AP80N03BDF

30V N-Channel Enhancement Mode MOSFET

Description

The AP80N03BDF 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

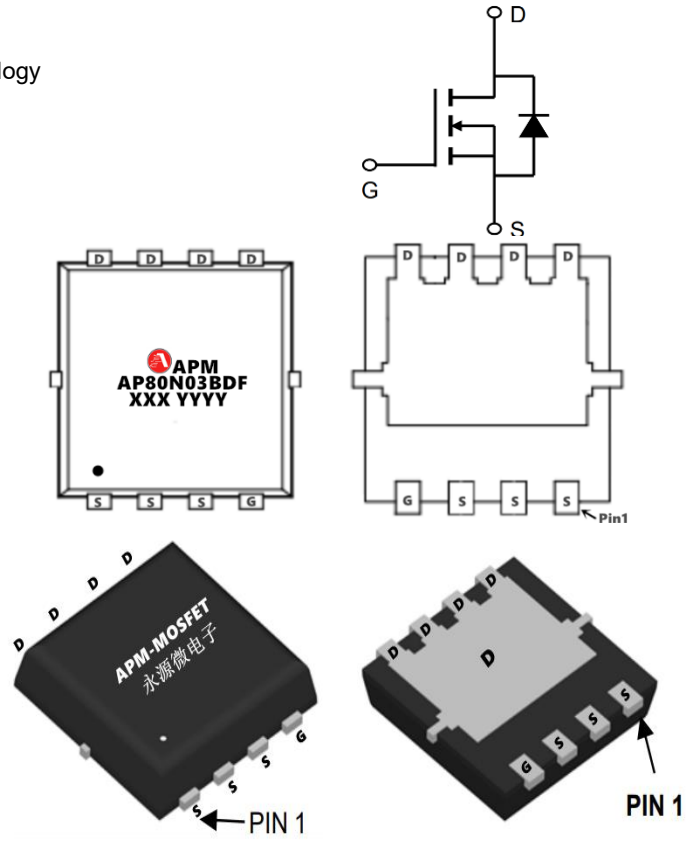
V_{DS} = 30V I_D =80A

$R_{DS(ON)}$ < 3.8mΩ @ V_{GS}=10V （**Type：3.0mΩ**）

Application

Buck

Boost



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP80N03BDF	PDFN3*3-8L	AP80N03BDF XXX YYYY	5000

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

Symbol	Parameter	Max.	Units
VDSS	Drain-Source Voltage	30	V
VGSS	Gate-Source Voltage	±20	V
ID@TC=25℃	Continuous Drain Current, VGS @ 10V1	80	A
ID@TC=100℃	Continuous Drain Current, VGS @ 10V1	54	A
IDM	Pulsed Drain Current	344	A
EAS	Single Pulsed Avalanche Energy	45	mJ
IAS	Avalanche Current	25	A
PD@TC=25℃	Power Dissipation	43.1	W
T_J TSTG	Operating Junction Temperature Range	-55 to 150	°C
$R_{\theta}JA$	Thermal Resistance Junction-Ambient [1]	25	°C/W
RθJC	Thermal Resistance, Junction to Case	2.9	℃/W

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	30	-	-	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} = 30V, 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	1.2	1.6	2.5	V
RDS(on)	Drain-Source On-Resistance[4]	V_{GS} = 10V, I_D = 20A	-	3.0	3.8	mΩ
		V_{GS} = 4.5V, I_D =10A	-	4.5	6.0	
gfs	Forward Transconductance[4]	V_{DS} = 10V, I_D = 20A	-	70	-	S
Ciss	Input Capacitance	V_{DS} = 15V, V_{GS} =0V, f =1MHz	-	1065	-	pF
Coss	Output Capacitance		-	428	-	
Crss	Reverse Transfer Capacitance		-	35	-	
R_g	Gate Resistance	f = 1MHz	-	1.2	-	Ω
Q_g	Total Gate Charge	V_{GS} = 10V, V_{DS} = 15V, I_D= 20A	-	18	-	nC
Qgs	Gate-Source Charge		-	3.2	-	
Qgd	Gate-Drain Charge		-	2.5	-	
td(on)	Turn-On Delay Time	V_{GS} =10V, V_{DD} = 15V, R_G = 3Ω, I_D= 20A	-	6.1	-	ns
t_r	Rise Time		-	4.0	-	
td(off)	Turn-Off Delay Time		-	16.9	-	
t_f	Fall Time		-	4.4	-	
trr	Body Diode Reverse Recovery Time	I_F=20A, dI/dt=100A/μs	-	35.6	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	10.8	-	nC
VSD	Diode Forward Voltage[4]	I_S = 20A, V_{GS} = 0V	-	-	1.2	V
IS	Continuous Source Current	T_C=25°C	-	-	100	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 =25V,VGS =10V,L=0.1mH,IAS =25A

