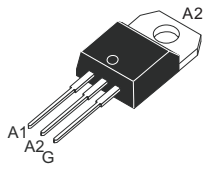
# TRIACs, 10A

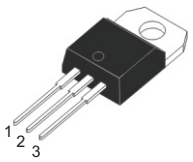
## Snubberless and Standard

### MAIN FEATURES

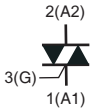
| SYMBOL | VALUE | UNIT |
|---|---|---|
| $I_{T(RMS)}$ | 10 | A |
| $V_{DRM}/V_{RRM}$ | 600 to 1000 | V |
| $I_{GT(Q1)}$ | 25 to 50 | mA |




TO-220AB (**non-Insulated**)
(10TxxA)




TO-220AB **(Insulated)**
(10TxxAI)




### DESCRIPTION

The 10T triac series is suitable for general purpose AC switching. They can be used as an ON/OFF function in applications such as static relays, heating regulation, induction motor starting circuits... or for phase control operation in light dimmers, motor speed controllers,...

The snubberless version are specially recommended for use on inductive loads, thanks to their high commutation performances.

By using an internal ceramic pad, the 10T series provides voltage insulated tab (rated at 2500$V_{RMS}$) complying with UL standards (File ref. :E320098)

### ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUE | UNIT |
|---|---|---|---|---|---|
| RMS on-state current (full sine wave) | $I_{T(RMS)}$ | TO-220AB | $T_c$ = 105°C | 10 | A |
| | | TO-220AB insulated | $T_c$ = 95°C | | |
| Non repetitive surge peak on-state current (full cycle, $T_j$ initial = 25°C) | $I_{TSM}$ | F =50 Hz | t = 20 ms | 100 | A |
| | | F =60 Hz | t = 16.7 ms | 105 | |
| $I^2t$ Value for fusing | $I^2t$ | $t_p$ = 10 ms | | 50 | $A^2s$ |
| Critical rate of rise of on-state current $I_G = 2xI_{GT}$, $t_r \leq 100ns$ | dI/dt | F =100 Hz | $T_j$ =125°C | 50 | A/µs |
| Peak gate current | $I_{GM}$ | $T_p$ =20 µs | $T_j$ =125°C | 4 | A |
| Average gate power dissipation | $P_{G(AV)}$ | $T_j$ =125°C | | 1 | W |
| Storage temperature range | $T_{stg}$ | | | - 40 to + 150 | °C |
| Operating junction temperature range | $T_j$ | | | - 40 to + 125 | |

## ◎ ELECTRICAL CHARACTERISTICS ($T_J$= 25 ºC unless otherwise specified)

| SNUBBERLESS (3 quadrants) | | | | | | |
|---|---|---|---|---|---|---|
| SYMBOL | TEST CONDITIONS | QUADRANT | | 10Txxxx | | Unit |
| | | | | CW | BW | |
| $I_{GT}$(1) | $V_D$ = 12 V, $R_L$ = 30Ω | I - II - III | MAX. | 35 | 50 | mA |
| $V_{GT}$ | | I - II - III | MAX. | 1.3 | | V |
| $V_{GD}$ | $V_D$ = $V_{DRM}$, $R_L$ = 3.3KΩ<br>$T_j$ = 125°C | I - II - III | MIN. | 0.2 | | V |
| $I_H$(2) | $I_T$ = 500 mA | | MAX. | 35 | 50 | mA |
| $I_L$ | $I_G$ = 1.2 $I_{GT}$ | I - III | MAX. | 50 | 70 | mA |
| | | II | | 60 | 80 | |
| dV/dt(2) | $V_D$ = 67% $V_{DRM}$, gate open, $T_j$ = 125°C | | MIN. | 500 | 1000 | V/µs |
| (dI/dt)c(2) | Without snubber, $T_j$ = 125°C | | MIN. | 5.5 | 9 | A/ms |

