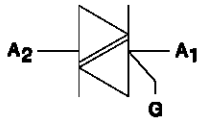
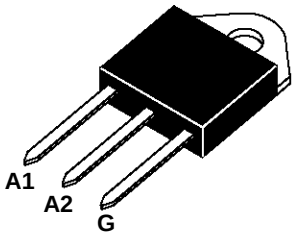
Toohong

# BTA41 A/B
# BTB41 B

## FEATURES

- HIGH SURGE CURRENT CAPABILITY
- COMMUTATION : (dV/dt)c > 10V/µs
- BTA Family :
  INSULATING VOLTAGE = 2500$V_{(RMS)}$
  (UL RECOGNIZED : E81734)




TOP 3
(Plastic)

## DESCRIPTION

The BTA41 A/B / BTB41 B triac family are high performance glass passivated PNPN devices.
These parts are suitables for general purpose applications where high surge current capability is required. 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 | 40 | A |
| | | BTB | Tc = 85 °C | 45 | |
| $I_{TSM}$ | Non repetitive surge peak on-state current ( Tj initial = 25°C ) | | tp = 8.3 ms | 315 | A |
| | | | tp = 10 ms | 300 | |
| $I^2t$ | $I^2t$ value | | tp = 10 ms | 450 | $A^2s$ |
| dI/dt | Critical rate of rise of on-state current Gate supply : $I_G$ = 500mA $di_G/dt$ = 1A/µs | | Repetitive F = 50 Hz | 10 | A/µs |
| | | | Non Repetitive | 50 | |
| 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 | BTA41-...A/B / BTB41-... B | | | | Unit |
|---|---|---|---|---|---|---|
| | | 400 | 600 | 700 | 800 | |
| $V_{DRM}$<br>$V_{RRM}$ | Repetitive peak off-state voltage Tj = 125 °C | 400 | 600 | 700 | 800 | V |

## THERMAL RESISTANCES

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| Rth (j-a) | Junction to ambient | | 50 | °C/W |
| Rth (j-c) DC | Junction to case for DC | BTA | 1.2 | °C/W |
| | | BTB | 0.8 | |
| Rth (j-c) AC | Junction to case for 360° conduction angle ( F= 50 Hz) | BTA | 0.9 | °C/W |
| | | BTB | 0.6 | |

## GATE CHARACTERISTICS (maximum values)

$P_{G\ (AV)}$ = 1W $P_{GM}$ = 40W (tp = 20 µs) $I_{GM}$ = 8A (tp = 20 µs) $V_{GM}$ = 16V (tp = 20 µs).

## ELECTRICAL CHARACTERISTICS

| Symbol | Test Conditions | | Quadrant | | Suffix | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | | A | B | |
| $I_{GT}$ | $V_D$=12V (DC) $R_L$=33Ω | Tj=25°C | I-II-III | MAX | 100 | 50 | mA |
| | | | IV | MAX | 150 | 100 | |
| $V_{GT}$ | $V_D$=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=125°C | I-II-III-IV | MIN | 0.2 | | V |
| tgt | $V_D$=$V_{DRM}$ $I_G$ = 500mA $dI_G/dt$ = 3A/µs | Tj=25°C | I-II-III-IV | TYP | 2.5 | | µs |
| $I_L$ | $I_G$=1.2 $I_{GT}$ | Tj=25°C | I-III-IV | TYP | 70 | 60 | mA |
| | | | II | | 200 | 180 | |
| $I_H$ * | $I_T$= 500mA gate open | Tj=25°C | | MAX | 100 | 80 | mA |
| $V_{TM}$ * | $I_{TM}$= 60A tp= 380µs | Tj=25°C | | MAX | 1.8 | | V |
| $I_{DRM}$ $I_{RRM}$ | $V_{DRM}$ Rated $V_{RRM}$ Rated | Tj=25°C | | MAX | 0.01 | | mA |
| | | Tj=125°C | | MAX | 6 | | |
| dV/dt * | Linear slope up to $V_D$=67%$V_{DRM}$ gate open | Tj=125°C | | MIN | 250 | 250 | V/µs |
| (dV/dt)c * | (dI/dt)c = 18A/ms BTA<br>(dI/dt)c = 20A/ms BTB | Tj=125°C | | MIN | 10 | | V/µs |

