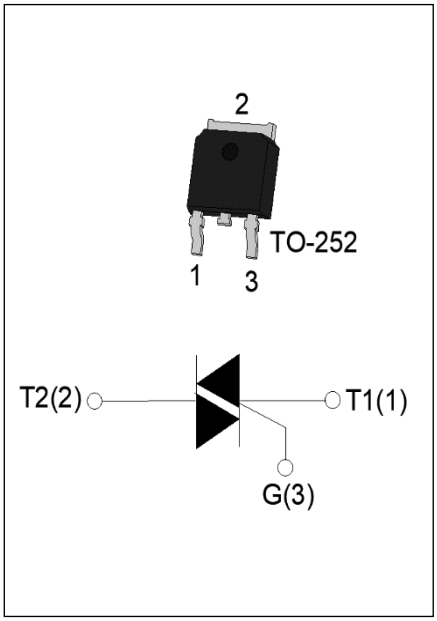
## JST136K-800T 4A TRIAC

Rev.A.1.0

### DESCRIPTION:

The JST136K-800T 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-252 is RoHS compliant.




### MAIN FEATURES

| Symbol | Value | Unit |
|---|---|---|
| $I_{T(RMS)}$ | 4 | A |
| $V_{DRM}$ /$V_{RRM}$ | 800 | V |
| $I_{GT\ I/II/III/IV}$ | 5/5/5/5 | mA |

### ABSOLUTE MAXIMUM RATINGS

| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Storage junction temperature range | | $T_{stg}$ | -40-150 | ℃ |
| Operating junction temperature range | | $T_j$ | -40-125 | ℃ |
| Repetitive peak off-state voltage ($T_j$=25℃) | | $V_{DRM}$ | 800 | V |
| Repetitive peak reverse voltage ($T_j$=25℃) | | $V_{RRM}$ | 800 | V |
| RMS on-state current ($T_C$≤83℃) | | $I_{T(RMS)}$ | 4 | A |
| Non repetitive surge peak on-state current (full cycle , $t_p$=20ms , $T_j$=25℃) | | $I_{TSM}$ | 35 | A |
| Non repetitive surge peak on-state current (full cycle , $t_p$=16.6ms , $T_j$=25℃) | | | 38.5 | |
| $I^2t$ value for fusing ($t_p$=10ms , $T_j$=25℃) | | $I^2t$ | 6.1 | $A^2s$ |
| Critical rate of rise of on-state current ($I_G$=2×$I_{GT}$ , f=100Hz , $T_j$=125℃) | I - II | dI/dt | 50 | A/μs |
| | III-IV | | 30 | |
| Peak gate current ($t_p$=20μs , $T_j$=125℃) | | $I_{GM}$ | 2 | A |
| Average gate power dissipation ($T_j$=125℃) | | $P_{G(AV)}$ | 0.5 | W |
| Peak gate power | | $P_{GM}$ | 5 | W |
| Peak pulse voltage ($T_j$=25℃; non-repetitive,off-state;FIG.8) | | $V_{pp}$ | 2.5 | kV |

## ELECTRICAL CHARACTERISTICS ($T_j$=25℃ unless otherwise specified)

| Symbol | Test Condition | Quadrant | Value | | Unit |
|---|---|---|---|---|---|
| $I_{GT}$ | $V_D$=12V $R_L$=33Ω | ALL | MAX. | 5 | mA |
| $V_{GT}$ | | ALL | MAX. | 1 | V |
| $V_{GD}$ | $V_D$=$V_{DRM}$ $T_j$=125℃ $R_L$=3.3KΩ | ALL | MIN. | 0.2 | V |
| $I_L$ | $I_G$=1.2$I_{GT}$ | Ⅰ-Ⅲ | MAX. | 10 | mA |
| | | Ⅱ-Ⅳ | | 15 | |
| $I_H$ | $I_T$=100mA | | MAX. | 5 | mA |
| dV/dt | $V_D$=540V Gate Open $T_j$=110℃ | | MIN. | 20 | V/μs |
| (dV/dt)c | (dI/dt)c=1.8A/ms, $T_j$=110℃ | | MIN. | 1 | V/μs |
| $t_{on}$ | $I_G$=10mA $I_A$=200mA $I_R$=20mA $T_j$=25℃ | | TYP. | 1 | μs |
| $t_{off}$ | | | | 12 | |

