TN10H04PPA

P-Channel Enhancement Mode Power MOSFET

Product Summary

- V_{DS}= -100V,I_D= -5A
- $R_{DS(on)}$< 350mΩ @V_{GS}= -10V
- $R_{DS(on)}$< 400mΩ @V_{GS}= -4.5V

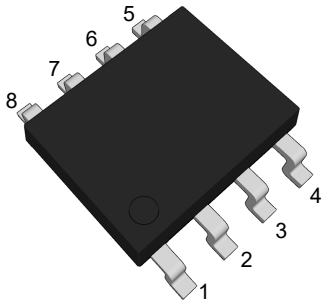
Features

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

Application

- Load Switch
- PWM Applications
- Power Management

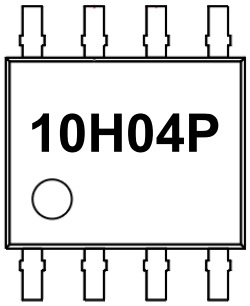
SOP-8



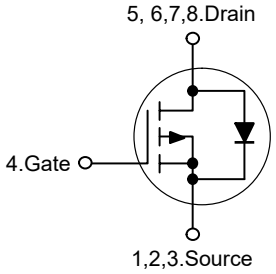
(Top View)

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

Marking Code



Schematic Diagram



Absolute Maximum Ratings

Ratings at 25℃ ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$-V_{DS}$	100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	$-I_D$	5	A
Drain Current-Pulsed Note1	$-I_{DM}$	26.8	A
Maximum Power Dissipation	P_D	40	W
Single Pulse Avalanche Energy Note2	E_{AS}	109	mJ
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance Junction-Case1 Note1	$R_{\theta JC}$	3.7	°C/W

Electrical Characteristics

(Ta=25℃ unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-100	---	---	V
△BV_{DSS}/△T_J	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	---	---	V/ ℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-10V , I_D=-15A	---	254	350	mΩ
		V_{GS}=-4.5V , I_D=-10A	---	290	400	
		V_{GS}=-2.5V , I_D=-5A	---	---	---	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-1	-1.7	-2.5	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	---	---	mV/ ℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-100V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-100V, V_{GS}=0V , T_J=100℃	---	---	-100	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=-10V , I_D=-4A	---	10	---	S
Q_g	Total Gate Charge	V_{DS}=-50V , V_{GS}=-10V , I_D=-3A	---	19.6	---	nC
Q_{gs}	Gate-Source Charge		---	6	---	
Q_{gd}	Gate-Drain Charge		---	4.2	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=-50V , V_{GS}=-10V , R_G=3Ω	---	13.5	---	ns
T_r	Rise Time		---	3.8	---	
$T_{d(off)}$	Turn-Off Delay Time		---	42	---	
T_f	Fall Time		---	6.4	---	
C_{iss}	Input Capacitance	V_{DS}=-50V , V_{GS}=0V , f=1MHz	---	1199	---	pF
C_{oss}	Output Capacitance		---	33.8	---	
C_{rss}	Reverse Transfer Capacitance		---	28.2	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	---	---	-5	A
I_{SM}	Pulsed Source Current[2,4]		---	---	-20	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-1.2	V
t_{rr}	Reverse Recovery Time	IF=-3A , di/dt=100A/μs , T_J=25℃	---	42.9	---	nS
Q_{rr}	Reverse Recovery Charge		---	83.7	---	nC

Note :

1.The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The EAS data shows Max. rating . The test condition is TJ = 25°C,VDD=-50V,VG=-10V, Rg=25Ω, L=0.5mH.

