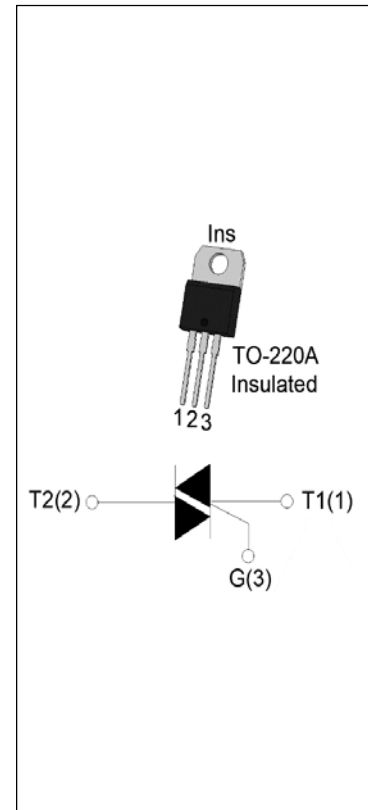


**JST12A-1000BW 12A TRIAC**

Rev.A.1.0

**DESCRIPTION:**

The JST12A-1000BW 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. JST12A-1000BW snubberless triac is especially recommended for use on inductive loads. By using an internal ceramic pad, JST12A-1000BW provides a rated insulation voltage of 2500 VRMS, complying with UL standards (File ref: E252906). Package TO-220A is RoHS compliant.


**MAIN FEATURES**

| Symbol             | Value    | Unit |
|--------------------|----------|------|
| $I_{T(RMS)}$       | 12       | A    |
| $V_{DRM}/V_{RRM}$  | 1000     | 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 ( $T_j=25^\circ\text{C}$ )   | $V_{DRM}$    | 1000    | V                      |
| Repetitive peak reverse voltage ( $T_j=25^\circ\text{C}$ )   | $V_{RRM}$    | 1000    | V                      |
| RMS on-state current ( $T_c \leq 86^\circ\text{C}$ )   | $I_{T(RMS)}$ | 12      | A                      |
| Non repetitive surge peak on-state current (full cycle, $t_p=20\text{ms}$ , $T_j=25^\circ\text{C}$ )             | $I_{TSM}$    | 120     | A                      |
| Non repetitive surge peak on-state current (full cycle, $t_p=16.6\text{ms}$ , $T_j=25^\circ\text{C}$ )           |              | 132     |                        |
| $I^2t$ value for fusing ( $t_p=10\text{ms}$ , $T_j=25^\circ\text{C}$ )   | $I^2t$       | 72      | $\text{A}^2\text{s}$   |
| 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>( $T_j=25^{\circ}C$ ; non-repetitive, off-state; FIG.7) | $V_{pp}$ | 4.5 | kV |

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

| Symbol               | Test Condition   | Quadrant    | Value |     | Unit       |
|----------------------|--|-------------|-------|-----|------------|
| $I_{GT}$             | $V_D=12V$ $R_L=33\Omega$                               | I - II -III | MAX.  | 50  | mA         |
| $V_{GT}$             |  | I - II -III | MAX.  | 1   | V          |
| $V_{GD}$             | $V_D=V_{DRM}$ $T_j=125^{\circ}C$<br>$R_L=3.3K\Omega$   | I - II -III | MIN.  | 0.2 | V          |
| $I_L$                | $I_G=1.2I_{GT}$  | I -III      | MAX.  | 70  | mA         |
|                      |  | II          |       | 90  |            |
| $I_H$                | $I_T=500mA$  |             | MAX.  | 50  | mA         |
| dV/dt                | $V_D=670V$ Gate Open $T_j=125^{\circ}C$                |             | MIN.  | 800 | V/ $\mu s$ |
| (dI/dt) <sub>c</sub> | (dV/dt) <sub>c</sub> =20V/ $\mu s$ $T_j=125^{\circ}C$  |             | MIN.  | 20  | A/ms       |
| $t_{on}$             | $I_G=80mA$ $I_A=400mA$ $I_R=40mA$<br>$T_j=25^{\circ}C$ |             | TYP.  | 5   | $\mu s$    |
| $t_{off}$            |  |             |       | 50  |            |

