

PJE138K-AU

50V N-Channel Enhancement Mode MOSFET – ESD Protected

Voltage

50 V

Current

350mA

Features

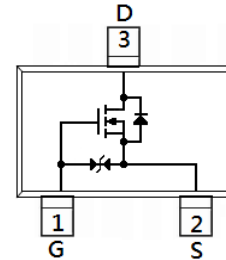
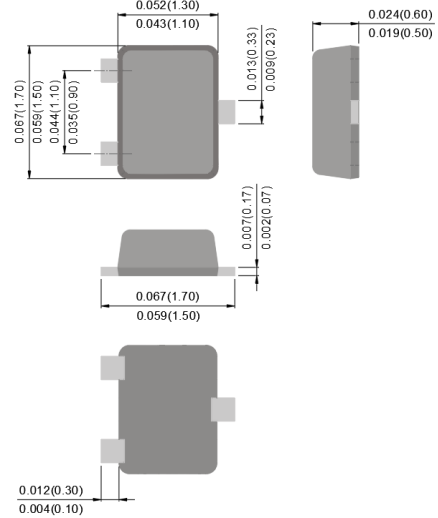
- $R_{DS(ON)}$, $V_{GS}@10V$, $I_D@500mA < 1.6\Omega$
- $R_{DS(ON)}$, $V_{GS}@4.5V$, $I_D@200mA < 2.5\Omega$
- $R_{DS(ON)}$, $V_{GS}@2.5V$, $I_D@100mA < 4.5\Omega$
- Advanced Trench Process Technology
- Specially Designed for Battery Operated Systems, Solid-State Relays Drivers: Relay, Displays, Memories, etc
- ESD Protected 2KV HBM
- AEC-Q101 qualified
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC61249 standard

Mechanical Data

- Case : SOT-523 Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.002 grams

SOT-523

Unit : inch(mm)



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

PARAMETER	SYMBOL	LIMIT	UNIT	
Drain-Source Voltage	V_{DS}	50	V	
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current ^(Note 4)	I_D	350	mA	
Pulsed Drain Current ^(Note 1)	I_{DM}	1200		
Power Dissipation	P_D	$T_A=25^\circ\text{C}$	223	mW
		Derate above 25°C	1.8	mW/ $^\circ\text{C}$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~150	$^\circ\text{C}$	
Typical Thermal Resistance	$R_{\theta JA}$	560	$^\circ\text{C/W}$	
- Junction to Ambient ^(Note 3,4)				

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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	50	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	0.8	1	1.5	
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =500mA	-	0.96	1.6	Ω
		V _{GS} =4.5V, I _D =200mA	-	1.25	2.5	
		V _{GS} =2.5V, I _D =100mA	-	2.73	4.5	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =50V, V _{GS} =0V	-	-	1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±10	
Dynamic (Note 5)						
Total Gate Charge	Q _g	V _{DS} =25V, I _D =250mA, V _{GS} =4.5V(Note 1,2)	-	0.63	1	nC
Gate-Source Charge	Q _{gs}		-	0.2	-	
Gate-Drain Charge	Q _{gd}		-	0.23	-	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHZ	-	25	50	pF
Output Capacitance	C _{oss}		-	9.5	20	
Reverse Transfer Capacitance	C _{rss}		-	2.1	5	
Turn-On Delay Time	t _{d(on)}	V _{DD} =25V, I _D =500mA, V _{GS} =10V, R _G =6Ω(Note 1,2)	-	2.2	5	ns
Turn-On Rise Time	t _r		-	19.2	38	
Turn-Off Delay Time	t _{d(off)}		-	6.2	12	
Turn-Off Fall Time	t _f		-	23	50	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I _s	---	-	-	500	mA
Diode Forward Voltage	V _{SD}	I _s =500mA, V _{GS} =0V	-	0.86	1.5	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. The maximum current rating is package limited.
5. Guaranteed by design, not subject to production testing.

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TYPICAL CHARACTERISTIC CURVES