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

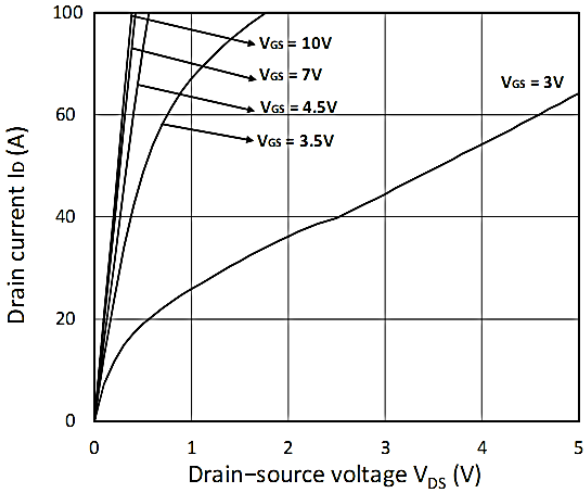


Figure 1. Output Characteristics

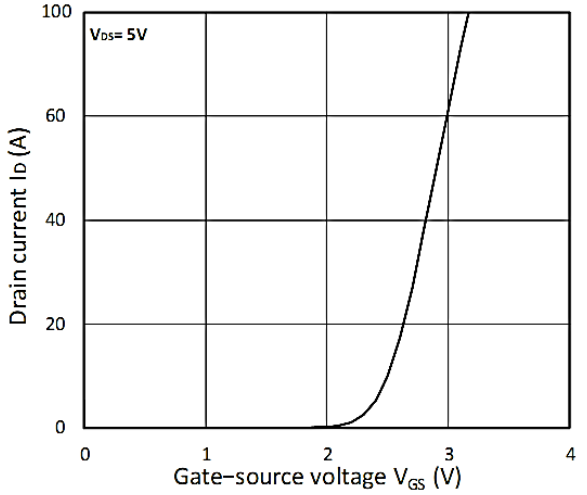


Figure 2. Transfer Characteristics

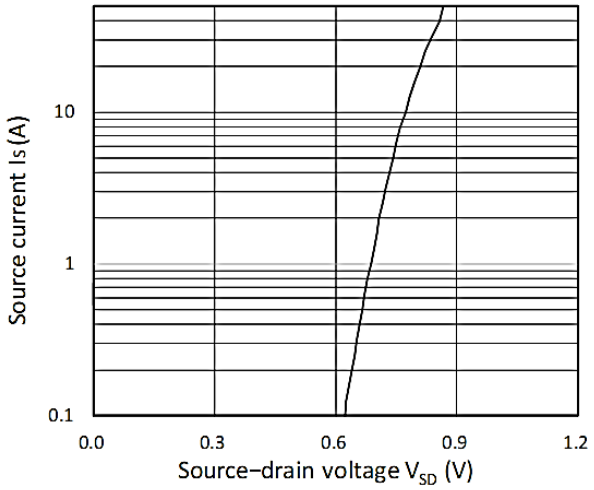


Figure 3. Forward Characteristics of Reverse

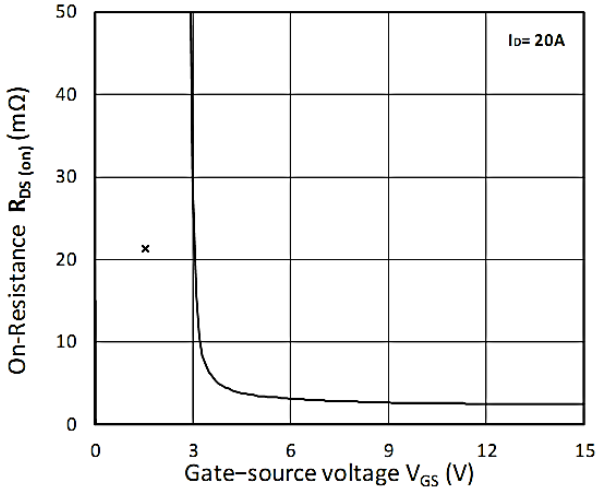


