

30V N-Channel Enhancement Mode MOSFET

Voltage	30 V	Rdson	4.6 mΩ
Current	65 A	Qg	43 nC

Feature:

- $R_{DS(ON)} < 4.6 \text{ m}\Omega$ @ $V_{GS}=10\text{V}, I_D=20\text{A}$
- $R_{DS(ON)} < 7.2 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}, I_D=15\text{A}$
- High Speed Switching and Low $R_{DS(ON)}$
- Low reverse transfer capacitance
- 100% UIS / Rg test in mass production
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

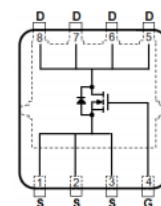
Mechanical Data

- Case: DFN5060-8L package
- Terminals: Solder able per MIL-STD-750, Method 2026
- Approx. Weight: 0.08 grams

Application

- Power supply, BMS

DFN5060-8L



Top side view

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise specified)

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		V_{DS}	30	
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (note 3)	$T_C=25^\circ\text{C}$	I_D	65	A
	$T_C=100^\circ\text{C}$		38	
Pulsed Drain Current (note 1)	$T_C=25^\circ\text{C}$	I_{DM}	250	A
Single Pulse Avalanche Energy (note 5)		E_{AS}	144	mJ
Power Dissipation	$T_C=25^\circ\text{C}$	P_D	35	W
	$T_C=100^\circ\text{C}$		14	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~150	$^\circ\text{C}$

Thermal Characteristics

PARAMETER		SYMBOL	VALUES	UNITS
Thermal Resistance	Junction-to-Case (Bottom)	$R_{\theta JC}$	3.6	$^\circ\text{C/W}$
	Junction-to-Ambient (Note 4)	$R_{\theta JA}$	50	$^\circ\text{C/W}$

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	30	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1	1.5	2	
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A	-	3.6	4.6	mΩ
		V _{GS} =4.5V, I _D =15A	-	6	7.2	mΩ
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	-	-	1.0	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} =15V, I _D =20A , V _{GS} =0V to 10V	-	43	-	nC
Gate-Source Charge	Q _{gs}		-	6.8	-	
Gate-Drain Charge	Q _{gd}		-	9.2	-	
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=250KHz	-	2057	-	pF
Output Capacitance	C _{oss}		-	307	-	
Reverse Transfer Capacitance	C _{rss}		-	245	-	
Turn-On Delay Time	td(on)	V _{DD} =15V, I _D =20A , V _{GS} =10V, R _g =3Ω (Note 2)	-	7.9	-	ns
Turn-On Rise Time	tr		-	6	-	
Turn-Off Delay Time	td(off)		-	38	-	
Turn-Off Fall Time	tf		-	12.4	-	
Gate Resistance	Rg	f=1.0MHz	-	2.8	-	Ω
Drain-Source Diode						
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V	-	-	1.2	V
Reverse Recovery Charge	Q _{rr}	I _S =20A di/dt=100A/μs	-	3.49	-	uC
Reverse Recovery Time	T _{rr}		-	11	-	ns
NOTES :						
1. Pulse width ≤ 170 μs, Duty cycle ≤ 2 %.						
2. Essentially independent of operating temperature typical characteristics.						
3. The maximum drain current calculated by maximum junction temperature and thermal impedance. It can be varied by application and environment.						
4. RθJA 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. EAS is calculated based on the condition of L = 0.5 mH, IAS =24A, VDD = 50 V, VGS = 10 V, Rg=25ohm.						
6. Guaranteed by design, not subject to production testing.						

