

Product Summary

- $V_{DS} = -30V, I_D = -5A$
- $R_{DS(on)} < 53m\Omega @ V_{GS} = -10V$

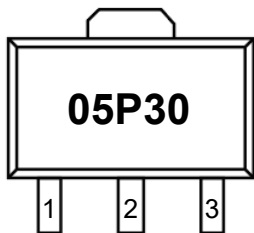
Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Green Device Available

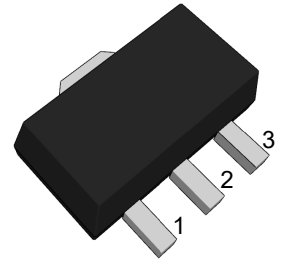
Application

- Power Switching Application
- Uninterruptible Power Supply

Marking Code



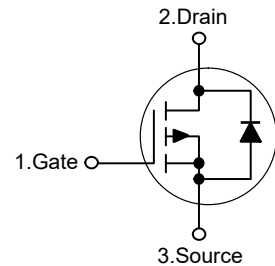
SOT-89



(Top View)

Pin	Description
1	Gate
2	Drain
3	Source

Schematic Diagram



Absolute Maximum Ratings

(Ta=25°C unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	-20	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $-V_{GS} @ -10V^1$	-5.0	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $-V_{GS} @ -10V^1$	-4.0	A
I_{DM}	Pulsed Drain Current ²	-20	A
EAS	Single Pulse Avalanche Energy ³	18	mJ
I_{AS}	Avalanche Current	8	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation ⁴	1.8	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	62.5	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	30	°C/W

Electrical Characteristics

(Ta=25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to 25°C, $I_D=-1mA$	---	-	---	V/°C
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-10V$, $I_D=-5.0A$	---	53	65	mΩ
		$V_{GS}=-4.5V$, $I_D=-3.8A$	---	80	98	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-1.0	-1.5	-2.0	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4.	---	mV/°C
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-24V$, $V_{GS}=0V$, $T_J=25^\circ C$	---	-	-1	uA
		$V_{DS}=-24V$, $V_{GS}=0V$, $T_J=55^\circ C$	---	-	-5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	-	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=-5V$, $I_D=-3A$	---	5		S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1MHz$	---	24	48	Ω
Q_g	Total Gate Charge (-4.5V)	$V_{DS}=-15V$, $V_{GS}=-4.5V$, $I_D=-5A$	---	11.6	---	nC
Q_{gs}	Gate-Source Charge		---	1.3	---	
Q_{gd}	Gate-Drain Charge		---	2.5	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-15V$, $V_{GEN}=-10V$, $R_G=3.3\Omega$ $I_D=-1A$, $R_L=15\Omega$	---	6	12	ns
T_r	Rise Time		---	12	23	
$T_{d(off)}$	Turn-Off Delay Time		---	25	46	
T_f	Fall Time		---	6	12	
C_{iss}	Input Capacitance	$V_{DS}=-15V$, $V_{GS}=0V$, $f=1MHz$	---	625	---	pF
C_{oss}	Output Capacitance		---	100	---	
C_{rss}	Reverse Transfer Capacitance		---	60	---	

Guaranteed Avalanche Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
EAS	Single Pulse Avalanche Energy ⁵	$V_{DD}=25V$, $L=0.1mH$, $I_{AS}=6A$	6	---	---	mJ

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,6}	$V_G=V_D=0V$, Force Current	---	---	-2.0	A
I_{SM}	Pulsed Source Current ^{2,6}		---	-	-20	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=-1.7A$, $T_J=25^\circ C$	---	-	-1	V

Note :

1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, $t<10sec$.2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$ 3.The EAS data shows Max. rating . The test condition is $V_{DD}=-25V$, $V_{GS}=-10V$, $L=0.1mH$, $I_{AS}=-6A$

4.The power dissipation is limited by 150°C junction temperature

5.The Min. value is 100% EAS tested guarantee.

