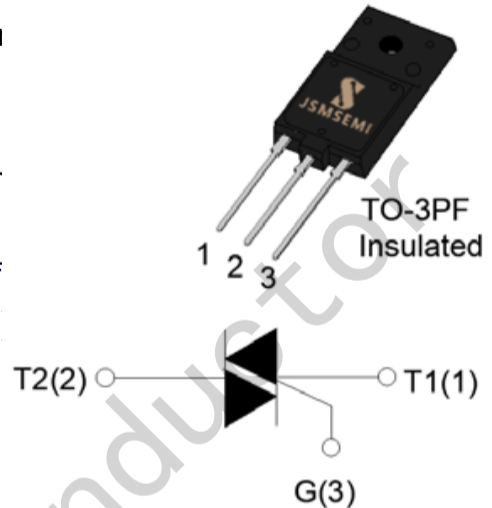


## DESCRIPTION:

The JST40UF-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. JST40UF-800BW snubberless triac is especially recommended for use on inductive loads. By using an external plastic package, JST40UF-800BW provides a rated insulation voltage of VRMS, complying with UL standards (File ref: E252906 Package TO-3PF is RoHS compliant).



| Symbol             | Value    | Unit |
|--------------------|----------|------|
| $I_{T(RMS)}$       | 40       | 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 ( $T_j=25^{\circ}C$ )                                              | $V_{DRM}$    | 800     | V                |
| Repetitive peak reverse voltage ( $T_j=25^{\circ}C$ )                                                | $V_{RRM}$    | 800     | V                |
| RMS on-state current ( $T_c \leq 66^{\circ}C$ )                                                      | $I_{T(RMS)}$ | 40      | A                |
| Non repetitive surge peak on-state current (full cycle , $t_p=20ms$ , $T_j=25^{\circ}C$ )            | $I_{TSM}$    | 420     | A                |
| Non repetitive surge peak on-state current (full cycle , $t_p=16.6ms$ , $T_j=25^{\circ}C$ )          |              | 462     |                  |
| $I^2t$ value for fusing ( $t_p=10ms$ , $T_j=25^{\circ}C$ )                                           | $I^2t$       | 1000    | A <sup>2</sup> s |
| Critical rate of rise of on-state current ( $I_G=2 \times I_{GT}$ , $f=100Hz$ , $T_j=125^{\circ}C$ ) | $di/dt$      | 100     | A/ $\mu s$       |
| Peak gate current ( $t_p=20\mu s$ , $T_j=125^{\circ}C$ )                                             | $I_{GM}$     | 8       | A                |

|                                                                                      |             |     |    |
|--------------------------------------------------------------------------------------|-------------|-----|----|
| Average gate power dissipation ( $T_j=125^{\circ}\text{C}$ )                         | $P_{G(AV)}$ | 0.5 | W  |
| Peak gate power                                                                      | $P_{GM}$    | 40  | W  |
| Peak pulse voltage<br>( $T_j=25^{\circ}\text{C}$ ; non-repetitive, off-state; FIG.7) | $V_{pp}$    | 1.5 | 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.  | 1.3  | 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.  | 80   | mA               |
|                          |                                                                                  | II          |       | 200  |                  |
| $I_H$                    | $I_T=500\text{mA}$                                                               |             | MAX.  | 100  | mA               |
| $dV/dt$                  | $V_D=540\text{V}$ Gate Open $T_j=125^{\circ}\text{C}$                            |             | MIN.  | 2000 | V/ $\mu\text{s}$ |
| ( $dI/dt$ ) <sub>c</sub> | ( $dV/dt$ ) <sub>c</sub> =20V/ $\mu\text{s}$ $T_j=125^{\circ}\text{C}$           |             | MIN.  | 25   | A/ms             |
| $t_{on}$                 | $I_G=80\text{mA } I_A=400\text{mA } I_R=40\text{mA}$<br>$T_j=25^{\circ}\text{C}$ |             | TYP.  | 10   | $\mu\text{s}$    |
| $t_{off}$                |                                                                                  |             |       | 70   |                  |

