



# PJM2333PSC

## P-Channel Enhancement Mode Power MOSFET

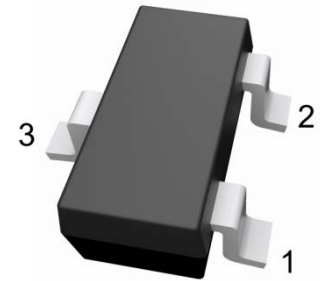
### Features

- $V_{DS} = -12V$ ,  $I_D = -6A$ ,  
 $R_{DS(on)} < 45m\Omega$  (Max.) @  $V_{GS} = -2.5V$   
 $R_{DS(on)} < 30m\Omega$  (Max.) @  $V_{GS} = -4.5V$
- High power and current handing capability
- Surface mount package

### Application

- PWM application
- Load switch
- Power Management

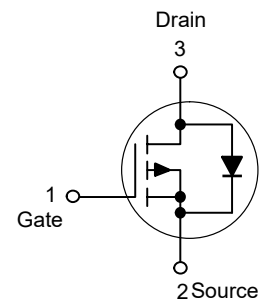
SOT-23-3



1.Gate 2.Source 3.Drain

Marking: Q33

Schematic Diagram



### Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-12	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Drain Current -Continuous	$I_D$	-6	A
Drain Current -Pulsed <sup>Note1</sup>	$I_{DM}$	-20	A
Power Dissipation	$P_D$	1.25	W
Junction Temperature	$T_J$	150	°C
Storage Temperature Range	$T_{STG}$	-55 to 150	°C

### Thermal Characteristics

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient <sup>Note2</sup>	$R_{\theta JA}$	100	°C/W



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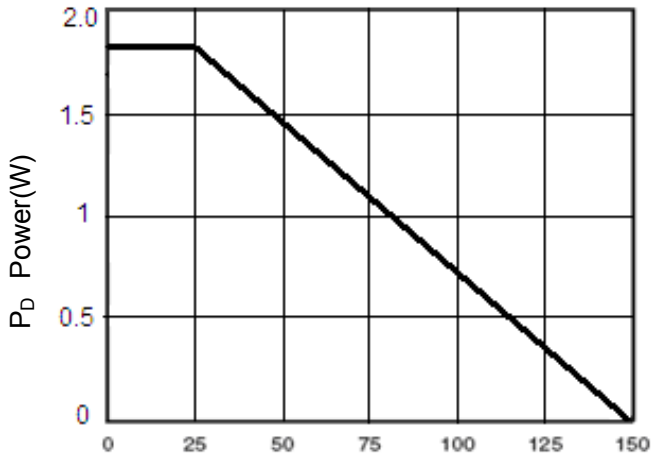
### Electrical Characteristics (T<sub>A</sub>=25°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0, I <sub>D</sub> =-250μA	-12	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-12V, V <sub>GS</sub> =0	-	-	-1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0	-	-	±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	-0.4	-0.65	-1	V
Drain-Source On-State Resistance <sup>Note3</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-6A	-	19	30	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-5A	-	26	45	
Forward Transconductance <sup>Note3</sup>	g <sub>FS</sub>	V <sub>DS</sub> =-5V, I <sub>D</sub> =-6A	-	17	-	S
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-6V, V <sub>GS</sub> =0V, f=1.0MHz	-	1100	-	pF
Output Capacitance	C <sub>oss</sub>		-	390	-	pF
Reverse Transfer Capacitance	C <sub>rss</sub>		-	300	-	pF
<b>Switching Characteristics</b>						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =-6V, I <sub>D</sub> =-1A, R <sub>L</sub> =6Ω, V <sub>GEN</sub> =-4.5V, R <sub>g</sub> =6Ω	-	25	-	nS
Turn-on Rise Time	t <sub>r</sub>		-	45	-	nS
Turn-Off Delay Time	t <sub>d(off)</sub>		-	72	-	nS
Turn-Off Fall Time	t <sub>f</sub>		-	60	-	nS
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-6V, I <sub>D</sub> =-6A, V <sub>GS</sub> =-4.5V	-	11.5	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	1.5	-	nC
Gate-Drain Charge	Q <sub>gd</sub>		-	3.2	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage <sup>Note3</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =-1.0A	-	-	-1.2	V
Diode Forward Current <sup>Note2</sup>	I <sub>S</sub>		-	-	-6	A

