AP140N03NF

35V N-Channel Enhancement Mode MOSFET

Description

The AP140N03NF 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} = 35V I_D =140A

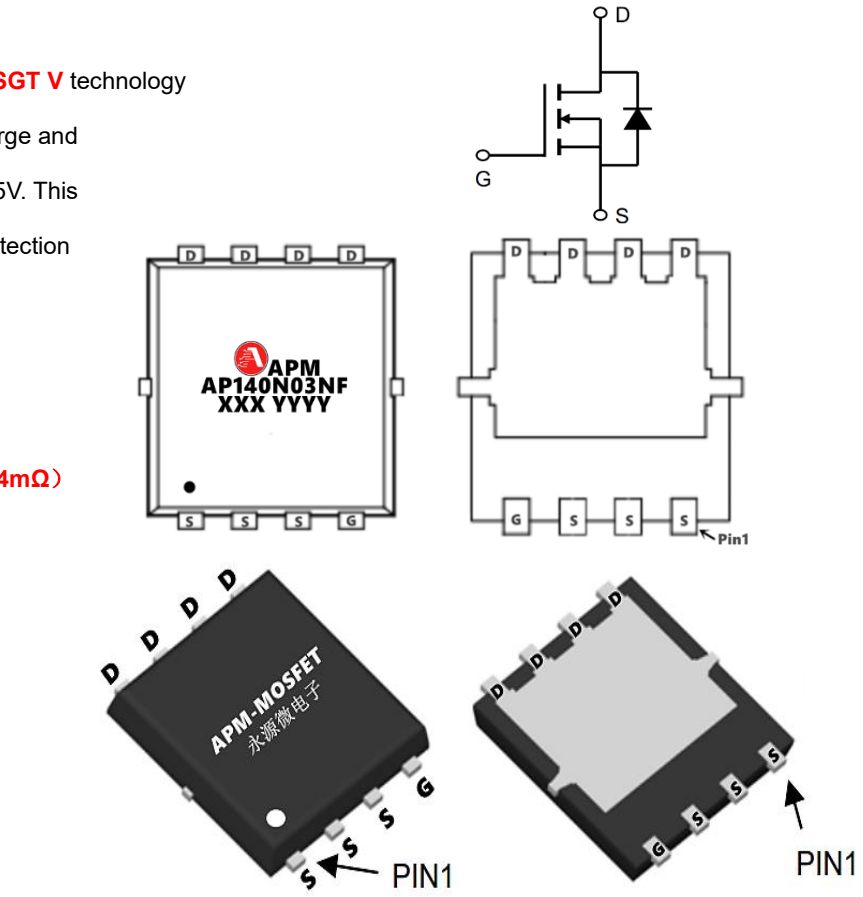
$R_{DS(ON)}$ < 1.6mΩ @ V_{GS}=10V **（Type：1.4mΩ）**

Application

Boost driver

Brushless motor

BLDC



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP140N03NF	PDFN5*6-8L	AP140N03NF XXX YYYY	5000

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	35	V
VGS	Gate-Source Voltage	±20	V
ID@TC=25℃	Continuous Drain Current, VGS @ 10V1	140	A
ID@TC=100℃	Continuous Drain Current, VGS @ 10V1	106	A
IDM	Pulsed Drain Current2	672	A
EAS	Single Pulse Avalanche Energy3	180	mJ
IAS	Avalanche Current	54	A
PD@TC=25℃	Total Power Dissipation4	81	W
TSTG	Storage Temperature Range	-55 to 150	℃
TJ	Operating Junction Temperature Range	-55 to 150	℃
RθJA	Thermal Resistance Junction-Ambient 1	25	℃/W
RθJC	Thermal Resistance Junction-Case1	1.7	℃/W

