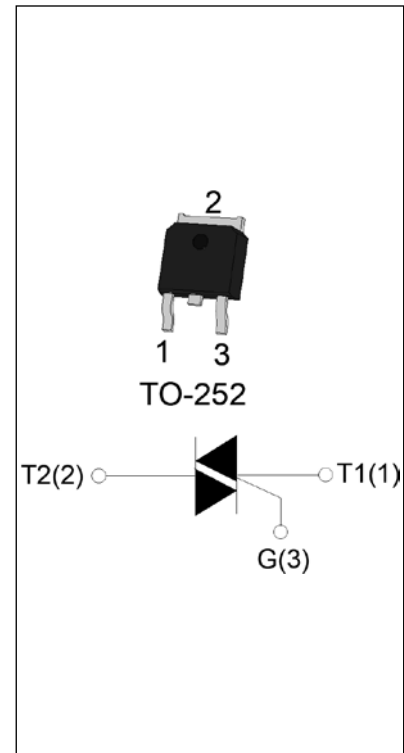


## JST06K-600SW 6A TRIAC

Rev.A.1.1

### DESCRIPTION:

The JST06K-600SW 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. JST06K-600SW snubberless triac is especially recommended for use on inductive loads. It can be driven directly through the MCU I/O port. Package TO-252 is RoHS compliant.



### MAIN FEATURES

| Symbol             | Value    | Unit |
|--------------------|----------|------|
| $I_{T(RMS)}$       | 6        | A    |
| $V_{DRM}/V_{RRM}$  | 600      | V    |
| $I_{GT\ I/II/III}$ | 10/10/10 | 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 ( $T_j=25^{\circ}C$ )                                              | $V_{DRM}$    | 600     | V         |
| Repetitive peak reverse voltage ( $T_j=25^{\circ}C$ )                                                | $V_{RRM}$    | 600     | V         |
| RMS on-state current ( $T_c \leq 91^{\circ}C$ )                                                      | $I_{T(RMS)}$ | 6       | A         |
| Non repetitive surge peak on-state current (full cycle , $t_p=20ms$ , $T_j=25^{\circ}C$ )            | $I_{TSM}$    | 65      | A         |
| Non repetitive surge peak on-state current (full cycle , $t_p=16.6ms$ , $T_j=25^{\circ}C$ )          |              | 72      |           |
| $I^2t$ value for fusing ( $t_p=10ms$ , $T_j=25^{\circ}C$ )                                           | $I^2t$       | 21      | $A^2s$    |
| Critical rate of rise of on-state current ( $I_G=2 \times I_{GT}$ , $f=100Hz$ , $T_j=125^{\circ}C$ ) | $di/dt$      | 50      | $A/\mu s$ |
| Peak gate current ( $t_p=20\mu s$ , $T_j=125^{\circ}C$ )                                             | $I_{GM}$     | 4       | A         |
| Average gate power dissipation ( $T_j=125^{\circ}C$ )                                                | $P_{G(AV)}$  | 0.5     | W         |
| Peak gate power                                                                                      | $P_{GM}$     | 10      | W         |

|                                                                                      |          |   |    |
|--------------------------------------------------------------------------------------|----------|---|----|
| Peak pulse voltage<br>( $T_j=25^{\circ}\text{C}$ ; non-repetitive, off-state; FIG.8) | $V_{pp}$ | 3 | 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               |
| $V_{GT}$    |                                                                                    | I - II -III | MAX.  | 1   | V                |
| $V_{GD}$    | $V_D=V_{DRM}$ $T_j=125^{\circ}\text{C}$<br>$R_L=3.3\text{k}\Omega$                 | I - II -III | MIN.  | 0.2 | V                |
| $I_L$       | $I_G=1.2I_{GT}$                                                                    | I -III      | MAX.  | 15  | mA               |
|             |                                                                                    | II          |       | 25  |                  |
| $I_H$       | $I_T=100\text{mA}$                                                                 |             | MAX.  | 15  | mA               |
| $dV/dt$     | $V_D=400\text{V}$ Gate Open $T_j=125^{\circ}\text{C}$                              |             | MIN.  | 300 | V/ $\mu\text{s}$ |
| $(dI/dt)_c$ | $(dV/dt)_c=10\text{V}/\mu\text{s}$ , $T_j=125^{\circ}\text{C}$                     |             | MIN.  | 1   | A/ms             |
| $t_{on}$    | $I_G=20\text{mA}$ $I_A=200\text{mA}$ $I_R=20\text{mA}$<br>$T_j=25^{\circ}\text{C}$ |             | TYP.  | 2.5 | $\mu\text{s}$    |
| $t_{off}$   |                                                                                    |             |       | 25  |                  |