6.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristic Curves

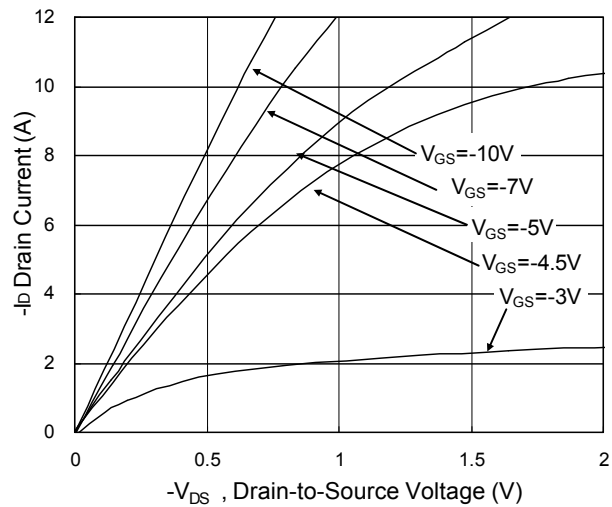


Fig.1 Typical Output Characteristics

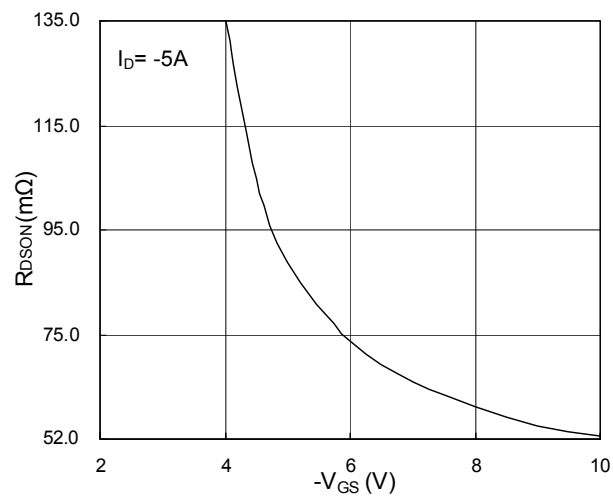
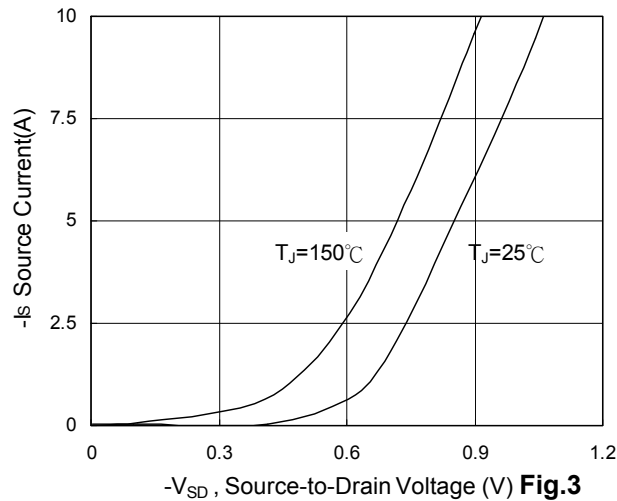


