General Description

The AGM406MBQ 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
- 100% Avalanche tested
- 100% DVDS tested

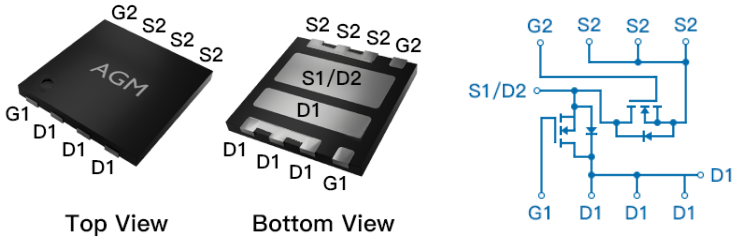
Application

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

Product Summary

BVDSS	RDSON	ID
40V	7.8mΩ	25A

WQFN3.3*3.3 Pin Configuration



Top View Bottom View

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM406MBQ	AGM406MBQ	WQFN3.3*3.3	330mm	12mm	5000

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	40	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25℃) **(Note 1)**	25	A
	Drain Current-Continuous(Tc=100℃)	18	A
IDM (pluse)	Drain Current-Pulsed **(Note 2)**	100	A
PD	Maximum Power Dissipation(Tc=25℃)	2.0	w
	Maximum Power Dissipation(Tc=125℃)	1.3	w
EAS	Avalanche energy **(Note 3)**	36	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]	78	94	℃/W
RθJC	Thermal Resistance Junction-Case[1]	---	34	℃/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	40	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=40V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.2	1.5	2.2	V
gFS	Forward Transconductance	VDS=5V,ID=6A	--	15	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=10A	--	7.8	11	mΩ
		VGS=4.5V, ID=6A	--	11	20	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=20V,VGS=0V, F=1MHZ	--	870	--	pF
Coss	Output Capacitance		--	265	--	pF
Crss	Reverse Transfer Capacitance		--	20	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	--	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=20V, ID=1A,RGEN=6Ω	--	5.6	--	nS
tr	Turn-on Rise Time		--	29	--	nS
td(off)	Turn-Off Delay Time		--	15	--	nS
tf	Turn-Off Fall Time		--	4.6	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=20V, ID=10A	--	13	--	nC
Qgs	Gate-Source Charge		--	2.7	--	nC
Qgd	Gate-Drain Charge		--	1.6	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	25	A
VSD	Forward on Voltage	VGS=0V,IS=10A	--	0.8	1.2	V
trr	Reverse Recovery Time	IF=10A , dI/dt=100A/μs , TJ=25℃	--	--	--	ns
Qrr	Reverse Recovery Charge		--	--	--	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℃ , VDD=25V,Vgs=10V,ID=12A,L=0.5mH,RG=25ohm

