

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.

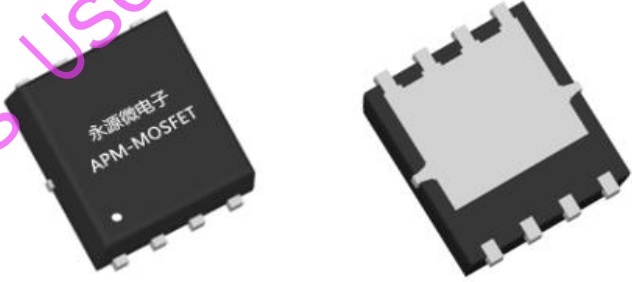
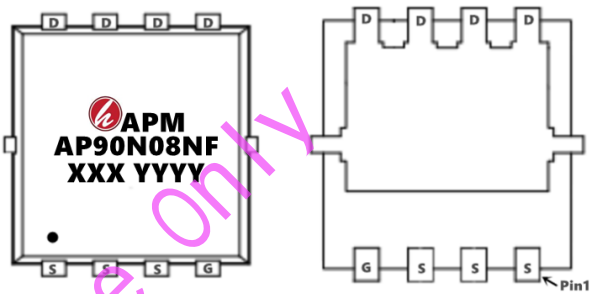
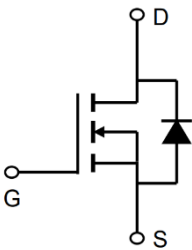
General Features

$V_{DS} = 85V$ $I_D = 95A$

$R_{DS(ON)} < 5.2m\Omega$ $V_{GS}=10V$ (Type: 4.5m Ω)

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°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	85	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Continuous Drain Current, V _{GS} @ 10V	95	A
I _D @T _C =100°C	Continuous Drain Current, V _{GS} @ 10V	75	A
I _{DM}	Pulsed Drain Current	480	A
E _{AS}	Single Pulse Avalanche Energy	560	mJ
I _{AS}	Avalanche Current	43.4	A
P _D @T _C =25°C	Total Power Dissipation ⁴	180	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C
R _{θJA}	Thermal Resistance Junction-Ambient	0.70	°C/W
R _{θJC}	Thermal Resistance Junction-Case	62	°C/W



85V N-Channel Enhancement Mode MOSFET

Electrical Characteristics (T_J=25°C, 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
Q _{gs}	Gate-Source charge		-	24.9	-	nC
Q _{gd}	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 inch² 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°C 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

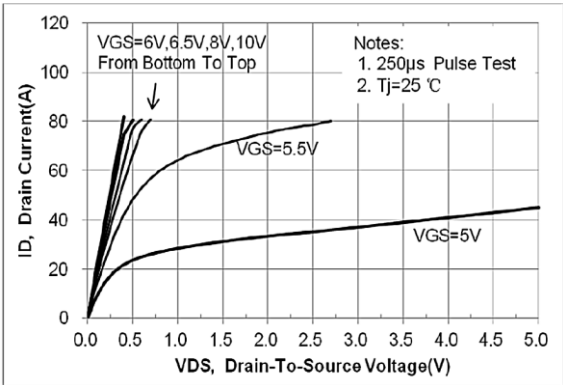


Figure 1. Typ. Output Characteristics (Tj=25 °C)

