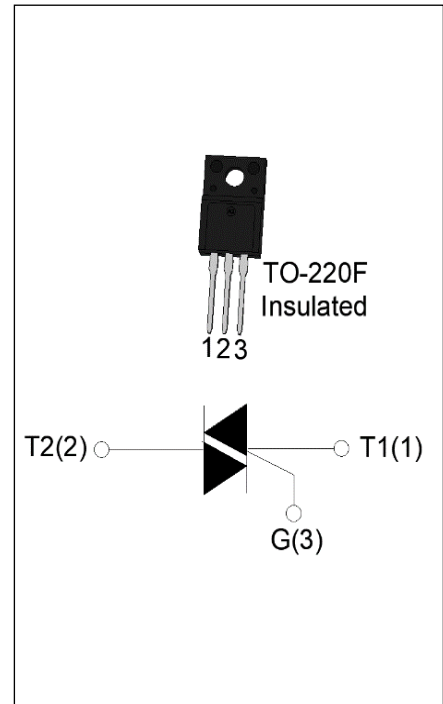


## JST139F-800D 16A TRIAC

Rev.A.1.1

### DESCRIPTION:

The JST139F-800D 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. By using an external plastic package, JST139F-800D provides a rated insulation voltage of 2000 VRMS, complying with UL standards (File ref: E252906). Package TO-220F is RoHS compliant.



### MAIN FEATURES

| Symbol                | Value    | Unit |
|-----------------------|----------|------|
| $I_{T(RMS)}$          | 16       | A    |
| $V_{DRM}/V_{RRM}$     | 800      | V    |
| $I_{GT\ I/II/III/IV}$ | 5/5/5/10 | 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> ≤70℃)                                                                        |        | 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               | 50      | A/μs             |
|                                                                                                                   | III-IV |                     | 20      |                  |
| 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>( $T_j=25^{\circ}\text{C}$ ; non-repetitive, off-state; FIG.7) | $V_{pp}$ | 4.5 | 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.  | 5   | mA               |
|             |                                                                                    | IV           |       | 10  |                  |
| $V_{GT}$    |                                                                                    | 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.  | 15  | mA               |
|             |                                                                                    | II           |       | 20  |                  |
| $I_H$       | $I_T=500\text{mA}$                                                                 |              | MAX.  | 10  | mA               |
| $dV/dt$     | $V_D=540\text{V}$ Gate Open $T_j=125^{\circ}\text{C}$                              |              | MIN.  | 40  | V/ $\mu\text{s}$ |
| $(dV/dt)_c$ | $(dI/dt)_c=7.2\text{A/ms}$ , $T_j=110^{\circ}\text{C}$                             |              | MIN.  | 2   | V/ $\mu\text{s}$ |
| $t_{on}$    | $I_G=20\text{mA}$ $I_A=200\text{mA}$ $I_R=20\text{mA}$<br>$T_j=25^{\circ}\text{C}$ |              | TYP.  | 3   | $\mu\text{s}$    |
| $t_{off}$   |                                                                                    |              |       | 50  |                  |

**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               |

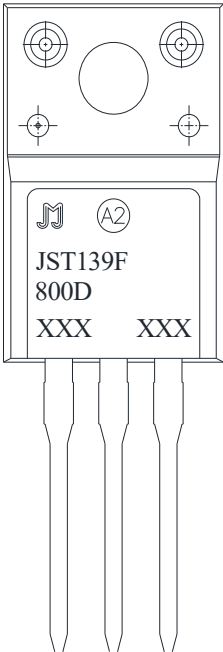
**THERMAL RESISTANCES**

| Symbol        | Parameter                | Value | Unit                 |
|---------------|--------------------------|-------|----------------------|
| $R_{th(j-c)}$ | junction to case (AC)    | 2.4   | $^{\circ}\text{C/W}$ |
| $R_{th(j-a)}$ | junction to ambient (AC) | 60    | $^{\circ}\text{C/W}$ |

ORDERING INFORMATION

|                                   |        |                |                  |                                 |                                                |
|-----------------------------------|--------|----------------|------------------|---------------------------------|------------------------------------------------|
| J                                 | ST     | 139            | F                | -800                            | D                                              |
| JieJie Microelectronics Co., Ltd. | Triacs | $I_T(RMS):16A$ | $F:TO-220F(Ins)$ | $800:V_{DRM}/V_{RRM} \geq 800V$ | $D:I_{GT1-3} \leq 5mA \quad I_{GT4} \leq 10mA$ |

