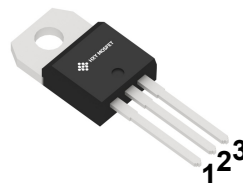


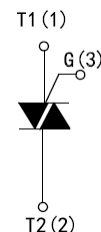


## Description

Available either in through-hole or surface-mount packages, the BTA16-800BWRG is suitable for general purpose AC switching. They can be used as an ON/OFF function in application such as static relays, heating regulation, Induction motor starting circuits or for phase control Operation in light dimmers, motor speed controllers.



**TO-220A**



## Absolute Maximum Ratings ( $T_a=25^{\circ}\text{C}$ unless otherwise noted )

| Symbol            | Parameter                                   | Test condition  | Value                         | Unit                   |
|-------------------|---|---|-------------------------------|------------------------|
| $V_{DSM}/V_{RSM}$ | Non repetitive surge peak off-state voltage | $T_p=10\text{ms}, T_c=25^{\circ}\text{C}$   | $V_{DRM}/V_{RRM}+100\text{V}$ | V                      |
| $I_{T(RMS)}$      | RMS on-state current                        | $T_c=110^{\circ}\text{C}$<br>$T_c=85^{\circ}\text{C}$ (Insulated)                         | 16                            | A                      |
| $I_{TSM}$         | Non repetitive surge peak on-state current  | $F=60\text{Hz}, t=16.7\text{ms}$  | 168                           | A                      |
|                   |   | $F=50\text{Hz}, t=20\text{ms}$  | 160                           |                        |
| $I^2t$            | $I^2t$ value                                | $t_p=10\text{ms}$   | 144                           | $\text{A}^2\text{s}$   |
| $di/dt$           | Critical rate of rise of on-state current   | $I_G=2 \cdot I_{GT}, t_r \leq 100\text{ns},$<br>$F=120\text{Hz}, T_j=125^{\circ}\text{C}$ | 50                            | $\text{A}/\mu\text{s}$ |
| $I_{GM}$          | Peak gate current                           | $t_p=20\mu\text{s}, T_j=125^{\circ}\text{C}$  | 4                             | A                      |
| $P_{G(AV)}$       | Average gate power                          | $T_j=125^{\circ}\text{C}$   | 1                             | W                      |
| $T_{STG}$         | Storage temperature                         |   | -40~+150                      | $^{\circ}\text{C}$     |
| $T_j$             | Operating junction temperature              |   | -40~+125                      |                        |



### Electrical Characteristics ( $T_j = 25^\circ\text{C}$ unless otherwise specified)

#### Snubberless™ and Logic Level (3 quadrants)

| Symbol                | Parameter                          | Test condition   |             |     | Value | Unit |
|-----------------------|------------------------------------|--|-------------|-----|-------|------|
| I <sub>GT</sub> (1)   | Gate trigger current               | V <sub>D</sub> =12V,<br>R <sub>L</sub> =30Ω,                                     | I - II -III | Max | 50    | mA   |
| V <sub>GT</sub>       | Gate trigger voltage               |  | I - II -III | Max | 1.3   | V    |
| V <sub>GD</sub>       | Non-triggering gate voltage        | V <sub>D</sub> =V <sub>DRW</sub> , T <sub>J</sub> =125°C<br>R <sub>L</sub> =3.3K | I - II -III | Min | 0.2   | V    |
| I <sub>H</sub> (2)    | Holding current                    | I <sub>T</sub> =500mA  |             | Max | 50    | mA   |
| I <sub>L</sub>        | Latching current                   | I <sub>G</sub> =1.2I <sub>GT</sub> ,   | I -III      | Max | 70    |      |
|                       |                                    |  | II          | Max | 80    |      |
| D <sub>V</sub> /dt(2) | Critical rate of rise of off-state | V <sub>D</sub> =67%V <sub>DRM</sub> , Gate Open T <sub>J</sub> =125°C            |             | Min | 1000  | V/μs |
| (DI /dt)c(2)          | Critical rate of rise of off-state | (dl/dt)c=0.1V/us, T <sub>J</sub> =125°C  |             | Min | -     | V/μs |
|                       |                                    | (dl/dt)c=10V/us, T <sub>J</sub> =125°C   |             |     | -     |      |
|                       |                                    | Without snubber, T <sub>J</sub> =125°C   |             |     | 14    |      |

