

**JST131V-800DS 1A TRIAC**

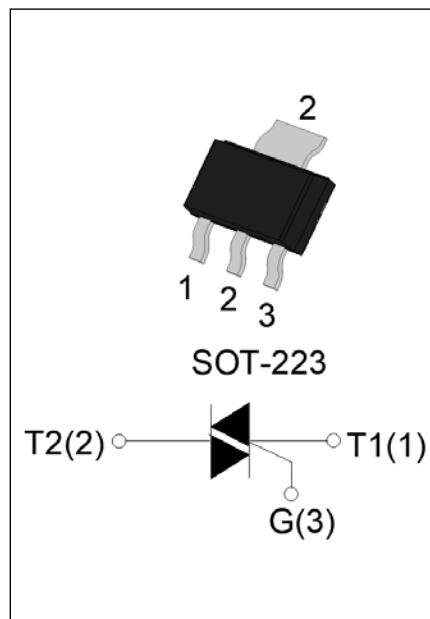
Rev.A.1.1

**DESCRIPTION:**

The JST131V-800DS 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. Package SOT-223 is RoHS compliant.

**MAIN FEATURES**

| Symbol                | Value    | Unit |
|-----------------------|----------|------|
| $I_{T(RMS)}$          | 1        | 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> ≤98℃)                                                                        |             | I <sub>T(RMS)</sub> | 1       | 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>    | 16.5    | A                |
| Non repetitive surge peak on-state current<br>(full cycle , t <sub>p</sub> =16.6ms , T <sub>j</sub> =25℃)         |             |                     | 18      |                  |
| I <sup>2</sup> t value for fusing (t <sub>p</sub> =10ms , T <sub>j</sub> =25℃)                                    |             | I <sup>2</sup> t    | 1.36    | 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 -III | di/dt               | 50      | A/μs             |
|                                                                                                                   | IV          |                     | 30      |                  |
| Peak gate current (t <sub>p</sub> =20μs , T <sub>j</sub> =125℃)                                                   |             | I <sub>GM</sub>     | 2       | 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>     | 5       | W                |
| Peak pulse voltage<br>(T <sub>j</sub> =25℃ ; non-repetitive,off-state;FIG.8)                                      |             | V <sub>PP</sub>     | 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.  | 5   | mA                     |
|             |                                                                                    | IV           |       | 10  |                        |
| $V_{GT}$    |                                                                                    | ALL          | MAX.  | 1.3 | 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.  | 5   | mA                     |
|             |                                                                                    | II           |       | 20  |                        |
| $I_H$       | $I_T=50\text{mA}$                                                                  |              | MAX.  | 7   | mA                     |
| $dV/dt$     | $V_D=540\text{V}$ Gate Open $T_j=110^{\circ}\text{C}$                              |              | MIN.  | 300 | $\text{V}/\mu\text{s}$ |
| $(dV/dt)_c$ | $(dI/dt)_c=0.44\text{A/ms}$ , $T_j=110^{\circ}\text{C}$                            |              | MIN.  | 3   | $\text{V}/\mu\text{s}$ |
| $t_{on}$    | $I_G=20\text{mA}$ $I_A=200\text{mA}$ $I_R=20\text{mA}$<br>$T_j=25^{\circ}\text{C}$ |              | TYP.  | 2.5 | $\mu\text{s}$          |
| $t_{off}$   |                                                                                    |              |       | 25  |                        |