Typical Characteristics

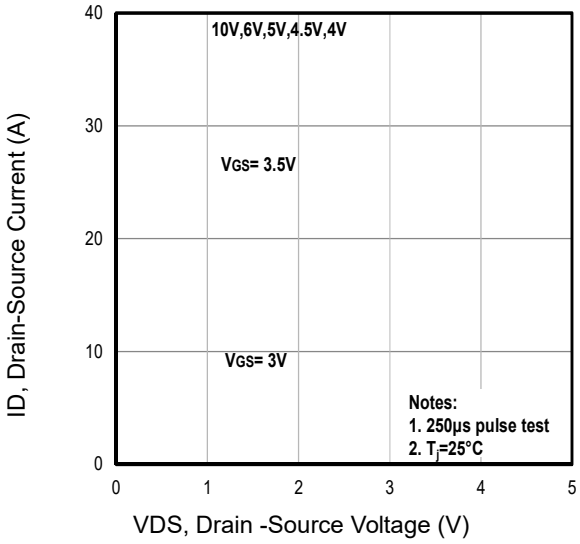


Fig1. Typical Output Characteristics

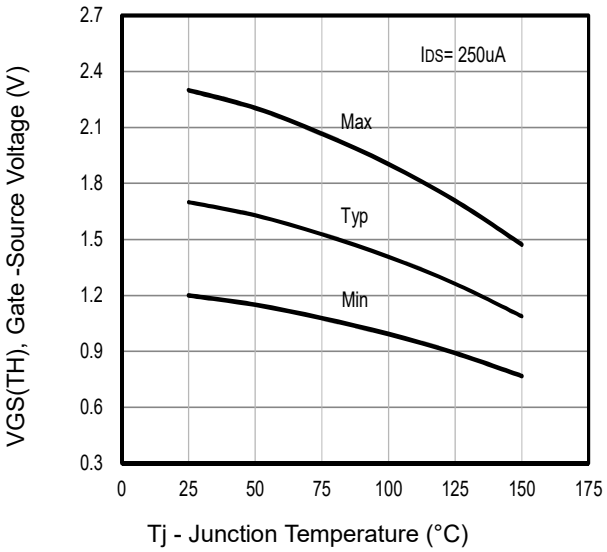


Fig2. Typical $V_{GS(TH)}$ Gate -Source Voltage Vs. Tj

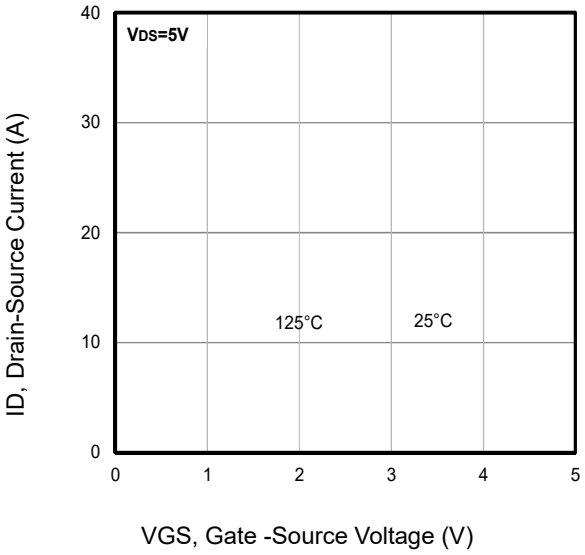


Fig3. Typical Transfer Characteristics

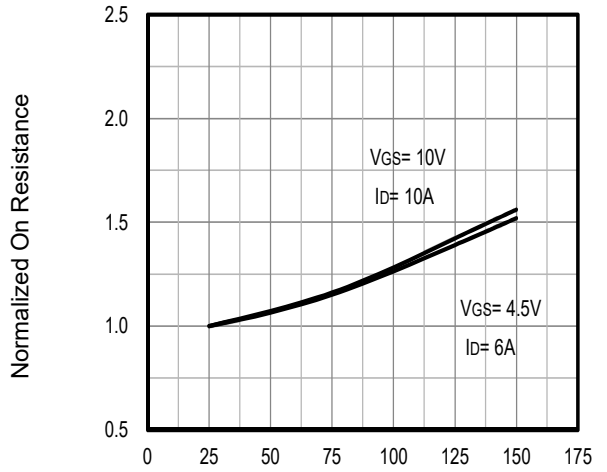


Fig4. Typical Normalized On-Resistance Vs. Tj

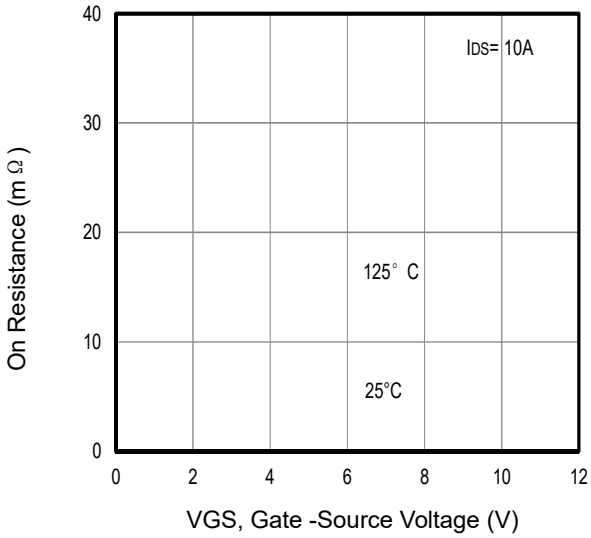


Fig5. Typical On Resistance Vs Gate -Source Voltage

