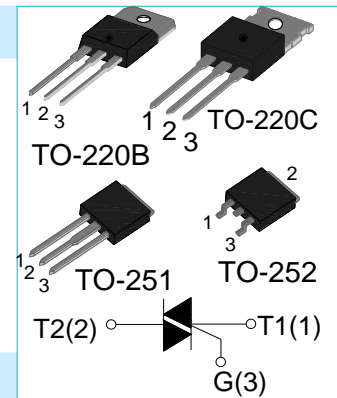


 Standard TRIACS

BTB04 Serial

**Main Features:**

|              |                   |          |
|--------------|-------------------|----------|
| $I_{T(RMS)}$ | $V_{DRM}/V_{RRM}$ | $V_{TM}$ |
| 4 A          | 600V and 800 V    | 1.55 V   |



**Description:**

BTB04 series triacs, with high ability to withstand the shock loading of large current, provide high dv/dt rate with strong resistance to electromagnetic interface. With high commutation performances, 3 quadrants products especially recommended for use on inductive load.

**Absolute Ratings(limiting values) :**

| Symbol       | Parameter  | Value                   | Unit             |   |
|--------------|--|-------------------------|------------------|---|
| $T_{stg}$    | Storage junction temperature range                             | - 40 to + 150           | °C               |   |
| $T_j$        | Operating junction temperature range                           | - 40 to + 125           | °C               |   |
| $I_{T(RMS)}$ | RMS on-state current   | TO-220BC (TC=95°C)      | 4                | A |
|              |  | TO-251/TO-252 (TC=86°C) |                  |   |
| $I_{TSM}$    | Non repetitive surge peak on-state current (full cycle,F=50Hz) | 40                      | A                |   |
| $V_{DRM}$    | Repetitive peak off-state voltage( $T_j = 25^\circ\text{C}$ )  | 600 and 800             | V                |   |
| $V_{RRM}$    | Repetitive peak reverse voltage( $T_j = 25^\circ\text{C}$ )    | 600 and 800             | V                |   |
| $V_{DSM}$    | Non repetitive surge peak Off-state voltage                    | $V_{DRM} + 100$         | V                |   |
| $V_{RSM}$    | Non repetitive peak reverse voltage                            | $V_{RRM} + 100$         | V                |   |
| $I^2t$       | $I^2t$ value for fusing $t_p = 10$ ms                          | 8                       | A <sup>2</sup> s |   |

|                          |   |    |            |
|--------------------------|---|----|------------|
| <b>dI/dt</b>             | Critical rate of rise of on-state current ( $I_G = 2 \times I_{GT}$ ) | 50 | A/ $\mu$ s |
| <b>I<sub>GM</sub></b>    | Peak gate current   | 4  | A          |
| <b>P<sub>G(AV)</sub></b> | Average gate power dissipation  | 1  | W          |
| <b>P<sub>GM</sub></b>    | Peak gate power   | 5  | W          |

### Electrical Characteristics :

| Symbol                     | Test Condition                                   | Quadrant | Range | Value |    |     |      | Unit       |
|----------------------------|--|----------|-------|-------|----|-----|------|------------|
|                            |  |          |       | T     | S  | C   | B    |            |
| <b>I<sub>GT</sub></b>      | $V_D=12V$ $R_L=33\Omega$                         | I-II-III | MAX   | 5     | 10 | 35  | 50   | mA         |
| <b>V<sub>GT</sub></b>      |  | I-II-III | MAX   | 1.5   |    |     |      | V          |
| <b>V<sub>GD</sub></b>      | $V_D=V_{DRM}$ $R_L=3.3k\Omega$ $T_j=125^\circ C$ | I-II-III | MIN   | 0.2   |    |     |      | V          |
| <b>I<sub>L</sub></b>       | $I_G=1.2 I_{GT}$                                 | I-III    | MAX   | 10    | 20 | 50  | 70   | mA         |
|                            |  | II       |       | 15    | 35 | 60  | 80   |            |
| <b>I<sub>H</sub></b>       | $I_T=100mA$                                      |          | MAX   | 10    | 15 | 35  | 60   | mA         |
| <b>dV/dt</b>               | $V_D=2/3 V_{DRM}$ Gate Open $T_j=125^\circ C$    |          | MIN   | 20    | 40 | 400 | 1000 | V/ $\mu$ s |
| <b>(dV/dt)<sub>c</sub></b> | $(dI/dt)_c=1.8A/ms$ $T_j=125^\circ C$            |          | MIN   | 0.5   | 1  | -   | -    | V/ $\mu$ s |

