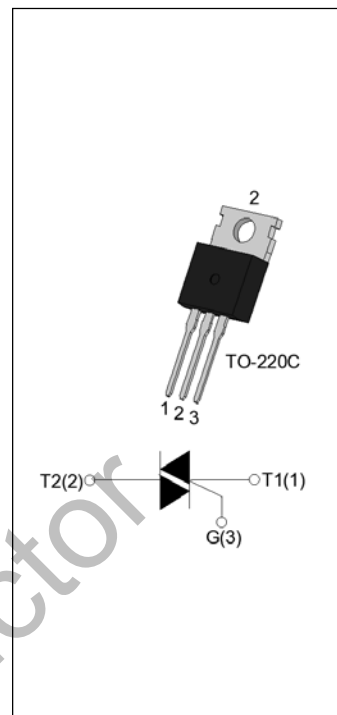


### DESCRIPTION:

The BTB16-800BW triac is suitable for general purpose AC switching. It can be used as an ON/OFF function in applications such as heating regulation, induction motor starting circuits, for phase control operation in light dimmers, motor speed controllers. BTB16-800BW snubberless triac is especially recommended for use on inductive loads. From T2 terminals to external heatsink. Package TO-220C is RoHS compliant.



### MAIN FEATURES

| Symbol             | Value    | Unit |
|--------------------|----------|------|
| $I_{T(RMS)}$       | 16       | A    |
| $V_{DRM}/V_{RRM}$  | 800      | V    |
| $I_{GT\ I/II/III}$ | 50/50/50 | mA   |

### ABSOLUTE MAXIMUM RATINGS

| Parameter  | Symbol       | Value   | Unit                   |
|--|--------------|---------|------------------------|
| Storage junction temperature range   | $T_{stg}$    | -40-150 | °C                     |
| Operating junction temperature range   | $T_j$        | -40-125 | °C                     |
| Repetitive peak off-state voltage ( $T_j=25^\circ\text{C}$ )   | $V_{DRM}$    | 800     | V                      |
| Repetitive peak reverse voltage ( $T_j=25^\circ\text{C}$ )   | $V_{RRM}$    | 800     | V                      |
| RMS on-state current ( $T_c \leq 100^\circ\text{C}$ )  | $I_{T(RMS)}$ | 16      | A                      |
| Non repetitive surge peak on-state current (full cycle , $t_p=20\text{ms}$ , $T_j=25^\circ\text{C}$ )            | $I_{TSM}$    | 160     | A                      |
| Non repetitive surge peak on-state current (full cycle , $t_p=16.6\text{ms}$ , $T_j=25^\circ\text{C}$ )          |              | 176     |                        |
| $I^2t$ value for fusing ( $t_p=10\text{ms}$ , $T_j=25^\circ\text{C}$ )   | $I^2t$       | 128     | $\text{A}^2\text{s}$   |
| Critical rate of rise of on-state current ( $I_G=2 \times I_{GT}$ , $f=100\text{Hz}$ , $T_j=125^\circ\text{C}$ ) | $di/dt$      | 100     | $\text{A}/\mu\text{s}$ |
| Peak gate current ( $t_p=20\mu\text{s}$ , $T_j=125^\circ\text{C}$ )  | $I_{GM}$     | 4       | A                      |
| Average gate power dissipation ( $T_j=125^\circ\text{C}$ )   | $P_{G(AV)}$  | 0.5     | W                      |
| Peak gate power  | $P_{GM}$     | 10      | W                      |

|  |          |   |    |
|--|----------|---|----|
| Peak pulse voltage<br>( $T_j=25^\circ\text{C}$ ; non-repetitive, off-state; FIG.7) | $V_{pp}$ | 4 | kV |
|--|----------|---|----|

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

| Symbol    | Test Condition   | Quadrant    | Value |      | Unit             |
|-----------|--|-------------|-------|------|------------------|
| $I_{GT}$  | $V_D=12\text{V}$ $R_L=33\Omega$  | I - II -III | MAX.  | 50   | mA               |
| $V_{GT}$  |  | I - II -III | MAX.  | 1    | V                |
| $V_{GD}$  | $V_D=V_{DRM}$ $T_j=125^\circ\text{C}$<br>$R_L=3.3\text{K}\Omega$                 | I - II -III | MIN.  | 0.2  | V                |
| $I_L$     | $I_G=1.2I_{GT}$  | I -III      | MAX.  | 70   | mA               |
|           |  | II          |       | 80   |                  |
| $I_H$     | $I_T=500\text{mA}$   |             | MAX.  | 50   | mA               |
| dV/dt     | $V_D=540\text{V}$ Gate Open $T_j=125^\circ\text{C}$                              |             | MIN.  | 1500 | V/ $\mu\text{s}$ |
| (dI/dt)c  | (dV/dt)c=20V/ $\mu\text{s}$ $T_j=125^\circ\text{C}$                              |             | MIN.  | 18   | A/ms             |
| $t_{on}$  | $I_G=80\text{mA}$ $I_A=200\text{mA}$ $I_R=20\text{mA}$<br>$T_j=25^\circ\text{C}$ |             | TYP.  | 10   | $\mu\text{s}$    |
| $t_{off}$ |  |             |       | 70   |                  |

