



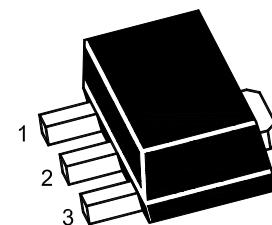
# PJM20N60SQ

## N-Channel Enhancement Mode Power MOSFET

### Features

- Fast Switching
- Low  $R_{DS(ON)}$  and Gate Charge
- Low Reverse Transfer Capacitance
- $V_{DS} = 60V, I_D = 20A$
- $R_{DS(on)} < 35m\Omega @ V_{GS} = 10V$

SOT-89



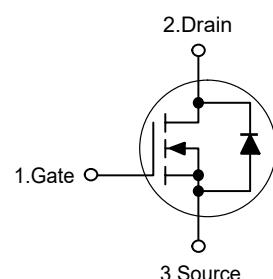
1. Gate 2. Drain 3. Source

**Marking Code: 20N06**

### Applications

- Power Switching Application
- Uninterruptible Power Supply

**Schematic Diagram**



### 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
Drain Current-Continuous	$I_D$	20	A
Drain Current-Pulsed <sup>Note1</sup>	$I_{DM}$	60	A
Single pulse avalanche energy <sup>Note4</sup>	$E_{AS}$	72	mJ
Avalanche energy, Repetitive <sup>Note1</sup>	$E_{AR}$	18	mJ
Avalanche Current <sup>Note1</sup>	$I_{AR}$	11	A
Maximum Power Dissipation	$P_D$	25	W
Junction Temperature	$T_J$	175	°C
Storage Temperature Range	$T_{STG}$	-55 to +175	°C

### Thermal Characteristics

Maximum Junction-to-Case <sup>Note2</sup>	$R_{eJC}$	5	°C/W
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### Electrical Characteristics

(Ta=25°C unless otherwise specified)

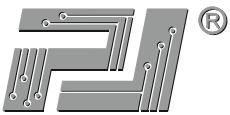
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	60	--	--	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V	--	--	1	μA
Gate-Body 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	1.7	2.5	V
Drain-Source On-Resistance <sup>Note3</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A	--	23	35	mΩ
Forward Transconductance <sup>Note3</sup>	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =5A	11	--	--	S
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1MHz	--	500	--	pF
Output Capacitance	C <sub>oss</sub>		--	60	--	pF
Reverse Transfer Capacitance	C <sub>rss</sub>		--	25	--	pF
<b>Switching Characteristics</b>						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =30V, I <sub>D</sub> =2A V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω	--	6	--	nS
Turn-on Rise Time	t <sub>r</sub>		--	2.8	--	nS
Turn-off Delay Time	t <sub>d(off)</sub>		--	9	--	nS
Turn-off Fall Time	t <sub>f</sub>		--	5	--	nS
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =4.5A, V <sub>GS</sub> =10V	--	47	--	nC
Gate-Source Charge	Q <sub>gs</sub>		--	6	--	nC
Gate-Drain Charge	Q <sub>gd</sub>		--	14	--	nC
<b>Source-Drain Diode Characteristics</b>						
Diode Forward Voltage <sup>Note3</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>s</sub> =20A	--	--	1.5	V
Diode Forward Current <sup>Note2</sup>	I <sub>s</sub>		--	--	20	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%.