Fig.2 On-Resistance vs. G-S Voltage



Forward Characteristics of Reverse

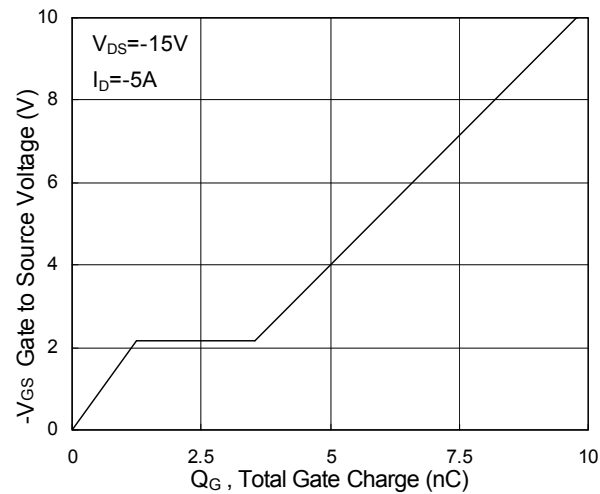


Fig.4 Gate-Charge Characteristics

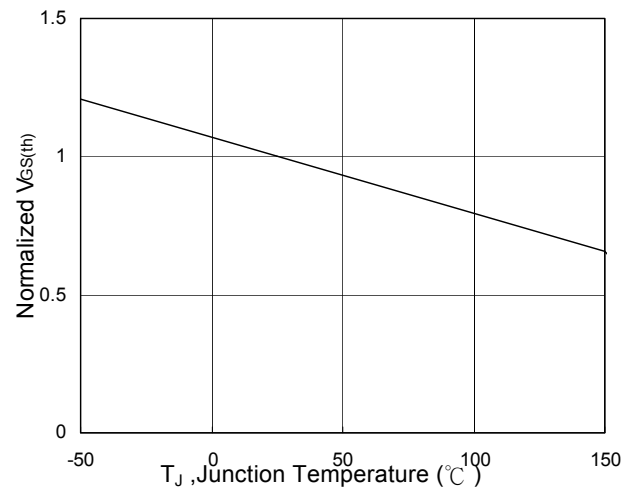


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

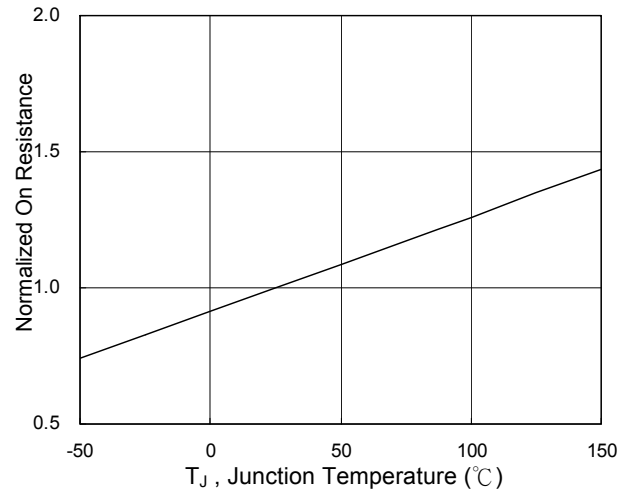


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

