



## BTA04/BTB04 Series/T4 Series 4A TRIACs

### DESCRIPTION:

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

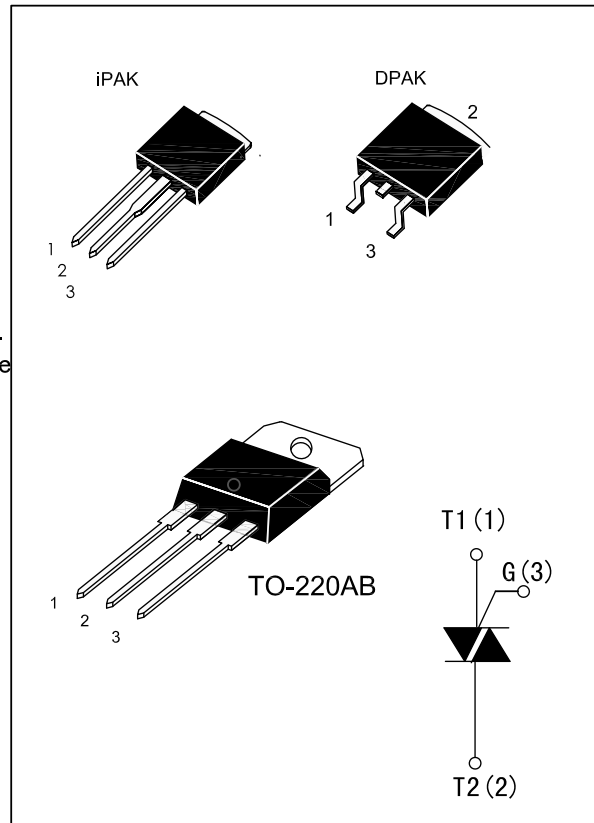
BTA04/BTB04 series triacs is suitable for general purpose AC switching.They can be used as an ON/OFF Function in applications such as static relays, heating regulation, induction motor starting circuits... or for phase control operation light dimmers,motorspeed controllers.

T4×× Series are 3 Quadrants triacs,They are specially recommended for use on inductive loads.

The TO-220AB ins Family are 2500V RMS insulating voltage.

### MAIN FEATURES

| Symbol                          | Value       | Unit |
|---------------------------------|-------------|------|
| $I_T(\text{RMS})$               | 4           | A    |
| $V_{\text{DRM}}/V_{\text{RRM}}$ | 600 and 800 | V    |
| $I_{\text{GT}}(\text{Q1})$      | 5 to 35     | mA   |



### ABSOLUTE MAXIMUM RATINGS

| Parameter  |  | Symbol             | Value       | Unit                   |
|--|--|--------------------|-------------|------------------------|
| Storage junction temperature range   |  | $T_{\text{stg}}$   | -40 to +150 | $^{\circ}\text{C}$     |
| Operating junction temperature range   |  | $T_j$              | -40 to +125 | $^{\circ}\text{C}$     |
| Repetitive Peak Off-state Voltage  | $T_j=25^{\circ}\text{C}$                     | $V_{\text{DRM}}$   | 600and800   | V                      |
| Repetitive Peak Reverse Voltage  | $T_j=25^{\circ}\text{C}$                     | $V_{\text{RRM}}$   | 600and800   |                        |
| Non repetitive Surge Peak Off-state Voltage  | $t_p=10\text{ms}, T_j=25^{\circ}\text{C}$    | $V_{\text{DSM}}$   | 700and900   | V                      |
| Non repetitive Peak Reverse Voltage  |  | $V_{\text{RSM}}$   | 700and900   |                        |
| RMS on-state current<br>(full sine wave)   | iPAK/DPAK/TO-220AB $T_c=105^{\circ}\text{C}$ | $I_T(\text{RMS})$  | 4           | A                      |
|  | TO-220AB ins $T_c=100^{\circ}\text{C}$       |                    |             |                        |
| Non repetitive surge peak on-state current<br>(full cycle, $T_j=25^{\circ}\text{C}$ )  | $f = 60 \text{ Hz}$ $t = 16.7\text{ms}$      | $I_{\text{TSM}}$   | 38          | A                      |
|  | $f = 50 \text{ Hz}$ $t = 20\text{ms}$        |                    | 35          |                        |
| $I^2t$ Value for fusing  | $t_p=10\text{ms}$                            | $I^2t$             | 6           | $\text{A}^2\text{s}$   |
| Critical rate of rise of on-state current<br>$I_G=2 \times I_{\text{GT}}$ , $t_r \leq 100 \text{ ns}$ , $f=120\text{Hz}$ , $T_j=125^{\circ}\text{C}$ |  | $dI/dt$            | 50          | $\text{A}/\mu\text{s}$ |
| Peak gate current  | $t_p=20\mu\text{s}, T_j=125^{\circ}\text{C}$ | $I_{\text{GM}}$    | 4           | A                      |
| Average gate power dissipation   | $T_j=125^{\circ}\text{C}$                    | $P_{\text{G(AV)}}$ | 1           | W                      |

