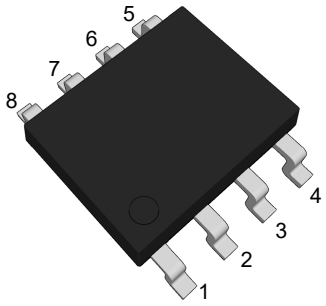
TN05P30JPA

P-Channel Enhancement Mode Power MOSFET

Product Summary

- V_{DS}= -30V,I_D= -5.1A
- $R_{DS(on)}$< 43mΩ @V_{GS}= -10V
- $R_{DS(on)}$< 65mΩ @V_{GS}= -4.5V

SOP-8



(Top View)

Features

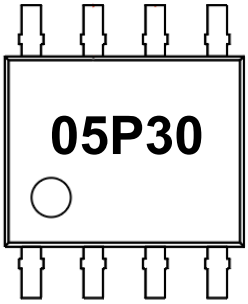
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Green Device Available

Application

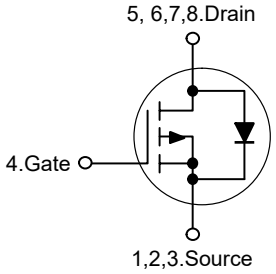
- Power Switching Application
- Uninterruptible Power Supply

Pin	Description
1,2,3	Source
4	Gate
5,6,7,8	Drain

Marking Code



Schematic Diagram



Absolute Maximum Ratings

(Ta=25℃ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$-V_{DS}$	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	$-I_D$	5.1	A
Drain Current-Pulsed Note1	$-I_{DM}$	20	A
Maximum Power Dissipation	P_D	1.4	W
Single Pulse Avalanche Energy Note2	E_{AS}	12	mJ
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance,Junction-to-Ambient Note3	$R_{\theta JA}$	89	°C/W

Electrical Characteristics

(Ta=25℃ unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=-250μA, V_{GS} =0V	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-30V, V_{GS} =0V	-	-	-1	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0V, V_{GS} =±20V	-	-	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=-250μA	-1.0	-1.8	-2.5	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance (3)	V_{GS}=-10V, I_D=-5A	-	31	43	mΩ
		V_{GS}=-4.5V, I_D=-4A	-	46	65	
V_{SD}	Diode Forward Voltage	I_S=-5.1A, V_{GS}=0V	-	-	-1.2	V
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-15V, f=1MHz	-	537	-	pF
C_{oss}	Output Capacitance		-	73	-	pF
C_{rss}	Reverse Transfer Capacitance		-	55	-	pF
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	V_{GS}=-10V, V_{DD}=-15V, I_D=-2A	-	10.9	-	nC
Q_{gs}	Gate Source Charge		-	2.1	-	nC
Q_{gd}	Gate Drain Charge		-	2.1	-	nC
$t_{D(on)}$	Turn-On Delay Time	V_{GS}=-10V, V_{DD}=-15V, I_D=-2A, R_{GEN}=3Ω	-	2.9	-	ns
t_r	Turn-On Rise Time		-	2.1	-	ns
$t_{D(off)}$	Turn-Off Delay Time		-	25	-	ns
t_f	Turn-Off Fall Time		-	13	-	ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=-2A, di/dt=100A/μs	-	8.7	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=-2A, di/dt=100A/μs	-	2.9	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. EAS condition: Starting T_J=25C, V_{DD}=-15V, V_G=-10V, R_G=25ohm, L=0.5mH, I_{AS}=-7A

3. Pulse Test: Pulse Width≤300us, Duty Cycle≤0.5%

4. $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB.

