

100V N-Channel Enhancement Mode MOSFET

Description

The AP150N10NF uses advanced **APM-SGT₁₁** technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS} = 100V$ $I_D = 150A$

$R_{DS(ON)} < 4.5m\Omega$ @ $V_{GS}=10V$ (Type: 4.0m Ω)

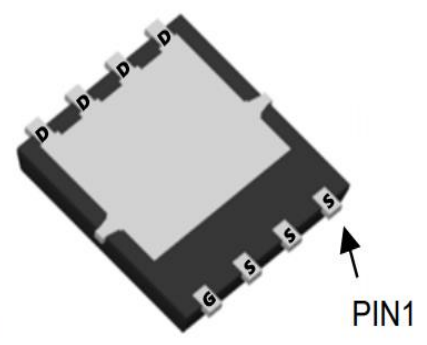
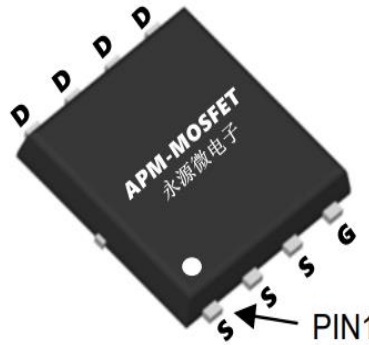
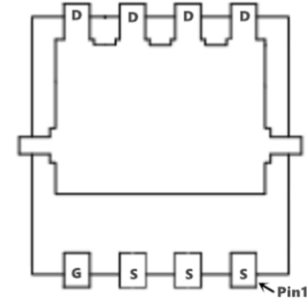
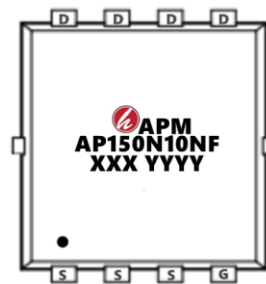
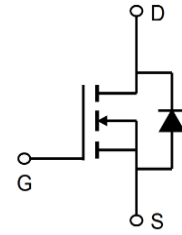
Application

Isolated DC

Motor control

Synchronous-rectification

Clip packaging process



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP150N10NF	PDFN5*6-8L	AP150N10NF XXX YYYY	5000

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_A=25^{\circ}C$	Continuous Drain Current ¹	150	A
$I_D @ T_A=70^{\circ}C$	Continuous Drain Current ¹	96	A
I_{DM}	Pulsed Drain Current ²	480	A
E_{AS}	Single Pulse Avalanche Energy ³	320	mJ
I_{AS}	Avalanche Current	40	A
$P_D @ T_A=25^{\circ}C$	Total Power Dissipation ⁴	131.6	W
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	25	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	0.95	$^{\circ}C/W$

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Electrical Characteristics (T_C=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	100	107	-	V
IGSS	Gate-body Leakage current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
IDSS	Zero Gate Voltage Drain Current T _J =25°C	V _{DS} =100V, V _{GS} = 0V	-	-	1	μA
	Zero Gate Voltage Drain Current T _J =100°C		-	-	100	
VGS(th)	Gate-Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	2.0	3.0	4.0	V
RDS(on)	Drain-Source on-Resistance ⁴	V _{GS} = 10V, I _D = 20A	-	4.1	4.5	mΩ
gfs	Forward Transconductance ⁴	V _{DS} = 10V, I _D = 20A	-	62	-	S
Ciss	Input Capacitance	V _{DS} = 50V, V _{GS} = 0V, f = 1MHz	-	6865	-	pF
Coss	Output Capacitance		-	740	-	
Crss	Reverse Transfer Capacitance		-	21	-	
R _g	Gate Resistance	f = 1MHz	-	1.3	-	Ω
Q _g	Total Gate Charge	V _{GS} = 10V, V _{DS} = 50V, I _D =20A	-	111.2	-	nC
Q _{gs}	Gate-Source Charge		-	30.5	-	
Q _{gd}	Gate-Drain Charge		-	27.3	-	
td(on)	Turn-on Delay Time	V _{GS} = 10V, V _{DD} = 50V, R _G = 3Ω, I _D = 20A	-	33	-	ns
t _r	Rise Time		-	39	-	
td(off)	Turn-off Delay Time		-	67.1	-	
t _f	Fall Time		-	32	-	
trr	Body Diode Reverse Recovery Time	I _F = 20A, dI/dt=100A/μs	-	58.7	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	97.3	-	nC
VSD	Diode Forward Voltage ⁴	I _S = 20A, V _{GS} = 0V	-	-	1.2	V
IS	Continuous Source Current T _C =25°C	-	-	-	120	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 ≤ 300us , duty cycle ≤ 2%
- 3、The EAS data shows Max. rating . The test condition is VDD=72V,VGS=10V, L=0.1mH IAS=40A
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation

Typical Characteristics

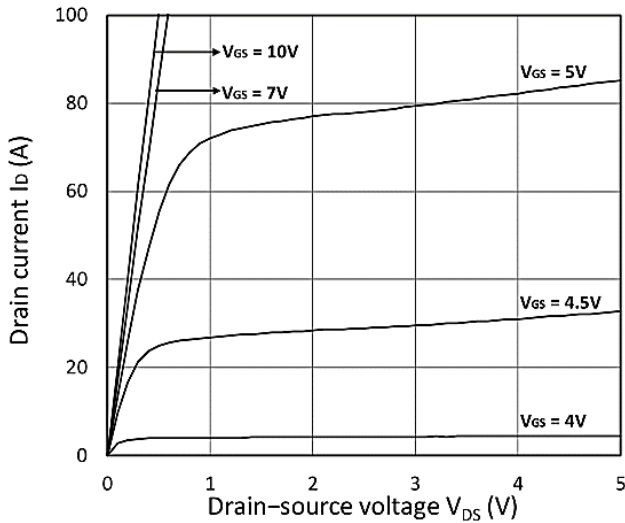


Figure 1. Output Characteristics

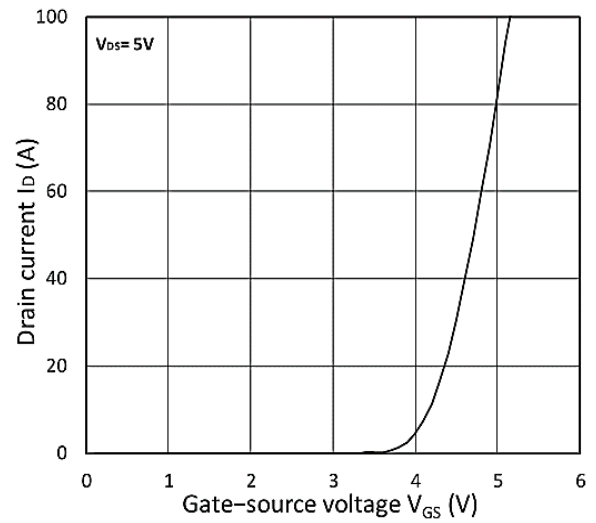


Figure 2. Transfer Characteristics

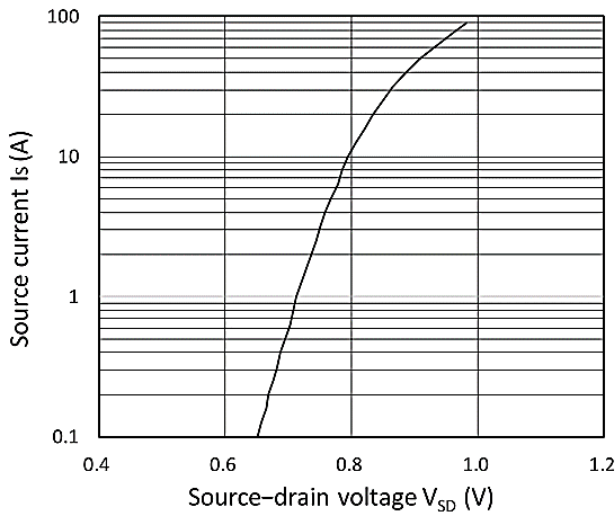


Figure 3. Forward Characteristics of Reverse

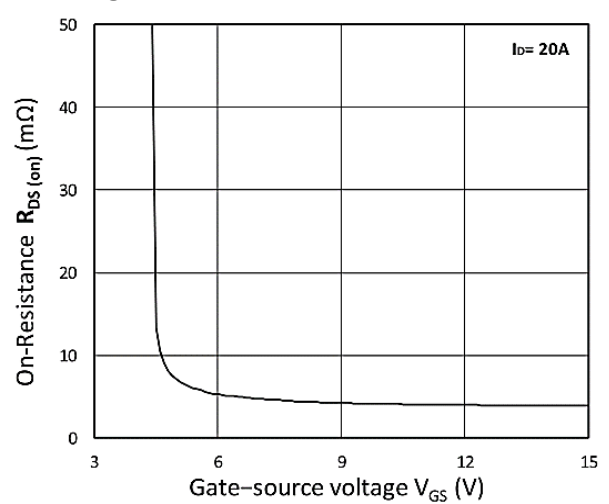


