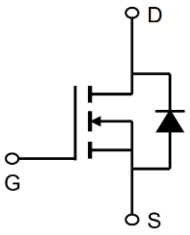
AP110N03NF

30V N-Channel Enhancement Mode MOSFET

Description

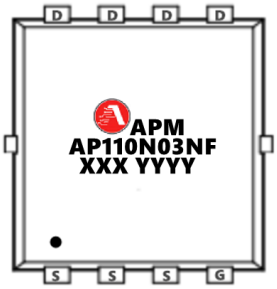
The AP110N03NF uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

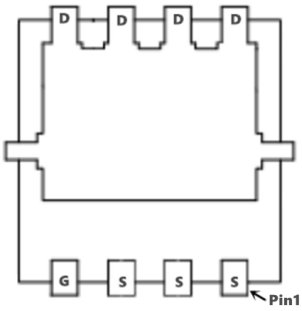


General Features

V_{DS}=30V I_D =110A

$R_{DS(ON)}$ < 2.2mΩ @ V_{GS}=10V **(Type：1.7mΩ)**



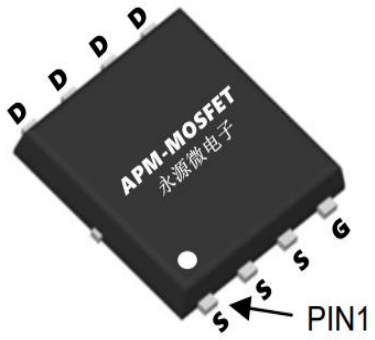


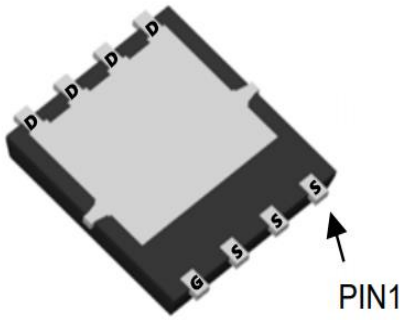
Application

Battery protection

Load switch

Uninterruptible power supply





Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP110N03NF	PDFN5*6-8L	AP110N03NF XXXX YYYY	5000

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	110	A
I_D@T_C=75℃	Continuous Drain Current, V_{GS} @ 10V[1]	76	A
I_{DM}	Pulsed Drain Current[2]	480	A
EAS	Single Pulse Avalanche Energy[3]	289	mJ
I_{AS}	Avalanche Current	34	A
P_D@T_C=25℃	Total Power Dissipation[4]	57	W
P_D@T_A=25℃	Total Power Dissipation[4]	12	W
T_{STG} T_J	Operating Junction /Storage Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	25	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	2.2	℃/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	30	-	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS} = 30V, V_{GS} = 0V	-	-	1.0	μA
IGSS	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1.3	1.9	2.5	V
RDS(ON)	Static Drain-Source ON-Resistance(4)	V_{GS} = 10V, I_D = 30A	-	1.7	2.2	mΩ
		V_{GS} = 4.5V, I_D = 20A	-	3.0	3.9	mΩ
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz	-	5065	-	pF
Coss	Output Capacitance		-	574	-	pF
C_{rss}	Reverse Transfer Capacitance		-	472	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DS} = 15V, I_D = 30A	-	97	-	nC
Q_{gs}	Gate Source Charge		-	20	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	23	-	nC
td(on)	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 15V I_D= 30A, R_{GEN} = 3Ω	-	16	-	ns
t_r	Turn-On Rise Time		-	30	-	ns
td(off)	Turn-Off DelayTime		-	54	-	ns
t_f	Turn-Off Fall Time		-	19	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	120	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	480	A
V_{SD}	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/us	-	23	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	14	-	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 ≦ 300us , duty cycle ≦ 2%

3、The EAS data shows Max. rating . The test condition is VDD=24V,VGS=10V,L=0.5mH,IAS=34A

