



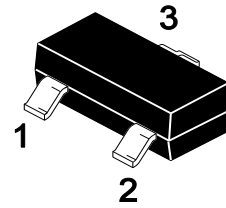
# PJM02B60SA

## N- Enhancement Mode Field Effect Transistor

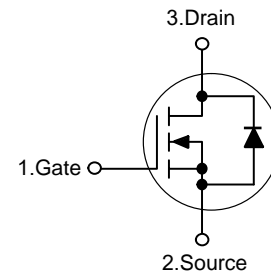
### Features

- ◆  $R_{DS(ON)} < 85m\Omega @ V_{GS} = 10V$   
 $R_{DS(ON)} < 120m\Omega @ V_{GS} = 4.5V$   
 $V_{DS}=60V, I_D=2A$
- ◆ High power and current handing capability

SOT-23



### Schematic diagram



### Applications

- ◆ DC/DC Converter
- ◆ Battery Switch

### Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	2	A
Pulsed Drain Current <sup>Note1</sup>	$I_{DM}$	10	A
Total Power Dissipation	$P_D$	0.9	W
Operating Junction Temperature	$T_J$	150	°C
Storage Temperature	$T_{STG}$	- 55 to + 150	°C

### Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction to Ambient <sup>Note2</sup>	$R_{\theta JA}$	139	°C/W



### Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

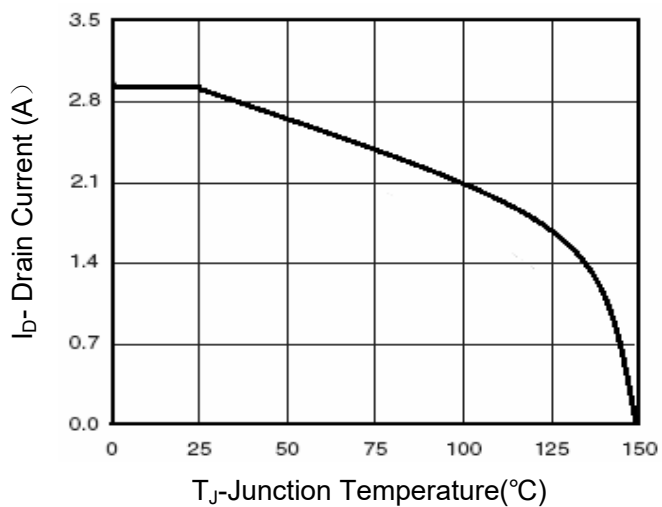
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	60			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V			1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
Gate Threshold Voltage <sup>Note3</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1	1.3	2	V
Drain-Source On-Resistance <sup>Note3</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 3A			105	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 2A			125	
Forward Transconductance <sup>Note3</sup>	g <sub>FS</sub>	V <sub>DS</sub> = 15V, I <sub>D</sub> = 2A		3		S
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V, f = 1MHz		510		pF
Output Capacitance	C <sub>oss</sub>			34		
Reverse Transfer Capacitance	C <sub>rss</sub>			26		
<b>SWITCHING Characteristics</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 30V, I <sub>D</sub> = 3A, V <sub>GS</sub> = 4.5V		7.5		nC
Gate-Source Charge	Q <sub>gs</sub>			1.4		
Gate-Drain Charge	Q <sub>gd</sub>			3		
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 30V, I <sub>D</sub> = 1.5A, R <sub>G</sub> = 1Ω		6		ns
Turn-On Rise Time	t <sub>r</sub>			15		
Turn-Off Delay Time	t <sub>d(off)</sub>			15		
Turn-Off Fall Time	t <sub>f</sub>			10		
<b>Source-Drain Diode characteristics</b>						
Body Diode Voltage	V <sub>SD</sub>	I <sub>S</sub> = 3A, V <sub>GS</sub> = 0V			1.2	V

