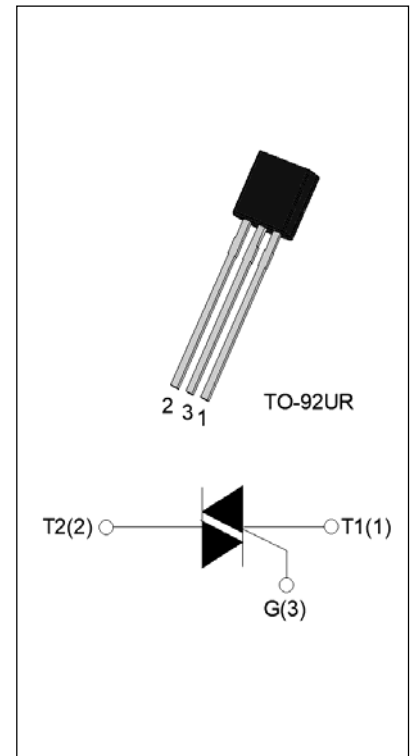


## JST02UR-1000SW 2A TRIAC

Rev.A.2.1

### DESCRIPTION:

The JST02UR-1000SW 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. JST02UR-1000SW snubberless triac is especially recommended for use on inductive loads. It can be driven directly through the MCU I/O port. Package TO-92UR is RoHS compliant.



### MAIN FEATURES

| Symbol             | Value    | Unit |
|--------------------|----------|------|
| $I_{T(RMS)}$       | 2        | A    |
| $V_{DRM}/V_{RRM}$  | 1000     | V    |
| $I_{GT\ I/II/III}$ | 10/10/10 | 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 ( $T_j=25^{\circ}C$ )                                              | $V_{DRM}$    | 1000    | V                |
| Repetitive peak reverse voltage ( $T_j=25^{\circ}C$ )                                                | $V_{RRM}$    | 1000    | V                |
| RMS on-state current                                                                                 | $I_{T(RMS)}$ | 2       | A                |
| Non repetitive surge peak on-state current (full cycle , $t_p=20ms$ , $T_j=25^{\circ}C$ )            | $I_{TSM}$    | 25      | A                |
| Non repetitive surge peak on-state current (full cycle , $t_p=16.6ms$ , $T_j=25^{\circ}C$ )          |              | 27.5    |                  |
| $I^2t$ value for fusing ( $t_p=10ms$ , $T_j=25^{\circ}C$ )                                           | $I^2t$       | 3.7     | 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 ( $t_p=20\mu s$ , $T_j=125^{\circ}C$ )                                             | $I_{GM}$     | 2       | A                |
| Average gate power dissipation ( $T_j=125^{\circ}C$ )                                                | $P_{G(AV)}$  | 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.  | 10  | 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.  | 20  | mA               |
|             |                                                                                    | II          |       | 30  |                  |
| $I_H$       | $I_T=100\text{mA}$                                                                 |             | MAX.  | 15  | mA               |
| $dV/dt$     | $V_D=670\text{V}$ Gate Open $T_j=125^{\circ}\text{C}$                              |             | MIN.  | 300 | V/ $\mu\text{s}$ |
| $(dI/dt)_c$ | $(dV/dt)_c=10\text{V}/\mu\text{s}$ $T_j=125^{\circ}\text{C}$                       |             | MIN.  | 1.5 | A/ms             |
| $t_{on}$    | $I_G=20\text{mA}$ $I_A=200\text{mA}$ $I_R=20\text{mA}$<br>$T_j=25^{\circ}\text{C}$ |             | TYP.  | 2.5 | $\mu\text{s}$    |
| $t_{off}$   |                                                                                    |             |       | 25  |                  |

**STATIC CHARACTERISTICS**

| Symbol    | Parameter                               |                           | Value(MAX.) | Unit          |
|-----------|-----------------------------------------|---------------------------|-------------|---------------|
| $V_{TM}$  | $I_{TM}=3\text{A}$ $t_p=380\mu\text{s}$ | $T_j=25^{\circ}\text{C}$  | 1.5         | V             |
| $V_{TO}$  | Threshold voltage                       | $T_j=125^{\circ}\text{C}$ | 0.93        | V             |
| $R_D$     | Dynamic resistance                      | $T_j=125^{\circ}\text{C}$ | 146         | m $\Omega$    |
| $I_{DRM}$ | $V_D=V_{DRM}$ $V_R=V_{RRM}$             | $T_j=25^{\circ}\text{C}$  | 8           | $\mu\text{A}$ |
| $I_{RRM}$ |                                         | $T_j=125^{\circ}\text{C}$ | 0.2         | mA            |

