



## 100V/1 00A N-Channel Advanced Power MOSFET

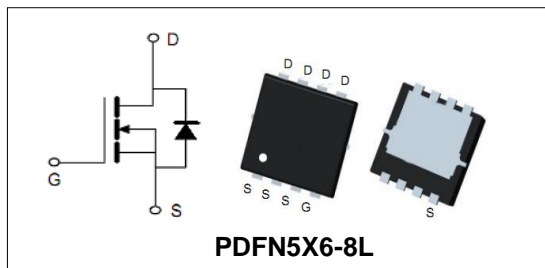
### General Description

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low RDS(ON)

BVDSS	60	V
ID	100	A
RDSON@VGS=10V	4	mΩ
RDSON@VGS=4.5V	6.5	mΩ

### Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply



### Order Information

Product	Package	Marking	Reel Size	Reel	Carton
PTN10HG10	PDFN5X6-8L	PTN10HG10	13inch	5000PCS	50000PCS

### Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit	
<b>Common Ratings (TC=25°C Unless Otherwise Noted)</b>				
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	100	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	100	A
<b>Mounted on Large Heat Sink</b>				
$E_{AS}$	Avalanche Energy, Single Pulsed (Note1)	400	mJ	
$I_{DM}$	Pulse Drain Current Tested (Silicon Limit) (Note2)	TC =25°C	360	A
$I_D$	Continuous Drain current	TC =25°C	100	A
$P_D$	Maximum Power Dissipation	TC =25°C	120	W
$R_{θJc}$	Thermal Resistance Junction-to-Case (Note3)	1.08	°C/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	VGS=0V ID=250μA	100	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain current	VDS=100V,VGS=0V	--	--	1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
V <sub>GS(TH)</sub>	Gate Threshold Voltage	VDS=VGS,ID=250μA	1	1.8	3	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance (Note4)	VGS=10V, ID=20A	--	4	5.5	mΩ
		VGS=4.5V, ID=20A	--	6.5	8.5	
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated) (Note5)</b>						
C <sub>iss</sub>	Input Capacitance	VDS=50V, VGS=0V, F=1MHz	--	3927	--	pF
C <sub>oss</sub>	Output Capacitance		--	1658	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	36	--	pF
Q <sub>g</sub>	Total Gate Charge	VDS=50V, ID=20A, VGS=10V	--	66	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	15.4	--	nC
Q <sub>gd</sub>	Gate-Drain Charge		--	10.6	--	nC
<b>Switching Characteristics (Note5)</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	VDD=50V, ID=20A, VGS=10V RGEN=2.2Ω	--	17.8	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	34.7	--	nS
t <sub>d(off)</sub>	Turn-off Delay Time		--	43.8	--	nS
t <sub>f</sub>	Turn-off Fall Time		--	61.4	--	nS
<b>Source- Drain Diode Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
V <sub>SD</sub>	Forward on voltage	IS=30A,VGS=0V	--	--	1.2	V
t <sub>rr</sub>	Reverse Recovery Time	IF=20A,VGS=0, di/dt=100A/us	--	64	--	nS
Q <sub>rr</sub>	Reverse Recovery Charge		--	82	--	nC

Note:

- Limited by T<sub>Jmax</sub>, starting T<sub>J</sub> = 25° C, R<sub>G</sub> = 4.5Ω, V<sub>D</sub> =30V, V<sub>GS</sub> =10V. Part not recommended for use above this value.
- Repetitive Rating: Pulse width limited by maximum junction temperature.
- Surface Mounted on FR4 Board, t ≤ 10 sec.
- Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.