Figure 4. R_DS(ON) vs. V_GS

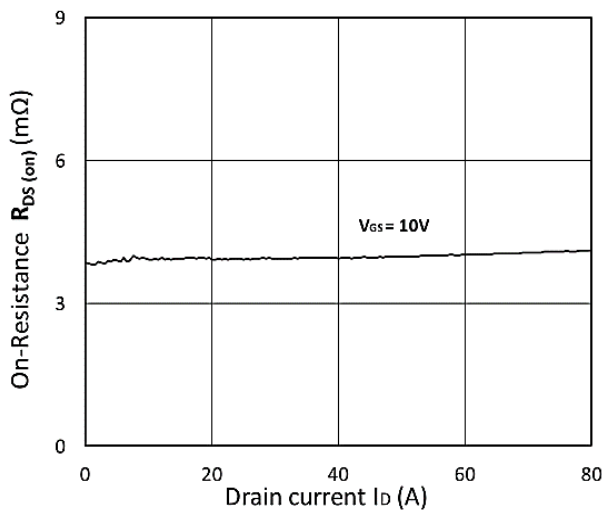


Figure 5. R_DS(ON) vs. I_D

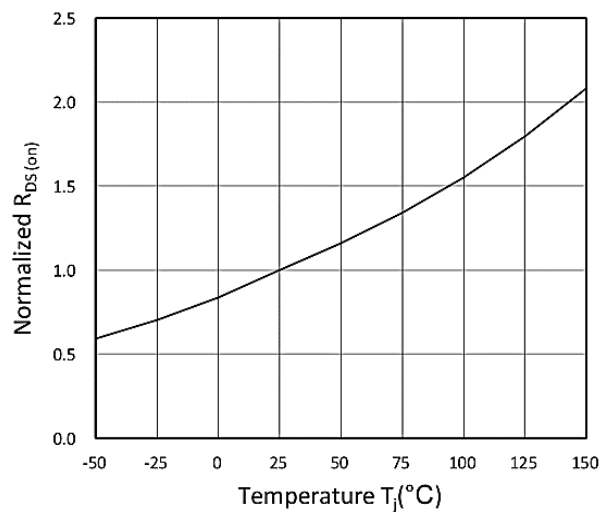


Figure 6. Normalized R_DS(on) vs. Temperature

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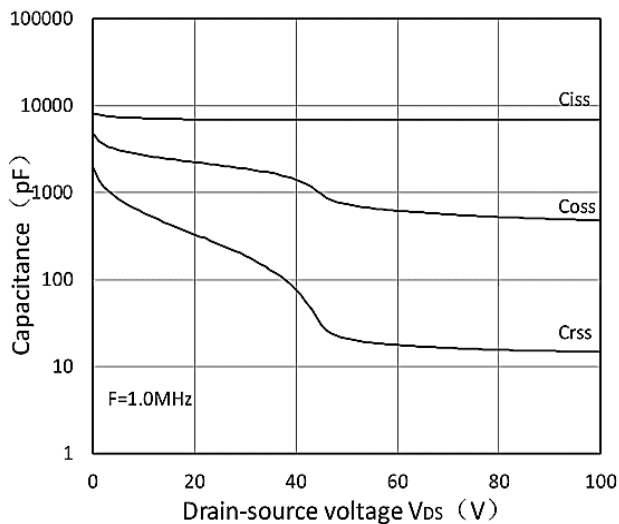


