

# PJW5N10

## 100V N-Channel Enhancement Mode MOSFET

<b>Voltage</b>	<b>100 V</b>	<b>Current</b>	<b>5 A</b>
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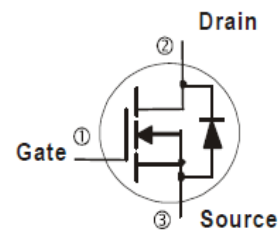
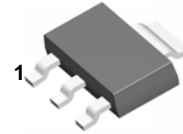
### Features

- $R_{DS(ON)}$ ,  $V_{GS}@10V, I_D@2.5A < 130m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@6V, I_D@1A < 135m\Omega$
- Low On-Resistance
- Low input capacitance
- 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 : 0.123grams
- Marking : W5N10

SOT-223



### Maximum Ratings and Thermal Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V <sub>DS</sub>	100	V
Gate-Source Voltage		V <sub>GS</sub>	+20	V
Continuous Drain Current	T <sub>C</sub> =25°C	I <sub>D</sub>	5	A
	T <sub>C</sub> =100°C		3.1	
Pulsed Drain Current <sup>(Note 1)</sup>	T <sub>C</sub> =25°C	I <sub>DM</sub>	10	
Power Dissipation	T <sub>C</sub> =25°C	P <sub>D</sub>	8	W
	T <sub>C</sub> =100°C		3.2	
Continuous Drain Current	T <sub>A</sub> =25°C	I <sub>D</sub>	3.1	A
	T <sub>A</sub> =70°C		2.5	A
Power Dissipation	T <sub>A</sub> =25°C	P <sub>D</sub>	3.1	W
Power Dissipation	T <sub>A</sub> =70°C		2	
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55~150	°C
Typical Thermal resistance <sup>(Note 4,5)</sup>	Junction to Case	R <sub>θJC</sub>	15.6	°C/W
	Junction to Ambient	R <sub>θJA</sub>	40.3	

- Limited only By Maximum Junction Temperature

# PJW5N10

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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
<b>Static</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	100	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	2.0	2.76	3.5	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =2.5A	-	110	130	mΩ
		V <sub>GS</sub> =6V, I <sub>D</sub> =1A	-	120	135	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V	-	0.01	1.0	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	±20	±100	nA
<b>Dynamic</b> <sup>(Note 6)</sup>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =37.5V, I <sub>D</sub> =5A, V <sub>GS</sub> =10V <sup>(Note 2,3)</sup>	-	12	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	3.1	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	2.2	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1.0MHZ	-	707	-	pF
Output Capacitance	C <sub>oss</sub>		-	40	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	16	-	
Turn-On Delay Time	td(on)	V <sub>DS</sub> =37.5V, RL=7.5Ω, V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω <sup>(Note 2,3)</sup>	-	6	-	ns
Turn-On Rise Time	tr		-	27	-	
Turn-Off Delay Time	td(off)		-	15	-	
Turn-Off Fall Time	tf		-	7	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>	---	-	-	5	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V	-	0.78	1	V

**NOTES :**

1. Pulse width ≤ 300us, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature typical characteristics.
3. Repetitive rating, pulse width limited by junction temperature T<sub>J</sub>(MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initial T<sub>J</sub> = 25°C.
4. The maximum current rating is package limited.
5. R<sub>θJA</sub> 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.

