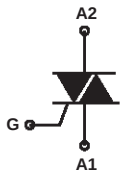
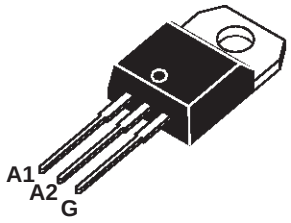
# BTA04 T/D/S/A
# BTB04 T/D/S/A

## SENSITIVE GATE TRIACS

### FEATURES

- Very low $I_{GT}$ = 10mA max
- Low $I_H$ = 15mA max
- BTA Family:
  Insulating voltage = 2500$V_{(RMS)}$
  (UL recognized: E81734)




**TO-220AB**

### DESCRIPTION

The BTA/BTB04 T/D/S/A triac family are high performance glass passivated PNPN devices.
These parts are suitables for general purpose applications where gate high sensitivity is required. Application on 4Q such as phase control and static switching.

### ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | | Value | Unit |
|---|---|---|---|---|---|
| $I_{T(RMS)}$ | RMS on-state current (360° conduction angle) | BTA | Tc = 90°C | 4 | A |
| | | BTB | Tc = 95°C | | |
| $I_{TSM}$ | Non repetitive surge peak on-state current (Tj initial = 25°C) | | tp = 8.3ms | 42 | A |
| | | | tp = 10ms | 40 | |
| $I^2t$ | $I^2t$ value | | tp = 10ms | 8 | $A^2s$ |
| dI/dt | Critical rate of rise of on-state current Gate supply: $I_G$ = 50mA $dI_G/dt$ = 0.1A/µs | | Repetitive F = 50Hz | 10 | A/µs |
| | | | Non repetitive | 50 | |
| Tstg<br>Tj | Storage and operating junction temperature range | | | -40 to +150<br>-40 to +110 | °C |
| Tl | Maximum lead soldering temperature during 10s at 4.5mm from case | | | 260 | °C |

| Symbol | Parameter | BTA / BTB04- | | | Unit |
|---|---|---|---|---|---|
| | | 400 T/D/S/A | 600 T/D/S/A | 700 T/D/S/A | |
| $V_{DRM}$<br>$V_{RRM}$ | Repetitive peak off-state voltage Tj = 110°C | 400 | 600 | 700 | V |



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## THERMAL RESISTANCE

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| Rth (j-a) | Junction to ambient | | 60 | °C/W |
| Rth (j-c) DC | Junction to case for DC | BTA | 4.4 | °C/W |
| | | BTB | 3.2 | |
| Rth (j-c) AC | Junction to case for 360° conduction angle (F = 50Hz) | BTA | 3.3 | °C/W |
| | | BTB | 2.4 | |

**GATE CHARACTERISTICS** (maximum values)

$P_{G(AV)}$ = 1W $P_{GM}$ = 40W (tp = 20µs) $I_{GM}$ = 4A (tp = 20µs) $V_{GM}$ = 16V (tp = 20µs)

## ELECTRICAL CHARACTERISTICS

| Symbol | Test conditions | | Quadrant | | BTA / BTB04 | | | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | T | D | S | A | |
| $I_{GT}$ | $V_D$ = 12V (DC) $R_L$ = 33Ω | Tj = 25°C | I - II - III | MAX. | 5 | 5 | 10 | 10 | mA |
| | | | IV | MAX. | 5 | 10 | 10 | 25 | |
| $V_{GT}$ | $V_D$ = 12V (DC) $R_L$ = 33Ω | Tj = 25°C | I - II - III - IV | MAX. | 1.5 | | | | V |
| $V_{GD}$ | $V_D$ = $V_{DRM}$ $R_L$ = 3.3kΩ | Tj =110°C | I - II - III - IV | MIN. | 0.2 | | | | V |
| tgt | $V_D$ = $V_{DRM}$ $I_G$ = 40mA $dI_G/dt$ = 0.5A/µs | Tj = 25°C | I - II - III - IV | TYP. | 2 | | | | µs |
| $I_L$ | $I_G$ = 1.2$I_{GT}$ | Tj = 25°C | I - III - IV | TYP. | 10 | 10 | 20 | 20 | mA |
| | | | II | | 20 | 20 | 40 | 40 | |
| $I_H$* | $I_T$ = 100mA Gate open | Tj = 25°C | | MAX. | 15 | 15 | 25 | 25 | mA |
| $V_{TM}$ * | $I_{TM}$ = 5.5A tp = 380µs | Tj = 25°C | | MAX. | 1.65 | | | | V |
| $I_{DRM}$ $I_{RRM}$ | $V_{DRM}$ rated $V_{RRM}$ rated | Tj = 25°C | | MAX. | 0.01 | | | | mA |
| | | Tj = 110°C | | MAX. | 0.75 | | | | |
| dV/dt * | Linear slope up to $V_D$ = 67% $V_{DRM}$ gate open | Tj = 110°C | | TYP. | 10 | 10 | - | - | V/µs |
| | | | | MIN. | - | - | 10 | 10 | |
| (dI/dt)c* | (dI/dt)c = 1.8A/ms | Tj = 110°C | | TYP. | 1 | 1 | 5 | 5 | V/µs |

