



# PJA3415A

## 20V P-Channel Enhancement Mode MOSFET

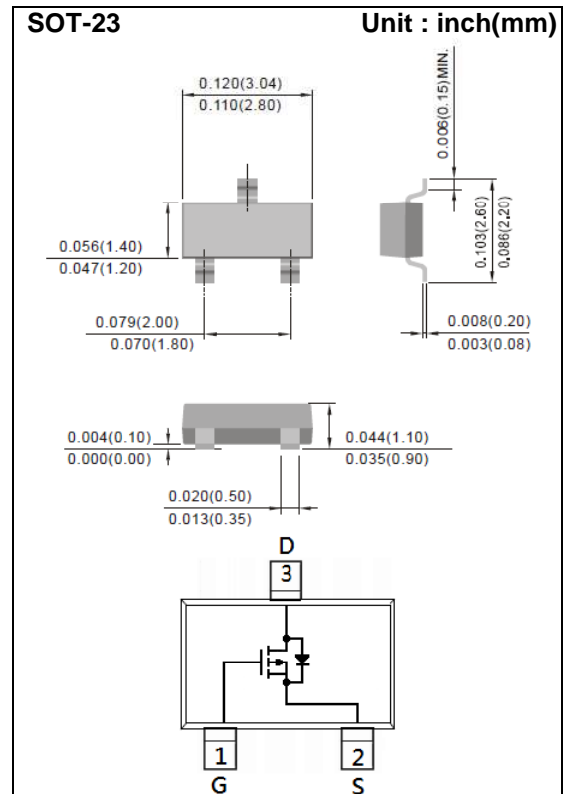
**Voltage**    **-20 V**    **Current**    **-4.5A**

### Features

- $R_{DS(ON)}$  ,  $V_{GS}@-4.5V$  ,  $I_D@-4.5A < 46m\Omega$
- $R_{DS(ON)}$  ,  $V_{GS}@-2.5V$  ,  $I_D@-3.0A < 56m\Omega$
- $R_{DS(ON)}$  ,  $V_{GS}@-1.8V$  ,  $I_D@-1.5A < 88m\Omega$
- Advanced Trench Process Technology
- Specially Designed for Switch Load, PWM Application, etc
- Lead free in compliance with EU RoHS 2011/65/EU directive.
- Green molding compound as per IEC61249 Std. (Halogen Free)

### Mechanical Data

- Case: SOT-23 Package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0003 ounces, 0.0084 grams
- Marking: A5A



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

PARAMETER	SYMBOL	LIMIT	UNITS
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current	$I_D$	-4.5	A
Pulsed Drain Current	$I_{DM}$	-18	A
Power Dissipation	$P_D$	$T_a=25^\circ C$	1.25
		Derate above $25^\circ C$	10
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 3)			



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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	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4.5A	-	38	46	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-3.0A	-	47	56	
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-1.5A	-	68	88	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V	-	-0.01	-1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	-	±10	±100	nA
<b>Dynamic</b>						
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>		-	1.7	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	2.4	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, f=1.0MHZ	-	980	-	pF
Output Capacitance	C <sub>oss</sub>		-	100	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	81	-	
<b>Switching</b>						
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>		-	54	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	44	-	
Turn-Off Fall Time	t <sub>f</sub>		-	31	-	
<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> =-1.0A, 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



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## TYPICAL CHARACTERISTIC CURVES

