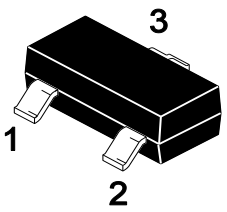
PJM2302NSA
N- Enhancement Mode Field Effect Transistor

Features
- Fast Switching
- Low Gate Charge and $R_{DS(on)}$
- High power and current handing capability

Applications
- Battery protection
- Load switch
- Power management

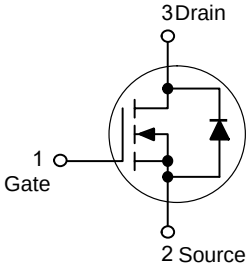
SOT-23



1. Gate 2.Source 3.Drain

Marking: M22

Schematic diagram



Absolute Maximum Ratings
Ratings at T_C = 25℃ unless otherwise specified.

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±8	V
Drain Current-Continuous	I_D	3.3	A
Drain Current-Pulsed Note 1	I_{DM}	16	A
Maximum Power Dissipation	P_D	0.9	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Characteristics

Parameter	Symbol	Limit	Unit
Thermal Resistance,Junction-to-Ambient Note 2	$R_{\theta JA}$	139	℃/W

Electrical Characteristics

T_A=25℃ unless otherwise noted

Parameter	Symbol	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}=±8V,V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage Note3	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	0.5	0.75	1.2	V
Drain-Source On-State Resistance Note3	$R_{DS(ON)}$	V_{GS}=2.5V, I_D=2.8A	-	35	60	mΩ
		V_{GS}=4.5V, I_D=3A	-	29	45	mΩ
Forward Transconductance Note3	g_{FS}	V_{DS}=5V,I_D=3A	-	8	-	S
Dynamic Characteristics						
Input Capacitance	C_{lss}	V_{DS}=10V,V_{GS}=0V, f=1.0MHz	-	300	-	pF
Output Capacitance	C_{oss}		-	120	-	pF
Reverse Transfer Capacitance	C_{rss}		-	80	-	pF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=10V, I_D=3A V_{GS}=4.5V,R_{GEN}=6Ω	-	10	-	nS
Turn-on Rise Time	t_r		-	50	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	17	-	nS
Turn-Off Fall Time	t_f		-	10	-	nS
Total Gate Charge	Q_g	V_{DS}=10V,I_D=3A, V_{GS}=4.5V	-	4	-	nC
Gate-Source Charge	Q_{gs}		-	0.7	-	nC
Gate-Drain Charge	Q_{gd}		-	1.5	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage Note 3	V_{SD}	V_{GS}=0V,I_S=3.3A	-	0.75	1.2	V
Diode Forward Current Note 2	I_S		-	-	3.3	A

Notes:

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 Characteristics Curves

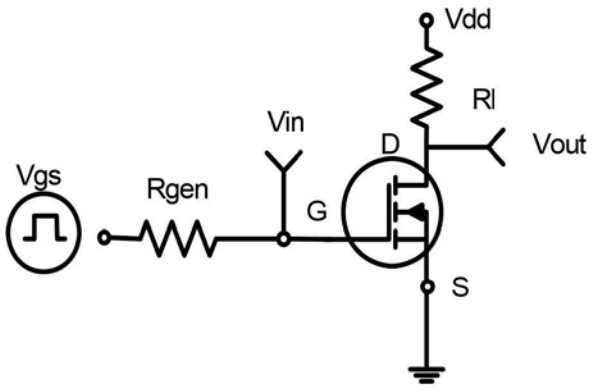


Figure 1:Switching Test Circuit

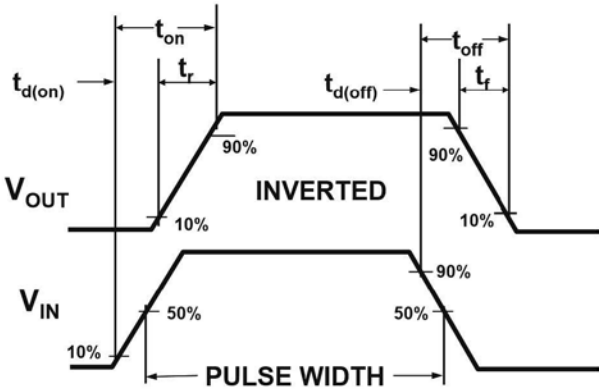


Figure 2:Switching Waveforms

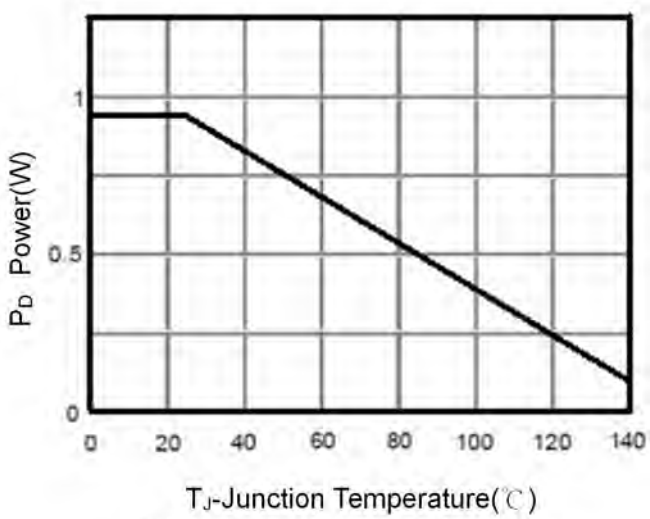


Figure 3 Power Dissipation

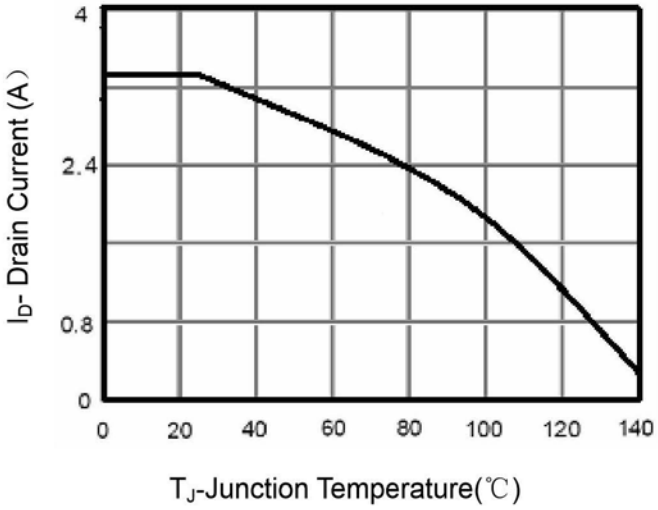


