



# PJA3415A-AU

## 20V P-Channel Enhancement Mode MOSFET

**Voltage**    **-20 V**    **Current**    **-4.5A**

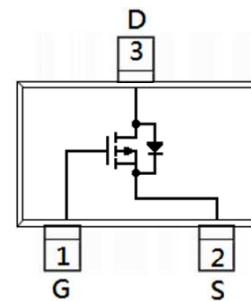
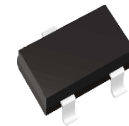
### Features

- $R_{DS(ON)}$ ,  $V_{GS}@-4.5V$ ,  $I_D@-4.5A < 48m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@-2.5V$ ,  $I_D@-3A < 60m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@-1.8V$ ,  $I_D@-1.5A < 88m\Omega$
- 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

SOT-23



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

PARAMETER	SYMBOL	LIMIT	UNITS
Drain-Source Voltage	V <sub>DS</sub>	-20	V
Gate-Source Voltage	V <sub>GS</sub>	±12	
Continuous Drain Current <sup>(Note 4)</sup>	I <sub>D</sub>	-4.5	A
Pulsed Drain Current <sup>(Note 1)</sup>	I <sub>DM</sub>	-18	
Power Dissipation	T <sub>a</sub> =25°C	1.25	W
	Derate above 25°C	10	mW/°C
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55~150	°C
Typical Thermal Resistance	R <sub>θJA</sub>	100	°C/W
- Junction to Ambient <sup>(Note 3,4)</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	-0.5	-0.74	-1.3	
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4.5A	-	40	48	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-3A	-	50	60	
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-1.5A	-	75	88	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V	-	-	-1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>Dynamic</b> (Note 5)						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-4.5A, V <sub>GS</sub> =-4.5V (Note 1,2)	-	10	-	nC
Gate-Source Charge	Q <sub>gs</sub>					
Gate-Drain Charge	Q <sub>gd</sub>					
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, f=1MHZ	-	980	-	pF
Output Capacitance	C <sub>oss</sub>					
Reverse Transfer Capacitance	C <sub>rss</sub>					
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =-10V, I <sub>D</sub> =-4.5A, V <sub>GS</sub> =-4.5V, R <sub>G</sub> =6Ω (Note 1,2)	-	9.8	-	ns
Turn-On Rise Time	t <sub>r</sub>					
Turn-Off Delay Time	t <sub>d(off)</sub>					
Turn-Off Fall Time	t <sub>f</sub>					
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>s</sub>	---	-	-	-1.5	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>s</sub> =-1A, V <sub>GS</sub> =0V	-	-0.78	-1.2	V

**NOTES :**

1. Pulse width ≤ 300us, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature typical characteristics.
3. 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 FR-4 with 2oz. square pad of copper.
4. The maximum current rating is package limited.
5. Guaranteed by design, not subject to production testing.



