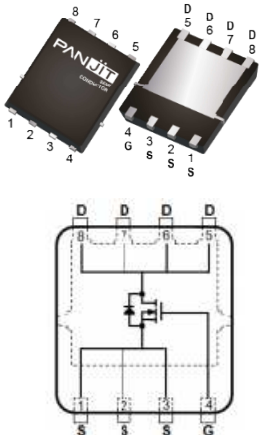
60V N-Channel Enhancement Mode MOSFET

Voltage	**60 V**	**R_{DSON}**	**12 mΩ**
Current	**39 A**	**$Q_{G\ (TYP)}$**	**16 nC**

DFN5060-8L



Top side view

Feature

- $R_{DS(ON)}$, V_{GS}@10V, I_D@20A<12mΩ
- $R_{DS(ON)}$, V_{GS}@4.5V, I_D@10A<16mΩ
- High switching speed
- Low reverse transfer capacitance
- 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: 0.0028 ounces, 0.08 grams

Application

- SR solutions of PD Charger, BMS, BLDC motor driver switch

Absolute Maximum Ratings (T_A = 25 °C unless otherwise specified)

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°C	I_D	39	A
	T_C=100°C		25	
Pulsed Drain Current	T_C=25°C	I_{DM}	156	A
Single Pulse Avalanche Current (Note 5)		I_{AS}	18	A
Single Pulse Avalanche Energy (Note 5)		E_{AS}	16	mJ
Power Dissipation	T_C=25°C	P_D	33	W
	T_C=100°C		13	
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55~150	°C

Thermal Characteristics

PARAMETER		SYMBOL	MAXIMUM	UNITS
Thermal Resistance	Junction-to-Case (Bottom)	$R_{\theta JC}$	3.8	°C/W
	Junction-to-Case (Top)	$R_{\theta JT}$	31	°C/W
	Junction-to-Ambient (Note.4)	$R_{\theta JA}$	50	°C/W

Electrical Characteristics (T_A = 25 °C unless otherwise specified)

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	1.2	1.8	2.5	
Drain-Source On-State Resistance (Note 1)	$R_{DS(on)}$	V_{GS}=10V, I_D=20A	-	9	12	mΩ
		V_{GS}=4.5V, I_D=10A	-	14	16	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=48V, V_{GS}=0V	-	-	1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Transfer characteristics (Note 1)	gfs	V_{DS}=10V, I_D=20A	-	26	-	S
Dynamic (Note 6)						
Total Gate Charge	Q_g	V_{DS}=30V, I_D=20A, V_{GS}=4.5V	-	8.3	-	nC
		V_{DS}=30V, I_D=20A, V_{GS}=10V	-	16	-	
Gate-Source Charge	Q_{gs}		-	3.2	-	
Gate-Drain Charge	Q_{gd}		-	3.6	-	
Plateau Voltage	V_{GP}		-	3.4	-	V
Input Capacitance	Ciss	V_{DS}=30V, V_{GS}=0V, f=1.0MHZ	-	850	-	pF
Output Capacitance	Coss		-	310	-	
Reverse Transfer Capacitance	Crss		-	23	-	
Turn-On Delay Time	$td_{(on)}$	V_{DD}=30V, I_D=20A, V_{GS}=10V, R_G=2Ω (Note 2)	-	21	-	ns
Turn-On Rise Time	t_r		-	88	-	
Turn-Off Delay Time	$td_{(off)}$		-	42	-	
Turn-Off Fall Time	t_f		-	92	-	
Gate Resistance	Rg	f =1.0MHz	-	1.9	-	Ω
Drain-Source Diode						
Diode Forward Voltage	V_{SD}	I_S=1A, V_{GS}=0V	-	-	1.1	V
Reverse Recovery Charge	Q_{rr}	I_{SD} = 20A, di/dt = 100A/μs	-	3	-	nC
Reverse Recovery Time	T_{rr}		-	15	-	ns