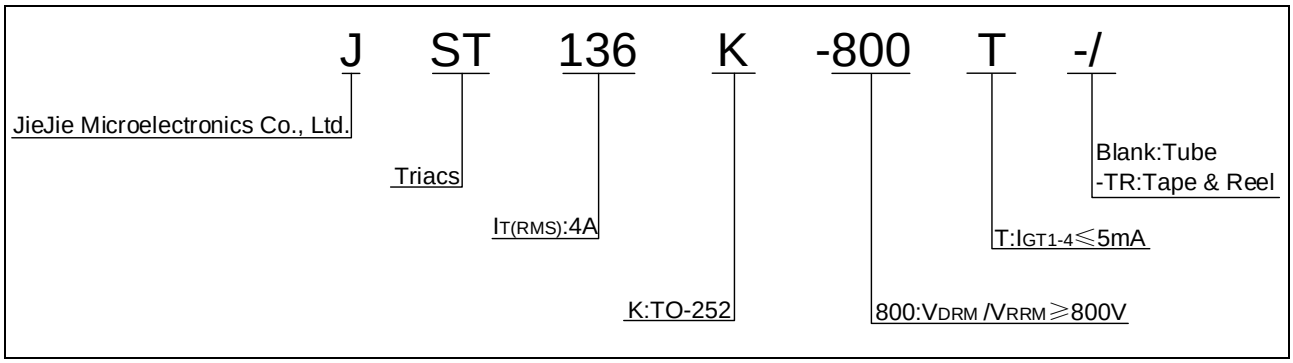
## STATIC CHARACTERISTICS

| Symbol | Parameter | | Value(MAX.) | Unit |
|---|---|---|---|---|
| $V_{TM}$ | $I_{TM}$=5A $t_p$=380μs | $T_j$=25℃ | 1.7 | V |
| $V_{TO}$ | Threshold voltage | $T_j$=125℃ | 0.94 | V |
| $R_D$ | Dynamic resistance | $T_j$=125℃ | 124 | mΩ |
| $I_{DRM}$ | $V_D$=$V_{DRM}$ $V_R$=$V_{RRM}$ | $T_j$=25℃ | 5 | μA |
| $I_{RRM}$ | | $T_j$=125℃ | 0.4 | mA |

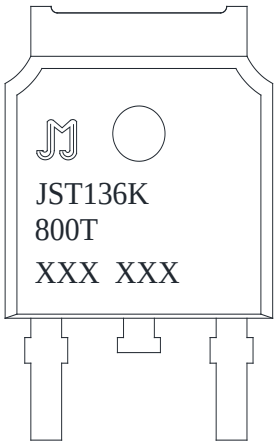
## THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{th(j-c)}$ | junction to case (AC) | 6.5 | ℃/W |
| $R_{th(j-a)}$ | junction to ambient (AC) | 150 | ℃/W |