ELECTRICAL CHARACTERISTICS(T<sub>j</sub>=25 °C unless otherwise specified)

## ● BTA04/JBTB04 Series

| Symbol               | Test Condition   | Qua<br>drant   |      | BTA04/BTB04 |         |          |          | Unit |
|----------------------|--|----------------|------|-------------|---------|----------|----------|------|
|                      |  |                |      | T           | D       | S        | A        |      |
| I <sub>GT</sub>      | V <sub>D</sub> =12V R <sub>L</sub> =33Ω                                      | I-II-III<br>IV | MAX. | 5<br>5      | 5<br>10 | 10<br>10 | 10<br>25 | mA   |
| V <sub>GT</sub>      |  | ALL            | MAX. | 1.5         |         |          |          | V    |
| V <sub>GD</sub>      | V <sub>D</sub> =V <sub>DRM</sub> R <sub>L</sub> =3.3KΩ T <sub>j</sub> =125°C | ALL            | MIN. | 0.2         |         |          |          | V    |
| I <sub>L</sub>       | I <sub>G</sub> =1.2I <sub>GT</sub>   | I-III-IV       | MAX. | 10          | 10      | 20       | 20       | mA   |
|                      |  | II             | MAX. | 20          | 20      | 40       | 40       | mA   |
| I <sub>H</sub>       | I <sub>T</sub> =500mA  |                | MAX. | 15          | 15      | 25       | 25       | mA   |
| dV/dt                | V <sub>D</sub> =67%V <sub>DRM</sub> gate open T <sub>j</sub> =125°C          |                | MIN. | 10          | 10      | 10       | 10       | V/μs |
| (dV/dt) <sub>c</sub> | (dI/dt) <sub>c</sub> =1.8A/ms T <sub>j</sub> =125°C                          |                | MIN. | 1           | 1       | 5        | 5        | V/μs |

## ● T4 Series

| Symbol               | Test Condition   | Quadrant |      | T4   |      |      | Unit |
|----------------------|--|----------|------|------|------|------|------|
|                      |  |          |      | T405 | T410 | T435 |      |
| I <sub>GT</sub>      | V <sub>D</sub> =12V R <sub>L</sub> =33Ω                                      | I-II-III | MAX. | 5    | 10   | 35   | mA   |
| V <sub>GT</sub>      |  | I-II-III | MAX. | 1.3  |      |      | V    |
| V <sub>GD</sub>      | V <sub>D</sub> =V <sub>DRM</sub> R <sub>L</sub> =3.3KΩ T <sub>j</sub> =125°C | I-II-III | MIN. | 0.2  |      |      | V    |
| I <sub>L</sub>       | I <sub>G</sub> =1.2I <sub>GT</sub>   | I-III    | MAX. | 10   | 25   | 50   | mA   |
|                      |  | II       | MAX. | 15   | 30   | 60   | mA   |
| I <sub>H</sub>       | I <sub>T</sub> =500mA  |          | MAX. | 10   | 15   | 35   | mA   |
| dV/dt                | V <sub>D</sub> =67%V <sub>DRM</sub> gate open T <sub>j</sub> =125°C          |          | MIN. | 20   | 40   | 400  | V/μs |
| (dI/dt) <sub>c</sub> | (dV/dt) <sub>c</sub> =0.1V/μs T <sub>j</sub> =125°C                          |          | MIN. | 1.8  | 2.7  | ---  | A/mS |
|                      | (dV/dt) <sub>c</sub> =10V/μs T <sub>j</sub> =125°C                           |          |      | 0.9  | 2.0  | ---  |      |
|                      | Without snubber T <sub>j</sub> =125°C  |          |      | ---  | ---  | 2.5  |      |