**STATIC CHARACTERISTICS**

| Symbol    | Parameter                                 |                           | Value(MAX.) | Unit             |
|-----------|-------------------------------------------|---------------------------|-------------|------------------|
| $V_{TM}$  | $I_{TM}=8.5\text{A}$ $t_p=380\mu\text{s}$ | $T_j=25^{\circ}\text{C}$  | 1.5         | V                |
| $V_{TO}$  | Threshold voltage                         | $T_j=125^{\circ}\text{C}$ | 0.82        | V                |
| $R_D$     | Dynamic resistance                        | $T_j=125^{\circ}\text{C}$ | 57          | $\text{m}\Omega$ |
| $I_{DRM}$ | $V_D=V_{DRM}$ $V_R=V_{RRM}$               | $T_j=25^{\circ}\text{C}$  | 5           | $\mu\text{A}$    |
| $I_{RRM}$ |                                           | $T_j=125^{\circ}\text{C}$ | 0.2         | mA               |

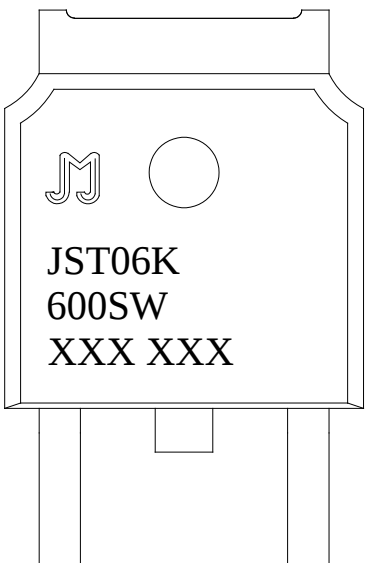
**THERMAL RESISTANCES**

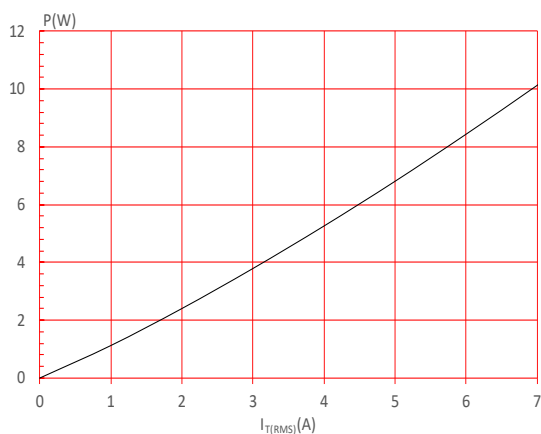
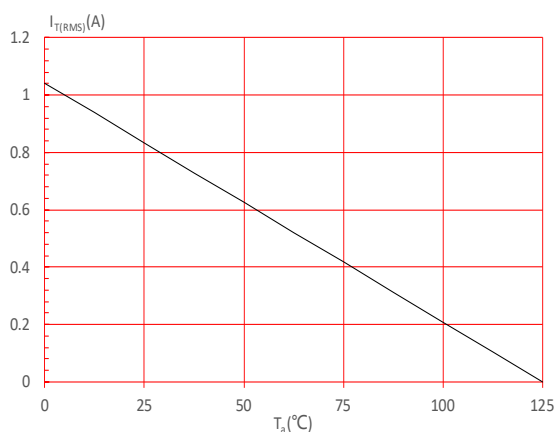
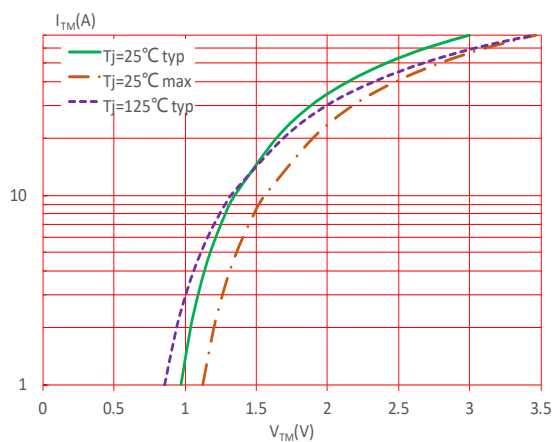
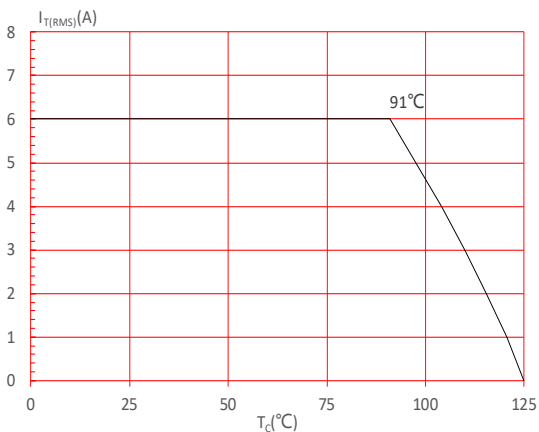
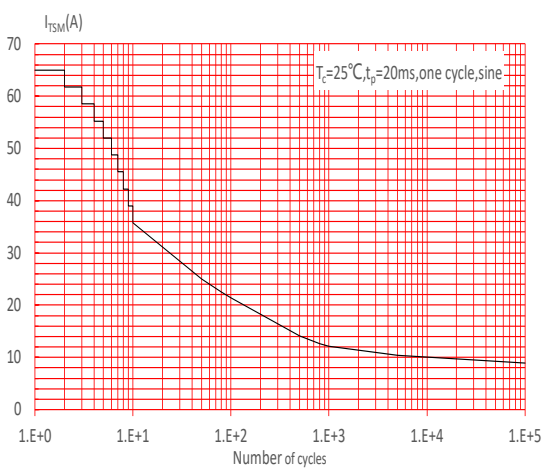
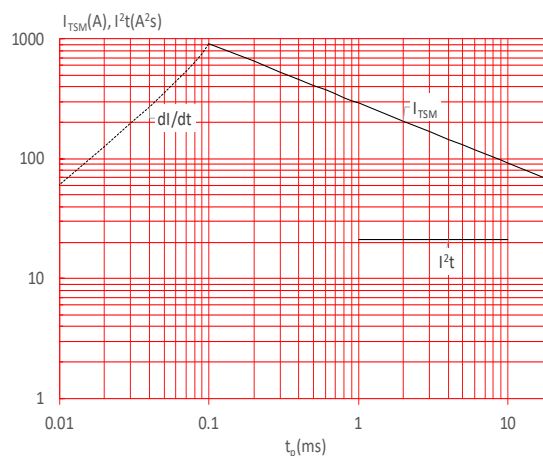
| Symbol        | Parameter                | Value | Unit                        |
|---------------|--------------------------|-------|-----------------------------|
| $R_{th(j-c)}$ | junction to case (AC)    | 4     | $^{\circ}\text{C}/\text{W}$ |
| $R_{th(j-a)}$ | junction to ambient (AC) | 120   | $^{\circ}\text{C}/\text{W}$ |

ORDERING INFORMATION

|                                   |        |                 |          |                                  |                           |                               |
|-----------------------------------|--------|-----------------|----------|----------------------------------|---------------------------|-------------------------------|
| J                                 | ST     | 06              | K        | -600                             | SW                        | -/                            |
| JieJie Microelectronics Co., Ltd. | Triacs | $I_{T(RMS)}:6A$ | K:TO-252 | 600: $V_{DRM}/V_{RRM} \geq 600V$ | SW: $I_{GT1-3} \leq 10mA$ | Blank:Tube<br>-TR:Tape & Reel |

MARKING

|                                                                                                                         |                                                                 |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
|  <p>JST06K<br/>600SW<br/>XXX XXX</p> | <p>XXX XXX</p> <p>Year<br/>Month</p> <p>Production<br/>Code</p> |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|