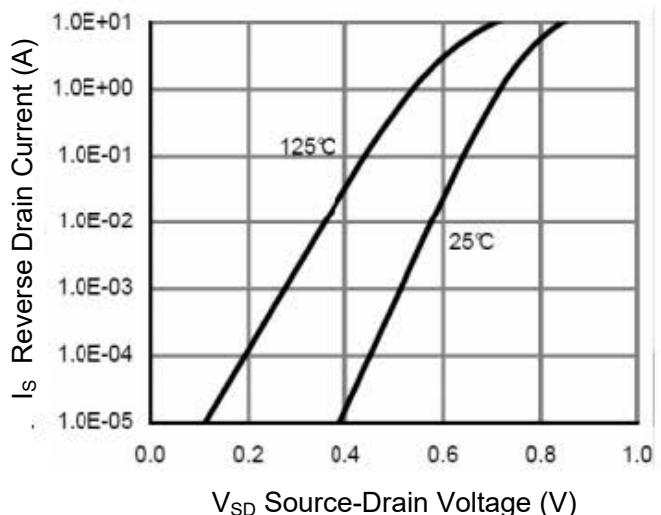
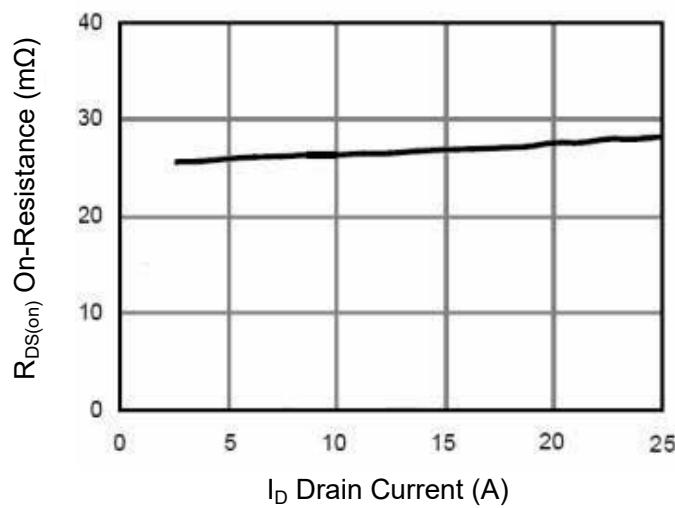
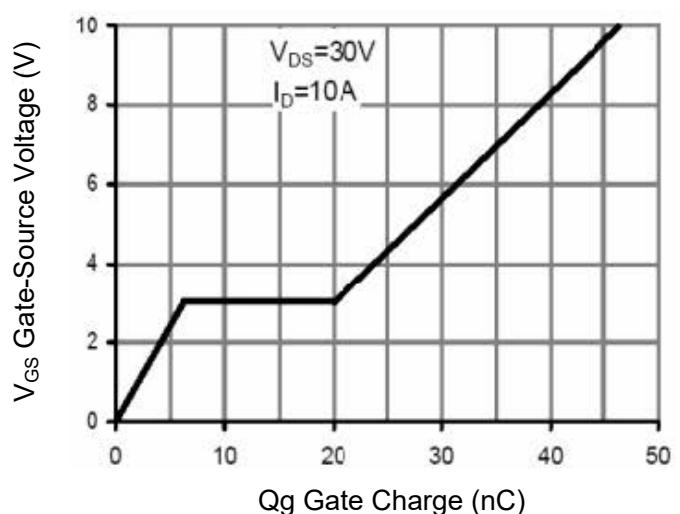
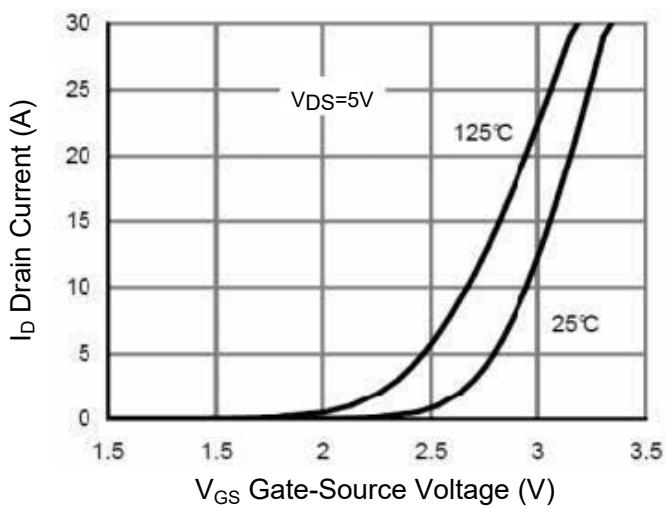
