

### ● General Description

The AGM306MBP 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

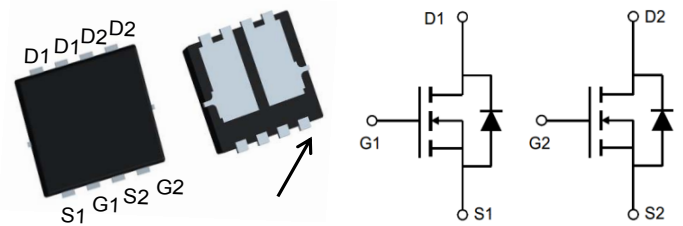
### ● Application

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

### Product Summary

BVDSS	RDSON	ID
30V	6.0mΩ	46A

### PDFN3.3\*3.3 Pin Configuration



### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM306MBP	AGM306MBP	PDFN3.3*3.3	330mm	12mm	5000

**Table 1. Absolute Maximum Ratings (TA=25°C)**

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	30	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) <b>(Note 1)</b>	46	A
	Drain Current-Continuous(Tc=100°C)	29	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed <b>(Note 2)</b>	184	A
PD	Maximum Power Dissipation(Tc=25°C)	20	w
	Maximum Power Dissipation(Tc=100°C)	8.0	w
EAS	Avalanche energy <b>(Note 3)</b>	67	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	°C

**Table 2. Thermal Characteristic**

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State) <sup>1</sup>	---	63	°C/W
RθJC	Thermal Resistance Junction-Case <sup>1</sup>	---	6.2	°C/W

**Table 3. Electrical Characteristics ( $T_J=25^{\circ}\text{C}$  unless otherwise noted)**

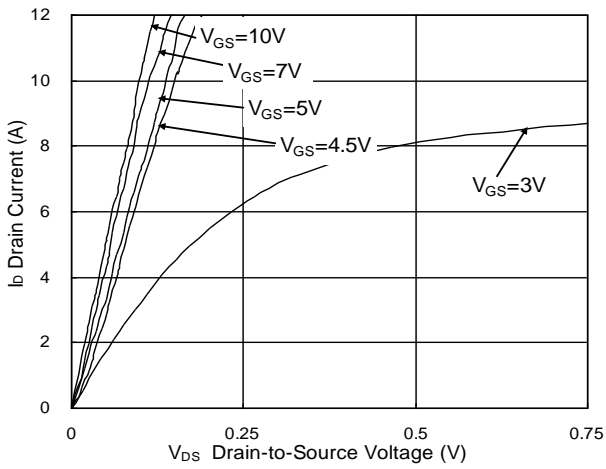
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250 $\mu$ A	30	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=30V, VGS=0V	--	--	1	$\mu$ A
IGSS	Gate-Body Leakage Current	VGS= $\pm$ 20V, VDS=0V	--	--	$\pm$ 100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250 $\mu$ A	1.2	1.4	2.1	V
gFS	Forward Transconductance	VDS=5V, ID=8A	--	18	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=12A	--	6.0	7.8	m $\Omega$
		VGS=4.5V, ID=8A	--	8.0	11	m $\Omega$
<b>Dynamic Characteristics</b>						
Ciss	Input Capacitance	VDS=15V, VGS=0V, F=1MHZ	--	1070	--	pF
Coss	Output Capacitance		--	163	--	pF
Crss	Reverse Transfer Capacitance		--	110	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V, f=1.0MHz	--	1.7	--	$\Omega$
<b>Switching Times</b>						
td(on)	Turn-on Delay Time	VGS=10V, VDS=12V, RL=0.75 $\Omega$ , RGEN=3.3 $\Omega$	--	4.5	--	nS
tr	Turn-on Rise Time		--	10.8	--	nS
td(off)	Turn-Off Delay Time		--	22.5	--	nS
tf	Turn-Off Fall Time		--	9.6	--	nS
Qg	Total Gate Charge	VGS=4.5V, VDS=20V, ID=12A	--	12.8	--	nC
Qgs	Gate-Source Charge		--	3.3	--	nC
Qgd	Gate-Drain Charge		--	6.5	--	nC
<b>Source-Drain Diode Characteristics</b>						
ISD	Source-Drain Current(Body Diode)	VG=VD=0V , Force Current	--	--	46	A
VSD	Forward on Voltage	VGS=0V, IS=12A	--	--	1.2	V
trr	Reverse Recovery Time	IF=12A , dI/dt=100A/ $\mu$ s , TJ=25 $^{\circ}$ C	--	--	--	ns
Qrr	Reverse Recovery Charge		--	--	--	nc

Notes 1.The maximum current rating is package limited.

