

### • General Description

The AGM216MNE 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

### Product Summary

BVDSS	RDSON	ID
20V	21mΩ	3.3A

### SOT23-6L Pin Configuration

### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM216MNE	AGM216MNE	SOT23-6L	178mm	8mm	3000

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

Symbol	Parameter	Value	Unit
$V_{DS}$	Drain-Source Voltage ( $V_{GS}=0V$ )	20	V
$V_{GS}$	Gate-Source Voltage ( $V_{DS}=0V$ )	±12	V
$I_D$	Drain Current-Continuous(TA=25°C) <b>(Note 1)</b>	3.3	A
	Drain Current-Continuous(TA=100°C)	2.1	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed <b>(Note 2)</b>	13.2	A
$P_D$	Total Power Dissipation(TA=25°C)	1.25	W
	Total Power Dissipation(TA=100°C)	0.5	W
EAS	Avalanche energy <b>(Note 3)</b>	25	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	°C

**Table 2. Thermal Characteristic**

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient (Steady State) <sup>1</sup>	---	100	°C/W

**Table 3. N- Channel 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	20	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=19.5V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±12V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	0.5	0.7	1.0	V
gFS	Forward Transconductance	VDS=5V,ID=4A	--	3	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=4.5V, ID=5A	--	21	24	mΩ
		VGS=2.5V, ID=4A	--	25	30	mΩ
<b>Dynamic Characteristics</b>						
Ciss	Input Capacitance	VDS=10V,VGS=0V, F=1MHZ	--	356	--	pF
Coss	Output Capacitance		--	67	--	pF
Crss	Reverse Transfer Capacitance		--	58	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	--	--	Ω
<b>Switching Times</b>						
td(on)	Turn-on Delay Time	VGS=4.5V,VDS=10V ID=4A,RGEN=3Ω	--	15	--	nS
tr	Turn-on Rise Time		--	50	--	nS
td(off)	Turn-Off Delay Time		--	20	--	nS
tf	Turn-Off Fall Time		--	15	--	nS
Qg	Total Gate Charge	VGS=4.5V, VDS=10V, ID=2A	--	5.4	--	nC
Qgs	Gate-Source Charge		--	0.65	--	nC
Qgd	Gate-Drain Charge		--	0.89	--	nC
<b>Source-Drain Diode Characteristics</b>						
ISD	Source-Drain Current(Body Diode)		--	--	3.3	A
VSD	Forward on Voltage	VGS=0V,IS=5A	--	--	1.2	V
trr	Reverse Recovery Time	IF=5A , dl/dt=100A/μs ,	--	--	--	ns
Qrr	Reverse Recovery Charge	TJ=25°C	--	--	--	nc

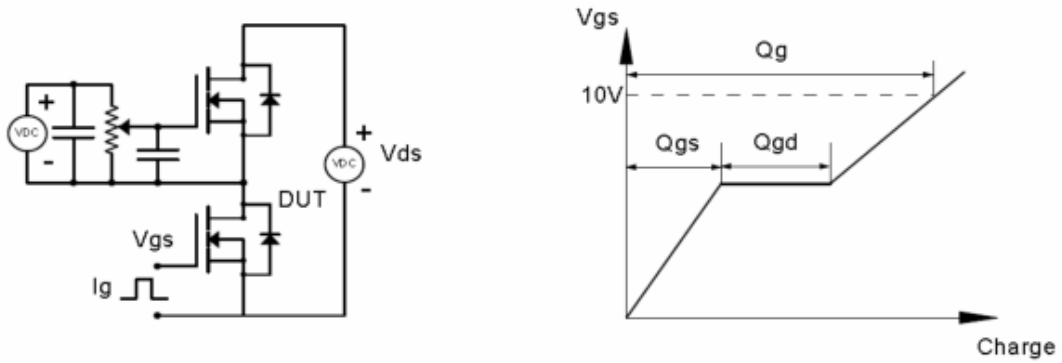
Notes 1.The maximum current rating is package limited.

