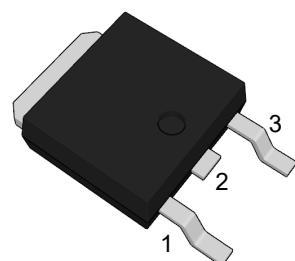


## Product Summary

- $V_{DS} = -30V, I_D = -30A$
- $R_{DS(on)} < 12m\Omega$  @  $V_{GS} = -10V$
- $R_{DS(on)} < 16.5m\Omega$  @  $V_{GS} = -4.5V$

TO-252



(Top View)

## Features

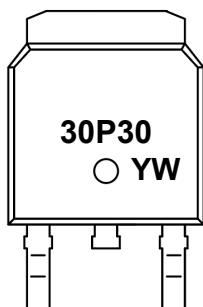
- Advanced Trench Technology
- 100% Avalanche Tested
- RoHS Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 3

## Application

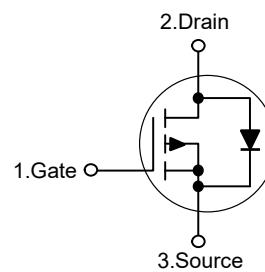
- Load Switch
- PWM Application
- Power management

| Pin | Description |
|-----|-------------|
| 1   | Gate        |
| 2   | Drain       |
| 3   | Source      |

## Marking Code



## Schematic Diagram



## Absolute Maximum Ratings

Ratings at 25°C case temperature unless otherwise specified.

| Parameter                             | Symbol    | Value       | Unit |
|---------------------------------------|-----------|-------------|------|
| Drain-Source Voltage                  | $-V_{DS}$ | 30          | V    |
| Gate-Source Voltage                   | $V_{GS}$  | $\pm 20$    | V    |
| Drain Current-Continuous              | $-I_D$    | 30          | A    |
| Drain Current-Pulsed <sup>Note1</sup> | $-I_{DM}$ | 120         | A    |
| Maximum Power Dissipation             | $P_D$     | 35          | W    |
| Junction Temperature                  | $T_J$     | 150         | °C   |
| Storage Temperature Range             | $T_{STG}$ | -55 to +150 | °C   |

## Thermal Characteristics

|                                      |                 |     |      |
|--------------------------------------|-----------------|-----|------|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 3.6 | °C/W |
|--------------------------------------|-----------------|-----|------|

## Electrical Characteristics

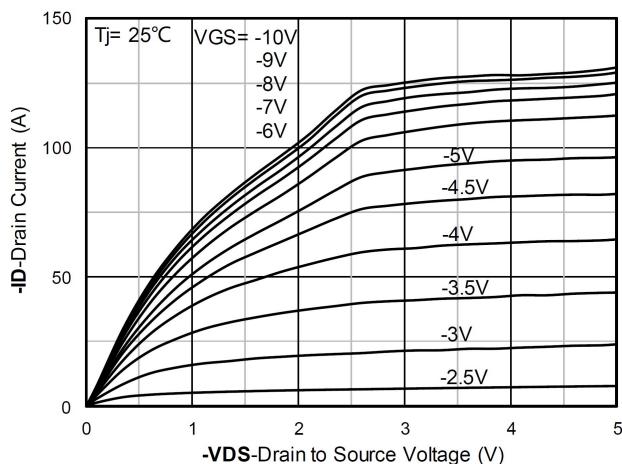
(T<sub>J</sub>=25°C unless otherwise specified)