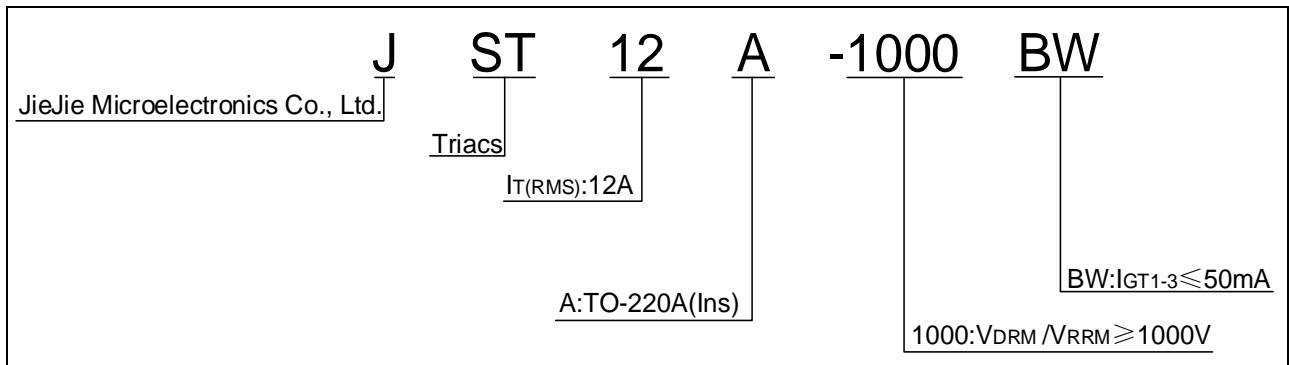
**STATIC CHARACTERISTICS**

| Symbol    | Parameter                   |                    | Value(MAX.) | Unit       |
|-----------|-----------------------------|--------------------|-------------|------------|
| $V_{TM}$  | $I_{TM}=17A$ $t_p=380\mu s$ | $T_j=25^{\circ}C$  | 1.5         | V          |
| $V_{TO}$  | Threshold voltage           | $T_j=125^{\circ}C$ | 0.77        | V          |
| $R_D$     | Dynamic resistance          | $T_j=125^{\circ}C$ | 35          | m $\Omega$ |
| $I_{DRM}$ | $V_D=V_{DRM}$ $V_R=V_{RRM}$ | $T_j=25^{\circ}C$  | 8           | $\mu A$    |
| $I_{RRM}$ |                             | $T_j=125^{\circ}C$ | 1           | mA         |