**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  $I^2t$  ( $dl/dt < 50A/\mu s$ )


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

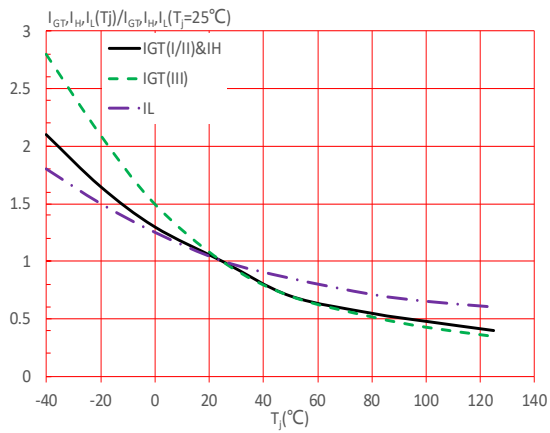
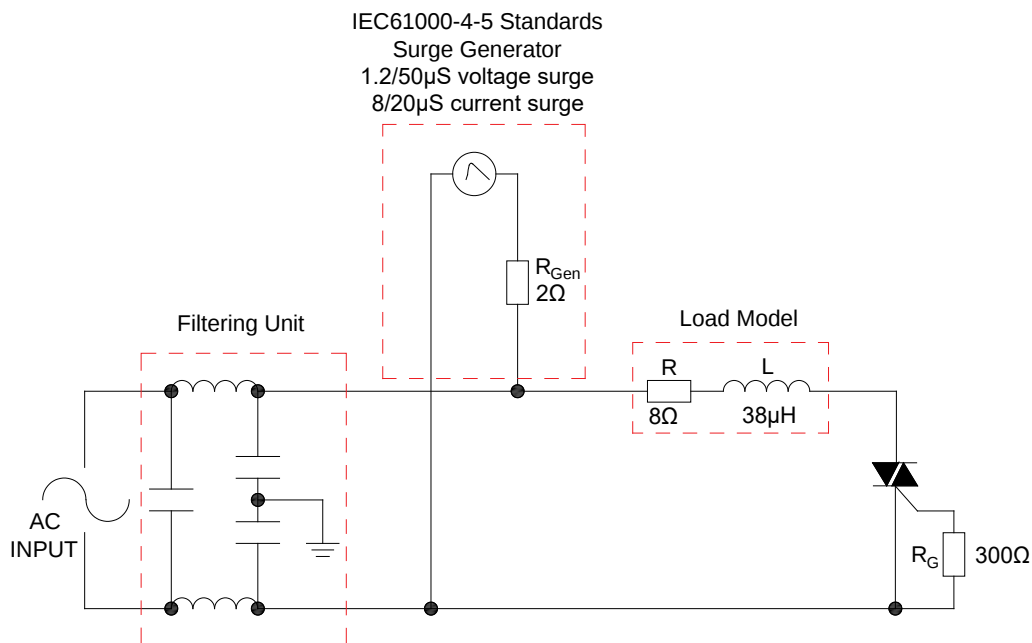
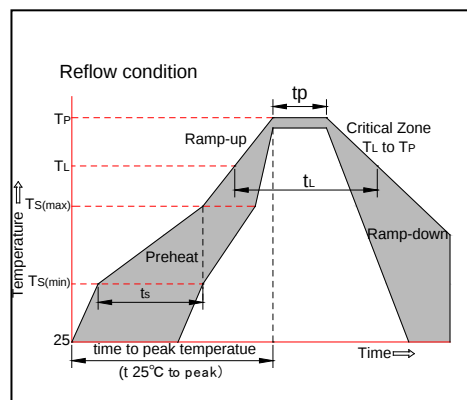


FIG.8: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



## SOLDERING PARAMETERS

| Reflow Condition                                            |                                      | Pb-Free assembly<br>(see figure at right) |
|-------------------------------------------------------------|--------------------------------------|-------------------------------------------|
| Pre Heat                                                    | -Temperature Min<br>( $T_{s(min)}$ ) | +150 $^{\circ}$ C                         |
|                                                             | -Temperature<br>Max( $T_{s(max)}$ )  | +200 $^{\circ}$ C                         |
|                                                             | -Time (Min to Max) (ts)              | 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                         |



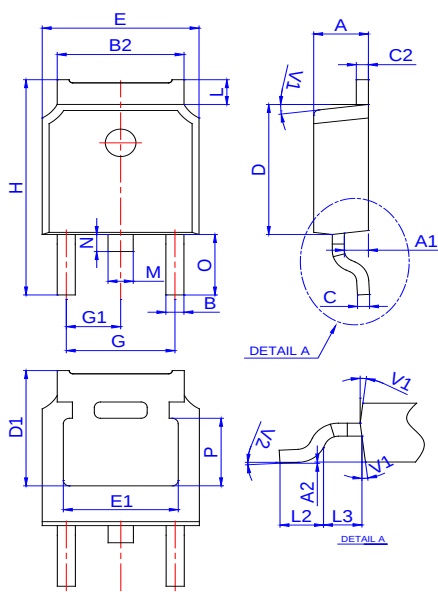
## ORDERING INFORMATION

| Order code      | Voltage<br>$V_{\text{DRM}}/V_{\text{RRM}}$ (V) | IGT(mA)      | Package | Base qty.<br>(pcs) | Delivery mode |
|-----------------|------------------------------------------------|--------------|---------|--------------------|---------------|
|                 |                                                | I - II - III |         |                    |               |
| JST06K-600SW    | 600                                            | 10           | TO-252  | 80                 | Tube          |
| JST06K-600SW-TR |                                                |              |         | 2,500              | Tape & Reel   |

