General Description

The AGM038N10A combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

This device is ideal for load switch and battery protection applications.

Features

- Advance high cell density Trench technology
- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance

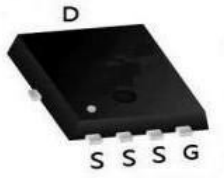
Application

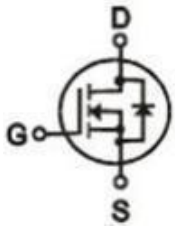
- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

Product Summary

BVDSS	RDSON	ID
100V	3.8mΩ	120A

PDFN5*6 Pin Configuration





Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM038N10A	AGM038N10A	PDFN5*6	----	----	3000

Table 1. Absolute Maximum Ratings (TA=25℃)

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	100	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25℃) **(Note 1)**	120	A
	Drain Current-Continuous(Tc=100℃)	80	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed **(Note 2)**	400	A
PD	Maximum Power Dissipation(Tc=25℃)	147	w
	Maximum Power Dissipation(Tc=100℃)	58	w
EAS	Avalanche energy **(Note 3)**	330	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	℃

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State)[1]	---	60	℃/W
RθJC	Thermal Resistance Junction-Case[1]	---	0.85	℃/W

Table 3. Electrical Characteristics (TA=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	100	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=68V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.4	--	2.4	V
gFS	Forward Transconductance	VDS=10V,ID=15A	--	10	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=40A	--	3.8	5.0	mΩ
		VGS=4.5V, ID=30A	--	5.7	7.5	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=50V,VGS=0V, F=1MHZ	--	4739	--	pF
Coss	Output Capacitance		--	622	--	pF
Crss	Reverse Transfer Capacitance		--	16	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	3.3	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=50V, ID=30A,RGEN=3Ω	--	21	--	nS
tr	Turn-on Rise Time		--	80	--	nS
td(off)	Turn-Off Delay Time		--	69	--	nS
tf	Turn-Off Fall Time		--	30	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=50V, ID=30A	--	67	--	nC
Qgs	Gate-Source Charge		--	24	--	nC
Qgd	Gate-Drain Charge		--	11	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	120	A
VSD	Forward on Voltage	VGS=0V,IS=20A	--	--	1.4	V
trr	Reverse Recovery Time	IF=20A , dI/dt=100A/μs , TJ=25℃	--	60	--	ns
Qrr	Reverse Recovery Charge		--	89	--	nc

Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: TJ=25℃

图 1. 输出特性

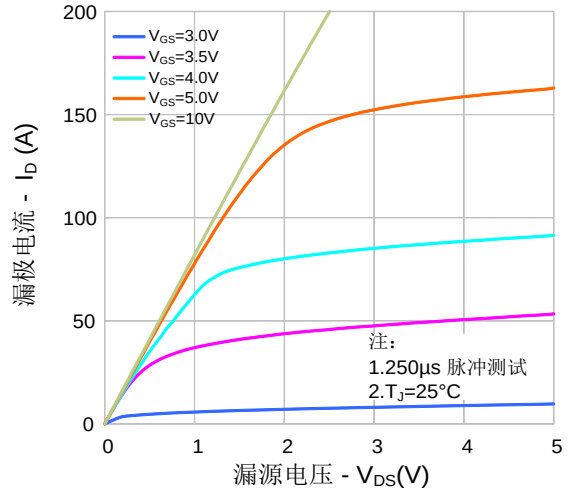


图 2. 传输特性

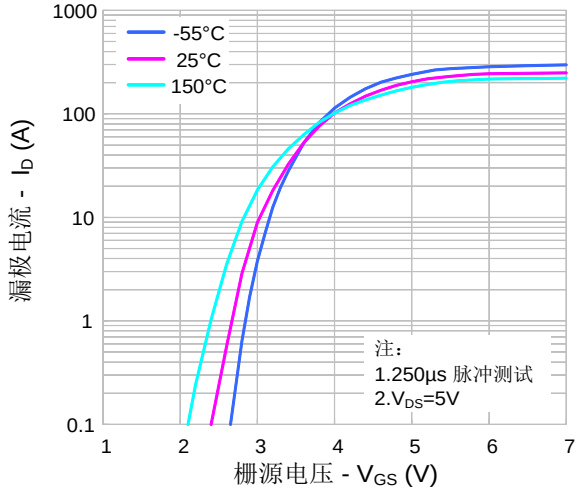


图 3. 导通电阻 vs. 漏极电流

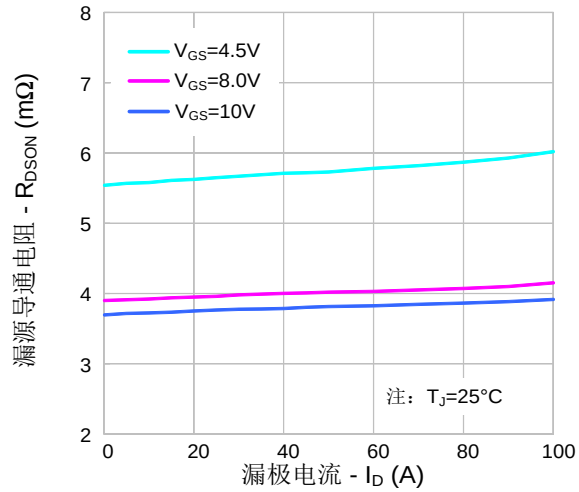


图 4. 导通电阻 vs. 栅源电压

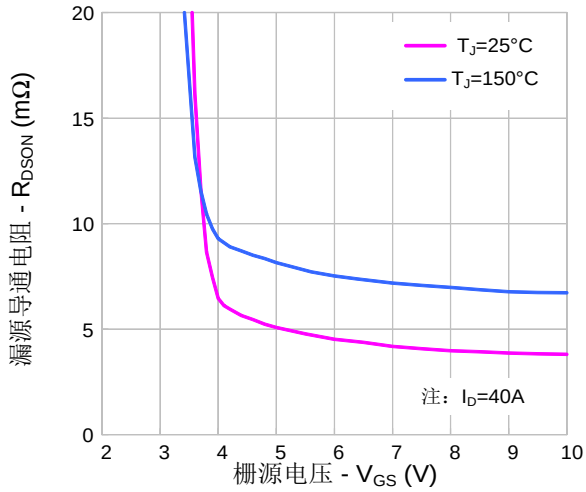


