

### ● General Description

The AGM4018S 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

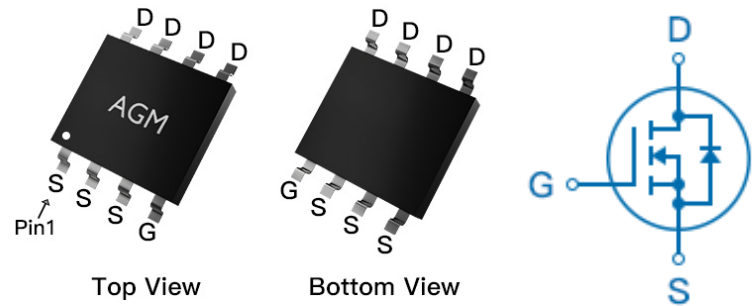
### ● Application

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

### Product Summary

| BVDSS | RDS(ON) | ID  |
|-------|---------|-----|
| 48V   | 5.8mΩ   | 18A |

### SOP8 Pin Configuration



### Package Marking and Ordering Information

| Device Marking | Device   | Device Package | Reel Size | Tape width | Quantity |
|----------------|----------|----------------|-----------|------------|----------|
| AGM4018S       | AGM4018S | SOP8           | 330mm     | 12mm       | 3000     |

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

| Symbol      | Parameter   | Value      | Unit |
|-------------|---|------------|------|
| VDS         | Drain-Source Voltage (VGS=0V)                     | 48         | V    |
| VGS         | Gate-Source Voltage (VDS=0V)                      | ±20        | V    |
| ID          | Drain Current-Continuous(TA=25°C) <b>(Note 1)</b> | 18         | A    |
|             | Drain Current-Continuous(TA=100°C)                | 7.0        | A    |
| IDM (pulse) | Drain Current-Pulsed <b>(Note 2)</b>              | 72         | A    |
| PD          | Maximum Power Dissipation(TA=25°C)                | 2.5        | w    |
|             | Maximum Power Dissipation(TA=100°C)               | 1.0        | w    |
| EAS         | Avalanche energy <b>(Note 3)</b>                  | 210        | 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 |

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

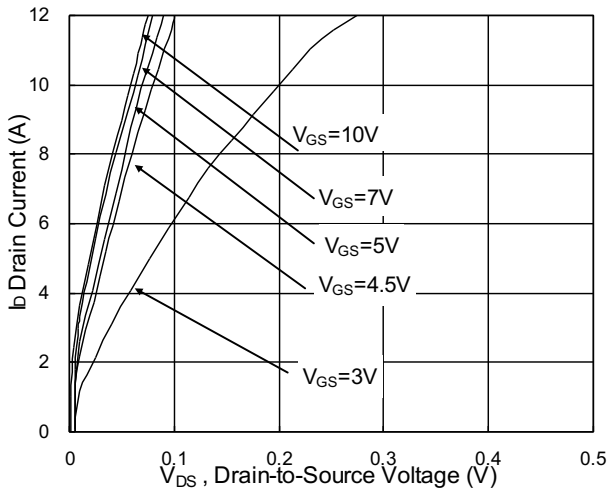
| Symbol                                    | Parameter                        | Conditions                          | Min | Typ  | Max  | Unit |
|---|----------------------------------|-------------------------------------|-----|------|------|------|
| <b>On/Off States</b>                      |                                  |                                     |     |      |      |      |
| BVDSS                                     | Drain-Source Breakdown Voltage   | VGS=0V ID=250μA                     | 48  | --   | --   | V    |
| IDSS                                      | Zero Gate Voltage Drain Current  | VDS=40V,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 | 1.5  | 2.2  | V    |
| gFS                                       | Forward Transconductance         | VDS=5V,ID=10A                       | --  | 29   | --   | S    |
| RDS(on)                                   | Drain-Source On-State Resistance | VGS=10V, ID=15A                     | --  | 5.8  | 8.5  | mΩ   |
