

General Description

The AGM20P16MBP 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

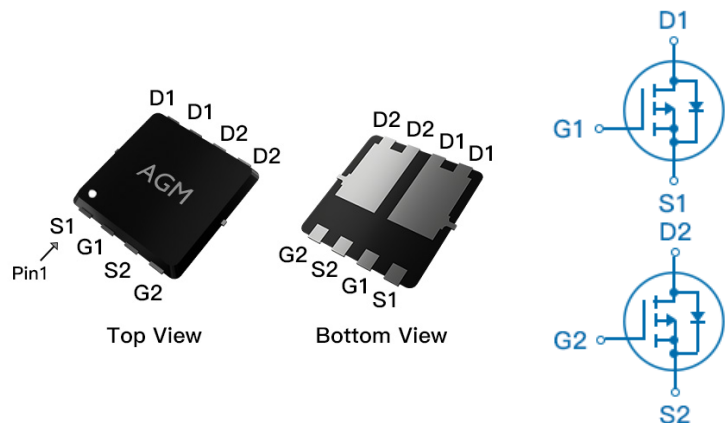
Application

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

Product Summary

BVDSS	RDSON	ID
-20V	16mΩ	-10A

PDFN3.3*3.3 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM20P16MB	AGM20P16MBP	PDFN3.3*3.3	330mm	12mm	5000

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	-20	V
VGS	Gate-Source Voltage (VDS=0V)	±12	V
ID	Drain Current-Continuous(TC=25°C) (Note 1)	-10	A
	Drain Current-Continuous(TC=100°C)	-6.8	A
IDM (pulse)	Drain Current-Pulsed (Note 2)	-40	A
PD	Maximum Power Dissipation(TC=25°C)	29	w
	Maximum Power Dissipation(TC=100°C)	12	w
EAS	Avalanche energy (Note 3)	--	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) ¹	---	50	°C/W
RθJC	Thermal Resistance Junction-Case ¹	---	4.2	°C/W

Table 3. Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=-250μA	-20	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=-20V,VGS=0V	--	--	-1	μA
IGSS	Gate-Body Leakage Current	VGS=±12V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-0.45	-0.6	-1.0	V
gFS	Forward Transconductance	VDS=-5V,ID=-3A	--	3	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=-4.5V, ID=-4A	--	16	21	mΩ
		VGS=-2.5V, ID=-3A	--	20	26	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=-10V,VGS=0V, VDS=0V,f=1.0MHz	--	980	--	pF
Coss	Output Capacitance		--	450	--	pF
Crss	Reverse Transfer Capacitance		--	250	--	Ω
Rg	Gate resistance	VGS=0V, VDS=0V, f=1.0MHz	--	--	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=-4V, VDS=-4.5V, ID=-3.3A,RG=1Ω	--	12	--	nS
tr	Turn-on Rise Time		--	35	--	nS
td(off)	Turn-Off Delay Time		--	30	--	nS
tf	Turn-Off Fall Time		--	10	--	nC
Qg	Total Gate Charge	VGS=-4V, VDS=-4.5V,ID=-4.1A	--	7.8	--	nC
Qgs	Gate-Source Charge		--	1.2	--	nC
Qgd	Gate-Drain Charge		--	1.6	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)	VGS=0V,IS=-4A	--	--	-10	A
VSD	Forward on Voltage	IF=-4A , dI/dt=100A/μs ,TJ=25℃	--	--	-1.2	V
trr	Reverse Recovery Time		--	--	--	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°C