图 5. 开启电压 vs. 温度特性

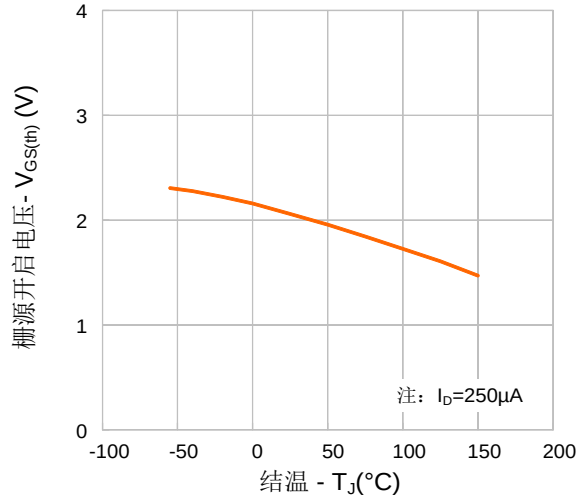


图 6. 体二极管正向压降 vs. 源极电流和温度

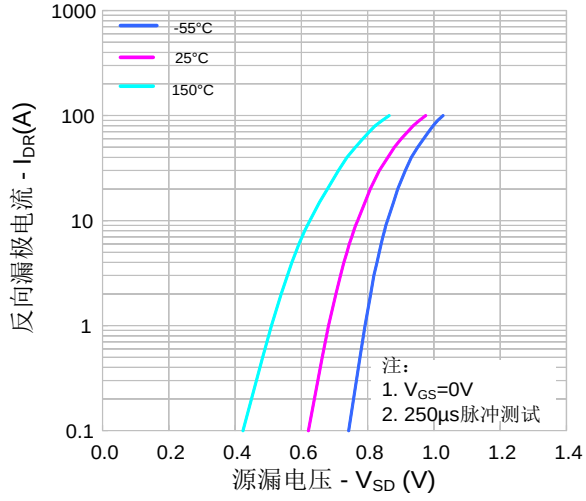


图7. 电容特性

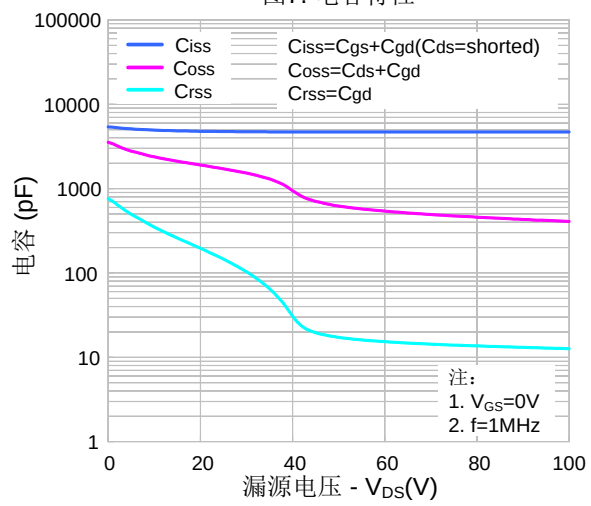


图 8. 电荷量特性

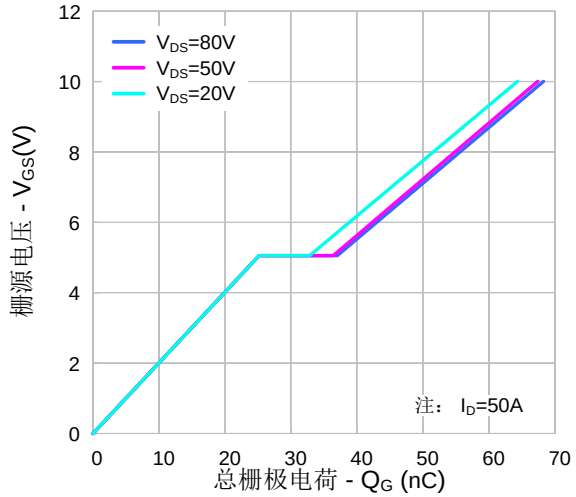


图 9. 击穿电压 vs. 温度特性