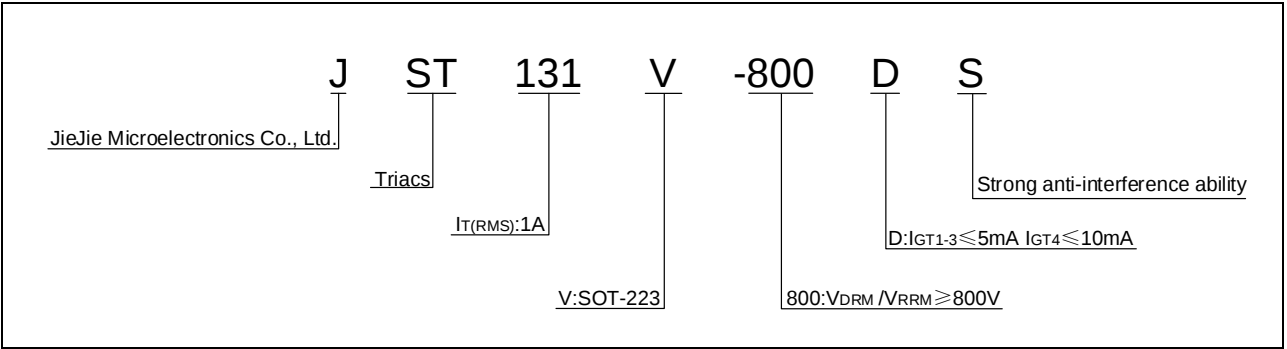
**STATIC CHARACTERISTICS**

| Symbol    | Parameter                                 |                           | Value(MAX.) | Unit             |
|-----------|-------------------------------------------|---------------------------|-------------|------------------|
| $V_{TM}$  | $I_{TM}=1.4\text{A}$ $t_p=380\mu\text{s}$ | $T_j=25^{\circ}\text{C}$  | 1.45        | V                |
| $V_{TO}$  | Threshold voltage                         | $T_j=125^{\circ}\text{C}$ | 0.96        | V                |
| $R_D$     | Dynamic resistance                        | $T_j=125^{\circ}\text{C}$ | 225         | $\text{m}\Omega$ |
| $I_{DRM}$ | $V_D=V_{DRM}$ $V_R=V_{RRM}$               | $T_j=25^{\circ}\text{C}$  | 5           | $\mu\text{A}$    |
| $I_{RRM}$ |                                           | $T_j=125^{\circ}\text{C}$ | 0.25        | mA               |

