

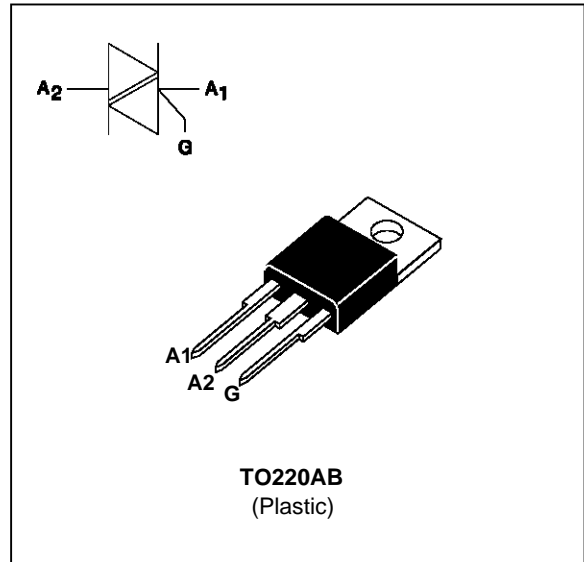
**LOGIC LEVEL TRIACS**

**FEATURES**

- LOW  $I_{GT} = 10\text{mA max}$
- HIGH EFFICIENCY SWITCHING ON COMMUTATION
- BTA Family :  
INSULATING VOLTAGE = 2500V(RMS)  
(UL RECOGNIZED : E81734)

**DESCRIPTION**

The BTA/BTB12 SW Triac family are high performance products glass passivated PNP devices. These parts are suited for low power trigger circuit (integrated circuits, microcontroller, microprocessors).



**ABSOLUTE RATINGS** (limiting values)

| Symbol             | Parameter                                                                                                          |     | Value                            | Unit |                  |
|--------------------|--------------------------------------------------------------------------------------------------------------------|-----|----------------------------------|------|------------------|
| $I_T(\text{RMS})$  | RMS on-state current<br>(360° conduction angle)                                                                    | BTA | $T_c = 70\text{ °C}$             | 12   | A                |
|                    |                                                                                                                    | BTB | $T_c = 75\text{ °C}$             |      |                  |
| $I_{TSM}$          | Non repetitive surge peak on-state current<br>( $T_j$ initial = 25°C )                                             |     | $t_p = 8.3\text{ ms}$            | 126  | A                |
|                    |                                                                                                                    |     | $t_p = 10\text{ ms}$             | 120  |                  |
| $I^2t$             | $I^2t$ value                                                                                                       |     | $t_p = 10\text{ ms}$             | 72   | A <sup>2</sup> s |
| di/dt              | Critical rate of rise of on-state current<br>Gate supply : $I_G = 50\text{mA}$ $di_G/dt = 0.1\text{A}/\mu\text{s}$ |     | Repetitive<br>$F = 50\text{ Hz}$ | 20   | A/ $\mu\text{s}$ |
|                    |                                                                                                                    |     | Non Repetitive                   | 100  |                  |
| $T_{stg}$<br>$T_j$ | Storage and operating junction temperature range                                                                   |     | - 40 to + 150<br>- 40 to + 110   |      | °C<br>°C         |
| $T_l$              | Maximum lead temperature for soldering during 10 s at 4.5 mm from case                                             |     | 260                              |      | °C               |

| Symbol                 | Parameter                                                  | BTA / BTB12- |        |        | Unit |
|------------------------|------------------------------------------------------------|--------------|--------|--------|------|
|                        |                                                            | 400 SW       | 600 SW | 700 SW |      |
| $V_{DRM}$<br>$V_{RRM}$ | Repetitive peak off-state voltage<br>$T_j = 110\text{ °C}$ | 400          | 600    | 700    | V    |

## BTA12 SW / BTB12 SW

### 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  |
|              |                                                           | BTB   | 2.7  |
| Rth (j-c) AC | Junction to case for 360° conduction angle<br>( F= 50 Hz) | BTA   | 2.5  |
|              |                                                           | BTB   | 2    |

### GATE CHARACTERISTICS (maximum values)

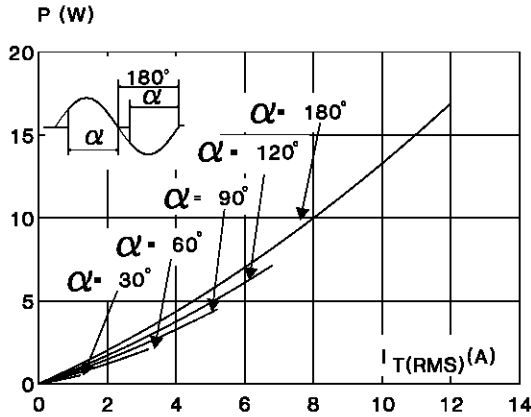
$P_G$  (AV) = 1W     $P_{GM}$  = 10W (tp = 20 μs)     $I_{GM}$  = 4A (tp = 20 μs)     $V_{GM}$  = 16V (tp = 20 μs).

