

65V N-Channel Enhancement Mode MOSFET

Description

The AP60N06NF uses advanced **APM-SGT11** 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

$V_{DS} = 65V$ $I_D = 60A$

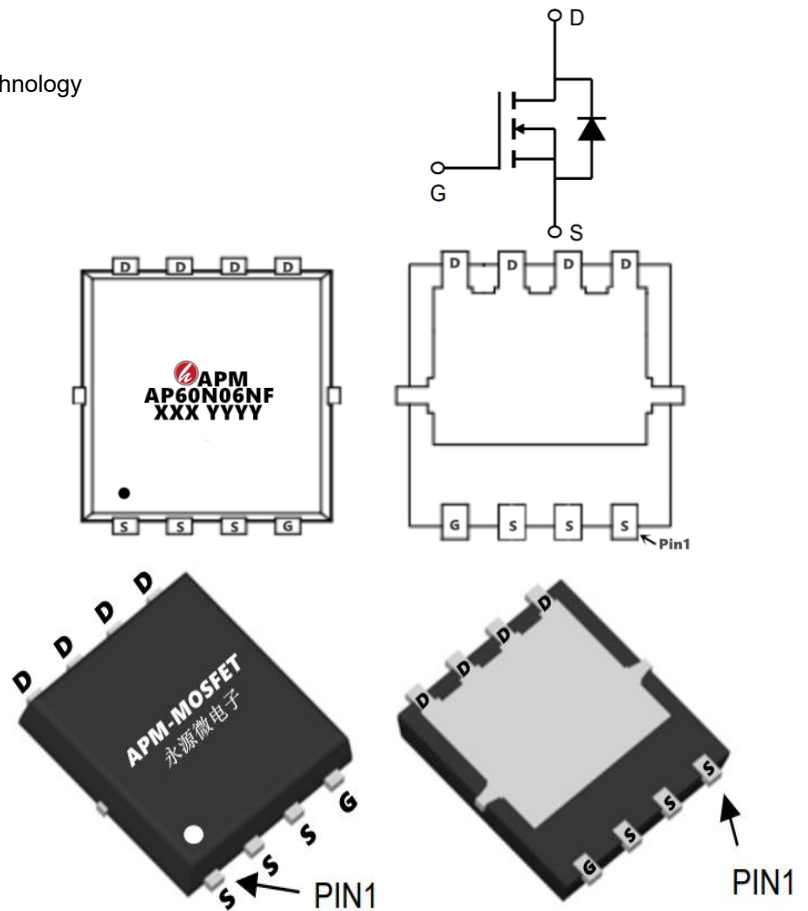
$R_{DS(ON)} < 13m\Omega$ @ $V_{GS}=10V$ (**Type: 9.5mΩ**)

Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP60N06NF	PDFN5*6-8L	AP60N06NF XXX YYYY	5000

Absolute Maximum Ratings ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	65	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C=25^\circ C$	Continuous Drain Current ^{1,6}	60	A
$I_D @ T_C=100^\circ C$	Continuous Drain Current ^{1,6}	24	A
I_{DM}	Pulsed Drain Current ²	180	A
E_{AS}	Single Pulse Avalanche Energy ³	20	mJ
$P_D @ T_C=25^\circ C$	Total Power Dissipation ⁴	31	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	4.0	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	85	$^\circ C/W$

