APM
A Power Microelectronics

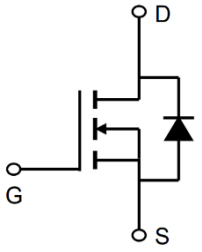
AP90N08NF

85V N-Channel Enhancement Mode MOSFET

Description

The AP90N08NF uses advanced trench 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} = 85V I_D =95A

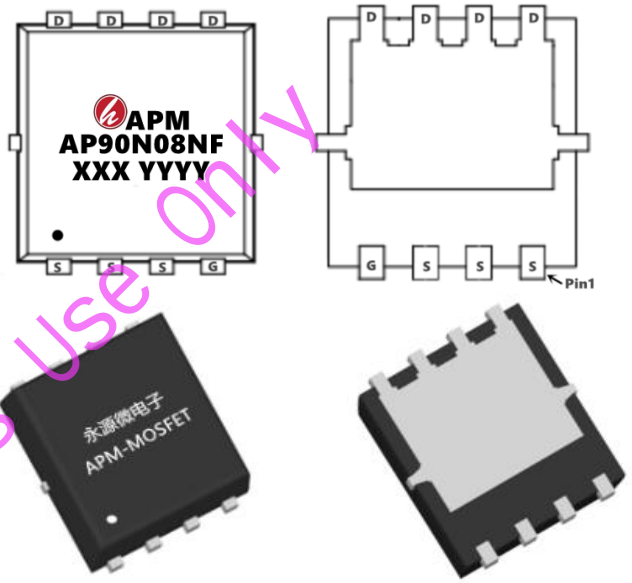
$R_{DS(ON)}$ < 5.2mΩ V_{GS}=10V (Type：4.5mΩ)

Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP90N08NF	PDFN5*6-8L	AP90N08NF XXX YYYY	5000

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	85	V
VGS	Gate-Source Voltage	±20	V
ID@TC=25℃	Continuous Drain Current, VGS @ 10V	95	A
ID@TC=100℃	Continuous Drain Current, VGS @ 10V	75	A
IDM	Pulsed Drain Current	480	A
EAS	Single Pulse Avalanche Energy	560	mJ
IAS	Avalanche Current	43.4	A
PD@TC=25℃	Total Power Dissipation4	180	W
TSTG	Storage Temperature Range	-55 to 150	℃
TJ	Operating Junction Temperature Range	-55 to 150	℃
RθJA	Thermal Resistance Junction-Ambient	0.70	℃/W
RθJC	Thermal Resistance Junction-Case	62	℃/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V(BR)DSS	Drain-source breakdown voltage	V_{GS}=0V, I_D=250uA	80	92		V
VGS(th)	Gate threshold voltage	V_{DS}=V_{GS},I_D=250uA T_j=25°C	2.0	3.0	4.0	V
IDSS	Zero gate voltage drain current	V_{DS}=80V,V_{GS}=0V T_j=25°C	-		1	μA
IDSS	Zero gate voltage drain current	V_{DS}=80V,V_{GS}=0V T_j=125°C		- 5		μA
IGSS	Gate-source leakage current	V_{GS}=20V,V_{DS}=0V	-	-	100	nA
RDS(on)	Drain-source on-state resistance	V_{GS}=10V, I_D=50A,T_j=25°C	-	4.5	5.2	mΩ
gfs	Transconductance	V_{DS}=5V,I_D=50A	-	80	-	S
Ciss	Input Capacitance	V_{GS}=0V, V_{DS}=40V, f=1MHz	-	4032	-	pF
Coss	Output Capacitance		-	546	-	pF
Crss	Reverse Transfer Capacitance	V_{GS}=10V, V_{DS}=40V,I_D=25A	-	35	-	pF
Q_G	Gate Total Charge		-	65.7	-	nC
Qgs	Gate-Source charge		-	24.9	-	nC
Qgd	Gate-Drain charge		-	13.9	-	nC
td(on)	Turn-on delay time	T_J=25°C, V_{GS}=10V, V_{DS}=40V, R_L=3Ω	-	20.1	-	ns
t_r	Rise time		-	38	-	ns
td(off)	Turn-off delay time		-	45.1	-	ns
t_f	Fall time		-	21	-	ns
R_G	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	2	-	Ω
VSD	Body Diode Forward Voltage	V_{GS}=0V,I_{SD}=50A	-	0.9	1.2	V
trr	Body Diode Reverse Recovery Time	I_F=20A, dI/dt=500A/μs	-	61	-	ns
Qrr	Body Diode Reverse Recovery Charge	I_F=20A, dI/dt=500A/μs	-	340	-	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 .The EAS data shows Max. rating .
3、The test cond≦300us duty cycle ≦ 2%, duty cycle ition is V_{DD}=64V_{GS}=10V,L=0.1mH,I_{AS}=53.8A
4、The power dissipation is limited by 175℃ 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