# PJW5N10

## TYPICAL CHARACTERISTIC CURVES

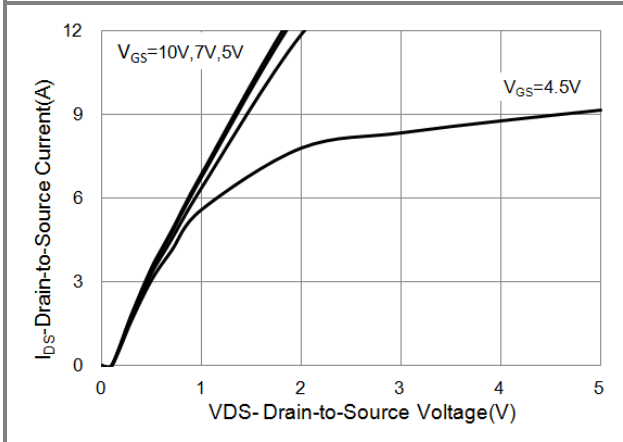


Fig.1 Output Characteristics

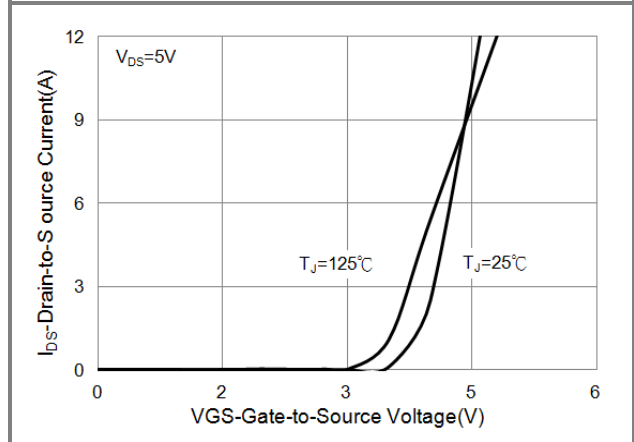


Fig.2 Transfer Characteristics

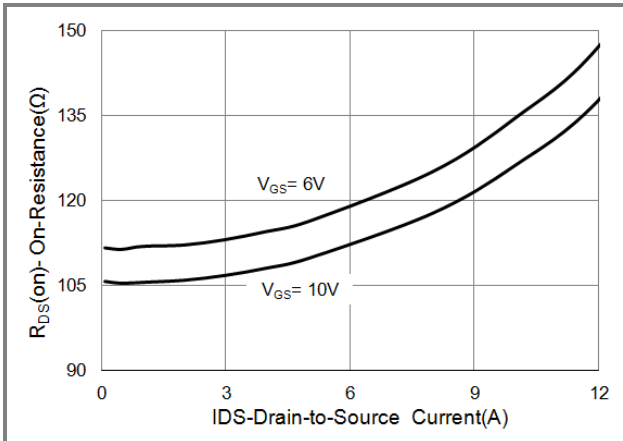


Fig.3 On-Resistance vs. Drain Current

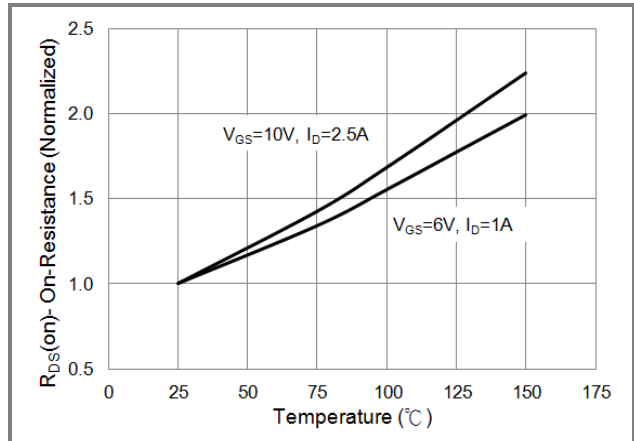


Fig.4 On-Resistance vs. Junction temperature

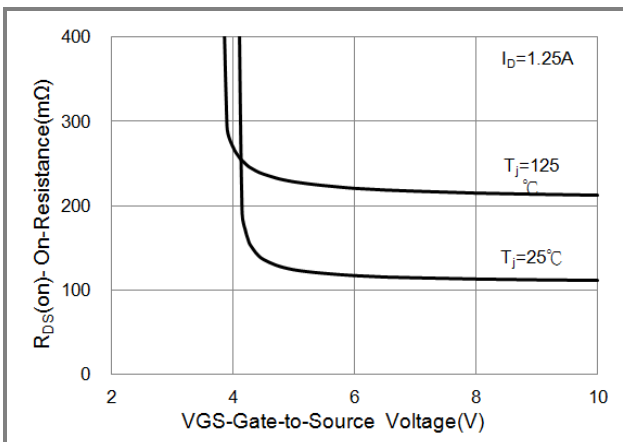


Fig.5 On-Resistance Variation with VGS.

