

# PJA3419AE-AU

## 20V P-Channel Enhancement Mode MOSFET – ESD Protected

**Voltage**

**-20 V**

**Current**

**-4 A**

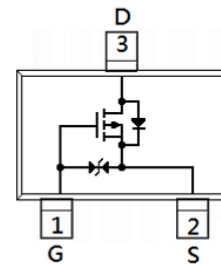
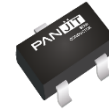
### Features

- $R_{DS(ON)}$ ,  $V_{GS}@-4.5V$ ,  $I_D@-4A < 50m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@-2.5V$ ,  $I_D@-2.5A < 70m\Omega$
- Advanced Trench Process Technology
- ESD Protected
- 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 : 0.0084 grams

SOT-23



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

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		$V_{DS}$	-20	V
Gate-Source Voltage		$V_{GS}$	$\pm 12$	
Continuous Drain Current <sup>(Note 4)</sup>	$T_A=25^\circ\text{C}$	$I_D$	-4	A
	$T_A=70^\circ\text{C}$		-3.2	
Pulsed Drain Current <sup>(Note 1)</sup>	$T_A=25^\circ\text{C}$	$I_{DM}$	-16	
Power Dissipation	$T_A=25^\circ\text{C}$	$P_D$	1.25	W
	Derate above $25^\circ\text{C}$		10	mW/ $^\circ\text{C}$
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~150	$^\circ\text{C}$
Thermal Resistance		$R_{\theta JA}$	100	$^\circ\text{C/W}$
- Junction to Ambient <sup>(Note 5)</sup>				

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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
<b>Static</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-20	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-0.4	-0.7	-1	
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A	-	38	50	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-2.5A	-	52	70	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V	-	-	-1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±10V, V <sub>DS</sub> =0V	-	-	±10	
<b>Dynamic</b> (Note 6)						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-4A, V <sub>GS</sub> =-4.5V (Note 2,3)	-	7	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	1	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	3	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, f=1MHz	-	515	-	pF
Output Capacitance	C <sub>oss</sub>		-	100	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	80	-	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-4A, V <sub>GS</sub> =-4.5V, R <sub>G</sub> =3Ω (Note 2,3)	-	5	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	40	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	30	-	
Turn-Off Fall Time	t <sub>f</sub>		-	45	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>	T <sub>A</sub> =25°C	-	-	-1.5	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V	-	-0.7	-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.

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## TYPICAL CHARACTERISTIC CURVES