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. $R_{\theta JA}$ 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 $inch^2$ with 2oz.square pad of copper.
5. The test condition is L=0.1mH, I_{AS}=18A, V_{DD}=25V, V_{GS}=10V, R_G=25ohm, Starting T_J=25°C
6. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTIC CURVES

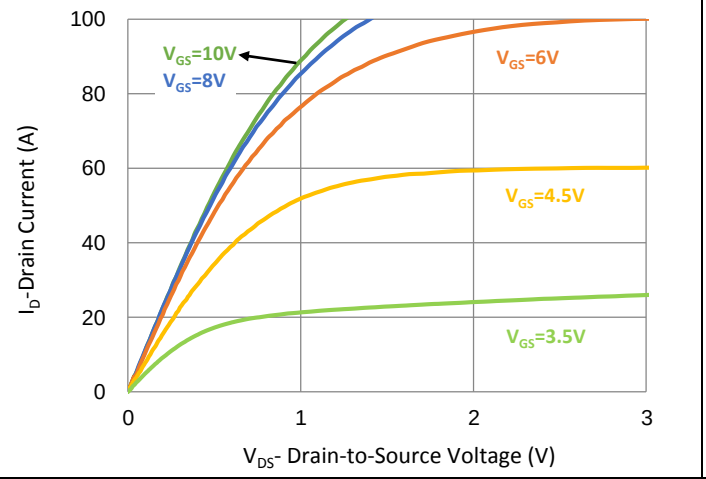


Fig.1 Output Characteristics

