



PJA3413

20V P-Channel Enhancement Mode MOSFET

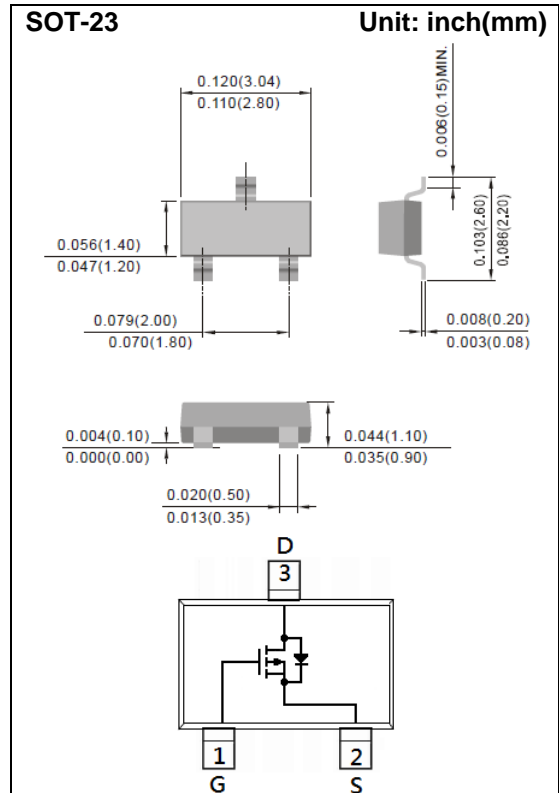
Voltage **-20 V** **Current** **-3.4A**

Features

- $R_{DS(ON)}$, $V_{GS@-4.5V}$, $I_D@-3.4A < 82m\Omega$
- $R_{DS(ON)}$, $V_{GS@-2.5V}$, $I_D@-2.2A < 110m\Omega$
- $R_{DS(ON)}$, $V_{GS@-1.8V}$, $I_D@-1.2A < 146m\Omega$
- 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: A13



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}	+12	V
Continuous Drain Current	I_D	-3.4	A
Pulsed Drain Current	I_{DM}	-13.6	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)			



PJA3413

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}	$V_{GS}=0V, I_D=-250\mu A$	-20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.65	-1.2	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-3.4A$	-	65	82	m Ω
		$V_{GS}=-2.5V, I_D=-2.2A$	-	82	110	
		$V_{GS}=-1.8V, I_D=-1.2A$	-	103	146	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$	-	0.01	-1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	-	± 10	± 100	nA
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=-10V, I_D=-3.4A,$ $V_{GS}=-4.5V$ (Note 1,2)	-	7	-	nC
Gate-Source Charge	Q_{gs}		-	1	-	
Gate-Drain Charge	Q_{gd}		-	1.8	-	
Input Capacitance	C_{iss}	$V_{DS}=-10V, V_{GS}=0V,$ $f=1.0\text{MHZ}$	-	522	-	pF
Output Capacitance	C_{oss}		-	55	-	
Reverse Transfer Capacitance	C_{rss}		-	40	-	
Switching						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-10V, I_D=-3.4A,$ $V_{GS}=-4.5V,$ $R_G=6\Omega$ (Note 1,2)	-	10	-	ns
Turn-On Rise Time	t_r		-	4	-	
Turn-Off Delay Time	$t_{d(off)}$		-	34	-	
Turn-Off Fall Time	t_f		-	5	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I_S	---	-	-	-1.5	A
Diode Forward Voltage	V_{SD}	$I_S=-1.0A, V_{GS}=0V$	-	0.77	-1.2	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