## Document Revision History

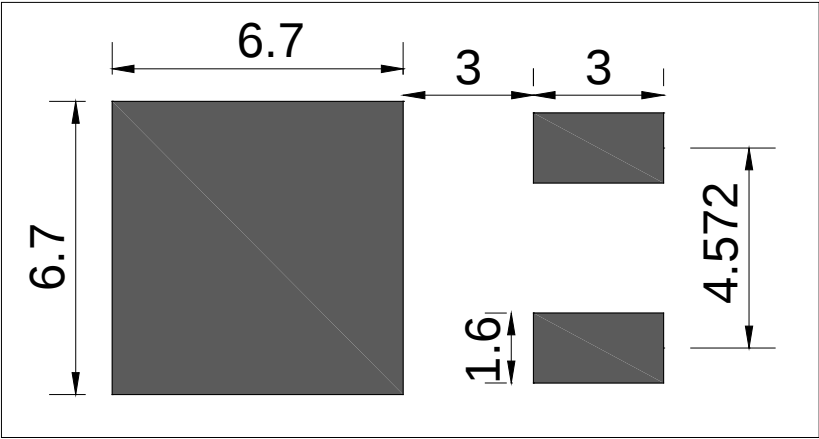
| Date         | Revision | Changes                        |
|--------------|----------|--------------------------------|
| Apr.11, 2023 | A.1.0    | Last updated                   |
| Oct.22, 2025 | A.1.1    | Revise PACKAGE MECHANICAL DATA |

