

### ● General Description

The AGM305AP 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 2<sup>nd</sup> Synchronous Rectifier
- POL application
- BLDC Motor driver

### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM305AP	AGM305AP	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>	68	A
	Drain Current-Continuous(Tc=100°C)	46	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed <b>(Note 2)</b>	240	A
PD	Maximum Power Dissipation(Tc=25°C)	70	w
	Maximum Power Dissipation(Tc=100°C)	28	w
EAS	Avalanche energy <b>(Note 3)</b>	172	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>	---	50	°C/W
RθJC	Thermal Resistance Junction-Case <sup>1</sup>	---	1.8	°C/W

### Product Summary

BVDSS	RDSON	ID
30V	4.5mΩ	68A

### PDFN3.3\*3.3 Pin Configuration



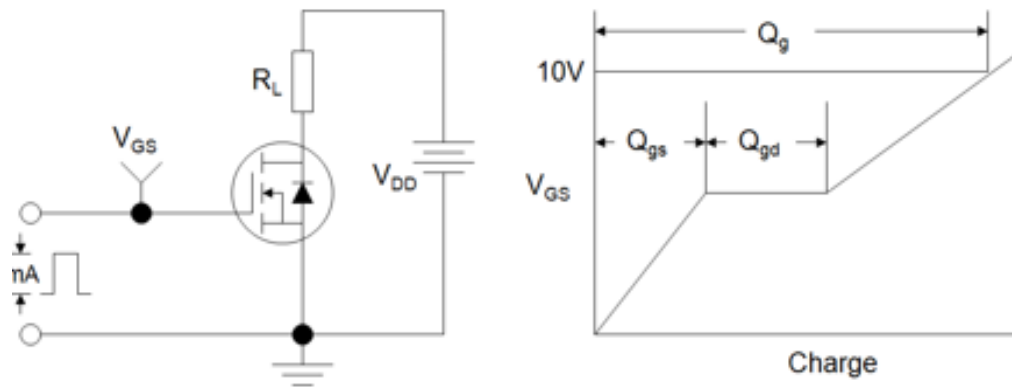
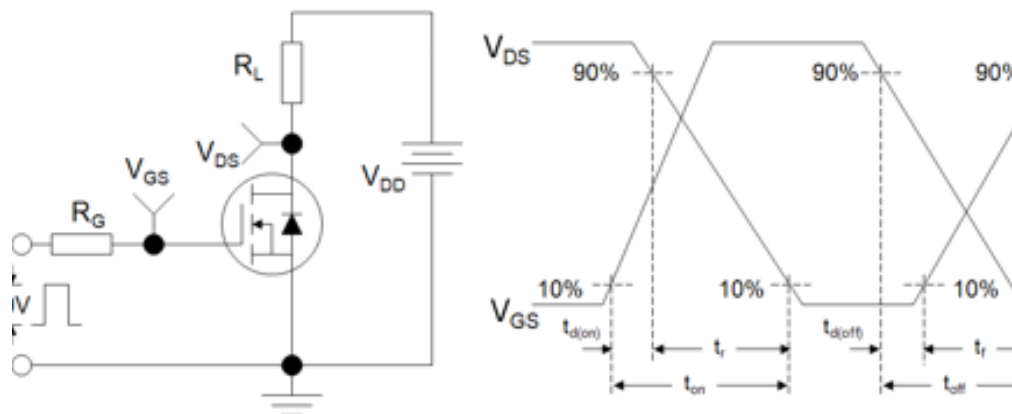
**Table 3. Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	30	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=30V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.0	1.5	2.5	V
gFS	Forward Transconductance	VDS=5V,ID=10A	--	13	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=20A	--	4.5	5.6	mΩ
		VGS=4.5V, ID=15A	--	5.8	8.2	mΩ
<b>Dynamic Characteristics</b>						
Ciss	Input Capacitance	VDS=15V,VGS=0V, F=1MHZ	--	1240	--	pF
Coss	Output Capacitance		--	235	--	pF
Crss	Reverse Transfer Capacitance		--	185	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	3.7	--	Ω
<b>Switching Times</b>						
td(on)	Turn-on Delay Time	VGS=10V,VDS=10V, ID=30A, RL=1Ω,RGEN=2.7Ω	--	18	--	nS
tr	Turn-on Rise Time		--	14	--	nS
td(off)	Turn-Off Delay Time		--	55	--	nS
tf	Turn-Off Fall Time		--	8	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=10V, ID=30A	--	27	--	nC
Qgs	Gate-Source Charge		--	6.3	--	nC
Qgd	Gate-Drain Charge		--	3.6	--	nC
<b>Source-Drain Diode Characteristics</b>						
ISD	Source-Drain Current(Body Diode)	VG=VD=0V , Force Current	--	--	68	A
VSD	Forward on Voltage	VGS=0V,IS=20A	--	--	1.2	V
trr	Reverse Recovery Time	IF=20A , dI/dt=100A/μs , TJ=25°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: T<sub>J</sub>=25°C

