

TN07P40SA

P-Channel Enhancement Mode Power MOSFET

Product Summary

- $V_{DS} = -40V, I_D = -7A$
- $R_{DS(on)} < 42m\Omega @ V_{GS} = -10V$
- $R_{DS(on)} < 58m\Omega @ V_{GS} = -4.5V$

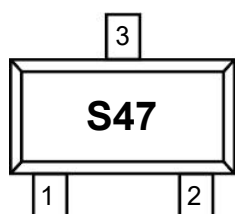
Features

- Advanced Trench Technology
- RoHS and Reach Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 1

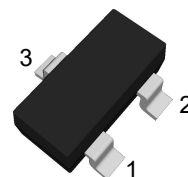
Application

- Load Switch
- PWM Application
- Power Management

Marking Code



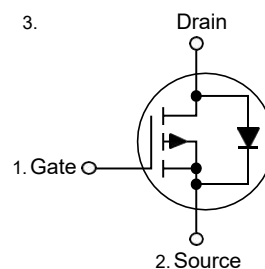
SOT-23



(Top View)

Pin	Description
1	Gate
2	Source
3	Drain

Schematic Diagram



Absolute Maximum Ratings

(Ta=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$-V_{DS}$	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	$-I_D$	7	A
Drain Current-Pulsed ^{Note1}	$-I_{DM}$	20	A
Maximum Power Dissipation	P_D	1.2	W
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance, Junction-to-Ambient ^{Note2}	$R_{\theta JA}$	104	°C/W
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Electrical Characteristics

(T_J=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 =-250μA	40	--	--	V
Zero Gate Voltage Drain Current	-I _{DSS}	V _{DS} =-40V,V _{GS} =0V	--	--	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V,V _{DS} =0V	--	--	±100	nA
Gate Threshold Voltage ^{Note3}	-V _{GS(th)}	V _{DS} =V _{GS} ,I _D =-250μA	1	1.6	2.5	V
Drain-Source On-Resistance ^{Note3}	R _{DS(on)}	V _{GS} =-10V,I _D =-3A	--	30	42	mΩ
		V _{GS} =-4.5V,I _D =-2A	--	46	58	mΩ
Forward Transconductance ^{Note3}	g _{FS}	V _{DS} =-5V,I _D =-1A	--	4.5	--	S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =-20V,V _{GS} =0V,f=1MHz	--	668	--	pF
Output Capacitance	C _{oss}		--	98	--	pF
Reverse Transfer Capacitance	C _{rss}		--	72	--	pF
Gate Resistance	R _G	V _{DS} =0V,V _{GS} =0V,f=1MHz	--	10.8	--	Ω
Total Gate Charge	Q _g	V _{DS} =-20V,I _D =-3A,V _{GS} =-10V	--	10	--	nC
Gate-Source Charge	Q _{gs}		--	2	--	nC
Gate-Drain Charge	Q _{gd}		--	1.6	--	nC
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =-20V, I _D =-5A, V _{GS} =-10V,R _{GEN} =2.4Ω	--	8.7	--	nS
Turn-on Rise Time	t _r		--	7	--	nS
Turn-off Delay Time	t _{d(off)}		--	31	--	nS
Turn-off Fall Time	t _f		--	17	--	nS
Source-Drain Diode Characteristics						
Diode Forward Voltage ^{Note3}	-V _{SD}	V _{GS} =0V,I _S =-5A	--	--	1.0	V
Diode Forward Current ^{Note2}	-I _S		--	--	2	A

Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse width≤300μs, duty cycle≤2%.

