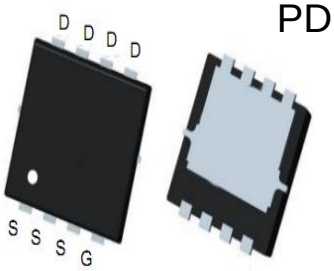
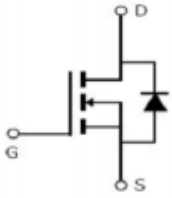
60V/100A N-Channel Advanced Power MOSFET

BVDSS	60	V
ID	100	A
R_{DSON}@V_{GS}=10V	2.8	mΩ
R_{DSON}@V_{GS}=4.5V	4.0	mΩ

PDFN5*6





General Description

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

Applications

DC-DC Converters
Power management functions
Synchronous-rectification applications

Order Information

Product	Package	Marking	Packing
M06N1006J	PDFN5*6	PTN10HG06	5000PCS/Reel

Absolute Maximum Ratings

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage		±20	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		60	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	T_C=25°C	100	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested (Note 2)	T_C=25°C	300	A
I_D	Continuous Drain current (Note 1)	T_C=25°C	100	A
P_D	Maximum Power Dissipation (Note 4)	T_C=25°C	120	W
EAS	Avalanche Energy, Single Pulsed (Note 3)		324	mJ
$R_{\theta JA}$	Thermal Resistance *Junction−to−*Ambient – Steady State (Note 5)		20	°C/W

Note :

1. The maximum current rating is package limited.
2. Repetitive rating, pulse width limited by max. junction temperature.
3. VDD=50V,RG=25Ω,L=0.5mH, starting TJ = 25°C
4. PD is based on max. junction temperature, using junction-case thermal resistance.
5. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper,in a still air environment with Ta = 25°C

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Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain current(Tc=25℃)	VDS=60V,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	1.0	--	2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	VGS=10V, ID=20A	--	2.1	2.8	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance	VGS=4.5V, ID=20A	--	2.7	4.0	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	VDS=25V,VGS=0V, f=100kHz	--	5950	--	pF
C_{oss}	Output Capacitance		--	1250	--	pF
C_{rss}	Reverse Transfer Capacitance		--	85	--	pF
Q_g	Total Gate Charge	VDS=50V,ID=50A, VGS=10V	--	93	--	nC
Q_{gs}	Gate-Source		--	17	--	nC
Q_{gd}	Gate-Drain Charge		--	14	--	nC
Switching Characteristics note B						
$t_{d(on)}$	Turn-on Delay Time	VDD=30V, ID=25A, RGEN=2Ω, VGS=10V	--	22.5	--	nS
t_r	Turn-on Rise Time		--	6.7	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	80.3	--	nS
t_f	Turn-Off Fall Time		--	26.9	--	nS
Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)						
t_{rr}	Reverse Recovery Time	IF=25A di/dt=100A/μs	--	68	--	nS
Q_{rr}	Reverse Recovery Charge		--	73	--	nC