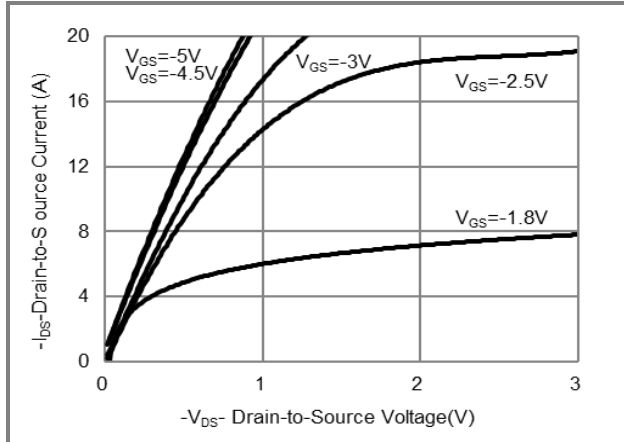


Fig.1 On-Region Characteristics

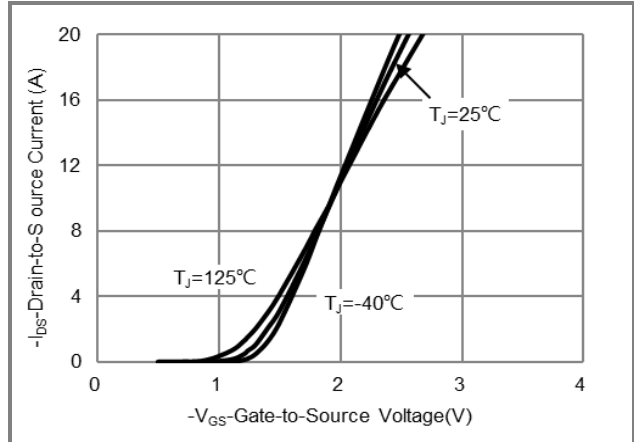


Fig.2 Transfer Characteristics

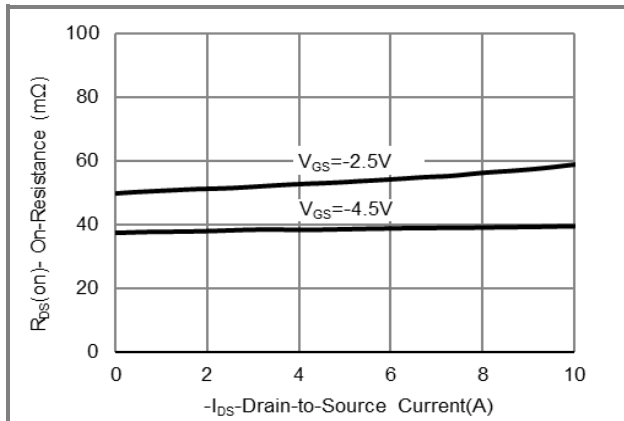


Fig.3 On-Resistance vs. Drain Current

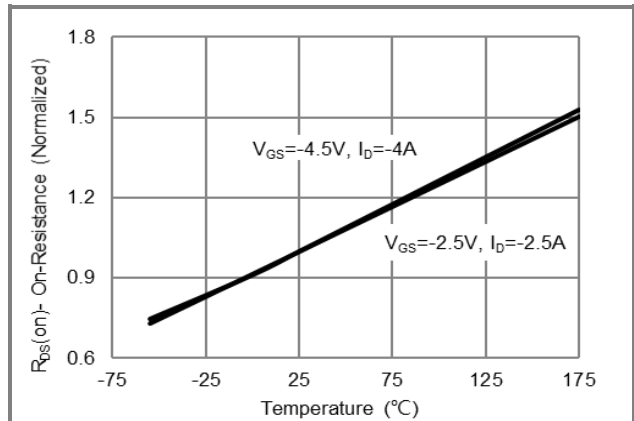


Fig.4 On-Resistance vs. Junction temperature

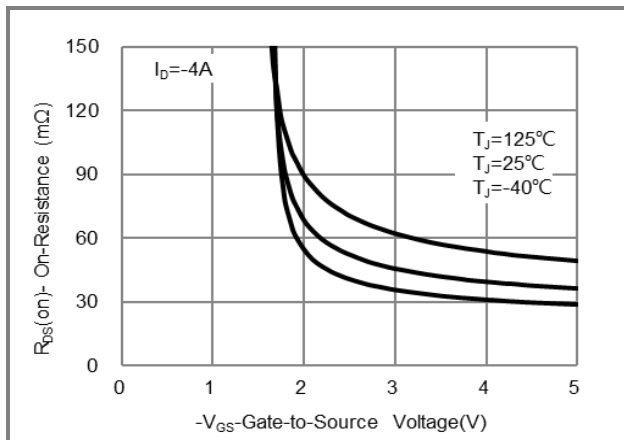


Fig.5 On-Resistance Variation with  $V_{GS}$

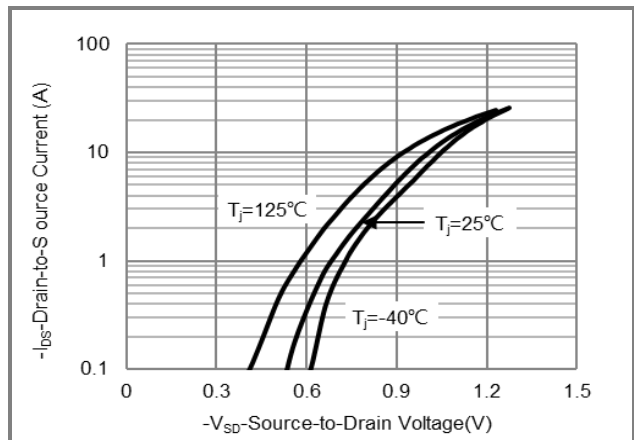


Fig.6 Source-Drain Diode Forward Voltage

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## TYPICAL CHARACTERISTIC CURVES