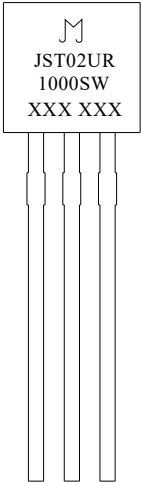
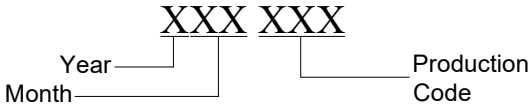
**THERMAL RESISTANCES**

| Symbol        | Parameter                | Value | Unit                        |
|---------------|--------------------------|-------|-----------------------------|
| $R_{th(j-c)}$ | junction to case (AC)    | 65    | $^{\circ}\text{C}/\text{W}$ |
| $R_{th(j-a)}$ | junction to ambient (AC) | 160   | $^{\circ}\text{C}/\text{W}$ |

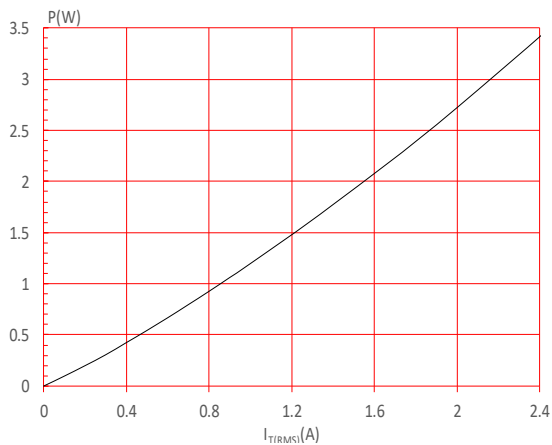
ORDERING INFORMATION

|                                   |        |                |             |                                    |                           |                                      |
|-----------------------------------|--------|----------------|-------------|------------------------------------|---------------------------|--------------------------------------|
| J                                 | ST     | 02             | UR          | -1000                              | SW                        | -/                                   |
| JieJie Microelectronics Co., Ltd. | Triacs | $I_T(RMS): 2A$ |             |                                    |                           | Blank: Bulk Pack<br>-TR: Tape & Reel |
|                                   |        |                | UR: TO-92UR |                                    | SW: $I_{GT1-3} \leq 10mA$ |                                      |
|                                   |        |                |             | 1000: $V_{DRM}/V_{RRM} \geq 1000V$ |                           |                                      |

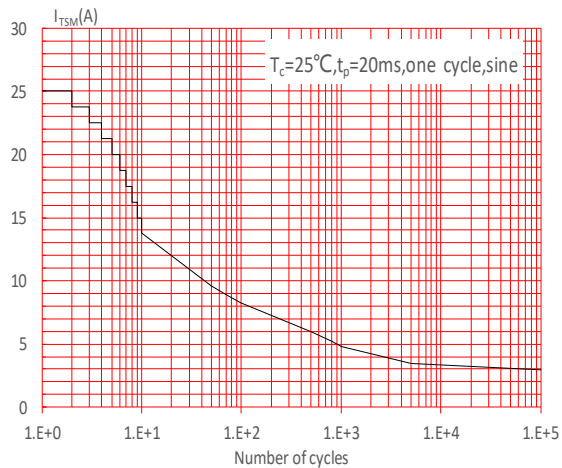
MARKING

|                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>Diagram showing the marking on the TO-92UR package. The marking is as follows:</p> <p><br/>JST02UR<br/>1000SW<br/>XXX XXX</p> |  <p>Diagram showing the marking on the package. The marking is as follows:</p> <p>XXX XXX</p> <p>Year _____<br/>Month _____</p> <p>Production Code _____</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