60V/100A N-Channel Advanced Power MOSFET

Typical Characteristics

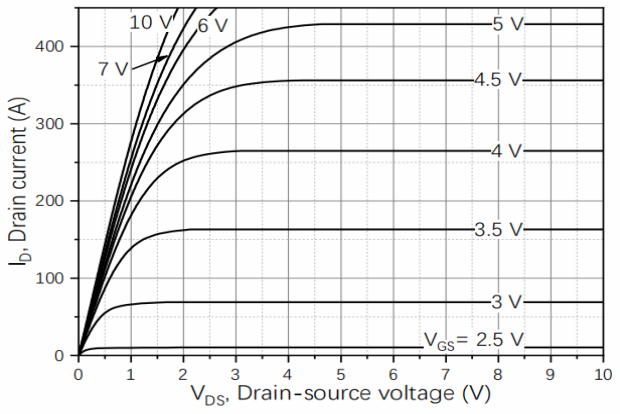

Figure1. Output Characteristics

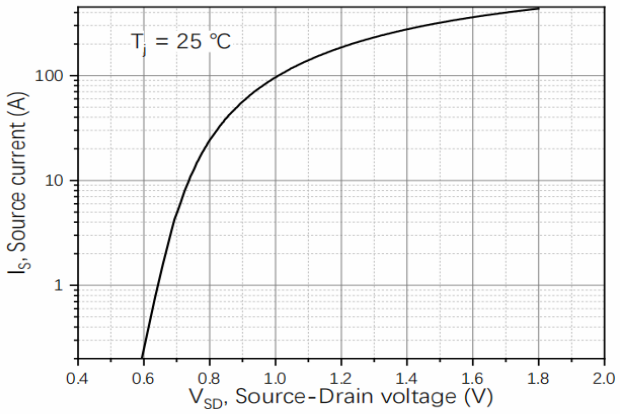

Figure2. Transfer Characteristics

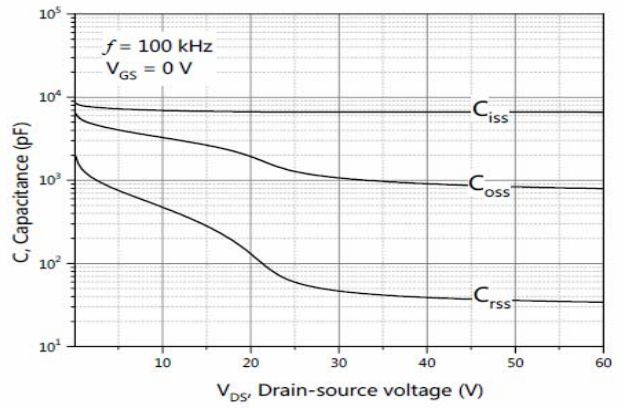

Figure3. Capacitance Characteristics

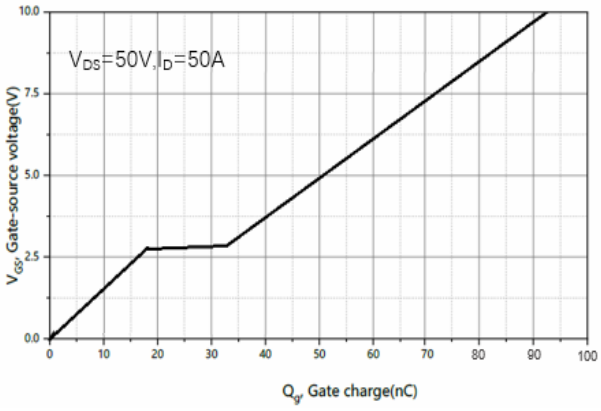

Figure4. Gate Charge

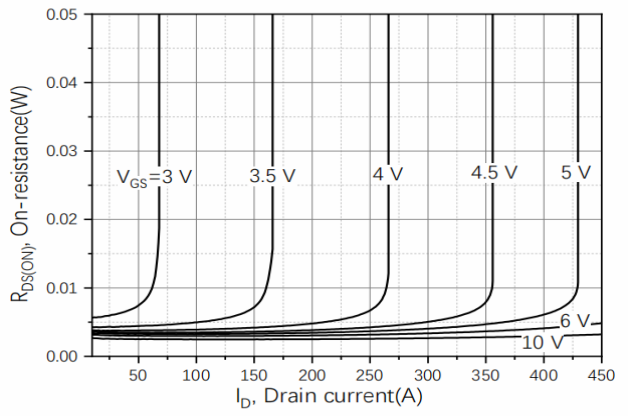

Figure5. Drain-Source on Resistance

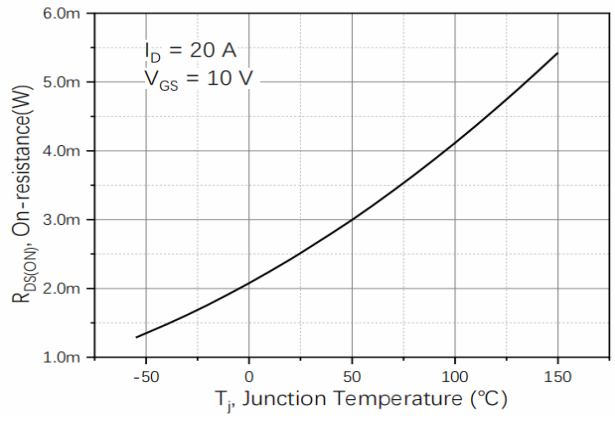

Figure6. Drain-Source on Resistance

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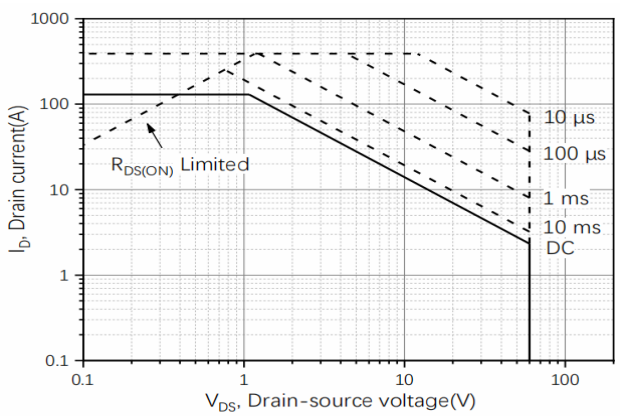

