

PJA138L

60V N-Channel Enhancement Mode MOSFET

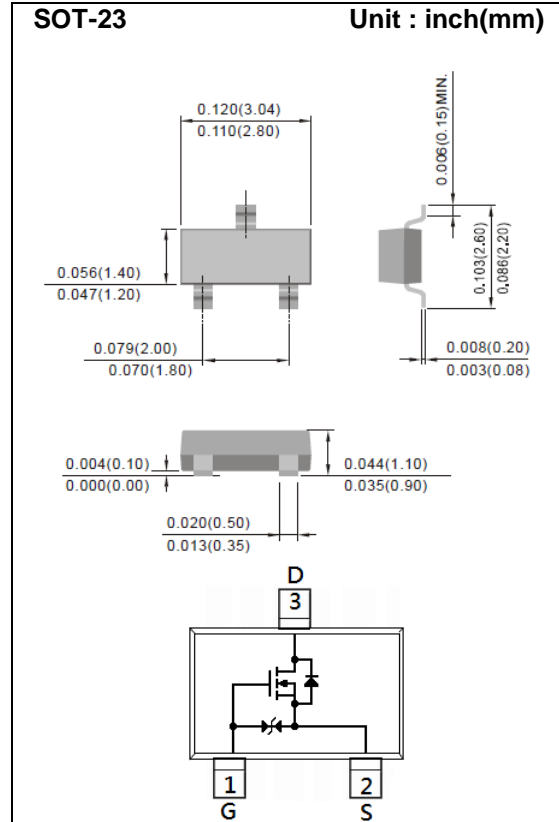
Voltage 60 V **Current** 250mA

Features

- $R_{DS(ON)}$, $V_{GS}@10V$, $I_D@250mA < 4.2\Omega$
- $R_{DS(ON)}$, $V_{GS}@4.5V$, $I_D@100mA < 5\Omega$
- $R_{DS(ON)}$, $V_{GS}@2.5V$, $I_D@50mA < 7\Omega$
- Advanced Trench Process Technology
- ESD Protected
- Specially Designed for Relay driver, Speed line drive, etc.
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

Mechanical Data

- Case : SOT-23 Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.0003 ounces, 0.0084 grams
- Marking : A8L



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

PARAMETER	SYMBOL	LIMIT	UNITS
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	+20	V
Continuous Drain Current	I_D	250	mA
Pulsed Drain Current	I_{DM}	1000	mA
Power Dissipation	$T_A=25^\circ\text{C}$	500	mW
	Derate above 25°C	4	mW/ $^\circ\text{C}$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~150	$^\circ\text{C}$
Typical Thermal resistance	$R_{\theta JA}$	250	$^\circ\text{C/W}$
- Junction to Ambient (Note 3)			

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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	60	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	0.8	1.2	1.5	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =250mA	-	2.5	4.2	Ω
		V _{GS} =4.5V, I _D =100mA	-	2.8	5	
		V _{GS} =2.5V, I _D =50mA	-	3.7	7	
		V _{GS} =1.8V, I _D =10mA	-	12	-	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V	-	0.01	1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	±1.0	±10	uA
Dynamic (Note 4)						
Total Gate Charge	Q _g	V _{DS} =15V, I _D =250mA, V _{GS} =4.5V (Note 1,2)	-	0.7	-	nC
Gate-Source Charge	Q _{gs}		-	0.33	-	
Gate-Drain Charge	Q _{gd}		-	0.2	-	
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1.0MHZ	-	15	-	pF
Output Capacitance	C _{oss}		-	8.4	-	
Reverse Transfer Capacitance	C _{rss}		-	4.2	-	
Turn-On Delay Time	t _{d(on)}	V _{DD} =10V, I _D =250mA, V _{GS} =10V, R _G =6Ω (Note 1,2)	-	7	-	ns
Turn-On Rise Time	t _r		-	22	-	
Turn-Off Delay Time	t _{d(off)}		-	21	-	
Turn-Off Fall Time	t _f		-	25	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I _S	---	-	-	250	mA
Diode Forward Voltage	V _{SD}	I _S =250mA, V _{GS} =0V	-	0.8	1.1	V

NOTES :

1. Pulse width ≤ 300us, Duty cycle ≤ 2%
2. Essentially independent of operating temperature typical characteristics.
3. R_{θJA} 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 square pad of copper
4. Guaranteed by design, not subject to production testing.

