AP90N06NF

60V N-Channel Enhancement Mode MOSFET

Description

The AP90N06NF 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} = 60V I_D =90A

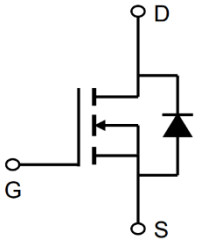
$R_{DS(ON)}$ < 7.0mΩ @ V_{GS}=10V （**Type：5.8mΩ**）

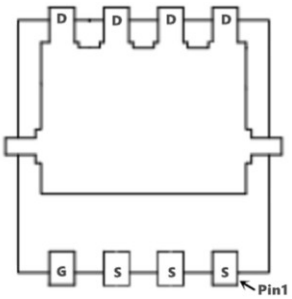
Application

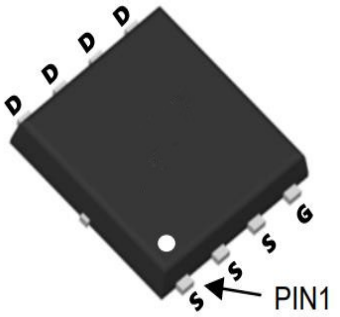
Battery protection

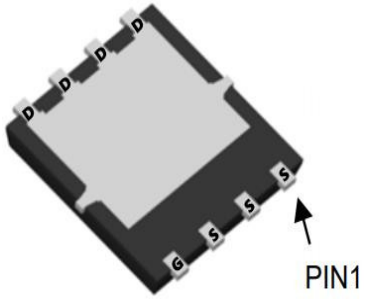
Load switch

Uninterruptible power supply









Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP90N06NF	PDFN5X6-8L	AP90N06NF XXX YYYY	5000

Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Value	Unit
VDS	Drain source voltage	60	V
VGS	Gate source voltage	±20	V
ID	Continuous drain current[1)]	90	A
IDM	Pulsed drain current[2)]	320	A
I_S	Diode forward current	37	A
ISP	Pulsed source current	210	A
P_D	Power dissipation	108	W
EAS	Single pulsed avalanche energy[)]	205.4	mJ
Tstg，Tj	Operation and storage temperature	-55 to 150	℃
RθJC	Thermal resistance, junction-case	1.4	℃/W
RθJA	Thermal resistance, junction-ambient[4)]	25	℃/W

60V N-Channel Enhancement Mode MOSFET

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	60	64	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS}=60V, V_{GS}=0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	2.0	3.0	4.0	V
RDS(on)	Static Drain-Source on-Resistance note	V_{GS}=10V, I_D=30A	-	5.8	7.0	mΩ
C_{iss}	Input Capacitance	V_{DS}=30V, V_{GS}=0V, f=1.0MHz	-	4136	-	pF
Coss	Output Capacitance		-	286	-	pF
Crss	Reverse Transfer Capacitance		-	257	-	pF
Q_g	Total Gate Charge	V_{DS}=30V, I_D=30A, V_{GS}=10V	-	90	-	nC
Q_{gs}	Gate-Source Charge		-	9	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	18	-	nC
td(on)	Turn-on Delay Time	V_{DS}=30V, I_D=30A, R_G=1.8Ω, V_{GS}=10V	-	9	-	ns
t_r	Turn-on Rise Time		-	7	-	ns
td(off)	Turn-off Delay Time		-	40	-	ns
t_f	Turn-off Fall Time		-	15	-	ns
IS	Maximum Continuous Drain to Source Diode ForwardCurrent		-	-	90	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	320	A
VSD	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F=30A, dI/dt=100A/μs	-	33	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	46	-	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 TJ =25℃, VDD =35V, VG =10V, R G =25Ω, L=0.5mH, IAS =21A
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.