## ORDERING INFORMATION




## MARKING



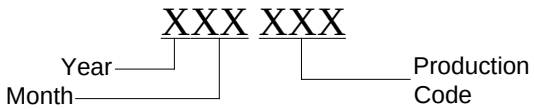



**FIG.1** Maximum power dissipation versus RMS on-state current

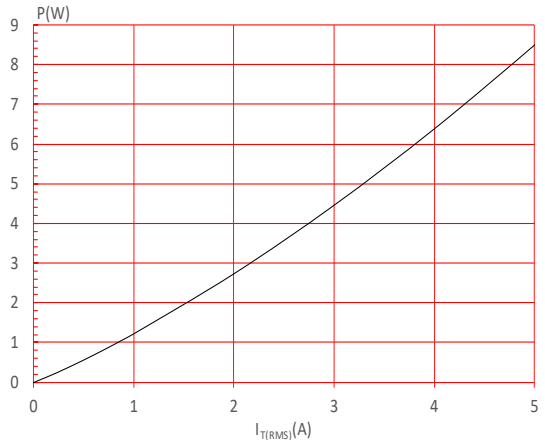



**FIG.2:** RMS on-state current versus case temperature

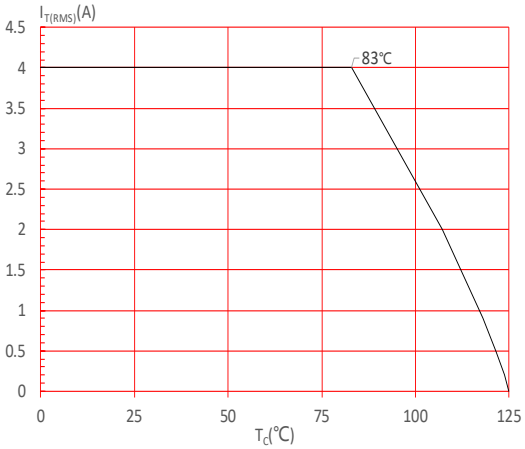



**FIG.3:** RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35μm) (full cycle)

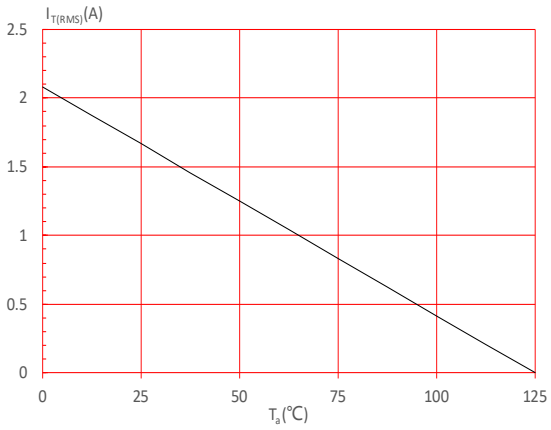



**FIG.4:** Surge peak on-state current versus number of cycles

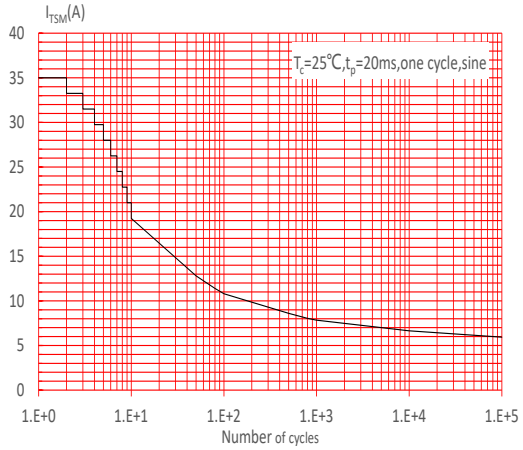



**FIG.5:** On-state characteristics

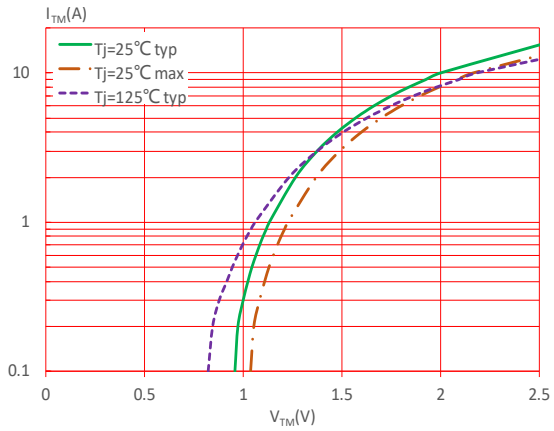



**FIG.6:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p$<20ms, and corresponding value of $I^2t$ (Ⅰ-Ⅱ: dI/dt<50A/μs;Ⅲ-Ⅳ: dI/dt<30A/μs)

