

## BTA20/BTB20 Series

- Description:**

High current density due to double mesa technology;  
SIPOS and Glass Passivation.

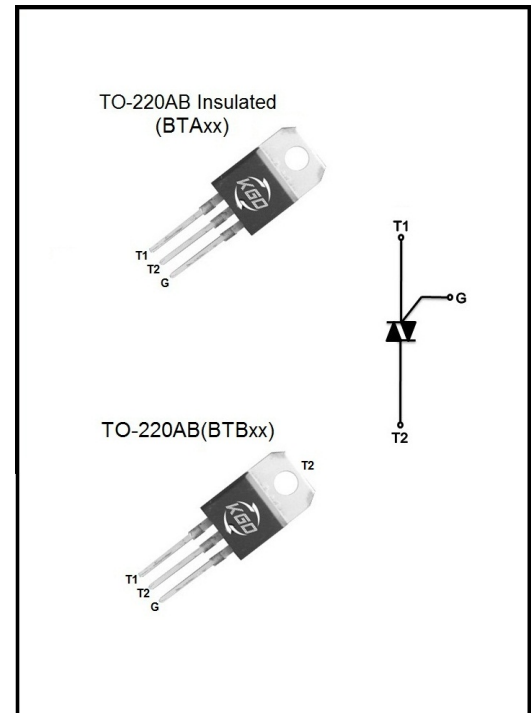
- Applications:**

BTA20/BTB20 series triacs is suitable for general purpose AC switching. They can be used as an ON/OFF function in applications such as static relays, heating regulation, induction motor starting circuits... or for phase control operation light dimmers, motor speed controllers.

- Features:**

BTA20/BTB20-XXXSW/CW/BW are 3 Quadrants TRIACS, They are specially recommended for use on inductive loads. BTA16 are isolated internally, they provide a 2500V RMS isolation voltage from all three terminals to external heatsink. Blocking voltage to 600/1200V  
On-state RMS current to 20A  
Non-repetitive peak on-state current to 200A

- Absolute Maximum Ratings**



| Symbol       | Parameter  | Conditions  | Min | Max  | Unit        |
|--------------|--|---|-----|------|-------------|
| $V_{DRM}$    | Repetitive peak off-state voltage  | $T_J=25^{\circ}C$                                       | 600 | 1200 | V           |
| $V_{RRM}$    | Repetitive peak Reverse voltage  | $T_J=25^{\circ}C$                                       | 600 | 1200 | V           |
| $I_{T(RMS)}$ | RMS on-state current<br>(full sine wave)                                 | TO-220AB  | -   | 20   | A           |
|              |  | TO-220AB Ins  |     |      |             |
| $I_{TSM}$    | Non-repetitive peak On-state current<br>(full cycle, $T_J=25^{\circ}C$ ) | $F=50Hz, t=20ms$  | -   | 200  | A           |
|              |  | $F=60Hz, t=16.7ms$                                      | -   | 210  | A           |
| $I^2t$       | $I^2t$ Value for fusing  | $T_p=10ms$  | -   | 200  | $A^2S$      |
| $di/dt$      | Rate of rise of on-state current   | $I_G=2 \times I_{GT}, t_r \leq 100ns, T_J=125^{\circ}C$ | -   | 50   | $A/\mu s$   |
| $I_{GM}$     | Peak gate current  | $t_p=20\mu s, T_J=125^{\circ}C$                         | -   | 4    | A           |
| $P_{G(AV)}$  | Average gate power   |   | -   | 1    | W           |
| $T_{STG}$    | Storage temperature  |   | -40 | 150  | $^{\circ}C$ |
| $T_J$        | Junction temperature   |   | -40 | 125  | $^{\circ}C$ |