* For either polarity of electrode $A_2$ voltage with reference to electrode $A_1$

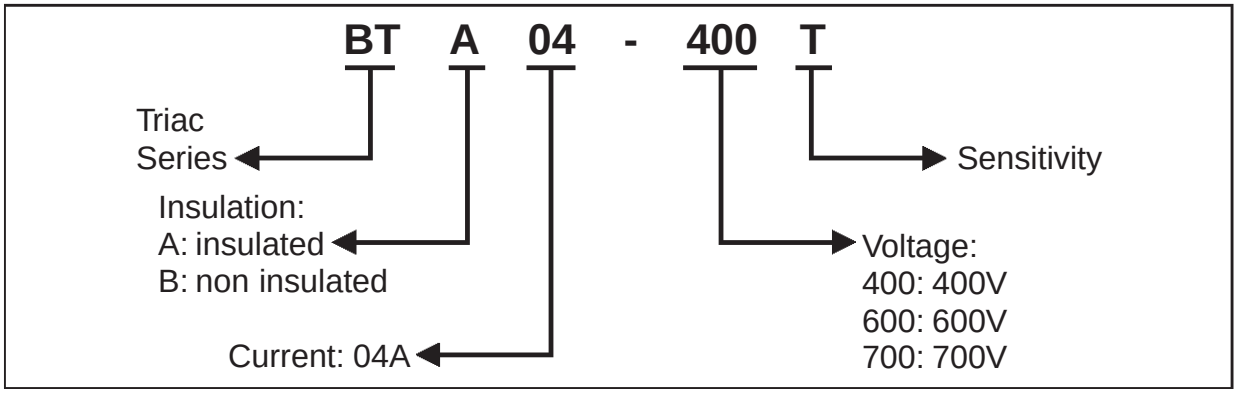


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## PRODUCT INFORMATION

| Package | $I_{T(RMS)}$ | $V_{DRM}$ / $V_{RRM}$ | Sensitivity Specification | | | |
|---|---|---|---|---|---|---|
| | A | V | T | D | S | A |
| BTA (Insulated) | 4 | 400 | X | | | X |
| | | 600 | X | X | | |
| | | 700 | X | | X | |
| BTB (Uninsulated) | | 400 | X | X | | |
| | | 600 | X | | X | |

## ORDERING INFORMATION






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**Fig. 1:** Maximum RMS power dissipation versus RMS on-state current (F = 50Hz).(Curves are cut off by (dI/dt)c limitation)

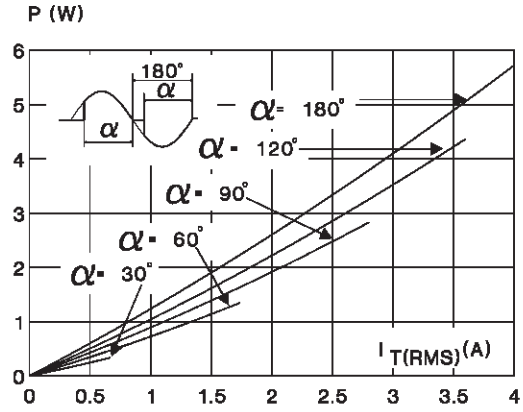



**Fig. 2:** Correlation between maximum RMS power dissipation and maximum allowable temperature (Tamb and Tcase) for different thermal resistances heatsink + contact (BTA).