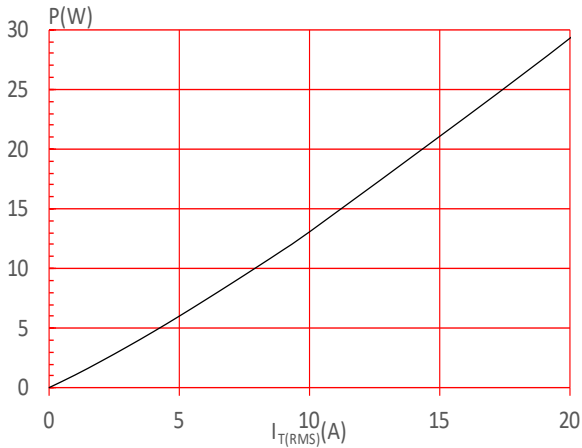
### STATIC CHARACTERISTICS

| Symbol    | Parameter                                  |                         | Value(MAX.) | Unit          |
|-----------|--|-------------------------|-------------|---------------|
| $V_{TM}$  | $I_{TM}=22.5\text{A}$ $t_p=380\mu\text{s}$ | $T_j=25^\circ\text{C}$  | 1.5         | V             |
| $V_{TO}$  | Threshold voltage                          | $T_j=125^\circ\text{C}$ | 0.77        | V             |
| $R_D$     | Dynamic resistance                         | $T_j=125^\circ\text{C}$ | 30          | m $\Omega$    |
| $I_{DRM}$ | $V_D=V_{DRM}$ $V_R=V_{RRM}$                | $T_j=25^\circ\text{C}$  | 5           | $\mu\text{A}$ |
| $I_{RRM}$ |  | $T_j=125^\circ\text{C}$ | 0.5         | mA            |

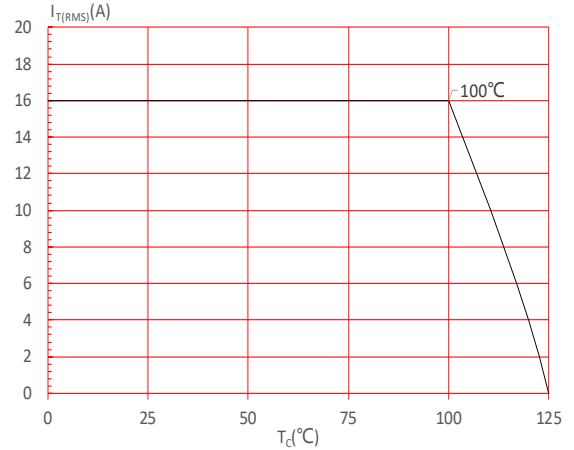
### THERMAL RESISTANCES

| Symbol        | Parameter                | Value | Unit               |
|---------------|--------------------------|-------|--------------------|
| $R_{th(j-c)}$ | junction to case (AC)    | 1.1   | $^\circ\text{C/W}$ |
| $R_{th(j-a)}$ | junction to ambient (AC) | 60    | $^\circ\text{C/W}$ |

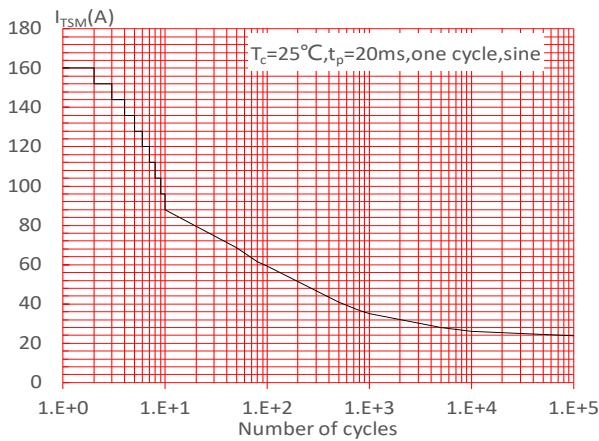
**FIG.1** Maximum power dissipation versus RMS on-state current