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

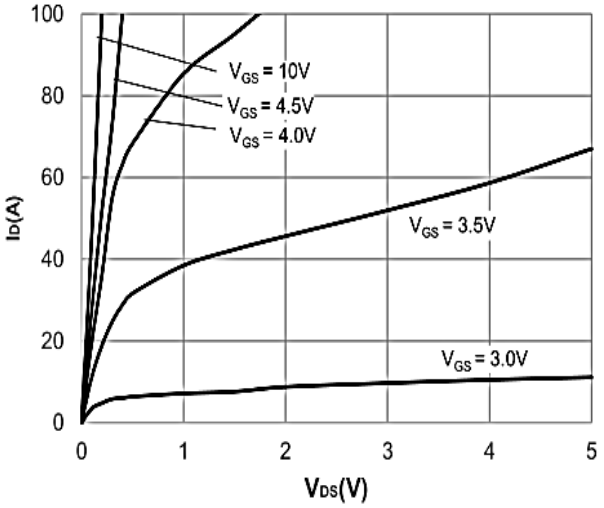


Figure 1: Output Characteristics

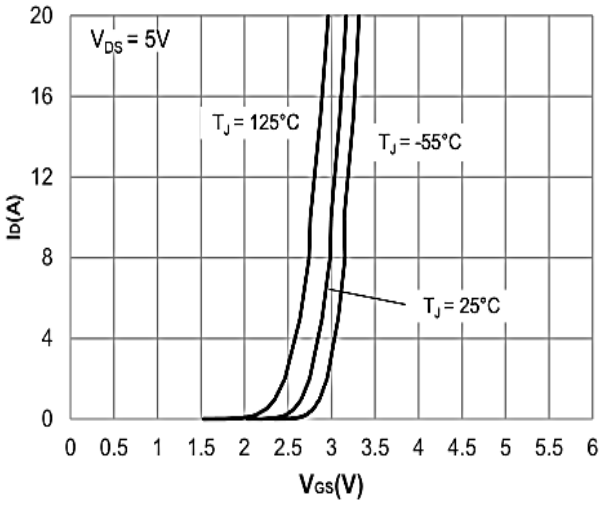


Figure 2: Typical Transfer Characteristics

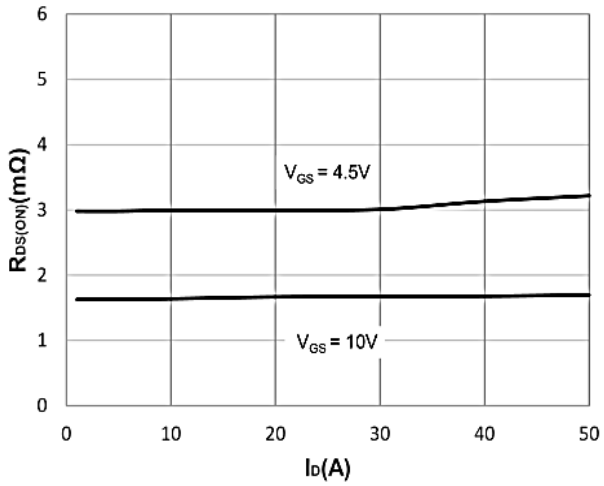


Figure 3: On-resistance vs. Drain Current

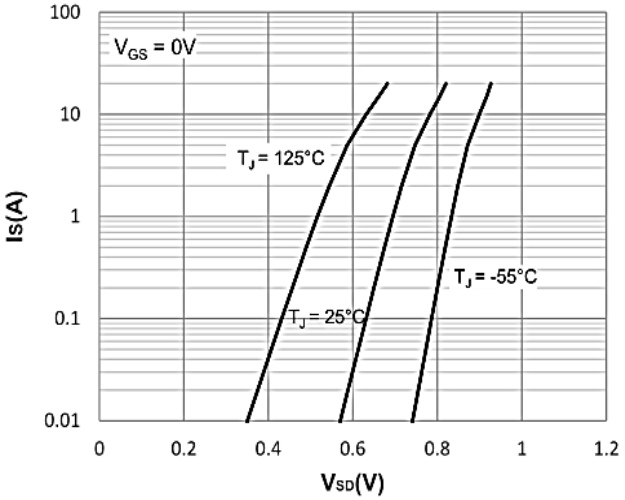


Figure 4: Body Diode Characteristics

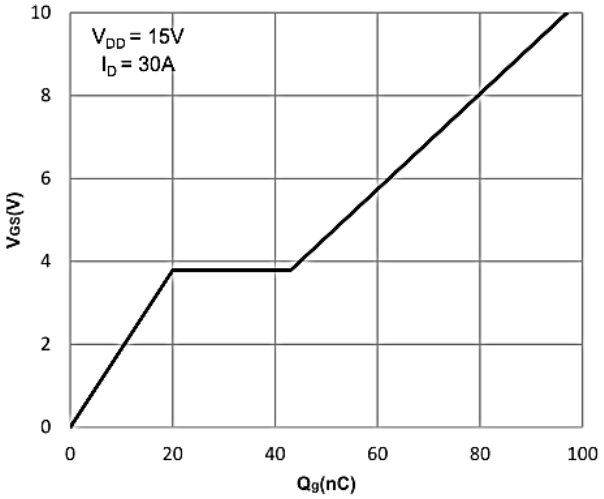


Figure 5: Gate Charge Characteristics

