# BTA24BW/CW
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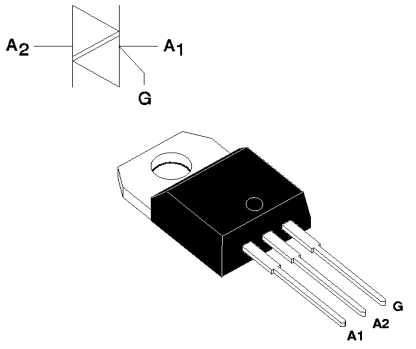
## SNUBBERLESS TRIACS

### FEATURES

- HIGH COMMUTATION : (dI/dt)c > 22A/ms without snubber
- HIGH SURGE CURRENT : $I_{TSM}$ = 250A
- $V_{DRM}$ UP TO 800V
- BTA family:
  Insulated voltage = 2500$V_{(RMS)}$
  (UL RECOGNIZED : E81734)




**TO220AB**
(Plastic)

### DESCRIPTION

The BTA/BTB24 BW/CW triac family are high performance glass passivated chips technology.
The SNUBBERLESS™ concept offers suppression of RC network and it is suitable for application such as phase control and static switching on inductive or resistive load.

### ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | | Value | Unit |
|---|---|---|---|---|---|
| $I_{T(RMS)}$ | RMS on-state current (360° conduction angle) | BTA | Tc = 75 °C | 25 | A |
| | | BTB | Tc = 95 °C | 25 | A |
| $I_{TSM}$ | Non repetitive surge peak on-state current ( Tj initial = 25°C ) | | tp = 8.3 ms | 260 | A |
| | | | tp = 10 ms | 250 | |
| $I^2t$ | $I^2t$ value | | tp = 10 ms | 312 | $A^2s$ |
| dI/dt | Critical rate of rise of on-state current Gate supply : $I_G$ = 500mA $di_G/dt$ = 1A/µs | | Repetitive F = 50 Hz | 20 | A/µs |
| | | | Non Repetitive | 100 | |
| Tstg<br>Tj | Storage and operating junction temperature range | | | - 40 to + 150<br>- 40 to + 125 | °C<br>°C |
| Tl | Maximum lead temperature for soldering during 10 s at 4.5 mm from case | | | 260 | °C |

| Symbol | Parameter | BTA/BTB24-... BW/CW | | | Unit |
|---|---|---|---|---|---|
| | | 600 | 700 | 800 | |
| $V_{DRM}$<br>$V_{RRM}$ | Repetitive peak off-state voltage<br>Tj = 125 °C | 600 | 700 | 800 | V |

## THERMAL RESISTANCES

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| Rth (j-a) | Junction to ambient | | 60 | °C/W |
| Rth (j-c) DC | Junction to case for DC | BTA | 2.3 | °C/W |
| | | BTB | 1.3 | °C/W |
| Rth (j-c) AC | Junction to case for 360° conduction angle ( F= 50 Hz) | BTA | 1.7 | °C/W |
| | | BTB | 1.0 | °C/W |

## GATE CHARACTERISTICS (maximum values)

$P_{G\ (AV)}$ = 1W $P_{GM}$ = 10W (tp = 20 µs) $I_{GM}$ = 4A (tp = 20 µs).

## ELECTRICAL CHARACTERISTICS

| Symbol | Test Conditions | | Quadrant | | Suffix | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | | BW | CW | |
| $I_{GT}$ | $V_D$=12V (DC) $R_L$=33Ω | Tj=25°C | I-II-III | MIN | 4 | 2 | mA |
| | | | | MAX | 50 | 35 | |
| $V_{GT}$ | $V_D$=12V (DC) $R_L$=33Ω | Tj=25°C | I-II-III | MAX | 1.3 | | V |
| $V_{GD}$ | $V_D$=$V_{DRM}$ $R_L$=3.3kΩ | Tj=125°C | I-II-III | MIN | 0.2 | | V |
| $I_L$ | $I_G$=1.2 $I_{GT}$ | Tj=25°C | I-III | MAX | 60 | 50 | mA |
| | | | II | MAX | 120 | 80 | |
| $I_H$ * | $I_T$= 250mA gate open | Tj=25°C | | MAX | 75 | 50 | mA |
| $V_{TM}$ * | $I_{TM}$= 35A tp= 380µs | Tj=25°C | | MAX | 1.5 | | V |
| $I_{DRM}$ $I_{RRM}$ | $V_{DRM}$ Rated $V_{RRM}$ Rated | Tj=25°C | | MAX | 5 | | µA |
| | | Tj=125°C | | MAX | 3 | | mA |
| dV/dt * | Linear slope up to $V_D$=67%$V_{DRM}$ gate open | Tj=125°C | | MIN | 1000 | 500 | V/µs |
| (dI/dt)c * | Without snubber | Tj=125°C | | MIN | 22 | 13 | A/ms |

* For either polarity of electrode A2 voltage with reference to electrode A1.

