TN60P30TE

P-Channel Enhancement Mode Power MOSFET

Product Summary

- V_{DS}= -30V,I_D= -60A
- $R_{DS(on)}$< 8.2mΩ @V_{GS}= -10V
- $R_{DS(on)}$< 12.5mΩ @V_{GS}= -4.5V

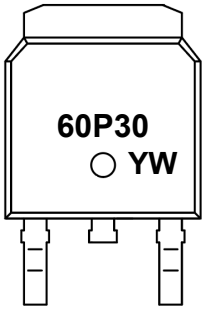
Features

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

Application

- Load Switch
- PWM Application
- Power management

Marking Code



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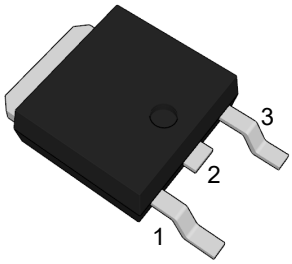
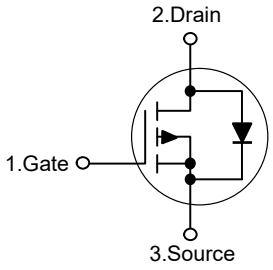


(Top View)

Pin	Description
1	Gate
2	Drain
3	Source

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25℃ case temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$-V_{DS}$	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	$-I_D$	60	A
Drain Current-Pulsed Note1	$-I_{DM}$	200	A
Maximum Power Dissipation	P_D	43.1	W
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	2.9	°C/W

Electrical Characteristics

(T_J=25℃ unless otherwise specified)

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-30	-	-	V
Gate-body Leakage current		I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T_J=25°C	I_{DSS}	V_{DS} = -30V, V_{GS} = 0V	-	-	-1	μA
	T_J=100°C			-	-	-100	
Gate-Threshold Voltage		$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-1	-1.5	-2.5	V
Drain-Source on-Resistance[4]		$R_{DS(on)}$	V_{GS} = -10V, I_D = -15A	-	7.5	14	mΩ
			V_{GS} = -4.5V, I_D = -10A	-	10.5	22	
Forward Transconductance[4]		g_{fs}	V_{DS} = -10V, I_D = -15A	-	44	-	S
Dynamic Characteristics[5]							
Input Capacitance		C_{iss}	V_{DS} = -15V, V_{GS} =0V, f =1MHz	-	2503	-	pF
Output Capacitance		C_{oss}		-	315	-	
Reverse Transfer Capacitance		C_{rss}		-	279	-	
Gate Resistance		R_g	f =1MHz	-	10.5	-	Ω
Switching Characteristics[5]							
Total Gate Charge		Q_g	V_{GS} = -10V, V_{DS} = -15V, I_D= -15A	-	30	-	nC
Gate-Source Charge		Q_{gs}		-	5	-	
Gate-Drain Charge		Q_{gd}		-	7.5	-	
Turn-on Delay Time		$t_{d(on)}$	V_{GS} =-10V, V_{DD}= -15V, R_G = 2.5Ω, I_D= -15A	-	14.1	-	ns
Rise Time		t_r		-	20	-	
Turn-off Delay Time		$t_{d(off)}$		-	94	-	
Fall Time		t_f		-	65	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage[4]		V_{SD}	I_S = -1A, V_{GS} = 0V	-	-	-1.2	V
Continuous Source Current	T_C=25°C	I_S	-	-	-	-60	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.

