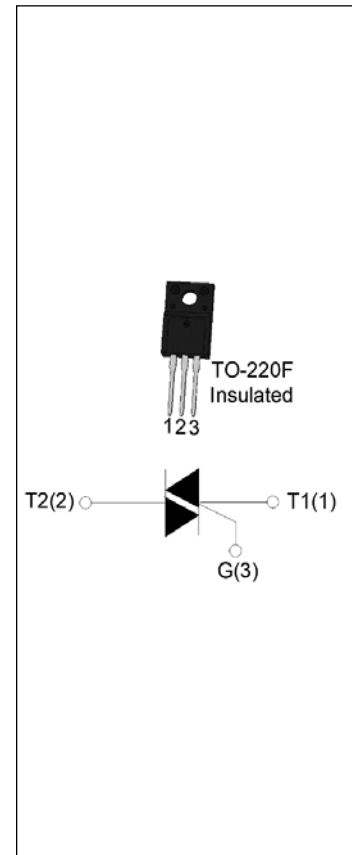


JST12F-800TW 12A TRIAC

Rev.A.1.0

DESCRIPTION:

The JST12F-800TW 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. JST12F-800TW snubberless triac is especially recommended for use on inductive loads. It can be driven directly through the MCU I/O port. By using an external plastic package, JST12F-800TW 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 |
|--------------------|-------|------|
| $I_{T(RMS)}$ | 12 | A |
| V_{DRM}/V_{RRM} | 800 | V |
| $I_{GT\ I/II/III}$ | 5/5/5 | 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} | 800 | V |
| Repetitive peak reverse voltage ($T_j=25^\circ\text{C}$) | V_{RRM} | 800 | V |
| RMS on-state current ($T_c \leq 85^\circ\text{C}$) | $I_{T(RMS)}$ | 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 | A^2s |
| 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 | 50 | $\text{A}/\mu\text{s}$ |
| 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 ($T_j=25^\circ\text{C}$; non-repetitive, off-state; FIG.7) | V_{pp} | 3.5 | 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 |
| V_{GT} | | I - II - III | MAX. | 1 | V |
| V_{GD} | $V_D=V_{DRM} T_j=125^\circ\text{C}$ $R_L=3.3\text{k}\Omega$ | I - II - III | MIN. | 0.2 | V |
| I_L | $I_G=1.2I_{GT}$ | I - III | MAX. | 10 | mA |
| | | II | | 15 | |
| 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. | 80 | V/ μs |
| $(dI/dt)_c$ | $(dV/dt)_c=10\text{V}/\mu\text{s } T_j=125^\circ\text{C}$ | | MIN. | 1 | A/ms |
| t_{on} | $I_G=10\text{mA } I_A=200\text{mA } I_R=20\text{mA}$ $T_j=25^\circ\text{C}$ | | TYP. | 2 | μs |
| t_{off} | | | | 20 | |

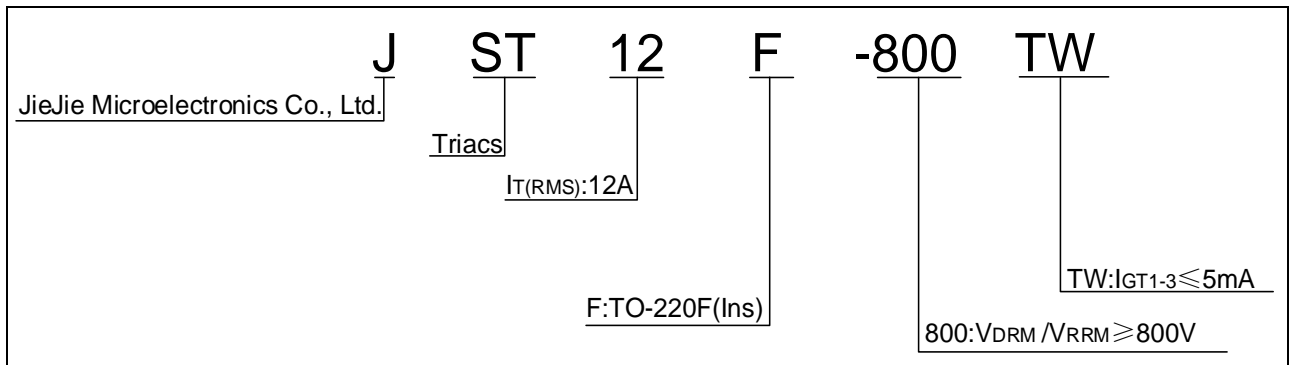
STATIC CHARACTERISTICS

| 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 | μA |
| 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 | $^\circ\text{C}/\text{W}$ |
| $R_{th(j-a)}$ | junction to ambient (AC) | 60 | $^\circ\text{C}/\text{W}$ |

