



# PJM07P20SA

## P Enhancement Field Effect Transistor

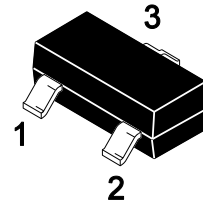
### Features

- $V_{DS}=-20V$ ,  $I_D=-7A$   
 $R_{DS(on)}=30m\Omega$  (Max.)@ $V_{GS}=-10V$
- High density cell design for ultra low  $R_{DS(ON)}$
- Low gate charge

### Applications

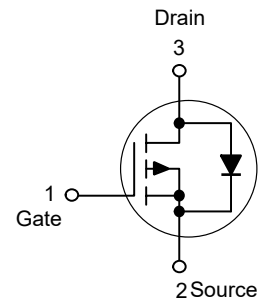
- Load Switch and in PWM Applications

SOT-23



1. Gate 2.Source 3.Drain

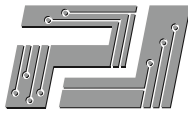
Schematic Diagram



### Absolute Maximum Ratings

Ratings at  $T_A=25^{\circ}C$  unless otherwise specified.

Parameter	Symbol	Value	Units
Drain-Source Voltage	$-V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current	$-I_D$	7	A
Power Dissipation	$P_D$	0.9	W
Junction and Storage Temperature Range	$T_J, T_{STG}$	150, -55 to 150	$^{\circ}C$
<b>Thermal Characteristics</b>			
Parameter	Symbol	Typ.	Units
Maximum Junction-to-Ambient <sup>Note1</sup>	$R_{\theta JA}$	139	$^{\circ}C/W$



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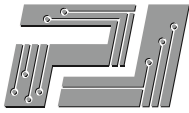
## P Enhancement Field Effect Transistor

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
<b>Static Characteristics</b>						
Drain-source breakdown voltage	-V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	20			V
Zero gate voltage drain current	-I <sub>DSS</sub>	V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V			1	μA
Gate-source leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V			±100	nA
Drain-source on-resistance <sup>Note2</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -4.1A		50	60	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3A		68	87	mΩ
Gate threshold voltage <sup>Note2</sup>	-V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	0.5	0.75	1.4	V
Forward transconductance <sup>Note2</sup>	g <sub>FS</sub>	V <sub>DS</sub> = -5V, I <sub>D</sub> = -4A	5.5			S
<b>Dynamic Characteristics</b>						
Input capacitance	C <sub>iSS</sub>	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1MHz		700		pF
Output capacitance	C <sub>oss</sub>			120		pF
Reverse transfer capacitance	C <sub>rSS</sub>			75		pF
<b>Switching Characteristics</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>GS</sub> = -10V, V <sub>DS</sub> = -15V, R <sub>L</sub> = 3.6Ω, R <sub>GEN</sub> = 3Ω		8.6		ns
Turn-on rise time	t <sub>r</sub>			5.0		ns
Turn-off delay time	t <sub>d(off)</sub>			28.2		ns
Turn-off fall time	t <sub>f</sub>			13.5		ns
<b>Source-Drain Diode Characteristics</b>						
Diode forward voltage	V <sub>SD</sub>	I <sub>S</sub> = -1A, V <sub>GS</sub> = 0V			-1	V