| Parameter                             | Symbol              | Conditions   | Min. | Typ. | Max. | Unit |
|---------------------------------------|---------------------|--|------|------|------|------|
| <b>Static Characteristics</b>         |                     |  |      |      |      |      |
| Drain-Source Breakdown Voltage        | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V , ID=-250uA                                    | -30  | -    | -    | V    |
| Drain-Source Leakage Current          | I <sub>DSS</sub>    | V <sub>DS</sub> =-24V , V <sub>GS</sub> =0V , T <sub>J</sub> =25°C | -    | -    | -1   | uA   |
| Gate-Source Leakage Current           | I <sub>GSS</sub>    | V <sub>GS</sub> =±20V , V <sub>DS</sub> =0V                        | -    | -    | ±100 | nA   |
| Gate Threshold Voltage                | V <sub>GS(th)</sub> | V <sub>GS</sub> =V <sub>DS</sub> , ID =-250uA                      | -1.2 | -1.6 | -2.5 | V    |
| Static Drain-Source On-Resistance     | R <sub>DS(ON)</sub> | V <sub>GS</sub> =-10V , ID=-20A                                    | -    | 13   | 18   | mΩ   |
|                                       |                     | V <sub>GS</sub> =-4.5V , ID=-15A                                   | -    | 22   | 30   |      |
| <b>Dynamic characteristics</b>        |                     |  |      |      |      |      |
| Input Capacitance                     | C <sub>iss</sub>    | V <sub>DS</sub> =-15V , V <sub>GS</sub> =0V , f=1MHz               | -    | 1600 | -    | pF   |
| Output Capacitance                    | C <sub>oss</sub>    |  | -    | 350  | -    |      |
| Reverse Transfer Capacitance          | C <sub>rss</sub>    |  | -    | 300  | -    |      |
| Total Gate Charge                     | Q <sub>g</sub>      | V <sub>DS</sub> =-15V , V <sub>GS</sub> =-10V , ID=-10A            | -    | 30   | -    | nC   |
| Gate-Source Charge                    | Q <sub>gs</sub>     |  | -    | 5.5  | -    |      |
| Gate-Drain Charge                     | Q <sub>gd</sub>     |  | -    | 8    | -    |      |
| <b>Switching Characteristics</b>      |                     |  |      |      |      |      |
| Turn-On Delay Time                    | T <sub>d(on)</sub>  | V <sub>DD</sub> =-15V, V <sub>GS</sub> =-10V, RG=3Ω, ID=-10A       | -    | 10   | -    | nS   |
| Rise Time                             | T <sub>r</sub>      |  | -    | 60   | -    |      |
| Turn-Off Delay Time                   | T <sub>d(off)</sub> |  | -    | 52   | -    |      |
| Fall Time                             | T <sub>f</sub>      |  | -    | 70   | -    |      |
| <b>Diode Characteristics</b>          |                     |  |      |      |      |      |
| Diode Forward Voltage                 | V <sub>SD</sub>     | V <sub>GS</sub> =0V , IS=-1A , T <sub>J</sub> =25°C                | -    | -    | 1.2  | V    |
| Maximum Body-Diode Continuous Current | I <sub>S</sub>      |  | -    | -    | -30  | A    |
| Reverse Recovery Time                 | T <sub>rr</sub>     | I <sub>S</sub> =-5A, di/dt=100A/us, T <sub>J</sub> =25°C           | -    | 15   | -    | nS   |
| Reverse Recovery Charge               | Q <sub>rr</sub>     |  | -    | 5    | -    | nC   |