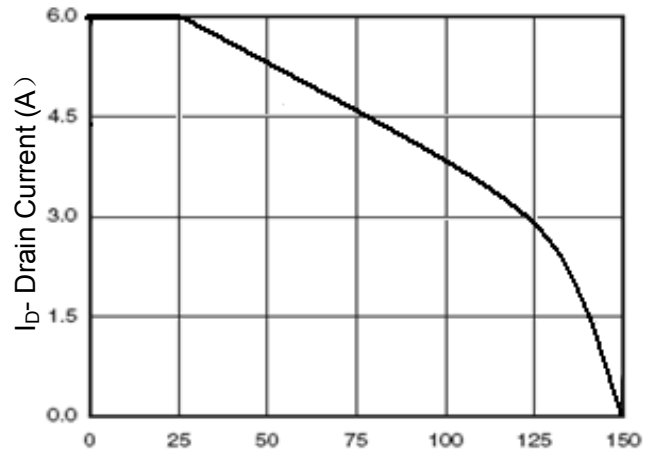
- Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.  
 2. Surface Mounted on FR4 Board, t ≤ 10 sec.  
 3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.



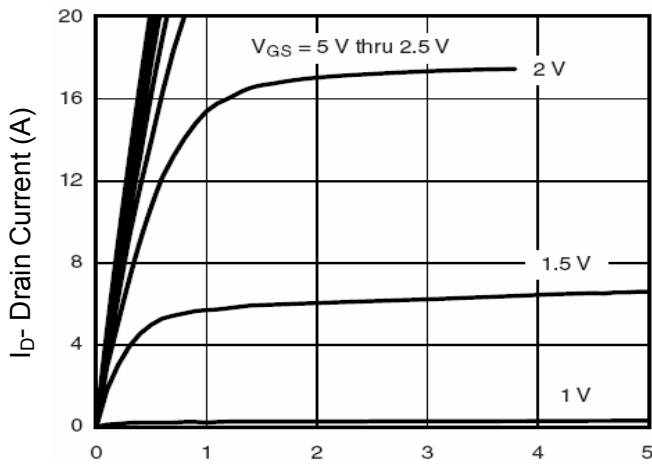
Typical Characteristics Curves



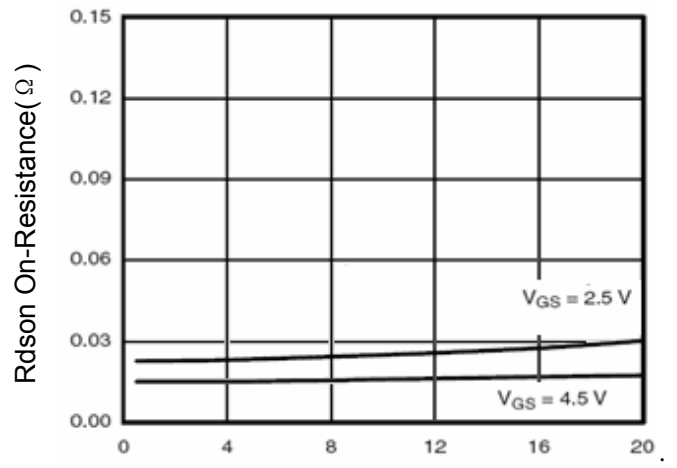
T<sub>J</sub>-Junction Temperature( °C )  
**Power Dissipation**



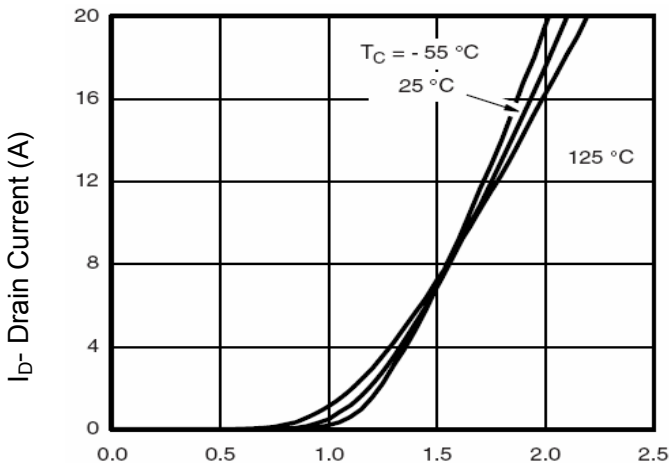
T<sub>J</sub>-Junction Temperature(°C)  
**Drain Current**



