# BTA20 BW/CW
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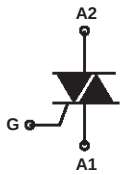
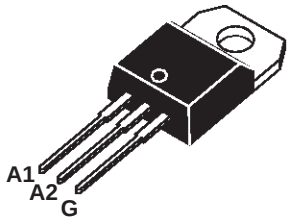
## SNUBBERLESS TRIACS

### FEATURES

- High commutation: (dI/dt)c > 18A/ms without snubber
- High surge current: $I_{TSM}$ = 200A
- $V_{DRM}$ up to 800V
- BTA Family:
  Insulating voltage = 2500$V_{(RMS)}$
  (UL recognized: E81734)




**TO-220AB**

### DESCRIPTION

The BTA/BTB20 BW/CW triac family are high performance glass passivated chips technology.
The SNUBBERLESS™ concept offer 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 = 70°C | 20 | A |
| | | BTB | Tc = 90°C | | |
| $I_{TSM}$ | Non repetitive surge peak on-state current (Tj initial = 25°C) | | tp = 8.3ms | 210 | A |
| | | | tp = 10ms | 200 | |
| $I^2t$ | $I^2t$ value | | tp = 10ms | 200 | $A^2s$ |
| dI/dt | Critical rate of rise of on-state current Gate supply: $I_G$ = 500mA $dI_G/dt$ = 1A/µs | | Repetitive F = 50Hz | 20 | A/µs |
| | | | Non repetitive | 100 | |
| Tstg<br>Tj | Storage and operating junction temperature range | | | -40 to +150<br>-40 to +125 | °C |
| Tl | Maximum lead soldering temperature during 10s at 4.5mm from case | | | 260 | °C |

| Symbol | Parameter | BTA/BTB20-...BW/CW | | Unit |
|---|---|---|---|---|
| | | 600 | 700 | |
| $V_{DRM}$<br>$V_{RRM}$ | Repetitive peak off-state voltage Tj = 125°C | 600 | 700 | V |

## 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 | 2.8 | °C/W |
| | | BTB | 1.7 | |
| Rth (j-c) AC | Junction to case for 360° conduction angle (F = 50Hz) | BTA | 2.1 | °C/W |
| | | BTB | 1.3 | |

**GATE CHARACTERISTICS** (maximum values)

$P_{G(AV)}$ = 1W $P_{GM}$ = 10W (tp = 20µs) $I_{GM}$ = 4A (tp = 20µs) $V_{GM}$ = 16V (tp = 20µs)

## ELECTRICAL CHARACTERISTICS

| Symbol | Test conditions | | Quadrant | | BTA / BTB20 | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | | BW | CW | |
| $I_{GT}$ | $V_D$ = 12V (DC) $R_L$ = 33Ω | Tj = 25°C | I - II - III | MIN. | 2 | 1 | mA |
| | | | | MAX. | 50 | 35 | |
| $V_{GT}$ | $V_D$ = 12V (DC) $R_L$ = 33Ω | Tj = 25°C | I - II - III | MAX. | 1.5 | | V |
| $V_{GD}$ | $V_D = V_{DRM}$ $R_L$ = 3.3kΩ | Tj =125°C | I - II - III | MIN. | 0.2 | | V |
| tgt | $V_D = V_{DRM}$ $I_G$ = 500mA $dI_G/dt$ = 3A/µs | Tj = 25°C | I - II - III | TYP. | 2 | | µs |
| $I_L$ | $I_G = 1.2I_{GT}$ | Tj = 25°C | I - III | TYP. | 50 | - | mA |
| | | | II | | 90 | - | |
| | | | I - II - III | MAX. | - | 80 | |
| $I_H$* | $I_T$ = 500mA Gate open | Tj = 25°C | | MAX. | 75 | 50 | mA |
| $V_{TM}$ * | $I_{TM}$ = 28A tp = 380µs | Tj = 25°C | | MAX. | 1.70 | | V |
| $I_{DRM}$ $I_{RRM}$ | $V_{DRM}$ rated $V_{RRM}$ rated | Tj = 25°C | | MAX. | 0.01 | | mA |
| | | Tj = 125°C | | MAX. | 3 | | |
| dV/dt * | Linear slope up to $V_D$ = 67% $V_{DRM}$ gate open | Tj = 125°C | | TYP. | 750 | 500 | V/µs |
| | | | | MIN. | 500 | 250 | |
| (dI/dt)c* | Without snubber | Tj = 125°C | | TYP. | 36 | 22 | A/ms |
| | | | | MIN. | 18 | 11 | |

