

PJQ44609AP-AU

60V P-Channel Enhancement Mode MOSFET

Voltage

-60 V

Current

-18 A

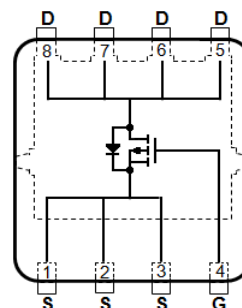
Features

- $R_{DS(ON)}$, $V_{GS}@-10V$, $I_D@-6A < 62m\Omega$
- $R_{DS(ON)}$, $V_{GS}@-4.5V$, $I_D@-3A < 83m\Omega$
- 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}	-60	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ^(Note 3)	$T_C=25^{\circ}C$	I_D	-18	A
	$T_C=100^{\circ}C$		-13	
Pulsed Drain Current ^(Note 1)	$T_C=25^{\circ}C$	I_{DM}	-34	
Power Dissipation	$T_C=25^{\circ}C$	P_D	39	W
	$T_C=100^{\circ}C$		20	
Continuous Drain Current ^(Note 4)	$T_A=25^{\circ}C$	I_D	-4.5	A
	$T_A=70^{\circ}C$		-3.8	
Power Dissipation	$T_A=25^{\circ}C$	P_D	2.5	W
	$T_A=70^{\circ}C$		1.8	
Single Pulse Avalanche Current ^(Note 5)		I_{AS}	-8.6	A
Single Pulse Avalanche Energy ^(Note 5)		E_{AS}	39	mJ
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~175	$^{\circ}C$
Thermal Resistance ^(Note 4)	Junction to Case	$R_{\theta JC}$	3.8	$^{\circ}C/W$
	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 _{DSS}	V _{GS} =0V, I _D =-250uA	-60	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250uA	-1	-1.7	-2.5	
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-6A	-	50	62	mΩ
		V _{GS} =-4.5V, I _D =-3A	-	64	83	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-60V, V _{GS} =0V	-	-	-1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Dynamic ^(Note 6)						
Total Gate Charge	Q _g	V _{DS} =-30V, I _D =-6A, V _{GS} =-10V	-	22	30	nC
Gate-Source Charge	Q _{gs}		-	3.7	-	
Gate-Drain Charge	Q _{gd}		-	4.2	-	
Input Capacitance	C _{iss}	V _{DS} =-30V, V _{GS} =0V, f=1MHz	-	1226	1600	pF
Output Capacitance	C _{oss}		-	70	120	
Reverse Transfer Capacitance	C _{rss}		-	54	95	
Gate resistance	R _g	f=1MHz	-	10.5	-	Ω
Turn-On Delay Time	td _(on)	V _{DS} =-30V, I _D =-6A, V _{GS} =-10V, R _G =3Ω (Note 2)	-	4.9	-	ns
Turn-On Rise Time	tr		-	2.9	-	
Turn-Off Delay Time	td _(off)		-	42	-	
Turn-Off Fall Time	tf		-	19	-	
Drain-Source Diode						
Diode Forward Current	I _S	T _C =25 ^o C	-	-	-18	A
Pulsed Diode Forward Current	I _{SM}		-	-	-34	
Diode Forward Voltage	V _{SD}	I _S =-6A, V _{GS} =0V	-	-0.85	-1.3	V
Reverse Recovery Time	T _{rr}	V _{DD} =-30V, V _{GS} =0V,	-	22	-	ns
Reverse Recovery Charge	Q _{rr}	I _S =-6A, dI _S /dt=100A/us	-	11	-	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 inch² with 2oz.square pad of copper.
5. E_{AS} is calculated based on the condition of $L=1mH$, $I_{AS}=-8.8A$, $V_{DD}=-30V$, $V_{GS}=-10V$. 100% test at $L=0.5mH$, $I_{AS}=-8.6A$ in production.
6. Guaranteed by design, not subject to production testing.

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TYPICAL CHARACTERISTIC CURVES

