

● General Description

The AGM306MNA 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

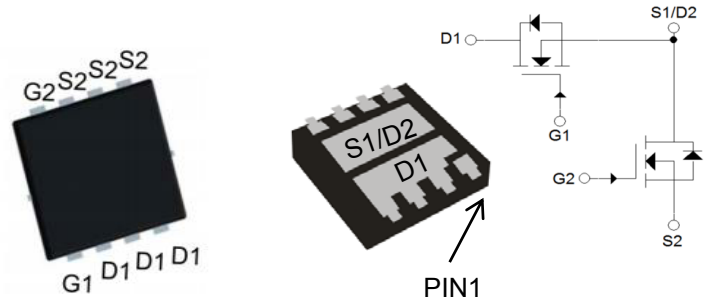
● Application

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

Product Summary

| BVDSS | RDSON | ID |
|-------|-------|-----|
| 30V | 6.8mΩ | 40A |

QFN5*6 Pin Configuration



Package Marking and Ordering Information

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity |
|----------------|-----------|----------------|-----------|------------|----------|
| AGM306MNA | AGM306MNA | QFN5*6 | ---- | ---- | 3000 |

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) (Note 1) | 40 | A |
| | Drain Current-Continuous(Tc=100°C) | 30 | A |
| IDM (pluse) | Drain Current-Continuous@ Current-Pulsed (Note 2) | 99 | A |
| PD | Maximum Power Dissipation(Tc=25°C) | 83 | w |
| | Maximum Power Dissipation(Tc=100°C) | 33 | w |
| EAS | Avalanche energy (Note 3) | 99 | 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 | --- | 1.5 | °C/W |

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|----------------------------------|--------------------------------------|-----|------|------|------|
| On/Off States | | | | | | |
| 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 | 1.2 | 1.4 | 2.1 | V |
| gFS | Forward Transconductance | VDS=10V,ID=6A | -- | 7 | -- | S |
| RDS(on) | Drain-Source On-State Resistance | VGS=10V, ID=10A | -- | 6.8 | 9.0 | mΩ |
| | | VGS=4.5V, ID=10A | -- | 9.5 | 14 | mΩ |
| Dynamic Characteristics | | | | | | |
| Ciss | Input Capacitance | VDS=15V,VGS=0V, F=1MHZ | -- | 1150 | -- | pF |
| Coss | Output Capacitance | | -- | 150 | -- | pF |
| Crss | Reverse Transfer Capacitance | | -- | 110 | -- | pF |
| Rg | Gate resistance | VGS=0V, VDS=-0V,f=1.0MHz | -- | 1.7 | -- | Ω |
| Switching Times | | | | | | |
| td(on) | Turn-on Delay Time | VGS=10V,VDS=12V, ID=5A, RGEN=3.3Ω | -- | 4.5 | -- | nS |
| tr | Turn-on Rise Time | | -- | 11 | -- | nS |
| td(off) | Turn-Off Delay Time | | -- | 25 | -- | nS |
| tf | Turn-Off Fall Time | | -- | 9.6 | -- | nS |
| Qg | Total Gate Charge | VGS=10V, VDS=25V, ID=10A | -- | 23 | -- | nC |
| Qgs | Gate-Source Charge | | -- | 3 | -- | nC |
| Qgd | Gate-Drain Charge | | -- | 6.0 | -- | nC |
| Source-Drain Diode Characteristics | | | | | | |
| ISD | Source-Drain Current(Body Diode) | | -- | -- | 40 | A |
| VSD | Forward on Voltage | VGS=0V,IS=10A | -- | -- | 1.2 | V |
| trr | Reverse Recovery Time | IF=15A , dI/dt=100A/μs , TJ=25°C | -- | -- | 6.5 | ns |
| Qrr | Reverse Recovery Charge | | -- | -- | 7 | 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,VDD=15V,VG=10V, RG=25Ω