MARKING

|                                                                                                                                                                                                                                                                                                                    |                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
|  <p>The diagram shows a triac component with a rectangular body and three pins. The top surface has four circular mounting holes. The bottom surface has a label with the following text: <br/>JST139F<br/>800D<br/>XXX XXX</p> | <p>XXX XXX</p> <p>Year _____<br/>Month _____</p> <p>Production Code</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|

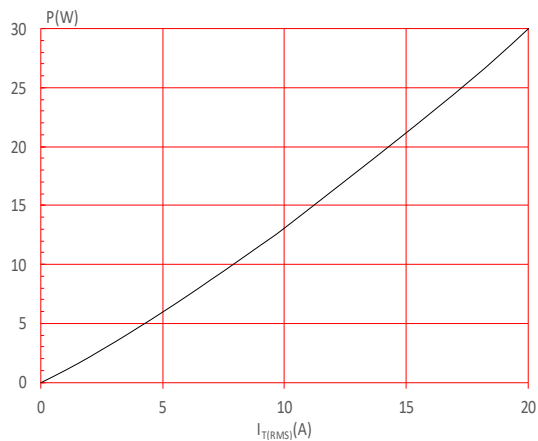
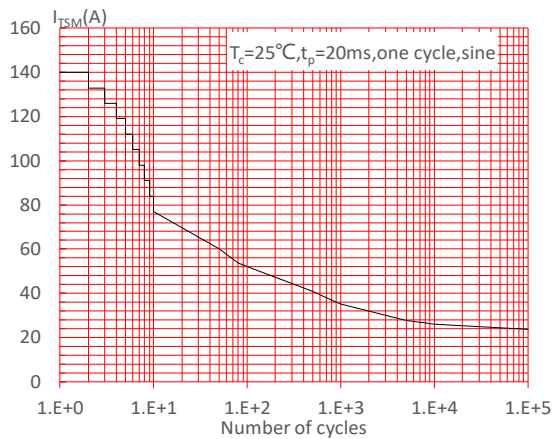
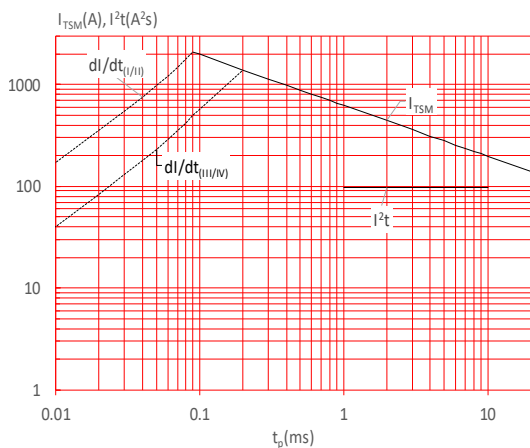
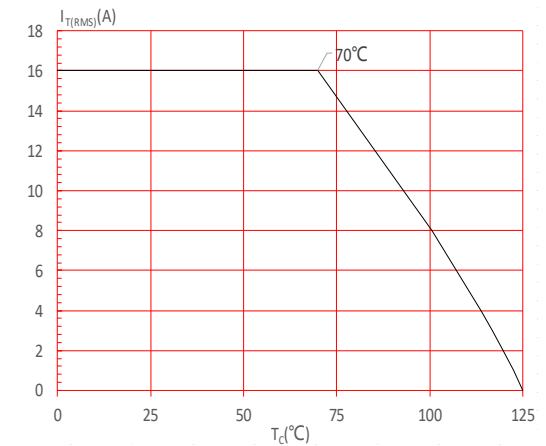
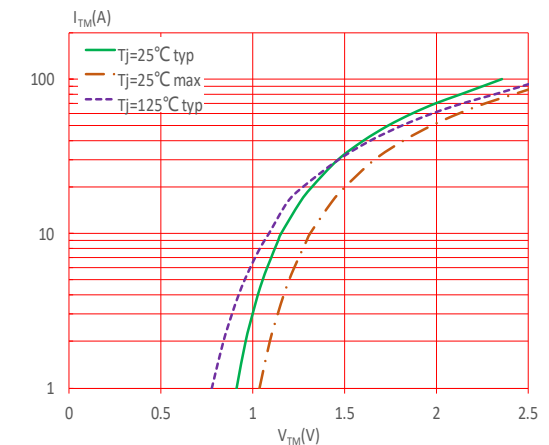
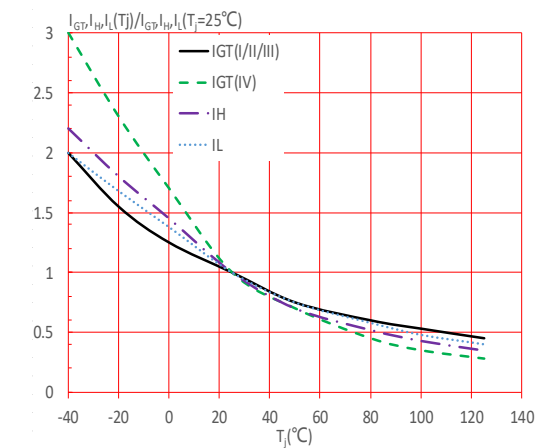
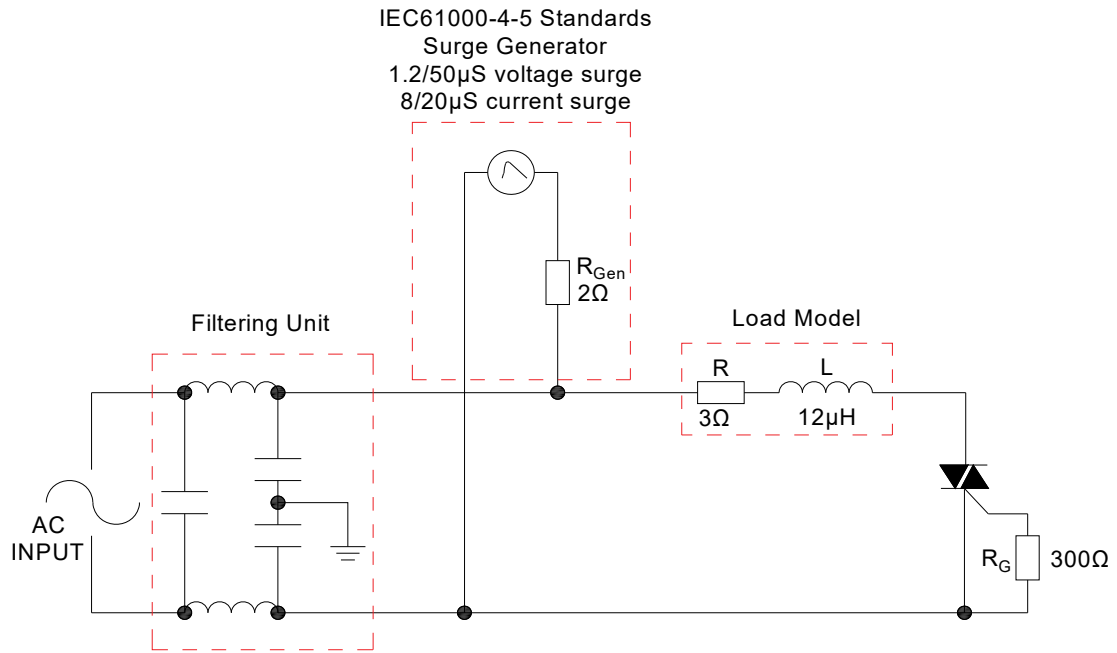
**FIG.1:** Maximum power dissipation versus RMS on-state current**FIG.3:** Surge peak on-state current versus number of cycles**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$ , and corresponding value of  $I^2t$  (I - II:  $di/dt < 50\text{A}/\mu\text{s}$ ; III-IV:  $di/dt < 20\text{A}/\mu\text{s}$ )**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.