Typical Characteristic Curves

Figure 1: Saturation Characteristics

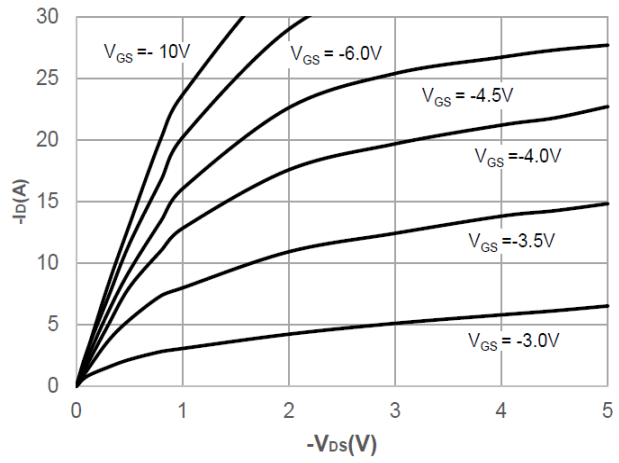


Figure 2: Transfer Characteristics

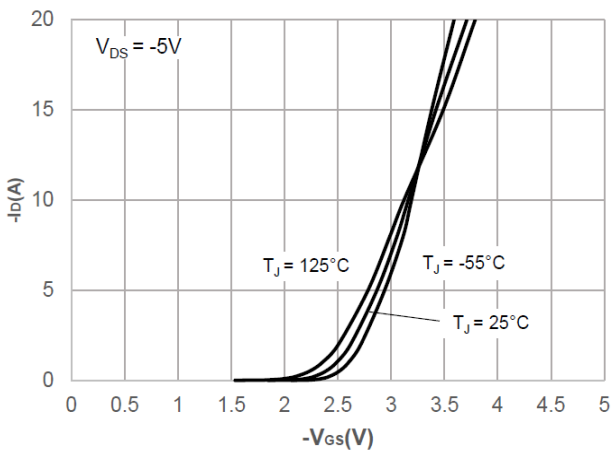


Figure 3: $R_{DS(ON)}$ vs. Drain Current

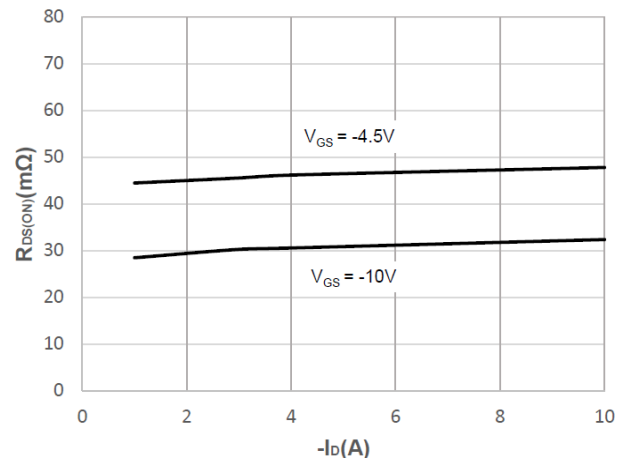


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