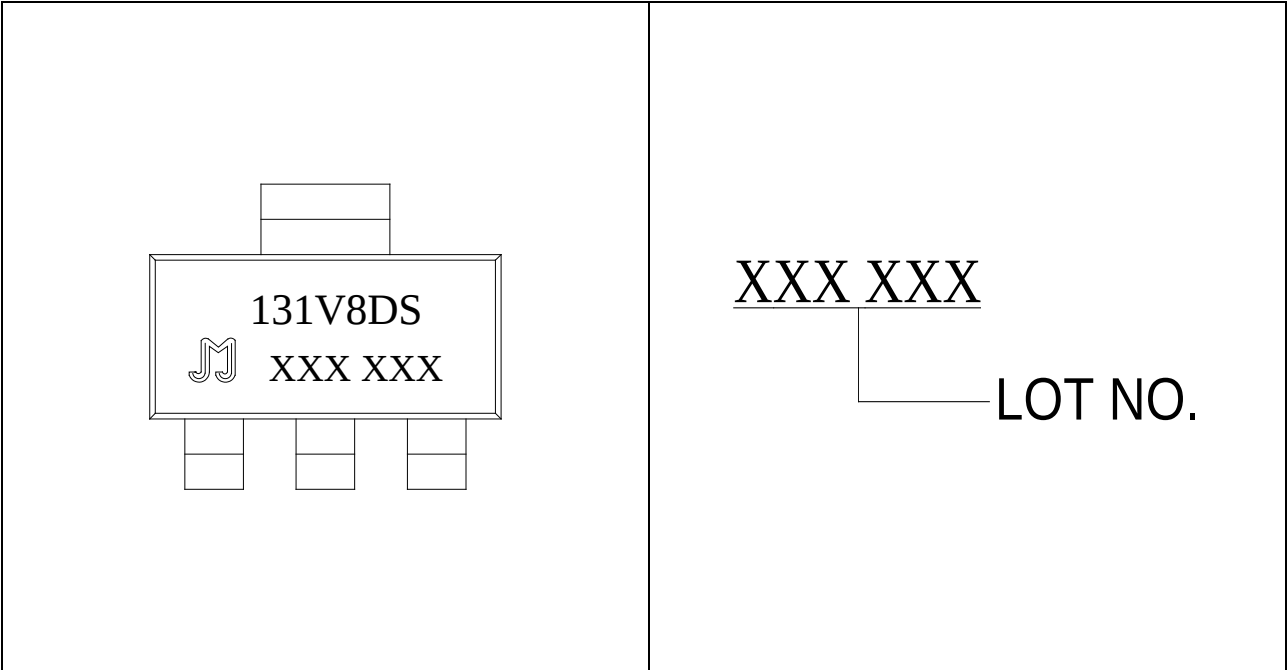
**THERMAL RESISTANCES**

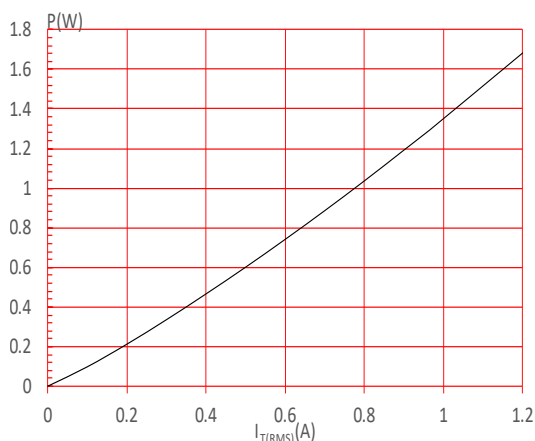
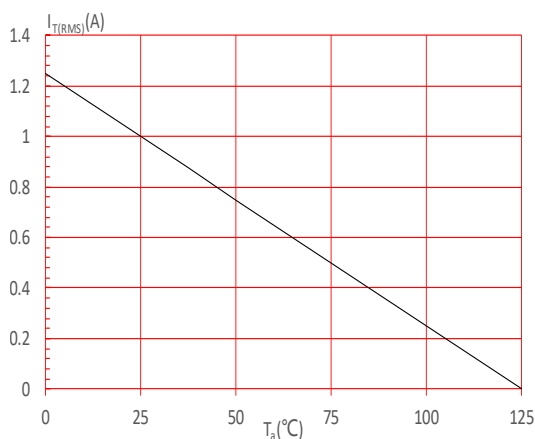
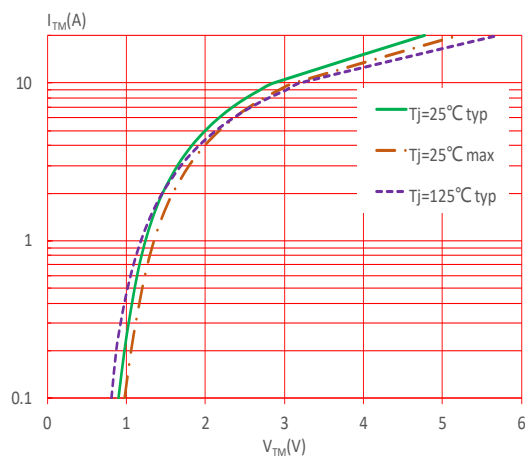
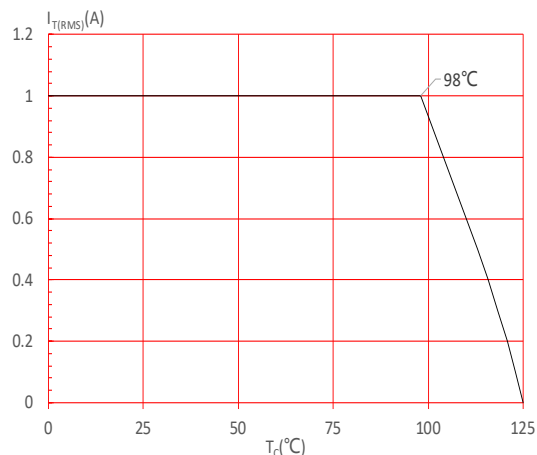
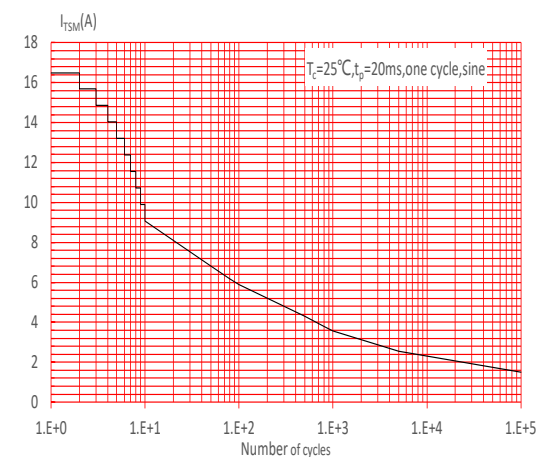
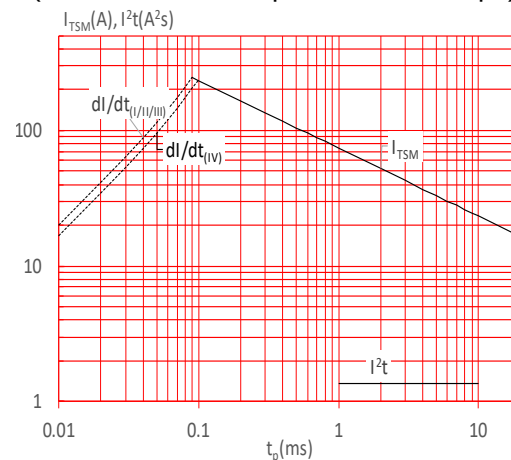
| Symbol        | Parameter                | Value | Unit                        |
|---------------|--------------------------|-------|-----------------------------|
| $R_{th(j-c)}$ | junction to case (AC)    | 20    | $^{\circ}\text{C}/\text{W}$ |
| $R_{th(j-a)}$ | junction to ambient (AC) | 130   | $^{\circ}\text{C}/\text{W}$ |