|   |                                  | VGS=4.5V, ID=10A                    | --  | 8.5  | 11   | mΩ   |
| <b>Dynamic Characteristics</b>            |                                  |                                     |     |      |      |      |
| Ciss                                      | Input Capacitance                | VDS=20V,VGS=0V<br>,F=1MHZ           | --  | 2332 | --   | pF   |
| Coss                                      | Output Capacitance               |                                     | --  | 193  | --   | pF   |
| Crss                                      | Reverse Transfer Capacitance     |                                     | --  | 138  | --   | pF   |
| Rg  | Gate resistance                  | VGS=0V,<br>VDS=0V,f=1.0MHz          | --  | 1.6  | --   | Ω    |
| <b>Switching Times</b>                    |                                  |                                     |     |      |      |      |
| td(on)                                    | Turn-on Delay Time               | VGS=10V,VDS=15V,<br>ID=1A,RGEN=3.3Ω | --  | 14.3 | --   | nS   |
| tr  | Turn-on Rise Time                |                                     | --  | 2.6  | --   | nS   |
| td(off)                                   | Turn-Off Delay Time              |                                     | --  | 77   | --   | nS   |
| tf  | Turn-Off Fall Time               |                                     | --  | 4.8  | --   | nS   |
| Qg  | Total Gate Charge                | VGS=4.5V,<br>VDS=20V, ID=12A        | --  | 18.8 | --   | nC   |
| Qgs                                       | Gate-Source Charge               |                                     | --  | 4.7  | --   | nC   |
| Qgd                                       | Gate-Drain Charge                |                                     | --  | 8.2  | --   | nC   |
| <b>Source-Drain Diode Characteristics</b> |                                  |                                     |     |      |      |      |
| ISD                                       | Source-Drain Current(Body Diode) |                                     | --  | --   | 18   | A    |
| VSD                                       | Forward on Voltage               | VGS=0V,IS=15A                       | --  | --   | 1.2  | V    |
| trr                                       | Reverse Recovery Time            | IF=15A , di/dt=100A/μs ,<br>TJ=25°C | --  | --   | --   | ns   |
| Qrr                                       | Reverse Recovery Charge          |                                     | --  | --   | --   | nc   |

