

100V N-Channel Enhancement Mode MOSFET

Description

The AP60N10NF 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

$V_{DS} = 100V$ $I_D = 60A$

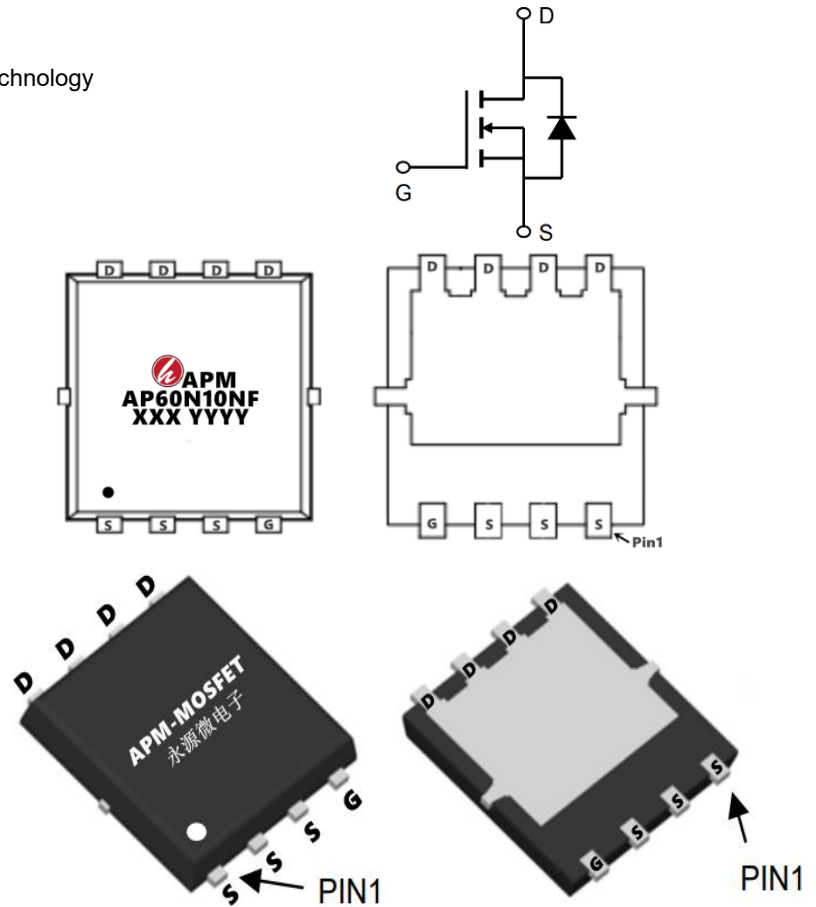
$R_{DS(ON)} < 12m\Omega$ @ $V_{GS}=10V$ (Type: 9m Ω)

Application

DC/DC Converter

LED Backlighting

Power Management Switches



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP60N10NF	PDFN5*6-8L	AP60N10NF XXX YYYY	5000

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	63	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	40	A
IDM	Pulsed Drain Current	252	A
EAS	Single Pulse Avalanche Energy	286	mJ
IAS	Avalanche Current	24	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	83	W
TSTG	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	1.5	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case	25	$^\circ\text{C/W}$

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Electrical Characteristics (T_c=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	ID = 250uA, VGS = 0V	100			V
IDSS	Zero Gate Voltage Drain Current	VDS=100V, VGS = 0V			1.0	uA
IGSS	Gate-Body Leakage Current	VDS=0V, VGS=±20V			±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250uA	1.2	1.6	2.5	V
RDS(ON)	Static Drain-Source ON-Resistance	VGS=10V, ID=10A		9	12	mΩ
		VGS=4.5V, ID=6A		11	15	mΩ
gFS	Forward Transconductance	VDS=5V, ID=20A		48		S
Ciss	Input Capacitance	VGS=0V, VDS=50V, f=1MHz		1372		pF
Coss	Output Capacitance			291		pF
Crss	Reverse Transfer Capacitance			2.0		pF
Rg	Gate Resistance	VGS=0V, VDS=0V, f=1MHz		2.0		Ω
Qg	Total Gate Charge (@ VGS = 10V)	VGS=0 to 10V VDS=50V, ID=10A		21		nC
Qg	Total Gate Charge (@ VGS = 6.0V)			13.9		nC
Qgs	Gate Source Charge			5.4		nC
Qgd	Gate Drain Charge			5.5		nC
tD(on)	Turn-On DelayTime	VGS=10V, VDS=50V RL=2.5Ω, RGEN=6Ω		10.7		ns
tr	Turn-On Rise Time			20		ns
tD(off)	Turn-Off DelayTime			25		ns
tf	Turn-Off Fall Time			19.5		ns
trr	Body Diode Reverse Recovery Time	IF=20A, dIF/dt = 100A/us		48		ns
Qrr	Body Diode Reverse Recovery Charge	IF=20A, dIF/dt = 100A/us		79		nC
IS	Diode Continuous Current	TC = 25°C			63	A
VSD	Diode Forward Voltage	IS = 1A, VGS = 0V		0.7	1.0	V

