

TN9928NPA

Dual N-Channel Enhancement Mode Power MOSFET

SOP-8

Product Summary

- $V_{DS} = 20V, I_D = 10.5A$
- $R_{DS(on)} < 18m\Omega @ V_{GS} = 4.5V$
- $R_{DS(on)} < 20m\Omega @ V_{GS} = 2.5V$

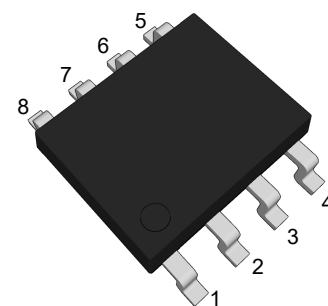
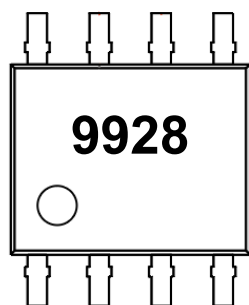
Features

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

Application

- Battery Protection
- Load Switch
- Wireless Charging

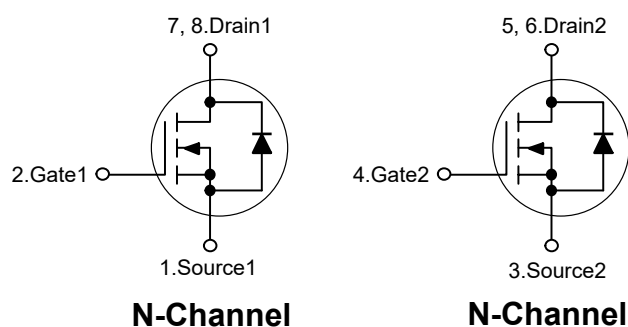
Marking Code



(Top View)

Pin	Description	Pin	Description
1	Source1	4	Gate2
2	Gate1	5,6	Drain2
3	Source2	7,8	Drain1

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current-Continuous	I_D	10.5	A
Drain Current-Pulsed ^{Note1}	I_{DM}	30	A
Maximum Power Dissipation	P_D	2	W
Single Pulse Avalanche Energy ^{Note2}	E_{AS}	16	mJ
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance, Junction-to-Ambient ^{Note3}	$R_{\theta JA}$	62.5	°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	20	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V	--	--	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±12V, V _{DS} =0V	--	--	±100	nA
Gate Threshold Voltage ^{Note4}	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.4	0.65	1.2	V
Drain-Source On-Resistance ^{Note4}	R _{DS(on)}	V _{GS} =4.5V, I _D =8A	--	--	18	mΩ
		V _{GS} =2.5V, I _D =6A	--	--	20	mΩ
Forward Transconductance ^{Note4}	g _{FS}	V _{DS} =5V, I _D =2A	--	8.7	--	S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHz	--	760	--	pF
Output Capacitance	C _{oss}		--	105	--	pF
Reverse Transfer Capacitance	C _{rss}		--	89	--	pF
Total Gate Charge	Q _g	V _{DS} =10V, I _D =3A, V _{GS} =4.5V	--	9	--	nC
Gate-Source Charge	Q _{gs}		--	1.5	--	nC
Gate-Drain Charge	Q _{gd}		--	2.5	--	nC
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =10V, I _D =3A, V _{GS} =4.5V, R _{GEN} =3Ω	--	5	--	nS
Turn-on Rise Time	t _r		--	16	--	nS
Turn-off Delay Time	t _{d(off)}		--	23	--	nS
Turn-off Fall Time	t _f		--	7	--	nS
Source-Drain Diode Characteristics						
Diode Forward Voltage ^{Note4}	V _{SD}	V _{GS} =0V, I _S =10.5A	--	--	1.2	V
Diode Forward Current	I _S		--	--	10.5	A