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

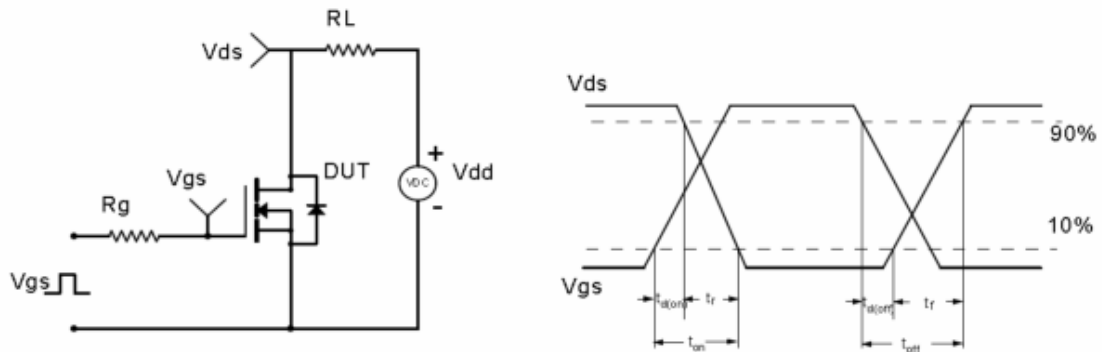
Notes 3.EAS condition: T<sub>J</sub>=25°C, VDD=15V, Vgs=10V, ID=10A, L=0.5mH, RG=25ohm

## Test Circuit & Waveform

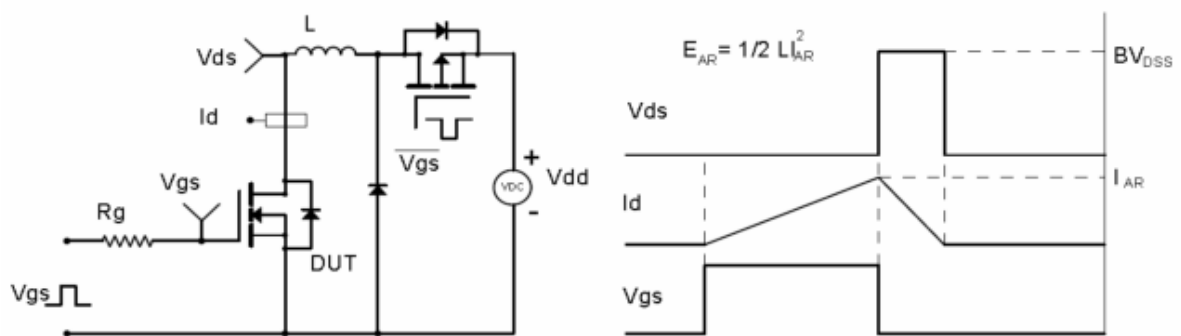
### Gate Charge Test Circuit & Waveform



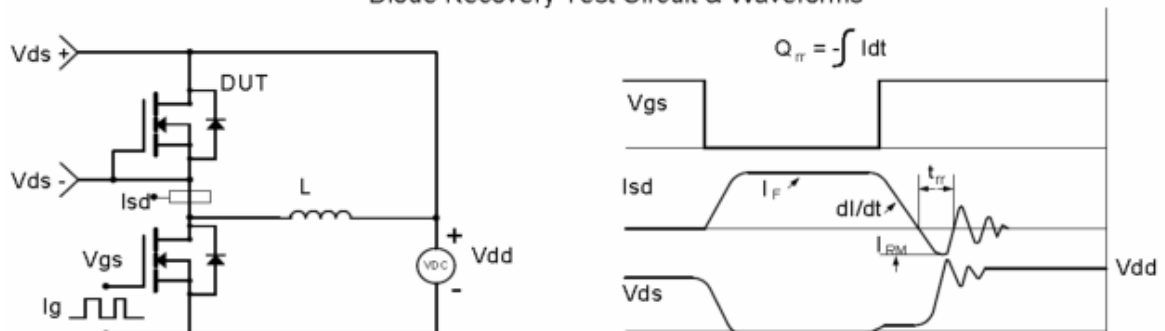
### Resistive Switching Test Circuit & Waveforms

