

## General Description

The AGM614MN 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

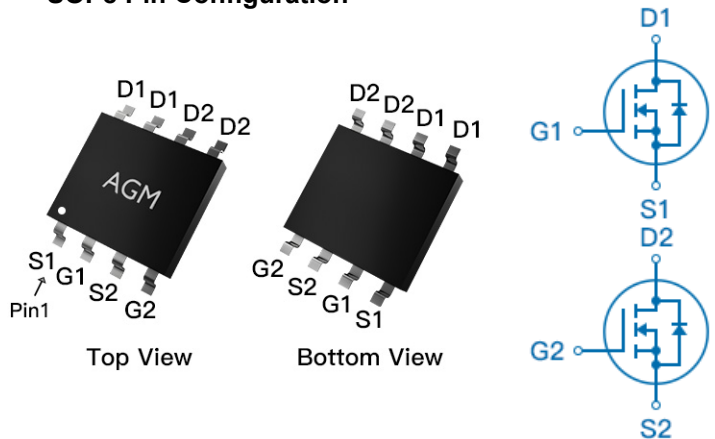
## Application

- Electronic Ballast
- Electronic Transformer
- Switch Mode Power Supply

## Product Summary

| BVDSS | RDSON  | ID  |
|-------|--------|-----|
| 60V   | 14.5mΩ | 17A |

## SOP8 Pin Configuration



## Package Marking and Ordering Information

| Device Marking | Device   | Device Package | Reel Size | Tape width | Quantity |
|----------------|----------|----------------|-----------|------------|----------|
| AGM614MN       | AGM614MN | SOP8           | 330mm     | 12mm       | 3000     |

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

| Symbol      | Parameter                                         | Value      | Unit |
|-------------|---------------------------------------------------|------------|------|
| VDS         | Drain-Source Voltage (VGS=0V)                     | 60         | V    |
| VGS         | Gate-Source Voltage (VDS=0V)                      | ±20        | V    |
| ID          | Drain Current-Continuous(Tc=25°C) <b>(Note 1)</b> | 17         | A    |
|             | Drain Current-Continuous(Tc=100°C)                | 10         | A    |
| IDM (pluse) | Drain Current-Pulsed <b>(Note 2)</b>              | 68         | A    |
| PD          | Maximum Power Dissipation(Tc=25°C)                | 6.3        | w    |
|             | Maximum Power Dissipation(Tc=100°C)               | 2.5        | w    |
| EAS         | Avalanche energy <b>(Note 3)</b>                  | 72         | 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> | --- | 60  | °C/W |