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

## PRODUCT INFORMATION

| Package | $I_{T(RMS)}$ | $V_{DRM}$ / $V_{RRM}$ | Sensitivity Specification | |
|---|---|---|---|---|
| | A | V | BW | CW |
| BTA (Insulated) | 20 | 600 | X | X |
| | | 700 | X | X |
| BTB (Uninsulated) | | 600 | | X |

## ORDERING INFORMATION

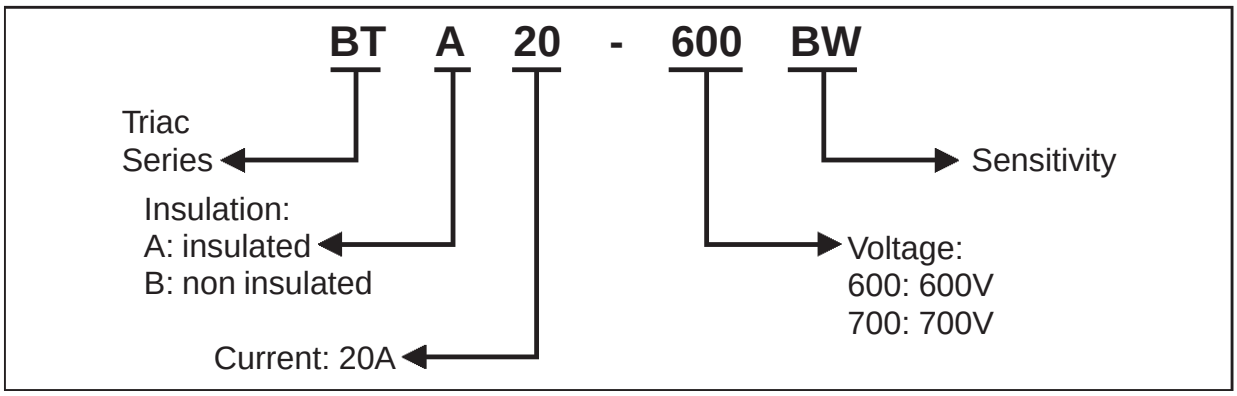


**Fig. 1:** Maximum RMS power dissipation versus RMS on-state current (F = 50Hz).(Curves are cut off by (dI/dt)c limitation)