Figure 4. R DS(ON) vs. VGS

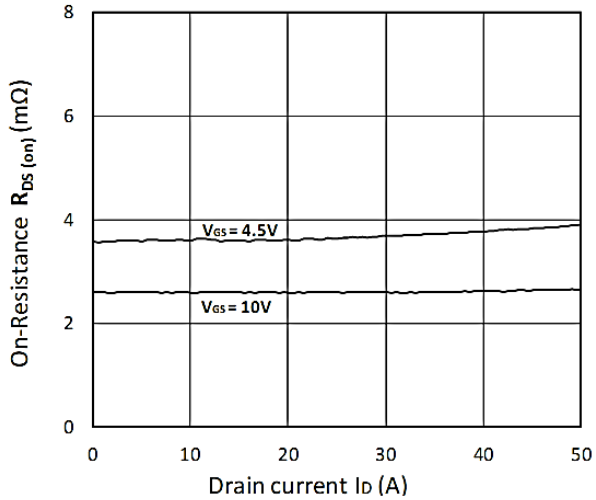


Figure 5. RDS(ON) vs. ID

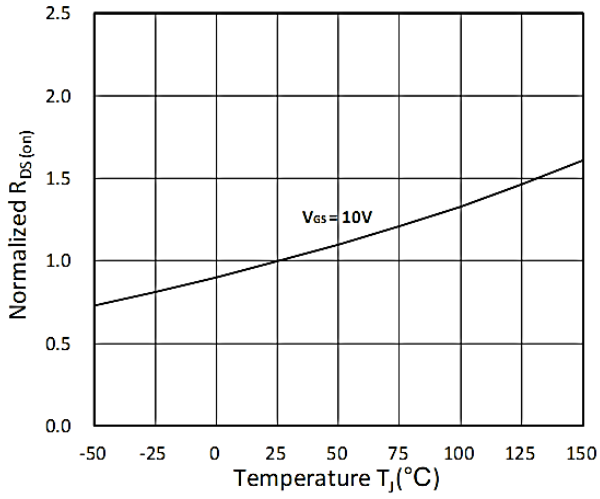


Figure 6. Normalized R DS(on) vs. Temperature

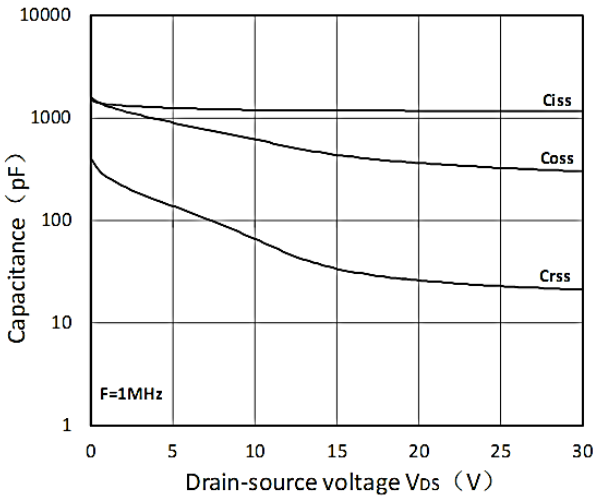


Figure 7. Capacitance Characteristics

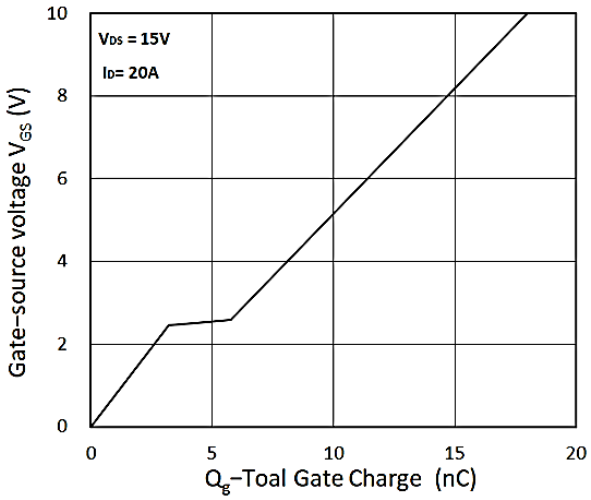


Figure 8. Gate Charge Characteristics

