

PJQ5946-AU

40V Dual N-Channel Enhancement Mode MOSFET

Voltage

40 V

Current

58 A

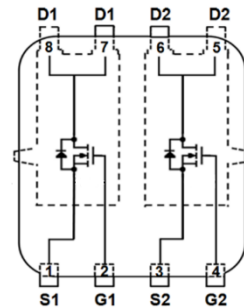
Features

- $R_{DS(ON)}$, $V_{GS}@10V$, $I_D@10A < 6.8m\Omega$
- $R_{DS(ON)}$, $V_{GS}@4.5V$, $I_D@6A < 9.1m\Omega$
- Excellent FOM
- Logic Level Drive
- AEC-Q101 qualified
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

Mechanical Data

- Case : DFN5060B-8L Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.092 grams

DFN5060B-8L



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

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ^(Note 3)	$T_C=25^\circ\text{C}$	I_D	58	A
	$T_C=100^\circ\text{C}$		41	
Pulsed Drain Current ^(Note 1)	$T_C=25^\circ\text{C}$	I_{DM}	232	
Power Dissipation	$T_C=25^\circ\text{C}$	P_D	42	W
	$T_C=100^\circ\text{C}$		21	
Continuous Drain Current ^(Note 4)	$T_A=25^\circ\text{C}$	I_D	14.3	A
	$T_A=70^\circ\text{C}$		12	
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 ^(Note 5)		E_{AS}	42	mJ
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~175	$^\circ\text{C}$
Thermal Resistance ^(Note 4)	Junction to Case	$R_{\theta JC}$	3.6	$^\circ\text{C/W}$
	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	40	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =50uA	1.1	1.6	2.3	
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =10A	-	5.4	6.8	mΩ
		V _{GS} =4.5V, I _D =6A	-	7	9.1	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V, 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} =32V, I _D =10A, V _{GS} =10V	-	20	26	nC
Gate-Source Charge	Q _{gs}		-	3.1	-	
Gate-Drain Charge	Q _{gd}		-	6.4	-	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz	-	1328	1726	pF
Output Capacitance	C _{oss}		-	276	414	
Reverse Transfer Capacitance	C _{rss}		-	31	54	
Gate resistance	R _g	f=1MHz	-	0.8	-	Ω
Turn-On Delay Time	t _{d(on)}	V _{DS} =32V, I _D =10A, V _{GS} =10V, R _G =3Ω (Note 2)	-	11	-	ns
Turn-On Rise Time	t _r		-	3	-	
Turn-Off Delay Time	t _{d(off)}		-	28	-	
Turn-Off Fall Time	t _f		-	5	-	
Drain-Source Diode						
Diode Forward Current	I _S	T _C =25°C	-	-	58	A
Pulsed Diode Forward Current	I _{SM}		-	-	232	
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V	-	0.86	1.3	V
Reverse Recovery Time	T _{rr}	V _{DD} =20V, V _{GS} =0V	-	23	-	ns
Reverse Recovery Charge	Q _{rr}	I _S =20A, dI _S /dt=100A/us	-	15	-	nC

NOTES :

1. Pulse width ≤ 100us, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature typical characteristics.
3. Chip capability with an R_{θJC}=3.6°C/W.
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}=13A, V_{DD}=30V, V_{GS}=10V, Starting T_J=25°C. the chip is about to carry I_{AS}=26A.
6. Guaranteed by design, not subject to production testing.

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TYPICAL CHARACTERISTIC CURVES