Notes:

- 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 V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=24A
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

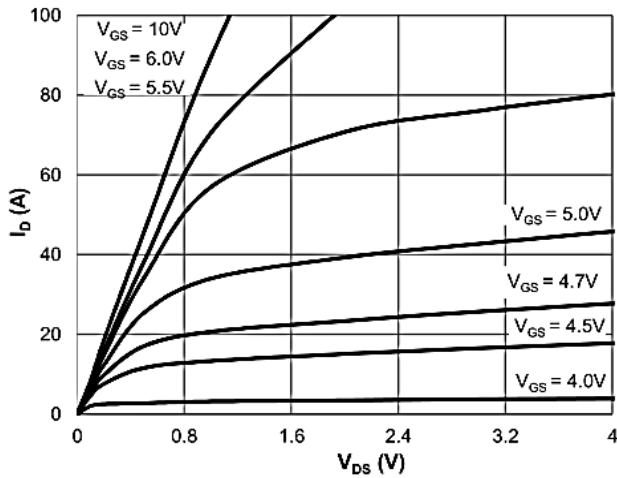


Figure 1: Saturation Characteristics

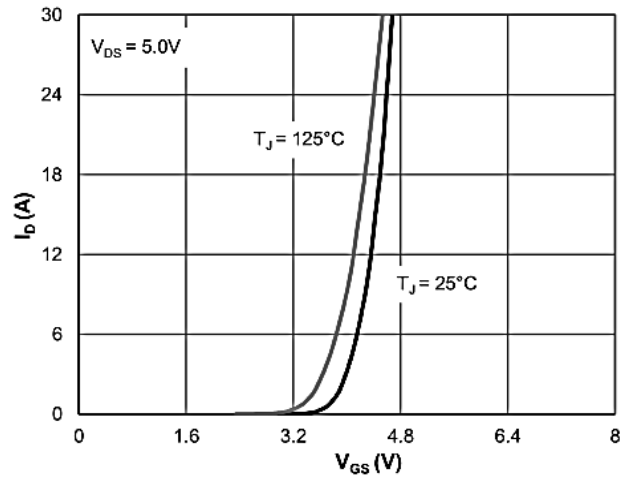


Figure 2: Transfer Characteristics

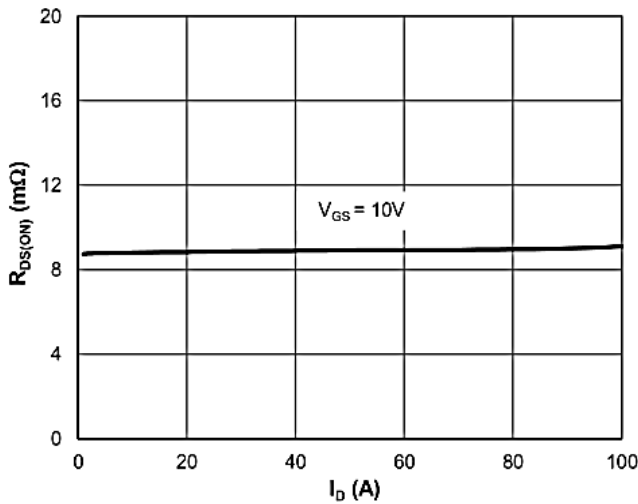


