



# PJ75ALXXSQ Series Low Dropout Regulators

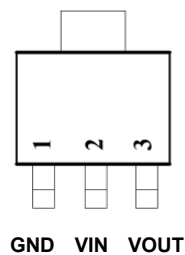
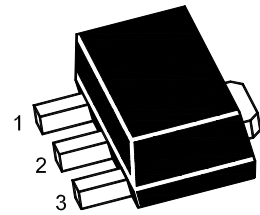
## Description

The PJ75ALXXSQ series is a set of three-terminal low power high voltage regulators implemented in CMOS technology. They allow input voltages as high as 36V. They are available with several fixed output voltages ranging from 2.8V to 5.0V. Because of the low power dissipation, PJ75ALXXSQ are widely used in a variety of equipment such as audio device, video device, communication device and so on.

## Features

- ◆ Low power consumption
- ◆ Low voltage drop
- ◆ Low temperature coefficient
- ◆ High input voltage (up to 36V)
- ◆ Quiescent current : 2.5 $\mu$ A
- ◆ Output voltage tolerance:  $\pm$ 2%
- ◆ HAF(halogen and antimony free) is acquired

SOT-89



Pin assignment

Selection Tablet PJ75ALXXSQ

| Designator | Symbol | Description  |
|------------|--------|--------------|
| XX         | 28     | 2.8V(output) |
|            | 30     | 3.0V         |
|            | 33     | 3.3V         |
|            | 36     | 3.6V         |
|            | 40     | 4.0V         |
|            | 44     | 4.4V         |
|            | 50     | 5.0V         |



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## Absolute Maximum Ratings<sup>(NOTE1)</sup>

Ratings at 25°C ambient temperature unless otherwise specified.

| Parameter                   | Limit      | Unit |
|-----------------------------|------------|------|
| Supply voltage              | -0.3 ~ +36 | V    |
| Storage temperature range   | -50 ~ +125 | °C   |
| Operating temperature range | -40 ~ +85  | °C   |

NOTE: 1. Stresses beyond those listed under absolute maximum ratings may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those conditions is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

| Parameter                              | Symbol          | Value | Unit |
|--|-----------------|-------|------|
| Junction-to-Ambient Thermal Resistance | $R_{\theta JA}$ | 200   | °C/W |
| Power Consumption                      | $P_D$           | 500   | mW   |

## Electrical Characteristics

### PJ75AL28SQ( $T_A=25^\circ\text{C}$ )

| Parameter                     | Symbol  | Test conditions   | Min.  | Typ. | Max   | Unit          |
|-------------------------------|---|---|-------|------|-------|---------------|
| Output voltage                | $V_{OUT}$   | $V_{IN}=V_{OUT}+2.0V$ , $I_{OUT}=10\text{mA}$   | 2.744 | 2.80 | 2.856 | V             |
| Output current                | $I_{OUT}$   | $V_{IN}=V_{OUT}+2.0V$   | 70    | 100  | —     | mA            |
| Load regulation               | $\Delta V_{OUT}$                                      | $V_{IN}=V_{OUT}+2.0V$<br>$1\text{mA}\leq I_{OUT}\leq 50\text{mA}$                                   | —     | 25   | 60    | mV            |
| Voltage drop <sup>Note1</sup> | $V_{DIF}$   | $I_{OUT}=1\text{mA}$ , $\Delta V_{OUT}=2\%$   | —     | 30   | 100   | mV            |
| Quiescent Current             | $I_Q$   | No Load   | —     | 2.5  | 3.0   | $\mu\text{A}$ |
| Line regulation               | $\frac{\Delta V_{OUT}}{V_{OUT}} \times \Delta V_{IN}$ | $V_{OUT}+1.0V\leq V_{IN}\leq 30V$ , $I_{OUT}=1\text{mA}$  | —     | —    | 0.2   | %/V           |
| Input voltage                 | $V_{IN}$  | —   | —     | —    | 36    | V             |
| Temperature coefficient       | $\frac{\Delta V_{OUT}}{V_{OUT}} \times \Delta T_A$    | $V_{IN}=V_{OUT}+2.0V$ , $I_{OUT}=10\text{mA}$ ,<br>$-40^\circ\text{C}\leq T_A\leq 85^\circ\text{C}$ | —     | 100  | —     | ppm/°C        |



