Description

This is 40V 70A N-Channel Enhancement Mode Power MOSFET in a PDFN5060-8L plastic package.

Uses advanced power trench technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.

Applications

- Battery Management
- Motor Control and Drive
- UPS

V_{DSS}	$R_{DS(on)}$ (typ)	I_D
40 V	4.7mΩ	70A

Features

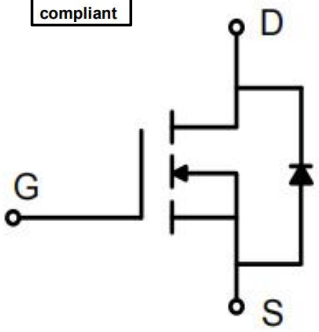
- VDS = 40V, ID = 70A

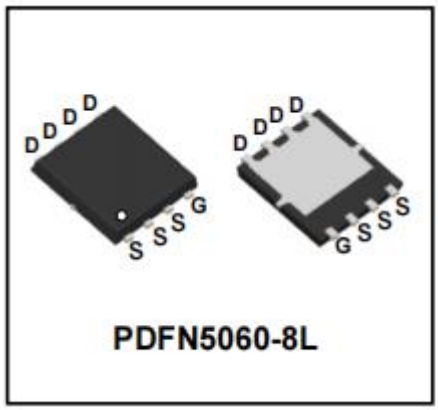
  RDS(on) < 6.5mΩ @ VGS = 10V

  RDS(on) < 8.5mΩ @ VGS = 4.5V
- Green Device Available
- Low Gate Charge
- 100% EAS Guaranteed

Equivalent Circuit & Pinning

RoHS compliant





Absolute Maximum Ratings(Ta=25℃)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current[1]	T_C=25℃	I_D	70	A
	T_C=100℃		56	
Pulsed Drain Current[2]		I_{DM}	146	A
Single Pulse Avalanche Energy[3]		EAS	88.2	mJ
Avalanche Current		I_{AS}	42	A
Total Power Dissipation[4]	T_C=25℃	P_D	51	W
Operating Junction and Storage Temperature Range		T_J , T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient[1]	$R_{\theta JA}$	61	°C/W
Thermal Resistance from Junction-to-Case[1]	$R_{\theta JC}$	2.5	°C/W

Electrical Characteristics（TJ = 25°C, unless otherwise noted）

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	40	-	-	V
Gate-body Leakage Current		I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T_J=25℃	I_{DSS}	V_{DS} = 32V, V_{GS} = 0V	-	-	1	μA
	T_J=55℃			-	-	5	
Gate-Threshold Voltage		$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.5	2.5	V
Drain-Source On-Resistance[2]		$R_{DS(on)}$	V_{GS} = 10V, I_D = 10A	-	4.7	6.5	mΩ
			V_{GS} = 4.5V, I_D = 5A	-	6.2	8.5	
Forward Transconductance[2]		g_{fs}	V_{DS} = 10V, I_D = 5A	-	26	-	S
Dynamic Characteristics							
Input Capacitance		C_{iss}	V_{DS} = 20V, V_{GS} =0V, f =1MHz	-	3260	-	pF
Output Capacitance		C_{oss}		-	245	-	
Reverse Transfer Capacitance		C_{rss}		-	185	-	
Switching Characteristics							
Gate Resistance		R_g	V_{DS} = 0V, V_{GS} =0V, f =1MHz	-	0.65	-	Ω
Total Gate Charge		Q_g	V_{GS} = 4.5V,V_{DS} = 20V, I_D= 10A	-	21	-	nC
Gate-Source Charge		Q_{gs}		-	5.7	-	
Gate-Drain Charge		Q_{gd}		-	9.6	-	
Turn-On Delay Time		$t_{d(on)}$	V_{GS} =10V, V_{DD} = 15V, R_G = 3.3Ω, I_D= 1A	-	15	-	nS
Rise Time		t_r		-	8.7	-	
Turn-Off Delay Time		$t_{d(off)}$		-	73	-	
Fall Time		t_f		-	7.2	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage[2]		V_{SD}	I_S = 1A, V_{GS} = 0V	-	-	1	V
Continuous Source Current[1,5]		I_S	V_G=V_D=0V , Force Current	-	-	70	A

Notes:

1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%

3.The EAS data shows Max. rating . The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=42A

