



# PJW7N04

## 40V N-Channel Enhancement Mode MOSFET

Voltage

40 V

Current

6.5 A

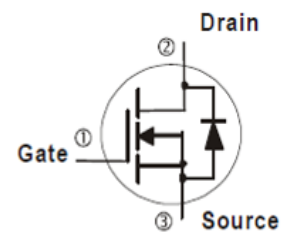
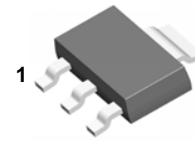
### Features

- $R_{DS(ON)}$ ,  $V_{GS}@10V$ ,  $I_D@5A < 42m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@4.5V$ ,  $I_D@4A < 51m\Omega$
- Advanced Trench Process Technology
- High density cell design for ultra low on-resistance
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### Mechanical Data

- Case : SOT-223 Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.043 ounces, 0.123 grams

SOT-223



### Maximum Ratings and Thermal Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNITS	
Drain-Source Voltage	$V_{DS}$	40	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current (Note 4)	$I_D$	$T_A=25^\circ\text{C}$	6.5	A
		$T_A=70^\circ\text{C}$	5	
Pulsed Drain Current (Note 1)	$I_{DM}$	26		
Power Dissipation	$P_D$	$T_A=25^\circ\text{C}$	3.1	W
		$T_A=70^\circ\text{C}$	2	
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~150	$^\circ\text{C}$	
Typical Thermal Resistance	$R_{\theta JA}$	40.3	$^\circ\text{C/W}$	
- Junction to Ambient (Note 4,5)				

- Limited only By Maximum Junction Temperature



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## Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.5	2.5	
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5A$	-	35	42	m $\Omega$
		$V_{GS}=4.5V, I_D=4A$	-	44	51	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=40V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>Dynamic</b> (Note 6)						
Total Gate Charge	$Q_g$	$V_{DS}=20V, I_D=4.3A,$ $V_{GS}=4.5V$ (Note 1,2)	-	4.8	-	nC
Gate-Source Charge	$Q_{gs}$		-	1.4	-	
Gate-Drain Charge	$Q_{gd}$		-	1.8	-	
Input Capacitance	$C_{iss}$	$V_{DS}=20V, V_{GS}=0V,$ $f=1\text{MHz}$	-	410	-	pF
Output Capacitance	$C_{oss}$		-	50	-	
Reverse Transfer Capacitance	$C_{rss}$		-	30	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=20V, I_D=3.5A,$ $V_{GS}=10V,$ $R_G=1\Omega$ (Note 1,2)	-	4	-	ns
Turn-On Rise Time	$t_r$		-	30	-	
Turn-Off Delay Time	$t_{d(off)}$		-	15	-	
Turn-Off Fall Time	$t_f$		-	8	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	$I_S$	---	-	-	6.5	A
Diode Forward Voltage	$V_{SD}$	$I_S=1A, V_{GS}=0V$	-	0.78	1.2	V

**NOTES :**

1. Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .
2. Essentially independent of operating temperature typical characteristics.
3. Repetitive rating, pulse width limited by junction temperature  $T_{J(MAX)}=150^\circ\text{C}$ . Ratings are based on low frequency and duty cycles to keep initial  $T_J=25^\circ\text{C}$ .
4. The maximum current rating is package limited.
5.  $R_{\theta JA}$  is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. Mounted on a 1 inch<sup>2</sup> with 2oz.square pad of copper.
6. Guaranteed by design, not subject to production testing.