Figure 4 Drain Current

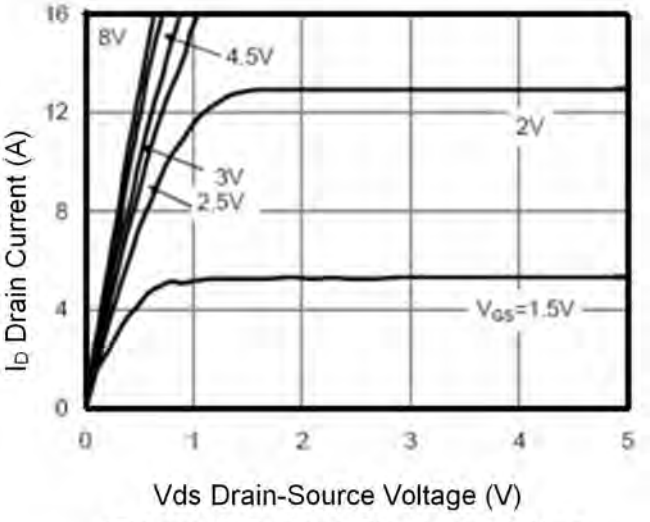


Figure 5 Output Characteristics

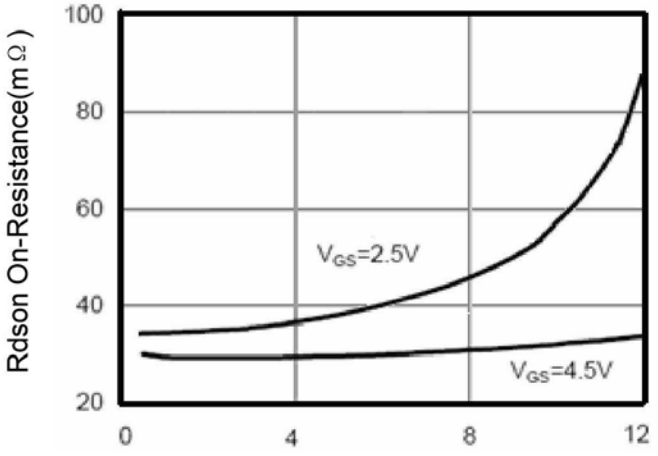


Figure 6 Drain-Source On-Resistance

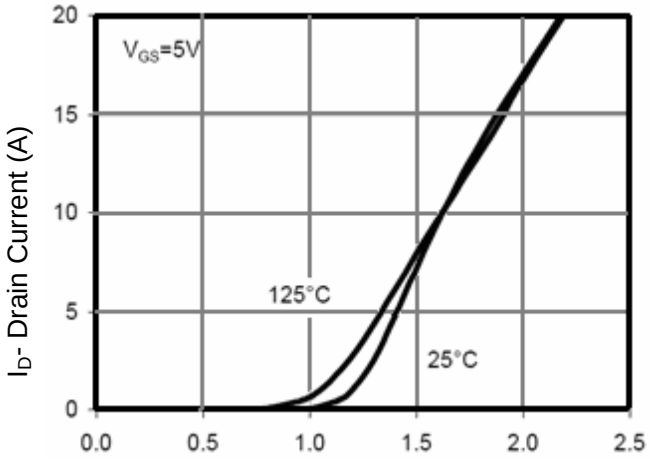


Figure 7 Transfer Characteristics

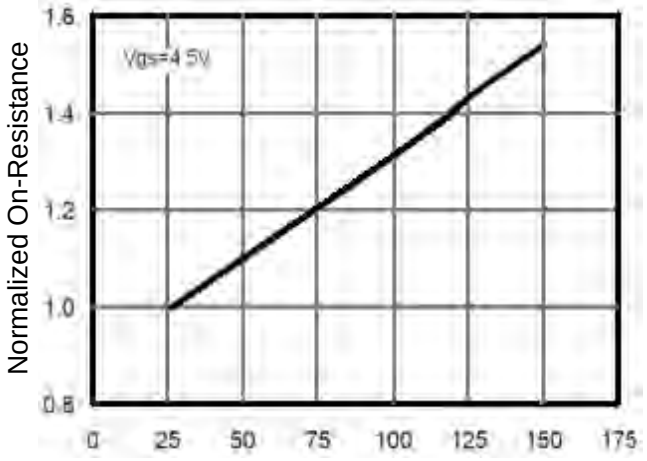


Figure 8 Drain-Source On-Resistance