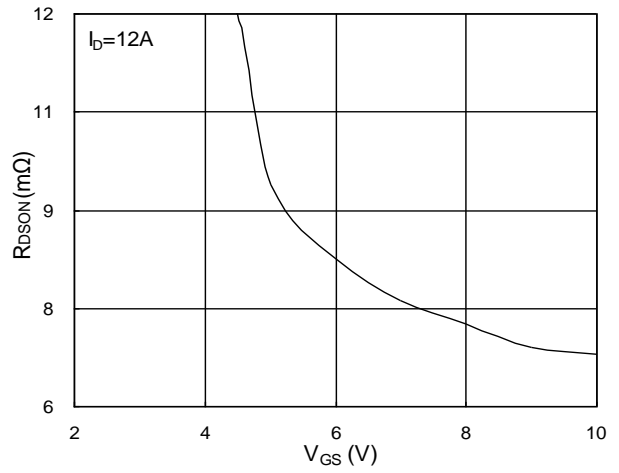
Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: TJ=25 $^{\circ}$ C

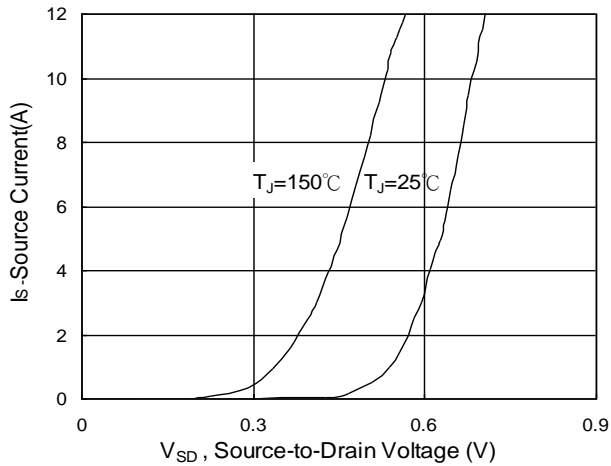
**Typical Characteristics**



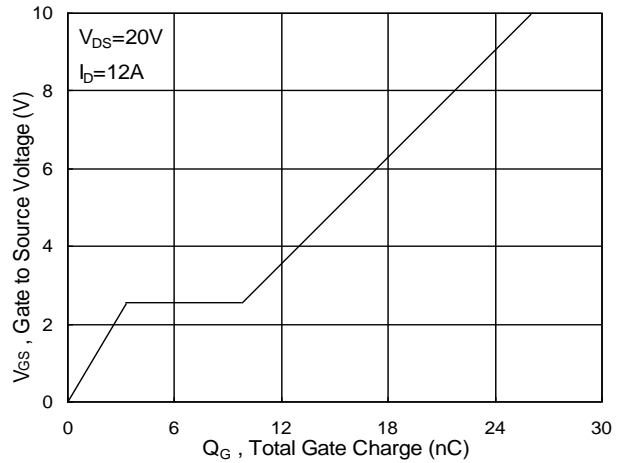
**Fig.1 Typical Output Characteristics**