# PJ75ALXXSQ Series Low Dropout Regulators

## PJ75AL30SQ(T<sub>A</sub>=25°C)

| Parameter                     | Symbol   | Test conditions  | Min.  | Typ. | Max   | Unit   |
|-------------------------------|--|--|-------|------|-------|--------|
| Output voltage                | V <sub>OUT</sub>   | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V, I <sub>OUT</sub> =10mA                                | 2.940 | 3.00 | 3.060 | V      |
| Output current                | I <sub>OUT</sub>   | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V  | 70    | 100  | —     | mA     |
| Load regulation               | ΔV <sub>OUT</sub>  | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V<br>1mA≤I <sub>OUT</sub> ≤50mA                          | —     | 25   | 60    | mV     |
| Voltage drop <sup>Note1</sup> | V <sub>DIF</sub>   | I <sub>OUT</sub> =1mA, ΔV <sub>OUT</sub> =2%   | —     | 30   | 100   | mV     |
| Quiescent Current             | I <sub>Q</sub>   | No Load  | —     | 2.5  | 3.0   | μA     |
| Line regulation               | ΔV <sub>OUT</sub> /V <sub>OUT</sub><br>×ΔV <sub>IN</sub> | V <sub>OUT</sub> +1.0V≤V <sub>IN</sub> ≤30V, I <sub>OUT</sub> =1mA                             | —     | —    | 0.2   | %/V    |
| Input voltage                 | V <sub>IN</sub>  | —  | —     | —    | 36    | V      |
| Temperature coefficient       | ΔV <sub>OUT</sub> /V <sub>OUT</sub><br>×ΔT <sub>A</sub>  | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V, I <sub>OUT</sub> =10mA,<br>-40°C≤T <sub>A</sub> ≤85°C | —     | 100  | —     | ppm/°C |

## PJ75AL33SQ(T<sub>A</sub>=25°C)

| Parameter                     | Symbol   | Test conditions  | Min.  | Typ. | Max   | Unit   |
|-------------------------------|--|--|-------|------|-------|--------|
| Output voltage                | V <sub>OUT</sub>   | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V, I <sub>OUT</sub> =10mA                                | 3.234 | 3.30 | 3.366 | V      |
| Output current                | I <sub>OUT</sub>   | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V  | 70    | 100  | —     | mA     |
| Load regulation               | ΔV <sub>OUT</sub>  | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V<br>1mA≤I <sub>OUT</sub> ≤50mA                          | —     | 25   | 60    | mV     |
| Voltage drop <sup>Note1</sup> | V <sub>DIF</sub>   | I <sub>OUT</sub> =1mA, ΔV <sub>OUT</sub> =2%   | —     | 25   | 55    | mV     |
| Quiescent Current             | I <sub>Q</sub>   | No Load  | —     | 2.5  | 3.0   | μA     |
| Line regulation               | ΔV <sub>OUT</sub> /V <sub>OUT</sub><br>×ΔV <sub>IN</sub> | V <sub>OUT</sub> +1.0V≤V <sub>IN</sub> ≤30V,<br>I <sub>OUT</sub> =1mA                          | —     | —    | 0.2   | %/V    |
| Input voltage                 | V <sub>IN</sub>  | —  | —     | —    | 36    | V      |
| Temperature coefficient       | ΔV <sub>OUT</sub> /V <sub>OUT</sub><br>×ΔT <sub>A</sub>  | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V, I <sub>OUT</sub> =10mA,<br>-40°C≤T <sub>A</sub> ≤85°C | —     | 100  | —     | ppm/°C |