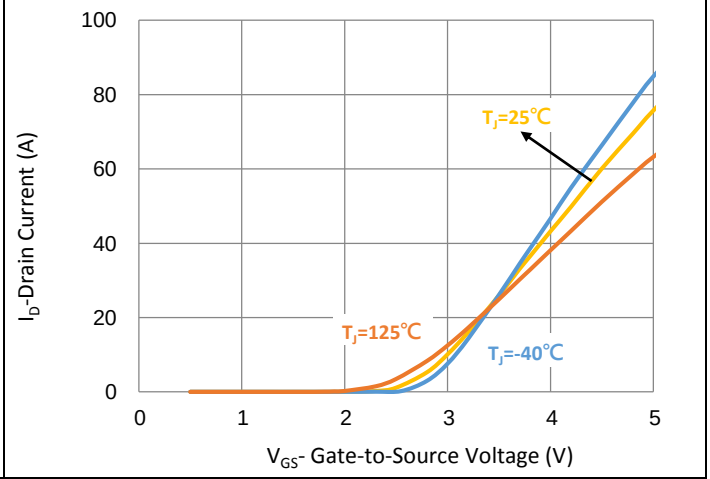


Fig.2 Transfer Characteristics

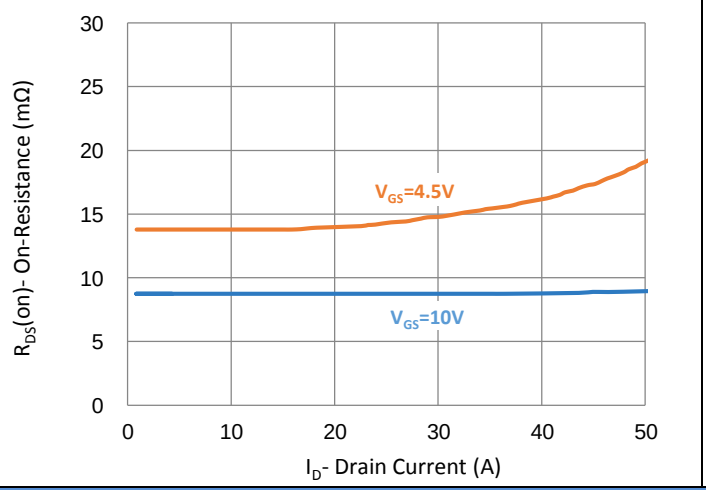


Fig.3 On-Resistance vs. Drain Current

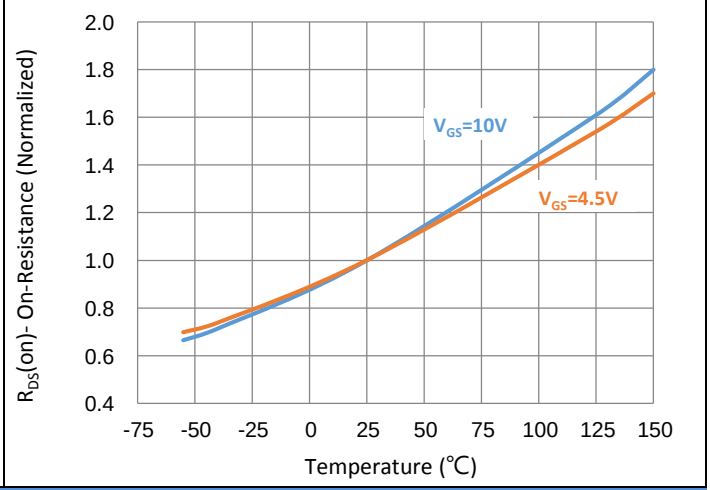


Fig.4 On-Resistance vs. Junction temperature

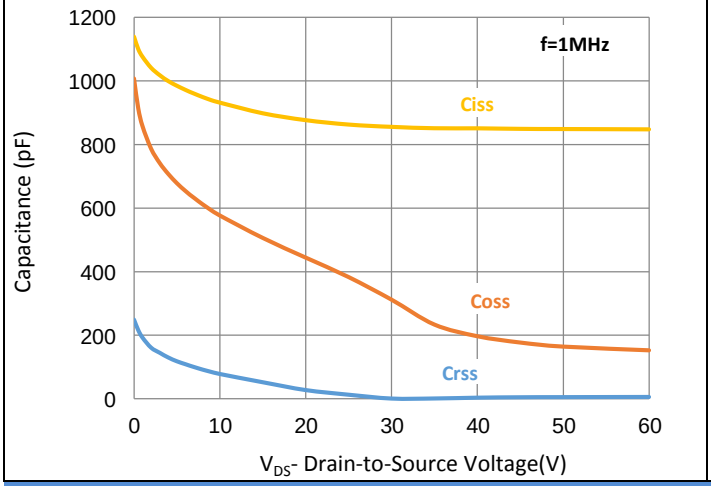


Fig.5 Capacitance vs. Drain-Source Voltage

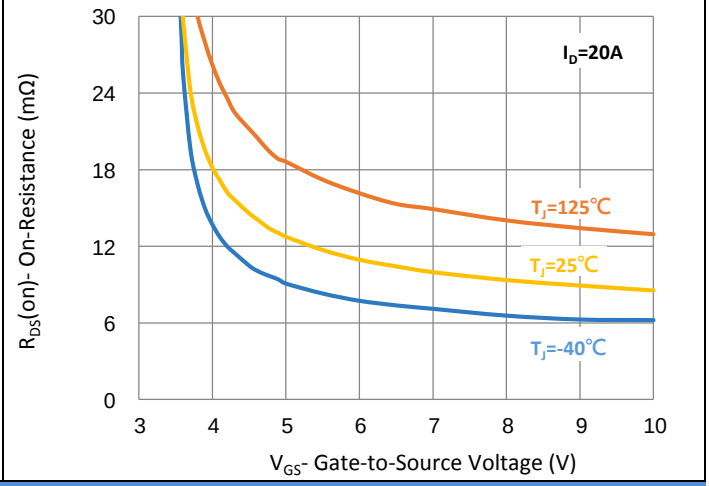


Fig.6 On-Resistance vs. Gate-Source Voltage