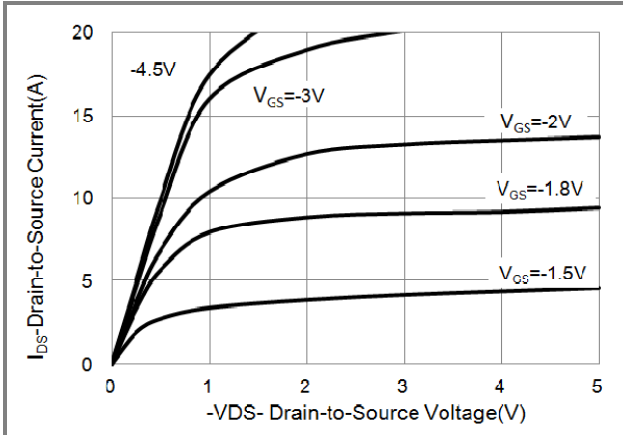


Fig.1 On-Region Characteristics

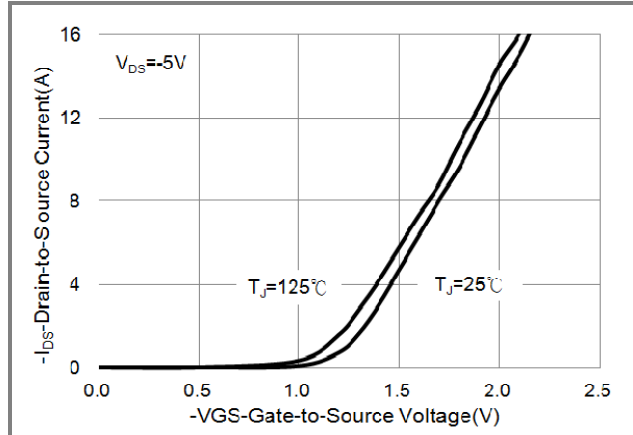


Fig.2 Transfer Characteristics

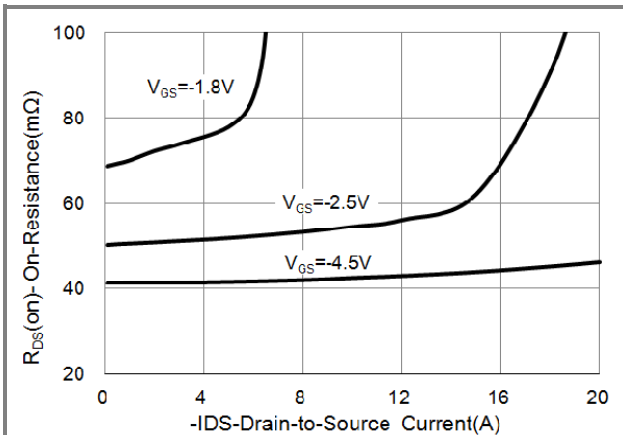


Fig.3 On-Resistance vs. Drain Current

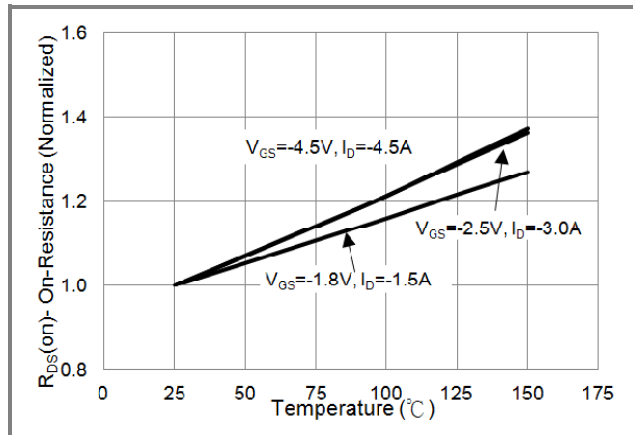


Fig.4 On-Resistance vs. Junction temperature

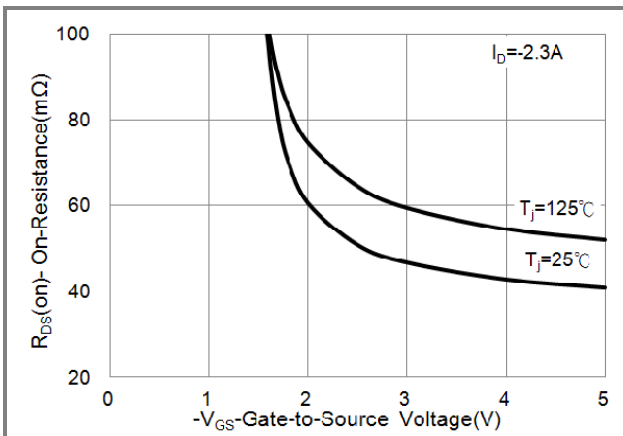


Fig.5 On-Resistance Variation with V\_GS.

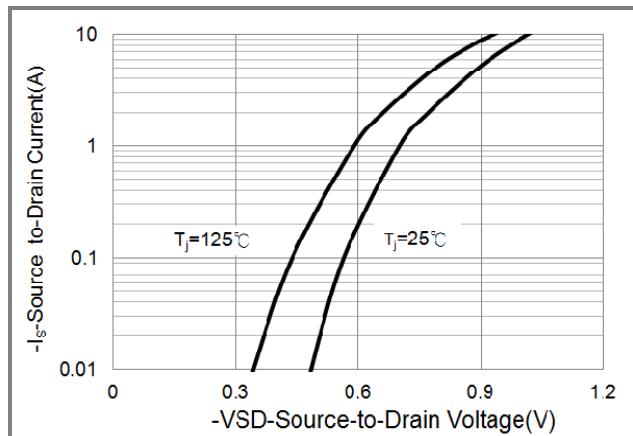


Fig.6 Body Diode Characteristics



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## TYPICAL CHARACTERISTIC CURVES