# PJA3415A-AU

## TYPICAL CHARACTERISTIC CURVES

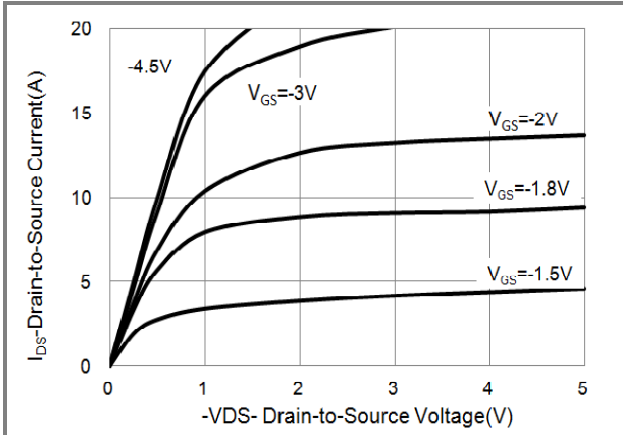


Fig.1 On-Region Characteristics

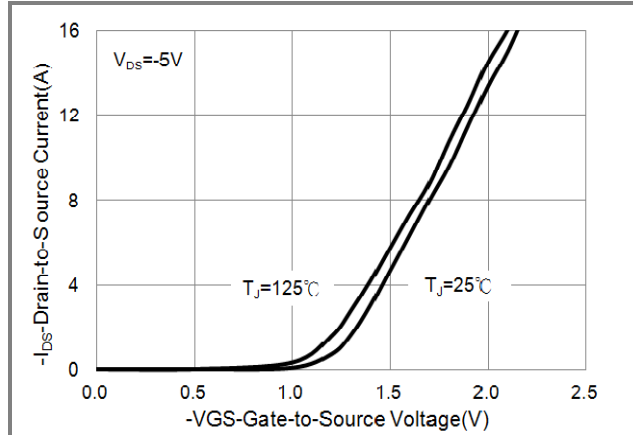


Fig.2 Transfer Characteristics

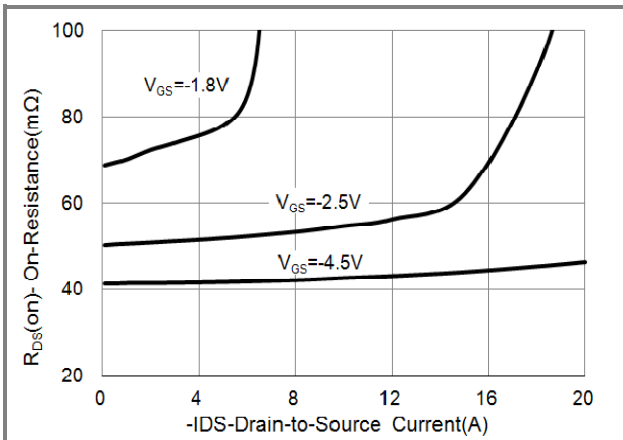


Fig.3 On-Resistance vs. Drain Current

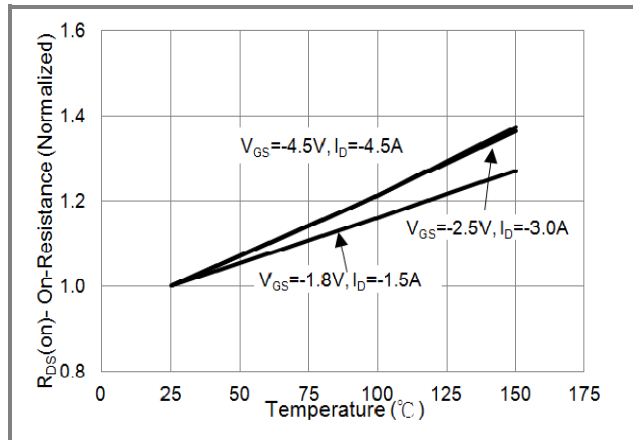


Fig.4 On-Resistance vs. Junction temperature

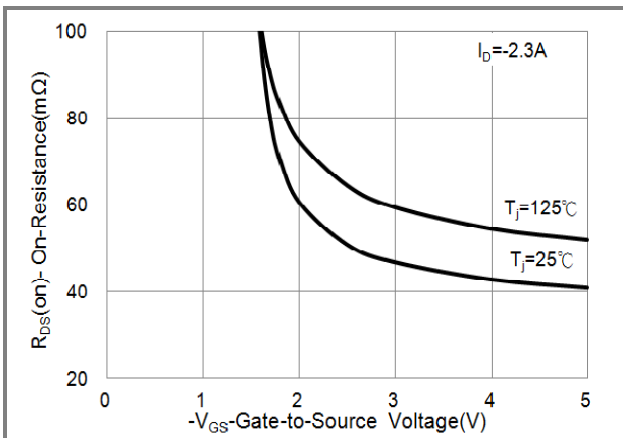


Fig.5 On-Resistance Variation with  $V_{GS}$

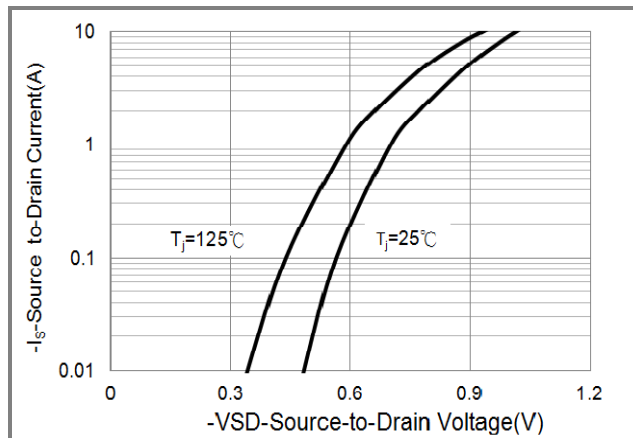


Fig.6 Body Diode Characteristics



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## TYPICAL CHARACTERISTIC CURVES