Electrical Characteristics Diagrams

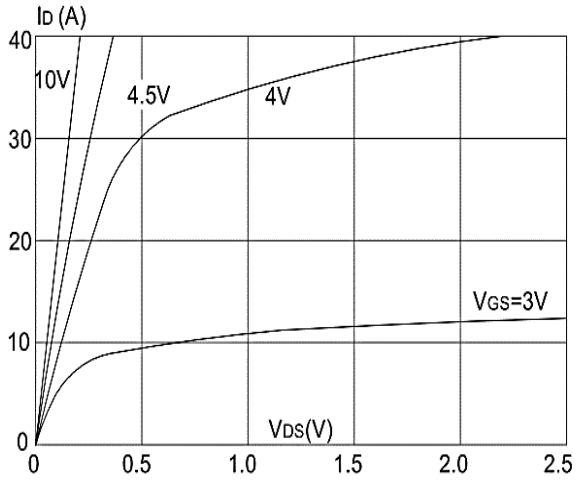


Figure1: Output Characteristics

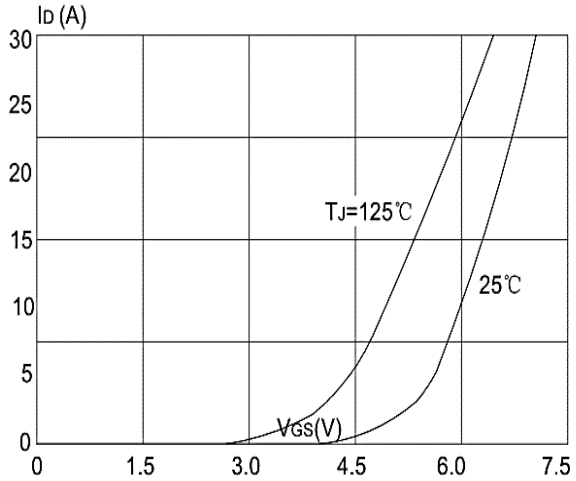


Figure 2: Typical Transfer Characteristics

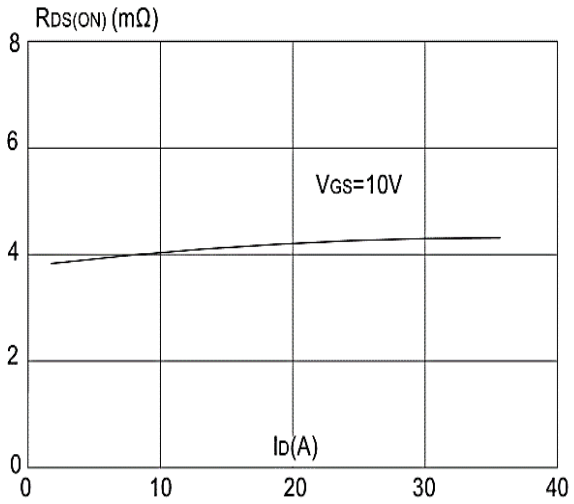


Figure 3:On-resistance vs. Drain Current

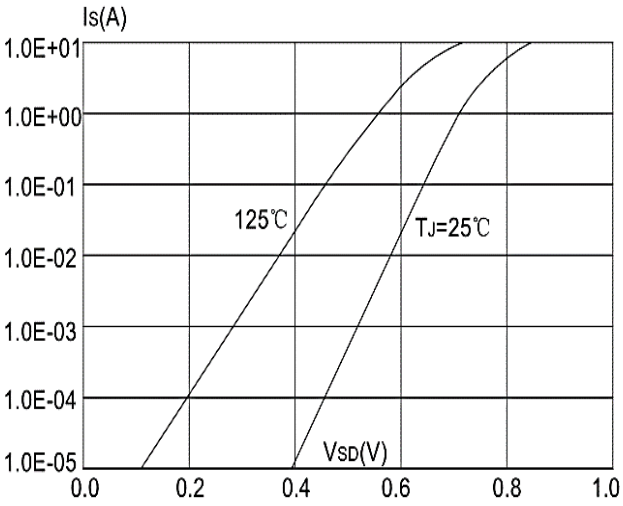


Figure 4: Body Diode Characteristics

