



# PJM01N20KSA

## N-Channel Enhancement Mode Power MOSFET

### Product Summary

- $V_{DS} = 20V, I_D = 0.9A$
- $R_{DS(on)} < 300m\Omega @ V_{GS} = 4.5V$
- $R_{DS(on)} < 350m\Omega @ V_{GS} = 2.5V$
- $R_{DS(on)} < 700m\Omega @ V_{GS} = 1.8V$

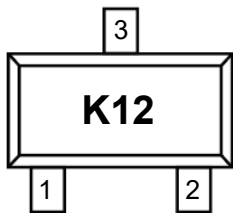
### Features

- ESD protected(HBM) up to 2KV
- Halogen and Antimony Free
- Moisture Sensitivity Level 1

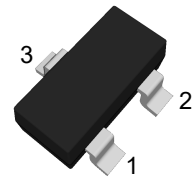
### Application

- Load Switch
- PWM applications
- Power Management

### Marking Code



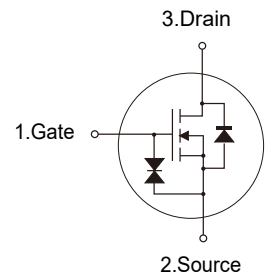
### SOT-23



(Top View)

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

### Schematic Diagram



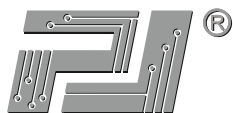
### Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

| Parameter                             | Symbol    | Value       | Unit |
|---------------------------------------|-----------|-------------|------|
| Drain-Source Voltage                  | $V_{DS}$  | 20          | V    |
| Gate-Source Voltage                   | $V_{GS}$  | $\pm 12$    | V    |
| Drain Current-Continuous              | $I_D$     | 0.9         | A    |
| Drain Current-Pulsed <sup>Note1</sup> | $I_{DM}$  | 3.5         | A    |
| Maximum Power Dissipation             | $P_D$     | 0.35        | W    |
| Junction Temperature                  | $T_J$     | 150         | °C   |
| Storage Temperature Range             | $T_{STG}$ | -55 to +150 | °C   |

### Thermal Characteristics

|                                                         |                 |     |      |
|---------------------------------------------------------|-----------------|-----|------|
| Thermal Resistance,Junction-to-Ambient <sup>Note2</sup> | $R_{\theta JA}$ | 357 | °C/W |
|---------------------------------------------------------|-----------------|-----|------|



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### Electrical Characteristics

(Ta=25°C unless otherwise specified)