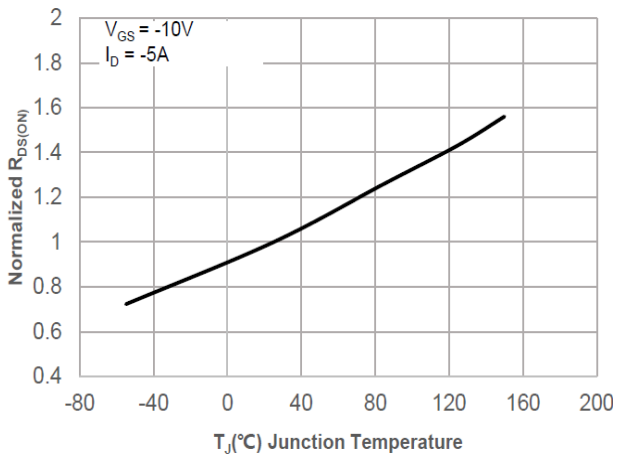


Figure 5: BVDSS vs. Junction Temperature

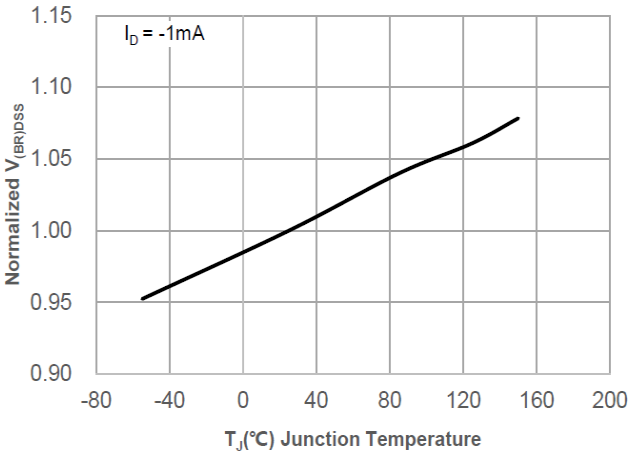


Figure 6: Body-Diode Characteristics

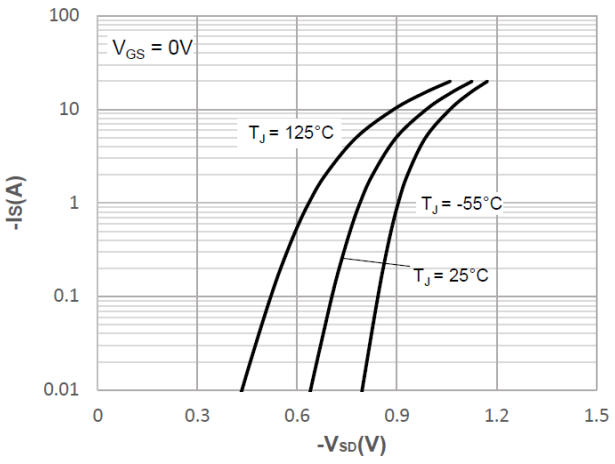


Figure 7: Gate-Charge characteristics

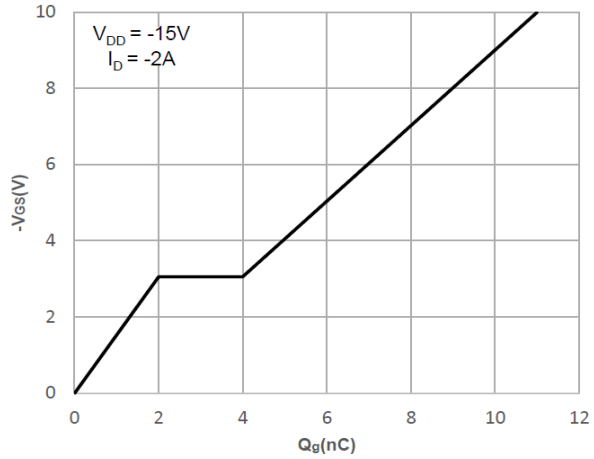


Figure 8: Capacitance characteristics

