

PJA3416AE

20V N-Channel Enhancement Mode MOSFET – ESD Protected

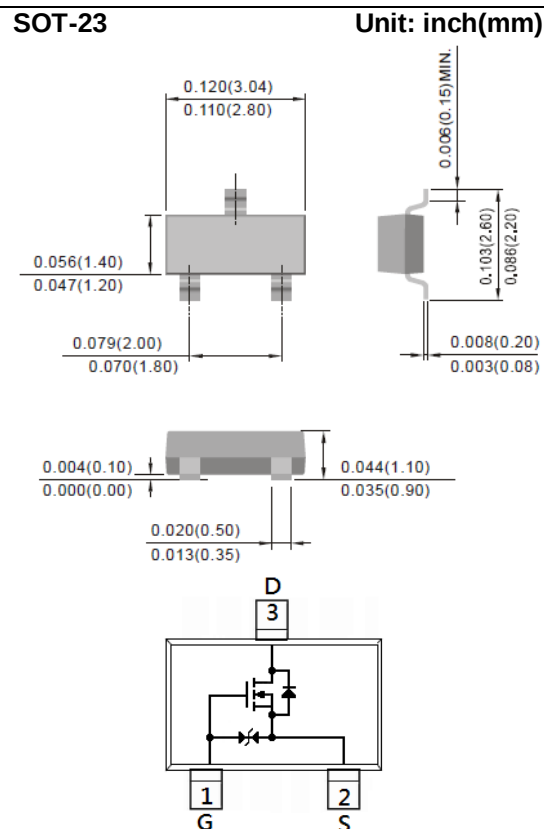
Voltage	20 V	Current	6.5A
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Features

- $R_{DS(ON)}$, $V_{GS}@4.5V$, $I_D@6.5A < 22m\Omega$
- $R_{DS(ON)}$, $V_{GS}@2.5V$, $I_D@5.5A < 26m\Omega$
- $R_{DS(ON)}$, $V_{GS}@1.8V$, $I_D@5.0A < 34m\Omega$
- Advanced Trench Process Technology
- Specially Designed for Switch Load, PWM Application, etc.
- ESD Protected 2KV HBM
- 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: A6E



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}	±8	V
Continuous Drain Current		I _D	6.5	A
Pulsed Drain Current ^(Note 4)		I _{DM}	32	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		R _{θJA}	100	°C/W
- Junction to Ambient ^(Note 3)				



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Electrical Characteristics ($T_A=25^{\circ}\text{C}$ 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	0.4	0.58	1.0	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =6.5A	-	18.4	22	mΩ
		V _{GS} =2.5V, I _D =5.5A	-	21.5	26	
		V _{GS} =1.8V, I _D =5.0A	-	26.4	34	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V	-	-	1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±8V, V _{DS} =0V	-	-	±10	uA
Dynamic						
Total Gate Charge	Q _g	V _{DS} =10V, I _D =6.5A, V _{GS} =4.5V ^(Note 1,2)	-	8.6	-	nC
Gate-Source Charge	Q _{gs}		-	1.06	-	
Gate-Drain Charge	Q _{gd}		-	1.04	-	
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1.0MHZ	-	836	-	pF
Output Capacitance	C _{oss}		-	96	-	
Reverse Transfer Capacitance	C _{rss}		-	80	-	
Switching						
Turn-On Delay Time	td _(on)	V _{DD} =10V, I _D =1A, V _{GS} =4.5V, R _G =3Ω ^(Note 1,2)	-	24	-	ns
Turn-On Rise Time	tr		-	46	-	
Turn-Off Delay Time	td _(off)		-	0.22	-	us
Turn-Off Fall Time	tf		-	0.30	-	
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	-	0.74	1.0	V

NOTES :

1. Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
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.

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TYPICAL CHARACTERISTIC CURVES