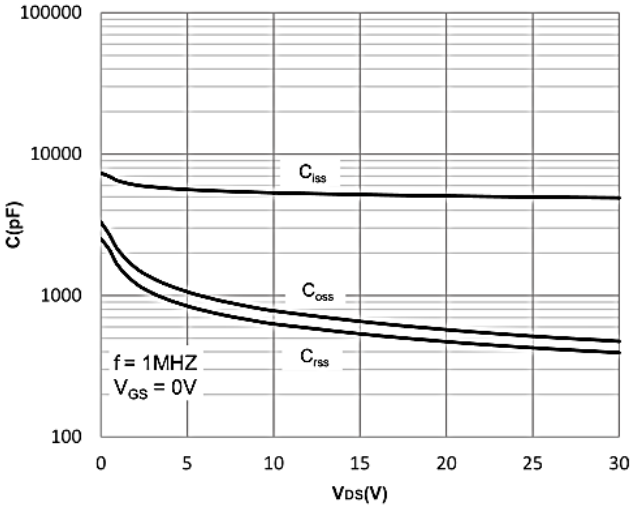


Figure 6: Capacitance Characteristics

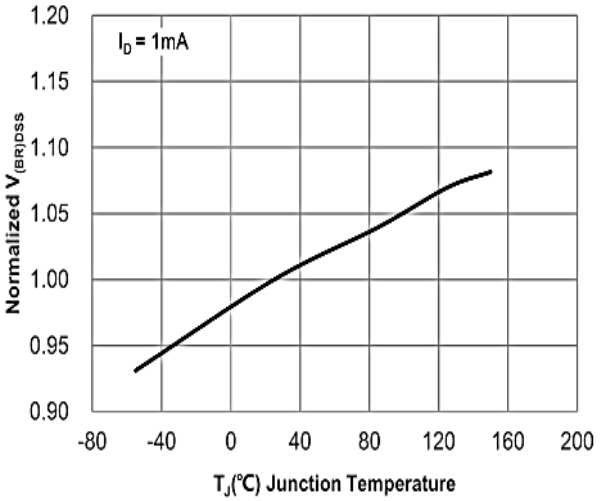


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

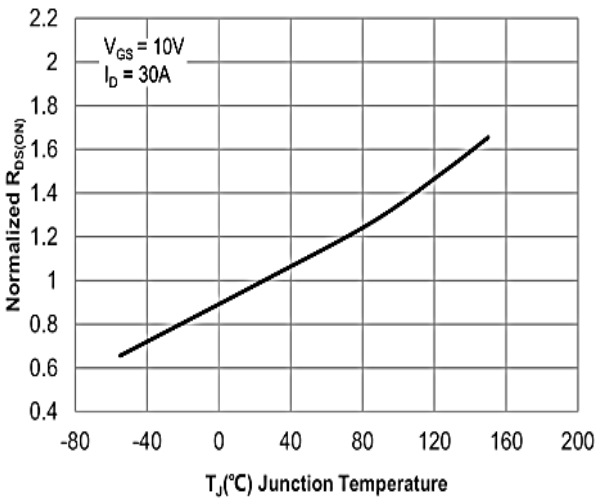


Figure 8: Normalized on Resistance vs. Junction Temperature

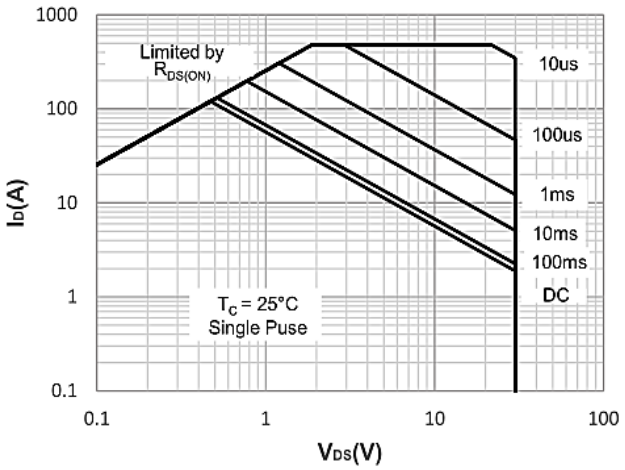


Figure 9: Maximum Safe Operating Area

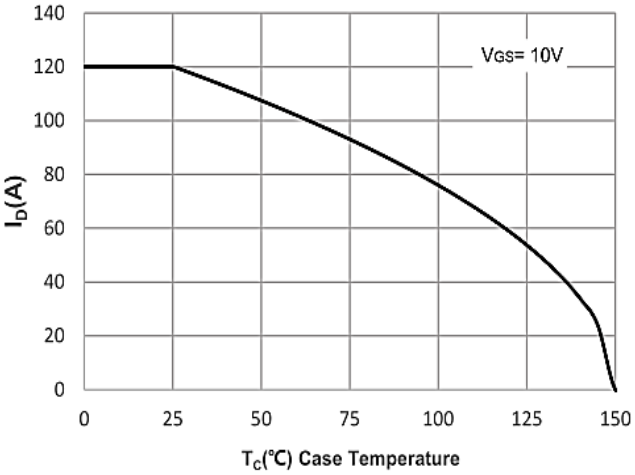


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

