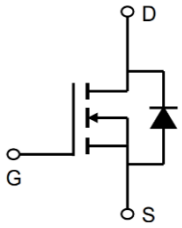
AP200N04BNF

40V N-Channel Enhancement Mode MOSFET



Description

The AP200N04BNF uses advanced **APM-SGT V** 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

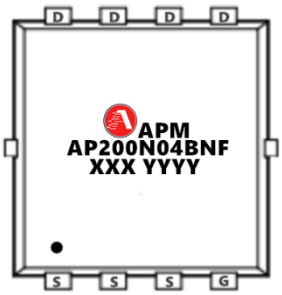
V_{DS} = 40V I_D =216A

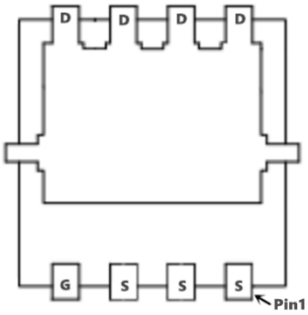
$R_{DS(ON)}$ < 1.1mΩ @ V_{GS}=10V **（Type：0.85mΩ）**

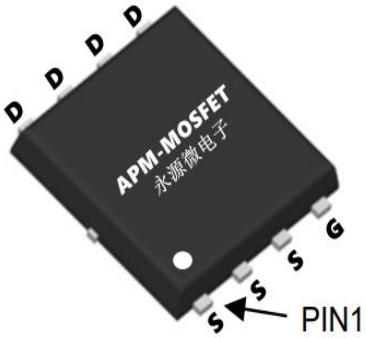
Application

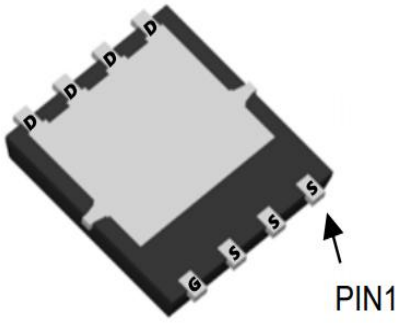
BMS

BLDC









Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP200N04BNF	PDFN5*6-8L	AP200N04BNF XXX YYYY	5000

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

Symbol	Parameter	Value	Unit
VDSS	Drain-Source Voltage	40	V
VGSS	Gate-Source Voltage	±20	V
ID@TC=25℃	Continuous Drain Current, VGS @ 10V1	216	A
ID@TC=100℃	Continuous Drain Current, VGS @ 10V1	200	A
IDM	Pulsed Drain Current	800	A
EAS	Single Pulsed Avalanche Energy	897	mJ
IAS	Avalanche Current	70	A
PD@TC=25℃	Power Dissipation	80.7	W
$R_{\theta}JA$	Thermal Resistance Junction-Ambient [1]	25	°C/W
RθJC	Thermal Resistance, Junction to Case	1.9	℃/W
T_J	Operating Junction Temperature Range	-55 to 150	°C
TSTG	Storage Temperature Range	-55 to 150	°C

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	40	47	-	V
IGSS	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
IDSS	Zero Gate Voltage Drain Current T_J=25°C	V_{DS} = 40V, V_{GS} = 0V	-	-	1	μA
	Zero Gate Voltage Drain Current T_J=100°C		-	-	100	
VGS(th)	Gate-Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.0	3.0	4.0	V
RDS(on)	Drain-Source on-Resistance[4]	V_{GS} = 10V, I_D = 20A	-	0.85	1.1	mΩ
gfs	Forward Transconductance[4]	V_{DS} = 10V, I_D = 20A	-	105	-	S
Ciss	Input Capacitance	V_{DS}=20V, V_{GS}=0V, f =1MHz	-	5850	-	pF
Coss	Output Capacitance		-	226	-	
Crss	Reverse Transfer Capacitance		-	71	-	
RG	Gate Resistance	f=1MHz	-	1.5	-	Ω
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=20V, I_D=20A	-	118	-	nC
Qgs	Gate-Source Charge		-	19	-	
Qgd	Gate-Drain Charge		-	22.2	-	
td(on)	Turn-on Delay Time	V_{GS} =10V, V_{DD}=20V, R_G=3Ω, I_D=20A	-	13.8	-	ns
t_r	Rise Time		-	14	-	
td(off)	Turn-off Delay Time		-	91	-	
t_f	Fall Time		-	43	-	
trr	Body Diode Reverse Recovery Time	I_F=20A, dI/dt=100A/μs	-	66	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	39.6	-	nC
VSD	Diode Forward Voltage[4]	I_S=20A, V_{GS}=0V	-	-	1.2	V
IS	Continuous Source Current	T_C=25°C	-	-	200	A