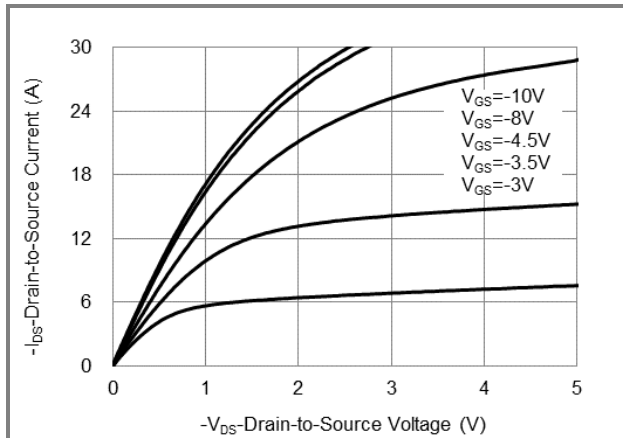


Fig.1 On-Region Characteristics

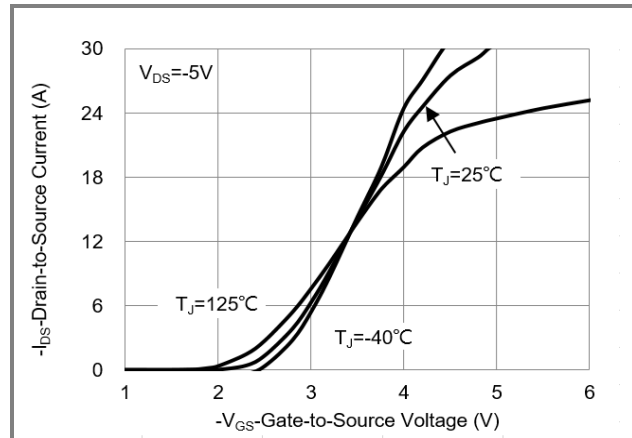


Fig.2 Transfer Characteristics

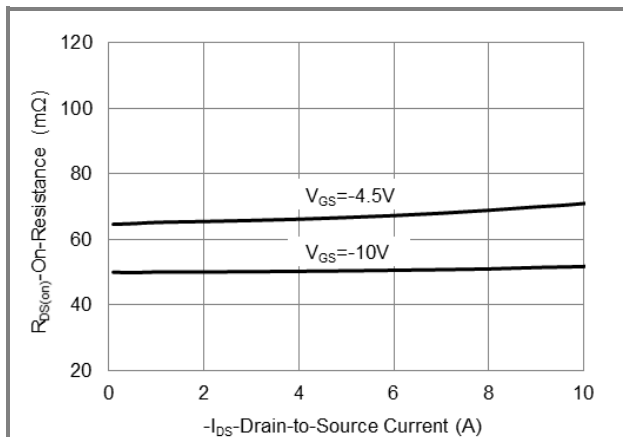


Fig.3 On-Resistance vs. Drain Current

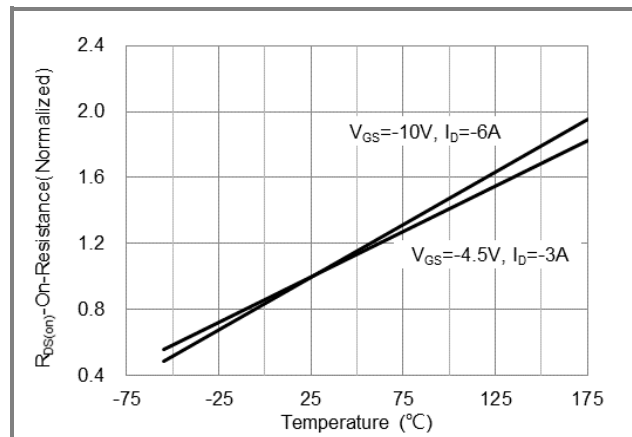


Fig.4 On-Resistance vs. Junction temperature

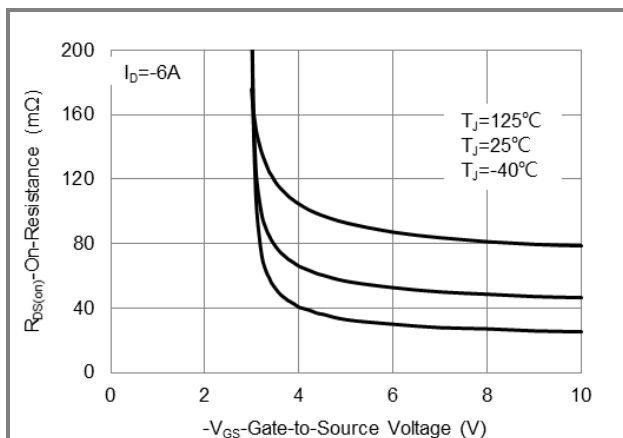


Fig.5 On-Resistance Variation with V_{GS}

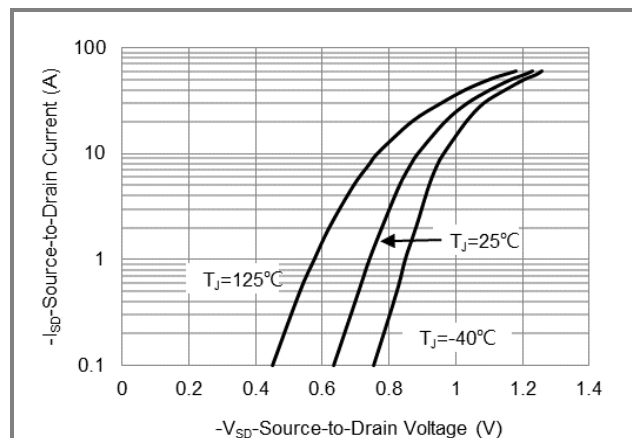


Fig.6 Source-Drain Diode Forward Voltage

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TYPICAL CHARACTERISTIC CURVES