Fig.1 Power Dissipation Derating Curve

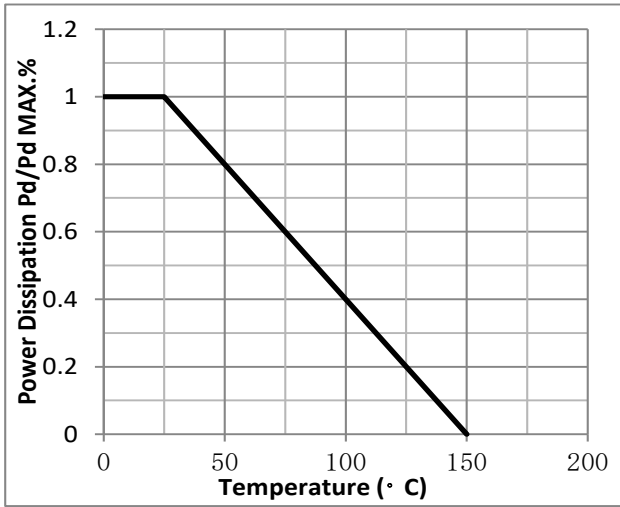


Fig.2 Typical output Characteristics

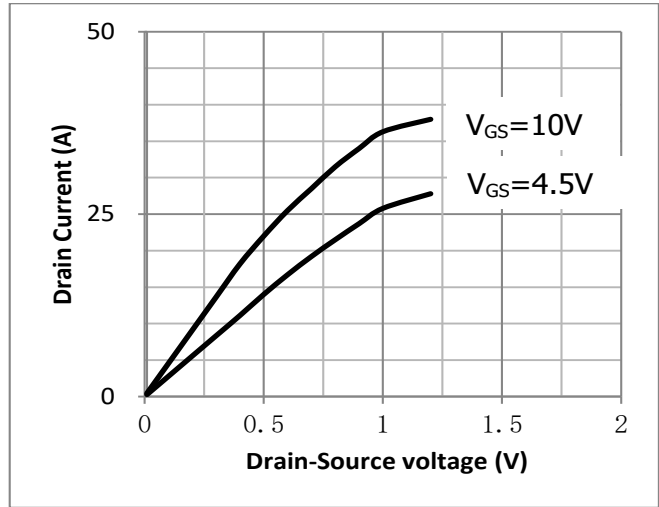


Fig.3 Threshold Voltage V.S Junction Temperature

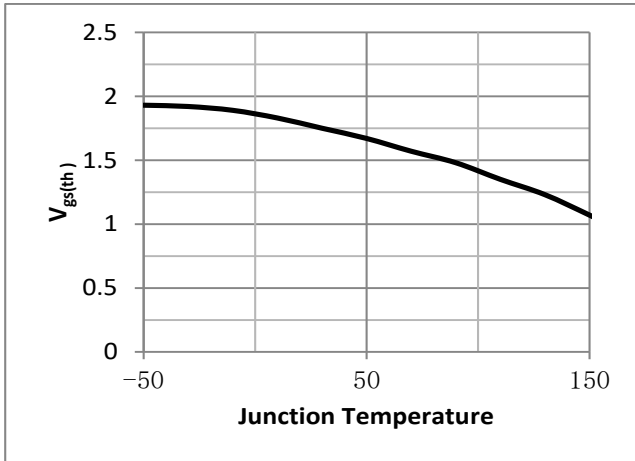


Fig.4 Resistance V.S Drain Current

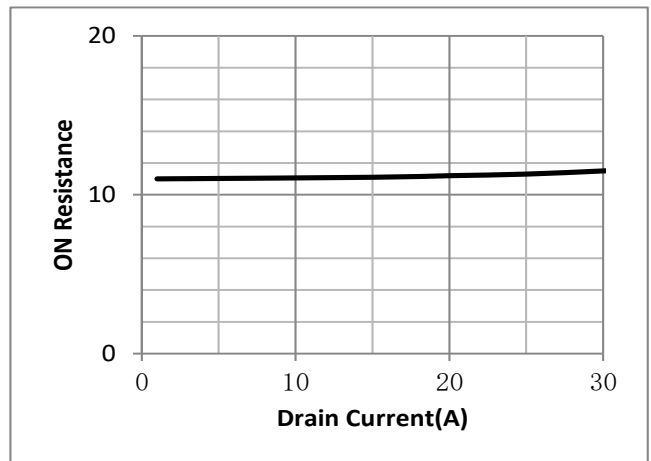


Fig.5 On-Resistance VS Gate Source Voltage

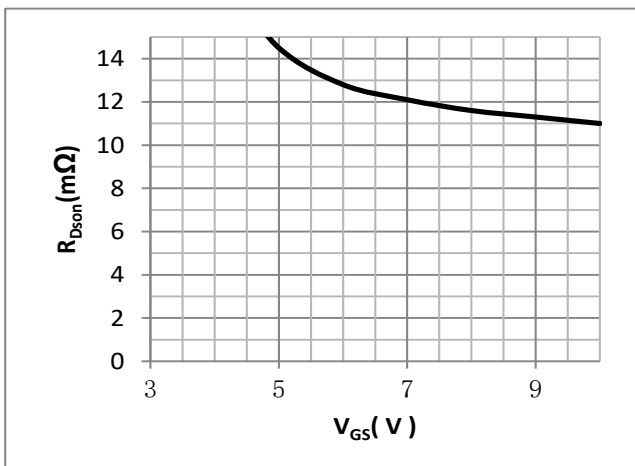