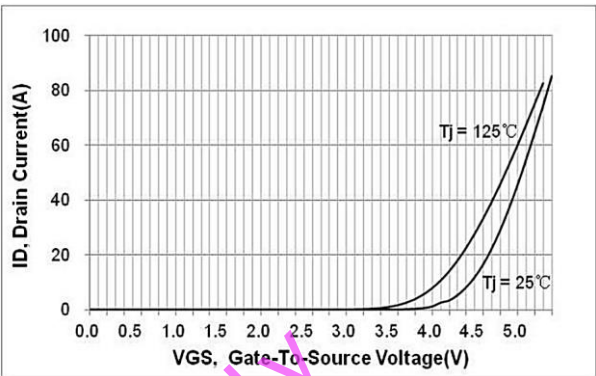


Figure 2. Transfer Characteristics

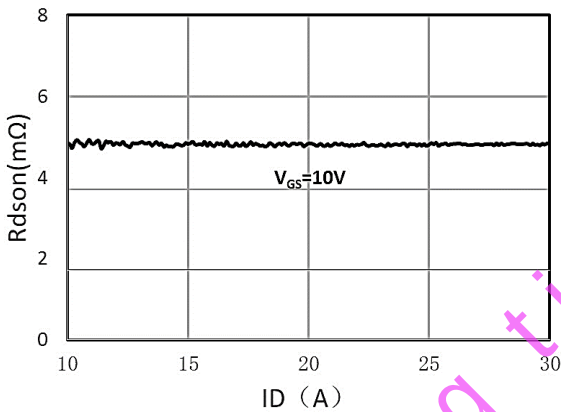


Figure 3. On-Resistance vs. Drain Current and Gate Voltage Figure

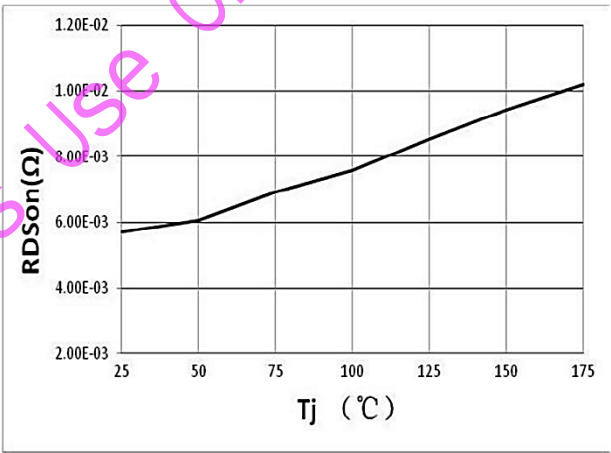


Figure 4. On-Resistance vs. Junction Temperature

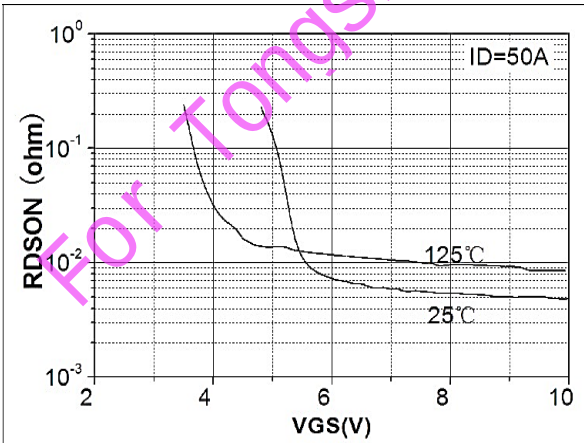


Figure 5. On-Resistance vs. Gate-Source Voltage

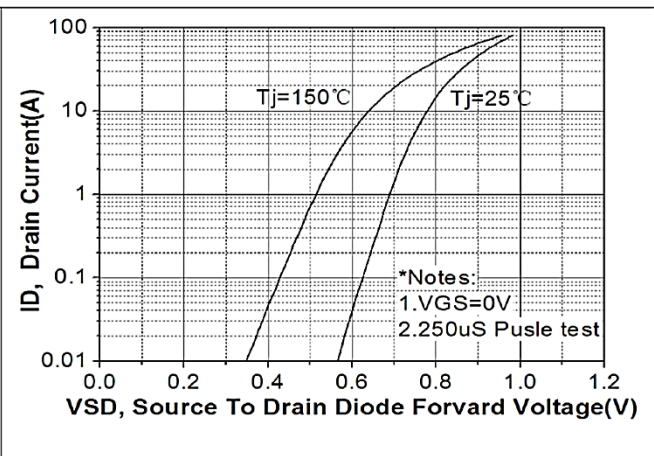


Figure 6 . Body-Diode Characteristics