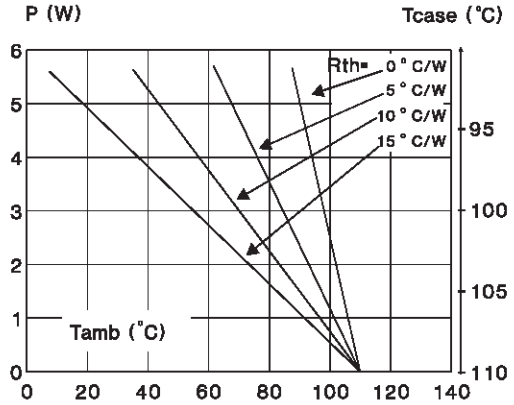



**Fig. 3:** Correlation between maximum RMS power dissipation and maximum allowable temperature (Tamb and Tcase) for different thermal resistances heatsink + contact (BTB).

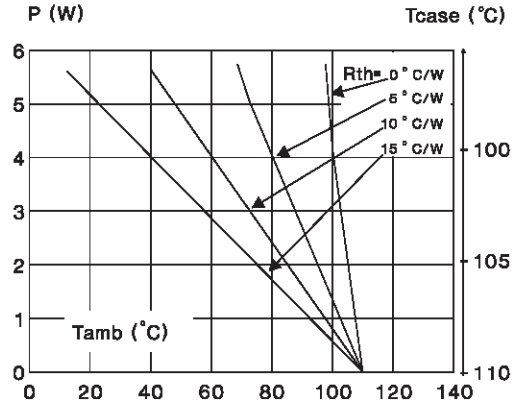



**Fig. 4:** RMS on-state current versus case temperature.

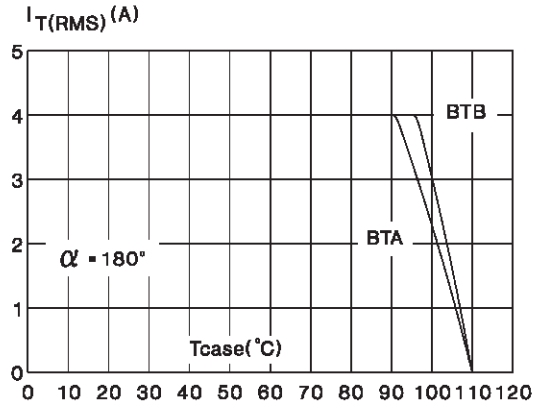



**Fig. 5:** Relative variation of thermal impedance versus pulse duration.

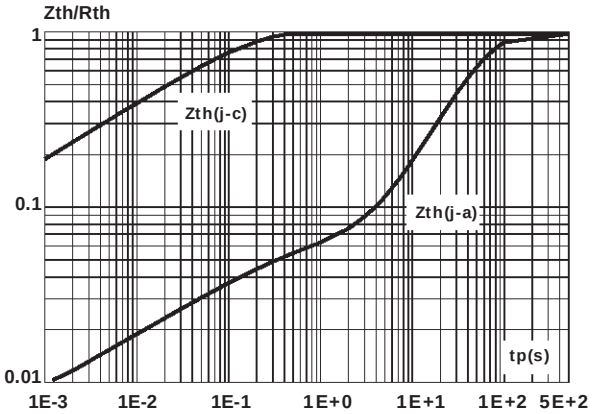
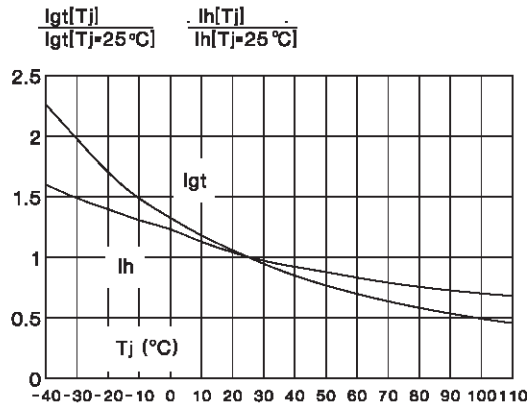