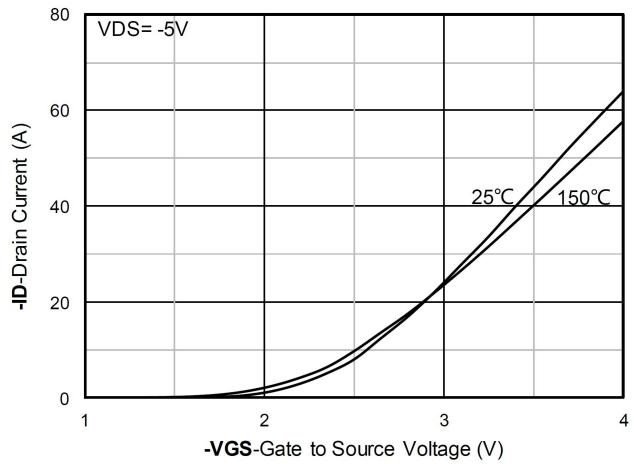
**Note :**

1. The EAS test condition is V<sub>DD</sub>=-15V, V<sub>GS</sub>=-10V, L=0.5mH, RG=25Ω

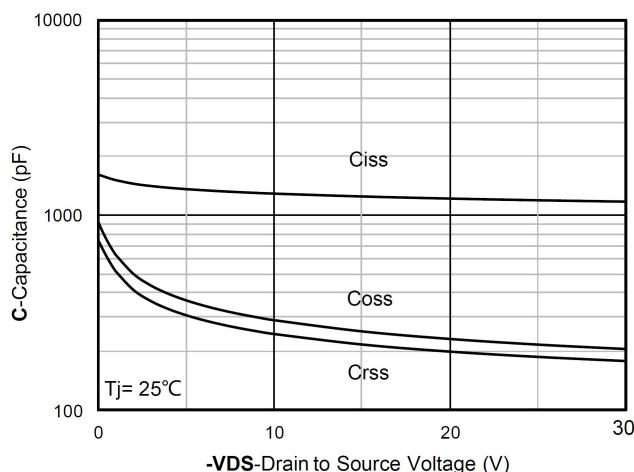
Typical Characteristic Curves



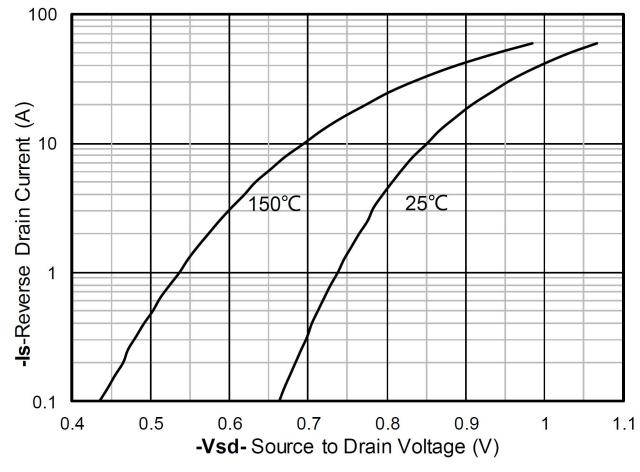
Output Characteristics



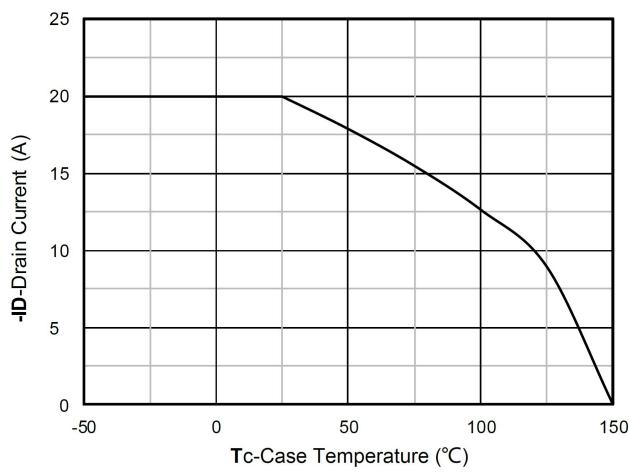
Transfer Characteristics



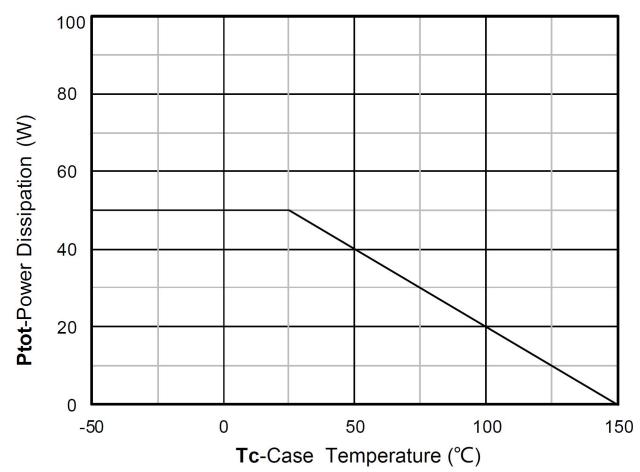
Capacitance Characteristics



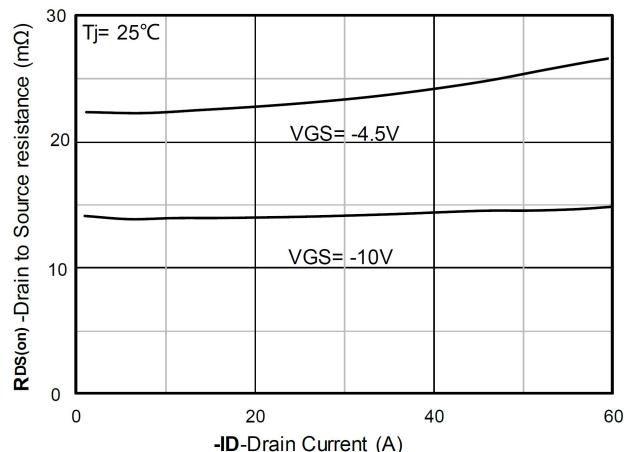
Forward characteristics of reverse diode



