



# PJA3439

## 60V P-Channel Enhancement Mode MOSFET

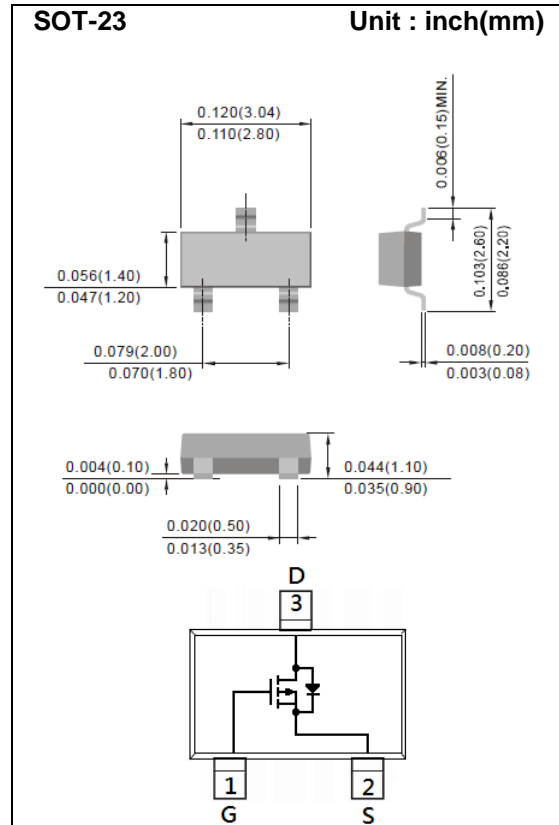
**Voltage**    **-60 V**    **Current**    **-300mA**

### Features

- RDS(ON) , VGS@-10V, ID@-500mA<4Ω
- RDS(ON) , VGS@-4.5V, ID@-200mA<6Ω
- RDS(ON) , VGS@-2.5V, ID@-50mA<13Ω
- Advanced Trench Process Technology
- Specially Designed for Relay driver, Speed line drive, 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: A39



### Maximum Ratings and Thermal Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		V <sub>DS</sub>	-60	V
Gate-Source Voltage		V <sub>GS</sub>	+20	V
Continuous Drain Current		I <sub>D</sub>	-300	mA
Pulsed Drain Current		I <sub>DM</sub>	-1000	mA
Power Dissipation	T <sub>A</sub> =25°C	P <sub>D</sub>	500	mW
	Derate above 25°C		4	mW/°C
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55~150	°C
Typical Thermal resistance		R <sub>θJA</sub>	250	°C/W
- Junction to Ambient <sup>(Note 3)</sup>				



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## Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
<b>Static</b> (Note 1)						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-60	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0	-1.5	-2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-500mA$	-	2.4	4	$\Omega$
		$V_{GS}=-4.5V, I_D=-200mA$	-	2.65	6	
		$V_{GS}=-2.5V, I_D=-50mA$	-	4.5	13	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-48V, V_{GS}=0V$	-	-	-1	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>Dynamic</b> (Note 4)						
Total Gate Charge	$Q_g$	$V_{DS}=-25V, I_D=-100mA,$ $V_{GS}=-4.5V$	-	1.1	-	nC
Gate-Source Charge	$Q_{gs}$		-	0.3	-	
Gate-Drain Charge	$Q_{gd}$		-	0.2	-	
Input Capacitance	$C_{iss}$	$V_{DS}=-25V, V_{GS}=0V,$ $f=1.0MHz$	-	51	-	pF
Output Capacitance	$C_{oss}$		-	15	-	
Reverse Transfer Capacitance	$C_{rss}$		-	2.2	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-25V, I_D=-100mA,$ $V_{GS}=-10V,$ $R_G=6\Omega$ (Note 1,2)	-	4.8	-	ns
Turn-On Rise Time	$t_r$		-	19	-	
Turn-Off Delay Time	$t_{d(off)}$		-	52	-	
Turn-Off Fall Time	$t_f$		-	32	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	$I_S$	---	-	-	-300	mA
Diode Forward Voltage	$V_{SD}$	$I_S=-500mA, V_{GS}=0V$	-	-0.95	-1.3	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. Guaranteed by design, not subject to production testing



