



PJ2301

20V P-Channel Enhancement Mode MOSFET

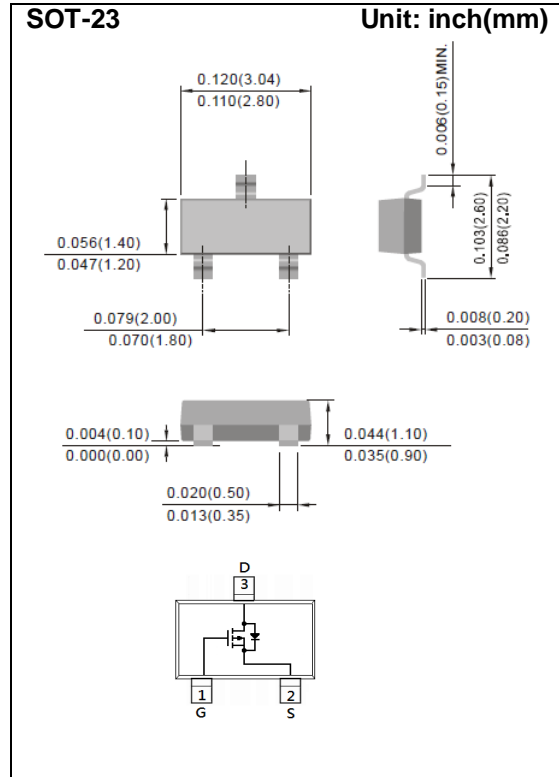
Voltage **-20 V** **Current** **-3.1A**

Features

- $R_{DS(ON)}$, $V_{GS}@-4.5V$, $I_D@-3.1A < 100m\Omega$
- $R_{DS(ON)}$, $V_{GS}@-2.5V$, $I_D@-2.0A < 135m\Omega$
- $R_{DS(ON)}$, $V_{GS}@-1.8V$, $I_D@-1.1A < 190m\Omega$
- 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



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	-3.1	A
Pulsed Drain Current	I_{DM}	-12.4	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 ($T_A=25^{\circ}\text{C}$ 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	-0.71	-1.2	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-3.1A$	-	84	100	m Ω
		$V_{GS}=-2.5V, I_D=-2.0A$	-	104	135	
		$V_{GS}=-1.8V, I_D=-1.1A$	-	134	190	
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	$V_{DS}=-10V, I_D=-3.1A,$ $V_{GS}=-4.5V$ (Note 1,2)	-	5.4	-	nC
Gate-Source Charge	Q_{gs}		-	0.7	-	
Gate-Drain Charge	Q_{gd}		-	1.3	-	
Input Capacitance	C_{iss}	$V_{DS}=-10V, V_{GS}=0V,$ $f=1.0\text{MHZ}$	-	416	-	pF
Output Capacitance	C_{oss}		-	43	-	
Reverse Transfer Capacitance	C_{rss}		-	32	-	
Switching						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-10V, I_D=-3.1A,$ $V_{GS}=-4.5V,$ $R_G=6\Omega$ (Note 1,2)	-	4	-	ns
Turn-On Rise Time	t_r		-	27	-	
Turn-Off Delay Time	$t_{d(off)}$		-	78	-	
Turn-Off Fall Time	t_f		-	45	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I_S	---	-	-	-1.5	A
Diode Forward Voltage	V_{SD}	$I_S=-1.0A, V_{GS}=0V$	-	0.8	-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



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TYPICAL CHARACTERISTIC CURVES