**Figure A: Gate Charge Test Circuit and Waveform**

**Figure B: Resistive Switching Test Circuit and Waveform**

**Figure C: Unclamped Inductive Switching Test Circuit and Waveform**


## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure 1. Output Characteristics

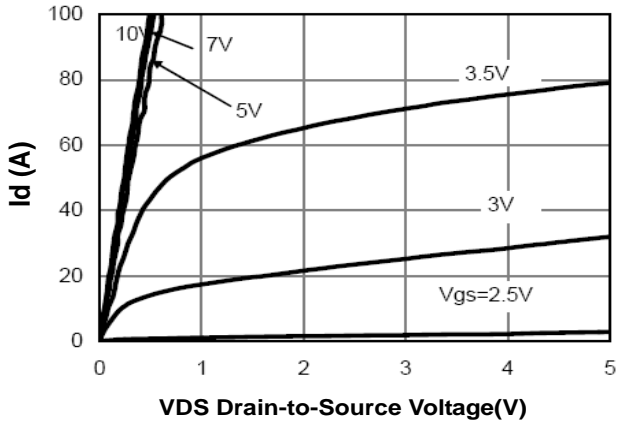


Figure 2. Transfer Characteristics

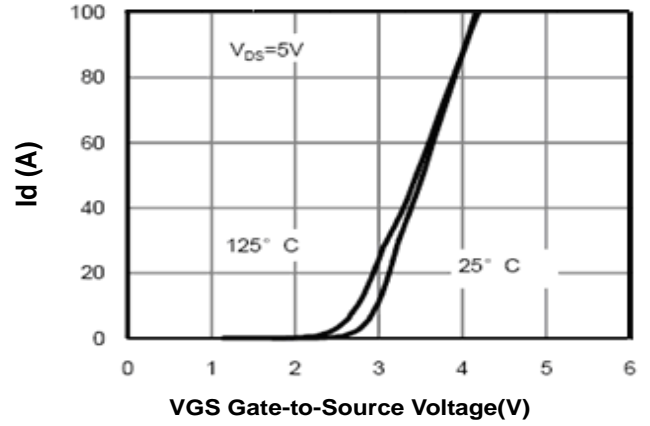
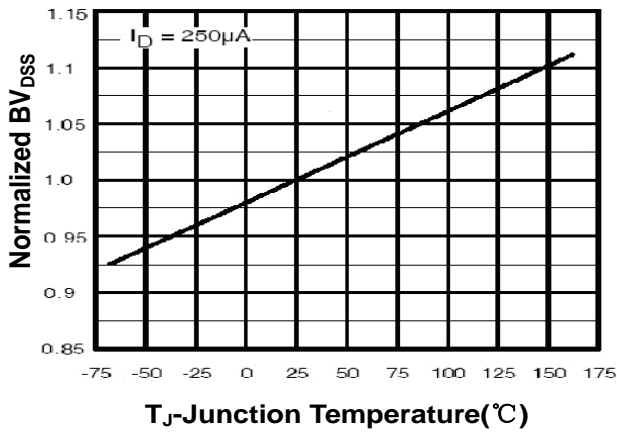