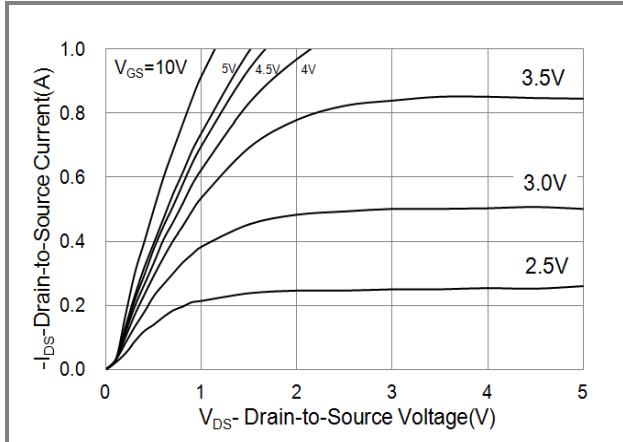


Fig.1 On-Region Characteristics

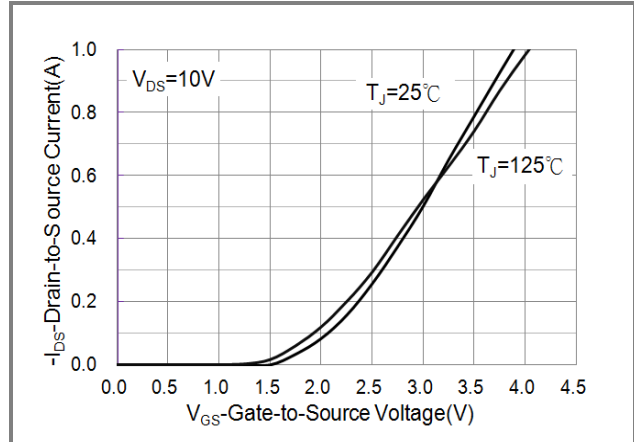


Fig.2 Transfer Characteristics

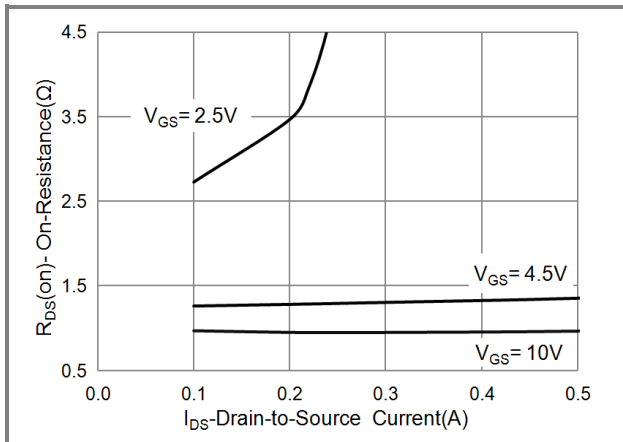


Fig.3 On-Resistance vs. Drain Current

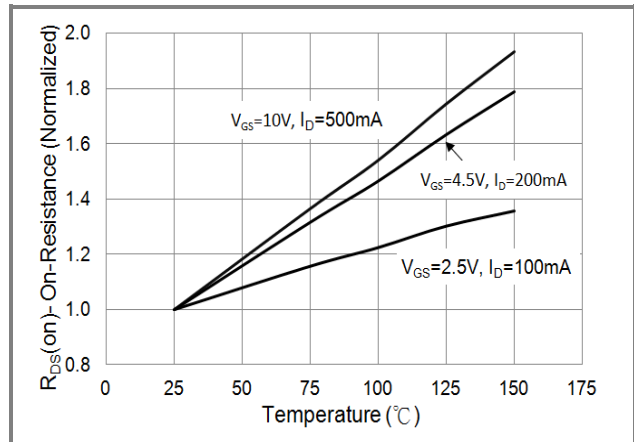


Fig.4 On-Resistance vs. Junction temperature

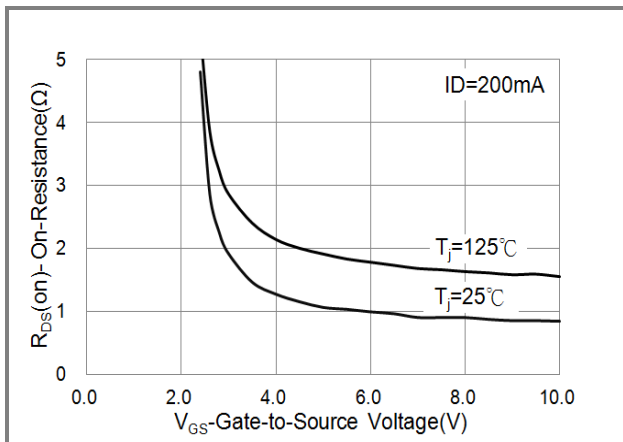


Fig.5 On-Resistance Variation with V_GS

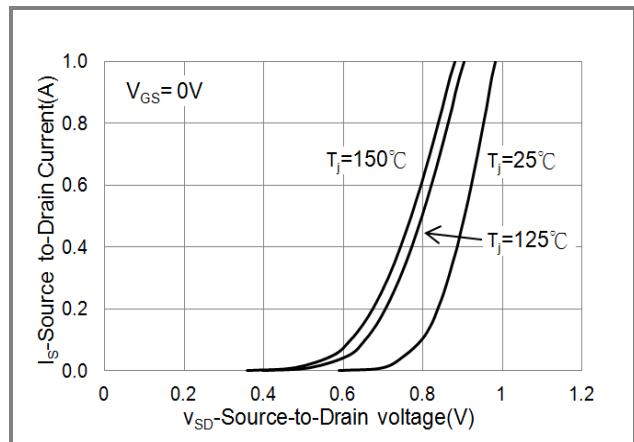
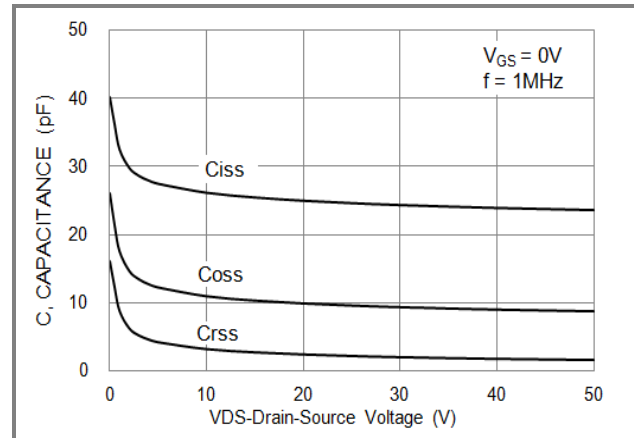
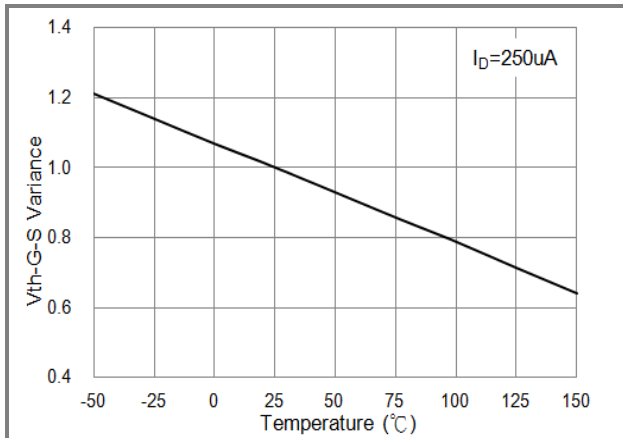