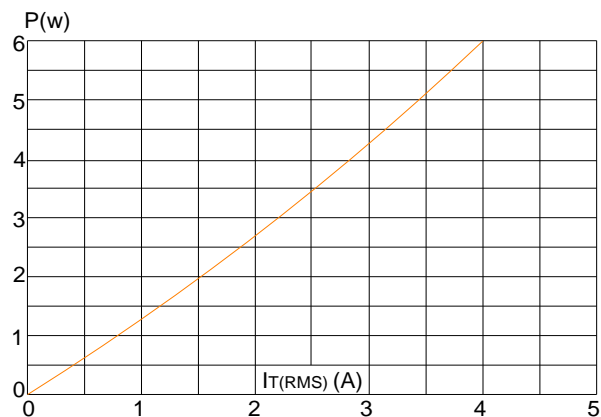
### Static Characteristics

| Symbol   | Parameter                     |                   | Value(MAX) | Unit    |
|--|-------------------------------|-------------------|------------|---------|
| <b>V<sub>TM</sub></b>                            | $I_{TM}=5.5A$ $tp=380\mu s$   | $T_j=25^\circ C$  | 1.55       | V       |
| <b>I<sub>DRM</sub></b><br><b>I<sub>RRM</sub></b> | $V_D=V_{DRM}$ , $V_R=V_{RRM}$ | $T_j=25^\circ C$  | 10         | $\mu A$ |
|  |                               | $T_j=125^\circ C$ | 0.75       | mA      |

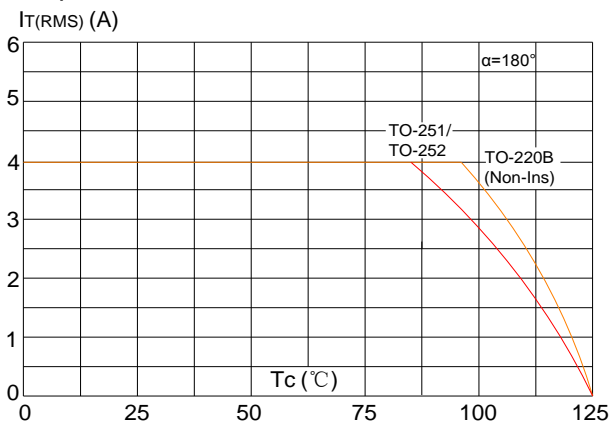
### Thermal Resistances :

| Symbol                     | Parameter            |               | Value | Unit         |
|----------------------------|----------------------|---------------|-------|--------------|
| <b>R<sub>th(j-c)</sub></b> | junction to base(AC) | TO-220BC      | 2.4   | $^\circ C/W$ |
|                            |                      | TO-251/TO-252 | 4.2   |              |

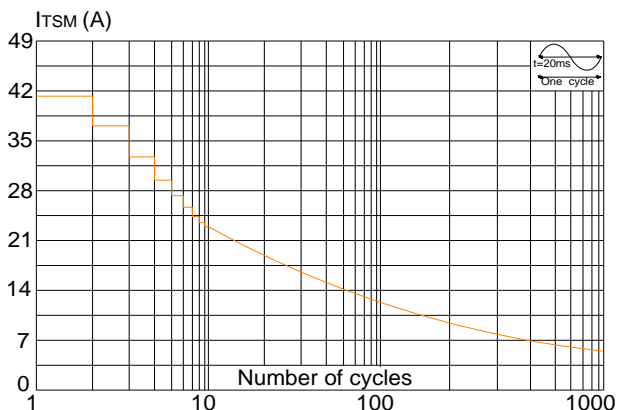
**FIG.1:** Maximum power dissipation versus RMS on-state current



