



PJQ5451E-AU

40V P-Channel Enhancement Mode MOSFET

Voltage

-40 V

Current

-67 A

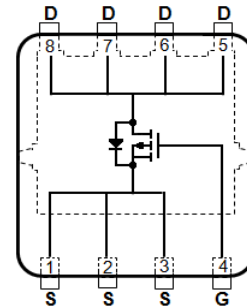
Features

- $R_{DS(ON)}$, $V_{GS}@-10V$, $I_D@-20A < 9.4m\Omega$
- $R_{DS(ON)}$, $V_{GS}@-4.5V$, $I_D@-10A < 14.3m\Omega$
- 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 : DFN5060-8L Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.08 grams

DFN5060-8L



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

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		V_{DS}	-40	V
Gate-Source Voltage		V_{GS}	± 25	
Continuous Drain Current ^(Note 3)	$T_C=25^\circ C$	I_D	-67	A
	$T_C=100^\circ C$		-47	
Pulsed Drain Current ^(Note 1)	$T_C=25^\circ C$	I_{DM}	-228	
Power Dissipation	$T_C=25^\circ C$	P_D	75	W
	$T_C=100^\circ C$		38	
Continuous Drain Current ^(Note 4)	$T_A=25^\circ C$	I_D	-14	A
	$T_A=70^\circ C$		-11.7	
Power Dissipation	$T_A=25^\circ C$	P_D	3.3	W
	$T_A=70^\circ C$		2.3	
Single Pulse Avalanche Energy ^(Note 5)		E_{AS}	132	mJ
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~175	$^\circ C$
Thermal Resistance ^(Note 4)	Junction to Case	$R_{\theta JC}$	2	$^\circ C/W$
	Junction to Ambient	$R_{\theta JA}$	45	



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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	-40	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250uA	-1	-1.9	-2.5	
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-20A	-	7.5	9.4	mΩ
		V _{GS} =-4.5V, I _D =-10A	-	11	14.3	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-40V, V _{GS} =0V	-	-	-1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±25V, V _{DS} =0V	-	-	±100	nA
Dynamic (Note 6)						
Total Gate Charge	Q _g	V _{DS} =-32V, I _D =-20A, V _{GS} =-10V	-	59	-	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	-	3300	-	pF
Output Capacitance	C _{oss}		-	380	-	
Reverse Transfer Capacitance	C _{rss}		-	240	-	
Gate resistance	R _g	f=1MHz	-	4	-	Ω
Turn-On Delay Time	t _{d(on)}	V _{DS} =-32, I _D =-20A, V _{GS} =-10V, R _C =3Ω (Note 2)	-	13	-	ns
Turn-On Rise Time	t _r		-	16	-	
Turn-Off Delay Time	t _{d(off)}		-	54	-	
Turn-Off Fall Time	t _f		-	33	-	
Drain-Source Diode						
Diode Forward Current	I _S	T _C =25°C	-	-	-67	A
Pulsed Diode Forward Current	I _{SM}		-	-	-228	
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	-	23	-	ns
Reverse Recovery Charge	Q _{rr}	dI _S /dt=100A/us	-	11	-	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}=-23A, 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

