

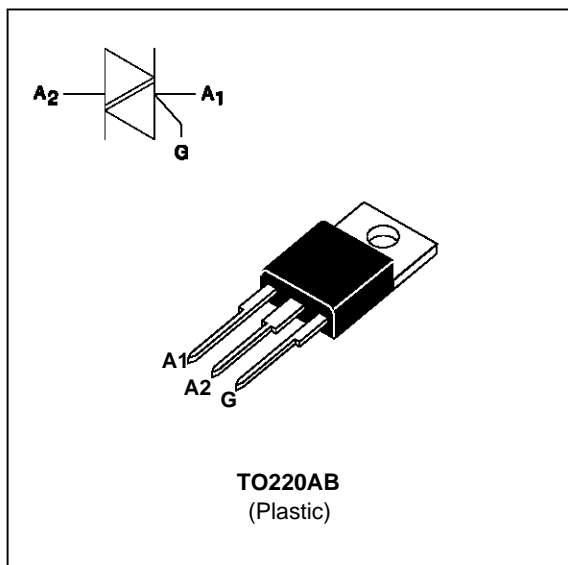
## SNUBBERLESS TRIACS

### FEATURES

- HIGH COMMUTATION :  $(di/dt)_c > 12A/ms$  without snubber
- HIGH SURGE CURRENT :  $I_{TSM} = 120A$
- $V_{DRM}$  UP TO 800V
- BTA Family :  
INSULATING VOLTAGE = 2500V<sub>(RMS)</sub>  
(UL RECOGNIZED : E81734)

### DESCRIPTION

The BTA/BTB12 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 <sub>T(RMS)</sub>                | RMS on-state current<br>(360° conduction angle)   | BTA | T <sub>c</sub> = 85 °C         | 12       | A                |
|                                    |   | BTB | T <sub>c</sub> = 95 °C         |          |                  |
| I <sub>TSM</sub>                   | Non repetitive surge peak on-state current<br>( T <sub>j</sub> initial = 25°C )                               |     | tp = 8.3 ms                    | 126      | A                |
|                                    |   |     | tp = 10 ms                     | 120      |                  |
| I <sup>2</sup> t                   | I <sup>2</sup> t value  |     | tp = 10 ms                     | 72       | A <sup>2</sup> s |
| di/dt                              | Critical rate of rise of on-state current<br>Gate supply : I <sub>G</sub> = 500mA di <sub>G</sub> /dt = 1A/μs |     | Repetitive<br>F = 50 Hz        | 20       | A/μs             |
|                                    |   |     | Non Repetitive                 | 100      |                  |
| T <sub>stg</sub><br>T <sub>j</sub> | Storage and operating junction temperature range  |     | - 40 to + 150<br>- 40 to + 125 | °C<br>°C |                  |
| TI                                 | Maximum lead temperature for soldering during 10 s at 4.5 mm from case  |     | 260                            | °C       |                  |

| Symbol                               | Parameter  | BTA / BTB12-... BW/CW |     |     |     | Unit |
|--------------------------------------|--|-----------------------|-----|-----|-----|------|
|                                      |  | 400                   | 600 | 700 | 800 |      |
| V <sub>DRM</sub><br>V <sub>RRM</sub> | Repetitive peak off-state voltage<br>T <sub>j</sub> = 125 °C | 400                   | 600 | 700 | 800 | V    |

# BTA12 BW/CW / BTB12 BW/CW

## 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 | 3.3   | °C/W |
|              |   | BTB | 2.7   |      |
| Rth (j-c) AC | Junction to case for 360° conduction angle<br>( F= 50 Hz) | BTA | 2.5   | °C/W |
|              |   | BTB | 2.0   |      |

## GATE CHARACTERISTICS (maximum values)

PG (AV) = 1W    PGM = 10W (tp = 20 μs)    IGM = 4A (tp = 20 μs)    VGM = 16V (tp = 20 μs).