2. The EAS data shows Max. rating . The test condition is V_{DD}= -25V, L=0.1mH, I_{AS}= -40A.

Typical Characteristic Curves

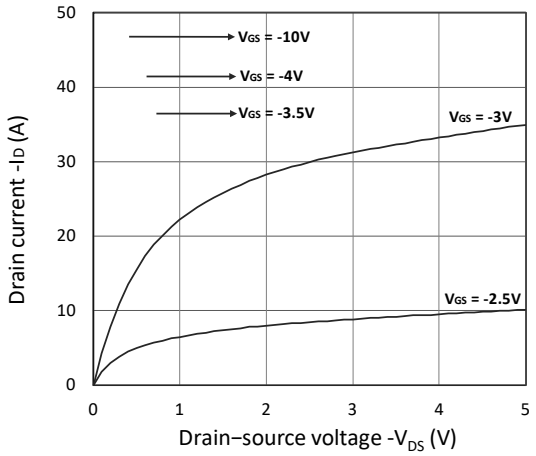


Figure 1. Output Characteristics

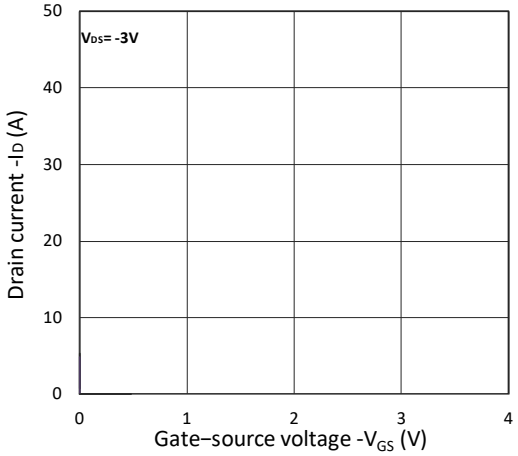


Figure 2. Transfer Characteristics

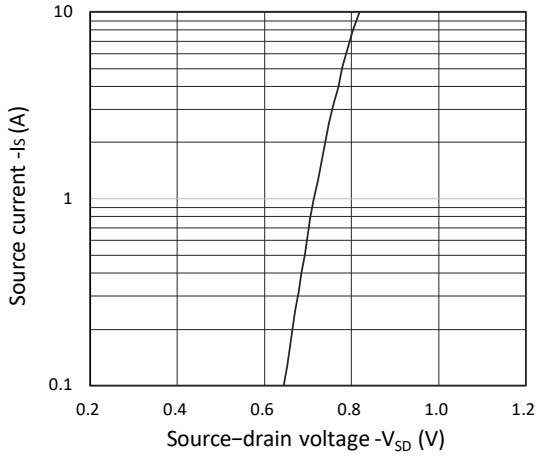