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

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	35	38		V
IDSS	Zero Gate Voltage Drain Current	V_{DS} = 30V, V_{GS} = 0V			1.0	μA
IDSS T_J = 55°C					5.0	
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	1.2	1.7	2.5	V
RDS(ON)	Static Drain-Source ON-Resistance	V_{GS} = 10V, I_D = 20A		1.4	1.6	mΩ
		V_{GS} = 4.5V, I_D = 15A		2.0	2.7	mΩ
gFS	Forward Transconductance	V_{DS} = 5V, I_D = 20A		85		S
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		2554		pF
C_{oss}	Output Capacitance			924		pF
C_{rss}	Reverse Transfer Capacitance			73		pF
R_g	Gate Resistance	V_{GS} = 0V, V_{DS}= 0V, f = 1MHz		1.4		Ω
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DS} = 15V, I_D = 20A		39.1		nC
Q_{gs}	Gate Source Charge			6.7		nC
Q_{gd}	Gate Drain Charge			5.9		nC
tD(on)	Turn-On DelayTime	V_{GS} = 10V, V_{DS} = 15V R_L = 0.75Ω, R_{GEN} = 3Ω		10		ns
t_r	Turn-On Rise Time			7.3		ns
tD(off)	Turn-Off DelayTime			38.6		ns
t_f	Turn-Off Fall Time			16.4		ns
trr	Body Diode Reverse Recovery Time	I_F = 20A, dI_F/dt = 100A/us		54		ns
Q_{rr}	Body Diode Reverse Recovery Charge			57		nC
IS	Diode Continuous Current	T_C = 25°C			140	A
V_{SD}	Diode Forward Voltage	I_S = 1A, V_{GS} = 0V		0.68	1.2	V

