PTN40P40

-40V/-40A P-Channel Advanced Power MOSFET

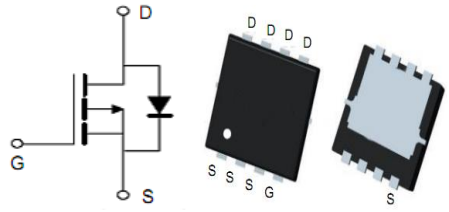
Features

- Improved dv/dt Capability, High Ruggedness·
- Maximum Junction Temperature Range (150°C)
- 100% Avalanche Tested

BVDSS	-40	V
ID	-40	A
RDSON@VGS=-10V	9.6	mΩ
RDSON@VGS=-4.5V	12.3	mΩ

Applications

- Battery and loading switching



PDFN5X6-8L

Order Information

Product	Package	Marking	Reel Size	Reel	Carton
PTN40P40	PDFN5X6-8L	PTN40P40	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	℃
T_{STG}	Storage Temperature Range		-55 to 150	℃
I_S	Diode Continuous Forward Current	TC =25°C	-40	A
Mounted on Large Heat Sink				
E_{AS}	Single Pulse Avalanche Energy (Note1)		186	mJ
I_{DM}	Pulse Drain Current Tested (Sillicon Limit) (Note2)	TC =25°C	-160	A
I_D	Continuous Drain current	TC =25°C	-40	A
P_D	Maximum Power Dissipation	TC =25°C	33	W
$R_{\theta JC}$	Thermal Resistance Junction−to−Case (Note3)		3.79	°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	--	-2.1	V
$R_{DS(ON)}$	Drain-Source On-State Resistance (Note4)	VGS=-10V, ID=-12A	--	9.6	13	mΩ
		VGS=-4.5V, ID=-10A	--	12.3	17.5	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) (Note4)						
C_{iss}	Input Capacitance	VDS= -20V, VGS=0V, F=1MHz	--	3230	--	pF
C_{oss}	Output Capacitance		--	262	--	pF
C_{rss}	Reverse Transfer Capacitance		--	3.8	--	pF
Q_g	Total Gate Charge	VDS= -20V, ID= -20A, VGS= -10V	--	67.4	--	nC
Q_{gs}	Gate-Source Charge		--	11.1	--	nC
Q_{gd}	Gate-Drain Charge		--	12.4	--	nC
Switching Characteristics (Note5)						
$t_{d(on)}$	Turn-on Delay Time	VDD=-20V, ID=-20A, RG=2.5Ω, VGS=-10V	--	11.4	--	nS
t_r	Turn-on Rise Time		--	27.8	--	nS
$t_{d(off)}$	Turn-off Delay Time		--	92.4	--	nS
t_f	Turn-off Fall Time		--	20.6	--	nS
Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage (Note4)	IS=-20A,VGS=0V	--	--	-1.2	V

Note:

1. Limited by TJmax, starting TJ = 25° C, RG = 25Ω, VD =-15V, VGS =-10V. Part not recommended for use above this value.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. Surface Mounted on FR4 Board, t ≤ 10 sec.
4. Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.
5. Guranteed by design, not subject to production testing.