ORDERING INFORMATION



MARKING



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

**FIG.3:** RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35 $\mu$ m) (full cycle)

**FIG.5:** On-state characteristics

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

**FIG.4:** Surge peak on-state current versus number of cycles

**FIG.6:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20ms$ , and corresponding value of  $I^2t$  (I - II - III:  $di/dt < 50A/\mu s$ ; IV:  $di/dt < 30A/\mu s$ )


**FIG.7:** Relative variations of gate trigger current, holding current and latching current versus junction temperature

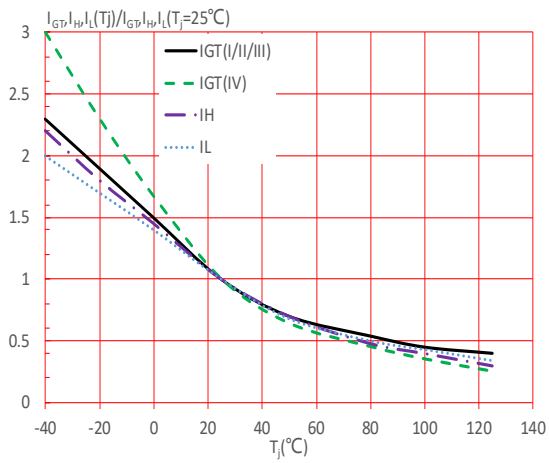
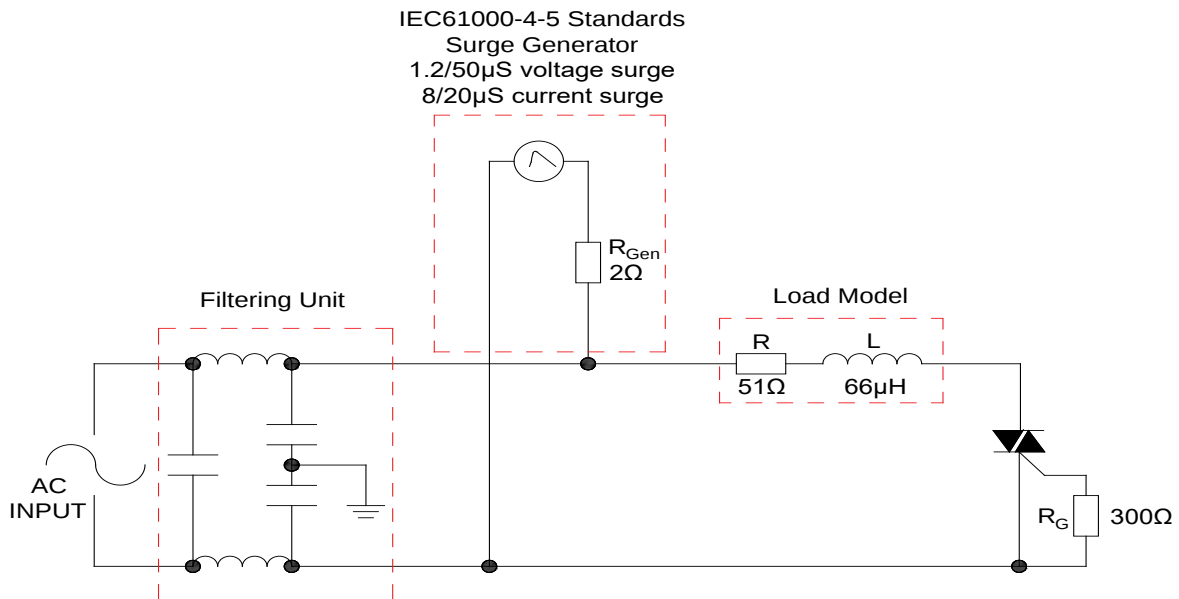
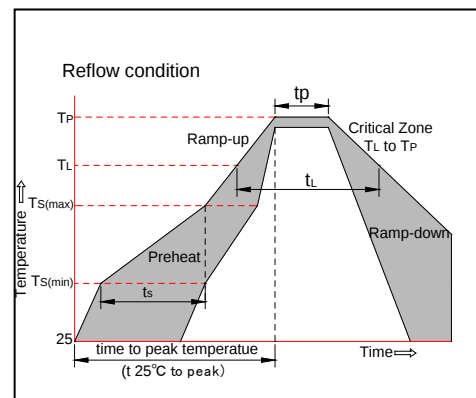