Typical Characteristic Curves

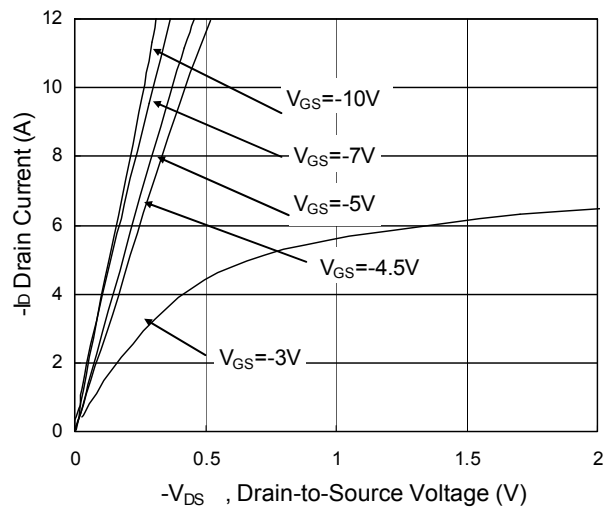


Fig.1 Typical Output Characteristics

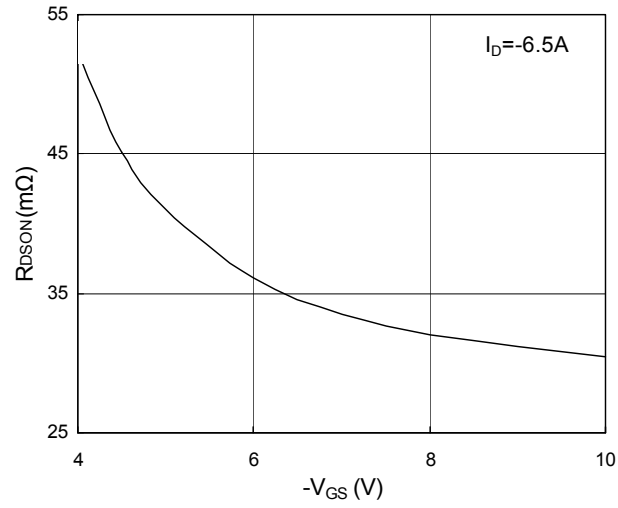


Fig.2 On-Resistance v.s Gate-Source

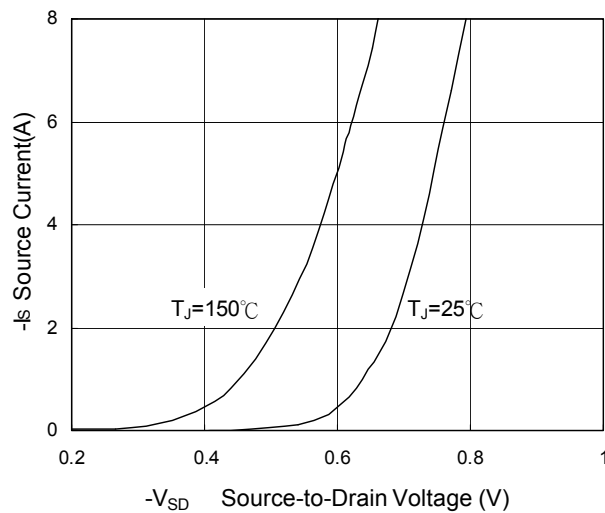