4.The power dissipation is limited by 150℃ junction temperature

5.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristic Curves

Figure 1. Output Characteristics

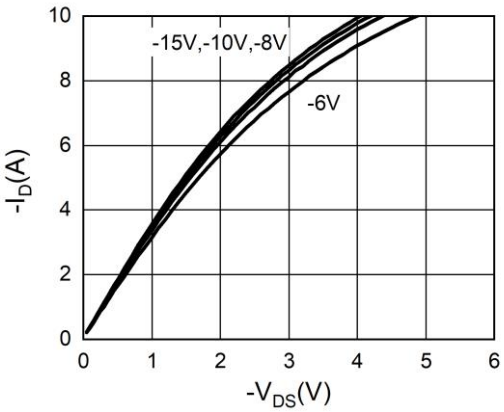


Figure 2. Transfer Characteristics

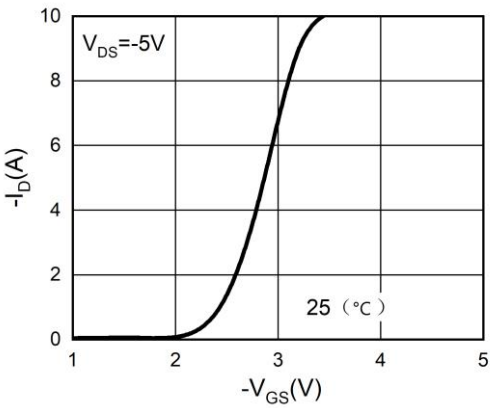


Figure 3. Power Dissipation

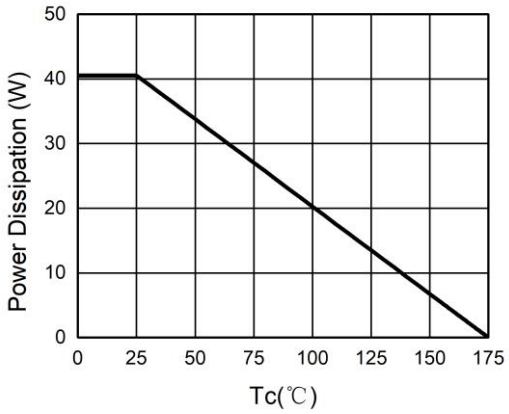


Figure 4. Drain Current

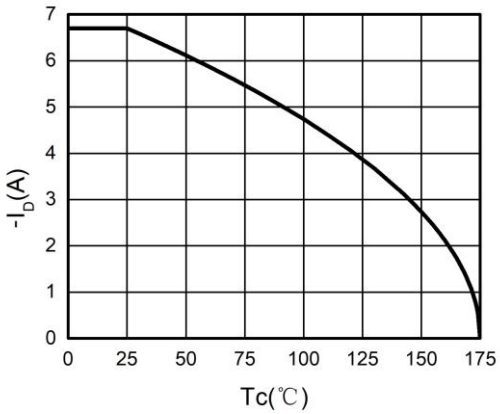


Figure 5. BV_{DSS} vs Junction Temperature

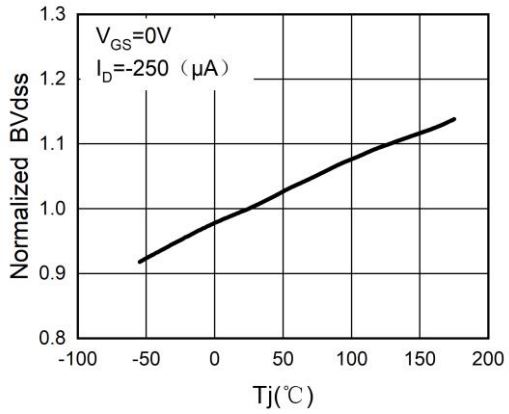
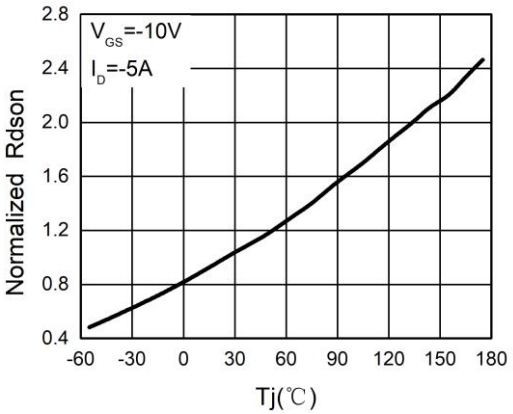