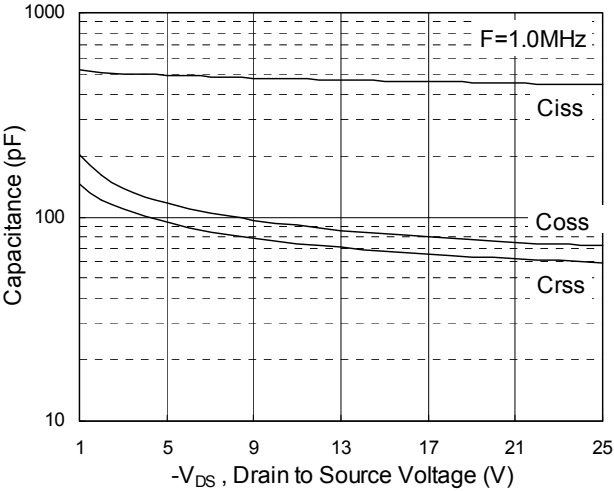


Fig.7 Capacitance

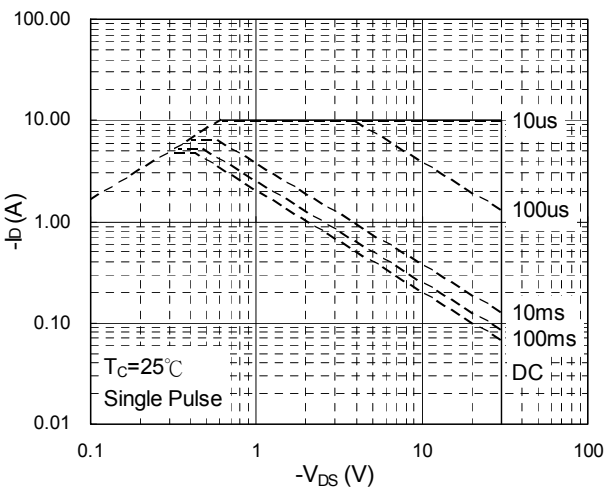


Fig.8 Safe Operating Area

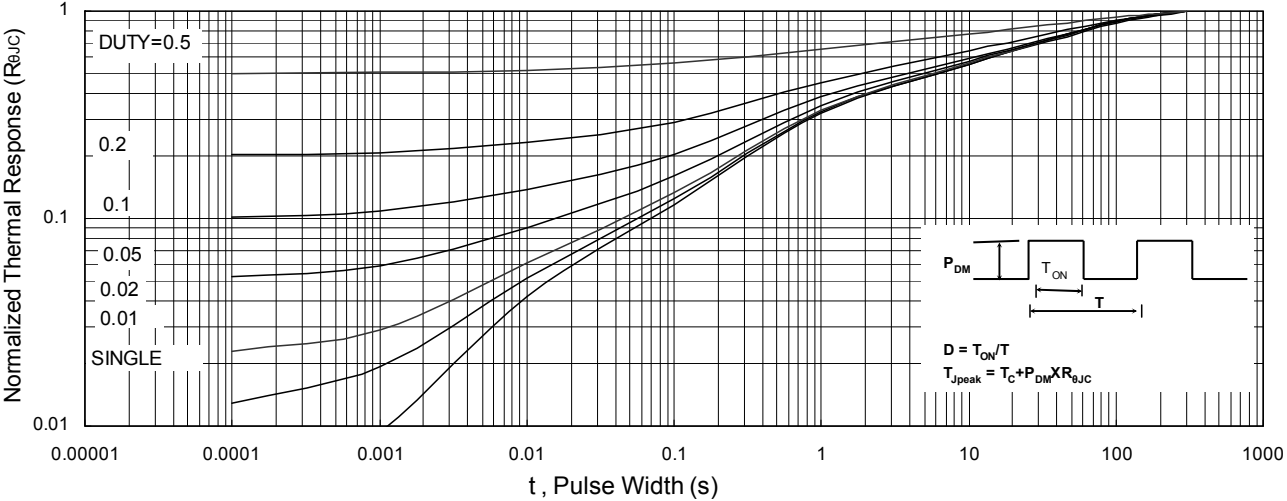


Fig.9 Normalized Maximum Transient Thermal Impedance

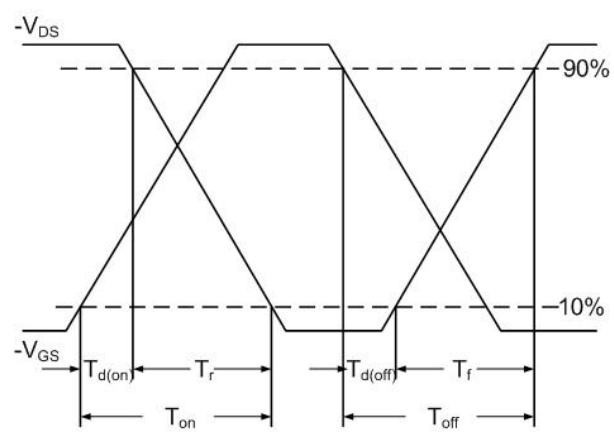


Fig.10 Switching Time Waveform

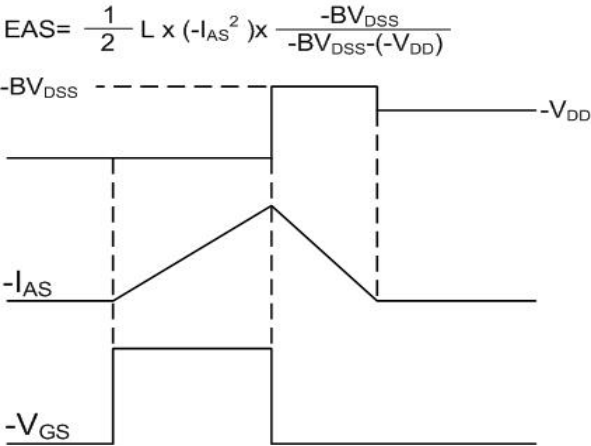
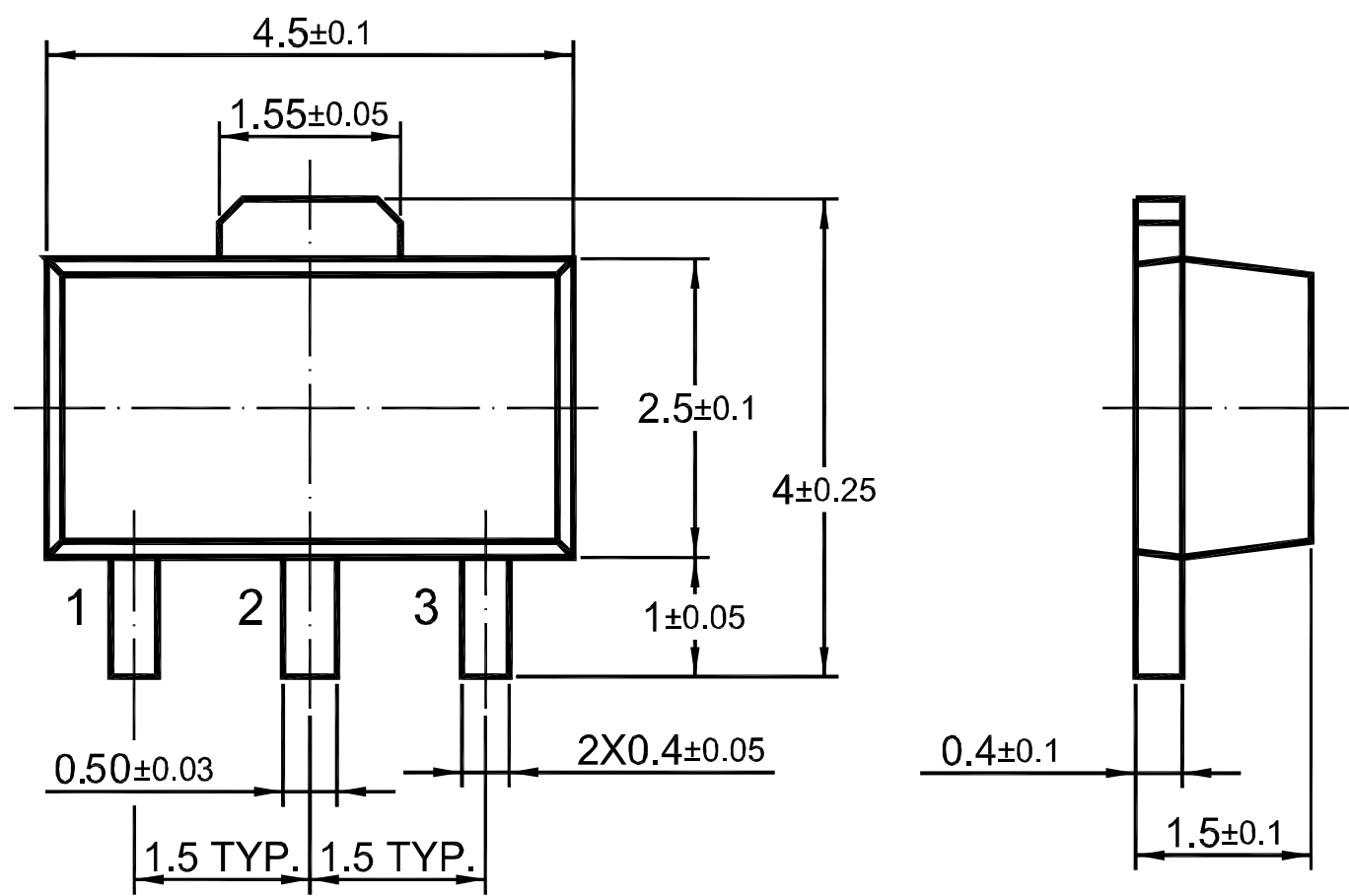


