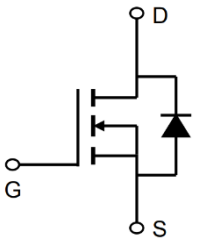
AP68N03NF

30V N-Channel Enhancement Mode MOSFET

Description

The AP68N03NF uses advanced **APM-SGT II** 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.

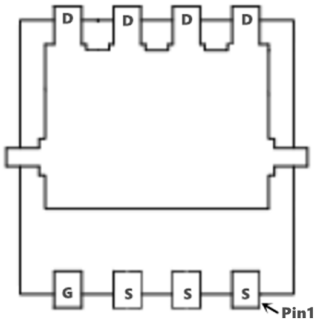


General Features

V_{DS} = 30V I_D =68A

$R_{DS(ON)}$ <6.0mΩ @ V_{GS}=10V **(Type：4.8mΩ)**

CISS≈814PF

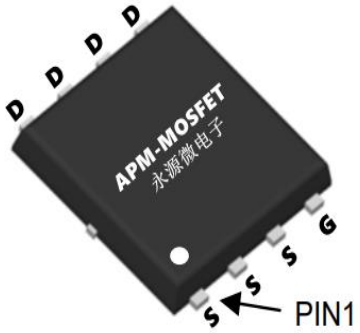


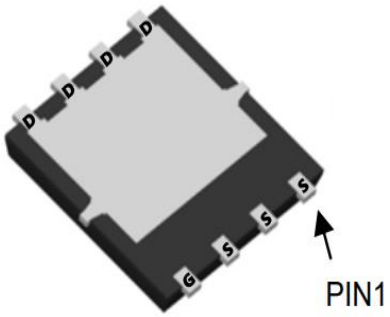
Application

Buck And Boost

Wireless impact

Car charging





Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP68N03NF	PDFN5*6-8L	AP68N03NF XXX YYYY	5000

Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	68	A
I_D@T_C=75℃	Continuous Drain Current, V_{GS} @ 10V[1]	35	A
I_{DM}	Pulsed Drain Current[2]	150	A
EAS	Single Pulse Avalanche Energy[3]	28.8	mJ
I_{AS}	Avalanche Current	24	A
P_D@T_A=25℃	Total Power Dissipation[4]	24	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	25	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	5.2	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30	---	---	V
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=20A	---	4.8	6.0	mΩ
		V_{GS}=4.5V , I_D=15A	---	6.9	9.0	
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	1.6	2.5	V
IDSS	Drain-Source Leakage Current	V_{DS}=24V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=55℃	---	---	5	
IGSS	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=30A	---	43	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	1.7	---	Ω
Q_g	Total Gate Charge (4.5V)	V_{DS}=15V , V_{GS}=4.5V , I_D=15A	---	8	---	nC
Qgs	Gate-Source Charge		---	2.4	---	
Qgd	Gate-Drain Charge		---	3.2	---	
Td(on)	Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω I_D=15A	---	7.1	---	ns
T_r	Rise Time		---	40	---	
Td(off)	Turn-Off Delay Time		---	15	---	
T_f	Fall Time		---	6	---	
Ciss	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	814	---	pF
Coss	Output Capacitance		---	498	---	
Crss	Reverse Transfer Capacitance		---	41	---	
I_S	Continuous Source Current[1,6]	V_G=V_D=0V , Force Current	---	---	24	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25Ω	---	---	1	V
t_{rr}	Reverse Recovery Time	I_F=15A , di/dt=100A/μs , T_J=25Ω	---	34	---	nS
Q_{rr}	Reverse Recovery Charge		---	15	---	nC

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 V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=24A
4、The power dissipation is limited by 175℃ 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

