



## 100V/110A N-Channel Power MOSFET

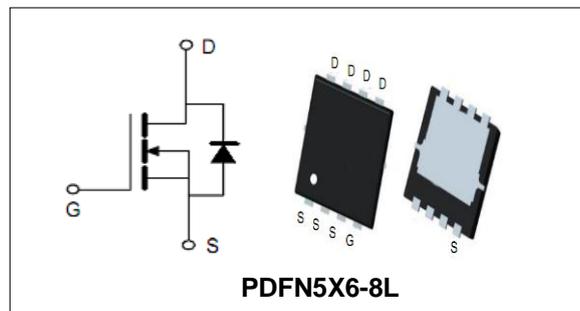
### Features

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

$V_{DS}$	100	V
$I_D$	110	A
$R_{DS(on), Typ} @ V_{GS}=10V$	3.9	m $\Omega$

### Applications

- DC/DC Converter
- Motor Control and Drives
- Battery Management



### Order Information

Product	Package	Marking	Reel Size	Reel	Carton
PGN10N052	PDFN5X6-8L	PGN10N052	13inch	5000PCS	50000PCS

### Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
<b>Common Ratings (<math>T_C=25^\circ\text{C}</math> Unless Otherwise Noted)</b>			
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	100	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$T_j$	Maximum Junction Temperature	150	$^\circ\text{C}$
$T_{stg}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 110	A
<b>Mounted on Large Heat Sink</b>			
$E_{AS}$	Single Pulse Avalanche Energy (Note1)	572	mJ
$I_{DM}$	Pulse Drain Current Tested (Note2)	$T_C=25^\circ\text{C}$ 330	A
$I_D$	Continuous Drain current	$T_C=25^\circ\text{C}$ 110	A
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 125	W
$R_{\theta JC}$	Thermal Resistance Junction-to-Case,	1	$^\circ\text{C}/\text{W}$



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Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub>= 25°C (unless otherwise stated)</b>						
V <sub>(BR)DSS</sub>	Drain- Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	100	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V	--	--	1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2	--	4	V
R <sub>DS(on)</sub>	Drain-Source On-State Resistance (Note3)	V <sub>GS</sub> =10V, I <sub>D</sub> =50A	--	3.9	5.2	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated) (Note4)</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz	--	3970	--	pF
C <sub>oss</sub>	Output Capacitance		--	642	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	17	--	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =50V, I <sub>D</sub> =50A, V <sub>GS</sub> =10V,	--	40	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	8	--	nC
Q <sub>gd</sub>	Gate-Drain Charge		--	9	--	nC
<b>Switching Characteristics (Note4)</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =50V, I <sub>D</sub> =50A, R <sub>G</sub> =6Ω, V <sub>GS</sub> =10V,	--	13	--	ns
t <sub>r</sub>	Turn-on Rise Time		--	29	--	ns
t <sub>d(off)</sub>	Turn-off Delay Time		--	40	--	ns
t <sub>f</sub>	Turn-off Fall Time		--	45	--	ns
<b>Source- Drain Diode Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
V <sub>SD</sub>	Forward on Voltage	I <sub>S</sub> =50A, V <sub>GS</sub> =0V,	--	--	1.2	V

Note:

- Limited by T<sub>Jmax</sub>, starting T<sub>J</sub>= 25° C, R<sub>θ</sub> = 25Ω, V<sub>D</sub> =50V, V<sub>GS</sub> =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 Characteristics