Notes 1.The maximum current rating is package limited.

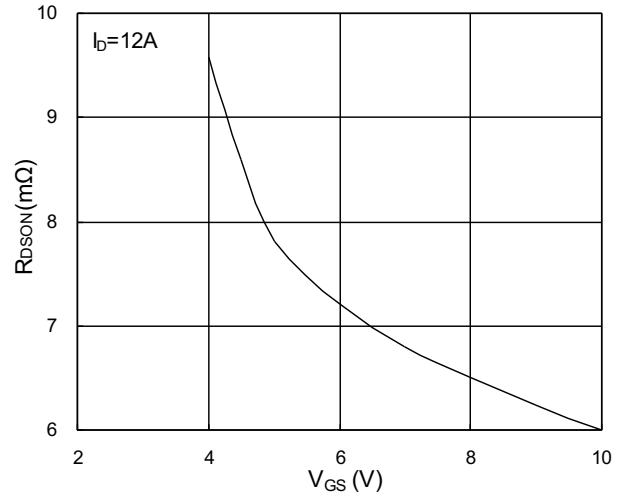
Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: T<sub>J</sub>=25°C ,VDD=25V,Vgs=10V,ID=29A,L=0.5mH,RG=25ohm

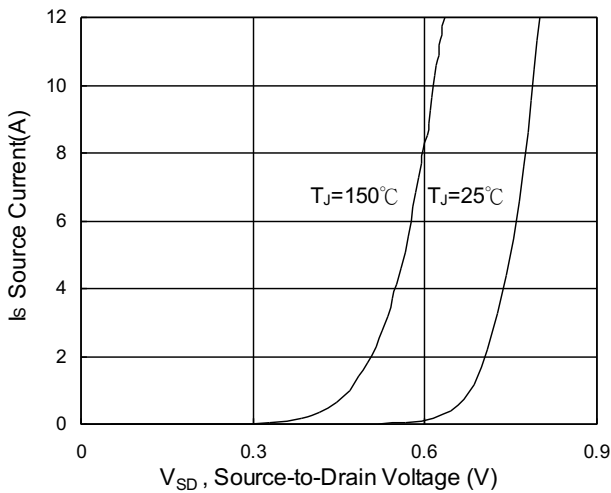
### Typical Characteristics



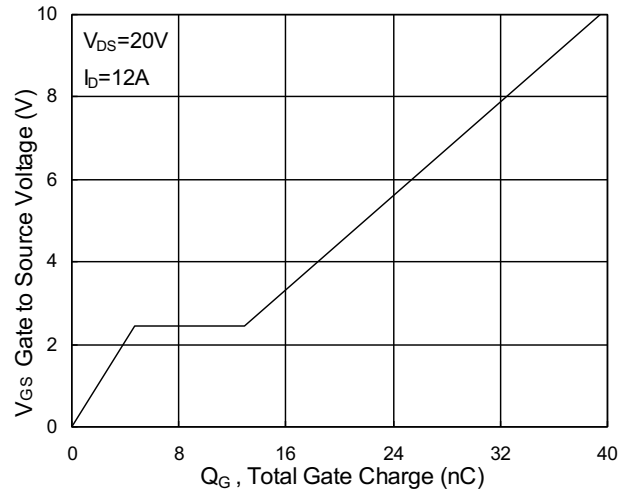
**Fig.1 Typical Output Characteristics**



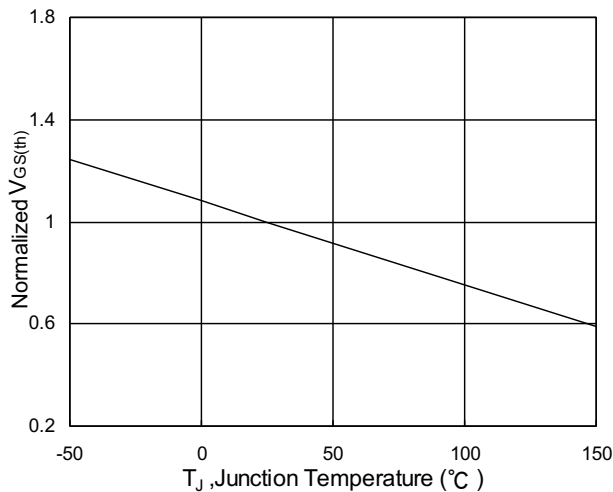
**Fig.2 On-Resistance vs. G-S Voltage**



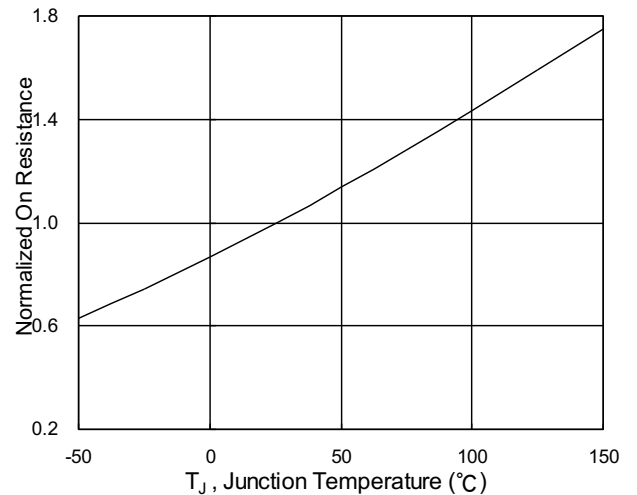
**Fig.3 Forward Characteristics of Reverse**



