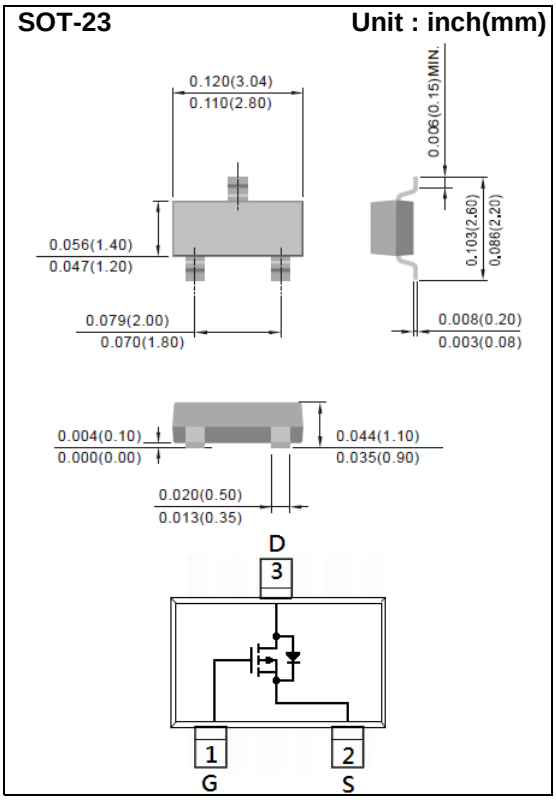
PJA3415A

20V P-Channel Enhancement Mode MOSFET

Voltage	-20 V	Current	-4.5A



Features

- $R_{DS(ON)}$, V_{GS}@-4.5V, I_D@-4.5A<46mΩ
- $R_{DS(ON)}$, V_{GS}@-2.5V, I_D@-3.0A<56mΩ
- $R_{DS(ON)}$, V_{GS}@-1.8V, I_D@-1.5A<88mΩ
- 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°C unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current		I_D	-4.5	A
Pulsed Drain Current		I_{DM}	-18	A
Power Dissipation	T_a=25°C	P_D	1.25	W
	Derate above 25°C		10	mW/°C
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55~150	°C
Typical Thermal resistance - Junction to Ambient (Note 3)		$R_{\theta JA}$	100	°C/W

PJA3415A

Electrical Characteristics (T_A=25°C unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250uA	-20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250uA	-0.5	-0.74	-1.3	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=-4.5V, I_D=-4.5A	-	38	46	mΩ
		V_{GS}=-2.5V, I_D=-3.0A	-	47	56	
		V_{GS}=-1.8V, I_D=-1.5A	-	68	88	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-16V, V_{GS}=0V	-	-0.01	-1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V	-	±10	±100	nA
Dynamic						
Total Gate Charge	Q_g	V_{DS}=-10V, I_D=-4.5A, V_{GS}=-4.5V (Note 1,2)	-	10	-	nC
Gate-Source Charge	Q_{gs}		-	1.7	-	
Gate-Drain Charge	Q_{gd}		-	2.4	-	
Input Capacitance	Ciss	V_{DS}=-10V, V_{GS}=0V, f=1.0MHZ	-	980	-	pF
Output Capacitance	Coss		-	100	-	
Reverse Transfer Capacitance	Crss		-	81	-	
Switching						
Turn-On Delay Time	$td_{(on)}$	V_{DD}=-10V, I_D=-4.5A, V_{GS}=-4.5V, R_G=6Ω (Note 1,2)	-	9.8	-	ns
Turn-On Rise Time	tr		-	54	-	
Turn-Off Delay Time	$td_{(off)}$		-	44	-	
Turn-Off Fall Time	tf		-	31	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I_S	---	-	-	-1.5	A
Diode Forward Voltage	V_{SD}	I_S=-1.0A, V_{GS}=0V	-	-0.78	-1.2	V

NOTES :

1. Pulse width≤300us, Duty cycle≤2%
2. Essentially independent of operating temperature typical characteristics.
3. $R_{\Theta JA}$ 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