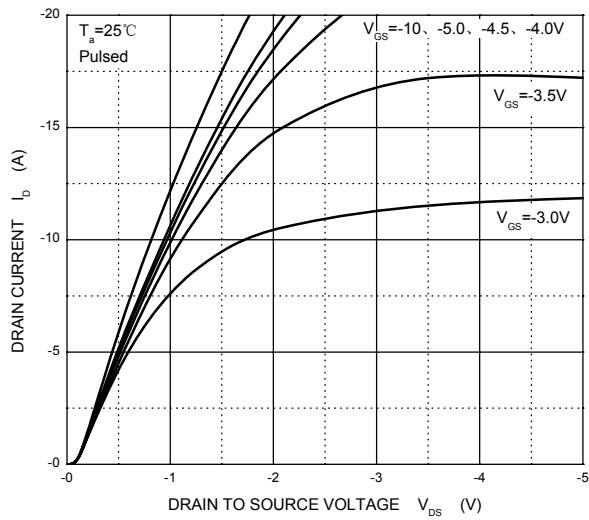
**Notes:**

1. Surface mounted on FR4 board, t ≤ 10 sec.
2. Pulse test: Pulse width ≤ 300μs, duty cycle ≤ 2%.

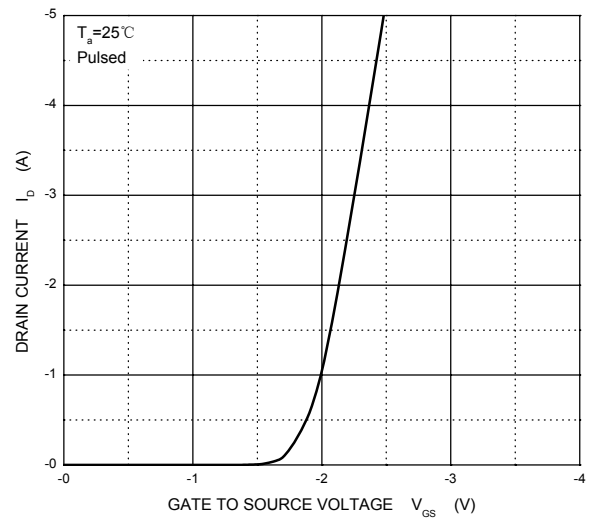


### Typical Curves

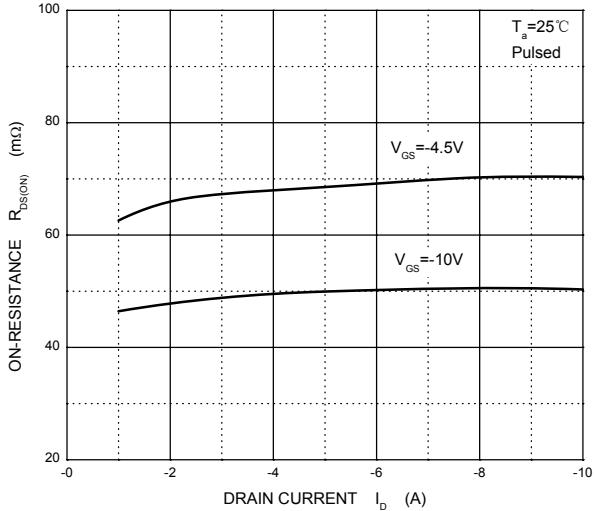
#### Output Characteristics



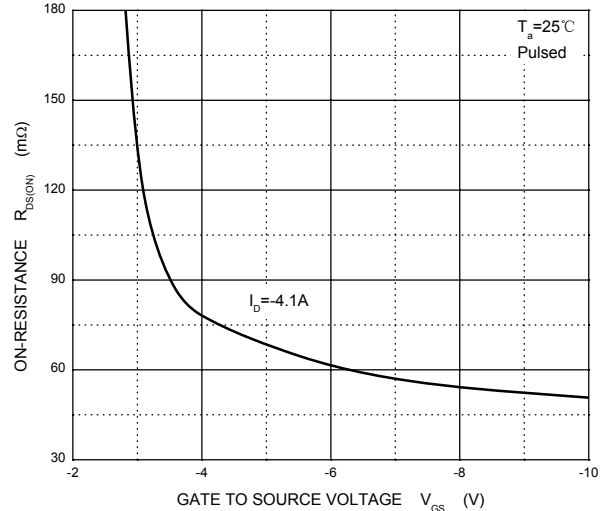