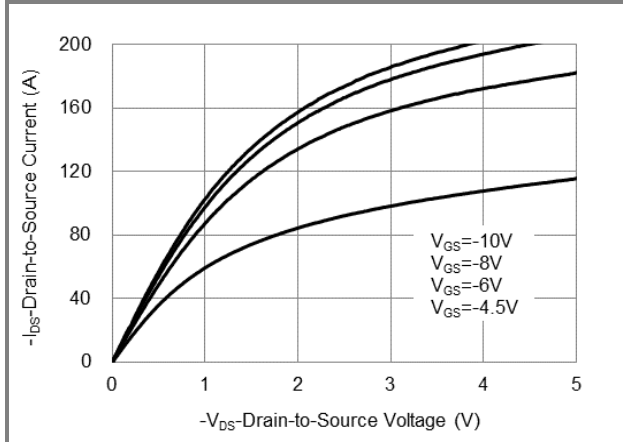


Fig.1 On-Region Characteristics

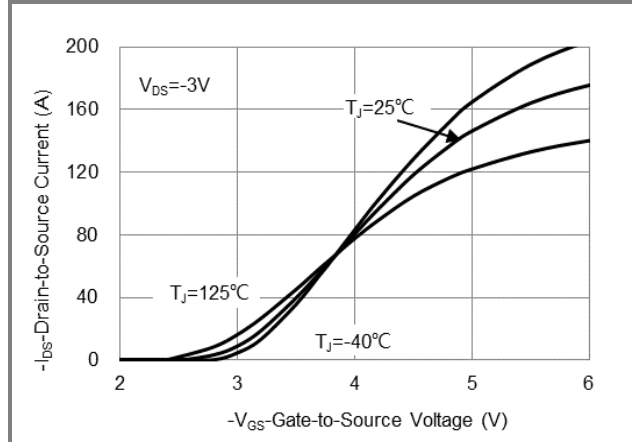


Fig.2 Transfer Characteristics

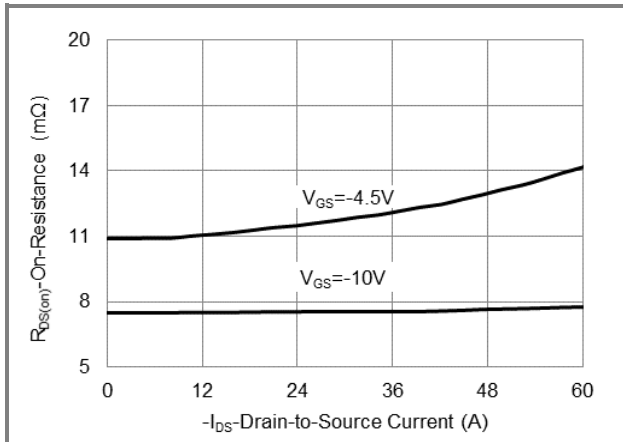


Fig.3 On-Resistance vs. Drain Current

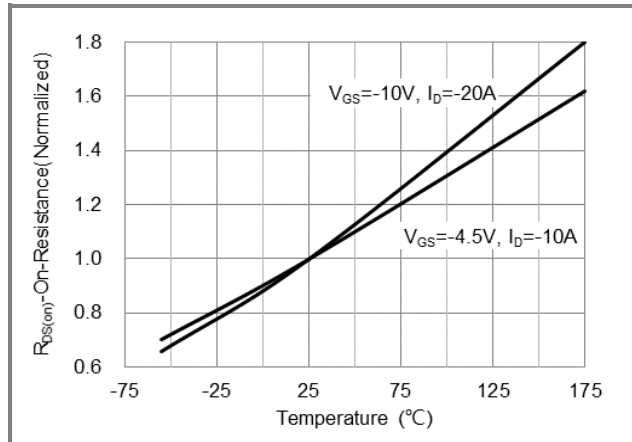


Fig.4 On-Resistance vs. Junction temperature

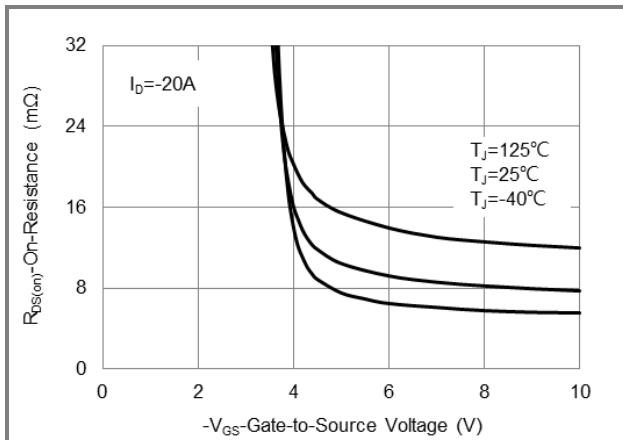


Fig.5 On-Resistance Variation with V_{GS}

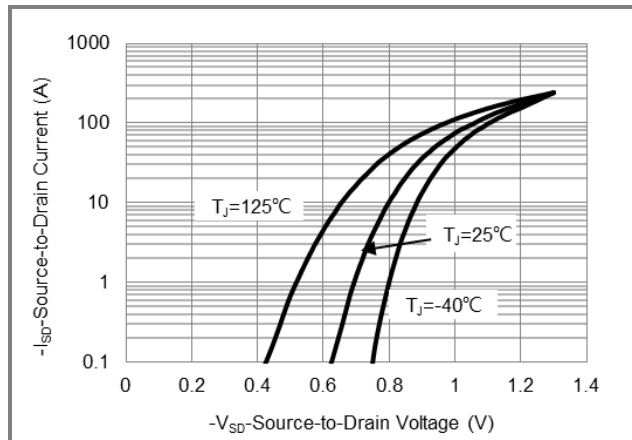


Fig.6 Source-Drain Diode Forward Voltage



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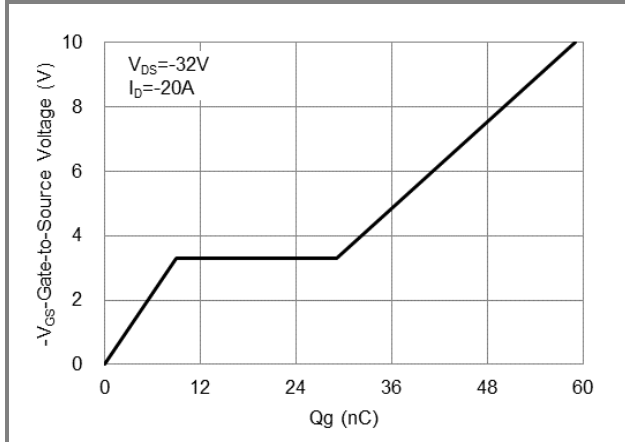


