

PJQ4431EP-AU

30V P-Channel Enhancement Mode MOSFET

Voltage

-30 V

Current

-84 A

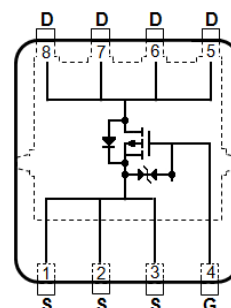
Features

- $R_{DS(ON)}$, $V_{GS}@-10V$, $I_D@-10A < 7m\Omega$
- $R_{DS(ON)}$, $V_{GS}@-4.5V$, $I_D@-6A < 11.1m\Omega$
- 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 ($T_A=25^\circ C$ unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	± 25	
Continuous Drain Current ^(Note 3)	$T_C=25^\circ C$	I_D	-84	A
	$T_C=100^\circ C$		-59	
Pulsed Drain Current ^(Note 1)	$T_C=25^\circ C$	I_{DM}	-215	
Power Dissipation	$T_C=25^\circ C$	P_D	79	W
	$T_C=100^\circ C$		39	
Continuous Drain Current ^(Note 4)	$T_A=25^\circ C$	I_D	-15	A
	$T_A=70^\circ C$		-12.5	
Power Dissipation	$T_A=25^\circ C$	P_D	2.5	W
	$T_A=70^\circ C$		1.8	
Single Pulse Avalanche Energy ^(Note 5)		E_{AS}	121	mJ
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~175	$^\circ C$
Thermal Resistance ^(Note 4)	Junction to Case	$R_{\theta JC}$	1.9	$^\circ C/W$
	Junction to Ambient	$R_{\theta JA}$	60	

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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	-30	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250uA	-1	-1.8	-2.5	
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-10A	-	5.6	7	mΩ
		V _{GS} =-4.5V, I _D =-6A	-	8.5	11.1	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-30V, V _{GS} =0V	-	-	-1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±25V, V _{DS} =0V	-	-	±10	uA
		V _{GS} =±10V, V _{DS} =0V	-	-	±1	
Dynamic ^(Note 6)						
Total Gate Charge	Q _g	V _{DS} =-24V, I _D =-10A, V _{GS} =-10V	-	68	-	nC
Gate-Source Charge	Q _{gs}		-	9	-	
Gate-Drain Charge	Q _{gd}		-	20	-	
Input Capacitance	C _{iss}	V _{DS} =-25V, V _{GS} =0V, f=1MHz	-	3040	-	pF
Output Capacitance	C _{oss}		-	427	-	
Reverse Transfer Capacitance	C _{rss}		-	344	-	
Gate resistance	R _g	f=1MHz	-	2.2	-	Ω
Turn-On Delay Time	td _(on)	V _{DS} =-24V, I _D =-10A, V _{GS} =-10V, R _G =3Ω (Note 2)	-	12	-	ns
Turn-On Rise Time	tr		-	15	-	
Turn-Off Delay Time	td _(off)		-	50	-	
Turn-Off Fall Time	tf		-	31	-	
Drain-Source Diode						
Diode Forward Current	I _s	T _C =25° C	-	-	-84	A
Pulsed Diode Forward Voltage	I _{SM}		-	-	-215	
Diode Forward Voltage	V _{SD}	I _S =-20A, V _{GS} =0V	-	-0.85	-1.3	V
Reverse Recovery Time	T _{rr}	V _{GS} =0V, I _S =-20A	-	26	-	ns
Reverse Recovery Charge	Q _{rr}	dI _S /dt=100A/us	-	16	-	nC

NOTES :

1. Pulse width≤300us, Duty cycle≤2%.
2. Essentially independent of operating temperature typical characteristics.
3. The maximum current rating is package limited.
4. 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 inch² with 2oz.square pad of copper.
5. The test condition is L=0.5mH, I_{AS}=-22A, V_{DD}=-30V, V_{GS}=-10V, Starting T_J=25°C.
6. Guaranteed by design, not subject to production testing.

