

# PJS6446-AU

## 40V N-Channel Enhancement Mode MOSFET

Voltage	40 V	Current	5.2 A
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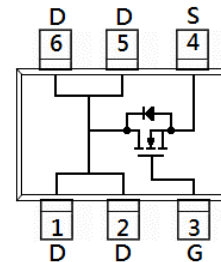
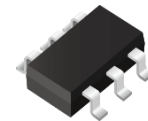
### Features

- $R_{DS(ON)}$ ,  $V_{GS}@10V$ ,  $I_D@5.2A < 42m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@4.5V$ ,  $I_D@2A < 51m\Omega$
- High switching speed
- Low gate charge
- Low reverse transfer capacitance
- AEC-Q101 qualified
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### Mechanical Data

- Case : SOT-23 6L-1 Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.0005 ounces, 0.0142 grams

SOT-23 6L-1



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

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DS}$	40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current <sup>(Note 4)</sup>	$I_D$	$T_A=25^\circ\text{C}$	5.2
		$T_A=70^\circ\text{C}$	4.2
Pulsed Drain Current <sup>(Note 1)</sup>	$I_{DM}$	20	A
Power Dissipation	$P_D$	$T_A=25^\circ\text{C}$	2
		Derate above $25^\circ\text{C}$	16
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~150	$^\circ\text{C}$
Typical Thermal Resistance	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
- Junction to Ambient <sup>(Note 5)</sup>			

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

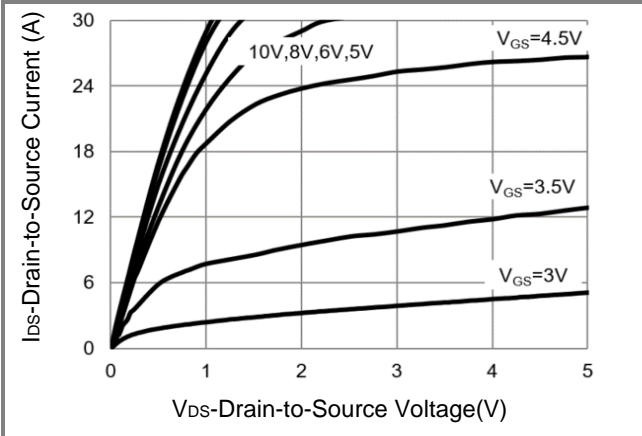
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.8	2.5	
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5.2A$	-	27	42	m $\Omega$
		$V_{GS}=4.5V, I_D=2A$	-	35	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> <sup>(Note 6)</sup>						
Total Gate Charge	$Q_g$	$V_{DS}=20V, I_D=5A,$ $V_{GS}=4.5V$ <sup>(Note 2,3)</sup>	-	4.4	-	nC
Gate-Source Charge	$Q_{gs}$		-	1.3	-	
Gate-Drain Charge	$Q_{gd}$		-	1.7	-	
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V,$ $f=1\text{MHZ}$	-	425	-	pF
Output Capacitance	$C_{oss}$		-	48	-	
Reverse Transfer Capacitance	$C_{rss}$		-	36	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=20V, I_D=1A,$ $V_{GS}=4.5V, R_G=25\Omega$ <sup>(Note 2,3)</sup>	-	9.4	-	ns
Turn-On Rise Time	$t_r$		-	29	-	
Turn-Off Delay Time	$t_{d(off)}$		-	21	-	
Turn-Off Fall Time	$t_f$		-	29	-	
<b>Drain-Source Diode</b>						
Diode Forward Current	$I_S$	$T_A=25^\circ\text{C}$	-	-	5.2	A
Diode Forward Voltage	$V_{SD}$	$I_S=1A, V_{GS}=0V$	-	0.74	1.2	V

Notes :