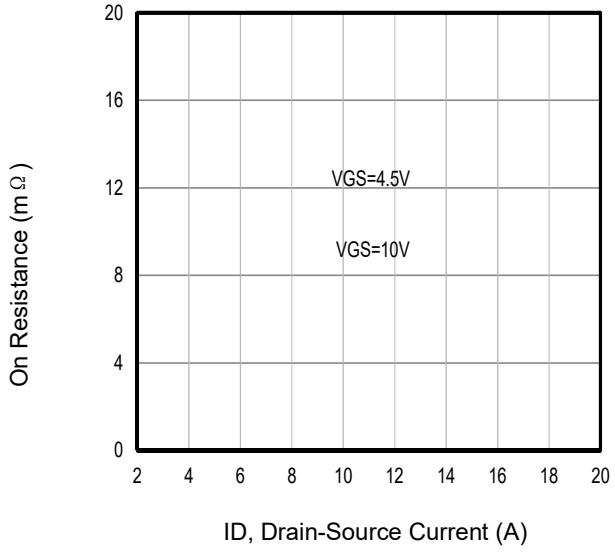


Fig6. Typical On Resistance Vs Drain Current

Typical Characteristics

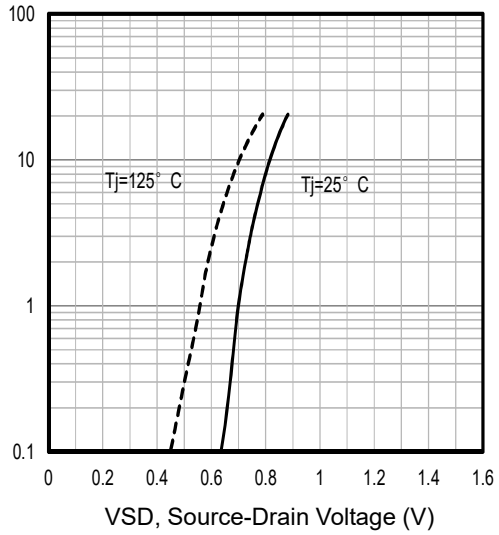


Fig7. Typical Source-Drain Diode Forward Voltage

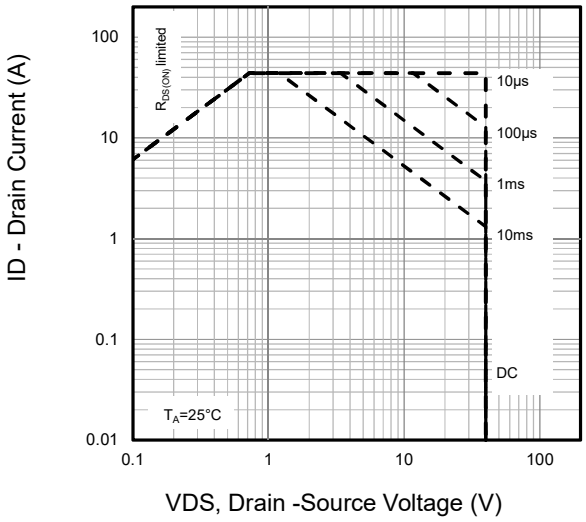


Fig8. Maximum Safe Operating Area

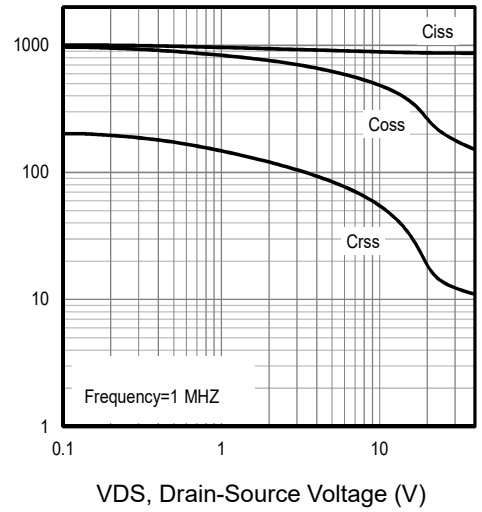


Fig9. Typical Capacitance Vs. Drain-Source Voltage

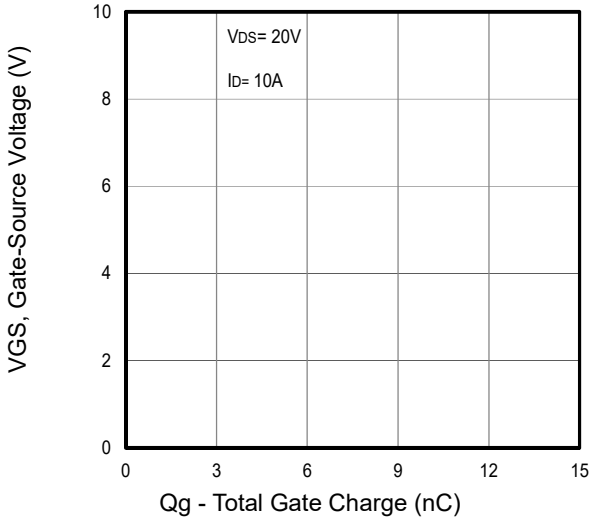