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TYPICAL CHARACTERISTIC CURVES

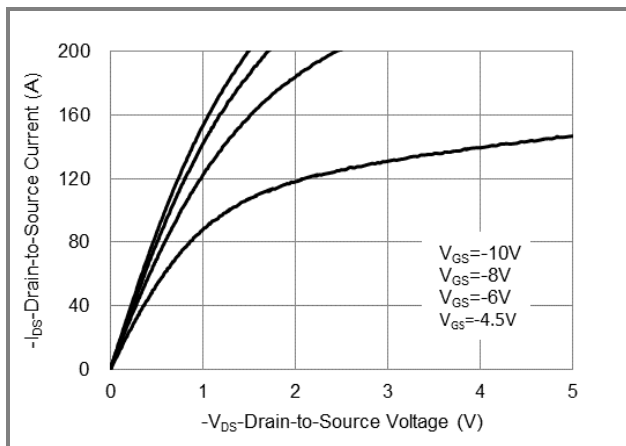


Fig.1 On-Region Characteristics

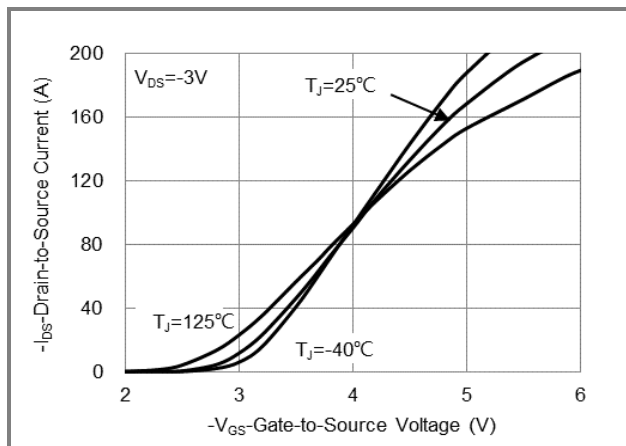


Fig.2 Transfer Characteristics

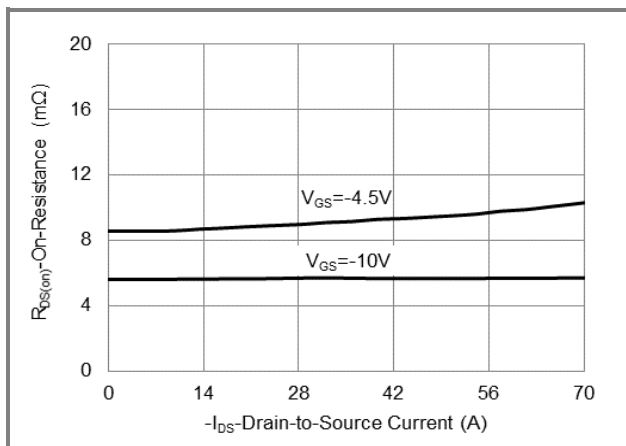


Fig.3 On-Resistance vs. Drain Current

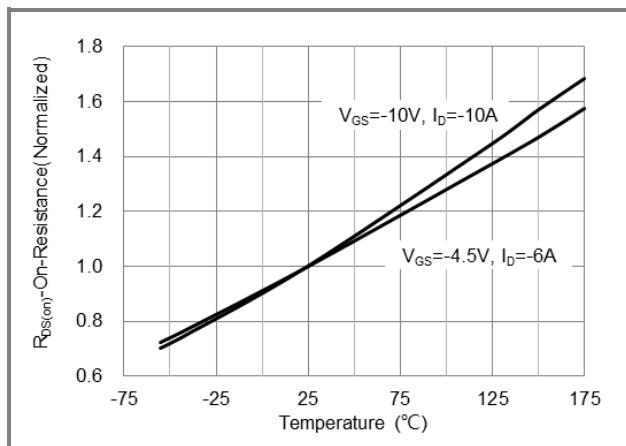


Fig.4 On-Resistance vs. Junction temperature