#### Standard (4 quadrants)

| Symbol         | Parameter                          | Test condition   |                    |     | Value     | Unit             |
|----------------|------------------------------------|--|--------------------|-----|-----------|------------------|
| $I_{GT}(1)$    | Gate trigger current               | $V_D = 12\text{V}$ ,<br>$R_L = 30\Omega$ ,                         | I - II - III<br>IV | Max | 50<br>100 | mA               |
| $V_{GT}$       | Gate trigger voltage               |  | ALL                | Max | 1.3       | V                |
| $V_{GD}$       | Non-triggering gate voltage        | $V_D = V_{DRW}$ , $T_j = 125^\circ\text{C}$<br>$R_L = 3.3\text{K}$ | ALL                | Min | 0.2       | V                |
| $I_H(2)$       | Holding current                    | $I_T = 500\text{mA}$   |                    | Max | 50        | mA               |
| $I_L$          | Latching current                   | $I_G = 1.2I_{GT}$ ,  | I - III - IV       | Max | 60        |                  |
|                |                                    |  | II                 | Max | 120       |                  |
| $D_V/dt(2)$    | Critical rate of rise of off-state | $V_D = 67\%V_{DRM}$ , Gate Open $T_j = 125^\circ\text{C}$          |                    | Min | 400       | V/ $\mu\text{s}$ |
| $(DI/dt)_c(2)$ | Critical rate of rise of off-state | $(D_V/dt)_c = 3.5\text{A}/\text{ms}$ , $T_j = 125^\circ\text{C}$   |                    | Min | 10        | V/ $\mu\text{s}$ |



## Static Characteristics

| Symbol                 | Test Conditions   |                           |      | Value   | Unit             |
|------------------------|---|---------------------------|------|---------|------------------|
| $V_{TM}(2)$            | $I_{TM} = 11\text{ A}$ , $t_p = 380\text{ }\mu\text{s}$ | $T_j = 25^\circ\text{C}$  | MAX. | 1.55    | V                |
| $V_{to}(2)$            | Threshold voltage                                       | $T_j = 125^\circ\text{C}$ | MAX. | 0.85    | V                |
| $R_d(2)$               | Dynamic resistance                                      | $T_j = 125^\circ\text{C}$ | MAX. | 25      | $\text{m}\Omega$ |
| $I_{DRM}$<br>$I_{RRM}$ | $V_{DRM} = V_{RRM}$                                     | $T_j = 25^\circ\text{C}$  | MAX. | 5       | $\mu\text{A}$    |
|                        |   | $T_j = 125^\circ\text{C}$ |      | 1       | mA               |
| $V_{DRM}/V_{RRM}$      | Voltage   | $T_j = 25^\circ\text{C}$  |      | 600/800 | mA               |

Note 1: minimum IGT is guaranteed at 5% of IGT max

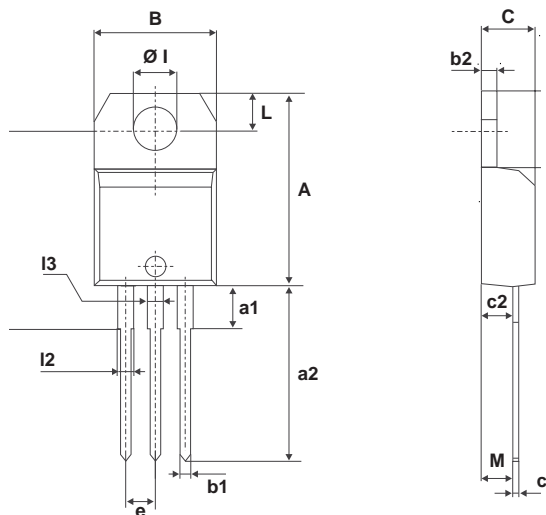
Note 2: for both polarities of A2 referenced to A1

## Thermal Resistances

| Symbol        | Parameter             | Value | Unit                      |
|---------------|-----------------------|-------|---------------------------|
| $R_{th}(j-c)$ | Junction to case (AC) | 2.1   | $^\circ\text{C}/\text{W}$ |
| $R_{th}(j-a)$ | Junction to ambient   | 60    | $^\circ\text{C}/\text{W}$ |



## Package Information TO-220A



| Ref. | Dimensions  |       |       |        |       |       |
|------|-------------|-------|-------|--------|-------|-------|
|      | Millimeters |       |       | Inches |       |       |
|      | Min.        | Typ.  | Max.  | Min.   | Typ.  | Max.  |
| A    | 15.20       |       | 15.90 | 0.598  |       | 0.625 |
| a1   |             | 3.75  |       |        | 0.147 |       |
| a2   | 13.00       |       | 14.00 | 0.511  |       | 0.551 |
| B    | 10.00       |       | 10.40 | 0.393  |       | 0.409 |
| b1   | 0.61        |       | 0.88  | 0.024  |       | 0.034 |
| b2   | 1.23        |       | 1.32  | 0.048  |       | 0.051 |
| C    | 4.40        |       | 4.60  | 0.173  |       | 0.181 |
| c1   | 0.49        |       | 0.70  | 0.019  |       | 0.027 |
| c2   | 2.40        |       | 2.72  | 0.094  |       | 0.107 |
| e    | 2.40        |       | 2.70  | 0.094  |       | 0.106 |
| F    | 6.20        |       | 6.60  | 0.244  |       | 0.259 |
| ØI   | 3.75        |       | 3.85  | 0.147  |       | 0.151 |
| I4   | 15.80       | 16.40 | 16.80 | 0.622  | 0.646 | 0.661 |
| L    | 2.65        |       | 2.95  | 0.104  |       | 0.116 |
| I2   | 1.14        |       | 1.70  | 0.044  |       | 0.066 |
| I3   | 1.14        |       | 1.70  | 0.044  |       | 0.066 |
| M    |             | 2.60  |       |        | 0.102 |       |



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