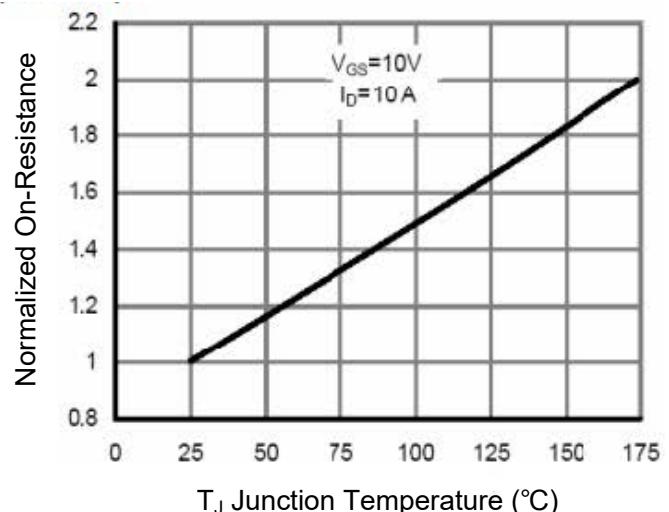
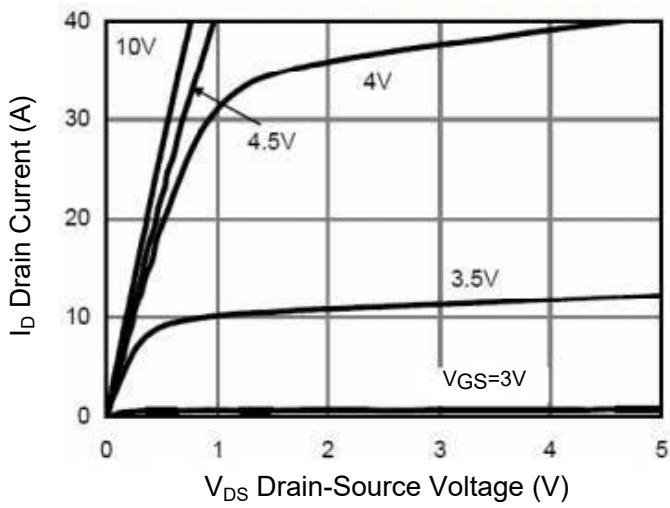
4. EAS condition: T<sub>j</sub>=25°C, V<sub>DD</sub>=30V, V<sub>G</sub>=10V, L=0.5mH, R<sub>g</sub>=25Ω.