**Fig.4 Gate-Charge Characteristics**



**Fig.5 Normalized V<sub>GS(th)</sub> vs. T<sub>J</sub>**



**Fig.6 Normalized R<sub>DS(on)</sub> vs. T<sub>J</sub>**

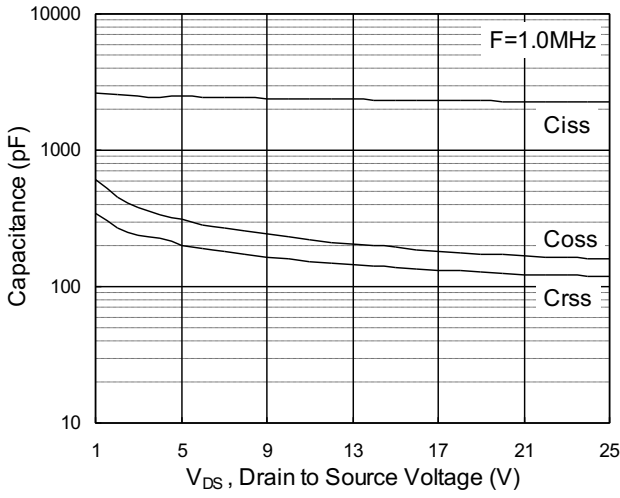


Fig.7 Capacitance

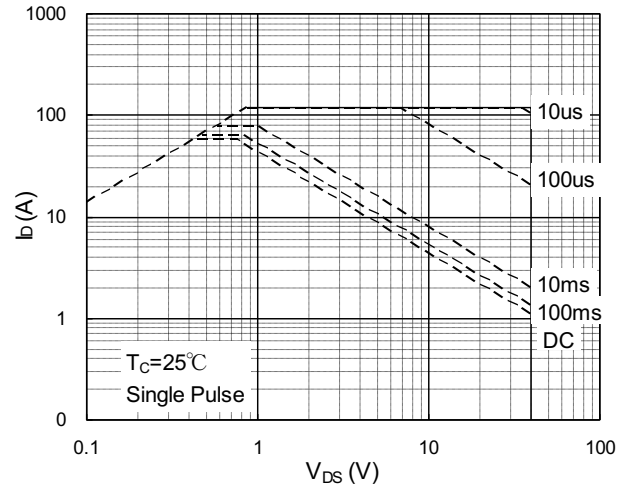


Fig.8 Safe Operating Area

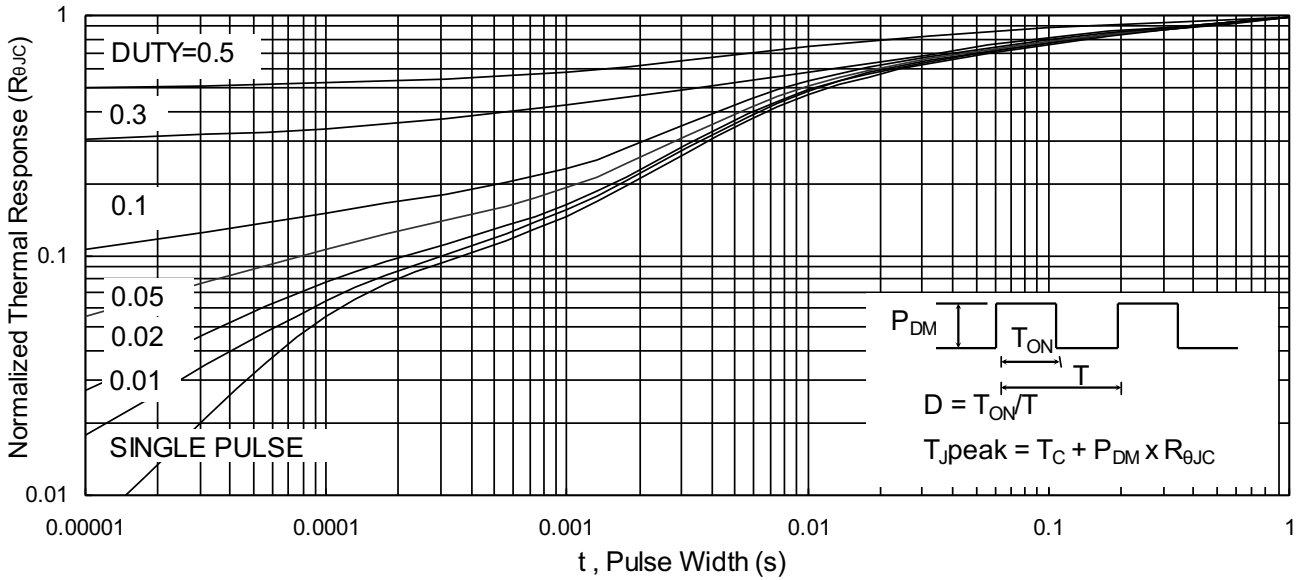


