

# PJQ4439EP-AU

## 30V P-Channel Enhancement Mode MOSFET

**Voltage**

**-30 V**

**Current**

**-31 A**

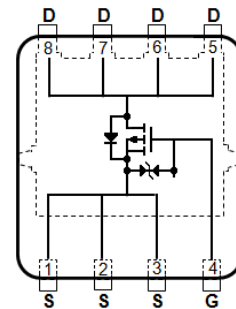
### Features

- $R_{DS(ON)}$ ,  $V_{GS}@-10V$ ,  $I_D@-10A < 19.1m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@-4.5V$ ,  $I_D@-6A < 31.2m\Omega$
- 100% UIS tested
- Reliable and Rugged
- AEC-Q101 qualified
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### Mechanical Data

- Case : DFN3333-8L Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.03 grams

DFN3333-8L



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

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		$V_{DS}$	-30	V
Gate-Source Voltage		$V_{GS}$	$\pm 25$	
Continuous Drain Current <sup>(Note 3)</sup>	$T_C=25^\circ\text{C}$	$I_D$	-31	A
	$T_C=100^\circ\text{C}$		-22	
Pulsed Drain Current <sup>(Note 1)</sup>	$T_C=25^\circ\text{C}$	$I_{DM}$	-90	
Power Dissipation	$T_C=25^\circ\text{C}$	$P_D$	30	W
	$T_C=100^\circ\text{C}$		15	
Continuous Drain Current <sup>(Note 4)</sup>	$T_A=25^\circ\text{C}$	$I_D$	-9	A
	$T_A=70^\circ\text{C}$		-7.6	
Power Dissipation	$T_A=25^\circ\text{C}$	$P_D$	2.5	W
	$T_A=70^\circ\text{C}$		1.8	
Single Pulse Avalanche Energy <sup>(Note 5)</sup>		$E_{AS}$	36	mJ
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~175	$^\circ\text{C}$
Thermal Resistance <sup>(Note 4)</sup>	Junction to Case	$R_{\theta JC}$	5	$^\circ\text{C/W}$
	Junction to Ambient	$R_{\theta JA}$	60	



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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 <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-30	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-1	-1.8	-2.5	
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-10A	-	15.3	19.1	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-6A	-	24	31.2	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V	-	-	-1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±25V, V <sub>DS</sub> =0V	-	-	±10	uA
		V <sub>GS</sub> =±10V, V <sub>DS</sub> =0V	-	-	±1	
Dynamic <sup>(Note 6)</sup>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-24V, I <sub>D</sub> =-10A, V <sub>GS</sub> =-10V	-	22	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	3	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	7	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-25V, V <sub>GS</sub> =0V, f=1MHz	-	1012	-	pF
Output Capacitance	C <sub>oss</sub>		-	145	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	121	-	
Gate resistance	R <sub>g</sub>	f=1MHz	-	10.4	-	Ω
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DS</sub> =-24V, I <sub>D</sub> =-10A, V <sub>GS</sub> =-10V, R <sub>G</sub> =3Ω (Note 2)	-	7	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	3	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	36	-	
Turn-Off Fall Time	t <sub>f</sub>		-	40	-	
Drain-Source Diode						
Diode Forward Current	I <sub>S</sub>	T <sub>c</sub> =25°C	-	-	-31	A
Pulsed Diode Forward Voltage	I <sub>SM</sub>		-	-	-90	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-20A, V <sub>GS</sub> =0V	-	-0.9	-1.3	V
Reverse Recovery Time	T <sub>rr</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =-20A	-	16	-	ns
Reverse Recovery Charge	Q <sub>rr</sub>	dI <sub>S</sub> /dt=100A/us	-	8	-	nC

### NOTES :

1. Pulse width $\leq 300\mu s$ , Duty cycle $\leq 2\%$ .
2. Essentially independent of operating temperature typical characteristics.
3. The maximum current rating is package limited.
4.  $R_{\theta JA}$  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<sup>2</sup> with 2oz.square pad of copper.
5. The test condition is  $L=0.5mH, I_{AS}=-12A, V_{DD}=-30V, V_{GS}=-10V$ , Starting  $T_J=25^{\circ}\text{C}$ .
6. Guaranteed by design, not subject to production testing.