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

| Symbol                             | Parameter                        | Conditions                                 | Min | Typ  | Max  | Unit |
|------------------------------------|----------------------------------|--------------------------------------------|-----|------|------|------|
| On/Off States                      |                                  |                                            |     |      |      |      |
| BVDSS                              | Drain-Source Breakdown Voltage   | VGS=0V ID=250μA                            | 60  | --   | --   | V    |
| IDSS                               | Zero Gate Voltage Drain Current  | VDS=60V,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 | 1.6  | 2.2  | V    |
| gFS                                | Forward Transconductance         | VDS=5V,ID=6A                               | --  | 5    | --   | S    |
| RDS(on)                            | Drain-Source On-State Resistance | VGS=10V, ID=10A                            | --  | 14.5 | 17.5 | mΩ   |
|                                    |                                  | VGS=4.5V, ID=6A                            | --  | 20   | 25.5 | mΩ   |
| Dynamic Characteristics            |                                  |                                            |     |      |      |      |
| Ciss                               | Input Capacitance                | VDS=30V,VGS=0V,<br>F=1MHZ                  | --  | 657  | --   | pF   |
| Coss                               | Output Capacitance               |                                            | --  | 227  | --   | pF   |
| Crss                               | Reverse Transfer Capacitance     |                                            | --  | 13   | --   | pF   |
| Rg                                 | Gate resistance                  | VGS=0V,<br>VDS=0V,f=1.0MHz                 | --  | 2.5  | --   | Ω    |
| Switching Times                    |                                  |                                            |     |      |      |      |
| td(on)                             | Turn-on Delay Time               | VDD=30V,<br>RD =5Ω,<br>RG = 10Ω<br>VGS=10V | --  | 6.0  | --   | nS   |
| tr                                 | Turn-on Rise Time                |                                            | --  | 14   | --   | nS   |
| td(off)                            | Turn-Off Delay Time              |                                            | --  | 12   | --   | nS   |
| tf                                 | Turn-Off Fall Time               |                                            | --  | 3.0  | --   | nS   |
| Qg                                 | Total Gate Charge                | VGS=10V, VDD=30V,<br>ID=10A                | --  | 13.2 | --   | nC   |
| Qgs                                | Gate-Source Charge               |                                            | --  | 1.87 | --   | nC   |
| Qgd                                | Gate-Drain Charge                |                                            | --  | 3.33 | --   | nC   |
| Source-Drain Diode Characteristics |                                  |                                            |     |      |      |      |
| ISD                                | Source-Drain Current(Body Diode) |                                            | --  | --   | 17   | A    |
| VSD                                | Forward on Voltage               | VGS=0V,ISD=10A                             | --  | --   | 1.2  | V    |
| trr                                | Reverse Recovery Time            | VDD=30V,IF=10A ,<br>dI/dt=100A/μs , TJ=25℃ | --  | --   | --   | 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, VDD=30V, Vgs=10V, ID=17A, L=0.5mH, RG=25ohm