Fig.9 Normalized Maximum Transient Thermal Impedance

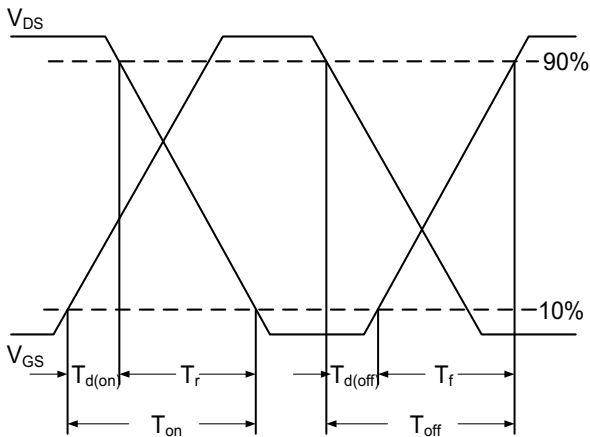


Fig.10 Switching Time Waveform

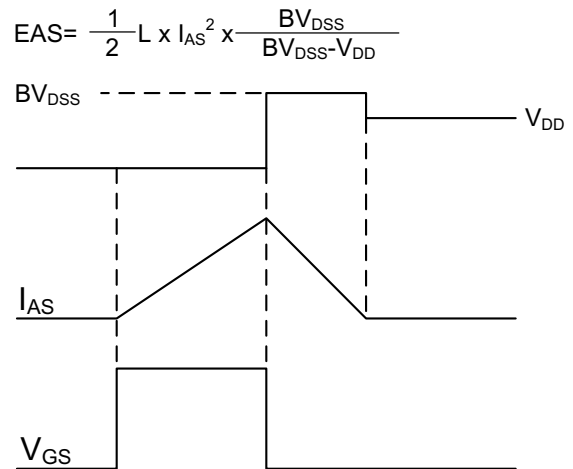
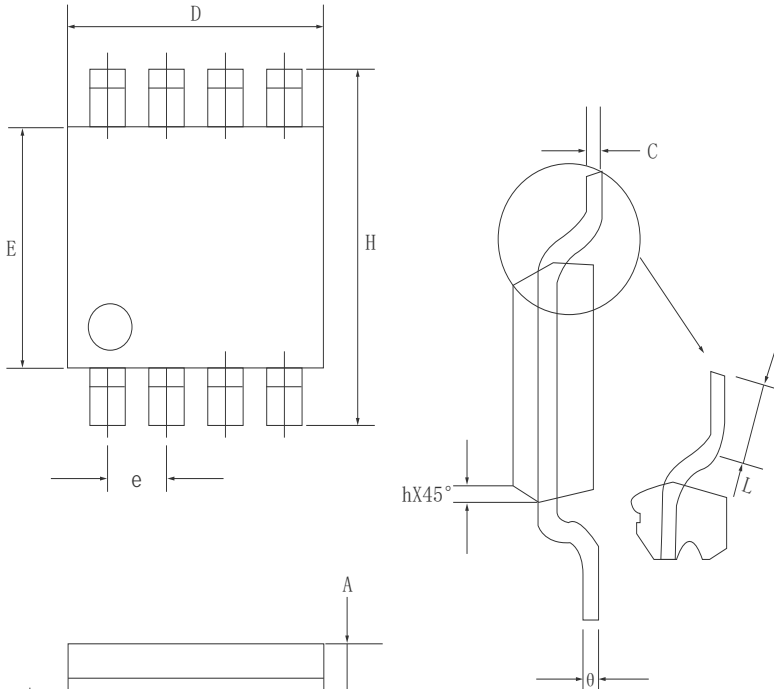
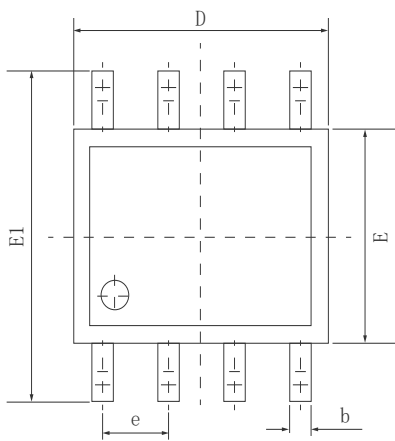
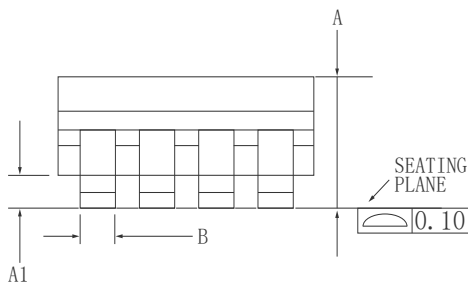