## ORDERING INFORMATION

| Package | $I_{T(RMS)}$ | $V_{DRM}$ / $V_{RRM}$ | Sensitivity Specification | |
|---|---|---|---|---|
| | A | V | BW | CW |
| BTA (Insulated) | 25 | 600 | X | X |
| | | 700 | X | X |
| | | 800 | X | X |
| BTB (Uninsulated) | 25 | 600 | X | X |
| | | 700 | X | X |
| | | 800 | X | X |

Fig.1 : Maximum RMS power dissipation versus RMS on-state current.

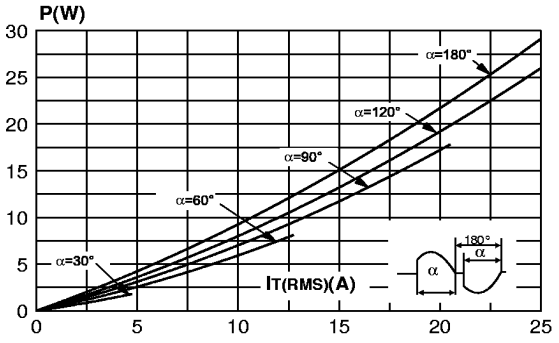



Fig.2 : Correlation between maximum power dissipation and maximum allowable temperatures ($T_{amb}$ and $T_{case}$) for different thermal resistances heatsink + contact. (BTA)

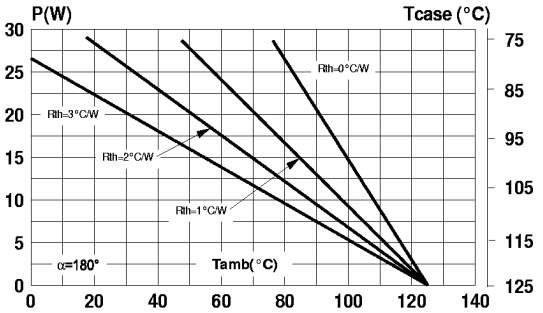



Fig.3 : Correlation between maximum power dissipation and maximum allowable temperatures ($T_{amb}$ and $T_{case}$) for different thermal resistances heatsink + contact.(BTB)

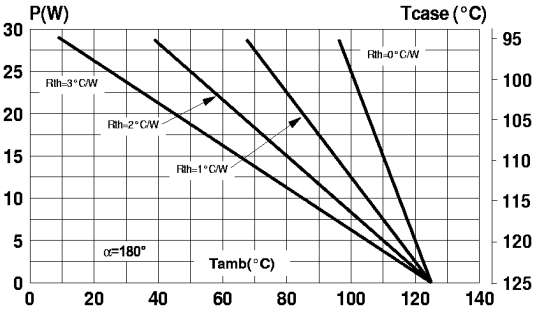


Fig.4 : RMS on-state current versus case temperature.

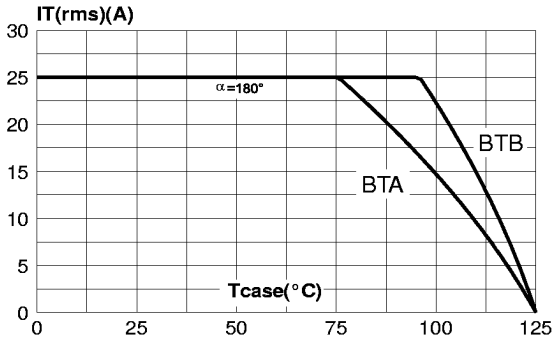



Fig.5 : Relative variation of thermal impedance versus pulse duration.

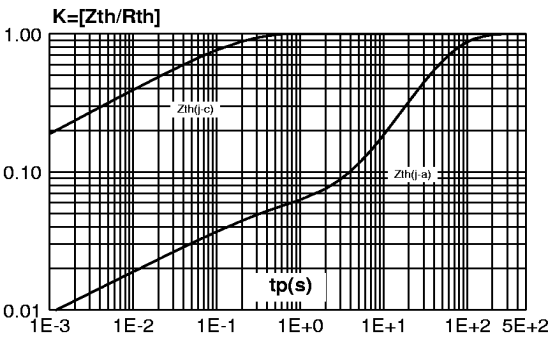



Fig.6 : Relative variation of gate trigger current and holding current versus junction temperature (typical values).

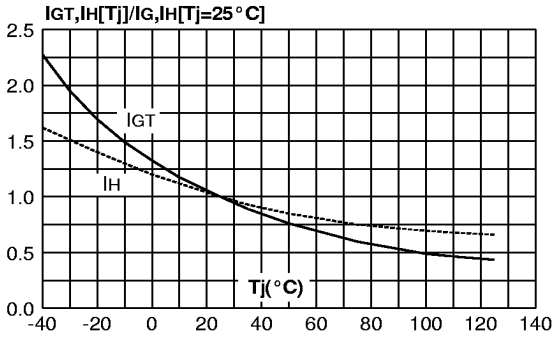



Fig.7 : Non Repetitive surge peak on-state current versus number of cycles.

