



30V/50A N-Channel Advanced Power MOSFET

Features

- Low $R_{DS(on)}$
- 5V Logic Level Control

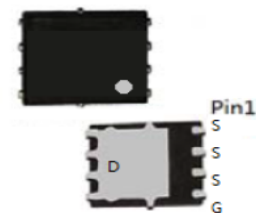
Applications

- High Side Load Switch
- Battery Switch
- Optimized for Power Management Applications for Portable Products, such as Aeromodelling, Power bank, Brushless motor, Main board , and Others

BVDSS	30	V
ID	50	A
$R_{DS(on)}@V_{GS}=10V$	6	mΩ
$R_{DS(on)}@V_{GS}=5V$	10	mΩ

Order Information

Product	Package	Marking	Packing
PTN3004	PDFN5X6	PTN3004	5000PCS/Reel



PDFN5x6

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		30	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	50	A
Mounted on Large Heat Sink				
I _{DM}	Pulse Drain Current Tested (Sillicon Limit)	T _C = 25°C	140	A
I _D	Continuous Drain current @V _{GS} =10V (Note 2)	T _C = 25°C	50	A
P _D	Maximum Power Dissipation	T _C = 25°C	32	W
EAS	Avalanche Energy, Single Pulsed (Note 3)		110	mJ
R _{θJC}	Thermal Resistance <i>Junction-to-Case</i> ≤ 5 s (Note 1)		3.9	°C/W

Note :

1. Surface-mounted on FR4 board using 1 in sq. pad size (Cu area = 1.127 in sq. [2 oz] including traces).
2. Pulse Test: pulse width ≤ 300 us, duty cycle $\leq 2\%$
3. Limited by T_{jmax} , starting $T_J = 25^\circ\text{C}$, $R_G = 25\Omega$, $V_{DS} = 20V$, $V_{GS} = 10V$.



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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	30	--	--	V
I _{DSS}	Zero Gate Voltage Drain current(Tc=25°C)	VDS=24V,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=-250μ	1	--	2	V
R _{DS(ON)}	Drain-Source On-State Resistance note A	VGS=10V, ID=30A	--	6	10	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance note A	VGS=5V, ID=20A	--	10	13	mΩ
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated) note B						
C _{iss}	Input Capacitance	VDS=15V,VGS=0V, f=1MHz	--	1070	--	pF
C _{oss}	Output Capacitance		--	158	--	pF
C _{rss}	Reverse Transfer Capacitance		--	135	--	pF
Q _g	Total Gate Charge	VDS=15V,ID=10A, VGS=10V	--	20	--	nC
Q _{gs}	Gate-Source Charge		--	7.8	--	nC
Q _{gd}	Gate-Drain Charge		--	5	--	nC
Switching Characteristics note B						
t _{d(on)}	Turn-on Delay Time	VDD=15V, ID=10A, RG=4.7Ω, VGS=10V	--	16	--	nS
t _r	Turn-on Rise Time		--	7	--	nS
t _{d(off)}	Turn-Off Delay Time		--	9	--	nS
t _f	Turn-Off Fall Time		--	5	--	nS
Source- Drain Diode Characteristics@ T _J = 25°C (unless otherwise stated)						
I _{SD}	Source-drain current(Body Diode)	Tc=25°C	--	--	50	A
V _{SD}	Forward on voltage	IS=20A,VGS=0V	--	0.82	1.2	V
t _{rr}	Reverse Recovery Time	Tj=25°C,ISD=20A, VGS=0V	--	22	--	nS
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs	--	15	--	nC

Note:

A: Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%

B: Guranteed by design, not subject to production testing.