Fig.11 Unclamped Inductive Waveform

Package Outline

SOT-89

Dimensions in mm

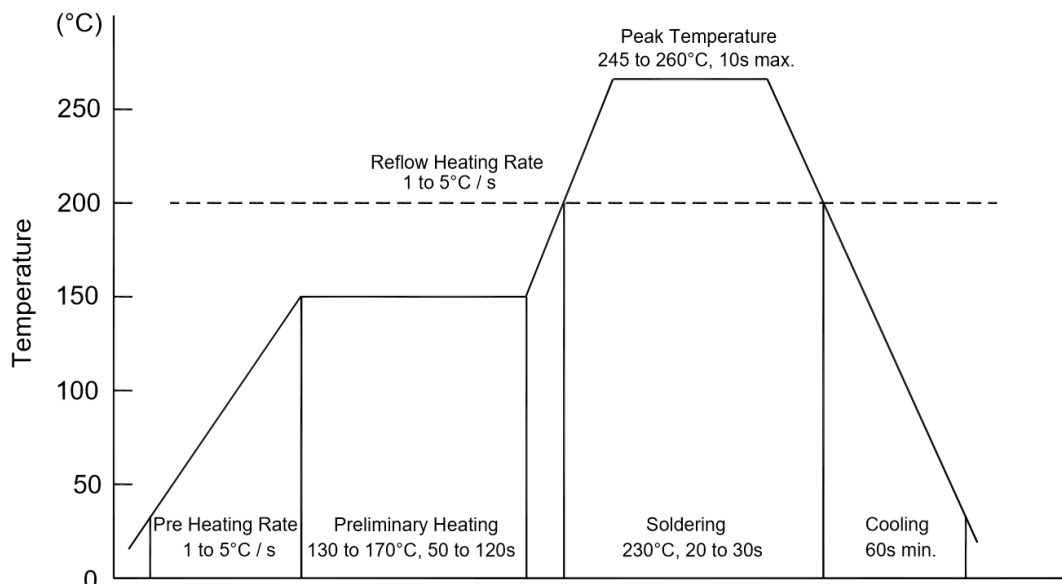


Ordering Information

Device	Package	Shipping
TN05P30JSQ	SOT-89	1,000PCS/Reel&7inches
		3,000PCS/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