### ELECTRICAL CHARACTERISTICS

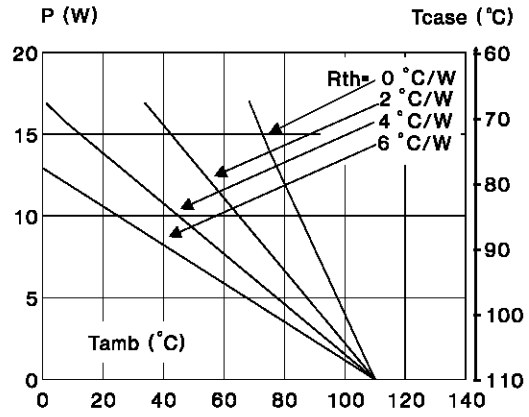
| Symbol                 | Test Conditions                                      | Quadrant          |          | Suffix | Unit |      |
|------------------------|------------------------------------------------------|-------------------|----------|--------|------|------|
|                        |                                                      |                   |          | SW     |      |      |
| $I_{GT}$               | $V_D=12V$ (DC) $R_L=33\Omega$                        | $T_j=25^\circ C$  | I-II-III | MAX    | 10   | mA   |
| $V_{GT}$               | $V_D=12V$ (DC) $R_L=33\Omega$                        | $T_j=25^\circ C$  | I-II-III | MAX    | 1.5  | V    |
| $V_{GD}$               | $V_D=V_{DRM}$ $R_L=3.3k\Omega$                       | $T_j=110^\circ C$ | I-II-III | MIN    | 0.2  | V    |
| tgt                    | $V_D=V_{DRM}$ $I_G = 40mA$<br>$dI_G/dt = 0.5A/\mu s$ | $T_j=25^\circ C$  | I-II-III | TYP    | 2    | μs   |
| $I_L$                  | $I_G=1.2 I_{GT}$                                     | $T_j=25^\circ C$  | I-III    | TYP    | 15   | mA   |
|                        |                                                      |                   | II       |        | 25   |      |
| $I_H$ *                | $I_T= 100mA$ gate open                               | $T_j=25^\circ C$  |          | MAX    | 25   | mA   |
| $V_{TM}$ *             | $I_{TM}= 17A$ tp= 380μs                              | $T_j=25^\circ C$  |          | MAX    | 1.75 | V    |
| $I_{DRM}$<br>$I_{RRM}$ | $V_{DRM}$ Rated<br>$V_{RRM}$ Rated                   | $T_j=25^\circ C$  |          | MAX    | 0.01 | mA   |
|                        |                                                      | $T_j=110^\circ C$ |          | MAX    | 1    |      |
| dV/dt *                | Linear slope up to $V_D=67\%V_{DRM}$<br>gate open    | $T_j=110^\circ C$ |          | MIN    | 50   | V/μs |
| (dI/dt)c *             | dV/dt= 0.1V/μs                                       | $T_j=110^\circ C$ |          | MIN    | 5.3  | A/ms |
|                        | dV/dt= 20V/μs                                        |                   |          | MIN    | 3.5  |      |

\* For either polarity of electrode A<sub>2</sub> voltage with reference to electrode A<sub>1</sub>.