**Fig. 6:** Relative variation of gate trigger current and holding current versus junction temperature.






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

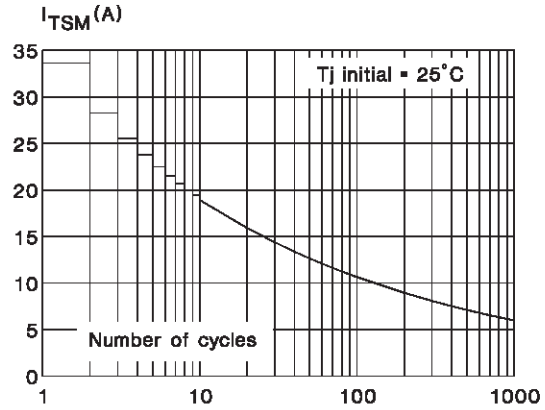



**Fig. 8:** Non repetitive surge peak on-state current for a sinusoidal pulse with width: t ≤ 10ms, and corresponding value of $I^2t$.

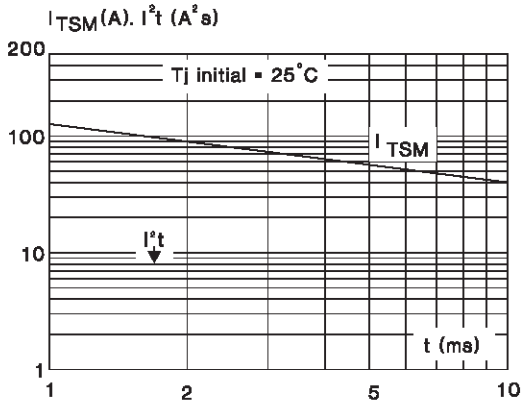
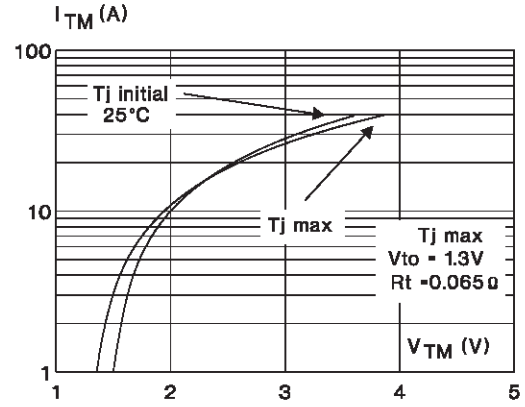



**Fig. 9:** On-state characteristics (maximum values).

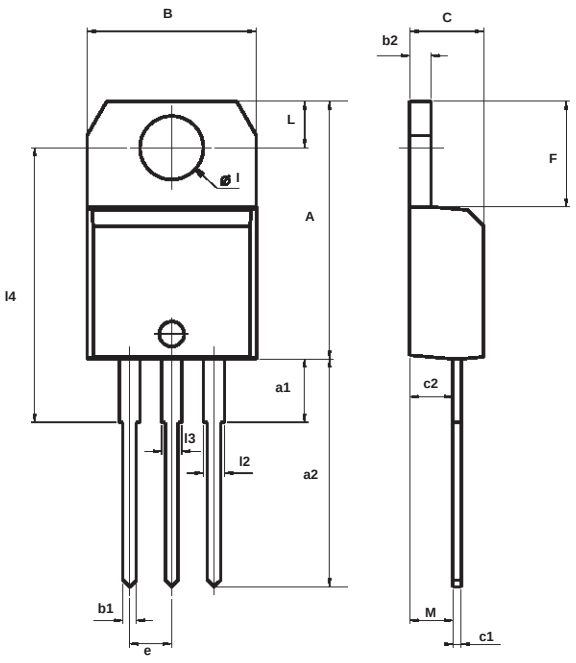





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## PACKAGE MECHANICAL DATA

TO-220AB (Plastic)




| REF. | DIMENSIONS | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 15.20 | | 15.90 | 0.598 | | 0.625 |
| a1 | | 3.75 | | | 0.147 | |
| 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 | 15.80 | 16.40 | 16.80 | 0.622 | 0.646 | 0.661 |
| 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 | | | 0.102 | |

## OTHER INFORMATION

| Ordering type | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| BTA/BTB04-xxxy | BTA/BTB04-xxxy | TO-220AB | 2.3 g | 250 | Bulk |

- Epoxy meets UL94,V0
- Cooling method: C
- Recommended torque value: 0.8 m.N.
- Maximum torque value: 1 m.N.

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