PACKAGE MECHANICAL DATA

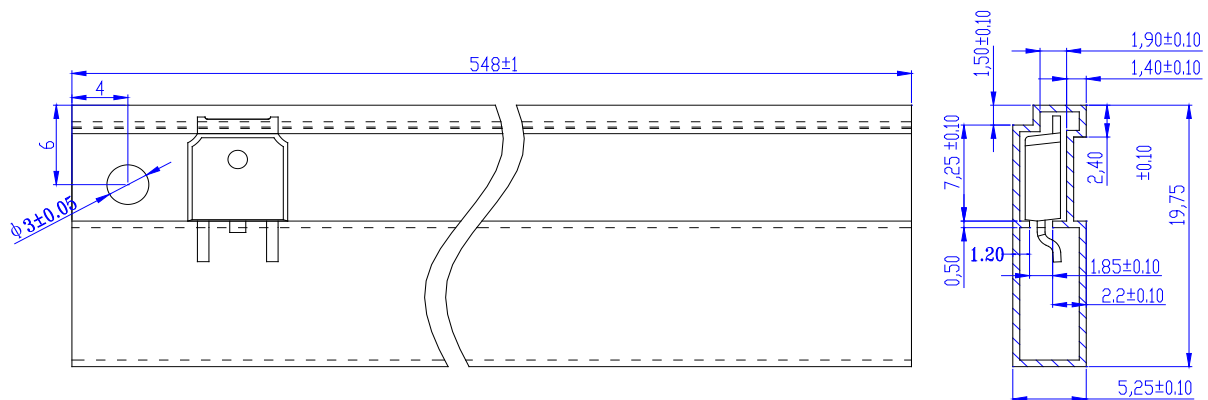


| Ref. | Dimensions  |      |       |          |      |       |
|------|-------------|------|-------|----------|------|-------|
|      | Millimeters |      |       | Inches   |      |       |
|      | Min.        | Typ. | Max.  | Min.     | Typ. | Max.  |
| A    | 2.10        |      | 2.50  | 0.083    |      | 0.098 |
| A1   | 0.80        |      | 1.20  | 0.031    |      | 0.047 |
| A2   | 0           |      | 0.15  | 0        |      | 0.006 |
| B    | 0.66        |      | 0.86  | 0.026    |      | 0.034 |
| B2   | 5.18        |      | 5.48  | 0.202    |      | 0.216 |
| C    | 0.40        |      | 0.60  | 0.016    |      | 0.024 |
| C2   | 0.44        |      | 0.58  | 0.017    |      | 0.023 |
| D    | 5.90        |      | 6.30  | 0.232    |      | 0.248 |
| D1   | 5.30REF     |      |       | 0.209REF |      |       |
| E    | 6.40        |      | 6.80  | 0.252    |      | 0.268 |
| E1   | 4.63        |      |       | 0.182    |      |       |
| G    | 4.47        |      | 4.67  | 0.176    |      | 0.184 |
| G1   | 2.18        |      | 2.38  | 0.086    |      | 0.094 |
| H    | 9.50        |      | 10.70 | 0.374    |      | 0.421 |
| L    | 1.09        |      | 1.21  | 0.043    |      | 0.048 |
| L2   | 1.35        |      | 1.65  | 0.053    |      | 0.065 |
| L3   | 1.10        |      | 1.50  | 0.043    |      | 0.059 |
| M    | 0.65        |      | 0.95  | 0.026    |      | 0.037 |
| N    | 0.65        |      | 0.95  | 0.026    |      | 0.037 |
| O    | 2.80        |      | 3.20  | 0.110    |      | 0.126 |
| P    | 3.10        |      | 3.30  | 0.122    |      | 0.130 |
| V1   |             | 7°   |       |          | 7°   |       |
| V2   | 0°          |      | 6°    | 0°       |      | 6°    |

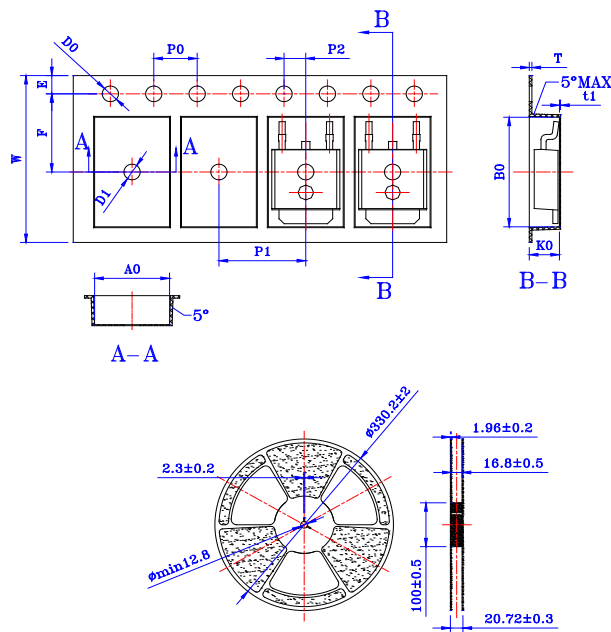
FOOTPRINT-TO-252 (dimensions in mm)



## DELIVERY MODE



| PACKAGE | OUTLINE | TUBE (PCS) | INNER BOX (PCS) | PER CARTON |
|---------|---------|------------|-----------------|------------|
| TO-252  | TUBE    | 80         | 4,000           | 20,000     |



| Ref. | Dimensions  |       |       |        |       |       |
|------|-------------|-------|-------|--------|-------|-------|
|      | Millimeters |       |       | Inches |       |       |
|      | Min.        | Typ.  | Max.  | Min.   | Typ.  | Max.  |
| W    | 15.90       | 16.00 | 16.10 | 0.626  | 0.630 | 0.634 |
| E    | 1.65        | 1.75  | 1.85  | 0.065  | 0.069 | 0.073 |
| F    | 7.40        | 7.50  | 7.60  | 0.291  | 0.295 | 0.299 |
| D0   | 1.50        | 1.55  | 1.60  | 0.059  | 0.060 | 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   | 1.90        | 2.00  | 2.10  | 0.075  | 0.079 | 0.083 |
| 10P0 | 39.80       | 40.00 | 40.20 | 1.567  | 1.575 | 1.583 |
| A0   | 6.80        | 6.90  | 7.00  | 0.267  | 0.272 | 0.276 |
| B0   | 10.40       | 10.50 | 10.60 | 0.408  | 0.413 | 0.417 |
| K0   | 2.60        | 2.70  | 2.80  | 0.102  | 0.106 | 0.110 |
| T    | 0.25        | 0.30  | 0.35  | 0.010  | 0.012 | 0.014 |
| t1   | 0.10        | —     | —     | 0.004  | —     | —     |

| PACKAGE | OUTLINE | REEL (PCS) | PER CARTON (PCS) | TAPE & REEL |
|---------|---------|------------|------------------|-------------|
| TO-252  | TAPING  | 2,500      | 25,000           | 13 inch     |

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