#### Notes :

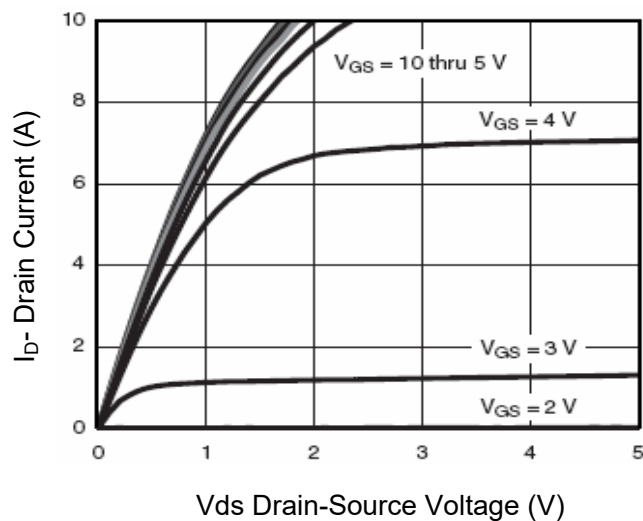
1. Repetitive rating : Pulse width limited by junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.



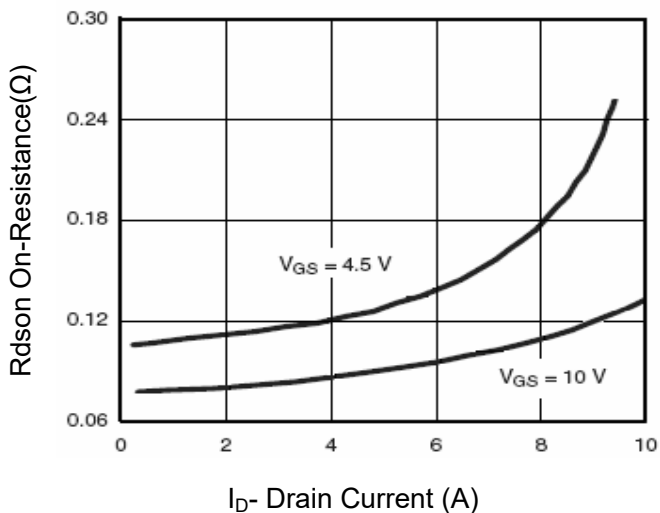
### Typical Characteristics Curves



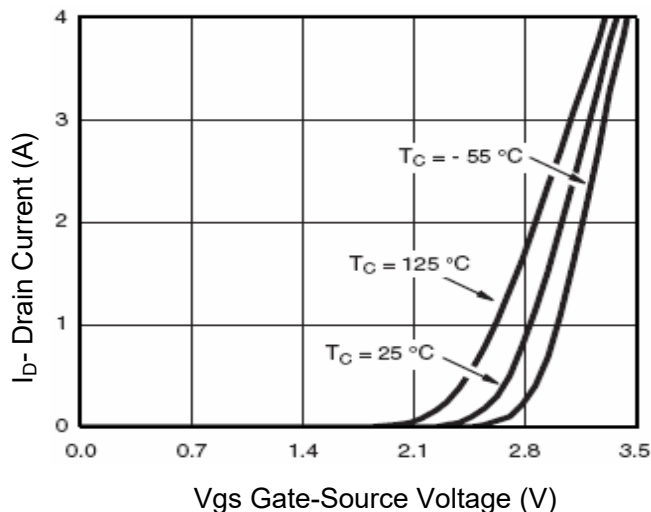
**Figure 1 Drain Current**



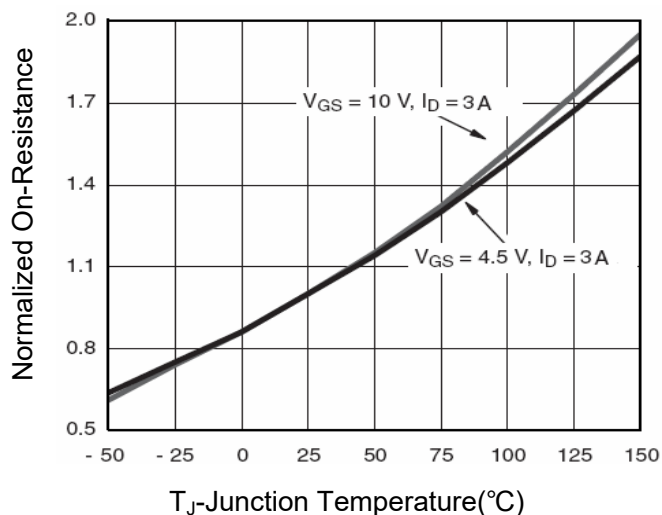