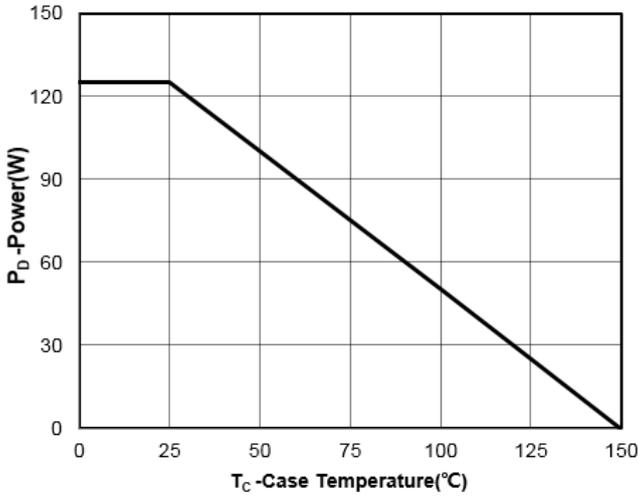


Figure1: Power De-rating

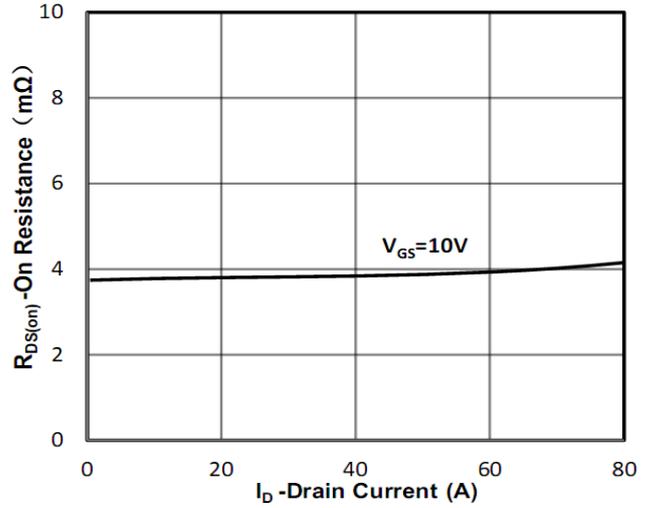


Figure2: R<sub>DS(on)</sub>-Drain Current

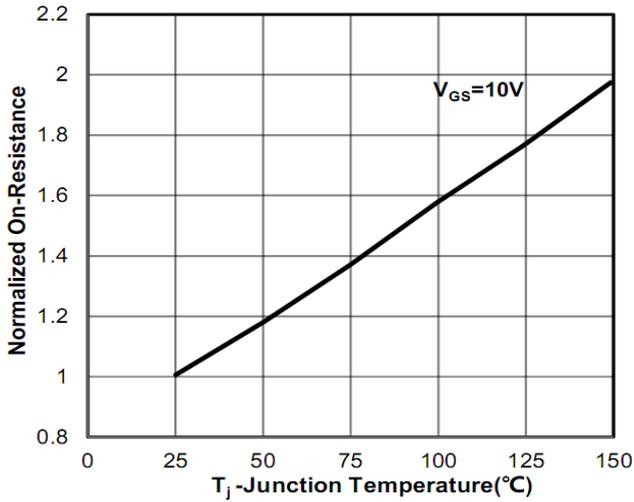


Figure3: R<sub>DS(on)</sub> -Junction Temperature

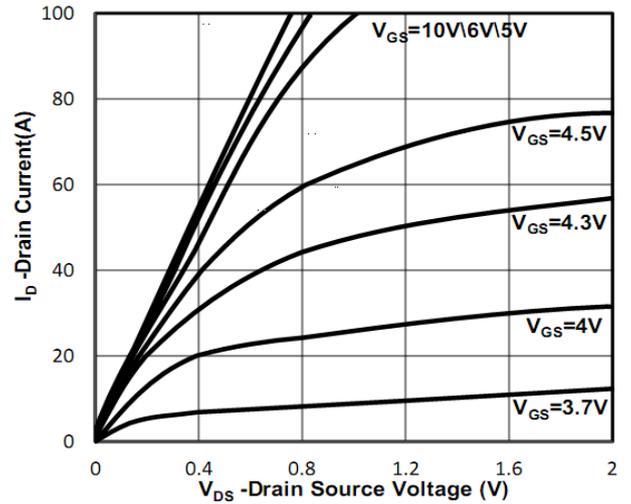


Figure4: Output Characteristics

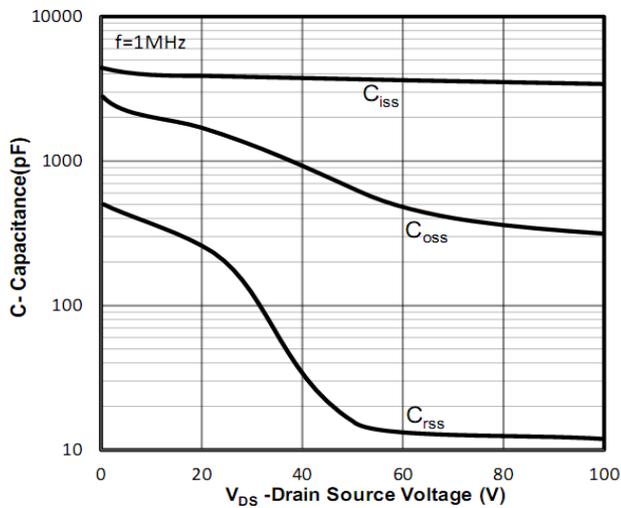


Figure5: Capacitance -V<sub>DS</sub>

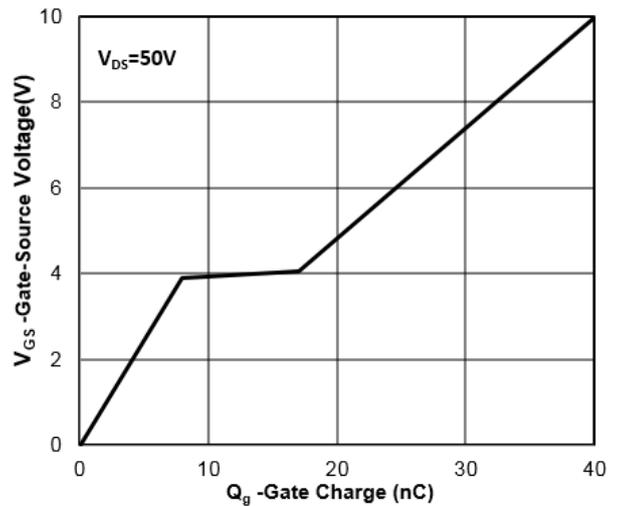


Figure6: Gate Charge



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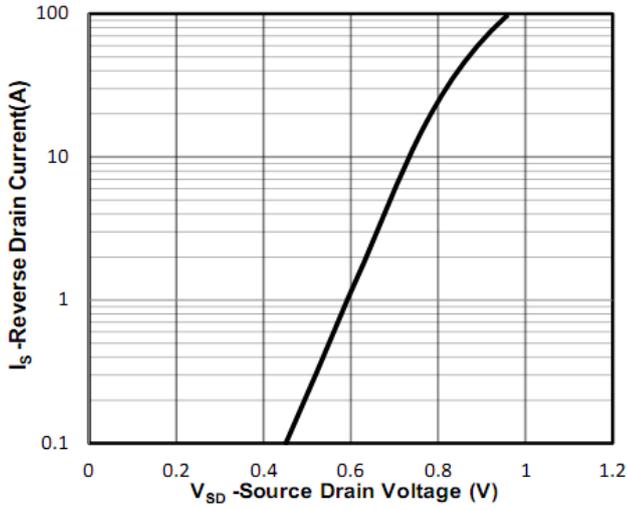


