

60V N-Channel Enhancement Mode MOSFET

Description

The AP150N06NF uses advanced **APM-SGT II** technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

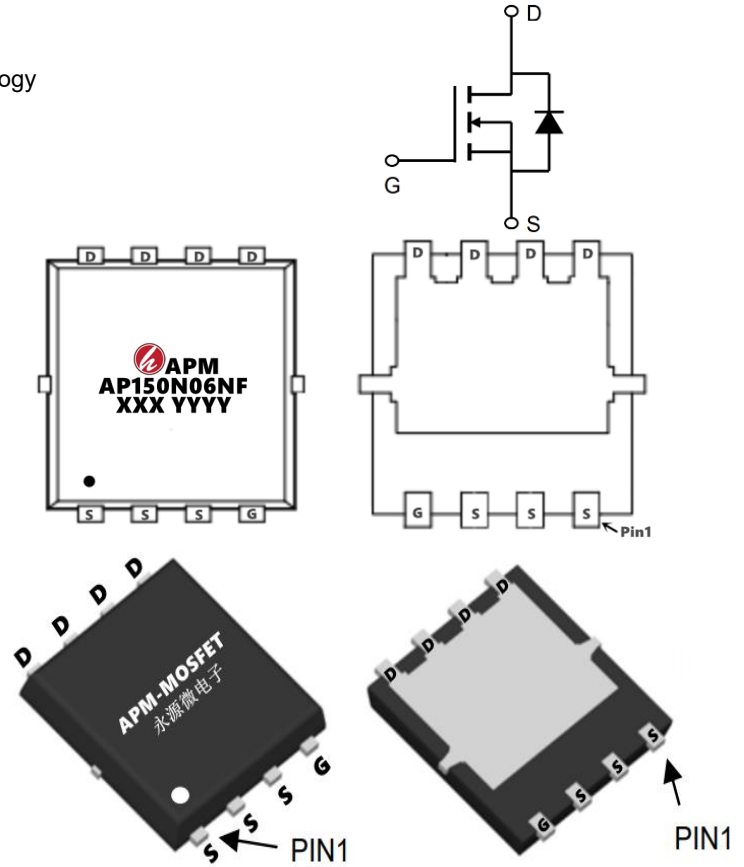
$V_{DS} = 60V$ $I_D = 150A$

$R_{DS(ON)} < 2.5m\Omega$ @ $V_{GS}=10V$ (**Type: 1.98mΩ**)

Application

Battery protection

UPS



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP150N06NF	PDFN5*6-8L	AP150N06NF XXX YYYY	5000

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current ^{1,6}	150	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current ^{1,6}	105	A
I_{DM}	Pulsed Drain Current ²	450	A
EAS	Single Pulse Avalanche Energy ³	585	mJ
IAS	Avalanche Current	55	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	168	W
TSTG	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	25	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	1.5	$^\circ\text{C/W}$

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Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Type	Max	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	60	68	-	V
IGSS	Gate-body Leakage Current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
IDSS T _J =25°C	Zero Gate Voltage Drain Current	V _{DS} = 60V, V _{GS} = 0V	-	-	1	μA
IDSS T _J =100°C	Zero Gate Voltage Drain Current		-	-	100	
VGS(th)	Gate-Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1.0	1.75	2.5	V
RDS(on)	Drain-Source On-Resistance ⁴	V _{GS} = 10V, I _D = 20A	-	1.98	2.7	mΩ
RDS(on)	Drain-Source On-Resistance ⁴	V _{GS} = 4.5V, I _D = 10A	-	2.7	3.5	mΩ
gfs	Forward Transconductance ⁴	V _{DS} = 5V, I _D = 20A	-	78	-	S
Ciss	Input Capacitance	V _{DS} = 30V, V _{GS} = 0V, f = 1MHz	-	5245	-	pF
Coss	Output Capacitance		-	1090	-	
Crss	Reverse Transfer Capacitance		-	25	-	
RG	Gate Resistance	f = 1MHz	-	2.2	-	Ω
Q _g	Total Gate Charge	V _{GS} = 10V, V _{DS} = 30V, I _D = 20A	-	72.5	-	nC
Q _{gs}	Gate-Source Charge		-	19.5	-	
Q _{gd}	Gate-Drain Charge		-	14	-	
td(on)	Turn-on Delay Time	V _{GS} = 10V, V _{DD} = 30V, R _G = 3Ω, I _D = 20A	-	26.5	-	ns
t _r	Rise Time		-	15	-	
td(off)	Turn-off Delay Time		-	73	-	
t _f	Fall Time		-	18	-	
trr	Body Diode Reverse Recovery Time	I _F = 20A, dI/dt = 100A/μs	-	25	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	90	-	nC
VSD	Diode Forward Voltage ⁴	I _S = 20A, V _{GS} = 0V	-	-	1.2	V
IS	Continuous Source Current T _C = 25°C		-	-	125	A