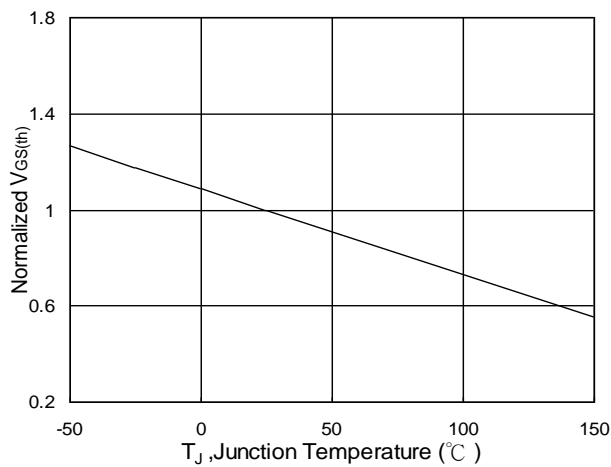
**Fig.2 On-Resistance vs. Gate-Source**



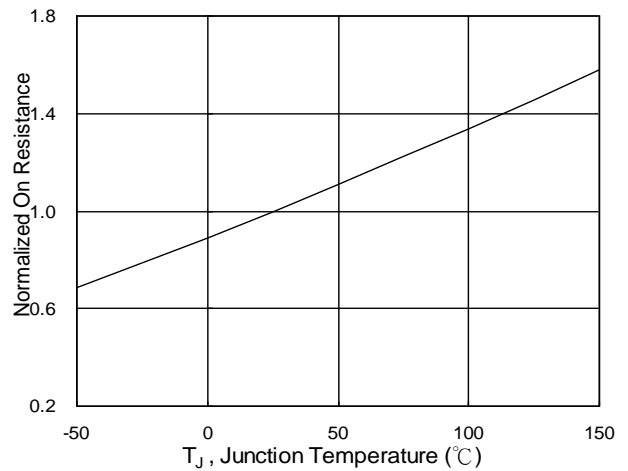
**Fig.3 Forward Characteristics Of Reverse**