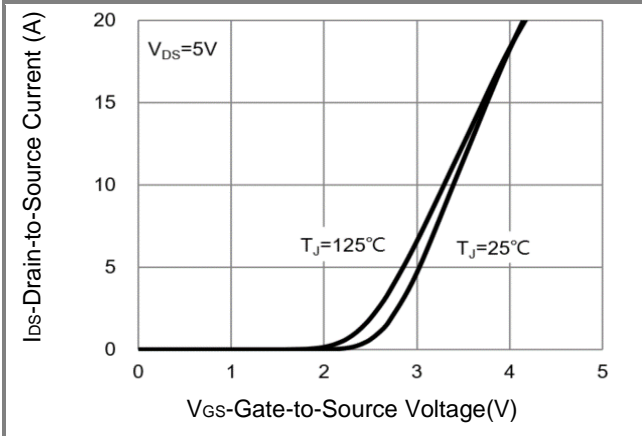
- Pulse width < 300 $\mu s$ , Duty cycle < 2%.
- Essentially independent of operating temperature typical characteristics.
- Repetitive rating, pulse width limited by junction temperature  $T_J(MAX)=150^\circ\text{C}$ . Ratings are based on low frequency and duty cycles to keep initial  $T_J=25^\circ\text{C}$ .
- The maximum current rating is package limited.
- $R_{\theta JA}$  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.
- Guaranteed by design, not subject to production testing.

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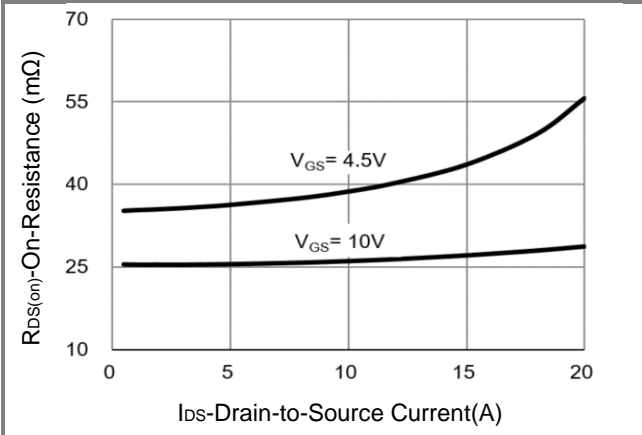
## TYPICAL CHARACTERISTIC CURVES