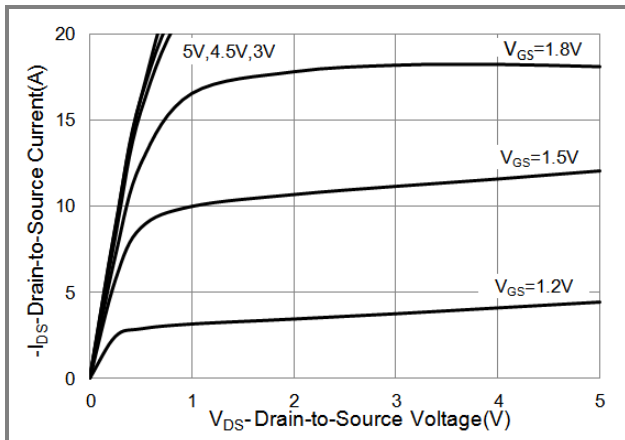


Fig.1 On-Region Characteristics

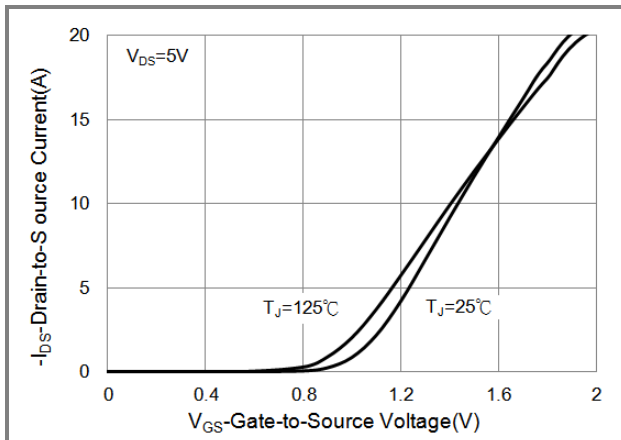


Fig.2 Transfer Characteristics

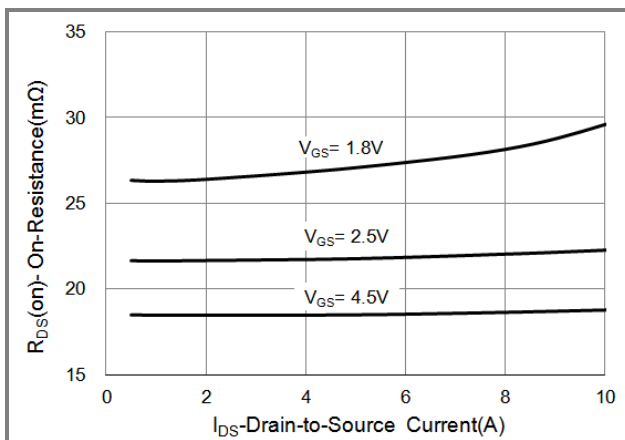


Fig.3 On-Resistance vs. Drain Current

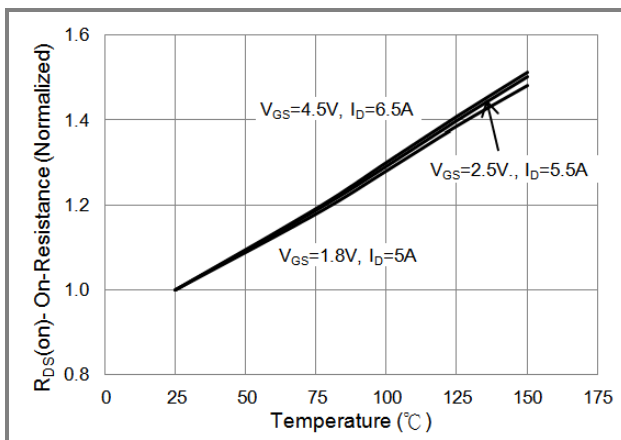


Fig.4 On-Resistance vs. Junction temperature

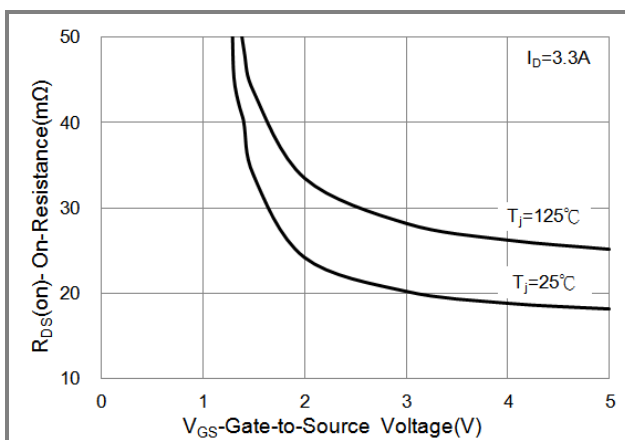


Fig.5 On-Resistance Variation with V_GS.

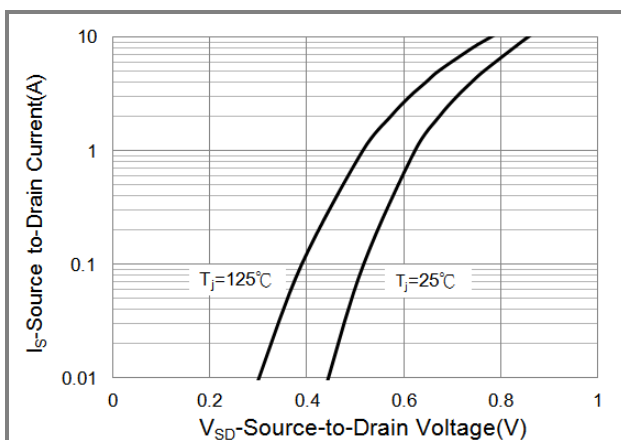


Fig.6 Body Diode Characteristics

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TYPICAL CHARACTERISTIC CURVES