4.The power dissipation is limited by 150℃ junction temperature

5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

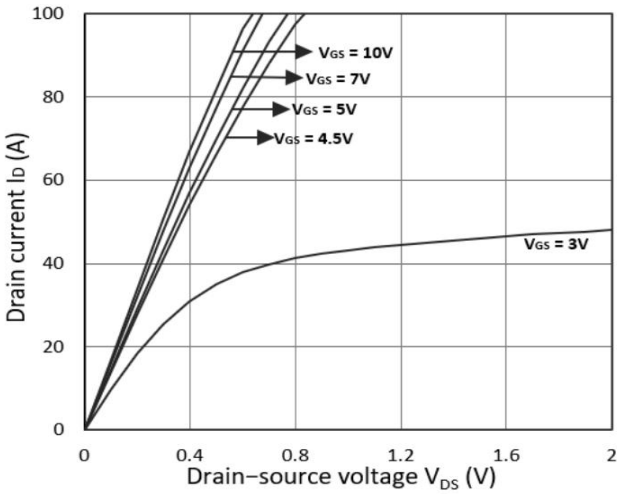


Figure 1. Output Characteristics

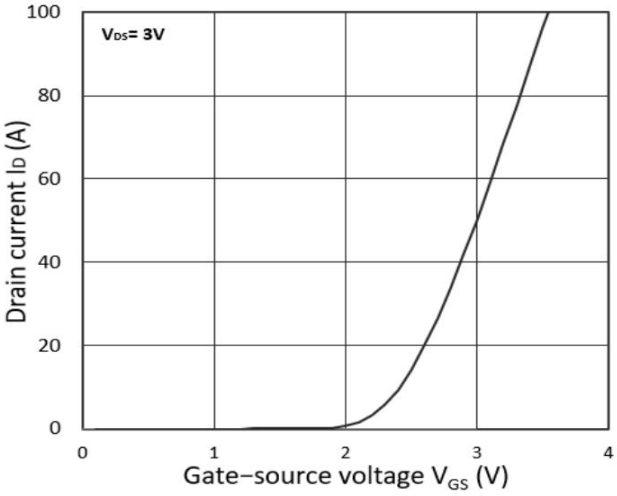


Figure 2. Transfer Characteristics

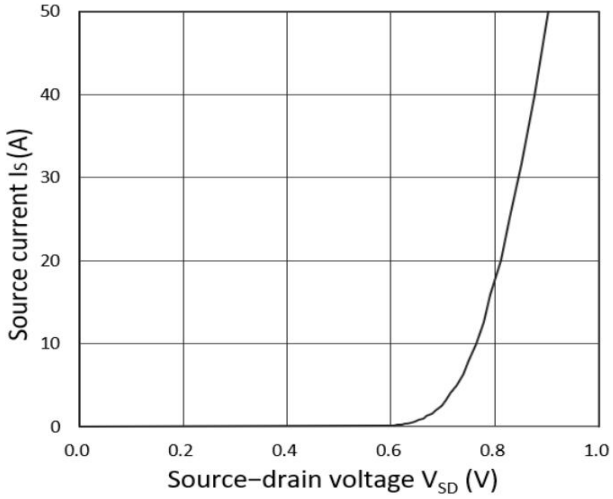


Figure 3. Forward Characteristics of Reverse

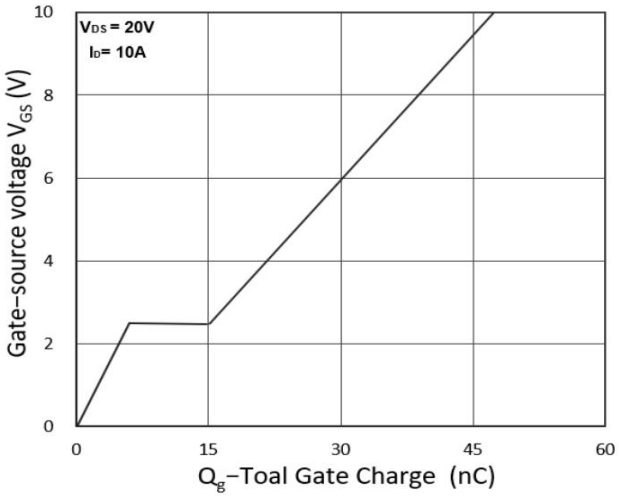


Figure 4. Gate Charge Characteristics

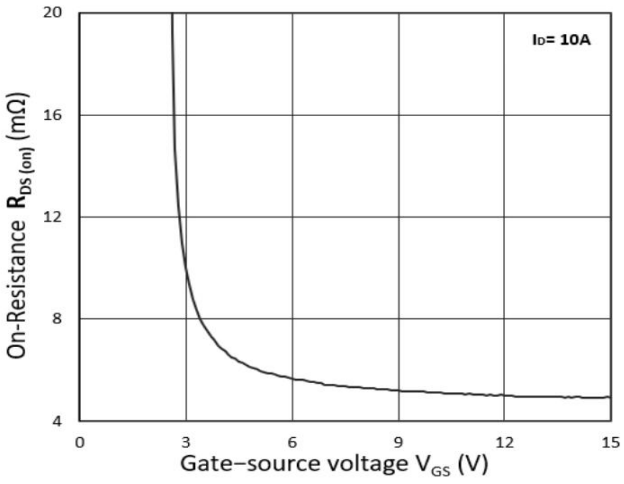


Figure 5. $R_{DS(on)}$ vs. V_{GS}

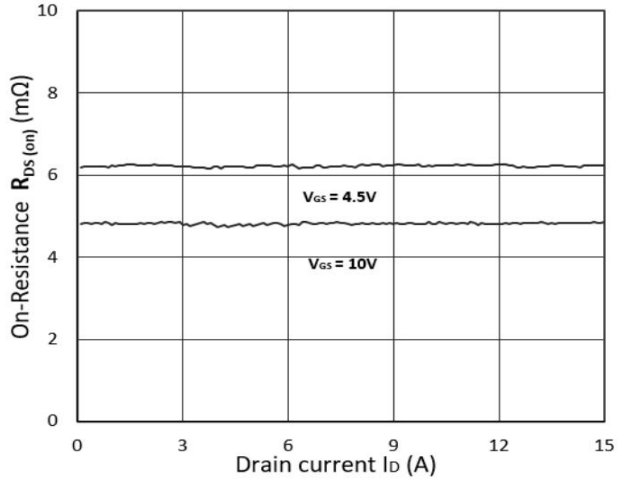