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Electrical Characteristics (T_J=25°C, 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	-	9.5	13	mΩ
RDS(on)	Drain-Source On-Resistance ⁴	V _{GS} =4.5V, I _D =10A		13	18	mΩ
gfs	Forward Transconductance ⁴	V _{DS} = 10V, I _D = 10A	-	81	-	S
Ciss	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f =1MHz	-	731	-	pF
Coss	Output Capacitance		-	224	-	
Crss	Reverse Transfer Capacitance		-	7.4	-	
R _g	Gate Resistance	f=1MHz	-	2.5	-	Ω
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =30V, I _D = 20A	-	13.9	-	nC
Q _{gs}	Gate-Source Charge		-	1.6	-	
Q _{gd}	Gate-Drain Charge		-	3.1	-	
td(on)	Turn-On Delay Time	V _{GS} =10V, V _{DD} =30V, R _G = 1.5Ω, I _D =15A	-	3.7	-	ns
t _r	Rise Time		-	4.3	-	
td(off)	Turn-Off Delay Time		-	16.2	-	
t _f	Fall Time		-	6.5	-	
trr	Body Diode Reverse Recovery Time	I _F =15A, dI/dt=100A/μs	-	24	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	9.3	-	nC
VSD	Diode Forward Voltage ⁴	I _S =15A, 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=48V,VGS=10V,L=0.1mH,IAS=18A
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation

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Typical Characteristics

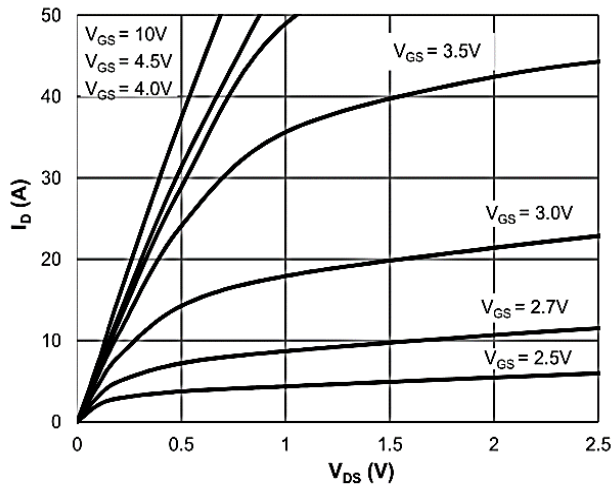


Figure 1: Saturation Characteristics

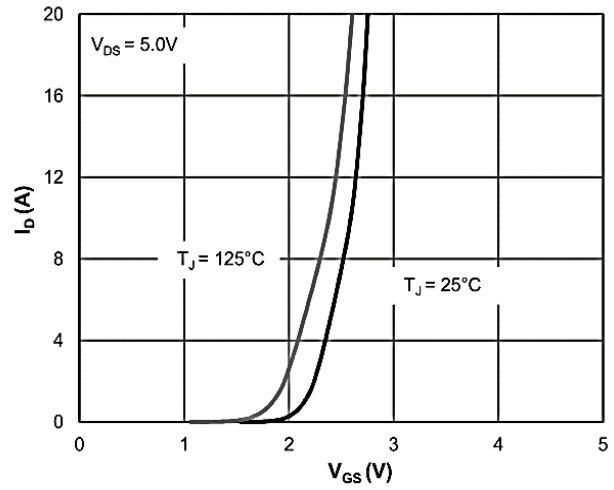


Figure 2: Transfer Characteristics

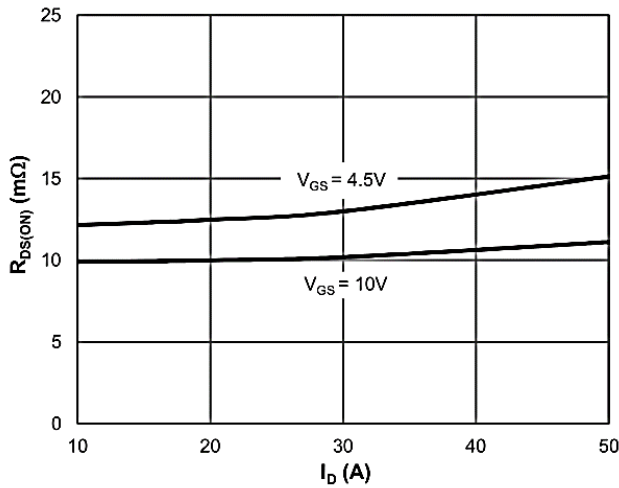


Figure 3: $R_{DS(ON)}$ vs. Drain Current