## ELECTRICAL CHARACTERISTICS

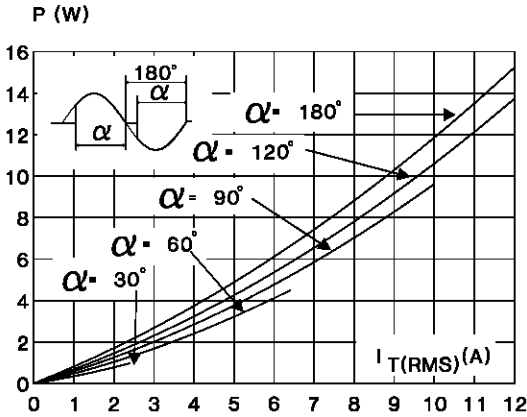
| Symbol       | Test Conditions                            | Quadrant |          | Suffix |      | Unit |      |
|--------------|--|----------|----------|--------|------|------|------|
|              |  |          |          | BW     | CW   |      |      |
| IGT          | VD=12V (DC) RL=33Ω                         | Tj=25°C  | I-II-III | MIN    | 2    | 1    | mA   |
|              |  |          |          | MAX    | 50   | 35   |      |
| VGT          | VD=12V (DC) RL=33Ω                         | Tj=25°C  | I-II-III | MAX    | 1.5  |      | V    |
| VGD          | VD=VDRM RL=3.3kΩ                           | Tj=125°C | I-II-III | MIN    | 0.2  |      | V    |
| tgt          | VD=VDRM IG = 500mA<br>dIG/dt = 3A/μs       | Tj=25°C  | I-II-III | TYP    | 2    |      | μs   |
| IL           | IG=1.2 IGT                                 | Tj=25°C  | I-III    | TYP    | 40   | -    | mA   |
|              |  |          | II       | TYP    | 80   | -    |      |
|              |  |          | I-III    | MAX    | -    | 50   |      |
|              |  |          | II       | MAX    | -    | 80   |      |
| IH *         | IT= 500mA gate open                        | Tj=25°C  |          | MAX    | 50   | 35   | mA   |
| VTM *        | ITM= 17A tp= 380μs                         | Tj=25°C  |          | MAX    | 1.60 |      | V    |
| IDRM<br>IRRM | VDRM Rated<br>VRRM Rated                   | Tj=25°C  |          | MAX    | 0.01 |      | mA   |
|              |  | Tj=125°C |          | MAX    | 2    |      |      |
| dV/dt *      | Linear slope up to VD=67%VDRM<br>gate open | Tj=125°C |          | MIN    | 500  | 250  | V/μs |
|              |  |          |          | TYP    | 750  | 500  |      |
| (di/dt)c *   | Without snubber                            | Tj=125°C |          | MIN    | 12   | 6.5  | A/ms |
|              |  |          |          | TYP    | 24   | 13   |      |

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

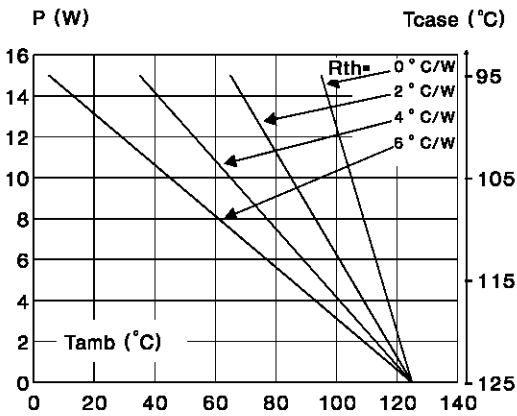
ORDERING INFORMATION

| Package              | $I_T(\text{RMS})$ | $V_{\text{DRM}} / V_{\text{RRM}}$ | Sensitivity Specification |    |
|----------------------|-------------------|-----------------------------------|---------------------------|----|
|                      | A                 | V                                 | BW                        | CW |
| BTA<br>(Insulated)   | 12                | 400                               | X                         | X  |
|                      |                   | 600                               | X                         | X  |
|                      |                   | 700                               | X                         | X  |
|                      |                   | 800                               | X                         | X  |
| BTB<br>(Uninsulated) | 12                | 400                               | X                         | X  |
|                      |                   | 600                               | X                         | X  |
|                      |                   | 700                               | X                         | X  |
|                      |                   | 800                               | X                         | X  |