 Figure 3. Max  $BV_{DSS}$  vs Junction Temperature


Figure 4. Drain Current

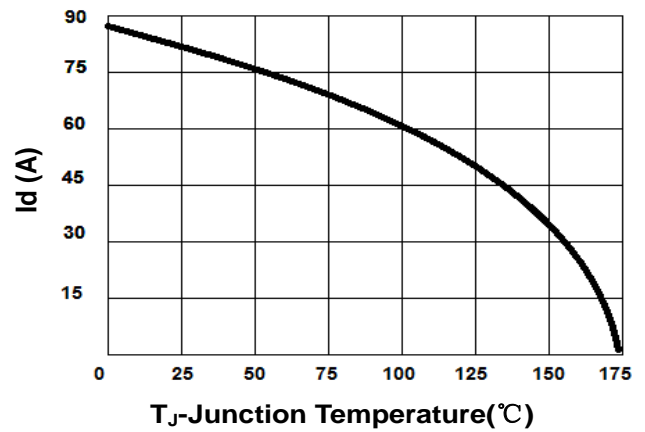
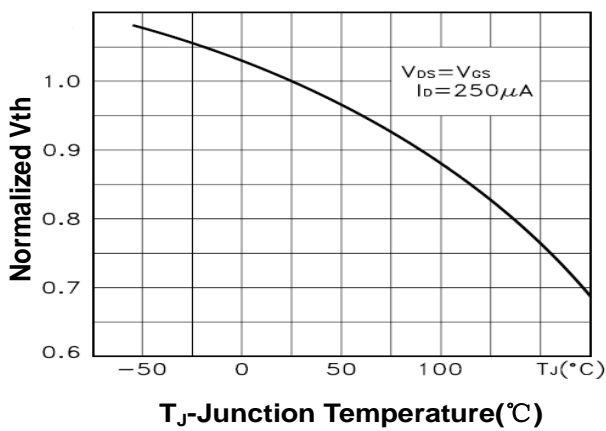
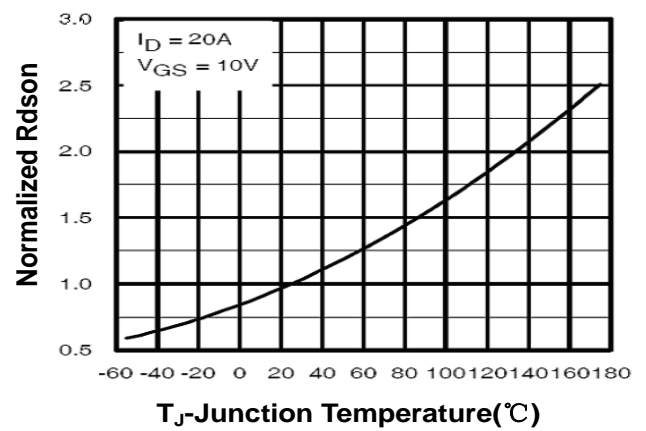