**Fig.4 Gate-Charge Characteristics**



**Fig.5 Normalized VGS(th) vs. TJ**



**Fig.6 Normalized RDS(on) vs. TJ**

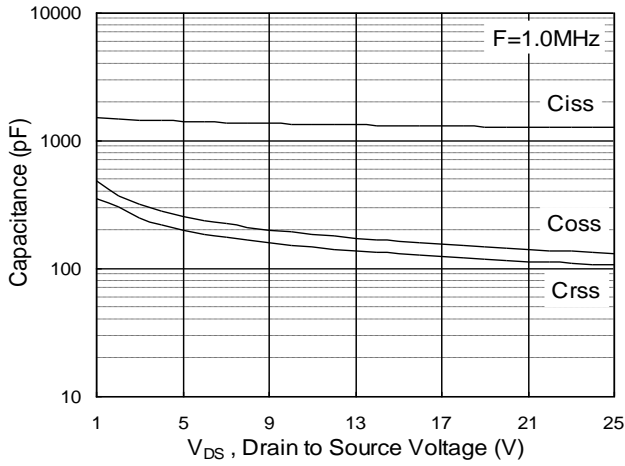


Fig.7 Capacitance

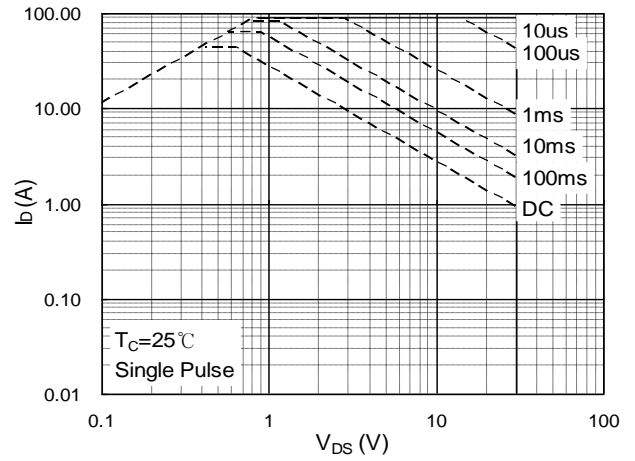


Fig.8 Safe Operating Area

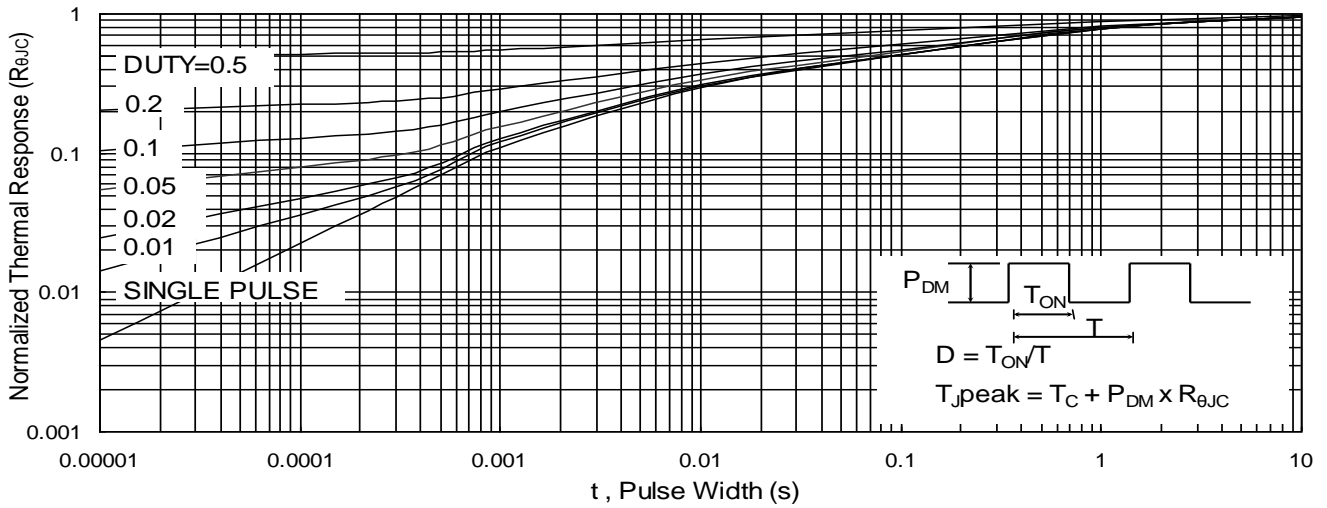


Fig.9 Normalized Maximum Transient Thermal Impedance

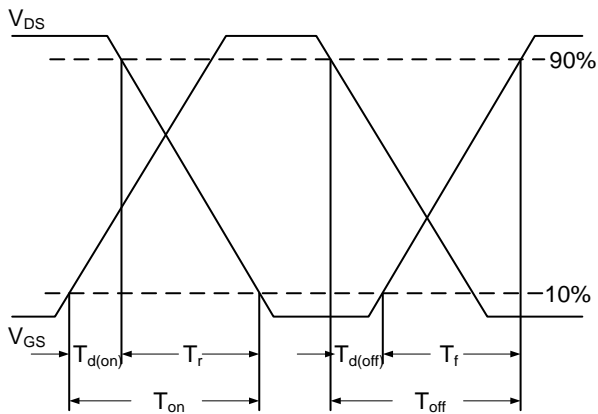


Fig.10 Switching Time Waveform

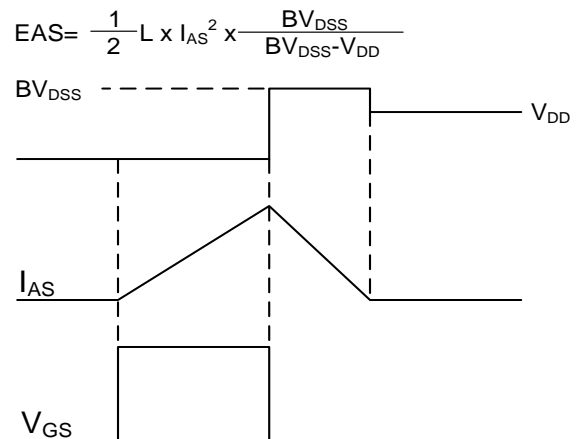
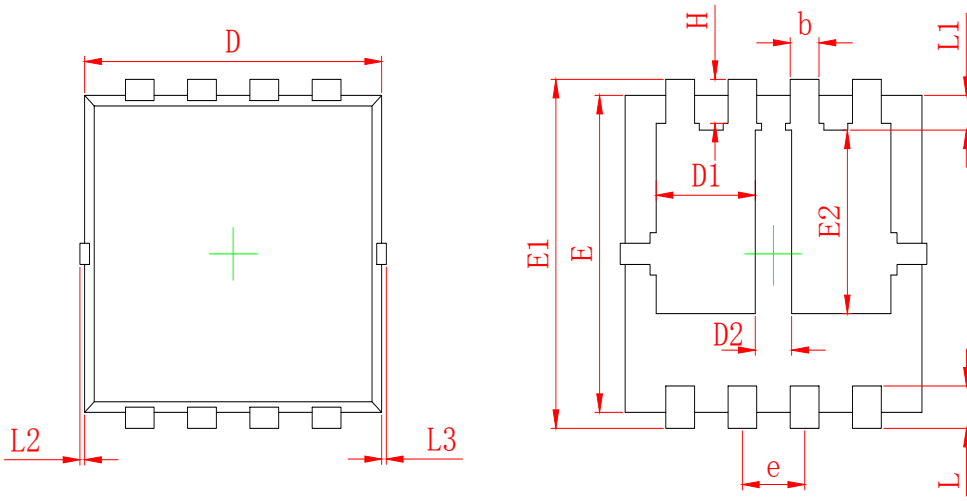
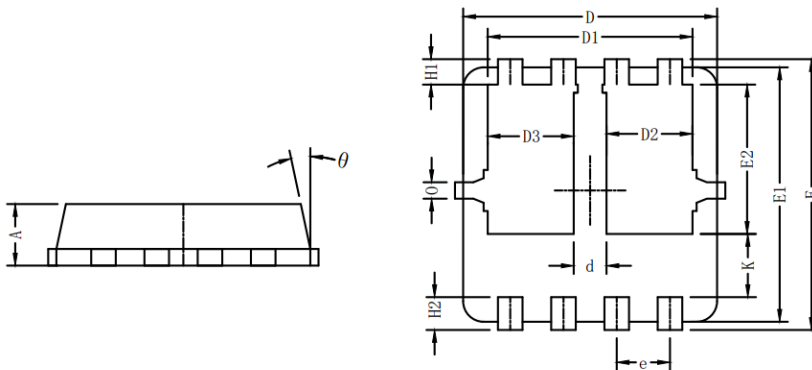
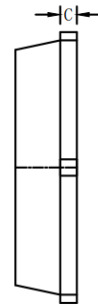
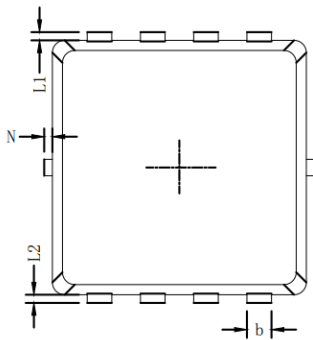
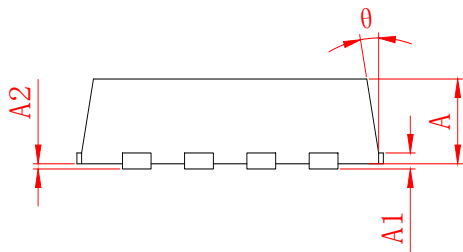


Fig.11 Unclamped Inductive Switching Waveform