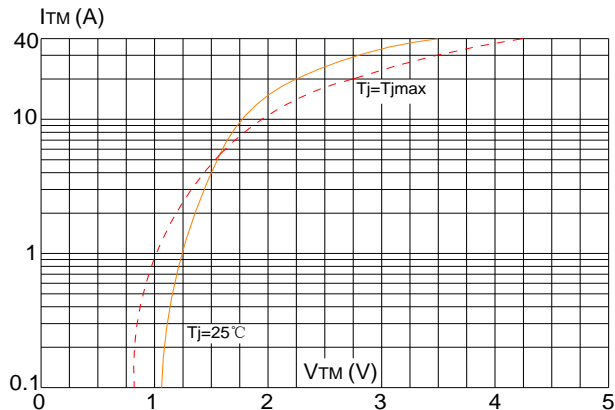
**FIG.2:** RMS on-state current versus case temperature



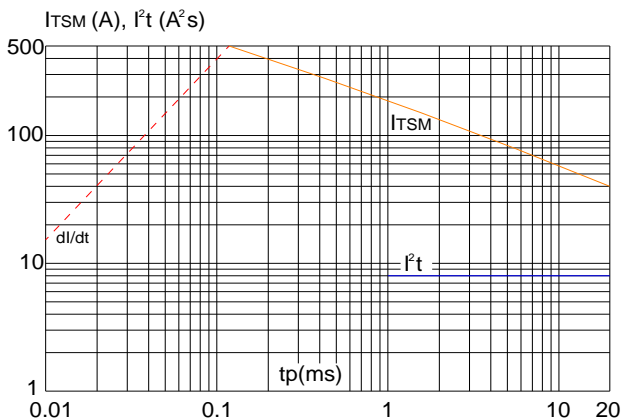
**FIG.3:** Surge peak on-state current versus number of cycles



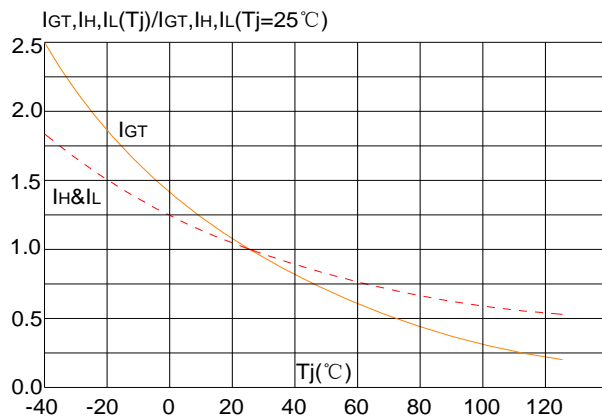
**FIG.4:** On-state characteristics (maximum values)



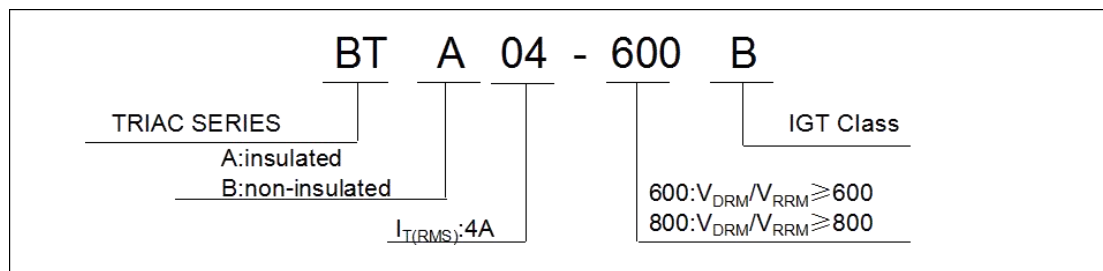
**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20ms$  and corresponding value of  $I^2t$  ( $di/dt < 50A/\mu s$ )