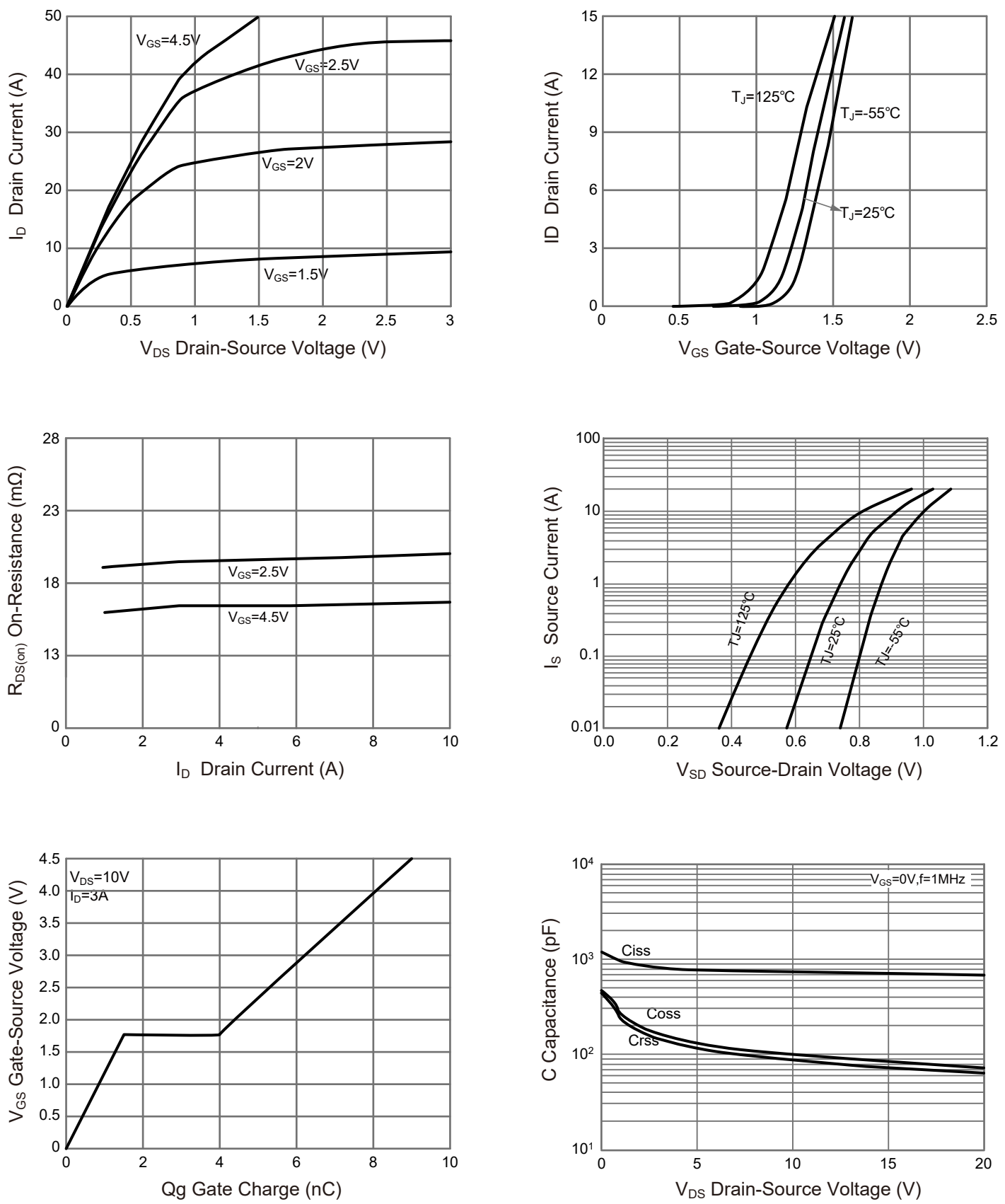
Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