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

## ORDERING INFORMATION

| Package | $I_{T(RMS)}$ | $V_{DRM}$ / $V_{RRM}$ | Sensitivity Specification | |
|---|---|---|---|---|
| | A | V | A | B |
| BTA (Insulated) | 41 | 400 | X | X |
| | | 600 | X | X |
| | | 700 | X | X |
| | | 800 | X | X |
| BTB (Uninsulated) | 45 | 400 | | X |
| | | 600 | | X |
| | | 700 | | X |
| | | 800 | | X |

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

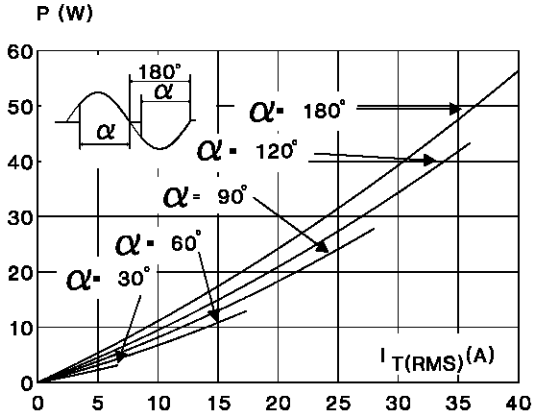



**Fig.2 :** Correlation between maximum RMS power dissipation and maximum allowable temperatures ($T_{amb}$ and $T_{case}$) for different thermal resistances heatsink + contact (BTA).

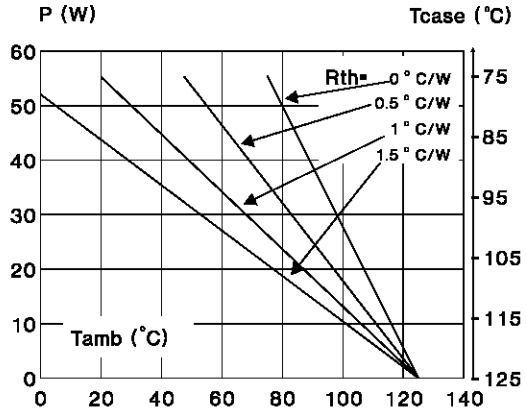



**Fig.3 :** Maximum RMS power dissipation versus RMS on-state current (F=50Hz).
(Curves are cut off by (dI/dt)c limitation) (BTB)

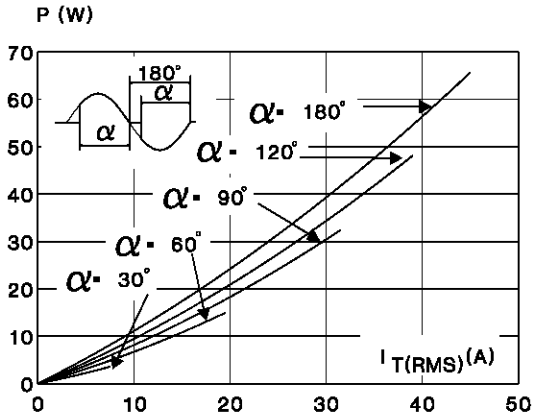



**Fig.4 :** Correlation between maximum RMS power dissipation and maximum allowable temperatures ($T_{amb}$ and $T_{case}$) for different thermal resistances heatsink + contact (BTB).