## ◎ ELECTRICAL CHARACTERISTICS ($T_J$= 25 ºC unless otherwise specified)

| Standard (4 quadrants) | | | | | | |
|---|---|---|---|---|---|---|
| SYMBOL | TEST CONDITIONS | QUADRANT | | 10Txxxx | | UNIT |
| | | | | C | B | |
| $I_{GT}$(1) | $V_D$ = 12 V, $R_L$ = 30Ω | I - II - III | MAX. | 25 | 50 | mA |
| | | IV | | 50 | 100 | |
| $V_{GT}$ | | ALL | | 1.3 | | V |
| $V_{GD}$ | $V_D$ = $V_{DRM}$, $R_L$ = 3.3KΩ, $T_j$ = 125°C | ALL | | 0.2 | | V |
| $I_H$(2) | $I_T$ = 500 mA | | MAX. | 25 | 50 | mA |
| $I_L$ | $I_G$ = 1.2 $I_{GT}$ | I - III - IV | MAX. | 40 | 50 | mA |
| | | II | | 80 | 100 | |
| dV/dt(2) | $V_D$ = 67% $V_{DRM}$, gate open, $T_j$ = 125°C | | MIN. | 200 | 400 | V/µs |
| (dV/dt)c(2) | (dI/dt)c = 4.4 A/ms, $T_j$ = 125°C | | MIN. | 5 | 10 | V/µs |

| STATIC CHARACTERISTICS | | | | | |
|---|---|---|---|---|---|
| SYMBOL | TEST CONDITIONS | | | VALUE | UNIT |
| $V_{TM}$(2) | $I_{TM}$ = 14 A, $t_P$ = 380 µs | $T_j$ = 25°C | MAX. | 1.55 | V |
| $V_{t0}$(2) | Threshold voltage | $T_j$ = 125°C | MAX. | 0.85 | V |
| $R_d$(2) | Dynamic resistance | $T_j$ = 125°C | MAX. | 40 | mΩ |
| $I_{DRM}$<br>$I_{RRM}$ | $V_{DRM}$ = $V_{RRM}$ | $T_j$ = 25°C | MAX. | 5 | µA |
| | | $T_j$ = 125°C | | 1 | mA |

**Note** 1: Minimum $I_{GT}$ is guaranted at 5% of $I_{GT}$ max.
**Note** 2: For both polarities of A2 referenced to A1.

## THERMAL RESISTANCE

| SYMBOL | | | VALUE | UNIT |
|---|---|---|---|---|
| $R_{th(j-c)}$ | Junction to case (AC) | TO-220AB | 1.5 | °C/W |
| | | TO-220AB Insulated | 2.4 | |
| $R_{th(j-a)}$ | Junction to ambient | TO-220AB | 60 | °C/W |
| | | TO-220AB Insulated | | |

## PRODUCT SELECTOR

| PART NUMBER | VOLTAGE (xx) | | | SENSITIVITY | TYPE | PACKAGE |
|---|---|---|---|---|---|---|
| | 600 V | 800 V | 1000 V | | | |
| 10TxxA-B/10TxxAI-B | V | V | V | 50 mA | Standard | TO-220AB |
| 10TxxA-BW/10TxxAI-BW | V | V | V | 50 mA | Snubberless | TO-220AB |
| 10TxxA-C/10TxxAI-C | V | V | V | 25 mA | Standard | TO-220AB |
| 10TxxA-CW/10TxxAI-CW | V | V | V | 35 mA | Snubberless | TO-220AB |

## ORDERING INFORMATION

| ORDERING TYPE | MARKING | PACKAGE | WEIGHT | BASE Q'TY | DELIVERY MODE |
|---|---|---|---|---|---|
| 10TxxA-yy | 10TxxA-yy | TO-220AB | 2.0g | 50 | Tube |
| 10TxxAI-yy | 10TxxAI-yy | TO-220AB (insulated) | 2.3g | 50 | Tube |