Figure7: Source-Drain Diode Forward

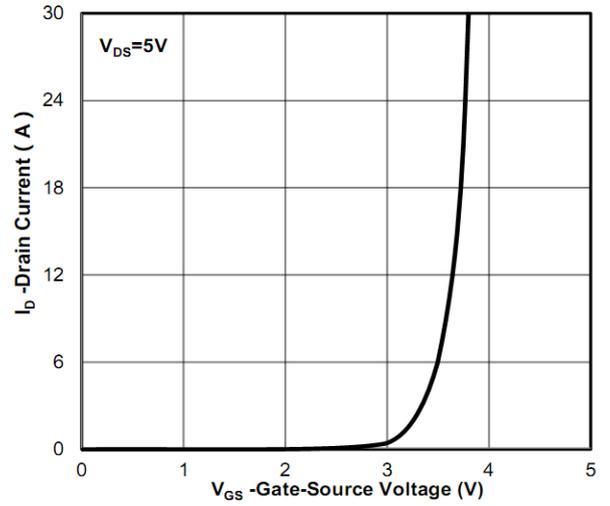


Figure8: Transfer Characteristics

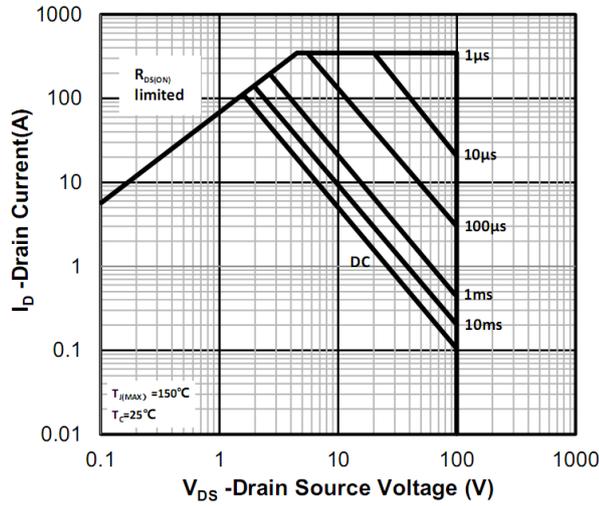


Figure9: Safe Operation Area

