

**JST137E-600E 8A TRIAC**

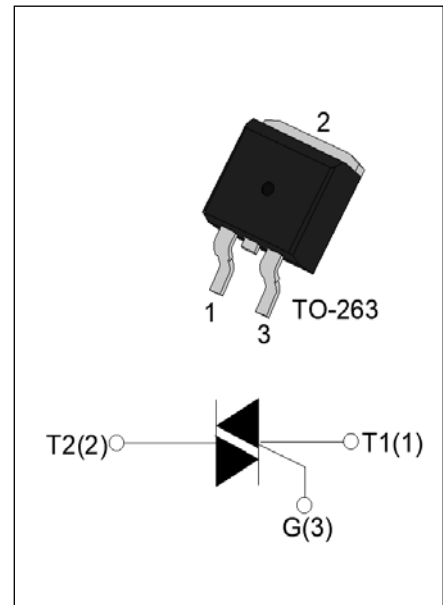
Rev.A.1.1

**DESCRIPTION:**

The JST137E-600E 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 TO-263 is RoHS compliant.

**MAIN FEATURES**

| Symbol                | Value       | Unit |
|-----------------------|-------------|------|
| $I_{T(RMS)}$          | 8           | A    |
| $V_{DRM}/V_{RRM}$     | 600         | V    |
| $I_{GT\ I/II/III/IV}$ | 10/10/10/25 | 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> ≤100℃)                                                                       |             | I <sub>T(RMS)</sub> | 8       | 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>    | 65      | A                |
| Non repetitive surge peak on-state current<br>(full cycle , t <sub>p</sub> =16.6ms , T <sub>j</sub> =25℃)         |             |                     | 72      |                  |
| I <sup>2</sup> t value for fusing (t <sub>p</sub> =10ms , T <sub>j</sub> =25℃)                                    |             | I <sup>2</sup> t    | 21      | 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               | 80      | A/μs             |
|                                                                                                                   | 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.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.  | 10  | mA                     |
|             |                                                                                    | IV           |       | 25  |                        |
| $V_{GT}$    |                                                                                    | 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.  | 20  | mA                     |
|             |                                                                                    | II           |       | 35  |                        |
| $I_H$       | $I_T=500\text{mA}$                                                                 |              | MAX.  | 20  | mA                     |
| $dV/dt$     | $V_D=400\text{V}$ Gate Open $T_j=125^{\circ}\text{C}$                              |              | MIN.  | 250 | $\text{V}/\mu\text{s}$ |
| $(dV/dt)_c$ | $(dI/dt)_c=2.7\text{A/ms}$ , $T_j=125^{\circ}\text{C}$                             |              | MIN.  | 5   | $\text{V}/\mu\text{s}$ |
| $t_{on}$    | $I_G=40\text{mA}$ $I_A=200\text{mA}$ $I_R=20\text{mA}$<br>$T_j=25^{\circ}\text{C}$ |              | TYP.  | 1.5 | $\mu\text{s}$          |
| $t_{off}$   |                                                                                    |              |       | 15  |                        |

**STATIC CHARACTERISTICS**

| Symbol    | Parameter                                |                           | Value(MAX.) | Unit             |
|-----------|------------------------------------------|---------------------------|-------------|------------------|
| $V_{TM}$  | $I_{TM}=10\text{A}$ $t_p=380\mu\text{s}$ | $T_j=25^{\circ}\text{C}$  | 1.5         | V                |
| $V_{TO}$  | Threshold voltage                        | $T_j=125^{\circ}\text{C}$ | 0.8         | V                |
| $R_D$     | Dynamic resistance                       | $T_j=125^{\circ}\text{C}$ | 53          | $\text{m}\Omega$ |
| $I_{DRM}$ | $V_D=V_{DRM}$ $V_R=V_{RRM}$              | $T_j=25^{\circ}\text{C}$  | 5           | $\mu\text{A}$    |
| $I_{RRM}$ |                                          | $T_j=125^{\circ}\text{C}$ | 0.35        | mA               |