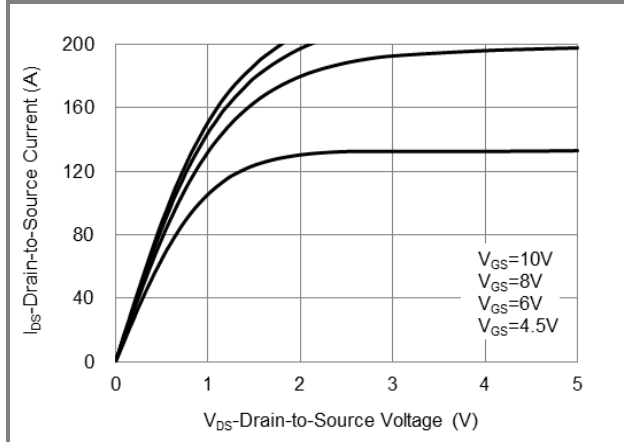


Fig.1 On-Region Characteristics

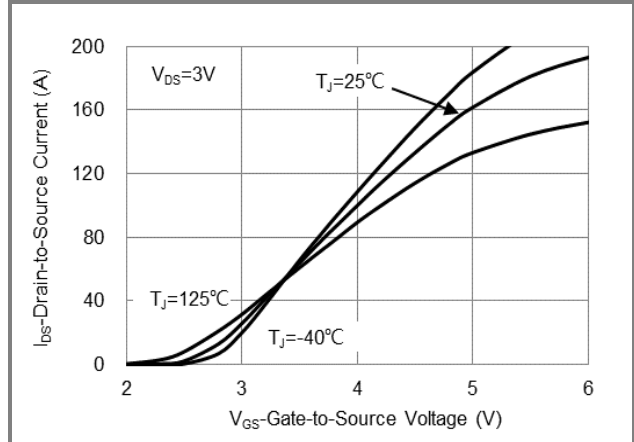


Fig.2 Transfer Characteristics

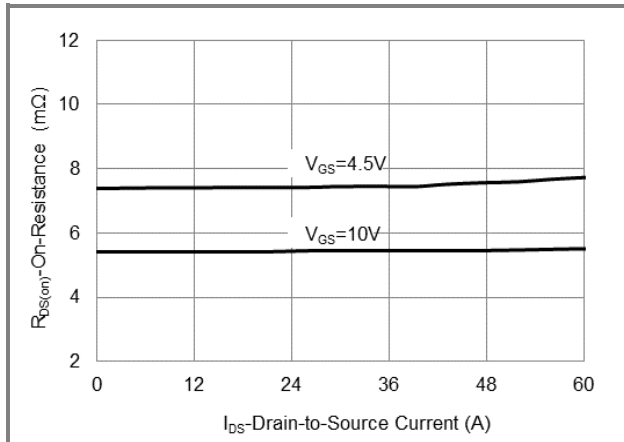


Fig.3 On-Resistance vs. Drain Current

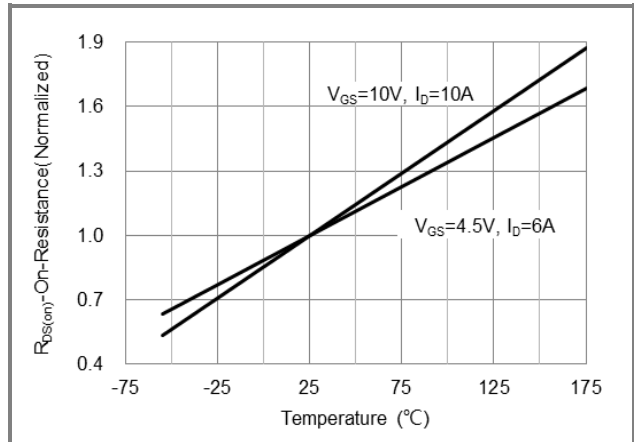


Fig.4 On-Resistance vs. Junction temperature

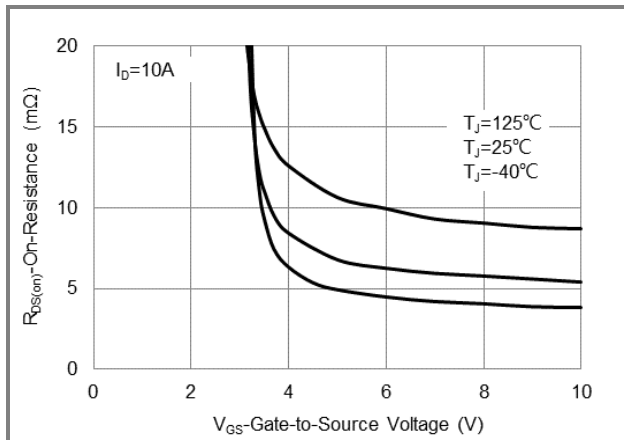


Fig.5 On-Resistance Variation with Vgs

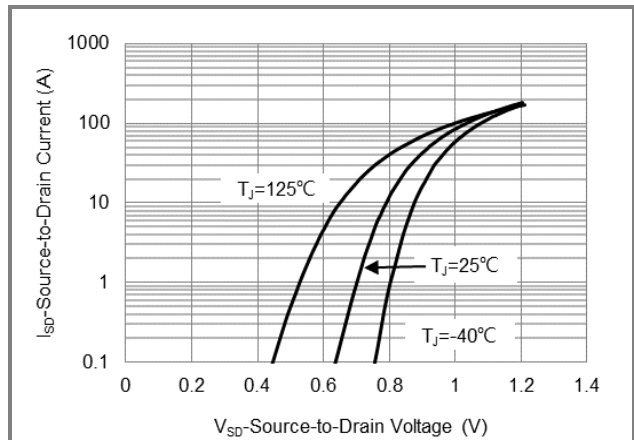


Fig.6 Source-Drain Diode Forward Voltage

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TYPICAL CHARACTERISTIC CURVES