| Parameter                                   | Symbol        | Test Condition                                        | Min. | Typ. | Max.     | Unit       |
|---------------------------------------------|---------------|-------------------------------------------------------|------|------|----------|------------|
| Static Characteristics                      |               |                                                       |      |      |          |            |
| Drain-Source Breakdown Voltage              | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$                             | 20   | --   | --       | V          |
| Zero Gate Voltage Drain Current             | $I_{DSS}$     | $V_{DS}=20V, V_{GS}=0V$                               | --   | --   | 1        | $\mu A$    |
| Gate-Body Leakage Current                   | $I_{GSS}$     | $V_{GS}=\pm 10V, V_{DS}=0V$                           | --   | --   | $\pm 10$ | $\mu A$    |
| Gate Threshold Voltage <sup>Note3</sup>     | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=250\mu A$                         | 0.35 | 0.75 | 1.1      | V          |
| Drain-Source On-Resistance <sup>Note3</sup> | $R_{DS(on)}$  | $V_{GS}=4.5V, I_D=0.9A$                               | --   | --   | 300      | m $\Omega$ |
|                                             |               | $V_{GS}=2.5V, I_D=0.45A$                              | --   | --   | 350      | m $\Omega$ |
|                                             |               | $V_{GS}=1.8V, I_D=0.2A$                               | --   | --   | 700      | m $\Omega$ |
| Forward Transconductance <sup>Note3</sup>   | $g_{FS}$      | $V_{DS}=5V, I_D=0.5A$                                 | --   | 1.5  | --       | S          |
| Dynamic Characteristics                     |               |                                                       |      |      |          |            |
| Input Capacitance                           | $C_{iss}$     | $V_{DS}=10V, V_{GS}=0V, f=1MHz$                       | --   | 56   | --       | pF         |
| Output Capacitance                          | $C_{oss}$     |                                                       | --   | 20   | --       | pF         |
| Reverse Transfer Capacitance                | $C_{rss}$     |                                                       | --   | 2.5  | --       | pF         |
| Total Gate Charge                           | $Q_g$         | $V_{DS}=10V, I_D=0.5A, V_{GS}=4.5V$                   | --   | 1    | --       | nC         |
| Gate-Source Charge                          | $Q_{gs}$      |                                                       | --   | 0.28 | --       | nC         |
| Gate-Drain Charge                           | $Q_{gd}$      |                                                       | --   | 0.22 | --       | nC         |
| Switching Characteristics                   |               |                                                       |      |      |          |            |
| Turn-on Delay Time                          | $t_{d(on)}$   | $V_{DD}=10V, I_D=0.5A$<br>$V_{GS}=4.5V, R_G=10\Omega$ | --   | 2    | --       | nS         |
| Turn-on Rise Time                           | $t_r$         |                                                       | --   | 18.8 | --       | nS         |
| Turn-off Delay Time                         | $t_{d(off)}$  |                                                       | --   | 10   | --       | nS         |
| Turn-off Fall Time                          | $t_f$         |                                                       | --   | 23   | --       | nS         |
| Source-Drain Diode Characteristics          |               |                                                       |      |      |          |            |
| Diode Forward Voltage <sup>Note3</sup>      | $V_{SD}$      | $V_{GS}=0V, I_S=0.9A$                                 | --   | --   | 1.2      | V          |
| Diode Forward Current <sup>Note2</sup>      | $I_S$         |                                                       | --   | --   | 0.9      | A          |

Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.