Figure 3: $R_{DS(ON)}$ vs. Drain Current

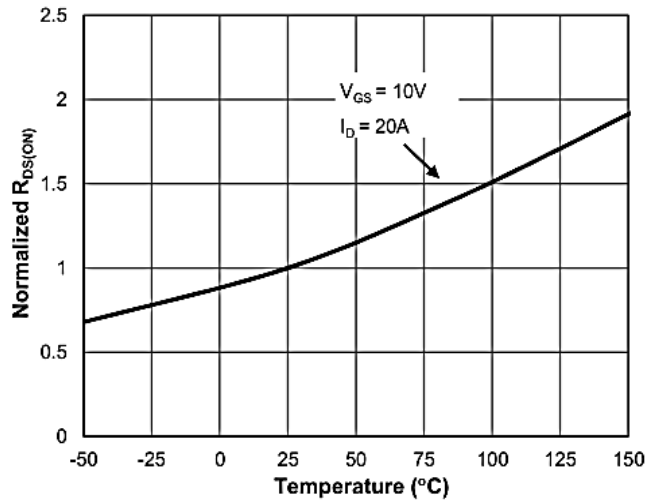


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

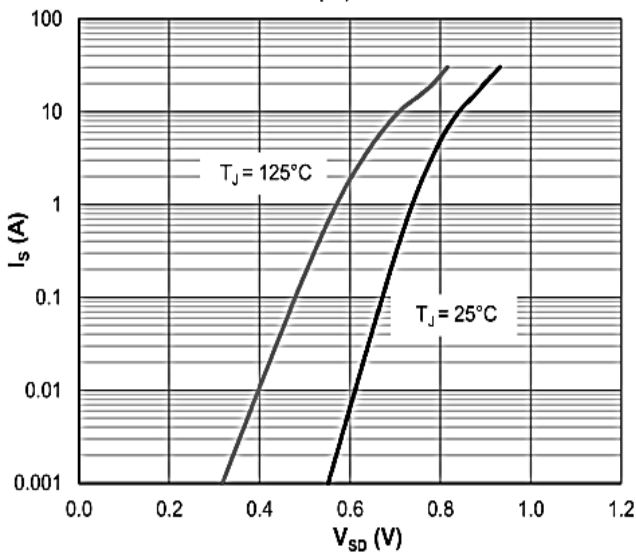


Figure 5: Body-Diode Characteristics

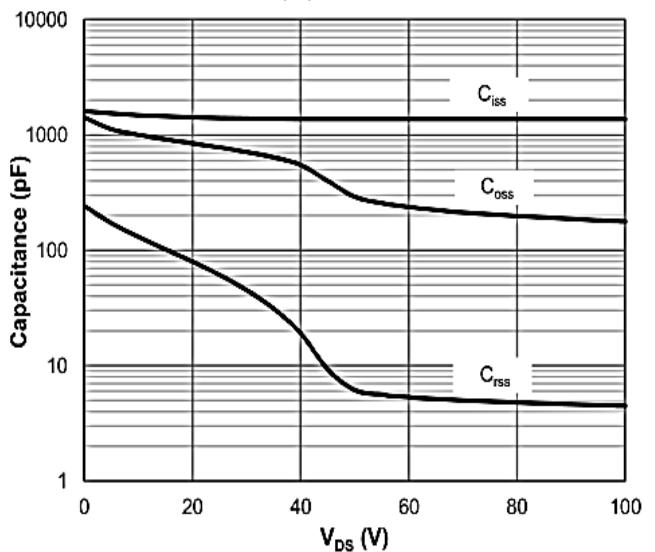


Figure 6: Capacitance Characteristics

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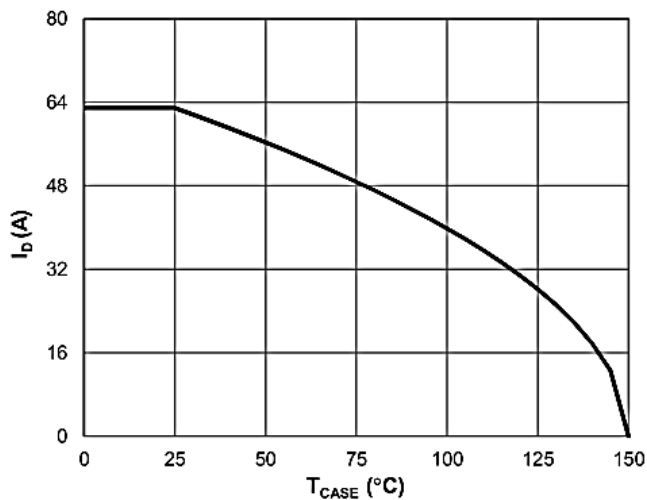