#### Transfer Characteristics



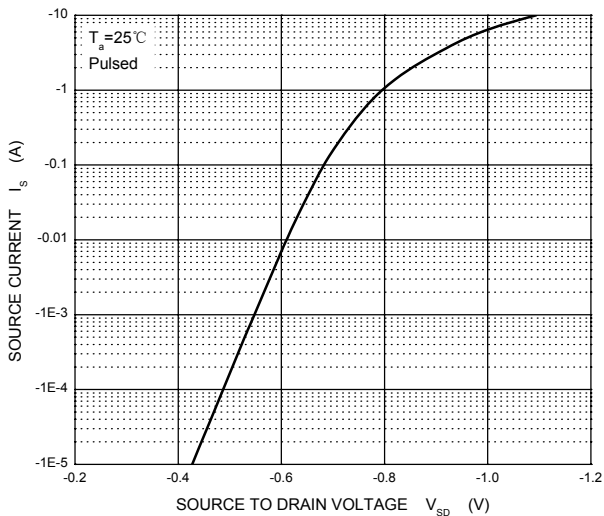
#### $R_{DS(ON)}$ — $I_D$



#### $R_{DS(ON)}$ — $V_{GS}$



#### $I_S$ — $V_{SD}$



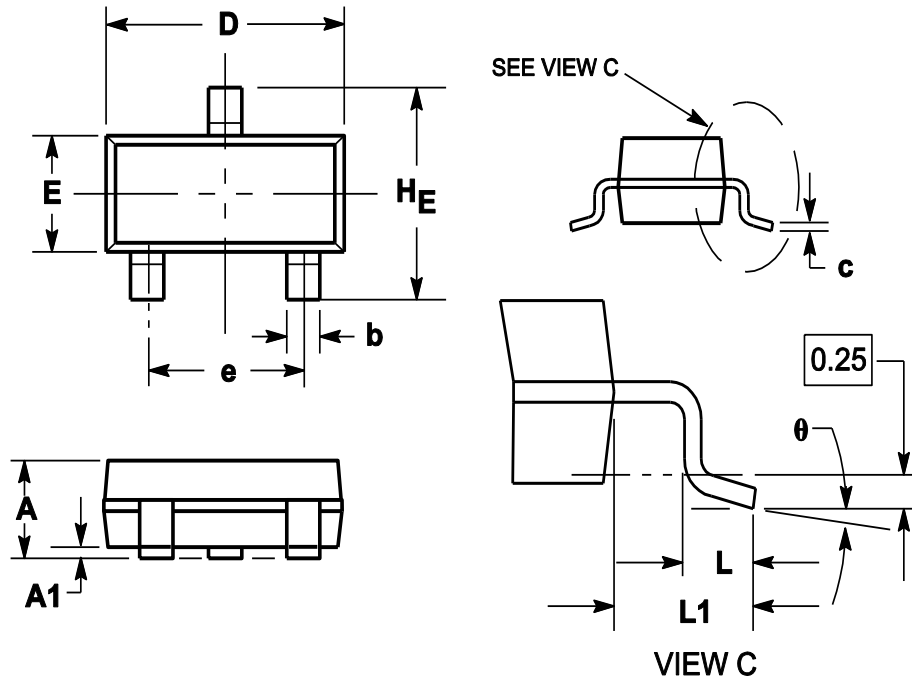


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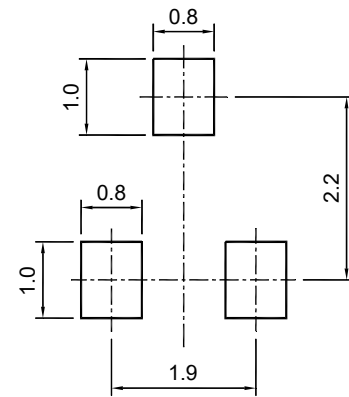
## P Enhancement Field Effect Transistor