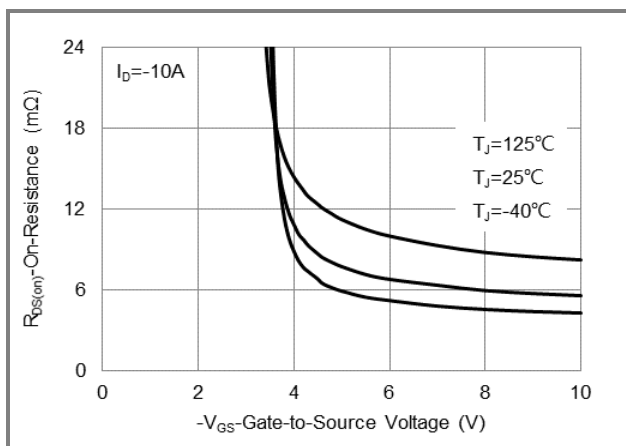


Fig.5 On-Resistance Variation with V_{GS}

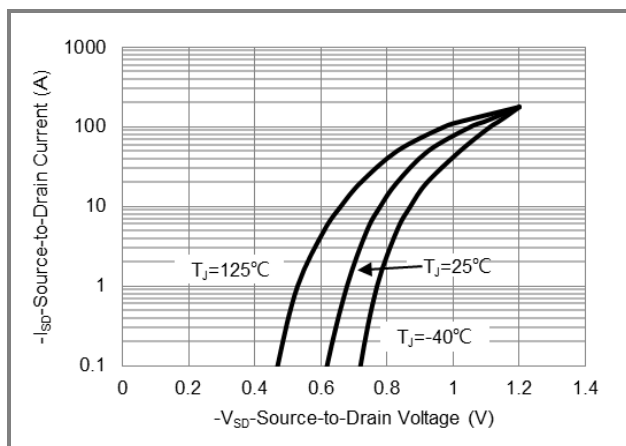
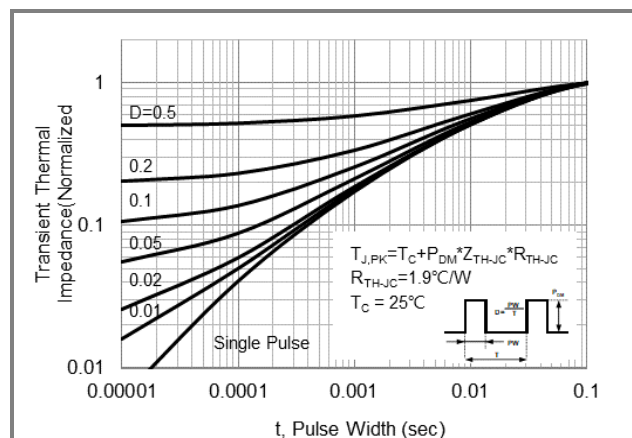
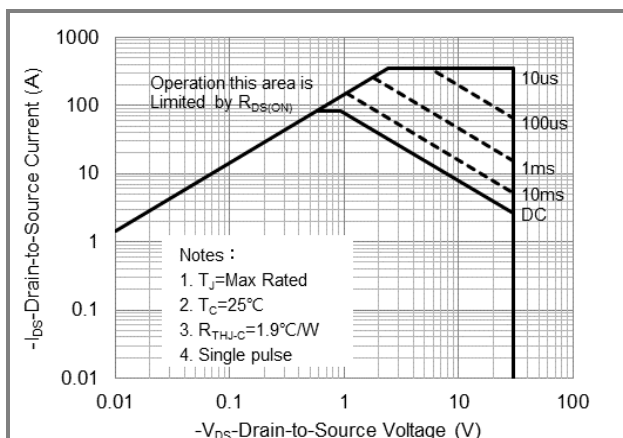
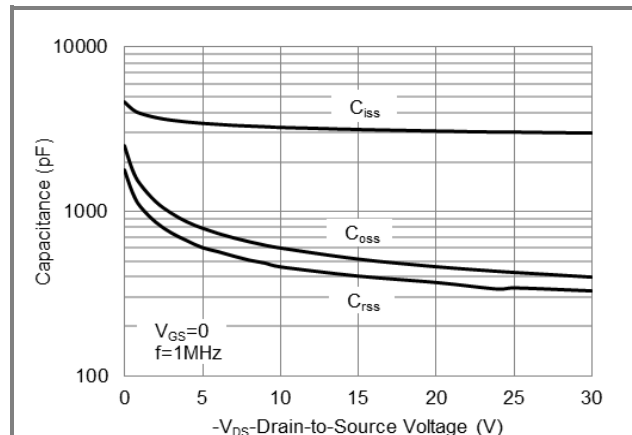
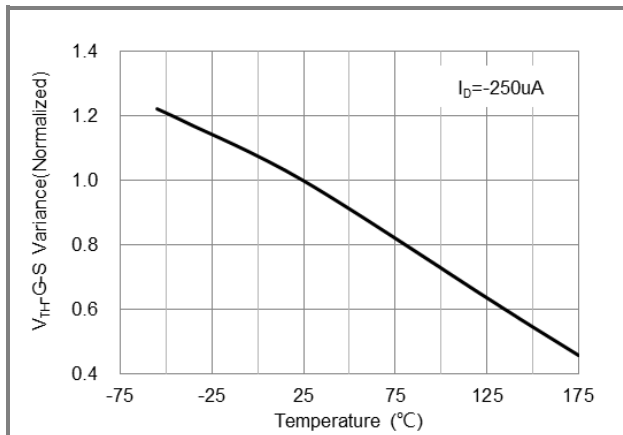
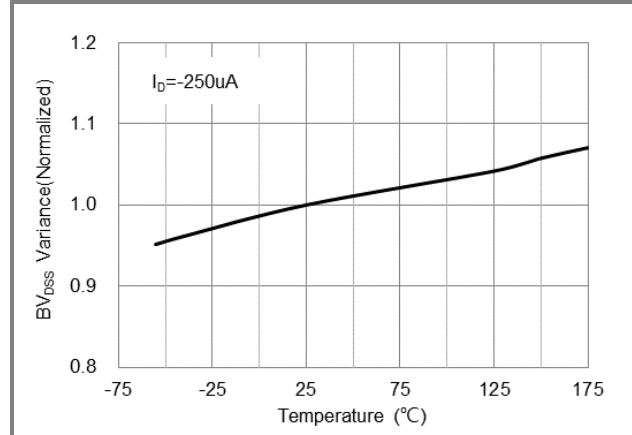
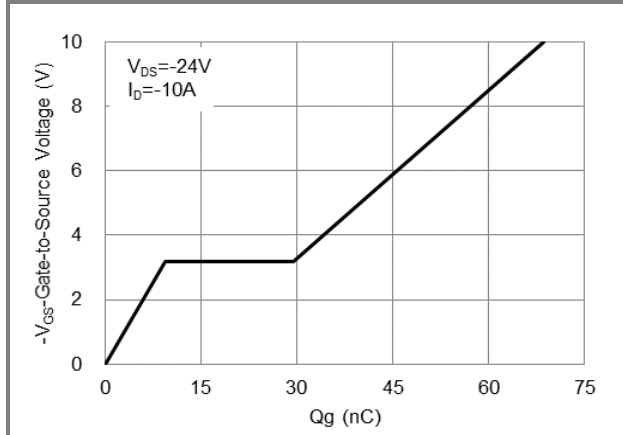