**BTA20/BTB20 Series**
**● Electrical Characteristics**
**■ 3 Quadrants**

| Symbol      | Conditions  | Quadrant |     | BTA20/BTB20 |     |      | Unit      |
|-------------|---|----------|-----|-------------|-----|------|-----------|
|             |   |          |     | SW          | CW  | BW   |           |
| $I_{GT}$    | $V_D=12V, R_L=33\Omega$                                 | I-II-III | MAX | 10          | 35  | 50   | mA        |
| $V_{GT}$    |   | I-II-III | MAX |             | 1.3 |      | V         |
| $V_{GD}$    | $V_D=V_{DRM}, R_L=3.3K\Omega, T_j=125^\circ C$          | I-II-III | MIN |             | 0.2 |      | V         |
| $I_L$       | $I_T=1.2I_{GT}$   | I-III    | MAX | 20          | 50  | 70   | mA        |
|             |   | II       | MAX | 35          | 60  | 80   |           |
| $I_H$       | $I_T=100mA$   |          | MAX | 15          | 40  | 60   | mA        |
| $dv/dt$     | $V_{DM}=67\%V_{DRM}, \text{gate open}, T_j=125^\circ C$ |          | MIN | 40          | 400 | 1000 | $V/\mu s$ |
|             | $(dv/dt)_c=0.1 V/\mu s, T_j=125^\circ C$                |          |     | 8.5         | /   | /    |           |
| $(di/dt)_c$ | $(dv/dt)_c=10 V/\mu s, T_j=125^\circ C$                 |          | MIN | 3.0         | /   | /    | A/ms      |
|             | Without snubber, $T_j=125^\circ C$                      |          |     | /           | 8.5 | 14   |           |

**■ 4 Quadrants**

| Symbol      | Conditions  | Quadrant |     | BTA20/BTB20 |     | Unit      |
|-------------|---|----------|-----|-------------|-----|-----------|
|             |   |          |     | C           | B   |           |
| $I_{GT}$    | $V_D=12V, R_L=33\Omega$                                 | I-II-III | MAX | 25          | 50  | mA        |
|             |   | IV       |     | 50          | 100 |           |
| $V_{GT}$    |   | ALL      | MAX |             | 1.3 | V         |
| $V_{GD}$    | $V_D=V_{DRM}, R_L=3.3K\Omega, T_j=125^\circ C$          | ALL      | MIN |             | 0.2 | V         |
| $I_L$       | $I_T=1.2I_{GT}$   | I-III-IV | MAX | 40          | 50  | mA        |
|             |   | II       | MAX | 80          | 100 | mA        |
| $I_H$       | $I_T=100mA$   |          | MAX | 25          | 50  | mA        |
| $dv/dt$     | $V_{DM}=67\%V_{DRM}, \text{gate open}, T_j=125^\circ C$ |          | MIN | 200         | 400 | $V/\mu s$ |
| $(dv/dt)_c$ | $(di/dt)_c=7A/ms, T_j=125^\circ C$                      |          | MIN | 5           | 10  | $V/\mu s$ |

## BTA20/BTB20 Series

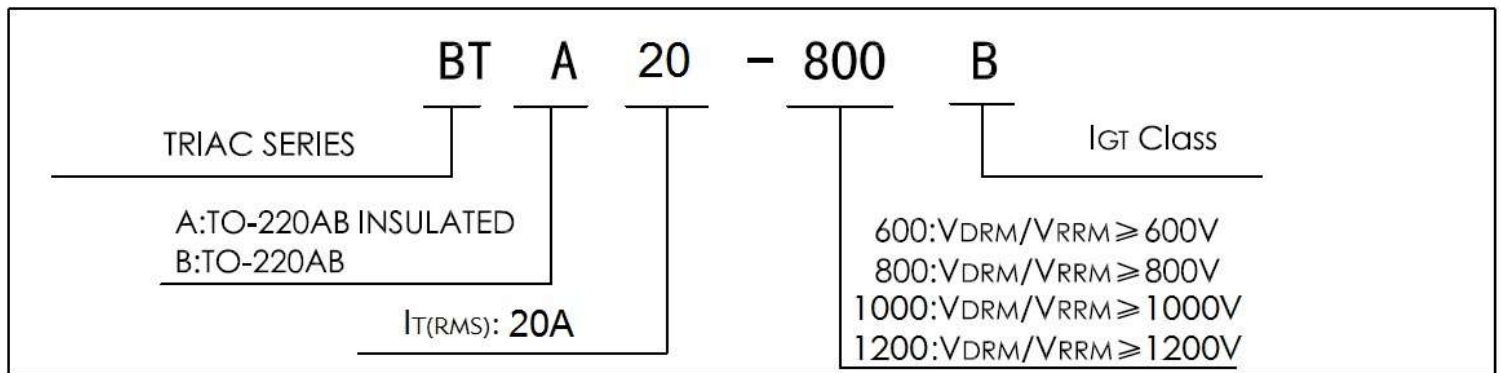
### ● Static Characteristics

| Symbol    | Conditions                 | Quadrant          |     | Value | Unit    |
|-----------|----------------------------|-------------------|-----|-------|---------|
| $V_{TM}$  | $I_T=25A, t_p=380\mu s$    | $T_J=25^\circ C$  | MAX | 1.55  | V       |
| $I_{DRM}$ | $V_D=V_{DRM}, V_R=V_{RRM}$ | $T_J=25^\circ C$  | MAX | 5     | $\mu A$ |
| $I_{RRM}$ |                            | $T_J=125^\circ C$ | MAX | 2     | mA      |