Figure 6. $R_{DS(ON)}$ vs Junction Temperature



Typical Characteristic Curves

Figure 7. Gate Charge Waveforms

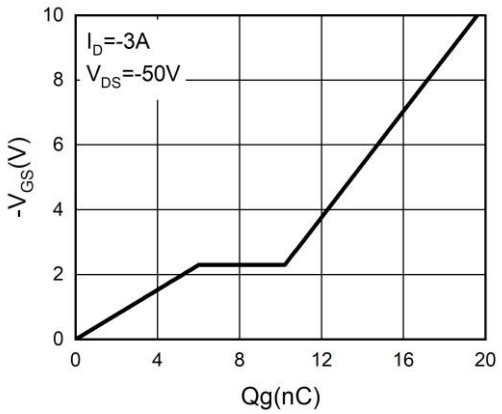


Figure 8. Capacitance

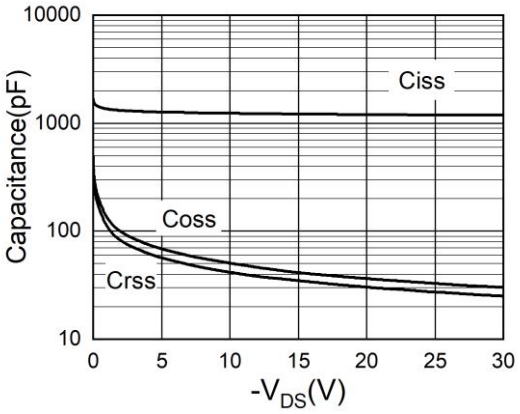


Figure 9. Body-Diode Characteristics

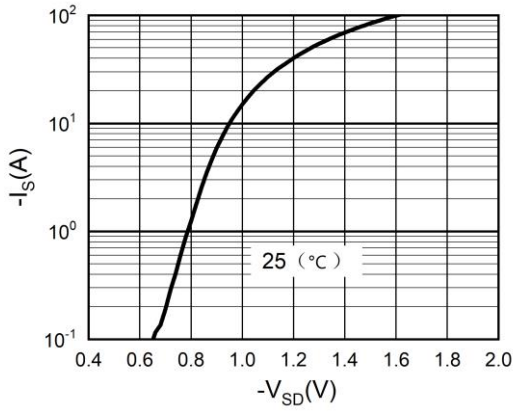
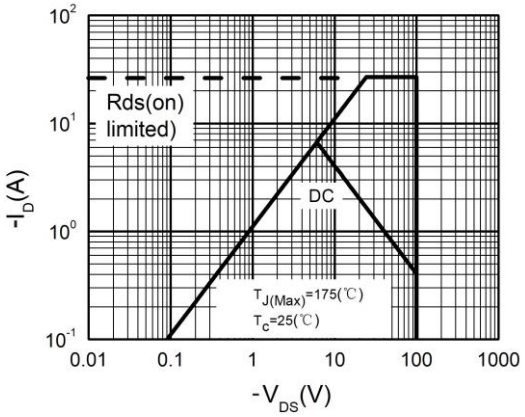