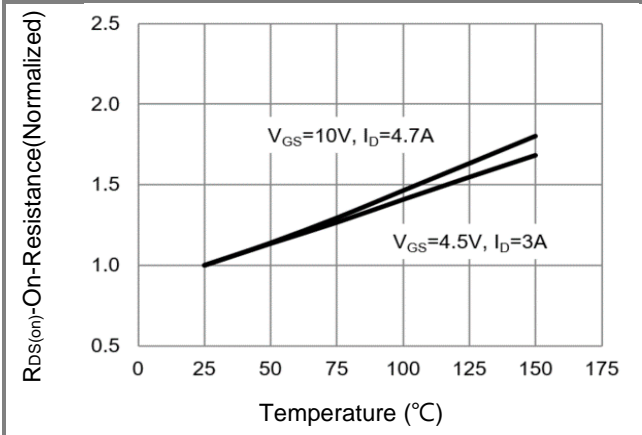
**Fig.1 Output Characteristics**



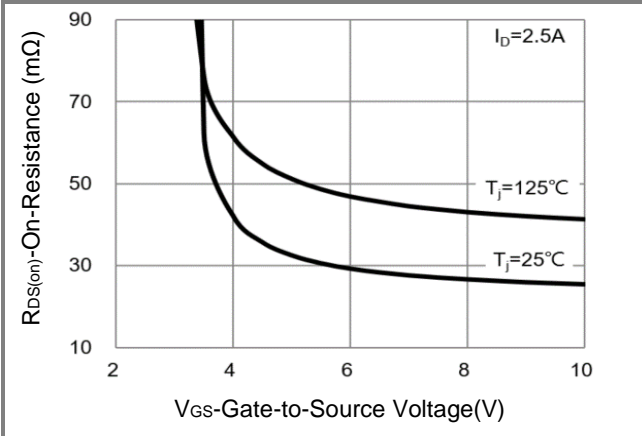
**Fig.2 Transfer Characteristics**



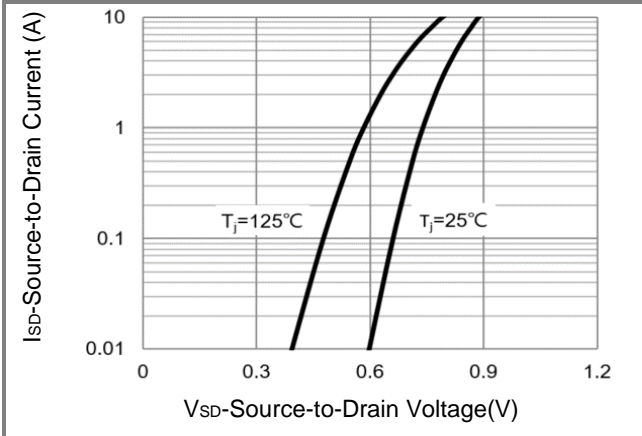
**Fig.3 On-Resistance vs. Drain Current**



**Fig.4 On-Resistance vs. Junction temperature**



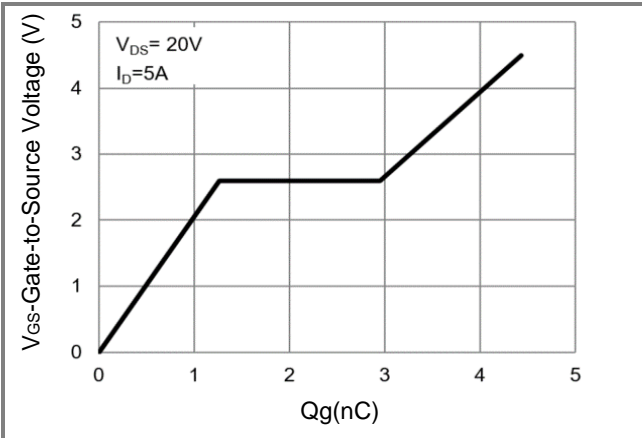
**Fig.5 On-Resistance Variation with VGS**



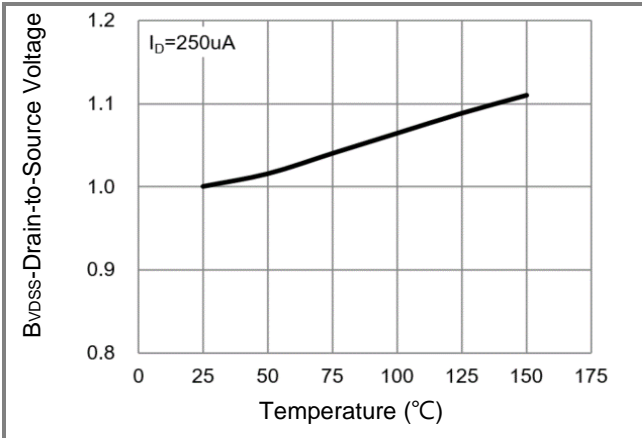
**Fig.6 Body Diode Characteristic**

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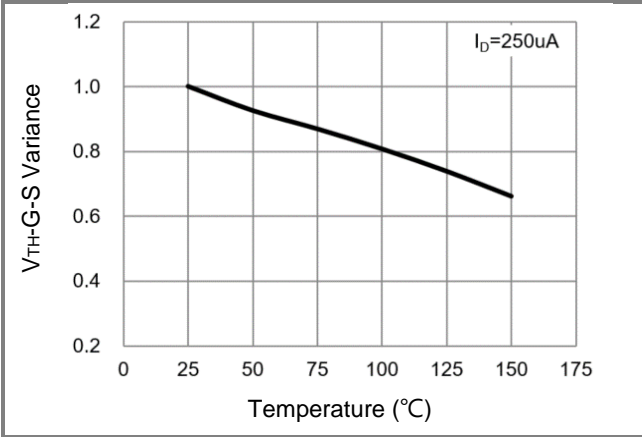
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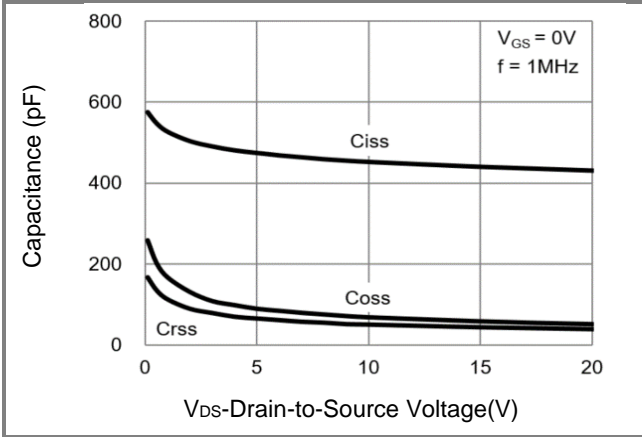
**Fig.7 Gate-Charge Characteristics**