Figure7. Safe Operation Area

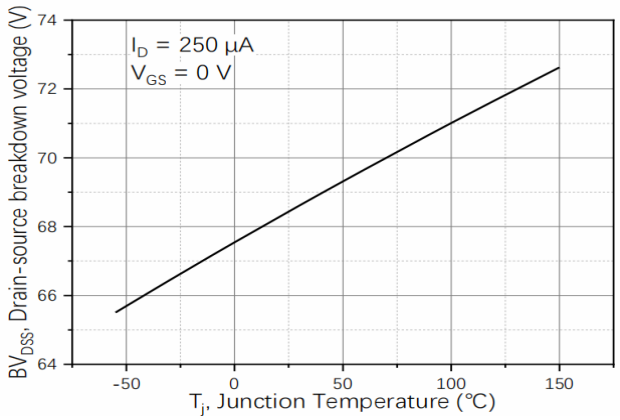

Figure8. Drain-source breakdown voltage

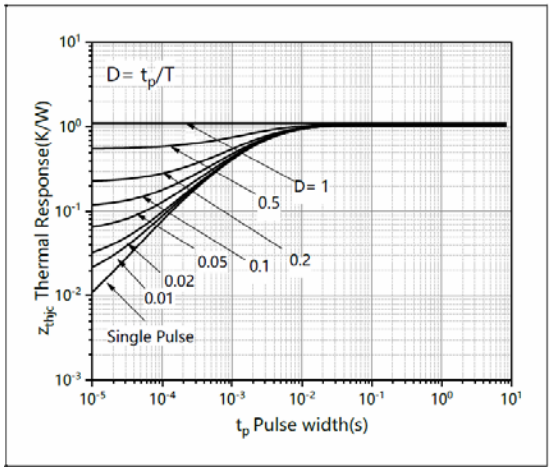

Figure 9.Transient thermal impedance

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■ Test circuits and waveforms