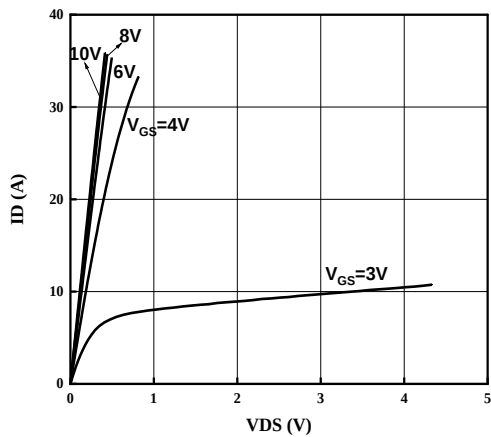


Fig1. Typical Output Characteristics

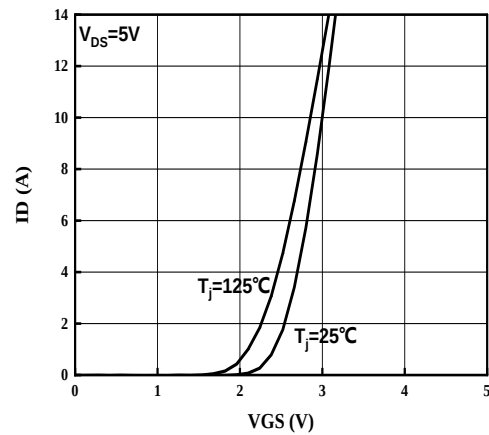


Fig2. Typical Transfer Characteristics

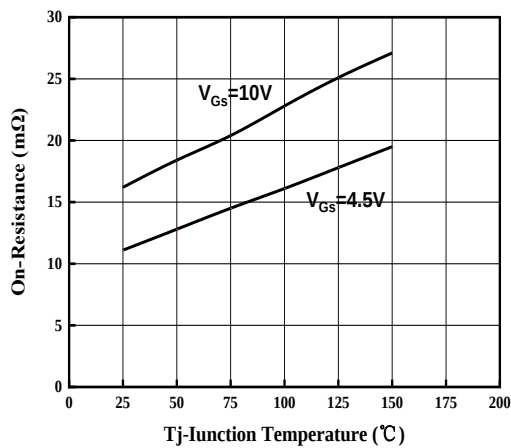


Fig3. On-Resistance Vs. Temperature

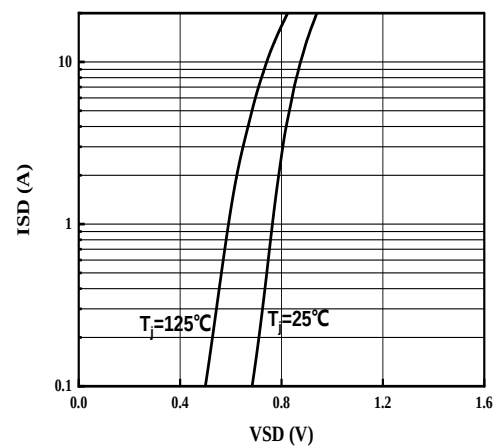


Fig4. Typical Source-Drain Diode Forward Voltage

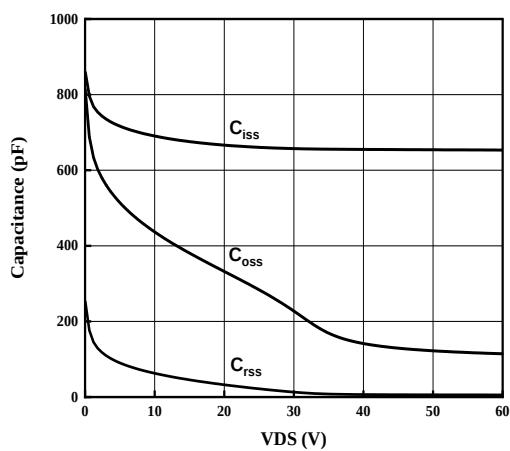


Fig5. Typical Capacitance

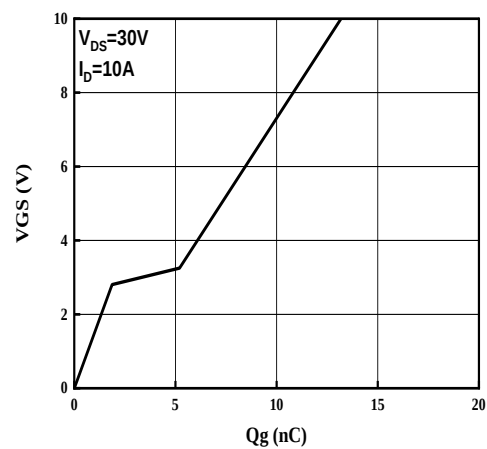


Fig6. Typical Gate Charge

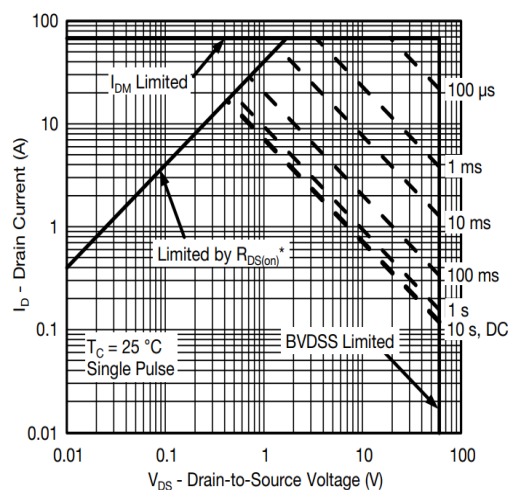


Fig7. Safe Operating Area

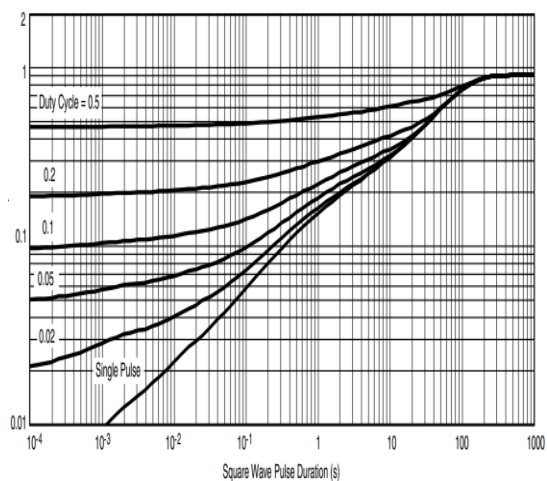
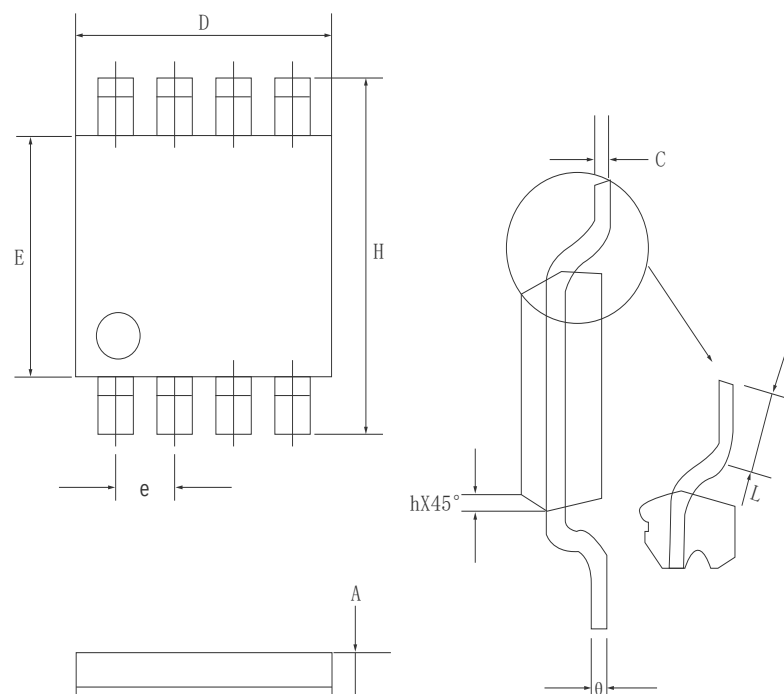