Figure 7: Current De-rating

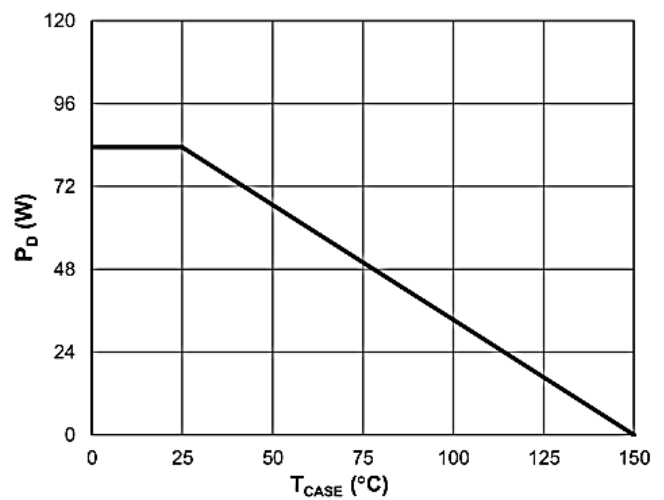


Figure 8: Power De-rating

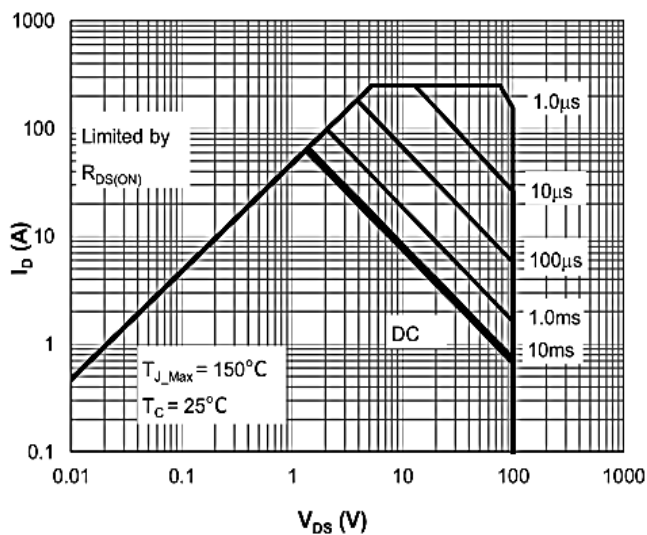


Figure 9: Maximum Safe Operating Area

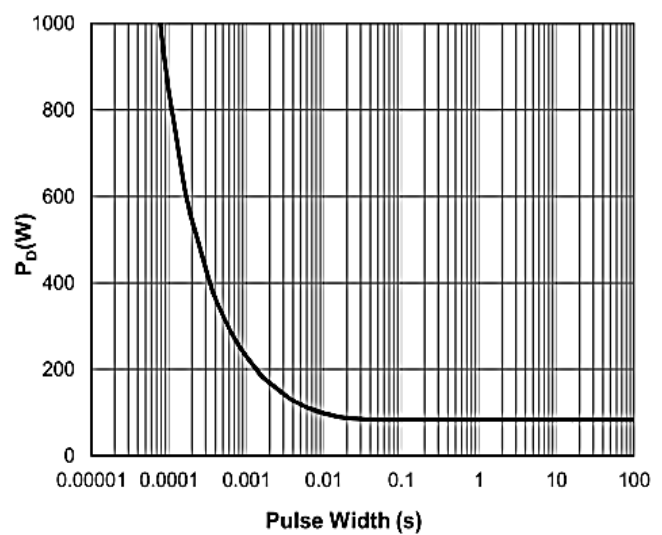


Figure 10: Single Pulse Power Rating, Junction-to-Case