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Typical Characteristics

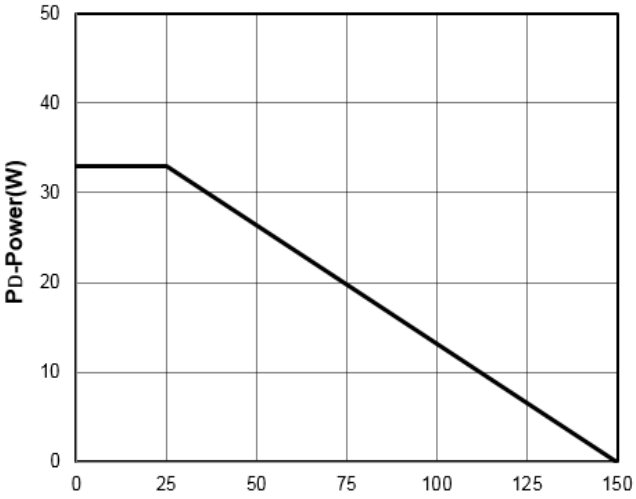

Figure1：T_J Junction Temperature（°C）

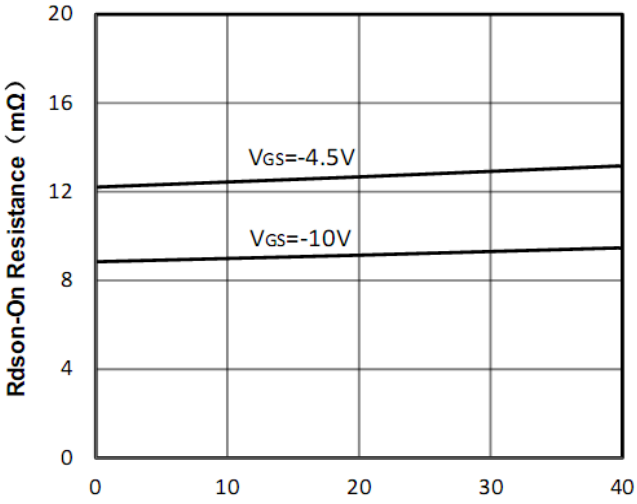

Figure2：-I_D Drain Current（A）

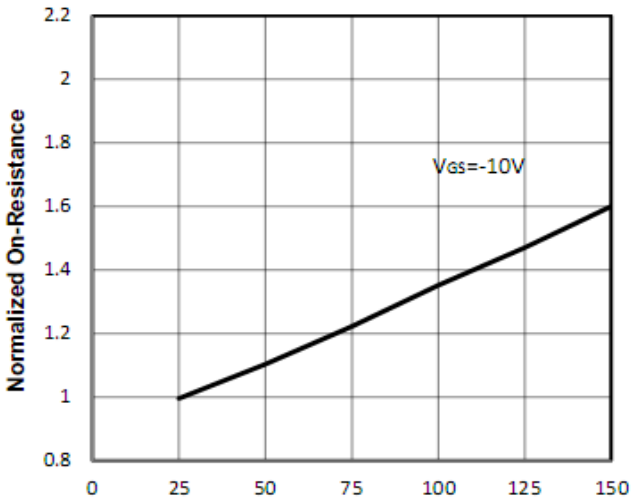

Figure3：T_J Junction Temperature（°C）