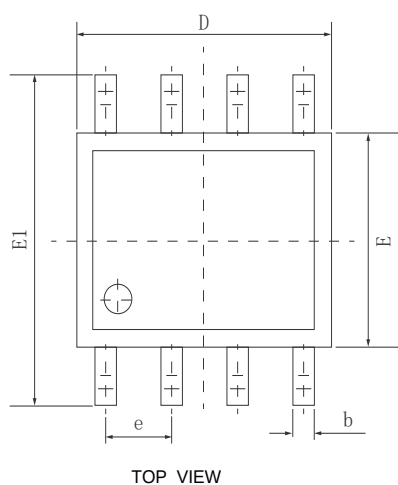


Fig8. Normalized transient thermal impedance

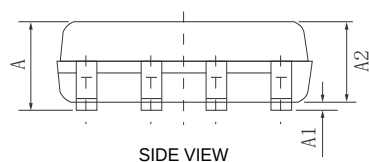
# Dimensions (SOP8)



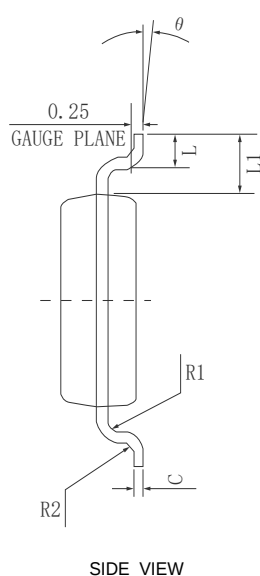
| DIM | MILLIMETERS |      |
|-----|-------------|------|
|     | MIN         | MAX  |
| A   | 1.35        | 1.75 |
| A1  | 0.02        | 0.15 |
| B   | 0.33        | 0.5  |
| C   | 0.1         | 0.25 |
| D   | 4.8         | 5    |
| E   | 3.8         | 4    |
| e   | 1.27 (BSC)  |      |
| H   | 5.8         | 6.2  |
| h   | 0.25        | 0.5  |
| I   | 0.4         | 1.25 |
| θ   | 0°          | 7°   |