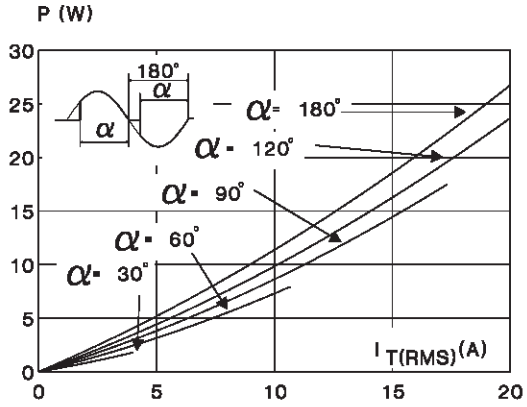



**Fig. 2:** Correlation between maximum RMS power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact (BTA).

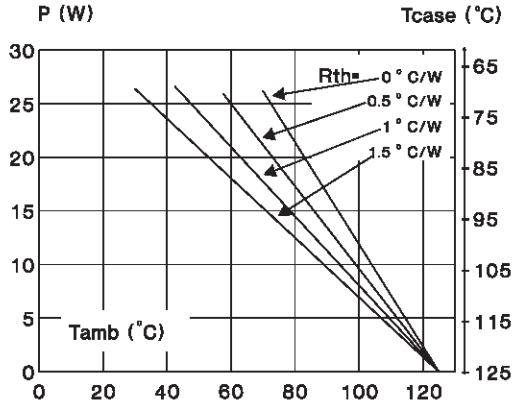



**Fig. 3:** Correlation between maximum RMS power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact (BTB).

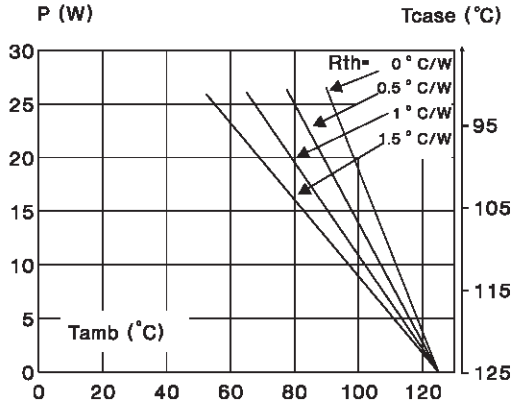



**Fig. 4:** RMS on-state current versus case temperature.

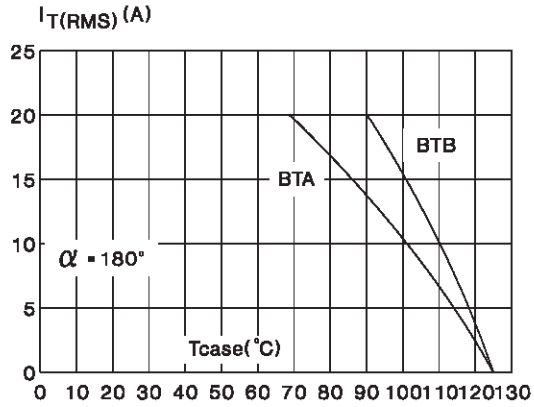



**Fig. 5:** Relative variation of thermal impedance versus pulse duration.

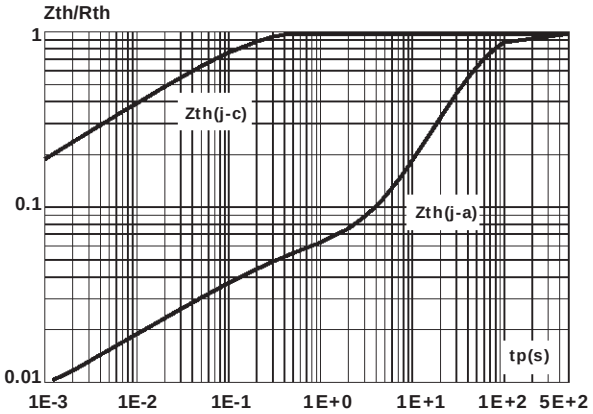



**Fig. 6:** Relative variation of gate trigger current and holding current versus junction temperature.

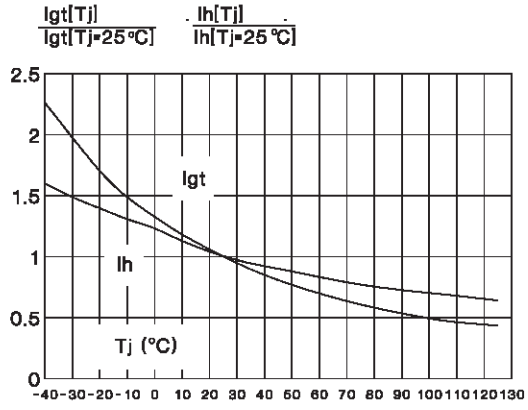