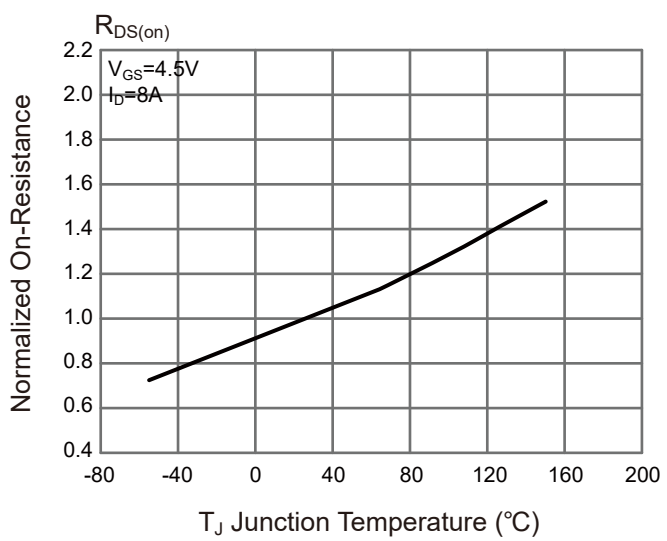
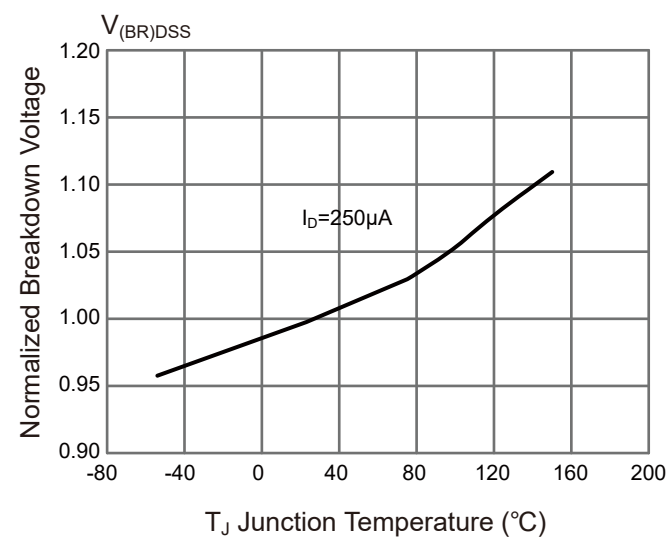
2. EAS Condition: T_J=25°C, V_{DD}=10V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=8A.