**Figure 2 Output Characteristics**



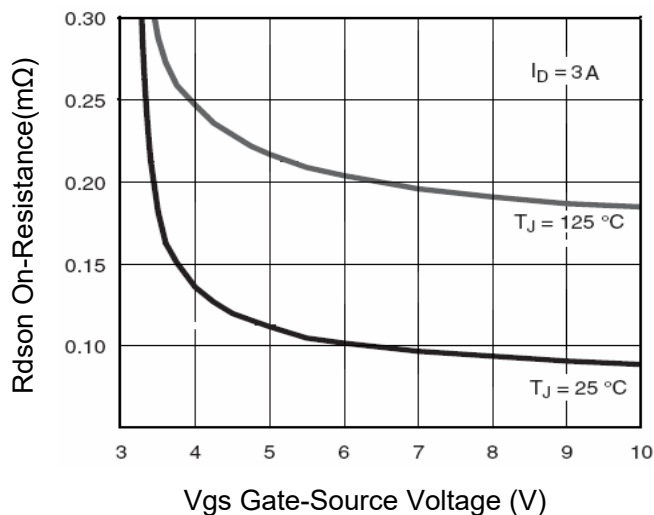
**Figure 3 Drain-Source On-Resistance**



**Figure 4 Transfer Characteristics**



**Figure 5 Drain-Source On-Resistance**



**Figure 6  $R_{DS(on)}$  vs  $V_{GS}$**

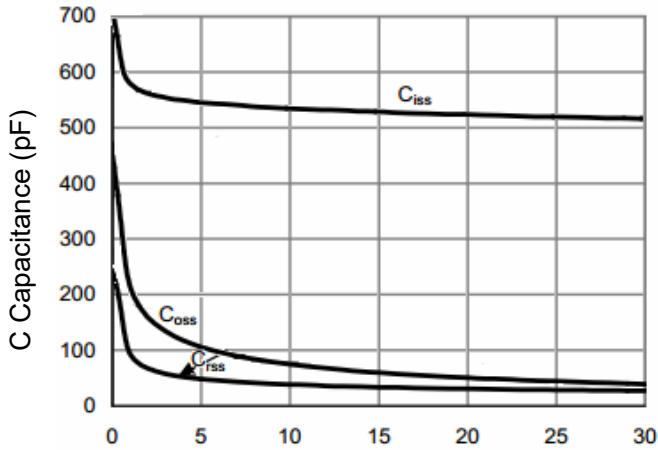