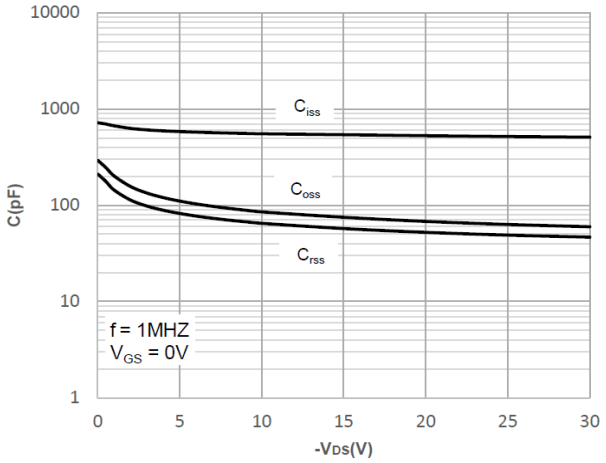


Figure 9: Current De-rating

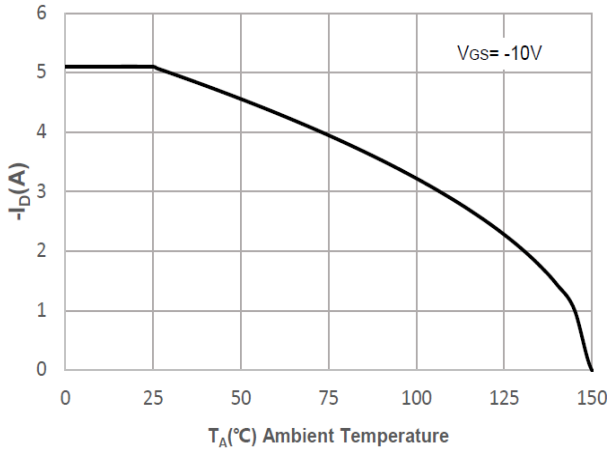


Figure 10: Maximum Safe Operating Area

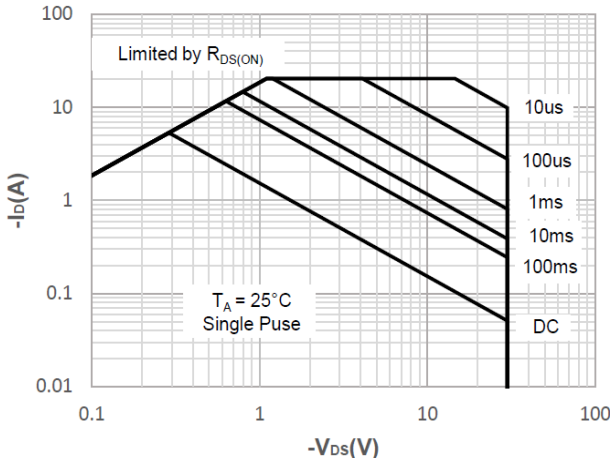


Figure 11: Normalized Maximum Transient Thermal Impedance

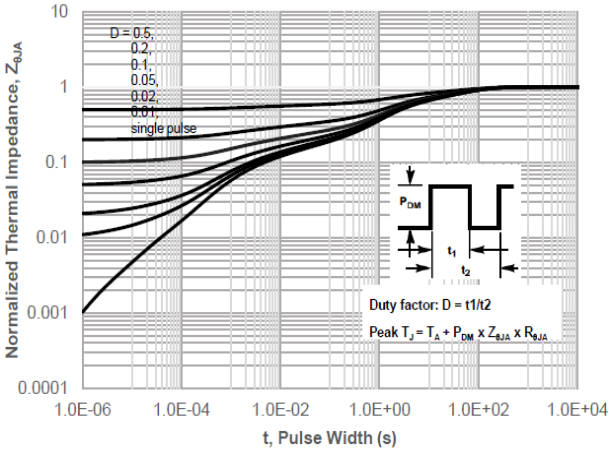
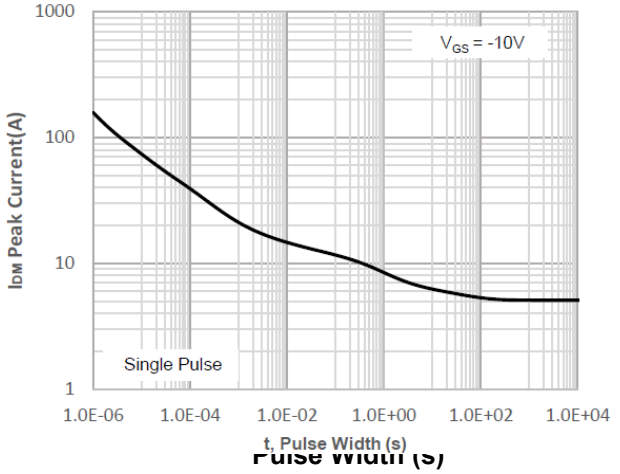