Figure 3. Forward Characteristics of Reverse

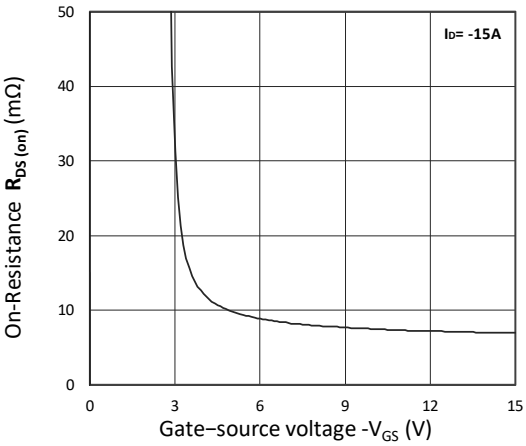


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

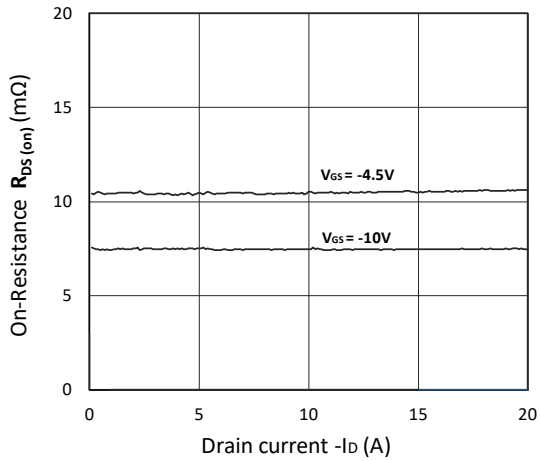


Figure 5. $R_{DS(ON)}$ vs. I_D

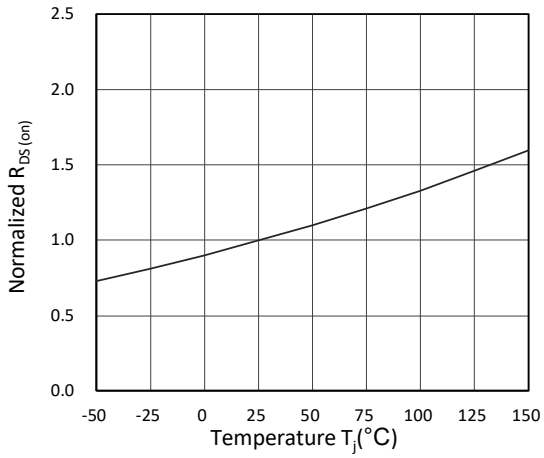


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

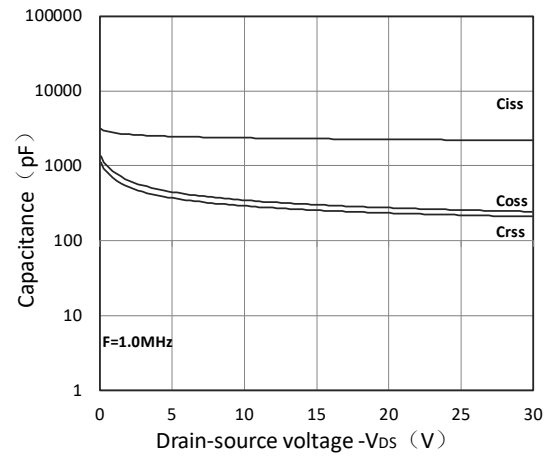