Figure 7 Capacitance vs Vds

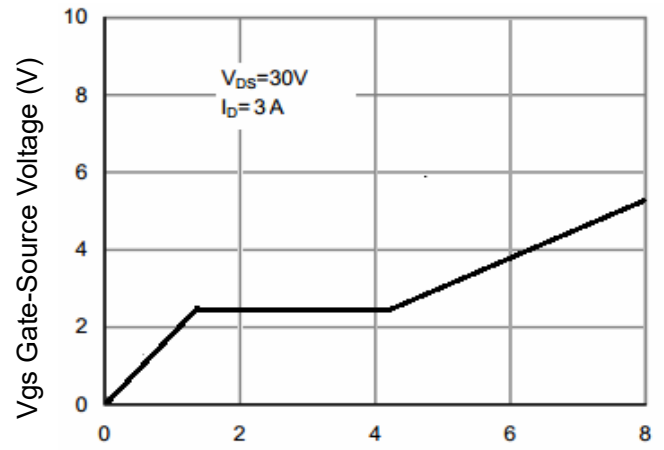


Figure 8 Gate Charge

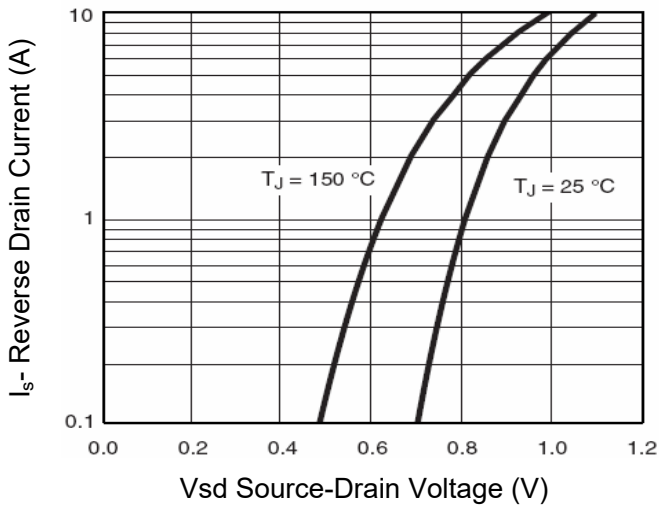


Figure 9 Source- Drain Diode Forward

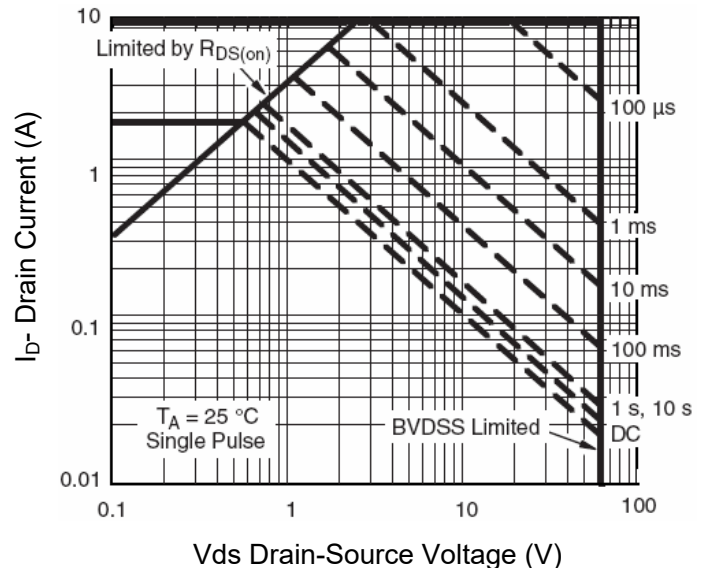


Figure 10 Safe Operation Area

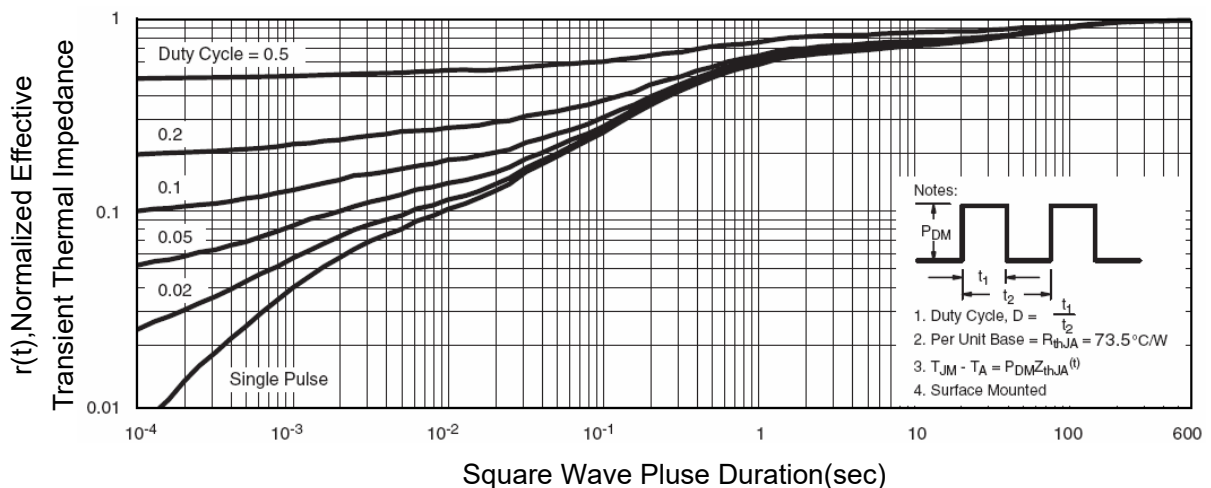
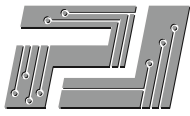