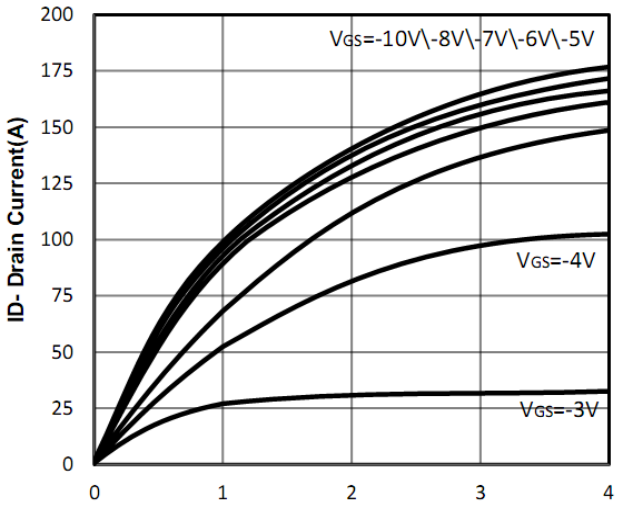

Figure4：-V_{DS} Drain-Source Voltage（V）

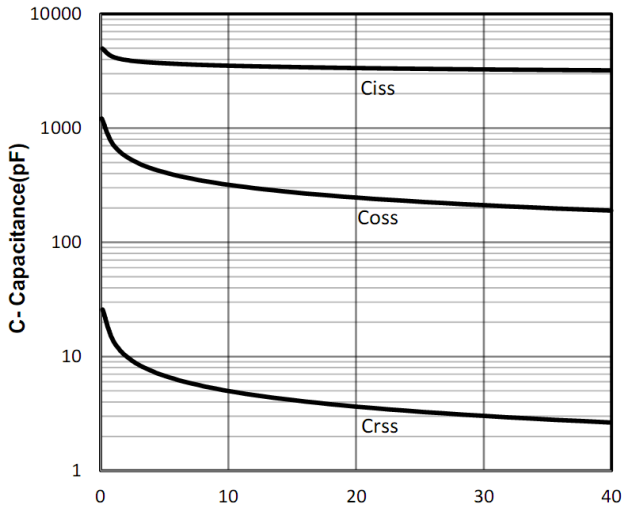

Figure5：-V_{DS} Drain-Source Voltage（V）

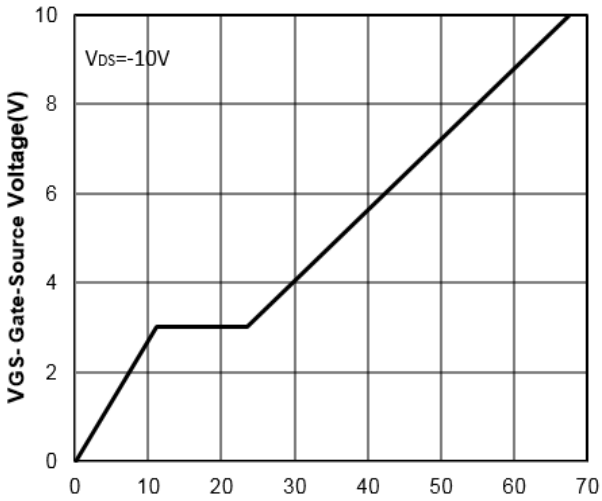

Figure6：Qg Gate Charge（nC）

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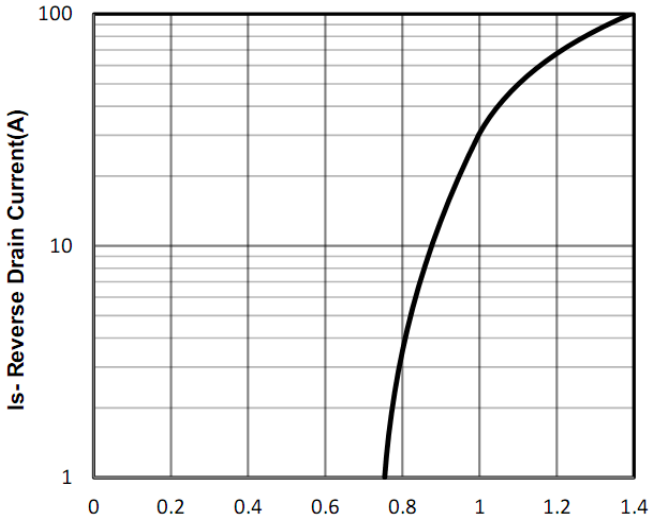