TYPICAL CHARACTERISTIC CURVES

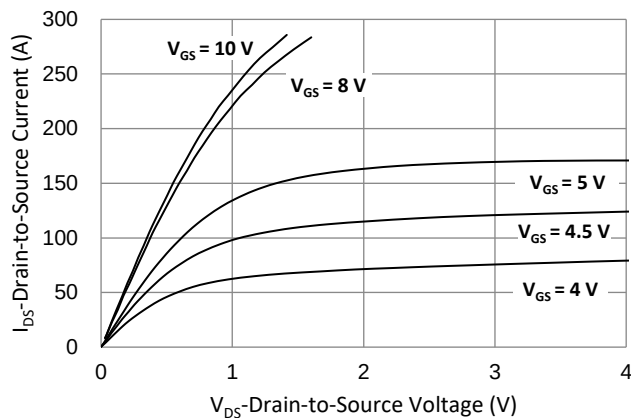


Fig.1 Output Characteristics

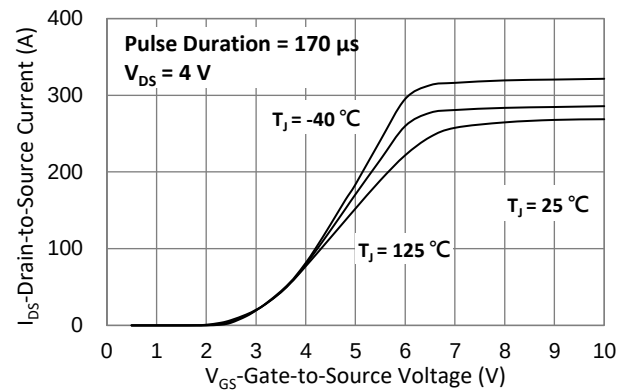


Fig.2 Transfer Characteristics

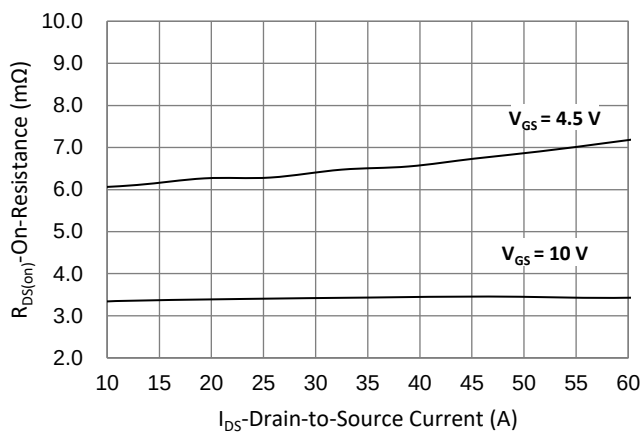


Fig.3 On-Resistance vs. Drain Current

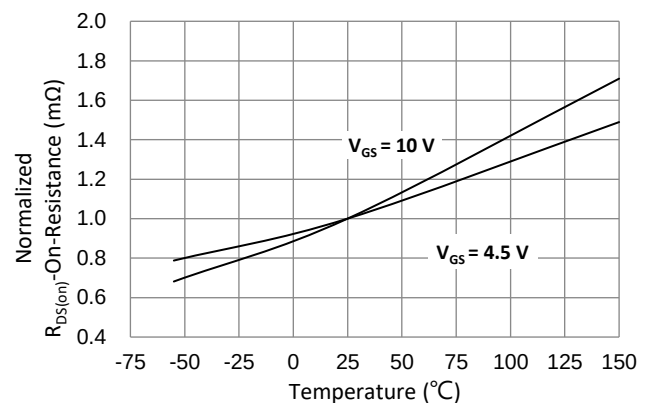


Fig.4 On-Resistance vs. Junction Temperature

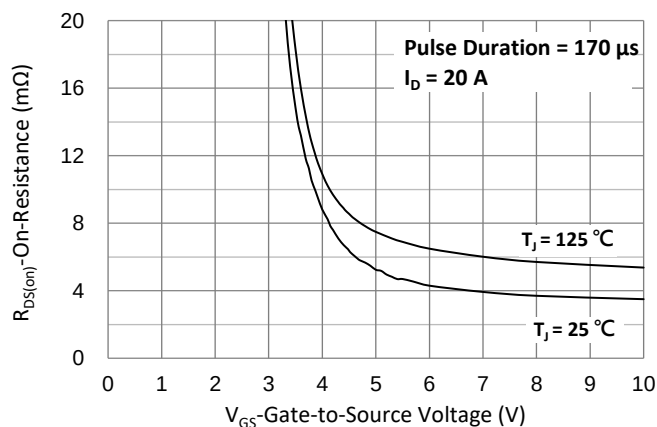


Fig.5 On-Resistance Variation with V_{GS}