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TYPICAL CHARACTERISTIC CURVES

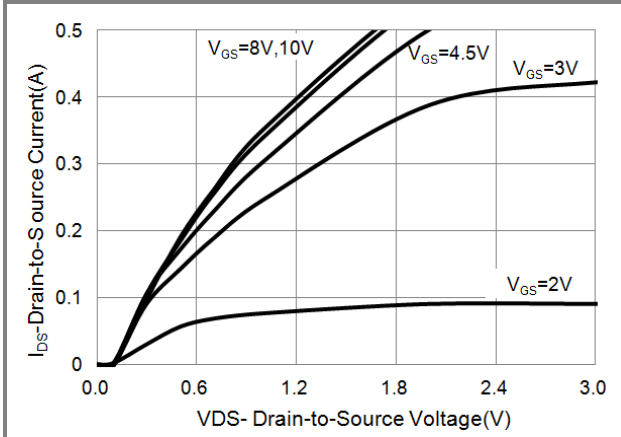


Fig.1 On-Region Characteristics

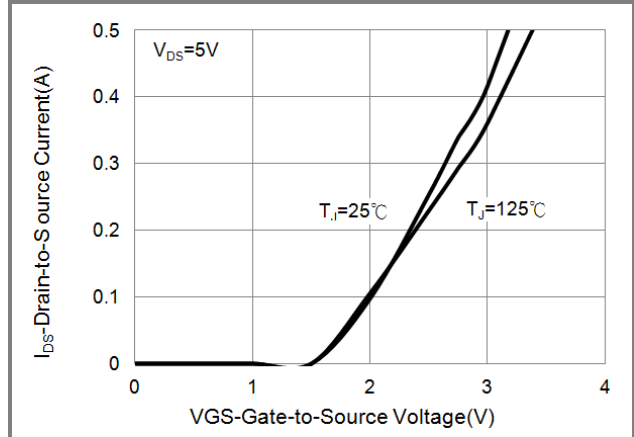


Fig.2 Transfer Characteristics

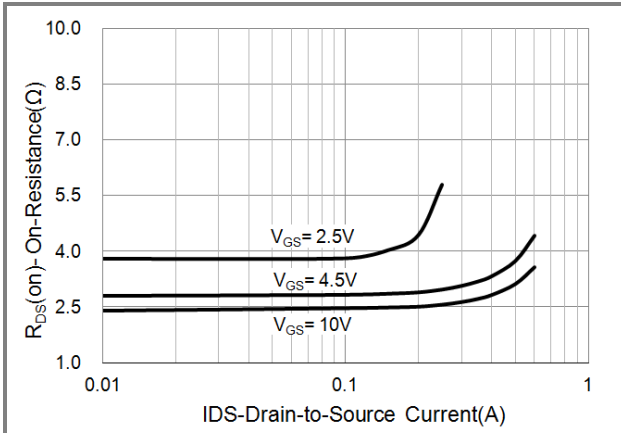


Fig.3 On-Resistance vs. Drain Current