ORDERING INFORMATION



MARKING

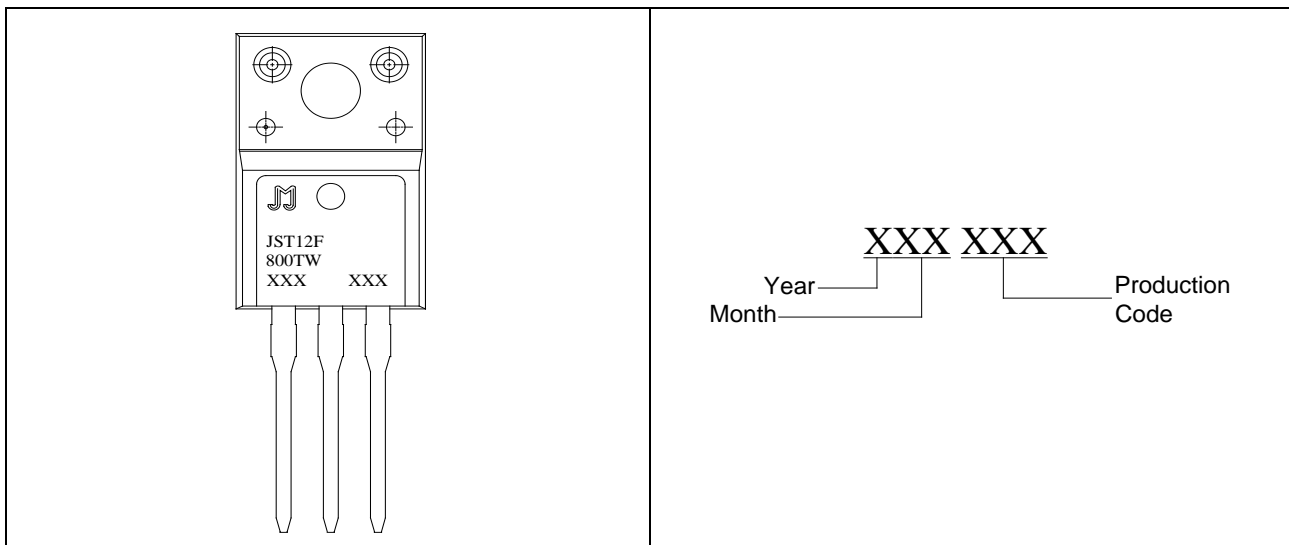


FIG.1 Maximum power dissipation versus RMS on-state current

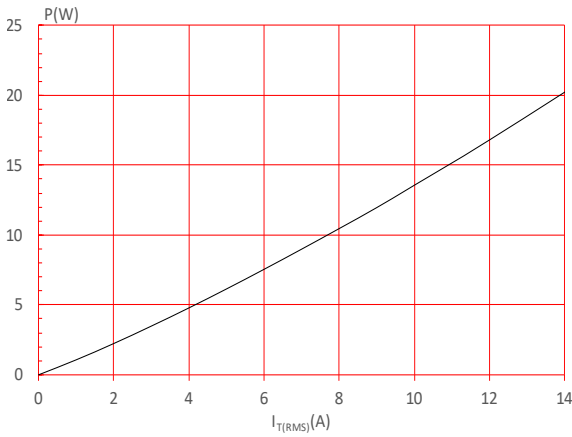


FIG.3: Surge peak on-state current versus number of cycles

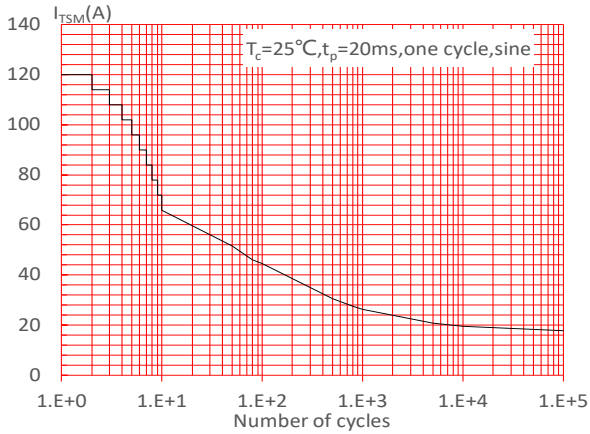


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 20\text{ms}$, and corresponding value of I^2t ($di/dt < 50\text{A}/\mu\text{s}$)