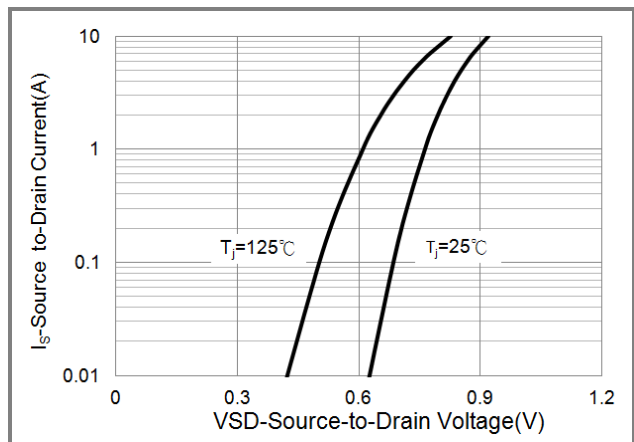


Fig.6 Source-Drain Diode Forward Voltage

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## TYPICAL CHARACTERISTIC CURVES

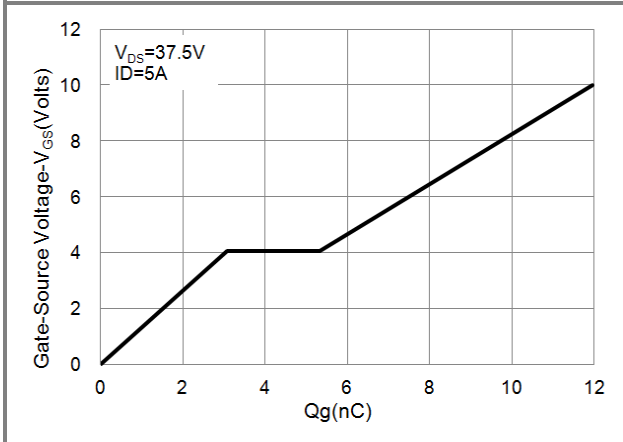


Fig.7 Gate-Charge Characteristics

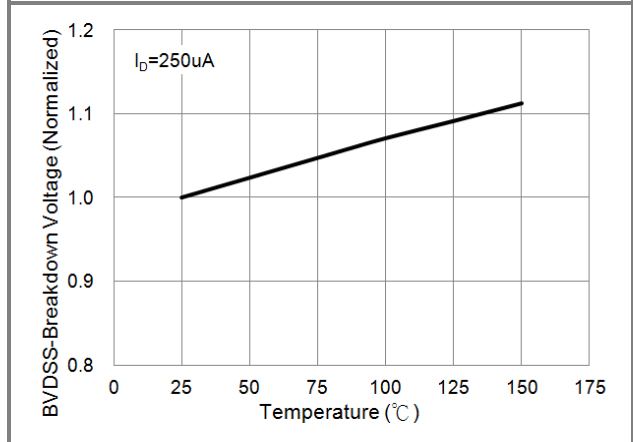


Fig.8 Breakdown Voltage Variation vs. Temperature