Figure 7. Capacitance Characteristics

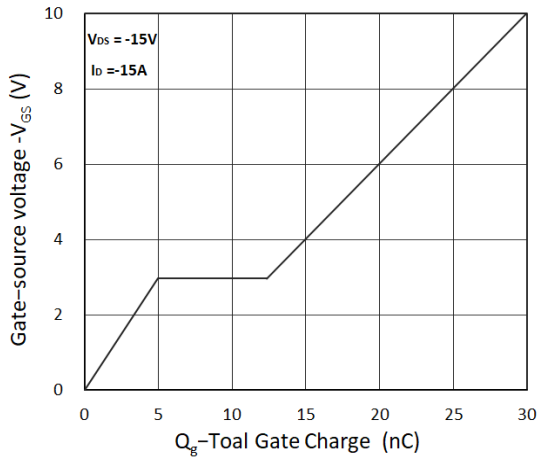


Figure 8. Gate Charge Characteristics

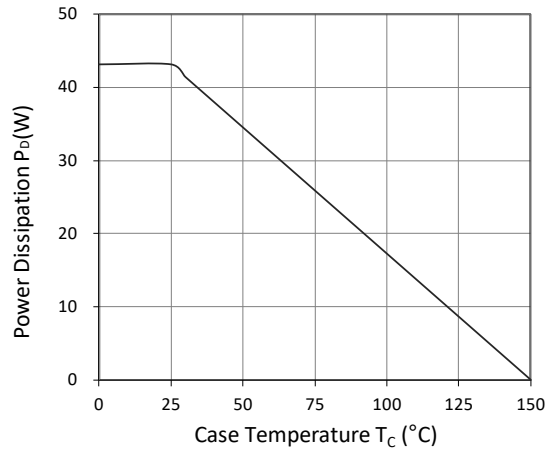


Figure 9. Power Dissipation

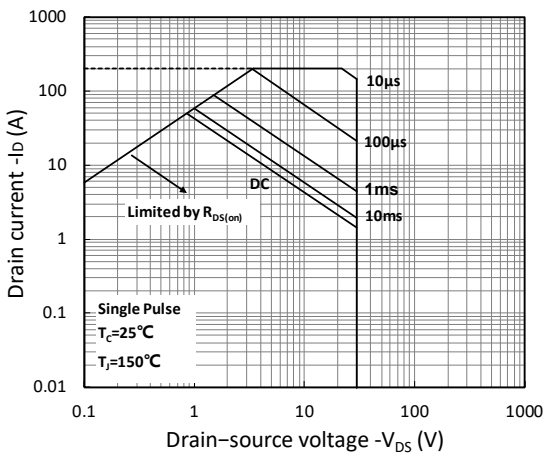


Figure10. Safe Operating Area

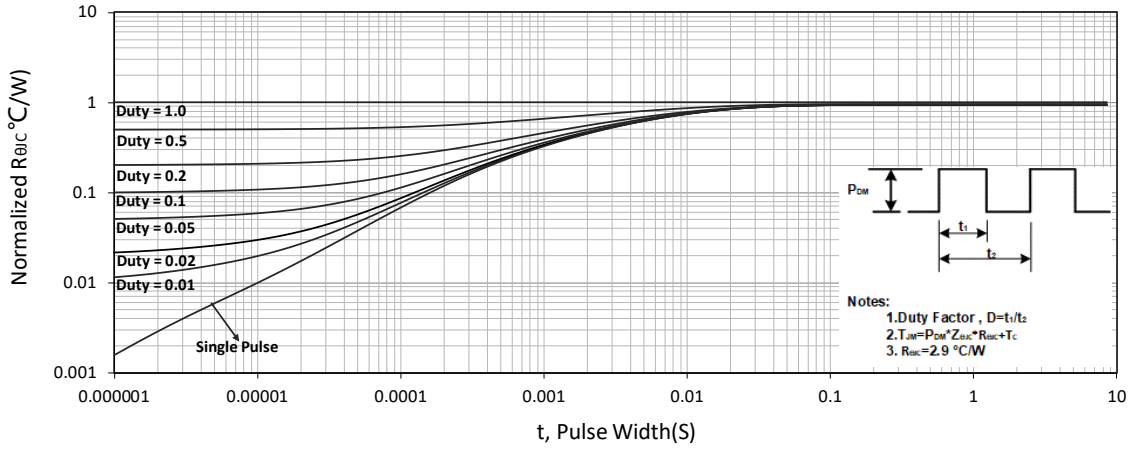
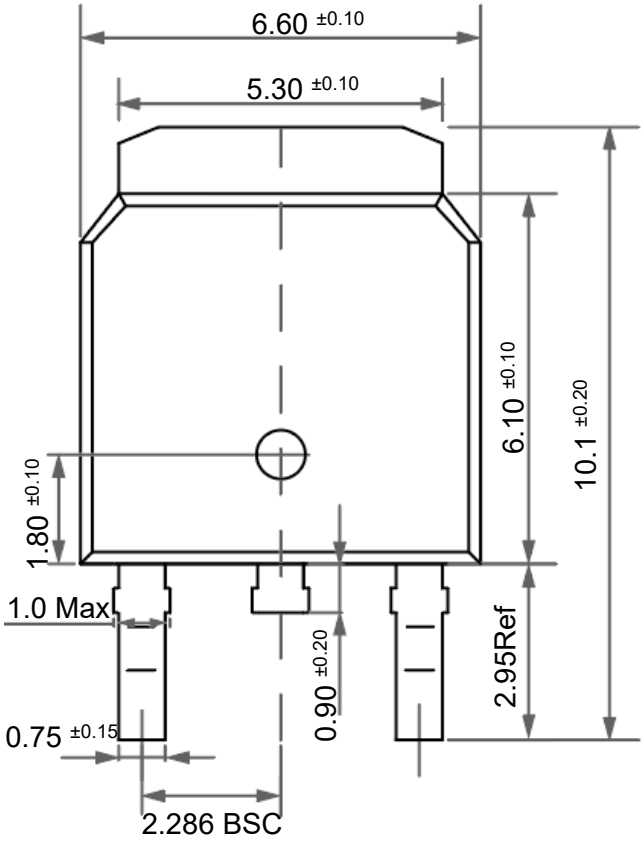


