

**JST12C-600C 12A TRIAC**

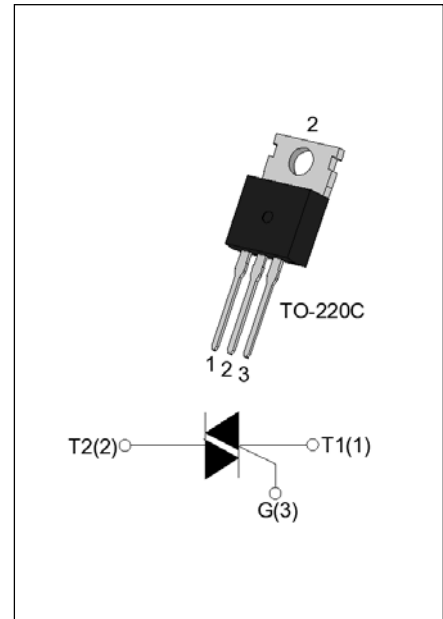
Rev.A.1.1

**DESCRIPTION:**

The JST12C-600C 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. From T2 terminals to external heatsink. Package TO-220C is RoHS compliant.

**MAIN FEATURES**

| Symbol                | Value       | Unit |
|-----------------------|-------------|------|
| $I_{T(RMS)}$          | 12          | A    |
| $V_{DRM}/V_{RRM}$     | 600         | V    |
| $I_{GT\ I/II/III/IV}$ | 25/25/25/50 | mA   |


**ABSOLUTE MAXIMUM RATINGS**

| Parameter                                                                                                         |        | Symbol              | Value   | Unit             |
|-------------------------------------------------------------------------------------------------------------------|--------|---------------------|---------|------------------|
| Storage junction temperature range                                                                                |        | T <sub>stg</sub>    | -40-150 | ℃                |
| Operating junction temperature range                                                                              |        | T <sub>j</sub>      | -40-125 | ℃                |
| Repetitive peak off-state voltage (T <sub>j</sub> =25℃)                                                           |        | V <sub>DRM</sub>    | 600     | V                |
| Repetitive peak reverse voltage (T <sub>j</sub> =25℃)                                                             |        | V <sub>RRM</sub>    | 600     | V                |
| RMS on-state current (T <sub>c</sub> ≤103℃)                                                                       |        | I <sub>T(RMS)</sub> | 12      | A                |
| Non repetitive surge peak on-state current<br>(full cycle , t <sub>p</sub> =20ms , T <sub>j</sub> =25℃)           |        | I <sub>TSM</sub>    | 120     | A                |
| Non repetitive surge peak on-state current<br>(full cycle , t <sub>p</sub> =16.6ms , T <sub>j</sub> =25℃)         |        |                     | 132     |                  |
| I <sup>2</sup> t value for fusing (t <sub>p</sub> =10ms , T <sub>j</sub> =25℃)                                    |        | I <sup>2</sup> t    | 72      | A <sup>2</sup> s |
| Critical rate of rise of on-state current<br>(I <sub>G</sub> =2×I <sub>GT</sub> , f=100Hz , T <sub>j</sub> =125℃) | I - II | di/dt               | 80      | A/μs             |
|                                                                                                                   | III-IV |                     | 40      |                  |
| Peak gate current (t <sub>p</sub> =20μs , T <sub>j</sub> =125℃)                                                   |        | I <sub>GM</sub>     | 4       | A                |
| Average gate power dissipation (T <sub>j</sub> =125℃)                                                             |        | P <sub>G(AV)</sub>  | 0.5     | W                |
| Peak gate power                                                                                                   |        | P <sub>GM</sub>     | 10      | W                |
| Peak pulse voltage<br>(T <sub>j</sub> =25℃; non-repetitive,off-state;FIG.7)                                       |        | V <sub>pp</sub>     | 1       | 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.  | 25  | mA                     |
|             |                                                                                  | IV          |       | 50  |                        |
| $V_{GT}$    |                                                                                  | ALL         | MAX.  | 1   | V                      |
| $V_{GD}$    | $V_D=V_{DRM} T_j=125^{\circ}\text{C}$<br>$R_L=3.3\text{k}\Omega$                 | ALL         | MIN.  | 0.2 | V                      |
| $I_L$       | $I_G=1.2I_{GT}$                                                                  | I -III-IV   | MAX.  | 40  | mA                     |
|             |                                                                                  | II          |       | 90  |                        |
| $I_H$       | $I_T=500\text{mA}$                                                               |             | MAX.  | 30  | mA                     |
| $dV/dt$     | $V_D=400\text{V}$ Gate Open $T_j=125^{\circ}\text{C}$                            |             | MIN.  | 800 | $\text{V}/\mu\text{s}$ |
| $(dV/dt)_c$ | $(dI/dt)_c=3.5\text{A/ms}$ , $T_j=125^{\circ}\text{C}$                           |             | MIN.  | 6   | $\text{V}/\mu\text{s}$ |
| $t_{on}$    | $I_G=80\text{mA } I_A=400\text{mA } I_R=40\text{mA}$<br>$T_j=25^{\circ}\text{C}$ |             | TYP.  | 5   | $\mu\text{s}$          |
| $t_{off}$   |                                                                                  |             |       | 50  |                        |