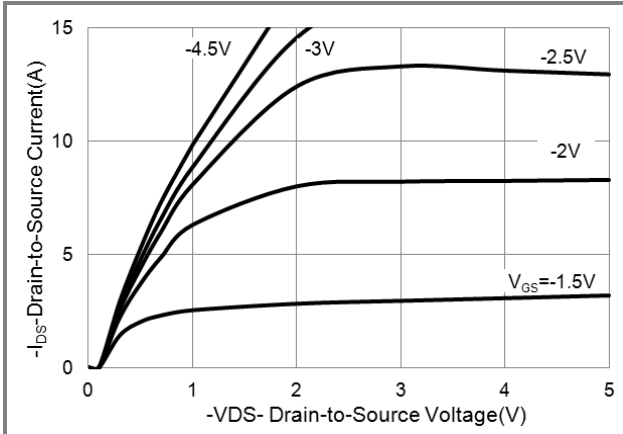


Fig.1 On-Region Characteristics

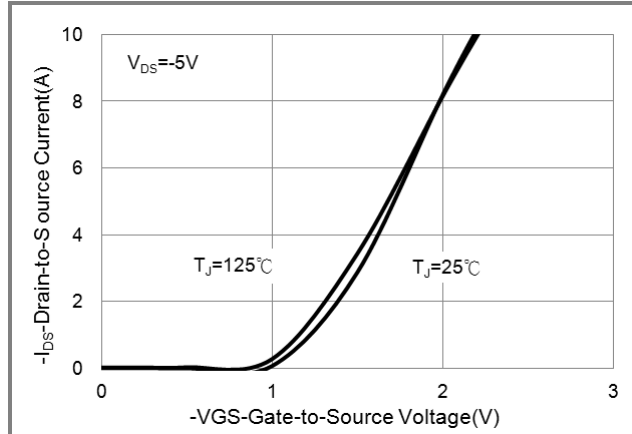


Fig.2 Transfer Characteristics

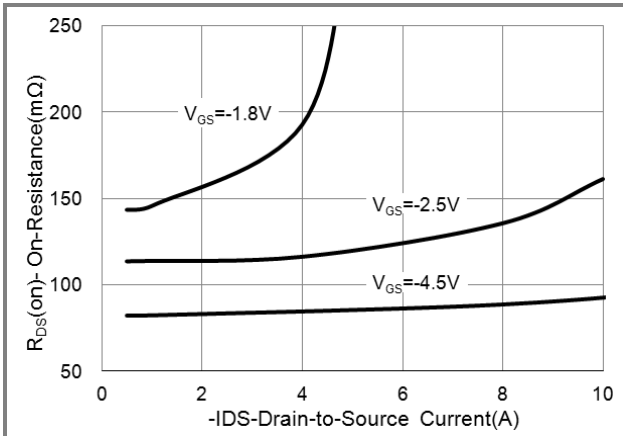


Fig.3 On-Resistance vs. Drain Current

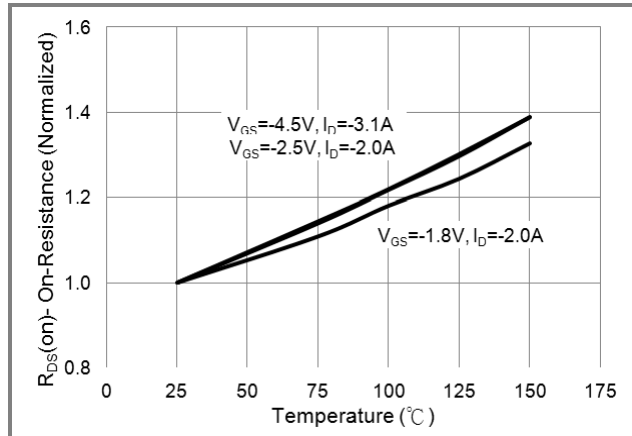


Fig.4 On-Resistance vs. Junction temperature

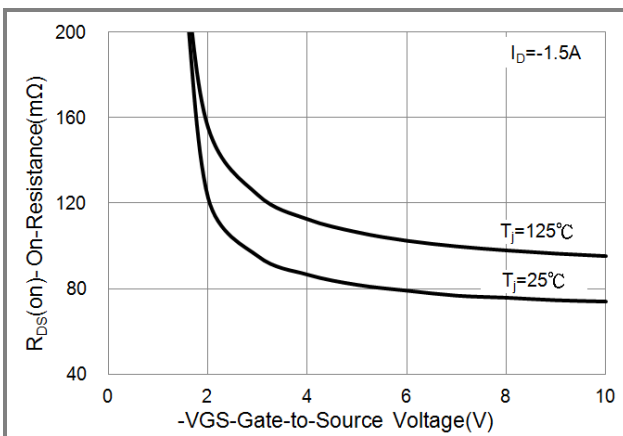


Fig.5 On-Resistance Variation with VGS.

