | | | V |
| Peak Gate Power | P_{GM} | 5 | | | W |
| Average Gate Power | $P_{G(AV)}$ | 0.5 | | | W |
| Operating Junction Temperature Range | T_J | 125 | | | $^\circ C$ |
| Storage Temperature Range | T_{stg} | -40 to 150 | | | $^\circ C$ |

*1 $I_{TM} = 20 \text{ A}; I_G = 0.2 \text{ A}; di_G/dt = 0.2 \text{ A}/\mu s$

BT139B series

■ Static Characteristics Ta = 25 °C

| Parameter | Symbol | Testconditons BT139B... | Min | Typ | Max | | | Unit |
|--|-----------------|--|------|--------------------|----------------------|----------------------|-----------------------|--------|
| | | | | | ... | ...F | ...G | |
| Gate Trigger Current (Continuous dc) MT2+, G+ MT2+, G- MT2-, G- MT2-, G+ | I _{GT} | V _D = 12 V, I _T = 0.1 A | | 5 8 10 22 | 35 35 35 70 | 25 25 25 70 | 50 50 50 100 | mA |
| Latching Current MT2+, G+ MT2+, G- MT2-, G- MT2-, G+ | I _L | V _D = 12 V, I _G = 0.1 A | | 7 20 8 10 | 40 60 40 60 | 40 60 40 60 | 60 90 60 90 | mA |
| Holding Current | I _H | V _D = 12 V, I _{GT} = 0.1 A | | 6 | 30 | 30 | 60 | |
| On-state voltage | V _T | I _T = 20 A | | 1.2 | 1.6 | | | V |
| Gate Trigger Voltage | V _{GT} | V _D = 12 V; I _T = 0.1 A V _D = 400 V; I _T = 0.1 A, T _j = 125 °C | 0.25 | 0.7 0.4 | 1.5 | | | V V |
| Off-state leakage current | I _D | V _D = V _{DRM(max)} ; T _j = 125 °C | | 0.1 | 0.5 | | | mA |

■ Dynamic Characteristics Ta = 25 °C

| Parameter | Symbol | Testconditons BT139B... | Min | | | Typ | Max | Unit |
|---|-----------------------|---|-----|------|------|-----|-----|------|
| | | | ... | ...F | ...G | | | |
| Critical rate of rise of off-state voltage | dV _D /dt | V _{DM} = 67% V _{DRM(max)} ; T _j = 125 °C; exponential waveform; gate open circuit | 100 | 50 | 200 | 250 | | V/μs |
| Critical rate of change of commutating voltage | dV _{com} /dt | V _{DM} = 400 V; T _j = 95 °C; I _{T(RMS)} = 16 A; di _{com} /dt = 7.2 A/ms; gate open circuit | | | 10 | 20 | | V/μs |
| Gate controlled turn-on time | t _{gt} | I _{TM} = 20 A; V _D = V _{DRM(max)} ; I _G = 0.1 A; di _G /dt = 5 A/μs | | | | | | μs |

BT139B series

■ Typical Characteristics

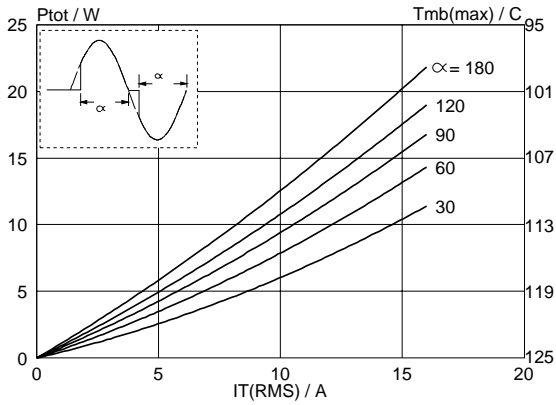


Fig.1. Maximum on-state dissipation, P_{tot} , versus rms on-state current, $I_{T(RMS)}$, where α = conduction angle.

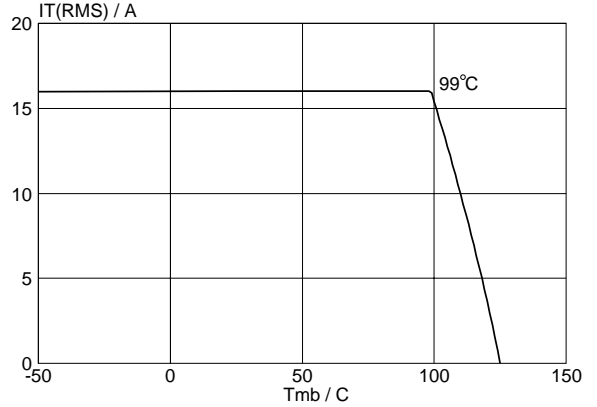


Fig.4. Maximum permissible rms current $I_{T(RMS)}$, versus mounting base temperature T_{mb} .