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### Typical Characteristics

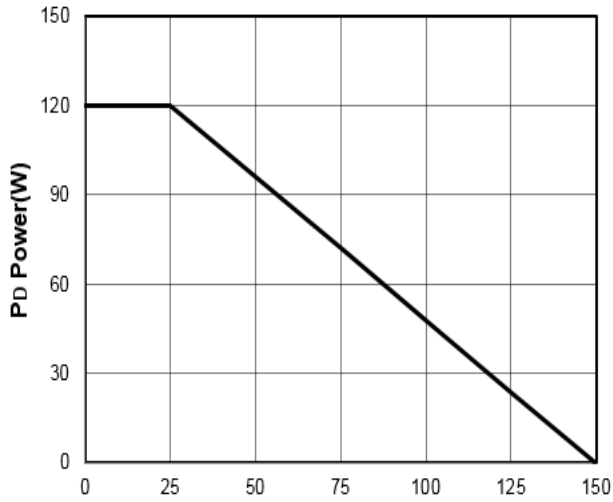


Figure1: T<sub>J</sub> Junction Temperature (°C)

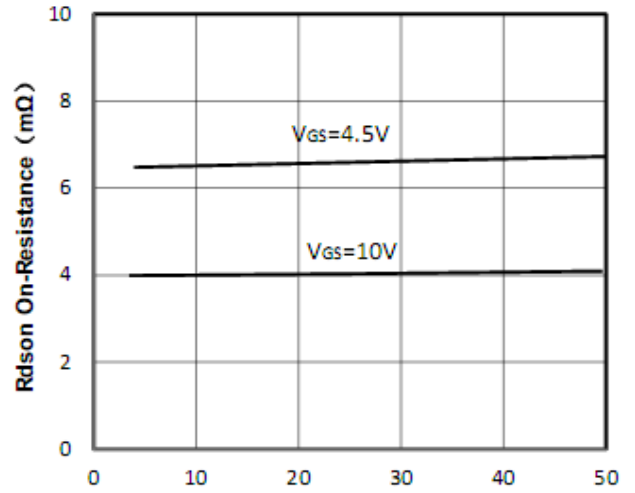


Figure2: I<sub>D</sub> Drain Current (A)

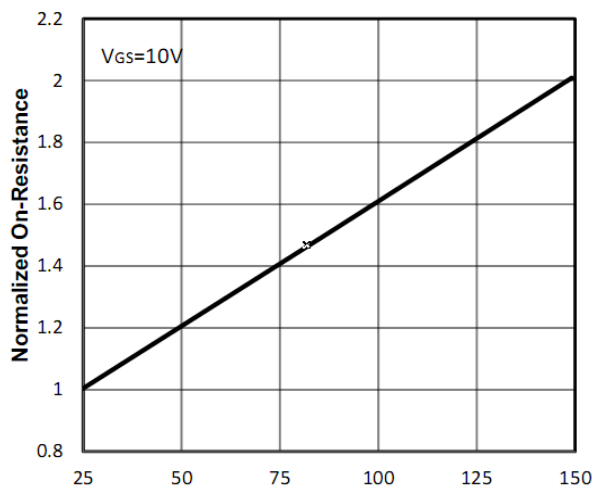


Figure3: T<sub>J</sub> Junction Temperature (°C)

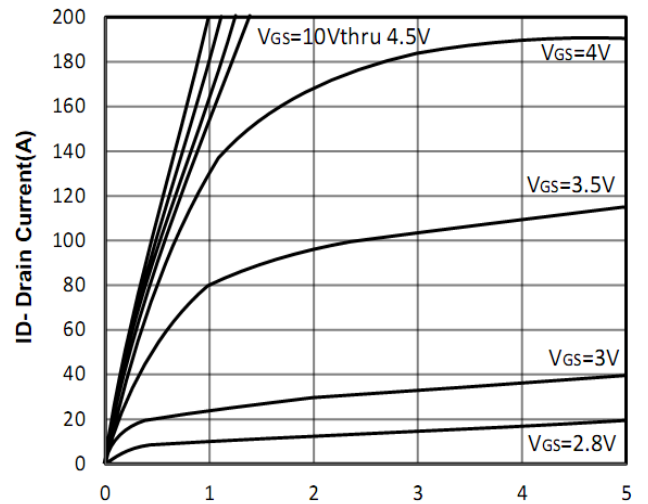


Figure4: V<sub>DS</sub> Drain-Source Voltage (V)