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## TYPICAL CHARACTERISTIC CURVES

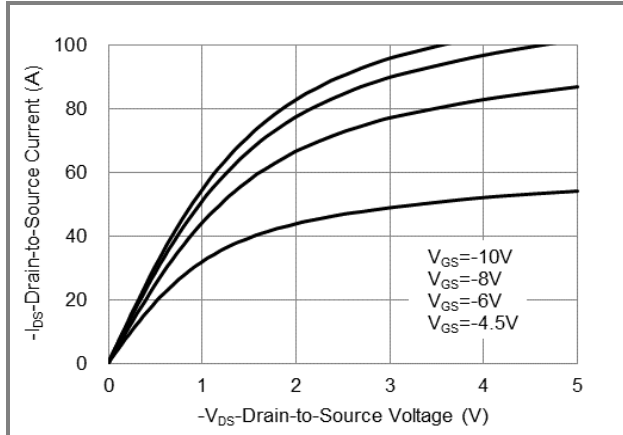


Fig.1 On-Region Characteristics

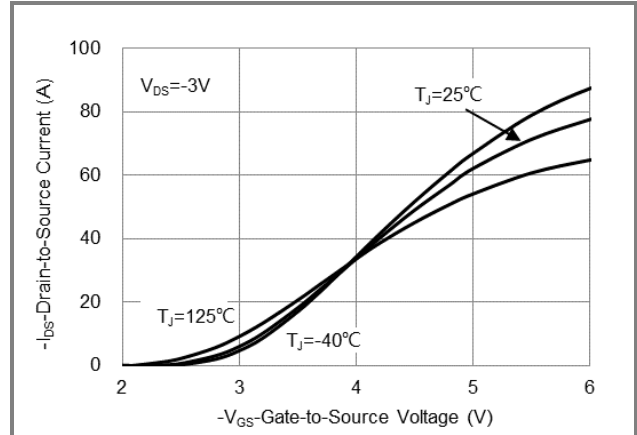


Fig.2 Transfer Characteristics

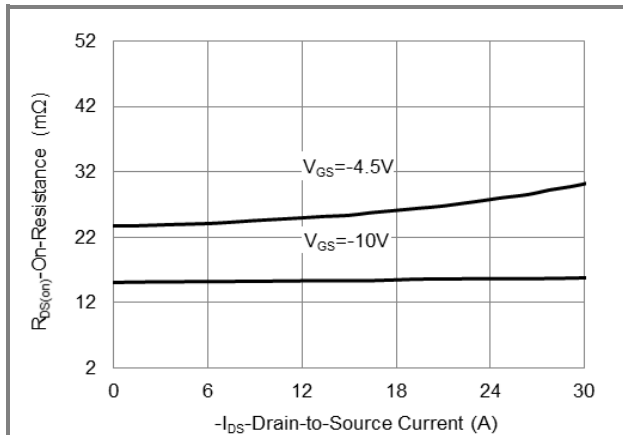


Fig.3 On-Resistance vs. Drain Current

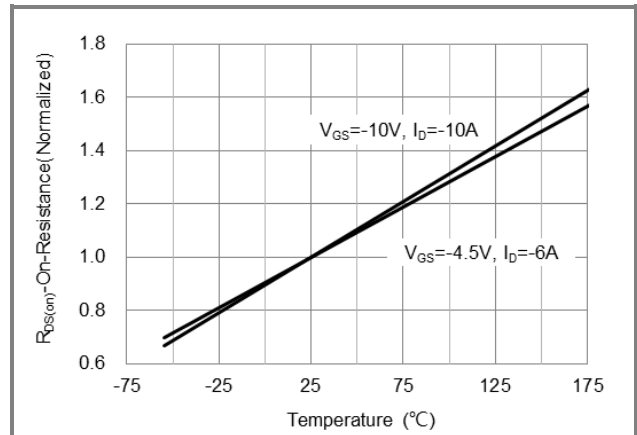


Fig.4 On-Resistance vs. Junction temperature

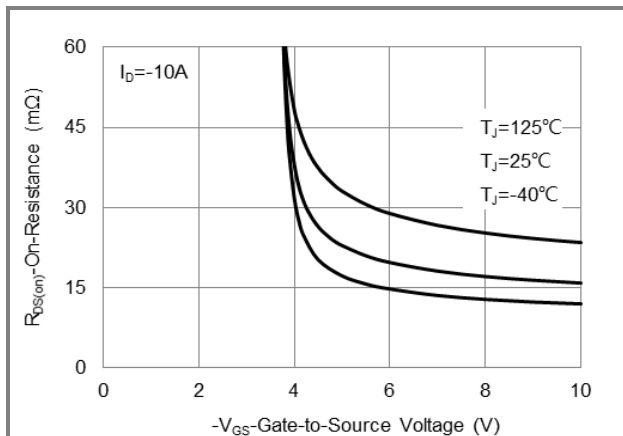


Fig.5 On-Resistance Variation with  $V_{GS}$

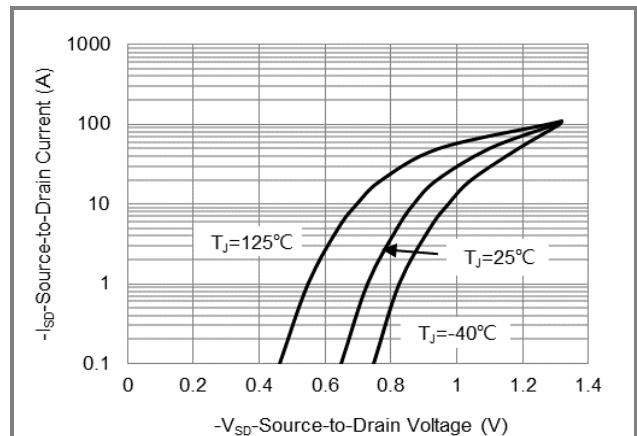


Fig.6 Source-Drain Diode Forward Voltage

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## TYPICAL CHARACTERISTIC CURVES