## PJ75AL36SQ(T<sub>A</sub>=25°C)

| Parameter                     | Symbol   | Test conditions  | Min.  | Typ. | Max   | Unit   |
|-------------------------------|--|--|-------|------|-------|--------|
| Output voltage                | V <sub>OUT</sub>   | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V, I <sub>OUT</sub> =10mA                                | 3.528 | 3.60 | 3.672 | V      |
| Output current                | I <sub>OUT</sub>   | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V  | 70    | 100  | —     | mA     |
| Load regulation               | ΔV <sub>OUT</sub>  | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V<br>1mA≤I <sub>OUT</sub> ≤50mA                          | —     | 25   | 60    | mV     |
| Voltage drop <sup>Note1</sup> | V <sub>DIF</sub>   | I <sub>OUT</sub> =1mA, ΔV <sub>OUT</sub> =2%   | —     | 25   | 55    | mV     |
| Quiescent Current             | I <sub>Q</sub>   | No Load  | —     | 2.5  | 3.0   | μA     |
| Line regulation               | ΔV <sub>OUT</sub> /V <sub>OUT</sub><br>×ΔV <sub>IN</sub> | V <sub>OUT</sub> +1.0V≤V <sub>IN</sub> ≤30V,<br>I <sub>OUT</sub> =1mA                          | —     | —    | 0.2   | %/V    |
| Input voltage                 | V <sub>IN</sub>  | —  | —     | —    | 36    | V      |
| Temperature coefficient       | ΔV <sub>OUT</sub> /V <sub>OUT</sub><br>×ΔT <sub>A</sub>  | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V, I <sub>OUT</sub> =10mA,<br>-40°C≤T <sub>A</sub> ≤85°C | —     | 100  | —     | ppm/°C |



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## PJ75AL40SQ(T<sub>A</sub>=25°C)

| Parameter                     | Symbol  | Test conditions   | Min.  | Typ. | Max   | Unit   |
|-------------------------------|---|---|-------|------|-------|--------|
| Output voltage                | V <sub>OUT</sub>  | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V, I <sub>OUT</sub> =10mA                                 | 3.920 | 4.0  | 4.080 | V      |
| Output current                | I <sub>OUT</sub>  | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V   | 70    | 100  | —     | mA     |
| Load regulation               | ΔV <sub>OUT</sub>   | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V<br>1mA≤I <sub>OUT</sub> ≤50mA                           | —     | 25   | 60    | mV     |
| Voltage drop <sup>Note1</sup> | V <sub>DIF</sub>  | I <sub>OUT</sub> =1mA, ΔV <sub>OUT</sub> =2%  | —     | 25   | 55    | mV     |
| Quiescent Current             | I <sub>Q</sub>  | No Load   | —     | 2.5  | 3.0   | μA     |
| Line regulation               | ΔV <sub>OUT</sub> /<br>V <sub>OUT</sub> ×ΔV <sub>IN</sub> | V <sub>OUT</sub> +1.0V≤V <sub>IN</sub> ≤30V,<br>I <sub>OUT</sub> =1mA                           | —     | —    | 0.2   | %/V    |
| Input voltage                 | V <sub>IN</sub>   | —   | —     | —    | 36    | V      |
| Temperature coefficient       | ΔV <sub>OUT</sub> /V <sub>OUT</sub><br>×ΔT <sub>A</sub>   | V <sub>IN</sub> = V <sub>OUT</sub> +2.0V, I <sub>OUT</sub> =10mA,<br>-40°C≤T <sub>A</sub> ≤85°C | —     | 100  | —     | ppm/°C |

## PJ75AL44SQ(T<sub>A</sub>=25°C)

| Parameter                     | Symbol  | Test conditions   | Min.  | Typ. | Max   | Unit   |
|-------------------------------|---|---|-------|------|-------|--------|
| Output voltage                | V <sub>OUT</sub>  | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V , I <sub>OUT</sub> =10mA                                | 4.312 | 4.4  | 4.488 | V      |
| Output current                | I <sub>OUT</sub>  | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V   | 70    | 100  | —     | mA     |
| Load regulation               | ΔV <sub>OUT</sub>   | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V<br>1mA≤I <sub>OUT</sub> ≤50mA                           | —     | 25   | 60    | mV     |
| Voltage drop <sup>Note1</sup> | V <sub>DIF</sub>  | I <sub>OUT</sub> =1mA, ΔV <sub>OUT</sub> =2%  | —     | 25   | 55    | mV     |
| Quiescent Current             | I <sub>Q</sub>  | No Load   | —     | 2.5  | 3.0   | μA     |
| Line regulation               | ΔV <sub>OUT</sub> / V <sub>OUT</sub><br>×ΔV <sub>IN</sub> | V <sub>OUT</sub> +1.0V≤V <sub>IN</sub> ≤30V,<br>I <sub>OUT</sub> =1mA                           | —     | —    | 0.2   | %/V    |
| Input voltage                 | V <sub>IN</sub>   | —   | —     | —    | 36    | V      |
| Temperature coefficient       | ΔV <sub>OUT</sub> /V <sub>OUT</sub><br>×ΔT <sub>A</sub>   | V <sub>IN</sub> = V <sub>OUT</sub> +2.0V, I <sub>OUT</sub> =10mA,<br>-40°C≤T <sub>A</sub> ≤85°C | —     | 100  | —     | ppm/°C |