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 =54A

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

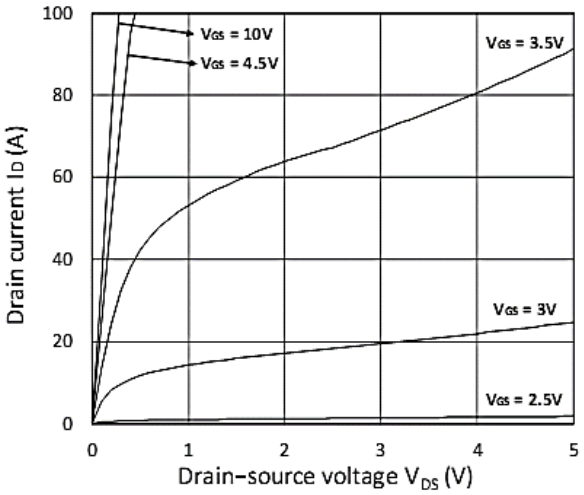


Figure 1. Output Characteristics

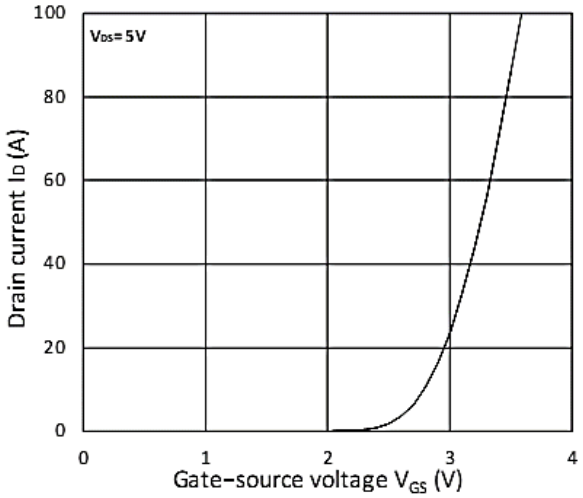


Figure 2. Transfer Characteristics

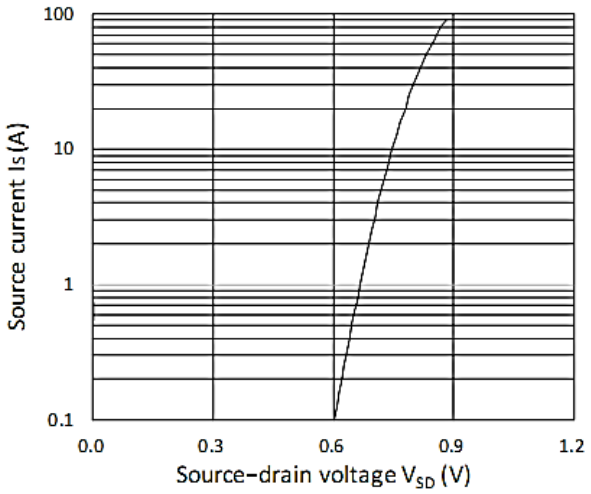


Figure 3. Forward Characteristics of Reverse

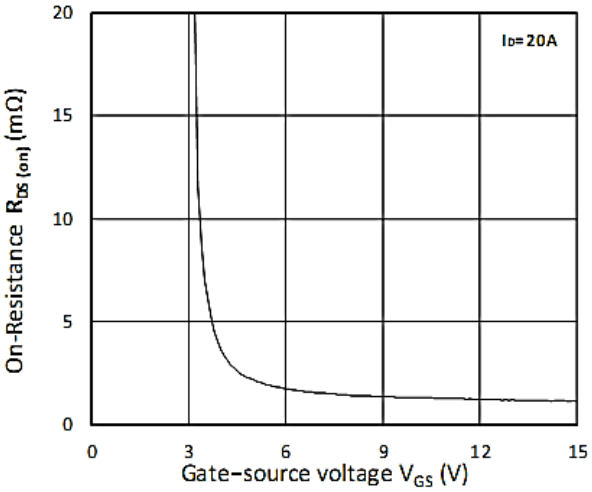


Figure 4. RDS(ON) vs. VGS

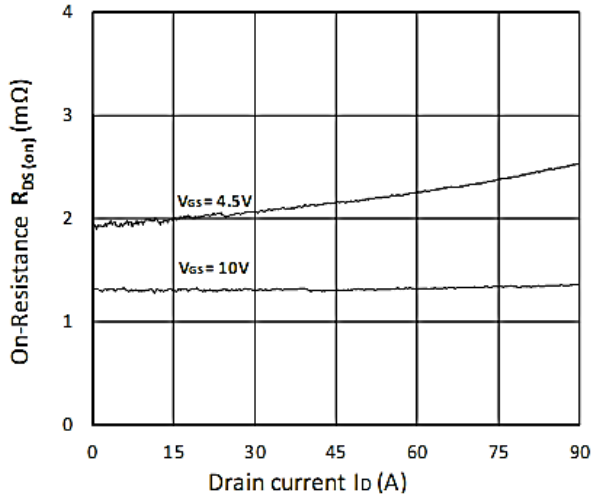