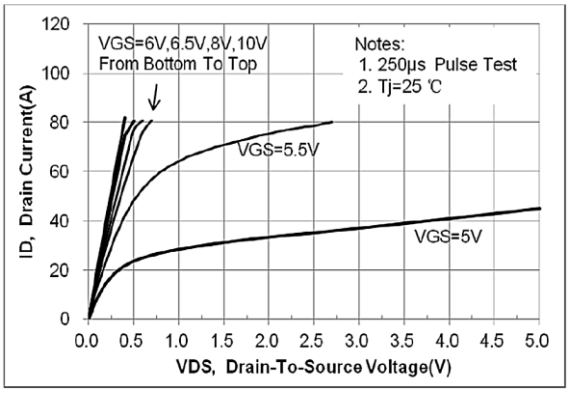


Figure 1. Typ. Output Characteristics (Tj=25 ℃)

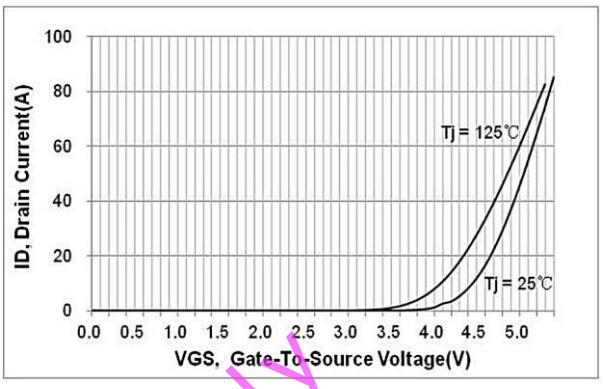


Figure 2. Transfer Characteristics

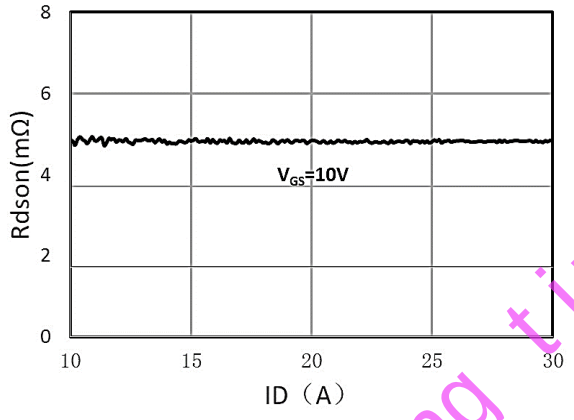


Figure 3. On-Resistance vs. Drain Current and Gate Voltage Figure

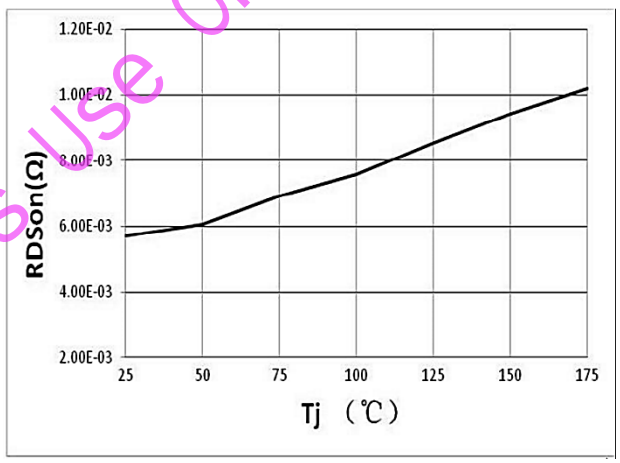


Figure 4. On-Resistance vs. Junction Temperature