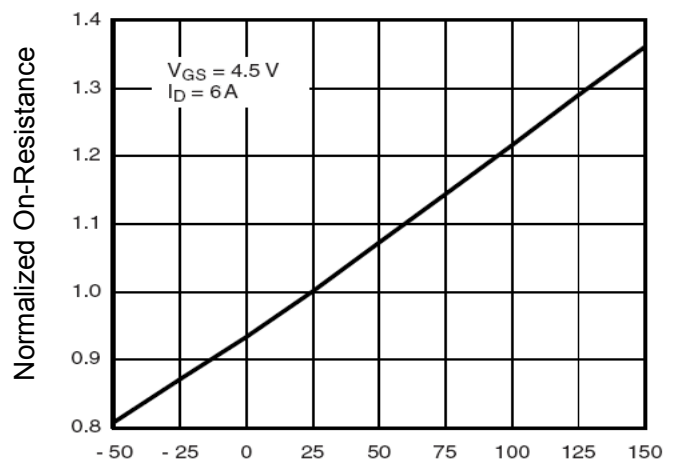
V<sub>ds</sub> Drain-Source Voltage (V)  
**Output Characteristics**



I<sub>D</sub>- Drain Current (A)  
**Drain-Source On-Resistance**



V<sub>gs</sub> Gate-Source Voltage (V)  
**Transfer Characteristics**

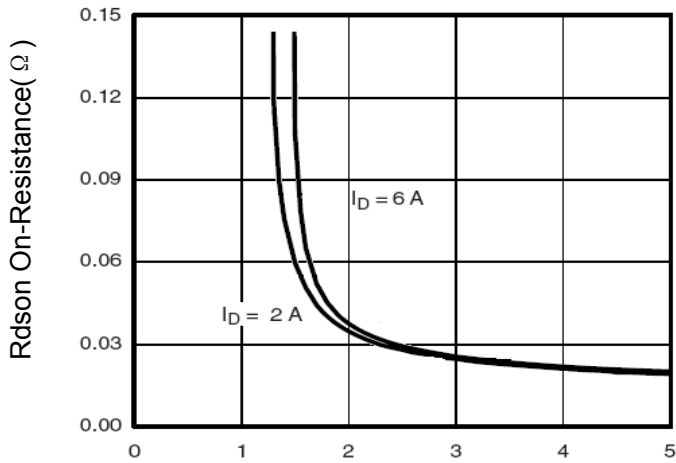


T<sub>J</sub>-Junction Temperature(°C)  
**Drain-Source On-Resistance**

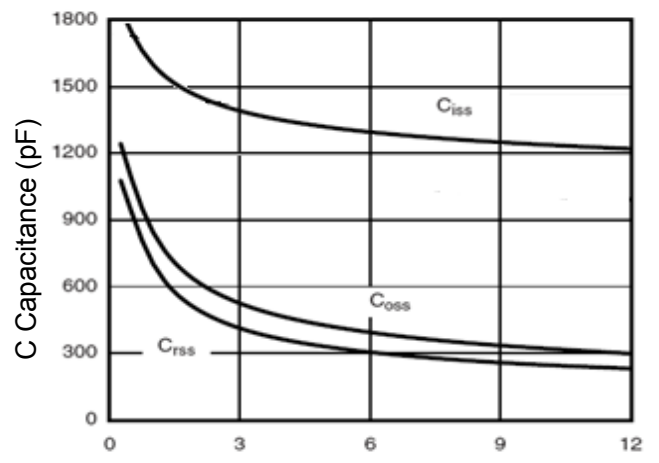


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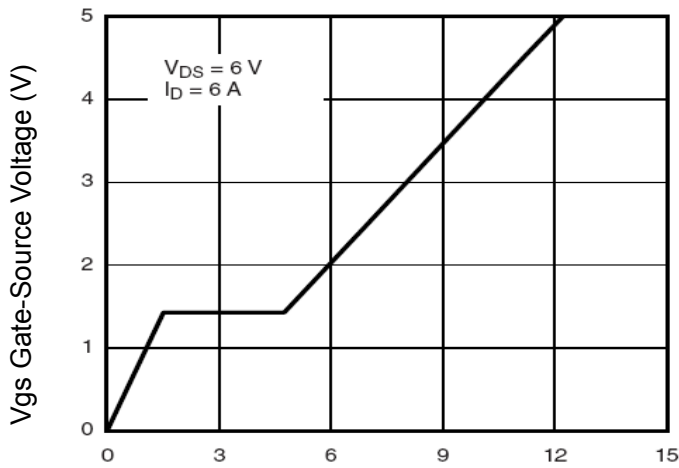