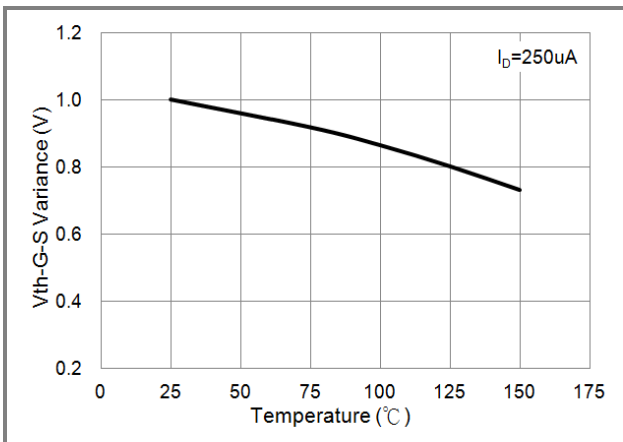


Fig.9 Threshold Voltage Variation with Temperature

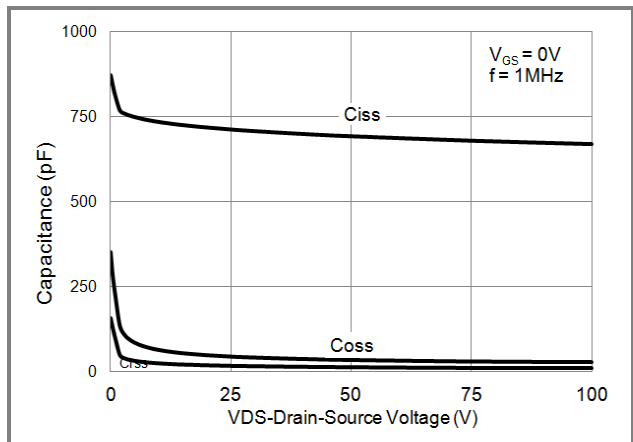


Fig.10 Capacitance vs. Drain-Source Voltage

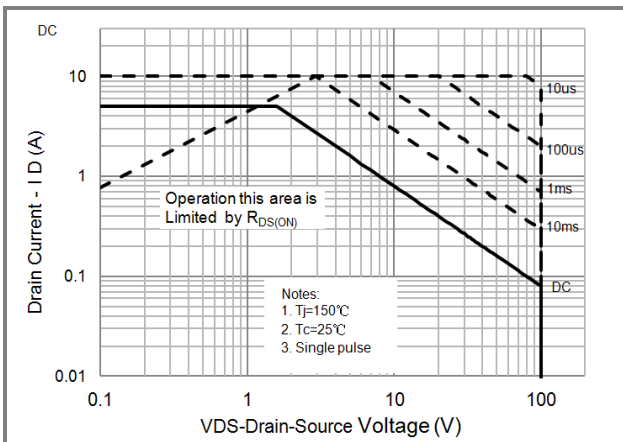


Fig.11 Maximum Safe Operating Area

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## TYPICAL CHARACTERISTIC CURVES