Typical Performance Characteristics

Figure 1: Output Characteristics

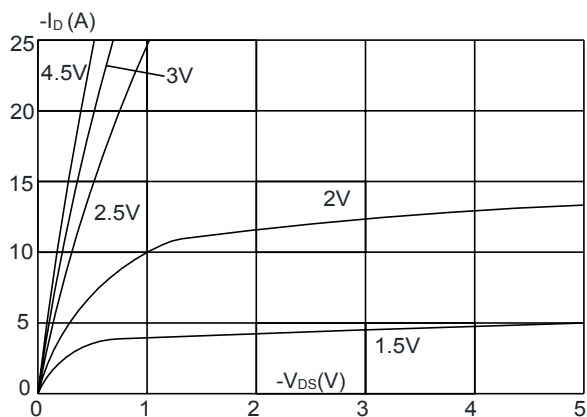


Figure 2: Typical Transfer Characteristics

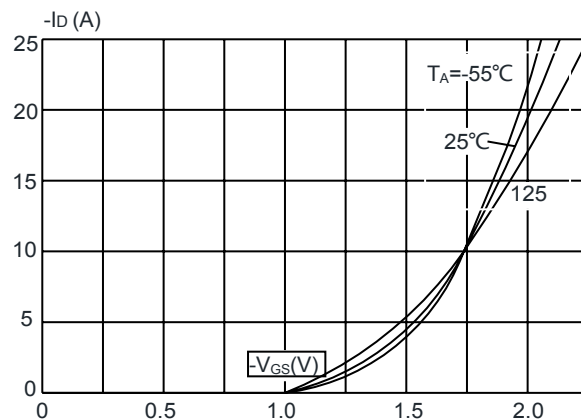


Figure 3: On-resistance vs. Drain Current

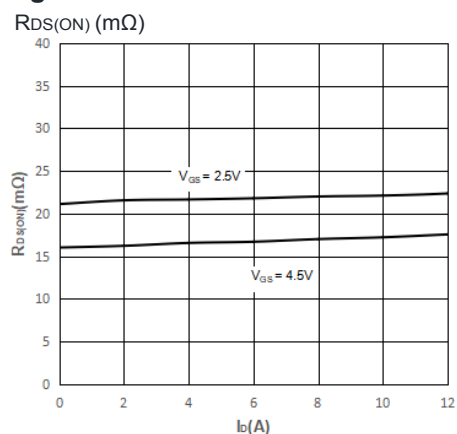


Figure 4: Body Diode Characteristics

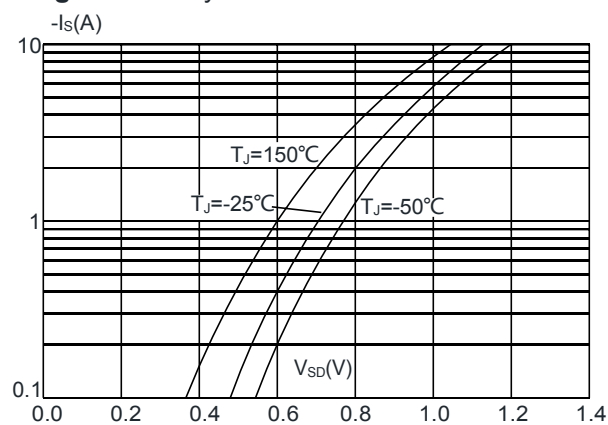


Figure 5: Gate Charge Characteristics

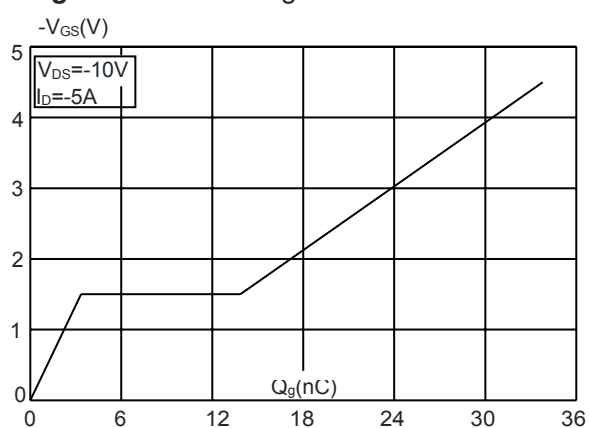