**Note**: xx = voltage, yy = sensitivity

## ORDERING INFORMATION SCHEME

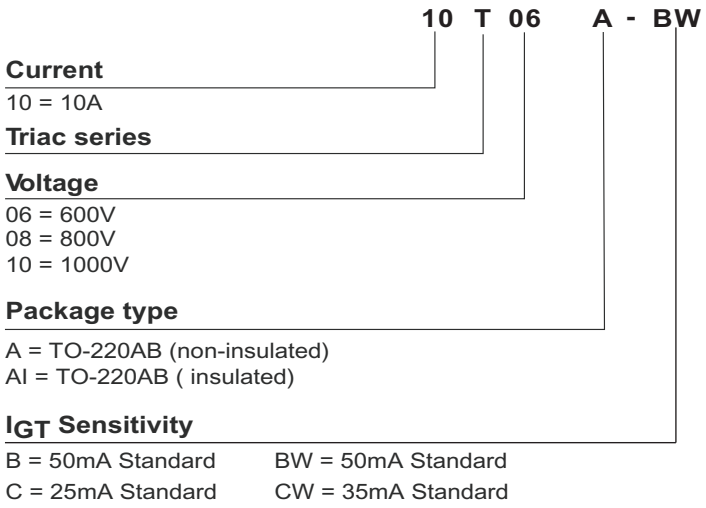


**Fig.1 Maximum power dissipation versus RMS on-state current (full cycle)**

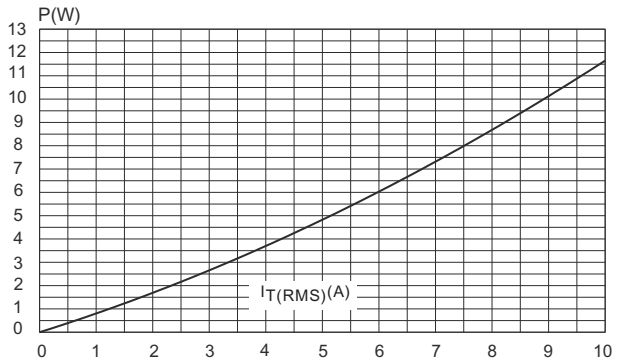



**Fig.2 RMS on-state current versus case temperature (full cycle)**

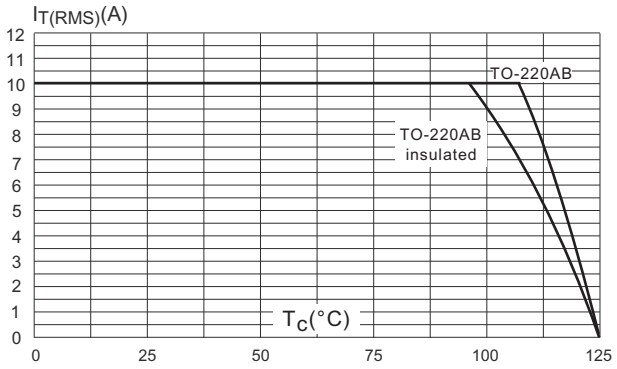



**Fig.3 Relative variation of thermal impedance versus pulse duration**

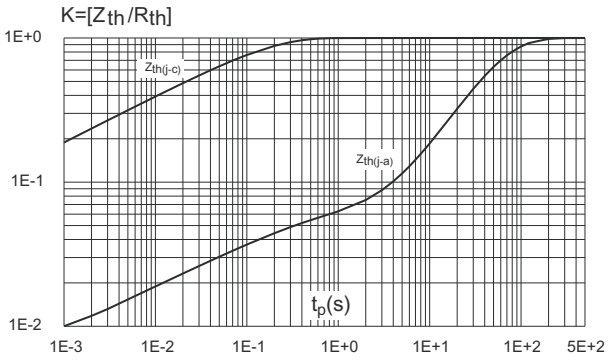



**Fig.4 On-state characteristics (maximum values)**

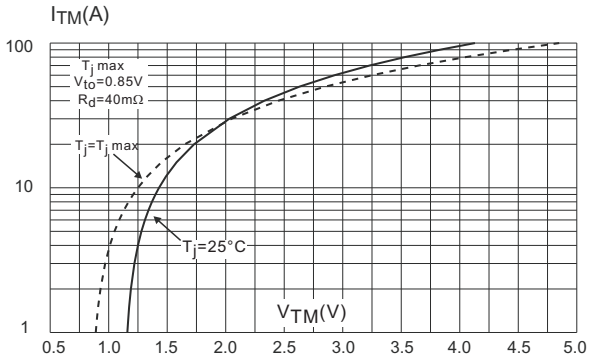



**Fig.5 Surge peak on-state current versus number of cycles**

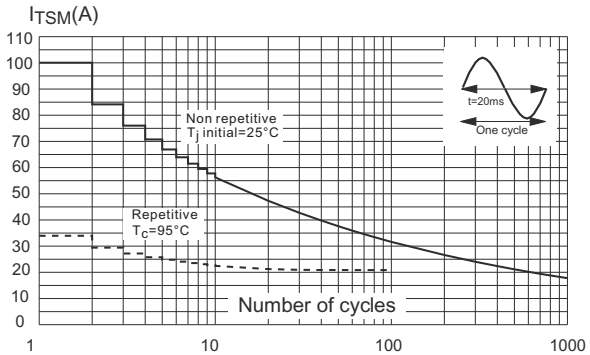