Note :

- 1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width .The EAS data shows Max. rating .
- 3、The power dissipation is limited by 175°C junction temperature
- 4、EAS condition: T_J = 25°C, V_{DD} = 48V, V_G = 10V, R_G = 25Ω, L = 0.1mH, I_{AS} = 55A
- 5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

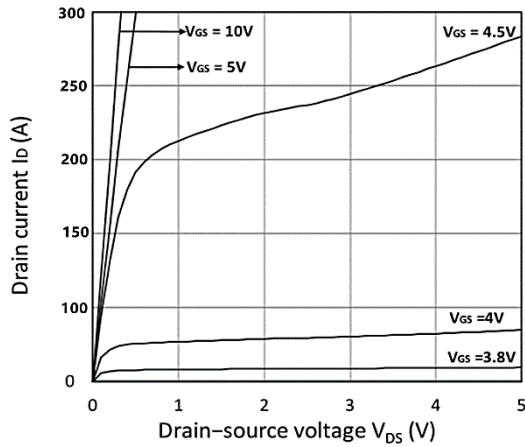


Figure 1. Output Characteristics

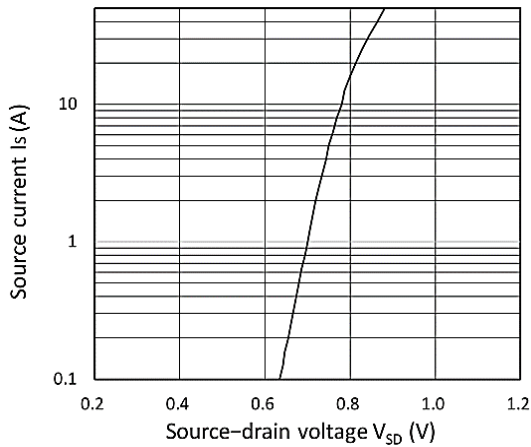


Figure 3. Forward Characteristics of Reverse

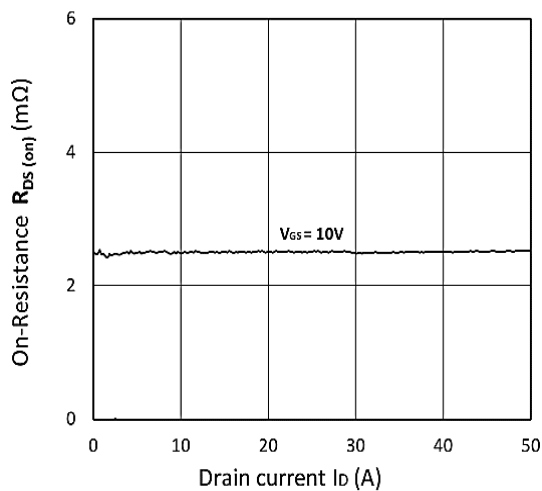


Figure 5. R_DS(ON) vs. I_D

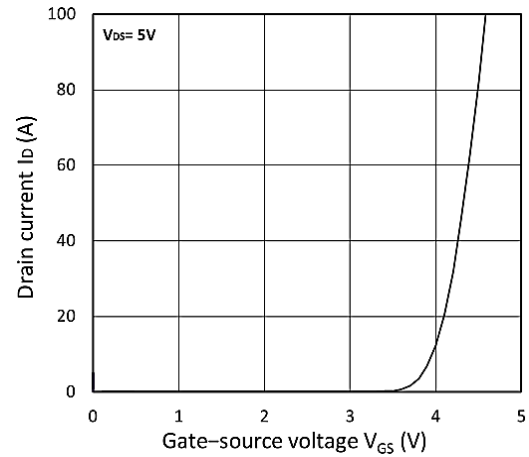


