



40V/60A N-Channel Advanced Power MOSFET

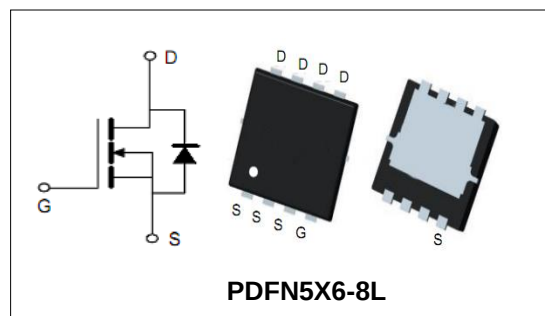
Features

- Ultra Low Gate Charge cause lower driving requirements
- 100% Avalanche Tested

BVDSS	40	V
ID	60	A
RDSON@VGS=10V	4.8	mΩ
RDSON@VGS=4.5V	6.6	mΩ

Applications

- Battery Management System
- Motor Drivers
- DC-DC Converter



PDFN5X6-8L

Order Information

Product	Package	Marking	Reel Size	Reel	Carton
PGN04N060	PDFN5X6-8L	PGN04N060	13inch	5000PCS	50000PCS

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (TC=25°C Unless Otherwise Noted)				
V _{(BR)DSS}	Drain-Source Breakdown Voltage		40	V
V _{GS}	Gate-Source Voltage		±20	V
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	TC =25°C	60	A
Mounted on Large Heat Sink				
E _{AS}	Single Pulse Avalanche Energy (Note1)		81	mJ
I _{DM}	Pulse Drain Current Tested (Note2)	TC =25°C	240	A
I _D	Continuous Drain current	TC =25°C	60	A
P _D	Maximum Power Dissipation	TC =25°C	40	W
R _{θJc}	Thermal Resistance Junction-to-Case		3.13	° C/W



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Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain- Source Breakdown Voltage	VGS=0V ID=250μA	40	--	--	V
I _{DSS}	Zero Gate Voltage Drain current	VDS=40V,VGS=0V	--	--	1	μA
I _{GSS}	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	VDS=VGS,ID=250μA	1	--	2.2	V
R _{DS(ON)}	Drain-Source On-State Resistance (Note3)	VGS=10V, ID=30A	--	4.8	5.8	mΩ
		VGS=4.5V, ID=20A	--	6.6	8.7	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated) (Note4)						
C _{iss}	Input Capacitance	VDS=20V, VGS=0V, f=1MHz	--	887	--	pF
C _{oss}	Output Capacitance		--	545	--	pF
C _{rss}	Reverse Transfer Capacitance		--	5.1	--	pF
Q _g	Total Gate Charge	VDS=20V, ID=20A, VGS=10V	--	17	--	nC
Q _{gs}	Gate-Source Charge		--	4.5	--	nC
Q _{gd}	Gate-Drain Charge		--	2	--	nC
R _G	Reverse Transfer Capacitance	f=1MHz	--	3.5	--	Ω
Switching Characteristics (Note4)						
t _{d(on)}	Turn-on Delay Time	VDS=20V, ID=20A, RG=3Ω, VGS=10V	--	6.5	--	ns
t _r	Turn-on Rise Time		--	2.7	--	ns
t _{d(off)}	Turn-off Delay Time		--	26	--	ns
t _f	Turn-off Fall Time		--	3.6	--	ns
Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	IS=20A,VGS=0V	--	--	1.2	V
t _{rr}	Reverse Recovery Time	IS=50A, di/dt=100A/us	--	22	--	ns
Q _{rr}	Reverse Recovery Charge		--	40	--	nc

Note:

- Limited by TJmax, starting TJ = 25° C, RG =25Ω, VDS =15V, VGS =10V. Part not recommended for use above this value.
- Repetitive Rating: Pulse width limited by maximum junction temperature.
- Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.