**Fig.6 Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp < 10ms. and corresponding value of $I^2t$**

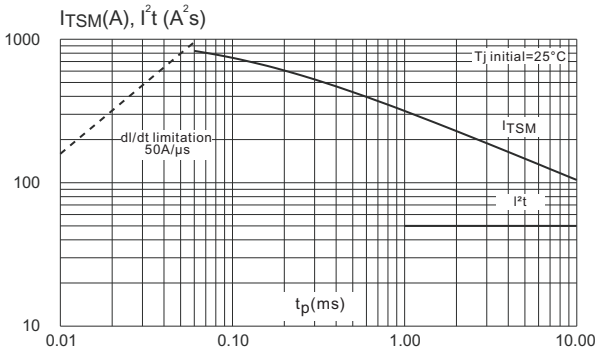


**Fig.7 Relative variation of gate trigger current,holding current and latching current versus junction temperature (typical values)**

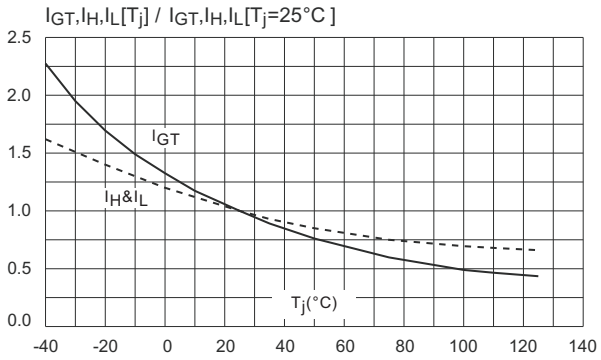



**Fig.8 Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values)**

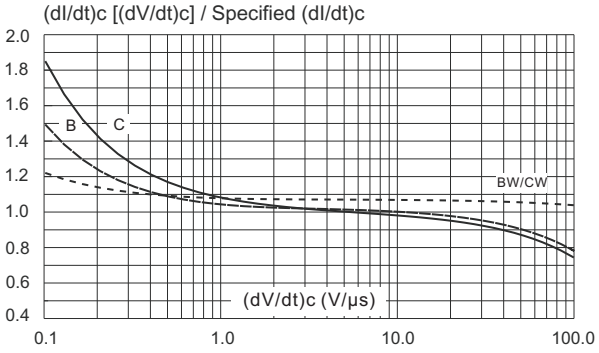
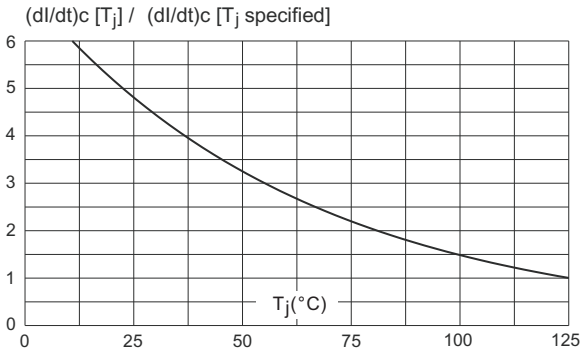
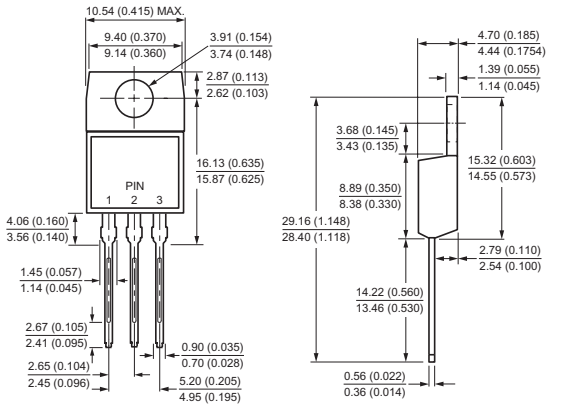


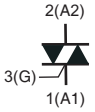

**Fig.9 Relative variation of critical rate of decrease of main current versus junction temperature**




## Case Style

**TO-220AB**




All dimensions in millimeters(inches)