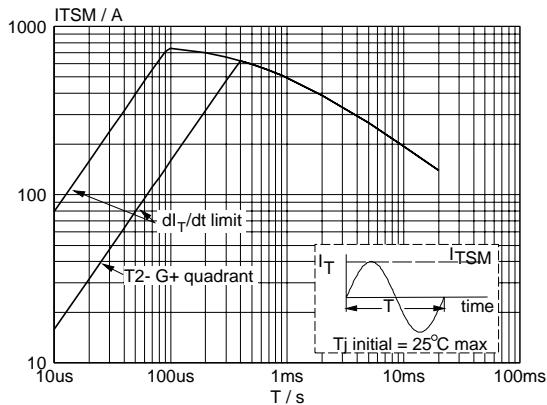


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus pulse width t_p , for sinusoidal currents, $t_p \leq 20ms$.

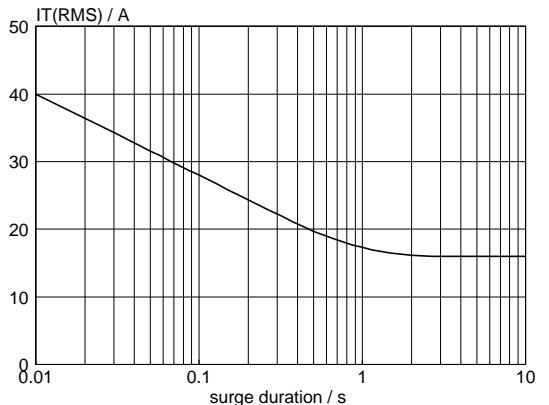


Fig.5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, $f = 50$ Hz; $T_{mb} \leq 99^\circ\text{C}$.

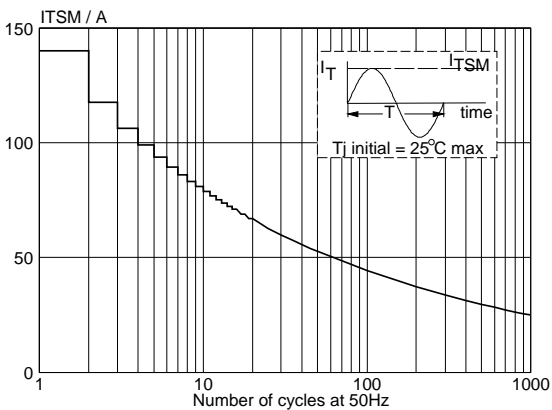


Fig.3. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus number of cycles, for sinusoidal currents, $f = 50$ Hz.

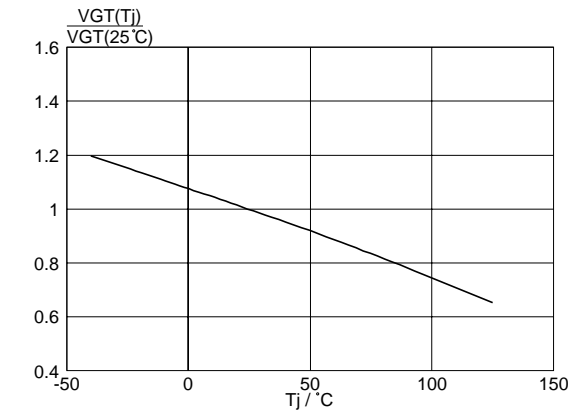


Fig.6. Normalised gate trigger voltage $V_{GT}(T_j) / V_{GT}(25^\circ\text{C})$, versus junction temperature T_j .

BT139B series

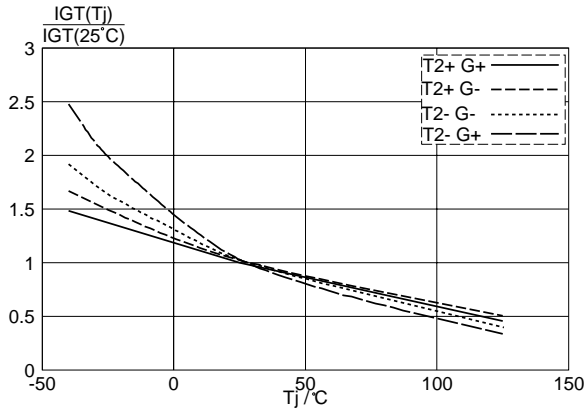


Fig. 7. Normalised gate trigger current $I_{GT}(T_j) / I_{GT}(25^\circ\text{C})$, versus junction temperature T_j .