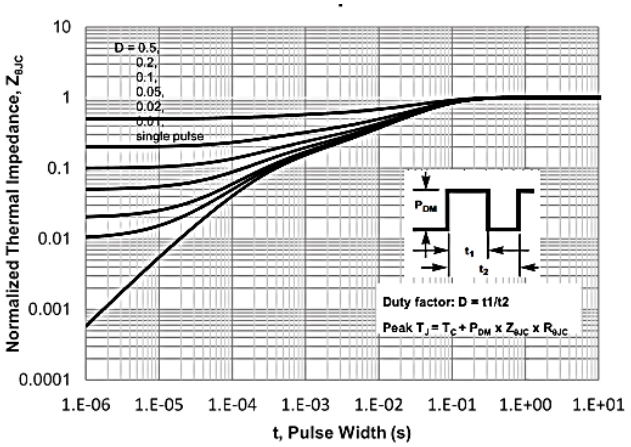


Figure 11: Normalized Maximum Transient

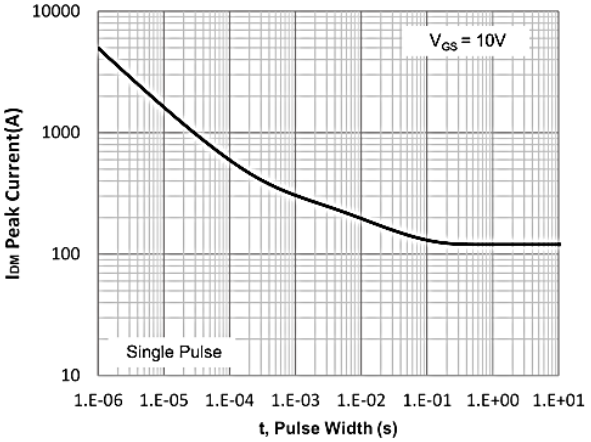
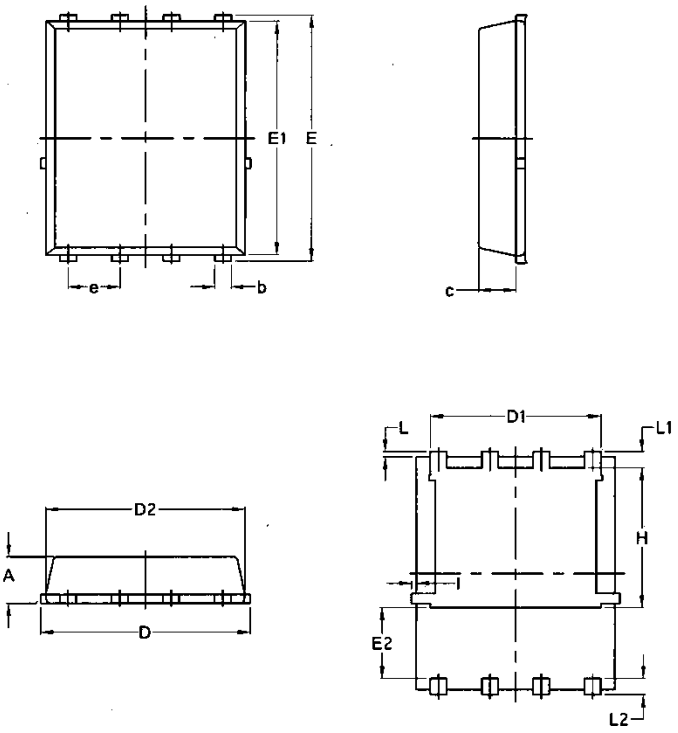


Figure 12: Peak Current Capacity Thermal Impedance

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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30V N-Channel Enhancement Mode MOSFET

Edition	Date	Change
REV1.0	2023/6/21	Initial release
REV1.1	2025/10/28	Update LOGO