



# PJA3416-AU

## 20V N-Channel Enhancement Mode MOSFET

**Voltage**

**20 V**

**Current**

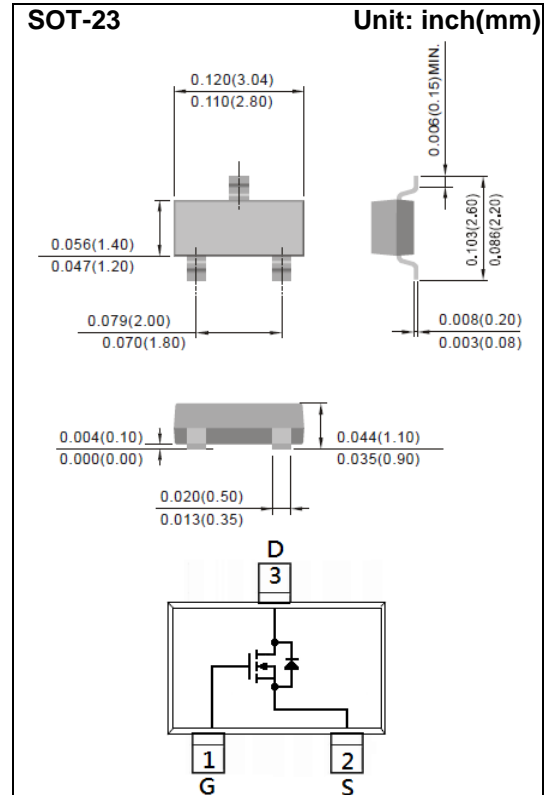
**5.8A**

### Features

- $R_{DS(ON)}$ ,  $V_{GS}@4.5V$ ,  $I_D@5.8A < 27m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@2.5V$ ,  $I_D@3.2A < 40m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@1.8V$ ,  $I_D@1.6A < 80m\Omega$
- 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 ( $T_A=25^\circ\text{C}$ 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>	$I_D$	5.8	A	
Pulsed Drain Current <sup>(Note 1)</sup>	$I_{DM}$	23.2		
Power Dissipation	$P_D$	$T_a=25^\circ\text{C}$	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	$^\circ\text{C}$	
Typical Thermal Resistance	$R_{\theta JA}$	100	$^\circ\text{C/W}$	
- 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	0.77	1.2	
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =5.8A	-	23	27	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =3.2A	-	32	40	
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =1.6A	-	61	80	
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> =±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> =5.8A, V <sub>GS</sub> =4.5V (Note 1,2)	-	6.7	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	1.2	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	2	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHZ	-	513	-	pF
Output Capacitance	C <sub>oss</sub>		-	75	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	59	-	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =10V, I <sub>D</sub> =5.8A, V <sub>GS</sub> =4.5V, R <sub>G</sub> =6Ω (Note 1,2)	-	6	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	56	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	23	-	
Turn-Off Fall Time	t <sub>f</sub>		-	13	-	
<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	-	0.71	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.



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## TYPICAL CHARACTERISTIC CURVES

