



# PJA3461-AU

## 60V P-Channel Enhancement Mode MOSFET

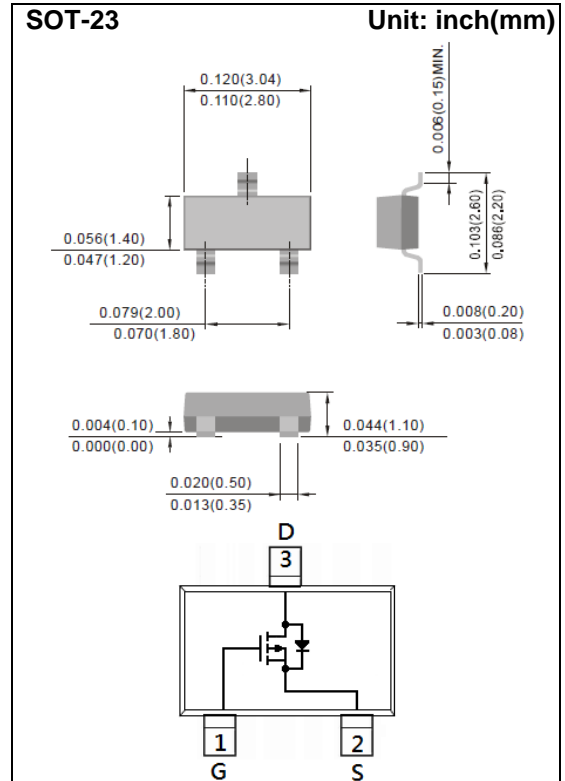
**Voltage**    **-60 V**    **Current**    **-1.9A**

### Features

- $R_{DS(ON)}$ ,  $V_{GS}@-10V$ ,  $I_D@-1.9A < 170m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@-4.5V$ ,  $I_D@-1.5A < 220m\Omega$
- Advanced Trench Process Technology
- Specially Designed for Switch Load, PWM Application, etc
- 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 Package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0003 ounces, 0.0084 grams



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

PARAMETER	SYMBOL	LIMIT	UNITS
Drain-Source Voltage	$V_{DS}$	-60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current (Note 4)	$I_D$	$T_A=25^\circ C$	-1.9
		$T_A=70^\circ C$	-1.5
Pulsed Drain Current (Note 1)	$I_{DM}$	-7.6	A
Power Dissipation	$P_D$	$T_A=25^\circ C$	1.25
		$T_A=70^\circ C$	0.8
Single Pulse Avalanche Energy (Note 6)	$E_{AS}$	32	mJ
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~150	$^\circ C$
Typical Thermal Resistance	$R_{\theta JA}$	100	$^\circ C/W$
- Junction to Ambient (Note 4,5)			



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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	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-60	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.88	-2.5	
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-1.9A$	-	140	170	m $\Omega$
		$V_{GS}=-4.5V, I_D=-1.5A$	-	190	220	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-60V, V_{GS}=0V$	-	-	-1	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>Dynamic</b> (Note 7)						
Total Gate Charge	$Q_g$	$V_{DS}=-30V, I_D=-1.9A,$ $V_{GS}=-10V$ (Note 2,3)	-	8.3	-	nC
Gate-Source Charge	$Q_{gs}$		-	1.8	-	
Gate-Drain Charge	$Q_{gd}$		-	1.6	-	
Input Capacitance	$C_{iss}$	$V_{DS}=-30V, V_{GS}=0V,$ $f=1.0\text{MHz}$	-	430	-	pF
Output Capacitance	$C_{oss}$		-	33	-	
Reverse Transfer Capacitance	$C_{rss}$		-	29	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-30V, I_D=-1A,$ $V_{GS}=-10V,$ $R_G=6\Omega$ (Note 2,3)	-	5.1	-	ns
Turn-On Rise Time	$t_r$		-	20	-	
Turn-Off Delay Time	$t_{d(off)}$		-	36	-	
Turn-Off Fall Time	$t_f$		-	11	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current (Note 3)	$I_S$	---	-	-	-1.5	A
Diode Forward Voltage	$V_{SD}$	$I_S=-1A, V_{GS}=0V$	-	-0.78	-1	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. The test condition is  $L=1\text{mH}, I_{AS}=-8A, V_{DD}=-25V, V_{GS}=-10V$ .
7. Guaranteed by design, not subject to production testing.