## PJ75AL50SQ(T<sub>A</sub>=25°C)

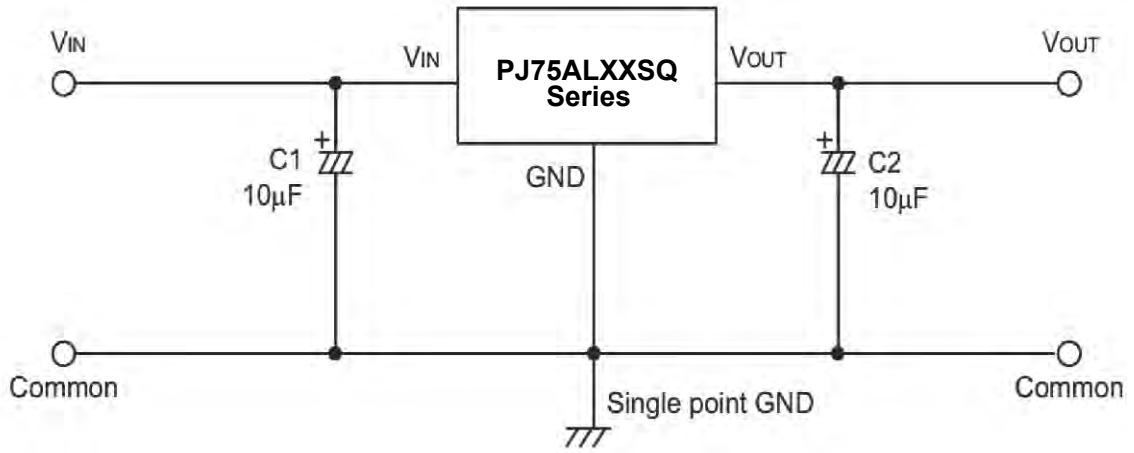
| Parameter                     | Symbol  | Test conditions   | Min.  | Typ. | Max   | Unit   |
|-------------------------------|---|---|-------|------|-------|--------|
| Output voltage                | V <sub>OUT</sub>  | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V , I <sub>OUT</sub> =10mA                                | 4.900 | 5.0  | 5.100 | V      |
| Output current                | I <sub>OUT</sub>  | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V   | 100   | 150  | —     | mA     |
| Load regulation               | ΔV <sub>OUT</sub>   | V <sub>IN</sub> =V <sub>OUT</sub> +2.0V<br>1mA≤I <sub>OUT</sub> ≤70mA                           | —     | 25   | 60    | mV     |
| Voltage drop <sup>Note1</sup> | V <sub>DIF</sub>  | I <sub>OUT</sub> =1mA, ΔV <sub>OUT</sub> =2%  | —     | 25   | 55    | mV     |
| Quiescent Current             | I <sub>Q</sub>  | No Load   | —     | 3.5  | 4.0   | μA     |
| Line regulation               | ΔV <sub>OUT</sub> / V <sub>OUT</sub><br>×ΔV <sub>IN</sub> | V <sub>OUT</sub> +1.0 V≤V <sub>IN</sub> ≤30V,<br>I <sub>OUT</sub> =1mA                          | —     | —    | 0.2   | %/V    |
| Input voltage                 | V <sub>IN</sub>   | —   | —     | —    | 36    | V      |
| Temperature coefficient       | ΔV <sub>OUT</sub> /V <sub>OUT</sub><br>×ΔT <sub>A</sub>   | V <sub>IN</sub> = V <sub>OUT</sub> +2.0V, I <sub>OUT</sub> =10mA,<br>-40°C≤T <sub>A</sub> ≤85°C | —     | 100  | —     | ppm/°C |

NOTE: 1.The difference of input voltage and output voltage when input voltage falls down gradually till output voltage equals to 98% of rating V<sub>OUT</sub> .