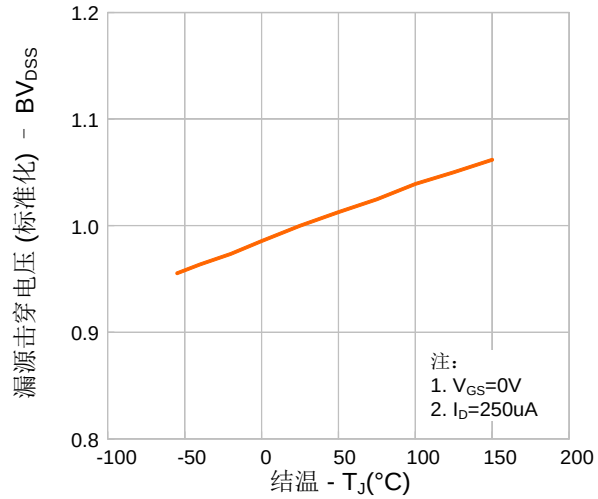


图 10. 导通电阻 vs. 温度特性

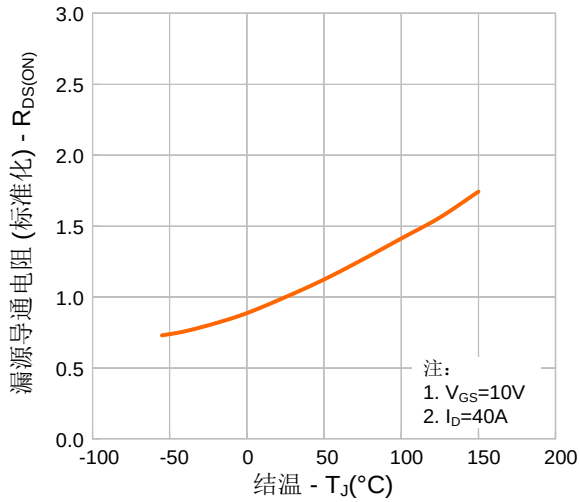


图 11. 最大安全工作区域

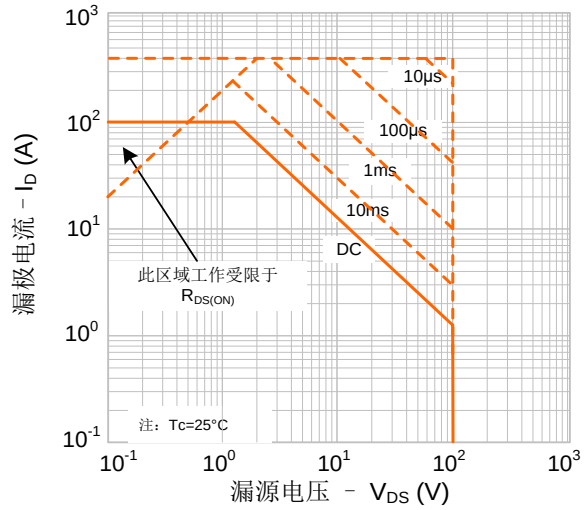
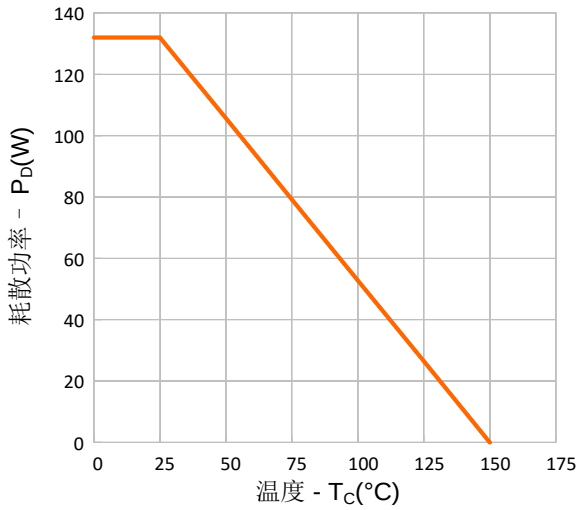
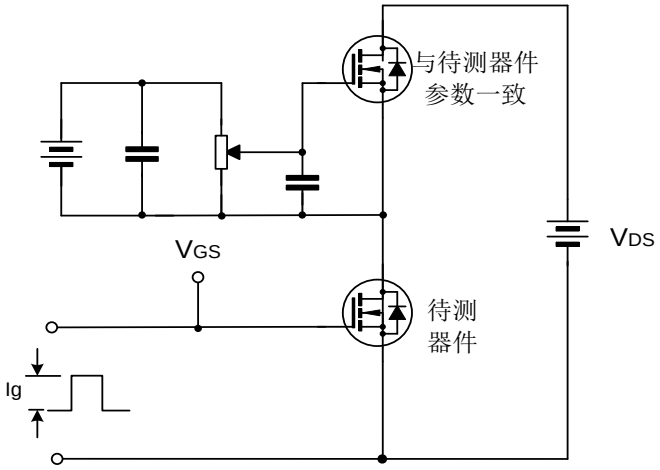
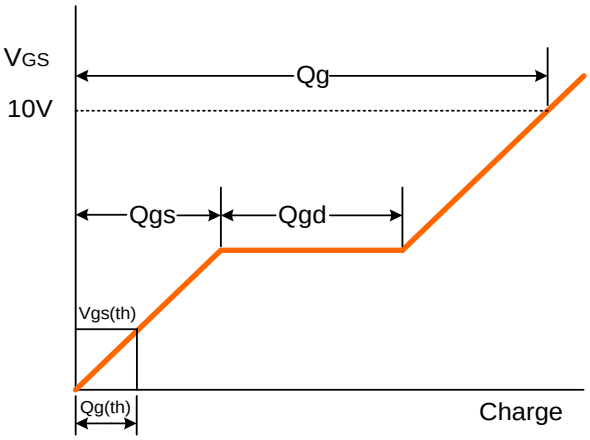