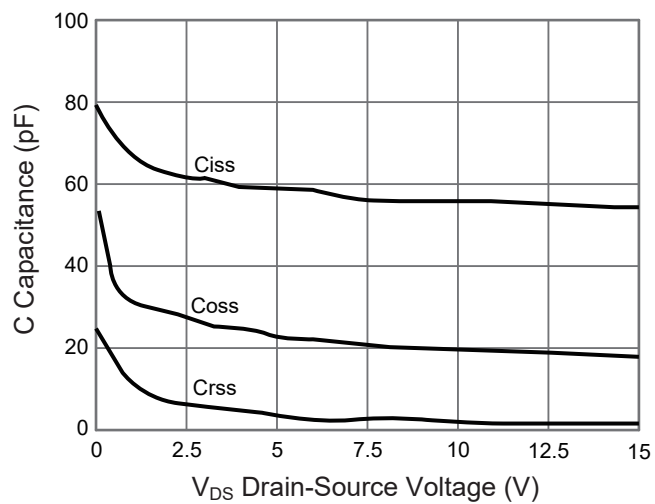
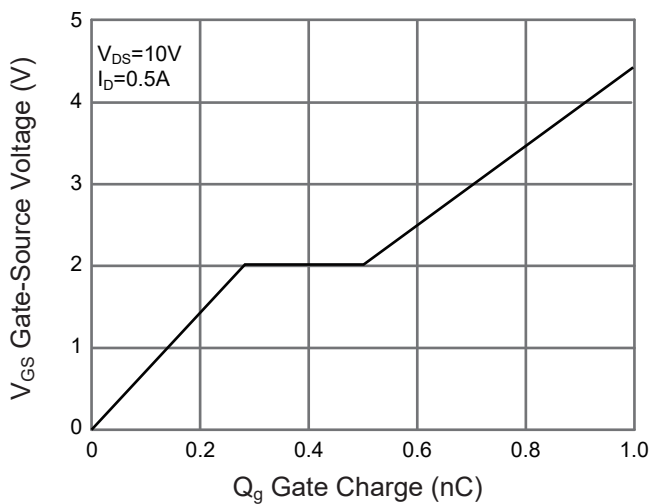
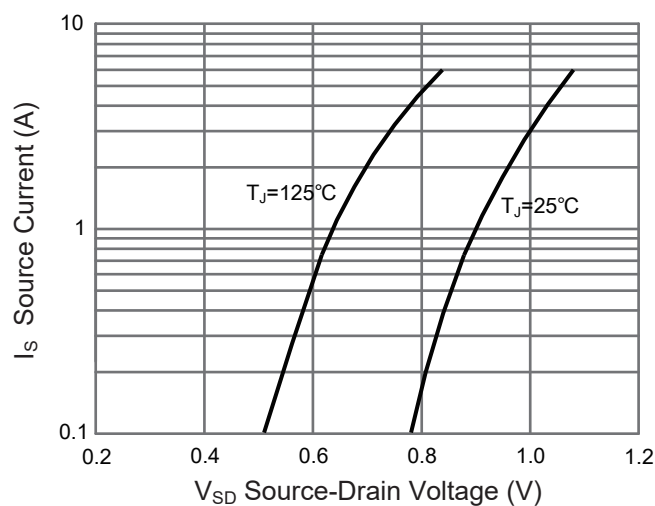
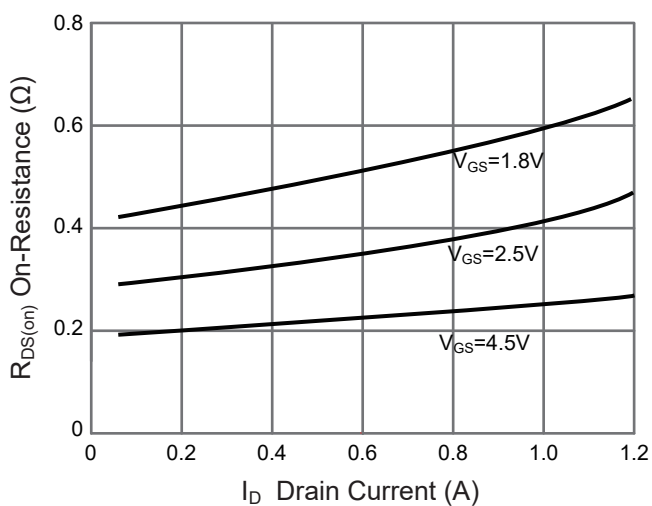
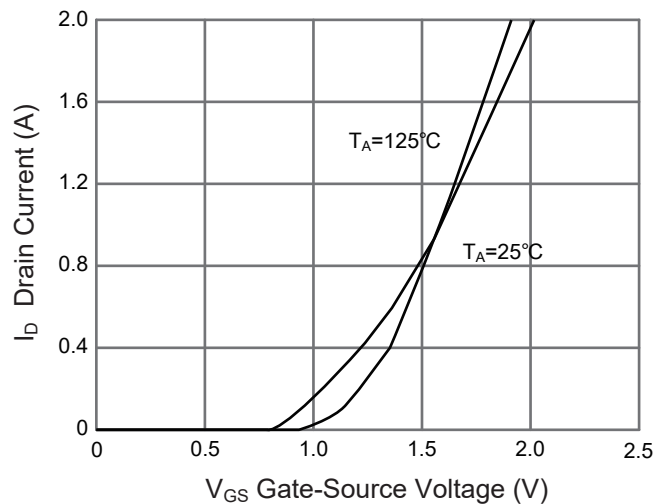
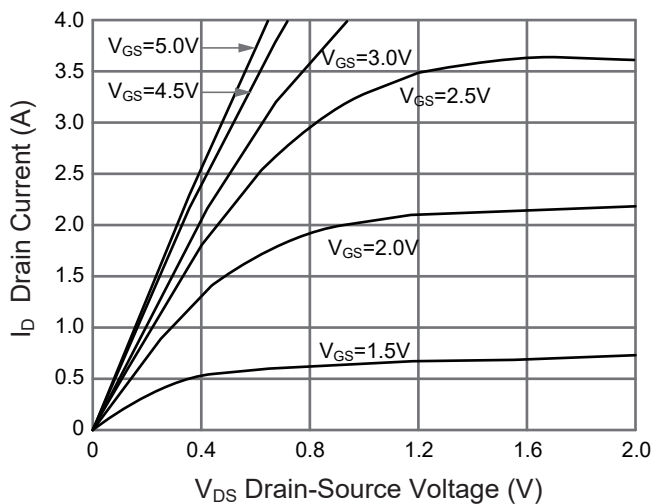
3. Pulse Test: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 0.5\%$ .