Figure 5. RDS(ON) vs. ID

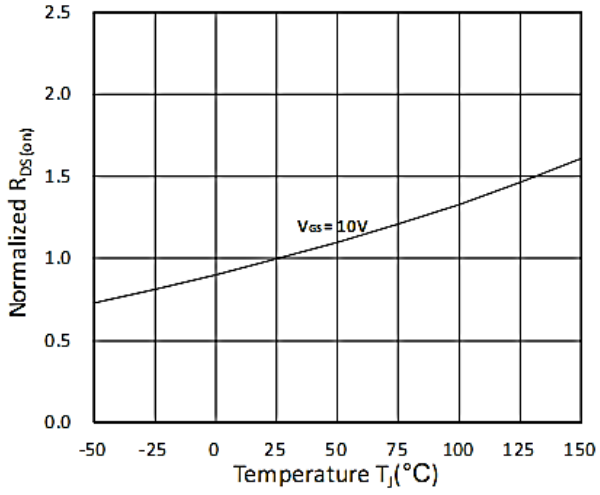


Figure 6. Normalized RDS(on)vs.Temperature

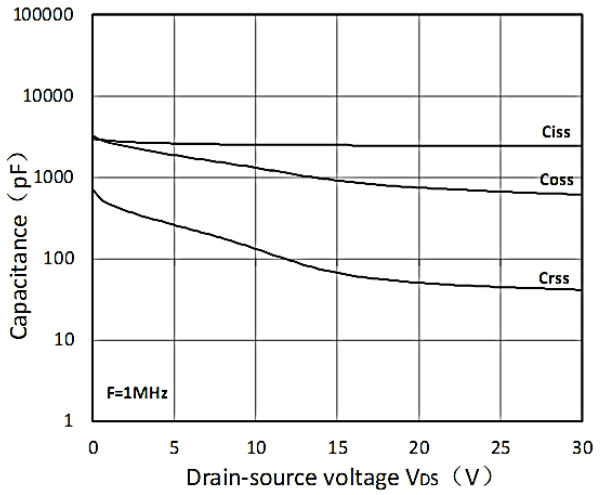


Figure7. Capacitance Characteristics

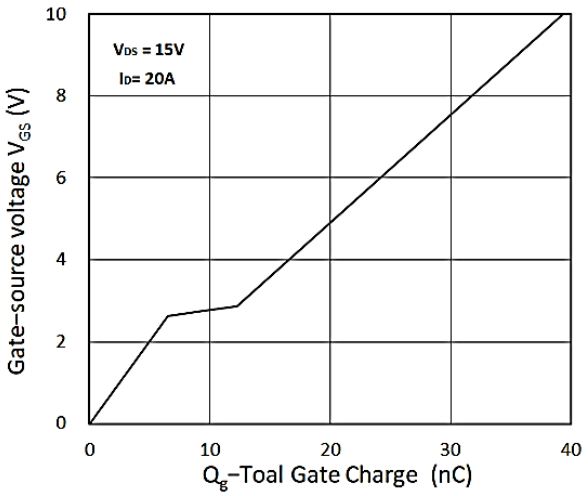


Figure8. Gate Charge Characteristics

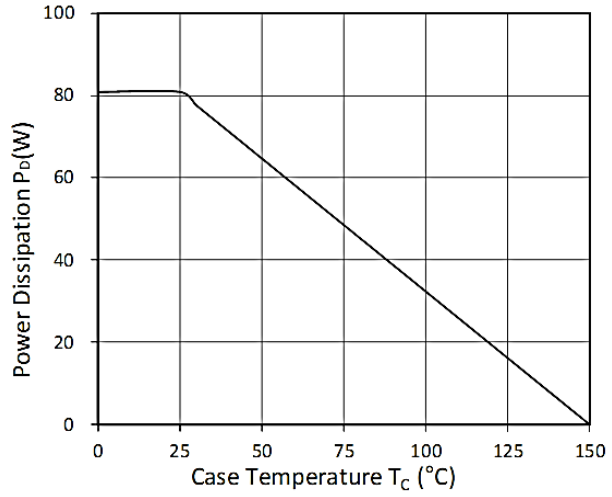


Figure9. Power Dissipation

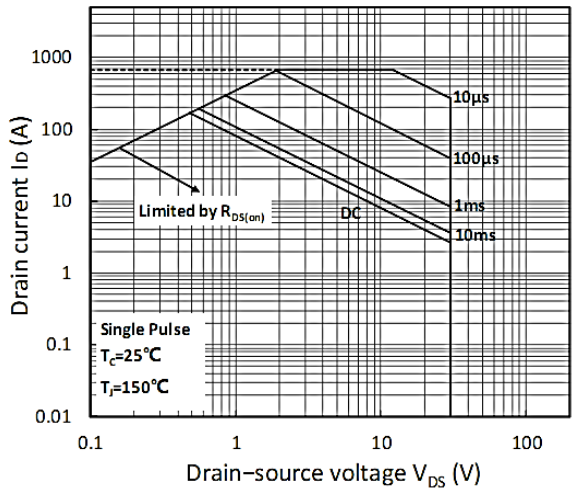


Figure10. Safe Operating Area

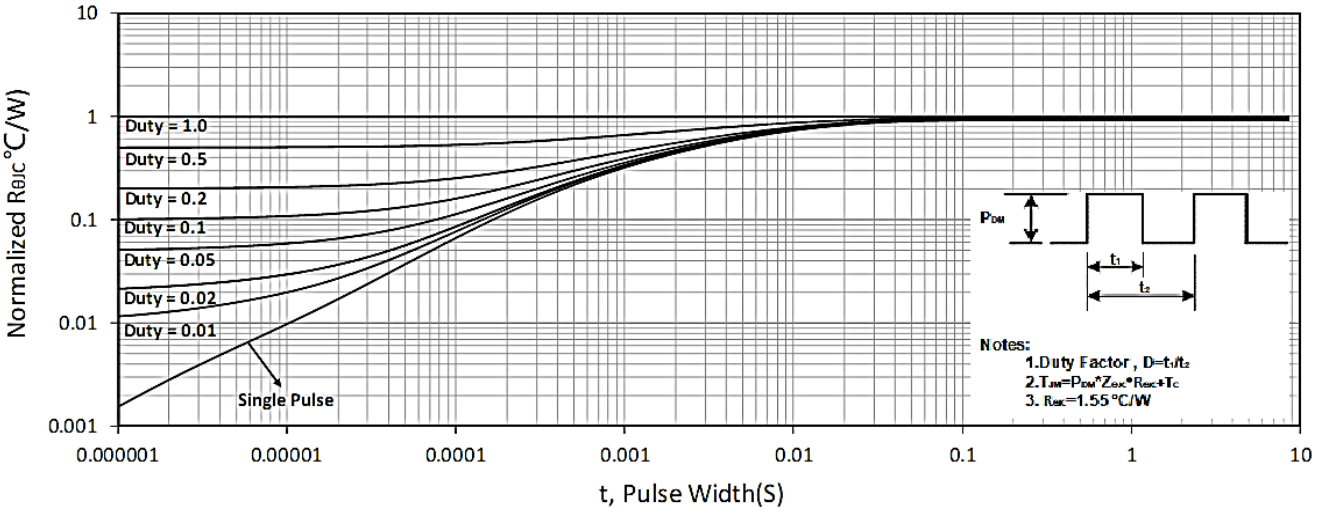
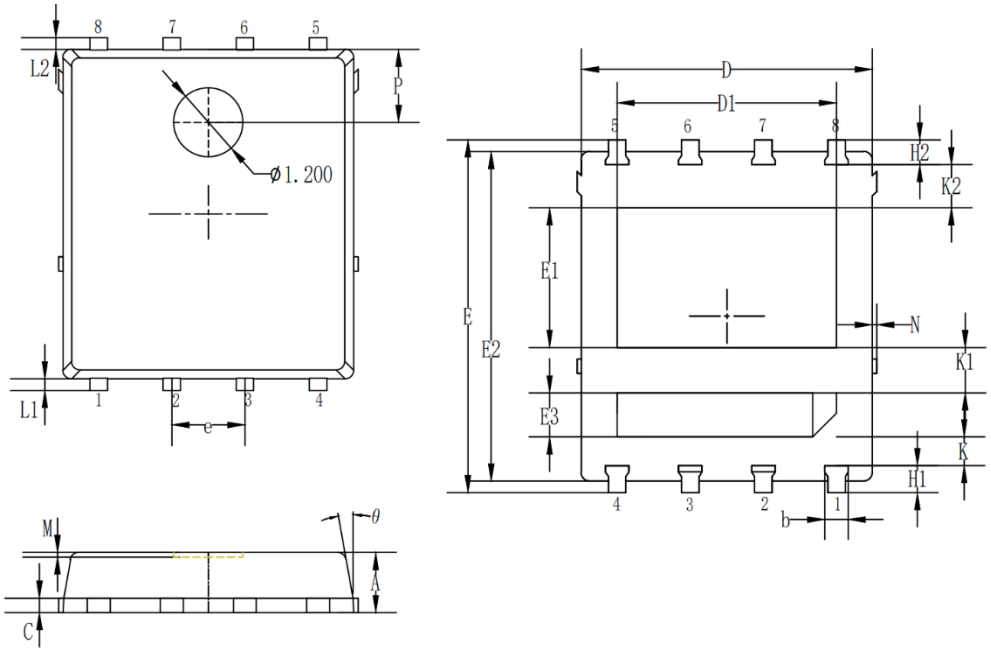


Figure11.Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-PDFN5*6-8L



Symbol	Dim in mm		
	Min	Typ	Max
A	0.9	1.05	1.2
b	0.3	0.4	0.5
C	0.2	0.25	0.35
D	4.9	5.05	5.2
D1/D2	1.51	1.66	1.81
E	5.9	6.1	6.3
E1	3.3	3.5	3.7
E2	5.6	5.75	5.9
e	1.27BSC		
H	0.48	0.58	0.7
K	1.14	1.27	1.4
L	0.54	0.74	0.84
L1/L2	0.1	0.2	0.3
θ	8°	10°	12°
M	0.08REF		
N	0		0.15
P	1.28REF		
d	0.5	0.6	0.7

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Edition	Date	Change
REV1.0	2023/9/31	Initial release