

# PJA3415-AU

## 20V P-Channel Enhancement Mode MOSFET

**Voltage**

**-20 V**

**Current**

**-4.0A**

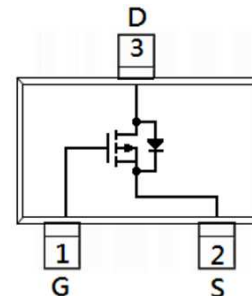
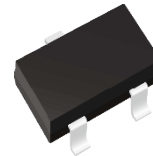
### Features

- $R_{DS(ON)}$ ,  $V_{GS}@-4.5V$ ,  $I_D@-4.0A < 62m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@-2.5V$ ,  $I_D@-2.8A < 75m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@-1.8V$ ,  $I_D@-2.1A < 95m\Omega$
- 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 ( $T_A=25^\circ C$ 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>	-4.0	A
Pulsed Drain Current <sup>(Note 1)</sup>		I <sub>DM</sub>	-16	
Power Dissipation	T <sub>a</sub> =25°C	P <sub>D</sub>	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)</sup>				



# PJA3415-AU

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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
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	-0.62	-1.2	
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4.0A	-	53	62	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-2.8A	-	63	75	
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-2.1A	-	78	95	
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
Dynamic <sup>(Note 5)</sup>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-4.0A, V <sub>GS</sub> =-4.5V <sup>(Note 1,2)</sup>	-	18	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	2	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	7	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, f=1.0MHZ	-	756	-	pF
Output Capacitance	C <sub>oss</sub>		-	75	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	58	-	
Turn-On Delay Time	td <sub>(on)</sub>	V <sub>DD</sub> =-10V, I <sub>D</sub> =-4.0A, V <sub>GS</sub> =-4.5V, R <sub>G</sub> =6Ω <sup>(Note 1,2)</sup>	-	5	-	ns
Turn-On Rise Time	tr		-	61	-	
Turn-Off Delay Time	td <sub>(off)</sub>		-	70	-	
Turn-Off Fall Time	tf		-	137	-	
Drain-Source Diode						
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> =-1.0A, V <sub>GS</sub> =0V	-	-0.76	-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.