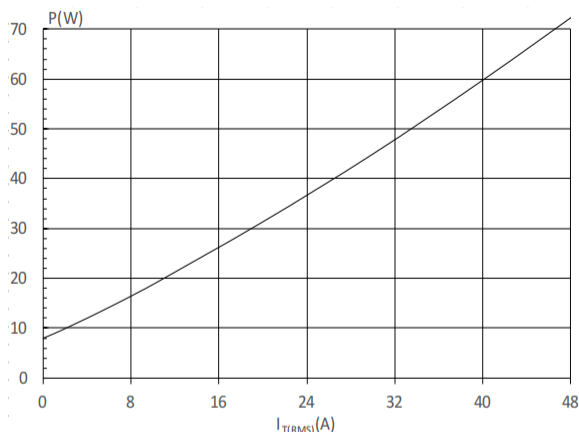
**STATIC CHARACTERISTICS**

| Symbol    | Parameter                               |                           | Value(MAX.) | Unit          |
|-----------|-----------------------------------------|---------------------------|-------------|---------------|
| $V_{TM}$  | $I_{TM}=60\text{A } t_p=380\mu\text{s}$ | $T_j=25^{\circ}\text{C}$  | 1.4         | V             |
| $V_{TO}$  | Threshold voltage                       | $T_j=125^{\circ}\text{C}$ | 0.73        | V             |
| $R_D$     | Dynamic resistance                      | $T_j=125^{\circ}\text{C}$ | 10          | m $\Omega$    |
| $I_{DRM}$ | $V_D=V_{DRM} V_R=V_{RRM}$               | $T_j=25^{\circ}\text{C}$  | 5           | $\mu\text{A}$ |
| $I_{RRM}$ |                                         | $T_j=125^{\circ}\text{C}$ | 5           | mA            |

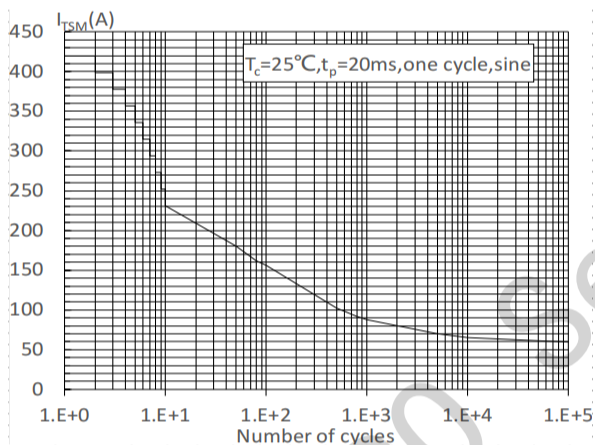
**THERMAL RESISTANCES**

| Symbol        | Parameter                | Value | Unit                 |
|---------------|--------------------------|-------|----------------------|
| $R_{th(j-c)}$ | junction to case (AC)    | 1.13  | $^{\circ}\text{C/W}$ |
| $R_{th(j-a)}$ | junction to ambient (AC) | 50    | $^{\circ}\text{C/W}$ |

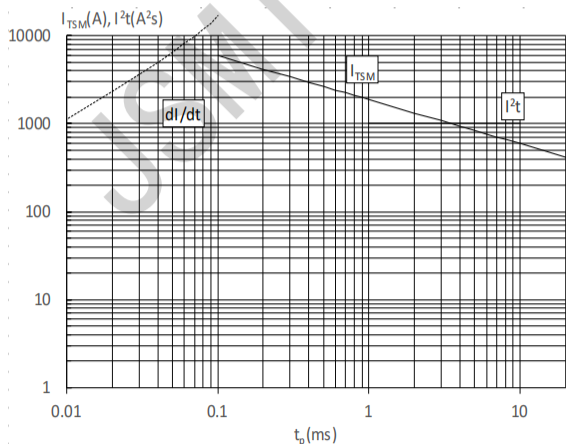
**FIG.1** Maximum power dissipation versus RMS on-state current



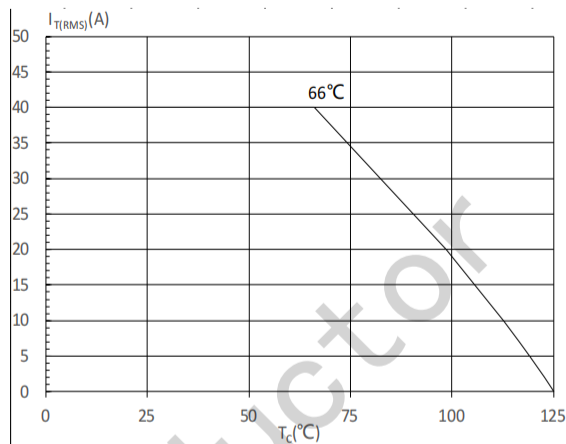
**FIG.3:** Surge peak on-state current versus number of cycles



