AP65N06NF

65V N-Channel Enhancement Mode MOSFET

Description

The AP65N06NF 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} = 65V I_D =65A

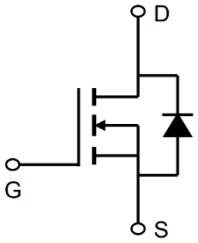
$R_{DS(ON)}$ < 8.0mΩ @ V_{GS}=10V **(Type：6.5mΩ)**

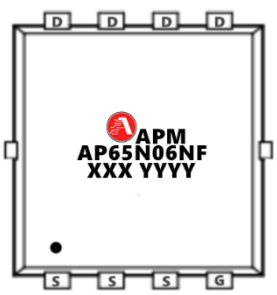
Application

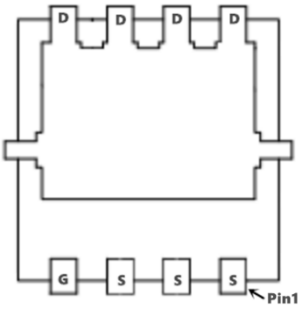
Battery protection

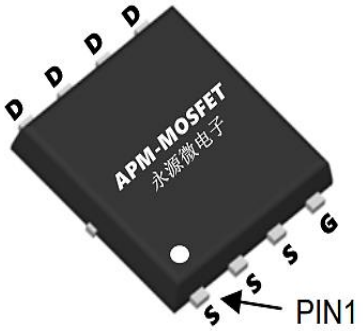
Load switch

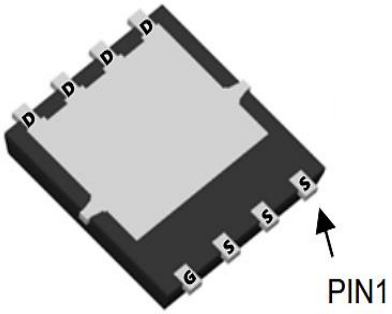
Uninterruptible power supply











Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP65N06NF	PDFN5*6-8L	AP65N06NF XXX YYYY	5000

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

Symbol	Parameter	Value	Unit
VDS	Drain source voltage	65	V
VGS	Gate source voltage	±20	V
I_D@T_A=25℃	Continuous drain current	65	A
I_D@T_A=70℃	Continuous drain current	31	A
IDM	Pulsed drain current	240	A
P_D@T_A=25℃	Power dissipation	33.1	W
EAS	Single pulsed avalanche energy	130	mJ
TSTG	Storage Temperature Range	-55 to 150	℃
Tj	Operation and storage temperature	-55 to 150	℃
RθJC	Thermal resistance, junction-case	2.1	°C/W
RθJA	Thermal resistance, junction-ambient5)	25	°C/W

65V N-Channel Enhancement Mode MOSFET

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	65	72	-	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}=65V, V_{GS}=0V			1	μA
IDSS T_J=100°C					100	
VGS(th)	Gate-Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1.2	1.7	2.5	V
RDS(on)	Drain-Source On-Resistance[4]	V_{GS}=10V, I_D=20A	-	6.5	8.0	mΩ
RDS(on)	Drain-Source On-Resistance[4]	V_{GS}=4.5V, I_D=10A		8.5	10	mΩ
gfs	Forward Transconductance[4]	V_{DS} = 10V, I_D = 10A	-	45	-	S
Ciss	Input Capacitance	V_{DS}=30V, V_{GS}=0V, f =1MHz	-	1210	-	pF
Coss	Output Capacitance		-	343	-	
Crss	Reverse Transfer Capacitance		-	17	-	
R_g	Gate Resistance	f=1MHz	-	1.5	-	Ω
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=30V, I_D= 10A	-	21.7	-	nC
Qgs	Gate-Source Charge		-	3.9	-	
Qgd	Gate-Drain Charge		-	4.5	-	
td(on)	Turn-On Delay Time	V_{GS}=10V, V_{DD}=30V, R_G= 3Ω, I_D=10A	-	7.3	-	ns
t_r	Rise Time		-	8.5	-	
td(off)	Turn-Off Delay Time		-	19.6	-	
t_f	Fall Time		-	5.6	-	
trr	Body Diode Reverse Recovery Time	I_F=10A, dI/dt=100A/μs	-	34	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	17	-	nC
VSD	Diode Forward Voltage[4]	I_S=10A, V_{GS} = 0V	-	-	1.2	V
IS	Continuous Source Current	T_A=25°C	-	-	65	A