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Typical Characteristics

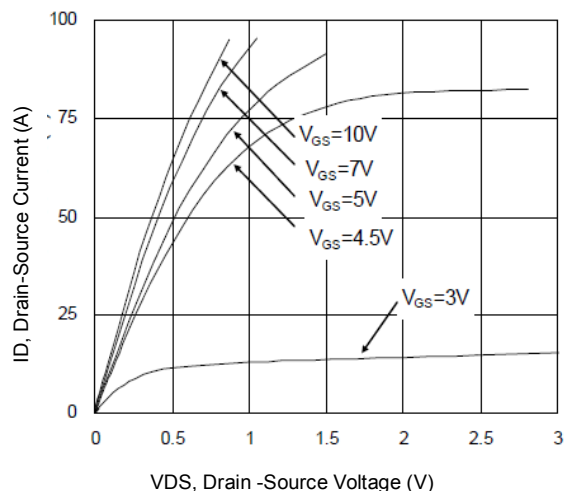


Fig1. Typical Output Characteristics

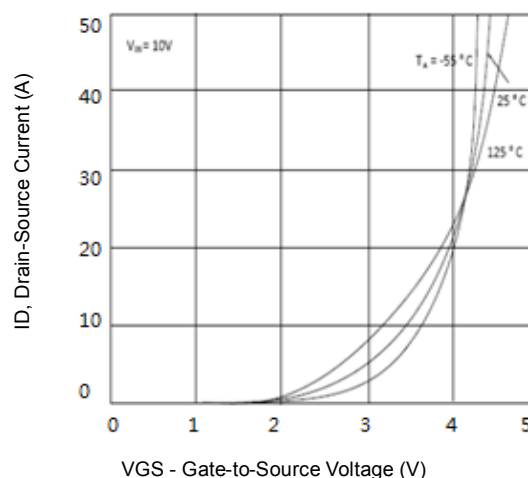


Fig2. Transfer Characteristics

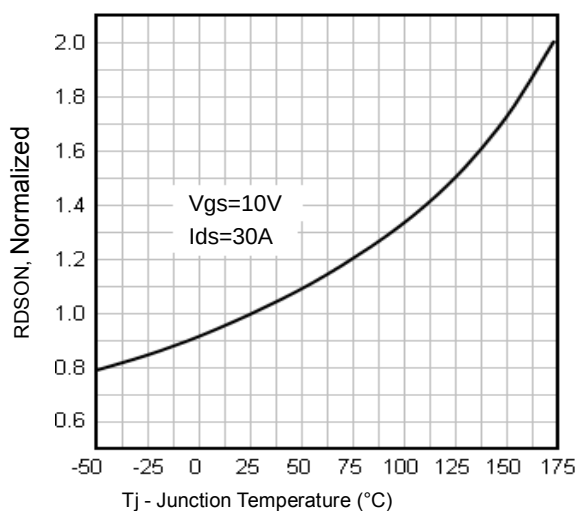


Fig3. Normalized On-Resistance Vs. Temperature

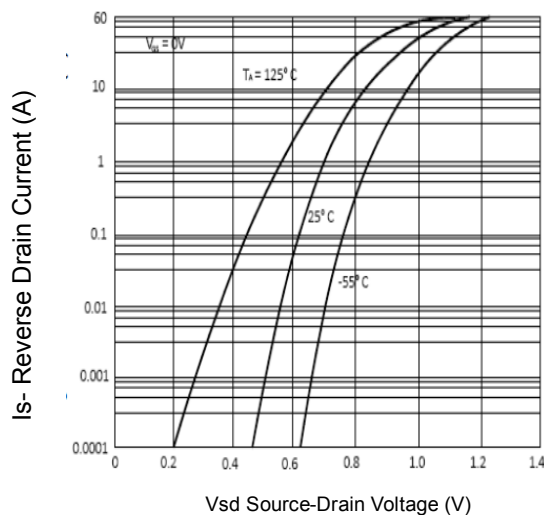