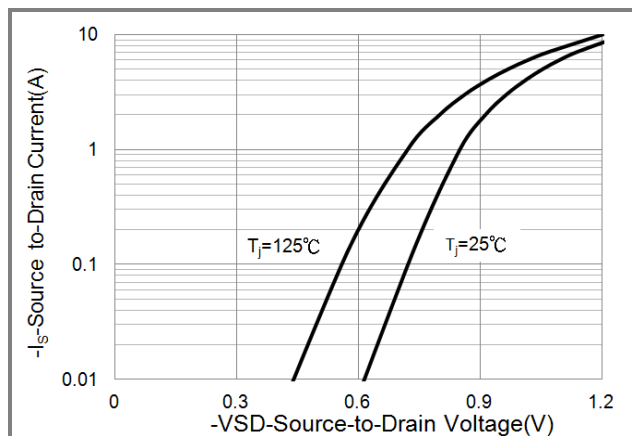


Fig.6 Body Diode Characteristics



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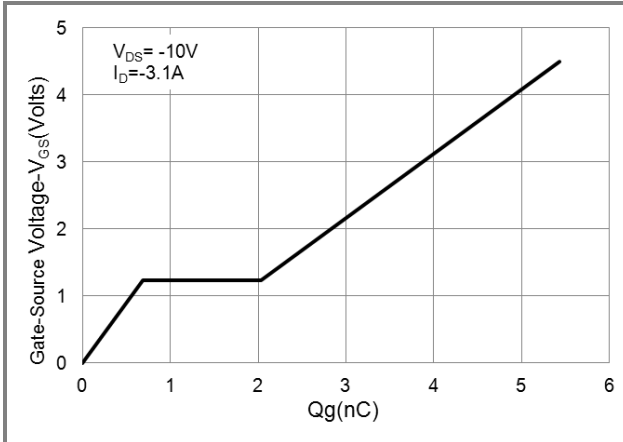


Fig.7 Gate-Charge Characteristics

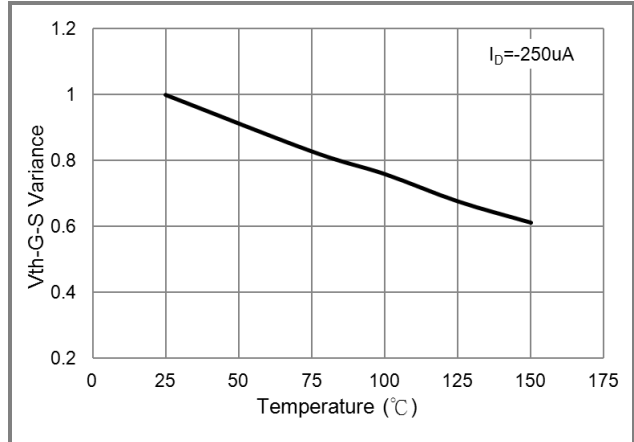


Fig.8 Threshold Voltage Variation with Temperature.

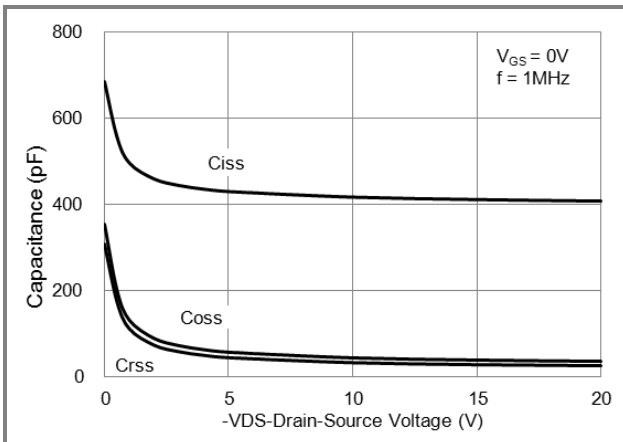


Fig.10 Capacitance vs. Drain-Source Voltage.

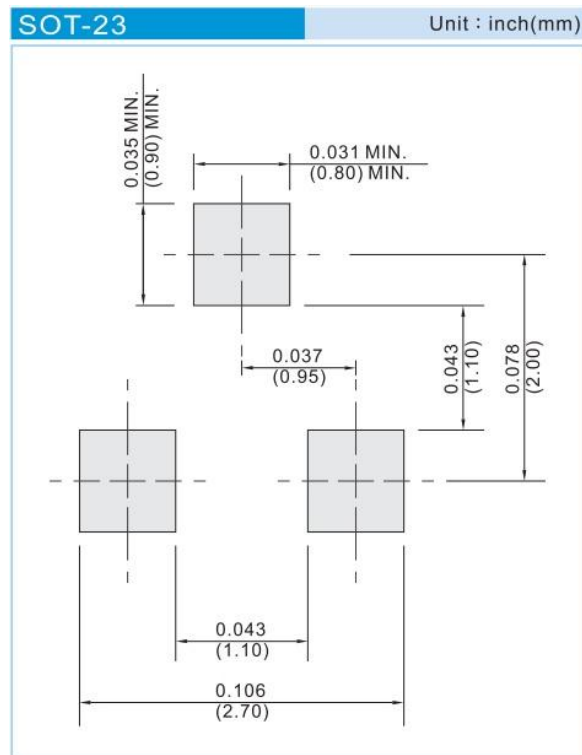


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PART NO PACKING CODE VERSION

Part No Packing Code	Package Type	Packing Type	Marking	Version
PJ2301_R1_00001	SOT-23	3K pcs / 7" reel	01	Halogen free
PJ2301_R2_00001	SOT-23	12K pcs / 13" reel	01	Halogen free

MOUNTING PAD LAYOUT





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