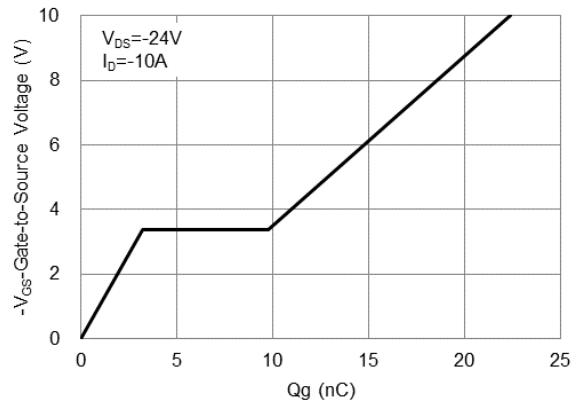


Fig.7 Gate-Charge Characteristics

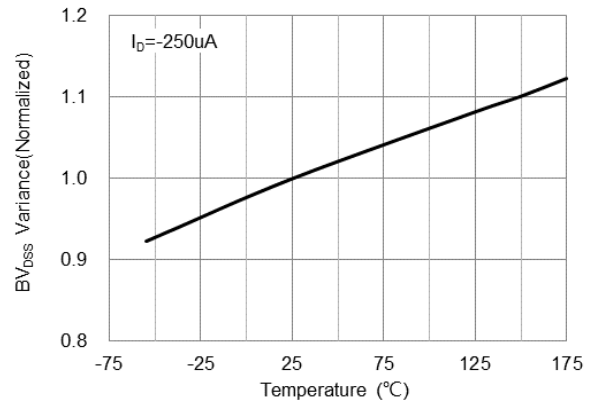


Fig.8 Breakdown Voltage Variation vs. Temperature

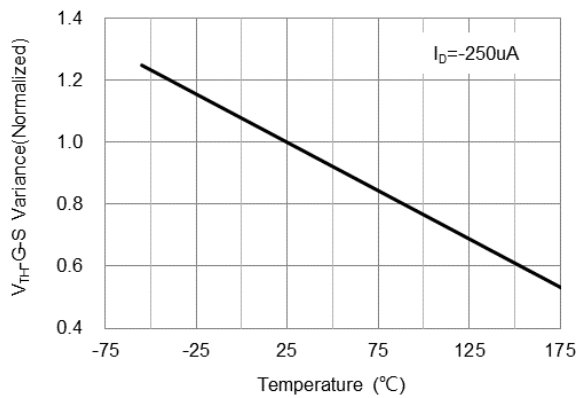


Fig.9 Threshold Voltage Variation with Temperature

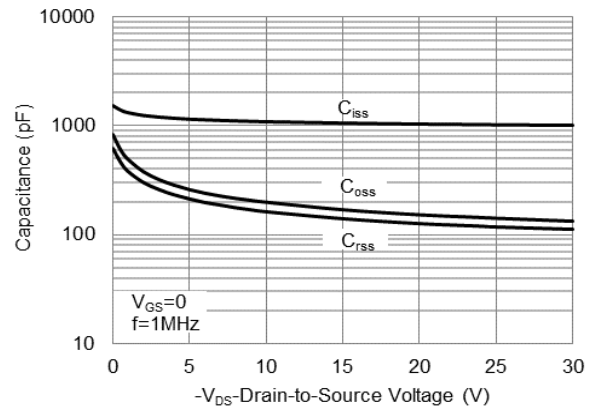


Fig.10 Capacitance vs. Drain-Source Voltage

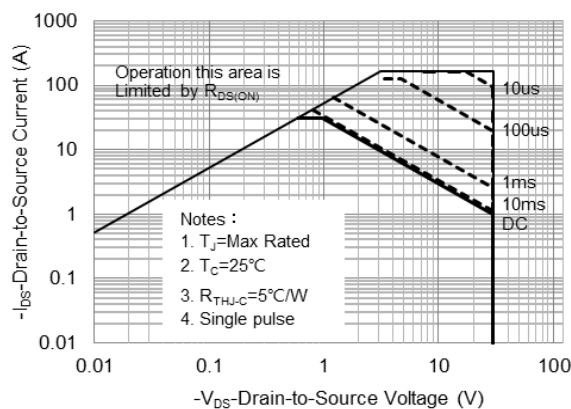


Fig.11 Maximum Safe Operating Area

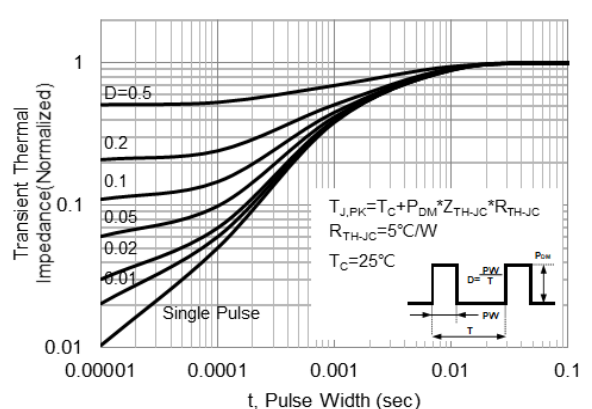