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Typical Performance Characteristics

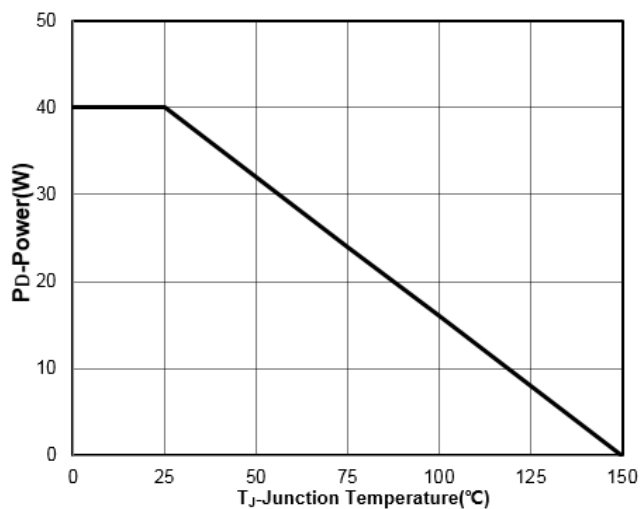


Figure1: Power De-rating

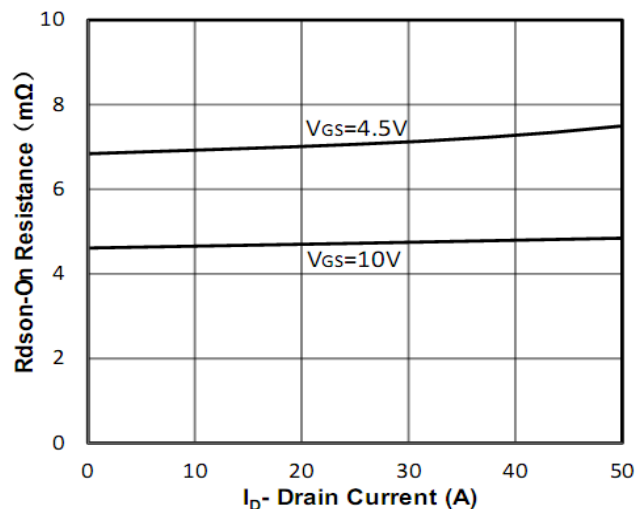


Figure2: Rdson- Drain Current

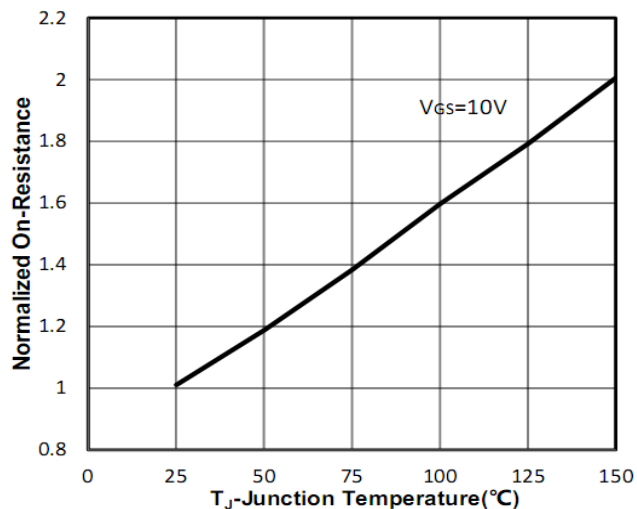


Figure3: Rdson-Junction Temperature