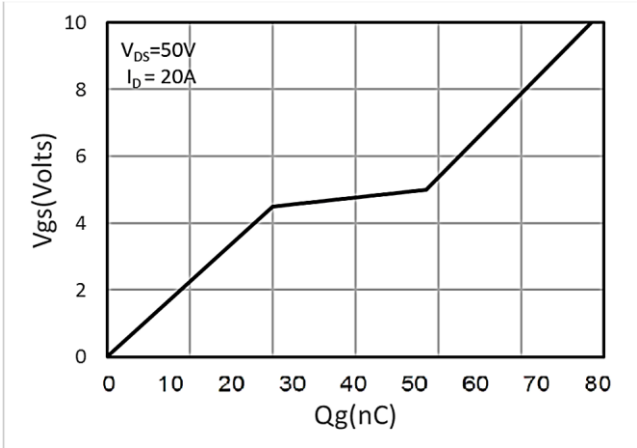


Figure 7. Gate-Charge Characteristics

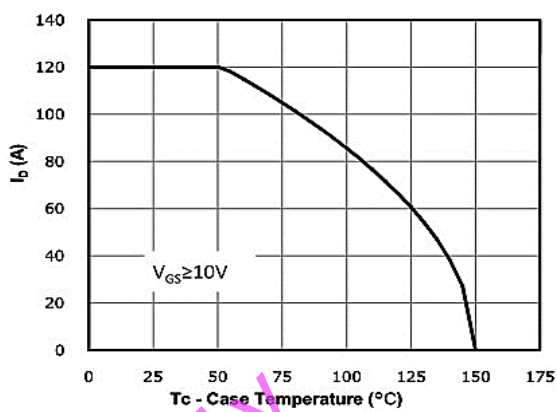


Figure 8. Drain Current Derating

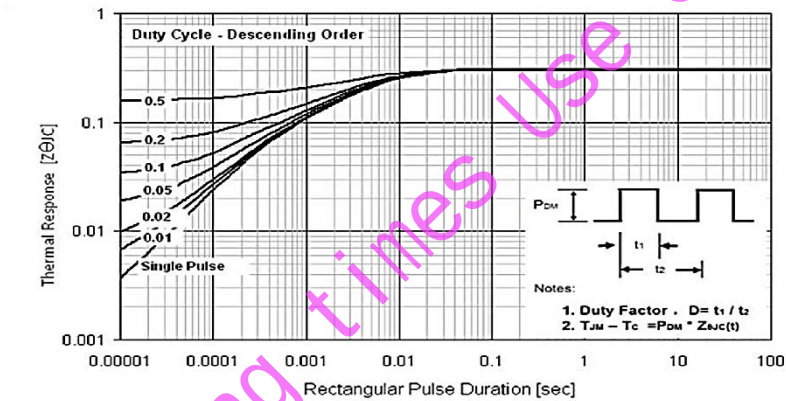


Figure 9: Normalized Maximum Transient Thermal Impedance

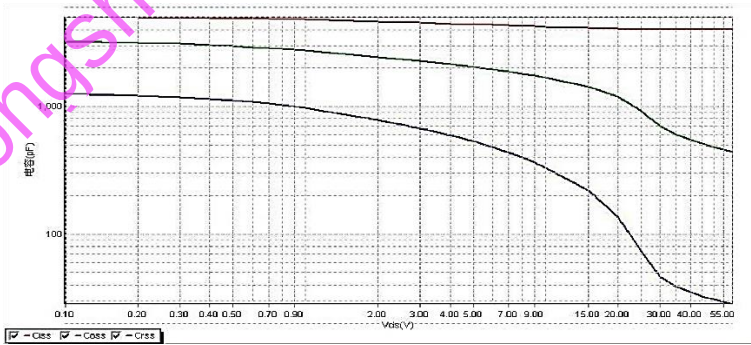
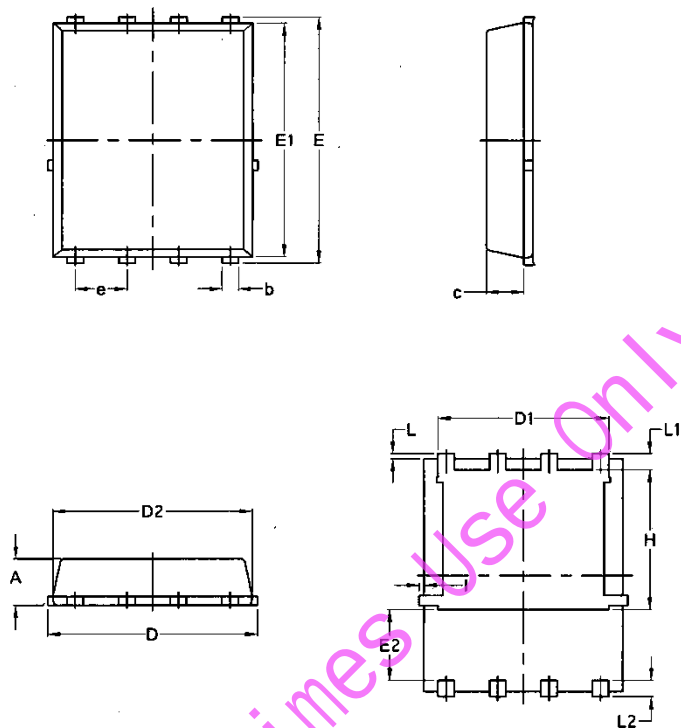


Figure 10. Capacitance Characteristics

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

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