Figure 6: Capacitance Characteristics

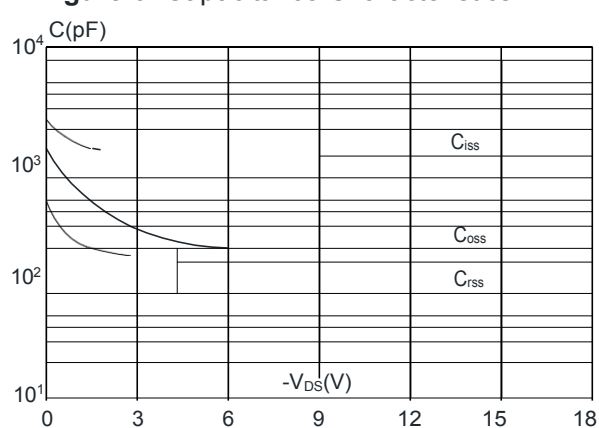


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

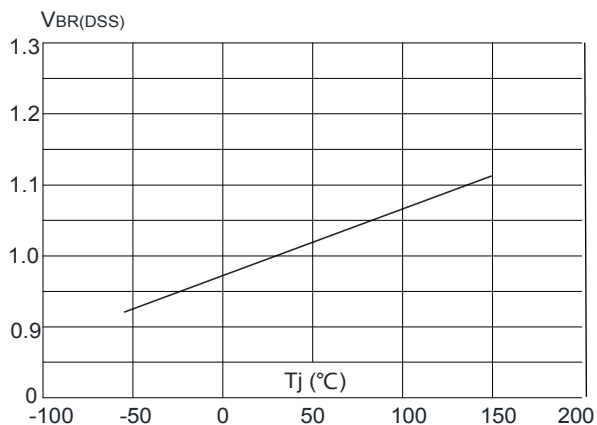


Figure 8: Normalized on Resistance vs. Junction Temperature

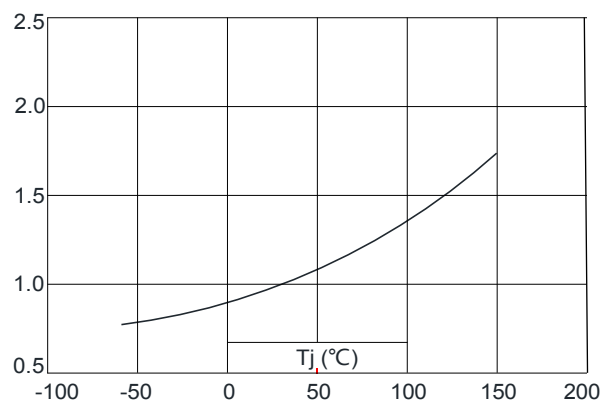
 $R_{DS(on)}$


Figure 9: Maximum Safe Operating Area

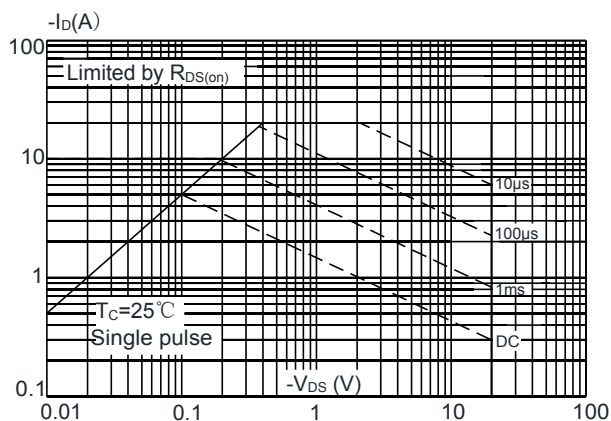


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