Fig10. Typical Gate Charge Vs. Gate-Source Voltage

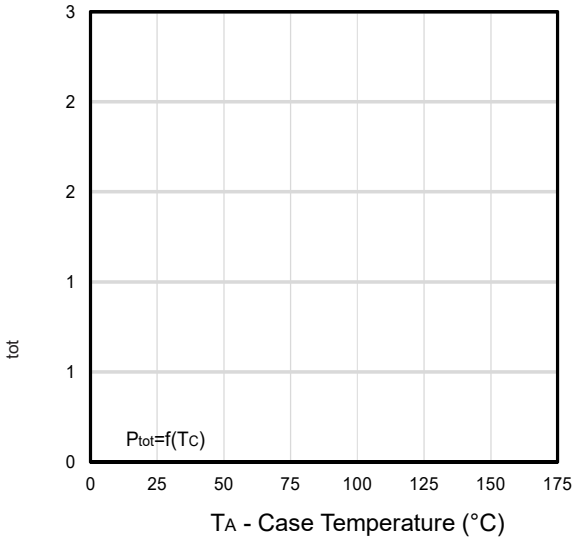


Fig11. Power Dissipation Vs. Case Temperature

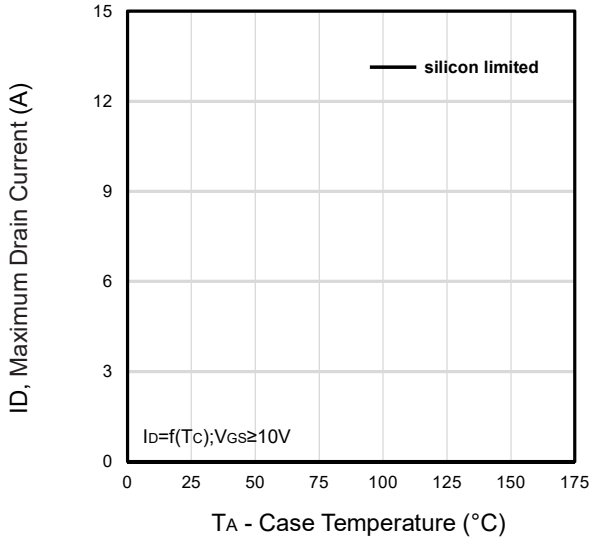


Fig12. Maximum Drain Current Vs. Case Temperature

Typical Characteristics

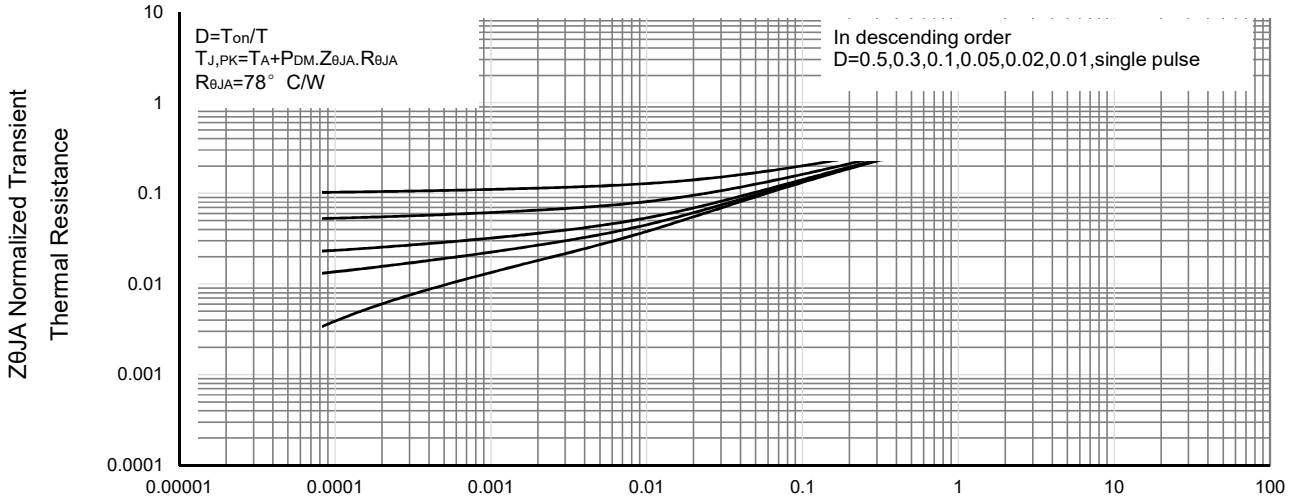
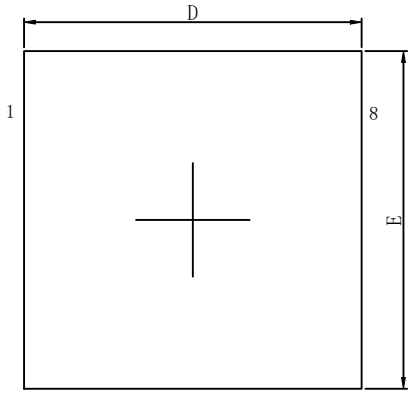
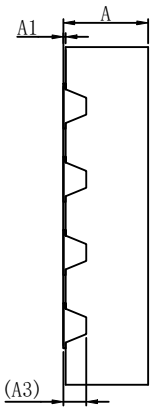


Fig13 . Normalized Maximum Transient Thermal Impedance