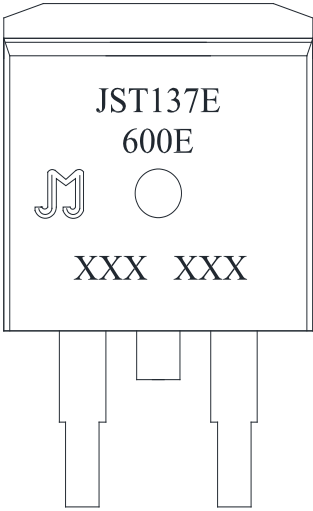
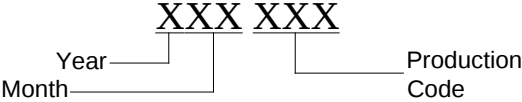
**THERMAL RESISTANCES**

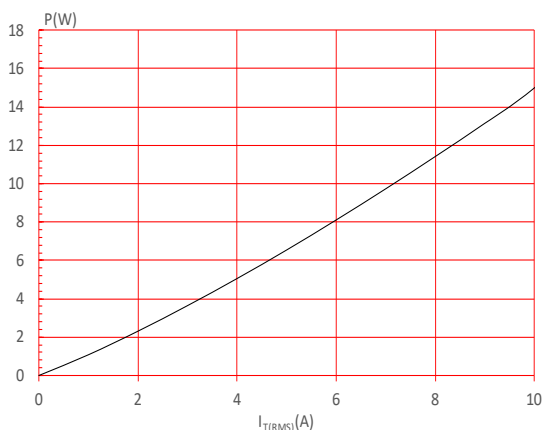
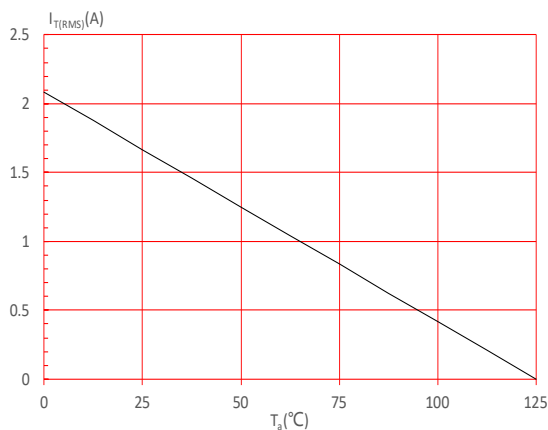
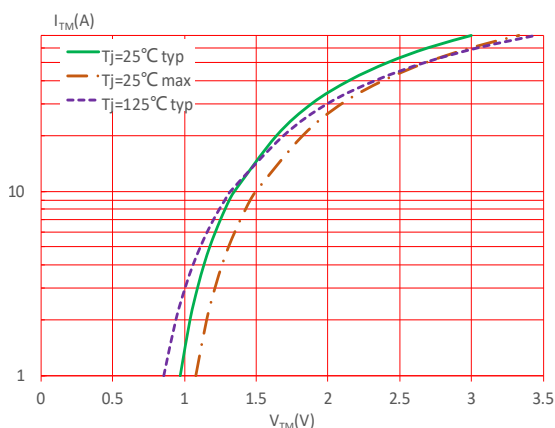
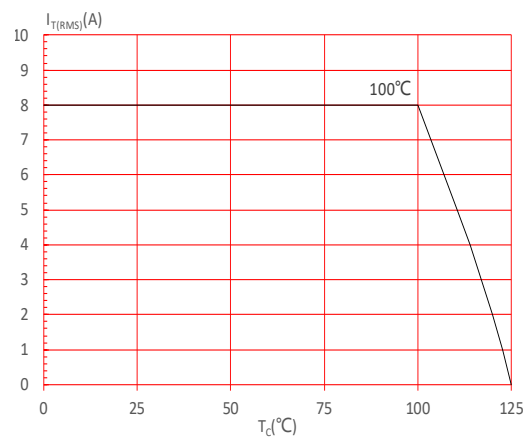
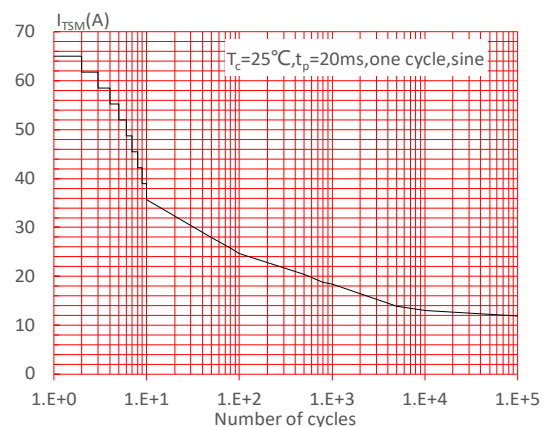
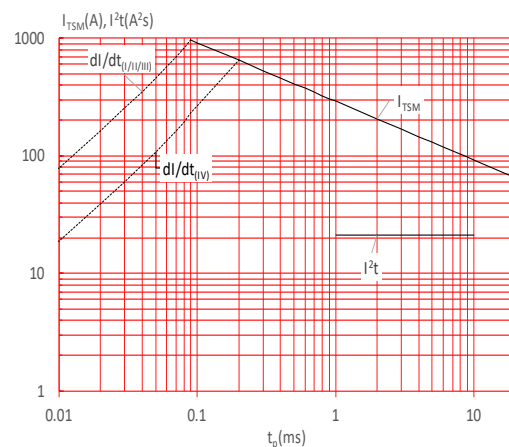
| Symbol        | Parameter                                                | Value | Unit                        |
|---------------|----------------------------------------------------------|-------|-----------------------------|
| $R_{th(j-c)}$ | junction to case (AC)                                    | 2.2   | $^{\circ}\text{C}/\text{W}$ |
| $R_{th(j-a)}$ | junction to ambient (AC, in free air, $S=2\text{cm}^2$ ) | 60    | $^{\circ}\text{C}/\text{W}$ |