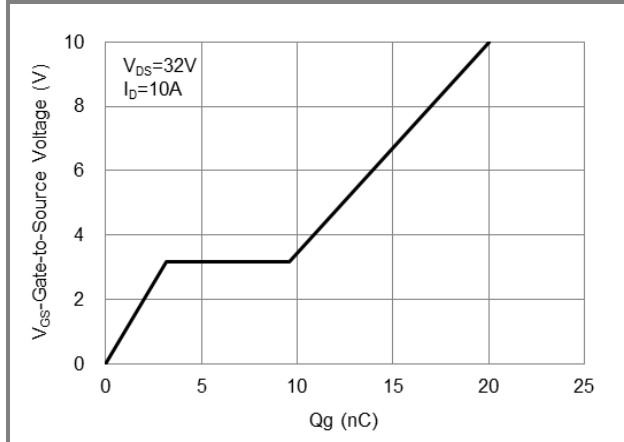


Fig.7 Gate-Charge Characteristics

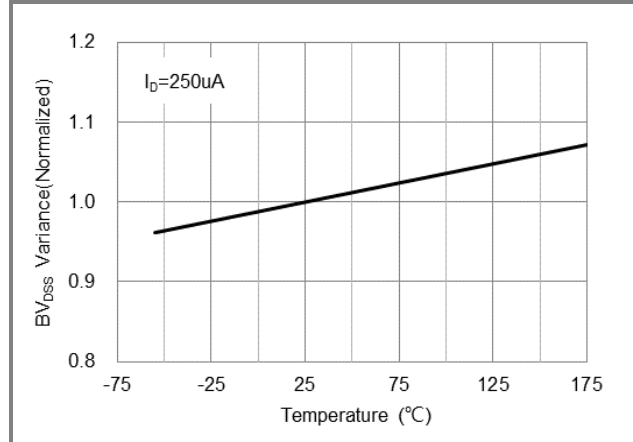


Fig.8 Breakdown Voltage Variation vs. Temperature

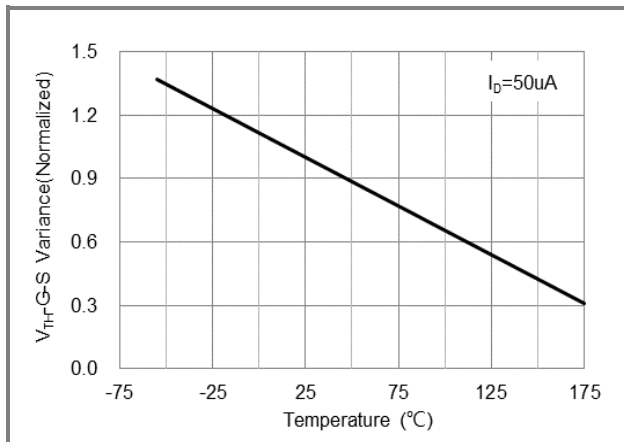


Fig.9 Threshold Voltage Variation with Temperature

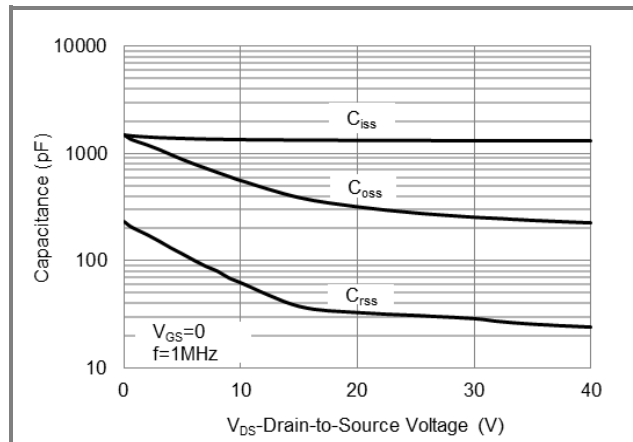


Fig.10 Capacitance vs. Drain-Source Voltage

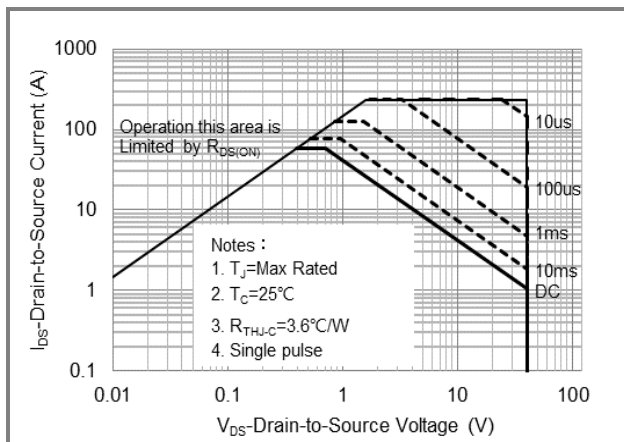


Fig.11 Maximum Safe Operating Area