Fig.6 On-Resistance V.S Junction Temperature

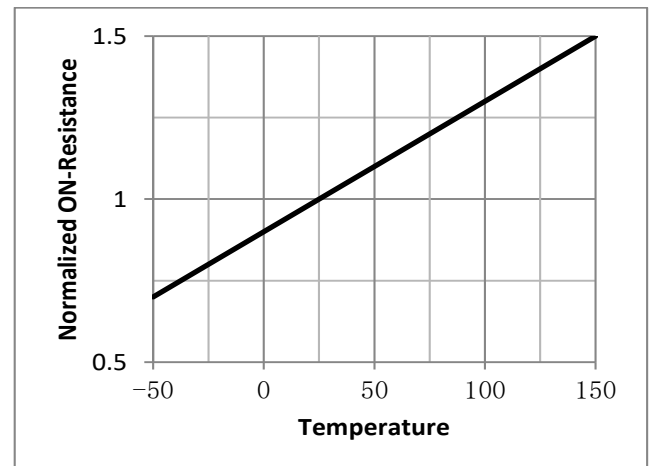


Fig.7 Switching Time Measurement Circuit

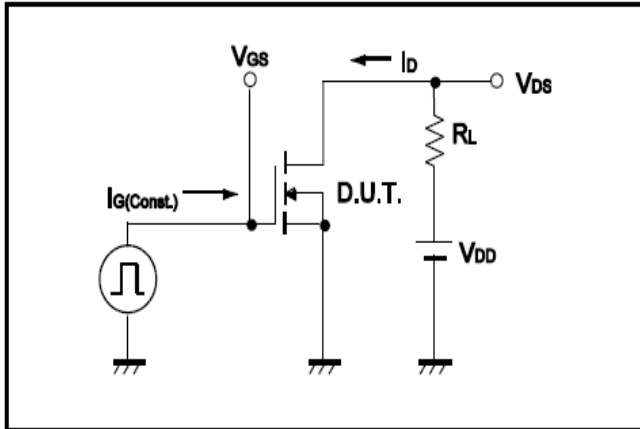


Fig.8 Gate Charge Waveform

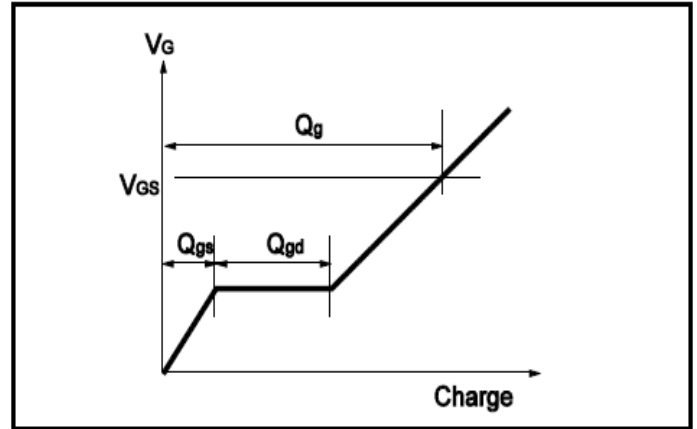


Fig.9 Switching Time Measurement Circuit

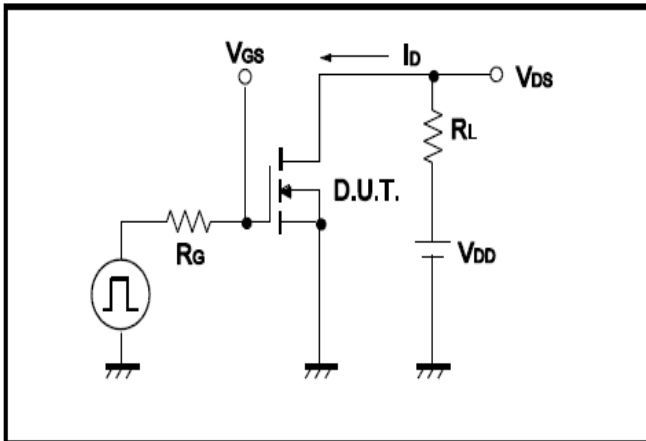


Fig.10 Gate Charge Waveform

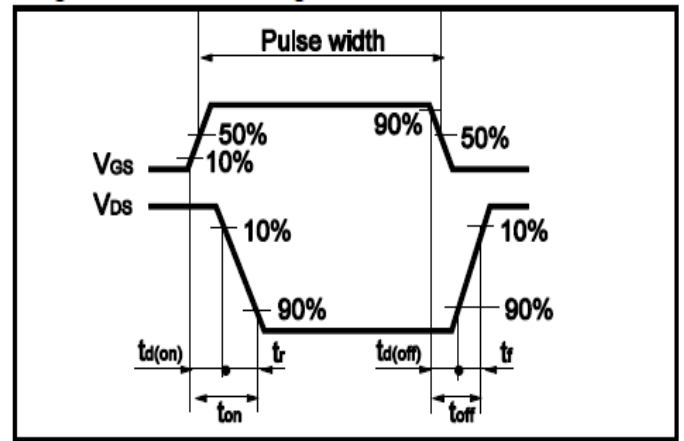


Fig.11 Avalanche Measurement Circuit