Fig.7 Gate-Charge Characteristics

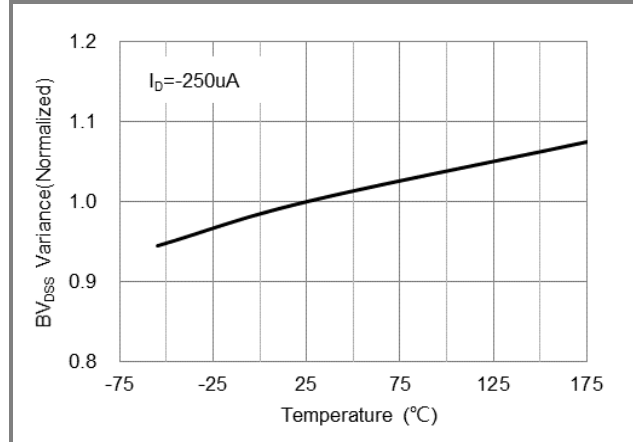


Fig.8 Breakdown Voltage Variation vs. Temperature

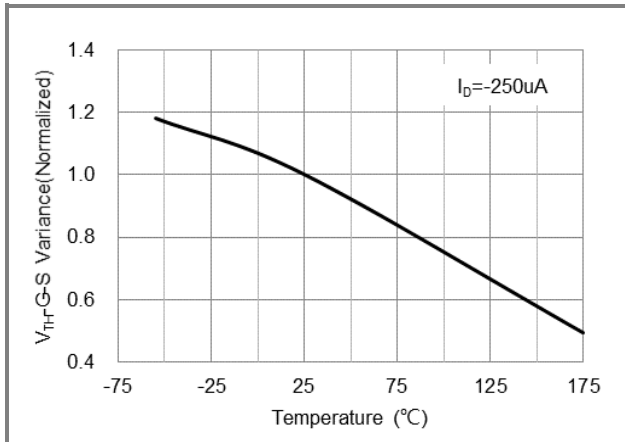


Fig.9 Threshold Voltage Variation with Temperature

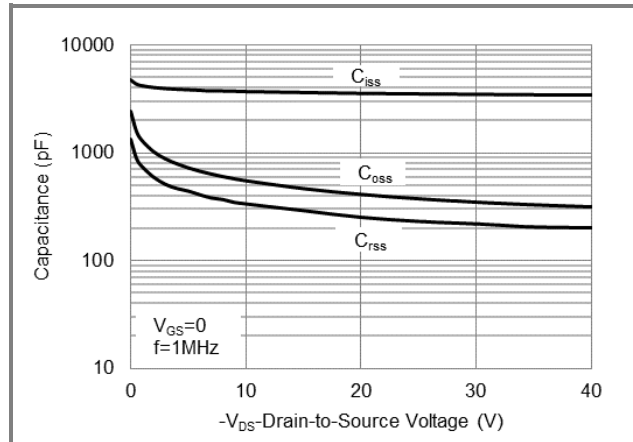


Fig.10 Capacitance vs. Drain-Source Voltage

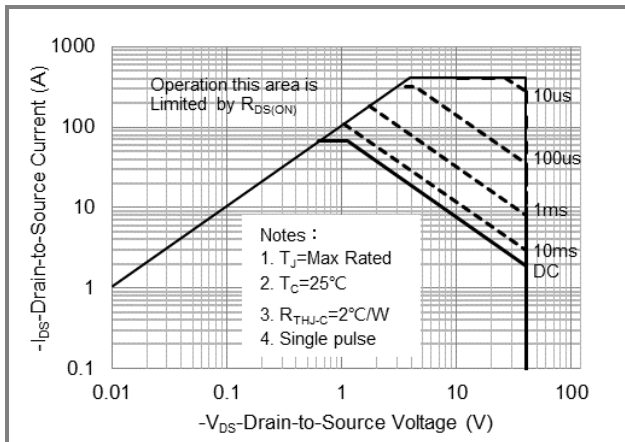


Fig.11 Maximum Safe Operating Area

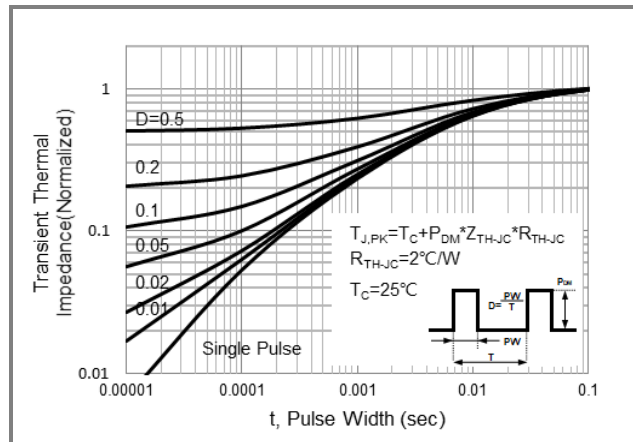