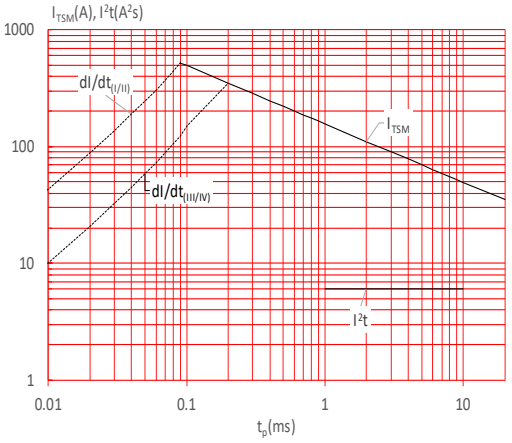


**FIG.7:** Relative variations of gate trigger current, holding current and latching current versus junction temperature

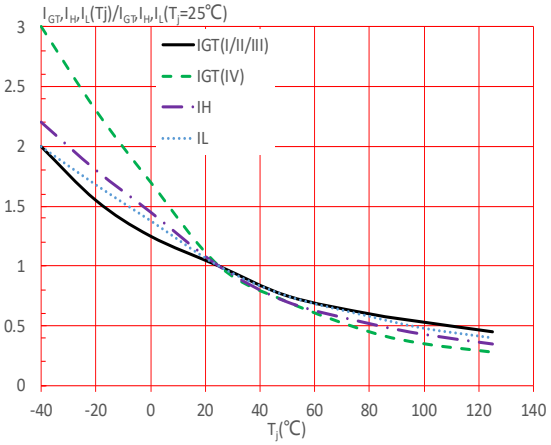
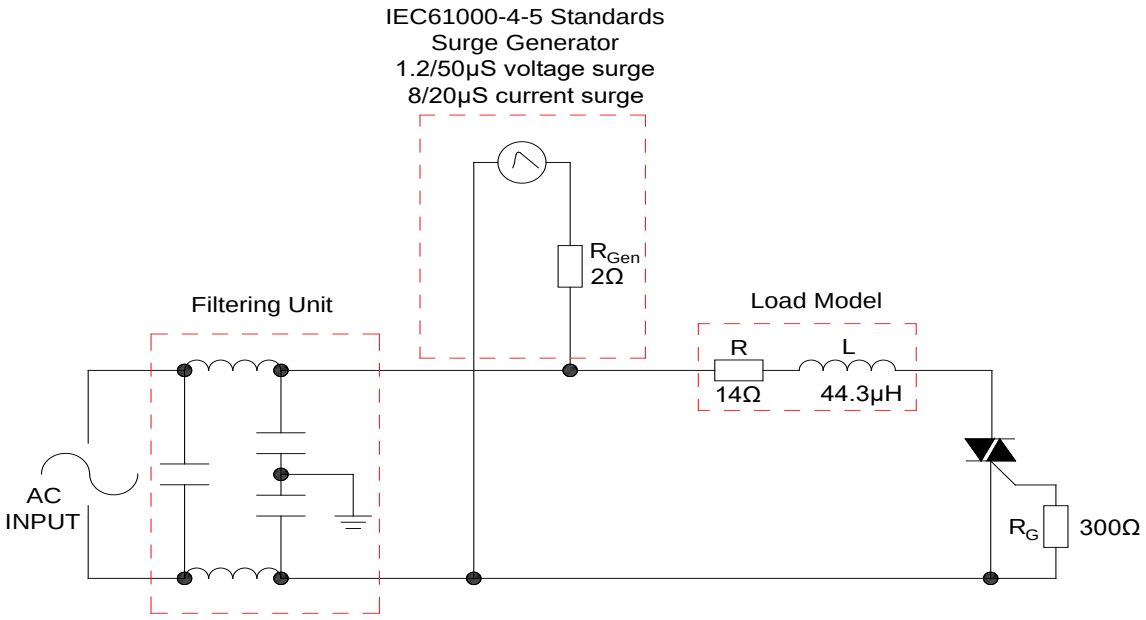
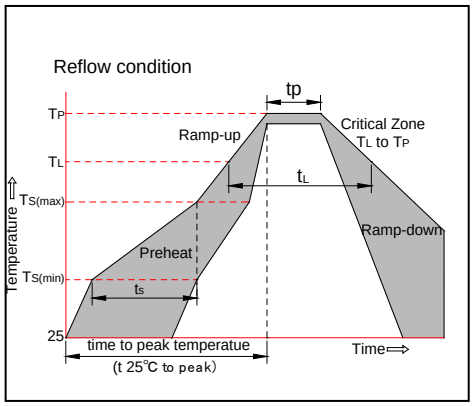