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## TYPICAL CHARACTERISTIC CURVES

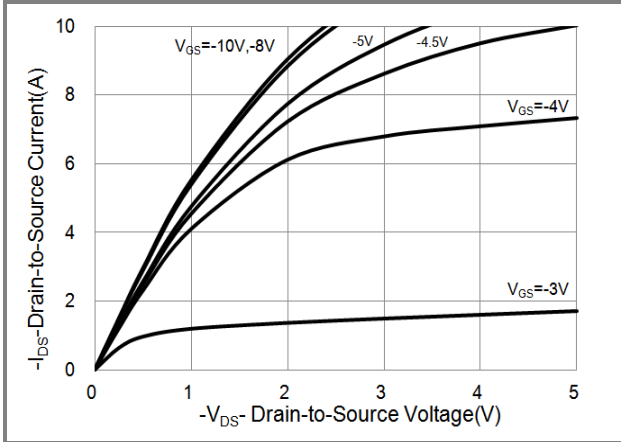


Fig.1 On-Region Characteristics

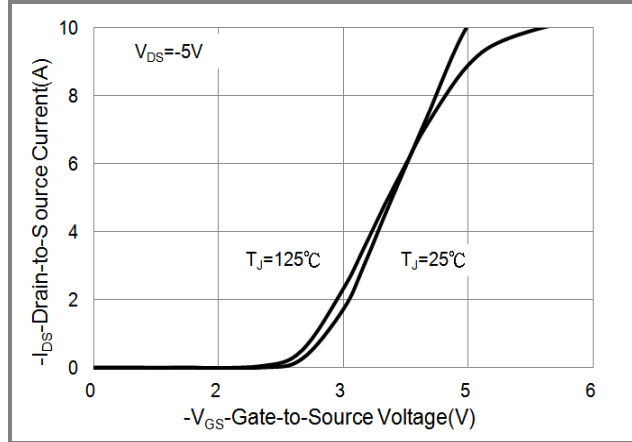


Fig.2 Transfer Characteristics

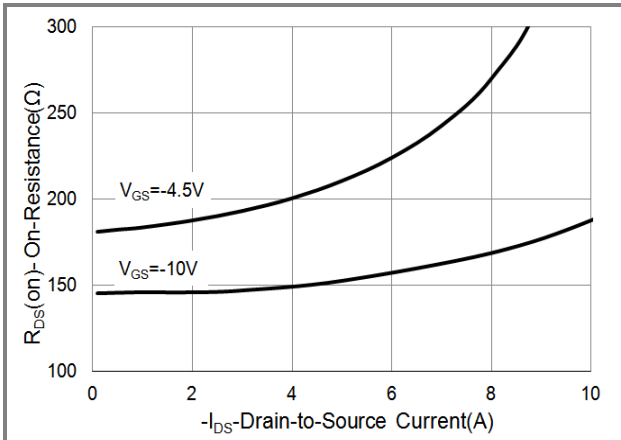


Fig.3 On-Resistance vs. Drain Current

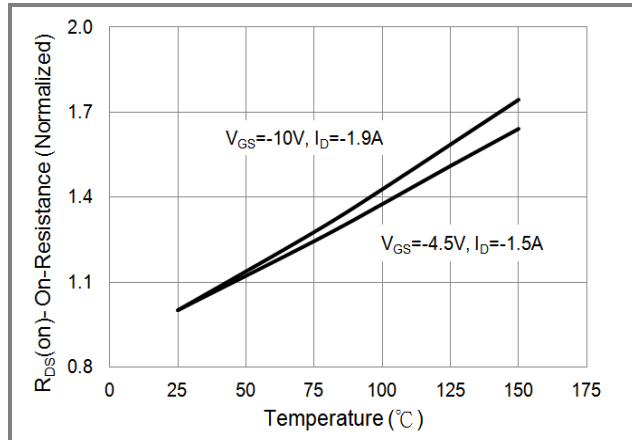


Fig.4 On-Resistance vs. Junction temperature

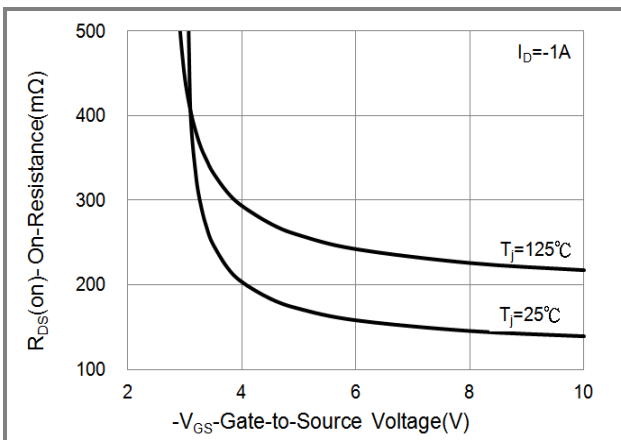


Fig.5 On-Resistance Variation with  $V_{GS}$

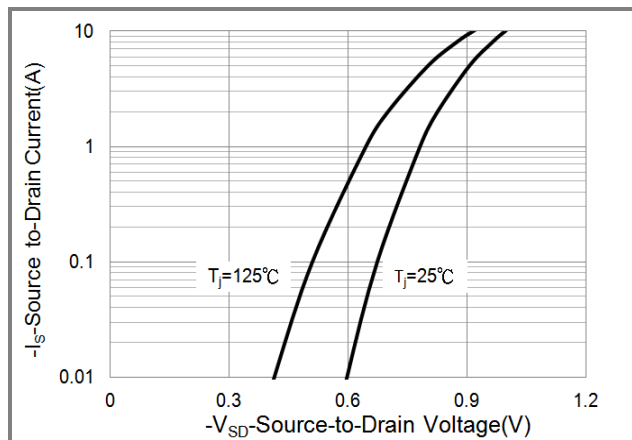


Fig.6 Body Diode Characteristics



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## TYPICAL CHARACTERISTIC CURVES