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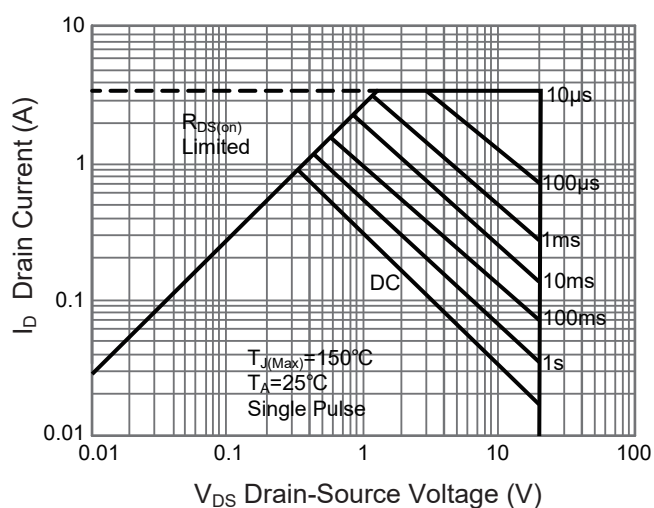
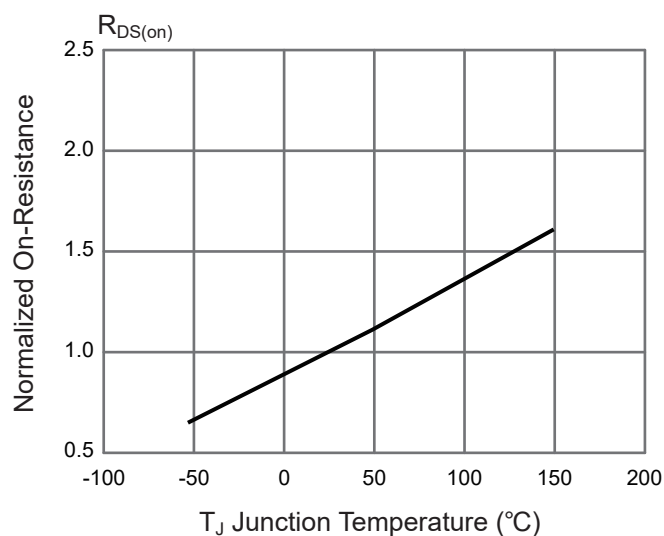
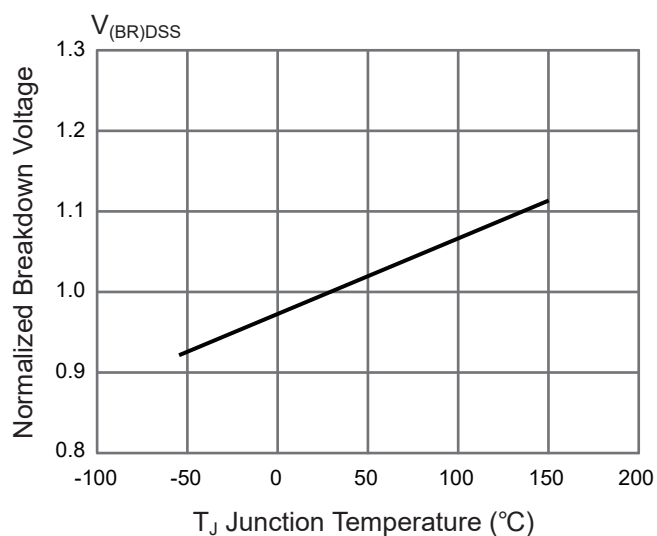
### Typical Characteristic Curves