Figure 11 Normalized Maximum Transient Thermal Impedance

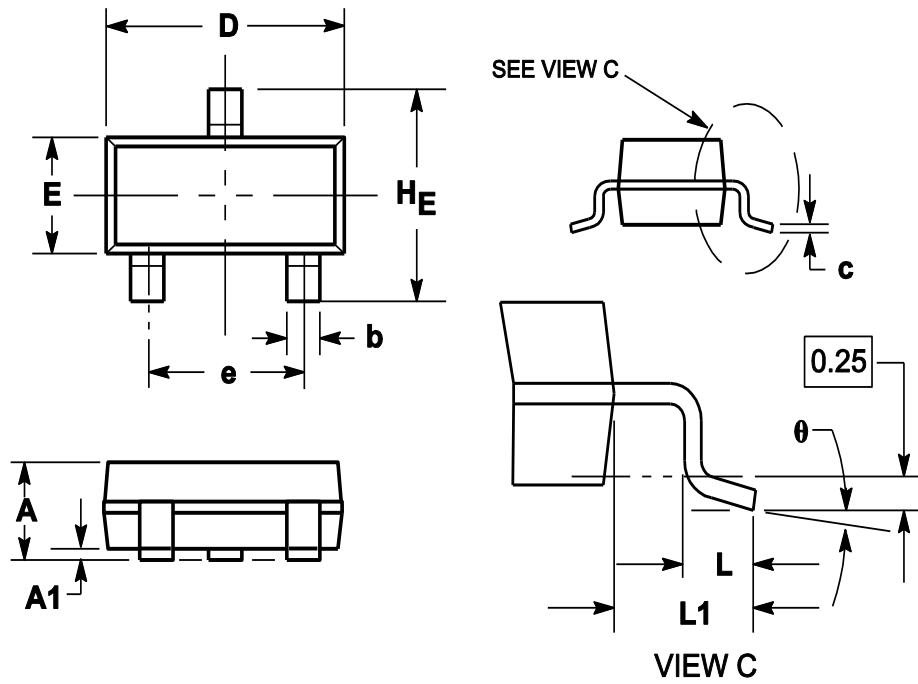


# PJM02B60SA

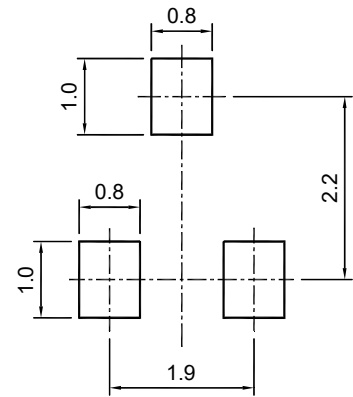
## N- Enhancement Mode Field Effect Transistor

### Package Outline

#### SOT-23



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
HE	2.250	2.400	2.550
e	1.800	1.900	2.000
L1	0.550REF		
L	0.300		0.500
$\theta$	0°		8°