# PJA3415-AU

## TYPICAL CHARACTERISTIC CURVES

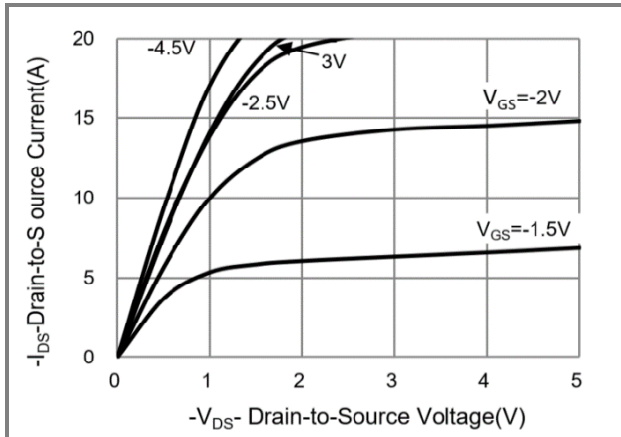


Fig.1 On-Region Characteristics

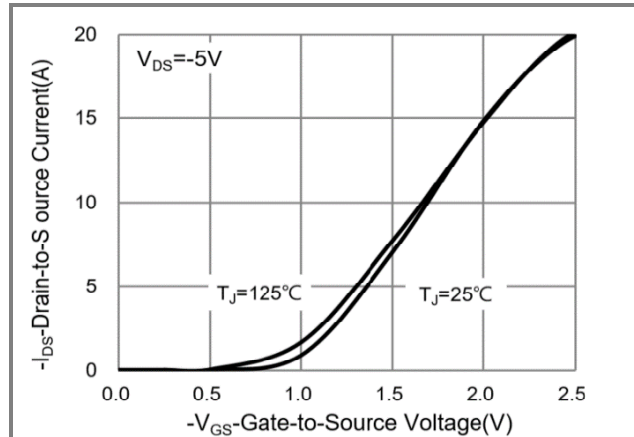


Fig.2 Transfer Characteristics

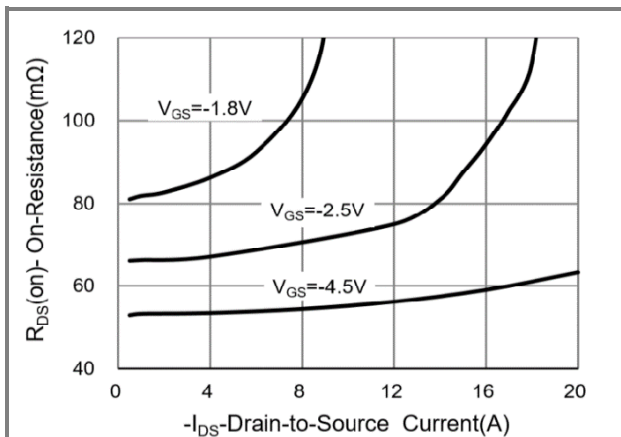


Fig.3 On-Resistance vs. Drain Current

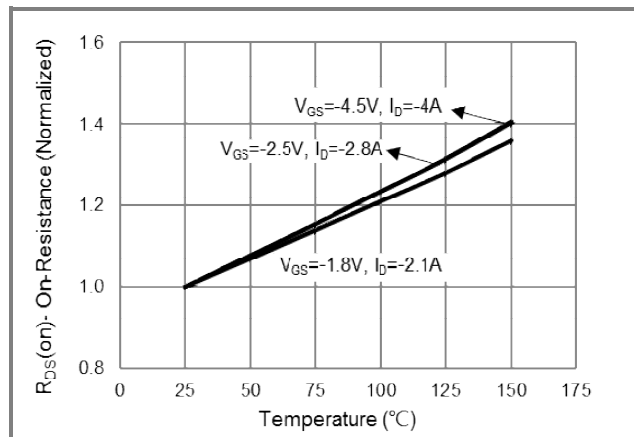


Fig.4 On-Resistance vs. Junction temperature

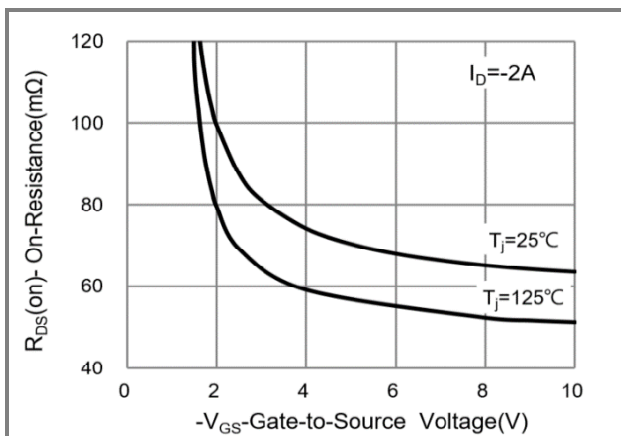


Fig.5 On-Resistance Variation with  $V_{GS}$

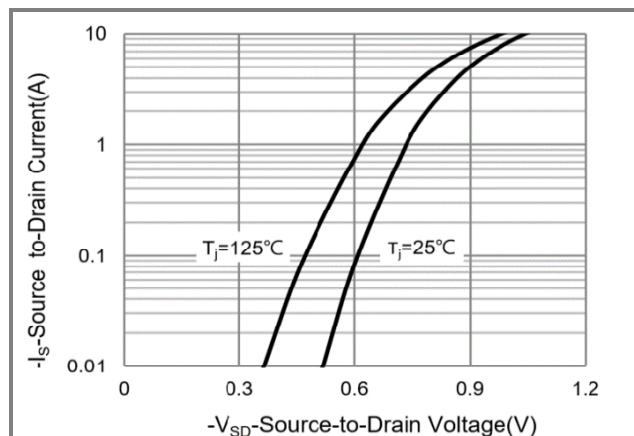


Fig.6 Body Diode Characteristics



## PJA3415-AU

### TYPICAL CHARACTERISTIC CURVES

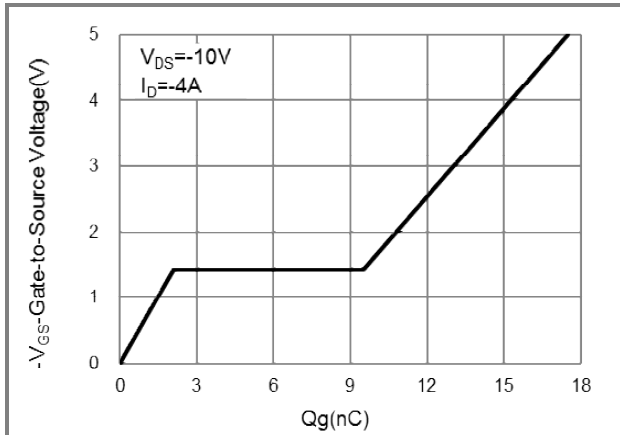