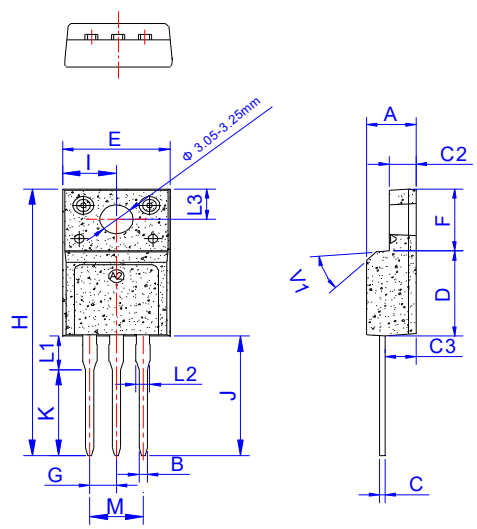
## ORDERING INFORMATION

| 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 |              |                    |                  |
| JST139F-800D | 800                                            | 5            | 10 | TO-220F(Ins) | 50                 | Tube             |

## Document Revision History

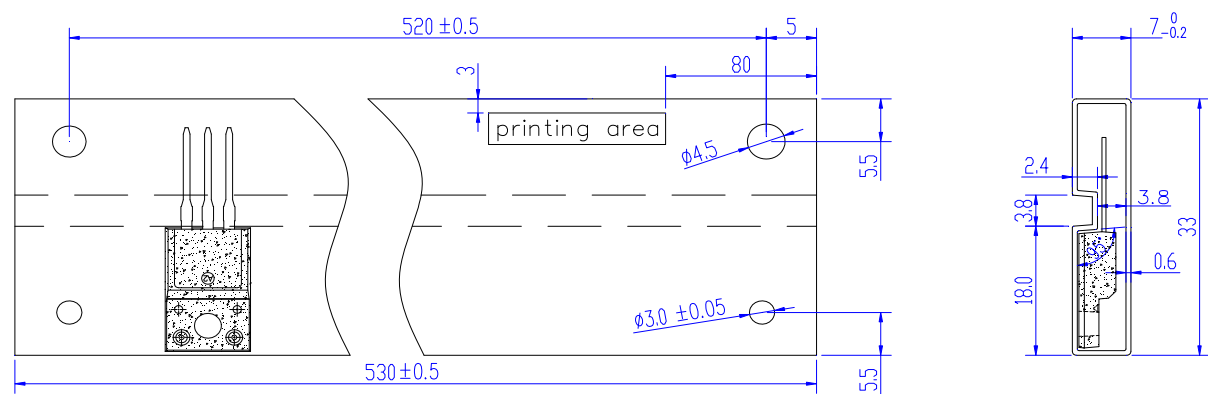
| Date         | Revision | Changes                        |
|--------------|----------|--------------------------------|
| Apr.14, 2023 | A.1.0    | Last updated                   |
| Oct.15, 2025 | A.1.1    | Revise PACKAGE MECHANICAL DATA |

PACKAGE MECHANICAL DATA



| Ref. | Dimensions  |      |       |        |       |       |
|------|-------------|------|-------|--------|-------|-------|
|      | Millimeters |      |       | Inches |       |       |
|      | Min.        | Typ. | Max.  | Min.   | Typ.  | Max.  |
| A    | 4.50        |      | 4.90  | 0.177  |       | 0.193 |
| B    | 0.74        | 0.80 | 0.83  | 0.029  | 0.031 | 0.033 |
| C    | 0.47        |      | 0.65  | 0.019  |       | 0.026 |
| C2   | 2.45        |      | 2.75  | 0.096  |       | 0.108 |
| C3   | 2.60        |      | 3.00  | 0.102  |       | 0.118 |
| D    | 8.80        |      | 9.30  | 0.346  |       | 0.366 |
| E    | 9.80        |      | 10.4  | 0.386  |       | 0.410 |
| F    | 6.40        |      | 6.80  | 0.252  |       | 0.268 |
| G    | 2.40        |      | 2.70  | 0.094  |       | 0.106 |
| H    | 28.0        |      | 29.8  | 1.102  |       | 1.173 |
| I    | 4.80        |      | 5.20  | 0.189  |       | 0.205 |
| J    | 12.60       |      | 13.00 | 0.496  |       | 0.512 |
| K    | 9.60        |      | 10.00 | 0.378  |       | 0.394 |
| L1   | 3.20        |      | 3.80  | 0.126  |       | 0.150 |
| L2   | 1.14        |      | 1.70  | 0.045  |       | 0.067 |
| L3   | 3.20        |      | 3.60  | 0.126  |       | 0.142 |
| M    | 4.80        |      | 5.20  | 0.189  |       | 0.205 |
| V1   |             | 45°  |       |        | 45°   |       |

DELIVERY MODE



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

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