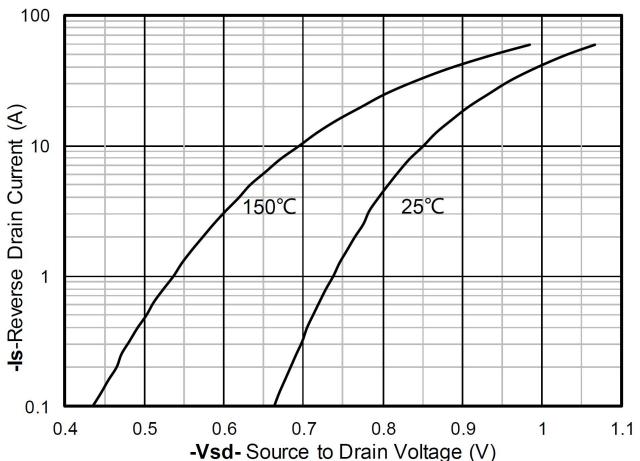
Current dissipation



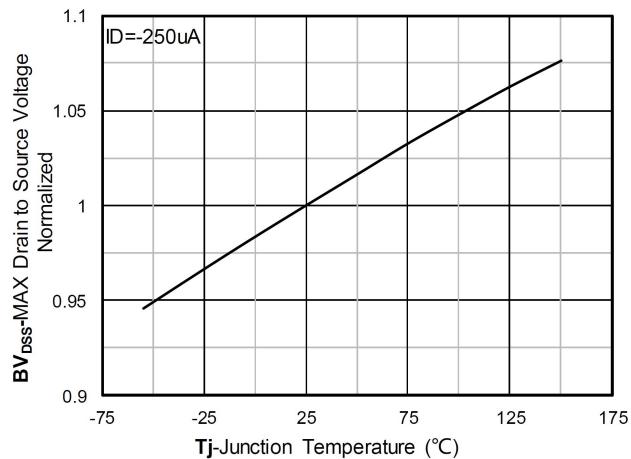
Power dissipation



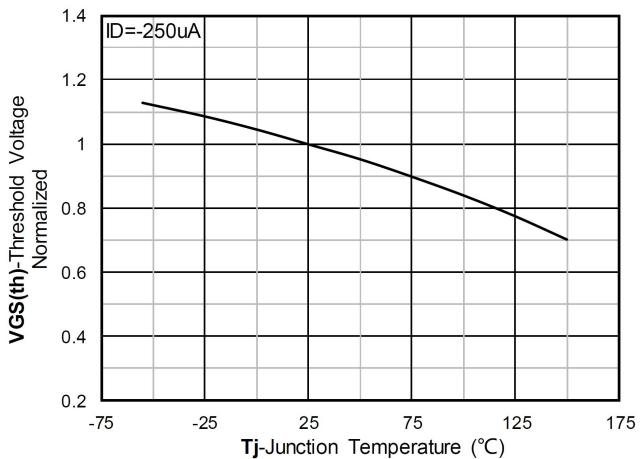
RDS(on) VS Drain Current



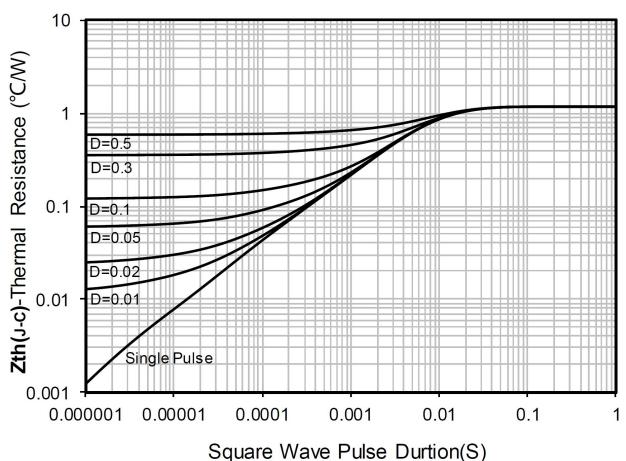
Forward characteristics of reverse diode