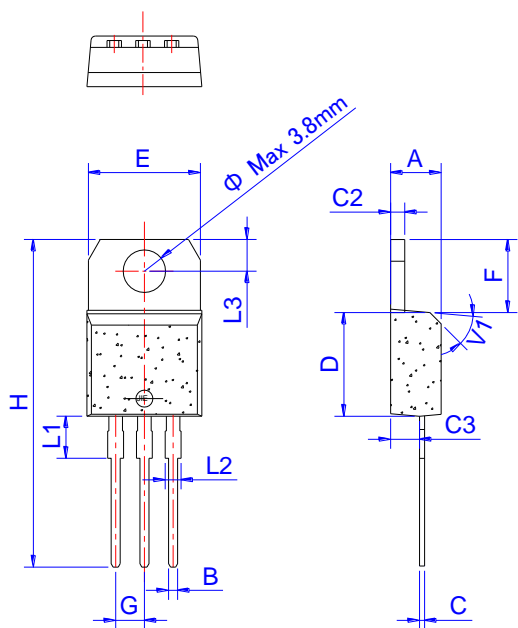
**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature



## Ordering Information

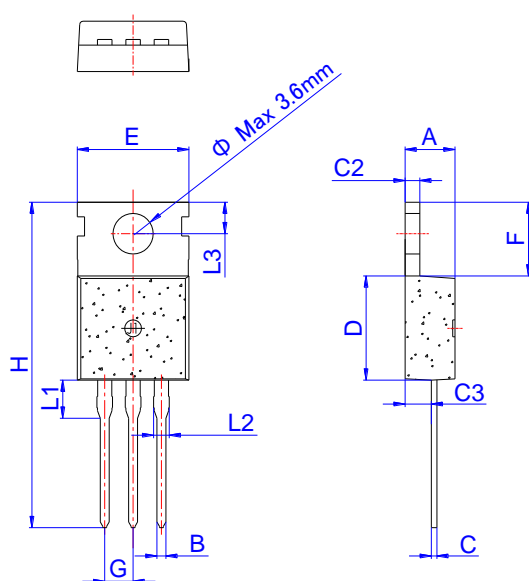


## Package Mechanical Data :



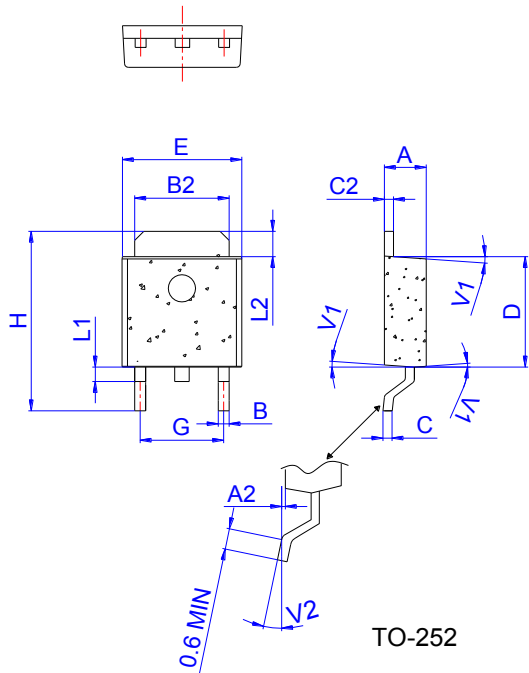
TO-220B Non-Ins

| Ref. | Dimensions  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    | 4.40        |      | 4.60 | 0.173  |       | 0.181 |
| B    | 0.61        |      | 0.88 | 0.024  |       | 0.035 |
| C    | 0.46        |      | 0.70 | 0.018  |       | 0.028 |
| C2   | 1.21        |      | 1.32 | 0.048  |       | 0.052 |
| C3   | 2.40        |      | 2.72 | 0.094  |       | 0.107 |
| D    | 8.60        |      | 9.70 | 0.339  |       | 0.382 |
| E    | 9.60        |      | 10.4 | 0.378  |       | 0.409 |
| F    | 6.20        |      | 6.60 | 0.244  |       | 0.260 |
| G    |             | 2.54 |      |        | 0.1   |       |
| H    | 28.0        |      | 29.8 | 1.102  |       | 1.173 |
| L1   |             | 3.75 |      |        | 0.148 |       |
| L2   | 1.14        |      | 1.70 | 0.045  |       | 0.067 |
| L3   | 2.65        |      | 2.95 | 0.104  |       | 0.116 |
| V1   |             | 45°  |      |        | 45°   |       |