3. Surface Mounted on FR4 Board, t ≤ 10 sec.

4. Pulse Test: Pulse width ≤ 300μs, duty cycle ≤ 2%.

Typical Characteristic Curves

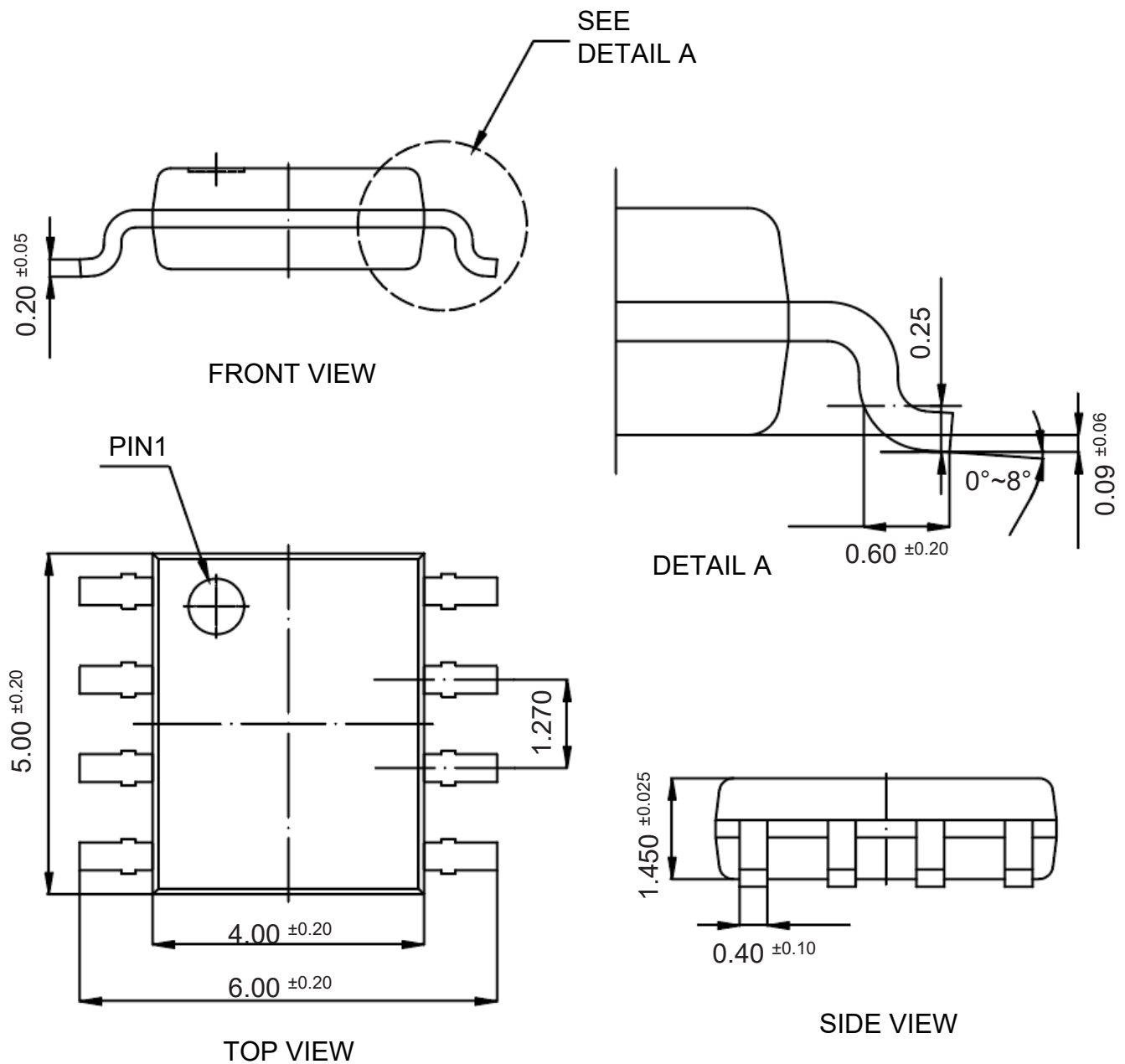




Package Outline

SOP-8

Dimensions in mm

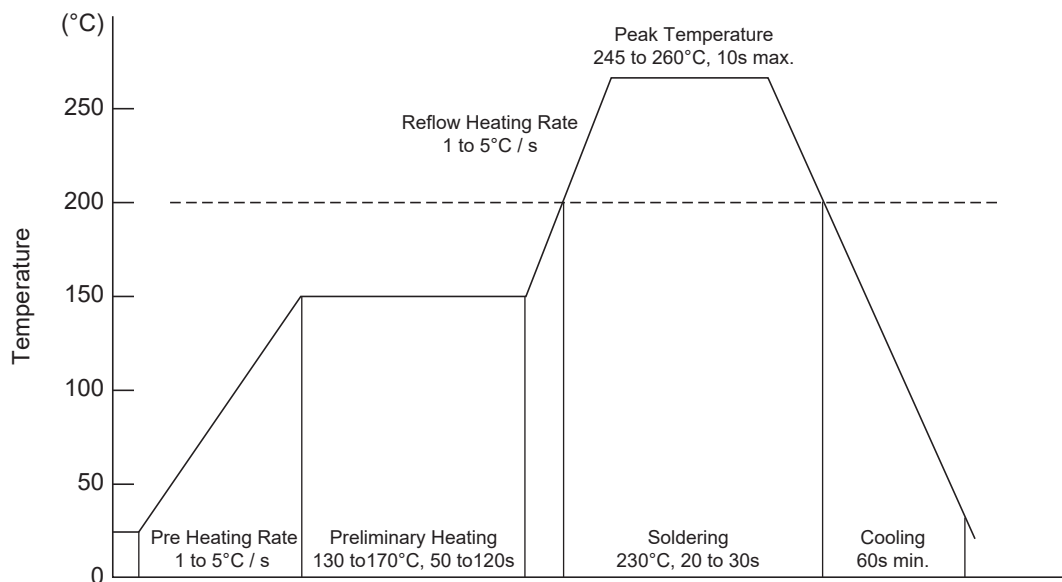


Ordering Information

Device	Package	Shipping
TN9928NPA	SOP-8	4,000PCS/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