Figure 11. Normalized Maximum Transient Thermal Impedance

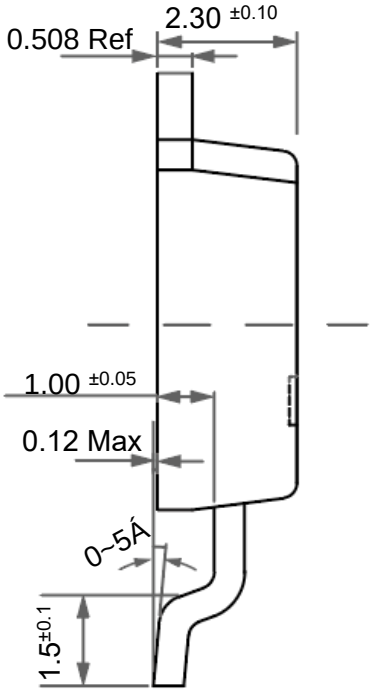
Package Outline

TO-252

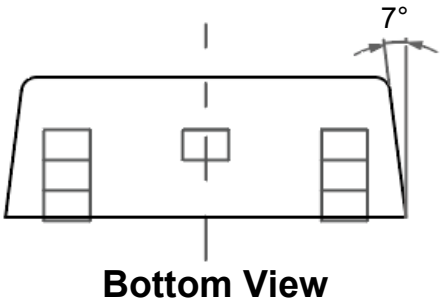
Dimensions in mm



Front View



Side View



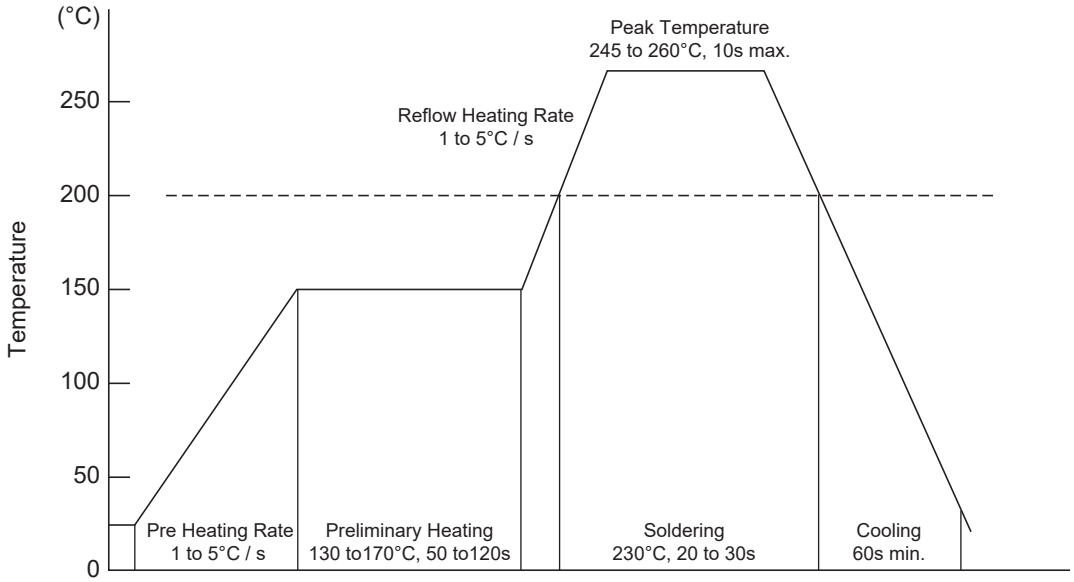
Bottom View

Ordering Information

Device	Package	Shipping
TN60P30TE	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

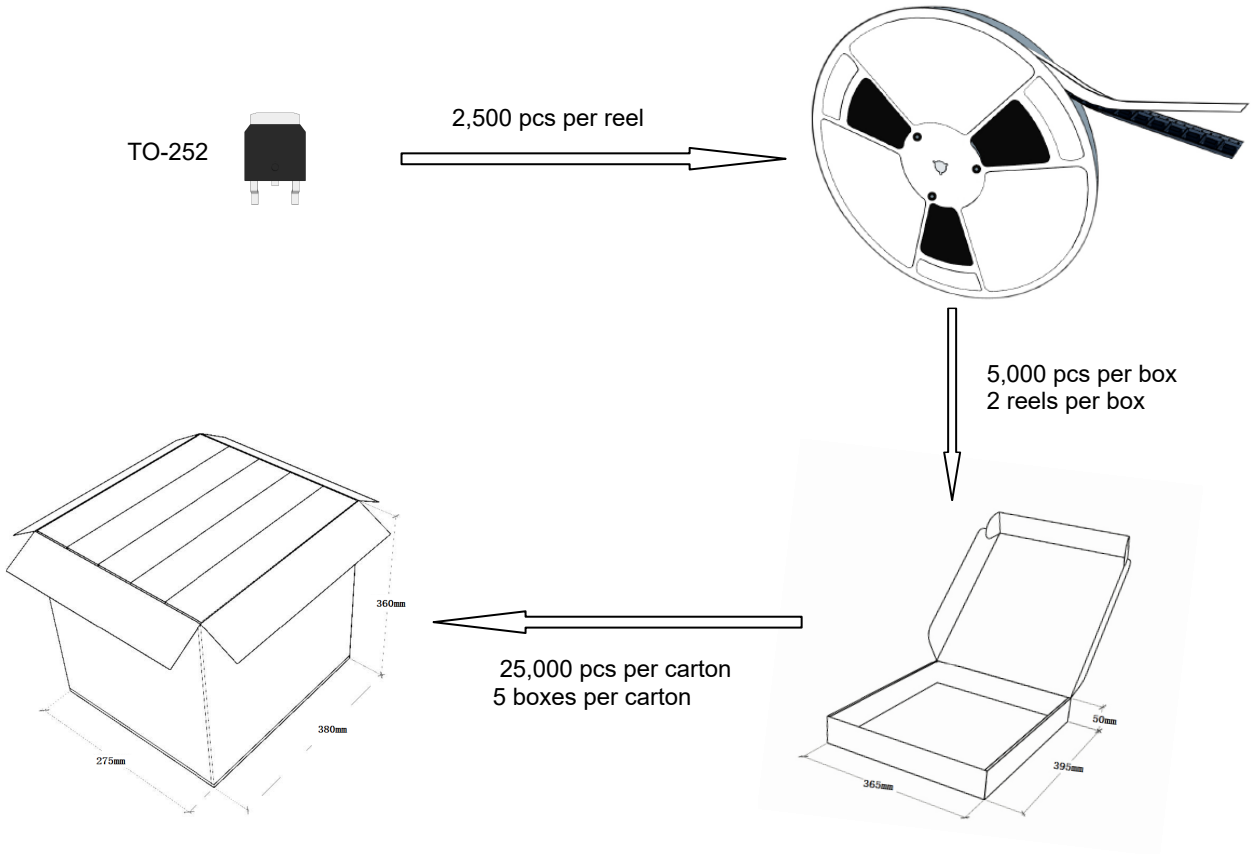
- Temperature: 300°C
- Time: 3s max.
- Times: one time