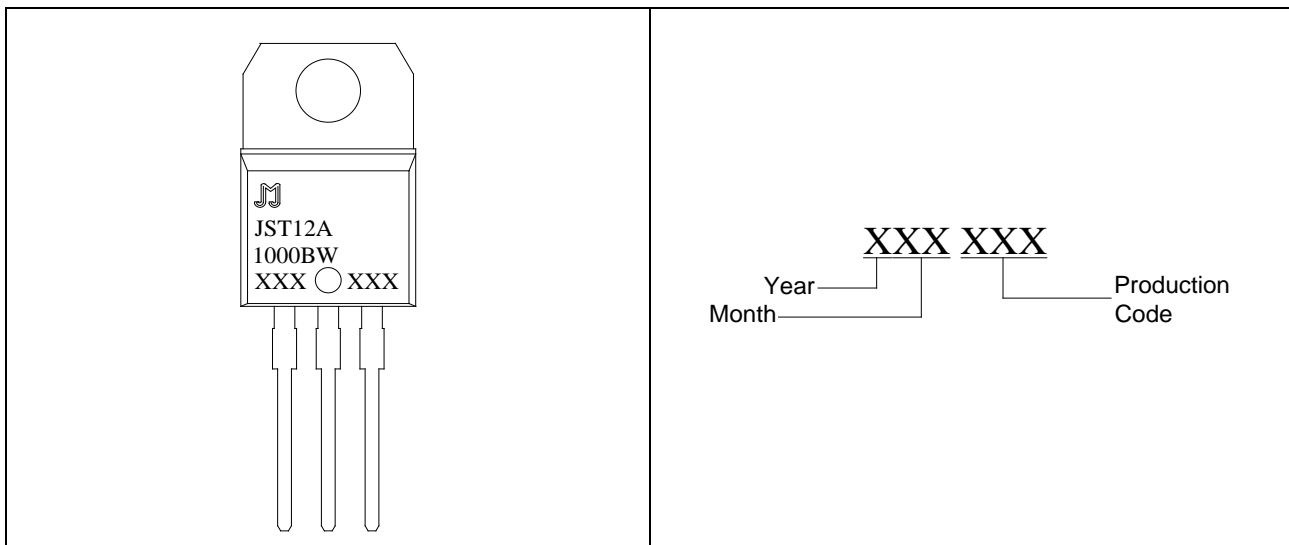
**THERMAL RESISTANCES**

| Symbol        | Parameter                | Value | Unit          |
|---------------|--------------------------|-------|---------------|
| $R_{th(j-c)}$ | junction to case (AC)    | 2.3   | $^{\circ}C/W$ |
| $R_{th(j-a)}$ | junction to ambient (AC) | 60    | $^{\circ}C/W$ |

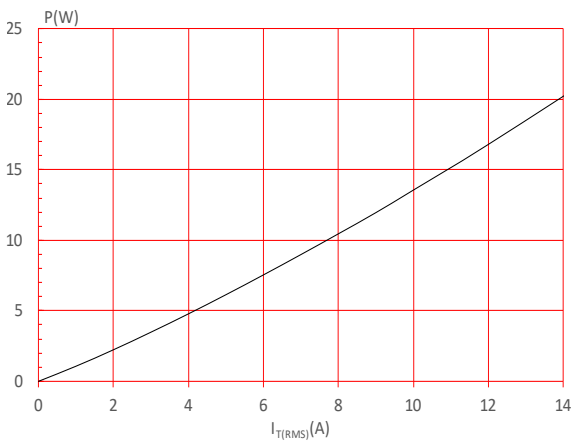
**ORDERING INFORMATION**



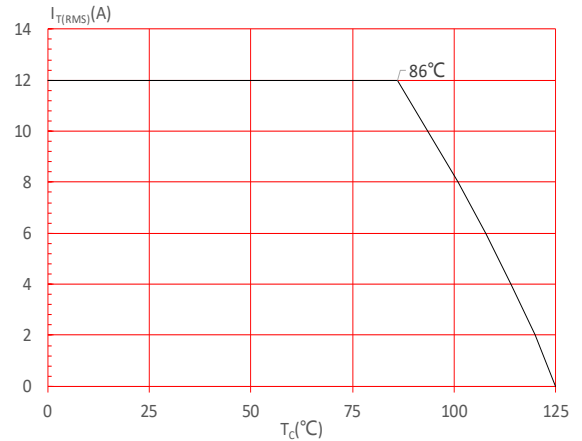
**MARKING**



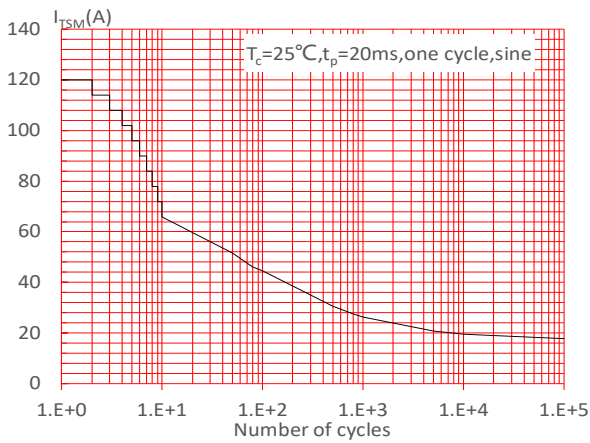
**FIG.1** Maximum power dissipation versus RMS on-state current



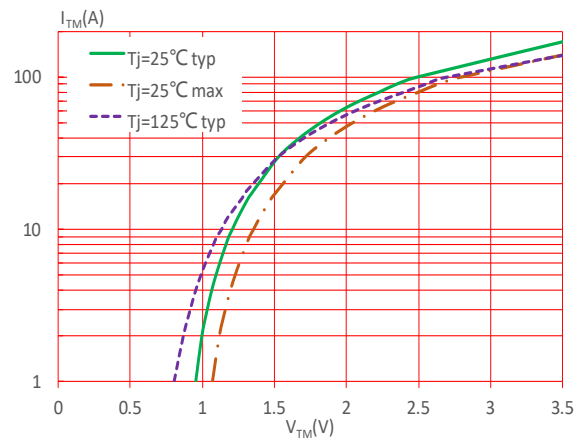
**FIG.2:** RMS on-state current versus case temperature