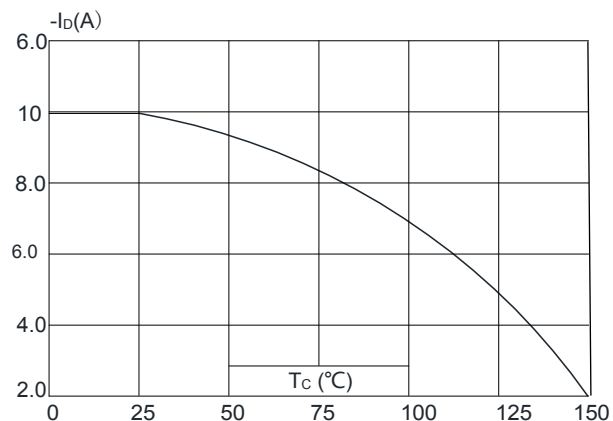
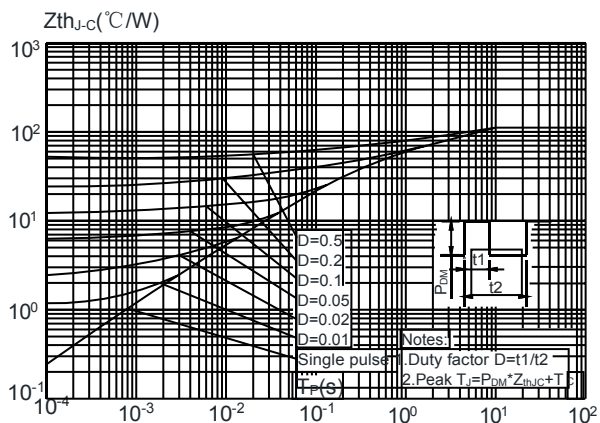
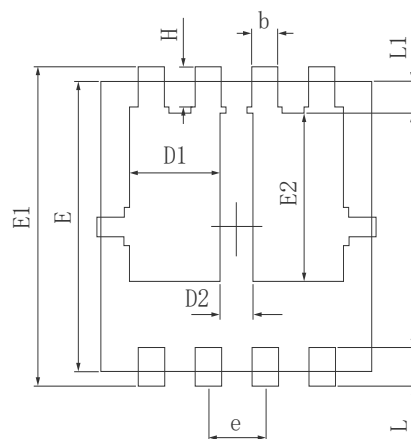
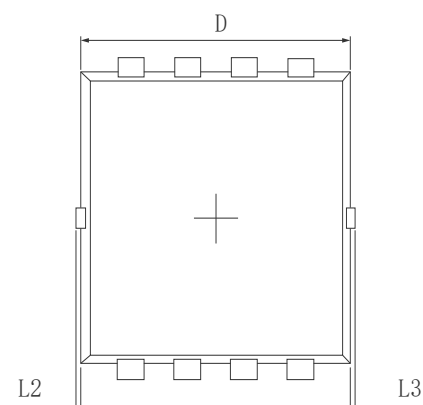


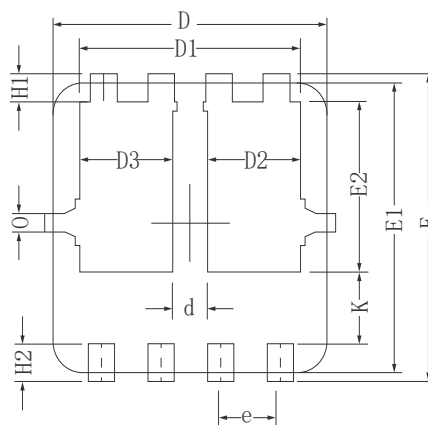
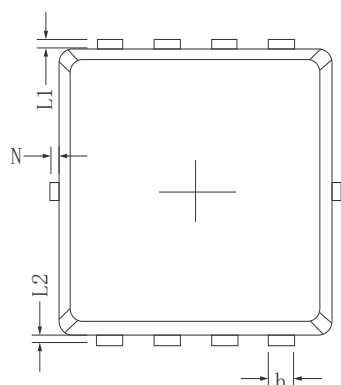
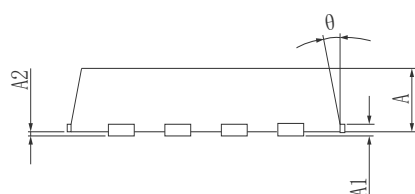
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



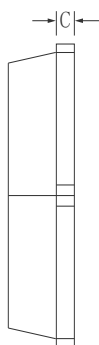
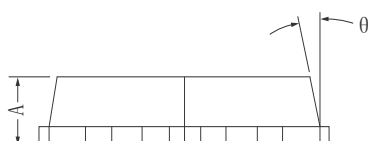
Dimensions (PDFN3.3*3.3)