PJA3413

TYPICAL CHARACTERISTIC CURVES

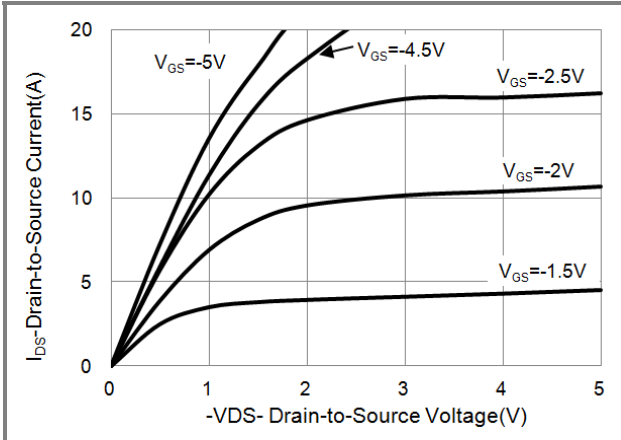


Fig.1 On-Region Characteristics

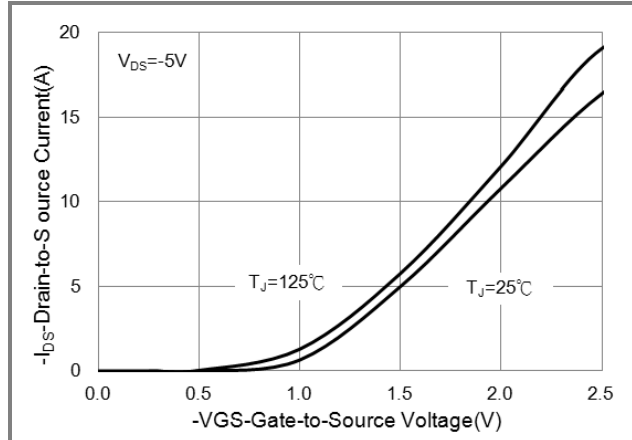


Fig.2 Transfer Characteristics

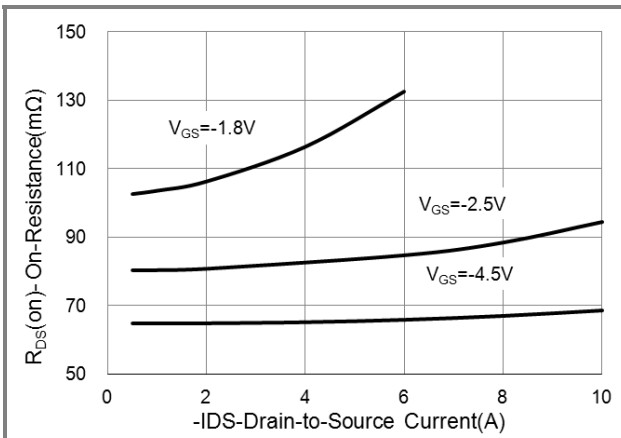


Fig.3 On-Resistance vs. Drain Current

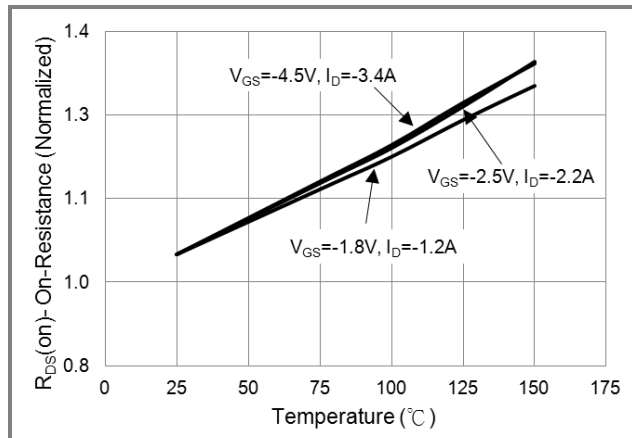


Fig.4 On-Resistance vs. Junction temperature

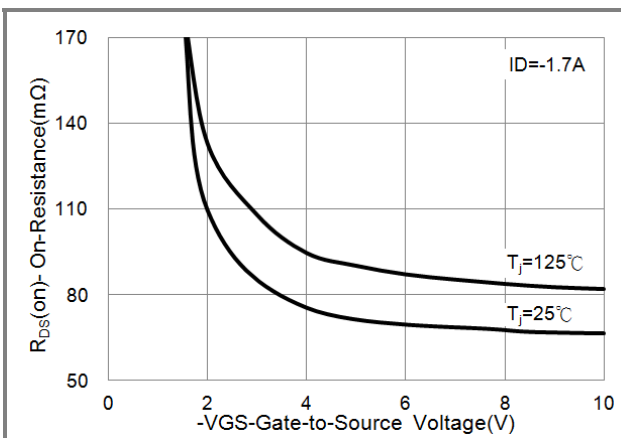


Fig.5 On-Resistance Variation with VGS.