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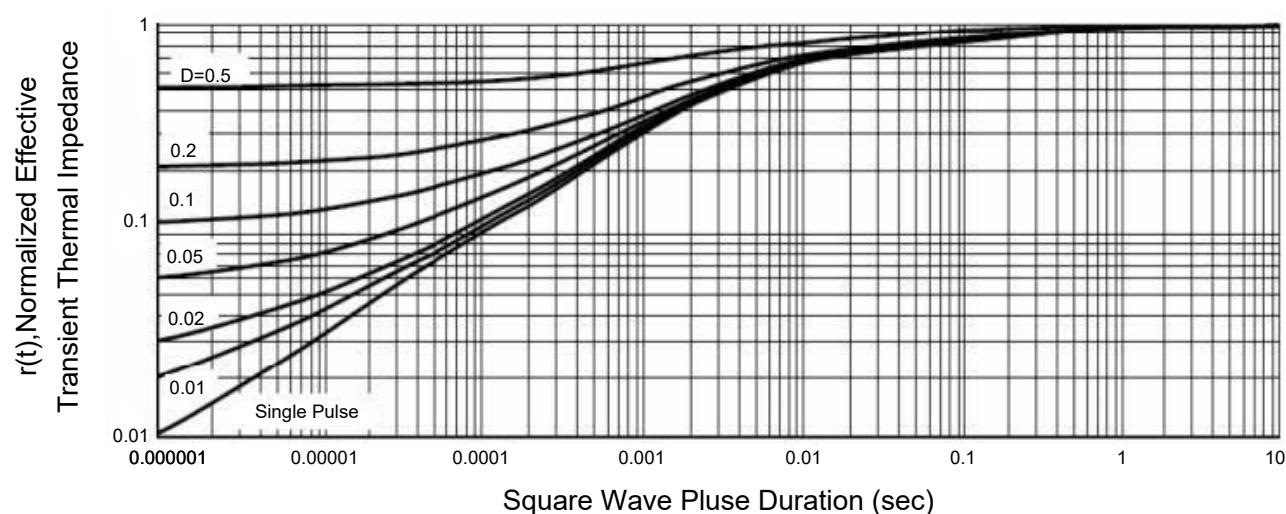
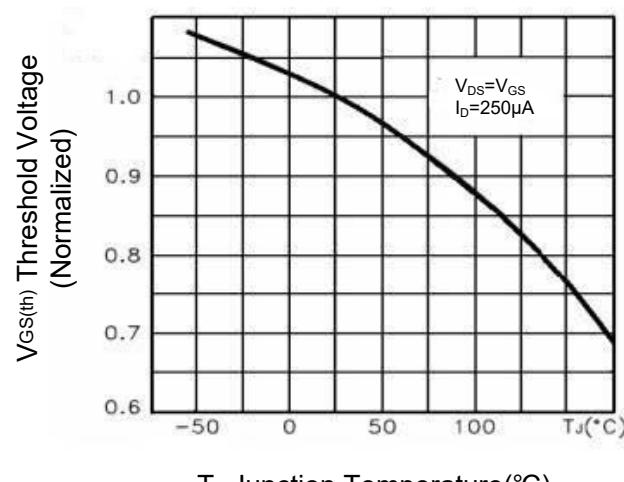
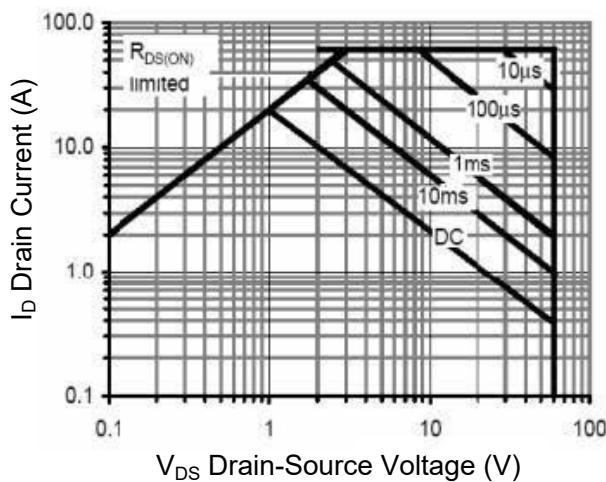
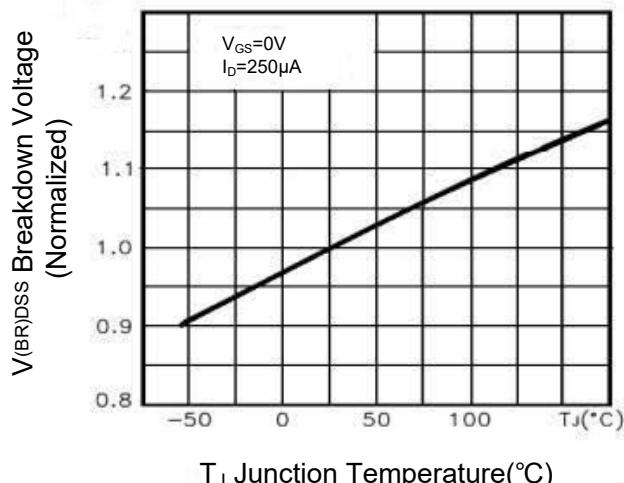
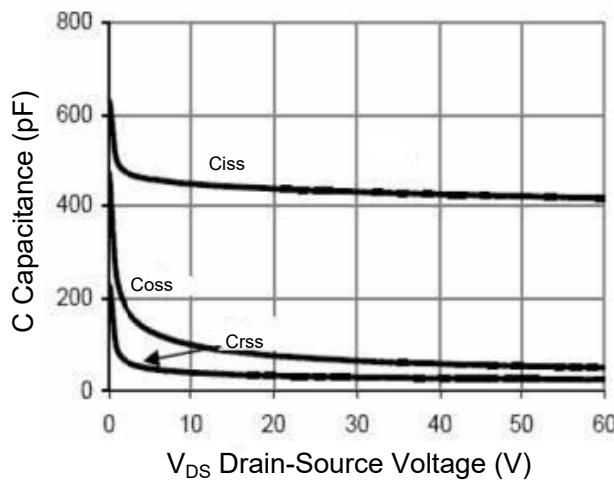
### Typical Characteristic Curves