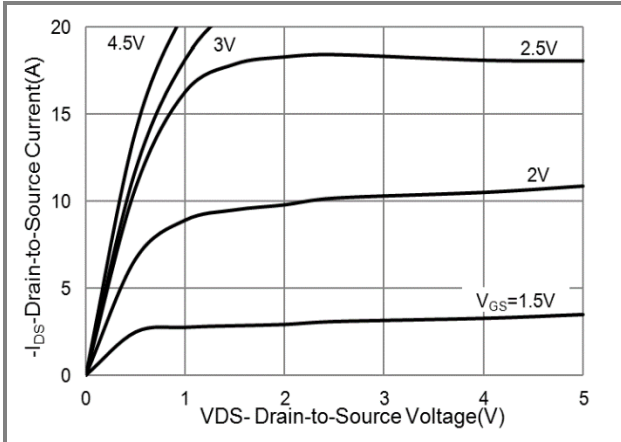


Fig.1 On-Region Characteristics

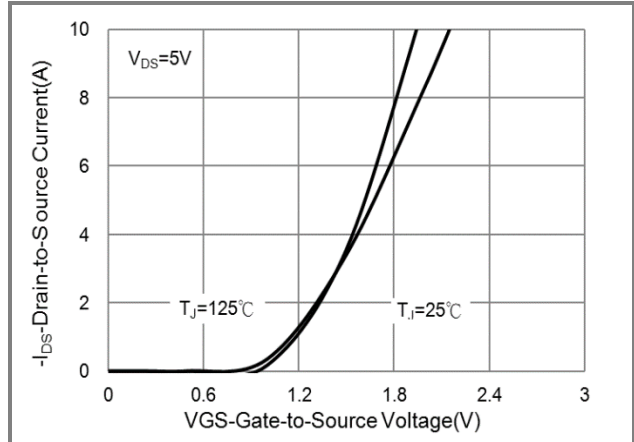


Fig.2 Transfer Characteristics

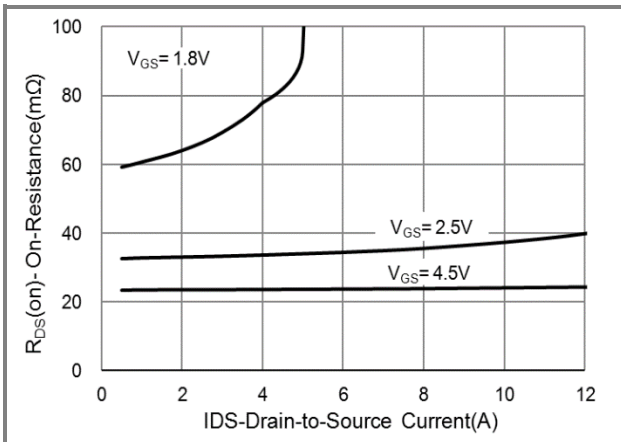


Fig.3 On-Resistance vs. Drain Current

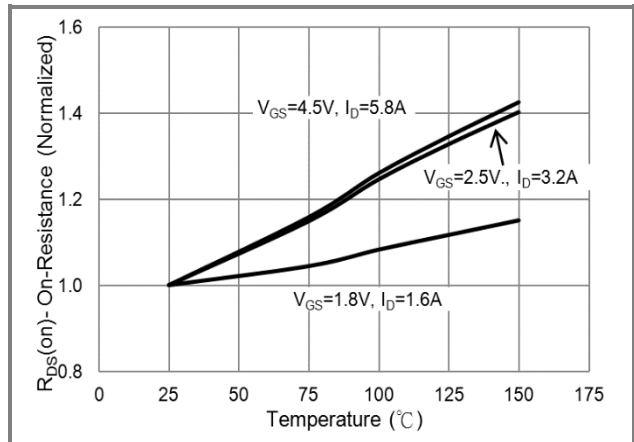


Fig.4 On-Resistance vs. Junction temperature

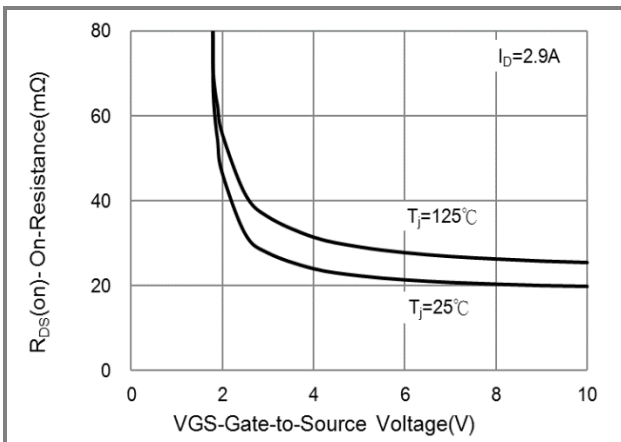


Fig.5 On-Resistance Variation with  $V_{GS}$

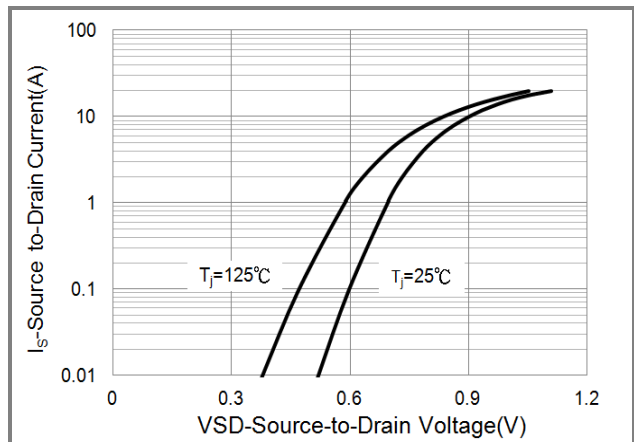


Fig.6 Body Diode Characteristics



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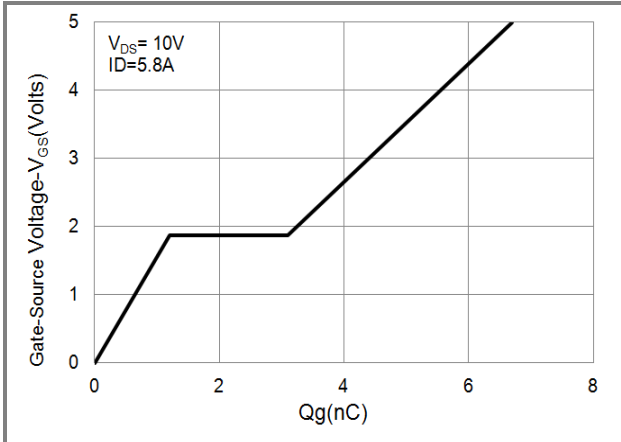