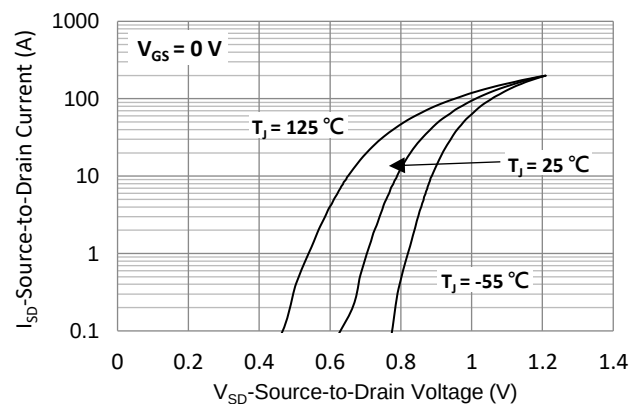


Fig.6 Body Diode Characteristics

TYPICAL CHARACTERISTIC CURVES

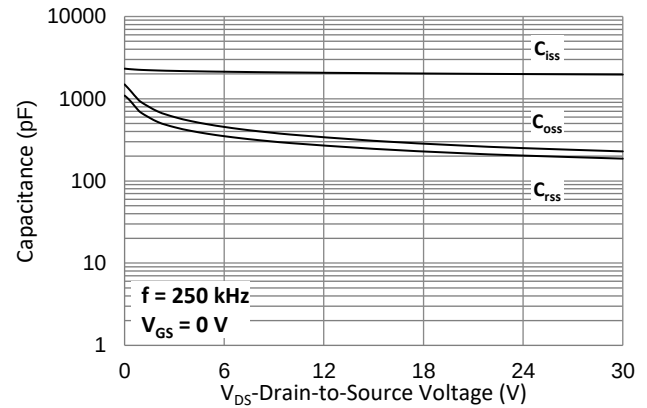
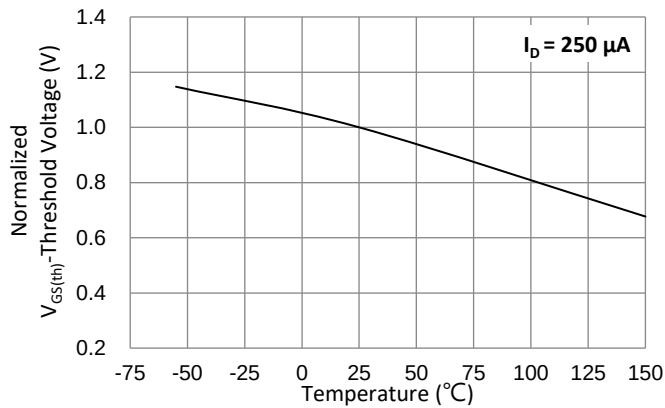
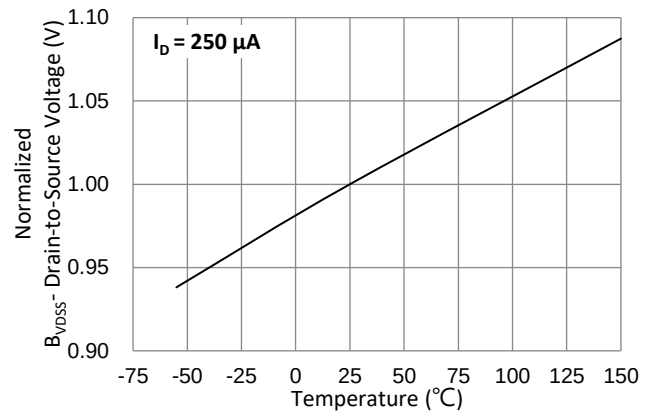
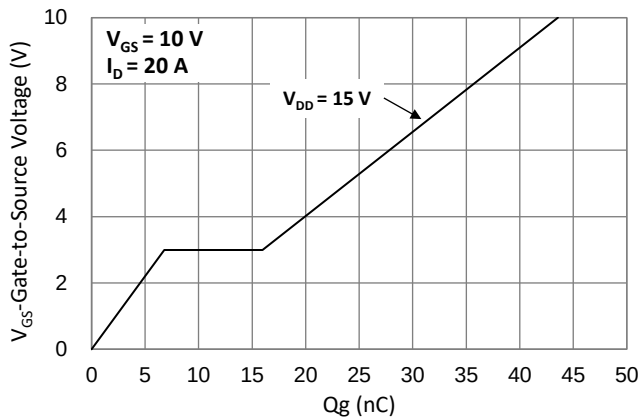


Fig.9 Threshold Voltage Variation with Temperature

Fig.10 Drain Current vs. Case Temperature

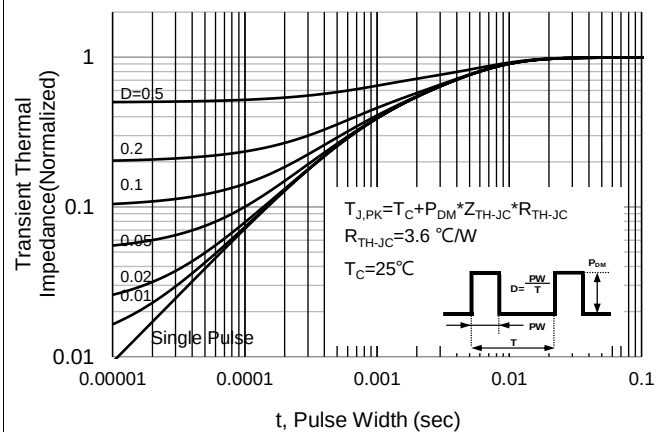
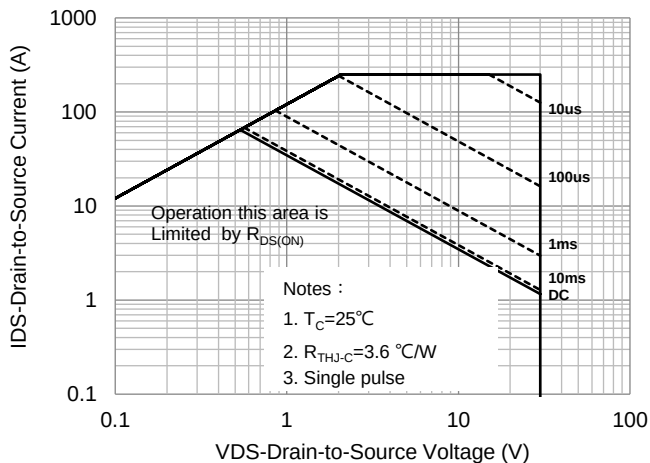