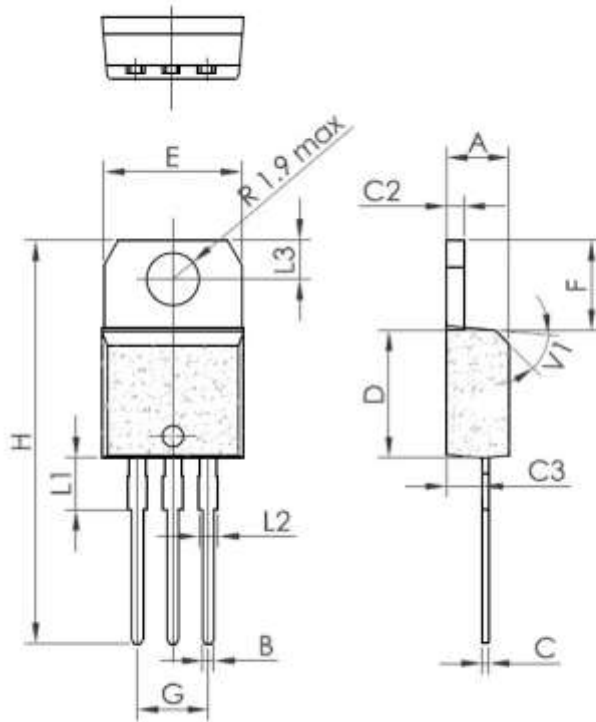
### ● Thermal Characteristics

| Symbol         | Parameter            | Value              | Unit |
|----------------|----------------------|--------------------|------|
| $R_{th(j-mb)}$ | Junction to Case(AC) | TO-220AB           | 1.2  |
|                |                      | TO-220AB Insulated | 2.1  |
| $R_{th(j-a)}$  | Junction to ambient  | TO-220AB           | 60   |
|                |                      | TO-220AB Insulated |      |