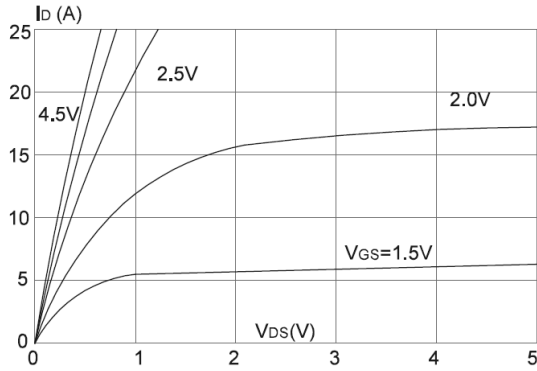
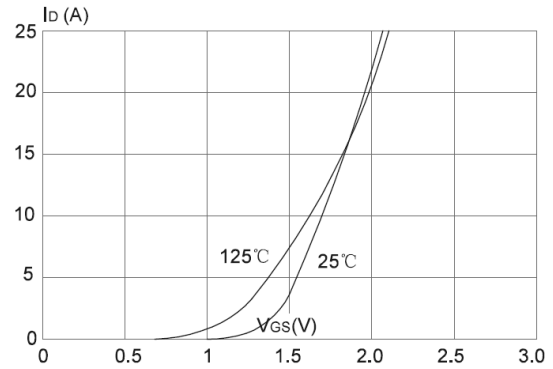
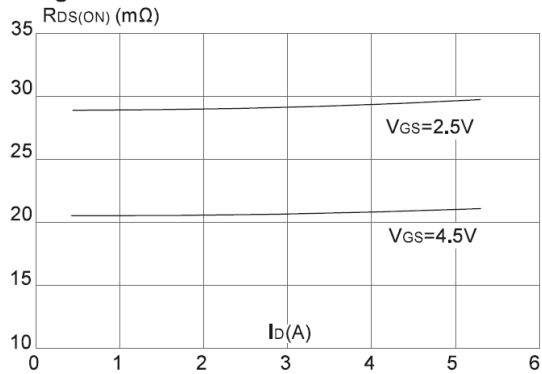
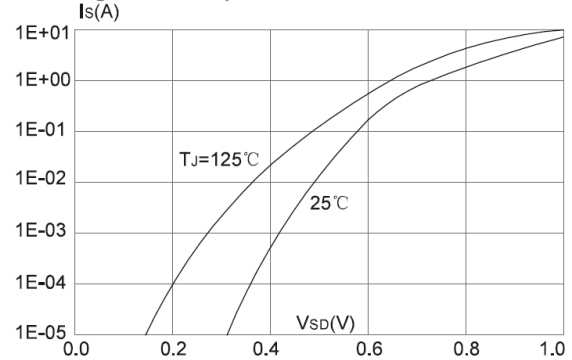
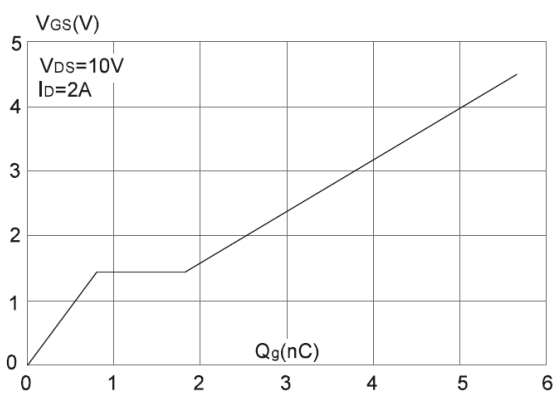
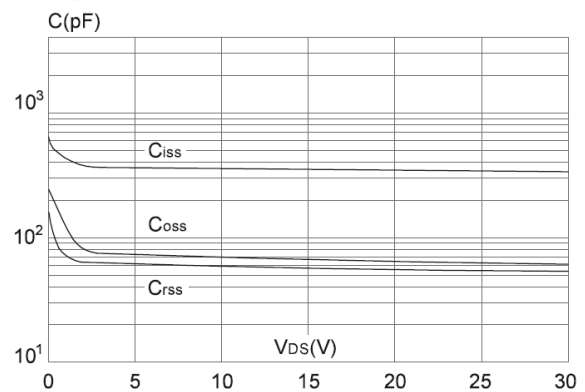


### Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

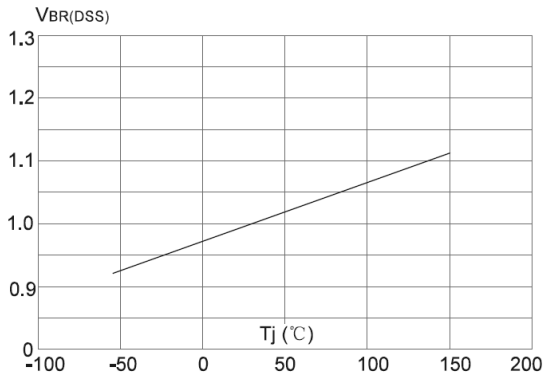


### Diode Recovery Test Circuit & Waveforms

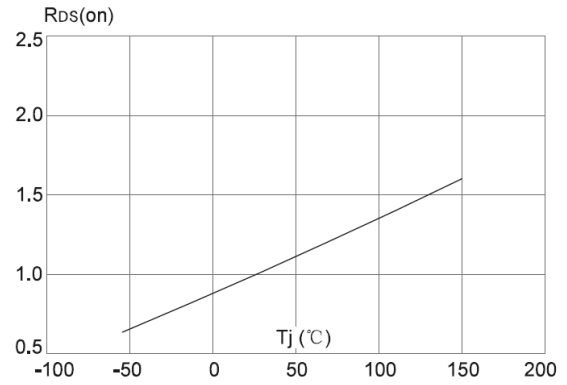


**Figure 1: Output Characteristics**

**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**



**Fig.9 Maximum Continuous Drain Current VS. Ambient Temperature**

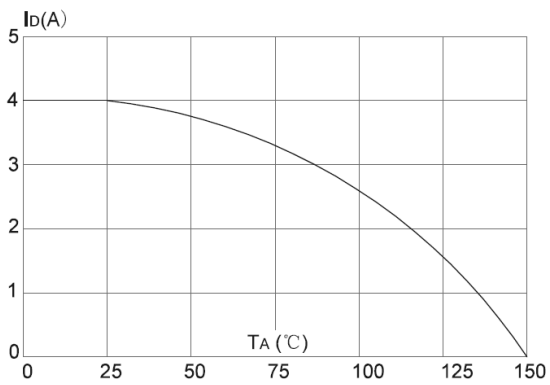


Fig.10 Maximum Safe Operating Area