**STATIC CHARACTERISTICS**

| Symbol    | Parameter                               |                           | Value(MAX.) | Unit             |
|-----------|-----------------------------------------|---------------------------|-------------|------------------|
| $V_{TM}$  | $I_{TM}=17\text{A } t_p=380\mu\text{s}$ | $T_j=25^{\circ}\text{C}$  | 1.5         | V                |
| $V_{TO}$  | Threshold voltage                       | $T_j=125^{\circ}\text{C}$ | 0.77        | V                |
| $R_D$     | Dynamic resistance                      | $T_j=125^{\circ}\text{C}$ | 35          | $\text{m}\Omega$ |
| $I_{DRM}$ | $V_D=V_{DRM} V_R=V_{RRM}$               | $T_j=25^{\circ}\text{C}$  | 5           | $\mu\text{A}$    |
| $I_{RRM}$ |                                         | $T_j=125^{\circ}\text{C}$ | 0.4         | mA               |

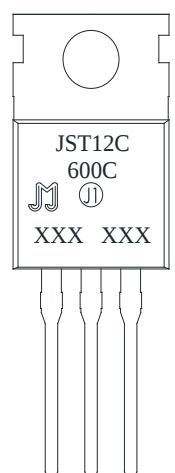
**THERMAL RESISTANCES**

| Symbol        | Parameter                | Value | Unit                        |
|---------------|--------------------------|-------|-----------------------------|
| $R_{th(j-c)}$ | junction to case (AC)    | 1.3   | $^{\circ}\text{C}/\text{W}$ |
| $R_{th(j-a)}$ | junction to ambient (AC) | 60    | $^{\circ}\text{C}/\text{W}$ |

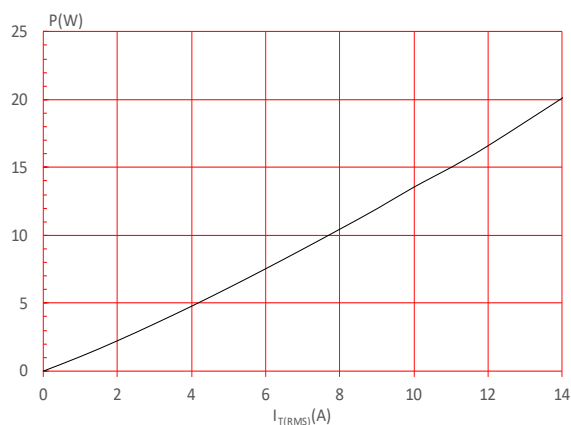
ORDERING INFORMATION

|                                   |        |                  |           |                                 |                                              |
|-----------------------------------|--------|------------------|-----------|---------------------------------|----------------------------------------------|
| J                                 | ST     | 12               | C         | -600                            | C                                            |
| JieJie Microelectronics Co., Ltd. | Triacs | $I_{T(RMS)}:12A$ | C:TO-220C | $600:V_{DRM}/V_{RRM} \geq 600V$ | C: $I_{GT1-3} \leq 25mA$ $I_{GT4} \leq 50mA$ |