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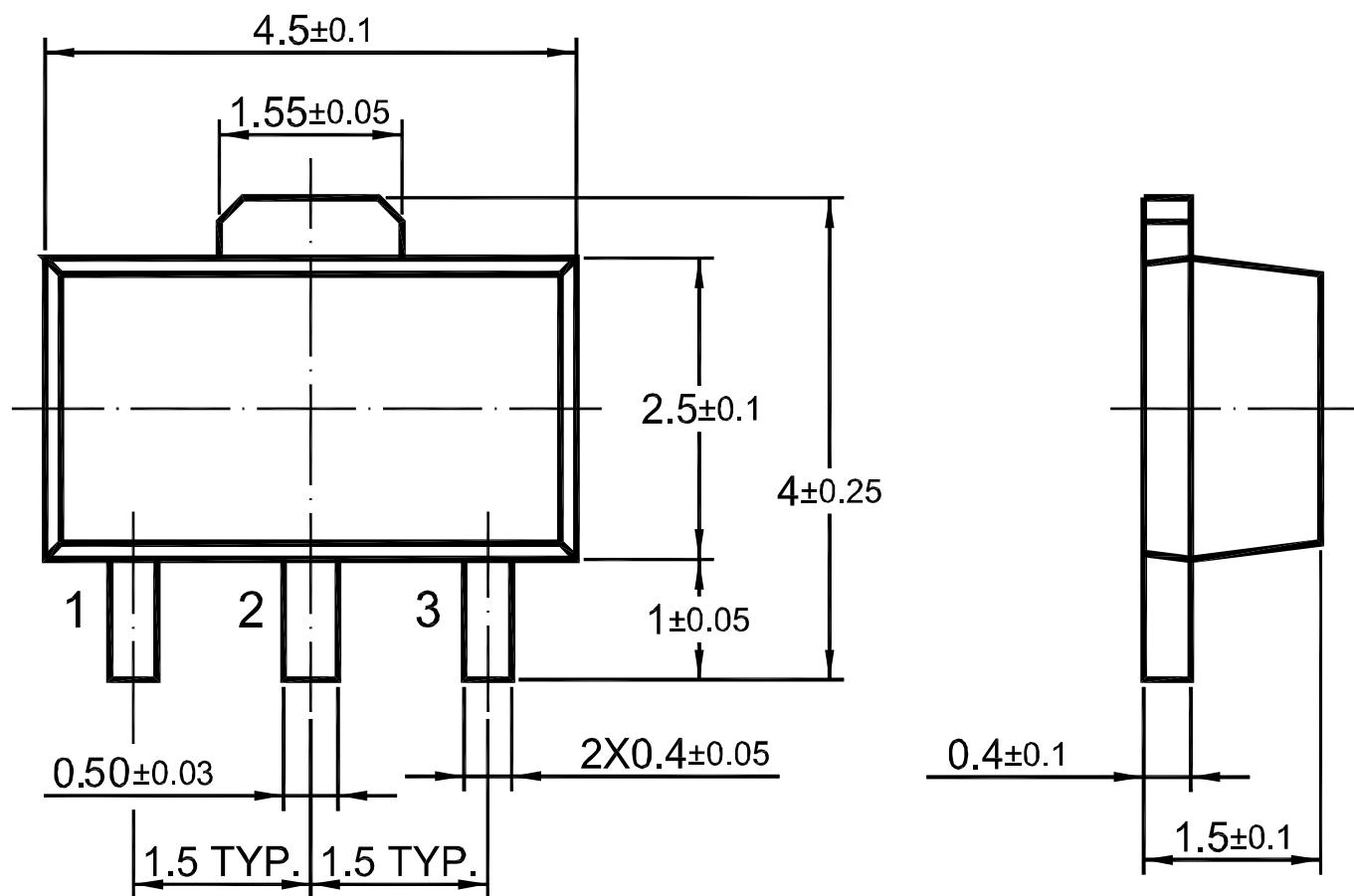