Fig.12 Normalized Transient Thermal Impedance

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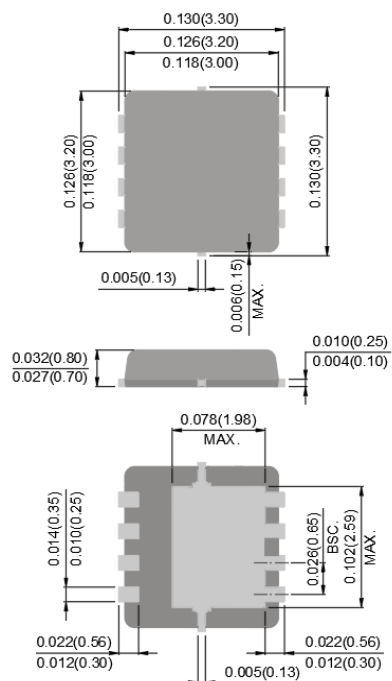
## Product and Packing Information

Part No.	Package Type	Packing Type	Marking
PJQ4439EP-AU	DFN3333-8L	5K pcs / 13" reel	439E

## Packaging Information & Mounting Pad Layout

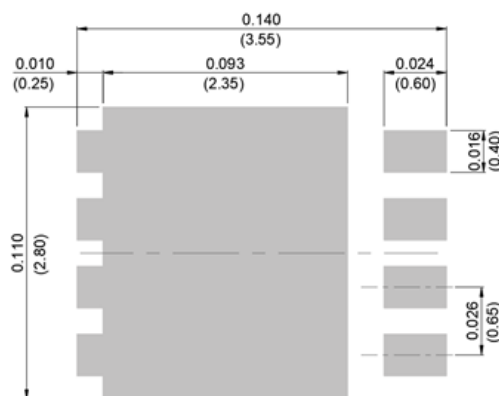
### DFN3333-8L Dimension

Unit: inch(mm)



### DFN3333-8L Pad Layout

Unit: inch(mm)





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