Figure4. Source- Drain Diode Forward

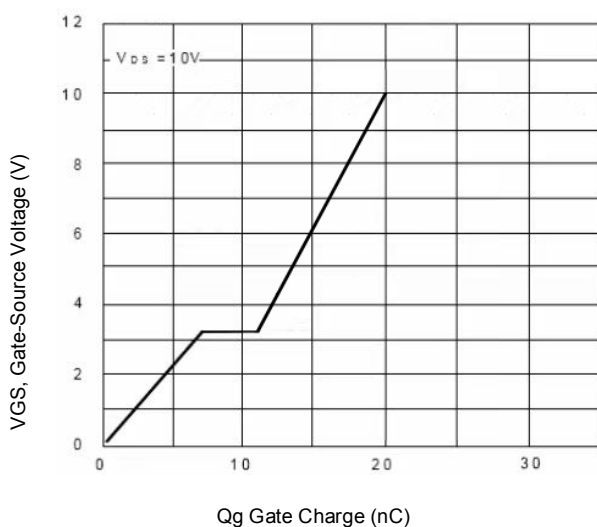


Figure 5 .Gate Charge Vs. Gate-Source Voltage

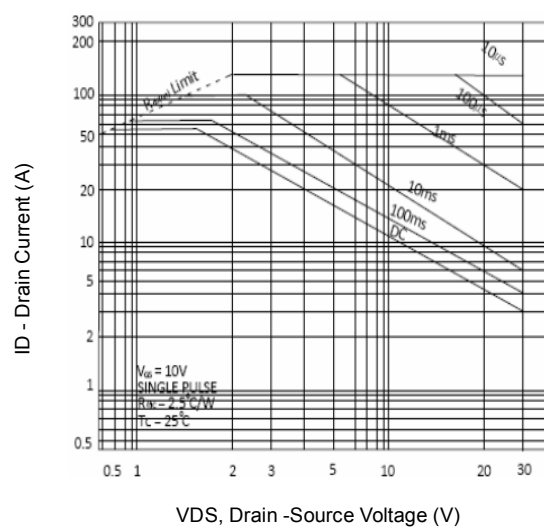


Fig6. Maximum Safe Operating Area

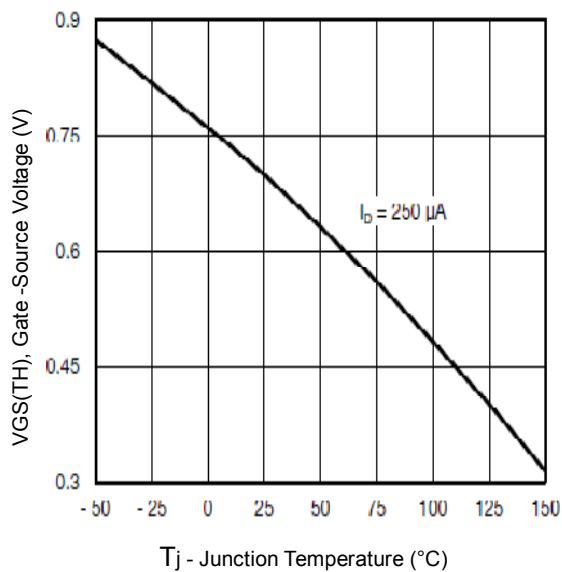
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Fig7. Threshold Voltage Vs. Temperature