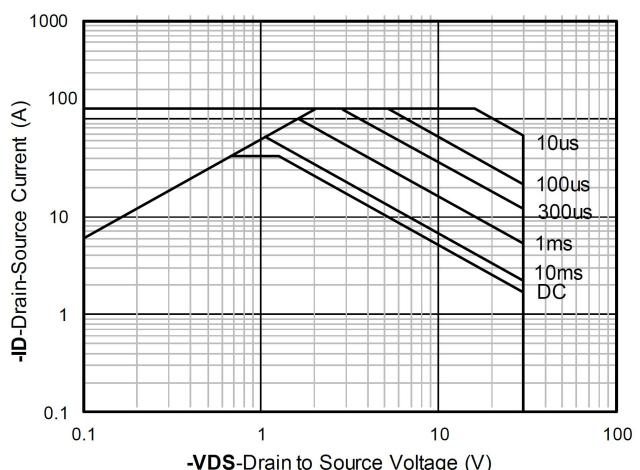
Normalized breakdown voltage



Normalized Threshold voltage



Maximum Transient Thermal Impedance

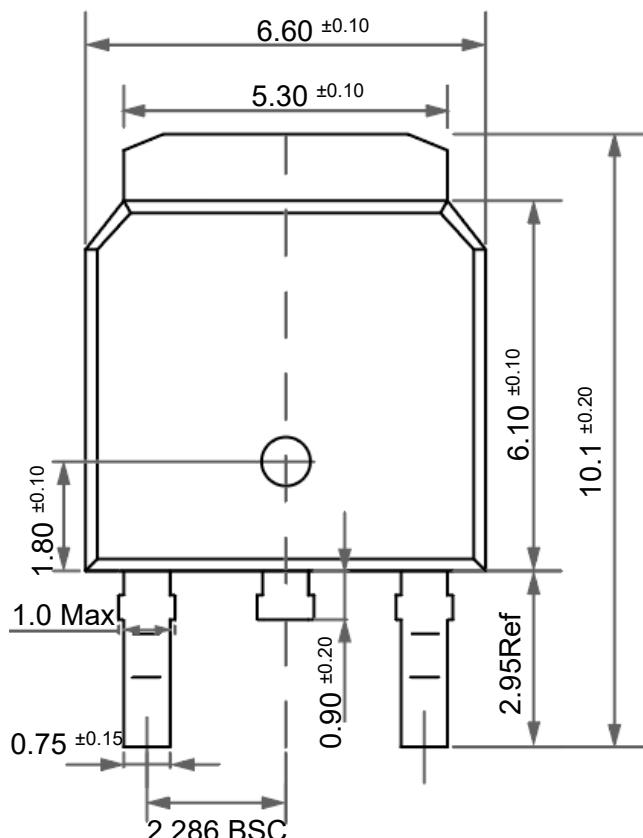
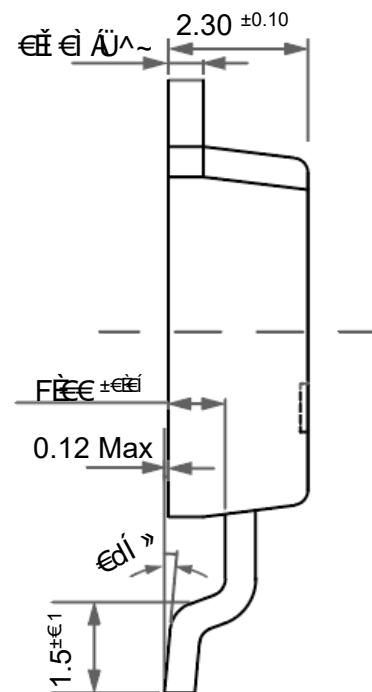
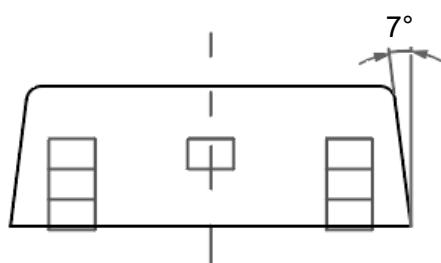


Safe Operation Area