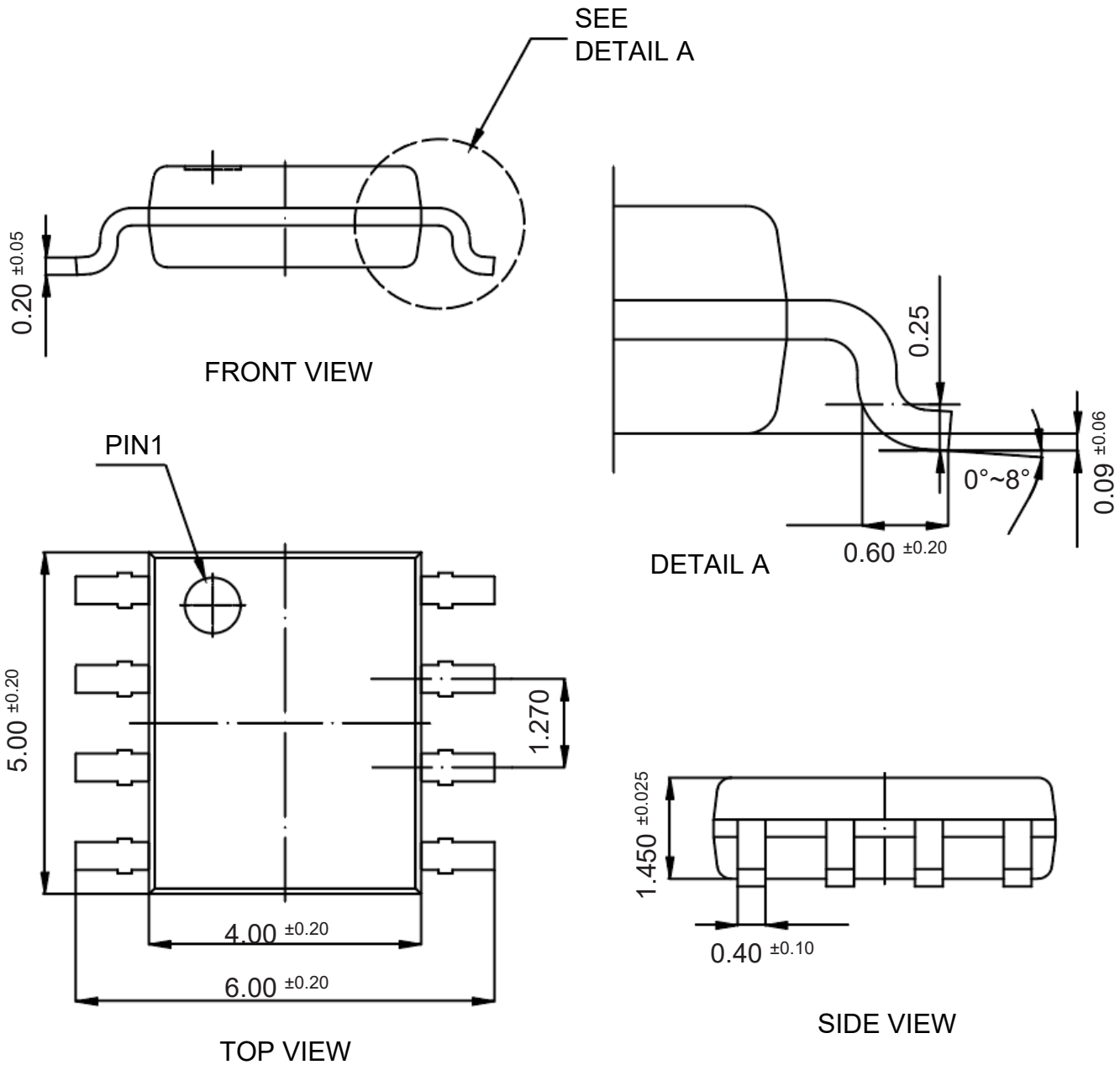
Figure 12: Peak Current Capacity



Package Outline

SOP-8

Dimensions in mm

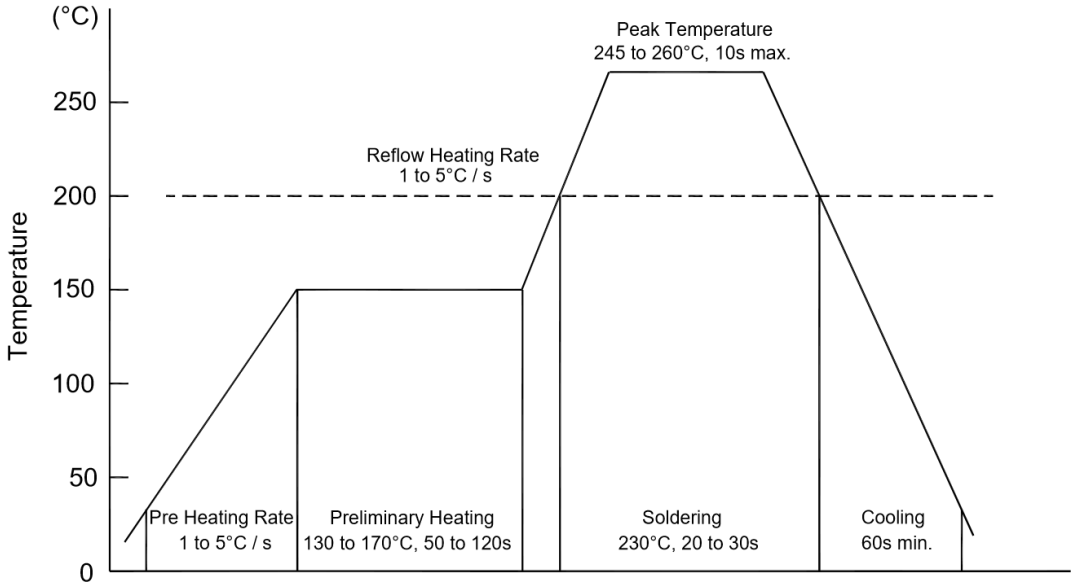


Ordering Information

Device	Package	Shipping
TN05P30JPA	SOP-8	4,000PCS/Reel&13inches

Conditions of Soldering and Storage