Figure 6. $R_{DS(on)}$ vs. I_D

Typical Characteristics

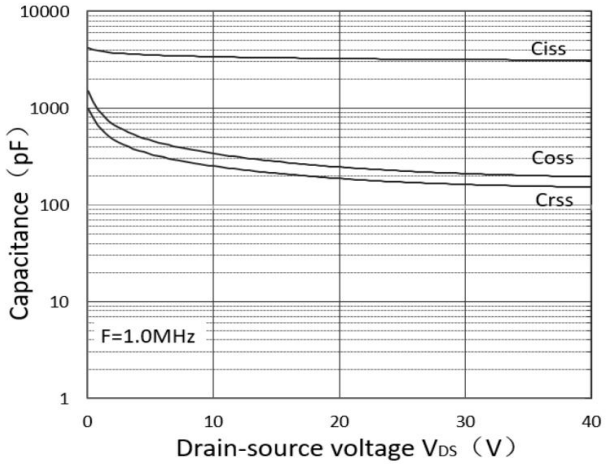


Figure 7. Capacitance Characteristics

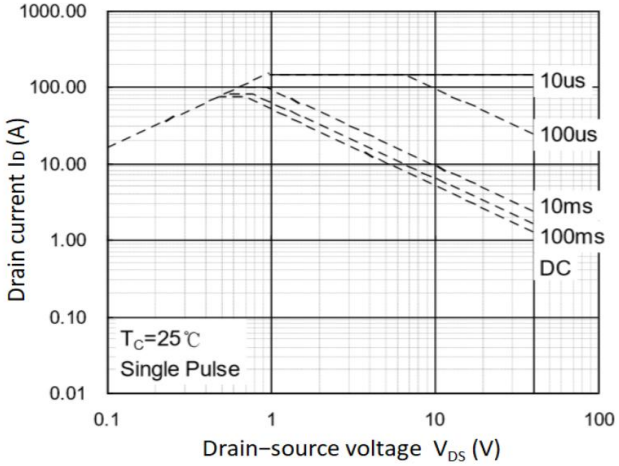


Figure 8. Safe Operating Area

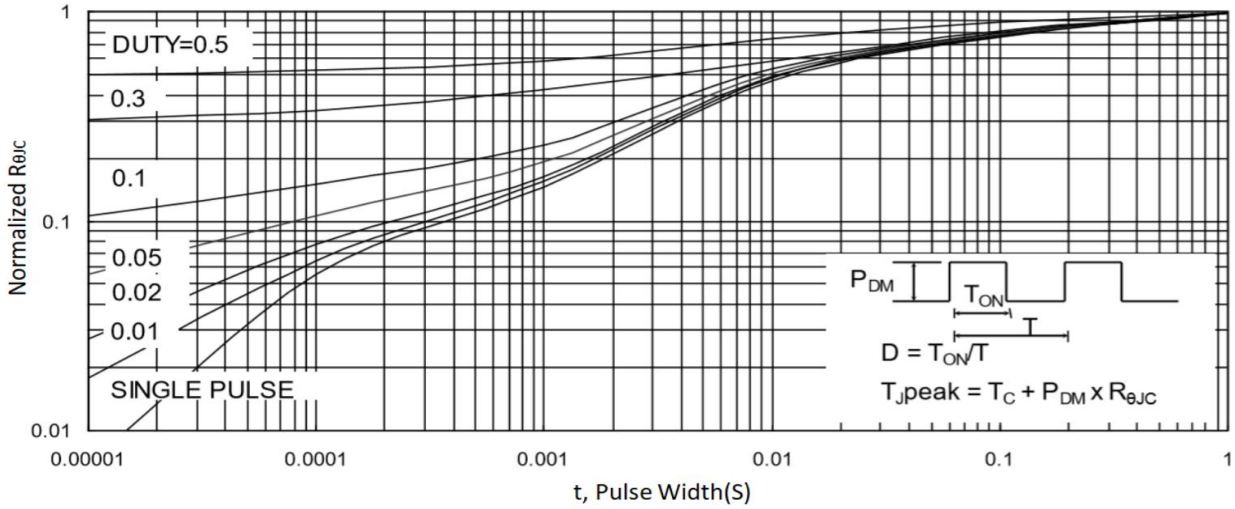


Figure 9. Normalized Maximum Transient Thermal Impedance

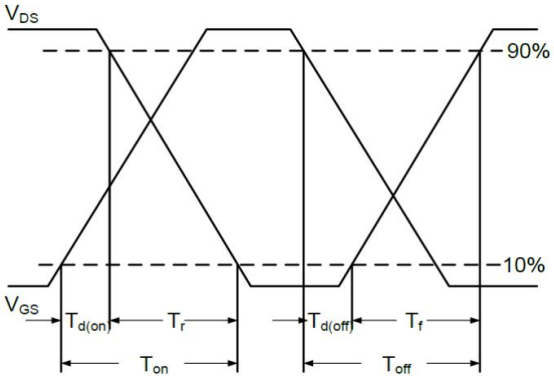


Figure 10. Switching Time Waveform

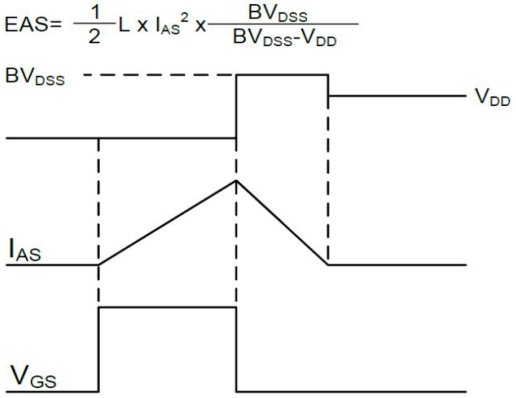
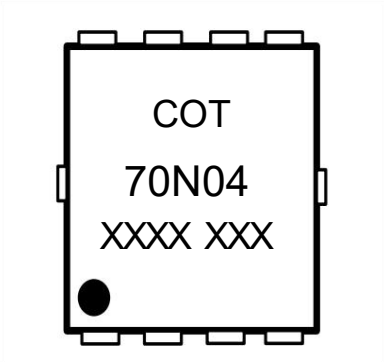


Figure 11. Unclamped Inductive Switching Waveform