Fig.7 Gate-Charge Characteristics

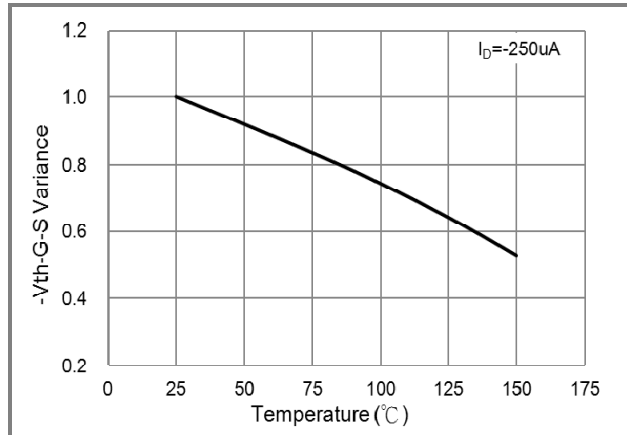


Fig.8 Threshold Voltage Variation with Temperature

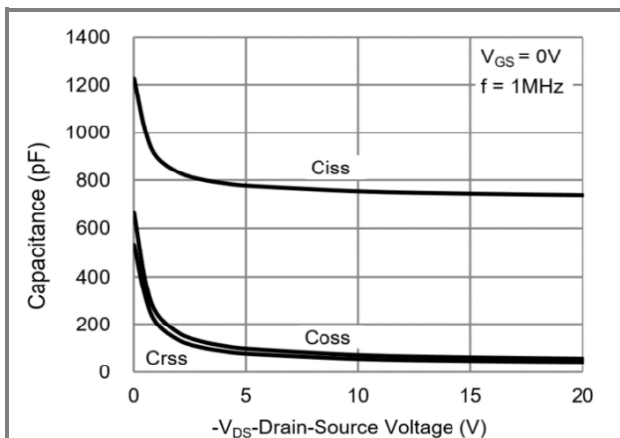


Fig.9 Capacitance vs. Drain-Source Voltage

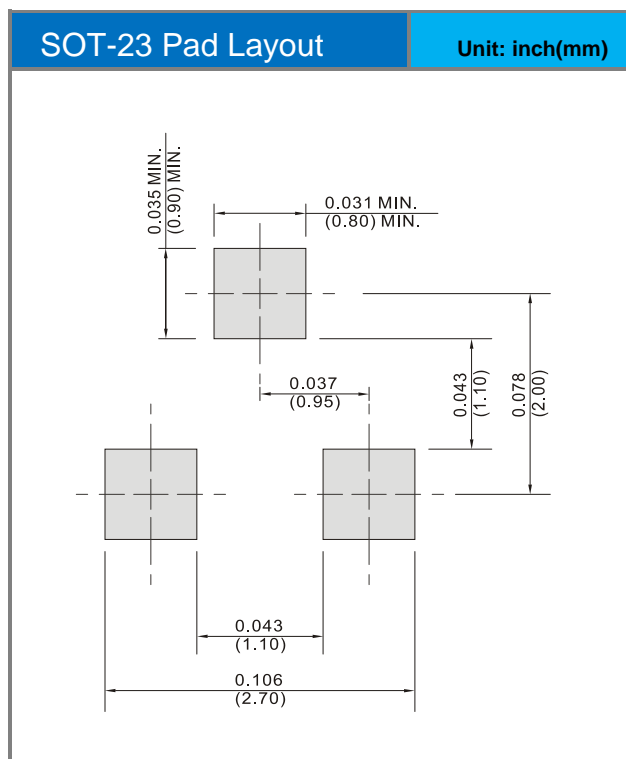
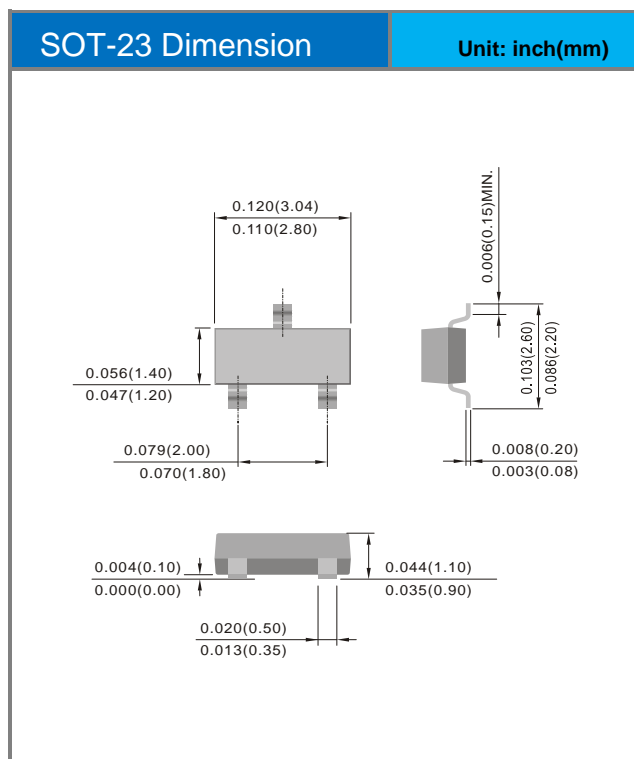


# PJA3415-AU

## Part No. Packing Code Version

Part No. Packing Code	Package Type	Packing Type	Marking	Version
PJA3415-AU_R1_000A1	SOT-23	3K pcs / 7" reel	A15	Halogen free RoHS compliant

## Packaging Information & Mounting Pad Layout





## PJA3415-AU

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