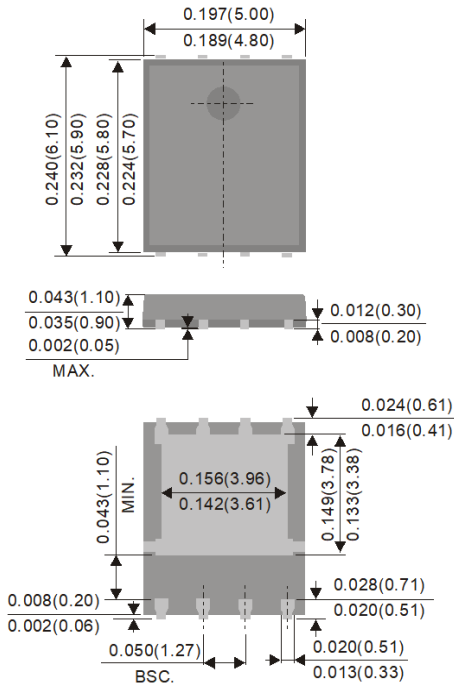
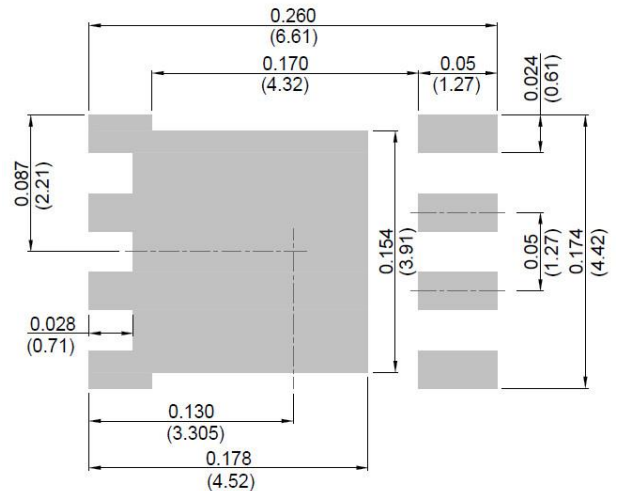
Fig.11 Maximum Safe Operating Area

Fig.12 Normalized Transient Thermal Impedance

Product and Packing Information

Part No.	Package Type	Packing Type	Marking
PTMQC046N03LSC1	DFN5060-8L	3K pcs / 13" reel	046N03LC

Packaging Information

DFN5060-8L Dimension	Unit: inch(mm)	DFN5060-8L Pad Layout	Unit: inch(mm)
 Top View Dimensions: Width: 0.197(5.00), 0.189(4.80) Height: 0.240(6.10), 0.232(5.90), 0.228(5.80), 0.224(5.70) Side View Dimensions: Thickness: 0.043(1.10), 0.035(0.90), 0.002(0.05) MAX. Stagger: 0.012(0.30), 0.008(0.20) Bottom View Dimensions: Width: 0.156(3.96), 0.142(3.61) Height: 0.149(3.78), 0.133(3.38) Stagger: 0.024(0.61), 0.016(0.41) MIN. 0.043(1.10) BSC. 0.050(1.27), 0.020(0.51), 0.013(0.33) 0.008(0.20), 0.002(0.06), 0.028(0.71), 0.020(0.51)		 Pad Layout Dimensions: Width: 0.260(6.61), 0.170(4.32), 0.05(1.27), 0.024(0.61) Height: 0.087(2.21), 0.154(3.91), 0.05(1.27), 0.174(4.42) Stagger: 0.028(0.71), 0.130(3.305), 0.178(4.52)	

Marking Diagram

PJ 046N03LC YWLL x	Y = Year Code W = Week Code (A~Z) LL = Lot Code (00~99) x = Production Line Code
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