◆ Recommended condition of reflow soldering



Recommended peak temperature is over 245 ^{O}C. If peak temperature is below 245 ^{O}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

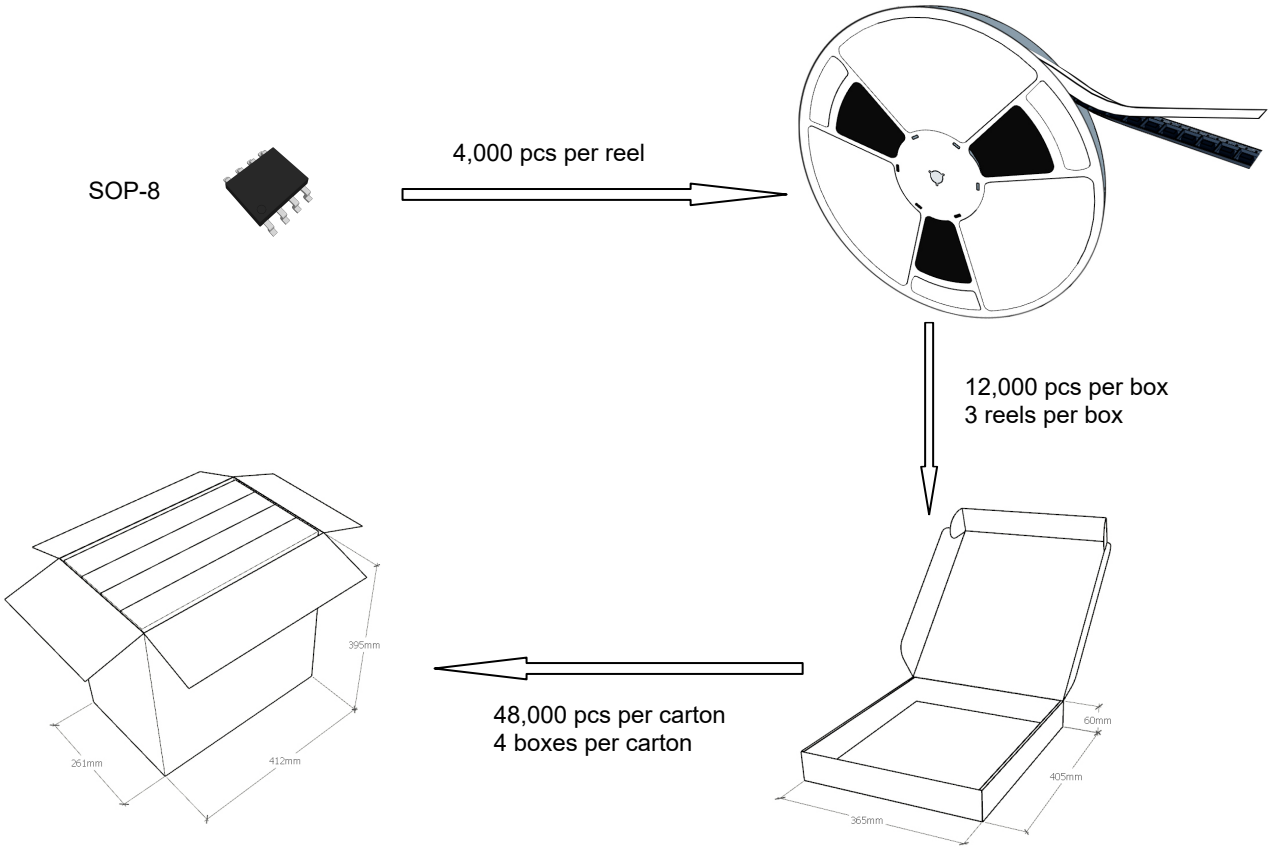
- Temperature: 370 ^{O}C
- Time: 3s max.
- Times: one time