### 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 (TO-236)

**Recommended soldering pad**

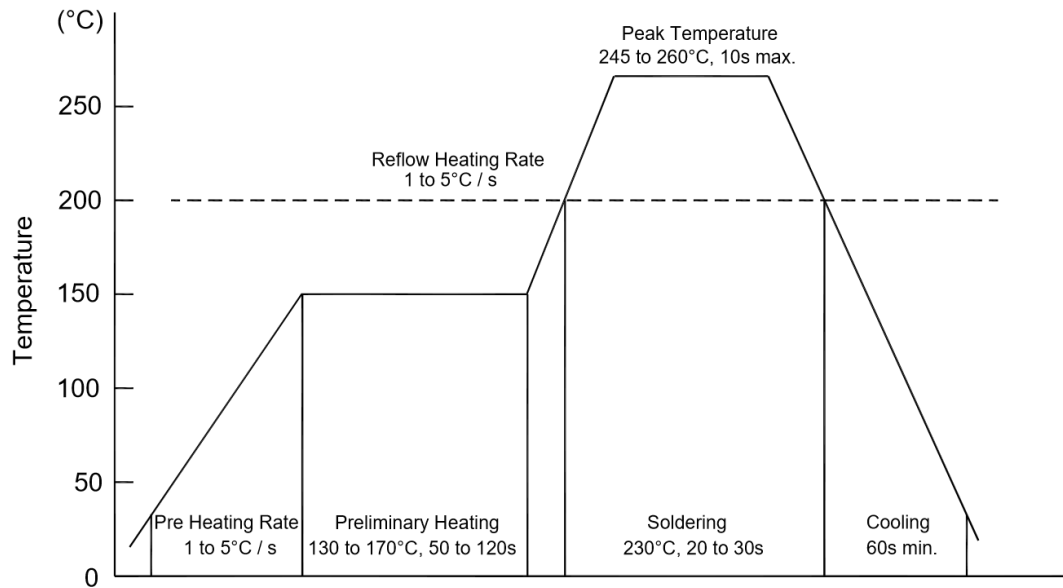
### Ordering Information

Device	Package	Shipping
PJM07P20SA	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:

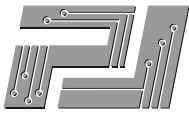
- Time length of peak temperature (longer)
- Time length of soldering (longer)
- Thickness of solder paste (thicker)