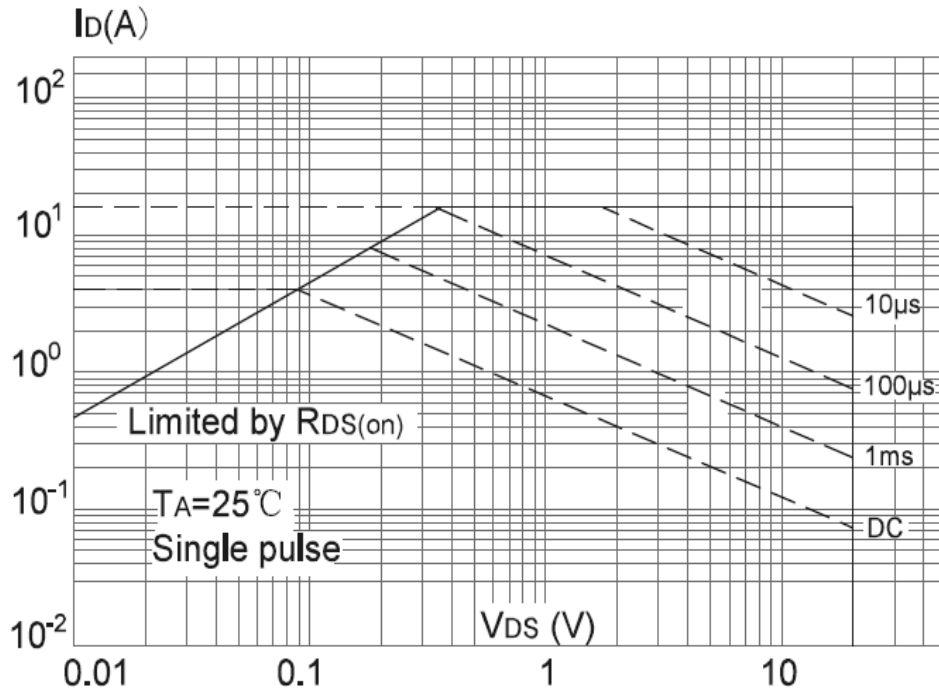
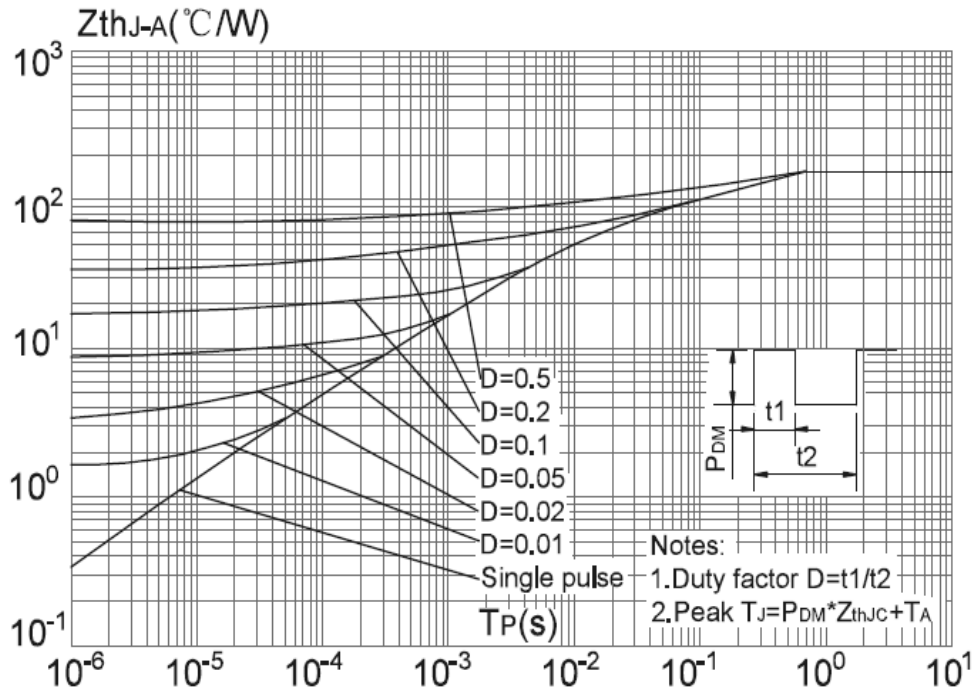
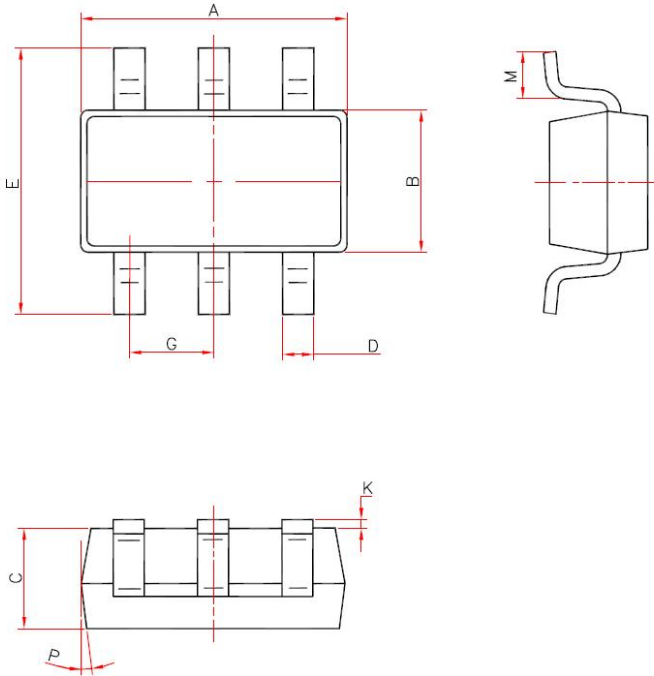


Fig. 11 Maximum Effective Transient Thermal Impedance , Junction-to-Ambient



### Package Outline Data SOT-23-6



DIM	MILLIMETERS
A	2.82~3.02
B	1.60 ± 0.10
C	1.10 ± 0.05
D	0.40 ± 0.10
E	2.65~2.95
G	0.95typ
K	0.00~0.10
M	0.20MIN
P	9 ± 2°


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