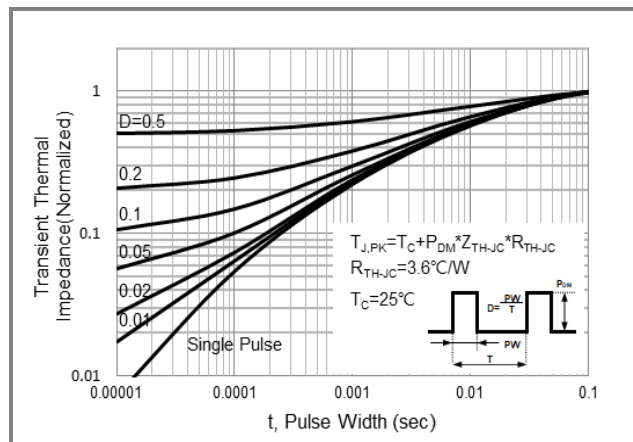


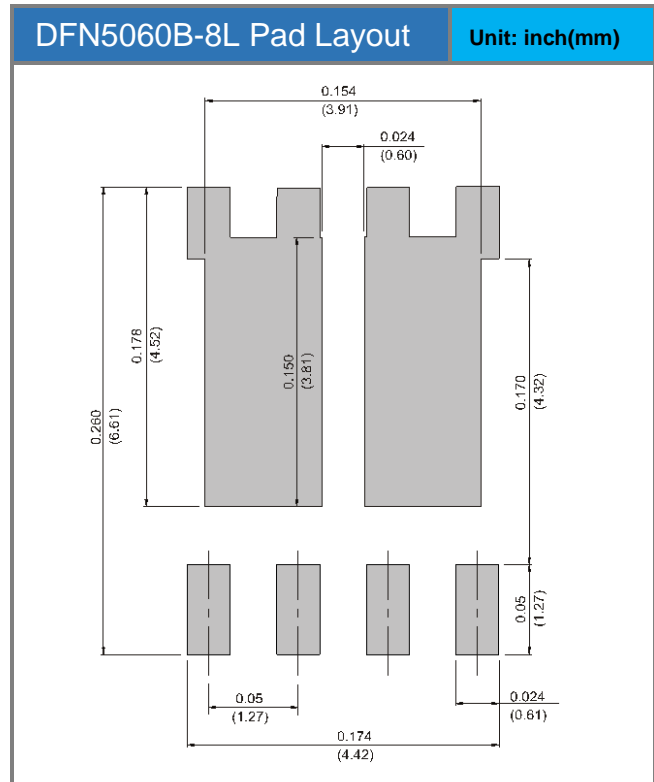
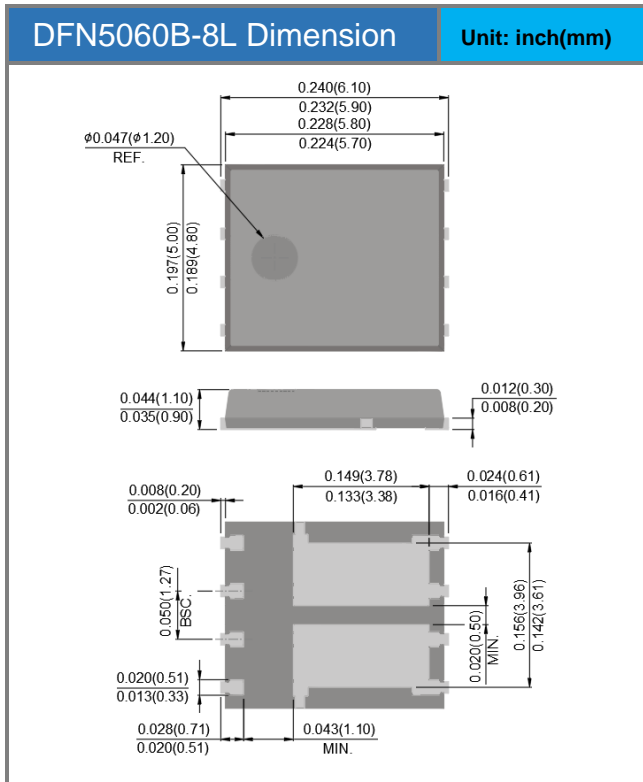
Fig.12 Normalized Transient Thermal Impedance

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Product and Packing Information

Part No.	Package Type	Packing Type	Marking
PJQ5946-AU	DFN5060B-8L	3K pcs / 13" reel	Q5946

Packaging Information & Mounting Pad Layout



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