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 ≦ 300us , duty cycle ≦ 2%
3、The EAS data shows Max. rating . The test condition is VDD =32V,VGS =10V,L=0.1mH,IAS =70A
4、The power dissipation is limited by 150℃ 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

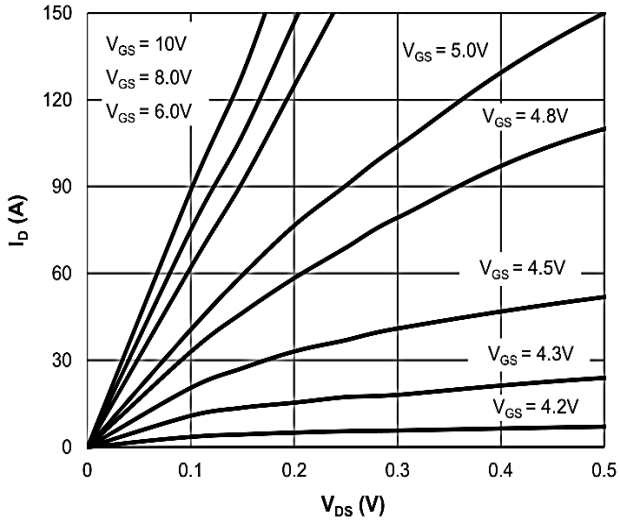


Figure 1: Saturation Characteristics

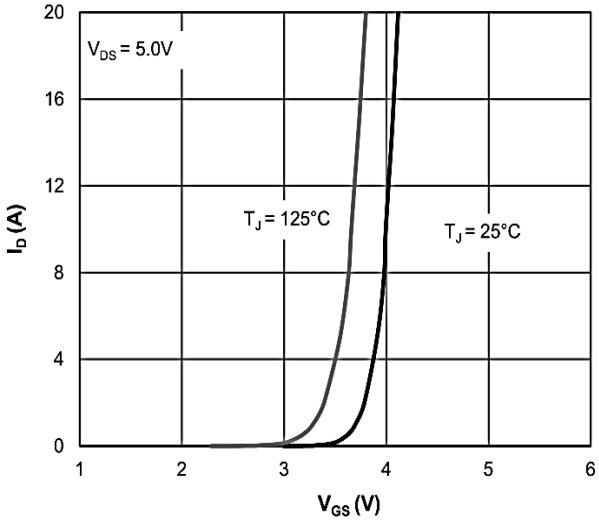


Figure 2: Transfer Characteristics

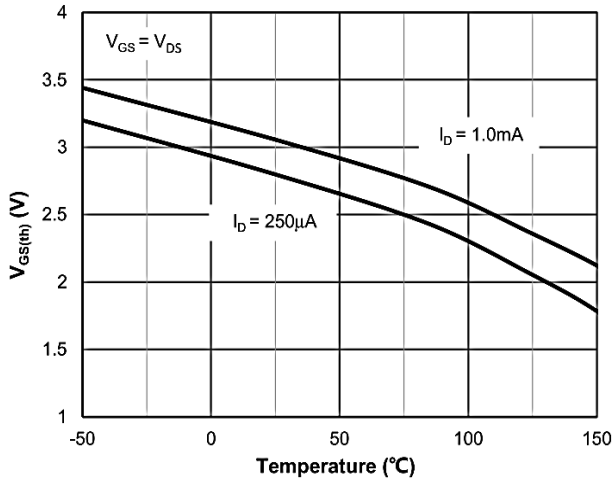