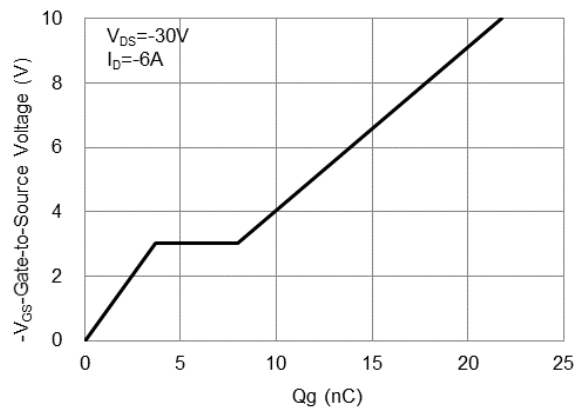


Fig.7 Gate-Charge Characteristics

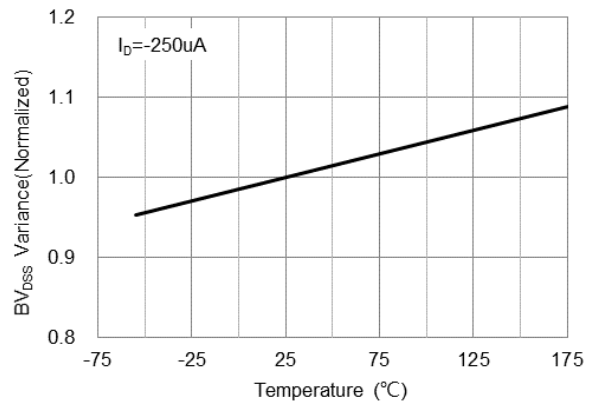


Fig.8 Breakdown Voltage Variation vs. Temperature

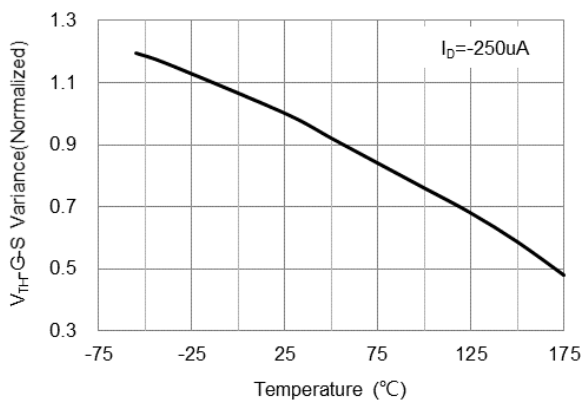


Fig.9 Threshold Voltage Variation with Temperature

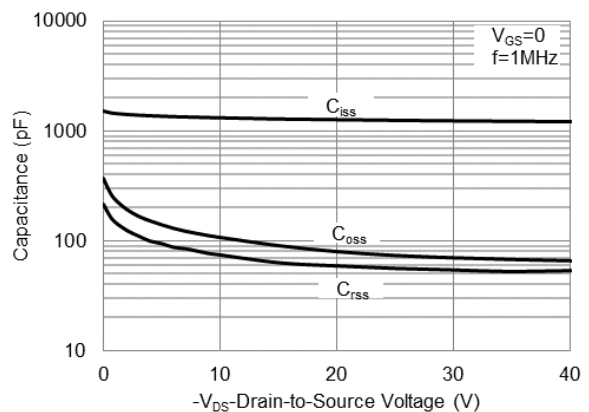


Fig.10 Capacitance vs. Drain-Source Voltage

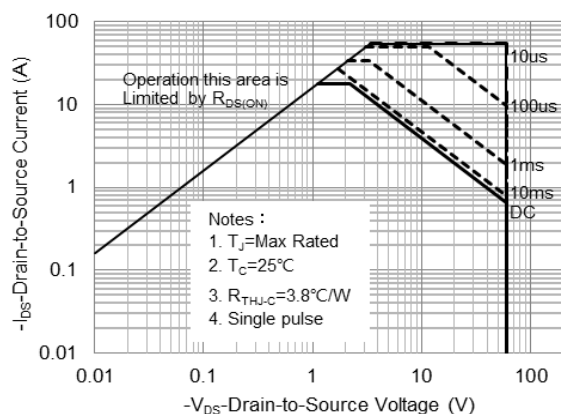


Fig.11 Maximum Safe Operating Area