Fig.12 Normalized Transient Thermal Impedance

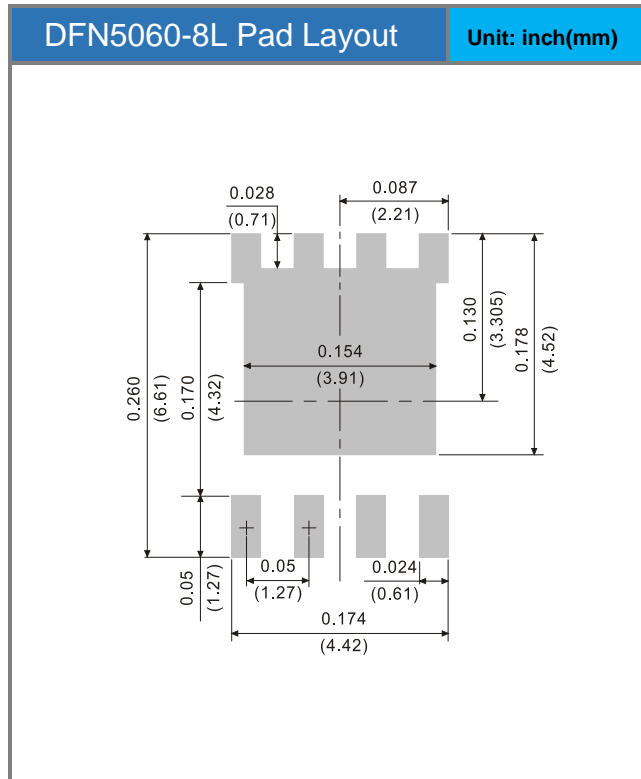
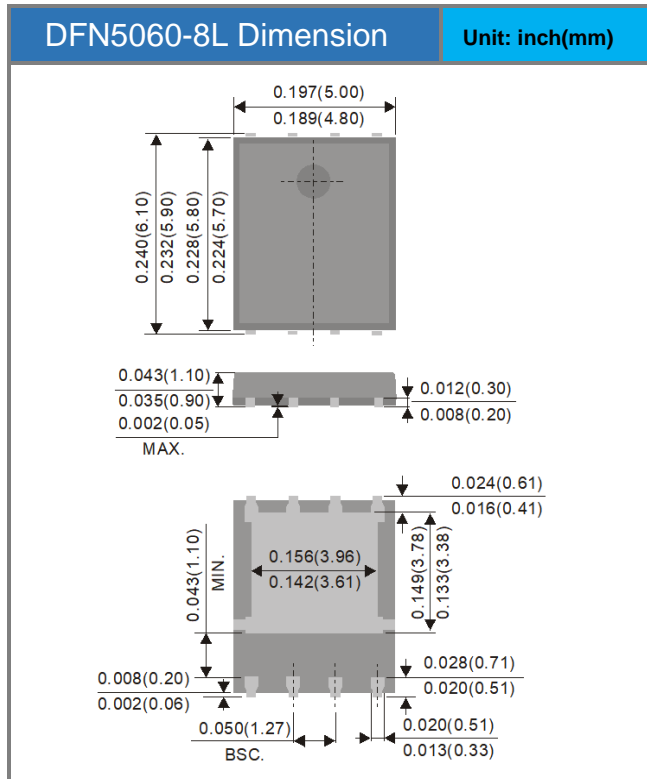


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Product and Packing Information

Part No.	Package Type	Packing Type	Marking
PJQ5451E-AU	DFN5060-8L	3K pcs / 13" reel	Q5451E

Packaging Information & Mounting Pad Layout





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