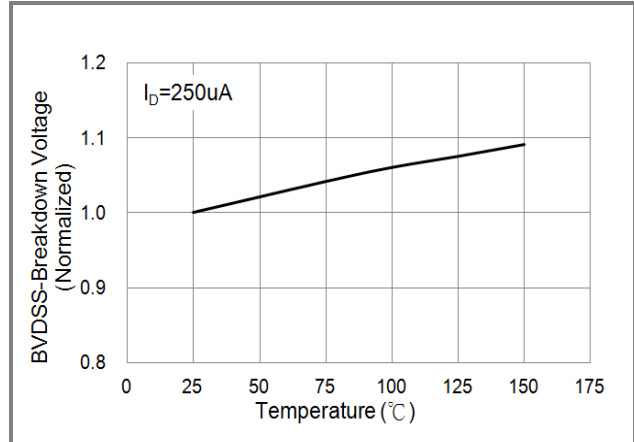
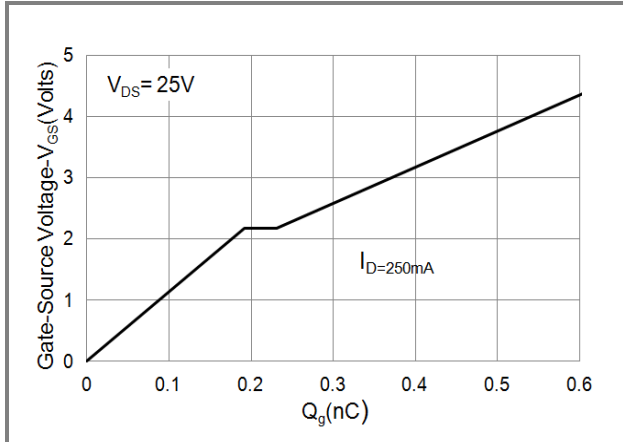


Fig.6 Body Diode Characteristics

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TYPICAL CHARACTERISTIC CURVES

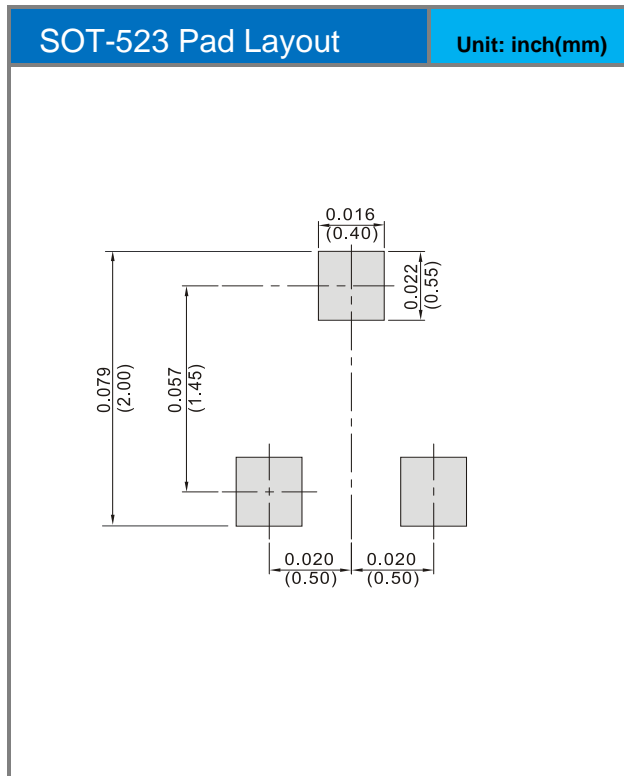


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Product and Packing Information

Part No.	Package Type	Packing Type	Marking
PJE138K-AU	SOT-523	4K pcs / 7" reel	8KT

Mounting Pad Layout



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