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## TYPICAL CHARACTERISTIC CURVES

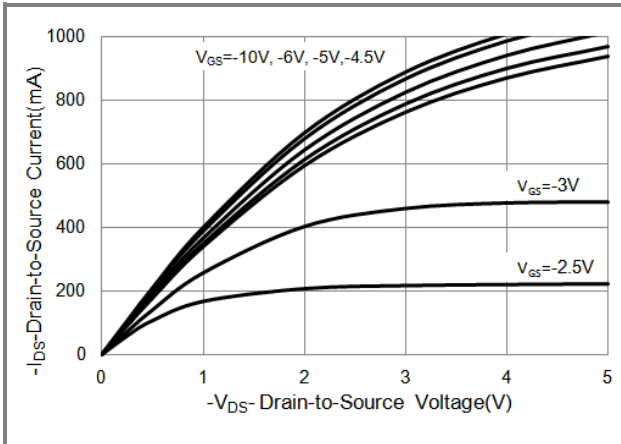


Fig.1 On-Region Characteristics

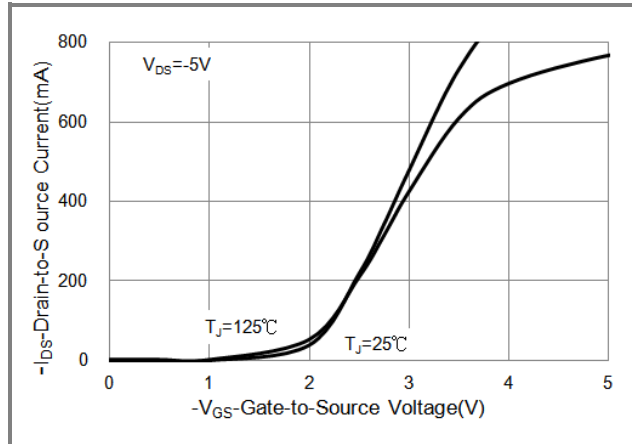


Fig.2 Transfer Characteristics

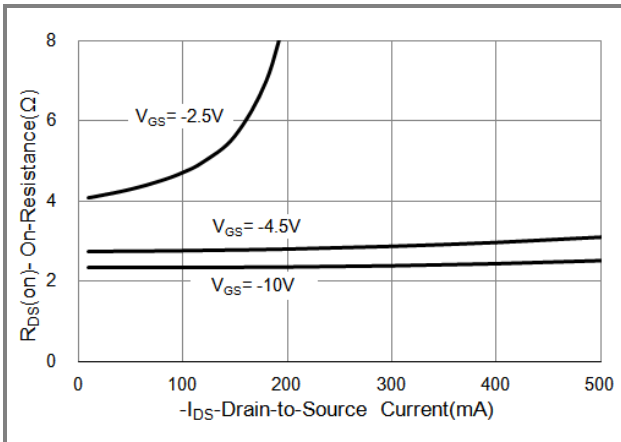


Fig.3 On-Resistance vs. Drain Current