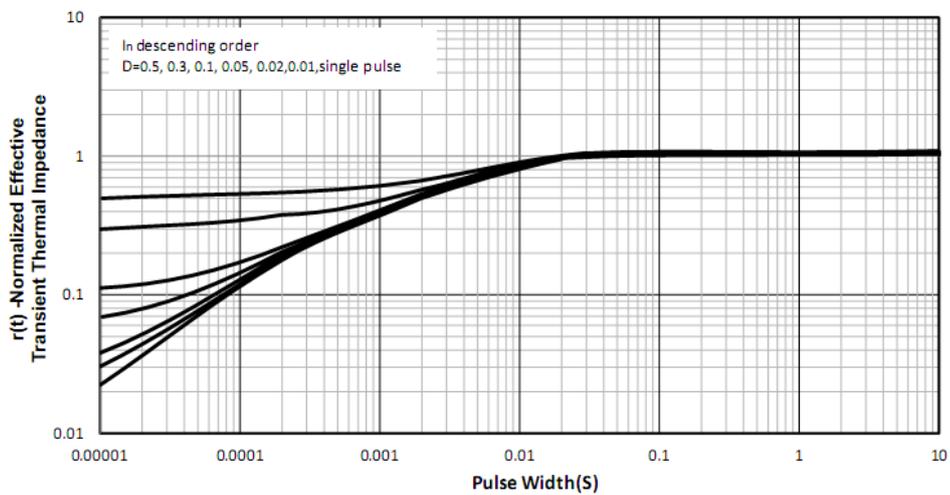
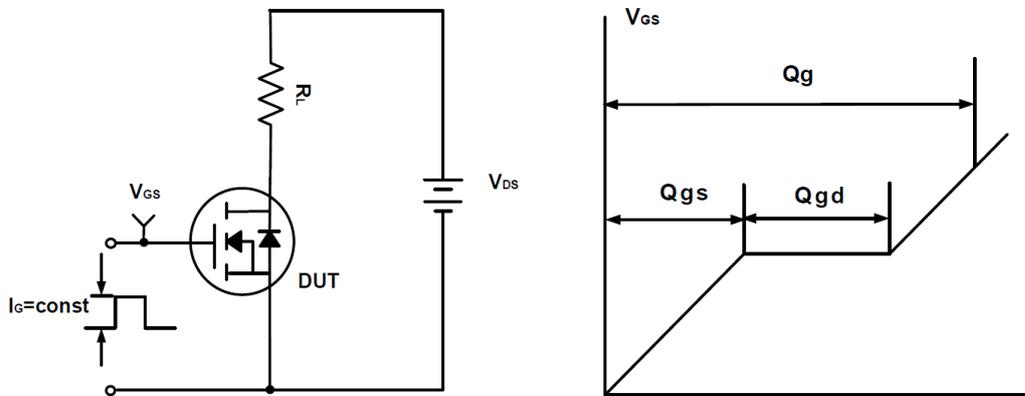
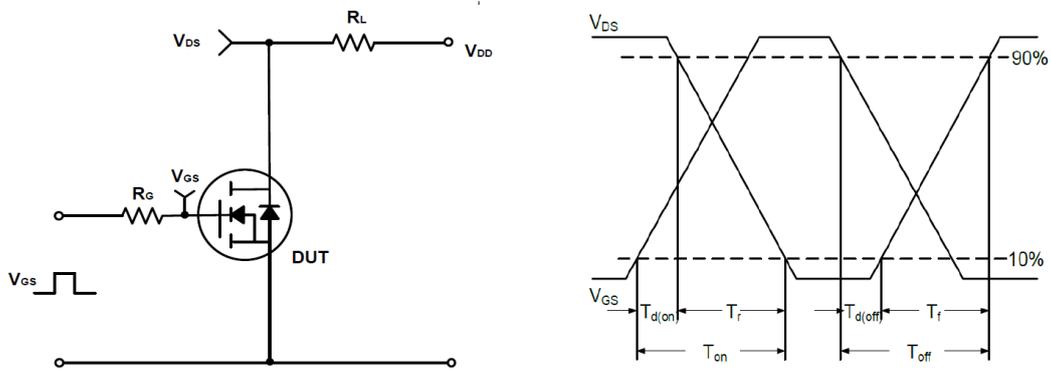
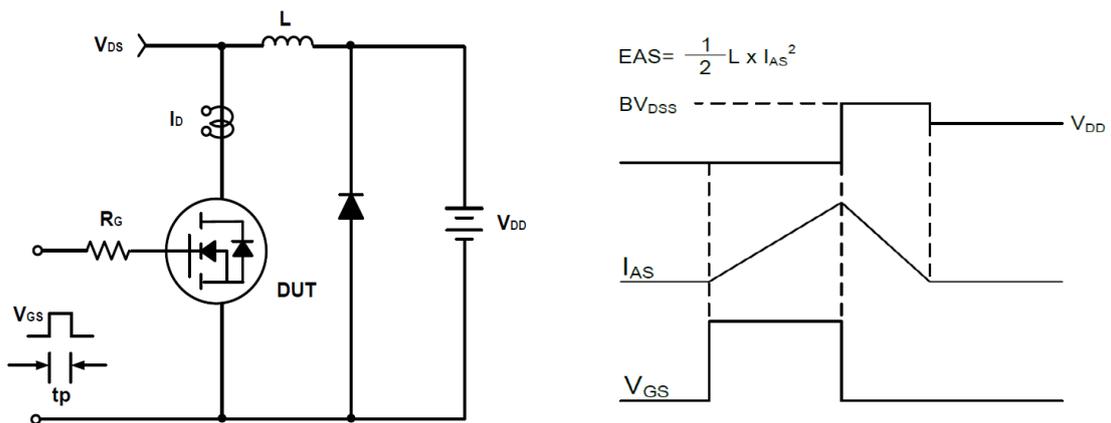