# PJW7N04

## TYPICAL CHARACTERISTIC CURVES

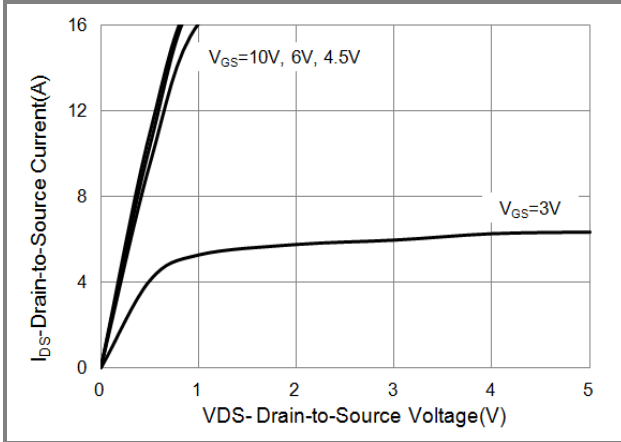


Fig.1 Output Characteristics

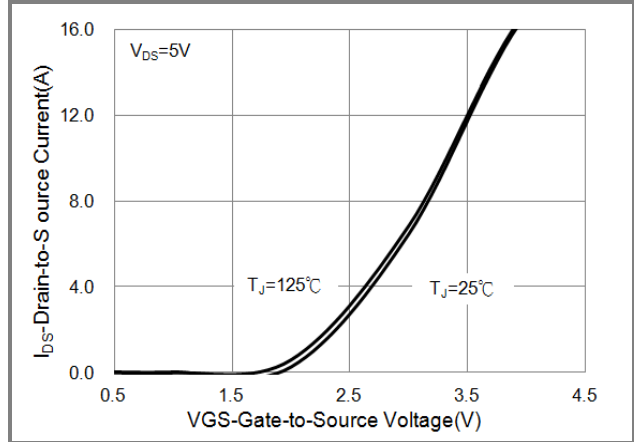


Fig.2 Transfer Characteristics

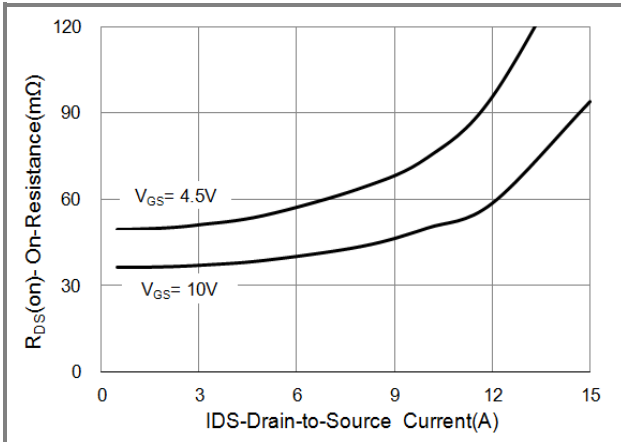


Fig.3 On-Resistance vs. Drain Current

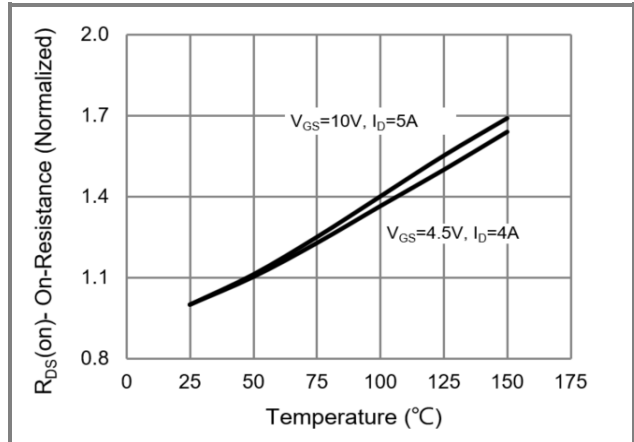


Fig.4 On-Resistance vs. Junction temperature

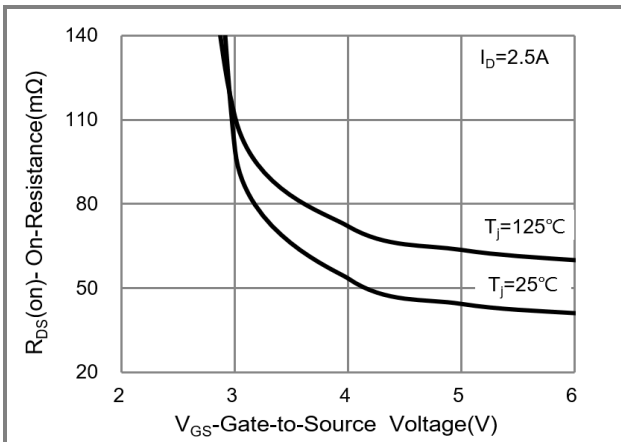


Fig.5 On-Resistance Variation with  $V_{GS}$

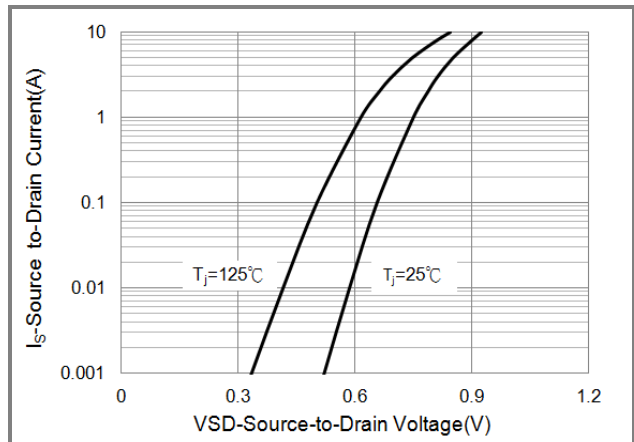


Fig.6 Source-Drain Diode Forward Voltage



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## TYPICAL CHARACTERISTIC CURVES