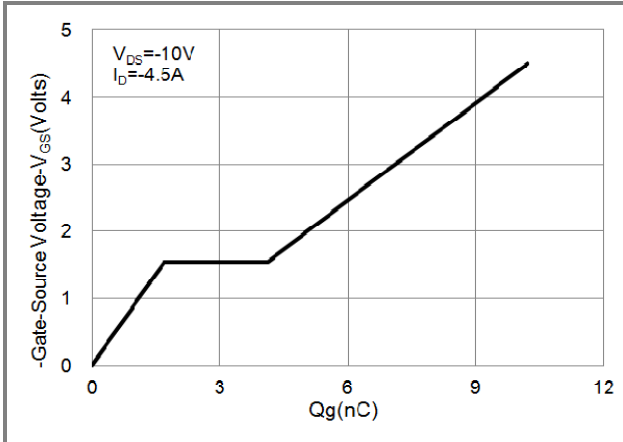


Fig.7 Gate-Charge Characteristics

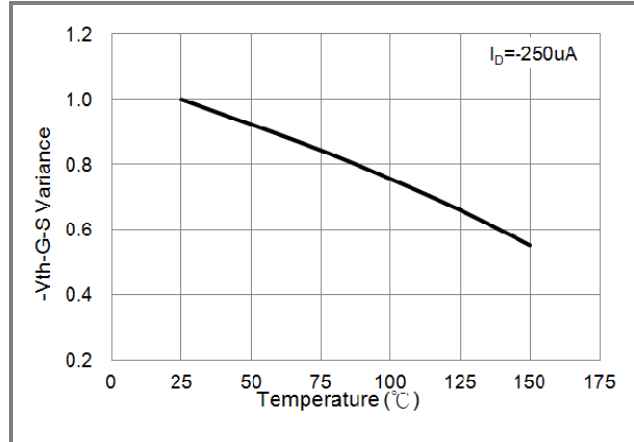


Fig.8 Threshold Voltage Variation with Temperature.

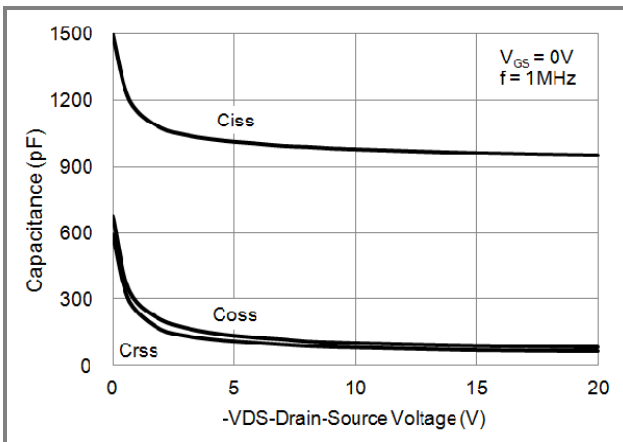


Fig.9 Capacitance vs. Drain-Source Voltage.

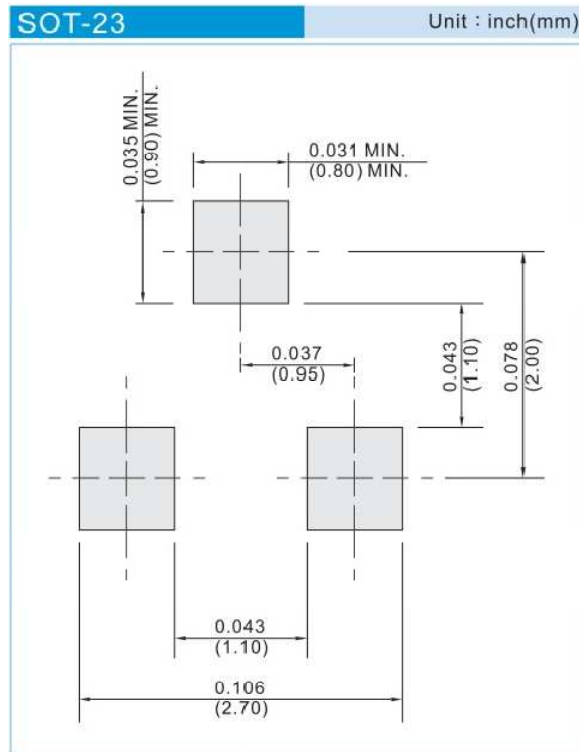


# PJA3415A

## PART NO. PACKING CODE VERSION

Part No. Packing Code	Package Type	Packing Type	Marking	Version
PJA3415A_R1_00001	SOT-23	3K pcs / 7" reel	A5A	Halogen free
PJA3415A_R2_00001	SOT-23	12K pcs / 13" reel	A5A	Halogen free

## MOUNTING PAD LAYOUT





## PJA3415A

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