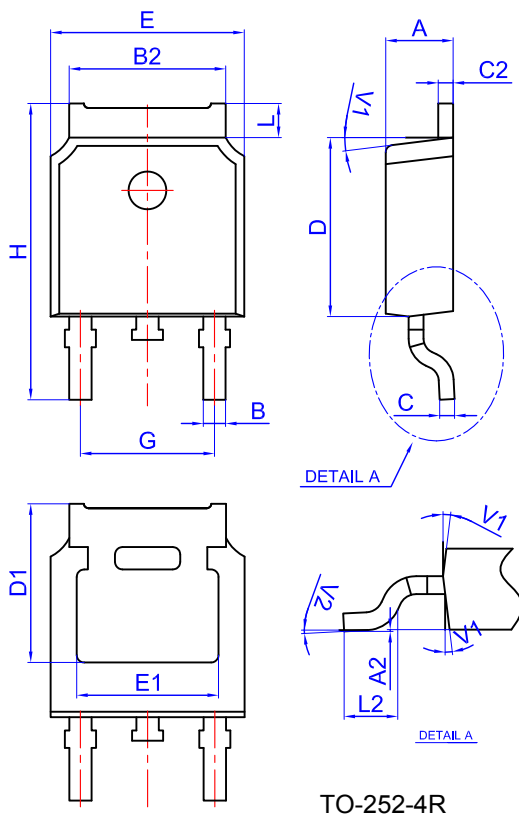


TO-220C

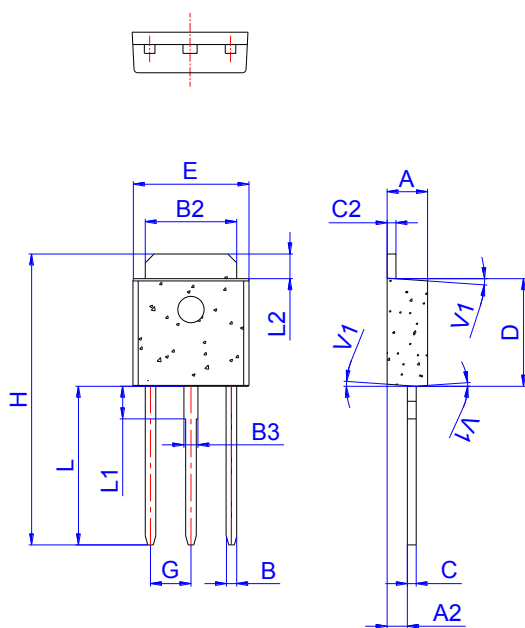
| Ref. | Dimensions  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    | 4.40        |      | 4.60 | 0.173  |       | 0.181 |
| B    | 0.70        |      | 0.90 | 0.028  |       | 0.035 |
| C    | 0.45        |      | 0.60 | 0.018  |       | 0.024 |
| C2   | 1.23        |      | 1.32 | 0.048  |       | 0.052 |
| C3   | 2.20        |      | 2.60 | 0.087  |       | 0.102 |
| D    | 8.90        |      | 9.90 | 0.350  |       | 0.390 |
| E    | 9.90        |      | 10.3 | 0.390  |       | 0.406 |
| F    | 6.30        |      | 6.90 | 0.248  |       | 0.272 |
| G    |             | 2.54 |      |        | 0.1   |       |
| H    | 28.0        |      | 29.8 | 1.102  |       | 1.173 |
| L1   |             | 3.39 |      |        | 0.133 |       |
| L2   | 1.14        |      | 1.70 | 0.045  |       | 0.067 |
| L3   | 2.65        |      | 2.95 | 0.104  |       | 0.116 |
| Φ    |             | 3.6  |      |        | 0.142 |       |