Fig.7 Gate-Charge Characteristics

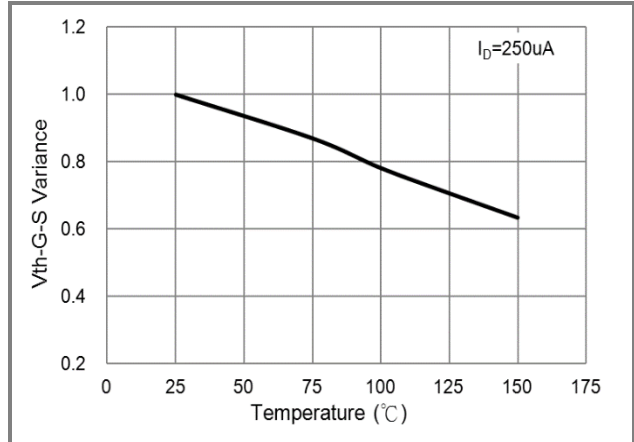


Fig.8 Threshold Voltage Variation with Temperature

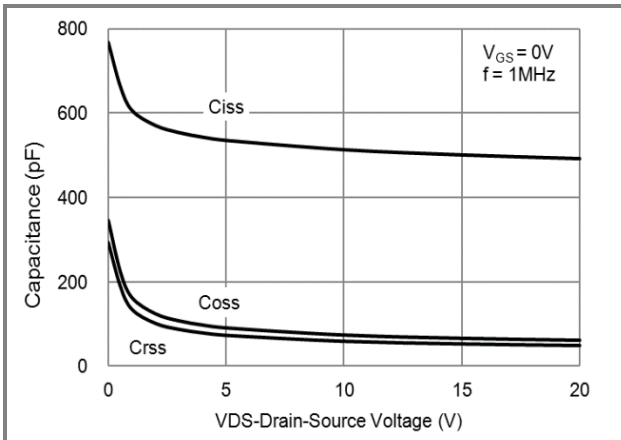


Fig.9 Capacitance vs. Drain-Source Voltage

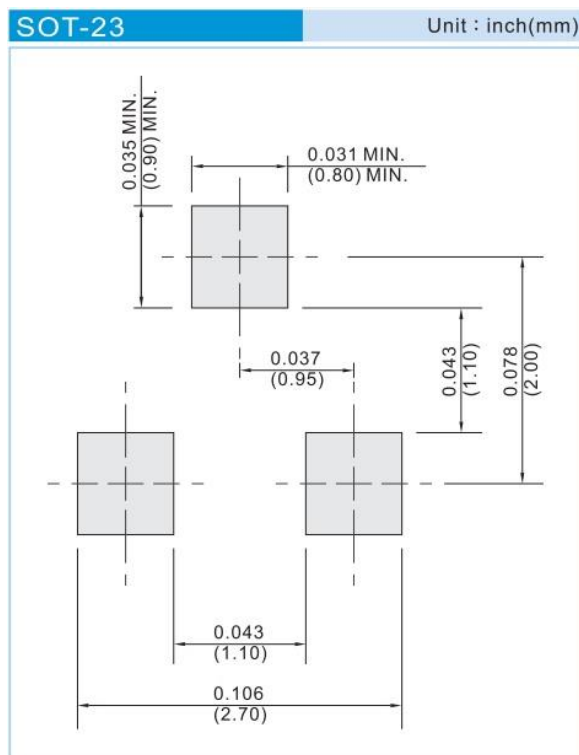


# PJA3416-AU

## Part No. Packing Code Version

Part No. Packing Code	Package Type	Packing Type	Marking	Version
PJA3416-AU_R1_000A1	SOT-23	3K pcs / 7" reel	A16	Halogen free RoHS compliant

## Packaging Information & Mounting Pad Layout





## PJA3416-AU

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