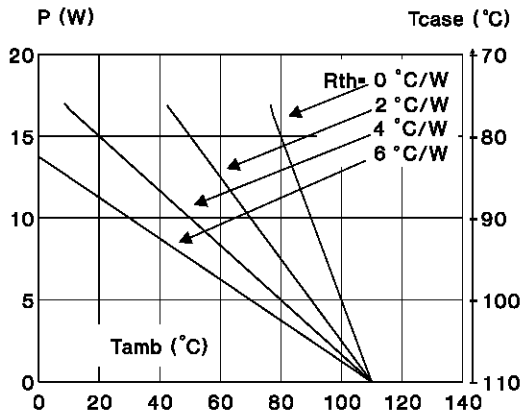
**Fig.1** : Maximum RMS power dissipation versus RMS on-state current (F=50Hz).  
(Curves are cut off by (di/dt)c limitation)



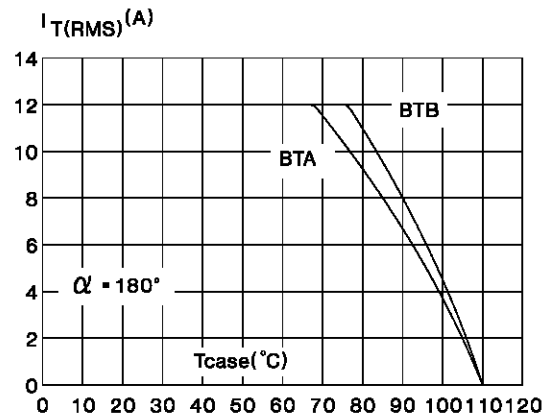
**Fig.2** : Correlation between maximum RMS power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact (BTA).



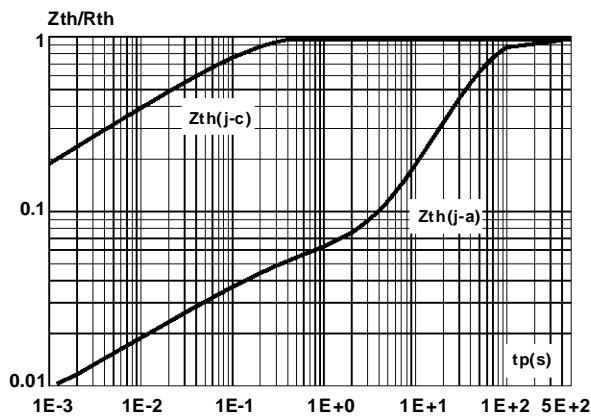
**Fig.3** : Correlation between maximum RMS power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact (BTB).



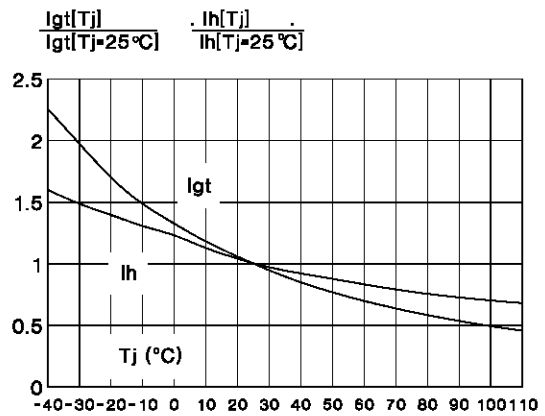
**Fig.4** : RMS on-state current versus case temperature.