## Application Circuit

### Basic circuits



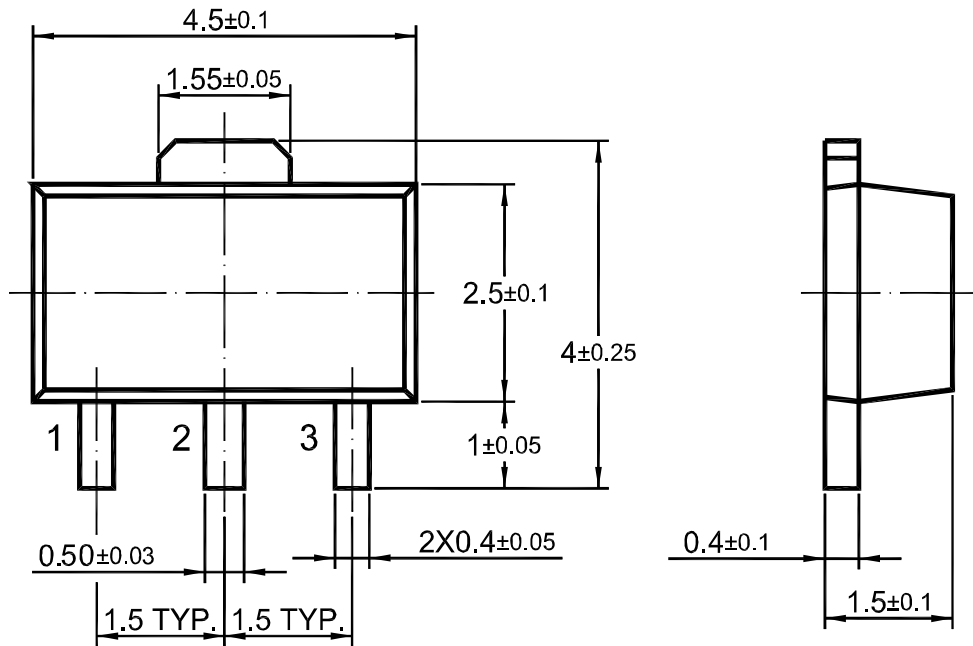


# PJ75ALXXSQ Series Low Dropout Regulators

## Package Outline

SOT-89

Dimensions in mm



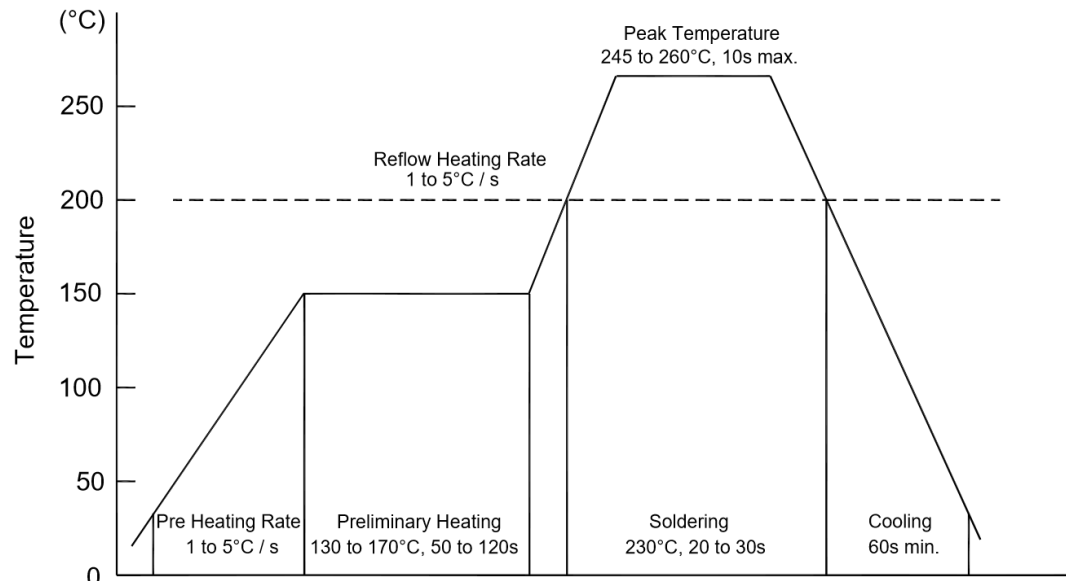
## Ordering Information

| Device     | Package | Shipping          |
|------------|---------|-------------------|
| PJ75ALXXSQ | SOT-89  | 1000PCS/Reel&Tape |