### Package Outline

SOT-89

Dimensions in mm



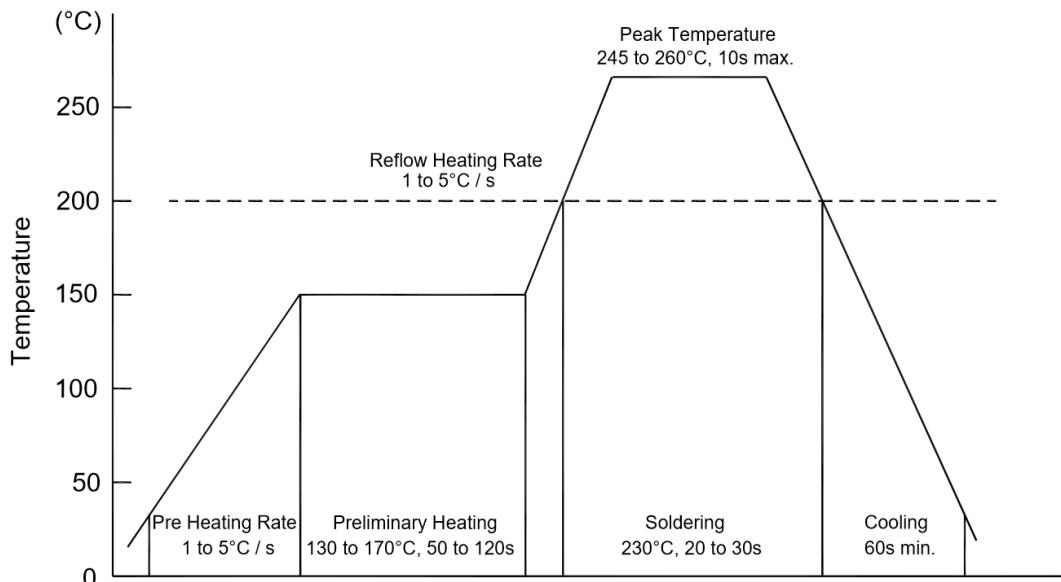
### Ordering Information

Device	Package	Shipping
PJM20N60SQ	SOT-89	1,000PCS/Reel&7inches
		3,000PCS/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: 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