◆ Storage conditions

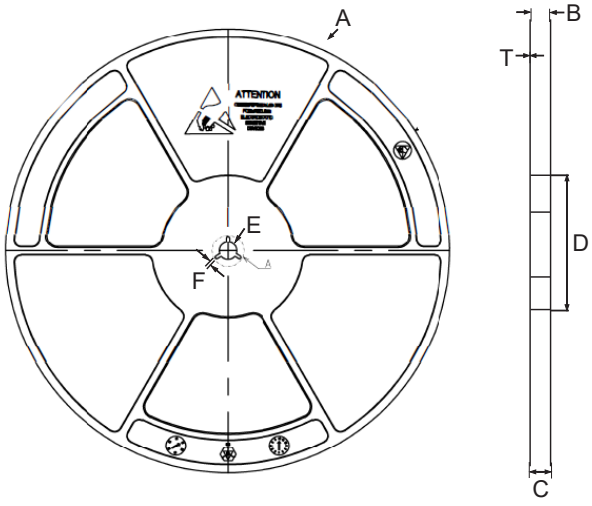
- **Temperature**
  5 to 40°C
- **Humidity**
  30 to 80% RH
- **Recommended period**
  One year after manufacturing

Package Specifications

- The method of packaging



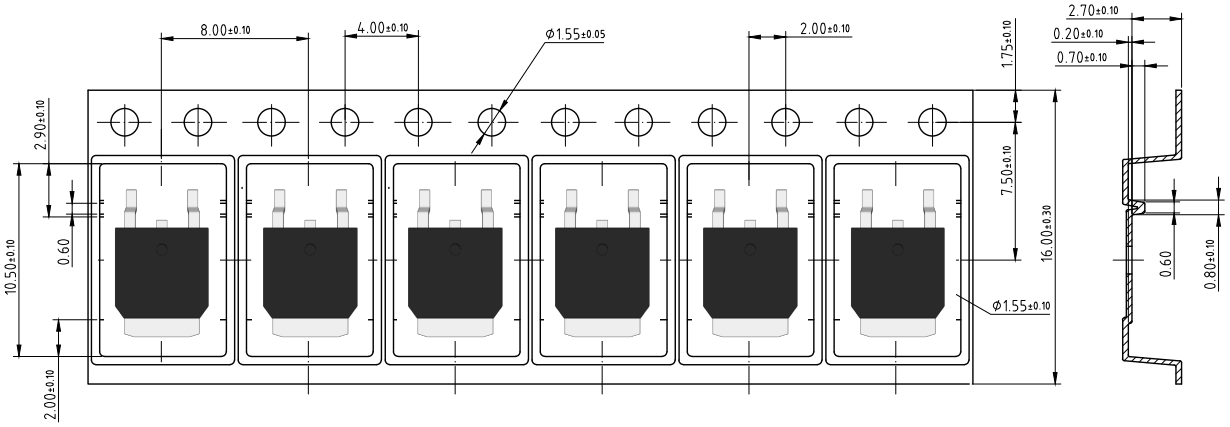
◆ **reel data**



Reel (13")

Symbol	Value(unit:mm)
A	Φ330.2±1
B	17±0.5
C	21.2±2
D	Φ100±0.5
E	Φ13.4±0.2
F	2.3±0.2
T	2.1±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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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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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.

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