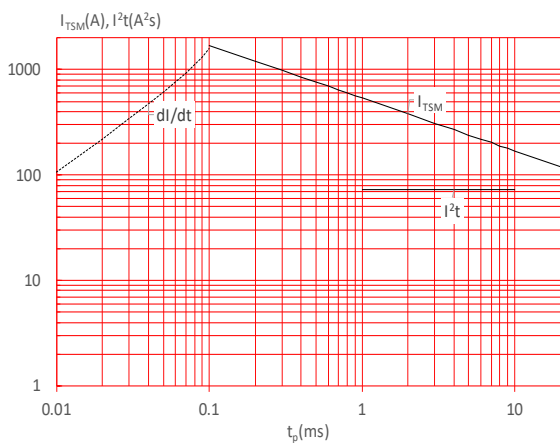
**FIG.3:** Surge peak on-state current versus number of cycles



**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

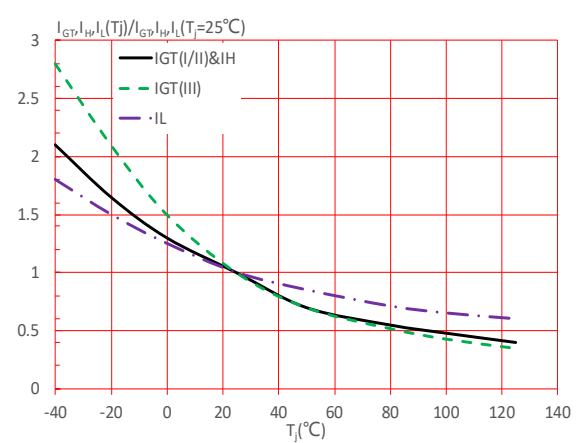
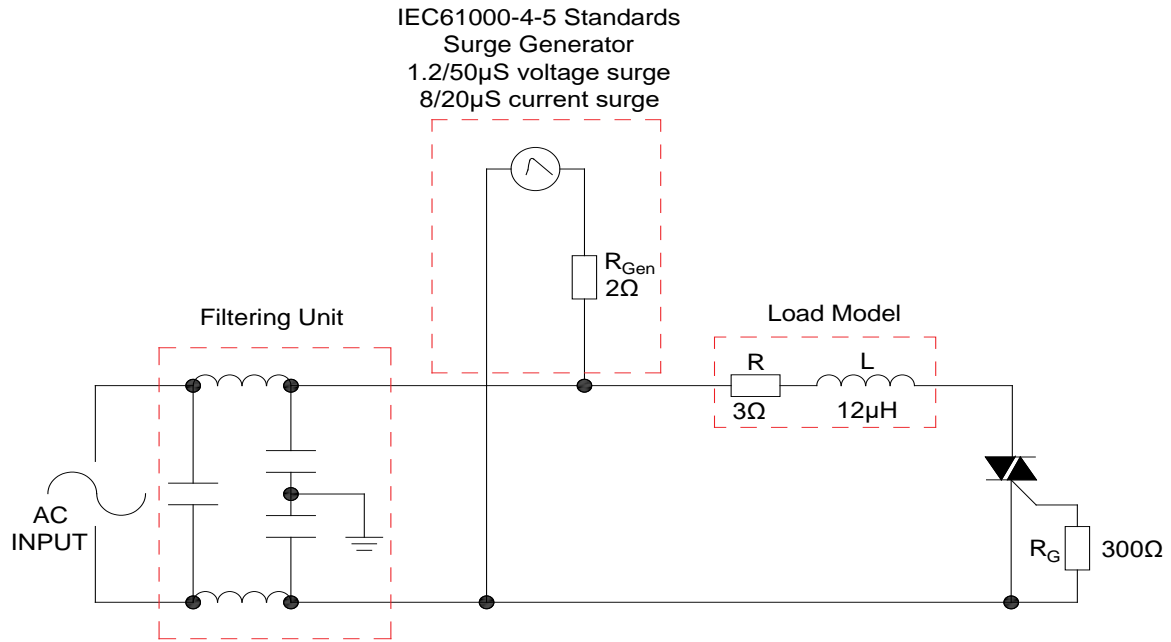