TOP VIEW



SIDE VIEW

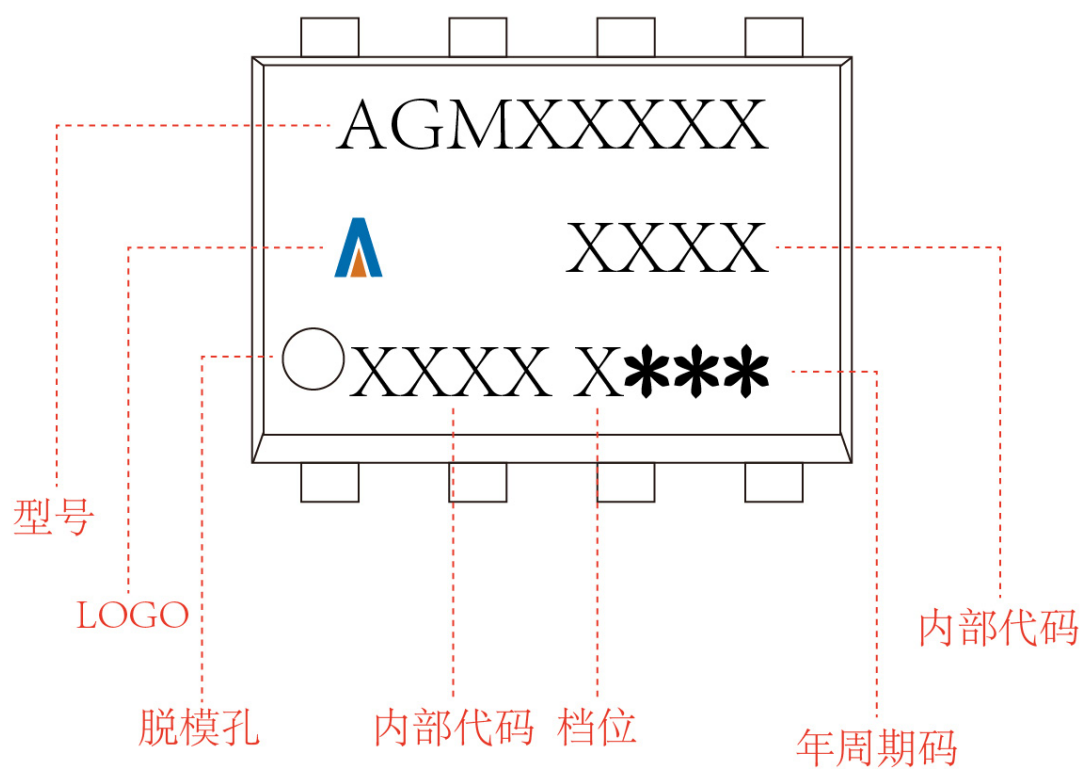


SIDE VIEW

| SYMBOL | MIN      | NOM   | MAX   |
|--------|----------|-------|-------|
| A      | 1.40     | 1.60  | 1.80  |
| A1     | 0.05     | 0.15  | 0.25  |
| A2     | 1.35     | 1.45  | 1.55  |
| b      | 0.30     | 0.40  | 0.50  |
| c      | 0.153    | 0.203 | 0.253 |
| D      | 4.80     | 4.90  | 5.00  |
| E      | 3.80     | 3.90  | 4.00  |
| E1     | 5.80     | 6.00  | 6.20  |
| L      | 0.45     | 0.70  | 1.00  |
| θ      | 2°       | 4°    | 6°    |
| L1     | 1.04 REF |       |       |
| e      | 1.27 BSC |       |       |
| R1     | 0.07 TYP |       |       |
| R2     | 0.07 TYP |       |       |

# SOP8

## Marking Instructions:



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