Fig.3 Forward Characteristics Of Reverse

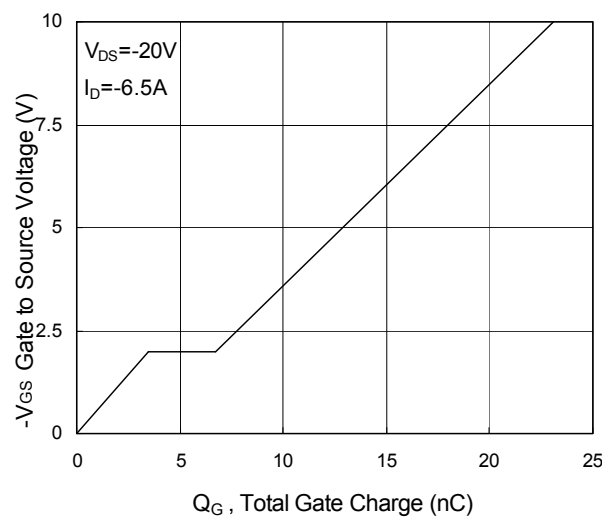


Fig.4 Gate Charge Characteristics

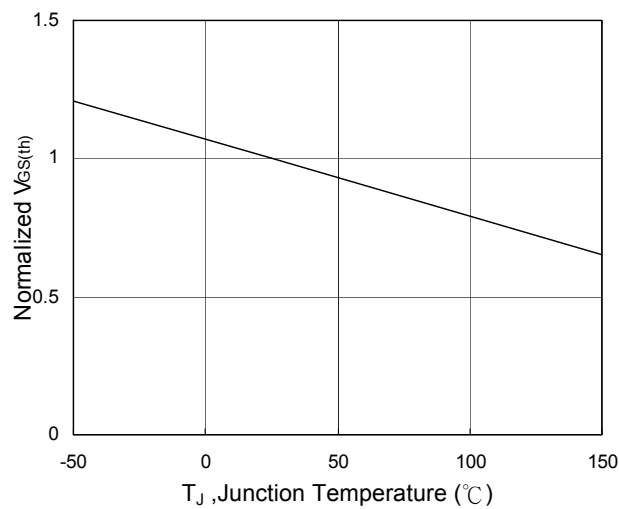


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

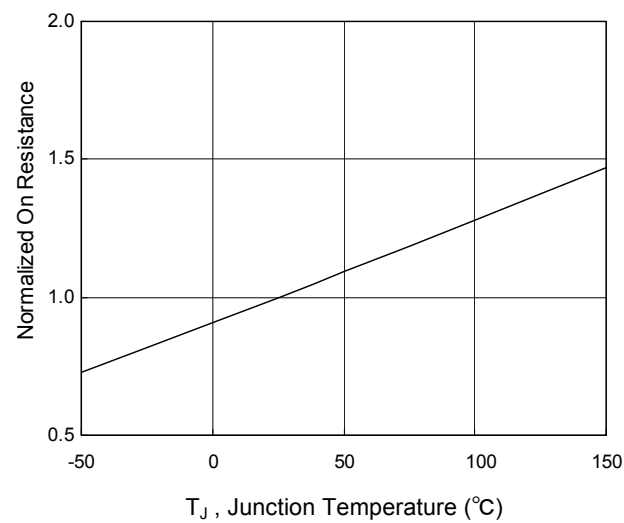