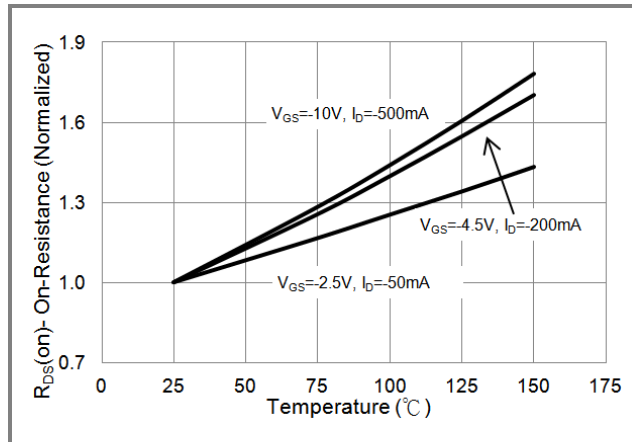


Fig.4 On-Resistance vs. Junction temperature

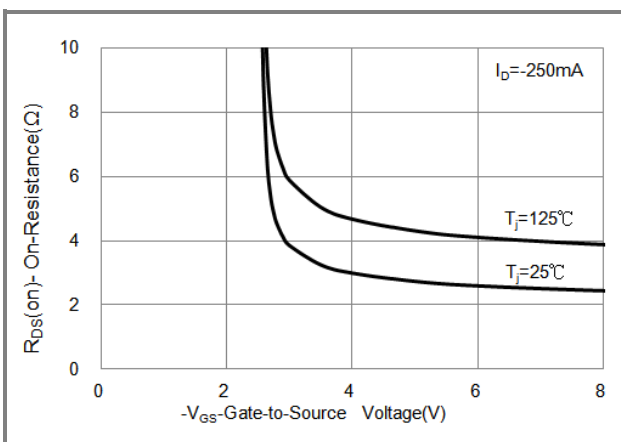


Fig.5 On-Resistance Variation with VGS.

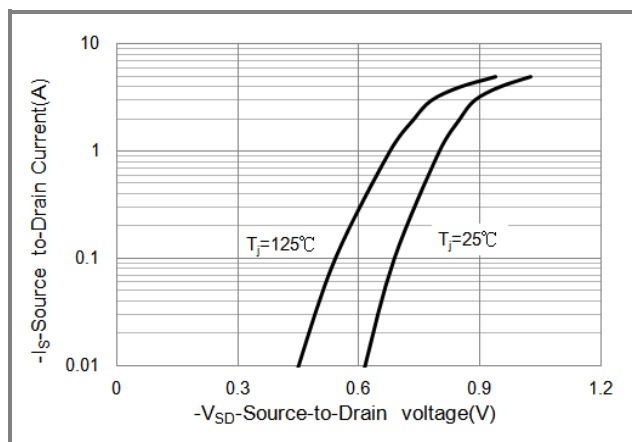


Fig.6 Body Diode Characteristics



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## TYPICAL CHARACTERISTIC CURVES