Marking Instructions



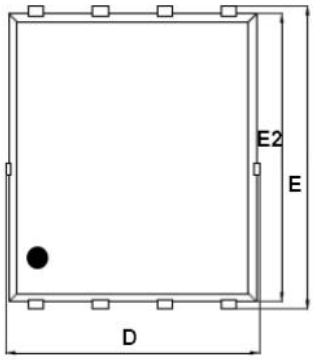
70N04 = Device code

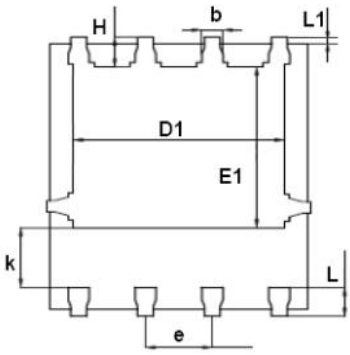
XXXX XXX= Date code

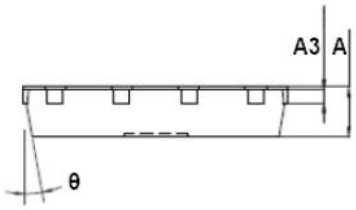
Ordering Information

Part	Package	Marking	Packing method
CT70N04ZC	PDFN5060-8L	70N04	Tape and Reel

Mechanical Dimensions for PDFN5060-8L







COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	0.90	1.20
A3	0.15	0.35
D	4.80	5.40
E	5.90	6.35
D1	3.61	4.31
E1	3.30	3.92
E2	5.65	6.06
k	1.10	-
b	0.30	0.51
e	1.27BSC	
L	0.38	0.71
L1	0.05	0.36
H	0.38	0.61
θ	0°	12°