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

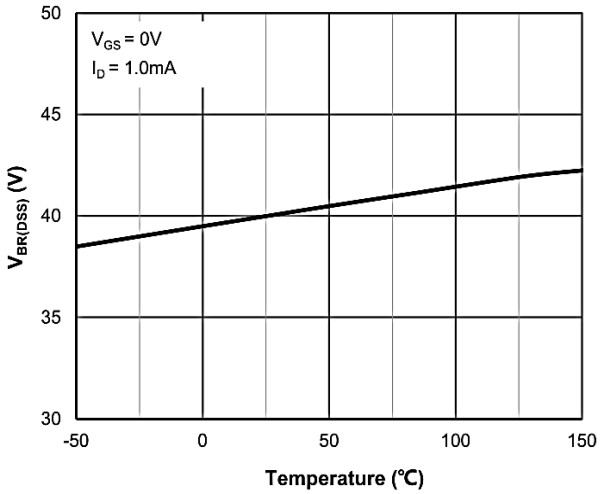


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

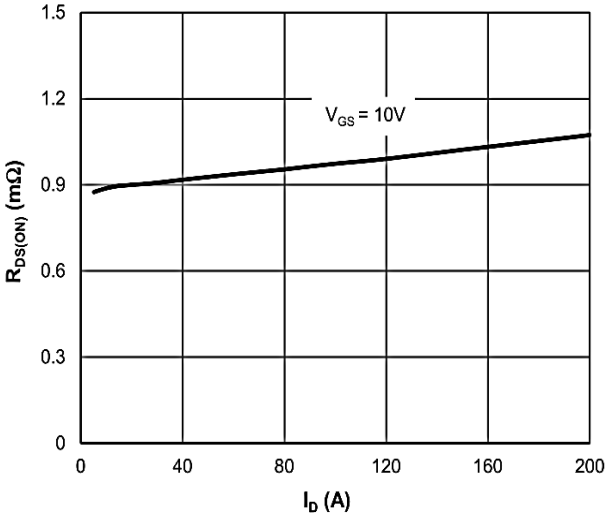


Figure 3: $R_{DS(ON)}$ vs. Drain Current

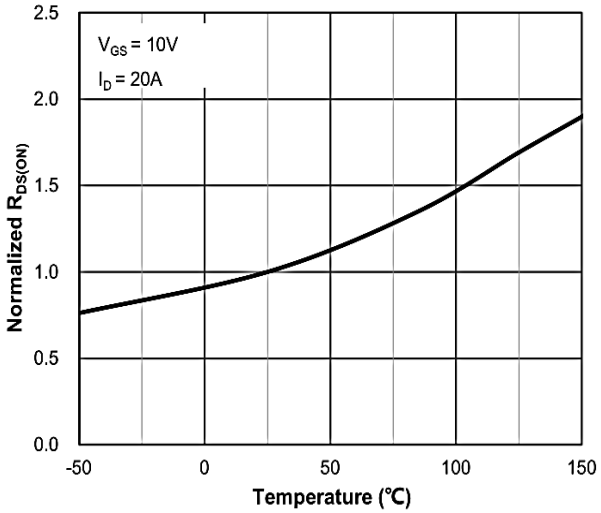


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

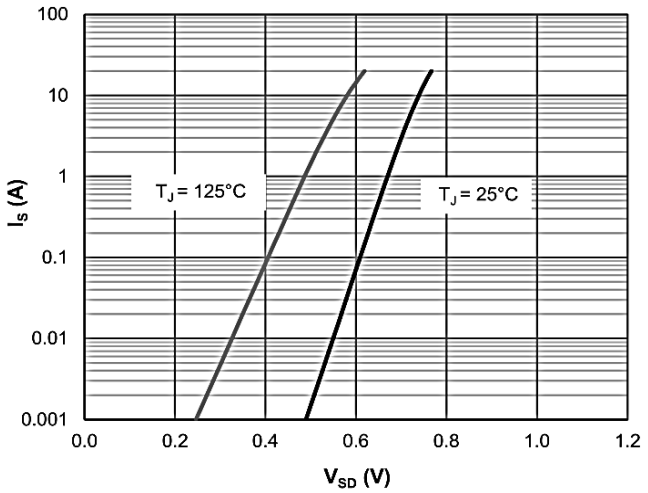


Figure 7: Body-Diode Characteristics

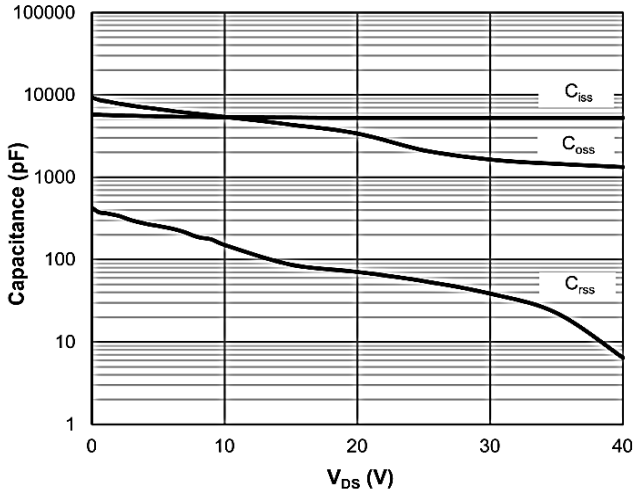


