



PJE138K-AU

50V N-Channel Enhancement Mode MOSFET – ESD Protected

Voltage

50 V

Current

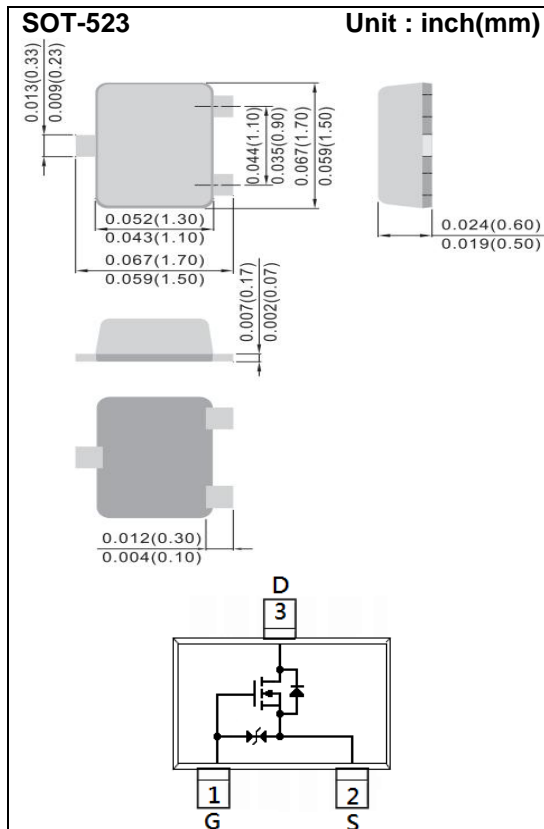
350mA

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 : 0.00007 ounces, 0.002 grams



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

PARAMETER		SYMBOL	LIMIT	UNITS
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	$T_A=25^\circ\text{C}$	P_D	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 ($T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	50	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	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	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 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	μF
Output Capacitance	C_{oss}		-	9.5	20	
Reverse Transfer Capacitance	C_{rss}		-	2.1	5	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=25V, I_D=500mA,$ $V_{GS}=10V,$ $R_G=6\Omega$ (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 $\leq 300\mu s$, 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 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