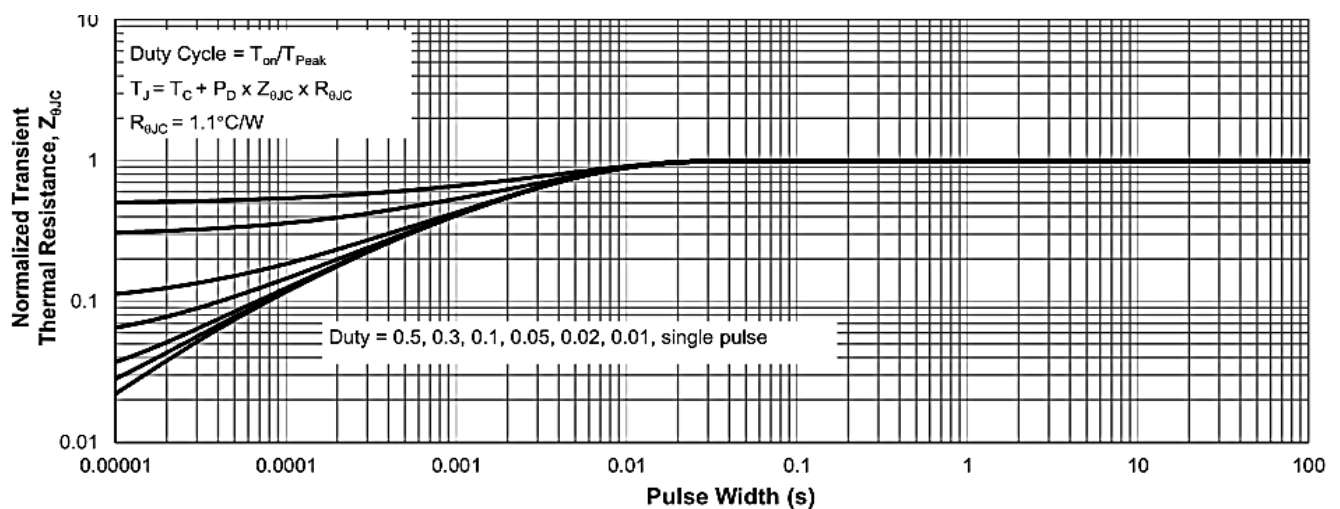
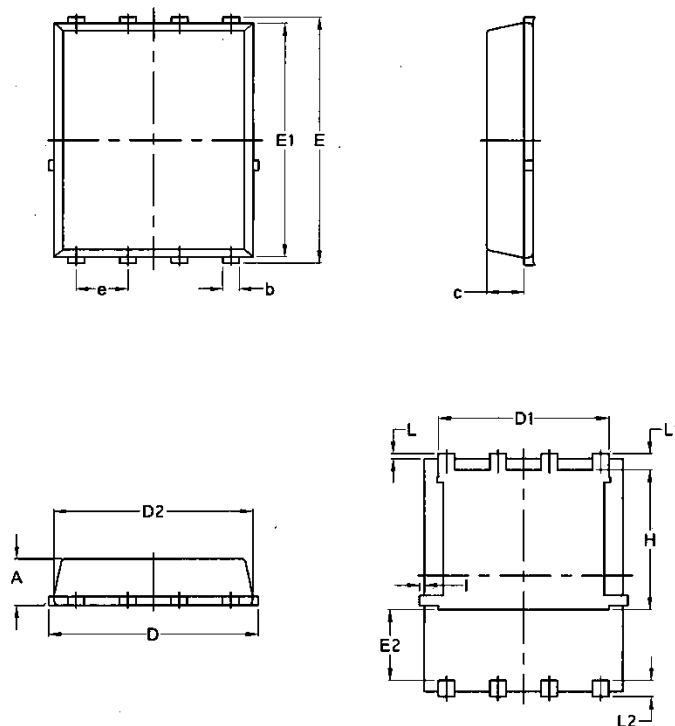


Figure 11: Normalized Maximum Transient Thermal Impedance

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
REV1.0	2023/11/24	Initial release

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