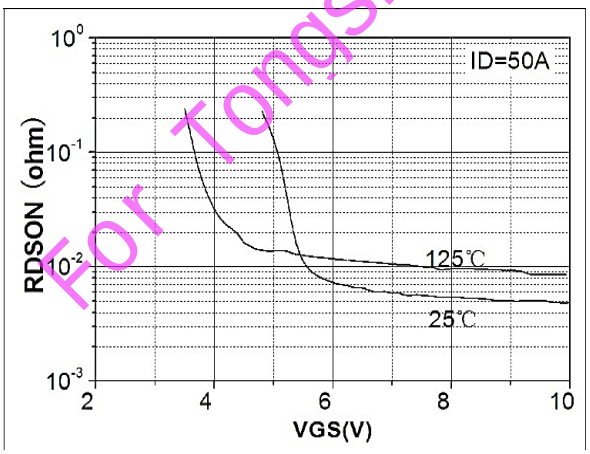


Figure 5. On-Resistance vs. Gate-Source Voltage

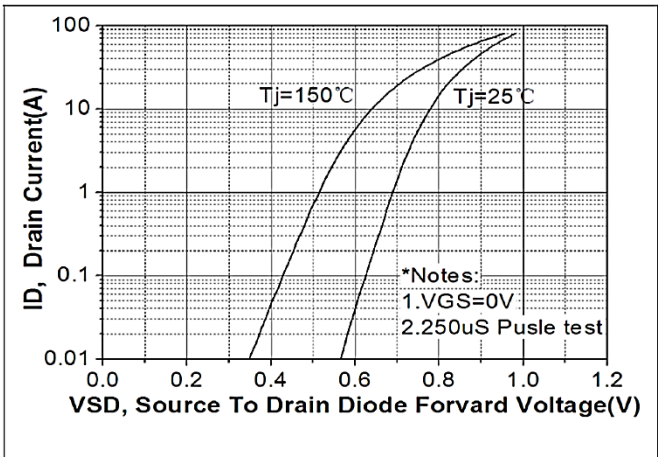


Figure 6 . Body-Diode Characteristics

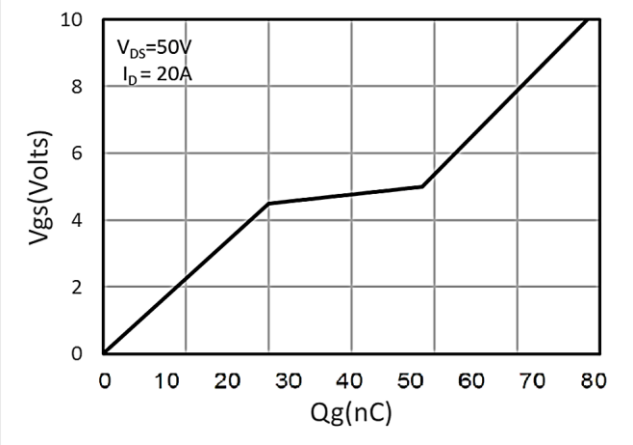


Figure 7. Gate-Charge Characteristics

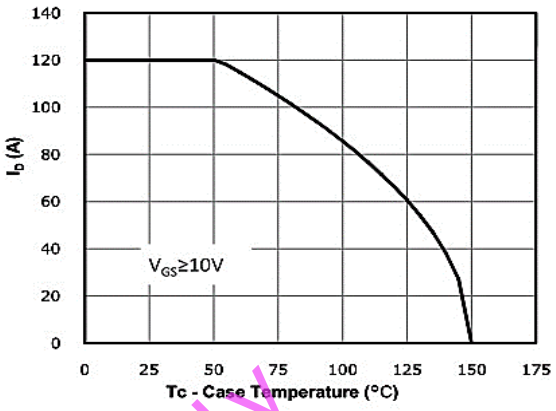


Figure 8. Drain Current Derating

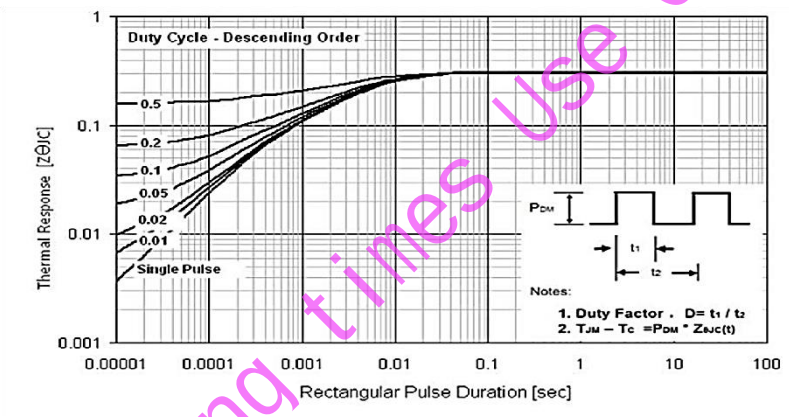


Figure 9: Normalized Maximum Transient Thermal Impedance