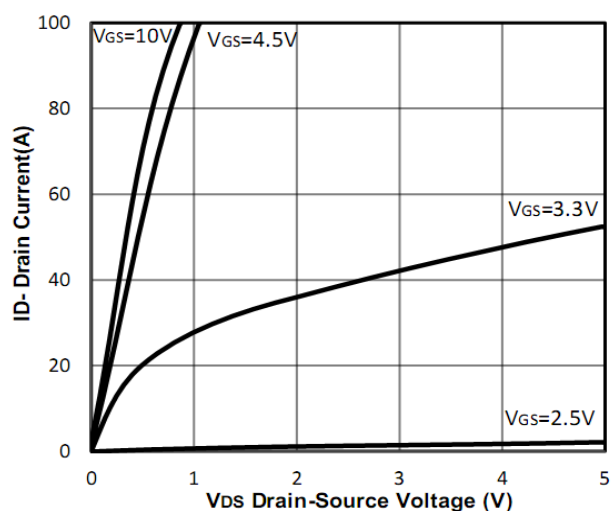


Figure4: Output Characteristics

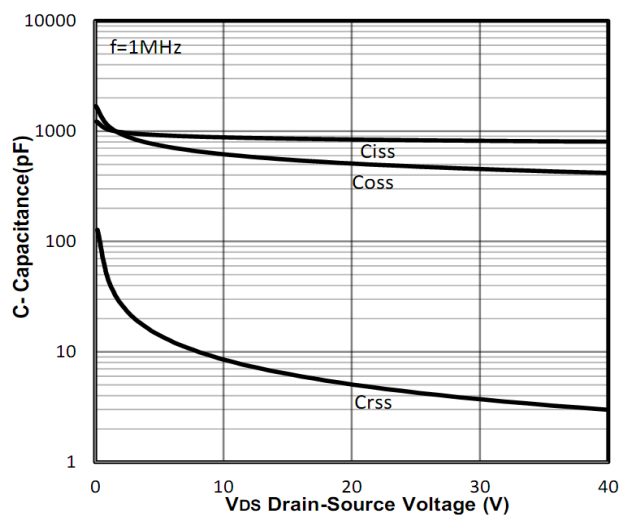


Figure5: Capacitance vs Vds

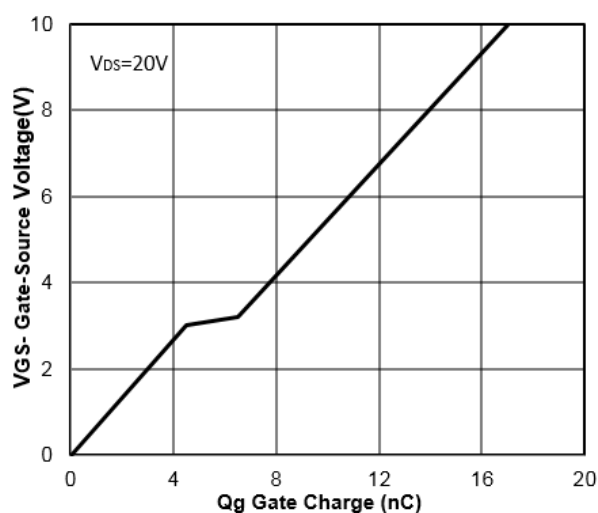


Figure6: Gate Charge



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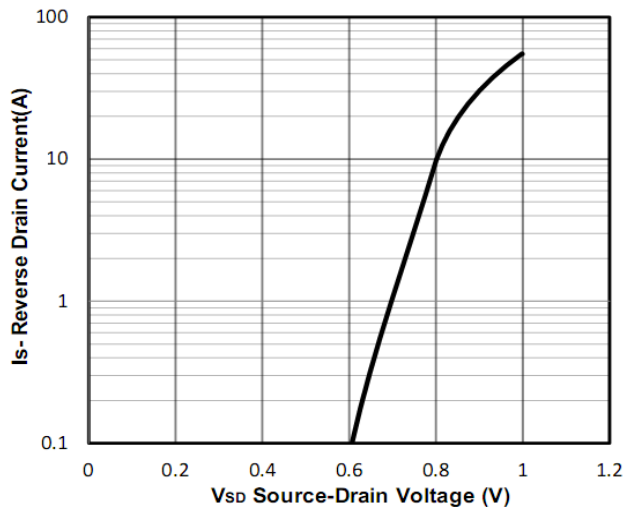