**Package Outline**

TO-252

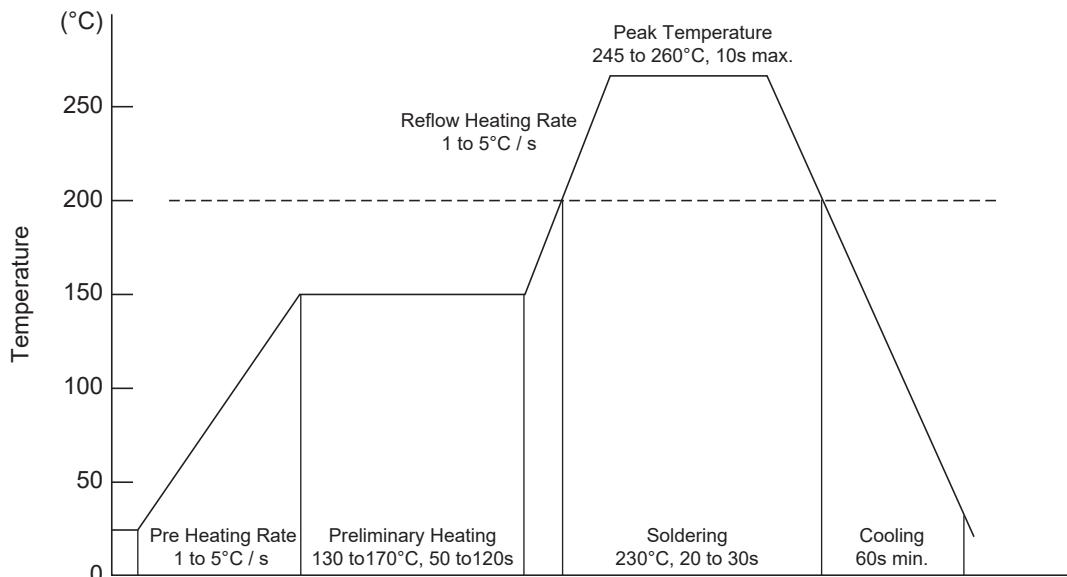
Dimensions in mm

**Front View****Side View****Bottom View****Ordering Information**

| Device    | Package | Shipping               |
|-----------|---------|------------------------|
| TN30P30TE | TO-252  | 2,500PCS/Reel&13inches |