Note

1、The data tested by surface mounted on a 1 inch2 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=25V,VGS=10V,L=0.1mH,IAS=38A

4、The power dissipation is limited by 150℃ junction temperature

5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation

Typical Characteristics

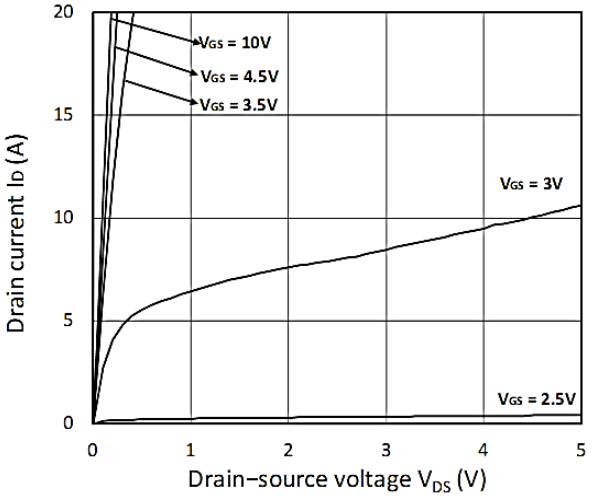


Figure 1. Output Characteristics

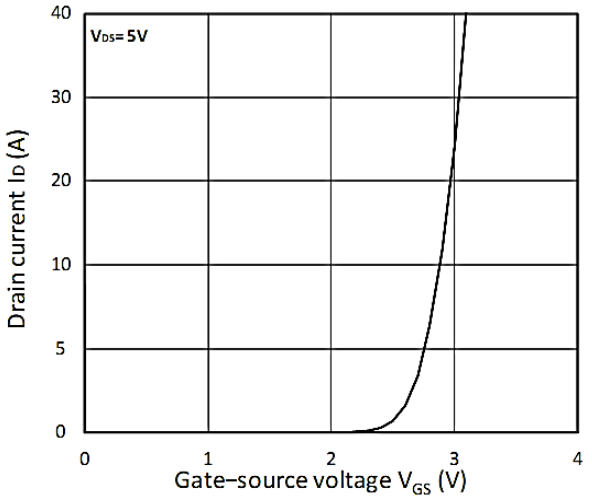


Figure 2. Transfer Characteristics