Figure7：-Vsd Source-Drain Voltage（V）

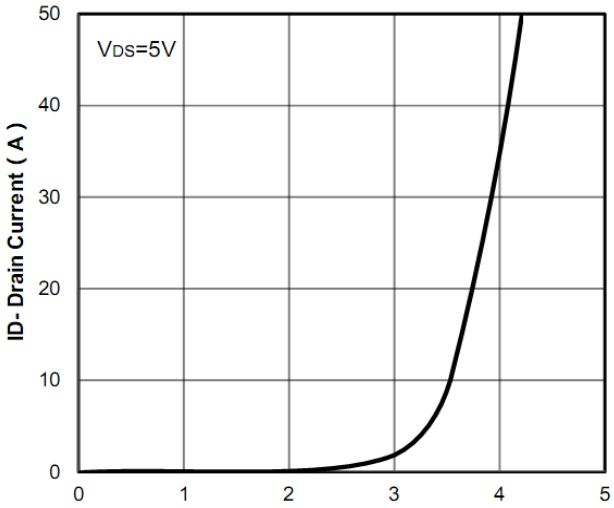


Figure8：-Vgs Gate-Source Voltage（V）

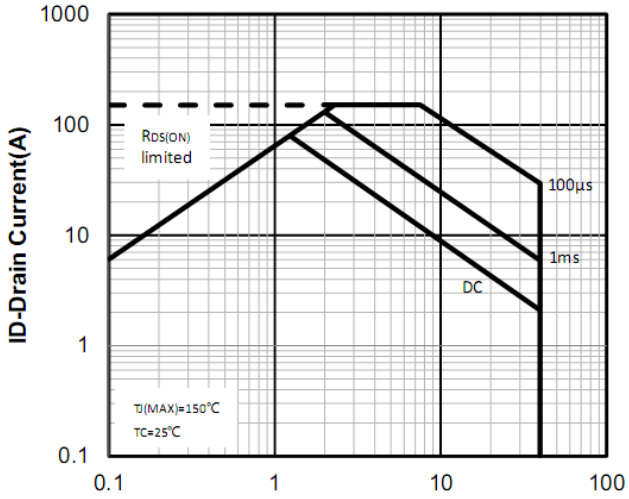


Figure9：-Vds Drain -Source Voltage（V）

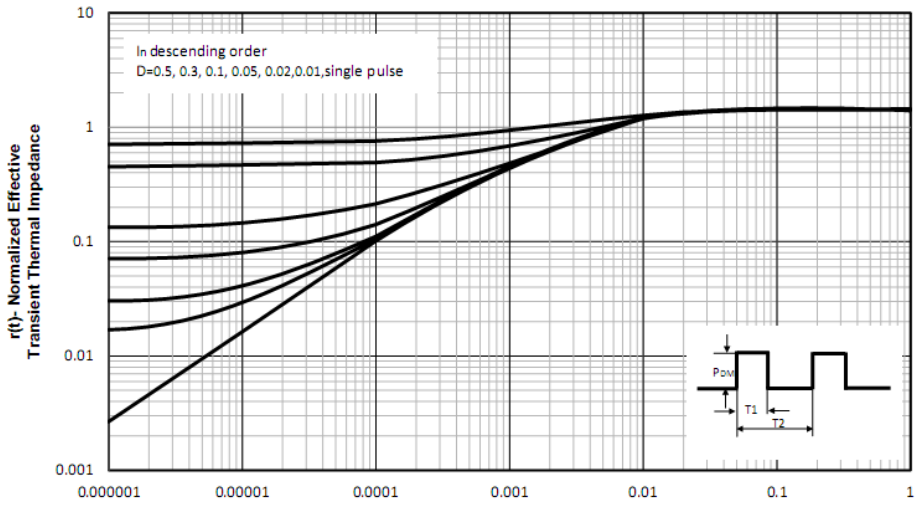


Figure10：Square Wave Pulse Duration（sec）

Test Circuit and Waveform:

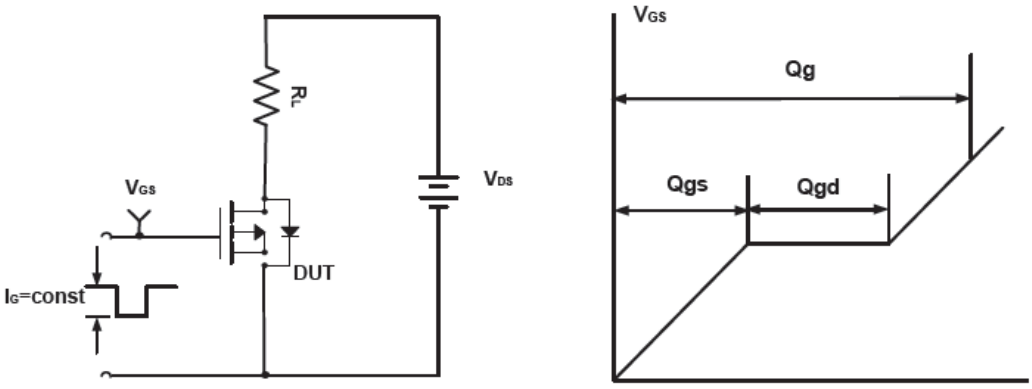


Figure A Gate Charge Test Circuit &Waveforms

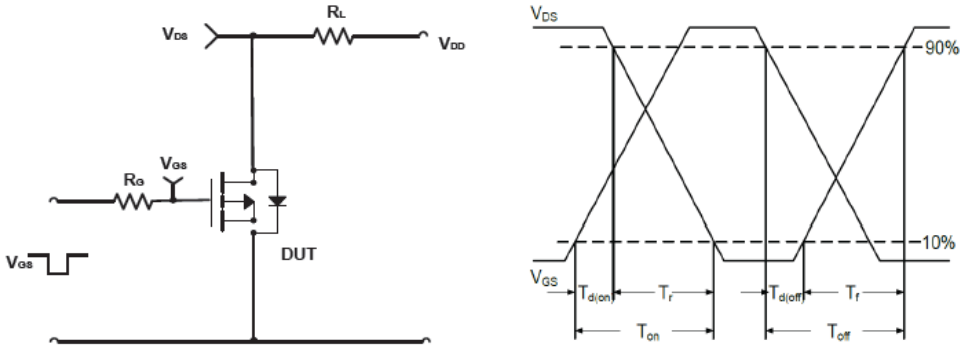


Figure B Switching Test Circuit & Waveforms

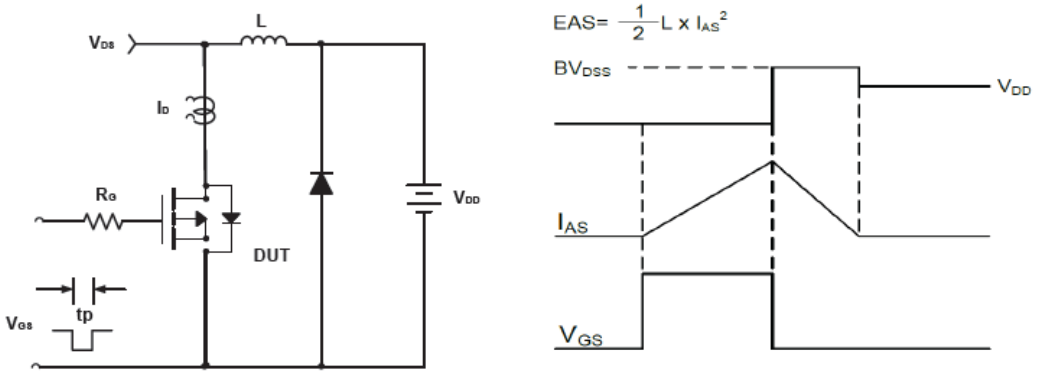
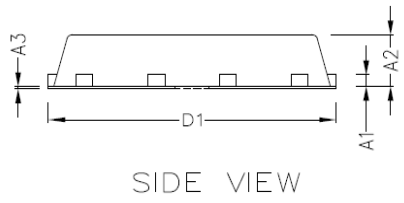
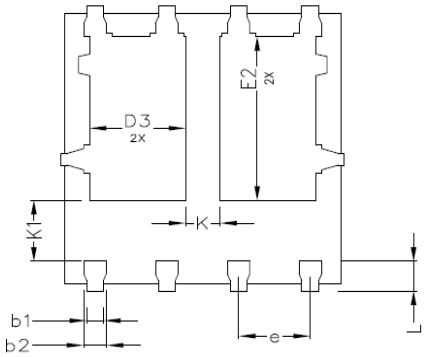


Figure C Unclamped Inductive Switching Circuit & Waveforms

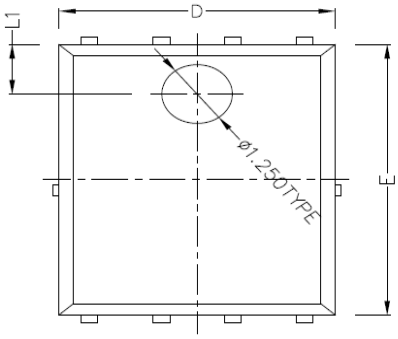
PDFN5X6-8L Package Outline Dimensions (Units: mm)



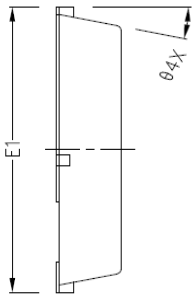
SIDE VIEW



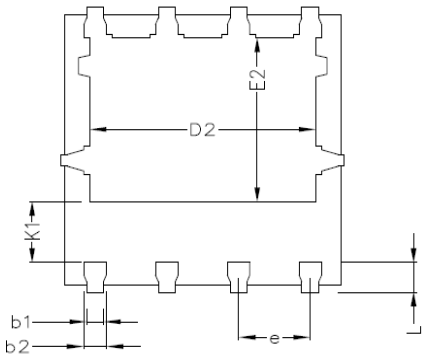
BOTTOM VIEW
OPTION 2



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		