**●Dimensions (PDFN3.3×3.3)**


SYMBOL	MILLIMETER	
	MIN	MAX
A	0.700	0.900
A1	0.152 REF.	
A2	0 <sup>~</sup> 0.05	
D	3.000	3.200
D1	0.935	1.135
D2	0.280	0.480
E	2.900	3.100
E1	3.150	3.450
E2	1.535	1.935
b	0.200	0.400
e	0.550	0.750
L	0.300	0.500
L1	0.180	0.480
L2	0 <sup>~</sup> 0.100	
L3	0 <sup>~</sup> 0.100	
H	0.315	0.515
θ	8°	12°



Symbols	Millimeters		
	MIN.	NOM.	MAX.
A	0.65	0.75	0.85
b	0.25	0.30	0.35
C	0.15	0.20	0.25
D	3.00	3.10	3.20
D1	2.40	2.50	2.60
D2/D3	1.00	1.05	1.10
d	0.30	0.40	0.50
E	3.20	3.30	3.40
E1	3.00	3.10	3.20
E2	1.72	1.82	1.92
e	0.65 BSC.		
H1	0.21	0.31	0.41
H2	0.30	0.40	0.50
K	0.67	0.77	0.87
L1/L2	0.10 REF.		
θ	11°	12°	13°
N	0	-	0.15
o	0.2 REF.		


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