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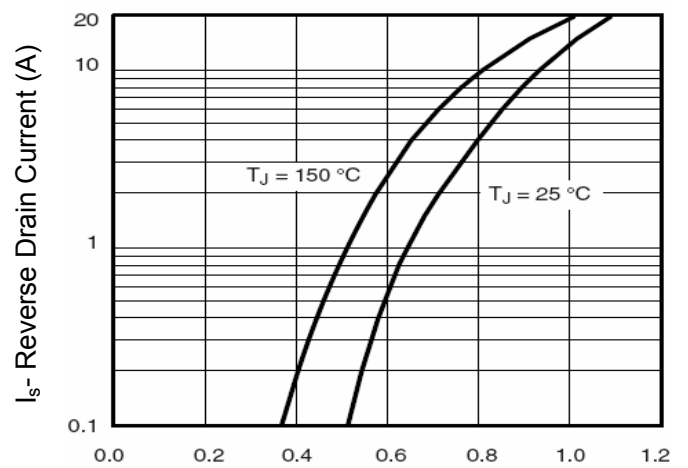
Vgs Gate-Source Voltage (V)  
**Rdson vs Vgs**



Vds Drain-Source Voltage (V)  
**Capacitance vs Vds**



Qg Gate Charge (nC)  
**Gate Charge**



Vsd Source-Drain Voltage (V)  
**Source- Drain Diode Forward**



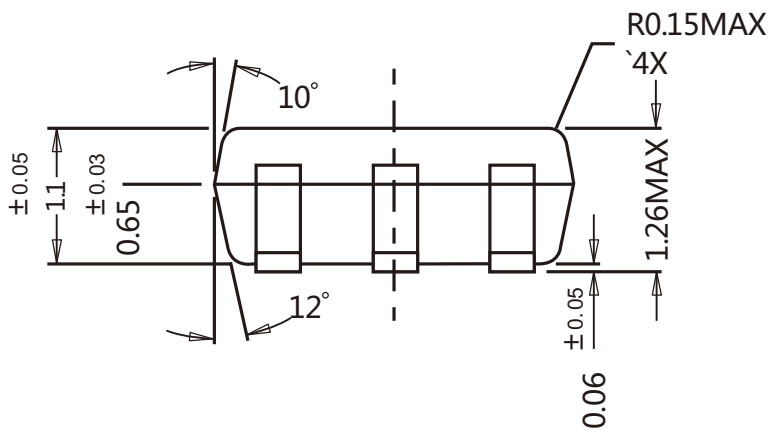
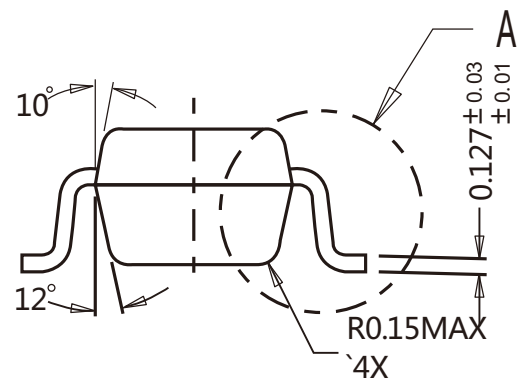
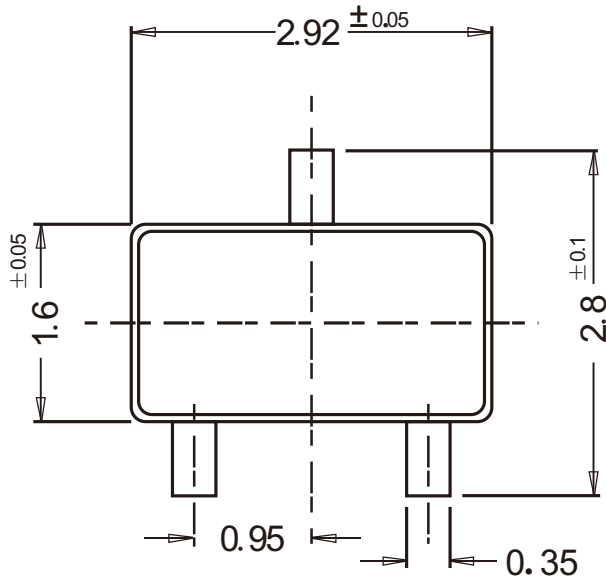
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### Package Outline