TYPICAL CHARACTERISTIC CURVES

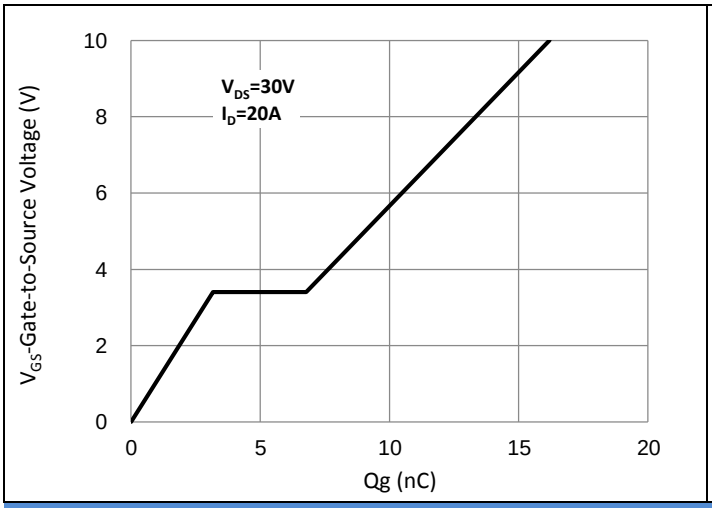


Fig.7 Gate-Charge Characteristics

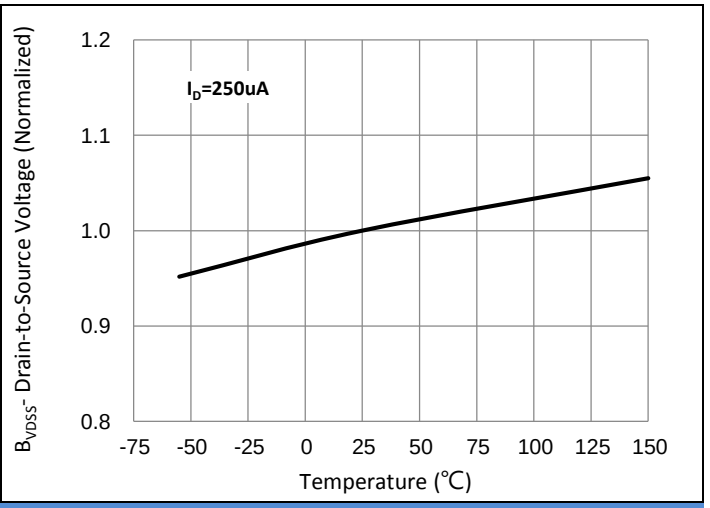


Fig.8 Breakdown Voltage Variation vs. Temperature

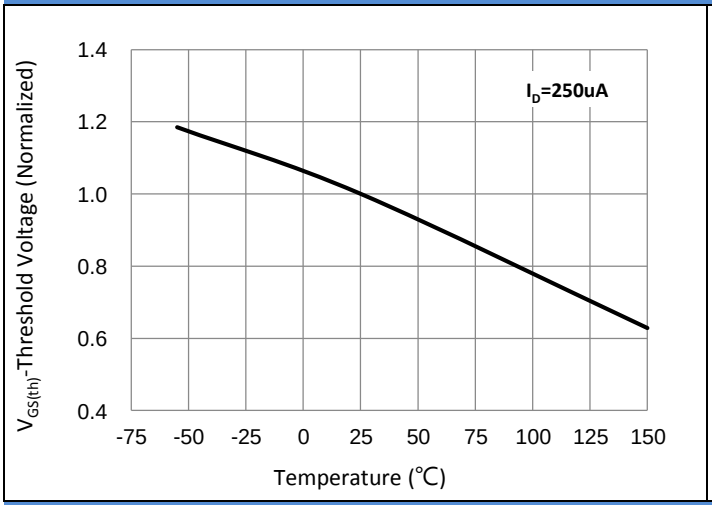


Fig.9 Threshold Voltage Variation with Temperature

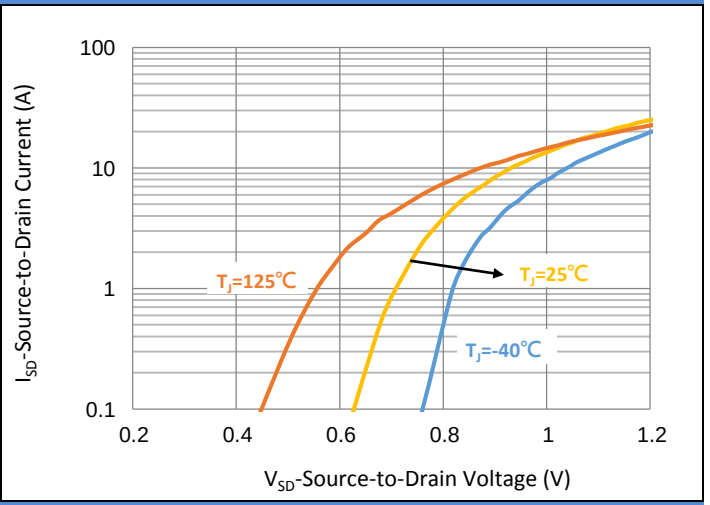


Fig.10 Source-Drain Diode Forward Voltage