## Conditions of Soldering

### ◆ 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

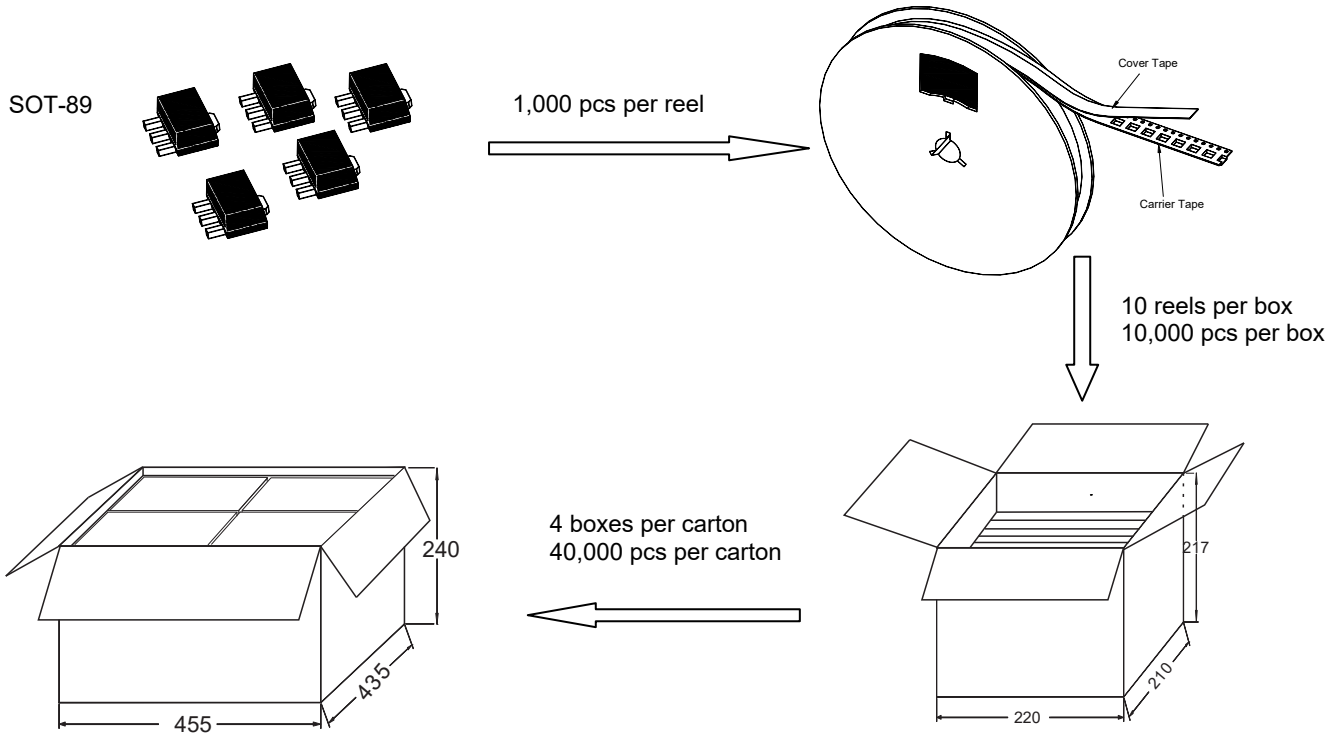
- **Temperature**  
5 to 40 °C
- **Humidity**  
30 to 80% RH
- **Recommended period**  
One year after manufacturing



# PJ75ALXXSQ Series Low Dropout Regulators

## Package Specification

The method of packaging and dimension are shown as below figure.



## Tape and reel data (Units: mm)