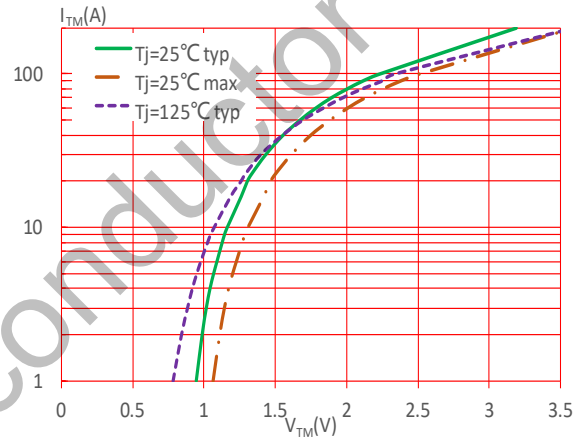
**FIG.2:** RMS on-state current versus case temperature



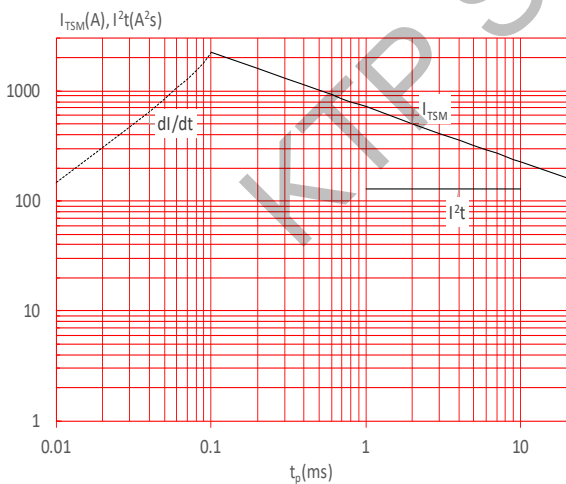
**FIG.3:** Surge peak on-state current versus number of cycles



**FIG.4:** On-state characteristics



**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

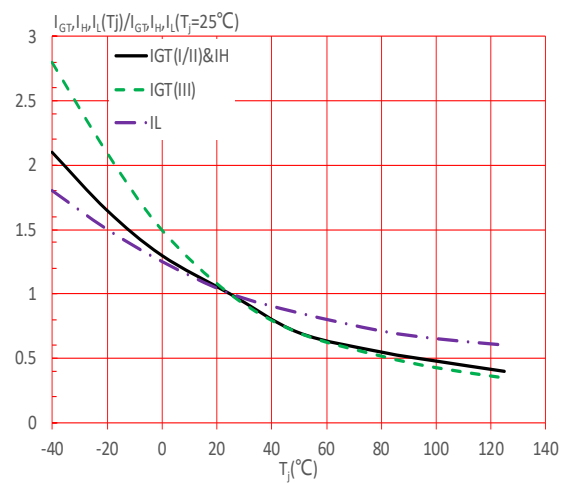
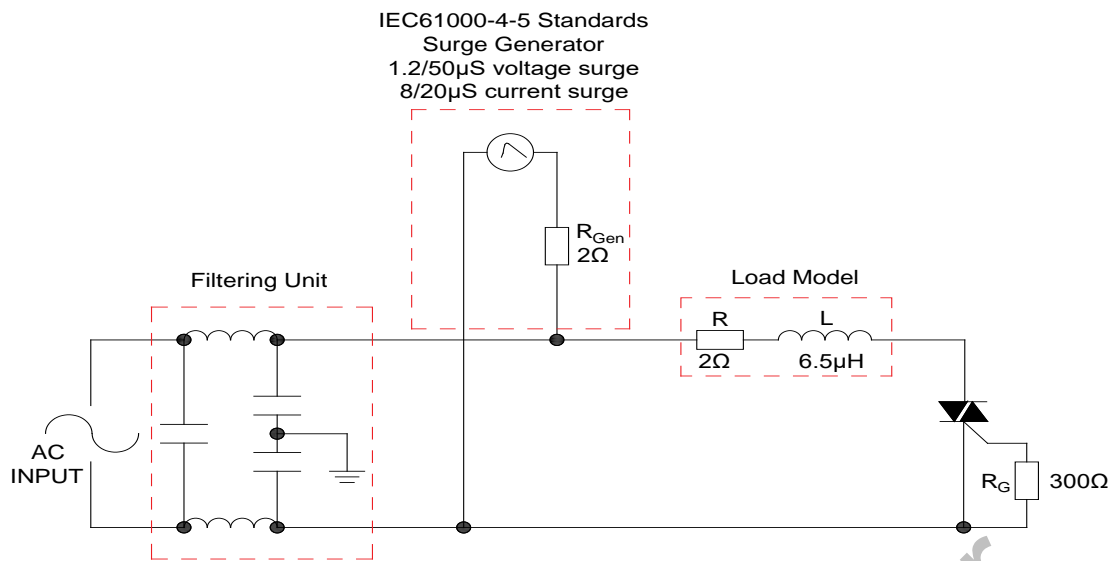