#### ◆ 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

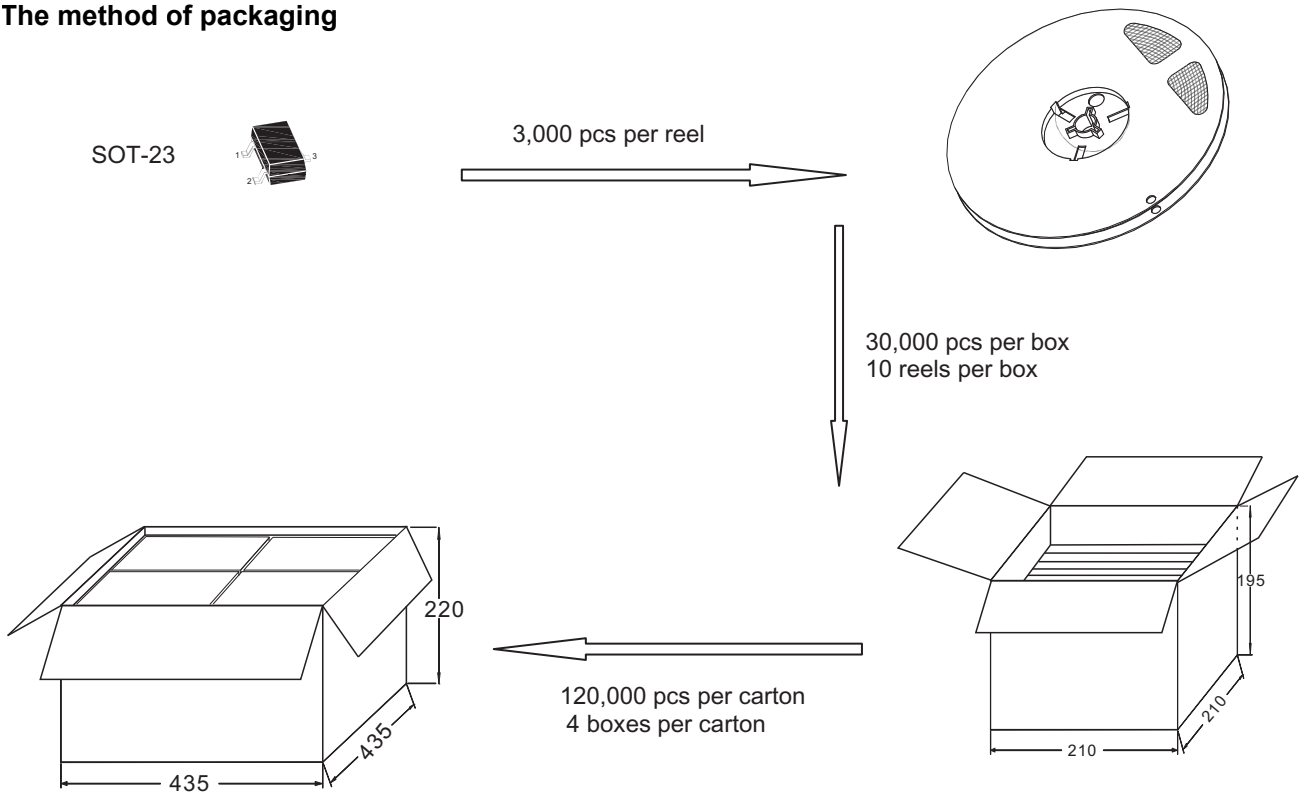


# PJM07P20SA

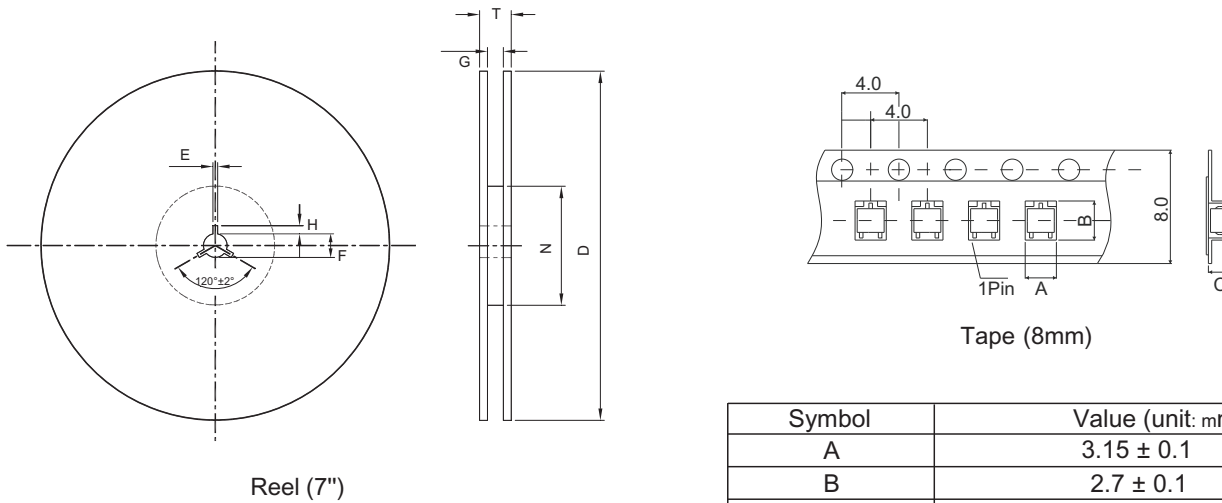
## P Enhancement Field Effect Transistor

### 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

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