Figure 2. Transfer Characteristics

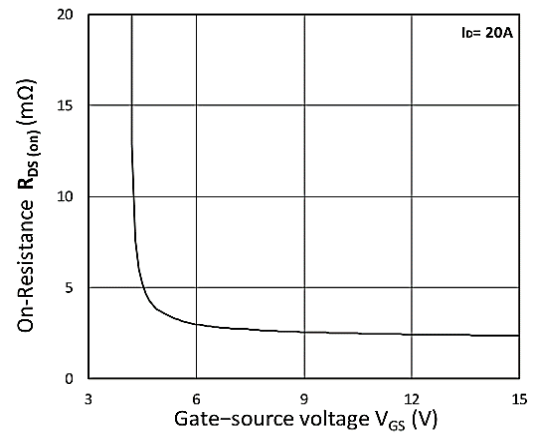


Figure 4. R_DS(ON) vs. V_GS

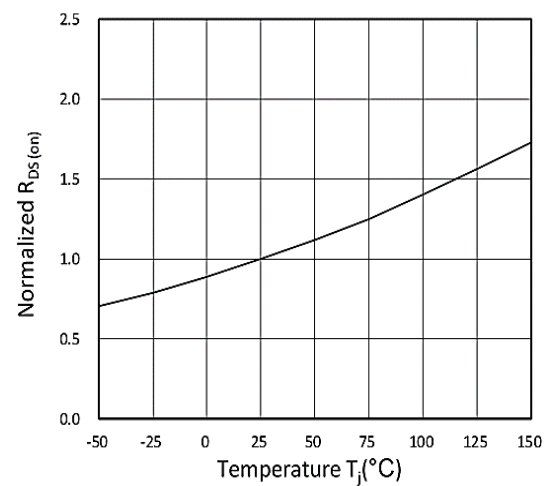


Figure 6. Normalized R_DS(on) vs. Temperature

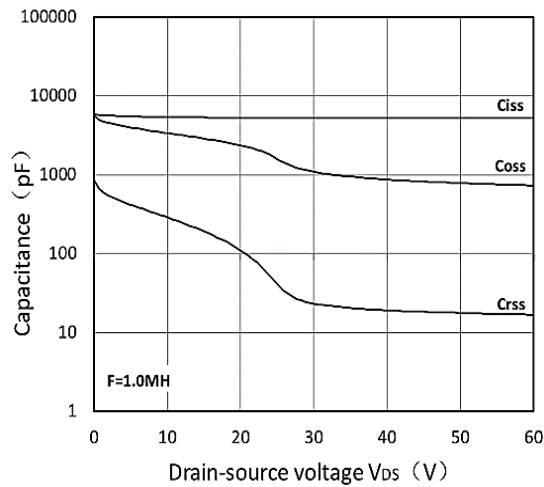


Figure 7. Capacitance Characteristics

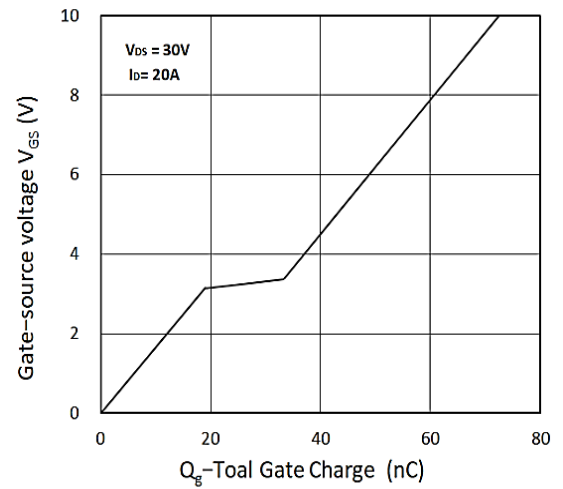


Figure 8. Gate Charge Characteristics

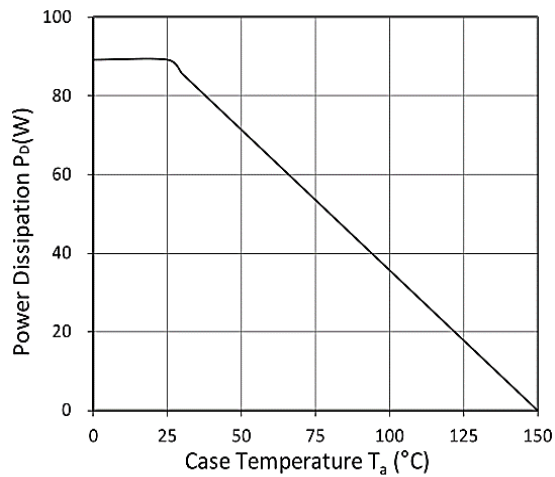


Figure 9. Power Dissipation

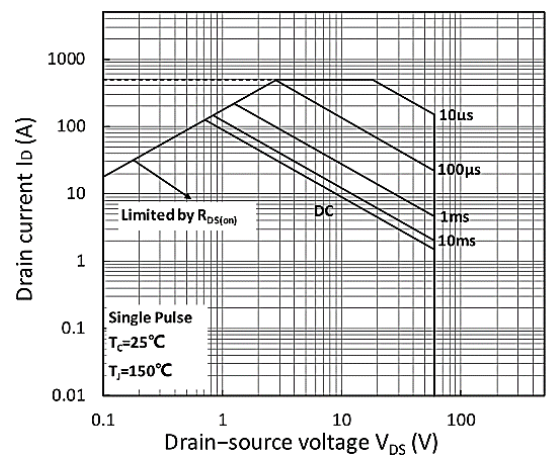


Figure10. Safe Operating Area

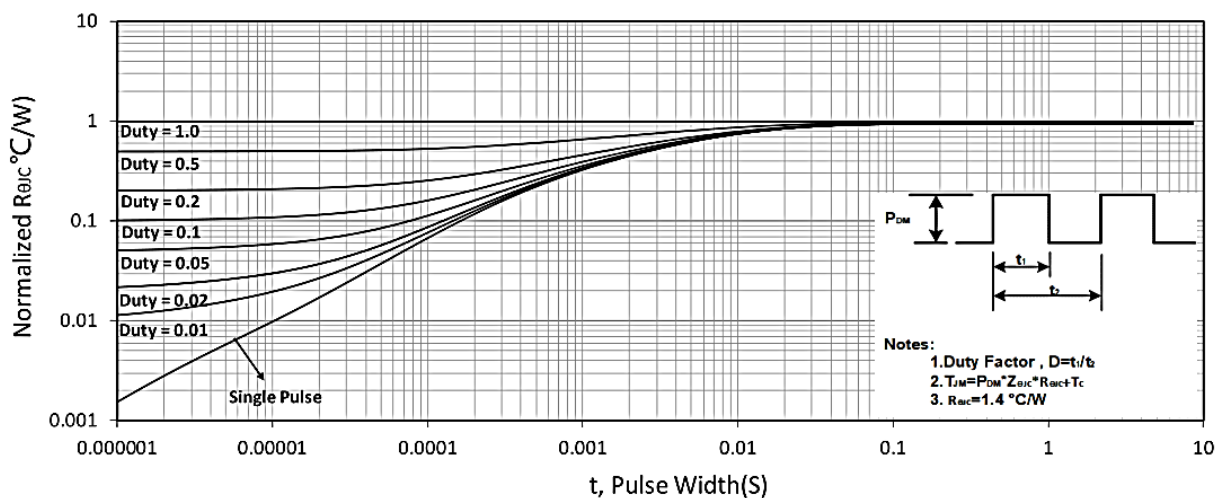