**Fig. 7:** Non repetitive surge peak on-state current versus number of cycles.

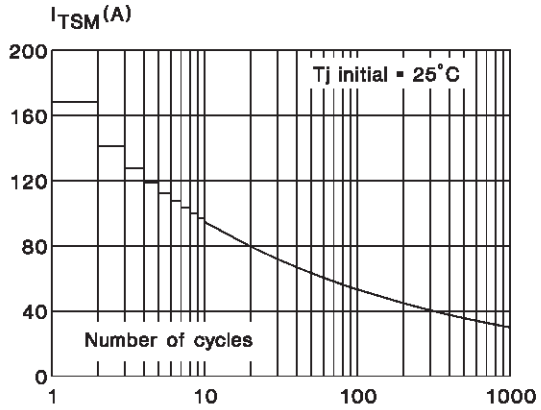



**Fig. 8:** Non repetitive surge peak on-state current for a sinusoidal pulse with width: $t \leq 10ms$, and corresponding value of $I^2t$.

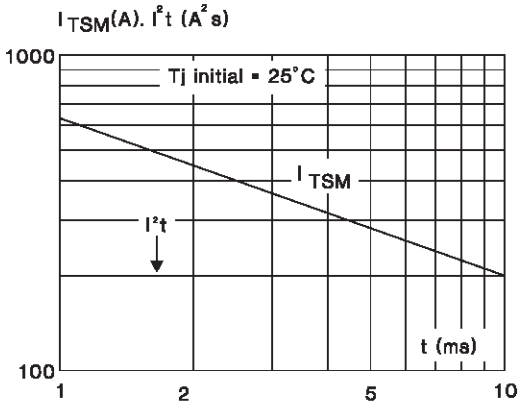
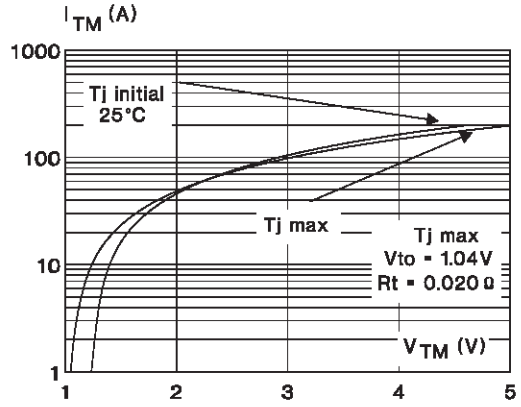
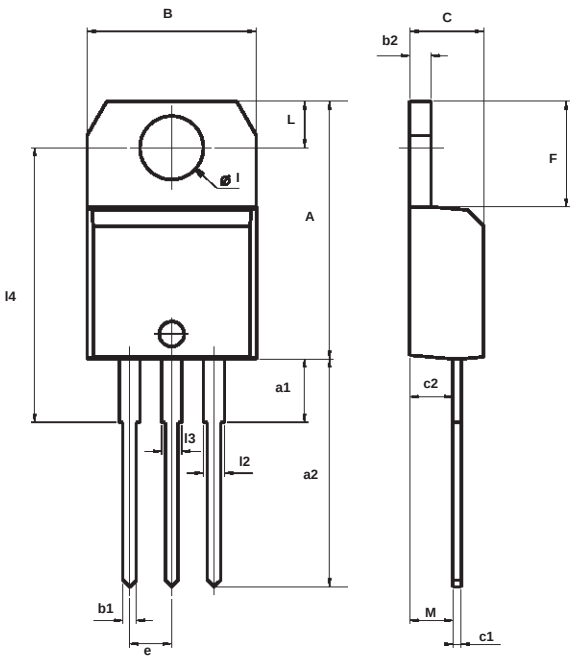



**Fig. 9:** On-state characteristics (maximum values).



## 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/BTB20-xxxyz | BTA/BTB20-xxxyz | 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.