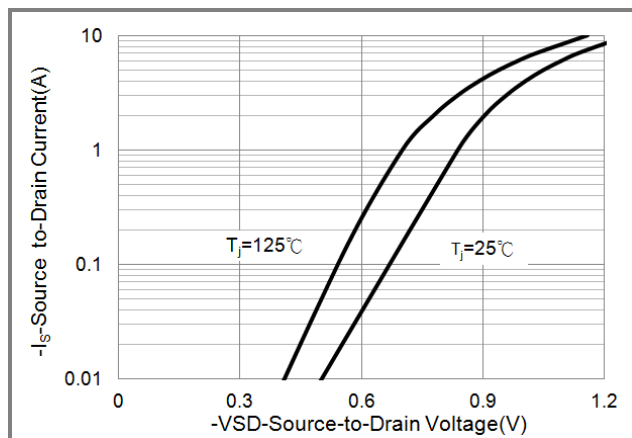


Fig.6 Body Diode Characteristics



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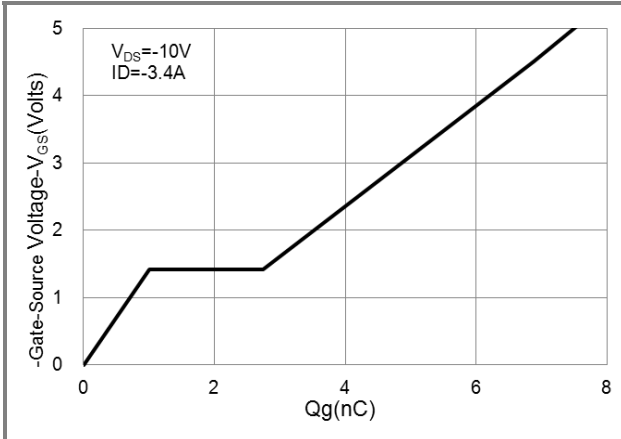


Fig.7 Gate-Charge Characteristics

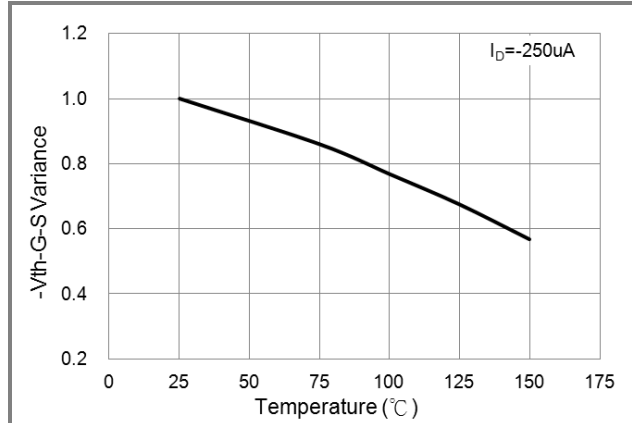


Fig.8 Threshold Voltage Variation with Temperature.

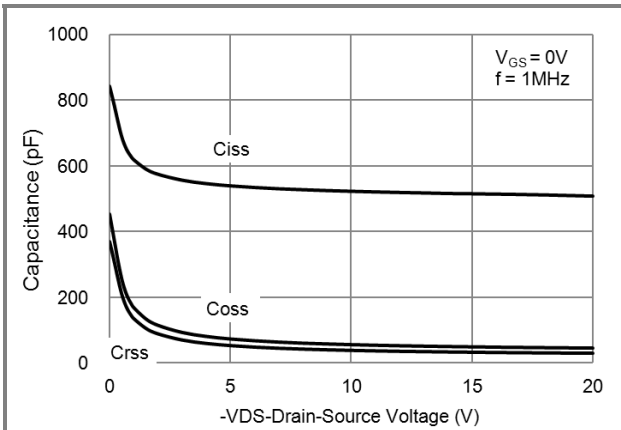


Fig.9 Threshold Voltage Variation with Temperature.

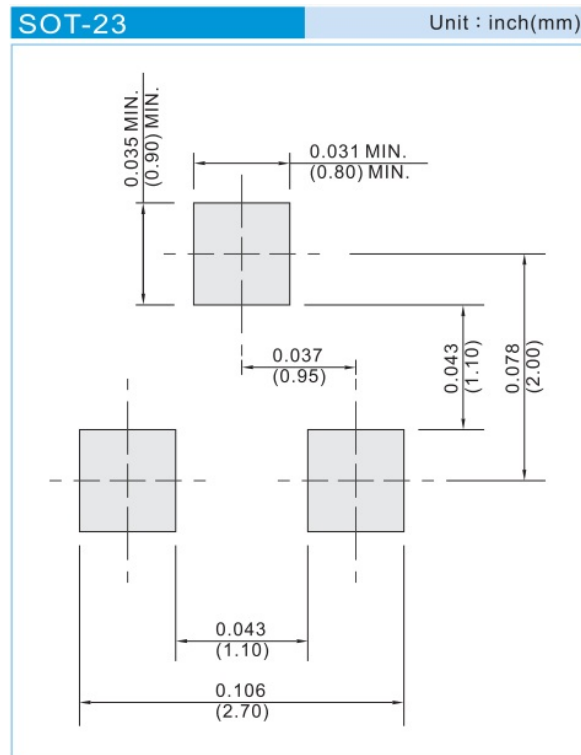


PJA3413

PART NO PACKING CODE VERSION

Part No Packing Code	Package Type	Packing type	Marking	Version
PJA3413_R1_00001	SOT-23	3K pcs / 7" reel	A13	Halogen free
PJA3413_R2_00001	SOT-23	12K pcs / 13" reel	A13	Halogen free

MOUNTING PAD LAYOUT





PJA3413

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