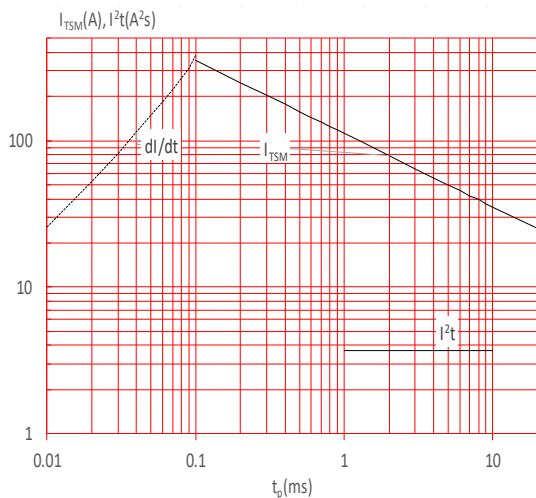
**FIG.1:** Maximum power dissipation versus RMS on-state current



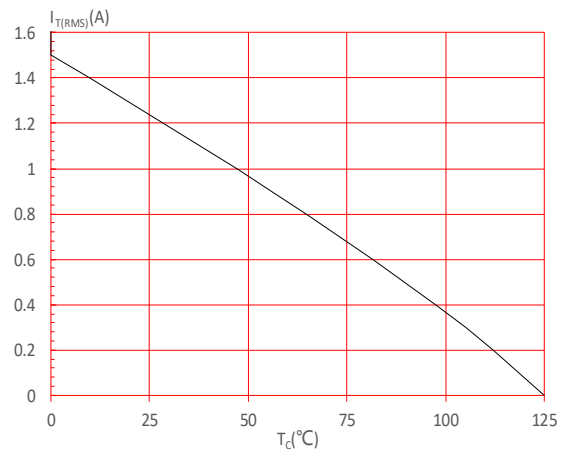
**FIG.3:** Surge peak on-state current versus number of cycles



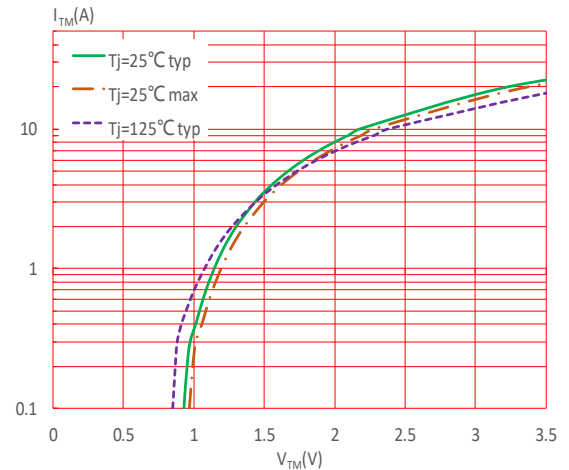
**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$ , and corresponding value of  $I^2t$  ( $di/dt < 100\text{A}/\mu\text{s}$ )



**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

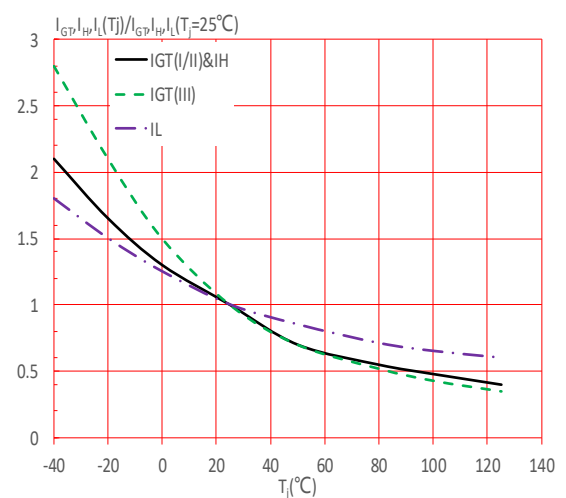
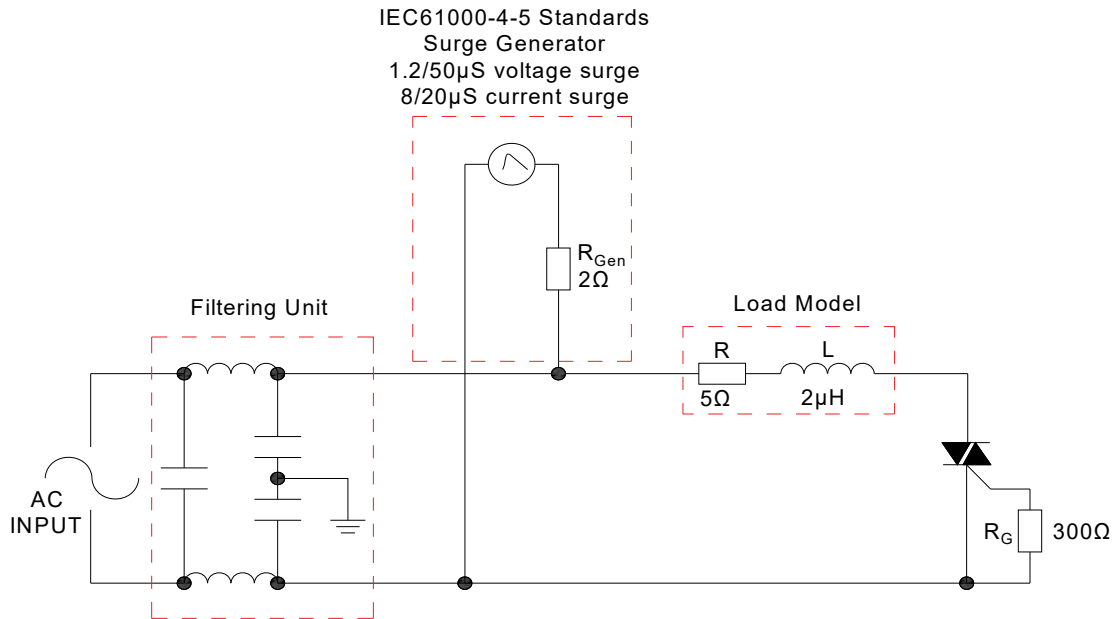