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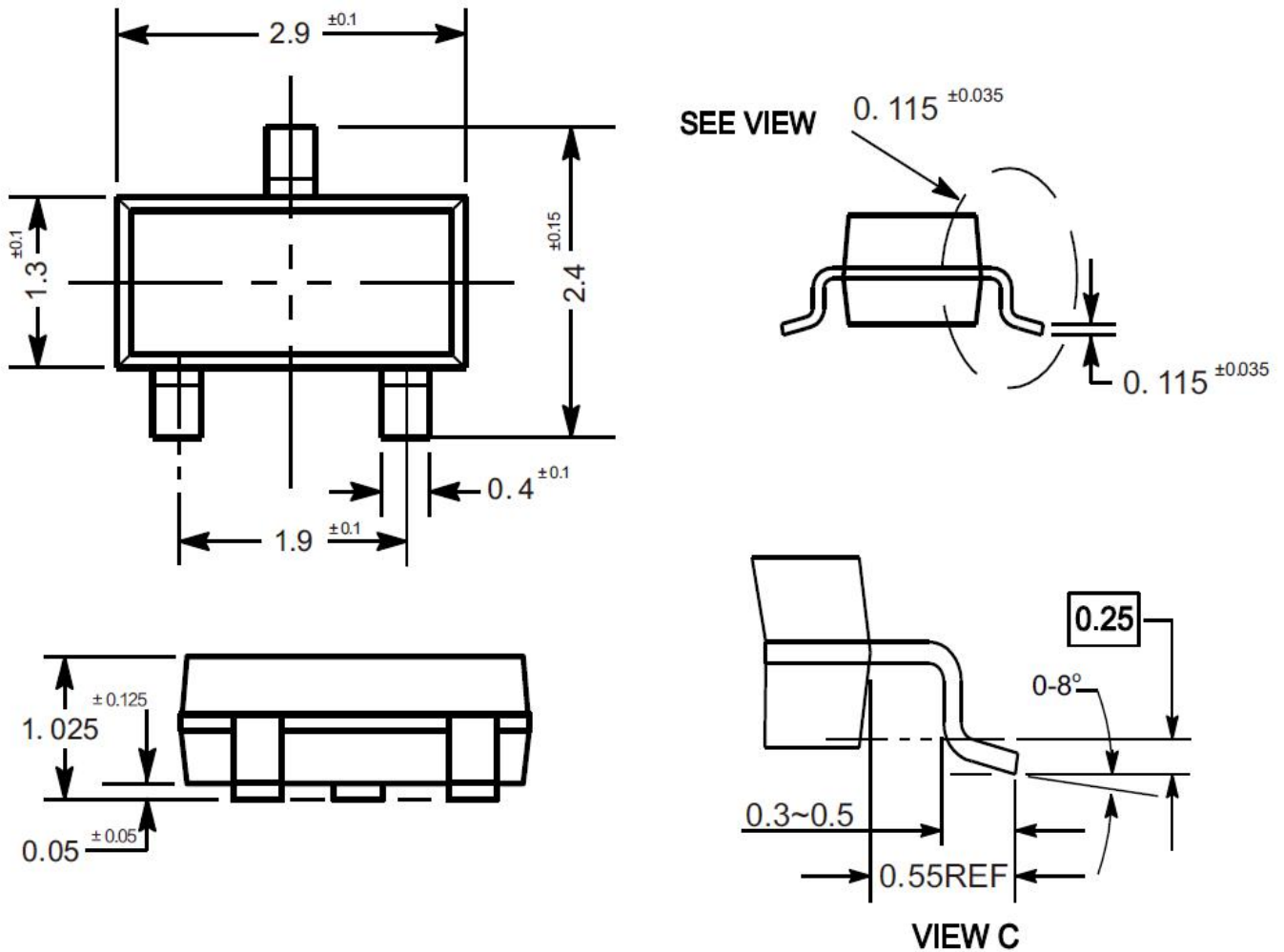
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### Package Outline