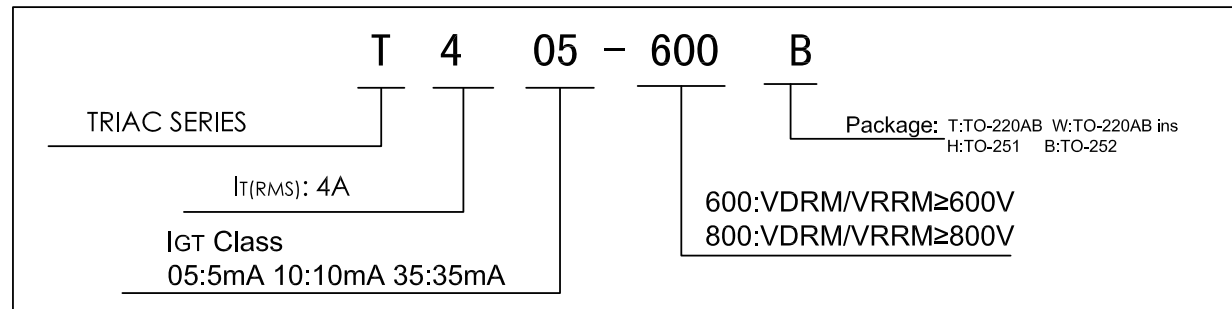
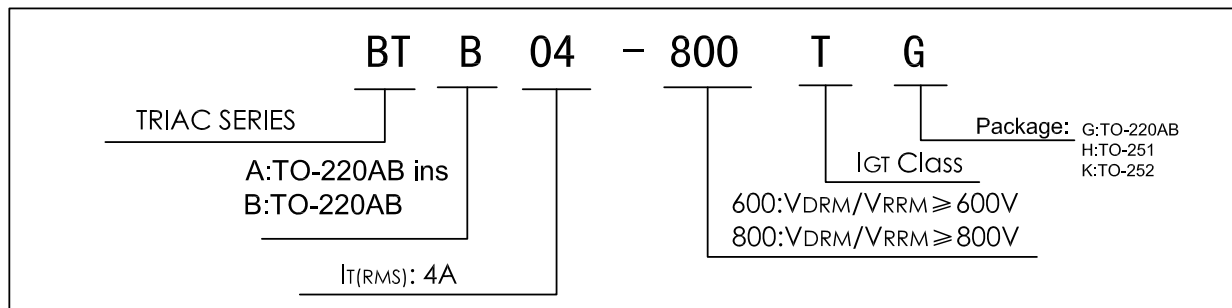
**STATIC CHARACTERISTICS**

| Symbol                               | Parameter   |                      | Value(MAX.) | Unit |
|--------------------------------------|---|----------------------|-------------|------|
| V <sub>TM</sub>                      | I <sub>TM</sub> =5.5A, t <sub>p</sub> =380μs                      | T <sub>j</sub> =25℃  | 1.6         | V    |
| I <sub>DRM</sub><br>I <sub>RRM</sub> | V <sub>D</sub> =V <sub>DRM</sub> V <sub>R</sub> =V <sub>RRM</sub> | T <sub>j</sub> =25℃  | 5           | μA   |
|                                      |   | T <sub>j</sub> =125℃ | 1           | mA   |

**THERMAL RESISTANCES**

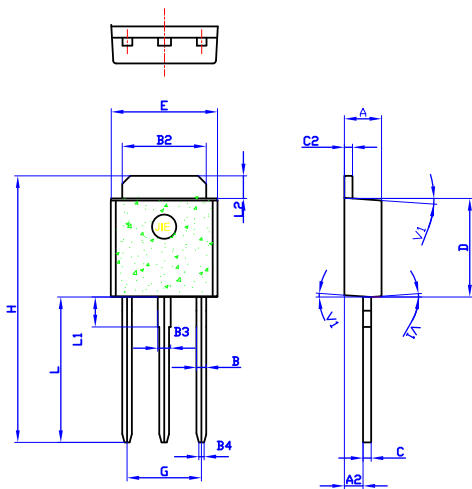
| Symbol                  | Parameter            |                    | Value | Unit |
|-------------------------|----------------------|--------------------|-------|------|
| R <sub>th</sub> ( J -C) | Junction to Case(AC) | iAPK/DPAK/TO-220AB | 2.6   | ℃/W  |
|                         |                      | TO-220AB ins       | 4.0   |      |

