

**JST139C-800F 16A TRIAC**

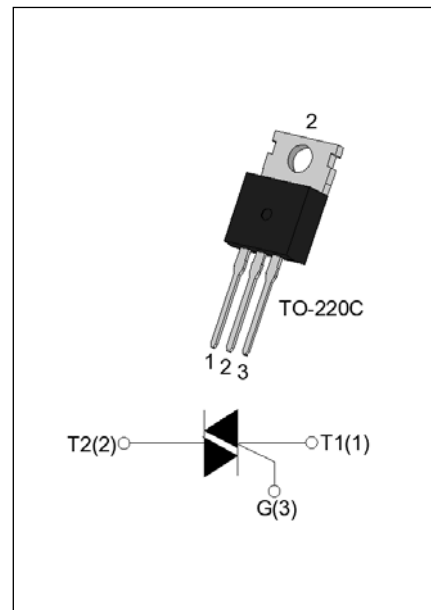
Rev.A.1.1

**DESCRIPTION:**

The JST139C-800F 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 |
|-----------------------|-------------|------|
| $I_{T(RMS)}$          | 16          | A    |
| $V_{DRM}/V_{RRM}$     | 800         | V    |
| $I_{GT\ I/II/III/IV}$ | 25/25/25/70 | 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>    | 800     | V                |
| Repetitive peak reverse voltage (T <sub>j</sub> =25℃)                                                             |        | V <sub>RRM</sub>    | 800     | V                |
| RMS on-state current (T <sub>c</sub> ≤95℃)                                                                        |        | I <sub>T(RMS)</sub> | 16      | 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>    | 140     | A                |
| Non repetitive surge peak on-state current<br>(full cycle , t <sub>p</sub> =16.6ms , T <sub>j</sub> =25℃)         |        |                     | 154     |                  |
| I <sup>2</sup> t value for fusing (t <sub>p</sub> =10ms , T <sub>j</sub> =25℃)                                    |        | I <sup>2</sup> t    | 98      | 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               | 100     | A/μs             |
|                                                                                                                   | III-IV |                     | 70      |                  |
| 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          |       | 70  |                        |
| $V_{GT}$    |                                                                                    | 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.  | 50  | mA                     |
|             |                                                                                    | II          |       | 100 |                        |
| $I_H$       | $I_T=500\text{mA}$                                                                 |             | MAX.  | 40  | mA                     |
| $dV/dt$     | $V_D=540\text{V}$ Gate Open $T_j=125^{\circ}\text{C}$                              |             | MIN.  | 200 | $\text{V}/\mu\text{s}$ |
| $(dV/dt)_c$ | $(dI/dt)_c=7.2\text{A/ms}$ , $T_j=110^{\circ}\text{C}$                             |             | MIN.  | 10  | $\text{V}/\mu\text{s}$ |
| $t_{on}$    | $I_G=80\text{mA}$ $I_A=400\text{mA}$ $I_R=40\text{mA}$<br>$T_j=25^{\circ}\text{C}$ |             | TYP.  | 10  | $\mu\text{s}$          |
| $t_{off}$   |                                                                                    |             |       | 70  |                        |

**STATIC CHARACTERISTICS**

| Symbol    | Parameter                                |                           | Value(MAX.) | Unit             |
|-----------|------------------------------------------|---------------------------|-------------|------------------|
| $V_{TM}$  | $I_{TM}=20\text{A}$ $t_p=380\mu\text{s}$ | $T_j=25^{\circ}\text{C}$  | 1.5         | V                |
| $V_{TO}$  | Threshold voltage                        | $T_j=125^{\circ}\text{C}$ | 0.75        | V                |
| $R_D$     | Dynamic resistance                       | $T_j=125^{\circ}\text{C}$ | 27          | $\text{m}\Omega$ |
| $I_{DRM}$ | $V_D=V_{DRM}$ $V_R=V_{RRM}$              | $T_j=25^{\circ}\text{C}$  | 5           | $\mu\text{A}$    |
| $I_{RRM}$ |                                          | $T_j=125^{\circ}\text{C}$ | 0.5         | mA               |

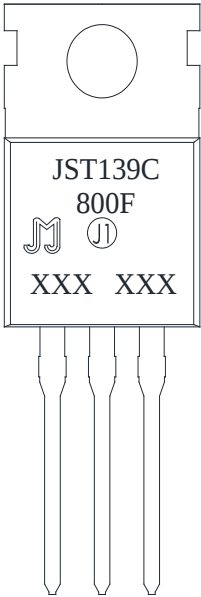
**THERMAL RESISTANCES**

| 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     | 139              | C         | -800                            | F                                            |
| JieJie Microelectronics Co., Ltd. | Triacs | $I_{T(RMS)}:16A$ | C:TO-220C | $800:V_{DRM}/V_{RRM} \geq 800V$ | F: $I_{GT1-3} \leq 25mA$ $I_{GT4} \leq 70mA$ |