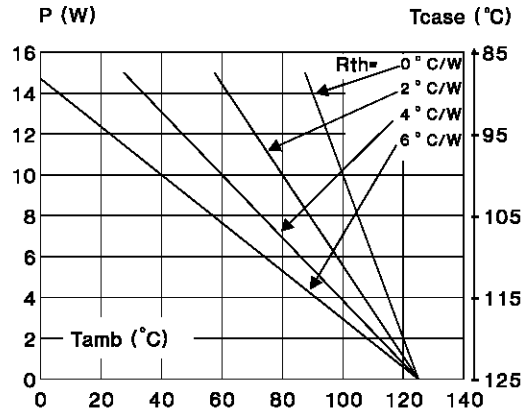
**Fig.1** : Maximum RMS power dissipation versus RMS on-state current ( $F=50\text{Hz}$ ).  
(Curves are cut off by  $(di/dt)_c$  limitation)



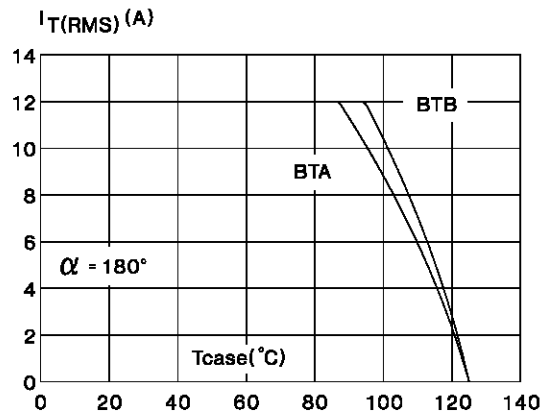
**Fig.3** : Correlation between maximum RMS power dissipation and maximum allowable temperatures ( $T_{\text{amb}}$  and  $T_{\text{case}}$ ) for different thermal resistances heatsink + contact (BTB).



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



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

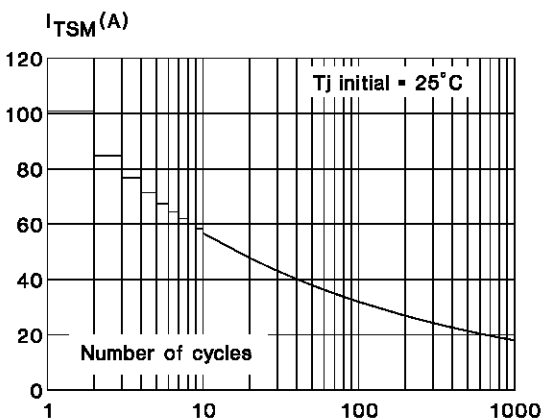


# BTA12 BW/CW / BTB12 BW/CW

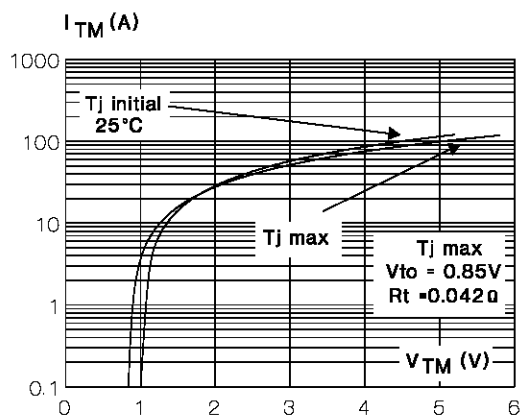
**Fig.5 :** Relative variation of thermal impedance versus pulse duration.



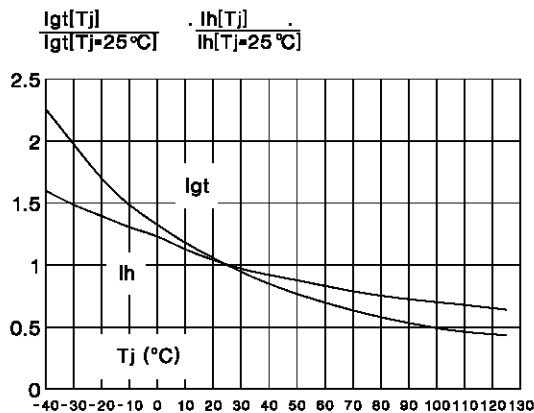
**Fig.7 :** Non Repetitive surge peak on-state current versus number of cycles.