**Fig.8 Breakdown Voltage Variation vs. Temperature**



**Fig.9 Threshold Voltage Variation with Temperature**



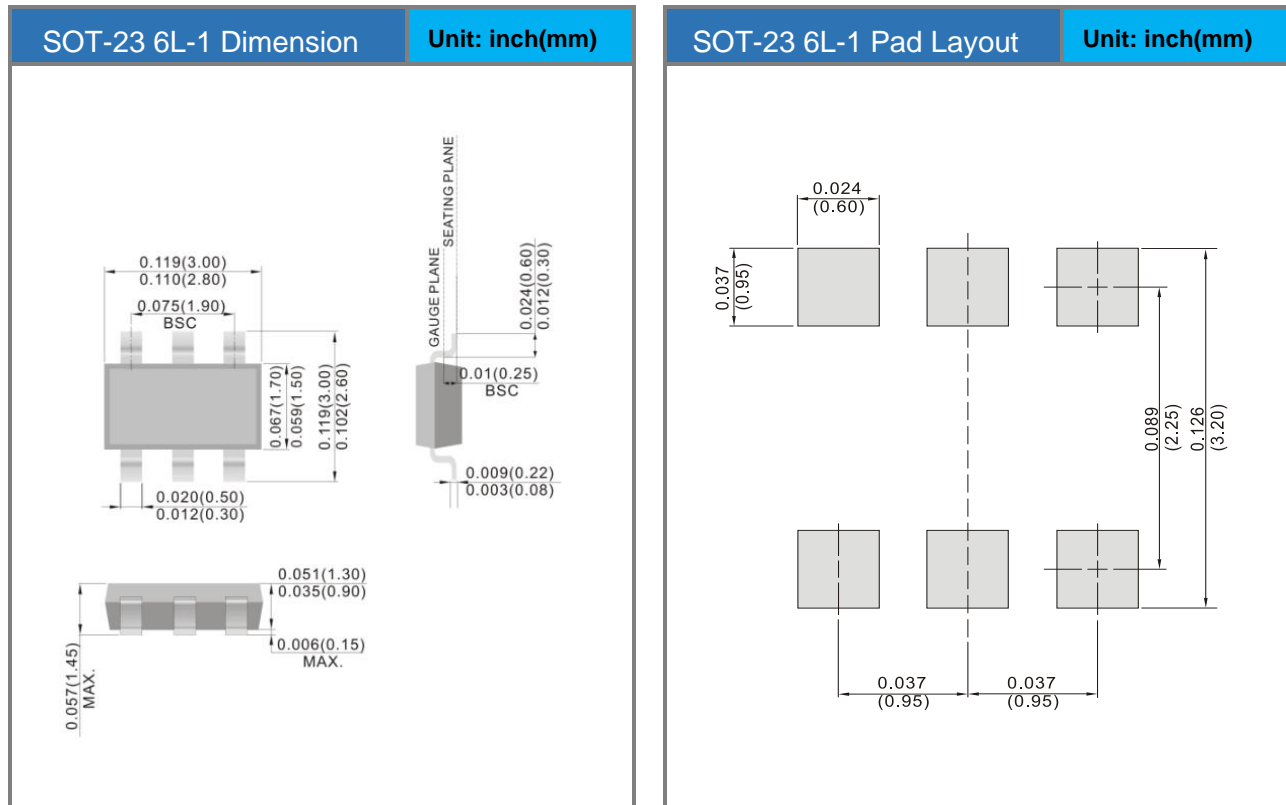
**Fig.10 Capacitance vs. Drain-Source Voltage**

# PJS6446-AU

## Product and Packing Information

Part No.	Package Type	Packing Type	Marking
PJS6446-AU	SOT-23 6L-1	3K pcs / 7" reel	S46

## Packaging Information & Mounting Pad Layout



## PJS6446-AU

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