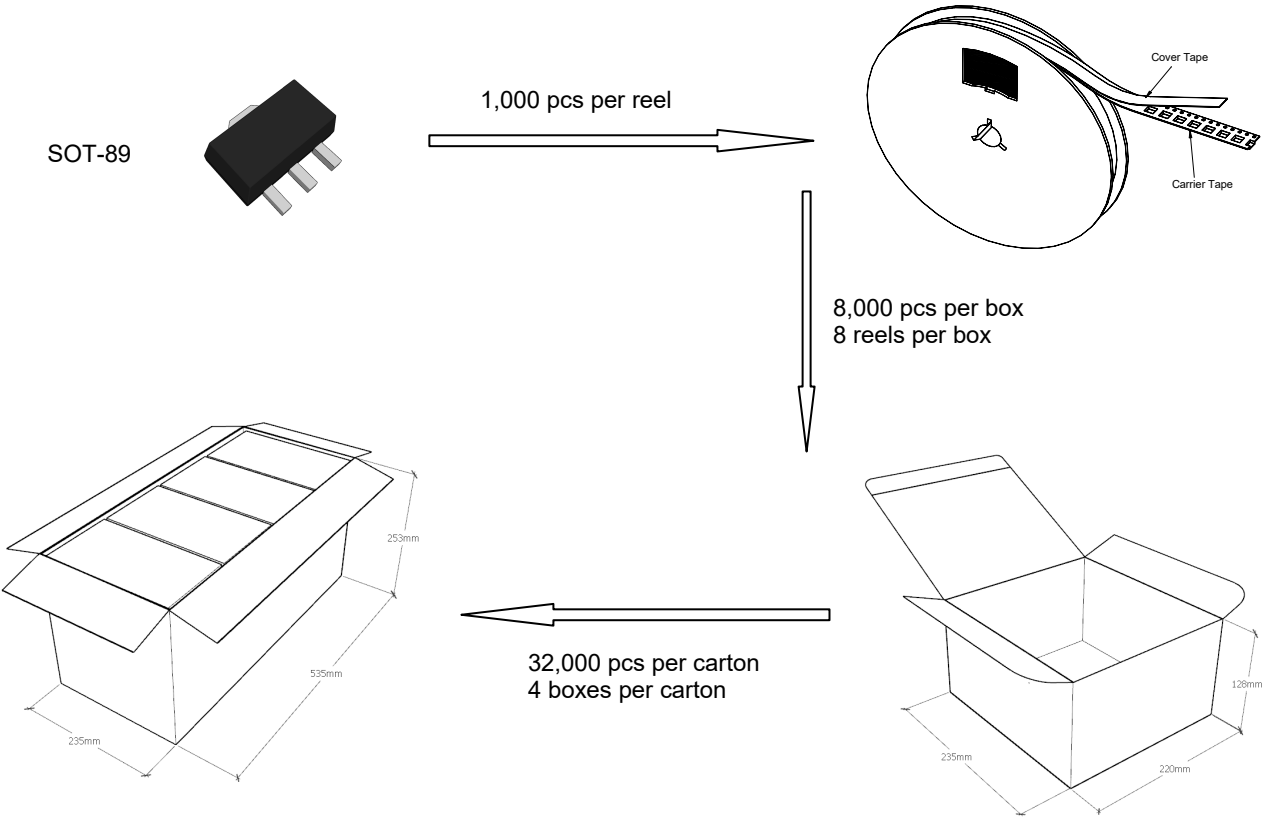
- Temperature: 370 °C
- Time: 3s max.
- Times: one time