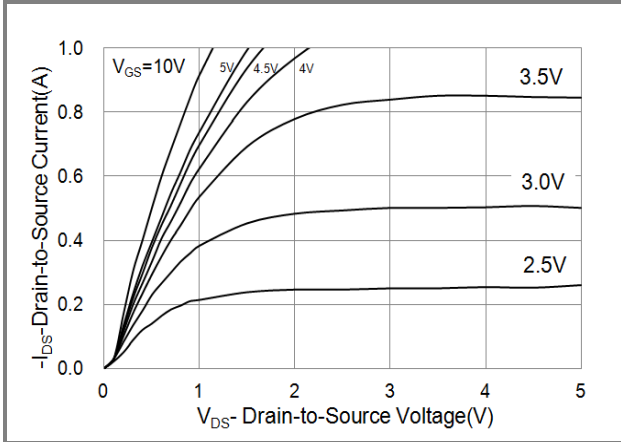


Fig.1 On-Region Characteristics

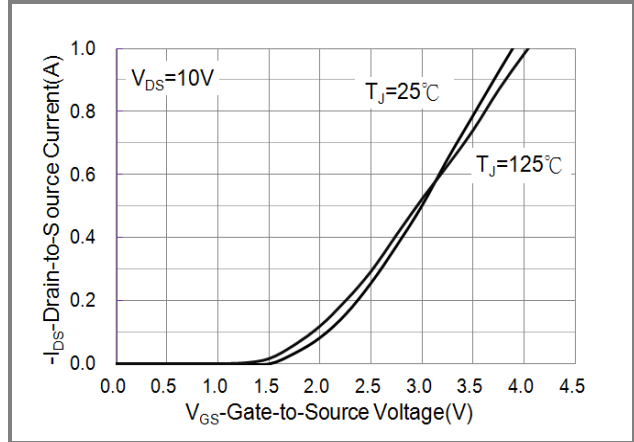


Fig.2 Transfer Characteristics

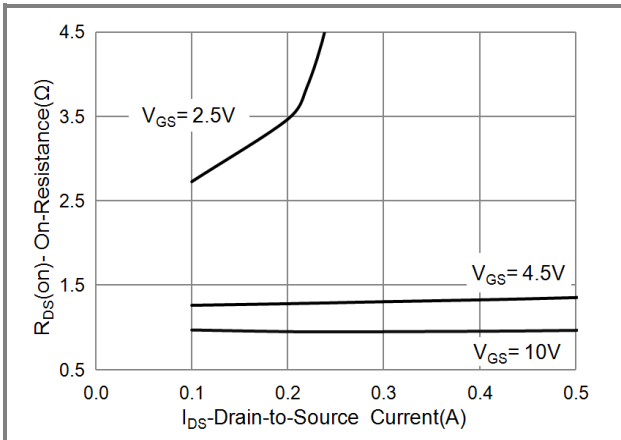


Fig.3 On-Resistance vs. Drain Current

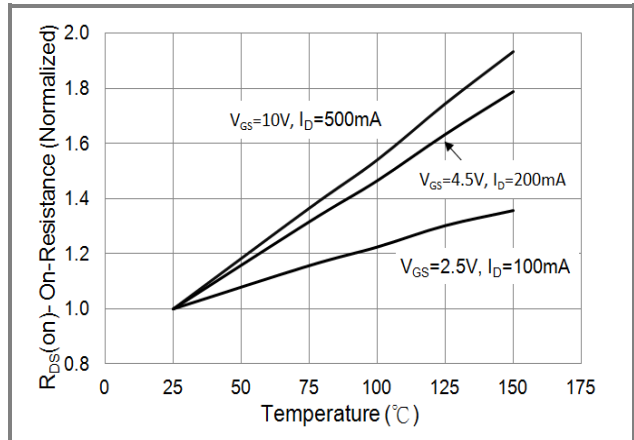


Fig.4 On-Resistance vs. Junction temperature

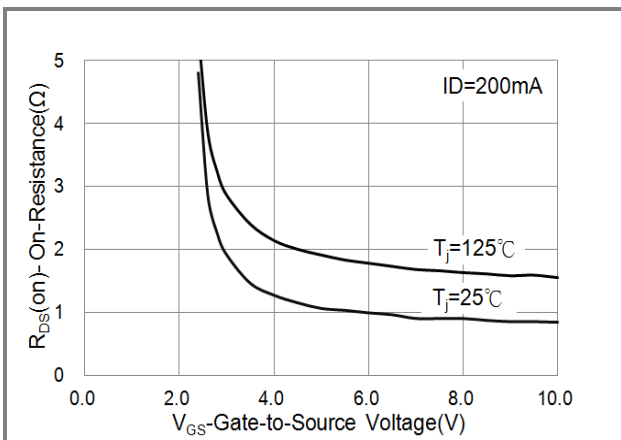


Fig.5 On-Resistance Variation with V_GS

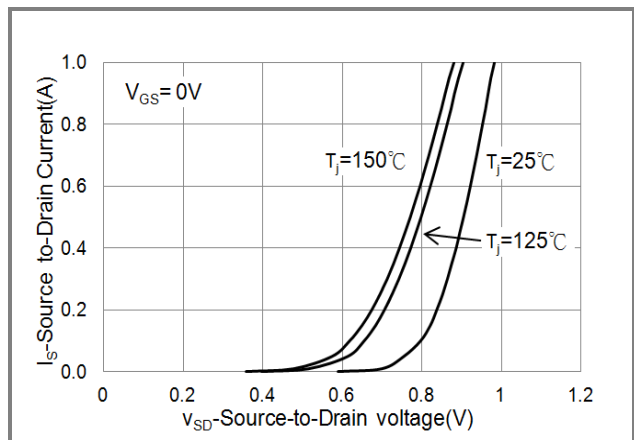


Fig.6 Body Diode Characteristics



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TYPICAL CHARACTERISTIC CURVES