MARKING

|                                                                                     |                                                                         |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
|  | <div>XXX XXX</div> <div>Year<br/>Month</div> <div>Production Code</div> |
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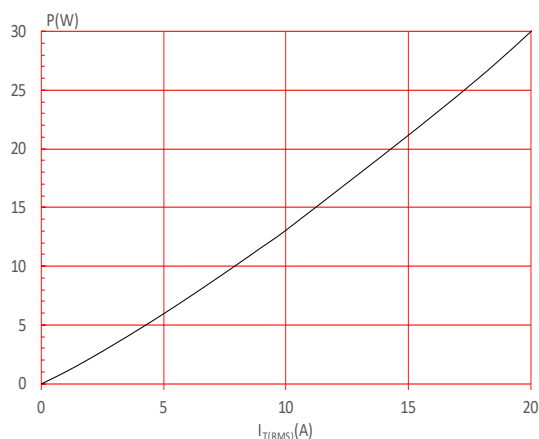
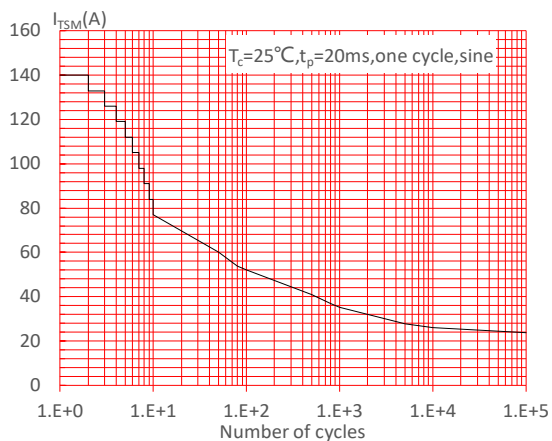
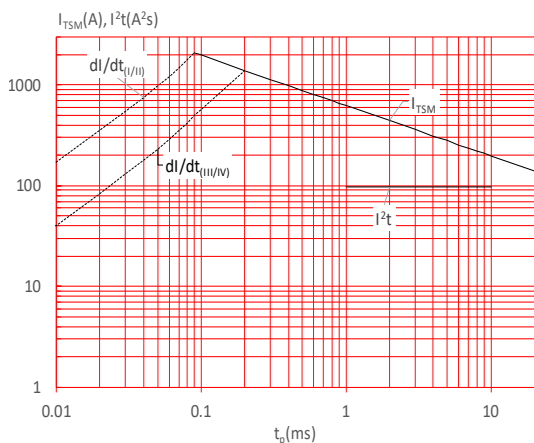
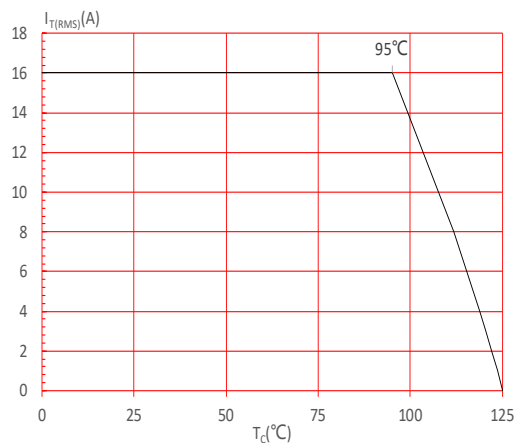
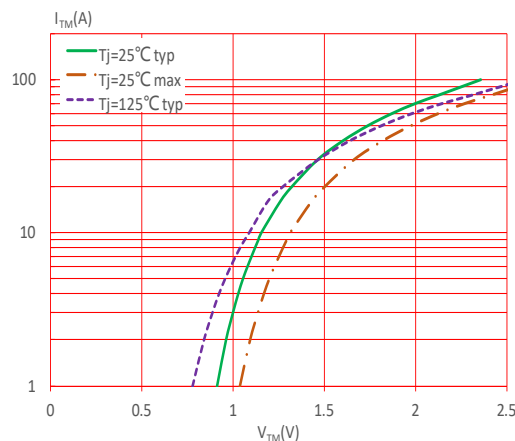
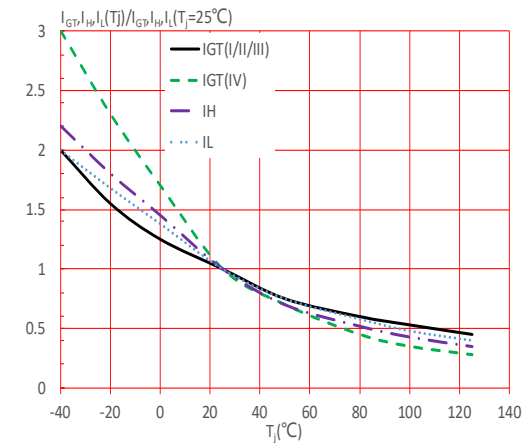
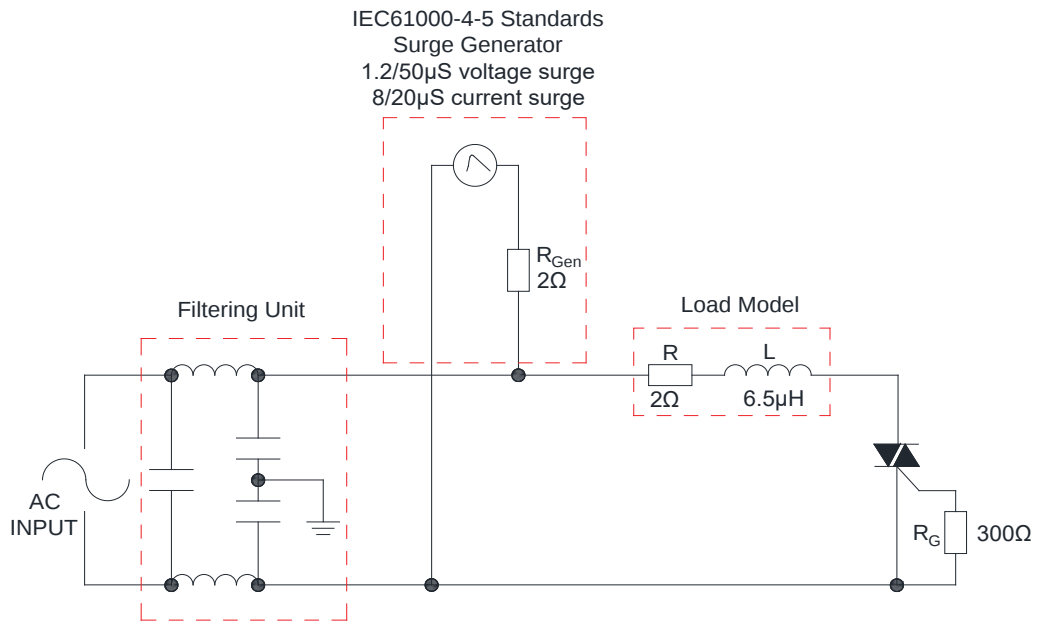
**FIG.1:** Maximum power dissipation versus RMS on-state current**FIG.3:** Surge peak on-state current versus number of cycles**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$ , and corresponding value of  $I^2t$  (I - II:  $di/dt < 100\text{A}/\mu\text{s}$ ; III-IV:  $di/dt < 70\text{A}/\mu\text{s}$ )**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>$V_{\text{DRM}}/V_{\text{RRM}}$ (V) | IGT(mA)      |    | Package | Base qty.<br>(pcs) | Delivery<br>mode |
|--------------|------------------------------------------------|--------------|----|---------|--------------------|------------------|
|              |                                                | I - II - III | IV |         |                    |                  |
| JST139C-800F | 800                                            | 25           | 70 | TO-220C | 50                 | Tube             |