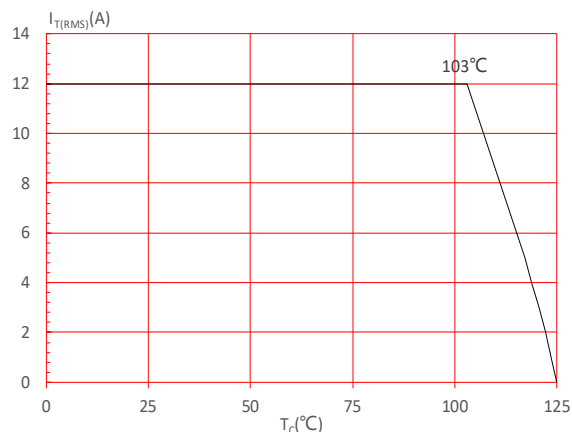
MARKING

|                                                                                     |                                                                         |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
|  | <p>XXX XXX</p> <p>Year _____<br/>Month _____</p> <p>Production Code</p> |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------|

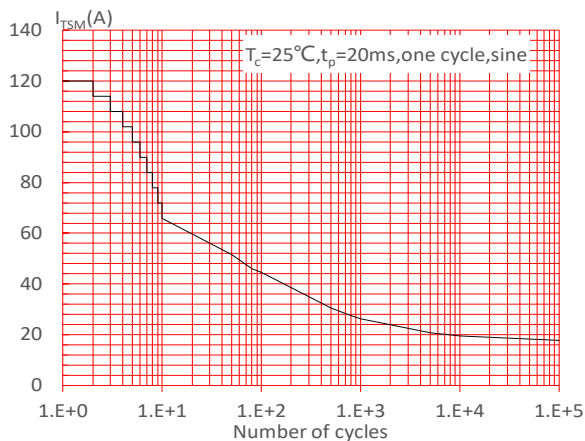
**FIG.1:** Maximum power dissipation versus RMS on-state current



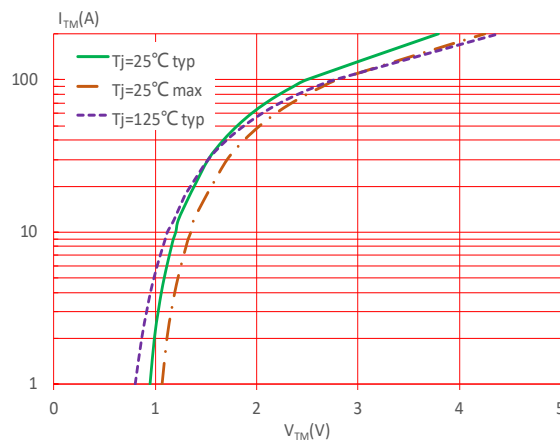
**FIG.2:** RMS on-state current versus case temperature



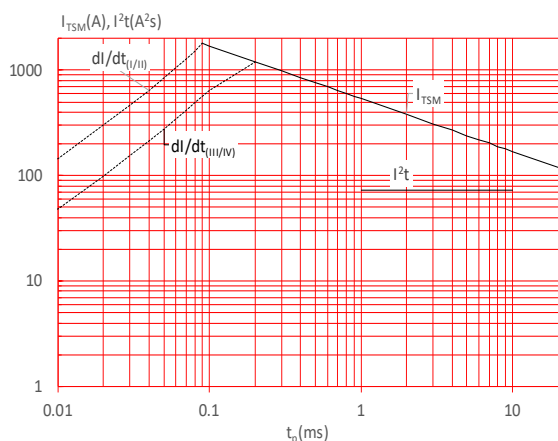
**FIG.3:** Surge peak on-state current versus number of cycles