**ORDERING INFORMATION**



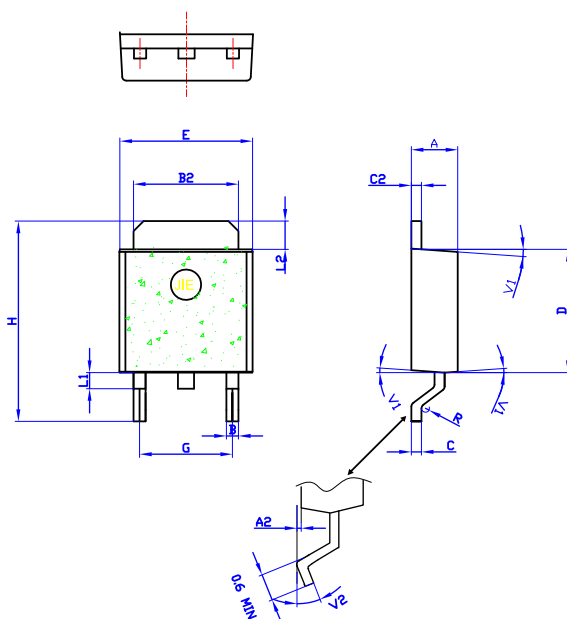
PACKAGE MECHANICAL DATA

iPAK



| Ref. | Dimensions  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    | 2.2         |      | 2.4  | 0.086  |       | 0.095 |
| A2   | 0.9         |      | 1.1  | 0.035  |       | 0.043 |
| B    | 0.55        |      | 0.65 | 0.021  |       | 0.026 |
| B2   | 5.1         |      | 5.4  | 0.200  |       | 0.212 |
| B3   | 0.76        |      | 0.85 | 0.030  |       | 0.033 |
| B4   |             | 0.32 |      |        | 0.013 |       |
| C    | 0.45        |      | 0.62 | 0.017  |       | 0.024 |
| C2   | 0.48        |      | 0.62 | 0.019  |       | 0.024 |
| D    | 6           |      | 6.2  | 0.236  |       | 0.244 |
| E    | 6.4         |      | 6.7  | 0.252  |       | 0.264 |
| G    | 4.4         |      | 4.7  | 0.173  |       | 0.185 |
| H    | 16.0        |      | 16.7 | 0.630  |       | 0.658 |
| L    | 8.9         |      | 9.4  | 0.350  |       | 0.370 |
| L1   | 1.8         |      | 1.9  | 0.071  |       | 0.075 |
| L2   | 1.37        |      | 1.5  | 0.054  |       | 0.059 |
| V1   |             | 4°   |      |        | 4°    |       |

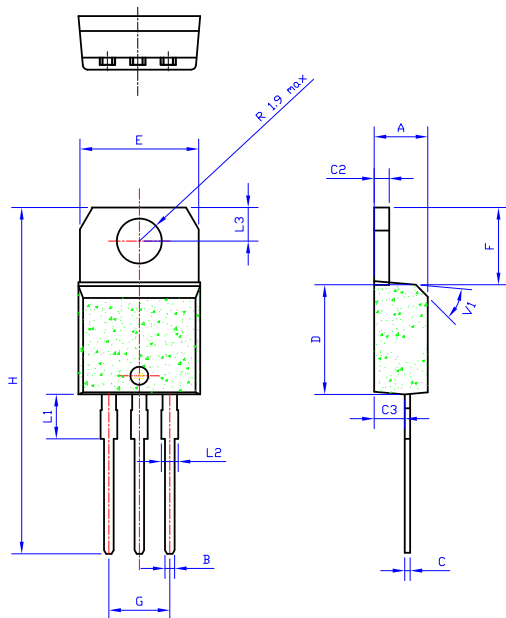
DPAK



| Ref. | Dimensions  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    | 2.2         |      | 2.4  | 0.086  |       | 0.095 |
| A2   | 0.03        |      | 0.23 | 0.001  |       | 0.009 |
| B    | 0.55        |      | 0.65 | 0.021  |       | 0.026 |
| B2   | 5.1         |      | 5.4  | 0.200  |       | 0.212 |
| C    | 0.45        |      | 0.62 | 0.017  |       | 0.024 |
| C2   | 0.48        |      | 0.62 | 0.019  |       | 0.024 |
| D    | 6           |      | 6.2  | 0.236  |       | 0.244 |
| E    | 6.4         |      | 6.7  | 0.252  |       | 0.264 |
| G    | 4.40        |      | 4.70 | 0.173  |       | 0.185 |
| H    | 9.35        |      | 10.1 | 0.368  |       | 0.397 |
| L1   |             | 0.8  |      |        | 0.031 |       |
| L2   | 1.37        |      | 1.5  | 0.054  |       | 0.059 |
| V1   |             | 4°   |      |        | 4°    |       |
| V2   | 0°          |      | 8°   | 0°     |       | 8°    |