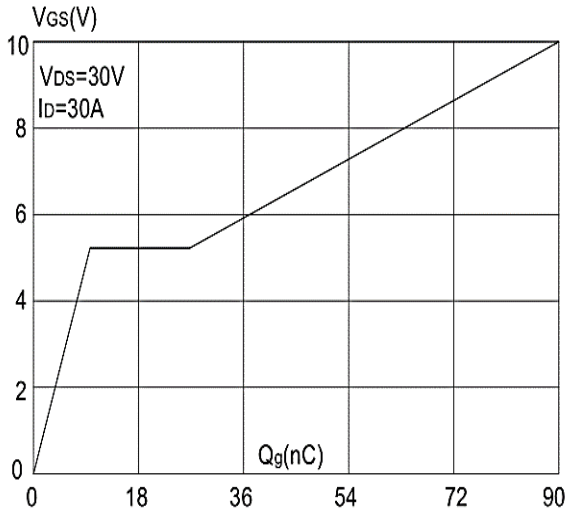


Figure 5: Gate Charge Characteristics

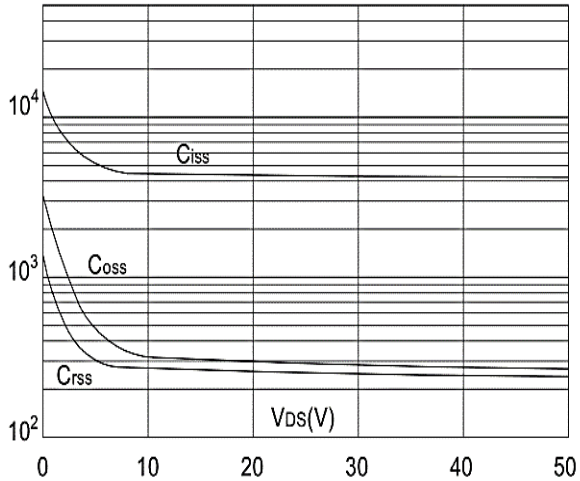


Figure 6: Capacitance Characteristics

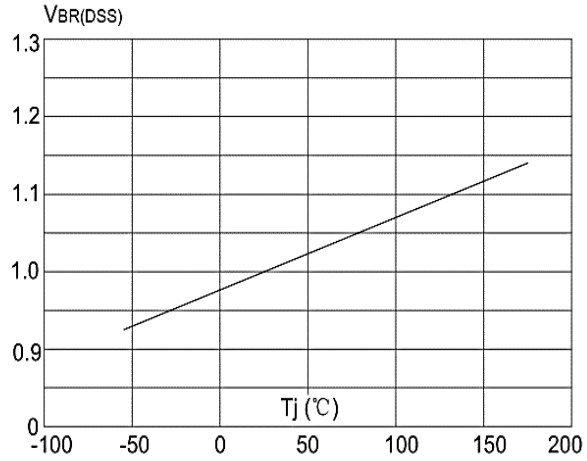


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

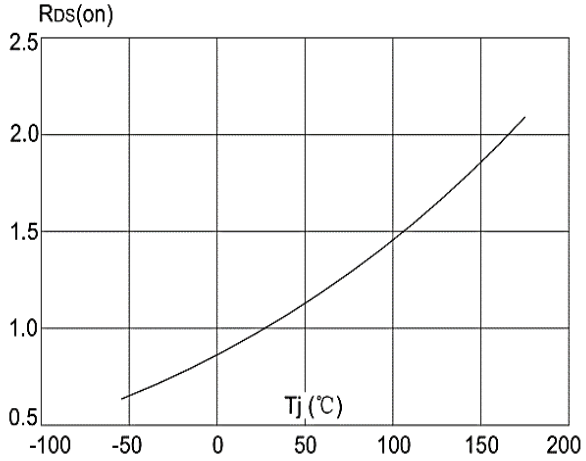


Figure 8: Normalized on Resistance vs. Junction Temperature

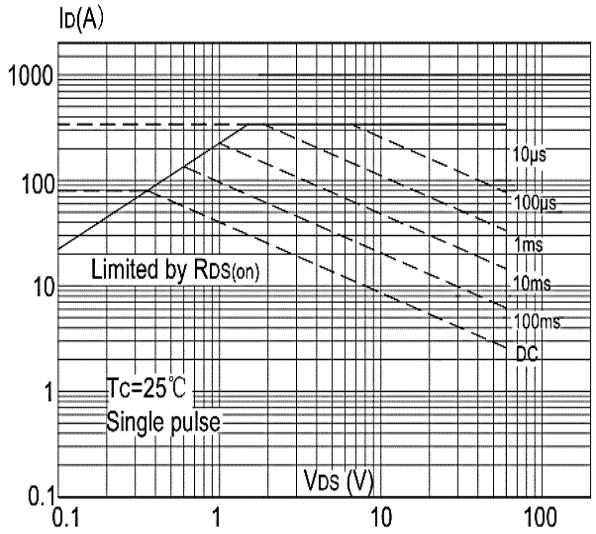