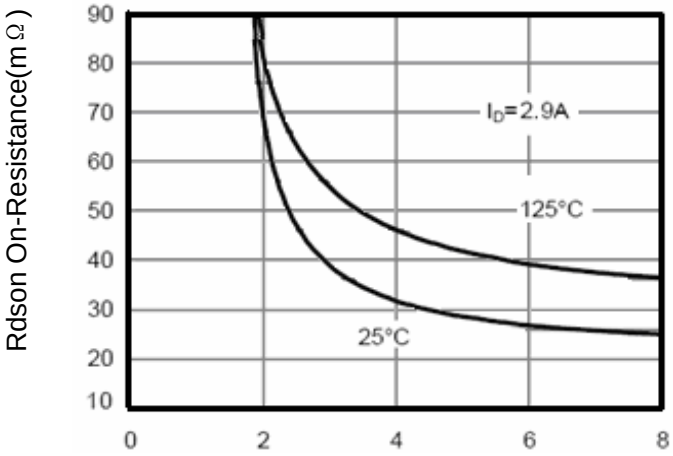


Figure 9 Rdson vs Vgs

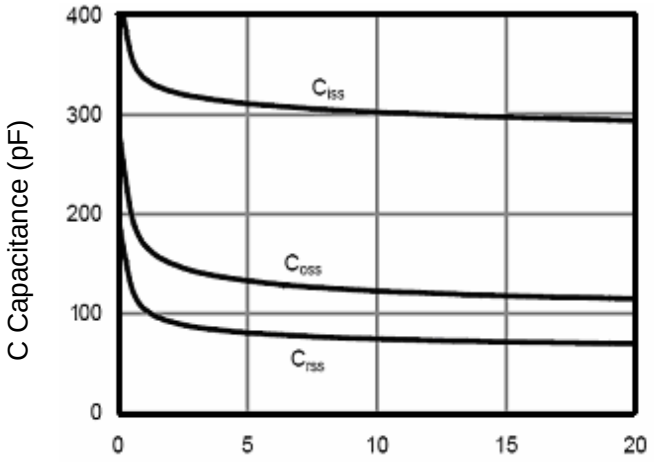


Figure 10 Capacitance vs Vds

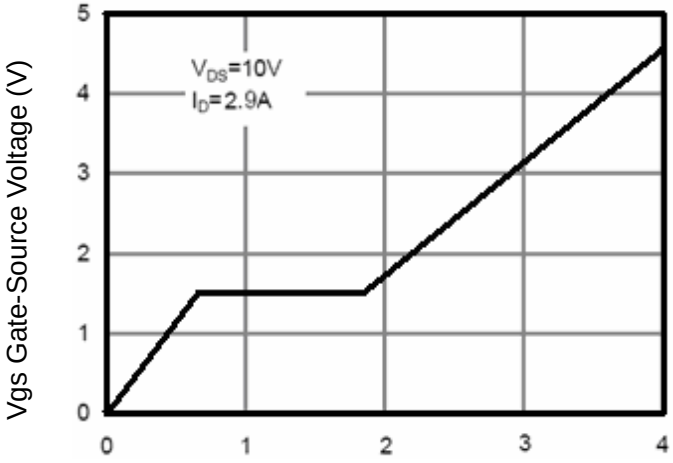


Figure 11 Gate Charge

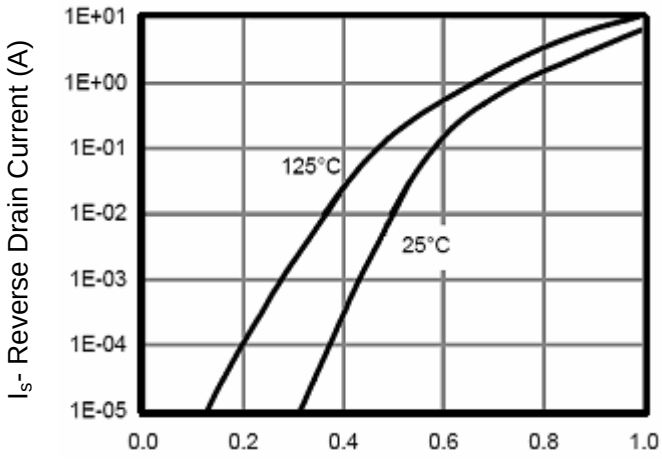
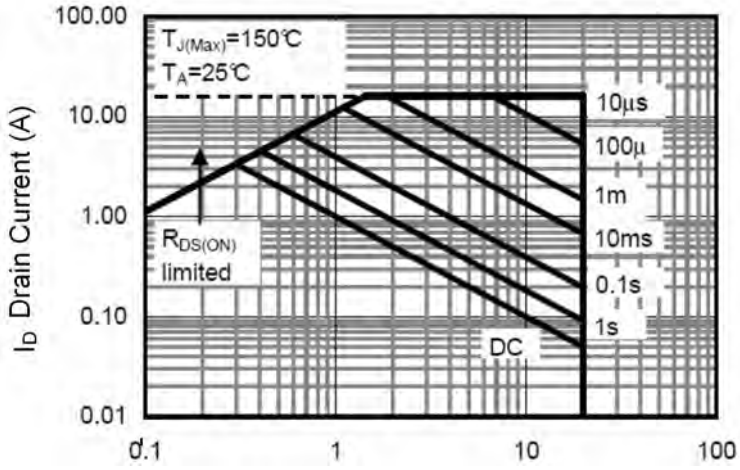
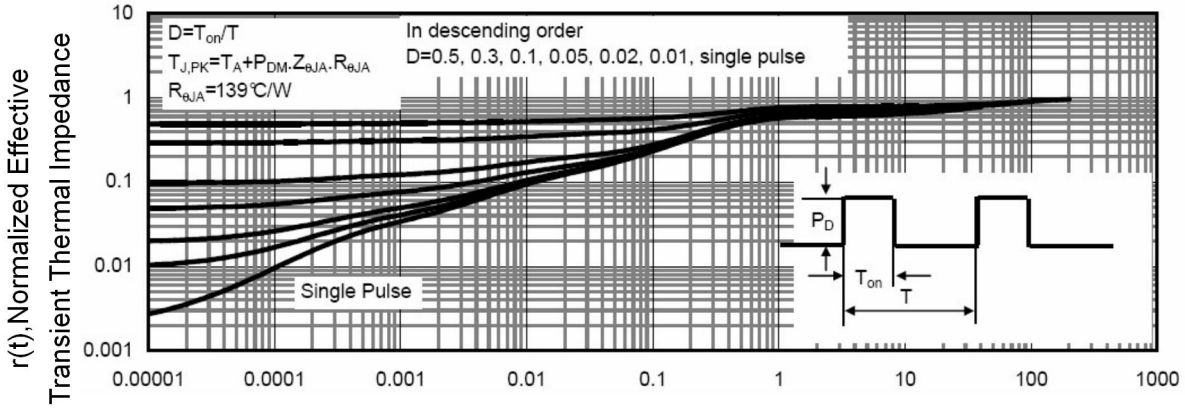