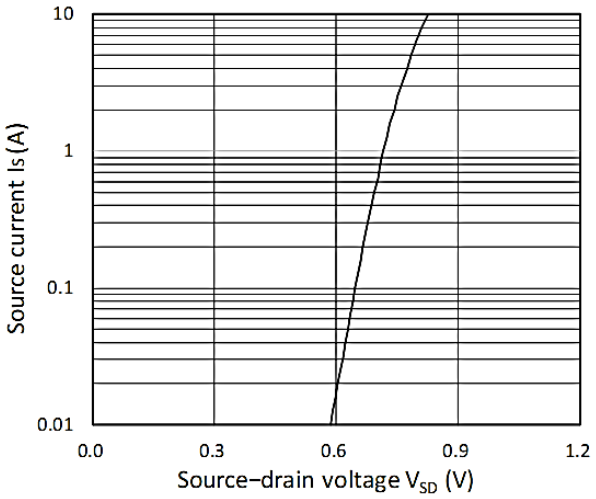


Figure 3. Forward Characteristics of Reverse

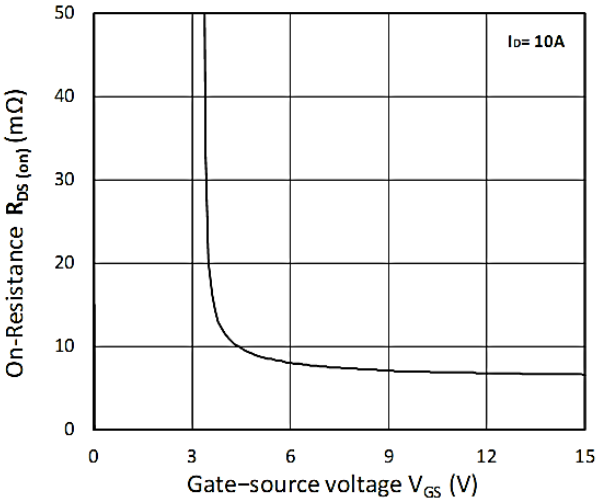


Figure 4. RDS(ON) vs.VGS

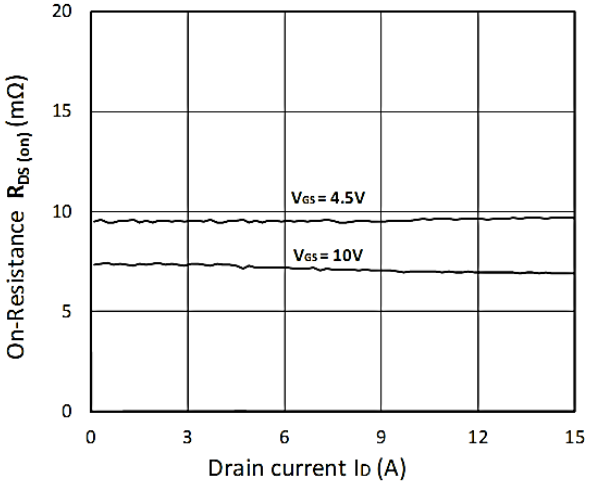


Figure 5. RDS(ON) vs. ID

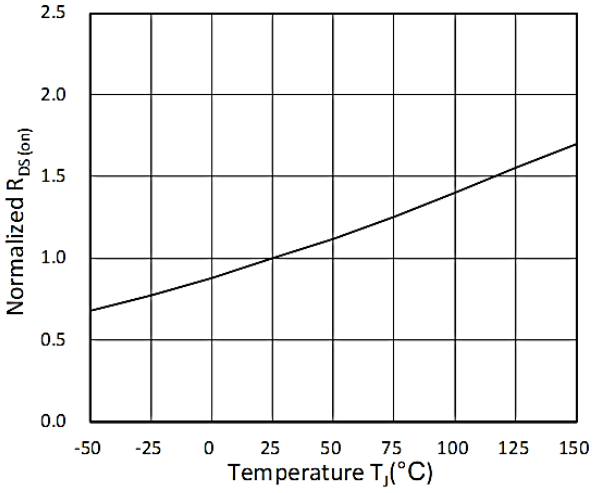


Figure 6. Normalized RDS(on) vs. Temperature

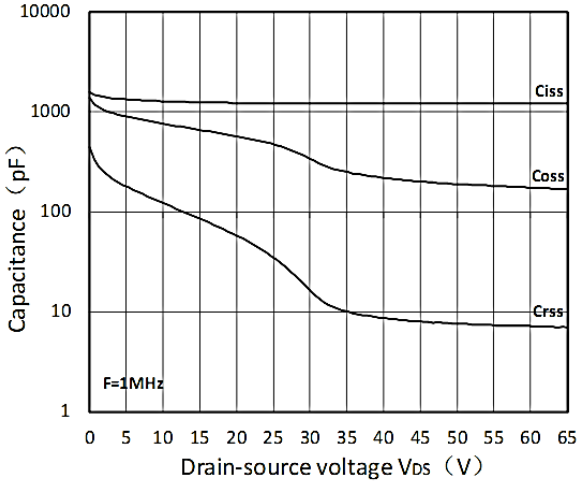


Figure 7. Capacitance Characteristics

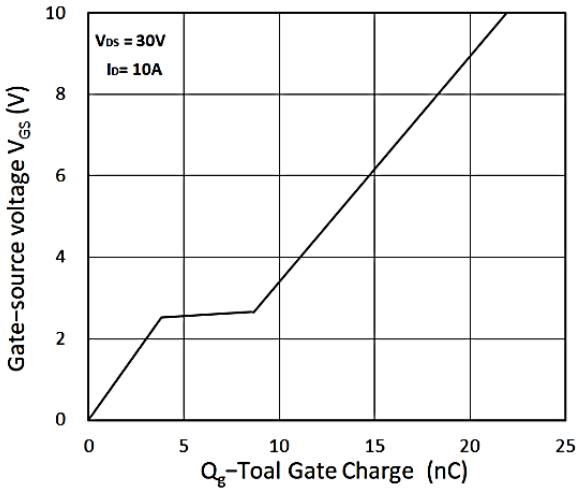