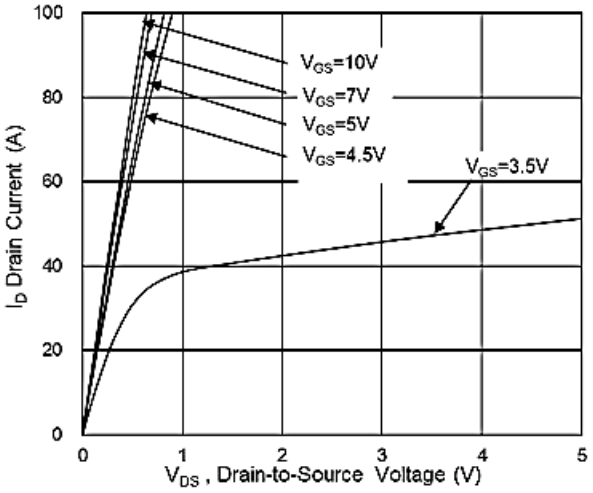


Fig.1 Typical Output Characteristics

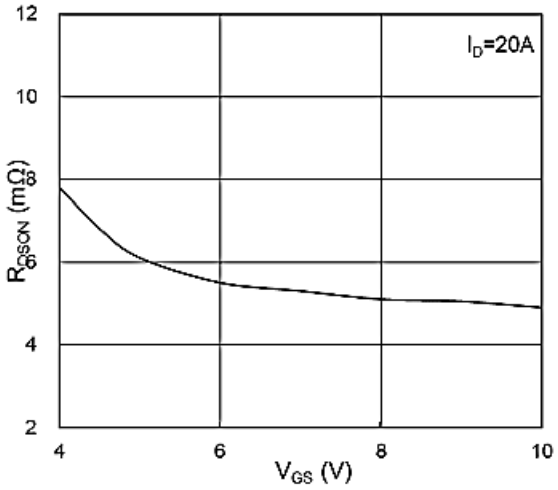


Fig.2 On-Resistance vs G-S Voltage

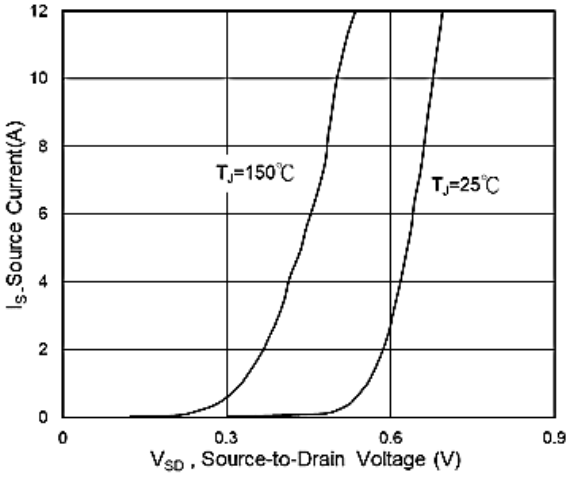


Fig.3 Source Drain Forward Characteristics

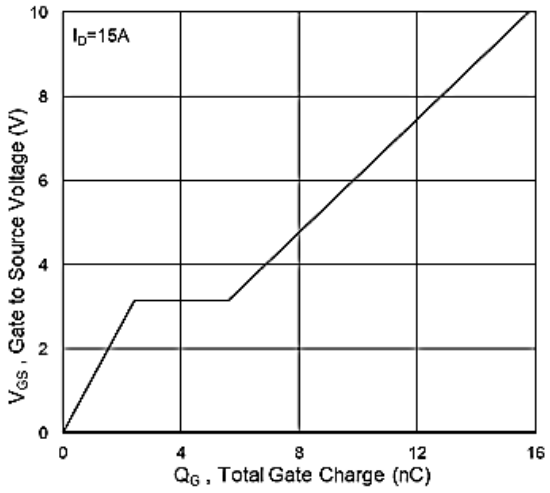


Fig.4 Gate-Charge Characteristics

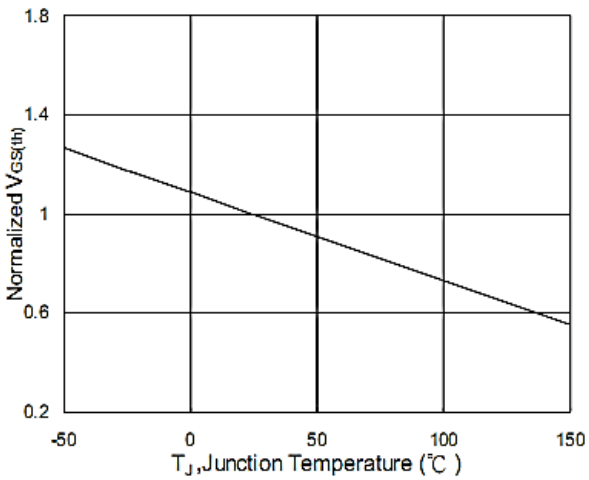


Fig.5 Normalized $V_{GS(th)}$ vs T_J