SOT-23-3

Dimensions in mm



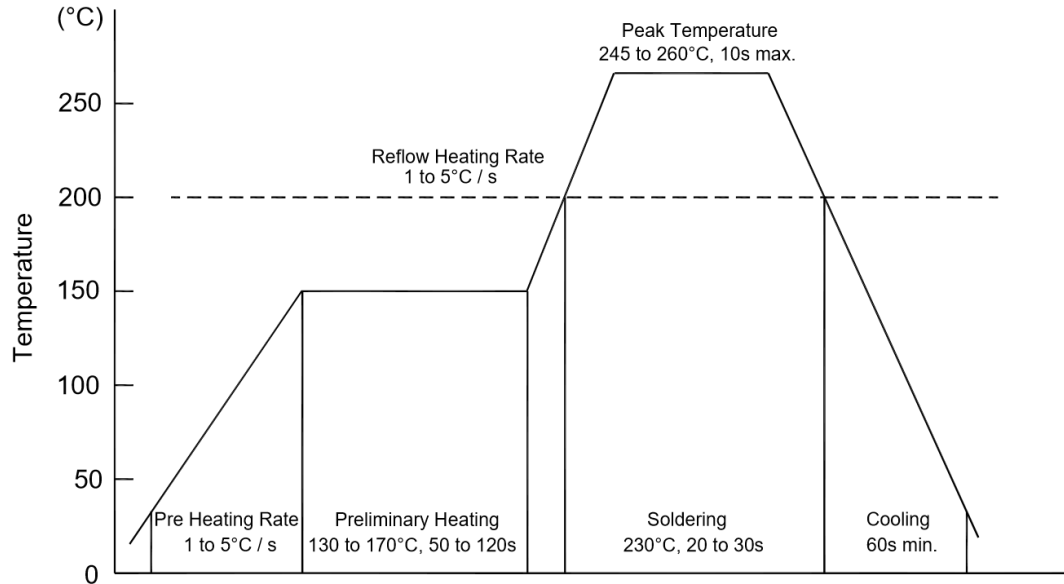
### Ordering Information

Device	Package	Shipping
PJM2333PSC	SOT-23-3	3000PCS/Reel&Tape



### 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

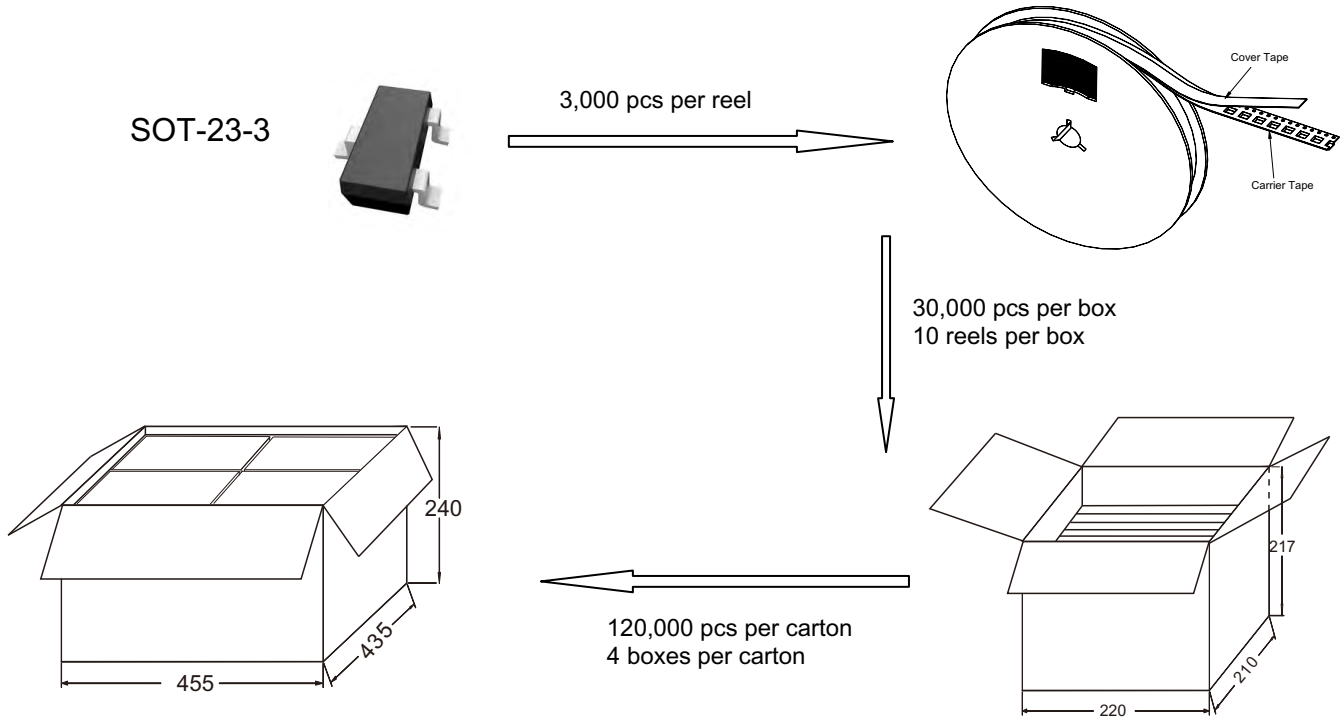
#### ◆ Storage conditions

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