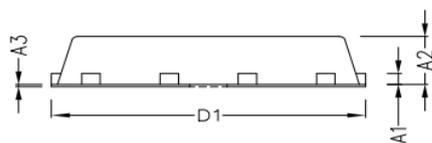
Figure10: Normalized Maximum Transient Thermal Impedance

**100V/110A N-Channel Power MOSFET**
**Test Circuit and Waveform:**

**Figure A Gate Charge Test Circuit & Waveforms**

**Figure B Switching Test Circuit & Waveforms**

**Figure C Unclamped Inductive Switching Circuit & Waveforms**

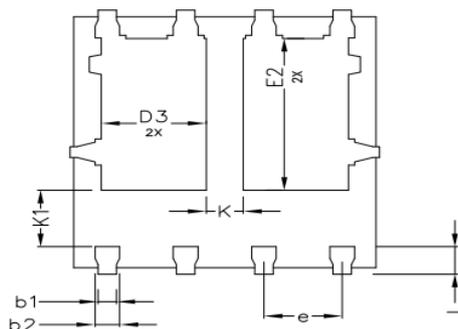


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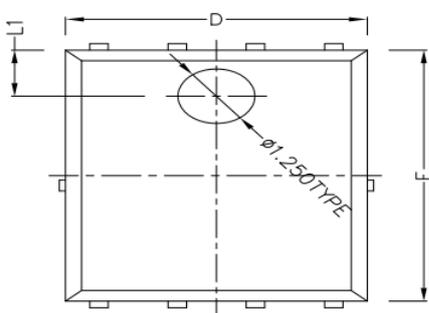
PDFN5X6-8L Package Outline Dimensions (Units: mm)



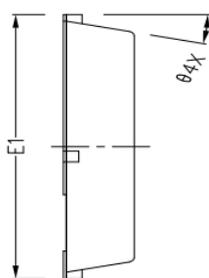
SIDE VIEW



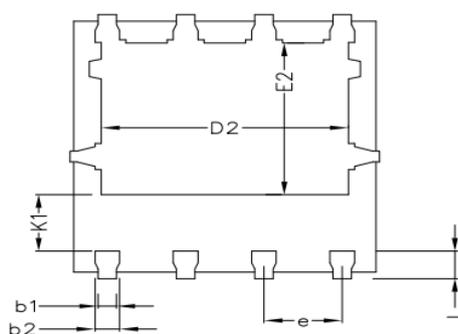
BOTTOM VIEW  
OPTION 2



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		
$\theta$	13° TYPE		
K	0.600 REF		
K1	1.235 REF		