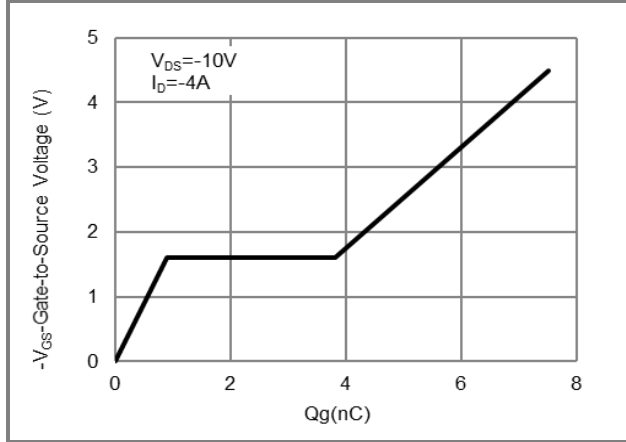


Fig.7 Gate-Charge Characteristics

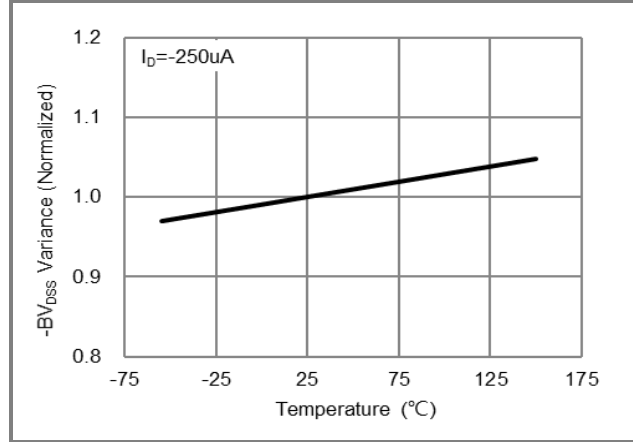


Fig.8 Breakdown Voltage Variation vs. Temperature

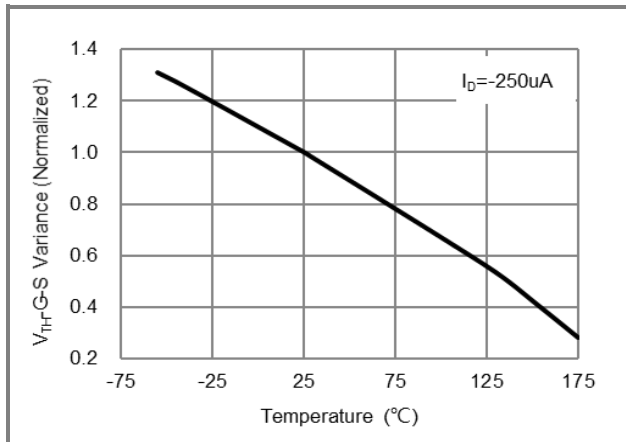


Fig.9 Threshold Voltage Variation with Temperature

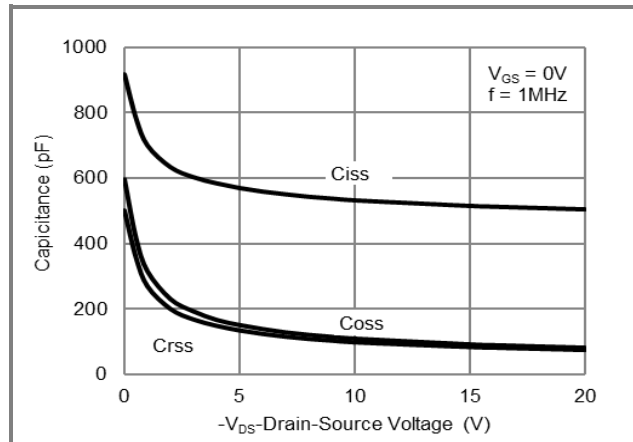


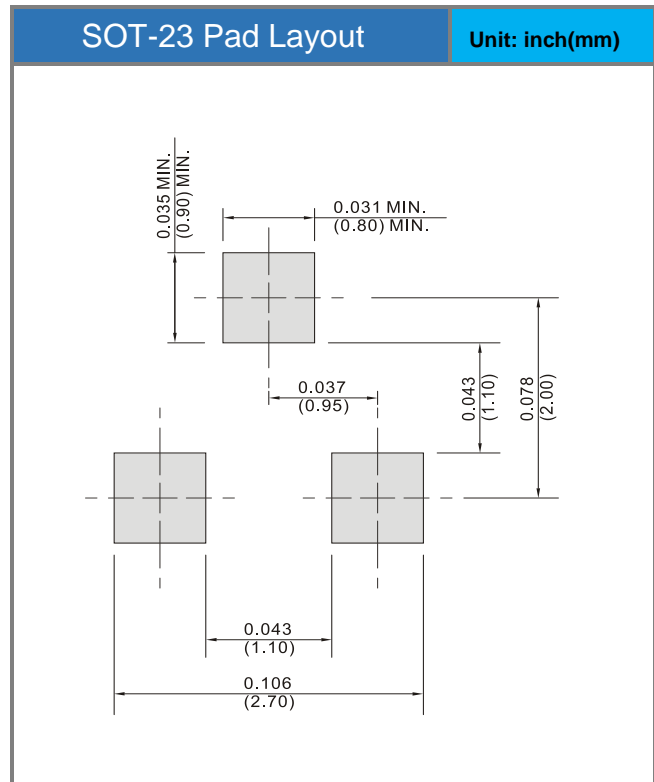