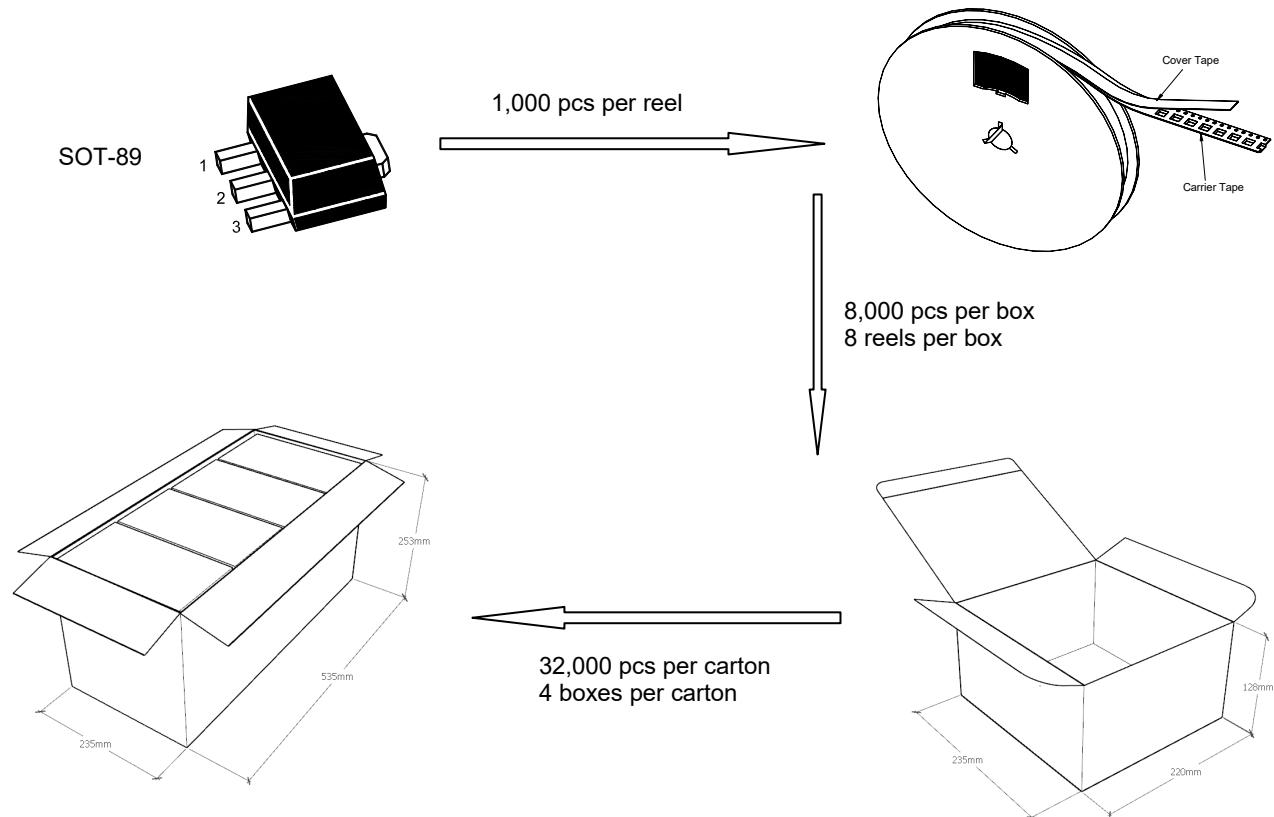


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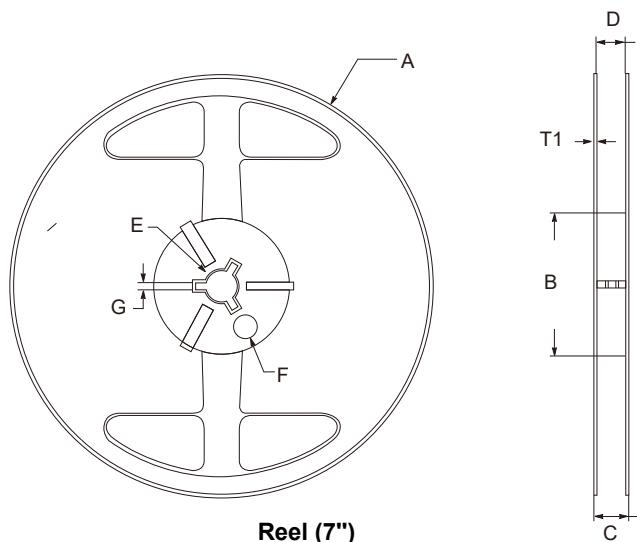
## N-Channel Enhancement Mode Power MOSFET

### Package Specifications

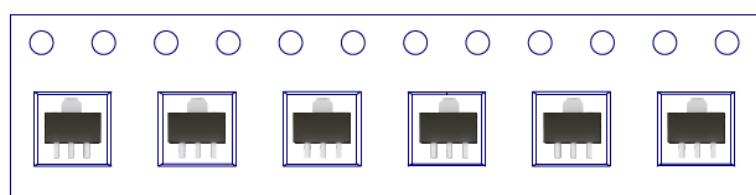
- The method of packaging (1,000PCS/Reel&7inches)



### ◆ Embossed tape and reel data



symbol	Value(unit:mm)
A	$\Phi 179 \pm 1$
B	60.5 $\pm 0.2$
C	15.3 $\pm 0.3$
D	12.5~13.7
E	$\Phi 13.5 \pm 0.2$
F	$\Phi 10.0 \pm 0.2$
G	2.7 $\pm 0.2$
T1	1.0 $\pm 0.2$