Figure7: Source- Drain Diode Forward

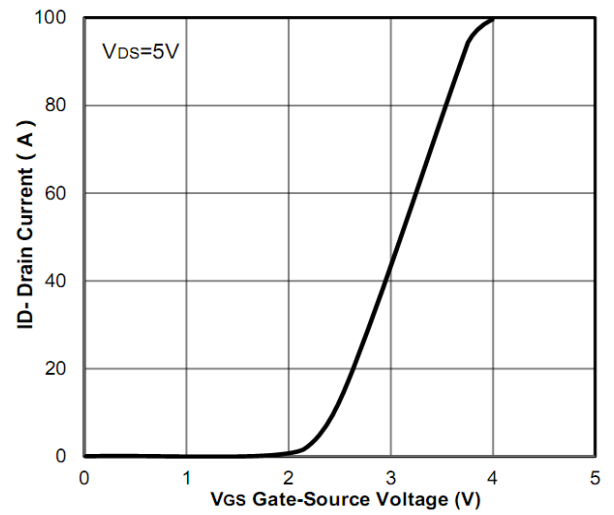


Figure8: Transfer Characteristics

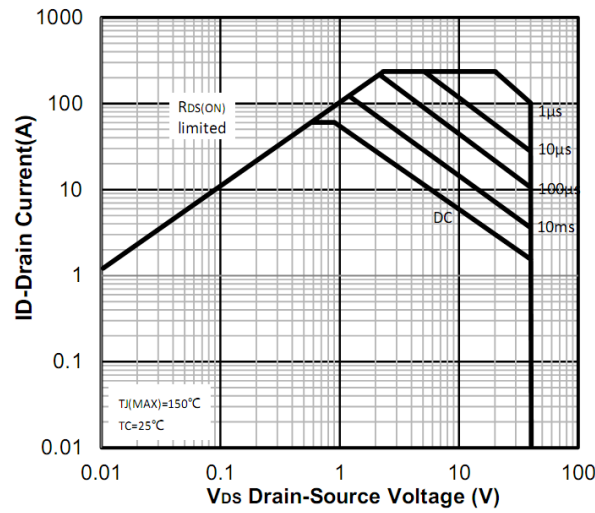


Figure9: Safe Operation Area

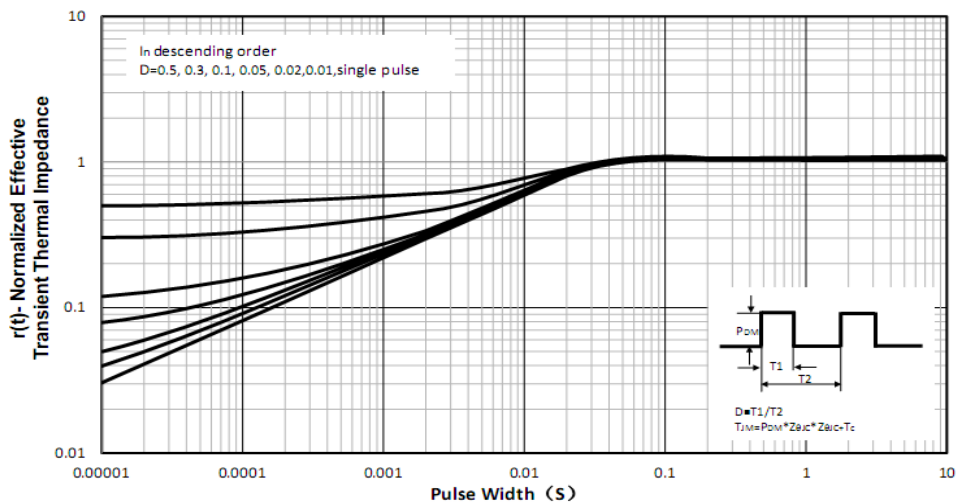


Figure10: Normalized Maximum Transient Thermal Impedance



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Test Circuit and Waveform:

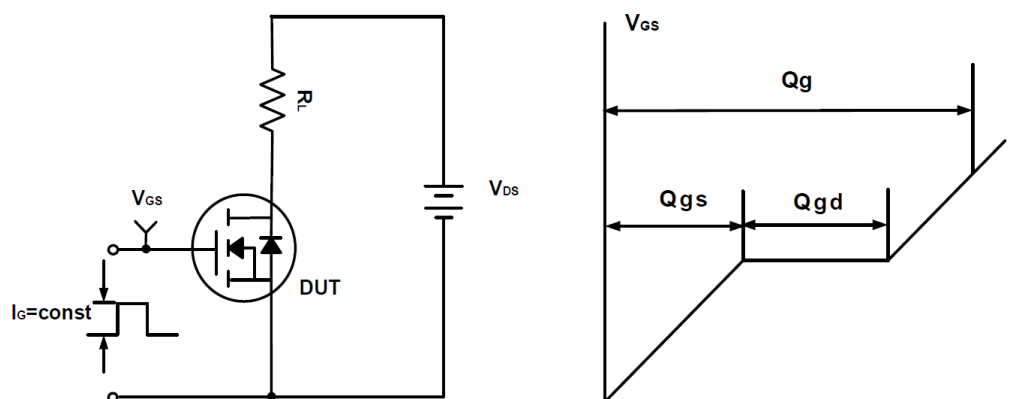


Figure A Gate Charge Test Circuit & Waveforms

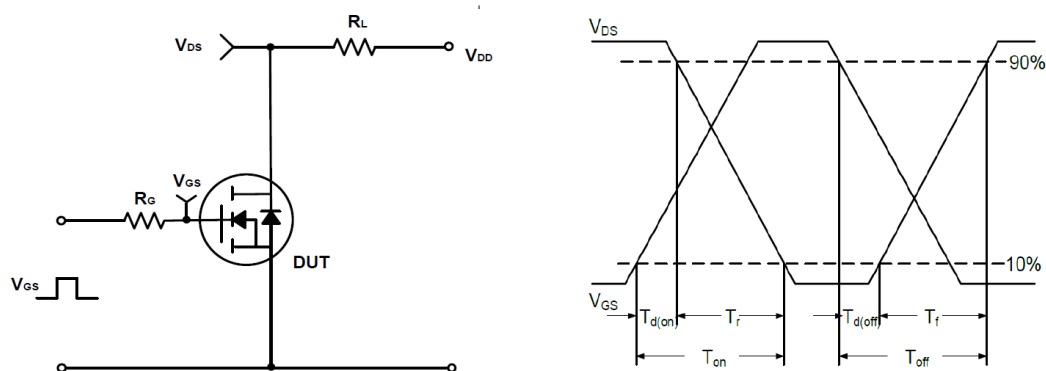


Figure B Switching Test Circuit & Waveforms

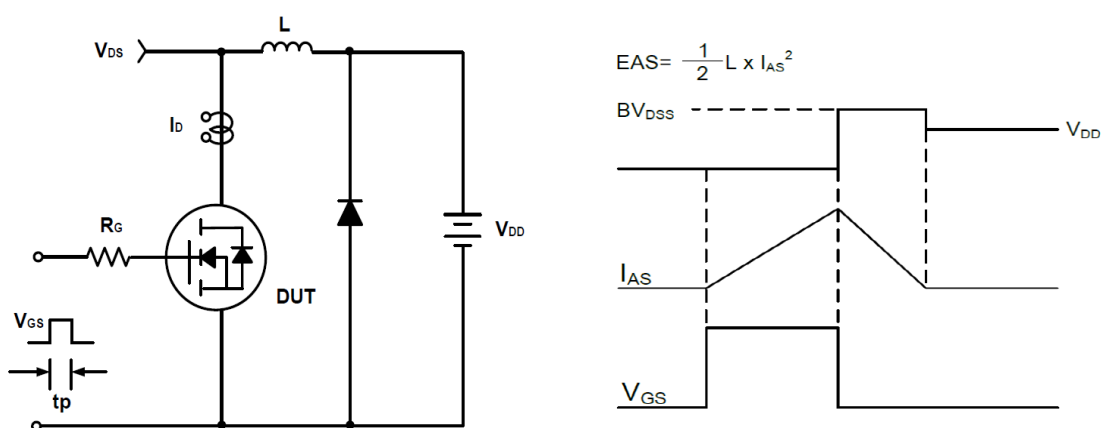
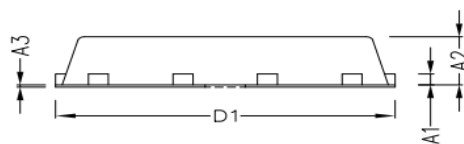
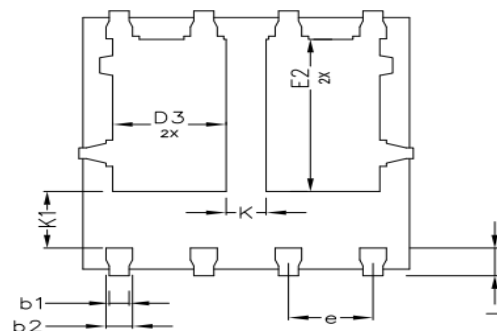
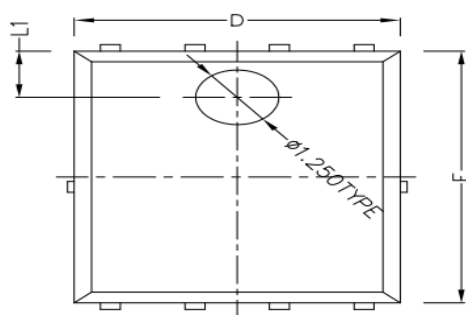


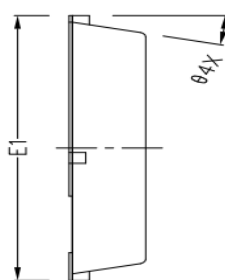
Figure C Unclamped Inductive Switching Circuit & Waveforms

**40V/60A N-Channel Advanced Power MOSFET****PDFN5X6-8L Package Outline Dimensions (Units: mm)**

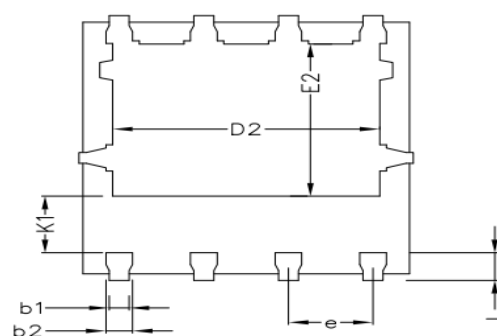
SIDE VIEW

BOTTOM VIEW
OPTION 2

TOP VIEW



SIDE VIEW

BOTTOM VIEW
OPTION 1

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A1	0.254 BSC		
A2	1.000	1.100	1.200
A3	0.005	—	0.020
b1	0.250	0.300	0.350
b2	0.350	0.400	0.450
D	4.800	4.900	5.000
D1	5.000	5.100	5.200
D2	3.910	4.010	4.110
D3	1.605	1.705	1.805
E	5.650	5.750	5.850
E1	5.950	6.050	6.150
E2	3.375	3.475	3.575
e	1.270 TYPE		
L	0.530	0.630	0.730
L1	1.00REF		
θ	13° TYPE		
K	0.600 REF		
K1	1.235 REF		