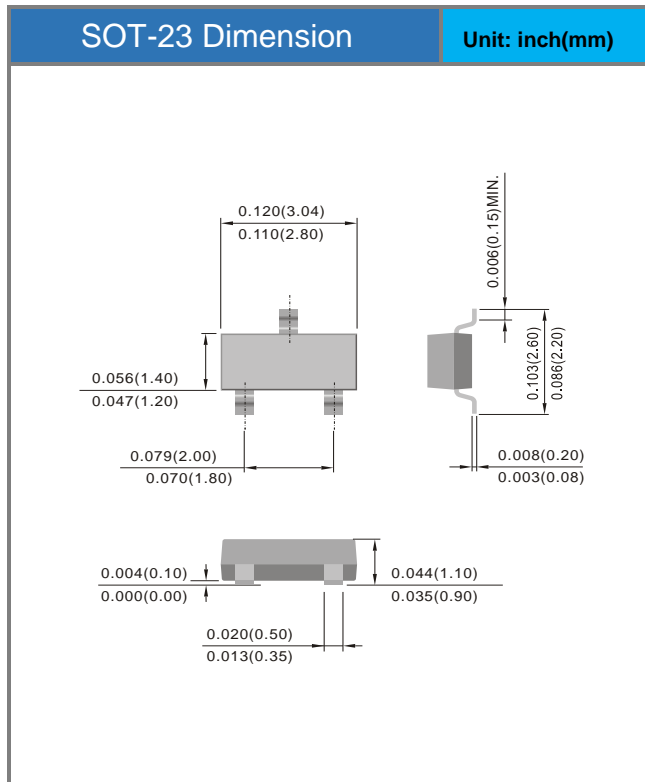
Fig.10 Capacitance vs. Drain-Source Voltage

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## Product and Packing Information

Part No.	Package Type	Packing Type	Marking
PJA3419AE-AU	SOT-23	3K pcs / 7" reel	9AE

## Packaging Information & Mounting Pad Layout



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