FIG.7: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



### SHAPING AND SOLDERING PARAMETERS

Refer to 《Instructions for installation of plastic-sealed in-line power devices》 released by JieJie

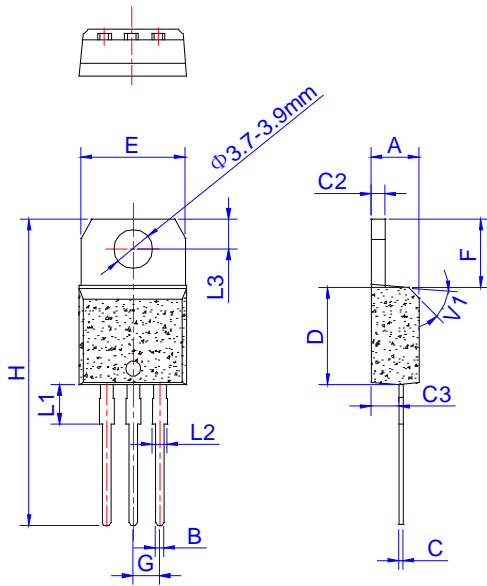
## ORDERING INFORMATION

| Order code    | Voltage<br>$V_{DRM}/V_{RRM}$ (V) | IGT(mA)      | Package      | Base qty.<br>(pcs) | Delivery<br>mode |
|---------------|----------------------------------|--------------|--------------|--------------------|------------------|
|               |                                  | I - II - III |              |                    |                  |
| JST12A-1000BW | 1000                             | 50           | TO-220A(Ins) | 50                 | Tube             |

## Document Revision History

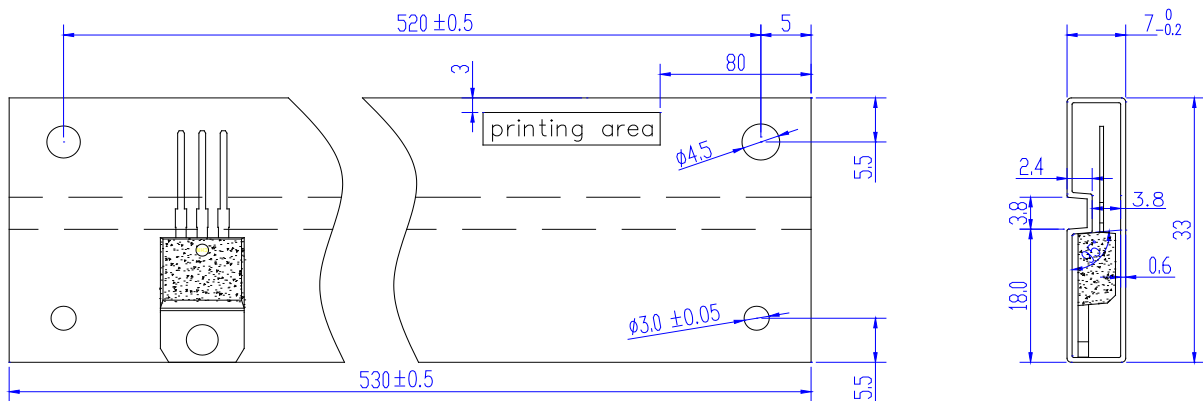
| Date         | Revision | Changes      |
|--------------|----------|--------------|
| Apr.11, 2023 | A.1.0    | Last updated |

PACKAGE MECHANICAL DATA



| 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    | 9.80        |      | 10.4 | 0.386  |      | 0.409 |
| F    | 6.25        |      | 6.85 | 0.246  |      | 0.270 |
| G    | 2.40        |      | 2.70 | 0.094  |      | 0.106 |
| H    | 28.0        |      | 29.8 | 1.102  |      | 1.173 |
| L1   | 3.45        |      | 4.05 | 0.136  |      | 0.159 |
| L2   | 1.14        |      | 1.70 | 0.045  |      | 0.067 |
| L3   | 2.65        |      | 2.95 | 0.104  |      | 0.116 |
| V1   |             | 45°  |      |        | 45°  |       |

DELIVERY MODE



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

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