ORDERING INFORMATION

|                                   |        |                 |          |                                  |                                              |                               |
|-----------------------------------|--------|-----------------|----------|----------------------------------|----------------------------------------------|-------------------------------|
| J                                 | ST     | 137             | E        | -600                             | E                                            | -/                            |
| JieJie Microelectronics Co., Ltd. | Triacs | $I_{T(RMS)}:8A$ | E:TO-263 | 600: $V_{DRM}/V_{RRM} \geq 600V$ | E: $I_{GT1-3} \leq 10mA$ $I_{GT4} \leq 25mA$ | Blank:Tube<br>-TR:Tape & Reel |

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:  $di/dt < 80A/\mu s$ ; IV:  $di/dt < 40A/\mu s$ )


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

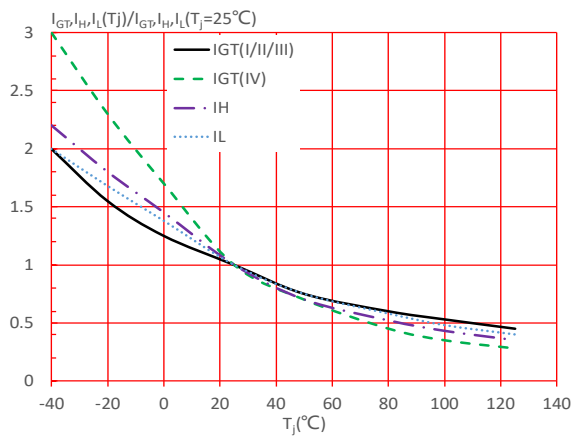
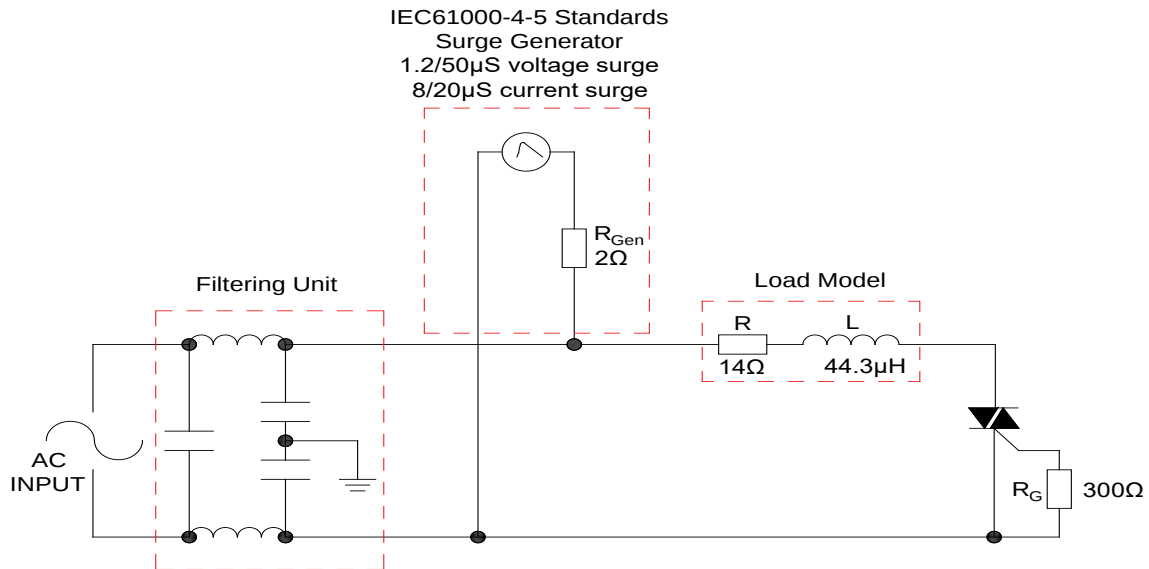
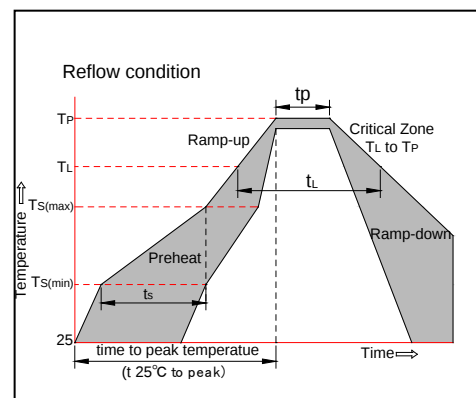


FIG.8: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



## SOLDERING PARAMETERS

| Reflow Condition                                                  |                                             | Pb-Free assembly<br>(see figure at right) |
|-------------------------------------------------------------------|---------------------------------------------|-------------------------------------------|
| Pre Heat                                                          | -Temperature Min<br>(T <sub>s(min)</sub> )  | +150°C                                    |
|                                                                   | -Temperature<br>Max(T <sub>s(max)</sub> )   | +200°C                                    |
|                                                                   | -Time (Min to Max) (ts)                     | 60-180 secs.                              |
| Average ramp up rate<br>(Liquidus Temp (T <sub>L</sub> ) to peak) |                                             | 3°C/sec. Max                              |
| T <sub>s(max)</sub> to T <sub>L</sub> - Ramp-up Rate              |                                             | 3°C/sec. Max                              |
| Reflow                                                            | -Temperature(T <sub>L</sub> )<br>(Liquidus) | +217°C                                    |
|                                                                   | -Temperature(t <sub>L</sub> )               | 60-150 secs.                              |
| Peak Temp (T <sub>p</sub> )                                       |                                             | +260(+0/-5)°C                             |
| Time within 5°C of actual<br>Peak Temp (t <sub>p</sub> )          |                                             | 20-40secs.                                |
| Ramp-down Rate                                                    |                                             | 6°C/sec. Max                              |
| Time 25°C to Peak Temp (T <sub>p</sub> )                          |                                             | 8 min. Max                                |
| Do not exceed                                                     |                                             | +260°C                                    |