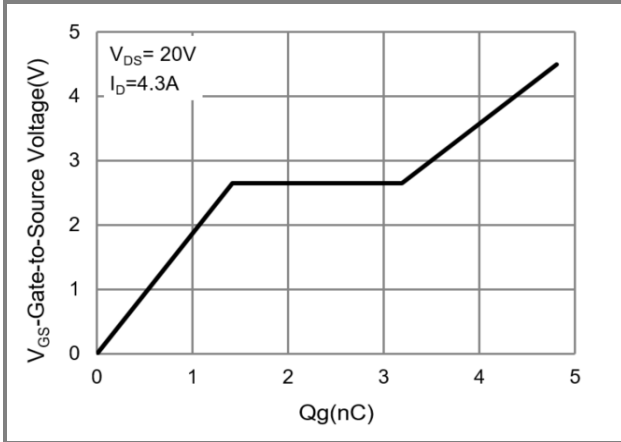


Fig.7 Gate-Charge Characteristics

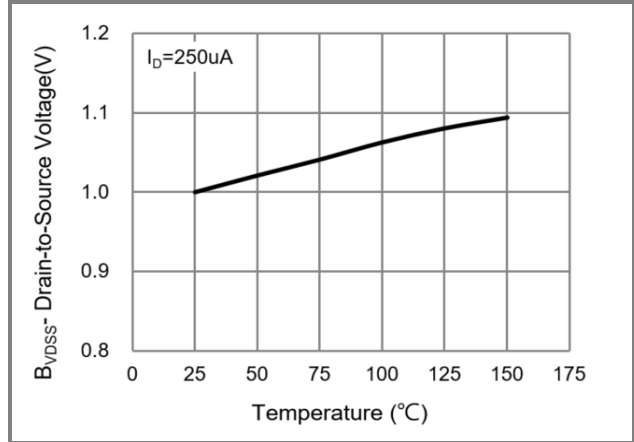


Fig.8 Breakdown Voltage Variation vs. Temperature

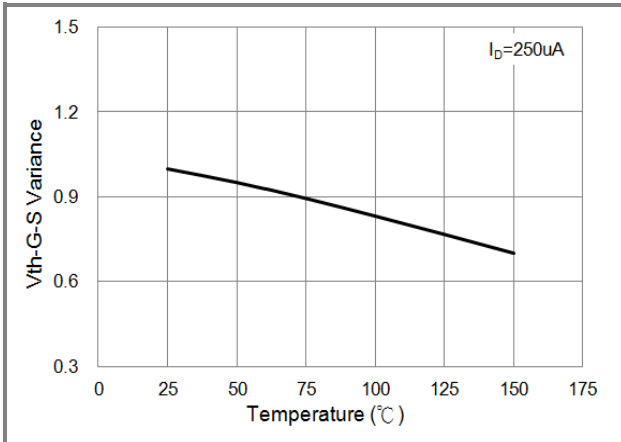


Fig.9 Threshold Voltage Variation with Temperature

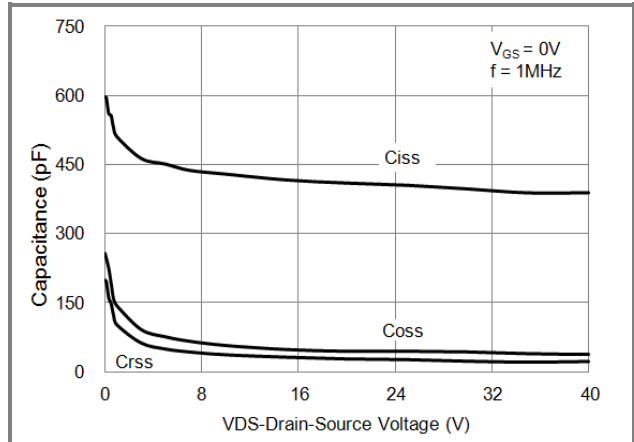


Fig.10 Capacitance vs. Drain-Source Voltage