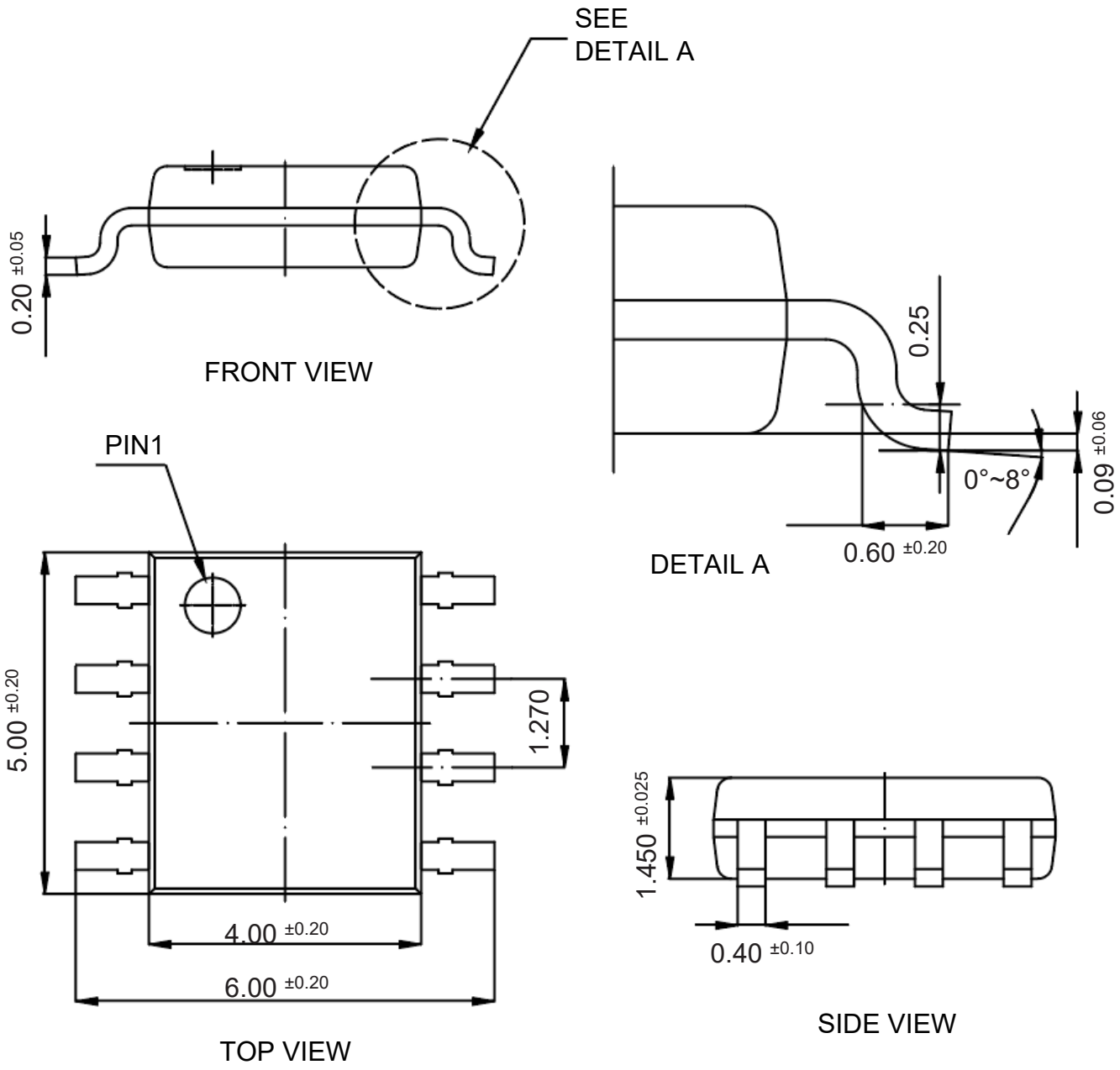
Figure 10. Maximum Safe Operating Area



Package Outline

SOP-8

Dimensions in mm

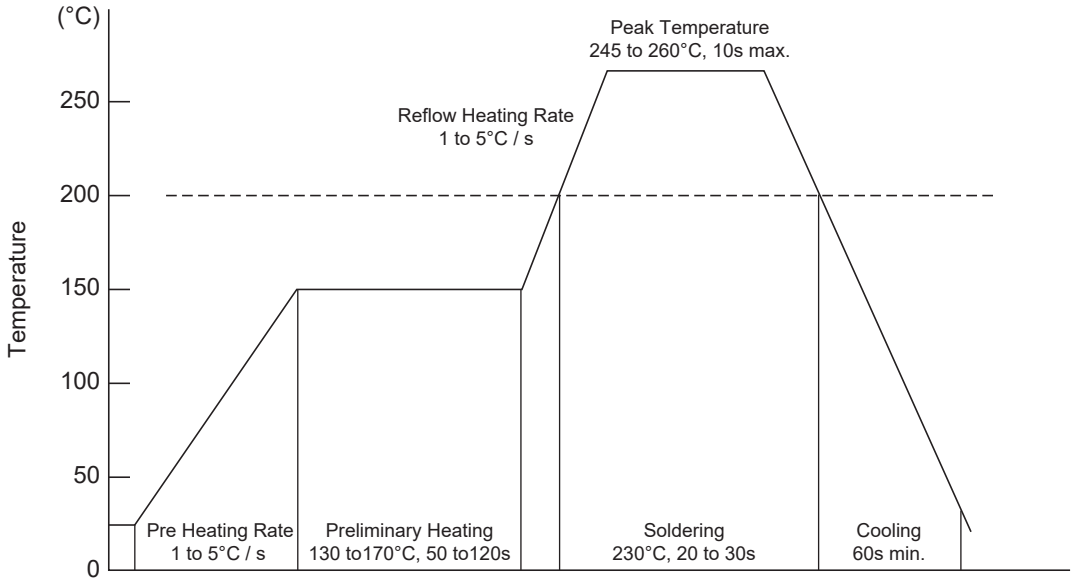


Ordering Information