Figure 9: Maximum Safe Operating Area

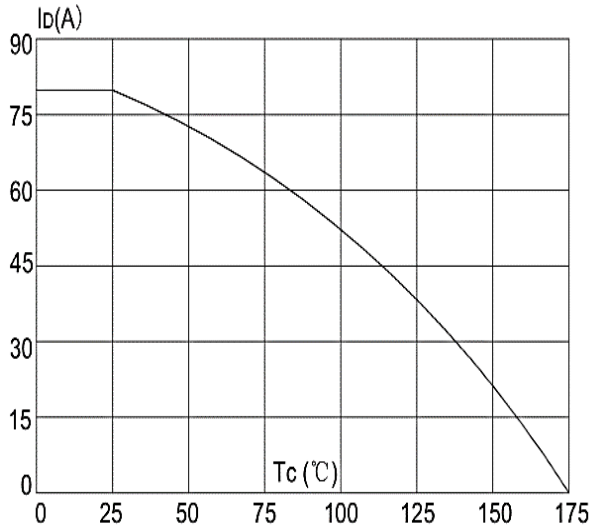


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

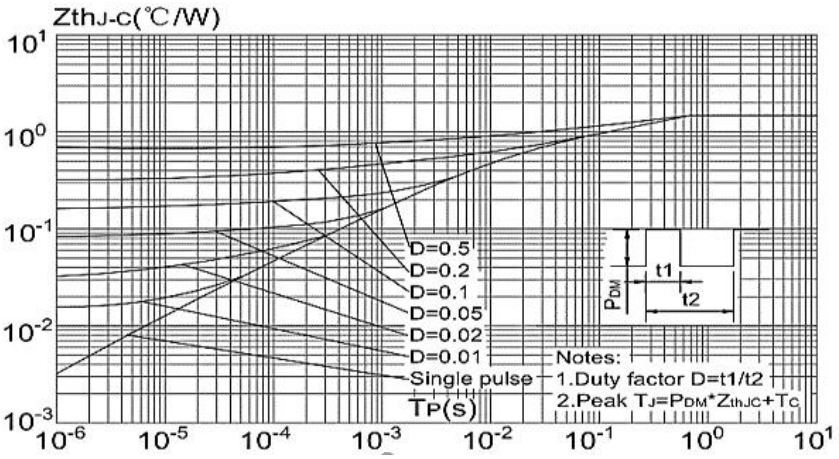
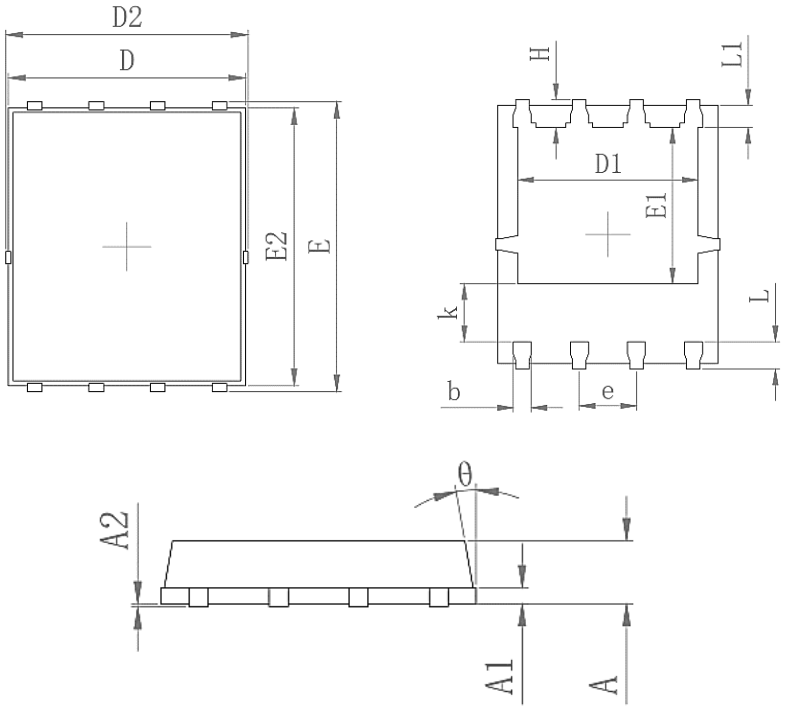


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

60V N-Channel Enhancement Mode MOSFET

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°