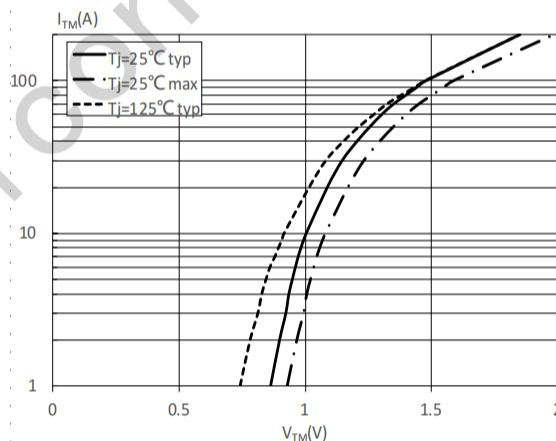
**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$ , and corresponding value of  $I^2t$  ( $di/dt < 100\text{A}/\mu\text{s}$ )



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



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



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

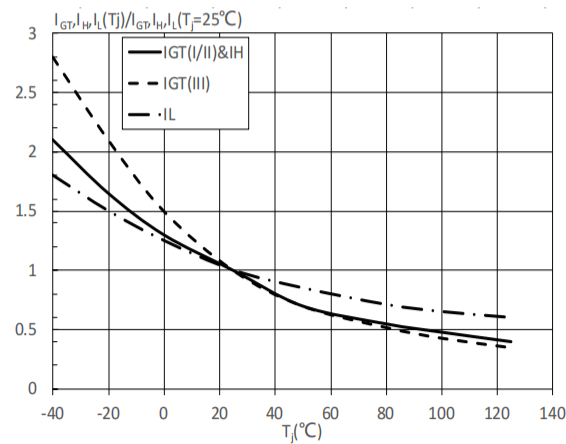
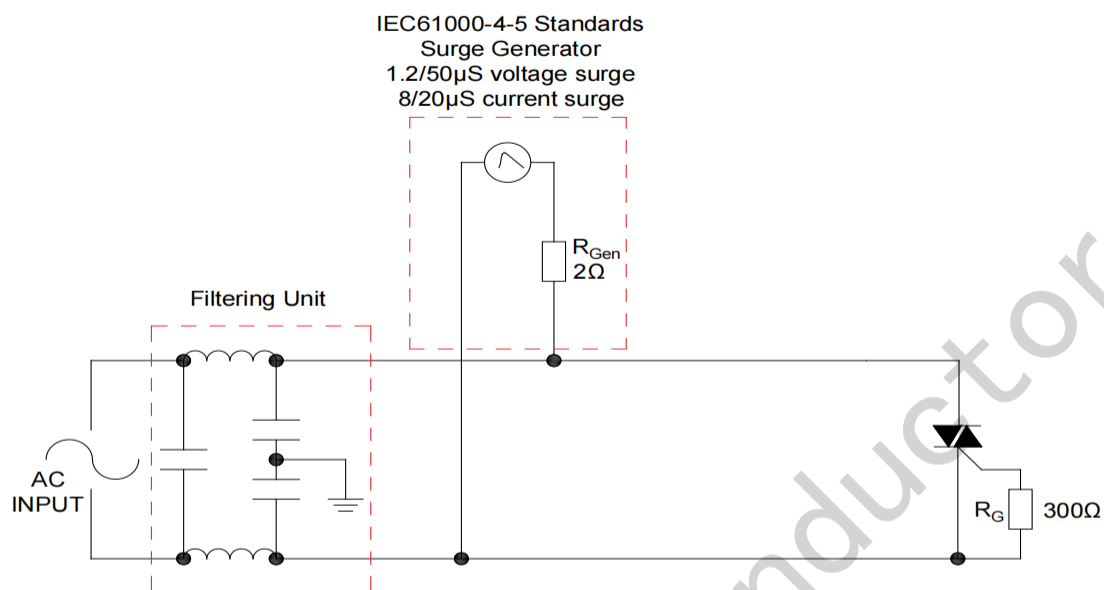


FIG.7: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



PACKAGE MECHANICAL DATA