Device	Package	Shipping
TN10H04PPA	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

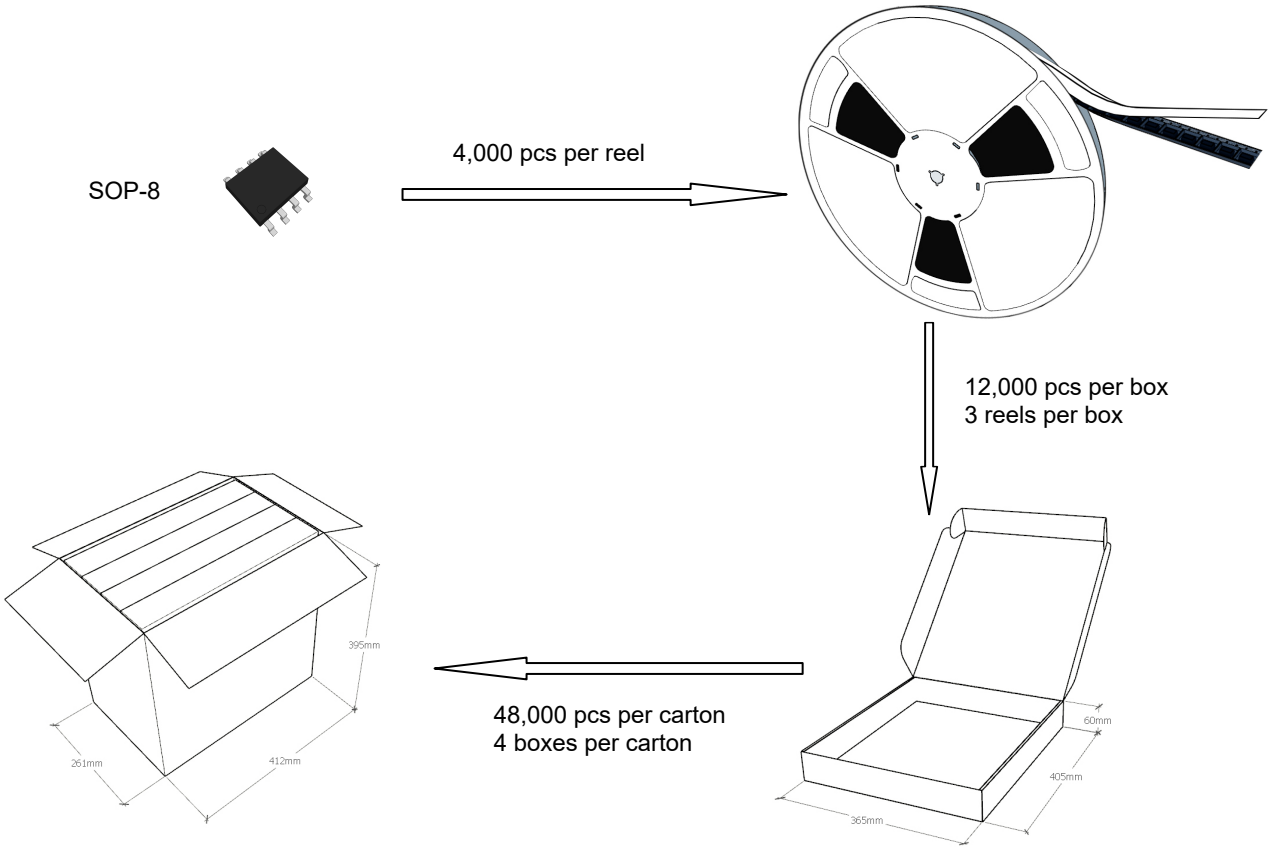
- Temperature: 300°C
- Time: 3s max.
- Times: one time