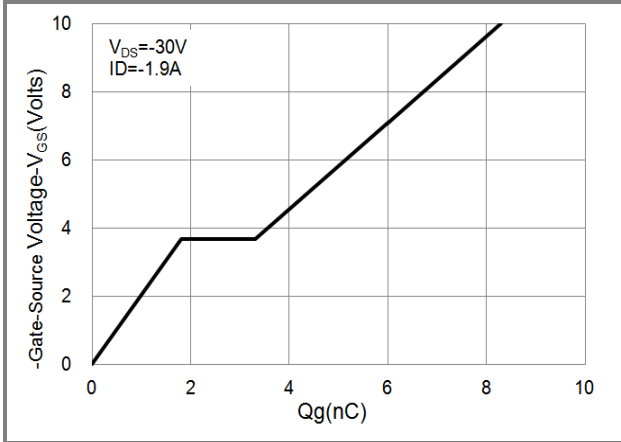


Fig.7 Gate-Charge Characteristics

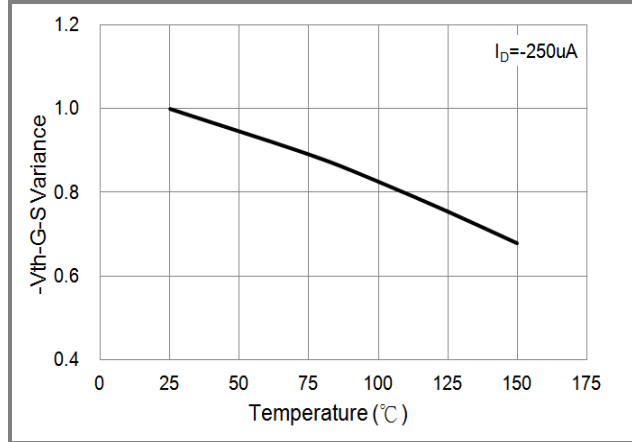


Fig.8 Threshold Voltage Variation with Temperature

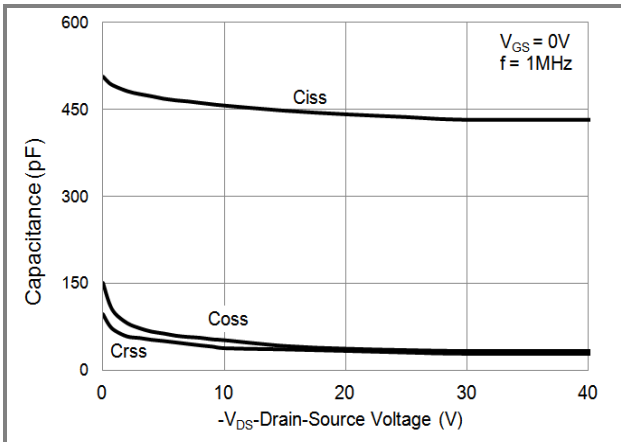


Fig.9 Capacitance vs. Drain-Source Voltage

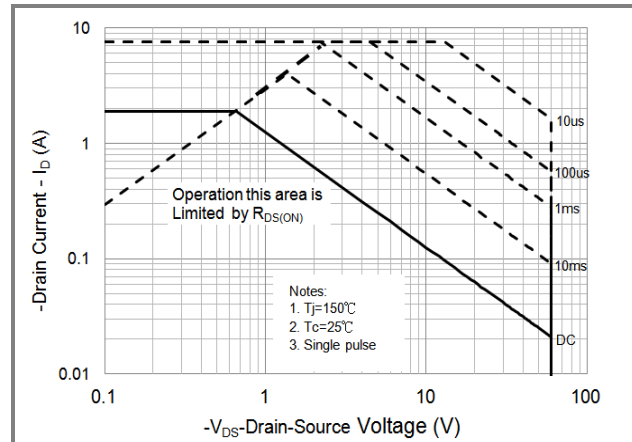


Fig.10 Maximum Safe Operating Area

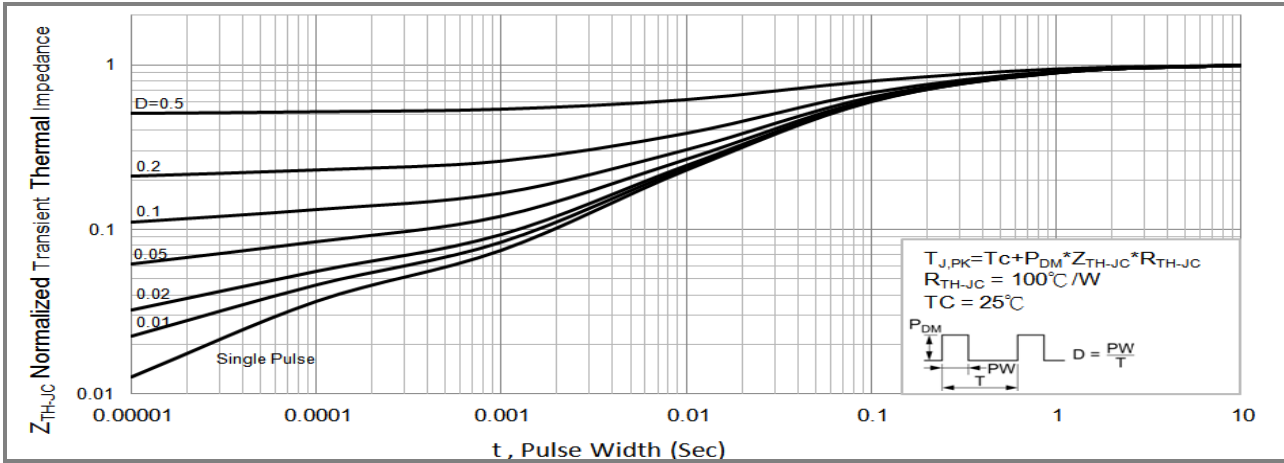