FIG.8：Test circuit for inductive and resistive loads to IEC-61000-4-5 standards




## SOLDERING PARAMETERS

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



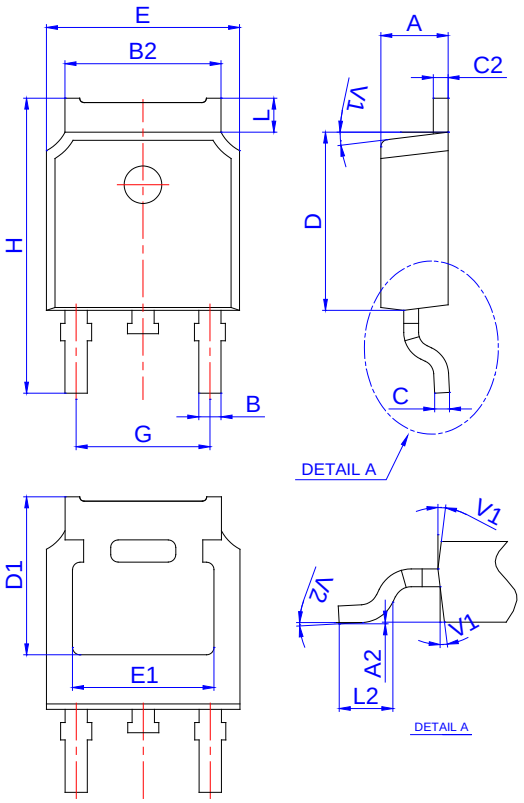
## ORDERING INFORMATION

| Order code | Voltage $V_{DRM}/V_{RRM}$ (V) | IGT(mA) | Package | Base qty. (pcs) | Delivery mode |
|---|---|---|---|---|---|
| | | Ⅰ-Ⅱ-Ⅲ-Ⅳ | | | |
| JST136K-800T | 800 | 5 | TO-252 | 80 | Tube |
| JST136K-800T-TR | | | | 2,500 | Tape & Reel |

## Document Revision History

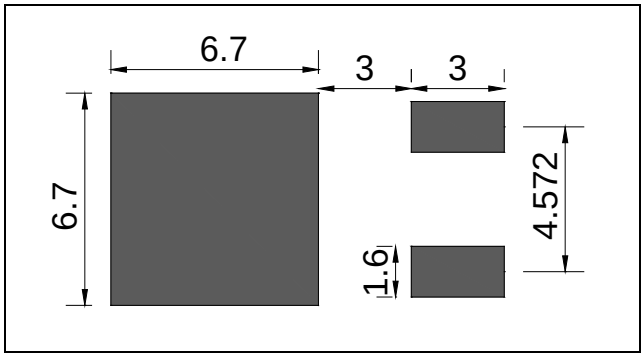
| Date | Revision | Changes |
|---|---|---|
| Apr.14, 2023 | A.1.0 | Last updated |