### ● Ordering Information

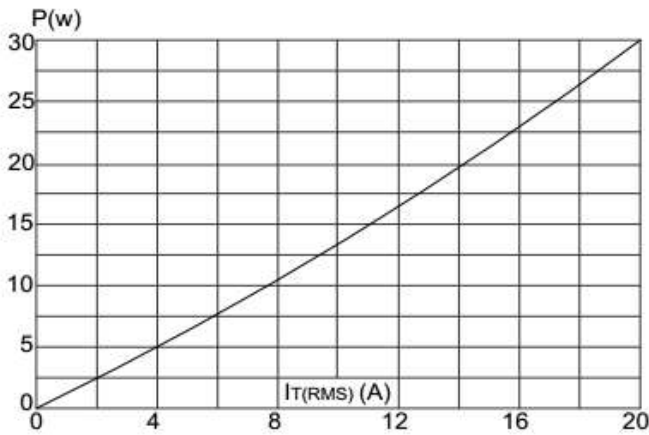


## ● Package Outline Dimensions

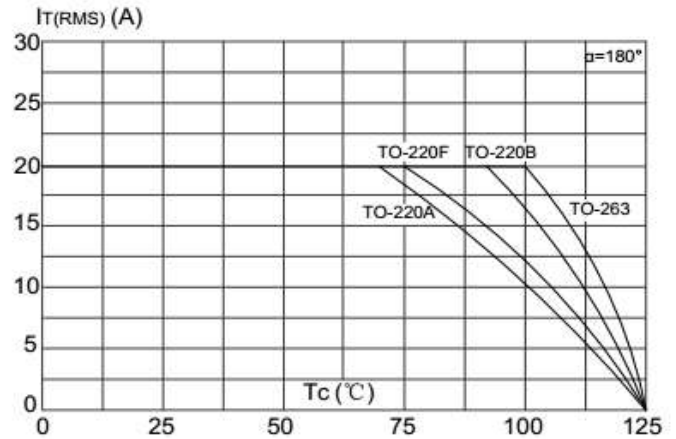
**TO-220AB**


| Ref. | Dimensions  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    | 4.4         |      | 4.6  | 0.173  |       | 1.181 |
| B    | 0.61        |      | 0.88 | 0.024  |       | 0.034 |
| C    | 0.49        |      | 0.70 | 0.019  |       | 0.027 |
| C2   | 1.23        |      | 1.32 | 0.048  |       | 0.051 |
| C3   | 2.4         |      | 2.72 | 0.094  |       | 0.107 |
| D    | 8.6         |      | 9.7  | 0.338  |       | 0.382 |
| E    | 10          |      | 10.4 | 0.393  |       | 0.409 |
| F    | 6.2         |      | 6.6  | 0.244  |       | 0.259 |
| G    | 4.8         |      | 5.4  | 0.189  |       | 0.213 |
| H    | 28.0        |      | 29.8 | 11.0   |       | 11.7  |
| L1   |             | 3.75 |      |        | 0.147 |       |
| L2   | 1.14        |      | 1.7  | 0.044  |       | 0.066 |
| L3   | 2.65        |      | 2.95 | 0.104  |       | 0.116 |
| V1   |             | 40°  |      |        | 40°   |       |

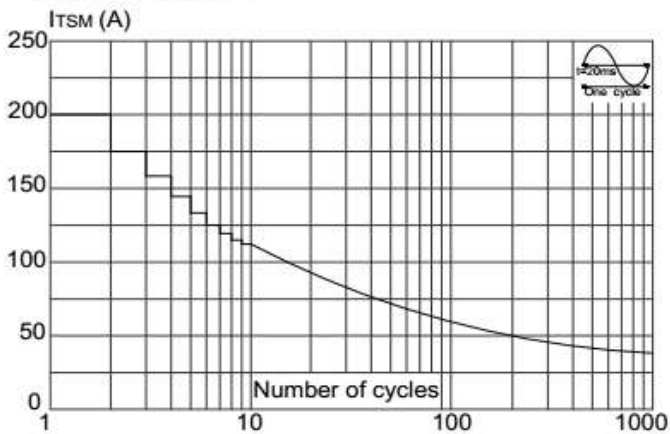
**FIG.1** Maximum power dissipation versus RMS on-state current



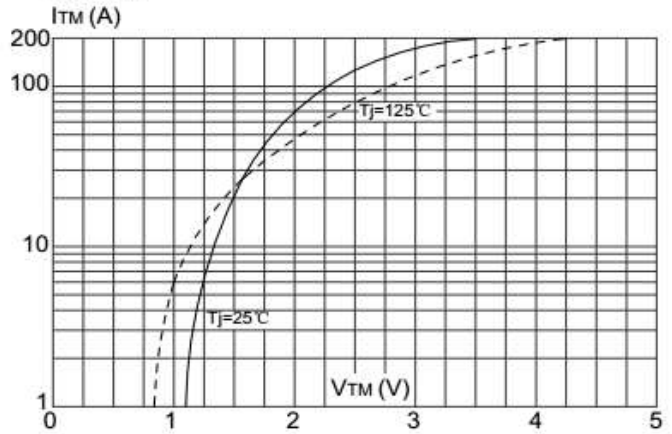
**FIG.2:** RMS on-state current versus case temperature



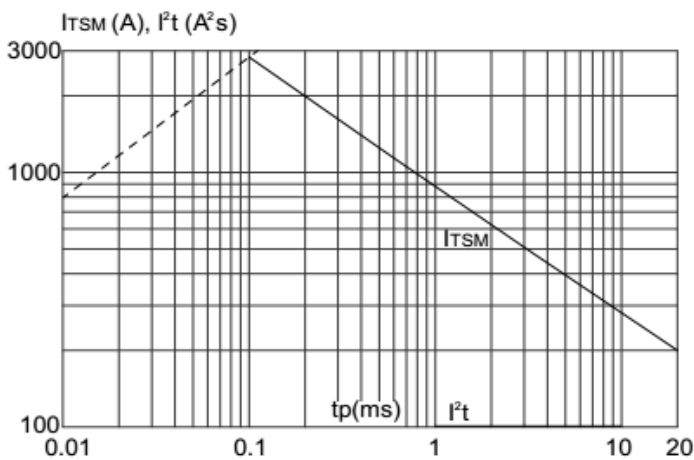
**FIG.3:** Surge peak on-state current versus number of cycles



**FIG.4:** On-state characteristics (maximum values)



**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$ , and corresponding value of  $I^2t$  ( $di/dt < 100\text{A}/\mu\text{s}$ )



**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature