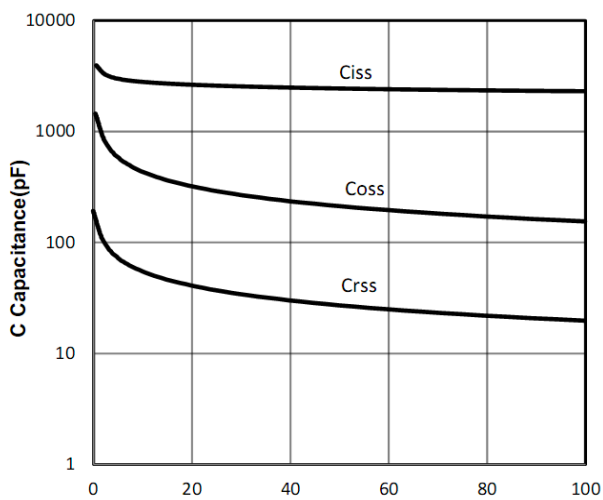


Figure5: V<sub>DS</sub> Draun-Source Voltage (V)

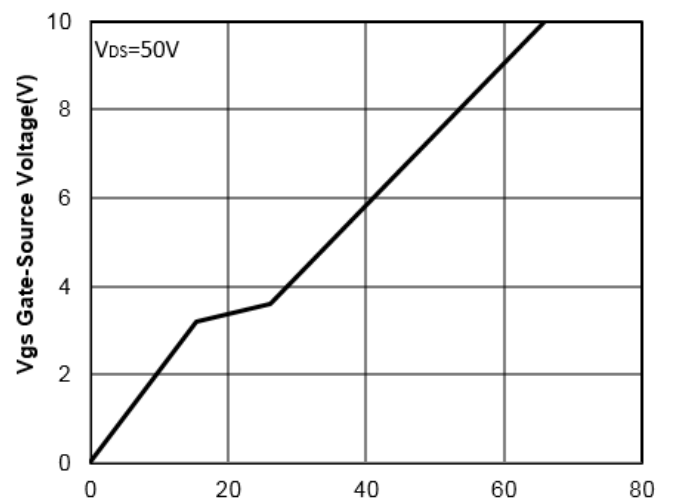


Figure6: Q<sub>g</sub> Gate Charge (nC)



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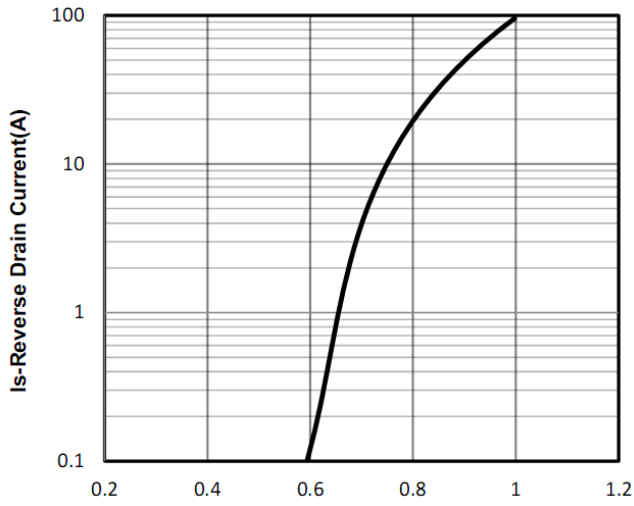


Figure7: Vsd Source-Drain Voltage (V)

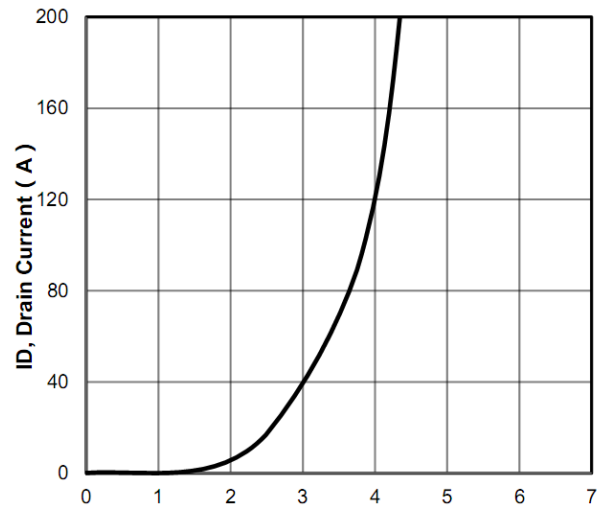


Figure8: Vgs Gate-Source Voltage (V)