图 12. 耗散功率 vs. 温度

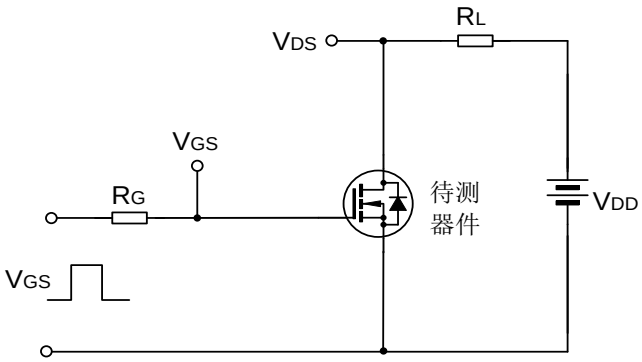


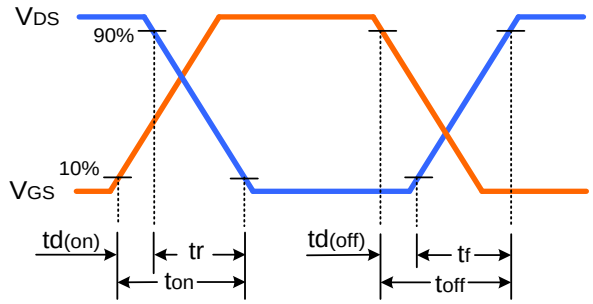
栅极电荷量测试电路及波形图



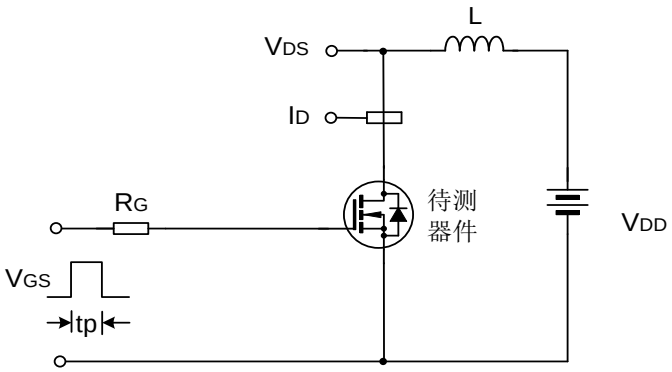


开关时间测试电路及波形图

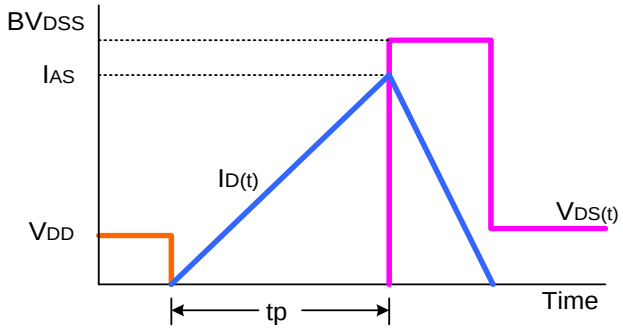




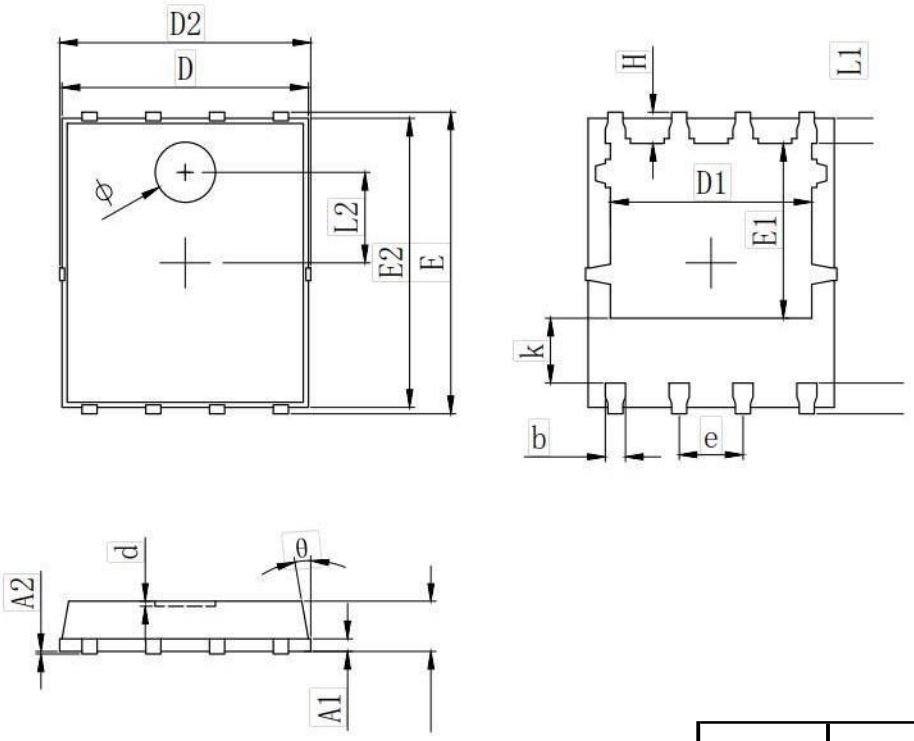
EAS测试电路及波形图



$$E_{AS} = \frac{1}{2} LI_{AS}^2 \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$



●Dimensions（DFN5×6）



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.900	1.000	1.100
A1	0.254 REF.		
A2	0~0.05		
D	4.824	4.900	4.976
D1	3.910	4.010	4.110
D2	4.924	5.000	5.076
E	5.924	6.000	6.076
E1	3.375	3.475	3.575
E2	5.674	5.750	5.826
b	0.350	0.400	0.450
e	1.270 TYP.		
L	0.534	0.610	0.686
L1	0.424	0.500	0.576
L2	1.800 REF.		
k	1.190	1.290	1.390
H	0.549	0.625	0.701
θ	8°	10°	12°
⌀	1.100	1.200	1.300
d			0.100

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