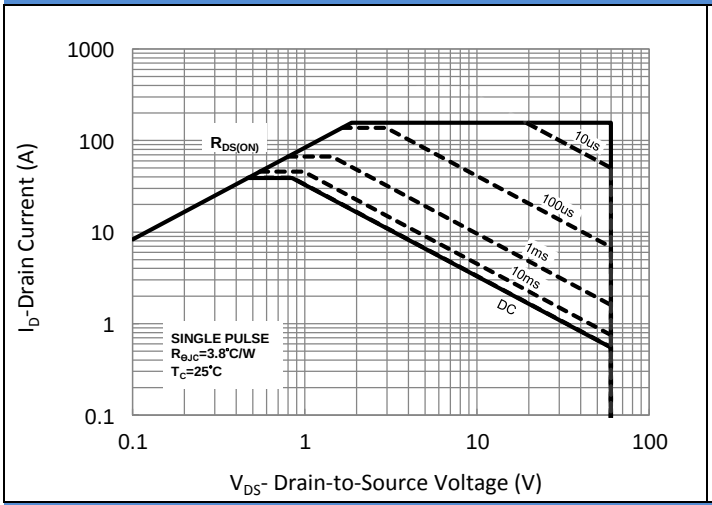


Fig.11 Maximum Safe Operating Area

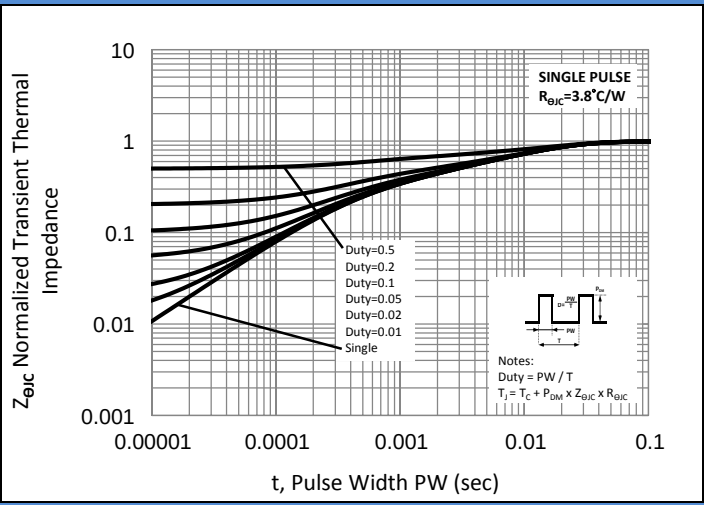


Fig.12 Normalized Transient Thermal Impedance

TYPICAL CHARACTERISTIC CURVES

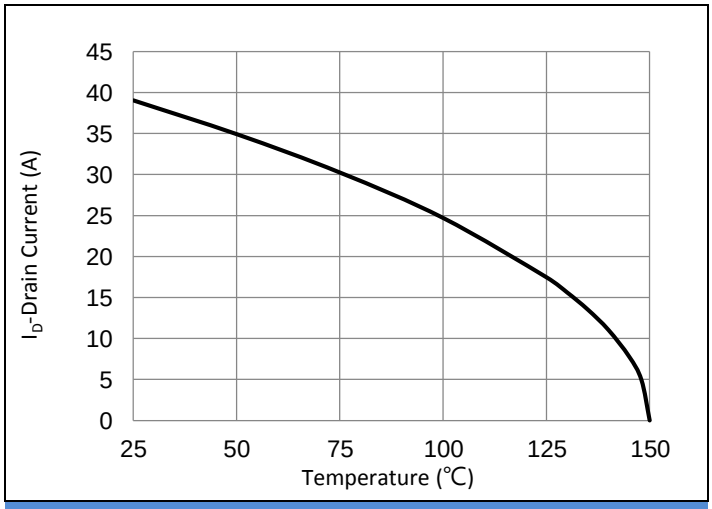


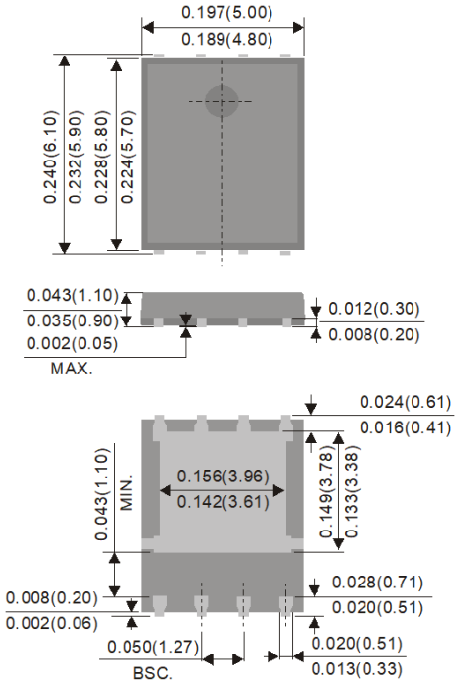
Fig.13 Drain Current vs. Case Temperature

Product and Packing Information

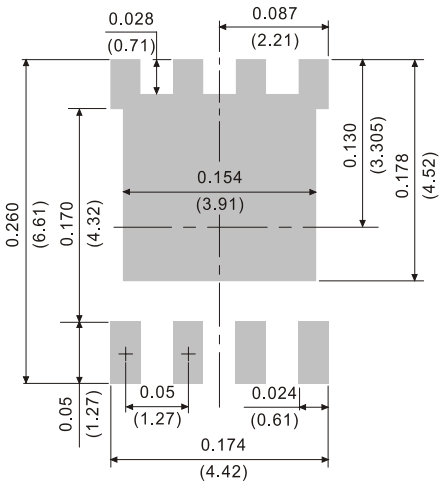
Part No.	Package Type	Packing Type	Marking
PSMQC120N06LS1	DFN5060-8L	3000pcs / 13” reel	120N06LS

Packaging Information & Mounting Pad Layout

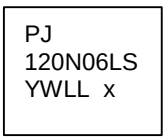
DFN5060-8L Dimension — Unit: inch(mm)



DFN5060-8L Pad Layout — Unit: inch(mm)



Marking Diagram



Y = Year Code
W = Week Code (A~Z)
LL = Lot Code (00~99)
x = Production Line Code

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