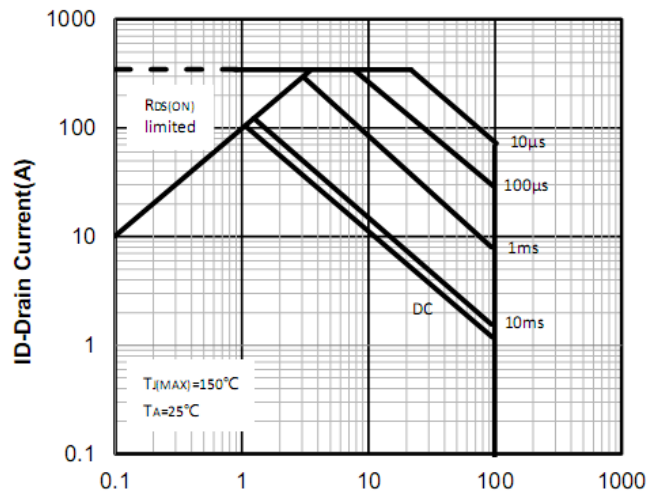


Figure9: VDS Drain-Source Voltage (V)

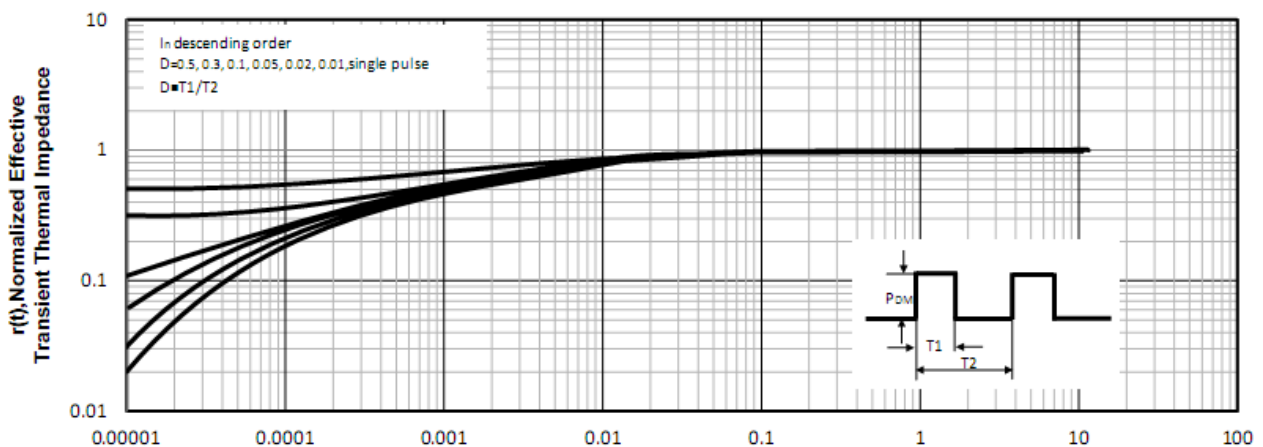


Figure10: Square Wave Pulse Duration (sec)

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### Test Circuit and Waveform:



Figure A Gate Charge Test Circuit & Waveforms



Figure B Switching Test Circuit & Waveforms

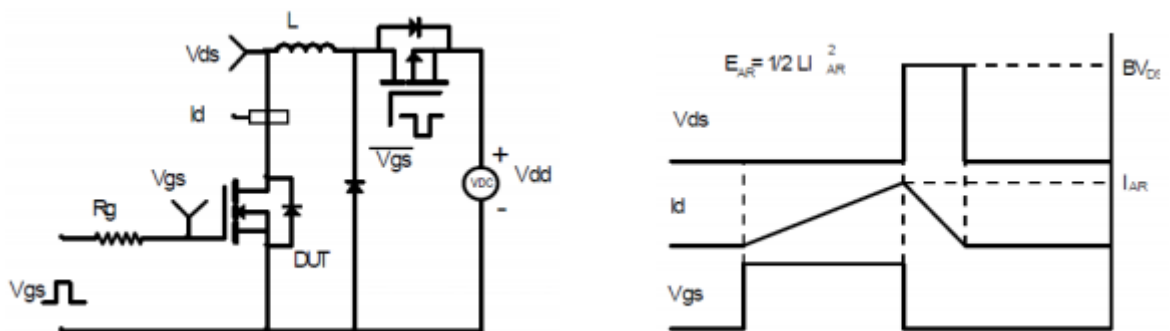
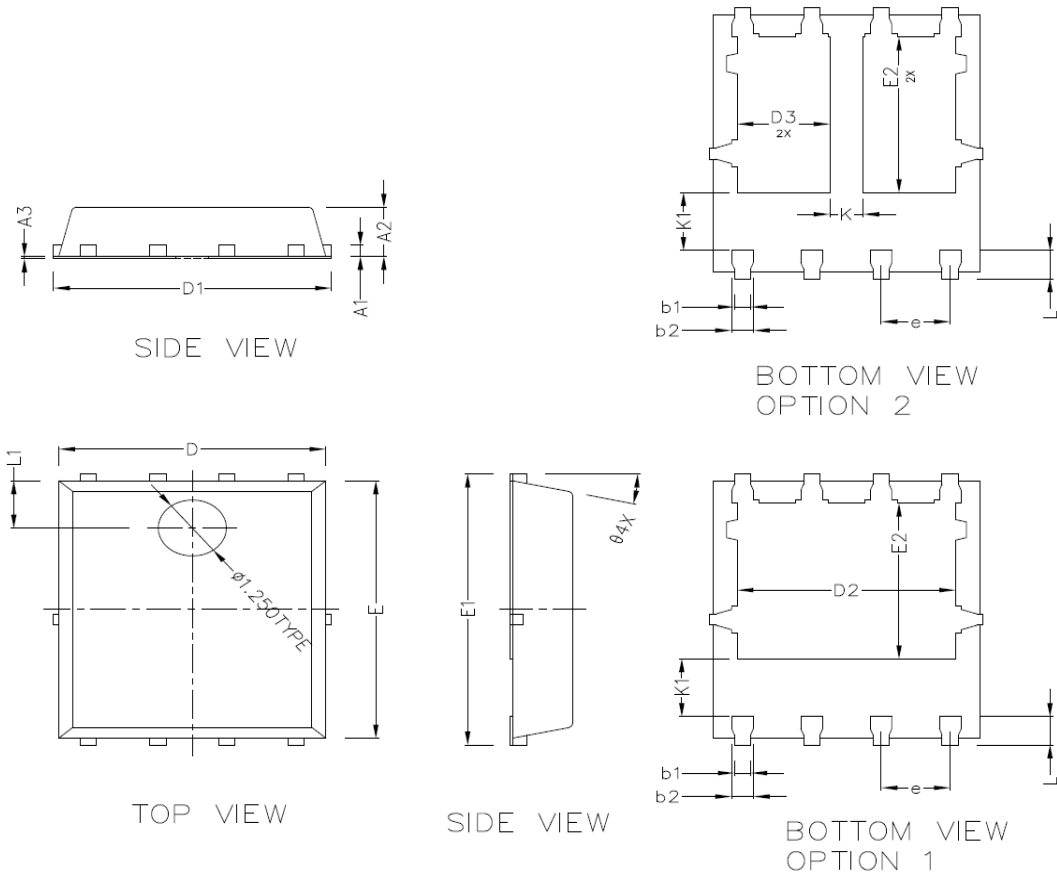


Figure C Unclamped Inductive Switching Circuit & Waveforms



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PDFN5X6-8 Package Outline Dimensions (Units: mm)



COMMON DIMENSIONS (UNITS OF MEASURE IS)			
	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	0.630	0.630	0.730
L1	1.00REF		
$\phi$	1.3' TYPE		
K	0.600 REF		
K1	1.236 REF		