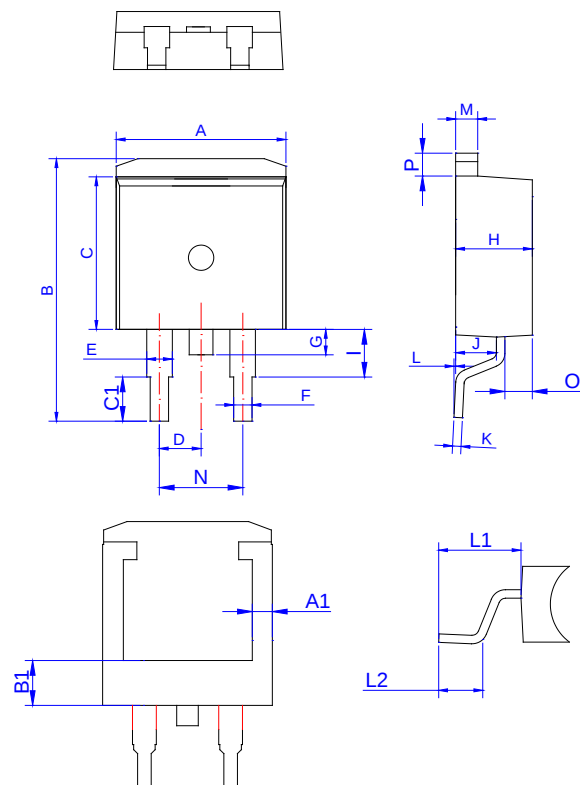
## ORDERING INFORMATION

| 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 |         |                    |                  |
| JST137E-600E    | 600                                            | 10           | 25 | TO-263  | 50                 | Tube             |
| JST137E-600E-TR |                                                |              |    |         | 800                | Tape & Reel      |

## Document Revision History

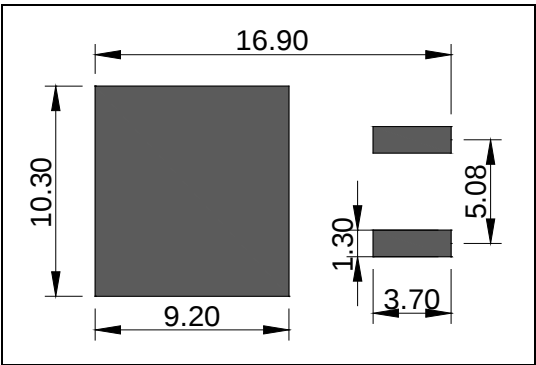
| Date         | Revision | Changes                        |
|--------------|----------|--------------------------------|
| Apr.14, 2023 | A.1.0    | Last updated                   |
| Oct.21, 2025 | A.1.1    | Revise PACKAGE MECHANICAL DATA |

PACKAGE MECHANICAL DATA



| Ref. | Dimensions  |      |       |        |       |       |
|------|-------------|------|-------|--------|-------|-------|
|      | Millimeters |      |       | Inches |       |       |
|      | Min.        | Typ. | Max.  | Min.   | Typ.  | Max.  |
| A    | 9.90        |      | 10.20 | 0.390  |       | 0.402 |
| A1   | 0.80        |      | 1.20  | 0.031  |       | 0.047 |
| B    | 14.70       |      | 15.80 | 0.579  |       | 0.622 |
| B1   | 2.15        |      | 2.55  | 0.085  |       | 0.100 |
| C    | 9.40        |      | 9.60  | 0.370  |       | 0.378 |
| C1   | 2.40        |      | 2.80  | 0.094  |       | 0.110 |
| D    | 2.40        |      | 2.70  | 0.094  |       | 0.106 |
| E    | 1.20        |      | 1.50  | 0.047  |       | 0.059 |
| F    | 0.75        |      | 0.85  | 0.029  |       | 0.033 |
| G    | 1.00        |      | 1.50  | 0.039  |       | 0.059 |
| H    | 4.40        |      | 4.70  | 0.173  |       | 0.185 |
| I    | 1.80        |      | 2.20  |        |       |       |
| J    | 2.30        |      | 2.70  | 0.091  |       | 0.106 |
| K    | 0.38        |      | 0.55  | 0.015  |       | 0.022 |
| L    | 0           | 0.10 | 0.25  | 0      | 0.004 | 0.010 |
| L1   | 4.65        |      | 5.05  | 0.183  |       | 0.199 |
| L2   | 1.90        |      |       | 0.075  |       |       |
| M    | 1.25        |      | 1.35  | 0.049  |       | 0.053 |
| N    | 4.80        |      | 5.20  |        |       |       |
| O    | 1.30        |      | 1.50  |        |       |       |
| P    | 1.20        |      | 1.50  | 0.047  |       | 0.059 |

FOOTPRINT-TO-263 (dimensions in mm)



Technical drawing of a mechanical part, showing front and side views with dimensions.