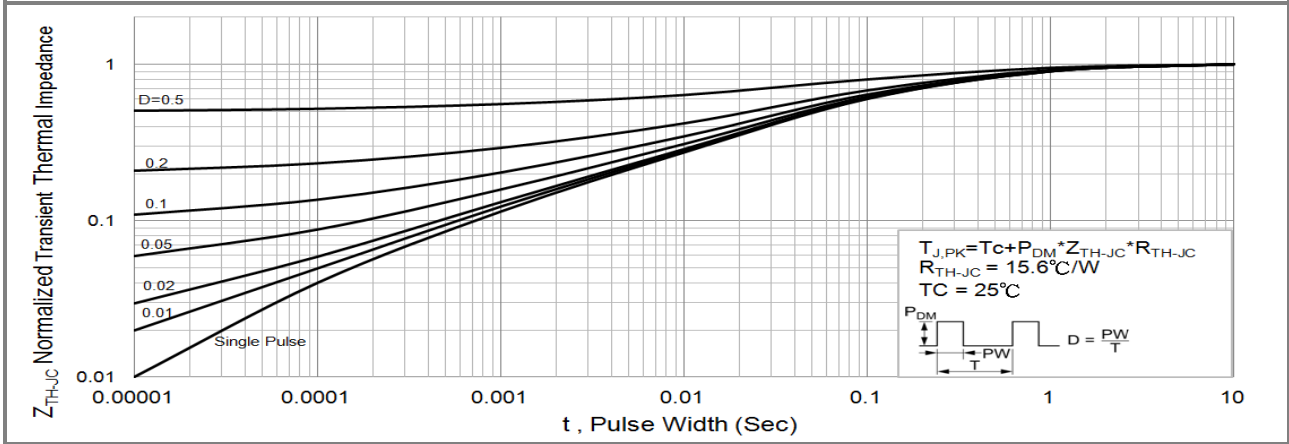


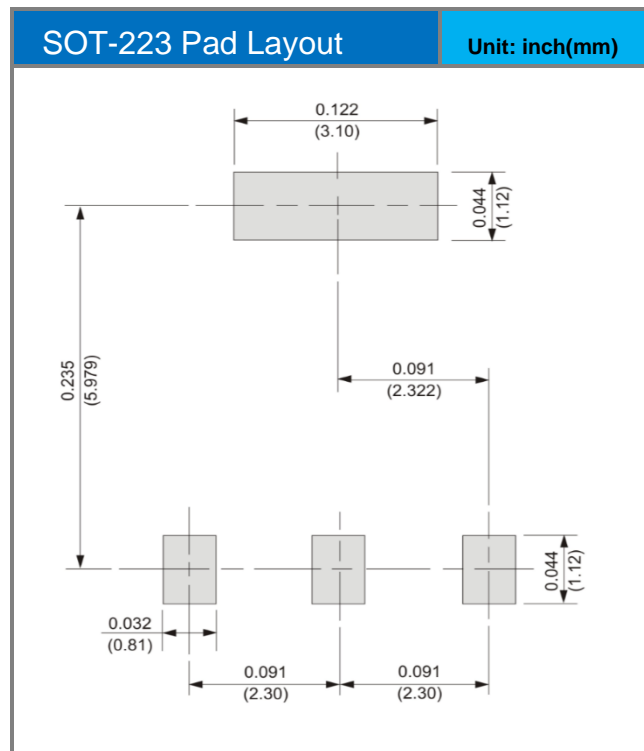
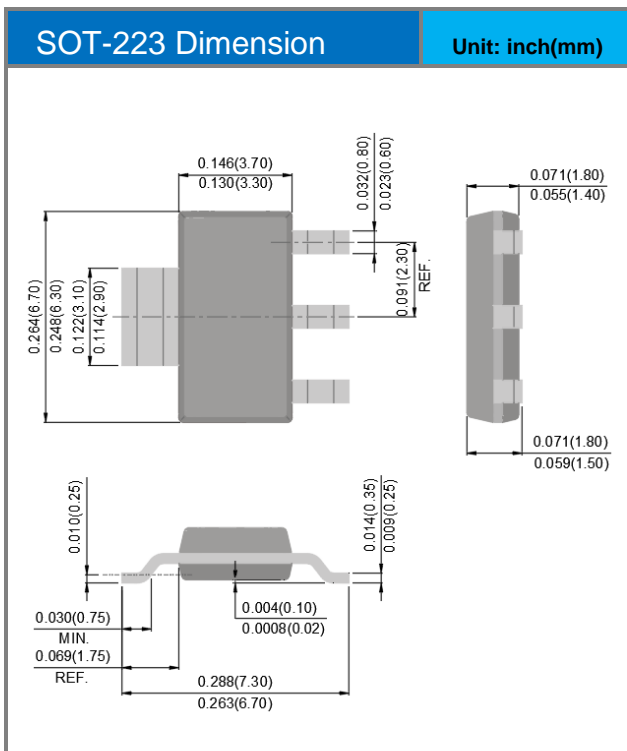
Fig.12 Normalized Transient Thermal Impedance vs. Pulse Width

# PJW5N10

## Product and Packing Information

Part No.	Package Type	Packing type	Marking
PJW5N10	SOT-223	2,500pcs / 13" reel	W5N10

## Packaging Information & Mounting Pad Layout



## PJW5N10

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