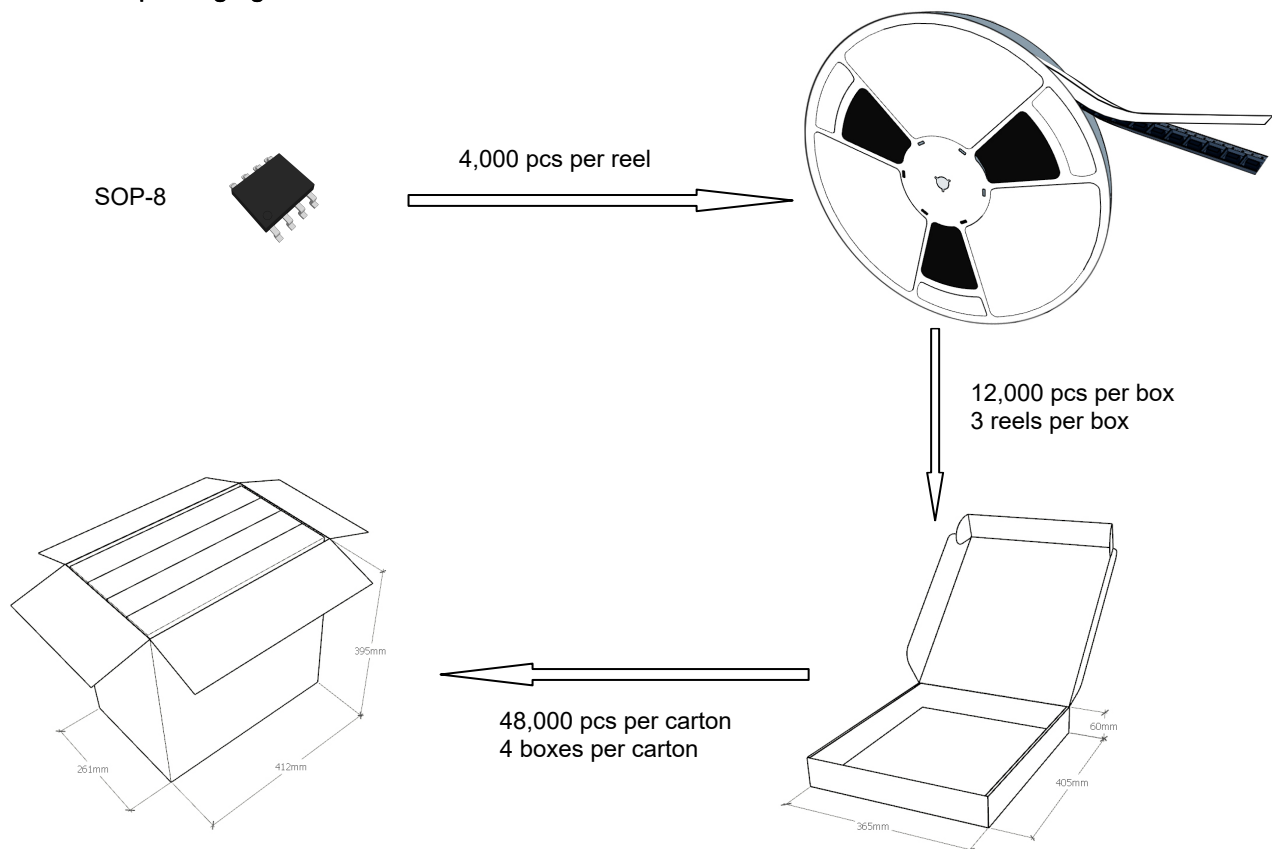
- Temperature: 300°C
- Time: 3s max.
- Times: one time