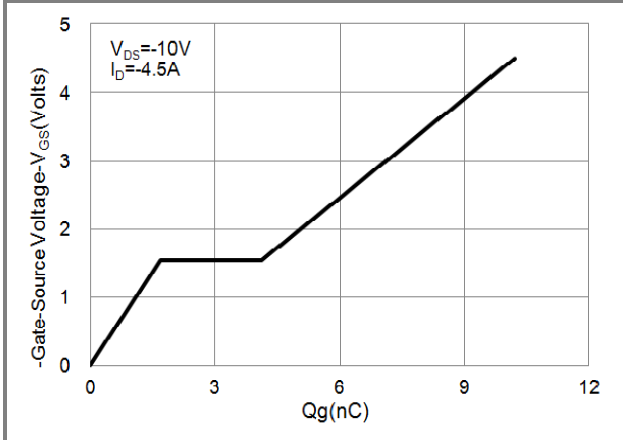


Fig.7 Gate-Charge Characteristics

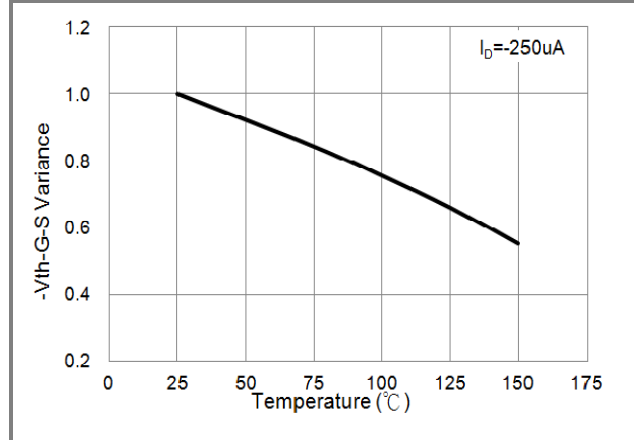


Fig.8 Threshold Voltage Variation with Temperature

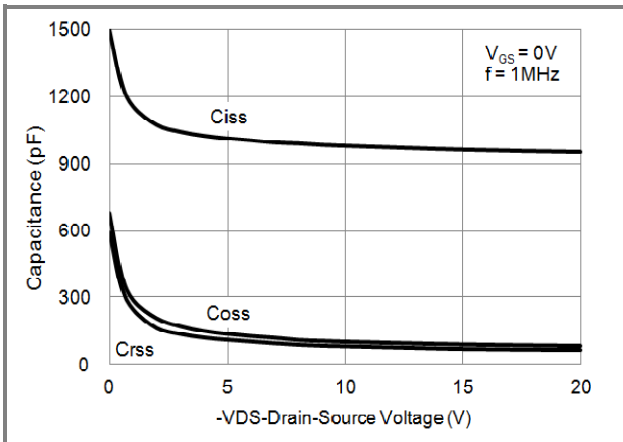


Fig.9 Capacitance vs. Drain-Source Voltage

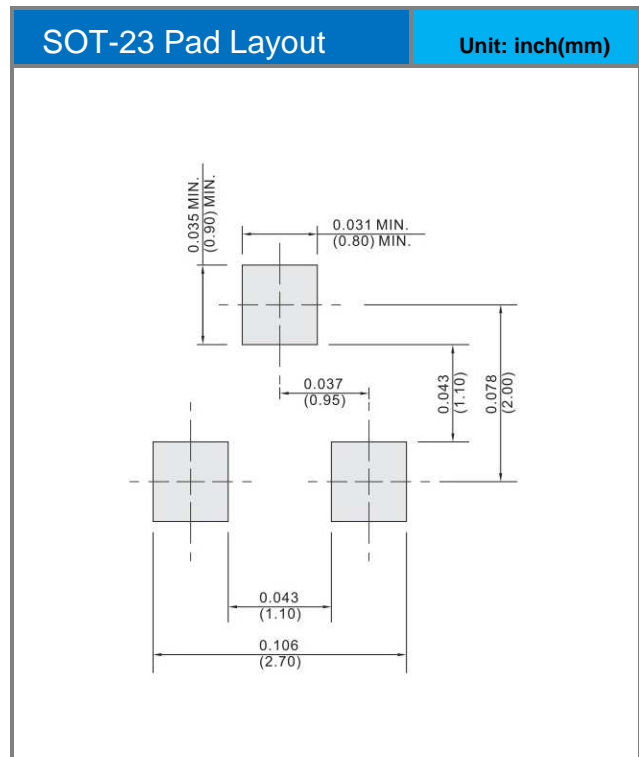
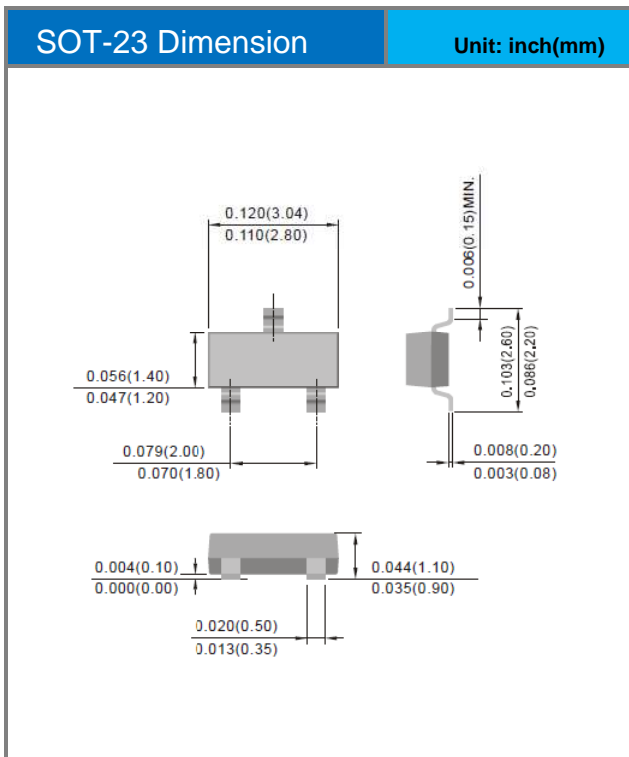


# PJA3415A-AU

## Part No. Packing Code Version

Part No. Packing Code	Package Type	Packing Type	Marking	Version
PJA3415A-AU_R1_000A1	SOT-23	3K pcs / 7" reel	A5A	Halogen free

## Packaging Information & Mounting Pad Layout





## PJA3415A-AU

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