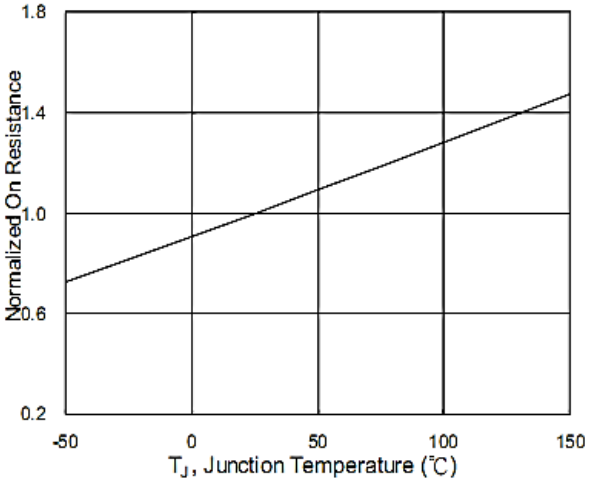


Fig.6 Normalized R_{DSON} vs T_J

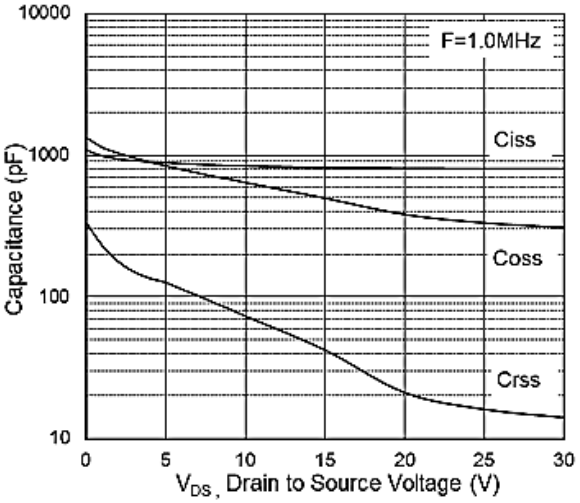


Fig.7 Capacitance

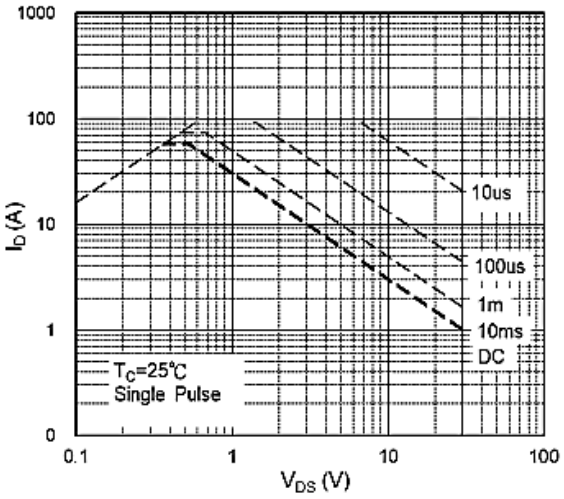


Fig.8 Safe Operating Area

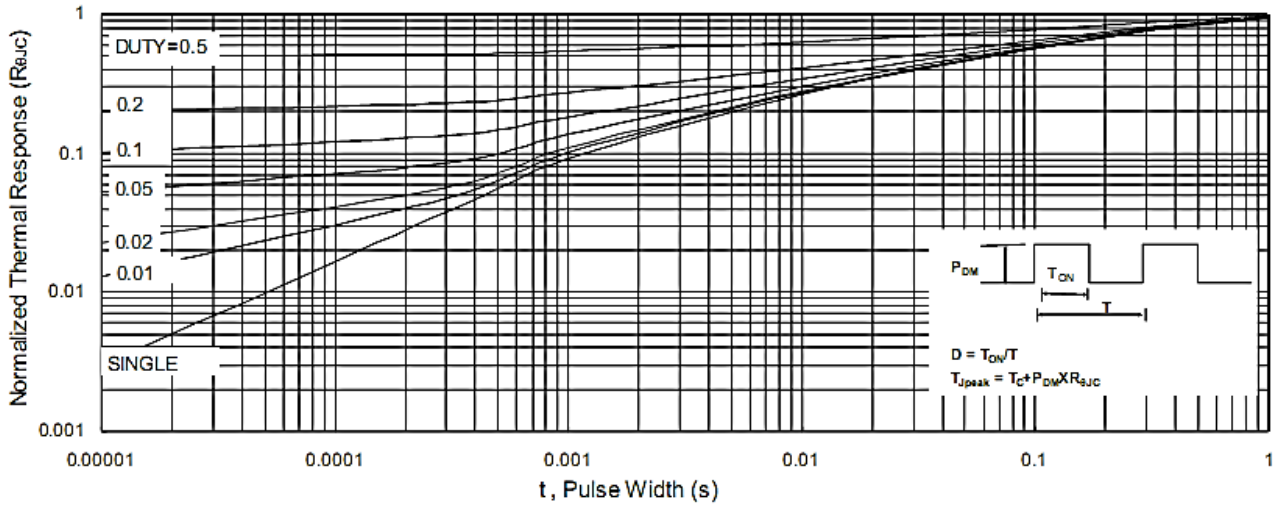


Fig.9 Normalized Maximum Transient Thermal Impedance

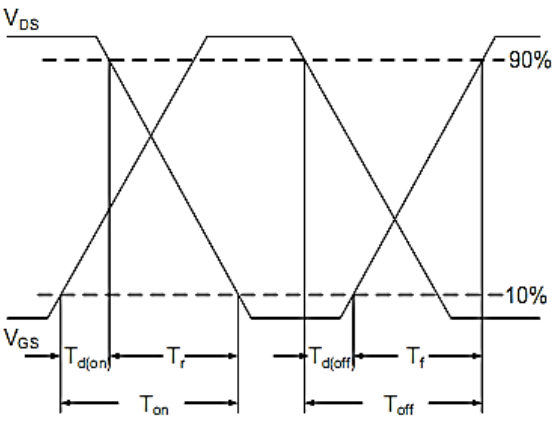


Fig.10 Switching Time Waveform

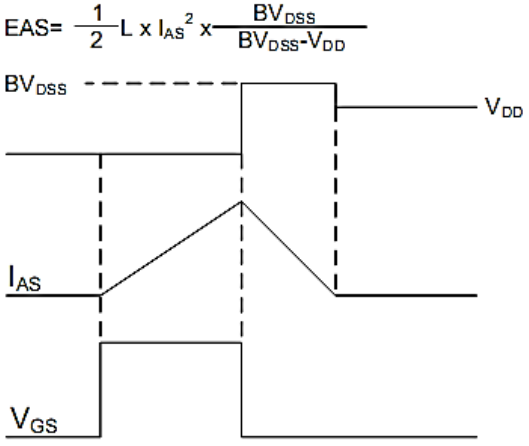