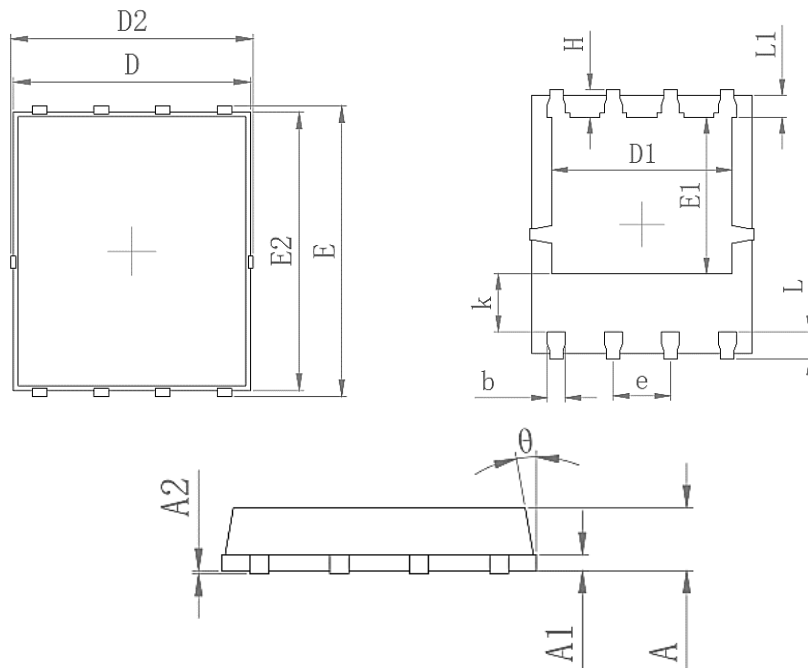


Figure 11. Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-PDFN5X6-8L-XZT Single



Symbol	Common	
	mm	
	Mim	Max
A	0.90	1.10
A1	0.254 REF	
A2	0-0.05	
D	4.824	4.976
D1	3.910	4.110
D2	4.944	5.076
E	5.924	6.076
E1	3.375	3.575
E2	5.674	5.826
b	0.350	0.450
e	1.270	
L	0.534	0.686
L1	0.424	0.576
K	1.190	1.390
H	0.549	0.701
Φ	8°	12°

60V N-Channel Enhancement Mode MOSFET**Attention**

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Edition	Date	Change
Rve1.0	2021/3/20	Initial release

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