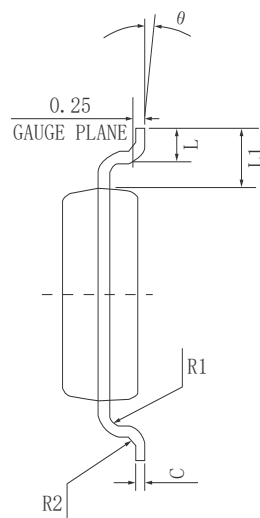
Fig.11 Unclamped Inductive Waveform

**•Dimensions (SOP8)**


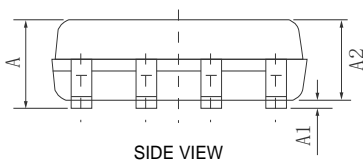
| DIM      | MILLIMETERS |           |
|----------|-------------|-----------|
|          | MIN         | MAX       |
| A        | 1.35        | 1.75      |
| A1       | 0.02        | 0.15      |
| B        | 0.33        | 0.5       |
| C        | 0.1         | 0.25      |
| D        | 4.8         | 5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



TOP VIEW



SIDE VIEW

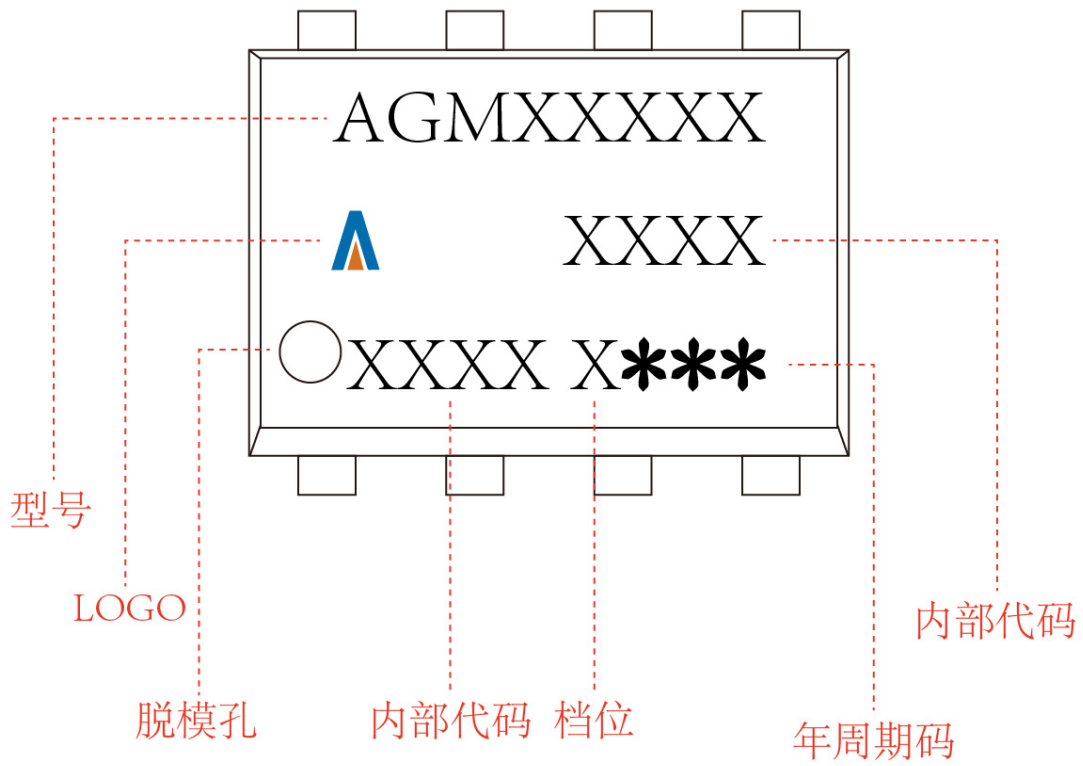


SIDE VIEW

| 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      |
| $\theta$ | $2^\circ$ | $4^\circ$ | $6^\circ$ |
| L1       | 1.04 REF  |           |           |
| e        | 1.27 BSC  |           |           |
| R1       | 0.07 TYP  |           |           |
| R2       | 0.07 TYP  |           |           |

SOP8

Marking Instructions:



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