◆ Storage conditions

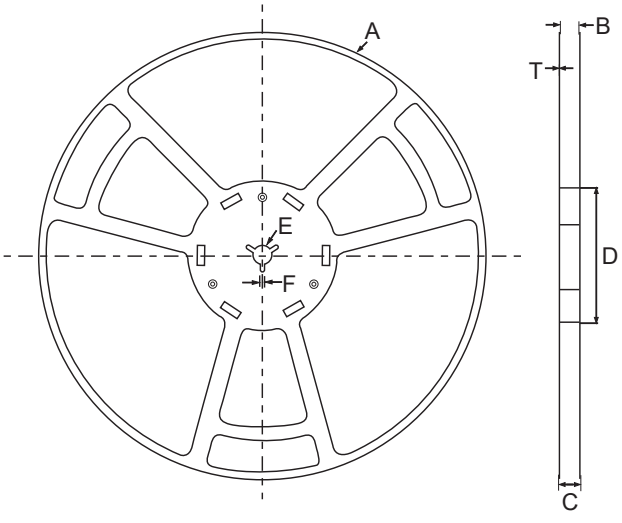
- **Temperature**
  5 to 40°C
- **Humidity**
  30 to 80% RH
- **Recommended period**
  One year after manufacturing

Package Specifications

- The method of packaging

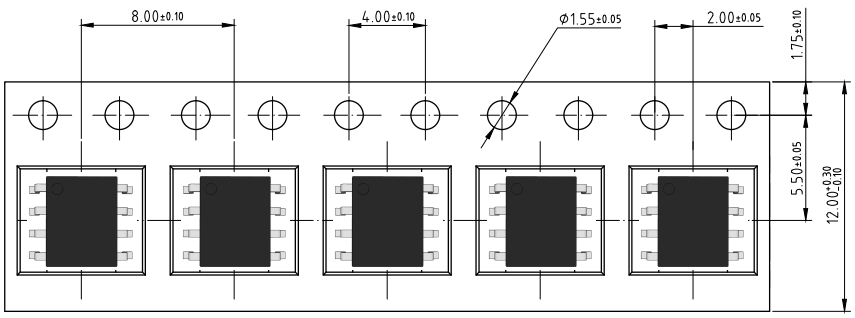


◆ **Embossed tape and reel data**



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

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For additional information, please contact your local Sales Representative.