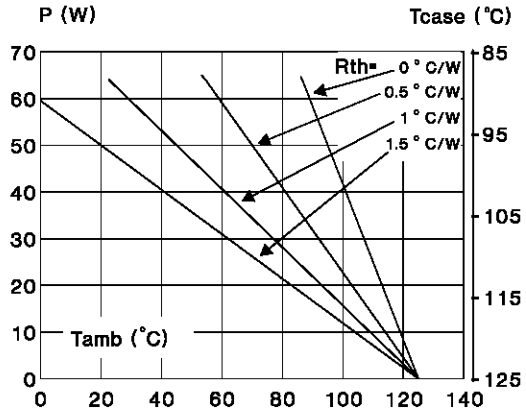


**Fig.5 :** RMS on-state current versus case temperature. (BTA)

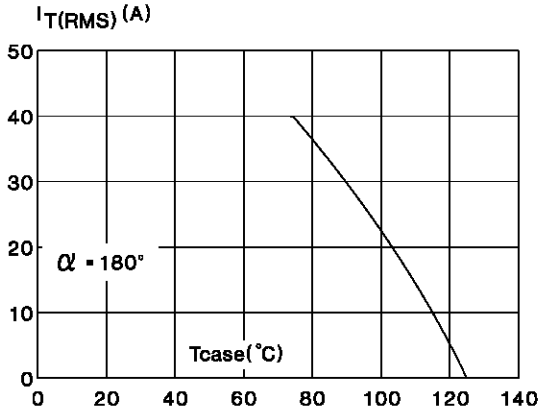



**Fig.6 :** RMS on-state current versus case temperature. (BTB)

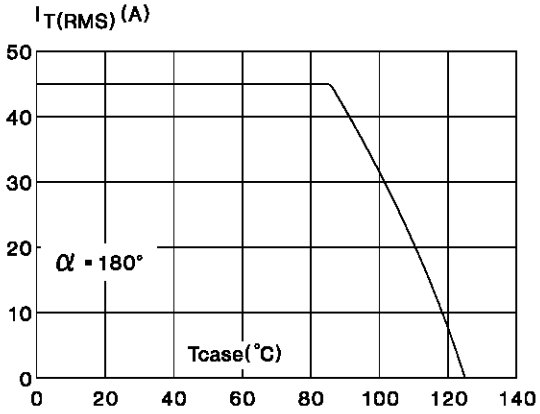



**Fig.7 :** Relative variation of thermal transient impedance pulse duration.

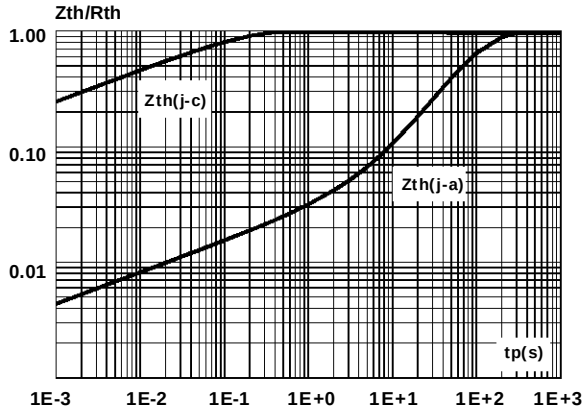



**Fig.8 :** Relative variation of gate trigger current and holding current versus junction temperature.

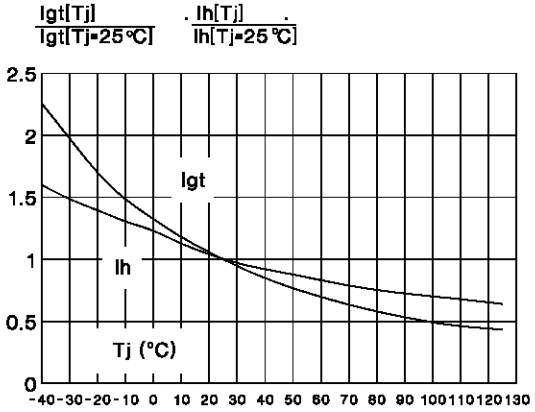



**Fig.9 :** Non Repetitive surge peak on-state current versus number of cycles.

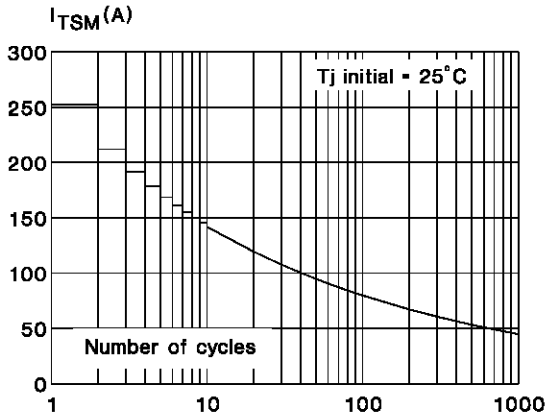



**Fig.10 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width : t ≤ 10ms, and corresponding value of $I^2t$.

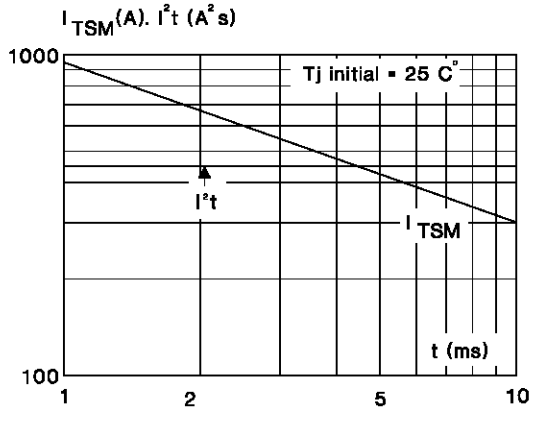