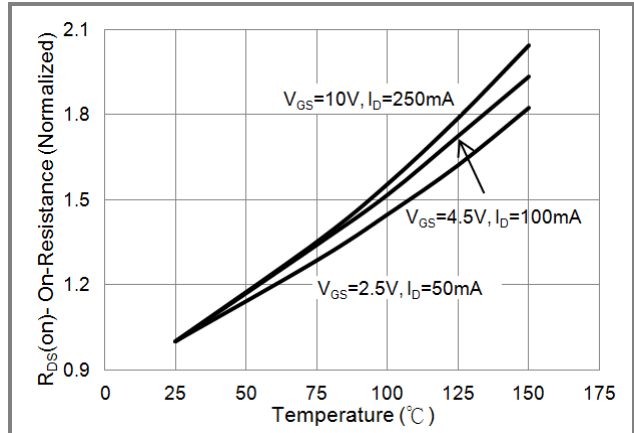


Fig.4 On-Resistance vs. Junction temperature

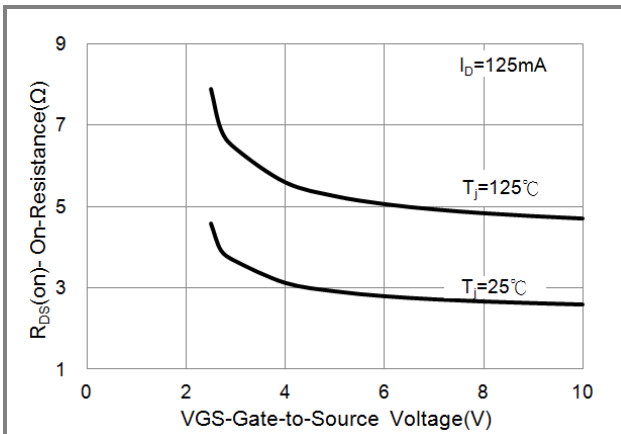


Fig.5 On-Resistance Variation with VGS.

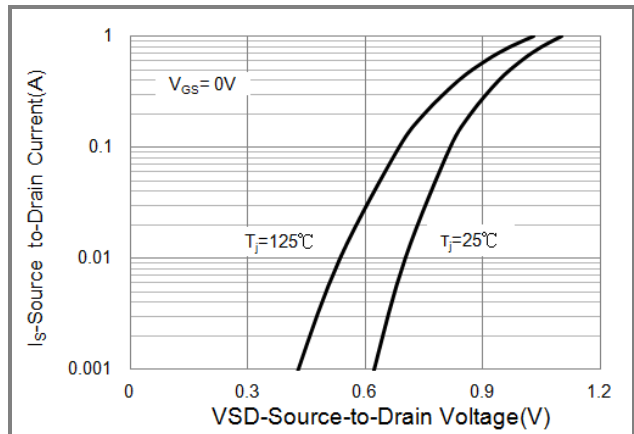


Fig.6 Body Diode Characteristics

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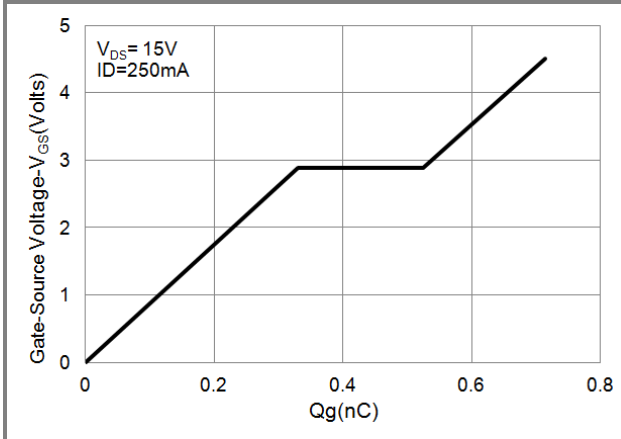