Figure A: Gate Charge Test Circuit & Waveforms

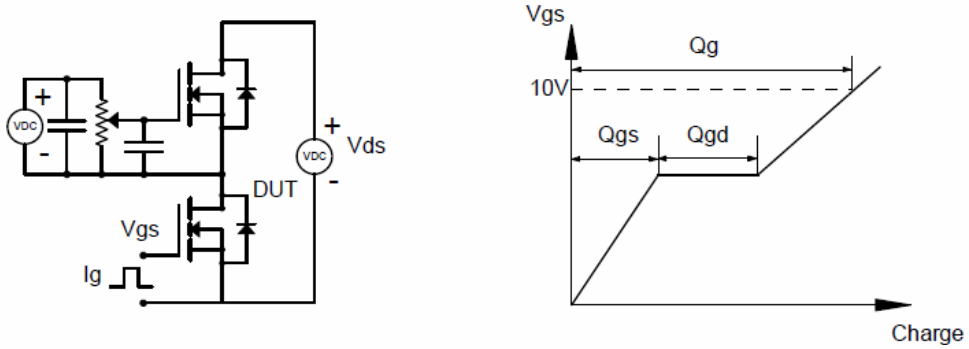


Figure B: Resistive Switching Test Circuit & Waveforms

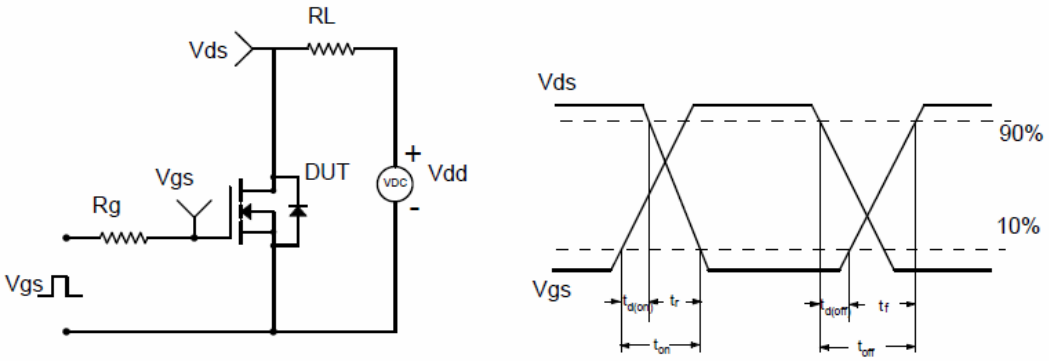


Figure C: Unclamped Inductive Switching (UIS) Test

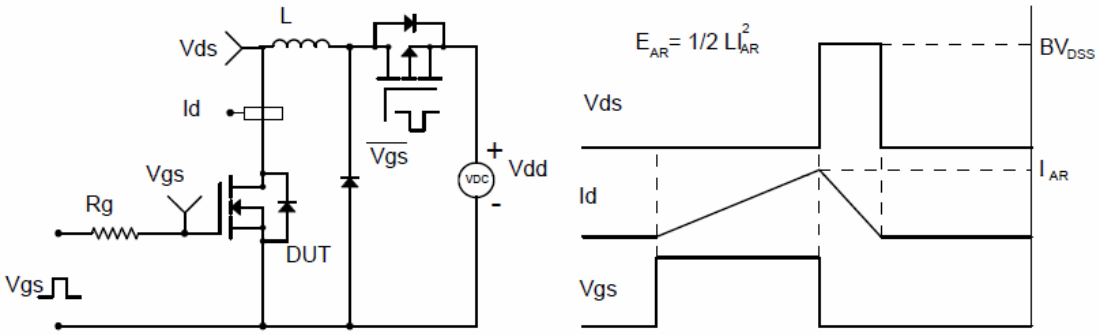
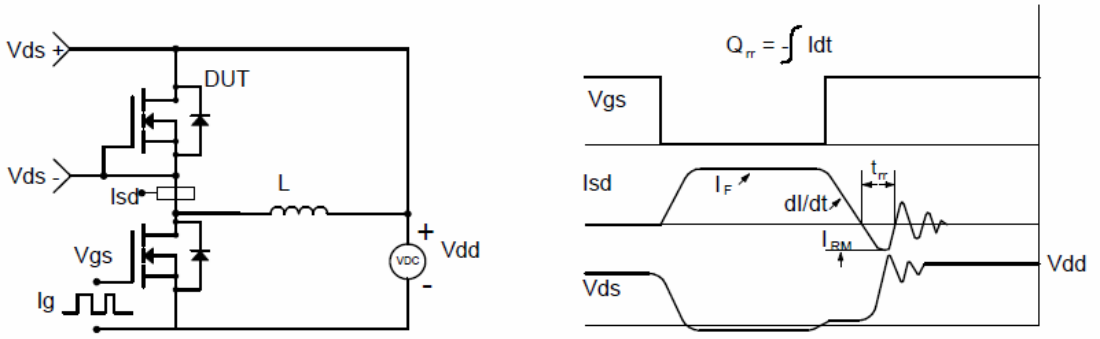
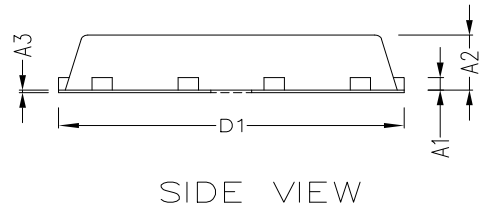


Figure D: Diode Recovery Test Circuit & Waveforms

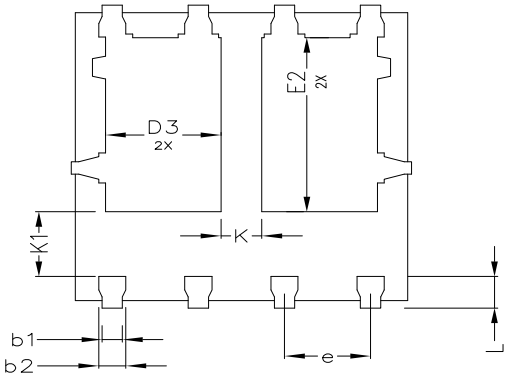


60V/100A N-Channel Advanced Power MOSFET

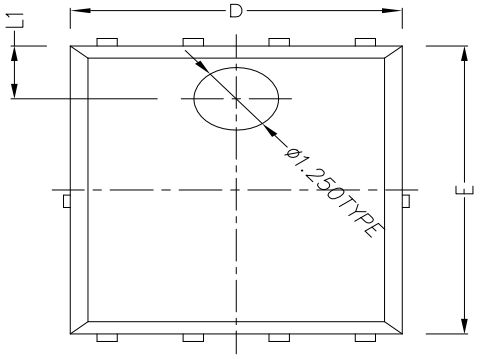
PDFN5X6 Package Outline Dimensions (Units: mm)



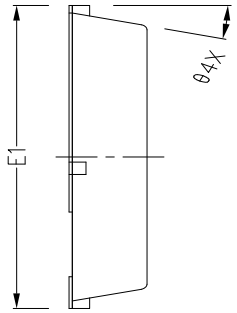
SIDE VIEW



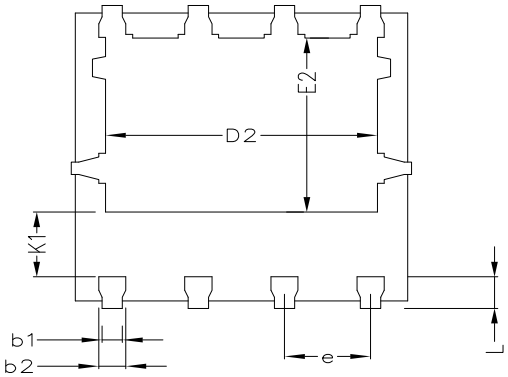
BOTTOM VIEW
OPTION 2



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	