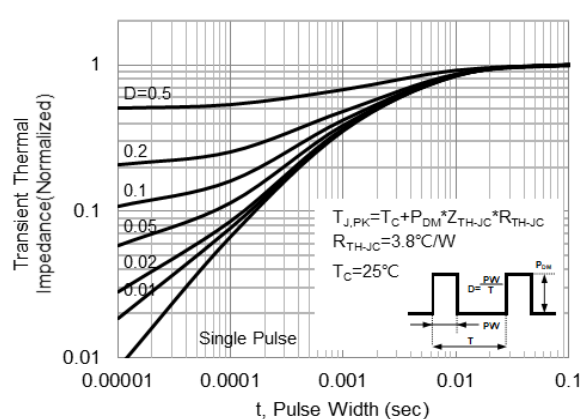


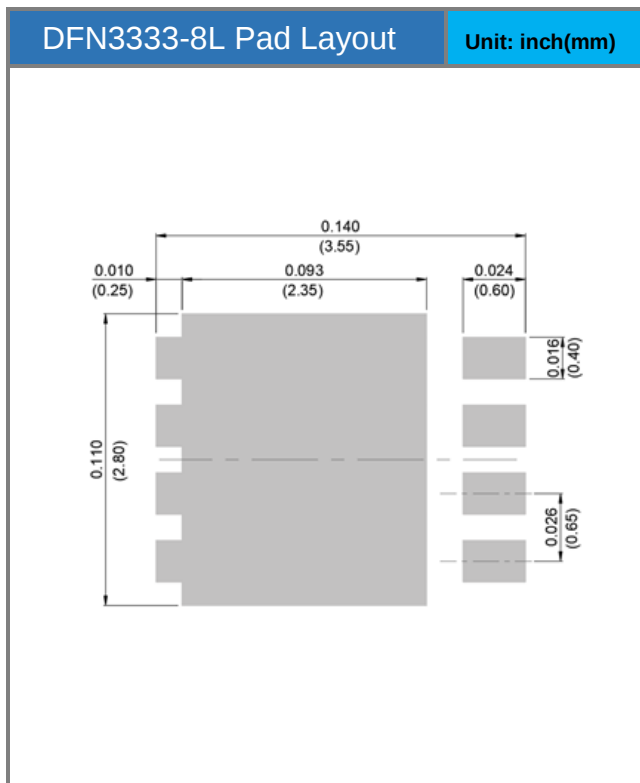
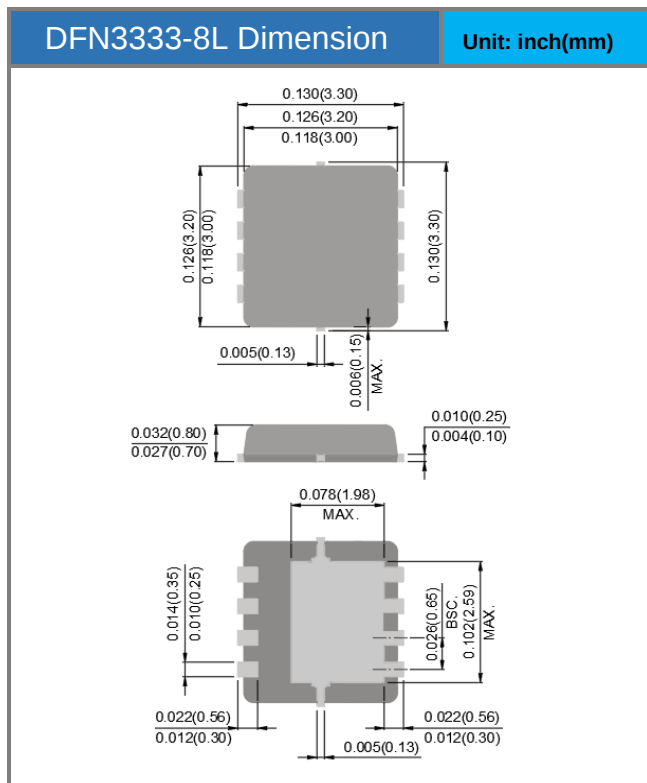
Fig.12 Normalized Transient Thermal Impedance

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Product and Packing Information

Part No.	Package Type	Packing Type	Marking
PJQ44609AP-AU	DFN3333-8L	5K pcs / 13" reel	44609A

Packaging Information & Mounting Pad Layout



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