**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  $I^2t$  (I - II:  $di/dt < 80\text{A}/\mu\text{s}$ ; III-IV:  $di/dt < 40\text{A}/\mu\text{s}$ )



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

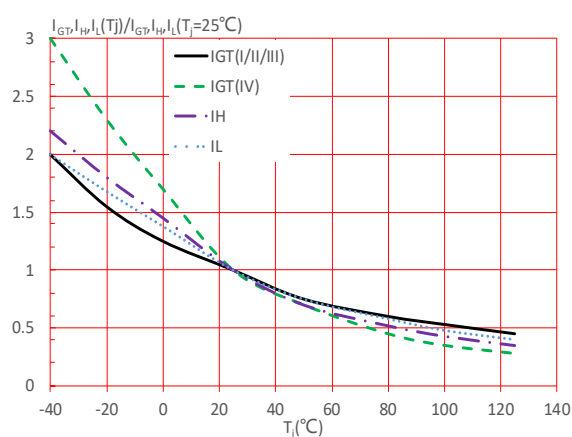
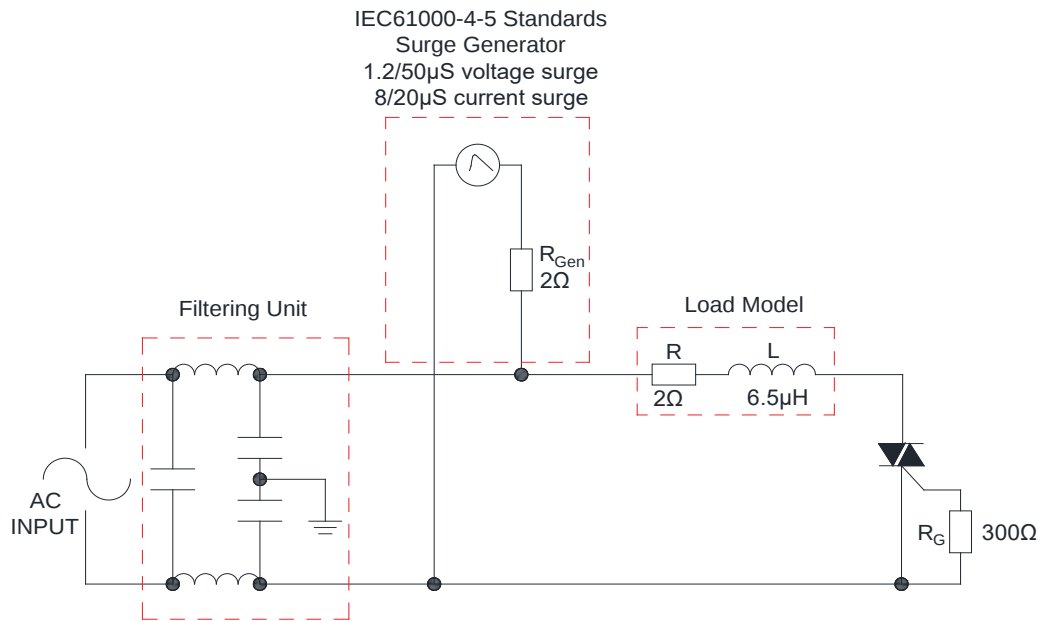


FIG.7: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



## 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>$V_{\text{DRM}}/V_{\text{RRM}}$ (V) | IGT(mA)      |    | Package | Base qty.<br>(pcs) | Delivery mode |
|-------------|------------------------------------------------|--------------|----|---------|--------------------|---------------|
|             |                                                | I - II - III | IV |         |                    |               |
| JST12C-600C | 600                                            | 25           | 50 | TO-220C | 50                 | Tube          |

## Document Revision History

| Date         | Revision | Changes                        |
|--------------|----------|--------------------------------|
| Apr.14, 2023 | A.1.0    | Last updated                   |
| Oct.15, 2025 | A.1.1    | Revise PACKAGE MECHANICAL DATA |