## Document Revision History

| Date         | Revision | Changes                        |
|--------------|----------|--------------------------------|
| Apr.14, 2023 | A.1.0    | Last updated                   |
| Oct.16, 2025 | A.1.1    | Revise PACKAGE MECHANICAL DATA |

Technical drawing of a 3-pin plug. The drawing includes a top view, a side view, and a front view. The top view shows a circular hole with a diameter of  $\varnothing 3.45-3.65\text{mm}$ . The side view shows the plug's profile with dimensions A, C2, C3, D, and E. The front view shows the plug's face with dimensions H, L1, K, L2, L3, M, and E1. The plug has three pins of length G and a base of length B. The total height is H, and the total width is M.

| 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 top, front, and side views with dimensions in millimeters.

**Top View:**

- Overall width:  $520 \pm 0.5$
- Overall height:  $530 \pm 0.5$
- Printing area dimensions:  $80$  (width) and  $5$  (height).
- Feature dimensions:  $\phi 4.5 \pm 0.05$  (hole diameter),  $3$  (filament diameter), and  $\phi 3 \pm 0.05$  (hole diameter).

**Front View:**

- Overall height:  $33$
- Feature dimensions:  $7 \pm 0.2$  (top width),  $2.4$  (filament diameter),  $3.8$  (filament diameter),  $3.8$  (filament diameter),  $0.6$  (filament diameter), and  $18$  (bottom height).

**Side View:**

- Overall width:  $520 \pm 0.5$
- Overall height:  $530 \pm 0.5$
- Feature dimensions:  $3$  (filament diameter),  $5$  (filament diameter),  $5.5$  (filament diameter), and  $5.5$  (filament diameter).

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

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