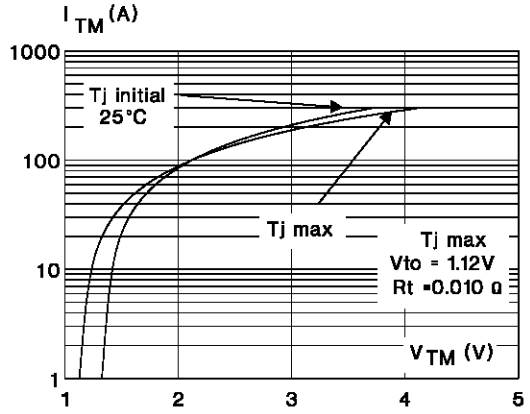
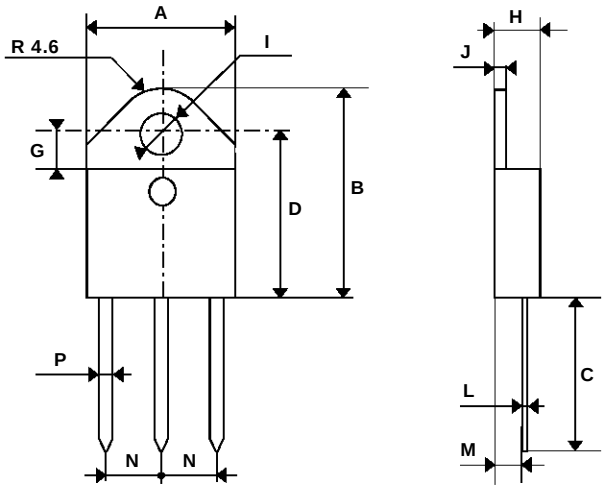


**Fig.11 :** On-state characteristics (maximum values).




## PACKAGE MECHANICAL DATA

TOP 3 Plastic




| REF. | DIMENSIONS | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 15.10 | 15.50 | 0.594 | 0.611 |
| B | 20.70 | 21.10 | 0.814 | 0.831 |
| C | 14.30 | 15.60 | 0.561 | 0.615 |
| D | 16.10 | 16.50 | 0.632 | 0.650 |
| G | 3.40 | - | 0.133 | - |
| H | 4.40 | 4.60 | 0.173 | 0.182 |
| I | 4.08 | 4.17 | 0.161 | 0.164 |
| J | 1.45 | 1.55 | 0.057 | 0.062 |
| L | 0.50 | 0.70 | 0.019 | 0.028 |
| M | 2.70 | 2.90 | 0.106 | 0.115 |
| N | 5.40 | 5.65 | 0.212 | 0.223 |
| P | 1.20 | 1.40 | 0.047 | 0.056 |