◆ Storage conditions

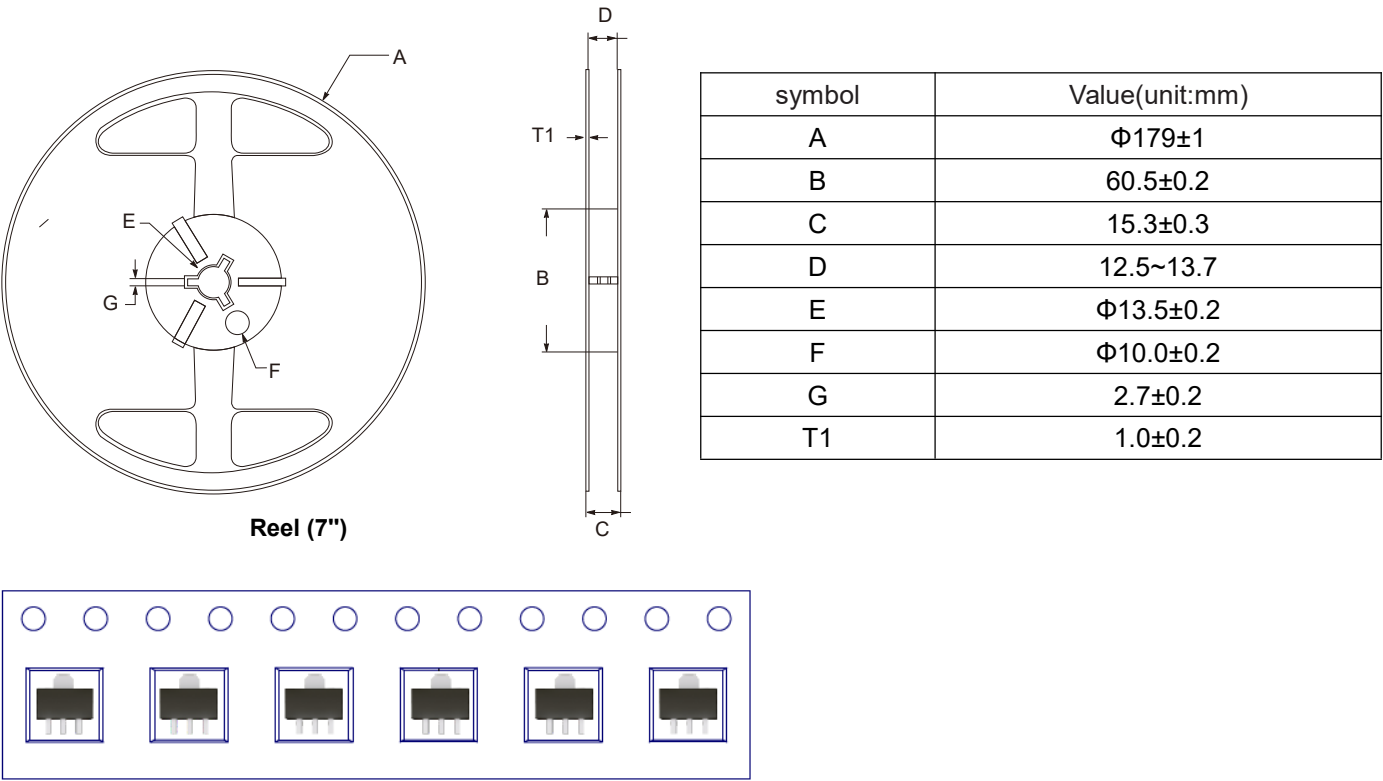
- **Temperature**
5 to 40 °C
- **Humidity**
30 to 80% RH
- **Recommended period**
One year after manufacturing

Package Specifications

- The method of packaging (1,000PCS/Reel&7inches)