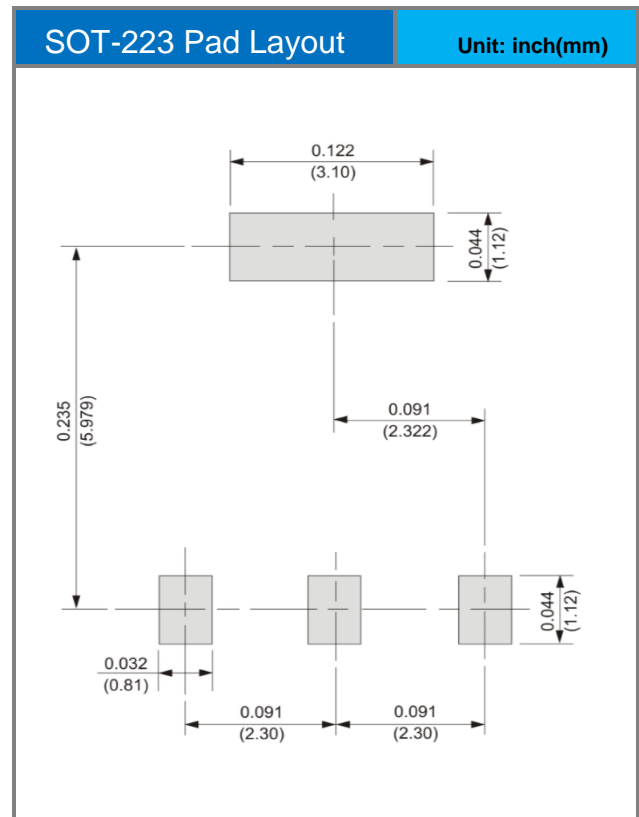
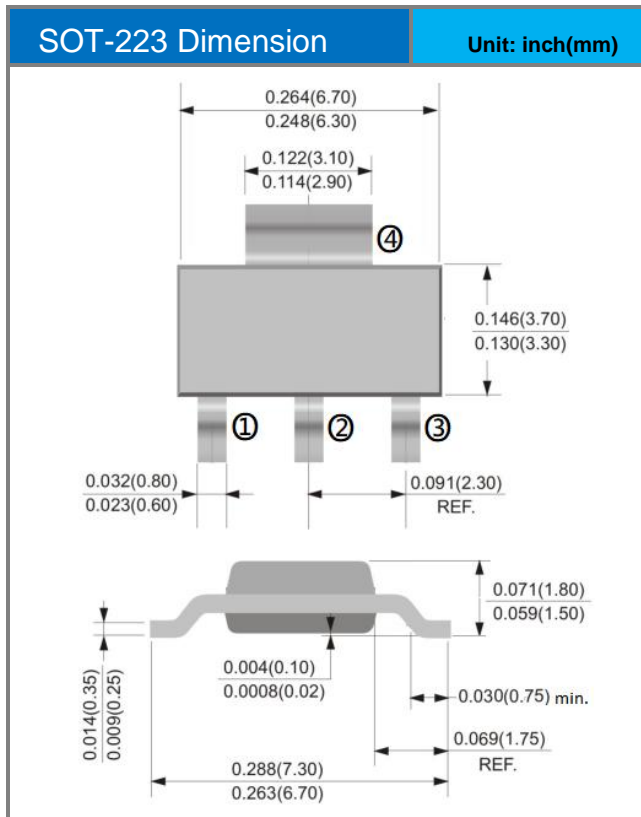


# PJW7N04

## Part No Packing Code Version

Part No Packing Code	Package Type	Packing Type	Marking	Version
PJW7N04_R2_00001	SOT-223	2,500pcs / 13" reel	W7N04	Halogen free

## Packaging Information & Mounting Pad Layout





## PJW7N04

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