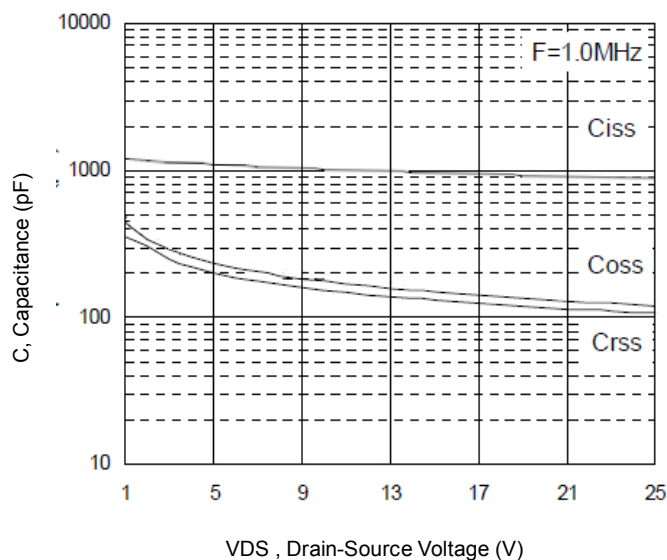


Fig8. Typical Capacitance Vs. Drain-Source Voltage

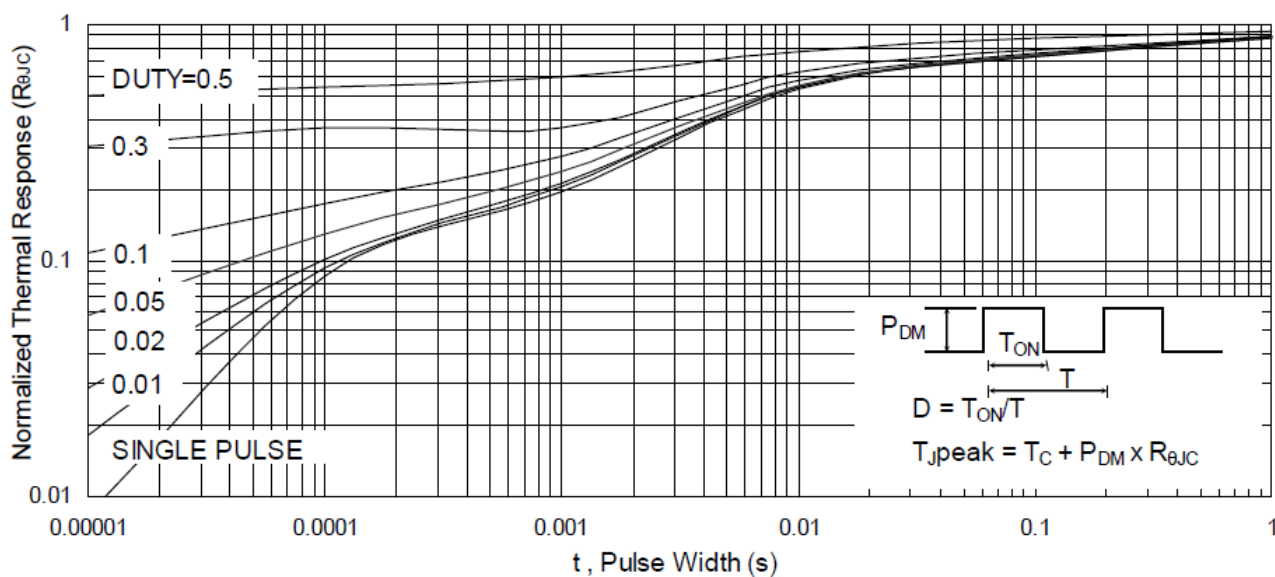


Fig9. Normalized Maximum Transient Thermal Impedance

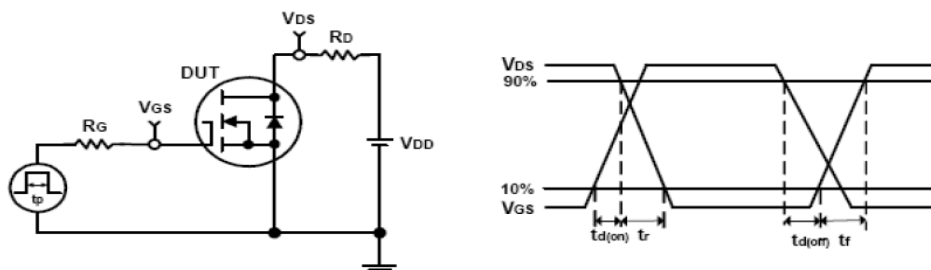
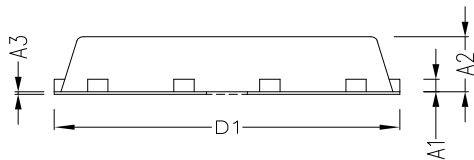


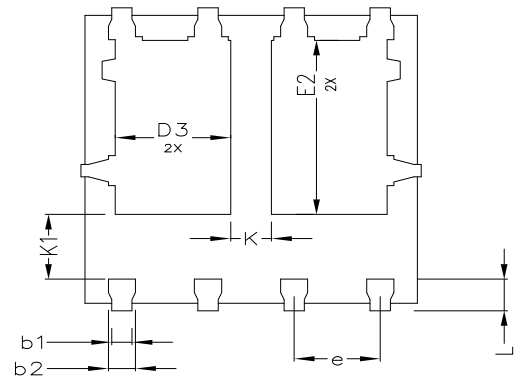
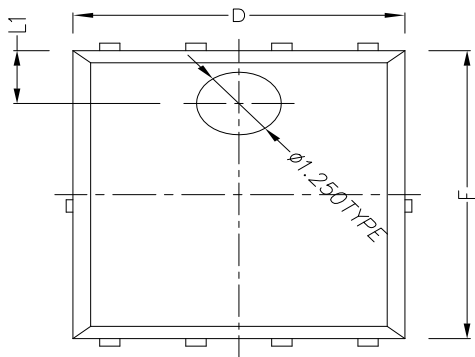
Fig10. Switching Time Test Circuit and waveforms

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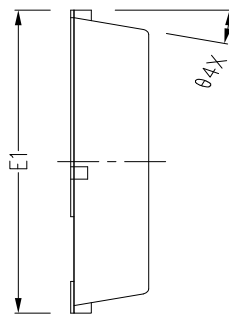
PDFN5X6 Package Outline Dimensions (Units: mm)



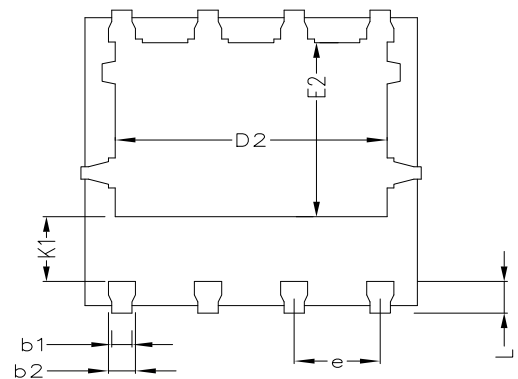
SIDE VIEW

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		