Fig.11 Normalized Transient Thermal Impedance vs. Pulse Width

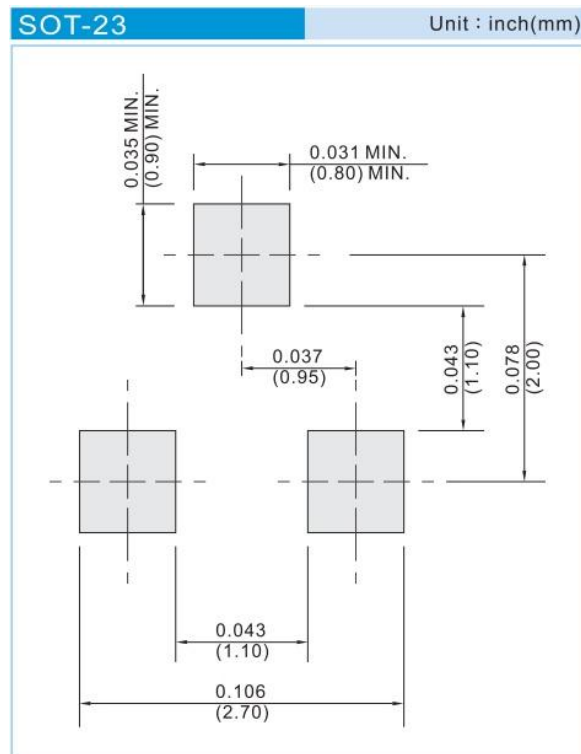


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## Part No Packing Code Version

Part No Packing Code	Package Type	Packing Type	Marking	Version
PJA3461-AU_R1_000A1	SOT-23	3K pcs / 7" reel	A61	Halogen free

## Packaging Information & Mounting Pad Layout





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