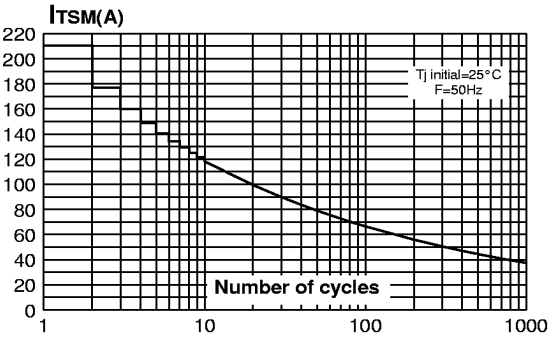



Fig.8 : Non repetitive surge peak on-state current for a sinusoidal pulse with width : tp ≤ 10ms, and corresponding value of $I^2t$.

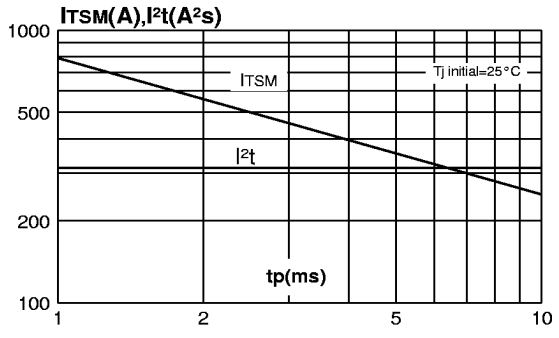
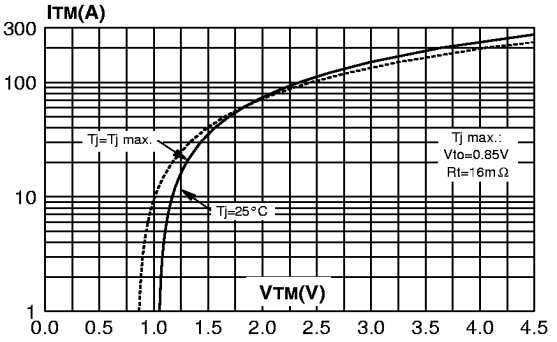
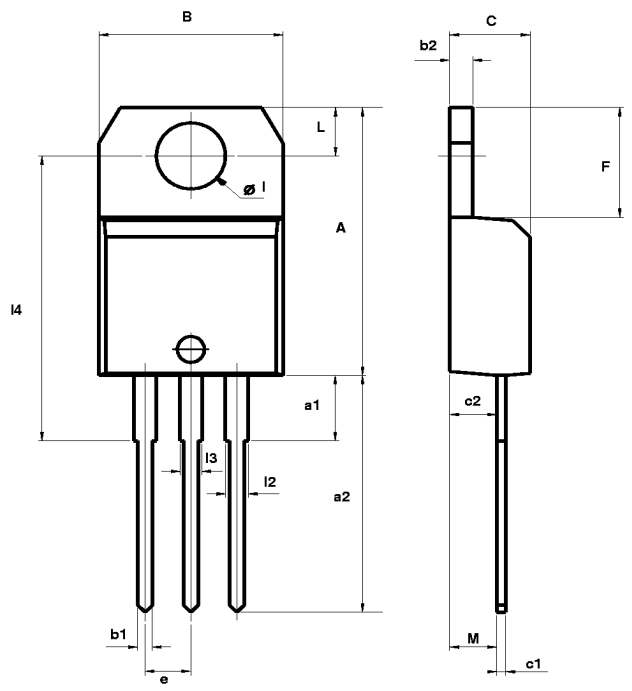



Fig.9 : On-state characteristics (maximum values).



## PACKAGE MECHANICAL DATA

TO220AB Plastic




| REF. | DIMENSIONS | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 15.20 | 15.90 | 0.598 | 0.625 |
| a1 | 3.50 | 4.20 | 0.137 | 0.165 |
| a2 | 13.00 | 14.00 | 0.511 | 0.551 |
| B | 10.00 | 10.40 | 0.393 | 0.409 |
| b1 | 0.61 | 0.88 | 0.024 | 0.034 |
| b2 | 1.23 | 1.32 | 0.048 | 0.051 |
| C | 4.40 | 4.60 | 0.173 | 0.181 |
| c1 | 0.49 | 0.70 | 0.019 | 0.027 |
| c2 | 2.40 | 2.72 | 0.094 | 0.107 |
| e | 2.40 | 2.70 | 0.094 | 0.106 |
| F | 6.20 | 6.60 | 0.244 | 0.259 |
| I | 3.75 | 3.85 | 0.147 | 0.151 |
| l4 | 16.40 Typ. | | 0.646 Typ. | |
| L | 2.65 | 2.95 | 0.104 | 0.116 |
| l2 | 1.14 | 1.70 | 0.044 | 0.066 |
| l3 | 1.14 | 1.70 | 0.044 | 0.066 |
| M | 2.60 Typ. | | 0.102 Typ. | |

Cooling method : C
Marking : type number
Weight : 2.1 g
Recommended torque value : 0.8 m.N.
Maximum torque value : 1 m.N.