| Ref. | Dimensions  |      |      |        |      |       |
|------|-------------|------|------|--------|------|-------|
|      | Millimeters |      |      | Inches |      |       |
|      | Min.        | Typ. | Max. | Min.   | Typ. | Max.  |
| A    | 2.20        |      | 2.40 | 0.086  |      | 0.095 |
| A2   | 0.03        |      | 0.23 | 0.001  |      | 0.009 |
| B    | 0.55        |      | 0.65 | 0.022  |      | 0.026 |
| B2   | 5.10        |      | 5.40 | 0.200  |      | 0.213 |
| C    | 0.45        |      | 0.62 | 0.018  |      | 0.024 |
| C2   | 0.48        |      | 0.62 | 0.019  |      | 0.024 |
| D    | 6.00        |      | 6.20 | 0.236  |      | 0.244 |
| E    | 6.40        |      | 6.70 | 0.252  |      | 0.264 |
| G    | 4.40        |      | 4.70 | 0.173  |      | 0.185 |
| H    | 9.35        |      | 10.6 | 0.368  |      | 0.417 |
| L1   | 1.30        |      | 1.70 | 0.051  |      | 0.067 |
| L2   | 1.37        |      | 1.50 | 0.054  |      | 0.059 |
| V1   |             | 4°   |      |        | 4°   |       |
| V2   |             | 0°   | 8°   |        | 0°   | 8°    |



| Ref. | Dimensions  |      |       |          |      |       |
|------|-------------|------|-------|----------|------|-------|
|      | Millimeters |      |       | Inches   |      |       |
|      | Min.        | Typ. | Max.  | Min.     | Typ. | Max.  |
| A    | 2.10        |      | 2.50  | 0.083    |      | 0.098 |
| A2   | 0           |      | 0.10  | 0        |      | 0.004 |
| B    | 0.66        |      | 0.86  | 0.026    |      | 0.034 |
| B2   | 5.18        |      | 5.48  | 0.202    |      | 0.216 |
| C    | 0.40        |      | 0.60  | 0.016    |      | 0.024 |
| C2   | 0.44        |      | 0.58  | 0.017    |      | 0.023 |
| D    | 5.90        |      | 6.30  | 0.232    |      | 0.248 |
| D1   | 5.30REF     |      |       | 0.209REF |      |       |
| E    | 6.40        |      | 6.80  | 0.252    |      | 0.268 |
| E1   | 4.63        |      |       | 0.182    |      |       |
| G    | 4.47        |      | 4.67  | 0.176    |      | 0.184 |
| H    | 9.50        |      | 10.70 | 0.374    |      | 0.421 |
| L    | 1.09        |      | 1.21  | 0.043    |      | 0.048 |
| L2   | 1.35        |      | 1.65  | 0.053    |      | 0.065 |
| V1   |             | 7°   |       |          | 7°   |       |
| V2   |             | 0°   | 6°    |          | 0°   | 6°    |



TO-251

| Ref. | Dimensions  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    | 2.20        |      | 2.40 | 0.086  |       | 0.095 |
| A2   | 0.90        |      | 1.20 | 0.035  |       | 0.047 |
| B    | 0.55        |      | 0.65 | 0.022  |       | 0.026 |
| B2   | 5.10        |      | 5.40 | 0.200  |       | 0.213 |
| B3   | 0.76        |      | 0.85 | 0.030  |       | 0.033 |
| C    | 0.45        |      | 0.62 | 0.018  |       | 0.024 |
| C2   | 0.48        |      | 0.62 | 0.019  |       | 0.024 |
| D    | 6.00        |      | 6.20 | 0.236  |       | 0.244 |
| E    | 6.40        |      | 6.70 | 0.252  |       | 0.264 |
| G    |             | 2.30 |      |        | 0.091 |       |
| H    | 16.0        |      | 17.0 | 0.630  |       | 0.669 |
| L    | 8.90        |      | 9.40 | 0.350  |       | 0.370 |
| L1   | 1.80        |      | 1.90 | 0.071  |       | 0.075 |
| L2   | 1.37        |      | 1.50 | 0.054  |       | 0.059 |
| V1   |             | 4°   |      |        | 4°    |       |