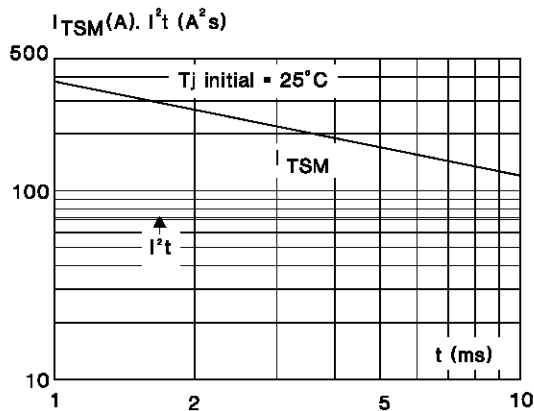
**Fig.9 :** On-state characteristics (maximum values).



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

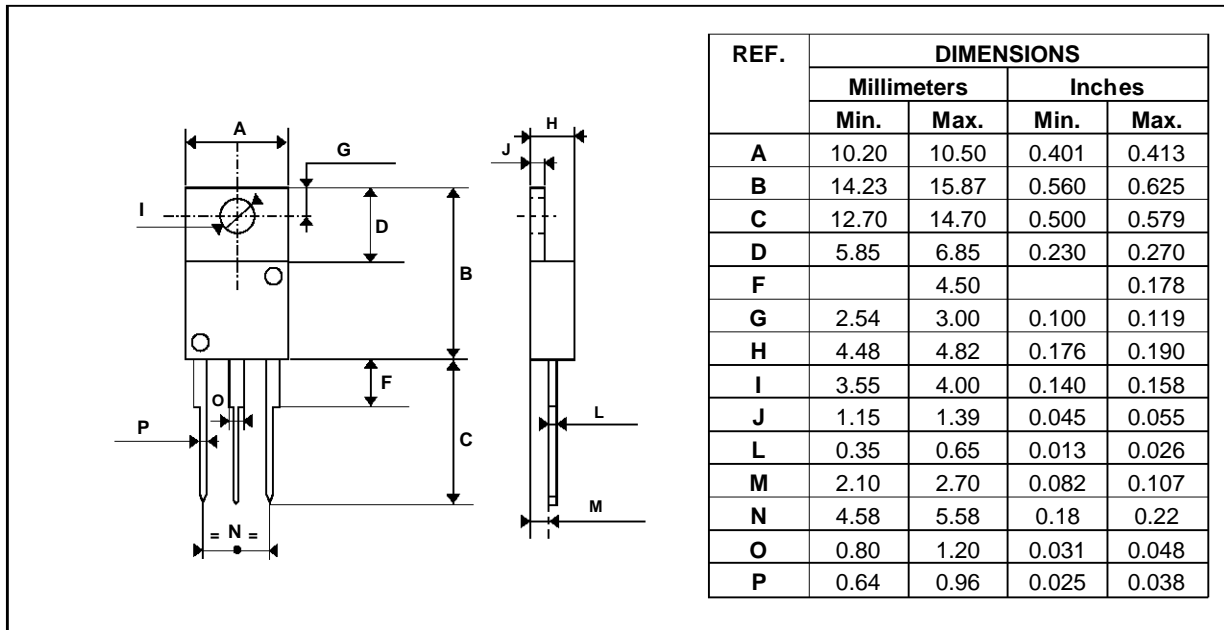


**Fig.8 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t \leq 10\text{ms}$ , and corresponding value of  $I^2t$ .



**PACKAGE MECHANICAL DATA**

TO220AB Plastic



Cooling method : C  
 Marking : type number  
 Weight : 2.3 g  
 Recommended torque value : 0.8 m.N.  
 Maximum torque value : 1 m.N.

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