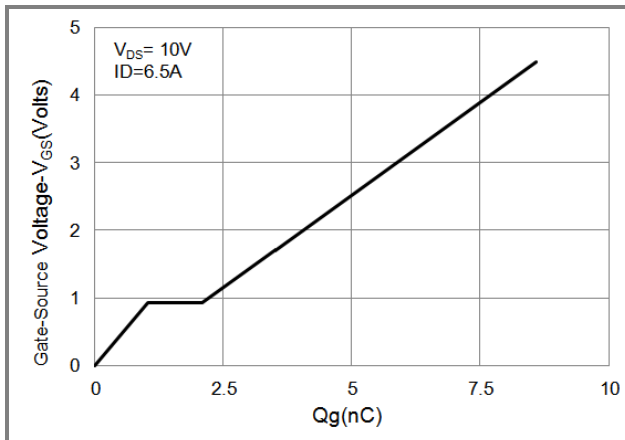


Fig.7 Gate-Charge Characteristics

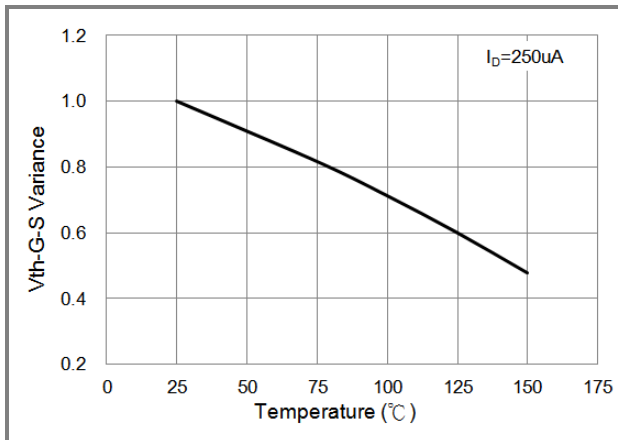


Fig.8 Threshold Voltage Variation with Temperature.

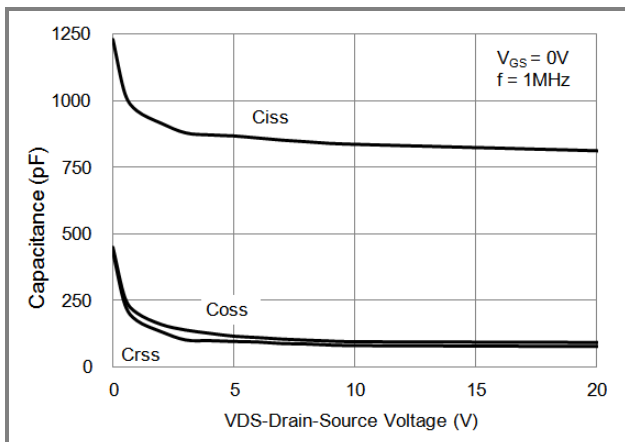


Fig.9 Capacitance vs. Drain-Source Voltage.

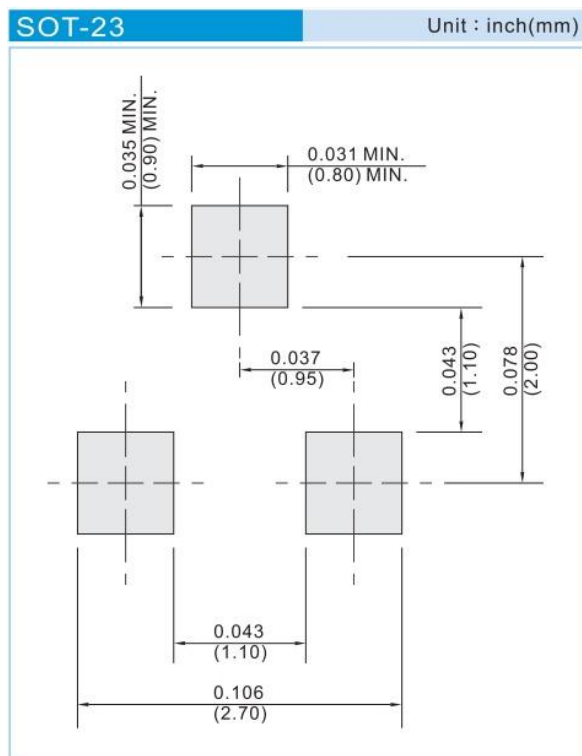


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PART NO PACKING CODE VERSION

PART NO PACKING CODE	Package Type	Packing type	Marking	Version
PJA3416AE_R1_00001	SOT-23	3K pcs / 7" reel	A6E	Halogen free
PJA3416AE_R2_00001	SOT-23	12K pcs / 13" reel	A6E	Halogen free

MOUNTING PAD LAYOUT





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