SOT-23

**Recommended soldering pad**

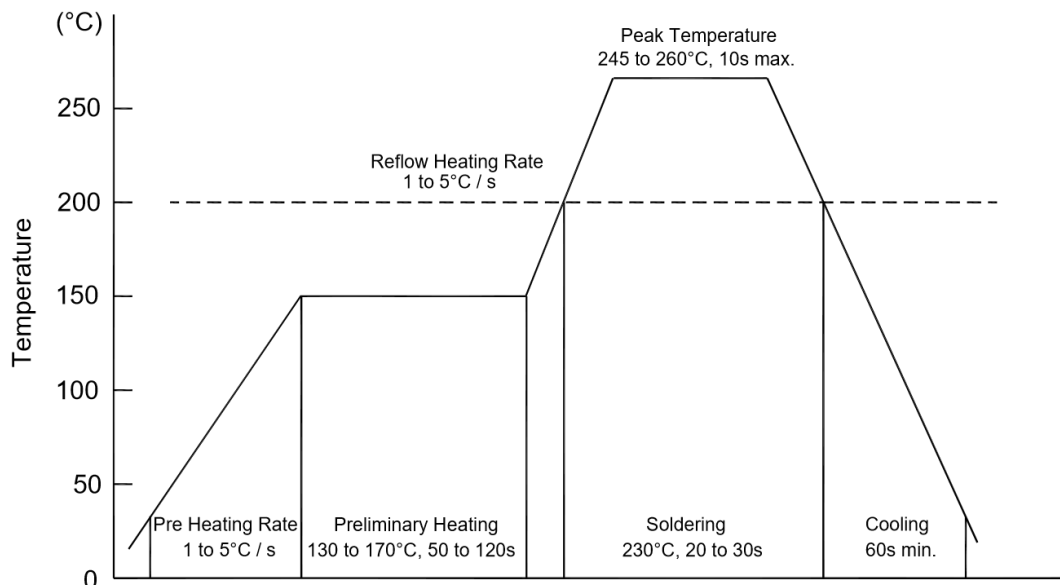
### Ordering Information

Device	Package	Shipping
PJM02N60SA	SOT-23	3000/Reel&Tape(7inch)