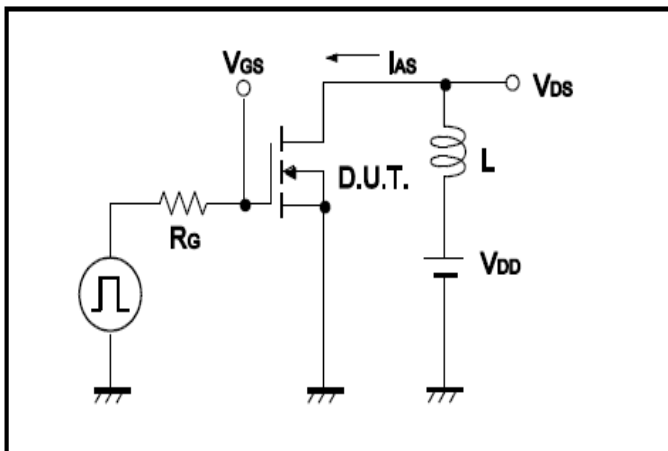
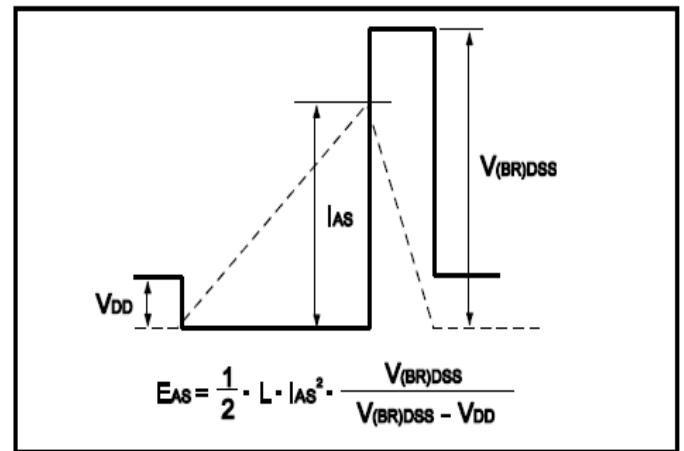
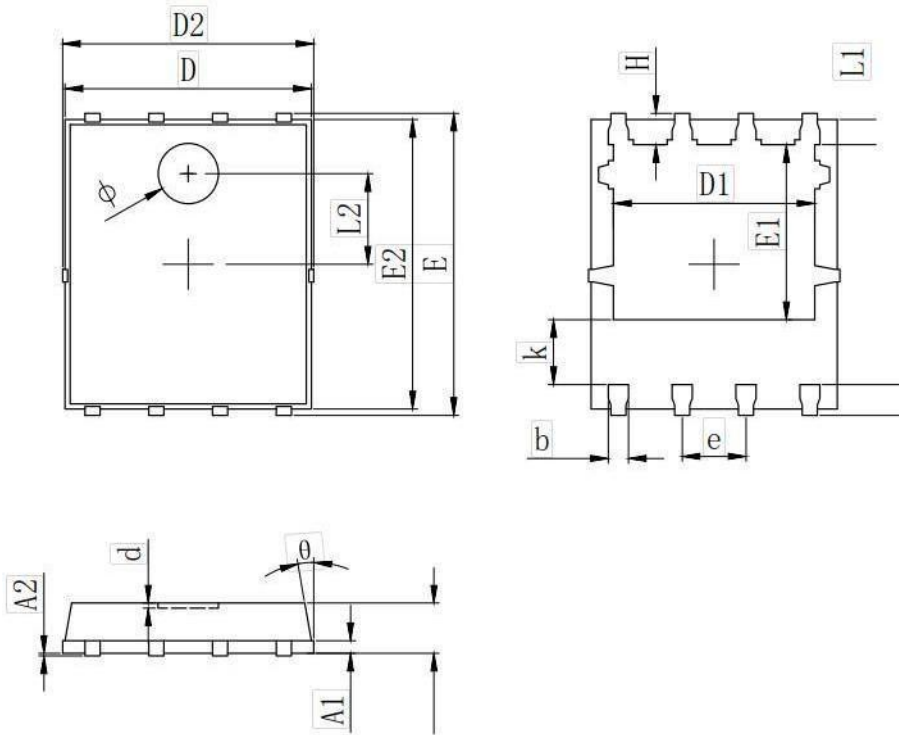


Fig.12 Avalanche Waveform



•Dimensions (DFN5×6)


| SYMBOL | MILLIMETER | | |
|---------------|------------|-------|-------|
| | MIN | Typ. | MAX |
| A | 0.900 | 1.000 | 1.100 |
| A1 | 0.254 REF. | | |
| A2 | 0~0.05 | | |
| D | 4.824 | 4.900 | 4.976 |
| D1 | 3.910 | 4.010 | 4.110 |
| D2 | 4.924 | 5.000 | 5.076 |
| E | 5.924 | 6.000 | 6.076 |
| E1 | 3.375 | 3.475 | 3.575 |
| E2 | 5.674 | 5.750 | 5.826 |
| b | 0.350 | 0.400 | 0.450 |
| e | 1.270 TYP. | | |
| L | 0.534 | 0.610 | 0.686 |
| L1 | 0.424 | 0.500 | 0.576 |
| L2 | 1.800 REF. | | |
| k | 1.190 | 1.290 | 1.390 |
| H | 0.549 | 0.625 | 0.701 |
| θ | 8° | 10° | 12° |
| \varnothing | 1.100 | 1.200 | 1.300 |
| d | | | 0.100 |


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