Figure 12 Source- Drain Diode Forward



Vds Drain-Source Voltage (V)

Figure 13 Safe Operation Area

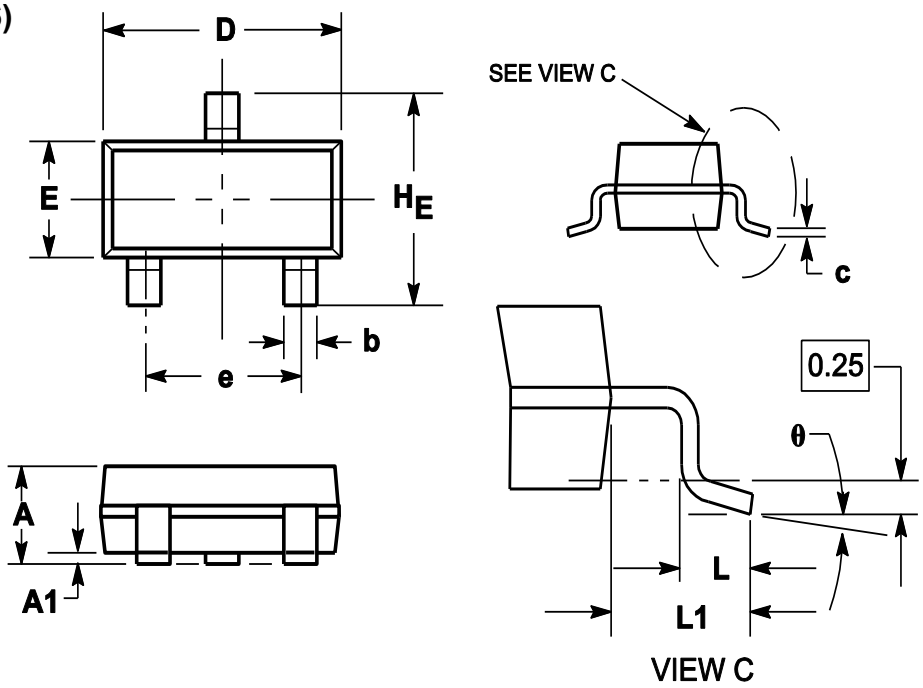


Square Wave Pluse Duration(sec)

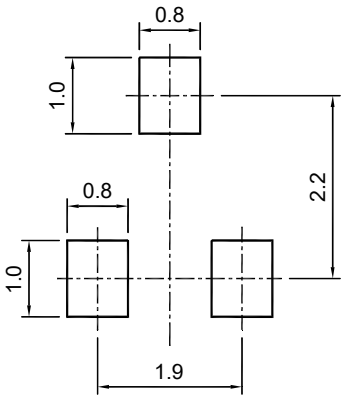
Figure 14 Normalized Maximum Transient Thermal Impedance