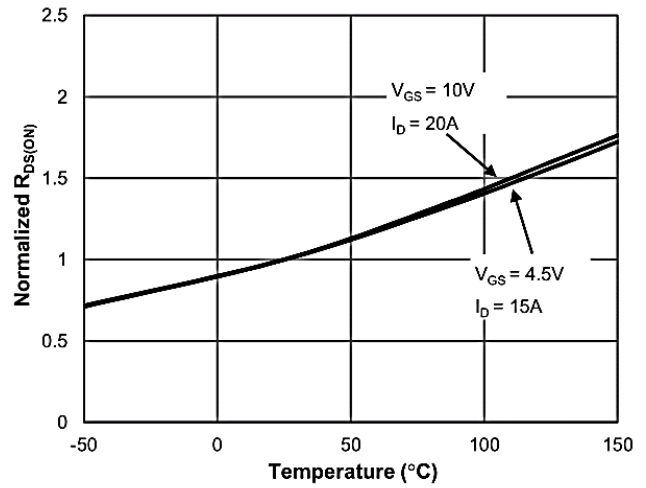


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

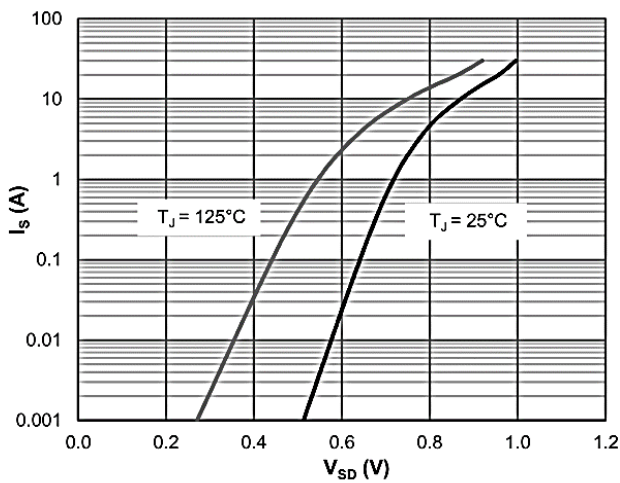


Figure 5: Body-Diode Characteristics

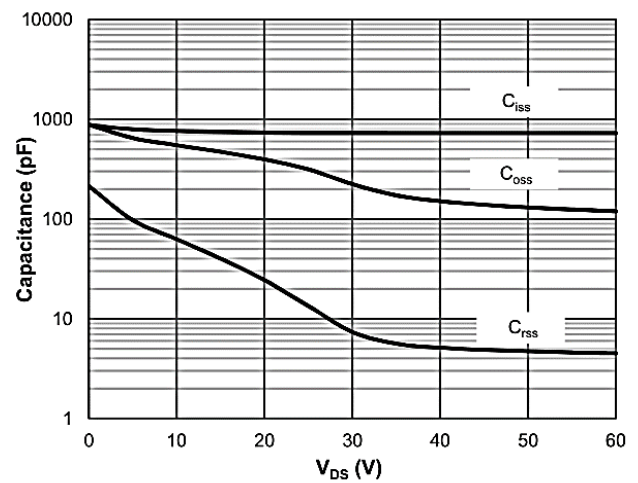


Figure 6: Capacitance Characteristics

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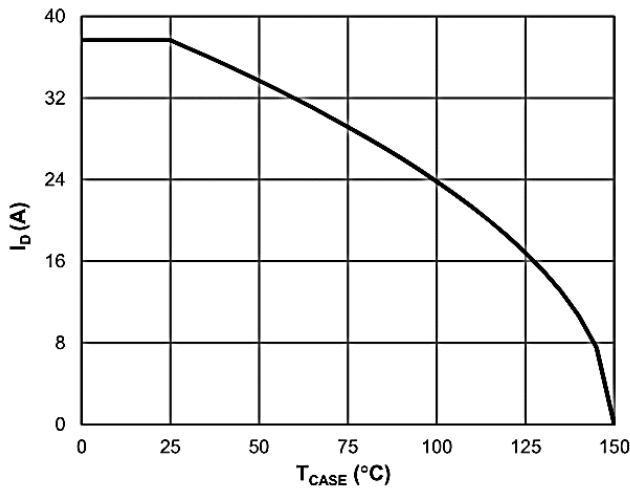