SOT-23

Dimensions in mm



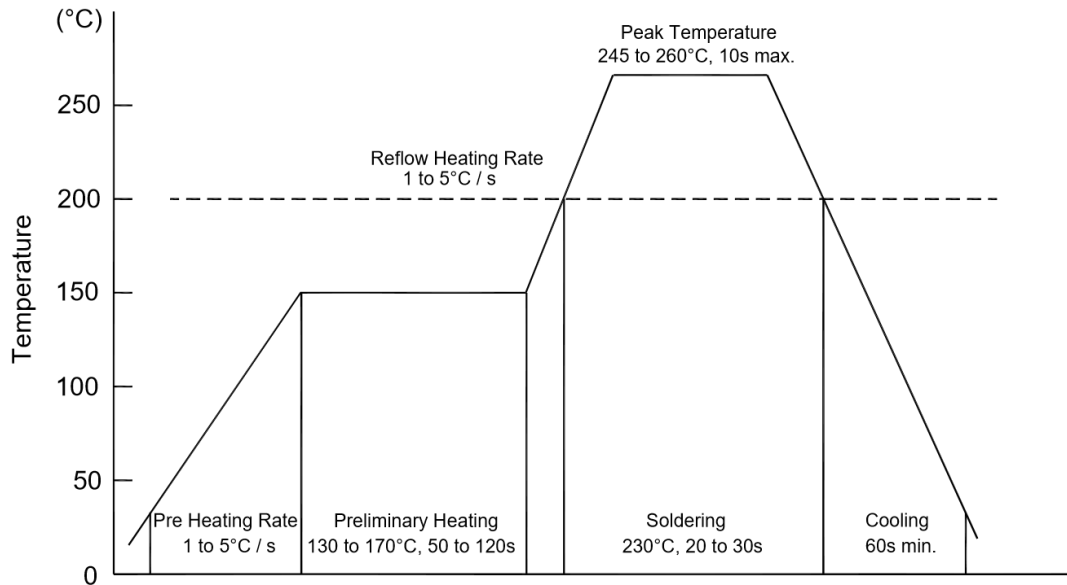
### Ordering Information

| Device      | Package | Shipping              |
|-------------|---------|-----------------------|
| PJM01N20KSA | SOT-23  | 3,000PCS/Reel&7inches |