Fig.6 Normalized $R_{DS(on)}$ v.s T_J

Typical Characteristic Curves

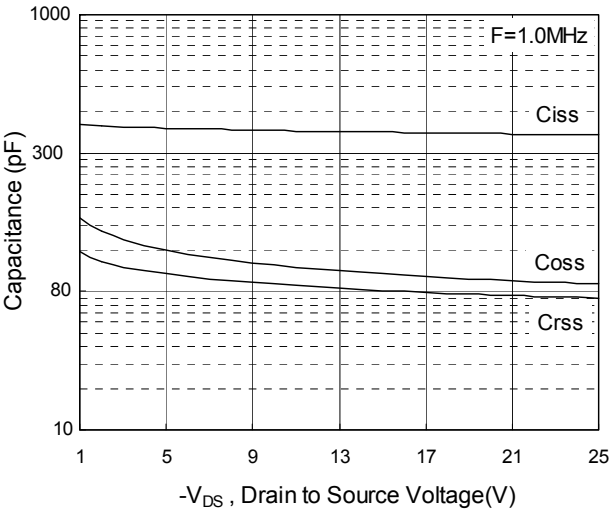


Fig.7 Capacitance

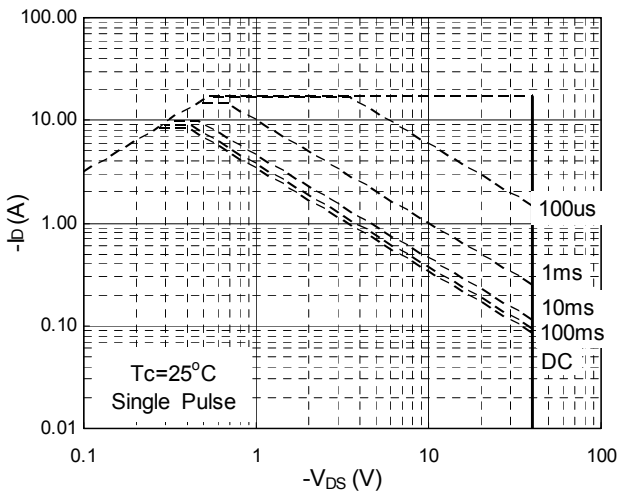


Fig.8 Safe Operating Area