## PACKAGE MECHANICAL DATA

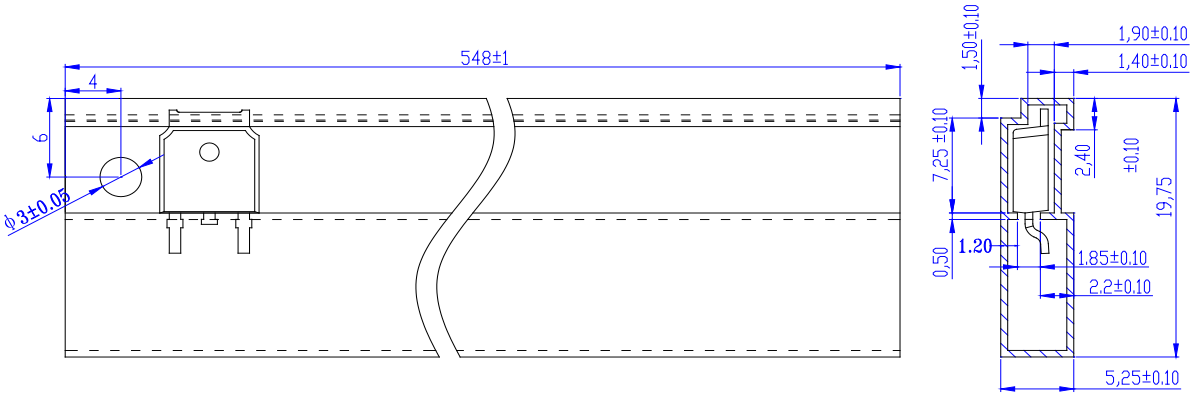



| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 2.10 | | 2.50 | 0.083 | | 0.098 |
| A2 | 0 | | 0.10 | 0 | | 0.004 |
| B | 0.66 | | 0.86 | 0.026 | | 0.034 |
| B2 | 5.18 | | 5.48 | 0.202 | | 0.216 |
| C | 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 | 5.10 | | 5.50 | 0.201 | | 0.217 |
| E | 6.40 | | 6.80 | 0.252 | | 0.268 |
| E1 | 4.63 | | | 0.182 | | |
| G | 4.47 | | 4.67 | 0.176 | | 0.184 |
| H | 9.50 | | 10.70 | 0.374 | | 0.421 |
| L | 0.95 | | 1.30 | 0.037 | | 0.051 |
| L2 | 1.35 | | 1.75 | 0.053 | | 0.069 |
| V1 | | 7° | | | 7° | |
| V2 | 0° | | 6° | 0° | | 6° |

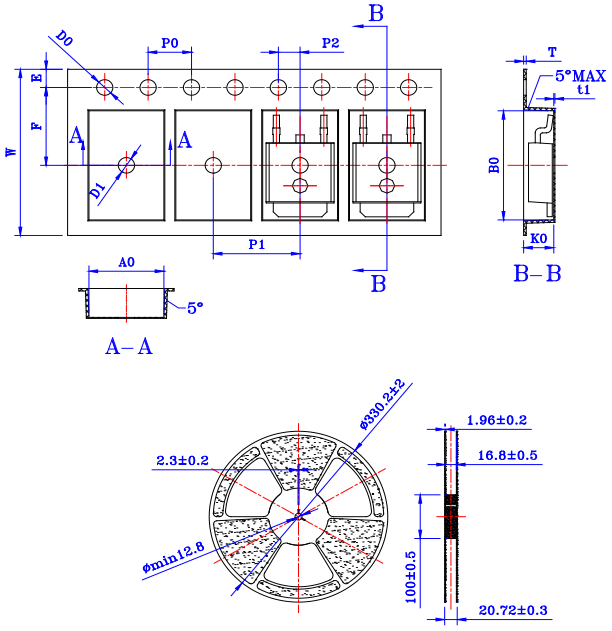
## FOOTPRINT-TO-252 (dimensions in mm)



## 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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