◆ Storage conditions

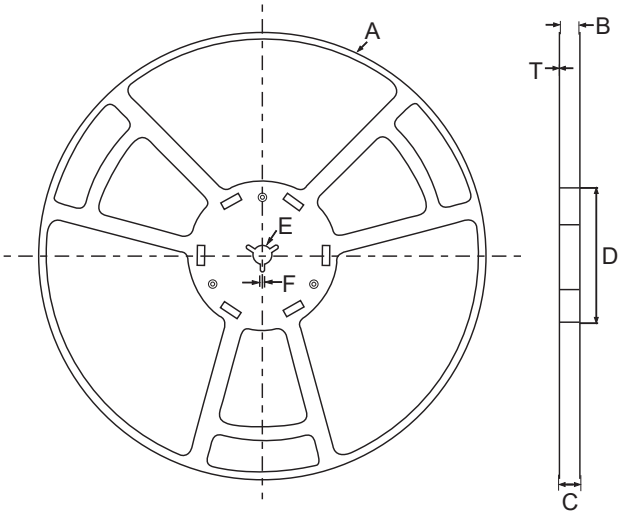
- **Temperature**
  5 to 40 ^{O}C
- **Humidity**
  30 to 80% RH
- **Recommended period**
  One year after manufacturing

Package Specifications

- The method of packaging

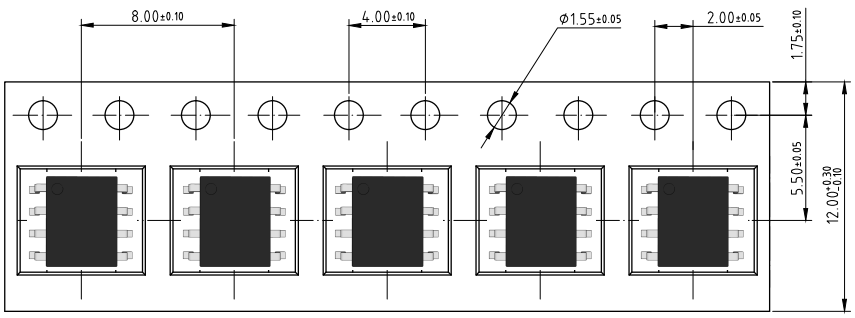


◆ Embossed tape and reel data



Reel (13")

symbol	Value(unit:mm)
A	ϕ330±1
B	12.7±0.5
C	16.5±0.3
D	ϕ99.5±0.5
E	ϕ13.6±0.3
F	2.8±0.3
T	1.9±0.2



Contact Information

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

For additional information, please contact your local Sales Representative.

® is registered trademarks of TANI Corporation.

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.

TANI reserves the right to revise or update the product specification and the products at any time without prior notice, and the user's continued use of the product specification is considered an acceptance of these revisions and updates. Prior to purchasing and using the product, users should verify the above information with TANI to ensure that the prod uct specification is the most current, effective, and complete. If users are particularly concerned about product parameters, please consult TANI in detail or request relevant product test reports. Any data not explicitly mentioned in the product specification shall be subject to separate agreement.

Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.

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.

Users should also comply with relevant laws, regulations, policies, and standards when using the product specification. Users are responsible for the risks and liabilities arising from the use of the product specification and must ensure that it is not used for illegal purposes. Additionally, users should respect the intellectual property rights related to the product specification and refrain from infringing upon any third- party legal rights. TANI shall assume no responsibility for any disputes or controv ersies arising from the above-mentioned issues in any form.