### 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: 370 °C
- Time: 3s max.
- Times: one time

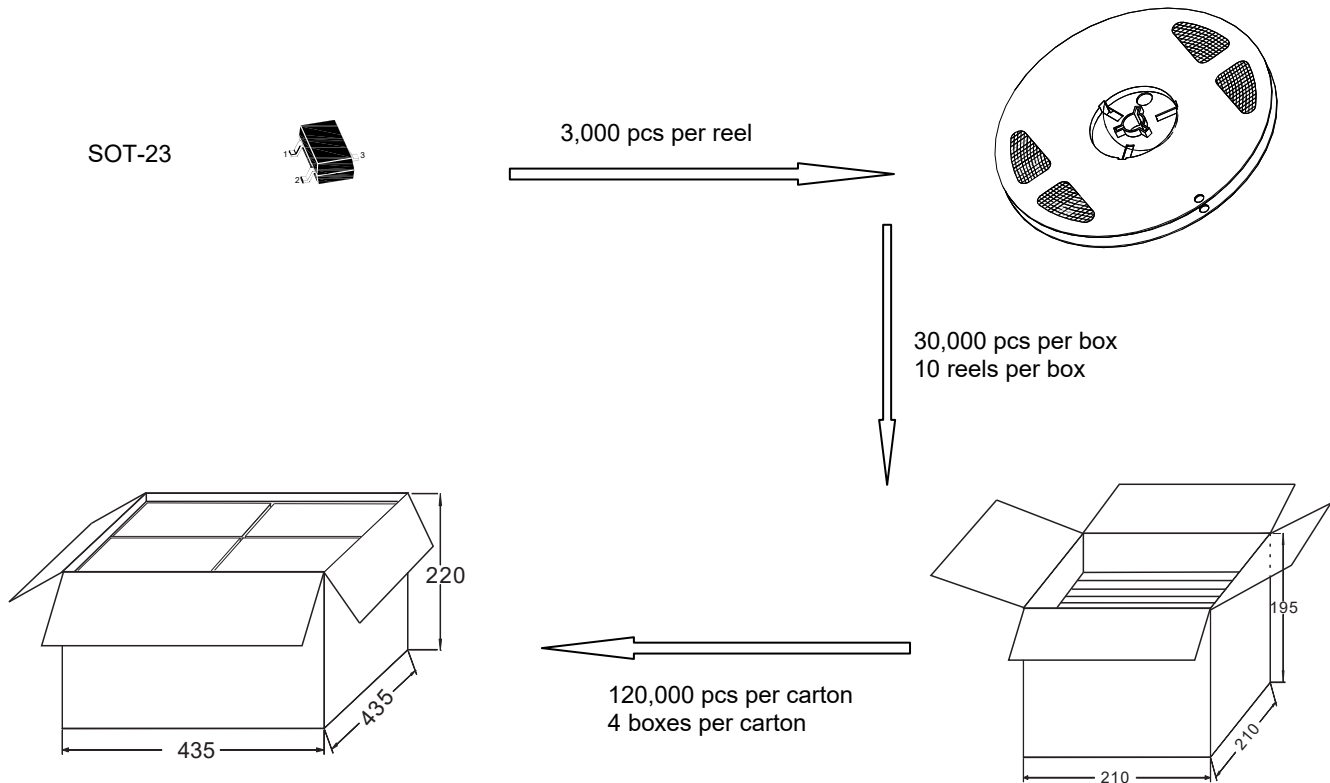
#### ◆ Storage conditions

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

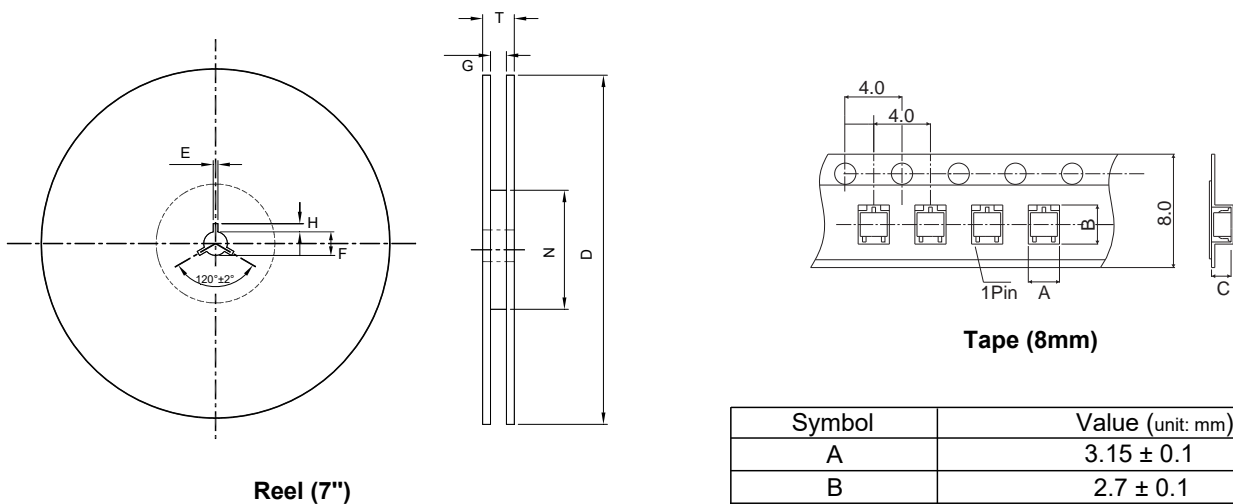


### Package Specifications

#### ◆ The method of packaging



#### ◆ Embossed tape and reel data



Symbol	Value (unit: mm)
A	3.15 ± 0.1
B	2.7 ± 0.1
C	1.25 ± 0.1
E	2 ± 0.5
F	13 ± 0.5
D	178 ± 2.0
G	8.4 ± 1.5
H	4 ± 0.5
N	60
T	< 14.9