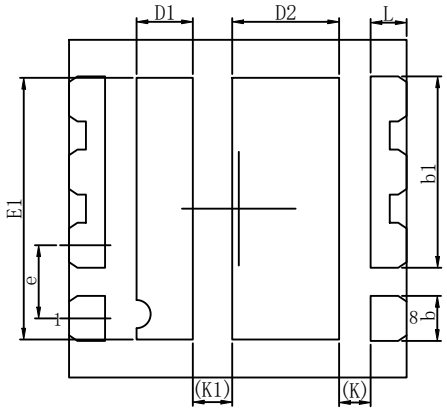
●Dimensions（WQFN3.3*3.3）



TOP VIEW
[顶视图]



SIDE VIEW
[侧视图]



BOTTOM VIEW
[背视图]

SYMBOL	MIN	NOM	MAX
A	0.700	0.750	0.800
A1	0.000	0.020	0.050
A3		0.203 REF	
b	0.350	0.400	0.450
b1	1.600	1.700	1.800
D	2.900	3.000	3.100
E	2.900	3.000	3.100
e		0.650 BSC	
D1	0.400	0.500	0.600
D2	0.850	0.950	1.050
E1	2.225	2.325	2.425
L	0.220	0.320	0.420
K		0.280 REF	
K1		0.350 REF	

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