## Conditions of Soldering and Storage

### ◆ Recommended condition of reflow soldering



Recommended peak temperature is over 245°C. If peak temperature is below 245°C, you may adjust the following parameters:

- Time length of peak temperature (longer)
- Time length of soldering (longer)
- Thickness of solder paste (thicker)

### ◆ Conditions of hand soldering

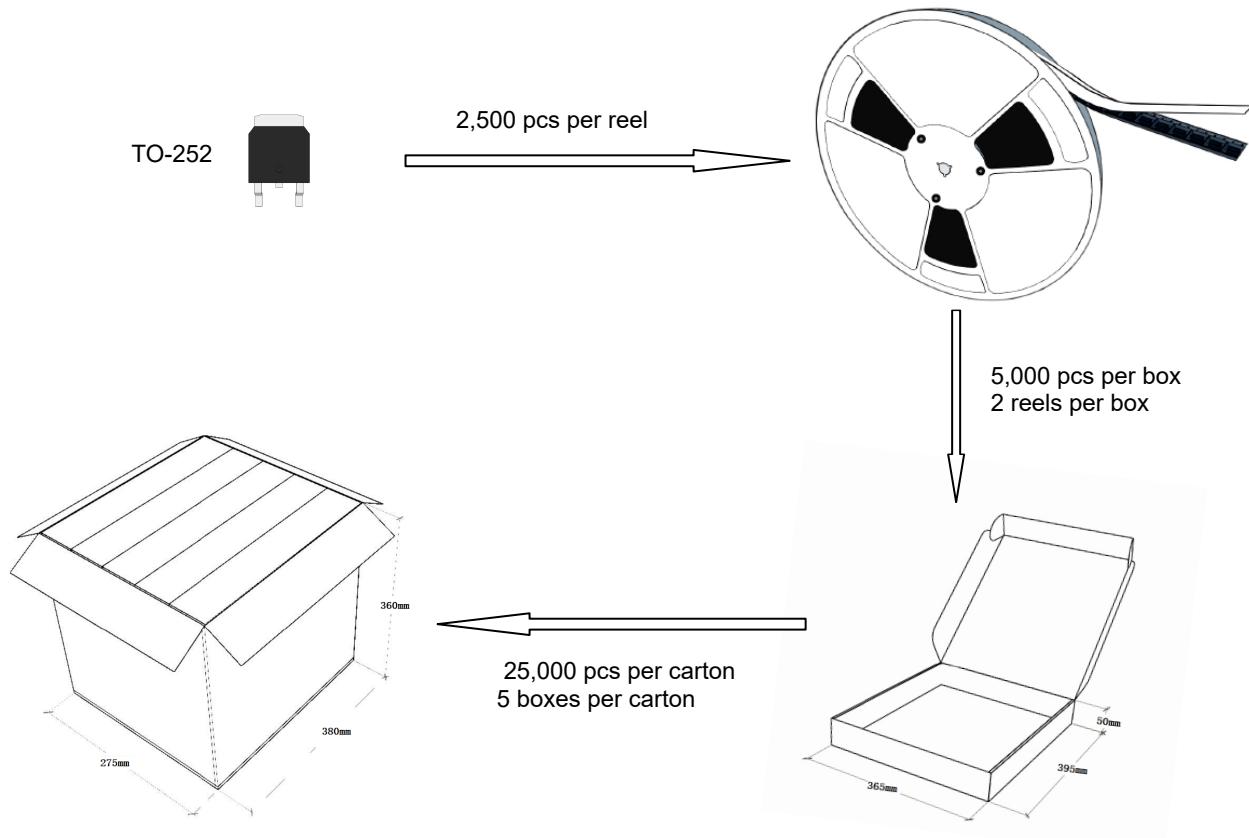
- Temperature: 300°C
- Time: 3s max.
- Times: one time