Fig.6 Source-Drain Diode Forward Voltage

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TYPICAL CHARACTERISTIC CURVES



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TYPICAL CHARACTERISTIC CURVES

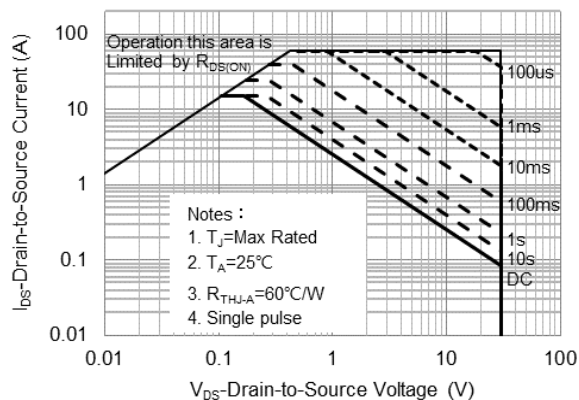


Fig.13 Maximum Safe Operating Area

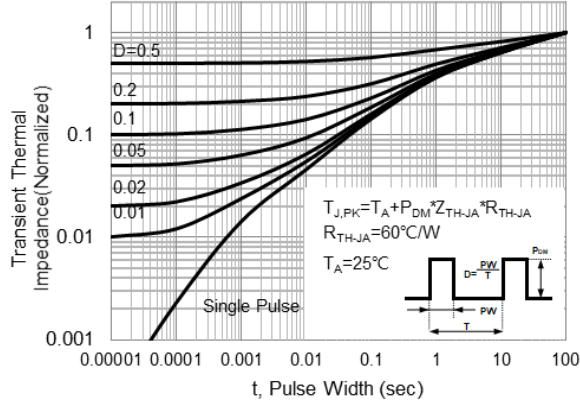


Fig.14 Normalized Transient Thermal Impedance

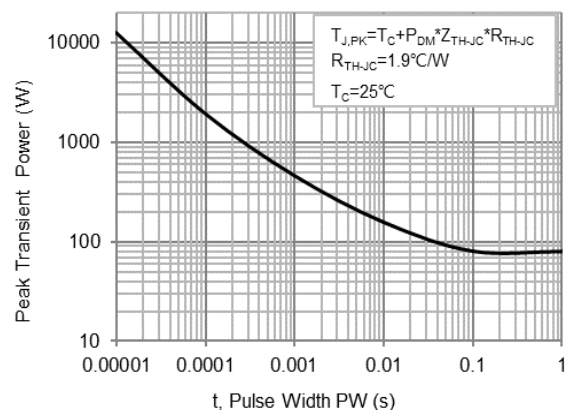


Fig.15 Single Pulse Maximum Power Dissipation