Package Outline

SOT-23（TO-236)



Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.900	1.025	1.150
A1	0.000	0.050	0.100
b	0.300	0.400	0.500
c	0.080	0.115	0.150
D	2.800	2.900	3.000
E	1.200	1.300	1.400
H_E	2.250	2.400	2.550
e	1.800	1.900	2.000
L1	0.550REF		
L	0.300		0.500
θ	0^o		8^o



SOT-23 (TO-236)

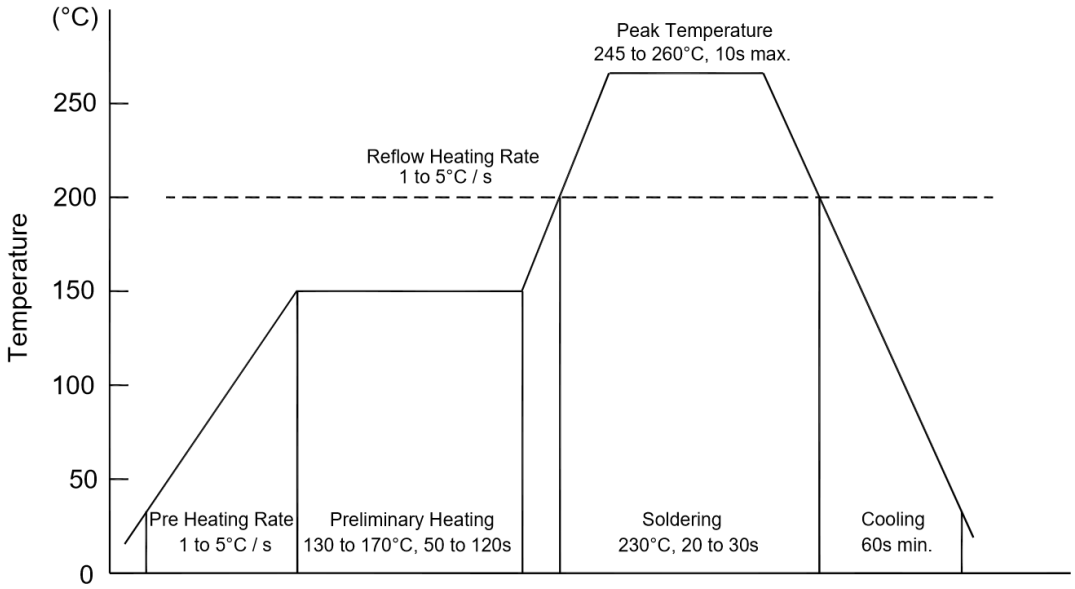
Recommended soldering pad

Ordering Information

Device	Package	Shipping
PJM2302NSA	SOT-23	3000/Reel&Tape(7inch)