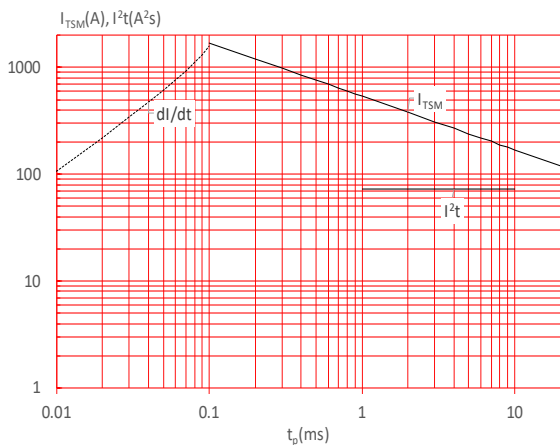


FIG.2: RMS on-state current versus case temperature

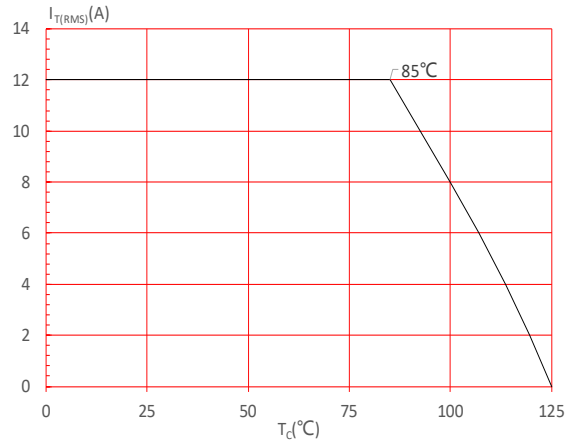


FIG.4: On-state characteristics

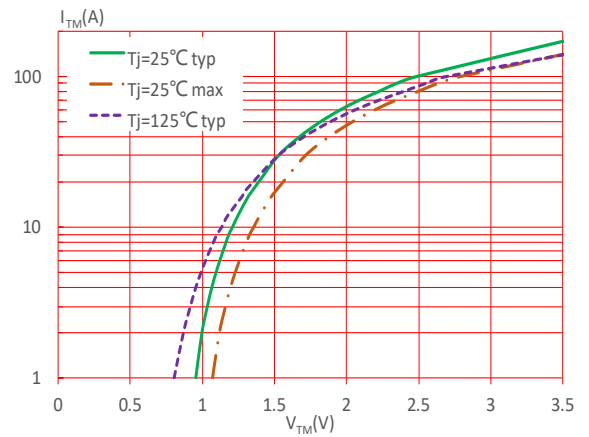


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature

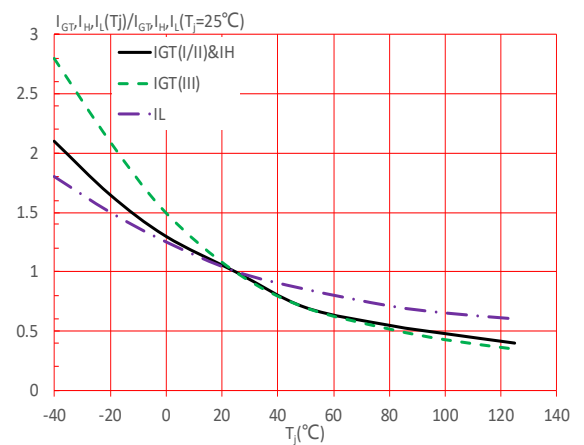


FIG.7: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



SHAPING AND SOLDERING PARAMETERS

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

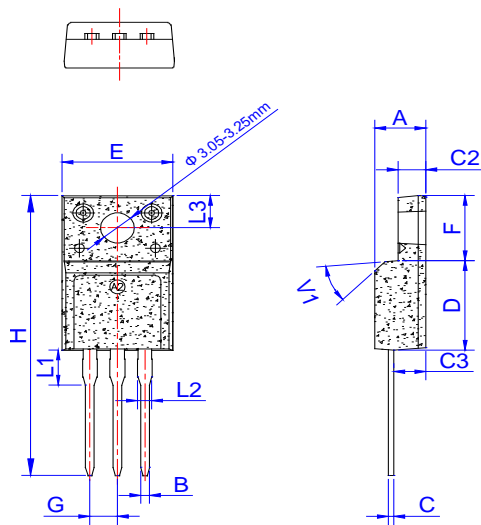
ORDERING INFORMATION

| Order code | Voltage V_{DRM}/V_{RRM} (V) | IGT(mA) | Package | Base qty. (pcs) | Delivery mode |
|--------------|----------------------------------|--------------|--------------|--------------------|------------------|
| | | I - II - III | | | |
| JST12F-800TW | 800 | 5 | TO-220F(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 | 4.50 | | 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 |
| 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 |
| 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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