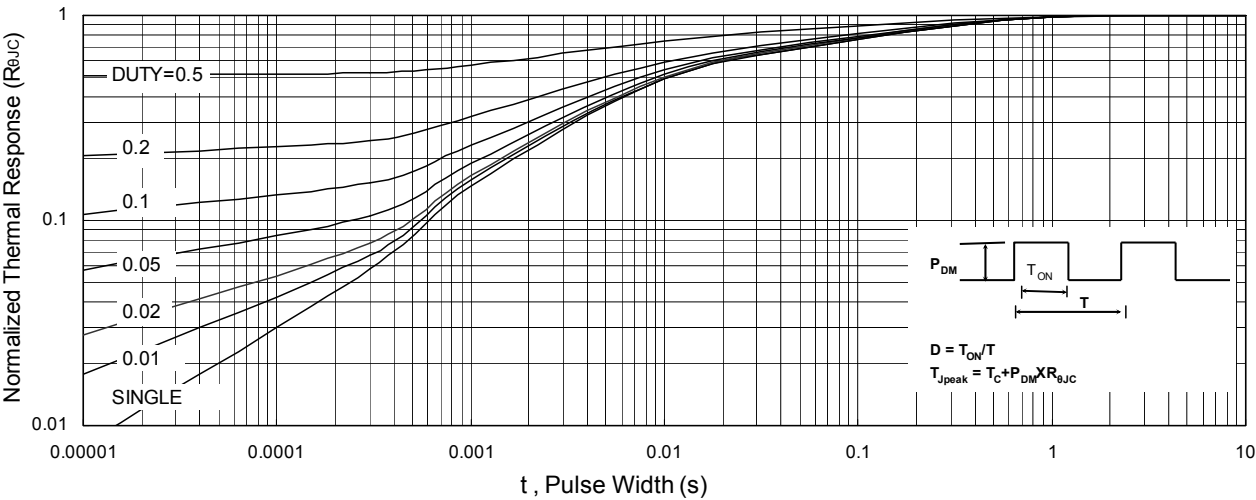


Fig.9 Normalized Maximum Transient Thermal Impedance

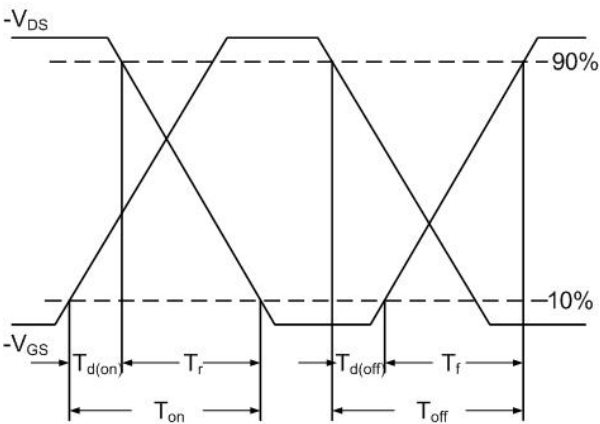


Fig.10 Switching Time Waveform

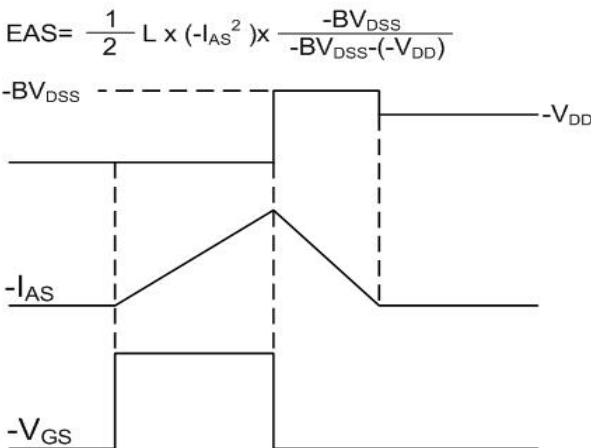
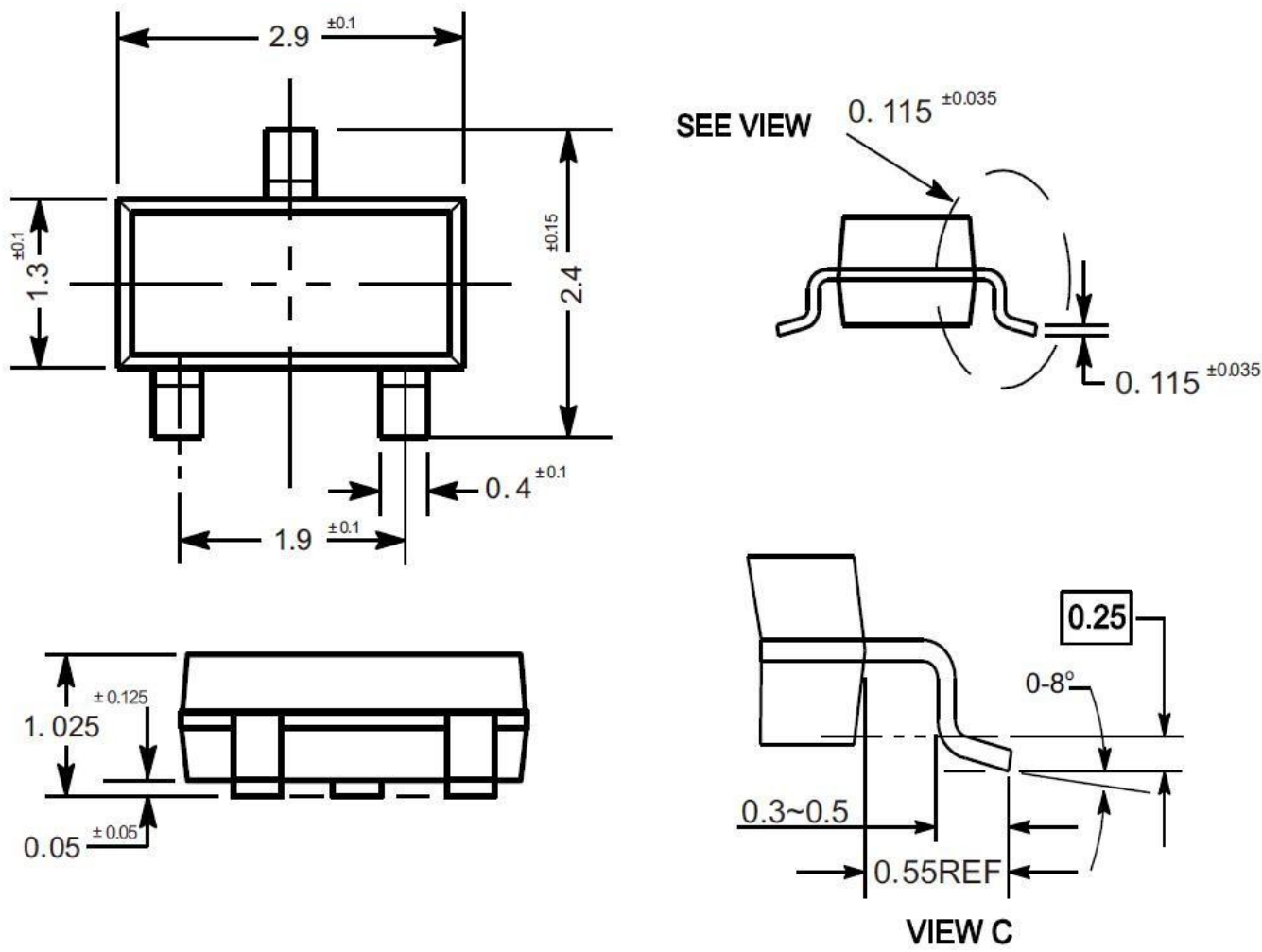