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

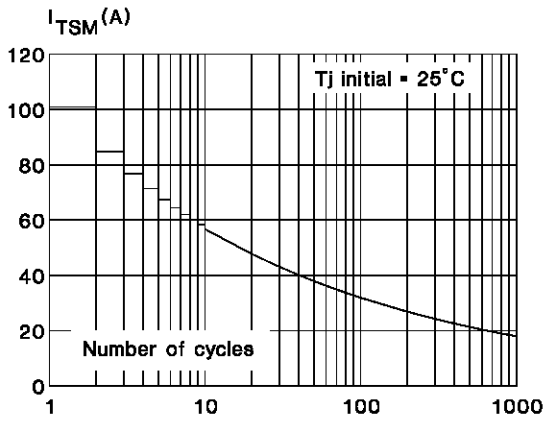


**Fig.6** : Relative variation of gate trigger current and holding current versus junction temperature.

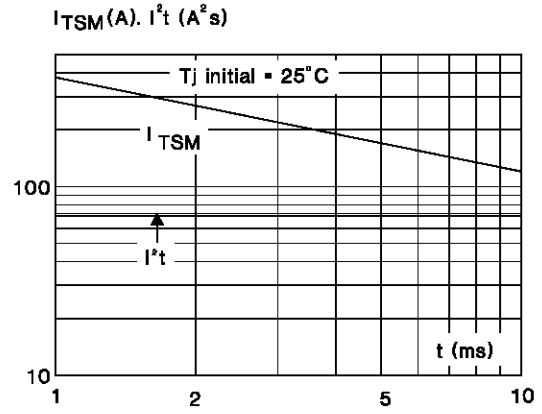


## BTA12 SW / BTB12 SW

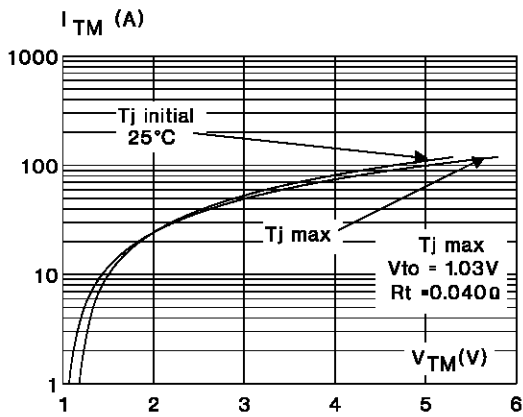
**Fig.7** : Non Repetitive surge peak on-state current versus number of cycles.



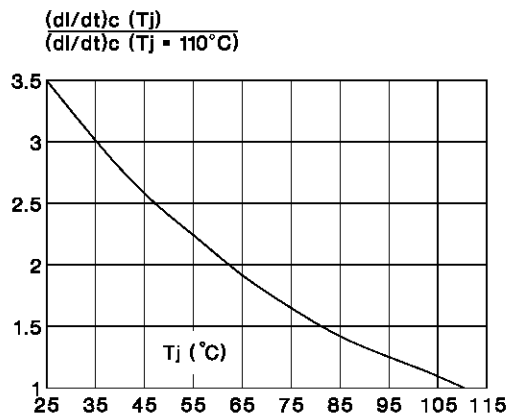
**Fig.8** : Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t \leq 10\text{ms}$ , and corresponding value of  $I^2t$ .



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

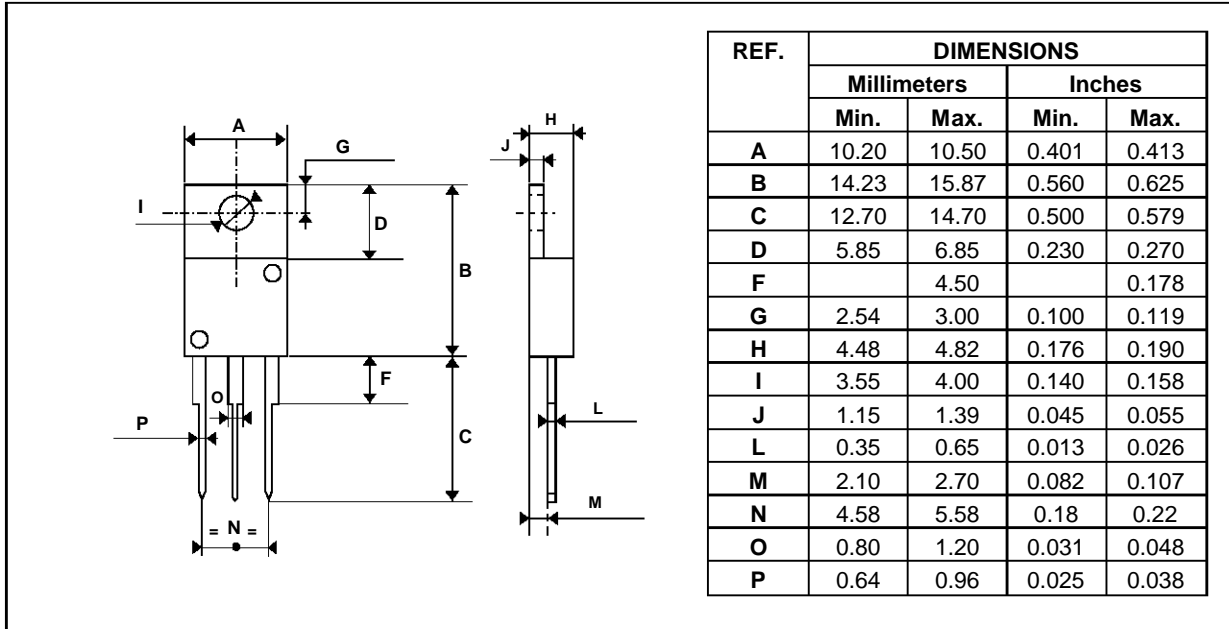


**Fig.10** : Relative variation of  $(di/dt)_c$  versus junction temperature.



**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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