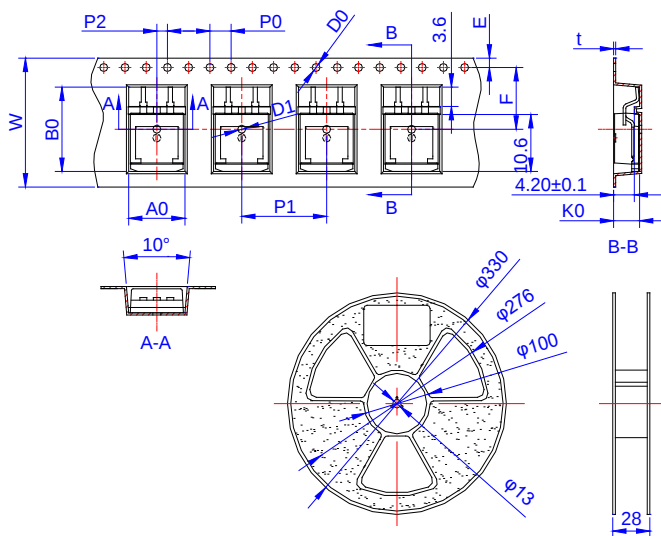
**Front View (Left):**

- Overall width:  $530 \pm 0.5$
- Distance from left edge to center of hole: 518
- Distance from center of hole to right edge: 12.9
- Overall height:  $17_{-0.1}^0$
- Internal hole diameter:  $\phi 3.0$
- Internal hole position tolerance:  $\pm 0.05$

**Side View (Right):**

- Overall width:  $7_{-0.2}^0$
- Overall height: 33
- Internal hole diameter:  $\phi 3.0$
- Internal hole position tolerance:  $\pm 0.05$
- Internal hole diameter:  $\phi 3.0$
- Internal hole position tolerance:  $\pm 0.05$
- Internal hole diameter:  $\phi 3.0$
- Internal hole position tolerance:  $\pm 0.05$

| PACKAGE | OUTLINE | TUBE<br>(PCS) | INNER BOX<br>(PCS) | PER CARTON |
|---------|---------|---------------|--------------------|------------|
| TO-263  | TUBE    | 50            | 1,000              | 5,000      |



| Ref. | Dimensions  |       |       |        |       |       |
|------|-------------|-------|-------|--------|-------|-------|
|      | Millimeters |       |       | Inches |       |       |
|      | Min.        | Typ.  | Max.  | Min.   | Typ.  | Max.  |
| W    | 23.70       | 24.00 | 24.30 | 0.933  | 0.945 | 0.957 |
| E    | 1.65        | 1.75  | 1.85  | 0.065  | 0.069 | 0.073 |
| F    | 11.40       | 11.50 | 11.60 | 0.449  | 0.453 | 0.457 |
| D0   | -           | 1.50  | 1.60  | -      | 0.059 | 0.063 |
| D1   | -           | 1.50  | 1.60  | -      | 0.059 | 0.063 |
| P0   | 3.90        | 4.00  | 4.10  | 0.154  | 0.157 | 0.161 |
| P1   | 15.90       | 16.00 | 16.10 | 0.626  | 0.630 | 0.634 |
| P2   | 1.90        | 2.00  | 2.10  | 0.075  | 0.079 | 0.083 |
| A0   | 10.80       | 10.90 | 11.00 | 0.425  | 0.429 | 0.433 |
| B0   | 16.20       | 16.30 | 16.40 | 0.638  | 0.642 | 0.646 |
| K0   | 4.80        | 4.90  | 5.00  | 0.189  | 0.193 | 0.197 |
| t    | 0.35        | 0.40  | 0.45  | 0.014  | 0.016 | 0.018 |

| PACKAGE | OUTLINE | REEL<br>(PCS) | PER CARTON<br>(PCS) | TAPE & REEL |
|---------|---------|---------------|---------------------|-------------|
| TO-263  | TAPING  | 800           | 4,000               | 13 inch     |

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