FIG.7: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



## LEAD FORMING AND SOLDERING

Refer to the application note “Assembly Instructions for Thyristors in Through-hole Package” released by JieJie Microelectronics

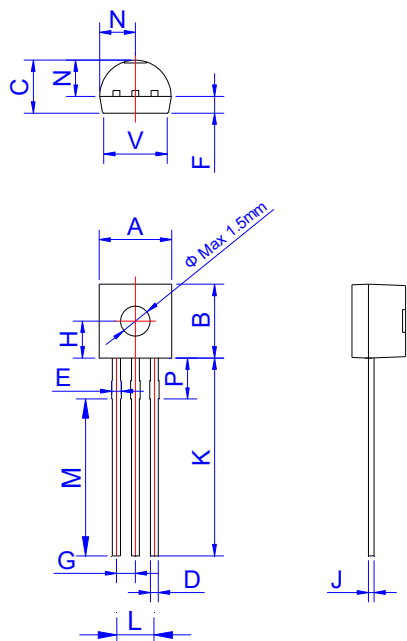
## ORDERING INFORMATION

| Order code        | Voltage<br>V <sub>DRM</sub> /V <sub>RRM</sub> (V) | IGT(mA)      | Package | Base qty.<br>(pcs) | Delivery<br>mode |
|-------------------|---------------------------------------------------|--------------|---------|--------------------|------------------|
|                   |                                                   | I - II - III |         |                    |                  |
| JST02UR-1000SW    | 1000                                              | 10           | TO-92UR | 1,000              | Bulk Pack        |
| JST02UR-1000SW-TR |                                                   |              |         | 2,000              | Tape & Reel      |

## Document Revision History

| Date          | Revision | Changes                        |
|---------------|----------|--------------------------------|
| Apr.10, 2023  | A.1.0    | Last updated                   |
| Apr.3, 2025   | A.2.0    | Renew PACKAGE MECHANICAL DATA  |
| Sept.28, 2025 | A.2.1    | Revise PACKAGE MECHANICAL DATA |