 Figure 5.  $V_{GS(th)}$  vs Junction Temperature

 Figure 6.  $R_{DS(on)}$  vs Junction Temperature


Figure 7. Gate Charge Waveforms

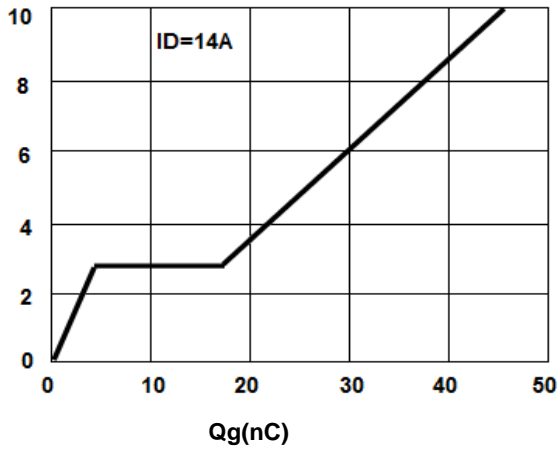


Figure 8. Capacitance

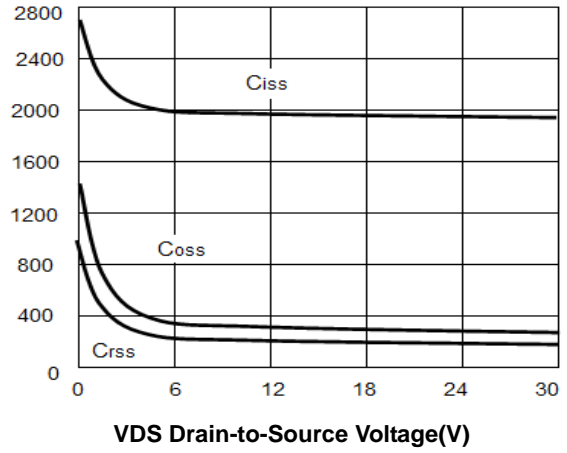


Figure 9. Body-Diode Characteristics

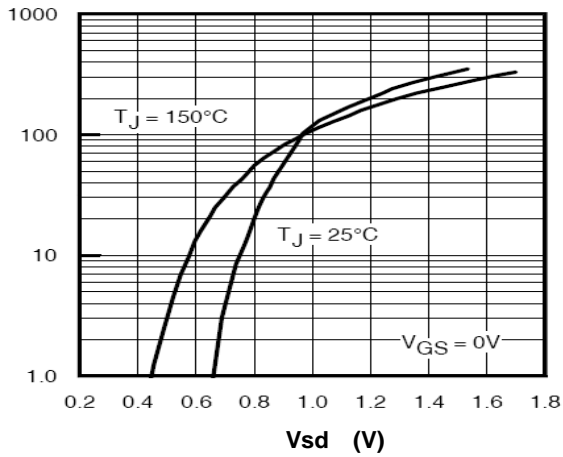


Figure 10. Maximum Safe Operating Area

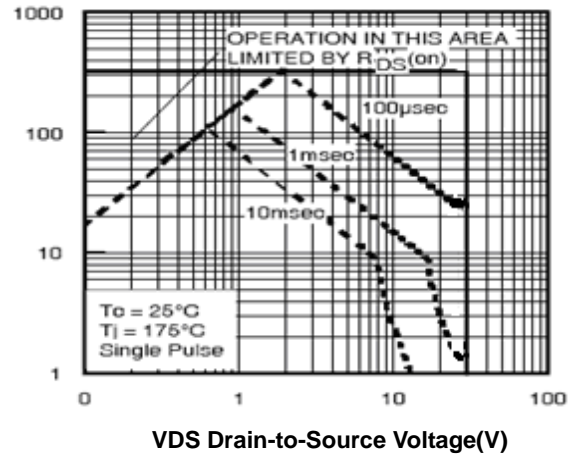
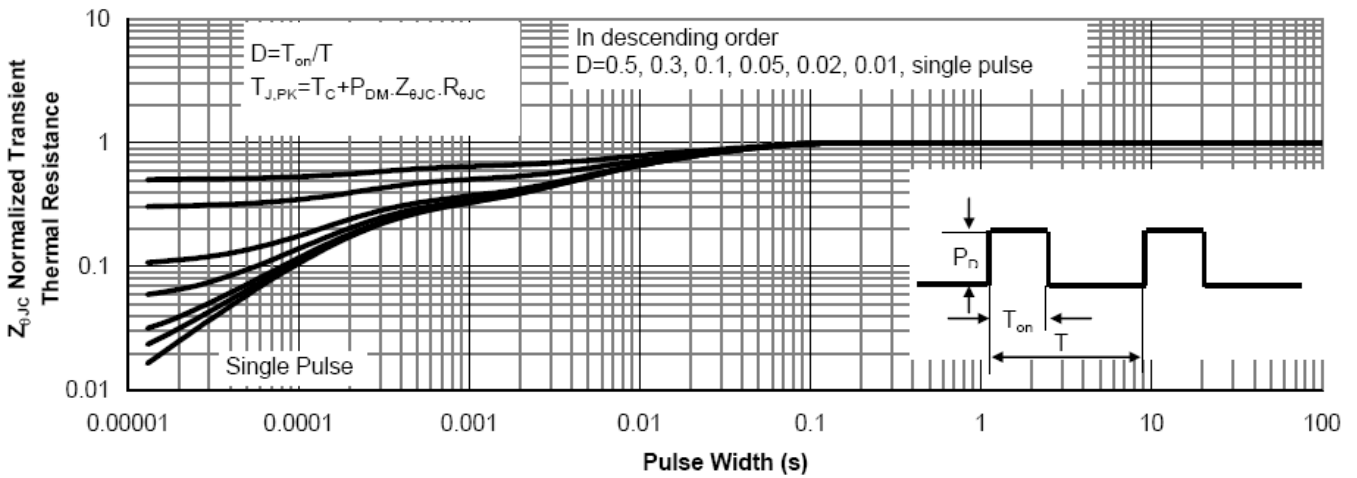
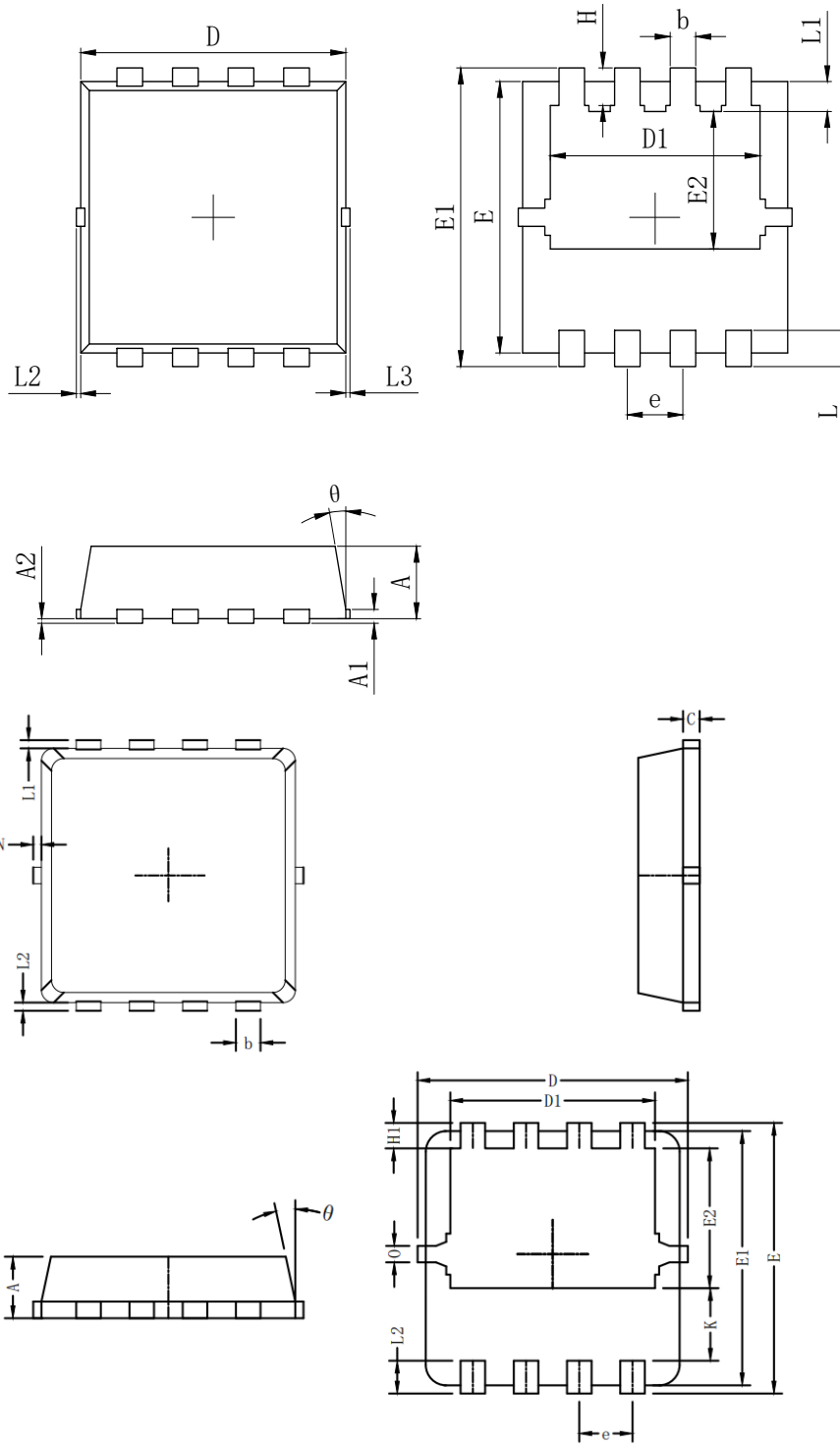


Figure 11. Normalized Maximum Transient Thermal Impedance



**•Dimensions (PDFN3.3×3.3)**


SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.700	0.800	0.900
A1	0.152 REF.		
A2	0 <sup>±</sup> 0.05		
D	3.000	3.100	3.200
D1	2.300	2.450	2.600
E	2.900	3.000	3.100
E1	3.150	3.300	3.450
E2	1.320	1.520	1.720
b	0.200	0.300	0.400
e	0.550	0.650	0.750
L	0.300	0.400	0.500
L1	0.180	0.330	0.480
L2	0 <sup>±</sup> 0.100		
L3	0 <sup>±</sup> 0.100		
H	0.315	0.415	0.515
$\theta$	8°	10°	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
E	3.20	3.30	3.40
E1	3.00	3.10	3.20
E2	1.60	1.70	1.80
e	0.65 BSC.		
H1	0.21	0.31	0.41
H2	0.30	0.40	0.50
K	0.78	0.88	0.98
L1/L2	0.10 REF.		
$\theta$	11°	12°	13°
N	0	-	0.15
0	0.2 REF.		


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