FIG.7: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards

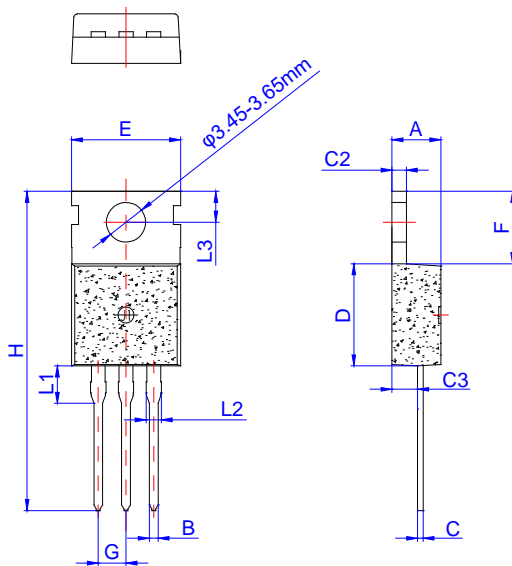


KTP Semiconductor

## ORDERING INFORMATION

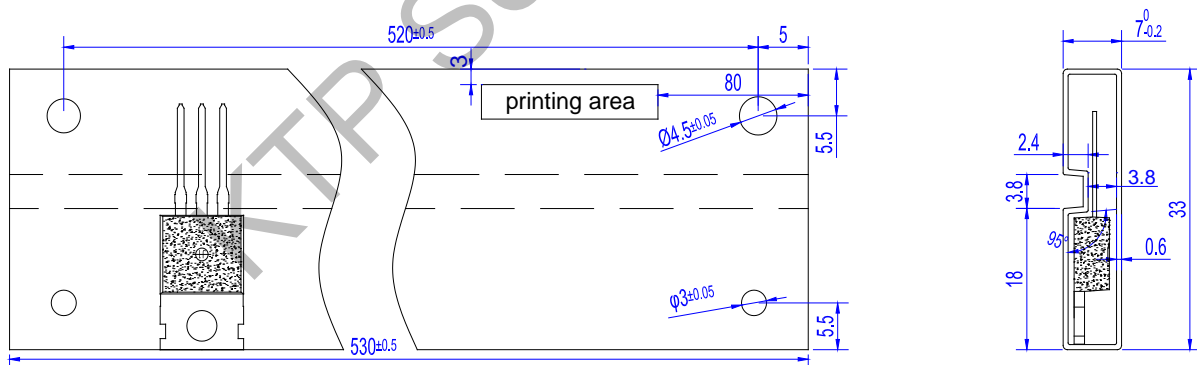
| Order code  | Voltage<br>$V_{DRM}/V_{RRM}$ (V) | IGT(mA)      | Package | Base qty.<br>(pcs) | Delivery mode |
|-------------|----------------------------------|--------------|---------|--------------------|---------------|
|             |                                  | I - II - III |         |                    |               |
| BTB16-800BW | 800                              | 50           | TO-220C | 50                 | Tube          |

## PACKAGE MECHANICAL DATA



| 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   | 1.25        |      | 1.35 | 0.049  |      | 0.053 |
| 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    | 2.40        |      | 2.70 | 0.094  |      | 0.106 |
| H    | 28.0        |      | 29.8 | 1.102  |      | 1.173 |
| L1   | 2.70        |      | 3.30 | 0.106  |      | 0.130 |
| L2   | 1.14        |      | 1.70 | 0.045  |      | 0.067 |
| L3   | 2.65        |      | 2.95 | 0.104  |      | 0.116 |

## DELIVERY MODE



| PACKAGE | OUTLINE | TUBE (PCS) | INNER BOX (PCS) | PER CARTON |
|---------|---------|------------|-----------------|------------|
| TO-220C | TUBE    | 50         | 1,000           | 5,000      |