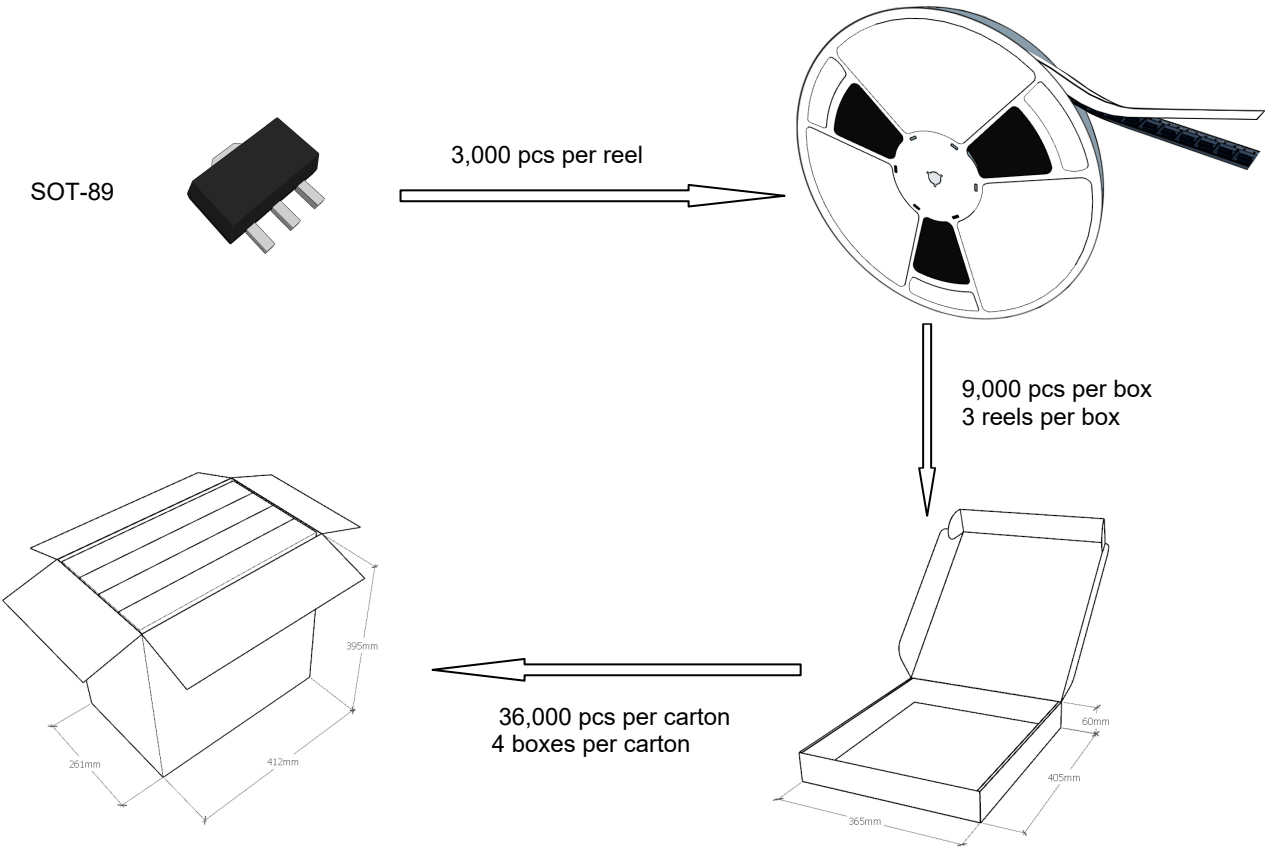


◆ Embossed tape and reel data

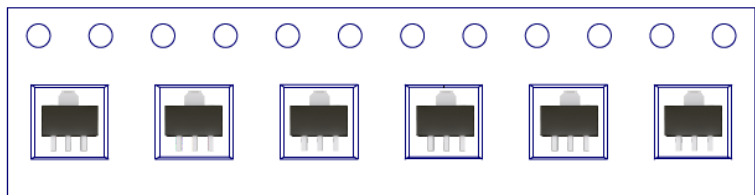
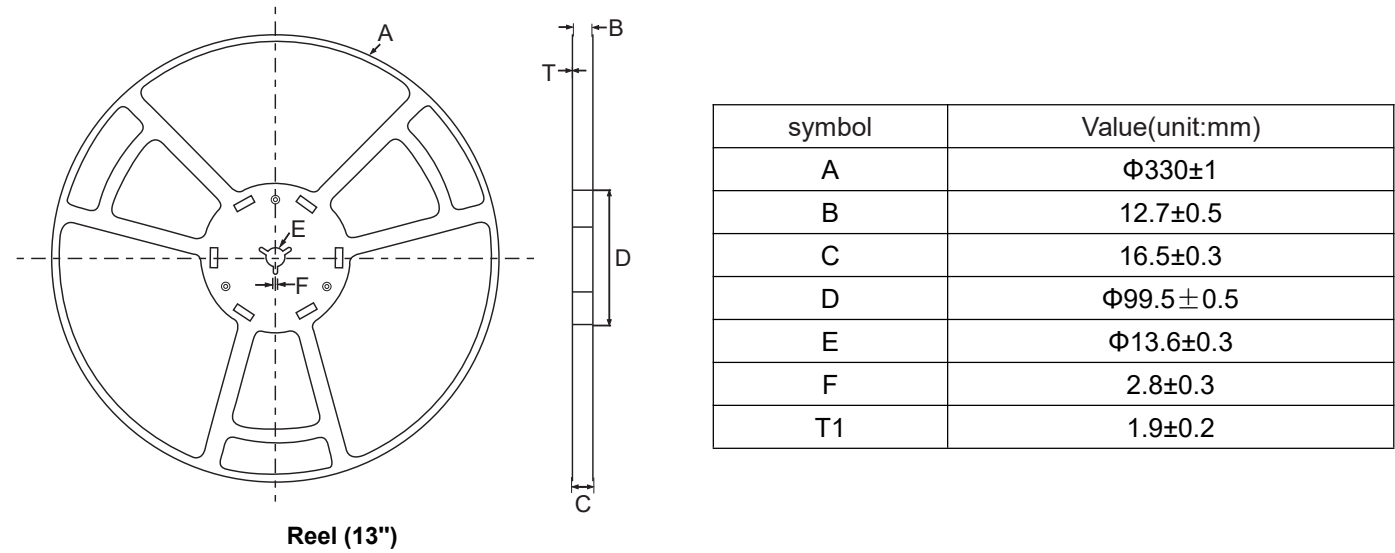


Package Specifications

- The method of packaging (3,000PCS/Reel&13inches)



◆ Embossed tape and reel data



Contact Information

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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.

The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. TANI shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and TANI assumes no responsibility for the application of the product. TANI strives to provide accurate and up-to-date information to the best of our ability. However, due to technical, human, or other reasons, TANI cannot guarantee that the information provided in the product specification is entirely accurate and error-free. TANI shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications.

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The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. TANI shall assume no responsibility for any consequences resulting from such usage.

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