Fig.11 Unclamped Inductive Waveform

Package Outline

SOT-23

Dimensions in mm

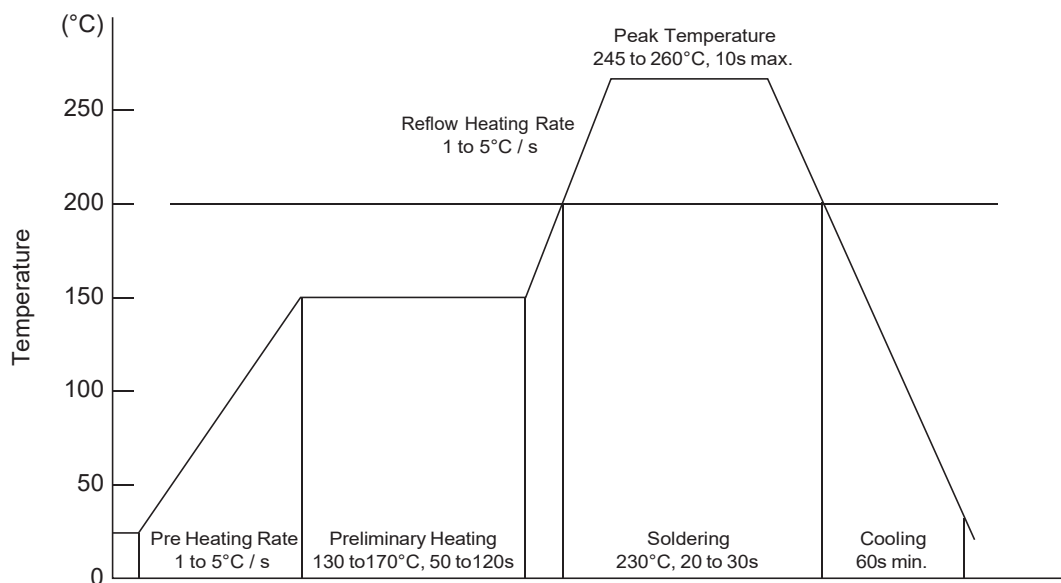


Ordering Information

Device	Package	Shipping
TN07P40SA	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: 300°C
- Time: 3s max.
- Times: one time