### 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

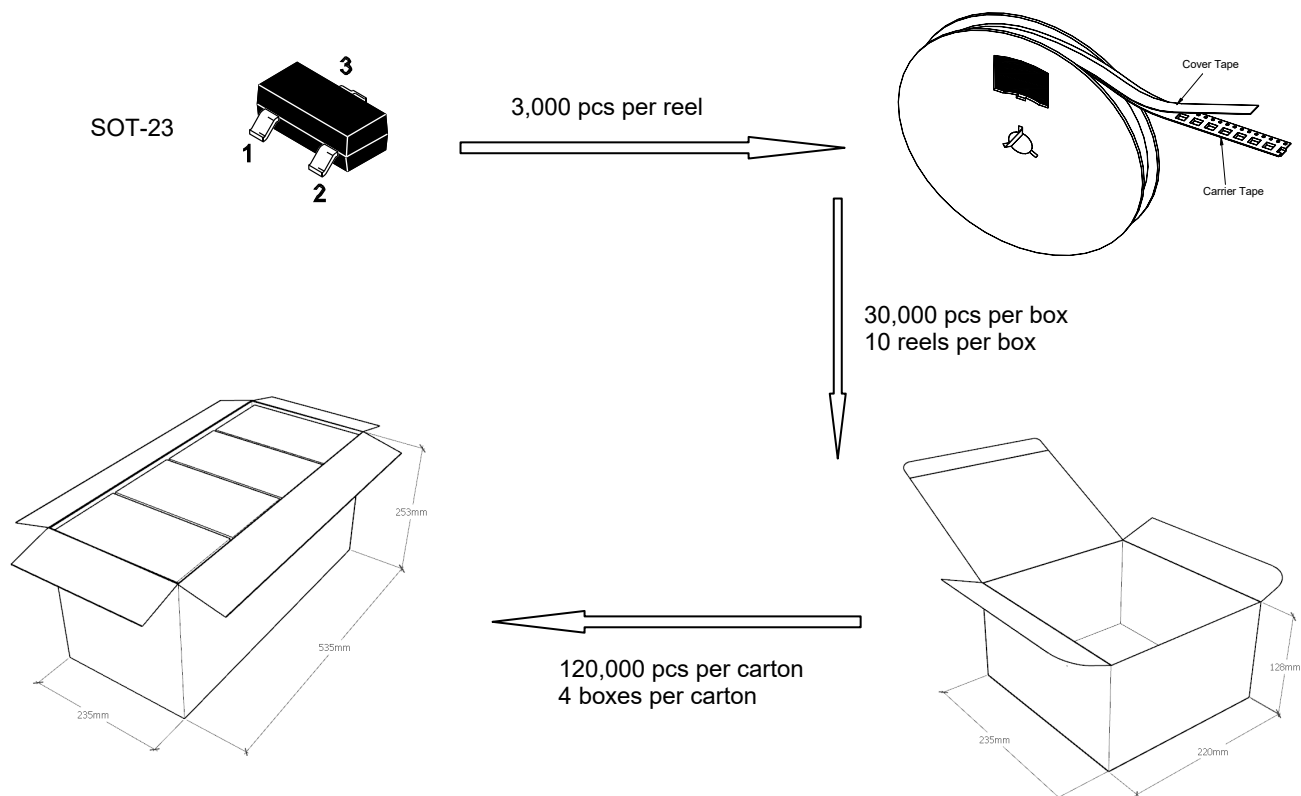
- Temperature: 370 °C
- Time: 3s max.
- Times: one time

#### ◆ Storage conditions

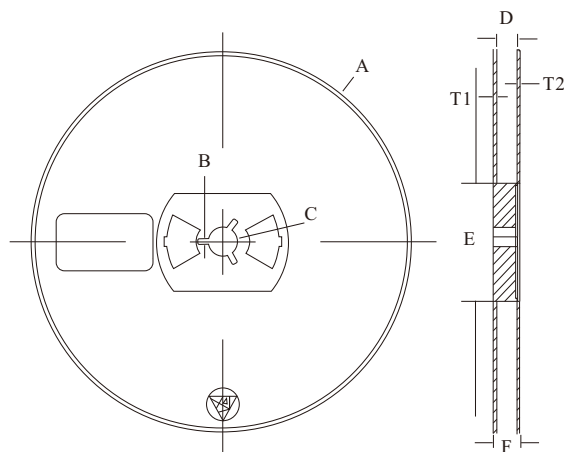
- **Temperature**  
5 to 40 °C
- **Humidity**  
30 to 80% RH
- **Recommended period**  
One year after manufacturing

### Package Specifications

- The method of packaging



### ◆ Embossed tape and reel data



| Symbol | Value (unit: mm)           |
|--------|----------------------------|
| A      | $\varnothing 177.8 \pm 1$  |
| B      | $2.7 \pm 0.2$              |
| C      | $\varnothing 13.5 \pm 0.2$ |
| E      | $\varnothing 54.5 \pm 0.2$ |
| F      | $12.3 \pm 0.3$             |
| D      | $9.6 \pm 2 / -0.3$         |
| T1     | $1.0 \pm 0.2$              |
| T2     | $1.2 \pm 0.2$              |

Reel (7")