FIG.8: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



## SOLDERING PARAMETERS

| Reflow Condition                                            |                                     | Pb-Free assembly<br>(see figure at right) |
|-------------------------------------------------------------|-------------------------------------|-------------------------------------------|
| Pre Heat                                                    | -Temperature Min ( $T_{s(min)}$ )   | +150 $^{\circ}$ C                         |
|                                                             | -Temperature Max( $T_{s(max)}$ )    | +200 $^{\circ}$ C                         |
|                                                             | -Time (Min to Max) ( $t_s$ )        | 60-180 secs.                              |
| Average ramp up rate<br>(Liquidus Temp ( $T_L$ ) to peak)   |                                     | 3 $^{\circ}$ C/sec. Max                   |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                        |                                     | 3 $^{\circ}$ C/sec. Max                   |
| Reflow                                                      | -Temperature( $T_L$ )<br>(Liquidus) | +217 $^{\circ}$ C                         |
|                                                             | -Temperature( $t_L$ )               | 60-150 secs.                              |
| Peak Temp ( $T_p$ )                                         |                                     | +260(+0/-5) $^{\circ}$ C                  |
| Time within 5 $^{\circ}$ C of actual<br>Peak Temp ( $t_p$ ) |                                     | 20-40secs.                                |
| Ramp-down Rate                                              |                                     | 6 $^{\circ}$ C/sec. Max                   |
| Time 25 $^{\circ}$ C to Peak Temp ( $T_P$ )                 |                                     | 8 min. Max                                |
| Do not exceed                                               |                                     | +260 $^{\circ}$ C                         |



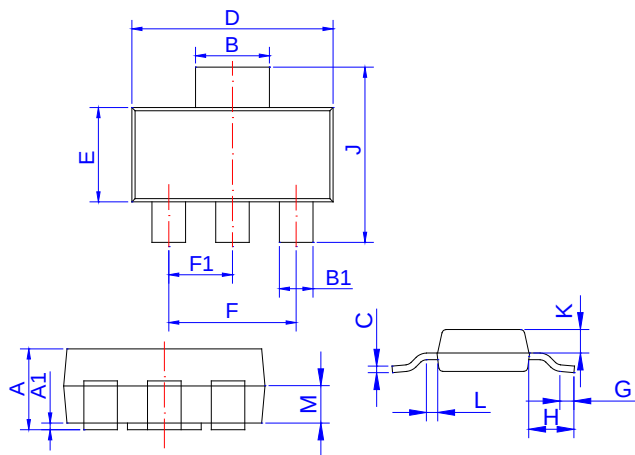
## ORDERING INFORMATION

| 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 |         |                    |                  |
| JST131V-800DS | 800                                            | 5            | 10 | SOT-223 | 4,000              | Tape & Reel      |

## Document Revision History

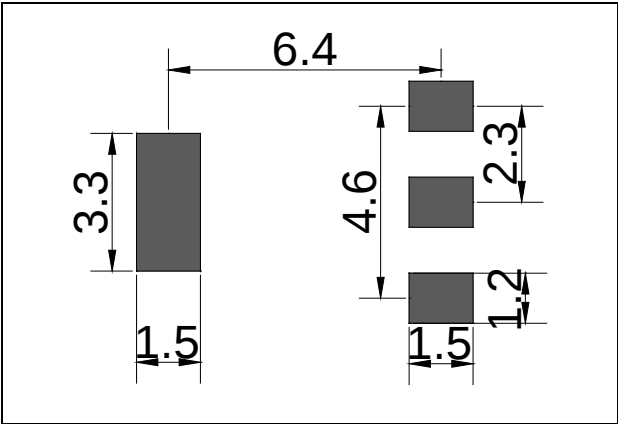
| Date         | Revision | Changes                        |
|--------------|----------|--------------------------------|
| Jan.11, 2024 | A.1.0    | Last updated                   |
| Oct.23, 2025 | A.1.1    | Revise PACKAGE MECHANICAL DATA |