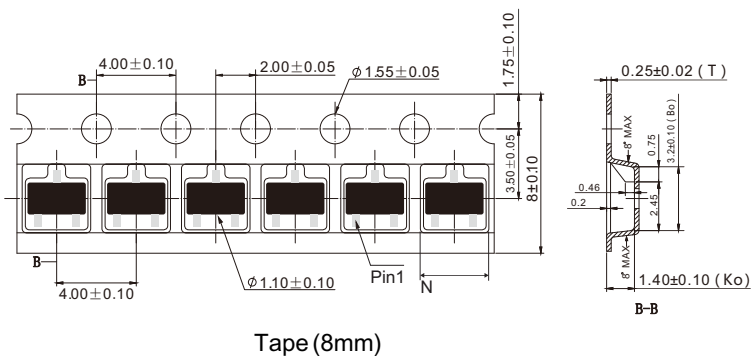
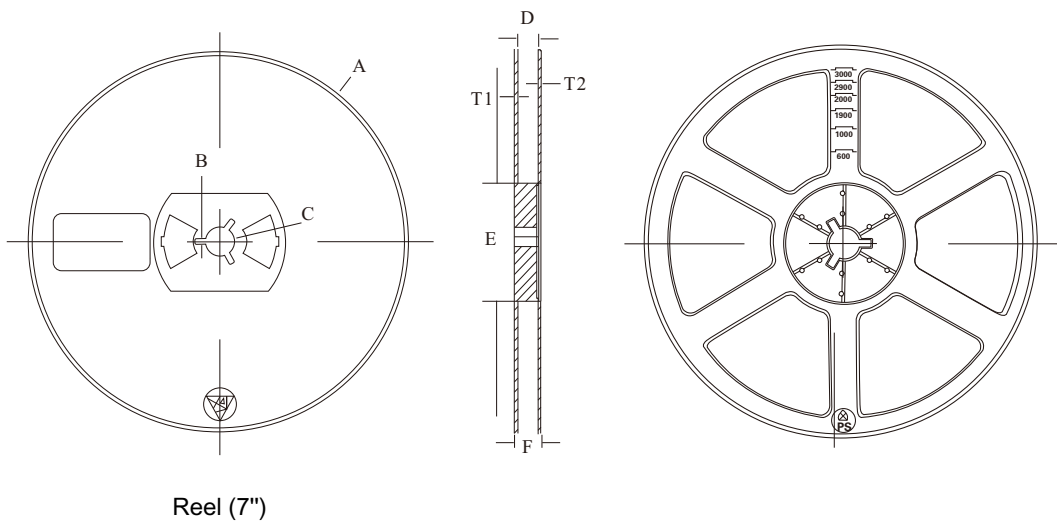


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## Package Specifications



## 2. Tape and reel data(7inch Units:mm)



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	1.22±0.1