SYMBOL	MILLIMETER	
	MIN	MAX
A	0.700	0.900
A1	0.152REF.	
A2	0~0.05	
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	0~0.100	
L3	0~0.100	
H	0.315	0.515
θ	8°	12°

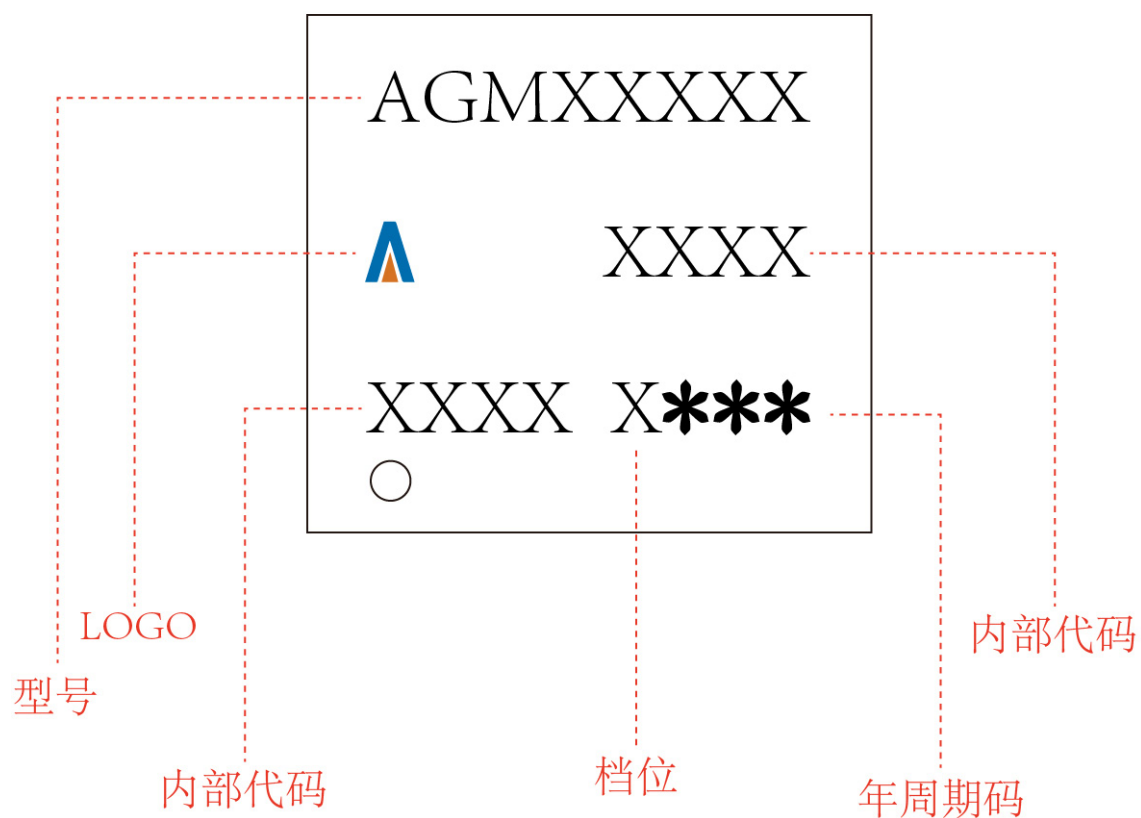


Symbols	Millimeters		
	MIN.	NOM.	MAX.
A	0.65	0.75	0.85
b	0.25	0.30	0.35
C	0.15	0.20	0.25
D	3.00	3.10	3.20
D1	2.40	2.50	2.60
D2/D3	1.00	1.05	1.10
d	0.30	0.40	0.50
E	3.20	3.30	3.40
E1	3.00	3.10	3.20
E2	1.72	1.82	1.92
e	0.65 BSC.		
H1	0.21	0.31	0.41
H2	0.30	0.40	0.50
K	0.67	0.77	0.87
L1/L2	0.10 REF.		
θ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



PDFN3.3*3.3

Marking Instructions:



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