◆ Storage conditions

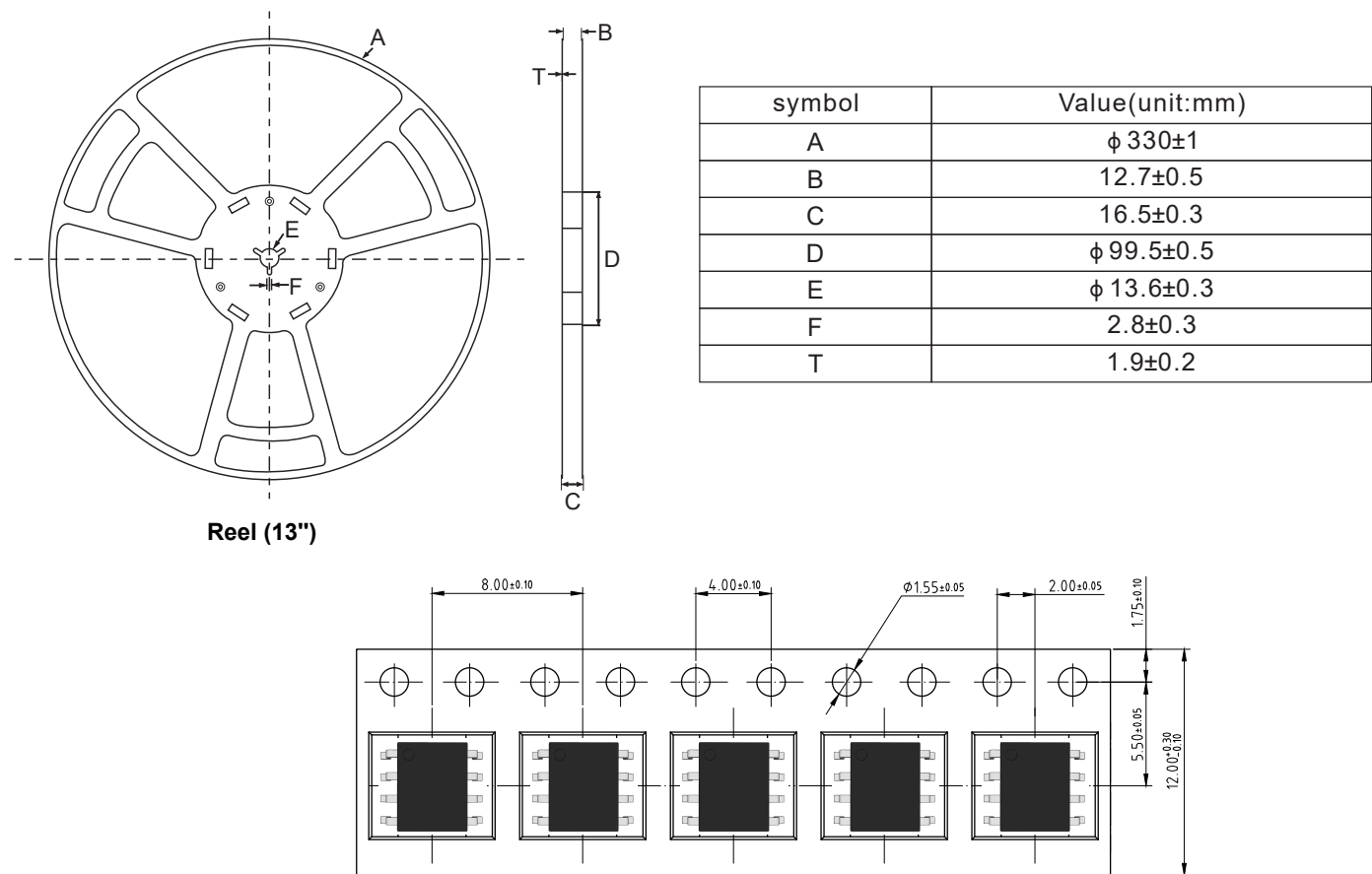
- **Temperature**
5 to 40°C
- **Humidity**
30 to 80% RH
- **Recommended period**
One year after manufacturing

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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