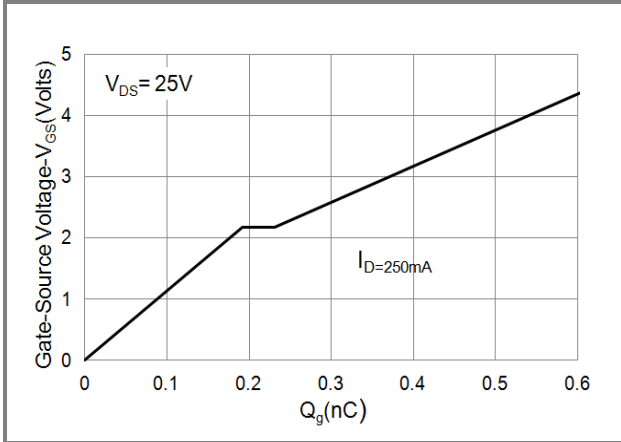


Fig.7 Gate-Charge Characteristics

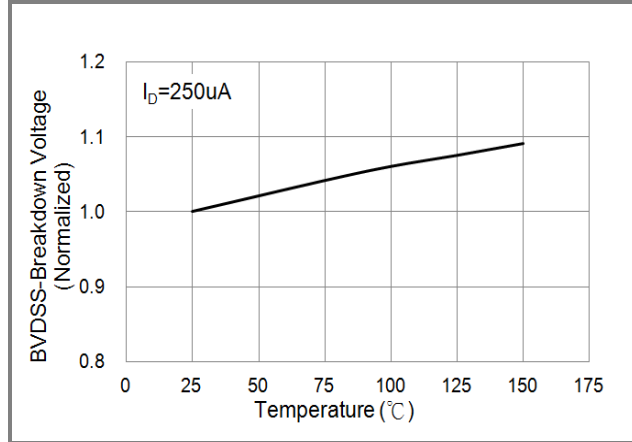


Fig.8 Breakdown Voltage Variation vs. Temperature

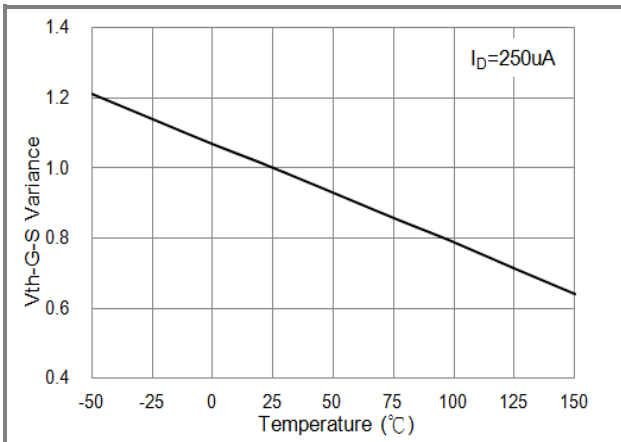


Fig.9 Threshold Voltage Variation with Temperature

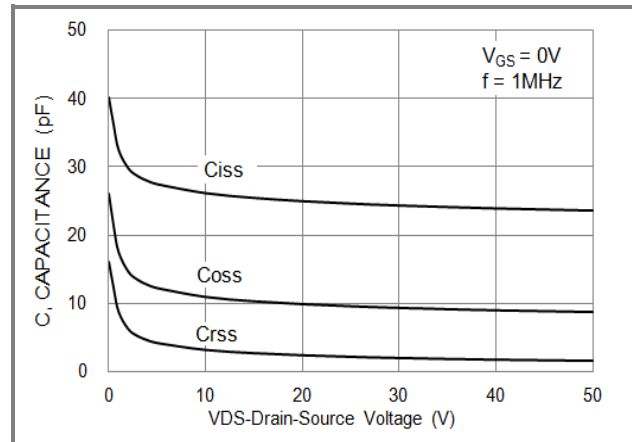


Fig.10 Capacitance vs. Drain-Source Voltage

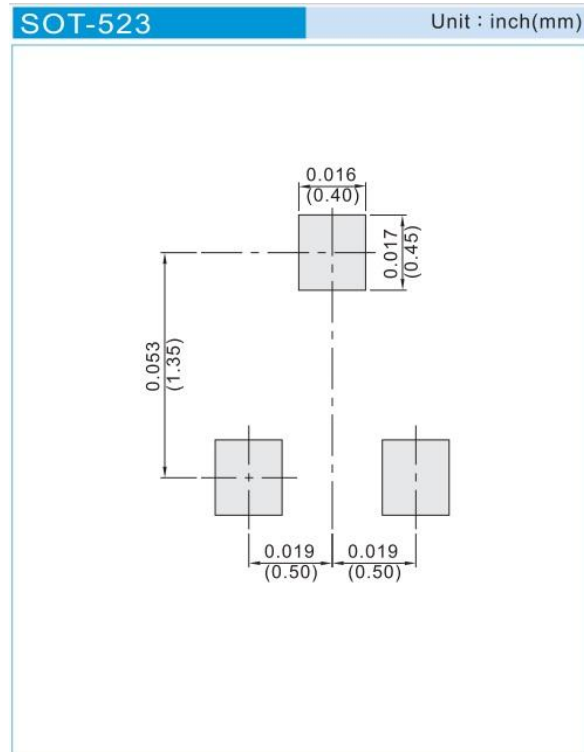


PJE138K-AU

Part No Packing Code Version

Part No Packing Code	Package Type	Packing Type	Marking	Version
PJE138K-AU_R1_000A1	SOT-523	4K pcs / 7" reel	8KT	Halogen free

Mounting Pad Layout





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