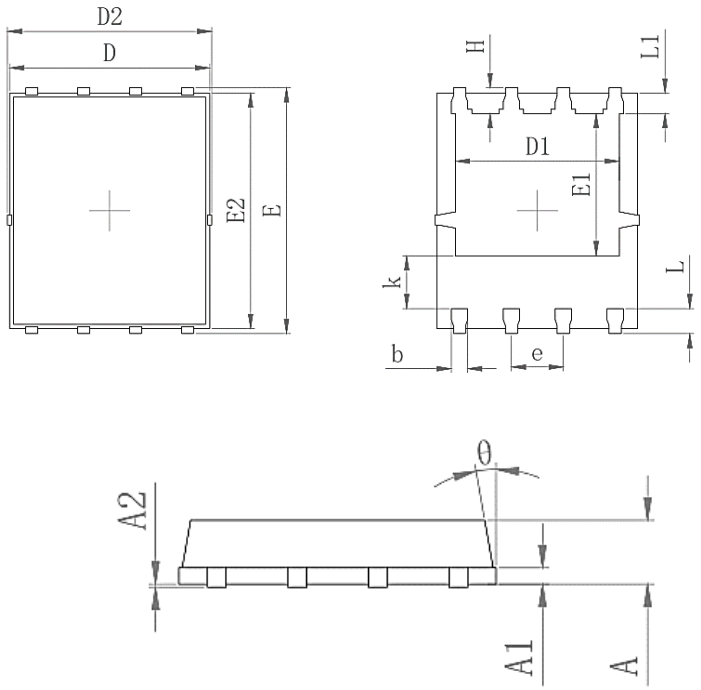


Fig.11 Unclamped Inductive Switching Waveform

Package Mechanical Data-PDFN5*6-8L-XZT Single



Symbol	Common	
	mm	
	Mim	Max
A	0.900	1.100
A1	0.254	
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
	8°	12°

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AP68N03NF

30V N-Channel Enhancement Mode MOSFET

Edition	Date	Change
Rve1.0	2021/3/18	Initial release