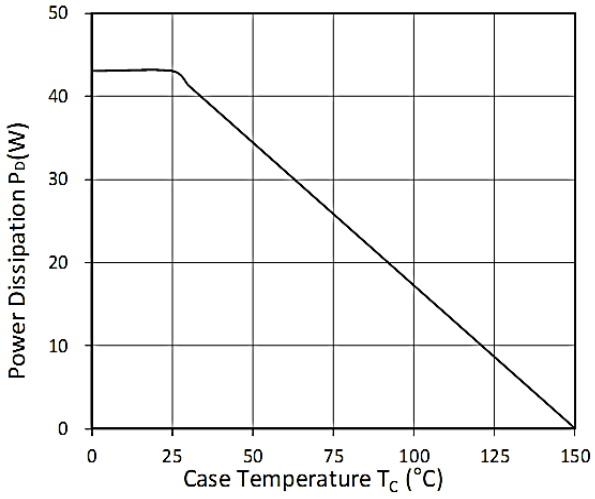


Figure 9. Power Dissipation

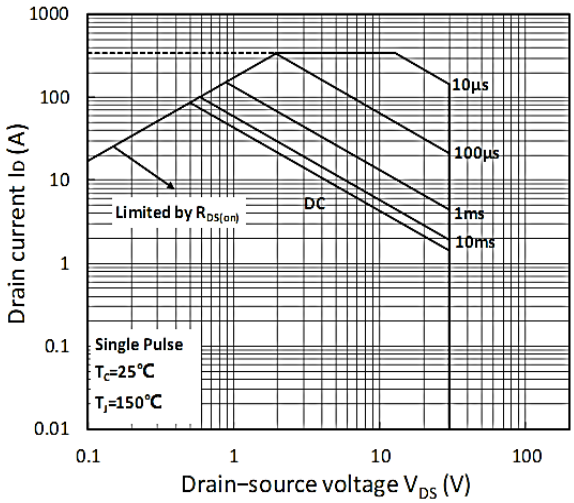


Figure10. Safe Operating Area

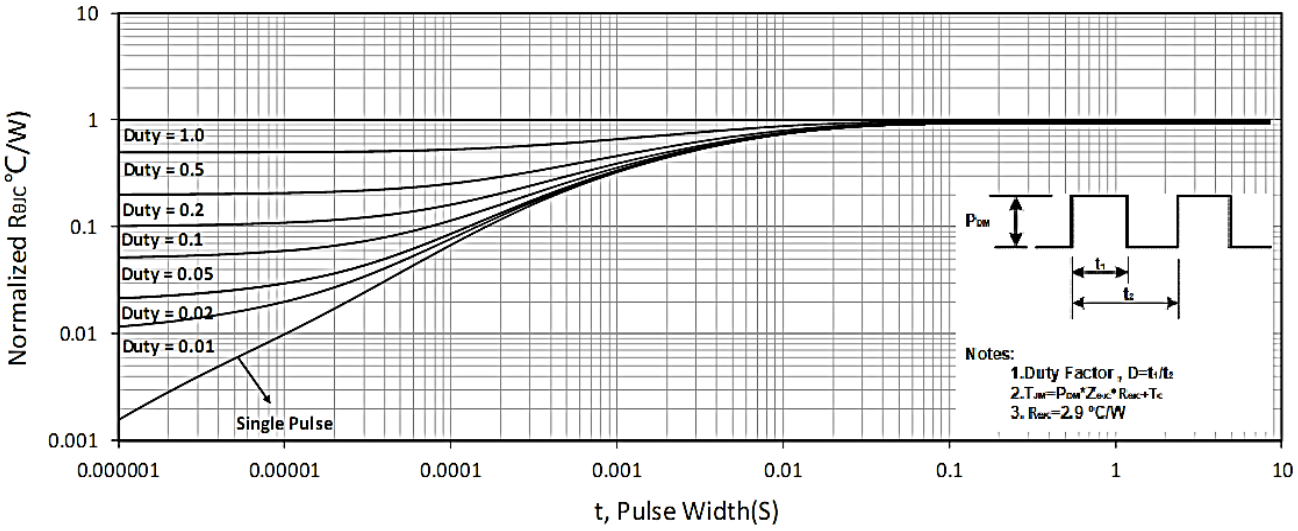
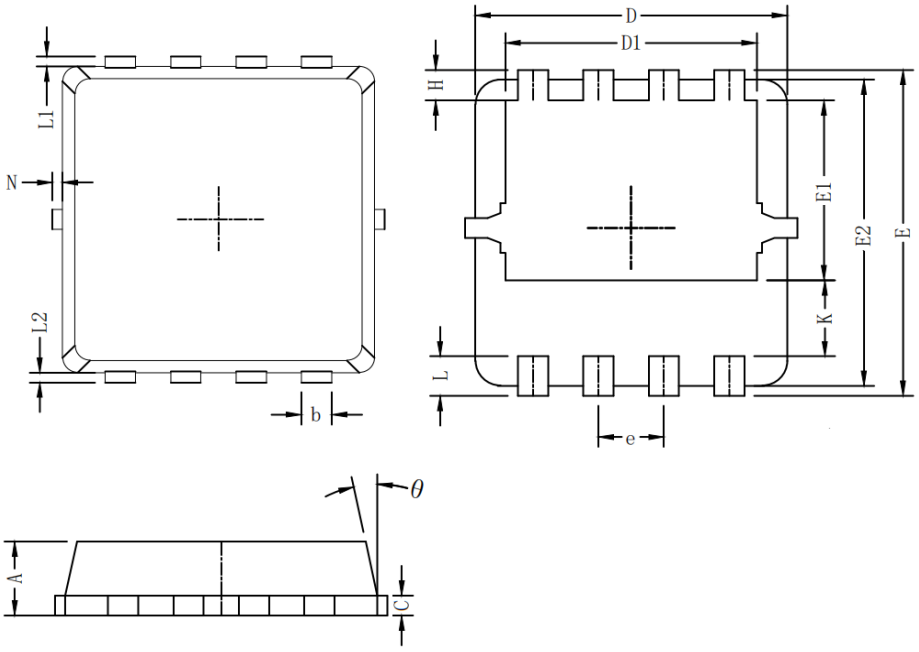


Figure 9 Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-PDFN3X3-8L



Symbol	Dim in mm		
	Min	Typ	Max
A	0.6	0.75	0.9
b	0.2	0.3	0.4
C	0.15	0.2	0.25
D	3	3.1	3.2
D1	2.3	2.45	2.6
E	3.15	3.3	3.45
E1	1.43	1.73	1.93
E2	2.9	3.05	3.2
e	0.65BSC		
H	0.2	0.35	0.5
K	0.57	0.77	0.87
L	0.3	0.4	0.5
L1/L2	0.1REF		
θ	8°	10°	13°
N	0		0.15

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Edition	Date	Change
REV1.0	2023/3/31	Initial release