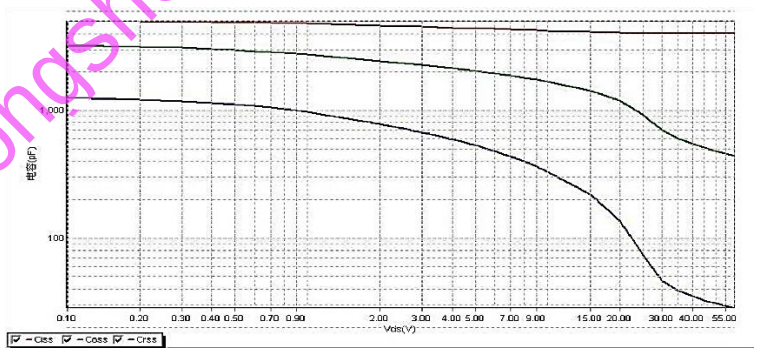
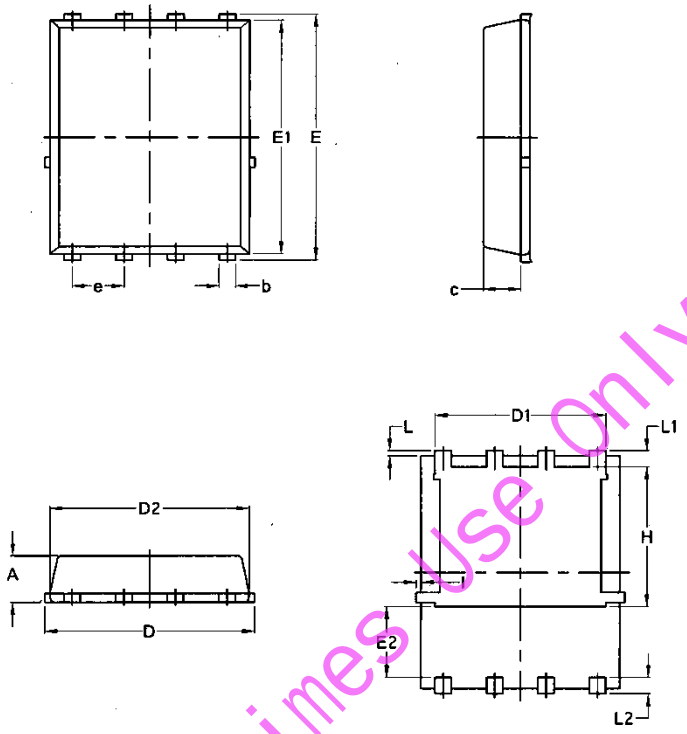


Figure 10. Capacitance Characteristics

Package Mechanical Data-DFN5*6-8L-JQ Single



Symbol	Common			
	mm		Inch	
	Mim	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070

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Edition	Date	Change
Rve1.0	2020/12/1	Initial release