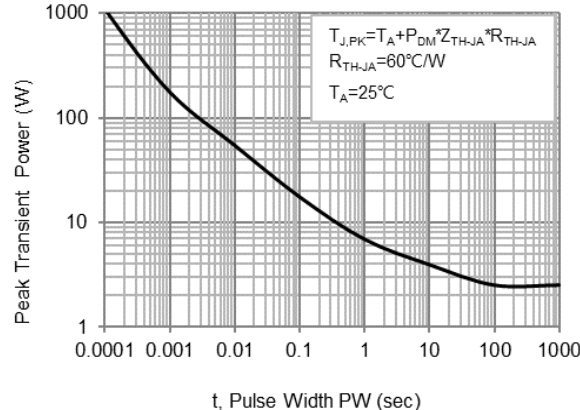


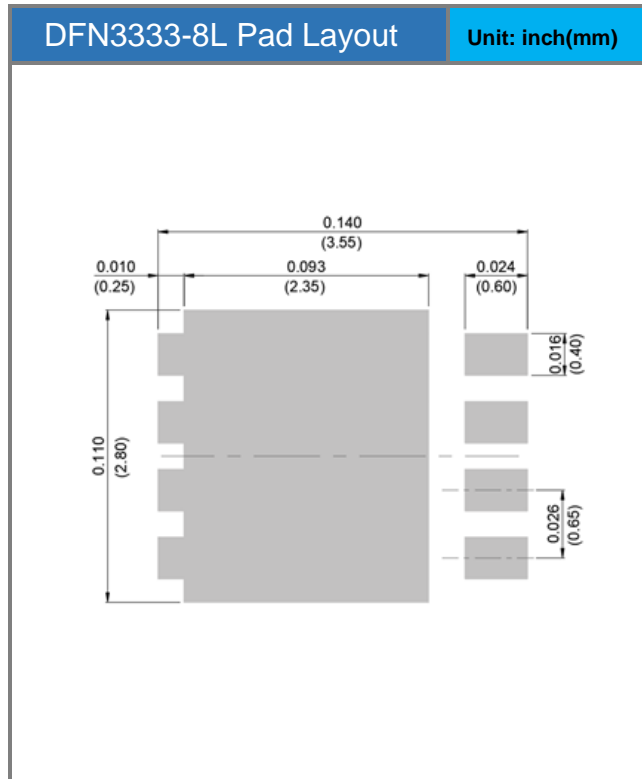
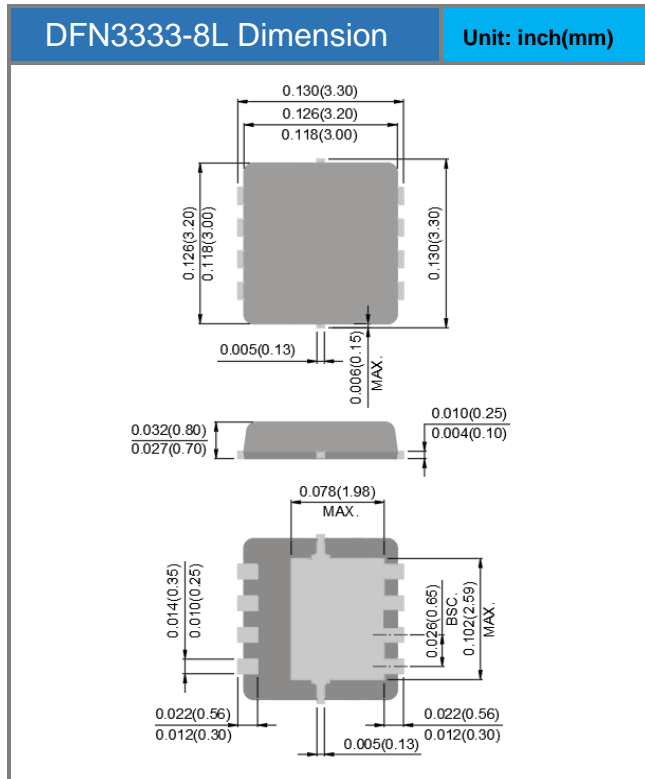
Fig.16 Single Pulse Maximum Power Dissipation

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Product and Packing Information

Part No.	Package Type	Packing Type	Marking
PJQ4431EP-AU	DFN3333-8L	5K pcs / 13" reel	431E

Packaging Information & Mounting Pad Layout



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