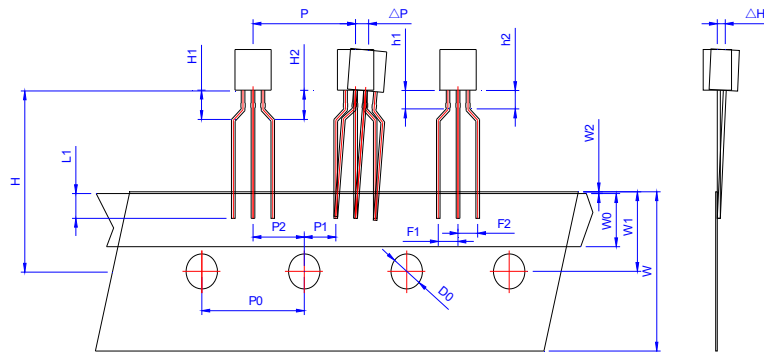
PACKAGE MECHANICAL DATA



| Ref. | Dimensions  |      |       |        |      |       |
|------|-------------|------|-------|--------|------|-------|
|      | Millimeters |      |       | Inches |      |       |
|      | Min.        | Typ. | Max.  | Min.   | Typ. | Max.  |
| A    | 4.45        |      | 5.20  | 0.175  |      | 0.205 |
| B    | 4.32        |      | 5.33  | 0.170  |      | 0.210 |
| C    | 3.18        |      | 4.19  | 0.125  |      | 0.165 |
| D    | 0.407       |      | 0.533 | 0.016  |      | 0.021 |
| E    | 0.50        |      | 0.70  | 0.020  |      | 0.028 |
| F    | 1.10        |      | 1.30  | 0.043  |      | 0.051 |
| G    | 1.10        |      | 1.40  | 0.043  |      | 0.055 |
| H    | 2.20        |      | 2.40  | 0.087  |      | 0.094 |
| J    | 0.36        |      | 0.50  | 0.014  |      | 0.020 |
| K    | 12.70       |      | 15.0  | 0.500  |      | 0.591 |
| L    | 2.44        |      | 2.64  | 0.096  |      | 0.104 |
| M    | 11.64       |      | 12.04 | 0.458  |      | 0.474 |
| N    | 2.04        |      | 2.66  | 0.080  |      | 0.105 |
| P    | 1.80        |      | 2.30  | 0.071  |      | 0.091 |
| V    | 4.10        |      | 4.50  | 0.161  |      | 0.177 |

## DELIVERY MODE

| PACKAGE | OUTLINE   | BAG (PCS) | INNER BOX (PCS) | CARTON BOX (PCS) |
|---------|-----------|-----------|-----------------|------------------|
| TO-92UR | Bulk Pack | 1,000     | 10,000          | 50,000           |



| Ref.  | Dimensions  |       |       |        |       |       |
|-------|-------------|-------|-------|--------|-------|-------|
|       | Millimeters |       |       | Inches |       |       |
|       | Min.        | Typ.  | Max.  | Min.   | Typ.  | Max.  |
| P     | 12.40       | 12.70 | 13.00 | 0.488  | 0.500 | 0.512 |
| P0    | 12.40       | 12.70 | 13.00 | 0.488  | 0.500 | 0.512 |
| P1    | 3.55        | 3.85  | 4.15  | 0.140  | 0.152 | 0.163 |
| P2    | 5.95        | 6.35  | 6.75  | 0.233  | 0.250 | 0.265 |
| ΔP    | -1.00       | 0     | 1.00  | -0.039 | 0     | 0.039 |
| F1、F2 | 2.30        | 2.50  | 2.70  | 0.090  | 0.098 | 0.106 |
| F1-F2 | -0.10       | 0     | 0.10  | -0.004 | 0     | 0.004 |
| W     | 17.50       | 18.00 | 19.00 | 0.689  | 0.709 | 0.748 |
| W0    | 5.50        | 6.00  | 6.50  | 0.217  | 0.236 | 0.256 |
| W1    | 8.50        | 9.00  | 9.50  | 0.335  | 0.354 | 0.374 |
| W2    |             |       | 1.00  |        |       | 0.039 |
| D0    | 3.80        | 4.00  | 4.20  | 0.150  | 0.157 | 0.165 |
| ΔH    | -1.00       | 0     | 1.00  | -0.039 | 0     | 0.039 |
| L1    | 2.50        |       |       | 0.098  |       |       |
| H     | 18.00       | 19.00 | 20.00 | 0.709  | 0.748 | 0.787 |
| H1、H2 |             |       | 3.00  |        |       | 0.119 |
| H1-H2 | -0.50       |       | 0.50  | -0.020 |       | 0.020 |
| h1、h2 |             |       | 1.00  |        |       | 0.040 |
| h1-h2 | -0.20       |       | 0.20  | -0.008 |       | 0.008 |

| PACKAGE | OUTLINE     | REEL (PCS) | INNER BOX (PCS) | CARTON BOX (PCS) |
|---------|-------------|------------|-----------------|------------------|
| TO-92UR | Tape & Reel | /          | 2,000           | 20,000           |

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