PJA3415A

TYPICAL CHARACTERISTIC CURVES

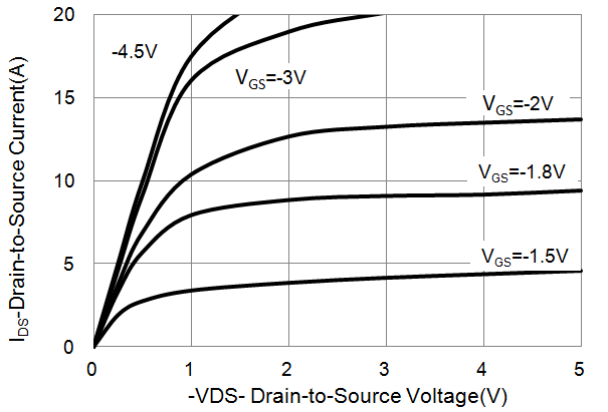


Fig.1 On-Region Characteristics

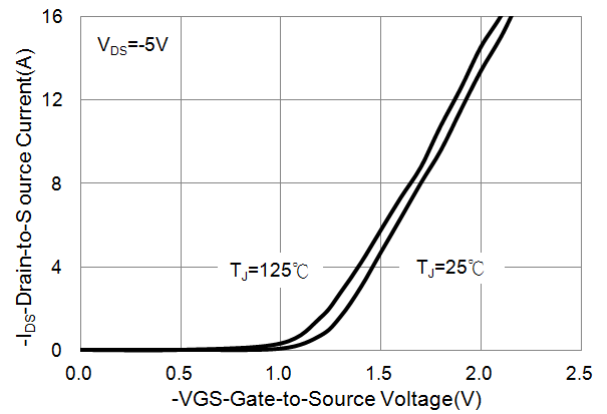


Fig.2 Transfer Characteristics

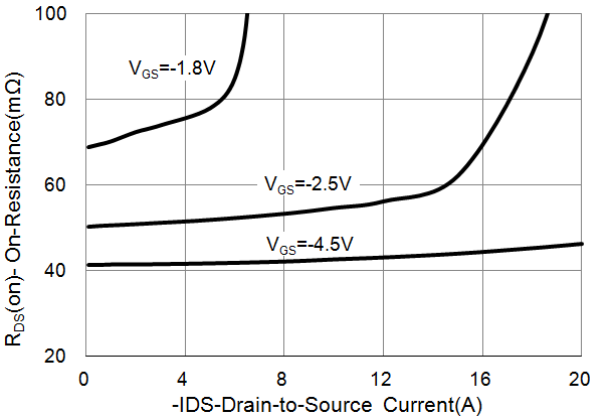


Fig.3 On-Resistance vs. Drain Current

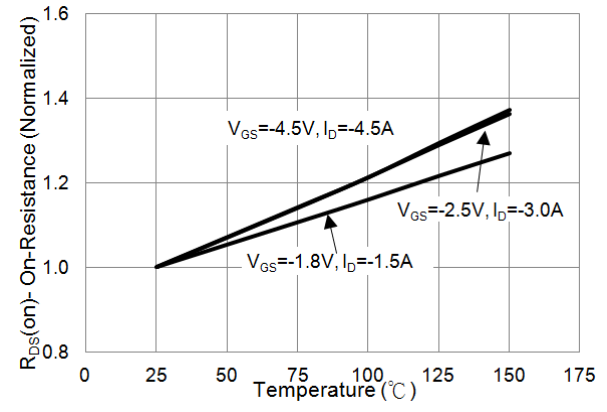


Fig.4 On-Resistance vs. Junction temperature

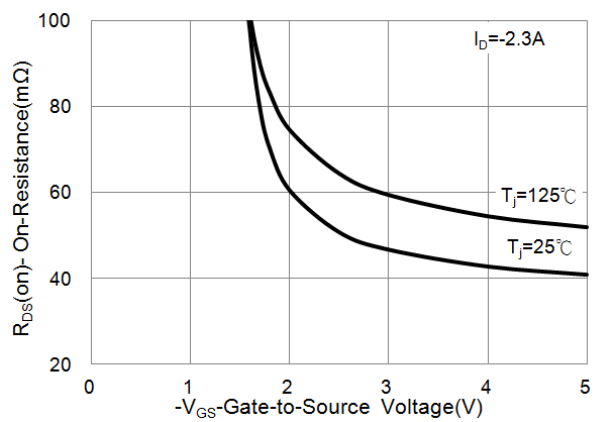


Fig.5 On-Resistance Variation with VGS.