Figure 8. Gate Charge Characteristics

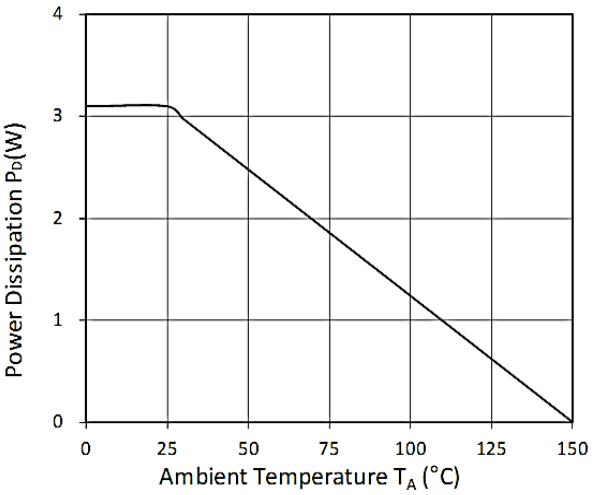


Figure 9. Power Dissipation

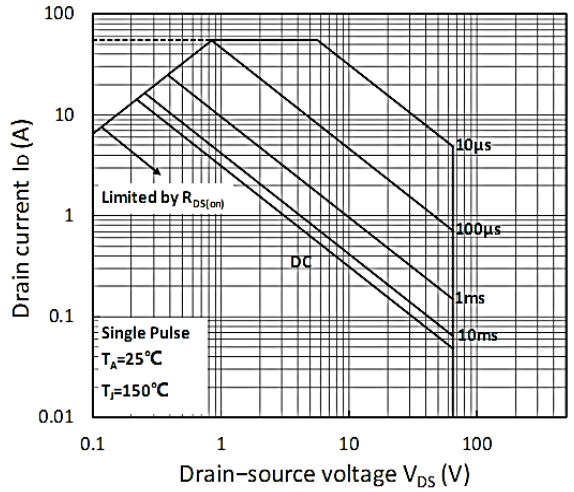


Figure10. Safe Operating Area

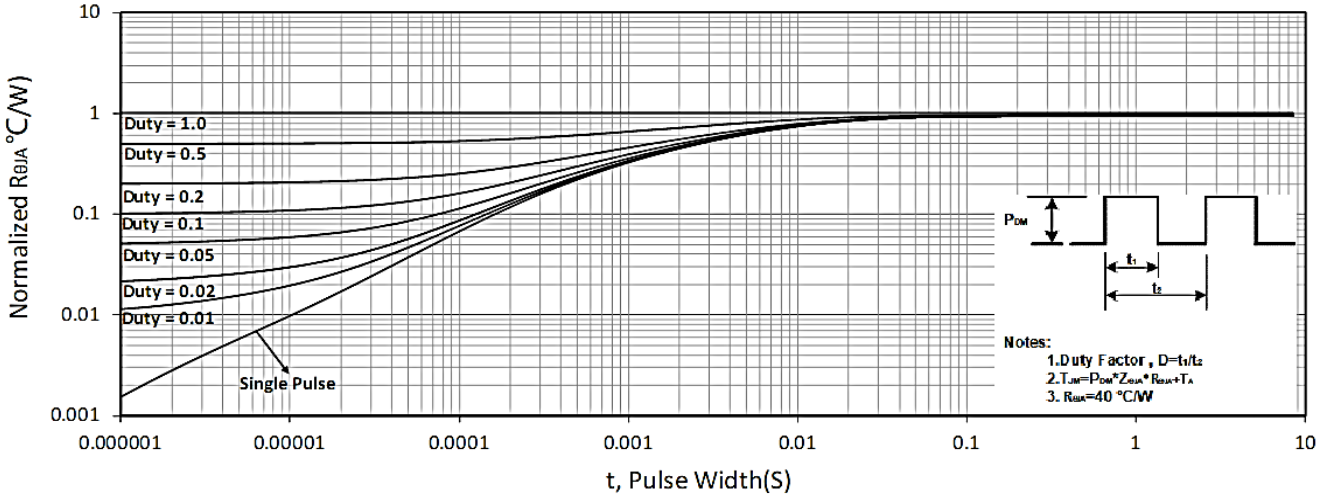
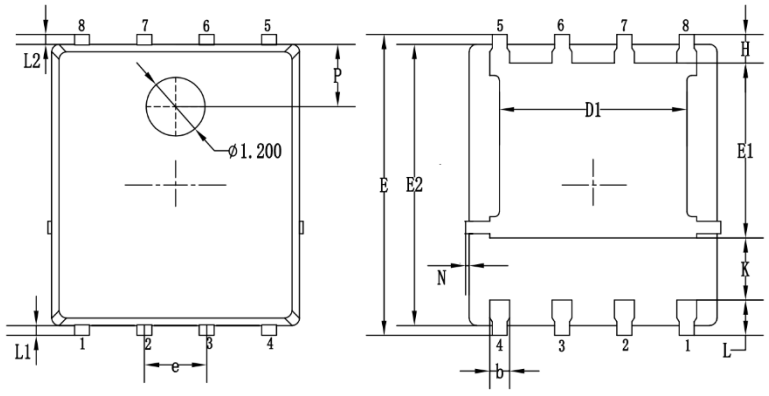
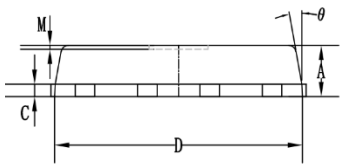


Figure 11. Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-PDFN5*6-8L Single





Symbol	Dim in mm		
	Min	Typ	Max
A	0.9	1.05	1.2
b	0.3	0.4	0.5
C	0.2	0.25	0.35
D	4.9	5.05	5.2
D1	3.72	3.82	4.12
E	5.9	6.1	6.3
E1	3.3	3.5	3.7
E2	5.6	5.75	5.9
e	1.27BSC		
H	0.48	0.58	0.7
K	1.14	1.27	1.4
L	0.54	0.74	0.84
L1/L2	0.1	0.2	0.3
θ	8°	10°	12°
M	0.08REF		
N	0		0.15
P	1.28REF		

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65V N-Channel Enhancement Mode MOSFET

Edition	Date	Change
REV1.0	2019/8/1	Initial release
REV1.1	2024/4/1	Internal Rds