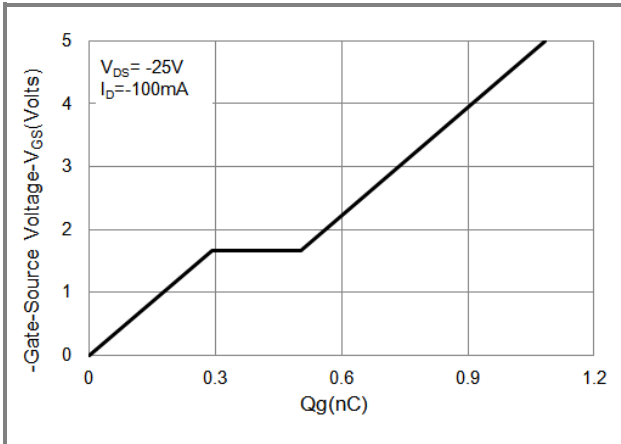


Fig.7 Gate-Charge Characteristics

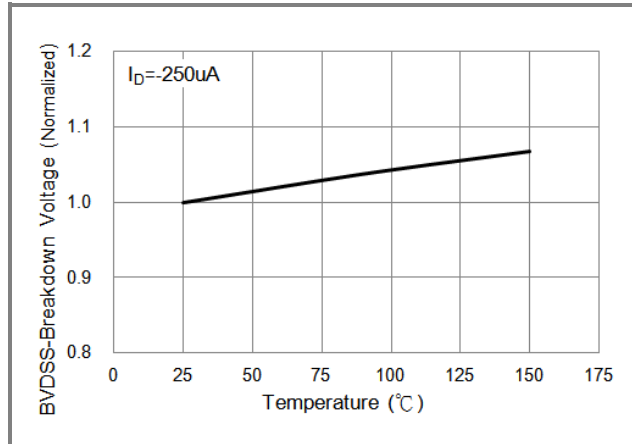


Fig.8 Breakdown Voltage Variation vs. Temperature

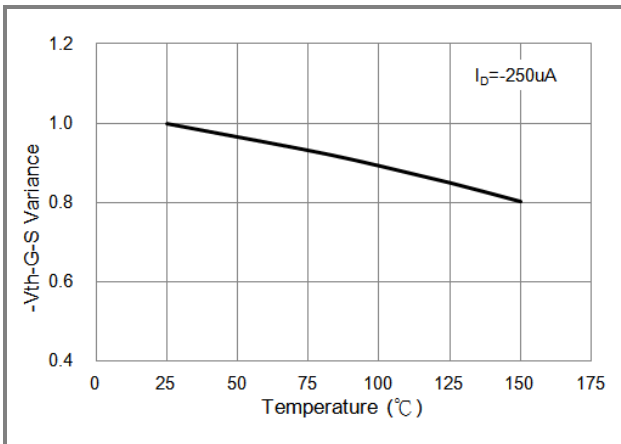


Fig.9 Threshold Voltage Variation with Temperature.

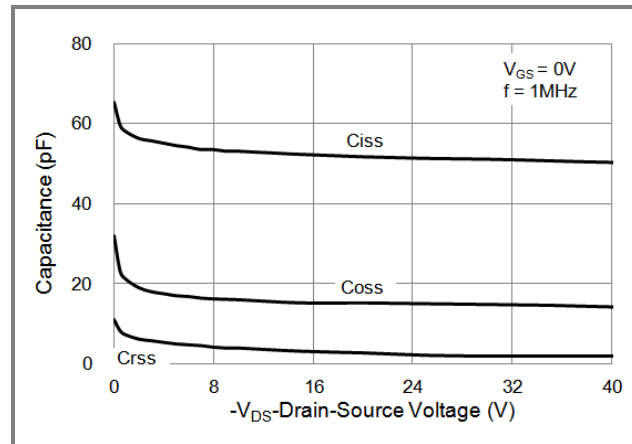


Fig.10 Capacitance vs. Drain-Source Voltage.

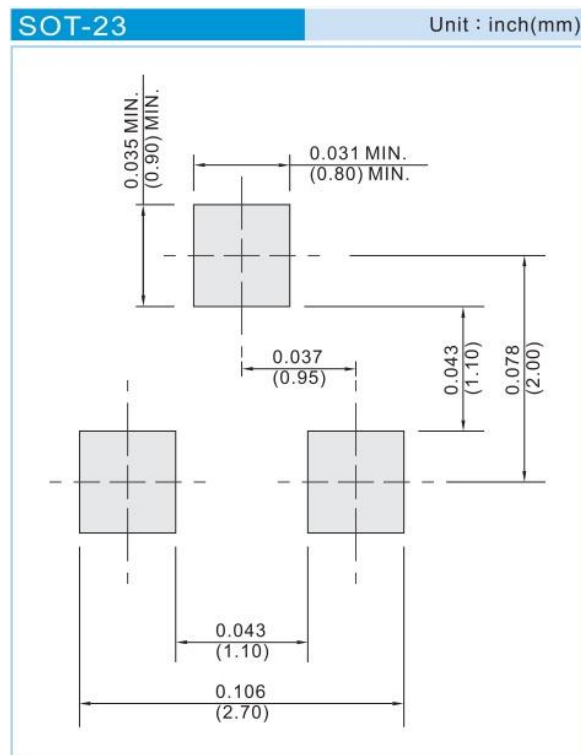


# PJA3439

## PART NO PACKING CODE VERSION

PART NO PACKING CODE	Package Type	Packing type	Marking	Version
PJA3439_R1_00001	SOT-23	3K pcs / 7" reel	A39	Halogen free
PJA3439_R2_00001	SOT-23	12K pcs / 13" reel	A39	Halogen free

## MOUNTING PAD LAYOUT





## PJA3439

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