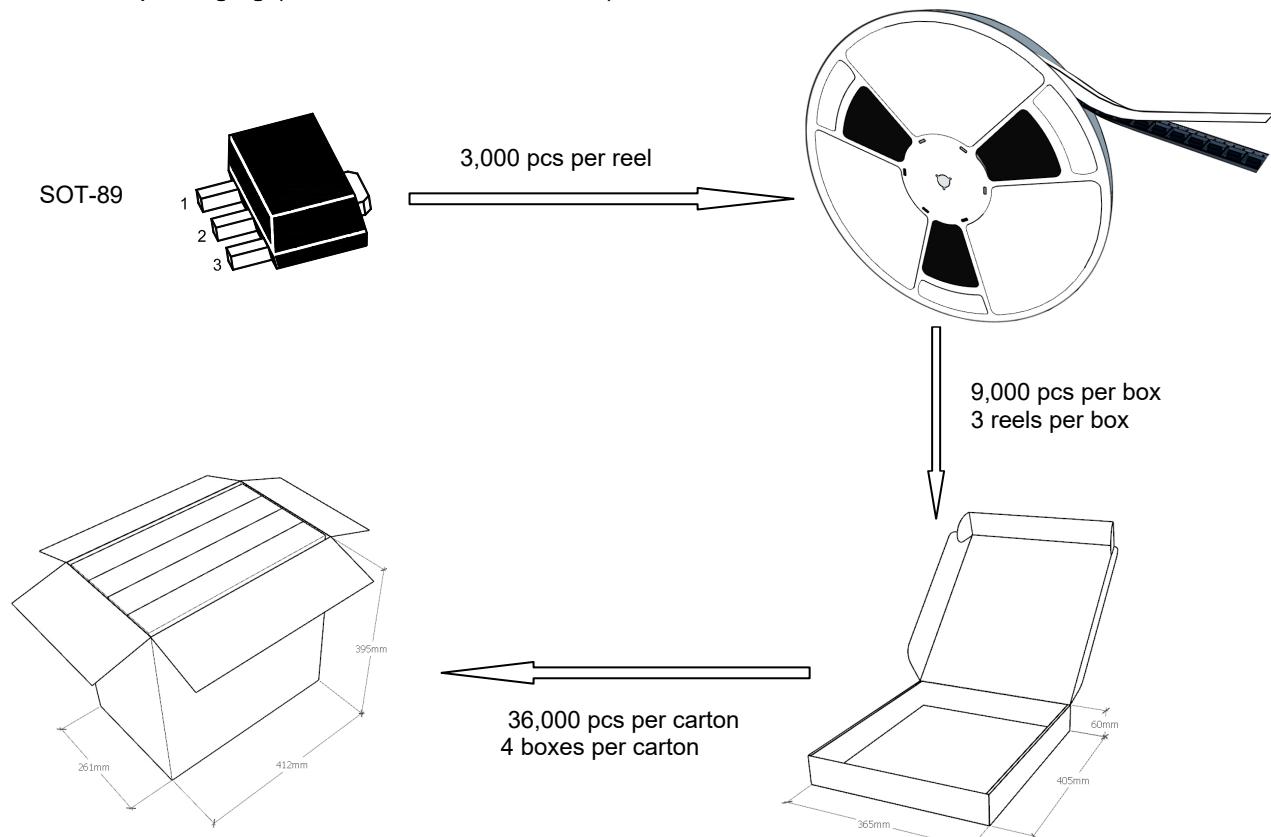


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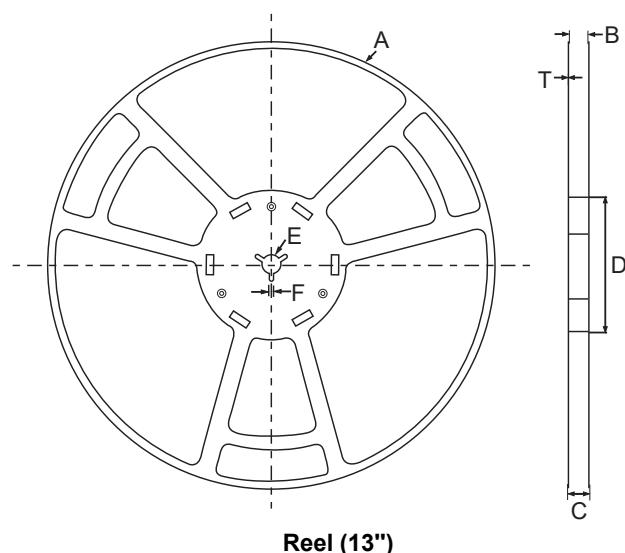
## N-Channel Enhancement Mode Power MOSFET

### Package Specifications

- The method of packaging (3,000PCS/Reel&13inches)



### ◆ Embossed tape and reel data



symbol	Value(unit:mm)
A	$\Phi 330 \pm 1$
B	$12.7 \pm 0.5$
C	$16.5 \pm 0.3$
D	$\Phi 99.5 \pm 0.5$
E	$\Phi 13.6 \pm 0.3$
F	$2.8 \pm 0.3$
T1	$1.9 \pm 0.2$