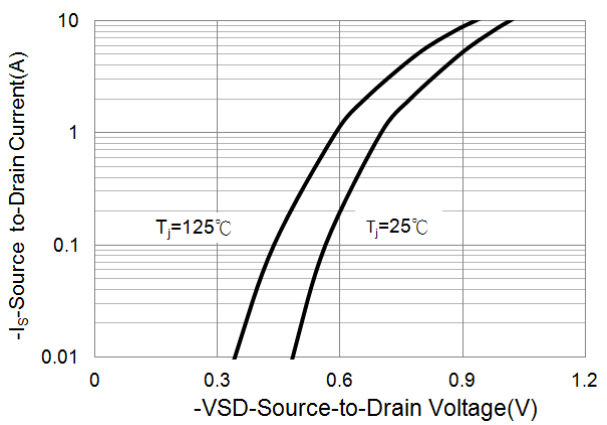


Fig.6 Body Diode Characteristics

PJA3415A

TYPICAL CHARACTERISTIC CURVES

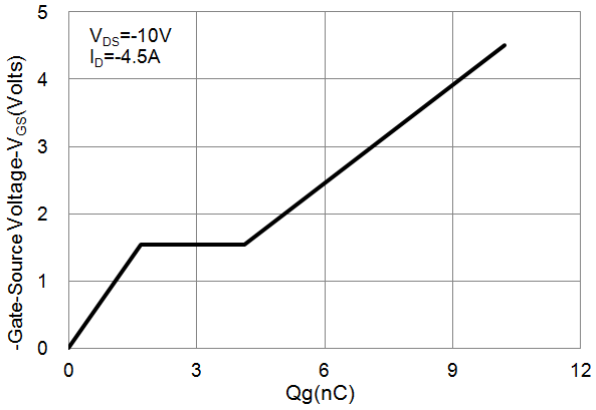


Fig.7 Gate-Charge Characteristics

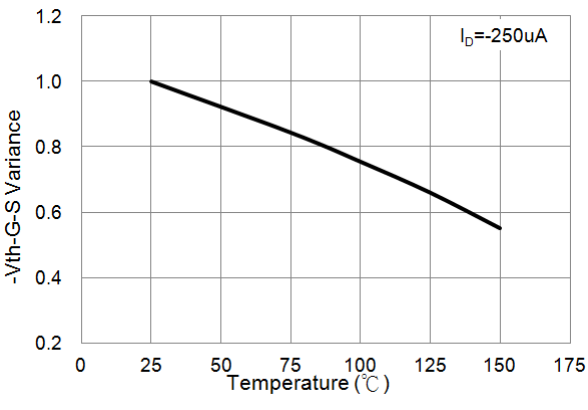


Fig.8 Threshold Voltage Variation with Temperature.

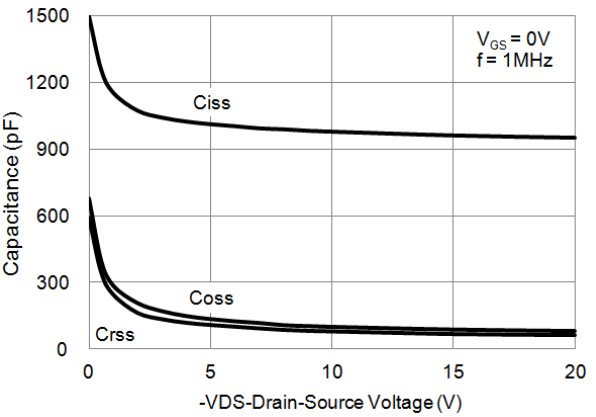


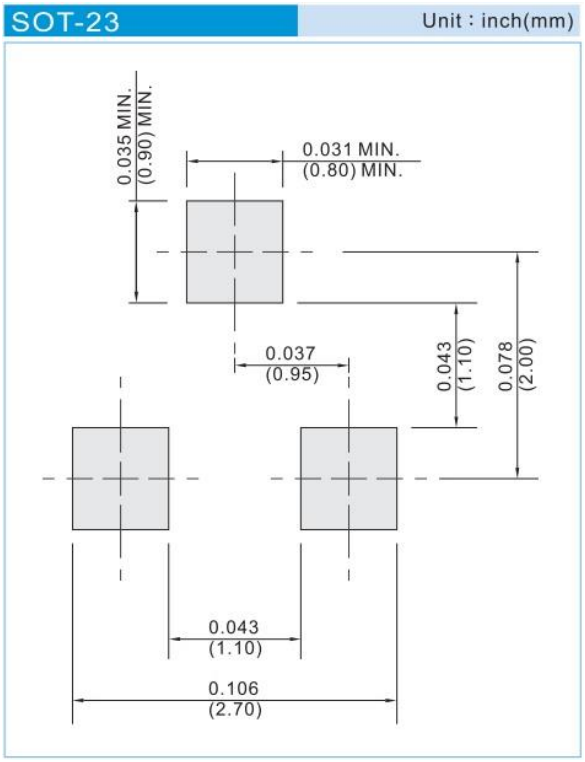
Fig.9 Capacitance vs. Drain-Source Voltage.

PJA3415A

Product and Packing Information

Part No.	Package Type	Packing Type	Marking
PJA3415A	SOT-23	3K pcs / 7” reel	A5A
PJA3415A	SOT-23	12K pcs / 13” reel	A5A

MOUNTING PAD LAYOUT



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