Technical drawing of a 3-pin plug, showing three views: a top view, a front view, and a side view. The top view shows a rectangular plug with a central circular hole and a smaller circular hole below it. The front view shows the plug with three pins (labeled L1, L2, L3) and dimensions E, H, K, G, B, M, and L. The side view shows the plug with dimensions A, C2, D, C3, and C. The drawing includes a note:  $\varnothing 3.45-3.65\text{mm}$  pointing to the central hole. The drawing is labeled with dimensions and labels: E, H, K, G, B, M, L, L1, L2, L3, A, C2, D, C3, C, E1, H1, and  $\varnothing 3.45-3.65\text{mm}$ .

| 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        |      | 10.30 | 0.390  |      | 0.406 |
| E1   | 0.80        |      | 1.20  | 0.031  |      | 0.047 |
| F    | 6.30        |      | 6.90  | 0.248  |      | 0.272 |
| G    | 2.40        |      | 2.70  | 0.094  |      | 0.106 |
| H    | 28.00       |      | 29.80 | 1.102  |      | 1.173 |
| H1   | 2.15        |      | 2.55  | 0.085  |      | 0.100 |
| I    | 4.70        |      | 5.10  | 0.185  |      | 0.201 |
| K    | 9.90        |      | 10.30 | 0.390  |      | 0.406 |
| 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 |
| M    | 4.80        |      | 5.20  | 0.189  |      | 0.205 |

Technical drawing of a 3D printed part, showing three views: top, front, and side views. The dimensions are as follows:

- Top View:**
  - Overall width:  $520 \pm 0.5$
  - Overall height:  $530 \pm 0.5$
  - Printing area:  $80 \times 5.5$
  - Distance from left edge to printing area:  $520 \pm 0.5 - 80 = 440$
  - Distance from top edge to printing area:  $530 \pm 0.5 - 5.5 = 524.5$
  - Distance from right edge to printing area:  $5$
  - Distance from bottom edge to printing area:  $5.5$
  - Distance from left edge to bottom hole:  $530 \pm 0.5 - 5.5 = 524.5$
  - Distance from right edge to bottom hole:  $5$
  - Distance from bottom edge to bottom hole:  $5.5$
  - Distance from left edge to top hole:  $520 \pm 0.5 - 80 = 440$
  - Distance from top edge to top hole:  $530 \pm 0.5 - 5.5 = 524.5$
  - Distance from right edge to top hole:  $5$
  - Distance from bottom edge to top hole:  $5.5$
- Front View:**
  - Overall width:  $520 \pm 0.5$
  - Overall height:  $530 \pm 0.5$
  - Printing area:  $80 \times 5.5$
  - Distance from left edge to printing area:  $520 \pm 0.5 - 80 = 440$
  - Distance from top edge to printing area:  $530 \pm 0.5 - 5.5 = 524.5$
  - Distance from right edge to printing area:  $5$
  - Distance from bottom edge to printing area:  $5.5$
  - Distance from left edge to bottom hole:  $530 \pm 0.5 - 5.5 = 524.5$
  - Distance from right edge to bottom hole:  $5$
  - Distance from bottom edge to bottom hole:  $5.5$
  - Distance from left edge to top hole:  $520 \pm 0.5 - 80 = 440$
  - Distance from top edge to top hole:  $530 \pm 0.5 - 5.5 = 524.5$
  - Distance from right edge to top hole:  $5$
  - Distance from bottom edge to top hole:  $5.5$
- Side View:**
  - Overall width:  $7 \pm 0.2$
  - Overall height:  $33$
  - Distance from top edge to top hole:  $3.8$
  - Distance from top hole to printing area:  $2.4$
  - Distance from printing area to bottom hole:  $3.8$
  - Distance from bottom hole to bottom edge:  $0.6$
  - Distance from left edge to top hole:  $95$
  - Distance from left edge to printing area:  $95$
  - Distance from left edge to bottom hole:  $95$

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

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