Figure 7. Capacitance Characteristics

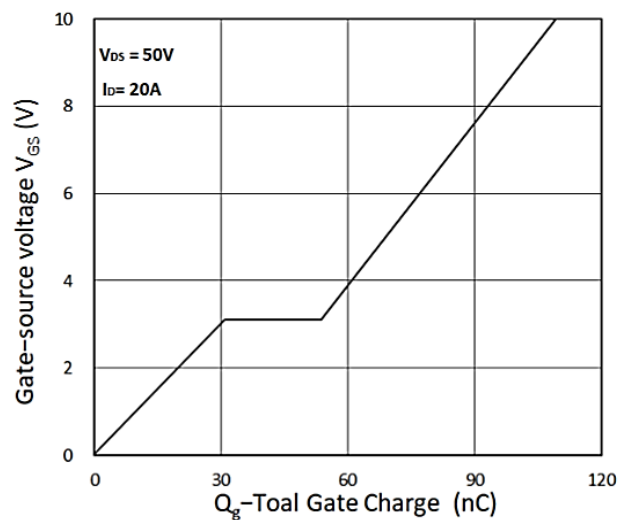


Figure 8. Gate Charge Characteristics

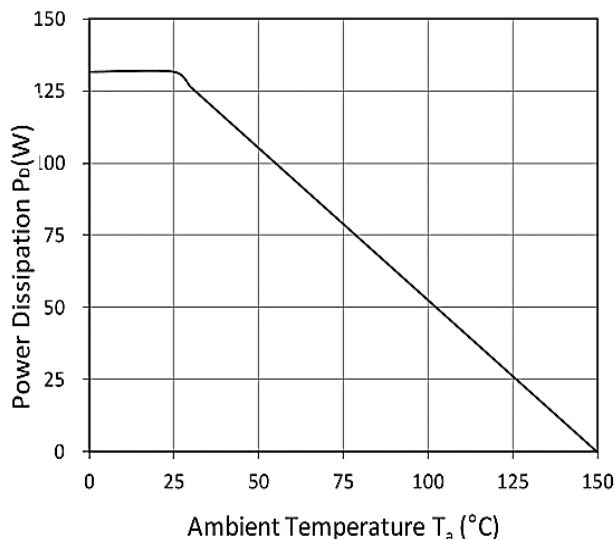


Figure 9. Power Dissipation

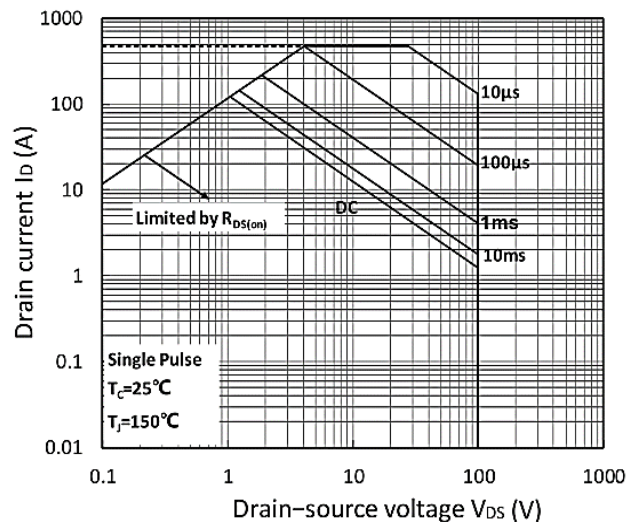


Figure10. Safe Operating Area

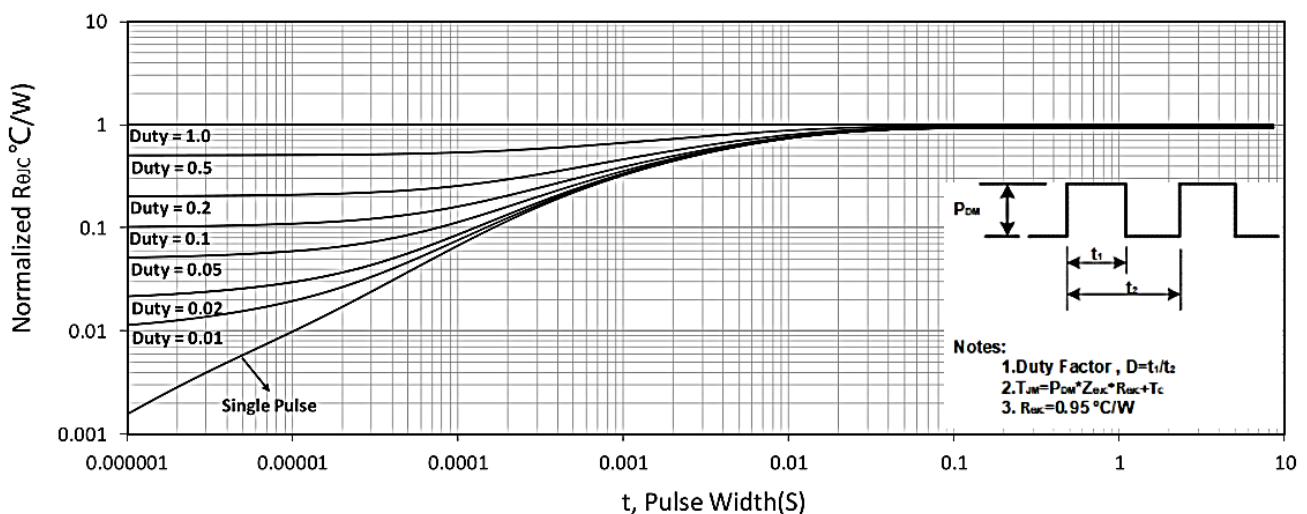
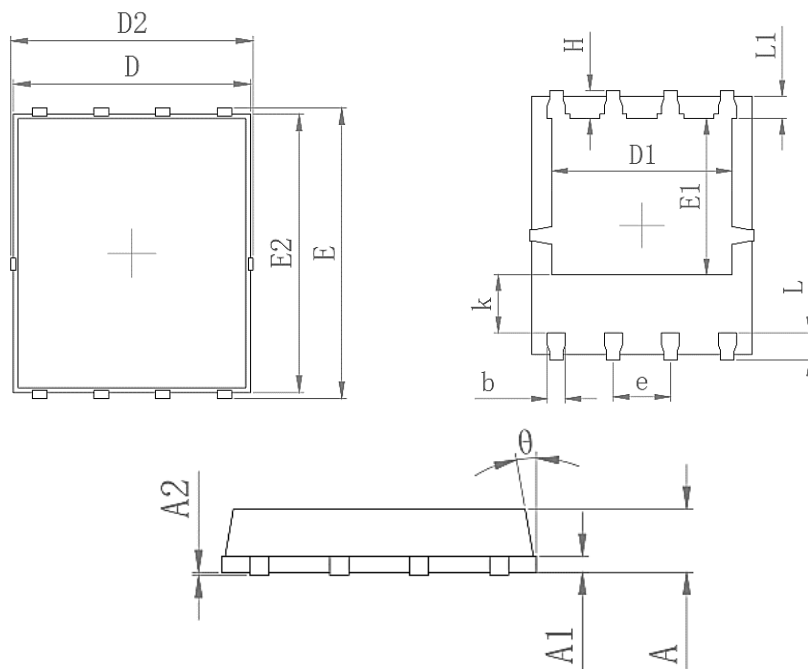


Figure 11. Normalized Maximum Transient Thermal Impedance

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°

100V N-Channel Enhancement Mode MOSFET**Attention**

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Edition	Date	Change
Rve1.0	2021/1/31	Initial release

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