PACKAGE MECHANICAL DATA

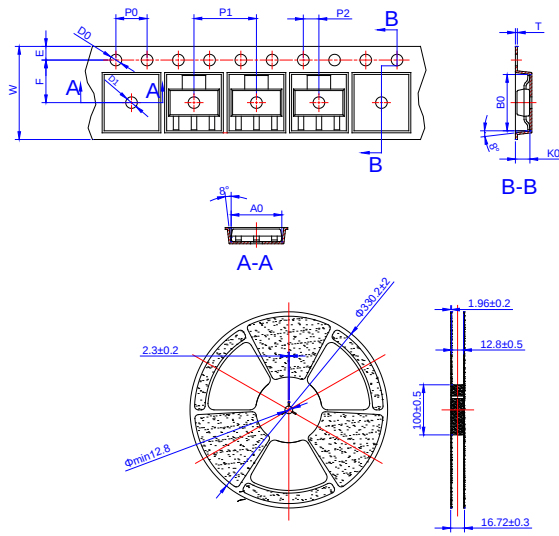


| Ref. | Dimensions  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    | 1.50        | 1.60 | 1.80 | 0.059  | 0.063 | 0.071 |
| A1   | 0.01        | 0.06 | 0.10 | 0.001  | 0.002 | 0.004 |
| B    | 2.90        | 3.00 | 3.10 | 0.114  | 0.118 | 0.122 |
| B1   | 0.60        | 0.70 | 0.80 | 0.024  | 0.028 | 0.031 |
| C    | 0.22        | 0.26 | 0.32 | 0.009  | 0.010 | 0.013 |
| D    | 6.30        | 6.50 | 6.70 | 0.248  | 0.256 | 0.264 |
| E    | 3.30        | 3.50 | 3.70 | 0.130  | 0.138 | 0.146 |
| F    | 4.40        |      | 4.80 | 0.173  |       | 0.189 |
| F1   | 2.20        |      | 2.40 | 0.087  |       | 0.094 |
| G    | 0.50        |      | 1.00 | 0.020  |       | 0.039 |
| H    | 1.50        | 1.75 | 2.00 | 0.059  | 0.069 | 0.079 |
| J    | 6.70        | 7.00 | 7.30 | 0.264  | 0.276 | 0.287 |
| K    | 0.80        |      | 1.00 | 0.031  |       | 0.039 |
| L    | 0.40        |      | 0.80 | 0.016  |       | 0.031 |
| M    | 0.75        |      | 0.95 | 0.030  |       | 0.037 |

FOOTPRINT-SOT-223 (dimensions in mm)



## DELIVERY MODE



| Ref. | Dimensions  |       |       |        |       |       |
|------|-------------|-------|-------|--------|-------|-------|
|      | Millimeters |       |       | Inches |       |       |
|      | Min.        | Typ.  | Max.  | Min.   | Typ.  | Max.  |
| W    | -           | -     | 12.30 | -      |       | 0.482 |
| E    | 1.65        | 1.75  | 1.85  | 0.065  | 0.069 | 0.073 |
| F    | 5.45        | 5.50  | 5.55  | 0.215  | 0.217 | 0.219 |
| D0   | 1.50        | 1.55  | 1.60  | 0.059  | 0.061 | 0.063 |
| D1   | 1.50        | -     | -     | 0.059  | -     | -     |
| P0   | 3.90        | 4.00  | 4.10  | 0.154  | 0.157 | 0.161 |
| P1   | 7.90        | 8.00  | 8.10  | 0.311  | 0.315 | 0.319 |
| P2   | 1.95        | 2.00  | 2.05  | 0.077  | 0.079 | 0.081 |
| 10P0 | 39.80       | 40.00 | 40.20 | 1.567  | 1.575 | 1.583 |
| A0   | 6.85        | 6.95  | 7.05  | 0.269  | 0.273 | 0.276 |
| B0   | 7.15        | 7.25  | 7.35  | 0.280  | 0.284 | 0.288 |
| K0   | 1.95        | 2.05  | 2.15  | 0.076  | 0.080 | 0.084 |
| T    | 0.20        | 0.25  | 0.30  | 0.008  | 0.010 | 0.012 |

| PACKAGE | OUTLINE | REEL (PCS) | PER CARTON (PCS) | TAPE & REEL |
|---------|---------|------------|------------------|-------------|
| SOT-223 | TAPING  | 4,000      | 40,000           | 13 inch     |

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