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

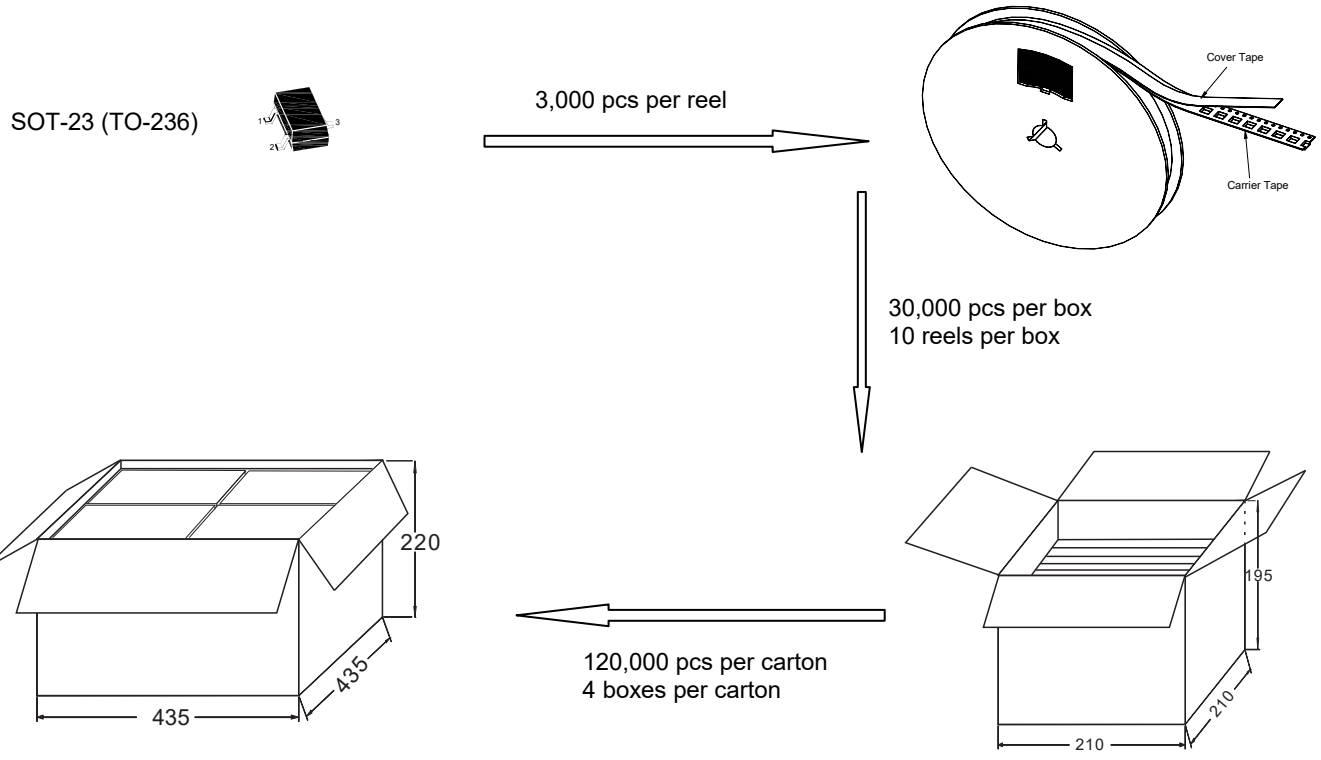
- Temperature: 370 ^{O}C
- Time: 3s max.
- Times: one time

◆ Storage conditions

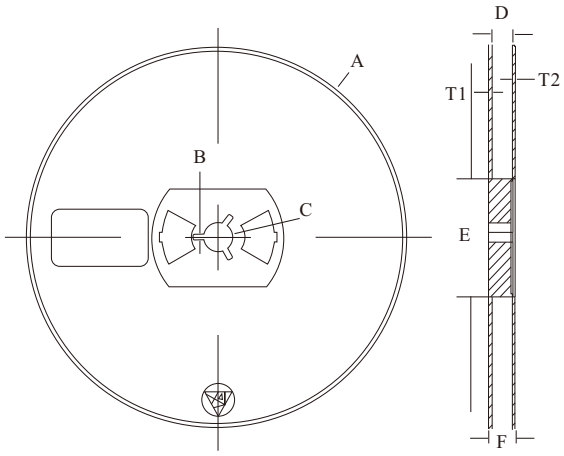
- **Temperature**
  5 to 40 ^{O}C
- **Humidity**
  30 to 80% RH
- **Recommended period**
  One year after manufacturing

Package Specifications

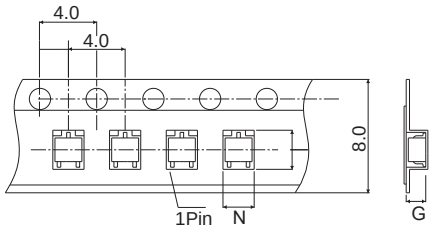
◆ The method of packaging



◆ Embossed tape and reel data



Reel (7")



Tape (8mm)

Symbol	Value (unit: mm)
A	Ø 177.8±1
B	2.7±0.2
C	Ø 13.5±0.2
E	Ø 54.5±0.2
F	12.3±0.3
D	9.6+2/-0.3
T1	1.0±0.2
T2	1.2±0.2
N	3.15±0.1
G	1.25±0.1