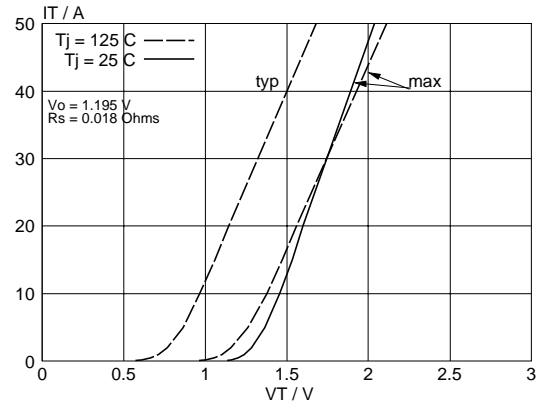


Fig. 10. Typical and maximum on-state characteristic.

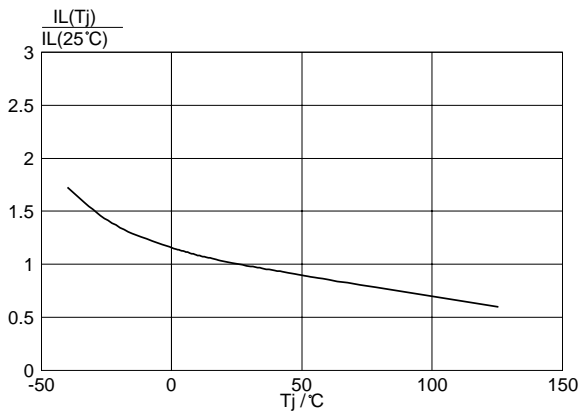


Fig. 8. Normalised latching current $I_L(T_j) / I_L(25^\circ\text{C})$, versus junction temperature T_j .

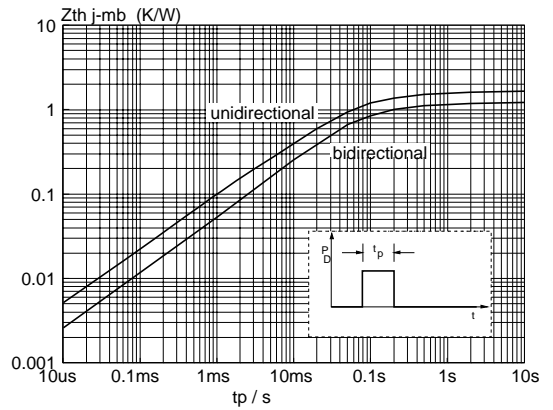


Fig. 11. Transient thermal impedance $Z_{th\ j-mb}$, versus pulse width t_p .

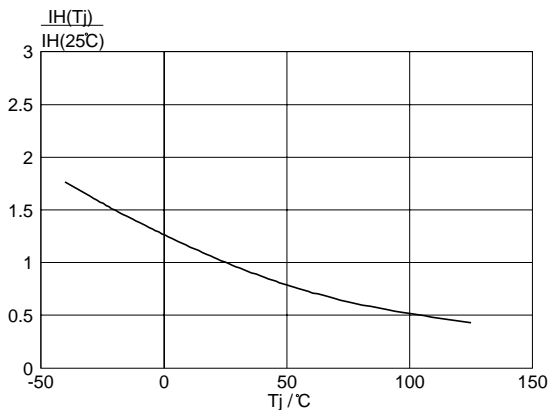


Fig. 9. Normalised holding current $I_H(T_j) / I_H(25^\circ\text{C})$, versus junction temperature T_j .

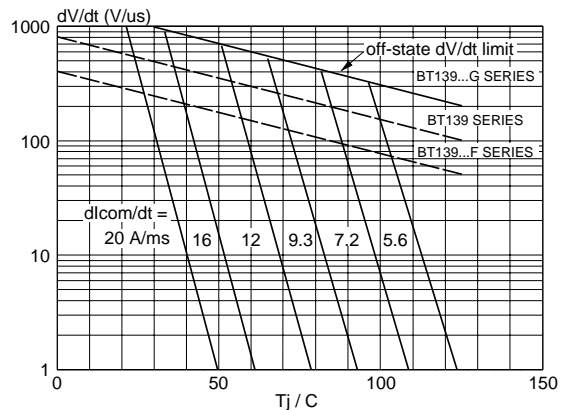


Fig. 12. Typical commutation dV/dt versus junction temperature, parameter commutation dl_T/dt . The triac should commute when the dV/dt is below the value on the appropriate curve for pre-commutation dl_T/dt .