Figure 8: Capacitance Characteristics

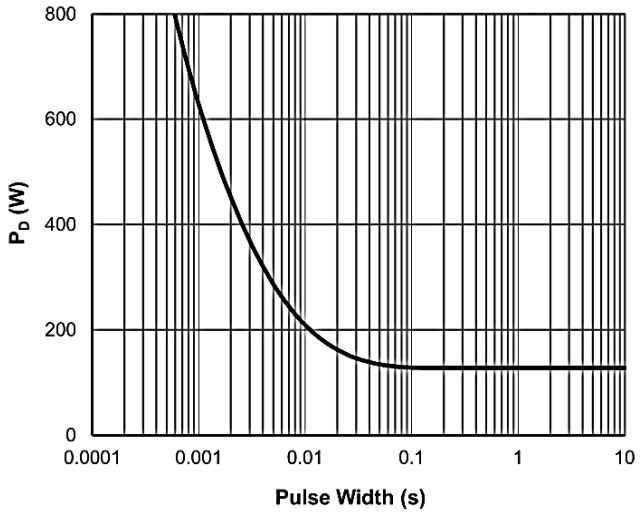


Figure 11: Single Pulse Power Rating, Junction-to-Case

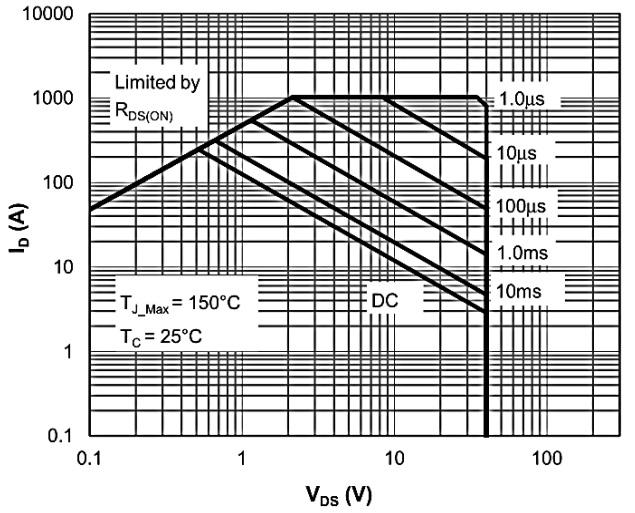


Figure 12: Maximum Safe Operating Area

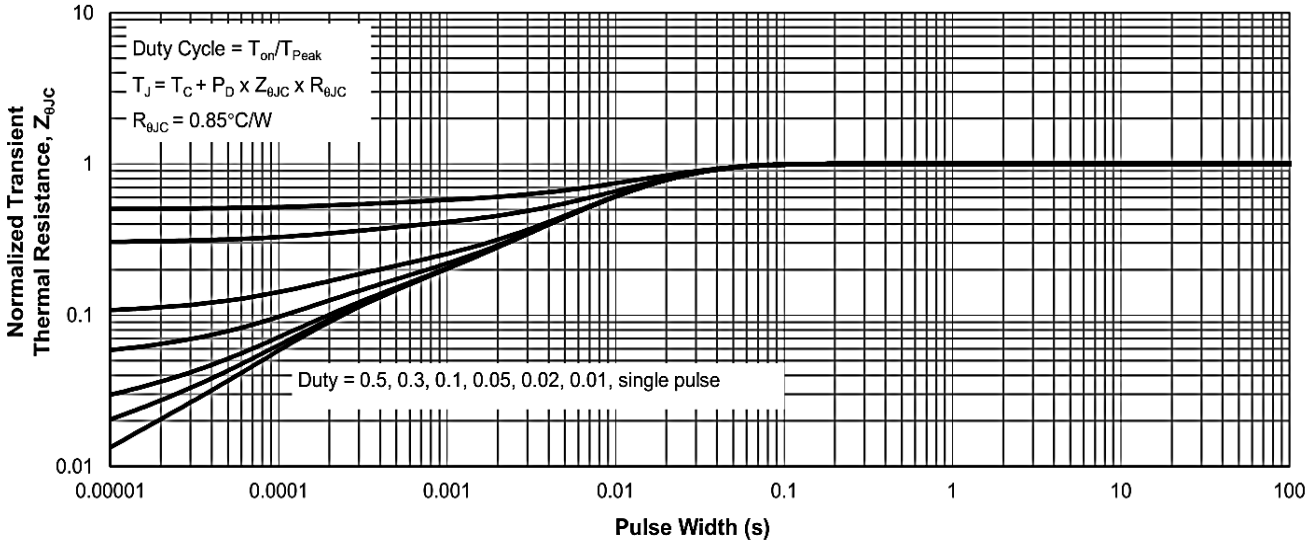
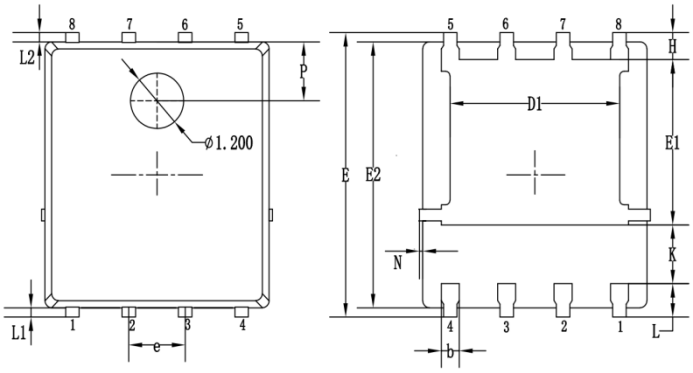
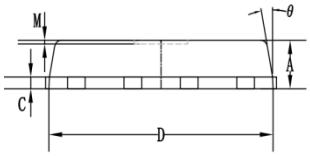


Figure 13: Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-PDFN5*6-8L





Symbol	Dimensions In Millimeters		
	min.	typ.	max.
A	0.90	1.05	1.20
b	0.30	0.40	0.50
C	0.20	0.25	0.35
D	4.90	5.05	5.20
D1	3.72	3.82	4.12
E	5.90	6.10	6.30
E1	3.30	3.50	3.70
E2	5.60	5.75	5.90
e	1.27BSC		
H	0.48	0.58	0.70
K	1.14	1.27	1.40
L	0.54	0.74	0.84
L1/L2	0.10	0.20	0.30
θ	8°	10°	12°
M	0.08REF		
N	0.00		0.15
P	1.28REF		

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Edition	Date	Change
REV1.0	2021/12/31	Initial release

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