### ◆ Storage conditions

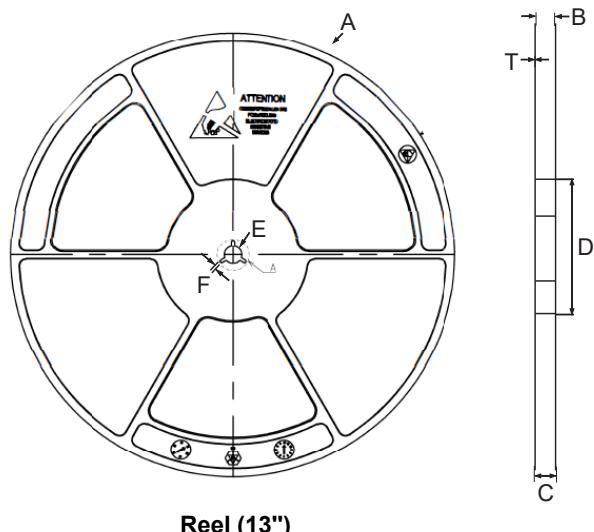
- **Temperature**  
5 to 40°C
- **Humidity**  
30 to 80% RH
- **Recommended period**  
One year after manufacturing

## Package Specifications

- The method of packaging

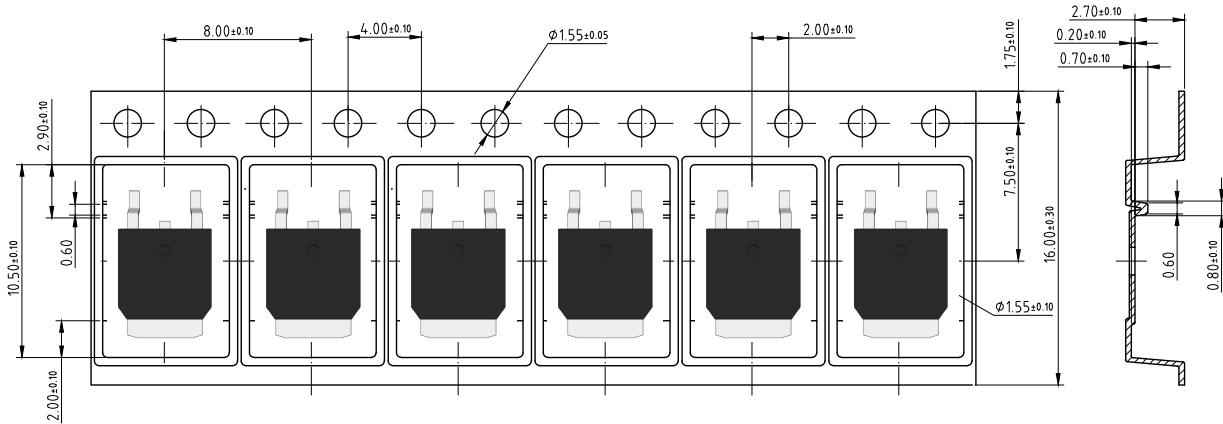


### ◆ reel data



| Symbol | Value(unit:mm)      |
|--------|---------------------|
| A      | $\Phi 330.2 \pm 1$  |
| B      | $17 \pm 0.5$        |
| C      | $21.2 \pm 2$        |
| D      | $\Phi 100 \pm 0.5$  |
| E      | $\Phi 13.4 \pm 0.2$ |
| F      | $2.3 \pm 0.2$       |
| T      | $2.1 \pm 0.2$       |

## ◆ Embossed tape data



## Contact Information

TANI website: <http://www.tanisemi.com> Email:tani@tanisemi.com

For additional information, please contact your local Sales Representative.



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## ***Product Specification Statement***

The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

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