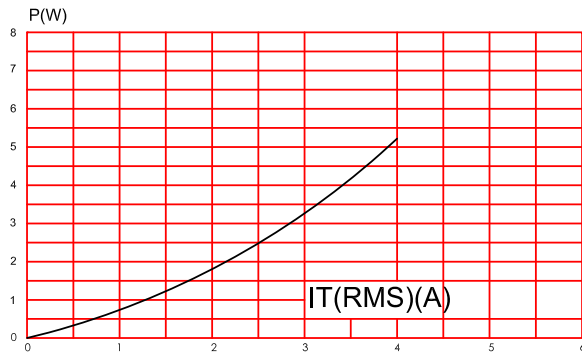
PACKAGE MECHANICAL DATA

TO-220AB

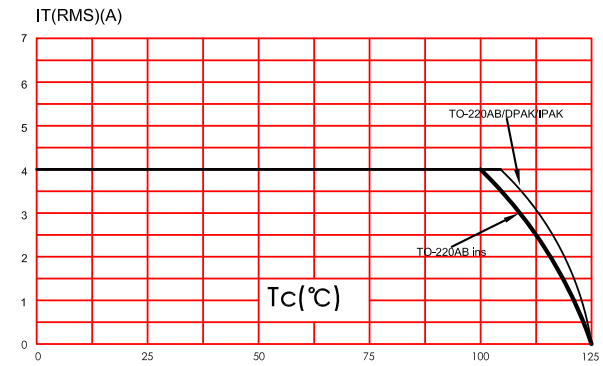


| Ref. | Dimensions  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    | 4.4         |      | 4.6  | 0.173  |       | 1.181 |
| B    | 0.61        |      | 0.88 | 0.024  |       | 0.034 |
| C    | 0.46        |      | 0.70 | 0.018  |       | 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    | 9.8         |      | 10.4 | 0.386  |       | 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°   |       |

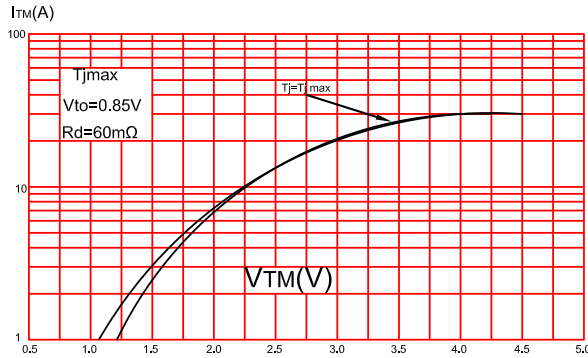
**FIG.1:** Maximum power dissipation versus RMS on-state current(full cycle)



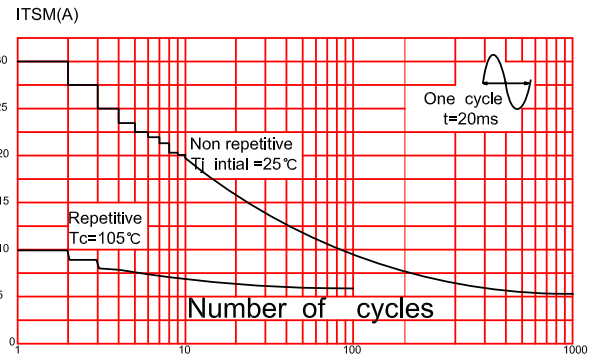
**FIG.2:** RMS on-state current versus case temperature(full cycle)



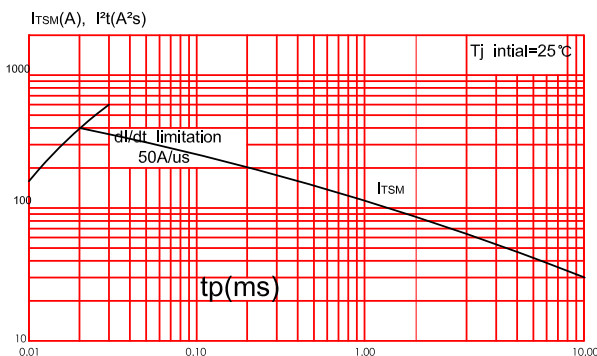
**FIG.3:** On-state characteristics (maximum values)



**FIG.4:** Surge peak on-state current versus number of cycles



**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10ms$ .



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