◆ Storage conditions

● Temperature

5 to 40°C

● Humidity

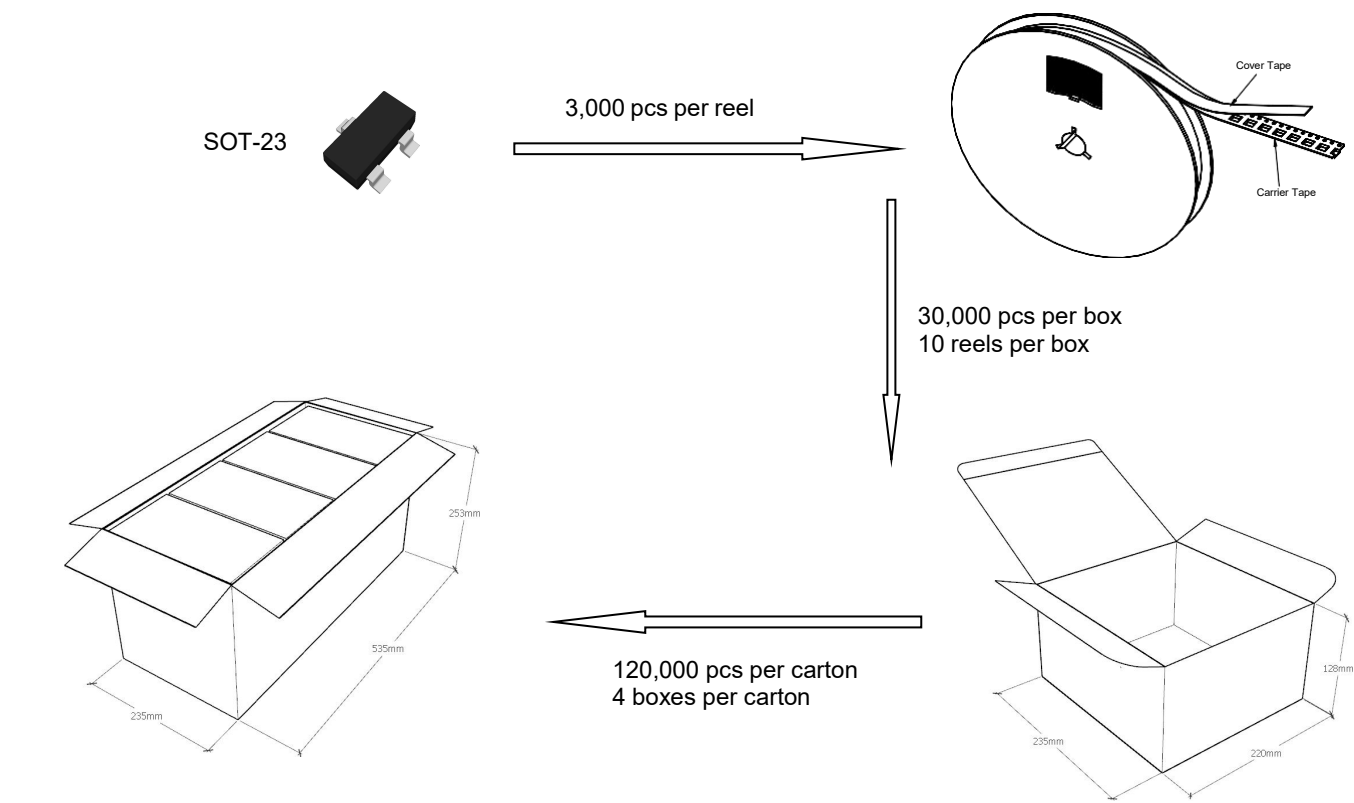
30 to 80% RH

● Recommended period

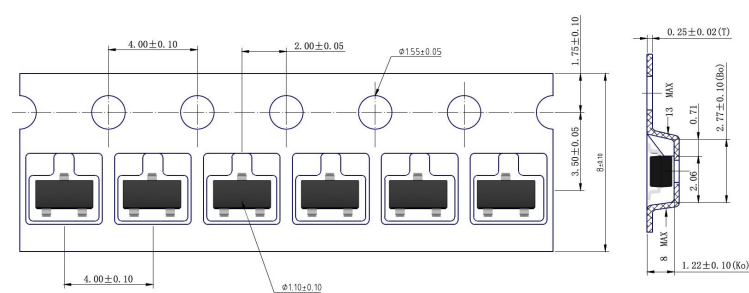
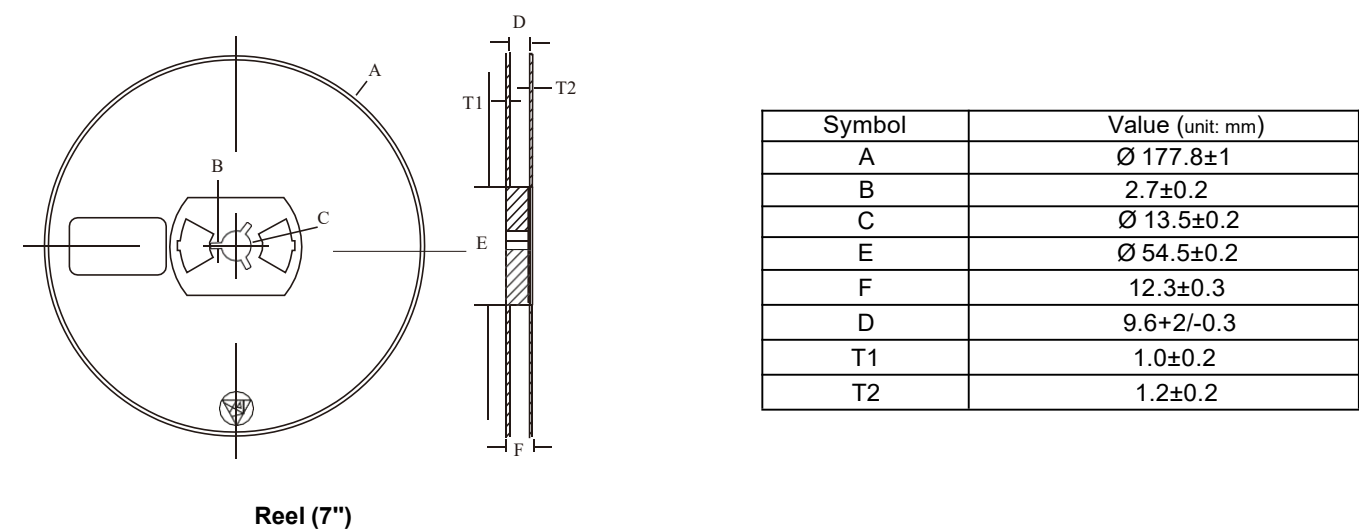
One year after manufacturing

Package Specifications

- The method of packaging



◆ 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.

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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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