Fig.7 Gate-Charge Characteristics

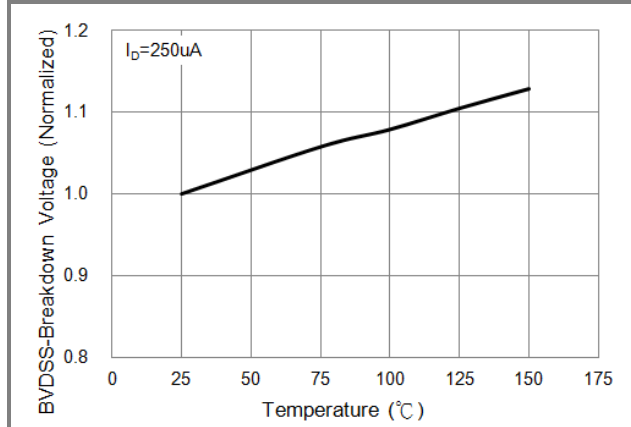


Fig.8 Breakdown Voltage Variation vs. Temperature

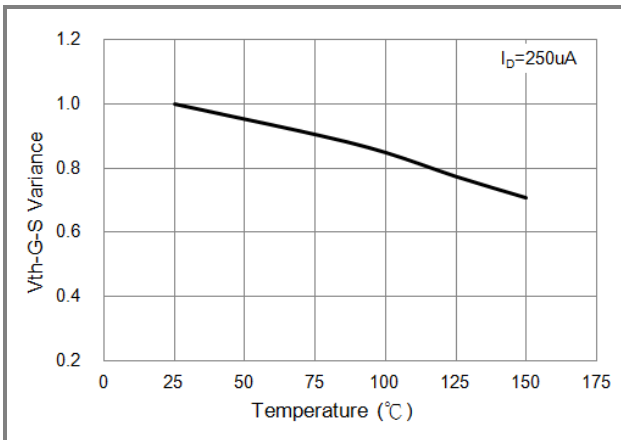


Fig.9 Threshold Voltage Variation with Temperature.

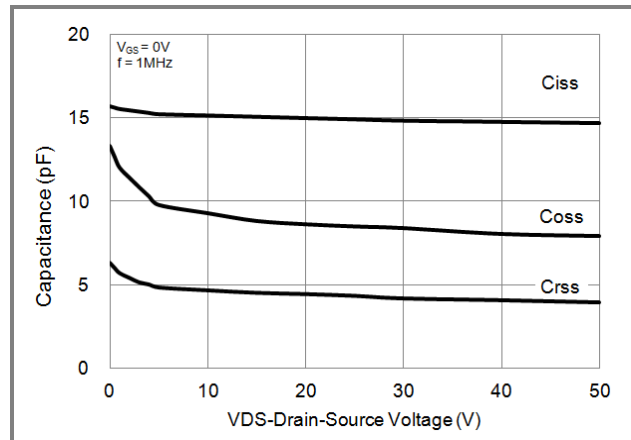


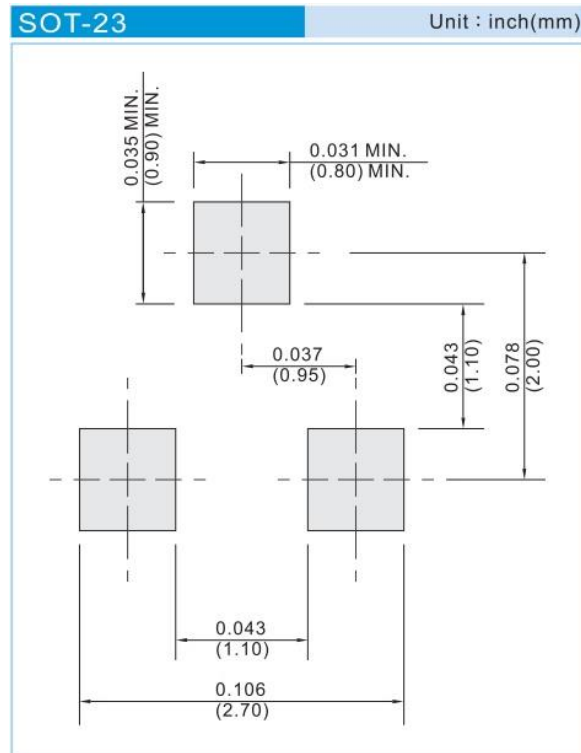
Fig.10 Capacitance vs. Drain-Source Voltage.

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Product and Packing Information

Part No.	Package Type	Packing Type	Marking
PJA138L	SOT-23	3K pcs / 7" reel	A8L
PJA138L	SOT-23	12K pcs / 13" reel	A8L

Mounting Pad Layout



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