Figure 7: Current De-rating

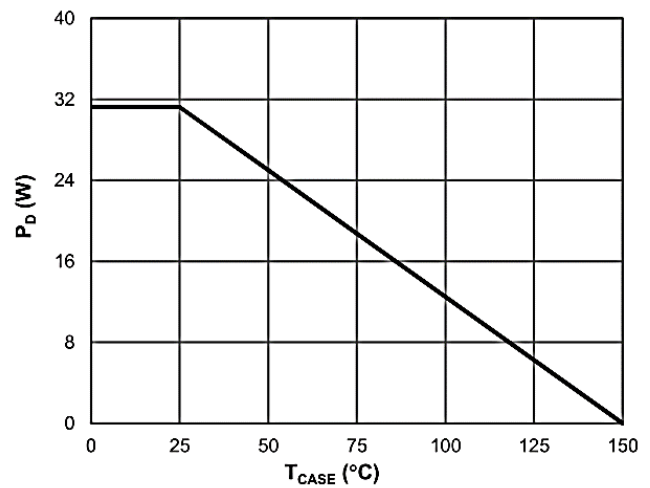


Figure 8: Power De-rating

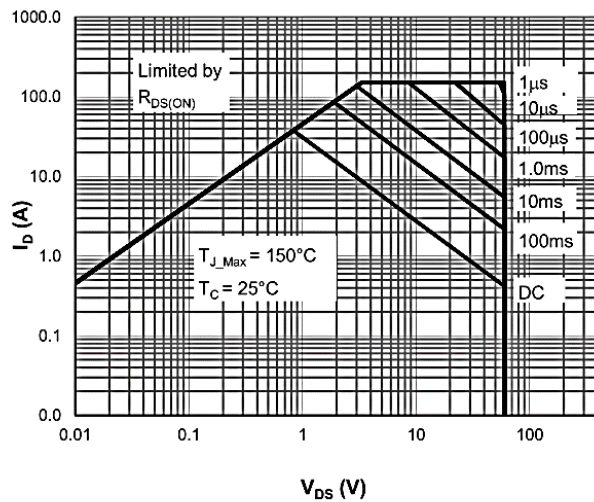


Figure 9: Maximum Safe Operating Area

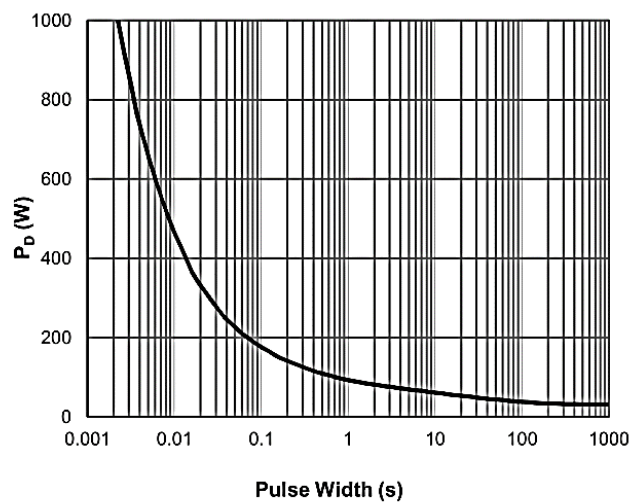


Figure 10: Single Pulse Power Rating, Junction-to-Case

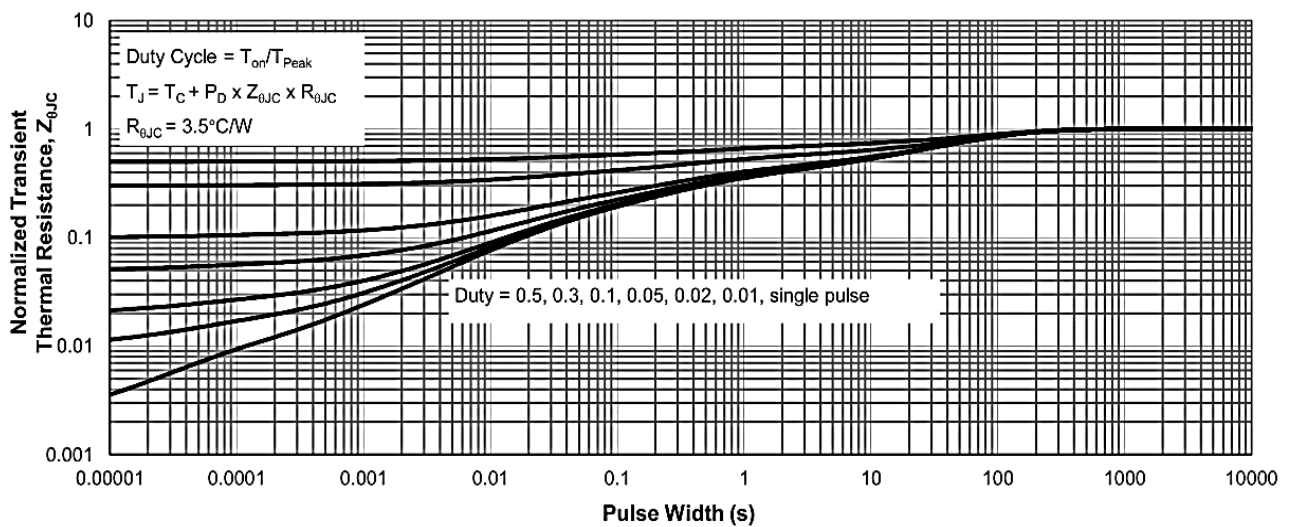
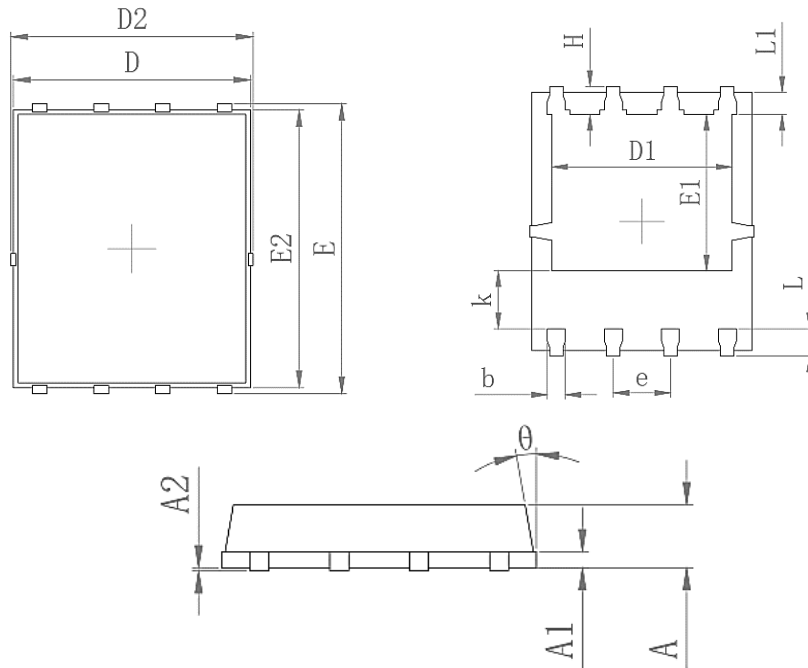


Figure 11: Normalized Maximum Transient Thermal Impedance

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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°

65V N-Channel Enhancement Mode MOSFET**Attention**

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Edition	Date	Change
REV1.0	2023/8/1	Initial release

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